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Authorized Developer

SmartDraft 26 Help

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Welcome to SmartDraft 26 Help

SmartDraft Suite

For AutoCAD and BricsCAD
Suite is our comprehensive set of AutoCAD® and BricsCAD® productivity enhancements. Suite provides tools for labeling plan and profile design, site layout, managing block (symbol) libraries, point placement and labeling, and many general drafting enhancements. These tools are tailored to civil engineers, surveyors, mapping professionals, and drafting professionals.

SmartDraft Survey

For AutoCAD and BricsCAD
Survey is a subset of SmartDraft Suite which focuses on surveyors and mapping professionals. Survey provides tools to label and modify labels of lines and curves with bearings, distances, deltas, radii, tangents, etc. Survey also offers tools to place and label points, create closure reports, and write legal descriptions from polylines or parcels, as well as tools for planview layout.

SmartDraft PConnect

For AutoCAD and BricsCAD
PConnect is an easy to use and superior point-connection tool designed to combine the best features of attributed point coding with an easily controlled, yet powerful, 2D and 3D line control language. PConnect's enhanced suffix codes give the operator increased flexibility and the ability to produce automated linework and layering. PConnect can use your company's specific description keys, combined with its suffix codes, to create robust geometry from surveyed data collected in the field. The linework is drawn on specified layers as defined by a Description Key Style file.

SmartDraft Construction Notes

For AutoCAD and BricsCAD
SmartDraft Construction Notes tools automates the process of placing construction notes and creating a construction notes table or list. Use reference symbol only, leaders with reference symbol, multiple leader with reference symbol, leaders with text, or leader, reference symbol, and text Once the construction note reference symbols are placed, a construction notes table can be created from the symbols.

SmartDraft HEC-RAS Tools

For AutoCAD Civil 3D and Land Desktop Only
HEC-RAS Tools provide an excellent set of tools for exchanging data between Civil 3D and HEC-RAS. Create a HEC-RAS data file from section lines, an alignment, and a surface. Create section lines at specified stations along an alignment. Import a HEC-RAS floodplain line into Civil 3D. Draw HEC-HAS Cross Section in Civil 3D. And more.

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Special thanks to:

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Part I

1 Welcome

SmartDraft® 26 *Ignite Your Productivity!*



http://www.smartdraft.com

Help file version: 26.2.3

Last updated: 11/9/2026

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SmartDraft® is designed to make AutoCAD®, AutoCAD Civil 3D®, AutoCAD Map 3D®, and BricsCAD® more productive for civil engineers, mapping professionals, and surveyors. It is the result of extensive research and development, combined with many years of experience in the engineering field. ***SmartDraft! Ignite your productivity.***

For support:

See Support Information

1.1 Introduction

SmartDraft® 26 *Ignite Your Productivity!*

Select an item below for more information on SmartDraft:

Suite

Survey

Construction Notes

Pipe 2 Polyline

Contact Us

Help file version: 26.2.3

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1.2 Credits

Credits

To build the installation/setup program, we used:

Inno Setup, an installer for Windows programs. © 1997-2010 Jordan Russell. All rights reserved.
Internet: http://www.jrsoftware.org/

To create the Help file and Manual, we used:

Help & Manual, © 2019 EC Software GmbH. All rights reserved.
Internet: http://www.ec-software.com/

1.3 SmartDraft Supports and Requirements

Supports and disk space requirements:

* AutoCAD Civil 3D 2022 - 2027 * or
* AutoCAD Map 3D 2022 - 2027 * or
* AutoCAD 2022 - 2027 * or
* BricsCAD Pro v24 - v27 *

* BricsCAD Pro for civil points, surfaces, and gradings, alignments, 3d alignments, vertical alignments, and vertical alignment views.
* Monitor resolution of at least 1080 x 1024
* 310 MB free disk space for installation

Commands support the AutoCAD versions, and BricsCAD versions listed above unless stated otherwise on the command page.

Supports:

* Microsoft Windows 11®

***Does Not* Support:**

* Any version of AutoCAD LT®
* Any version of AutoCAD 2021 based products or prior.
* Any version of BricsCAD v23 or prior.

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1.4 Coordinate System

AutoCAD / BricsCAD has a user coordinate system (UCS). The UCS provides a movable coordinate system for coordinate entry, planes of operation, and viewing.

Warning: These tools are written for drawings only created in the UCS of WORLD, and some commands return incorrect values if the UCS is not WORLD.

AutoCAD / BricsCAD uses a fixed Cartesian coordinate system (x, y, z or easting, northing, elevation). The X axis indicates horizontal distance, the Y axis indicates vertical distance, and the Z axis indicates depth. The origin is where the value of the X, Y, and Z axes equal zero. Negative values are allowed in all three axes.

AutoCAD stores coordinate values to 14 significant figures. Therefore, northerly and easterly coordinate values are limited to 12 figures (total numeric characters on both sides of the decimal). This limit is for all objects created in the AutoCAD drawing editor. This limit can cause apparent rounding discrepancies, particularly with bearings/angles on short line segments and arc deltas/angles.

The northing (y) and easting (x) coordinates of a project are very important. The linework of a drawing should represent the calculated coordinates, if they exist. One should not rotate or move the base linework of a project. If you need the linework twisted differently to better fit on a border, use View Twist. Using this method of view manipulation, instead of linework manipulation, allows the coordinate values of all linework to remain true. All of the labeling and text commands take the view twist into account automatically.

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1.5 Installation for AutoCAD

1. Make a backup copy of the original media.

2. You will need 310.0 MB of free disk space to complete the installation process.
   The software can be installed on a local or network drive.
   For network installation, see License Agreement for rules and Network Options for additional information.

3. Insert media into drive
   Start button, RUN...
   Then type: drv:\SETUP
   Enter destination drive and folder

4. If you have purchased a SmartDraft product, request a license file from authcodes@smartdraft.com.

AutoCAD Setup

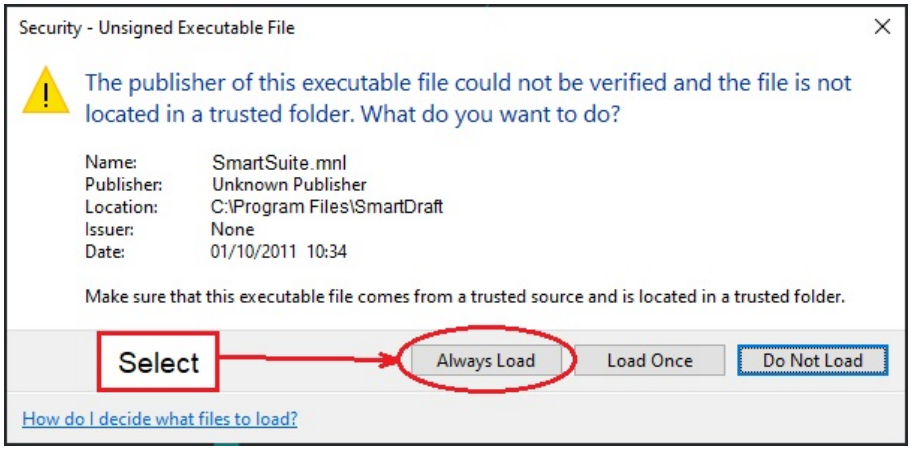
AutoCAD

a. Command: cuiload ENTER
   Select the Browse button, and go to the SmartDraft installation folder:
   Only load **one** of the following menus based on the product you purchased:

Suite:	**SmartSuite.cuix**
Survey:	**SmartSurvey.cuix**
Construction Notes:	**SmartCNote.cuix**

   File is located in the destination drive and folder specified during installation
   Select the Load button

   Warning for AutoCAD: When you load the SmartDraft menu for the first time, the **File Loading - Security Concern** dialog box may appear. If it does, you **must** select the **Load** button for SmartDraft to work correctly. Note: The listed file could be smartsuite.mnl, smartsurvey.mnl, or smartcnote.mnl.



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b. Register the software. See Software Authorization.

1.6 Installation for BricsCAD

1. Make a backup copy of the original media.

2. You will need 310.0 MB of free disk space to complete the installation process.
   The software can be installed on a local or network drive.
   For network installation, see License Agreement for rules and Network Options for additional information.

3. Insert media into drive
   Start button, RUN...
   Then type: drv:\SETUP
   Enter destination drive and folder

4. If you have purchased a SmartDraft product, request a license file from authcodes@smartdraft.com.

BricsCAD Setup

BricsCAD Pro

a. Command: **cuiload** ENTER
   Select the Browse button, and go to the SmartDraft for BricsCAD installation folder:
   Only load **one** of the following menus based on the product you purchased:

Suite:	**SmartSuiteBC.cui**
Survey:	**SmartSurveyBC.cui**
Construction Notes:	**SmartCNoteBC.cui**

   File is located in the destination drive and folder specified during installation
   Select the Load button

b. Register the software. See Software Authorization.

1.7 Unload SmartDraft

Unload SmartDraft from AutoCAD, or BricsCAD

This command Unloads the SmartDraft menus, and removes search paths added by SmartDraft

Command entry: **SmartUnload**

Command:

Unload SmartDraft Promo Command from AutoCAD? [Yes/No] <No>: Enter **Y**es to unload SmartDraft from CAD

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After SmartDraft is unloaded from all versions of CAD, you can use the uninstall tool in Windows to remove it from the workstation.

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10.1. No Assignment; Insolvency. This Agreement and any rights hereunder are non-assignable by You and any purported assignment shall be void. The Agreement and the licenses granted hereunder shall terminate without further notice or action by SDI if You become bankrupt or insolvent, regardless of any arrangements with your creditors, or go into liquidation.

10.2. Choice of Law. This Agreement and any disputes arising out of or in connection with this Agreement shall be governed by Arkansas law without reference to conflict-of-laws principles and excluding the UN Convention on Contracts for the International Sale of Goods.

10.3 Severability. If and to the extent any provision of this Agreement is held illegal, invalid, or unenforceable in whole or in part under applicable law, such provision or such portion thereof shall be ineffective only as to the jurisdiction in which it is illegal, invalid, or unenforceable to the extent of its illegality, invalidity, or unenforceability and shall be deemed modified to the extent necessary to conform to applicable law so as to give the maximum effect to the intent of the parties. The illegality, invalidity, or unenforceability of such provision in that jurisdiction shall not in any way affect the legality, validity, or enforceability of any other provision of this Agreement in any other jurisdiction.

10.4 Audits. To ensure compliance with this Agreement, You agree that upon reasonable notice, SDI or SDI's authorized representative shall have the right to inspect and audit your installation, access and use of the Software. Any such inspection or audit shall be conducted during regular business hours at your facilities or electronically. If such inspections or audits disclose that You have installed, accessed or permitted access to the Software on Computer(s) in a manner that is not permitted under this Agreement or have otherwise violated this Agreement or SDI's intellectual property rights, then SDI may terminate this Agreement immediately and You are liable to pay for any unpaid license fees as well as the reasonable costs of the audit in addition to any damages and other remedies to which SDI is eligible for any of Your

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Part II

2 Contact Us

2.1 Contact Us



SmartDraft, Inc.

https://smartdraft.com/

For more information, comments, or suggestions, please contact us.

For support:

See Support Information

Evaluation Version

You may install, access, and for the purpose of commercial evaluation and demonstration, without cost, for a period of thirty (30) days. If you want to continue using the SmartDraft software after thirty (30) days, you must purchase a license(s) per the License Agreement. Additionally, functional limitations apply, as set forth in Section 7 of the license Agreement.

Purchasing these tools

A license must be purchased per the License Agreement.

For pricing information, contact:

E-mail: sales@smartdraft.com

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2.2 Support Information

Display Information about SmartDraft, necessary for support

The primary method of product support is via e-mail. We reply to your request as soon as possible.
E-mail: support@smartdraft.com

When requesting support, please provide the following information to help us serve you more quickly:

- Copy and paste the SmartDraft support information to an email to assist in SmartDraft support
- A description of the problem. e.g. When using the <command name or alias>, I receive the error <xyz> when selecting a <object type, point, typing, etc...).
- A copy of the file(s), Xref(s), or project files needed to test the problem using your data.
- Indicate in the file, the area, or objects you selected when the error occurred.

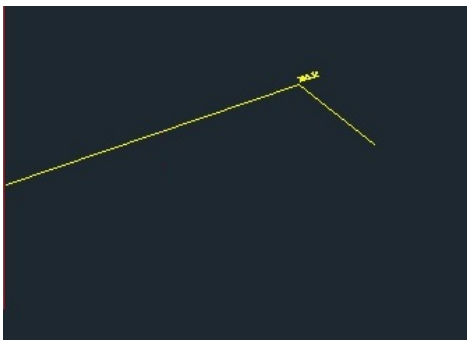
Command entry: **smartinfo**

Dialog Box Options

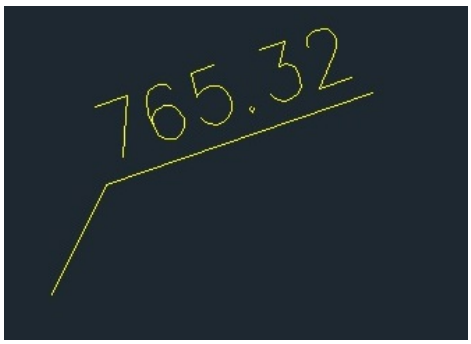
Clipboard	Copy the SmartDraft support information to the Clipboard. Use to copy information into an email.
Email	Open your email client with our support email and subject added (if one is installed).
Close	Close the dialog

2.3 Block Scaling Issue

If you experience issues with SmartDraft blocks being inserted a the incorrect scale:



Correctly scaled block



Incorrectly scaled block

To correct the scaling issue:

1. **Erase** all the incorrectly scaled SmartDraft blocks.
2. **Purge** all the blocks.
3. Run the "**-DWGUNITS**" command. **Note**: Use dash before the command name.

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4. Press ENTER for the the prompts of the "-DWGUNITS" command except the **Scale objects from other drawings upon insert? [Yes/No] <Yes>:**
5. Enter **NO** for the **Scale objects from other drawings upon insert? [Yes/No] <Yes>:** prompt.
6. Rerun the SmartDraft command to confirm the block is scaled correctly.

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Part III

3 Autodesk App Store

3.1 Pipe 2 Polyline

Create a planview 3D polyline from a Civil 3D pipe network.

Click on the icon below to view a video demonstration

Setup Panel

 Create Planview 3D Polyline from Pipe Network Create a 3D polyline along the selected pipe network structures or pipe, using the top, center, or invert elevations of the pipes.

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Part IV

4 Command Reference

4.1 Command Aliases

4.1.1 Command Aliases - Suite

3DP	Create 3D Polyline with Elevation Prompt
AAR	Add Arrowhead
ABL	Arc by Length
ABS	Abutment Symbol
AC	Label Contours
ADD	Length (Add)
AF	Alignment Station Intersection Label
AFU	Alignment Station Intersection Update
ALDE	Define/ Edit Alignment
ALR	Arc Leader
ALT	ALTA Label
ALV	Arc Leader (Variable)
AM	Text, Arc Text, and Attribute Mask
AMA	Toggle Label Masking On / Off
AML	Text, Arc Text, and Attribute Mask to Layer
AMT	Text, Arc Text, and Attribute Mask to Top
AN	Measure Angle
APR	Angular Precision
ARD	Define Parcels
ARL	Label / Manage Parcels
ARP	Area by Point and Create Polyline by Point
ART	Area Table
ARV	Area Divide
AS	Alignment Stationing Label
ASD	Area
ASO	Alignment Station and Offset Labels
ASOU	Alignment Station and Offset Update
AT	Attribute Move
ATM	Attribute Move and Rotate
ATR	Attribute Rotate
ATV	Attribute Replace
AU	Text, Arc Text, and Attribute Unmask
BA	Break At
BAC	Break At Crossing
BAD	Break at Distance
BBL	Block to Bylayer
BCT	Block Count
BF	Break First
BK	Block and Detail Manager (formerly BKeeper)
BKM	Block and Detail Category File Manager
BKU	Block Create Unnamed
BM	Blipmode Toggle
BMR	Block Mirror and Rotate
BP	Points Setback (20s & 80s)
BPS	Base Point Adjustment
BRE	Block Replace / Substitute
BRT	Block (Text) Rotate
BS	Barscale
BSC	Block Scale

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BUP	Block Update
BX	Block Explode Attributes to Text
CA	Change Angle
CAT	Attribute Change
CBL	Change Bearing Direction
CE	Calculate Elevation
CFA	Crow's Feet - Automatic
CFM	Crow's Feet - Manual
CL	Change Length
CLD	Change Label Direction
CLO	Change Label Leader Offset
CLP	Change Label Precision
CLY	Copy to Layer
CN	Construction Notes
CNCW	Construction Notes List: Change Width
CNF	Construction Notes File Information
CNM	Construction Notes Manager
CNU	Construction Notes List: Update
CPR	Coordinate Precision
CRF	Coordinate Label
CRFU	Coordinate Label Update
CRR	Corridor Design Report
CS	Calculate Slope
CSL	Cross Section Label (formerly Sectional Bubble)
CV	Layer Color Conversion Dialog Box Version
CV2	Layer Color Conversion Command Entry Version
CW	Polyline Edit Width
D	Distance
DDS	Drawing Setup
DN	Detail Notes
DPR	Decimal, Linear Precision
DRT	Dimension Truncate
DSA	Dimension Text - Alternate Units
DSC	Dimension Arc
DSD	Dimension
DSN	Dimension without Leader
DSPF	Profile Dimension
DSO	Dimension Outside
DSP	Dimension with Prompt
DST	Dimension Truncate
DTA	Line by Turned or Deflection Angle
DTS	Daylight to Surface
DTSS	Daylight to Surface - Segment
DTSP	Daylight to Surface - Point
E3PL	Erase 3D Polylines
EAD	Adjust Elevation
EAT	Attribute Edit
EC	Edit Object's Elevation
ECPL	Extract Contour(s) from a Surface
ED	Edit Label
EDD	Edit Text Multiple Strings or Blocks with Attributes Editor
EF	Elevation Label
EFC	Convert Elevation Label to Elevation Label Manual
EFF	Elevation Label - Lot Lines
EFSO	Elevation Label Station Output Option Off - Polyline Type Only
EFU	Elevation Label Update
ELS	List Object

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EO	Erase Outside
EP	Point Elevation
EPA	Modify Elevations of Points: Absolute Hinge
EPL	Erase Polylines
EPR	Modify Elevations of Points: Relative Hinge
EPU	Point Elevation Update
ES	Spot Elevation
ETR	Extend and Trim
F2	Fillet 3 Limits (180d)
FR	Fillet with Radius Prompt
FTR	Free Form Tree or Brush Line
FZ	Fillet Zero (Radius = 0)
GLB	Grid Tick and Label
GLBD	Grid Label Display Update
GLBR	Grid Label Reposition
GTS	Toe / Top of Slope
HS	Horizontal Scale
IB	Break Symbol
ICO	Interpolate Contours
IDP	ID Point
II	Interpolate Interval
JN	Join
JS2	Junction Structure No 2
LB	Labeling
LBO	Labeling Options
LBS	Labeling Style Manager
LBT	Labeling Table
LBTS	Labeling Table Style Manager
LC	Change Layer
LER	Layer Erase
LEXP	Layer Export
LFR	Freeze Object or Block Layer
LMK	Layer Make
LRN	Layer Rename
LSC	Slope Label (One Point)
LSC2	Slope Label (Two Points)
LSCM	Slope Label (Manual)
LSCU	Slope Label Update
LSD	List
LTH	Layer Thaw
LTT	Labeling Tags Tool
LTY	Layer Type (Change)
LWB	ID Block Layer
LWT	ID Layer
LYI	Layer Isolate
LYPS	Layer change adding Prefix/Suffix
LYR	Layer Isolate Restore
MSC	Solid Circle Monument
MHC	Half Circle Monument
MOC	Open Circle Monument
MDC	Double Circle Monument
MDCS	Double Circle Solid Monument
MCS	Cross Circle Monument
MSS	Solid Square Monument
MHS	Half Square Monument
MOS	Open Square Monument
MSCS	Square Circle Solid Monument

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MDS	Double Square Monument
MDSS	Double Square Solid Monument
MCS	Cross Square Monument
MST	Solid Triangle Monument
MOT	Open Triangle Monument
MTCS	Triangle Circle Solid Monument
MTT	Text Copy String (Match Text)
NA	North Arrow
NED	Northing and Easting Difference Label
NRS	North Rotation
O3	Offset 3D Polyline
OB	Offset from Xref/Blocks
OBX	Offset from Xref/Block to Object's Layer
OC	Offset to Current Layer
ODR	Open Drawing Folder
OM	Offset Multiple
OSTR	Offset Street
OX	Open External Reference File (Xref)
P2S	Point to Spot Label
PAA	Purge All Possible Objects.
PB	PBlock
PBM	PBlock Style Manager
PC	PConnect
PCL	Planview Crossing Pipes Label
PCM	PConnect Description Key Style Manager
PCT	PConnect Template Manager
PFC	Profile Copy and Adjust - Profile View
PFEG	Create Existing Ground Profile
PFM	Define / Edit Profile
PJ	Join 2D Polylines
PKC	Parking Spaces Count Symbols
PKI	Parking Spaces along Polyline
PKR	Parking Spaces Report
PKS	Parking Spaces
PLAV	Add Vertices
PLBE	Modify Selected Segment
PLL	Legal Description by Polyline
PLLM	Legal Description Options Style Manager
PLM	Planview Label Manual
PLO	Create Polyline by Objects
PLS	Polyline Change Start Point
PLTL	Convert to Tree Line
PNM	Point Number
PNAS	Adjust Pipe Slope / Elevations
PNIS	Insert a Null Structure into a Pipe Network
PRD	Define Parcels
PRL	Label / Mange Parcels
PRLR	Parcel List Reset
PRR	Create Reports
PRQ	Parcel Inquiry
PSB	Set Pipe Network Pipe direction to "By Slope"
PSCV	Convert Survey Points into Drawing Points
PSIM	Import Drawing Points into the Survey Database
PSO	Alignment Station and Offset Labels
PTA	List Available Point Numbers
PTADB	List Available Point Numbers in Survey Database
PTAO	Points along Objects

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PTAS	Point Label Style to As Composed for a Point
PTBS	Points Elevation by Slope
PTBE	Point Block Extract
PTC	Points by Coordinates
PTCR	Point Labels Clean
PTCS	Points Calculate Slope
PTCVT	Convert SmartDraft or Land Desktop Point into Civil 3D Points
PTDUP	Check for Duplicate Point Numbers
PTEX	Points Export
PTFB	Convert ASCII Point File to Fieldbook File
PTFR	Point Description Find and Replace
PTGM	Point Group States Manager
PTGP	Point Groups for a Point
PTI	Inverse Points
PTIN	Point Import
PTL	Point Label
PTLU	Point Label Update
PTM	Points Manual
PTPVI	Points Elevation at PVI
PTR	Point Labels Rotation
PTRP	Points Report using Surface(s)
PTSO	Point Station and Offset Information
PTSOU	Point Station and Offset Update
PTSOR	Station and Offset Report from Points
PTX	Cross Sections from Points
PTZ	Point: Zoom to Point Number
PVBL	Profile Structure Bottom Label
PVC	Profile Labels - Cleanup
PVCPL	Profile Crossing Pipe Label
PVD	Create Profile Line
PVDAL	Profile Pipe Deflection Angle Label
PVDP	Profile Single Pipe Line
PVG	Create Profle View
PVH	Profile Labels - Reset to Home Position
PVHG	Label Profile (Alignment Horizontal Geometry Data)
PVI	Label Profile (Alignment Station Intersection)
PVL	Label Profile View
PVL2	Label Profile View (2 Points)
PVN	Label Profile (Note)
PVRL	Profile Structure RIM Label
PVS	Label Profile (At Station)
PVSE	Label Profile (Station and Elevation)
PVSL	Planview Structure Label
PVSP	Profile Angle, Draw, Inquire, Label, or Pipe
PVU	Profile Labels - Update
PX	Pipe Crossing Symbol
	For the next 8 aliases, see Text Add Prefix / Suffix.
PREN	Add the prefix "(" and the suffix ")" to selected text. Text Add Prefix / Suffix
PREN2	Add the prefix "((" and the suffix "))" to selected text. Text Add Prefix / Suffix
P[	Add the prefix "[" and the suffix "]" to selected text. Text Add Prefix / Suffix
P[[	Add the prefix "[[" and the suffix "]]" to selected text. Text Add Prefix / Suffix
P<	Add the prefix "<" and the suffix ">" to selected text. Text Add Prefix / Suffix
P<<	Add the prefix "<<" and the suffix ">>" to selected text. Text Add Prefix / Suffix
P{	Add the prefix "{" and the suffix "}" to selected text. Text Add Prefix / Suffix
P{{	Add the prefix "{{" and the suffix "}}" to selected text. Text Add Prefix / Suffix
QJ	Join Quick
RAA	Rotate Along an Arc or Circle

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RB	Redefine Blocks
RBR	Radial Bearing Label
RECT	Rectangle
RLF	Remove all Layer Filters in the Drawings
RLFAUTO	Toggle Automatic Removal of Layer Filters when Drawing is Opened
RLN	Radial Lines
RLS	Remove All of the Express Tool's Layer States in the Current Drawing
RTV	Rotate ?d and Move
RP	Polyline Reverse Direction
RPT	Reposition Labels and Arc Text
RTA	Rotate Align
RTS	Shadow Rectangle / Box
SAL	Slide Along a Line Segment
SAP	Add Points to a BricsCAD Surface (BricsCAD Only)
SCP	Create BricsCAD Surface from Points (BricsCAD Only)
SDP	Storm Drain Pipe Edges
SDU	Update Labels
SDUT	Toggle Update Labels On / Off
SLB	Scale Labels
SLR	Straight Leader
SPP	Convert Spline to Polyline
STP	Load Land Desktop Set Style File (STP File)
SSL	Slope Symbols
SSP	Points: Create Selection Set
SVDR	Section View: Draw a polyline
SVF	Survey Working Folder
SVL	Label Section Views
SVW	Display who has a Survey Database Open
SVP	Section View: Points
SVU	Section View Label Update
TAD	Text: Adjust Numbers
TAR	Text in an Arc
TC	Endpoint Ticks
TD	Text: Dialog
TE	Text Edit Properties
TF	Text Fit
TFF	Text Add Prefix / Suffix
THZ	Text Horizontal
TI	Toggle TILEMODE Off/On
TL	Text X Align
TMH	Text Mathematics
TMT	Text to Mtext
TN	Text Add Note
TON	Text Online
TP	Text Align Parallel or Tangent
TPL	Text Polyline Text
TRA	Traverse
TRR	Tangency Report
TRS	Text Spacing
TS	Text Sequential
TSG	Text Respacing
TSW	Text Swap
TT	Toggle Tilemode
TTM	Convert Text or Reference Symbol to MultiLeader
TV	Text Vertical
TW	Text Parallel or Tangent
UO	Crosshairs Align to Object

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UV	Crosshairs Horizontal to Screen
UW	Crosshairs to 0 (UCS World)
V0	Drawing's View (if twisted) to the PLAN. Crosshairs to 0.
VA	View All
VL	Viewport Lock
VLA	Viewport Lock All
VPA	Viewport Align
VPAVP	Viewport Align with Profile View
VPD	Viewport Divide
VPF	Viewport Frame
VPM	Viewport Make
VPMV	Viewport Move
VPU1	Viewport Move the Contents of a Viewport up 1 Unit.
VPU5	Viewport Move the Contents of a Viewport up 5 Units.
VPD1	Viewport Move the Contents of a Viewport down 1 Unit.
VPD5	Viewport Move the Contents of a Viewport down 5 Units.
VPZ	Viewport Zoom
VSA	View Save All
VT	View Twist
VU	Viewport Unlock
XA0	Xref Attach
XCM	Xref Match XCLIP
XCS	Xref Colors Screened
XLT	Xref Lock Layer Toggle
XO0	Xref Overlay
XO0P	Xref Overlay - Modify Reference Name
XM	Xref Overlay Multiple
XRR	Xref Reload
XRU	Xref Unload
XRX	Xref Overlay2
ZH	Zoom Handle
Z?	ID Elevation

Note: For these aliases to operate, they must be enabled. See User Options.

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4.1.2 Command Aliases - Survey

3DP	Create 3D Polyline with Elevation Prompt
AAR	Add Arrowhead
ABL	Arc by Length
ABS	Abutment Symbol
AC	Label Contours
ADD	Length (Add)
AF	Alignment Station Intersection Label
AFU	Alignment Station Intersection Update
ALDE	Define/ Edit Alignment
ALR	Arc Leader
ALT	ALTA Label
ALV	Arc Leader (Variable)
AM	Text, Arc Text, and Attribute Mask
AMA	Toggle Label Masking On / Off
AML	Text, Arc Text, and Attribute Mask to Layer
AMT	Text, Arc Text, and Attribute Mask to Top
AN	Measure Angle
APR	Angular Precision
ARD	Define Parcels
ARL	Label / Manage Parcels
ARP	Area by Point and Create Polyline by Point
ART	Area Table
ARV	Area Divide
AS	Alignment Stationing Label
ASD	Area
ASO	Alignment Station and Offset Labels
ASOU	Alignment Station and Offset Update
ARV	Area Divide
AU	Text, Arc Text, and Attribute Unmask
BA	Break At
BAC	Break At Crossing
BAD	Break at Distance
BBL	Block to Bylayer and Layer to 0
BCT	Block Count
BK	Block and Detail Manager (formerly BKeeper)
BKM	Block and Detail Category File Manager
BKU	Block Create Unnamed
BMR	Block Mirror and Rotate
BP	Points Setback (20s & 80s)
BPS	Base Point Adjustment
BRE	Block Replace / Substitute
BRT	Block (Text) Rotate
BS	Barscale
BSC	Block Scale
BUP	Block Update
BX	Block Explode Attributes to Text
CA	Change Angle
CBL	Change Bearing Direction
CFA	Crow's Feet - Automatic
CFM	Crow's Feet - Manual
CL	Change Length
CLD	Change Label Direction
CLO	Change Label Leader Offset
CLP	Change Label Precision
CN	Construction Notes

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CNCW	Construction Notes List: Change Width
CNF	Construction Notes File Information
CNM	Construction Notes Manager
CNU	Construction Notes List: Update
CPR	Coordinate Precision
CRF	Coordinate Label
CRFU	Coordinate Label Update
CRR	Corridor Design Report
CSL	Cross Section Label (formerly Sectional Bubble)
CW	Polyline Edit Width
D	Distance
DDS	Drawing Setup
DN	Detail Notes
DPR	Decimal, Linear Precision
DRT	Dimension Truncate
DSA	Dimension Text - Alternate Units
DSC	Dimension Arc
DSD	Dimension
DSN	Dimension without Leader
DSO	Dimension Outside
DSP	Dimension with Prompt
DST	Dimension Truncate
DTA	Line by Turned or Deflection Angle
E3PL	Erase 3D Polylines
EAT	Attribute Edit
ED	Edit Label
EDD	Edit Text Multiple Strings or Blocks with Attributes Editor
ELS	List Object
EO	Erase Outside
EP	Point Elevation
EPA	Modify Elevations of Points: Absolute Hinge
EPL	Erase Polylines
EPR	Modify Elevations of Points: Relative Hinge
EPU	Point Elevation Update
F2	Fillet 3 Limits (180d)
FR	Fillet with Radius Prompt
FTR	Free Form Tree or Brush Line
FZ	Fillet Zero (Radius = 0)
GLB	Grid Tick and Label
GLBD	Grid Label Display Update
GLBR	Grid Label Reposition
HS	Horizontal Scale
IB	Break Symbol
IDP	ID Point
JN	Join
LB	Labeling
LBO	Labeling Options
LBS	Labeling Style Manager
LBT	Labeling Table
LBTS	Labeling Table Style Manager
LC	Change Layer
LER	Layer Erase
LEXP	Layer Export
LFR	Freeze Object or Block Layer
LMK	Layer Make
LRN	Layer Rename
LSD	List

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LTH	Layer Thaw
LTT	Labeling Tags Tool
LTY	Layer Type (Change)
LWB	ID Block Layer
LWT	ID Layer
LYI	Layer Isolate
LYPS	Layer change adding Prefix/Suffix
LYR	Layer Isolate Restore
MSC	Solid Circle Monument
MHC	Half Circle Monument
MOC	Open Circle Monument
MDC	Double Circle Monument
MDCS	Double Circle Solid Monument
MCS	Cross Circle Monument
MSS	Solid Square Monument
MHS	Half Square Monument
MOS	Open Square Monument
MSCS	Square Circle Solid Monument
MDS	Double Square Monument
MDSS	Double Square Solid Monument
MCS	Cross Square Monument
MST	Solid Triangle Monument
MOT	Open Triangle Monument
MTCS	Triangle Circle Solid Monument
MTT	Text Copy String (Match Text)
NA	North Arrow
NED	Northing and Easting Difference Label
NRS	North Rotation
O3	Offset 3D Polyline
OB	Offset from Xref/Blocks
OBX	Offset from Xref/Block to Object's Layer
OC	Offset to Current Layer
ODR	Open Drawing Folder
OM	Offset Multiple
OSTR	Offset Street
OX	Open External Reference File (Xref)
P2S	Point to Spot Label
PAA	Purge All Possible Objects.
PB	PBlock
PBM	PBlock Style Manager
PC	PConnect
PCM	PConnect Description Key Style Manager
PCT	PConnect Template Manager
RECT	Rectangle
PJ	Join 2D Polylines
PKC	Parking Spaces Count Symbols
PKI	Parking Spaces along Polyline
PKR	Parking Spaces Report
PKS	Parking Spaces
PLAV	Add Vertices
PLBE	Modify Selected Segment
PLL	Legal Description by Polyline
PLLM	Legal Description Options Style Manager
PLM	Planview Label Manual
PLO	Create Polyline by Objects
PLS	Polyline Change Start Point
PLTL	Convert to Tree Line

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PNM	Point Number
PRD	Define Parcels
PRL	Label / Mange Parcels
PRLR	Parcel List Reset
PRR	Create Reports
PRQ	Parcel Inquiry
PSCV	Convert Survey Points into Drawing Points
PSIM	Import Drawing Points into the Survey Database
PSO	Alignment Station and Offset Labels
PTA	List Available Point Numbers
PTADB	List Available Point Numbers in Survey Database
PTAO	Points along Objects
PTAS	Point Label Style to As Composed for a Point
PTBS	Points Elevation by Slope
PTBE	Point Block Extract
PTC	Points by Coordinates
PTCR	Point Labels Clean
PTCS	Points Calculate Slope
PTCVT	Convert SmartDraft or Land Desktop Point into Civil 3D Points
PTDUP	Check for Duplicate Point Numbers
PTEX	Points Export
PTFB	Convert ASCII Point File to Fieldbook File
PTFR	Point Description Find and Replace
PTGM	Point Group States Manager
PTGP	Point Groups for a Point
PTI	Inverse Points
PTIN	Point Import
PTL	Point Label
PTLU	Point Label Update
PTM	Points Manual
PTPVI	Points Elevation at PVI
PTR	Point Labels Rotation
PTRP	Points Report using Surface(s)
PTSO	Point Station and Offset Information
PTSOU	Point Station and Offset Update
PTSOR	Station and Offset Report from Points
PTX	Cross Sections from Points
PTZ	Point: Zoom to Point Number
PX	Pipe Crossing Symbol
	For the next 8 aliases, see Text Add Prefix / Suffix.
PREN	Add the prefix "(" and the suffix ")" to selected text. Text Add Prefix / Suffix
PREN2	Add the prefix "((" and the suffix "))" to selected text. Text Add Prefix / Suffix
P[	Add the prefix "[" and the suffix "]" to selected text. Text Add Prefix / Suffix
P[[	Add the prefix "[[" and the suffix "]]" to selected text. Text Add Prefix / Suffix
P<	Add the prefix "<" and the suffix ">" to selected text. Text Add Prefix / Suffix
P<<	Add the prefix "<<" and the suffix ">>" to selected text. Text Add Prefix / Suffix
P{	Add the prefix "{" and the suffix "}" to selected text. Text Add Prefix / Suffix
P{{	Add the prefix "{{" and the suffix "}}" to selected text. Text Add Prefix / Suffix
QJ	Join Quick
RAA	Rotate Along an Arc or Circle
RECT	Rectangle
RBR	Radial Bearing Label
RLN	Radial Lines
RP	Polyline Reverse Direction
RPT	Reposition Labels and Arc Text
RTV	Rotate ?d and Move
SAL	Slide Along a Line Segment

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SDU	Update Labels
SDUT	Toggle Update Labels On / Off
SLB	Scale Labels
SLR	Straight Leader
SPP	Convert Spline to Polyline
STP	Load Land Desktop Set Style File (STP File)
SSP	Points: Create Selection Set
SVF	Survey Working Folder
SVW	Display who has a Survey Database Open
TAD	Text: Adjust Numbers
TAR	Text in an Arc
TC	Endpoint Ticks
TD	Text: Dialog
TE	Text Edit Properties
TF	Text Fit
TFF	Text Add Prefix / Suffix
THZ	Text Horizontal
TI	Toggle TILEMODE Off/On
TL	Text X Align
TMH	Text Mathematics
TMT	Text to Mtext
TN	Text Add Note
TON	Text Online
TP	Text Align Parallel or Tangent
TPL	Text Polyline Text
TRA	Traverse
TRR	Tangency Report
TRS	Text Spacing
TS	Text Sequential
TSG	Text Respacing
TSW	Text Swap
TTM	Convert Text or Reference Symbol to MultiLeader
TV	Text Vertical
TW	Text Parallel or Tangent
UO	Crosshairs Align to Object
UV	Crosshairs Horizontal to Screen
UW	Crosshairs to 0 (UCS World)
V0	Drawing's View (if twisted) to the PLAN. Crosshairs to 0.
VA	View All
VL	Viewport Lock
VLA	Viewport Lock All
VPA	Viewport Align
VPAVP	Viewport Align with Profile View
VPD	Viewport Divide
VPF	Viewport Frame
VPM	Viewport Make
VPMV	Viewport Move
VPU1	Viewport Move the Contents of a Viewport up 1 Unit.
VPU5	Viewport Move the Contents of a Viewport up 5 Units.
VPD1	Viewport Move the Contents of a Viewport down 1 Unit.
VPD5	Viewport Move the Contents of a Viewport down 5 Units.
VPZ	Viewport Zoom
VSA	View Save All
VT	View Twist
VU	Viewport Unlock
XA0	Xref Attach
XCM	Xref Match XCLIP

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XCS	Xref Colors Screened
XLT	Xref Lock Layer Toggle
XO0	Xref Overlay
XO0P	Xref Overlay - Modify Reference Name
XM	Xref Overlay Multiple
XRR	Xref Reload
XRU	Xref Unload
XRX	Xref Overlay2

Note: For these aliases to operate, they must be enabled. See User Options.

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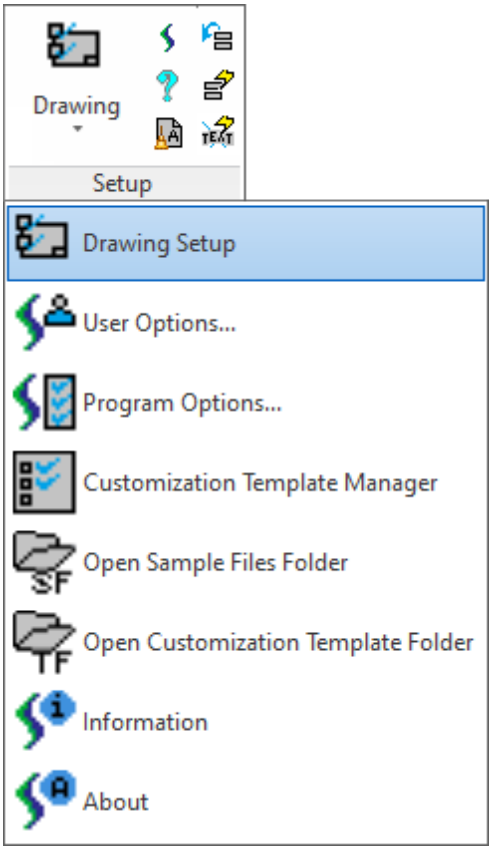
4.1.3 Command Aliases - Construction Notes

ALR	Arc Leader
AMA	Toggle Label Masking On / Off
BRE	Block Replace / Substitute
BUP	Block Update
CN	Construction Notes
CNCW	Construction Notes List: Change Width
CNF	Construction Notes File Information
CNM	Construction Notes Manager
CNU	Construction Notes List: Update
DDS	Drawing Setup
ODR	Open Drawing Folder
RB	Redefine Blocks
SDU	Update Labels
SDUT	Toggle Update Labels On / Off
SLR	Straight Leader
TTM	Convert Text or Reference Symbol to MultiLeader

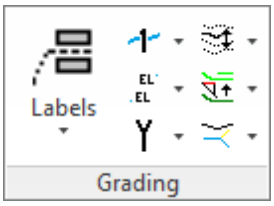
Note: For these aliases to operate, they must be enabled. See User Options.

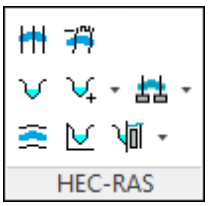
4.2 Ribbon Panels

4.2.1 SmartDraft Suite - Panels

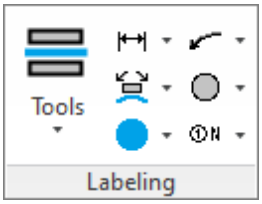


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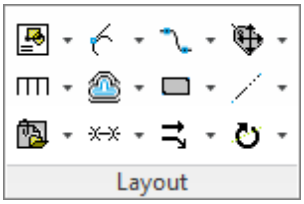


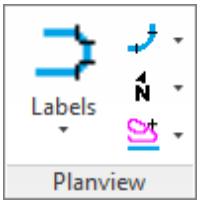


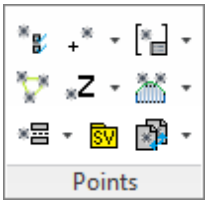




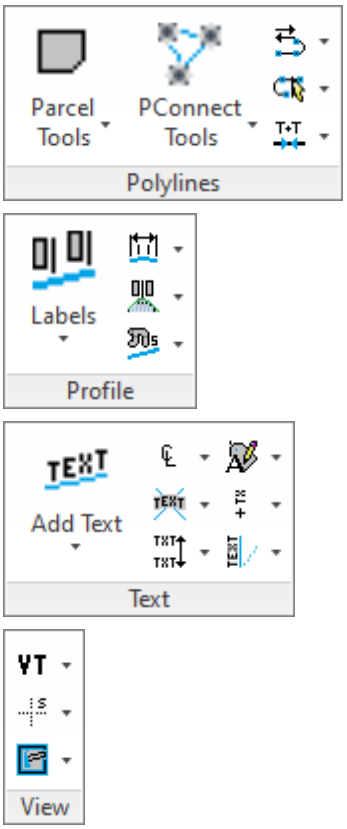






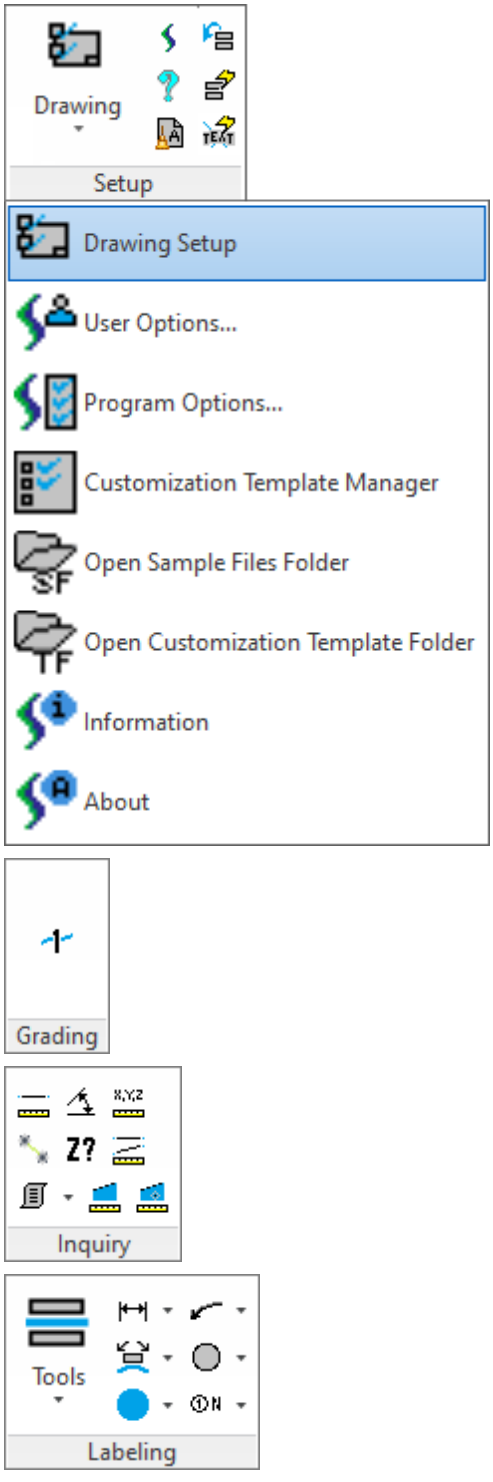


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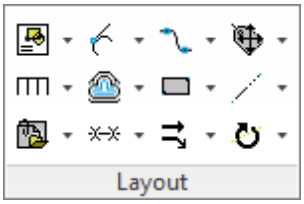
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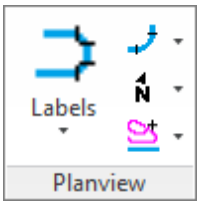
4.2.2 SmartDraft Survey - Panels

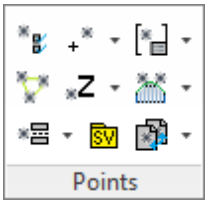


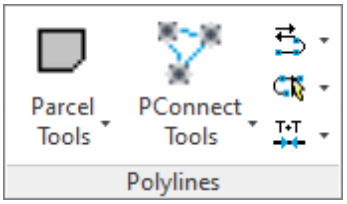
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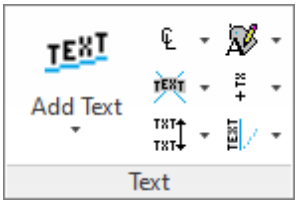








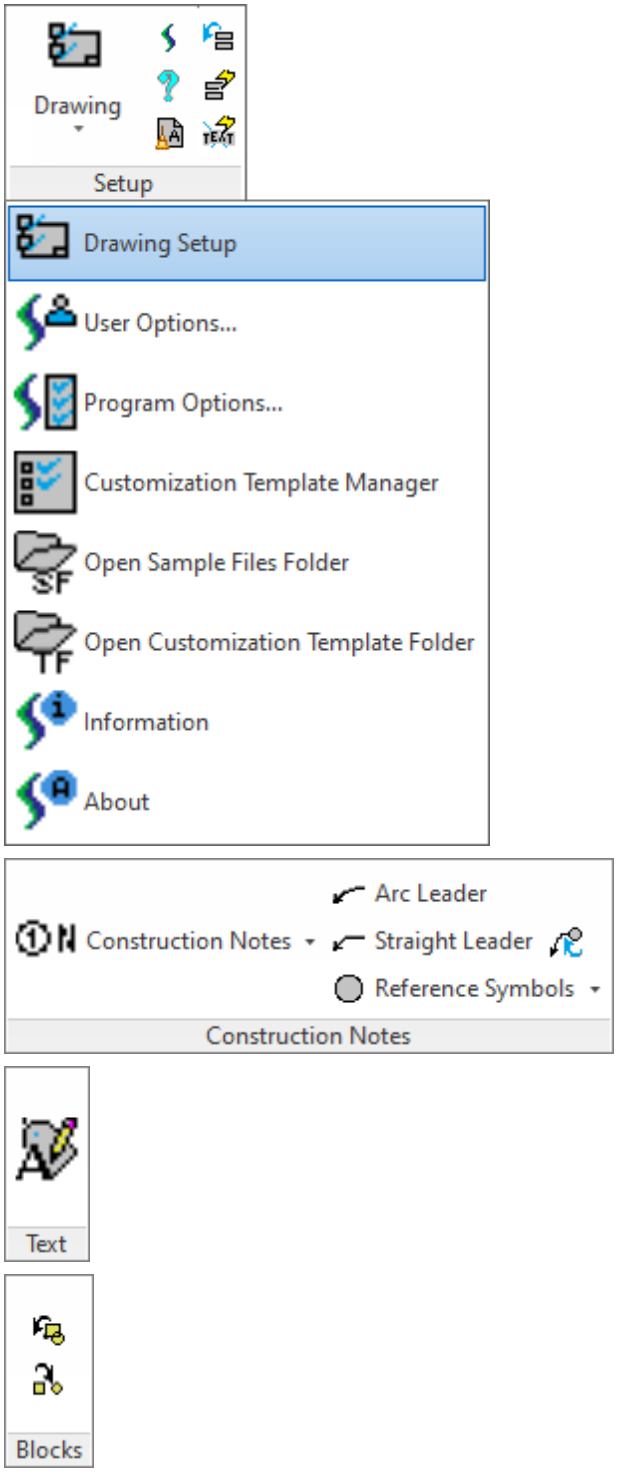






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4.2.3 SmartDraft Construction Notes - Panels



4.2.4 Setup Panel

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 Display the Drawing Setup dialog box. Select to setup a drawing for these tools.

 Open the SmartDraft website in the default browser. See SmartDraft Website

 Display SmartDraft's help file.

 SmartDraft's Purge All.

 Update the text values of all the dynamic SmartDraft labels. See Update Labels

 Toggle Update Labels for the dynamic SmartDraft labels. See Toggle Update Labels On / Off

 Toggle automatic masking for the text, mtext, and blocks with attributes for SmartDraft commands. See Toggle Label Masking On / Off

 Set User Setup Options. See User Options...

 Set the file location paths and program options. See Program Options...

 Create and maintain Customization Templates and their data files. See Customization Template Manager

 Open the SmartDraft Sample Files folders. See Sample Files

 Open the SmartDraft Customization Template folder. See Customization Template Folder

 Display SmartDraft Setup and Debug Information. See Information

 Display version, license, and authorization information. See About

4.2.5 Construction Notes Panel - Construction Notes

Construction Notes

 Add a construction note or a construction notes list. See Construction Notes

 Update the construction notes lists in the current drawing. See Construction Notes List: Update

 Change the width of a Construction Notes List and maintain the correct width for the tag column and the correct height of each row. See Construction Notes List: Change Width

 Create and modify construction notes files. See Construction Notes Manager

Leaders

 Create an arced leader with an arrowhead. See Arc Leader

 Create a straight leader with an arrowhead. See Straight Leader

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Create a multileader from a selected text , mtext, or reference symbol**.** See Convert Text or Reference Symbol to MultiLeader

Blocks

Update the definition of blocks in the current drawing. See Block Update

Replace one block with another block. See Block Replace / Substitute

Reference Symbols

Create a circle reference symbol.

Create a diamond reference symbol.

Create a hexagon reference symbol.

Create a keyhole reference symbol.

Create an oval reference symbol.

Create a pentagon reference symbol.

Create a rectangle reference symbol.

Create A star reference symbol

Create a square reference symbol.

Create a triangle reference symbol.

Text Edit

Edit Label: Edit text, mtext, attributes, and labels.

Blocks

Update the definition of blocks in the current drawing. See Block Update

Replace one block with another block. See Block Replace / Substitute

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4.2.6 Grading Panel - Suite

Labels

 Create a dynamic elevation label from polylines, surfaces, profiles, or feature lines. See Elevation Label

 Create an elevation label along a lot line from Civil 3D alignment and profile. See Elevation Label (Lot Line)

 Create manual elevation label by entering or selecting elevation values. See Elevation Label (Manual)

 Create a dynamic slope label. See Slope Label (One Point)

 Create a dynamic slope label. See Slope Label (Two Points)

 Create a manual slope label. See Slope Label (Manual)

 Create spot elevation. See Spot Elevation

 Label an object's elevation. See Label Contours

 Interpolate spot elevations between two polylines. See Interpolate Contours

 Interpolate spot elevations between two points. See Interpolate Interval

 Calculate slope from two selected objects with elevation. See Calculate Slope

 Adjust selected elevations by both an adjustment value and source elevation. See Adjust Elevation

 Calculate elevation from a selected object with elevation and a selected point (distance). See Calculate Elevation

 Edit the elevation (z) value of an object. See Edit Object's Elevation

 Create slope symbols. See Slope Symbols

 Create toe or top of slope. See Toe / Top of Slope

 Create a flowline arrow.

 Create a daylight symbol along an object, or change object to the daylight linetype. See Daylight Symbol

 Create a cut/fill symbol along an object, or change object to the cut / fill linetype. See Cut / Fill Symbol

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 Create a brow ditch symbol along an object, or change object to the brow ditch linetype. See Brow Ditch Symbol

 Edit polyline elevation. See Edit polyline elevation

 Edit polyline datum elevation. See Edit polyline datum elevation

 Assign polyline elevation. See Assign polyline elevation

 Use a hinge line to edit the elevations of selected feature lines and 3D polylines. Absolute Hinge. See Modify Elevations of Feature Lines or 3D Polylines: Absolute Hinge

 Use a hinge line to edit the elevations of selected feature lines and 3D polylines. Relative Hinge. See Modify Elevations of Feature Lines or 3D Polylines: Relative Hinge

 Check for 0 elevation polylines. See Check for 0 elevation polylines

 Change polyline layer at elevation. See Change polyline layer at elevation

Offset

 Offset polyline by rise / run. See Offset polyline by Rise/Run

 Offset polyline by slope (%). See Offset polyline by slope (%)

 Offset polyline by slope (%) and distance. See Offset polyline by slope (%) and distance

 Offset polyline by slope (%) and elevation limit. See Offset polyline by slope (%) and elevation limit

Volumes

 Daylight to a surface from a line, arc, polyline, 3D polyline or feature line. See Daylight to Surface

 Daylight to a surface from a segment of a polyline, 3D polyline or feature line. See Daylight to Surface - Segment

 Daylight to a surface from a point. See Daylight to Surface - Point

 Calculate a pond/basin or stockpile volume from polylines (contours). See Volume from Polylines (Contours)

 Extract a single or all contours from a surface. See Extract Contour(s) from a Surface

4.2.7 Grading Panel - Survey

 Label an object's elevation. See Label Contours

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4.2.8 HEC-RAS Panel

See HEC-RAS Panel Tools for more information

 Create Sample Lines or Polyline Cross Sections at specified stations along an alignment. See Create Sample Lines or Polylines along an alignment

 Rename or Renumber Sample Lines and add polylines to a Sample Lines Group. See Sample Lines Tool - Civil 3D Only

 Extract a single or all contours from a surface. See Extract Contour(s) from a Surface - BricsCAD Only

 Create a HEC-RAS project file or geometry file from Sample Lines or Polylines, an alignment, and a surface. See Create HEC-RAS Data

 Add new Cross Sections to an existing HEC-RAS Project from Sample Lines or Polylines along an alignment. See Add Sections to a HEC-RAS Project

 Add new River / Reach to an existing HEC-RAS Project from Sample Lines or Polylines along an alignment. See Add a River / Reach to a HEC-RAS Project

 Create Section Lines and labels on HEC-RAS cross section lines in the plan view of the drawing. See Create HEC-RAS Planview Sections Lines and Labels

 Change the direction of the HEC-RAS Planview Sections Line Labels. See HEC-RAS Planview Sections Labels: Change Direction

 Change the side of the HEC-RAS Planview Sections Line Labels. See HEC-RAS Planview Sections Labels: Change Side

 Create floodplain limit utilizing the results of the HEC-RAS Floodplain analysis from a HEC-RAS Output File. See Create HEC-RAS Floodplain Lines

 Create HEC-RAS Cross Sections for each section in the HEC-RAS Project, from a HEC-RAS Output FIle (sdf). See Create HEC-RAS Cross Sections

 Create a HEC-RAS Water surface Profile in the CADD Project, from a HEC-RAS Output File. See Create HEC-RAS Water Surface Profile

 Label a water surface's stations and elevations, in profile, from a HEC-RAS Output File. See Label HEC-RAS Water Surface Profile

4.2.9 Inquiry Panel

 Measure the distance and angle between two points or three points along a curve. See Distance

 Measure the angle between two lines or a line and an arc. See Measure Angle

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 Display the coordinate values of a location. See ID Point

 Inverse between point objects, point numbers, or Civil 3D survey database points. See Inverse Points

 Display the elevation (z) value of an object. See ID Elevation

 Add the lengths of selected arcs, ellipses, circles, lines, polylines, and splines. See Length (Add)

 Display the survey information for lines, arcs, and polylines. See List

 Calculate the area of selected objects and points. See Area

 Calculate the area and perimeter of an enclosed area by selecting a point. See Area by Point

 Display the information for selected objects. See List Object

 Create a tangency report from selected objects. See Tangency Report

 Create / View a Corridor Design Report. See Corridor Design Report

4.2.10 Labeling Panel

Tools

 Create labels, leaders, and/or tags using the current Labeling Options and Labeling Style. See Labeling

 Renumber, consolidate, or zoom to labeling tags. See Labeling Tags Tool

 Create labeling table using the available options and table style. See Labeling Table

 Labeling Overrides Toolbar. See Labeling Style Override toolbar

 Create and modify label styles. See Labeling Style Manager.

 Create and modify labeling table styles. See Labeling Table Style Manager

 Create from / to point tags for create a Labeling by Points - Table. See Labeling by Points

 Create a labeling by Points - table using the table options and table style, and tags created by the Labeling by Points command. See Labeling by Points - Table

Dimensions

 Label the distance between two points. See Dimension

 Label the truncated distance between two selected points, and add dimension suffix. See Dimension Truncate

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Label the distance between two points with a prompt for the label. See Dimension with Prompt

Label the distance between two points without a leader line. See Dimension without Leader

Label the distance between two points with the leader line and annotation on the outside. See Dimension Outside

Label the distance of a selected arc. See Dimension Arc

Add an alternate unit (metric) length for a selected dimension text string. See Dimension Text - Alternate Units

Edit Labeling

Rotate text and blocks along a selected arc or circle. See Rotate Along an Arc or Circle

Change the bearing/angle direction of text. See Change Bearing Direction

Change the text or arc text direction. See Change Label Direction

Change the position of existing labels. See Reposition Labels and Arc Text

Change existing label's precision. See Change Label Precision

Scale existing labels or arc text. See Scale Labels

Label a radial bearing/angle. See Radial Bearing Label

ALTA label. Label a distance, direction and description label. See ALTA Label

Create crow's feet by selecting labels in the drawing. See Crow's Feet - Automatic

Erase crow's feet by selecting label test or crow's feet in the drawing. See Crow's Feet - Erase

Create crow's feet in a specified direction and size. See Crow's Feet - Manual

Create an arrow with or without a break symbol. See Labeling Arrow

Monument Symbols

Create filled circle.

Create half-filled circle.

Create open circle.

Create circle inside circle.

Create solid circle inside circle.

Create circle with filled x.



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Create filled square.

Create open square.

Create square inside square.

Create solid square inside square.

Create solid circle inside square.

Create square with filled x.

Create filled triangle.

Create open triangle.

Create solid circle inside triangle.

Leaders

Create an arced leader with an arrowhead. See Arc Leader

Create a straight leader with an arrowhead. See Straight Leader

Create a multileader from a selected text , mtext, or reference symbol**.** See Convert Text or Reference Symbol to MultiLeader

Create an arced leader with a variable arrowhead and ending width. See Arc Leader (Variable)

Create a continuation symbol. See Continuation Symbol

Create an arrowhead at the end of selected objects. See Add Arrowhead

Create a break symbol along a line or arc. See Break Symbol

Create a pipe crossing symbol along a line or arc. See Pipe Crossing Symbol

Reference Symbols

Create a circle reference symbol.

Create a diamond reference symbol.

Create a hexagon reference symbol.

Create a keyhole reference symbol.

Create an oval reference symbol.

Create a pentagon reference symbol.

Create a rectangle reference symbol.

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Create A star reference symbol 

Create a square reference symbol. 

Create a triangle reference symbol. 

Construction Notes

Add a construction note or a construction notes list. See Construction Notes

Update the construction notes lists in the current drawing. See Construction Notes List: Update

Change the width of a Construction Notes List and maintain the correct width for the tag column and the correct height of each row. See Construction Notes List: Change Width

Create and modify construction notes files. See Construction Notes Manager

Create a detail type symbol with optional leader and notes. See Detail Notes

4.2.11 Labeling Style Override toolbar

Override the current style's placement options, but use all other settings, including layer, text style, prefixes, and decimal precision.

For example, the current style is set to display Bearing and Distance, 1 above. This style generates both data elements side by side, one line above the object. However, due to display limitations, several of the lines in the drawing need to be labeled with Bearing above and Distance below. Instead of creating a new labeling style to address this need, simply select the Bearing Above / Distance Below icon.

Select the objects according to current labeling Selection Type (Object, Nested, Layers, Points), and place the labels. Exit the Labeling Override command by pressing Enter. The override settings are discarded, and the current labeling style settings are back in place.

Set Bearing and Distance to one above.

Set Bearing and Distance to one below.

Set Bearing and Distance to two above.

Set Bearing and Distance to two below.

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 Set Bearing to two above, and Distance to one above.

 Set Distance to one below, and Bearing to two below.

 Set Bearing to one below, and Distance to two below.

 Set Bearing to one above, and Distance to one below.

 Set Distance to one above, and Bearing to one below.

 Set Distance to one above, and no Bearing.

 Set Distance to one below, and no Bearing.

 Set Bearing and Distance to table with Reference above.

 Set Bearing and Distance to table with Reference below.

 Set Line Labeling Bearing and Distance data off line.

 Set Delta, Radius, Length to one above, and no Tangent.

 Set Delta, Radius, Length to one below, and no Tangent.

 Set Delta three above, Radius two above, Length one above, and no Tangent.

 Set Delta one below, Radius two below, Length three below, and no Tangent.

 Set Length two above, Delta, and Radius one above, and no Tangent.

 Set Delta and Radius one below, Length two below, and no Tangent.

 Set Delta and Length to one above, and no Radius or Tangent.

 Set Delta and Length to one below, and no Radius or Tangent.

 Set Length two above, Delta one above, and no Radius or Tangent.

 Set Delta one below, Length two below, and no Radius or Tangent.

 Set Length to one above, and no Delta, Radius or Tangent.

 Set Length to one below, and no Delta, Radius or Tangent.

 Set Delta, Radius, and Length to table with Reference to one above.

 Set Delta, Radius, and Length to table and Reference to one below.

 Set Arc Labeling Delta, Radius, and Length data off arc.

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 Set Arc Labeling Delta and Length off arc.

 Set the label style of a selected label as the current label style. See Select Label Style

 Toggle Step Option. See Labeling Step

4.2.12 Layer Panel

 Create new layer from the layer database. See Layer Make

 Change the layer type. Cycle layer type between Proposed, Existing, and Demolition. See Change Layer Type

 Thaw layers currently frozen from a dialog box. See Layer Thaw

 Freeze an object's layer by selecting it. See Freeze Object or Block Layer

 Freeze an object's layer inside a block or Xref by selecting it. See Freeze Object or Block Layer

 Freeze a layer in a viewport. See Freeze VP Layer

 Freeze block layers independently in a viewport. See Freeze VP Block Layer

 Modify the layer name of objects in a viewport. See Change Layer in Viewports

 Thaw layers in a viewport. See Thaw VP Layer

 Modify the layer property of object(s) to the layer property of another object. See Change Layer

 Copy and Move selected objects to a layer. See Copy to Layer

 Move object to the current point layer. See Points: Move Object to Current Point Layer

 Isolate object's layer. See Layer Isolate

 Restore layers after Isolate Layer. See Layer Isolate Restore

 Rename a layer. See Layer Rename

 Delete all the objects on selected layers. See Erase Objects on Layer

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 List the layer names of objects at the command prompt. See ID Layer

 Inquire layer name within blocks or Xref. See ID Block Layer

4.2.13 Layout Panel

 Organize, share, and insert blocks and details in an efficient method. See Block and Detail Manager

 Create and modify the BKEEPER.BKL and category files used with the Block and Detail Manager block management command.See Block and Detail Category File Manager

 Rotate selected blocks and text using insertion point as base point. See Block (Text) Rotate

 Enlarge, reduce, or rotate selected blocks. See Block Scale

 Count all the blocks within the drawing. See Block Count

 Update the definition of blocks in the current drawing. See Block Update

 Change objects inside selected blocks to color bylayer. See Block to Bylayer

 Mirror and rotate a block with attributes. See Block Mirror and Rotate

 Replace one block with another block. See Block Replace / Substitute

 Create an unnamed block. See Block Create Unnamed

 Explode block and convert attribute values within the block to text. See Block Explode Attributes to Text

 Create a line tangent to an arc. See Line Tangent to Arc

 Create a line tangent to two arcs. See Line Tangent to Two Arcs

 Create a line perpendicular to a line or radial to an arc or circle. See Line Perpendicular to a Line

 Create a line at the bisection angle of two selected lines. See Line Bisect

 Create a line at a turned or deflection angle. See Line by Turned or Deflection Angle

 Create an arc tangent to an existing line. See Arc Tangent to Line

 Create an arc by center point, start point, and length. See Arc by Length

 Create radial lines from selected arcs. See Radial Lines

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 Create a reverse curve between two lines. See Reverse Curve

 Create an arc of 180+/- degrees between two lines and a crossing object. See Fillet 3 Limits

 Create linework and/or points using bearing, turned angle, length, delta, and coordinates. See Traverse

 Create lot lines along a line or arc. See Lot Lines

 Create a Cul-de-sac. See Cul-de-sac

 Create a Knuckle from two intersecting lines. See Knuckle

 Create driveway wings. See Driveway Wings

 Create a pedestrian ramp. See Pedestrian Ramp

 Change the attribute text insertion point. See Attribute Move

 Change the attribute text rotation angle. See Attribute Rotate

 Change the attribute text insertion point and rotation angle. See Attribute Move and Rotate

 Change properties of selected attributes. See Attribute Change

 Edit the Color/Style/Layer of selected attributes. See Attribute Edit

 Replace the value of the attribute text. See Attribute Replace

 Create parking spaces along an arc or line. See Parking Spaces

 Create parking spaces along a polyline. See Parking Spaces along Polyline.

 Create a parking spaces count or handicap symbol. See Parking Spaces Count Symbol

 Create a report of the number of regular and handicap parking spaces. See Parking Spaces Report

 Create multiple concentric circles, parallel lines, and parallel curves. See Offset Multiple

 Create concentric circles, parallel lines, and parallel curves, and place the new objects on the current layer. See Offset to Current Layer

 Create concentric circles, parallel lines, and parallel curves from objects that are within a block or Xref, a given distance, and place the new objects on the current layer. See Offset from Xref/Blocks

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 Create multiple offset objects on both sides and to specified layers. See Offset Street

 Create parallel lines from 3D polylines. See Offset 3D Polyline

 Create a rectangular polyline. See Rectangle

 Create a shadow rectangular / box. See Shadow Rectangle / Box

 Change the length of a line or arc. See Change Length

 Change the angle (bearing) of a line. See Change Angle

 Break the select object at a specified point. See Break At

 Break the select object at an entered distance from the end point. See Break at Distance

 Erase outside - select objects to remain. See Erase Outside

 Open an Xref for editing. See Xref Open

 Attach an Xref with scale set to 1, at 0,0,0, and rotation angle 0 on its own layer named X-<Xref filename>. See Xref Attach

 Overlay an Xref with scale set to 1, at 0,0,0, and rotation angle 0 on its own layer named X-<Xref filename>. See Xref Overlay

 Overlay an Xref with scale set to 1, at 0,0,0, and rotation angle 0 on its own layer named X-<Xref filename> with option to modify the XREF Reference Name. See Xref Overlay - Modify Reference Name

 Overlay an Xref with scale set to 1, at 0,0,0, and rotation angle 0 on the layer Xref. See Xref Overlay2

 Overlay multiple Xrefs with scale set to 1, at 0,0,0, and rotation angle 0 on its own layer named X-<Xref filename>. See Xref Overlay Multiple

 Apply the xclip boundary of a source Xref to selected Xrefs. See Xref Match XCLIP

 Change the colors of the Xref layers from non-screen to screened colors. See Xref colors screened

 Create chainlink fence linetype. See Chainlink Fence

 Create linetype with circle symbol. See Circle Linetype Symbol

 Create retaining wall linetype type 1. See Retaining Wall

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Create retaining wall linetype type 2. See Retaining Wall "V"

Create linetype with hash marks. See Demolition Symbol

Create abutment symbol along selected object. See Abutment Symbol

Load custom linetypes. See Load Linetypes

Create pavement arrows from a Traffic Control Symbols.

Create pavement words and symbols from a Traffic Control Symbols.

Create caution signs from a Traffic Control Symbols.

Create warning signs from a Traffic Control Symbols.

Create regulatory signs from a Traffic Control Symbols.

Create barricade block.

Create single or multiple traffic cones along selected paths. See Traffic Control Cones.

Create sign block type 1.

Create sign block type 2.

Create sign block type 3.

Rotate selected objects, and align them to an object, horizontal, or vertical. See Rotate Align

Move objects about a base point at a desired angle and displace the orientation. See Rotate ?d and Move

4.2.14 Planview Panel

Define an alignment from objects, or edit an existing alignment's properties. See Define/ Edit Alignment

Create or list stationing, offset, and create description labels. See Alignment Station and Offset Label

Create alignment station intersection labels. See Alignment Station Intersection Label

Create stationing and tick marks along alignment. See Label Alignment Stationing

Create laterals along an alignment. See Laterals Along Alignment

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 Create a planview label by entering the text or selecting an object with text to obtain the text. See Planview Label Manual

 Create a coordinate label for a selected point. See Coordinate Label

The next three commands are not in Survey

 Create a crossing pipes label in planview. See Planview Crossing Pipes Label

 Create planview structure labels. See Planview Structure Label

 Change the leader offset from the insertion point for specific planview labels. See Change Label Leader Offset

 Create tick marks at endpoints of lines and arcs. See Endpoint Ticks

 Create dynamic coordinate grid ticks and labels. See Grid Tick Label

 Create grid ticks coordinate labeling. See Grid Label Display Update

 Relocate a Grid Tick Label to the nearest northing and easting coordinate values rounded to 100 units. See Grid Label Reposition

 Create a North Arrow using the current horizontal scale.

 Create a Barscale using the current horizontal scale, the viewport scale, or an operator-specified scale.

 Create a dynamic cross section label. See Cross Section Label

 Create a planview 3D polyline from an alignment profile. See Create Planview 3D Polyline from Profile

 Create a planview 3D polyline from a Civil 3D pipe network. See Create Planview 3D Polyline from Pipe Network

The next two commands are not in Survey

 List the stations and elevations along an alignment at selected points. List Alignment Stations and Elevations

 List the stations and elevations at selected points from two crossing alignments. List Crossing Alignments Stations and Elevations

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4.2.15 Points Panel


Control point insertion settings. See Point Input Options


Set points by specifying a point on the screen. See Points Manual


Set points by specifying a northing and easting coordinate values. See Points by Coordinates


Set points and elevations along a calculated slope from two selected elevation objects along an arc or line. See Points Calculate Slope


Set points from a select point and elevation, calculate the elevation by a slope and a selected point (distance). See Points Elevation by Slope


Set a point and elevation for a PVI from two elevation objects and two slopes. See Points Elevation at PVI


Set one or two points along a line at specified setbacks. See Points Setback


Set points at end and radius points of selected objects. See Points Along Objects


Set points along an alignment at specified stations and offsets. See Points at Station and Offset


Set points at a projection from a line to a target, corner offset, or offset along an arc / line. See Points Offset Staking


Create a traverse of lines and arcs. See Traverse


Purge empty Point Groups from the drawing. See Purge Point Groups


Delete selected Point Groups. See Delete Point Groups


Display a list of Point Groups for a selected point. See Point Groups for a Point


Change the Dragged State Display Value to As Composed for Point Groups of a selected point. See Point Label Style to As Composed for a Point


Connect points with a polyline or 3D polyline. See Points Connect with Polyline


Assign a calculated elevation to Civil 3D points from a profile and alignment, surface, polyline, feature line, parcel segment, or survey figure. See Point Elevation

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Use a hinge line to edit the elevations of selected points. The hinge line is defined by two points. The absolute slope can be a slope (%) or a slope (X:1). See Modify Elevations of Points: Absolute Hinge


Use a hinge line to edit the elevations of selected points. The hinge line is defined by two points. The relative slope can be a slope (%) or a slope (X:1). See Modify Elevations of Points: Relative Hinge


Report the elevations of selected points. See Points Report using Surface(s)


Create cross sections from points collected in the field in a cross-sectional pattern along an alignment. See Cross Sections from Points


Create a station and offset report from points along an alignment. See Station and Offset Report from Points


Associate a point with an alignment, add the station, offset, and offset direction to the point data. When the point is moved, the station, offset, and offset direction update. See Point Station and Offset Information


Instruction to create a station and offset point table. See Create Point Station and Offset Table


Create a point label either by selecting point blocks, or Civil 3D points. See Point Label


Rotate the labels of Civil 3D points. See Point Labels Rotation


Reposition Civil 3D Point's Point Label Styles to enhance label readability. See Point Labels Clean


Export the drag state location of all the Civil 3D point labels in the current drawing. See Point Labels Drag Location Export


Import the drag state location of all the Civil 3D point labels from an exported PLX file created with the Point Labels Drag Location Export command. See Point Labels Drag Location Import


Extract the block from selected Civil 3D point objects with a block defined in their current Point Style. See Point Block Extract


Create a spot elevation label from a point. See Point to Spot Label


Create a northing and easting difference label from the selected points. See Northing and Easting Difference Label


Create a coordinate list of points. See Coordinate Table (Points)


Create and modify coordinate table styles to be used with the Coordinate Table command. See Coordinate Table Style Manager (Points)


Associate the Civil 3D Survey Working Folder with a drawing(s). See Survey Working Folder

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 Merge the point data from two ASCII point files. See Points Merge

 Display who has a Survey Database Open. See Display who has a Survey Database Open

 Find and replace point raw descriptions or descriptions of Civil 3D survey points. See Point Description Find and Replace

 Zoom to the location of a specified point number. See Point: Zoom To

 Display the point numbers that are available for use in the current project. See List Available Point Numbers

 List Available Points in Survey Database. See List Available Point Numbers in Survey Database

 Create a selection set of point blocks, and points objects. See Points: Create Selection Set

 Convert survey database points currently in the drawing into drawing points. See Convert Survey Points into Drawing Points

 Import points from the Drawing into the Survey Database. See Import Drawing Points into the Survey Database

 Convert ASCII Point File to Fieldbook File. See Convert ASCII Point File to Fieldbook File

 Import points from a file. See Points Import

 Export point data to a file. See Points Export

4.2.16 Polylines Panel

Parcel Tools

 Define a parcel from a closed polyline. See Define Parcels

 Label a parcel's name and area. See Label / Manage Parcels

 Create Reports from defined parcels. See Create Reports

 View and Modify Parcel Data. See Parcel Inquiry

 Divide a closed area by a sliding or rotating a division line. See Area Divide

 Create an area table. See Area Table

 Create and modify area table styles to be used with the Area Table command. See Area Table Style Manager

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 Create a legal description from a selected polyline or Parcel Label. See Legal Description from Polyline

 Create and modify legal description styles. See Legal Description Options Style Manager

PConnect Tools

 Create polylines with tangents and arcs to represent geometric shapes by connecting specific point descriptions. See PConnect

 Create and modify PConnect description key styles. See PConnect Description Key Style Manager

 Create and modify PConnect templates. See PConnect Template Manager

 Process point description keys to insert a block and format the Full Description. See PBlock

 Create and modify PBlock Styles used by the PBlock command. See PBlock Style Manager

 Erase polylines on selected or all layers. See Erase Polylines

 Erase 3D polylines on selected or all layers. See Erase 3D Polylines

Polyline Tools

Modify

 Reverse polyline direction. See Polyline Reverse Direction

 Change the starting point of a closed polyline. See Polyline Change Start Point

 Convert an arc, line, or polyline to a Tree / Brush line. See Convert to Tree Line

 Convert 2D polyline to 3D polyline. See Convert 2D to 3D Polyline

 Convert 3D polyline to 2D polyline. See Convert 3D to 2D Polyline

 Convert a Spline to a 2D or 3D polyline. See Convert Spline to Polyline

 Convert Civil 3D survey figure to 2D polyline. See Convert Survey Figure to 2D Polyline

 Add vertices to a polyline. See Add Vertices

 Modify the (bulge) arc factor of all segments in a polyline. See All Segments to Arcs

 Add, modify, or remove an arc from a selected polyline segment. See Modify Selected Segment

 Turn the PLINEGEN attribute of polylines to on.

 Modify the width of polylines. See Polyline Edit Width

 Edit the elevations of polyline, and increment the elevations. See Edit Elevation of Polylines

Create

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 Create a polyline over existing objects. See Create Polyline by Objects

 Create 3D polyline from selected object. See Create 3D Polyline

 Create a polyline with arcs - free form tree or brush line. See Create Polyline with Arcs - tree or brush line

Join

 Join arcs, lines, polylines, and text strings. See Join

 Join arcs, lines, and 2D polylines with gap tolerance. See Join 2D Polylines

 Join arcs, lines, and polylines on the same layer and at the same elevation. See Join Quick

4.2.17 Profile Panel - Suite

 Define or Edit profile design data associated to an alignment. See Define / Edit Profile

 Create a existing ground (EG) profile from a surface or polyline along an alignment.. See Create Existing Ground Profile

 Label a Civil 3D profile or create a profile from entering stations and elevations. See Label Profile (Station and Elevation)

 Create at profile label at a station and elevation or at a station along a profile. See Label Profile (At Station)

 Create profile labels for alignment horizontal geometry. See Label Profile (Alignment Horizontal Geometry Data)

 Create Profile Alignment Station Intersection Labels. See Label Profile (Alignment Station Intersection)

 Create slope labels for a profile. See Label Profile (Slope)

 Create profile line from a Civil 3D profile. See Create Profile Line

 Cleanup overlap of SmartDraft profile labels. See Profile Labels - Cleanup

 Reset SmartDraft dynamic profile labels to their home position. See Profile Labels - Reset to Home Position

 Update the values of the SmartDraft dynamic profile labels. See Profile Labels - Update

 Create station and elevation labels in a profile view. See Label Profile View

 Create station with two elevations labels in a profile view. See Label Profile View - (2 Points)

 Create Alignment Labels from profile data. See Label Alignment (Profile Geometry Data)

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 Create a profile from distances, and elevations or slopes. See Profile Distance and Elevation or Slope

 Create a profile from digitized planview points and elevations. See Profile Digitizing Planview

 Create a curb return profile. See Profile Curb Return

Annotation

 Create a profile file from points along an alignment. See Profile from Points or 3D Polylines along an Alignment

 Create profile lines at given slopes. See Profile Angle, Draw, Inquire, Label, or Pipe

 Create crossing pipe symbols in the profile. See Profile Crossing Pipes

 Create cut away pipe symbols. See Profile Pipe Cut Away

 Create an arced leader with an arrowhead on the profile text layer. See Arc Leader

 Create a straight leader with an arrowhead on the profile text layer. See Straight Leader

 Start the DTEXT command using the Profile Small style on the profile text layer.

 Label the distance between two selected points on the profile text layer. See Profile Dimension

 Profile slope, intersection and vertical curve calculator. See Profile Calculator

Section View

 Create station and offset labels for Civil 3D section views cross sections. See Label Section Views

 Create a polyline in a section view using offsets and elevations, or specify point. See Section View: Draw a Polyline

 Set points along an alignment at the station, offset, and elevation by selecting a point on a section view. See Section View: Points

Pipe Network Tools

 Adjust the slope / elevations of Civil 3D pipe network pipes in plan or profile. See Adjust Pipe Slope / Elevations

 Insert a Null Structure into a Civil 3D pipe network. See Insert a Null Structure into a Pipe Network

 Create a single line pipe of Civil 3D pipe network pipes in the profile. See Profile Single Pipe Line

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 Create Structure RIM labels in the profile. See Profile Structure RIM Label

 Create Structure Bottom labels in the profile. See Profile Structure Bottom Label

 Create Crossing Pipe labels in the profile. See Profile Crossing Pipe Label

 Create Pipe Deflection Angle labels in the profile. See Profile Pipe Deflection Angle Label

4.2.18 Profile Panel - Survey

 Create a profile file from points along an alignment. See Profile from Points Along an Alignment

4.2.19 Text Panel

SmartDraft uses predefined text styles throughout. This is to create a uniformed look between all the operators in a team. These styles can be modified using the Drawing Setup dialog box.

 Create text parallel or tangent to a selected line, arc, or polyline. See Text Parallel or Tangent

 Create text along an arc. See Arc Text

 Create text to follow along a polyline and other multiple segments and curved objects. See Polyline Text

 Create text with the same style, rotation, layer, and standard spacing as selected text. See Text Add Note

 Create text with sequential numbers or letters. See Text Sequential

 Create a text symbol along a line or arc. See Text Online

 Set Planview Small style and small text layer current, and start the TEXT or MTEXT command. See Text Styles

 Set Planview Medium style and medium text layer current, and start the TEXT or MTEXT command. See Text Styles

 Set Planview Large style and large text layer current, and start the TEXT or MTEXT command. See Text Styles

 Set Filled style current, and start the TEXT or MTEXT command. See Text Styles

 Set Shadow style and reference text layer current, and start the TEXT or MTEXT command. See Text Styles

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 Set Dashed style current, and start the TEXT or MTEXT command. See Text Styles

 Set Street Main style and Street Name layer current, and start the TEXT or MTEXT command. See Text Styles

 Set Lot Regular style and Lot Number layer current, and start the TEXT or MTEXT command. See Text Styles

 Set Lot Shadow style and Lot Number layer current, and start the TEXT or MTEXT command. See Text Styles

 Place a mask object behind selected text, attributes, or arc text. See Text, Arc Text, and Attribute Mask

 Place a mask object behind selected text, attributes, or arc text. See Text, Arc Text, and Attribute Unmask

 Moves masked text, mtext, and blocks with attributes above the masking object. See Text, Arc Text, and Attribute Mask to Top

 Adjust the spacing between selected text strings. See Text Respacing

 Create text and prompts for the line spacing. See Text Spacing

 Fit text between selected points. See Text Fit

 Convert text to Mtext. See Text to Mtext

 Edit text, mtext, attributes, and labels. See Edit Label

 Modify multiple text strings at once or blocks with attributes. See Edit Multiple Labels

 Modify the properties of text, mtext and attributes within a block. See Edit Text Properties

 Erase all empty text string objects. See Erase Empty Strings

 Copy / Match the source text string to target text string(s). See Copy String (Match Text)

 Swap one text string for another. See Swap Strings

 Adjust the number within a text string. See Adjust Numbers

 Add, Subtract, Multiply, and/or divide numeric values of selected text, mtext, or attribute objects. See Text Mathematics

 Import an ASCII file. See Text Import

 Export text to an ASCII file. See Text Export

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 Add a prefix and/or a suffix to text and attributes. See Text Add Prefix / Suffix

 Add Parentheses. See Text Add Prefix / Suffix

 Add Double Parentheses. See Text Add Prefix / Suffix

 Add Square Brackets. See Text Add Prefix / Suffix

 Add Double Square Brackets. See Text Add Prefix / Suffix

 Add Less and Greater Than. See Text Add Prefix / Suffix

 Add Double Less and Greater Than. See Text Add Prefix / Suffix

 Add Curly Braces. See Text Add Prefix / Suffix

 Add Double Curly Braces. See Text Add Prefix / Suffix

 Remove prefix and suffix. See Text Remove Prefix / Suffix

 Add underline to text.

 Add overscore to text.

 Rotate text vertical to the bottom of the screen. See Text Vertical

 Rotate text horizontal to the bottom of the screen. See Text Horizontal

 Rotate and moves text parallel or radial to a line, arc or polyline. See Text Align Parallel or Tangent

 Modify the horizontal alignment point of text along the vertical axis of the current VIEW TWIST. See Text X-Align

4.2.20 View Panel - Suite

 Twist or tilt the view around the line of sight. See View Twist

 Restore a drawing's view (if twisted) to the northerly direction pointing up.

 Restore the view named ALL or ALL-? in a viewport, where ? is the viewport number. See View All

 Save named views ALL or All-*. See View Save All

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Rotate the crosshairs to be parallel with the bottom of the screen. See Crosshairs Horizontal to Screen

Rotate the crosshairs to point in a northerly direction. See Crosshairs to 0

Align crosshairs to a selected object. See Crosshairs Align to Object

Viewport zoom setup by selecting the viewport frame. See Viewport Zoom

Divide a viewport vertically or horizontally. See Viewport Divide

Create a polyline of the viewport frame in modelspace. See Viewport Frame

Align selected viewports' content to a source viewport. See Viewport Align

Viewport Lock. See Viewport Lock

Viewport Unlock. See Viewport Unlock

Move the contents of a viewport vertically or horizontally by a given interval. See Viewport Move

Move the contents of a viewport up 1 unit.

Move the contents of a viewport up 5 unit.

Move the contents of a viewport down 1 unit.

Move the contents of a viewport down 5 unit.

4.3 Drawing Setup Panel

4.3.1 Drawing Setup

Set up a drawing for use with these tools.

When an operator selects one of the tools of the SmartDraft commands for the first time in a drawing, the Drawing Setup dialog appears. The initial values are supplied from the New Drawing Settings of the Customization Template. If the drawing was setup in Civil 3D, the Horizontal Scale, Unit Type, Angle Type, and all the Precision settings are used as initial values. Smart Draft synchronizes these drawing setup values with the Civil 3D drawing setup values.

Button

Ribbon: SmartDraft ▸ Setup panel ▸ Drawing Setup

Toolbar: SmartDraft Tools ▸ Drawing Setup button

Menu: SmartDraft ▸ Drawing Setup...

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Command entry: **dds**

Dialog Box Options

Drawing Setup

Customizati A drop-down list of the pre-defined Customization Templates. Specify the Template to be assigned to this drawing.

Horizontal Enter the Horizontal Scale. This value controls the height of text, block insertion scale and arrow head size for these tools.

Architectur Specify if the setting should honor architectural units. See Architectural Scales table. See Architectural Units: Command List which honor this setting.

Unit Type: Specify if the drawing Unit Type are Imperial or Metric.

Angle Type: Specify the output Angle Type.

Angular Specify the Angular Precision.

Linear Specify the Decimal, Linear Precision.

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Add Linear Distance Commas Check this option to add commas to linear distances for distance labels and command prompts.

Coordinate Specify the Coordinate Precision.

Elevation Specify the Elevation Precision.

Station Specify the position of the station delimiter.

Readability Specifies the angle counter clockwise off straight up at which label text flips 180 degrees to remain plan readable. Minimum -25.0 to 25.0.

North Select the Adjust North button to adjust the north rotation of the drawing. World is when north is equal to the y-axis, Non-World is when north not equal to the y-axis.

Base Point Select the Adjust Base Point button to adjust the coordinate base point of the drawing. World is when the drawing coordinate 0,0 is equal to 0,0, Non-World is when the drawing coordinate 0,0 is not equal to 0,0.

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Dimstyle Specify the dimstyle variables to be used with the dimension, labeling, and leader commands. See Dimstyle Variables.

Text Style: Specify the pre-defined text style values used throughout SmartDraft. See Text Styles.

Create Annotative Blocks / Styles: Specify if the blocks inserted by SmartDraft commands or the styles created by SmartDraft will be annotative or not.

Use Rounded Curve Calculations in Labeling and Reports Check to use the curve calculation method used by SmartDraft labeling and reporting commands (rounded). Uncheck to used arc (curve) calculation method used by Civil 3D.

Warning: SmartDraft can change the value of the drawing's LTSCALE under various situations unless the Program Options or User Options, **Enable LTSCALE Update by SmartDraft** option, is unchecked.

4.3.1.1 Unit Type

Set unit type.

SmartDraft synchronizes the unit type with Civil 3D's linear units.

FEET: One unit in the drawing will indicate one foot.
METERS: One unit in the drawing will indicate one meter.

4.3.1.2 Angle Type

Set the output type for bearing listing and labeling.

SmartDraft synchronizes the angle type with Civil 3D's angle display style.

All North: Bearings will be listed or labeled in a northerly direction format.
North & South: Bearings will be listed or labeled in either their northerly or southerly direction format. The direction the line was drawn will determine the displayed or labeled bearing direction format.
N Azimuth: Bearings will be listed or labeled in north azimuth direction format.
S Azimuth: Bearings will be listed or labeled in south azimuth direction format.

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Azimuth < 180: Bearings will be listed or labeled in azimuth direction format less than 180 degree.
Gradian: Bearings will be listed or labeled using gradian angles.

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4.3.1.3 Horizontal Scale

Set horizontal scale.

Enter a value for the horizontal scale. The horizontal scale value controls many features of SmartDraft. This value controls the text height, block insertion scale, and size of arrow heads for dimensions and leaders.

Command synchronizes the horizontal scale with Civil 3D's horizontal scale.

Command entry: **hs**

Enter horizontal scale <current>: Enter a number greater than 0 or press ENTER.

Warning: **SmartDraft** can change the value of the drawing's LTSCALE under various situations unless the Program Options or User Options, **Enable LTSCALE Update by SmartDraft** option, is unchecked.

4.3.1.4 Angular Precision

Set coordinate precision for angular display and labeling.

Selecting a value from the angular precision list sets a different precision.

SmartDraft synchronizes the angular precision with Civil 3D's angular precision.

Menu: SmartDraft ▸ Dimension ▸ Angular Precision: current
Command entry: **apr**

Command:
Enter angular Precision [0/1/2/3/4/5/6/7/8] <*current*>: Enter a value (**0-8**) or press ENTER.

0 outputs angles in degrees, 128d.
1 or **2** outputs angles in degrees, and minutes, 128d12'.
3 or **4** outputs angles in degrees, minutes, and seconds 128d12'52"
5 outputs angles in degrees, minutes, and seconds 128d12'52.1"
6 outputs angles in degrees, minutes, and seconds 128d12'52.12"
7 outputs angles in degrees, minutes, and seconds 128d12'52.123"
8 outputs angles in degrees, minutes, and seconds 128d12'52.1234"

4.3.1.5 Decimal, Linear Precision

Set coordinate precision for linear display and labeling.

Selecting a value from the linear precision list sets a different precision.

SmartDraft synchronizes the linear precision with Civil 3D's linear precision.

Menu: SmartDraft ▸ Dimension ▸ Decimal Precision: current

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Command entry: **dpr**

Enter decimal precision [0/1/2/3/4/5/6/7/8] <*current*>: Enter a value (**0-8**), or press ENTER.

0 outputs distance measurements to the nearest unit, 128.
1 - **8** outputs distance measurements to the decimal precision entered.

When the **Architectural Units** option is checked in Drawing Setup, the down-down values will appear as the Architectural column below.

Civil	Architectural
0	**0' - 0"**
1	**0' - 0 1/2"**
2	**0' - 0 1/4"**
3	**0' - 0 1/8"**
4	**0' - 0 1/16"**
5	**0' - 0 1/32"**
6	**0' - 0 1/64**
7	**0' - 0 1/128"**
8	**0' - 0 1/256"**

4.3.1.6 Coordinate Precision

Set coordinate precision for coordinate display and labeling.

Selecting a value from the coordinate precision list sets a different precision. This value controls decimal precision on commands which display coordinate values. SmartDraft synchronizes the coordinate precision with Civil 3D's coordinate precision.

Command entry: **cpr**

0 outputs coordinates to the nearest unit, 128.
1 - **8** outputs coordinates to the decimal precision entered.

4.3.1.7 Elevation Precision

Set coordinate precision for elevation display and labeling.

Selecting a value from the elevation precision list sets a different precision. This value controls decimal precision on commands which display elevation values. SmartDraft synchronizes the elevation precision with Civil 3D's elevation precision.

0 outputs elevations to the nearest unit, 128.
1 - **8** outputs elevations to the decimal precision entered.

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4.3.1.8 Architectural Scales

When using the "Architectural" setting in the Drawing Setup, the following Horizontal Scale values can be specified for the corresponding Architectural Scale. Enter the Horizontal Scale in the Horizontal Scale field.

Architectural Scale	Horizontal Scale	Plot Scale	Zoom
1/32"=1'-0"	384	1=384	1/384
1/16"=1'-0"	192	1=192	1/192
3/32"=1'-0"	128	1=128	1/128
1/8"=1'-0"	96	1=96	1/96
3/16"=1'-0"	64	1=64	1/64
1/4"=1'-0"	48	1=48	1/48
3/8"=1'-0"	32	1=32	1/32
1/2"=1'-0"	24	1=24	1/24
3/4"=1'-0"	16	1=16	1/16
1"=1'-0"	12	1=12	1/12
1 1/2"=1'-0"	8	1=8	1/8
3"=1'-0"	4	1=4	1/4
1"=1"	1	1=1	1/1

Architectural Units: Command List

4.3.1.8.1 Architectural Units: Command List

The following Commands honor the Architectural Units setting in Drawing Setup

Commands:

Add Arrowhead
Arc Leader
Break Symbol
Change Length
Dimension
Dimension with Prompt
Dimension Outside
Dimension without Leader
Distance
Length (Add)
List
Fillet with Radius Prompt
Offset to Current Layer

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Offset from Xref/Blocks

Offset Multiple

Rectangle

Reference Symbol

Straight Leader

Text Styles: Small, Medium, Large, Filled, Dashed, Shadow

4.3.1.9 North Rotation

Adjust the north rotation of the drawing

World is when north is equal to the y-axis, Non-World is when north not equal to the y-axis.


Button


Ribbon: SmartDraft ▸ Setup panel ▸ Drawing Setup  ▸ Adjust North

Toolbar: SmartDraft Tools ▸ Drawing Setup button  ▸ Adjust North

Menu: SmartDraft ▸ Drawing Setup... ▸ Adjust North


Command entry: **nrs**

Set the North Rotation of the drawing.

Specify the first point of the base line or [World]: Specify the first point for the new base line or **W**orld to set the drawing to World.

Specify the second point of the base line: Specify the second point for the base line angle.

If Angle Type set to **All North** or **North & South**

Enter bearing (QDD.MMSSssss) or [North/South/East/West]: Enter with the base line angle is equal to as Quadrant and bearing, **N**orth to north, **S**outh for south, **E**ast for east, or **W**est for west.

If Angle Type set to **N Azimuth**, **S Azimuth,** or **Azimuth < 180**

Enter azimuth (DD.MMSSssss) or [North/South/East/West]: Enter with the base line angle is equal to as azimuth, **N**orth to north, **S**outh for south, **E**ast for east, or **W**est for west.

If Angle Type set to **Gradian**

Enter gradian (DD.DDDD) or [North/South/East/West]: Enter with the base line angle is equal to as gradian, **N**orth to north, **S**outh for south, **E**ast for east, or **W**est for west.

Drawing North Rotation set to <*World/Non-World*>.

This command updates Labeling, Coordinate Labels, Northing and Easting Difference Label, North Arrow, and Grid Tick Label.

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4.3.1.10 Base Point Adjustment

Adjust the coordinate base point of the drawing

World is when the drawing coordinate 0,0 is equal to 0,0, Non-World is when the drawing coordinate 0,0 is not equal to 0,0.


Button

Ribbon: SmartDraft ▸ Setup panel ▸ Drawing Setup ▸ Adjust Base Point

Toolbar: SmartDraft Tools ▸ Drawing Setup button ▸ Adjust Base Point

Menu: SmartDraft ▸ Drawing Setup... ▸ Adjust Base Point

Command entry: **bps**

Set coordinate base point adjustment.

Settings: Coordinate base point set to <*World/Non-World*>.

Specify the coordinate base point origin or [Coordinates/World]: Specify the coordinate base point, **C**oordinate to enter the base point by northing and easting coordinates, or **W**orld to set the base point 0,0 equal to 0,0.

If a point is specified.

Enter new northing coordinate value <default>: Enter the northing coordinate value.

Enter new easting coordinate value <default>: Enter the easting coordinate value.

If Coordinates

Enter the northing coordinate base point origin <default>: Enter the base point northing coordinate value.

Enter the easting coordinate base point origin <default>: Enter the base point easting coordinate value.

Enter new northing coordinate value <default>: Enter the northing coordinate value.

Enter new easting coordinate value <default>: Enter the easting coordinate value.

This command updates Labeling, Coordinate Labels, Northing and Easting Difference Label, and Grid Tick Label.

4.3.1.11 Dimstyle Variables

The dimension variables to be used with SmartDraft's dimension style.

SmartDraft creates a dimension style named "SmartDraft" + the horizontal scale. If the horizontal scale is 40, the dimension scale will be named SmartDrafting40. Also, a dimension style is created for Layouts with the prefix "PS-". This dimension style is set current for all tools used by SmartDraft while in paperspace. Values are used by the dimension, leader, and labeling commands.


Button

Ribbon: SmartDraft ▸ Setup panel ▸ Drawing Setup ▸ Dimstyle Variables button

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Toolbar: SmartDraft Tools ▸ Dimstyles Variables button 
Menu: SmartDraft ▸ Drawing Setup ▸ Dimstyle Variables button
Command entry: **dds** ▸ Dimstyle Variables button

Dialog Box Options
Dimstyle Variables
Dimensioning

Style Name:	Dimstyle prefix name used by SmartDraft Dimensions.
Suffix Feet:	Suffix for dimensioning when the drawing's unit type is feet. See DIMPOST
Suffix Meters:	Suffix for dimensioning when the drawing's unit type is meters. See DIMPOST
Suffix Gradians:	Suffix for labeling and inquiry of angles when the drawing's angle type is Gradian.
Arrow Size:	Set dimension arrowhead size. See DIMASZ
MLeader Name:	MLeader style name used by SmartDraft.
Alternate Units	
Enable	Enable alternate units. See DIMALT
Precision Feet:	Decimal precision used for alternate units when the drawing's unit type is feet. See DIMALTD
Precision Meters:	Decimal precision used for alternate units when the drawing's unit type is meters. See DIMALTD
Scale Factor Feet:	Scale factor used for alternate units when the drawing's unit type is feet. See DIMALTF
Scale Factor Meters:	Scale factor used for alternate units when the drawing's unit type is meters. See DIMALTF

The controlled dimension variables values are:

Variable	Value
DIMPOST	Suffix for primary unit labeling
DIMAPOST	Suffix for alternate unit labeling
DIMALTF	Alternate unit scale factor used to label alternate units
DIMALTD	Decimal precision for alternate unit labeling
DIMALT	Enable alternate units
DIMASZ	Arrow size
DIMSCALE	Horizontal Scale

The fixed dimension variable values are:

DIMLDRBLK	SM_ARR
DIMBLK	SM_ARR
DIMBLK1	SM_ARR
DIMBLK2	SM_ARR
DIMASO	1
DIMASSOC	1
DIMAUNIT	0
DIMCEN	0.09
DIMCLRD	0
DIMCLRE	0

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DIMCLRT	0
DIMDEC	2
DIMDLE	0.00
DIMDLI	0.38
DIMEXE	0.18
DIMEXO	0.06
DIMFIT	3
DIMGAP	0.024
DIMJUST	0
DIMLIM	0
DIMRND	0.00
DIMSD1	0
DIMSD2	0
DIMSE1	1
DIMSE2	1
DIMSHO	1
DIMSOXD	0
DIMTAD	0
DIMTDEC	4
DIMTFAC	1.2
DIMTIH	0
DIMTIX	0
DIMTM	0.00
DIMTOFL	0
DIMTOH	0
DIMTOL	0
DIMTOLJ	1
DIMTP	0.00
DIMTSZ	0.00
DIMTVP	1.00
DIMTXT	0.12
DIMTZIN	0
DIMUPT	0

4.3.1.12 Text Styles

SmartDraft uses pre-defined text styles for the commands that add text to the drawing. The properties of the text styles are controlled by the values in this dialog box. To edit a text style, highlight the style type from the list, set the desired values, and select the Apply button to save the new values.


Button

Ribbon: SmartDraft ▸ Setup panel ▸ Drawing Setup ▸ Text Styles button 

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Toolbar: SmartDraft Tools ▸ Text Styles button 
Menu: SmartDraft ▸ Drawing Setup ▸ Text Styles button
Command entry: **dds** ▸ Text Styles button

Dialog Box Options

Styles:	The list of the pre-defined styles used by SmartDraft.
Type:	The style types as defined by SmartDraft.
Name:	Enter the text style's name.
Height:	Enter the desired plotting height for the text style. SmartDraft will multiply the supplied value times the current horizontal scale. To calculate the text height, multiply the Height by the Horizontal Scale. i.e., (Height) 0.1 x (Horizontal Scale) 40 = (Style Height) 4
Width:	Enter the text style's width factor.
Angle:	Enter the text style's oblique angle. Enter an oblique angle between -85 and 85.
Font File:	Enter the font file to use with this text style. Enter any font in the search path or any true type font files installed in the Windows Font folder. No need to add the extension *.shx for standard AutoCAD font files, but *.ttf must be added for true type fonts.
Browse:	Select the desired font file by browsing the computer's hard drive.
Apply:	Save the changed values to the Styles List. Only values in the style list are saved.
Masking Options	
Offset:	Enter a new offset factor.
Type:	Select masking type. Either Wipeout or Solid
Color:	If masking type is: Solid, the Color only will be used. Select Color button to display the dialog box and specify the color of the mask object.
Wipeout Frame:	Select if the Wipeout frame will display (ON), not display (OFF), or stay as set (Current).

Current Text Styles Defined:

Planview Small	Previously called **Small Text**
Planview Medium	Previously called **Medium Text**
Planview Large	Previously called **Large Text**
Profile Small	
Profile Medium	
Profile Large	
Street Main	
Filled	
Shadow	
Dashed	
Dimension	
Street Side	
Lot Regular	
Lot Shadow	

Note: See Customization Guide Appendix to see which commands use which text styles.

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4.3.2 User Options

Set User Setup Options.

The User Options control SmartDraft settings, such as enabling command aliases, enabling the autoload pull-down feature, and user customization template type. These settings apply to the current user only and are stored in the AutoCAD / BricsCAD Profile.


Button

Ribbon: SmartDraft ▸ Setup panel ▸ User Options...

Toolbar: SmartDraft Tools ▸ Drawing Setup:

SmartDraft menu ▸ Options ▸ User Options...

Command entry: **smartuser**

Dialog Box Options

User Options

Enable Command Aliases:	Check box to enable SmartDraft's Command Aliases.
Disable Autoload of SmartDraft's menu bar:	Check box to disable the autoload feature, which loads SmartDraft's main pull-down menu.
Enable Layer Type Mode Status Line:	Check box to enable SmartDraft's Layer Type at the Mode Status Line.
Enable Labels Update on Open:	Check box to enable Labels Update on Open. See Update Labels
Enable Labels Update on Plot:	Check box to enable Labels Update on Plot. See Update Labels
Enable LTSCALE Update by SmartDraft:	Check box to enable SmartDraft's ability to change the LTSCALE in Drawing Setup or Horizontal Scale.
Disable SmartDraft Right-Click tools (AutoCAD only)	Check box to disable the SmartDraft right-click tools.
Enable INSUNITS value with the Block Manager:	Check box to enable the SmartDraft Block and Detail Manager to use the AutoCAD settings, INSUNITS, INSUNITSDEFSOURCE, and INSUNITSDEFTARGET when inserting blocks or Xrefs.
Enable Prompt for Survey Working Folder	Check box to enable the SmartDraft's Prompt for Survey Working Folder. Civil 3D only.
Enable Survey Working Folder Mode Status Line	Check box to enable the display of the current Survey Working Folder at the Mode Status Line. Civil 3D only
Enable Construction Notes List Update on Open	Check box to enable the SmartDraft's Construction Notes List: Update on Open
Enable Construction Notes List Update on Save	Check box to enable the SmartDraft's Construction Notes List: Update on Save

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User Customization Template: Select the user Customization Template to be used whenever a new drawing is created.

4.3.3 Program Options

Set the file location paths and program options

The Program Options control program-wide and network-wide options, such as path locations, default user customization template, and default user options.


Button

Ribbon: SmartDraft ▸ Setup panel ▸ Program Options...

Toolbar: SmartDraft Tools ▸ Drawing Setup:

SmartDraft menu ▸ Options ▸ Program Options...

Command entry: **smartoptions**

Dialog Box Options

File Locations

Type: Select the file location path type.
- **Customization Templates** The location of the customization templates.
- **Block Manager** The location of the Block and Detail Manager (formerly BKeeper) files.
- **Traffic Symbols** The location of the Traffic Control Symbols, Block and Detail Manager, setup files.

Path: Display the current folder location.

Browse: Select button to set the folder location for the selected file location type.

Default User Customization Template

Enable Default Network User Customization Template: Check box to enable setting default customization template from the network.

User Customization Template: Select the user Customization Template to be used whenever a new drawing is created.

Default Network User Options

Enable Default Network User Options: Check box to enable setting the following options from the network.

Enable Command Aliases: Check box to enable SmartDraft's Command Aliases.

Disable Autoload of SmartDraft's menu bar: Check box to disable the autoload feature, which loads SmartDraft's main pull-down menu.

Enable Layer Type Mode Status Line: Check box to enable SmartDraft's Layer Type at the Mode Status Line.

Enable Labels Update on Open: Check box to enable Labels Update on Open. See Update Labels

Enable Labels Update on Plot: Check box to enable Labels Update on Plot. See Update Labels

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Enable LTSCALE Update by SmartDraft:	Check box to enable SmartDraft's ability to change the LTSCALE in Drawing Setup or Horizontal Scale.
Disable SmartDraft Right-Click tools (AutoCAD only)	Check box to disable the SmartDraft right-click tools.
Enable INSUNITS value with the Block Manager:	Check box to enable the SmartDraft Block and Detail Manager to use the AutoCAD settings, INSUNITS, INSUNITSDEFSOURCE, and INSUNITSDEFTARGET when inserting blocks or Xrefs.
Enable Prompt for Survey Working Folder	Check box to enable the SmartDraft's Prompt for Survey Working Folder. Civil 3D only.
Enable Survey Working Folder Mode Status Line	Check box to enable the display of the current Survey Working Folder at the Mode Status Line. Civil 3D only
Enable Construction Notes List Update on Open	Check box to enable the SmartDraft's Construction Notes List: Update on Open
Enable Construction Notes List Update on Save	Check box to enable the SmartDraft's Construction Notes List: Update on Save

1. From the SmartDraft menu, choose Options > Program Options.
2. Under File Locations, select the path you want to change from the Type list.
   Customization Templates: The location of the customization templates. See Customization Templates Manager to create and/or modify customization templates.
3. Select Browse to locate the new folder for the file location type.
   NOTE: Changing a path for a folder location type does not move that component's files. It just tells SmartDraft where to look for the files. You must move the files using Windows Explorer.
4. Press OK.
   NOTE: Paths are saved in the SmartDraftSetup.ini file in SmartDraft's installation folder.

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4.3.4 Customization Template Manager

Create and maintain Customization Templates and their data files.

Customization Templates determine the basic drawing settings such as horizontal scale, decimal precision, dimension variables, and other drawing settings. Customization Templates also determine global settings to be applied to all drawings assigned to the template such as layer names and properties, blocks libraries, new drawing settings, and labeling styles. Customization Templates are used to organize and maintain different custom settings for a set of drawings.

Note: Do not make changes in the default customization template. This template is supplied as the model for your own template. In the Customization Template Manager create a new template for your company using the Save As button. Future upgrades to SmartDraft could overwrite your changes to the default template, but will not affect any other customization template.

Ribbon: SmartDraft ▸ Setup panel ▸ Customization Template Manager...
Toolbar: SmartDraft Tools ▸ Drawing Setup button
SmartDraft menu ▸ Options ▸ Customization Template Manager...
Command entry: **SmartCTM**

Customization Template Manager
Customization Template

Name	Drop-down list of the available Customization Templates Select the name of the template to edit.
Save As...	Create a copy of the current customization template and all its settings and styles
Description	A description of the selected customization template

List of Settings and Styles
A list of available settings and styles for the currently loaded SmartDraft product.

Description:	Modify the description of the currently selected template. See Template Description.
Unlock Files:	Unlock Files in the selected template.
Layer Database (Enter Data):	Modify the Layer Database using the Layer Database Manager (Enter Data).
Layer Database (Match Layer):	Modify the Layer Database using the Layer Database Manager (Match Layer).
Make Layer List:	Modify the list of layers displayed by the Layer Make command.
Offset Street Layer List:	Modify the list of layers displayed by the Offset Street command.
Profile Layer List:	Modify the list of layers displayed by the Profile Setup command.
Point Layer List:	Modify the list of layers displayed by the Point Options command.
New Drawing Settings:	Modify the New Drawing Settings for the selected Customization Template.
Area Table Styles:	Create and modify area table styles using the Area Table Style Manager.
Coordinate Table Styles:	Create and modify coordinate table styles using the Coordinate Table Style Manager.
Labeling Styles:	Create and modify labeling styles using the Labeling Style Manager.
Labeling Table Styles:	Create and modify labeling table styles using the Labeling Table Style Manager.
PConnect Key Styles:	Create and modify PConnect description key styles using the PConnect Description Key Style Manager.

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Styles File Manager: Copy, and Move Styles between Customization Templates. Rename and delete styles within a Customization Template. Use Styles File Manager.

Edit.. Select one of the Settings and Styles options to edit.

To modify files within a Customization Template:

1. Select the Customization Template of the files to modify.
2. Highlight the type of Settings or Styles to modify from the list.
3. Select the Edit... button.

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4.3.4.1 Create Customization Template

Create a new Customization Template from an existing template by selecting Save As.

Create a new Customization Template using the name supplied in the name field. The data files in the selected Customization Template will be copied to the new template. The template will be created under the Customization Template path set using Program Options.

Dialog Box Options

Name: Specify a unique template name. The template name has been limited to 50 characters.
Description: Enter a description for the new template. The description has been limited to 50 characters.

4.3.4.2 Template Description Manager

Modify the Template Description.

Dialog Box Options

Name: The name of the current Customization Template.
Description: Enter a new description for the current template. The description has been limited to 50 characters.

4.3.4.3 Unlock Files Manager

Display a list of all locked files in the selected customization template.

SmartDraft menu ▸ Options ▸ Customization Template Manager ▸ highlight Unlock Files and select Edit...

Dialog Box Options
Locked File List: A list of the locked files in the selected customization template and the category files associated to the Block and Detail Manager path. Highlight a file to unlock.
Unlock: Unlock the selected file in the Lock File List box. Once a file is unlocked, it is removed from the Locked File List.

4.3.4.4 Styles File Manager

Copy, or move Area Table, Coordinate Table, Labeling, Labeling Table, and Offset Street Styles between Customization Templates. Rename or delete Area, Coordinate, Labeling, Labeling Table, Offset Street Styles within a Customization Template (Template).

SmartDraft menu ▸ Options ▸ Customization Template Manager ▸ highlight Styles File Manager and select Edit...

Dialog Box Options
Customization Template: Source
Source Template: List of Customization Templates. Select the source Template.

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Description: Description of selected Template.
List Box: List of SmartDraft Styles within the source Template.
All: Selects all the listed styles.
Clear: Clears all selected styles.

Customization Template: Destination
Destination Template: List of Customization Templates. Select the destination Template.
Description: Description of selected Template.
List Box: List of SmartDraft Styles within the destination Template.
All: Selects all the listed styles.
Clear: Clears all selected styles.

Buttons
Copy->: Copy the selected style(s) from the source to the destination Template.
<-Copy: Copy the selected style(s) from the destination to the source Template.
Move->: Move the selected style(s) from the source to the destination Template.
<-Move: Move the selected style(s) from the destination to the source Template.
Rename: Rename the selected style.
Delete: Delete selected style(s) from either the source or destination Template.
Close: Close the dialog box and return to the Customization Template Manager.

Note: Can only rename a single style at a time. Only select one style for the rename option to become active. Delete option will only be active if styles are selected in either the source or the destination list. If styles are selected in both lists, the delete button will be deactivated. Use the Clear button to clear either the source or destination list to activate the delete button.

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4.3.5 Open Sample Files Folder

Open the Sample Files folders

There are Sample Files for various commands.


Button

Ribbon: SmartDraft ▸ Setup panel ▸ Open Sample Files Folder 
Toolbar: SmartDraft Tools ▸ Open Sample Files Folder button 
Menu: SmartDraft ▸ Open Sample Files Folder...
Command entry: **SM_OSFF**

Block Tools
Construction Notes
Cross Sections from Points
HEC-RAS Tools
Inquiry Tools
Inverse Points
Parcels
PConnect
Polyline Tools
Survey Working Folder
Text Tools
View Tools

4.3.6 Open Customization Template Folder

Open the Customization Template folders

Open the Customization Template folder to explore the Customization Template files.


Button

Ribbon: SmartDraft ▸ Setup panel ▸ Open Customization Template Folder 
Toolbar: SmartDraft Tools ▸ Open Customization Folder button 
Menu: SmartDraft ▸ Open Customization Template Folder...
Command entry: **SM_OCTF**

4.3.7 Information

Display SmartDraft Setup and Debug Information.

When sending a support request, please include this information in your e-mail.

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Button

Ribbon: SmartDraft ▸ Setup panel ▸ Information

Toolbar: SmartDraft Tools ▸ Drawing Setup:

Command entry: **smartinfo**

Dialog Box Options

Support Information

Copy: Copy the information in the dialog for pasting into an email for support.
Email: Open the email client on your system.
Close: Close the dialog box.

Command: **smartinfo**

Version: SmartDraft <type and version>

Licensed to: <name>

Serial Number: <number>

Installation folder: <installation folder>

Customization template folder: <customization template root folder>

Default customization template: <Default customization template>

Block Manager default folder: <Block and Detail Manager folder>

Traffic Symbols default folder: <Traffic Symbols Categories folder>

Enable Command Aliases: <Yes/No>

Disable AutoLoad of SmartDraft menu bar: <Yes/No>

Enable Status Mode Line: <Yes/No>

Enable Labels Update on Open: <Yes/No>

Enable Labels Update on Plot: <Yes/No>

Drawing's customization template: <Current customization template>

AutoCAD Caption: <Current Caption>

AutoCAD Version: <Current AutoCAD Version>

AutoCAD Platform: <32 bit/64 bit>

Windows Type: <Windows XP/Vista/7>

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4.3.8 SmartDraft About

Display version, serial number, and license information.


Button


Ribbon: SmartDraft ▸ Setup panel ▸ About 

Toolbar: SmartDraft Tools ▸ Drawing Setup: 

Menu: SmartDraft ▸ About


Command entry: **smartabout**

Command: **SmartAbout**

About Dialog Box Options

Product type:	Product name and version.
Licensed to:	Licensed to: or evaluation copy.
Serial Number:	If licensed, serial number.
Import License	Select button to import a provide individual license.
Remove License	Select button to remove the license from the current workstation. This allow the license to be transferred to another workstation.
Visit Website	Select to open the SmartDraft website in a web browser.
Notes	Copyright notice.

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4.3.8.1 Software License

Import SmartDraft license to convert the software from an evaluation copy to a licensed version.

Using SmartAbout

Before importing the license file, confirm the correct SmartDraft menu is loaded.

To **Change to the correct SmartDraft menu.**

At the command prompt type:

SmartSuite for	Suite
SmartSurvey for	Survey
SmartCNote for	Construction Notes Tools

To register / authorize the software either:

Individual Seat License:

Command: **SmartAbout**

About Dialog Box: Select the **Import License** button:

Select the provided license file.

OR

Site (Network) License:

Copy the provided license file (SmartDraft26.2.3.lic) to SmartDraft's installation folder on a network drive.

Note: A Site License mandates a network drive installation.

Note: If license file is invalid, confirm you have the correct SmartDraft menu loaded. If the issue continues, please contact us

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4.3.8.2 License Transfer

Option to remove a license from a workstation and transfer to another workstation.

Use the **Remove License** button of the **SmartAbout** command to remove a license from a workstation. Once the license has been removed, the license can be transferred to another workstation.

4.3.8.3 Company Name

When a license file is provide, and a company / user name is not included in the file, the user will be prompted to enter a company / user name.

SmartDraft Authorization Dialog

Information

Company / Name:	Enter a company or user name.
OK	Save the company / user name to license information.

4.3.9 SmartDraft Website

Open the SmartDraft website in the default browser.


Button

Ribbon: SmartDraft ▸ Setup panel ▸ SmartDraft Website 

Toolbar: SmartDraft Tools ▸ Drawing Setup 

Command entry: **sm_web**

4.3.10 Update Labels

Update the text values of all the dynamic SmartDraft labels.

Updates the labels listed below.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Yes


Button

Ribbon: SmartDraft ▸ Setup panel ▸ 

Toolbar: SmartDraft Tools: 

Menu: SmartDraft ▸ Update Labels

Command entry: **sdu**

Command:

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Updating SmartDraft Labels.	Count
Arc Dimension Labels:	<count>
Area Labels:	<count>
Coordinate Labels:	<count>
Radial Labels:	<count>
ALTA Labels	<count>
Cross Section Labels:	<count>
Elevation Labels:	<count>
Contour Labels:	<count>
Grid Labels:	<count>
Alignment Intersection Labels:	<count>
Alignment Station and Offset Labels:	<count>
Alignment Stationing Labels:	<count>
Planview Structure Labels:	<count>
Planview Crossing Pipes Labels:	<count>
Northing/Easting Difference Labels:	<count>
Point Labels:	<count>
Point Elevations:	<count>
Slope (1 Point) Labels:	<count>
Slope (2 Points) Labels:	<count>
Line / Curve Labels:	<count>
Section View Labels:	<count>
Profile View Labels:	<count>
Profile View (2 Points) Labels:	<count>
Profile Structure RIM Labels:	<count>
Profile Structure Bottom Labels:	<count>
Profile Crossing Pipe Labels:	<count>
Profile Pipe Deflection Angle Labels:	<count>
Profile Slope Labels:	<count>
Profile Labels:	<count>
Profile Lines:	<count>

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4.3.11 Toggle Update Labels On / Off

Toggle Update Labels for the dynamic SmartDraft labels.

When editing an alignment, profile, and / or ProfileView with multiple SmartDraft dynamic labels, toggling the dynamic Update Labels off, may be more productive.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Yes


Button


Ribbon: SmartDraft ▸ Setup panel ▸ 

Toolbar: SmartDraft Tools: 

Menu: SmartDraft ▸ Toggle Update Labels On / Off


Command entry: **sdut**

Command:

SmartDraft dynamic label updating turned <off / on>

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4.3.12 Toggle Label Masking On / Off

Toggle automatic masking for the text, mtext, and blocks with attributes for SmartDraft commands.

Automatically mask text, mtext, and blocks with attributes when using any of the SmartDraft commands which add text, mtext, arc text, polyline text, or blocks with attributes to a drawing.

Supports:

AutoCAD Products: Yes

BricsCAD Pro: Yes



Button



Ribbon: SmartDraft ▸ Setup panel ▸ 

Toolbar: SmartDraft Tools: 

Menu: SmartDraft ▸ Toggle Label Masking On / Off



Command entry: **ama**

Command:

SmartDraft label masking <off / on>

4.4 Grading Panel Tools

4.4.1 Elevation Label

Create a dynamic elevation label by reading the elevation from a polyline, Civil 3D's alignment and profile, pipes, feature line, survey figure, parcel segment, and surface.

When using the polyline, Civil 3D's alignment option, feature line, pipes, survey figure, and parcel segment the station and offset can be calculated.

Dynamic Data: When elevation labels are assigned to a polyline, alignment and profile, surface, pipes, feature line, survey figure, and parcel segment will update when moved, copied, arrayed, or grip edited using standard commands.

Create straight and angle point elevation labels using different methods to provide the elevation of the labels. Elevations can be adjusted by an adjustment value, a slope, and the decimal precision. Prefix and Suffix text can be added to the elevation, station, and offset values. Elevation entry methods include typing values, selection of text, mtext, attributes, points along a polyline, and Civil 3D's alignment and profile, surfaces, and points. When selecting a Civil 3D's points, the elevation value is used.

Warning: When using elevation values from the Civil 3D's database, it is important to check the integrity of the data used. The output from this command is only as good as the information it extracts. If the Civil 3D's data is not up to date or incorrect, the command will return faulty results.

Supports:

AutoCAD Products: Yes

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BricsCAD Pro: Yes - polylines, BricsCAD Pro Civil Objects


Button

Ribbon: SmartDraft ▸ Grading panel ▸ 

Toolbar: Grading Tools: 

Menu: SmartDraft ▸ Grading ▸ Elevation Label

Command entry: **ef**

Video

Note: The label is a Dynamic Block.

Note: Label styles are saved in the sub-folder **\LABELS** of the current Customization Template as (style name).esy files.

Command:

Create elevation labels.

Surface:

Specify point or [Angle/Edit/Options/Reassociate/Update]: Specify the point, **A**ngle, **E**dit to change the assigned options of existing elevation labels, **O**ptions to change setup options, **R**eassociate to re-associate existing label to a new source object, or **U**pdate to update values of existing elevation labels.

Specify point or [Pan/Zoom]: Specify a placement point for the elevation label, **P** for real time Pan, or **Z** to real time Zoom. **Note:** Do not press ENTER after the **P** or **Z**.

Alignment / Profile:

Specify point or [Angle/Edit/Multiple/Options/Reassociate/Update/Vertices]: Specify the point, **A**ngle to change the angle of the label, **E**dit to change the assigned options of existing elevation labels, **M**ultiple to place labels at a specified interval along the selected alignment, **O**ptions to change setup options, **R**eassociate to re-associate existing label to a new source object, **U**pdate to update values of existing elevation labels, or **V**ertices to place labels at each vertice of the polyline, feature line, or alignment.

Polyline / Feature Line:

Select <first/second> polyline, feature line, survey figure, parcel line or [Edit/Multiple/Options/Reassociate/Update/Vertices]: Select a polyline, **E**dit to change the assigned options of existing elevation labels, **M**ultiple to place labels at a specified interval along the selected object, **O**ptions to change setup options, **R**eassociate to re-associate existing label to a new source object, **U**pdate to update values of existing elevation labels, or **V**ertices to place a label at each vertices of the polyline, feature line, or alignment.

Enter starting station for first polyline <0.00>: Enter a starting station for the polyline, feature line, survey feature, or parcel line. This prompt only appears if the station option is checked and a station hasn't already been associated to the selected object. SmartDraft alignment information will be assigned to the selected object.

Specify point or [Angle/Edit/Multiple/Options/Select/Update/Vertices]: Specify a point, **A**ngle to change the angle of the label, **E**dit to change the assigned options of existing elevation labels, **M**ultiple to place labels at specified intervals along the selected object, **O**ptions to change setup options, **R**eassociate to re-associate existing label to a new source object, **U**pdate to update values of existing elevation labels, or **V**ertices to place a label at each vertices of the polyline, feature line, or alignment.

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Pipe Network and Pressure Pipes:

Select Alignment for station/offset or [Edit/Options/Update]: Select an alignment, **E**dit to change the assigned options of existing elevation labels, **O**ptions to change setup options, or **U**pdate to update values of existing elevation labels.

Select Pipe Network Pipe or [Edit/Options/Reassociate/Update]: Select a pipe, **E**dit to change the assigned options of existing elevation labels, **O**ptions to change setup options, **R**eassociate to re-associate existing label to a new source object,or **U**pdate to update values of existing elevation labels.

Re-associate:

Associate the selected labels to a new source object without changing the selected label display settings.

Select Elevation / Slope (1 point) Labels to associate to new source object.

Select objects: Select Elevation and Slope (1 point) Labels to associate to a new source object.

Select source object to associate to labels: Select the new source object which can be an alignment / profile, pipe, polyline, or surface.

Angle:

Set a rotation angle for all the elevation labels.

Specify angle for elevation label <0.0000>: Specify an angle for the elevation label, or select two points for the angle.

To edit: To edit the options of an existing elevation label, you can either use this command and the Edit option, or use the SmartDraft Text Edit (**ed**) command.

Multiple:

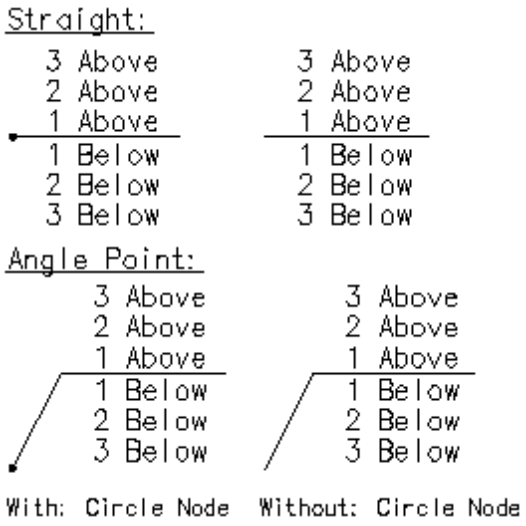
Enter label station interval: Enter the interval for placing labels.

Start labels at station <starting station>: Specify the station to start placing labels. Default is the first station of the alignment.

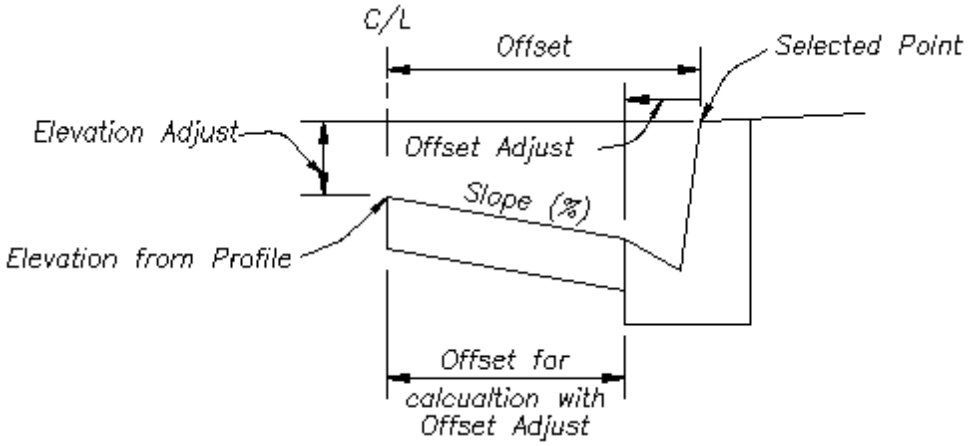
End labels at station <ending station>: Specify the station to end placing labels50. Default is the last station of the alignment.

Example

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Example of Offset, Slope, Adjust, and Offset Adjust



4.4.1.1 Elevation Label Options

Set elevation label options for the Elevation Label command.

Note: Elevation Labels originally placed using the Manual options will be changed to alignment, surface, or polyline / feature line.

Dialog Box Options

Elevation Label Style

Name:	A list of the currently defined elevation label styles. Select the label style to use or edit.
Save As:	Save the current elevation label settings to a new style.
Lock:	Set the selected elevation label style (Name above) as read-only. Lock a style to avoid accidental modification. See Unlock Customization Template Files to remove the lock.
Delete:	Delete the current elevation label style. **Note:** Cannot delete the "default" or a locked style. Deleting a style cannot be undone.
Rename:	Rename the current elevation label style.

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Input Data Type 1: Select input data type 1.
Poly/Feature Line: Extract elevation value from a point along a polyline or feature line, survey feature, or parcel segment.
Alignments: Extract elevation value from a vertical alignment profile defined in Civil 3D.
Surfaces: Extract elevation value from a surface defined in Civil 3D.
Pipes: Extract elevation value from a pipe defined in Civil 3D. For station, selected an alignment.
Note: The following options are only available with the Alignments and Surfaces input data types.
Surface: List of surfaces defined in Civil 3D. Select the surface to use for elevations.
Alignment: List of alignments defined in Civil 3D. Select the alignment.
Profile: List of profile types defined for selected alignment. Select the profile type to use for elevations.

Input Data Type 2: Select input data type 2.
None: Select to only use the input data type 1.
Poly/Feature Line: Extract elevation value from a point along a polyline or feature line, survey feature, or parcel segment.
Alignments: Extract elevation value from a vertical alignment profile defined in Civil 3D.
Surfaces: Extract elevation value from a surface defined in Civil 3D.
Pipes: Extract elevation value from a pipe defined in Civil 3D. For station, selected an alignment.
Note: The following options are only available with the Alignments and Surfaces input data types.
Elevations for vertically curved pressure pipes are only supported in Civil 3D 2021 - 2023.
Surface: List of surfaces defined in Civil 3D. Select the surface to use for elevations.
Alignment: List of alignments defined in Civil 3D. Select the alignment.
Profile: List of profile types defined for selected alignment. Select the profile type to use for elevations.

Labeling:
Station 1 or 2: Toggle to include station value of the label. This option is available with the alignments and polyline / feature line input data types.
Placement: Select the location of the station value.
Prefix: Edit box for prefix text that will be added to the station value.
Suffix: Edit box for suffix text that will be added to the station value.
Precision: Set the number of decimal places for the station output display.

Offset 1 or 2: Toggle to include offset value of the label. This option is available with the alignments and polyline / feature line input data types.
Placement: Select the location of the offset value.
Prefix: Edit box for prefix text that will be added to the offset value.
Suffix: Edit box for suffix text that will be added to the offset value.
Precision: Set the number of decimal places for the offset output display.
Type: Select the offset direction type:

+/-	To display the offset as a positive or negative value.
Prefix Lt/Rt	To add the Left / Right direction as a prefix.
Suffix Lt/Rt	To add the Left / Right direction as a suffix.
None	To display the offset as a positive value.

Elevation 1: Toggle to include elevation 1 value (1st) of the label.
Elevation 2: Toggle to include elevation 2 value (2nd) of the label.
Elevation 3: Toggle to include elevation 3 value (3rd) of the label.
Note: Common options for elevation 1, 2, and 3.
Input: Select the input option for the elevation.
Placement: Specify the location of the elevation value.
Prefix: Edit box for prefix text that will be added to the elevation value.

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Suffix: Edit box for suffix text that will be added to the elevation value.
Adjust: The elevation value will be adjusted by this value. Note: A positive value adds to the elevation, and a negative value subtracts from it.
Grade (%): The elevation value will be adjusted by the grade (%) multiplied by the offset distance from the selected polyline or alignment. This option is only available with the polyline and alignment input data types.
Offset Adjust: The selected offset distance will be adjusted by this value for calculating with the grade to adjust the elevation. Added to support Top of Curb to Edge of Gutter adjustment when calculating street cross fall.
Note: A positive value adds to the offset, and a negative value subtracts from it. This option is only used with the polyline and alignment input data types.
See example below.

Leader:
Yes: Option to include a leader in the label.
No: Option to exclude a leader in the label.
Center: Option to centers the elevation label. (Option only available when No leader is selected)

Leader Style:
Straight: The elevation label leader will be straight.
Angle Point: The elevation label leader will have an angle point.

Node Type:
Arrow: Option to include a solid arrow at the end of the label. Added 21.1.2. Note: If the older block is already inserted, the option will be disabled.
Circle: Option to include a solid circle at the end of the label.
X: Option to include an X at the end of the label.
None: Option to exclude a marker at the end of the label.

Label Type:
Left/Right: Option to place an elevation label with the text labels justified to the left or right.
Center: Option to place an elevation label with the text labels justified center.

Rotation Angle: **Note:** These options are not saved in the style.
Specify On-Screen: Specify the rotation angle of each elevation label using the pointing device.
Angle: Set a rotation angle for all the elevation labels.
Set Angle: Set the value of Angle (above) using the pointing device.

Elevations:
Truncate: Set the number of places the elevation will be truncated left of the decimal point.
Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.
Precision: Set the number of decimal places for the elevation output display.

Layer:
Layer: Set the output layer type. Default (to use the layer database layer) or *current*.
Layer Type: Toggle the layer type for the layer name selection.

4.4.1.2 Elevation Label Edit

Edit elevation labels created using the Elevation Label command.

Note: Elevation Labels originally placed using the Manual options will be changed to alignment, surface, or polyline / feature line.

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Edit

Select Elevation Labels to edit

Select objects: Select the Elevation Labels to edit the assigned options.

Edit Elevation Labels

Input Data Type 1: Select input data type 1.
Alignments: Extract elevation value from a vertical alignment profile defined in Civil 3D.
Surfaces: Extract elevation value from a surface defined in Civil 3D.
Pipes: Extract elevation value from a pipe defined in Civil 3D. For station, selected an alignment.
Poly/Feature Line: Extract elevation value from a point along a polyline, feature line, survey feature, or parcel segment.
Select New Select a new pipe, polyline, or feature line.
Note: The following options are only available with the Alignments and Surfaces input data types.
Surface: List of surfaces defined in Civil 3D. Select the surface to use for elevations.
Alignment: List of alignments defined in Civil 3D. Select the alignment.
Profile: List of profile types defined for selected alignment. Select the profile type to use for elevations.

Input Data Type 2: Select input data type 2.
None: Select to only use the input data type 1.
Poly/Feature Line: Extract elevation value from a point along a polyline or feature line, survey feature, or parcel segment.
Alignments: Extract elevation value from a vertical alignment profile defined in Civil 3D.
Surfaces: Extract elevation value from a surface defined in Civil 3D.
Pipes: Extract elevation value from a pipe defined in Civil 3D. For station, selected an alignment.
Note: The following options are only available with the Alignments and Surfaces input data types.
Surface: List of surfaces defined in Civil 3D. Select the surface to use for elevations.
Alignment: List of alignments defined in Civil 3D. Select the alignment.
Profile: List of profile types defined for selected alignment. Select the profile type to use for elevations.

Labeling:
Station 1 or 2: Toggle to include station value of the label. This option is only available with the alignments and polyline / feature line input data types.
Placement: Select the location of the station value.
Prefix: Edit box for prefix text that will be added to the station value.
Suffix: Edit box for suffix text that will be added to the station value.
Precision: Set the number of decimal places for the station output display.

Offset 1 or 2: Toggle to include offset value of the label. This option is only available with the alignments and polyline / feature line input data types.
Placement: Select the location of the offset value.
Prefix: Edit box for prefix text that will be added to the offset value.
Suffix: Edit box for suffix text that will be added to the offset value.
Precision: Set the number of decimal places for the offset output display.
Type: Select the offset direction type:

+/-	To display the offset as a positive or negative value.
Prefix Lt/Rt	To add the Left / Right direction as a prefix.
Suffix Lt/Rt	To add the Left / Right direction as a suffix.
None	To display the offset as a positive value.

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Elevation 1: Toggle to include elevation 1 value (1st) of the label.
Elevation 2: Toggle to include elevation 2 value (2nd) of the label.
Elevation 3: Toggle to include elevation 3 value (3rd) of the label.
Note: Common options for elevation 1, 2, and 3.
Input: Select the input option for the elevation.
Placement: Specify the location of the elevation value.
Prefix: Edit box for prefix text that will be added to the elevation value.
Suffix: Edit box for suffix text that will be added to the elevation value.
Adjust: The elevation value will be adjusted by this value. Note: A positive value adds to the elevation, and a negative value subtracts from it.
Grade (%): The elevation value will be adjusted by the grade (%) multiplied by the offset distance from the selected polyline or alignment. This option is only available with the polyline and alignments input data types.
Offset Adjust: The selected offset distance will be adjusted by this value for calculating with the grade to adjust the elevation. Added to support Top of Curb to Edge of Gutter adjustment when calculating street cross fall.
Note: A positive value adds to the offset, and a negative value subtracts from it. This option is only used with the polyline and alignment input data types.
See example below.

Node Type:
Arrow: Option to include a solid arrow at the end of the label. Added 21.1.2. Note: If the older block is already inserted, the option will be disabled.
Circle: Option to include a solid circle at the end of the label.
X: Option to include an X at the end of the label.
None: Option to exclude a marker at the end of the label.

Elevations:
Truncate: Set the number of places the elevation will be truncated left of the decimal point.
Example: If the elevation value is 1234.56 and truncate is set to 00.0, the output value will be 34.56.
Precision: Set the number of decimal places for the elevation output display.

Change Label Offset Start the Change Label Leader Offset command.

If Polyline:
Select polyline, feature line, survey figure, parcel line, or <current>: Select a valid object, or if <current> is displayed press enter to use the original object.

4.4.1.3 Select Profile

The select alignment's profile for the Elevation Label and Slope Label (One Point) commands re-associate option.

Input Data Type:
Alignments: Name of the select alignment
Profile: List of profiles associated with the selected alignment. Select the profile to use for elevations.

4.4.1.4 Placement Options

Elevation Label Placement options:

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3 above: The data will be placed three spaces above the leader line.
2 above: The data will be placed two spaces above the leader line.
1 above: The data will be placed one space above the leader line.
1 below: The data will be placed one space below the leader line.
2 below: The data will be placed two spaces below the leader line.
3 below: The data will be placed three spaces below the leader line.

4.4.1.5 Input Options

Elevation Label Input Options

Polyline 1 or 2: The elevation value will be calculated along the selected polyline, feature line, survey figure, or parcel segment perpendicular to the specified point.
Profile 1 or 2: The elevation value will be extracted from the alignment's selected profile. The operator will be prompted to specify a point along the alignment. The station value will be calculated perpendicular or radial back to the alignment from the specified point.
Surface 1 or 2: The elevation value will be extracted from the selected surface. The operator will be prompted to specify points.
Pipe 1 or 2: The elevation value will be extracted from the selected surface. The operator will be prompted to specify points.
Note: Use the Prefix text value as a note.
Prompt: The elevation value can be entered or selected from an object.

4.4.1.6 Change to the Elevation Label Option

Notifies operator that changes have been made to an existing Elevation Label Style. You can cancel your changes, choose OK to apply the changes to the current operation without saving them to the style, or save the changes to the Elevation Label Style.

Apply changes for the current use only: This option saves the changes as temporary overrides to the style. These changes remain until changed or a different style is selected.

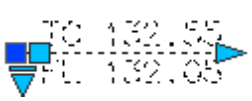
Save changes to the following style: This option saves the changes to the current Elevation Style.

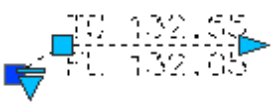
4.4.1.7 Elevation Label Dynamic Block

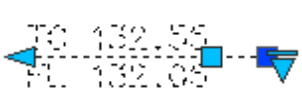
Elevation Label as a dynamic block.

A dynamic block has flexibility and intelligence. A dynamic block reference can easily be changed in a drawing while you work. You can manipulate the geometry through custom grips or custom properties. This allows you to adjust as necessary the block reference in-place rather than searching for another block to insert or redefining the existing one.

The Elevation Label block has the following special dynamic properties.


Right - Node


Right - Grip Move


Left - Node

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 Move grip. Select this grip to move the text and leader line

 Leader search grip. There is one leader search grip; it updates as the text is edited (when SmartDraft is loaded).

 Visibility options. Two options to have the label pointing Right and two options to have the label pointing Left. Each of the Right and Left visibility directions has the additional options to display the circle node or not.

Notes:

- Do not use the Scale command to increase or decrease the size of the block. Use either the Custom Scale property in the Properties Palette, or use the Block Scale command. The Custom Scale property is equal to the text height.
- Do not mirror or include in a block you plan to mirror. This can cause the dynamic grips to stop working.
- The Change Label Direction **CLD** command can be used to toggle the Right and Left direction of the Elevation Label.
- When SmartDraft is loaded and running, the leader will resize when the attribute values are modified.

4.4.1.8 Elevation Label Station Output Option Off - Polyline Type Only

Turn the Station Output Option Off for polyline \ feature line Elevation Label Type.

Command created to fixed an issue on older Elevation Labels created before SmartDraft 16.1.0 when we added the Station output option for the polyline \ feature line.

Button

 Command entry: **efso**

Command:

Select Elevation Labels to turn Station output off.

Create elevation labels.

Select objects: Select Elevation Labels.

4.4.2 Elevation Label Update

Update elevation labels (Dynamic Blocks Only) created using the Elevation Label and Elevation Label - Lot Line commands.

It does not update elevation labels created using the Manual options or if the operator entered the elevation manually.

Warning: When using elevation values from the Civil 3D's objects, it is important to check the integrity of the data used. The output from this command is only as good as the information it extracts. If the Civil 3D data is not up to date or incorrect, the command will return faulty results.

Supports:

AutoCAD Products: Yes

BricsCAD Pro: Polylines, and BricsCAD Pro Civil Objects

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Command entry: **efu**

Command:

Select Elevation Labels to update.

Select Objects: Select the Elevation Labels to update.

Note: If the original alignments, profiles, surfaces, polylines, or feature lines are not found in the current drawing or project, this command will place a "?" for the station, offset, and elevation values.

4.4.3 Elevation Label (Lot Line)

Create an elevation label along a lot line from a Civil 3D's alignment and profile.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	BricsCAD Pro Civil Objects

The elevation, station, and offset are placed along the selected lot lines at a used specified offset. Elevations can be adjusted by an adjustment value, a slope, and the decimal precision. Prefix and Suffix text can be added to the elevation, station, and offset values. Elevation entry methods include typing values, selection of text, mtext, attributes, Civil 3D points, points along a polyline, alignment and profile, and surfaces. When selecting a Civil 3D point, the elevation value is used.

Warning: When using elevation values from the Civil 3D's objects, it is important to check the integrity of the data used. The output from this command is only as good as the information it extracts. If the Civil 3D's data is not up to date or incorrect, the command will return faulty results.

Button

Ribbon: SmartDraft ▸ Grading panel ▸

Toolbar: Grading Tools:

Menu: SmartDraft ▸ Grading ▸ Elevation Label - Lot Line

Command entry: **eff**

Note: The label is a Dynamic Block.

Note: Label styles are saved in the sub-folder **\LABELS** of the current Customization Template as (style name).esy files.

Command:

Create elevation labels - Lot Lines.

Specify point or [Edit/Options/Update]: Specify the point of the elevation, **E**dit to change the assigned options of existing elevation labels, **O**ptions to change the setup options, or **U**pdate to update values of existing elevation labels.

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Select lotline: Select the lot line for placement. The label will be placed at the offset distance from the endpoint nearest the alignment centerline.

Additional prompts when the following Input Types are selected:

Prompt:

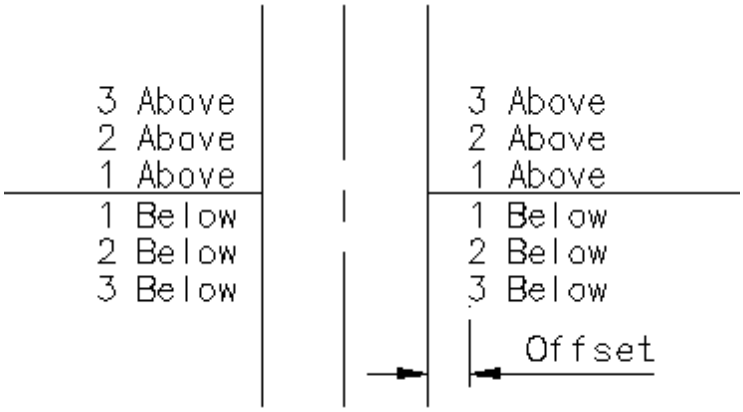
Enter elevation 1-3: Enter an elevation value for the prompted elevation.

Select:

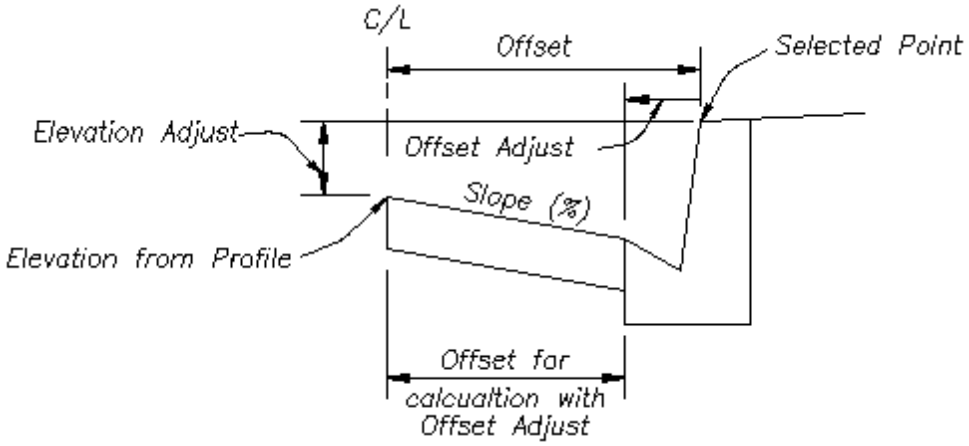
Select elevation 1-3: Select a text string or attribute for the prompted elevation.

To edit: To edit the options of an existing elevation label, you can either use this command and the Edit option, or use the Text Edit (**ed**) command.

Example



Example of Offset, Slope, Adjust, and Offset Adjust



4.4.3.1 Elevation Label Options (Lot Line)

Set elevation label options for the Elevation Label (Lot Line) command.

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Note: Elevation Labels originally placed using the Manual options will be changed to alignment, surface, or polyline / feature line.

Dialog Box Options

Elevation Label Style

Name: A list of the currently defined elevation label styles. Select the label style to use or edit.
Save As: Save the current elevation label settings to a new style.
Lock: Set the selected elevation label style (Name above) as read-only. Lock a style to avoid accidental modification. See Unlock Customization Template Files to remove the lock.
Delete: Delete the current elevation label style. **Note:** Cannot delete the "default" or a locked style. Deleting a style cannot be undone.
Rename: Rename the current elevation label style.

Input Data Type 1:
Alignment 1: Extract elevation value from a vertical alignment profile defined in Civil 3D.
Alignment 1: List of alignments defined in Civil 3D. Select the alignment.
Profile: List of profile types defined for selected alignment. Select the profile type to use for elevations.

Input Data Type 2: Select input data type 2.
None: Select to only use the input data type 1.
Alignment 2: Extract elevation value from a vertical alignment profile defined in Civil 3D.
Alignment 2: List of alignments defined in Civil 3D. Select the alignment.
Profile: List of profile types defined for selected alignment. Select the profile type to use for elevations.

Labeling:
Station 1 or 2: Toggle to include station value of the label. This option is only available with the alignments input data type.
Placement: Select the location of the station value.
Prefix: Edit box for prefix text that will be added to the station value.
Suffix: Edit box for suffix text that will be added to the station value.
Precision: Set the number of decimal places for the station output display.

Offset 1 or 2: Toggle to include offset value of the label. This option is only available with the polyline and alignment input data types.
Placement: Select the location of the offset value.
Prefix: Edit box for prefix text that will be added to the offset value.
Suffix: Edit box for suffix text that will be added to the offset value.
Precision: Set the number of decimal places for the offset output display.
Type: Select the offset direction type:

+/-	To display the offset as a positive or negative value.
Prefix Lt/Rt	To add the Left / Right direction as a prefix.
Suffix Lt/Rt	To add the Left / Right direction as a suffix.
None	To display the offset as a positive value.

Elevation 1: Toggle to include elevation 1 value (1st) of the label.
Elevation 2: Toggle to include elevation 2 value (2nd) of the label.
Elevation 3: Toggle to include elevation 3 value (3rd) of the label.
Note: Common options for elevation 1, 2, and 3.
Input: Select the input option for the elevation.
Placement: Specify the location of the elevation value.
Prefix: Edit box for prefix text that will be added to the elevation value.
Suffix: Edit box for suffix text that will be added to the elevation value.

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Adjust: The elevation value will be adjusted by this value. Note: A positive value adds to the elevation, and a negative value subtracts from it.

Grade (%): The elevation value will be adjusted by the grade (%) multiplied by the offset distance from the selected polyline or alignment. This option is only available with the polyline and alignment input data types.

Offset Adjust: The selected offset distance will be adjusted by this value for calculating with the grade to adjust the elevation. Added to support Top of Curb to Edge of Gutter adjustment when calculating street cross fall.
Note: A positive value adds to the offset, and a negative value subtracts from it. This option is only used with the polyline and alignment input data types.
See example below.

Justification: **Note:** These options are not saved in the style.

Offset: Specify the offset distance, multiplied by the horizontal scale, and the label will be placed away from the nearest lot line endpoint.

Node Type:

Circle: Option to include a solid circle at the end of the label.

X: Option to include an X at the end of the label.

None: Option to exclude a marker at the end of the label.

Elevations:

Truncate: Set the number of places the elevation will be truncated left of the decimal point.
Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.

Precision: Set the number of decimal places for the elevation output display.

Layer:

Layer: Set the output layer type. Default (to use the layer database layer) or *current*.

Layer Type: Toggle the layer type for the layer name selection.

4.4.3.2 Elevation Label Edit

Edit elevation labels created using the Elevation Label - Lot Line commands.

Note: Elevation Labels originally placed using the Manual options will be changed to alignment, surface, or polyline / feature line.

Edit

Select Elevation Labels to edit

Select objects: Select the Elevation Labels to edit the assigned options.

Edit Elevation Labels

Input Data Type 1: Select input data type 1.

Alignment 1: Extract elevation value from a vertical alignment profile defined in Civil 3D.

Alignment 1: List of alignments defined in Civil 3D. Select the alignment.

Profile: List of profile types defined for selected alignment. Select the profile type to use for elevations.

Input Data Type 2: Select input data type 2.

None: Select to only use the input data type 1.

Alignment 2: Extract elevation value from a vertical alignment profile defined in Civil 3D.

Alignment 2: List of alignments defined in Civil 3D. Select the alignment.

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Profile: List of profile types defined for selected alignment. Select the profile type to use for elevations.

Labeling:

Station 1 or 2: Toggle to include station value of the label. This option is only available with the alignments input data type.

Placement: Select the location of the station value.

Prefix: Edit box for prefix text that will be added to the station value.

Suffix: Edit box for suffix text that will be added to the station value.

Precision: Set the number of decimal places for the station output display.

Offset 1 or 2: Toggle to include offset value of the label. This option is only available with the polyline and alignments input data types.

Placement: Select the location of the offset value.

Prefix: Edit box for prefix text that will be added to the offset value.

Suffix: Edit box for suffix text that will be added to the offset value.

Precision: Set the number of decimal places for the offset output display.

Type: Select the offset direction type:

+/-	To display the offset as a positive or negative value.
Prefix Lt/Rt	To add the Left / Right direction as a prefix.
Suffix Lt/Rt	To add the Left / Right direction as a suffix.
None	To display the offset as a positive value.

Elevation 1: Toggle to include elevation 1 value (1st) of the label.

Elevation 2: Toggle to include elevation 2 value (2nd) of the label.

Elevation 3: Toggle to include elevation 3 value (3rd) of the label.

Note: Common options for elevation 1, 2, and 3.

Input: Select the input option for the elevation.

Placement: Specify the location of the elevation value.

Prefix: Edit box for prefix text that will be added to the elevation value.

Suffix: Edit box for suffix text that will be added to the elevation value.

Adjust: The elevation value will be adjusted by this value. Note: A positive value adds to the elevation, and a negative value subtracts from it.

Grade (%): The elevation value will be adjusted by the grade (%) multiplied by the offset distance from the selected polyline or alignment. This option is only available with the polyline and alignments input data types.

Offset Adjust: The selected offset distance will be adjusted by this value for calculating with the grade to adjust the elevation. Added to support Top of Curb to Edge of Gutter adjustment when calculating street cross fall.

Note: A positive value adds to the offset, and a negative value subtracts from it. This option is only used with the polyline and alignment input data types.

See example below.

Node Type:

Circle: Option to include a solid circle at the end of the label.

X: Option to include an X at the end of the label.

None: Option to exclude a marker at the end of the label.

Elevations:

Truncate: Set the number of places the elevation will be truncated left of the decimal point.

Example: If the elevation value is 1234.56 and truncate is set to 00.0, the output value will be 34.56.

Precision: Set the number of decimal places for the elevation output display.

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4.4.3.3 Input Options

Elevation Label Input Options

Options command to all input data types.

Prompt The operator will be prompted to enter the elevation at the command prompt.

Select: The operator will be prompted to select a text string, point object, attribute, or object with elevation to extract the number value from it.

Note: If the Elevation option, "Numbers Only," is checked, only the number of the selected object will be used; if it is unchecked, the whole text string will be used.

Note: Text value will be a the value entered in the "Prefix" and "Suffix" edit boxes.

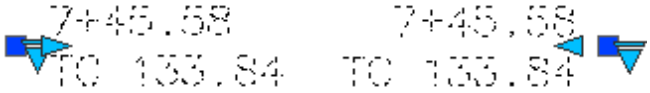
Profile: The elevation value will be extracted from the alignment's selected profile. The operator will be prompted to specify a point along the alignment. The station value will be calculated perpendicular or radial back to the alignment from the specified point.

4.4.3.4 Elevation Label Lots Dynamic Block

Elevation Label Lots as a dynamic block.

A dynamic block has flexibility and intelligence. A dynamic block reference can easily be changed in a drawing while you work. You can manipulate the geometry through custom grips or custom properties. This allows you to adjust as necessary the block reference in-place rather than searching for another block to insert or redefining the existing one.

The Elevation Label Lots block has the following special dynamic properties.



Right **Left**

Offset search grip. There is one offset search grip. It updates the text offset from the insertion point.

Visibility options: Right or Left. Right and the text is left justified and to the right of the insertion point; Left and the text is right justified with the insertion point to the left.

Notes:

- Do not use the AutoCAD Scale command to increase or decrease the size of the block. Use either the Custom Scale property in AutoCAD's Properties Palette, or use the Block Scale command. The Custom Scale property is equal to the text height.
- Do not mirror or include in a block you plan to mirror. This can cause the dynamic grips to stop working.

4.4.4 Elevation Label (Manual)

Create an elevation label by entering the elevation or selecting an object with text to obtain the elevation.

Note: Label values placed using this command do not update when the design data changes.

Supports:

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AutoCAD Products: Yes

BricsCAD Pro: Yes


Button


Ribbon: SmartDraft ▸ Grading panel ▸ 

Toolbar: Grading Tools: 

Menu: SmartDraft ▸ Grading ▸ Elevation Label Manual


Command entry: **efm**

Note: The label is a Dynamic Block

Command:

Create manual elevation labels.

Specify point or [Angle/Options]: Specify the point of the elevation or **A**ngle, or **O**ptions to change setup options.

Specify point or [Pan/Zoom]: Specify a placement point for the elevation label, **P** for real time Pan, or **Z** to real time Zoom. **Note:** Do not press ENTER after the **P** or **Z.**

Additional prompts when the following Input Types are selected:

Prompt:

Enter elevation 1-3 <default>: Enter an elevation value for the prompted elevation. Note: Default value is elevation of specified elevation point.

Select:

Select elevation 1-3: Select a text string or attribute for the prompted elevation.

Angle:

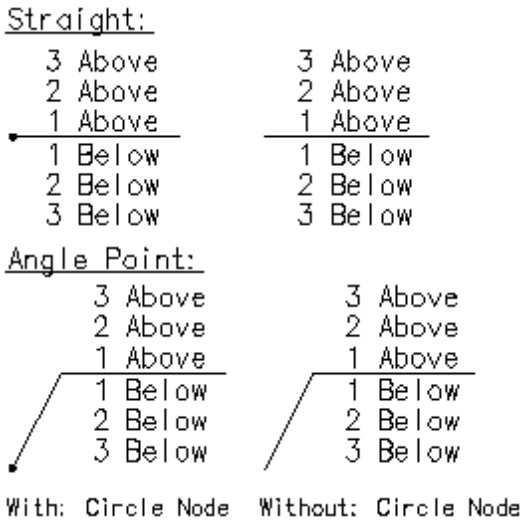
Set a rotation angle for all the elevation labels.

Specify angle for elevation label <0.0000>: Specify an angle for the elevation label, or select two points for the angle.

To edit: To edit this label, use the Text Edit (**ed**) command.

Example

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4.4.4.1 Elevation Label Options (Manual)

Set elevation label options for the Elevation Label (Manual) command.

Dialog Box Options

Elevation Label Style

Name:	A list of the currently defined elevation label styles. Select the label style to use or edit.
Save As:	Save the current elevation label settings to a new style.
Lock:	Set the selected elevation label style (Name above) as read-only. Lock a style to avoid accidental modification. See Unlock Customization Template Files to remove the lock.
Delete:	Delete the current elevation label style. **Note:** Cannot delete the "default" or a locked style. Deleting a style cannot be undone.
Rename:	Rename the current elevation label style.

Labeling:

Elevation 1:	Toggle to include elevation 1 value (1st) of the label.
Elevation 2:	Toggle to include elevation 2 value (2nd) of the label.
Elevation 3:	Toggle to include elevation 3 value (3rd) of the label.
	Note: Common options for elevation 1, 2, and 3.
Input:	Select the input option for the elevation.
Placement:	Specify the location of the elevation value.
Prefix:	Edit box for prefix text that will be added to the elevation value.
Suffix:	Edit box for suffix text that will be added to the elevation value.
Adjust:	The elevation value will be adjusted by this value. **Note:** A positive value adds to the elevation, and a negative value subtracts from it.

Leader:

Yes:	Option to include a leader in the label.
No:	Option to exclude a leader in the label.
Center:	Option to center the elevation label. (Option only available when **No** leader is selected.)

Leader Style:

Straight:	The elevation label leader will be straight.
Angle Point:	The elevation label leader will have an angle point.

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Node Type:

Arrow: Option to include a solid arrow at the end of the label. Added 21.1.2. Note: If the older block is already inserted, the option will be disabled.

Circle: Option to include a solid circle at the end of the label.

X: Option to include an X at the end of the label.

None: Option to exclude a marker at the end of the label.

Label Type:

Left/Right: Option to place an elevation label with the text labels justified to the left or right.

Center: Option to place an elevation label with the text labels justified center.

Rotation Angle: **Note:** These options are not saved in the style.

Specify On-Screen: Specify the rotation angle of each elevation label using the pointing device.

Angle: Set a rotation angle for all the elevation labels.

Set Angle: Set the value of Angle (above) using the pointing device.

Elevations:

Truncate: Set the number of places the elevation will be truncated left of the decimal point.
Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.

Precision: Set the number of decimal places for the elevation output display.

Numbers Only: When elevation 1, 2, or 3's input method is Select, and this option is checked, the selected text string will return only the number; all alphabetic characters will be removed. When it is unchecked all characters are returned.

Layer:

Layer: Set the output layer type. Default (to use the layer database layer) or *current*.

Layer Type: Toggle the layer type for the layer name selection.

4.4.4.2 Input Options Manual

Elevation Label Manual Input Options

Options command to all input data types.

Prompt The operator will be prompted to enter the elevation at the command prompt; the default elevation will be the elevation of the selected elevation point.

Select: The operator will be prompted to select a text string, point object, attribute, or object with elevation to extract the number value from it.
Note: If the Elevation's option, "Numbers Only," is checked, only the number of the selected object will be used; if it is unchecked, the whole text string will be used.

Note: Text value will be the value entered in the "Prefix" and "Suffix" edit boxes.

Options available with the Manual input data type.

Elev 1: The elevation for this label will be taken from the elevation 1 value. The Adjust value of this elevation will be used to modify the elevation.
Example: Elevation 2's Input option has been set to Elev 1. Elevation 1's input type has been set to Select. The Adjust value for elevation 2 was set to -0.5. The operator selects an elevation of 123.89 for elevation 1. The command calculated elevation 2 as 123.39.

Elev 2: The elevation for this label will be taken from the elevation 2 value. The Adjust value of this elevation will be used to modify the elevation.

Elev 3: The elevation for this label will be taken from the elevation 3 value. The Adjust value of this elevation will be used to modify the elevation.

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4.4.5 Slope Label (One Point)

Create a dynamic slope label by reading the slope from a polyline, Civil 3D alignment and profile, surface, feature line, survey figure, parcel segment, and pipe.

Dynamic Data: Slope labels assigned to a polyline, Civil 3D's profile and alignment, surface, feature line, survey figure, parcel segment, or pipes will update when moved, copied, arrayed, or grip edited using standard AutoCAD commands.

Warning: When using slope values from the Civil 3D's object, it is important to check the integrity of the data used. The output from this command is only as good as the information it extracts. If the Civil 3D data is not up to date or incorrect, the command will return faulty results.

Create a slope label specifying the direction and slope, or reads a Civil 3D's profile slope, when selecting a point along an alignment.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Yes


Button


Ribbon: SmartDraft ▸ Grading panel ▸ 
Toolbar: Grading Tools: 
Menu: SmartDraft ▸ Grading ▸ Slope Label (1 Point)


Command entry: **lsc**

Note: The label is a Dynamic Block.

Command:
Slope Label (1 Point)
Current settings: Label = <On/Off>, <Above/Below>, Prefix = "", Suffix = "", Precision: 2, Type: <Grade%, Decimal, Run : Rise, Run : Rise 2>
Specify slope insertion point or [Edit/Options/Reassociate/Update]: Specify an insertion point (1), **E**dit to change the assigned options of existing slope labels, **O**ptions to change the slope appearance options, **R**eassociate to re-associate existing label to a new source object, or **U**pdate to update values of existing slope labels.

Polyline:
Select polyline, feature line, survey figure, parcel line or [Edit/Options/Reassociate/Update]: Select a polyline, **E**dit to change the assigned options of existing elevation labels, **O**ptions to change setup options, **R**eassociate to re-associate existing label to a new source object, or **U**pdate to update values of existing elevation labels.

Pipe Network or Pressure Pipes (does not support vertically curved pipes):
Select Alignment for station/offset or [Edit/Options/Update]: Select an alignment, **E**dit to change the assigned options of existing elevation labels, **O**ptions to change setup options, or **U**pdate to update values of existing elevation labels.

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Select Pipe Network Pipe or [Edit/Options/Reassociate/Update]: Select a pipe, **E**dit to change the assigned options of existing elevation labels, **O**ptions to change setup options, **R**eassociate to re-associate existing label to a new source object,or **U**pdate to update values of existing elevation labels.

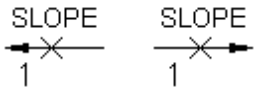
Re-associate:

Associate the selected labels to a new source object without changing the selected label display settings.

Select Elevation / Slope (1 point) Labels to associate to new source object.
Select objects: Select Elevation and Slope (1 point) Labels to associate to a new source object.
Select source object to associate to labels: Select the new source object which can be an alignment / profile, pipe, polyline, or surface.

To edit: To edit the options of an existing slope label, you can either use this command and the Edit option, or use the SmartDraft Text Edit (**ed**) command.

Example



4.4.5.1 Slope Label Options (One Point)

Set slope label options for the Slope Label (One Point) command.

Dialog box Slope Label (One Point) options:

Input Data Type:

Poly/Feature Line: Extract elevation value from a point along a polyline or feature line, survey feature, or parcel segment.
Alignments: Extract elevation value from a vertical alignment profile defined in Civil 3D.
Surfaces: Extract elevation value from a surface defined in Civil 3D.
Pipes: Extract elevation value from a pipe defined in Civil 3D. For station, selected an alignment.
Note: The following options are only available with the Alignments and Surfaces input data types.
Surface: List of surfaces defined in Civil 3D. Select the surface to use for elevations.
Alignment: List of alignments defined in Civil 3D. Select the alignment.
Profile: List of profile types defined for selected alignment. Select the profile type to use for elevations.

Labeling:

Check Box: Check to display the slope text, uncheck to only display the slope arrow.
Prefix: Enter the prefix text for the slope label.
Suffix: Enter the suffix text for the slope label.
Precision: Select the decimal precision for slope.
Type: Select slope type Grade %, Decimal, Run : Rise, or Run : Rise 2 (text only rotated 90 degrees).

Text:

Above: Slope label will be placed above the directional leader.
Below: Slope label will be placed below the directional leader.
Leader Length Past Text: Specify a distance which will be multiplied by the horizontal scale; the leader length will extend past the text with half the length on either side of the slope text.

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Layer:

Layer: Set the output layer type. Default (to use the layer database layer) or *current*.

Layer Type: Toggle the layer type for the layer name selection.

4.4.5.2 Slope Label Edit (One Point)

Edit slope labels (Dynamic Blocks Only) created using the Slope Label (One Point) command.

Edit

Select Slope Labels to edit

Select objects: Select the Slope Labels to edit the assigned options.

Edit Slope Label Options (One Point):

Input Data Type:

Alignments: Extract slope value from a vertical alignment profile defined in Civil 3D.

Surfaces: Extract slope value from a surface defined in Civil 3D.

Pipes: Extract elevation value from a pipe defined in Civil 3D. For station, selected an alignment.

Poly/Feature Line: Extract slope value from a point along a polyline or a Civil 3D's feature line, survey feature, or parcel segment.

Select New Select a new pipe, polyline, or feature line.

Note: The following options are only available with the Alignments and Surfaces input data types.

Surface: List of surfaces defined in Civil 3D. Select the surface to use for elevations.

Alignment: List of alignments defined in Civil 3D. Select the alignment.

Profile: List of profile types defined for selected alignment. Select the profile type to use for elevations.

Labeling:

Check Box: Check to display the slope text, uncheck to only display the slope arrow.

Prefix: Enter the prefix text for the slope label.

Suffix: Enter the suffix text for the slope label.

Precision: Select the decimal precision for slope.

Type: Select slope type Grade %, Decimal Run : Rise, or Run : Rise 2 (text only rotated 90 degrees).

Text:

Above: Slope label will be placed above the directional leader.

Below: Slope label will be placed below the directional leader.

Leader Length Past Text: Specify a distance which will be multiplied by the horizontal scale; the leader length will extend past the text with half the length on either side of the slope text.

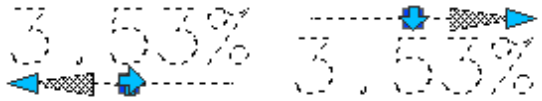
4.4.5.3 Slope Label Dynamic Block

Slope Label as a dynamic block.

A dynamic block has flexibility and intelligence. A dynamic block reference can easily be changed in a drawing while you work. You can manipulate the geometry through custom grips or custom properties. This allows you to adjust as necessary the block reference in-place rather than searching for another block to insert or redefining the existing one.

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The Slope Label block has the following special dynamic properties.



Arrow Left
Text Above

Arrow Right
Text Below

Flip grip. Select the grip to change the direction of the arrow or location of the text.

Leader search grip. There is one leader search grip. It updates the leader length.

Notes:

- Do not use the AutoCAD Scale command to increase or decrease the size of the block. Use either the Custom Scale property in AutoCAD's Properties Palette or use the Block Scale command. The Custom Scale property is equal to the text height.
- Do not mirror or include in a block you plan to mirror. This can cause the dynamic grips to stop working.
- The Change Label Direction **CLD** command can be used to toggle the Right and Left direction of the Elevation Label.

4.4.5.4 Slope Label Update (One Point)

Update slope labels (Dynamic Blocks Only) created using the Slope Label (One Point) command.

It does not update slope labels created using the Manual options or if the operator entered the slope manually.

Warning: When using elevation values from the Civil 3D's objects, it is important to check the integrity of the data used. The output from this command is only as good as the information it extracts. If the Civil 3D data is not up to date or incorrect, the command will return faulty results.

Command entry: **lscu**

Command:

Select Slope Labels to update.

Select Objects: Select the Slope Labels to update.

Note: If the original surface, alignments, profiles, polylines, or feature lines are not found in the current drawing or project, this command will place a "?" for the slope value.

4.4.6 Slope Label (Two Points)

Create a dynamic slope label by reading the elevations of two points from a polyline, Civil 3D's alignment and profile, surface, feature line, survey figure, and parcel segment .
Slope value is calculated from the difference in the two elevations, divided by the distance between the two points.

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Dynamic Data: Slope labels assigned to a polyline, Civil 3D profile and alignment, surface, feature line, survey figure, or parcel segment object will update when moved, copied, arrayed, or grip edited using standard AutoCAD commands.

Warning: When using slope values from the Civil 3D's objects, it is important to check the integrity of the data used. The output from this command is only as good as the information it extracts. If the Civil 3D data is not up to date or incorrect, the command will return faulty results.

Warning: When using this command with the Drawing Setup option set to Annotative Blocks, when a scale is changed, the node for the northing and easting points also scale. They will have to be relocated to display the correct values.

Create a slope label specifying the direction and slope, or reads a Civil 3D profile slope, when selecting a point along an alignment.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Yes


Button


Ribbon: SmartDraft ▸ Grading panel ▸ 

Toolbar: Grading Tools: 

Menu: SmartDraft ▸ Grading ▸ Slope Label (2 Points)


Command entry: **lsc2**

Note: The label is a Dynamic Block.

Command:

Slope Label (2 Points).

Input Data: <Alignment/Surface/Polyline/Point>

Current settings: Below, Prefix = <"">, Suffix = <"">, Precision: <2>, Type: <Grade%>

For Alignment, and Surface:

Specify first point of the slope or [Edit/Options/Update]: Specify the first point (1), **E**dit to change the assigned options of existing slope labels, **O**ptions to change the slope appearance options, or **U**pdate to update values of existing slope labels.

Specify second point of the slope: Specify the second point (2).

Polyline:

Select polyline, feature line, survey figure, parcel line, or [Edit/Options/Update]: Select a polyline or feature line, **E**dit to change the assigned options of existing slope labels, **O**ptions to change setup options, or **U**pdate to update values of existing slope labels.

Point:

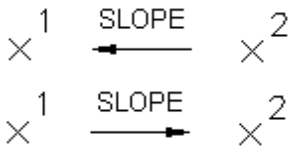
Select first or [Edit/Options/Update]: Select the first point object, **E**dit to change the assigned options of existing slope labels, **O**ptions to change the slope appearance options, or **U**pdate to update values of existing slope labels.

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Select second point: Select the second point object.

To edit: To edit the options of an existing slope label, you can either use this command and the Edit option, or use the SmartDraft Text Edit (**ed**) command.

Example



4.4.6.1 Slope Label Options (Two Points)

Set slope label options for the Slope Label (Two Points) command.

Dialog box Slope Label (Two Points) options:

Input Data:

Use Same Input for Both Points Check to use the same input data options for both selected points of the slope label.

Point 1:

Polyline /Feature Line 1: Extract elevation value from a point along a polyline or feature line, survey feature, or parcel segment.

Alignment 1: Extract elevation value from a vertical alignment profile defined in Civil 3D.

Select from the list of alignments defined in Civil 3D. Select the alignment.

Select from the list of profile types defined for selected alignment. Select the profile type to use for elevations.

Surface 1: Extract elevation value from a surface defined in Civil 3D.

Select from the list of surfaces defined in Civil 3D. Select the surface to use for elevations.

Pipe 1: Extract elevation value from a pipe defined in Civil 3D. For station, selected an alignment.

Note: The following options are only available with the Alignments and Surfaces input data types.

Adjust: The elevation value will be adjusted by this value. Note: A positive value adds to the elevation, and a negative value subtracts from it.

Grade (%): The elevation value will be adjusted by the grade (%) multiplied by the offset distance from the selected polyline or alignment. This option is only available with the polyline and alignments input data types.

Offset Adjust: The selected offset distance will be adjusted by this value for calculating with the grade to adjust the elevation. Added to support Top of Curb to Edge of Gutter adjustment when calculating street cross fall.

Note: A positive value adds to the offset, and a negative value subtracts from it. This option is only used with the polyline and alignment input data types.

Point 2:

Polyline /Feature Extract elevation value from a point along a polyline or feature line, survey feature, or parcel segment

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Line 2:

Alignment 2: Extract elevation value from a vertical alignment profile defined in Civil 3D.

Select from the list of alignments defined in Civil 3D. Select the alignment.

Select from the list of profile types defined for selected alignment. Select the profile type to use for elevations.

Surface 2: Extract elevation value from a surface defined in Civil 3D.

Select from the list of surfaces defined in Civil 3D. Select the surface to use for elevations.

Pipe 2: Extract elevation value from a pipe defined in Civil 3D. For station, selected an alignment.

Note: The following options are only available with the Alignments and Surfaces input data types.

Adjust: The elevation value will be adjusted by this value. Note: A positive value adds to the elevation, and a negative value subtracts from it.

Grade (%): The elevation value will be adjusted by the grade (%) multiplied by the offset distance from the selected polyline or alignment. This option is only available with the polyline and alignments input data types.

Offset Adjust: The selected offset distance will be adjusted by this value for calculating with the grade to adjust the elevation. Added to support Top of Curb to Edge of Gutter adjustment when calculating street cross fall.

Note: A positive value adds to the offset, and a negative value subtracts from it. This option is only used with the polyline and alignment input data types.

Labeling:

Type: Select slope type Grade %, Decimal, Run : Rise, or Run : Rise 2 (text only rotated 90 degrees).

Prefix: Enter the prefix text for the slope label.

Suffix: Enter the suffix text for the slope label.

Precision: Select the decimal precision for slope.

Distance:

Prefix: Enter the prefix text for the distance label.

Suffix: Enter the suffix text for the distance label.

Precision: Select the decimal precision for the distance.

Slope Text:

Above: Slope label will be placed above the directional leader.

Below: Slope label will be placed below the directional leader.

Include Check to include the distance on the label.

Leader Length Specify a distance which will be multiplied by the horizontal scale; the leader length will extend past the text with half the length on either side of the slope text.

Past Text:

Center Label When the slope label is updated, the label and slope will be centered between the two points or will remain in the original location.

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between Point 1 and Point 2:

Layer:

Layer: Set the output layer type. Default (to use the layer database layer) or *current*.

Layer Type: Toggle the layer type for the layer name selection.

Node Type:

Circle: Option to include a solid circle at each of the two points' location.

X: Option to include an X at each of the two points' location.

None: Option to exclude markers at each of the two points' location.

4.4.6.2 Slope Label Edit (Two Points)

Edit slope labels (Dynamic Blocks Only) created using the Slope Label (Two Points) command.

Edit

Select Slope Labels to edit

Select objects: Select the Slope Labels to edit the assigned options.

Edit Slope Label Options (Two Points):

Input Data:

Alignments: Extract elevation value from a vertical alignment profile defined in Civil 3D.

Surfaces: Extract elevation value from a surface defined in Civil 3D.

Poly/Feature Line: Extract elevation value from a point along a polyline or feature line, survey feature, or parcel segment.

Point: Extract elevation value from the elevation value of the selected point.

Note: The following options are only available with the Alignments and Surfaces input data types.

Surface: List of surfaces defined in Civil 3D. Select the surface to use for elevations.

Alignment: List of alignments defined in Civil 3D. Select the alignment.

Profile: List of profile types defined for selected alignment. Select the profile type to use for elevations.

Adjust: The elevation value will be adjusted by this value. Note: A positive value adds to the elevation, and a negative value subtracts from it.

Grade (%): The elevation value will be adjusted by the grade (%) multiplied by the offset distance from the selected polyline or alignment. This option is only available with the polyline and alignments input data types.

Offset Adjust: The selected offset distance will be adjusted by this value for calculating with the grade to adjust the elevation. Added to support Top of Curb to Edge of Gutter adjustment when calculating street cross fall.

Note: A positive value adds to the offset, and a negative value subtracts from it. This option is only used with the polyline and alignment input data types.

Labeling:

Prefix: Enter the prefix text for the slope label.

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Suffix: Enter the suffix text for the slope label.
Precision: Select the decimal precision for slope.
Type: Select slope type Grade %, Decimal, Run : Rise, or Run : Rise 2 (text only rotated 90 degrees).

Text:
Above: Slope label will be placed above the directional leader.
Below: Slope label will be placed below the directional leader.
Leader Length Past Text: Specify a distance which will be multiplied by the horizontal scale; the leader length will extend past the text with half the length on either side of the slope text.
Center Label between Point 1 and Point 2: When the slope label is updated, the label and slope will be centered between the two points or will remain in the original location.

Node Type:
Circle: Option to include a solid circle at each of the two points' location.
X: Option to include an X at each of the two points' location.
None: Option to exclude markers at each of the two points' location.

4.4.6.3 Slope Label Update (Two Points)

Update slope labels (Dynamic Blocks Only) created using the Slope Label (Two Point) command.

It does not update slope labels created using the Manual options or if the operator entered the slope manually.

Warning: When using elevation values from the Civil 3D's objects, it is important to check the integrity of the data used. The output from this command is only as good as the information it extracts. If the Civil 3D data is not up to date or incorrect, the command will return faulty results.

Command entry: **lscu**

Command:
Select Slope Labels to update.
Select Objects: Select the Slope Labels to update.

Note: If the original surface, alignments, profiles, polylines, or feature lines are not found in the current drawing or project, this command will place a "?" for the slope value.

4.4.7 Slope Label (Manual)

Create a slope label by entering the slope and angle.

Note: Label values placed using this command do not update when the design data changes.

Note: Dynamic Slope Labels can be placed with the Slope Label (One Point) and Slope Label (Two Points) commands.

Create a slope label specifying the direction and slope.

Supports:

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AutoCAD Products: Yes

BricsCAD Pro: Yes

Button

Ribbon: SmartDraft ▸ Grading panel ▸

Toolbar: Grading Tools:

Menu: SmartDraft ▸ Grading ▸ Slope Label Manual

Command entry: **lscm**

Note: The label is a Dynamic Block.

Command:

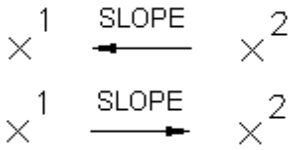
Specify slope insertion point or [Options]: Specify an insertion point (1), or **O**ptions to change the slope appearance options

Specify leader angle <*default*>: Specify the leader rotation angle (2), a point on screen, or press ENTER to accept the default.

Enter slope: Enter the slope.

To edit: To edit the options of an existing slope label, you can either use this command and the Edit option, or use the SmartDraft Text Edit (**ed**) command.

Example



4.4.7.1 Slope Label Options (Manual)

Set slope label options for the Slope Label (Manual) command.

Dialog box Slope Label options:

Labeling:

Prefix: Enter the prefix text for the slope label.
Suffix: Enter the suffix text for the slope label.
Precision: Select the decimal precision for slope.
Type: Select slope type Grade %, Decimal, Run : Rise, or Run : Rise 2 (text only rotated 90 degrees).

Text:
Above: Slope label will be placed above the directional leader.
Below: Slope label will be placed below the directional leader.
Leader Length Past Text: Specify a distance which will be multiplied by the horizontal scale; the leader length will extend past the text with half the length on either side of the slope text.

Layer:

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Layer: Set the output layer type. Default (to use the layer database layer) or *current*.
Layer Type: Toggle the layer type for the layer name selection.

4.4.7.2 Slope Label Edit (Manual)

Edit slope labels (Dynamic Blocks Only) created using the Slope Label (Manual) command.

Edit
Select Slope Labels to edit
Select objects: Select the Slope Labels to edit the assigned options.

Edit Slope Label Options (Manual):

Input Data:
Manual
Value: Enter a value for the slope.

Labeling:

Prefix: Enter the prefix text for the slope label.
Suffix: Enter the suffix text for the slope label.
Precision: Select the decimal precision for slope.
Type: Select slope type Grade %, Decimal, Run : Rise, or Run : Rise 2 (text only rotated 90 degrees).

Text:
Above: Slope label will be placed above the directional leader.
Below: Slope label will be placed below the directional leader.
Arrow:
Left: Slope label arrow direction pointing to the left.
Right: Slope label arrow direction pointing to the right.
Leader Length Past Text: Specify a distance which will be multiplied by the horizontal scale; the leader length will extend past the text with half the length on either side of the slope text.

4.4.8 Spot Elevation

Create a spot elevation from text, object selection, or a Civil 3D's surface .

Supports:

AutoCAD Products: Yes
BricsCAD Pro: Text, and BricsCAD Pro Civil Objects

Button
Ribbon: SmartDraft ▸ Grading panel ▸
Toolbar: Grading Tools:
Menu: SmartDraft ▸ Grading ▸ Spot Elevation
Command entry: **es**

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Command:

Current settings: Input = <Value/Text/Surface>, Adjust = <default>-, Method = <Add/Multiply/Divide>, Output = <Screen/Text/Replace/Block>

Input: Value
Enter elevation or [Options]: Enter the elevation, **O**ptions to change the options, or press ENTER to end.

Input: Object
Select elevation or [Options]: Select elevation to supply the numeric value, **O**ptions to change the options, or press ENTER to end.

Input: Surface (This input option is only available when a Civil 3D is loaded)
Specify point on surface or [Options]: Specify a point within the surface area, **O**ptions to change the options, or press ENTER to end.

Example



4.4.8.1 Spot Elevation Options

Set spot elevation label options for the Spot Elevation command.

Dialog Box Options

Input:
Radio buttons: To set the input method.

Prompt:	The operator will be prompted to enter the elevation value.
Select:	The operator will be prompted to select a text string or object to extract the number value from it.
Surface:	Select the surface from the list of all surfaces in Civil 3D.
Name	Option to specify a Civil 3D surface to use.

Elevation:

Prefix:	Edit box for prefix text that will be added to the value.
Suffix:	Edit box for suffix text that will be added to the value.
Adjust:	Edit box to enter an adjustment value to the elevation value.
Precision:	Specify the Elevation Precision.
Truncate:	Set the number of places the elevation will be truncated left of the decimal point. Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.

Radio buttons: To set the adjust operation. If set to 0.00, no adjustment to the elevation value will be made.

Add:	Add the adjustment value to the elevation text.
Multiply:	Multiply the adjustment value by the elevation text.
Divide:	Divide the elevation text by the adjustment value.

Output:

Screen:	The spot elevation value is displayed at the Command entry.
Text:	The spot elevation value will be output as text.
Replace:	The spot elevation value can replace an existing text or attribute string.
Block:	The spot elevation value will be placed in the first attribute of the selected block.

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Name: A list of all the blocks in the current drawing with attributes. If Block is selected as the output type, you can select the block to use.
Browse: Open the Select Drawing File dialog box where you can select a file to insert. If the selected file does not have an attribute, it will not be added as a valid spot elevation block.

Rotation: Specify the rotation angle for the output object.
Specify On-Screen: Specify the rotation of the spot elevation using the pointing device.
Angle: Set a rotation angle for the spot elevation.
Set Angle: Set the value of Angle (above) using the pointing device.

Placement:
Specified Point: The insertion point of the spot elevation is taken from the selected object.
Second Point: Specify the insertion point of the spot elevation using the pointing device.

Layer:
Layer: Set the output layer type. Default (to use the layer database layer) or *current*.
Layer Type: Toggle the layer type for the layer name selection.

4.4.9 Label Contours

Label an object's elevation by selecting objects one at a time or by selecting two points of a line.

Label the elevation of selected lines, arcs, and polylines with the elevation value (z). The contour elevation label can have a prefix or suffix based on the options.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Polylines and BricsCAD Pro Civil Objects


Button
Ribbon: SmartDraft ▸ Grading panel ▸ 
Toolbar: Grading Tools: 
Menu: SmartDraft ▸ Grading ▸ Label Contours
Command entry: **ac**

Command:

Current settings: Offset factor = *<current>*, Mask type = *<current>*, Mask color/Frame = *<current>*, *Suppress Zeros = <Yes/No>*, *Type = <Object/Line>*, *Output = <Text/MText>*, *Layer = <Default/*current*>*

If **Object:** (selection method)

Select object to label elevation or [Masktype/OFfset/Options]: Select an object (1), **M**asktype to change masking type, **OF**fset to change offset factor, or **O**ptions to display the options dialog. *Default osnap is **NEA**rest.*

If **Line:** (selection method)

Specify starting point on line to label elevation or [Masktype/OFfset/Options]: Specify the starting point, **M**asktype to change masking type, **OF**fset to change offset factor, or **O**ptions to display the options dialog. *Default osnap is **NEA**rest.*

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Specify ending point on line to label elevation: Specify the ending point. Any objects which cross the line created by the two points will be labeled with its elevation value.

If **Select Crossing:** (selection method)

Select crossing lines or polylines to label elevation or [Select Layer/Options]: Select lines and/or polylines, **S**elect Layer to select an object for all lines / polylines on the layer, or **O**ptions to display the options dialog.

If **Masktype:**

Solid places a solid mask object behind the text using the specified color and offset.

Wipeout places a wipeout object behind the text using the specified offset.

Enter masking type [None/Solid/Wipeout] <*current*>: Enter a new type **N**one**, S**olid, **W**ipeout, or press ENTER to accept current.

If **Masktype wipeout:**

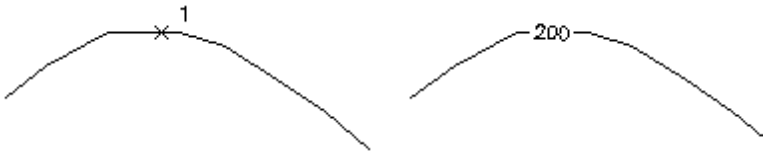
Wipeout frame [Current/OFF/ON] <Current>: Enter if the wipeout frame will be turned on, off, or remain the same (current).

If **OFfset:**

Enter offset factor relative to text height <*current*>: Enter a new offset factor, or press ENTER to accept current.

Note: The mask object is placed on the same layer as the selected text or attribute object. The selected text and arc text objects are grouped together with the mask objects so that they move, copy, or erase as one object. Attribute and mask objects are not grouped. The mask object is an AutoCAD Hatch. To mask text objects, set the plotting to overwrite mode and the pen table's color to 0% screening.
Use Text, Arc Text, and Attribute Unmask to remove the mask objects.

Example



4.4.9.1 Label Contours Options

Label Contours Options for Label Contours

Dialog Box Options

Label Contours Options:

Selection Method

Type: Select Line, Object, or Select Crossing selection method.
Line: Draw a line to label the elevations of the objects crossed by the line.
Object: Select an object to label the elevation of the selected object.
Select Crossing: Select lines and polylines to label elevation were the lines and polyline crossed by the selected lines and polylines.

Interval Only active when type is Line or Select Crossing.

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All:	Label all labels no matter the elevation of the object.
Interval:	Enter an interval so only object dividable by the internal will be labeled.
Prefix / Suffix	
Proposed:	Select the prefix / suffix to be used when the layer type is set to **PROP**.
Existing:	Select the prefix / suffix to be used when the layer type is set to **EXIST**.
Output	
Type:	Select the output contour label as MText or Text object.
Precision:	Select the elevation precision.
Suppress Zeros:	Select if the trailing zeros are suppressed.
Outline:	Add a rectangular polyline outline around the label.
Dynamic Labels:	Check to create a dynamic contour labels.
Layer	
Layer:	Set the output layer type. Default (to use the layer database layer) or *current*.
Layer Type:	Toggle the layer type for the slope symbol.
Text	
Style	Select the text style to used for the labels.
Height	Enter the height of the text label. If the height of the selected text style is predefined, this edit box will be disabled. Otherwise enter the desired plotted text height, the command will multiple the entered height by the drawings current Horizontal Scale.

4.4.9.2 Edit Label Contours Options

Edit Label Contours Options for Label Contours

Dialog Box Options

Edit Label Contours Options:

Prefix / Suffix	
Type:	Select the prefix / suffix to be used.
Output	
Precision:	Select the elevation precision.
Suppress Zeros:	Select if the trailing zeros are suppressed.
Outline:	Add a rectangular polyline outline around the label.

4.4.10 Interpolate Interval

Interpolate interval elevations between two points. Output the elevations as spot elevation blocks, elevation labels, or point objects.

Interpolates between two selected points and inserts a block at specified elevation intervals. Supports the selection of text, mtext, attributes, Civil 3D's contour, and points for the elevation value.

Button

Ribbon: SmartDraft ▸ Grading panel ▸

Toolbar: Grading Tools:

Menu: SmartDraft ▸ Grading ▸ Interpolate

Command entry: **ii**

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Command:

Interpolate.

Current settings: Point = <Object/Select>, Type = <Arc/Line> Current options.

Distance Calculation type:

Type: Arc Calculated along an arc.
Type: Line Calculated along a line.

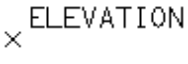
Point options:

Point: Object Selected object's insertion point will be used for calculations.
Point: Select Selected point will be used for calculations.

Output options:

Output: Label Label is the Elevation Label Dynamic Block.

Output: Point Insert either point block or Civil 3D's point object. Per Point Options.

Output: Spot Spot elevation block 

Options: "Select" - "Line" prompts:

Select first elevation or [Output/Point/Type]: Select first elevation object, **O** for output options, **P** to toggle selection type, or **T** to toggle type.

Specify first point: Select point for first elevation object.

Select second elevation: Select second elevation object.

Specify second point: Select point for second elevation object.

Enter elevation interval <1.00>: Enter an elevation interval, or press ENTER.

Options: "Object"- "Line" prompts:

Select first elevation or [Output/Point/Type]: Select first elevation object, **O** for output options, **P** to toggle selection type, or **T** to toggle type.

Select second elevation: Select second elevation object.

Enter elevation interval <1.00>: Enter an elevation interval, or press ENTER.

Options: "Object" - "Arc" prompts

Select first elevation along arc (counter-clockwise) or [Output/Point/Type]: Select first elevation object, **O** for output options, **P** to toggle selection type, or **T** to toggle type.

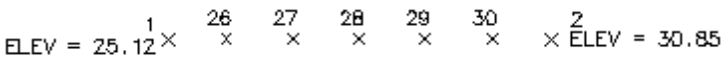
Select arc: Select an arc.

Select second elevation: Select second elevation object.

Enter elevation interval <1.00>: Enter an elevation interval, or press ENTER.

Note: Output precision is controlled via the Elevation Precision setting in the Drawing Setup dialog box.

Example



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4.4.11 Interpolate Contours

Interpolate spot elevations between two polylines or contours.

Supports:

AutoCAD Products:	Yes - does not support Civil 3D contours
BricsCAD Pro:	Yes

Button

Ribbon: SmartDraft ▸ Grading panel ▸

Toolbar: Grading Tools:

Menu: SmartDraft ▸ Grading ▸ Interpolate Contours

Command entry: **ico**

Command:

Interpolate contours.

Current settings: Precision = <0-8>, Truncate = <Yes/No>, Prefix/Suffix = <value/value>

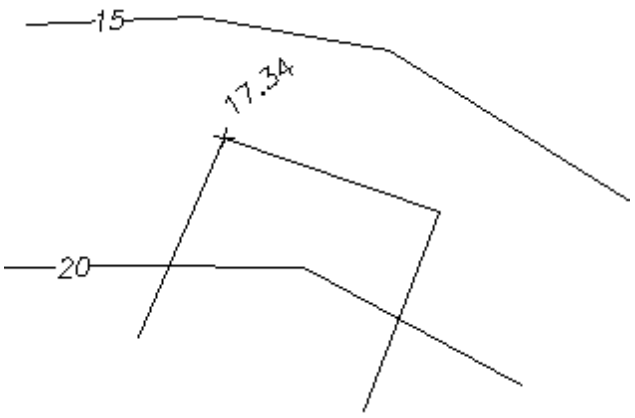
Select first contour or [Options]: Select first contour (polyline) or **O**ption to change the current settings.

Select second contour: Select second contour (polyline) or **O**ption to change the options.

Specify interpolation point or [Options]: Specify the point to interpolate elevation or **O**ption to change the current settings.

Note: The specified point must be between the two contours; if on the outside or past one or the other, the commands will return an out of range message.
Output precision is controlled via the Elevation Precision setting in the Drawing Setup dialog box.

Example



4.4.11.1 Interpolate Contours Options

Options for the Interpolate Contours command.

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Dialog Box Options

Elevation:

Prefix:	Edit box for prefix text that will be added to the value.
Suffix:	Edit box for suffix text that will be added to the value.
Precision:	Specify the Elevation Precision.
Truncate:	Set the number of places the elevation will be truncated left of the decimal point. Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.
Rotation:	Specify the rotation angle for the output object.
Specify On-Screen:	Specify the rotation of the spot elevation using the pointing device.
Angle:	Set a rotation angle for the spot elevation.
Set Angle:	Set the value of Angle (above) using the pointing device.

Layer:

Layer:	Set the output layer type. Default (to use the layer database layer) or *current*.
Layer Type:	Toggle the layer type for the layer name selection.

4.4.12 Calculate Slope

Calculate slope from two selected objects with elevation along an arc or line.

Selected elevation can be from text, mtext, attributes, Civil 3D's point objects, lines, arcs, polylines, splines, or Civil 3D's contours. If the selected object is text, mtext, an attribute, a Civil 3D's point object, the elevation is the text value. If the selected object is a line, arc, polyline, spline, or a Civil 3D's contours, the elevation is the elevation (z) value of the object at the selected point. The distance can be calculated from either an operator-specified "Point", or from the "Object". The "Object" point for text, mtext, attributes, and Civil 3D's point is the insertion point. The "Object" point for lines, arcs, polylines, splines, and a Civil 3D's contour is the point at which the object is selected.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Yes

Button

Ribbon: SmartDraft ▸ Grading panel ▸

Toolbar: Grading Tools:

Menu: SmartDraft ▸ Grading ▸ Calculate Slope

Command entry: **cs**

Calculate Driveway Slope Example

Command:

Calculate slope.

Current: Point = <Object/Select>, Type = <Arc/Line>, Output =<Label/Point/Screen/Slope/Spot>, Adjust = <default>/<default> Current options.

Select first elevation or [Adjust/Output/Point/Type]: Select first elevation object, **A** to change the adjustment values for the selected elevation, **O** for output options, **P** for selection type, or **T** to toggle distance type Line/Arc.

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Point type: Select: Selected point will be used for calculations.

Specify first point: Select point for first elevation object.

Select second elevation: Select second point object.

Specify second point: Select point for second elevation object.

Dist: 35.31, Elv 1: 123.12, Elv 2: 134.43, Elv Diff: 11.31, Slope: 0.32%.

Point type: Object: Selected object's insertion point will be used for calculations.

Select second elevation: Select second point object.

Dist: 35.31, Elv 1: 123.12, Elv 2: 134.43, Elv Diff: 11.31, Slope: 0.32%.

Adjustment option:

Enter first elevation adjustment value <default>: Enter a value to adjust the first selected elevation.

Enter second elevation adjustment value <default>: Enter a value to adjust the second selected elevation.

Distance Calculation type:

Type: Arc Slope calculated along an arc.

Type: Line Slope calculated along a line.

Point options:

Point: Object Selected object's insertion point will be used for calculations.

Point: Select Selected point will be used for calculations.

Label output and Type Line:

Current settings: Point = Object, Type = Line, Output = Label, Adjust = 0.0/0.0 Current options.

Select elevation label point: Select point to calculate elevation and insert label, or press ENTER to end.

Offset distance xx.xx' right/left Offset from line between selected points.

Specify rotation angle <0.00>: Specify rotation angle.

Point output and Type Line:

Current settings: Point = Object, Type = Line, Output = Point, Adjust = 0.0/0.0 Current options.

Specify location for point <Number>: Select point to calculate elevation and placement of point, or press ENTER to end.

Offset distance xx.xx' right/left Offset from line between selected points.

Spot output and Type Line:

Current settings: Point = Object, Type = Line, Output = Spot, Adjust = 0.0/0.0 Current options.

Select spot elevation point: Select point to calculate spot elevation and insert block, or press ENTER to end.

Offset distance xx.xx' right/left Offset from line between selected points.

Specify rotation angle <0.00>: Specify rotation angle.

Slope output:

Current: Point = Object, Type = Line, Output = SLope, Adjust = 0.0/0.0 Current options.

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Specify insertion point or [Options]: Select insertion point, or **O**ptions for slope options. See Label Slope for options.

Label output and Type Arc:

Current: Point = Object, Type = Arc, Output = Label, Adjust = 0.0/0.0 Current options.

Select first elevation along arc (counter-clockwise) or [Adjust/Output/Point/Type]: Select first point object, **A** to change the adjustment values for the selected elevation, **O** for output options, **P** for selection type, or **T** for distance type.

Select arc: Select the arc.

Select second elevation: Select second point object.

Dist: 35.31, Elv 1: 123.12, Elv 2: 134.43, Elv Diff: 11.31, Slope: 0.32%.

Select elevation label point: Select point to calculate elevation and insert label, or press ENTER to end.

Offset distance xx.xx' right/left Offset from line between selected points.

Specify rotation angle <0d0'0.00">: Specify rotation angle.

Point output and Type Arc:

Current: Point = Object, Type = Arc, Output = Point, Adjust = 0.0/0.0 Current options.

Select first elevation along arc (counter-clockwise) or [Adjust/Output/Point/Type]: Select first point object, **A** to change the adjustment values for the selected elevation, **O** for output options, **P** for selection type, or **T** for distance type.

Select arc: Select the arc.

Select second elevation: Select second point object.

Dist: 35.31, Elv 1: 123.12, Elv 2: 134.43, Elv Diff: 11.31, Slope: 0.32%.

Specify location for point <Number>: Select point to calculate elevation and placement of point, or press ENTER to end.

Offset distance xx.xx' right/left Offset from line between selected points.

Spot output and Type Arc:

Current: Point = Object, Type = Arc, Output = Spot, Adjust = 0.0/0.0 Current options.

Select first elevation along arc (counter-clockwise) or [Adjust/Output/Point/Type]: Select first point object, **A** to change the adjustment values for the selected elevation, **O** for output options, **P** for selection type, or **T** for distance type.

Select arc: Select the arc.

Select second elevation: Select second point object.

Dist: 35.31, Elv 1: 123.12, Elv 2: 134.43, Elv Diff: 11.31, Slope: 0.32%.

Select spot elevation point: Select point to calculate spot elevation and insert block, or press ENTER to end.

Offset distance xx.xx' right/left Offset from line between selected points.

Specify rotation angle <0d0'0.00">: Specify rotation angle.

4.4.12.1 Slope Label Options

Set slope label options for the Calculate Slope command when the output option is Slope.

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Dialog box Slope Label options:

Labeling:

Prefix: Enter the prefix text for the slope label.
Suffix: Enter the suffix text for the slope label.
Precision: Select the decimal precision for slope.
Type: Select slope type Grade %, Decimal, Run : Rise, or Run : Rise 2 (text only rotated 90 degrees).

Text:
Above: Slope label will be placed above the directional leader.
Below: Slope label will be placed below the directional leader.
Leader Length Past Text: Specify a distance which will be multiplied by the horizontal scale; the leader length will extend past the text with half the length on either side of the slope text.

Layer:
Layer: Set the output layer type. Default (to use the layer database layer) or *current*.
Layer Type: Toggle the layer type for the layer name selection.

4.4.13 Adjust Elevation

Adjust selected elevations by both an adjustment value and source elevation.

This command adjusts TEXT, TEXT in a BLOCK, ATTRIBUTES, or MTEXT objects by a supplied numeric factor.

Warning: When MTEXT is selected, command will adjust every number in the MTEXT object. Command processes text formatted as station (11+34.50) as a single number.

Button
Ribbon: SmartDraft ▸ Grading panel ▸
Toolbar: Grading Tools:
Menu: SmartDraft ▸ Grading ▸ Adjust Elevations
Command entry: **ead**

Command:

Current settings: Highlight = <Yes/No>, Adjust = <current>, Precision = <current>

Select source elevation or [Adjust/Highlight/Precision/Undo]: Select the source elevation (string, point object, object with elevation) or **H** to toggle AutoCAD's highlight function on or off, **P** to specify the decimal precision, **A** to change the adjustment value, **U** to undo the last changes, or press ENTER to exit.

Source elevation: <selected elevation>, Adjust: <current>

Select elevations to adjust or [Undo]: Select elevation string(s) to adjust or **U** to undo the last changes, or press ENTER to exit.

Adjust

Enter adjustment value <0.00>: Enter an adjustment value.

Precision

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New precision [No Change/1/2/3/5/6/7/8] <No>: Specify a new precision or **N** to not change the current precision of the text string.

Note: If the precision value is set to **No**, the adjustment and source value will be rounded to the decimal precision of the selected elevation.

If a block is selected by this option, a dialog will display the attribute tags, which can be modified. Select the desired attribute tags.

Select valid attribute tag(s): Highlight the attribute tag(s) to be adjusted.

If no number(s) is/are found in text string(s):

No number(s) in selected text string.

Example:
Source: 123.40
Adjust by -**0.14**

Selected Elevation	Adjusted Elevation
0.4	123.9
FL -0.21	FL 123.42
1.35 IE	124.89 IE

4.4.14 Calculate Elevation

Calculate elevation from a selected object with elevation and a selected point (distance).

Selected elevation can be from text, mtext, attributes, Civil 3D's Point s, lines, arcs, polylines, splines, or Civil 3D's Contours. If the selected object is text, mtext, an attribute, or a Civil 3D's Point object, the elevation is the text value. If the selected object is a line, arc, polyline, spline, or a Civil 3D's Contours, the elevation is the elevation (z) value of the object at the selected point. The distance can be calculated from either an operator-specified "Point" or from the "Object". The "Object" point for text, mtext, attributes, and a Civil 3D's Point is the insertion point. The "Object" point for lines, arcs, polylines, splines, and a Civil 3D's Contour is the point at which the object is selected.

Note: The elevation values of the selected points are ignored when calculating the distance.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Yes

Button
Ribbon: SmartDraft ▸ Grading panel ▸
Toolbar: Grading Tools:
Menu: SmartDraft ▸ Grading ▸ Calculate Elevation
Command entry: **ce**

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Command:

Calculate elevation.

Current settings: Point = <Object/Select>, Type = <Arc/Line>, Slope = <default>, Adjust = <default>, Output = <Point/SCreen/SPot/Text>, Next = <Yes/No> Current options.

Select elevation or [Adjust/Next/Options/Point/Slope/Type]: Select elevation object, **A** to change the adjustment value for the selected elevation, **O** for output options, **P** for selection type, **S** for slope, or **T** to toggle distance type Line/Arc.

Point type: Select: Selected point will be used for calculations.

Specify start point: Select point for the selected elevation object.

Starting elevation = <value>, Slope = <default>, Adjust = <default>, Output = <Point/SCreen/SPot/Text>, Next = <Yes/No>

Specify point for distance or [Adjust/Next/Options/Slope]: Specify point to calculate elevation (uses the current slope and distance from start point to specified point).

Point type: Object: Selected object's insertion point will be used for calculations.

Starting elevation = <value>, Slope = <default>, Adjust = <default>, Output = <Point/SCreen/SPot/Text>, Next = <Yes/No>

Specify point for distance or [Adjust/Next/Options/Slope]: Specify point to calculate elevation (uses the current slope and distance from start point to specified point).

Adjust option:

Enter elevation adjustment value <default>: Enter a value to adjust the selected elevation.

Reset adjustment value to 0.00 on exit [Yes/No] <default>: Reset the adjustment value to 0.00 on command exit.

Next options:

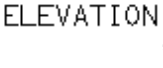
Next: Yes	The calculate from point is moved to the last specified point, and the elevation is changed to the last calculated value.
Next: No	Last selected point and elevation remain the same, new elevations are calculated for these values.

4.4.14.1 Calculate Elevation\Slope Output Options

Options for the Calculate Elevation and Calculate Slope command.

Dialog Box Options

Calculate Elevation/Slope Output Options:

Type:	Select the output type: Label = Label is the Elevation Label Dynamic Block, Point = Insert either Point Block or Civil 3D's Point object. Per Point Options, Screen = Prompt to Command entry only, Spot = Spot elevation block.  , and Text = Text entity.
Prefix:	Edit box for prefix text that will be added to the elevation.
Suffix:	Edit box for suffix text that will be added to the elevation.
Insert at Elevation	
Truncate:	Set the number of places the elevation will be truncated left of the decimal point.

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Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.

Precision: Specify the Elevation Precision.

Node Type:

Arrow: Option to include a solid arrow at the end of the label. Added 21.1.2. Note: If the older block is already inserted, the option will be disabled.

Circle: Option to include a solid circle at the end of the label.

X: Option to include an X at the end of the label.

None: Option to exclude a marker at the end of the label.

Specify On-Screen: Specify the rotation of the spot elevation using the pointing device.

Angle: Set a rotation angle for the spot elevation.

Set Angle: Set the value of Angle (above) using the pointing device.

Layer:

Layer: Set the output layer type. Default (to use the layer database layer) or *current*.

Layer Type: Toggle the layer type for the layer name selection.

4.4.15 Edit Object's Elevation

Edit selected object's elevation (z) value.

Modify the elevation of selected objects (arcs, blocks, circles, dimensions, ellipses, lines, lwpolylines, points, polylines, and text). The new elevation can be to an absolute elevation or an adjustment to the select object's current elevation. If the selected object is a 3D polyline and an absolute elevation is entered, the 3D polyline will be converted to a 2D polyline at the new elevation.


Button


Ribbon: SmartDraft ▸ Grading panel ▸ 

Toolbar: Grading Tools: 

Menu: SmartDraft ▸ Grading ▸ Edit Object's Elevation


Command entry: **ec**

Command:

Modelspace or Paperspace only.

Current settings: Adjust = <default>, Type = <Enter / Select>, Adjust Point Elevation = <Yes/No>

Type = Enter

Enter new elevation or [Adjust/Change/Point/Reference/Type] <default>: Enter a new elevation, **A** to change the adjustment values for the specified elevation, **P**oint to toggle if the point object's elevation is to be adjusted, **R**eference to specify a reference and new elevation, **C**hange to enter a change in elevation, **T**ype to toggle entry type, or press ENTER to accept default.

Changing object's elevation to <value>: **Note:** Adjustment value applied.

Select objects: Select objects to modify.

Type = Select

Select new elevation or [Adjust/Change/Point/Reference/Type] <0.00>: Select text, attribute, Civil 3D's Point object, or object with elevation, **A** to change the adjustment values for the selected elevation, **P**oint to toggle if

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the point object's elevation is to be adjusted, **R**eference to specify a reference and new elevation, **C**hange to enter a change in elevation, **T**ype to toggle entry type, or press ENTER to accept default.
Changing object's elevation to <value>: **Note:** Adjustment value applied.
Select objects: Select objects to modify.

Reference will adjust the elevation of selected objects by the difference between the new elevation and the reference elevation.

Enter reference elevation <*default*>: Enter the reference elevation.
Enter new elevation <*default*>: Enter a new elevation.
Changing object's elevation by <value> **Note:** Adjustment value **not** applied.
Select objects: Select objects to modify.

Change

Enter change in elevation <default>: Enter a value that will be used to adjust the elevation of selected objects.
Changing object's elevation by <value> **Note:** Adjustment value **not** applied.
Select objects: Select objects to modify.

If **Adjust Point Elevation = Yes**

The elevation attribute of the point block will also be changed, or the elevation property of a Civil 3D's Point will be adjusted.

For the point block, the object's Z value will not be changed.

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4.4.16 Slope Symbol

Create slope symbol types.

Create a slope symbol between the toe and top of slope line.

Button
Ribbon: SmartDraft ▸ Grading panel ▸
Toolbar: Grading Tools:
Menu: SmartDraft ▸ Grading ▸ Slope Symbol
Command entry: **ssl**

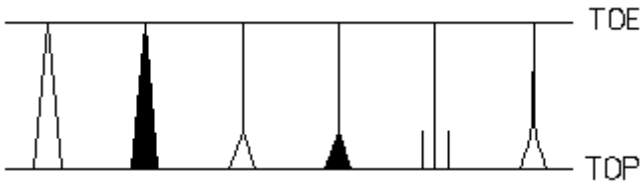
Command:

Current settings: Slope = <type>, Layer = <type>

Specify top of slope point or [Options]: Select point (1), **O**ptions to change slope and/or layer type, or press ENTER to end. *Default osnap is **NEA**rest.*

Specify toe of slope point: Select point (2) *Default osnap is **PER**pendicular.*

Slope symbol types:



4.4.16.1 Slope Symbol Options

Options for the Slope Symbol command.

Dialog Box Options

Symbol

Slope Symbols: Select the slope symbol type.

Width

Default: The default width is 0.125 x Horizontal Scale. (Example: 40 Scale: 40 x 0.125 = 5 units wide.)

Factor: Enter a value to be multiplied by the horizontal scale.

Length (only for slope types 3, 4, 5, and 6)

Default: The default length is 1/4 the distance from the top to toe of slope. (Example: 12 slope: 12 x 0.25 = 4 units wide.)

Factor: Enter a value to be multiplied by the horizontal scale. This option sets the length to a fixed value vs. a length based on the distance between the top and toe of slope.

Divide: Select the division factor: 1/2, 1/3, 1/4, or 1/5.

Layer:

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Layer:	Set the output layer type. Default (to use the layer database layer) or *current*.
Layer Type:	Toggle the layer type for the slope symbol.
OK:	Save specified options, and return to creating slope symbols.
Cancel:	Exit dialog box without saving option changes, and return to creating slope symbols.

4.4.17 Toe / Top of Slope

Create toe or top of slope.

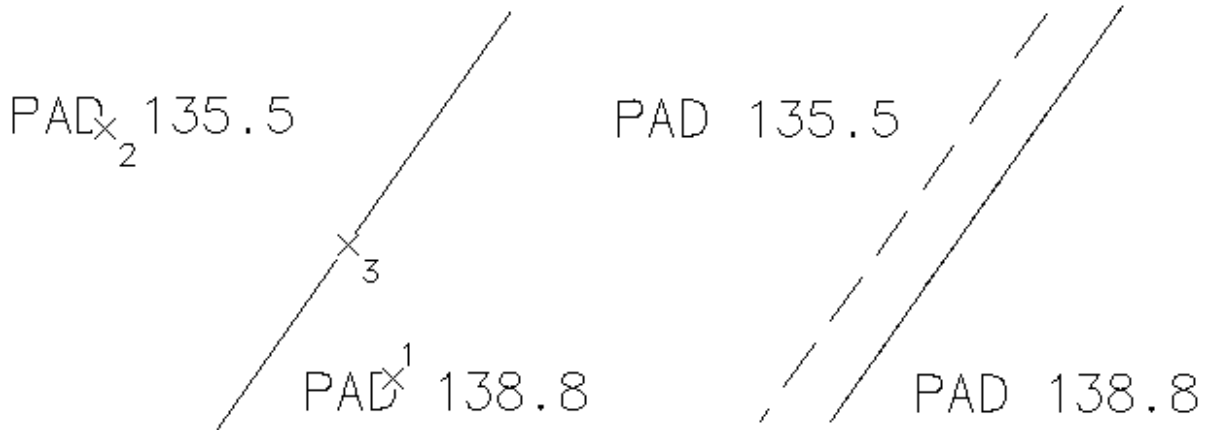
Create a toe or top of slope from two elevations, a slope, and by selecting the top of slope object. Options to create a copy of the top/toe of slope include offset bench, creating the slope a the actual elevation, and use of lines and arcs, or polylines.

Button
Ribbon: SmartDraft ▸ Grading panel ▸
Toolbar: Grading Tools:
Menu: SmartDraft ▸ Grading ▸ Toe / Top of Slope
Command entry: **gts**

Command:
Current settings: Adjust = <Value/Value>, Elevation = <Prompt or Select>, Output = <Toe/Top>, <LineArc/Polyline>, <Actual/0>, <Yes/No>, Slope = <value>:1
If **Elevation option is Select:**
Select first pad elevation or [Options]: Select first elevation object, or **O** to change the options.
Select second pad elevation: Select second elevation object.
Select <top/toe> of slope: Select the slope object to offset the new slope.

If **Elevation option is Prompt**
Enter first pad elevation or [Options]: Enter the first elevation, or **O** to change the options.
Specify point in first pad area: Specify a point within the first pad area.
Enter second pad elevation: Enter the second elevation.
Specify point in second pad area: Specify a point within the second pad area.
Select top of slope: Select the slope object to offset the new slope.

Example



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4.4.17.1 Toe / Top of Slope Options

Options for Toe / Top of Slope command.

Dialog Box Options

Elevation Input:

First / Second

Prompt:	The operator will be prompted to enter the elevation value.
Select:	The operator will be prompted to select an object to extract the number value from it.
Adjust:	The elevation value will be adjusted by this value.

Calculation:

Slope:	The slope used to calculate the offset distance from the top of slope elevation to the toe of slope elevation.

Bench:

Offset:	Specify an offset distance. A bench will be drawn at the specified offset distance; slope lines will be drawn from the offset bench line.

Output:

Type:	Select
Linework:	Select if the slope will be a line/arc or a polyline.
Original:	Select Yes for the command to make a copy of the original slope, or No not to copy.
Elevation:	Select Actual to create the new toe and top of slope at their actual elevation or 0 to create them at elevation 0.

Layer

Layer:	Set the output layer type. Default (to use the layer database layer) or *current*.
Layer Type:	Toggle the layer type for the slope symbol.

4.4.18 Daylight Symbol

Create daylight symbol along an object or change object to the daylight linetype.

Add the daylight symbol to selected objects or change the selected objects to the daylight layer with the daylight complex linetype.


Button


Ribbon: SmartDraft ▸ Grading panel 

Toolbar: Grading Tools: 

Menu: SmartDraft ▸ Grading ▸ Daylight Symbol

Command:

Current settings: Type = <Linetype/Block>, Spacing = <value>

Select path for Daylight Symbol or [Type/Spacing]:

To change symbol spacing when using the Block option: Specify **S**

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Enter symbol spacing <*default*>: Enter new distance.

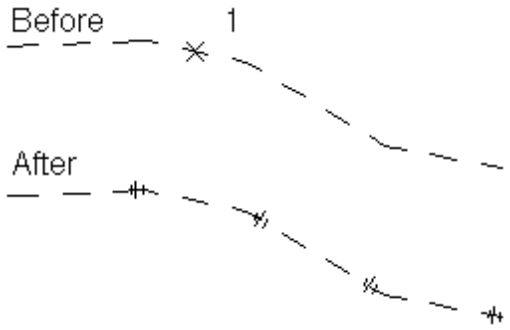
Use **T**ype to change the linetype and block options.

The Block option inserts a symbol along the selected object.

The Linetype option changes the selected object to the Daylight layer and changes the linetype of the Daylight layer to the linetype specified in the layer database if it is not already set.

Select path for Daylight Symbol or [Type/Spacing]: Select path (1).

Example



4.4.19 Cut / Fill Symbol

Create cut and fill symbol along an object or change object to the cut / fill linetype.

Add the cut / fill symbol to selected objects or change the selected objects to the cut / fill layer with the cut / fill complex linetype.

Button
Ribbon: SmartDraft ▸ Grading panel ▾
Toolbar: Grading Tools:
Menu: SmartDraft ▸ Grading ▸ Cut Fill Symbol

Command:
Current settings: Type = <Linetype/Block>, Spacing = <value>
Select path for Cut/Fill Symbol or [Type/Spacing]:

To change symbol spacing when using the Block option: Specify **S**

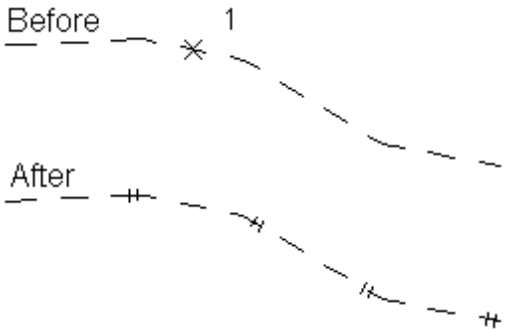
Enter symbol spacing <*default*>: Enter new distance

Use **T**ype to change the linetype and block options.
The Block option inserts a symbol along the selected object.
The Linetype option changes the selected object to the Cut /Full layer and changes the linetype of the Cut/Fill layer to the linetype specified in the layer database if it is not already set.

Select path for Cut/Fill Symbol or [Type/Spacing]: Select path (1).

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Example



4.4.20 Brow Ditch Symbol

Create a brow ditch symbol along an object or change object to the brow ditch linetype.

Add the brow ditch symbol to selected objects or change the selected objects to the brow ditch layer with the brow ditch complex linetype.

Button

Ribbon: SmartDraft ▸ Grading panel ▾

Toolbar: Grading Tools:

Menu: SmartDraft ▸ Grading ▸ Brow Ditch

Command:

Current settings: Type = <Linetype/Block>, Spacing = <value>

Select path for Brow Ditch Symbol or [Type/Spacing]:

To change symbol spacing when using the Block option: Specify **S**

Enter symbol spacing <*default*>: Enter new distance

Use **T**ype to change the linetype and block options.

The Block option inserts a symbol along the selected object.

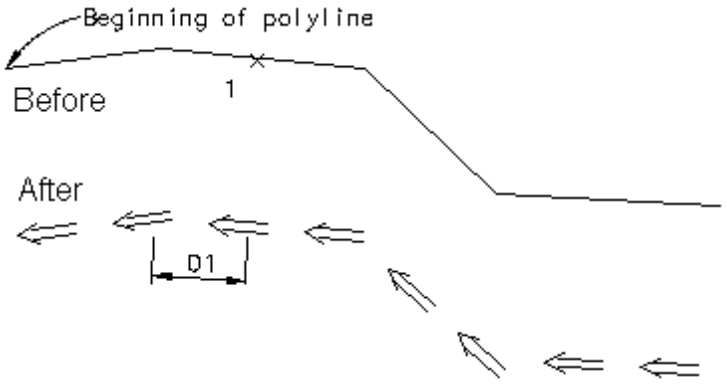
The Linetype option changes the selected object to the Brow Ditch layer and changes the linetype of the Brow Ditch layer to the linetype specified in the layer database if it is not already set.

Select path for Brow Ditch Symbol or [Type/Spacing]: Select path (1).

Note: If a polyline is selected, the arrows will point toward the start point.

Example

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4.4.21 Edit Polyline Elevation

Edit the elevation of selected polylines.

Change the elevation of any 2D polyline in the drawing.

Button
Ribbon: SmartDraft ▸ Grading panel ▸
Toolbar: Grading by Polyline Tools:
Menu: SmartDraft ▸ Grading by Polyline ▸ Edit polyline elevation

Command:
Edit polyline elevation.
Current settings: Elevation Type: <Prompt/Select>

Select arc, line, polyline, or [Options]:	Select an arc, line, polyline, or Options. Select Options to toggle between elevation type Prompt and Select.

Elevation Type: Prompt

Enter new elevation <X.X.X>:	Enter a new elevation, or press ENTER to accept current elevation.

Elevation Type: Select

Select new elevation <X.X.X>:	Select an object with an elevation or a text object with numbers for the new elevation, or press ENTER to accept current elevation.

4.4.22 Edit Polyline Datum Elevation

Edit the elevations of the selected polyline by a datum value.

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Change 2D polyline elevations by adding or subtracting a specific amount.


Button

Ribbon: SmartDraft ▸ Grading panel ▸ 
Toolbar: Grading by Polyline Tools: 
Menu: SmartDraft ▸ Grading by Polyline ▸ Edit polyline datum elevation

Command:

Edit polyline datum elevation.

Select polylines or [LAYer]: Select polylines or **LAY**er to select all the polylines on a selected layer.

Select polylines or [LAYer]: Select more polylines, or press ENTER to continue.

Enter change in elevation: Enter the adjustment value. This value will be added/subtracted from the elevation of the selected polylines.

LAYer

Select layer for polylines or [Objects]: Select an object on the layer. All polylines on selected layer will be selected and processed, or **O**bject to toggle back to selecting polylines.

4.4.23 Assign Polyline Elevation

Assign an elevation to selected polylines.

Enter the elevations for selected polylines. Begin by assigning an elevation to the first contour, and then define an interval for the next contour elevation. The command automatically calculates all subsequent contour elevations.


Button

Ribbon: SmartDraft ▸ Grading panel ▸ 
Toolbar: Grading by Polyline Tools: 
Menu: SmartDraft ▸ Grading by Polyline ▸ Assign polyline elevation

Command:

Assign polyline elevation.

Select first polyline: Select a polyline

Enter first polyline elevation <XXX.XX>: Enter an elevation for the first polyline.

Enter elevation interval (+ Increase / - Decrease) <1.00>: Enter an elevation interval; a positive number to increase or a negative number to decrease the next contour's elevation.

Select next polyline or [Interval]: Select a polyline, or enter **I**nterval to change the interval elevation.

Current elevation (XXX.XX), Enter new elevation <XXX.XX>: Press ENTER to accept calculated elevation, or enter an elevation.

Select next polyline or [Interval]: Select a polyline, enter **I**nterval to change the interval elevation, or press ENTER to end.

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Interval

Enter elevation interval (+ Increase / - Decrease) <1.00>: Enter an elevation interval; a positive number to increase or a negative number to decrease the next contour's elevation.

4.4.24 Modify Elevations of Feature Lines or 3D Polylines: Absolute Hinge

Use a hinge line to edit the elevations of selected feature lines and 3D polylines. The hinge line is defined by two points. The absolute slope can be a slope (%) or a slope (X:1).

Button

Ribbon: SmartDraft ▸ Grading panel ▸

Toolbar: Grading by Polyline Tools:

Menu: SmartDraft ▸ Grading by Polyline ▸ Modify Elevations of Feature Lines or 3D Polylines: Absolute Hinge

Command:

Modify elevations of feature lines or 3D polylines: Absolute Hinge.

Current settings: Slope Type = <%, X:1>

Specify first point or [Options]: Specify the point, **O**ptions to toggle slope type, or press ENTER to end.

Enter elevation [x.xxx]: Enter an elevation, or enter to accept the default.

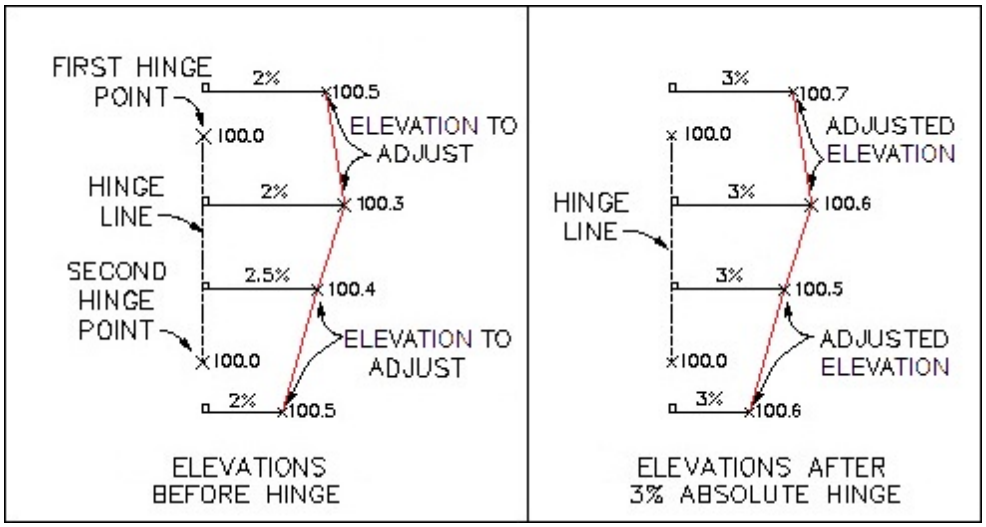
Specify next point: Specify the point to define the hinge line.

Enter elevation [x.xxx]: Enter an elevation, or enter to accept the default.

Enter slope (%, X:1): Enter a slope.

Select feature line or 3D polyline objects: Select the feature line or 3D polyline objects to modify their elevations.

Example:



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4.4.25 Modify Elevations of Feature Lines or 3D Polylines: Relative Hinge

Use a hinge line to edit the elevations of selected feature lines and 3D polylines. The hinge line is defined by two points. The relative slope can be a slope (%) or a slope (X:1).

Button

Ribbon: SmartDraft ▸ Grading panel ▸

Toolbar: Grading by Polyline Tools:

Menu: SmartDraft ▸ Grading by Polyline ▸ Modify Elevations of Feature Lines or 3D Polylines: Relative Hinge

Command:

Modify elevations of feature lines or 3D polylines: Relative Hinge.

Current settings: Slope Type = <%, X:1>

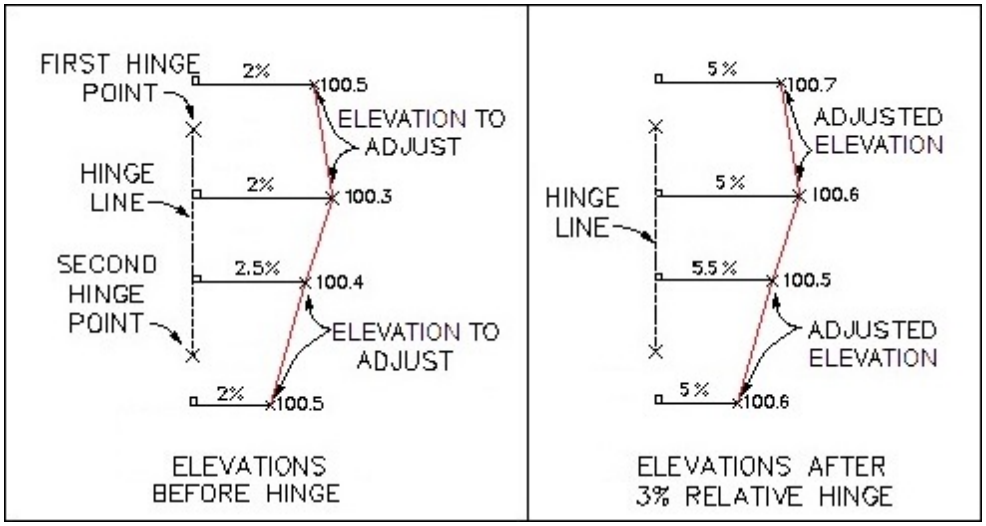
Specify first point or [Options]: Specify the point, **O**ptions to toggle slope type, or press ENTER to end.

Specify next point: Specify the point to define the hinge line.

Enter slope (%, X:1): Enter a slope.

Select feature line or 3D polyline objects: Select the feature line or 3D polyline objects to modify their elevations.

Example:



4.4.26 Check for 0 Elevation Polylines

Change selected polylines with a zero elevation, and prompt for new elevation.

Select a group of polylines to check if they have an assigned elevation; if the elevation is zero, prompt for a new elevation.

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Button

Ribbon: SmartDraft ▸ Grading panel ▸

Toolbar: Grading by Polyline Tools:

Menu: SmartDraft ▸ Grading by Polyline ▸ Check for 0 elevation polyline

Command:

Edit polyline datum elevation.

Check for 0 elevation polylines.

Select polylines or [LAYer]: Select polylines or **LAY**er to select all the polylines on a selected layer.

Select polylines or [LAYer]: Select more polylines, or press ENTER to continue.

Enter new elevation <0.00>: If any of the selected polylines have a zero elevation, prompt for a new elevation.

LAYer

Select layer for polylines or [Objects]: Select an object on the layer. All polylines on selected layer will be selected and processed, or **O**bject to toggle back to selecting polylines.

4.4.27 Change Polyline Layer at Elevation

Change polyline layer at elevation.

Change selected polylines to major and minor contour layers at specified elevations.

Button

Ribbon: SmartDraft ▸ Grading panel ▸

Toolbar: Grading by Polyline Tools:

Menu: SmartDraft ▸ Grading by Polyline ▸ Change polyline layer at elevation

Command:

Change Polyline Layer at Elevation.

Current settings: Major: <CONT-MAJ> at <10>, Minor: <CONT-MIN>.

Select polylines to change layer or [Options]: Select polylines, **O**ptions to change layer names, and interval, or press ENTER to end.

Select objects:

4.4.27.1 Change Polyline Layer at Elevation Options

Options for the Change Polyline Layer at Elevation command.

Dialog Box Options

Settings

Use Layer Database: Use the contour layers in the database associated with the layer type.

Type: Toggle the contour layer type. Enabled when Use Layer Database is checked.

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Major: Enter a name for the major contour layer. Enabled when Use Layer Database is not checked, or select the Major button to select a layer in the drawing.

Minor: Enter a name for the minor contour layer. Enabled when Use Layer Database is not checked, or select the Minor button to select a layer in the drawing.

Interval: Enter the major contour interval for placement of polylines with an elevation matching this interval. Note: Elevation 0 is always placed in the major contour layer.

OK: Save specified options.

4.4.27.2 Layer Type

One of three layers which can be created. If there is a "Type" button, it is used to toggle between the layer types.

PROP	for the layer assigned as proposed contours.	Index 283 and 286 in the layer database
EXIST	for the layer assigned as existing.	Index 284 and 287 in the layer database
ROUGH	for the layer assigned as demolition.	Index 285 and 288 in the layer database

4.4.27.3 Select Layer

Select a contour layer.

Dialog Box Options

Layer Name:
List Box: Display a list of all the layers in the drawing. Select the desired target layer.
Name: Enter a layer name to create a new layer not in the list.
Buttons:
OK: Use the layer selected from the list.

4.4.28 Offset Polyline by Rise/Run

Offset a selected polyline by setting the elevation to rise over run (rise/run).

Offset polylines at a calculated distance from the entered elevation interval, rise, and run values.


Button
Ribbon: SmartDraft ▸ Grading panel ▸ 
Toolbar: Grading by Polyline Tools: 
Menu: SmartDraft ▸ Grading by Polyline ▸ Offset polyline by Rise/Run

Command:

Offset polyline elevation by Rise / Run.

Enter elevation interval (+ Increase / - Decrease) <-1.00>: Enter an elevation interval; a positive number to increase or a negative number to decrease the next contour's elevation.

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Enter slope run <2.00>: Enter the run value.

Enter slope rise <1.00>: Enter the rise value.

Select first polyline: Select a polyline.

Elevation of polyline (100.00), Slope 2.00/1.00.

Elevation of next polyline (99.00).

Specify point on side to offset or [Options]: Specify a point on the side to offset, **O**ptions to change the interval, run, and rise values, or press ENTER to end.

Elevation of next polyline (98.00).

Specify point on side to offset or [Options]: Continue specifying points to offset additional polylines, or press ENTER to end.

4.4.29 Offset Polyline by Slope (%)

Offset a selected polyline, setting the elevation by slope (%).

Offset polylines at a calculated distance from the entered elevation interval and percentage of slope.


Button

Ribbon: SmartDraft ▸ Grading panel ▸ 

Toolbar: Grading by Polyline Tools: 

Menu: SmartDraft ▸ Grading by Polyline ▸ Offset polyline by slope (%)

Command:

Offset polyline elevation by slope %.

Enter elevation interval (+ Increase / - Decrease) <-1.00>: Enter an elevation interval; a positive number to increase or a negative number to decrease the next contour's elevation.

Enter slope (%) <4.00>: Enter the slope value.

Select first polyline: Select a polyline.

Elevation of polyline (100.00), Slope: 4.0000%.

Elevation of next polyline (99.00).

Specify point on side to offset or [Options]: Specify a point on the side to offset, **O**ptions to change the interval, run, and rise values, or press ENTER to end.

Elevation of next polyline (98.00).

Specify point on side to offset or [Options]: Continue specifying points to offset additional polylines, or press ENTER to end.

4.4.30 Offset Polyline by Slope (%) and Distance

Offset a selected polyline to a distance limit, setting the elevation by slope (%).

Offset multiple polylines at a calculated distance from the entered elevation interval and percentage of slope until it meets the specified distance.

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Button

Ribbon: SmartDraft ▸ Grading panel ▸ 

Toolbar: Grading by Polyline Tools: 

Menu: SmartDraft ▸ Grading by Polyline ▸ Offset polyline by slope (%) and distance

Command:

Offset polyline elevation by slope % and distance.

Enter elevation interval (+ Increase / - Decrease) <-1.00>: Enter an elevation interval; a positive number to increase or a negative number to decrease the next contour's elevation.

Enter slope (%) <4.00>: Enter the slope value.

Select first polyline: Select a polyline.

Specify point on side to offset: Specify a point on the side to offset.

Specify offset distance: Enter a distance value, or specify two points to calculate a distance.

4.4.31 Offset Polyline by Slope (%) and Elevation Limit

Offset a selected polyline to an elevation limit, setting the elevation by slope (%).

Offset multiple polylines at a calculated distance from the entered elevation interval and percentage of slope until it meets the specified elevation.


Button

Ribbon: SmartDraft ▸ Grading panel ▸ 

Toolbar: Grading by Polyline Tools: 

Menu: SmartDraft ▸ Grading by Polyline ▸ Offset polyline by slope (%) and elevation

Command:

Offset polyline elevation by slope % and elevation.

Enter elevation interval (+ Increase / - Decrease) <-1.00>: Enter an elevation interval; a positive number to increase or a negative number to decrease the next contour's elevation.

Enter slope (%) <4.00>: Enter the slope value.

Select first polyline: Select a polyline.

Specify point on side to offset: Specify a point on the side to offset.

Specify offset distance: Enter an elevation limit.

4.4.32 Daylight to Surface

Daylight to a surface from a line, arc, polyline, 3D polyline or feature line.

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Create a daylight 3D polyline calculated from a line, arc, polyline, 3D polyline, or feature line to a selected surface.

Known Issues: Daylighting to the inside of a closed polyline may yield unexpected results.

Note: Use the Daylight to Surface - Segment command if Daylight to Surface returns an error.

Supports:

AutoCAD Products: Civil 3D only

BricsCAD Pro: BricsCAD Pro Civil Objects



Button

Ribbon: SmartDraft ▸ Grading panel ▸ 

Toolbar: Grading by Polyline Tools: 

Menu: SmartDraft ▸ Grading by Polyline ▸ Daylight to surface

Command entry: **dts**

Command:

Daylight to surface.

Current settings: Cut = <Slope/Grade>: <X:1/X%>, Fill = <Slope/Grade>: <X:1/X%>, Supplemental: Arc = <value>, Line = <value>

Select surface or [Elevation/LIst/Options]: Select a surface, **LI**st to select a surface from a dialog, **E**levation to create a target elevation surface, or **O**ptions to change the command settings.

Surface name: <name of selected surface>

Select an arc, line, polyline, feature line, or [Elevation/Options/Surface]: Select the source object to calculate the daylight from, surface to select a different target surface, , **E**levation to create a different target elevation surface, or **O**ptions to change the command settings.

Specify point on side to daylight: Specify a point to indicate the side to calculate the daylight polyline from the source object to the selected target surface.

4.4.32.1 Daylight to Surface - Options

Daylight to Surface Options for Daylight to Surface

Dialog Box Options

Daylight to Surface Options:

Surface Name of selected surface.

Cut Options

Type: Select Slope to calculate the daylight using a rise:run value, or Grade to calculate the daylight using a percentage.

Edit box Enter the slope or grade value.

Fill Options

Type: Select Slope to calculate the daylight using a rise:run value, or Grade to calculate the daylight using a percentage.

Edit box Enter the slope or grade value.

Supplemental Options

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Along Arcs: Select the a number of degrees to use to divide the delta of an arc to add additional points around an arc.

Along tangents: Enter the number of extra points to add between the beginning and ending points of a line segment.

Output Option:

2D Polyline when Elevation Target A 2D polyline will be created if the user entered an elevation as a target and this option is checked.

Layer

Layer: Set the output layer type. Default (to use the layer database layer) or *current*.

Layer Type: Toggle the layer type for the slope symbol.

4.4.33 Daylight to Surface - Segment

Daylight to a surface from a segment of a polyline, 3D polyline or feature line.

Create a daylight 3D polyline calculated from a segment of a polyline, 3D polyline, or feature line to a selected surface.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	BricsCAD Pro Civil Objects



Button



Ribbon: SmartDraft ▸ Grading panel ▸ 

Toolbar: Grading by Polyline Tools: 

Menu: SmartDraft ▸ Grading by Polyline ▸ Daylight to surface - Segment



Command entry: **dtss**

Command:

Daylight to surface - segment.

Current settings: Cut = <Slope/Grade>: <X:1/X%>, Fill = <Slope/Grade>: <X:1/X%>, Supplemental: Arc = <value>, Line = <value>

Select surface or [Elevation/LIst/Options]: Select a surface, **LI**st to select a surface from a dialog, **E**levation to create a target elevation surface, or **O**ptions to change the command settings.

Surface name: <name of selected surface>

Select segment, or [Elevation/Options/Surface]: Select the source object segment to calculate the daylight from, surface to select a different target surface, **E**levation to create a different target elevation surface, or **O**ptions to change the command settings.

Specify point on side to daylight: Specify a point to indicate the side to calculate the daylight polyline from the source object to the selected target surface.

4.4.34 Daylight to Surface - Point

Daylight to a surface from a point

Create a daylight point, label, spot label, or display elevation. Two calculation methods. Between points, or Cut / Fill

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Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	BricsCAD Pro Civil Objects


Button


Ribbon: SmartDraft ▸ Grading panel ▸ 

Toolbar: Grading by Polyline Tools: 

Menu: SmartDraft ▸ Grading by Polyline ▸ Daylight to surface - Point


Command entry: **dtsp**

Command:

If Calculation Method: Cut/Fill

Daylight to surface - Point.

Current settings: Daylight Cut = <Slope/Grade>: <X:1/X%>, Fill = <Slope/Grade>: <X:1/X%>, Point = <Single/Multiple>, Output = <Label/Point/Screen/Spot>

Select surface or [Elevation/LIst/Options]: Select a surface, **LI**st to select a surface from a dialog, **E**levation to create a target elevation surface, or **O**ptions to change the command settings.

Surface name: <name of selected surface>

Specify point or Elevation/[Options/Surface]: Select the source point to calculate the daylight from, **O**ptions to change the command settings, **E**levation to create a different target elevation surface, or surface to select a different target surface,

Enter elevation <default>: Enter the elevation for the selected point or press enter to accept the default value.

Specify direction for daylight: Specify a point to indicate a direction to calculate the daylight.

Daylight elevation: <default>

If Calculation Method: BetweenPoints

Daylight to surface - Point.

Current settings: Daylight between points, Type: <Extend/Within>, Output = <Label/Point/Screen/Spot>

Select surface or [Options]: Select a surface or **O**ptions to change the command settings.

Surface name: <name of selected surface>

Specify point or [Elevation/Options/Surface]: Specify the source point to calculate the daylight from, **E**levation to create a target elevation surface, **O**ptions to change the command settings, or surface to select a different target surface,

Enter elevation <default>: Enter the elevation for the selected point or press enter to accept the default value.

Calculate daylight between points.

Specify second point: Specify the second point to calculate the daylight along the slope between the points.

Enter elevation <default>: Enter the elevation for the selected point or press enter to accept the default value.

4.4.34.1 Daylight to Surface - Point - Options

Daylight to Surface - Point Options for Daylight to Surface - Point

Dialog Box Options

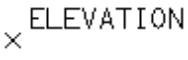
Copyright © 1989-2026, SmartDraft, Inc.

Daylight to Surface - Point Options:

Surface	Name of selected surface.
Calculation Method	
Type	Select Cut/Fill to use the Cut / Fill Options to calculate the daylight, or Between Points to calculate a daylight along the slope between two points.
Repeat	When the calculation method is Cut/Fill this option indicates if the selection direction prompt is repeated for a select point.
Limit	When the calculation method is Between Points this option indicates if the calculated daylight will be limited to within the two points, or extend pass the second point.
Output Options	
Type:	Select Slope to calculate the daylight using a rise:run value, or Grade to calculate the daylight using a percentage.
Type:	Select the Label, Point, Screen, or Spot output options.
Description	Enter the point output description value.
Prefix	Enter the label output prefix value.
Suffix	Enter the label output prefix value.
At Elevation	Select if the spot elevation output label will be inserted at the elevation or at elevation 0.0.
Cut Options	
Type:	Select Slope to calculate the daylight using a rise:run value, or Grade to calculate the daylight using a percentage.
Edit box	Enter the slope or grade value.
Fill Options	
Type:	Select Slope to calculate the daylight using a rise:run value, or Grade to calculate the daylight using a percentage.
Edit box	Enter the slope or grade value.

Layer	
Layer:	Set the output layer type. Default (to use the layer database layer) or *current*.
Layer Type:	Toggle the layer type for the slope symbol.

Output options:

Output: Label	Label is the Elevation Label Dynamic Block.
Output: Point	Insert either Point Block or Civil 3D's Point object. Per Point Options.
Output: Screen	Prompt to Command entry only.
Output: Spot	Spot elevation block. 

4.4.35 Volume from Polylines (Contours)

Calculate a pond/basin or stockpile volume from polylines (contours)

Current limitations of the calculations. Command assigns each polyline (contour) fully within the previous polyline. Each polyline must have an area less/greater than the previous polyline.

The command does not subtract volume due to islands in a pond/basin or hole in a stockpile.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Yes

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Button


Ribbon: SmartDraft ▸ Grading panel ▾ 
Toolbar: Polyline Tools on the Drawing Tools: 
Menu: SmartDraft ▸ Grading by Polyline ▸ Volume from Polylines (Contours)

Command:

Volume from polylines or contours.

Select polylines or [LAYer]]: Select polylines or **LAY**er to select all the polylines on a selected layer.

Select polylines or [LAYer]: Select more polylines, or press ENTER to continue.

LAYer

Select layer for polylines or [Objects]: Select an object on the layer. All polylines on selected layer will be selected and processed, or **O**bject to toggle back to selecting polylines.

Dialog Box Options

Volume Information
Type
Area is a <Stockpile/Pond/Basin>
<Height/Depth>: x.xx
Bottom Elevation: x.xx
Top Elevation: x.xx
Perimeter: x.xx
Area 1: x.xx <Sq Feet/Sq Meters>
Area 2: x.xx <Acres/Hectares>

Average End Method:
x.xx <Cubic Feet/Cubic Meters>
x.xx <Cubic Yards>
x.xx <Acre Feet>
x.xx <U.S. Gallons/Liters>

Conic Approximation Method:
x.xx <Cubic Feet/Cubic Meters>
x.xx <Cubic Yards>
x.xx <Acre Feet>
x.xx <U.S. Gallons/Liters>

Output: Output the volume information to text in the drawing.

4.4.35.1 Volumes Output Options

Output text in the drawing from the calculated volume from Volume from Polylines (Contours)

Dialog Box Options

Volume Output Options
Type
Average End Method Calculate the volume using the average end method.
Conic Approximation Calculate the volume using the conic approximation method.

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Format	
Value with Commas	Check to format the output values with commas.
Justify	Justify the output text, "Left" or "Center" justified.
Output	
Title	Check to include the title in the output.
	Enter the title text.
Perimeter	Check to include the perimeter in the output.
Prefix	Enter to add a prefix to the perimeter output.
Suffix	Enter to add a suffix to the perimeter output.
Precision	Select the precision for the perimeter output.
Area 1	Check to include the area 1 in the output.
Prefix	Enter to add a prefix to the area 1 output.
Suffix	Enter to add a suffix to the area 1 output.
Precision	Select the precision for the area 1, Cubic Feet, and Cubic Yards/Meters output.
Area 2	Check to include the area 2 in the output.
Prefix	Enter to add a prefix to the area 2 output.
Suffix	Enter to add a suffix to the area 2 output.
Precision	Select the precision for the area 2 and Acre Feet output.
Cubic Feet	Check to include the Cubic Feet in the output.
Prefix	Enter to add a prefix to the Cubic Feet output.
Suffix	Enter to add a suffix to the Cubic Feet output.
Cubic Yards/Meters	Check to include the Cubic Yards/Meters in the output.
Prefix	Enter to add a prefix to the Cubic Yards/Meters output.
Suffix	Enter to add a suffix to the Cubic Yards/Meters output.
US Gallons/Liters	Check to include the U.S. Gallons/Liters in the output.
Prefix	Enter to add a prefix to the U.S. Gallons/Liters output.
Suffix	Enter to add a suffix to the U.S. Gallons/Liters output.
Precision	Select the precision for the U.S. Gallons/Liters output.
Layer	
Layer	Select the layer type: Default or *current*.

Label Select to label the volume in the drawing.

Label:

Command:

Specify point for volume label: Specify a point to place the volume label.

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4.4.35.2 Volumes Conic compared to Average End

Which volume calculation method should I use, Average End or Conic Approximation?

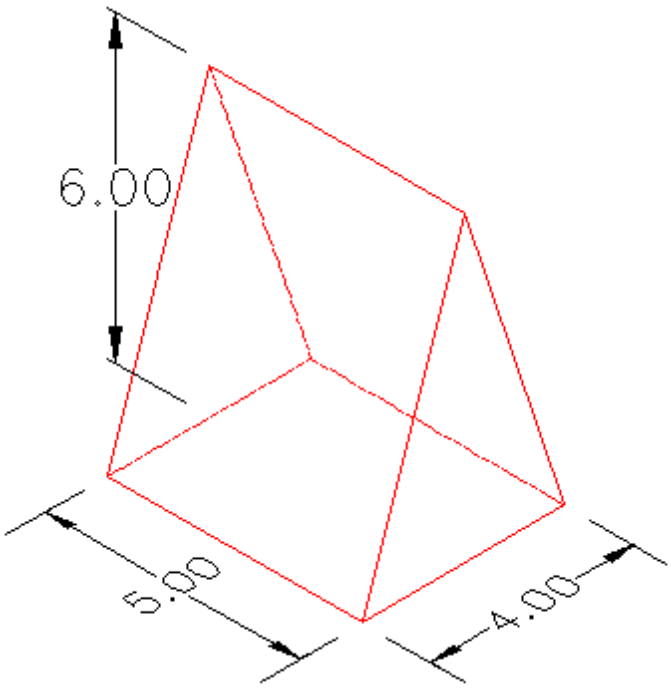
Volume Calculation Options

The majority of designers calculating volumes use the Average End Area Method. Why? Because it is the method we always use.
In many cases, this is a great method for calculating volumes; but for same shapes, it will return an over estimation.

Average End Method
How it works: The area of one section (a1) is added to the area of the next section (A2), divide the total by 2, and multiple the value by the distance (D) between the sections.
[(A1 + A2) / 2] * D

Is there a problem with this method?
Well, maybe. It works great if only one value between the two sections changes width or length. If both change, this is not so great.
A good example of only one value changing is calculating material volumes for road cross sections. The pavement depth between cross sections may vary in width but not in depth.

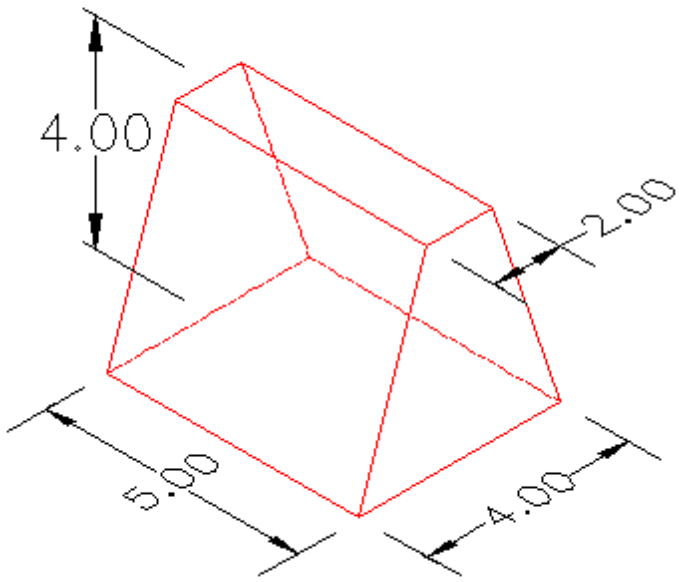
Volume of a Wedge



The length is 5.0 units, width is 4.0 units, and height is 6.0 units. The length is the same at the base and the top.
A1 (top) = 5.0 x 0.0 = 0.0, A2 (bottom) = 5.0 x 4.0 = 20.0, and D (height) = 6.0, [(0.0 + 20.0) / 2.0)] * 6.0 = 60.0 cubic units.

Volume of a Modified Wedge
If the top of the wedge is removed, and the length remains the same.

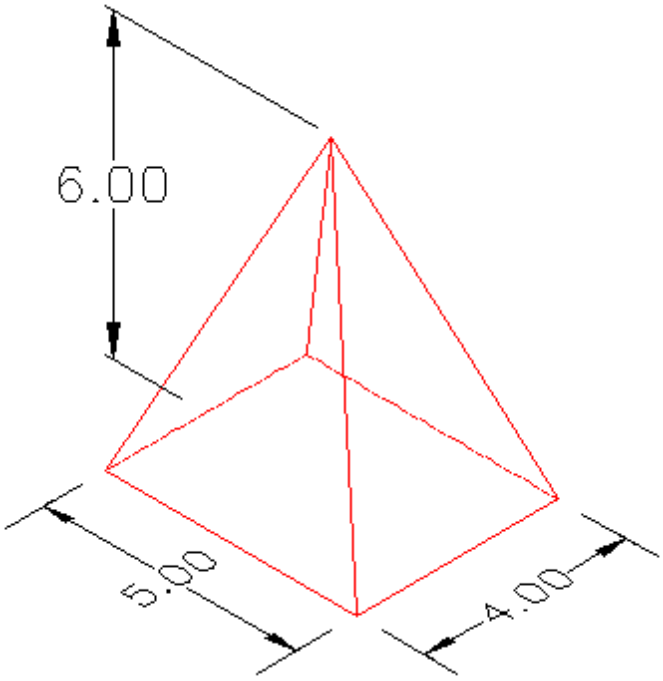
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The length is 5.0 units, width is 4.0 units, and height is 6.0 units. The length is the same at the base and the top.
A1 (top) = 5.0 x 2.0 = 10.0, A2 (bottom) = 5.0 x 4.0 = 20.0, and D (height) = 4.0, [(10.0 + 20.0) / 2.0)] * 4.0 = 60.0 cubic units.
In this case, the volume is still correct, because the length at the top and bottom are still the same.

Now, if we take the exact same length, width, and height as the first example, the unmodified wedge, and change it into a pyramid, the average end volume is no longer valid.
The volume of a pyramid is 1/3 * Base * Height. If we, as designers, used the average end method on this shape, the volume would be over estimated.

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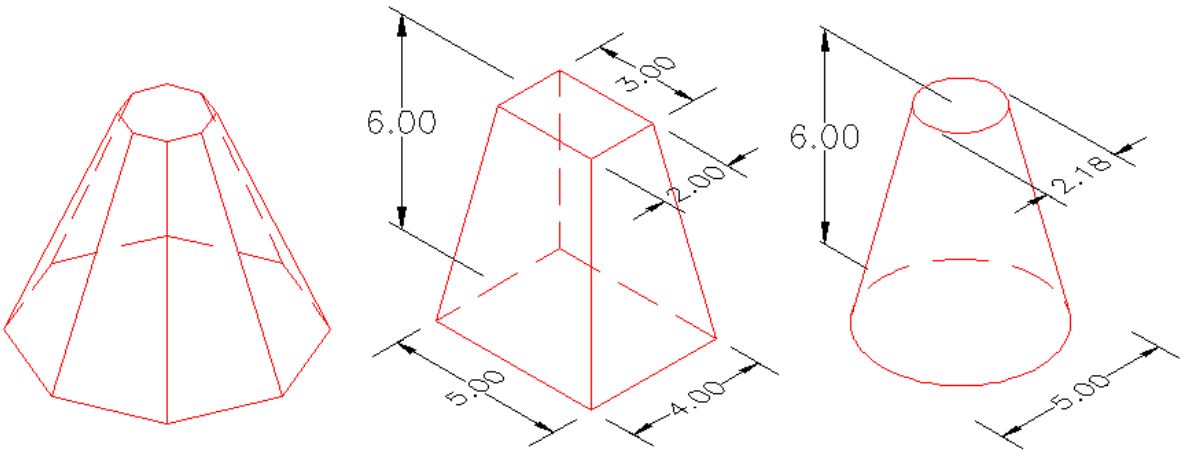
Average End Method: A1 (top) = 0.0 * 0.0 = 0.0, A2 (bottom) = 5.0 * 4.0 = 20.0, and D (height) = 6.0, [(0.0 + 20.0) / 2.0)] * 6.0 = 60.0 cubic units.
Pyramid Method: Base = 5.0 * 4.0 = 20.0, Height = 6.0, 1/3 * 20.0 * 6.0 = 40.0 cubic units.

So, in most cases, which shape most closely represents the shape of a pond/basin or stockpile? Most of the time (but not always), it will be the pyramid, or, at least, a pyramid with the top removed.

The geometric term, frustum, is used for the portion of a solid (normally a cone or pyramid) that lies between two parallel planes cutting it.
The volume of a frustum is D/3 * [A1 + A1 + sqrt(A1 * A2)], where D is the height between the two parallel planes, and A1 and A2 are the areas of the two cross sections.
This is the formula SmartDraft uses for the Conic Approximation method.

Examples of Frusta

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With the above information, we hope you can better select the method to use in your designer situation.

4.4.36 Extract Contour(s) from a Surface

Extract a single or all contours from a surface.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	BricsCAD Pro Civil Objects

Button

Ribbon: SmartDraft ▸ Grading panel ▸

Toolbar: Grading by Polyline Tools:

Menu: SmartDraft ▸ Grading by Polyline ▸ Extract Contour(s) from a surface

Command entry: **ecpl**

Command:

Extract contour(s) from a surface.

Current settings: Contours: <Single/All>

If **Single**

Select a surface contour or [Options]: Select a surface contour, or **O**ptions to change to All to extract all the contours of a surface.

If **All**

Select a surface or [LIst/Options]: Select a surface, **LI**st to select a surface from a dialog, or **O**ptions to change to Single to extract a selected contour from a surface.

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4.4.37 Create BricsCAD Surface from Points

Create a BricsCAD surface from SmartDraft points in the drawing.

Note: Supports SmartDraft Points at this time

Supports:

AutoCAD Products:	No
BricsCAD Pro:	BricsCAD Pro Civil Objects



Button



Ribbon: SmartDraft ▸ Grading panel ▸ 

Toolbar: Grading Tools: 

Menu: SmartDraft ▸ Grading ▸ Create BricsCAD Surface from Points

Dialog Box Options

Create Surface from Points

Point Filter Options:

All:	Select this option to process all the points in the drawing.
Selected:	Select this option to process only the points you select from the drawing.
Description Keys:	A list of all the description keys of the points in the file. Select the description keys to process.
All: (button)	Select this button to automatically select all the description keys.
Clear:	Select this button to automatically deselect all the description keys.
Save:	Select this button to save a list of the select Description Keys to a file, which can be used by the Load button.
Load:	Select this button to select Description Keys saved in a file.
Elevation:	
Min:	Optional: Enter a minimum elevation if you want to filter the points by elevation.
Max:	Optional: Enter a maximum elevation if you want to filter the points by elevation.
Select an outer boundary polyline:	Check this option if you want to select a polyline as an outer boundary with the surface.

Surface Information:

Name:	Enter the name of the surface.
Description:	Enter the description of the surface (optional).
Layer:	Select the layer for the surface
Prefix/Suffix:	Optional: Enter the layer Prefix/Suffix if <Prefix><Name> or <Name><Suffix> is select on the Layer.
Contour data:	
Major Color:	Select the Color button to change the color assigned to the major contour property.
Major Interval:	Enter the major contour interval.
Minor Color:	Select the Color button to change the color assigned to the minor contour property.
Minor Interval:	Enter the minor contour interval.

Command:

Create BricsCAD surface from Points.

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Select a polyline boundary: Select a closed polyline. Note: This prompt only displays if the

If the **Selected** radio button is selected

Point selection method [All/Layers/Range/Selection] Select the Point selection method.

4.4.38 Add Points to a BricsCAD Surface

Add SmartDraft points to a BricsCAD surface.

Note: Supports SmartDraft Points at this time

Supports:

AutoCAD Products: No

BricsCAD Pro: BricsCAD Pro Civil Objects



Button



Ribbon: SmartDraft ▸ Grading panel ▸ 

Toolbar: Grading Tools: 

Menu: SmartDraft ▸ Grading ▸ Add Points to a BricsCAD Surface

Command:

Add points to a BricsCAD Surface.

Point selection method [All/Layers/Range/Selection] Select the Point selection method.

Select a TIN surface: Select a BricsCAD Tin surface.

4.5 HEC-RAS Panel Tools

Tools to exchange data between Civil 3D / BricsCAD Pro and HEC-RAS

HEC-RAS Tools Support

HEC-RAS 3.1.3, 4.0, 4.1.0, and 5.0.0

Supports:

AutoCAD Products: Civil 3D only

BricsCAD Pro: BricsCAD Pro for Civil objects

Click on the icon below to view a video demonstration

HEC-RAS Tools

Create Sample Lines or Polylines along an alignment

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Sample Lines Tool

Create HEC-RAS Data

Add Sections to a HEC-RAS Project

Add a River / Reach to a HEC-RAS Project

Note The following commands requires data from the HEC-RAS project to be exported as a *.sdf file. It is import to select the correct output options for them to work correctly. See HEC-RAS Output (sdf) file for exporting instructions.

Create HEC-RAS Planview Sections Lines and Labels

Create HEC-RAS Floodplain Lines

Create HEC-RAS Cross Sections

Create HEC-RAS Water Surface Profile

Label HEC-RAS Water Surface Profile

Know limitations:

Add to HEC-RAS Project

1. If a new section is placed exactly at either the beginning or ending station of the alignment (even if the operator uses osnap) the station may not be added due to station rounding.
2. If the alignment has been modified and the cross-section in the existing HEC-RAS project file, no longer match the stations in CADD, the new sections will be added to the HEC-RAS project at the stations in CADD which may not correspond with the stations in the HEC-RAS project.

Sample Files:

Sample Files to practice with these commands have been placed in the <installation folder>\Sample Files\HEC-RAS Tools

4.5.1 Create Sample Lines or Polylines along an alignment

Create sample lines or polylines along an alignment

Create sample lines or polyline section lines at specified stations along an alignment.

The cross sections are created at each station specified in a text file and / or stations entered by the operator.

The operator enters two offset distances either side of the alignment.

Note For more information on using this command, see Example: Create Sample Lines or Polylines along an alignment.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	BricsCAD Pro

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Button

Ribbon: SmartDraft or SmartDraft Hydro tab ▸ HEC-RAS panel ▸

Toolbar: HEC-RAS Tools on the SmartDraft Tools

Command entry: **SM_SLCRT**

Video demonstration

Dialog Box Options

Create Sample Lines Or Polylines along Alignment

Alignment Option:

Alignment: Select the alignment.

Offset Options:

Internal Width:

Left: Enter a value for the offset to the left of the alignment

Right: Enter a value for the offset to the right of the alignment

Swath Width:

Left: Enter a value for the offset to the left of the alignment

Right: Enter a value for the offset to the right of the alignment

Station Input Options

File: Name of the selected station file.

Browse: Select a file with the desired stations.

Enter or Select Stations: Select to enter stations or select stations along alignment.

Output Options:

Polyline: Create polylines at the specified stations perpendicular or radial to the alignment at the with verities at the specified width values.

Sample Lines: Create sample lines associated to the selected alignment in the selected sample line group.

Group: Sample line groups associated to the selected alignment.

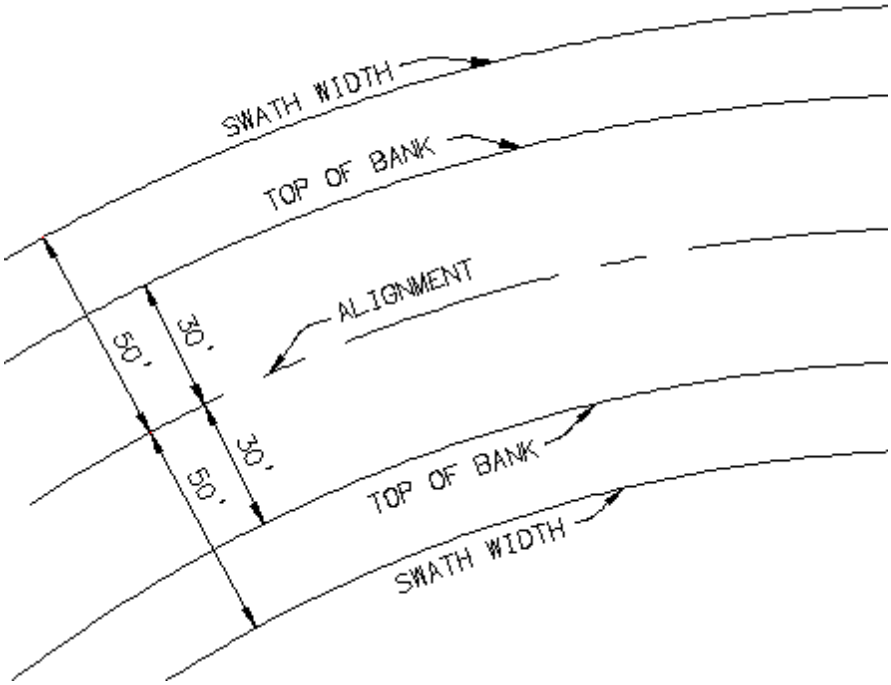
Create: Create a sample line group

If **Enter Stations:**

Enter a station or [List/Remove/Save]: Enter a station, **L**ist to display a list of entered stations and the stations in the selected file, **R**emove to remove a station from the list, or **S**ave to save the current list to a file for later use.

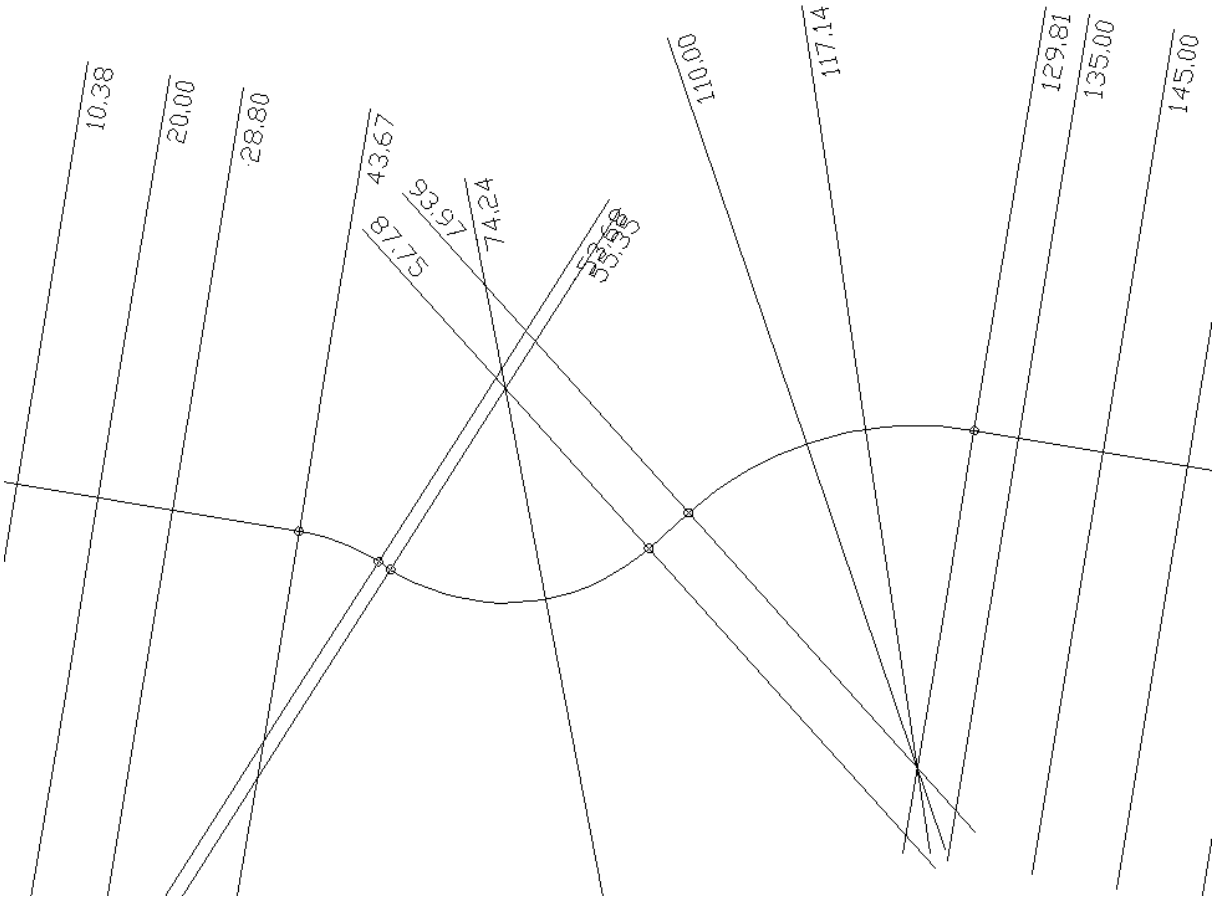
The internal vertices coincide with the Top of Bank width specified above.
The operator can modify the end section (from top of bank to swath width point) to change the angle to better follow the channel grading and floodplain.

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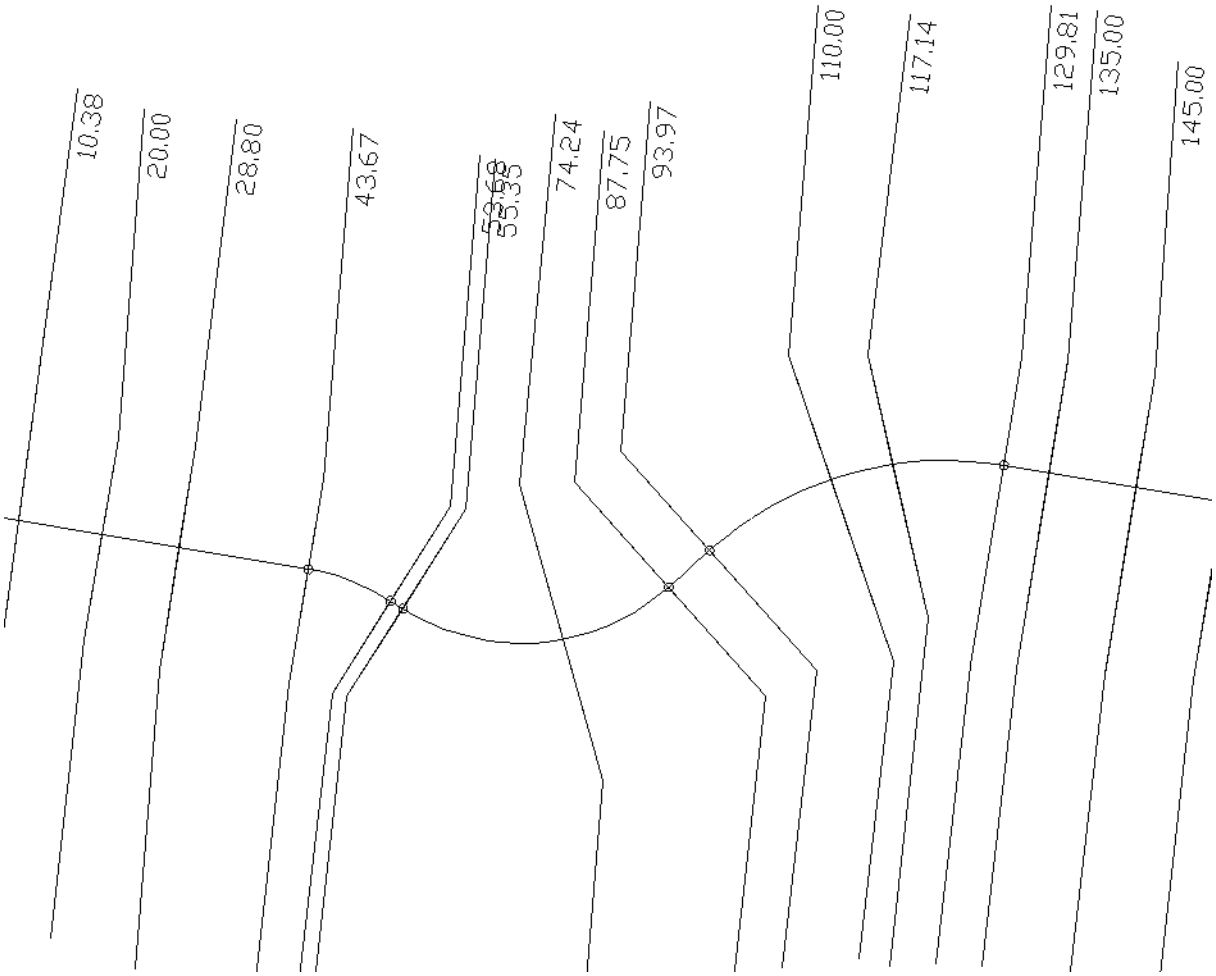
Example
Sample lines created along an alignment at stations 10.38, 20.00, 28.80, 43.67, 53.68, 55.35, 74.24, 87.75, 93.97, 110.00, 117.14, 129.81, 135.00, and 145.00.

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Note: The sample line cross along the example alignment. The operator can edit the sample lines to better following the floodplain. See below:

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4.5.1.1 Sample Lines Station File

Sample Lines Station File

The format of the Sample Lines Station File used for Create Sample Lines or Polylines along an alignment is a simple ASCII file with a single station on each line without any special formatting.

Example:

10.38
20.00
28.80
43.67
53.68
55.35
74.24
87.75
93.97

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110.00
117.14
129.81
135.00
145.00
...

4.5.1.2 Sample Line Stations

Enter station to place sample lines along the alignment

Sample Line Stations

Enter Stations

Starting	Starting station of the alignment
Ending	Ending station of the alignment
Station List	List of station where sample lines will be added
Station	Enter a station to add to the list
Edit	Select to edit a selected station
Planview	Select to specify points along an alignment to calculate stations to add
Delete	Delete the highlighted stations from the Station List.
Save	Save the current Station List to a Sample Lines Station File for later use.

4.5.1.2.1 Edit Sample Line Station

Edit a station entered in the Sample Line Stations dialog.

Edit Sample Line Station

Edit Station

Starting	Starting station of the alignment
Ending	Ending station of the alignment
Station	Enter a station to edit the value

4.5.1.2.2 Sample Line Stations - Planview

Calculate stations for the Sample Line Stations dialog by specifying points along an alignment.

Command:

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Select point along alignment <*alignment name*> for station: Specify a point along an alignment to calculate a station or press enter to return to the sample line stations.

Processing station: <*station*>.

4.5.1.3 Create Sample Line Group

Create sample lines group

Dialog Box Options

Create Sample Line Group

Name: Enter sample line group name.
Layer: Enter the layer for the sample line group
Style: Select the sample line style
Label Style: Select the sample line label style

4.5.1.4 Example: Create Sample Lines or Polylines along an alignment

Two additional pieces of information will be required: the minimum radius of curvature used in the centerline alignment (50 feet in this example), and the nominal proposed bankfull width (25 feet in this example). These two values are used as input to the command to create the HEC-RAS section sample line geometry.

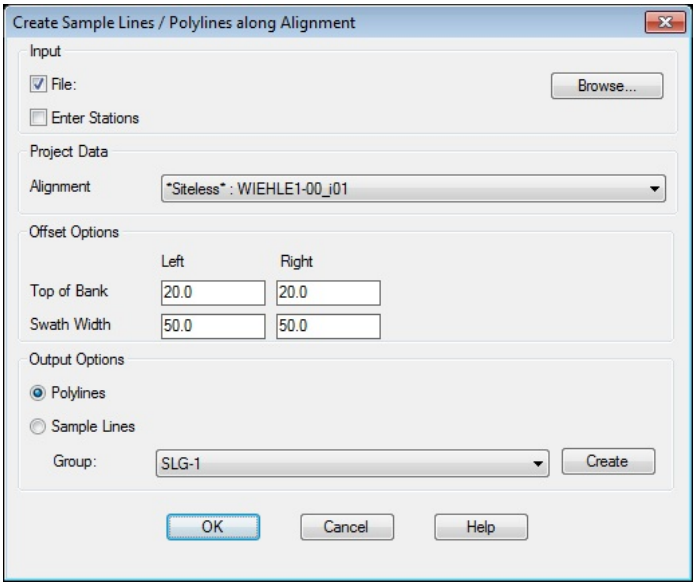
Press the icon from the *HEC-RAS* panel on the *SmartDraft or SmartDraft Hydro* tab, running the **SM_SLCRT** command.

In the *Create Sample Lines / Polylines along Alignment* dialog, select a sample lines Station file you created or check the Enter Stations option and when OK is selected, the command will prompt for stations.

Select the alignment for placement.

Enter the Offset Options for Top of Bank Left and Right values, and the Swath Width Left and Right values, coinciding with one half the nominal proposed bankfull width and the radius of curvature respectively.

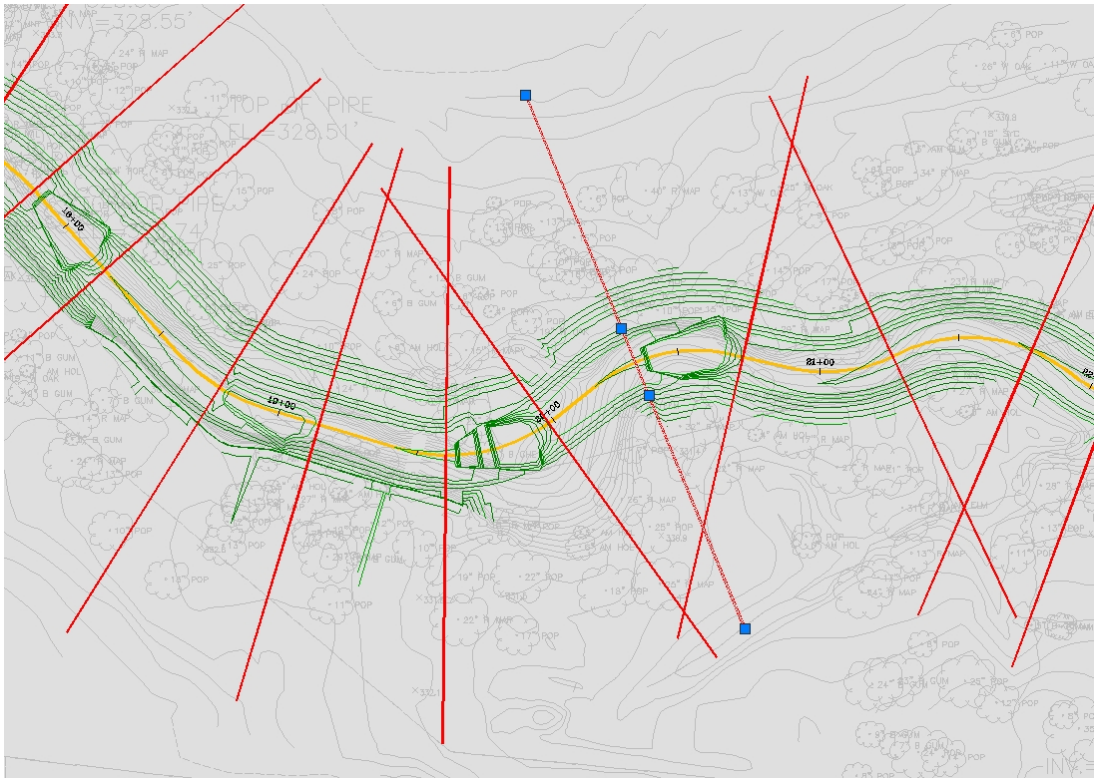
The Output Options setting should be left on polylines at this time since the SmartDraft tool to read the section only works with polylines at this time. Press **OK** to create the HEC-RAS section sample lines.



Create Section Lines Dialog Options

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The HEC-RAS section sample lines are created as polylines, each with four vertices as shown in the figure below. The internal vertices coincide with the bankfull width specified in the settings, and will be used to maintain the internal portion of the section perpendicular to the channel while the outer portion of the sample line is made perpendicular to the floodplain.



HEC-RAS Section Sample Lines as Created

The HEC-RAS section sample lines are created on the '-W-HYDR-XS-[alignment name]-[profile number]' layer.

Initially, an assessment of the uniformity of spacing of the HEC-RAS section sample lines along the alignment should be made. If the spacing of the sample lines is not satisfactory, there are several possible solutions:

- Individual additional four vertex polylines could be drawn on the '-W-HEC-XS-FLOOD-[alignment name]-[profile number]' layer.
- Section sample lines (actually polylines) could be copied and placed as desired along the reach.
- The contents of the '-W-HYDR-XS-[alignment name]-[profile number]' layer could be erased, the profile settings changed, and the Draw button on the Labels tab > HEC-RAS: Sample Lines to rerun and create the lines with the desired spacing.

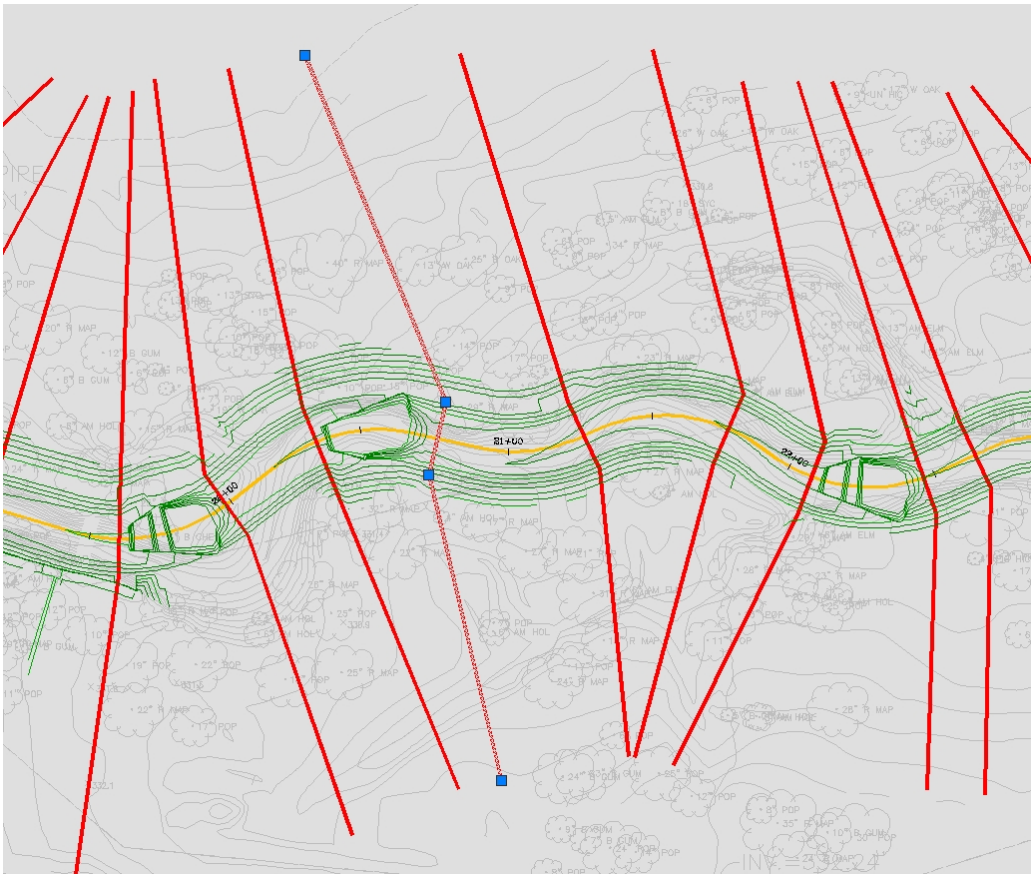
Note If a new section sample polyline is drawn, it must have four vertices, even if the floodplain section sample polyline is perpendicular to the channel over its entire length (effectively a straight line).

With the spacing of the section line sample polylines acceptable, the polylines must be modified such that each section line is perpendicular to the channel within its confines, and then perpendicular to the existing terrain beyond the channel.

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For this operation, the existing and/or proposed contours need to be visible, through manipulation of layers and surface styles.

Each four vertex polyline is easily repositioned using Grips. Polylines should be Grip Stretched such that the portion outside the channel is perpendicular to the existing terrain, and that the polyline is lengthened to cover sufficient elevation change as to permit floodplain analysis. In stretching the polylines, make sure that none of them cross when done.



Section Sample Line Polylines Adjusted with Grips

Establishing Overbank Positions

As the HEC-RAS sections are sampled the command will calculate the distance between cross sections along the centerline and along the left and right overbanks. The overbank establishes the centroid of the floodplain on each side of the reach; half the distance from the top of bank to the edge of the floodplain. The overbank is essential in HEC-RAS in Floodplain analysis, and will be processed by StreamNCD, so the program needs to know where the overbank position is so it can do these distance calculations.

There are three options in SmartDraft to determine the overbank position:

1. A horizontal alignment can be used to determine the overbank position.

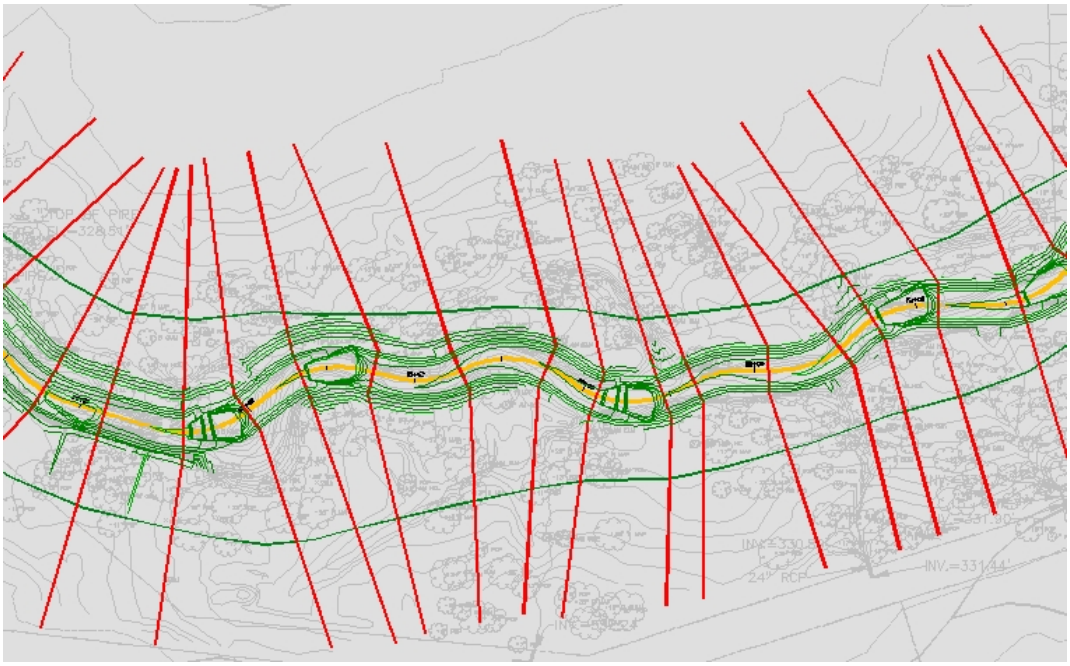
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2. A fixed offset distance from the centerline can be used to determine the overbank position.
3. Polylines can be drawn through the approximate center of each overbank, and the command determines the overbank distances between cross sections along these polylines.

In this example project the polyline option is used to create the overbank data for the Floodplain analysis:

Thaw and turn On the existing topo layers. Create the layer '-W-HYDR-[alignment name]-OBANKS' and make it current.

Using the Pline command, draw polylines for the left and right overbanks. The polyline should fall in a position half the distance from the top of bank to the edge of the anticipated floodplain position.



Overbank Polylines

The overbank polylines ***must*** extend beyond the first and last cross section sample lines in the drawing.

A stipulation of the overbank polylines is that their length cannot exceed the length of the centerline by a factor of more than 15%. If the total length of an overbank polyline is greater than 115% of the centerline length the command will fail. This restriction is required to permit the checking of overbanks on the left versus the right side. If it is desired to draw the overbanks at total lengths greater than this restriction, they must be broken into polyline segments based on this length restriction.

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4.5.2 Sample Lines Tool

Rename or Renumber sample lines and add polylines to a sample lines group

Supports:

AutoCAD Products: Civil 3D only

BricsCAD Pro: No



Button

Ribbon: SmartDraft or SmartDraft Hydro tab ▸ HEC-RAS panel ▸ 

Toolbar: HEC-RAS Tools on the SmartDraft Tools 

Command entry: **SM_SLTOOL**

Dialog Box Options

Sample Lines Tool

Project Data

Alignment: Select the alignment.

Sample Line Group: Select sample line group

Rename

Renumber Select to renumber sample lines from 1 to x along alignment

Prefix: Enter sample line name Prefix

Suffix: Enter sample line name Suffix

Station Select to rename sample lines using the Station along the alignment. Format: 117.12 = 1+17.12

Add

Select Polylines: Check option to select polylines from drawing to Convert to sample lines and add to sample line group

4.5.3 Create HEC-RAS Data

Create HEC-RAS Data

Create a HEC-RAS project files or geometry file from Sample Lines or Polylines, an alignment, and a surface.

Note: The cross-sections are Georeferenced to the coordinates in the drawing.

For more information on creating and using the HEC-RAS files created by this command, see Example: HEC-RAS Output, Example: Opening or Importing Design HEC-RAS Cross Section Data, Example: Adding Steady Flow Data, and Example: Viewing and Editing Design HEC-RAS Cross Section Data

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Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	BricsCAD Pro



Button


Ribbon: SmartDraft or SmartDraft Hydro tab ▸ HEC-RAS panel ▸ 

Toolbar: HEC-RAS Tools on the SmartDraft Tools 


Command entry: **SM_HECRASOUT**


Video demonstration

Dialog Box Options

Design Information

Centerline:	List of all alignments defined in the drawing. Select the desired channel centerline alignment.
Down Stream:	Select the down point (Start or End of alignment).
Start:	Display the elevation at the start of the alignment, if it is within the selected surface.
End:	Display the elevation at the end of the alignment, if it within the selected surface.
Surface:	List of all the surfaces defined in the drawing. Select the desired surface.

Cross Section Options

Polyline	Select this option to select polylines as section line input
Sample Lines	Select this option to use all sample lines in a sample line group associated to the centerline alignment.
Group	Select the sample line group

Design Values

Left Overbank n Value:	Enter the n value or select the Table button to select the value for a table. Limits are *0.015 – 0.2*
Right Overbank n Value:	Enter the n value or select the Table button to select the value for a table. Limits are *0.015 – 0.2*
Channel n Value:	Enter the n value or select the Table button to select the value for a table. Limits are *0.015 – 0.2*
Expansion Coefficient:	Enter the expansion coefficient value. Limits are *0.0 – 0.8*
Contraction Coefficient:	Enter the contraction coefficient value. Limits are *0.0 – 0.6*

Left/Right Bank Input Options

Select Bank Polylines	Select this option to specify the left and right bank locations by selecting a polyline or alignment within the drawing.
Offset from Centerline	Select this option to specify an offset distances from the Centerline to be used as the left and right banks.
Alignment	Use this option to select alignments as the left and right banks.
Left Bank:	Use the desired Left Bank alignment. List of all the defined alignments.
Right Bank:	Use the desired Right Bank alignment. List of all the defined alignments.

Left/Right Overbank Input Options

Select Overbank Polylines	Select this option to specify the left and right bank locations by selecting a polyline or alignment within the drawing.
Offset from Centerline	Select this option to specify an offset distances from the Centerline to be used as the left and right overbank lines.
Alignment	Use this option to select alignments as the left and right overbank lines.
Left Bank:	Use the desired Left Overbank alignment. List of all the defined alignments.

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Right Bank: Use the desired Right Overbank alignment. List of all the defined alignments.

HEC-RAS Output Options

Project (prj + g01) Use this option to create a HEC-RAS project file (prj) with an associated Geometry File (g01)

GIS Format (sdf) Use this option to create a HEC-RAS GIS Format file (sdf).

River Name Enter a River Name

Reach Name Enter a Reach Name

Title Enter a Project title.

Description Enter a Project description.

If **Polyline** as Section Lines Options (by layer)

Select layer of Section Line polylines or [Select]: Select an object on the section line polylines layer. All polylines on the selected layer will be processed.

If **Polyline** as Section Line Options (select)

Select Section Line polylines or [By layer]: Select the section line polylines or **B**y layer to select all the section lines on a layer.

Note: If a selected polyline has any curved segments, it will be removed from the selection set and not processed. All polyline cross sections must created using straight segments only.
Polylines and sample lines may have multiple segments, angle points, etc...

Select Bank polylines option

Select Left Bank polyline: Select a the left bank polyline.
Select Right Bank polyline: Select a the right bank polyline.

Select Overbank polylines option

Select Left Overbank polyline: Select a the left overbank polyline.
Select Right Overbank polyline: Select a the right overbank polyline.

Command begins to process cross sections and alignments

Checking direction of selected section line polylines:

The command confirms the selected polylines are drawn left to right, determined by the selected down stream point.

If they aren't is reverse their direction in the AutoCAD file and sets there elevation to 0.

96 polylines crossed centerline once and will process.

The command confirms the selected cross section polylines cross the specified channel centerline alignment.

Processing selected section line polylines:

Output file name Dialog box appears

Enter an output file name.

Command creates the HEC-RAS data file(s) selected.

How LOB, Channel, and ROB Downstream Reach Lengths are calculated

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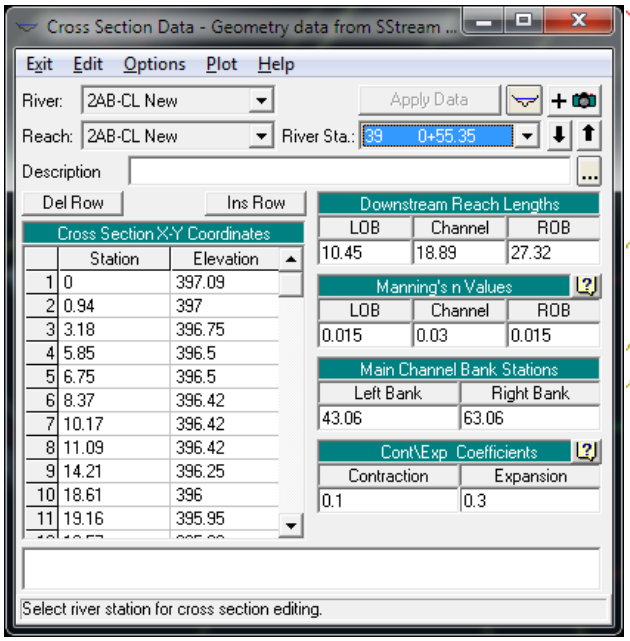


Figure 1: Cross Section 0+55.35

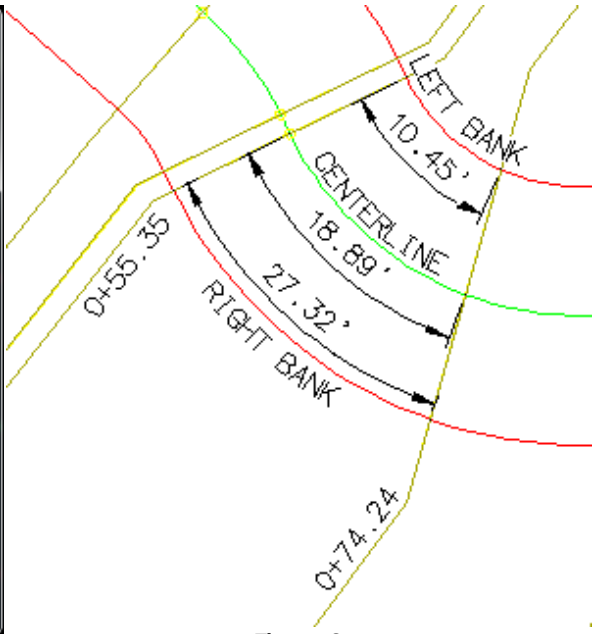


Figure 2

In this example station 0+74.24 is downstream of station 0+55.35 displayed above.
In Figure 2, the green line is the Centerline alignment (stream / channel centerline)
The distance along the alignment from the station 0+55.35 to 0+74.24 is 18.89' and is supplied as the Downstream Reach Length Channel.
In Figure 2, the red line labeled Left Bank is the Left Bank.
The distance along the alignment / polyline from the station 0+55.35 to 0+74.24 is 10.45' and is supplied as the Downstream Reach Length LOB.
In Figure 2, the red line labeled Right Bank is the Right Bank.
The distance along the alignment / polyline from the station 0+55.35 to 0+74.24 is 27.32' and is supplied as the Downstream Reach Length ROB.

The value entered for the Left Overbank n Value will be supplied to Manning's n Values LOB.
The value entered for the Right Overbank n Value will be supplied to Manning's n Values ROB.
The value entered for the Channel n Value will be supplied to Manning's n Values Channel.
The value entered for the Expansion Coefficient will be supplied to Cont.\Exp. Coefficient Expansion
The value entered for the Contraction Coefficient will be supplied to Cont.\Exp. Coefficient Contraction

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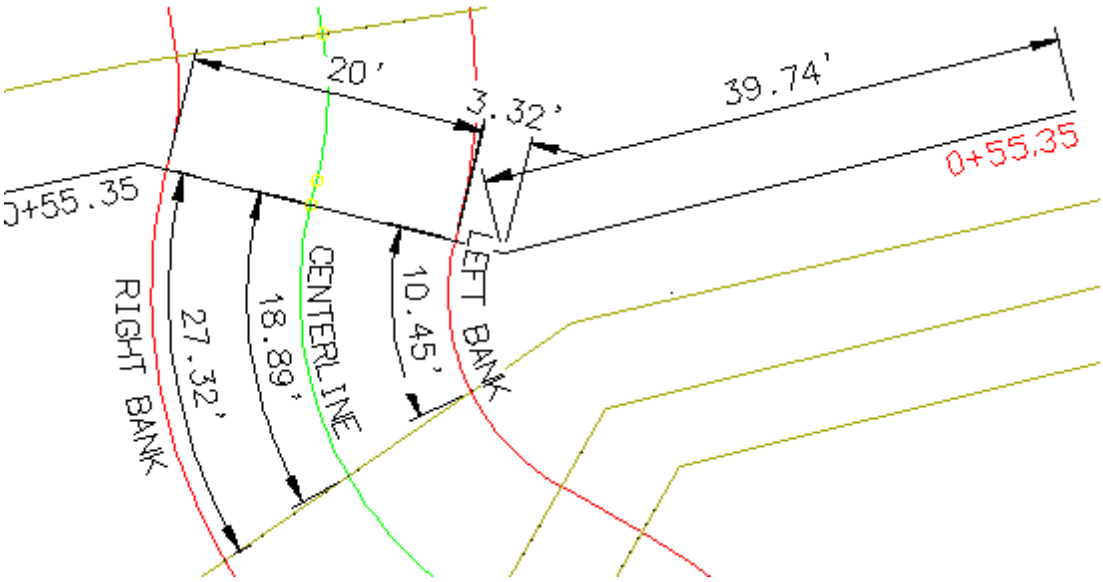


Figure 3

In Figure 3, the black line cross section labeled 0+55.35 displays how the Main Channel Bank Stations are calculated.
The distance starting from the left of the Centerline along the cross section to the first angle 39.74' plus the distance from the angle until the Left Bank line crosses the cross section line 3.32'. The total of these distances is 43.06' and is supplied to the Main Channel Bank Stations Left Bank.
The distance from the Left Bank point to the intersection of the Right Bank line with the cross section 20.00' is added to the Left Bank value 43.06' to get the Right Bank value 63.06' This value is supplied to the Main Channel Bank Stations Right Bank.

4.5.3.1 Manning 'n' Values Table

Select the Manning 'n' Value from a table for the HEC-RAS Output, HEC-RAS Add Sections to Project, and Add a River / Reach to a HEC-RAS Project commands.

Dialog Box Options

Manning's 'n' Values: Natural Stream

List of conditions

List Box: The list of conditions. List the condition to get the correct Manning's 'n' value.
Radio Buttons
Minimum: Use the minimum value from the table.
Normal: Use the normal value from the table.
Maximum: Use the maximum value from the table.

OK: Accept selected value, close dialog box, and transfer selected value to edit box.

4.5.3.2 HEC-RAS Output (sdf) File

Many of the SmartDraft HEC-RAS tools require the operator to export the HEC-RAS project into GIS Data which SmartDraft can bring into AutoCAD.

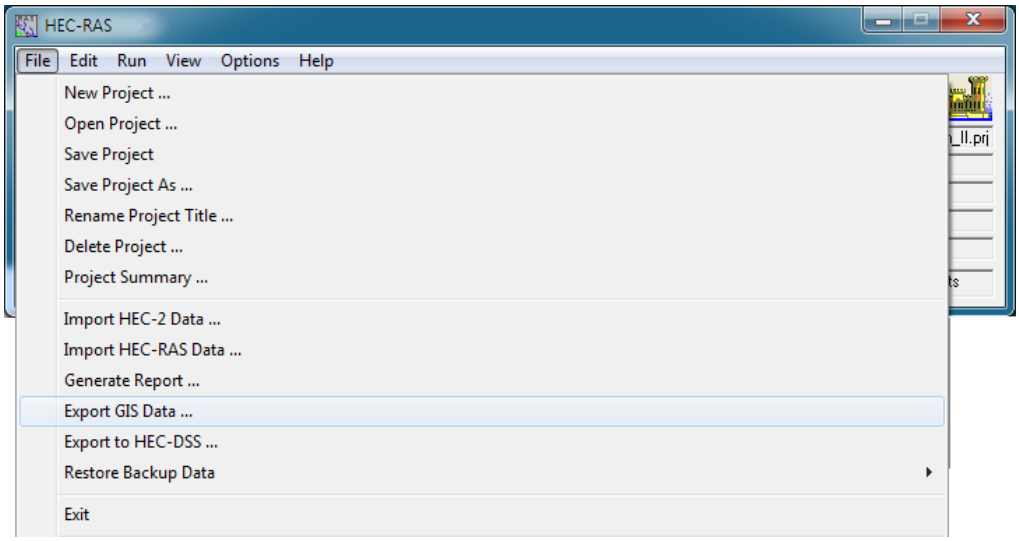
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SmartDraft HEC-RAS specific tools currently support HEC-RAS versions 3.1.3, 4.0, 4.1.0, and 5.0.0

Creating the HEC-RAS Output File

The data from the HEC-RAS Project will be used with the Create HEC-RAS Planview Sections Lines and Labels, Create HEC-RAS Floodplain Lines, Create HEC-RAS Cross, and Sections, and Create HEC-RAS Water Surface Profile commands. To make these data available, the section data will be exported from HEC-RAS in the same .sdf GIS format that can be used for import.

From the HEC-RAS **File** pull-down, select **Export GIS Data**.



In the **Export File** field, use the **Browse** button to set the path and enter the file name.

Warning: **Be careful not to overwrite existing files which may be needed at a later date.**

For the other settings in the GIS Export dialog, make sure Export Water surfaces is On.

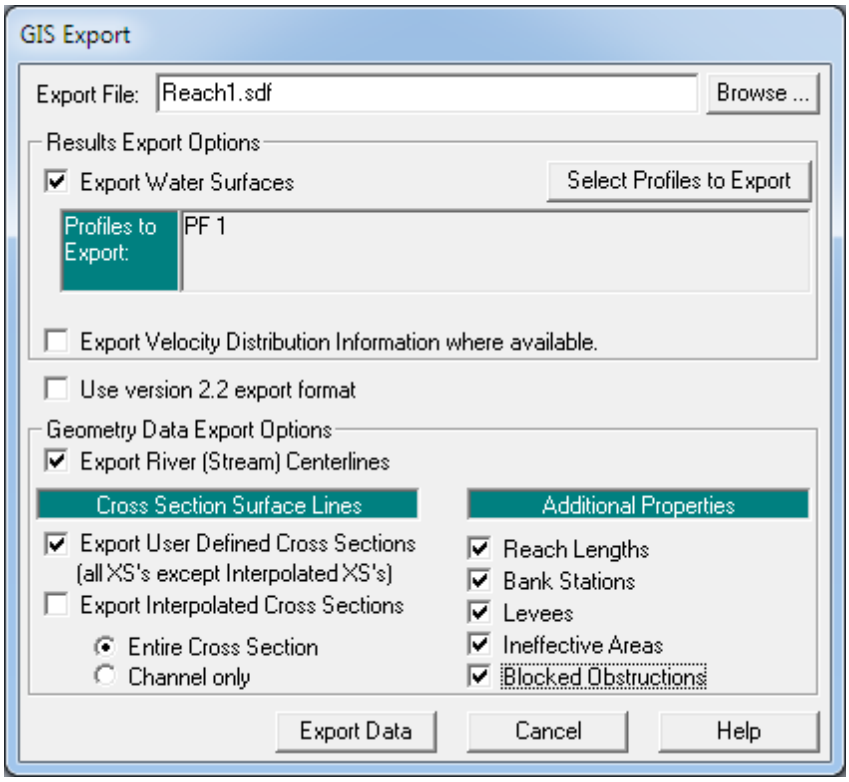
If all water surface profiles are not immediately displayed, use the **Select Profiles to Export** button and select them.

GIS Export options for HEC-RAS 3.1.3:

Check: (at least)

Export Water Surfaces
Export River (Stream) Centerlines
Export User Defined Cross Sections
Reach Lengths
Bank Stations
Levees
Ineffective Areas
Blocked Obstructions

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Select the **Export Data** button to write the file.

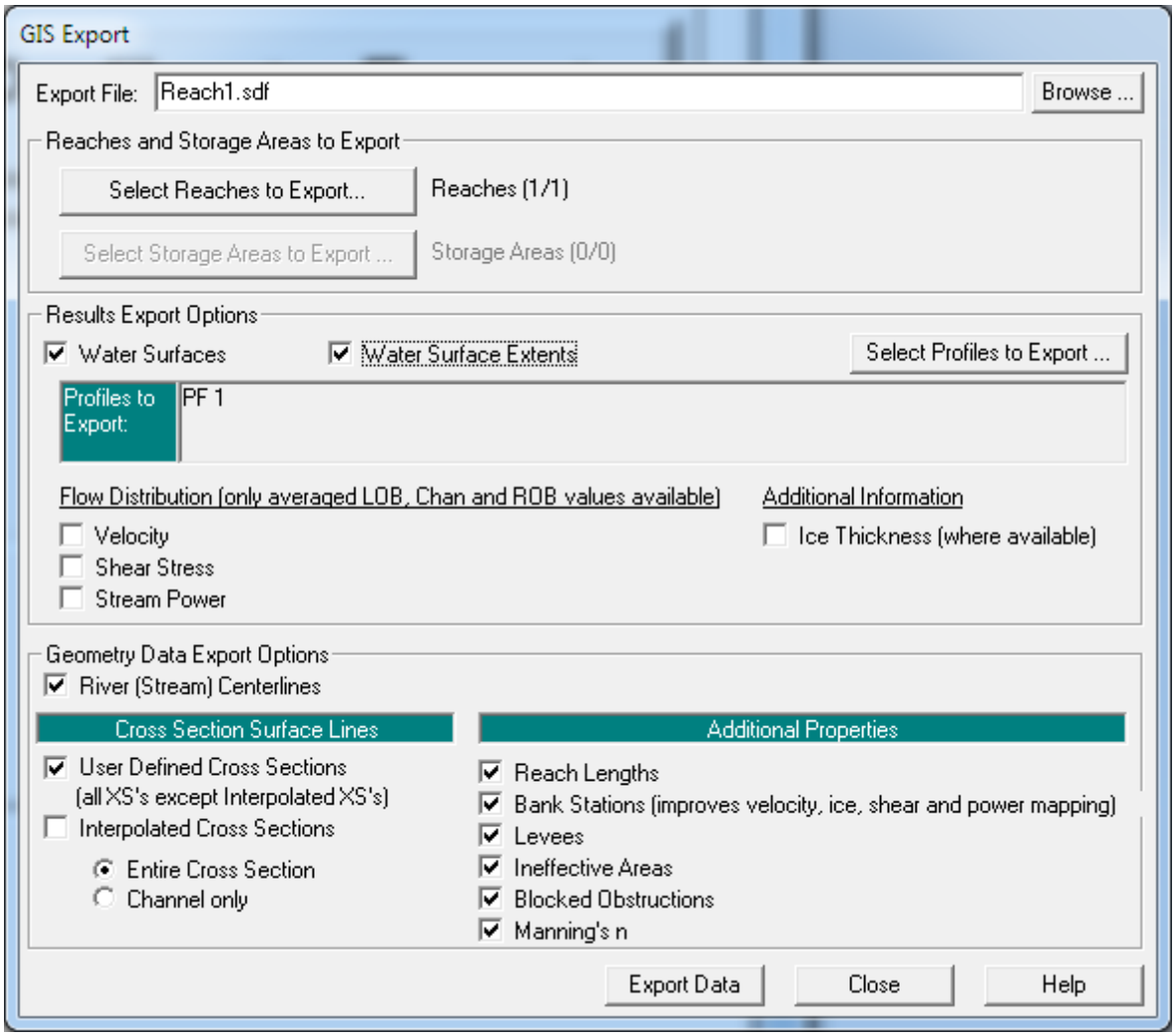
From the HEC-RAS **File** pull-down, select **Exit** to close HEC-RAS.

GIS Export options for HEC-RAS 4.0.0, 4.1.0, and 5.0.0

Check: (at least)

Water Surfaces
Water Surface Extents
River (Stream) Centerlines
User Defined Cross Sections
Reach Lengths
Bank Stations
Levees
Ineffective Areas
Blocked Obstructions
Mannings' n

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Select the **Export Data** button to write the file.

From the HEC-RAS **File** pull-down, select **Exit** to close HEC-RAS.

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4.5.3.3 Example: HEC-RAS Output

HEC-RAS section data can be sampled from your Overall Proposed surface using the sample lines and overbank polylines created by the Create Sample Lines or Polylines along an alignment. The sampled data can be used to create a HEC-RAS project file, starting a new HEC-RAS project, a HEC-RAS GIS file, for import into an existing HEC-RAS project, which can be used in a variety of HEC-RAS applications.

Sampling HEC-RAS Data with SM_HECRASOUT

To begin sampling the HEC data, use the  icon from the *StreamNCD* tab > *HEC-RAS* panel, which runs the **SM_HECRASOUT** command.

Create HEC-RAS Cross Section Data Files.

Select Cross Section polylines or [By layer]: **b** Individually select section lines, or type **B** to pick layer.

Select layer of Cross Section polylines or [Select]: **Select** sample line layer.

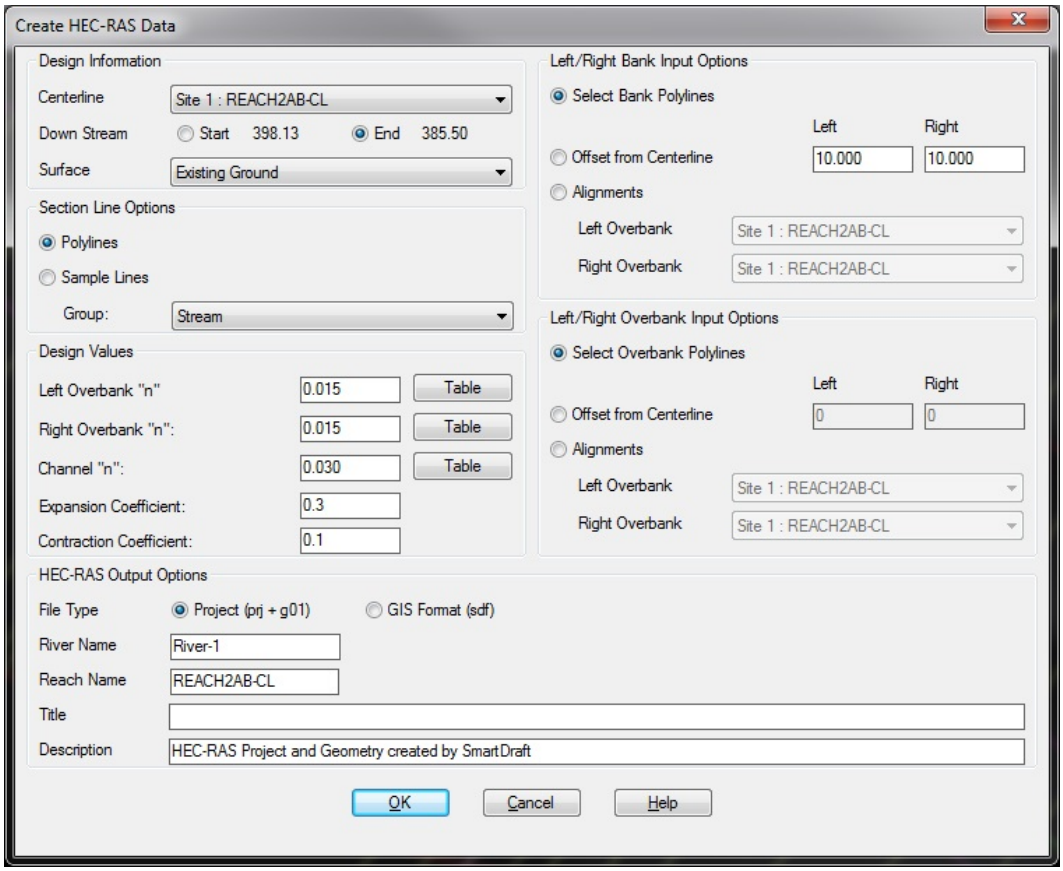
264 polylines found on layer -W-HYDR-XS-REACH04B-05A-00_i01-PROFILE3

Specify down stream point of channel: **Snap** to the downstream end of the centerline alignment **Endpoint *with an* Endpoint snap**.

Warning: **It is important to snap to the end of the alignment, not merely pick near it.**

After the endpoint is picked, the *Sample HEC-RAS Cross Sections* dialog opens.

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HEC-RAS Output Dialog

In the *HEC-RAS Output* dialog, initially set the **Output File Type** as desired, formatting the remainder of the dialog. The **HEC-RAS (prj)** option will create a new HEC-RAS project which can be directly opened in HEC-RAS. The **HEC-RAS (sdf)** option creates a HEC-RAS GIS file which can be imported into an existing HEC-RAS project. The **HEC-2** option creates HEC card data that can be used in either HEC-RAS or HEC-2 applications.

Select the **Centerline** alignment from the list (be careful of the sorting in the list).

Select your **Surface** from the list.

The **Number of Discharges** is fixed at 1 if the HEC-RAS output options; the value can be changed if HEC-2 is selected.

The **n Values** for **Left** and **Right Overbank** and **Channel** can be entered, or selected from a reference table accessible by picking the appropriate **Table** buttons.

The **Expansion** and **Contraction Coefficients** values can be entered.

The **Slope** value entry is disabled in **SM_HECRASXS** Release 3.0; this limitation will be expanded in future releases.

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For the **Left** and **Right Bank Alignment**, select the appropriate left and right alignments (output earlier from the corridor).

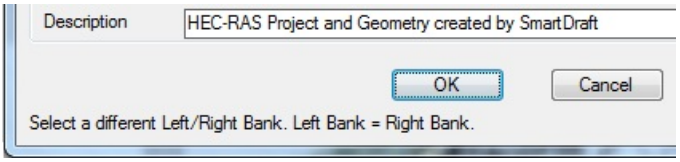
The **Left** and **Right Bank Offset** values are used if the selected bankfull alignments do not cross a selected cross section polyline; enter an appropriate value to approximate the bank position in this case.

Set the **Left/Right Overbank Alignment Option** to **Offset from Centerline**, or to either of the other available options if an offset is not to be used, **Enter** a **Left** and **Right** Offset value (2 times bankfull in this case).

If the ***HEC-RAS*** output option was selected, enter the HEC-RAS project **Title** and **Description**.

Press **OK**.

Error detection in the **SM_HECRASXS** command will report incorrectly selected data at the bottom left of the dialog. If pressing *OK* seems to have no effect, check for errors.

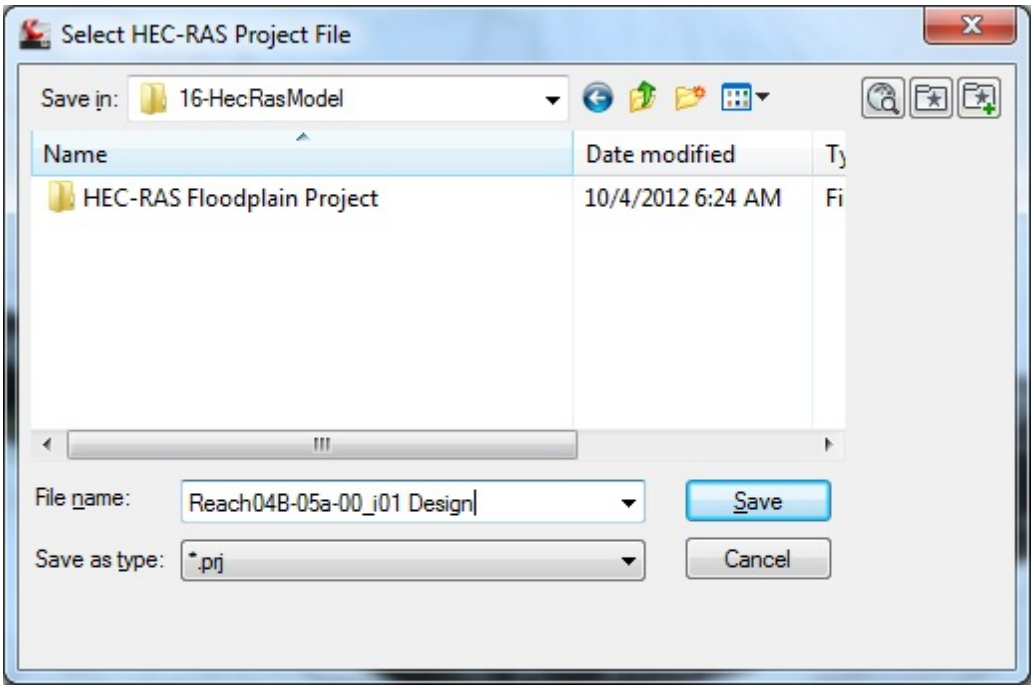


Error Reporting in SM_HECRASXS

The command prompts for the name and location for the HEC-RAS file(s). Navigate to the desired folder, and save the file with a meaningful name.

Note The actual naming of the HEC-RAS files is at the discretion of the designer. A single HEC-RAS project file, created with HECSX as a .prj file, can ultimately contain both bankfull and floodplain data for the same reach, as separate geometry files. Carrying this further, a single HEC-RAS project can contain data for multiple reaches, through the use of various geometry and plan files.

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HEC-RAS Project File Name and Location

After the Save button is pressed the command should terminate normally back to a command prompt. An error message may, however, display.

Dealing with Error Messages

Rather than returning gracefully back to the command prompt, the **SM_HECRASXS** command may display the AutoCAD text screen where a message of this type may be found:

HEC-RAS project and geometry files <Reach04B-05A-00_i01 Design> created.

Cross Sections which didn't cross the left or right bank alignment.

1 31+51.91

These sections written to L:\99000s\99200\99205.01\Admin\04-ENGR\16-HecRasModel\Reach04B-05A-00_i01 Design-no-bank.txt

This message is an indicator of a problem, specifically that the left or right bankfull alignment used was shorter than the centerline. Opening the text file created displays the same information.

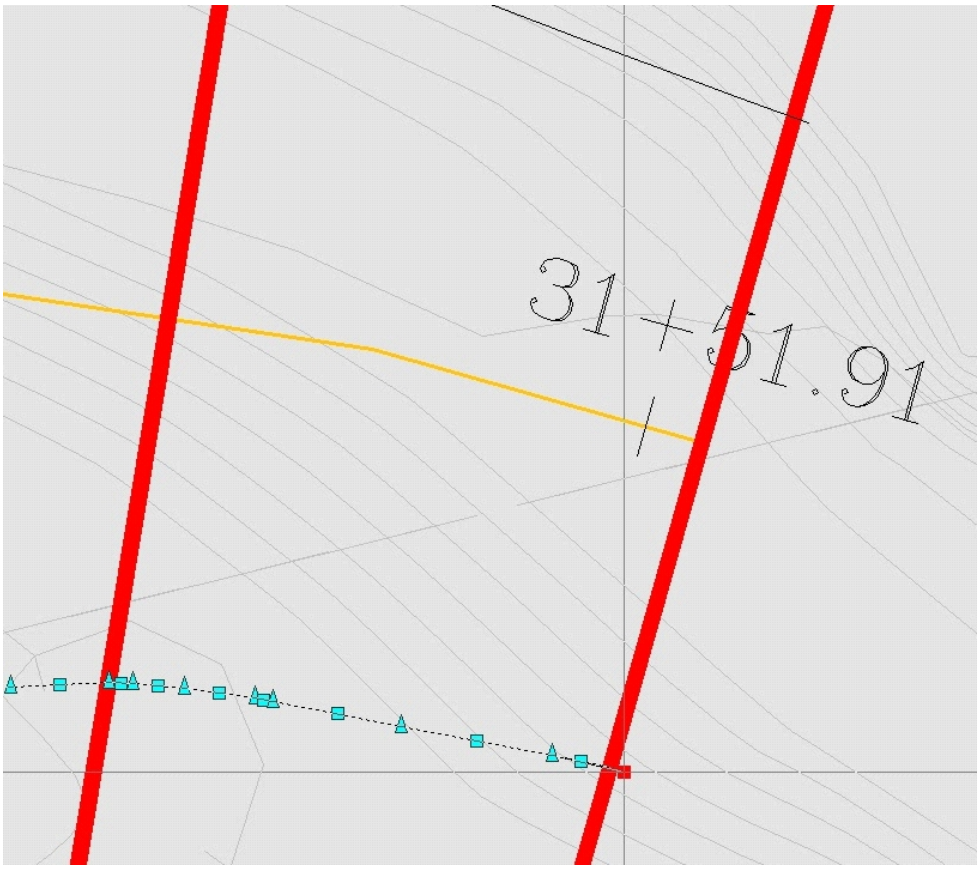
This error typically results from the adjustment of the corridor back to its full length in the initial processing of the reach corridor by typing the ending station rather than snapping to the end of the centerline alignment.

The error will not prevent the section from being written to HEC-RAS, but will prevent the establishment of the bank stations on the section - the stations would have to be entered manually in HEC-RAS.

The solution is to lengthen the bankfull alignments.

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Grip Stretch the alignments slightly, bringing them just past the last section sample line as shown in the figure below.



Grip Stretch Promoted Bankfull Alignment

Once the bankfull alignments are lengthened, erase the HEC-RAS project files created and recreate them by rerunning the **SM_HECRASXS** command.

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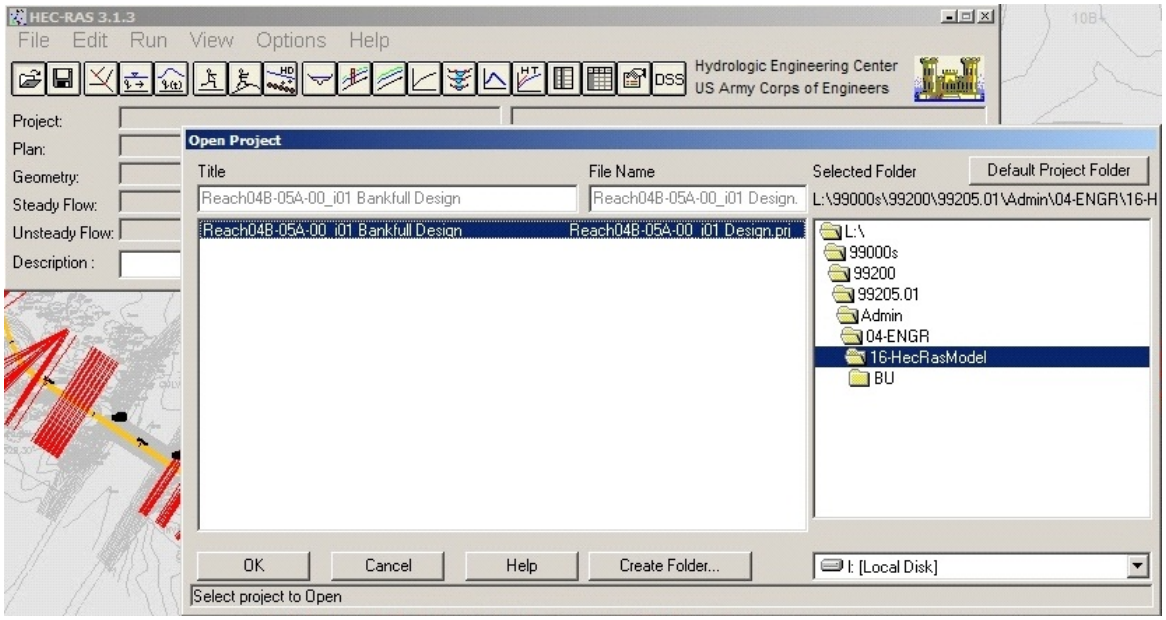
4.5.3.4 Example: Opening or Importing Design HEC-RAS Cross Section Data

Opening the HEC-RAS Project Created by SM_HECRASXS

This alternative is used if a new ***HEC-RAS Project (prj)*** was produced from HECXS. To import a ***HEC-RAS GIS (sdf)*** file into an existing HEC-RAS project instead, skip to the next page.

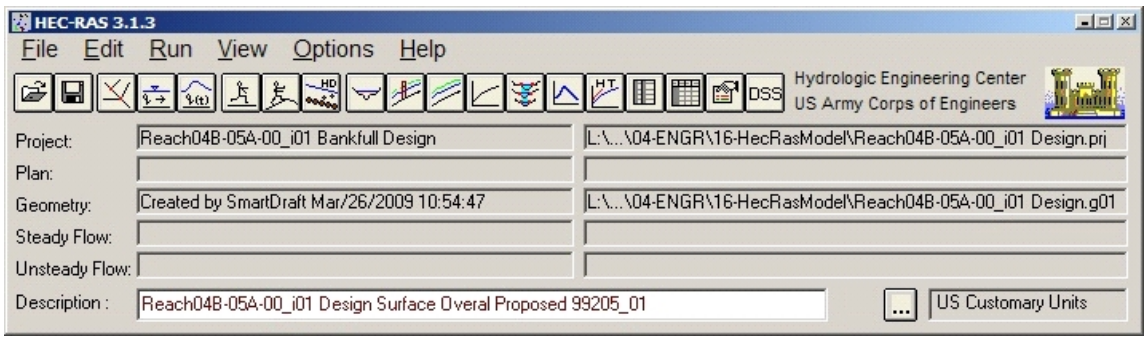
HEC-RAS can be started from within Civil 3D by using the RAS icon from the *HEC-RAS* panel on the *SmartDraft Hydro* tab.

In HEC-RAS, use the **File** pulldown, select **Open Project**. Browse to the project's folder and select the prj file created by **SM_HECRASXS**. Press **OK** to open the project.



Selection of Project File Created by SM_HECRASXS

Opening the project file automatically includes the Geometry file, produced by **SM_HECRASXS**. The **Description** in the project can be added, after which the project file should be **Saved**.



Project Contents as Opened

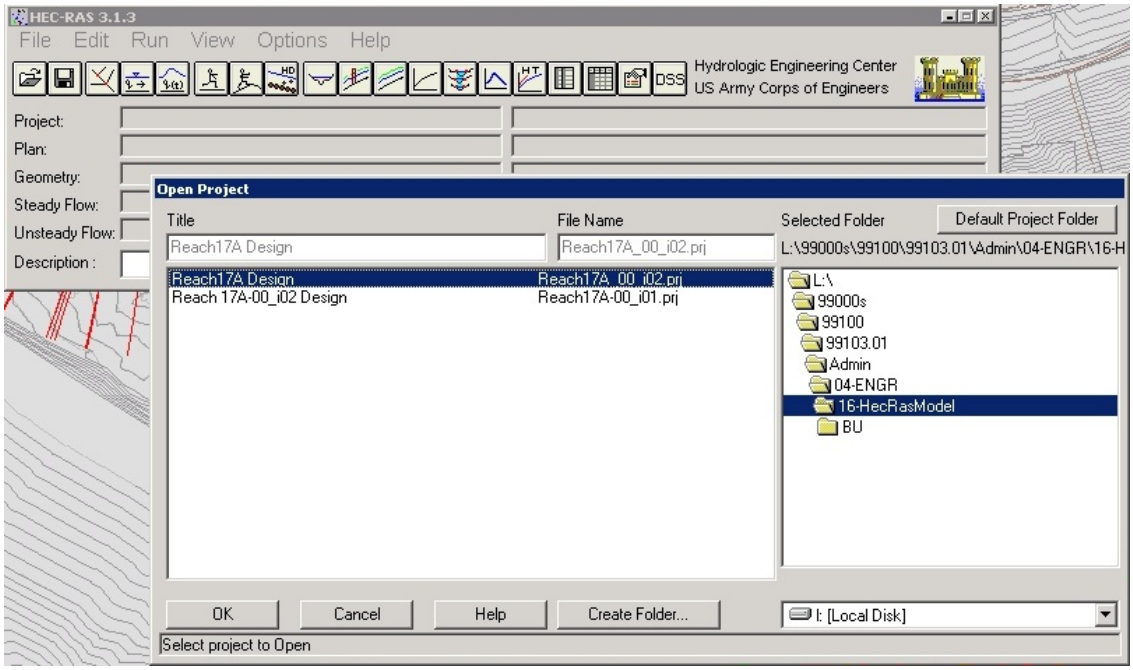
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Importing the HEC-RAS GIS File Created by SM_HECRASXS

This process is used if the ***HEC-RAS GIS (sdf)*** file format was produced using HECSX, and the resulting file is to be imported into an existing HEC-RAS project (or one created in HEC-RAS rather than HECXS).

HEC-RAS can be started from within Civil 3D by using the RAS icon from the *HEC-RAS* panel on the *SmartDraft or SmartDraft Hydro* tab.

In HEC-RAS, use the **File** pulldown, select **Open Project**.



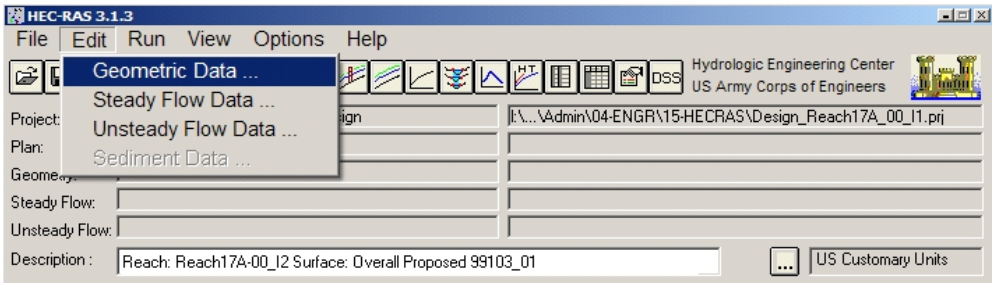
Open HEC-RAS Project

Note A new HEC-RAS project can be started as well. If starting the project through the HEC-RAS interface, the underscore ("_") character must be used in place of the hyphen ("-") in HEC-RAS file names.

Once the project is created and displayed in HEC-RAS, enter a **Description** in the field at the bottom of the dialog.

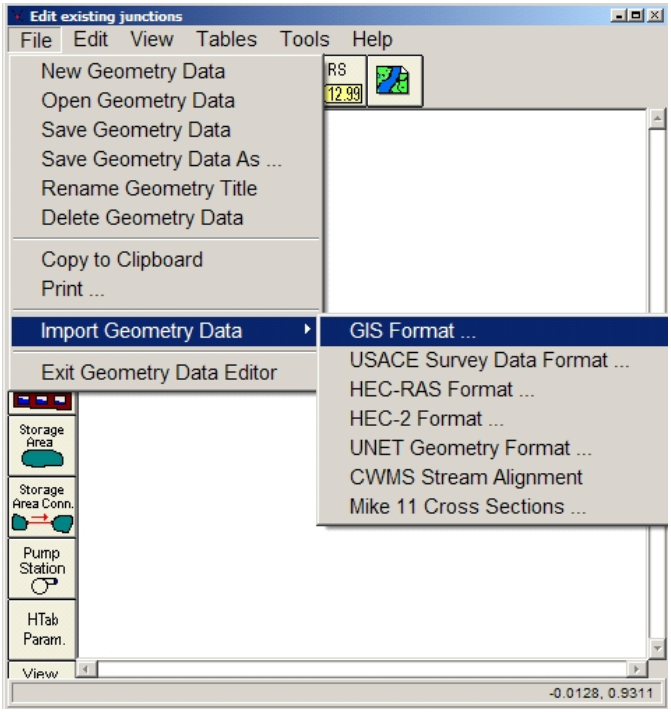
To bring the section data into HEC-RAS, use the **Edit** pulldown to select **Geometric Data…**

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HEC-RAS Geometric Data Menu

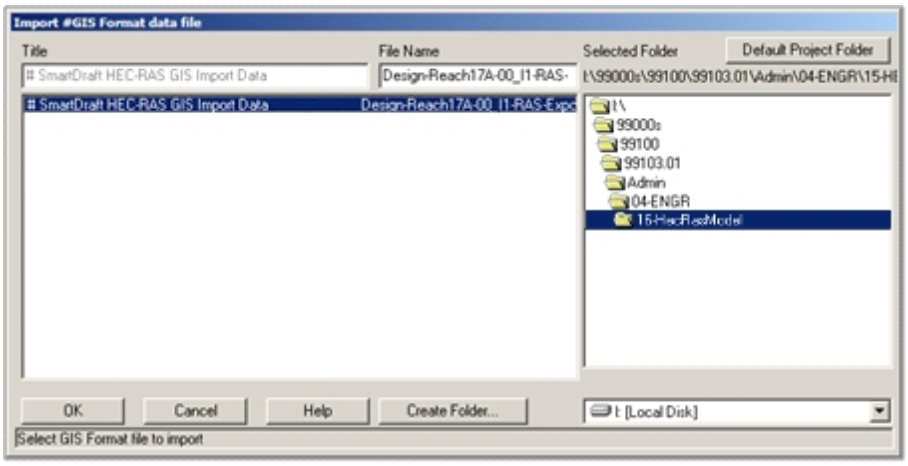
As the Geometric Data dialog displays. Use the **File** pulldown to select **Import Geometry Data** > **GIS Format**.



Import Geometry Data > GIS Format

From the project's folder select the .sdf file created earlier. Press **OK**.

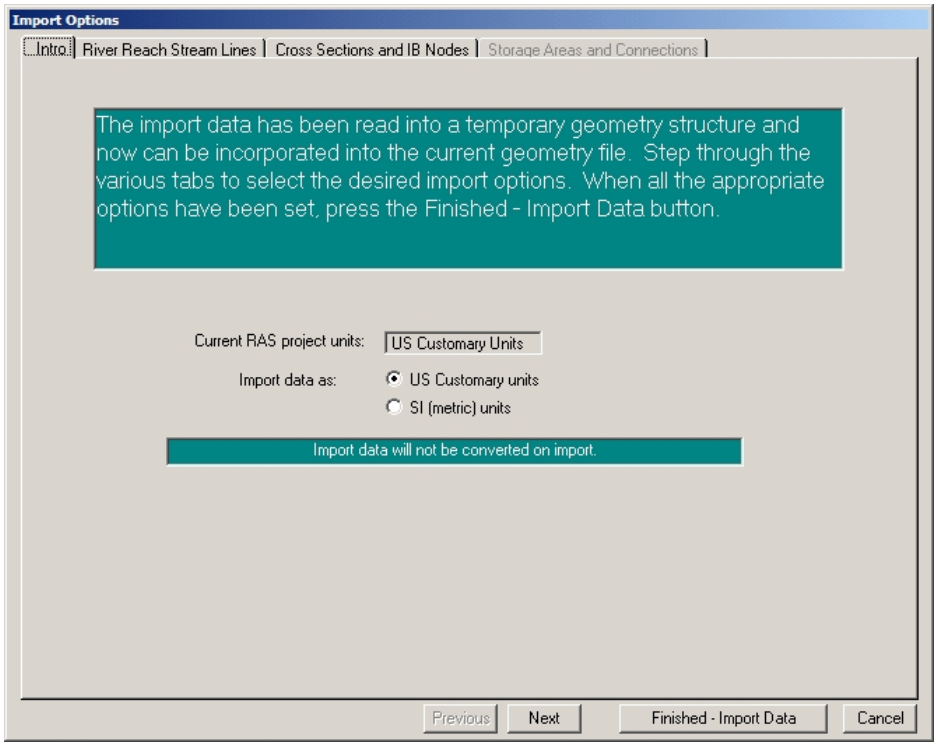
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.sdf File Import

Use either the tabs at top or the **Next** button at bottom to advance through the HEC-RAS Import Wizard, verifying or setting the import options as required.

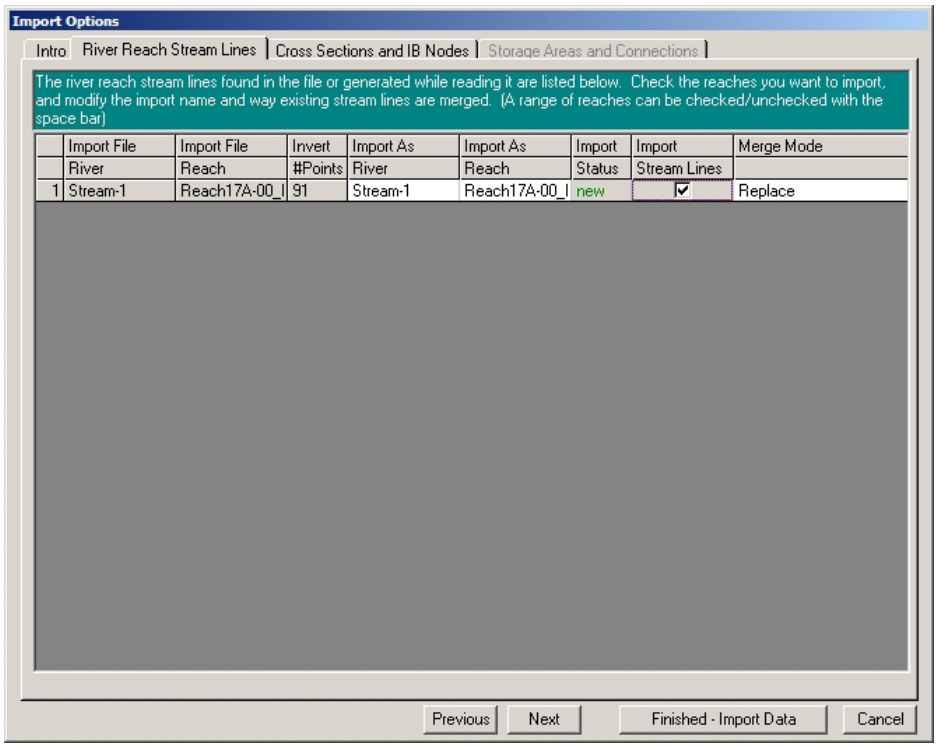
On the **Intro** tab, make sure that the RAS Project data and Import data are in **US Customary Units**.



Import Wizard - Intro Tab

On the **River Reach Stream Lines** tab leave the **River** as **Stream-1**; leave the **Reach** as the imported [alignment name]. Make sure **Import Stream Lines** is checked **On**, and the **Merge Mode** is **Replace**.

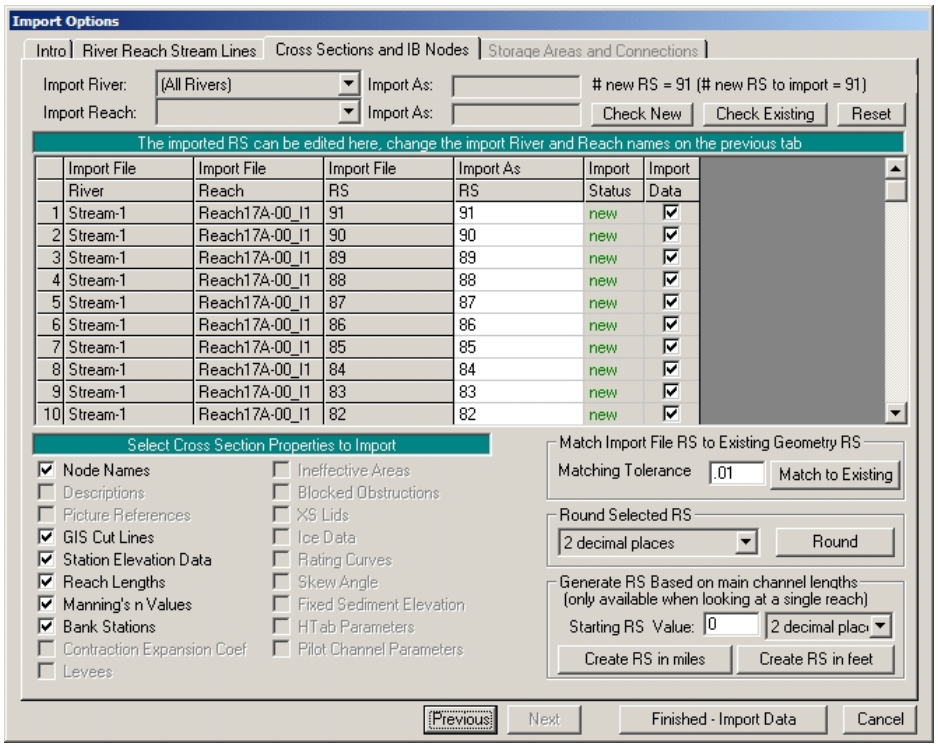
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Import Wizard - River Reach Stream Lines Tab

On the **Cross Sections and IB Nodes** tab, make sure that import of data from all available stations are checked on in the upper half of the dialog. Make sure that all available **Cross Section Properties** are checked on in the lower half of the dialog.

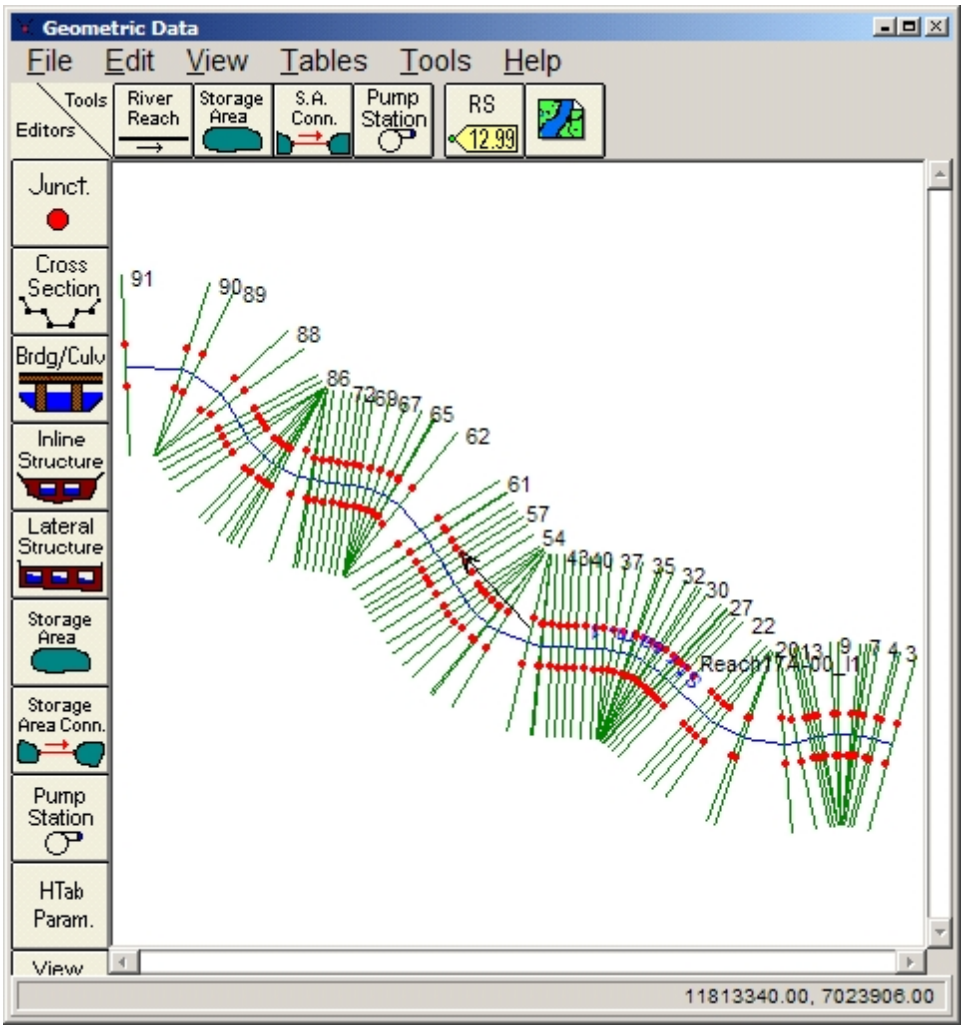
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Import Wizard - Cross Sections and IB Nodes Tab

Press **Finished - Import Data** to import the geometry data into HEC-RAS.

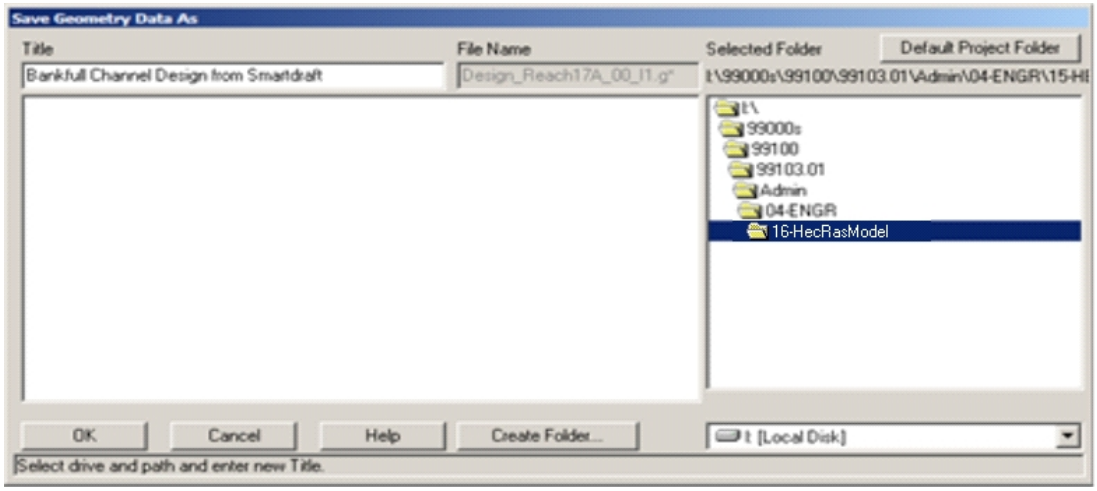
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Geometry Data Successfully Imported into HEC-RAS

From the **File** pulldown in the Geometry Editor, use **Save Geometry Data** to save the imported information. Supply an appropriate Title, and press **OK** to save the data.

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Save Geometry Data Dialog

Exit from the Geometry Editor using the **File** pulldown.

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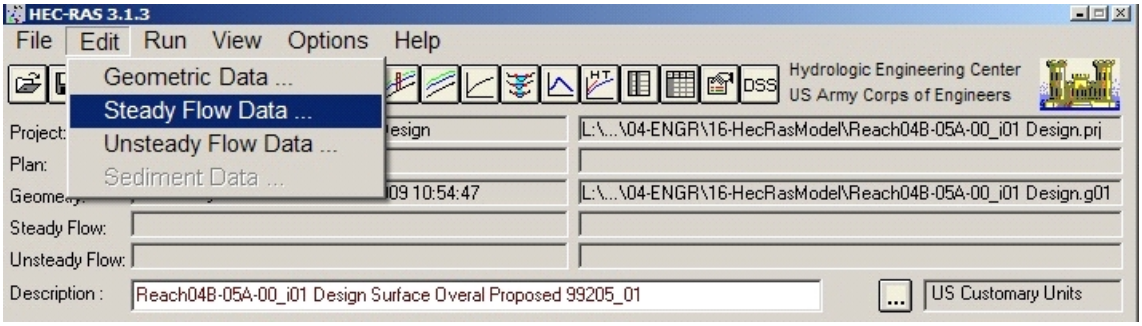
4.5.3.5 Example: Adding Steady Flow Data

This step adds the desired number of HEC-RAS profiles, each with their flow data. Steady Flow Analysis also exposes potential problems with the HEC-RAS section data, which can be corrected through the Geometric Data Editor.

Adding Steady Flow Data

Open HEC-RAS and the HEC-RAS project if not already open from the previous step.

From the **Edit** pulldown in HEC-RAS, select Steady **Flow Data…**

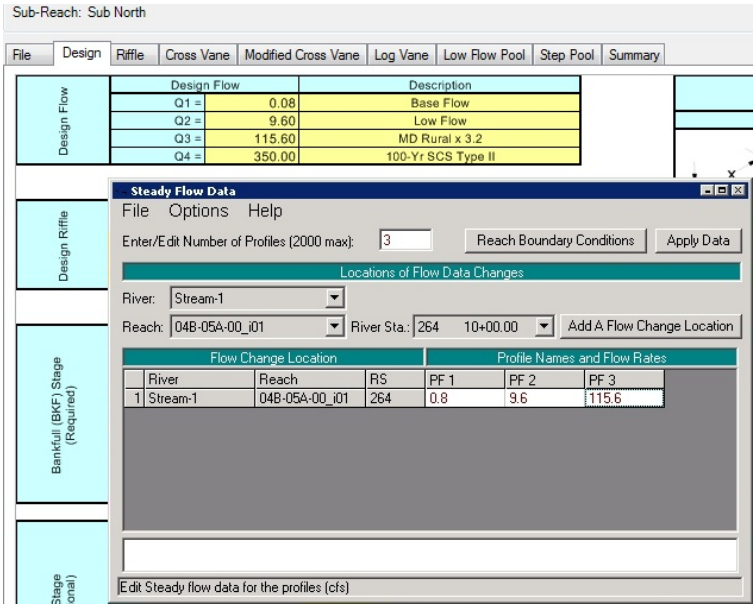


HEC-RAS Steady Flow Data Menu

In the **Steady Flow Data** dialog, set the **Number of Profiles** desired for the Bankfull Channel Design at the top of the dialog. Press the **Apply Data** button to create the additional fields in the dialog (three profiles for the bankfull analysis in this case).

The Flow Data entered in the profile fields will be taken from or match the Input supplied to the Feature Design file on the Design tab of the specific sub-reach.

Enter the **Flow Rates** as desired for the profiles.

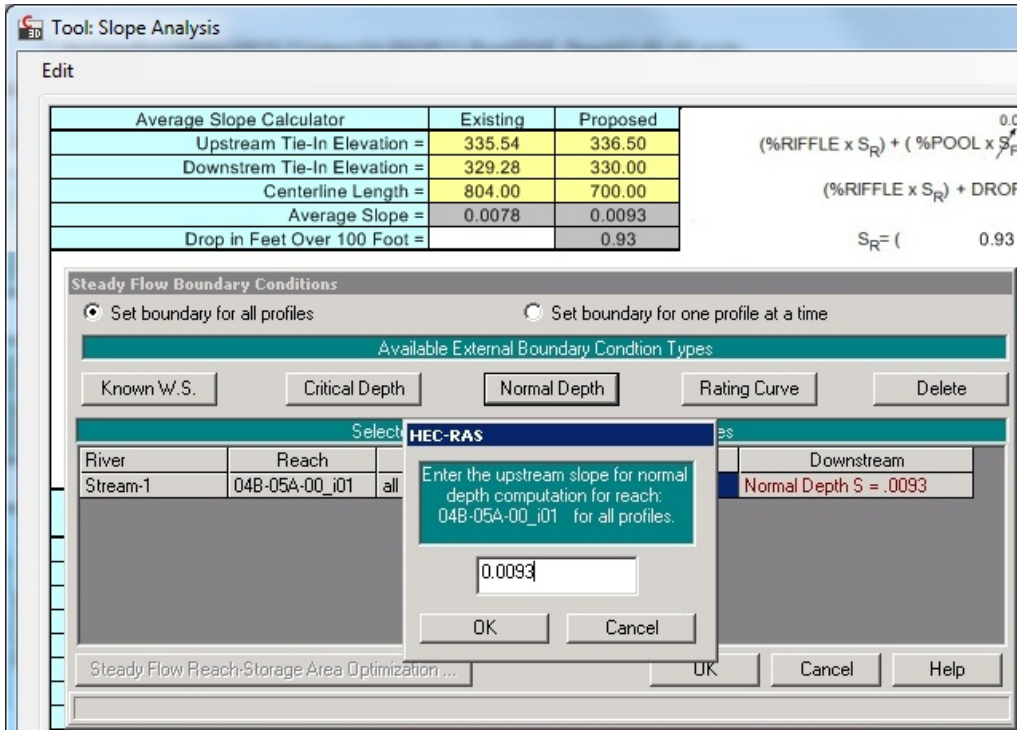


Profile Flow Rate Entry for Three Profiles, with Feature Design Tool in Background

Click on the **Reach Boundary Conditions** button at the top of the **Steady Flow Data** dialog.

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Make sure that the option is set to **Set Boundary for All Profiles** at the top of the dialog. Click in the **Upstream** slope field, and press the **Normal Depth** button. Enter the slope value in ft/ft, and press **OK** to apply the value to the **Upstream** cell. The slope value is present in the Feature Design file on the Design tab > Slope Analysis button of the specific sub-reach, as well as the Reach Design file on the Boundary Conditions tab. Repeat the process, clicking in the **Downstream** cell.



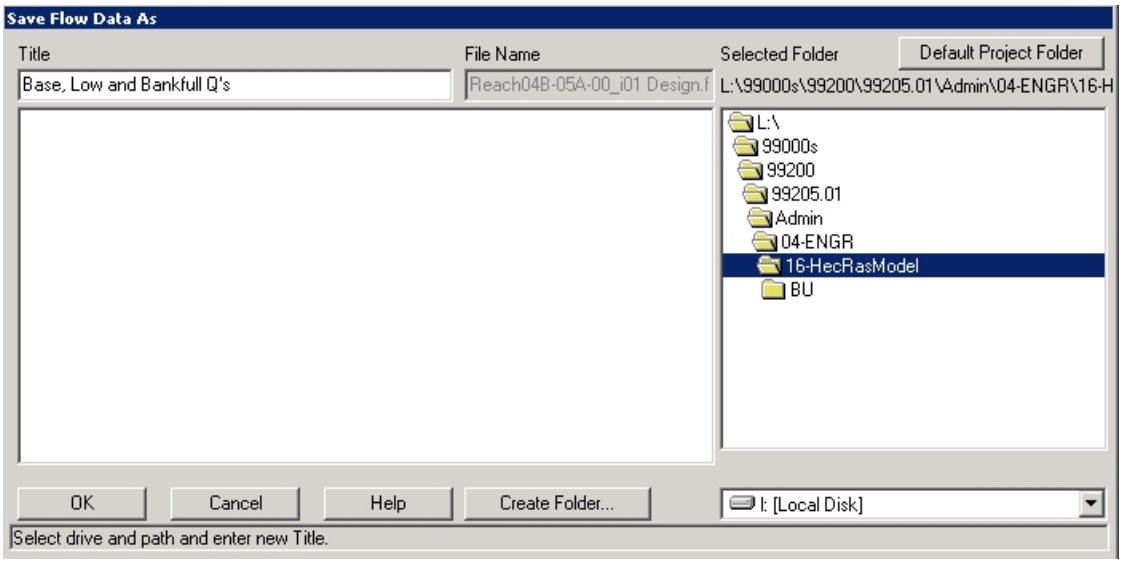
Boundary Condition Slope Data Entry, with Feature Design Tool in Background

Press **OK** to save the Boundary Conditions data.

In the **Steady Flow Data** dialog, press the **Apply Data** button to apply the flow data.

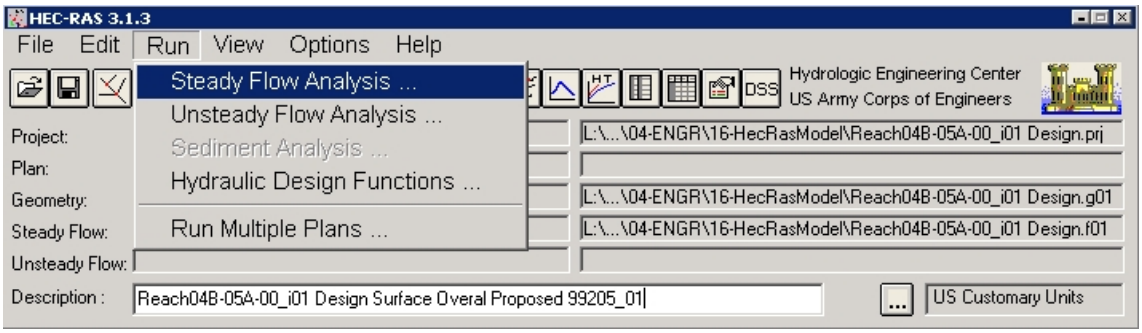
From the **File** pulldown in the **Steady Flow Data** dialog, select **Save Flow Data**. Supply an appropriate Title, and press **OK** to save the flow data.

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Save Flow Data Dialog

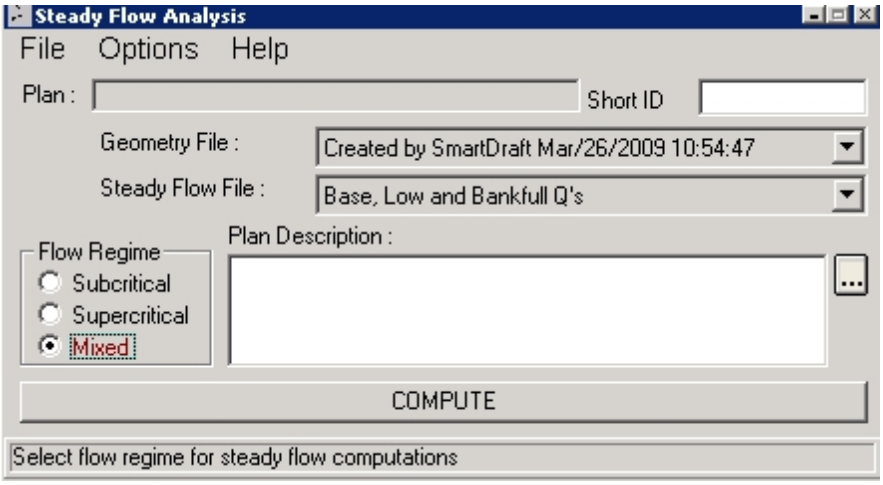
From the **Run** pulldown in HEC-RAS, select **Steady Flow Analysis...**



HEC-RAS Steady Flow Analysis Menu

In the **Steady Flow Analysis** dialog, set the **Flow Regime** to **Mixed**. Press the **Compute** button to check errors.

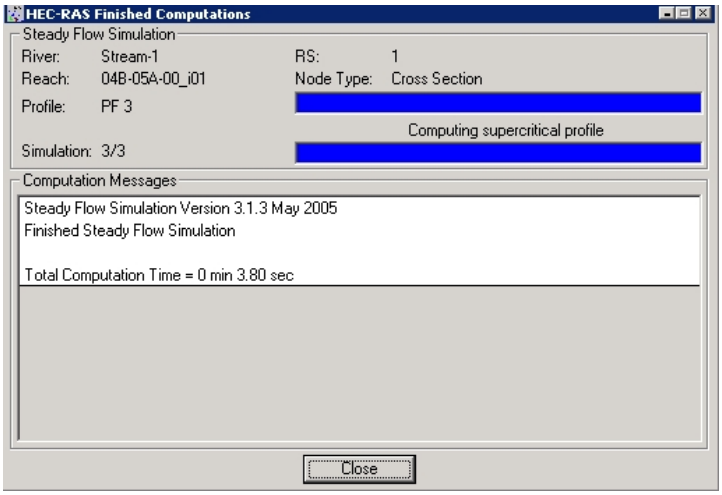
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Steady Flow Analysis Dialog

The desirable result of the steady flow simulation is a dialog box indicating no errors.

If the simulation ran with no errors, press **Close** to exit the dialog, and use **File** > **Save** to save the plan file. Use **File** > **Exit** to close the **Steady Flow Analysis** dialog. **Save** the HEC-RAS project.



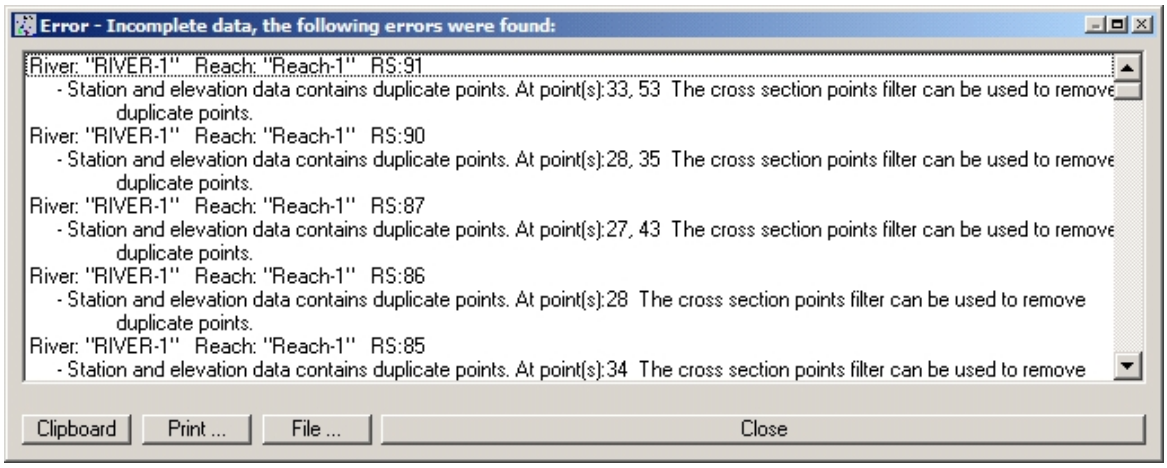
Steady Flow Simulation Results with No Errors

If the simulation generated errors, it is likely due to duplicate sample points within a cross section. The HECXS program that samples the original cross section data attempts to filter out duplicate points within each section. The filtering is based on multiple sample points in the same section with exactly matching station and elevation values. If two or more sample points have the same station value and different elevations, they will not be filtered out and must be weeded using the procedures described in the following pages.

Deleting Duplicate Points in Cross Section Data

If the steady flow simulation returns errors, the result will be very different and immediately apparent. One potential type of error is a ***duplicate point error***, which manifests itself in this message from Steady Flow Simulation:

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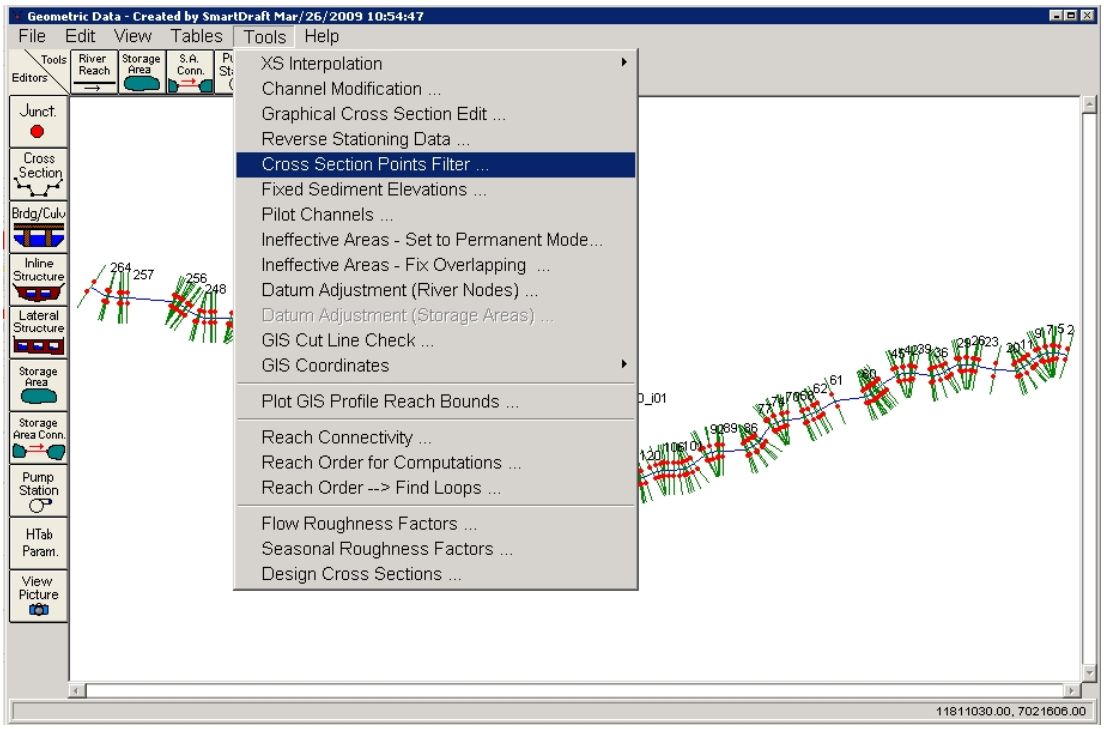


Steady Flow Simulation Results with Duplicate Points Error

Note The SM_HECRASXS command attempts to filter out duplicate points at sections, reducing the likelihood of this error.

If this error occurs, press **Close** to dismiss the results dialog, and use **File** > **Exit** to close the **Steady Flow Analysis** dialog.

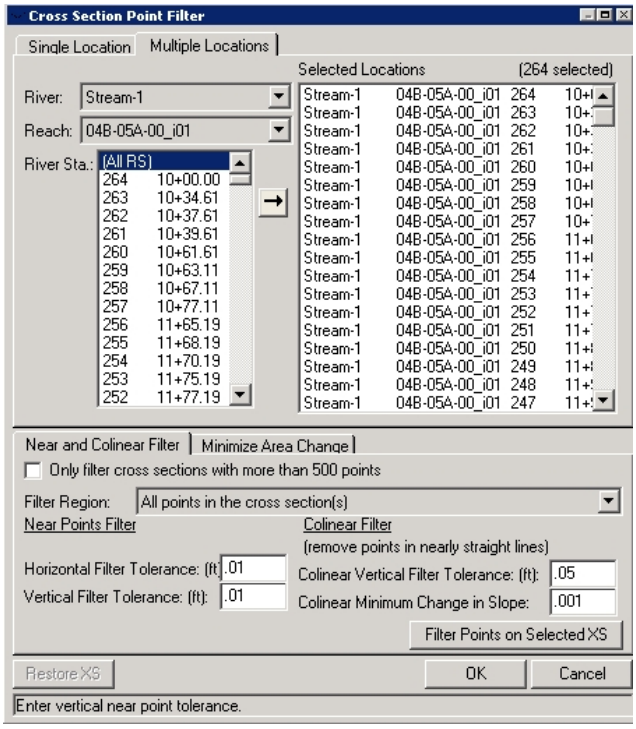
From the main menu in HEC-RAS, select **Edit** > **Geometric Data...** From the *Geometric Data* dialog, select **Tools** > **Cross Section Points Filter**.



Geometric Editor > Cross Section Points Filter

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In the *Cross Section Point Filter* dialog, click on the **Multiple Locations** tab. In the **River Sta.** field, highlight the **(All RS)** selection, and use the  icon to select all river stations. Adjust the tolerance values as desired in the fields at the bottom of the dialog, typically adjusting the Horizontal **Filter Tolerance** and **Vertical Filter Tolerance**. Press the **Filter Points on Selected XS** button to remove the duplicate points.



Cross Section Point Filter

A summary dialog box displays the number of points removed at each section. Press **Close** to dismiss this dialog. Press **OK** to close the *Cross Section Point Filter*. From the *Geometry Editor*, use **File** > **Save Geometry Data** to save the filtered cross sections, then use **File** > **Exit Geometry Data Editor** to return to the HEC-RAS main menu.

Warning: **Don't forget to save the geometry data, or you're going to end up filtering the cross section points again.**

From the **Run** pulldown in HEC-RAS, again select **Steady Flow Analysis…** Rerun the steady flow simulation.

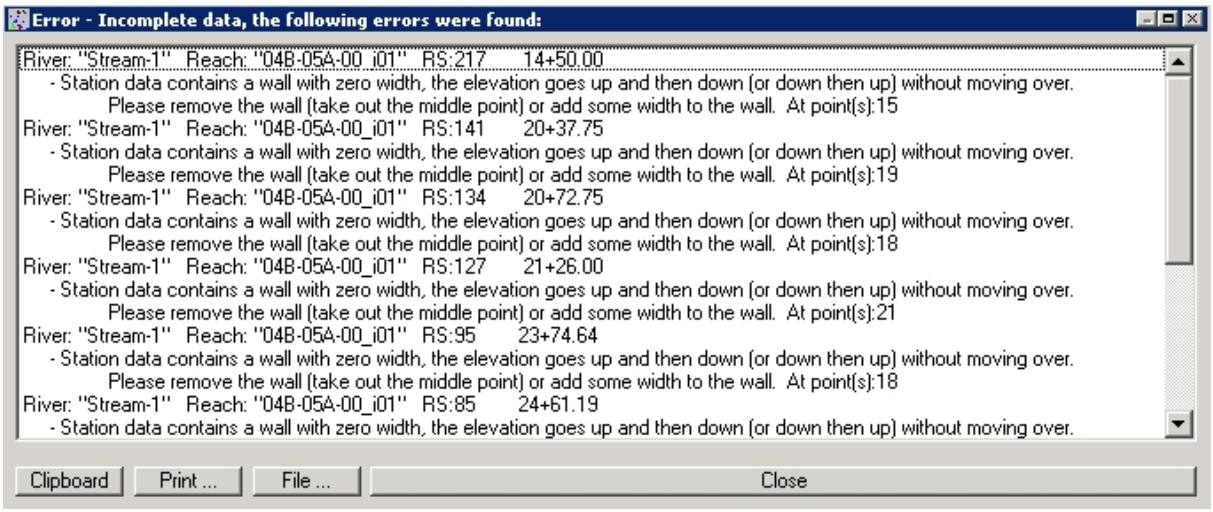
If the simulation ran with no errors, press Close to exit the dialog, and use File > Save to save the plan file. Use File > Exit to close the Steady Flow Analysis dialog. Save the HEC-RAS project.

If the simulation generated errors, it is likely due to multiple sample points within a cross section that need to be weeded, reported as a wall, as shown below.

Weeding Vertices in Cross Section Data

A second error message likely to be displayed reports the presence of a "wall" at a given section:

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“Wall” Error at Numerous Stations

This error is seen at some sections as the corridor transitions out of or into riffle; three points are placed extremely close together, within a tolerance that makes them appear to be the same station but different elevations. The exact geometry is shown in the figure below, greatly magnified. Since three points are involved, HEC-RAS reports the error as the presence of a wall.



“Wall” Points in Section

To clear these errors, it is important to record the river station and data point number at which the errors occur. There are 10 errors reported in the message shown in ""Wall" Error at Numerous Stations" figure above, these values are as follows:

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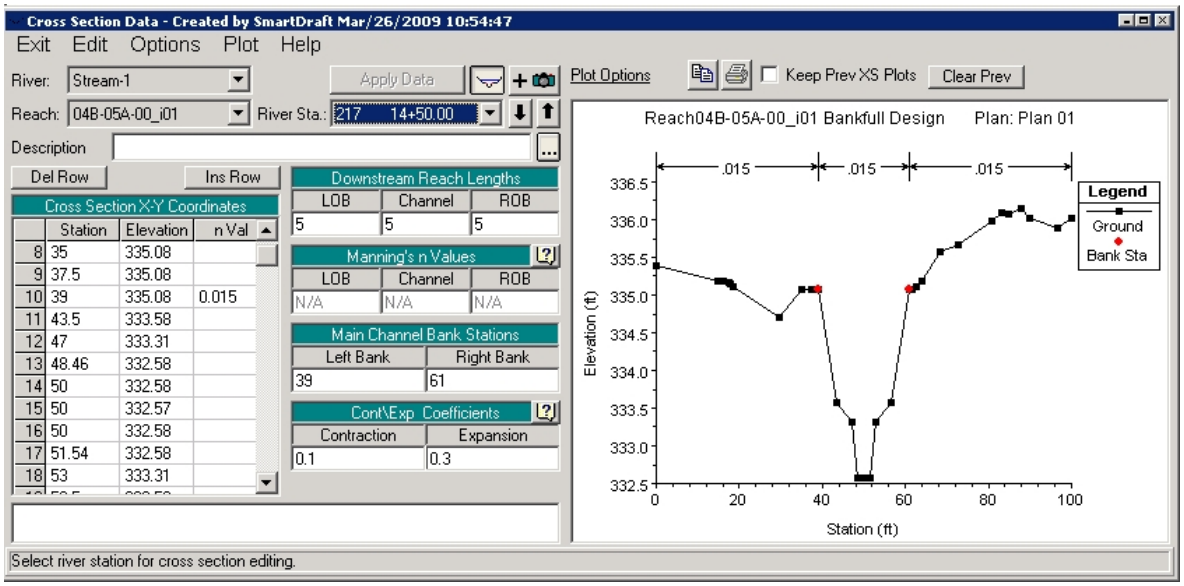
RS 217 14+50.00 Pnt 15 RS 141 20+37.75 Pnt 19 RS 134 20+72.75 Pnt 18
RS 127 21+26.00 Pnt 21 RS 95 23+74.64 Pnt 18 RS 85 24+61.19 Pnt 20
RS 78 24+96.19 Pnt 23 RS 45 27+98.47 Pnt 15 RS 20 30+00.00 Pnt 17
RS 19 30+41.71 Pnt 19

Note The buttons in the bottom of the error dialog box permit the information to be copied to the Clipboard, printed, or saved to a file.

With the stations recorded, press **Close** to dismiss the results dialog, and use **File** > **Exit** to close the **Steady Flow Analysis** dialog.

From the main menu in HEC-RAS, select **Edit** > **Geometric Data…** From the *Geometric Data* dialog, use the 

icon to examine the affected sections, verifying the error. Advance using the fields in the *Cross Section Data* dialog to each of the river stations and data points as shown below. At RS 217, station 14+50.00, the point reported was 15. In the *Cross Section Data* dialog, points 14, 15 and 16, shown in the left side of the dialog, all have the same station and elevations differing by 1/100th of a foot. Verify each of the affected sections to insure that an actual feature is not present before weeding the vertices, and to establish the weeding value to be used.



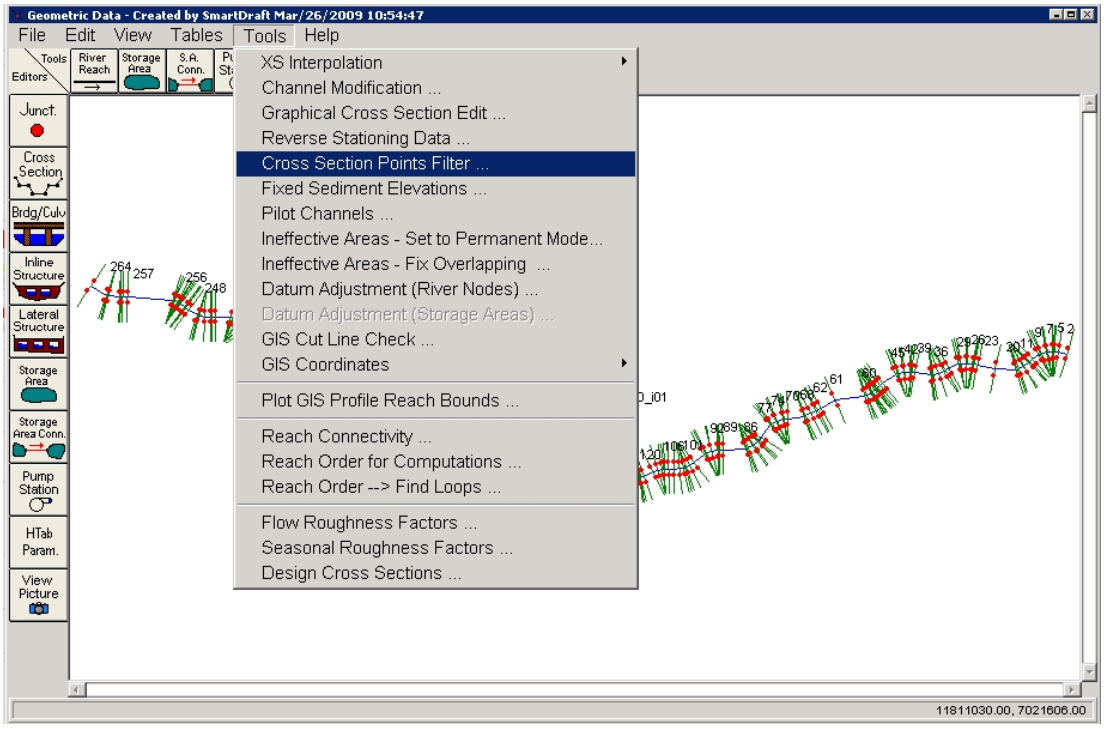
Cross Section with Three Points Displayed

Note Don't weed the points reported in this manner without verifying them. Willy nilly weeding is dangerous.

When the affected sections have been examined and the threshold for weeding established, **Exit** from the Cross Section Data dialog with its Exit pulldown.

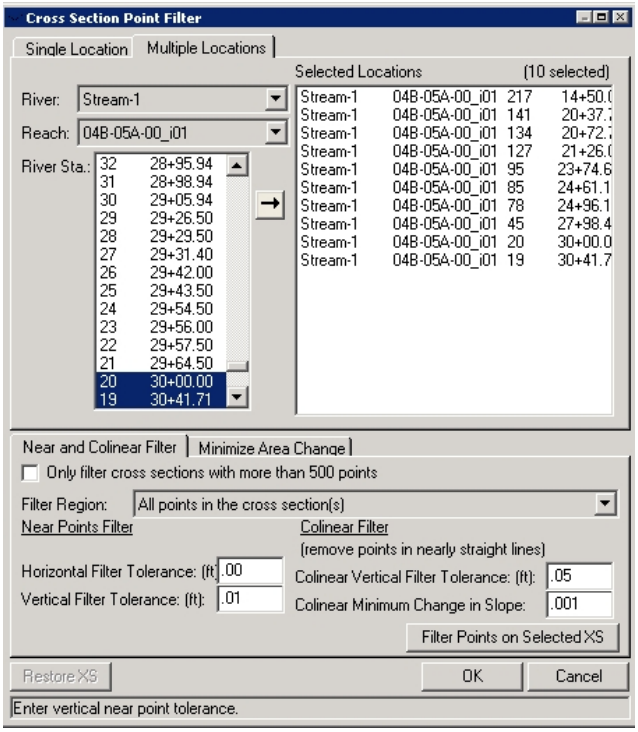
From the main menu in HEC-RAS, select **Edit** > **Geometric Data…** From the *Geometric Data* dialog, select **Tools** > **Cross Section Points Filter**.

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Geometric Editor > Cross Section Points Filter

In the *Cross Section Point Filter* dialog, click on the **Multiple Locations** tab. In the **River Sta**. field, highlight the individual stations to be weeded, and use the  icon to select the stations. Adjust the **Horizontal Filter Tolerance** and **Vertical Filter Tolerance** settings using the values determined from the sections. Press the **Filter Points on Selected XS** button to remove the duplicate points.



Cross Section Point Filter

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A summary dialog box displays the number of points removed at each section. Press **Close** to dismiss this dialog. Press **OK** to close the *Cross Section Point Filter*. From the *Geometry Editor*, use **File** > **Save** to save the plan file. Use **File** > **Save Geometry Data** to save the filtered cross sections, then use **File** > **Exit Geometry Data Editor** to return to the HEC-RAS main menu.

Warning: **Don't forget to save the geometry data, or you're going to end up weeding the cross section points again.**

From the **Run** pulldown in HEC-RAS, again select **Steady Flow Analysis...** Rerun the steady flow simulation.

If the simulation ran with no errors, press **Close** to exit the dialog, and use **File** > **Exit** to close the **Steady Flow Analysis** dialog. **Save** the HEC-RAS project.

Warning: **If you still have errors after filtering duplicate points from the sections, seek professional help.**

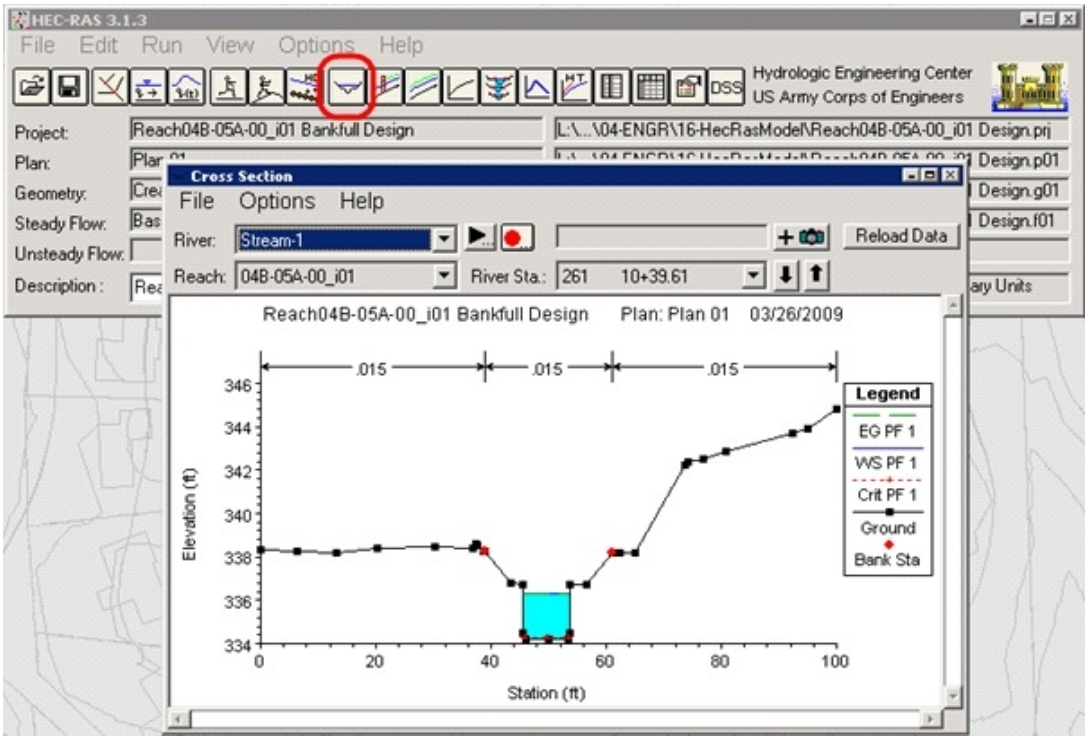
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4.5.3.6 Example: Viewing and Editing Design HEC-RAS Cross Section Data

The cross sections exported from Civil3D and imported will be viewed and edited in HEC-RAS. Editing in HEC-RAS permits the establishment in the model of ineffective flow areas, levees and obstructions on a section-by-section basis, as well as the inclusion of culverts and bridges.

Viewing HEC-RAS Cross Section Data

HEC-RAS cross sections can be viewed using the Cross Section Viewer, found as the  icon in the main HEC-RAS interface.



HEC-RAS Cross Section Viewer

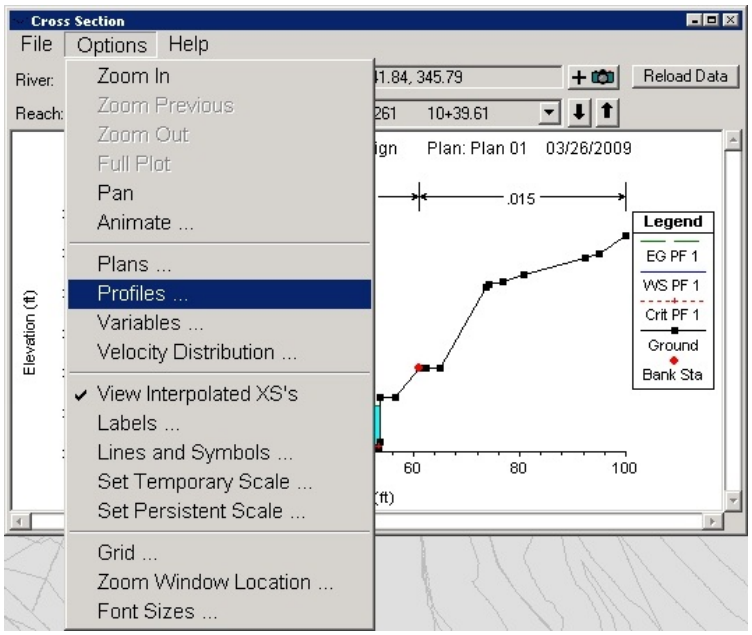
Navigation between sections in the *Cross Section Viewer* can be accomplished with the River Station selection list, or by using the  and  icons adjacent to it.

The *Cross Section Viewer* will display the same number of water surface profiles as the *Cross Section Editor* will. In this case only one of the three water surface profiles created is displayed.

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Setting the Number of Water Surface Profiles Displayed

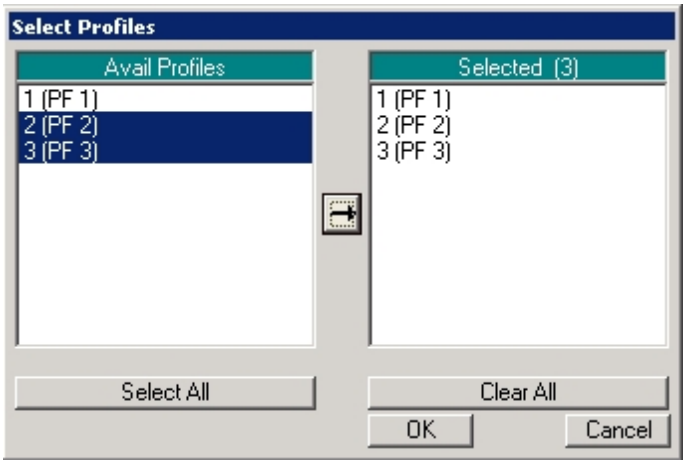
In the Cross Section Viewer, use the Options pulldown, and select profiles from the menu.



Profiles Menu Selection

In the *Select Profiles* dialog, select the water surface profiles to be displayed from the list on the left side, and press the  icon in the center of the dialog to add them to the list on the right side.

Press OK from the *Select Profiles* dialog, and the additional water surface profiles are displayed in the *Cross Section Viewer*. Exit from the *Cross Section Viewer* using its File pulldown; the additional water surface profiles will also display in the *Cross Section Editor*.

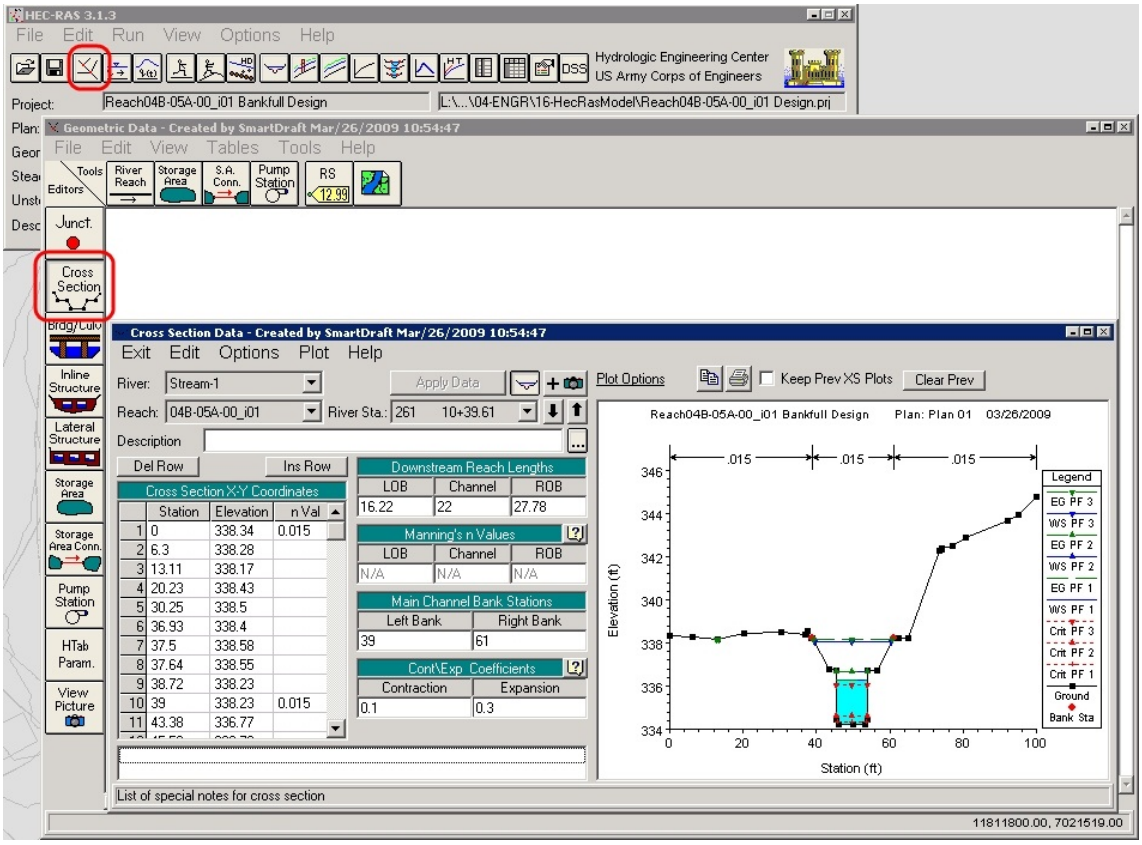


Water Surface Profile Selection

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Editing HEC-RAS Cross Section Data

From the Edit pulldown (or Edit/Enter Geometric Data button) in HEC-RAS, select Geometric Data… Use the Cross Section button in the Geometry Editor to display HEC-RAS sections in the Cross Section Data Editor.



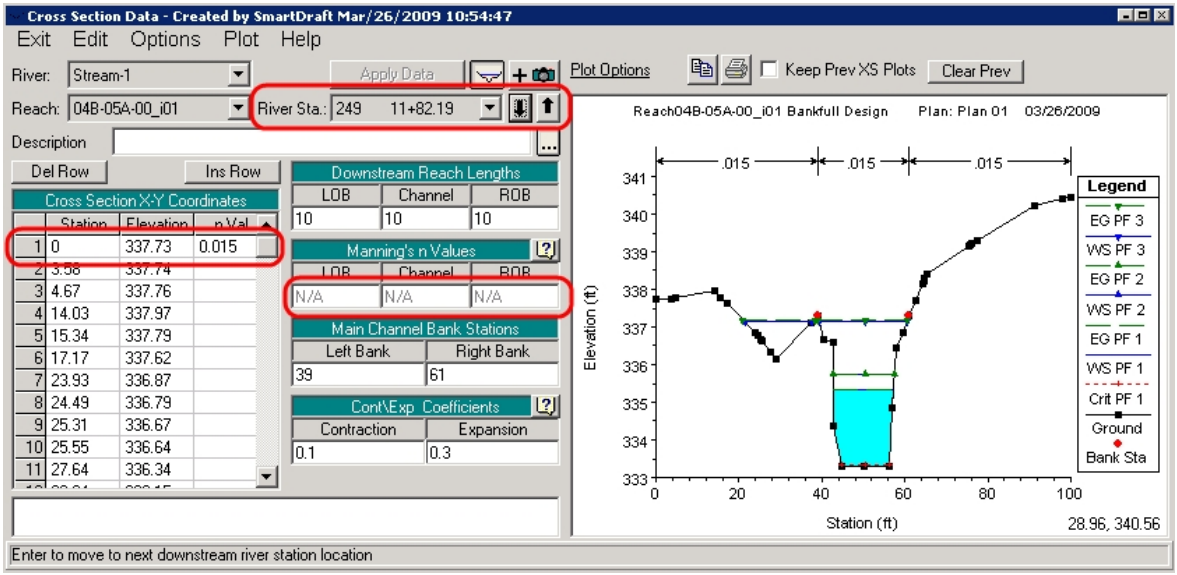
Cross Section Data Editor, with Buttons for its Access

Like the Cross Section Viewer, navigation between sections in the *Cross Section Editor* can be accomplished with the River Station selection list, or by using the ⬇ and ⬆ icons adjacent to it.
Several settings and features should be noted in viewing the cross sections.

The alignment station value is displayed in the *River Sta*. field in the section editor, not the *Description* field. A separate Description can be added at each section if desired.

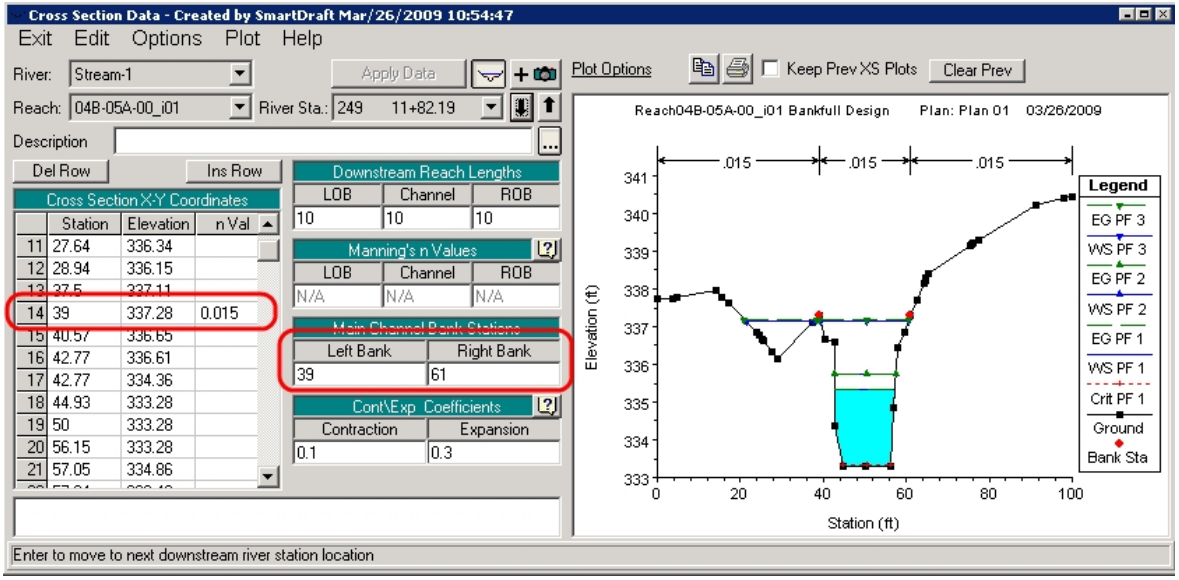
The Manning's Values for *Left Overbank, Channel* and *Right Overbank* appear to be disabled by the presence of "N/A" in the fields. In fact, the Manning's values supplied in the HECXS dialog are in use, and the project creation (or GIS import) has toggled on a setting for Horizontal Variation in N Values for each section. This setting, found in the section's Options pulldown, permits the entry of multiple N Values for different station ranges across the section. The beginning station at a section displays an N Value which is used for all succeeding stations until a new value is entered.

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River and Alignment Stations, N Value Application at Section Station 0+00 (Left Overbank)

By using Horizontal Variation in N Values, different N Values could be entered for ineffective flow areas or other portions of the section where flow differs due to plantings, etc.

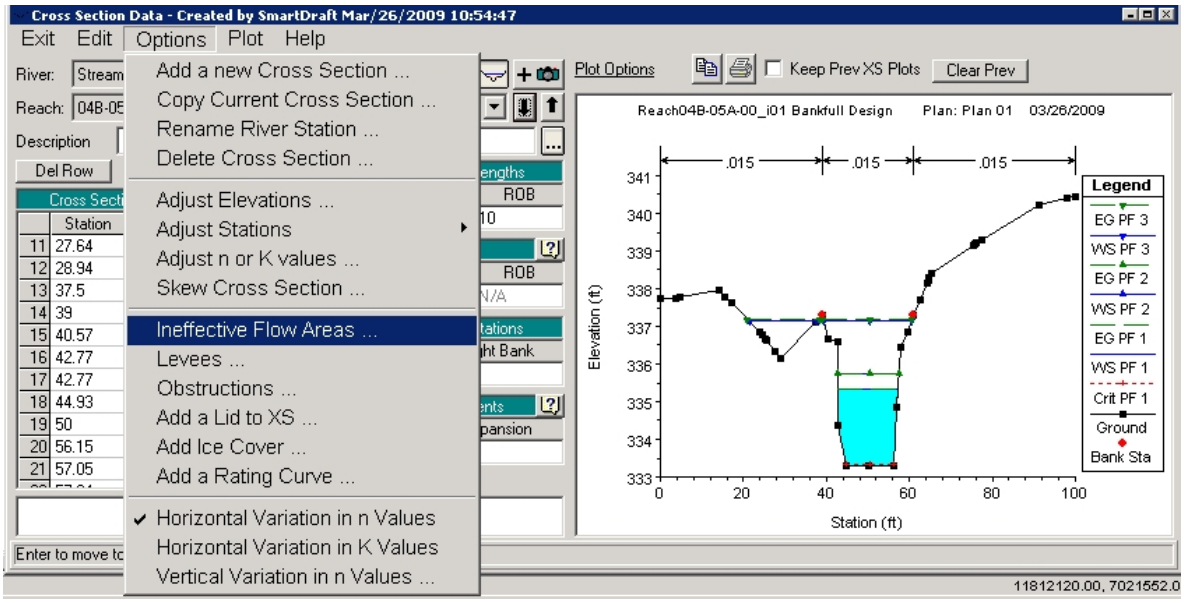


N Value Change at Section Station 0+85 (Channel)

Ineffective flow areas, levees and obstructions are not imported by HECXS, so these must be added in the *Cross Section Data Editor*. The entry of any of these three are roughly similar in function. Picking any location in the section view will display the station and elevation picked. These values can be used to enter data for these conditions in the *Cross Section Data Editor*.

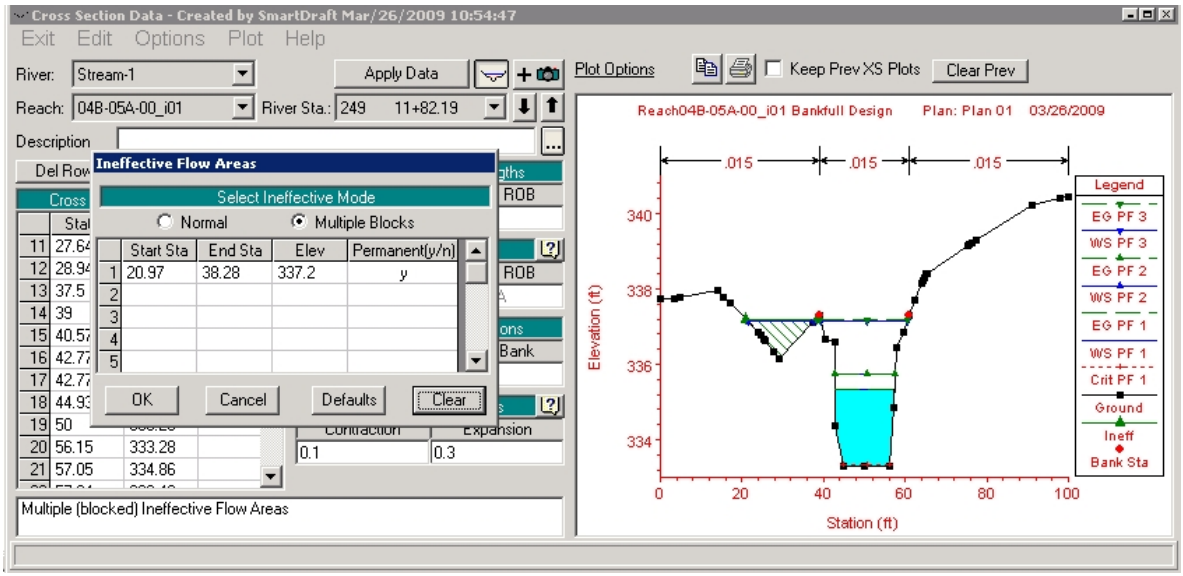
Use the Options pulldown on any individual section. Select Ineffective Flow Areas (or Levees or Obstructions).

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Ineffective Flow Areas Selection on Options Pulldown

As the dialog opens, toggle the data entry mode to Multiple Block. Enter the Start Sta., End Sta., Elev. of each area. Toggle each to Permanent by typing Y in the last column. Press OK.



Ineffective Flow Area Data Entry

Repeat this entry mode for each individual section.

When all conditions are entered, Exit from the Cross Section Editor with the Exit pulldown. From the Geometry Editor, use File > Save Geometry Data to save the cross sections, then use File > Exit Geometry Data Editor to return to the HEC-RAS main menu. Save the HEC-RAS project.

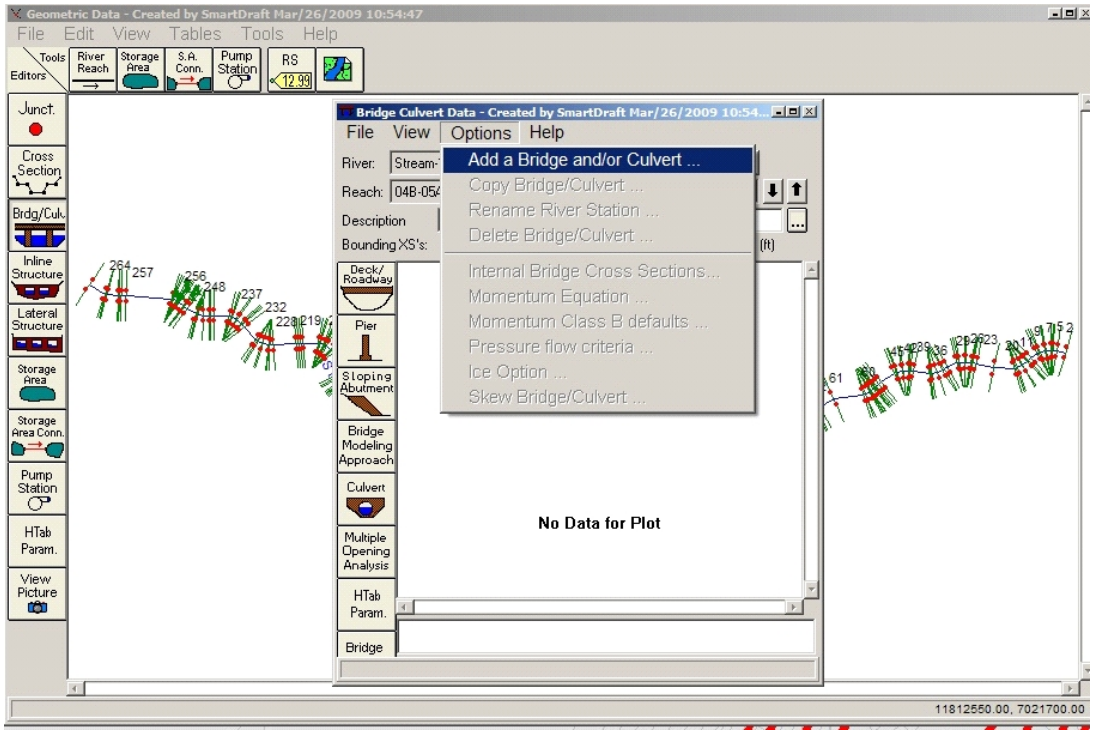
Warning: **Don't forget to save the geometry data.**

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Adding a Culvert to the HEC-RAS Model

A culvert can be added in the *Geometry Editor*, by using the 

icon on the left side. In the *Bridge Culvert Data* dialog box that opens, use the Options pulldown menu and select Add a Bridge and/or Culvert.



Bridge Culvert Data Dialog and Menu

Enter a River Station for the culvert in the dialog that displays. The River Station must be numerically between the cross sections upstream and downstream of the culvert, 179 and 178 in this case.

Press OK.



Culvert River Station Entry

Press the 

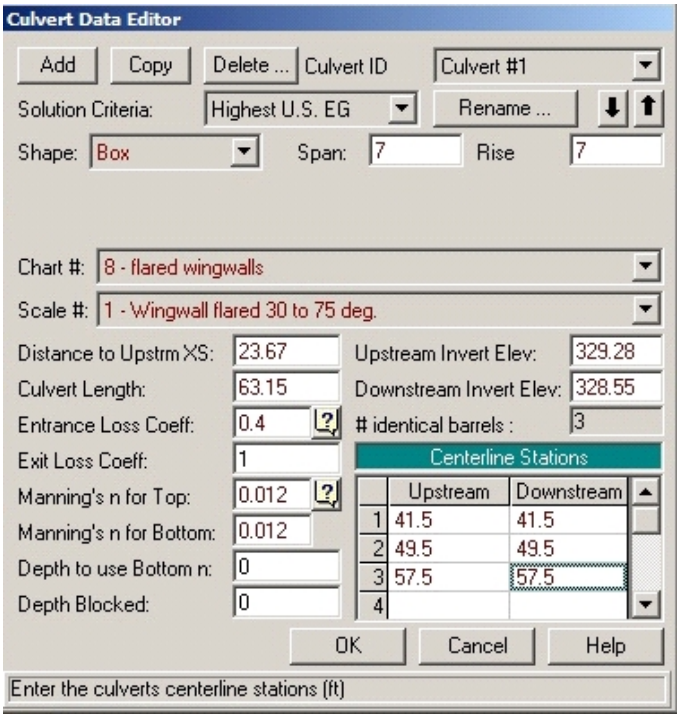
icon in the *Bridge Culvert Data* dialog box to begin entering culvert data. In the *Culvert Data Editor*, enter values as appropriate to model the culvert.

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The Distance to Upstrm XS should be taken from the edge of the culvert to the upstream section line in CAD.

The # identical barrels value is automatically populated based on the number of entries made in Centerline Stations; the station is the position across the section line where the upstream and downstream center of each culvert barrel is found.

When all values are entered, press OK to return to the *Bridge Culvert Data* dialog box.

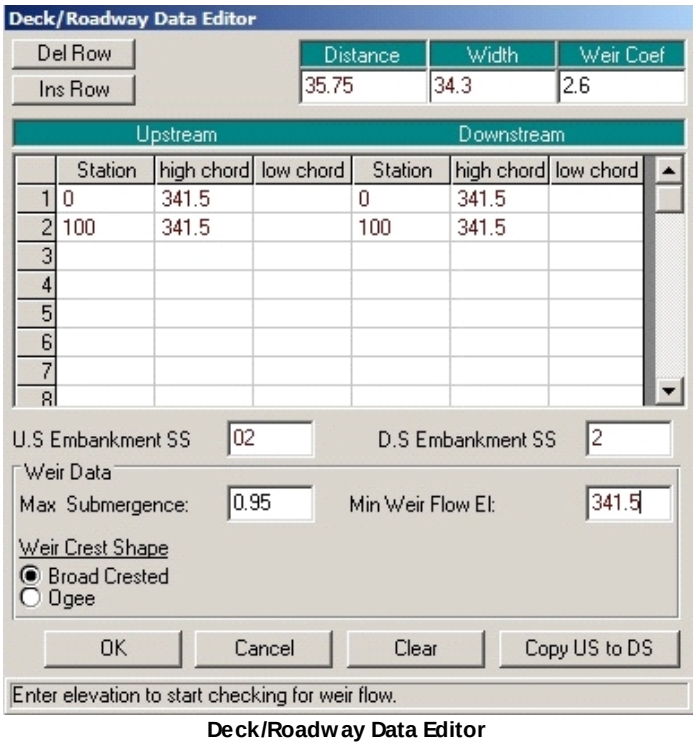


Culvert Data Editor

Press the 

icon in the *Bridge Culvert Data* dialog box to enter data for the roadway through which the culvert passes. In the Deck/Roadway Data Editor enter values as appropriate to model the roadway conditions.

The Distance value is the distance from the upstream cross section to the roadway. The Width is the width of the roadway, which will function as a weir. The U.S. Embankment SS and D.S. Embankment SS are Upstream Embankment Side Slope and Downstream Embankment Side Slope respectively. In this example the entire roadway is entered as flat from one side to the other; the plane of the roadway could be pitched in any dimension by varying the Station and High Chord entries. When all values are entered, press OK to return to the *Bridge Culvert Data* dialog box.

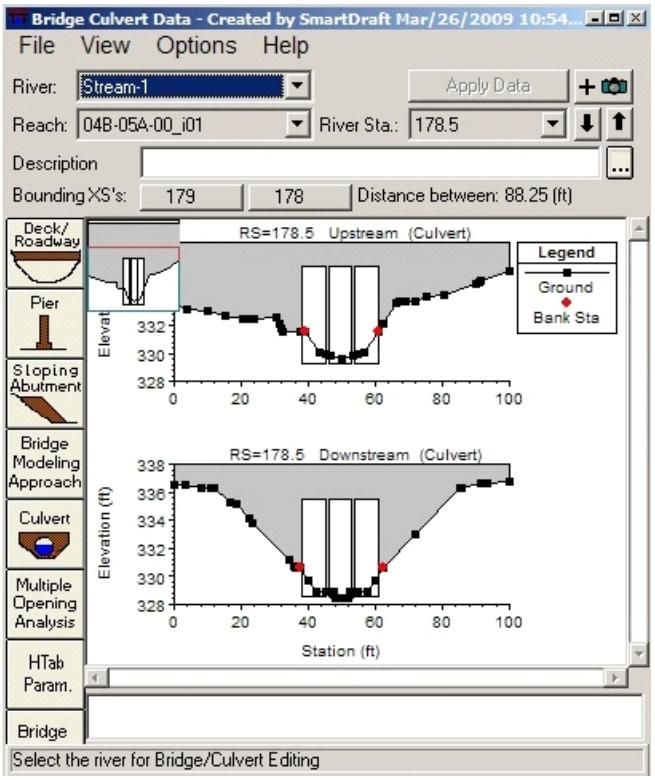


Deck/Roadway Data Editor

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The *Bridge Culvert Data* dialog box should display the upstream and downstream views of the culvert. Exit from the *Bridge Culvert Data* dialog box using its File pulldown, and Save the Geometry file.

Warning: **Don't forget to save the geometry file. Especially after all that.**

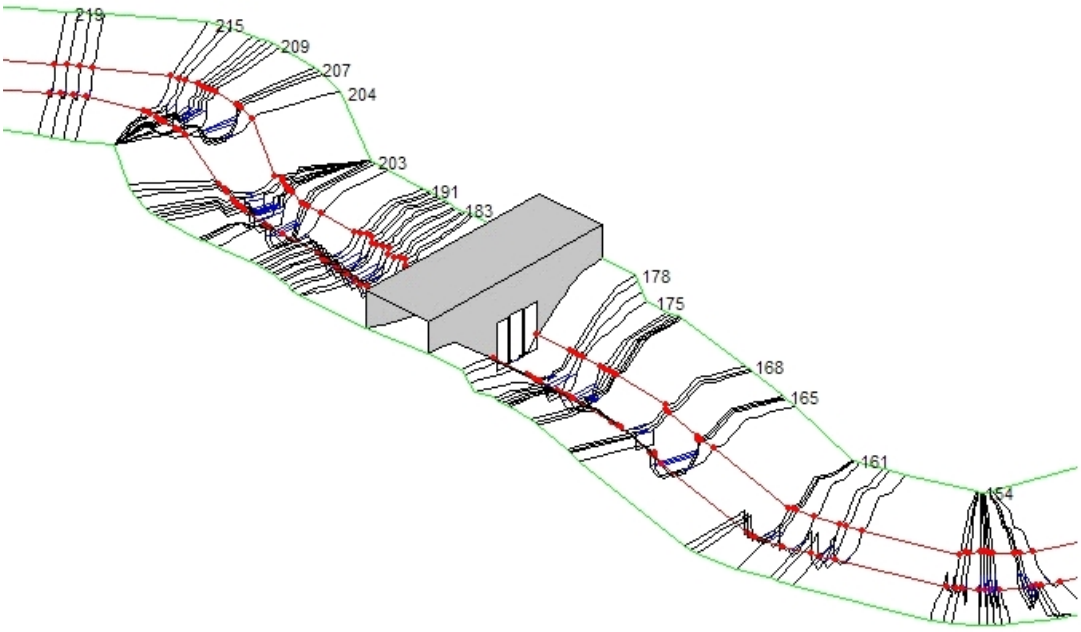


Bridge Culvert Data Dialog

Close the Geometry Editor. Return to the Run pulldown in HEC-RAS, select Steady Flow Analysis. In the Steady Flow Analysis dialog, set the Flow Regime to Mixed. Press the Compute button to rerun the analysis. Use File > Save to save the plan file. Use File > Exit to close the Steady Flow Analysis dialog. Save the HEC-RAS project.

The resulting culvert can be seen in the HEC-RAS View Profiles ( ) or View 3D Multiple Cross Section Plot ( ) viewers.

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Culvert and Roadway in View 3D Multiple Cross Section Plot Viewer

The user should complete any additional input requirements to fully develop a working HEC-RAS model. Additional boundary conditions may need to be included. Changes in discharges along the reach may be revised as desired. Additional bridge and/or culvert data should be added as applicable. The user should consult the HEC-RAS manual to properly develop a model that accurately reflects the proposed design. Once an adequate model is developed, the user should review the output results and determine if the proposed design (i.e., the cross section geometry, the alignment, the profile) needs to be modified. If design changes need to be made, return back to the appropriate portion of the design process, make the desired revisions, and run through the remaining design steps until satisfactory HEC-RAS output results are achieved. Once a satisfactory HEC-RAS model is developed, the design process can proceed, the HEC-RAS data can be exported and the plan set can then be developed.

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4.5.4 Add Sections to a HEC-RAS Project

Add new Cross Sections to an existing HEC-RAS Project from Sample Lines or Polylines along an alignment

Add new cross sections to a HEC-RAS Project using sample lines / polylines, an alignment, a surface, and an existing HEC-RAS project.

Note: This command only works as expected when the following rule has been followed in making the original HEC-RAS project.

Cross Sections in the HEC-RAS are numbered from higher numbers (upstream) to lower numbers (downstream).

This is the method the Create HEC-RAS Data command uses.

For more information on using this command, see Example: HEC-RAS Add Sections to Project.

Warning: This command **DOES NOT** work on HEC-RAS projects created by Civil 3D's HEC-RAS Export command.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	BricsCAD Pro



Button



Ribbon: SmartDraft or SmartDraft Hydro tab ▸ HEC-RAS panel ▸ 

Toolbar: HEC-RAS Tools on the SmartDraft Tools 



Command entry: **sm_hecrasadd**

Dialog Box Options

Design Information

Centerline:	List of all alignments defined in the drawing. Select the desired channel centerline alignment.
Down Stream:	Select the down point (Start or End of alignment).
Start:	Display the elevation at the start of the alignment, if it is within the selected surface.
End:	Display the elevation at the end of the alignment, if it within the selected surface.
Surface:	List of all the surfaces defined in the drawing. Select the desired surface.

Design Values

Left Overbank n Value:	Enter the n value or select the Table button to select the value for a table. Limits are *0.015 – 0.2*
Right Overbank n Value:	Enter the n value or select the Table button to select the value for a table. Limits are *0.015 – 0.2*
Channel n Value:	Enter the n value or select the Table button to select the value for a table. Limits are *0.015 – 0.2*
Expansion Coefficient:	Enter the expansion coefficient value. Limits are *0.0 – 0.8*
Contraction Coefficient:	Enter the contraction coefficient value. Limits are *0.0 – 0.6*

Left/Right Bank Input Options

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Select Bank Polylines Select this option to specify the left and right bank locations by selecting a polyline or alignment within the drawing.
Offset from Centerline Select this option to specify an offset distances from the Centerline to be used as the left and right banks.
Alignment Use this option to select alignments as the left and right banks.
Left Bank: Use the desired Left Bank alignment. List of all the defined alignments.
Right Bank: Use the desired Right Bank alignment. List of all the defined alignments.

Left/Right Overbank Input Options
Select Overbank Polylines Select this option to specify the left and right bank locations by selecting a polyline or alignment within the drawing.
Offset from Centerline Select this option to specify an offset distances from the Centerline to be used as the left and right overbank lines.
Alignment Use this option to select alignments as the left and right overbank lines.
Left Bank: Use the desired Left Overbank alignment. List of all the defined alignments.
Right Bank: Use the desired Right Overbank alignment. List of all the defined alignments.

HEC-RAS Information
River Select a River name from a list of rivers in the HEC-RAS project
Reach Select a Reach name from a list of reaches in the HEC-RAS project

HEC-RAS Output Options
Input The name of the selected HEC-RAS project.
Output... (button) Browse for the Output file name.
Output (edit box) Enter the name of the HEC-RAS project. Default is the input folder and file name with the date appended to the end.
Title Enter a Project title.
Description Enter a Project description.

If **Polylines** as Section Line Options (select)

Select Section Line polylines or Sample Lines: Select the section line polylines or sample lines to add to the HEC-RAS project.

Note: If a selected polyline as any curved segments, it will be removed from the selection set and not processed. All polyline cross section must be straight segments only.

Select Bank Polylines option

Select Left Bank polyline: Select a the left bank polyline.
Select Right Bank polyline: Select a the right bank polyline.

Select Overbank Polylines option

Select Left Bank polyline: Select a the left overbank polyline.
Select Right Bank polyline: Select a the right overbank polyline.

How the new section line will be numbered

1. If before any existing section line downstream, the first existing section line number (typically 1) will be divided by the number of new section lines.
2. If after the last existing section line upstream, each new section line will be numbers one higher than the last existing section line.
3. If between two existing section lines, the new section lines will be numbered between the lowest and highest existing numbered section lines.

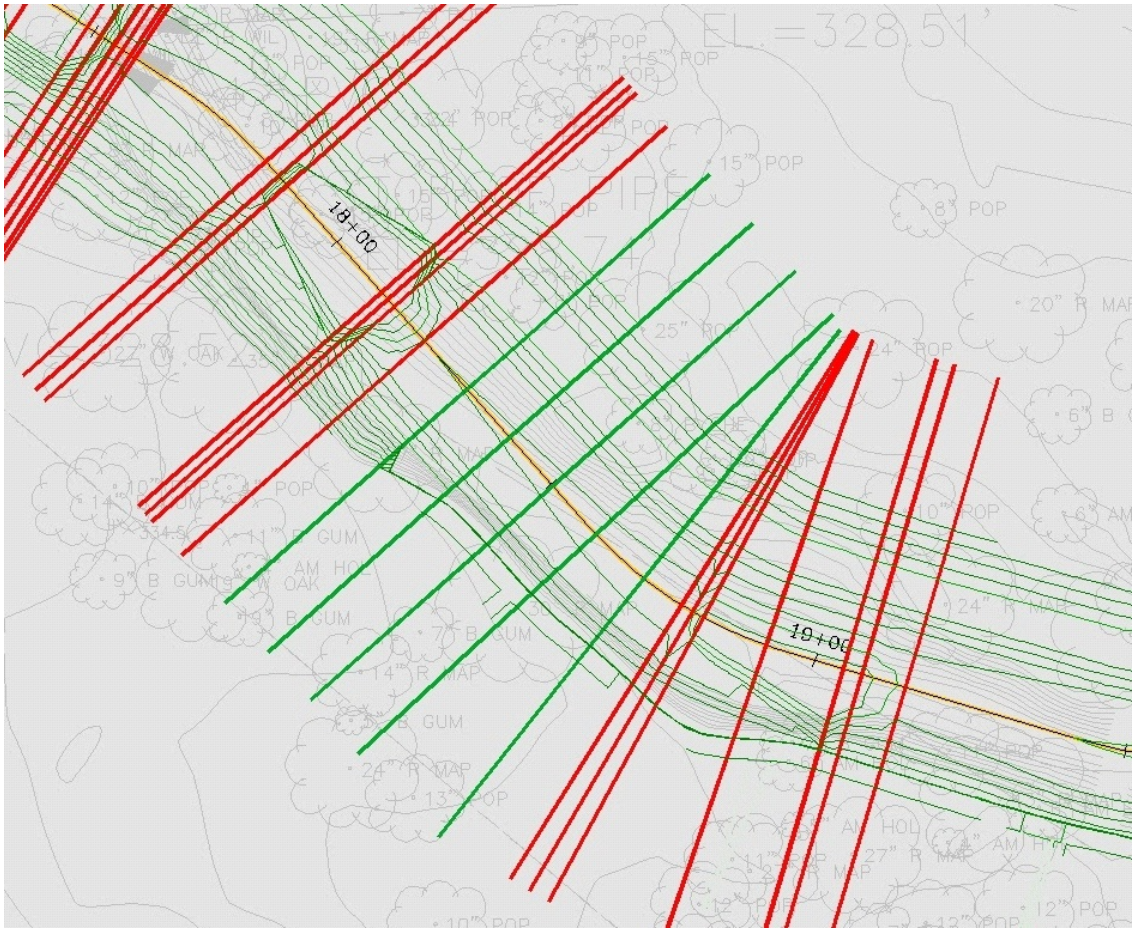
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4.5.4.1 Example: Add Sections to a HEC-RAS Project

In the analysis of the bankfull design in HEC-RAS, a determination may be made that it is necessary to add one or more sections into the model. This necessitates resampling data from the surface and interjecting additional sections into the HEC-RAS project without disrupting the flow and other data already in place. This can be accomplished with the StreamNCD **SM_HECRASXSADD** command.

The HEC section line layer must be visible for this command to proceed; additional cross section polylines will be placed on this layer. If overbank polylines were used, their layer must also be on.

In the drawing, use Offset, Copy or Pline to place new section polylines on the '-W- HYDR-XS -[alignment name]-[profile number]' layer where the new HEC-RAS sections are desired. Newly drawn polylines must have four vertices, two at the tops of bank, just like the ones placed automatically.



New Section Polylines Drawn, in Green

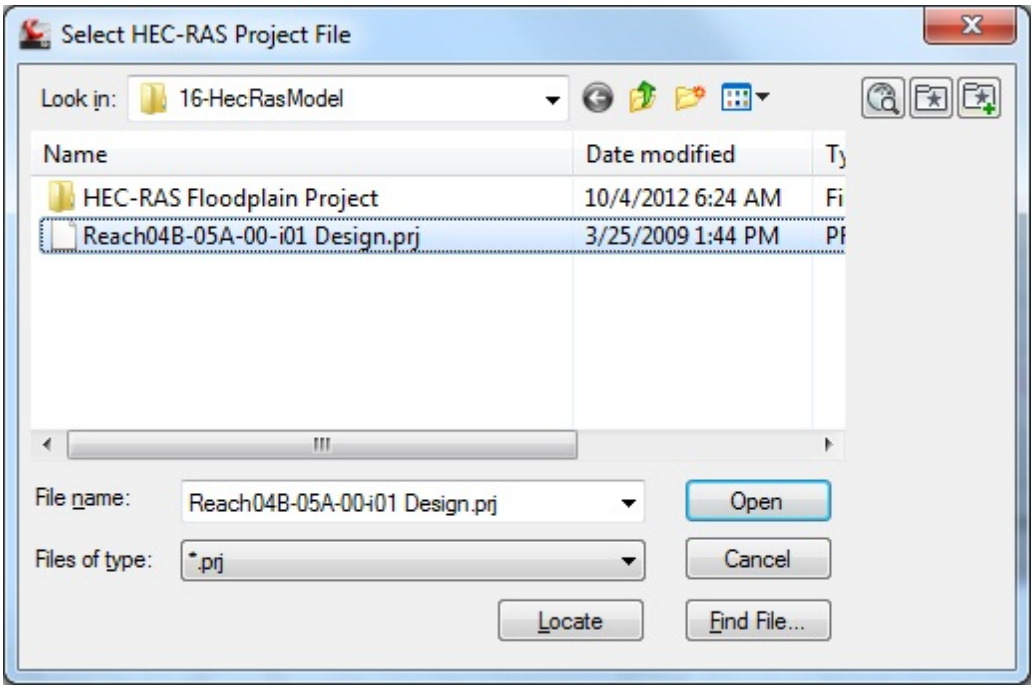
Note The new section polylines can be before, between or after the current polylines. Moving, deleting or modifying the current section polylines will have no effect on the HEC-RAS project.

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Press the icon from the *HEC-RAS* panel on the *SmartDraft or SmartDraft Hydro* tab, running the **SM_HECRASXSADD** command.

In the *Select HEC-RAS Project File* dialog, Select the HEC-RAS project to which the section(s) will be added. It is important to note that the **SM_HECRASXSADD** command will actually add the section(s) to a ***copy*** of this project, and will not modify the original. A new geometry file will be written for the new project, and the previous flow file will be copied into the project.

Note This command writes directly to a HEC-RAS project and is not dependent on the GIS file (.sdb).



Source HEC-RAS Project Selection

As the command prompts:

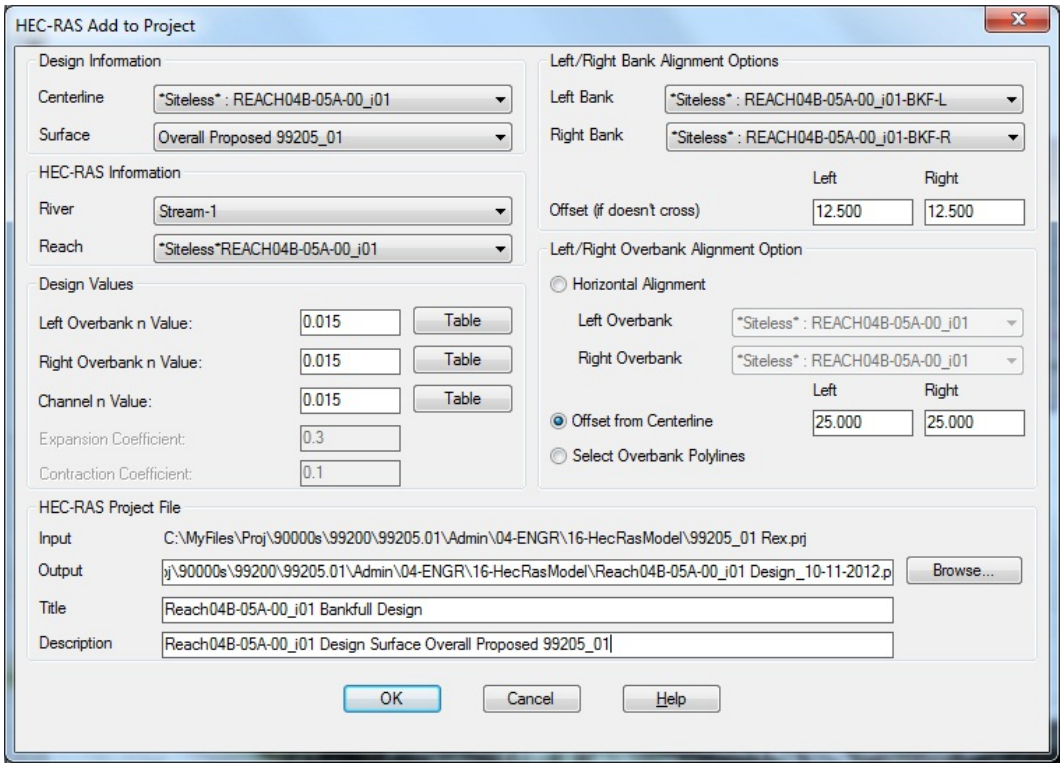
Specify down stream point of channel: Snap to the downstream endpoint.

Select Cross Section polylines to add.

Select objects: Select the new section polylines, and press Enter when done.

The *HEC-RAS Add Cross Sections* dialog displays.

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HEC-RAS Add Cross Sections Dialog

Set the Centerline and Surface selections as appropriate. The River and Reach data have been read from the HEC-RAS project; they could be changed if desired for the new project that will be written. The Design Values have also been read from the HEC-RAS project. Changes to these values would ***only*** effect the new sections that are added; sections currently in the project would remain unchanged as they are passed into the new project. The determination of the Left and Right Bank and Overbank positions affect only new sections in the same fashion. Using the Select Overbank Polylines option will require selecting the two overbank polylines as the command executes.

The path and name of the new HEC-RAS project that will be written is displayed on the Output line; this name can be modified if desired. By default the command appends the date to the name of the previous project. The Title and Description should be expanded to indicate the nature of the data in the new project.

Press OK to proceed.

If the overbank polyline option was used the command prompts:

Select Left Overbank polyline: Select the left overbank polyline in the drawing

Select Left Overbank polyline: Select the right overbank polyline in the drawing

The command then prompts:

Checking direction of selected cross section polylines: /

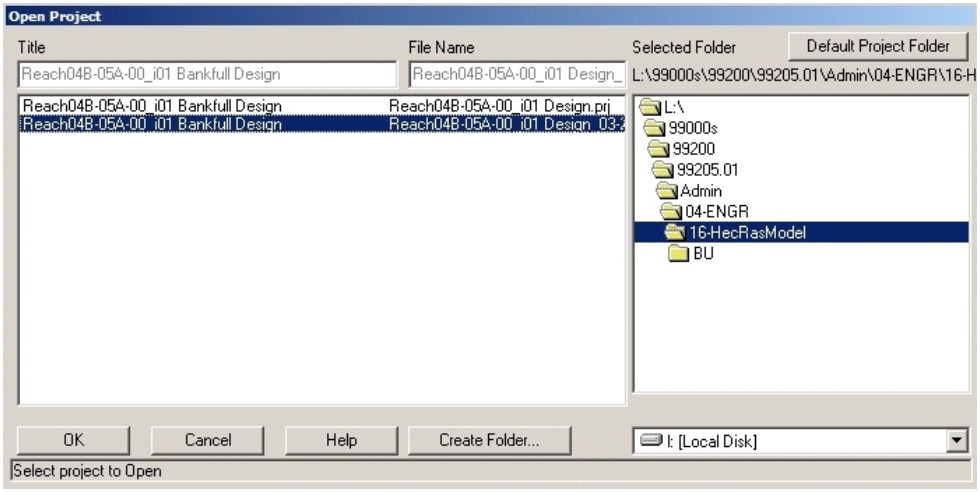
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93 polylines crossed centerline once and will process.

Processing selected cross section polylines: -

New project files <Design_Reach17A_00_I1_11-10-2007> complete.

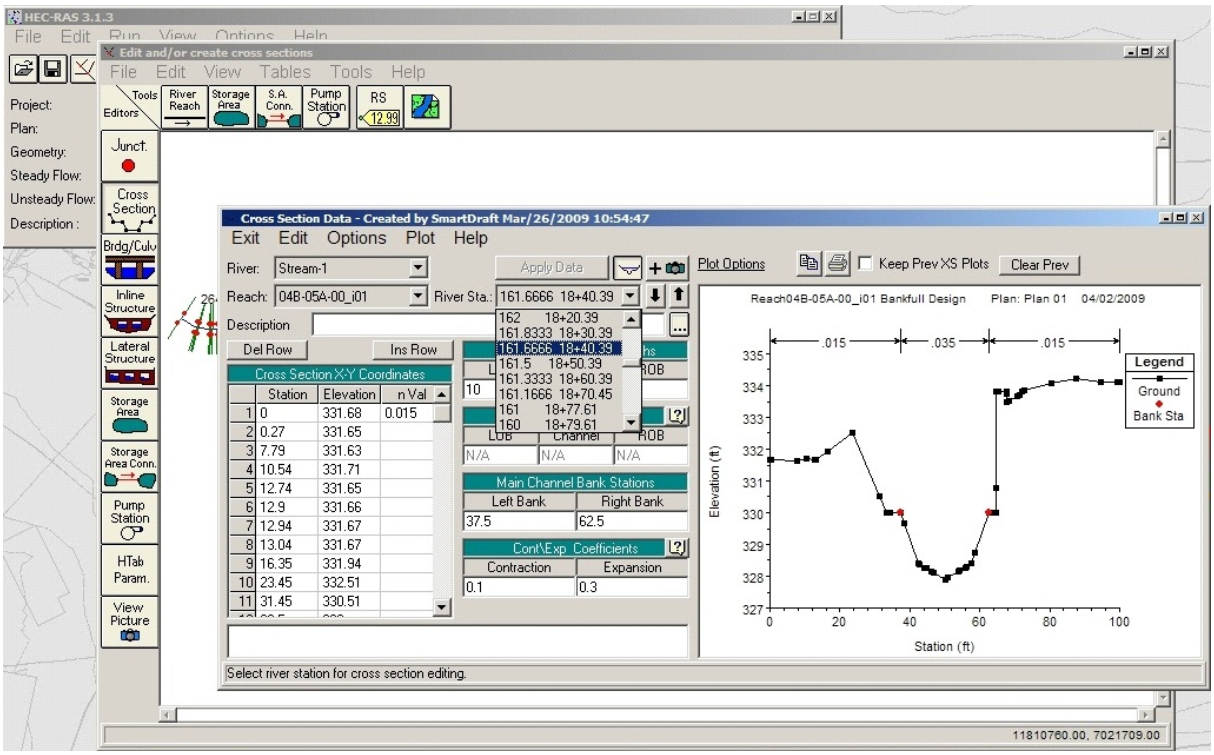
Start HEC-RAS using the RAS icon from *HEC-RAS* panel of the *SmartDraft or SmartDraft Hydro* tab. In HEC-RAS, browse to and open the new project created with the additional section(s).



New Project Selection in HEC-RAS

Open the Geometry Editor in HEC-RAS, and view the new section(s) to insure that they have been added.

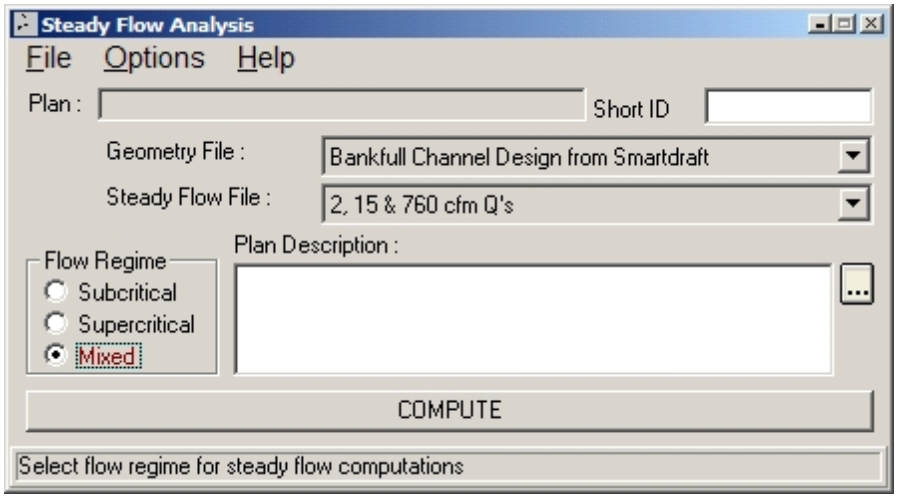
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New Sections in Geometry Editor

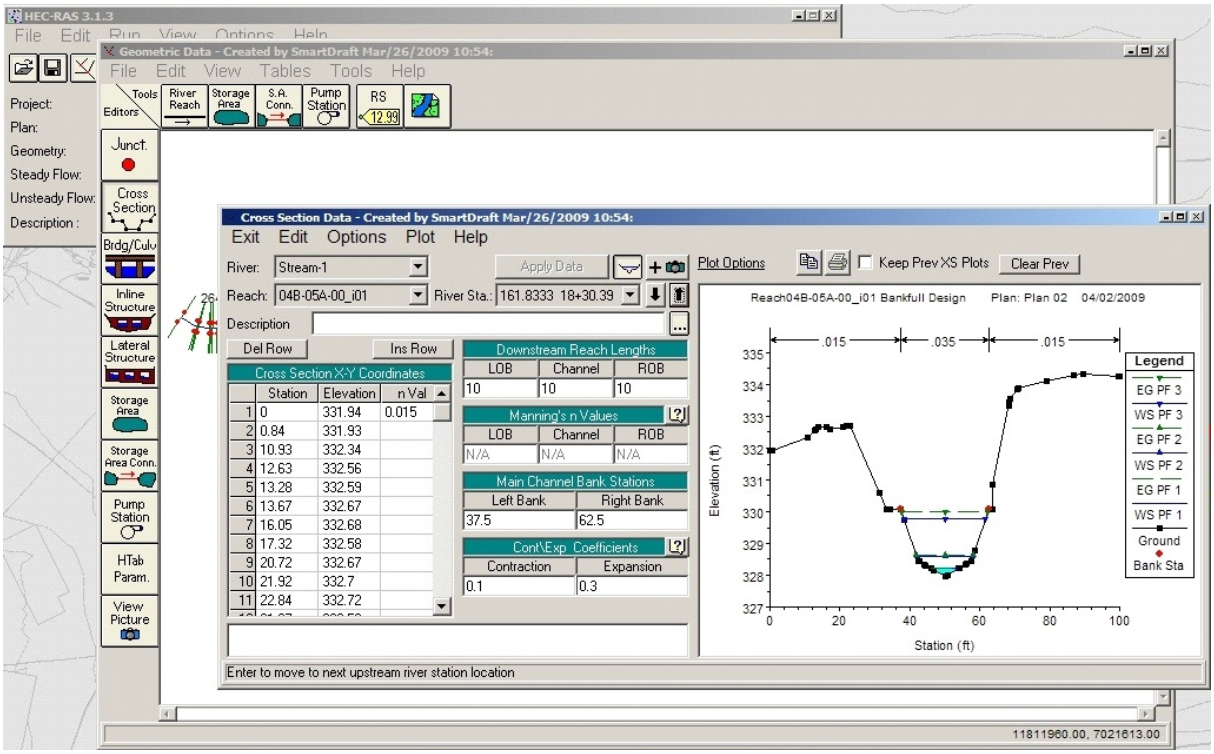
Note the new River Stations displayed in the *Geometry Editor*; since five new sections were added between River Stations 161 and 162, the new River Stations are added as 161.1666, 161.3333, 161.5, 161.6666 and 161.8333.

The new sections displayed in the *Geometry Editor* do not display water surface elevations as the Steady Flow simulation was run before they were added. Since the flow file was copied into the new project the Steady Flow simulation can be rerun with same values as before.



Steady Flow Data Editor with Data at New Section

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New Section After Running Steady Flow Analysis

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4.5.5 Add a River / Reach to a HEC-RAS Project

Add new river / reach to an existing HEC-RAS Project from Sample Lines or Polylines along an alignment

Add new river / reach to a HEC-RAS Project using sample lines / polylines, an alignment, a surface, and an existing HEC-RAS project.

Note: This command only works as expected when the following rule has been followed in making the original HEC-RAS project.

Cross Sections in the HEC-RAS are numbered from higher numbers (upstream) to lower numbers (downstream).

This is the method the Create HEC-RAS Data command uses.

Command does not create junctions. Create the necessary junctions within HEC-RAS.

Warning: This command **DOES NOT** work on HEC-RAS projects created by Civil 3D's HEC-RAS Export command.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	BricsCAD Pro



Button



Ribbon: SmartDraft or SmartDraft Hydro tab ▸ HEC-RAS panel ▸ 

Toolbar: HEC-RAS Tools on the SmartDraft Tools 



Command entry: **sm_hecrasaddr**

Dialog Box Options

Design Information

Centerline:	List of all alignments defined in the drawing. Select the desired channel centerline alignment.
Down Stream:	Select the down point (Start or End of alignment).
Start:	Display the elevation at the start of the alignment, if it is within the selected surface.
End:	Display the elevation at the end of the alignment, if it within the selected surface.
Surface:	List of all the surfaces defined in the drawing. Select the desired surface.

HEC-RAS Information

River	Select a River name from a list of rivers in the HEC-RAS project
Add	Select the Add button to add a new river to the list of Rivers
Reach	Enter a Reach name. Must not be the same as an existing reach name with the same river name

Cross Section Options

Polyline	Select this option to select polylines as section line input
Sample Lines	Select this option to use all sample lines in a sample line group associated to the centerline alignment.
Group	Select the sample line group

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Design Values

Left Overbank n Value: Enter the n value or select the Table button to select the value for a table. Limits are *0.015 – 0.2*

Right Overbank n Value: Enter the n value or select the Table button to select the value for a table. Limits are *0.015 – 0.2*

Channel n Value: Enter the n value or select the Table button to select the value for a table. Limits are *0.015 – 0.2*

Expansion Coefficient: Enter the expansion coefficient value. Limits are *0.0 – 0.8*

Contraction Coefficient: Enter the contraction coefficient value. Limits are *0.0 – 0.6*

Left/Right Bank Input Options

Select Bank Polylines Select this option to specify the left and right bank locations by selecting a polyline or alignment within the drawing.

Offset from Centerline Select this option to specify an offset distances from the Centerline to be used as the left and right banks.

Alignment Use this option to select alignments as the left and right banks.

Left Bank: Use the desired Left Bank alignment. List of all the defined alignments.

Right Bank: Use the desired Right Bank alignment. List of all the defined alignments.

Left/Right Overbank Input Options

Select Overbank Polylines Select this option to specify the left and right bank locations by selecting a polyline or alignment within the drawing.

Offset from Centerline Select this option to specify an offset distances from the Centerline to be used as the left and right overbank lines.

Alignment Use this option to select alignments as the left and right overbank lines.

Left Bank: Use the desired Left Overbank alignment. List of all the defined alignments.

Right Bank: Use the desired Right Overbank alignment. List of all the defined alignments.

HEC-RAS Output Options

Input The name of the selected HEC-RAS project.

Output... (button) Browse for the Output file name.

Output (edit box) Enter the name of the HEC-RAS project. Default is the input folder and file name with the date appended to the end.

Title Enter a Project title.

Description Enter a Project description.

If **Polyline** as Section Lines Options (by layer)

Select layer of Section Line polylines or [Select]: Select an object on the section line polylines layer. All polylines on the selected layer will be processed.

If **Polyline** as Section Line Options (select)

Select Section Line polylines or [By layer]: Select the section line polylines or **B**y layer to select all the section lines on a layer.

Note: If a selected polyline has any curved segments, it will be removed from the selection set and not processed. All polyline cross sections must created using straight segments only.
Polylines and sample lines may have multiple segments, angle points, etc...

Select Bank polylines option

Select Left Bank polyline: Select a the left bank polyline.
Select Right Bank polyline: Select a the right bank polyline.

Select Overbank polylines option

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Select Left Overbank polyline: Select a the left overbank polyline.
Select Right Overbank polyline: Select a the right overbank polyline.

Command begins to process cross sections and alignments

Checking direction of selected section line polylines:

The command confirms the selected polylines are drawn left to right, determined by the selected down stream point.

If they aren't is reverse their direction in the AutoCAD file and sets there elevation to 0.

96 polylines crossed centerline once and will process.

The command confirms the selected cross section polylines cross the specified channel centerline alignment.

Processing selected section line polylines:

Select a the right overbank polyline.

4.5.5.1 Add a River Name

Add a River Name to the list of Available River names for the Add a River / Reach to a HEC-RAS Project commands.

Dialog Box Options

Add a River Name

River Name

Name: Enter a new river name.

OK: Accept the value..

4.5.6 Create HEC-RAS Planview Sections Lines, Levees, and Labels

Create HEC-RAS Planview Sections Lines, Reach Line, Levees, and Labels

Create Section Lines, Reach line, Levees, and labels on HEC-RAS cross section lines in the plan view of the drawing from a HEC-RAS Output File.

Note This command requires data from the HEC-RAS project to be exported as a *.sdf file. It is import to select the correct output options for them to work correctly. See HEC-RAS Output (sdf) file for exporting instructions.

For more information on using this command, see Example: Create HEC-RAS Planview Sections Lines and Labels.

Supports:

AutoCAD Products: Civil 3D only
BricsCAD Pro: BricsCAD Pro

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Button

Ribbon: SmartDraft or SmartDraft Hydro tab ▸ HEC-RAS panel ▸ 

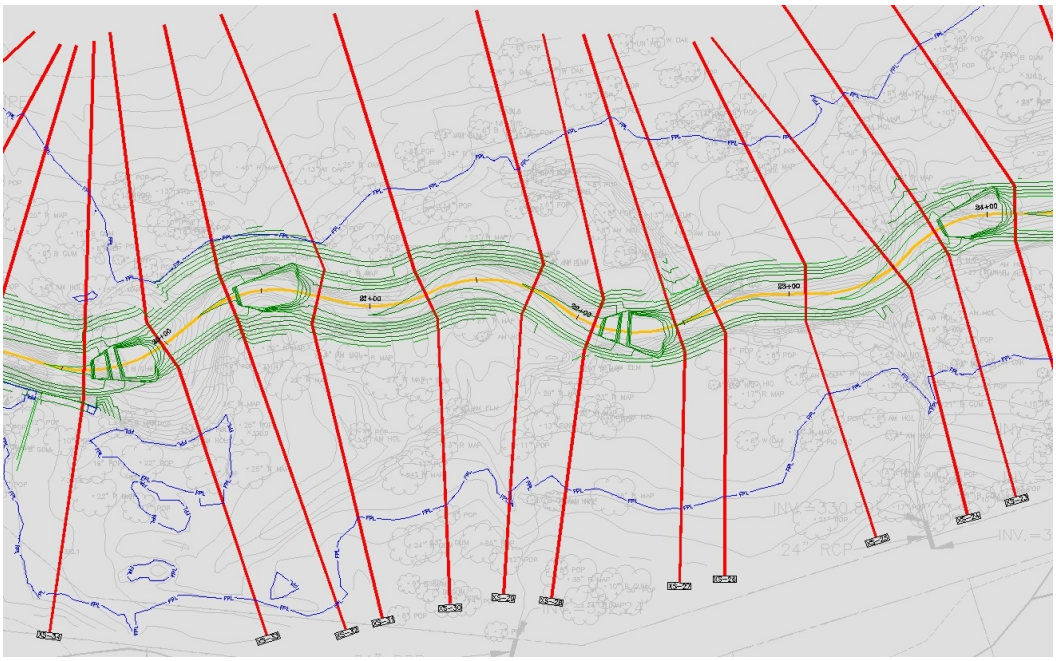
Toolbar: HEC-RAS Tools on the SmartDraft Tools 

Command entry: **SM_HECRASLXS**

HEC-RAS SDF File

Browse	Select the HEC-RAS Output (SDF) file.
HEC-RAS Data	
Reach	Select the Reach name from the list of Reaches in the SDF file.
Sections	A list of the Sections associated to the selected Reach.
All	Select to highlight all the listed Sections.
Clear	Select to un-highlight all the listed Sections
Draw Reach Line	Check to draw the reach line as a polyline. The polyline will be straight segments between the sections. **Note**: To only draw the reach line, un-check the other options.
Draw Bank Line	Check to draw the bank lines as polylines. The polylines will be straight segments between the sections. **Note**: To only draw the bank lines, un-check the other options.
Draw Section Lines	Check to draw the section lines.
Draw Levees	Check to drawing the Levees in the Cross Sections. Circle as single point, 3D polyline as multiple point levee.
Labels	
Include	Check to add the section line label to the end of the section lines.
Perpendicular / Parallel	Select the direction of the HEC-RAS Planview Sections Label
Style	Select the text style to used for the labels.
Height	Enter the height of the text label. If the height of the selected text style is predefined, this edit box will be disabled. Otherwise enter the desired plotted text height, the command will multiple the entered height by the drawings current Horizontal Scale.

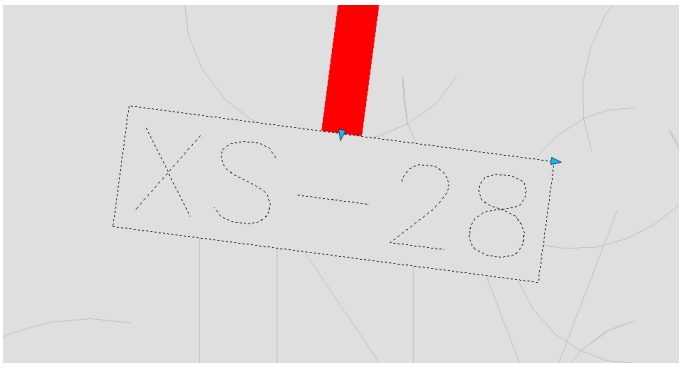
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Example of Section Lines and Labels

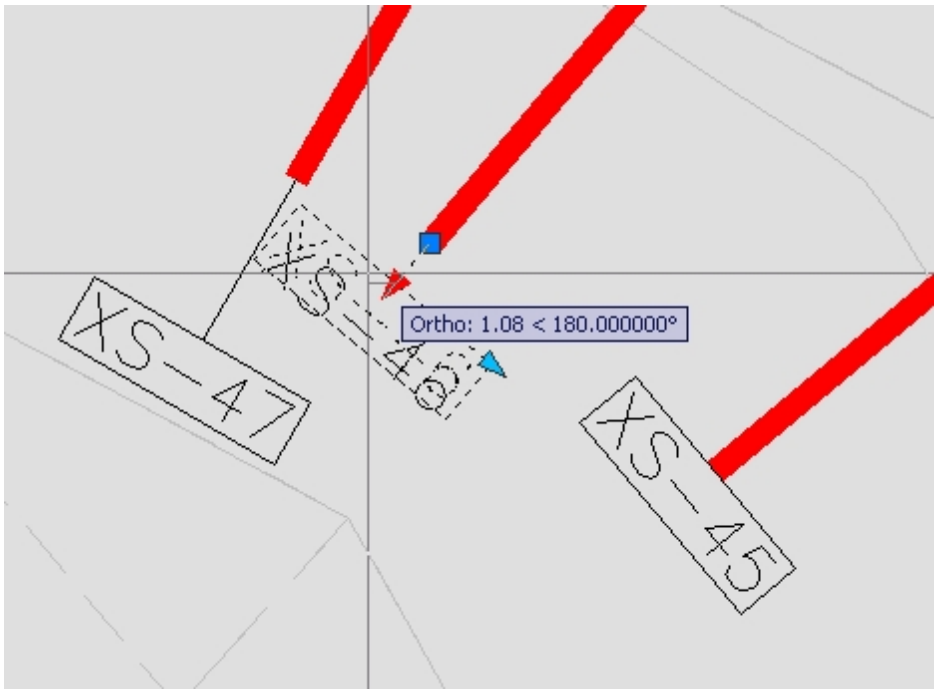
The labels placed by this command are dynamic blocks, with their own built-in grip editing points.

The grip at the top of the label can be used to drag the label away from the section line, creating a leader back to the line. The grip at the end of the label can be used to lengthen the rectangular portion of the label, creating more space between the text and the perimeter of the label.



Grips on a Section Line Label

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Section Line Label Grips at Work

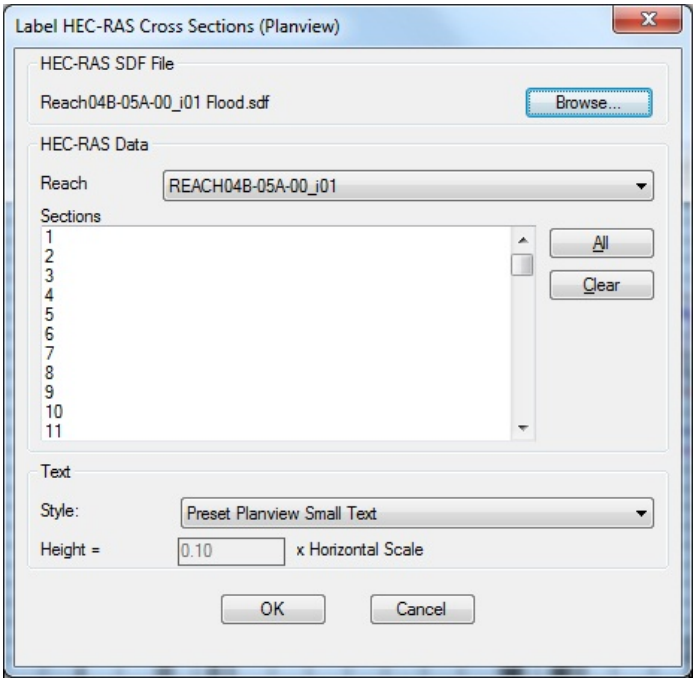
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4.5.6.1 Example: Create HEC-RAS Planview Sections Lines and Labels

This example creates planview HEC-RAS cross section labels from the information in the HEC-RAS Output (sdf) file.

To label the section lines use the  icon from the *HEC-RAS* panel on the *SmartDraft or SmartDraft Hydro* tab, running the **SM_HECRASLXS** command.

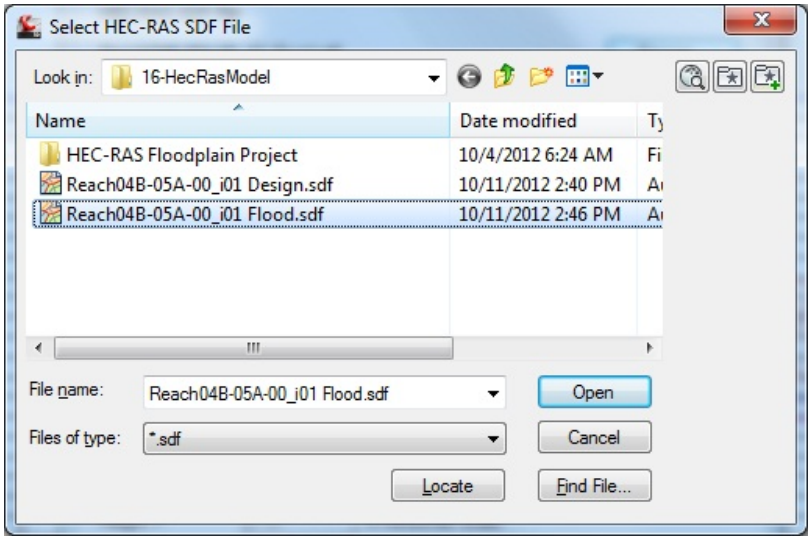
As the *HEC-RAS Planview XS Labels* dialog opens, press the **Browse** button to select the sdf input file.



HEC-RAS Planview Section Lines and Labels Dialog

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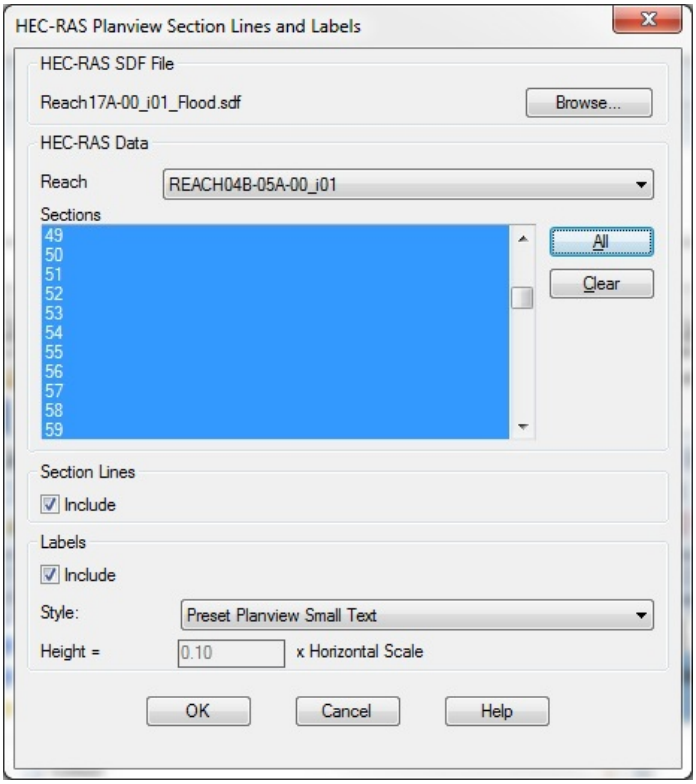
Select the sdf file for the desired HEC-RAS project, the Floodplain file in this case. Press the **Open** button to complete the selection.



Selection of SDF File for Command

Back in the *HEC-RAS Planview Section Lines and Labels* dialog, select or confirm the **Reach** from the sdf file. **Select** the individual sections to be labeled, or use the **All** button to select all. **Check** the **Include** option in the Section Lines section. **Check** the **Include** option in the Labels section. Select the **Text Style** for the labels.

Press **OK** when all settings are made.

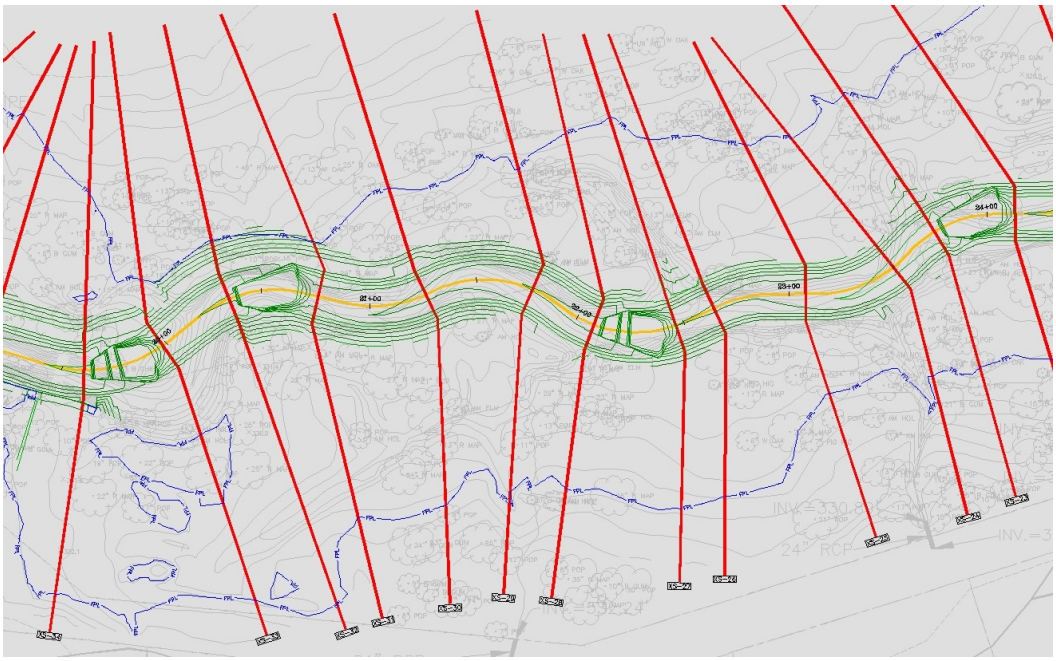


Planview Section Lines and Labels Settings

The **SM_HECRASLXS** command remembers the last text style used, and will default to that style for the next use, even if in another drawing. If the text style set in **SM_HECRASLXS** options does not exist in the drawing a dialog will display: Since the text style indicated is not in the drawing, the command will substitute the current style in its place. The buttons in the dialog allow the operator to confirm the use of the **Current** style, or to

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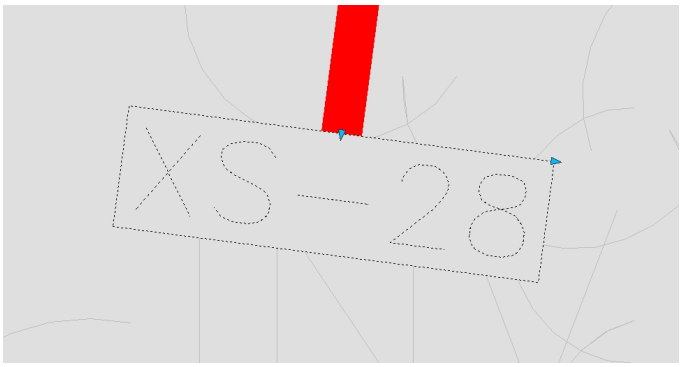
Select another style from the drawing, or to load a style from an **STP** file. Pressing the **OK** button also confirms the use of the current style in the drawing.



Planview Section Lines and Labels as Placed

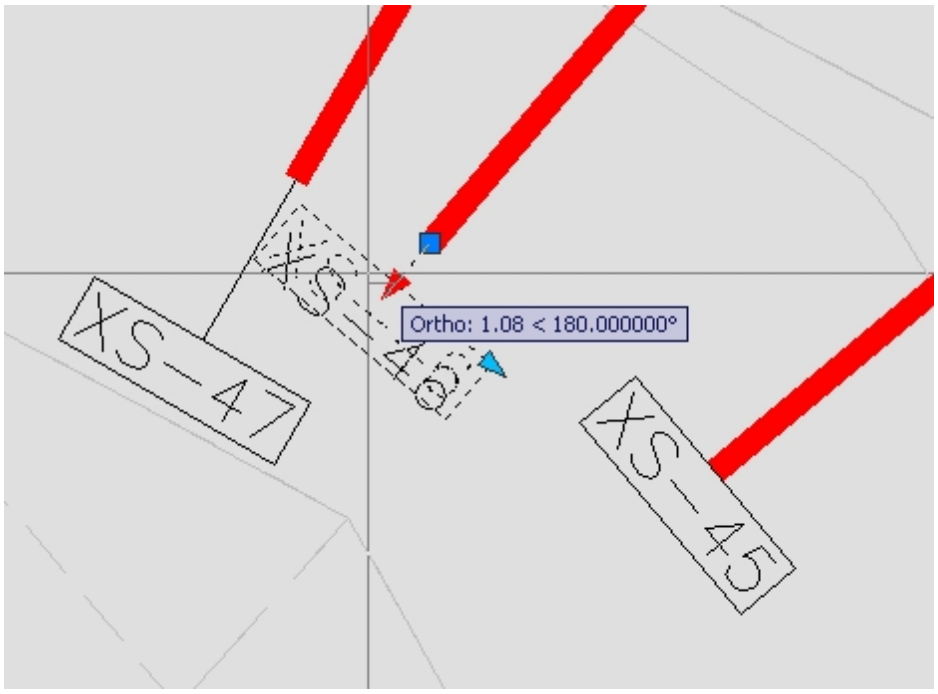
The labels placed by this command are dynamic blocks, with their own built-in grip editing points.

The  grip at the top of the label can be used to drag the label away from the section line, creating a leader back to the line. The  grip at the end of the label can be used to lengthen the rectangular portion of the label, creating more space between the text and the perimeter of the label.



Grips on Planview Label

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Planview Label Grips at Work

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4.5.7 HEC-RAS Planview Sections Labels: Change Direction

Change the direction of the HEC-RAS Planview Sections Line Labels

Change the direction of the HEC-RAS Planview Sections Line Labels create by Create HEC-RAS Planview Sections Lines, Levees, and Labels commands.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	BricsCAD Pro



Button

Ribbon: SmartDraft or SmartDraft Hydro tab ▸ HEC-RAS panel ▸

Toolbar: HEC-RAS Tools on the SmartDraft Tools

Command entry: **SM_HECRASLXSD**

Command:
Select objects: Select HEC-RAS Section Labels

HEC-RAS Planview Section Labels Direction

Labels Direction

Perpendicular /

Parallel Select the direction of the HEC-RAS Planview Sections Label

4.5.8 HEC-RAS Planview Sections Labels: Change Side

Change the side of HEC-RAS Planview Sections Line Labels

Change the side of HEC-RAS Planview Sections Line Labels create by Create HEC-RAS Planview Sections Lines, Levees, and Labels commands.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	BricsCAD Pro



Button

Ribbon: SmartDraft or SmartDraft Hydro tab ▸ HEC-RAS panel ▸

Toolbar: HEC-RAS Tools on the SmartDraft Tools

Command entry: **SM_HECRASLXSS**

Command:
HEC-RAS Planview Sections Labels: Change Side

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Select a HEC-RAS Section Label:	Select a HEC-RAS Section Label
Select a HEC-RAS Section Line:	Select a section line polyline or Civil 3D Sample line.

4.5.9 Create HEC-RAS Floodplain Lines

Create HEC-RAS Floodplain Lines

Create floodplain limits utilizing the results of the HEC-RAS Floodplain analysis from a HEC-RAS Output File.

Note This command requires data from the HEC-RAS project to be exported as a *.sdf file. It is import to select the correct output options for them to work correctly. See HEC-RAS Output (sdf) file for exporting instructions.

For more information on using this command, see Example: HEC-RAS Floodplain Lines.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	BricsCAD Pro



Button

Ribbon: SmartDraft or SmartDraft Hydro tab ▸ HEC-RAS panel ▸ 

Toolbar: HEC-RAS Tools on the SmartDraft Tools 

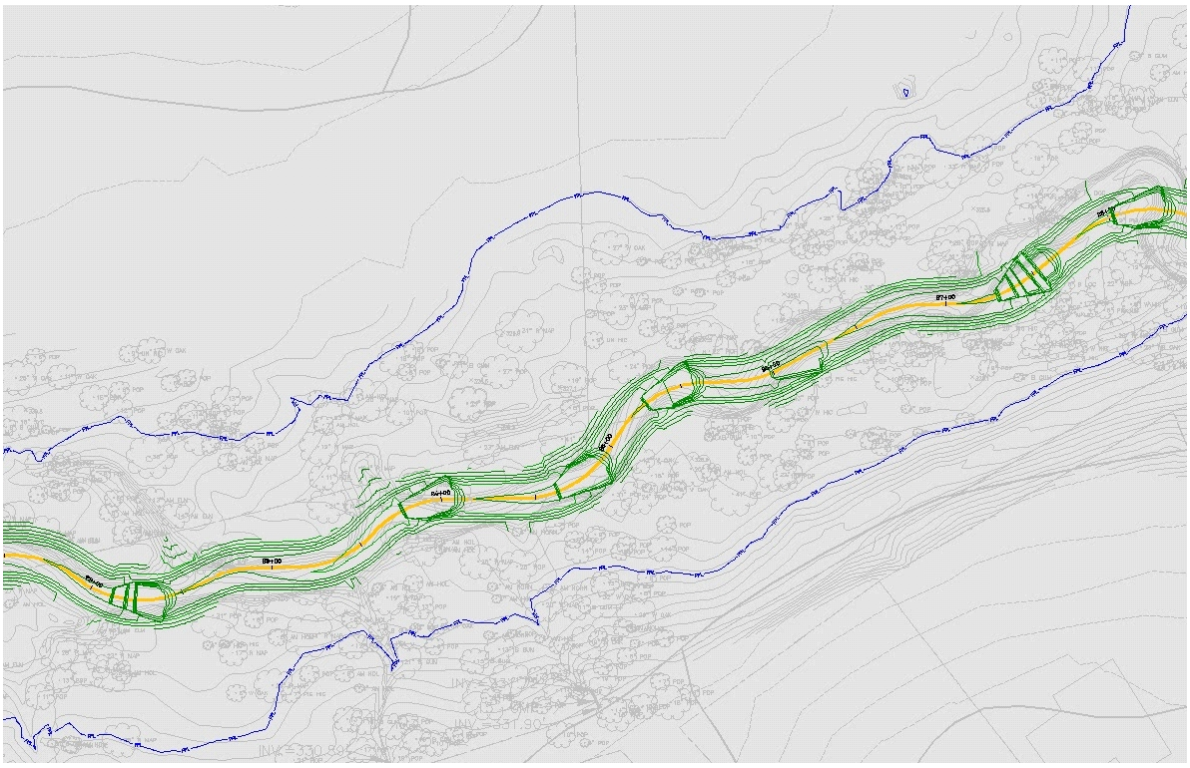
Command entry: **SM_HECRASFP**

Video demonstration

HEC-RAS SDF File

Browse	Select the HEC-RAS Output (SDF) file.
HEC-RAS Data	
Reach	Select the reach name from the list of reaches in the SDF file.
Water Surface	Select the Water surface from the list of Water surfaces in the SDF file.
Elevation Adjustment	Enter a value to adjust the water surface elevation from the HEC-RAS model.
Project Data	
Surface	Select the a drawing's surface used when creating the HEC-RAS project.
Output Options	
Polyline	Select this option to create the floodplain files as polylines.
Surface	Select this option to create the floodplain files as a Civil 3D surface.

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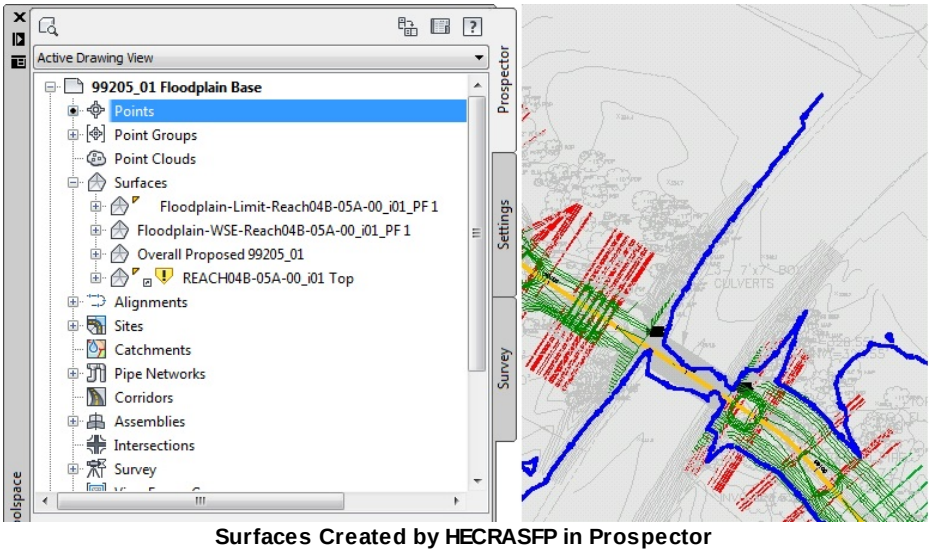


Example of HEC-RAS Floodplain Polylines (Blue lines)

If the output from HECFP was set to *polylines*, the polylines are produced on the layer '-W- HYDR-REACH reach name]_[profile name] '.

If the output was set to surface, the two surfaces can be seen in the Prospector.

The Floodplain-WSE-Reach[reach name]_[profile name] surface is the actual water surface elevation. The default surface Style for this surface is _No Display. The Floodplain-Limit-Reach[reach name]_[profile name] surface is the composite volume



Surfaces Created by HECRASFP in Prospector

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comparison of the WSE surface to the one selected in the HECFP dialog. The default surface style for this surface is Floodplain Line, which displays the limit of the floodplain as a single contour.

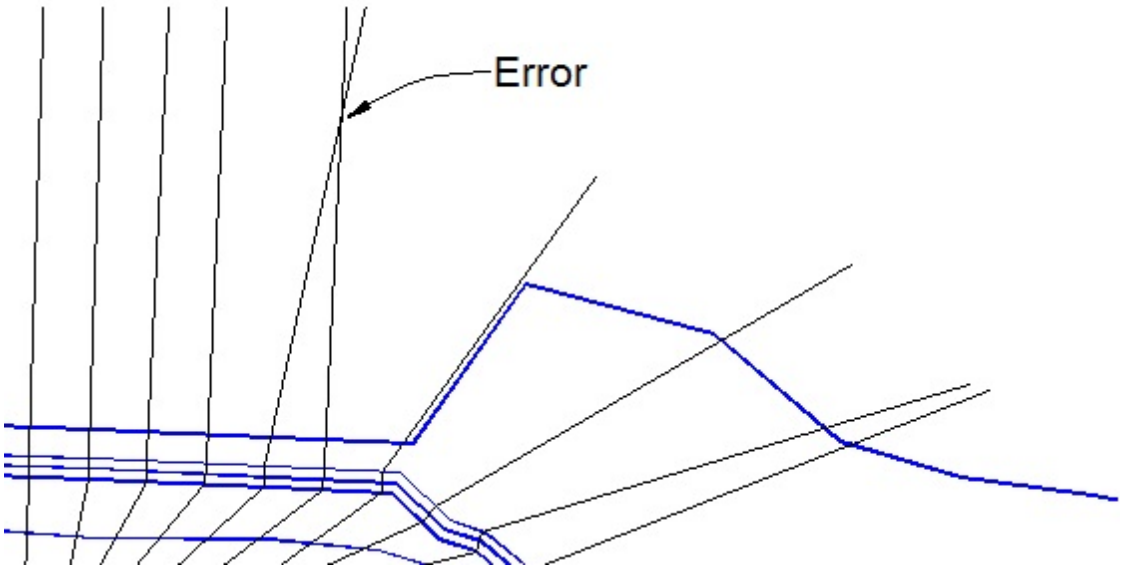
Know issues:

If you receive the following error message when trying to create the floodplain lines.

Error: Could not add boundary to surface.

There are there known causes:

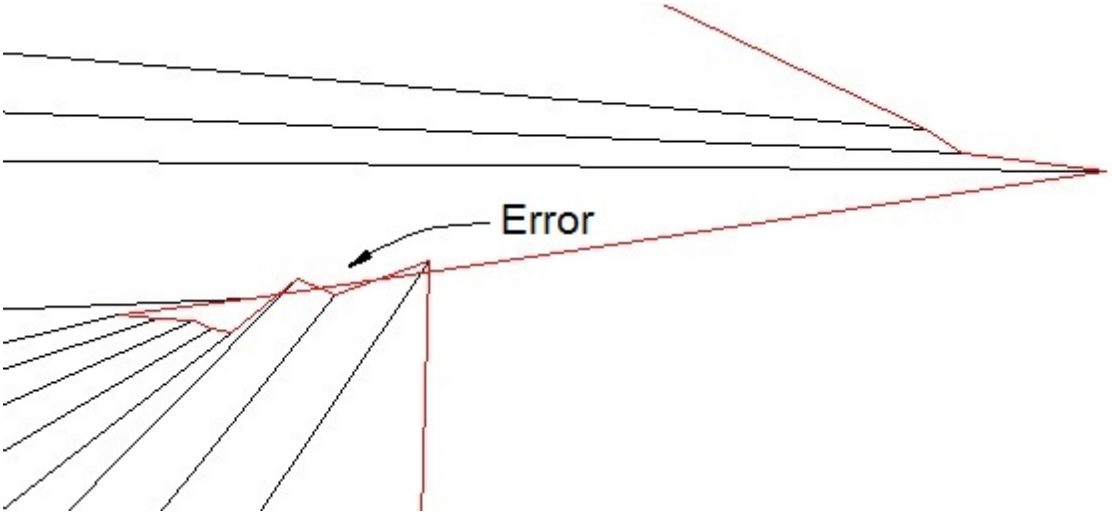
1. If any of the section lines in the HEC-RAS project cross, the command cannot add the boundary. Workaround: Modify cross section lines so they do not cross.



Error: Cross section lines cross.

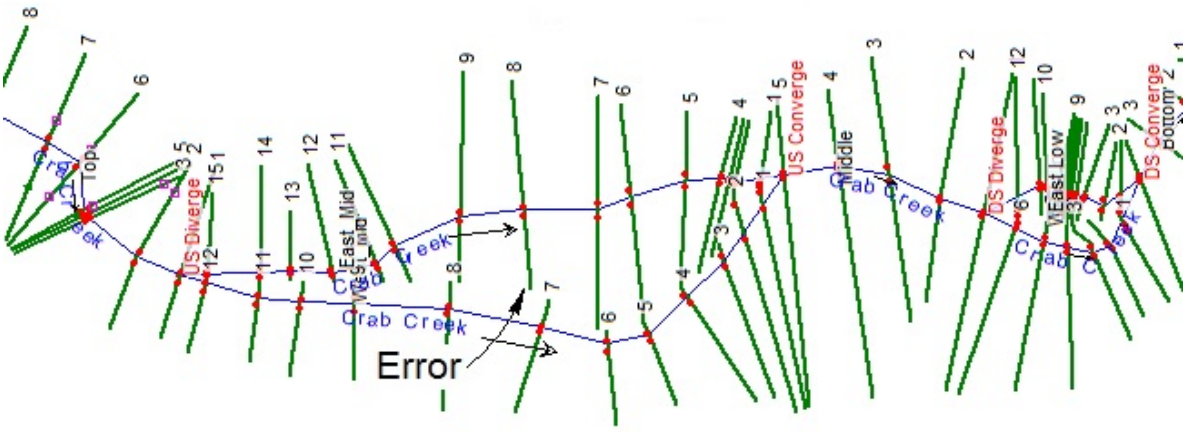
2. If the boundary created by connecting the end points of each section, in sequence, cross over itself, the command cannot add the boundary. Workaround: Modify cross section lines so boundary does not cross itself.

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Error: Boundary of cross section lines crosses itself.

3. Multiple Reaches are exported to the SDF and they create an open area. Workaround: Export two separate SDF files.



Error: Multiple reaches with an open area.

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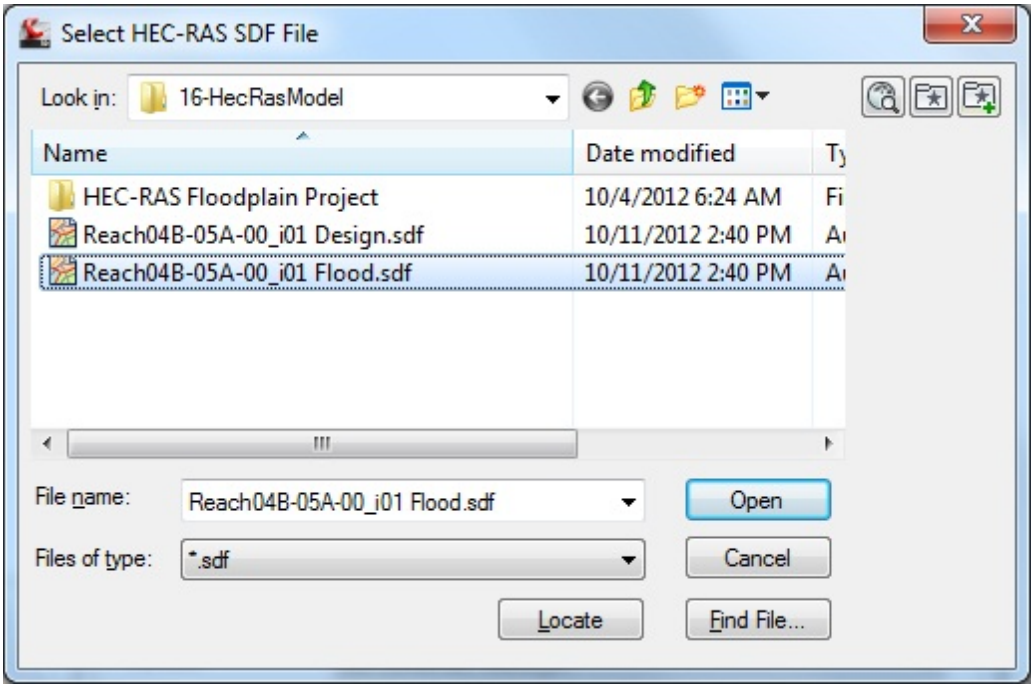
4.5.9.1 Example: HEC-RAS Floodplain Lines

This procedure utilizes results of the HEC-RAS Floodplain analysis and the GIS file produced from it to draft the floodplain lines in plan view.

This example utilizes results of the HEC-RAS Floodplain analysis from the HEC-RAS Output (sdf) file to draft the floodplain lines in plan view.

Press the icon from the *HEC-RAS* panel on the *StreamNCD* tab, running the **SM_HECRASFP** command.

As the *HEC-RAS Profile Labels* dialog displays, use the **Browse** button in its upper right corner to select the Floodplain .sdf file produced from the HEC-RAS project. Press **Open**.



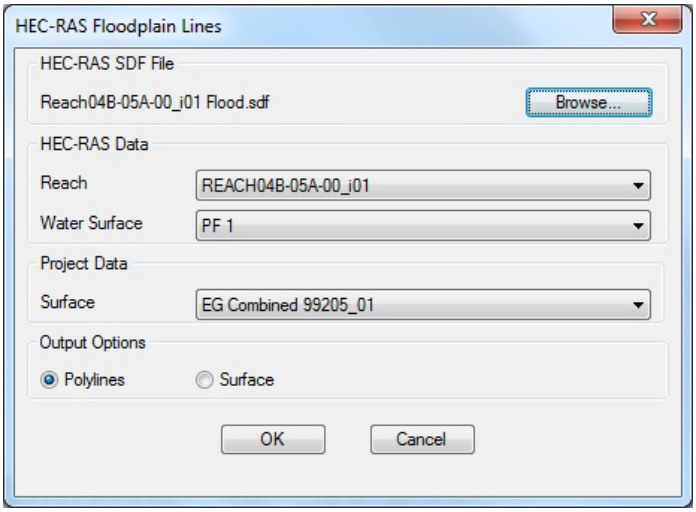
GIS File Selection for Floodplain Lines

The *Import HEC-RAS Floodplain* dialog allows selection of the **Reach** and the **Profile**; since these data result from the separate HEC-RAS project used for the 100 year Floodplain analysis in this example, there is only one choice available for each.

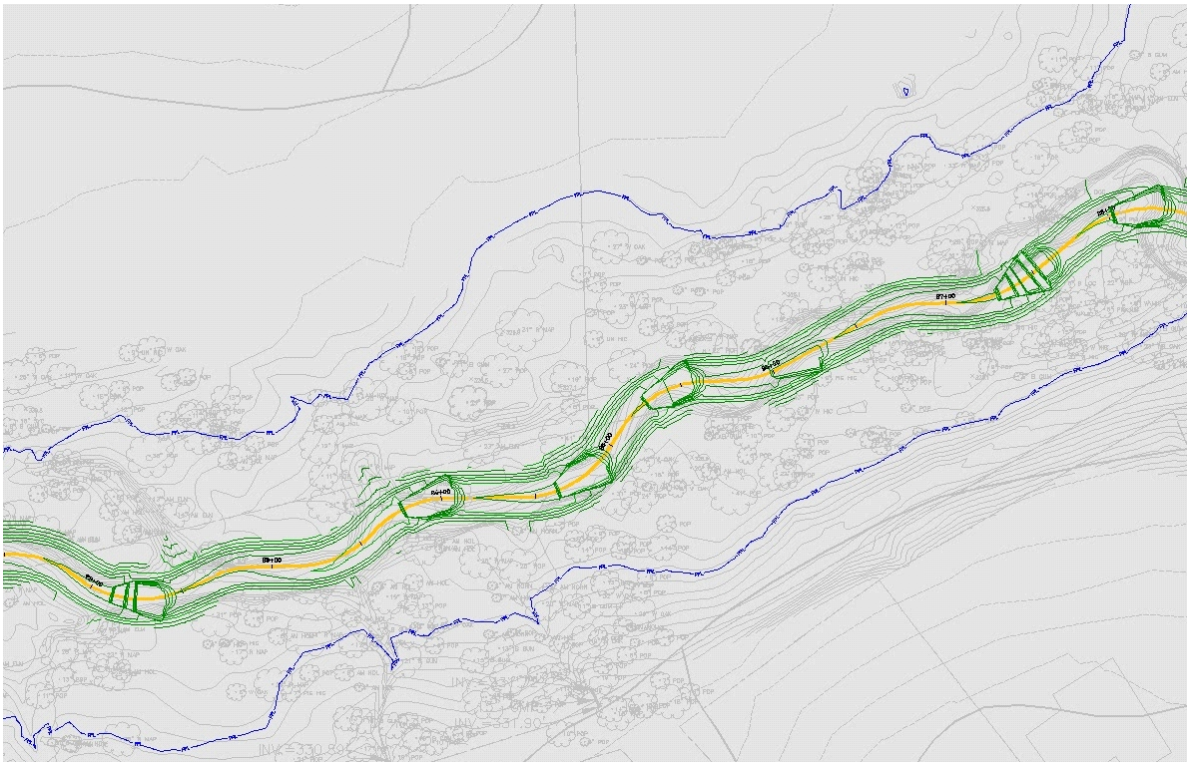
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Select the **Surface** against which the floodplain will be calculated, which should be your Overall Proposed.

The **Output Options** selection determines how the command will represent the floodplain. The **polylines** option produces the floodplain line as a 2D polyline. The **Surface** option actually creates two surfaces in Civil 3D: the actual water surface elevation itself, and a composite volume surface that shows the floodplain extents, or where the water surface meets existing. Select the desired out put option, and press **OK** to import the floodplain data.



HEC-RAS Floodplain Output Dialog



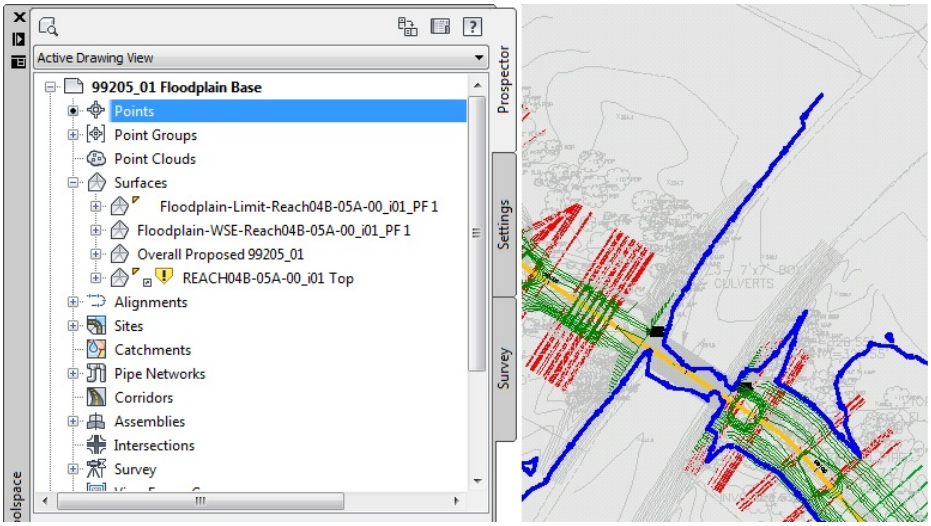
HEC-RAS Floodplain Output

If the output from **SM_HECRASFP** was set to *polylines*, the polylines are produced on the layer '-W- HYDR-REACH reach name]_[profile name] '.

If the output was set to surface, the two surfaces can be seen in the Prospector.

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The Floodplain-WSE-Reach[reach name]_[profile name] surface is the actual water surface elevation. The default surface style for this surface is _No Display. The Floodplain-Limit-Reach[reach name]_[profile name] surface is the composite volume comparison of the WSE surface to the one selected in the **SM_HECRASFP** dialog. The default surface style for this surface is Floodplain Line, which displays the limit of the floodplain as a single contour.



Surfaces Created by SM_HECRASFP in Prospector

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4.5.10 Create HEC-RAS Cross Sections

Create HEC-RAS Cross Sections

Create HEC-RAS Cross Sections for each section in the HEC-RAS Project, from a HEC-RAS Output FIle (sdf)

Note This command requires data from the HEC-RAS project to be exported as a *.sdf file. It is import to select the correct output options for them to work correctly. See HEC-RAS Output (sdf) file for exporting instructions.

For more information on using this command, see Example: Create HEC-RAS Cross Sections.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	BricsCAD Pro



Button



Ribbon: SmartDraft or SmartDraft Hydro tab ▸ HEC-RAS panel ▸ 

Toolbar: HEC-RAS Tools on the SmartDraft Tools 



Command entry: **SM_HECRASDWG**



Video demonstration

HEC-RAS SDF File

Browse	Select the HEC-RAS Output (SDF) file.
HEC-RAS Data	
Reach	Select the reach name from the list of reaches in the SDF file.
Profiles	Select the profile name from the list of profiles in the SDF file.
Cross Sections	
Sections	A list of the Cross Sections and Stations associated to the selected Reach. Select the Cross Sections to create.
Sort By	Select **Station** to sort by the stations, or **Section** to sort by the sections.
All	Select to highlight all the listed Sections.
Clear	Select to un-highlight all the listed Sections
Draw Levees	Check to drawing the Levees in the Cross Sections
Format Information	
Horizontal Scale	Enter the horizontal scale. Defaults to the horizontal scale of the drawing.
Vertical Scale	Enter the vertical scale. Defaults to 1/10th of the horizontal scale.
Offset Labels	Enter the value to determine the offset labels interval.
Elevation Labels	Enter the value to determine the elevation labels interval.
Row Spacing	Enter the row distance in inches between cross sections.
Column Spacing	Enter the column distance in inches between cross sections.
Height	Enter the page height limit in inches for placing cross sections.

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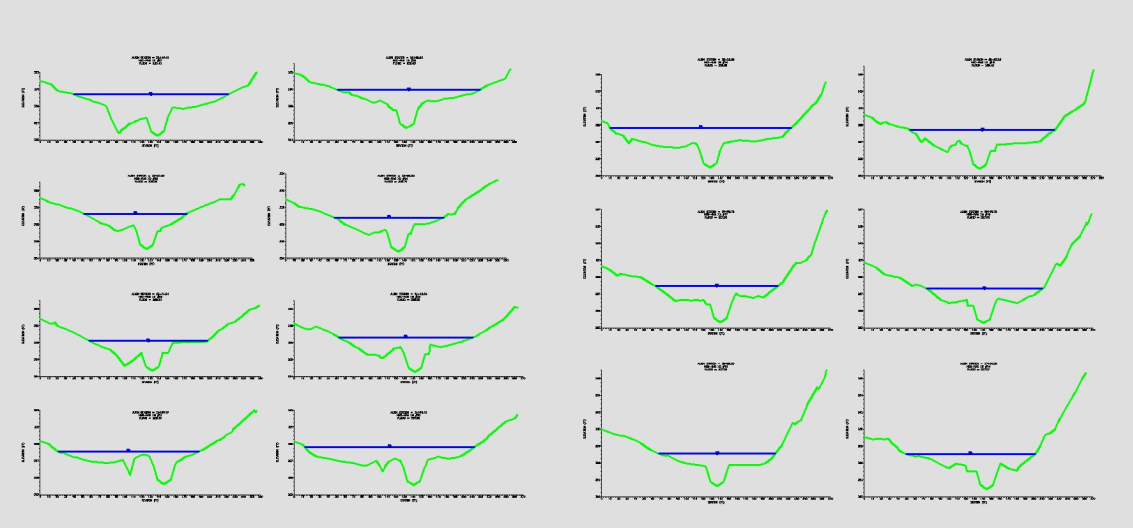
Width Enter the page width limit in inches for placing cross sections.

Text

Style Select the text style to used for the labels.

Height Enter the height of the text label. If the height of the selected text style is predefined, this edit box will be disabled. Otherwise enter the desired plotted text height, the command will multiple the entered height by the drawings current Horizontal Scale.

The command prompts for the insertion of each page of cross sections based on its upper left corner. **PICK** the desired location for each page in sequence.



Multiple Pages Aligned by Top Left

Note These cross sections are not like the cross sections produced by Civil 3D: they are dumber and more forgiving. They can easily moved if placed in the wrong location.

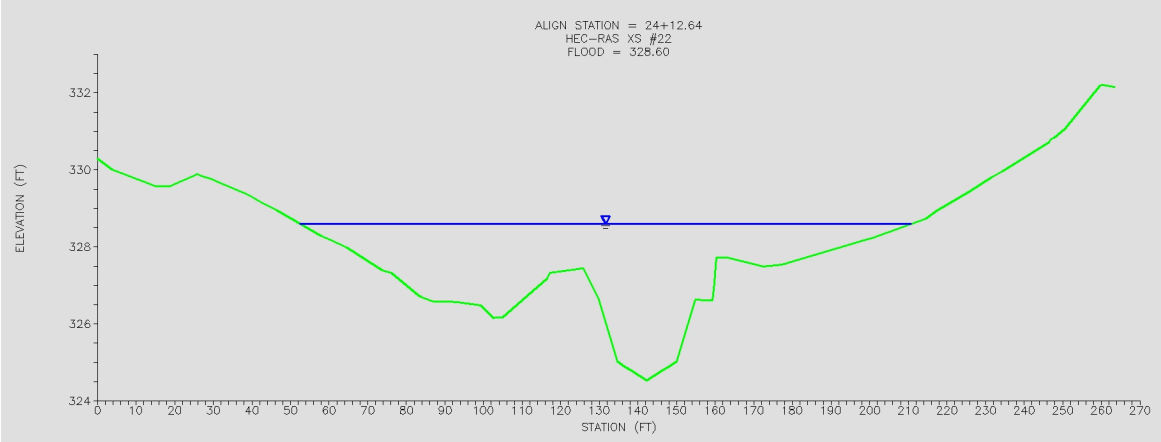
Each section is comprised of several different layers. The layer settings can be adjusted as desired.



Figure 15-11.04 – HEC Cross Section Layers

The prefix for the elevation value is the Water surface profile name provided in HEC-RAS. If desired, the AutoCAD **FIND** command could be used to change a value such as "PF 1" in the sections to read as "FLOOD" or any other value.

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HEC-RAC Section Detail

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4.5.10.1 Example: Create HEC-RAS Cross Sections

This example imports the HEC-RAS cross sections from the HEC-RAS Output (sdf) file.

Select the icon from the *HEC-RAS* panel on the *SmartDraft or SmartDraft Hydro* tab, starting the **SM_HECRASDWG** command.

In the *Create HEC-RAS Cross Sections* dialog, use the **Browse** button and select the project's HEC-RAS Output (sdf) file. Press **Open**.

In the dialog, **select** the Water Surface Elevation **Profiles** to be drafted.

Select the **Cross Sections** to be drafted, either individually or by using the **All** button.

The **Sort By** selection determines the order in which the section will appear. By **Section** presents them in the drawing by section number (river station); by **Station** presents them by alignment station (centerline station).

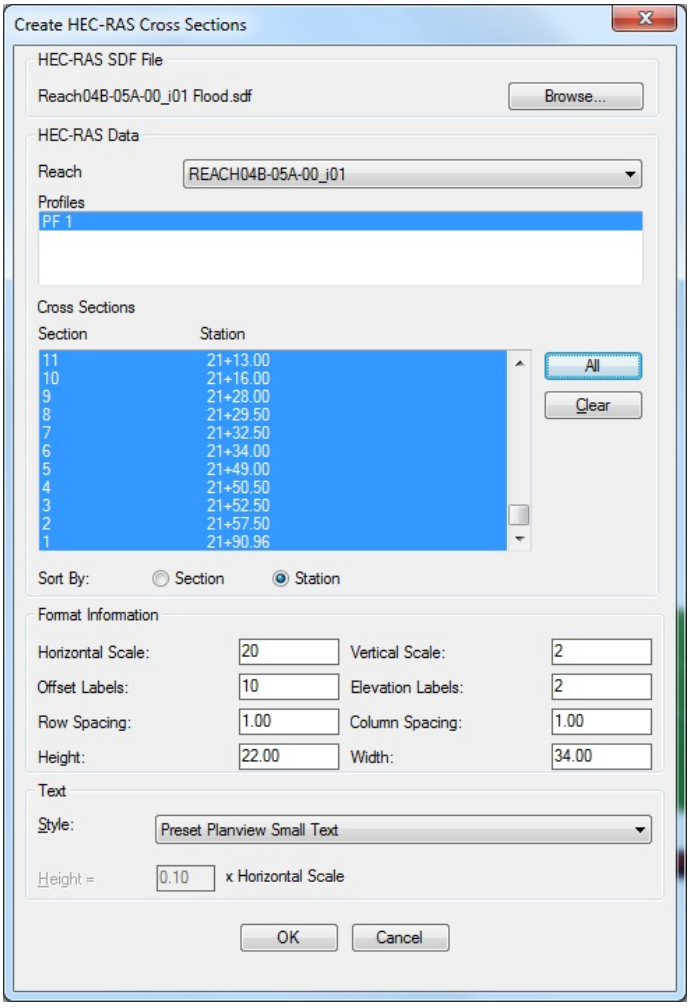
Enter the desired **Horizontal Scale** and **Vertical Scale** to determine the vertical exaggeration in the sections.

The **Offset Labels** and **Elevation Labels** fields determine the interval for horizontal and vertical labels in each section; adjust the values accordingly.

The **Row Spacing** and **Column Spacing** determine the amount of space between sections horizontally and vertically; adjust the values accordingly.

The **Height** and **Width** should be set to the available space on the plotted sheet, determining the number of sections imported per page.

Press **OK**.



Import HEC-RAS Cross Sections Options

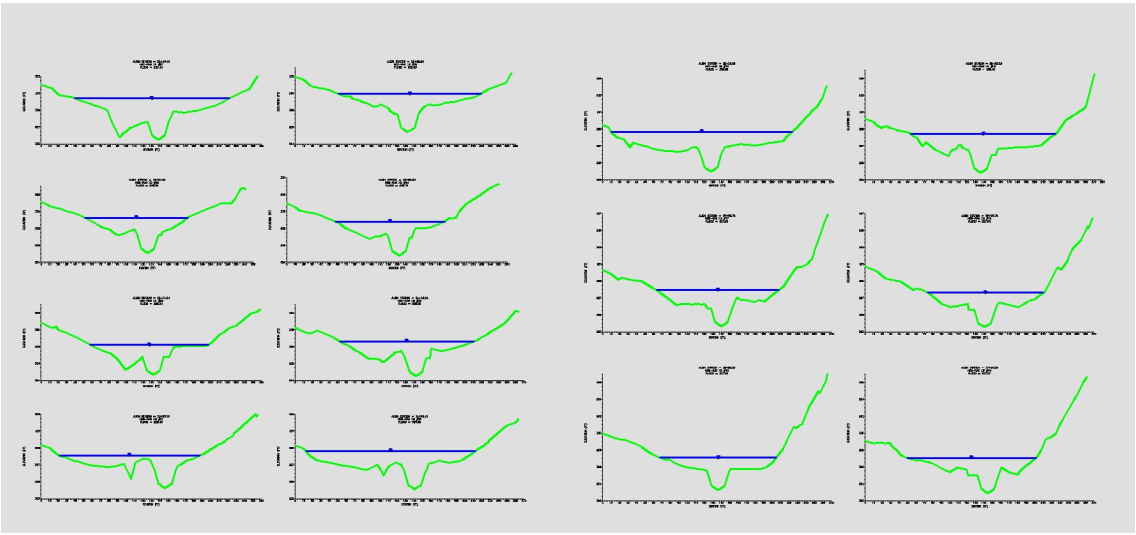
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The SM_HECRASDWG command remembers the last text style used, and will default to that style for the next use, even if in another drawing. If the text style set in SM_HECRASDWG options does not exist in the drawing a dialog will display: Since the text style indicated is not in the drawing, the command will substitute the **current** style in its place. The buttons in the dialog allow the operator to confirm the use of the **Current** style, or to Select another style from the drawing, or to load a style from an **STP** file. Pressing the **OK** button also confirms the use of the current style in the drawing.



Select Text Style Dialog

The command prompts for the insertion of each page of cross sections based on its upper left corner. **Pick** the desired location for each page in sequence.



Multiple Pages Aligned by Top Left

Note These cross sections are not like the cross sections produced by Civil 3D: they are simple lines, polylines, and text and are more forgiving. These sections do not have invisible anchor points for annotation, so they can easily moved if placed in the wrong location.

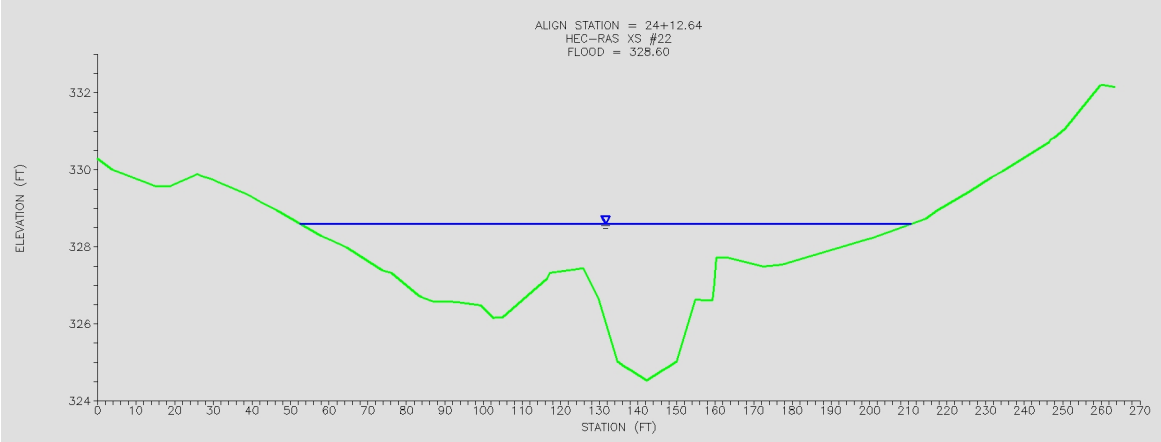
Each section is comprised of several different layers. The layer settings can be adjusted as desired.



HEC-RAS Cross Section Layers

The prefix for the elevation value is the Water surface profile name provided in HEC-RAS. If desired, the AutoCAD **Find** command could be used to change a value such as “PF 1” in the sections to read as “FLOOD” or any other value.

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HEC-RAS Section Detail

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4.5.11 Create HEC-RAS Water Surface Profile

Create HEC-RAS Water Surface Profile

Create a HEC-RAS Water surface profile in the CADD Project, from a HEC-RAS Output File (sdf).

Note This command requires data from the HEC-RAS project to be exported as a *.sdf file. It is import to select the correct output options for them to work correctly. See HEC-RAS Output (sdf) file for exporting instructions.

For more information on using this command, see Example: Create HEC-RAS Water Surface Profile.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	BricsCAD Pro



Button

Ribbon: SmartDraft or SmartDraft Hydro tab ▸ HEC-RAS panel ▸

Toolbar: HEC-RAS Tools on the SmartDraft Tools

Command entry: **SM_HECRASPRF**

HEC-RAS SDF File

Browse	Select the HEC-RAS Output (SDF) file.
HEC-RAS Data	
Reach	Select the Reach name from the list of Reaches in the SDF file.
Water Surface	A list of the Water surfaces in the SDF file.
All	Select to highlight all the listed Water surfaces.
Clear	Select to un-highlight all the listed Water surfaces
Profile Data	
Alignment	Select the reach alignment associated to the selected SDF file.
Profile	All list of the profiles which will be creates. If they already exist, the station and elevations will be updated from the SDF file.

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4.5.11.1 Example: Create HEC-RAS Water Surface Profile

This example imports the HEC-RAS profile from the HEC-RAS Output (sdf) file into the Civil 3D drawing.

Note Remember that Civil 3D distinguishes between a profile and a profile view. A profile view is a display frame that contains one or more profiles, displaying them with given vertical scales and other settings.

Creating a Water Surface Profile View

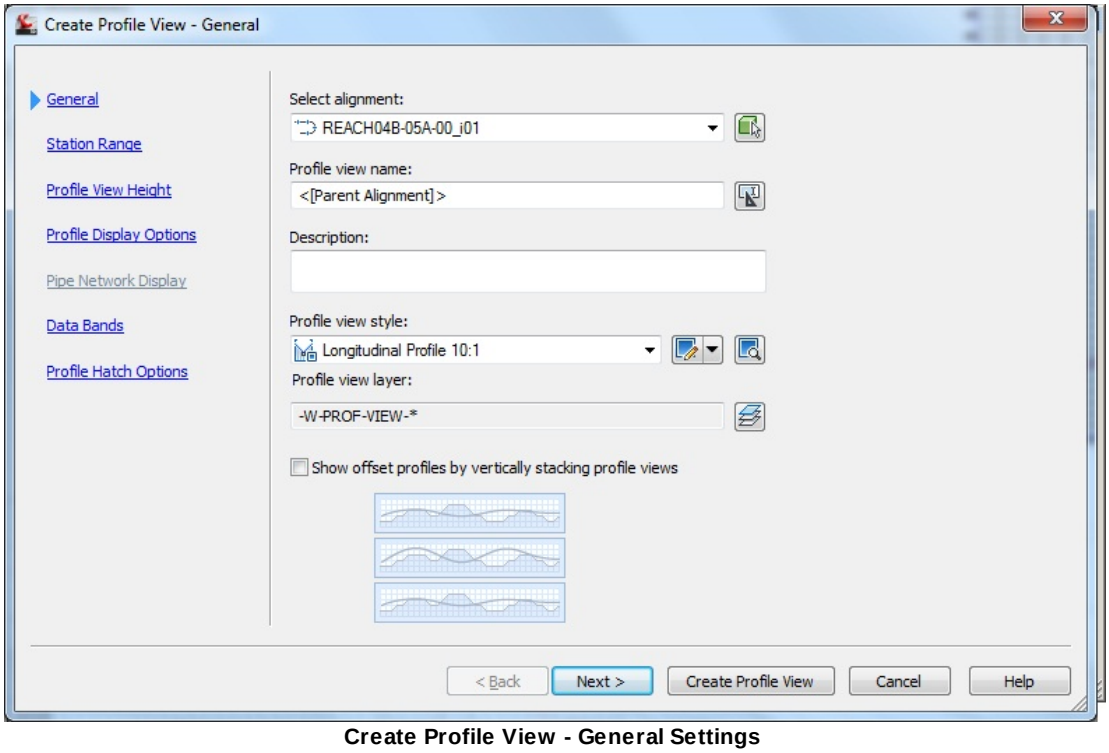
A single initial profile view will be created. This profile view will be used to determine the portion that will be visible in Planset grading drawing viewports, and its values will establish the length and height values to use in creating the remaining profile views necessary to plot the water surface profiles on the required number of sheets.

From Civil 3D's *Home* tab > *Profile & Section Views* panel > *Planview* > select **Create Profile View**.

The *Create Profile View* dialog opens, which is a step-by-step wizard.

The *Create Profile View* dialog begins on the **General** page. A **Description** can optionally be entered in the field supplied. The default **Profile view style** configured in the template provides for a vertical exaggeration of 10:1 in the graphical profile. If desired, profile view styles with vertical exaggerations of 5:1 and 2:1 can be selected, along with style selections that suppress the display of the grid.

Note Most profiles will use the 10:1 exaggeration, with grid.



Create Profile View - General Settings

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Advance in the wizard by clicking on the Profile Display Options link on the left side of the dialog.

The *Create Profile View* dialog jumps to the *Profile Display Options* page. The dialog box can be widened or scrolled to check and adjust these settings:

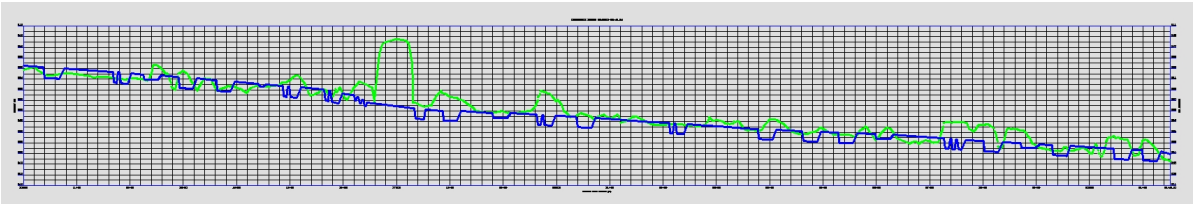
In the Draw column, the **Draw** check box should be **on** for the your Existing Ground and Proposed Ground profiles.

In the layer column, check the assigned layer for each selected profile. The Existing Ground profile should have its own layer, already assigned. If it is not set, click in the layer field and pick the layer from the drawing.

Set **profile style** for the the selected profiles.

With all settings complete, press the Create Profile View button at the bottom of the dialog.

As the command prompts: Select profile view origin: pick an insertion point in the drawing for the profile view; the insertion point will be the profile view's lower left corner.



Profile View As Created

Create HEC-RAS Water Surface Profiles

To import the water surface profiles, pick the icon from the *HEC-RAS* panel on the *SmartDraft or SmartDraft Hydro* tab, running the **SM_HECRASPRF** command.

In the *HEC-RAS Water Surface Profiles* dialog, use the **Browse** button and select the project's HEC-RAS Output (sdf) file. Press **Open**.

Note Only one sdf file can be imported at a time. If more than one is required to plot all water surface profiles desired, make multiple passes through the command.

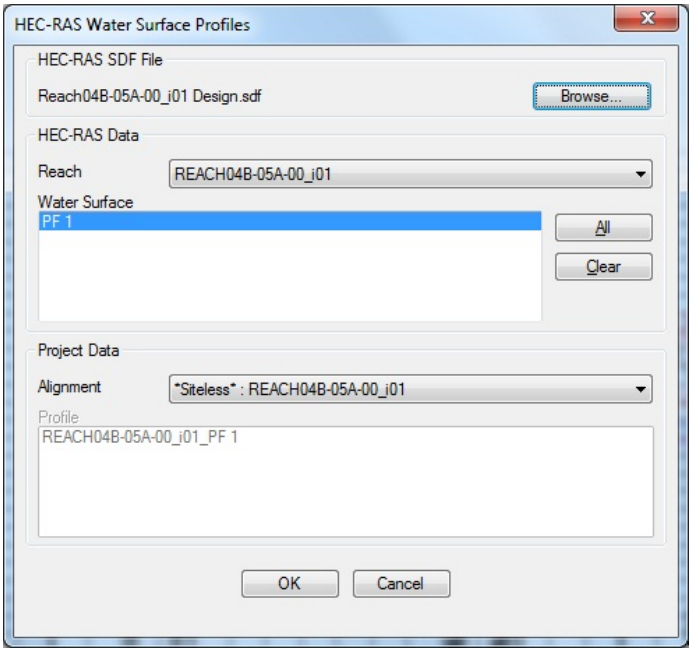
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The *HEC-RAS Water Surface Profiles* dialog, use the **Reach** selection to identify the desired reach from those found in the sdf file.

The **Water Surface** profiles for the selected reach are displayed. Individually **select** the profiles to be drafted, or use the **All** button to the right.

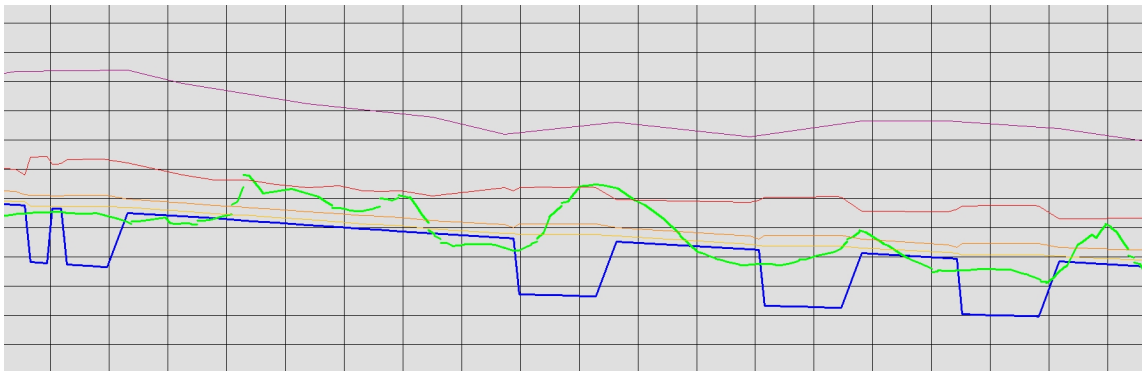
Select the **alignment** from those listed in the dialog; the selection of the alignment identifies the profile views in which the profiles will be drawn.

The actual profile names to be created are displayed at the bottom of the dialog, based on the selection of the Water surface profiles. Press **OK** to create the profiles.



HEC-RAS Water Surface Profiles Dialog

Since the profiles created are actual Civil 3D profiles, they will be displayed by default in all profile views for the selected alignment. Once created, the visibility of each water surface profile can be controlled on a profile view by profile view basis by using profile view Properties in each.

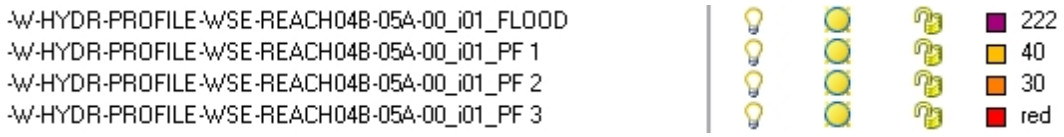


Portion of Profile View Showing Four Water Surface Profiles

Note Not all Water surface profiles would normally be imported, and not all would be displayed in the same profile view.

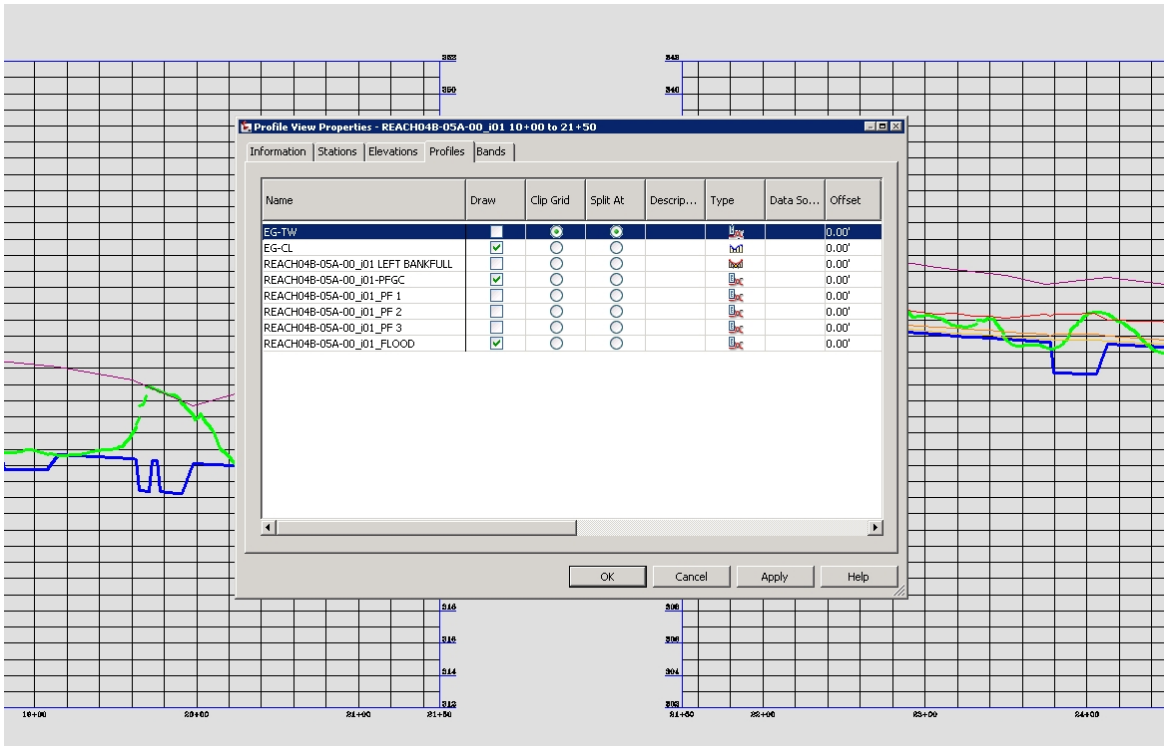
Each of the Water surface profiles is imported onto its own layer automatically. The format of the layer name is '-W-HYDR-PROFILE-WSE-REACH[reach name]-[profile name]'. The profiles themselves are also configured to take their color from the layer's color. Freezing one of the profile layers suppresses the display of the profile in all profile views in the drawing.

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Water Surface Elevation Profile Layers

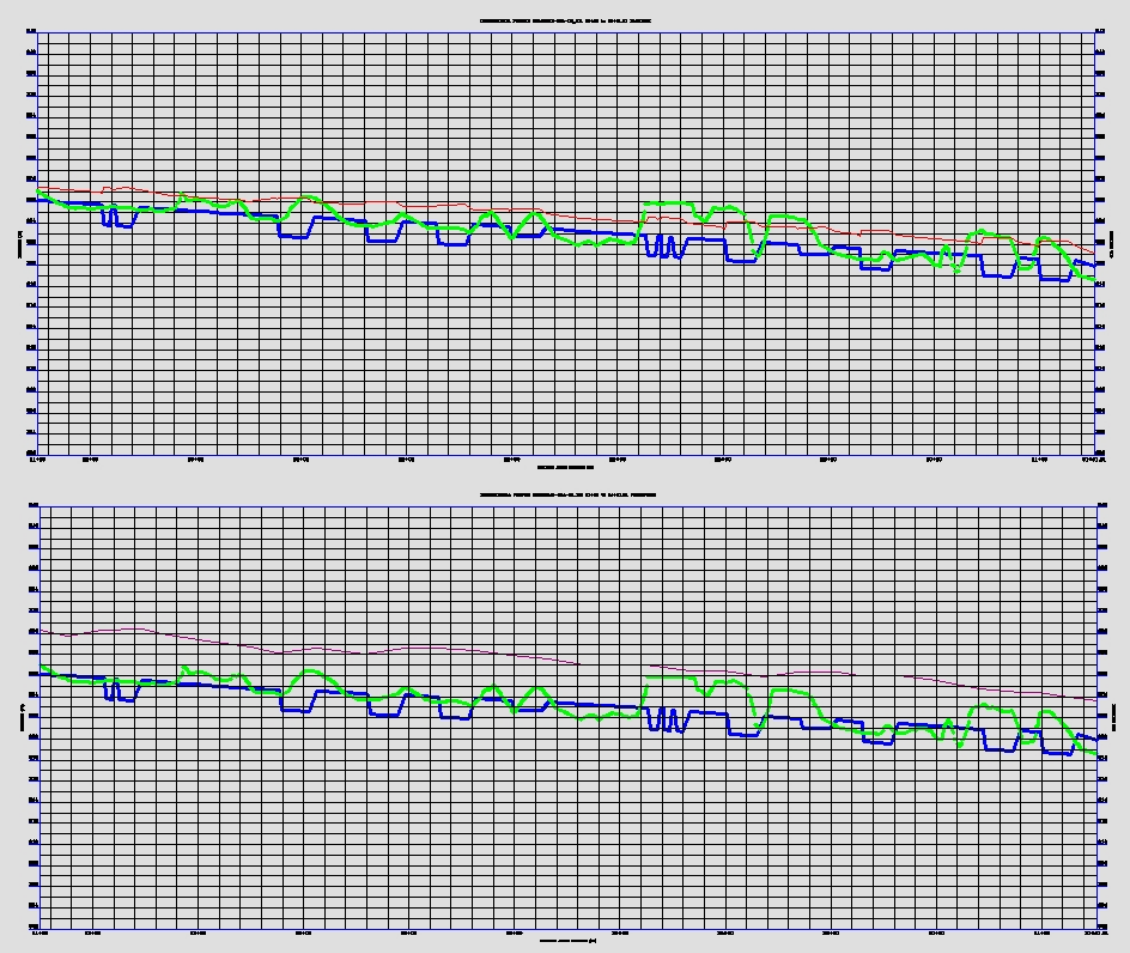
To control the display of Water surface profiles within an individual profile view, Right-click on the desired profile view and access profile view Properties. In the *Profile View Properties* dialog, click to the profiles tab. In the Draw column, click off any profiles not to be drawn.



Profile Draw Turned Off in Profile View to Left

Using the techniques described in this section, multiple profile views can be created and renamed, then set to display different information. The upper profile view in figure below is named REACH04B-05A-00_i01 21+50 to 31+51.91 BANKFULL, and displays the bankfull profile only. The lower view is named REACH04B-05A-00_i01 21+50 to 31+51.91 FLOODPLAIN, displaying the floodplain profile only.

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Multiple Profile Views

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4.5.12 Label HEC-RAS Water Surface Profile

Label a HEC-RAS Water Surface Profile

Label a water surface's stations and elevations, in profile, from a HEC-RAS Output File (sdf).

Note This command requires data from the HEC-RAS project to be exported as a *.sdf file. It is import to select the correct output options for them to work correctly. See HEC-RAS Output (sdf) file for exporting instructions.

For more information on using this command, see Example: Label HEC-RAS Water Surface Profile.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	BricsCAD Pro



Button



Ribbon: SmartDraft or SmartDraft Hydro tab ▸ HEC-RAS panel ▸ 

Toolbar: HEC-RAS Tools on the SmartDraft Tools 

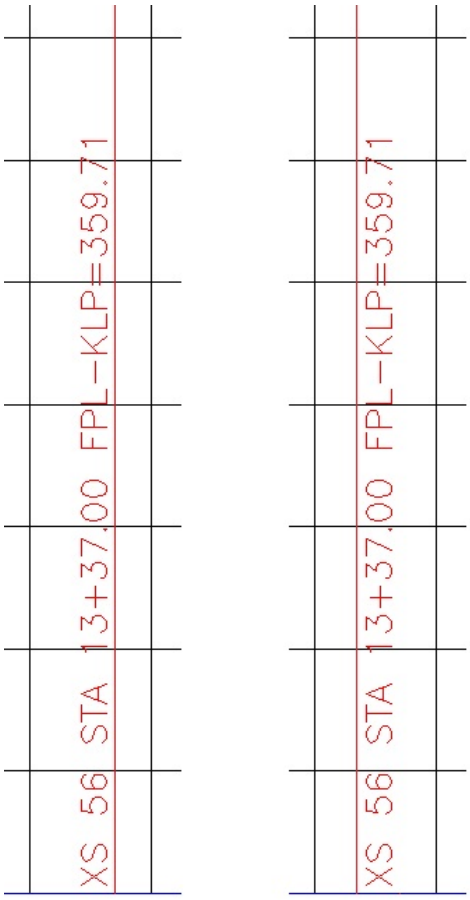


Command entry: **SM_HECRASLPRF**

HEC-RAS SDF File

Browse	Select the HEC-RAS Output (SDF) file.
Profile Data	
Alignment	Select the reach alignment associated to the selected SDF file.
Profile Views	Select the drawing profile views to label from the SDF file.
HEC-RAS Data	
Reach	Select the Reach name from the list of Reaches in the SDF file.
Water Surface	Select the Water surface name from the list of Water surfaces in the SDF file. The stations and elevations of the selected Water surface will be labeled.
Sections	A list of the section associated to the selected Reach.
All	Select to highlight all the listed sections.
Clear	Select to un-highlight all the listed sections
Label Options	
Number	Enter the Section Number prefix
Station	Enter the Station prefix
Elevation	Enter the Elevation prefix
Style	Select the text style to used for the labels.
Height	Enter the height of the text label. If the height of the selected text style is predefined, this edit box will be disabled. Otherwise enter the desired plotted text height, the command will multiple the entered height by the drawings current Horizontal Scale.
Location	Specify if the label text will be on the **Left** or **Right** of the leader line
Elevation	Select the elevation precision.

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HEC-RAS Water Surface Profile Label (Left and Right)

Note If the **SM_HECRASLPRF** command is repeated, and a profile view previously labeled is selected, all labels in the selected view are deleted and new labels placed.

By using multiple profile views and multiple passes through the **SM_HECRASLPRF** command, multiple Water surface profile elevations can be labeled.

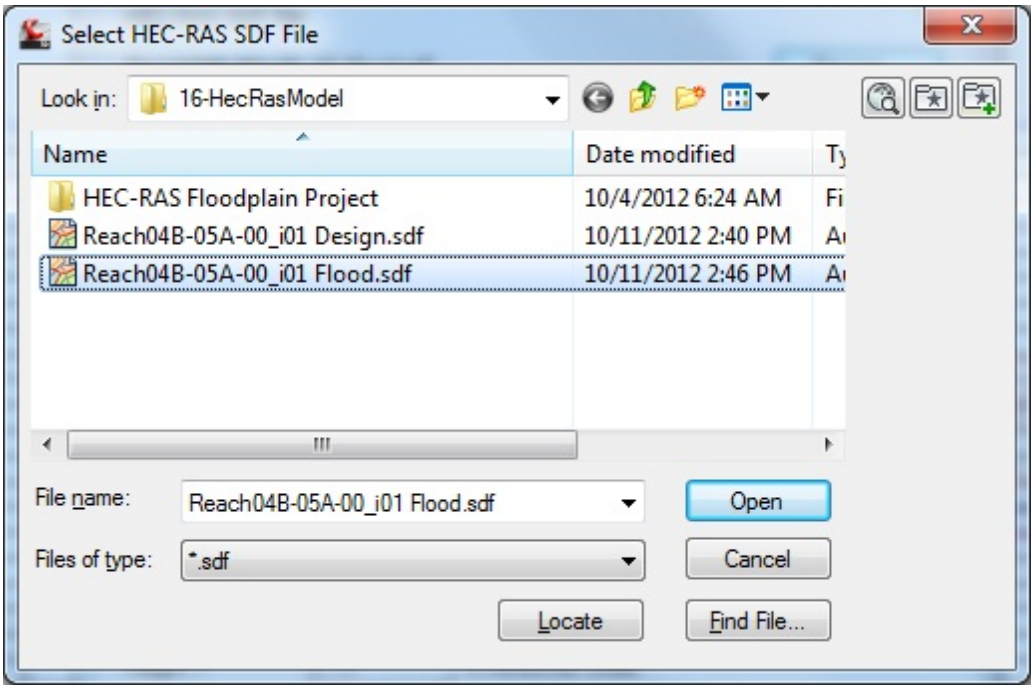
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4.5.12.1 Example: Label HEC-RAS Water Surface Profile

This example creates profile labels from the information in the HEC-RAS Output (sdf) file.

Select the icon from the *HEC-RAS* panel of the *SmartDraft or SmartDraft Hydro* tab, starting the **SM_HECRASLPRF** command.

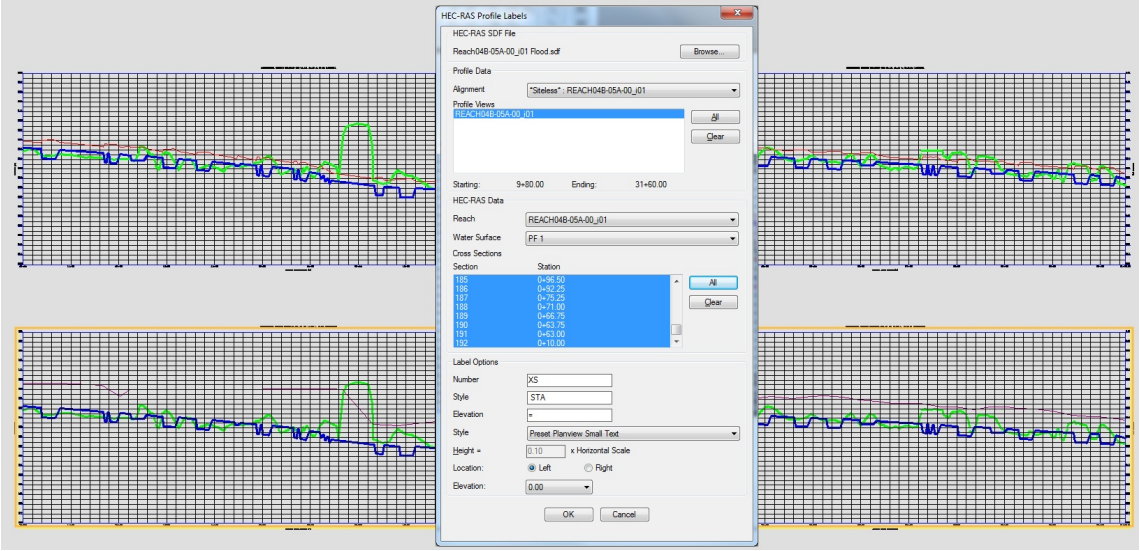
In the *HEC-RAS Profile Labels* dialog, use the **Browse** button and select the project's HEC-RAS Output (sdf) file. Press **Open**. This file contains the water surface elevations and feature information to be labeled.



Design Water Surface Profile sdf File Selection

Like the other profile labeling commands, the Profile HEC-RAS labeling tools facilitate the selection of the correct profile view when there are multiple profile views in the drawing for the same alignment. When multiple profiles are available for selection in the dialog, the selected profile view will be highlighted by the presence of a yellow bounding box surrounding its limits.

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SM_HECRASLPRF Selection of HEC-RES Profile in List

In this example, there are four profile views, two for bankfull and two for floodplain. Since the floodplain GIS file was selected for labeling, the two floodplain profile views have been selected in the dialog.

In the lower portion of the *HEC-RAS Profile Labels* dialog, set or confirm the **Reach** selection. Select the desired **Water Surface** elevation, which corresponds to the Water surface profile established earlier for the desired elevations.

Select the **Cross Sections** to be labeled, or use the **All** button to the right.

Select the **Text Style** for the labels from the options available.

Press **OK** when all settings are made.

The **SM_HECRASLPRF** command remembers the last text style used, and will default to that style for the next use, even if in another drawing. If the text style set in **SM_HECRASLPRF** options does not exist in the drawing a *Select Text Style* dialog will display: Since the text style indicated is not in the drawing, the command will substitute the current style in its place. The buttons in the dialog allow the operator to confirm the use of the **Current** style, or to **Select** another style from the drawing, or to load a style from an **STP** file. Pressing the **OK** button also confirms the use of the current style in the drawing.



Select Text Style Dialog

The command prompts:

Processing HEC-RAS file: -

Regenerating model.

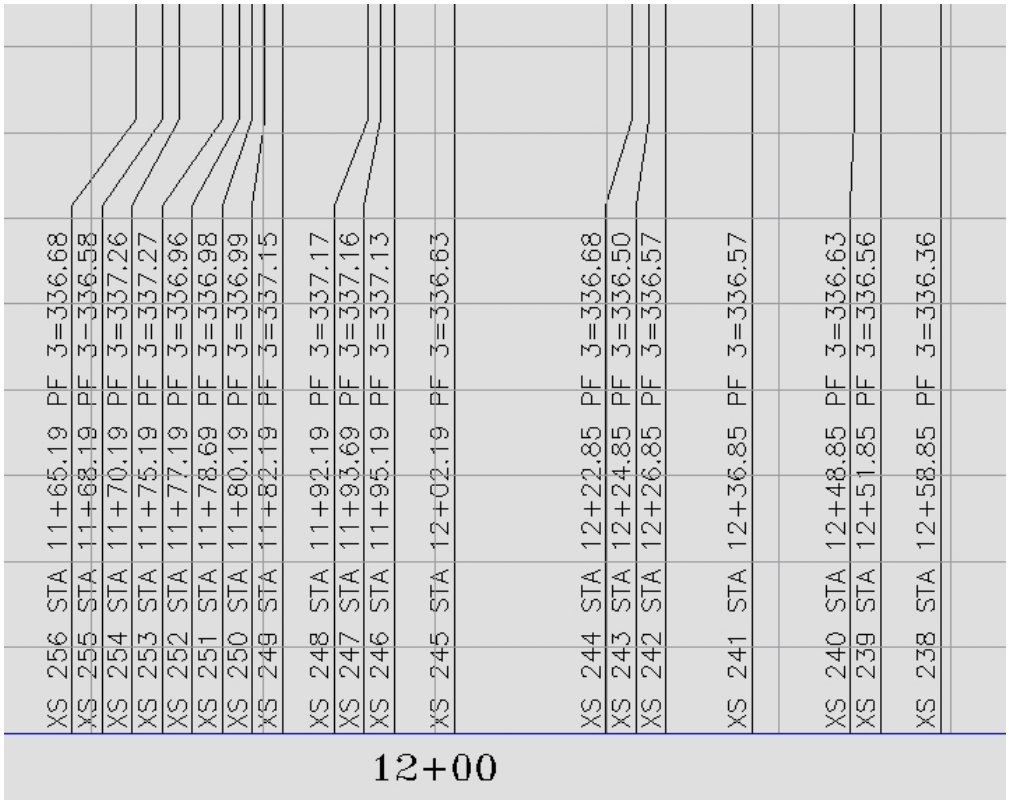
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Processing Profile View: REACH04B-05A-00_i01 10+00 to 21+50 FLOODPLAIN

Processing Profile View: REACH04B-05A-00_i01 21+50 to 31+51.91 FLOODPLAIN

Adding Cross Section Profile Data:

SmartDraft first places the labels in a profile view, then attempts to adjust the labels to prevent overlaps and improve readability. It then repeats the process in subsequent selected profile views.

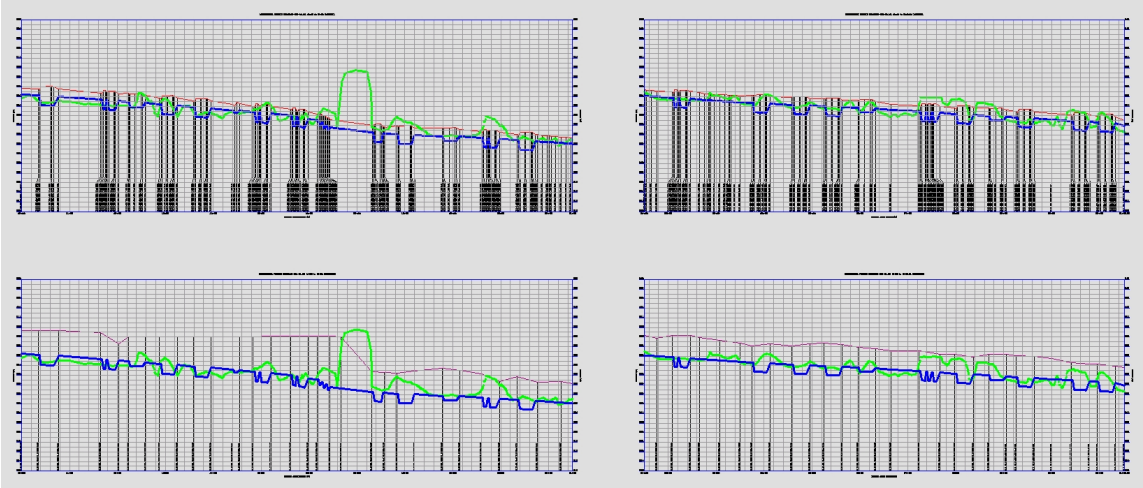


Labels as Placed

If the **SM_HECRASLPRF** command is repeated, and a profile view previously labeled is selected, all labels in the selected view are deleted and new labels placed.

By using multiple profile views and multiple passes through the **SM_HECRASLPRF** command, multiple Water surface profile elevations can be labeled. In the example in figure below, the upper two profile views show labels on the bankfull water surface elevations, while the lower two label the floodplain water surface elevations.

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Bankfull and Floodplain Profile Views

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4.6 Inquiry Panel Tools

Tools to find information about your design

Click on the icon below to view a video demonstration

Inquiry

Distance
Measure Angle
ID Point
ID Elevation
Length (Add)
List
Block Count

Area

Area
Area by Point

4.6.1 Distance

Measure the distance and angle between two points or measure the length, delta, radius, tangent, chord, and chord angle along an arc.

Note: The elevation values of the selected points are ignored when calculating the distance.

Button
Ribbon: SmartDraft ▸ Inquiry panel ▸
Toolbar: Inquiry Tools:
Menu: SmartDraft ▸ Inquiry ▸ Distance
Command entry: **d**
Video demonstration

Command

Current settings: Multiple = <Yes/No>, Path = <Yes/No>, Continuous = <Yes/No>, Alternate Units = <Yes/No>

Type: Line

Specify start point or [Multiple/Path]: Specify a point, **C**ontinuous to toggle between the command request and the start point continuously, or run once and return to the command prompt, **M**ultiple to toggle between prompting for two points or unlimited, **P**ath to toggle between displaying a magenta dragline or not, **U**nits to toggle between displaying or not displaying alternate units, or select the start point.

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Specify next point or [Arc]: Specify a point, or **A**rc to toggle to measure arcs.

Type: Arc

Specify point on arc: Specify a point along the arc, or press ENTER to return to line entry.

Specify endpoint of arc: Specify the endpoint of the arc, or press ENTER to return to line entry.

Note: Draws a temporary magenta dragline. This dragline is removed at the end of the command.

Output Line:

Distance = 112.70', Bearing = N90°00'00"E, Running Total: 312.12'

Output Arc:

Delta = 19°18'03" (RND 19°18'03"), Radius = 121.00, Length = 40.76

Tangent = 20.58, Chord = 40.57, Bearing = N38°33'37"W, Running Total = 102.84'

Note: (RND) is the delta calculated by using the rounded starting and ending radial bearings.

4.6.2 Measure Angle

Measure the angle between two lines, a line and an arc, or two arcs. Works on objects within a block or Xref.

Measure the angle between lines, polylines, and arcs. The output is the two angles on either side of the first line as it intersects the second line. The total of the two angles will always be 180 degrees. Works with objects in blocks or Xref.

Arc (curve) calculation method. Arc (curve) deltas are calculated bases on the in and out radial bearings rounded to the current angular precision. This method better represents deltas calculated in a closure report and helps to reduce discrepancies between labels and the closure report. Note: Using this method, the labeled delta may be different than the delta of the selected arc (curve).


Button

Ribbon: SmartDraft ▸ Inquiry panel ▸ 

Toolbar: Inquiry Tools: 

Menu: SmartDraft ▸ Inquiry ▸ Measure Angle

Command entry: **an**

Video demonstration

Command:

Measure Angle. Output: <perpendicular / 90°>

Select first line, arc, or point object or [Option/Points]: Select the first line segment, arc, point object, **O**ption**,** or **P**oints to specify points in the drawing area.

Select second line or arc: Select the second line segment or arc.

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If Points option selected:

Specify first point:	Specify a point.
Specify second point:	Specify a point.
Specify third point:	Specify a point.

If point object selected:

Select second point object:	Select the point object.
Select third point object:	Select the point object.

If Option selected: - toggle between output perpendicular and 90°

Measure Angle. Output: <perpendicular / 90°>

Possible output information when two lines are selected:

Angle 1 = 69°01'11" (RND 69°01'11") Angle 2 = 110d58'49" (RND 110d58'49"). Endpoints match.

Angle 1 = 69°01'11" (RND 69°01'11") Angle 2 = 110d58'49" (RND 110d58'49"). Endpoint of first line on second line.

Angle 1 = 69°01'11" (RND 69°01'11") Angle 2 = 110d58'49" (RND 110d58'49"). Endpoint of second line on first line.

Angle 1 = 69°01'11" (RND 69°01'11") Angle 2 = 110d58'49" (RND 110d58'49"). Endpoints do not match.

Output information if the selected lines are collinear:

Lines collinear. Endpoints match.

Lines collinear. Endpoints do not match.

Output information if the selected lines are perpendicular:

Lines perpendicular. Endpoints match.

Lines perpendicular. Endpoint of first line on second line.

Lines perpendicular. Endpoint of second line on first line.

Lines perpendicular. Endpoints do not match.

Output information when two lines are selected and they are parallel:

The offset distance between the lines is calculated.

Lines parallel. Distance: xx.xx

Output prompt when three points are selected:

Angle 1 = 69°01'11" (RND 69°01'11") Angle 2 = 110d58'49" (RND 110d58'49").

Output information when the points are collinear:

Points collinear.

Output information when the points are perpendicular:

Points perpendicular. or Points 90°

Output prompts when a line and an arc are selected:

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Line tangent to arc. Endpoints match.
Line tangent to arc. Endpoint of line on arc.
Line tangent to arc. Endpoint of line not on arc.
Line tangent to arc. Endpoints do not match.
Line radial to arc. Endpoints match.
Line radial to arc. Endpoint of line on arc.
Line radial to arc. Endpoint of line not on arc.
Line radial to arc. Endpoints do not match.
Line intersects arc in two places.
Line does not intersect arc.
Line not radial to arc. 09°01'11" degrees off radial.

Output prompts when two arcs are selected:
Arcs concentric. Distance: xx.xx
Arcs Tangent. Endpoints match.

4.6.3 ID Point

Display the coordinate values of a selected point.

Select points to identify coordinate values. Output displayed in X,Y,Z and Northing, Easting, Elevation format.


Button
Ribbon: SmartDraft ▸ Inquiry panel ▸ 
Toolbar: Inquiry Tools: 
Menu: SmartDraft ▸ Inquiry ▸ ID Point
Command entry: **idp**
Video demonstration

Command:
Specify point: Specify a point.

Output:
Drawing X = 421.5398 Y = 511.7838 Z = 0.0000
Northing = 511.7838 Easting = 421.5398 Elevation = 0.0000

4.6.4 Inverse Points

Inverse between drawing points, point objects, point numbers, or Civil 3D Survey database points.
Options to inverse radial from a base point and inverse along an open or closed path.

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Options for lines, arcs clockwise, counter-clockwise, and arcs by 3 points.

Supports:

AutoCAD Products:	Yes, when there is an open Civil 3D Survey database, using survey point numbers will be an option.
BricsCAD Pro:	Yes



Button

 Ribbon: SmartDraft ▸ Inquiry panel ▸ 

Toolbar: Inquiry Tools: 

Menu: SmartDraft ▸ Inquiry ▸ Inverse Points

 Command entry: **pti**

 Video demonstration

Command Line Options

Line	Inverse between two points to get the bearing, distance, and slope.
ACCw	Inverse an arc using the starting point, radial point, and ending point selected counter-clockwise (CCW) to get the delta, length, radius, tangent, chord, and slope.
ACW	Inverse an arc using the starting point, radial point, and ending point selected clockwise (CW) to get the delta, length, radius, tangent, chord, and slope.
A3	Inverse an arc using the starting point, point along arc, and ending point to get the delta, length, radius, tangent, chord, and slope.
Options	Display the Inverse Points Options.
DRawing	Enter **DR** to change to the specify points (drawing points) input option.
Select	Enter **S** to change to the select points input option.
Point Number	Enter **P** to change to the enter point numbers input option.
Database	Enter **D** to change to the enter survey point numbers input option. Applicable to Civil 3D only. Available only if a Survey Database is currently open.

If **Radial**

Command: **PTI**

Inverse points.

Current settings: Source = Select, Type = Radial, Line

Select base point or [Options]: Select the base point, **P**oint (to change point source to point numbers), **D**atabase (to change point source to Survey Database), or **O**ptions.

Select next point or [Options]: Select next point, **P**oint (to change point source to point numbers), **D**atabase (to change point source to Survey Database), or **O**ptions.

Bearing = N89°26'19"W, Distance = 269,304.30', Slope = 4.49%

Select next point or [Options]: Select additional points, or press ENTER to end.

If **Traverse**

Command: **PTI**

Inverse points.

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Inverse points.

Current settings: Source = Select, Type = Traverse, Line

Select starting point or [A3/ACCw/ACW/Line/Options]: Select the starting point, **DR**awing (to change point source to drawing point), **P**oint (to change point source to point numbers), **D**atabase (to change point source to Survey Database), **A3** for arc 3-points, **ACCw** for arc counter-clockwise, **ACW** for arc clockwise, or **O**ptions.

Select next point or [A3/ACCw/ACW/Line/Options]: Next point selected.

Bearing = N89°26'19"W, Distance = 13.26', Slope = 4.49%

Select next point or [A3/ACCw/ACW/Line/Options]: **acw** Entered **ACW** for arc clockwise entry mode.

Current settings: Source = Select, Type = Traverse, ACW

Select radial point or [A3/Line/Options]: Radius point of arc selected.

Select end of arc point (clockwise) or [ACCw/Line]: End of arc point selected.

Delta = 110°44'44" (RND 110°44'43"), Radius = 3.52', Length = 6.81'

Slope = 2.24%, Running Total = 20.07'

Select radial point or [A3/Line/Options]: **l** Enter **L**ine for line entry mode.

Current settings: Source = Select, Type = Traverse, Line

Select next point or [A3/ACCw/ACW/Line/Options]: Next point selected.

Bearing = N21°18'24"E, Distance = 9.21', Slope = 1.07%, Running Total = 29.28'

Select next point or [A3/ACCw/ACW/Line/Options]: Next point selected.

Bearing = S89°58'53"E, Distance = 15.63', Slope = 1.92%, Running Total = 44.91'

Select next point or [A3/ACCw/ACW/Line/Options]: Next point selected.

Bearing = S10°21'39"W, Distance = 13.73', Slope = 3.98%, Running Total = 58.64'

Select next point or [A3/ACCw/ACW/Line/Options]: Pressed Enter to end.

Output:

Line:

Bearing = N89°26'19.38"W, Distance = 26.93', Slope = 4.493%
Running Total = 210.01'

Arc:
Delta = 110°44'44" (RND 110°44'44"), Radius = 7.16', Length = 13.84'
Tangent = 10.37', Chord = 11.78', Bearing = S34°03'58"E
Slope = 2.240%, Running Total = 223.85'

Note: (RND) is the delta calculated by using the rounded starting and ending radial bearings.

4.6.4.1 Inverse Points Options

Options for the Inverse Points command.

Inverse Points

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Options	
Point Source	
Specify Points (Drawing Points)	Specify a point in the drawing. OSNAPs and the z value are supported. **Note**: At any point input prompt, type **DR** to change to this point source.
Select Points	Select a point object in the drawing. Supported point types: Civil 3D, and SmartDraft. **Note**: At any point input prompt, type **S** to change to this point source.
Point Numbers	Enter a point number. Supported point types: Civil 3D drawing, and SmartDraft. **Note**: At any point input prompt, type **P** to change to this point source.
Civil 3D Survey Database	Enter a point number from the currently open Civil 3D Survey Data. **Note**: At any point input prompt, type **D** to change to this point source.
Method	
Traverse	Inverse point information (Line and Arc) along a path of travel.
Radial	Inverse point information (Line only) from the starting point.
Output	
Linear	Specify the Linear Precision.
Angular	Specify the Angular Precision.
Feet/Meters	Enter a suffix string to add to the Feet/Meters text. Note: To print a space between the Area and suffix add a space before the suffix.
Precision	Specify the decimal precision for the Feet/Meters area value.
Acres/Hectares	Enter a suffix string to add to the Acres/Hectares text. Note: To print a space between the Area and suffix, add a space before the suffix.
Precision	Specify the decimal precision for the Acres/Hectares area value.
Tangent	Check to include tangent information at the command prompt.
Chord	Check to include chord and chord angle information at the command prompt.
Slope	Check to include the slope at the command prompt.
Slope	Specify the Slope Precision.
Report	Check to display a dialog with all the inverse information processed. There is an option to Save the report to an ASCII file.

4.6.4.2 Inverse Points Report

Report information for Inverse Points

List inverse information of the selected segments.

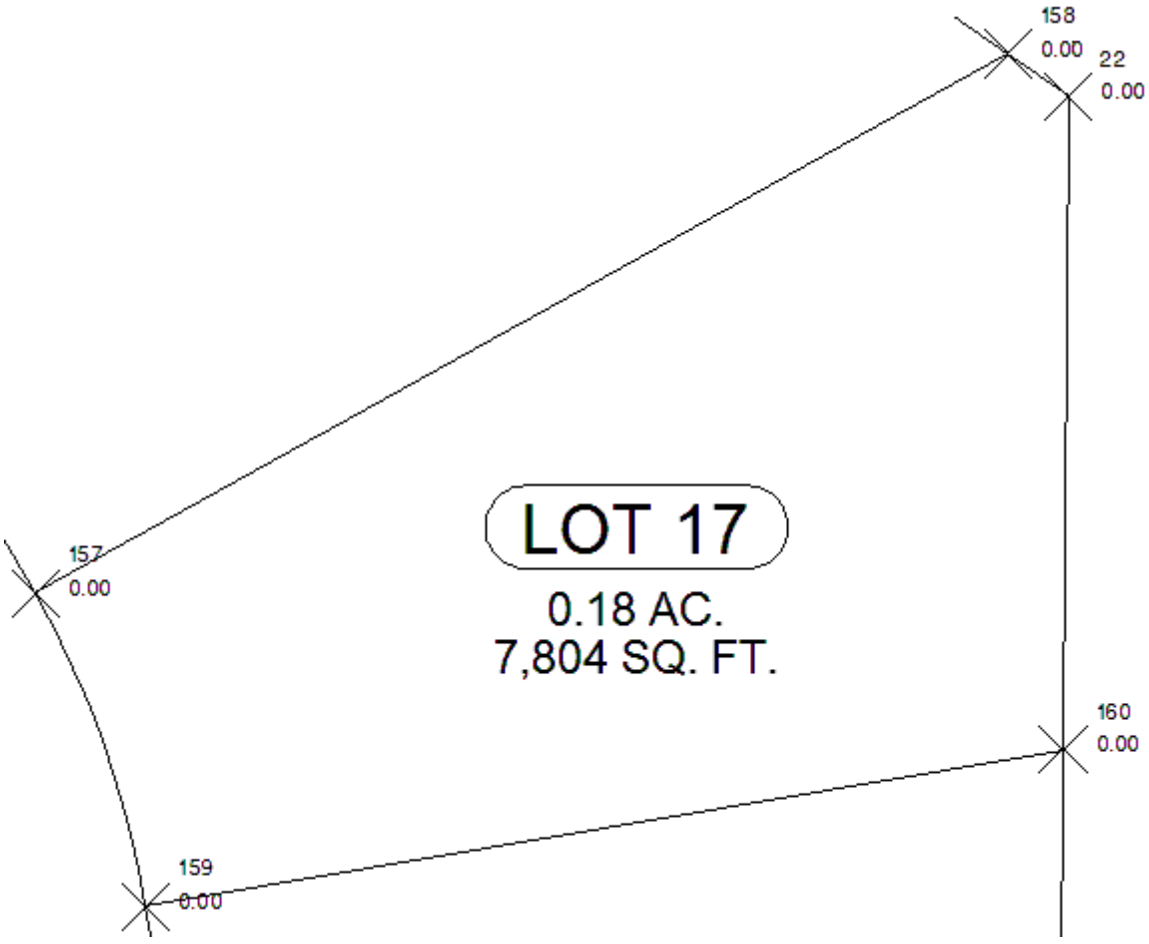
Output the information to a file.

Inverse Points Report	
Title	Enter the report title.
Author	Enter the author's name.
List	Inverse data of selected segments.

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Output	
Linear	Specify the Linear Precision.
Angular	Specify the Angular Precision.
Feet/Meters Precision	Specify the decimal precision for the Feet/Meters area value.
Acres/Hectares Precision	Specify the decimal precision for the Acres/Hectares area value.
Tangent	Check to include tangent information in the report.
Chord	Check to include chord and chord angle information in the report.
Slope	Check to include the slope in the report.
Slope	Specify the Slope Precision.
Buttons	
Save	Save the report information to a file. Enter a file name and location.
Print	Print the report to Window's current default printer.

Example: Traverse Report



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Inverse Points Report: Lot 17

Author: Bob Smith

From	Delta	Length	Radius	Tangent	Chord	Bearing	To
160	S80°16'54"W	113.71					159
159	19°19'11"	40.80'	121.00'	20.60'	40.61'	N19°22'42"W	157
157	N60°57'43"E	135.90'					158
158	S54°59'13"E	9.06'					22
22	S00°29'15"W	79.88'					160

Perimeter:	379.35'	
Area:	7,804.12 SF	0.18 ACRES

4.6.5 ID Elevation

Display the elevation (z) value of a select object or the elevation along or within a selected feature (object).

Display the elevation (z) of a selected object at the command prompt.

Note: Feature option only available in Civil 3D. Supported features: surface, 3D polyline, feature line, survey figure, parcel segment, alignment and profile, and pipes.

Z?
Button

Ribbon: SmartDraft ▸ Inquiry panel ▸ Z?

Toolbar: Inquiry Tools: Z?

Menu: SmartDraft ▸ Inquiry ▸ ID Elevation

Command entry: **z?**

Video demonstration

Command:

Select object for elevation or [Feature]: Select an object to inquire its elevation

Output:

Elevation (*elevation*).

4.6.5.1 ID Elevation Feature Option

Feature option for the ID Elevation command.

Command:

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Select feature or [Object]: Select a feature to ID an elevation along or within, **O**bject to toggle to object mode, or press enter to end.

Prompt if a Surface was selected:

Selected surface: <*surface name*>

Specify a point on the surface or [Feature/Object]: Specify a point, **F**eature to select a different feature, **O**bject to toggle to object mode, or press ENTER to end.

Prompt if a 3D Polyline, Feature Line, Survey Figure, Parcel Segment was selected.

Selected: <*feature type*>

Specify a point along the <feature type> or [Feature/Object]: Specify a point, **F**eature to select a different feature, **O**bject to toggle to object mode, or press ENTER to end.

Prompt if an Alignment and Profile:

Selected Alignment: <*site name*>, <*alignment name*>, Profile: " <*profile name*>

Select a Profile for an alignment dialog appears.

Specify a point along the alignment or [Feature/Object]: Specify a point, **F**eature to select a different feature, **O**bject to toggle to object mode, or press ENTER to end.

Prompt if Pipe Network or Pressure Pipe and Alignment:

Note: Elevations for vertically curved pressure pipes are only supported in Civil 3D 2021 - 2023.

Select an alignment for station: Select an alignment for the alignment stationing and offset, or press ENTER for only the offset from the pipe will be given.

Selected Alignment: <*alignment name*>, Pipe Network: " <*pipe network name*>

Specify a point along the pipe network object or [Feature/Object]: Specify a point, **F**eature to select a different feature, **O**bject to toggle to object mode, or press ENTER to end.

Output Surface:

Surface: <*surface name*>

Elevation <*elevation*>

Output 3D Polyline, Feature Line, Survey Figure, Parcel Segment:

Feature: <*feature type*>

Elevation <*elevation*>

Output Alignment and Profile:

Alignment: <*site name, alignment name*>, Profile: <*profile name*>

Station: <*station*>, Elevation <*elevation*>, Offset: <*offset*>

Output Pipe Network Pipe and Alignment:

Pipe Station: <*station*>, Offset: <*offset*>

Elevations: Top: <*elevation*>, Center: <*elevation*>, Invert: <*elevation*>

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4.6.5.2 Select a Profile for an Alignment

Select a profile associated to the selected alignment for the ID Elevation command.

Select a profile for alignment

Alignment	Name of the selected alignment
Profile	List of profiles associated to selected alignment. Select a profile from the list.

4.6.6 Length (Add)

Add the lengths of selected arcs, ellipses, circles, lines, polylines, and splines.


Button


Ribbon: SmartDraft ▸ Inquiry panel ▸ 

Toolbar: Inquiry Tools: 

Menu: SmartDraft ▸ Inquiry ▸ Length


Command entry: **add**


Video demonstration

Command:

Current settings: Output = <type>
Select objects to add lengths or [Dialog/Options/Select Layer]: Select all objects to add their lengths, **D**ialog to get lengths via dialog box options, **O**ption to change the object filter and output options, **S**elect to change to select by layer, or press ENTER.

If **Options** option
Output type [Screen/Text] <default>: Specify desired output type. Screen = only display the result at the Command entry, Text = Prompt operator to place the result as text in the drawing.

If **Select layer**
Select object layer to add lengths or [Dialog/Options/Select objects]: Select an object to specify the layer to add the lengths, **D**ialog to get lengths via dialog box options, **O**ption to change the object filter and output options, or **S**elect objects to add their lengths.

Options Dialog box:

Object Filter

Arc:	Check to include selected arcs.
Circle:	Check to include selected circles.
Ellipse:	Check to include selected ellipses.
Line:	Check to include selected lines.
Polyline:	Check to include selected polylines and lwpolylines.
Spline:	Check to include selected splines.
Select All:	Select to check all object filters.
Clear All:	Select to clear all checked objects.
Output	
Screen	Select to output the total to the command prompt.
Text	Select to output the total as a text string.

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Buttons:

OK: Apply any changes, and return to select objects prompt.

Output:

Number of objects processed: 2

Total length of processed objects: 155.31

If output type **Text**:

Specify start point of text: Select the insertion point of the text string.

Specify rotation angle of text <default>: Specify the rotation angle of the new text.

4.6.6.1 Length Dialog (Add)

Dialog option of the Length (Add) command.

This is a dialog-driven version of the command for adding 2D and 3D lengths of arcs, lines, and polylines.

Dialog can filter the selected objects by layer, linetype, color, thickness, and polyline width.

Dialog box:

Object Filter

Layers: Select the layers from the list to process.
Select All: Use this button to select all the layers.
Clear All: Use this button to clear selection of all the layers.
Filter: Enter a single or multiple filter options separated by commas. Can use wildcards.
Linetypes: Select the linetypes from the list to process.
Byblock Select this option to include objects set to linetype BYBLOCK.
Bylayer Select this option to include objects set to linetype BYLAYER.
Select All: Use this button to select all the layers.
Clear All: Use this button to clear selection of all the layers.
Filter: Enter a single or multiple filter options separated by commas. Can use wildcards.
Polyline: Check to include selected polylines and lwpolylines.
Spline: Check to include selected splines.
Select All: Select to check all object filters.
Clear All: Select to clear all checked objects.
Line: Check to include select lines.
Polyline: Check to include selected polylines and lwpolylines.
Spline: Check to include selected splines.
Select All: Select to check all object filters.
Clear All: Select to clear all checked objects.

Layout Tab Select the model or layout tab to process.
Objects
Arcs Check to include arcs in the calculations.
Lines Check to include lines in the calculations.
Polylines Check to include polylines in the calculations.
Buttons:
Process: Calculate the total lengths of the selected objects using the current filter options.

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4.6.7 List

Display the survey information for lines, arcs, polylines, Civil 3D alignments, pipes, survey figures, feature lines, and parcel segments. Works on objects within a block of Xref.

Also see: List Object

Note: Supports Civil 3D objects: feature lines, survey figures, parcel segments, alignments, and pipes.
Note: Supports BricsCAD Pro alignments.

Button
Ribbon: SmartDraft ▸ Inquiry panel ▸
Toolbar: Inquiry Tools:
Menu: SmartDraft ▸ Inquiry ▸ List
Command entry: **lsd**
Video demonstration

Command:

Current settings: Alternate Units = <Yes/No>

Select object or [Units]: Select an object to list or **U**nits to toggle between displaying or not displaying alternate units.

Output:

Bearing = N64°31'20"E, Distance = 261.47'
or
Delta = 52°22'26" (RND 55°22'26"), Radius = 500.00', Length = 457.05'
Tangent = 245.89', Chord = 441.30', Bearing = N89°17'27"W

Note: (RND) is the delta calculated by using the rounded starting and ending radial bearings.

4.6.8 Area

Display or output the area in Feet or Meters from selected closed polylines or selected points around a boundary.

Dynamic Data: The area labels are associated to the polyline (when the options are set to Object and Text) and when the polyline is edited, the area labels will update.

Button
Ribbon: SmartDraft ▸ Inquiry panel ▸
Toolbar: Inquiry Tools:
Menu: SmartDraft ▸ Inquiry ▸ Area
Command entry: **asd**
Video demonstration

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Command:

Calculate areas.

Current settings: Type = <*Object/Objects/Points*>, Output = <*Screen/Text/Replace*>

Object (type): Select a single object for the area

Select polyline or [Options/Reset]: Select polyline to calculate area, **O**ptions to change options, **R**eset to reset running total, or press ENTER to end.

Objects (type): Select multiply objects for the area

Select polylines or [Options/Reset]: Select polylines to calculate area, **O**ptions to change options, **R**eset to reset running total, or press ENTER to end.

Points (type)

Specify first point for area or [Options/Reset]: Specify a point to calculate area, **O**ptions to change options. or **R**eset to reset running total, or press ENTER to end.
Specify next point or [Arc/Undo]: Specify a point, **A**rc to specify an arc, **U**ndo to undo the last segment, or press ENTER to close. Must specify at least three points to calculate an area.

Screen (output)

Object(s):
Selected objects area: 142169.44 SF, 3.26 Acres This is the area of all polylines selected at the last select objects prompt.
Running Area: 142169.44 SF, 3.26 Acres This is a running total of all areas since the start of the command.
Points:

Selected points perimeter: 2,834.78', Area: 142169.44 SF, 3.26 Acres This is the area of all points selected during the last series of points selected.
Running Area: 142169.44 SF, 3.26 Acres This is a running total of all areas since the start of the command.

Text (output)

Specify center point for area text: Specify a point.

Running Area: 66,509.60 SF, 1.53 Acres

Replace (output)

Select text to replace with <Feet/Meter> value 13,234.090 SF: Select a text or attribute string and replace the current value with the displayed value, or press ENTER to skip this value.
Select text to replace with <Acres/Hectares> value 0.30 Acres: Select a text or attribute string and replace the current value with the displayed value, or press ENTER to skip this value.
Running Area: 13,234.090 SF, 0.30 Acres

To edit: To edit the options of an existing area label, you can either use this command, change the options and select the polyline to apply the new settings, or use the SmartDraft Text Edit (**ed**) command.

4.6.8.1 Area Options

Options for the Area command.

Dialog Box Options

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Options:

Selection:	Specify the selection method. Objects to select polylines, or Points to specify points in the drawing.
Output:	Specify the output method. Screen to display the values at the Command entry, Text to add new text to the drawing, or Replace to replace the value of existing text or attribute with the area.
	When the output option is screen, the Text Output Options will be disabled.
Text Output Options:	
Feet/Meters:	Select to output the Feet/Meters text.
Prefix:	Enter a prefix string to add to the Feet/Meters text. Note: To print a space between the Area and prefix, add a space after the prefix.
Suffix:	Enter a suffix string to add to the Feet/Meters text. Note: To print a space between the Area and suffix, add a space before the suffix.
Precision:	Specify the decimal precision for the Feet/Meters area value.
Acres/Hectares:	Select to output the Acres/Hectares text.
Prefix:	Enter a prefix string to add to the Acres/Hectares text. Note: To print a space between the Acres/Hectares and prefix, add a space after the prefix.
Suffix:	Enter a suffix string to add to the Acres/Hectares text. Note: To print a space between the Acres/Hectares and suffix, add a space before the suffix.
Precision:	Specify the decimal precision for the Acres/Hectares area value.
Layer:	Select Default to user layer database or *current* to use the current layer.
Text Style:	Select Default to use Planview Small or *current* to use the current text style.

4.6.9 Area by Point

Display the area of an enclosed area by selecting a point. Create a polyline for the enclosed area.

Dynamic Data: The area labels from this command are associated to the polyline (if the Boundary option is checked) and when the polyline is edited, the area labels will update.

Calculate the area and perimeter of an enclosed area by selecting a point. Supports both Feet and Meters setup and provides the option to create the polyline and label the enclosed area.

Note: Zoom out enough to view the whole enclosed area to measure.


Button


Ribbon: SmartDraft ▸ Inquiry panel ▸ 

Toolbar: Inquiry Tools: 

Menu: SmartDraft ▸ Inquiry ▸ Area by Point


Command entry: **arp**


Video demonstration

Command:
Current settings: Polyline = <Yes/No>, Output: <Text/Screen>

Select interior point<s> for area or [Options]: Specify a point within an enclosed area on the screen, **O**ptions to change the options, or press ENTER to end.

Output:
Area: 6,099.74 SF, 0.140 ACRES, Perimeter: 347.06

Running Area: 66,509.60 SF, 1.53 Acres

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To edit: To edit the options of an existing area label, you can either use this command, change the options and select the polyline to apply the new settings, or use the SmartDraft Text Edit (**ed**) command.

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4.6.9.1 Area by Point Options

Options for the Area by Point command.

Dialog Box Options

Options:

Selection:	Specify the selection method. Point to select a single area, or Points to specify multiple areas in the drawing. When the selection option is Points, no boundary polylines will be added.
Boundary:	Select None to remove the polyline created by the command or polyline to retain the polyline boundary created by the command.
Layer:	Select the layer to place the boundary polyline.
Output:	Specify the output method. Screen to display the values at the Command entry, or Text to add new text to the drawing. When the output option is Screen the Text Output Options will be disabled.
Text Output Options:	
Feet/Meters:	Select to output the Feet/Meters text.
Prefix:	Enter a prefix string to add to the Feet/Meters text. Note: To print a space between the Area and prefix, add a space after the prefix.
Suffix:	Enter a suffix string to add to the Feet/Meters text. Note: To print a space between the Area and suffix, add a space before the suffix.
Precision:	Specify the decimal precision for the Feet/Meters area value.
Acres/Hectares:	Select to output the Acres/Hectares text.
Prefix:	Enter a prefix string to add to the Acres/Hectares text. Note: To print a space between the Acres/Hectares and prefix, add a space after the prefix.
Suffix:	Enter a suffix string to add to the Acres/Hectares text. Note: To print a space between the Acres/Hectares and suffix, add a space before the suffix.
Precision:	Specify the decimal precision for the Acres/Hectares area value.
Layer:	Select Default to user layer database or *current* to use the current layer.
Text Style:	Select Default to use Planview Small or *current* to use the current text style.

4.6.10 List Object

Display information for a selected object.

Also see: List



Button



Ribbon: SmartDraft ▸ Inquiry panel 

Toolbar: Inquiry Tools: 

Menu: SmartDraft ▸ Inquiry ▸ List Object

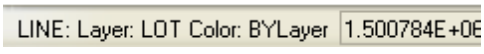


Command entry: **els**

Command:

Select object or [Pan/Zoom]: Select an object to list, **P**an to realtime pan, or **Z**oom to realtime zoom.

Note: The Object type, layer, and color are displayed at the status line when the cursor is over the object.



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Output:

LINE
Layer: LOT, Color: BYLayer, Linetype: BYLayer
From: N 6,000,519.6638 E 1,500,762.6080 Elev 0.00
To: N 6,000,620.4352 E 1,500,833.2028 Elev 0.00
<Bearing/Azimuth/Gradian> = N35°00'47"E Grade = 0.00%
2D Length = 123.03'
3D Length = 123.03'

ARC
Layer: ST-CL, Color: BYLayer, Linetype: BYLayer
Radius point: N 6,000,526.7780 E 1,500,829.2071 Elev = 0.00
Radius = 100.00', Delta = 55°28'28" (RND 55°28'28"), Length = 96.82' (96.82')
Tangent = 52.58', Chord = 93.08', <Bearing/Azimuth/Gradian> = N27°14'59"W

LWPOLYLINE: Open
Layer: CONT1, Color: BYLayer, Linetype: BYLayer
Width = 0.00
Elev = 0.00, 2D Length = 179.13'
Press ENTER to continue.

TEXT
Layer: TXT, Color: BYLayer, Linetype: BYLayer
Style: L100, Font: SIMPLEX, Justify: Center
Height: 4.00000000, Width: 1.00000000, Oblique: 00°00'00"
Rotation: 00°00'00"
Text: PAD X

Note: (RND) is the delta calculated by using the rounded starting and ending radial bearings.

4.6.11 Tangency Report

Create a tangency report from selected objects.

This command checks if selected adjoining lines and arcs are tangent, gaps between adjoining lines and arcs, bearings of lines, and deltas of arcs.

It will alert the operator with Warnings and/or Suggestions if any of the following conditions occur:

- Line segment bearings contain decimal seconds;
- Gaps between alignment segments are greater than 5 units, and did not continue checking alignment past the gap;
- Gaps between alignment segments are less than 5 units;
- Radius of arcs is not rounded to nearest unit; and/or
- Adjoining segments are not tangent.

Button
Ribbon: SmartDraft ▸ Inquiry panel
Toolbar: Inquiry Tools:
Menu: SmartDraft ▸ Inquiry Tools ▸ Tangency Report
Command entry: t**rr**

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Command:

Specify point near starting station: Specify a point at the beginning of the alignment.
Starting station <0.00>: Specify a starting station, or press ENTER for default.
Select alignment lines and arcs in order:
Select object: Select all objects that represent the alignment.

Dialog Box Options

Alignment Tangency Report:

Report Name: Enter a name for the report if creating an ASCII file from "Write File...".
Report Listing: Tangency listing of selected objects.

OK: Ends command and exits.
Print: Print report to the default Window's printer.
Write File: Create an ASCII file list of the Tangency Report.

Example

Alignment Tangency Report

3 objects selected, 3 objects processed.
From Station: 0+00.00 to Station: 8+16.04.

First segment: LINE
Starting station: 0+00.0000 Ending station: 2+22.4338
Distance: 222.43378241'
Bearing: N64d22'10.7556"E
SUGGESTION: Remove decimal seconds in Bearing. Round it to nearest 15 seconds

Next segment: ARC
LINE to ARC:
WARNING! Not tangent. Difference in Angle: 00d29'03.9576"
WARNING! 4.22745986' gap between segments
Starting station: 2+22.4338 Ending station: 5+53.3461
Delta: 37d55'11.1157"
Radius: 500.00000000'
Length: 330.91228256'

WARNING! 3.79229092' gap between segments
Next segment: LINE
ARC to LINE: Tangent
Starting station: 5+53.3461 Ending station: 8+16.0376
Distance: 262.69155915'
Bearing: N77d13'34.1711"W
SUGGESTION: Remove decimal seconds in Bearing. Round it to nearest 15 seconds

End of report

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4.6.12 Corridor Design Report

Create / View a Corridor Design Report

Create a report selected link and feature line codes of a selected baseline of a corridor.

Note: Knowledge of the Assembly used for the select baseline is very important to get a useful report. Which Link Code(s) (e.g. Top), plus and Feature Code(s) (e.g. Daylight) are important to get the full corridor section.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	No


Button


Ribbon: SmartDraft ▸ Inquiry panel 

Toolbar: Inquiry Tools: 

Menu: SmartDraft ▸ Inquiry Tools ▸ Corridor Design Report


Command entry: **crr**

Command:
Corridor Design Report
Select corridor or [List]: Select a corridor, or **L**ist to select the corridor from a dialog list.

Dialog Box Options

Corridor Information

Name	Name of selected corridor	
Baseline	Select the desired baseline to view or create a report. Only one baseline at a time can be selected.	
Alignment	Name of the alignment associated to the selected baseline.	
Profile	Name of the profile associated to the selected baseline.	
Project Name	Enter a description for the report's project.	
Created by	Enter the creator of the report.	
Output Options		
Station/Offset	Specify the decimal precision for the station / offset values.	
Offset Type:	+/-	To display the offset as a positive or negative number.
	Prefix Lt/Rt	To add the Left / Right direction as a prefix.
	Suffix Lt/Rt	To add the Left / Right direction as a suffix.
	None	To display the offset as a positive value.
Elevation:	Specify the decimal precision for the elevation values.	
Slope:	Specify the decimal precision for the slope values.	
Header:	Change the report header values.	
Code Selection		

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Link Codes	Select the link code(s) used in the Assembly to be included in the report. Note: Cannot include two level at once (e.g. Top and Base). So select only the ones needed for the desire level.
Feature Line Codes	Select the feature line code(s) used in the Assembly to be included in the report. Note: One of these are typically the daylight condition. If the daylight feature line code is not selected, the daylight slopes will not be included in the report.
Station Options	
Type:	Select "All" to include all the stations within the selected baseline in the station list, select "Filter" to filter the station list using the Filter edit box value.
Start:	Select the starting station to include in the report.
End	Select the ending station to include in the report.
Filter	Enter a filter value to limit the list of station which meet the filter station value. Is only used if the the Type is set to Filter.
Design Data	Use this section to preview the design data and a preview of the select.
<	Move to the previous station in the list
Station List	Select a station from the list.
>	Move to the next station in the list
Elevation	Display the elevation of the selected station on the baseline's profile.
Design List Area	Where the Offset, Elevation, and Slope are displayed for the selected station
Preview	
Preview Area	A graphic view of the selected stations section data. Use to preview if the correct link and feature line code(s) were selected.
View	View a report of the select stations from Start to End from the Station Options
Print	Print a report of the select stations from Start to End from the Station Options to the default printer.
Save	Save a report of the select stations from Start to End from the Station Options to a file.
Close	Close the Corridor Design Report dialog.

4.6.12.1 Corridor Design Report Header Options

Corridor Design Report Header Options

Change the header options for a Corridor Design Report.

Dialog Box Options

Header:

Check or Uncheck to include or exclude items in the report header

Company Name:	Enter the company name for the report.
Report Title:	Enter a title for the report.
Date	Check to include the date on the report.
Project Number:	Enter a project number for the report.
Project Name:	Enter a description for the report's project.
Created by:	Enter the creator of the report.

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Buttons

OK	Save option changes.
Cancel	Cancel changes to the options

4.6.12.2 Corridor Design Report View

View the Corridor Design Report information for the selected baseline, link codes, and feature line codes.

Dialog Box Options

Report Text

Header and Report information.

Buttons

Clipboard	Copy the Corridor Design Report data to the clipboard, so it can be pasted into another program.
Close	Close the view dialog.

4.7 Labeling Panel Tools

4.7.1 Labeling Overview

The labeling tool is used to create mapping type annotation labels for lines, arcs, and polylines

Getting Started

Before you can label lines, arcs, or polylines, Label Style(s) must be created. The Label Styles control the settings for layer, precision, and appearance of the labels.

The Arc (Curve) Calculation Method. Arc (curve) deltas are calculated bases on the in and out radial bearings rounded to the current Angular Precision. This method better represents deltas calculated in a closure report and helps to reduce discrepancies between labels and the closure report. Note: Using this method, the labeled delta may be different than the delta of the selected arc (curve).

Label Styles: See Labeling Style Manager

Each label is based on a label style. Label styles control how line, arc, and polyline labels appear and function. These styles control what information is labeled, such as length, chord, bearing, direction, etc. They also control label position, text appearance, precision, and layer. For example, a label style can be set up to label distance above the line and bearing below the line.

Label Styles make it easier to maintain consistency in your drawings:

- Label appearance is controlled by the text properties, such as text style, layer, leader options, and tag symbol type.
- Label content is controlled by choosing data elements. Data elements are items such as Bearing, Distance, Delta, Length, Radius, Tangent, Chord, and Chord Angle.

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The command includes several default label styles. These labeling styles have a file extension of *.lsy. Label styles are saved in the sub-folder **\LABELS** of the current Customization Template as (style name).lsy files.

To override the current style's labeling position, see Labeling Style Override Toolbar.

Labeling Table Styles: See Labeling Table Style Manager

Each table is based on a label table style. Label table styles control what data elements are included in the table and the table's appearance.

Table Label Styles make it easier to maintain consistency in your drawings:

- Table appearance is controlled by the text properties, such as text style, justification, layer, and column width.
- Table content is controlled by choosing data elements. Data elements are items such as Bearing, Distance, Delta, Length, Radius, Tangent, Chord, and Chord Angle.

SmartDraft includes several default table styles. These labeling table styles have a file extension of *.tsy. Table styles are saved in the sub-folder **\LABELS** of the current Customization Template as (style name).tsy files.

Procedure Overview

A brief overview of the labeling process:

- Create one or more labeling styles.
- Choose the preferred labeling options. Example: Label Style, Selection Type, Method, Output Type, Starting Tag Numbers, Alternate Units, and Label Size Checking.
- Create Data Table for any Label Tags in the drawing.
- Add Crow's Feet and Ticks at the beginning and ending of objects.

Post Process Labeling Tools: The original locations of the labeled objects are stored with the labels. The following tools use this information.

Labeling Tags Tool

Labeling Table

Crow's Feet - Automatic

Crow's Feet - Manual

Beginning and Ending of Arcs, and Endpoints of Lines - Tick Insert

Change Label Direction

Change Label Precision

Scale Labels

Reposition Labels

4.7.1.1 Arc (Curve) Calculation Method

Starting with 19.0.11, rounded or none rounded arc (curve) calculation method can used. See Drawing Setup.

Arc (curve) deltas are calculated based on the in and out radial bearings rounded to the current Angular Precision.

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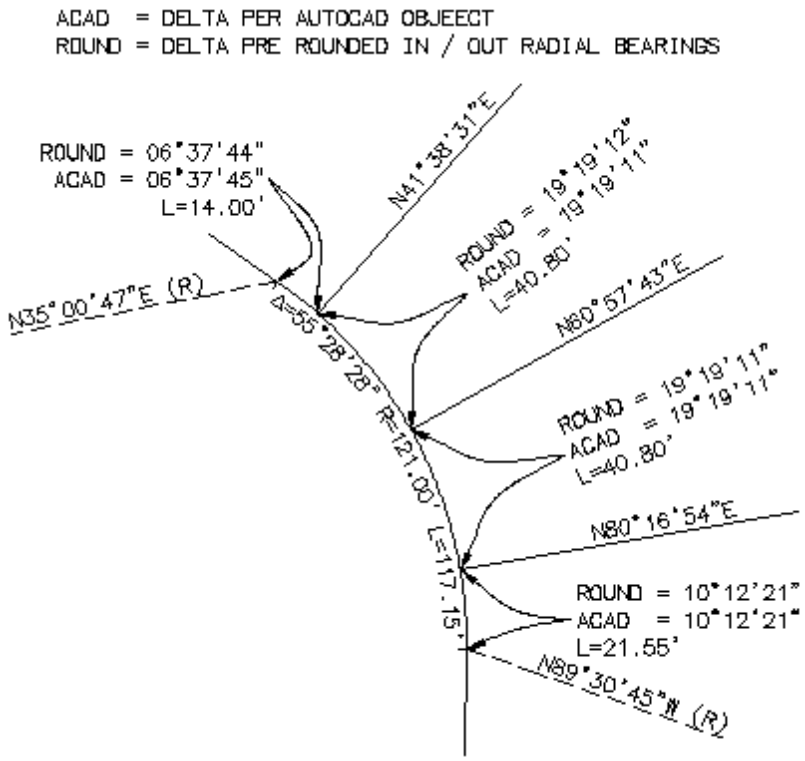
This method better represents the deltas calculated in a closure report and helps to reduce discrepancies between the labels and the closure report.

This method will reduce delta rounding error. Adding the deltas of each part of a curve should now equal the overall delta of the curve.

There still may be length rounding errors.

Note: Using this method, the labeled delta may be different than the delta of the selected arc (curve).

Example: Labeled deltas are different than the AutoCAD object delta.
But the labeled delta will calculate correctly to the in and out rounded radial bearings.



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4.7.2 Labeling

Create labels, leaders, and/or tags using the current Labeling Options and Labeling Style.

Overview

Create labels for lines, arcs, polylines, Civil 3D alignments, Civil 3D parcels, Civil 3D pipes, and BricsCAD Pro alignments. **Note**: Arced segments of block references with unequal x and y scales will not be labeled.

SmartDraft uses the Arc (Curve) Calculation Method by default. Arc (curve) deltas are calculated based on the in and out radial bearings rounded to the current Angular Precision. This method better represents deltas calculated in a closure report and helps to reduce discrepancies between labels and the closure report. Note: Using this method, the labeled delta may be different than the delta of the selected arc (curve). Starting with 19.0.11, rounded or none rounded arc (curve) calculation method can used. See Drawing Setup.


Button


Ribbon: SmartDraft ▸ Labeling panel ▸ 

Toolbar: Labeling Tools: 

Menu: SmartDraft ▸ Labeling ▸ Labeling


Command entry: **lb**

Selection Types:

Objects:

Select objects or [Options/Type/Undo]: Select all objects to be labeled (objects in blocks and Xrefs will be ignored), **O**ptions to return to Labeling Options, **T**ype to toggle selection type, or **U**ndo to erase last label.

Nested Objects:

Select object or [Options/Type/Undo]: Select each object to be labeled one at a time, press ENTER to end, **O**ptions to return to Labeling Options, **T**ype to toggle selection type, or **U**ndo to erase last label. Labels objects nested in Xrefs and blocks. Also, labels each segment of a polyline individually.

Layer:

The Label Layer Options dialog will appear. See Layer for the layer options.

Points:

The operator will be prompted to select the end points of the objects to label. See Points for all the points options.

Note: Decimal precision, angular precision, and angle type affect the labels created by the label command. These are specified within the Labeling style.

Note: When actively labeling objects, the name of the Current Style is displayed on the status bar at the bottom of the screen. When an override is activated, the Current Style is still displayed but with the additional override settings following.

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Note: When actively labeling objects, the Command entry also provides a status of certain labeling settings: Labeling Selection Type, Output, and Style. These settings are controlled by the Labeling Options dialog box and remain in effect until changed. The operator has the ability to modify these settings at any time during the labeling process by typing the letter O at the command prompt or via the right-click menu.

Labeling Style Override Toolbar is used to override the current placement options within a label style but uses all other settings, including layer, text style, prefixes, decimal precision, etc.

For example, the current style is set to display Bearing and Distance, 1 above. This style generates both data elements side by side, one line above the object. However, due to display limitations, several of the lines in the drawing need to be labeled with Bearing above and Distance below. Instead of creating a new labeling style to address this need, simply select the Bearing Above / Distance Below icon.

4.7.2.1 Labeling Options

Set the options used with Labeling command.

Button
Ribbon: SmartDraft ▸ Labeling panel ▸
Toolbar: Labeling Tools:
Menu: SmartDraft ▸ Labeling ▸ Labeling Options
Command entry: **lbo**

Dialog Box Options

Current Style:	A drop-down list of the pre-defined label styles. Specify the desired label style to be used when labeling objects. See Labeling Style Manager to define or edit label styles.
Select:	Select an existing label to set its label style current.
Selection Type:	Specify the selection method to be used, and the selection type will be included in the Type toggle.
Step:	Option to allow operators to select intersecting lines and to do detailed label placement on each selected object.
Zoom:	Toggle: When the option is selected, the command zooms to the selected objects if the end points are not visible in the current display. The command will automatically toggle the zoom option on when both the layer Selection Type and the step options are set.
Output Type:	
Draw:	Create labels in the drawing.
Report:	Display labeling data in a dialog box with an option to save this information to a file.
Tag Options:	Specify if tags will be numbers or letters, and set the next number or letter for tag labels.
Alternate Units:	Specify if alternate units will be labeled along with primary units.
Brackets:	Specify the bracket type used with alternate unit labels.
Check Label Size:	Specify the command's reaction if the label is longer than the selected object.
Buttons:	
OK:	Place labels using the current options.
Cancel:	Exit dialog box without saving changes.

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4.7.2.1.1 Labeling Step

Step through each selected object; operator is prompted for the side to place label. The step option must be selected to receive the option to select intersecting lines.

If the zooming option is selected, the command zooms to an object when either of its end points is not visible in the current display.

Command:

Select side or [Repeat/Skip/Intersecting/Location]: Specify the side to place the label or select an option.

or

Select side or [Disable repeat/Skip/Intersecting/Location]: Specify the side to place the label or select an option.

Options:

Repeat: Option to label the specified object multiple times. Useful when the operator desires to label both sides of an object and intersecting objects are different from one side to the other.

Disable: Disable the repeat mode on the current line.

Skip: Skip to the next selected object without labeling the currently indicated object.

Intersecting: Specify intersecting (tie) lines or arcs to label the intermediate segments of the current object. Select intersecting line, arc or [Fence]: Select nested/non-nested lines and arcs one at a time or use the **F**ence option to select multiple non-nested lines and arcs with the fence type selection method.

Location: Specify different placement options for the data other than that which is defined in the label style.

4.7.2.1.1.1 Labeling Location

Set the temporary location overrides when prompted during Labeling step process.

Changed locations are in effect for the current line or arc only. Once the command advances to the next line/arc, the locations defined in the current style will be used. If the repeat mode is enabled, the temporary location overrides will stay in effect until reset or the repeat mode is disabled.

Line: Set up the labeling style of lines and straight segments of polylines.
Arc: Set up the labeling style of arcs and arced segments of polylines.

Set the labeling position for the distance and bearing of a line segment.

Dialog Box Options

Bearing: Set the bearing labeling position relative to the selected line.
Distance: Set the distance labeling position relative to the selected line.

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Line Tag: Set the tag labeling position relative to the selected line.

Placement options:

No: No data will be placed for this information.
3 above: The labeling data will be placed three spaces above the line.
2 above: The labeling data will be placed two spaces above the line.
1 above: The labeling data will be placed one space above the line.
1 below: The labeling data will be placed one space below the line.
2 below: The labeling data will be placed two spaces below the line.
3 below: The labeling data will be placed three spaces below the line.
On Line: Tag option only. A tag will be placed at the midpoint of the selected line.
Tag: Bearing option only: When selected, a tag will be placed at the specified location. Table created as a separate process.
Leader/Text: The labeling data will be placed next to the selected line using the specified leader options.
Leader/Tag: Bearing option only: When selected a labeling tag will be placed next to the selected line using the specified leader options.

Set the labeling position for the delta, length, radius, tangent, chord, and chord angle of an arc segment.

Dialog Box Options

Delta: Set the delta labeling position relative to the selected arc.
Radius: Set the radius labeling position relative to the selected arc.
Length: Set the length labeling position relative to the selected arc.
Tangent: Set the tangent labeling position relative to the selected arc.
Chord: Set the chord labeling position relative to the selected arc.
Chord Angle: Set the chord angle labeling position relative to the selected arc.
Arc Tag: Set the tag labeling position relative to the selected arc.

Placement options:

No: No data will be placed for this information.
3 above: This data type will be placed three spaces above the arc.
2 above: This data type will be placed two spaces above the arc.
1 above: This data type will be placed one space above the arc.
1 below: This data type will be placed one space below the arc.
2 below: This data type will be placed two spaces below the arc.
3 below: This data type will be placed three spaces below the arc.
On Line: Tag option only. A tag will be placed at the midpoint of the selected arc.
Tag: Delta option only: When selected, a tag will be placed at the specified location. Table created as a separate process.
Leader/Text: The labeling data will be placed next to the selected arc using the specified leader options.
Leader/Tag: Delta option only: When selected, a labeling tag will be placed next to the selected arc using the specified leader options.

4.7.2.1.2 Tag Options

Set the tag type of numbers or letters, and assign the next tag value to be used when a tag is placed. Set in Labeling Options**.**

Tags:

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Numbers	Indicates numbers will be used when placing tags. The Numbers option honors any Tag Prefixes assigned in the labeling style.
Letters	Indicates letters will be used when placing tags. The Letters option ignores the Tag Prefixes assigned in the labeling style.
Sequential	Check to increment the tag number or letter or un-check to check for the tag number or letter.
Message	Indicates if the same number or letter is used for Arc and Line tags. The same tag is used for both Lines and Arcs if the labeling style specifies the same symbol and prefix for both the lines and arcs, or the letters option is selected.
Type	Display the current labeling style's symbol type.
Prefix	Display the current labeling style's prefix type.
Tag	Enter starting/next number or letter to be used when placing labeling tags. **Note:** Tags are assigned consecutively. Unless a tag is currently being used, the next available tag will be used automatically.

4.7.2.1.3 Alternate Units

Alternate units labeling displays the label in an additional measurement system. They commonly display the metric equivalent for imperial labels or the imperial version for metric labels. Alternate units labeling is displayed in the bracket type selected next to the primary units. Alternate units are created for all values except angular.

- Multiplier for Alternate Units is the DIMALTF setvar. The primary unit is multiplied by DIMALTF to create the alternate units.
- The DIMAPOST setvar is used to place a text suffix on alternate unit measurements, except for angular.

4.7.2.1.4 Check Label Size

Specify the reaction if the label is too long for the selected object.

Starting numbers:

If Too Long:	Specify the reaction to labels which are too long for the selected object. Options include: Leader, Place, Prompt, or Tag.
Leader:	Place label in drawing next to selected object using the current leader settings.
Place:	Place the label on the selected object, and the command will try to stack the label to reduce the text overhang.
Prompt:	Prompt operator with options: Leader, Place, Tag, or Skip.
Tag:	Place a label tag using the current style's tag settings.
Skip:	No label is placed.
Prompt Type:	Specify if the prompt for placement options will be a dialog box or Command entry.

4.7.2.2 Selection Type

Objects:	Objects in the current file. Can select multiple objects with the standard AutoCAD selection options. This option ignores objects nested in blocks and Xrefs. Lines, arcs, and polylines are the only objects that can be labeled, all other object types are filtered out of the selection set.
Nested:	Can select an object in the current file or a nested object in a block, Xref, or polyline segment. Can only select one object at a time.
Layers:	Select objects in the current file based on their layer. Can select multiple layers at a time from a list by holding the Ctrl or Shift key down.

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Points: Label lines by selecting the start and end points. Label arcs by selecting the start and end points in a counter-clockwise direction.

Note: The toggle after the selection type indicates if the selection type will be included in the cycle Selection Type when the Type option is entered at the Command entry.

4.7.2.3 Points Selection Type

Label lines by selecting the start and end points. Label arcs by selecting the start and end points in a counter-clockwise direction.

Command:

Select object type or [Option/Type/Undo]: Select a line or arc segment to label, **O**ption to return to Labeling Options, **T**ype to toggle selection type, or **U**ndo to erase last label.

LINE selected:

Specify from point: Select the first point, or press ENTER to end.

Specify to point or [Undo]: Select the next point, or press ENTER to return to the From Point: prompt, or **U**ndo to erase last label.

ARC selected:

Select counter-clockwise. Specify from point: Select the first point, or press ENTER to end.

Specify to point or [Undo]: Select the end point, or press ENTER to return to From Point: prompt, or **U**ndo to erase last label.

4.7.2.4 Select Text Style

Select a substitute text style when the text style defined in labeling style is not already defined in the drawing.

If the defined text style is not in the drawing when the labeling command is selected, the operator will be requested to use the current text style, select a text style defined in the current drawing, or load a Land Desktop STP file (style set), which defines the desired text style.

Starting numbers
Message: Informs operator when a substitute text style is used.

Buttons:
Current: Set the substitute text style to the current text style in the drawing.
Select: Select the text style from a list of all text styles defined in the current drawing.
STP: Load a Land Desktop style set or *.stp file. Once the styles defined in the style set are loaded, the command will confirm the desired style was in the selected style set. See Land Desktop help for more information on style sets.
OK: Close the dialog box, and use the text style indicated in the second message line.

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4.7.2.5 Options

Set the processing method and default position.

Processing method [Step/Automatic] <default>: Specify the processing method.

Step

The selected labels are processed one at a time, allowing the operators to specify a different position for each label.

Automatic

The selected labels are processed as a group. The specified position is applied to the selected labels.

Position for labels

[3Above/2Above/1Above/Online/1Below/2Below/3Below] <default>: Specify the new position for all selected annotation labels.

4.7.2.6 Label Layer Options

Labeling Option to place labels for all lines and arcs on layer(s) by the selected layer method.

Dialog Box Options

Layer Methods

List	Select the layer(s) to label from a list box of all non-Xref layers in the drawing.
Select	Select the layer(s) to label by selecting the object(s) from the drawing screen.
Nested	Select the nested layer(s) to label by from the list box of all layers in the selected block or Xref.

Buttons:

Options	Set options used with Label command.
Close	Exit the labeling without doing anything.

4.7.2.6.1 List Method

Label all lines, arcs, and polylines on layer(s) in the current drawing.

To select more than one layer name, hold the Shift or Ctrl key down when selecting layer names.

Dialog Box Options

Layer List:

Layers:	List of layers in the current drawing. Select layer(s) to label.
Buttons:	
OK:	Label objects on the selected layer(s).
Cancel:	Exit without labeling objects.

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4.7.2.6.2 Select Method

Label all lines, arcs, and polylines on layer(s) in the current drawing by selecting an object from the drawing screen.

Command:

Select layer(s) to label

Select object: Select object(s) on the layer(s) to label.

4.7.2.6.3 Nested Method

Label all lines, arcs, and polylines on layer(s) nested in a block or Xref.

To select more than one layer name, hold the Shift or Ctrl key down when selecting layer names.

Command:

Select block or Xref to label: Select the block or Xref to label.

Dialog Box Options

Layer List:

Layers: List of layers in the selected Xref or layers in the current drawing if a block is selected. Select layer(s) to label.

Buttons:

OK: Label object(s) on the selected layer.

Cancel: Exit without labeling objects.

4.7.2.7 Label if too Long

Labeling placement method if label is too long. Either a dialog box or Command entry prompt.

Options: Specify the reaction to labels which are too long for the selected object. Options include: Leader, Place, Prompt, or Tag.

Label is too long. Specify [Skip/Place/Tag/Leader] <default>:

Skip: No label is placed.

Place: Place the label - Command will try to stack the label to reduce the text overhang.

Tag: Place a label tag using the current style's tag settings.

Leader: Place label in the drawing next to selected object using the current style's leader settings.

4.7.2.8 Labeling Edit

Edit Line, Curve, or Tag Label created using the Labeling command.

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Button

Ribbon: SmartDraft ▸ Text panel ▸ Edit labels pull-down

Toolbar: Text Tools:

Menu: SmartDraft ▸ Text ▸ Label Edit

Command entry: **ed**

Double-click a Line, Curve, or Tag label to start command also.

Options

Style:	A list of the currently defined labeling styles. Select the labeling style to assign to the label. Labeling style controls decimal precision of the label.
Prefix:	Enter the prefix.
Value Toggle:	Check to manually modify the label information. Use the entered value, not the calculated value.
Value Edit Box:	Enter a modified label value.
Suffix:	Enter the suffix.
Tag:	Check to convert to a tag label.
Line:	
Bearing:	Check to include the bearing in a line label.
Distance:	Check to include the distance in a line label.
Curves:	
Delta:	Check to include the delta in a curve label.
Radius:	Check to include the radius in a curve label.
Length:	Check to include the length in a curve label.
Tangent:	**Check to include the tangent in the label.**
Chord Length:	Check to include the chord length in the label.
Chord Angle:	Check to include the chord angle units in the label.
Alternate Units:	Check to include alternate units in the label.

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4.7.3 Label Style Select

Select an existing label to set its label style current for use with Labeling.


Button

Toolbar: Labeling Style Override:

Command:
Select a label to set its label style current
Select objects: Select a label. The label style of the selected label is set current.
Label style "<Label style name>" set current.

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4.7.4 Labeling Tags Tool

Renumber, consolidate, or zoom to labeling tags.

Note: For labeling tags created by the Labeling command.
It is recommended to modify the tags before creating the table, because this tool does not update the labeling tables created from the original tags.


Button


Ribbon: SmartDraft ▸ Labeling panel ▸ 
Toolbar: Labeling Tools: 
Menu: SmartDraft ▸ Labeling ▸ Labeling Tags Tool


Command entry: **ltt**

Dialog Box Options

Tag Types:

Symbol: Specify the symbol type to process by the tags tool. Lists only those symbol types found in the current drawing.

Prefix: Specify the prefix type to process by the tags tool. Lists only the prefix types, of the symbol type selected, found in the drawing.

Numbers: Indicates the command will process number-based tags only.

Letters: Indicates the command will process letter-based tags only.

Message: Display the tags found in the current drawing for the symbol and prefix selected.

Tags:

List Box: The list of labeling tags of the selected symbol, prefix, and character type in the current drawing.

Select All: Selects and highlights all labeling tags listed in the list box. The highlighted labeling tags will be processed by the selected tool.

Zoom: Zoom to the selected labeling tag. Only one tag can be selected.

Delete: Delete the selected labeling tags from the drawing.

Renumber: Change the numbers or letters either by the sequential or consolidate option.

Starting Tag: Specify the new starting tag number or letter. Note: The command will skip tag numbers or letters that are already in the drawing.

Sequential: Change labeling tags sequential from the specified starting tag. This option will skip any labeling tag numbers or letters not selected in the list box.

Consolidate: Change labeling tags by combining tag numbers or letters with identical line and arc data the tags represent. This option will skip any existing labeling tags that would create a duplicate tag for no duplicate data.

Lines Select the data type to use during the consolidate process of tagged lines.

- ***Bearing and Distance*** All lines with identical bearings and distances will be combined.
- ***Bearing*** All lines with identical bearings will be combined.
- ***Distance*** All lines with identical distances will be combined.

Arcs Select the data type to use during the consolidate process of tagged arcs.

- ***Radius and Delta*** All arcs with identical radii and deltas will be combined.
- ***Radius and Length*** All lines with identical radii and lengths will be combined.
- ***Radius, Length and Chord Angle*** All lines with identical radii, lengths, and chord angles will be combined.

Buttons:

OK: Create labeling table with the current settings and style.

Cancel: Exit labeling tags tool without modifying any tags.

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4.7.4.1 Consolidate Tags

Specify the precision and angle type to be used during the consolidation process.

Display when the Consolidate option of the Labeling Tags Tool is selected.

Dialog Box Options

Precision:

Linear	Specify the coordinate precision for linear consolidation.
Angular	Specify the coordinate precision for angular consolidation.

Bearing:

Type	Specify the angle type for consolidation.

Buttons:

OK:	Consolidate the selected tags using the specify precision and bearing settings.
Cancel:	Exit labeling tags tool without modifying any tags.

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4.7.5 Labeling Table

Create a labeling table using the table options and table style.

The Arc (Curve) Calculation Method. Arc (curve) deltas are calculated based on the in and out radial bearings rounded to the current Angular Precision. This method better represents deltas calculated in a closure report and helps to reduce discrepancies between labels and the closure report. Note: Using this method, the labeled delta may be different than the delta of the selected arc (curve). Starting with 19.0.11, rounded or none rounded arc (curve) calculation method can used. See Drawing Setup.


Button


Ribbon: SmartDraft ▸ Labeling panel ▸ 

Toolbar: Labeling Tools: 

Menu: SmartDraft ▸ Labeling ▸ Labeling Table


Command entry: **lbt**

Dialog Box Options

Current Style	A drop-down list of the pre-defined labeling table styles. Specify the desired labeling table style to be used when creating the table. Either a line or arc or combined line and arc table can be created. See Labeling Table Style Manager to define or edit table styles.
Tag Types:	
Symbol:	Specify the symbol type to include in the table. Lists only those symbol types found in the current drawing.
Prefix:	Specify the prefix type to include in the table. Lists only the prefix types, of the symbol type selected, found in the drawing.
Message:	Display the type of tags found in the current drawing for the symbol and prefix selected. Warning: If the message reads, "Only Arc tags found", and the current style is a Line-only type table, no data lines will be created.
Tags:	
By Tag or By Viewport	Select By Tag to use the All or Starting and Ending tag numbers as input option, or By Viewport to select viewport(s) to find tags within the viewport as input option.
All:	If selected, all tags based on the Style, Symbol, Prefix, and Number or Letter settings will be included in the table. If not selected, select a Starting and Ending number to specify a range to insert additional lines of data to an existing table.
Numbers:	Indicates the table will include number-based tags only.
Letters:	Indicates the table will include letter-based tags only.
Starting:	Specify the starting tag to include in the table, if the **All** toggle is off.
Ending:	Specify the ending tag to include in the table, if the **All** toggle is off.
Include Duplicate Tags:	Check to create a data line for every tag following the current settings even if the tag and data are duplicates. Uncheck to create only one data line for each unique tag label following the current settings.
Options:	
Table or File	Select Table to output the tag information to a table in the drawing, or select File to output the tag information to a text file.
Title Text	Add the Title Text defined in the selected style.
Header Text	Add the Header Text for the table.
Text / Symbol Tag	Specify if the tag number will be text or the symbol with text in the value lines.
Title Lines	Create lines around Title Text in the data table.
Header Lines	Create lines around Header Text in the data table.
Values Lines	Create lines around values in the data table.

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Alternate Units Add alternate unit dimensions to the table after each drawing unit dimension. The command uses the DIMALTF servar to calculate the alternate dimensions and DIMAPOST to specify the unit type.
Add Bearing Space Add a space after the N or S and before the W or E in the bearing output value. (N 45 vs N45).
Angle Type: Specify the output angle type.
Round to nearest 10 seconds Check to round an angle to the nearest 10 seconds.
Buttons:
OK: Create labeling table with the current settings and style.
Cancel: Exit labeling table setup without creating a table.

4.7.6 Labeling Style Manager

Create and modify labeling styles used with the Labeling command.

Label styles hold the values used when creating labels with the labeling command.


Button

Ribbon: SmartDraft ▸ Labeling panel 
Toolbar: Labeling Tools: 
Menu: SmartDraft ▸ Labeling ▸ Labeling Style Manager

Command entry: **lbs**

Dialog Box Options

Name: A list of the currently defined labeling styles. Select the labeling style to edit.
Save As: Save the current labeling settings to a new style.
Lock: Set the selected labeling style (Name above) as read-only. Lock a style to avoid accidental modification. See Unlock Customization Template Files to remove the lock.
Delete: Delete the current labeling style. **Note:** Cannot delete the "default" or a locked style. Deleting a style cannot be undone.
Rename: Rename the current label style.
Line Setup: Control the line setup options.
Arc Setup: Control the arc setup options.
Precision: Control the decimal precision options.
Leader: Control the leader options.
Text: Control the labeling text options.
Buttons:
Apply: Apply any changes made to current style.
Close: Exit Labeling Style Manager without saving changes.

Note: Label styles are saved in the sub-folder **\LABELS** of the current Customization Template as (style name).lsy files.

4.7.6.1 Line Setup

Bearing: Set the bearing labeling position relative to the selected line(s). Note: In order to use Tags for Lines, the bearing setting MUST be set to "Tag."

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Prefix: Enter a prefix to be added to the bearing.
Distance: Set the distance labeling position relative to the selected line(s).
Prefix: Enter a prefix to be added to the distance.
Tag: Set the tag labeling position relative to the selected line(s).
Align: Specify if the label tag will be aligned parallel to the line or horizontal to the screen. Checked indicates parallel to line.
Tag Symbol: Specify a tag symbol. Options: Text Only, Circle, Diamond, Hexagon, Keyhole, Oval, Pentagon, Rectangle, Star, Square, or Triangle.
Tag Prefix: Enter the tag labeling prefix for line data placed in a table. Default is the letter "T". The tag prefix can only be alphabetic characters with no spaces.
Angle Type: Specify the angle display type.
Add Bearing Space: Specify if a space will be added after the N or S and before the W or E (N 45 vs N45).

Note: Prefixes are applied even if a Labeling Style Override Icon is selected.

Placement Options:
No: Data type will not be placed.
3 above: The data will be placed three spaces above the line.
2 above: The data will be placed two spaces above the line.
1 above: The data will be placed one space above the line.
1 below: The data will be placed one space below the line.
2 below: The data will be placed two spaces below the line.
3 below: The data will be placed three spaces below the line.
On Line: Tag option only. Tag will be placed at the midpoint of the selected line(s).
Tag: Bearing option only: When selected, a tag will be placed at the specified location. Table created as a separate process.
Leader/Text: Bearing option only: When selected, labeling data will be placed next to the selected line(s) using the specified leader options.
Leader/Tag: Bearing option only: When selected, a labeling tag will be placed next to the selected line(s) using the specified leader options.

4.7.6.2 Arc Setup

Delta: Set the delta labeling position relative to the selected arc(s). Note: In order to use Tags for Arcs, the bearing setting MUST be set to "Tag."
Prefix: Enter a prefix to be added to the delta. Use the prefix \U+0394= to create the delta symbol.
Radius: Set the radius labeling position relative to the selected arc(s).
Prefix: Enter a prefix to be added to the radius.
Length: Set the length labeling position relative to the selected arc(s).
Prefix: Enter a prefix to be added to the length.
Tangent: Set the tangent labeling position relative to the selected arc(s).
Prefix: Enter a prefix to be added to the tangent.
Chord: Set the chord labeling position relative to the selected arc(s).
Prefix: Enter a prefix to be added to the chord.
Chord Angle: Set the chord angle labeling position relative to the selected arc(s).
Prefix: Enter a prefix to be added to the chord angle.
Tag: Set the reference labeling position relative to the selected arc(s).
Align: Specify if the label tag will be aligned parallel to the arc or horizontal to the screen. Checked indicates parallel to arc.
Tag Symbol: Specify a tag symbol. Options: Text Only, Circle, Diamond, Hexagon, Keyhole, Oval, Pentagon, Rectangle Star, Square, or Triangle.
Tag Prefix: Enter the tag labeling prefix for arc data placed in a table. Default is the letter "C". The tag prefix can only be alphabetic characters with no spaces.

Note: Prefixes are applied even if a Labeling Style Override Icon is selected.

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Placement Options:

No:	Data type will not be placed.
3 above:	The data will be placed three spaces above the arc.
2 above:	The data will be placed two spaces above the arc.
1 above:	The data will be placed one space above the arc.
1 below:	The data will be placed one space below the arc.
2 below:	The data will be placed two spaces below the arc.
3 below:	The data will be placed three spaces below the arc.
On Line:	Tag option only. Tag will be placed at the midpoint of the selected arc(s).
Tag:	Delta option only: When selected, a tag will be placed at the specified location. Table created as a separate process.
Leader/Text:	Delta option only: When selected, labeling data will be placed next to the selected arc(s) using the specified leader options.
Leader/Tag:	Delta option only: When selected, a labeling tag will be placed next to the selected arc(s) using the specified leader options.

4.7.6.3 Precision

Linear

0	Outputs length measurements to the nearest unit, 128.
1 - **8**	Outputs length measurements to the decimal precision entered.

Angular - Angle Type: All North, North and South, N Azimuth, S Azimuth, and Azimuth < 180

0	Outputs angles in degrees, 128d.
1 or **2**	Outputs angles in degrees, and minutes, 128d12'.
3 or **4**	Outputs angles in degrees, minutes, and seconds 128d12'52".
5	Outputs angles in degrees, minutes, and seconds 128d12'52.1".
6	Outputs angles in degrees, minutes, and seconds 128d12'52.12".
7	Outputs angles in degrees, minutes, and seconds 128d12'52.123".
8	Outputs angles in degrees, minutes, and seconds 128d12'52.1234".

Angular - Angle Type: Gradians

0	Outputs angles in gradians, 0g.
1	Outputs angles in gradians, 0.0g.
2	Outputs angles in gradians, 0.00g.
3	Outputs angles in gradians, 0.000g.
4	Outputs angles in gradians, 0.0000g.
5	Outputs angles in gradians, 0.00000g.
6	Outputs angles in gradians, 0.000000g.
7	Outputs angles in gradians, 0.0000000g.
8	Outputs angles in gradians, 0.00000000g.

Round to nearest 10 seconds Check to round an angle to the nearest 10 seconds. Only available if angular precision set to 0'00"00".

Alternate	Alternate unit precision.
0	Outputs length measurements to the nearest unit, 128.
1 - **8**	Outputs length measurements to the decimal precision entered.

4.7.6.4 Leader

Type:	One of three selections can be made on leader type. Leader types are Straight, Spline, or None.

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Arrowhead: Specify the arrowhead type to be used when placing leaders.

Layer: Specify on which layer the labeling leader will be placed. Select *Type a Layer Name* to specify a layer not in the current drawing. If the layer does not exist in the drawing being labeled, the command will create the layer with the color white and the linetype continuous. Selecting either "Preset Labeling Text" or "Preset Leader" will use the layer defined in the layer data base for that select.

4.7.6.5 Text

Style: Select the text style to use for labeling text. All text styles defined in the current drawing are listed with three special selections of *current*, * Type a style name*, or Preset Small Text. *current* uses the style current when the label command starts. Preset Small Text style uses the style Small defined by this software. *Type a style name* allows an operator to type any text style, even if it does not exist in the current file.

Height: This is the height that will be used if the selected style is not a fixed height style. **Note:** The specified height will be multiplied by the horizontal scale to create the actual height of the style.

Layer: Specify on which layer the text labels will be placed. Select *Type a Layer Name* to specify a layer not in the current drawing. If the layer does not exist in the drawing being labeled, the command will create the layer with the color white and the linetype continuous. Selecting either "Preset Labeling Text" or "Preset Leader" will use the layer defined in the layer data base for that select.

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4.7.7 Labeling Table Style Manager

Create and modify labeling table styles used with the Labeling Table command.


Button

Ribbon: SmartDraft ▸ Labeling panel ▾

Toolbar: Labeling Tools:

Menu: SmartDraft ▸ Labeling ▸ Labeling Table Style Manager

Command entry: **lbts**

Dialog Box Options

Name:	A list of the currently defined labeling table styles. Select the labeling table style to edit.
Save As:	Save the current table settings to a new style.
Lock:	Set the current table styles (Name: above) as read-only. Lock a style if you desire to avoid accidental modification. See Unlock Customization Template Files to remove the lock.
Delete:	Delete the current labeling table style. **Note:** Cannot delete the "default" or a locked style. Deleting a style cannot be undone.
Rename:	Rename the current table style.
Table Setup:	Specify the title text, type, text styles, text heights, and layers to be used to create the table.
Title Text	Enter a text string to be used as the table title.
Type:	Specify the type of object data to be included in the table. Options: Line, Arc, and Combined Line and Arc table.
Style:	All text styles defined in the current drawing are listed with five special selections of *current*, * Type a style name*, or Preset Small, Medium, and Large Text. *current* uses the style current when the table command starts. Preset Small, Medium, or Large Text style uses the style Small, Medium, or Large defined by this software. *Type a style name* allows an operator to type any text style, even if it does not exist in the current file.
Title:	Specify the text style to use for the Title text.
Justify:	Specify the text justification for the Title text. Options are Left, Center, and Right.
Header:	Specify the text style to use for the Header text.
Data:	Specify the text style to use for the Data text values.
Height:	Specify the height for the selected text style for the Title, Header, and Data text. **Note:** The specified height will be multiplied by the horizontal scale to create the actual height of the style.
Layer:	Specify the layer for the Title, Header, and Data text. Also specify the layer for the Table Lines. Select *Type a Layer Name* to specify a layer not in the current drawing. If the layer does not exist in the drawing being labeled, the command will create the layer with the color white and the linetype continuous. Selecting either "Preset Labeling Text" or "Preset Leader" will use the layer defined in the layer data base for that select.
Table Values:	Specify the data values, header text, justification, and column width to be used to create the table. Note: Up to 10 columns can be defined.
Value:	Specify the data value type for the defined column. Options are Bearing/Delta, Distance/Length, Radius, Tangent, Chord, Chord Angle, and Prompted Note.
Header:	Specify the header text used with the value specified above.
Justify:	Specify the text justification for the data in the defined column. Options are Left, Center, and Right.
Width:	Specify the width of the column. Options are 8 - 30. The number is the width of one text character of the selected text style. Remember to specify enough characters to hold the selected data type. If the data value is too long, it will extend into the next column.
Precision:	
Delta Prefix:	Enter a prefix to be added to the delta. Use the prefix \U+0394= to create the delta symbol.
Buttons:	

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Apply: Apply any changes made to current style.
Close: Exit Labeling Table Style Manager without saving changes.

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4.7.8 ALTA Label

Label a distance, direction, and description label.

Create an ALTA type label from a selected point, point block, or point object.


Button

Ribbon: SmartDraft ▸ Labeling panel ▸ Label Extras pull-down 

Toolbar: Labeling Tools on the Labeling: 

Menu: SmartDraft ▸ Labeling ▸ ALTA Labels

Command entry: **alt**

Command:

Point method: <COGO/Drawing>, Description: <Select/Type It>, Style: <Arrow/2 Arrows/Circle>, Direction text: <a text string>, Output: <Block/Text>

If **COGO Point** is point method:

Select COGO point description, text, or [Edit/Options/Update]: Select a point (1), **E**dit to edit labels, **O**ptions to change the options, **U**pdate to update the values, or press ENTER to end.

Select line: Specify the point (2) on the line to calculate distance and direction. Distance is calculated perpendicular or radial from selected point.

For description

Description: If description type is Type It, enter a description for the object at the selected point; otherwise, the description is read from the selected object.

Specify point or [Pan/Zoom]: Specify a point (3) to create the label, **P** for real time Pan, or **Z** to real time Zoom. Do not press ENTER after **P** or **Z**. Adjust display first, then press ENTER to exit display command.

If **Drawing Point** is point method:

Specify point or [Edit/Options/Update]: Select a point (1), **E**dit to edit labels, **O**ptions to change the options, **U**pdate to update the values, or press ENTER to end.

Select line: Specify the point (2) on the line to calculate distance and direction. Distance is calculated perpendicular or radial from selected point.

For description

Description: Enter a description for the object at the selected point.

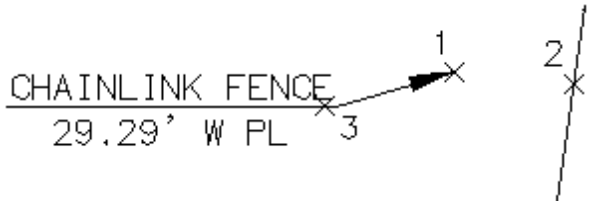
or

Select text description: Select a text string, an attribute, point block, or point object.

Specify point or [Pan/Zoom]: Specify a point (3) to create the label, **P** for real time Pan, or **Z** to real time Zoom. Do not press ENTER after **P** or **Z**. Adjust display first, then press ENTER to end.

Example:

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4.7.8.1 ALTA Label Options - Output: Block

Options for ALTA label created by the ALTA Label command.

See Output: Text options

ALTA Label Options:

Leader Select the leader type: Straight, or Angle Point

Point

Drawing Specify an x/y point in the drawing as the insertion point.

COGO Select a point block or point object as the insertion point.

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Label

Angular Specify the output Angle Type.

Precision Specify the Angular Precision.

Add Specify if a space will be added after the N or S and before the W or E (N 45 E vs N45E).

Descriptio

Placemen Select the location of the description value.

Type It: Receive a prompt requesting the description.

Select: If drawing point is selected above, operator will be prompted to select text, attribute, or block/point object for the description.

Direction

Placemen Select the location of the direction value. If the placement value of direction is the same as description, as space " " will be added between the two values.

Input Select the direction type: N/S (the direction with be abbreviated), or North/South (the direction will be the full word).

Value Enter the Line Selection suffix value, e.g., PL

Note 1: Toggle to include note 1 value (1st) of the label.

Note 2: Toggle to include note 2 value (2nd) of the label.

Note 3: Toggle to include note 3 value (3rd) of the label.

Note 4: Toggle to include note 4 value (4th) of the label.

Note: Common options for Note 1, 2, 3, and 4.

Placemen Specify the location of the note value.

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Input Select the input option for the note.
Value: Enter the note value, if the input option is set to Note.

Layers
Layer: Set the output layer type. Default (to use the layer database layer) or *current*.
Layer Toggle the layer type for the layer name selection.

Node

Arrow Option to include an arrowhead at the end of the label.
2 Arrows Option to include an arrowhead at both the selected point, and the point on the selected line.
Circle: Option to include a solid circle at the end of the label.

4.7.8.2 ALTA Label Options - Output: Text

Options for ALTA label created by the ALTA Label command.
See Output: Block options

ALTA Label Options:
Leader Select the leader type: Straight, or Angle Point

Point

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Drawing Specify an x/y point in the drawing as the insertion point.

COGO Select a point block or point object as the insertion point.

Label

Angular Specify the output Angle Type.

Precision Specify the Angular Precision.

Add Specify if a space will be added after the N or S and before the W or E (N 45 E vs N45E).

Descriptio

Placemen Select the location of the description value.

Type It: Receive a prompt requesting the description.

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Select: If drawing point is selected above, operator will be prompted to select text, attribute, or block/point object for the description.

Direction

Placemen Select the location of the direction value. If the placement value of direction is the same as description, as space " " will be added between the two values.

Input Select the direction type: N/S (the direction with be abbreviated), or North/South (the direction will be the full word).

Value Enter the Line Selection suffix value, e.g., PL

Note 1: Toggle to include note 1 value (1st) of the label.

Note 2: Toggle to include note 2 value (2nd) of the label.

Note 3: Toggle to include note 3 value (3rd) of the label.

Note 4: Toggle to include note 4 value (4th) of the label.

Note: Common options for Note 1, 2, 3, and 4.

Placemen Specify the location of the note value.

Input Select the input option for the note.

Value: Enter the note value, if the input option is set to Note.

Layers

Layer: Set the output layer type. Default (to use the layer database layer) or *current*.

Layer Toggle the layer type for the layer name selection.

Node

Arrow Option to include an arrowhead at the end of the label.

2 Arrows Option to include an arrowhead at both the selected point, and the point on the selected line.

Circle: Option to include a solid circle at the end of the label.

4.7.8.3 ALTA Label Edit

Edit ALTA labels created by the ALTA Label command.

Edit ALTA Labels:

Label

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Angular Specify the output Angle Type.

Precision Specify the Angular Precision.

Add Specify if a space will be added after the N or S and before the W or E (N 45 E vs N45E).

Descriptio

Placemen Select the location of the description value.

Value Enter or edit the existing description value.

Direction

Placemen Select the location of the direction value. If the placement value of direction is the same as description, as space " " will be added between the two values.

Input Select the direction type: N/S (the direction with be abbreviated), or North/South (the direction will be the full word).

Value Enter the Line Selection suffix value, e.g., PL

Note 1: Toggle to include note 1 value (1st) of the label.

Note 2: Toggle to include note 2 value (2nd) of the label.

Note 3: Toggle to include note 3 value (3rd) of the label.

Note 4: Toggle to include note 4 value (4th) of the label.

Note: Common options for Note 1, 2, 3, and 4.

Placemen Specify the location of the note value.

Value: Enter the note value, if the input option is set to Note.

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Node

Arrow Option to include an arrowhead at the end of the label.

2 Arrows Option to include an arrowhead at both the selected point, and the point on the selected line.

Circle: Option to include a solid circle at the end of the label.

4.7.9 Radial Bearing Label

Label the radial bearing/angle of a point on an curve.

Create the radial bearing/angle of a selected point along an arc.


Button


Ribbon: SmartDraft ▸ Labeling panel ▸ Label Extras pull-down 

Toolbar: Labeling: 

Menu: SmartDraft ▸ Labeling ▸ Radial Bearing


Command entry: **rbr**

Command:

Option: <Default/*current*>, <Angle/Straight>, Radial text <above/below>, Angle: <Mixed/North>, Text: <(R)>

Select curve or [Edit/Options/Update]: Select the arc (1). To identify the radius point, **E**dit to edit the radial labels, **O**ptions to change the options, or **U**pdate to reread the radius point and location and update the values.

Select radial point: Specify the point (2). To calculate the radial bearing.

Specify point or [Pan/Zoom]: Specify a point (3) to create the label, **P** for real time Pan, or **Z** to real time Zoom.

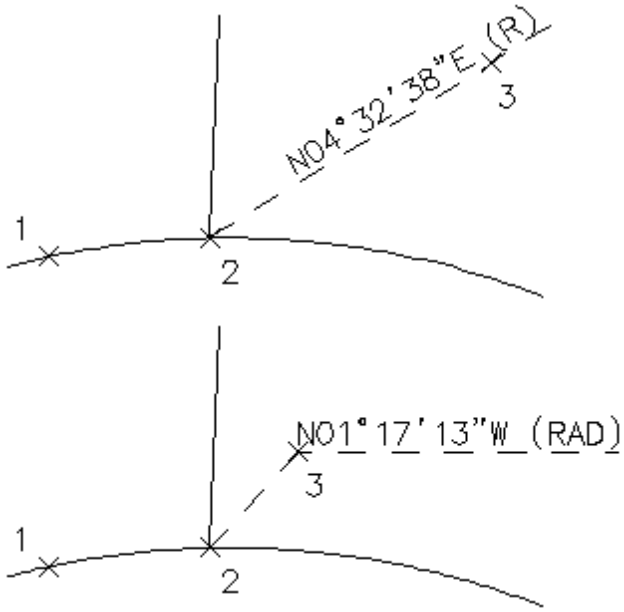
Note: The Edit and Update options only edit or update radial labels created with SmartDraft v10.x or later
The label is a Dynamic Block.

If **Add (R) to text**

Select text or [Options]: Select text strings to add radial text suffix, **O**ptions to change options, or press ENTER to end.

Example

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4.7.9.1 Radial Bearing Label Options

Options for radial bearing label created by the Radial Bearing Label command.

Radial Labels Options

Radial Select the radial type: Straight, Angle Point, or Add Text

Label

Angular Specify the output Angle Type.

Precision Specify the Angular Precision.

Add Specify if a space will be added after the N or S and before the W or E (N 45 E vs N45E).

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Angle

Placemen Select the location of the angle value.

Radial

Placemen Select the location of the radial text value.

Value Enter the radial text value, e.g., (R).

Note 1: Toggle to include note 1 value (1st) of the label.

Note 2: Toggle to include note 2 value (2nd) of the label.

Note 3: Toggle to include note 3 value (3rd) of the label.

Note 4: Toggle to include note 4 value (4th) of the label.

Note: Common options for Note 1, 2, 3, and 4.

Placemen Specify the location of the note value.

Input Select the input option for the note.

Value: Enter the note value, if the input option is set to Note.

Layers

Layer: Set the output layer type. Default (to use the layer database layer) or *current*.

Layer Toggle the layer type for the layer name selection.

Node

Arrow: Option to include a solid arrow at the end of the label. Added 21.1.2. Note: If the older block is already inserted, the option will be disabled.

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Circle: Option to include a solid circle at the end of the label.

X: Option to include an X at the end of the label.

None: Option to exclude a marker at the end of the label.

4.7.9.2 Radial Bearing Label Edit

Edit Radial Labels created using the Radial Bearing Label command.

Edit

Select Radial Labels to edit

Select objects: Select the Radial Bearing Labels to edit the display of the radial bearing or change the associated curve.

Edit Radial Labels

Label

Angular Specify the output Angle Type.

Precision Specify the Angular Precision.

Add Specify if a space will be added after the N or S and before the W or E (N 45 E vs N45E).

Angle

Placemen Select the location of the angle value.

Radial

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Placemen Select the location of the radial text value.

Value Enter the radial text value, e.g., (R).

Leave Check to leave the notes as-is.

Note 1: Toggle to include note 1 value (1st) of the label.
Note 2: Toggle to include note 2 value (2nd) of the label.
Note 3: Toggle to include note 3 value (3rd) of the label.
Note 4: Toggle to include note 4 value (4th) of the label.

Note: Common options for Note 1, 2, 3, and 4.
Placemen Specify the location of the note value.

Value: Enter the note value, if the input option is set to Note.

Arc
Select If only a single radial bearing label, this option will be enabled.

Node

Circle: Option to include a solid circle at the end of the label.
X: Option to include an X at the end of the label.
None: Option to exclude a marker at the end of the label.

Change Start the Change Label Leader Offset command.

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4.7.9.3 Placement Options

Coordinate Label Placement Options:

3 above: The data will be placed three spaces above the leader line.
2 above: The data will be placed two spaces above the leader line.
1 above: The data will be placed one space above the leader line.
1 below: The data will be placed one space below the leader line.
2 below: The data will be placed two spaces below the leader line.

4.7.9.4 Input Options

Coordinates Label Input Options

Note / description input option.

Input Options
Prompt: Option to prompt the operator to enter the note value.
Select: Option to prompt the operator to select an object with text to be used as the note value.
Note: Option to use the value entered in the Note edit box as the note value.

4.7.9.5 Radial Bearing Label Update

Update radial labels (Dynamic Blocks Only) created using the Radial Bearing Label command.

Select Objects: Select the Radial Labels to update the values.

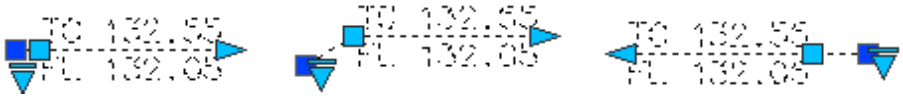
4.7.9.6 Radial Bearing Label Dynamic Block

Radial Bearing Label as a dynamic block.

A dynamic block has flexibility and intelligence. A dynamic block reference can easily be changed in a drawing while you work. You can manipulate the geometry through custom grips or custom properties. This allows you to adjust as necessary the block reference in-place rather than searching for another block to insert or redefining the existing one.

The SmartDraft Label Radial Bearing block has the following special dynamic properties.

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Right - Node **Right - Grip move** **Left - Node**

Move grip. Select this grip to move the text and leader line.

Leader search grip. There is one leader search grip. It updates as the text is edited (when SmartDraft is loaded).

Visibility options. Two options to have the label pointing Right and two options to have the label pointing Left. Each of the Right and Left visibility directions has the additional options to display the circle node or not.

Notes:

- Do not use the AutoCAD Scale command to increase or decrease the size of the block. Use either the Custom Scale property in AutoCAD's Properties Palette, or use the Block Scale command. The Custom Scale property is equal to the text height.
- Do not mirror or include in a block you plan to mirror. This can cause the dynamic grips to stop working.
- The Change Label Direction **CLD** command can be used to toggle the Right and Left direction of the Radial Label.
- When SmartDraft is loaded and running, the leader will resize when the attribute values are modified.

4.7.10 Crow's Feet - Automatic

Create crow's feet by selecting existing labels.

Note: Create crow's feet for labels created by the Labeling command.

Button

Ribbon: SmartDraft ▸ Labeling panel ▸ Label Arrows pull-down

Toolbar: Labeling Arrows on the Labeling Tools:

Menu: SmartDraft ▸ Labeling ▸ Crow's Feet - Automatic

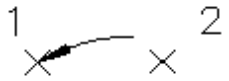
Command entry: **cfa**

Command:

Current settings: Crow's feet arrow = <current>
Select labeling text to place crow's feet.
Select objects or [Arrow]: Select the labels for crow's feet placement, **A** to change the crow's feet arrow direction, or press ENTER to end.

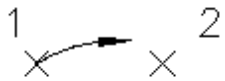
Example

Crow's feet arrow = In



Crow's feet arrow = Out

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4.7.11 Crow's Feet - Erase

Erase crow's feet by selecting existing label text or crow's feet.

Note: Erases crow's feet created by the Crow's Feet - Automatic command.

Button
Ribbon: SmartDraft ▸ Labeling panel ▸ Label Arrows pull-down
Toolbar: Labeling Arrows on the Labeling Tools:
Menu: SmartDraft ▸ Labeling ▸ Crow's Feet - Erase

Command:

Select labeling text to erase crow's feet.
Select objects: Select the label text or crow's feet to erase them, or press ENTER to end.

4.7.12 Crow's Feet - Manual

Create crow's feet in a specified direction and size.

Create crow's feet either above or below the selected line. Also change the size from single above/below to double above/below to triple above/below.

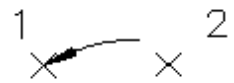
Button
Ribbon: SmartDraft ▸ Labeling panel ▸ Label Arrows pull-down
Toolbar: Labeling Arrows on the Labeling Tools:
Menu: SmartDraft ▸ Labeling ▸ Crow's Feet - Manual
Command entry: **cfm**

Command:

Current settings: Crow's feet arrow = *current*, Size = *current*
Specify insertion point or [Arrow/Size]: Specify a point (1), **A**rrow to change the arrow type or **S**ize to toggle arrow size between single, double, or triple. *Default osnap is **END**point or **INT**ersection.*
Select angle: Specify an angle by selecting a point (2).
Select side or [Size]: Specify a side for the arrow or **S**ize to toggle between single, double, or triple.

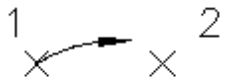
Example

Crow's feet arrow = In



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Crow's feet direction = Out



4.7.13 Labeling Arrow

Create an arrow with or without a break symbol.

Button

Ribbon: SmartDraft ▸ Labeling panel ▸ Label Arrows pull-down

Ribbon: SmartDraft ▸ Design panel ▸ Label Arrows and Symbols pull-down

Toolbar: Labeling Arrows on the Labeling Tools:

Toolbar: Arrow Symbols on the Drawing Tools:

Menu: SmartDraft ▸ Labeling ▸ Arrows

Command:

Current settings: Arrow type = <current type>

Specify insertion point or [Type]: Specify an insertion point or **T**ype to change the arrow type.
Specify rotation angle <0d0'0">: Specify point or a rotation angle.

Example

Without break

With break symbol

4.7.14 Labeling Tools

4.7.14.1 Rotate Along an Arc or Circle

Rotate objects along a selected arc or circle.

Button

Ribbon: SmartDraft ▸ Labeling panel ▸ Label Extras pull-down

Toolbar: Labeling Tools on the Labeling:

Menu: SmartDraft ▸ Labeling ▸ Rotate Along Arc

Command entry: **raa**

Command:

Rotate objects along arc or circle.
Select objects: Select the objects to rotate along an arc and press ENTER.
Select arc, circle or [Reference]: Select an arc or circle to rotate object(s) about or **R**eference to toggle prompting for a reference point.

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Reference: **No**

Specify the new angle: Specify a point for the new angle.

Reference: **Yes**

Specify the reference point: Specify a point for the reference point.
Specify the new angle: Specify a point for the new angle.

4.7.14.2 Slide Along a Line Segment

Slide objects along a selected a line segment.


Button

Ribbon: SmartDraft ▸ Labeling panel ▸ Label Extras pull-down 
Toolbar: Labeling Tools on the Labeling: 
Menu: SmartDraft ▸ Labeling ▸ Slide Along Line Segment

Command entry: **sal**

Command:

Prompt for base point: <Yes/No>
Slide objects along line segment.
Select objects: Select the objects to rotate along an arc and press ENTER.
Select line segment or [Base]: Select a line segment to slide along or **B**ase to toggle prompting for a base point.

Base: **No**

Specify new point: Specify the new point.

Base: **Yes**

Specify base point: Specify a base point.
Specify new angle: Specify the new point.

4.7.14.3 Change Bearing Direction

Change the bearing direction of labels.

Change selected text, mtext, dimensions, and attributes bearing text.

When Angle Type: **All North or North South**

Example: N 23d12'45" W to S 23d12'45" E

Warning: Changes any N to S, S to N, W to E, E to W, NORTH to SOUTH, SOUTH to NORTH, EAST to WEST, and WEST to EAST.

When Angle Type: **N Azimuth, S Azimuth, or Azimuth < 180**

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Add 180 to angles < 180

Subtracts 180 from angles > 180

Example: 23d12'45" to 203d12'45"

When Angle Type: **Gradian**

Add 200 to angles < 200

Subtracts 200 from angles > 200

Example: 23d12'45" to 223d12'45"



Button

Ribbon: SmartDraft ▸ Labeling panel ▸ Label Extras pull-down 

Toolbar: Labeling Tools on the Labeling: 

Menu: SmartDraft ▸ Labeling ▸ Change Bearing Direction

Command entry: **cbl**

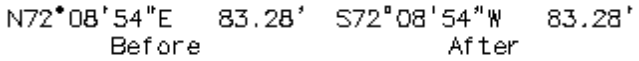
Command:

Flip bearing text.
Select text or [Multiple]: Specify the bearing text to change, or press ENTER to end. Enter **M**ultiple to select many text bearings at once.

Multiple:

Select objects: Select all the text bearings to change, and press ENTER to end. See warning above.

Example



4.7.14.4 Change Label Direction

Change the direction of text, mtext, arc labels, and arc text. Flip text object 180 degrees.

Note: Change labels and text created with the Labeling and Arc Text commands.



Button

Ribbon: SmartDraft ▸ Labeling panel ▸ Label Extras pull-down 

Toolbar: Labeling Tools on the Labeling: 

Menu: SmartDraft ▸ Labeling ▸ Change Label Direction

Command entry: **cld**

Video demonstration

Command:

Flip Text, Arc Text, or Dimension Direction.
Select text, dimension, or [Multiple]: Specify the text or dimension to change, or press ENTER to end.

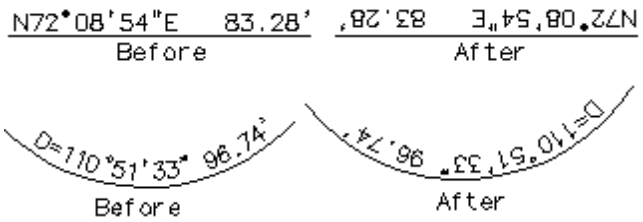
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Enter **M**ultiple to select multiple text, labels, or dimension at once.

Multiple:

Select objects: Select all the text and dimensions to change, and press ENTER to end.

Example



4.7.14.5 Reposition Labels and Arc Text

Change the vertical position of existing labels or existing arc text.

Note: Change labels and text created with the Labeling and Arc Text commands.

Also repositions Crow's Feet created with Crow's Feet - Automatic but not Crow's Feet - Manual.

Button

Ribbon: SmartDraft ▸ Labeling panel ▸ Label Extras pull-down

Toolbar: Labeling Tools on the Labeling:

Menu: SmartDraft ▸ Labeling ▸ Reposition Labels

Command entry: **rpt**

Video demonstration

Command:

Current settings: Method = <Step/Automatic>, Position = <Variable/default>
Select labels to reposition:
Select objects or [Options]: Select the labels to reposition and press ENTER, or **O**ptions and press ENTER to change the current settings. Labels and Arc Text will be selected; all other objects will be filtered out of the selection set.

Step

Specify point or [Pan/Zoom]: Specify a point when the highlighted object is in the correct position, or **P** for realtime pan, or **Z** for realtime zoom. Do not press ENTER after **P** or **Z**. Adjust display first, then press ENTER to exit display command.

4.7.14.6 Change Label Precision

Change the decimal precision of distances, lengths, radii, tangents, chords, and the angular precision of bearings and deltas.

Note: Change labels created with the Labeling command.

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Button

Ribbon: SmartDraft ▸ Labeling panel ▸ Label Extras pull-down

Toolbar: Labeling Tools on the Labeling:

Menu: SmartDraft ▸ Labeling ▸ Change Label Precision

Command entry: **clp**

Dialog Box Options

Precision:	Specify the new precisions.
Alternate Units	
Add:	Add alternate units if they do not exist.
Remove:	Remove alternate units if they exist.
Lease As-Is:	Do not change current alternate units' visibility.

Command:

Current settings: Linear = *current*, Angular = *current*, AltUnits = *current* and *current*
Change precision of selected labels.
Select objects or [Options]: Select the labels to change, **O**ptions to change current settings, or press ENTER to end.

4.7.14.7 Scale Labels

Scale existing labels or arc text. Change height of text.

Note: Change labels and text created with the Labeling and Arc Text commands.

Also scales Crow's Feet created with Crow's Feet - Automatic but not Crow's Feet - Manual

Button

Ribbon: SmartDraft ▸ Labeling panel ▸ Label Extras pull-down

Toolbar: Labeling Tools on the Labeling:

Menu: SmartDraft ▸ Labeling ▸ Scale Labels

Command entry: **slb**

Dialog Box Options

Scale Method:

Reference:	Scale the selected labels based on an old and new value. If the new value is larger than the old value, the selected objects are enlarged.
Scale Factor:	Multiply the size of the selected labels by the specified scale. A scale factor greater than 1 enlarges the labels. A scale factor between 0 and 1 reduces the labels.
Text Height:	Enter a new text height. All selected labels will be scaled to specified text height.
Value x Scale:	Enter a value to be multiplied by the drawing's current scale. Units = feet In modelspace, Scale = horizontal scale In paperspace, Scale = 1 Units = meters In modelspace, Scale = horizontal scale * 0.0254 In paperspace, Scale = 1

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Command:

Current settings: Method = *current*, Value = *current*
Scale selected labels.
Select objects or [Options]: to scale, **O**ptions to change current settings, or press ENTER to end.

4.7.15 Dimension Tools

4.7.15.1 Dimension

Label the distance between two selected points. The label is placed above and in the center of the leader line. Option to use dimension object or polyline with text.

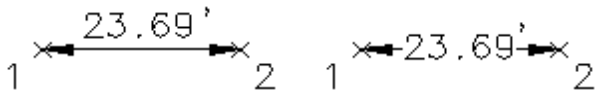
Note: When the Type = Object there will be an option to place the dimension text above the leader line or in the middle of the leader line.

Button
Ribbon: SmartDraft ▸ Labeling panel ▸
Toolbar: Dimension Tools on the Labeling Tools:
Menu: SmartDraft ▸ Dimension ▸ Dimension
Command entry: **dsd**

Command:

Current settings: Type = <Object/Polyline>, Location = <Above/Within>, Arrow = <Arrow/Dot/Integral/Oblique>, Suppress trailing zeros = <Yes/No>
Specify from point or [OPtions/OSnap]: Specify a point (1), **OP**tions change the current settings, or **OS**nap to change default osnaps. *Default osnap is **NEA**rest.*
Specify to point or [[OPtions/OSnap]: Specify a point (2). *Default osnap is **PER**pendicular.*
Specify to point or [[OPtions/OSnap]: Specify a point (x) to continue, or press ENTER to end. *Default osnap is **PER**pendicular.*

Example



4.7.15.1.1 Dimension Options

Change the dimension options for the Dimension, Dimension Outside, Dimension Truncate, Dimension with Prompt, and Dimension Outside commands.

Dialog Box Options

Type:	Select "Object" to create dimension using the AutoCAD dimension object, or "Polyline" to create dimension using a polyline and text.
Location:	Select "Above" to place the dimension above the leader, or "Within" to place the dimension within the leader.

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Arrow Type:	Select the dimension leader arrowhead type.
Precision:	Set the number of decimal places for the dimension output display.
Suppress Trailing Zero:	Check to suppress trailing zeros in the dimension.
Backgound Masking On:	Check to turn background masking on for the dimension.
Distance	
Prefix:	Enter a value for a prefix.
Suffix:	Enter a value for a suffix other than the unit type suffix.
Scale Factor:	Enter a scale factor. The will be used to recalculate the displays distance. Can be used to label items in a profile view.
Scales:	Select a predefine scale: 1:1 for planview dimension, 5:1 or 10:1 for profile view dimension labeling vertically.
Layer:	Set the output layer type. Default (to use the layer database layer) or *current*.
Layer Type:	Toggle the layer type for the slope symbol.

4.7.15.1.2 Dimension Osnap

Change the default osnaps associated to the dimension prompts for selection of the From and To point.

Dialog Box Options

Clear:	Clear all osnaps from both the From and To points.
Default:	Reset: From Point to Nearest. To Point to Perpendicular.
From Point:	Set the osnap type for the From Point prompt.
To Point:	Set the osnap type for the To Point prompt.

4.7.15.2 Dimension Outside

Label the distance between two selected points with the leader line and annotation on the outside of the second point. Option to use dimension object or polyline with text.

Button

Ribbon: SmartDraft ▸ Labeling panel ▸

Toolbar: Dimension Tools on the Labeling Tools:

Menu: SmartDraft ▸ Dimension ▸ Dimension Outside

Command entry: **dso**

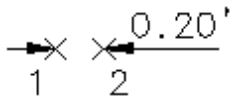
Command:

Current settings: Type = <Object/Polyline>, Location = <Above/Within>, Arrow = <Arrow/Dot/Integral/Oblique>, Suppress trailing zeros = <Yes/No>
Specify from point or [OPtions/OSnap]: Specify a point (1), **OP**tions change the current settings, or **OS**nap to change default osnaps. *Default osnap is **NEA**rest.*
Specify to point or [[OPtions/OSnap]: Specify a point (2). *Default osnap is **PER**pendicular.*

Note: The second selected point (2) controls the side of text placement.

Example

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4.7.15.3 Dimension Truncate

Label the truncated distance between two selected points with suffix option. The label is placed above and in the center of the leader line. Option to use dimension object or polyline with text.

Note: When the Type = Object there will be an option to place the dimension text above the leader line or in the middle of the leader line.

Button

Ribbon: SmartDraft ▸ Labeling panel ▸

Toolbar: Dimension Tools on the Labeling Tools:

Menu: SmartDraft ▸ Dimension ▸ Dimension Truncate

Command entry: **drt**

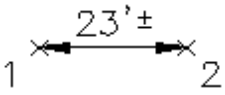
Command:

Current settings: Type = <Object/Polyline>, Location = <Above/Within>, Arrow = <Arrow/Dot/Integral/Oblique>, Suffix = <current>.
Specify from point or [OPtions/OSnap]: Specify a point (1), **OP**tions change the current settings, or **OS**nap to change default osnaps. *Default osnap is **NEA**rest.*
Specify to point or [[OPtions/OSnap]: Specify a point (2). *Default osnap is **PER**pendicular.*

Options

Enter dimension suffix <default>: Enter the dimension suffix.

Example



4.7.15.4 Dimension with Prompt

Label the distance between two selected points with a prompt for the label. Option to use dimension object or polyline with text.

Button

Ribbon: SmartDraft ▸ Labeling panel ▸

Toolbar: Dimension Tools on the Labeling Tools:

Menu: SmartDraft ▸ Dimension ▸ Dimension with Prompt

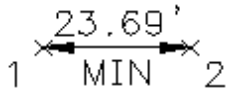
Command entry: **dsp**

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Command:

Current settings: Type = <Object/Polyline>, Location = Above, Arrow = <Arrow/Dot/Integral/Oblique>, Suppress trailing zeros = <Yes/No>
Specify from point or [OPtions/OSnap]: Specify a point (1), **OP**tions change the current settings, or **OS**nap to change default osnaps. *Default osnap is **NEA**rest.*
Specify to point or [[OPtions/OSnap]: Specify a point (2). *Default osnap is **PER**pendicular.*
Enter dimension text <23.69'>: Enter text or press ENTER to accept.
Enter text: **MIN** Enter text, or press ENTER to end.

Example



4.7.15.5 Dimension without Leader

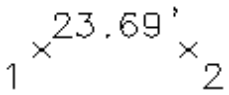
Label the distance between two selected points without the leader. Option to use dimension object or text.

Button
Ribbon: SmartDraft ▸ Labeling panel ▸
Toolbar: Dimension Tools on the Labeling Tools:
Menu: SmartDraft ▸ Dimension ▸ Dimension without Leader
Command entry: **dsn**

Command:

Current settings: Type = <Object/Polyline>, Arrow = <Arrow/Dot/Integral/Oblique>, Suppress trailing zeros = <Yes/No>
Specify from point or [OPtions/OSnap/Rotate]: Specify a point (1), **OP**tions change the current settings, **OS**nap to change default osnaps, or **R**otate to rotate the label perpendicular to the selected points. *Default osnap is **NEA**rest.*
Specify to point or [[OPtions/OSnap/Rotate]: Specify a point (2). *Default osnap is **PER**pendicular.*
Specify to point or [[OPtions/OSnap/Rotate]: Specify a point (x) to continue, or press ENTER to end. *Default osnap is **PER**pendicular.*

Example



4.7.15.6 Dimension Arc

Label the distance of a selected arc.

Dynamic arc dimension. Note: Reply to prompt for radius when grip editing after placement.

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Button

Ribbon: SmartDraft ▸ Labeling panel ▸

Toolbar: Dimension Tools on the Labeling Tools:

Menu: SmartDraft ▸ Dimension ▸ Dimension Arc

Command entry: **dsc**

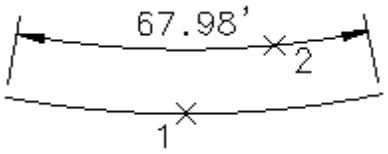
Command:

Current settings: Type= <Arc/Points>, Suppress trailing zeros = <Yes/No>
Select an arc or [Edit/Options/Update]: Specify a point (1), **E**dit to change the assigned options arc dimensions, **O**ptions to change setup options, or **U**pdate to update values of existing arc dimensions.
Specify dimension arc line location: Specify a point (2).

Points

Specify first angle endpoint: Specify starting angle of the arc to label.
Specify second angle endpoint (ccw): Specify ending angle of the arc to label in a counter-clockwise direction from the first point selected.
Specify dimension arc line location: Specify a point (2).

Example



4.7.15.6.1 Dimension Arc Options

Change the dimension options for the Dimension Arc command.

Dialog Box Options

Options

Precision: Set the number of decimal places for the station output display.
Suppress Trailing Zeros: Check to suppress trailing zeros in the distance.

Type
Arc Use this option to select and label the whole arc.
Points Use this option to select the arc, the starting, and ending points.

Layer:
Layer: Set the output layer type. Default (uses layers in layer database) or *current*.
Layer Type: Toggle the layer type for the slope symbol.

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4.7.15.6.2 Dimension Arc Edit

Edit arc dimensions created using SmartDraft Dimension Arc command.

Edit
Select Arc Dimensions to edit
Select objects: Select the Arc Dimensions to edit the assigned options.

Options

Precision: Set the number of decimal places for the station output display.
Suppress Trailing Zeros: Check to suppress trailing zeros in the distance.

4.7.15.7 Dimension Text - Alternate Units

Add an alternate unit (metric) length for a selected dimension text string.

If selected object is a text string, output is a text string formatted: [###.## m].
If selected object is a dimension object, alternate units will be toggled on and off.


Button
Ribbon: SmartDraft ▸ Labeling panel ▾ 
Toolbar: Dimension Tools on the Labeling Tools: 
Menu: SmartDraft ▸ Dimension ▸ Dimension Text - Alternate Units
Command entry: **dsa**

Command:

Dimension Text - Alternate Units:
Select dimension text: Select a text string or dimension.

Note: This command uses the system variables **DIMALTF**, **DIMALTD**, and **DIMAPOST** to calculate and format the alternate unit text output.

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4.7.16 Monuments

Create monument symbols.

Note: Option to use regular monument block (original method), or a dynamic block with all monument symbols included in a single block, so the symbol can be changed after insertion.

Ribbon: SmartDraft ▸ Labeling panel ▸ Monuments
Toolbar: Monuments on the Labeling Tools
Menu: SmartDraft ▸ Labeling Tools ▸ Monuments

Command:

Current settings: Layer Type = <Default/Current>, Block = <Dynamic/Regular>
Specify from point or [Options]: Specify a point (1), **O**ptions toggle the layer type between "Default" (layer database), or Current, or **B**lock to toggle between dynamic or regular block insertion.

	Symbol	Alias
Create filled circle.		**MSC**
Create half-filled circle.		**MHC**
Create open circle.		**MOC**
Create circle inside circle.		**MDC**
Create solid circle inside circle.		**MDCS**
Create circle with filled X.		**MCC**
Create filled square.		**MSS**
Create half-filled square.		**MHS**
Create open square.		**MOS**
Create solid circle inside square.		**MSCS**
Create square inside square.		**MDS**
Create solid square inside square.		**MDSS**
Create square with filled X.		**MCS**
Create filled triangle.		**MST**
Create open triangle.		**MOT**
Create solid circle inside triangle.		**MTCS**

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4.7.17 Arrow Symbols

4.7.17.1 Arc Leader

Create an arced leader with various arrowhead types and an optional reference symbol. The leader can be either an AutoCAD leader , mleader, or polyline.



Button


Ribbon: SmartDraft ▸ Labeling panel ▸ Leaders drop-down 

Toolbar: Arrow Symbols on the Labeling Tools 

Menu: SmartDraft ▸ Drawing Tools ▸ Arc Leader


Command entry: **alr**

Command:

Create arc leader.

Current settings: Leader = <Arc/Straight>, <None/Arrow/Dot/Integral>, <Object/Polyline>, Points = <2/3/4/5>, Symbol = <name>

Type: Object

Specify first leader point or [Option]: Specify a point (1) where you want the arrowhead, **O**ptions to change the leader options.

Specify next point: Specify the next point(s) along the leader, or press ENTER to end.

Type: Polyline

Specify first leader point or [Options]: Specify a point (1) where you want the arrowhead, or **O**ptions to change the leader options.

Specify end point: Specify a point (2) end of leader. Rubber-band arc appears. Select a point when arc is at desired curvature.

Specify direction from start point: Specify a point (3).

Symbol: (when not set to None)

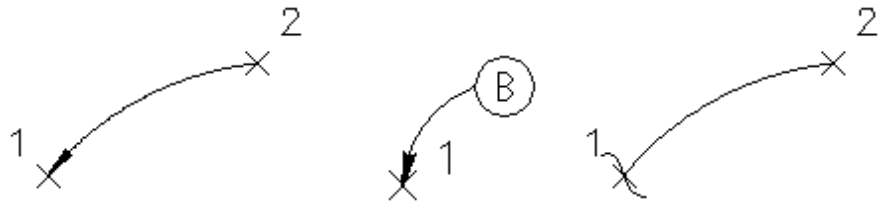
Enter symbol text: **B** Enter the text for the symbol.

Leader Options

Leader Options	
Type	Select if the leader will be an AutoCAD Leader object, MLeader object, or a polyline. Note: Known limitation. When leader type set to MLeader and a symbol type is selected, the tag length is limited to 4 characters.
Line	Select if the leader line will be arced or straight.
ArrowHead	Select the leader arrowhead type.
Points	Select the number of points prompted for the leader.
Symbol Options	
Symbol	Select the symbol type.
Width Factor	Select a value to control the number of character within a symbol before the symbol increases in size. If the Width Factor is set to: 0.80, 2 characters fit in the symbol before it increases in size. 0.65, 3 characters fit in the symbol before it increases in size.

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Example



Note: Straight Leader and Arc Leader use the horizontal scale and **DIMASZ** system variable to create the arrowhead size.

4.7.17.2 Straight Leader

Create a straight leader with various arrowhead types and an optional reference symbol. The leader can be either an AutoCAD leader, mleader, or polyline.

Button

Ribbon: SmartDraft ▸ Labeling panel ▸ Leaders drop-down

Toolbar: Arrow Symbols on the Labeling Tools

Menu: SmartDraft ▸ Drawing Tools ▸ Straight Leader

Command entry: **slr**

Command:

Create straight leader.

Current settings: Leader = <Arc/Straight>, <None/Arrow/Dot/Integral>, <Object/Polyline>, Points = <2/3/4/5>, Symbol = <name>

Type: Object

Specify first leader point or [Option]: Specify a point (1) where you want the arrowhead, **O**ptions to change the leader options.

Specify next point: Specify the next point(s) along the leader, or press ENTER to end.

Type: Polyline

Specify first leader point or [Options]: Specify a point (1) where you want the arrowhead, or **O**ptions to change the leader options.

Specify end point: Specify a point (2) end of leader. Rubber-band arc appears. Select a point when arc is at desired curvature.

Specify direction from start point: Specify a point (3).

Symbol: (when not set to None)

Enter symbol text: **B** Enter the text for the symbol.

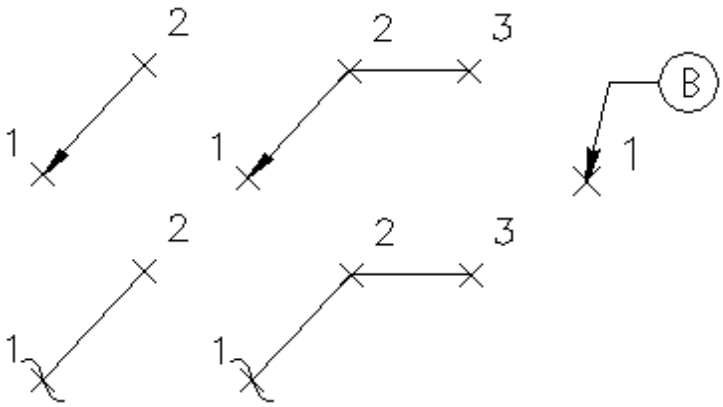
Leader Options

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Leader Options

Type	Select if the leader will be an AutoCAD Leader object, MLeader object, or a polyline. Note: Known limitation. When leader type set to MLeader and a symbol type is selected, the tag length is limited to 4 characters.
Line	Select if the leader line will be arced or straight.
ArrowHead	Select the leader arrowhead type.
Points	Select the number of points prompted for the leader.
Symbol Options	
Symbol	Select the symbol type.
Width Factor	Select a value to control the number of character within a symbol before the symbol increases in size. If the Width Factor is set to: 0.80, 2 characters fit in the symbol before it increases in size. 0.65, 3 characters fit in the symbol before it increases in size.

Example



Note: Straight Leader and Arc Leader use the horizontal scale and **DIMASZ** system variable to create the arrowhead size.

4.7.17.3 Convert Text or Reference Symbol to MultiLeader

Create a multileader from a selected text , mtext, or reference symbol.

Button

Ribbon: SmartDraft ▸ Labeling panel ▸ Leaders drop-down

Toolbar: Arrow Symbols on the Labeling Tools

Menu: SmartDraft ▸ Drawing Tools ▸ Convert Text or Reference Symbol to MultiLeader

Command entry: **ttm**

Command:

Convert text or reference symbol to multileader.

Current settings: Leader = <Arc/Straight>, <None/Arrow/Dot/Integral>, Points = <2/3/4/5>

Type: Object

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Select source text or reference symbol or [Options]:: Select text, mtext, arc text, polyline text, or reference symbol, **O**ptions to change the leader options.

Specify first leader point: Specify the point for the leader endpoint.

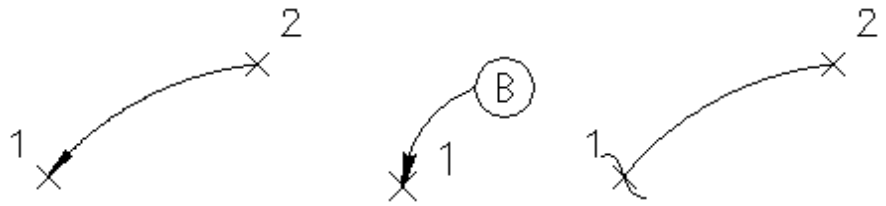
Specify next point: Specify the next point(s) along the leader, or press ENTER to end.

Leader Options

Leader Options

Line	Select if the leader line will be arced or straight.
ArrowHead	Select the leader arrowhead type.
Points	Select the number of points prompted for the leader.

Example



Note: Straight Leader and Arc Leader use the horizontal scale and **DIMASZ** system variable to create the arrowhead size.

4.7.17.4 Arc Leader (Variable)

Create an arced leader with a variable arrowhead and ending width. The leader is a polyline.

Button

Ribbon: SmartDraft ▸ Labeling panel ▸ Leaders drop-down

Toolbar: Arrow Symbols on the Labeling Tools

Menu: SmartDraft ▸ Drawing Tools ▸ Arc Leader (Variable)

Command entry: **alv**

Command:

Create a variable arc leader.

Leader settings: Arrowhead = <Normal/Wide/Xwide>, Ending = <Normal/Wide/Xwide>, Length = <value>

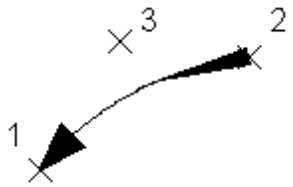
Specify first leader point or [Arrow width/End Width/Length]: Specify a point (1) where you want the arrowhead, **A**rrow to change to arrowhead width, **E**nd to change the ending width, or **L**ength to change the arrowhead length.

Specify end point: Specify a point (2) end of leader. Rubber-band arc appears. Select a point when arc is at desired curvature.

Specify direction from start point: Specify a point (3).

Example

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Note: The default arrowhead size is the horizontal scale multiplied by the **DIMASZ** system variable.

4.7.17.5 Continuation Symbol

Add a continuation symbol at the end of an existing object.

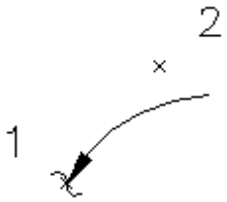
Button
Ribbon: SmartDraft ▸ Labeling panel ▸ Leaders drop-down
Toolbar: Arrow Symbols on the Labeling Tools
Menu: SmartDraft ▸ Drawing Tools ▸ Continuation Symbol

Command:

Create Continuation Symbol

Specify insertion point: Specify a point (1). *Default osnap is **END**point.*
Specify rotation angle: Specify an angle, or select a point (2).

Example



4.7.17.6 Add Arrowhead

Add an arrowhead symbol at the end of an existing object.

Create an arrowhead symbol at the end of selected objects. Arrowhead is placed on the object at the endpoint nearest the selected point.
Note: The command uses the horizontal scale and **DIMASZ** system variable to create the arrowhead size.

Button
Ribbon: SmartDraft ▸ Labeling panel ▸ Leaders drop-down
Toolbar: Arrow Symbols on the Labeling Tools
Menu: SmartDraft ▸ Drawing Tools ▸ Add Arrowhead
Command entry: **aar**

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Command:

Current settings: Layer <Current/Default/Object>

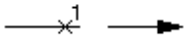
Add arrowhead to object

Select object or [Options]: Select the object nearest the end point you want the arrowhead added (1) or Options to change the layer type.

Options:

Arrowhead layer type [Current/Default/Object] <Default>: Current to place the arrowhead on the current layer when the command started, Default to use the layer from the layer database, or Object to place the arrowhead on the layer of the selected object.

Example



4.7.17.7 Break Symbol

Create a Break symbol along an object.

Button

Ribbon: SmartDraft ▸ Labeling panel ▸ Leaders drop-down

Toolbar: Arrow Symbols on the Labeling Tools

Menu: SmartDraft ▸ Drawing Tools ▸ Break Symbol

Command entry: **ib**

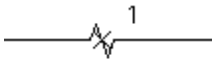
Command:

Create Break Symbol

Specify insertion point: Specify a point (1). *Default osnap is NEArest.*

Note: The Break Symbol contains a masking object which is used to hide objects drawn behind it.

Example



4.7.17.8 Pipe Crossing Symbol

Create a Pipe Crossing Symbol along an object.

Button

Ribbon: SmartDraft ▸ Labeling panel ▸ Leaders drop-down

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Toolbar: Arrow Symbols on the Labeling Tools
Menu: SmartDraft ▸ Drawing Tools ▸ Pipe Crossing Symbol
Command entry: **px**

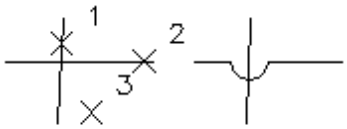
Command:
Create pipe crossing symbol
Current settings: Width = <default>, Height = <default>
Select main pipe or [Size/Prompt]: Select the main pipe object (1).
Select crossing pipe: Select the crossing pipe object (2).
Specify the side: Specify a point (3) on the side the arc of the symbol will be placed.

Size:
Specify symbol width <default>: Specify a width, or press ENTER for default.
Specify symbol height <default>: Specify a height, or press ENTER for default.

Prompt:
Prompt for symbol size [Yes/No] <No>: **Y**es to specify a width and height for each pipe-crossing symbol, or **N**o to use the width and height specified in the options prompt.

Note: The Crossing Pipe Symbol contains a masking object which is used to hide objects drawn behind it. The Crossing Pipe Symbol is placed on the layer of the selected crossing pipe.

Example



4.7.18 Reference Symbol

Create a reference symbol with or without a leader.

Supports:
AutoCAD Products: Yes
BricsCAD Pro: Yes

Button
Ribbon: SmartDraft ▸ Labeling panel ▸ Reference Symbols drop-down
Toolbar: Reference Symbols on the Labeling Tools:
Menu: SmartDraft ▸ Reference Symbols ▸ Symbol Type

Command:

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Current settings: Leader = <Arc/Straight/Off>, Points = <2/3/4/5>, Symbol = <name>

Enter symbol text or [Options]: **A** Enter a tag value, or **O**ptions to change the options.

Leader Off

Specify insertion point: Specify a point (1).

Specify rotation angle <*current*>: Specify an angle, and press ENTER, or select a point (2).

Leader On

Specify first leader point: Specify a point (1).

Specify next point: Specify the next point(s) along the leader, or press ENTER to end.

Attach to Label

Select SmartDraft label: Select a SmartDraft label(1).

Reference Symbol Options

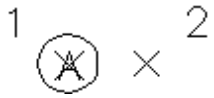
Symbol Options

Symbol	Select the symbols type.
Width Factor	Select a value to control the number of character within a symbol before the symbol increases in size. If the Width Factor is set to: 0.80, 2 characters fit in the symbol before it increases in size. 0.65, 3 characters fit in the symbol before it increases in size.

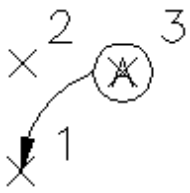
Leader Options

Type	Select the option: Leader Off, Leader On, MLeader, or Attach to Label. Note: Known limitation. When leader type set to MLeader and a symbol type is selected, the tag length is limited to 4 characters.
Align to View	If Type: set to "Attach to Label", specifies if the reference symbol will be aligned with the label line or horizontal to the screen. Checked indicates horizontal to the screen.
Line	Select if the leader line will be arced or straight.
ArrowHead	Select the leader arrowhead type.
Points	Select the number of points prompted for the leader.

Example: Leader Off

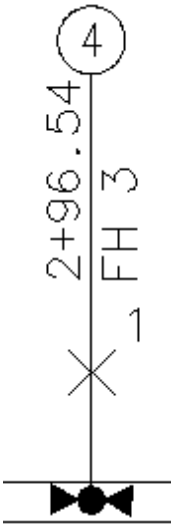


Example: Leader On



Example: Attach to Label

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4.7.18.1 Symbol Types

Circle Symbol

Circle2 Symbol

Diamond Symbol

Keyhole Symbol

Hexagon Symbol

Oval Symbol

Pentagon

Rectangle

Star

Square Symbol

Text ?

Triangle Symbol

Note: The Symbols contains a masking object which is used to hide objects drawn behind them.

4.7.18.2 Reference Symbol Attach

Attach a reference symbol to a SmartDraft label.

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Supports:

AutoCAD Products: Yes

BricsCAD Pro: Yes



Button



Ribbon: SmartDraft ▸ Labeling panel ▸ Reference Symbol Attach drop-down 

Toolbar: Reference Symbols on the Labeling Tools: 

Menu: SmartDraft ▸ Reference Symbols ▸ Reference Symbol Attach

Command:

Current settings: Type = *<Attach/Detach>*, Align = *<Yes/No>*

Select SmartDraft reference symbol or [Align/Type]: Select a reference symbol, **A**lign to toggle the alignment, **T**ype to toggle Attach or Detach, or ENTER to end.

Select SmartDraft label: Select a SmartDraft label.

Align:

Specify if the reference symbol will be aligned with the label line or horizontal to the screen. **Yes** indicates horizontal to the screen.

4.7.19 Construction Notes

Add a construction note or a construction notes list.
Command uses a construction note file (.cnm) created by the Construction Notes Manager command.

Construction Notes automates the process of placing construction notes and creating a construction notes table or list. Use reference symbol only, leaders with reference symbol, multiple leader with reference symbol, leaders with text, or leader, reference symbol, and text Once the construction note reference symbols are placed, a construction notes table can be created from the symbols.

A construction notes file can be associated to one drawing or a full project of drawings. The construction notes table can be limited to only notes from reference symbol which appear within selected viewports.

When create a construction notes file, there is not a limit to the length of the note. When the table is created, the note with word-wrap within the table. The width of the table can be changed once the table is created. If a set of drawings are associated to a construction notes file, all the construction notes table can be updated in each drawing automatically.

Reference symbol and / or construction notes can be place by selecting them from a list, or if the numbering is known reference symbols can be placed using the SmartDraft Leader commands with the Reference Symbol option enabled.

The reference symbol text can be modified as needed.

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Warning: Only a single construction note file can be associated to a drawing.

Note: After a Construction Notes List is placed, a user can add additional columns (e.g. Quantity and Unit Type). These user added columns and data will remain when the table is update using the Construction Notes List: Update command or **Update Associated Drawings List** option of this command.

Button

Ribbon: SmartDraft ▸ Labeling panel ▸ Notes drop-down (Lower right corner)
Toolbar: Construction Notes Tools on the Labeling Tools:
Menu: SmartDraft ▸ Construction Notes

Command entry: **cn**

Dialog Box Options

File Options

File	Display the current Construction Notes file, or select a recently used file.
Open	Open a construction notes file. (.cnm)
Category	List of note categories in the current file. Select a category.
Relative to:	Select the "Relative to:" option to as the current drawing in the associated drawings list using a relative vs absolute path. This option helps when the construction notes tools are used on different drives, but the same file structure.

Project Information

Name	Display the project name of the current file.
Number	Display the project number of the current file.

Notes

List	A list of the construction notes of the selected Category. Select a note or double-click a note to add a note to the drawing.

Note Options

Type	The symbol of the category. Defined in the construction note file.
Drop-down	Select the type of note: Tag Only, Tag and Note, or Note Only
Leader	Include a leader and the options associated with adding leaders.
Type	Leader, or MLeader. Note: Known limitation. When leader type set to MLeader and a symbol type is selected, the tag length is limited to 4 characters.
Line	None = No Leader, Straight = Straight with a single angle point, or Arc = Spline
Arrowhead	None, Arrow, Dot, or Integral
Number	1 or 2 leaders with a single note.

Note Rotation

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Specify On- The tag symbol and / or note will be inserted and the operator will be prompted to specify a rotation angle during the insertion.

Viewtwist 0 The tag symbol and / or note will be rotated to be horizontal to the current viewtwist.

Angle Enter a fixed angle for the rotation angle of the tag symbol and / or note.

List Options

Type Add/Update Current to add / update in the current drawing, Associated Drawings to update existing construction note lists in any drawing associated to the category.

Notes The selection method to use when creating a construction note list.

All	All Notes will be used to create the list.
Selected Viewports	Notes corresponding to tags found within the selected viewports will be used to create the list.
Selected Notes	Notes selected from the list will be used to create the list.
Selected Tags	Notes corresponding to selected tags will be added to the list.
Modelspace / Current Layout	Notes corresponding to tags found in the current tab (layout or modelspace) will be used to create the list.

Update Associated Drawings List Check to confirm the current drawing is in the associated drawings list of the category. If checked when a construction notes list is added, and the current drawing is not within the associated drawings list of the category, the drawing will be added to the associated drawings list of the construction notes list file. Select the "Relative to:" option to as the current drawing in the associated drawings list using a relative vs absolute path.

Buttons:

Note Create the note with the tag and notes using the current Symbol Options

List Create or update a construction note list using Type option of current List Options: Add / Update Current or Associated Drawings

Note: The Note List will not be updated if it is on a frozen or off layer.

Close Close the Construction Note dialog

Note: Symbols add by the Arc Leader, Straight Leader, and Reference Symbol commands are recognized by this command when adding a construction notes list.

4.7.19.1 Add a Construction Note

Create a construction note using the current Note Options from the Construction Notes command.

To create a construction note from a construction note file, either double-click on the note in the Notes list or highlight a note and select the **Note** button.

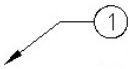
Depending on the options, the construction note can consist of leader(s), a tag and symbol, and the note text.

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Note Options:

Type Tag Only, Tag and Note, or Note Only

Tag Only



Tag and Note



Note Only

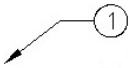


Leader Type None, Straight, or Arc.

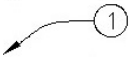
None



Straight



Arc



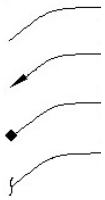
Arrowhead None, Arrow, Dot, or Integral

None

Arrow

Dot

Integral



Leader Number 1 or 2

1



2



If **Leader Line: None**

Create a construction note.
Tag: 1, Note: SEWER NOTE 1
Specify insertion point or [Options]: Select the insertion point for a tag symbol and/or note.

If **Note Option: Note Only, and Leader Line: None:**

Specify start point of note or [Options]: Select the starting point of the note.

If **Leader Type: Straight or Arc:**

Create a construction note.
Tag: 1, Note: SEWER NOTE 1
Specify first leader point or [Options]: Select the insertion point of the first leader.
Specify next point: Select the next point. Angle point or point along the arc.
Specify next point: Select the next point which is also the insertion point for a tag symbol and/or note.

If **Leader Number is 2:**

Specify second leader point or [Options]: Select the insertion point of the second leader.

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4.7.19.2 Add / Update a Construction Notes List

Create a construction notes list using the current List Options from the Construction Notes command.

Note: The Construction Notes List is an AutoCAD Table object. The command creates either a table style named **SmartDraft-CN-Borders-Off** or **SmartDraft-CN-Borders-On** based on the option **List without Borders** or **List with Borders** in the Construction Notes files. A special text style is also created **SmarDraft-Table** to be used with the construction notes table style.

Warning: It is important **NOT** to change the table styles or text styles created by this command. If so, the command may not work as designed.

Select the **List** button from the Construction Notes dialog with the **List Option, Type** set to **Add/Update Current**.

When there is not an existing Construction Notes List in the current Layout or Model with the specified Tag Symbol:

Create a construction notes list.

See note / tag selection methods below.

Specify insertion point: Specify the insertion point for the Construction Notes List.

Enter a width or specify the width point: Enter a width, specify a point for the width, or press Enter to create a list at the maximum width.

When there is an existing Construction Notes List in the current Layout or Model with the specified Tag Symbol:

Update a construction notes list.

See note / tag selection methods below.

Note / Tag Selection Methods:

All

All notes / tag in the Notes list will be added to the Construction Notes List.

Selected Viewports (Option only available in a Layout)

All tags of the specified symbol found within the selected viewport windows will be added to the Construction Notes List.

Select viewport: Select the viewport window frame.

1 viewport selected.

Select viewport: Select another viewport window frame or press Enter to continue.

Selected Notes

Selected Notes in the Notes list added to the Construction Notes List.

Selected Drawing Tags

Selected tags for the specified symbol type will be added to the Construction Notes List.

Select viewport: Select the viewport window frame.

1 viewport selected.

Select viewport: Select another viewport window frame or press Enter to continue.

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Modelspace / Current Layout

If in modelspace, all tags of the specified symbol found within modelspace will be added to the Construction Notes List.

If in paperspace, all tags of the specified symbol found within current layout tab will be added to the Construction Notes List.

Note: The Construction Notes List: Change Width command can be used to change the width of an existing Construction Notes List

Note: After a Construction Notes List is placed, a user can add additional columns (e.g. Quantity and Unit Type). These user added columns and data will remain when the table is update using the Construction Notes List: Update command or **Update Associated Drawings List** option of this command.

Note: The Note List will not be updated if it is on a frozen or off layer.

4.7.19.3 Associated Drawings: Update Construction Notes Lists

Update construction notes list of associated drawings of the current category from the Construction Notes command.

Select the **List** button from the Construction Notes dialog with the **List Option, Type** set to **Associated Drawings**.

Note: When the Process button is selected, the command makes a script file of the associated drawings in the list with a status of Open, and Found. The drawings with an Open status are closed in the current session before the script file is processed. The script file opens each file, updates the construction notes lists, saves the file, and closes it. The files with an Open status prior to running the script will not be reopen when the script is finished. A file with a status of Current will remain open and be updated.

Dialog Box Options

Construction Notes - Associated Drawings

Category Information

Category	Name of the category
Path	The root path for associated drawings.
List of Drawings:	A list of the drawings associated to the current category and their status.

Status Options

Current	This is the current drawing.
Open	The drawing file is open in the current session.
Found	The drawing file was found and can be updated.
Not Found	The drawing file was not found and will not be updated.
Locked	The drawing file is open by another operator and will not be updated.

Buttons:

Process	Process the drawings with a status of Current, Open, and Found.

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Close Close without updating the associated drawing.

4.7.19.4 Construction Note Select Options

Options to change the tag / note, and placement options for the Construction Notes command.

Dialog Box Options

Notes

List A list of the construction notes of the selected Category. Select a note or double-click a note to add a note to the drawing.

Note Options

Type The symbol of the category. Defined in the construction note file.

Drop-down Select the type of note: Tag Only, Tag and Note, or Note Only

Leader Include a leader and the options associated with adding leaders.

Type Leader, or MLeader

Line None = No Leader, Straight = Straight with a single angle point, or Arc = Spline

Arrowhead None, Arrow, Dot, or Integral

Number 1 or 2 leaders with a single note.

Note Rotation

Specify On- The tag symbol and / or note will be inserted and the operator will be prompted to specify a rotation angle during the insertion.

Viewtwist 0 The tag symbol and / or note will be rotated to be horizontal to the current viewtwist.

Angle Enter a fixed angle for the rotation angle of the tag symbol and / or note.

Buttons:

Note Create the note with the tag and notes using the current Symbol Options

Cancel Cancel any changes made to the options

4.7.20 Construction Notes List: Update

Update the construction notes lists within the current drawing, using the associated construction notes file.

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Note: Uses the last associated construction note file and the List Option > Notes used to create the Construction Notes List, to update the list.

If the "List Options > Notes" selection method needs to be changes, erase the Construction Notes List and use the Construction Notes command to create it.

Note: The Note List will not be updated if it is on a frozen or off layer.

Supports user added columns and data. User added columns and data will remain after update, if the tag number is still in the table.


Button

Ribbon: SmartDraft ▸ Labeling panel ▸ Notes drop-down (Lower right corner)

Toolbar: Construction Notes Tools on the Labeling Tools:

Menu: SmartDraft ▸ Construction Notes

Command entry: **cnu**

Command: **cnu**

Updating the Construction Notes List.

4.7.21 Construction Notes List: Change Width

Change the width of a Construction Notes List (created by the Construction Notes command) and maintain the correct width for the tag column and the correct height of each row.

Supports user added columns.


Button

Ribbon: SmartDraft ▸ Labeling panel ▸ Notes drop-down (Lower right corner)

Toolbar: Construction Notes Tools on the Labeling Tools:

Menu: SmartDraft ▸ Construction Notes

Command entry: **cncw**

Command: **cncw**

Change the width of a Construction Notes List.

Select a Construction Notes List: Select a Construction Notes List object.

Enter a width or specify the width point: Enter a new width or specify a point to get a new width.

4.7.22 Construction Notes Manager

Create and modify construction notes files (.cnm).

Note: Use the Construction Notes command to add note tags and or construction note list.

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Button

Ribbon: SmartDraft ▸ Labeling panel ▾ Notes drop-down (Lower right corner)

Toolbar: Construction Notes Tools on the Labeling Tools:

Menu: SmartDraft ▸ Construction Notes

Command entry: **cnm**

Dialog Box Options

Construction Notes Manager

File Options:

File	List of file options, Select Open, New, Save, or Save As from the drop-down list.
Open	Open an existing construction note file. Construction Note files have a .cnm extension.
New	Create a new construction note file.
Save	Save the changes to the current construction note file. A backup file .cnb is created when this option is used.
Save As	Save the current construction note file as a new construction note file.
File List	Display the currently opened construction note file and a list of the last ten opened construction note files. To open a previously opened file, select the file name from the drop-down list.
Category (drop-down)	List of category options: Add, Remove, Rename, Save As, or Import. A construction note file can have multiple categories within a file to work with larger project and allow multiple disciples to store construction notes within a single file.
Add	Add a new category to the current construction note file.
Remove	Delete a category from a construction note file. Note: deleted categories cannot be restored.
Rename	Rename the current category in a construction note file.
Save As	Create a copy of the current category, including all the Tag Symbol Options, Construction Note List Options, and Associated Drawings to a new category.
Import	Import categories from an existing construction note file.
Category List	List of the categories in the current construction note file. Select a category from the list to manage the notes, options, and associated drawings.
Drawings	Select the Drawings button to view and manage the list of drawings associated to the current category. Associated drawings are drawings which may have a construction note list and the list for each drawing can be updated from the Construction Notes without having to manually open each drawing.

Project Information:

Name	Enter a name for the project to associate the construction note file to it.
Number	Optional: Enter a project number
Path	The root path for associated drawings, either enter a path or select the Browse... button to select the path via a dialog both. This path is used to start the selection of associated drawings and removed from the save path in the associated drawings path. Note: Each category can have a separate root path, but this path is used as a starting point until a specific path has been selected for a category.

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Browse...	Select a root path, using the folder selection dialog, for drawings to be associated to the project.
Notes	A list of the tag and associated note. Double-click on a note to edit it.
Options (drop-down)	
Import	Import a comma or tab delimited file of notes into the notes list. Format: Tag,Note or Tag<tab>Note
Export	Export an ASCII file of the notes in the format: Tag <tab> Note
Sort	Sort the notes by the tags.
Add...	Add a tag and note to the current category
Remove	Remove the selected notes from the current category.
Edit	Edit the selected note.
Up	Move a note up in the list.
Down	Move a note down in the list.
Note Options:	
Layer	Select the layer to place the tag symbol and note. A list of all the layers within the current drawing are available in the drop-down list. There is an option for *current* in the list, which indicated the layer current when the list is created will be used. The *Type a layer name* option allows for a layer name to be specified which is not within the current drawing. Default is Preset Small Text.
Symbol	Select the tag symbol from the drop-down list. Available symbols are: Circle, Diamond, Hexagon, Keyhole, Oval, Pentagon, Rectangle Star, Square, Text (only), and Triangle.
Width Factor	Select a value to control the number of character within a symbol before the symbol increases in size. If the Width Factor is set to: 0.80, 2 characters fit in the symbol before it increases in size. 0.65, 3 characters fit in the symbol before it increases in size.
Construction Notes List Options:	With the Construction Notes command a list of the notes can be added to a drawing.
List	Options for the construction notes list
Layer	Select the layer used to create the Construction Notes List. A list of all the layers within the current drawing are available in the drop-down list. There is an option for *current* in the list, which indicated the layer current when the list is created will be used. The *Type a layer name* option allows for a layer name to be specified which is not within the current drawing. Default is Preset Table Text.
Borders	Select if the construction notes list will include borders around the title and notes. Options: List without Borders or List with Borders.
Title	Options for the title within a construction notes list
Check Box	Check to include a title using the text entered in the Text edit box.
Text	Enter a title for the category of construction notes
Justification	Select the justification of the Title text in the List. Options: Left, Center, or Right.
Underline	Check if the Title should be underlined.
Style	Select the text style to be used with the Title text. Default is Preset Planview Medium Text.
Height	Enter a text height for the Title Text. This value will be multiplied by the current horizontal scale when a Construction Notes List is placed in Modelspace.
Color	Select the color of the Title Text. Default is ByLayer.
Notes:	Options for the notes within a construction notes list

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Style	Select the text style to be used with the Notes text. Default is Preset Planview Small Text.
Height	Enter a text height for the Notes Text. This value will be multiplied by the current horizontal scale when a Construction Notes List is placed in Modelspace.
Color	Select the color of the Notes Text. Default is ByLayer.

4.7.22.1 New File - Construction Notes

Create a Construction Notes file (.cnm).

Note: To create a new construction notes file use the Construction Note Manager command.

Select the **New** option from File drop-down list.

The Create a new Construction Notes file file dialog appears:

Browse to the desired folder.

Enter a name construction notes file name.

The Construction Notes File Data dialog will appear

Dialog Box

Construction Notes File Data

Project Information:	
Name	Enter a name for the project to associate the construction note file.
Number	Optional: Enter a project number
Root Folder	
Path	The root path for associated drawings, either enter a path or select the Browse... button to select the path via a dialog both. This path is used to start the selection of associated drawings and removed from the save path in the associated drawings path. Note: Each category can have a separate root path, but this path is used as a starting point until a specific path has been selected for a category.
Browse...	Select a root path, using the folder selection dialog, for drawings to be associated to the project.

A construction note file is creates with an empty category "Construction Notes". If a root path was entered or selected,

Warning: We DO NOT recommend editing this file in a text editor.

The format of a construction note file is as follows:

Any line starting with ";" is a comment line

The starting section [Settings] is the Project Information

For each category in the list, it will be listed on the Categories= line separated by a comma.

Each category will have a [<category>] header, [<category>-Notes] header, and [<category>-Drawings] header section.

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Example: For a category of Sewer

The [<category>] header section would be: [Sewer]

Under the [<category>] header section are the Tag Symbol and Construction Notes List Options.

The [<category>-Notes] header section for Sewer would be: [Sewer-Notes]

Under the [<category>-Notes] header will be each note tag and note, prefixed with Note=, and separated by a Tab.

The [<category>-Drawings] header section for Sewer would be: [Sewer-Drawings]

Under the [<category>-Drawings] header section will be the associated drawings, prefixed with Dwg= and the path and filename.

The path may be truncated if the file is found along the Path= value in the [<category>] Path= section.

Example of the Construction Notes file format:

```
;This is a SmartDraft Construction Notes File
[Settings]
Path=L:\21000s\21700\21732.14\CADD\04-ENGR
ProjectName=Test Project
ProjectNumber=12345
Categories=Sewer,Storm Drain,Water
[Sewer]
Symbol=Circle
SymbolLayer=Preset Small Text
LinesOn=0
ListLayer=Preset Table Text
TitleOn=1
TitleJust=0
TitleText=CONSTRUCTION NOTES
TitleStyle=Preset Planview Medium Text
TitleHeight=0.15
TitleColor=ByLayer
NoteStyle=Preset Planview Small Text
NoteHeight=0.10
NoteColor=ByLayer
Path=L:\21000s\21700\21732.14\CADD\04-ENGR
[Sewer-Notes]
;Notes section format: Note=Tag<tab>Note text
Note=1  SEWER NOTE 1
Note=2  SEWER NOTE 2
Note=3  SEWER NOTE 3
Note=4  SEWER NOTE 4
Note=5  SEWER NOTE 5
Note=6  SEWER NOTE 6
Note=7  SEWER NOTE 7
Note=8  SEWER NOTE 8
```

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[Sewer-Drawings]
;Associated Drawings section format: Dwg=Path and Filename.dwg
Dwg=..\13-Planset-Final\SEWER PLAN 01.dwg
Dwg=..\13-Planset-Final\SEWER PLAN 02.dwg
Dwg=..\13-Planset-Final\SEWER PLAN 03.dwg
Dwg=..\13-Planset-Final\SEWER PLAN 04.dwg
[Storm Drain]
Symbol=Diamond
SymbolLayer=Preset Small Text
LinesOn=0
ListLayer=Preset Table Text
TitleOn=1
TitleJust=0
TitleText=CONSTRUCTION NOTES
TitleStyle=Preset Planview Medium Text
TitleHeight=0.15
TitleColor=ByLayer
NoteStyle=Preset Planview Small Text
NoteHeight=0.10
NoteColor=ByLayer
Path=L:\21000s\21700\21732.14\CADD\04-ENGR
[Storm Drain-Notes]
;Notes section format: Note=Tag<tab>Note text
Note=1 STORM DRAIN NOTE 1
Note=2 STORM DRAIN NOTE 2
Note=3 STORM DRAIN NOTE 3
[Storm Drain-Drawings]
;Associated Drawing section format: Dwg=Path and Filename.dwg
Dwg=..\13-Planset-Final\STORM DRAIN PLAN & PROFILE 01.dwg
Dwg=..\13-Planset-Final\STORM DRAIN PLAN & PROFILE 02.dwg
Dwg=..\13-Planset-Final\STORM DRAIN PLAN & PROFILE 03.dwg
[Water]
Symbol=Square
SymbolLayer=Preset Small Text
LinesOn=0
ListLayer=Preset Table Text
TitleOn=1
TitleJust=0
TitleText=CONSTRUCTION NOTES
TitleStyle=Preset Planview Medium Text
TitleHeight=0.15
TitleColor=ByLayer

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NoteStyle=Preset Planview Small Text
NoteHeight=0.10
NoteColor=ByLayer
Path=L:\21000s\21700\21732.14\CADD\04-ENGR
[Water-Notes]
;Notes section format: Note=Tag<tab>Note text
Note=1 WATER NOTE 1
Note=2 WATER NOTE 2
Note=3 WATER NOTE 3
[Water-Drawings]
;Associated Drawing section format: Dwg=Path and Filename.dwg
Dwg=..\13-Planset-Final\WATER PLAN 01.dwg
Dwg=..\13-Planset-Final\WATER PLAN 02.dwg

4.7.22.2 Category - Construction Notes

A category is collection of tags and notes, tag symbol options, construction notes list options, and associated drawings in the construction notes file.

To edit the notes and setting of a category use the Construction Note Manager command.

Multiple categories are supported in a construction notes files. This allow a single file to support a large project with multiple disciples.

Limitation of multiple categories:

Best practices is for each category to have a a unique symbol type.

If using the same symbol type between two or more categories, each category must have unique tag numbers / letters.

Category down-down list options:

Add	Add a new category. Each category must have a unique name.
Remove	Delete a category from the file. Remove cannot be undone. The removed category will have to be recreated.
Rename	Change the category name.
Save As	Save a category and all the notes with a new name.
Import	Import a category from an existing construction notes file (.cnm).

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4.7.22.2.1 Add Category - Construction Notes

Create a new Category in the current Construction Notes file (.cnm).

Note: To add a category use the Construction Note Manager command.

Select the **Add** option from Category drop-down list.
The Add a Category dialog will appear

Dialog Box Options

Add a Category

Name	Enter a new category name.
Buttons:	
OK	Adds a new the category using the entered name.
Cancel	Exit the Add a Category dialog without creating a new category.

4.7.22.2.2 Rename Category - Construction Notes

Rename an existing Category in the current Construction Notes file (.cnm).

Note: To rename a category use the Construction Note Manager command.

Select the **Rename** option from Category drop-down list.
The Rename a Category dialog will appear

Dialog Box Options

Rename a Category

Current: <category>	The name of the category being saved to a new name.
Name	Enter a new name.
Buttons:	
OK	Rename the category using the entered name.
Cancel	Exit the Rename a Category dialog without changing the category name.

4.7.22.2.3 Save As Category - Construction Notes

Save as copy of the current Category with a new name in the current Construction Notes file (.cnm).

Note: To save a category with a new name use the Construction Note Manager command.

Select the **Save As** option from Category drop-down list.

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The Save As Category Name dialog will appear

Dialog Box Options

Save As Category Name

Current: <category>	The name of the category being saved to a new name.
Name	Enter a new name.
Buttons:	
OK	Create a new category using the entered name, with the notes, options, and associated drawings of the current category.
Cancel	Exit the Save As Categories Name dialog without creating a new category

4.7.22.2.4 Import a Category - Construction Notes

Import Categories into the current Construction Notes file from an existing Construction Notes file (.cnm). With an option to included or excluding the currently associated drawings to the categories.

Note: To import category from an existing construction notes file use the Construction Note Manager command.

Select the **Import** option from Category drop-down list.

Select an existing Construction Notes file (.cnm).

If any categories exist in the selected construction notes file, the Import Categories dialog will appear

Dialog Box Options

Import Categories

File: <filename.ext>	Name of the selected file.
List box	List of the available categories in the selected file. Select the category or categories to import.
Included Associated Drawings	Check this box to included the drawings associated to the category in the selected file. If this is not checked, any associated drawings will not be included in the imported category.
Buttons:	
Import	Import the selected categories. Note: If the name of a selected category exists in the current file, a suffix number will be added to the imported Category name.
Cancel	Exit the Import Categories dialog without importing any categories.

4.7.22.2.5 Add Layer - Construction Notes

Add a layer to the layer list in the current layer Construction Notes file (.cnm).

The Layer selection options within the Construction Note Manager command list the *current*, Preset Small Text, Preset Table Text, all the layer in the current drawing, and an option *Type a layer name*.

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Select the ***Type a layer name*** option from one of the layer drop-down lists.

The Enter a Layer Name dialog will appear

Dialog Box Options

Enter a Layer Name

Name	Enter the layer name. Note: If the layer does not exist when the construction notes list is create, it will be create it with a color of white, and a linetype of continuous unless the name exists in the SmartDraft layer database and those properties will be used.
Buttons:	
OK	Add the entered layer name to the layer list and set it as the selected layer.
Cancel	Exit the Enter a Layer Name dialog without adding a new layer to the layer list.

4.7.22.2.6 Add Style - Construction Notes

Add a text style to the style list in the current Construction Notes file (.cnm).

The a Style selection options within the Construction Note Manager command list the *current*, Preset Planview Small Text, Preset Planview Medium Text, all the test styles in the current drawing, and an option *Type a style name*.

Select the ***Type a style name*** option from one of the style drop-down lists.

The Enter a Layer Name dialog will appear

Dialog Box Options

Enter a Style Name

Name	Enter the text style name. Note: If the style does not exist when the construction notes list is create, it will prompt the operator to import a style or use the default style.
Buttons:	
OK	Add the entered style name to the layer list and set it as the selected style.
Cancel	Exit the Enter a Style Name dialog without adding a new style to the style list.

4.7.22.3 Notes

A construction note consist of a tag which can either be numeric or alphabetic and an associated note.

Construction notes can be edited using the Construction Note Manager command.

Construction note symbol tags, and notes can be added to drawing using the Construction Notes command.

Multiple notes can be added to a category. There is no limit to number of notes associated to a category.

Notes	A list of the tag and associated note. Double-click on a note to edit it.

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Options (drop-down)	
Import	Import a comma or tab delimited file of notes into the notes list. Format: Tag,Note or Tag<tab>Note
Export	Export an ASCII file of the notes in the format: Tag <tab> Note
Sort	Sort the notes by the tags.
Add...	Add a tag and note to the current category
Remove	Remove the selected notes from the current category. No undo option.
Edit	Edit the selected note.
Up	Move a note up in the list.
Down	Move a note down in the list.

4.7.22.3.1 Import File Construction Notes

Import a comma or tab delimited file of notes into the notes list. Format: Tag,Note or Tag<tab>Note

Note: Use the Category down-down list option **Import** to import notes from an existing Construction Notes File (.cnm).

Select the **Import** option from Notes > Options drop-down list.

Select a plain text (ASCII) file without any special formatting. (e.g. MS Word file)

4.7.22.3.2 Add Note - Construction Notes

Add a note to the category in the current Construction Notes file (.cnm).

Add a note to the current category using the Construction Note Manager command.

Note: Enter Note in lower or mixed case. Spell check does not work on uppercase words. Spell check see all caps as acronyms. Use the **Convert** option to convert the note to all caps on save.

Select the **Add** button from the Construction Notes Manager dialog.

The Add a Construction Note dialog will appear

Dialog Box Options

Add a Construction Note

Note:

Tag	Enter a tag (not optional). This can be any combination of 11 numbers, or letters.
Note	Enter the note text. Can paste text using Windows cut-and-paste options.
Convert Note to uppercase on Save	Check this option to convert the text in the Note edit box to uppercase when the Save button is selected
Convert	Select the button to convert the text in the Note: edit box to lower case so the spell check option will be available. Spell check does not work on all caps words. They are seem

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acronyms.

Buttons:

Save	Add the tag and note to the current category.
Cancel	Exit the Add a Construction Note dialog without adding a new note to the notes list.

4.7.22.3.3 Edit Note - Construction Notes

Edit an existing note within a category of the current Construction Notes file (.cnm).

Edit an existing note to the current category using the Construction Note Manager command.

Note: Enter Note in lower or mixed case. Spell check does not work on uppercase words. They are seem acronyms.

Select the **Edit** button or double-click a Note in the Notes list from the Construction Notes Manager dialog.

The Edit a Construction Note dialog will appear

Dialog Box Options

Edit a Construction Note

Note:

Tag	Enter a tag (not optional). This can be any combination of 11 numbers, or letters.
Convert Note to uppercase on Save	Check this option to convert the text in the Note edit box to uppercase when the Save button is selected
Convert	Select the button to convert the text in the Note: edit box to lower case so the spell check option will be available. Spell check does not work on all caps words. They are seem acronyms.
Note	Enter the note text. Can paste text using Windows cut-and-paste options.

Buttons:

OK	Save the changes to the selected note.
Cancel	Exit the Edit a Construction Note dialog without changing the changes to the note.

4.7.22.4 Drawings

Manage the associated drawings list of the current category.

Select the **Drawings** button from the Construction Note Manager command.

The category has its own associated drawing list.

The list of associated drawings is used to update existing construction notes lists in each drawing when using the List button with the **List Options, Type**, set to **Associated Drawings** in the Construction Notes command.

Select the **Drawings** button from Construction Notes Manager.

The Associated Drawings dialog will appear

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Dialog Box Options

Associated Drawings

Category:

Name: <category> Name of the category currently managing.

Root Path

Path The root path for associated drawings, either enter a path or select the Browse... button to select the path via a dialog both. This path is used to start the selection of associated drawings and removed from the save path in the associated drawings path.

Browse... Select a root path, using the folder selection dialog, for drawings to be associated to the project.

Relative to: Select the "Relative to:" option to as the current drawing in the associated drawings list using a relative vs absolute path.

This option helps when the construction notes tools are used on different drives, but the same file structure.

List of Drawings: A list of the drawings associated to the current category and if they where found or not.

Add... Open a dialog box to select a single file.

Folder... Open a dialog box to select a folder. Any drawings found in the folder will be added to the List of Drawings.

Remove Remove a drawing from the List of Drawings.

Fix Change / Fix the associated path to the selected drawings in the List of Drawings.

Buttons:

Save Save any changes made to the Path or List of Drawings.

Cancel Exit the Associated Drawings dialog without saving any of the changes.

4.7.23 Construction Notes File Information

Get the construction notes files (.cnm) information for a drawing and optionally open the folder of the file.

Note: Use the Construction Notes command to add note tags and or construction note list.

Command entry: **cnf**

Dialog Box Options

Construction Notes File

Information:

File Name of the construction notes file associated to the drawing.

Folder File folder location.

Buttons

Open Open the folder of the construction notes file.

4.7.24 Detail Notes

Create a detail type symbol with optional leader and notes.

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Button

Ribbon: SmartDraft ▸ Labeling panel ▸ Notes drop-down (Lower right corner)
Toolbar: Construction Notes Tools on the Labeling Tools:
Menu: SmartDraft ▸ Construction Notes
Command entry: **dn**

Leader: None

Command:
Create a detail note.
Insertion point: Specify a point.

Leader: Straight or Arc

Command:
Create a detail note.
Create a detail note.
Specify first leader point: Specify arrow point of the leader.
Specify next point: Specify next point along the leader.
Specify next point: Specify endpoint of the leader.

Detail Notes Options

File:
Name: The currently selected detail notes file (*.dtn) and a list of the last 9 opened files.
Open: Open an existing detail notes file.
New: Create a new detail notes file.
Save: Save the changes to the currently open detail notes file.
Save As: Save the currently open detail notes file with a new name and location.

Notes: List of the detail notes in the current detail notes file.
Add: Add a new detail note to the detail notes file.
Remove: Remove a detail note from the detail notes file.
Edit: Edit an existing detail note.
Up: Move the selected detail note up in the list order.
Down: Move the selected detail note down in the list order.

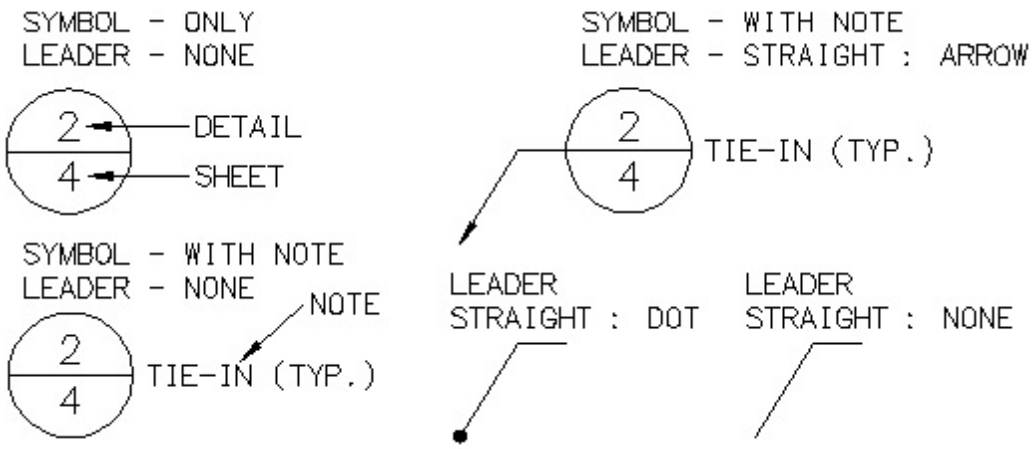
Leader:
Type: Type of leader when creating the detail symbol.
None: Do not create a leader.
Straight: Prompt for a straight (single angle point) leader.
Arc: Prompt for an arc leader.
End:
None: Do not include any terminator on the leader.
Arrow: Include an arrow terminator on the leader.
Dot: Include a dot terminator on the leader.
Count:
One: Prompt for a single leader.
Two: Prompt for two leaders.

Symbol:
Only: Create the detail symbol without the note.
With Note: Create the detail symbol with the note.

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Insert: Select to insert the symbol and option note. Or double-click on the note in the Notes list.

Examples



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4.7.24.1 Add / Edit a Detail Note

Add or edit a detail note

Add / Edit Detail Note

Detail: Enter the detail number / letter.
Sheet: Enter the sheet number (optional).
Note: Enter a note (optional).

OK: Save the detail note.
Cancel: Cancel changes to the detail note.

4.7.25 Labeling by Points

Create from / to point tags for create a Labeling by Points - Table

Create tag lines and arcs by selecting from and to point objects.

Note: Once By Points tags are placed, the Labeling by Points - Table command is used to create the table.


Button

Ribbon: SmartDraft ▸ Labeling panel ▸ 
Toolbar: Labeling Tools: 
Menu: SmartDraft ▸ Labeling ▸ Labeling by Points

Command entry: **lbpt**

Line - Select:

Select start point of line or [Arc/Numbers/Options/Undo]: Select the from / start point object for the line to tag, **A**rc to change to Arc input, **N**umbers to change to entering point numbers, **O**ptions to change options, or **U**ndo to erase last label.

Select end point of arc: Select the to / end point for the line.

Arc - Select:

Select start point of arc or [LIne/Numbers/Options/Undo]: Select the from / start point object for the arc to tag, **LI**ne to change to Line input, **N**umbers to change to entering point numbers, **O**ptions to return to Labeling Options, or **U**ndo to erase last label.

Select end point of arc: Select the to / end point for the arc.

Select radius point of arc: Select the radial point for the arc.

Start to end point selected clockwise? [Yes/No] <Yes>: Indicate the arc direction based on the direction from the from / start point to the to / end point of the arc.

Line - Numbers:

Enter the point numbers for lines (Start,End,End...) or [Arc/Options/Select/Undo]: Select the from / start point object for the line to tag, **A**rc to change to Arc input, **O**ptions to change options, **S**elect change to selecting point object, or **U**ndo to erase last label.

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Note: Can do multiple line labels with a single enter. Enter a string of point numbers. First one is the start point, the next is the end point. The end point becomes the start point, with the next end point, etc...

Arc - Select:

Enter the point numbers for arc (Start,End,Radius,Direction) or [LIne/Options/Select/Undo]: Select the from / start point object for the arc to tag, **LI**ne to change to Line input, **O**ptions to return to Labeling Options, **S**elect change to selecting point object, or **U**ndo to erse last label.

Note: Valid direction formats:

Clockwise:	C, CW, or nothing
Counter-Clockwise:	CC, CCW, AC, or ACW

4.7.25.1 Labeling by Points - Options

Set the options used with Labeling by Points command.

Dialog Box Options

Text

Style: Select the text style to use for labeling text. All text styles defined in the current drawing are listed with three special selections of *current*, or Preset Small Text. *current* uses the style current when the label command starts. Preset Small Text style uses the style Small defined by this software.

Height: This is the height that will be used if the selected style is not a fixed height style. **Note:** The specified height will be multiplied by the horizontal scale to create the actual height of the style.

Layer: Specify on which layer the text labels will be placed. If the layer does not exist in the drawing being labeled, the command will create the layer with the color white and the linetype continuous. Selecting either "Preset Labeling Text" will use the layer defined in the layer data base for the selection.

Buttons:

OK: Place labels using the current options.

Cancel: Exit dialog box without saving changes.

4.7.26 Labeling by Points - Table

Create a labeling by Points - table using the table options and table style, and tags created by the Labeling by Points command.


Button

Ribbon: SmartDraft ▸ Labeling panel ▸ 

Toolbar: Labeling Tools: 

Menu: SmartDraft ▸ Labeling ▸ Labeling by Points - Table

Command entry: **lbptb**

Dialog Box Options

Current Style A drop-down list of the pre-defined labeling table styles. Specify the desired labeling table style to be used when creating the table. Either a line or arc or combined line

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and arc table can be created. See Labeling Table Style Manager to define or edit table styles.

By Numbers - Tags:

All: If selected, all tags will be included in the table based on the Style (Line only, Arc Only, or Both)

Selected: If selected, only tags selected in the Tag List will be included in the table based on the Style (Line only, Arc Only, or Both)

Tag List

From / To / Type

List of Tags: If Selected is selected, select the tags to include.

Options:

From/To Column Width Select the number of character for the From/To column with.

Title Text Add the Title Text defined in the selected style.

Header Text Add the Header Text for the table.

Angle Type: Specify the output angle type.

Add Bearing Space Add a space after the N or S and before the W or E in the bearing output value. (N 45 vs N45).

Round to nearest 10 seconds Check to round an angle to the nearest 10 seconds.

Buttons:

OK: Create labeling table with the current settings and style.

Cancel: Exit labeling table setup without creating a table.

4.8 Layer Panel Tools

4.8.1 Make Layer

Create a new layer from the layer database.

Display a dialog box, which provides a way to create layers from the layer database file. The layer database file stores the name, color, and linetype for each layer. The Layers' box lists all the layers that can be created from this command. To create a layer, click on the layer name in the description box. If you select one layer, the layer will be created and/or set current. If you select multiple layers, all layers will be created, and the layer current before the command starts will remain the current layer.


Button

Ribbon: SmartDraft ▸ Layer panel ▸ 

Toolbar: Layer Tools: 

Menu: SmartDraft ▸ Layer ▸ Make Layer

Command entry: **lmk**

Dialog Box Options

Layer Type: Toggle the layer type for the layer name selection.

Select Multiple Layers: Toggle the ability to select multiple layers from the "Layers List Box".

Layers List Box: Select layer name(s) from the list to create it from the database.

Reset Layer Properties: Reset layer properties to match the layer database settings of the current customization template. If a layer's properties are reset, the layer name will be listed at the command prompt.

OK: Select to create selected layers and save settings.

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Note: To modify the layers listed in the Make Layers List, use the SmartDraft menu ▸ Program Setup ▸ Customization Template Manager.

Reset Layer Properties:
Command:
Reset layer properties to match layers database settings [Yes/No] <No>: Enter **Y**es to process layer in the drawing.

4.8.1.1 Layer Type

One of three layers which can be created. If there is a "Layer Type" button, it is used to toggle between the layer types.

PROP	for the layer assigned as proposed.
EXIST	for the layer assigned as existing.
DEMO	for the layer assigned as demolition.

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4.8.2 Change Layer Type

When a layer is created by one of the SmartDraft commands, one of three different layers will be created. It will create a proposed, existing, or demolition layer.


Button
Ribbon: SmartDraft ▸ Layer panel ▸ 
Toolbar: Layer Tools: 
Command entry: **lty**

Select icon to cycle layer type

Command:
Layer type PROPOSED set current.
Layer type EXISTING set current.
Layer type DEMOLITION set current.

See Make Layer for additional information on layer types.

4.8.3 Layer Thaw

Thaw frozen or turn on layers which are off from a dialog box.

Display a dialog box of the currently frozen or turned off layers. Select the layer(s) you wish to thaw, and turn on, and press OK. Use the Ctrl or Shift key to select multiple layers.


Button
Ribbon: SmartDraft ▸ Layer panel ▸ 
Toolbar: Layer Tools: 
Menu: SmartDraft ▸ Layer ▸ Thaw Layer
Command entry: **lth**

Dialog Box Options

Layers:	List of the currently frozen layer(s).
Include Off Layers:	Include both layers that are frozen and off in the layer list. If unchecked, only frozen layers are displayed.
Include Xref Layers:	Include both layers in Xrefs and the drawing. If unchecked only layers in the drawing are displayed..
Select All:	Highlight all the layers.
Clear All:	Clear all selected layers.
OK:	Thaw currently selected layers, and exit the command.

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4.8.4 Freeze Object or Block Layer

Freeze an object, block, or Xref layer by selecting it.

Select an object or object within a block or Xref. The layer of the selected object will be frozen. You can freeze the current layer (except layer 0). If you select an object on the current layer, layer 0 is set current, and the layer is frozen.

Added support for select Civil 3D objects, when a Civil 3D object is supported, a dialog block of the object and component layers will appear. The operator can select the layers to freeze.

 &
Button

Ribbon: SmartDraft ▸ Layer panel ▸ Freeze pull-down  & 
Toolbar: Layer Tools:  & 
SmartDraft menu ▸ Layer ▸ Freeze Layer
SmartDraft menu ▸ Layer ▸ Freeze Block Layer

Command entry: **lfr**

Command:

Objects

Select object to freeze its layer or [Undo/Block]: Select an object or **B**lock to select object within a block / Xref.

Blocks

Select object within block/Xref to freeze layer or [Undo/Object]: Select an object or **O**bject to select a non-block / Xref object.

4.8.5 Freeze VP Layer

Freeze a layer in a viewport.

Freeze layer(s) in a viewport by selecting objects without freezing them in other viewports. This is a modification to the VPLAYER command.



Ribbon: SmartDraft ▸ Layer panel ▸ Freeze pull-down 
Menu: SmartDraft ▸ Layer ▸ Freeze VP Layer

Command:

Select object to freeze in Viewport(s):

Select objects: Select the object(s) of layer(s) to freeze in viewport(s), and press ENTER.
Target Viewport [All/Current/Select] <Current>: Specify **ALL** for all viewports, **Select** to select which viewports, or press ENTER for the current viewport only.

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4.8.6 Freeze VP Block Layer

Freeze block layers independently in a viewport.

Freeze layers within block or Xref in one VIEWPORT by selecting objects from the graphics screen, without freezing them in other VIEWPORTS. This is a modification to the **VPLAYER** command.



Ribbon: SmartDraft ▸ Layer panel ▸ Freeze pull-down
Menu: SmartDraft ▸ Layer ▸ Freeze VP Block Layer

Command:
Select object Xref/Block layer to freeze in Viewport(s):

Select objects: Select the object(s) of layer(s) to freeze in viewport(s).

Target Viewport [All/Current/Select] <Current>: Specify **ALL** for all viewports, **Select** to select which viewports, or press ENTER for the current viewport only.

4.8.7 Change Layer in Viewports

Modify the layer name of objects in a viewport.

This command adds the current viewports number as a suffix to the layer name of the selected objects.

These layers can now be selected using the Freeze VP and Freeze VP Block Layer.

These are the same layer names created by Make Layer in the Paperspace Layer Control.



Ribbon: SmartDraft ▸ Layer panel ▸ Freeze pull-down
Menu: SmartDraft ▸ Layer ▸ Change Layer in Viewports

Command:

Change Layers in Viewports.

Select Objects: Specify the layer name to thaw, and press ENTER.

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4.8.8 Thaw VP Layer

Thaw layers in a viewport.

Display a dialog box of the currently VP frozen layers. Select the layer(s) you wish to thaw and press OK. Use the Ctrl or Shift key to select multiple layers.



Ribbon: SmartDraft ▸ Layer panel ▸ Freeze pull-down 
Menu: SmartDraft ▸ Layer ▸ Thaw VP Layer

Dialog Box Options

Layers:	List of the currently frozen layer(s).
Method:	Indicates if Viewports were selected or using the Current Viewport.
Select All:	Highlight all the layers.
Clear All:	Clear all selected layers.
OK:	Thaw currently selected layers, and exit the command.

4.8.9 Change Layer

Modify the layer property of object(s) to the layer property of another object or the current layer.

Modify the layer property of selected objects to the layer of a selected object on the target layer, the current layer, or selected from a list in a dialog box.


Button

Ribbon: SmartDraft ▸ Layer panel ▸ Change pull-down 
Toolbar: Layer Tools: 
Menu: SmartDraft ▸ Layer ▸ Change Layer

Command entry: **lc**

Command:

Select objects to change layer.
Select objects: Select objects you want to change to a target layer.
Select object on target layer or [Current/Dialog]: Select an object, **C**urrent for the current layer, **D**ialog to select from a list of layers in the drawing, and press ENTER.

Dialog Box Options

Layer Name:

List Box:	Display a list of all the layers in the drawing. Select the desired target layer.
Name:	Enter a layer name to create a new layer not in the list.
Select:	Return to the Select Object on target layer prompt.
Current:	Use the current layer.

Buttons:

OK:	Use the layer selected from the list.

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4.8.10 Copy to Layer

Copy and move selected objects to a layer.


Button

Ribbon: SmartDraft ▸ Layer panel ▸ Change drop-down 

Toolbar: Layer Tools: 

Menu: SmartDraft ▸ Drawing Tools ▸ Copy to Layer

Command entry: **cly**

Command:

Copy and Move selected objects to layer.

Select objects: Select objects to copy.

Select object on target layer or [Current/Dialog] <default>: Select an object for the target layer, **C**urrent for the current layer, or **D**ialog to select the layer from a list of all layers in the drawing.

If you select an object for the layer, the command will prompt you to accept the layer name.

Accept target layer "<Layer Name>" [Yes/No]: <Yes>: Enter to accept or **No** to specify a different layer.

Specify base point: Specify the base point for the move option or Enter to leave in-place.

Specify second point: Specify second point to move copied objects or Enter to leave in-place.

Dialog Box Options

Layer Name:

List Box:	Display a list of all the layers in the drawing. Select the desired target layer.
Name:	Enter a layer name to create a new layer not in the list.
Select:	Return to the Select Object on target layer prompt.
Current:	Use the current layer.
Buttons:	
OK:	Use the layer selected from the list.

4.8.11 Points: Move Object to Current Point Layer

Move object to the current point layer.

Change the layer of an object to the point layer currently set by the Point Options command.


Button

Ribbon: SmartDraft ▸ Layer panel ▸ Change drop-down 

Toolbar: Points Tools: 

Menu: SmartDraft ▸ Points ▸ Move Object to Current Point Layer

Command:

Change selected object to current point layer: *<current point layer>*

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Select object to change layer or [Options]: Select object to change to the currently set point layer, **O** to change the point options, or press ENTER to end.

4.8.12 Layer Isolate

Isolate the layers of one or more selected objects by turning all other layers off.


Button

Ribbon: SmartDraft ▸ Layer panel ▸ Layer Control pull-down

Toolbar: Layer Tools II on the Layer Tools:

Menu: SmartDraft ▸ Layer ▸ Change Layer

Command entry: **lyi**

Command:

Select object(s) on the layer(s) to be isolated.

Select object: Select object(s) for the layer(s) you want to remain visible, and press ENTER.

Type "LYR" to restore per isolate layer status. See Layer Isolate Restore.

4.8.13 Layer Isolate Restore

Restore layer setting to before the isolate layer command use executed.

Note: Layer settings can only be restored within the same editing session of AutoCAD.


Button

Ribbon: SmartDraft ▸ Layer panel ▸ Layer Control pull-down

Toolbar: Layer Tools II on the Layer Tools:

Menu: SmartDraft ▸ Layer ▸ Restore after Isolate Layer

Command entry: **lyr**

See Layer Isolate for information on isolating layers.

4.8.14 Layer Export

Export layer setting to a comma delimited file.

Note: Layer settings exported: Name, On/Off, Thawed/Frozen, Color, Linetype, Lineweight, Plot Style Name, Plottable, Description


Button

Ribbon: SmartDraft ▸ Layer panel ▸ Layer Control pull-down

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Command entry: **lexp**

Example file:
Drawing name: Example EG.DWG
0,On,Thawed,Unlocked,7,Continuous,-3,Color_7,Plot,
Defpoints,On,Thawed,Unlocked,7,Continuous,-3,Color_7,No Plot,
E-1,On,Thawed,Unlocked,8,Continuous,-3,Color_8,Plot,EXISTING 1 FOOT CONTOUR INTERVAL
E-2,On,Thawed,Unlocked,8,Continuous,-3,Color_8,Plot,EXISTING 2 FOOT CONTOUR INTERVAL
E-5,On,Thawed,Unlocked,11,Continuous,-3,Color_11,Plot,EXISTING 5 FOOT CONTOUR INTERVAL
E-5 TXT,On,Thawed,Unlocked,213,Continuous,-3,Color_213,Plot,EXISTING 5 FOOT CONTOUR ELEVATION LABEL
E-10,On,Thawed,Unlocked,11,Continuous,-3,Color_11,Plot,EXISTING 10 FOOT CONTOUR INTERVAL
E-10 TXT,On,Thawed,Unlocked,213,Continuous,-3,Color_213,Plot,EXISTING 1 FOOT CONTOUR ELEVATION LABEL
E-10 TXT 100,On,Thawed,Unlocked,213,Continuous,-3,Color_213,Plot,EXISTING 1 FOOT CONTOUR ELEVATION LABEL 100 SCALE
E-BRUSH,On,Thawed,Unlocked,254,BRUSHLINE,9,Color_254,Plot,EXISTING BRUSH
E-DG,On,Thawed,Unlocked,213,HIDDEN3,-3,Color_213,Plot,EXISTING DECOMPOSED GRANITE EDGE
E-DIRT RD,On,Thawed,Unlocked,9,DIRT-RD,9,Color_9,Plot,EXISTING DIRT ROAD
E-GRID,On,Thawed,Unlocked,1,Continuous,9,Color_1,Plot,EXISTING PHOTOGRAMMETRY HORZ. CONTROL GRID
E-HV,On,Thawed,Unlocked,111,Continuous,-3,Color_111,Plot,HORIZONTAL VERTICAL CONTROL POINT
E-ROCK,On,Thawed,Unlocked,111,HIDDEN3,9,Color_111,Plot,EXISTING ROCK - BOULDER
E-SLOPE,On,Thawed,Unlocked,253,HIDDEN3,-3,Color_253,Plot,EXISTING SLOPE ARROW
E-SPOT,On,Thawed,Unlocked,8,Continuous,9,Color_8,Plot,EXISTING SPOT ELEVATION
E-SWALE,On,Thawed,Unlocked,8,STREAM,-3,Color_8,Plot,EXISTING EARTHEN SWALE FLOWLINE
E-TOPTOE,On,Thawed,Unlocked,9,TOPTOE,-3,Color_9,Plot,EXISTING TOP OR TOE OF SLOPE
E-TREE,On,Thawed,Unlocked,254,Continuous,9,Color_254,Plot,EXISTING TREE BLOCKS
E-TREE LINE,On,Thawed,Unlocked,254,TREELINE,9,Color_254,Plot,EXISTING TREE CANOPY
E-TREE PALM,On,Thawed,Unlocked,254,Continuous,9,Color_254,Plot,EXISTING PALM TREE BLOCK
End of layer list for drawing: 2014 LAYERS EG.DWG

4.8.15 Layer Control

Manage layer settings. Save and restore layer configuration settings.

Create a file of the current status of each layer (i.e., on/off, thawed/frozen, locked/unlocked, color, linetype, and VPLAYER settings). Multiple layer setups can be saved to one file.

Have you ever needed to change layer colors, linetypes, and visibility for viewing and plotting and had to write down the current properties to reset them at a later time? If the answer is "yes", this is a command for you. It writes the current layer properties to a file, so you can restore those properties at a later time.

The command begins by looking for a ".lay" file with the current drawing's name. If it does not locate one, the Layer Control file dialog box will appear. This dialog box allows you to select any existing *.lay file or begin a new one. The default file name is the drawing name with a .lay extension.

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Button

Ribbon: SmartDraft ▸ Layer panel ▸Layer Control pull-down
Toolbar: Layer Tools II on the Layer Tools:
Menu: SmartDraft ▸ Layer ▸ Layer Control

Dialog Box Options

Description: List of currently saved layer settings.
File: Select button to open an existing or new Layer Control file. The text lists the current layer control file.
Buttons:
Restore: Restore the currently selected settings from the Description list. If a layer is not within the saved layer settings, it will be thawed and turned on.
Add: Save the current layer settings to a new description in the Description list. The command will prompt for a description to assign to the layer settings. The description has been limited to 32 characters.
Modify: Change the description of the selected layer control, and save the drawing's current layer settings to the setup.
Delete: Delete the selected layer settings from the Description list and the file.
OK: Accept any changes made to the currently selected layer file, and exit the command.

Note: Layer settings using the VPLAYER command, will only be restored if TILEMODE is set to 0.

4.8.16 Layer Rename

Rename a layer of a selected object.


Button

Ribbon: SmartDraft ▸ Layer panel ▸ Layer Control pull-down
Toolbar: Layer Tools II on the Layer Tools:
Menu: SmartDraft ▸ Layer ▸ Rename Layer
Command entry: **lrn**

Command:
Rename a layer of selected object.
Select object: Select object on the layer to rename.

Dialog Box Options

New layer name: Enter a new layer name for selected object, and press the OK button.

4.8.17 Erase Objects on Layer

Delete all the objects on selected layers.

All objects will be erased from layer(s) of selected objects. To remove the layer name from the layer list, use the PURGE command.

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Button

Ribbon: SmartDraft ▸ Layer panel ▸ Layer Control pull-down

Toolbar: Layer Tools II on the Layer Tools:

Menu: SmartDraft ▸ Layer ▸ Erase Object's on Layer

Command entry: **ler**

Command:

Select object on layers to erase.

Select objects: Select object(s) on the layer(s) to erase all objects on the layer(s), and press ENTER.

4.8.18 ID Layer

Inquire layer name of selected object.

The name of the layer is displayed at the Command entry.

Added support for select Civil 3D objects, now will also list the component layers if the object is supported.


Button

Ribbon: SmartDraft ▸ Layer panel ▸ Layer Inquiry pull-down

Toolbar: Layer Tools II on the Layer Tools:

Menu: SmartDraft ▸ Layer ▸ ID Layer

Command entry: **lwt**

Command:

Select object on layer in question: Select object to inquire layer name, and press ENTER.

Output:

Layer of selected object is: CL

Example when selecting a Civil 3D surface:

Layer of selected Civil 3D object is: BLDG, Component layers: Major: Maj, Minor: Min, Boundary: Bdy

4.8.19 ID Block Layer

Inquire layer name of selected object within a block or Xref.

ID Block Layer displays the layer name of selected object, which is inside of a block or Xref. The name of the layer is displayed at the Command entry.

Added support for select Civil 3D objects, now will also list the component layers if the object is supported.

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Button

Ribbon: SmartDraft ▸ Layer panel ▸ Layer Inquiry pull-down 
Toolbar: Layer Tools II on the Layer Tools: 
Menu: SmartDraft ▸ Layer ▸ ID Block Layer
Command entry: **lwb**

Command:

Select object on layer in question: Select an object to inquire layer name.

Output:

Layer of selected nested object is: ROW

Example when selecting a Civil 3D surface:

Layer of selected Civil 3D object is: BLDG, Component layers: Major: Maj, Minor: Min, Boundary: Bdy

4.8.20 Layer change adding Prefix/Suffix

Modify the layer property of an object adding a prefix or suffix.

If the layer does not exist, it will be created with color white, and linetype equal to the linetype of the layer of the selected object.

Button
Command entry: **lyps**

Command:

Select object to add <prefix/suffix> to layer.
Select object or [Addition/Type]: Select object or Addition to change the prefix/suffix text, or Type to toggle between prefix and suffix

Addition

"Enter <prefix/suffix> text <default>: Enter prefix or suffix text.

4.8.21 Layer Color Conversion

Convert colors of layers, objects, and objects in blocks to a new color.

Convert colors of layers from one setup to another, of objects that have a color property, and of blocks that have objects within them that have a color property, using a color conversion file.

Command entry: **cv** (dialog box version)
Command entry: **cv2** (Command entry version)

Dialog box version:

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Conversion Table:	The list of the current color conversion table, listing the "From Color" (the colors currently in the file) and the "To Color" (the colors that the current colors will be changed to).
To:	Edit box to modify the current table.
File:	Change the currently loaded conversion table. The default file name is SMCLRCVT.CVT. If this file is found, it will be loaded, if not, a file will need to be selected.
Convert:	Save any changes, and run the current conversion table on the current file.

Command entry version:
Command:

Color conversion file: <current conversion file>

Process file or [File/Yes/No] <Yes>: Enter **F**ile to change to a different conversion file, or press ENTER to process current drawing using the current conversion file.

4.8.21.1 Color conversion file

The conversion file is a standard text (ASCII) file.
It is formatted in two columns with 1 - 255 lines.
First column
The color number to convert from (1 - 255).
Second column (starting at 5th character of the row).
The color number to be converted to.

The file extension should be *.CVT.

Example
1 15
2 12
3 3
4 7
...

4.9 Layout Panel Tools

4.9.1 Block Tools

4.9.1.1 Block and Detail Manager

Block and Detail Management (formerly BKeeper)

The Block and Detail Manager provides a tool to efficiently organize, share, and insert your blocks and details (block).

The Block and Detail Category File Manager provides an interface to create and modify the category files used by the Block and Detail Manager.

The Block and Detail Manager is a simple solution for managing AutoCAD blocks. This command can simplify your AutoCAD drafting and increase efficiency by standardizing your block library.

With the Block and Detail Manager you can:

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- Categorize your block library.
- Display a list of your blocks with a slide.
- Associate a description to a block.
- Support Visibility Property of Dynamic Blocks.
- Insert your block into the drawing.
- Insert as a block or Xref.
- Insert your block multiple times.
- Insert your block exploded.
- Insert with a preset horizontal scale, or enter one.
- Insert with a preset rotation angle, or enter one.
- Insert your block on one or three Layer Types.
- Assign layers and their properties (e.g., color and linetype) from the layer database.
- Quick search the categories by name and description.
- Use SmartDraft Block and Detail Manager Menu tools to access the Block Manager and category files from your company's custom menu.

The Block and Detail Manager uses two types of Category Files (*.BKL) to organize your block library.

The BKEEPER.BKL stores the Category File names and the individual <Category>.BKL files.

4.9.1.1.1 BKEEPER.BKL

The Bkeeper.bkl category list file

During installation, the default BKEEPER.BKL and individual Category files are placed in the <installation folder>\bkeeper.

Due to file rights in Windows Vista and Windows 7, the installed Block and Detail Manager files are copied to:

Windows XP: All Users\SmartDraft\Bkeeper

Windows Vista/7: ProgramData\SmartDraft\BKeeper

But the files can be stored anywhere on the network.

Multiple libraries of Category files to manage symbols for various departments, office locations, agencies, etc.

Each symbol's Category file library is placed into separate folders for each BKEEPER.BKL file and its corresponding Category files.

- The BKEEPER.BKL file stores the names of the individual Category files.
- The BKEEPER.BKL file is the associated <Category>.BKL files listed within it and must be stored in the same folder.
- The <Category>.BKL file name is not to exceed 57 characters (dialog box display limitation).
- The first character of the individual <Category>.BKL files will be capitalized.
- The "BKEEPER" name is reserved by the command as a special category file.
- The "Search..." name is reserved by the command as a special category.

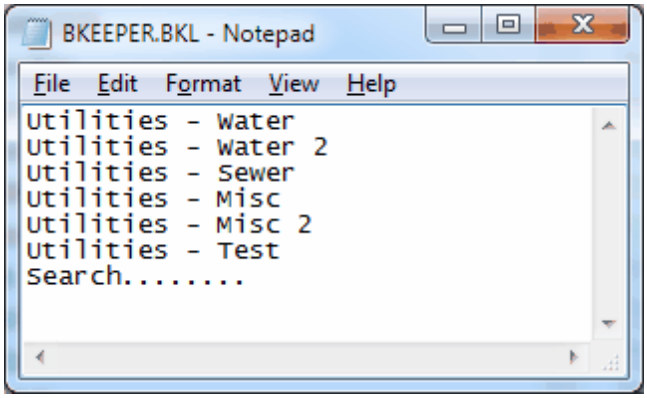
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- The symbols listed in the individual <Category>.BKL files can be located anywhere on the network, even across a WAN.
- The slide files of the symbols listed in the <Category>.BKL file are stored in the same folder as the specified block.

The Current Path listed at the top of the dialog box indicates where the Block and Detail Tool search for the BKEEPER.BKL and individual Category files is located.

Obviously, there can only be one BKEEPER.BKL master list per folder. If the Block and Detail Manager is configured to have multiple BKEEPER.BKL files, the operator may have to change the path to access the various BKEEPER.BKL files.

Example of the BKEEPER.BKL file



Adding a Category file to BKEEPER.BKL

- From the Block and Detail Category File Manager command, select **Add** from the Category Files section.
- Enter the category file name for the list (maximum of 57 characters), and select **OK**.

See Category Files for information and setup.

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4.9.1.1.2 Category Files

Category files are used by the Block and Detail Manager to organize and associate additional information with a block.

These files can be created and modified using the Block and Detail Category File Manager.

Category file

A category file is a "|" (vertical bar) delimited file with multiple fields.

The fields specify various data and options used by the Block and Details Manager.

These files can be created and modified using the Block and Detail Category File Manager.

See Add and Add+ for information on adding symbols using the Block and Detail Category File Manager.

The category files can also be edited with a text edit but be careful to follow the format below, or the Block and Detail Manager will have unpredictable results.

Category file (<category>.BKL) fields

The screen shot below shows an example of a <category>.BKL file.

The format for these 'named list' files is:

Block path & name | Description | Layer | Horizontal Scale | Rotation Angle | Single / Multiple insertion | Insert / Xref | Exploded / Not | Display Attribute Dialog | Visibility State

Block name

Enter a valid drawing name with the DWG extension, and also include the drive and path. If the drive and path are excluded, the drawing file must exist in the current Customization Template Folder. A portion of the drive and path may contain a string variable which can be associated to a folder path defined in the BKEEPER.INI file.

Description field option

Enter any description up to 40 characters, including space (dialog box display limitation). You may not use the "|" character in any description, as this character is reserved for delimiting the fields in this file.

Layer field options

- Can use a valid layer name (hard coding) or the Layer Database Index of the Layer Database.
- When a layer name is used: If it does not exist in the drawing but exists in the Layer Database, the layer will be created with the specified properties in the SmartDraft layer database. Otherwise, it will be created with color white and linetype Continuous.
- The reserved word <CURRENT> can be used in the layer field to specify the current layer will be used when the command starts. It can be used for any of the three layers.
- In the layer field, either one, two, or three layers can be specified.
- If only one layer is specified, it will be used for all three Layer Types.
- To specify two or three layers, separate the layers by the "/" (forward slash) character.

Examples:

WAT	One layer. This layer name will be used by all three Layer Types.

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WAT/WAT-EX	Two layers. WAT will be used by the *PROP* and *DEMO* layer types, and WAT-EX will be used by the *EXIST* layer type.
WAT/WAT-EX/WAT-DEMO	Three layers. WAT will be used by the *PROP* layer type, WAT-EX will be used by the *EXIST* layer type, and WAT-DEMO will be used by the *DEMO* layer type.
11	One layer index. The layer name associated to the Layer Database Index 11 for all three Layer Types.
11/12	Two layer indexes. The layer name associated to the Layer Database Index 11 for *PROP*, 12 for *EXIST*, and 11 for *DEMO*.
11/12/13	Three layer indexes. The layer name associated to the Layer Database Index 11 for *PROP*, 12 for *EXIST*, and 13 for *DEMO*.

<CURRENT>

WAT/<CURRENT>/WAT-DEMO

Horizontal Scale options

- The horizontal scale field can be used to specify a fixed scale (1), the current horizontal scale (HS), or to specify an on-screen scale (at the command prompt).
- If not specified, the default is current horizontal scale in Modelspace or a Viewport, and 1 in Paperspace.

Example

1	Fixed scale of 1.
10	Fixed scale of 10.
HS	The current Horizontal scale in Modelspace or a Viewport, or 1 if in Paperspace.
OS	Specify the scale on-screen (at the command prompt).

Rotation Angle options

- The rotation angle field can be used to specify a fixed rotation angle in degrees (90), specify on-screen, or be horizontal to screen at the current View Twist
- If not specified, the default is OS.

Example

0	Fixed rotation angle of 0.
90	Fixed rotation angle of 90.
OS	Specify the rotation angle on-screen (at the command prompt).
VT	Horizontal to Screen (0) at current View Twist.

Single / Multiple insertion options

- The single / multiple insertion field can specify if the Multiple option is toggled on.
- If not specified, the Multiple toggle option is not changed.

Example

S	Turns the Multiple option toggle off.
M	Turns the Multiple option toggle on.

Insert / Xref options

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- The Insert / Xref field can specify if the Block Manager is going to insert the block as a block or Xref.
- If not specified, the default is I (insert).

Example

I	Turns the Xref option toggle off. Insert the block .
X	Turns the Xref option toggle on. Xref the block.

Explode options

- The Explode field can specify if the insert block will be exploded. Note: Will not explode an Xref.
- If not specified, the default is N.

Example

N	Turns the Explode option toggle off.
E	Turns the Explode option toggle on.

Display Attribute Dialog

- The Display Attribute Dialog field can specify if the Attribute Edit Dialog will appear after the block is inserted. Does not work on an Xref.
- If not specified, the default is D.

Example

D	Display the Attribute Edit Dialog if the inserted block has an attribute.
N	Does not display the Attribute Edit Dialog even if the inserted block has an attribute.

Visibility State

If the block is an AutoCAD Dynamic Block with a Visibility property, a visibility state can be associated to the block.

- The format of this field is the visibility state property name (default Visibility) and the visibility state name separated by a colon ":" This field is case sensitive.
- If not specified, the default is "".

Example:

The "|" block is added as a delimiter to separate the possible fields.

All the block names have a Variable for a portion of the path.

The first four blocks use the same dynamic block with a visibility state specified.

```
;Block Name Description LayerProp/LayerExist/LayerDemo Scale Rotation Angle Single/Multip
SDMISC\Detail_Bubble.dwg Detail Bubble 55/55/55 HS VT S I N D
SDMISC\Section_Bubble.dwg Section Bubble (Up) 55/55/55 HS VT S I N D Visibility:Up
SDMISC\Section_Bubble.dwg Section Bubble (Right) 55/55/55 HS VT S I N D Visibility:Right
SDMISC\Section_Bubble.dwg Section_Bubble (Down) 55/55/55 HS VT S I N D Visibility:Down
SDMISC\Section_Bubble.dwg Section_Bubble (Left) 55/55/55 HS VT S I N D Visibility:Left
SDMISC\Title_Bubble.dwg Title Bubble 55/55/55 HS VT S I N D
```

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4.9.1.1.3 Network Options

There are various options the CADD Manager or Network Administrator can set to customize the use of the Block and Detail Manager.

Default Values and Block and Detail Manager Path file

The following Defaults for BKEEPER are stored in the BKEEPER.DFT file, located in the current Customization Template folder:

Any line of the file starting with the ";" character is considered a comment

Line #	Description	Values
1	Default folder to find the *.BKL files	This value is now stored in the Program Options File Locations: Type: Block Manager. And the value stored in this file is ignored.
2	Save/Use insertion layer toggle state	This value is ignored and feature removed.
3	Toggle Specify Scale On-Screen	0 off, 1 on.
4	Toggle Redefine option	This value is ignored and feature removed.
5	Toggle Explode option	0 off, 1 on.
6	Toggle Multiple option	0 off, 1 on.
7	Toggle Xref option	0 off, 1 on.
8	Toggle Add Slide option	This value is ignored and feature replaced.
XREFDISABLE=<value>	Disable Xref option	0 enabled (default), or 1 disabled.

Note: Values for lines 1, 2, 4, and 8 will be ignored but will remain in the file so the old file will work with the new code.
Values for lines 3, 5, 6, and 7 are the default values for these options in the Block and Detail Manager if the values have not been set in the category file for the specific block being selected.
XREFDISABLE= is an option added in SmartDraft version 9.x to disable the Xref option, even if set in the category file.

Fixed Path

The path to the default Block and Detail Manager category file (BKEEPER.BKL) can be fixed.

If a path value is set to the variable $CV_BKEEPER_PATH, the Block and Detail Manager will use the specified path only and disable the Change Path button.

One option to set this variable in the ACADDOC.LSP file is by adding a line:

(SETQ $CV_BKEEPER_PATH <path>) where <path> is a valid folder path. e.g. "\\\\<servername>\\blocks\\"

Remember to place quotations around the path and to use double backslashes "\\" or a single forward slash "/" as the path delimiter.

If your organization needs the option to change the path, do not set a value for this variable.

Folder Rights

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The Network Administrator can restrict rights to changes in the Block and Detail Manager Category File (BKEEPER.BKL) list and the individual blocks listed in the <Category>.BKL file.

Note: The operator will still have access to view and insert blocks from the various categories.

If the Network Administrator restricts the rights to modify the contents of the folder these files are within, various buttons and options on the Block and Detail Category File Manager dialog box will be disabled.

Slides

The Block and Detail Manager displays a slide of the selected block, if a slide file (*.SLD) is found in the same folder.

The Block and Detail Category File Manager makes a strong effort to automatically create slides that give the operator a large preview of each block in the Block and Detail Manager library.

A slide of the selected block cannot be created if the operator does not have rights to create a file in the folder.

If you are not pleased with the slide generated, you may create your own using AutoCAD's MSLIDE command.

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4.9.1.1.4 Menu tools

Special AutoLISP functions have been created so the CADD Manager can start the Block and Detail Manager tool from a ribbon, icon, or pull-down menu item.

Before using any of these functions, first load the RACBKEEP.VLX file

(IF (NOT SM_BKEEP) (SM:LWPREN "RACBKEEP"))

Start the Block and Detail Manager with a specified category file displayed.

(SM_BKEEP path categoryfile)

path

A string containing a complete path. Slashes (/) and backslashes (\) are accepted as folder delimiters. UNC paths can be used.

categoryfile

A string containing the exact file name without the path or extension. Case sensitive. The category file must exist in the path provided. If it does not exist, the first one listed in the BKEEPER.BKL file in the path provided will be listed.

No Return Value

Example: (SM_BKEEP "C:\\Program Files\\SmartDraft\\Traffic" "Arrows")

Insert a block using the associated properties stored in the specified category file. The command prompt options will be the same as those using the dialog interface of the Block and Detail Manager tool.

(SM_BKEEPBNM path categoryfile blockname)

path

A string containing a complete path. Slashes (/) and backslashes (\) are accepted as folder delimiters. UNC paths can be used.

categoryfile

A string containing the exact file name without the path or extension. Case sensitive. The category file must exist in the path provided. If it does not exist, the first one listed in the BKEEPER.BKL file in the path provided will be listed.

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blockname

A string containing the block name without the path or extension of the block within the specified category file.

No Return Value

Example: (SM_BKEEPBNM "C:\\Program Files\\SmartDraft\\Traffic" "Arrows" TC-I10")

Suggestion

When adding the path value for the above functions in the menu, use an AutoLISP variable. Set the value of the AutoLISP variable in your menu "MNL" file. This way, if you have to move the BKEEPER.BKL and Category.BKL files, you'll only have to update the variable versus editing the menu file (CUI or CUIX).

Example:

In your <menu filename>.mnl add

(SETQ SMPATH "C:\\Program Files\\SmartDraft\\Traffic")

(SM_BKEEPBNM SMPATH "Arrows" TC-I10")

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4.9.1.1.5 Block and Detail Manager

Organize, share, and insert blocks and details efficiently.

See Block and Detail Manager Overview for additional information.

See Block and Detail Category File Manager for information on setting up the data files used by this command.

Note: By default, the Block and Detail Manager ignores the AutoCAD settings, INSUNITS, INSUNITSDEFSOURCE, and INSUNITSDEFTARGET, when inserting blocks or Xrefs. To enable the option to use the AutoCAD settings, INSUNITS, INSUNITSDEFSOURCE, and INSUNITSDEFTARGET, use the User Options.


Button

Ribbon: SmartDraft ▸ Layout panel ▸ Block drop-down

Toolbar: Block Tools on the Layout Tools

Menu: SmartDraft ▸ Drawing Tools ▸ Block and Detail Manager

Command entry: **bk**

Dialog Box Options

Block and Detail Manger

Change Path:	Set the folder location for the Block and Detail Manager category file (BKEEPER.BKL). See Network Options. **Note:** Once changed, the new values are stored in your current AutoCAD profile.
Category	
Category List	Select the category to list the associated blocks. See Search... category.
Description	Display the description associated with the selected item.
Search	The Description edit box changes to the Search edit box when the Search... category is selected. Enter the search condition, and press enter. See Search... for more information. Once the operator enters a search condition, the command searches every category files for a match with the block name or their descriptions. The results are displayed as a Category File List, which the operator can use to insert an item from the list.
List	
Name	Name of block within the selected category. **Note:** The drawing name will be truncated to 16 (for display only).
Description	Description associated to the item.
Layer	
Layer (drop-down)	Set the output layer type. Default (uses layers associated to the item), *current* (the layer current when the command started), or "Select...".
Select...	To select a layer from the drawing, use the **Select...** option from the Layer drop-down list.
Layer: (Edit box)	Enter a layer name for the selected block. If the layer name is within the current Customization Templates layer database, and the layer does not exist, it will be created with the properties

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specified in the layer database. Otherwise, the layer is created with color white and linetype continuous. If the Explode option is selected, the Layer edit box is disabled.

Layer Type: Toggle the Layer Type when the Layer pull-down list is set to "Default". It is used to determine which of the three layer types will be used with the block.

Scale

Scale The Scale options include the choice of entering a predetermined insertion scale factor or specifying the scale later ("On-screen") as part of the insertion process. If "Specify On-screen" is toggled OFF, the command uses the current scale factor determined by the SmartDraft drawing scale. The operator may enter a scale other than the default. The scale will be applied uniformly, and the rotation angle can be entered on the screen or at the command prompt.

Specify On-screen Alternatively, if "Specify On-screen" is toggled ON, then the operator will be given normal AutoCAD insertion options, including dragging its location and varying the X,Y,and Z scale factors, as well as rotation angle.

Options

Multiple This option permits the operator to perform multiple insertions of the block at multiple locations and rotation angles. This will be enabled only if the operator has selected a predetermined scale factor and has not selected the Xref option.

Xref To attach the block as an Xref. Operators cannot insert a block as an Xref if the block is defined in the drawing. The Redefine and Multiple options are disabled if the Xref option is selected. An Xref is attached as an Overlay when using the Block and Detail Manager.

Explode This option will insert the block and explode it. Multiple exploded insertions are permitted. The Xref option is disabled if the explode option is selected.

Command:

Specify Insertion point: Specify an insertion point, or press ENTER to end.

Specify Rotation angle <0d0'0">: Enter a rotation angle.

If the Scale option is set to On-Screen

Command:

Specify scale factor for XYZ axes <1>: 40

Specify insertion point or [Basepoint/Scale/X/Y/Z/Rotate]: Specify an insertion point, or press ENTER to end.

Specify Rotation angle <0d0'0">: Enter a rotation angle.

If the Rotation Angle is set to an angle, the Specify Rotation angle <0d0'0">: **will be omitted.**

4.9.1.1.5.1 Searching

Search the Name and Description fields of all the Category files, and create a Search.BKL Category File List.

The Search... Category option can be used to search through the content of all the Category Files listed in the Category section.

You can now use a special unique list item named "Search....." to search through the contents of all the lists for entries that contain the search criteria in either their name or description.

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When the operator selects the **Search...** category, the Description edit box changes to the Search edit box.

Search: Enter the search conditions.
The wildcard character "*" is added to the beginning and end of each search condition.
Multiple search conditions can be entered separating each with a comma.
Spaces are interpreted literally.
Wildcards CANNOT be used.
It is NOT case sensitive.
Whole words ARE NOT required.
The search condition is saved in the file "SEARCH.BKL" in the operator's TEMP folder and is unique to each operator.

4.9.1.1.5.2 Select Layer

Select a layer from a list of layers in the drawing (excluding Xref layers).

When the layer drop-down option is set to "Select...", all layers in the drawing matching the layer FILTER, excluding Xref layers, appear in a dialog box, allowing the operator to pick the desired layer from the list, or type it in. You may use the layer FILTER edit box to focus on layer names that match the filter, making it easier to find the desired layer. Refer to filters in your AutoCAD reference manual. If you enter a layer name that does not exist, the layer will be created whenever you insert the file by picking the OK button. The command will prevent you from entering invalid layer names.

Dialog Box Options

Select Layer

Layers: A list of all the layers in the drawing (except Xref layers). Select the desired layer, and the name will be placed in the **Name** edit box.
Name: The currently selected layer. Enter any valid layer name.
Filter: Enter a filter condition to limit the list of layer displayed. Multiple filter conditions can be entered separating each with a comma.

Cancel Selecting cancel will cancel the selection of a layer and reset the Layer option to Default.

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4.9.1.1.6 Block and Detail Category File Manager

Create, and modify the BKEEPER.BKL and category files used with the Block and Detail Manager block management command.

Command

Ribbon: SmartDraft ▸ Layout panel ▾

Toolbar: Block Tools on the Layout Tools

Command entry: **bkm**

Dialog Box Options

Block and Detail Category Manager

Change Path: Set the folder location for the Block and Detail Manager Category File. See Network Options.

Note: Once changed, the new values are stored in your current AutoCAD profile.

Category File List (BKEEPER.BKL)

Category Files List Select the Category File to list, or manage the blocks within the Category File.

Add Create a new Category File, and add it to the list. The new Category File name will be added above the currently selected category name.

Remove Remove a Category File from the list. (Does not delete the Category File from the folder.)

Rename Rename a Category File.

Move Up Move a Category File name up in the Category File list.

Move Down Move a Category Files name down in the Category File list.

Note: The “Search.....” category can be moved to the top of the list. If the “Search…” category is left at the top of the list, the Block and Detail Manager command will start with the Searching option active.

Lock Set the BKEEPER.BKL file as read-only. Lock the BKEEPER.BKL file to avoid accidental modification. See Unlock Customization Template Files to remove the lock.

Variable Folders

Folders List of the Folder Variables in the BKEEPER.INI file.

Edit... Edit / Manager the Folder Variables file.

Category File List

Name Name of block within the selected category list.

Note: The drawing name will be truncated to 16 (for display only).

Description Description associated to the block.

Description (Edit Box) Edit the description associated to the block. The description can include any character (except "|"), spaces, and have up to 40 characters. Leading and trailing spaces will be removed. If the operator presses the Enter key when completing the description, the block's properties will be updated, like pressing the Update button.

Add Add a block name to the block list. The description (edit box value), layer, scale, rotation angle, and type options will be associated with the selected block.

Add+ Add a list of blocks to the block list. An option to create a corresponding slide for each of the selected drawings will be displayed.

Delete Remove the selected drawing file from the current category list. A dialog box will appear requiring the operator to confirm the deletion. Selecting the "NO", or pressing the "ESC" key will cancel the

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action and return to the main dialog box.

Update Update the property values associated to the selected block in the Category File List. Uses the currently set values for Description, Layers, Scale, Rotations Angle, and Type.

Visibility States If the block is a Dynamic Block, and has visibility states, select the button to search for the visibility states.

Select the visibility state to display when the block is inserted.

Sort Sort the block list. It performs an alphabetic sort of block lists by their description. A dialog box asks you to confirm the sort. Once a list has been sorted, the results are written to a file and cannot be undone.

Move Up Move a block name up in the Category List.

Move Down Move a block name down in the Category List.

Copy To... Copy a block name from the current Category List to a different Category File List.

Move To... Move a block name from the current Category List to a different Category File List.

Lock Set the selected Category File as read-only. Lock a Category File to avoid accidental modification. See Unlock Customization Template Files to remove the lock.

Advance on Update Check option to advance to the next block in the Category list upon an Update to the properties. If it is the last item in the list, it will cycle to the first item.

Slide Display a slide associated to the current block. If it does not exist, it will display No Slide. If the folder of the block is not read-only, the Make Slide button will be enabled.

Make Slide Make a Slide of the current block, if it does not already exist. If the block's folder is read-only, this option is ignored. The slide will be made in the same folder as the block.

Delete Slide Delete an existing Slide. Can be recreated after deletion.

Layers

Proposed

(Button) Use to select the proposed layer from the current drawing.

(Edit Box) Enter a layer name, <CURRENT>, or Layer Database Index to associate to the proposed layer type.

Existing

(Button) Use to select the existing layer from the current drawing.

(Edit Box) Enter a layer name, <CURRENT>, or Layer Database Index to associate to the existing layer type.

Demolition

(Button) Use to select the demolition layer from the current drawing.

(Edit Box) Enter a layer name, <CURRENT>, or Layer Database Index to associate to the demolition layer type.

Current Set the layer types to "<CURRENT>".

Layer Index... Display the layers and layer database index numbers defined in the layer database. See Layer Database Index. If no layer database index number is specified, SmartDraft supplies index 0 which signifies the block will be inserted on layer 0.

Scale

Horizontal Scale The block will be inserted at the scale of the drawing if in modelspace, or a viewport. If in paperspace, the scale will be 1.

Specify On-screen The block will be inserted, and the operator will be prompted to specify a scale during the insertion.

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Scale	Enter a scale if the scale factor of the block is fixed, regardless of the scale of the drawing.
Rotation Angle	
Specify On-screen	The block will be inserted, and the operator will be prompted to specify a rotation angle during the insertion.
Viewtwist 0	The block will be rotated to be horizontal to the current viewtwist.
Angle	Enter an angle if the rotation angle of the block is fixed.
Type	
Block	Select the block type if the block is to be inserted as a block.
Multiple	Option to insert the block multiple times without reentering the command.
Explode	Option to explode the block after insertion. Can be combined with the Multiple option.
Attribute Dialog	Option to display the Attribute Edit Dialog box after insertion, if the block has any attributes.
Xref Overlay	Select the Xref Overlay to attach the block as an Xref. The Operator cannot insert a block as an Xref if the block is already defined in the drawing.

4.9.1.1.6.1 Add Category

Add a Category File to the current BEEKER.BKL.

The new Category File name will be added above the currently selected category name in the list.

There are two ways to enter the Category File:

1. Select it from a file selection dialog; or
2. Type the name.

When you select the Add button from the Category Files section of the dialog box, the Select Category File dialog will appear.

- Select an existing Category FIle (*.bkl); or
- Select the Cancel button to enter a Category File name.

Manually type a new category file name:

- The Add New Category File dialog box appears;
- Type a name value (name cannot be BKEEPER, SEARCH, or a name already in the list); and
- Select OK.

4.9.1.1.6.2 Add Block and Add+ Blocks

Add: Add a single block to a Category file one at a time.

- Start Block and Detail Category File Manager.
- Select the Category name.
- Set the layer options. Three layer types can be set.

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- Set the desired scale type and scale.
- Set the desired rotation type and angle.
- Set Block or Xref.
- If Block, set the individual block options.
- Select the **Add** button in the Category File List section.
- Browse, and select the desired drawing from a folder.
- Enter a description value.
- If the block is a dynamic block with Visibility States.
  - Select the **Search** button to list the Visibility States; and
  - Select the desired Visibility State.
- Select **OK** to accept the description and Visibility State.
- If the selected drawing's folder is not read-only, a prompt to create a slide will appear.

Add+: Add multiple blocks from a single folder to a Category File

- Start Block and Detail Category File Manager.
- Select the Category name.
- Set the layer options. Three layer types can be set.
- Set the desired scale type and scale.
- Set the desired rotation type and angle.
- Set Block or Xref.
- If Block, set the individual block options.
- Select the **Add+** button in the Category File List section.
- Browse, and select the desired drawings from a folder.
- The default description will be the file name without the extension.
- The default visibility state is set to "" (None). Use the **Visibility** button in the main dialog to set.
- If the selected drawing folder is not read-only, a prompt to create slides will appear.

Slide creation hints

- AutoCAD cannot read a Slide file from a folder with either "(" or ")" in the path.
- To better center the block in the slide, reshape the drawing screen area into a square, then start the command.

4.9.1.1.6.3 Rename

Rename an existing category list.

There are a few character restrictions to ensure that file names are valid and to prevent internal formatting errors.

Category names can be mixed case, contain spaces, and be up to 57 characters long (a dialog limitation only). The first character will be automatically capitalized to aid in legibility. Leading and trailing spaces are always removed.

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Since the "Delete List" option deletes only the list name from the master BKEEPER.BKL file, and not the <list name>.BKL file itself, it's often possible that a .BKL file will exist that matches the intended new list name. In this situation, there are three (3) possibilities:

- If there is no <old name>.BKL file (the list is empty), then there is no warning, and the existing <new name>.BKL file will be used to fill in the contents of the renamed list.
- If there is an <old name>.BKL and no <new name>.BKL, the <old name>.BKL will be renamed to <new name>.BKL.
- If there is an <old name>.BKL file and a <new name>.BKL, the operator will be given the choice to replace the <new name>.BKL with the contents of the <old name>.BKL, or use the contents of the <new name>.BKL. In either case, the <old name>.BKL will remain.

Note: You cannot rename a category list to a name already in the list.

4.9.1.1.6.4 Copy To...

Copy a block and the associated properties to another Category File list.

A dialog with a list of the Category files listed in the BKEEPER.BKL will appear.

Select Target Category File

Category Files Select a category file to copy the selected block.

4.9.1.1.6.5 Move To...

Move a block and the associated properties to another Category File list.

A dialog with a list of the Category files listed in the BKEEPER.BKL will appear.

Select Target Category File

Category Files Select a category file as the target to move the selected block.

4.9.1.1.6.6 Folder Variables Manager

Edit / Manage the Folder Variables file (BKEEPER.INI).

Access from the **Edit...** button in the Block and Detail Category File Manager.

Dialog Box Options

Folder Variables List of existing Variables associated to a folder path.
Variable A string value associated to a folder path. This value will be substituted for the corresponding path in a block name in a category file.
Folder Directory path. Use the Browse... button to change the value.
Browse... Change the Folder value to a selected folder path.

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Add	Add a new Folder Variable to the list.
Delete	Remove the selected Folder Variable from the list.
Update	Update the selected Folder Variable with the current Variable and Folder values.
Cancel	Disregard changes.
OK	Save changes to the file.

Large, multiple office organizations, may share the same blocks, but may not share the same drive or root path. The BKeeper.ini file allows a variable to be associated to a portion of a drive and folder path of the block name. This allows the manager of the Category Files to manage blocks at various offices.

The BKeeper.ini is saved in the same folder as the BKEEPER.BKL file. Make sure you have the correct path set before creating or editing the BKeeper.ini file.

This file is used by the Block and Detail Manager and Block and Detail Category Manager.

The values inside the BKeeper.ini file, replace the Variable with the Folder (folder path) in a drawing value in a category file.

The file format is:

Variable=Folder

The Variable is converted to uppercase

Example:

Value in the BKEEPER.INI file: SMUTIL=U:\BLOCKS\UTIL

Block name in category file: SMUTIL\SD-HM.DWG

Convert to: U:\BLOCKS\UTIL\SD-HM.DWG

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4.9.1.2 Block Scale

Enlarge, reduce, and rotate selected blocks.

The same value will be applied to the X, Y, and Z scale factors. The insertion point of each block remains the same.


Button

Ribbon: SmartDraft ▸ Layout panel ▸ Block Tools drop-down

Toolbar: Block Tools on the Layout Tools

Menu: SmartDraft ▸ Drawing Tools ▸ Scale Blocks

Command entry: **bsc**

Command:

Scale blocks about the insertion point.

Select objects: Select the blocks to rescale, and press ENTER.

Enter scale factor or [Reference/Absolute]: Enter a scale factor, **R**eference to specify a reference and new length, or **A**bsolute to enter a new scale.

Specify angle to rotate blocks <0>: Specify an angle to rotate the blocks. This angle will be added to the existing angle of the selected blocks.

Reference:

Specify reference length <1>: Enter the reference length.

Specify new length: Enter a new length.

Specify angle to rotate blocks <0>: Specify an angle to rotate the blocks. This angle will be added to the existing angle of the selected blocks.

Absolute:

Enter the absolute scale: Enter the new scale for all selected blocks.

Specify angle to rotate blocks <0>: Specify an angle to rotate the blocks. This angle will be added to the existing angle of the selected blocks.

4.9.1.3 Block (Text) Rotate

Rotate blocks or text strings holding the insertion point.

Rotate blocks or text strings using the insertion point as the base point. The blocks or text can be rotated a given angle counter-clockwise, or an absolute angle relative to the easterly direction being 0 and the angle entered measured in a counter-clockwise direction.


Button

Ribbon: SmartDraft ▸ Layout panel ▸ Block Tools drop-down

Toolbar: Block Tools on the Layout Tools

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Menu: SmartDraft ▸ Drawing Tools ▸ Rotate Blocks (Text)

Command entry: **brt**

Command:

Rotate blocks and text about the insertion point.

Select objects: Select the blocks and text to rotate, and press ENTER.

Specify rotation angle or [Absolute]: Specify a rotation angle or **A**bsolute to enter an angle relative to 0.

If **A**bsolute:

Specify absolute angle for all objects: Specify a rotation angle.

4.9.1.4 Block Count

Count all or the selected blocks within the drawing.

Count all the inserted blocks in a drawing by selecting a specific area or all of the blocks.

Note: Supports dynamic blocks. Each dynamic block is listed by block name and the current visibility property separated by a colon.

Button

Ribbon: SmartDraft ▸ Layout panel ▸ Block Tools drop-down

Toolbar: Block Tools on the Layout Tools

Menu: SmartDraft ▸ Drawing Tools ▸ Count Blocks

Command entry: **bct**

Video demonstration

Command:

Block count.

Select objects: Select all blocks within a specified area. All objects except blocks will be filtered out.
Can also select a close polylines as boundaries to select blocks within the closed polylines.

Dialog Box Options

Block List: List of selected blocks and the count of those blocks.
Close: Close dialog box without saving data in the block list.
Save: Save list of blocks and their count to a comma delimited file.

Example of output file

NAME,COUNT

B-D,1

D-PD,1

D-TM,84

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DATUM,2
EF-DOT,2
POINT,4
PRO_DEF2,2
PVI2,6
SL-2,1
W-FH1,1

4.9.1.5 Block Update

Update the definition of blocks in the current drawing.

If changes are made to a block file inserted into a drawing, and there is a need to change the existing block definition without creating a new block insertion. Use this command to replace the block definition of any block defined in a drawing.

Note: The new definition of the block file must have the same name as the block in the drawing.


Button

Ribbon: SmartDraft ▸ Layout panel ▸ Block Tools drop-down
Toolbar: Block Tools on the Layout Tools
Menu: SmartDraft ▸ Drawing Tools ▸ Update Blocks
Command entry: **bup**

Command:

Block Update.

Select Blocks to Update dialog box appears.

Select Blocks to Update Dialog Box
Select the block file(s) to redefine.

4.9.1.6 Block to Bylayer and Layer to 0

Change objects inside selected blocks to color bylayer and option to change layer to 0.

Note: Does not change any objects in Xrefs.


Button

Ribbon: SmartDraft ▸ Layout panel ▸ Block Tools drop-down
Toolbar: Block Tools on the Layout Tools
Menu: SmartDraft ▸ Drawing Tools ▸ Block to Bylayer
Command entry: **bbl**

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Command:

Change objects inside selected blocks to color bylayer and layer 0.

Select blocks or [Options]: Select the blocks in the drawing, or **O**ptions to toggle layer to 0 on and off.

4.9.1.7 Block Mirror and Rotate

Mirror and rotate a block with attributes.



Button

Ribbon: SmartDraft ▸ Layout panel ▸ Block Tools drop-down

Toolbar: Block Tools on the Layout Tools

Menu: SmartDraft ▸ Drawing Tools ▸ Block Mirror and Rotate

Command entry: **bmr**

Command:

Mirror and rotate a block with attributes.
Select a block: Select the block to mirror and rotate.
Select rotation point: Select a point for the rotation angle.

4.9.1.8 Block Replace / Substitute

Replace one block with another block

Note: Both blocks must already be in the drawing. If both blocks have attributes, they both should have the same number of attributes and in the same order.
The replacement block will be placed on the same layer, scale, and



Button

Ribbon: SmartDraft ▸ Layout panel ▸ Block Tools drop-down

Toolbar: Block Tools on the Layout Tools

Menu: SmartDraft ▸ Drawing Tools ▸ Block Replace / Substitute

Command entry: **bre**

Command:

Select Name of Block to Replace: Select the block to replace from the block list. Press the **Select** button to continue.
<number> blocks found.
Select Replacement Block Name: Select the replacement block from the block list. Press the **Select** button to continue.
<number> blocks replaced.

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4.9.1.9 Block Create Unnamed

Create an unnamed block from selected objects. Unnamed blocks are self-purging if erased.


Button

Ribbon: SmartDraft ▸ Layout panel ▸ Block Tools drop-down
Toolbar: Block Tools on the Layout Tools
Menu: SmartDraft ▸ Drawing Tools ▸ Block Create Unnamed
Command entry: **bku**

Command:

Create an unnamed block.

Specify insertion base point: Specify the block's insertion point.
Select objects: Select the objects to create into the unnamed block.

4.9.1.10 Block Explode Attributes to Text

Explode blocks, converting attribute values to text objects.


Button

Ribbon: SmartDraft ▸ Layout panel ▸ Block Tools drop-down
Toolbar: Block Tools on the Layout Tools
Menu: SmartDraft ▸ Drawing Tools ▸ Explode Attributes to Text
Command entry: **bx**

Command:

Explodes blocks and changes attributes to text.
Select objects: Select all blocks to explode.

Note: The exploded attributes assume the original attribute definition's layer and style.

4.9.1.11 Redefine Blocks

Redefine blocks with masking or User Defined Blocks.

When creating and maintaining Customization Templates, new User Defined Blocks can be added to the template. Also, masking has been added to many blocks supplied with SmartDraft. To update the current drawing to use the currently defined blocks or User Defined Blocks, type RB.

Command entry: **rb**

Command:

Redefining masking blocks and moving to front.

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Move to front with draworder or copy? [Copy/Draworder] <default>: Specify **C**opy to move the blocks to the front with a copy / erase, or **D**raworder to move the blocks to the front using draworder (recommended), or press ENTER to accept the current default.

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4.9.2 Draw Tools

4.9.2.1 Line Tangent to Arc

Create a line tangent to an arc.

Button

Ribbon: SmartDraft ▸ Layout panel ▸ Draw drop-down

Toolbar: Draw Tools on the Layout Tools:

Menu: SmartDraft ▸ Design ▸ Line Tangent to Arc

Command:

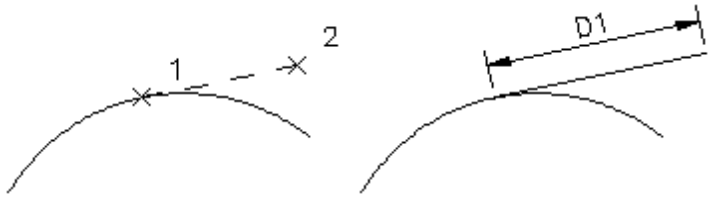
Create a line tangent to an arc.

Select an arc: Select an arc (1). Note: Selected point is also the tangency point.

Specify direction of tangent: Specify a point (2).

Specify tangent length: Specify a length (D1), and press ENTER, or select a point to specify a length.

Example



4.9.2.2 Line Tangent to Two Arcs

Create a line tangent to two arcs.

Button

Ribbon: SmartDraft ▸ Layout panel ▸ Draw drop-down

Toolbar: Draw Tools on the Layout Tools:

Menu: SmartDraft ▸ Design ▸ Line Tangent Two Arcs

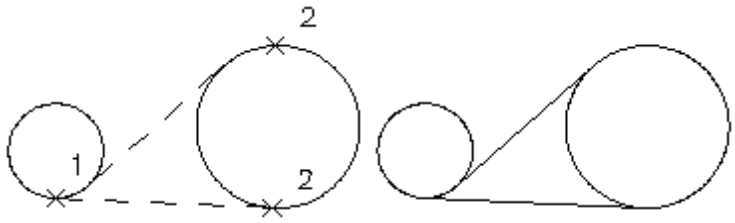
Command:

Specify first point: Select a point (1) along the first arc.

Specify next point: Select a point (2) along the second arc.

Example

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4.9.2.3 Line Perpendicular

Create a line perpendicular to a line, or radial to an arc or circle.

Button

Ribbon: SmartDraft ▸ Layout panel ▸ Draw drop-down

Toolbar: Draw Tools on the Layout Tools:

Menu: SmartDraft ▸ Design ▸ Line Perpendicular

Command:

Create a line perpendicular or radial from an object.

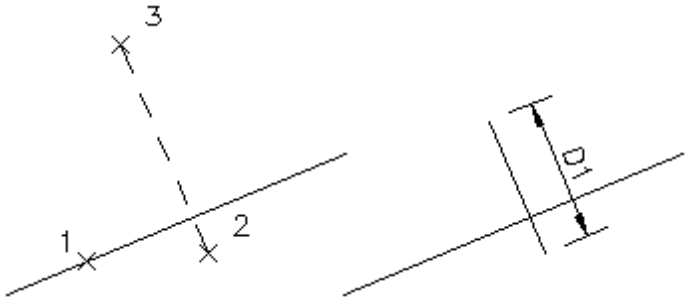
Select a line, arc, circle or polyline: Select a line or arc to calculate the angle from (1).

Specify first point: Specify a point (2). This will be the start point of the line.

Specify direction: Specify a point (3) for the direction from the start point (2).

Specify length: Specify a length (D1), or select a point to specify the length.

Example



4.9.2.4 Line Bisect

Create a line at the bisection angle of two selected lines.

Button

Ribbon: SmartDraft ▸ Layout panel ▸ Draw drop-down

Toolbar: Draw Tools on the Layout Tools:

Menu: SmartDraft ▸ Design ▸ Line Bisect

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Command:

Create a line at the bisect angle of two selected lines.

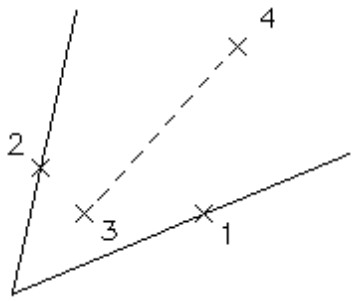
Select first line: Select the first line to calculate the bisection angle from (1).

Select second line: Select the second line to calculate the bisection angle from (2).

Specify first point: Specify a point (3). This will be the start point of the line.

Specify next point: Specify a point (4). This will be the ending point of the line.

Example



4.9.2.5 Line by Turned or Deflection Angle

Create a line at a turned or deflection angle.

Button

Ribbon: SmartDraft ▸ Layout panel ▸ Draw drop-down

Toolbar: Draw Tools on the Layout Tools:

Menu: SmartDraft ▸ Design ▸ Line Turned Angle

Command entry: **dta**

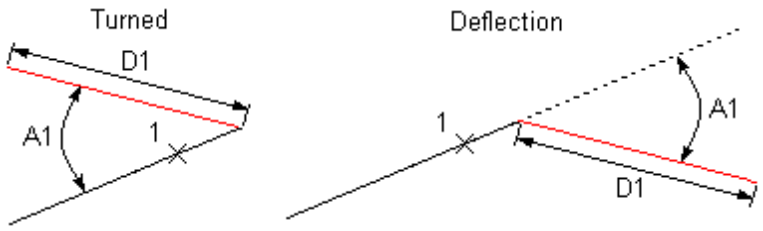
Command:

Create line by turned or deflection angle.
Select a line: Select a line near the end point to draw the new line (1).
Option: Type = <Turned/Deflection>

Turned
Enter turned angle DD.MMSS (ccw, -cw) or [Type]: Enter an angle (A1), **T**ype to toggle between Turned or Deflection angle, or press ENTER to end.
Deflection
Enter deflection angle DD.MMSS (ccw, -cw) or [Type]: Enter an angle (A1), **T**ype to toggle between Turned or Deflection angle, or press ENTER to end.
Specify distance <default>: Specify a distance (D1), or press ENTER to accept default.

Example

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4.9.2.6 Arc Tangent to Line

Create an arc tangent to an existing line.

Button
Ribbon: SmartDraft ▸ Layout panel ▸ Draw drop-down
Toolbar: Draw Tools on the Layout Tools:
Menu: SmartDraft ▸ Design ▸ Arc Tangent to line

Command:

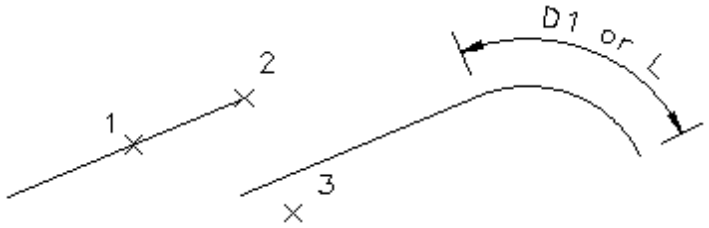
Create an arc tangent to a line.
Select a line: Select a line (1).
Specify start point of arc: Select a point (2). *Default osnap is ENDpoint.*
Specify radius: Specify a radius (R1) or a point (3).
Enter delta DD.MMSS (ccw, -cw) or [Length]: Enter a delta in degrees, minutes, and seconds (D1), or **L**ength to specify a length.

Length

Command:

Specify length (ccw, -cw): Specify a length (L). Positive for clockwise, negative for counter-clockwise.

Example



4.9.2.7 Arc by Length

Create an arc by center point, start point, and length.

Button
Ribbon: SmartDraft ▸ Layout panel ▸ Draw drop-down

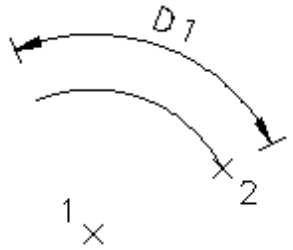
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Toolbar: Draw Tools on the Layout Tools:
Menu: SmartDraft ▸ Design ▸ Arc by Length
Command entry: **abl**

Command:

Create an arc by length.
Specify center point of arc: Select a point (1).
Specify start point of arc: Select a point (2).
Specify arc length (ccw, - cw): Specify an arc length (D1).

Example



4.9.2.8 Radial Lines

Create radial lines from selected arc or arc.

Button
Ribbon: SmartDraft ▸ Layout panel ▸ Draw drop-down
Toolbar: Draw Tools on the Layout Tools:
Menu: SmartDraft ▸ Design ▸ Radial Lines

Command:

Current settings: Selection Option = <Arc/Arcs>

Create radial lines from selected arc(s).

Arc (this option allows user to select a single arc or an arc within a multiple segment object)

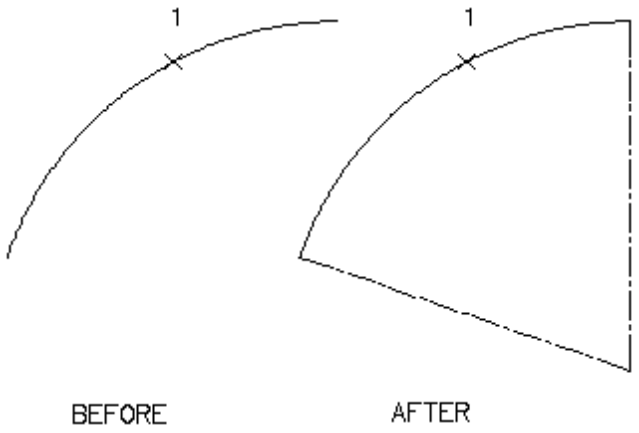
Select an arc or [Option]: Select a curve (1), or **O**ption to toggle to the Arcs selection option.

Arcs (this option only supports the Arc object, not polylines, alignments, feature lines, etc.)

Select arc objects or [Option]: Select arcs (1), or **O**ption to toggle to the Arc selection option.

Example

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4.9.3 Design Tools

4.9.3.1 Reverse Curve

Create a reverse curve, with or without a tangent segment, between two lines, or an arc and line.

Create a reverse curve from two selected lines. There must be one known control point on the first selected line.

Note: First selected object can be an arc or a line; the second object can only be a line. The solutions will be drawn at elevation 0.

Button

Ribbon: SmartDraft ▸ Layout panel ▸ Draw drop-down

Toolbar: Design Tools on the Layout Tools:

Menu: SmartDraft ▸ Design ▸ Reverse Curve

Command:

Select first line or arc: Select the first line or arc (1).

Specify fixed point on first line: Specify a point on the first line (2). *Default osnap is **END**point and **INT**ersection.*

In the direction the reverse curve is to be calculated from the fixed point.

Select second line: Select the second line (3). See note below.

Enter first radius: Enter the radius of the curve off the first line.

Enter tangent distance <0.00>: Enter the tangent distance between the two curves. Enter 0 for no tangent.

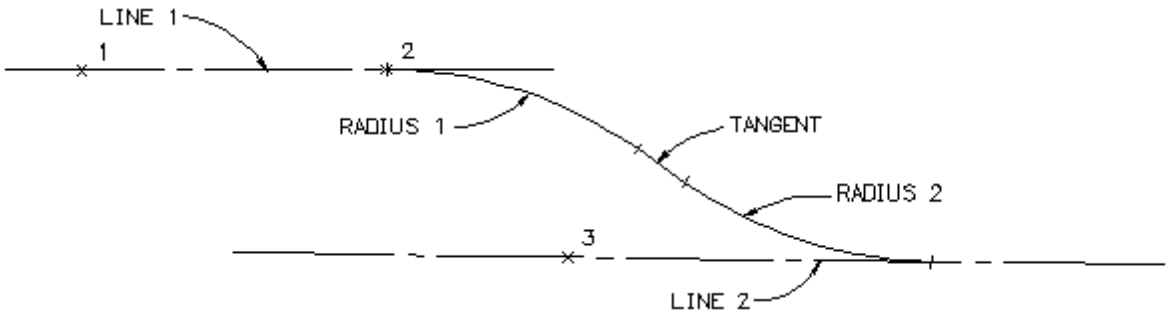
Enter second radius <default>: Enter the radius of the curve off the second line, or press ENTER to accept default.

Manually trim or extend selected lines to reverse curves.

Note: When selecting the second line, select a point on the line in the direction the reverse curve is to be calculated from the fixed point.

Example

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4.9.3.2 Fillet 3 Limits

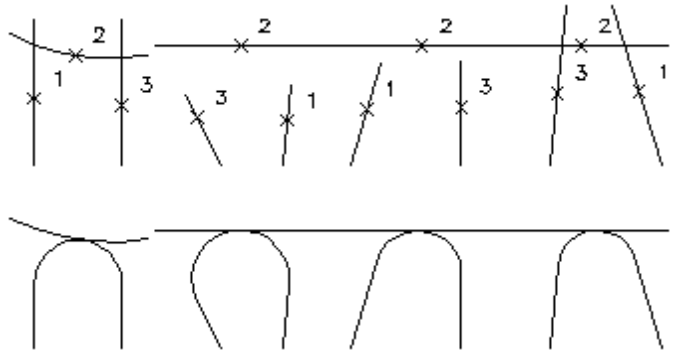
Create a fillet arc tangent to three objects.

Button
Ribbon: SmartDraft ▸ Layout panel ▸ Draw drop-down
Toolbar: Design Tools on the Layout Tools:
Menu: SmartDraft ▸ Drawing Tools ▸ Fillet 3 limits
Command entry: **f2**

Command:
Select first line: Select a line (1).
Select limit line or arc: Select a line or arc (2).
Select second line: Select a line (3).

Note: The fillet is drawn on the layer of the first selected line.

Example



4.9.3.3 Traverse

Create linework and/or points using bearing, turned angle, length, delta, and coordinates. Option to create Civil points along with linework.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Use the BricsCAD Point Creation Options to use the BricsCAD Pro Civil points.

Button
Ribbon: SmartDraft ▸ Layout panel ▸ Design drop-down
Toolbar: Design Tools on the Layout Tools:
Menu: SmartDraft ▸ Design ▸ Traverse
Command entry: **tra**

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Command:
Elevation setting: Auto, Default: 0.000
Create linework and/or points using bearings/angles, lengths, deltas/angles, or coordinates.
Current settings: Linework: <Yes/No>, Points: <Yes/No>.
Specify point or [COordinate/Linework/Options/Points]: Select the Linework option to toggle linework creation Yes/ No, select the Points option to toggle point creation Yes / No, or Options to change point creation options. See the selection below for additional prompt information.

Command Prompts: Traverse - Angle Type: Bearing
Command Prompts: Traverse - Angle Type: Azimuth
Command Prompts: Traverse - Angle Type: Gradian

Traverse Example

4.9.3.3.1 Traverse - Angle Type: Bearing

Command prompts for the Traverse command if the Angle Type is Bearing (All North, North & South)

Command:

Create linework and/or points using bearings, lengths, deltas, or coordinates.
Current settings: Linework: <Yes/No>, Points: <Yes/No>.
Specify point or [COordinate/Options/Points]: Select a start point, **CO** to enter a coordinate to start the traverse, **O**ptions to change the point insertion options, or **P**oints to toggle point insertion.
Enter Quadrant or [1/2/3/4/Arc/Backsite/COordinate/Options]: Enter the desired option.

Full options prompt:

Enter Quadrant or [1/2/3/4/Undo/Arc/COordinate/Tangent/TUrned angle/CLose/Options]: Enter the desired option.

Backsite:

Specify point or [COordinate/Quadrant]: Select a point on the screen, **CO** to enter a coordinate value, or **Q** to specify the bearing.

COordinate: Create line segment by specifying the northing and easting coordinate values.

Enter northing or [Undo]: Specify a northing coordinate value, **U** to undo the last segment, or press ENTER for additional options. (Note: Undo option will not show on first point.)
Enter easting: Specify an easting coordinate value.

Arc: Create a tangent or non-tangent arc.
Arc is [Tangent/Non-tangent] <current>: Press ENTER for a tangent arc, or **N** for a non-tangent arc.

Tangent:

Specify radius: Specify the radius in decimal units.
Enter delta DD.MMSS (ccw, -cw) or [Length]: Enter a delta in degrees, minutes, seconds, or **L** to specify the length.

Non-tangent:

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Direction to radius point: Quadrant [1/2/3/4]: Specify the quadrant direction towards the radius point from the last point: **1** (northeast), **2** (southeast), **3** (southwest), and **4** (northwest).
Enter bearing DD.MMSS: Enter a bearing in degrees, minutes, seconds within the select quadrant.
Specify radius: Specify the radius in decimal units.
Enter delta DD.MMSS (ccw, -cw) or [Length]: Enter a delta in degrees, minutes, seconds, or **L** to specify the length.

Tangent: Create line segment tangent to last arc, or line continued at last bearing.
Specify distance: Specify a distance in decimal units.

TUrned angle: Create a line segment for a specified angle from the last line segment drawn.
Enter bearing DD.MMSS (ccw, -cw): Enter an angle in degrees, minutes, seconds, or press ENTER to return to all options.
Specify distance: Specify a distance in decimal units.

Quadrant [1/2/3/4]: Enter the quadrant direction: **1** (northeast), **2** (southeast), **3** (southwest), and **4** (northwest).
Enter bearing DD.MMSS: Enter a bearing in degrees, minutes, seconds within the select quadrant.
Specify distance: Specify a distance in decimal units.

CLose:

Specify [First/Select/COordinate] <current>: Press ENTER to close back to the starting point, **CO** to specify a northing and easting coordinate, or **S** to select a point on the screen.

4.9.3.3.2 Traverse - Angle Type: Azimuth

Command prompts for the Traverse command if the Angle Type is Bearing (N Azimuth, S Azimuth, Azimuth < 180)

Command:

Create linework and/or points using bearings, lengths, deltas, or coordinates.
Current settings: Linework: <Yes/No>, Points: <Yes/No>.
Specify point or [COordinate/Options/Points]: Select a start point, **CO** to enter a coordinate to start the traverse, **O**ptions to change the point insertion options, or **P**oints to toggle point insertion.
Enter azimuth DD.MMSS or [Arc/Backsite/COordinate/Options]: Enter an azimuth angle or the desired option.

Full options prompt:

Enter azimuth DD.MMSS or [/Undo/Arc/COordinate/Tangent/TUrned angle/CLose/Options]: Enter an azimuth angle or the desired option.

Backsite:

Specify point or [COordinate/Azimuth]: Select a point on the screen, **CO** to enter a coordinate value, or **A** to specify the azimuth.

COordinate: Create line segment by specifying the northing and easting coordinate values.

Enter northing or [Undo]: Specify a northing coordinate value, **U** to undo the last segment, or press ENTER for additional options. (Note: Undo option will not show on first point.)
Enter easting: Specify an easting coordinate value.

Arc: Create a tangent or non-tangent arc.

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Arc is [Tangent/Non-tangent] <current>: Press ENTER for a tangent arc, or **N** for a non-tangent arc.

Tangent:

Specify radius: Specify the radius in decimal units.
Enter azimuth DD.MMSS (ccw, -cw) or [Length]: Enter a delta in degrees, minutes, seconds, or **L** to specify the length.

Non-tangent:

Enter azimuth to radius point DD.MMSS: Specify the azimuth direction towards the radius point from the last point.
Specify radius: Specify the radius in decimal units.
Enter azimuth DD.MMSS (ccw, -cw) or [Length]: Enter a delta in degrees, minutes, seconds, or **L** to specify the length.

Tangent: Create line segment tangent to last arc, or line continued at last bearing.
Specify distance: Specify a distance in decimal units.

TUrned angle: Create a line segment for a specified angle from the last line segment drawn.
Enter azimuth DD.MMSS (ccw, -cw): Enter an angle in degrees, minutes, seconds, or press ENTER to return to all options.
Specify distance: Specify a distance in decimal units.

CLose:

Specify [First/Select/COordinate] <current>: Press ENTER to close back to the starting point, **CO** to specify a northing and easting coordinate, or **S** to select a point on the screen.

4.9.3.3.3 Traverse - Angle Type: Gradian

Command prompts for the Traverse command if the Angle Type is Bearing (Gradian)

Command:

Create linework and/or points using bearings, lengths, deltas, or coordinates.
Current settings: Linework: <Yes/No>, Points: <Yes/No>.
Specify point or [COordinate/Options/Points]: Select a start point, **CO** to enter a coordinate to start the traverse, **O**ptions to change the point insertion options, or **P**oints to toggle point insertion.
Enter gradian DD.DDDD or [Arc/Backsite/COordinate/Options]: Enter a gradian angle or the desired option.

Full options prompt:

Enter gradian DD.DDDD or [/Undo/Arc/COordinate/Tangent/TUrned angle/CLose/Options]: Enter a gradian angle or the desired option.

Backsite:

Specify point or [COordinate/Gradian]: Select a point on the screen, **CO** to enter a coordinate value, or **G** to specify the gradian.

COordinate: Create line segment by specifying the northing and easting coordinate values.

Enter northing or [Undo]: Specify a northing coordinate value, **U** to undo the last segment, or press ENTER for additional options. (Note: Undo option will not show on first point.)

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Enter easting: Specify an easting coordinate value.

Arc: Create a tangent or non-tangent arc.
Arc is [Tangent/Non-tangent] <current>: Press ENTER for a tangent arc, or **N** for a non-tangent arc.

Tangent:

Specify radius: Specify the radius in decimal units.
Enter gradian DD.DDDD (ccw, -cw) or [Length]: Enter a gradian angle, or **L** to specify the length.

Non-tangent:

Enter gradian to radius point DD.DDDD: Specify the gradian direction towards the radius point from the last point.
Specify radius: Specify the radius in decimal units.
Enter gradian DD.DDDD (ccw, -cw) or [Length]: Enter a gradian angle, or **L** to specify the length.

Tangent: Create line segment tangent to last arc, or line continued at last bearing.
Specify distance: Specify a distance in decimal units.

TUrned angle: Create a line segment for a specified angle from the last line segment drawn.
Enter gradian DD.DDDD (ccw, -cw): Enter a gradian angle, or press ENTER to return to all options.
Specify distance: Specify a distance in decimal units.

CLose:

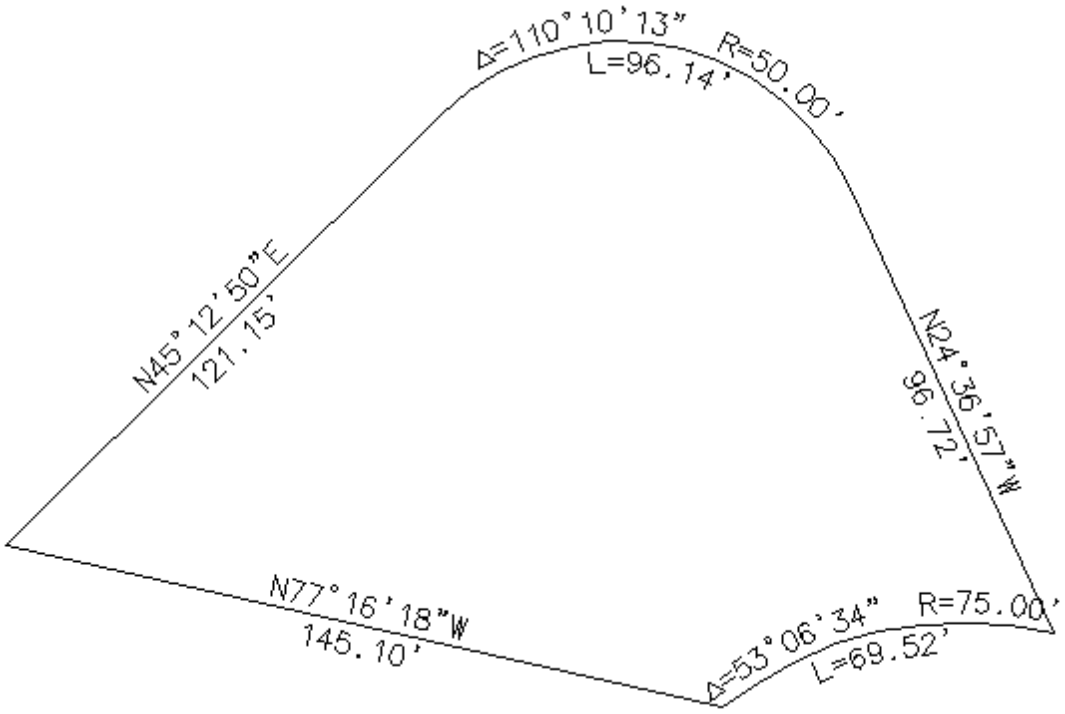
Specify [First/Select/COordinate] <current>: Press ENTER to close back to the starting point, **CO** to specify a northing and easting coordinate, or **S** to select a point on the screen.

4.9.3.3.4 Traverse Example

Back to Traverse:

Example

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Command:

Create linework and/or points using bearings, lengths, deltas, or coordinates.
Current settings: Linework: Yes, Points:No.
Specify point or [COordinate/Options/Points]: Enter **co** for the start points' northing and easting coordinate values.
Enter northing: **1000**
Enter easting : **1000**
Enter northing or [Undo]: press ENTER to stop entering points by coordinate values.
Enter Quadrant or [1/2/3/4/Arc/COordinate/Tangent/TUrned angle/CLose/Options]: Enter **1** to create a line segment in quadrant 1 (northeast).
Enter bearing DD.MMSS : **45.1250**
Specify distance: **121.15**
Enter Quadrant or [1/2/3/4/Undo/Arc/COordinate/Tangent/TUrned angle/CLose/Options]: Enter **a** to create an arc.
Arc is [Tangent/Non-tangent] <Tangent>: Press ENTER to create an arc Tangent to the last segment.
Specify radius: **50**
Enter delta DD.MMSS (ccw, -cw) or [Length]: **110.1013**
Enter Quadrant or [1/2/3/4/Undo/Arc/COordinate/Tangent/TUrned angle/CLose/Options]: Enter **t** to create a line segment tangent to the last arc.
Specify distance: **96.72**
Enter Quadrant or [1/2/3/4/Undo/Arc/COordinate/Tangent/TUrned angle/CLose/Options]: Enter **a** to create an arc.
Arc is [Tangent/Non-tangent] <Tangent>: Enter **n** to create an arc non-tangent to the last segment.
Direction to radius point: Quadrant [1/2/3/4]: Enter **3** for the quadrant direction from the last point to the radius point (southwest).
Enter bearing DD.MMSS: **13.5216**
Specify radius: **75**
Enter delta DD.MMSS (ccw, -cw) or [Length]: Enter **l** to create an arc by length.
Specify length (-ccw, -cw): **-69.52**

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Enter Quadrant or [1/2/3/4/Undo/Arc/COordinate/Tangent/TUrned angle/CLose/Options]: Enter **cl** to create a line back to the start point.
Specify [First/COordinate] <First>: Press ENTER to accept, and end.

The labeling of the lines and arcs is shown for example only. It is not done automatically. Use Labeling tool to label the linework.

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4.9.3.4 Lot Lines

Create lot lines along a line or arc.

These lots are either perpendicular or radial to the selected object. The command does not automatically draw a lot line at the start point. To create a lot line at the specified start point, enter 0 for the lot width and 1 for lots at this width. Lot width calculated by chord distance along Radius length is used to calculate lot separation.


Button

Ribbon: SmartDraft ▸ Layout panel ▸ Design drop-down
Toolbar: Design Tools on the Layout Tools:
Menu: SmartDraft ▸ Design ▸ Lot Lines

Command:
Select line or arc: Select an object.

If you select a line:

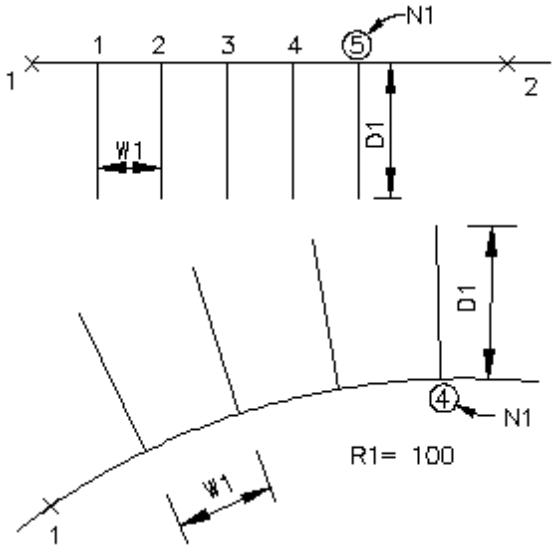
Specify start point: Specify a point (1). *Default osnap is **END** and **INT**ersection point.*
Specify angle to follow: Specify a point (2). *Select point on line for angle that lot line will follow.*
Enter lot depth (-left, +right): Enter a value for the lot depth. (D1)
Enter lot width: Enter a value for the lot width. (W1)
Enter number of lots at this width: **5** Enter a value for the number of lot lines at this width. (N1)
Enter lot width: Enter a new width (W1), or press ENTER to end

If you select an arc:

Specify start point: Specify a point (1). *Default osnap is **END** and **INT**ersection point.*
Specify calculation method: [Chord/Arc] <Arc>:
Enter lot depth (-in, +out): Enter a value for the lot depth. (D1)
Enter radius to calculate lot width <current>: Enter a value to calculate the lot width. This allows the width to be calculated at a setback distance from the selected arc. (R1)
Enter lot width (ccw, -cw): Enter a value for the lot width. (W1)
Enter number of lots at this width: **4** Enter a value for the number of lot lines at this width. (N1)
Enter lot width (ccw, -cw): Enter a new width (W1), or press ENTER to end.

Example

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4.9.3.5 Cul-de-sac

Create a cul-de-sac.

Create a cul-de-sac along a selected line or arc. It can be drawn with or without a tangent segment or offset. If lines exist at the entered offset distance, they will be trimmed.

Button

Ribbon: SmartDraft ▸ Layout panel ▸ Design drop-down

Toolbar: Design Tools on the Layout Tools:

Menu: SmartDraft ▸ Design ▸ Cul-de-sac

Command:

Select centerline line or arc: Specify a point (1).

Specify Cul-de-sac radius point: Specify a point (2). *Default osnap is **END**point.*

Specify point on centerline towards opening of Cul-de-sac: Specify a point (3). *Default osnap is **NEA**rest.*

Dialog Box Options

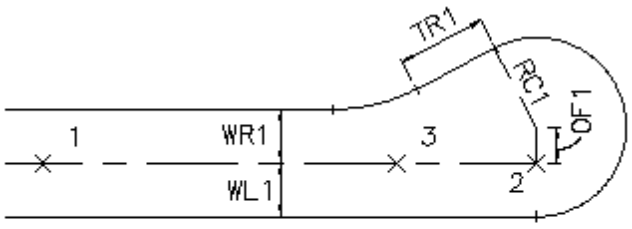
Design Data

Cul-de-sac Radius: R3	Cul-de-sac radius (RC1).
Centerline Offset: OF1	Enter a (OF1) value. 0 for no offset.
Left / Outside:	
R/W Width: D1	Left/Outside ROW width side 1 (WR1).
Return Radius: R1	Return radius side 1 (PR1).
Tangent: T1	Optional tangent side 1 (TR1). 0 for no tangent.
Curb, Sidewalk, Gutter Offsets:	
Sidewalk:	Optional sidewalk offset distance. If 0.0, no sidewalks will be drawn.
Curb: D3	Optional curb offset distance. If 0.0, no curbs will be drawn.
Gutter	Optional gutter offset distance. If 0.0, no gutters will be drawn.
Right/Inside:	
Inside Width: D2	Right/Inside ROW width side 2 (WL1).

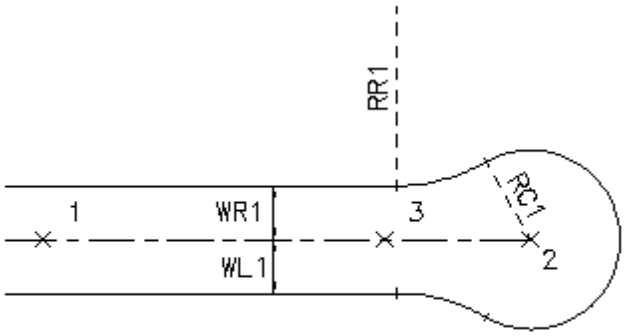
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Return Radius: R2 Return radius side 2 (PL1).
Tangent: T2 Optional tangent side 2 (TL1). 0 for no tangent.

Example



CUL-DE-SAC LEFT OFFSET WITH A TANGENT



CUL-DE-SAC WITHOUT TANGENTS

4.9.3.6 Knuckle

Create a knuckle from two intersecting line segments.

Note: The command does not trim, extend, or fillet existing linework.

Button
Ribbon: SmartDraft ▸ Layout panel ▸ Design drop-down
Toolbar: Design Tools on the Layout Tools:
Menu: SmartDraft ▸ Design ▸ Knuckle

Command:
Select first centerline: Select a centerline.
Select second centerline: Select a centerline.

Dialog Box Options

Design Data:
Knuckle Radius: R1 Knuckle radius.
Return Radius: R4 Inside return radius.

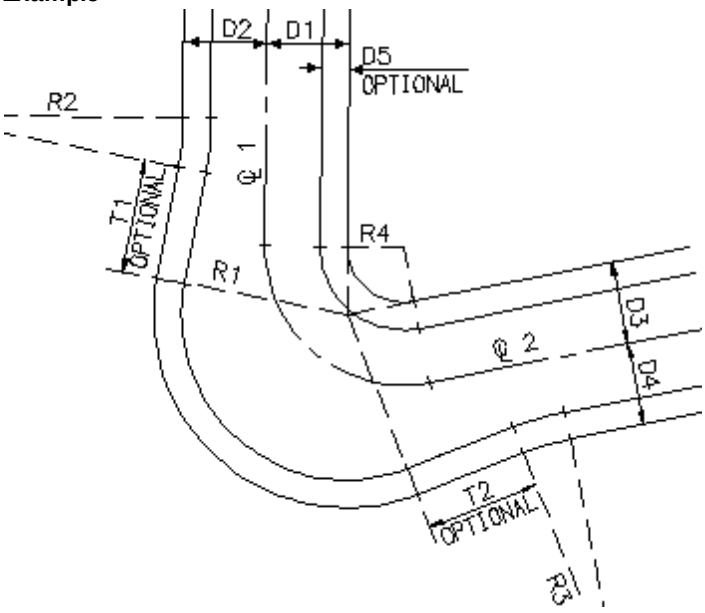
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Return Type:	Select if return for R4 will be an **Arc** or a **Line**.
Offsets:	
Sidewalk:	Optional sidewalk offset distance. If 0.0, no sidewalks will be drawn.
Curb: D3	Optional curb offset distance. If 0.0, no curbs will be drawn.
Gutter	Optional gutter offset distance. If 0.0, no gutters will be drawn.
Centerline 1:	
Inside Width: D1	Inside ROW width-side 2.
Outside Width: D2	Outside ROW width-side 1.
Return Radius: R2	Return radius-side 1.
Tangent: T1	Optional tangent between return and knuckle.
Centerline 2:	
Inside Width: D3	Inside ROW width-side 2.
Outside Width: D4	Outside ROW width-side 2.
Return Radius: R3	Return radius-side 2.
Tangent: T2	Optional tangent between return and knuckle.

Display this prompt after drawing a knuckle:

Manually trim or extend lines to complete knuckle.

Example



4.9.3.7 Pedestrian Ramp

Create a pedestrian ramp.

Button

Ribbon: SmartDraft ▸ Layout panel ▸ Design drop-down

Toolbar: Design Tools on the Layout Tools:

Menu: SmartDraft ▸ Design ▸ Pedestrian Ramp

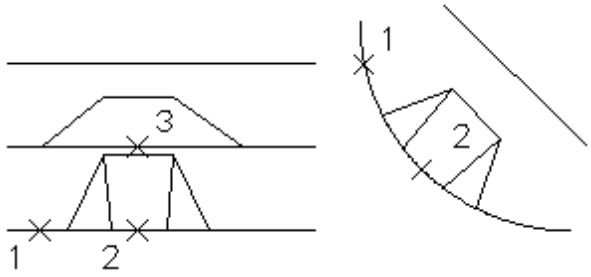
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Command:
Pedestrian Ramp.
Enter curb height [1/2/3/4/5/6/7/8] <6>: Enter a curb height (H1), or press ENTER to accept default.
Select curb: Select an object (1).

Line selected:
Select center of Pedestrian Ramp: Specify a point (2). *Default osnap is **NEA**rest.*
Select sidewalk: Specify a point (3). *Default osnap is **PER**pendicular.*
Select curb: Select an object, or press ENTER to end.

Arc selected:
Select center of Pedestrian Ramp: Specify a point (2). *Default osnap is **NEA**rest.*
Select sidewalk: Specify a point (3). Note: This prompt only appears if radius is greater than 80. *Default osnap is **PER**pendicular.*
Select curb: Select an object, or press ENTER to end.

Example



4.9.3.8 Driveway Wings

Create driveway wings.

Create the driveway wings from the R/W or Back of Walk towards the entry of the driveway.


Button
Ribbon: SmartDraft ▸ Layout panel ▸ Design drop-down
Toolbar: Design Tools on the Layout Tools:
Menu: SmartDraft ▸ Design ▸ Driveway Wing

Command:
Create driveway wings.
Current settings: Width = *<current>*
Specify point at back of driveway or [Width]: Specify a point (1), or **W**idth to change the width value. *Default osnap is **END**point and **INT**ersection.*
Specify point at front of driveway: Specify a point (2). *Default osnap is **END**point and **INT**ersection.*
Specify the side: Specify a side to place the driveway wing. (3)

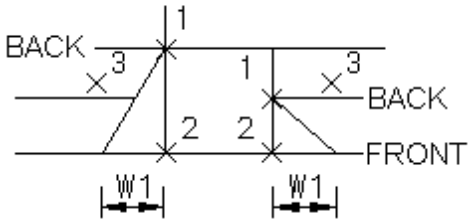
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Specify point at back of driveway or [Width]: Specify a point (1), or **W**idth to change the width value, or press ENTER to end.

Width

Enter driveway width <default>: Enter a new width (W1), or press ENTER to accept default.

Example



4.9.4 Attribute Tools

4.9.4.1 Attribute Move

Change the attribute text insertion point.

Button

Ribbon: SmartDraft ▸ Layout panel ▸ Attribute Tools drop-down

Toolbar: Attribute Tools on the Layout Tools

Menu: SmartDraft ▸ Drawing Tools ▸ Attribute Move

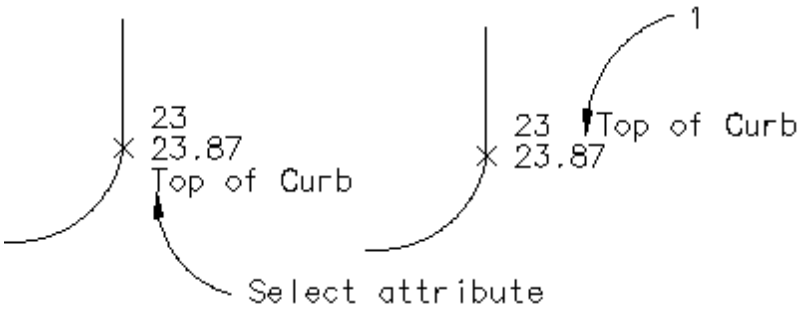
Command entry: **at**

Command:

Select Attribute or point object: Select an attribute to move.

Specify new text insertion point: Specify the new insertion point (1).

Example



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4.9.4.2 Attribute Rotate

Change the attribute text rotation angle.

Button

Ribbon: SmartDraft ▸ Layout panel ▸ Attribute Tools drop-down

Toolbar: Attribute Tools on the Layout Tools

Menu: SmartDraft ▸ Drawing Tools ▸ Attribute Rotate

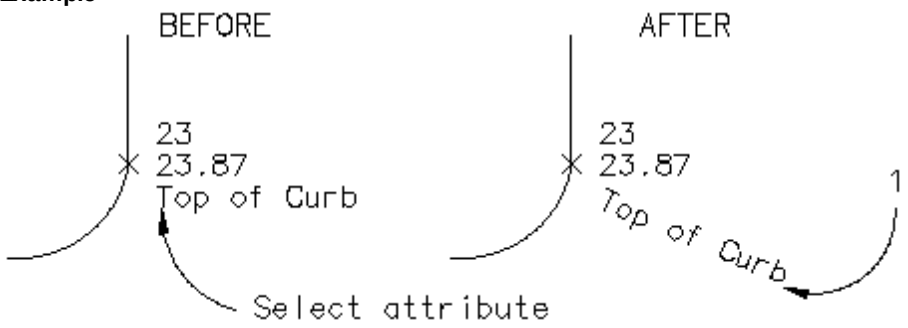
Command entry: **atr**

Command:

Select Attribute: Select an attribute to rotate.

Specify rotation angle: Specify the new rotation angle (1).

Example



4.9.4.3 Attribute Move and Rotate

Change the attribute text insertion point and rotation angle.

Button

Ribbon: SmartDraft ▸ Layout panel ▸ Attribute Tools drop-down

Toolbar: Attribute Tools on the Layout Tools

Menu: SmartDraft ▸ Drawing Tools ▸ Attribute Move and Rotate

Command entry: **atm**

Command:

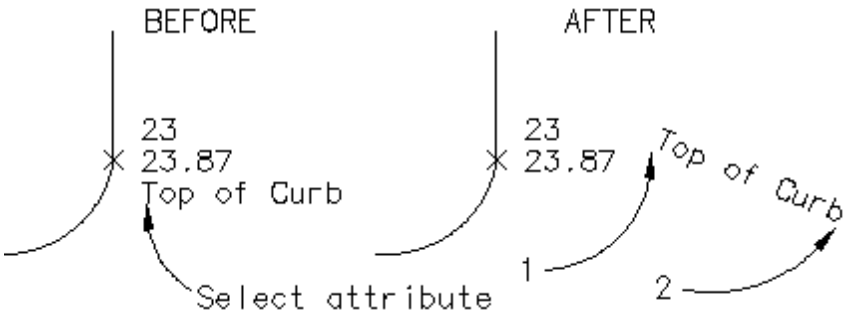
Select Attribute: Select an attribute to move.

Specify insertion point: Specify the new insertion point (1).

Specify rotation angle: Specify the new rotation angle (2).

Example

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4.9.4.4 Attribute Change

Change properties of selected attributes.

Button

Ribbon: SmartDraft ▸ Layout panel ▸ Attribute Tools drop-down

Toolbar: Attribute Tools on the Layout Tools

Menu: SmartDraft ▸ Drawing Tools ▸ Attribute Change

Command entry: **cat**

Command:

Select attribute: Select an attribute to modify its properties.

<number> attribute(s) selected.

Enter property to change Angle/Case/Color/Height/Justify/Layer/Oblique/Position/Style/Width]: Enter **A**ngle to change the rotation angle, **CA**se to convert the text case, **CO**lor to change the color, **H**eight to change the height, **J**ustify to change the justification, **L**ayer to change the layer, **O**blique to change the oblique angle, **P**osition to move the attributes, **S**tyle to change the style, or **W**idth to change the width factor.

If **Angle:**

New angle <default>: Enter a new rotation angle.

If **CAse:**

Enter case [Lower/Upper/Mixed] <default>: Enter **L**ower to convert all to lowercase, **U**pper to convert all to uppercase, or **M**ixed to leave as-is.

If **COlor:**

Current color: bylayer

Color selection dialog box appears. Use to select the desired color.

If **Height:**

Enter text height <default>: Enter the new height.

If **Justify:**

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Enter an option [Left/Center/Middle/Right/TL/TC/TR/ML/MC/MR/BL/BC/BR] <default>: Enter the desired justification.

If **Oblique:**

Enter oblique angle <default>: Enter the oblique angle.

If **Position:**

Specify base point: Specify the movement base point.

Specify second point: Specify the second point.

If **Style:**

Style selection dialog box appears. Use to select the desired style.

If **Width:**

Enter width factor <default>: Enter the new width factor.

4.9.4.4.1 Select Style

Dialog to select a text style

Dialog Box Options

Style List: List of text styles in the drawing. Select a style from the list.
OK: Return the name of the highlighted text style.

4.9.4.5 Attribute Edit

Edit the Color/Style/Layer of selected attributes of all blocks with the same name.



Button


Ribbon: SmartDraft ▸ Layout panel ▸ Attribute Tools drop-down 
Toolbar: Attribute Tools on the Layout Tools 
Menu: SmartDraft ▸ Drawing Tools ▸ Attribute Edit


Command entry: **eat**

Command:
Select block: Select a block. The command will select all blocks with the same name as the selected block.

Processing selected block... <number> found.

Select Insertion Layer(s) dialog box appears.
This dialog box lists the layer(s) of the block(s) found and the number (count) of blocks on the layer(s).
Block Name: <name of selected block>

Block Layer: List of block insertion layers and number of the selected blocks on the layer(s). Highlights the blocks to change by selecting the desired layer names.
OK Continue to next attribute selection.
Close Exit the command.

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Select Attribute Tag dialog box appears
Select the attribute tag to change.
Block Name: <name of selected block>

Attribute List:	List of attributes in the selected block. Highlights the attribute tag to edit. Note: Only one attribute tag at a time can be edited. This dialog will reappear after the selected attribute tag is processed.
OK	Proceed to Attribute Edit Options dialog box.
Close	Exit the command.

Attribute Edit Options dialog box appears
Attribute Tag: <tag of selected attribute>

Color...	Select to change the color of the attribute tag. The Select Color dialog box will appear.
Layer...	Select to change the layer of the attribute tag. Note: Not the block layer. The Select Layer dialog box will appear.
Style...	Select to change the style assigned to the attribute tag. The Select Style dialog appears.
Process	Process the specified Color, Layer, and / or Style changes.
Cancel	Cancel any Color, Layer, or Style changes specified.

4.9.4.6 Attribute Replace

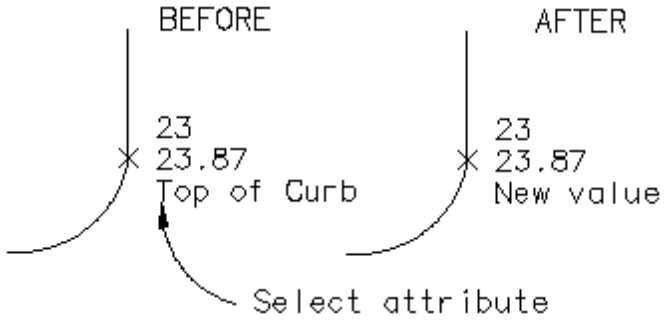
Replace the value of the attribute text.

Button
Ribbon: SmartDraft ▸ Layout panel ▸ Attribute Tools drop-down
Toolbar: Attribute Tools on the Layout Tools
Menu: SmartDraft ▸ Drawing Tools ▸ Attribute Replace
Command entry: **atv**

Command:
Select Attribute: Select an attribute to replace.

Edit Text dialog box displays.
In dialog box: Enter the new attribute value, and press ENTER or OK to update.

Example



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4.9.5 Parking Spaces Tools

4.9.5.1 Parking Spaces

Create parking spaces (stalls) along an arc or line.

These stalls are either perpendicular or radial to the selected object. The command does not automatically draw a stall strip at the start point. To create a parking stall at the specified start point, enter 0 for the stall width and 1 for stalls at this width. Stall width calculated by chord distance along arcs.


Button

Ribbon: SmartDraft ▸ Layout panel ▸ Parking Tools drop-down

Toolbar: Parking Tools on the Layout Tools

Menu: SmartDraft ▸ Design ▸ Parking Spaces

Command entry: **pks**

Command:
Create parking stalls.
Select line or arc: Select an object.

If you select a line:

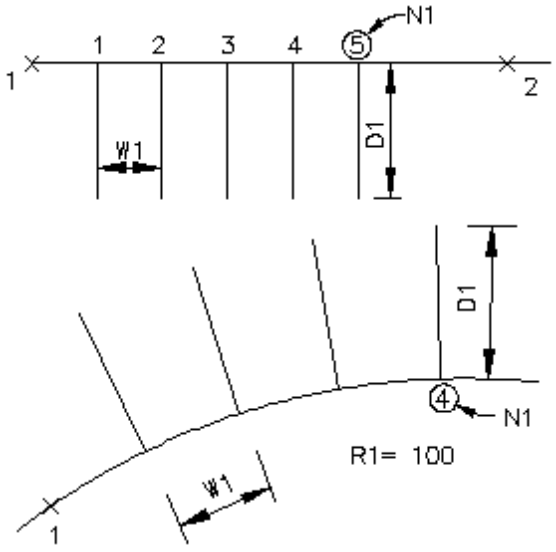
Specify start point: Specify a point (1). *Default osnap is **END**point and **INT**ersection point.*
Select angle to follow: Specify a point (2). *Select point on line for angle that stall striping will follow. Default osnap is **Nea**rest.*
Enter stall depth (-left, +right): Enter a value for the stall depth. (D1)
Enter stall width: Enter a value for the stall width. (W1)
Enter number of stalls at this width: **5** Enter a value for stalls at this width. (N1)
Enter stall width: Enter a new width (W1), or press ENTER to end.

If you selected an arc.

Specify start point: Specify a point (1). *Default osnap is **END** and **INT**ersection point.*
Enter stall depth (-in, +out): Enter a value for the stall depth. (D1)
Enter stall width (ccw,-cw): Enter a value for the stall width. (W1)
Enter number of stalls at this width: **4** Enter a value for stalls at this width. (N1)
Enter stall width (ccw, -cw): Enter a new width (W1), or press ENTER to end.

Example

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4.9.5.2 Parking Spaces along Polyline

Create parking spaces (stalls) along a polyline.

These stalls are either perpendicular or radial to the selected object. The command does not automatically draw a stall strip at the start point. To create a parking stall at the specified start point, enter 0 for the stall width and 1 for stalls at this width. Stall width is calculated by chord distance along arcs.

Button
Ribbon: SmartDraft ▸ Layout panel ▸ Parking Tools drop-down
Toolbar: Parking Tools on the Layout Tools
Menu: SmartDraft ▸ Design ▸ Parking Spaces along polyline
Command entry: **pki**

Command:
Create parking stalls along polyline.
Select line or arc: Select an object.

If you select a line:

Specify start point: Specify a point (1). *Default osnap is **END**point and **INT**ersection point.*
Select angle to follow: Specify a point (2). *Select point on line for angle that stall striping will follow. Default osnap is **Nea**rest.*
Enter stall depth (-left, +right): Enter a value for the stall depth. (D1)
Enter stall width: Enter a value for the stall width. (W1)
Enter number of stalls at this width: **5** Enter a value for stalls at this width. (N1)
Enter stall width: Enter a new width (W1), or press ENTER to end.

If you select an arc:

Specify start point: Specify a point (1). *Default osnap is **END** and **INT**ersection point.*

Enter stall depth (-in, +out): Enter a value for the stall depth. (D1)

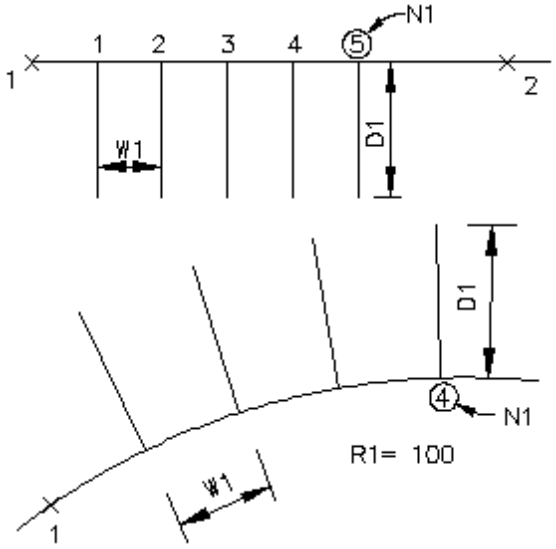
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Enter stall width (ccw,-cw): Enter a value for the stall width. (W1)

Enter number of stalls at this width: **4** Enter a value for stalls at this width. (N1)

Enter stall width (ccw, -cw): Enter a new width (W1), or press ENTER to end.

Example



4.9.5.3 Parking Spaces Count Symbol

Create a parking spaces count or handicap symbol.

Create a parking spaces count symbol or handicap symbol. These symbols can be counted and reported to the command prompt or added as text to the drawing using Parking Spaces Report.

Button

Ribbon: SmartDraft ▸ Layout panel ▸ Parking Tools drop-down

Toolbar: Parking Tools on the Layout Tools

Menu: SmartDraft ▸ Design ▸ Parking Spaces Count Symbol

Command entry: **pkc**

Command:

Current settings: Type: *<Count/Outline/Solid>*, Layer: *<Proposed/Existing/Demo/*current*>*

Specify insertion point or [Options]: Specify a point (1), or **O**ptions to change the current settings.

The next prompt only appears if Type is **Count**

Enter number of parking spaces <1>: **10** Enter the number of parking spaces.

Specify rotation angle <0.00>: Specify an angle, and press ENTER, or select a point (2).

Dialog Box Options

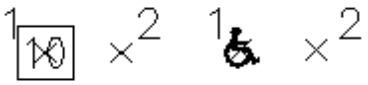
Parking Spaces Options

Type

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Count: Select to insert a square block for counting parking spaces.
Outline: Select to insert a handicap space symbol. Outline only.
Solid: Select to insert a handicap space symbol. Solid fill only.
Layer:
Layer: Set the output layer type. Default (uses layers in layer database) or *current*.
Layer Type: Toggle the layer type for the slope symbol.

Example



4.9.5.4 Parking Spaces Report

Create a report of the number of regular and handicap parking spaces.

The report can separate the parking spaces count by layer or combine all in one output.

The report can display at the command prompt or placed as MTEXT.

Adds the number of the Parking Spaces Symbol (Block name: D-SPC or SPACES) and Handicap symbol (Block name: TC-HC, TC-HCS, or HANDI).

Button
Ribbon: SmartDraft ▸ Layout panel ▸ Parking Tools drop-down
Toolbar: Parking Tools on the Layout Tools
Menu: SmartDraft ▸ Design ▸ Parking Spaces Report
Command entry: **pkr**

Command:

Parking Spaces Report settings: Report = *<Combined/Layer>*, Output = *<Screen/Text>*

Current settings: Output = <type>
Select objects or [Options/Select Layer]: Select all parking space symbols, **O**ption to change the report options, **S**elect to change to select by layer, or press ENTER.

If **Select layer:**
Select object layer or [Options/Select objects]: Select an object to specify the layer, **O**ption to change the report options, or **S**elect objects.

Dialog Box Options

Parking Report Options

Report

Combined: Select to create a report of parking spaces without separation by layers.
By Layer: Select to create a report of parking spaces totals by layers.
Solid: Select to insert a handicap space symbol. Solid fill only.
Output
Screen Select to output the totals to the command prompt.
Text Select to output the totals as mtext.

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Example by Layer

Regular	Handicap	Layer
15	2	Section 1
10	3	Section 2
4	3	Section 3
29	8	Total

Example Combined

Regular	Handicap	Layer
29	8	Total

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4.9.6 Offset Tools

4.9.6.1 Offset Multiple

Create multiple concentric circles, parallel lines, and parallel curves.

Button

Ribbon: SmartDraft ▸ Layout panel ▸ Offset Tools drop-down
Toolbar: Offset Tools on the Layout Tools
Menu: SmartDraft ▸ Drawing Tools ▸ Multiple Offset
Command entry: **om**

Command:

Specify offset distance or [Through] <Through>: Specify a distance, **t** to select the distance**,** or press ENTER.

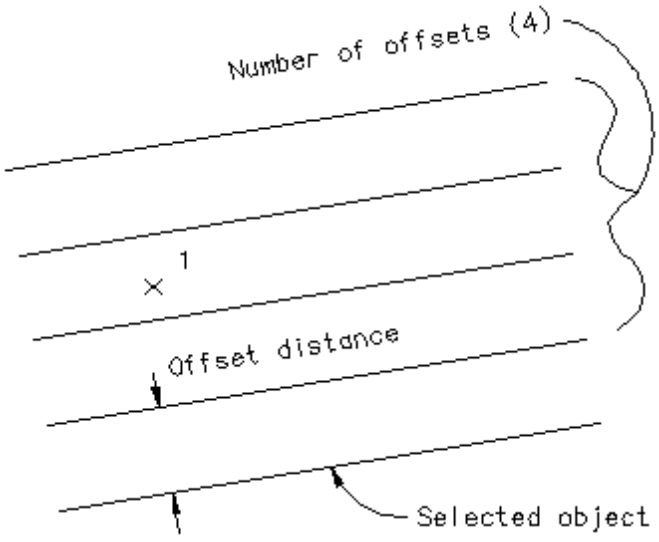
Enter number of offsets <1>: Enter a number of offset objects.

Select object to offset: Select object to offset.

Specify point on side to offset: Specify a point (1) on the side to offset.

Select object to offset: Select object to offset, or press ENTER to end.

Example



4.9.6.2 Offset to Current Layer

Create concentric circles, parallel lines, and parallel curves and place the new objects on the current layer. With an option to offset to both sides.

Button

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Ribbon: SmartDraft ▸ Layout panel ▸ Offset Tools drop-down
Toolbar: Offset Tools on the Layout Tools
Menu: SmartDraft ▸ Drawing Tools ▸ Offset to Current Layer
Command entry: **oc**

Command:

Offset to current layer.

Specify offset distance <*current*>: Specify a distance, select two points to specify a distance, or press ENTER.

Current settings: Both Sides = <Yes/No>, Offset distance <current>:

Select objects to offset or [Both/Offset]: Select object(s) to offset, **B**oth to toggle offset to both sides, **O**ffset to change the offset distance**,** or press ENTER.

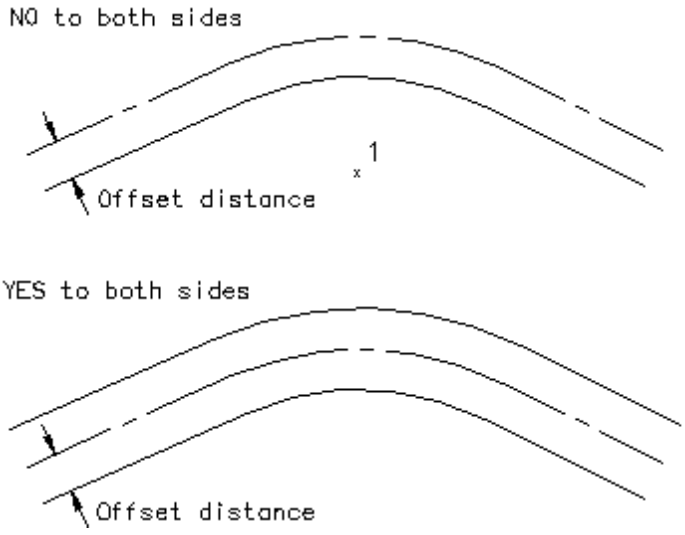
No on Offset both sides

Specify point on side to offset: Specify a point (1) on the side of the object(s) you want to offset.

Offset

Specify offset distance <*current*>: Specify a distance, select two points to specify a distance, or press ENTER.

Example



4.9.6.3 Offset from Xref/Blocks

Create a new object at a specified distance from an existing object within a block or Xref, and place the new object on the current layer. With an option to offset to both sides.

Button

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Ribbon: SmartDraft ▸ Layout panel ▸ Offset Tools drop-down
Toolbar: Offset Tools on the Layout Tools
Menu: SmartDraft ▸ Drawing Tools ▸ Offset from Xref/Block
Command entry: **ob**

Command:

Specify offset distance <*current*>: Specify a distance, select two points to specify a distance, or press ENTER.

Current settings: Both Sides = <Yes/No>, Offset distance <current>:

Select objects to offset or [Both/Offset]: Select object(s) to offset, **B**oth to toggle offset to both sides, **O**ffset to change the offset distance**,** or press ENTER.

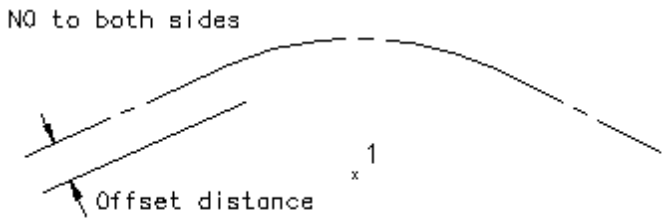
For **No** to Offset to both sides

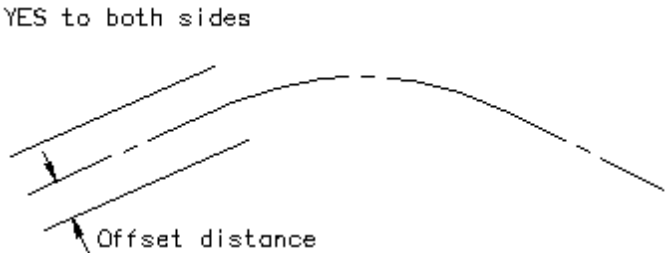
Specify point on side to offset: Specify a point (1) on the side of the object you want to offset.

Offset

Specify offset distance <*current*>: Specify a distance, select two points to specify a distance, or press ENTER.

Example





4.9.6.4 Offset from Xref/Block to Object's Layer

Create a new object at a specified distance from an existing object within a block or Xref, and place the new object on the same layer as the original object. If the original object was on an Xref layer, create a non-Xref layer if one does not exist.

Button
Command entry: **obx**

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Command:

Offset block / Xref to object's layer.

Specify offset distance <*current*>: Specify a distance, select two points to specify a distance, or press ENTER.

Current settings: Both Sides = <Yes/No>, Offset distance <current>:

Select objects to offset or [Both/Offset]: Select object(s) to offset, **B**oth to toggle offset to both sides, **O**ffset to change the offset distance**,** or press ENTER.

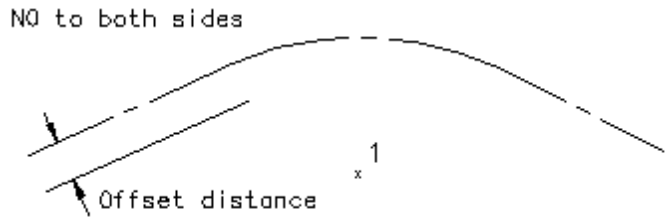
For **No** to Offset to both sides

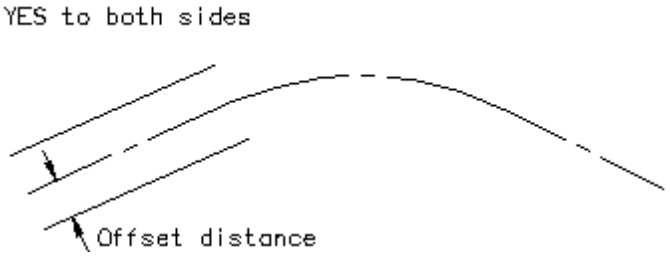
Specify point on side to offset: Specify a point (1) on the side of the object you want to offset.

Offset

Specify offset distance <*current*>: Specify a distance, select two points to specify a distance, or press ENTER.

Example





4.9.6.5 Offset Street

Create multiple offset objects on both sides and to specified layers. Create up to 10 offsets (five per side). The offset objects can be placed on specified layers from the layer database.

Currently supports lines, arcs, polylines (not 3D), Civil 3D alignments, and BricsCAD Pro horizontal alignments.

Use the Break At Crossing and Offset Street Fillet commands to clean up intersections.

Button

Ribbon: SmartDraft ▸ Layout panel ▸ Offset Tools drop-down

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Toolbar: Offset Tools on the Layout Tools 
Menu: SmartDraft ▸ Drawing Tools ▸ Offset Street
Command entry: **ostr**

Command:

Current settings: Style = <*current*>

Select objects to offset or [Options]: Select object(s) to offset, **O**ptions to change the current settings**,** or press ENTER.

Dialog Box Options

Offset Street Style

Name:	A list of the currently defined elevation label styles. Select the label style to use or edit.
Save As:	Save the current elevation label settings to a new style.
Lock:	Set the selected elevation label style (Name above) as read-only. Lock a style to avoid accidental modification. See Unlock Customization Template Files to remove the lock.
Delete:	Delete the current elevation label style. **Note:** Cannot delete the "default" or a locked style. Deleted styles cannot be undone.
Rename:	Rename the current elevation label style.

Settings:

Layer Type:	Toggle the layer type for the layer name selection.

First - Fifth Offset:

Toggle:	Toggle on / off the left and right offsets.
Layer:	Select the layer to place the offset.
Left:	Edit box for left offset values.
Right:	Edit box for right offset values.

Note: Offset Street styles are saved in the sub-folder **\LABELS** of the current Customization Template as (style name).osy files.
To modify the layers listed in the Offset Street Layers List, use the Menu: SmartDraft ▸ Program Setup ▸ Customization Template Manager.

4.9.6.6 Offset Street Fillet

Fillet offset street lines, arcs, and polylines at offsets from starting fillet.

Currently supports lines, arcs, and polylines (non 3D polylines).

Use the Break At Crossing command to prepare intersections after using Offset Street command.


Button
Ribbon: SmartDraft ▸ Layout panel ▸ Offset Tools drop-down 
Toolbar: Offset Tools on the Layout Tools 
Menu: SmartDraft ▸ Drawing Tools ▸ Offset Street Fillet
Command entry: **ofr**

Command:

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Current settings: Style = <*current*>

Select first object or [Options]: Select first object to fillet at the starting fillet value, or **O**ptions to change the current settings

Select second object: Select object to fillet.

Dialog Box Options

Offset Street Filler Style

Name: A list of the currently defined elevation label styles. Select the label style to use or edit.
Save As: Save the current elevation label settings to a new style.
Lock: Set the selected elevation label style (Name above) as read-only. Lock a style to avoid accidental modification. See Unlock Customization Template Files to remove the lock.
Delete: Delete the current elevation label style. **Note:** Cannot delete the "default" or a locked style. Deleted styles cannot be undone.
Rename: Rename the current elevation label style.

Settings
Start Enter the starting fillet radius.
First - Forth Offset:
Toggle: Toggle on / off to the fillet radii value.
Radius: Edit box for first to forth fillet radii values.

Note: Offset Street styles are saved in the sub-folder **\LABELS** of the current Customization Template as (style name).fsy files.
To modify the layers listed in the Offset Street Layers List, use the Menu: SmartDraft ▸ Program Setup ▸ Customization Template Manager.

4.9.6.7 Offset 3D Polyline

Create parallel lines from 3D polylines, and place the new objects on the current layer.

Button
Ribbon: SmartDraft ▸ Layout panel ▸ Offset Tools drop-down
Toolbar: Offset Tools on the Layout Tools
Menu: SmartDraft ▸ Drawing Tools ▸ Offset 3D Polyline to Current Layer
Command entry: **o3**

Command:

Current settings: Both Sides = <Yes/No>, Offset distance = <current/Prompt>, <Elevation/Slope> = <current/Prompt>

Specify offset distance <*current*>: Specify a distance, select two points to specify a distance, or press ENTER.

Enter elevation adjustment or [Slope] <0.00>: Enter a value to adjust the polyline's elevations, or **S**lope to toggle to the slope option.

or

Enter slope (%) or [Elevation] <2.00%>: Enter a slope value. Slope * offset to calculate elevation adjustment, or **E**levation to toggle to the elevation option.

Current settings: Both Sides = <Yes/No>, Offset distance = <current/Prompt>, <Elevation/Slope> = <current/Prompt>

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Select 3D polyline to offset or [Both/Options]: Select 3D polyline to offset, **B**oth to toggle offset to both sides, **O**ptions to change the current settings**,** or press ENTER.

No on Offset both sides

Specify point on side to offset: Specify a point (1) on the side of the object(s) you want to offset.

Prompt Elevation

Enter elevation adjustment or [Slope] <0.00>: Enter a value to adjust the polyline's elevations, or **S**lope to toggle to the slope option.

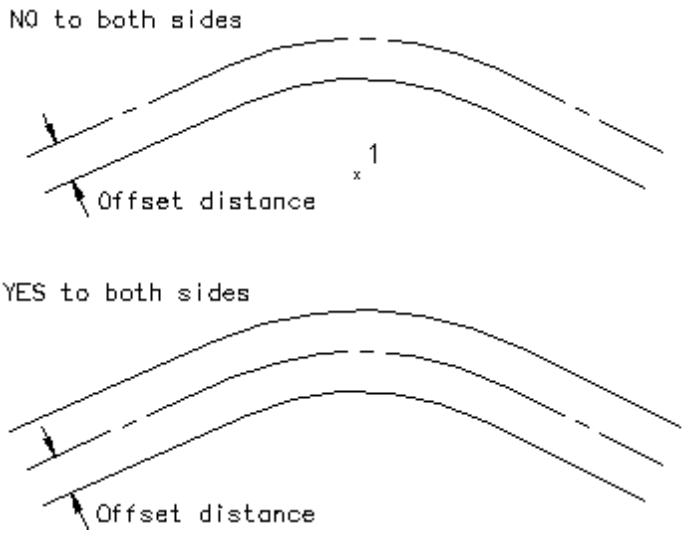
Prompt Slope

Enter slope (%) or [Elevation] <2.00%>: Enter a slope value. Slope * offset to calculate elevation adjustment, or **E**levation to toggle to the elevation option.

Prompt Offset

Specify offset distance <*current*>: Specify a distance, select two points to specify a distance, or press ENTER.

Example



4.9.6.7.1 Options: Offset 3D Polyline

Options for offsets created by the Offset 3D Polyline command.

Dialog Box Options
Options: Offset 3D Polyline
Calculation Options

Offset	Enter an offset.
Offset Prompt	Check so the command prompts for an offset each time.

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Elevation / Slope:	Select the calculation type: Elevation or Slope
Elevation	Enter an elevation adjustment value.
Elevation Prompt	Check so the command prompts for an elevation each time.
Slope	Enter an elevation adjustment value.
Slope Prompt	Check so the command prompts for a slope each time.
Both Sides	Check to offset polyline on both sides.

4.9.7 Retangles Tools

Enter topic text here.

4.9.7.1 Rectangle

Create a rectangular polyline.

Create a rectangular polyline with the options to select the two corners or specify the width and height of the sides.

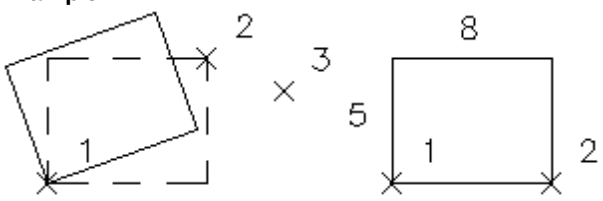
Button
Ribbon: SmartDraft ▸ Layout panel ▸ Rectangles drop-down
Toolbar: Layout Tools
Menu: SmartDraft ▸ Drawing Tools ▸ Rectangle
Command entry: **rect**

Command:
Specify first corner: Specify a point (1).
Specify other corner or [Dimensions]: Specify a point (2) or **D** to specify a width and height.
Specify rotation angle: Select an angle by specifying a point (3).

Dimensions

Specify width for rectangle: **8** Specify a value, and press ENTER.
Specify height for rectangle <*default*>: **5** Specify a value, and press ENTER.
Specify rotation angle: Specify an angle, or select a point (2).

Example



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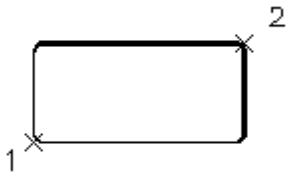
4.9.7.2 Shadow Rectangle / Box

Create a shadow rectangular / box.

Button
Ribbon: SmartDraft ▸ Layout panel ▸ Rectangles drop-down
Toolbar: Layout Tools
Menu: SmartDraft ▸ Drawing Tools ▸ Shadow Rectangle
Command entry: **rts**

Command:
Specify first corner: Specify a point (1).
Specify other corner: Specify a point (2).

Example



4.9.8 Change Tools

4.9.8.1 Change Length

Change the length of an arc, line, or polyline.

Change the length of a line dynamically or by entering a new distance, and change the length of an arc by distance, decimal degrees, degrees-minutes-seconds, or radians, and change the length of a polyline by entering a new distance or selecting a point along the polyline.

Note: The length of a 3D polyline is measured along the angular distance along the polyline. Not the plainer distance.

Button
Ribbon: SmartDraft ▸ Layout panel ▸ Change drop-down
Toolbar: Layout Tools
Menu: SmartDraft ▸ Design ▸ Change Length
Command entry: **cl**

Command:
Change length of an arc, line, or polyline.
Select an arc, line, or polyline: Select an arc, line, or polyline nearest the endpoint to hold.

Arc selected:

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Enter new length or [DEgrees / DDdmmss / Radians] <*current*>: Display the current length. Enter a new length, enter **DE**grees to enter decimal degrees, **DD**dmmss to enter degrees-minutes-seconds, **R**adians to enter radians, or press ENTER to accept current.

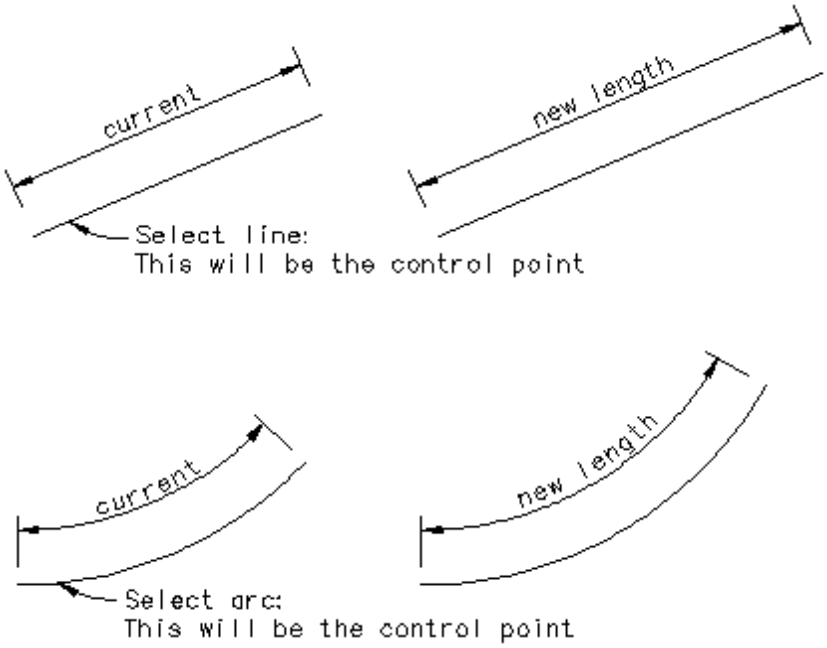
Line selected:

Specify new length <*current*>: Display the current length. Specify a new length, select a point for length, or press ENTER to accept current.

Polyline selected:

Specify new length or [Point] <*current*>: Display the current length. Specify a new length, **P**oint to specify a point along the polyline, or press ENTER to accept current.

Examples

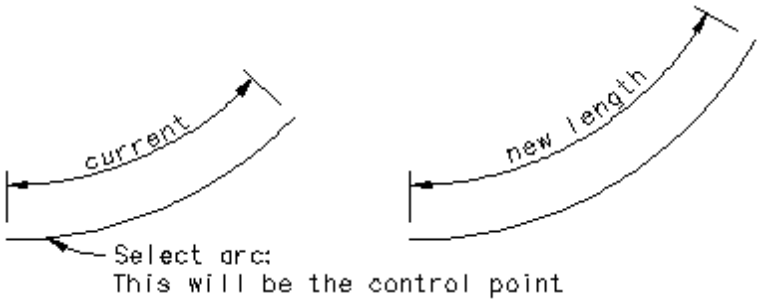


4.9.8.1.1 Degrees (Change Length)

Change the length of an arc by changing the included angle to the specified decimal degrees.

Enter new angle in decimal degrees <*current*>: Enter the new decimal degrees, or press ENTER to accept the current.

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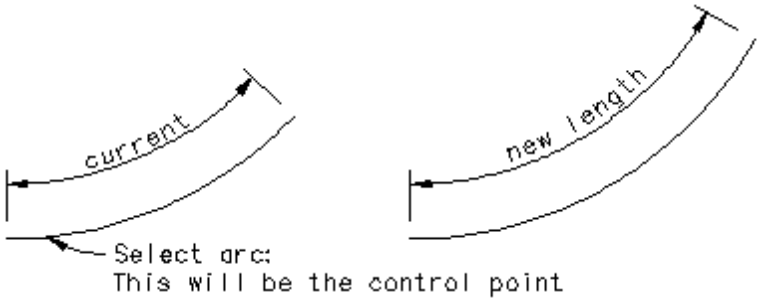


4.9.8.1.2 DDmmss (Change Length)

Change the length of an arc by changing the included angle to the specified degrees, minutes, and seconds.

Enter new angle in ddd.mmss <*current*>: Enter the new degrees-minutes-seconds, or press ENTER to accept the current.

Example

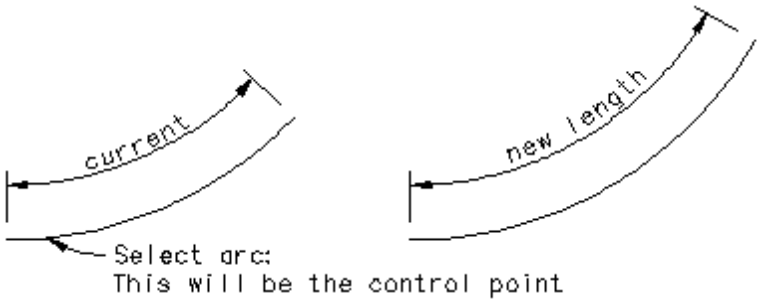


4.9.8.1.3 Radians (Change Length)

Change the length of an arc by changing the included angle to the specified radians.

Enter new radians <*current*>: Enter the new radian angle, or press ENTER to accept current.

Example



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4.9.8.2 Change Angle

Change the angle (bearing) of a line.

Change the angle (bearing) of a line by entering a new angle. Command designed to remove the decimal seconds from a line to aid in map closures.

Button
Ribbon: SmartDraft ▸ Layout panel ▸ Change drop-down
Toolbar: Layout Tools
Menu: SmartDraft ▸ Design ▸ Change Angle
Command entry: **ca**

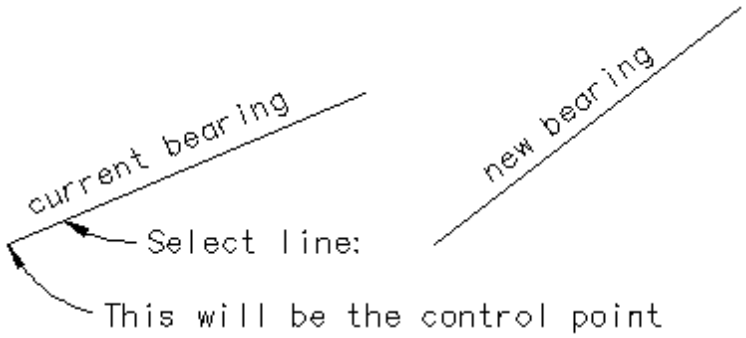
Command:
Change angle of line.
Select a line: Select line nearest the endpoint to hold.

If Angle Type is set to All North or North & South
Bearing (QDD.MMSSssss): Enter a new angle, or press ENTER to accept the current.

If Angle Type is set to N Azimuth, S Azimuth, or Azimuth < 180
Azimuth (DD.MMSSssss): Enter a new angle, or press ENTER to accept the current.

If Angle Type is set to Gradian
Gradian (DD.DDDD): Enter a new angle, or press ENTER to accept the current.

Example



4.9.8.3 Break At

Break the select object at a specified point.

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Button

Ribbon: SmartDraft ▸ Layout panel ▸ Break Tools drop-down

Toolbar: Break Tools on the Layout Tools

Menu: SmartDraft ▸ Drawing Tools ▸ Break At

Command entry: **ba**

Command:

Break at point.

Select object: Select the object to break.
Specify break point: Select the point to break the object. *Default osnap* ***INT***

4.9.8.4 Break at Crossing Object

Break the select objects at a the crossing point of a selected object.

Limitation. If the selected breaking object crosses at multiple locations, a break at is only added at the first location.

Button

Ribbon: SmartDraft ▸ Layout panel ▸ Break Tools drop-down

Toolbar: Break Tools on the Layout Tools

Menu: SmartDraft ▸ Drawing Tools ▸ Break At Crossing Object

Command entry: **bac**

Command:

Break at crossing object.

Select objects to break: Select the objects to break.
Select breaking object: Select an object which crosses the selected objects

4.9.8.5 Break at Distance

Break the select object at an entered distance from the end point.

Button

Ribbon: SmartDraft ▸ Layout panel ▸ Break Tools drop-down

Toolbar: Break Tools on the Layout Tools

Menu: SmartDraft ▸ Drawing Tools ▸ Break at Distance

Command entry: **bad**

Command:

Break at distance.

Select an arc or line: Select the object to break.
Enter break length: Enter the distance to break the object from the end point.

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4.9.8.6 Break First

Break the select object at a specified point.



Button

Ribbon: SmartDraft ▸ Layout panel ▸ Break Tools drop-down

Toolbar: Break Tools on the Layout Tools

Menu: SmartDraft ▸ Drawing Tools ▸ Break First

Command entry: **bf**

Command:

Break first.

Select object: Select the object to break.
Specify first break point: Specify the first break point.
Specify second break point: Specify the second break point.

4.9.8.7 Erase Outside

Erase outside - select objects to remain

All non-selected, non-frozen objects.



Button

Ribbon: SmartDraft ▸ Layout panel ▸

Toolbar: Layout Tools

Menu: SmartDraft ▸ Drawing Tools ▸ Erase Outside

Command entry: **eo**

Command:

Select Objects: Select all objects to remain.

4.9.9 Xref Tools

4.9.9.1 Xref Open

Open an Xref for editing by selecting the Xref from the graphic screen or a dialog box.



Button

Ribbon: SmartDraft ▸ Layout panel ▸ Xref Tools pull-down

Toolbar: Xref Tools on the Layout Tools:

Menu: SmartDraft ▸ Drawing Tools ▸ Xref Open

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Command entry: **ox**

Command:

Select Xref to open or [Dialog]: Select the Xref file to open or **D**ialog to display a dialog of all the Xrefs in the drawing.

Dialog Box Options

List: List of all the Xref files in the drawing. Select the Xref to open.
Open: Open the highlighted Xref in the list box.
Cancel: Close the dialog box without doing anything.

Possible Open Methods

- AutoCAD set to MDI (Multiple Document Interface) mode: Xref file will be loaded in the current session.
- AutoCAD set to SDI (Single Document Interface) mode: Xref file will be opened in a new session of AutoCAD.
- Xref file already open in current session: Xref file will be made current.
- Xref file in use or read-only: User will be prompted to open file in read-only mode.

When the original file is made current, a dialog box will request the operator to Reload the Xref with the latest changes.

4.9.9.2 Xref Lock Layer Toggle

Command to toggle if the Xref Attach, Xref Overlay, Xref Overlay - Modify Reference Name, Xref Overlay Multiple, and Xref Overlay2 commands lock the layer used to attach or overlay the Xref.

Button
Command entry: **xlt**

Command: **xlt**
The prompt will be one of the following:
SmartDraft Xref commands will lock the Xref layer.
or
SmartDraft Xref commands will not lock the Xref layer.

4.9.9.3 Xref Attach

Attach an Xref with scale set to 1, at 0,0,0, and rotation angle 0 on its own layer named X-<Xref filename>.
Layer name can be customized. For more information, see Customization Guide Appendix - Layout Panel.
See Xref Lock Layer Toggle to toggle if the command will lock the layer after attaching the Xref.

Button
Ribbon: SmartDraft ▸ Layout panel ▸ Xref Tools pull-down
Toolbar: Xref Tools on the Layout Tools:
Menu: SmartDraft ▸ Drawing Tools ▸ Xref Attach

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Command entry: **xa0**

Command: **xa0**

The "**Select file to Attach"** dialog box displays.

Select the Xref file to attach.

Supports the AutoCAD System Variable: REFPATHTYPE

Controls whether reference files are attached using full, relative or no paths when they are first attached to a host drawing file.

Value	Description
0	Uses no path as default
1	Uses relative path as default
2	Uses full path as default

4.9.9.4 Xref Overlay

Overlay an Xref with scale set to 1, at 0,0,0, and rotation angle 0 on its own layer named X-<Xref filename>.

Layer name can be customized. For more information, see Customization Guide Appendix - Layout Panel.

See Xref Lock Layer Toggle to toggle if the command will lock the layer after overlaying the Xref.

Button

Ribbon: SmartDraft ▸ Layout panel ▸ Xref Tools pull-down

Toolbar: Xref Tools on the Layout Tools:

Menu: SmartDraft ▸ Drawing Tools ▸ Xref Overlay

Command entry: **xo0**

Command: **xo0**

The **"Select file to Overlay"** dialog box displays**.**

Select the Xref file to overlay.

Supports the AutoCAD System Variable: REFPATHTYPE

Controls whether reference files are attached using full, relative or no paths when they are first attached to a host drawing file.

Value	Description
0	Uses no path as default
1	Uses relative path as default
2	Uses full path as default

4.9.9.5 Xref Overlay - Modify Reference Name

Overlay an Xref with scale set to 1, at 0,0,0, and rotation angle 0 on its own layer named X-<Xref filename> with option to modify the XREF Reference Name.

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Layer name can be customized. For more information, see Customization Guide Appendix - Layout Panel.

See Xref Lock Layer Toggle to toggle if the command will lock the layer after overlaying the Xref.


Button

Ribbon: SmartDraft ▸ Layout panel ▸ Xref Tools pull-down 

Toolbar: Xref Tools on the Layout Tools: 

Menu: SmartDraft ▸ Drawing Tools ▸ Xref Overlay

Command entry: **xo0p**

Command: **xo0p**

The **"Select file to Overlay"** dialog box displays**.**

Select the Xref file to overlay.

The **"Modify the Reference Name of the XREF**' dialog box displays.

Enter the name.

Note: Name cannot match an existing block, or existing Reference Name with a different XREF file.

4.9.9.6 Xref Overlay2

Overlay an Xref with scale set to 1, at 0,0,0, and rotation angle 0 on the layer Xref.

Layer name can be customized. For more information, see Customization Guide Appendix - Layout Panel.

See Xref Lock Layer Toggle to toggle if the command will lock the layer after overlaying the Xref.


Button

Ribbon: SmartDraft ▸ Layout panel ▸ Xref Tools pull-down 

Toolbar: Xref Tools on the Layout Tools: 

Menu: SmartDraft ▸ Drawing Tools ▸ Xref Overlay2

Command entry: **xrx**

Command: **xrx**

The **"Select file to Overlay"** dialog box displays**.**

Select the Xref file to overlay.

Supports the AutoCAD System Variable: REFPATHTYPE

Controls whether reference files are attached using full, relative or no paths when they are first attached to a host drawing file.

Value	Description
0	Uses no path as default
1	Uses relative path as default
2	Uses full path as default

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4.9.9.7 Xref Overlay Multiple

Overlay multiple Xref with scale set to 1, at 0,0,0, and rotation angle 0 on its own layer named X-<Xref filename>.

Layer name can be customized. For more information, see Customization Guide Appendix - Layout Panel.

See Xref Lock Layer Toggle to toggle if the command will lock the layer after overlaying the Xref.


Button

Ribbon: SmartDraft ▸ Layout panel ▸ Xref Tools pull-down 

Toolbar: Xref Tools on the Layout Tools: 

Menu: SmartDraft ▸ Drawing Tools ▸ Xref Overlay Multiple

Command entry: **xm**

Command: **xm**

The **"Select file to Overlay"** dialog box displays**.**

Select one or more Xref files to overlay.

Supports the AutoCAD System Variable: REFPATHTYPE

Controls whether reference files are attached using full, relative or no paths when they are first attached to a host drawing file.

Value	Description
0	Uses no path as default
1	Uses relative path as default
2	Uses full path as default

4.9.9.8 Xref Match XCLIP

Apply the XCLIP boundary of a source Xref to selected Xrefs.


Button

Ribbon: SmartDraft ▸ Layout panel ▸ Xref Tools pull-down 

Toolbar: Xref Tools on the Layout Tools: 

Menu: SmartDraft ▸ Drawing Tools ▸ Xref Match XCLIP

Command entry: **xcm**

Command: **xcm**

Match XCLIP boundary.

Select source Xref: Select the Xref which has the desired XCLIP boundary to apply to the target Xrefs.
Select target Xrefs:
Select objects: Select the target Xrefs.

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4.9.9.9 Xref Colors Screened

Change the colors of the Xref layers from non-screen to screened colors.


Button

Ribbon: SmartDraft ▸ Layout panel ▸ Xref Tools pull-down 

Toolbar: Xref Tools on the Layout Tools: 

Menu: SmartDraft ▸ Drawing Tools ▸ Xref Colors Screened

Command entry: **xcs**

Command: **xcs**

Convert selected Xref colors to screening colors.

Select objects: Select the Xref file(s) to change.

Note: Reads the XSC.INI file in the customization template for the conversion table information.

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4.9.9.10 Xref Reload

Reload all Xrefs in the current drawing.

Command entry: **xrr**

Command:
Reloading Xref: <name of Xref>

4.9.9.11 Xref Unload

Unload all Xrefs in the current drawing.

Command entry: **xru**

Command:
Unload all XRefs? [Yes/No] Yes and enter to unload all Xrefs in the drawing.
Unloading Xref: <name of Xref>

4.9.10 Special Linetypes

4.9.10.1 Chain-link Fence

Create chain-link fence linetype.

Add the chain-link symbol (X) to selected objects or change the selected objects to the chain-link layer with the chain-link complex linetype.

Button
Ribbon: SmartDraft ▸ Layout panel ▸ Special Linetypes drop-down
Toolbar: Special Linetypes on the Layout Tools
Menu: SmartDraft ▸ Design ▸ Chain-link Fence

Command:
Current settings: Type = <Linetype or Block>, Spacing = <current>
Select path for Chain-link Fence Symbol or [Type/Spacing]: Select path (1), **T**ype to toggle linetype or block, or **S**pacing to change symbol spacing on type block.

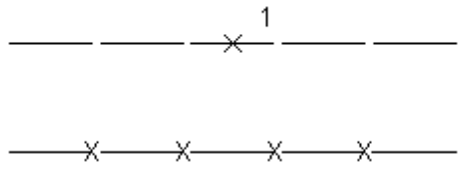
Spacing:
Enter symbol spacing <default>: Enter new distance, or press ENTER to accept default.

Type:
Block option inserts a symbol along the selected object.

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Linetype option changes the selected object to the Chain-link Fence layer and changes the linetype of the Chain-link Fence layer to the linetype specified in the layer database if it is not already set.

Example



4.9.10.2 Circle Linetype Symbol

Create linetype with circle symbol.

Add the circle symbol (o) to selected objects or change the selected objects to the chain-link layer with the circle complex linetype.

Button
Ribbon: SmartDraft ▸ Layout panel ▸ Special Linetypes drop-down
Toolbar: Special Linetypes on the Layout Tools
Menu: SmartDraft ▸ Design ▸ Circle Symbol Fence

Command:

Current settings: Type = <Linetype or Block>, Spacing = <current>

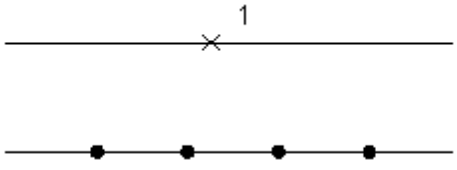
Select path for Circle Symbol or [Type/Spacing]: Select path (1), **T**ype to toggle linetype or block, or **S**pacing to change symbol spacing on type block.

Spacing:

Enter symbol spacing <default>: Enter new distance, or press ENTER to accept default.

Type:
Block option inserts a symbol along the selected object.
Linetype option changes the selected object to the Circle Fence and changes the linetype of the Circle Fence layer to the linetype specified in the layer database if it is not already set.

Example:



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4.9.10.3 Retaining Wall

Create retaining wall linetype symbol.

Button

Ribbon: SmartDraft ▸ Layout panel ▸ Special Linetypes drop-down

Toolbar: Special Linetypes on the Layout Tools

Menu: SmartDraft ▸ Design ▸ Retaining Wall

Command:

Create offset retaining wall.

Current settings: Width = <Graphic/Size>

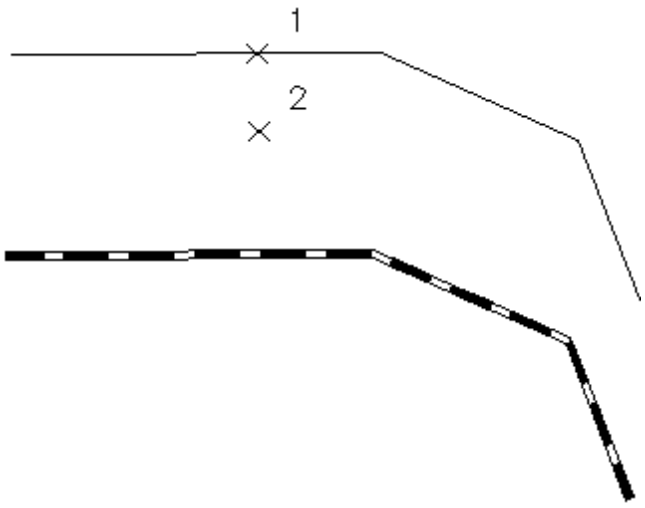
Select wall path or [Options]: Select an object (1) or **O**ptions to change the wall width.

Specify the side: Specify a point (2).

Options

Enter wall width in <inches/milleters> or [Graphic]: <default>: Enter the wall width for design width or **G**raphic to design the wall for plotting purposes.

Example:



4.9.10.4 Retaining Wall "V"

Create retaining wall linetype type 2.

Add the retaining wall "V" symbol to selected objects.

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Button

Ribbon: SmartDraft ▸ Layout panel ▸ Special Linetypes drop-down
Toolbar: Special Linetypes on the Layout Tools
Menu: SmartDraft ▸ Design ▸ Retaining Wall "V"

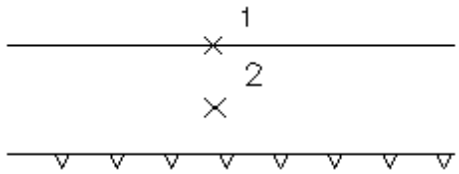
Command:

Current settings: Spacing = 25.00

Select wall path or [Spacing]: Select an object (1) or **S**pacing to change symbol spacing.

Specify the side: Specify a side to offset (2).

Example



4.9.10.5 Demolition Symbol

Create linetype with hash marks.

Add hash marks that straddle both sides of the selected objects.

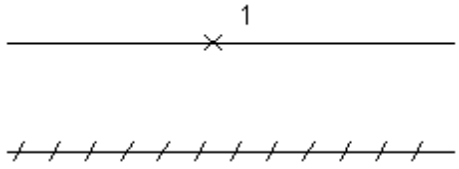
Button

Ribbon: SmartDraft ▸ Layout panel ▸ Special Linetypes drop-down
Toolbar: Special Linetypes on the Layout Tools
Menu: SmartDraft ▸ Design ▸ Demolition Symbol

Command:

Create demolition symbol along selected object.
Select object: Select an object (1).

Example



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4.9.10.6 Abutment Symbol

Create abutment symbol to the right (inside) or left (outside).

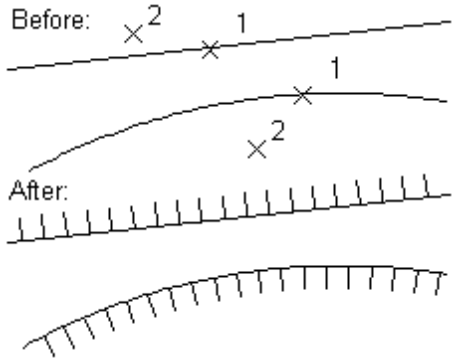
Add a hash mark on the side of the selected line, arc, or polyline.

Button
Ribbon: SmartDraft ▸ Layout panel ▸ Special Linetypes pull-down
Toolbar: Special Linetypes on the Layout Tools:
Menu: SmartDraft ▸ Labeling ▸ Abutment Symbol
Command entry: **abs**

Command:

Select abutment path or [Options]: Select an object (1), or press ENTER to end.
Specify the side: Specify a point (2) to indicate the side to place the symbol.

Example



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4.9.10.6.1 Abutment Options

Options for Abutment created by the Abutment Symbol command.

Dialog Box Options
Abutment Options:
Angle Off Perpendicular
Angle: Select the angle in degrees off perpendicular.

4.9.10.7 Load Linetypes

Load custom linetypes into the drawing.


Button
Ribbon: SmartDraft ▸ Layout panel ▸ 
Toolbar: Special Linetypes on the Layout Tools: 
Menu: SmartDraft ▸ Layer ▾ Load Linetypes...

Dialog Box Options

List box: Display the linetypes defined in the Customization Template and the ACAD.LIN linetype file.
Current: Display the name of the drawing's current linetype.
Buttons
Load: Load the currently selected linetype(s) into the drawing.
Current: Set the highlighted linetype as the current linetype, and exit the dialog box.

4.9.11 Traffic Tools

4.9.11.1 Traffic Control Symbols

Display various Traffic Control symbols


Button
Ribbon: SmartDraft ▸ Layout panel ▸ Traffic pull-down 
Toolbar: Traffic Tools on the Layout Tools: 

These blocks are inserted using the Block and Detail Manager command.

4.9.11.2 Traffic Control Cones

Create a single or multiple traffic control cones along a path at a specified distance.

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Add the traffic control cone symbol to selected objects.


Button


Ribbon: SmartDraft ▸ Layout panel ▸ Traffic pull-down 
Toolbar: Traffic Tools on the Layout Tools: 
Menu: SmartDraft ▸ Traffic ▸ Cones

Command:

Current settings: Type = <Single or Multiple>, Spacing = <current>

Create Traffic Control Cones.

Multiple

Select paths for traffic control cones or [Type/Spacing]: Select path (1), **T**ype to toggle single or multiple, or **S**pacing to change symbol spacing.

Single

Specify insertion point or [Type/Spacing]: Specify insertion point (1), **T**ype to toggle single or multiple, or **S**pacing to change symbol spacing.

Spacing:

Enter symbol spacing <default>: Enter new distance, or press ENTER to accept default.

Type:
Single option inserts a symbol at a specified point.
Multiple option inserts a symbol along the selected objects at a specified distance.

Example

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4.9.12 Align Tools

4.9.12.1 Rotate ?d and Move

Move objects about a base point at a desired angle, and displace the orientation.

Button

Ribbon: SmartDraft ▸ Layout panel ▸ Align drop-down

Toolbar: Layout Tools:

Menu: SmartDraft ▸ Drawing Tools ▸ Rotate ?d and Move

Command entry: **rtv**

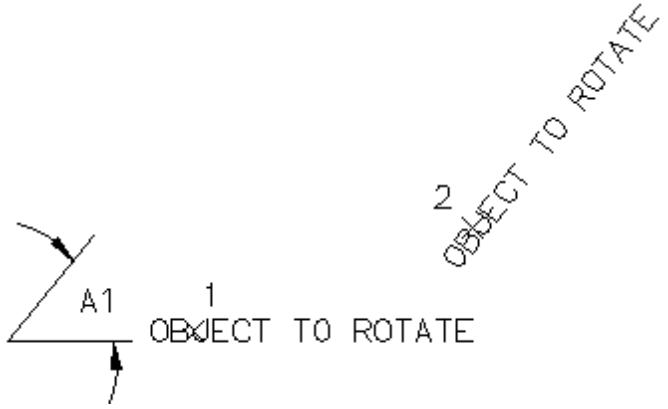
Command:

Specify rotation angle <*current*>: Specify a rotation angle (A1).

Select object: Select object (1).

Specify point: Specify a point to move (2).

Example



4.9.12.2 Rotate Align

Rotate selected objects, and align them to an object, horizontal or vertical.

Button

Ribbon: SmartDraft ▸ Layout panel ▸ Align drop-down

Toolbar: Layout Tools

Menu: SmartDraft ▸ Drawing Tools ▸ Rotate Align

Command entry: **rta**

Command:

Rotate align

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Current settings: Reference Angle = <Text/Select>

Select objects or [Options]: Select objects to rotate, or **O**ptions to change reference angle.

Specify base point: Specify a base point for the rotation (1).

If the Reference Angle is set to Text and one of the selected objects is a text string, the reference angle is read from the text string; otherwise, the operator is prompted for the reference angle.

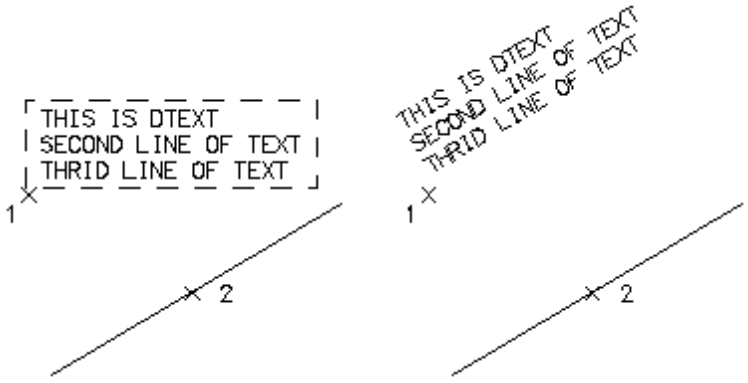
Select reference angle object: Select an object to find reference angle, or enter to specify a reference angle.

Specify the reference angle <0d0'0">: Specify a reference angle.

Select new angle object or [Horizontal/Vertical]: Select an object to find the new angle, or enter to specify a new angle (2).

Specify the new angle <0d0'0">: Specify a new angle.

Example



4.9.13 Fillet with Radius Prompt

Fillet with the radius prompt. Extends two objects to a corner.

Menu: SmartDraft ▸ Drawing Tools ▸ Fillet: R=<current>

Command entry: **fr**

Command:

Enter fillet radius <*current*>: Enter a radius, or press ENTER to accept current.

Select first object or [Polyline/Radius/Trim]: Select first object.

Select second object: Select second object.

4.9.14 Fillet Zero

Fillet with the radius of 0. Extends two objects to a corner.

Menu: SmartDraft ▸ Drawing Tools ▸ Fillet Zero

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Command entry: **fz**

Command:
Select first object or [Polyline/Radius/Trim]: Select first object.
Select second object: Select second object.

4.9.15 Extend and Trim

Extend and Trim multiple lines.

Note: Boundary and cutting edges are limited to lines, arcs, and polylines.
Extends and Trims only lines.

Command entry: **etr**

Command:
Multiple Extend and Trim.
Select boundary and cutting edges ...
Select object: Select the boundary and cutting edge objects.
Select LINES to extend or trim.
Select objects: Select the lines to extend or trim.
<count> lines were modified.

4.9.16 Blipmode Toggle

Toggle blipmode.

Toggle AutoCAD's BLIPMODE setvar.

Command entry: **bm**

4.10 Planview Panel Tools

4.10.1 Define / Edit Alignment

Define an alignment from objects, or edit an existing alignment's properties

Define an alignment from selected objects. Assign or edit the name, description, type, and starting station associated to the alignment.
In BricsCAD only: An option to create a SmartDraft or BricsCAD alignment from lines, arc, and polylines.

Supports:

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AutoCAD Products: Yes

BricsCAD Pro: Yes


Button


Ribbon: SmartDraft ▸ Planview panel ▸ 

Toolbar: Planview Tools: 

Menu: SmartDraft ▸ Planview ▸ Define / Edit Alignment


Command entry: **alde**

Note: Civil 3D: Valid objects to create a SmartDraft alignment are: arcs, lines, polylines, feature lines, survey figures, and parcel lines.
AutoCAD: Valid objects to create a SmartDraft alignment are: arcs, lines, and polylines.
BricsCAD Pro: Valid objects to create a BricsCAD alignment are: arcs, lines, and 2d polylines.

Command:

Define / Edit Alignment

Current settings: Alignment creation type = <SmartDraft / BricsCAD>

AutoCAD select objects prompt

Select objects ,or an alignment : Select objects to create a SmartDraft alignment or an existing alignment to edit it's properties.

BricsCAD select objects prompt

Select objects, alignment, or [Options] : Select objects to create an alignment , an existing alignment to edit it's properties, or **O**ptions to toggle between creating a SmartDraft or BricsCAD alignment.

If a 3D polyline, feature line, survey figure, or parcel line is selected.

Enter starting station for alignment or [Point]: Enter the station station for the selected object, or **P**oint to specify a point and a station at the selected point.

If an arc, line, or 2D polyline is selected.

Select next arc, line or 2d polyline: Select an arc, line or 2D polyline to connect to the prior selected object, to form an alignment, or press Enter to enter Station and alignment information.

Enter starting station for alignment or [Point/Reverse]: Enter the station station for the selected object, **P**oint to specify a point and a station at the selected point, or **R**everse to change the direction of the alignment.

SmartDraft alignment properties dialog

BricsCAD alignment properties dialog

Civil 3D alignment properties dialog

4.10.1.1 Edit Alignment Properties (SmartDraft)

Edit Alignment Properties

Dialog Box Options

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Alignment Properties:

Name:	Enter the name of the alignment.
Description:	Enter the description of the alignment (optional).
Type:	Select an alignment type.
Starting Station	Enter the starting station of the alignment.

Remove Alignment Information from Object: Convert the SmartDraft alignment to a polyline

4.10.1.2 Edit Alignment Properties (BricsCAD)

Edit Alignment Properties

Dialog Box Options
Alignment Properties:

Name:	Enter the name of the alignment.
Description:	Enter the description of the alignment (optional).
Starting Station	Enter the starting station of the alignment.
Line Color	Select a color for the line segments of the alignment
Curve Color	Select a color for the curve segments of the alignment
Tangent Ex Color	Select a color for the tangent extension segments of the alignment
Element Ex Color	Select a color for the element extension segments of the alignment
Extensions Visibility	Select: an option to toggle the visibility of the Element or Tangent extensions. "Both On". "Both Off", Tangents On", or Elements On".

4.10.1.3 Edit Alignment Properties (Civil 3D)

Edit Alignment Properties (Civil 3D)

Dialog Box Options
Alignment Properties:

Name:	Enter the name of the alignment.
Description:	Enter the description of the alignment (optional).
Style:	Select an alignment style.

4.10.2 Alignment Station and Offset Labels

Create a dynamic station and offset label with a note options.

Label the station, offset and optional notes at selected points along an alignment.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Polylines and BricsCAD Pro for Civil objects

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Button

Ribbon: SmartDraft ▸ Planview panel ▸

Toolbar: Planview Tools:

Menu: SmartDraft ▸ Planview ▸ Label Alignment Stations and Offsets

Command entry: **aso**

Note: The label is a Dynamic Block.

Note: Label styles are saved in the sub-folder **\LABELS** of the current Customization Template as (style name).aosy files.

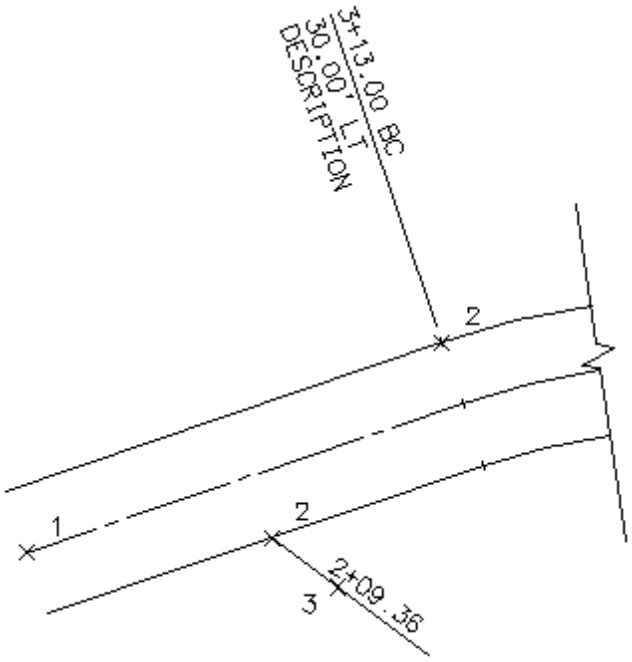
Command:

Alignment station and offset labels.

Select alignment [Edit/List/Options/Update]: Select an alignment, or **E**dit to change the assigned options of existing labels, **L**ist to select the alignment from a dialog list, **O**ptions to change setup options, or **U**pdate to update values of existing labels.

Specify point along alignment: Specify a point along the alignment to label with the values specified by the options.

Example



4.10.2.1 Option Alignment Station and Offset Label

Options alignment station and offset labels (Dynamic Blocks Only) created using Alignment Station and Offset Label command.

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Dialog Box Options

Alignment Station and Offset Label Options

Alignment Station and Offset Label Style:

Name: A list of the currently defined elevation label styles. Select the label style to use or edit.
Save As: Save the current elevation label settings to a new style.
Lock: Set the selected elevation label style (Name above) as read-only. Lock a style to avoid accidental modification. See Unlock Customization Template Files to remove the lock.
Delete: Delete the current elevation label style. **Note:** Cannot delete the "default" or a locked style. Deleting a style cannot be undone.
Rename: Rename the current elevation label style.

Labeling:
Station: Toggle to include station value of the label.
Placement: Select the location of the station value.
Prefix: Edit box for prefix text that will be added to the station value.
Suffix: Edit box for suffix text that will be added to the station value.
Precision: Set the number of decimal places for the station output display.

Horizontal Geometry Text: Specify if geometry point text will be added to the label and whether it it will be a prefix or a suffix.
Text: View / Edit the Geometry Point Text values.

Offset: Toggle to include offset value of the label.
Placement: Select the location of the offset value.
Prefix: Edit box for prefix text that will be added to the offset value.
Suffix: Edit box for suffix text that will be added to the offset value.
Precision: Set the number of decimal places for the offset output display.
Type: Select the offset direction type:

+/-	To display the offset as a positive or negative number.
Prefix Lt/Rt	To add the Left / Right direction as a prefix.
Suffix Lt/Rt	To add the Left / Right direction as a suffix.
None	To display the offset as a positive value.

Note 1: Toggle to include note 1 value (1st) of the label.
Note 2: Toggle to include note 2 value (2nd) of the label.
Note 3: Toggle to include note 3 value (3rd) of the label.
Note 4: Toggle to include note 4 value (4th) of the label.
Note: Common options for Notes 1, 2, 3, and 4:
Placement: Specify the location of the note value.
Input: Select the input option for the note.
Note: Enter the note value if the input option is set to Note.

Leader Style: Select Straight or Angle Point.
Flip: Automatic so the label automatically flips based on the side of the alignment, Manual to manually flip / rotate the label, or Flip 180 to automatically flip 180 of Automatic.

Node Type:
Arrow: Option to include a solid arrow at the end of the label. Added 21.1.2. Note: If the older block is already inserted, the option will be disabled.
Circle: Option to include a solid circle at the end of the label.
X: Option to include an X at the end of the label.
None: Option to exclude a marker at the end of the label.

Layer:

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Layer:	Set the output layer type. Default (uses layers in layer database) or *current*.
Layer Type:	Toggle the layer type for the layer name selection.

4.10.2.2 Edit Alignment Station and Offset Label

Edit alignment station and offset labels (Dynamic Blocks Only) created using Alignment Station and Offset Label command.

Edit

Select Alignment Station and Offset Labels to edit

Select objects: Select the Labels to edit the assigned options.

Dialog Box Options

Edit Alignment Station and Offset Label Options

Alignment

Name:	Name of the selected labels' alignment or Multiple if more than one label was selected.
Select a Different:	Check to select a new section view to assign to the selected label(s).

Labeling:

Station:	Toggle to include station value of the label.
Placement:	Select the location of the station value.
Prefix:	Edit box for prefix text that will be added to the station value.
Suffix:	Edit box for suffix text that will be added to the station value.
Precision:	Set the number of decimal places for the station output display.
Horizontal Geometry Text:	Specify if geometry point text will be added to the label and whether it it will be a prefix or a suffix.
Text:	View / Edit the Geometry Point Text values.
Offset:	Toggle to include offset value of the label.
Placement:	Select the location of the offset value.
Prefix:	Edit box for prefix text that will be added to the offset value.
Suffix:	Edit box for suffix text that will be added to the offset value.
Precision:	Set the number of decimal places for the offset output display.
Type:	Select the offset direction type:

+/-	To display the offset as a positive or negative value.
Prefix Lt/Rt	To add the Left / Right direction as a prefix.
Suffix Lt/Rt	To add the Left / Right direction as a suffix.
None	To display the offset as a positive value.

Leave Notes As-is	Check this option to retain the value of any existing notes.
Note 1:	Toggle to include note 1 value (1st) of the label.
Note 2:	Toggle to include note 2 value (2nd) of the label.
Note 3:	Toggle to include note 3 value (3rd) of the label.
Note 4:	Toggle to include note 4 value (3rd) of the label.

Note: Common options for Notes 1, 2, 3, and 4:

Placement:	Specify the location of the note value.
Input:	Select the input option for the note.

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Note: Enter the note value, if the input option is set to Note.

Node Type:
Arrow: Option to include a solid arrow at the end of the label. Added 21.1.2. Note: If the older block is already inserted, the option will be disabled.
Circle: Option to include a solid circle at the end of the label.
X: Option to include an X at the end of the label.
None: Option to exclude a marker at the end of the label.

Flip: Automatic so the label automatically flips based on the side of the alignment, Manual to manually flip / rotate the label, or Flip 180 to automatically flip 180 of Automatic.

Change Label Offset Start the Change Label Leader Offset command.

If Select new alignments from the drawing:
Select alignment: Select an alignment.

4.10.2.3 Placement Options

Alignment Station and Offset Label Placement Options:

3 above: The data will be placed three spaces above the leader line.
2 above: The data will be placed two spaces above the leader line.
1 above: The data will be placed one space above the leader line.
1 below: The data will be placed one space below the leader line.
2 below: The data will be placed two spaces below the leader line.
3 below: The data will be placed three spaces below the leader line.

4.10.2.4 Input Options

Alignment Station and Offset Label Input Options

Note / description input option.

Input Options
Prompt: Option to prompt the operator to enter the note value.
Select: Option to prompt the operator to select an object with text to be used as the note value.
Note: Option to use the value entered in the Note edit box as the value.

4.10.2.5 Change to the Alignment Station and Offset Label Option

Notifies operator that changes have been made to an existing Alignment Station and Offset Label Style. You can cancel your changes, choose OK to apply the changes to the current operation without saving them to the style, or save the changes to the Alignment Station and Offset Label Style.

Apply changes for the current use only: This option saves the changes as temporary overrides to the style. These changes remain until changed or a different style is selected.

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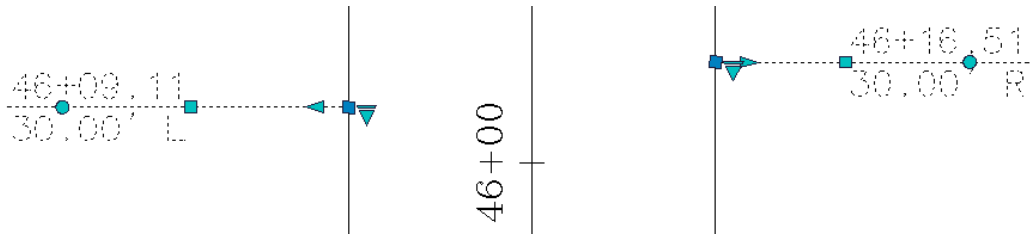
Save changes to the following style: This option saves the changes to the current Alignment Station and Offset Label Style.

4.10.2.6 Alignment Station and Offset Dynamic

Alignment Station and Offset Label dynamic block

A dynamic block has flexibility and intelligence. A dynamic block reference can easily be changed in a drawing while you work. You can manipulate the geometry through custom grips or custom properties. This allows you to adjust as necessary the block reference in-place rather than searching for another block to insert or redefining the existing one.

The SmartDraft Alignment Station and Offset Label block has the following special dynamic properties.



Move grip. Select this grip to move the text and leader line.

Leader search grip. There is one leader search grip.

Visibility options. There are two options to have the label pointing Right and two options to have the label pointing Left. Each of the Right and Left visibility directions has the additional options to display the circle node or not.

Notes:

- Do not use the AutoCAD Scale command to increase or decrease the size of the block. Use either the Custom Scale property in AutoCAD's Properties Palette, or use the Block Scale command. The Custom Scale property is equal to the text height.
- Do not mirror or include in a block you plan to mirror. This can cause the dynamic grips to stop working.
- The Change Label Direction **CLD** command can be used to toggle the Right and Left direction of the Alignment Station Intersection Label.
- When SmartDraft is loaded, and running the leader will resize when the attribute values are modified.

4.10.2.7 Alignment Station and Offset Update

Update alignment station and offset labels (Dynamic Blocks Only) created using Alignment Station and Offset Label command.

Command entry: **asou**

Command:

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Select Alignment Station and Offset Labels to update.

Select Objects: Select the Labels to update.

Note: If the original alignments are not found in the current drawing, this command will place a "?" for the alignment name. If the station is outside the alignment range, this command will place a "?" for the station value.

4.10.3 Alignment Station Intersection Label

Create a dynamic alignment station intersection label.

Dynamic Data: Alignment station intersection labels assigned to an alignment will update when moved, copied, arrayed, or grip edited using standard AutoCAD commands.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Polylines and BricsCAD Pro for Civil objects


Button


Ribbon: SmartDraft ▸ Planview panel ▸ 

Toolbar: Planview Tools: 

Menu: SmartDraft ▸ Planview ▸ Alignment Intersection Label


Command entry: **af**

Note: The label is a Dynamic Block.

Command:

Alignment station intersection labels.

Current settings: <#> Alignments, <Placement>, <Uppercase>, <Add "=">, Station: <Before/After>

Select first alignment [Edit/List/Options/Update]: Select an alignment, or **E**dit to change the assigned options of existing labels, **L**ist to select the alignment from a dialog list, **O**ptions to change setup options, or **U**pdate to update values of existing labels.

Select second alignment:

Specify point or [Pan/Zoom]: Specify a placement point for the label, **P** for real time Pan, or **Z** to real time Zoom. **Note:** Do not press ENTER after the **P** or **Z**! Adjust display, and then press ENTER.

Angle:

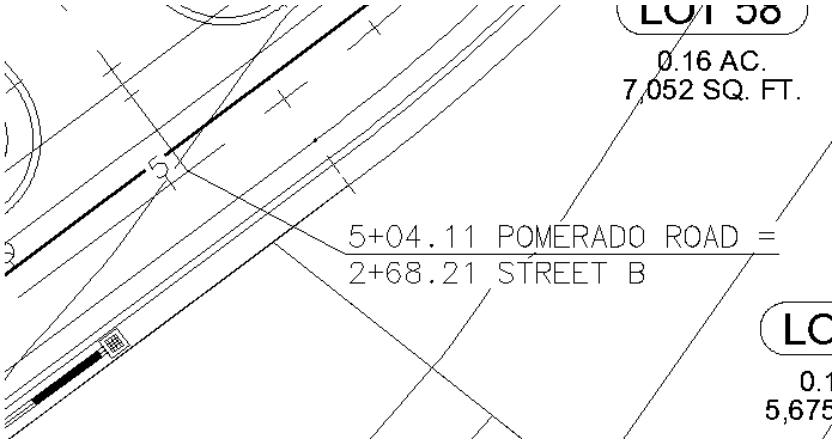
Set a rotation angle for all the labels.

Specify angle for elevation label <0.0000>: Specify an angle for the label, or select two points for the angle.

To edit: To edit the options of an existing elevation label, you can either use this command and the Edit option, or use the SmartDraft Text Edit (**ed**) command.

Example

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4.10.3.1 Alignment Station Intersection Label Options

Options for the Label Profile Alignment Station Intersection command.

Alignment Station Intersection Label Options

Labeling:

Alignment Name to Uppercase: Convert the alignment name to uppercase.

Add Suffix Check to add the text "=" to the end of the alignment lines, if there is another alignment name on the next line.

Station

Placemen Select the location of the first station value. The second station will be one row below.

Prefix: Edit box for prefix text that will be added to the station value.

Suffix: Edit box for suffix text that will be added to the station value.

Precision: Set the number of decimal places for the station output display.

Order: Select the station information before or after the alignment name.

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Alignment Name:

from Check 1 to add the offset to the first alignment, 2 for second alignment, 3 for 3rd alignment, and 4 for forth alignment

Offset:

for Check 1 to add the offset to the first alignment, 2 for second alignment, 3 for 3rd alignment, and 4 for forth alignment

Prefix: Edit box for prefix text that will be added to the offset value.

Suffix: Edit box for suffix text that will be added to the offset value.

Precision: Set the number of decimal places for the offset output display.

Type: Select the offset direction type:S

+/-	To display the offset as a positive or negative number.
Prefix Lt/Rt	To add the Left / Right direction as a prefix.
Suffix Lt/Rt	To add the Left / Right direction as a suffix.
None	To display the offset as a positive value.

Note 1: Toggle to include note 1 value (1st) of the label.

Note 2: Toggle to include note 2 value (2nd) of the label.

Note 3: Toggle to include note 3 value (3rd) of the label.

Note 4: Toggle to include note 4 value (4th) of the label.

Note: Common options for Note 1, 2, 3, and 4.

Placemen Specify the location of the note value.

Input: Select the input option for the note.

Note: Enter the note value, if the input option is set to Note.

Leader

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Straight: The elevation label leader will be straight.

Angle The elevation label leader will have an angle point.

Node

Arrow: Option to include a solid arrow at the end of the label. Added 21.1.2. Note: If the older block is already inserted, the option will be disabled.

Circle: Option to include a solid circle at the end of the label.

X: Option to include an X at the end of the label.

None: Option to exclude a marker at the end of the label.

Rotation

Specify Specify the rotation angle of each elevation label using the pointing device.

Angle: Set a rotation angle for all the elevation labels.

Set Angle: Set the value of Angle using the pointing device.

Layer:

Layer: Set the output layer type. Default (to use the layer database layer) or *current*.

Layer Toggle the layer type for the layer name selection.

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4.10.3.2 Edit Alignment Station Intersection Label

Edit alignment station intersection labels created using the Alignment Station Intersection Label command.

Edit
Select Alignment Station Intersection Labels to edit
Select objects: Select the Labels to edit the assigned options.

Dialog Box Options

Edit Alignment Station Intersection Label Options

Alignment Options:
Select New Alignments from the Drawing: Check this option to assign new alignments via selecting an alignment from the drawing.
Use Pre-selected Alignments: Check this option to retain the existing alignments assigned to a label, but use all the other format options.

First: Select an alignment. Available if neither of the two above options is selected.
Second: Select an alignment. Available if neither of the two above options is selected.
Third: Select an alignment. Available if neither of the two above options is selected.
Fourth: Select an alignment. Available if neither of the two above options is selected.

Alignment Station Intersection Label Options

Alignment

Select New Alignments from the Drawing Check to prompt the operator to select new alignments vs selecting them from the drop down lists.
Use Pre-selected Alignments
First Select an alignment for the first position, name, station, and offset
Second Select an alignment for the second position, name, station, and offset
Third Select an alignment for the third position, name, station, and offset
Forth Select an alignment for the forth position, name, station, and offset

Alignment Name to Convert the alignment name to uppercase.

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Uppercase:

Add Suffix Check to add the text "=" to the end of the alignment lines, if there is another alignment name on the next line.

Alignments to request Choose the number of alignments to select when reassigning alignments to a label.

Labeling:

Station:

Placemen Select the location of the first station value. The second station will be one row below.

Prefix: Edit box for prefix text that will be added to the station value.

Suffix: Edit box for suffix text that will be added to the station value.

Precision: Set the number of decimal places for the station output display.

Order: Select the station information before or after the alignment name.

Alignment

from Check 1 to add the offset to the first alignment, 2 for second alignment, 3 for 3rd alignment, and 4 for forth alignment

Offset:

for Check 1 to add the offset to the first alignment, 2 for second alignment, 3 for 3rd alignment, and 4 for forth alignment

Prefix: Edit box for prefix text that will be added to the offset value.

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Suffix: Edit box for suffix text that will be added to the offset value.

Precision: Set the number of decimal places for the offset output display.

Type: Select the offset direction type:S

+/-	To display the offset as a positive or negative number.
Prefix Lt/Rt	To add the Left / Right direction as a prefix.
Suffix Lt/Rt	To add the Left / Right direction as a suffix.
None	To display the offset as a positive value.

Note 1: Toggle to include note 1 value (1st) of the label.

Note 2: Toggle to include note 2 value (2nd) of the label.

Note 3: Toggle to include note 3 value (3rd) of the label.

Note 4: Toggle to include note 4 value (4th) of the label.

Note: Common options for Note 1, 2, 3, and 4.

Placemen Specify the location of the note value.

Input: Select the input option for the note.

Note: Enter the text value, if the input option is set to Note.

Node

Arrow: Option to include a solid arrow at the end of the label. Added 21.1.2. Note: If the older block is already inserted, the option will be disabled.

Circle: Option to include a solid circle at the end of the label.

X: Option to include an X at the end of the label.

None: Option to exclude a marker at the end of the label.

Change Start the Change Label Leader Offset command.

If Selecting new alignments from the drawing:

Select first alignment [Edit/Options/Update]: Select an alignment, or **E**dit to change the assigned options of existing labels, **O**ptions to change setup options, or **U**pdate to update values of existing labels.

Select second alignment:

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4.10.3.3 Placement Options

Alignment Station Intersection Label Placement Options:

3 above: The data will be placed three spaces above the leader line.
2 above: The data will be placed two spaces above the leader line.
1 above: The data will be placed one space above the leader line.
1 below: The data will be placed one space below the leader line.
2 below: The data will be placed two spaces below the leader line.

4.10.3.4 Alignment Station Intersection Dynamic Block

Alignment Station Intersection Label dynamic block

A dynamic block has flexibility and intelligence. A dynamic block reference can easily be changed in a drawing while you work. You can manipulate the geometry through custom grips or custom properties. This allows you to adjust as necessary the block reference in-place rather than searching for another block to insert or redefining the existing one.

The Alignment Station Intersection Label block has the following special dynamic properties.



Move grip. Select this grip to move the text and leader line.

Leader search grip. There is one leader search grip.

Visibility options. There are two options to have the label pointing Right and two options to have the label pointing Left. Each of the Right and Left visibility directions has the additional options to display the circle node or not.

Notes:

- Do not use the AutoCAD Scale command to increase or decrease the size of the block. Use either the Custom Scale property in AutoCAD's Properties Palette, or use the Block Scale command. The Custom Scale property is equal to the text height.
- Do not mirror or include in a block you plan to mirror. This can cause the dynamic grips to stop working.
- The Change Label Direction **CLD** command can be used to toggle the Right and Left direction of the Alignment Station Intersection Label.
- When SmartDraft is loaded and running, the leader will resize when the attribute values are modified.

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4.10.3.5 Alignment Station Intersection Update

Update alignment station intersection labels (Dynamic Blocks Only) created using the Alignment Station Intersection Label command.

Command entry: **afu**

Command:

Select Alignment Station Intersection Labels to update.

Select Objects: Select the Labels to update.

Note: If the original alignments are not found in the current drawing or project, this command will place a "?" for the alignment name. If the station is outside the alignment range, this command will place a "?" for the station value.

4.10.4 Alignment Stationing Label

Create station labels and tick marks along an alignment.

Label stations and place stationing ticks at specified intervals along selected objects or an alignment.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Polylines and BricsCAD Pro for Civil objects

Button

Ribbon: SmartDraft ▸ Planview panel ▸

Toolbar: Planview Tools:

Menu: SmartDraft ▸ Planview ▸ Label Alignment Stationing

Command entry: **as**

Command:

Create station labels along an alignment.

Selecting a line or arc:

Select the starting segment or alignment or [List/Options]: Select the first line or arc of the objects to represent a path, or **L**ist to select an alignment.

Specify point near starting station: Specify a point to be the start point of the alignment, must be the endpoint of the selected object. *Default osnap is **END**point.*

Enter starting station <0.00>: 100 Specify the station for the starting station selected above.

Select alignment lines and arcs in order:

Select object: Select all objects which represent the alignment.

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(number of selected) objects selected, (number of processed) objects processed. Note: if numbers are different, end the command, and select objects again.

Selecting a polyline, feature line, survey figure, or parcel line:

Select the starting segment or alignment or [List]: Select a polyline, feature line, survey figure, or parcel line, or **L**ist to select an alignment.

Enter starting station for first polyline <0.00>: Enter a starting station for the polyline, feature line, survey feature, or parcel line. SmartDraft alignment information will be assigned to the selected object.

Selecting an alignment:

Select the starting segment or alignment or [List/Options]: Select an alignment, or **L**ist to select an alignment.

Select alignment dialog box appears. Select alignment.

Selected alignment: (alignment name)

List:

Select alignment dialog box appears. Select alignment.

Selected alignment: (alignment name)

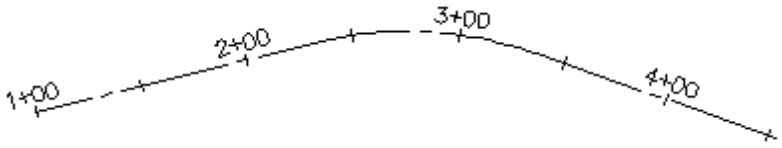
Common prompts:

From Station: (starting station) to Station: (ending station).

Start station labels at <starting station>: Enter the station to begin labeling the alignment.

End station labels at <ending station>: Enter the station to end labeling the alignment.

Example



4.10.4.1 Alignment Stationing Label Options

Options for the Alignment Stationing Label command.

Alignment Stationing Label Options

Settings

Label Location Select location. Station value can be placed Above or Below the alignment.

Station Label Interval Enter the distance for stationing of alignment.

Station Tick Enter the distance for stationing ticks without stationing text.

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Interval

Linear Precision: Specify the stationing precision for station not a whole number.

Station Format: Display the position of the station delimiter. (Edit value in Drawing Setup)

Remove Numbers after the Station Delimiter Check to remove the zero numbers after the station delimiter

Create Check to associate the labels to the select alignment. Label update as object is modified.

Layer:

Layer: Set the output layer type. Default (uses layers in layer database) or *current*.

Layer Type: Toggle the layer type for the layer name selection.

4.10.4.2 Edit Alignment Stationing Label Options

Options to edit the Alignment Stationing Labels.

Edit Alignment Stationing Label Options

Settings

Label Location Select location. Station value can be placed Above or Below the alignment.

Rotate Label 180 Degrees Check to rotate the label 180 degrees.

Station Prefix: Edit the station prefix.

Station Suffix: Edit the station suffix.

Linear Precision: Specify the stationing precision for station not a whole number.

Station Format: Display the position of the station delimiter. (Edit value in Drawing Setup)

Remove Numbers after the Check to remove the zero numbers after the station delimiter

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Station
Delimiter

4.10.5 Laterals along Alignment

Create laterals (perpendicular / radial lines) along an alignment at entered stations.

The laterals are drawn on the current layer, using the current color and linetype settings.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Polylines and BricsCAD Pro for Civil objects


Button

Ribbon: SmartDraft ▸ Planview panel ▸ 
Toolbar: Planview Tools: 
Menu: SmartDraft ▸ Planview ▸ Laterals along Alignment

Command:

Create lateral lines along an alignment.

Selecting a line or arc:

Select the starting segment or alignment or [List]: Select the first line or arc of the objects to represent a path, or **L**ist to an alignment.

Specify point near starting station: Specify a point to be the start point of the alignment, must be the endpoint of the selected object. *Default osnap is **END**point.*

Enter starting station <0.00>: 100 Specify the station for the starting station selected above.

Select alignment lines and arcs in order:

Select object: Select all objects which represent the alignment.

(number of selected) objects selected, (number of processed) objects processed. Note: if numbers are different, end the command, and select objects again.

Selecting a polyline, feature line, survey figure, or parcel line:

Select the starting segment or alignment or [List]: Select a polyline, feature line, survey figure, or parcel line, or **L**ist to select an alignment.

Enter starting station for first polyline <0.00>: Enter a starting station for the polyline, feature line, survey feature, or parcel line. SmartDraft alignment information will be assigned to the selected object.

Selecting an alignment:

Select the starting segment or alignment or [List]: Select an alignment, or **L**ist to select an alignment.

Select alignment dialog box appears. Select alignment.

Selected alignment: (alignment name)

List:

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Select alignment dialog box appears. Select alignment.

Selected alignment: (alignment name)

Common prompts:

From Station: (starting station) to Station: (ending station). Starting point: (next point)

Enter offset distance (+right/-left) or [Multiple]: Specify a distance. Negative if lateral is on the left of the alignment.

Selecting an alignment:

Enter station along alignment or [Point]: Specify the stations (one at a time) to draw the laterals, or **P**oint to change to "Specify point..." prompt

Specify point along alignment or [Station]: Specify the stations (one at a time) to draw the laterals, or **S**tation to change to "Enter station..." prompt

Selecting other objects:

Enter station along alignment: Specify the stations (one at a time) to draw the laterals. Press ENTER to return to offset prompt.

Multiple:

Enter lateral station interval: Enter the interval for placing laterals.

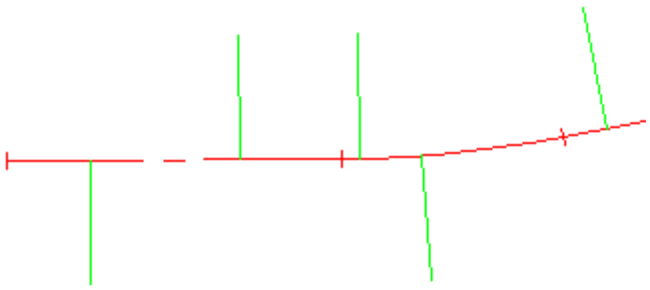
Start laterals at station <starting station>: Specify the station to start placing laterals. Default is the first station of the alignment.

End laterals at station <ending station>: Specify the station to end placing laterals. Default is the last station of the alignment.

Enter right offset distance: Enter the right offset distance. If no distance is entered, laterals will not be drawn on the right side.

Enter left offset distance: Enter the left offset distance. If no distance is entered, laterals will not be drawn on the left side.

Example



4.10.6 Planview Label Manual

Create a planview label by entering the text or selecting an object with text to obtain the text.

Note: Label values placed using this command do not update when the design data changes.

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Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Yes


Button

Ribbon: SmartDraft ▸ Planview panel ▸ 

Toolbar: Planview Tools: 

Menu: SmartDraft ▸ Planview ▸ Planview Label Manual

Command entry: **plm**

Note: The label is a Dynamic Block

Dialog Box Options

Planview Label Style

Name:	A list of the currently defined planview label styles. Select the label style to use or edit.
Save As:	Save the current planview label settings to a new style.
Lock:	Set the selected planview label style (Name above) as read-only. Lock a style to avoid accidental modification. See Unlock Customization Template Files to remove the lock.
Delete:	Delete the current planview label style. **Note:** Cannot delete the "default" or a locked style. Deleting a style cannot be undone.
Rename:	Rename the current planview label style.

Labeling:

Note 1:	Toggle to include note 1 value (1st) of the label.
Note 2:	Toggle to include note 2 value (2nd) of the label.
Note 3:	Toggle to include note 3 value (3rd) of the label.
Note 4:	Toggle to include note 4 value (4th) of the label.
Note 5:	Toggle to include note 5 value (5th) of the label.
Note 6:	Toggle to include note 6 value (6th) of the label. **Note: Common options for notes 1, 2, 3, 4, 5, and 6.**
Input:	Select the input option for the note value.
Placement:	Specify the location of the note value.
Value / Prefix:	Enter the note value or prompt / select prefix value.
Suffix:	Enter the prompt / select suffix value.

Leader:

Yes:	Option to include a leader in the label.
No:	Option to exclude a leader in the label.

Leader Style:

Straight:	The elevation label leader will be straight.
Angle Point:	The elevation label leader will have an angle point.

Node Type:

Arrow:	Option to include a solid arrow at the end of the label. Added 21.1.2. Note: If the older block is already inserted, the option will be disabled.
Circle:	Option to include a solid circle at the end of the label.
X:	Option to include an X at the end of the label.
None:	Option to exclude a marker at the end of the label.

Rotation Angle: **Note:** These options are not saved in the style.

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Specify On-Screen: Specify the rotation angle of each elevation label using the pointing device.
Angle: Set a rotation angle for all the elevation labels.
Set Angle: Set the value of Angle (above) using the pointing device.

Layer:
Layer: Set the output layer type. Default (to use the layer database layer) or *current*.
Layer Type: Toggle the layer type for the layer name selection.

Note: Label styles are saved in the sub-folder **\LABELS** of the current Customization Template as (style name).nsy files.

Command:

Create manual planview labels.

Specify point or [Angle/Options]: Specify the point of the planview label, **A**ngle, or **O**ptions to change options.

Additional prompts when the following Input Types are selected:

Prompt:

Enter text for note <1-6>: Enter a note value.

Select:
Select source text for note <1-6>: Select a text string or attribute for the prompted note.

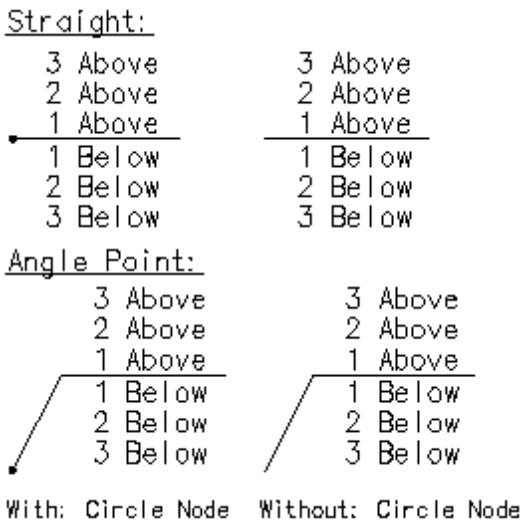
Angle:

Set a rotation angle for all the elevation labels.

Specify angle for planview label <0.0000>: Specify an angle for the planview label, or select two points for the angle.

To edit: To edit this label, use the Text Edit (**ed**) command.

Example



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4.10.6.1 Input Options Manual

Planview Label Manual Input Options

Options command to all input data types.

Prompt The operator will be prompted to enter the elevation at the command prompt; the default elevation will be the elevation of the selected elevation point.

Select: The operator will be prompted to select a text string, point object, attribute, or object with elevation to extract the number value from it.

Note: If the Elevation's option, "Numbers Only," is checked, only the number of the selected object will be used; if it is unchecked, the whole text string will be used.

Note: Text value will be a the value entered in the "Prefix" and "Suffix" edit boxes.

4.10.6.2 Placement Options

Planview Label Placement options:

3 above: The data will be placed three spaces above the leader line.

2 above: The data will be placed two spaces above the leader line.

1 above: The data will be placed one space above the leader line.

1 below: The data will be placed one space below the leader line.

2 below: The data will be placed two spaces below the leader line.

3 below: The data will be placed three spaces below the leader line.

4.10.6.3 Planview Label Manual - Edit

Edit the text values of a Planview Label Manual.

Dialog Box Options

Planview Label Manual - Edit

Label Values:

Note 3 Above: Enter a value for the note location.

Note 2 Above: Enter a value for the note location.

Note 1 Above: Enter a value for the note location.

Note 1 Below: Enter a value for the note location.

Note 2 Below: Enter a value for the note location.

Note 3 Below: Enter a value for the note location.

Node Type:

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Arrow: Option to include a solid arrow at the end of the label. Added 21.1.2. Note: If the older block is already inserted, the option will be disabled.

Circle: Option to include a solid circle at the end of the label.

X: Option to include an X at the end of the label.

None: Option to exclude a marker at the end of the label.

Change Start the Change Label Leader Offset command.

4.10.7 Coordinate Label

Create a coordinate label at a specified point.

Dynamic Data: Coordinate labels will update when moved, copied, arrayed, or grip edited using standard AutoCAD commands.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Yes


Button


Ribbon: SmartDraft ▸ Planview panel ▸ 

Toolbar: Planview Tools: 

Menu: SmartDraft ▸ Points ▸ Label Coordinates (Label Point)


Command entry: **crf**

Command:

Label coordinate. Type: <Dynamic/Text>, Precision: <current setting>, Commas: <Yes/No>.

Specify insertion point or [Edit/Options/Update]: Select the point (1) to identify, **E**dit to change the precision of existing coordinate labels, **O**ptions to change the options, or **U**pdate to reread the coordinates and update the values.

Specify point: Select a point for placement. (2)

Note: The label is a Dynamic Block.

Update

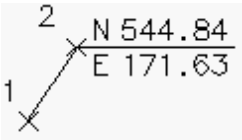
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Select Coordinate Labels to update

Select objects: Select the Coordinate Labels to update the coordinate values.

To edit: To edit the options of an existing label coordinate, you can either use this command and the Edit option, or use the SmartDraft Text Edit (**ed**) command.

Example



4.10.7.1 Label Coordinates Options

Coordinate Labels options for the Coordinate Label command.

Label Coordinates Options

Options:

Coordinat Set the number of decimal places for the coordinate output display.

Direction Select if the coordinate prefix will be N, S, E, W or North, South, East, West or X, Y

Format:

Turn Check to format coordinates without commas.

North /

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Placemen Select the location of the north / south coordinate value.

East/West

Placemen Select the location of the east / west coordinate value.

Leave Check to leave the notes as-is.

Note 1: Toggle to include note 1 value (1st) of the label.

Note 2: Toggle to include note 2 value (2nd) of the label.

Note 3: Toggle to include note 3 value (3rd) of the label.

Note 4: Toggle to include note 4 value (4th) of the label.

Note: Common options for Note 1, 2, 3, and 4.

Placemen Specify the location of the note value.

Input: Select the input option for the note.

Note: Enter the note value, if the input option is set to Note.

Rotation

Specify Specify the rotation angle of each elevation label using the pointing device.

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Angle: Set a rotation angle for all the elevation labels.

Set Angle: Set the value of Angle using the pointing device.

Node

Arrow: Option to include a solid arrow at the end of the label. Added 21.1.2. Note: If the older block is already inserted, the option will be disabled.

Circle: Option to include a solid circle at the end of the label.

X: Option to include an X at the end of the label.

None: Option to exclude a marker at the end of the label.

Layer:

Layer: Set the output layer type. Default (uses layers in layer database) or *current*.

Layer Toggle the layer type for the layer name selection.

4.10.7.2 Edit Coordinates Label Options

Edit Coordinate Labels created using the Coordinate Label command.

Edit

Select Coordinate Labels to edit

Select objects: Select the Coordinate Labels to edit the precision and update the coordinate values.

Edit Coordinate Label

Options:

Coordinat Set the number of decimal places for the coordinate output display.

Direction Select if the coordinate prefix will be N, S, E, W or North, South, East, West or X, Y

Format:

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Turn Check to format coordinates without commas.

North /

Placemen Select the location of the north / south coordinate value.

East/West

Placemen Select the location of the east / west coordinate value.

Leave Check to leave the notes as-is.

Note 1: Toggle to include note 1 value (1st) of the label.
Note 2: Toggle to include note 2 value (2nd) of the label.
Note 3: Toggle to include note 3 value (3rd) of the label.
Note 4: Toggle to include note 4 value (4th) of the label.

Note: Common options for Note 1, 2, 3, and 4.
Placemen Specify the location of the note value.

Note: Enter the note value, if the input option is set to Note.

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Node

Arrow: Option to include a solid arrow at the end of the label. Added 21.1.2. Note: If the older block is already inserted, the option will be disabled.

Circle: Option to include a solid circle at the end of the label.

X: Option to include an X at the end of the label.

None: Option to exclude a marker at the end of the label.

Change Start the Change Label Leader Offset command.

4.10.7.3 Placement Options

Coordinate Label Placement Options:

3 above: The data will be placed three spaces above the leader line.

2 above: The data will be placed two spaces above the leader line.

1 above: The data will be placed one space above the leader line.

1 below: The data will be placed one space below the leader line.

2 below: The data will be placed two spaces below the leader line.

4.10.7.4 Input Options

Coordinates Label Input Options

Note / description input option.

Input Options

Prompt: Option to prompt the operator to enter the note value.

Select: Option to prompt the operator to select an object with text to be used as the note value.

Note: Option to use the value entered in the Note edit box as the note value.

4.10.7.5 Coordinate Label Update

Update coordinate labels (Dynamic Blocks Only) created using the Coordinate Label command.

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Command entry: **crfu**

Command:

Select Coordinate Labels to update.

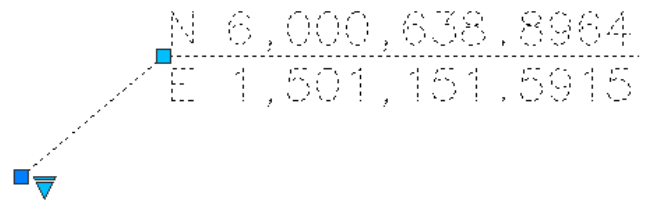
Select Objects: Select the Coordinate Labels to update the coordinate values.

4.10.7.6 Coordinate Label Dynamic Block

Coordinate Label as a dynamic block.

A dynamic block has flexibility and intelligence. A dynamic block reference can easily be changed in a drawing while you work. You can manipulate the geometry through custom grips or custom properties. This allows you to adjust as necessary the block reference in-place rather than searching for another block to insert or redefining the existing one.

The Coordinate Label block has the following special dynamic properties.



Move grip. Select this grip to move the text and leader line.

Visibility options. There a multiple options to display the leader line, an X or circle at the insertion point, and leader to the left or right.

Notes:

- Do not use the AutoCAD Scale command to increase or decrease the size of the block. Use either the Custom Scale property in AutoCAD's Properties Palette, or use the Block Scale command. The Custom Scale property is equal to the text height.
- Do not mirror or include in a block you plan to mirror. This can cause the dynamic grips to stop working.
- The Change Label Direction **CLD** command can be used to toggle the Right and Left direction of the Elevation Label.
- When SmartDraft is loaded and running, the leader will resize when the attribute values are modified.

4.10.8 Planview Crossing Pipes Label

Create a crossing pipes label in planview for Civil 3D.

Label the station, offset and optional notes at selected points along a Civil 3D alignment.

Supports:

AutoCAD Products: Civil 3D only

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BricsCAD Pro: No

Button

Ribbon: SmartDraft ▸ Planview panel ▸

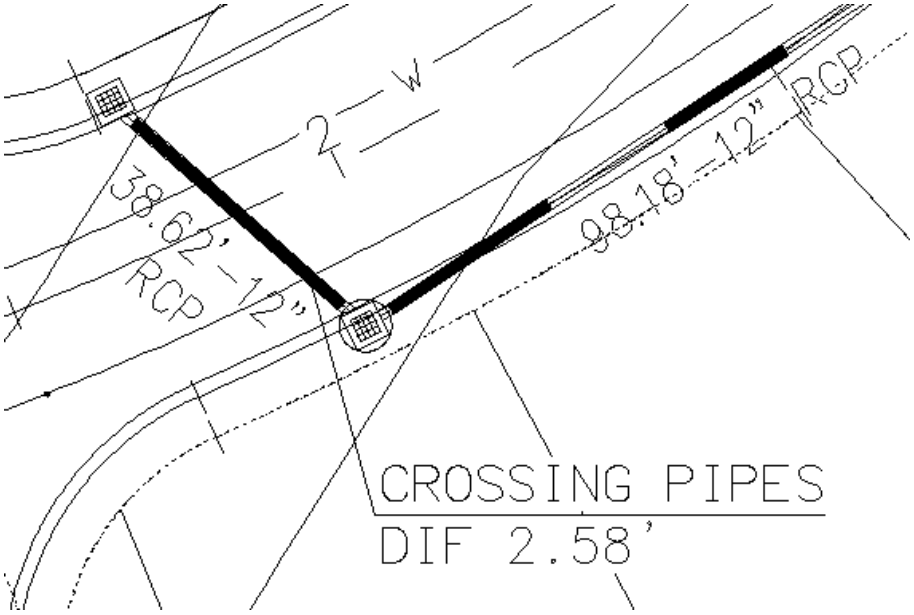
Toolbar: Planview Tools:

Menu: SmartDraft ▸ Planview ▸ Planview Crossing Pipes Label

Command entry: **PCL**

Command:
Create Planview Crossing Pipes Labels.
Select first crossing pipe or [Angle/Edit//Options/Update]: Select a pipe, **A**ngle to select the label angle,**E**dit to change the assigned options of existing labels, **O**ptions to change setup options, or **U**pdate to update values of existing labels.
Select second crossing pipe: Select a pipe which crosses the first pipe.

Example



4.10.8.1 Planview Crossing Pipes Label Options

Options for the Planview Crossing Pipes Label

Dialog Box Options

Planview Crossing Pipes Label Label Options

Labeling:

Station:	Toggle to include station value of the label.
Placement:	Select the location of the station value.
Prefix:	Edit box for prefix text that will be added to the station value.
Suffix:	Edit box for suffix text that will be added to the station value.

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Precision: Set the number of decimal places for the station output display.

Offset: Toggle to include offset value of the label.
Placement: Select the location of the offset value.
Prefix: Edit box for prefix text that will be added to the offset value.
Suffix: Edit box for suffix text that will be added to the offset value.
Precision: Set the number of decimal places for the offset output display.
Type: Select the offset direction type:

+/-	To display the offset as a positive or negative number.
Prefix Lt/Rt	To add the Left / Right direction as a prefix.
Suffix Lt/Rt	To add the Left / Right direction as a suffix.
None	To display the offset as a positive value.

Elevation:
Precision: Set the number of decimal places for the elevation output display.
Type: Set the pipe elevation type: Outside (for the outside of the pipes), Inside (for the inside of the pipes), and Center (for the centerline of the pipes)
Truncate: Set the number of places the elevation will be truncated left of the decimal point. Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.

Include Pipe Diameter with Pipe Elevations: Check to at the pipe diameter at the end of the Top and Bottom elevations. If you want a space between the elevation and the diameter, add it in the suffix.

Top: Toggle to include the elevation value of the Top pipe
Placement: Select the location of the elevation value.
Prefix: Edit box for prefix text that will be added to the elevation value.
Suffix: Edit box for suffix text that will be added to the elevation value.

Bottom: Toggle to include the elevation value of the Bottom pipe
Placement: Select the location of the elevation value.
Prefix: Edit box for prefix text that will be added to the elevation value.
Suffix: Edit box for suffix text that will be added to the elevation value.

Difference: Toggle to include the difference of elevation between to pipe elevations selected.
Placement: Select the location of the elevation value.
Prefix: Edit box for prefix text that will be added to the elevation value.
Suffix: Edit box for suffix text that will be added to the elevation value.

Interference: Enter the text to use if the two pipe intersect.

Note 1: Toggle to include note 1 value (1st) of the label.
Note 2: Toggle to include note 2 value (2nd) of the label.
Note 3: Toggle to include note 3 value (3rd) of the label.
Note: Common options for Notes 1, 2, and 3:
Placement: Specify the location of the note value.
Input: Select the input option for the note.
Note: Enter the note value if the input option is set to Note.

Rotation Angle:
Specify On-Screen: Specify the rotation angle of each elevation label using the pointing device.
Angle: Set a rotation angle for all the elevation labels.
Set Angle: Set the value of Angle (above) using the pointing device.

Layer:

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Layer: Set the output layer type. Default (uses layers in layer database) or *current*.
Layer Type: Toggle the layer type for the layer name selection.

4.10.8.2 Edit Planview Crossing Pipes Label

Edit planview crossing pipes labels created using Planview Crossing Pipes Label command.

Edit
Select Planview Crossing Pipes Labels to edit
Select objects: Select the Labels to edit the assigned options.

Dialog Box Options

Edit Planview Crossing Pipe Label Label Options

Labeling:
Station: Toggle to include station value of the label.
Placement: Select the location of the station value.
Prefix: Edit box for prefix text that will be added to the station value.
Suffix: Edit box for suffix text that will be added to the station value.
Precision: Set the number of decimal places for the station output display.

Offset: Toggle to include offset value of the label.
Placement: Select the location of the offset value.
Prefix: Edit box for prefix text that will be added to the offset value.
Suffix: Edit box for suffix text that will be added to the offset value.
Precision: Set the number of decimal places for the offset output display.
Type: Select the offset direction type:

+/-	To display the offset as a positive or negative number.
Prefix Lt/Rt	To add the Left / Right direction as a prefix.
Suffix Lt/Rt	To add the Left / Right direction as a suffix.
None	To display the offset as a positive value.

Elevation:
Precision: Set the number of decimal places for the elevation output display.
Type: Set the pipe elevation type: Outside (for the outside of the pipes), Inside (for the inside of the pipes), and Center (for the centerline of the pipes)
Truncate: Set the number of places the elevation will be truncated left of the decimal point. Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.

Include Pipe Diameter with Pipe Elevations: Check to at the pipe diameter at the end of the Top and Bottom elevations. If you want a space between the elevation and the diameter, add it in the suffix.

Top: Toggle to include the elevation value of the Top pipe
Placement: Select the location of the elevation value.
Prefix: Edit box for prefix text that will be added to the elevation value.
Suffix: Edit box for suffix text that will be added to the elevation value.

Bottom: Toggle to include the elevation value of the Bottom pipe
Placement: Select the location of the elevation value.
Prefix: Edit box for prefix text that will be added to the elevation value.

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Suffix: Edit box for suffix text that will be added to the elevation value.

Difference: Toggle to include the difference of elevation between to pipe elevations selected.
Placement: Select the location of the elevation value.
Prefix: Edit box for prefix text that will be added to the elevation value.
Suffix: Edit box for suffix text that will be added to the elevation value.

Interference: Enter the text to use if the two pipe intersect.

Leave Notes As-is: Check to leave the value of the notes already in the label.

Note 1: Toggle to include note 1 value (1st) of the label.
Note 2: Toggle to include note 2 value (2nd) of the label.
Note 3: Toggle to include note 3 value (3rd) of the label.
Note: Common options for Notes 1, 2, and 3:
Placement: Specify the location of the note value.
Input: Select the input option for the note.
Note: Enter the note value if the input option is set to Note.

Change Label Offset Start the Change Label Leader Offset command.

4.10.8.3 Update Planview Crossing Pipe Label

Update planview crossing pipe labels created using Planview Crossing Pipes Label command.

Command:
Select Planview Crossing Pipes Labels to update.
Select Objects: Select the Labels to update.

4.10.8.4 Input Options

Planview Crossing Pipes Label Input Options

Note / description input option.

Input Options
Prompt: Option to prompt the operator to enter the note value.
Select: Option to prompt the operator to select an object with text to be used as the note value.
Note: Option to use the value entered in the Note edit box as the note value.

4.10.9 Planview Structure Label

Create Planview Structure Labels for Civil 3D pipe network structures

Dynamic Data: Planview structure labels will update when the structure's pipe elevation(s) changes.

Supports:

AutoCAD Products: Civil 3D only

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BricsCAD Pro: No

Note: For the In / Out to work correctly make sure the Flow Direction is set correctly. "By Slope" is a best option for Flow Direction except for flat pipes.


Button

Ribbon: SmartDraft ▸ Planview panel ▸

Command entry: **pvsl**

Video

Note: The label is a Dynamic Block.

Command:
Create Planview Structure Labels
Select Pipe Network Structure or [Edit/Options/Update]: Select a planview pipe network structure, **E**dit to edit existing labels, **O**ptions to change the labeling options, **U**pate the values of existing labels, or Enter to end.

4.10.9.1 Planview Structure Label Options

Options for the Planview Structure Label command.

Planview Structure Label Options

Labeling:

Station: Toggle to include offset value of the label.

Placemen Select the location of the station value.

Prefix: Edit box for prefix text that will be added to the station value.

Suffix: Edit box for suffix text that will be added to the station value.

Precision: Set the number of decimal places for the station output display.

Elevation:

Precision: Set the number of decimal places for the elevation output display.

Type: Select the pipe elevation type. Top, Crown, Center, Invert, or Bottom.

Truncate: Set the number of places the elevation will be truncated left of the decimal point.
Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.

Include Pipe Diameter with Pipe Elevations: Include the pipe diameter with the pipe elevation value.

RIM: Toggle to include RIM elevation value of the label.

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Placemen Select the location of the RIM value.

Prefix: Edit box for prefix text that will be added to the RIM value.

Suffix: Edit box for suffix text that will be added to the RIM value.

Sump: Toggle to include Sump elevation value of the label.

Placemen Select the location of the sump value.

Prefix: Edit box for prefix text that will be added to the sump value.

Suffix: Edit box for suffix text that will be added to the sump value.

Pipe In: Toggle to include pipe In elevation value of the label.

Placemen Select the location of the pipe In value.

Prefix: Edit box for prefix text that will be added to the pipe In value.

Suffix: Edit box for suffix text that will be added to the pipe In value.

Pipe Out: Toggle to include pipe out elevation value of the label.

Placemen Select the location of the pipe out value.

Prefix: Edit box for prefix text that will be added to the pipe out value.

Suffix: Edit box for suffix text that will be added to the pipe out value.

Pipe Join: Toggle to join the Pipe In and Pipe Out elevation value of the label if they are the same value. This will replace the Pipe In and Pipe Out values.

Placemen Select the location of the Pipe Join value.

Prefix: Edit box for prefix text that will be added to the Pipe Join value.

Suffix: Edit box for suffix text that will be added to the Pipe Join value.

Name: Toggle to include Structure Name value in the label.

Placemen Select the location of the name value.

Prefix: Edit box for prefix text that will be added to the name value.

Suffix: Edit box for suffix text that will be added to the name value.

Descriptio Toggle to include Structure Description value in the label.

Placemen Select the location of the description value.

Prefix: Edit box for prefix text that will be added to the description value.

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Suffix: Edit box for suffix text that will be added to the description value.

Note 1: Toggle to include note 1 value (1st) of the label.
Note 2: Toggle to include note 2 value (2nd) of the label.
Note 3: Toggle to include note 3 value (3rd) of the label.
Note: Common options for Note 1, 2, and 3.

4.10.9.1.1 Placement Options

Planview Structure Label Placement Options:

3 above: The data will be placed three spaces above the leader line.
2 above: The data will be placed two spaces above the leader line.
1 above: The data will be placed one space above the leader line.
1 below: The data will be placed one space below the leader line.
2 below: The data will be placed two spaces below the leader line.
3 below: The data will be placed three spaces below the leader line.

4.10.9.1.2 Input Options

Planview Structure Label Input Options

Note / description input option.

Input Options
Prompt: Option to prompt the operator to enter the note value.
Select: Option to prompt the operator to select an object with text to be used as the note value.
Note: Option to use the value entered in the Note edit box as the note value.

4.10.9.2 Edit Planview Structure Label

Edit Planview Structure Labels (Dynamic Blocks Only) created using Planview Structure Label command.

Edit Planview Structure Label Options
Structure:
Select a Check to select a new structure to assign to the selected label.

Labeling:

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Station: Toggle to include offset value of the label.

Placemen Select the location of the station value.

Prefix: Edit box for prefix text that will be added to the station value.

Suffix: Edit box for suffix text that will be added to the station value.

Precision: Set the number of decimal places for the station output display.

Elevation:

Precision: Set the number of decimal places for the elevation output display.

Type: Select the pipe elevation type. Top, Crown, Center, Invert, or Bottom.

Truncate: Set the number of places the elevation will be truncated left of the decimal point.
Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.

Include Pipe Diameter with Pipe Elevations: Include the pipe diameter with the pipe elevation value.

RIM: Toggle to include RIM elevation value of the label.

Placemen Select the location of the RIM value.

Prefix: Edit box for prefix text that will be added to the RIM value.

Suffix: Edit box for suffix text that will be added to the RIM value.

Sump: Toggle to include Sump elevation value of the label.

Placemen Select the location of the sump value.

Prefix: Edit box for prefix text that will be added to the sump value.

Suffix: Edit box for suffix text that will be added to the sump value.

Pipe In: Toggle to include Pipe In elevation value of the label.

Placemen Select the location of the Pipe In value.

Prefix: Edit box for prefix text that will be added to the Pipe In value.

Suffix: Edit box for suffix text that will be added to the Pipe In value.

Pipe Out: Toggle to include Pipe Out elevation value of the label.

Placemen Select the location of the Pipe Out value.

Prefix: Edit box for prefix text that will be added to the Pipe Out value.

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Suffix: Edit box for suffix text that will be added to the Pipe Out value.

Pipe Join: Toggle to join the Pipe In and Pipe Out elevation value of the label if they are the same value. This will replace the Pipe In and Pipe Out values.

Placemen Select the location of the Pipe Join value.

Prefix: Edit box for prefix text that will be added to the Pipe Join value.

Suffix: Edit box for suffix text that will be added to the Pipe Join value.

Name: Toggle to include Structure Name value in the label.

Placemen Select the location of the name value.

Prefix: Edit box for prefix text that will be added to the name value.

Suffix: Edit box for suffix text that will be added to the name value.

Descriptio Toggle to include Structure Description value in the label.

Placemen Select the location of the description value.

Prefix: Edit box for prefix text that will be added to the description value.

Suffix: Edit box for suffix text that will be added to the description value.

Leave Notes As-is: Toggle to leave notes as they are.

Note 1: Toggle to include note 1 value (1st) of the label.

Note 2: Toggle to include note 2 value (2nd) of the label.

Note 3: Toggle to include note 3 value (3rd) of the label.

Note: Common options for Note 1, 2, and 3.

Placemen Specify the location of the note value.

Input: Select the input option for the note.

Note: Enter the note value, if the input option is set to Note.

Change Start the Change Label Leader Offset command.

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Command:
Select Profile Structure Bottom Labels to edit.
Select Objects: Select the profile labels to edit the values.

4.10.9.3 Update Planview Label

Update planview labels (Dynamic Blocks Only) created using Planview Structure Label command.

Command entry: **pvu**

Command:
Select Planview Labels to update.
Select Objects: Select the Palnview Labels to update the values.

4.10.10 Change Label Leader Offset

Change the leader offset from the insertion point for specific planview labels

Supports:

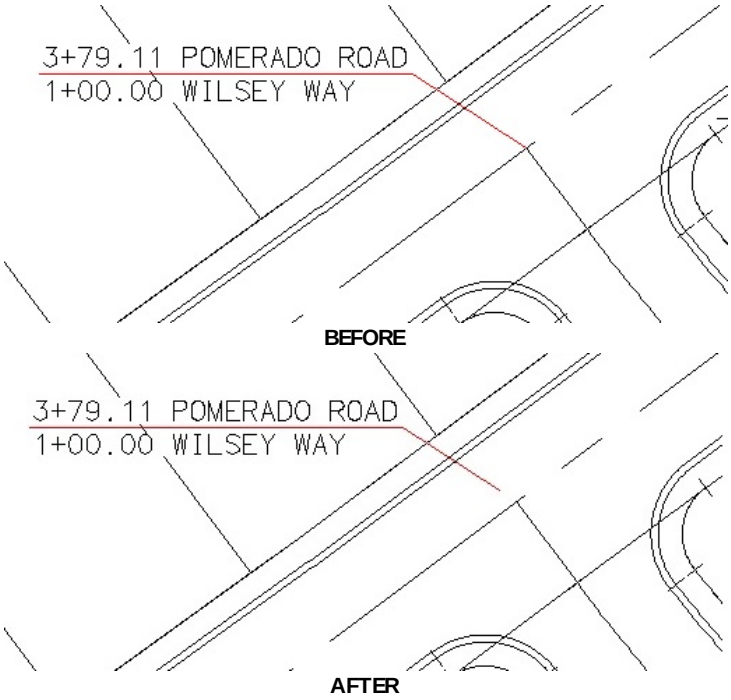
AutoCAD Products:	Yes
BricsCAD Pro:	Yes

Note: Supports labels created by the Alignment Station and Offset Labels, Alignment Station Intersection Label, and Planview Structure Label. If any of these labels existing in a drawing before version 15.1.0, an offset cannot be added.


Button
Ribbon: SmartDraft ▸ Planview panel ▸ 
Command entry: **clo**

Command:
Change label leader offset.
Select label to offset the leader: Select a supported planview label.
Specify offset distance <0.00>: Specify a new offset distance.

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4.10.11 Endpoint Ticks

Create tick marks at endpoints of lines and arcs.

Place endpoint ticks at the end points of each line, arc, polyline segment, Civil 3D parcel segments alignments, and feature lines. The endpoint tick is placed on the same layer as the selected object. Additional checking has been added so the command does not place duplicate endpoint ticks at the same point if an endpoint tick exists at the same scale.

AutoCAD Products:	Yes
BricsCAD Pro:	Polylines and BricsCAD Pro for Civil objects

Button

Ribbon: SmartDraft ▸ Planview panel ▸

Toolbar: Labeling Tools on the Labeling:

Toolbar: Planview Tools:

Menu: SmartDraft ▸ Labeling ▸ Endpoint Ticks

Menu: SmartDraft ▸ Planview ▸ Endpoint Ticks

Command entry: **tc**

Command:

Create endpoint ticks along: *<Lines/Arc or Arcs>*

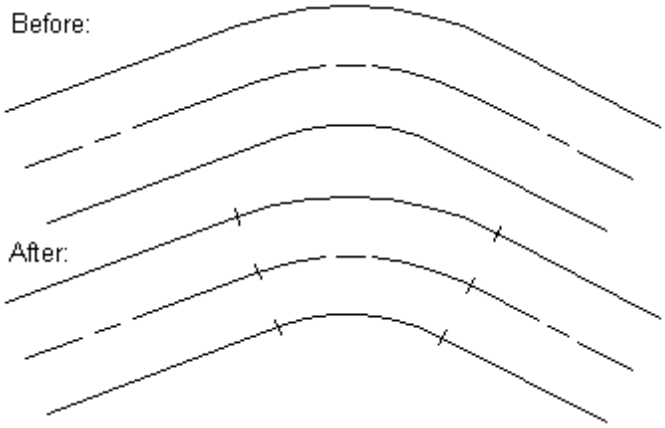
Select lines, arcs and polylines or [Type/Select layer]: Select all objects to place endpoint ticks, **T**ype to toggle between placing endpoint ticks along Lines/Arcs or Arcs only, or **S**elect layer to place endpoint ticks on all objects on the selected layer.

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If **Select layer:**

Select an object for the layer or [Type/Select objects]: Select an object to specify the layer to place endpoint ticks, **T**ype to toggle between placing endpoint ticks along Lines/Arcs or Arcs only, or **S**elect objects to place endpoint ticks on selected objects.

Example



4.10.12 Grid Tick Label

Create dynamic coordinate grid ticks and labels.

Create grid ticks and labels based on a specified northing and easting separation.

The displayed coordinates can be changed using the Grid Label Display Update command or the Grid Label Dynamic Block visibility properties.

Dynamic Data: Grid labels assign Northing and Easting coordinate values based on the insertion point of the tick. If the tick is placed on a coordinate value with only trailing zeros, they will be truncated. If you move the label, the coordinates will update.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Yes

Button

Ribbon: SmartDraft ▸ Planview panel ▸

Toolbar: Grid Tools:

Menu: SmartDraft ▸ Planview ▸ Grid Labels ▸ Grid Tick Label

Command entry: **glb**

Note: The label is a Dynamic Block.

Command:

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Select area of Grid placement.

Specify first point or [Edit/Options/Update]: Specify the first point of the boundary limits of the grid ticks and labels, **E**dit to change the options of existing grid labels, **O**ptions to change the options for future grid labels, or **U**pdate to reread the coordinates and update the values.

Specify next point: Specify all the points which indicate the boundary limits, and press ENTER when complete.

Northerly Grid Spacing <*default*>: Enter the northing separation value, or press ENTER to accept default.

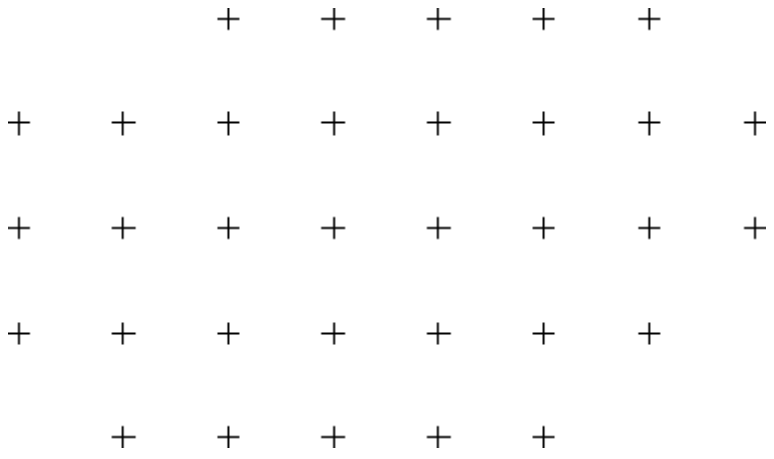
Easterly Grid Spacing <*default*>: Enter the easting separation value, or press ENTER to accept default.

If there are existing Grid ticks in the drawing:

Erase existing grid? [Yes/No] <*default*>: **Y**es to erase existing Grid; **N**o to keep it.

To Edit: To edit the options of an existing label coordinate, you can either use this command and the Edit option, or use the SmartDraft Text Edit (**ed**) command.

Example



4.10.12.1 Grid Tick Label Options

Options for grid labels (Dynamic Blocks Only) created using the Grid Tick Label command.

Edit Grid Labels

Options:

Coordinate Precision: Set the number of decimal places for the coordinate output display.
Turn Commas Off: Check to format coordinates without commas.
Text Style: Specify the pre-defined text style values used throughout SmartDraft. See Text Styles.

Layer:
Layer: Set the output layer type. Default (uses layers in layer database) or *current*.
Layer Type: Toggle the layer type for the layer name selection.

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4.10.12.2 Grid Label Update

Update grid labels (Dynamic Blocks Only) created using the Grid Tick Label command.

Command:
Select Grid Labels to update.
Select Objects: Select the Grid Labels to update the coordinate values.

4.10.12.3 Grid Label Edit

Edit grid labels (Dynamic Blocks Only) created using the Grid Tick Label command.

Edit
Select Grid Labels to edit
Select objects: Select the Grid Labels to edit the precision and update the coordinate values.

Edit Grid Labels

Options:

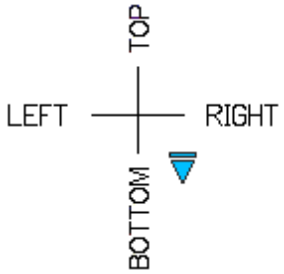
Coordinate Precision: Set the number of decimal places for the coordinate output display.
Turn Commas Off: Check to format coordinates without commas.

4.10.12.4 Grid Label Dynamic Block

Grid Label as a dynamic block

A dynamic block has flexibility and intelligence. A dynamic block reference can easily be changed in a drawing while you work. You can manipulate the geometry through custom grips or custom properties. This allows you to adjust as necessary the block reference in-place rather than searching for another block to insert or redefining the existing one.

The Grid Label block has the following special dynamic properties.



None (no coordinates shown), Top, Top-Right, Top-Left, Right, Left, Bottom, Bottom-Right, and Bottom-Left

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Visibility options. There are nine options to have the coordinate label display None, Right, Left, Top, Bottom, and combinations of Top, Bottom, Right, and Left.

Notes:

- Do not use the AutoCAD Scale command to increase or decrease the size of the block. Use either the Custom Scale property in AutoCAD's Properties Palette, or use the Block Scale command. The Custom Scale property is equal to the text height.
- Do not mirror or include in a block that you plan to mirror. This can cause the dynamic grips to stop working.
- The Grid Label Display Update **GLBD** command can be used to toggle the Right, Left, Top, and Bottom directions of the Grid Label.

4.10.13 Grid Label Display Update

Grid coordinate label display update.

Change the displayed northing and easting coordinate values on the selected grid labels created with Grid Tick and Label.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Yes


Button


Ribbon: SmartDraft ▸ Planview panel ▸ 

Toolbar: Grid Tools: 

Menu: SmartDraft ▸ Planview ▸ Grid Labels ▸ Grid Label Display Update


Command entry: **glbd**

Command:

Select grid labels to change coordinates displayed.
Select objects: Select the grid labels to change, and press ENTER.

If only one grid label selected:
Specify point or [None/Pan/Zoom]: Select point (2) for placement, press **None** to remove all coordinates displayed, or press **P** to PAN or **Z** to Zoom. Do not press ENTER after **P** or **Z**. Adjust display.

If more than one grid label selected:
Specify point on side to display: Specify a point on the screen to determine the direction (Right, Left, Top, or Bottom) for the coordinates to display.

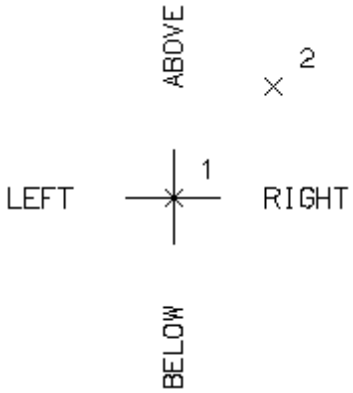
Angle in degrees between selected grid point (1) and select point (2):

<= 20	and	>= 340:	Northing right
> 20	and	< 70:	Northing right and Easting above
>= 70	and	<= 110	Easting above
> 110	and	< 160:	Northing left and Easting above

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>= 160	and	<= 200:	Northing left
> 200	and	< 250:	Northing left and Easting below
>= 250	and	<= 290:	Easting below
> 290	and	< 340:	Northing right and Easting below

Example



4.10.14 Grid Label Reposition

Grid coordinate label reposition.

Relocate a Grid Label to the nearest northing and easting coordinate values rounded to 100 units.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	No

Button
Ribbon: SmartDraft ▸ Planview panel ▸
Toolbar: Grid Tools:
Menu: SmartDraft ▸ Planview ▸ Grid Labels ▸ Grid Label Reposition
Command entry: **glbr**

Command:

Select grid labels to reposition.
Select objects: Select the grid labels to reposition, and press ENTER.

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4.10.15 North Arrow

Create a north arrow.

Create a north arrow block. If using a north arrow block with attributes, the current horizontal scale factor is inserted as an attribute value. The block is inserted with a rotation angle of 0, and the current viewtwist is used to determine the direction of the scale factor text. In paperspace there is the option to select viewport boundary to rotate the north arrow per the twist in the viewport.


Button

Ribbon: SmartDraft ▸ Planview panel ▸ 

Toolbar: Planview Tools: 

Menu: SmartDraft ▸ Planview ▸ North Arrow

Command entry: **na**

Command:

Specify insertion point or [Options/Update]: Specify a point (1), **U**pdate to update the rotation of the north arrow, or **O**ptions to change setup options.

In paperspace only:
Select viewport boundary for rotation angle <0.00>: Select the viewport boundary to rotate the north arrow per the twist of the view in the viewport, or press ENTER to insert the north arrow with a rotation of 0.00.

If **U**pdate:
Select North Arrow to update rotation.
Select objects: Select the SmartDraft north arrow blocks to change the rotation.

Note: If the north arrow is in modelspace, it is rotated to North (0.0).
If the north arrow is in paperspace, it checks for an associated viewport and rotates it to match the viewport twist.
If the north arrow is in paperspace and there is no associated viewport, the command will prompt to select a viewport.

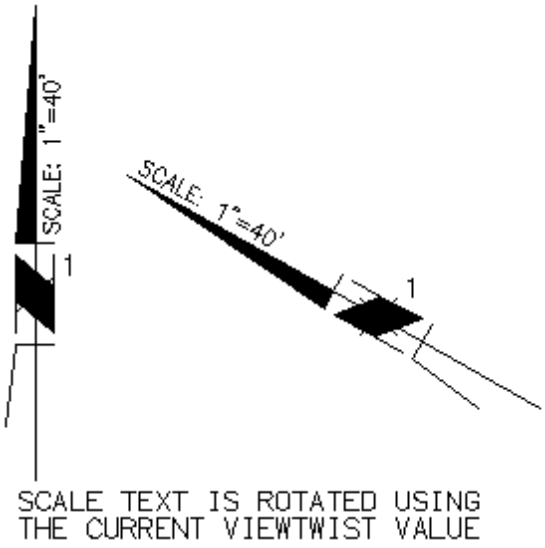
North Arrow Options

North Arrow Type:
List: Select Arrow 1, Arrow 2, Arrow 3, or Arrow 4.

Attribute:
Scale: Select to place the scale in the north arrow, if there are any attributes.
Do Not Set: Do not change any of the attributes within the block.
Note: Select to enter a value for the label attribute.
Value: Enter a value to use if the Note option is selected.

Layer:
Layer: Set the output layer type. Default (uses layers in layer database) or *current*.
Layer Type: Toggle the layer type for the layer name selection.

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4.10.16 Barscale

Create a Barscale.

Create a barscale using the current horizontal scale, the viewport scale, or an operator-specified scale.

Supports:

AutoCAD Products: Yes

BricsCAD Pro: Yes - without dynamic update when associated to a viewport

Button

Ribbon: SmartDraft ▸ Planview panel ▸

Toolbar: Planview Tools:

Menu: SmartDraft ▸ Planview ▸ Barscale

Command entry: **bs**

In Modelspace:

Command:

Specify insertion point or [Options/Scale]: Specify a point (1) for the insertion point and to use the current horizontal scale for the values of the barscale, **O**ptions to change setup options, or **S** to specify a different scale for the barscale values. The barscale will be inserted in the drawing per the current Horizontal scale.

In Paperspace (Layout):

Command:

Select viewport boundary for viewport scale or [Options/Scale]: Select the viewport boundary to use the viewport scale, **O**ptions to change setup options, or **S** to specify a different scale for the barscale values.

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Note: If the viewport boundary is selected, the scale values are read from the current viewport scale. The values are placed as fields and will update if the viewport's scale is changed. The values are updated when either the REGEN or PLOT commands are used.

Specify insertion point: Specify a point (1).

If **S**cale:
Enter scale factor: Enter a value.
Specify insertion point: Specify a point (1).

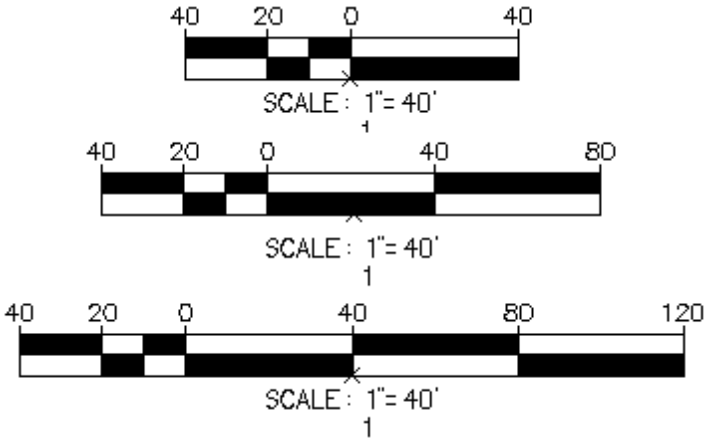
Barscale Options

Size:
List: If unit type set to Feet: Select the 1, 2, 3, or 4-unit barscale. (Default: 4 units.)
If unit type set to Meters: Select the 2, 3, 4, or 5-unit barscale. (Default: 5 units.)

Text Below: Change setting to include or exclude the text below the barscale.
Include: Check to include the text.
Prefix: Check to include the prefix text.
Prefix (Edit Box): Enter the prefix text. Note: Include a space after the prefix if you want a space between the prefix and suffix.
Include Scale: Check to include the scale factor suffix.

Layer:
Layer: Set the output layer type. Default (uses layers in layer database) or *current*.
Layer Type: Toggle the layer type for the layer name selection.

Example



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4.10.17 Cross Section Label

Create a dynamic cross section label.

Create a dynamic cross section label with section label aligned to label or view.

The displayed section label can be changed using the Cross Section Label Update command.

Dynamic Data: Cross Section labels assign section labels. The rotation of the label will update if copied, rotated, or changed.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Yes


Button


Ribbon: SmartDraft ▸ Planview panel ▸ 

Toolbar: Planview Tools: 

Menu: SmartDraft ▸ Planview ▸ Cross Section Label


Command entry: **csl**

Note: The label is a Dynamic Block.

Command:

Cross Section label option. Align = <Yes/No>, Type = <Single/Detail>

Specify start point or [Type/Edit/Options/Update]: Specify the first point of the cross section label, **T**ype to change the type of section, **E**dit to change the options of existing cross section labels, **O**ptions to change the label alignment option, or **U**pdate to update selected cross section labels.

Specify end point:	Specify a point.
Specify leader direction:	Specify a point to the right or left of the highlighted line.

Single:

Enter section label:	Enter a value (**A**), and press ENTER.

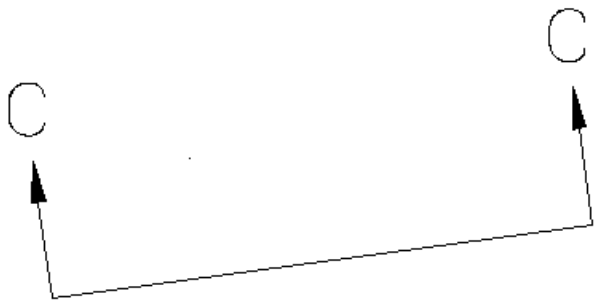
Detail:

Enter section label:	Enter a value (**1**), and press ENTER.
Enter sheet label:	Enter a value (**D500**), and press ENTER.
Enter section line label:	Enter a value (**A**), and press ENTER.

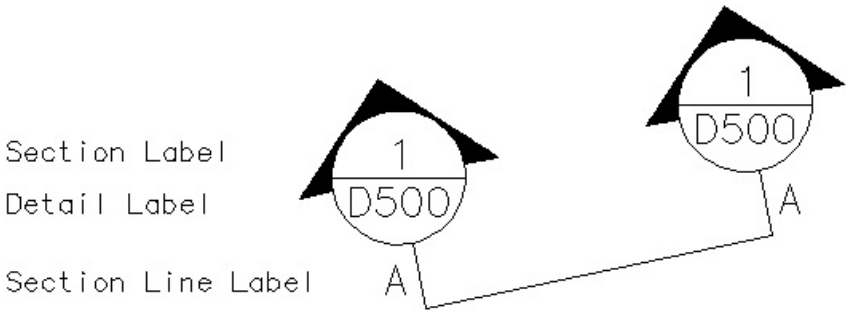
To edit: To edit the options of an existing label coordinate, you can either use this command and the Edit option, or use the SmartDraft Text Edit (**ed**) command.

Example of Single Type

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Example of Detail Type



4.10.17.1 Cross Section Label Update

Update cross section labels (Dynamic Blocks Only) created using the Cross Section Labels command.

Command:
Select Cross Section Labels to update.
Select Objects: Select the Cross Section Labels to update the section label value and label alignment.

4.10.17.2 Cross Section Label Edit

Update cross section labels (Dynamic Blocks Only) created using the Cross Section Labels command.

Edit
Select Cross Section Labels to edit
Select Objects: Select the Cross Section Labels to update the section label value and label alignment.

Edit Cross Section Labels

Options:

Section:	Enter the section label value.
Retain Existing Section Labels:	Check to retain the current section text value. Value will remain as-is if more than one cross section label is selected.
Align to View	Check to align section label to horizontal to the current viewtwist.

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4.10.17.3 Cross Section Label Dynamic Block

Cross Section Label as a dynamic block

A dynamic block has flexibility and intelligence. A dynamic block reference can easily be changed in a drawing while you work. You can manipulate the geometry through custom grips or custom properties. This allows you to adjust as necessary the block reference in-place rather than searching for another block to insert or redefining the existing one.

The Cross Section Label block has the following special dynamic properties.



Leader search grip. There is one leader search grip. which updates the leader length.
To change the direction of the label, use the right-click Change Label Direction, Change Label Direction command, or **CLD**.

Notes:

- Do not use the AutoCAD Scale command to increase or decrease the size of the block. Use the Block Scale command.
- Do not mirror or include in a block you plan to mirror. This can cause the dynamic grips to stop working.
- The Cross Section Label Update command can be used to change the label value and label alignment property.

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4.10.18 Create Planview 3D Polyline from Profile

Create planview 3D polyline from an alignment and profile.

Create a 3D polyline along the selected alignment, using the elevation information in the vertical profile. The 3D polyline will include elevations at each specified segment length, BCs and ECs along the alignment, grade breaks along the profile, and BVCs and EVCs along the profile.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	BricsCAD Pro for Civil objects


Button


Ribbon: SmartDraft ▸ Planview panel ▸ 
Toolbar: Planview Tools: 
Menu: SmartDraft ▸ Planview ▸ Create Planview 3D polyline from profile

Command:
Select alignment and profile dialog box appears.

Dialog Box Options

Profile

Alignment:	Select an alignment.
Profile:	Select the profile associated with the alignment.
Selection List	
Segment Length:	Specify the maximum segment length along the alignment.
OK:	Create the 3D polyline using the information above.

Create a planview 3D polyline from an alignment and profile.

Alignment name: <*selected alignment name*>

Starting Station: <station> Ending Station: <station>

Start profile stationing at <default>: Enter a station to start drafting the profile, or press ENTER to accept default.
End profile stationing at <default>: Enter a station to end drafting the profile, or press ENTER to accept default.

4.10.19 Create Planview 3D Polyline from Pipe Network

Create a planview 3D polyline from a Civil 3D pipe network.

Create a 3D polyline along the selected pipe network structures or pipe, using the top, center, or invert elevations of the pipes.

Supports:

AutoCAD Products:	Civil 3D only

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BricsCAD Pro: No


Button
Ribbon: SmartDraft ▸ Planview panel ▸
Command entry: **sm_p23dp**

Command:
Create a planview 3D polyline along a Civil 3D pipe network.
Current settings: Chord Length = <default>, Elevation Type: <Top, CRown, CEnter, Invert, or Bottom>
Select starting structure or pipe or [Chord length / Elevation type]: Select the starting pipe network structure or pipe in planview, **C**hord to enter a new chord length to use along curved pipe, **E**levation to change the pipe elevation type, or press ENTER to end.
Select ending structure or pipe (enter for a single pipe): Select the ending pipe network structure, pipe in planview, or enter.

Elevation
Pipe elevation to use [Top/CRown/CEnter/Invert/Bottom] <Invert>: Select the pipe elevation to use when creating the polyline.

Chord
Enter chord length <10.0000>: Enter a new chord length, or press ENTER to accept the default.

4.10.20 List Alignment Stations and Elevations

List the stations, elevations, and offset along an alignment at selected points.

Can select up to three profiles for selected alignment.

Create an ASCII file listing the selected point number, station, and elevation.

Supports:

AutoCAD Products: Civil 3D only

BricsCAD Pro: No


Button
Ribbon: SmartDraft ▸ Planview panel ▾
Toolbar: Planview Tools:
Menu: SmartDraft ▸ Planview ▸ List Alignment Stations and Elevations

Command:
Alignment: Station and Elevation dialog box appears
Dialog Box Options

Input Data Type

Alignment: List of alignments defined in the current project. Select the alignment.
Elevation 1: List of profile types defined for selected alignment. Select the profile type to use for elevations.
Adjust: The Elevation 1 value will be adjusted by this value. Note: A positive value adds to the elevation, and a negative value subtracts from it.

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Elevation 2: List of profile types defined for selected alignment. Select the profile type to use for elevations.
Adjust: The Elevation 2 value will be adjusted by this value. Note: A positive value adds to the elevation, and a negative value subtracts from it.
Elevation 3: List of profile types defined for selected alignment. Select the profile type to use for elevations.
Adjust: The Elevation 3 value will be adjusted by this value. Note: A positive value adds to the elevation, and a negative value subtracts from it.
Output Options
Station Precision: Specify the station precision.
Elevation Precision: Specify the elevation precision.

List stations, offsets, and elevations of selected points.

Active alignment: (alignment name)

Specify point: Specify a point along the selected alignment, or press Enter to end selection.
Output List dialog box appears.

Dialog Box Options

Selection List: List of selected points' Stations and Elevations.
Delete: Delete selected stations and elevations from selection list.
Restore All: Restore all deleted stations and elevations.

OK: Ends command and exits.
Write File: Create an ASCII file of the listed data.

Example of screen output for a selected point:

Num: 1 Station: 400.00 Offset: 0.00 elevation @ Center: 104.88, elevation @ Left 1: 99.68, elevation @ Left 2: 100.00

Example of ASCII output

Magnolia

Elevation 1: Center, Adjustment: 0.00

Elevation 2: Left 1, Adjustment: 0.00

Elevation 3: Left 2, Adjustment: 0.00

Number	Station	Elevation1	Elevation2	Elevation3	Offset
1	400	104.88	99.68	100	0.00
2	450	105.52	100.32	100.5	0.00
3	500	106.17	100.97	101	0.00
4	550	107.6	102.4	101.5	0.00
5	600	108.43	103.23	102	0.00
6	650	109.34	104.14	102.5	0.00
7	700	110.31	105.11	103	0.00
8	750	111.36	106.16	103.5	0.00
9	800	112.49	107.29	104	0.00

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4.10.21 List Crossing Alignments Stations and Elevations

List the stations and elevations at selected points from two crossing alignments.

Create an ASCII file listing the selected point number, station, elevation of main alignment, and the alignment name, station, and elevation of crossing alignment.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	No

Button

Ribbon: SmartDraft ▸ Planview panel

Toolbar: Planview Tools:

Menu: SmartDraft ▸ Planview ▸ List Crossing Alignment Stations and Elevations

Select alignment dialog box appears. Select Alignment for Main alignment, and press OK.

Select alignment dialog box appears. Select Alignment for Crossing alignment, and press OK.

List crossing stations, offsets, and elevations of selected points.

Main alignment: (alignment name)

Crossing alignment: (alignment name)

Specify point: Specify a point along the selected alignment, or press ENTER to end selection.

Select alignment dialog box appears. Select Alignment for Crossing alignment, select another alignment, and press OK to continue, or select Cancel to display the Output List dialog box.

Dialog Box Options

Selection List: List of selected points' Station, Elevation, Crossing alignment, X-Station, and X-Elevation.
Delete: Delete selected listing from selection list.
Restore All: Restore all deleted stations and elevations.

OK: Ends command and exits.
Write File: Create an ASCII file of the listed data.

Example of screen output for a selected point:

Num: 1 Station: 865.58 Offset: 0.00 elevation @ CL: 112.85

Crossing Station: 100.00 Offset: 0.00 elevation @ CL: 112.85

Example of ASCII output

Magnolia

Number	Station	Elevation	Offset	Crossing Street	Station	Elevation	Offset
1	100.00	120.00	0	Side Street	25.00	121.00	10.0
2	200.00	122.00	0	Side Street	15.00	123.21	10.0
3	300.00	124.00	0	Side Street	10.00	125.11	10.0
4	400.00	126.00	0	Side Street	5.00	127.51	10.0

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5	500.00	128.00	0	Side Street	30.00	129.25	10.0

4.10.21.1 Select Alignment

Select alignment dialog box.

Set a Civil 3D alignment current from the dialog box.

Dialog Box Options

Alignment List:	List of alignments in Civil 3D. Select alignment to set current.
Active Alignment:	Display the current active alignment.
OK:	Set the selected alignment as active alignment.

4.11 Points Panel Tools

4.11.1 Point Input Options

Control point insertion settings. Option to add the new point to the survey database.

Supports:

AutoCAD Products:	SmartDraft Point Block for AutoCAD and AutoCAD Map, Civil 3D Point for AutoCAD Civil 3D.
BricsCAD Pro:	Use the BricsCAD Point Creation Options to use the BricsCAD Pro Civil points.


Button


Ribbon: SmartDraft ▸ Points panel ▸ 
Toolbar: Points: 
Menu: SmartDraft ▸ Points ▸ Point Options

Dialog Box Options

Layer:	Set the layer to be used by the point insertion commands.
Layer Type:	Toggle the layer type for the layer name selection.
Styles:	Point Object Styles: Civil 3D and BricsCAD Pro only.
Civil 3D	
Point	Select a Point Style to override the one assigned in a Point Group. Selecting <default> will let the Point Group style setting apply. Any other selected style will set an override Point Style on the Point object.
Label	Select a Label Style to override the one assigned in a Point Group. Selecting <default> will let the Point Group style setting apply. Any other selected style will set an override Label Style on the Point object.
Symbol	Select a Symbol Style to be assigned to the Point object.
Label	Select a Label Style to be assigned to the Point object.
Point Type:	AutoCAD and AutoCAD Map 3D, Drawing **block** is the point type BricsCAD Pro: Drawing **block** is the point type

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Civil 3D: Drawing or Survey DB is the point type.

Drawing: Create point in the drawing
Survey DB: Create a point in the Civil 3D Survey Database of the currently open database, the selected Network, and either a Non-Control or Control point.
Non-Control: Create the points as an Non-Control Point in the Survey Database.
Control: Create the points as a Control Point in the Survey Database.
Insert Manually: The point will be created in the Survey Database but not inserted into the drawing. Operator will need to manually insert new points into the drawing. If the Survey Database is very large, this option should be used.
Insert into Drawing: The point will be inserted into the drawing along with the Survey Database. Due to programming limitations, all the survey database points will be temporarily inserted into the drawing; and at the end of the command, the extra points will be removed.

Numbering
Sequential Numbering: Select the check box to sequentially number new points using the Current Number as they are created. Clear the check box to be prompted for a point number each time a new point is created.
Current Number: Enter the current point number for point insertion commands.

Elevations
Automatic: Select to automatically assign the Default Elevation to a new point.
Enter / Select: Select to have prompt option to Enter elevation, or Select elevation from an object.
None: Select to assign no elevation to a new point.
Object: Select the button to specify a Selected Z, pipe, profile, surface, or polyline / feature line as the elevation. This is a dynamic elevation and will update if the data changes. It uses the same elevation input options as the Point Elevation command.
Default Elevation: The value used with the Automatic option, and the default value used with the Manual option.

Descriptions
Automatic: Select to automatically assign the Default Description to a new point.
Manual: Select to manually assign the description to a new point.
None: Select to assign no description to a new point.
Default Description: The value used with the Automatic option, and the default value used with the Manual option.

Note: To modify the layers listed in the Point Layers List, use the SmartDraft menu ▸ Program Setup ▸ Customization Template Manager.

Warning: For AutoCAD, and AutoCAD Map 3D, if you use the Block option, there is currently no guard against multiple points with the same point number. A Points Check command is built into all point output commands to check if duplicate point numbers have been used in the current file.

4.11.1.1 SmartDraft Point Block

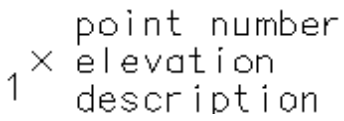
The SmartDraft point is a block with attributes for the point number, elevation, and description. These blocks are used to store coordinate information in a drawing. The block's insertion point stores the northing and easting coordinate values. If you need to relocate the point number, elevation, or description attribute, use the Attribute Tools on the Layout Panel. Do not move the block using the MOVE command unless you want to change the point's coordinate location.

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Warning: When using these point block, it is possible to manual edit the point number, creating a situation with duplicate point numbers. When using the SmartDraft point tools, we try to protect this situation, but cannot block the use of attribute edit commands in AutoCAD. See Check for Duplicate Point Numbers.

To retain the true coordinate values, do not rotate or move linework using AutoCAD's ROTATE or MOVE commands. To twist the view for plotting or sheet creation, use View Twist.

Example



4.11.1.2 Check for Duplicate Point Numbers

Check for duplicate point numbers in the drawing.

Command: **ptdup**

Creating data: ***

Checking for duplicate point numbers.

Processing point: ***

If any duplicate points are found, the "Duplicate Point Numbers" dialog box appears.

Dialog Box Options

Point List:	List of duplicate points.
Save:	Save the duplicate point list to an external ASCII file.
Show <:	Zoom to the selected point from the list. Specify [Renumber/Delete/Exit] <default> **Renumber** to enter a new number, **Delete** to delete the point from the drawing, or **Exit** to return to the dialog box.
Renumber:	Renumber the selected point from the list.
OK:	To proceed with the point output.

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4.11.1.3 Survey Database Warning

When creating points in the Survey Database, also insert a point into the drawing.

When creating points and an operator selects the "**Insert into Drawing**" option in the Civil 3D Survey Database, points will be inserted into the drawing along with the Survey Database.

Warning: Due to programming limitations, all the survey database points will be temporarily inserted into the drawing; and at the end of the command, the extra points will be removed.

If the Survey Database has a large number of points, use the "**Insert Manually**" options to increase point command speed.

4.11.2 BricsCAD Point Creation Options

Control point creation type in BricsCAD Pro.

Select SmartDraft point or BricsCAD Pro Civil point, Symbol Style, and Point Label Style.

Note: In SmartDraft, the default option is the BricsCAD Pro Civil Points.

Note: Know limitations in BricsCAD v24.1.05. Only the Raw Description is added. The user will be required to creates a Point Label Style which references the Raw Description property (Description) vs the Full Description to display the description.

Note: BricsCAD Pro v24.2.x and later, the Full Description is set equal to the Raw Description.

Supports:

AutoCAD Products:	No
BricsCAD Pro:	Yes


Button


Ribbon: SmartDraft ▸ Points panel ▸ 
Toolbar: Points: 
Menu: SmartDraft ▸ Points ▸ BricsCAD Point Creation Options

Dialog Box Options

BricsCAD Pro:	Select to use the BricsCAD Pro Civil Point
SmartDraft:	Select to use the SmartDraft Point block
Symbol Style:	Select the Symbol Style to be used when creating BricsCAD Pro Civil Point This is how the point node appears.
Label Style:	Select the Point Label Style to be used when creating BricsCAD Pro Civil Point. These are the properties displayed. i.e. Point Number, Elevation, and Description

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4.11.3 Point Number

Set the next point number for point insertion commands.

Command entry: **pnm**

Command:

Next point number <*current*>: Enter a value, or press ENTER to accept the current value.

4.11.4 Points Manual

Create a point by specifying a point on the screen.

Set a cogo point by specifying a point graphically.

Supports:

AutoCAD Products:	SmartDraft Point Block for AutoCAD and AutoCAD Map, Civil 3D Point for AutoCAD Civil 3D.
BricsCAD Pro:	Use the BricsCAD Point Creation Options to use the BricsCAD Pro Civil points.

Button

Ribbon: SmartDraft ▸ Points panel ▸ Create pull-down

Toolbar: Point Create on the Points:

Menu: SmartDraft ▸ Points ▸ Manual

Command entry: **ptm**

Command:

Points manual.

Specify insertion point for point *X* or [Options]: Specify a point, **O** to change the point options, or press ENTER to end. *X* is the number of the point to be inserted.

4.11.5 Points by Coordinates

Create a point by specifying a northing and easting coordinate.

Set points by specifying northing and easting coordinate values.

Supports:

AutoCAD Products:	SmartDraft Point Block for AutoCAD and AutoCAD Map, Civil 3D Point for AutoCAD Civil 3D.
BricsCAD Pro:	Use the BricsCAD Point Creation Options to use the BricsCAD Pro Civil points.

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Button

Ribbon: SmartDraft ▸ Points panel ▸ Create pull-down

Toolbar: Point Create on the Points:

Menu: SmartDraft ▸ Points ▸ Coordinate

Command:

Points by coordinates.

Specify Northing coordinate for point X or [Options]: Specify a value, **O** to change the point options, or press ENTER to end. *X* is the number of the point to be inserted.

Specify Easting coordinate for point X: Specify a value.

4.11.6 Points Calculate Slope

Create a point and set its elevations along a calculated slope from two selected elevation objects along an arc or line.

Selected elevations can be from text, mtext, attributes, Civil 3D's Point objects, lines, arcs, polylines, splines, or Civil 3D's Contours. If the selected object is text, mtext, an attribute, a Civil 3D's Point object, the elevation is the text value. If the selected object is a line, arc, polyline, spline, or a Civil 3D's Contours, the elevation is the elevation (z) value of the object at the selected point. The distance can be calculated from either an operator-specified "Point", or from the "Object". The "Object" point for text, mtext, attributes, and Civil 3D's Point is the insertion point. The "Object" point for lines, arcs, polylines, splines, and a Civil 3D's Contour is the point at which the object is selected.

Supports:

AutoCAD Products:	SmartDraft Point Block for AutoCAD and AutoCAD Map, Civil 3D Point for AutoCAD Civil 3D.
BricsCAD Pro:	Use the BricsCAD Point Creation Options to use the BricsCAD Pro Civil points.


Button

Ribbon: SmartDraft ▸ Points panel ▸

Toolbar: Point Create on the Points:

Menu: SmartDraft ▸ Points ▸ Points Calculate Slope

Command entry: **ptcs**

Adjustment option:

Enter first elevation adjustment value <default>: Enter a value to adjust the first selected elevation.

Enter second elevation adjustment value <default>: Enter a value to adjust the second selected elevation.

Distance Calculation type:

Type: Arc Slope calculated along an arc.

Type: Line Slope calculated along a line.

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Point options:

Point: Object Selected object's insertion point will be used for calculations.

Point: Select Selected point will be used for calculations.

Select "point" prompts:

Calculate slope.

Current: Point = <Object/Select>, Type = <Arc/Line>, Adjust = <default>/<default>

Select first elevation or [Adjust/Options/Point/Type]: Select first elevation object, **A** to change the adjustment values for the selected elevation, **O** to change the point options, **P** for selection type, or **T** for distance type.

Specify first point: Select point for first elevation object.

Select second elevation: Select second point object.

Specify second point: Select point for second elevation object.

Dist: 35.31, Elv 1: 123.12, Elv 2: 134.43, Elv Diff: 11.31, Slope: 0.32%.

Object "point" prompts:

Current: Point = Object, Type = Line, Adjust = 0.0/0.0 Current options.

Select first elevation or [Adjust/Options/Point/Type]: Select first elevation object, **A** to change the adjustment values for the selected elevation, **O** to change the point options, **P** for selection type, or **T** for distance type.

Select second elevation: Select second point object.

Dist: 35.31, Elv 1: 123.12, Elv 2: 134.43, Elv Diff: 11.31, Slope: 0.32%.

Type Line:

Current settings: Point = Object, Type = Line, Adjust = 0.0/0.0 Current options.

Select spot elevation point: Select point to calculate spot elevation and insert block, or press ENTER to end.

Offset distance xx.xx' right/left Offset from line between selected points.

Specify location for point <Number>: Select point to calculate elevation and placement of point, or press ENTER to end.

Type Arc:

Current: Point = Object, Type = Arc, Adjust = 0.0/0.0 Current options.

Select first elevation along arc (counter-clockwise) or [Adjust/Options/Point/Type]: Select first point object, **A** to change the adjustment values for the selected elevation, **O** to change the point options, **P** for selection type, or **T** for distance type.

Select arc: Select the arc.

Select second elevation: Select second point object.

Dist: 35.31, Elv 1: 123.12, Elv 2: 134.43, Elv Diff: 11.31, Slope: 0.32%.

Select spot elevation point: Select point to calculate spot elevation and insert block, or press ENTER to end.

Offset distance xx.xx' right/left Offset from line between selected points.

Specify location for point <Number>: Select point to calculate elevation and placement of point, or press ENTER to end.

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4.11.7 Points Elevation by Slope

Create a point from a select point and elevation, calculate the elevation by a slope and a selected point (distance).

Selected elevation can be from text, mtext, attributes, Civil 3D's Point s, lines, arcs, polylines, splines, or Civil 3D's Contours. If the selected object is text, mtext, an attribute, or a Civil 3D's Point object, the elevation is the text value. If the selected object is a line, arc, polyline, spline, or a Civil 3D's Contours, the elevation is the elevation (z) value of the object at the selected point. The distance can be calculated from either an operator-specified "Point" or from the "Object". The "Object" point for text, mtext, attributes, and a Civil 3D's Point is the insertion point. The "Object" point for lines, arcs, polylines, splines, and a Civil 3D's Contour is the point at which the object is selected.

Note: The elevation values of the selected points are ignored when calculating the distance.

Supports:

AutoCAD Products:	SmartDraft Point Block for AutoCAD and AutoCAD Map, Civil 3D Point for AutoCAD Civil 3D.
BricsCAD Pro:	Use the BricsCAD Point Creation Options to use the BricsCAD Pro Civil points.


Button


Ribbon: SmartDraft ▸ Points panel ▸ 

Toolbar: Point Create on the Points: 

Menu: SmartDraft ▸ Points ▸ Points Elevation by Slope


Command entry: **ptbs**

Adjustment option:

Enter elevation adjustment value <default>: Enter a value to adjust the selected elevation.

Point options:

Point: Object	Selected object's insertion point will be used for calculations.
Point: Select	Selected point will be used for calculations.

Next options:

Next: Yes	The calculate from point is moved to the last specified point, and the elevation is changed to the last calculated value.
Next: No	Last selected point and elevation remain the same, new elevations are calculated for these values.

Select "point" prompts:

Points elevation by slope.

Current settings: Point = <Object/Select>, Next = <Yes/No>, Adjust = <default>, Slope = <default>

Select elevation or [Adjust/Next/Options/Point/Slope]: Select elevation object, **A** to change the adjustment value for the selected elevation, **N** to toggle next option, **O** to change the point options, **P** for selection type, or **S** for slope.

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Specify start point: Select point for the selected elevation object.

Starting elevation = <value>, Slope = <value>

Specify distance for point <number> or [Next/Options/Slope]: Specify point to calculate elevation (uses the current slope and distance from start point to specified point).

Object "point" prompts:

Points elevation by slope.

Current settings: Point = <Object/Select>, Next = <Yes/No>, Adjust = <default>, Slope = <default>

Select elevation or [Adjust/Next/Options/Point/Slope]: Select elevation object, **A** to change the adjustment value for the selected elevation, **N** to toggle next option, **O** to change the point options, **P** for selection type, or **S** for slope.

Starting elevation = <value>, Slope = <value>

Specify distance for point <number> or [Next/Options/Slope]: Specify point to calculate elevation (uses the current slope and distance from start point to specified point).

4.11.8 Points Elevation at PVI

Create a point and elevation for a PVI from two elevation objects and two slopes.

Selected elevations can be from text, mtext, attributes, Civil 3Dt's point objects, lines, arcs, polylines, splines, or Civil 3D's contours. If the selected object is text, mtext, an attribute, a Civil 3D's point object, the elevation is the text value. If the selected object is a line, arc, polyline, spline, or a Civil 3D's contours, the elevation is the elevation (z) value of the object at the selected point. The distance can be calculated from either an operator-specified "Point", or from the "Object". The "Object" point for text, mtext, attributes, and Civil 3D's point is the insertion point. The "Object" point for lines, arcs, polylines, splines, and a Civil 3D's contour is the point at which the object is selected.

Supports:

AutoCAD Products:	SmartDraft Point Block for AutoCAD and AutoCAD Map, Civil 3D Point for AutoCAD Civil 3D.
BricsCAD Pro:	Use the BricsCAD Point Creation Options to use the BricsCAD Pro Civil points.


Button

Ribbon: SmartDraft ▸ Points panel ▸ 

Toolbar: Point Create on the Points: 

Menu: SmartDraft ▸ Points ▸ Points Elevation at PVI

Command entry: **ptpvi**

Adjustment option:

Enter first elevation adjustment value <default>: Enter a value to adjust the first selected elevation.

Enter second elevation adjustment value <default>: Enter a value to adjust the second selected elevation.

Distance Calculation type:

Type: Arc Slopes calculated along an arc.

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Type: Line Slopes calculated along a line.

Point options:

Point: Object Selected object's insertion point will be used for calculations.

Point: Select Selected point will be used for calculations.

Select "point" prompts:

Points at PVI.

Current: Point = <Object/Select>, Type = <Arc/Line>. Adjust = <default>/<default>, Slope = <Slope1>/<Slope2>

Select first elevation or [Adjust/Options/Point/Slope/Type]: Select first elevation object, **A** to change the adjustment values for the selected elevation, **O** to change the point options, **P** for selection type, **S** to change slopes, or **T** for distance type.

Specify first point: Select point for first elevation object.

Select second elevation: Select second point object.

Specify second point: Select point for second elevation object.

Dist: 35.31, Elv 1: 123.12, Elv 2: 134.43, Elv Diff: 11.31, Slope: 1.00% / 1.00%.

Object "point" prompts:

Points at PVI.

Current: Point = <Object/Select>, Type = <Arc/Line>, <default>/<default>, Slope = <Slope1>/<Slope2>

Select first elevation or [Adjust/Options/Point/Type]: Select first elevation object, **A** to change the adjustment values for the selected elevation, **O** to change the point options, **P** for selection type, **S** to change slopes, or **T** for distance type.

Select second elevation: Select second point object.

Dist: 35.31, Elv 1: 123.12, Elv 2: 134.43, Elv Diff: 11.31, Slope: 1.00% / 1.00%.

Output

Current: Point = <Object/Select>, Type = <Arc/Line>, Adjust = <default>/<default>, Slope = <Slope1>/<Slope2>

Enter to accept location for point <number> or [Options/Slope]: Press ENTER to accept location, **O** to change the point options, or **S** to change slopes.

4.11.9 Points Setback

Create one or two points along a line at specified setbacks.

Set points by selecting a line graphically.

Supports:

AutoCAD Products: SmartDraft Point Block for AutoCAD and AutoCAD Map, Civil 3D Point for AutoCAD Civil 3D.

BricsCAD Pro: Use the BricsCAD Point Creation Options to use the BricsCAD Pro Civil points.



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Button

Ribbon: SmartDraft ▸ Points panel ▸ Create pull-down

Toolbar: Point Create on the Points:

Menu: SmartDraft ▸ Points ▸ Setbacks

Command entry: **bp**

Command:

Create points along lot line.

Distances: First: 20.00, Second: 80.00.

Select lot line near Right-of-way or [Distances/Options]: Select the line to insert points, **O** to change the point options, **D** to change the offset distances, or press ENTER to end.

If **Distances:**

Enter first distance <20.00>: Enter the first distance along the line.

Enter second distance or "." for none <80.00>: Enter the second distance along the line or "**.**" for none.

4.11.10 Points along Objects

Create points at key points along selected objects.

Set points at the end and at radius points of selected lines, arcs, or polylines.

Supports:

AutoCAD Products:	SmartDraft Point Block for AutoCAD and AutoCAD Map, Civil 3D Point for AutoCAD Civil 3D.
BricsCAD Pro:	Use the BricsCAD Point Creation Options to use the BricsCAD Pro Civil points.



Button

Ribbon: SmartDraft ▸ Points panel ▸ Create pull-down

Toolbar: Point Create on the Points:

Menu: SmartDraft ▸ Points ▸ Along Objects

Command:

Points along objects.

Current settings: Radii = <Yes or No>, Duplicate: <Yes, No> Radii to Yes places a point at the radius point of arc segments. Duplicate No creates a list of the points currently in the drawing and checks the coordinates but does not add a new point if one already exists at those coordinates.

Specify start point or [Duplicate/Radii/Options]: Specify a point (1 - see example below). *Default osnap is **END**point,* **Options** to change point options, **D**uplicate to toggle placement of a point if one already exists at the same coordinates, or **R**adii to toggle placement of points at radii points.

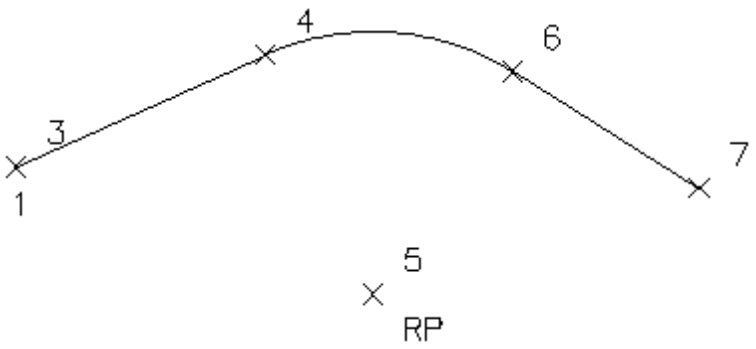
Starting point: 3 Starting point number prompt.

Select lines, arcs, polylines, alignments, parcel segments, and feature lines:

Select objects: Select all the objects to place points at the start and end points of straight segments, and arc segments, and the radii of arc segments.

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Example



4.11.11 Points at Station and Offset

Create points along an alignment at a station and offset.

Set points by station and offset along selected objects or an alignment.

Supports:

AutoCAD Products:	SmartDraft Point Block for AutoCAD and AutoCAD Map, Civil 3D Point for AutoCAD Civil 3D.
BricsCAD Pro:	Use the BricsCAD Point Creation Options to use the BricsCAD Pro Civil points.

Button

Ribbon: SmartDraft ▸ Points panel ▸ Create pull-down

Toolbar: Point Create on the Points:

Menu: SmartDraft ▸ Points ▸ At Station and Offset

Command:

Points by station and offset.

Create points along an alignment using stations and offsets.

Selecting a line or arc:

Select the starting segment or alignment or [List]: Select the first line or arc of the objects to represent a path, or **L**ist to select an alignment.

Specify point near starting station: Specify a point to be the start point of the alignment, must be the endpoint of the selected object. *Default osnap is **END**point.*

Enter starting station <0.00>: 100 Specify the station for the starting station selected above.

Select alignment lines and arcs in order:

Select object: Select all objects which represent the alignment.

(number of selected) objects selected, (number of processed) objects processed. Note: if numbers are different, end the command, and select objects again.

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Selecting a polyline, feature line, survey figure, or parcel line:

Select the starting segment or alignment or [List]: Select a polyline, feature line, survey figure, or parcel line, or **L**ist to select an alignment.

Enter starting station for first polyline <0.00>: Enter a starting station for the polyline, feature line, survey feature, or parcel line. SmartDraft alignment information will be assigned to the selected object.

Selecting an alignment:

Select the starting segment or alignment or [List]: Select an alignment, or **L**ist to select an alignment.

Select alignment dialog box appears. Select alignment.

Selected alignment: (alignment name)

List:

Select alignment dialog box appears. Select alignment.

Selected alignment: (alignment name)

Common prompts:

From Station: (starting station) to Station: (ending station). Starting point: (next point)

Enter station or [Duplicate/Multiple/Options]: **130** Enter a station, **D**uplicate to toggle placement of a point if one already exists at the same coordinates, **M**ultiple to place points at a specified interval, **O**ptions to change the point options, or press ENTER to end.

Enter offset distance(s) (+right/-left): **2** Enter offset distance(s), or press ENTER to end.

Multiple:

Enter point station interval: **10** Enter an interval value.

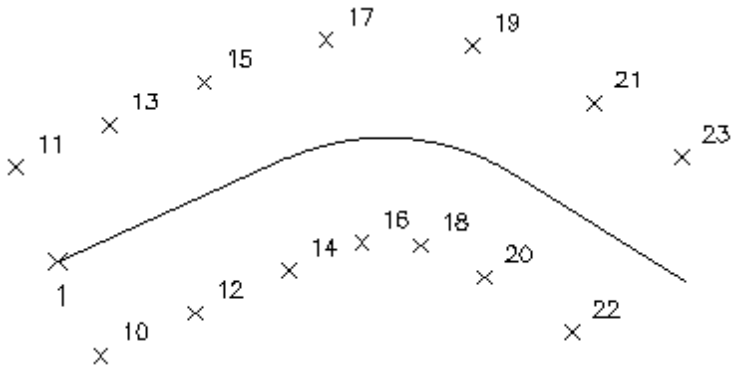
Start points at station <*beginning station*>: Enter the station to begin multiple point insertion, or press ENTER to accept beginning station.

End points at station <*ending station*>: Enter the station to end multiple point insertion, or press ENTER to accept ending station.

Add points at vertices [Yes/No] <No>: **N** Enter **Y**es to add points on start and end vertices, or **N**o to skip them.

Enter offset distance(s) (+right/-left): **2** Enter offset distance(s), or press ENTER to end.

Example



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4.11.12 Points Offset Staking

Create points at a projection from a line to a target, corner offset, or offset along an arc / line.

Supports:

AutoCAD Products:	SmartDraft Point Block for AutoCAD and AutoCAD Map, Civil 3D Point for AutoCAD Civil 3D.
BricsCAD Pro:	Use the BricsCAD Point Creation Options to use the BricsCAD Pro Civil points.


Button


Ribbon: SmartDraft ▸ Points panel ▸ Create pull-down 
Toolbar: Point Create on the Points: 
Menu: SmartDraft ▸ Points ▸ Offset Staking

Command:

Points Offset Staking.

If **Projection:**

Current settings: Type: Projection, Duplicate: <*Yes/No*>

Select projection line for point <#>, or [Options]: Select the line to project, or **O**ptions to change the settings.

Select projection target: Select the projection target object.

If **Corner:**

Current Settings: Type: Corner, Offset 1: <*Value*>, 2: <*Value*>, Duplicate: <*Yes/No*>

Select arc, line for along for point <#>, or [Options]: Select the arc or line to offset along, or **O**ptions to change the settings.

Specify side for offset: Specify a point on the side of the object to indicate the offset side.

If **Along Line / Arc:**

Current Settings: Type: Along, By <*Distance/Number*>: <*Value*>, Duplicate: <*Yes/No*>

Select first line of corner for point <#>, or [Options]: Select the first line of the corner, or **O**ptions to change the settings.

Select second line of corner: Select the second line of the corner.

Specify side for offset: Specify a point on the side of the object to indicate the offset side.

4.11.12.1 Points Offset Staking Options

Point offset staking options used by the Points Offset Staking command.

Point Offset Staking Options
Offset Staking Type

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Projection:	Project in the direction of a select line to a target object. Set a point at the projected location.
Corner:	Select two lines, calculate the offset 1 and offset 2 intersection from the select lines. Set a point at the intersection of the two offsets.
Along Line / Arc:	Calculate offsets from a selected line or arc to the side specified. Set points either by a set number along the object (evenly divided), or at a specified distance.
Point Options	
Offset 1	The offset from the first line of the Corner type, or the offset distance of the Along Line / Arc type.
Offset 2:	The offset from the second line of the Corner type.
Distance:	The distance between points along the selected object for the Along Line / Arc type.
Number:	The number of points set along the select object for the Along Line / Arc type.
Duplicate:	Yes if you want the command to place a point if one already exists at the same coordinates. No to not place another point.
Point Input Options	Select to set next point number, elevation, and description options.

4.11.13 Points Connect with Polyline

Connect points with a 2D or 3D polyline.

Create a 2D polyline or 3D polyline between point blocks or Civil 3D's point objects. Connects the dots by placing the crosshairs over the object.

Note: If Object is the point type, the command will not connect to the same point twice unless the command is stopped and restarted. Supports Civil 3D and SmartDraft point objects via an Xref.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Yes


Button


Ribbon: SmartDraft ▸ Points panel ▸ 
Toolbar: Points: 
Menu: SmartDraft ▸ Points ▸ Connect points with Polyline

Point type: Object
Command:

Current point type = <Object/Select>, Draw = <3dpoly/Polyline>

First point Block/Object, click for pen up or [Options/Join]: Drag the crosshairs over the point block/object, **J**oin, or **O**ptions to change the selection objects. The polyline will start at the insertion point of the object.

Next Point Block/Object, click for pen up or [Options]: Drag the crosshairs over the next point block/object or **O**ptions to change the selection objects.

Next Point Block/Object, click for pen up or [Options/Undo]: Drag the crosshairs over the next point block/object, **O**ptions to change the selection objects, or **U** to undo the last segment.

Next Point Block/Object, click for pen up or [Options/Close/Undo]: Drag the crosshairs over the next point block/object, **O**ptions to change the selection objects, **C** to close the polyline object, or **U** to undo the last segment.

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Point type: Select

Command:

Current point type = <Object/Select>, Draw = <3dpoly/Polyline>

Select first point Block/Object [Options/Join]: Drag the crosshairs over the point block/object, **J**oin, or **O**ptions to change the selection objects. The polyline will start at the insertion point of the object.

Select next point Block/Object or [Options]: Drag the crosshairs over the next point block/object or **O**ptions to change the selection objects.

Select next point Block/Object or [Options/Undo]: Drag the crosshairs over the next point block/object, **O**ptions to change the selection objects, or **U** to undo the last segment.

Select next point Block/Object or [Options/Close/Undo]: Drag the crosshairs over the next point block/object, **O**ptions to change the selection objects, **C** to close the polyline object, or **U** to undo the last segment.

Note: While in "Select" mode, press ENTER after typing **O**; but while in "Object" mode, you do not have to press ENTER after typing **O.**

Dialog Box Options

Selection: Select the Object to drag the cursor over a point to create the polyline, or Select to select the point object with the left mouse button.

Draw: Select the polyline option to draw as a 2D polyline or 3D polyline. When drawn as a 3D polyline, the point's elevation is used for the Z value of the polyline vertex. Note: If a polyline has already started, this option will be disabled.

OK: To proceed with the point output.

4.11.14 Point Elevation

Assign a calculated elevation to Civil 3D's point object from a profile and alignment, surface, polyline, feature line, parcel segment, or survey figure.

Dynamic Data: Point objects with SmartDraft point elevation data will update when moved, copied, arrayed, or grip edited using standard AutoCAD commands. Any Point Label assigned to a point object will also update.

Supports:

AutoCAD Products: Yes

BricsCAD Pro: Yes


Button


Ribbon: SmartDraft ▸ Points panel ▸ 

Toolbar: Point Modify Elevations on the Points: 

Menu: SmartDraft ▸ Points ▸ Modify Elevations ▸ Point Elevation


Command entry: **ep**

Point Elevation Options

Input Data: Select input data type.

Poly/Feature Line: Extract elevation value from a point along a polyline or feature line, survey feature, or parcel segment.

Alignments: Extract elevation value from a vertical alignment profile defined in Civil 3D.

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Surfaces: Extract elevation value from a surface defined in Civil 3D.
Pipes: Extract elevation value from a pipe defined in Civil 3D. For station, selected an alignment.
Note: The following options are only available with the Alignments and Surfaces input data types.
Surface: List of surfaces defined in Civil 3D. Select the surface to use for elevations.
Alignment: List of alignments defined in Civil 3D. Select the alignment.
Profile: List of profile types defined for selected alignment. Select the profile type to use for elevations.
See example below.
Selected Z: Will use the Z value of the selected point for the elevations.

Labeling:
Adjust: The elevation value will be adjusted by this value. Note: A positive value adds to the elevation, and a negative value subtracts from it.
Grade (%): The elevation value will be adjusted by the grade (%) multiplied by the offset distance from the selected polyline or alignment. This option is only used with the polyline and alignments' input data types.
Offset Adjust: The selected offset distance will be adjusted by this value for calculating with the grade to adjust the elevation. Added to support Top of Curb to Edge of Gutter adjustment when calculating street crossfall.
Note: A positive value adds to the offset, and a negative value subtracts from it. This option is only used with the polyline and alignment input data types.

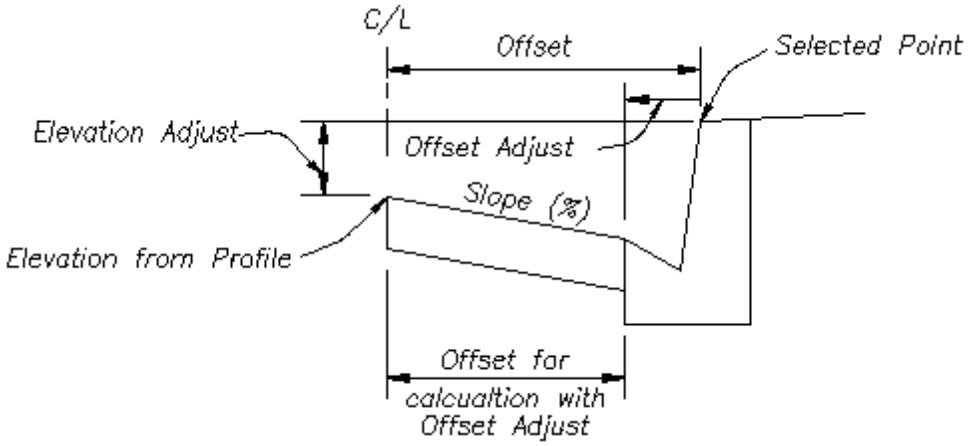
Command:

Point Elevation Type: <Profile/Surface/Polyline>, Name: <alignment name or surface name>, <profile name>

Select point objects/block or [Options/Update]: Select the points, **O**ptions to change output settings, **U**pdate to update the values, or press ENTER to end.

To edit: To edit the options of an existing point object with point elevation data, you can either use this command, change the options and select the points to apply the new settings, or use the SmartDraft Text Edit (**ed**) command.

Example of Offset, Slope, Adjust, and Offset Adjust



4.11.14.1 Point Elevation Update

Update point elevations (Civil 3D point objects) created using the Point Elevation command.

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Command entry: **epu**

Command:
Select Point Elevations to update.
Select Objects: Select the Point Elevations to update.

4.11.14.2 Point Elevation Edit

Update point elevations (Civil 3D point objects) created using the Point Elevation command.

Edit
Select Point Elevations to edit
Select objects: Select the Point Elevations to edit the options.

Edit Point Elevation Options

Input Data:	Select input data type.
Select New	Select a new pipe, polyline, or feature line.
Poly/Feature Line:	Extract elevation value from a point along a polyline or feature line, survey feature, or parcel segment.
Alignments:	Extract elevation value from a vertical alignment profile defined in Civil 3D.
Surfaces:	Extract elevation value from a surface defined in Civil 3D.
Pipes:	Extract elevation value from a pipe defined in Civil 3D. For station, selected an alignment. **Note: The following options are only available with the Alignments and Surfaces input data types.**
Surface:	List of surfaces defined in Civil 3D. Select the surface to use for elevations.
Alignment:	List of alignments defined in Civil 3D. Select the alignment.
Profile:	List of profile types defined for selected alignment. Select the profile type to use for elevations.

Labeling:

Adjust:	The elevation value will be adjusted by this value. Note: A positive value adds to the elevation, and a negative value subtracts from it.
Grade (%):	The elevation value will be adjusted by the grade (%) multiplied by the offset distance from the selected polyline or alignment. This option is only used with the polyline and alignments' input data types.
Offset Adjust:	The selected offset distance will be adjusted by this value for calculating with the grade to adjust the elevation. Added to support Top of Curb to Edge of Gutter adjustment when calculating street crossfall. Note: A positive value adds to the offset, and a negative value subtracts from it. This option is only used with the polyline and alignment input data types. See example Point Elevation.

If Polyline:
Select polyline, feature line, survey figure, parcel line, or <current>: Select a valid object or if <current> is displayed press ENTER to use the original object.

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4.11.15 Modify Elevations of Points: Absolute Hinge

Use a hinge line to edit the elevations of selected points. The hinge line is defined by two points. The absolute slope can be a slope (%) or a slope (X:1).

Dynamic Data: Any Point Label assigned to a point object will also update.

Supports:

AutoCAD Products:	SmartDraft Point Block for AutoCAD and AutoCAD Map, Civil 3D Point for AutoCAD Civil 3D.
BricsCAD Pro:	Use the BricsCAD Point Creation Options to use the BricsCAD Pro Civil points.

Button

Ribbon: SmartDraft ▸ Points panel ▸

Toolbar: Point Modify Elevations on the Points:

Menu: SmartDraft ▸ Points ▸ Modify Elevations ▸ Modify Elevations of Points: Absolute Hinge

Command entry: **epa**

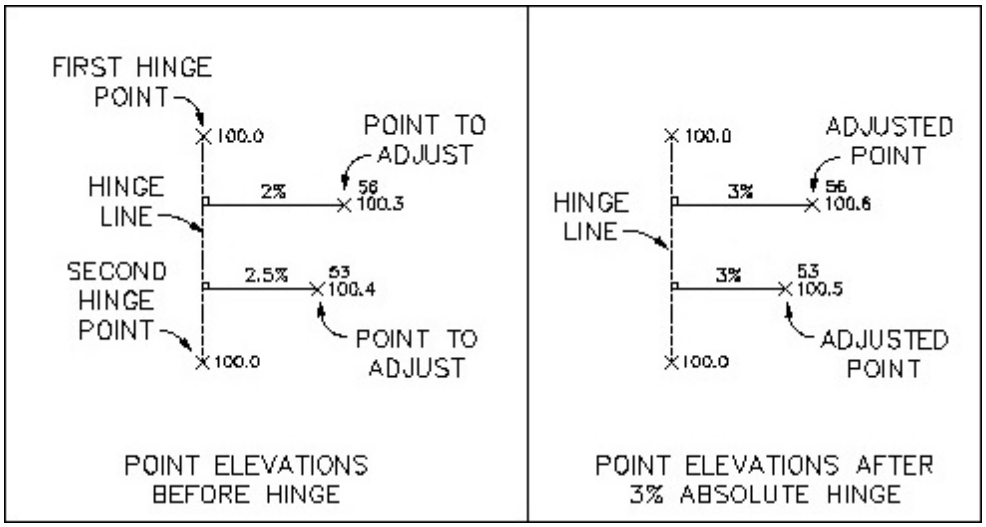
Command:

Modify elevations of points: Absolute Hinge.

Current settings: Slope Type = <%, X:1>

Specify first point or [Options]:	Specify the point, **O**ptions to toggle slope type, or press ENTER to end.
Enter elevation [x.xxx]:	Enter an elevation, or enter to accept the default.
Specify next point:	Specify the point to define the hinge line.
Enter elevation [x.xxx]:	Enter an elevation, or enter to accept the default.
Enter slope (%, X:1):	Enter a slope.
Select point objects:	Select the point objects to modify their elevations.

Example:



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4.11.16 Modify Elevations of Points: Relative Hinge

Use a hinge line to edit the elevations of selected points. The hinge line is defined by two points. The relative slope can be a slope (%) or a slope (X:1).

Dynamic Data: Any Point Label assigned to a point object will also update.

Supports:

AutoCAD Products:	SmartDraft Point Block for AutoCAD and AutoCAD Map, Civil 3D Point for AutoCAD Civil 3D.
BricsCAD Pro:	Use the BricsCAD Point Creation Options to use the BricsCAD Pro Civil points.

Button

Ribbon: SmartDraft ▸ Points panel ▸

Toolbar: Point Modify Elevations on the Points:

Menu: SmartDraft ▸ Points ▸ Modify Elevations ▸ Modify Elevations of Points: Relative Hinge

Command entry: **epr**

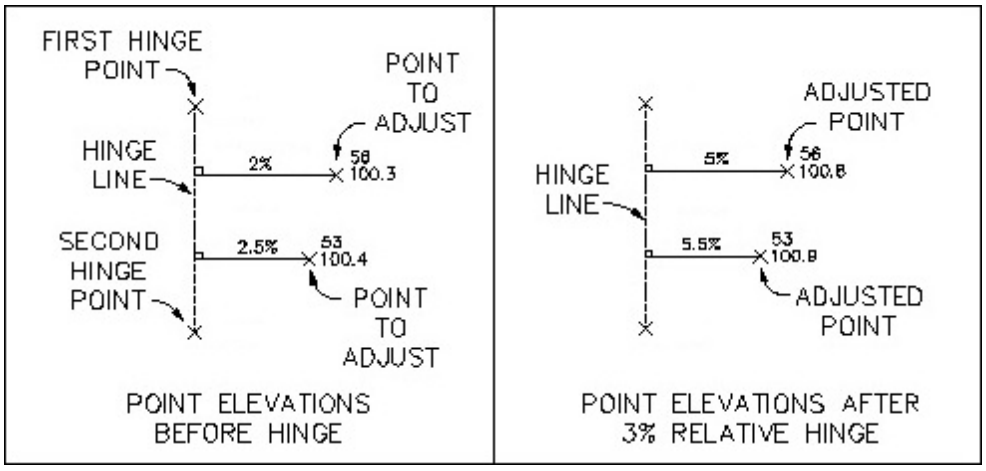
Command:

Modify elevations of points: Relative Hinge.

Options: Slope Type = <%, X:1>

Specify first point or [Options]:	Specify the point, **O**ptions to toggle slope type, or press ENTER to end.
Specify next point:	Specify the point to define the hinge line.
Enter slope (%, X:1):	Enter a slope.
Select point objects:	Select the point objects to modify their elevations.

Example:



4.11.17 Points Report using Surface(s)

Report the elevations of selected points.

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Report the elevations of selected points based on two surfaces, a surface and the point, or the point.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	Use the BricsCAD Point Creation Options to use the BricsCAD Pro Civil points.


Button

Ribbon: SmartDraft ▸ Points panel ▸ 

Toolbar: Point Labels on the Points: 

Menu: SmartDraft ▸ Points ▸ Modify Elevations ▸ Points Report using Surface(s)

Command entry: **ptrp**

Dialog Box Options

Input Data:	
Surface 1:	Select the first surface for elevations at selected point locations.
Surface 2:	Select the second surface for elevations at selected point locations.
Surface 3:	Select the third surface for elevations at selected point locations.
Surface 4:	Select the fourth surface for elevations at selected point locations.
Output Options:	
Coordinates	Check to include the northing and easting coordinates in the report.
Point Elevation	Check to include the point elevation in the report.
Surface 1 Elevation	Check to include the elevation of the first surface in the report.
Surface 2 Elevation	Check to include the elevation of the second surface in the report.
Surface 3 Elevation	Check to include the elevation of the third surface in the report.
Surface 4 Elevation	Check to include the elevation of the fourth surface in the report.
Elevation Difference	Check to include the elevation difference between, selected surface, or point elevations in the report.
Elevation Type:	Select the elevation difference type: Base on the input selection. Select between Point, Surface 1, Surface 2, Surface 3, and Surface 4
Description:	Check to include the point description in the report.
Description Type:	Select the description difference type: Full or Raw
Output **Precision:**	
Coordinate:	Specify the Coordinate Precision.
Elevation:	Specify the Elevation Precision.

Command:

Point selection method [All/Group/Layers/Range/Selection] <Selection>: Specify **R**ange to indicate a range of numbers, **G**roup to select one or more point groups, **L**ayers to select layers to select objects for layer, or **S**election to select points from the drawing.

Dialog Box Options

Point Information:	List of point data of selected points, and surfaces.
Close:	Close dialog box without saving data in the point information.
Save:	Save list of point information to a comma delimited file.

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Example of output file

Name surface 1: Existing Ground

Name surface 2: 2-1 Slope

Type elevation difference: Surface 1 - Surface 2

P#,Northing,Easting,Surface 1,Surface 2,Difference

518,6000882.1084,1500205.8809,112.90,107.78,5.12

517,6000807.4347,1500317.4715,120.39,106.89,13.50

516,6000858.3793,1500235.2716,115.10,108.65,6.45

515,6000834.1515,1500270.6425,117.48,109.56,7.93

409,6000924.1031,1500325.1243,116.55

4.11.18 Cross Sections from Points

Create cross sections from points collected in the field in a cross-sectional pattern along an alignment.

The cross section interval is based on the points found within the offset tolerance. Sample lines are added based on the cross section's station. Section views can be created from these sample lines. See Cross Section from Points Description or information on how the command processes points and the data it creates.

Note: After the command is run and the surface and sample lines are created, the operator will be required to complete a number of manual setups to create Civil 3D section views. See Section Views - Manual Steps.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	No


Button

Ribbon: SmartDraft ▸ Points panel ▸ 

Toolbar: Points: 

Menu: SmartDraft ▸ Points ▸ Station and Offset ▸ Cross Sections from Points

Command entry: **ptx**

Cross Section from Points Options

Alignments

Alignment: Select the alignment to be used as the centerline / baseline of the cross sections.

Point Section:

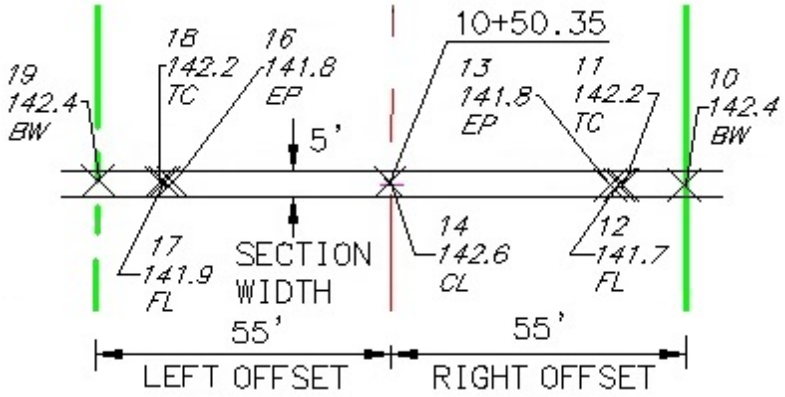
Centerline

Offset Tolerance: Enter a desired offset tolerance from the alignment. When selected points fall within the offset tolerance value, they are used as a start of a cross section. Once these station cross

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section points are determined by the command, cross section points will be associated with them.

Section Width: Enter a desired section width value (one half of this value is applied either side of the cross section point station). When a station point is found, the command determines if other points will be included in a cross section by the section width tolerance. See figure below.



Surface Options:

Name: Once an alignment is selected, a surface name is created from the alignment name with the " - CrossSectionData <index> (new)" suffix. The index number starts at 1 and is incremented as the command is run along the sample alignment. This allows the command to be run multiple times along the sample alignment if there are gaps between cross sections. To rerun an existing set of cross sections, select an existing surface. This will overwrite the surface and sample lines, and any existing section views in the drawing will be erased and have to be recreated.

Layer: Enter the drawing layer for the surface object. The drawing layer will be read from the drawing settings, and if there is a suffix or prefix in the surface drawing layer, the alignment name will be added.

Style: Select a surface style to be used with the surface.

Sample Line Group Options:

Name: Display the sample line group name. The name will match a leader in the surface name.

Layer: Enter the drawing layer for the sample line objects. The drawing layer will be read from the drawing settings, and if there is a suffix or prefix in the drawing layer, the alignment name will be added.

Style: Select the sample line style to be used with the sample lines.

Label Style: Select the sample line label style to be used with the sample lines.

Left Offset: Enter a left offset value. This value is used to limit the selection of points along the alignment and creates the left side of the sample lines. Only points within this value on the left side of the alignment will be included in cross sections. See figure above.

Right Offset: Enter a right offset value. This value is used to limit the selection of points along the alignment and creates the right side of the sample lines. Only points within this value on the right side of the alignment will be included in cross sections. See figure above.

See Point Selection and Included or Excluded Points for information on how the offset and width options affect the selection and processing of points.

Command:

Selected alignment: <current alignment>

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Point selection method: [All/Group/Layers/Range/Selection] <Selection>: Enter **A**ll for all points in the current point database, **R**ange to enter a point number and/or a range of points, **G**roup to select Point Group(s) to include, or **S**election to select point blocks or point objects in the drawing.

Cross Sections Options dialog box appears and is used to preview and edit the cross sections.

4.11.18.1 Cross Sections Options

A display of the cross section information from points selected with the Cross Section from Points command. From this dialog, an operator will be able to remove cross sections and round the station value associated to the cross sections.

Cross Sections Options

Alignment:

Name: List the selected alignment.

Start: The starting station of the alignment.

End: The ending station of the alignment.

Cross Sections List:

A list of the cross sections from selected points along the alignment.

The centerline point, station, offset, description, and number of points associated with the section station are displayed.

All: Select all the cross sections in the list box.

Clear: Clear the selection of cross sections in the list box.

Edit: From a single selected cross section, remove points associated to the cross section, and edit the section station.

Delete: Delete the currently selected cross sections. **Note:** The points associated with the deleted cross section will be reprocessed, and if found within the Section Width value specified in the Cross Section from Points' options, they will be added to the other cross section.

Round: For all the selected cross sections, the section's station value will be rounded to the nearest unit. If the rounding of the first or last section's section would fall below or above the starting and ending station of the alignment, the rounding of those sections will be skipped. The operator will be required to adjust those station values manually using the Edit option.

Redo: Reverse the effects of the previous Undo.

Undo: Reverse the effects of the last Edit, Delete, Round, or Redo.

Cross Section Preview:

Display a cross section preview of a selected Cross Section. If multiple cross sections are selected, no preview is displayed.

OK: Select OK to create the surface, sample line group, and the sample line objects from the cross section information. See Cross Section from Points Description to ascertain which data is created and what has to be done manually to create section views.

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4.11.18.2 Edit Cross Section Options

A display of the points associated with a cross section when using the Cross Section from Points command. From this dialog, an operator can delete points and modify the station associated to a cross section.

Edit Cross Sections Options

Section Station:

Original: List the original station of the section.

Round: Round the original station value, and place the results in the Modified edit box.

Modified: Enter a value to modify the station associated with the cross section. The modified station value is limited to half the Section Width value specified in the Cross Section from Points' options. Also, the value cannot be less or greater than the starting or ending station of the alignment.

Cross Section Point List:

A list of the points associated to the cross section.

The station, offset, elevation, and description are displayed.

Delete: Delete the currently selected points from the cross section.

Redo: Reverse the effects of the previous Undo.

Undo: Reverse the effects of the last Delete or Redo.

Cross Section Preview:

Display a preview of the cross section points in the list.

OK: Accept the changes made to the section station and list of points within the cross section, and return to the Cross Sections Options' dialog box.

4.11.18.3 Cross Section from Points Description

How the Cross Section from Points command works.

Input / Edit Process

- Specify the option for alignment, offset tolerance, section width, surface layer, sample lines layer, style, label style, Left Offset, and Right Offset. See Point Selection and Included or Excluded Points for information on how the offset and width options affect the selection and processing of points.
- Select the points to process using one of the point selection methods.
- Delete cross sections which are not needed.
- Modify the station value for cross section, as desired.
- Edit each cross section by deleting points which should not be included.

Output / Data Creation

- Breaklines are created from the points of each cross section. The X, Y coordinate values are modified to place the breakline at the specified station for the section.
- A surface is created using the breaklines created above.
- A sample line group is created with the name, style, and label style specified.

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- Sample lines are created at each station using the Left and Right Offset values for the width of the sample line.

To create section views from created surface and sample lines, additional steps are required. See Section Views - Manual Steps for the additional steps required.

4.11.18.4 Point Selection and Included or Excluded Points

The image below is provided to explain how the Cross Section from Points Options affect points used for the cross section stations and which points are included or excluded from cross sections during processing.

Offset Tolerance is the offset value left and right from the selected alignment used to determine if a selected point will be used to indicate a section in the collection of cross sections.

Section Width is the perpendicular or radial width value used to determine if points will be included in a cross section. The width value is divided in half and applied on either side of the station from the point within the Offset Tolerance.

Left Offset is the offset value left of the selected alignment used to limit point selection along the alignment.

Right Offset is the offset value right of the selected alignment used to limit point selection along the alignment.

Note: Any points before the starting station or after the ending station of the selected alignment projected perpendicularly or radially will be excluded from selected points.

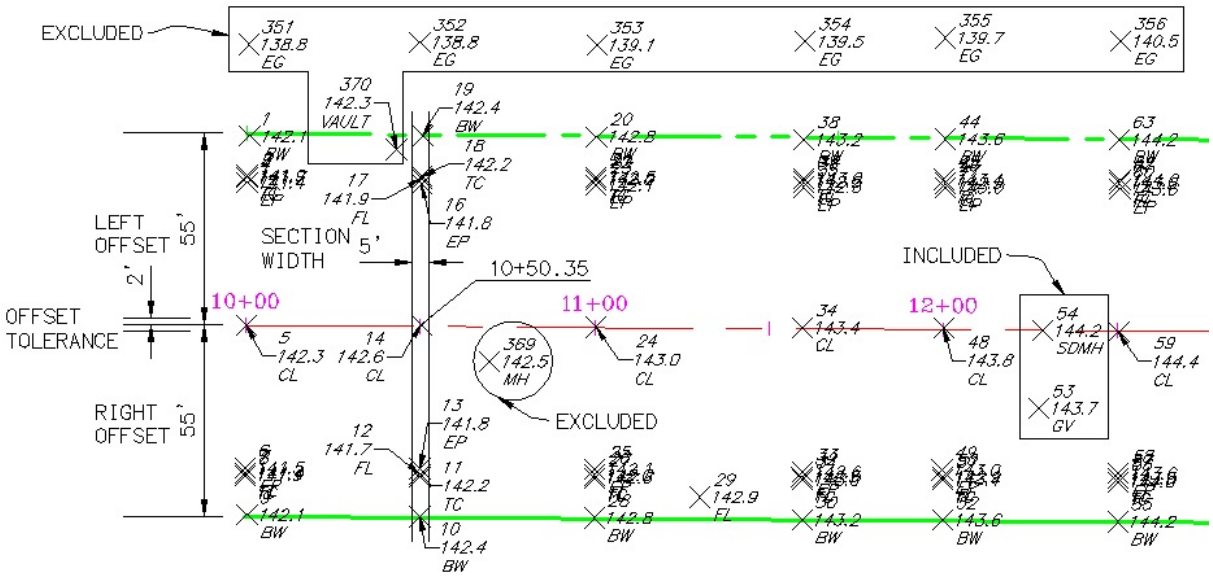
Options:

Offset Tolerance: 2.00'

Section Width: 5.00'

Left Offset: 55.00'

Right Offset: 55.00'



- Cross Section will be created at the station of points 5, 14, 24, 34, 48, 54, and 59.

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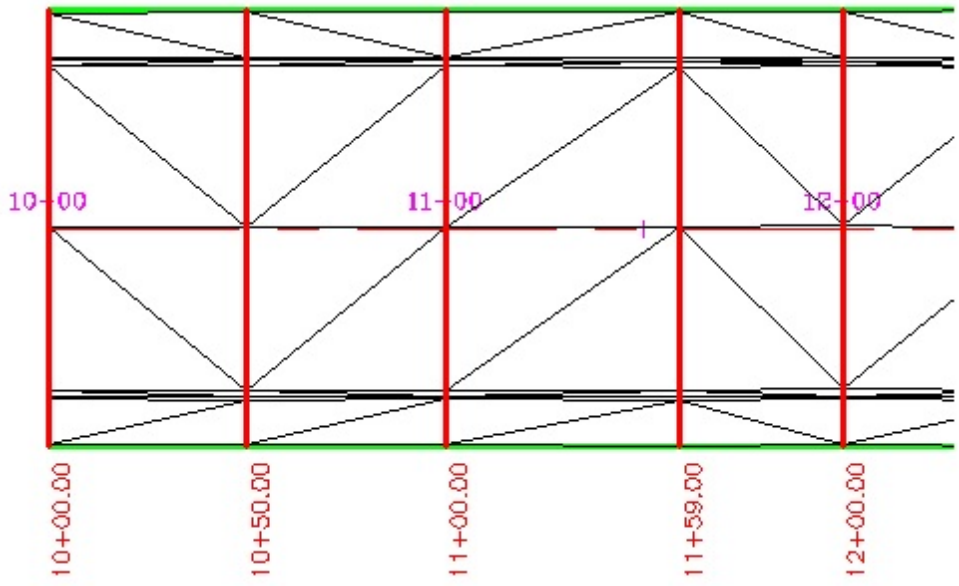
- The cross section at point 14 will be created at station 10+50.35. This cross section will ***INCLUDE*** the points 10, 11, 12, 13, 14, 16, 17, 18, and 19. Point 370 will be ***EXCLUDED***, because it is ***NOT*** within the Section Width value based on the station of point 14, even though it is within the Left and Right Offset value from the selected alignment.
- A cross section will be created at point 54 and will only include points 54 and 53, because they are the only points within the Section Width based on point 54.
- Point 53 would be ***INCLUDED***, because point 54 is within the Offset Tolerance value from the selected alignment and is within the Section Width of the station value of point 53. During the edit process, this section can be deleted from the collection of cross sections.
- Points 351 through 356 will be ***EXCLUDED,*** because they are outside the Left Offset value of 55.00' from the selected alignment.
- Point 369 will be ***EXCLUDED,*** because there is no point within the Offset Tolerance value from the selected alignment to start a cross section which would use this point.
- Using the Edit option, the cross section at point 14, with a station of 10+50.35, can be modified to the value 10+50.00 to create a section on an even unit station.

4.11.18.5 Surface from Cross Section Points

Once the operator has edited the points associated with cross sections and edited / rounded the station associated with the cross sections, a surface is created from points with modified northing and easting locations so they land directly on the station and offset of the cross sections.

Sample lines are added to a sample line group at the cross section's station.

The sample line group is named the same as the surface name.



In the image above:

- The surface style is a "triangle only" view; and
- The red lines are the sample lines added to the alignment.

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4.11.18.6 Section Views - Manual Steps

Additional manual steps required to create section views associated to the surface and sample lines created by the Cross Sections from Points command.

Add Surfaces to the Sample Line Group

- In the Toolspace, go to the Prospector tab.
- Browse to the selected alignment.
- Expand the select alignment to see the sample line groups section.
- Expand the sample line groups section.
- Highlight the <alignment name> - CrossSectionData <index> sample line group.
- Right-click, and select the Properties... option.
- In the sample line group properties dialog box, change to the Sections tab.
- Select the Sample more sources... button.
- On the left, select the <alignment name> - CrossSectionData <index> surface.
- Select the Add >> button to add it to the Sample sources' list on the right.
- Under the Sampled sources' section, select and modify the Style and Layer name associated with CrossSectionData surface. Since this surface was created from points, it is most likely the existing ground conditions.
- If there is a proposed ground surface, possibly created from a corridor, add it to the Sample sources, and modify its Style and Layer, as well.
- Select the OK button to save, and exit the Section Sources' dialog.
- Select the OK button to save, and exit the sample line group properties' dialog.

Add Section View(s)

- In the Ribbon, change to the Civil 3D Home tab.
- In the Profile & Section Views' panel, select Section Views.
- Select the Create Multiple Views or Create Section View, as desired.
- Enter the appropriate data in the Wizard to create the Section View(s).
- On the Offset Range section, the Automatic Offset range values should be the same as the Left and Right Offset values entered in the Cross Sections from Points Options' dialog.
- **Note:** When using the Create Multiple Views, the operator may have to edit the Elevation Range of each section after placement.
- Identify section view origin.

4.11.19 Station and Offset Report from Points

Create a station and offset report from points along an alignment.

Create a comma delimited file which can be opened by Microsoft Excel.

Supports:

AutoCAD Products: SmartDraft Point Block for AutoCAD and AutoCAD Map, Civil 3D Point for AutoCAD Civil 3D.

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BricsCAD Pro: Use the BricsCAD Point Creation Options to use the BricsCAD Pro Civil points.


Button

Ribbon: SmartDraft ▸ Points panel ▸ 

Menu: SmartDraft ▸ Points ▸ Station and Offset ▸ Station and Offset Report from Points

Command entry: **ptsor**

Station and Offset Report from Points Options

Alignments

Alignment: Select the alignment to be used as the centerline / baseline of the cross sections.

Point Section:

Left Offset: Enter a left offset value. This value is used to limit the selection of points along the alignment. Only points within this value on the left side of the alignment will be included in the selection.

Right Offset: Enter a right offset value. This value is used to limit the select of points along the alignment. Only points within this value on the right side of the alignment will be included in the selection.

Command:

Selected alignment: <current alignment>

Point selection method: [All/Group/Layers/Range/Selection] <Selection>: Enter **A**ll for all points in the current point database, **R**ange to enter a point number and/or a range of points, **G**roup to select Point Group(s) to include, or **S**election to select point blocks or point objects in the drawing.

Station and Offset List Report dialog box appears and is used to preview and edit the list of station and offset points.

4.11.19.1 Station and Offset List Report

A display of the point number, station, offset, elevation, and description of points selected when using the Station and Offset Report from Points' command. From this dialog, an operator can delete points from the station and offset list.

Station and Offset from Point List Report

Alignment:

Name: List the selected alignment.

Station and Offset List:

A list of the station and offset for the selected points along the alignment.

Delete: Delete the currently selected station and offset.

Redo: Reverse the effects of the previous Undo.

Undo: Reverse the effects of the last Edit, Delete, Round, or Redo.

Save: Select Save to create a comma delimited file for the points in the Station and Offset List.

Example

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Main Street
Number,Station,Offset,Elevation,Description,Northing,Easting
3,1000.06,-42.53,141.71,FL,6000059.4506,1500210.4184
8,1000.06,43.07,141.86,TC,5999973.8521,1500209.8829
2,1000.07,-43.02,141.86,TC,6000059.9411,1500210.4267
4,1000.08,-41.02,141.45,EP,6000057.9374,1500210.4267
5,1000.12,-0.05,142.27,CL,6000016.9727,1500210.2074
6,1000.12,40.95,141.45,EP,5999975.9688,1500209.9512
7,1000.14,42.51,141.45,FL,5999974.4154,1500209.9683
9,1000.68,54.42,142.09,BW,5999962.5009,1500210.4252
1,1000.79,-54.25,142.09,BW,6000071.1636,1500211.2212
370,1042.89,-50.74,142.31,VAULT,6000067.3916,1500253.2961
17,1050.04,-42.51,141.85,FL,6000059.1205,1500260.3967
16,1050.08,-40.93,141.79,EP,6000057.5419,1500260.4267
18,1050.09,-43.07,142.20,TC,6000059.6757,1500260.4501
11,1050.12,43.21,142.20,TC,5999973.4003,1500259.9381

4.11.20 Point Station and Offset Information

Associate a point with a Civil 3D alignment; add the station, offset, offset direction, associated alignment, and site name to the point data. When the point is moved, the station, offset, and offset direction update.

The station, offset, offset direction, alignment name and alignment site name are added to the point database using User-Defined Property Classification (UDP). When using the command, the SmartDraft UDP is associated to the selected point group and adds the selected point. Using the selected point group as input for a point table with dynamic station and offset data can be added to a drawing.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	No


Button


Ribbon: SmartDraft ▸ Points panel ▸ 
Menu: SmartDraft ▸ Points ▸ Station and Offset ▸ Point Station and Offset Information


Command entry: **ptso**

Command:

The Point Station Offset Options dialog appears.

Dialog Box Options

Alignment:	Select the alignment to be associated to the selected point objects.
Point Group:	Select a point group. The selected points will be added to the selected point group. The "SmartDraft" User-Defined Property Classification (UDP) will also be associated to the selected point group. The SmartDraft UDP must be associated to a point group for it to be usable by a Point Table and display the Station and Offset information.
Create:	Select to create a new point group.

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Direction Text:

Right: Enter the right offset directional text to be used. This is the same value as the Civil 3D abbreviation Right.

Left: Enter the left offset directional text to be used. This is the same value as the Civil 3D abbreviation Left.

Data Tools

Update: Select to update point station and offset information.

Remove: **Select to remove point station and offset information.**

Note: Once selected points have been associated to an alignment using this command, a Point Table can be created to list the desired station and offset information.

4.11.20.1 Create Point Group

Create a Civil 3D point group for use with the Point Station and Offset Information command.

Create Point Group Options

Name: Enter a name for the point group.

Style: Select the point style for the point group.

Label Style: Select the point label style for the point group.

OK: Select to create the point group using the above options.

Note: The point group will also be associated to the "SmartDraft" User-Defined Property Classification which is needed for a Point Table to display the station and offset information.

4.11.20.2 Point Station and Offset Remove

Remove point station and offset information created using the Point Station and Offset Information command.

Command:

Select point objects with station and offset information to remove data.

Select Objects: Select the point objects to remove data.

4.11.20.3 Point Station and Offset Update

Update point station and offset information created using the Point Station and Offset Information command.

Command entry: **ptsou**

Command:

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Select point objects with station and offset information to update.

Select Objects: Select the point objects to update.

4.11.20.4 Create Point Station and Offset Table

Create a point table with station and offset information created using the Point Station and Offset Information command.

Note: A point group has to be used as input by the Civil 3D point table. The point group must have the "SmartDraft" User-Defined Property Classification (UDP) associated to it. This can be done by using the Point Station and Offset Information command or by manually selecting the point group of the current drawing in the Prospector, locating the point group name and changing the classification to SmartDraft or All.

The Point Station and Offset Information command creates a Point Table style which is NOT complete, but can be used as a template to create a complete Point Table style.

Before a Point Table can be created, create or modify a Point Table style with the station and offset User-Define Properties created by the Point Station and Offset Information command.

Create a Point Table

From the ribbon, select the **Annotate** tab

1. From the **Labels & Tables** panel, select the **Add Tables** down arrow, and select **Add Point Tables** command.
2. Select the table style with the station and offset information. **Note**: The Point Station and Offset Information command created a SmartDraftStationOffset point table style, but it must be modified to properly display the station and offset information associated to points in the drawing.
3. Set the **Table layer**.
4. Select the  button to a point group.
5. Highlight the point group(s) to add to the Point Table. **Note**: The selected point groups must have the SmartDraft User-Defined Properties Classification associated to it for the station and offset information to display. The point objects within the selected point group(s) must be associated to an alignment using the Point Station and Offset Information command.
6. Select the **OK** button to select the highlighted point group(s).
7. Set the Split Table values as needed.
8. Select the **OK** button to add the point table.
9. Select upper left corner for placement of the point table.

4.11.20.5 Create a Point Table Style

Create a point table style with station and offset information created using the Point Station and Offset Information command.

Return to Create Point Station and Offset Table

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Create / Modify a Point Table Style

From the **Toolspace** Window

1. Select the **Settings** tab.
2. Expand the **Point** section.
3. Expand the **Table Styles** section.
4. Select the **SmartDraftStationOffset** style or another existing point table style.
5. Right-click, and select **Edit...**.
6. Change to the **Data Properties** tab. Add the **Station** value to a column.
7. Either double-click on the STATION column or select the  button to add a new column and double-click after it is created.
8. In the Text Component Editor - Column Contents, enter the value for the column header in the display value area on the right.
9. Select the **OK** button to save the changes.
10. Double-click the Column Value row in the Station column.
11. In the Text Component Editor - Column Contents, change to the **Properties** tab.
12. Highlight the value in the display window on the right.
13. Select the **SDStation** property for the **Properties** pull-down list.
14. Set the **Unit** value.
15. Set the **Format** value station format.
16. Set the **Precision** value to **0.01**.
17. Set the **Rounding** value.
18. Set the **Decimal character** value.
19. Set the **Sign** value.
20. Set the **Station character** value.
21. Set the **Station character position** value.
22. Select the  button on the **SDStation** property line to replace the value in the display window to the right.
23. Select the **OK** button to save the changes. Add the **Offset** value to a custom.
24. Either double-click on the OFFSET column or select the  button to add a new column and double-click after it is created.
25. In the Text Component Editor - Column Contents, enter the value for the column header in the display value area on the right.
26. Select the **OK** button to save the changes.
27. Double-click the Column Value row in the Offset column.
28. In the Text Component Editor - Column Contents, change to the **Properties** tab.
29. Highlight the value in the display window to the right.
30. Select the **SDOffset** property for the **Properties** pull-down list.
31. Set the **Precision** value to **0.01**.
32. Set the **Rounding** value.
33. Set the **Decimal character** value.

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34. Set the **Sign** value. Typically, the sign value is **drop sign** if the **SDOffsetDirection** property will be used to indicate an offset direction.
35. Select the  button on the **SDOffset** property line to replace the value in the display window to the right.
36. To add the offset direction text, go to step 37; otherwise go to step 42.
37. Select the **SDOffsetDirection** property for the **Properties** pull-down list.
38. Set the **Capitalization** value as desired.
39. In the display window to the right, set cursor as a prefix or as a suffix.
40. Add character spaces as desired.
41. Select the  button on the **SDOffsetDirection** property line to add the value in the display window.
42. Select the **OK** button to save the changes.

Return to Create Point Station and Offset Table.

4.11.21 Point Label

Create a point label from SmartDraft point blocks, Civil 3D's points, and BricsCAD Pro Civil points.

Dynamic Data: Point label assigned to a point object will update when moved, copied, arrayed, or grip edited using standard AutoCAD commands and elevation values with update, if the points' elevation value is changed.

Warning: Since these point labels are assigned to point objects, if the operator tries to move or grip move them, they will move back to the insertion point of the point object.

Create straight point labels using elevation and description from the point. Elevations can be adjusted by an adjustment value and the decimal precision is user definable. Prefix and suffix text can be added to the elevation value.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Use the BricsCAD Point Creation Options to use the BricsCAD Pro Civil points.


Button


Ribbon: SmartDraft ▸ Points panel ▸ 

Toolbar: Points ▸ Point Labels: 

Menu: SmartDraft ▸ Points ▸ Point Label


Command entry: **ptl**

Note: The label is a Dynamic Block.

Point Label Options:

Place Elevation's decimal point at Point Object's insertion: Select this option to format the point label as the elevation option with the decimal point of the elevation text located at the insertion coordinates of the point object. The Below, Leader, and Node Type options will be disabled if this is selected.

Text:

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Option: Select the leader output option. None: No value, Note: The Prefix and Suffix value, Elevation Pt1, Description Pt1 (Full), Description Pt1 (Raw), Elevation Pt2, Description Pt2 (Full), Description Pt2 (Raw), Select, or Prompt.
Prefix: Edit box for prefix text that will be added to the Above/Below value.
Suffix: Edit box for suffix text that will be added to the Above/Below value.
Adjust: If the elevation option is selected, the elevation value will be adjusted by this value.

Offset Length: Specify the offset length distance. Multiplied by horizontal scale, the label text will be placed away from the point insertion point.
Offset Height: Specify the offset height distance. Multiplied by horizontal scale, the label text will be placed above/below the horizontal line from the insertion point.

Leader:
Yes: Option to include a leader in the label.
No: Option to exclude a leader in the label.

Node Type:
Arrow: Option to include a solid arrow at the end of the label. Added 21.1.2. Note: If the older block is already inserted, the option will be disabled.
Circle: Option to include a solid circle at the end of the label.
X: Option to include an X at the end of the label.
None: Option to exclude a marker at the end of the label.

Elevation:
Truncate: Set the number of places the elevation will be truncated left of the decimal point.
Example: The elevation value is 1234.56 and truncate is set to 00.0; the output value will be 34.56.
Precision: Set the number of decimal places for the elevation output display.

Rotation Angle:
Angle: Set a rotation angle for all the elevation labels.
Set Angle: Set the value of Angle using the pointing device.

Layer:
Layer: Set the output layer type. Default (uses layers in layer database) or Current.
Type: Toggle the layer type for the layer name selection.

Command:

Create point labels.

Select points or [All/Groups/Layers/Range/Edit/Options/Update]: Select the points, **E**dit to modify existing labels, **O**ptions to change output settings, **U**pdate to update the values, or press ENTER to end.

Additional prompts when the following Input Types are selected:

Prompt:

Enter <top/bottom> text for point [number] <default>: Enter the text for the prompted point number.

Select:
Select <top/bottom> text for point [number]: Select a text string, attribute, or point object for the prompted elevation.

Set Angle:

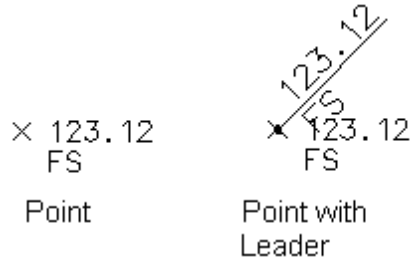
Set a rotation angle for all the point labels.

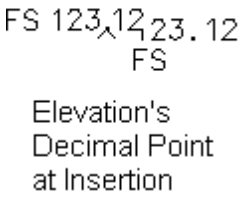
Specify angle for point label <0.0000>: Specify an angle for the point label, or select two points for the angle.

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To edit: To edit the options of an existing point label, you can either use this command and the Edit option, or use the SmartDraft Text Edit (**ed**) command.

Example





4.11.21.1 Point Label Update

Update point labels (Dynamic Blocks Only) created using the Point Label command.

Command entry: **ptlu**

Command:
Select Point Labels to update.
Select Objects: Select the Elevation Labels to update.

4.11.21.2 Point Label Edit

Edit point labels (Dynamic Blocks Only) created using the Point Label command.

Edit
Select Point Labels to edit
Select objects: Select the point labels to edit the precision and update the point values.

Edit Point Labels

Place Elevation's decimal point at Point Object's insertion: Select this option to format the point label as the elevation option with the decimal point of the elevation text located at the insertion coordinates of the point object. The Below, Leader, and Node Type options will be disabled if this is selected. **Note:** The option was added in 15.1.0, if the existing label was created before 15.1.0, this option will be disabled.

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Text:

Option: Select the leader output option. None: No value, Note: The Prefix and Suffix value, Elevation Pt1, Description Pt1 (Full), Description Pt1 (Raw), Elevation Pt2, Description Pt2 (Full), or Description Pt2 (Raw).
Prefix: Edit box for prefix text that will be added to the Above/Below value.
Suffix: Edit box for suffix text that will be added to the Above/Below value.
Adjust: If the elevation option is selected, the elevation value will be adjusted by this value.

Leader:
Yes: Option to include a leader in the label.
No: Option to exclude a leader in the label.

Node Type:
Arrow: Option to include a solid arrow at the end of the label. Added 21.1.2. Note: If the older block is already inserted, the option will be disabled.
Circle: Option to change to a solid circle at the end of the label.
X: Option to change to an X at the end of the label.
None: Option to change to no marker at the end of the label.

Elevation:
Truncate: Set the number of places the elevation will be truncated left of the decimal point.
Example: The elevation value is 1234.56 and truncate is set to 00.0; the output value will be 34.56.
Precision: Set the number of decimal places for the elevation output display.

4.11.22 Point Labels Rotation

Rotate the labels of SmartDraft point blocks, Civil 3D points, and BricsCAD Pro Civil points.

Rotate the point label to a specified angle.

Note: To work correctly with BricsCAD Pro Civil points, the LabelStyle's > General property > Orientation reference: Must be set to WCS.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Use the BricsCAD Point Creation Options to use the BricsCAD Pro Civil points.

Button
Ribbon: SmartDraft ▸ Points panel ▸
Toolbar: Point Labels on the Points:
Menu: SmartDraft ▸ Points ▸ Point Labels Rotation
Command entry: **ptr**

Command:
Point labels rotation.
Select point objects: Select the points to rotate, or press ENTER to end.

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Specify rotation angle or [Match]: Specify an angle for the point label, select two points for the angle, **A**long to calculate the angle along an object, or **M**atch to select an object for an angle.

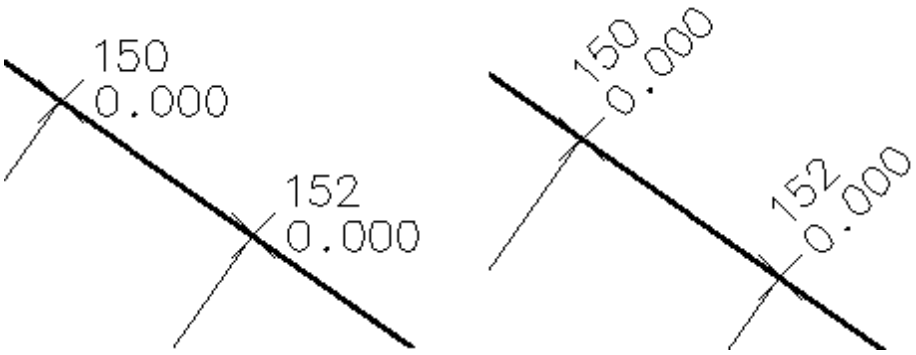
If **Match:**

Select object to match angle: Select an object to match the rotation angle of the object.

If **Along:**

Enter rotation angle <0.00>: Enter a rotation angle from the calculated angle of the selected object.

Example



4.11.23 Point Labels Clean

Reposition Civil 3D Point's Point Label Styles to enhance label readability. Multiple methods available.

Note: The command uses the Point Label Style assigned to the selected point objects. It does not modify the Point Label Style.

If the drag state of the Point Label Style has a visible leader, it will display.

Supports:

AutoCAD Products: Civil 3D only

BricsCAD Pro: No

Button

Ribbon: SmartDraft ▸ Points panel ▸

Toolbar: Point Labels on the Points:

Menu: SmartDraft ▸ Points ▸ Point Labels Clean

Command entry: **ptcr**

Command:

Reposition the Point Label Style to enhance readability.

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Select point objects or [All/Group/LAYers/Range]: Enter **A**ll for all points in the current point database, **G**roup to select Point Group(s) to include, **LAY**ers to select all points on the selected layers, **R**ange to enter a point number and/or a range of points, or ENTER to continue.

Angle Method:

Note: This method requests to angles. The angle to reposition the Point Label Style and the angle to rotation the Point Label Style.

Reposition Angle Method.

Specify reposition angle or [Path/Radial]: Specify the angle from the coordinate of the point to the new location of the point label style, **P**ath to change to the Path method, or **R**adial to change to the Radial method.

Specify point label style angle <default>: Specify the Point Label Style angle or enter to accept the reposition angle.

Enter the offset: Enter the offset distance from the coordinate of the point to the new location of the point label style.

Path Method:

Note: Only points along the path will be repositioned.

A positive offset is to the right side of the path, and a negative offset is to the left side of the path.

The Point Label Style will be rotated perpendicular or radial to the path object.

Reposition Path Method.

Select path or [Angle/Radial]: Select a path object, **A**angle to change to the Angle method, or **R**adial to change to the Radial method.

Enter the offset: Enter the offset distance from the coordinate of the point to the new location of the point label style.

Radial Method:

Note: Do not select too many points and specify a offset distance needed to give enough clearance.

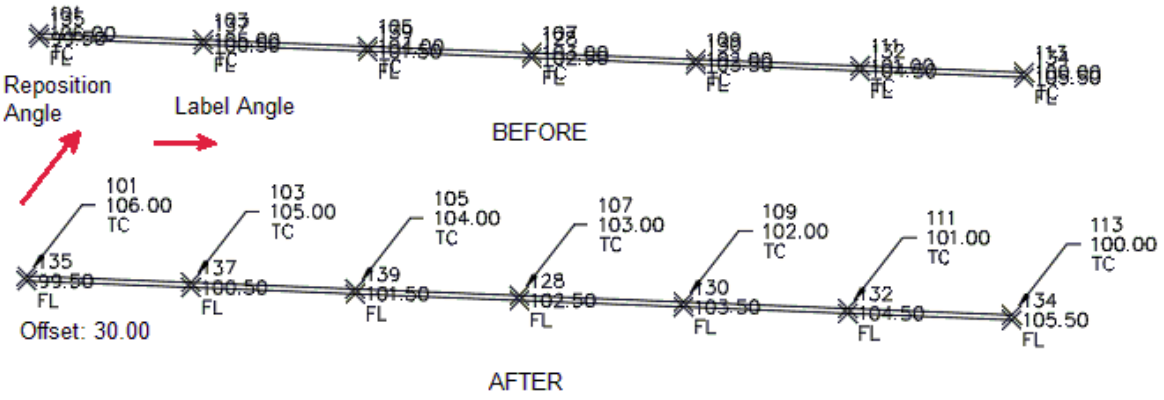
Reposition Radial Method.

Enter the offset: Enter the offset distance from the coordinate of the point to the new location of the point label style.

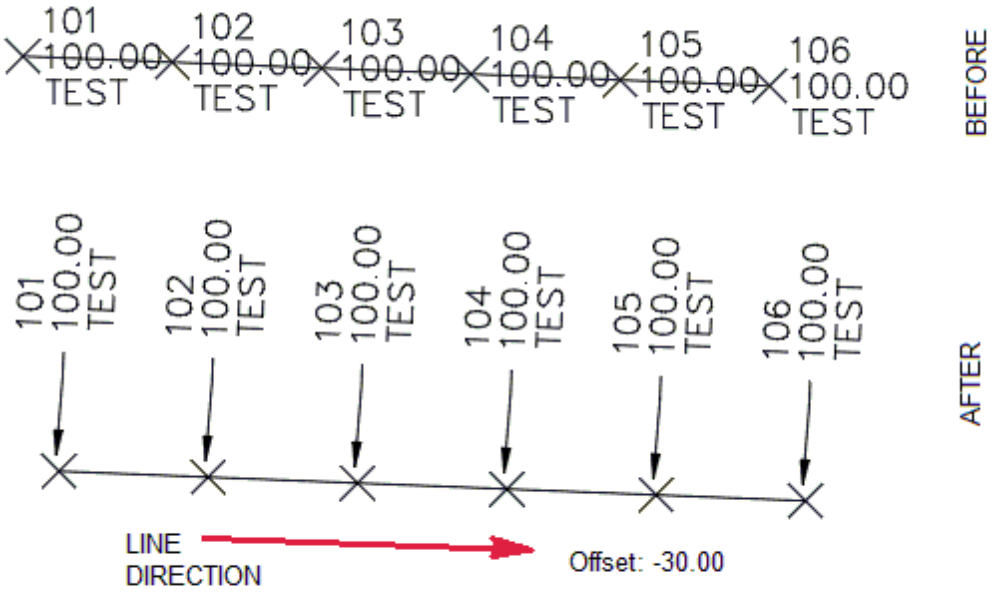
Specify point label style angle <default>: Specify the Point Label Style angle or enter to accept the default angle.

Examples

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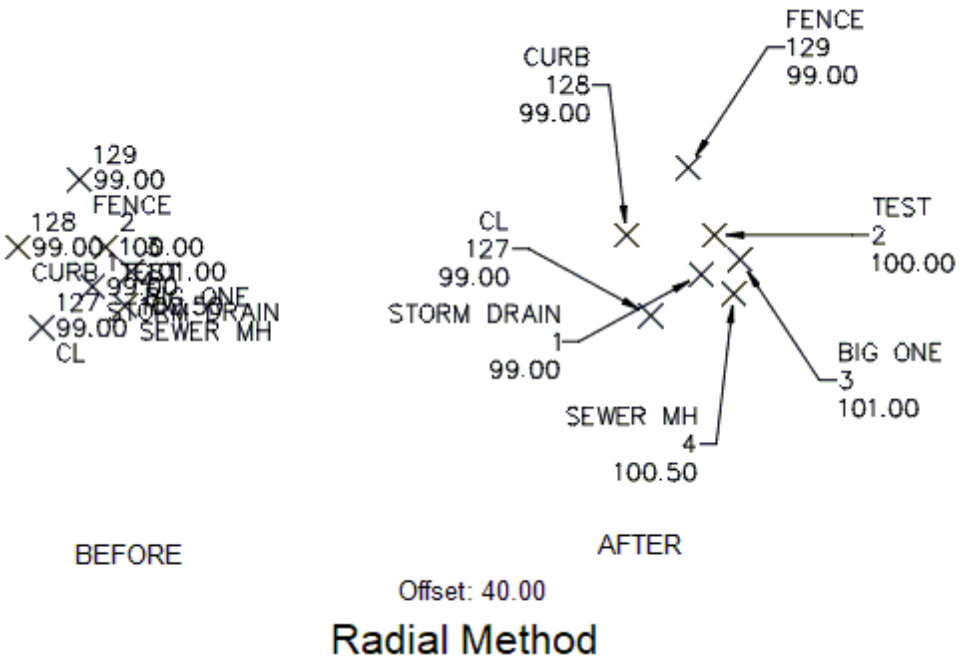


Angle Method



Path Method

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Radial Method

4.11.24 Point Labels Drag Location Export

Export the drag state location of all the Civil 3D point labels in the current drawing.

Create a *.PLX point labels drag state location file.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	No

Button

Ribbon: SmartDraft ▸ Points panel ▸

Toolbar: Point Labels on the Points:

Menu: SmartDraft ▸ Points ▸ Point Labels Drag Location Export

Command entry: **ptdle**

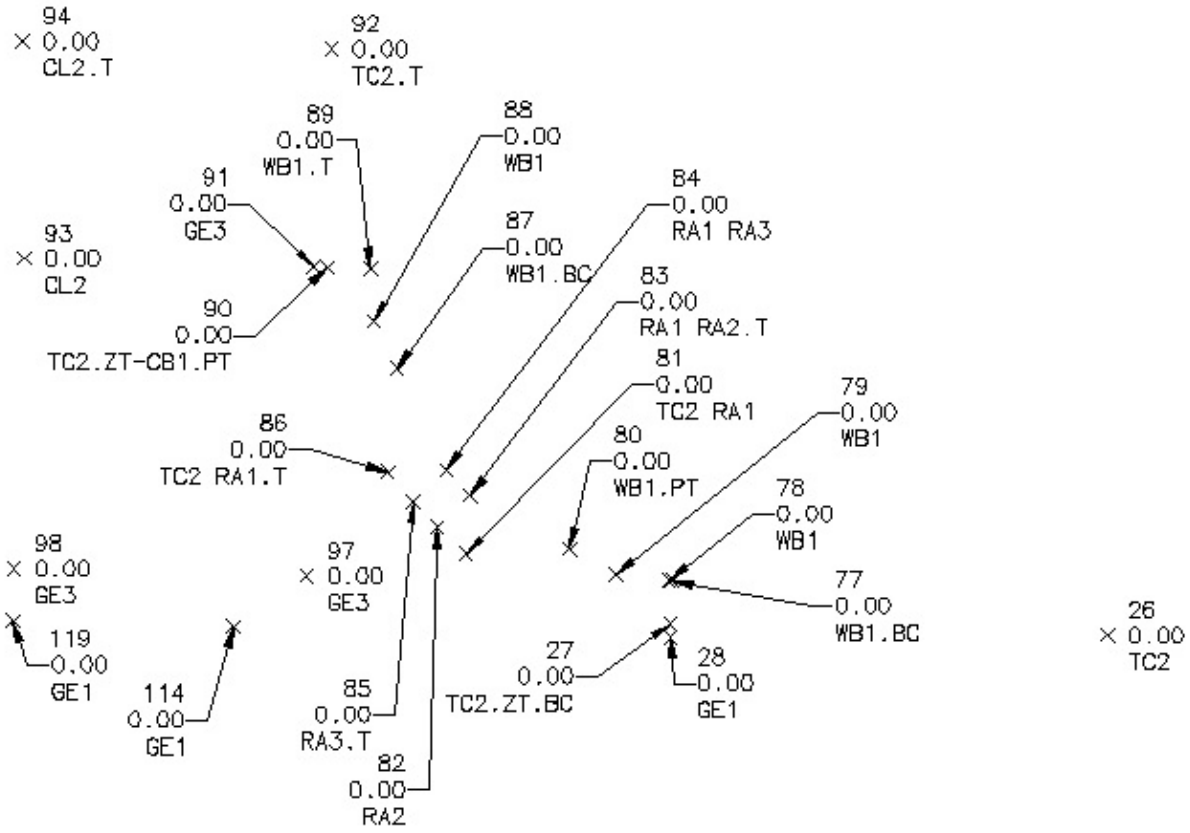
Export a file with the point labels drag location
A file selection dialog box will appear to enter the name of the PLX file.

The file is an ASCII file formatted:

Point Number,X Location,Y Location

Example

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```
;SmartDraft Point Drag Location Export File
;Point Number,X Location, Y Location
26,6280933.79170000,1854133.45050000
27,6280927.69412258,1854194.05102701
28,6280927.18021332,1854180.55423715
77,6280936.35616431,1854165.01990160
78,6280946.80036909,1854171.92751469
79,6280958.59713620,1854164.85081243
80,6280952.45918692,1854190.63801470
81,6280961.26730862,1854186.01375911
82,6280914.33765417,1854213.02507174
83,6280970.82712457,1854188.00404447
84,6280982.03597820,1854184.67218159
85,6280922.86720280,1854217.14924485
86,6280952.92968650,1854227.47367291
87,6280976.62602517,1854203.53452673
88,6280989.39763355,1854204.01029602
89,6280988.51202195,1854222.87533682
90,6280965.89063528,1854234.04664377
91,6280980.93052149,1854234.98394463
92,6280998.94810000,1854223.64420000
93,6280974.21780000,1854258.29070000
94,6280999.07660000,1854258.99150000
97,6280938.56330000,1854225.15520000
98,6280938.66250000,1854258.65520000
114,6280921.70026504,1854238.49671561
119,6280927.67670754,1854254.44829533
```

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4.11.25 Point Labels Drag Location Import

Import the drag state location of all the Civil 3D point labels from an exported PLX file created with the Point Labels Drag Location Export command.

Import a *.PLX point labels drag state location file.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	No


Button


Ribbon: SmartDraft ▸ Points panel ▸ 

Toolbar: Point Labels on the Points: 

Menu: SmartDraft ▸ Points ▸ Point Labels Drag Location Import


Command entry: **ptdli**

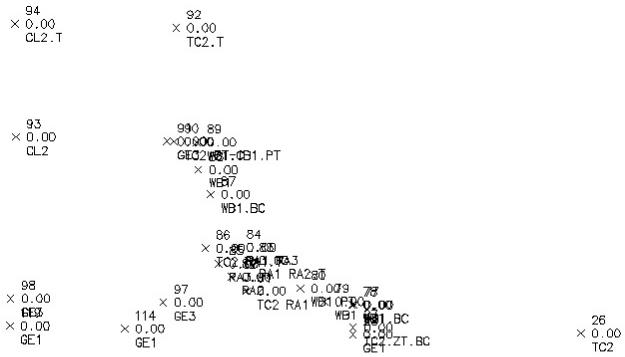
Import a file with the point labels drag location
A file selection dialog box will appear to select a PLX file.

The file is an ASCII file formatted:

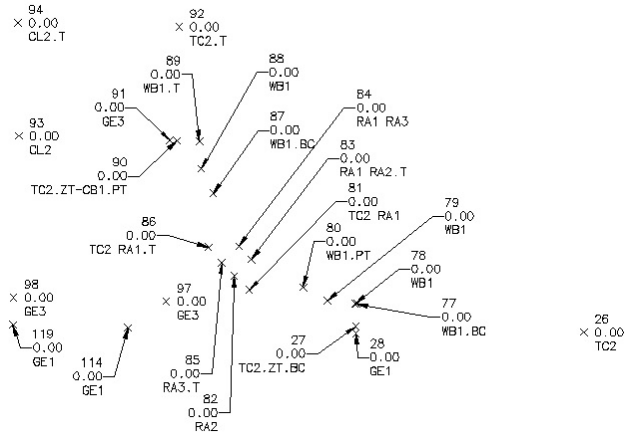
Point Number,X Location,Y Location

Example

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BEFORE



AFTER

Sample PLX File.

;SmartDraft Point Drag Location Export File
;Point Number,X Location, Y Location
26,6280933.79170000,1854133.45050000
27,6280927.69412258,1854194.05102701
28,6280927.18021332,1854180.55423715
77,6280936.35616431,1854165.01990160
78,6280946.80036909,1854171.92751469
79,6280958.59713620,1854164.85081243
80,6280952.45918692,1854190.63801470
81,6280961.26730862,1854186.01375911
82,6280914.33765417,1854213.02507174
83,6280970.82712457,1854188.00404447
84,6280982.03597820,1854184.67218159
85,6280922.86720280,1854217.14924485
86,6280952.92968650,1854227.47367291
87,6280976.62602517,1854203.53452673
88,6280989.39763355,1854204.01029602
89,6280988.51202195,1854222.87533682
90,6280965.89063528,1854234.04664377
91,6280980.93052149,1854234.98394463
92,6280998.94810000,1854223.64420000
93,6280974.21780000,1854258.29070000
94,6280999.07660000,1854258.99150000

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97,6280938.56330000,1854225.15520000
98,6280938.66250000,1854258.65520000
114,6280921.70026504,1854238.49671561
119,6280927.67670754,1854254.44829533

4.11.26 Point Block Extract

Extract the block from selected Civil 3D point objects with a block defined in their current point style.

This command extracts the block from Civil 3D point objects with a point style with has a block specified in its definition.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	No


Button

Ribbon: SmartDraft ▸ Points panel ▸ 
Toolbar: Point Labels on the Points: 
Menu: SmartDraft ▸ Points ▸ Point Block Extract
Command entry: **ptbe**

Command:
Point block extract.
Select point objects: Select the points to extract the block, or press ENTER to end.
XX block(s) extracted from the selected point objects.

4.11.27 Point to Spot Label

Create a spot label from a point object.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Yes


Button

Ribbon: SmartDraft ▸ Points panel ▸ 
Toolbar: Point Labels on the Points: 
Menu: SmartDraft ▸ Points ▸ Point to Spot Label
Command entry: **p2s**

Command:

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Point to Spot.

Current settings: Label = <Label Value>, Output: <Block/Text>, At <Elevation/Zero>, Angle: <Angle/Match/On-Screen>

Select point objects or [Options/Points]: Select point objects, **O**ptions to change the settings, or **P**oints to select points using additional options.

Points option:

Point selection method [All/Group/Layers/Range/Selection] <Selection>: Specify **R**ange to indicate a range, **A**ll to select all points, **G**roup to select one or more point groups, **L**ayers to select objects for layer, or **O**ptions to change point selection type, or press ENTER to select the points in the file.

4.11.27.1 Point to Spot Options

Options for the Point to Spot Label command.

Dialog Box Options

Label Options:

Value:	Select the value to be placed in the spot elevation label attribute. Note: The description is the full description value.
Prefix:	Edit box for prefix text that will be added to the Above/Below value.
Suffix:	Edit box for suffix text that will be added to the Above/Below value.
Output Type:	
Block with Attribute:	A block with an attribute will be inserted.
AutoCAD Point and Text:	An AutoCAD point and text object will be inserted.
User Node and Text	A user specified point node block and text object will be inserted.
Node Style...	Specify the point node block appearance for the User Node and Text option.
Elevation:	
Truncate:	Set the number of places the elevation will be truncated left of the decimal point. Example: The elevation value is 1234.56 and truncate is set to 00.0; the output value will be 34.56.
Precision:	Set the number of decimal places for the elevation output display.
Insertion:	
At Elevation:	Check to insert the point label at the elevation value.
Rotation Angle:	
Match Point Rotation:	Rotation the point label to match the rotation angle of the point.
Specify On-Screen:	Specify the rotation angle of each spot label using the pointing device.
Angle:	Set a rotation angle for all the elevation labels.
Set Angle:	Set the value of Angle using the pointing device.
Layer:	
Layer:	Set the output layer type. Default (uses layers in layer database) or Current.
Type:	Toggle the layer type for the layer name selection

4.11.28 Northing and Easting Difference Label

Create a northing and easting difference label from two selected points.

Warning: When using this command with the Drawing Setup option set to Annotative Blocks, when a scale is changed, the node for the northing and easting points also scales. They will have to be relocated to display the correct values.

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Supports:

AutoCAD Products: Yes

BricsCAD Pro: Yes



Button



Ribbon: SmartDraft ▸ Points panel ▸ 

Toolbar: Point Labels on the Points: 

Menu: SmartDraft ▸ Points ▸ Northing and Easting Difference



Command entry: **ned**

Command:

Label Northing and Easting Difference. Precision: <current setting>

Specify reference point or [Edit/Options/Update]: Specify the reference point (1 - see example below), **E**dit to change the properties of existing labels, **O**ptions to change the options, or **U**pdate to reread the coordinates and update the values.

Specify second point: Specify the second point (2 - see example below).

Delta = N <value>', E <value>'

Specify label point: Specify the label point (3 - see example below), or enter to use the second point (2 - see example below).

Specify rotation angle <0d0'0">: Specify a rotation angle.

Enter description or (. for none): Enter a description or "." for no description.

Options

Northing and Easting Difference Options' Dialog box:

Options:

Coordinate Precision: Set the number of decimal places for the coordinate output display.
Turn Commas Off: Check to format coordinates without commas.

Node Type:
Circle: Option to include a solid circle at the end of the label.
X: Option to include an X at the end of the label.
None: Option to exclude a marker at the end of the label.

Rotation Angle:
Specify On-Screen: Specify the rotation angle of each elevation label using the pointing device.
Angle: Set a rotation angle for all the elevation labels.
Set Angle: Set the value of Angle using the pointing device.

Layer:
Layer: Set the output layer type. Default (uses layers in layer database) or *current*.
Layer Type: Toggle the layer type for the layer name selection.

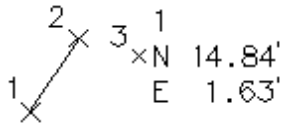
Update:

Select Northing and Easting Difference Labels to update

Select objects: Select the Northing and Easting Difference Labels to update the coordinate values.

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Example



4.11.28.1 Northing and Easting Difference Labels Edit

Edit Northing and Easting Difference Labels (Dynamic Blocks Only) created using the Northing and Easting Difference Label command.

Edit
Select Northing and Easting Difference Labels to edit

Select objects: Select the Northing and Easting Difference Labels to edit the precision and update the coordinate values.

Edit Northing and Easting Difference Labels

Description:

Edit Box: Enter the value of the description line.

Options:

Coordinate Precision: Set the number of decimal places for the coordinate output display.
Turn Commas Off: Check to format coordinates without commas.

Node Type:
Circle: Option to include a solid circle at the end of the label.
X: Option to include an X at the end of the label.
None: Option to exclude a marker at the end of the label.

4.11.29 Coordinate Table (Points)

Create a coordinate table from points.

Create a list of northing and easting coordinate values or Coordinate Table from points in the drawing.

Supports:

AutoCAD Products: Yes
BricsCAD Pro: Yes

Button
Ribbon: SmartDraft ▸ Points panel ▸
Toolbar: Point Labels on the Points:

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Menu: SmartDraft ▸ Points ▸ Coordinate Table (Points)

Dialog Box Options

Current Style:	A drop-down list of the pre-defined coordinate table styles. Specify the desired coordinate table style to be used when creating the table. See Coordinate Table Style Manager to define or edit coordinate table styles.
Points:	
List:	The list of all points in the current drawing. Select the point numbers to include in the table output.
All:	Select all the listed points.
Clear:	Clear all selected points in the list.
Options:	
Title Text:	Add the Title Text defined in the selected style.
Header Text:	Add the Header Text for the table.
Title Lines:	Create lines around Title Text in the data table.
Header Lines:	Create lines around Header Text in the data table.
Values Lines:	Create lines around values in the data table.
Coordinate Precision:	Specify the Coordinate Precision.
Elevation Precision:	Specify the Elevation Precision.
Buttons:	
Create:	Create coordinate table with the current settings and style.
Close:	Exit coordinate table setup without creating a table.

Command:

Header option selected:

Specify insertion point for upper left corner: Specify point on drawing to place the new table.

Header option not selected:

Specify last line for insertion point: The Insert OSNAP will automatically invoke. Select the last line of text in the existing table. The specified points will be added to the bottom of the table, based on the response given to the next prompt.

Specify the number of lines or [Limit] <*current*>: The number in the default brackets represents the total number of lines of coordinate data that will be added to the table. If you want all the lines to be added, press ENTER. If you need to control the amount of lines being added to the table, there are two options:

1. Type the number of lines to be added, and press ENTER.
2. Type **L** for **Limit.**
   Select limit point: A temporary "rubber band" line appears from the last line of text in the table. Using the line as a guide, select a point on the drawing that you do not want the table to go beyond. If all points are able to fit within the established limit, the command places the point values and ends. If additional points remain, the command sequence repeats, starting with the "Include Coordinate Table Header" prompt.

Note: If there is more than one point with the same point number, the Points Check command will prompt operator to correct the problem before continuing.

4.11.30 Coordinate Table Style Manager (Points)

Create and modify coordinate table styles to be used with the Coordinate Table command.

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Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Yes


Button

Ribbon: SmartDraft ▸ Points panel ▸ Point Labels (drop-down) ▸ 

Toolbar: Point Labels on the Points: 

Menu: SmartDraft ▸ Points ▸ Coordinate Table Style Manager (Points)

Command entry: **ctsm**

Dialog Box Options

Name:	A list of the currently defined coordinate table styles. Select the coordinate table style to edit.
Save As:	Save the current coordinate table settings to a new style.
Lock:	Set the current table style (Name: above) as read-only. Lock a style if you desire to avoid accidental modification. See Unlock Customization Template Files to remove the lock.
Delete:	Delete the current coordinate table style. **Note:** Cannot delete the "default" or a locked style. Deleting a style cannot be undone.
Rename:	Rename the current table style.
Table Setup:	Specify the title text, text styles, text heights, and layers to be used to create the table.
Title Text:	Enter a text string to be used as the table title.
Justify	Specify the text justification for the Title text. Options are Left, Center, and Right.
Style:	All text styles defined in the current drawing are listed with five special selections of *current*, * Type a style name*, or Preset Small, Medium, and Large Text. *current* uses the style current when the table command starts. Preset Small, Medium, or Large Text style uses the style Small, Medium, or Large defined by this software. *Type a style name* allows the operator to type any text style, even if it does not exist in the current file.
Title:	Specify the text style to use for the Title text.
Header:	Specify the text style to use for the Header text.
Data:	Specify the text style to use for the Data text values.
Height:	Specify the height for the selected text style for the Title, Header and Data text. **Note:** The specified height will be multiplied by the horizontal scale to create the actual height of the style.
Layer:	Specify the layer for the Title, Header, and Data text. Also specify the layer for the Table Lines. Select *Type a Layer Name* to specify a layer not in the current drawing. If the layer does not exist in the drawing being labeled, the command will create the layer with the color white, and the linetype continuous. Selecting either "Preset Coordinate Text" or "Preset Leader" will use the layer defined in the layer data base for that select.
Table Values:	Specify the data values, header text, , justification, and column width to be used to create the table. Note: Up to 10 columns can be defined.
Value:	Specify the data value type for the defined column. Options are Northing, Easting, Elevation, Description (Full), Description (Raw), and Prompted Note.
Header:	Specify the header text used with the value specified above.
Justify:	Specify the text justification for the data in the defined column. Options are Left, Center, and Right.
Width:	Specify the width of the column. Options are 8 - 30. The number is the width of one text character of the selected text style. Remember to specify enough characters to hold the selected data type. If the data value is too long, it will extend into the next column.
Buttons:	
Apply:	Apply any changes made to current style.
Close:	Exit Labeling Table Style Manager without saving changes.

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4.11.31 Survey Working Folder

Associate a drawing with the Civil 3D Survey Working Folder.

This allows SmartDraft to set the Survey Working Folder, the next time the drawing is open or set current, to the folder associated to the drawing.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	No


Button

 Ribbon: SmartDraft ▸ Points panel 

Toolbar: Points: 

Menu: SmartDraft ▸ Points ▸ Survey Working Folder

 Command entry: **svf**

 Video demonstration

Dialog Box Options

Associate Civil 3D Survey Working Folder

Survey Working Folder

Civil 3D:	Select to associate the currently set working folder to the drawing.
Drawing:	Select to keep the currently associated survey working folder.
Associate:	The survey working folder to be associated to the drawing, when the Set button is selected.
Browse...	Display the Browse for Folder dialog box (a standard file selection dialog box), in which you can specify a new location for the folder selected in the list.
Buttons:	
Associate:	Select to associate the folder listed; Associate: <folder> value with the drawing.
Clear:	Select to clear the survey working folder currently associated to the drawing.
Multiple:	Select to associate multiple drawings with a Civil 3D Survey Working Folder.

If **Clear:**

Survey working folder cleared from the drawing.

If the Prompt for Survey Working Folder option is enabled, the next time the drawing is set current, or open, the operator will be prompted to associate the drawing again.

If **Set:**

Survey working folder: <folder> associated to the drawing.

4.11.31.1 Survey Working Folder to Multiple Drawings

Associate multiple drawings with a Civil 3D Survey Working Folder.

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This allows SmartDraft to set the Survey Working Folder, the next time the drawing is open or set current, to the folder associated to the drawing.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	No

To associate the current drawing only, see Survey Working Folder.


Button


Ribbon: SmartDraft ▸ Points panel 

Toolbar: Points Tools: 

Menu: SmartDraft ▸ Points ▸ Survey Working Folder


Command entry: **SVF** and select the **Multiple** button.

Dialog Box Options

Associate Multiple Drawings with a Civil 3D Survey Working Folder

Survey Working Folder

Associate to:	The survey working folder to be associated to the drawing, when the Process button is selected.
Browse...	Display the Browse for Folder dialog box (a standard file selection dialog box), in which you can specify a new location for the folder selected in the list.

List of Drawings

Status:	Display the status of the listed drawing:
	Blank Not processed;
	Added Processed survey working folder added to drawing; and
	Failed Processed but not added.
Add...	Display the Browse for Files dialog box. The selected drawing files will be added to the List of Drawings.
Folder...	Display the Browse for Folder dialog box. All the drawing files in the selected folder will be added to the List of Drawings.
Remove:	Remove highlighted drawings from the List of Drawing.

Buttons

Process:	Attempt to add the Survey Working Folder to the drawings in the List of Drawings.
Close:	Close the dialog box.

4.11.31.2 Prompt for Survey Working Folder

Prompt the operator to associate the current drawing to a Civil 3D survey working folder. See Survey Working Folder.

When enabled, this command will prompt the operator when a drawing is open or set current.

The operator will be prompted to associate the drawing with a survey working folder if:

1. **This option has been enabled.**

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2. **The drawing is not associated to a survey working folder.**
3. **The operator has selected "No" from this command.**


Button

Ribbon: SmartDraft ▸ Setup panel ▸ User Options...

Command entry: **This option is Enabled/Disabled using the User Options.**

Dialog Box Options

Associate Drawing to a Civil 3D Survey Working Folder

Do not display this message in this drawing again.	Check this option to suppress this prompt in the future for this drawing.
Yes:	Open the Survey Work Folder dialog.
No:	Close the dialog without assigning a survey working folder. If "Do not display this message in this drawing again." is checked, the value will be saved within the drawing.

4.11.32 Merge Point Files

Merge the point data from two ASCII point files.

Merge data from two separate ASCII point files in Point number, Northing, Easting, Elevation, and Description format. The command removes duplicate information when creating the output file. There are options to process common point numbers with different information associated with it. It can also create an output file removing duplicate point information, read either comma or space delimited point files.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Yes


Button

Ribbon: SmartDraft ▸ Points panel ▸

Toolbar: Point Tools on the Points:

Menu: SmartDraft ▸ Points ▸ Point Tools ▸ Merge

Dialog Box Options

Files

1st Input...:	Select the first input point file.
2nd Input:	Select the second input point file.
Output...:	Select the output point file name.

Tolerance

Horizontal:	Enter a value to compare the coordinate values associated with the same point number between the 1st and 2nd point files.

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Elevation: Enter a value to compare the elevation values associated with the same point number between the 1st and 2nd point files.

Exclude Points: Enter a range of point numbers to exclude (ignore) during processing. The format is: 1-300,302,310,500-600. No spaces, zeros, or negative numbers are allowed.

It is useful to exclude points already processed.

Descriptions: Enter a series of descriptions to exclude (ignore) during processing. The format is: WV,TCP,OG*,??,OAK **Note:** Wildcards are permitted, and excluded points are used with the recall and terminate with number Suffix Codes options.

Exact Duplicates: Check if the output file will exclude the point number data common to both files.

Output Delimiter

Comma: Check if the output file delimiter should be a comma.

Space: Check if the output file delimiter should be a space.

Description Options

Remove Leading / Trailing Spaces Check to remove any leading or trailing spaces in the description when creating the output file.

Duplicate Point Resolution

Add an Offset from: Enter a value in the box to add an amount to each point number in the point file. For example, if you type **200** in the box, then points 1, 2, and 3 in the point file are numbered 201, 202, and 203, when imported.

Merge Options

Merge: Select this option to merge point data with duplicate point numbers. The command will process the duplicate point numbers based on the options of Horizontal, Elevation, and Description below.

Renumber 1st: Select this option to renumber the duplicate point data from the 1st input file with the "Add an offset from" value above.

Renumber 2nd: Select this option to renumber the duplicate point data from the 2nd input file with the "Add an offset from" value above.

Horizontal

Notify: Select to display the Duplicate Point Resolution dialog when the coordinate values are not with the Horizontal tolerance value above.

Use 1st: Select to use the coordinate values from the 1st input file.

Use 2nd: Select to use the coordinate values from the 2nd input file.

Elevation

Notify: Select to display the Duplicate Point Resolution dialog when the elevation values are not with the Elevation tolerance value above.

Use 1st: Select to use the elevation values from the 1st input file.

Use 2nd: Select to use the elevation values from the 2nd input file.

Description

Notify: Select to display the Duplicate Point Resolution dialog when the description values differ from the 1st and 2nd input files.

Use 1st: Select to use the description values from the 1st input file.

Use 2nd: Select to use the description values from the 2nd input file.

4.11.32.1 Duplicate Point Resolution

Point data resolution options when the operator selects the Notify option.

Dialog Box Options

Duplicate Point Resolution Data

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1st Data Choose 2nd Data	
Point:	Enter a new point number for the 1st or 2nd point number
Northing:	Enter a new coordinate value for the 1st or 2nd point number if there is a conflict, or select the radio button next to the coordinate value to use.
Easting:	Enter a new coordinate value for the 1st or 2nd point number if there is a conflict.
Elevation:	Enter a new elevation value for the 1st or 2nd point number if there is a conflict, or select the radio button next to the coordinate value to use.
Description:	Enter a new description value for the 1st or 2nd point number if there is a conflict, or select the radio button next to the coordinate value to use.
Decision Options	
Renumber 1st:	Renumber the point number of the point data of the 1st input file; keep the point data of the 2nd input file.
Renumber 2st:	Renumber the point number of the point data of the 2nd input file; keep the point data of the 1st input file.
Abort Notification Options	
Use 1st for Remainder:	Use the point data information from the 1st input file for the remainder of the data processing.
Use 2nd for Remainder:	Use the point data information from the 2nd input file for the remainder of the data processing.
Renumber 1st for Remainder:	Renumber the point number of the point data of the 1st input file; keep the point data of the 2nd input file for the remainder of the data processing.
Renumber 2nd for Remainder:	Renumber the point number of the point data of the 2nd input file; keep the point data of the 1st input file for the remainder of the data processing.
Stop Processing Altogether:	Stop processing data without creating an output file.
OK:	To process the point date using the current settings.

4.11.33 Display who has a Survey Database Open

Display who has the Survey Database open for the current survey working folder.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	No


Button

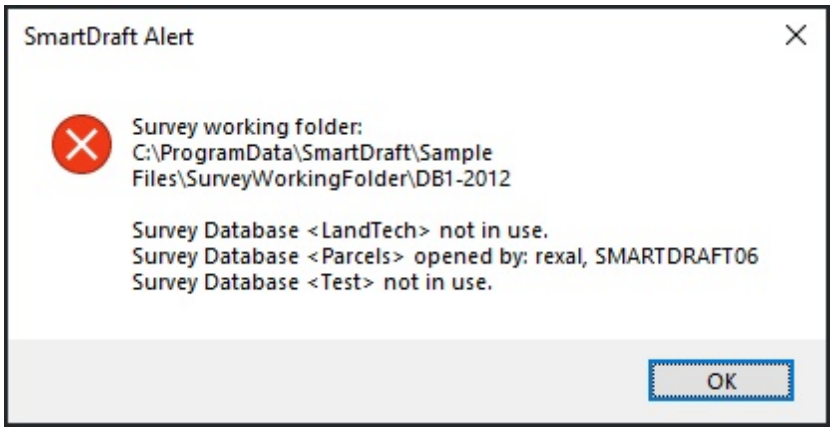
Ribbon: SmartDraft ▸ Points panel 

Toolbar: Points Tools on the Points: 

Menu: SmartDraft ▸ Points ▸ Point Tools ▸ Display who has a Survey Database open

Command:

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4.11.34 Point Description Find and Replace

Find and Replace point raw descriptions or descriptions of Civil 3D COGO points BricsCAD Pro Civil points, or SmartDraft point blocks

Enter the portion of a description you want to find, replace, and specify the point numbers to apply the search.

Search for any portion of a description, such as, words or individual characters, in the specified point numbers. You can replace all occurrences of the text with other text, or you can delete the text.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Yes

Button

Ribbon: SmartDraft ▸ Points panel ▸

Toolbar: Points Tools on the Points:

Menu: SmartDraft ▸ Points ▸ Point Tools ▸ Point Description Find and Replace

Command entry: **ptfr**

Command: **ptfr**

Dialog Box Options

Edit Point's Raw Description

Point Source

Project:	Check to use the points in Civil 3D.
Civil 3D Survey:	Check to use the points in the selected Survey Database.
List:	List of Survey Database. Select the desired Survey Database.

Find and Replace

Find What:	Specify the text string you want to find. Wild-card characters are not supported.
Add if No Description:	Check to Add to points when the current raw description has no value.
Replace With/Add:	Specify the text string you want to use to replace/add the found text.

If Point Source Project:

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Point selection method [All/Group/Layers/Range/Selection/eXit] <eXit>: Specify **R**ange to indicate a range of numbers, **G**roup to select one or more point groups, **L**ayers to select layers to select objects for layer, **S**election to select points from the drawing, or e**X**it to exit point selection and continue processing.

If Point Source Civil 3D Survey:

Point selection method [All/Range/eXit] <eXit>: Specify **A**ll to select all points, **R**ange to indicate a range of numbers, or e**X**it to exit point selection, and continue processing.

Range:

Enter Point Numbers: Either enter each point or a range of points.

Group:

The Point Groups, dialog box appears listing the Point Groups and points in the group. Select one or more point groups.

Layers:

Select an object on desired layer: Select an option to include its layer in the list of layers to process. Prompt continues to request for objects. Press ENTER to end.

Selection:

Select objects: Select point objects to include. Command filters out all other objects.

4.11.35 Point: Zoom To

Zoom to the location of a specified point number.

Zoom to the location of a specified point number at the specified zoom height.

Supports:

AutoCAD Products:	SmartDraft Point Block for AutoCAD and AutoCAD Map, Civil 3D Point for AutoCAD Civil 3D.
BricsCAD Pro:	Use the BricsCAD Point Creation Options to use the BricsCAD Pro Civil points.


Button

Ribbon: SmartDraft ▸ Points panel ▸ Create pull-down 

Toolbar: Points Tools on the Points: 

Menu: SmartDraft ▸ Points ▸ Point Tools ▸ Zoom To

Command entry: **ptz**

Command: **ptz**

Zoom to point number.

Enter point number: **110** Enter the point number to zoom to.

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Zoom height <*default*>: Enter a desired height value, or press ENTER to accept the current display height.

4.11.36 List Available Point Numbers

List the available point numbers in the drawing / project.

Supports:

AutoCAD Products: Yes

BricsCAD Pro: Yes



Button

Ribbon: SmartDraft ▸ Points panel ▸ Create pull-down 

Toolbar: Points Tools on the Points: 

Menu: SmartDraft ▸ Points ▸ Point Tools ▸ Point List Available

Command entry: **pta**

Command: **pta**

Available points:

1-26,52-59,76-99,101-103,111-123,138-627,629,633,635-658,662-4477,4479-4500,4513
,4514,4516-4678,4691,4692,4712-5000,5072,5074,5084-5129,5145,5191-5763,5784,5785
,5813-5815,5856,5900,5901,5994-5997,6001-6055,6058-6124,6129,6132,6133,6135,6145
-7025,7082,7150-7152,7183,7184,7261-9003,9008-12166,12224,12225,12292,12293,1229
6,12297,12334-12500,12503,12527,12582,12583,12749,12750,12779+

4.11.37 List Available Point Numbers in Survey Database

List the available point numbers in the open survey database.

Supports:

AutoCAD Products: Civil 3D only, currently open Survey Point Database

BricsCAD Pro: No



Button

Ribbon: SmartDraft ▸ Points panel ▸ Create pull-down 

Toolbar: Points Tools on the Points: 

Menu: SmartDraft ▸ Points ▸ Point Tools ▸ List Available Point Numbers in Survey Database

Command entry: **ptadb**

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Command: **ptadb**

Available points:

1-26,52-59,76-99,101-103,111-123,138-627,629,633,635-658,662-4477,4479-4500,4513
,4514,4516-4678,4691,4692,4712-5000,5072,5074,5084-5129,5145,5191-5763,5784,5785
,5813-5815,5856,5900,5901,5994-5997,6001-6055,6058-6124,6129,6132,6133,6135,6145
-7025,7082,7150-7152,7183,7184,7261-9003,9008-12166,12224,12225,12292,12293,1229
6,12297,12334-12500,12503,12527,12582,12583,12749,12750,12779+

4.11.38 Points: Create Selection Set

Create a selection set of point blocks and points objects.

Operator can enter a range, raw description, point group, all, selected layers, or enter layer names.

Formerly called: Points: By range or All.

Supports:

AutoCAD Products:	SmartDraft Point Block for AutoCAD and AutoCAD Map, Civil 3D Point for AutoCAD Civil 3D.
BricsCAD Pro:	Use the BricsCAD Point Creation Options to use the BricsCAD Pro Civil points.


Button

Ribbon: SmartDraft ▸ Points panel ▸ Create pull-down 

Toolbar: Points Tools on the Points: 

Menu: SmartDraft ▸ Points ▸ Point Tools ▸ Create Selection Set


Command entry: **ssp** or **'ssp** (transparently)

Command:

Current settings: Point selection type = <All/Block/Object>

Point selection method [All/Description raw/Exit/Group/Layers/Options/Range/Select ion] <Manually>:
Specify **A**ll to select all points, **D**escription to enter raw descriptions for matching (wild card characters are allowed), **E**xit to end, **G**roup to select one or more point groups, **L**ayers to select objects for layer, **S**election to select points from the drawing, **R**ange to indicate a point number range, or **O**ptions to change point selection type.

Group:

The Point Groups dialog box appears listing the Point Groups and points in the group. Select one or more point groups.

Selection:

Select objects: Select point objects to include. Command filters out all other objects.

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Range:

Enter point numbers: Either enter each point or a range of points.

Layers:

Select an object on desired layer: Select an option to include its layer in the list of layers to process. Prompt continues to request for objects. Press ENTER to end.

Options:

Specify point type [All/Block/Object] <Object>: Specify the point selection type. **A**ll for both point blocks and Civil 3D's point objects, **B**lock for point blocks only, or **O**bject for Civil 3D's point objects.

Create a selection set. Use the **P**revious selection option at any Select Objects: prompt to access the selection set.

Command can also be used transparently using **'SSP**.

4.11.39 Convert Survey Points into Drawing Points

Convert survey database points currently in the drawing into drawing points. This command converts survey database points in the drawing into drawing points so the points can be moved, elevation edited, and re-imported into the survey database using the Import Points from the Drawing into the Survey Database.

An operator can convert survey database points currently in a drawing into drawing points so they can be modified.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	No


Button

Ribbon: SmartDraft ▸ Points panel ▸ 

Toolbar: Points Tools on the Points: 

Menu: SmartDraft ▸ Points ▸ Point Tools ▸ Convert Survey Points into Drawing Points

Command entry: **pscv**

Command:

Convert Survey Points into Drawing Points.

Select point objects: Select the points, or press ENTER to end.

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4.11.40 Import Drawing Points into the Survey Database

Import points from the drawing into the Survey Database.

An operator can import drawing points into the Survey Database and convert the drawing points into survey points. Options to overwrite or ignore existing points within the survey database with conflicting point numbers.

Warning: The tool is able to overwrite existing point data in the survey database. Extreme care should be taken if the Overwrite option is selected.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	No



Button



Ribbon: SmartDraft ▸ Points panel ▸ 

Toolbar: Points Tools on the Points: 

Menu: SmartDraft ▸ Points ▸ Point Tools ▸ Import Drawing Points into Survey Database



Command entry: **psim**

Import Drawing Points into the Survey Database.

Select point objects: Select the points, or press ENTER to end.

Dialog Box Options
Import Points from the Drawing into the Survey Database
New Survey Point Options
Number of New Points Selected

Database Name:	Name of currently open survey database.
Network:	Select a network. Selected points from the drawing will be added to this network.
Non-Control:	Add the selected points as a Non-Control Point in the Survey Database.
Control:	Add the selected points as a Control Point in the Survey Database.

Existing Survey Point Options
Number of Existing Points Selected

Resolution:	Select Ignore or Overwrite. If **Ignore** is selected and the point number of a selected drawing point already exists in the survey database, the drawing point will be ignored and not added / updated in the survey database. If **Overwrite** is selected and the point number of a selected drawing point already exists in the survey database, the northing, easting, elevation, and description values can be modified / updated with the information from the drawing point.
Add an Offset from:	If **Overwrite** is selected and the point number of a drawing point conflicts with an existing survey point, the point number will be adjusted by the offset value. Example: With an offset of 1000, a point number of 25 will become 1025.
Sequence from:	If **Overwrite** is selected and a drawing point's point number conflicts with an existing survey point, the point number will be reassigned starting with the sequence from value. If point numbers exist in the survey database, the next point number will be used upon a conflict.

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4.11.41 Convert ASCII Point File to Fieldbook File

Convert an ASCII point file into an AutoCAD Fieldbook File (FBK).

Convert a standard ASCII file into a fieldbook file with either NEZ (control) or NE SS (no-control) point for importing into a Civil 3D Survey database. The PtToFBK.INI file in the current Customization Template folder will determine which points, based on their descriptions, are converted to control points. The PtToFBK.INI file is just a list of control point descriptions, one per line. All other points with descriptions not included in the PtToFbk.INI are converted as non-control points.

Note: When the command reads the ASCII Point File raw description, it removes any quotes, and removes all text after the first space " ", period ".", and forward slash "/". This means only the first description key is read, if a point has multiple description keys assigned to it. The comparison between the description keys in the PtToFBK.INI file and the point's descriptions are NOT case sensitive.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	No


Button


Ribbon: SmartDraft ▸ Points panel ▸ 
Toolbar: Points Tools on the Points: 
Menu: SmartDraft ▸ Points ▸ Point Tools ▸ Convert ASCII Point File to Fieldbook File


Command entry: **ptfb**

The Import ASCII point file dialog box appears to select a comma or space delimited point file, followed by the Import points from a file dialog box options.

Dialog Box Options

Input File Options:

File Name: List the selected file name.

File Format: Select the output file format:

#	=	Point number
N	=	Northerly Coordinate
E	=	Easterly Coordinate
Z	=	Elevation
D	=	Description

File Type: The field separator. Comma or Space.

Output File Options

File Name: The file name of the output fieldbook file. The default name is the name of the input file with the extension changed to ".fbk".

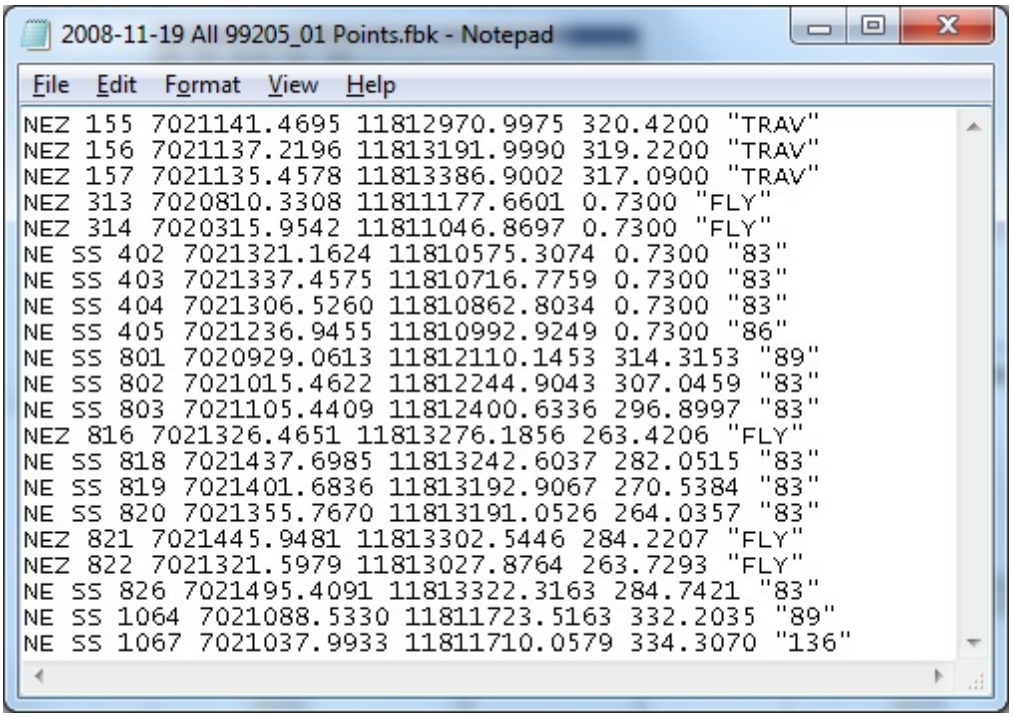
Precision

Elevation: Set elevation precision.

Coordinate: Set coordinate precision.

Example of a converted ASCII Point File into a Fieldbook file. The PtToFBK.INI has two description keys of TRAV and FLY to assign to control points (NEZ).

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Example of converted Fieldbook File

4.11.42 Convert SmartDraft or Land Desktop Points into Civil Points

Convert SmartDraft or Land Desktop Points into Civil 3D COGO points

Convert SmartDraft Points into BricsCAD Pro Civil points

Convert SmartDraft points into Point Objects

or

Convert Land Desktop points into Civil 3D points using the insertion point of the Land Desktop point vs the coordinate point store in the Land Desktop point object. The command will also rotate the Civil 3D label to the same angle as the Land Desktop point. If the Land Desktop point has been dragged from the insertion point, and a leader is displayed, the command will drag the Civil 3D point to the end of the leader point.

Information: Known limitation: The all Land Desktop points must have the point number, elevation, and description displayed for the command to successfully convert the points.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	Yes


Button


Ribbon: SmartDraft ▸ Points panel ▸

Toolbar: Point Labels on the Points:

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Menu: SmartDraft ▸ Points ▸ Point Tools ▸ Convert SmartDraft or Land Desktop Points into Civil 3D Points
Command entry: **ptldt**

Command: **ptldt**

Convert SmartDraft or Land Desktop points to Civil 3D points.

Current settings: Point Group: *<Point Group Name>*

Convert <number of points found> <SmartDraft/Land Desktop> points? [Options/Yes/No] <Yes>: Enter to convert point, or **O**ptions to change the settings.

4.11.42.1 Select / Create Point Group Options

Select or create the point group for the Convert SmartDraft or Land Desktop Point into Civil 3D Points command.

Dialog Box Options

Add converted points to a group Check to add converted points to a Civil 3D point group.

Point Select a point group. The converted points will be added to the selected point group.

Create: Select to create a new point group.

4.11.43 Points Import

Import points from a file.

Import point data from a standard ASCII file. The input file can have a comma or space field separation and various formats.

Supports:

AutoCAD Products: Yes

BricsCAD Pro: Yes

Button
Ribbon: SmartDraft ▸ Points panel
Toolbar: Points Tools on the Points:
Menu: SmartDraft ▸ Points ▸ Point Tools ▸ Import

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Command entry: **ptin**

Dialog Box Options
Import Points Options
File
File Name: List the selected file name.
File Options
File Format: Select the output file format:
# = Point Number
N = Northerly Coordinate
E = Easterly Coordinate
Z = Elevation
D = Description
File Type: The field separator. Comma or Space.
Output Precision
Coordinate: Set coordinate precision.
Elevation: Set elevation precision
Points:
All Select to process all the points in the point file.
Range Select to limit the point numbers to import from the point file.
Point List: List of point numbers to import when Range is selected.
Enter Points: Enter the point numbers to import, using the format below.
Accepted format for entering points:
single points
#,# or #-# range of points between the "," or "-".
Point Numbers Options
Skip if Existing Select to skip importing a point from the point file, it there is already a point with the same point number in the drawing.
Overwrite if Existing Select to erase and replace a point in the drawing with the properties in the point file, if the point number in the file matches a point number in the drawing.
Add an Offset Select to insert add the points from the file, adding the offset to the point number in the file,
Offset Enter the point number offset to add to the point number in the file.
Note: If the offset point number already exists in the drawing, it will be renumbered to the next available point number, if you do not want this to happen make sure the offset set is large enough.
Point Group Options
Add Points to Point Group Check to add the imported points into the specified Point Group
Drop-down List Select an existing Point Group, or Create Point Group for a new one.
OK: Process the import file using the current settings.

4.11.43.1 Create Point Group

Create Point Group

Use this option while importing points to either create a point group that includes all the imported points or to add the imported points to an existing point group.

Point Group

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Specifies the name of the point group to which the points are added. If the point group does not exist, it is created..

Note: Point groups organize and identify points that share common characteristics.

4.11.44 Points Export

Export point data to a file.

Export a selection, range, or all the points currently in the drawing, and write the information to a standard ASCII file. The field separator can be a space or a comma. The default output format is: point number, northing, easting, elevation, and description.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Yes


Button


Ribbon: SmartDraft ▸ Points panel 

Toolbar: Points Tools on the Points: 

Menu: SmartDraft ▸ Points ▸ Point Tools ▸ Export


Command entry: **ptex**

The Export points to ASCII file dialog box prompts to select or create the output. Select an existing file, or enter any file name.

Dialog Box Options

Point Source

Drawing	Select point from the drawing.
Civil 3D Survey Database	Select points from an open Civil 3D Database

Output Options

File Format:	Select the output file format:
#	= Point Number
N	= Northerly Coordinate
E	= Easterly Coordinate
Z	= Elevation
D	= Description
File Type:	The field separator. Comma or Space.

Output Precision

Coordinate:	Set precision for coordinates.
Elevation:	Set precision for elevations.

Station and Offset Output Options

Note: Option only available if an Output Format type includes a description.

Alignment	Select an alignment to include station and offset information in the export file. Note: Even if All points are selected, only the points which fall along the alignment will be included in the output file.
Station:	Set precision for stations.
Offset:	Set precision for offsets.
Type:	Select the offset direction type:

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	+/-	To display the offset as a positive or negative number.
	Prefix Lt/Rt	To add the Left / Right direction as a prefix.
	Suffix Lt/Rt	To add the Left / Right direction as a suffix.
	None	To display the offset as a positive value.
Output:	Select the output type for the station and offset data	
	Description Prefix	Adds as a prefix to description
	Description Suffix	Adds as a suffix to description
	Description Replace	Station and offset replaces the description
	Additional Fields	Adds Station and Offset with the selected field separator.
Sort By:	Point Number - Sort output by point numbers	
	Station - Sort output by stations	
OK:	Process the import file using the current settings.	

Note: If there is more than one point with the same point number, the Points Check command will prompt you to correct the problem before continuing.

If **Select** is the Points options:
Select points or [All/Groups/Layers/Range]: Select points using any of the available selection methods.

For all Points' options, a prompt shows the progress of selected points.

Exports point data to ASCII file.

Writing point to file: *** Shows progress of processing.

4.11.45 Point Group States Manager

Saves, restores, and manages sets of point group orders that are called named point group states.

The Point Group States Manager is displayed.

Saves the current point group order in the current point group states file as a named point group state. Point group states can then be restored, edited, and used in other drawings.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	No


Button

Ribbon: SmartDraft ▸ Points panel ▾ 

Toolbar: Point Groups on the Points: 

Menu: SmartDraft ▸ Points ▸ Point Groups ▸ Point Group States

Command entry: **ptgm**

Dialog Box Options

Point Group States Manager

File Options:

File	List of file options, Select Open, New, Save, or Save As from the drop-down list.

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Open	Open an existing point group states file. Point group states files have a .pgs extension.
New	Create a new point group states file.
Save	Save the changes to the current point group states file. A backup file .pgb is created when this option is used.
Save As	Save the current point group states file as a new point group states file.
File List	Display the currently opened point group states file and a list of the last ten opened point group states files.
	To open a previously opened file, select the file name from the drop-down list.
States	A list of the point group states and descriptions. Double-click on a state to restore it.
New...	Add a point group state of the current point group offer.
Save	Save the current point group order to the selected point group state name.
Edit	Edit the selected state to manually modify the print group order.
Rename	Change the point group state name and description.
Delete	Delete the selected point group state from the current file.
Buttons	
Restore	Restore the point group order of the selected point group state

4.11.45.1 Point Group States Files

Create a Point Group States file (.pgs).

Note: To create a new point group states file use the Point Group States Manager command.

Select the **New** option from File drop-down list.

The Create a new Point Group States file dialog appears:

Browse to the desired folder.

Enter a name point group states file name.

The newly created point group states file is created and the command returns to the Point Group States Manager dialog without any point group states.

A point group states file,

Warning: We DO NOT recommend editing this file in a text editor.

Example of the Point Group States file format:

;This is a SmartDraft Point Group States File

[Settings]

States=Sewer,Storm Drain,Water

[Sewer]

Description=Display sewer points only

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Groups=Sewer,_No Display,....
[Storm Drain]
Description=Display storm drain points only
Groups=Storm Drain,_No Display,....
[Water]
Description=Display water points only
Groups=Water,_No Display,....

4.11.45.1.1 States

A point group states consist of list of point groups in a specific order.

Point group states can be edited using the Point Group States Manager command.

Multiple point group states can be added to point group states file. There is no limit to number of states which can be added to a point group states files.

New point group states can be added to a file (New...), a point group state can be changed (Edit), and a state can be deleted (Delete) buttons.

4.11.45.1.1.1 New Point Group State

Add a new point group state of the current point group order to the current Point Group States file (.pgs).

Add a new point group state to the current point group state file using Point Group States Manager command.

Select the **New...** button from the Point Group States Manager dialog.
The New Point Group States dialog will appear

Dialog Box Options

New Point Group State

Point Group State Information:

Name	Enter a name for the new point group state.
Description	Enter a description for the point group states. Can paste text using Windows cut-and-paste options.
Buttons:	
OK	Add the point group state to the current file.
Cancel	Exit the New a Point Group States dialog without adding a new state to the states list.

4.11.45.1.1.2 Edit Point Group State

Edit the existing point group state order within a Point Group States file (.pgs).

Edit the point group order of an existing point group state in the current file using the Point Group States Manager command.

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Select the **Edit** button or double-click a State in the States list from the Point Group States Manager dialog.

The Edit Point Group State dialog will appear

Dialog Box Options

Edit Point Group State

Point Group State Information

Name	Name of the selected point group state
Description	Description of the selected point group state

Point Groups

List Box	List of the point groups in the point group state in the order the will be restored.
Top	Move the selected point group to the top of the list.
Up	Move the selected point group up one in the list.
Down	Move the selected point group down one in the list.
Bottom	Move the selected point group to the bottom of the list.

Buttons:

Save	Save the changes to the selected state.
Cancel	Exit the Edit Point Group State dialog without changing the point group order of the selected point group state.

4.11.45.1.1.3 Rename Point Group State

Change the name and description of the selected point group state within the current Point Group States file (.pgs).

Rename a point group state within the current point group state file using Point Group States Manager command.

Select the **Rename** button from the Point Group States Manager dialog.

The Rename Point Group State dialog will appear

Dialog Box Options

Rename Point Group State

Point Group State:

Name	Enter a name for the new point group state.
Description	Enter a description for the point group states. Can paste text using Windows cut-and-paste options.

Buttons:

OK	Rename the point group state to the current file.
Cancel	Exit the Rename a Point Group States dialog without adding a new state to the states list.

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4.11.46 Purge Point Groups

Purge empty Point Groups from the drawing

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	No


Button


Ribbon: SmartDraft ▸ Points panel ▾ 
Toolbar: Point Groups on the Points: 
Menu: SmartDraft ▸ Points ▸ Point Groups ▸ Purge Point Groups

Dialog Box Options

SmartDraft: Purge Point Groups

Purge:	Purge all empty point groups from the drawing.
Cancel:	Do not purge anything from the drawing.

4.11.47 Delete Point Groups

Delete selected Point Groups

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	No


Button


Ribbon: SmartDraft ▸ Points panel ▾ 
Toolbar: Point Groups on the Points: 
Menu: SmartDraft ▸ Points ▸ Point Groups ▸ Delete Point Groups

Dialog Box Options

Point Group List

List:	Select the Civil 3D's point group(s) to delete.
Select All	Check to select All. If checked when a new filter is entered, all of the filtered list will be selected.
Filter	Enter text (case sensitive), numbers, special characters to filer the list of point groups.
OK:	To delete the highlighted point groups in the List.

Command:
Select Point Groups' dialog box appears.

Delete point groups.

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4.11.48 Point Groups for a Point

Display a list of Point Groups for a selected point

Supports:

AutoCAD Products: Civil 3D only
BricsCAD Pro: No


Button
Ribbon: SmartDraft ▸ Points panel ▾ 
Toolbar: Point Groups on the Points: 
Menu: SmartDraft ▸ Points ▸ Point Groups ▸ Point Groups for a Point
Command entry: **ptgp**

Command: **ptgp**
Point Groups for a point.
Select a point object: Select a Civil 3D point object to display a list of the point groups associated with it.

Dialog Box Options

Point Groups for Point <Point Number>

List: List of Point Groups associated to the selected point object.
OK: Select to prompt for another point object.
Cancel: Select to cancel the command.

4.11.49 Point Label Style to As Composed for a Point

Change the Dragged State Display Value to As Composed for Point Groups of a selected point

Supports:

AutoCAD Products: Civil 3D only
BricsCAD Pro: No


Button
Ribbon: SmartDraft ▸ Points panel ▾ 
Toolbar: Point Groups on the Points: 
Menu: SmartDraft ▸ Points ▸ Point Groups ▸ Point Label Style to As Composed for a Point
Command entry: **ptas**

Command: **ptas**
Point Label Style to As Composed for a Point.
Select a point object: Select a Civil 3D point object to set Point Label Style to As Composed for a list the point groups associated with it.

Dialog Box Options

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Point Groups for Point <Point Number>. Set Point Label Style to As Composed

List: Select the Point Groups to change the associated Point Label Style to As Composed.
OK: Process the selected Point Groups.

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4.11.50 Reset Civil Point Drag to Home

Reset BricsCAD Civil Point drag state to Home

Supports:

AutoCAD Products:	No
BricsCAD Pro:	BricsCAD Pro Civil points

Command entry: **ptrs**

Command: **ptrs**

Reset Civil Point Drag State to Home
Point selection method [All/Group/Layers/Range/Selection/eXit] <eXit>: Specify **R**ange to indicate a range of numbers, **G**roup to select one or more point groups, **L**ayers to select layers to select objects for layer, **S**election to select points from the drawing, or e**X**it to exit point selection and continue processing.

4.11.51 Export Description Key Set

Export a Description Key Set to a CSV file.

Open the CSV file with Microsoft Excel and modify the values to import the changes using the Import Description Key Set command.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	No

Command entry: **dksex**

Command: **dksex**

Export a Description Key Set
Name: Select the description key set to export the key values.
OK: Export the key values of the selected set.

A file selection dialog box will appear to enter the name of the CSV.

Example of the exported file:

The first line is the description key set name.
The second line is the column headers which describe the column data
The third line is the data type in the column
Do not remove the semi-colon on the second and third lines.

Special formatting notes:

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If the key name starts with a zero (**0**), place a single-quote character **'** before the zero
The second column is used to rename the key. Leave blank if no renaming is required. Be careful not to reuse a key name.
The third column can indicate if a key is to be deleted by changing the value to **Delete**
If the Layer name value starts with a dash (**-**) character, place a single-quote character **'** before the zero
The Format column is the only column which allows a comma character (**,**).

To get a list of Point and Point Label Styles, use the Export Point Styles command.

;Key						
;Name	New Name	Style On	Style Name	Point Label Style On	Point Label Style Name	Format
;String		On / Off / Delete	Sting	On / Off	Sting	Sting
BB*		On	0.05 X 3D	On	EX L80 Elevation-Description	BB $1 $2
BC*		On	0.05 X 3D	On	EX L80 Elevation-Description	BC $1 $2
BENCH		On	0.05 X 3D	On	EX L80 Elevation-Description	BENCH
BLD*		On	0.05 X 3D	On	EX L80 Elevation-Description	BLD $1 $2
BO		On	0.05 X 3D	On	EX L80 Elevation-Description	BO $1 $2
BOL		On	0.05 X 3D	On	EX L80 Elevation-Description	BOL $1 $2
BRK*		On	0.05 X 3D	On	EX L80 Elevation-Description	BRK $1 $2

;Key Cont								
Layer On	Layer	Scale Parameter On	Scale Parameter	Fixed Scale On	Fixed Scale Factor	Use Drawing Scale	Apply to X-Y	Apply to Z
On / Off	Sting	On / Off	1 to 9	On / Off	Real	On / Off	On / Off	On / Off
On	SRF-BREAKLINES	Off	1	Off	1	Off	On	On
On	X-CG	Off	1	Off	1	Off	Off	Off
On	X-MISC-FEATURES	Off	1	Off	1	Off	Off	Off
On	X-BLD	Off	1	Off	1	Off	On	Off
On	X-FENCE	Off	1	Off	1	Off	On	Off
On	X-SIGN	Off	1	Off	1	Off	On	Off
On	SRF-BREAKLINES	Off	1	Off	1	Off	On	On

;Key Cont								
Maker Rotate Parameter On	Maker Rotate Parameter	Maker Fixed Rotation On	Maker Fixed Rotation	Label Rotate Parameter On	Label Rotate Parameter	Label Fixed Rotation On	Label Fixed Rotation	Rotation Direction
On / Off	1 to 9	On / Off	DMS	On / Off	1 to 9	On / Off	DMS	Clockwise / Counter Clockwise

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Off	2	Off	0	Off	1	Off	0	Clockwise
Off	2	Off	0	Off	1	Off	0	Clockwise
Off	2	Off	0	Off	1	Off	0	Clockwise
Off	2	Off	0	Off	1	Off	0	Clockwise
Off	2	Off	0	Off	1	Off	0	Clockwise
Off	2	Off	0	Off	1	Off	0	Clockwise
Off	2	Off	0	Off	1	Off	0	Clockwise

4.11.51.1 Export Point Styles

Export the Point and Point Label Styles to a CSV file.

Open the CSV file with Microsoft Excel and use the values for the Point Style and Point Label Styles for the CSV file created the Export Description Key Set command.

Command entry: **plsex**

Command: **plsex**

Example of the exported file:

The first column are the Point Styles in the drawing.
The second column are the Point Label Styles in the drawing.

Point Style	Point Label Style
0.05 Green Tick	EX L100 Description
0.05 Red Tick	EX L100 Elevation
0.05 X 2D	EX L100 Elevation-Description
0.05 X 3D	EX L100 Northing-Easting-Description
0.10 X 2D	EX L100 Northing-Easting-Raw Description

4.11.52 Import Description Key Set

Import Description Key Set information from a CSV file to update or create a set.

The CSV file originally created with the Export Description Key Set command.

Supports:

AutoCAD Products: Civil 3D only
BricsCAD Pro: No

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Command entry: **dksim**

Command: **dksim**

Import a Description Key Set

Name: Select the description key set to update or add the key values. Select the "**Create new Description Key Set**" to enter a new set name.

OK: Export the key values of the selected set.

A file selection dialog box will appear to enter the name of the CSV.

4.11.52.1 Description Key Set Name

Add a new Description Key Set name to the Import Description Key Set list.

Description Key Set Name

Name: Enter a new Description Key Set name.

OK:

4.12 Polylines Panel Tools

4.12.1 Parcel Tools

4.12.1.1 Parcel Tools Overview

Parcel

A discrete piece of 2D area defined in SmartDraft as a polyline. Synonymous with lot.

Terms used in Parcel Tools.

Traverse, Closed:	A two-dimensional geographical or mathematical series of consecutive lines (tangents) and arcs (circular curves) which enclose an area (the starting and ending points ***are*** the same). Typical closed traverses include lots, parcels, right-of-ways, and boundaries.
Traverse, Open:	A two-dimensional geographical or mathematical series of consecutive lines (tangents) and arcs (circular curves) which ***do not*** enclose an area (starting and ending points ***are not*** the same). Typical open traverse include easements and alignments.
Course:	A line or an arc (curve). A line is defined by its bearing and distance. An arc (circular curve) is defined as part of a circle.
Closure Precision:	The length (distance) required to close the traverse divided by its perimeter.
Error of Closure:	The length (distance) from the beginning point to the computed ending point.
Length of Traverse:	The sum of lengths (distances) of each course of an opened traverse.
Perimeter:	The sum of lengths (distances) of each course of a closed traverse.

The Area Reports - Closure button creates a report of the closure calculation based on the traverse information, rounded off to the bearing and distance precision. If the angular and linear precisions are the same, the

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SmartDraft labeling command will label the lines and arcs with the same values as the report. The report also includes the traverse information, area, and perimeter.

4.12.1.2 Define Parcels

Define a parcel from a closed polyline.

Create a named parcel from a closed polyline. Assign a type, name, and optional description to each parcel. Use Label Parcels to label and manage these parcels, Area Table to create a tabular list of the parcels, and Create Reports to create an area, closure, and legal description report.

Note: If the command errors when the command starts, try the Parcel List Reset command (Alias: **prlr**). Afterward rerun this command.


Button


Ribbon: SmartDraft ▸ Polylines panel ▸ 

Toolbar: Parcel Tools on the Layout Tools: 

Menu: SmartDraft ▸ Parcel ▸ Define Parcels


Command entry: **ard**

Command:

Create parcels: <Select Name. Create Pline/Select Pline and Name/Select Name. Create Pline>, Type = <Numbers/(AA > AB)/(AA > BB)>, Prefix = <Value> , Description = <Prompt/None/Value>

Select Pline selection
Select polyline for <Type and Name> or [Missed/Options]: Select a polyline to define a parcel, **M**issed to view missed parcel text, or **O**ptions to change options.
Select Name selection
Select text layer for Lot creation or [Missed/Options/Select Objects]: Select a polyline to define a parcel, **M**issed to view missed parcel text, **O**ptions to change options, or **S**elect to select the text using the standard Select Objects: method.

4.12.1.2.1 Define Parcels Options

Options for the Define Parcels command.

Dialog Box Options
Define Parcels Options:

Type: Select the type of SmartDraft Parcels. Boundary, Easement, Lot, Parcel, Right-of-way, or a user defined parcel type.

User Defined: Select the button to create or modify the user defined parcel types.

Name Selection: Selection method used to create the parcels.

- **Select Pline. Enter Name:** Operator selects an existing polyline and enters a name. If sequential is selected, the naming will be automatic.
- **Select Pline and Name:** Operator selects an existing polyline and selects a text with a number to provide the name. If the selected text does not have any numbers in it, the operator will be prompted for a number.

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Select Name. Create Pline: Operator selects an existing text string. The command finds all text strings on the layer of the selected text. For each text string on the selected layer, if it has a number, the command attempts to create a closed polyline using the insertion point of the text as the internal point and AutoCAD's boundary command to create the polyline. If the boundary command cannot create a closed polyline, the text string will be listed as a parcel it couldn't create. **Note:** When using this option, zoom out to see all the parcels the command will create. If a selected text string is off the screen, the boundary command will not be able to find the enclosed area.

Type: Select Numbers, Letters AA > AB, or AA > BB.

Prefix: Enter the parcel prefix which will be added to the sequential number or letter.

Next: Enter the next parcel number or letter.

Sequential: Select the check box to sequentially number new parcels using the Next number as they are created. Clear the check box to be prompted for a parcel number each time a new parcel is created.

Descriptions

Default: Select to automatically assign the Default description value to the new parcel.

Prompt: Select to enter a description to the new parcel.

None: Select to assign no description to the new parcel.

Default: The value used with the Default option and the default value used with the Prompt option.

Buttons:

OK: Save define parcel options, and close dialog box.

Cancel: Exit define parcel options without saving changes.

4.12.1.2.2 User Defined Parcel Types

Create and edit the user defined parcel types.

Create and edit user defined parcel types used by the Define Parcels command.

Dialog Box Options

Parcel Types:

List: List of the user defined parcel types. Select the type define parcel type to modify or reorder.

Add: Add a user defined parcel type to the list.

Remove: Remove a user defined parcel type from the list.

Edit: Edit the name of the selected user defined parcel types.

Up: Move the select parcel type up in the list.

Down: Move the select parcel type down in the list.

Buttons:

OK: Save user define parcel list, and close dialog box.

Cancel: Exit User Defined Parcels dialog without saving changes.

4.12.1.2.3 Add User Defined Parcel Type

Add Parcel Type

Add a user define parcel type created with the Define Parcels command.

Dialog Box Options

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Parcel:

Type:	Enter the user define parcel type name.
Buttons:	
OK:	Save changes to the user defined parcel type.
Cancel:	Exit saving changes.

4.12.1.2.4 Edit User Defined Parcel Type

Edit Parcel Type

Edit the user define parcel type created with the Define Parcels command.

Dialog Box Options

Parcel:

Type:	Enter the user define parcel type name.
Buttons:	
OK:	Save changes to the user defined parcel type.
Cancel:	Exit saving changes.

4.12.1.3 Label / Manage Parcels

Label a parcel's name and area, or manage parcels.

Label the SmartDraft Parcels with its name, square feet / meters, and acres / hectares. Manage the name, zoom to, and delete these parcels.

Note: If the command errors when the command starts, try the Parcel List Reset command (Alias: **prlr**). Afterward rerun this command.

Button

Ribbon: SmartDraft ▸ Polylines panel ▸

Toolbar: Parcel Tools on the Layout Tools:

Menu: SmartDraft ▸ Parcel ▸ Label Parcels

Command entry: **arl**

Dialog Box Options

Parcels:

Type:	Select the type of SmartDraft Parcels. All, Boundary, Easement, Lot, Parcel, Right-of-way, or a user defined parcel type.
Name:	The list of all parcels in the current drawing.
All:	Select all the listed names.
Clear:	Clear all selected names in the list.
Refresh List:	Use to reread all the SmartDraft Parcel in the drawing. A list can become out of sync, if parcels are deleted using the AutoCAD Erase command, and late an Undo.
Zoom:	Zoom to the selected named parcel. Only one named parcel can be selected at a time

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Edit:	Edit the selected named parcel. Only one named parcel can be selected at a time.
Start/Direction:	Change the direction and starting point of the selected named parcel (if closed).
Resequence:	Change the selected named parcels sequentially from a starting number or letter, with a prefix option.
Delete:	Remove the selected named parcels.
Labeling:	
Name:	Select to output the name.
Prefix:	Enter a prefix string to add to the name. Note: To print a space between the name and prefix, add a space after the prefix.
Suffix:	Enter a suffix string to add to the name. Note: To print a space between the name and suffix, add a space before the suffix.
Feet / Meters:	Select to output the Feet / Meters text.
Prefix:	Enter a prefix string to add to the Feet / Meters text. Note: To print a space between the area and prefix, add a space after the prefix.
Suffix:	Enter a suffix string to add to the Feet / Meters text. Note: To print a space between the area and suffix, add a space before the suffix.
Precision:	Specify the decimal precision for the Feet / Meters area value.
Acres / Hectares:	Select to output the Acres / Hectares text.
Prefix:	Enter a prefix string to add to the Acres / Hectares text. Note: To print a space between the Acres / Hectares and prefix, add a space after the prefix.
Suffix:	Enter a suffix string to add to the Acres / Hectares text. Note: To print a space between the Acres / Hectares and suffix, add a space before the suffix.
Precision:	Specify the decimal precision for the Acres / Hectares area value.
Buttons:	
Label:	Create parcel labels with the current settings.
Close:	Exit label parcel without creating labels.

Note: Places the selected labels at the centroid of the parcels. If the centroid cannot be calculated, the program will prompt, or an insertion point.

Command:

Cannot calculate the centroid of <type> <Name>!

Specify insertion point: Specify label insertion point.

4.12.1.3.1 Delete Parcels

Delete Parcels

Delete the assigned parcel information created with the Define Parcels command.

Ribbon: SmartDraft ▸ Polylines panel ▸
SmartDraft menu ▸ Parcel ▸ Label Parcels
Command entry: **arl**

Select named parcels and the Delete button on the Label / Manage Parcels command.

Warning: Once the SmartDraft Parcel information is deleted, it will have to be recreated.

Dialog Box Options

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Options:

Delete existing parcel text labels: Check to erase the existing text labels with the assigned SmartDraft parcel information.

Buttons:

OK: Delete the assigned SmartDraft parcel information of the selected parcels.

Cancel: Exit delete parcels without deleting assigned SmartDraft parcel information.

4.12.1.3.2 Edit Parcel

Edit Parcel

Edit the assigned parcel information created with the Define Parcels command.

Ribbon: SmartDraft ▸ Polylines panel ▸
SmartDraft menu ▸ Parcel ▸ Label Parcels
Command entry: **arl**

Select named parcel and the Edit button on the Label / Manage Parcels command.

Dialog Box Options

Parcel:

Type: Select the type of SmartDraft Parcels. Boundary, Easement, Lot, Other, and ROW.

Name: Enter the parcel name.

Description: Enter an optional description.

Buttons:

OK: Save changes to the defined parcel information.

Cancel: Exit edit parcel options without saving changes.

4.12.1.3.3 Resequence Parcels

Resequence the parcel name created with the Define Parcels command.

Dialog Box Options

Resequence Parcels:

Type: Select Numbers, Letters AA > AB, or AA > BB.

Prefix: Enter the parcel prefix which will be added to the sequential number or letter.

Starting: Enter the starting number or letter

Buttons:

OK: Resequence parcel name.

Cancel: Exit resequence parcel without making changes.

4.12.1.4 Create Reports

Create are, closure, and legal description reports from defined parcels.

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Create an area, closure, and legal description report from SmartDraft Parcels or Civil 3D Parcels.

Note: If the command errors when the command starts, try the Parcel List Reset command (Alias: **prlr**). Afterward rerun this command.

Button

Ribbon: SmartDraft ▸ Polylines panel ▸

Toolbar: Parcel Tools on the Layout Tools:

Menu: SmartDraft ▸ Parcel ▸ Create Reports

Command entry: **arp**

Video

Dialog Box Options

Parcels:

List:	Select SmartDraft, or Civil 3D Parcels.
Site / Type	Civil 3D Parcels: Site or SmartDraft Parcels: Type: All, Boundary, Easement, Lot, Parcel, Right-of-way, or a user defined parcel type.
List	The list of parcels in the current drawing.
All:	Select all the listed names.
Clear:	Clear all selected names in the list.
Refresh:	Use to reread all the SmartDraft Parcel in the drawing. A list can become out of sync, if parcels are deleted using the AutoCAD Erase command, and late an Undo.

Reports:

Keep Create Reports Dialog Open	Check to keep this dialog open between reports, until the Close button is selected.
Area:	Create a report of the selected parcel's square feet / meters, acres / hectares, and perimeter.
Closure:	Create a Closure / Mapcheck Report of the selected parcels.
Inverse:	Create an Inverse Report of the selected parcels.
Legal:	Create a Legal Description Report of the selected parcels.

Buttons:

Close:	Exit Create Reports without creating a report.

Inverse Report

An Inverse Report provides a sequential report of directions and distances, starting and ending coordinates, curve data for each parcel segment from a specified Point of Beginning (POB), and parcel area.

Inverse Report ending:

Area = 9,426,274 SF 216.397 Acres

Perimeter = 18,204.26' Precision = 1 : 6411181

Closure / Mapcheck Report

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A Closure Report provides the same basic information as the Inverse Report, except all starting and ending coordinates for each parcel segment are computed relative to the coordinates of the POB and the previous segment, using the decimal precision, linear and angular. Because bearings, distances, and deltas are recalculated using the specified precision, an error is introduced and accumulated so that the coordinates of the last segment may not equal the coordinate of the POB. This is termed “Error of closure”.

Closure Report ending:

Error of closure North = 0.00185257 East = 0.00215186

Bearing N 49°16'27" E Distance = 0.0028

Area = 9,426,274 SF 216.397 Acres

Perimeter = 18,204.26' Precision = 1 : 6411181

4.12.1.4.1 Area Report

Area Report Options

Area report options from the Create Reports. Area report from SmartDraft Parcels.

Select named parcels and the Area button on the Create Reports command.

Dialog Box Options

Header

Check or Uncheck to include or exclude items in the report header

Company	Enter the company name for the report.
Report Title	Enter a title for the report.
Date	Check to include the date on the report.
Project #	Enter a project number for the report.
Description	Enter a description for the report's project.
Created by	Enter the creator of the report.
Each Traverse on New Page:	Check to place each traverse on a separate page.
Header on Each Page:	If "Each traverse on a new page" is checked and this option is also checked, the header will be added to each page of the report; otherwise, the header will only be added to the first page.
Output:	
Format:	Select the output format between "Text Format" and "Comma-delimited Format". The comma-delimited places each parcel on one line, with each value separated by a comma.
Feet / Meters:	Distance prefix, suffix, and precision values.
Prefix:	Enter a prefix string to add to the distance values. Note: To print a space between the area and prefix, add a space after the prefix.
Suffix:	Enter a suffix string to add to the distance values. Note: To print a space between the area and suffix, add a space before the suffix.
Precision:	Specify the decimal precision for the distance values.
Acres / Hectares:	Area prefix, suffix, and precision values.

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Prefix:	Enter a prefix string to add to the area values. Note: To print a space between the Acres / Hectares and prefix, add a space after the prefix.
Suffix:	Enter a suffix string to add to the area values. Note: To print a space between the Acres / Hectares and suffix, add a space before the suffix.
Precision:	Specify the decimal precision for the area values.
Perimeter:	Specify the decimal precision for the Perimeter value.
All Text Uppercase:	Check to have all the text in the closure report uppercase.
Include Parcel Description:	Check to include the optional description added to the parcel.
Include Totals for Selected Parcels:	Check to include the total of all the selected parcels by type (SmartDraft) or Style Name (Civil 3D).
Buttons	
View	View the report before printing or saving.
Print	Print the report to the current default print without saving.
Save	Save report to a file.

Example:

Text Format:
Report Header Information
Lot 1
  Perimeter: 336.02 Area: 5,874.62 SF 0.135 ACRES

Lot 2
  Perimeter: 350.21 Area: 6,427.95 SF 0.148 ACRES

Lot 3
  Perimeter: 337.88 Area: 5,801.31 SF 0.133 ACRES

Lot 4
  Perimeter: 331.89 Area: 5,655.94 SF 0.130 ACRES

Lot 5
  Perimeter: 327.37 Area: 5,544.15 SF 0.127 ACRES

Comma-delimited Format:
Report Header Information
Name, SF, ACRES,Perimeter
Lot 1,5874.62,0.135,336.02
Lot 2,6427.95,0.148,350.21
Lot 3,5801.31,0.133,337.88
Lot 4,5655.94,0.130,331.89
Lot 5,5544.15,0.127,327.37

4.12.1.4.2 Closure Report

Closure / Mapcheck Report Options

Closure report options from the Create Reports. Closure report from SmartDraft Parcels.

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A closure report provide the same basic information as the Inverse Report, except all starting and ending coordinates for each parcel segment are computed relative to the coordinates of the POB and the previous segment, using the decimal precision, linear, and angular. Because bearings, distances, and deltas are recalculated using the specified precision, an error is introduced and accumulated so that the coordinates of the last segment may not equal the coordinate of the POB. This is termed “Error of closure”.

Select named parcels and the Closure button on the create reports command.

Dialog Box Options

Header

Check or Uncheck to include or exclude items in the report header

Company	Enter the company name for the report.
Report Title	Enter a title for the report.
Date	Check to include the date on the report.
Project #	Enter a project number for the report.
Description	Enter a description for the report's project.
Created by	Enter the creator of the report.
Each Traverse on New Page:	Check to place each traverse on a separate page.
Header on Each Page:	If "Each traverse on a new page" is checked and this option is also checked, the header will be added to each page of the report; otherwise, the header will only be added to the first page.
Output:	
Format:	Select the output format between "SmartDraft Format" and "Autodesk Format".
Method:	Select the calculation method to use on arcs (curves).
Bearing, and Chord Data:	Calculates the traverse bases on the bearing of lines and the chord information of arcs (curves).
Bearing, Radii, and Deltas:	Calculates the traverse bases on the bearing of lines and the radii and deltas of the arcs (curves). Based on radials in and out.
Feet / Meters:	Distance suffix and precision values.
Suffix:	Enter a suffix string to add to the distance values. Note: To print a space between the area and suffix add a space before the suffix.
Precision:	Specify the decimal precision for the distance values.
Acres / Hectares:	Area suffix and precision values.
Suffix:	Enter a suffix string to add to the area values: To print a space between the Acres / Hectares and suffix, add a space before the suffix.
Precision:	Specify the decimal precision for the area values.
Linear:	Specify the Linear Precision. This value will be used to round all distance calculations used, including the perimeter.
Angular Format:	Select the angular format: dd mm ss, dd-mm-ss, dd°mm'ss", or gradian
Angular:	Specify the Angular Precision. This value will be used to round all bearings' calculations.
Coordinate:	Specify the Coordinate Precision.
Combine linear courses with the same angle	Check to combine the line data of consecutive lines with the same angle.

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Combine curve courses with the same radius / direction	Check to combine the arc data of consecutive arcs with the same radius point and direction.
Process Selected Parcel Segment Order Reverse	Check to reverse the order of the segments in the report
All Text Uppercase:	Check to have all the text in the closure report uppercase.
Include Parcel Description:	Check to include the optional description to the parcel.
Include Space between Each Course:	Check to include a space between each course of the traverse.
Include Totals for Selected Parcels:	Check to include the total of all the selected parcels by type (SmartDraft) or Style Name (Civil 3D).
Point Numbers:	Check to include point numbers if found at start, end, and radii points.
Survey DB:	Check to use points from an open Civil 3D Survey Database.
Buttons	
View	View the report before printing or saving.
Print	Print the report to the current default print without saving.
Save	Save report to a file.

Example: SmartDraft Format

Report Header Information

TRAVERSE OF: Lot 15

BEARING	DISTANCE		NORTHING	EASTING	POINT
	STARTING	AT	6000700.5687	1500983.7338	15
N 54 59 13 W	58.46	TO	6000734.1106	1500935.8541	16
S 35 00 47 W	110.00	TO	6000644.0181	1500872.7403	17
S 54 59 13 E	31.61	TO	6000625.8797	1500898.6322	18
S 35 00 47 W (R)	121.00	TO	6000526.7780	1500829.2071	19
DELTA =	06 37 45		RADIUS = 121.00	LENGTH = 14.00	
CHORD =	S 51 40 21 E		13.99	TANGENT = 7.01	
N 41 38 31 E (R)	121.00	TO	6000617.2026	1500909.6085	20
N 41 38 31 E	111.55	TO	6000700.5687	1500983.7338	15

ERROR OF CLOSURE NORTH = 0.00140679 EAST = 0.00624822

BEARING N 77 18 41 E DISTANCE = 0.0064

AREA = 5,731.24 SF 0.132 ACRES

PERIMETER = 325.62 FEET PRECISION = 1 : 50841

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4.12.1.4.3 Inverse Report

Inverse Report Options

Inverse Report options from the Create Reports. Inverse Report from SmartDraft Parcels.

An Inverse Report provides a sequential report of directions and distances, starting and ending coordinates, curve data for each parcel segment from a specified Point of Beginning (POB), and parcel area.

Select named parcels and the Inverse button on the Create Reports command.

Dialog Box Options

Header

Check or Uncheck to include or exclude items in the report header

Company	Enter the company name for the report.
Report Title	Enter a title for the report.
Date	Check to include the date on the report.
Project #	Enter a project number for the report.
Description	Enter a description for the report's project.
Created by	Enter the creator of the report.
Each Traverse on New Page	Check to place each traverse on a separate page.
Header on Each Page	If "Each traverse on a new page" is checked and this option is also checked, the header will be added to each page of the report; otherwise, the header will only be added to the first page.

Output

Format:	Select the output format between "SmartDraft Format" and "Autodesk Format".
Method:	Select the calculation method to use on arcs (curves).
Bearing, and Chord data:	Calculates the traverse based on the bearing of lines and the chord information of arcs (curves).
Bearing, Radii, and Deltas:	Calculates the traverse based on the bearing of lines and the radii and deltas of the arcs (curves). Based on radials in and out.
Feet / Meters:	Distance suffix and precision values.
Suffix:	Enter a suffix string to add to the distance values. Note: To print a space between the area and suffix, add a space before the suffix.
Precision:	Specify the decimal precision for the distance values.
Acres / Hectares:	Area suffix and precision values.
Suffix:	Enter a suffix string to add to the area values. **Note:** To print a space between the Acres / Hectares and suffix, add a space before the suffix.
Precision:	Specify the decimal precision for the area values.
Linear:	Specify the Linear Precision.
Angular Format:	Select the angular format: dd mm ss, dd-mm-s, dd mm'ss", or gradian
Angular:	Specify the Angular Precision.
Coordinate:	Specify the Coordinate Precision.

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Combine linear courses with the same angle	Check to combine the line data of consecutive lines with the same angle.
Combine curve courses with the same radius / direction	Check to combine the arc data of consecutive arcs with the same radius point and direction.
Process Selected Parcel Segment Order Reverse	Check to reverse the order of the segments in the report
All Text Uppercase:	Check to have all the text in the Inverse Report uppercase.
Add Parcel Description:	Check to include the optional description added to the parcel.
Include Space between Each Course:	Check to include a space between each course of the traverse.
Include Totals for Selected Parcels:	Check to include the total of all the selected parcels by type (SmartDraft) or Style Name (Civil 3D).
Point Numbers:	Check to include point numbers if found at start, end, and radii points.
Survey DB:	Check to use points from an open Civil 3D Survey Database.
Buttons	
View	View the report before printing or saving.
Print	Print the report to the current default print without saving.
Save	Save report to a file.

Example: SmartDraft Format

Report Header Information

TRAVERSE OF: Lot 15

BEARING	DISTANCE		NORTHING	EASTING	POINT
	STARTING	AT	6000700.5687	1500983.7338	15
N 54 59 13 W	58.46	TO	6000734.1106	1500935.8541	16
S 35 00 47 W	110.00	TO	6000644.0181	1500872.7403	17
S 54 59 13 E	31.61	TO	6000625.8797	1500898.6322	18
S 35 00 47 W (R)	121.00	TO	6000526.7780	1500829.2071	19
DELTA =	06 37 45		RADIUS = 121.00	LENGTH = 14.00	
CHORD =	S 51 40 21 E		13.99	TANGENT = 7.01	
N 41 38 31 E (R)	121.00	TO	6000617.2026	1500909.6085	20
N 41 38 31 E	111.55	TO	6000700.5687	1500983.7338	15

AREA = 5,731.24 SF 0.132 ACRES

PERIMETER = 325.62 FEET PRECISION = 1 : 50841

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4.12.1.4.4 Legal Description Report

Legal Description Report Options

Legal Description Report options from the Create Reports and Legal Description from Polyline commands.

A legal description can be created from SmartDraft, or Civil 3D's Parcels, or from polylines in the drawing.

Parcel Report version:

Select named parcels and the Legal button on the Create Reports command.

Dialog Box Options

Header:

Check or Uncheck to include or exclude items in the report header

Company	Enter the company name for the report.
Date	Check to include the date on the report.
Report Title	Enter a title for the report.
Project #	Enter a project number for the report.
Description	Enter a description for the report's project.
Created by	Enter the creator of the report.
Each Traverse on New Page:	Check to place each traverse on a separate page.
Header on Each Page:	If "Each traverse on a new page" is checked and this option is also checked, the header will be added to each page of the report; otherwise, the header will only be added to the first page.
Output:	
Style	A drop-down list of the pre-defined Legal Description Options styles. Specify the desired legal description options style to be used when creating the report. See Legal Description Options Style Manager to define or edit legal options styles.
Feet / Meters:	Perimeter suffix and precision values.
Suffix:	Enter a suffix string to add to the perimeter values. Note: To print a space between the perimeter and suffix, add a space before the suffix.
Precision:	Specify the decimal precision for the perimeter values.
Acres / Hectares:	Area suffix and precision values.
Suffix:	Enter a suffix string to add to the area values. Note: To print a space between the area and suffix, add a space before the suffix.
Precision:	Specify the decimal precision for the area values.
Linear:	Linear suffix and precision values.
Suffix:	Enter a suffix string to add to the linear values. Note: To print a space between the linear value and suffix, add a space before the suffix.
Precision:	Specify the Linear Precision. This value will be used to round all distance calculations used, including the perimeter.
Angular Format:	Select the angular format: dd mm ss, dd-mm-s, dd mm'ss", dd degrees mm minutes ss seconds, or gradian

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Angular:	Specify the Angular Precision. This value will be used to round all bearings' calculations.
Direction:	Specify if the North, South, East, and West directions will be a single character, N, S, E, W, or the full word.
Use North, South, East, or West for Cardinal Direction	Check to use cardinal directions for bearings: North for N 0º0'0" E, South for S 0º0'0" W, East for N 90º0'0" E, and West for N 90º0'0" W.
Curve:	Specify the curve direction readout type. Concave Direction or Left/Right.
Add Spaces	Select the number of spaces between each course of the traverse.
Curve Data:	Specify the extra curve data type. Radials (non-tangent), Radials (in only), Radials (all), or Chord Data, or Chord Data with Tangent.
Numbering:	Specify if and the type of course numbering. Options: None, 1, 1., 1), or (1).
Combine linear courses with the same angle	Check to combine the line data for consecutive lines with the same angle.
Combine curve courses with the same radius-direction	Check to combine the arc data for consecutive arcs with same the radius point and direction.
Reverse Order	Check to process selected parcel segments in reverse order
All Text Uppercase	Check to have all the text in the legal description report uppercase.
Add Perimeter	Check to include the perimeter to each parcel.
Add Parcel Description	Check to include the optional description added to the parcel.

Buttons

View	View the report before printing or saving.
Print	Print the report to the current default printer without saving.
Save	Save report to a file.

See **Example:**

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4.12.1.5 Parcel Inquiry

View and Modify Parcel Data

Note: SmartDraft Parcel only

Ribbon: SmartDraft ▸ Polylines panel ▸
Toolbar: Parcel Tools on the Layout Tools:
Command entry: **prq**

Command:
Parcel Inquiry.
Select a parcel: Select a SmartDraft parcel polyline.

Parcel Inquiry

Parcel:

Type: Select the type of SmartDraft Parcels. Boundary, Easement, Lot, Parcel, Right-of-way, or a user defined parcel type.
User Defined: Select the button to create or modify the user defined parcel types.
Name: Enter the parcel name (number).
Description: Enter an optional description.
Perimeter: Display the perimeter of the selected parcel.
Area: Display the area of the selected parcel
Buttons:
OK: Save changes to the defined parcel information.

4.12.1.6 Parcel List Reset

Reset the Parcel list in the current drawing session.

Sometimes when editing, deleting, renaming parcels, the parcel list in the current drawing session develops an error: Error: bad argument type: vla-object nil

This error can cause other parcel commands to error. Use this command to reset the parcel list.

Command entry: **prlr**

Command: **prlr**
Parcel list reset in this drawing session.

4.12.1.7 Area Divide

Divide a closed area by sliding or rotating a division line.

Note: Zoom out enough to view the whole enclosed area.

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Button

Ribbon: SmartDraft ▸ Polylines panel ▸

Toolbar: Parcel Tools on the Layout Tools:

Command entry: **arv**

Command: **arv**

Divide a closed area.

Specify interior point of area to subdivide: Specify a point within the enclosed area to divide.

Enter division method or [Rotate/Slide] <Slide>: To select the division method enter **S** for slide, **R** for rotate the division line, or press Enter to accept default.

If **Slide** is the type of line movement method.

Specify a point on the boundary edge: Specify a point along the boundary of the enclosed area. Point **1** in the example below. *Default osnap is **NEA**rest.*

Specify point for division line angle or [Ddmmss/Median/Select]: Specify a point to to determine the angle of the sliding division line. Point **2** in the example below. A magenta temporary line will be drawn to indicate the angle. *Default osnap is **PER**rpendicular.* Select a point across from the first point which crosses the enclosed area.

Specify point inside area on starting side : Specify a point within the enclosed area to indicate which side to start subdividing the enclosed area. Point **3** in the example below.

Slide Division Angle Options:

If **Ddmmss**

Enter bearing (QDD.MMSSssss) or [North/South/East/West]: Enter the angle, **N**orth, **S**outh, **E**ast, or **W**est.

If **Median**

Select a line for first angle: Select the first line for an angle to calculate the median angle.

Select a line for second angle: Select the second line for an angle to calculate the median angle.

If **Select**

Select a line for division angle: Select a line from the division angle.

If **Rotate** is the type of line movement method.

Specify radius point (rotation point): Specify a point along the boundary of the enclosed area. Point **1** in the example below. *Default osnap is **CEN**ter.*

Specify a point on the boundary edge: Specify a point along the boundary of the enclosed area. Point **2** in the example below. *Default osnap is **NEA**rest.* Select a point which crossing the enclosed area from the radius point.

Specify point inside area on starting side: Specify a point within the enclosed area to indicate which side to start subdividing the enclosed ares. Point **3** in the example below.text

If **Area** is the current division method:

Enter area to subdivide area 54,826.70 or [Divide/End]: Enter an area value for to be calculated, **D** to change to divide the enclosed area by a number of equally sized areas, **E** or **0** to end subdividing the enclosed area.

Enter area to subdivide area 48,056.7641 or [Divide/End] <6769.9400>: Continue to enter an area value or the desired option.

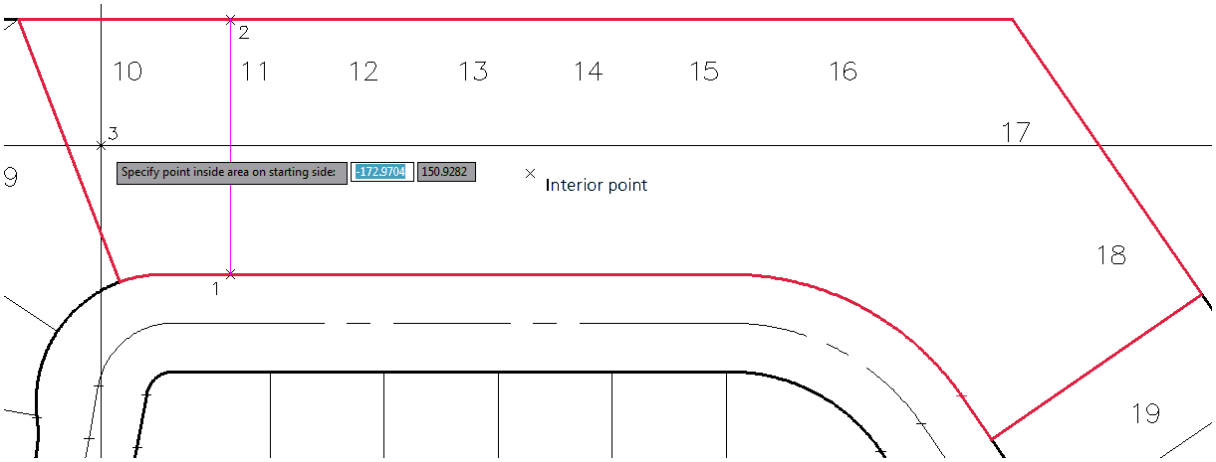
If **Divide** is the current division method:

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Enter number to divide area 54,826.70 or [Area/End]: Enter the number of parts to divide the displayed area, **A** to change to the area option, **E** or **0** to end subdividing the enclosed area.

Example (Slide and Area options)

The red boundary indicates the closed area the command found when the interior point X was selected.
x 1 indicates the point on the boundary edge.
x 2 indicates the point for division line angle.
x 3 indicates the point inside are on starting side.
The magenta line indicates the angle of the sliding line.



Example (Rotate and Area options)

The red boundary indicates the closed area the command found when the interior point X was selected.
x 1 indicates the selecting the arc (osnap set to enter) to calculate the radius point (rotation point) in the green circle below.
x 2 indicates the point for division line starting angle. The line will be rotated about the radius point (green circle)
x 3 indicates the point inside are on starting side.
The magenta line indicates the starting angle of the rotate line.

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4.12.1.8 Area Table

Create an area table.

Create a list of areas, perimeters, acres, or hectares reading SmartDraft Parcels or Civil 3D's Parcel data.

Note: If the command errors when the command starts, try the Parcel List Reset command (Alias: **prlr**). Afterward rerun this command.

Button
Ribbon: SmartDraft ▸ Polylines panel ▸
Toolbar: Parcel Tools on the Layout Tools:
Menu: SmartDraft ▸ Parcel ▸ Area Table
Command entry: **art**

Dialog Box Options

Current Style	A drop-down list of the pre-defined area table styles. Specify the desired area table style to be used when creating the table. See Area Table Style Manager to define or edit area table styles.
Parcels:	
List:	Select to process SmartDraft Parcels or Civil 3D's Parcels.
Type:	Select the type of SmartDraft Parcels. All, Boundary, Easement, Lot, Parcel, Right-of-way, or a user defined parcel type.
Name:	The list of all parcels in the current drawing or parcels in Civil 3D. Select the names to include in the table output.
All:	Select all the listed names.
Clear:	Clear all selected names in the list.

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Options:

Title Text:	Add the Title Text defined in the selected style.
Title Lines:	Create lines around Title Text in the data table.
Header Text:	Add the Header Text for the table.
Header Lines:	Create lines around Header Text in the data table.
Values Lines:	Create lines around values in the data table.
Total Text:	Add the Totals of Square Feet / Meters, and/or Acres / Hectares. Does not total the perimeter column.
Total Lines:	Create lines around Total Text in the data table.
Feet / Meters:	Specify the decimal precision for the Feet/Meters area value.
Acres / Hectares:	Specify the decimal precision for the Acres/Hectares area value.
Perimeters:	Specify the decimal precision for the Perimeters value.
Buttons:	
Create:	Create area table with the current settings and style.
Close:	Exit area table setup without creating a table.

Command:

Header option selected:

Specify insertion point for upper left corner: Specify point on drawing to place the new table.

Header option not selected:

Specify last line for insertion point: The Insert OSNAP will automatically invoke. Select the last line of text in the existing table. The specified points will be added to the bottom of the table, based on the response given to the next prompt.

Specify the number of lines or [Limit] <*current*>: The number in the default brackets represents the total number of lines of area data that will be added to the table. If you want all the lines to be added, press ENTER. If you need to control the amount of lines being added to the table, there are two options:

1. Type the number of lines to be added, and press ENTER.
2. Type **L** for **Limit.**
   Select limit point: A temporary "rubber band" line appears from the last line of text in the table. Using the line as a guide, select a point on the drawing that you do not want the table to go beyond. If all points are able to fit within the established limit, the command places the point values and ends. If additional points remain, the command sequences repeat, starting with the "Include Area Table Header" prompt.

4.12.1.9 Area Table Style Manager

Create and modify area table styles to be used with the Area Table command.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Yes


Button


Ribbon: SmartDraft ▸ Polyline panel ▸ Parcel Tools (drop-down) ▸ 
Toolbar: Parcel Tools on the Layout Tools: 
Menu: SmartDraft ▸ Parcel ▸ Area Table Style Manager (Points)


Command entry: **atsm**

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Dialog Box Options

Name:	A list of the currently defined area table styles. Select the area table style to edit.
Save As:	Save the current area table settings to a new style.
Lock:	Set the current area table style (Name: above) as read-only. Lock a style if you desire to avoid accidental modification. See Unlock Customization Template Files to remove the lock.
Delete:	Delete the current area table style. **Note:** Cannot delete the "default" or a locked style. Deleting a style cannot be undone.
Rename:	Rename the current table style.
Table Setup:	Specify the title text, text styles, text heights, and layers to be used to create the table.
Title Text:	Enter a text string to be used as the table title.
Title Justify	Specify the text justification for the Title text. Options are Left, Center, and Right.
Data Text:	Enter a text string to be used as the Area Type column header. e.g. LOTS or parcels.
Data Justify:	Specify the text justification for the Data header text. Options are Left, Center, and Right.
Data Width:	Specify the width of the Area Type column. Options are 8 - 30. The number is the width of one text character of the selected text style. Remember to specify enough characters to hold the selected data type. If the data value is too long, it will extend into the next column.
Style:	All text styles defined in the current drawing are listed with five special selections of *current*, * Type a style name*, or Preset Small, Medium, and Large Text. *current* uses the style current when the table command starts. Preset Small, Medium, or Large Text style uses the style Small, Medium, or Large defined by this software. *Type a style name* allows the operator to type any text style, even if it does not exist in the current file.
Title:	Specify the text style to use for the Title text.
Header:	Specify the text style to use for the Header text.
Data:	Specify the text style to use for the Data text values.
Height:	Specify the height for the selected text style for the Title, Header and Data text. **Note:** The specified height will be multiplied by the horizontal scale to create the actual height of the style.
Layer:	Specify the layer for the Title, Header, and Data text. Also specify the layer for the Table Lines. Select *Type a Layer Name* to specify a layer not in the current drawing. If the layer does not exist in the drawing being labeled, the command will create the layer with the color white, and the linetype continuous. Selecting either "Preset Coordinate Text" or "Preset Leader" will use the layer defined in the layer data base for that select.
Table Values:	Specify the data values, header text, , justification, and column width to be used to create the table. Note: Up to 10 columns can be defined.
Value:	Specify the data value type for the defined column. Options are Northing, Easting, Elevation, Description (Full), Description (Raw), and Prompted Note.
Header Feet:	Specify the header text when the drawing is set to Feet.
Header Meters:	Specify the header text when the drawing is set to Meters.
Justify:	Specify the text justification for the data in the defined column. Options are Left, Center, and Right.
Width:	Specify the width of the column. Options are 8 - 30. The number is the width of one text character of the selected text style. Remember to specify enough characters to hold the selected data type. If the data value is too long, it will extend into the next column.
Buttons:	
Apply:	Apply any changes made to current style.
Close:	Exit Labeling Table Style Manager without saving changes.

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4.12.1.10 Legal Description from Polyline

Legal Description Metes and Bounds Report from a selected polyline or Civil 3D parcel.

Create a customizable Metes and Bounds legal description from a selected polyline, closed or open, or a Civil 3D parcel.

Ribbon: SmartDraft Polylines panel
Toolbar: Parcel Tools on the Layout Tools:
SmartDraft menu ▸ Polyline Tools ▸ Legal Description from Polyline
Command entry: **pll**

Command:
Legal Description from a Polyline <or Civil 3D Parcel Label>.
Select Polyline <or Civil 3D Parcel Label> : Select an open, closed, polyline, or Civil 3D Parcel Label.
If polyline is open, the following prompt appears. If it is a closed polyline, it does not.
Selected polyline is open. Continue [Yes/No] <Yes>: Enter if you want to continue with the open polyline.
Reverse polyline direction [Arrows/Yes/No] <No>: Enter **A**rrow to update the directional arrows, **Y**es to reverse the polyline's direction, or **N**o or Enter to retain current direction of polyline.
Specify new start point: Specify a new starting point, or Enter to accept the current starting point. *Default osnap is ENDpoint.*
Dialog Box Options appear

Note: See Legal Description Options Style Manager to define or edit legal options styles.

4.12.1.10.1 Civil 3D Parcel Union

Select a portion (loop) from a parcel after the Parcel Union command of Civil 3D has been used.

Civil 3D allows the operator to join two or more closed parcels using the Parcel Union command on the Parcel Layout Tools.

This creates two or more closed parcels associated to a single parcel label.

If the operator selects one of these Parcel Labels, only one of the associated parcels can be processed at a time.

The operator will be prompted to select one of the parcels (loops) to process its legal description.

Dialog Box Options

Select Loop: Select the parcel loop to process

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4.12.1.11 Legal Description Options Style Manager

Create and modify legal description custom styles used with the Legal Description from Polyline and Legal Report commands.

Ribbon: SmartDraft Polylines panel
Toolbar: Parcel Tools on the Layout Tools:
SmartDraft menu ▸ Options ▸ Customization Template Manager ▸ highlight Legal Description Options Styles and select Edit...
Command entry: **pllm**

Dialog Box Options

Name: A list of the currently-defined area table styles. Select the area table style to edit.
Save As: Save the current area table settings to a new style.
Lock: Set the current area table style (Name: above) as read-only. Lock a style if you desire to avoid accidental modification. See Unlock Customization Template Files to remove the lock.
Delete: Delete the current area table style. **Note:** Cannot delete the "default" or a locked style. Deleting a style cannot be undone.
Rename: Rename the current table style.
General Options:
Start: Enter a text string to add before any courses are added.
End Closed: Enter a text string to add to the last course if the Parcel is closed.
End Open: Enter a text string to add to the last course if the Parcel is open.
Area Prefix: Enter a text string to add before the area value.
Perimeter Prefix: Enter a text string to add before the perimeter value.
Line Segment Options:
Start: Enter a text string to add before the bearing of a line segment course.
End: Enter a text string to add at the end of the line course ***if it is not*** the last course.
If Last: Enter a text string to add at the end of the line course ***if it is*** the last course.
Distance: Enter a text string to add before the distance of a line segment course.
Curve Segment Options:
Start: Enter a text string to add before the bearing of an arc segment course.
End: Enter a text string to add at the end of the arc course ***if it is not*** the last course.
If Last: Enter a text string to add at the end of the arc course ***if it is*** the last course.
Right/Left: Enter a text string to add before the arc direction if the Right/Left Direction option is selected.
Concave: Enter a text string to add before the arc direction if the Concave Direction option is selected.
Length Order: Select the order for the length information when the curve data is output. Location options 1 - 6.
Length: Enter a text string to add before the length of an arc segment course.
Note: If the variable value <direction> is included in the string value, the variable <direction> will be replaced with the value Northerly, Southerly, Easterly, or Westerly. If the variable <non-tangent> to include in the string value, the variable <direction> will be replace with "non-tangent" for a non-tangent curve, or nothing for other curve types. If the variable <curve-type> to include in the string value, the variable <curve-type> will be replaced by either "non-tangent", "tangent", "compound", or "reverse", the variable <length> will be replaced by the arc length, the variable <no-curve-type> will be replaced by "" vs the curve type (e.g. tangent curve, reverse curve, etc.), the variable <radius-direction> will be replaced by the radius direction text (e.g. to the right/left, concave Northeasterly).
Radius Order: Select the order for the radius information when the curve data is output. Location options 1 - 6.

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Radius: Enter a text string to add before the radius of an arc segment course.
Chord Order: Select the order for the chord information when the curve data is output. Location options 1 - 6.
Chord Angle: Enter a text string to add before the chord angle of an arc segment course.
Chord Length: Enter a text string to add before the chord length of an arc segment course.
Chord Angle/Length Order: Select Angle/Length to have the chord angle before the chord length, or Length/Angle to have the chord length before the chord angle.
Tangent Order: Select the order for the tangent length information when the curve data is output and curve output type is set to Chord Data with Tangent in the report dialog. Location options 1 - 6.
Tangent: Enter a text string to add before the tangent length of an arc segment course.
Delta Order: Select the order for the delta information when the curve data is output. Location options 1 - 6.
Delta: Enter a text string to add before the delta angle of an arc segment course.
Note: If the variable value <direction> is included in the string value, the variable <direction> will be replaced with the value Northerly, Southerly, Easterly, or Westerly. The direction is calculated from the starting point of the curve to the ending point.
Radial: Enter a text string to add before the Radial In of an arc segment course.
Radial In: Select "other" for the radial into the curve information when the curve data is output. Location options 1 - 6.
Radial Out: Select "other" for the radial out of the curve information when the curve data is output. Location options 1 - 6.
Buttons:
Apply: Apply any changes made to current style.
Close: Exit Labeling Table Style Manager without saving changes.

Note: The string values entered are stripped of any leading or trailing spaces.
When the strings are processed, a space is added to the start and end except for the following cases:
No spaces are added to an empty (blank) string.
A leading space is not added to any string starting with the characters, ";" (semi-colon) or "," (comma).
A leading space is not added to The General Options, the Line Start, and Curve Start.

Example of Legal Description Options File: *.lgl file in the \labels folder.

```
;Version 1

[Legal]

Start=BEGINNING at
EndClosed= "Note"
EndOpen=
AreaPrefix=area =
PerimeterPrefix=perimeter =
LinePrefix=
LineSuffix=to a point; thence
LineSuffixEnd=to the point of beginning.
LineDistance=, a distance of
CurvePrefix=Along a
CurveSuffix=to a point; thence
CurveSuffixEnd=to the point of beginning.
RightLeft=to the
Concave=
CurveLength=, an arc distance of
RadiusLength=, having a radius of
ChordBearing=, a chord bearing of
ChordLength=and a distance of
DeltaAngle=, a central angle of
RadialInPrefix=, a radial line to said curve bears
```

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RadialInSuffix= Note: Not used in current version of the command.
RadialOutPrefix= Note: Not used in current version of the command.
RadialOutSuffix= Note: Not used in current version of the command.
CurveOrder=0,2,4,5,1,6,3 Length, Radius, Chord, Delta, Radial In, Radial Out, Tangent

ChordOrder=1
TangentLengthPrefix=, tangent length

Example of legal description output using the above Legal Description Options file and the following report output settings.

Feet:	
Suffix:	" sf"
Precision:	2
Acres:	
Suffix:	" acres"
Precision:	3
Linear:	
Suffix:	" feet"
Precision:	**2**
Angular Format:	"degrees minutes seconds"
Angular:	0d00'00"
Direction:	North, South, East, West
Curve:	Left/Right.
Curve Data:	Chord Data.
Numbering:	None
All Text Uppercase:	Unchecked
Include Space between each Course:	Unchecked
Include Parcel Description:	Checked

Example Output with comments in <value (type)>

<BEGINNING at (Start=)

<(LinePrefix)>North 10 degrees 08 minutes 59 seconds West<, a distance of (LineDistance)>156.29 <feet (LinearSuffix)> < to a point; thence(LineSuffix)

...

<along a (CurvePrefix)>non-tangent curve< to the (RightLeft)>left<, having a radius of (RadiusPrefix)>255.04 feet<, a central angle of (DeltaAngle)>27 degrees 45 minutes 26 seconds<, a chord bearing of (ChordBearing) >South 47 degrees 54 minutes 36 seconds East< and a distance of (ChordLength)>122.35 feet<, an arc distance of (CurvePrefix)123.56 feet< to a point; thence (CurveSuffix)>

...

South 64 degrees 37 minutes 45 seconds West, a distance of 444.41 feet< to the point of beginning (LineSuffixEnd)>

< Note. (EndClosed)>

<area =(AreaPrefix)> 179,057.74< sf (feet suffix)> or 4.111< acres(acres suffix)>

<perimeter ="(PerimeterPrefix)> 2,084.68< feet (linear suffix)>

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4.12.2 PConnect Tools

PConnect provides an easy to use and superior point-connection tool designed to combine the best features of attributed point coding with an easily controlled, yet powerful, 2D and 3D line control language

Click on the icon below to view a video demonstration

Setup Panel

PConnect

PConnect: Create polylines with tangents and arcs to represent geometric shapes by connecting specific point descriptions.

PConnect Description Key Style Manager: Create and modify PConnect description key styles.

PConnect Template Manager: Create and modify PConnect templates.

Erase polylines on selected or all layers. See Erase Polylines

Erase 3D polylines on selected or all layers. See Erase 3D Polylines

Sample Files to practice with these commands have been placed in:
Open the Sample Files folder using the Sample Files commands.

4.12.2.1 PConnect

Create polylines with straight and curved segments to represent geometric shapes by connecting specific point descriptions.

Create tangent, non-tangent, and best fit curves, rectangles, right angle turns, and other special geometry shapes.

Supports input point information from ASCII files, SmartDraft points, Civil 3D's Point objects, Civil 3D points within the Survey Databases, or BricsCAD Pro Civil points.

See Overview

Button
Ribbon: SmartDraft ▸ Polylines panel ▸ PConnect Tools ▸
Toolbar: PConnect Tools on the Polylines Tools:
Menu: SmartDraft ▸ PConnect ▸ PConnect
Command entry: **pc**
Video demonstration

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Dialog Box Options

Description Keys

Key:	Each description key record has a field for a Description Key. Description Keys are similar but not identical to Civil 3D description keys. SmartDraft PConnect uses description keys to associate points by their description value for the purpose of connecting them with polylines, while avoiding points that do not match the description. To add or modify description keys, use the PConnect Description Key Style Manager.
Layer:	Each description key record has a field for the 2D polyline layer. **Note:** If the layer name does not exist in the current drawing, PConnect will check the drawing's current Customization Template layer database. If the layer is found in the database, it will be created with the color and linetype specified. If not found in the layer database, it will be created with the default layer settings.
Description:	The description key record has an optional description field to define each key.
2D	If this value is **Yes**, this description key will be processed when the 2D polylines option is selected.
3D	If this value is **Yes**, this description key will be processed when the 3D polylines option is selected.
All:	Select to highlight all the description keys in the list.
Clear:	Select to unhighlight all the description keys in the list.
User...	Select to create, edit, or manage User Description Keys.
Optional Layer Prefix	Add an optional layer prefix to the layer name of each layer
Suffix	Add an optional layer suffix to the layer name of each layer
Point Source	
Drawing	Check to use only the points in the current drawing.
Prompt for Selection	Check this option to be prompted for point selection to include only specified points. (e.g., All, Group, Layers, Range, or Selection). When unchecked all points are included.
File...	Check to use the points in an ASCII input file in the PNEZD format.
File name	The name of the selected point file.
Civil 3D Survey Database	Check to use the points in the selected Civil 3D Survey Database.
List	List of Civil 3D Survey Databases. Select the desired Survey Database.
Draw Options	
2D Polylines:	Select to create 2D polylines when processing. This instructs PConnect to draw 2D polylines at elevation 0.0 for the respective description key. The 2D polylines are drawn on the layer specified in the Layer field for the corresponding description key. A polyline will not be drawn with fewer than two (2) points. All polylines are drawn as LWPOLYLINEs (light-weight polylines).
3D Polylines:	Select to create 3D polyline when processing. This instructs PConnect to draw 3D polylines at the elevation value and the respective description key. 3D polylines are drawn on the layer specified in the 3D Polylines... options. 3D polylines cannot have true curved segments but can have varying elevations for each point. To approximate a curve, 3D polylines must contain additional points creating short chords along the path of a curve. Elevations are interpolated linearly for the added points. A polyline will not be drawn with fewer than two (2) points.
Civil 3D Survey Figures:	Select to create Civil 3D survey figure when processing. This instructs PConnect to draw Civil 3D survey figures at the elevation value and the respective description key.

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	Civil 3D survey figures are drawn on the layer specified in the Survey Figures... options. Elevations are interpolated linearly for the added points. A Civil 3D survey figure will not be drawn with fewer than two (2) points.
Suffix Codes...	Open the Description Key Suffix Codes options to set the description key suffix codes.
3D Polyline Options...	Open the 3D polyline Options to set 3D polyline options.
Survey Figure Options...	Open the survey figure Options to set Civil 3D survey figure options. This drawing option is only available when a Civil 3D Survey Database point source is selected.
Figure Prefix Database:	Select the Figure Prefix Database to determine the layer that a survey figure is drawn on or how a survey figure is stylized.
Exclude	
Points	Enter a range of point numbers to exclude (ignore) during processing. The format is: 1-300,302,310,500-600. No spaces, zeros, or negative numbers are allowed. It is useful to exclude points already processed.
Descriptions	Enter a series of descriptions to exclude (ignore) during processing. The format is: "WV,TCP,OG*,??,OAK." **Note:** Wildcards are permitted, and excluded points are used with the recall and terminated with number Suffix Codes options.
Description Suffixes	
Leave	Select to Leave the existing descriptions as-is (recommended).
Strip	Select to remove all suffix codes except the Description Key from the point's description. For example, if a description key code is ".PC," the "TCDC.PC" would be stripped to the value, "TCDC." Warning: Once the description key codes are stripped, you will not be able to run PConnect on those points again.
Require Begin Line Code	Check this options to require a Begin Line code to start a line. If checked and no code Begin Line code found, the points are skipped.
Layers	
Type:	Toggle for desired layer type. **Note:** If the description key style uses layer indexes, the layer name will change in the list; if the layer name was used, the layer name may not change.
Buttons:	
Process	Select to process the selected Description Keys, Point Source, and options.

4.12.2.1.1 PConnect Overview

SmartDraft PConnect provides an easy to use and superior point-connection tool designed to combine the best features of attributed point coding with an easily controlled, yet powerful, 2D and 3D line control language. PConnect's enhanced Suffix Codes give the operator increased flexibility and the ability to produce automated linework and layering. PConnect can use your company's specific description keys, combined with its suffix codes, to create robust geometry from survey data collected in the field. The linework is drawn on specified layers as defined by a Description Key Style file.

Three pieces of data are used to achieve the desired linework: field-data, suffix codes, and the description key file. Suffix codes instruct PConnect which type of calculations to perform when creating the linework between coordinates. The description key file specifies user-defined descriptions to process features (lines and curves) onto a user-specified layer name.

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PConnect supports field-data from:

- Civil 3D point objects;
- Civil 3D Survey database;
- SmartDraft points; and
- An ASCII coordinate file in the PNEZD format.

PConnect has three linework output options:

- 2D polylines drawn at elevation 0 for planimetrics;
- 3D polylines (breaklines) drawn at the collected elevation; and
- Civil 3D survey figures drawn at the collected elevations from point data in Survey database.

The 3D polylines and/or Civil 3D survey figures can be used to create surfaces.

User-defined descriptions are used to separate feature and line work. For example, the code EP could indicate edge of pavement. If there are two separate edges of pavement being collected in a cross-section method, the field crew could indicate the right edge of pavement as EP1 and the left edge of pavement as EP2. The command will draw a separate polyline for each code. In addition, PConnect has suffix codes that field crews can add to the description to instruct it to begin curves, end curves, draw templates, offset features, draw circles, squares, rectangles, extend a line, calculate a hidden right angle corner, end features, recall a point, and close a feature. With the combination of the descriptions and the suffix codes, field crews can reuse EP1 once a previous EP1 has been terminated using a terminate suffix code (.T, .CC, .CS, and .RCT).

Curves (Arcs)

- PConnect uses intelligent analysis of point relationships to create as correct a curve as possible, whether through 2 or more points.
- A curve is started upon recognition of a curve suffix code (.PC, .BC, or .C3), provided there is/are point(s) after the with the same description key. Curved segments will continue to be created until an end of curve (.PT), closing straight (.CS), or terminate (.T) suffix code, or the last point of the unique description is encountered.
- 2-point curves (.PC followed immediately by a .PT) derive their shape by the direction of the previous or next straight tangent, depending on which is present. If there are only two (2) points, a straight segment is drawn.
- Using the Begin Curve (.PC) (Tangent) suffix code option and multiple points (three (3) or more points), PConnect creates separate curved segments between each point.
- A 3-point curve (.C3) suffix code creates a non-tangent curve through three (3) points. The code uses the starting point and the next two (2) points with the same description key to calculate the curve. **Note:** If a 3rd point is not found, or there is no terminate to suffix code (.T#) to a 3rd point, PConnect defaults to the (.PC) curve calculation method.
- A Best-Fit curve (.BC) suffix code creates a non-tangent curve through three (3) or more points. The curve segments pass through all points creating a smooth curve consisting of arcs joining each pair of points. A minimum of three (3) points are required for a curve in one direction. **Note:** If a 3rd point is not found or there is no terminator (.T#) to a 3rd point, PConnect defaults to the (.PC) curve calculation method.
- 3D polylines cannot have true curved segments. To approximate a curve, PConnect draws 3D polylines containing additional vertices striking short chords along the path of the corresponding 2D curve.

Data Collection

There are three (3) items to consider with collecting data: Points, Elevations, and Descriptions.

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Points

- Point numbers are processed in ascending order, except when the recall (.R#) or terminate to (.T#) suffix codes are used.
- Point data can be collected in the field in either parallel (cross-sections) or sequential manner. See PConnect Cross Section Examples

Elevations

- 2D polylines are always drawn at elevation 0.0, ignoring the point's elevation.
- 3D polylines are drawn using the point's elevation. PConnect treats points with invalid elevation as elevation 0.0. Since this will probably result with inaccurate interpolated elevations, make sure the points you are connecting with 3D polylines have real elevations.
- Elevations are interpolated linearly when adding intermediate points.

Descriptions

- Point descriptions are used to identify geographic features.
- A control character is added before the suffix code.The default control character is a "." period, but it can be changed in the Suffix Codes options.
- Unique descriptions are processed separately (e.g., EP1 is different than EP2, even if the description key is EP*).
- Descriptions can be used over and over again for separate features, if a terminate suffix code (.T, .CC, .CS, or .RCT) is used to end a feature. The next point number with the same description starts a new feature.
- Multiple descriptions can be entered for a single point. Each code must be separated by a space (e.g., 102.EP1 SWK1 BLDG1).
- To instruct the command not to process special notes, add the comment character, default of "/" (forward slash), before the note. This instructs the command to not process any information past the comment character.
- If data is collected in a sequential manner (as in one curb line at a time), descriptions need not have a unique index added, but must have a terminate code to instruct PConnect to end the feature.
- If data is collected in a parallel (cross-section) or random order, then the description for the left must be different from the right (such as, "TC1" and "TC2"). Otherwise, the resulting polyline will be drawn back and forth across the road. See Wildcards with the description key.
- PConnect also provides suffix codes for beginning a tangent curve (.PC), ending a curve (.PT), closing a polyline (such as, for an island or building), either straight (.CS), tangent curved (.CC), or 3-point non-tangent curve (.C3), terminating a polyline (.T), terminating a polyline to a point number (.T#), and recalling a point by its number (.R#).
- A polyline is drawn between the same description until a terminate suffix code (.T, .CC, .CS, or .RCT) or the last point with the same description is encountered.
- A point without a description will fail to match any description key and is excluded during processing.

Layers

- Unique description keys in the description key style, can be assigned a hard-coded layer name or layer indexes from the SmartDraft layer database.
- The SmartDraft layer database has proposed, existing, and demolition (which can be set up as As-Built) layer types. It also controls layer properties.
- PConnect will check all selected points and each attribute for the status of whether its layer is LOCKED or UNLOCKED. Stripping or replacing description values ***cannot*** be done if either the attribute layer or its parent "POINT" insertion layer is locked.

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- If locked layers are encountered, PConnect will display their names and ask you whether to unlock some or all of the layers. Leaving a layer locked will exclude the point(s) entirely from the selection, resulting in missing connection points, and ugly results, most likely.
- If a layer is frozen or off, PConnect thaws, or turns it on so the linework can be drawn.

4.12.2.1.2 PConnect User Description Keys

Select to create, edit, or manage User Description Keys.

User Description Keys are not intended to list all the possible description keys used in a point file. But from time to time, a field crew will connect data for an item not listed in the Description Key Style. The User Description Keys allow the operator to add the description key to the list without modifying the Description Key Style. User Description Keys are appended to the selected list of Description Keys in the selected Description Key Style.

Dialog Box Options

User Description Keys:	Includes a list of the description keys entered by the operator, the layer associated to the defined key, and an optional description to delineate the key. The user description keys will be appended to the current Description Key Style.
	Select a Description Key to edit or remove it.
Add:	Select option to add the key value, layer value, and description value in the edit boxes below the description key list box. **Note:** Operator ***cannot*** add duplicate description keys.
Remove:	Remove the selected User Description Keys.
Remove All:	Remove all the User Description Keys listed.
Update:	Update the selected description key values with the values in the edit boxes. **Note:** Operator ***cannot*** update if the key already exists in the list.
Edit Boxes	
Key:	Enter a description. The description key must have a unique value and can be numeric and/or character based, but cannot contain spaces. They are similar but not identical to Civil 3D description keys. PConnect uses description keys to associate points by their description value for the purpose of connecting them with polylines, while avoiding points that do not match the description. A description key may contain the wildcards such as *, ?, #, or @. See Wildcards with the description key.
Layer:	Enter a layer name to create the polyline when processing the specified key. **Note:** If the layer name does not exist in the current drawing, PConnect will check the current Customization Templates layer database. If the layer is found in the database, it will create it with the color and linetype specified; if not found in the layer database, it will be created with the default settings.
Description:	Enter an optional note to describe the description key.
2D	Enter **Yes** if this key is to be processed when the 2D polylines option is selected in PConnect.
3D	Enter **Yes** if this key is to be processed when the 3D polylines option is selected in PConnect.
Buttons	
Apply:	Select to save changes, and return to PConnect.

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Note: The User Description Key file is saved in your TEMP folder, and it is called "PConnectUser.dsy."

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4.12.2.1.3 Suffix Codes

Suffix Code Options for PConnect

The following suffix codes are added to descriptions entered during data collection. These suffix codes instruct PConnect to make various calculations when connecting points to draw polylines.

Select the suffix code name below to display examples of linework drawn using the code.

Dialog Box Options

Control Character	Select the control character the field crew will enter to indicate a suffix code is entered.
Comment Character	Select the comment character the field crew will enter to indicate the start of comments or notes which will not be processed by this command.
Begin Curve (.PC):	Enter the characters to represent the code to begin a tangent curve. Begin Curve uses the previous segment, straight or curved, and next point to calculate the tangent curve and continues to calculate tangent curves until it encounters an End Curve (.PT), Terminate (.T), Close Straight (.CS), or Close Curved (.CC) code.
Best Fit Curve (.BC)	Enter the characters to represent the code to begin a best fit curve (multiple points) non-tangent curve. The curve passes through all points creating a smooth curve consisting of curves joining each pair of points; a minimum of three (3) points is required.
3-Point Curve (.C3)	Enter the characters to represent the code to begin a three (3) point non-tangent curve.
End Curve (.PT):	Enter the characters to represent the code to end a curve.
Circle (.CR): (.CR#)	Enter the characters to represent the code for drawing a circular polyline (multiple-sided polygon). The distance (#) value is the radius.
Square (.SQ): (.SQ#)	Enter the characters to represent the code for drawing a square polyline (4-sided polygon). The distance (#) value is the length from the collected points to the edge of the square (one-half the distance along one side of the square).
Begin Line (.BG)	Enter the characters to represent the code for the start of drawing a line or arc. This code is only used if the Require Begin Line Code is check in the PConnect options.
Turn 90° Angles (.TN): (.TN#,#)	Enter the characters followed by the distance or distances, separated by commas, to instruct the command to place additional points after the current point at a right angle to the last straight segment. Positive numbers are to the right (CW); negative numbers are to the left (CCW). The command assumes the previous segment was a straight segment, and this suffix code is ignored if it is in the middle of any of the curve suffix codes. It can be combined with termination codes (.T, .CS, and .CC) but requires at least one prior point to calculate the starting angle.
Right Angle Back (.RA):	Enter the characters to calculate a right angle point back from the current point. This suffix code requires at least two prior points and at least one point to follow to calculate the angles.
Offset (.O): (.O#)	Enter the characters to represent the code for offsetting the current polyline. The offset distance (#) is the number entered after the suffix code. Positive numbers are offset to the right; negative numbers are offset to the left. **Note:** If the

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command encounters another offset (.O) or middle (.M) with or without an offset distance (#), template (.ZT), or offset terminate (.OT), it ends the current offset.

Middle (.M): (.M#) Enter the characters to represent the code for offsetting middle. Offset middle is for collecting the middle of a feature; a polyline is **NOT** drawn along the original path, but polylines are drawn at one-half the width (#) on either side. **Note:** If the command encounters another offset (.O) or middle (.M) with or without an offset distance (#), template (.ZT), or offset terminate (.OT), it ends the current offset.

Elevation on Offsets (.Z): Enter the characters to represent the code to adjust the elevation of offset polylines. This suffix code does not adjust the elevation of an individual point or elevations along the primary polyline. The suffix code also works with PConnect Templates to replace the first height value left of the field collected point. If this code is used without a height value, it sets the elevation adjustment to zero (0.0) for offsets and sets the template heights back to its designed height. This suffix code only applies to the Draw Options: 3D polyline and Civil 3D survey figures. 2D polylines are always drawn at elevation zero (0.0).

Templates (.ZT): Enter the characters to represent the code for templates. See Templates. A template is for collecting a single point along a feature in the field which follows a specific offset and height pattern. Add the template name to the suffix code to start using a template. Include the template suffix ***without*** a template name to end using a template. If the template is to be mirrored, add the "-" negative character before the template name (i.e., .ZT-CB1). To create a template, use the PConnect Template Manager. **Note:** If the command encounters another offset (.O) or middle (.M) with or without an offset distance (#), template (.ZT), or offset terminate (.OT), it ends the current template. The template suffix code can only be used with the first description assigned a point.

Terminate Offset (.OT): Enter the characters to represent the code terminating an offset for either Offset (.O) or Middle (.M). The difference between Terminate Offset (.OT) and Terminate (.T) is Terminate Offset does not terminate the primary polyline, just the offset polyline(s).

Close Straight (.CS): Enter the characters to represent the code for closing a polyline with a straight segment. **Note:** The next point encountered with the same description will start a new polyline.

Close Curved (.CC): Enter the characters to represent the code for closing a polyline with a tangent curved segment. **Note:** The next point encountered with the same description will start a new polyline.

Terminate (.T and .T#): Enter the characters to represent the code for stopping a polyline with a specific description, so that the next sequence of points with the same description will start a new polyline. If the current sequence of points with the same description was in the Best Fit Curve (.BC) instruction, Terminate (.T) would also end the curve. The terminate suffix code can only be combined with the Turn 90° Angles (.TN), Extend (.E), and Circle (.CR) codes. When combined with any other suffix codes, those codes will be ignored. Terminate (.T) also terminates any offsets or middles associated with the description.

Terminate to # (.T#): The terminate suffix code can be followed by a point number. When the terminate suffix code is followed by a point number (#), it terminates at the specified point. This allows a non-sequential or previous point to be added to the end of a polyline, and the description of the specified point is ignored. This Terminate to (.T#) suffix code can be combined with the Begin Curve (.PC), End Curve (.PT), Right Angle Back, Turn 90° Angle (.TN), Extend (.E), and can be used on the point just after the 3-point curve (.C3).

Rectangle (.RCT): Enter the characters to create a closed rectangle from two points or closed right angle back to the starting point from three or more points. When using two points, an offset distance for the rectangle's width, positive to the right and negative to the

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	left, is required. For three or more points, do not enter an offset, because it is ignored.
Extend (.E): (.E#)	Enter the characters to represent the code for extending or shortening a segment along two points. When the distance (#) is a positive number, the segment is extended by the specified value; if the distance (#) is a negative number, the segment is shortened by the specified value.
Recall Point # (.R): (.R#)	Enter the characters to represent the code to recall a point (by number) to be used in sequence before the current point. The description of the recalled point is ignored, so that the previous suffix code (such as, .PC or .PT) controls the curvature that is later applied to the recalled point. Beginning a new polyline at a point that recalls another point is equivalent to beginning the polyline as a straight segment from the recalled point.
Set Default:	Reset suffix codes to their default character values.

Code Entry Rules and Suggestions:

- **All suffix codes must begin with the period "." as the first character.** This approach should make the descriptions entered by the field crew more legible and tends to preclude any wildcard conflicts.
- All suffix codes must be added to the end of the description.
- All suffix codes are converted to upper-case (as are descriptions) and stripped of leading and trailing spaces.
- Suffix code characters must be alphabetic characters only.
- Blank or duplicate values for suffix codes are not permitted.
- **Do not use commas in the suffix codes, except to separate distances when using the Turn 90° Angles (.TN) suffix code.**
- **Do not use the "/" character in the suffix codes.**
- **Do not use commas in your description values.**
- Suffix codes, that can be combined, can be combined in any order. PConnect analyzes the suffix data in an organized fashion to detect all possible combinations of description key suffix code data. The only exceptions to combining suffix codes are:

.PC.T	(without the optional point number)
.CC.T	(without the optional point number)
.CS.T	(without the optional point number)
.CC.CS	and all derivatives of the above
.CC.C3	CC is a terminator
.CC.BC	CC is a terminator
.BC.T	(without the optional point number)
.C3.T	(without the optional point number)
.RCT.T	Rectangle is already a termination code
.PC.RCT	Rectangle code is ignored in curves
.BC.RCT	Rectangle code is ignored in curves
.C3.RCT	Rectangle code is ignored in curves
.C3.TN	Turn Angle ignored within curves
.BC.TN	Turn Angle ignored within curves
.PC.TN	Turn Angle ignored within curves
.CS.C3	CS is a terminator

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.CS.BC CS is a terminator

.CS.RCT Both are terminator codes

.CC.RCT Both are terminator codes

.T#.RCT Both are terminator codes

Example

For point 109, the following description key suffix codes will process the same. G1.PC.R99.T150, G1.T150.R99.PC, or G1.R99.PC.T150: These suffix codes would be interpreted as connecting the recalled point 99, starting a curve at point 109, and terminating the polyline at point 150, respectively.

Also see Overview.

4.12.2.1.3.1 Defaults

Values Supplied for the Suffix Codes

The DEFAULTS suffix codes are stored outside the drawing in the file PConnect.ini in the current Customization Template folder. If this file is not found, the command will use the hard-coded defaults. The default description suffix file is read only the first time the operator runs the command. Once read, the default values are stored in the operator's AutoCAD profile.

- The suffix code for beginning a curve (.PC)
- The suffix code for beginning a curve fit / multiple point curve (.BC)
- The suffix code for beginning a 3-point curve (.C3)
- The suffix code for ending a curve (.PT)
- The suffix code for circle (.CR)
- The suffix code for square (.SQ)
- The suffix code for begin line (.BG)
- The suffix code for turn 90 degree angle (.TN)
- The suffix code for right angle back (.RA)
- The suffix code for offset (.O)
- The suffix code for middle (.M)
- The suffix code for elevation on offsets (.Z)
- The suffix code for templates (.ZT)
- The suffix code for terminate offset (.OT)
- The suffix code for closing a polyline curved (.CC)
- The suffix code for closing a polyline straight (.CS)
- The suffix code for terminating a polyline (.T)
- The suffix code for rectangle (.RCT)
- The suffix code for extend (.E)
- The suffix code for recalling a point (.R)
- Control Character is a period. (.)

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- Comment Character is a forward slash. (/)

Format of the PConnect.ini file located in the Customization Template folder.

```
;default values for description key suffixes for PConnect
[CODES]
SufBCT=PC
SufECT=PT
SufBCN=BC
SufT=T
SufCS=CS
SufCC=CC
SufC3=C3
SufR=R
SufZT=ZT
SufZ=Z
SufO=O
SufM=M
SufE=E
SufTN=TN
SufRC=RCT
SufCR=CR
SufRA=RA
SufSQ=SQ
SufBG=SQ
CtrlChr=.
CmmtChr=/
ReqBG=0
```

See Description Key Styles for more information about these files.

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4.12.2.1.4 3D Polyline Options

3D polyline Options for PConnect

Dialog Box Options

Draw Options:

Maximum Mid Ordinate Along Arcs:	Enter the maximum value for the mid-ordinate distance. This value will be used to determine the length of segments used in a 3D polyline to represent a curve. The larger the value, fewer segments will be added and vice versa.
Maximum & Distance Between Vertices:	Enter the maximum segment length for both straight and curved segments. PConnect will compute the number of additional segments to create based on this value. The larger the value, fewer segments will be added and vice versa.

Elevations:

Calculated Points for code Right Angle Back (RA):

Use previous point's elevation	Select to use the previous point's elevation when using the Right Angle Back (RA).
Elevation	Select to use the elevation entered in the edit box when using the Right Angle Back (RA).

Calculated Points for code Rectangle (RCT):

Use previous point's elevation	Select to use the previous point's elevation when using the Rectangle (RCT).
Elevation	Select to use the elevation entered in the edit box when using the Rectangle (RCT).

Calculated Points for code Turn 90° Angles (TN):

Use previous point's elevation	Select to use the previous point's elevation when using the Turn 90° Angles (TN).
Elevation	Select to use the elevation entered in the edit box when using the Turn 90° Angles (TN).

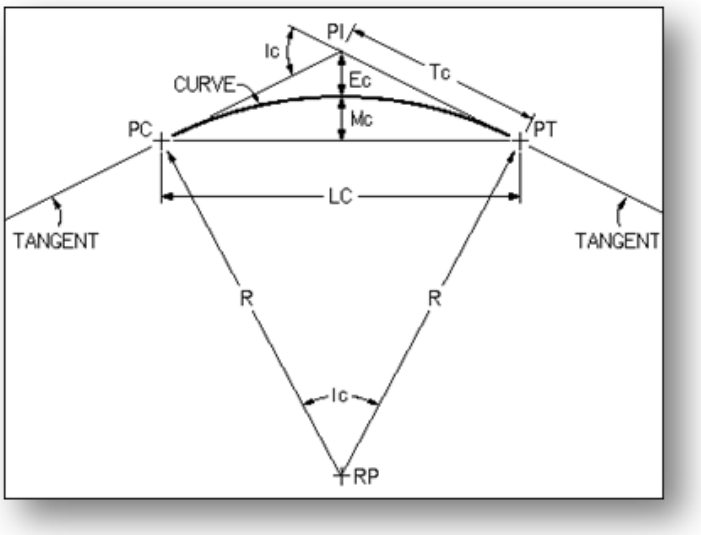
3D Polyline Layer:

Use Single Layer:	Check this option to instruct the command to use the Single Layer Name entered below for all 3D polylines. Uncheck this option to instruct the command to use the description key layers for each 3D polyline.
Layer...	Use to select a layer from the current drawing.
Single Layer Name:	Enter the layer name to place all 3D polylines when the Use Single Layer option is selected. Use this option when the 3D polylines will be used to create a surface. If the selected layer does not exist, it will be created. If the box is left blank, the command will use the current layer.

Note: AutoCAD 3D polylines do not have true curved segments but can have varying elevations for each point. To approximate a curve, PConnect calculates additional points which are placed along the path of a curve. Elevations are interpolated linearly for these additional points. A polyline will not be drawn with fewer than two (2) points.

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In the illustration, the mid-ordinate of an arc is labeled Mc:



Mid-ordinate of arc

Creating a surface from the 3D polylines

Civil 3D: Add the 3D polylines to a surface as Breaklines.

4.12.2.1.4.1 Select Layer

Select a Layer from a List of Layers in the Drawing (Excluding Xref Layers)

All the layers in the drawing (***except*** Xref layers) appear in a layer list. This allows the operator to select the desired layer from it. The operator can also type a layer name in the Name edit box. The operator can use the "Filter" edit box to limit the layer names to those which match the filter, making it easier to find the desired layer. If an operator enters a layer name that does not exist, the layer will be created when PConnect processes the points. The command will prevent the operator from entering invalid layer names.

Dialog Box Options

Select Layer

Layers:	A list of all layers in the drawing (***except*** Xref layers). Select the desired layer, and the name will be placed in the **Name** edit box.
Name:	Currently selected layer. Enter any valid layer name.
Filter:	Enter a filter condition to limit the list of layers displayed. Multiple filter conditions can be entered separating each with a comma.

Buttons

Cancel	Selecting Cancel will cancel the selection of a layer and reset the Layer option to Default.

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4.12.2.1.5 Survey Figure Options

Survey Figure Options for PConnect

Dialog Box Options	
Civil 3D Survey Figure Layer:	
Use Figure Prefix Database Layer:	Check this option to instruct the command to use the layer name specified in the Figure Prefix Database. If an entry for the collected description key is not found in the Figure Prefix Database, the command will either use the Single Layer option, if checked, or the layer specified in the Description Keys if the Single Layer option is unchecked.
Use Single Layer:	Check this option to instruct the command to use the Single Layer Name entered below for all Civil 3D survey figures. Uncheck this option to instruct the command to use the description key layers for each Civil 3D survey figure.
Single Layer Name:	Enter the layer name to place all Civil 3D survey figures when the Use Single Layer option is selected. If the box is left blank, the command will use the current layer.

Figure Prefix Database

The survey figure prefix database contains information to determine the layer that a survey figure is drawn on, how a survey figure is stylized, and whether survey figures are created as breaklines or lot lines.

When survey figures are created, they are matched based on their names (based on the point's description) and the prefix names. When a survey figure is created and its name is matched with a figure prefix, the figure prefix properties are assigned to the new survey figure, such as a layer name.

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4.12.2.1.6 PConnect File Option

Point Source from File option for PConnect

Select an ASCII Point Data Input File in the PNEZD Format (point number, northing, easting, elevation, and description).

This option provides the ability to connect points without having the points in the drawing or even having Civil 3D.

The point file can be either space-delimited or comma-delimited, as PConnect will automatically interpret the data for either type of delimiter. Column-delimited files are equivalent to space-delimited files provided that there is data (not blank spaces) for the Point, Northing, Easting, and Elevation fields in every record.

Note: Points without description values will fail to match any description keys and are excluded during processing.

Lines in ASCII point files which begin with a semicolon ";" will be treated as "comments" or "remarks" and will be ignored.

Caution: Always inspect the input file for its format to ensure that it is in fact PNEZD and not PENZD.

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4.12.2.1.7 PConnect Line Examples

Suffix codes examples for PConnect

Straight segment suffix codes:

PConnect has multiple straight segment suffix codes.

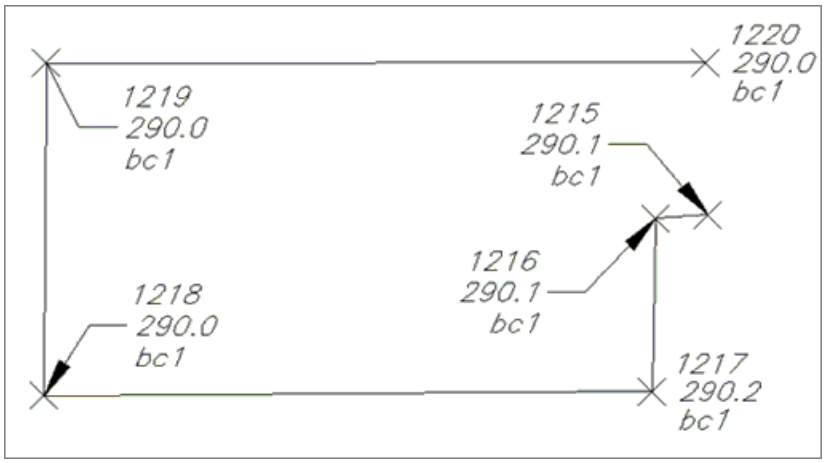
Straight Segment:	If no suffix codes are added to descriptions, a polyline with straight segments between the points is created.
Close Straight (.CS):	This suffix code closes a polyline back to the starting point using a straight segment.
Square (.SQ#):	This suffix code draws a square polyline (4-sided polygon). The distance (#) is the length from the point to one edge of the square (one-half the distance along one of the square's sides).
Turn 90° Angle (.TN#,#):	This suffix code adds straight segments turned at 90° angles from the previous segment. Multiple segments can be drawn with commas separating the distances (#) of the segments. If the distance (#) is a positive number, the segment is turned right (CW); and if the distance (#) is a negative number, the segment is turned left (CCW).
Right Angle Back (.RA):	This suffix code calculates two straight segments forming a right angle. At least two (2) points prior to the point with the code and one after are required for the calculations to be made.
Rectangle (.RCT#):	This suffix code creates a closed rectangle from two points (with an offset distance) or closes back to the starting point at a right angle when three (3) points or more are used. When only two (2) points are used, the specified distance (#) is used to create a closed rectangle. If the specified distance (#) is a positive number, the width of the rectangle will be to the right; if the specified distance (#) is a negative number, the width of the rectangle will be to the left. When three (3) or more points are used, any specified distance is ignored. PConnect tries to calculate an intersection at right angles from the first and last segments.
Extend (.E#):	This suffix code extends or shortens a straight segment along the bearing of the point with the code and the previous point. When the distance (#) is positive, the segment is extended; when the distance (#) is negative, the segment is shortened.

Examples of Using Straight Segment Suffix codes:

Straight Segments:

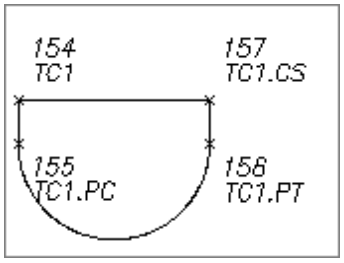
- The default connection between points, without any specific suffix code, is a straight segment.
- The polyline, BC1, is drawn starting at point 1215, continues through points 1216, 1217, 1218, 1219, and ends at point 1220.

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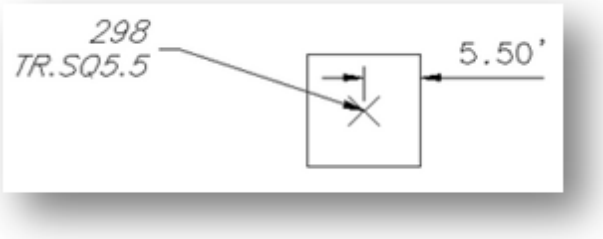


Close polyline with Straight Segment (.CS):

- To close geometry back to the starting point with a straight segment, add the description suffix Close Straight (.CS).
- The polyline, TC1, is drawn starting at point 154, continuing through points 155, 156, and 157 where it encounters the Close Straight (.CS) code, and a final segment is drawn back to the starting point 154.



Square Example:



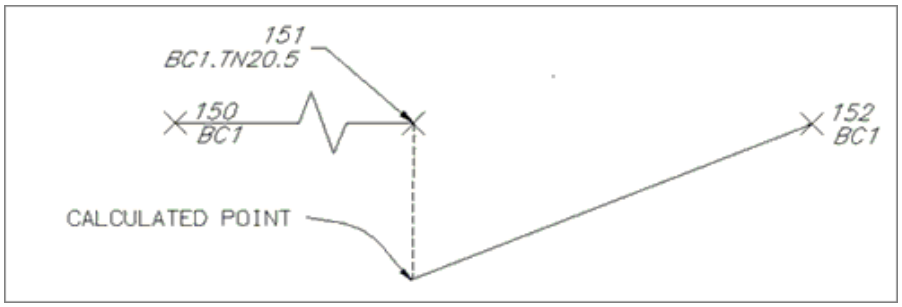
- To draw a square at a point, use the square suffix code and an offset distance value.
- The distance (#) must be entered after the square code (.SQ#).
- The square code can be added to a single description (TR.SQ5.5), and a square polyline (polygon with 4 sides) will be drawn, or it can be one of the multiple descriptions added to a point (EG1 HM.CR5.5).

Turn 90° Angles Example:

A single distance following the Code:

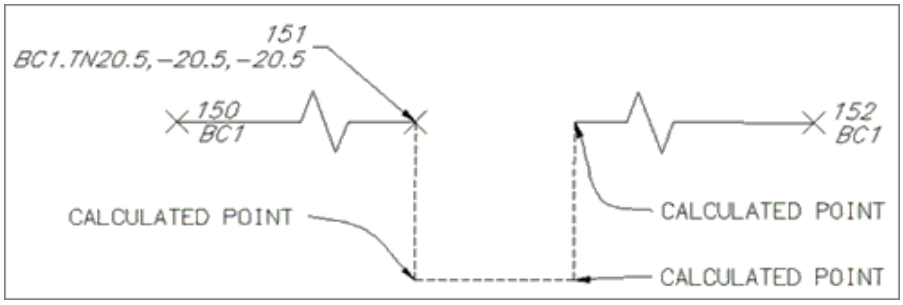
- The polyline, BC1, is drawn starting at point 150, continues to point 151, and encounters the Turn 90° Angles (.TN) code.
- The code is followed by one distance (20.5); one segment will be added between point 151 and point 152.
- Since the distance is a positive number, the segment will be at a right angle to the previous segment and turning to the right (CW) 20.5 units. From this new point, a segment is drawn continuing to point 152.

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Multiple distances following the Code:

- The polyline, BC1, is drawn starting at point 150, continues to point 151, and encounters the Turn 90° Angles (.TN) code.
- Since the code is followed by three distances (20.5,-20.5,-20.5) separated by commas, three additional straight segments will be added between points 151 and 152.
- The first segment is drawn at a right angle from the previous segment to the right (CW) at 20.5 units since the distance (#) is a positive value.
- The second segment is drawn at a right angle from the first segment to the left (CCW) at 20.2 units since the distance (#) is a negative value.
- The third segment is drawn to the left from the previous segment at 20.5 units again.
- From this last calculated point, point connection continues sequentially to point 152.

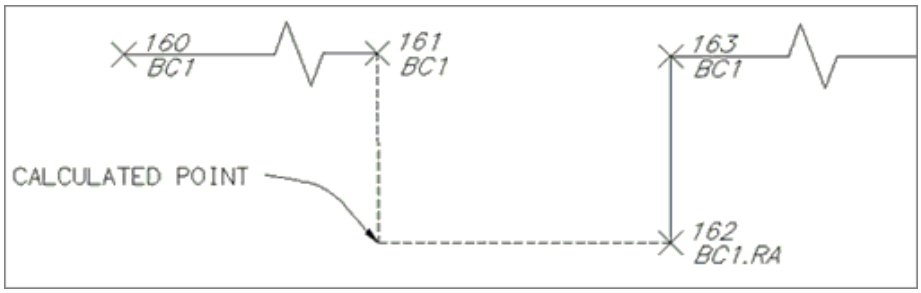


Note: The code assumes the previous segment was a straight segment, and this suffix code is ignored if in the middle of any of the curve suffix codes. This code can be combined with a termination code (.T, .CS, or .CC).

Right Angle Back Example:

- To calculate a hidden point which is at right angles to two known points, use the Right Angle Back suffix code.
- The polyline, BC1, is drawn starting at point 160, continues to point 162, where it encounters the Right Angle Back code.
- The code instructs PConnect to calculate a right angle back from the previous two points of 160 and 161, the current point 162, and the next point 163 as the straight segments to calculate the starting bearing for the right angle point.
- The right angle point is placed between point 162 (point with the code) and the previous point 161.

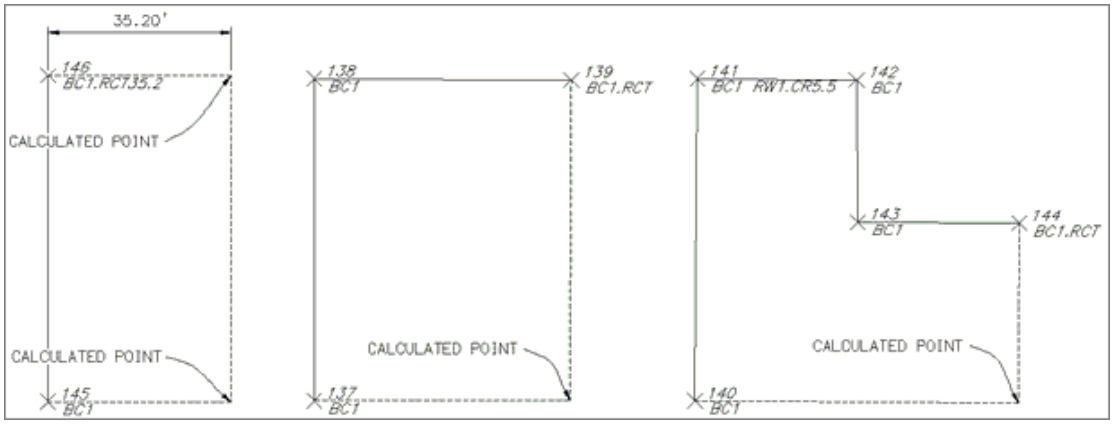
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Note: This suffix code requests at least two prior points to calculate the starting angle and at least one point to follow to calculate the ending angle. If there is no solution, parallel lines, or the calculated point is too far away, a straight line is drawn between the two points and a warning message is displayed at the end.

Rectangle Examples:

- To draw a rectangle or a closed polyline with a right angle calculation point, use the rectangle suffix code.
- To calculate a rectangle using only two points, an offset distance (#) must be entered after the rectangle code (.TN#).
- If there are three or more points, any offset distance value will be ignored, and the command will attempt to calculate a right angle point from the end and starting points of the polyline.
- The command will assume the first segment was a straight segment and the last segment was a straight segment.

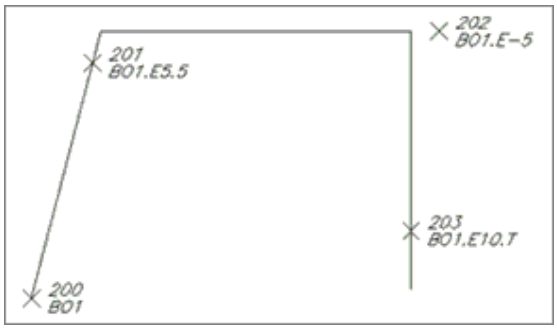


Extend Examples:

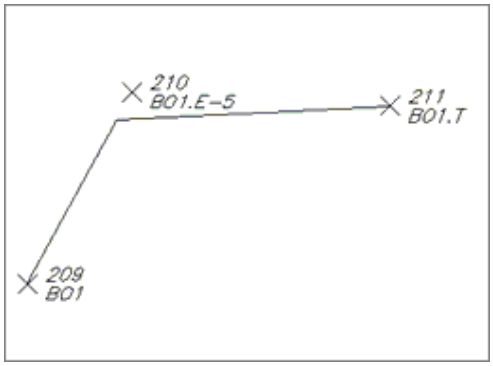
- To extend a point a given distance (e.g., something is obscuring an object's corner), use the extend (.E#) code.
- If the given distance (#) is positive, the point will move the given distance along the angle (bearing) created from the previous point.
- If the given distance (#) is negative, the point will be moved back (straight segment shorten) along the angle (bearing) created from the previous point.

Example of Extend with both Positive and Negative Distances:

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- A polyline, BO1, is drawn starting at point 200, continues to point 201, where it encounters the Extend (.E) code.
- Since the code is followed by a positive distance (5.5), the straight segment between point 200 and point 201 is extended 5.5 units.
- The polyline continues from this calculated point to the next point 202, where it encounters an Extend (.E) code with a negative number.
- A straight segment is now drawn from the previously calculated point (not from the coordinates of point 201) to a location 5.0 units short of point 202.
- The polyline continues from this point towards the next point 203, where it encounters a point with two codes, Extend (.E) and Terminate (.T).
- A straight segment is drawn from the previously calculated point toward 203, extends past it 10.0 units, and because of the Terminate (.T) code, B01 ends at this location.



Example of Extend Using a Negative Distance:

- A polyline, BO1, is drawn starting at point 209, continuing to point 210, where it encounters the Extend (.E) code.
- Since the code is followed by a negative distance (-5), the straight segment between point 209 and point 210 is shortened 5.0 units.
- The polyline continues from this calculated point and ends at point 211, where it encounters a Terminate (.T).

4.12.2.1.8 PConnect Curve Examples

Suffix Codes Examples for PConnect

Curve Suffix Codes:

PConnect has multiple curve suffix codes.

Begin Curve (.PC): This suffix code creates a tangent curve from the last segment. Tangent curves are calculated between points until the End Curve (.PT) code, the last point, or a Terminate code (.T) is encountered.

3-Point Curve (.C3): This suffix code creates a non-tangent curve using three (3) points. It reads the next two points with the same description key. If only one point, or the next point has the Terminate (.T) code, the calculation converts back to Begin Curve (.PC).

Best Fit Curve (.BC): This suffix code creates a Best Fit Curve with all the points that follow with the same description keys until the End Curve (.PT), the last point, or a Terminate code (.T) is encountered. The first curve may not be tangent to a proceeding straight or curve segment. If only one point follows, the calculation converts back to Begin Curve (.PC).

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Close Curved (.CC): This suffix code closes the current polyline back to the starting point with a tangent curve from the last segment.

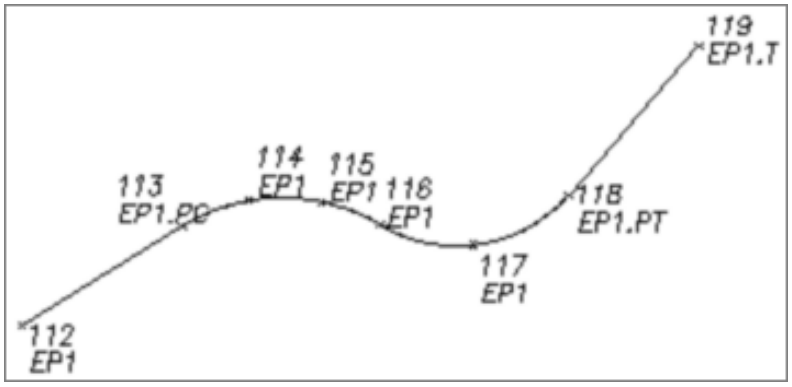
Circle (.CR#) This suffix code draws a circle at the radius (#).

End Curve (.PT) This suffix code stops curve calculation and begins straight segments.

Examples of Using Curve Suffix Codes:

Curve Example Using .PC (2-Point Tangent Curve)

- The polyline, EP1, is drawn starting at point 112 and continues to point 113 with the Begin Curve (.PC).
- A tangent curve is calculated from point 113 to point 114 from the bearing along point 112 to point 113.
- Curve segments are created between points 114 and 115, 115 and 116, 116 and 117, 117 and 118, and are all tangent to the proceeding curve segment.
- The End Curve (.PT) code is encountered at point 118, and a straight segment is drawn between points 118 and 119.
- The polyline ends at point 119.

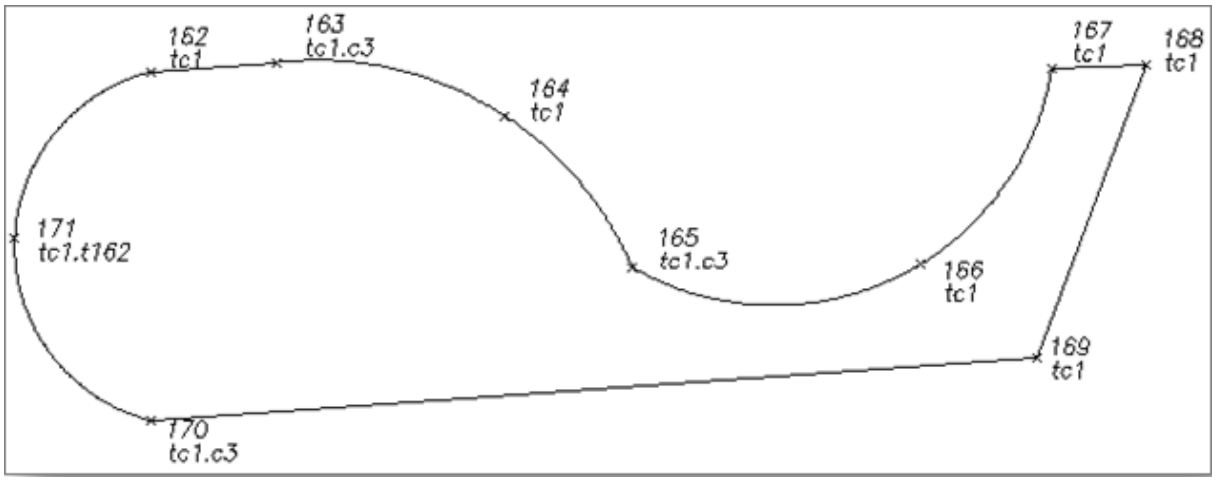


Note: Field crews do not have to add a description suffix at a point of reverse or compound curve. As long as there is not a straight segment, do not add the (.PT) code, and the command will draw the reversing or compound curve segments. PConnect checks for direction changes between segments and automatically determines the presence of a PRC or PCC, therefore, there is no need to identify the PRC or PCC with a PT/PC.

Curve Example Using .C3 (3-Point Non-Tangent Curve)

- The polyline, TC1, is drawn starting at point 162 and continues to point 163 with the 3-Point Curve (.C3).
- A non-tangent 3-point curve is drawn starting at point 163, through points 164 and 165.
- A 3-Point Curve (.C3) code is encountered at point 165.
- Another non-tangent 3-point curve is drawn starting at point 165, through points 166 and 167.
- An End Curve (.PT) was not needed at point 165 or point 167 to end the 3-Point Curve.
- At point 167, straight segments begin continuing through points 168, 169, and 170.
- At point 170, the last 3-Point Curve (.C3) code is encountered, and the next two points are used. In this case, the second point 162 has the Terminate to # (.T162), so the points 171 and 162 are used to calculate the 3-point curve.
- The polyline ends at point 162.

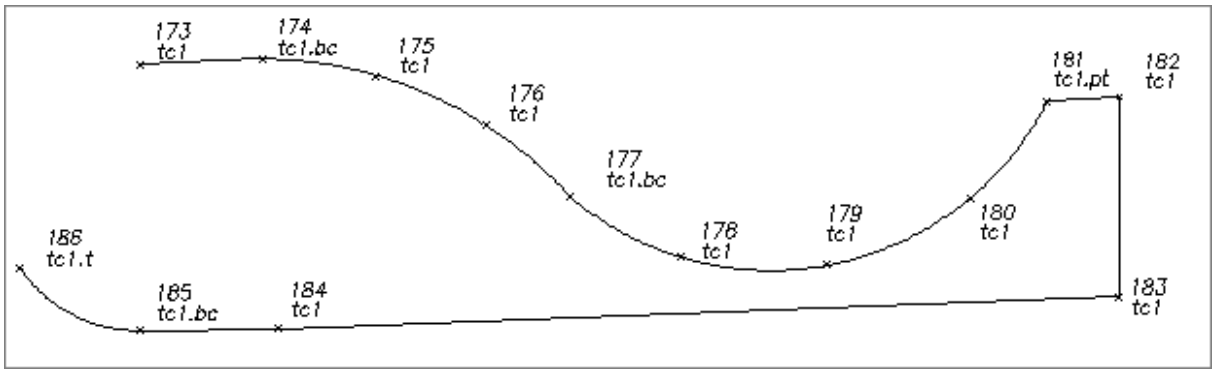
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Note: Field crews do not have to add a description suffix at a point of reverse or compound curve, since the .C3 suffix code only reads three (3) consecutive points. Field crews can add a new C3 to start a new 3-point curve. PConnect checks for direction changes between segments and automatically determines the presence of a PRC or PCC, so there is no need to identify the PRC or PCC when using the C3 suffix code. See points 162 - 171 above.

Curve Example Using Best Fit Curve (.BC) (Best Fit Non-Tangent Curve)

- The polyline, TC1, is drawn starting at point 173, and continues to point 174 where the Best Fit Curve (.BC) code is encountered.
- Starting at point 174, TC1 continues through points 175, 176, 177, 178, 179, 180, and ends at point 181.
- A Best Fit Curve is calculated passing through each of the points.
- At point 181, straight segments begin continuing through points 182, 183, 184, and 185.
- At point 185, a Best Fit Curve (.BC) code is encountered. At point 186, a terminate code is encountered.
- Because this leaves only two points to calculate a curve, and best fit method requires at least three (3) points, PConnect tries to use the (.PT) tangle curve method.
- Since there is a segment before point 185, PConnect calculates the curve between points 185 and 186 using the tangent curve (.PC) method.
- The polyline then ends at point 186.

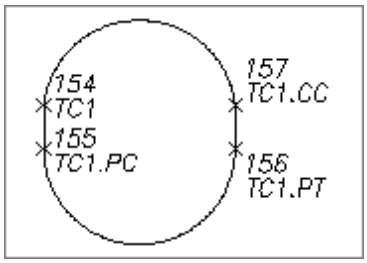


Note: If only two points are encountered after the Best Fit Curve (.BC) code, and the bearings created between the first two points and the second two points differ by less than five (5) degrees, the Begin Curve (.PC) calculation method is used to create a reverse curve. If the Best Fit Curve method was used, the curved segments would appear almost like two straight segments.

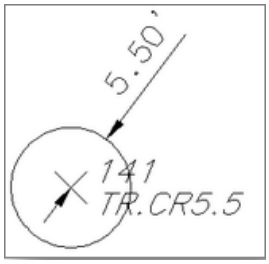
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Close polyline with Curve (.CC)

- To close geometry back to the starting point with a curve segment, add the description suffix Close Curved (.CC).
- The polyline, TC1, is drawn starting at point 154, continues through points 155, 156, and 157 where it encounters the Close Curved (.CC) code, and a final segment is drawn back to the starting point 154 as a tangent curve using the last segment 156 and 157 to calculate the curve.



Circle Example



- To draw a circle at a point, use the circle suffix code and a radius value. The radius (#) must be entered after the circle code (.CR#).
- The circle code can be added to a single description (TR.CR5.5), and a circular polyline (polygon with multiple sides) will be drawn, or it can be one of the multiple descriptions added to a point (EG1 HM.CR5.5).

4.12.2.1.9 PConnect Offset Examples

Suffix Codes Examples for PConnect

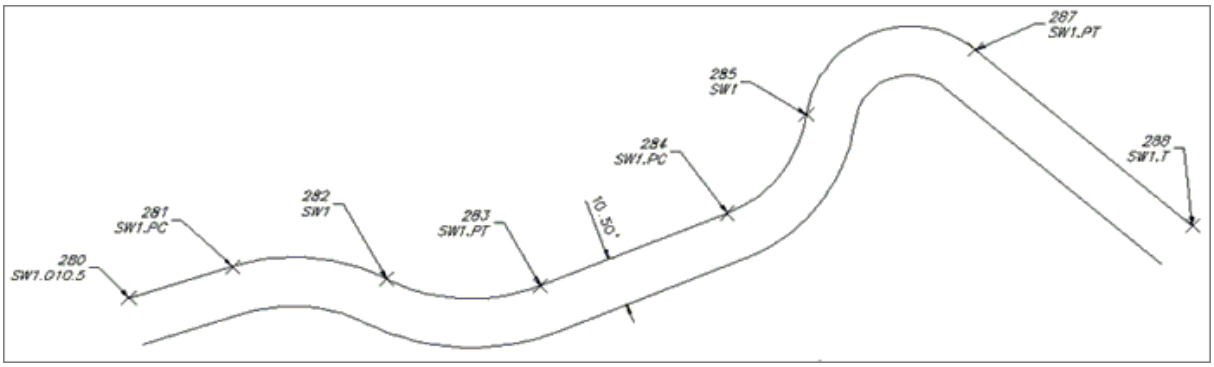
- The Offset (.O#) code is used to offset polylines to either the right, with a positive distance (#), or to the left, with a negative distance (#).
- The Offset code is terminated by Offset Terminate (.OT), another Offset, a Middle, or a Template code.
- The Offset, Middle, or Template suffix codes cannot be combined.
- The Offset code can be associated to the first (primary) description or any of the descriptions when using multiple descriptions assigned to a single point.
- When it is not the primary description key, the offset follows the primary description for the path but uses the offset description for the layer and any Elevation on Offset adjustment.

Example of Using the Offset Suffix Code:

Example of Offset along a Path:

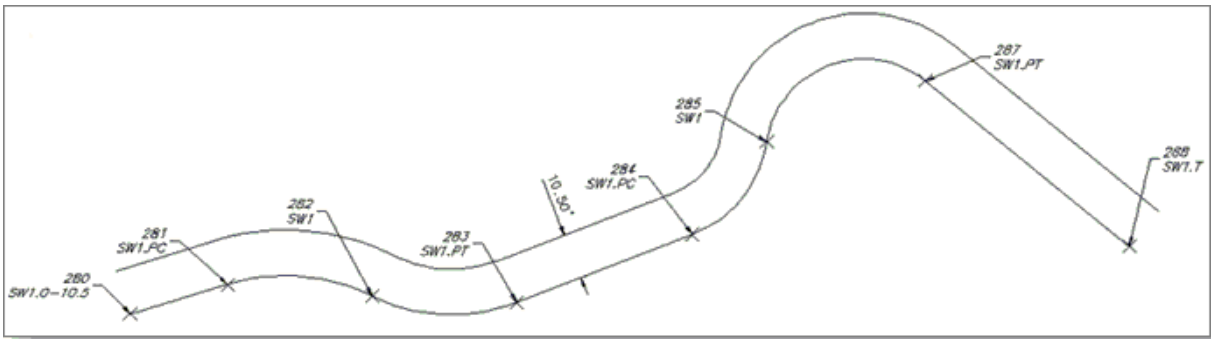
- A polyline, SW1, is drawn starting at point 280 and ending at point 288, creating curves and lines per the encountered suffix codes.
- The offset polyline, SW1, is drawn at 10.5 units to the right side of the original path of the collected points starting at point 280 and ending at point 288, creating curves and lines per the encountered suffix codes.

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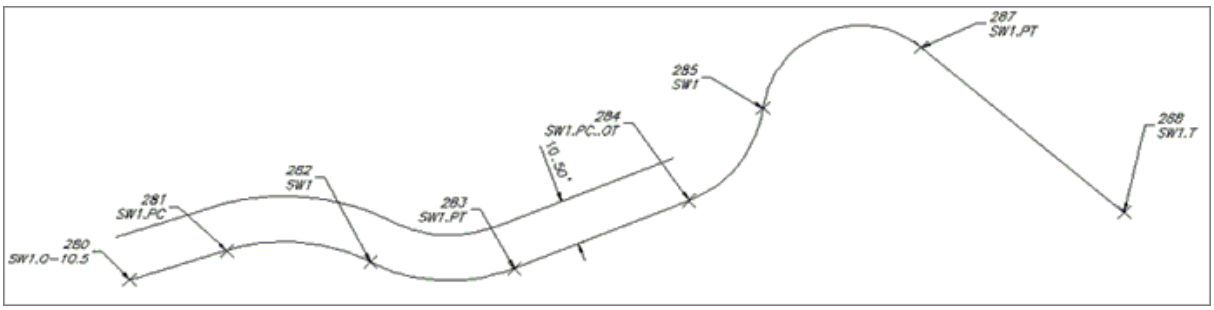
Note: The offset polylines will create a fillet with a zero (0) distance if the offset is larger than a calculated curve radius.

- A polyline, SW1, is drawn starting at point 280 and ending at point 288, creating curves and lines per the encountered suffix codes.
- The offset polyline, SW1, is drawn at 10.5 units to the left side of the original path of the collected points, starting at point 280 and ending at point 288, creating curves and lines per the encountered suffix codes.



Example of Offset Stopping before the End of the Original Path:

- A polyline, SW1, is drawn starting at point 280 and ending at point 288, creating curves and lines per the encountered suffix codes.
- The offset polyline, SW1, is drawn at 10.5 units to the left side of the original path of the collected points, starting at point 280 and ending at point 284 where it encounters the Offset Terminate (.OT) code.

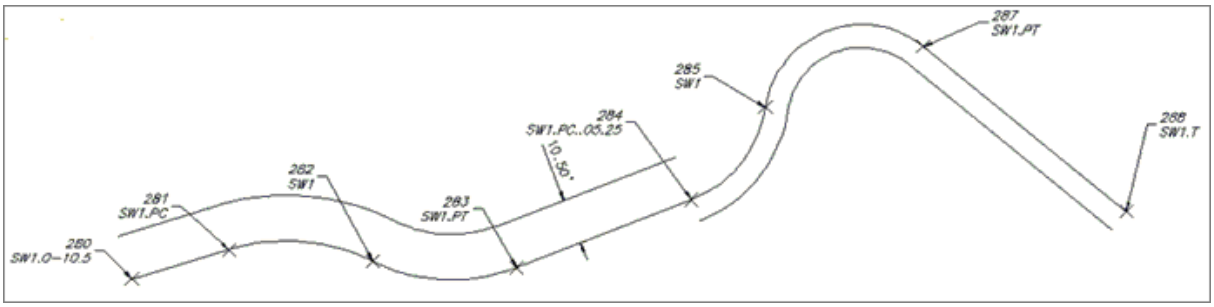


Example of Offset Where the Offset Changes:

- A polyline, SW1, is drawn starting at point 280 and ending at point 288, creating curves and lines per the encountered suffix codes.

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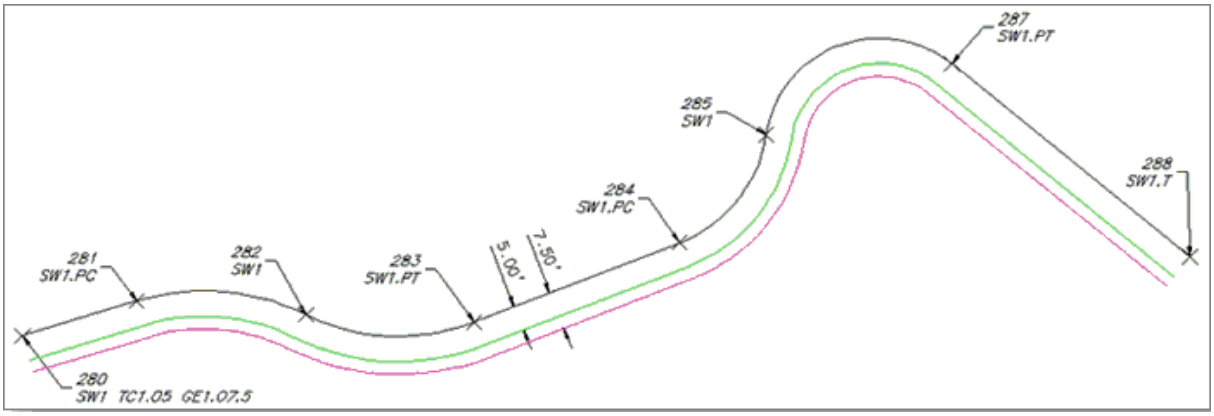
- The first offset polyline, SW1, is drawn at 10.5 units to the left side of the original path of the collected points starting at point 280 and ending at point 284 when it encounters the second Offset (.O5.25) code.
- The second offset polyline, SW1, is drawn at 5.25 units to the right side of the original path of the collected points starting at point 284 and ends at point 288 when it encounters the terminate (.T) code.



Note: There is not a transition from the first Offset code offset distance (-10.5) to the second Offset code offset distance (5.25); the first one stops, and the second one begins.

Example of Multiple Offsets to Different Layers:

- The first point along the SW1 path has three description keys.
- The second and third description keys have the Offset (#) code.
- A polyline, SW1, is drawn starting at point 280 and ending at point 288, creating curves and lines per the encountered suffix codes.
- The first offset polyline, TC1, is drawn at 5.0 units to the right side of the original path on the layer specified by the TC# description key in the description key style file.
- The second offset polyline, GE1, is drawn at 7.5 units to the right side of the original path on the layer specified by the GE# description key in the description key style file.



4.12.2.1.10 PConnect Middle Examples

Suffix Codes Examples for PConnect

- The Middle (.M#) code is used to offset polylines on both the right and left sides of the collected points at half (1/2) the specified distance (#).

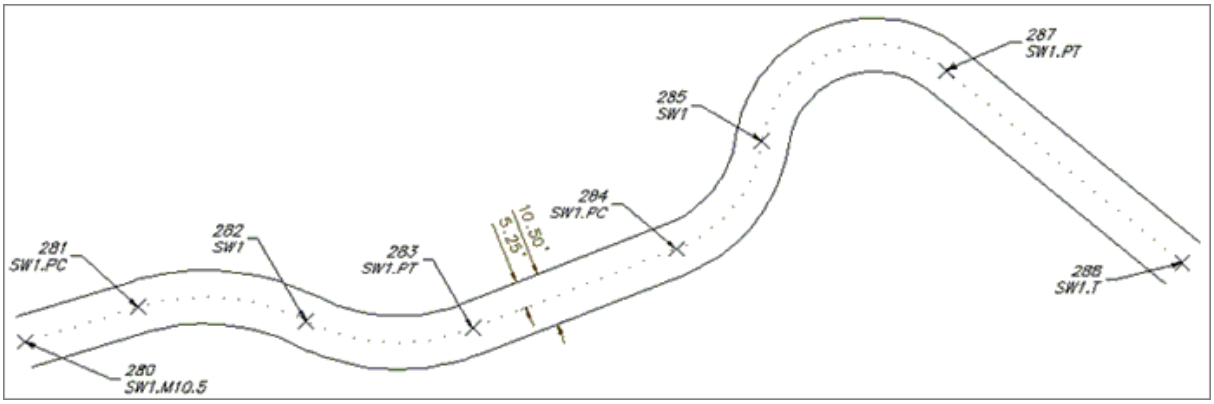
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- No polyline is drawn along the originally collected point's path.
- The Middle code is terminated by Offset Terminate (.OT), another Middle, an Offset, or a Template code.
- The Offset, Middle, or Template suffix codes cannot be combined.
- The Middle code can be associated to the first (primary) description but not to any other when multiple descriptions are assigned to a single point.
- The Elevation on Offset (.Z#) code can adjust the elevations anywhere along the Middle polyline.

Example of Using the Middle Suffix Code:

Example of Middle along a Path:

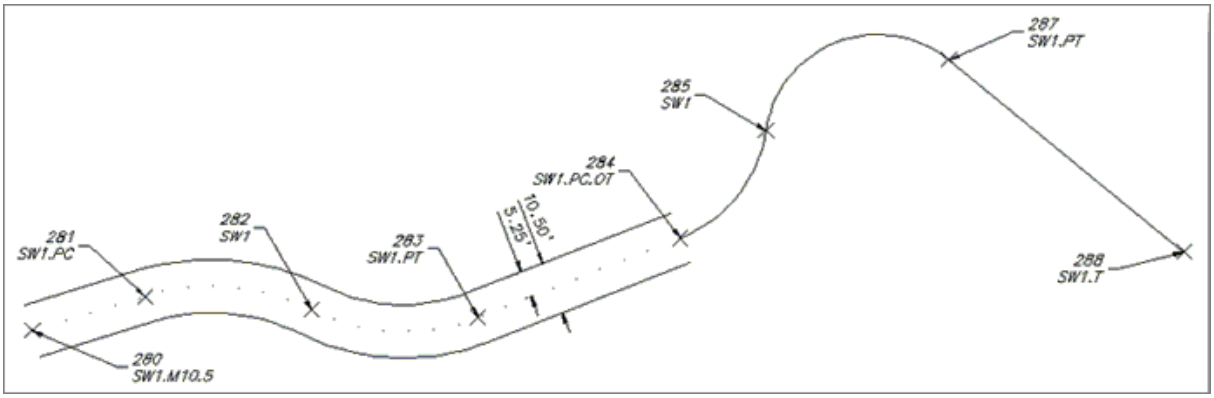
- The offset polylines, SW1, are drawn at 5.25 units each side of the original path of the collected points starting at point 280 and ending at point 288, creating curves and lines per the encountered suffix codes.



Note: The offset polylines will create a fillet with a zero (0) distance if the offset is larger than a calculated curve radius.

Example of Middle Stopping before the End of the Original Path:

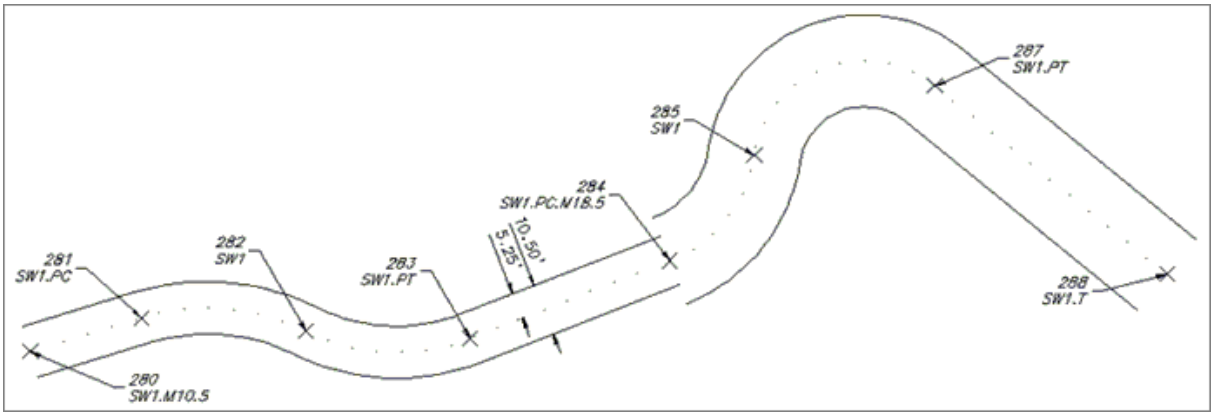
- The offset polylines, SW1, are drawn at 5.25 units each side of the original path of the collected points starting at point 280 and ending at point 284, creating curves and lines per the encountered suffix codes.
- It encounters an Offset Terminate (.OT) code at point 284.
- The offsets end and a single polyline is drawn starting at point 284, continuing through points 285, 287, and ending at point 288.



Example of Middle Change Offset Distance before the End of the Original Path.

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- The offset polylines, SW1, are drawn at 5.25 units each side of the original path of the collected points starting at point 280 and ending at point 284, creating curves and lines per the encountered suffix codes.
- It encounters another Middle (.M18.5) code at point 284.
- The second set of offset polylines, SW1, are drawn at 9.25 units each side of the original path of the collected points starting at point 284 and ending at point 288, creating curves and lines per the encountered suffix codes.



Note: There is not a transition from the first Middle code offset distance (10.5) to the second Middle code offset distance (18.5); the first one stops, and the second one begins.

4.12.2.1.11 PConnect Template Examples

Suffix Codes Examples for PConnect

The Template code is for collecting a single point along a feature in the field which follows a specific pattern of offsets and heights.

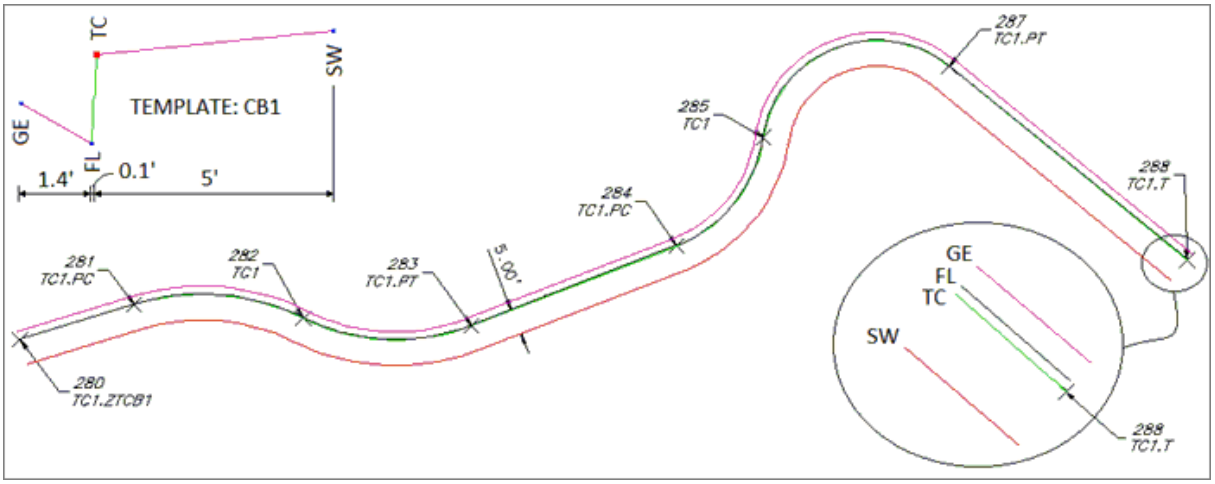
- The Template (.ZT#) code can be used to offset polylines on both the right and left sides multiple times and with elevation adjustments.
- The template name (#) specifies the template file to be used.
- Add the template name (#) to the template code (.ZT#) to start using a template.
- If the template is to be mirrored, add the "-" negative character before the template name (e.g., .ZT-CB1).
- The Template Terminate code (.ZT) is the Template code without a template name. Using this code ends the offsets started in a template.
- The Template code is terminated by Offset Terminate (.OT), another Template, a Middle, or an Offset code. The Offset, Middle, or Template suffix codes cannot be combined.
- The Template code can be associated to the first (primary) description but not to any other when multiple descriptions are assigned to a single point.
- The Elevation on Offset (.Z#) code can replace the elevation of the first segment to the right or left (as defined in the template) of the field shot point.
- Templates are created and modified with the PConnect Template Manager.

Example of Using the Template Suffix Code:

Example of a Template along a Path:

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- The template CB1 has three offsets: The first offset, SW, is 5.0 units to the right of the field shot point (red dot, TC). The second offset, FL, is 0.1 units to the left of the field shot point. The third offset, GE, is 1.4 units left of the second offset.
- The polyline, TC1 (green line), is drawn starting at point 280 and ending at point 288, creating curves and lines per the encountered suffix codes.
- The first offset polyline, SW1 (red line), is drawn at 5.0 units to the right of the original path of the collected point starting at point 280 and ending at point 288, creating curves and lines per the encountered suffix codes.
- The second offset polyline, FL1 (black line), is drawn at 0.1 units to the left of the original path of the collected points starting at point 280 and ending at point 288, creating curves and lines per the encountered suffix codes.
- The third offset polyline, GE1 (magenta line), is drawn at 1.5 (0.1 + 1.4) units to the left of the original path of the collected points starting at point 280 and ending at point 288, creating curves and lines per the encountered suffix codes.

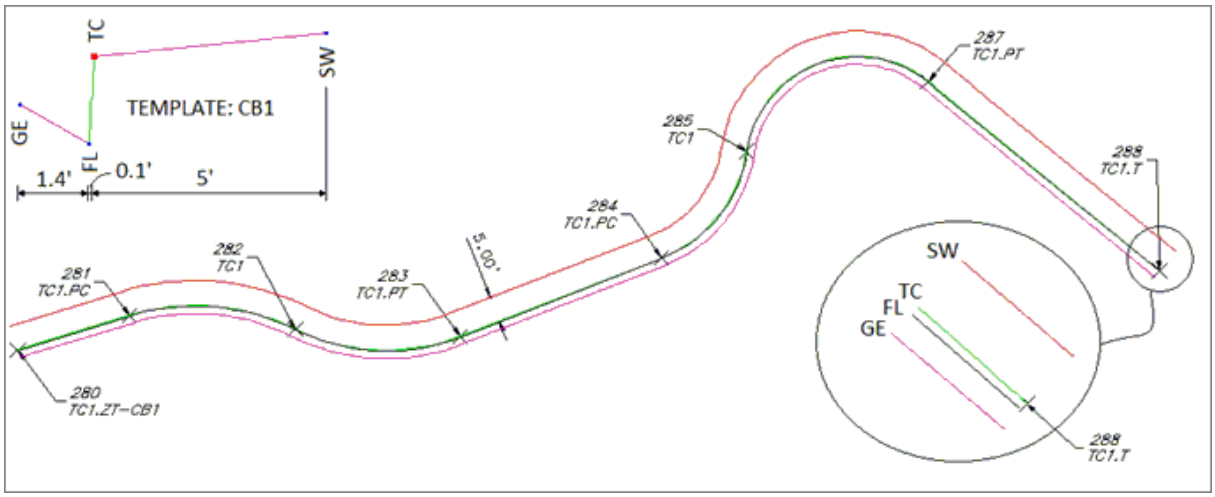


Note: The offset polylines will create a fillet with a zero (0) distance if the offset is larger than a calculated curve radius.

Example of a Template along a Path Mirrored:

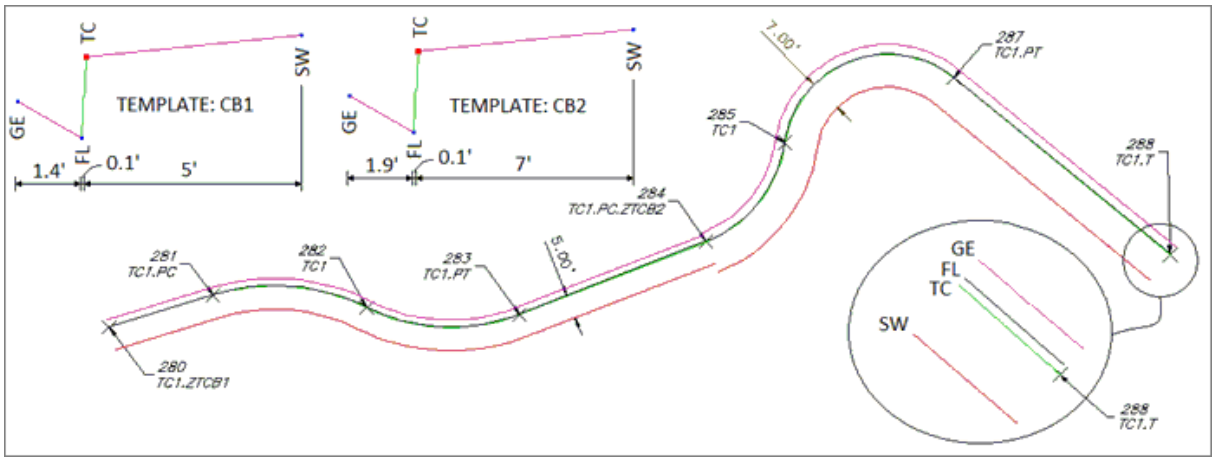
- The template CB1 has three offsets: The first offset, SW, is 5.0 units to the right of the field shot point (red dot, TC). The second offset, FL, is 0.1 units to the left of the field shot point. The third offset, GE, is 1.4 units left of the second offset.
- When a "-" negative character is added between the Template code (.ZT) and the template name (#), the template offset distances are mirrored (reversed) about the field shot point (red dot) in the template.
- The polyline, TC1 (green line), is drawn starting at point 280 and ending at point 288, creating curves and lines per the encountered suffix codes.
- The first offset polyline, SW1 (red line), is drawn at 5.0 units to the left of the original path of the collected points starting at point 280 and ending at point 288, creating curves and lines per the encountered suffix codes.
- The second offset polyline, FL1 (black line), is drawn at 0.1 units to the right of the original path of the collected points starting at point 280 and ending at point 288, creating curves and lines per the encountered suffix codes.
- The third offset polyline, GE1 (magenta line), is drawn at 1.5 (0.1 + 1.4) units to the right of the original path of the collected points starting at point 280 and ending at point 288, creating curves and lines per the encountered suffix codes.

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Example of a Template Change along a Path:

- The template, CB1, has three offsets. The first offset, SW, is 5.0 units to the right of the field shot point (red dot, TC). The second offset, FL, is 0.1 units to the left of the field shot point. The third offset, GE, is 1.4 units left of the second offset.
- The template, CB3, has three offsets. The first offset, SW, is 5.0 units to the right of the field shot point (red dot, TC). The second offset, FL, is 0.1 units to the left of the field shot point. The third offset, GE, is 1.4 units to the left of the second offset.
- The polyline, SW1, is drawn starting at point 280 and ending at point 288, creating curves and lines per the encountered suffix codes.
- The first offset polyline, SW1, is drawn at 10.5 units to the left of the original path of the collected points starting at point 280 and ending at point 284, when it encounters the second Offset (.O5.25) code.
- The second offset polyline, SW1, is drawn at 5.25 units to the right of the original path of the collected points starting at point 284 and ending at point 288, when it encounters the Terminate (.T) code.



Note: There is not a transition from the first Template to the second Template; the first one stops, and the second one begins.

4.12.2.1.12 PConnect Elevation on Offsets Examples

Suffix Codes Examples for PConnect

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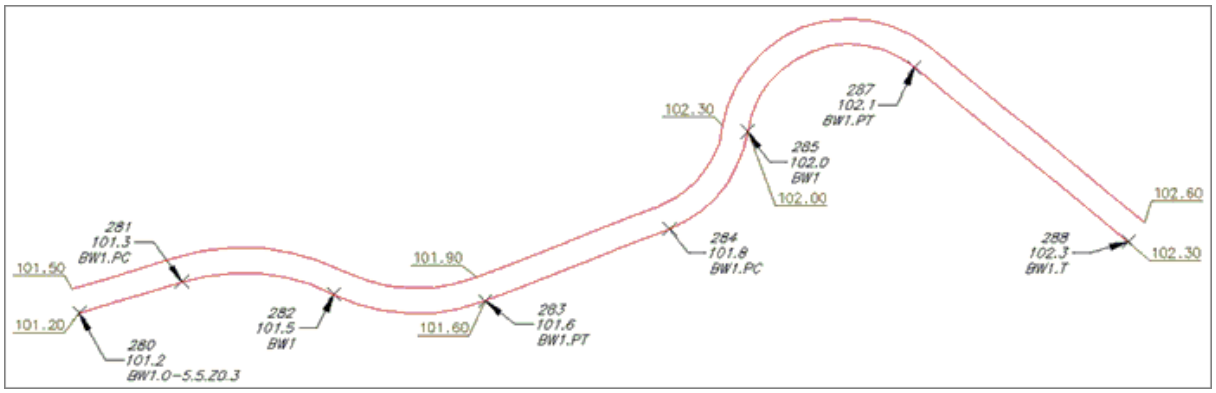
This code only applies to PConnect Draw Options: 3D polyline and Civil 3D survey gigures.

- The Elevation on Offset (.Z#) code does not adjust the elevation on individual points or elevations along the original path of a polyline.
- The Elevation on Offset (.Z#) code adjusts the elevation of the offset and middle offset polylines.
- If the Elevation on Offset (.Z) code is used without an adjustment number (#), the elevations are not adjusted from this point forward.
- The Elevation on Offset (.Z#) code replaces the first height value specified in a PConnect Template.
- If the Elevation on Offset (.Z) code is used without an adjustment number (#) when a template is active, the replaced height returns to the height specified in the template.

Example of Using the Elevation on Offsets Suffix Code:

Example of Elevation Change on Offset Using the 3D polylines Draw Option:

- The Elevation on Offset (.Z#) code adjusts the collected elevation of a point by the height (#) value.
- A 3D polyline, SW1, is drawn starting at point 280 and ending at point 288, creating curves and lines per the encountered suffix codes and at the elevations associated to the points.
- The offset 3D polyline, SW1, is drawn at 5.5 units to the left of the original path of the collected points, starting at point 280 and ending at point 288, creating curves and lines per the encountered suffix codes and at the adjusted elevations of 0.3.
- Note the elevations at points 280, 283, 285, and 288.
- The elevations along the original path are the same as the elevation of the associated point, but the elevations along the offset 3D polyline are 0.3 higher than the elevation associated to the original point.

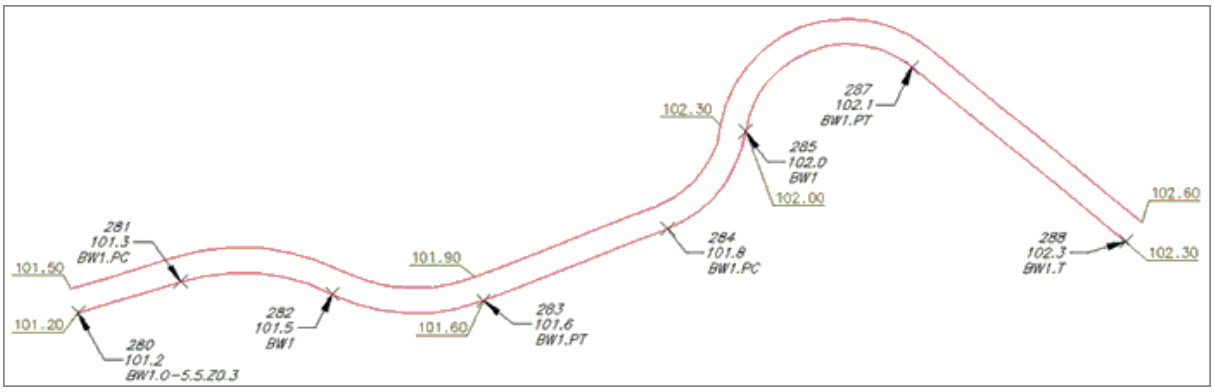


Example of Elevation Change on Offset Using the 3D polylines Draw Option

- Using the same points from above, but with one modification to the description of point 284, the Elevation on Offset (.Z) suffix code is added without an adjustment value.
- A 3D polyline, SW1, is drawn starting at point 280 and ending at point 288, creating curves and lines per the encountered suffix codes and at the elevations associated to the points.
- The offset 3D polyline, SW1, is drawn at 5.5 units to the left of the original path of the collected points.
- Starting at point 280 and continues through point 283, the elevations on the offset 3D polyline have been adjusted higher by 0.3 units. Starting at point 284 through point 288, the elevations on the offset 3D polyline are the same as the associated point.

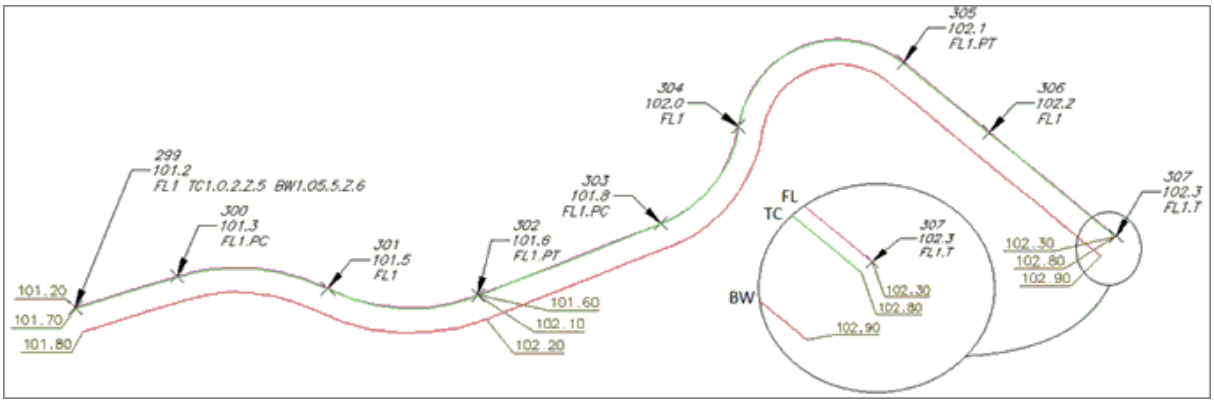
Note: Like all elevations between points on a 3D polyline, there is a linear interpolation of the elevations on the offset 3D polyline between points 283 and 284.

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Example of Elevation Change on Offset Using the 3D polylines Draw Option:

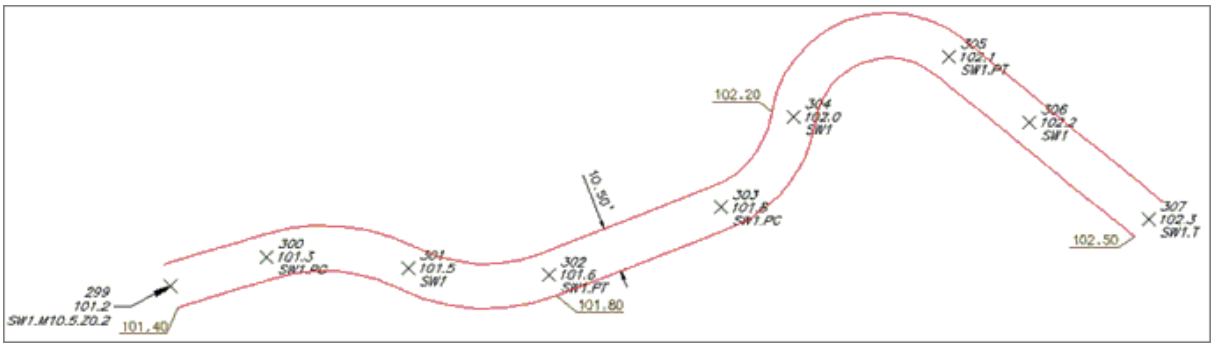
- A third example uses three (3) descriptions, with the second and third descriptions having both an Offset (.O#) and an Elevation on Offset (.Z#) suffix code.
- A 3D polyline, FL1, is drawn starting at point 299 and ending at point 307, creating curves and lines per the encountered suffix codes and at the elevations associated to the points.
- The first offset 3D polyline, TC1, is drawn at 0.2 units to the right of the original path of the collected points with elevations 0.5 units higher than the elevations of the associated points.
- The second offset 3D polyline, BW1, is drawn at 5.5 units to the right of the original path of the collected points with elevations 0.6 units higher than the elevations of the associated points.



Example of Elevation Change on Middle Using the 3D polylines Draw Option:

- The Elevation on Offset (.Z#) code adjusts the collected elevation of a point by the height (#) value.
- No 3D polyline is drawn along the original path when using the Middle suffix code.
- Two offset 3D polylines, SW1, are drawn at 5.25 units each side of the original path of the collected point starting at point 299 and ending at point 307, creating curves and lines per the encountered suffix codes.
- The elevations on the offset 3D polylines are 0.2 units higher than the elevations associated to the original points.

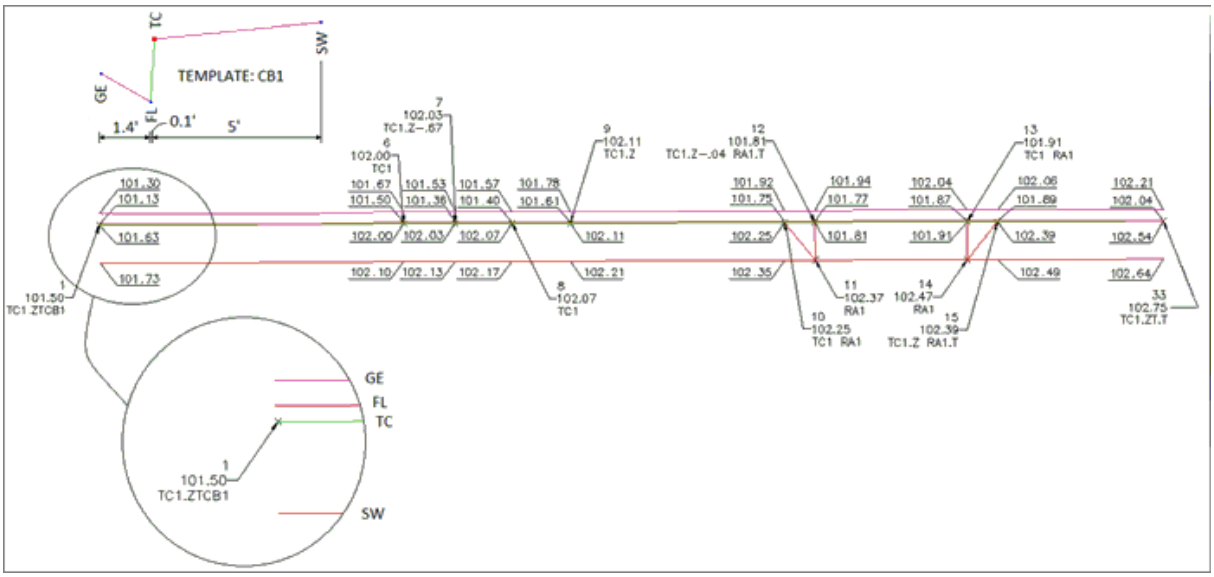
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Example of Elevation Change on Template

- The Elevation on Offset (.Z#) code replaces the green segment's height (as displayed in the PConnect Template Manager) with the height (#) on the code.
- A 3D polyline, TC1, is drawn starting at point 1, through points 6, 7, 8, 9, 10, 12, 13, and ending at point 33 at the elevations associated to the points.
- From the template, three additional offsets are specified, GE, FL, and SW.
- SW is 5.0 units to the right and 0.1 units higher than TC1.
- FL is 0.1 units to the left and 0.5 units lower than TC1.
- GE is 1.4 units to the left and 0.17 units higher than FL.
- At point 7, notice the Elevation on Offset (.Z-.67).
- The -0.5 height defined in the template (green segment) will be replaced with -0.67, due to a curb inlet, and will continue through point 8.
- At point 9, notice the Elevation on Offset (.Z) without a value.
- The temporary height of -0.67, for the green segment, returns to the defined height of -0.5.
- Compared to the associated elevations of TC1, the 3D polylines drawn along the FL between points 6 and 7 transition from -0.5 at point 6 to -0.67 at point 7 and transition between points 8 and 9 from -0.67 to -0.05.
- At point 10, notice the two descriptions, TC1 and RA1. A 3D polyline drawn along RA starts at point 10, continues through point 11, and ends at point 12, which also has two descriptions, TC1 and RA1.T.
- At point 12, notice the Elevation on Offset (.Z-.04). The -0.5 height defined in the template (green segment) will be replaced with -0.04, due to a driveway, and will continue through point 14.
- At point 15, notice the Elevation on Offset (.Z) without a value. The temporary height of -0.04, for the green segment, returns to the defined height of -0.5.
- The 3D polylines drawn along the FL between points 10 and 12 transition from -0.5 at point 10 to -0.04 at point 12, relative to the associated elevations, and transition between points 13 and 14 from -0.04 to -0.05.
- The elevations on the offset 3D polylines, SW, are 0.1 higher than the elevations associated to the original points.

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4.12.2.1.13 PConnect Terminate and Recall Examples

Suffix Codes Examples for PConnect

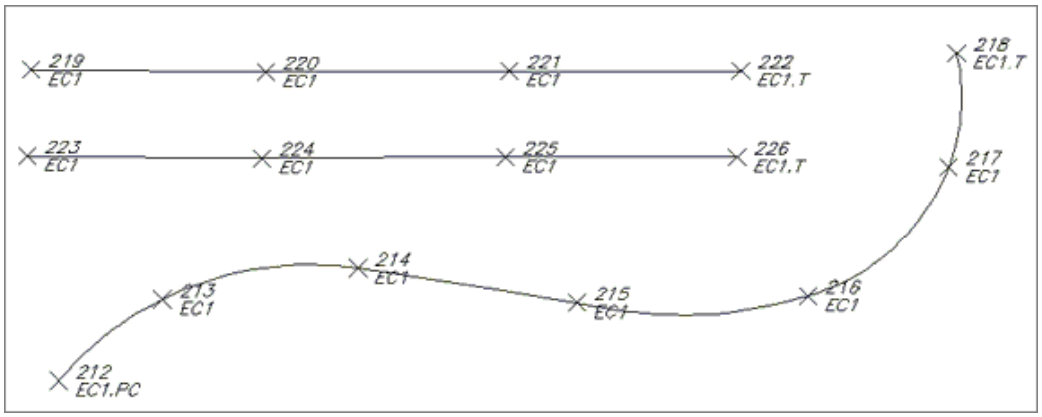
- The Terminate suffix code ends a polyline / survey figure drawn along the same description key code, i.e., EC1.
- The Terminate suffix code also terminates offsets, middles, and templates.
- There are two types of Terminate suffix codes; one without a point number following the code (.T) and one with a point number (.T100) following it.
- When a point number is added to the Terminate code, the polyline ends at the coordinate value of the point number.
- PConnect normally processes points in ascending point number order.
- Using a point number after the Terminate suffix code allows the polyline to end on a coordinate with a lower point number than the current point number.
- The Terminate suffix code can be combined with the Turn 90 Degree Angle (.TN), Extend (.E), Square (.SQ), and Circle (.CR) codes
- The Terminate to point number (#) suffix code can be combined with the Begin Curve (.PC) , End Curve (.PT), Right Angle Back (.RA), Turn 90 Degree Angle (.TN), Extend (.E), and can be used on the point just after the 3-point curve (.C3).

Example of Using the Terminate Suffix Code:

Terminate and Description Keys:

- PConnect creates a polyline along points with a common description.
- Once the Terminate code has been added to a description (e.g., EC1.T), the next time EC1 is used, a new polyline is started. In the examples below, three separate polylines are drawn using the same description of EC1, and they are terminated at points 218, 222, and 226 because of the added Terminate code (.T).

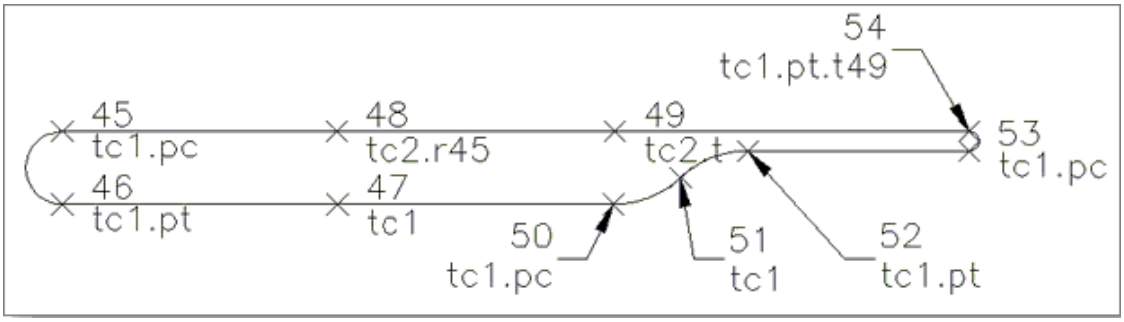
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Terminate to Point Number Examples:

The Terminate suffix code can be followed by a point number. When the Terminate suffix code is followed by a point number (#), it terminates at the specified point. This allows a non-sequential or previous point to be added to the end of a polyline. The description of the specified point is ignored.

- In the example below, the point 54 has two suffix codes, the End Curve (.PT) and the Terminate to # (.T49).
- The curve started at point 53 and ends at point 54; and the polyline started at point 45, and ends at point 49.
- Also note the recall to point (.R45) at point 48.
- A second polyline is drawn starting at point 45, continues through point 48, and ends at point 49.

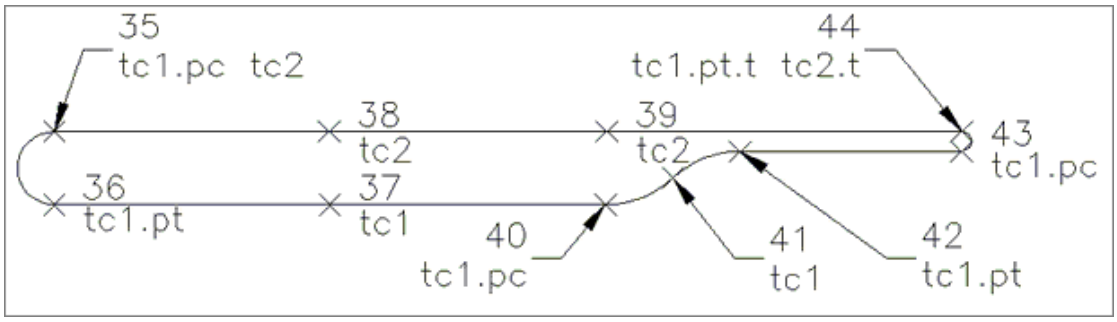


Note: To use these options, the field crew will have to note the point numbers used with the Terminate and Recall suffix codes.

Example using Cross Section Method of Collecting Points:

- The first polyline, TC1, is drawn starting at point 35, continuing through points 36, 37, 40, 41, 42, 43, and ending at point 44 (TC1.PT.T).
- The second polyline, TC2, is drawn starting at point 35 (second description key at point 35), continuing through points 38, 39, and ending at point 44 (TC2.T).

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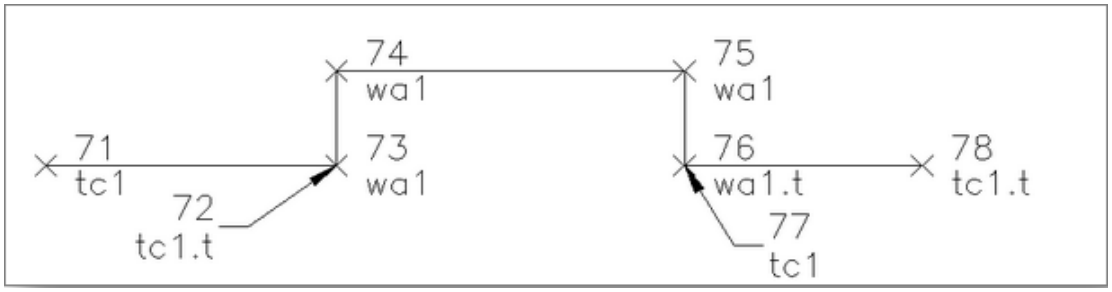


Example Terminating Linework and Recalling a Point:

Examples of drawing a trash enclosure using three different methods are provided below.

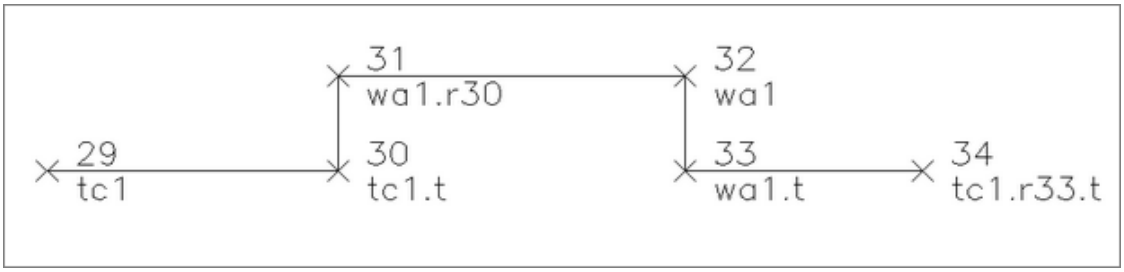
Example Using Two Points Collected at the Same Location:

- The first polyline, TC1, is drawn starting at point 71 and ends at point 72.
- The second polyline, WA1, is drawn starting at point 73 (a second point collected at the same location as point 72), continues through points 74, 75, and ends at point 76.
- The third polyline, TC1, is drawn starting at 77 and ends at point 78.



Example of Same Geometry Using Recall Point Number (R#):

- The first polyline, TC1, is drawn starting at point 29 and ending at point 30.
- The first point number with the WA1 description key is point 31; but with the recall at # (.R30), the second polyline is drawn starting at point 30, continues through points 31, 32, and ends at point 33.
- The third polyline, TC1, only has one point 34, but with the recall at # (.R33), a polyline will be drawn starting at point 33, and end at point 34.

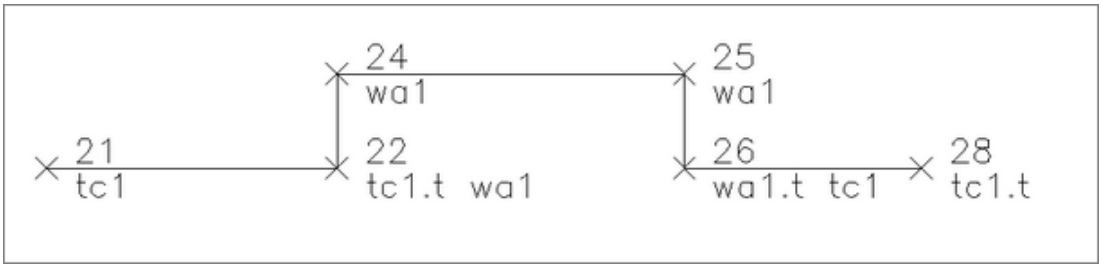


Example of Same Geometry Using Multiple Descriptions at a Single Point:

- The final example uses multiple description keys at a single point.
- The first polyline, TC1, is drawn starting at point 21 and end at point 22.
- The second polyline, WA1, drawn starting at point 22 (due to the second description), continues through points 24, 25, and ends at point 26.

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- The third polyline, TC1, drawn starting at point 26, ends at point 28.



4.12.2.1.14 PConnect Multiple Descriptions Examples

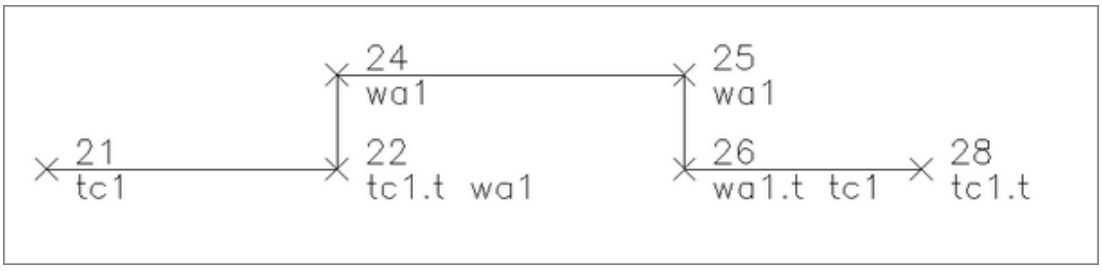
Suffix Codes Examples for PConnect

- PConnect allows the field crew to assign multiple descriptions to the same field point.
- A space is required between each description to separate them and indicate to PConnect that there are multiple descriptions.
- Each description can also have a separate suffix code or no suffix code.

Multiple Descriptions Examples

Example of Drawing a Trash Enclosure:

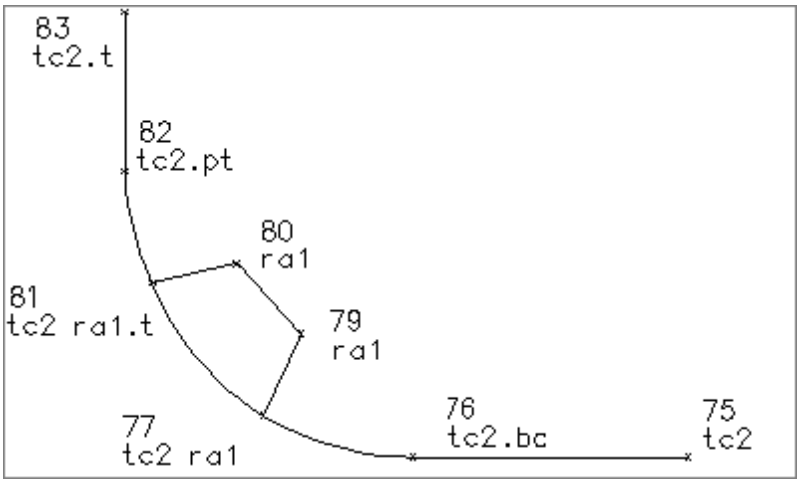
- The first polyline, TC1, starts at point 21 and ends at point 22.
- The second polyline, WA1, starts at point 22 (due to second the description) and travels through points 24, and 25, and ends at point 26.
- The third polyline, TC1, starts at point 26 and ends at point 28.



Example of Drawing a Pedestrian Ramp:

- The first polyline, TC2, starts at point 75, continues through points 76, 77, 81, and 82, and ends at point 83.
- The pedestrian ramp (RA1) starts at point 77, continues through points 79, and 80, and ends at point 81.

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4.12.2.1.15 PConnect Cross-Section Examples

Suffix Codes Examples for PConnect

- PConnect allows the field crew to collect common features in the cross-section method of data collection.
- The field crew must use a unique description key with a different index number (#) to identify each feature.
- Once a Terminate (.T), Rectangle (.RCT), Close Straight (.CS), or Close Curved (.CC) code is encountered, the same description and index number (#) can be used again.
- Example: TC1 for Top-of Curb on the left and TC2 for Top-of-Curb on the right.

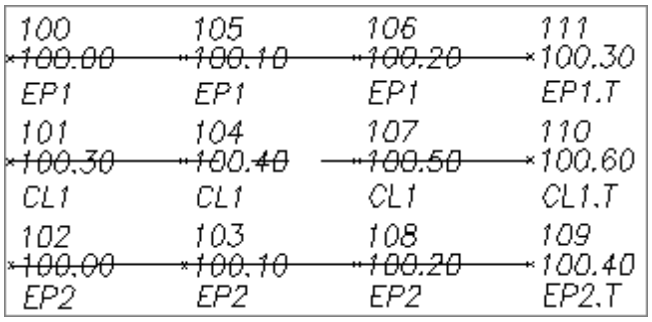
Cross-Section Data Collection Examples

A Simple Cross-Section Example:

In this simple example, the field crew is collecting edge-of-pavement (EP#) on either side of the street. As long as each EP has a unique number (#), PConnect processes each as a separate description key. PConnect still processes point numbers in ascending order but makes a distinction between EP1 and EP2.

- The first polyline, EP1, is drawn starting at point 100, continues through points 105, 106, and ends at point 111 where it encounters the Terminate (.T) code.
- The second polyline, CL1, is drawn starting at point 101, continues through points 104, 107, and ends at point 110 where it encounters the Terminate (.T) code.
- The third polyline, EP2, is drawn starting at point 102, continues through points 103, 108, and ends at point 109 where it encounters the Terminate (.T) code.

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A Complex Cross-Section Example:

In this complex example, the field crew is collecting data along a street using the cross-section method, encounters an intersection and collects shots on either side, and then continues collecting data down the street.

Starting along the Main Street:

- The field data was started at a point on the top of curb on the southwest side of the main street at point 1.
- The point is assigned TC1 with the template name CB1 (.TC1.ZTCB1).
- On the northeast side of the main street, the top of curb is assigned TC2 with the same template mirrored (.ZT-CB1) at point 3.
- As the field crew moves eastward along the street, it encounters a median starting at point 5.
- At this point, the median will have two sides: the north side TC3 and the south side TC4.
- Point 5 is assigned two descriptions: TC3 for the north side and TC4.PC (also a begin curve) for the south side.

Electrical Vault:

- Continuing down the street, the field crew encounters an electrical value and collects two points, 14 and 15, along one side and assigns the Rectangle (.RCT#) code with an offset distance (#) of 4.2 units.
- This draws a rectangular polyline that is 4.2 units wide.
- At point 19, the field crew assigns the Begin Curve (.PC) code to draw the turn lane.

Coming to the Intersection:

- As the filed crew nears the intersection, on the north side of the street, the Terminate Template (.ZT) code is assigned to point 27.
- To complete the median, the field crew assigns both the Begin Curve (.PT) and Terminate to P# (.T#) codes to point 29 (TC3).
- Since the field crew knows the next point will be 30, it assigns the Terminate to P# (.T30) code to point 29.
- When the flied crew collects point 30, it assigns the description TC4 with the Terminate (.T) code.
- The south side of the median curb (TC4) starts at point 5, continues through points 7, 10, 19, 22, 24, and ends at point 30 with the Terminate code.
- The north side of the median curb (TC3) also starts at point 5, continues through points 12, 17, 25, 29, and ends at point 30.
- On the south side of the street, the template running along TC1 is terminated at point 33 using the Template Terminate (.ZT) code.

Southwest Corner Curb Return:

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- Since the template stops at point 33, to draw the back of the sidewalk line around the curb return, the field crew starts at point 34 and continues through points 35, 36, 37, 44, 45, and ends at 46 with a Terminate (.T) code.
- In the middle of collecting the WB1 line, the crew collects point 38 with both a TC1 (to continue the TC1 into a curve around the curb return at starting point 33) and RA1 (ramp), a second RA2 ramp line is shot at point 39, with both RA1 and RA2 going to point 40, and RA2 terminates at this point.
- RA1 continues to point 41, and RA3 is also assigned to start a third ramp line.
- Point 42 Terminates (.T) RA3 at point 43, RA1 is Terminated (.T) at point 43, which is also assigned TC1 to continue the top of curb curve starting at point 33, continues through points 38, 43, and ends at point 47.

Side Street:

- At point 47, the Template CB1 is assigned again (.ZTCB1) to run through point 51 where the template CB1 is terminated (.ZT).

Cross-Gutter:

- Starting at point 48, GE3, begins and continues through points 49, 56, 59, and ends at point 60 (GE3.T).

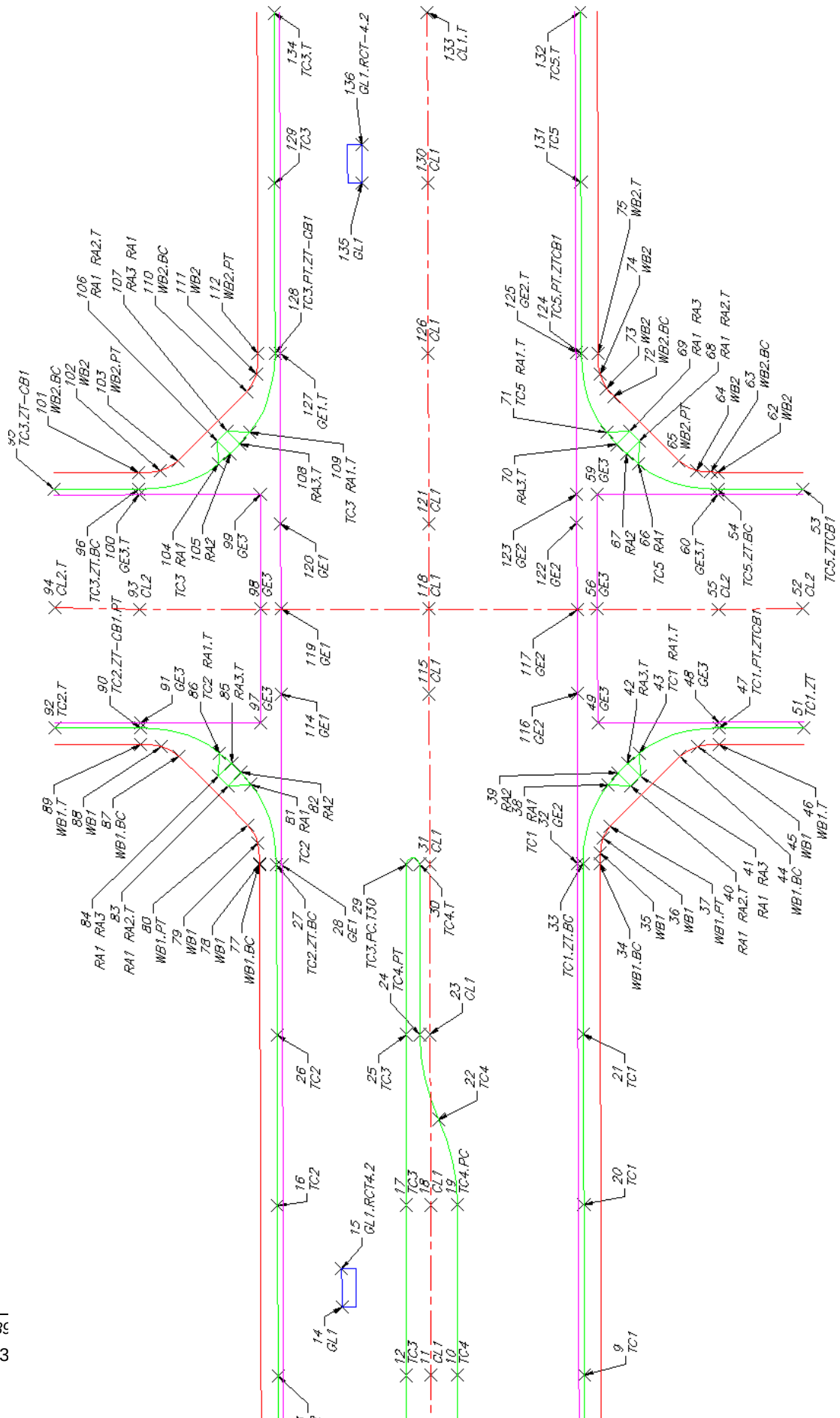
The processes of starting and stopping templates for the back of sidewalk, ramp line, cross-gutters, and curbs are used on the other three curb returns, as well. Once the three curb returns and cross street points are collected, the main street cross-section collection begins again.

- On the north side of the main street, at point 114, the GE1 line started at point 28 continues through points 114, 119, 120, and ends at point 127 (GE1.T).
- On the south side of the main street, at point 116, the GE2 line started at point 32 continues through points 116, 117, 122, 123, and ends at point 125 (GE2.T).
- The template CB1 (.ZTCB1) is assigned at point 124 (TC5), continues through point 131, and ends at point 132 where both the polyline for TC5 and the template CB1 end when the Terminate (.T) code is encountered.
- The mirrored template CB1 (.ZT-CB1) is assigned at point 128 (TC3), continues through point 129, and ends at point 134 where both the polyline for TC3 and the mirrored template CB1 end when the Terminate (.T) code is encountered.
- The centerline of the main street is drawn starting at point 2 (CL1), continues through points 6, 11, 18, 23, 31, 115, 118, 121, 126, 130, and ends at point 133 where the Terminate (.T) code is encountered.

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- The centerline of the side street is drawn starting at point 52 (CL2), continues through points 55 and 93, and ends at point 94 where the Terminate (.T) code is encountered.

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Note: Not all the point descriptions and suffix codes have been explained in this example.

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4.12.2.2 PConnect Description Key Style Manager

Create and modify PConnect's Description Key Styles


Button

Ribbon: SmartDraft ▸ Polylines panel ▸ PConnect Tools ▸ 

Toolbar: PConnect Tools on the Layout Tools: 

Menu: SmartDraft ▸ PConnect ▸ PConnect Key Styles Manager

Command entry: **pcm**

Dialog Box Options

Description Keys

Name:	List of the currently defined description key styles. Select the description key style to edit.
Save As:	Copy the current description key style settings into a new style.
Lock:	Set the current description key style (Name: above) as "read-only." Lock a style if you desire to avoid accidental modification. See Unlock Customization Template Files to remove the lock.
Delete:	Delete the current description key style. **Note:** Cannot delete the "default" or a locked style. ***Deleting a style cannot be undone.***
Rename:	Rename the current description key style.
Import:	Create a new description key style from data in a CADVantage formatted PConnect description keys (DAT) file or from Civil 3D's description keys.
Description Keys:	List of the currently defined description keys, the layer(s) polylines that will be created when processing the defined key, and an optional note to describe the description key. Select a Description Key to edit, or remove it.
Find:	Search for text within the description keys.
Add:	Select option to add the key value, layer value, and note value in the edit boxes below the description key list box. **Note:** User cannot add duplicate description keys.
Remove:	Remove the selected description key.
Update:	Update the selected description key values with the values in the edit boxes. **Note:** User cannot update if the key already exists in the list.

Edit Boxes

Key:	Enter a description. The description key must have a unique value and can be numeric and/or character based. They cannot contain spaces. They are similar but not identical to Civil 3D description keys. PConnect uses description keys to associate points by their description value for the purpose of connecting them with polylines, while avoiding points that do not match the description. A description key may contain wildcard character, such as *, ?, #, or @. See Wildcards with the description key.

Layers

Proposed (Button)	Use to select the proposed layer from the current drawing.
Proposed	Enter a layer name or layer database index to associate to the proposed layer type.
Existing (Button)	Use to select the existing layer from the current drawing.

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Existing	Enter a layer name or layer database index to associate to the existing layer type.
Demolition (Button)	Use to select the demolition layer from the current drawing.
Demolition	Enter a layer name or layer database index to associate to the demolition layer type.
Layer Index...	Display the layers and layer database index numbers defined in the layer database. See Layer Database Index. If no layer database index number is specified, SmartDraft supplies index 0 which signifies the symbol will be inserted on layer 0.
Description:	Enter an optional note to describe the description key.
2D	Enter **Yes** if this key is to be processed when the 2D polylines option is selected in PConnect.
3D	Enter **Yes** if this key is to be processed when the 3D polylines option is selected in PConnect.
Buttons	
Apply:	Select to save changes back to the description key style.
Print:	Print the layer database file to Microsoft Window's current default printer.
Export:	Save the Description Key Style as a comma delimited file to help in the process of creating a surveyor's field card.

4.12.2.2.1 Description Key Style File

The description key style is used by PConnect to process point descriptions and place the created polylines on the specified layers.

Description key styles are:

- Stored outside the drawing;
- Have the file extension of ".dsy";
- Are stored in the \labels folder of the current Customization Template;
- Are a comma delimited file where each line contains a description key, layer information, and note to describe the key;
- Are used by PConnect to allow the operator to select which description keys will be used; and
- Can be managed by the PConnect Description Key Style Manager.

Wildcard characters in description keys:

- Each description key must be unique.

Wildcard	Description	Example	
➢ None	Matches the specific description	CL	Matches CL, but ***not*** C, CL1, etc.
➢ # (pound)	Matches any single numeric digit	CL#	Matches CL1, CL2, ... CL9, but ***not*** CL10 because there is a fourth character.
		CL#*	Matches CL1, CL2, ... CL100 and will also match CL1XYZ, but ***not*** EPT1 since the third character is ***not*** a numeric digit.
➢ @ (at)	Matches any single alphabetic character	CL@	Matches CLE, CLX, etc..., but ***not*** CL1, CL2, CL&, or CLXYZ.

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		CL@#*	Matches CL (without anything) or a description starting with CL followed by any single alphabetic (CLT, CLX, CLW, but ***not*** CL1 since the third character is a numeric digit), or a description starting with CL followed by any single alphabetic followed by a single numeric digit (EPT1, EPX3, EPW5, EPW01, but ***not*** EP1 since the third character is a number).
➢ . (period)	Matches any single non-alphanumeric character		
➢ * (asterisk)	Matches any character sequence, including an empty one, and it can be used anywhere in the search pattern: at the beginning, middle, or end	CL*	Matches CL, CL1, CLS, CL100, CL?$#@!, etc.
➢ ? (question mark)	Matches any single character		Matches CL1, CL2, CLX, CL>, CL&, etc.

- When using numeric description keys, wildcards can cause undesired results if not used carefully. A description key of 1* would match 1, 11, 11111, 12345, 1DA1, etc. But an example of where wildcards could work with numeric description keys would be a case where all top of curb features have a description between 10 and 19. In this case, 1# would match all 10 of these possibilities.
- Wildcard characters can be helpful, but if not used correctly, can return some undesired results.

Example 1:

This example includes four description keys within the description key style and points collected with the following descriptions:

	Key	Layer	Description	Points
1.	CL	CL-EX	Centerline	CL, CL1, CL2, CL3,CL15, CLT1, and CLS
2.	CL#*	CL-EX		
3.	CLS	CONC-LIP-EX		
4.	CL*	CL-EX		

- When the first description key, CL, is processed, it will draw polylines connecting the point description with CL.
- When the second description key, CL#*, is processed, it finds only CL1, CL2, CL3, and CL15.
- The wildcard character #* instructs the command to match descriptions starting with CL and any number as the third character. CL15 matches as well since the description starts with CL, and the third character is a number. It does not matter if the fourth character is also a number. If both should be in the description key file, both points with descriptions of CL and CL# will be drawn on the CL-EC.
- When the third description key, CLS, is processed, the command only finds CLS. Since this is placed on a separate layer, this is the desired result.
- When the fourth description key, CL*, is processed, the command finds all the descriptions starting with CL. This is a problem since it will draw polylines for them a second time. **Note**: A description key of CL* would be okay, if there were no other description keys starting with CL.

Example 2:

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- A point description imported from field data reads, "TCDC.PC," which is intended to represent "Top of Depressed Curb/PC" (beginning of arc).
- With a description key of "TC*", PConnect recognizes the description and even recognizes the suffix code ".PC."
- ***However***, it will also match a description of TCD when the field personnel intend to describe a "Traffic Control Device."

Use caution to avoid similar confusion with suffix codes. As in the example where a "TCP" was intended to be a "Top of Curb Piece," because the suffix code for a PC was set to "P," it is treated as the beginning of an arc for a "Top of Curb."

It is required to use a period "." as the first character for all the suffix codes.

Example 3:

This example demonstrates the method using "G" (with no wildcards) as the key:

Point	North	East	Elevation	Description	Match
101	1193.3282	1136.4035	97.95	FH	
102	1219.4643	1121.8127	100.07	G.R99	Yes
103	1242.0138	1109.2242	101.14	G.PC	Yes
104	1261.1244	1116.3927	101.75	G1DC	
105	1234.4419	1137.6957	99.35	WV	
106	1216.5331	1151.9939	97.36	G.PT	Yes
107	1199.2768	1165.7712	96.08	G1	
108	1201.1581	1206.0286	92.96	G	Yes
109	1227.3876	1187.4109	91.34	G.T	Yes

Note: Points 102, 103, 106, and 109 are included; because they also contain the recognized suffix codes for recalling a point (.R99), begin curve (.PC), end curve (.PT), and terminating the polyline (.T).

Example 4:

Demonstrates the method using "G1*" (with wildcard) as the key:

Point	North	East	Elevation	Description	Match
101	1193.3282	1136.4035	97.95	FH	
102	1219.4643	1121.8127	100.07	G1DC	Yes
103	1242.0138	1109.2242	101.14	G1.PT	Yes
104	1261.1244	1116.3927	101.75	G1.R99 HCR	Yes
105	1234.4419	1137.6957	99.35	WV	
106	1216.5331	1151.9939	97.36	G.PT	
107	1199.2768	1165.7712	96.08	G1	Yes
108	1201.1581	1206.0286	92.96	G	

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109	1227.3876	1187.4109	91.34	G1.PT.T150	Yes

- Point 102 is included, because the wildcard, "*", accepts the "DC" characters following "G1."
- Point 104 is included, because the wildcard "*" accepts the "HCR" characters following "G1.", and the ".R99" is recognized as a valid suffix code for recalling point 99.
- Points 103, 106, and 109 are included, because they also contain the recognized suffix codes for beginning a curve (.PC), ending a curve (.PT), and terminating the polyline (.T150).

Note: The space in the description for point 104 between G1.R99 and HCR; HCR will be processed as a possible second description.

4.12.2.2.2 Import Description Keys

Import Option for PConnect Description Key Style Manager

Create a PConnect Description Key Style from information in a PConnect DAT file or a Civil 3D Description Key.

Dialog Box Options

Import Description Key Options

Name:	Enter the name of the Description Key Style File. This file will be saved in the current Customization Template styles folder.
Source Data	
PConnect File (DAT):	Select this option to convert an existing PCONNECT.DAT file into a SmartDraft Description Key Style.
Civil 3D:	Select this option to convert the current Civil 3D Description Keys into a PConnect Description Key Style. This option will not be available if not within Civil 3D.
OK:	Process the selected options.

If **PConnect File (DAT)**
A dialog box appears to select an existing PConnect.dat description key file. The default folder is c:\cadvant.age.

4.12.2.2.3 Select Layer

Select a layer from a list of layers in the drawing (excluding Xref layers)

When the “Proposed,” Existing,” or “Demolition” button is selected, all the layers in the drawing matching the layer FILTER, ***excluding*** Xref layers, appear in a Layers list. The operator can select the desired layer from the list or type a new layer name. A FILTER can be entered to reduce the listed layers to make selecting an existing layer easier. The layer Name field will be checked for a valid layer name.

Dialog Box Options

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Select Layer

Layers:	A list of all the layers in the drawing (***except*** Xref layers). Select the desired layer, and the name will be placed in the **Name** edit box.
Name:	The currently selected layer. Enter any valid layer name.
Filter:	Enter a filter condition to limit the list of layers displayed. Multiple filter conditions can be entered by separating each with a comma.

Buttons

Cancel:	Selecting Cancel will annul the selection of a layer and reset the Layer option to Default

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4.12.2.3 PConnect Template Manager

Create and modify PConnect templates.

PConnect Templates:

- A PConnect template is a collection of offset, height, and Description Key values saved in a file with the extension of "zsy."
- The offset values represent offset distances along a PConnect polyline.
- There can be multiple offsets on either the right or left of the points collected in the field.
- The height values are the changes in elevation from the points collected in the field and are relative to the last segment along the template.
- The height adjustment value is only used in the Draw Options: 3D polylines and Civil 3D survey figures.
- PConnect always draws 2D polylines at elevation zero (0.0).
- The Description Key values are used to determine the layer to place the offset polyline.

When a field crew adds the template suffix code (.ZT) + the template name, parallel / concentric polylines or survey figures will be created with the offset and height values specified in the template. The template suffix code (.ZT) allows for the template to be run along the field points either per design or mirrored by adding the negative character ("-") before the template name. There is also an Elevation on Offset suffix code (.Z) to replace the per design height value of the first segment left of the Field Point value (Green line in the Preview).


Button

Ribbon: SmartDraft ▸ Polylines panel ▸ PConnect Tools ▸ 

Toolbar: PConnect Tools on the Layout Tools: 

Menu: SmartDraft ▸ PConnect ▸ PConnect Template Manager

Command entry: **pct**

Dialog Box Options

Templates

Name:	A list of the currently defined templates. Select the template to edit.
Save As:	Copy the current template settings into a new template.
Lock:	Set the current template (Name: above) as "read-only." Lock a template if you desire to avoid accidental modification. See Unlock Customization Template Files to remove the lock.
Delete:	Delete the current template. **Note:** User cannot delete the "default" or a locked template. ***Deleting a template cannot be undone.***
Rename:	Rename the current template.
Points:	Create a template from selecting point objects in the drawing.

Template Design

Right of the Field Point:	List of the Offsets, Heights, Grades, and Description Keys for offset polylines to be drawn to the right of the collected field point.
Left of the Field Point:	List of the Offsets, Heights, Grades, and Description Keys for offset polylines to be drawn to the left of the collected field point. **Note**: The selected values will display as a thicker line in the Preview boxes.

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Buttons

Add Right: Select option to add the offset value, height value, and description key value in the edit boxes below the Right of the Field Point list box.

Add Left: Select option to add the offset value, height value, and description key value in the edit boxes below the Left of the Field Point list box.

Remove: Remove the selected values from either the Right or Left of the Field Point list boxes.

Move Up: Change location in list up.

Move Down: Change location in list down.

Look Up: Open the Description Key Look Up dialog box to search for a Description Key from any of the Description Key Styles.

Update: Update the selected offset, height, and Description Key values with the values in the edit boxes.

Edit Boxes

Offset: Enter an offset value. The value will be relative to the previous point. Only positive and non-zero values are valid.

Height: Enter a height value. The value will be relative to the previous point. Positive, negative, and zero values are all valid.

Key: Enter a description key. This value is used to match a value in the Description Key style file used during processing of the points. If a match is found, the command will draw the new polyline or survey figure on the layer specified in the Description Key style.

Process All Key Values: A template can have a different Key for each point. The Key is used for two purposes. First, if the Key is found in the Description Key Style files with an associated layer, the polyline is drawn on that layer. Second, the Key can be a filter to excluding the Key from being processed unless it is selected from the Description Key List when running PConnect. If this option is checked in the template, all Keys within the template will be processed as long as the main description key associated with the template name was selected.

Preview

Template per Design: A preview of the offset and height values in the Right and Left of the Field Point list boxes. These are the values used if the template suffix code + template name are used.

Template Mirrored: A preview of the mirrored offset, and height values in the Right and Left of the Field Point list boxes. These are the values used if the template suffix code + "-" (negative character) + template name are used.

Note: The green line in the preview is the first offset and height values are in the Left of the Field Point list box. The height value of this segment can be replaced in the field by using the Elevation on Offsets suffix code (.Z) + new height and returned to the template height value by using the Elevation on Offsets suffix code (.Z) without a height value.

Buttons

Apply: Select to save changes back to the template file.

Template Examples

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4.12.2.3.1 Description Key Look Up

Look Up Option for PConnect Template Manager

Look Up a description key from the currently saved Description Key Styles created for PConnect.

Dialog Box Options

Description Key Look Up

Name:	Select the name of the Description Key Style file to list. This file will be saved in the current Customization Template styles folder.

Description Keys

List:	Select a description key from the list to place in the edit box.
Edit Box:	The currently selected or entered Description Key.

Buttons

OK:	Places the Description Key text from the Edit Box into the Key box of the PConnect Template Manager dialog.

4.12.2.3.2 PConnect Template Examples

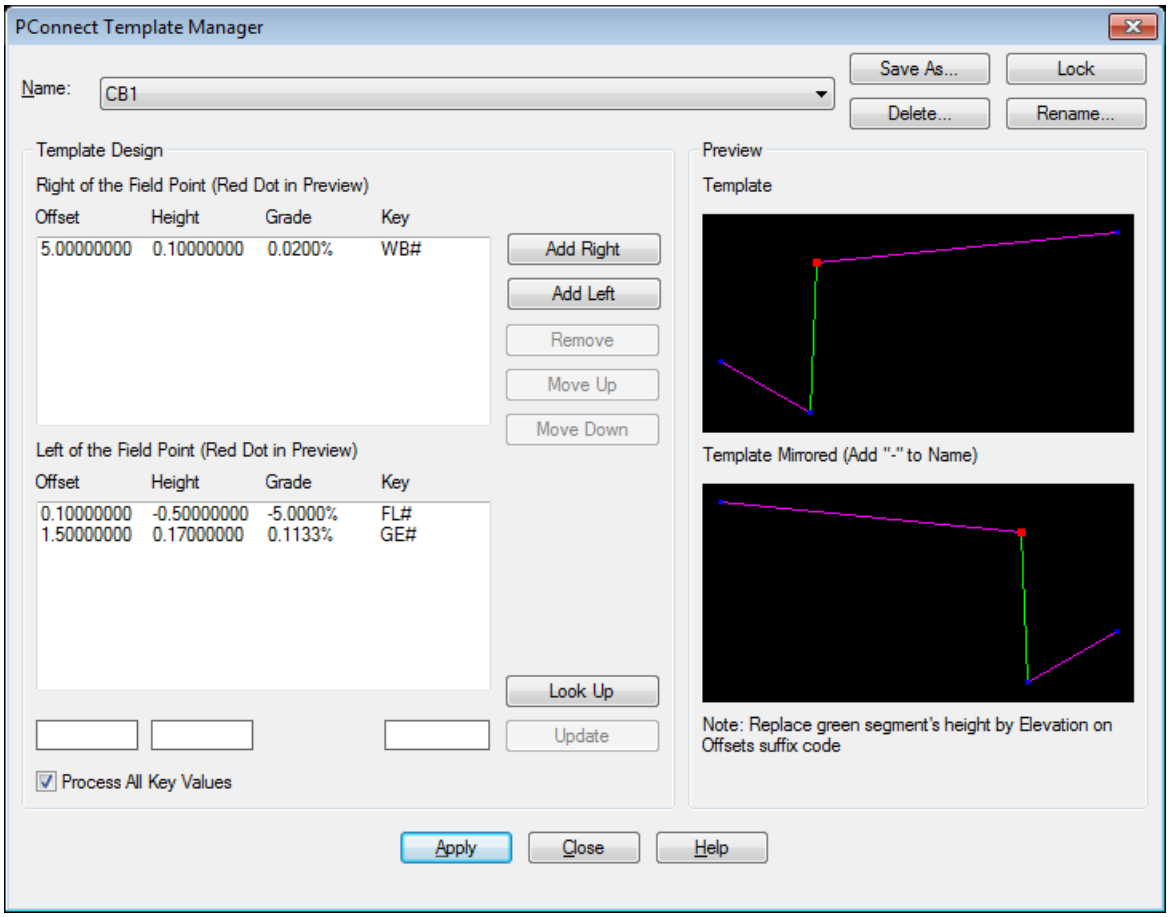
Templates are created with the PConnect Template Manager

Template examples for PConnect

Example of Creating Templates for PConnect:

Template Example Where the Top of Curb (TC#) is the Field Shot:

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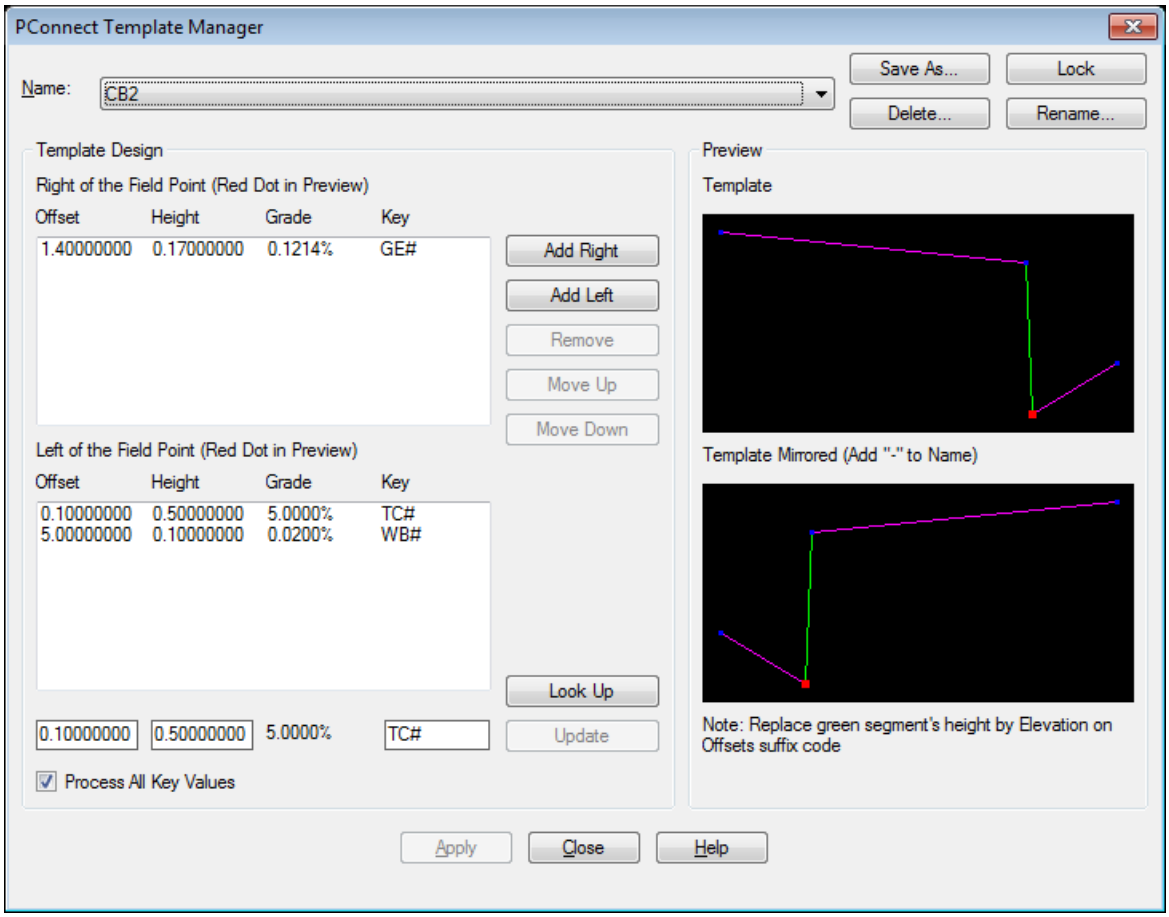
- The default is the only template which comes with the program.
- To create a new template named CB1, select the Save As... button, and enter the name CB1.
- Highlight the first segment in the Right (top) list box.
- The values for the Offset, Height, and Key appear in the edit boxes near the bottom of the dialog.
- Enter an Offset of 5.0 units, a Height of 0.1, and a Key of WB#. If you have created your own Description Key Style File, a Key can be selected from the file using the Look Up button.
- Once all the values are as needed, select the Update button and update the values in the list. If the Update button is not selected, the new values will be lost.
- Highlight the second segment from the default values.
- Select the Remove button to delete the segment.
- Highlight the first segment in the Left (bottom) list box.
- The values for the Offset, Height, and Key appear in the edit boxes near the bottom of the dialog.
- Enter an Offset of 0.1 units, a Height of -0.5, and a Key of FL#.
- Once all the values are as needed, select the Update button and update the values in the list. If the Update button is not selected, the new values will be lost.
- To add a second segment in the Left (bottom) list box, select a segment in the list, and select the Add Left button.
- A new segment will be added.
- Enter an Offset of 1.4 units, a Height of 0.17, and a Key of GE#.

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- Once all the values are as needed, select the Update button, and update the values in the list. If the Update button is not selected, the new values will be lost.
- Select the Apply button to save all the changes back to the Template file.

Note: There is not an undo button. If you reselect the same Template name, the command will reread the template from the file, returning to the original values.

Template Example Where the Flowline (FL#) is the Field Shot:



- After creating the Template CB1, create a new template named CB2, select the Save As... button, and enter the name "CB2".
- Highlight the first segment in the Right (top) list box.
- The values for the Offset, Height, and Key appear in the edit boxes near the bottom of the dialog.
- Enter an Offset of 1.4 units, a Height of 0.17, and a Key of GE#. If you have created your own Description Key Style File, a Key can be selected from the file using the Look Up button.
- Once all the values are as needed, select the Update button, and update the values in the list. If the Update button is not selected, the new values will be lost.
- Highlight the first segment in the Left (bottom) list box.
- The values for the Offset, Height, and Key appear in the edit boxes near the bottom of the dialog.
- Enter an Offset of 0.1 units, a Height of 0.5, and a Key of TC#.

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- Once all the values are as needed, select the Update button, and update the values in the list. If the Update button is not selected, the new values will be lost.
- Highlight the first segment in the Left (bottom) list box.
- The values for the Offset, Height, and Key appear in the edit boxes near the bottom of the dialog.
- Enter an Offset of 5.0 units, a Height of 0.1, and a Key of WB#.
- Once all the values are as needed, select the Update button, and update the values in the list. If the Update button is not selected, the new values will be lost.
- Select the Apply button to save all the changes back to the Template file.

4.12.2.3.3 Template from Points

Create a PConnect Template from AutoCAD point objects (Field Points).


Button

Ribbon: SmartDraft ▸ PConnect panel ▸ 

Toolbar: PConnect Tools on the Points Tools: 

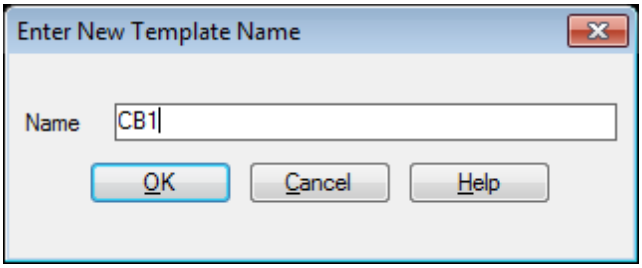
Menu: SmartDraft ▸ Points ▸ PConnect Template Manager

Command entry: **pcz**

Command: **pcz**

Select the Points button from the PConnect Template Manager

Enter the Template name **CB1**



Select Ok

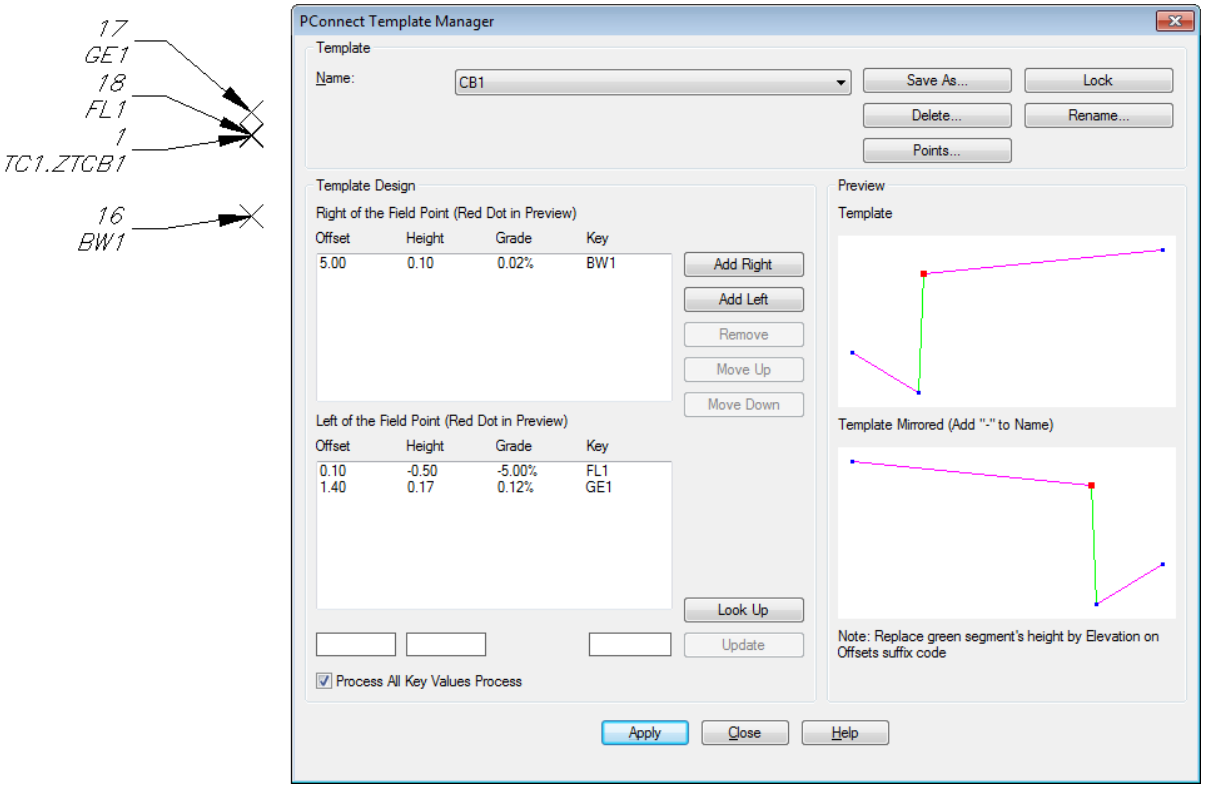
Select field point: Select the point object **(1 TC1.ZTCB1),** which represents the point in the template controlled by the field shot (**Red Dot**).

Select adjust elevation point: Select the point object (**18 FL1),** which represents the segment (**green segment**) opposite the field point which can be replaced by the Elevation on Offset (.Z#) suffix code.

Select other points.

Select objects: Select the other points (**17 GE1 and 16 BW1**) to be used in the template. User can reselect the field point (**1**) and adjust the elevation point (**18**), but they will be ignored. Offset distances are calculated along the bearing from the field point (**1**) to the adjust elevation point (**18**). If any of the "Select other points:" are directly on top of each other, an additional distance of 0.001 is added to the second point since segments of the template cannot have vertical faces. If any of the "Select other points:" are more than 5 units off to the right or left of the bearing from the field point (**1**) to the adjust elevation point (**18**), they will be ignored.

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4.12.2.4 Erase Polylines

Erase polylines on selected or all layers.


Button

Ribbon: SmartDraft ▸ Polylines panel ▸ PConnect Tools ▸ 

Toolbar: PConnect Tools on the Layout Tools: 

Menu: SmartDraft ▸ PConnect ▸ Erase Polylines

Command entry: **epl**

Command:

Erase polylines on selected or all layers.

Select polylines or [All]: Select a polylines to erase all polylines on the layer or **A**ll to erase all polylines in the drawing.

4.12.2.5 Erase 3D Polylines

Erase 3D polylines on selected or all layers.


Button

Ribbon: SmartDraft ▸ Polylines panel ▸ PConnect Tools ▸ 

Toolbar: PConnect Tools on the Layout Tools: 

Menu: SmartDraft ▸ PConnect ▸ Erase 3D Polylines

Command entry: **e3pl**

Command:

Erase 3D polylines on selected or all layers.

Select 3D polylines or [All]: Select a polylines to erase all polylines on the layer or **A**ll to erase all polylines in the drawing.

4.12.3 PBlock Tools

4.12.3.1 PBlock

Process point description keys to insert blocks and format the full descriptions

Inserting a block at the X,Y coordinate of a COGO point, on a specified layer, scale, and rotation angle, and if supported, process the Full Description using the Format property assigned to the key.

Supports:

Inserting a block at Point:

SmartDraft Point	Yes

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Civil 3D Point	Yes
BricsCAD Pro Civil Points	Yes

Formatting Full Description:

SmartDraft Point Block	Yes, since there is only a single description property and it is changed.
Civil 3D Point	Yes
BricsCAD Pro Point v24	No, BricsCAD Pro v24 does not allow the Full Description property to be changed by 3rd party tools like SmartDraft.
BricsCAD Pro Point v25 or later	Yes

See Overview


Button


Ribbon: SmartDraft ▸ Polylines panel ▸ PConnect Tools ▸ 
Toolbar: PConnect Tools on the Polylines Tools: 
Menu: SmartDraft ▸ PConnect ▸ PBlock


Command entry: **pb**

Dialog Box Options

Point: Description Key Style	
Drop-down list	List of the Point Description Key styles. Select the desired style.
Point: Description Keys	
List box	List of the currently defined point description keys.
Key	The key and valid Wildcard characters using during point description key processing. The key is used to match with descriptions and parameters entered in the field during data collection (raw description). PBlock uses these keys for the purpose of inserting blocks and formatting the Full Description from the raw description. To add or modify keys, use the PBlock Style Manager.
Format	How the Full Description property will be formatted, if the Format: Raw Description to Full Description option is available and checked.
Block	The block which will be inserted into the drawing at the point's x, y coordinates.
Layer	The layer name or layer database index the block will be inserted.
Scale	The scale used during block insertion.
Scale X	A multiplier with the Scale value to insert the block. (Scale * Scale X)
Rotation Angle	The rotation angle used during block insertion.
Attribute	If Yes, it will update the first attribute of the block with the formatted description value. If No or if no attribute found, nothing is done.
Point Source	
Drawing	Check to use only the points in the current drawing.
Prompt for Selection	Check this option to be prompted for point selection to include only specified points. (e.g., All, Group, Layers, Range, or Selection). When unchecked all points are included.

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File...	Check to use the points in an ASCII input file in the PNEZD format.
File name	The name of the selected point file.
Civil 3D Survey Database	Check to use the points in the selected Civil 3D Survey Database.
List	List of Civil 3D Survey Databases. Select the desired Survey Database.
Processing Options	
Insert Block	Check option to insert the block during key processing.
Format: Raw Description to Full Description	Check to format the Full Description using the Format value when the Raw Description value matches the Description Key. **Note:** Option not available for the File or Civil 3D Survey Database Point Sources.
Full Description to Uppercase	Set the formatted description value to uppercase when setting Full Description property. **Note:** Option not available for the File or Civil 3D Survey Database Point Sources.
Process	Select to process the Point Description Keys, for the selected points, and processing options.

If **Selection** is the Points option:

Command:

Select points or [All/Groups/Layers/Range]: Select points using any of the available selection methods.

4.12.3.1.1 PBlock Overview

The PBlock command processes Point Description Keys to insert a block and format the Full Description

In Civil 3D and BricsCAD Pro, COGO points have to types of descriptions. There is a Raw Description, the information entered from the field, and a Full Description which can be the same or a formatted description created from the raw description. The SmartDraft point block only has a single description attribute, if you format the description of a SmartDraft point, the original field information is lost..

The PBlock command uses the Raw Description to match to a Point Description Key. If a match is found the command interprets the code and any parameters to format the Full Description and insert a block per those parameters.

Since PConnect also processes Raw Description to draw polyline between points, and allows multiple description keys within a single COGO point raw description, only the first point description key match by the PBlock command is processed and the parameters which follow.

The PBlock command must be run to insert blocks and format full descriptions.

Topics:

- PBlock Style: File
- PBlock Style: Entry
- PBlock Style: Key Property
- PBlock Style: Format Property
- PBlock Sytle: Scale and Rotation Properties
- PBlock Import Civil 3D Description Key Set

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4.12.3.1.1.1 PBlock Style: File

The point description key style is used by PBlock to process point descriptions and place the created polylines on the specified layers.

Point Description key styles:

- Are stored outside the drawing;
- Have the file extension of ".bsy";
- Are stored in the \labels folder of the current Customization Template;
- Are "|" delimited files where each line contains a key | block name | layer name / layer index | Format | Scale | Scale X | Rotation | Attribute | Visibility State name of Block:
- Are used by the PBlock command to allow the operator to select which point description keys will be used; and
- Can be managed by the PBlock Style Manager.

Properties in a Point Description Key

Key	Unique value, can be character and/or numeric based, and cannot contain spaces, and valid Wildcard characters. It is used to match a raw description of a COGO point.
Format	Text string used for the formatting of the Full Description from the description and parameters entered in the field during data collection (Raw Description). The default value is $* and indicates the Full Description will match the Raw Description. The Key and Format properties are required in a Point Description Key.
Block	A block to insert. (Optional property)
Visibility States	Select the button if the entered block name is a dynamic block with visibility states. This option will read the block definition and list any available visibility states in the drop down list to the right.
Drop down list	If the block is a dynamic block with visibility states, this is the selected visibility state to set when the block is inserted. (Optional property)
Layer	The layer name or layer database index, ("index" (in lowercase), followed by ":" (a colon) and the layer index number. (e.g. index:123). used when inserting the block.
Scale	Property used to set the scale of the block when inserting it. Options: 1.0, HS (horizontal scale), $1, $2, $3, $4, $5, $6, $7, $8, $9. $1-$9 are the parameters entered in the field when the description entered.
Scale X	Enter a scale multiplier. Must be greater than 0. Default: 1.0. This value is used to multiple with the Scale value
Rotation Angle	Property used to set the rotation angle of the block when inserting it. Options: 0.0, VT (View Twist angle), $1, $2, $3, $4, $5, $6, $7, $8, $9. $1-$9 are the parameters entered in the field when the description entered. (e.g. PTP which is an angle for the current point's insertion to the previous number's insertion)

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Attribute	If Yes, it will update the first attribute of the block with the formatted description value. If No or if no attribute found, nothing is done.

4.12.3.1.1.2 PBlock Style: Entry

The properties of a point description key used by PBlock

Point Description Keys Entry:	
Key	Enter a key property and valid Wildcard characters. It must be a unique value, can be character and/or numeric based, and cannot contain spaces. They are using during point description key processing. The key is used to match descriptions and parameters entered in the field during data collection. PBlock uses these keys for the purpose of inserting blocks and formatting the Full Description property from the descriptions and parameters entered in the field during data collection
Format	Enter the formatting of the Full Description from the description and parameters entered in the field during data collection (Raw Description). The default value is $* and indicates the Full Description will match the Raw Description. The Key and Format properties are required in a Point Description Key.
Block Name	Select the button to browse for the file. The selected file will be entered into the edit box on the right.
Edit box	The block name can be entered into the edit box. If no path is entered, the program will search the folders in the Block Search Paths list. (Optional property)
Visibility States	Select the button if the entered block name is a dynamic block with visibility states. This option will read the block definition and list any available visibility states in the drop down list to the right.
Drop down list	A list of the available visibility states for the current block name. Select the one to display when the block is inserted by the PBlock command. (Optional property)
Layer	Select the button to choose the layer name from all the layers currently in the drawing.
Edit box	The layer name can be entered into the edit box. To use the layer database, enter "index" (in lowercase), followed by ":" (a colon) and the layer index number. (e.g. index:123)
or Index	Select the button to choose the layer index from a list box.
Scale	Select the scale parameter from the drop-down list. Options: 1.0, HS (horizontal scale), $1, $2, $3, $4, $5, $6, $7, $8, $9. $1-$9 are the parameters entered in the field when the description entered.
Scale X	Enter a scale multiplier. Must be greater than 0. Default: 1.0. This value is used to multiple with the Scale value

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Rotation Angle	Select the rotation angle parameter from the drop-down list. Options: 0.0, VT (View Twist angle), $1, $2, $3, $4, $5, $6, $7, $8, $9. $1-$9 are the parameters entered in the field when the description entered. (e.g. PP which is an angle for the current point's insertion to the previous number's insertion)
Attribute	Select "Yes" or "No". If Yes, it will update the first attribute of the block with the formatted description value. If No or if no attribute found, nothing is done.

4.12.3.1.1.3 PBlock Style: Key Property

The Key property is used to match with the descriptions (Raw Description) and parameters entered in the field during data collection.

The key and valid Wildcard characters used during point description key processing.

PBlock uses these keys for the purpose of inserting blocks and formatting the Full Description property from the descriptions and parameters entered in the field during data collection.

You can either specify a simple string for a key property or use wildcard characters, such as an asterisk (*), to expand the matching behavior of the keys.

For example, all your sign points might have the SI prefix in their raw descriptions, such as SI-1 and SI-2. When you process sign points to a drawing, you might want all of the to have the same block inserted, and full description. To do this, you can create a key property with a code of SI*. (The asterisk means that the code will match all raw descriptions that begin with SI.) Then, all points with a raw description that begins with SI will format the Full Description, and the block inserted would be the same as specified in the point description key.

The following table shows wild card characters you can use in a description key code:

Wildcard characters in Key property:

- Each point description key must be unique.

Wildcard	Description	Example	
None	Matches the specific description	SI	Matches SI, but ***not*** S, SI1, etc.
# (pound)	Matches any single numeric digit	SI#	Matches SI1, SI2, ... SI9, but ***not*** SI10 because there is a fourth character.
		SI#*	Matches SI1, CL2, ... SI100 and will also match SI1XYZ, but ***not*** EPT1 since the third character is ***not*** a numeric digit.
@ (at)	Matches any single alphabetic character	SI@	Matches SIE, SIX, etc..., but ***not*** SI1, SI2, SI&, or SIXYZ.
		SI@#*	Matches SI (without anything) or a description starting with SI followed by any single alphabetic (SIT, SIX, SIW, but ***not*** SI1 since the third character is a numeric digit), or a description starting with SI followed by any single alphabetic followed by a single numeric digit (EPT1, EPX3, EPW5, EPW01, but ***not*** EP1 since the third character is a number).
. (period)	Matches any single non-alphanumeric character		

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- * (asterisk) Matches any character sequence, including an empty one, and it can be used anywhere in the search pattern: at the beginning, middle, or end — SI* — Matches SI, SI1, SIS, SI100, SI?$#@!, etc.
- ? (question mark) Matches any single character — Matches SI1, SI2, SIX, SI>, SI&, etc.

- When using numeric description keys, wildcards can cause undesired results if not used carefully. A description key of 1* would match 1, 11, 11111, 12345, 1DA1, etc. But an example of where wildcards could work with numeric description keys would be a case where all top of curb features have a description between 10 and 19. In this case, 1# would match all 10 of these possibilities.
- Wildcard characters can be helpful, but if not used correctly, can return some undesired results.

Example:

This example includes four point description keys within the point description key style and points collected with the following descriptions:

	Key	Layer	Description	Points
1.	SI	SIGN-EX	Sign	SI
2.	SI#*	SIGN-EX		SI1, SI2, SI3, and SI15
3.	SIS	SIGN-EX	Stop Sign	SIS
4.	SI*	SIGN-EX		SI1, SI2, SI3, and SI15, SIT1, and SIS

- When the first description key, SI, is processed, it will process the Raw to Full description, and insert the block/symbol associated with SI.
- When the second description key, SI#*, is processed, it finds only SI1, SI2, SI3, and SI15.
- The wildcard character #* instructs the command to match descriptions starting with SI and any number as the third character. SI15 matches as well since the description starts with SI, and the third character is a number. It does not matter if the fourth character is also a number. If both should be in the description key file, both points with descriptions of SI and SI# will insert the block on the SIGN-EX layer.
- When the third description key, SIS, is processed, the command only finds SIS. Since this is placed on a separate layer, this is the desired result.
- When the fourth description key, SI*, is processed, the command finds all the descriptions starting with SI. This is a problem since it will draw polylines for them a second time. **Note**: A description key of SI* would be okay, if there were no other point description keys starting with SI.

4.12.3.1.1.4 PBlock Style: Format Property

Point Description Formatting used by PBlock.

The formatting of the Full Description from the description and parameters entered in the field during data collection (raw description).

The default value is $* and indicates the Full Description will match the raw description.

The vertical bar character "|" is not allowed.

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The Key and Format properties are required in a Point Description Key.

The following are samples of raw descriptions:

SI NO PARKING
TR ELM 12 15

The raw description can consist of up to 10 alphanumeric parameters separated by spaces.

The first parameter in the raw descriptions (SI, and TR in the preceding samples) is compared to key properties during description key matching. The remaining parameters can be used to translate the raw description into a more readable full description and to rotate or scale the point symbol in the drawing. Since PConnect also reads the raw description and allows multiple description keys to be entered for a single point, only the first key is ever processed for matching by the PBlock command.

If the first parameter in the raw description matches a key, the block and the layer specified in the point description key are used to insert the block. The raw description you entered is translated into a full description using the format entered in the point description key. If the raw description includes scaling and rotation information, the block is scaled and rotated as specified.

Note: Key matching is not case-sensitive, which means the key will match a raw description if entered upper case or lower case. For example, the raw description “TR” or "tr" would match the key property “tr”.

Simple Format for Specifying Full Descriptions

Define a full description for raw description that matches a key by specifying the desired full description in the format property. For example, if you want all points that match a specific key to have a full description of SIGN, enter SIGN for the format. Then, points that match the key property will be created with the full description SIGN.

Using Parameters to Format a Raw Description into a Full Description

Create a full description from a raw description by either changing the order of the parameters in the raw description or adding descriptive text. To do this, you must define the Format property to transform the raw description into a full description.

The raw description for a point can consists of a list of parameters separated by spaces, for example, TREE ELM 12. To change the order of the parameters in a raw description, you must reference the individual elements. When creating the Format property, you reference the 0 parameter (the parameter which matches the key property) in a raw description using the symbol $0. You reference the remaining parameters using a $ followed by a number (1-9) that specifies the position for the parameter in the raw description.

For example, in the raw description TREE ELM 12, the 0 parameter in the raw description, TREE, is referenced using the symbol $0. The first parameter, OAK, is referenced using the symbol $1. The second parameter, 12, is referenced using the symbol $2.

When a key property match occurs, the raw description is translated into a full description using the format, which references the elements in the raw description.

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You are processing points using the PBlock command, and for the raw description, you specify TR ELM 12. The Point Description Key Style contains a key property with the code TR and the Format property “$2" $1 TREE”.

The 0 parameter in the raw description, TR, matches the property in the point description key, which is also TR. The format specified in the point description key, “$2" $1 TREE,” is used to change the raw description into a full description for the point.

The $2 in the Format property refers to the second parameter in the raw description, which is 12. The $1 in the Format property refers to the first parameter in the raw description, which is ELM. The full description is created by substituting 12 for $2 and ELM for $1 in the format “$2" $1 TREE”. The text in the Format property (“ and TREE) is left unchanged. After the substitutions are made, the translated full description is “7" ELM TREE”.

The following is a chart of description key parameter substitution codes, including the code to use if you want the raw description to be used for the full description:

Example Raw Description: TR ELM 12 24

Parameter	**Description**	**Example Parameter Value(s)**	**Full Description**
$0	Reference the 0 parameter in the raw description.	TR	TR
$1	Reference the first parameter in the raw description.	ELM	ELM
$2	Reference the second parameter in the raw description.	12	12
$3	Reference the third parameter in the raw description.	24	24
$4 - $9	Reference the fourth parameter through the ninth parameter.		
$*	Reference all the parameters in the raw description and the 0 parameter. The Full Description will be the same as the Raw Description	TR ELM 12 24	TR ELM 12 24
$+	Reference parameters $1 to $ $9, ignoring the 0 parameter.	ELM 12 24	ELM 12 24
$$	Insert a single $ into the description.		If you used $$200.00 as part of the format, then that part of the translated full description would be $200.00.
	Format property		
Example	$2" $1 TREE		12" ELM TREE

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4.12.3.1.1.5 PBlock Sytle: Scale and Rotation Angle Properties

About Block Insertion Scaling and Rotation Angle Property used by PBlock.

Use parameters to specify the block insertion scale or rotation angle using the raw description matches a key property.

Parameters that are included in the raw description. For example, the raw description TR ELM 12 24 consists of a 0 parameter, TR, followed by their parameters, ELM, 12, and 24, separated by spaces.

Specifying Scale Using a Parameter

If you want the block's insertion scale to be read from the raw description when a key property match is found, use the scale parameter property. In the previous example, ELM is parameter 1, 12 is parameter 2, and 24 is parameter 24. If you wanted the point description key to use the block's insertion scale from the third parameter (24) you would specify $3 as the Scale property.

Specifying Rotation Angle Using a Parameter

If you want the block's insertion rotation angle to be read from the raw description when a key property match is found, use the rotation parameter property. For example with a raw description FH 45 A consists of the 0 parameter FH followed by two parameters: 45 is parameter 1, and A is parameter 2. If you wanted the point description key to use 45 to rotate the block, you would specify $1 as the rotation angle property.

Rotation Angle:

When the rotation angle property is assigned as $1 to $9, the following are codes, which if entered, provide special functionality.

They can be entered upper or lower case.

Code	Functionality
PP or pp	The rotation angle is calculated from the current point's x,y coordinates to the previous point's x,y coordinate.
PPD or PPD	The rotation angle is calculated from the current point's x,y coordinates to the previous point's x,y coordinate and a line is drawn between to two points on the layer.
P#	The rotation angle is calculated from the current point's x,y coordinates to the x,y coordinate of the point number (#) entered. No spaces.
P#,#	The rotation angle is calculated from the point's x,y coordinates of the first point number (#), separated by a comma (,) and to the x,y coordinate of the second point number (#) entered. No spaces.
PDY	The rotation angle is calculated from the current point's x,y coordinates to the previous point's x,y coordinate, and if the block inserted has a dynamic property name Length, the Length property will be set to the distance value from the current point's x,y coordinate to the previous point's x,y coordinate.

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4.12.3.2 PBlock Style Manager

Create and modify PBlock Styles used by the PBlock command.

See Overview


Button

Ribbon: SmartDraft ▸ Polylines panel ▸ PConnect Tools ▸ 

Toolbar: PConnect Tools on the Layout Tools: 

Menu: SmartDraft ▸ PConnect ▸ PBlock Style Manager

Command entry: **pbm**

Dialog Box Options

Description Keys

Name:	List of the currently defined point description key styles. Select the point description key style to edit.
Save As:	Copy the current point description key style settings into a new style.
Lock:	Set the current point description key style (Name: above) as "read-only." Lock a style if you desire to avoid accidental modification. See Unlock Customization Template Files to remove the lock.
Delete:	Delete the current point description key style. Note: Cannot delete the "default" or a locked style. *Deleting a style cannot be undone.*
Rename:	Rename the current point description key style.
Import:	Create a new point description key style from a Civil 3D's Description Key Set.

Block Search Paths

List box	List of the folder paths to search for a block.
Add Path	Add a folder search path to the list of folders.
Remove	Remove a folder search path from the list of folders.

Point: Description Keys:

List box	List of the currently defined point description keys, Full Description Formatting, Block name, Layer name to insert block, Scale, Scale X (multiplier). Rotation Angle, and Attribute. Select a Description Key to edit, or remove it.
Key	The key and valid Wildcard characters using during point description key processing. The key is used to match with descriptions and parameters entered in the field during data collection. PBlock uses these keys for the purpose of inserting blocks and formatting the Full Description property from the descriptions and parameters entered in the field during data collection.
Format	How the Full Description property will be formatted, if the Format: Raw Description to Full Description option is available and checked.

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Block	The block which will be inserted into the drawing at the matching point's x, y coordinates.
Layer	The layer name or layer database index the block will be inserted.
Scale	The scale used during block insertion.
Scale X	A multiplier with the Scale value to insert the block. (Scale * Scale X)
Rotation Angle	The rotation angle used during block insertion.
Attribute	If Yes, it will update the first attribute of the block with the formatted description value. If No or if no attribute found, nothing is done.
Add:	Select the button to add a new point description key and its properties. Note: User cannot add duplicate description keys.
Edit:	Edit the properties of the select point description key.
Delete:	Delete the selected point description keys from the list.
Buttons	
Apply	Select to save changes back to the point block style.

4.12.3.2.1 PBlock: Add Description Key

Add a Point Description Key used by PBlock.

Dialog Box Options

Key	Enter a key property and valid Wildcard characters. It must be a unique value, can be character and/or numeric based, and cannot contain spaces. They are using during point description key processing. The key is used to match descriptions and parameters entered in the field during data collection. PBlock uses these keys for the purpose of inserting blocks and formatting the Full Description property from the descriptions and parameters entered in the field during data collection
Format	Enter the formatting of the Full Description from the description and parameters entered in the field during data collection (Raw Description). The default value is $* and indicates the Full Description will match the Raw Description. The vertical bar character "|" is not allowed. The Key and Format properties are required in a Point Description Key.
Block Name	Select the button to select a Block Name from a list of Block Names in the drawing.
Edit box	The block name can be entered into the edit box. If no path is entered, the program will search the folders in the Block Search Paths list. (Optional property)
Block File	Select the button to browse for the file. The selected file will be entered into the edit box to the right.
Visibility States	Select the button if the entered block name is a dynamic block with visibility states. This option will read the block definition and list any available visibility states in the drop down list to the right.

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Drop down list	A list of the available visibility states for the current block name. Select the one to display when the block is inserted by the PBlock command. (Optional property)
Layer	Select the button to choose the layer name from all the layers currently in the drawing.
Edit box	The layer name can be entered into the edit box. To use the layer database, enter "index" (in lowercase), followed by ":" (a colon) and the layer index number. (e.g. index:123)
or Index	Select the button to choose the layer index from a list box.
Scale	Select the scale parameter from the drop-down list. Options: 1.0, HS (horizontal scale), $1, $2, $3, $4, $5, $6, $7, $8, $9. $1-$9 are the parameters entered in the field when the description entered.
Scale X	Enter a scale multiplier. Must be greater than 0. Default: 1.0. This value is used to multiple with the Scale value
Rotation Angle	Select the rotation angle parameter from the drop-down list. Options: 0.0, VT (View Twist angle), $1, $2, $3, $4, $5, $6, $7, $8, $9. $1-$9 are the parameters entered in the field when the description entered. (e.g. PP which is an angle for the current point's insertion to the previous number's insertion)
Attribute Replace	Select "Yes" or "No". If Yes, it will update the first attribute of the block with the formatted description value. If No or if no attribute found, nothing is done.

4.12.3.2.2 PBlock: Edit Description Key

Edit an existing Point Description Key used by PBlock.

Dialog Box Options

Key	Enter a key property and valid Wildcard characters. It must be a unique value, can be character and/or numeric based, and cannot contain spaces. They are using during point description key processing. The key is used to match descriptions and parameters entered in the field during data collection. PBlock uses these keys for the purpose of inserting blocks and formatting the Full Description property from the descriptions and parameters entered in the field during data collection
Format	Enter the formatting of the Full Description from the description and parameters entered in the field during data collection (Raw Description). The default value is $* and indicates the Full Description will match the Raw Description. The vertical bar character "|" is not allowed. The Key and Format properties are required in a Point Description Key.
Block Name	Select the button to select a Block Name from a list of Block Names in the drawing.
Edit box	The block name can be entered into the edit box. If no path is entered, the program will search the folders in the Block Search Paths list. (Optional property)

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Block File	Select the button to browse for the file. The selected file will be entered into the edit box to the right.
Visibility States	Select the button if the entered block name is a dynamic block with visibility states. This option will read the block definition and list any available visibility states in the drop down list to the right.
Drop down list	A list of the available visibility states for the current block name. Select the one to display when the block is inserted by the PBlock command. (Optional property)
Layer	Select the button to choose the layer name from all the layers currently in the drawing.
Edit box	The layer name can be entered into the edit box. To use the layer database, enter "index" (in lowercase), followed by ":" (a colon) and the layer index number. (e.g. index:123)
or Index	Select the button to choose the layer index from a list box.
Scale	Select the scale parameter from the drop-down list. Options: 1.0, HS (horizontal scale), $1, $2, $3, $4, $5, $6, $7, $8, $9. $1-$9 are the parameters entered in the field when the description entered.
Scale X	Enter a scale multiplier. Must be greater than 0. Default: 1.0. This value is used to multiple with the Scale value
Rotation Angle	Select the rotation angle parameter from the drop-down list. Options: 0.0, VT (View Twist angle), $1, $2, $3, $4, $5, $6, $7, $8, $9. $1-$9 are the parameters entered in the field when the description entered. (e.g. PP which is an angle for the current point's insertion to the previous number's insertion)
Attribute Replace	Select "Yes" or "No". If Yes, it will update the first attribute of the block with the formatted description value. If No or if no attribute found, nothing is done.

4.12.3.2.3 Select Layer

Select a layer from a list of layers in the drawing (excluding Xref layers).

A list of all layers in the drawing matching the layer FILTER, excluding Xref layers. The dialog box allows the operator to pick the desired layer from the list, or type it in. Use the layer FILTER edit box to focus on layer names that match the filter, making it easier to find the desired layer. Refer to filters in your AutoCAD reference manual. If you enter a layer name that does not exist, the layer will be created whenever you insert the file by picking the OK button. The command will prevent you from entering invalid layer names.

Dialog Box Options

Select Layer

Layers:	A list of all the layers in the drawing (except Xref layers). Select the desired layer, and the name will be placed in the **Name** edit box.
Name:	The currently selected layer. Enter any valid layer name.
Filter:	Enter a filter condition to limit the list of layer displayed. Multiple filter conditions can be entered separating each with a comma.

Cancel Selecting cancel will cancel the selection of a layer and reset the Layer option to Default.

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4.12.3.2.4 Select Block

Select a block from a list of blocks in the drawing (excluding Xref Blocks).

A list of all blocks in the drawing matching, excluding Xref blocks. The dialog box allows the operator to pick the desired block from the list, or type it in. Use the layer FILTER edit box to focus on layer names that match the filter, making it easier to find the desired layer. Refer to filters in your AutoCAD reference manual. If you enter a layer name that does not exist, the layer will be created whenever you insert the file by picking the OK button. The command will prevent you from entering invalid layer names.

Dialog Box Options

Select a Block Name

Block List: A list of all the blocks in the drawing (except Xref blocks). Select the desired block, and the name will be displayed below the list of available blocks in the drawing. Double-click the block name to select and accept the block name.
Name: The name of the currently selected block.
Select: Use the currently selected block name and place it in the Block Name edit box.
Cancel Selecting cancel will cancel the selection of a block.

4.12.3.2.5 Layer Index List

Layer Database Index Unique numbers in the layer database file, which are associated to each layer definition. The index number is used to access the defined layer properties by the tools in SmartDraft.

Dialog Box Options

Layer Index List

List box: List of all the layers in the layer database and their assigned layer database index number. The index number of the selected layer from the list will fill in the Index edit box.
Index: Enter an index number from the layer database.
Filter: Filter the list of layers in the list box by description. Enter a value to filter the list.
OK: Accept the index number in the edit box.

4.12.3.2.6 PBlock Import Civil 3D Description Key Set

Import Option for PBlock Style Manager

Create a PBlock Style from information in a Civil 3D Description Key Set.

Dialog Box Options

Description Key Sets

List List of Description Key Sets in the current Civil 3D drawing

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Name	Select the Civil 3D Description Key Set to import into the current Point Description Key style. This option will not be available if not within Civil 3D.
OK:	Process the selected options.

What database is read from the Civil 3D Description Key Set

PBlock Style Property	**Civil 3D Description Key Set: Property**
Key	**Code**
	Style
Block Name	**Point Label Style:** If there is a block associated to the Maker Symbol Name
	Point Style, and Text of Point Label Style ignored.
Format	**Format**
Visibility States	Set to ""
Layer	**Layer**
Scale	**$1 - $9** when the **Scale Parameter** is checked. The Parameter # = $#
	HS when **Use drawing scale** is checked, or if the Maker Symbol Size is set to drawing scale.
	Otherwise set to **1.0**
	Apply to Z ignored.
Scale X	Set to **Fixed Scale Factor** value when the property is checked.
	Otherwise set to **1.0**
Rotation Angle	**$1 - $9** when the **Label Rotation Parameter** is checked. The Parameter # = $#
	Set to **Label Fixed Rotation** value when the property is checked.
	Otherwise set to **0.0**
	Maker Rotation Parameter, Maker Fixed Rotation, and Rotation Angle ignored.
Attribute	Set to **"No"**

4.12.4 Polyline Reverse Direction

Reverse the direction of a polyline, lwpolyline, 3D polyline, or Civil 3D feature line.

Limits of current version: Variable width values are removed. XDATA is removed.


Button


Ribbon: SmartDraft ▸ Polylines panel ▸ 

Toolbar: Polyline Tools: 

Menu: SmartDraft ▸ Drawing Tools ▸ Polyline Tools ▸ Reverse Polyline Direction


Command entry: **rp**

Command:

Reverse polyline or feature line direction.

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Select polyline or feature line: Select a polyline or feature line to reverse its direction.

Successful

Polyline direction reversed. X indicates start point.

Feature line direction reversed. Triangle indicates start point.

Not successful

Selected object is not a polyline or feature line.

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4.12.5 Polyline Change Start Point

Change the starting point of a closed polyline.

Button
Ribbon: SmartDraft ▸ Polylines panel ▸
Toolbar: Polyline Tools:
Menu: SmartDraft ▸ Drawing Tools ▸ Polyline Tools ▸ Polyline Change Start Point
Command entry: **pls**

Command:

Change the start point of a closed polyline.

Select polyline: Select a closed polyline.
Specify new start point: Specify the new start point of the polyline. *Default osnap is **END**point.*
Note: The X indicates start point of the polyline.

4.12.6 Convert to Tree Line

Convert an arc, circle, line, or polyline to a tree / brush line.

Button
Ribbon: SmartDraft ▸ Polylines panel ▸ Arc to Polyline Tools
Toolbar: Polyline Tools:
Menu: SmartDraft ▸ Drawing Tools ▸ Polyline Tools ▸ Convert to Tree Line
Command entry: **pltl**

Command:

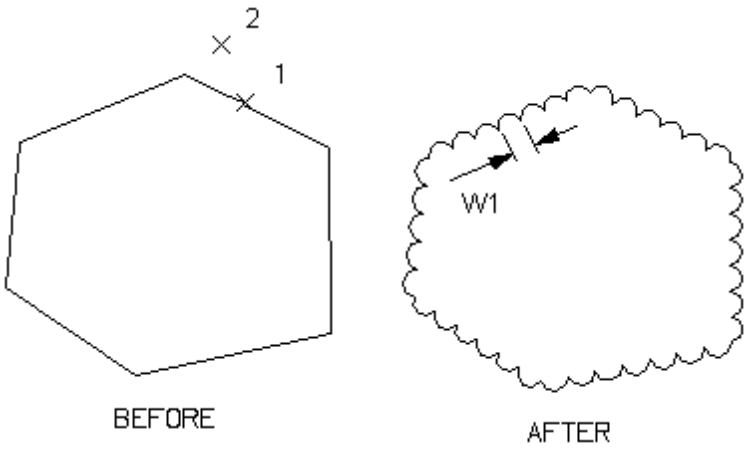
Convert to tree / brush line.
Current settings: Width = 5.00, Percent = 90, Original = Erase
Select objects to convert or [Options]: Select a polyline (1), **O**ptions to change the options, or press ENTER to end.
Select convex side: Specify side to offset (2)

Options
Dialog Box Options

Width of Arc:	Enter the width (W1) for arc in the new tree line polyline.
Percent of Arc (Bulge):	Select 100, 90, 80, or 70. 100 indicates 100% of a half circle, 90%, 80%, and 70%.
Taper Arc:	Check to taper each arc. 
Retain Original Object:	Check to retain the originally selected object; uncheck to erase originally selected object.

Example

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4.12.7 Convert 2D to 3D Polyline

Convert 2D polylines to 3D polylines.

Button
Ribbon: SmartDraft ▸ Polylines panel ▾
Toolbar: Polyline Tools:
Menu: SmartDraft ▸ Drawing Tools ▸ Polyline Tools ▸ Convert 2D to 3D Polyline

Command:
Convert 2D Polylines to 3D Polylines.
Current settings: Arc = <distance>
Select polylines or [Options]: Select all the 2D polylines to convert to 3D polylines, **O**ptions to change the current settings, or press ENTER to end.

Convert 2D to 3D Polyline Options

Options
Arc Distance: Enter the new minimum distance between vertices along arc segments.

4.12.8 Convert 3D to 2D Polyline

Convert 3D polylines to 2D polylines.

Button
Ribbon: SmartDraft ▸ Polylines panel ▾
Toolbar: Polyline Tools:
Menu: SmartDraft ▸ Drawing Tools ▸ Polyline Tools ▸ Convert 3D to 2D Polyline

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Command:
Convert 3D Polylines to 2D Polylines.
Current settings: Elevation <First / Value>
Select polylines or [Elevation/First]: Select all the 3D polylines to convert to 2D polylines, **E**levation to specify an elevation for the converted polylines, and press ENTER to end..

If **Elevation**
Enter elevation<0.00>: Enter an elevation value which will be used for the converted polylines, or press ENTER for the default.

If **First**
Toggle between using the first elevation of the 3D polyline to a specified elevation.

4.12.9 Convert Spline to Polyline

Convert a spline to a 2D or 3D polyline.


Button
Ribbon: SmartDraft ▸ Polylines panel ▾
Toolbar: Polyline Tools:
Menu: SmartDraft ▸ Drawing Tools ▸ Polyline Tools ▸ Convert Spline to Polyline
Command entry: **pls**

Command:
Convert selected SPLINEs to POLYLINEs.
Current Settings: Delete = <Yes/No>, Type = <2D/3D>, Mid = <value>, Max = <value>
Select splines or [Options]: Select the splines to convert, or **O**ptions to change the current settings.

Dialog Box Options

Type:	Select 2D or 3D polylines for the type of output object.
Erase Original:	Select if the original spline should be erased.
Maximum Mid Ordinate along Arcs:	Enter the maximum value for the mid ordinate of each 3D polyline segment along a 2D arc. PConnect will compute the number of additional segments to create based on this value. The higher the value, the fewer the segments and vice versa.
Maximum Distance between Vertices:	Enter the maximum segment length for 3D polylines along both straight and arced 2D segments. PConnect will compute the number of additional segments to create based on this value. The higher the value, the fewer the segments and vice versa.

Note: The minimum distance for a segment will not be less than 1/10 the maximum distance.

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4.12.10 Convert Survey Figure to Polyline / Feature Line

Convert Civil 3D survey figure to polyline / feature line.

Note: The 2D polyline will be at elevation 0.0.

Supports:

AutoCAD Products: Civil 3D only

BricsCAD Pro: No

Button

Ribbon: SmartDraft ▸ Polylines panel ▾

Toolbar: Polyline Tools:

Menu: SmartDraft ▸ Drawing Tools ▸ Polyline Tools ▸ Convert Survey Figure to 2D Polyline

Command:

Convert Civil 3D Survey Figures to 2D Polylines.

Current settings: Elevation <default>

Select survey figures or [Elevation/Feature line]: Select all the survey figures to convert to 2D polylines, **E**levation to specify an elevation for the converted polylines, feature line to output feature lines, and press ENTER to end..

If **Elevation**

Enter elevation<0.00>: Enter an elevation value which will be used for the converted polylines, or press ENTER for the default.

If **Feature line**

The Create Feature Line from Survey Figure dialog appears

Convert Civil 3D Survey Figures to Feature Lines.

Select survey figures or [Polyline]: Select all the survey figures to convert to feature lines, polyline to output polylines, and press ENTER to end..

4.12.10.1 Create Feature Line from Survey Figure

Set feature line options for the Convert Survey Figure to Polyline / Feature Line command.

Create Feature Line from Survey Figure

Options

Site Select an existing site, or Create a Site

Name Enter the Prefix text for name the feature lines. If blank, no name will be assigned.

Style Select the feature line style.

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Layer Select to use a layer from the drawing for the new feature lines.

Layer List Select a layer from the list.

Use layer of Survey Figure radio button Select to use the layer of the original survey figure for the new feature lines.

4.12.10.2 Feature Line - Site Name

Set feature line options for the Convert Survey Figure to Polyline / Feature Line command.

Feature Line - Site Name

Site Name

Name Enter the new site name

4.12.11 Add Vertices

Add vertices to existing polylines.


Button

Ribbon: SmartDraft ▸ Polylines panel ▸ 

Toolbar: Polyline Tools: 

Menu: SmartDraft ▸ Drawing Tools ▸ Polyline Tools ▸ Add Vertices

Command entry: **plav**

Command:

Polyline: Add Vertices.
Current settings: Tangent = 25.00, Arc = 10.00, Original = Erase
Select objects or [Options]: Select polyline(s) (1), **O**ptions to change the options, or press ENTER to end.

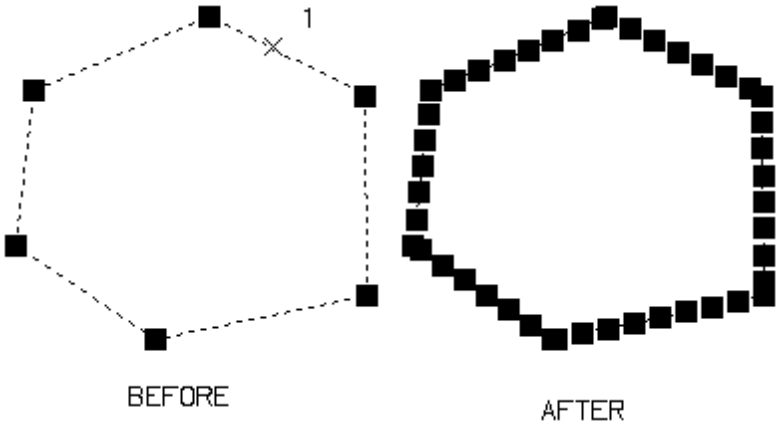
Options

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Dialog Box Options

Tangent Distance:	Enter the new minimum distance between vertices along tangent segments.
Arc Distance:	Enter the new minimum distance between vertices along arc segments.
Retain Original Object:	Check to retain the originally selected object; uncheck to erase originally selected object.

Example



4.12.12 All Segments to Arcs

Modify the arc (bulge factor) of all segments in a polyline.

Button
Ribbon: SmartDraft ▸ Polylines panel ▸ Arc to Polyline Tools
Toolbar: Polyline Tools:
Menu: SmartDraft ▸ Drawing Tools ▸ Polyline Tools ▸ All Segments to Arcs

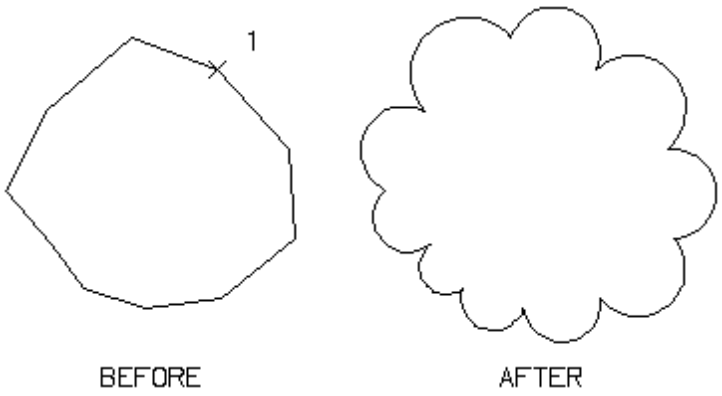
Command:

Polyline: All Segments to Arcs.
Select objects: Select a polyline (1).
Enter bulge factor: Enter a value. Enter **1** for a bulge to the right or **-1** for a bulge to the left.

Note: A bulge of 1 creates semi-circle arcs.

Example

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4.12.13 Modify Selected Segment

Add, modify, or remove an arc from a selected polyline segment.

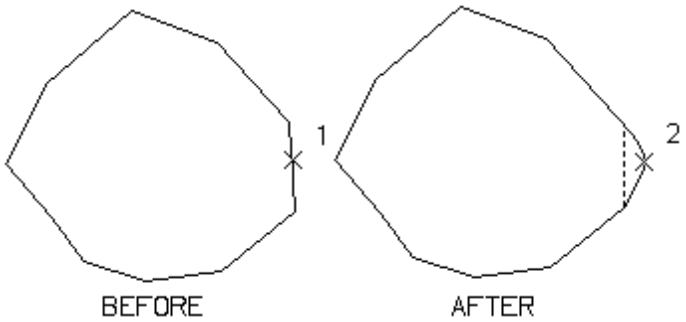
Button
Ribbon: SmartDraft ▸ Polylines panel ▸ Arc to Polyline Tools
Toolbar: Polyline Tools:
Menu: SmartDraft ▸ Drawing Tools ▸ Polyline Tools ▸ Modify Selected Segment
Command entry: **plbe**

Command:

Add, modify, or remove a polyline segment's arc.

Select polyline segment: Select a polyline (1).
Specify new point for arc or [0] to straighten: Specify a new point (2) that the desired arc will pass through or **0** to straighten the segment.

Example



4.12.14 Edit Polyline Width

Modify the width of polylines.

Button

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Ribbon: SmartDraft ▸ Polylines panel ▾
Toolbar: Polyline Tools:
Menu: SmartDraft ▸ Drawing Tools ▸ Polyline Tools ▸ Edit Polyline Width
Command entry: **cw**

Command:
Select polylines.
Select objects: Select all the polylines, and press ENTER. If other objects are selected, they will be filtered out.
Enter new width for all segments <0.00>: Enter a new value. **0** for no width.

4.12.15 Edit Polyline Linetype gen to ON

Change the linetype gen property of polyline to ON.

Button
Ribbon: SmartDraft ▸ Polylines panel ▾
Toolbar: Polyline Tools:
Menu: SmartDraft ▸ Drawing Tools ▸ Polyline Tools ▸ Edit Polyline Linetype gen to ON

Command:
Select polylines.
Select objects: Select all the polylines, and press ENTER. If other objects are selected, they will be filtered out.

4.12.16 Edit Elevation of Polylines

Increment the elevation (z) value of the selected polylines.

Change the elevation (z) value of selected 2D polylines. Select the polylines in increasing or decreasing elevation order. Command increments the selected polyline's elevation by the specified interval.

Button
Ribbon: SmartDraft ▸ Polylines panel ▸
Toolbar: Polyline Tools:
Menu: SmartDraft ▸ Drawing Tools ▸ Polyline Tools ▸ Edit Elevation of Polylines

Command:
Edit elevation of selected polylines.
Select objects: Select all 2D polylines in either increasing or decreasing order.
Current settings: Highlight = <Yes/No>, Interval = <current>
Enter starting elevation or [Highlight/Interval] <140.00>: Enter the starting elevation, **H**ighlight to toggle highlight on and off, or **I**nterval to enter the interval between each polyline's new elevation.
Select objects: Select all 2D polylines in either increasing or decreasing order.

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Note: Order of selection has bearing on how polylines are incremented.

Interval:

Enter elevation interval (+ Increase / - Decrease) <default>: Enter the elevation interval.

4.12.17 Create Polyline by Objects

Create a polyline by select objects.

Create a polyline over existing arc, line, or polyline segments even if nested within a block or Xref. Closes polyline when the start and end points match.


Button


Ribbon: SmartDraft ▸ Polylines panel ▸ 

Toolbar: Polyline Tools: 

Menu: SmartDraft ▸ Drawing Tools ▸ Polyline Tools ▸ Create Polyline by Objects


Command entry: **plo**

Command:

Create Polyline by Objects.

Specify start point: Specify the start point of the polyline. *Default osnap is **END**point and **INT**ersection.*
Select first segment or [Arc/Line]: Select the first segment starting at or near the start point, **A**rc to specify the second point and endpoint of a three-point arc, or **L**ine to specify the endpoint of the line.
Specify end point or [Segment] : Specify the ending point of the segment. If either endpoint of the selected segment matches the previously selected point, an option to create the whole segment **** will be available. *Default osnap is **END**point and **INT**ersection.*
Select next segment or [Arc/Line]: Select the next segment starting at or along the previously selected point, **A**rc to specify the second point and endpoint of a three-point arc, or **L**ine to specify the endpoint of the line.
Specify end point: If neither end point of the selected segment matches the previously selected point, specify the desired end point along the selected segment. *Default osnap is **END**point and **INT**ersection.*
Repeat segment and end point selection until the polyline is complete

If the end point matches the start point of the polyline, the command will automatically close the polyline and end the command.
Closing Polyline.

If Line:

Specify end point: Specify the end point of line. *Default osnap is **END**point and **INT**ersection.*

If Arc:

Specify second point on arc: Specify the second point along the arc. *Default osnap is **NEA**rest.*
Specify end point of arc: Specify the end point of the arc. *Default osnap is **END**point and **INT**ersection.*

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4.12.18 Create 3D Polyline

Create a 3D polyline with elevation prompt.

Create a 3D polyline with option to join an existing 3D polyline; select, or enter the elevation.

Note: This command replaced the *Create 3D polyline from selected object* command.


Button

Ribbon: SmartDraft ▸ Polylines panel ▸ 

Toolbar: Polyline Tools: 

Menu: SmartDraft ▸ Drawing Tools ▸ Polyline Tools ▸ Create 3D polyline

Command entry: **3dp**

Command:

Create a 3D polyline with elevation prompt.

Current settings: Elevation = Select, Adjust = 0.00

Specify start point of polyline or [Join]: Select the starting point, or **J**oin to select an existing 3D polyline to start from.

If Elevation type Enter:

Enter elevation or [Grade/SElect/SLope/Vertdiff] <default>: Enter the elevation, **G**rade for rise over run, **SE**lect to select an object's elevation, **SL**ope to calculate elevation by slope and distance, or **V**ertdiff to calculate elevation with difference.

If Elevation type Grade:

Select grade (2.00:1) or [Enter/SElect/SLope/Vertdiff] <default>: Select an object in the drawing to calculate the elevation, **E**nter to change the elevation prompt enter, **SL**ope to calculate elevation by slope and distance, **SE**lect to select an object's elevation, or **V**ertdiff to calculate elevation with difference.

If Elevation type Select:

Select elevation or [Adjust/Enter/Grade/SLope/Vertdiff] <defaut>: Select an object in the drawing to calculate the elevation, **AD**just to change the elevation adjust value, **E**nter to change the elevation prompt enter, **G**rade for rise over run, **SL**ope to calculate elevation by slope and distance, or **V**ertdiff to calculate elevation with difference.

If Elevation type Slope:

Select slope (%) or [Enter/Grade/SElect/Vertdiff] <default>: Select an object in the drawing to calculate the elevation, **E**nter to change the elevation prompt enter, **G**rade for rise over run, **SE**lect to select an object's elevation, or **V**ertdiff to calculate elevation with difference.

If Elevation type Vertdiff:

Select elevation difference or [Enter/Grade/SElect/SLope] <default>: Select an object in the drawing to calculate the elevation, **E**nter to change the elevation prompt enter, **G**rade for rise over run, **SE**lect to select an object's elevation, or **SL**ope to calculate elevation by slope and distance.

Specify endpoint of line or [Arc/Close/Undo]: Select the next point of the polyline, **A**rc to draw a chorded arc, **C**lose to close back to the starting point (only displays if three points have been selected), or **U**ndo the last entered point.

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If Arc:

Specify second point on arc: Specify a point along an arc. *Default OSNAP:* ***Nea****rest.*
Specify end point of arc: Specify the end point of the arc.
Elevation prompt per type above:
Select elevation or [Enter]:
Enter segment length <*default*>: Enter the chord segment length of the arc.

If Join:

Select 3D polyline to join: Select an existing open 3D polyline.

4.12.19 Create Polyline with Arcs - Tree or Brush line

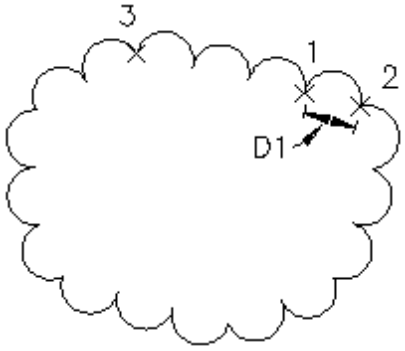
Create a free form tree or bush line on the plant layer with a uniform arc.


Button
Ribbon: SmartDraft ▸ Polylines panel ▸ 
Toolbar: Polyline Tools: 
Menu: SmartDraft ▸ Drawing Tools ▸ Polyline Tools ▸ Create Polyline with Arcs
Command entry: **ftr**

Command:

Specify arc distance <*default*>: Specify a distance (D1), two points (1,2), or press ENTER to accept default.
Specify arc direction [Left/Right] <Right>: Specify **L** for left side as you draw, or press ENTER for the right side as you draw.
Specify from point: Specify a point (3).
Track points or [Close]: Move the cursor within graphic area to create arced line, **C** to close back to the start point (3), or press ENTER to end.

Example



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4.12.20 Join Tools

4.12.20.1 Join

Join arcs, lines, polylines, text strings, or feature lines.

Join the second selected arc, line, or text to the first selected arc, line, or text. Arcs can only be joined with the same radius point and radii. Both collinear and non-collinear lines can be joined. An optional space character is added between the two text strings when they are joined. The command supports both 2D and 3D polylines. 3D polylines can only be joined to other 3D polylines or lines. 2D polylines can be joined to other 2D polylines, lines, or arcs. The Z (elevation) value is ignored when joining objects.

To join features lines, the a feature lines must be selected first.


Button

Ribbon: SmartDraft ▸ Polylines panel ▸ Join Tool pull-down
Toolbar: Text Tools II on the Text Tools:
Toolbar: Join Tools on the Polylines Tools:
Menu: SmartDraft ▸ Text ▸ Join Strings
Menu: SmartDraft ▸ Drawing Tools ▸ Join
Menu: SmartDraft ▸ Drawing Tools ▸ Polyline Tools ▸ Join
Command entry: **jn**

Command:

Join text, arcs, lines, or polylines. Text: <*Space or No_space*>

Select text, arc, line, polyline, or [Quick/Options]: Select first text, arc, line, polyline (1), **Q**uick to join objects, or **O**ption to toggle the space of no space option when joining text.

If **TEXT:**
Select next text: Select second text (2).

If **LINE:**
Select next line: Select second line.

If lines are non-collinear, the operator is given the option to join them.
Selected lines are non-collinear. Join [Yes/No] <Yes>: **Y**es to join the two lines using the two points farthest apart or **N**o to do nothing.

If **ARC:**
Select next arc: Select second arc.

Note: Arcs are joined counter-clockwise.

If **3D POLYLINE:**
Select next 3D polyline or line: Select next 3D polyline, line, or press ENTER to end.

If **2D POLYLINE or LWPOLYLINE:**
Select next polyline, arc, or line: Select next 3D polyline, arc, line, or press ENTER to end.

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Note: If the selected object closes the polyline, the command ends automatically and closes the polyline.

Example

```
1
  FIRST TEXT STRING
  TEXT TO MERGE
2

  FIRST TEXT STRING TEXT TO MERGE
```

4.12.20.2 Join 2D Polylines

Join arcs, lines, and 2D polylines with a gap tolerance

Join selected arcs, lines, and 2D polylines to create a new 2D polyline. Options to specify a gap tolerance and still join.

Option to close automatically at end of command. Option to connect with a straight segment if gap is larger than specified gap tolerance.

If the gap is within the specified gap tolerance, the command will try to extend the segments to join. If it is not possible to join by extending, the command will join the segments using a straight segment added between the selected objects to join. Note: If the second selected object is at a different elevation, it will be moved to the elevation of the polyline.


Button

Ribbon: SmartDraft ▸ Polylines panel ▸ Join Tool pull-down 

Toolbar: Join Tools on the Polylines Tools: 

Menu: SmartDraft ▸ Drawing Tools ▸ Join 2D Polylines

Command entry: **pj**

Command:
Join 2D polylines with tolerance using arcs, lines, and 2D polylines.
Current settings: Tolerance: <default>, Close: <Yes/No>, Auto: <Yes/No>
Select arc, line, polyline or [Options]: Select an arc, line, 2D polyline, or **Options** to change the current settings.

If **3D POLYLINE or 3D LINE:**
Cannot use 3D polyline or 3D line:

Note: If the selected object closes the polyline, the command ends automatically and closes the polyline.

4.12.20.3 Join Quick

Join arcs, lines, and polylines on the same layer and at the same elevation.

Join Quick joins all the arcs, lines, and polylines next to a selected arc, line, or polyline on the same layer and at the same elevation. Does not join closed polylines, 3D polylines, 3D meshes, or lines with endpoints at different elevations.

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Button

Ribbon: SmartDraft ▸ Polylines panel ▸ Join Tool pull-down

Toolbar: Join Tools on the Polylines Tools:

Menu: SmartDraft ▸ Drawing Tools ▸ Join Quick

Command entry: **qj**

Command:
Join arcs, lines, and polylines on the same layer and same elevation.
Select arc, line, or polyline: Select an arc, line, or polyline.

4.13 Profiles Panel Tools

4.13.1 Profile Tools Overview

Use the Profile Tools to create existing and finished ground profiles. The Profile Tools draw the profiles without creating the vertical grid lines.

The Profile Tools create profiles from a variety of input methods and can create profiles from profile data.

Profile drawing options. See Profile Labels Options

- Multiple profiles in one a drawing. Each profile must have its own Profile View.
- Three-line profiles.
- Tangent lines can be placed on the operator-specified layer.
- Station and Elevation label direction.
- Circle at label location.
- Prefix, suffix, and precision options for station, elevation, and slope labels.
- Label using dynamic block.

Profile View:

SmartDraft can read the SmartDraft, BricsCAD, and Civil 3D profile views. The profile label commands need a Profile View.

Input Methods:

Enter data for stations, elevations, and vertical curves. See Label Profile (Station and Elevation)

Enter data for Curb Returns. See Profile Curb Return

Profile Post Processing Tools:

Label or query tangent slope and vertical deflection angle. See Profile Angle, Draw, Inquire, Label, or Pipe

Create station and elevation label. See Label Profile (At Station)

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4.13.1.1 Profile Labels Options

Set profile label options for adding labels along a Civil 3D or SmartDraft profile, BricsCAD vertical alignments ,or when entering station and elevation values.

For Civil 3D Profile Views: Profile View Offset Options	**Add Offset Top and Bottom values when selecting a profile view.**
For BricsCAD Vertical Alignment View: SmartDraft profile commands.	**Add Offset Top and Bottom values so you can use them by**
For SmartDraft Profile Views -	**Create, modify, or select a Edit Profile View.**

The starting station, elevation location, vertical scale and direction are determined by the profile datum option block. Multiple profiles can be created within one file, but each profile requires its own profile datum option block.

Supports Civil 3D profile views, and the SmartDraft profile view block.

Note: The label is a Dynamic Block.

Dialog Box Options

Profile

View: Select a profile or vertical alignment view. Suffixes: (C3D) = Civil 3D Profile View, (BCAD) = BricsCAD Pro Vertical Alignment View, and (SD) = SmartDraft Profile View

Create: Create a Profile View (profile grid).

Edit: Modify the data of the selected profile view. For Civil 3D and BricsCAD: Profile View Offset Options, for SmartDraft: Edit Profile View

Location: Select the profile offset location. Top, Center, or Bottom. Top and Bottom are only available if an offset value has been assigned. Use the Edit button to assign the values.

Alignment: Select an alignment to use one of the associated profile design data, Projected Feature Lines, or select Manual Entry to create a non-dynamic profile by entering the stations and elevations at the command line.

Profile: Select the profile / vertical alignment to label.

Layer

Profile Check to drawing the profile line.

List: Select the layer type to draw the profile lines. Display current Customization Template's Profile Layer List.

Type: Change the layer type. Display current setting. If the layer type is set to "Exist", elevation labels will be surrounded with parentheses "(xxxx.xx)".

Leader Layer for the labels. Select Default to use the layer in the database associated to Profile Labels, or *current* to use the current layer when the command statted.

Labeling

Create Dynamic Labels Check to create dynamic profile labels.

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and Profile Labels: Check to include label profile labels.
Add Offset: Check to offset the leader from the profile point to the beginning of the leader.
GB Circles (Grade Break) Check to include a circle at each station label.
Profile Text Station text for profile geometry data.
Alignment Text Station text for horizontal geometry data.
Direction: Select Up or Down for the direction of the station and elevation label leader.
Placement: Select placement: Station above Elevation or Elevation above Station on the label.

Stations

Station: Check to include station on label.
Prefix: Enter the prefix text for station labels.
Suffix: Enter the suffix text for station labels.
Precision: Select the decimal precision for station from the list.

Elevations

Elevation: Check to include elevation on label.
Prefix: Enter the prefix text for elevation labels.
Suffix: Enter the suffix text for elevation labels.
Precision: Select the decimal precision for elevations from the list.
Truncate: Set the number of places the elevation will be truncated left of the decimal point.
Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.
Prompt Vertical Curve's Label Length Check to individually prompt for each vertical curve the length between labels within the vertical curve. Not checked indicates the same value will be used for all vertical curves along the profile.
VC Options Select to change the vertical curve internal label spacing, prefix and suffix values, and what to include in the vertical curve information data.

Interval: Check to include interval station labels.
Interval edit box: Enter the station interval as an integer (e.g. 10, 25, 50, 100 ...)
GB Circles Check to include a circle at each interval station label.
Place inside Vertical Curves Check to include label leader, station, and elevation between vertical curves.
Horizontal Geometry Check to include labels at horizontal geometry locations.
GB Circles Check to include a circle at each horizontal geometry labels

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Slope Labeling

Slope: Check to include slope labels.

Prefix: Enter the prefix text for slope labels.

Suffix: Enter the suffix text for slope labels.

Precision: Select the decimal precision for slope from the list.

Type: Select **Decimal** to label slope using grade in decimal or **Percent** to label slope using grade in percent.

Placement: Select Above to place the slope label above the profile or Below to place it below.

Arrow: Add slope arrow.

Minus Sign: Add minus sign to decreasing slopes.

4.13.1.2 Profile / Alignment Setup

Use to set the alignment and profile type.

Dialog Box Options

Alignment: Select an alignment to use the vertical design data, or select Manual Entry to create a non-dynamic profile by entering the stations and elevations at the command line.

Profile: Select the Civil 3D's profile.

Stations

Prefix: Enter the prefix text for station labels.

Suffix: Enter the suffix text for station labels.

Precision: Select the decimal precision for station from the list.

Elevations

Prefix: Enter the prefix text for elevation labels.

Suffix: Enter the suffix text for elevation labels.

Precision: Select the decimal precision for elevations from the list.

4.13.1.3 Profile Manual Entry

These are the prompts for profile Manual Entry for the Label Profile (Station and Elevation) and Create Profile Line commands.

Manual Entry Profiles:

Enter station or [Point]: Enter a station value (format 1+00.00 as 100), **P**oint to specify a point to calculate a station, or press ENTER to end.

Enter elevation: Enter the elevation value for the station.

Enter station or [Point/Undo]: Enter the next grade break or Vertical Curve PI station value (format 1+00.00 as 100), **P**oint to specify a point to calculate a station, **U**ndo to undo last station and elevation, or press ENTER to end.

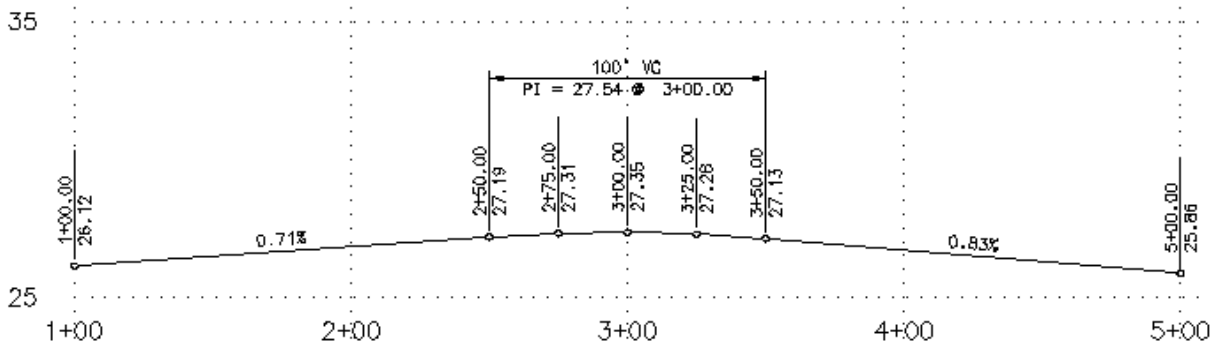
Enter elevation or [Slope]: Enter the elevation value for the next grade break or PI station, or **S**lope to enter slope to calculate elevation to next station.

Is Station 3+00.00, Elevation 27.54 a VC PI [Yes/No] <No>: **Y**es if station is a Vertical Curve PI, or **N**o, and press ENTER if it is only the next grade break.

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Example

Label direction: Up, Grade break circles: Yes
First station: 1+00.00, Elevation: 25.00
PI Station: 3+00.00, Elevation: 25.74
PI length: 100, PI grade breaks: 25
Last station 5+00.00, Elevation: 25.88



4.13.1.4 Profile Manual Entry: Vertical Curve Information

Specify the requested information to draw a vertical curve.

Dialog Box Options

Station and Elevation

Incoming

Station:	BVC Station value. The value is from the last drawn station.
Elevation:	BVC Elevation value. The value is from the last drawn elevation.
Slope:	Value calculated from BVC Station, BVC Elevation, PVI Station, and PVI Elevation.
PVI	
Station:	Enter a PVI Station value. The value must be greater than the BVC Station and less than the EVC Station.
Elevation:	Enter a PVI Elevation value.
Outgoing	
Station:	Enter an EVC Station value. The value must be greater than the PVI station.
Elevation:	Enter an EVC Elevation value, or press ENTER to enter the slope.
Slope:	Value calculated from PVI Station, BVC Elevation, PVI Station, and PVI Elevation. If the operator specifies a slope value, the EVC Station remains unchanged, and the EVC Elevation is recalculated.
Vertical Curve	
Curve Length:	Enter the length of the vertical curve.
Labeling Length:	Enter the length for the labels within the vertical curve.
Labels	
List:	Display the vertical curve information if the entered values are valid.
OK:	Confirms values and draws vertical curve if values are valid.

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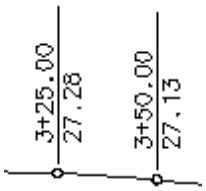
Cancel: Exit command and prompt if Incoming Station and Elevation are a grade break.

4.13.1.5 Profile Label Direction

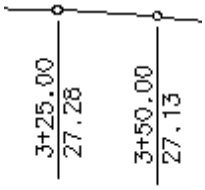
Specify the type or direction of the station and elevation label.

Examples

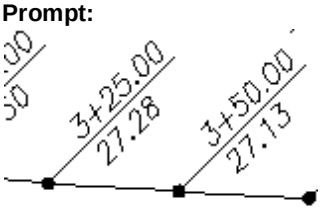
Up:



Down:



Prompt:



Prompt:

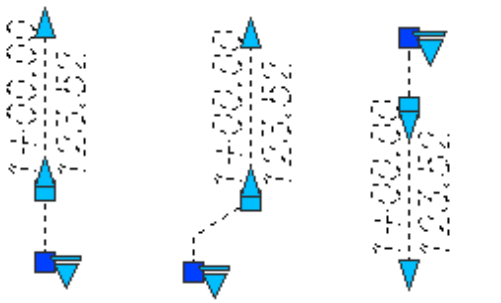
Specify angle for profile label <45d00'00">: Specify an angle for the profile label or Enter.

4.13.1.6 Profile Dynamic Block

Profile Label as a Dynamic Block.

A dynamic block has flexibility and intelligence. A dynamic block reference can easily be changed in a drawing while you work. You can manipulate the geometry through custom grips or custom properties. This allows you to adjust as necessary the block reference in-place rather than searching for another block to insert or redefining the existing one.

The profile label block has the following special dynamic properties.



Up - Node **Up - Grip move** **Down - Node**

Move grip. Select this grip to move the text and leader line.

Leader search grips. There is one leader search grips. The lower leader search grip will create a leader that does update as the text is edited.

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Visibility options. There are four options to have the leader pointing Up and four options to have the leader pointing Down. Each of the Up and Down visibility directions has the additional options to display the grade break node or not, to have the leader start at the elevation, or offset from the set elevation.



Notes:

- Do not use the AutoCAD Scale command to increase or decrease the size of the block. Use either the Custom Scale property in AutoCAD's Properties Palette, or use the Block Scale command. The Custom Scale property is equal to the text height.
- Do not mirror or include in a block you plan to mirror. This can cause the dynamic grips to stop working.
- The Change Label Direction **CLD** command can be used to toggle the Up and Down direction of the profile label.
- When SmartDraft is loaded and running, the leader will resize when the attribute values are modified.

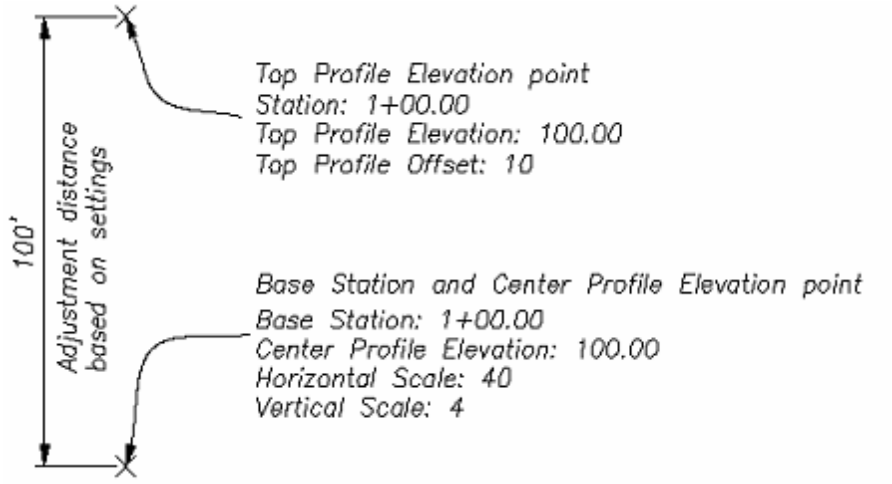
4.13.1.7 Profile View Offset Options

Set the profile view Top and Bottom offset options for creating 3 line profiles

Dialog Box Options

Profile View:	Name of the profile view
Top Profile Offset:	Optional. Specify an offset distance from the Center Profile Elevation.
Bottom Profile Offset:	Optional. Specify an offset distance from the Center Profile Elevation.

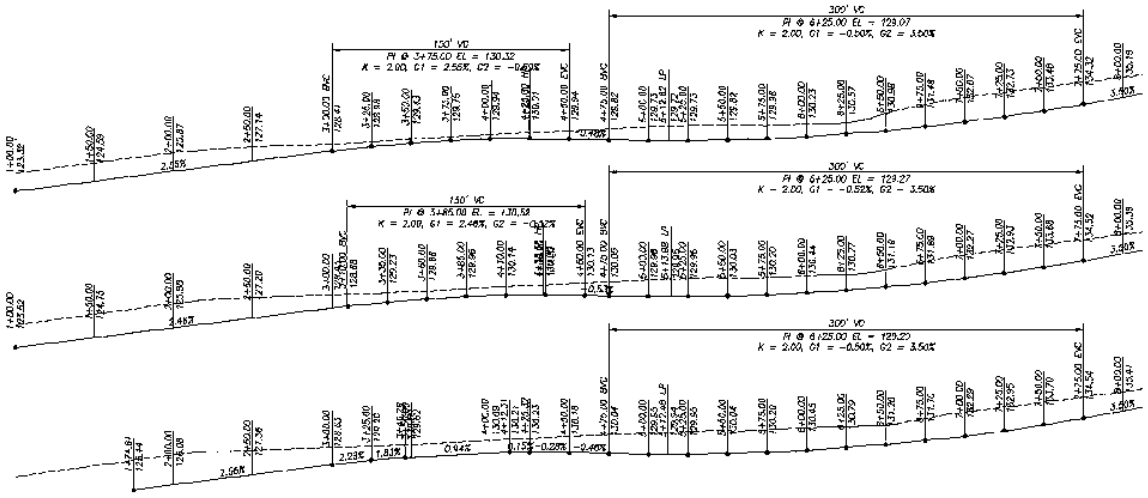
Example of Profile View Offset Value



Top Profile Offset = 10
Horizontal Scale (HS) = 40
Vertical Scale (VS) = 4

Example of Profile View 3 Line Profile

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4.13.2 Define / Edit Profile

Define or Edit profile design data associated to an alignment

Overview

Supports:

AutoCAD Products: Yes

BricsCAD Pro: Yes

Button

Ribbon: SmartDraft ▸ Profile panel ▸

Toolbar: Profile Tools:

Menu: SmartDraft ▸ Profile ▸ Define / Edit Profile

Command entry: **pfm**

Command:

Define / Edit Alignment's Profile(s).

Select a alignment [List]: Select a SmartDraft alignment.

Profile Manager: Define / Edit Alignment;s Profile(s)

Alignment

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Alignment Name of the selected alignment

Starting The starting station of the alignment

Ending The ending station of the alignment

Profile

Profile List of profiles associated to the alignment

Descriptio Description of the selected profile

Type: Type of the selected profile. (i.e. EG, Centerline, etc.)

Add Add a new profile design to the alignment

Edit Edit the select profile in the Profile List.

Copy Copy the select profile in the Profile List. There are station and elevation adjustments.

Delete Delete the select profile in the Profile List.

Save Save the changes to the profile(s) associated to the alignment

Discard Discard the changes.

4.13.2.1 Add / Edit Profile Design

Add a profile design or edit existing profiled design. Add or edit PVI (Profile Vertical Intersection) or Break Stations.

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Dialog appears for the Define / Edit Profile, Create Existing Ground Profile, and right-click Edit Profile Geometry commands.

Add / Edit Profile Design

Alignment

Alignment Name of the selected alignment

Starting The starting station of the alignment

Ending The ending station of the alignment

Profile

Name Enter or edit the profile name

Type Select the profile type. Note: If EG (Exiting Ground), it cannot be changed.

Descriptio Enter or edit the profile description

Profile

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Profile List of existing PVI of the profile design

Adjust Adjust all the PVI stations and/or elevations by value.

Add PVI Add a PVI to the profile design.

Edit PVI Edit the selected PVI.

Delete PVI Delete the select PVIs from the profile design

Profile Break Stations Information Note: Not supported for BricsCAD Pro Profiles (Vertical alignments)

Profile Station Breaks List List of existing Break Stations of the profile design

Add Break Add Break Stations to the profile design

Edit Break Edit the selected Break Stations.

Delete Break Delete the selected Break Stations from the profile design

Break Station Text Enter the default Break Station Text when using the Add Break or Edit Break options.

Save Save the changes to the profile design

Discard Discard the changes.

4.13.2.1.1 Adjust PVIs

Adjust all the stations and elevations of a profile PVIs and Break stations

Profile PVIs and Break Stations: Adjust stations and elevations

Profile

Name Profile name

Options

Adjust Enter a value to adjust all the elevations of the select profile design

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Adjust Enter a value to adjust all the stations of the select profile design

Save Save changes to the
Discard Discard the changes.

4.13.2.1.2 Add PVI

Add a profile PVI (Profile Vertical Intersection) to the profile design

Add Profile PVI
In / Out

In Station: If there is a PVI before the current PVI, the In PVI's Station and Elevation will be displayed
Elevation
Out If there is a PVI after the current PVI, the Out PVI's Station and Elevation will be displayed

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Current

Grade In The Grade In by percentage (%) from the In PVI (if exists), and the Current PVI (if both the Station and Elevation are entered)

Enter a Grade In by percentage to calculate the Elevation of the Current PVI from the In PVI (if exists) and both the Station and Elevation of the current PVI exist.

Station Enter the PVI station

Elevation Enter the PVI elevation

Grade Out The Grade Out by percentage (%) from the Current PVI (if both the Station and Elevation are entered) and the Out PVI (if exists)

Enter a Grade Out by percentage to calculate the Out PVI Elevation (if exists) from the Current PVI (if both the Station and Elevation are entered).

VC Length If the PVI is for a Vertical Curve (VC) the VC length, otherwise enter 0.0 for a station break.

Radius If VC Length is not 0.0, and the Grades In and Out are not parallel, the radius of the vertical curve will be calculated and displayed.

K If VC Length is not 0.0, and the Grades In and Out are not parallel, the K value of the vertical curve will be calculated and displayed.

Save Save the changes to the PVI

Discard Discard the changes.

4.13.2.1.3 Edit PVI

Edit a profile PVI (Profile Vertical Intersection) from the profile design

Edit Profile PVI

In / Out

In Station: If there is a PVI before the current PVI, the In PVI's Station and Elevation will be displayed
Elevation
Out If there is a PVI after the current PVI, the Out PVI's Station and Elevation will be displayed

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Current

Grade In The Grade In by percentage (%) from the In PVI (if exists), and the Current PVI (if both the Station and Elevation are entered)

Enter a Grade In by percentage to calculate the Elevation of the Current PVI from the In PVI (if exists) and both the Station and Elevation of the current PVI exist.

Station Enter the PVI station

Elevation Enter the PVI elevation

Grade Out The Grade Out by percentage (%) from the Current PVI (if both the Station and Elevation are entered) and the Out PVI (if exists)

Enter a Grade Out by percentage to calculate the Out PVI Elevation (if exists) from the Current PVI (if both the Station and Elevation are entered).

VC Length If the PVI is for a Vertical Curve (VC) the VC length, otherwise enter 0.0 for a station break.

Radius If VC Length is not 0.0, and the Grades In and Out are not parallel, the radius of the vertical curve will be calculated and displayed.

K If VC Length is not 0.0, and the Grades In and Out are not parallel, the K value of the vertical curve will be calculated and displayed.

Save Save the changes to the PVI

Discard Discard the changes.

4.13.2.1.4 Add Breaks

Add break stations to a profile design. These breaks station will be labeled when using the Label Profile (Station and Elevation). If the Profile draw option is selected the profile line well break at the starting station and restart at the ending station. The station value will be labeled with the corresponding station text.

Add Profile Break Stations

Break Stations Information

Starting The starting station to break and label the profile

Starting The starting station labeling text

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Ending The ending station to break and label the profile

Ending The ending station labeling text

Save Save the changes to the station break

Discard Discard the changes.

4.13.2.1.5 Edit Breaks

Edit break stations to a profile design. These breaks station will be labeled when using the Label Profile (Station and Elevation). If the Profile draw option is selected the profile line well break at the starting station and restart at the ending station. The station value will be labeled with the corresponding station text.

Edit Profile Break Stations

Break Stations Information

Starting The starting station to break and label the profile

Starting The starting station labeling text

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Ending The ending station to break and label the profile

Ending The ending station labeling text

Save Save the changes to the station break
Discard Discard the changes.

4.13.2.2 Copy Profile Design

Copy a profile design with the options to adjust the stations and elevations
Dialog appears for the Define / Edit Profile, and Profile Copy and Adjust - Profile View commands.

Copy Profile
Profile

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Name Enter a new profile name

Type Select the profile type. Note: If EG (Exiting Ground), it cannot be changed.

Descriptio Enter the profile description

Adjust Enter a value to adjust all the elevations of the select profile design

Adjust Enter a value to adjust all the stations of the select profile design

Save Save a copy of the selected profile design with the new name

Discard Discard the changes.

4.13.3 Create Existing Ground Profile

Create a existing ground (EG) profile from a surface or polylines along a SmartDraft alignment.

Note: If there are not Surfaces in the drawing, only the Polylines option will be available.

Supports:

AutoCAD Products: Yes

BricsCAD Pro: Yes


Button


Ribbon: SmartDraft ▸ Profile panel ▸ 

Toolbar: Profile Tools: 

Menu: SmartDraft ▸ Profile ▸ Create Existing Ground Profile


Command entry: **pfeg**

Command:

Create Existing Ground Profile.

Select a alignment [List]: Select an alignment, or **L**ist to select the alignment from a dialog list.

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Select a Surface [List/Polylines]: Select a surface, **L**ist to select the surface from a dialog list, or **P**olylines to select crossing polylines

The Edit Profile Design dialog appears.

If **Polylines**

Select polylines [LAYers/Surface]: Select polylines, **L**ayers to select layers to select polylines on those layers, or **S**urface to select a surface.

The Edit Profile Design dialog appears.

4.13.4 Label Profile (Station and Elevation)

Label a profile with dynamic label for stations, elevations, and slopes. Options to label Vertical Curve data, brake points, horizontal geometry points.

Overview

Note: Creating labels from Civil 3D's alignment and profile data. The label is a Dynamic Block. This command has been enhanced to create dynamic profile label for Civil 3D profiles. It supports 3 line dynamic profile labels.

Manual Entry allows the operator to create a profile with grade breaks, station and elevation labels, tangents, and vertical curves.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	BricsCAD Pro for Civil objects


Button


Ribbon: SmartDraft ▸ Profile panel ▸ 

Toolbar: Profile Tools: 

Menu: SmartDraft ▸ Profile ▸ Label Profile (Station and Elevation)


Command entry: **pvse**


Video demonstration

Command:

Profile Labels Options dialog box will appear.

Profile Name base station: <*datum station*>, elevation: <*datum elevation*>, and direction: <*Left to Right / Right to Left*>

Create Profile.....

When selecting an alignment and profile

Starting Station: <station> Ending Station: <station>

Start profile stationing at <default>: Enter a station to start drafting the profile, or press ENTER to accept default.

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End profile stationing at <default>: Enter a station to end drafting the profile, or press ENTER to accept default.

When selecting Manual Entry as the alignment

Manual Entry

Profile: 3-Line Profile Example

4.13.4.1 Vertical Curve Information Label Options

Specify the requested information to create the vertical curve information label.

Dialog Box Options

Profile Vertical Curve Information Options

Interval Labels

Length Toggle: Check to add interval labels within the vertical curve
Length: Enter the length between vertical curve interval labels.
GB Circle at Interval Labels Check to display the grade break circle for each interval label.

Labeling:

Length: Check to include the length information
Placement: Select the location of the length value.
Prefix: Enter the prefix text for length value.
Suffix: Enter the suffix text for length value.
Precision: Select the decimal precision for length from the list.
PVI Station: Check to include the PVI station information
Placement: Select the location of the PVI station value.
Prefix: Enter the prefix text for PVI station value.
Precision: Select the decimal precision for station from the list.
PVI Elevation: Check to include the PVI elevation information
Placement: Select the location of the PVI elevation value.
Prefix: Enter the prefix text for PVI elevation value.
Precision: Select the decimal precision for elevation from the list.
Truncate: Set the number of places the elevation will be truncated left of the decimal point. Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.
K Value: Check to label the K value of the vertical curve.
Placement: Select the location of the K value.
Prefix: Enter the prefix text for K value.
Precision: Select the decimal precision for K value from the list.
Radius: Check to label the Radius of the vertical curve.
Placement: Select the location of the Radius.
Prefix: Enter the prefix text for Radius.
Precision: Select the decimal precision for Radius from the list.
Include Grade In and Grade Out: Check to label the incoming (G1) and outgoing G2) slopes of the vertical curve.
Precision: Select the decimal precision for Grades from the list.
Grade In:
Placement: Select the location of the Grade In value.
Prefix: Enter the prefix text for Grade In value.
Grade Out:
Placement: Select the location of the Grade Out value.
Prefix: Enter the prefix text for Grade Out value.

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GB Circle at High / Low Point Check to display the grade break circle for a high / low point label.
GB Circle at Beginning / Ending of Vertical Curve Check to display the grade break circle for the beginning and ending station label.

Note 1: Check to include note 1 value (1st) of the label.
Note 2: Check to include note 2 value (2nd) of the label.
Note 3: Check to include note 3 value (3rd) of the label.
Note: Common options for Note 1, 2, and 3.
Placement: Specify the location of the note value.
Input: Select the input option for the note.
Note: Enter the note value, if the input option is set to Note.

OK: Confirms values and draws vertical curve if values are valid.
Cancel: Exit command and prompt if Incoming Station and Elevation are a grade break.

4.13.4.2 Profile Geometry Station Text Options

Station Label Suffix options for Label Profile (Station and Elevation)

Dialog Box Options

Profile Geometry Station Text Options

Text Placement

Position Select if the Station text will be a prefix or a suffix

Add space between text and station Check to add a space.

Text

Grade Break: Specify the station suffix for a grade break (i.e., GB).

Beginning Vertical Curve: Specify the station suffix for beginning of vertical curve (i.e., BVC).

Ending Vertical Curve: Specify the station suffix for ending of vertical curve (i.e., EVC).

Delimiter when EVC = BVC Specify the delimiter characters when the station of an EVC is equal to a BVC.

High Point: Specify the station suffix for high point of vertical curve (i.e., HP).

Low Point: Specify the station suffix for low point of vertical curve (i.e., LP).

Note: In Civil 3D these values are read from the drawing's Abbreviations and changes are push to the drawing's Abbreviations.

4.13.4.3 Edit Profile Grade Break Label Options

Edit the display options of a profile grade break label created by the Label Profile (Station and Elevation) command.

Edit Profile Grade Break Label Options

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Informatio

Alignment The name of the associated alignment

Profile The name of the associated profile

Starting The starting station of the profile or profile view.

Ending The ending station of the profile or profile view.

Location

Station Station of the Grade Break Label

Labeling:

Leader Select **Up** to have the label above the profile or **Down** to have the label below the profile.

Leader Check to draw an offset from the profile point to the beginning of the leader.

Grade Check to include a circle at the label's insertion point.

Leader to Profile View Top / Bottom Extend the leader to the top of the profile view.

Profile Suffixes Select to modify the Special Station Suffixes related to profile design points.

Planview Suffixes Select to modify the Special Station Suffixes related to alignment design points.

Suppress Special Station Text Check to suppress the Special Station Suffix text. i.e. GB, BC, EC, etc.

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Station: Toggle to include offset value of the label.

Placemen Select the location of the station value.

Prefix: Edit box for prefix text that will be added to the station value.

Suffix: Edit box for suffix text that will be added to the station value.

Precision: Set the number of decimal places for the station output display.

Elevation: Toggle to include elevation value of the label.

Placemen Select the location of the elevation value.

Prefix: Edit box for prefix text that will be added to the elevation value.

Suffix: Edit box for suffix text that will be added to the elevation value.

Precision: Set the number of decimal places for the elevation output display.

Truncate: Set the number of places the elevation will be truncated left of the decimal point.

Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.

Note 1: Toggle to include note 1 value (1st) of the label.

Note 2: Toggle to include note 2 value (2nd) of the label.

Note 3: Toggle to include note 3 value (3rd) of the label.

Note 4: Toggle to include note 3 value (4th) of the label.

Note: Common options for Note 1, 2, and 3.

Placemen Specify the location of the note value.

Input: Select the input option for the note.

Note: Enter the note value, if the input option is set to Note.

4.13.4.4 Edit Profile Horizontal Geometry Label Options

Edit the display options of a profile horizontal geometry label created by the Label Profile (Station and Elevation) command.

Edit Profile Horizontal Geometry Label Options

Informatio

Alignment The name of the associated alignment

Profile The name of the associated profile

Starting The starting station of the profile or profile view.

Ending The ending station of the profile or profile view.

Location

Station Station of horizontal geometry label

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Labeling:

Leader Select **Up** to have the label above the profile or **Down** to have the label below the profile.

Leader Check to draw an offset from the profile point to the beginning of the leader.

Grade Check to include a circle at the label's insertion point.

Leader to Profile View Top / Bottom Extend the leader to the top of the profile view.

Profile Suffixes Select to modify the Special Station Suffixes related to profile design points.

Planview Suffixes Select to modify the Special Station Suffixes related to alignment design points.

Suppress Special Station Text Check to suppress the Special Station Suffix text. i.e. GB, BC, EC, etc.

Station: Toggle to include offset value of the label.

Placemen Select the location of the station value.

Prefix: Edit box for prefix text that will be added to the station value.

Suffix: Edit box for suffix text that will be added to the station value.

Precision: Set the number of decimal places for the station output display.

Elevation: Toggle to include elevation value of the label.

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Placemen Select the location of the elevation value.

Prefix: Edit box for prefix text that will be added to the elevation value.

Suffix: Edit box for suffix text that will be added to the elevation value.

Precision: Set the number of decimal places for the elevation output display.

Truncate: Set the number of places the elevation will be truncated left of the decimal point.

Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.

Note 1: Toggle to include note 1 value (1st) of the label.

Note 2: Toggle to include note 2 value (2nd) of the label.

Note 3: Toggle to include note 3 value (3rd) of the label.

Note 4: Toggle to include note 3 value (4th) of the label.

Note: Common options for Note 1, 2, and 3.

Placemen Specify the location of the note value.

Input: Select the input option for the note.

Note: Enter the note value, if the input option is set to Note.

4.13.4.5 Edit Profile Start / End Label Options

Edit the display options of a profile start or end of profile label created by the Label Profile (Station and Elevation) command.

Edit Profile Start or End of Profile Label Options

Informatio

Alignment The name of the associated alignment

Profile The name of the associated profile

Starting The starting station of the profile or profile view.

Ending The ending station of the profile or profile view.

Location

Station Station of Start or End of the Profile

Labeling:

Leader Select **Up** to have the label above the profile or **Down** to have the label below the profile.

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Leader Check to draw an offset from the profile point to the beginning of the leader.

Grade Check to include a circle at the label's insertion point.

Leader to Profile View Top / Bottom Extend the leader to the top of the profile view.

Profile Suffixes Select to modify the Special Station Suffixes related to profile design points.

Planview Suffixes Select to modify the Special Station Suffixes related to alignment design points.

Suppress Special Station Text Check to suppress the Special Station Suffix text. i.e. GB, BC, EC, etc.

Station: Toggle to include offset value of the label.

Placemen Select the location of the station value.

Prefix: Edit box for prefix text that will be added to the station value.

Suffix: Edit box for suffix text that will be added to the station value.

Precision: Set the number of decimal places for the station output display.

Elevation: Toggle to include elevation value of the label.

Placemen Select the location of the elevation value.

Prefix: Edit box for prefix text that will be added to the elevation value.

Suffix: Edit box for suffix text that will be added to the elevation value.

Precision: Set the number of decimal places for the elevation output display.

Truncate: Set the number of places the elevation will be truncated left of the decimal point.
Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.

Note 1: Toggle to include note 1 value (1st) of the label.

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Note 2: Toggle to include note 2 value (2nd) of the label.

Note 3: Toggle to include note 3 value (3rd) of the label.

Note 4: Toggle to include note 3 value (4th) of the label.

Note: Common options for Note 1, 2, and 3.

Placemen Specify the location of the note value.

Input: Select the input option for the note.

Note: Enter the note value, if the input option is set to Note.

4.13.4.6 Edit Profile Station Label Options

Edit the display options of a profile station label created by the Label Profile (Station and Elevation) and Label Profile (At Station) commands.

Edit Profile Station Label Options

Informatio

Alignment The name of the associated alignment

Profile The name of the associated profile

Starting The starting station of the profile or profile view.

Ending The ending station of the profile or profile view.

Location

Station Enter a station value to move the label.

Labeling:

Leader Select **Up** to have the label above the profile or **Down** to have the label below the profile.

Leader Check to draw an offset from the profile point to the beginning of the leader.

Grade Check to include a circle at the label's insertion point.

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Leader to Profile View Top / Bottom Extend the leader to the top of the profile view.

Profile Suffixes Select to modify the Special Station Suffixes related to profile design points.

Planview Suffixes Select to modify the Special Station Suffixes related to alignment design points.

Suppress Special Station Text Check to suppress the Special Station Suffix text. i.e. GB, BC, EC, etc.

Station: Toggle to include offset value of the label.

Placemen Select the location of the station value.

Prefix: Edit box for prefix text that will be added to the station value.

Suffix: Edit box for suffix text that will be added to the station value.

Precision: Set the number of decimal places for the station output display.

Elevation: Toggle to include elevation value of the label.

Placemen Select the location of the elevation value.

Prefix: Edit box for prefix text that will be added to the elevation value.

Suffix: Edit box for suffix text that will be added to the elevation value.

Precision: Set the number of decimal places for the elevation output display.

Truncate: Set the number of places the elevation will be truncated left of the decimal point.

Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.

Name: Toggle to include Structure Name value in the label.

Placemen Select the location of the name value.

Prefix: Edit box for prefix text that will be added to the name value.

Suffix: Edit box for suffix text that will be added to the name value.

Descriptio Toggle to include Structure Description value in the label.

Placemen Select the location of the description value.

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Prefix: Edit box for prefix text that will be added to the description value.

Suffix: Edit box for suffix text that will be added to the description value.

Note 1: Toggle to include note 1 value (1st) of the label.

Note 2: Toggle to include note 2 value (2nd) of the label.

Note 3: Toggle to include note 3 value (3rd) of the label.

Note 4: Toggle to include note 3 value (4th) of the label.

Note: Common options for Note 1, 2, and 3.

Placemen Specify the location of the note value.

Input: Select the input option for the note.

Note: Enter the note value, if the input option is set to Note.

4.13.4.7 Edit Profile Station Equation Label Options

Edit the display options of a profile station equation label created by the Label Profile (Station and Elevation) command.

Edit Profile Station Equation Label Options

Informatio

Alignment The name of the associated alignment

Profile The name of the associated profile

Starting The starting station of the profile or profile view.

Ending The ending station of the profile or profile view.

Location

Station Station of the Station Equation label

Labeling:

Leader Select **Up** to have the label above the profile or **Down** to have the label below the profile.

Leader Check to draw an offset from the profile point to the beginning of the leader.

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Grade Check to include a circle at the label's insertion point.

Leader to Profile View Top / Bottom Extend the leader to the top of the profile view.

Profile Suffixes Select to modify the Special Station Suffixes related to profile design points.

Planview Suffixes Select to modify the Special Station Suffixes related to alignment design points.

Suppress Special Station Text Check to suppress the Special Station Suffix text. i.e. GB, BC, EC, etc.

Station: Toggle to include offset value of the label.

Placemen Select the location of the station value.

Prefix: Edit box for prefix text that will be added to the station value.

Suffix: Edit box for suffix text that will be added to the station value.

Precision: Set the number of decimal places for the station output display.

Elevation: Toggle to include elevation value of the label.

Placemen Select the location of the elevation value.

Prefix: Edit box for prefix text that will be added to the elevation value.

Suffix: Edit box for suffix text that will be added to the elevation value.

Precision: Set the number of decimal places for the elevation output display.

Truncate: Set the number of places the elevation will be truncated left of the decimal point.

Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.

Note 1: Toggle to include note 1 value (1st) of the label.

Note 2: Toggle to include note 2 value (2nd) of the label.

Note 3: Toggle to include note 3 value (3rd) of the label.

Note 4: Toggle to include note 3 value (4th) of the label.

Note: Common options for Note 1, 2, and 3.

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Placemen Specify the location of the note value.

Input: Select the input option for the note.

Note: Enter the note value, if the input option is set to Note.

4.13.4.8 Edit Profile Vertical Curve BVC / EVC Label Options

Edit the display options of a profile vertical curve BVC / EVC label created by the Label Profile (Station and Elevation) command.

Edit Profile Vertical Curve BVC / EVC Label Options

Informatio

Alignment The name of the associated alignment

Profile The name of the associated profile

Starting The starting station of the profile or profile view.

Ending The ending station of the profile or profile view.

Location

Station Station of the BVC or EVC label

Labeling:

Leader Disabled. Move the associated Profile Vertical Curve Information Label to change the direction and leader length of the label.

Leader Check to draw an offset from the profile point to the beginning of the leader.

Grade Check to include a circle at the label's insertion point.

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Leader to Profile Disabled. Move the associated Profile Vertical Curve Information Label to change the direction and leader length of the label.

View Top / Bottom

Profile Suffixes Select to modify the Special Station Suffixes related to profile design points.

Planview Suffixes Select to modify the Special Station Suffixes related to alignment design points.

Suppress Special Station Text Check to suppress the Special Station Suffix text. i.e. GB, BC, EC, etc.

Station: Toggle to include offset value of the label.

Placemen Select the location of the station value.

Prefix: Edit box for prefix text that will be added to the station value.

Suffix: Edit box for suffix text that will be added to the station value.

Precision: Set the number of decimal places for the station output display.

Elevation: Toggle to include elevation value of the label.

Placemen Select the location of the elevation value.

Prefix: Edit box for prefix text that will be added to the elevation value.

Suffix: Edit box for suffix text that will be added to the elevation value.

Precision: Set the number of decimal places for the elevation output display.

Truncate: Set the number of places the elevation will be truncated left of the decimal point.

Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.

Note 1: Toggle to include note 1 value (1st) of the label.

Note 2: Toggle to include note 2 value (2nd) of the label.

Note 3: Toggle to include note 3 value (3rd) of the label.

Note 4: Toggle to include note 3 value (4th) of the label.

Note: Common options for Note 1, 2, and 3.

Placemen Specify the location of the note value.

Input: Select the input option for the note.

Note: Enter the note value, if the input option is set to Note.

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4.13.4.9 Edit Profile Vertical Curve HP / LP Label Options

Edit the display options of a profile vertical curve HP / LP label created by the Label Profile (Station and Elevation) command.

Edit Profile Vertical Curve HP / LP Label Options

Informatio

Alignment The name of the associated alignment

Profile The name of the associated profile

Starting The starting station of the profile or profile view.

Ending The ending station of the profile or profile view.

Location

Station Station of the HP or LP label

Labeling:

Leader Select **Up** to have the label above the profile or **Down** to have the label below the profile.

Leader Check to draw an offset from the profile point to the beginning of the leader.

Grade Check to include a circle at the label's insertion point.

Leader to Profile View Top / Bottom Extend the leader to the top of the profile view.

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Profile Suffixes Select to modify the Special Station Suffixes related to profile design points.

Planview Suffixes Select to modify the Special Station Suffixes related to alignment design points.

Suppress Special Station Text Check to suppress the Special Station Suffix text. i.e. GB, BC, EC, etc.

Station: Toggle to include offset value of the label.

Placemen Select the location of the station value.

Prefix: Edit box for prefix text that will be added to the station value.

Suffix: Edit box for suffix text that will be added to the station value.

Precision: Set the number of decimal places for the station output display.

Elevation: Toggle to include elevation value of the label.

Placemen Select the location of the elevation value.

Prefix: Edit box for prefix text that will be added to the elevation value.

Suffix: Edit box for suffix text that will be added to the elevation value.

Precision: Set the number of decimal places for the elevation output display.

Truncate: Set the number of places the elevation will be truncated left of the decimal point.

Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.

Note 1: Toggle to include note 1 value (1st) of the label.

Note 2: Toggle to include note 2 value (2nd) of the label.

Note 3: Toggle to include note 3 value (3rd) of the label.

Note 4: Toggle to include note 3 value (4th) of the label.

Note: Common options for Note 1, 2, and 3.

Placemen Specify the location of the note value.

Input: Select the input option for the note.

Note: Enter the note value, if the input option is set to Note.

4.13.4.10 Edit Profile Vertical Curve Information Label Options

Edit the display options of a profile vertical curve information label created by the Label Profile (Station and Elevation) command.

Edit Profile Vertical Curve Information Label Options

Informatio

Alignment The name of the associated alignment

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Profile The name of the associated profile
Starting The starting station of the profile or profile view.
Ending The ending station of the profile or profile view.

Labeling:
Length Check to include the length information
Placemen Select the location of the length value.

Prefix: Edit box for prefix text that will be added to the length value.
Suffix: Edit box for suffix text that will be added to the length value.
Precision: Set the number of decimal places for the length output display.

PVI Check to include the PVI station information

Placemen Select the location of the station value.

Prefix Edit box for prefix text that will be added to the station value.
Precision: Set the number of decimal places for the station output display.

PVI Check to include the PVI elevation information

Placemen Select the location of the elevation value.

Prefix: Edit box for prefix text that will be added to the elevation value.
Precision: Set the number of decimal places for the elevation output display.
Truncate: Set the number of places the elevation will be truncated left of the decimal point.
Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.

K Value: Check to include the K value of the vertical curve.
Placemen Select the location of the K value.

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Prefix: Edit box for prefix text that will be added to the K value.

Precision: Set the number of decimal places for the K value output display.

Radius Check to include the Radius of the vertical curve.

Placemen Select the location of the Radius.

Prefix: Edit box for prefix text that will be added to the Radius.

Precision: Set the number of decimal places for the Radius output display.

Include Grade In and Grade Out Check to include the Grade In and Grade Out

Precision: Set the number of decimal places for the slope values output display.

Grade In

Placemen Select the location of the Grade In value.

Prefix: Edit box for prefix text that will be added to the Grade In value.

Grade Out

Placemen Select the location of the Grade Out value.

Prefix: Edit box for prefix text that will be added to the Grade Out value.

Note 1: Check to include note 1 value (1st) of the label.

Note 2: Check to include note 2 value (2nd) of the label.

Note 3: Check to include note 3 value (3rd) of the label.

Note: Common options for Note 1, 2, and 3.

Placemen Specify the location of the note value.

Input: Select the input option for the note.

Note: Enter the note value, if the input option is set to Note.

4.13.4.11 Edit Profile Vertical Curve Interval Label Options

Edit the display options of a profile vertical curve interval label created by the Label Profile (Station and Elevation) command.

Edit Profile Vertical Curve Interval Label Options

Informatio

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Alignment The name of the associated alignment

Profile The name of the associated profile

Starting The starting station of the profile or profile view.

Ending The ending station of the profile or profile view.

Location

Station Enter a station value to move the label.

Labeling:

Leader Select **Up** to have the label above the profile or **Down** to have the label below the profile.

Leader Check to draw an offset from the profile point to the beginning of the leader.

Grade Check to include a circle at the label's insertion point.

Leader to Profile View Top / Bottom Extend the leader to the top of the profile view.

Profile Suffixes Select to modify the Special Station Suffixes related to profile design points.

Planview Suffixes Select to modify the Special Station Suffixes related to alignment design points.

Suppress Special Station Text Check to suppress the Special Station Suffix text. i.e. GB, BC, EC, etc.

Station: Toggle to include offset value of the label.

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Placemen Select the location of the station value.

Prefix: Edit box for prefix text that will be added to the station value.
Suffix: Edit box for suffix text that will be added to the station value.
Precision: Set the number of decimal places for the station output display.

Elevation Toggle to include elevation value of the label.
Placemen Select the location of the elevation value.

Prefix: Edit box for prefix text that will be added to the elevation value.
Suffix: Edit box for suffix text that will be added to the elevation value.
Precision: Set the number of decimal places for the elevation output display.
Truncate: Set the number of places the elevation will be truncated left of the decimal point.
Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.

Note 1: Toggle to include note 1 value (1st) of the label.
Note 2: Toggle to include note 2 value (2nd) of the label.
Note 3: Toggle to include note 3 value (3rd) of the label.
Note 4: Toggle to include note 3 value (4th) of the label.

Note: Common options for Note 1, 2, and 3.
Placemen Specify the location of the note value.

Input: Select the input option for the note.
Note: Enter the note value, if the input option is set to Note.

4.13.5 Label Profile (At Station)

Create at profile label at a station and elevation or at a station along a profile

Overview

Note: Creating labels from Civil 3D's alignment and profile data. The label is a Dynamic Block. This command has been enhanced to create dynamic profile label for Civil 3D profiles. It supports 3 line dynamic profile labels.

Note: The Re-associate option can have unexpected results or error out on profile vertical curve, BC, and EC Labels copied from one drawing to another drawing.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	BricsCAD Pro for Civil objects

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Button

Ribbon: SmartDraft ▸ Profile panel ▸

Toolbar: Profile Tools:

Menu: SmartDraft ▸ Profile ▸ Label Profile (At Station)

Command entry: **pvs**

Command:

Profile Label Options dialog box will appear.

Settings used from profile setup: Profile Datum, Labeling: Profile Location, Direction, Grade Break Circle, Elevation/Station Prefix, Suffix, and Precision. All other settings are ignored.

Profile Name base station: <*datum station*>, elevation: <*datum elevation*>, and direction: <*Left to Right / Right to Left*>

Create profile station and elevation labels.

Current settings: Direction = Up, Grade Break Circle = Yes

Points

Select Profile Point or [Options/Planview/Reassociate/Station/Undo]: Specify a point in the profile, **O**ptions to change the options, **PL**anview to select a point along the planview, **R**eassociate to associate selected profile labels to the selected profile view and profile, **S**tation to enter a station, **U**ndo to erase the last label, or press ENTER to end.

Manual Profile Information

The station and elevation are calculated from the selected point and the profile datum information. The label is placed at the selected point.

Civil 3D Profile Information

The station is calculated from the selected point and the profile datum information; the elevation is calculated along the Civil 3D's profile. The label is placed at the calculated location.

Station

Enter station or [Interval/Options/PLanview/Point/Reassociate/Undo]: Enter a station along the profile, **I**nterval to place labels at a 25, 50, or 100 unit station interval, **PL**anview to select a point along the planview, **P**oint to select a point along the profile, **O**ptions to change the options, **R**eassociate to associate selected profile labels to the selected profile view and profile, **U**ndo to erase the last label, or press ENTER to end.

Manual Profile Information

Enter elevation: Enter the elevation value for the station.

The label location is calculated from the entered station, elevation, and the profile datum information. The label is placed at the calculated location.

Civil 3D Profile Information

The elevation is calculated at the entered station along the Civil 3D's profile. The label location is calculated from the enter station, calculated elevation, and the profile datum information. The label is placed at the calculated location.

PLanview (Note: This option is only available when Civil 3D's alignment is selected.)

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Select Planview point or [Options/Point/Reassociate/Station/Undo]: Enter a station along the profile, **P**oint to select a point along the profile, **R**eassociate to associate selected profile labels to the selected profile view and profile, **S**tation to enter a station, **O**ptions to change the options, **U**ndo to erase the last label, or press ENTER to end.

Civil 3D Profile Information
The station is calculated from the selected point perpendicular or radial to the alignment in planview; the elevation is calculated along the Civil 3D's profile. The label is placed at the calculated location in the profile.

Example

Profile Label Direction

4.13.5.1 Profile Label Options

Set profile label options for adding labels at an entered station or selected a point.

For Civil 3D add Offset Top and Bottom values when selecting a profile view. Profile View Offset Options

For SmartDraft profile view - create, modify, or select a Create Profile View (Profile Grid)

The starting station, elevation location, vertical scale and direction are determined by the profile datum option block. Multiple profiles can be created within one file, but each profile requires its own profile datum option block.

Supports Civil 3D profile views, and the SmartDraft profile view block.

Note: The label is a Dynamic Block.

Dialog Box Options

Profile

Name:	Select a profile view. A profile view has a suffix of (C3D) .
Location:	Select the profile offset location. Top, Center, or Bottom. Top and Bottom are only available if an offset value has been assigned. Use the Edit button to assign the values.
Alignment:	Select a Civil 3D (C3D) alignment to use one of the associated profile design data, Projected Feature Line, or select "Manual Entry" to enter the stations and elevations through the command line entry.
Profile:	Select the Civil 3D profile.

Datum

New:	Create a new profile datum setup block.
Edit:	Modify the data of the selected profile datum setup block. For Civil 3D: Profile View Offset Options, and SmartDraft: Create Profile View (Profile Grid)
Erase:	Delete the selected profile datum block from the drawing. Does not delete the associated profile linework.

Layer

Type:	Change the layer type. Display current setting. If the layer type is set to "Exist", elevation labels will be surrounded with parentheses "(xxxx.xx)".
List:	Layer to create the label.

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Labeling	
Create Dynamic Labels	Check to create dynamic profile labels in Civil 3D when a profile view, alignment, and profile are also selected.
Labels:	Check to include profile geometry labels.
Add Offset:	Check to offset the leader from the profile point to the beginning of the leader for profile geometry labels.
Profile Text	Station text for profile geometry data.
Alignment Text	Station text for horizontal geometry data.
GB Circle (Grade Break):	Check to include a circle for profile geometry labels.
Direction:	Select Up or Down for the direction of the station and elevation label leader.
Placement:	Select placement: Station above Elevation or Elevation above Station on the label.
Stations	
Station:	Check to include station on label.
Prefix:	Enter the prefix text for station labels.
Suffix:	Enter the suffix text for station labels.
Precision:	Select the decimal precision for station from the list.
Elevations	
Elevation:	Check to include elevation on label.
Prefix:	Enter the prefix text for elevation labels.
Suffix:	Enter the suffix text for elevation labels.
Precision:	Select the decimal precision for elevations from the list.
Truncate:	Set the number of places the elevation will be truncated left of the decimal point. Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.

4.13.6 Label Profile (Alignment Horizontal Geometry Data)

Create profile labels for alignment horizontal geometry

Create profile label at the alignment design stations and elevations along the profile, i.e., PI, BC, EC, compound curve, reverse curve, and spiral points. The label is a Dynamic Block.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	No


Button

Ribbon: SmartDraft ▸ Profile panel ▸ 

Toolbar: Profile Tools: 

Menu: SmartDraft ▸ Profile ▸ Label Profile (Alignment Horizontal Geometry Labels)

Command entry: **pvhg**

Command:

Profile: Setup Options dialog box will appear.

Create Alignment Labels along the Profile.

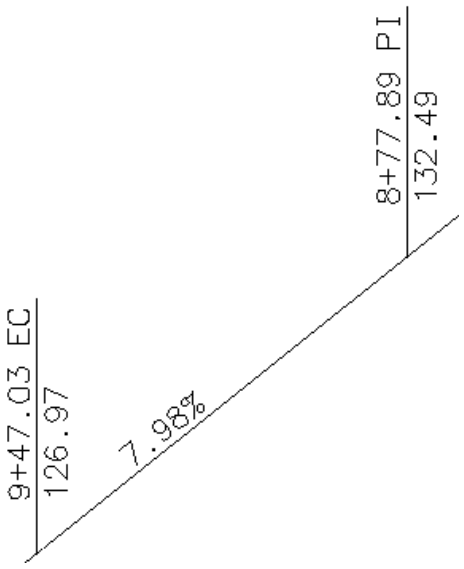
Starting Station: <station> Ending Station: <station>

Start profile stationing at <default>: Enter a station to start drafting the profile, or press ENTER to accept default.

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End profile stationing at <default>: Enter a station to end drafting the profile, or press ENTER to accept default.

Example



4.13.6.1 Alignment Geometry Station Text Options

Alignment Geometry Station Text Options for the Label Profile (Alignment Horizontal Geometry Data) and Alignment Station and Offset Labels commands.

Dialog Box Options

Alignment Geometry Station Text Options

Text Placement

Position Select if the Station text will be a prefix or a suffix
Add space between text and station Check to add a space.

Text

Station Equation Ahead: Specify the station text ahead of the station equation.
Station Equation Back: Specify the station text behind the station equation.
Start of Alignment: Specify the station text for the start of the alignment.
End of Alignment: Specify the station text for the end of the alignment.
Tangent / Tangent: Specify the station text of the point of intersection between two tangents, i.e., PI.
Beginning of Curve: Specify the station text at the beginning of the point of curvature, i.e., BC.
Curve / Tangent: Specify the station text of the point of tangency where a curve and tangent intersect, i.e., EC.
Compound Curve: Specify the station text of the intersections between compound curves and curves, i.e., PCC.
Reverse Curve: Specify the station text of the intersections between reverse curves and curves, i.e., PRC.
Tangent / Spiral: Specify the station text of the intersections between tangents and spirals.
Spiral Tangent: Specify the station text of the intersections between spirals and tangents.
Curve / Spiral: Specify the station text of the intersections between curves and spirals.
Spiral / Curve: Specify the station text of the intersections between spirals and curves.

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Spiral / Spiral: Specify the station text of the intersections between spirals.

Note: In Civil 3D these values are read from the drawing's Abbreviations and changes are push to the drawing's Abbreviations.

4.13.7 Label Profile (Alignment Station Intersection)

Create Profile Alignment Station Intersection Labels

Note: Profile labels will update when moved, copied, arrayed, or grip edited using standard AutoCAD commands. The label is a Dynamic Block.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	No


Button


Ribbon: SmartDraft ▸ Profile panel ▸ 

Toolbar: Profile Tools: 

Menu: SmartDraft ▸ Profile ▸ Label Profile (Alignment Station Intersection)


Command entry: **pvi**

Command:

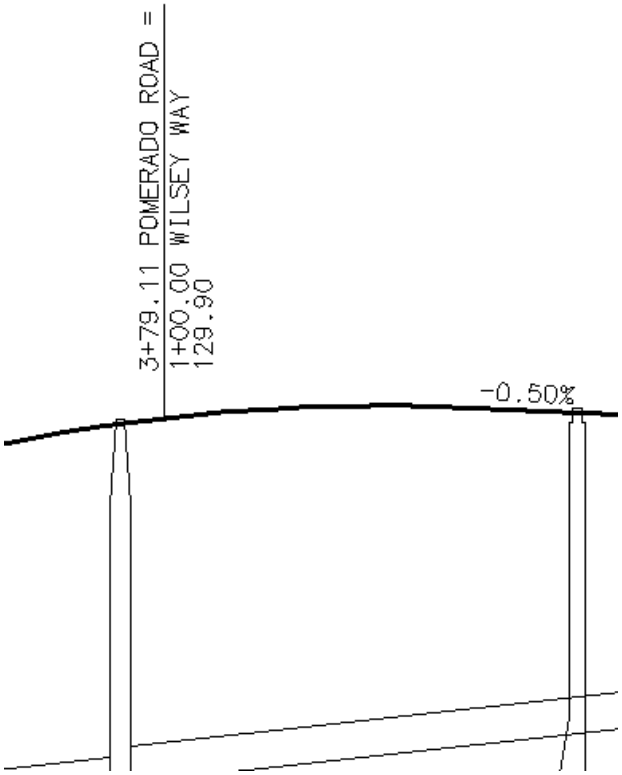
Create Profile Alignment Station Intersection Labels

Current settings: <#> Alignments, <Placement>, <Uppercase>, <Add "=">, Station: <Before/After>

Select Profile in Profile View or [LIst/Options]:	Select a profile in a profile view, **LI**st to select the profile view / profile from a dialog list,or **O**ptions to change the labeling options.
Dialog to select the crossing alignment appears.	Select an alignment.

Example:

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4.13.7.1 Profile Alignment Station Intersection Options

Options for the Label Profile (Alignment Station Intersection) command.

Profile Alignment Station Intersection Label Options

Labeling:

Leader Select Up ,Down, or Prompt for the direction of the station and elevation label leader.

Leader Check to draw an offset from the profile point to the beginning of the leader.

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Grade Check to draw a circle at each label.

Leader to Profile View Top / Bottom: Extend the leader to the top (if label up), or bottom (if label down) of the profile view.

Alignment Name to Uppercase: Convert the alignment name to uppercase.

Add Suffix Check to add the text "=" to the end of the alignment lines, if there is another alignment name on the next line.

Alignment

from Check 1 to add the offset to the first alignment, 2 for second alignment.

Station

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Placemen Select the location of the first station value. The second station will be one row below.

Prefix: Edit box for prefix text that will be added to the station value.
Suffix: Edit box for suffix text that will be added to the station value.
Precision: Set the number of decimal places for the station output display.
Order: Select the station information before or after the alignment name.

Elevation: Toggle to include elevation value of the label.
Placemen Select the location of the elevation value.

Prefix: Edit box for prefix text that will be added to the elevation value.
Suffix: Edit box for suffix text that will be added to the elevation value.
Precision: Set the number of decimal places for the elevation output display.
Truncate: Set the number of places the elevation will be truncated left of the decimal point.
Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.

Note 1: Toggle to include note 1 value (1st) of the label.
Note 2: Toggle to include note 2 value (2nd) of the label.
Note 3: Toggle to include note 3 value (3rd) of the label.
Note 4: Toggle to include note 4 value (4th) of the label.
Note: Common options for Note 1, 2, 3, and 4.
Placemen Specify the location of the note value.

Input: Select the input option for the note.
Note: Enter the note value, if the input option is set to Note.

Layer:
Layer: Set the output layer type. Default (to use the layer database layer) or *current*.
Layer Toggle the layer type for the layer name selection.

4.13.7.1.1 Placement Options

Profile Alignment Station Intersection Label Placement Options:

3 above: The data will be placed three spaces above the leader line.
2 above: The data will be placed two spaces above the leader line.
1 above: The data will be placed one space above the leader line.
1 below: The data will be placed one space below the leader line.

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2 below: The data will be placed two spaces below the leader line.
3 below: The data will be placed three spaces below the leader line.

4.13.7.1.2 Input Options

Profile Alignment Station Intersection Label Input Options

Note / description input option.

Input Options
Prompt: Option to prompt the operator to enter the note value.
Select: Option to prompt the operator to select an object with text to be used as the note value.
Note: Option to use the value entered in the Note edit box as the note value.

4.13.7.2 Edit Profile Alignment Station Intersection Label Options

Edit Profile Alignment Station Intersection Labels (Dynamic Blocks Only) created using Label Profile (Alignment Station Intersection) command.

Profile Alignment Station Intersection Label Options
Profile

Name: Name of the profile associated to the selected label.

Labeling:
Leader Select Up ,Down, or Prompt for the direction of the station and elevation label leader.

Leader Check to draw an offset from the profile point to the beginning of the leader.

Grade Check to draw a circle at each label.

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Leader to Profile View Top / Bottom: Extend the leader to the top (if label up), or bottom (if label down) of the profile view.

Alignment Name to Uppercase: Convert the alignment name to uppercase.

Add Suffix Check to add the text "=" to the end of the alignment lines, if there is another alignment name on the next line.

Alignment

from Check 1 to add the offset to the first alignment, 2 for second alignment.

Station

Placemen Select the location of the first station value. The second station will be one row below.

Prefix: Edit box for prefix text that will be added to the station value.

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Suffix: Edit box for suffix text that will be added to the station value.

Precision: Set the number of decimal places for the station output display.

Order: Select the station information before or after the alignment name.

Elevation: Toggle to include elevation value of the label.

Placemen Select the location of the elevation value.

Prefix: Edit box for prefix text that will be added to the elevation value.

Suffix: Edit box for suffix text that will be added to the elevation value.

Precision: Set the number of decimal places for the elevation output display.

Truncate: Set the number of places the elevation will be truncated left of the decimal point.

Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.

Note 1: Toggle to include note 1 value (1st) of the label.

Note 2: Toggle to include note 2 value (2nd) of the label.

Note 3: Toggle to include note 3 value (3rd) of the label.

Note 4: Toggle to include note 4 value (4th) of the label.

Note: Common options for Note 1, 2, 3, and 4.

Placemen Specify the location of the note value.

Input: Select the input option for the note.

Note: Enter the note value, if the input option is set to Note.

Layer:

Layer: Set the output layer type. Default (to use the layer database layer) or *current*.

Layer Toggle the layer type for the layer name selection.

4.13.8 Label Profile (Slope)

Create slope labels for a profile

Note: Profile labels will update when moved, copied, arrayed, or grip edited using standard AutoCAD commands. The label is a Dynamic Block. Starting in SmartDraft 16, this command has been enhanced to create dynamic profile slope label for Civil 3D profiles. It supports 3 line dynamic profile labels.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	BricsCAD Pro for Civil objects

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Button


Ribbon: SmartDraft ▸ Profile panel ▸ 

Toolbar: Profile Tools: 

Menu: SmartDraft ▸ Profile ▸ Label Profile (Slope)


Command entry: **pvsp**

Command:

Create profile slope labels in Profile View

Select Profile in Profile View or [LIst/Options]: Select a profile or projected Feature Line in a profile view, **LI**st to select the profile view / profile from a dialog list,or **O**ptions to change the labeling options.

If **Point**

Specify point along profile or [Edit/Options/Station/PRofile/Update]: Specify a point within the profile, **E**dit to edit existing labels, **O**ptions to change the labeling options, **S**tation to enter a station to place the label, **PR**ofile to select a different profile, **U**pate the values of existing labels, or Enter to end.

If **Station**

Enter a station value along along profile or [Edit/Options/Point/PRofile/Update]: Enter a station the profile, **E**dit to edit existing labels, **O**ptions to change the labeling options, **P**oint to specify a point to place the label, **PR**ofile to select a different profile, **U**pate the values of existing labels, or Enter to end.

4.13.8.1 Profile Slope Label Options

Options for the Label Profile (Slope) command.

Slope Label Options

Slope

Prefix: Edit box for prefix text that will be added to the slope value.

Suffix: Edit box for suffix text that will be added to the slope value.

Precision: Set the number of decimal places for the slope output display.

Type Select the slope type: Decimal, Percent, or Run : Rise

Placemen Select the location of the slope: Above or Below the profile.

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Arrow: Check to display a directional arrow with the slope value

Minus Check to add a minus sign to a negative slope, otherwise the absolute value of the slope will be displayed.

Layer:

Layer: Set the output layer type. Default (to use the layer database layer) or *current*.

Layer Toggle the layer type for the layer name selection.

4.13.8.2 Edit Profile Profile Slope Label

Edit Profile Slope Labels (Dynamic Blocks Only) created using Label Profile (Slope) command.

Slope Label Options

Profile

Name Name of the profile associated to the selected label.

Select a Check to select a new profile to assign to the selected label(s).

Slope

Prefix: Edit box for prefix text that will be added to the slope value.

Suffix: Edit box for suffix text that will be added to the slope value.

Precision: Set the number of decimal places for the slope output display.

Type Select the slope type: Decimal, Percent, or Run : Rise

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Placemen Select the location of the slope: Above or Below the profile.

Arrow: Check to display a directional arrow with the slope value

Minus Check to add a minus sign to a negative slope, otherwise the absolute value of the slope will be displayed.

Command:

Select Profile Slope Labels to edit.

Select Objects: Select the profile slope labels to edit the values.

4.13.9 Label Profile (Note)

Create a profile note

Note: The end of the note leader(s) will move stay connected to the associated profile. This is a dynamic profile note.

Supports:

AutoCAD Products: Yes

BricsCAD Pro: No



Button

Ribbon: SmartDraft ▸ Profile panel ▸ 

Toolbar: Profile Tools: 

Menu: SmartDraft ▸ Profile ▸ Label Profile (Note)

Command entry: **pvn**

Command:

Profile Notes dialog box will appear.

Create a profile note.

Note: <Text of selected note>

Select Profile at point to add profile note or [Options]: Select a profile or project Feature Line at the point to add the profile note, or **O**ptions to display the profile notes dialog.

Specify next point: Specify the point of the next leader point.

Specify leader landing location: Specify the point for the text note.

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4.13.9.1 Profile Notes

Options for the Label Profile (Note) command.

Profile Notes

Note List

List List of available profile notes. Select a note or double-click a note to select it and continue.

Edit Notes Select to edit the note list

Text

Style Select the text style to use for the note.

Leader

Type Select leader type: Arc (spline) or Straight (angle points)

Arrowhea Select the leader arrowhead type.

Number Select the number of leaders: 1 or Multiple

Layer

Layer: Set the output layer type. Default (to use the layer database layer) or *current*.

Layer Toggle the layer type for the layer name selection.

Rotation

Specify The note will be inserted and the operator will be prompted to specify a rotation angle during the insertion.

Viewtwist The note will be rotated to be horizontal to the current viewtwist.

Angle Enter a fixed angle for the rotation angle of the tag symbol and / or note.

4.13.9.2 Add / Edit: Profile Notes

Options to add, or edit the profile notes for the Label Profile (Note) command.

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Add / Edit: Profile Notes

Note List

List List of available profile notes. Select a note to edit it.

Add Select to add a new profile note.

Edit Select to edit the selected profile note.

Remove Select to remove the selected profile note from the list.

Up Select to move the selected profile note up in the list.

Down Select to move the selected profile note down in the list.

4.13.10 Create Profile Line

Create profile line from a Civil 3D profile

Note: This command has been enhanced to create dynamic or non-dynamic profile line for Civil 3D profiles. It supports 3 line dynamic profile lines. The profile line can be clipped as specified stations.

Supports:

AutoCAD Products: Yes

BricsCAD Pro: BricsCAD Pro for Civil objects



Button



Ribbon: SmartDraft ▸ Profile panel ▸ 

Toolbar: Profile Tools: 

Menu: SmartDraft ▸ Profile ▸ Label Profile (Profile Line)



Command entry: **pvd**

Command:

Profile Label - Profile Line Options dialog box will appear.

Profile Label - Profile Line Options

Profile

Profile View: Select a profile view

Location: Select the profile elevation datum location.

Edit Offset: Modify the Top and Bottom offset values for 3 line profiles.

Alignment: Select an alignment of the profile line to create, or select Manual Entry to create a non-dynamic profile by entering the stations and elevations at the command line.

Profile: Select the profile.

Non-dynamic Check to create a profile line as a non-dynamic polyline.

Layer

Profile: Layer to draw the profile line between the station and elevation labels. Display current Customization Template's Profile Layer List.

Type: Change the layer type. Display current setting. If the layer type is set to "Exist", elevation labels will be surrounded with parentheses "(xxxx.xx)".

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When selecting an alignment and profile

Starting Station: <station> Ending Station: <station>

Start profile stationing at <default>: Enter a station to start creating the profile, or press ENTER to accept default.

End profile stationing at <default>: Enter a station to end creating the profile, or press ENTER to accept default.

When selecting Manual Entry as the alignment

Manual Entry

4.13.10.1 Edit Profile Line Options

Edit the display options of a profile line created by the Label Profile (Station and Elevation) and Create Profile Line commands.

Change the layer, stationing, or make the profile non-dynamic.

Edit Profile Line Options

Information	
Alignment	The name of the associated alignment
Profile	The name of the associated profile
Starting	The current starting station of the associated profile
Ending	The current ending station of the associated profile
Profile Length	
Full - Partial	Select **Full** to draw the full length of the profile, or **Partial** to draw the profile from the starting to ending station.
Starting (button)	With **Partial** selected, select the **Starting** button to reset the starting station to the beginning station of the profile.
Starting	The starting station of the profile or profile view.
Ending (button)	With **Partial** selected, select the **Ending** button to reset the ending station to the ending station of the profile.
Ending	The ending station of the profile or profile view.
Profile	
Create a copy	Check to create a copy of the profile
Non-dynamic Layer	Check to remove the association to the profile data. Creates a non updating polyline.
Profile	Check to change a profile line to a non-dynamic polyline.
Profile drop-down	Layer to draw the profile line between the station and elevation labels. Display current Customization Template's Profile Layer List.
Type:	Change the layer type. Display current setting. If the layer type is set to "Exist", elevation labels will be surrounded with parentheses "(xxxx.xx)".

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4.13.11 Profile Labels - Cleanup

Cleanup overlap of SmartDraft profile labels

Cleanup the overlap of the selected profile labels based on a cleanup point.

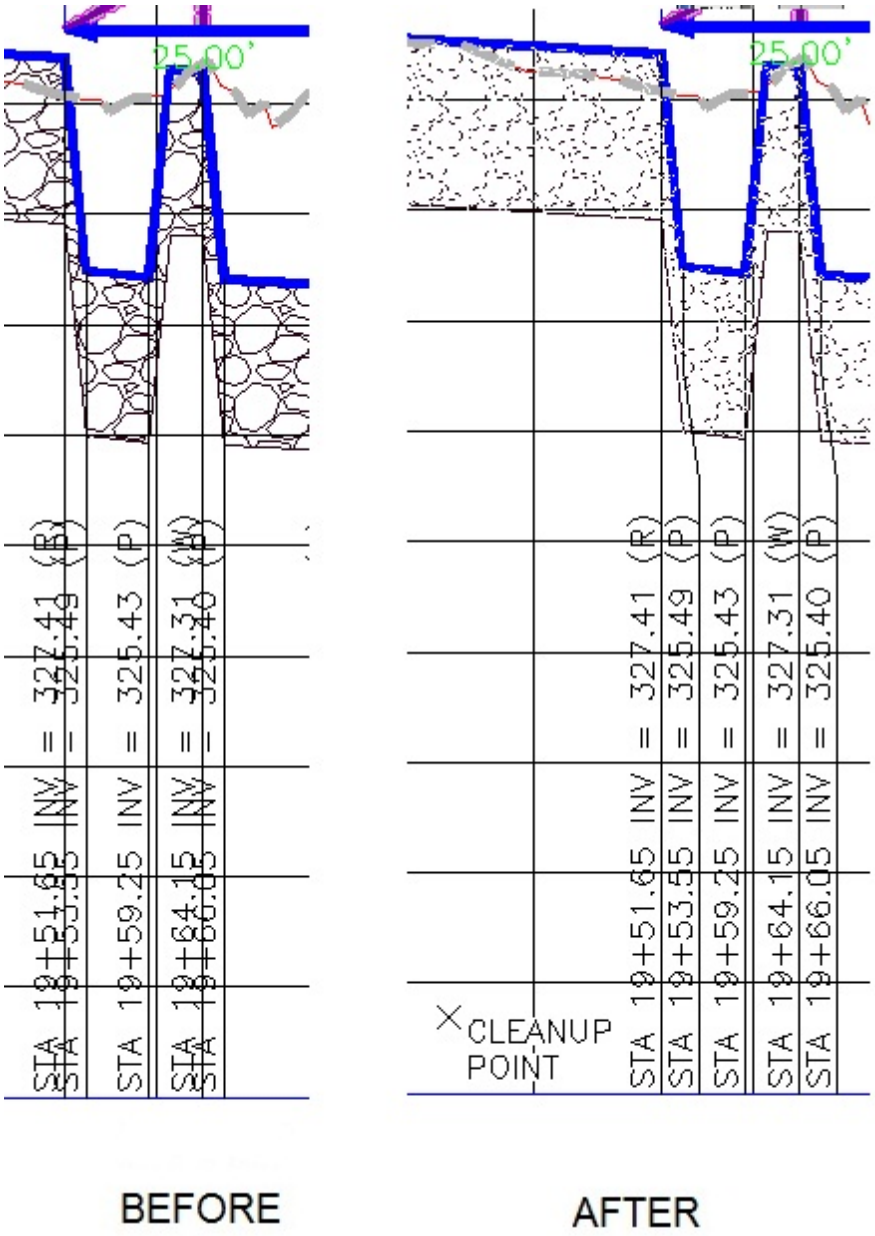

Button


Ribbon: SmartDraft tab ▸ Profile panel ▸ 
Menu: SmartDraft ▸ Profile ▸ Profile Labels - Cleanup


Command entry: **pvc**

Command:	
Profile Labels - Cleanup.	
Select objects:	Select the profile labels to realign
Select objects:	Press Enter to continue
Specify cleanup point:	Specify a clean point. profile Labels will move to the right or left of the cleanup if they need to realign.

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Profile Labels - Cleanup

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4.13.12 Profile Labels - Reset to Home Position

Reset SmartDraft dynamic profile labels to their home position

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Yes


Button

Ribbon: SmartDraft ▸ Profile panel ▸ 
Toolbar: Profile Tools: 
Menu: SmartDraft ▸ Profile ▸ Profile Labels - Reset to Home Position
Command entry: **pvh**

Command:
Set Profile labels to reset home position.
Select objects: Select profile labels to reset.
"X" Profile Labels reset to home position.

4.13.13 Profile Labels - Update

Update the values of the SmartDraft dynamic profile labels

Updates the following labels: Label Profile View, Profile Structure RIM Label, Profile Structure Invert Label, Profile Crossing Pipe Label, and Profile Station and Elevation Labels

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Yes


Button

Ribbon: SmartDraft ▸ Profile panel ▸ 
Toolbar: SmartDraft Tools: 
Menu: SmartDraft ▸ Profile ▸ Profile Labels - Update
Command entry: **pvu**

Command:
Select Profile Labels to update.
Select objects: Select profile labels to update.

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4.13.14 Profile from Points or 3D Polylines along an Alignment

Profile from a selected alignment and either point objects, 3D polylines points, or Civil 3D feature line points

Create a profile output file of stations and elevations. The file is generated from points along an alignment. The project needs a defined alignment, point objects, point blocks, or 3D polyline, and an offset tolerance.

Note: Use the <Selection> option to select a 3D polylines.

Supports:

AutoCAD Products: Yes

BricsCAD Pro: Yes


Button


Ribbon: SmartDraft ▸ Profile panel ▸ 

Toolbar: Profile Tools: 

Menu: SmartDraft ▸ Profile ▸ Profile File from Points along an Alignment

Civil 3D

Dialog Box Options

Alignment

Alignment:	Select an alignment.
Output	
File:	Select to output the data as an ASCII file.
Offset:	Check to include the offset.
Description:	Check to include the description.
Description Type:	Select the description type: Raw or Full.
Profile:	Select to output the data directly to a Civil 3D profile.
Profile Name:	Enter the desired profile name.
Profile Style:	Select the profile style to use when creating the profile.
Profile Layer:	Select the layer for the profile.

Command:

Profile from Points 3D Polylines, or Feature Lines along an Alignment.

Alignment: <current alignment>

Offset tolerance <default> Enter a desired tolerance, a point can be away from the alignment and still be included for processing.

Point selection method: [All/Group/Layers/Range/Selection] <Selection>: Enter **A**ll for all points in the current point database, **R**ange to enter a point number and/or a range of points, **G**roup to select Point Group(s) to include, or **S**election to select point blocks, point objects, or 3D polyline.

Processing point: ** Display the current point being processed.

Point outside alignment stationing. Message when point is not along the alignment.

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Output List dialog box appears

If File (as Output):

Profile file: Path\file.pro written to disk. Message if output file is written to disk successfully.

Selection

Select points, 3D polylines, or Feature Files.

Select object: Select points or 3D polylines.

4.13.14.1 Select Point Group(s)

Select a Civil 3D's Point Group(s) dialog box.

Select Civil 3D Point Group(s) from the dialog box. Using the Ctrl or Shift key, multiple Point Groups can be selected. Common points will be filtered out.

Dialog Box Options

Point Group List:	List of all Point Groups in Civil 3D. Select Point Group(s) to be used.
OK:	Accept the selected Point Group(s).

4.13.14.2 Output Stations and Elevations

Output stations and elevations of selected points to an ASCII file.

Display the stations, elevations, and offset distances from provided alignment and point data.

Edit and output the displayed data to an ASCII file.

Output List dialog from Profile file from points along alignment command.

Dialog Box Options

Selection List:	List of point numbers, stations, elevations, and offset distance for processed points.
Delete:	Delete any station(s) and elevation(s) selected in the Selection list above.
Restore All:	Restores all data before any edits were made.
OK:	Accepts the current data and supplies an output file location and name.

Sample Output File:

100.00 101.00

100.00 150.00

145.60 102.03

260.60 104.44

272.17 0.00

313.55 105.46

428.13 150.00

528.60 109.77

765.06 114.70

836.12 116.08

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905.36 117.40
984.34 118.84
1054.82 120.16
1119.89 121.89
1153.21 0.00
1188.20 123.71
1280.05 125.72
1345.74 126.84
1423.51 128.17

4.13.15 Profile from Polyline - Profile View

Create a profile from a polyline within a profile view

Known Limits: Arcs are ignored. Removes points from polyline which would have smaller station values than the previous point.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Yes


Button

Ribbon: SmartDraft ▸ Profile panel ▸ 
Toolbar: Profile Tools: 
Menu: SmartDraft ▸ Profile ▸ Profile from Polyline - Profile View

Dialog Box Options

Profile from Polyline - Profile View

Alignment

Alignment:	Selected profile view alignment.
Profile Options:	
Name:	Enter the desired profile name.
Style:	Select the profile style to use when creating the profile.
Layer:	Select the layer for the profile.

Command:
Create Profile from Polyline - Profile View.
Select Profile View: Select a profile view.
Profile Options appear.
Select Polyline within the Profile View: Select a polyline withing the profile view selected above.

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4.13.16 Profile Copy and Adjust - Profile View

Copy and adjust the elevations of a profile within a profile view

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Does not support BricsCAD Pro Civil profiles, support SmartDraft profiles.


Button


Ribbon: SmartDraft ▸ Profile panel ▸ 

Toolbar: Profile Tools: 

Menu: SmartDraft ▸ Profile ▸ Profile Copy and Adjust - Profile View


Command entry: **pfc**

Dialog Box Options

Profile Copy and Adjust - Profile View.

Source Profile

Profile:	Selected profile view profile.
New Profile Options:	
Name:	Enter the name of the new profile.
Style:	Select the profile style to use when creating the profile.
Layer:	Select the layer for the profile.
Elevation Change:	Enter the change in datum elevation from the source

Command:

Profile Copy and Adjust - Profile View.

Select Profile in a Profile View: Select a profile in a profile view.

4.13.17 Label Alignment (Profile Geometry Data)

Create alignment labels with profile geometry data

Create labels at the profile design point stations and elevations along the alignment, i.e., start point, end point, beginning vertical curve, ending vertical curve, grade breaks, high point, and low point.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	No



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Button

Ribbon: SmartDraft ▸ Profile panel ▸

Toolbar: Profile Tools:

Menu: SmartDraft ▸ Profile ▸ Label Alignment (from Profile Data)

Command:
Select alignment, and profile dialog box appears.

Dialog Box Options

Profile

Alignment:	Select a Civil 3D's alignment.
Profile:	Select a Civil 3D's profile associated with the alignment.
Station Labels (Note: Select the check box to include any of the labeling options below.)	
Start Point:	Enter start point station suffix.
Grade Breaks:	Enter grade break station suffix.
Beginning Vertical Curve:	Enter beginning of vertical curve station suffix.
Vertical Curve PI:	Enter vertical curve PI station suffix.
Vertical Curve Distance:	Enter vertical curve distance suffix.
Ending Vertical Curve:	Enter ending of vertical curve station suffix.
High Point:	Enter high point station suffix.
Low Point:	Enter low point station suffix.
End Point:	Enter end point station suffix.
Interval:	Enter station interval and interval station suffix.
Enter Stations:	Enter the station suffix of entered stations.
Horizontal Geometry	Check to include labels at horizontal geometry locations.
Alignment Text	Station text for horizontal geometry data.
Labels	
Placement	Select placement: Station above Elevation or Elevation above Station on the label.
Station:	Check to include station on label; uncheck to include suffix only.
Precision:	Select the decimal precision for station from the list.
Prefix:	Enter the prefix text for station labels.
Elevations	
Elevation:	Check to include elevation on label.
Prefix:	Enter the prefix text for elevation labels.
Suffix:	Enter the suffix text for elevation labels.
Precision:	Select the decimal precision for elevations from the list.
Perpendicular Labels:	Check to draw label perpendicular / radial to the alignment. Uncheck to draw labels along the alignment.

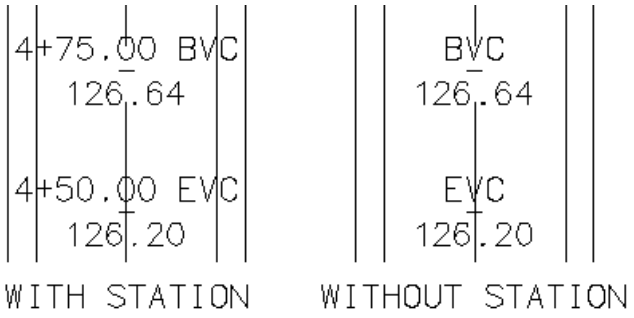
Create Profile Labels along the Alignment.

Starting Station: <station> Ending Station: <station>

Start profile stationing at <default>: Enter a station to start drafting the profile, or press ENTER to accept default.
End profile stationing at <default>: Enter a station to end drafting the profile, or press ENTER to accept default.

Example

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4.13.18 Label Profile View

Create station and elevation labels in a profile view

Dynamic Data: Profile labels will update when moved, copied, arrayed, or grip edited using standard AutoCAD commands.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	BricsCAD Pro for Civil objects and SmartDraft Profile View

Button

Ribbon: SmartDraft ▸ Profile panel ▸

Toolbar: Profile Tools:

Menu: SmartDraft ▸ Profile ▸ Profile View Labels ▸ Label Profile View

Command entry: **pvl**

Note: The label is a Dynamic Block.

Command:

Create view profile labels

Select a profile view [LIst]: Select a profile view, or **LI**st to select the profile view from a list.

If **Point**

Specify Profile View Point or [Edit/Station/Options/Update/View]: Specify a point within the profile view, **E**dit to edit existing labels, **S**tation to toggle to entering station and elevation valves, **O**ptions to change the labeling options, **V**iew to select a different profile view, **U**pate the values of existing labels, or Enter to end.

If **Station**

Enter an station value or [Edit/Options/Point/Update/View]: Enter an offset value, **E**dit to edit existing labels, **O**ptions to change the labeling options, or output settings, **P**oint to label by selecting points, **V**iew to select a different profile view, **U**pate the values of existing labels, or Enter to end.

Enter an elevation: Enter an elevation.

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4.13.18.1 Profile View Label Options

Options for the Label Profile View command.

Profile View Label Options

Labeling:

Leader Select Up ,Down, or Prompt for the direction of the station and elevation label leader.

Leader Check to draw an offset from the profile point to the beginning of the leader.

Grade Check to draw a circle at each label.

Leader to Profile View Top / Bottom: Extend the leader to the top (if label up), or bottom (if label down) of the profile view.

Location Select the profile offset location. Top, Center, or Bottom. Top and Bottom are only available if an offset value has been assigned.

Station: Toggle to include offset value of the label.

Placemen Select the location of the station value.

Prefix: Edit box for prefix text that will be added to the station value.

Suffix: Edit box for suffix text that will be added to the station value.

Precision: Set the number of decimal places for the station output display.

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Elevation: Toggle to include elevation value of the label.

Placemen Select the location of the elevation value.

Prefix: Edit box for prefix text that will be added to the elevation value.

Suffix: Edit box for suffix text that will be added to the elevation value.

Precision: Set the number of decimal places for the elevation output display.

Truncate: Set the number of places the elevation will be truncated left of the decimal point.

Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.

Note 1: Toggle to include note 1 value (1st) of the label.

Note 2: Toggle to include note 2 value (2nd) of the label.

Note 3: Toggle to include note 3 value (3rd) of the label.

Note 4: Toggle to include note 4 value (4th) of the label.

Note: Common options for Note 1, 2, 3, and 4.

Placemen Specify the location of the note value.

Input: Select the input option for the note.

Note: Enter the note value, if the input option is set to Note.

Layer:

Layer: Set the output layer type. Default (to use the layer database layer) or *current*.

Layer Toggle the layer type for the layer name selection.

4.13.18.1.1 Placement Options

Profile Label Data Placement Options:

3 above: The data will be placed three spaces above the leader line.

2 above: The data will be placed two spaces above the leader line.

1 above: The data will be placed one space above the leader line.

1 below: The data will be placed one space below the leader line.

2 below: The data will be placed two spaces below the leader line.

3 below: The data will be placed three spaces below the leader line.

4.13.18.1.2 Input Options

Profile Label Note Input Options

Note / description input option.

Input Options

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Prompt: Option to prompt the operator to enter the note value.
Select: Option to prompt the operator to select an object with text to be used as the note value.
Note: Option to use the value entered in the Note edit box as the note value.

4.13.18.2 Edit Profile View Label

Edit Profile View Labels (Dynamic Blocks Only) created using Label Profile View command.

Edit Profile View Label Options

Profile

Name Name of the section view associated to the selected label.

Location Select the profile offset location. Top, Center, or Bottom. Top and Bottom are only available if an offset value has been assigned.

Labeling:

Leader Check to draw an offset from the profile point to the beginning of the leader.

Grade Check to draw a circle at each label.

Leader to Profile View Top / Bottom: Extend the leader to the top (if label up), or bottom (if label down) of the profile view.

Station: Toggle to include offset value of the label.

Placemen Select the location of the station value.

Prefix: Edit box for prefix text that will be added to the station value.

Suffix: Edit box for suffix text that will be added to the station value.

Precision: Set the number of decimal places for the station output display.

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Elevation: Toggle to include elevation value of the label.

Placemen Select the location of the elevation value.

Prefix: Edit box for prefix text that will be added to the elevation value.

Suffix: Edit box for suffix text that will be added to the elevation value.

Precision: Set the number of decimal places for the elevation output display.

Leave Notes As-is: Toggle to leave notes as they are.

Note 1: Toggle to include note 1 value (1st) of the label.

Note 2: Toggle to include note 2 value (2nd) of the label.

Note 3: Toggle to include note 3 value (3rd) of the label.

Note 4: Toggle to include note 4 value (4th) of the label.

Note: Common options for Note 1, 2, 3, and 4.

Placemen Specify the location of the note value.

Input: Select the input option for the note.

Note: Enter the note value, if the input option is set to Note.

Command:

Select Profile View Labels to edit.

Select Objects: Select the profile view Labels to edit the values.

4.13.18.3 Update Profile View Label

Update profile view labels created using Label Profile View command.

Command entry: **pvu**

Command:

Select Profile View Labels to update.

Select Objects: Select the profile view labels to update the values.

4.13.18.4 Select a Profile View

Select a profile view from a list of all profile views in the drawing.

Select a Profile View

Profile View List Select the profile view to use.

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4.13.19 Label Profile View - (2 Points)

Create station with two elevations labels in a profile view

Dynamic Data: Profile labels will update when moved, copied, arrayed, or grip edited using standard AutoCAD commands.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	BricsCAD Pro for Civil objects and SmartDraft Profile View


Button


Ribbon: SmartDraft ▸ Profile panel ▸ 

Toolbar: Profile Tools: 

Menu: SmartDraft ▸ Profile ▸ Profile View Labels ▸ Label Profile View - (2 Points)


Command entry: **pvl2**

Note: The label is a Dynamic Block.

Command:

Create view profile labels

Select a profile view [LIst]: Select a profile view, or **LI**st to select the profile view from a list.

Specify point within profile or [Edit/Options/Update/View]: Specify a point within the profile view, **E**dit to edit existing labels, **O**ptions to change the labeling options, **V**iew to select a different profile view, **U**pate the values of existing labels, or Enter to end.

4.13.19.1 Profile View Label Options (2 Points)

Options for the Label Profile View (2 Points) command.

Profile View Label Options

Labeling:

Leader Select Up ,Down, or Prompt for the direction of the station and elevation label leader.

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Leader Check to draw an offset from the profile point to the beginning of the leader.

Grade Check to draw a circle at each label.

Leader to Profile View Top / Bottom: Extend the leader to the top (if label up), or bottom (if label down) of the profile view.

Location Select the profile offset location. Top, Center, or Bottom. Top and Bottom are only available if an offset value has been assigned.

Station: Toggle to include offset value of the label.

Placemen Select the location of the station value.

Prefix: Edit box for prefix text that will be added to the station value.

Suffix: Edit box for suffix text that will be added to the station value.

Precision: Set the number of decimal places for the station output display.

Elevation Toggle to include elevation 1 value of the label.

Placemen Select the location of the elevation 1 value.

Prefix: Edit box for prefix text that will be added to the elevation 1 value.

Suffix: Edit box for suffix text that will be added to the elevation 1 value.

Precision: Set the number of decimal places for the elevation output display.

Truncate: Set the number of places the elevation will be truncated left of the decimal point.

Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.

Elevation Toggle to include elevation 2 value of the label.

Placemen Select the location of the elevation 2 value.

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Prefix: Edit box for prefix text that will be added to the elevation 2 value.

Suffix: Edit box for suffix text that will be added to the elevation 2 value.

Note 1: Toggle to include note 1 value (1st) of the label.

Note 2: Toggle to include note 2 value (2nd) of the label.

Note 3: Toggle to include note 3 value (3rd) of the label.

Note 4: Toggle to include note 4 value (4th) of the label.

Note: Common options for Note 1, 2, 3, and 4.

Placemen Specify the location of the note value.

Input: Select the input option for the note.

Note: Enter the note value, if the input option is set to Note.

Layer:

Layer: Set the output layer type. Default (to use the layer database layer) or *current*.

Layer Toggle the layer type for the layer name selection.

4.13.19.1.1 Placement Options (2 Points)

Profile View Label Placement Options:

3 above: The data will be placed three spaces above the leader line.
2 above: The data will be placed two spaces above the leader line.
1 above: The data will be placed one space above the leader line.
1 below: The data will be placed one space below the leader line.
2 below: The data will be placed two spaces below the leader line.
3 below: The data will be placed three spaces below the leader line.

4.13.19.1.2 Input Options (2 Points)

Profile View Label Input Options

Note / description input option.

Input Options
Prompt: Option to prompt the operator to enter the note value.
Select: Option to prompt the operator to select an object with text to be used as the note value.
Note: Option to use the value entered in the Note edit box as the note value.

4.13.19.2 Edit Profile View Label (2 Points)

Edit Profile View Labels (2 Points) (Dynamic Blocks Only) created using Label Profile View (2 Points) command.

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Edit Profile View Label Options

Profile

Name Name of the section view associated to the selected label.

Location Select the profile offset location. Top, Center, or Bottom. Top and Bottom are only available if an offset value has been assigned.

Labeling:

Leader Check to draw an offset from the profile point to the beginning of the leader.

Grade Check to draw a circle at each label.

Leader to Profile View Top / Bottom: Extend the leader to the top (if label up), or bottom (if label down) of the profile view.

Station: Toggle to include offset value of the label.

Placemen Select the location of the station value.

Prefix: Edit box for prefix text that will be added to the station value.

Suffix: Edit box for suffix text that will be added to the station value.

Precision: Set the number of decimal places for the station output display.

Elevation Toggle to include elevation 1 value of the label.

Placemen Select the location of the elevation 1 value.

Prefix: Edit box for prefix text that will be added to the elevation 1 value.

Suffix: Edit box for suffix text that will be added to the elevation 1 value.

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Precision: Set the number of decimal places for the elevation output display.

Elevation Toggle to include elevation 2 value of the label.

Placemen Select the location of the elevation 2 value.

Prefix: Edit box for prefix text that will be added to the elevation 2 value.

Suffix: Edit box for suffix text that will be added to the elevation 2 value.

Leave Notes As-is: Toggle to leave notes as they are.

Note 1: Toggle to include note 1 value (1st) of the label.

Note 2: Toggle to include note 2 value (2nd) of the label.

Note 3: Toggle to include note 3 value (3rd) of the label.

Note 4; Toggle to include note 4 value (4th) of the label.

Note: Common options for Note 1, 2, 3, and 4.

Placemen Specify the location of the note value.

Input: Select the input option for the note.

Note: Enter the note value, if the input option is set to Note.

Command:

Select Profile View Labels to edit.

Select Objects: Select the profile view labels to edit the values.

4.13.20 Profile View: Points

Set points along an alignment at the station, offset(s), and elevation(s) by selecting a point on a profile view.

Supports:

AutoCAD Products:	Civil 3D
BricsCAD Pro:	No


Button


Ribbon: SmartDraft ▸ Profile panel ▸ 

Menu: SmartDraft ▸ Profile ▸ Profile View: Points


Command entry: p**vp**

Command: p**vp**

Set Point along Alignment from Point in Profile View.

Select a profile view or [List]: Select a profile view, or **LI**st to select the profile view from a list.

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Select point within section for point <Point#> or [Options]: Specify a point within the profile view, **O**ptions to change the point options.

If Offset Type is **Command Prompt**:

Enter offset from centerline <*Offset Default*>: Enter an offset value or Enter to accept the default or end.

If Elevation Type is **Command Prompt**:

Enter elevation adjustment from <*Selected Elevation*> [*Default Adjustment*]]: Enter an elevation adjustment or Enter to accept the default.

4.13.20.1 Profile View: Points Options

Point insertion options for the Profile View: Points command.

Dialog Box Options

Layer: Set the layer to be used by the point insertion commands.
Layer Type: Toggle the layer type for the layer name selection.

Point Type: For AutoCAD, AutoCAD Map 3D, and BricsCAD, Block is the only option.
For Civil 3D, Object (Civil 3D Point Object) is the only option.

Block:
Civil 3D Only
Object: Create Civil 3D.
Survey: Create a point in the Civil 3D Survey Database of the currently open database, the selected Network, and either a Non-Control or Control point.
Non-Control: Create the points as an Non-Control Point in the Survey Database.
Control: Create the points as a Control Point in the Survey Database.
Insert Manually: The point will be created in the Survey Database but not inserted into the drawing. Operator will need to manually insert new points into the drawing. If the Survey Database is very large, this option should be used.
Insert into Drawing: The point will be inserted into the drawing along with the Survey Database. Due to programming limitations, all the survey database points will be temporarily inserted into the drawing; and at the end of the command, the extra points will be removed.

Numbering
Sequential Numbering: Select the check box to sequentially number new points using the Current Number as they are created. Clear the check box to be prompted for a point number each time a new point is created.
Current Number: Enter the current point number for point insertion commands.

Offsets
Type: Select **At Centerline** to place a point on the centerline or 0.0 offset, **Command Line** to enter the offset at the command prompt, **Edit Box** to enter one or multiple offsets in the Offsets edit box.
Offsets: Enter a single or multiple offsets. (Note: The syntax is comma delimited between the offsets, with negative numbers indicating a left offset from the centerline, and positive numbers indicating to a right offset from the centerline.)

Elevations
Type: Select **At Selected** to place a point at the elevation selected in the profile view, **Command Line** to enter the elevation adjustment for each offset at the command

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prompt, **Edit Box** to enter the elevation adjustment for each offset in the Adjustments edit box.

Adjustments: Enter a single or multiple elevations adjustment values. (Note: The syntax is comma delimited between the elevation adjustments. If less elevation adjustments are entered than offsets, an elevation adjustment of 0.0 will be used. If more elevation adjustments are entered than offsets, the additional elevation adjustments will be ignored.)

Descriptions

Automatic: Select to automatically assign the Default Description to a new point.

Manual: Select to manually assign the description to a new point.

None: Select to assign no description to a new point.

Default Description: The value used with the Automatic option, and the default value used with the Manual option.

Note: To modify the layers listed in the Point Layers List, use the SmartDraft menu ▸ Program Setup ▸ Customization Template Manager.

4.13.21 Create Profile View (Profile Grid)

Create a profile view (profile grid)

Create a profile grid (profile view) of an alignment and profile using a dynamic block.

It supports both Civil 3D alignments and profiles, and profiles drawn with the Manual option of Label Profile (Station and Elevation).

We plan to add profiles for SmartDraft Alignment in the future.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Yes



Button



Ribbon: SmartDraft ▸ Profile panel ▸ 

Toolbar: Profile Tools: 

Menu: SmartDraft ▸ Profile ▸ Profile View Labels ▸ Create Profile View (Profile Grid)



Command entry: **pvg**

Command:

Specify Profile View insertion point: Specify the insertion point for the profile view.

Create Profile View Options

General

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Alignment Select alignment to associate to the profile view.

Do not associate to an alignment Check to create a profile view no associated to an alignment.

Name Enter the name for the profile view

Name to Uppercase Check to convert the Name value to Uppercase.

Direction Select a stationing direction for the profile from the drop-down list. Left-to-Right or Right-to-Left.

Grid Select the grid spacing for the profile from the drop-down list: Major: @ 100 / @ 10 or @ 50 / @5 or @ 20 / @2

Scale

Vertical Select the vertical exaggeration ratio

Horizontal Displays the drawing's current horizontal scale

Vertical Displays the calculated vertical scale based on the horizontal scale and vertical exaggeration ratio

Station

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Start Enter the starting station for the profile view

End Enter the ending station for the profile view

Enter station values in multiples of 100 or 50 based on the Grid Spacing option above

Elevation

Center

Minimum Enter the minimum elevation value for the profile view.

Maximum Enter the maximum elevation value for the profile view

Enter elevation values in multiples of 10 or 5 based on the the Grid Spacing option above

Top Profile Optional. Specify an offset distance from the Center Profile Elevation.

Bottom Optional. Specify an offset distance from the Center Profile Elevation.

Layer

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Grid Major Select a layer for the Grid Major lines

Grid Minor Select a layer for the Grid Major lines

Title Select a layer for the profile view Title

4.13.21.1 Edit Profile View

Edit the Profile View (Profile Grid) options of profile views created by the Create Profle View

Edit Profile View Options

General

Alignment Name of associated alignment

Name Enter the name for the profile view

Name to Uppercase Check to convert the Name value to Uppercase.

Direction Select a stationing direction for the profile from the drop-down list. Left-to-Right or Right-to-Left.

Grid Select the grid spacing for the profile from the drop-down list: Major: @ 100 / @ 10 or @ 50 / @5 or @ 20 / @2

Scale

Vertical Select the vertical exaggeration ratio

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Horizontal Displays the drawing's current horizontal scale

Vertical Displays the calculated vertical scale based on the horizontal scale and vertical exaggeration ratio

Station

Start Enter the starting station for the profile view

End Enter the ending station for the profile view

Enter station values in multiples of 100 or 50 based on the Grid Spacing option above

Elevation

Center

Minimum Enter the minimum elevation value for the profile view.

Maximum Enter the maximum elevation value for the profile view

Enter elevation values in multiples of 10 or 5 based on the the Grid Spacing option above

Top Profile Optional. Specify an offset distance from the Center Profile Elevation.

Bottom Optional. Specify an offset distance from the Center Profile Elevation.

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4.13.22 Create Profile View Station / Elevation Label

Create a profile view station or elevation labels at specified locations.

Supports:

AutoCAD Products: Yes

BricsCAD Pro: Yes



Button

Ribbon: SmartDraft ▸ Profile panel ▸ 

Toolbar: Profile Tools: 

Menu: SmartDraft ▸ Profile ▸ Profile View Labels ▸ Create Profile View Station / Elevation Label

Command entry: **pvgl**

If type: **Station**

Command:

Create Profile View Station / Elevation Labels.

Select a profile view [LIst]: Select a profile view, or **LI**st to select the profile view from a list.

Specify Profile View insertion point: Specify the insertion point for the profile view.

Specify point for station labels: Specify the insertion point elevation on the profile view.

If type: **Elevation**

Command:

Create Profile View Station / Elevation Labels.

Select a profile view [LIst]: Select a profile view, or **LI**st to select the profile view from a list.

Specify Profile View insertion point: Specify the insertion point for the profile view.

Specify insertion for first elevation label: Specify the insertion point elevation on the profile view.

Enter number of labels starting from elevation <default>: Enter the number of elevation labels

Create Profile View Station / Elevation Label Options

General

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Alignment Alignment name associated to selected Profile View

Profile View Name of selected Profile View

Starting: / Starting / Ending station of the selected Profile View

Minimum: / Minimum / Maximum elevation of the selected Profile View.
Maximum:

Labeling

Type: Select either Station or Elevation. Select Station to label station along the horizontal axis of the Profile View, or Elevation to label elevation along the vertical axis of the Profile View

Prefix: Enter the prefix text for Station / Elevation labels.

Suffix: Enter the suffix text for Station / Elevation labels.

Station Options Available options when the Labeling Options > Type: > Station is selected above.

Format: Displays the position of the station delimiter. (Edit value in Drawing Setup)

Remove Numbers after the Station Delimiter Check to remove the zero numbers after the station delimiter

Spacing Select the station label spacing unit. Select 25, 50, or 100 units from the drop-down list.

Placement Select Prompt or Along Full Length. Select **Prompt** to be prompted for the next station label at the select **Spacing** unit, or **Along Full Length** to label all stations along the horizontal length of the Profile View at the select **Spacing** unit.

No Label at Starting and / or Ending If: Select this option to remove the Starting and / or Ending station labels if either of the following conditions are true.

The Starting station label is not added, if the starting station label would match the starting station of the Profile View

The Ending station label is not added, if the ending station label would match the ending station of the Profile View

Elevation Available options when the Labeling Options > Type: > Elevation is selected above.

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Location Select the profile offset location. Top, Center, or Bottom. Top and Bottom are only available if an offset value has been assigned.

Spacing Select the elevation label spacing unit. Select 1, 2, 5, or 10 units from the drop-down list.

Placement Select **Prompt** or **Along Full Height**. Select **Prompt** to be prompted for the next elevation label at the select **Spacing** unit, or **Along Full Height** to label all elevations along the vertical height of the Profile View at the select **Spacing** unit.

No Label at Bottom and / or Top If: Select this option to remove the Bottom and / or Top elevation labels if either of the following conditions are true.

The Bottom elevation label is not added, if the bottom elevation label would match the bottom elevation of the Profile View

The Top elevation label is not added, if the top elevation label would match the top elevation of the Profile View

Layer

Layer: Set the output layer type. Default (to use the layer database layer) or *current*.

Layer Toggle the layer type for the layer name selection.

4.13.22.1 Edit Profile View Station / Elevation Label Options

Edit the Profile View Station / Elevation options of labels created by the Create Profile View Station / Elevation Label

Create Profile View Station / Elevation Label Options

General

Alignment Alignment name associated to selected Profile View

Profile View Name of selected Profile View

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Starting: / Ending: Starting / Ending station of the selected Profile View

Minimum: / Maximum: Minimum / Maximum elevation of the selected Profile View.

Labeling

Type: Select either Station or Elevation. Select Station to label station along the horizontal axis of the Profile View, or Elevation to label elevation along the vertical axis of the Profile View

Prefix: Enter the prefix text for Station / Elevation labels.

Suffix: Enter the suffix text for Station / Elevation labels.

Station Options Available options when the selected Label was a Profile View Station Label

Format: Display the position of the station delimiter. (Edit value in Drawing Setup)

Remove Numbers after the Station Delimiter Check to remove the zero numbers after the station delimiter

Spacing Select the station label spacing unit. Select 25, 50, or 100 units from the drop-down list.

Along Full Check to label all the stations at the selected station **Spacing** unit along the full horizontal length of the Profile View.

Starting Options only available if the option **Along Full Length** is not checked.

Select the **Starting** Station and **Ending** Station from the list of available stations.

No Label at Starting and / or Ending If: Select this option to remove the Starting and / or Ending station labels if either of the following conditions are true.

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The Starting station label is not added, if the starting station label would match the starting station of the Profile View

The Ending station label is not added, if the ending station label would match the ending station of the Profile View

Location Elevation Select the elevation, related to the Profile View elevation to place the Station labels

Elevation Available options when the Labeling Options > Type: > Elevation is selected above.

Location Select the profile offset location. Top, Center, or Bottom. Top and Bottom are only available if an offset value has been assigned.

Spacing Select the elevation label spacing unit. Select 1, 2, 5, or 10 units from the drop-down list.

Placement Select Prompt or Along Full Height. Select Prompt to be prompted for the next elevation label at the select spacing unit, or Along Full Height to label all elevations at the select **Spacing** unit.

Starting Options only available if the option **Along Full Height** is not checked.

Select the **Starting** elevation and select the **Number** of elevations above the starting elevation to label at the selected elevation **Spacing** unit.

No Label at Bottom and / or Top If: Select this option to remove the Bottom and / or Top elevation labels if either of the following conditions are true.

The Bottom elevation label is not added, if the bottom elevation label would match the bottom elevation of the Profile View

The Top elevation label is not added, if the top elevation label would match the top elevation of the Profile View

Location Station Select the station, related to the Profile View stationing to place the Elevation labels

4.13.23 Profile Annotation

4.13.23.1 Profile Curb Return

Create a curb return profile


Button

Ribbon: SmartDraft ▸ Profile panel ▸ 

Toolbar: Profile Tools: 

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Menu: SmartDraft ▸ Profile ▸ Profile Annotation ▸ Curb Returns

Note: The label is a Dynamic Block.

Dialog Box Options

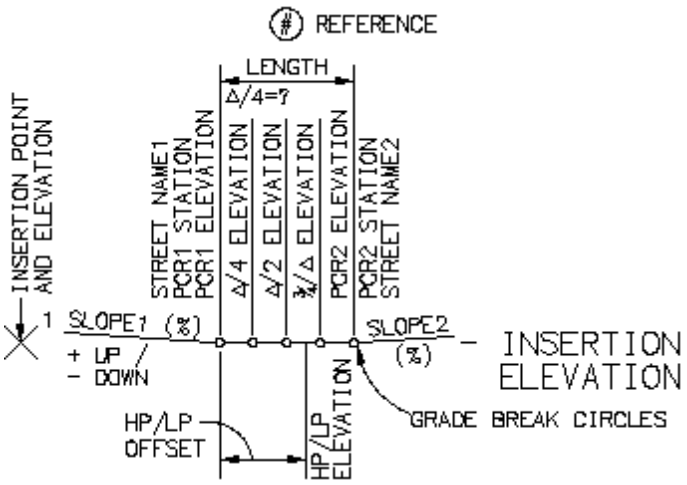
Curb Return Profile	
Return Data	
Length on Curb:	Enter a value for curb return length.
Length Graphic:	Enter a value for drawing length, used when placing the Curb Return at PCR1 or PCR2. (optional)
PCR1 Elevation:	Enter a value.
1/4 Delta Elevation:	Enter a value. (optional)
1/2 Delta Elevation:	Enter a value. (optional)
3/4 Delta Elevation:	Enter a value. (optional)
PCR2 Elevation:	Enter a value.
Insertion Options	
Elevation:	Option to insert the Curb Return at the Insertion Elevation below. Use this option to create a curb return with all the options.
@ PCR1:	Option to insert the Curb Return at the PCR1 elevation and selected point. The PCR1 elevation is not added to the drawing.
@ PCR2:	Option to insert the Curb Return at the PCR2 elevation and selected point. The PCR2 elevation is not added to the drawing.
Insertion Elevation:	Reference elevation at insert point (1).
Labeling	
Leader Direction:	Specify leader direction.
Leader Offset:	Check to draw an offset from the profile point to the beginning of the leader.
Grade Break Circles:	Check to draw a circle at each station and elevation.
Scale	
Horizontal Scale:	Enter the horizontal scale. Default is the drawing's Horizontal Scale.
Vertical Scale:	Vertical scale. Default is 1/10 of horizontal scale.
High/Low Point	
HP or LP:	Select **HP**, **LP** or **None** to a High or Low point.
Elevation:	Enter an elevation for the HP/LP.
Offset:	Enter an offset distance for the HP/LP from PCR1.
Optional Data	
PCR1 Station:	Enter a value for 1st station (100.00 for 1+00.00).
Street Name1:	Enter a value for 1st street name.
Slope1 (%):	Enter a value for incoming slope (- downward, + upward).
PCR2 Station:	Enter a value for 2nd station (100.00 for 1+00.00).
Street Name2:	Enter a value for 2nd street name.
Slope2 (%):	Enter a value for outgoing slope (- downward, + upward).
Reference:	Enter a value for reference symbol, or leave blank for no symbol.
Symbol:	Specify a reference symbol. Options: Circle, Diamond, Hexagon, Keyhole, Oval, Pentagon, Rectangle, Star, Square, or Triangle.
Layer	
Type:	Change the layer type. Display current setting.

Command:

Specify insertion point: Specify a point (1).

Example

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4.13.23.2 Profile Angle, Draw, Inquire, Label, or Pipe

Create profile lines at a given slope, label slope, find vertical deflection angle, inquire slope, and offset pipe of selected line

Button

Ribbon: SmartDraft ▸ Profile panel ▸

Toolbar: Profile Tools:

Menu: SmartDraft ▸ Profile ▸ Profile Annotation ▸ Angle, Draw, Inquire, Label, or Pipe

Command:

Profile Slope Tools.
Current settings: Scale = <*current*>, Size = <*current*>, Label = <*Percent/Decimal*>, Minus = <*Yes/No*>,
Prefix/Suffix =<*current*>

If **Angle** is selected:

Find vertical deflection angle

Select first slope line or [Angle/Draw/Inquire/Label/Pipe/Options]: Select profile line to find percentage of slope, or **A**ngle to find the deflection angle between two sloped lines, **D**raw to draw profile line at a given slope, **I**nquire to inquire the slope of a profile line, **L**abel to label a profile line's slope, **O**ptions to change the output options, or press ENTER to exit.

Select second slope line: Select profile line to find percentage of slope.

Output:

Slope: First line: -4.00, Second line: 6.00, Deflection angle: 05d42'38"

If **Draw** is selected:

Slope in percent (- if down) or [Angle/Draw/Inquire/Pipe/Label/Options]: Enter a value, or **A**ngle to find the deflection angle between two sloped lines, **D**raw to draw profile line at a given slope, **I**nquire to inquire the slope of a profile line, **L**abel to label a profile line's slope, **P**ipe to offset a pipe, **O**ptions to change the output options, or press ENTER to exit. This value adjusts the crosshairs to the value specified.

Specify point: Select first point of profile line.

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Specify point or [Slope]: Select second point of profile line, **S** to enter a new slope, or press ENTER to end command.

If **Inquire** is selected:

Select line to list slope or [Angle/Draw/Inquire/Pipe/Label/Options]: Select profile line to find percentage of slope, or **A**ngle to find the deflection angle between two sloped lines, **D**raw to draw profile line at a given slope, **I**nquire to inquire the slope of a profile line, **L**abel to label a profile line's slope, **P**ipe to offset a pipe, **O**ptions to change the output options, or press ENTER to exit.

Output:

Slope of selected line: 4.00%

If **Label** is selected:

Select line to label slope or [Angle/Draw/Inquire/Pipe/Label/Options]: Select profile line to label with percentage or decimal slope, or **A**ngle to find the deflection angle between two sloped lines, **D**raw to draw profile line at a given slope, **I**nquire to inquire the slope of a profile line, **L**abel to label a profile line's slope, **P**ipe to offset a pipe, **O**ptions to change the output options, or press ENTER to exit.

If **Pipe** is selected:

Select line to offset pipe or [Angle/Draw/Inquire/Pipe/Label/Options]: Select profile line to offset with the current pipe size, **A**ngle to find the deflection angle between two sloped lines, **D**raw to draw profile line at a given slope, **I**nquire to inquire the slope of a profile line, **L**abel to label a profile line's slope, **P**ipe to offset a pipe, **O**ptions to change the output options, or press ENTER to exit.

Specify the side: Specify the point for the side to offset other pipe edge.

4.13.23.2.1 Profile Label Options

Set options for profile slope tools: Angle, Draw, Inquire, Label, or Pipe.

Dialog Box Options

Profile Label Options

Scale	
Vertical:	Enter a value. Default is Horizontal Scale divided by four.
Pipe	
Prompt:	Check to have the command prompt for the pipe size each time.
Size:	Enter a value (the pipe size to offset).
Profile Direction	
Direction:	Select the stationing direction for the profile from the drop-down list. Left-to-Right or Right-to-Left. **Note:** Used to determine decreasing slope and the correct labeling of the sign.
Layer	
Profile List:	Layer to draw the lines between the station and elevation labels. Display current Customization Template's Profile Layer List.
Type:	Change the layer type. Display current setting.
Slope Labeling	
Slope:	Check to include slope labels.
Prefix:	Enter the prefix text for slope labels.
Suffix:	Enter the suffix text for slope labels.
Precision:	Select the decimal precision for slope from the list.

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Type:	Select **Decimal** to label slope using grade in decimal or **Percent** to label slope using grade in percent.
Placement:	Select Above to place the slope label above the profile or Below to place it below.
Arrow:	Add slope arrow.
Minus Sign:	Add minus sign to decreasing slopes.

4.13.23.3 Profile Crossing Pipes

Create crossing pipe symbols in the profile

Crossing pipe symbol is created perpendicular to the profile.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Yes


Button

Ribbon: SmartDraft ▸ Profile panel ▸ 
Toolbar: Profile Tools: 
Menu: SmartDraft ▸ Profile ▸ Profile Annotation ▸ Pipe Crossing

Command:

Create Crossing Pipes in Profile.....

Specify [Datum/Points] <Datum>: Specify if symbol will be drawn from profile **D**atum information (label option) or by **P**oints (pipe only).

Points:

Current settings: Pipe = <Top/Invert>, Size = <size>, Vertical Scale = <current>

Specify profile point or [Options/Undo]: Specify a point to draw the pipe with the current options, **O**ptions to change the options, **U**ndo to erase the last pipe, or press ENTER to end.

Datum:

Profile Setup Options dialog box will appear.

Create or select a profile view

Select options:

Profile Name base station: <*datum station*>, elevation: <*datum elevation*>, and direction: <*Left to Right / Right to Left*>

Datum by Station:

Current settings: Pipe = <Top/Invert>, Size = <size>, Prefix = <current>, Suffix = <current>

Enter station or [Options/PLanview/Point/Undo]: Enter a station value, **PL**anview to change to planview mode, **P**oint to change to point mode, **O**ptions to change the current options, **U**ndo to erase the last pipe and label, or press ENTER to end.

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Enter elevation: Enter the elevation for the station.

Datum by Point:

Current settings: Pipe = <Top/Invert>, Size = <size>, Prefix = <current>, Suffix = <current>

Specify profile point or [Options/PLanview/Station/Undo]: Specify a point, **PL**anview to change to planview mode, **S**tation to change to station mode, **O**ptions to change the current options, **U**ndo to erase the last pipe and label, or press ENTER to end.

Datum by PLanview: (Note: This option is only available when a Civil 3D is selected.)

Select Planview point or [Options/Point/Station/Undo]: Enter a station along the profile, **P**oint to select a point along the profile, **S**tation to enter a station, **O**ptions to change the options, **U**ndo to erase the last label, or press ENTER to end.

Manual Profile Information

Enter elevation: Enter the elevation value for the station.
The label location is calculated from the entered station, elevation, and the profile datum information. The label is placed at the calculated location.

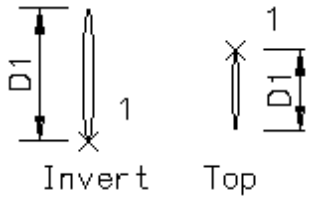
Civil 3D Profile Information

The elevation is calculated at the entered station along the Civil 3D's profile. The label location is calculated from the enter station, calculated elevation, and the profile datum information. The label is placed at the calculated location.

Civil 3D Profile Information

The station is calculated from the selected point perpendicular or radial to the alignment in planview; the elevation is calculated along the Civil 3D's profile. The label is placed at the calculated location in the profile.

Example



4.13.23.3.1 Pipe Crossing Options

The starting station and elevation location, vertical scale and direction are determined by the profile setup block. Multiple profiles can be created within one file, but each profile requires its own profile setup block.

Dialog Box Options

Scale	
Vertical:	Enter a value. Default is Horizontal Scale divided by four.
Pipe	
Prompt:	Check to have the command prompt for the pipe size each time.
Size:	Enter a value (the pipe size to offset).
Top:	Select this option when point specified indicates Top of pipe elevation.
Invert:	Select this option when point specified indicates Invert elevation of pipe.
Layer	

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Profile List:	Layer to draw the lines between the station and elevation labels. Display current Customization Template's Profile Layer List.
Type:	Change the layer type. Display current setting.
Leader List:	Layer to draw the leader and text or dynamic block.
Labeling (disabled when type is Points)	
Leader:	Check to include label leader, station, and elevation. If not checked, the station and elevation are echoed at the command prompt.
Direction:	Select Up, Down, or Prompt for the direction of the station and elevation label leader.
Dynamic Block	Option to insert label as a dynamic block
Leader Offset:	Check to draw an offset from the profile point to the beginning of the leader.
Grade Break Circle:	Disabled for this command. Command does not draw the grade break circle.
Placement:	Select placement: Station above Elevation or Elevation above Station on the label.
Stations	
Station:	Check to include station on label.
Prefix:	Enter the prefix text for station labels.
Suffix:	Enter the suffix text for station labels.
Precision:	Select the decimal precision for station from the list.
Elevations	
Elevation:	Check to include elevation on label.
Prefix:	Enter the prefix text for elevation labels.
Suffix:	Enter the suffix text for elevation labels.
Precision:	Select the decimal precision for elevations from the list.

4.13.23.4 Profile Pipe Cut Away

Create a cut away pipe symbols in the profile


Button

Ribbon: SmartDraft ▸ Profile panel ▸ 
Toolbar: Profile Tools: 
Menu: SmartDraft ▸ Profile ▸ Profile Annotation ▸ Pipe Cut Away

Command:

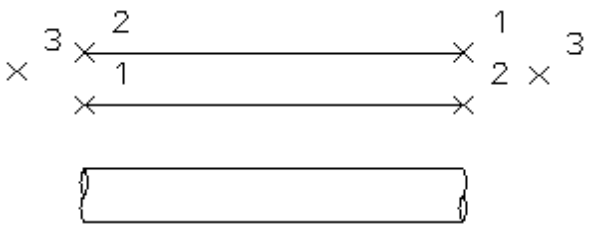
Create pipe cut away.

Select first side of pipe: Specify a point (1). *Default osnap is **END**point.*

Select second side of pipe: Specify a point (2). *Default osnap are **END**point and **PER**pendicular.*

Specify open side of pipe: Specify the point (3) on the open end of the pipe.

Example



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4.13.23.5 Profile Distance and Elevation or Slope

Create a profile from distances and elevations or slopes

Overview

Create a profile using distances and elevations or slopes to calculate the profile.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Yes


Button


Ribbon: SmartDraft ▸ Profile panel ▸ 

Toolbar: Profile Tools: 

Menu: SmartDraft ▸ Profile ▸ Profile Annotation ▸ Distance and Elevation/Slope

Note: The label is a Dynamic Block.

Dialog Box Options

Datum

Elevation:	Enter a datum elevation.
Vertical Scale:	Enter a value. Default is Horizontal Scale divided by four.
Dimension:	Toggle: If checked, the specified distance will be labeled when drawing profiles.
Units from Elevation:	Enter location, in number of units from the elevation, that the dimension lines will be drawn. Default is 8. Note: Recommend value of 4 to 6 units above the highest elevation when label direction is Up, or 4 to 6 units below lowest elevation when label direction is Down.
Layer	
Profile List:	Layer to draw the lines between the station and elevation labels. Display current Customization Template's Profile Layer List.
Type:	Change the layer type. Display current setting. If the layer type is set to "Exist", elevation labels will be surrounded with parentheses "(xxxx.xx)".
Leader List:	Layer to draw the leader and text or Dynamic Block.
Labeling	
Leader:	Check to include label leader, station, and elevation.
Direction:	Select Up or Down for the direction of the station and elevation label leader.
Leader Offset:	Check to draw an offset from the profile point to the beginning of the leader.
Grade Break Circles:	Check to draw a circle at each station and elevation.
Placement:	Specify placement: Station above Elevation or Elevation above Station on the label.
Stations	
Station:	Check to include station on label.
Prefix:	Enter the prefix text for station labels.
Suffix:	Enter the suffix text for station labels.
Precision:	Select the decimal precision for station from the list.
Elevations	
Elevation:	Check to include elevation on label.
Prefix:	Enter the prefix text for elevation labels.
Suffix:	Enter the suffix text for elevation labels.

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Precision:	Select the decimal precision for elevations from the list.
Slope Labeling	
Slope:	Check to include slope labels.
Prefix:	Enter the prefix text for slope labels.
Suffix:	Enter the suffix text for slope labels.
Precision:	Select the decimal precision for slope from the list.
Type:	Select **Decimal** to label slope using grade in decimal or **Percent** to label slope using grade in percent.
Placement:	Select Above to place the slope label above the profile or Below to place it below.
Arrow:	Add slope arrow.
Minus Sign:	Add minus sign to decreasing slopes.

Command:

Create Profile by Distance and Elevation or Slope.

Select datum elevation point: Specify a point (1). *Default osnap is **INT**ersection.*

Enter elevation: Enter the elevation, or press ENTER to end.

Enter station: Enter the station, or press ENTER for none.

Enter incoming slope <%>: Enter the slope value (negative for down), or press ENTER for none.

Enter distance or [Undo]: Enter the distance to next station/elevation label for the next label, **U**ndo to undo, or press ENTER to enter outgoing slope.

If type **Elevation:**

Enter elevation or [Slope]: Enter the elevation, **S**lope to toggle to enter slopes, or press ENTER to end.

If type **Slope:**

Enter slope (%) or [Elevation]: Enter the slope, **E**levation to toggle to enter elevations, or press ENTER to end.

Enter outgoing slope <%>: Enter the slope value (negative for down), or press ENTER for none.

Example

4.13.23.5.1 Distance and Elevation or Slope Example

Elevation: 25

Labeling Direction: Up,

Grade Break Circles: Off

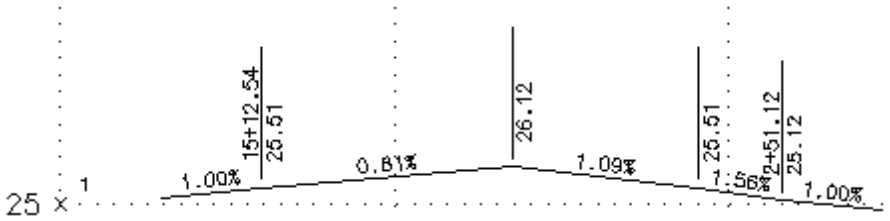
First station: 15+12.00, Elevation: 25.51, Incoming slope: 1

Distance: ..., Elevation: ...

Last station 5+00.00, Outgoing slope: -1

Dimensions: Off

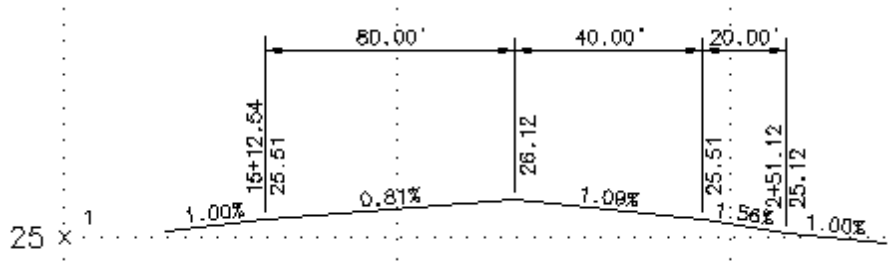
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Dimensions Off

Dimensions: On

Units from Elevation: 6



Dimensions On

4.13.23.6 Profile Digitizing Planview

Create a profile from digitized planview points and elevations

Overview

Digitize planview features inside the drawing or from a paper drawing. Set up tablet for digitizing using the TABLET command.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	Yes

Button

Ribbon: SmartDraft ▸ Profile panel ▸

Toolbar: Profile Tools:

Menu: SmartDraft ▸ Profile ▸ Profile Annotation ▸ Digitize

Note: The label is a Dynamic Block.

Command:

Profile Setup Options dialog box will appear.

Create or select a profile view

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Select options:

Profile Name base station: <*datum station*>, elevation: <*datum elevation*>, and direction: <*Left to Right / Right to Left*>

Create Profile by Digitizing Planview.....

Specify planview starting point: Specify a point (1) in the planview drawing area.

Specify starting point station: Specify a station value for point (1) above.

Enter elevation: Enter the elevation value for the station.

Specify planview point or [Undo]: Specify a point (2, 3, etc...) in the planview, **U**ndo to undo the last station and elevation, or press ENTER to end.

Enter station <*default*>: Enter the next station value, or press ENTER to accept the default.

Enter elevation: Enter the elevation value for the station.

Example

4.13.23.6.1 Digitize Example

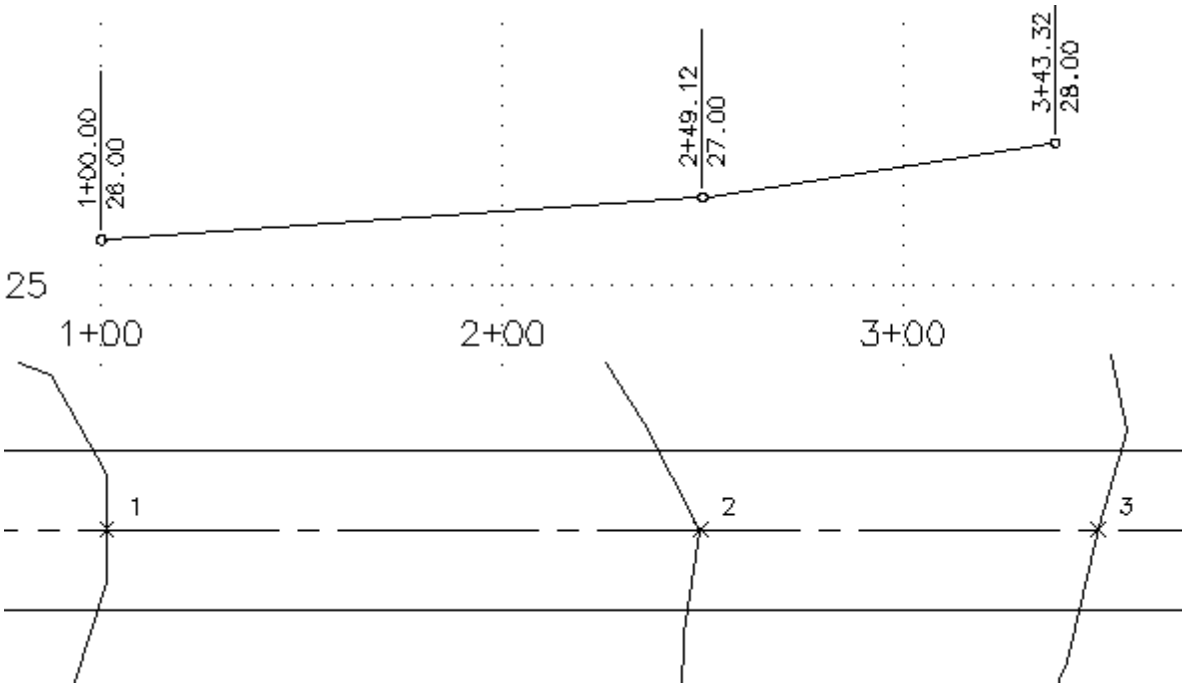
Label direction: Up, Grade break circles: Yes

Point (1), Station: 100, Elevation: 26

Point (2), Station: 249.12, Elevation: 27

Point (3), Station 343.32, Elevation: 28

Point (...)



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4.13.23.7 Profile Arc Leader

Create an arced leader with various arrowhead and optional symbol. The leader can be either a leader object or a polyline


Button

Ribbon: SmartDraft ▸ Profile panel ▾ 

Toolbar: Profile Tools: 

Menu: SmartDraft ▸ Profile ▸ Profile Annotation ▸ Profile Arc Leader

Command entry: **alrp**

Command:

Create arc leader.

Current settings: Leader = <Arc/Straight>, <None/Arrow/Dot/Integral>, <Object/Polyline>, Points = <2/3/4/5>, Symbol = <name>

Type: Object

Specify first leader point or [Option]: Specify a point (1) where you want the arrowhead, **O**ptions to change the leader options.

Specify next point: Specify the next point(s) along the leader, or press ENTER.

Type: Polyline

Specify first leader point or [Options]: Specify a point (1) where you want the arrowhead, or **O**ptions to change the leader options.

Specify end point: Specify a point (2), end of leader. Rubber-band arc appears. Select a point when arc is at desired curvature.

Specify direction from start point: Specify a point (3).

Symbol: (when not set to "None")

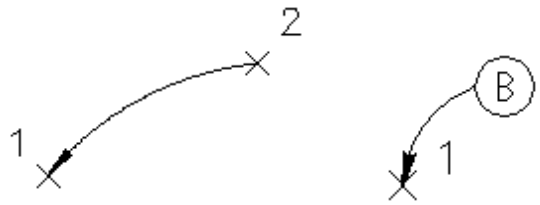
Enter symbol text: **B** Enter the text for the symbol.

Leader Options

Leader Options	
Type	Select if the leader will be an AutoCAD Leader object, MLeader object, or a polyline.
Line	Select if the leader line will be arced or straight.
ArrowHead	Select the leader arrowhead type.
Points	Select the number of points prompted for the leader.
Symbol Options	
Symbol	Select the symbol type.
Width Factor	Select a value to control the number of character within a symbol before the symbol increases in size. If the Width Factor is set to: 0.80, 2 characters fit in the symbol before it increases in size. 0.65, 3 characters fit in the symbol before it increases in size.

Example

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Note: Straight Leader and Arc Leader use the horizontal scale and **DIMASZ** system variable to create the arrowhead size.

4.13.23.8 Profile Straight Leader

Create a straight leader with various arrowhead and optional symbol. The leader can be either a leader object or a polyline

Button

Ribbon: SmartDraft ▸ Profile panel

Toolbar: Profile Tools:

Menu: SmartDraft ▸ Profile ▸ Profile Annotation ▸ Profile Straight Leader

Command entry: **slrp**

Command:

Create straight leader.

Current settings: Leader = <Arc/Straight>, <None/Arrow/Dot/Integral>, <Object/Polyline>, Points = <2/3/4/5>, Symbol = <name>

Type: Object

Specify first leader point or [Option]: Specify a point (1) where you want the arrowhead, **O**ptions to change the leader options.

Specify next point: Specify the next point(s) along the leader, or press ENTER.

Type: Polyline

Specify first leader point or [Options]: Specify a point (1) where you want the arrowhead, or **O**ptions to change the leader options.

Specify end point: Specify a point (2), end of leader. Rubber-band arc appears. Select a point when arc is at desired curvature.

Specify direction from start point: Specify a point (3).

Symbol: (when not set to "None")

Enter symbol text: **B** Enter the text for the symbol.

Leader Options

Leader Options

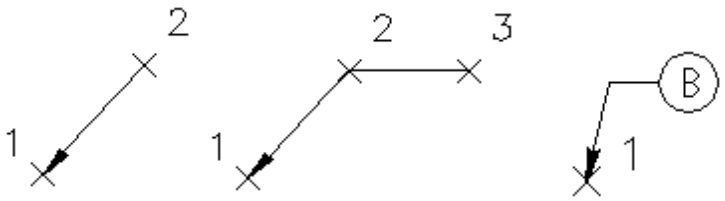
Type Select if the leader will be an AutoCAD Leader object, MLeader object, or a polyline.

Line Select if the leader line will be arced or straight.

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ArrowHead Select the leader arrowhead type.
Points Select the number of points prompted for the leader.
Symbol Options
Symbol Select the symbol type.
Width Factor Select a value to control the number of character within a symbol before the symbol increases in size.
If the Width Factor is set to:
0.80, 2 characters fit in the symbol before it increases in size.
0.65, 3 characters fit in the symbol before it increases in size.

Example



Note: Straight Leader and Arc Leader use the horizontal scale and **DIMASZ** system variable to create the arrowhead size.

4.13.23.9 Profile Dimension

Label the distance between two selected points. The label is placed above and in the center of the leader line. The distance value can be overwritten with an entered value

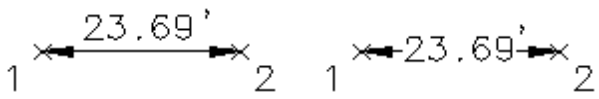
Note: When the Type = Object there will be an option to place the dimension text above the leader line or in the middle of the leader line.

Button
Ribbon: SmartDraft ▸ Profile panel
Toolbar: Profiles Tools:
Menu: SmartDraft ▸ Profile ▸ Profile Annotation ▸ Profile Dimension
Command entry: **dspf**

Command:

Current settings: Type = <Object/Polyline>, Location = <Above/Within>, Arrow = <Arrow/Dot/Integral/Oblique>, Suppress trailing zeros = <Yes/No>
Specify from point or [OPtions/OSnap]: Specify a point (1), **OP**tions change the current settings, or **OS**nap to change default osnaps. *Default osnap is **NEA**rest.*
Specify to point or [[OPtions/OSnap]: Specify a point (2). *Default osnap is **PER**pendicular.*
Enter dimension text <xxx.xx'>: Enter a value to overwrite the default, or press ENTER to accept.

Example



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4.13.23.1 Profile Calculator

This command calculates the following vertical profile data; it does not draw any linework:

- A slope and/or elevations along a slope.
- The intersection point of two slopes.
- A vertical curve.


Button

Ribbon: SmartDraft ▸ Profile panel ▾

Toolbar: Profile Tools:

Menu: SmartDraft ▸ Profile ▸ Profile Annotation ▸ Profile Calculator

To calculate a slope:

Deselect the PVI check box; specify the First station and elevation, then the Second station and elevation. The calculated slope will display in the "First Slope" text box. To calculate a ***station*** along the slope, specify an elevation in the "Additional Data" section. To calculate an ***elevation*** along the slope, specify a station in the "Additional Data" section.

To calculate elevation along a slope:

Deselect the PVI check box; specify the First station, elevation, and slope. To calculate a station or elevation along the slope, specify either an elevation or station in the "Additional Data" section.

To calculate the intersection point of two slopes:

Select the PVI check box; specify the incoming station, elevation and slope, and the outgoing station, elevation, and slope. The PVI station and elevation will be calculated and displayed in the PVI station and elevation text boxes. To calculate additional stations and elevations along the two slopes, specify either an elevation or station in the "Additional Data" section.

To calculate a Vertical Curve:

Select the PVI check box; specify the incoming station, elevation and slope, the PVI station and elevation, and the outgoing station, elevation, and slope. Specify a length and grade break lengths. The resulting vertical curve calculation will display in the "Calculation List."

Dialog Box Options

Input Data

Incoming/First

Station:	Enter an incoming station.
Elevation:	Enter an incoming elevation.
Slope (%):	Enter a percentage of slope or allow command to calculate value by entering a PVI station and elevation.
PVI:	Select check box to calculate a vertical curve or intersection of two slopes.
Station:	Enter a PVI station or allow command to calculate PVI by entering outgoing station, elevation, and slope.
Elevation:	Enter a PVI elevation or allow command to calculate PVI.

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Precision:	Select the decimal precision for the stations, elevations, and slopes from the drop-down list.
Outgoing/Second	
Station:	Enter an outgoing station.
Elevation:	Enter an outgoing elevation.
Slope (%):	Enter a percentage of slope, or allow command to calculate value by entering a PVI station and elevation.
Vertical Curve	
Curve Length:	Enter the length of the vertical curve.
Labeling Length:	Enter the length for the calculate stations within the vertical curve.
Speed MPH:	Specify a MPH speed for the specified length and incoming and outgoing slopes.
Additional Data	
Station:	Enter a station. PVI is not checked: calculates elevations along a straight slope. PVI is checked, but no Curve Length and Labeling Length are specified: calculates along the two intersecting straight slopes. PVI is checked, Curve Length, and Labeling Length are specified: calculates elevations along a Vertical Curve.
Elevation	Enter an elevation to find a station along a straight slope.
Add to List:	Select box to add calculated stations and elevations to the "Calculation List".
Calculation List	
List Box:	List of calculated values.
Delete from List:	Delete selected lines of data from the "Calculation List".
Buttons	
Close:	Exit the command.
Clear:	Clear all entered data.
Save:	Save the data in the "Calculation List" to an ASCII file. At the "Profile information to a file" dialog, enter the file name for the output file.

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4.13.24 Section View Labels and Tools

4.13.24.1 Label Section Views

Create offset and elevation labels for Civil 3D section views

Dynamic Data: Section View labels will update when moved, copied, arrayed, or grip edited using standard AutoCAD commands.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	No


Button


Ribbon: SmartDraft ▸ Profile panel ▸ 

Toolbar: Profile Tools: 

Menu: SmartDraft ▸ Profile ▸ Section View ▸ Label Section Views


Command entry: **svl**

Note: The label is a Dynamic Block.

If **Civil 3D:**

Command:

Create view section labels

Select a Section View: Select a section view.

If **Point:**

Select point within section or [OFFset/Options/View]: Specify a point within the section view, **OFF**set to toggle to entering offset and elevation valves, **O**ptions to change the labeling options, **V**iew to select a different section view, or Enter to end.

If **Offset:**

Enter an offset value or [Options/Point/View]: Enter an offset value, **O**ptions to change the labeling options or output settings, **P**oint to label by selecting points, **V**iew to select a different section view, or Enter to end.

Enter an elevation: Enter an elevation.

If Point:

Specify Point or [Options/OBject/Undo]: Select a line or polyline to label, **O**ptions to change the station to label, or output settings, **OB**ject to label by selecting an object, **U**ndo to remove last label, or Enter to end.

If Object:

Select Object or [Options/Point/Undo]: Select a line or polyline to label, **O**ptions to change the station to label, or output settings, **P**oint to label by selecting points, **U**ndo to remove last label, or Enter to end.

To edit: To edit the options of an existing label, you can use the SmartDraft Text Edit (**ed**) command.

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4.13.24.1.1 Section View Label Options

Options for the Label Section Views command.

Section View Label Options

Labeling:

Leader Direction:	Select Up ,Down, or Prompt for the direction of the offset and elevation label leader.
Leader Offset:	Check to draw an offset from the profile point to the beginning of the leader.
Grade Break Circle:	Check to draw a circle at each label.
Offset:	Toggle to include offset value of the label.
Placement:	Select the location of the offset value.
Prefix:	Edit box for prefix text that will be added to the offset value.
Suffix:	Edit box for suffix text that will be added to the offset value.
Precision:	Set the number of decimal places for the offset output display.
Type:	Select the offset direction type:

+/-	To display the offset as a positive or negative value.
Prefix Lt/Rt	To add the Left / Right direction as a prefix.
Suffix Lt/Rt	To add the Left / Right direction as a suffix.
None	To display the offset as a positive value.

Elevation:	Toggle to include elevation value of the label.
Placement:	Select the location of the elevation value.
Prefix:	Edit box for prefix text that will be added to the elevation value.
Suffix:	Edit box for suffix text that will be added to the elevation value.
Precision:	Set the number of decimal places for the elevation output display.
Truncate:	Set the number of places the elevation will be truncated left of the decimal point. Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.

Note 1:	Toggle to include note 1 value (1st) of the label.
Note 2:	Toggle to include note 2 value (2nd) of the label.
Note 3:	Toggle to include note 3 value (3rd) of the label.

Note: Common options for Note 1, 2, and 3.

Placement:	Specify the location of the note value.
Input:	Select the input option for the note.
Note:	Enter the note value, if the input option is set to Note.

Layer:

Layer:	Set the output layer type. Default (Uses layers in layer database) or *current*.
Layer Type:	Toggle the layer type for the layer name selection.

4.13.24.1.1.1 Placement Options

Section View Offset and Elevation Label Placement Options:

3 above:	The data will be placed three spaces above the leader line.
2 above:	The data will be placed two spaces above the leader line.
1 above:	The data will be placed one space above the leader line.
1 below:	The data will be placed one space below the leader line.
2 below:	The data will be placed two spaces below the leader line.
3 below:	The data will be placed three spaces below the leader line.

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4.13.24.1.1.2 Input Options

Section View Offset and Elevation Label Input Options

Note / description input option.

Input Options

Prompt:	Option to prompt the operator to enter the note value.
Select:	Option to prompt the operator to select an object with text to be used as the note value.
Note:	Option to use the value entered in the Note edit box as the note value.

4.13.24.1.2 Edit Section View Label

Edit Section View Labels (Dynamic Blocks Only) created using Label Section Views command.

Edit Section View Label Options

Section View Name	Name of the section view associated to the selected label.
Select a Different Labeling:	Check to select a new section view to assign to the selected label(s).
Leader Direction:	Select Up ,Down, or Prompt for the direction of the offset and elevation label leader.
Leader Offset:	Check to draw an offset from the profile point to the beginning of the leader.
Grade Break Circle:	Check to draw a circle at each label.
Offset:	Toggle to include offset value of the label.
Placement:	Select the location of the offset value.
Prefix:	Edit box for prefix text that will be added to the offset value.
Suffix:	Edit box for suffix text that will be added to the offset value.
Precision:	Set the number of decimal places for the offset output display.
Type:	Select the offset direction type:

+/-	To display the offset as a positive or negative value.
Prefix Lt/Rt	To add the Left / Right direction as a prefix.
Suffix Lt/Rt	To add the Left / Right direction as a suffix.
None	To display the offset as a positive value.

Elevation:	Toggle to include elevation value of the label.
Placement:	Select the location of the elevation value.
Prefix:	Edit box for prefix text that will be added to the elevation value.
Suffix:	Edit box for suffix text that will be added to the elevation value.
Precision:	Set the number of decimal places for the elevation output display.
Leave Notes As-is	Toggle to leave notes as they are.
Note 1:	Toggle to include note 1 value (1st) of the label.
Note 2:	Toggle to include elevation 2 value (2nd) of the label.
Note 3:	Toggle to include elevation 3 value (3rd) of the label.

Note: Common options for Note 1, 2, and 3.

Placement:	Specify the location of the note value.
Input:	Select the input option for the note.
Note:	Enter the note value, if the input option is set to Note.

4.13.24.1.3 Section View Label Update

Update section view labels (Dynamic Blocks Only) created using Label Section Views command.

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Command entry: **svu**

Command:
Select Section View Labels to update.
Select Objects: Select the Section View Labels to update the values.

4.13.24.2 Section View: Draw a Polyline

Create a polyline in a section view using offsets and elevations, or specify point.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	No


Button
Ribbon: SmartDraft ▸ Profile panel ▸ 
Menu: SmartDraft ▸ Profile ▸ Section View ▸ Section View: Draw a Polyline
Command entry: **svdr**

Command: **svdr**
Select a Section View: Select a section view.

If type: **Offset**
Enter an offset or [Point/View]: Enter an offset valve, **P**oint to specify a point graphically, or **V**iew to select a different section view.
Enter an elevation: Enter an elevation.

If type: **Point**
Select point within section or [Offset/View]: Specify a point within the section view, **O**ffset to enter an offset and elevation, or **V**iew to select a different section view.

4.13.24.3 Section View: Points

Set points along an alignment at the station, offset, and elevation by selecting a point on a section view.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	No


Button
Ribbon: SmartDraft ▸ Profile panel ▸ 

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Menu: SmartDraft ▸ Profile ▸ Section View ▸ Section View: Points

Command entry: **svp**

Command: **svp**

Set Point along Alignment from Point in Section View.

Select a section view: Select a section view.

If type: **Offset**

Enter an offset or [Options/Point/View]: Enter an offset valve, **P**oint to specify a point graphically, or **V**iew to select a different section view.

Enter an elevation: Enter an elevation.

If type: **Point**

Select point within section for point <Point#> or [Offset/Options/View]: Specify a point within the section view, **O**ffset to enter an offset and elevation, or **V**iew to select a different section view.

4.13.24.4 Section View: Slope Label (2 Points)

Create a slope label within a Civil 3D section views by selecting 2 points.

Supports:

AutoCAD Products: Civil 3D only

BricsCAD Pro: No

Button

Ribbon: SmartDraft ▸ Profile panel ▸

Toolbar: Profile Tools:

Menu: SmartDraft ▸ Profile ▸ Section View ▸ Section View: Slope Label (2 Points)

Command entry: **svs**

Command:

Create view section slope labels

Select a section view: Select a section view.

Specify first section view point or [Options/View]: Specify a point within the section view, **O**ptions to change the labeling options, **V**iew to select a different section view, or Enter to end.

Specify second section view point: Specify a point within the section view.

4.13.24.4.1 Section View : Slope Label Options

Options for the Section View: Slope Label (2 Points) command.

Slope Label Options

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Slope

Prefix: Edit box for prefix text that will be added to the slope value.

Suffix: Edit box for suffix text that will be added to the slope value.

Precision: Set the number of decimal places for the slope output display.

Type Select the slope type: Decimal, Percent, or Run : Rise

Placemen Select the location of the slope: Above or Below the profile.

Arrow: Check to display a directional arrow with the slope value

Minus Check to add a minus sign to a negative slope, otherwise the absolute value of the slope will be displayed.

Layer:

Layer: Set the output layer type. Default (to use the layer database layer) or *current*.

Layer Toggle the layer type for the layer name selection.

4.13.24.5 Section View: Adjust Elevations

Adjust the minimum and maximum elevations of a Section View

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	No


Button

Ribbon: SmartDraft ▸ Profile panel ▸ 

Toolbar: Profile Tools: 

Menu: SmartDraft ▸ Profile ▸ Section View ▸ Section View: Adjust Elevations

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Command entry: **sve**

If **Civil 3D:**

Command:
Adjust elevations of Section Views.
Current settings: Minimum Elevation: <Prompt/Default>, Maximum Elevation: <Prompt/Default/Height>.
Select a Section View or [Options]: Select a section view, or **O**ptions to change the elevation prompt options

Minimum Elevation: **Prompt:**
Enter minimum elevation <Min>: Enter the minimum elevation for the selected section view.

Maximum Elevation: **Prompt:**
Enter maximum elevation <Max>: Enter the minimum elevation for the selected section view. Maximum elevation must to greater than the minimum elevation value.

4.13.24.5.1 Section View : Adjust Elevations Options

Options for the Section View: Adjust Elevations command.

Section View: Adjust Elevations Options

Minimum

Prompt Select this option to be prompted for the minimum elevation for each selected section view.

Default Select this option to set a default minimum elevation for each selected section view.

Default Enter the default minimum elevation value.

Maximum

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Prompt Select this option to be prompted for the maximum elevation for each selected section view.

Default Select this option to set a default maximum elevation for each selected section view.

Default Enter the default maximum elevation value.

Height Select this option to set a height which will be added to the minimum elevation to calculated the maximum elevation for each selected section view.

Height Enter the height value which will be added to the minimum elevation to calculated the maximum elevation.

4.13.25 Profile Pipe Network Labels and Tools

4.13.25.1 Insert a Null Structure into a Pipe Network

Insert a Null Structure into a pipe network by selecting a pipe in plan or profile

The command breaks a pipe, inserts a Null Structure and connects the pipes to the new structure

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	No


Button

Ribbon: SmartDraft ▸ Profile panel ▸ 

Menu: SmartDraft ▸ Profile ▸ Pipe Networks ▸ Insert a Null Structure into a Pipe Network

Command entry: **pnis**

Command:
Insert a Null Structure into a Pipe Network
Select first pipe network pipe: Select the a pipe network pipe either in plan or profile, or Enter to end.
Specify the insertion point of the structure: Specify a point along the select pipe.

4.13.25.2 Profile Single Pipe Line

Draw a single line pipe of Civil 3D pipe network pipes in the profile

Dynamic Data: Profile single pipe polyline will update when the pipe network changes.

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Button
Ribbon: SmartDraft ▸ Profile panel ▸ 
Menu: SmartDraft ▸ Profile ▸ Pipe Networks ▸ Profile Single Pipe Line
Command entry: **pvdp**

Command:
Create Single Pipe Line in Profile
Current settings: Elevations = <Top/Crown/Center/Invert/Bottom>, Linked = <Yes/No>, Layer = <Current/Other>
Select first pipe network part or [Options]: Select the first pipe network pipe or structure either and plan or profile, **O**ptions to change the options, or Enter to end.
Select second pipe network part: Select the second pipe network pipe or structure either and plan or profile, **O**ptions to change the options, or Enter to draw from a single pipe.

4.13.25.2.1 Profile Pipe Line Options

Options for the Profile Pipe Line command.

Profile Pipe Line Options

Pipe: Single Line

Elevation Type:	Select which pipe elevation to use for the drawn polyline. Top, Crown, Center, Invert, or Bottom.
Create Dynamic Link to the Pipes	Creates a dynamic link to the pipes. Then, the polyline updates dynamically with any changes to the pipes. If the polyline is created with the dynamic link, the link can be disabled later. When the dynamic link is disabled, it cannot be restored. However, when the polyline is not linked to the pipes, it can be edited with any AutoCAD commands.

Layer

Profile	Layer to draw the lines between the station and elevation labels. Display current Customization Template's Profile Layer List.
Type:	Change the layer type. Display current setting.

4.13.25.2.2 Edit Profile Pipe Line Options

Edit for polylines created by the Profile Pipe Line command.

Edit Profile Pipe Line Options

Pipe: Single Line

Elevation Type:	Select which pipe elevation to use for the drawn polyline. Top, Crown, Center, Invert, or Bottom.
Dynamic Link to the Pipes	Dynamic link to the pipes. Then, the polyline updates dynamically with any changes to the pipes. If the polyline is created with the dynamic link, the link can be disabled later. When the dynamic link is disabled, it cannot be restored. However, when the polyline is not linked to the pipes, it can be edited with any AutoCAD commands.

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4.13.25.3 Profile Structure RIM Label

Create Structure RIM Labels for Civil 3D pipe network structures in the profile

Dynamic Data: Profile structure RIM labels will update when the structure's RIM elevation changes.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	No


Button


Ribbon: SmartDraft ▸ Profile panel ▸ 


Command entry: **pvrl**

Menu: SmartDraft ▸ Profile ▸ Pipe Networks ▸ Profile Structure RIM Label


Video

Note: The label is a Dynamic Block.

Command:
Create view profile Structure RIM labels
Select Profile Pipe Network Structure or [Edit/Options/Update]: Select a pipe network structure within the profile, **E**dit to edit existing labels, **O**ptions to change the labeling options, **U**pate the values of existing labels, or Enter to end.

4.13.25.3.1 Profile Structure RIM Label Options

Options for the Profile Structure RIM Label command.

Profile Structure RIM Label Options

Labeling:

Leader Check to draw an offset from the profile point to the beginning of the leader.

Leader to Profile View Top Extend the leader to the top of the profile view.

Suppress Special Station Text Check to suppress the special station suffix text. i.e. GB, BC, EC, etc.

Station: Toggle to include offset value of the label.

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Placemen Select the location of the station value.

Prefix: Edit box for prefix text that will be added to the station value.
Suffix: Edit box for suffix text that will be added to the station value.
Precision: Set the number of decimal places for the station output display.

RIM: Toggle to include RIM elevation value of the label.
Placemen Select the location of the elevation value.

Prefix: Edit box for prefix text that will be added to the elevation value.
Suffix: Edit box for suffix text that will be added to the elevation value.
Precision: Set the number of decimal places for the elevation output display.
Truncate: Set the number of places the elevation will be truncated left of the decimal point.
Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.

Name: Toggle to include Structure Name value in the label.
Placemen Select the location of the name value.

Prefix: Edit box for prefix text that will be added to the name value.
Suffix: Edit box for suffix text that will be added to the name value.

Descriptio Toggle to include Structure Description value in the label.

Placemen Select the location of the description value.

Prefix: Edit box for prefix text that will be added to the description value.
Suffix: Edit box for suffix text that will be added to the description value.

Note 1: Toggle to include note 1 value (1st) of the label.
Note 2: Toggle to include note 2 value (2nd) of the label.
Note 3: Toggle to include note 3 value (3rd) of the label.
Note: Common options for Note 1, 2, and 3.
Placemen Specify the location of the note value.

Input: Select the input option for the note.
Note: Enter the note value, if the input option is set to Note.

Layer:
Layer: Set the output layer type. Default (to use the layer database layer) or *current*.
Layer Toggle the layer type for the layer name selection.

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4.13.25.3.1.1 Placement Options

Profile Structure RIM Elevation Label Placement Options:

3 above:	The data will be placed three spaces above the leader line.
2 above:	The data will be placed two spaces above the leader line.
1 above:	The data will be placed one space above the leader line.
1 below:	The data will be placed one space below the leader line.
2 below:	The data will be placed two spaces below the leader line.
3 below:	The data will be placed three spaces below the leader line.

4.13.25.3.1.2 Input Options

Profile Structure RIM Elevation Label Input Options

Note / description input option.

Input Options

Prompt:	Option to prompt the operator to enter the note value.
Select:	Option to prompt the operator to select an object with text to be used as the note value.
Note:	Option to use the value entered in the Note edit box as the note value.

4.13.25.3.2 Edit Profile Structure RIM Label

Edit Profile Structure RIM Labels (Dynamic Blocks Only) created using Profile Structure RIM Label command.

Edit Profile Structure RIM Label Options

Profile

Name	Name of the section view associated to the selected label.
Select a	Check to select a new profile view to assign to the selected label(s).

Labeling:

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Leader Check to draw an offset from the profile point to the beginning of the leader.

Leader to Profile View Top Extend the leader to the top of the profile view.

Suppress Special Station Text Check to suppress the special station suffix text. i.e. GB, BC, EC, etc.

Station: Toggle to include offset value of the label.

Placemen Select the location of the station value.

Prefix: Edit box for prefix text that will be added to the station value.

Suffix: Edit box for suffix text that will be added to the station value.

Precision: Set the number of decimal places for the station output display.

RIM: Toggle to include RIM elevation value of the label.

Placemen Select the location of the elevation value.

Prefix: Edit box for prefix text that will be added to the elevation value.

Suffix: Edit box for suffix text that will be added to the elevation value.

Precision: Set the number of decimal places for the elevation output display.

Name: Toggle to include Structure Name value in the label.

Placemen Select the location of the name value.

Prefix: Edit box for prefix text that will be added to the name value.

Suffix: Edit box for suffix text that will be added to the name value.

Descriptio Toggle to include Structure Description value in the label.

Placemen Select the location of the description value.

Prefix: Edit box for prefix text that will be added to the description value.

Suffix: Edit box for suffix text that will be added to the description value.

Leave Notes As-is: Toggle to leave notes as they are.

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Note 1: Toggle to include note 1 value (1st) of the label.

Note 2: Toggle to include note 2 value (2nd) of the label.

Note 3: Toggle to include note 3 value (3rd) of the label.

Note: Common options for Note 1, 2, and 3.

Placemen Specify the location of the note value.

Input: Select the input option for the note.

Note: Enter the note value, if the input option is set to Note.

Command:

Select Profile Structure RIM Labels to edit.

Select Objects: Select the profile labels to edit the values.

4.13.25.3.3 Update Profile Label

Update profile labels (Dynamic Blocks Only) created using Profile Structure RIM Label command.

Command entry: **pvu**

Command:

Select Profile Labels to update.

Select Objects: Select the profile labels to update the values.

4.13.25.4 Profile Structure Bottom Label

Create Structure Bottom Labels for Civil 3D pipe network structures in the profile

Dynamic Data: Profile structure bottom labels will update when the structure's pipe elevation(s) changes.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	No

Note: For the In / Out to work correctly make sure the Flow Direction is set correctly. "By Slope" is a best option for Flow Direction except for flat pipes.

Button

Ribbon: SmartDraft ▸ Profile panel ▸

Command entry: **pvil**

Menu: SmartDraft ▸ Profile ▸ Pipe Networks ▸ Profile Structure Bottom Label

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Video

Note: The label is a Dynamic Block.

Command:
Create view profile Structure Bottom labels
Select Profile Pipe Network Structure or [Edit/Options/Update]: Select a pipe network structure within the profile, **E**dit to edit existing labels, **O**ptions to change the labeling options, **U**pate the values of existing labels, or Enter to end.

4.13.25.4.1 Profile Structure Bottom Label Options

Options for the Profile Structure Bottom Label command.

Profile Structure Bottom Label Options

Labeling:

Leader Check to draw an offset from the profile point to the beginning of the leader.

Leader to Profile View Top Extend the leader to the top of the profile view.

Station: Toggle to include offset value of the label.

Placemen Select the location of the station value.

Prefix: Edit box for prefix text that will be added to the station value.

Suffix: Edit box for suffix text that will be added to the station value.

Precision: Set the number of decimal places for the station output display.

Elevation:

Precision: Set the number of decimal places for the elevation output display.

Type: Select the pipe elevation type. Top, Crown, Center, Invert, or Bottom.

Truncate: Set the number of places the elevation will be truncated left of the decimal point.

Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.

Include Pipe Diameter with Elevations: Include the pipe diameter with the elevation value.

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Sump: Toggle to include Sump elevation value of the label.

Placemen Select the location of the sump value.

Prefix: Edit box for prefix text that will be added to the sump value.

Suffix: Edit box for suffix text that will be added to the sump value.

Pipe In: Toggle to include Pipe In elevation value of the label.

Placemen Select the location of the Pipe In value.

Prefix: Edit box for prefix text that will be added to the Pipe In value.

Suffix: Edit box for suffix text that will be added to the Pipe In value.

Pipe Out: Toggle to include Pipe Out elevation value of the label.

Placemen Select the location of the Pipe Out value.

Prefix: Edit box for prefix text that will be added to the Pipe Out value.

Suffix: Edit box for suffix text that will be added to the Pipe Out value.

Pipe Join: Toggle to join the Pipe In and Pipe Out elevation value of the label if they are the same value. This will replace the Pipe In and Pipe Out values.

Placemen Select the location of the Pipe Join value.

Prefix: Edit box for prefix text that will be added to the Pipe Join value.

Suffix: Edit box for suffix text that will be added to the Pipe Join value.

Name: Toggle to include Structure Name value in the label.

Placemen Select the location of the name value.

Prefix: Edit box for prefix text that will be added to the name value.

Suffix: Edit box for suffix text that will be added to the name value.

Descriptio Toggle to include Structure Description value in the label.

Placemen Select the location of the description value.

Prefix: Edit box for prefix text that will be added to the description value.

Suffix: Edit box for suffix text that will be added to the description value.

Note 1: Toggle to include note 1 value (1st) of the label.

Note 2: Toggle to include note 2 value (2nd) of the label.

Note 3: Toggle to include note 3 value (3rd) of the label.

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Note: Common options for Note 1, 2, and 3.
Placemen Specify the location of the note value.

Input: Select the input option for the note.
Note: Enter the note value, if the input option is set to Note.

Layer:
Layer: Set the output layer type. Default (to use the layer database layer) or *current*.
Layer Toggle the layer type for the layer name selection.

4.13.25.4.1.1 Placement Options

Profile Structure Bottom Elevation Label Placement Options:

3 above: The data will be placed three spaces above the leader line.
2 above: The data will be placed two spaces above the leader line.
1 above: The data will be placed one space above the leader line.
1 below: The data will be placed one space below the leader line.
2 below: The data will be placed two spaces below the leader line.
3 below: The data will be placed three spaces below the leader line.

4.13.25.4.1.2 Input Options

Profile Structure Bottom Elevation Label Input Options

Note / description input option.

Input Options
Prompt: Option to prompt the operator to enter the note value.
Select: Option to prompt the operator to select an object with text to be used as the note value.
Note: Option to use the value entered in the Note edit box as the note value.

4.13.25.4.1.3 Pipe Elevation Type

Select the pipe elevation type:

Top: The elevation will be the top outside of pipe which includes the pipe thickness.
Crown: The elevation will be the top inside of pipe.
Center: The elevation will be the center of the pipe.
Invert: The elevation will be the bottom inside of pipe.
Bottom: The elevation will be the bottom outside of pipe which includes the pipe thickness.

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4.13.25.4.2 Edit Profile Structure Bottom Label

Edit Profile Structure Bottom Labels (Dynamic Blocks Only) created using Profile Structure Bottom Label command.

Edit Profile Structure Bottom Label Options

Profile

Name Name of the section view associated to the selected label.

Select a Check to select a new profile view to assign to the selected label(s).

Labeling:

Leader Check to draw an offset from the profile point to the beginning of the leader.

Leader to Profile View Top Extend the leader to the top of the profile view.

Station: Toggle to include offset value of the label.

Placemen Select the location of the station value.

Prefix: Edit box for prefix text that will be added to the station value.

Suffix: Edit box for suffix text that will be added to the station value.

Precision: Set the number of decimal places for the station output display.

Elevation:

Precision: Set the number of decimal places for the elevation output display.

Type: Select the pipe elevation type. Top, Crown, Center, Invert, or Bottom.

Include Pipe Diameter Include the pipe diameter with the elevation value.

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with Elevations:

Sump: Toggle to include Sump elevation value of the label.

Placemen Select the location of the sump value.

Prefix: Edit box for prefix text that will be added to the sump value.

Suffix: Edit box for suffix text that will be added to the sump value.

Pipe In: Toggle to include Pipe In elevation value of the label.

Placemen Select the location of the Pipe In value.

Prefix: Edit box for prefix text that will be added to the Pipe In value.

Suffix: Edit box for suffix text that will be added to the Pipe In value.

Pipe Out: Toggle to include Pipe Out elevation value of the label.

Placemen Select the location of the Pipe Out value.

Prefix: Edit box for prefix text that will be added to the Pipe Out value.

Suffix: Edit box for suffix text that will be added to the Pipe Out value.

Pipe Join: Toggle to join the Pipe In and Pipe Out elevation value of the label if they are the same value. This will replace the Pipe In and Pipe Out values.

Placemen Select the location of the Pipe Join value.

Prefix: Edit box for prefix text that will be added to the Pipe Join value.

Suffix: Edit box for suffix text that will be added to the Pipe Join value.

Name: Toggle to include Structure Name value in the label.

Placemen Select the location of the name value.

Prefix: Edit box for prefix text that will be added to the name value.

Suffix: Edit box for suffix text that will be added to the name value.

Descriptio Toggle to include Structure Description value in the label.

Placemen Select the location of the description value.

Prefix: Edit box for prefix text that will be added to the description value.

Suffix: Edit box for suffix text that will be added to the description value.

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Leave Notes As-is: Toggle to leave notes as they are.

Note 1: Toggle to include note 1 value (1st) of the label.

Note 2: Toggle to include note 2 value (2nd) of the label.

Note 3: Toggle to include note 3 value (3rd) of the label.

Note: Common options for Note 1, 2, and 3.

Placemen Specify the location of the note value.

Input: Select the input option for the note.

Note: Enter the note value, if the input option is set to Note.

Command:

Select Profile Structure Bottom Labels to edit.

Select Objects: Select the profile labels to edit the values.

4.13.25.4.3 Update Profile Label

Update profile labels (Dynamic Blocks Only) created using Profile Structure Bottom Label command.

Command entry: **pvu**

Command:

Select Profile Labels to update.

Select Objects: Select the profile labels to update the values.

4.13.25.5 Profile Crossing Pipe Label

Create Crossing Pipe Labels for Civil 3D pipe network pipes in the profile

Dynamic Data: Profile structure labels will update when the pipe's elevation(s) changes.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	No


Button

Ribbon: SmartDraft ▸ Profile panel ▸ 

Command entry: **pvcpl**

Menu: SmartDraft ▸ Profile ▸ Pipe Networks ▸ Profile Crossing Pipe Label

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Video

Note: The label is a Dynamic Block.

Command:
Create view profile Crossing Pipe labels
Select Profil Pipe Network Pipe or [Edit/Options/Update]: Select a pipe network pipe within the profile, **E**dit to edit existing labels, **O**ptions to change the labeling options, **U**pate the values of existing labels, or Enter to end.

4.13.25.5.1 Profile Crossing Pipe Label Options

Options for the Profile Crossing Pipe Label command.

Profile Crossing Pipe Label Options

Labeling:

Leader Select Up ,Down, or Prompt for the direction of the station and elevation label leader.

Insertion Select the insertion point of the label on the pipe. Top (Top of Pipe), Crown (Top of inside of Pipe), Center (Centerline of Pipe), Invert (Invert of the Pipe), or the Bottom (Bottom of Pipe).

Leader Check to draw an offset from the profile point to the beginning of the leader.

Grade Check to draw a circle at each label.

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Leader to Profile View Top / Bottom: Extend the leader to the top (if label up), or bottom (if label down) of the profile view.

Offset from Alignment: Enter an offset value to calculation the station and elevation values at the offset value from the alignment

Adjust Elevation: Enter a value to adjust the calculated elevation.

Station: Toggle to include offset value of the label.

Placemen Select the location of the station value.

Prefix: Edit box for prefix text that will be added to the station value.

Suffix: Edit box for suffix text that will be added to the station value.

Precision: Set the number of decimal places for the station output display.

Elevation: Toggle to include elevation value of the label.

Placemen Select the location of the elevation value.

Prefix: Edit box for prefix text that will be added to the elevation value.

Suffix: Edit box for suffix text that will be added to the elevation value.

Precision: Set the number of decimal places for the elevation output display.

Type: Select the pipe elevation type. Top, Crown, Center, Invert, or Bottom.

Truncate: Set the number of places the elevation will be truncated left of the decimal point.

Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.

Diameter: Toggle to include the diameter value of the label.

Placemen Select the location of the diameter value.

Prefix: Edit box for prefix text that will be added to the diameter value.

Suffix: Edit box for suffix text that will be added to the diameter value.

Name: Toggle to include Structure Name value in the label.

Placemen Select the location of the name value.

Prefix: Edit box for prefix text that will be added to the name value.

Suffix: Edit box for suffix text that will be added to the name value.

Descriptio Toggle to include Structure Description value in the label.

Placemen Select the location of the description value.

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Prefix: Edit box for prefix text that will be added to the description value.
Suffix: Edit box for suffix text that will be added to the description value.

Note 1: Toggle to include note 1 value (1st) of the label.
Note 2: Toggle to include note 2 value (2nd) of the label.
Note 3: Toggle to include note 3 value (3rd) of the label.
Note: Common options for Note 1, 2, and 3.
Placemen Specify the location of the note value.

Input: Select the input option for the note.
Note: Enter the note value, if the input option is set to Note.

Layer:
Layer: Set the output layer type. Default (to use the layer database layer) or *current*.
Layer Toggle the layer type for the layer name selection.

4.13.25.5.1.1 Placement Options

Profile Crossing Pipe Elevation Label Placement Options:

3 above: The data will be placed three spaces above the leader line.
2 above: The data will be placed two spaces above the leader line.
1 above: The data will be placed one space above the leader line.
1 below: The data will be placed one space below the leader line.
2 below: The data will be placed two spaces below the leader line.
3 below: The data will be placed three spaces below the leader line.

4.13.25.5.1.2 Input Options

Profile Crossing Pipe Elevation Label Input Options

Note / description input option.

Input Options
Prompt: Option to prompt the operator to enter the note value.
Select: Option to prompt the operator to select an object with text to be used as the note value.
Note: Option to use the value entered in the Note edit box as the note value.

4.13.25.5.2 Edit Profile Crosing Pipe Label

Edit Profile Structure Invert Labels (Dynamic Blocks Only) created using Profile Crossing Pipe Label command.

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Edit Profile Crossing Pipe Label Options

Profile

Name: Name of the section view associated to the selected label.

Select a Check to select a new profile view to assign to the selected label(s).

Labeling:

Insertion Select the insertion point of the label on the pipe. Top (Top of Pipe), Crown (Top of inside of Pipe), Center (Centerline of Pipe), Invert (Invert of the Pipe), or the Bottom (Bottom of Pipe).

Leader Check to draw an offset from the profile point to the beginning of the leader.

Grade Check to draw a circle at each label.

Leader to Profile View Top / Bottom: Extend the leader to the top (if label up), or bottom (if label down) of the profile view.

Offset from Enter an offset value to calculation the station and elevation values at the offset value from the alignment

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Alignment:

Adjust Elevation: Enter a value to adjust the calculated elevation.

Station: Toggle to include offset value of the label.

Placemen Select the location of the station value.

Prefix: Edit box for prefix text that will be added to the station value.

Suffix: Edit box for suffix text that will be added to the station value.

Precision: Set the number of decimal places for the station output display.

Elevation: Toggle to include elevation value of the label.

Placemen Select the location of the elevation value.

Prefix: Edit box for prefix text that will be added to the elevation value.

Suffix: Edit box for suffix text that will be added to the elevation value.

Precision: Set the number of decimal places for the elevation output display.

Type: Select if the elevation value will be the Top (Top of Pipe), Crown (Top of inside of Pipe), Center (Centerline of Pipe), Invert (Invert of the Pipe), or the Bottom (Bottom of Pipe).

Diameter: Toggle to include the diameter value of the label.

Placemen Select the location of the diameter value.

Prefix: Edit box for prefix text that will be added to the diameter value.

Suffix: Edit box for suffix text that will be added to the diameter value.

Name: Toggle to include Structure Name value in the label.

Placemen Select the location of the name value.

Prefix: Edit box for prefix text that will be added to the name value.

Suffix: Edit box for suffix text that will be added to the name value.

Descriptio Toggle to include Structure Description value in the label.

Placemen Select the location of the description value.

Prefix: Edit box for prefix text that will be added to the description value.

Suffix: Edit box for suffix text that will be added to the description value.

Leave Toggle to leave notes as they are.

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Note 1: Toggle to include note 1 value (1st) of the label.

Note 2: Toggle to include note 2 value (2nd) of the label.

Note 3: Toggle to include note 3 value (3rd) of the label.

Note: Common options for Note 1, 2, and 3.

Placemen Specify the location of the note value.

Input: Select the input option for the note.

Note: Enter the note value, if the input option is set to Note.

Command:

Select Profile Structure RIM Labels to edit.

Select Objects: Select the profile labels to edit the values.

4.13.25.5.3 Update Profile Label

Update profile labels (Dynamic Blocks Only) created using Profile Crossing Pipe Label command.

Command entry: **pvu**

Command:

Select Profile Labels to update.

Select Objects: Select the profile labels to update the values.

4.13.25.6 Profile Pipe Deflection Angle Label

Create Pipe Deflection Angle Labels for Civil 3D pipe network pipes in the profile

Dynamic Data: Profile labels will update when the pipe's elevation(s) changes.

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	No

Button

Ribbon: SmartDraft ▸ Profile panel ▸

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Command entry: **pvdal**
Menu: SmartDraft ▸ Profile ▸ Pipe Networks ▸ Profile Pipe Deflection Angle Label

Note: The label is a Dynamic Block.

Command:
Create Profile Pipe Deflection Angle labels
Select Profile Structure or first Pipe or [Edit/Options/Update]: Select a pipe network structure or the first pipe within the profile, **E**dit to edit existing labels, **O**ptions to change the labeling options, **U**pate the values of existing labels, or Enter to end.

If a profile view pipe is selected, the operator will be prompted for the second pipe.
The second pipe must be have a common structure with the first pipe selected.
Select second Profile Pipe: Select a the second pipe network pipe, or Enter to end.

4.13.25.6.1 Profile View Pipe Deflection Angle Label Options

Options for the Profile Pipe Deflection Angle Label command.

Profile Pipe Deflection Angle Label Options

Labeling:

Leader Select Up ,Down, or Prompt for the direction of the station and elevation label leader.

Leader Check to draw an offset from the profile point to the beginning of the leader.

Grade Check to draw a circle at each label.

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Leader to Profile View Top / Bottom: Extend the leader to the top (if label up), or bottom (if label down) of the profile view.

Station: Toggle to include offset value of the label.

Placemen Select the location of the station value.

Prefix: Edit box for prefix text that will be added to the station value.

Suffix: Edit box for suffix text that will be added to the station value.

Precision: Set the number of decimal places for the station output display.

Elevation: Toggle to include elevation value of the label.

Placemen Select the location of the elevation value.

Prefix: Edit box for prefix text that will be added to the elevation value.

Suffix: Edit box for suffix text that will be added to the elevation value.

Precision: Set the number of decimal places for the elevation output display.

Type: Select the pipe elevation type. Top, Crown, Center, Invert, or Bottom.

Truncate: Set the number of places the elevation will be truncated left of the decimal point.
Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.

Angle: Toggle to include the deflection angle value of the label.

Placemen Select the location of the deflection angle value.

Prefix: Edit box for prefix text that will be added to the deflection angle value.

Suffix: Edit box for suffix text that will be added to the deflection angle value.

Precision: Set the angular precision of the deflection angle

Type Select angle type: dd°mm'ss", or Decimal degrees

Note 1: Toggle to include note 1 value (1st) of the label.

Note 2: Toggle to include note 2 value (2nd) of the label.

Note 3: Toggle to include note 3 value (3rd) of the label.

Note: Common options for Note 1, 2, and 3.

Placemen Specify the location of the note value.

Input: Select the input option for the note.

Note: Enter the note value, if the input option is set to Note.

Layer:

Layer: Set the output layer type. Default (to use the layer database layer) or *current*.

Layer Toggle the layer type for the layer name selection.

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4.13.25.6.1.1 Placement Options

Profile Pipe Deflection Angle Label Placement Options:

3 above:	The data will be placed three spaces above the leader line.
2 above:	The data will be placed two spaces above the leader line.
1 above:	The data will be placed one space above the leader line.
1 below:	The data will be placed one space below the leader line.
2 below:	The data will be placed two spaces below the leader line.
3 below:	The data will be placed three spaces below the leader line.

4.13.25.6.1.2 Input Options

Profile Pipe Deflection Angle Label Input Options

Note / description input option.

Input Options

Prompt:	Option to prompt the operator to enter the note value.
Select:	Option to prompt the operator to select an object with text to be used as the note value.
Note:	Option to use the value entered in the Note edit box as the note value.

4.13.25.6.1.3 Pipe Elevation Type

Select the pipe elevation type:

Top:	The elevation will be the top outside of pipe which includes the pipe thickness.
Crown:	The elevation will be the top inside of pipe.
Center:	The elevation will be the center of the pipe.
Invert:	The elevation will be the bottom inside of pipe.
Bottom:	The elevation will be the bottom outside of pipe which includes the pipe thickness.

4.13.25.6.2 Edit Profile Pipe Deflection Angle Label

Edit Profile Pipe Deflection Angle Labels (Dynamic Blocks Only) created using Profile Pipe Deflection Angle Label command.

Profile Pipe Deflection Angle Label Options

Profile

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Name: Name of the profile view associated to the selected label.

Select a Check to select a new profile view to assign to the selected label(s).

Labeling:

Leader Select Up ,Down, or Prompt for the direction of the station and elevation label leader.

Leader Check to draw an offset from the profile point to the beginning of the leader.

Grade Check to draw a circle at each label.

Leader to Profile View Top / Bottom: Extend the leader to the top (if label up), or bottom (if label down) of the profile view.

Station: Toggle to include offset value of the label.

Placemen Select the location of the station value.

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Prefix: Edit box for prefix text that will be added to the station value.
Suffix: Edit box for suffix text that will be added to the station value.
Precision: Set the number of decimal places for the station output display.

Elevation: Toggle to include elevation value of the label.
Placemen Select the location of the elevation value.

Prefix: Edit box for prefix text that will be added to the elevation value.
Suffix: Edit box for suffix text that will be added to the elevation value.
Precision: Set the number of decimal places for the elevation output display.
Type: Select the pipe elevation type. Top, Crown, Center, Invert, or Bottom.
Truncate: Set the number of places the elevation will be truncated left of the decimal point.
Example: The elevation value is 1234.56, and truncate is set to 00.0; the output value will be 34.56.

Angle: Toggle to include the deflection angle value of the label.
Placemen Select the location of the deflection angle value.

Prefix: Edit box for prefix text that will be added to the deflection angle value.
Suffix: Edit box for suffix text that will be added to the deflection angle value.
Precision: Set the angular precision of the deflection angle
Type Select angle type: dd°mm'ss", or Decimal degrees

Note 1: Toggle to include note 1 value (1st) of the label.
Note 2: Toggle to include note 2 value (2nd) of the label.
Note 3: Toggle to include note 3 value (3rd) of the label.
Note: Common options for Note 1, 2, and 3.
Placemen Specify the location of the note value.

Input: Select the input option for the note.
Note: Enter the note value, if the input option is set to Note.

Layer:
Layer: Set the output layer type. Default (to use the layer database layer) or *current*.
Layer Toggle the layer type for the layer name selection.

4.13.25.6.3 Update Profile Label

Update profile labels (Dynamic Blocks Only) created using the Profile Deflection Angle Label command.

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Command entry: **pvu**

Command:
Select Profile Labels to update.
Select Objects: Select the profile labels to update the values.

4.13.25.7 Zoom to Planview Part from Profile Part

Zoom to planview pipe network part from a selected profile pipe network part

Supports:

AutoCAD Products:	Civil 3D only
BricsCAD Pro:	No

Command entry: **pnz**

Command: **pnz**
Zoom to planview pipe network part.
Select Profile Pipe Network Part:: Select a pipe network part in a profile.

4.13.25.8 Adjust Pipe Slope / Elevations

Adjust the slope / elevations of Civil 3D pipe network pipes in plan or profile

Adjust the slope / elevations of a single Civil 3D pipe network pipe object or the slope and elevations of a sequence of pipe network pipe objects between selected pipe or structure objects.

Design Type Options

Elevation:
- Enter an elevation.
- Select a point in a profile. The elevation is calculated from the point.
- Select a pipe in plan / profile. The elevation is obtained from the endpoint nearest the selection of the pipe.
- Calculate elevation from an entered slope using the pipe(s) length.

Slope:
- Enter a slope.
- Specify two points in the profile.
- Select a pipe. Slope matches selected pipe.
- Change slope at each junction structure.

Profile:
- Select a profile and specify a elevation change.

Supports:

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AutoCAD Products: Civil 3D only

BricsCAD Pro: No



Button

Ribbon: SmartDraft ▸ Profile panel ▸ 

Menu: SmartDraft ▸ Profile ▸ Pipe Networks ▸ Adjust Pipe Slope / Elevation

Command entry: **pnas**

Video

Command:

Adjust Pipe Slope / Elevations

Select first pipe network part or [Options]: Select the first pipe network pipe or structure either and plan or profile, **O**ptions to change the options, or Enter to end.

Select second pipe network part: Select the second pipe network pipe or structure either and plan or profile, **O**ptions to change the options, or Enter to use single pipe mode.

If **Profile** as **Design Type**

Pipe network: <Pipe Network Name>

Select Profile or [LIst]: Select a Civil 3D profile, or **LI**st to select the from a dialog list.

Elevation change from profile <0.00>: Enter the elevation change from the profile elevation.

4.13.25.8.1 Adjust Pipe Slope / Elevations Options

Options for the Adjust Pipe Slope / Elevations command.

Adjust Pipe Slope / Elevations Options	
Pipe:	
Elevation Type:	Select which pipe elevation to use for the calculations. Crown, Top, Center, Invert, or Bottom.
Design Type:	Select the default pipe calculation type. Slope, elevation, or profile. The operator will be able to toggle between these options during the command.
Structure:	
Drop Value at:	Enter the elevation change (drop) at a structure.
Apply Drop at Null Structure	Specify if the above drop in elevation is to be applied at Null Structures. Default is No.
Change Slope at each Junction	Prompt for the slope at each junction structure. No, Yes, or @ Null. No = the same slope will be applied to all the pipes of a selected run. Yes = the user will be prompted for a slope at each structure (ignoring Null Structures) of a selected run. @ Null = the user will be prompted for a slope at each structure (including Null Structures) of a selected run.
Precision:	
Elevation:	Specify the Elevation Precision.

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Slope: Specify the slope precision. This value is used to adjust to slope precision during display of slope values.

4.13.25.8.2 Adjust Pipe Slope / Elevations: Single pipe mode

Single pipe edit option for the Adjust Pipe Slope / Elevations command.

Command:
Adjust Pipe Slope / Elevations
Select first pipe network part or [Options]: Select the first pipe network pipe or structure either and plan or profile.
Select second pipe network part: Press Enter to use single pipe mode.
Pipe length: <length of selected pipe>
Enter first <crown/centerline/invert> elevation or [Pipe/PV Point] <default elevation>: Enter an elevation for the start of pipe, **P**ipe to select a pipe in plan / profile, and the elevation is obtained from the endpoint nearest the selection of the pipe, **PV** point to select a point in the profile view and the elevation is calculated from the point, or press Enter to accept the default elevation.
Pipe's first invert elevation set to <new elevation>.

Slope Method:

Pipe run has 2 pipes with a length: 281.51'
Enter start invert elevation or [Pipe/PV Point] <115.95>:

Pipe run's start invert elevation set to <115.95>.
Enter slope (%) or [Elevation/Pipe/PV points] <1.04>:

Pipe's slope update to: 1.04%.
Select first pipe network part or [Options]:Pipe run has 2 pipes with a length: 281.51'
Enter start invert elevation or [Pipe/PV Point] <115.95>:
Pipe run's start invert elevation set to <115.95>.
Enter slope (%) or [Elevation/Pipe/PV points] <1.04>:
Pipe's slope update to: 1.04%.
Select first pipe network part or [Options]:

Elevation Method:
Pipe run has 2 pipes with a length: 281.51'
Enter start invert elevation or [Pipe/PV Point] <115.95>:
Pipe run's start invert elevation set to <115.95>.
Enter end invert elevation or [Pipe/PV Point/Slope] <118.87>:
Pipe's slope update to: 1.04%.
Select first pipe network part or [Options]:

4.13.25.8.3 Elevation from selected Pipe

Obtain the elevation from a selected a pipe network pipe in either plan or profile. The elevation is obtained from the endpoint nearest the selection of the pipe.

Command:

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Select Pipe Network Pipe: Select a pipe network pipe in either plan or profile. The elevation of the pipe nearest the selection point will be obtained.

4.13.25.8.4 Elevation from Profile (PV) Points

Obtain the elevation from a point in a profile. The elevation is calculated from the point.

Command:
Specify a point in the profile: Specify a point in a profile and the elevation of the specified point will be calculated.

Note: If the first pipe was selected from the plan view, the operator will be prompted to select a profile view.

4.13.26 Assign / Edit BricsCAD Vertical Alignment View Information

Assign / edit the BricsCAD vertical alignment view name, and the top and bottom offsets used by SmartDraft.

Supports:

AutoCAD Products: No

BricsCAD Pro: BricsCAD Pro for Civil objects


Button

Ribbon: SmartDraft ▸ Profile panel ▸ 
Toolbar: Profile Tools: 
Menu: SmartDraft ▸ Profile ▸ Edit BricsCAD Vertical Alignment View Information

Command:

Assign / Edit BricsCAD vertical alignment view information.

Select BricsCAD vertical alignment view: : Select a vertical alignment view.

Edit the name, and the top and bottom offset information associated to a BricsCAD Vertical Alignment View.

Dialog Box Options

Create Vertical Alignment View Options

General

Alignment Name of associated alignment

Name Enter the name for the profile view

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Name to Uppercase Check to convert the Name value to Uppercase.

Direction Left-to-Right or Right-to-Left

Grid No applicable at this time

Scale

Vertical No applicable at this time

Horizontal Displays the drawing's current horizontal scale

Vertical Displays the calculated vertical scale based on the horizontal scale and vertical exaggeration ratio

Station

Start Displays the starting station for the vertical alignment view (alignment stations)

End Displays the ending station for the vertical alignment view (alignment stations)

Elevation

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Center

Minimum Display the minimum elevation value for the vertical alignment view.
Maximum Display the maximum elevation value for the vertical alignment view

Top Profile Optional. Specify an offset distance from the Center Profile Elevation.

Bottom Optional. Specify an offset distance from the Center Profile Elevation.

4.14 Text Panel Tools

Tools to add, edit and manage Text, MText, and Attributes

Click on the icon below to view a video demonstration

Text
Text Parallel

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Text in an Arc
Text Sequential
Text Add Note
Text: Dialog
Text Respacing
Text Mathematics
Text Import
Text Export

Text Align

Text Horizontal
Text Vertical
Text Align Parallel
Text X Align
Text Spacing
Text Fit

Text Adjust

Text: Adjust Number
Change Label Direction
Text Swap
Reposition Labels and Arc Text
Text Copy String (Match Text)
Erase Empty Strings

Text Edit

Label Edit
Text Multiple Strings or Blocks with Attributes Editor
Text Edit Properties

Text Mask

Textmask Attribute/Arc Text
Text, Arc Text, and Attribute Unmask

Text Prefix / Suffix

Text Add Prefix / Suffix
Text Remove Prefix / Suffix

Add the prefix "(" and the suffix ")" to selected text.	**PREN**
Add the prefix "((" and the suffix "))" to selected text.	**PREN2**
Add the prefix "[" and the suffix "]" to selected text.	**P[**
Add the prefix "[[" and the suffix "]]" to selected text.	**P[[**

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Add the prefix "<" and the suffix ">" to selected text. **P<**

Add the prefix "<<" and the suffix ">>" to selected text. **P<<**

Add the prefix "{" and the suffix "}" to selected text. **P{**

Add the prefix "{{" and the suffix "}}" to selected text. **P{{**

4.14.1 Text Parallel or Tangent

Create text parallel or tangent to a selected line, arc, or polyline.

Button

Ribbon: SmartDraft ▸ Text panel ▸

Toolbar: Text Tools:

Menu: SmartDraft ▸ Text ▸ Text Parallel or Tangent

Command entry: **tw**

Video demonstration

Command:
Text parallel or tangent.
Select object: Select object (1).

Current text style: "R" Text height: 4.00 Type: <Text/MText>

Specify start point or [Justify/Type]: Specify a point (2) to begin text or **J**ustify change justification, **T**ype to toggle be Text and MText or specify a point,

Specify start point: Specify starting point of text

Enter text: **WRITE PARALLEL** Enter text or press ENTER to end.

Example



4.14.2 Arc Text

Create arc text from a selected arc or circle.

Create a text string along an existing arc.

Button

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Ribbon: SmartDraft ▸ Text panel ▸
Toolbar: Text Tools:
Menu: SmartDraft ▸ Text ▸ Arc Text
Command entry: **tar**
Video demonstration

Command

Create arc text.

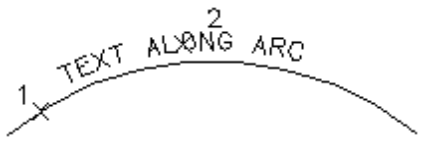
Enter text or press ENTER to select text: **TEXT ALONG ARC** Enter the text and press ENTER.

Select arc or radius point: Specify a point. *Default osnap is* ***CEN****ter*, if point selected is near an arc (1) the radius point will be used.

Specify middle of text or [Zoom/Pan]: Specify a point (2).

Reverse text direction [Yes/No] <No>: **Yes** to mirror text about insertion point.

Example



Reposition arc text concentric to the radius point the SmartDraft Reposition Labels (**rpt**) command.

Change the text height with the SmartDraft Scale Labels (**slb**) and Text Edit (**te**) commands.

Change the text style, height, width factor, and oblique angle with the SmartDraft Text Edit (**te**) command.

To edit: To edit the arc text use the SmartDraft Edit Label (**ed**) command.

4.14.3 Polyline Text

Create text which follows along a polyline, spline, arc, circle, ellipse, and Civil 3D alignment, feature line, parcel segment, and survey feature.

Create text which follows along a polyline and other multiple segments and curved objects.

Button

Ribbon: SmartDraft ▸ Text panel ▸
Toolbar: Text Tools:
Menu: SmartDraft ▸ Text ▸ Polyline Text
Command entry: **tpl**
Video demonstration

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Command

Create polyline text.

Select path object: Select the object for the text to follow

Specify start point: Specify a point near the selected path.

Enter text or press ENTER to select text: **THIS IS PLINE TEXT ALONG A SPLINE** Enter the text and press ENTER.

Reverse direction [Yes/No] <No>: **Yes** to mirror text about insertion point.

Example



Change the text style, height, width factor, and oblique angle with the SmartDraft Text Edit (**te**) command.

To edit: To edit the pline text use the SmartDraft Edit Label (**ed**) command.

4.14.4 Add Note

Create text with the same style, rotation, layer, and standard spacing as selected text.

Change to the current layer and style and start the TEXT command one line below/above and at the same angle of the selected text string.

Button

Ribbon: SmartDraft ▸ Text panel ▸

Toolbar: Text Tools:

Menu: SmartDraft ▸ Text ▸ Add Note

Command entry: **tn**

Video demonstration

Command:
Add note. Direction: <Above/Below>

Select text or [Direction]: Select a text object or **D**irection to change the placement direction.

Enter text: Enter the new text string and press ENTER.

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4.14.5 Text Sequential

Create or replace text with sequential numbers or letters.

Display a dialog box for drawing sequential numbers or letters.

Button

Ribbon: SmartDraft ▸ Text panel ▸

Toolbar: Text Tools:

Menu: SmartDraft ▸ Text ▸ Sequential Numbering

Command entry: **ts**

Video demonstration

Dialog Box Options

Type:	Select Numbers, Letters AA > AB, or AA > BB.
Starting value:	Enter the starting number or letter.
Value Increment:	Enter the value to increment the sequence. Numbers only. Must be positive and non-zero.
Prefix string:	Enter a value to be used as a prefix for the sequence. e.g., LOT- if you wanted LOT-1, LOT-2.
Suffix string:	Enter a value to be used as a suffix for the sequence.
Output	
Text or Replace	Specify if the output type is a new text string or replace the value of existing text, attribute, or arctext
Text Justification:	Select text justification type: Left, Right, Center or Middle.
Use Orthomode:	If selected, text will be added with ortho on from previously specified point.

Command:

If output type **Text**:

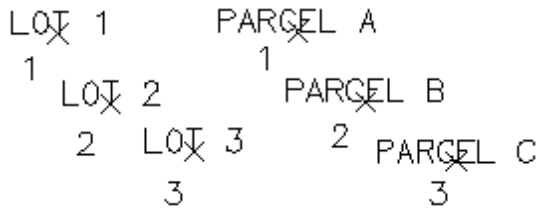
Specify rotation angle <0.00>: Specify a rotation angle.

Specify <Center/Left/Middle/Right> point: Specify the point (1,2,3...) or press ENTER to end

If output type **Replace**:

Select text or attribute to replace with value xx.xx: Select the text or attribute to replace with the value.

Example



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4.14.6 Text Online

Create block text for various utilities from a dialog box.

Display the Insert Text Online dialog box, which allows you to create a list of your custom Text Blocks for insertion. These blocks can be inserted on any layer in the layer database. They will be inserted using the current horizontal scale in modelspace, or a scale factor of 1 in paperspace.

Note: Added support for custom annotative blocks. The command will determine if the block has been set to annotative. If so, the block will be inserted at scale 1.

Added support for Visibility States.



Button



Ribbon: SmartDraft ▸ Text panel ▸ 

Toolbar: Text Tools on the SmartDraft Tools: 

Menu: SmartDraft ▸ Text ▸ Text Online



Command entry: **ton**

Insert Text Online

Description:	A list of the Text Blocks to insert. The Description list is sorted in alphabetical order.
Add:	Add a new block to the Description list.
Edit:	Edit the data of a block in the Description list.
Remove:	Remove the selected block from the Description list.
OK:	Create the selected block from the list. Any changes made to the Text Block list box will be saved.

Command:
Insert Text Online: <block description>
Select object or [Options]: Select an object (1), **O**ptions to display the Insert Text Online dialog to select a different block, or press ENTER to end. The text block is insert perpendicular to a line or radial to an arc.

4.14.6.1 Edit Text Block List

Add.../Edit... a text block to/in the Description list.

Dialog Box Options

Description:	Enter a description for the file. This description will display in the Description list. It has been limited to 31 characters.
File:	Display the standard file selection dialog box. Select a filename and press OK or type the drive, sub-folder and filename.
Visibility Search	If the block is a dynamic block with Visibility States, select the button to list the available Visibility States, and select he desired Visibility State.
Layer Index:	Display the layers and index numbers defined in the layer database. See Layer Database Indexes. If no layer database index number is specified, the command supplies index 0, which signifies the block will be inserted on layer 0.

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4.14.7 Text Styles

Create text or mtext using a specified layer and text style.

SmartDraft uses predefined text styles throughout. This is to create a uniformed look between all the operators in a team. These styles can be modified using the Drawing Setup dialog box.

Note: The default small, medium, and large text styles use the font MONOPLEX, Filled Text uses FIL1 (filled type), Shadow Text uses SHADOW (shadowed type), and Dashed uses DASHED (dashed type).

SM, MD, LG, S, D, SN, L#, and L#

Button

Ribbon: SmartDraft ▸ Text panel ▸ SM, MD, LG, S, D, SN, L#, and L#
Toolbar: Text Tools on the SmartDraft Tools: SM, MD, LG, S, D, SN, L#, and L#
Menu: SmartDraft ▸ Text ▸ Current Style: <text style>
Small Text, Medium Text, Large Text, Shadow Text, Filled Text, Dashed Text, Street Names, Lot # Large, and Lot # Shadow

Command:
Current settings: SmartDraft <Style Type>, Type: <Text/MText>, Layer: <Reset/ Not Reset>
Specify first corner or [Justify/Layer/Type]: Specify the starting point, **J**ustify to change the justification, **L**ayer to change if the layer and text style is reset or not reset back to before the command starts, and **T**ype to toggle between Text and Mtext.

SM Planview Small

MD Planview Medium

LG Planview Large

FD Filled

S Shadow

D Dashed

SN Street Main

L# Lot Regular

L# Lot Shadow

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4.14.8 Load Land Desktop Set Style File (STP File)

Load a style set (Land Desktop STP file) using the current horizontal scale. Style sets have the file extension *.stp.

Under Style Set Name, select the style set you want to load into the current drawing. When you select a style set, the Styles in this Set list shows all the text styles in the style set.

Note: Added support for custom annotative blocks. The command will determine if the block has been set to annotative. If so, the block will be inserted at scale 1.



Button

Ribbon: SmartDraft ▸ Text panel ▸ 
Toolbar: Text Tools on the SmartDraft Tools: 
Menu: SmartDraft ▸ Text ▸ Current Style: Load and Desktop Set Style File (STP File)
Command entry: **stp**

Command

The Select a Style STP file dialog appears. Browse to the file location and select the file.

4.14.9 Edit Label

Modify text created with TEXT, DTEXT, Labeling, ARCTEXT, Blocks with Attributes, Civil 3D's Point objects, and Point Label, Point Elevation, Label Coordinate, Slope Label (1 Point), Dimension Arc, **and** SD Arc Text.



Button

Ribbon: SmartDraft ▸ Text panel ▸ Edit labels pull-down 
Toolbar: Text Tools: 
Menu: SmartDraft ▸ Text ▸ Label Edit
Command entry: **ed**
Video demonstration

Command:
Current settings: Update mask = Yes
Select text or blocks with attributes or [Options]: Select text string, block attribute, dimension, mtext, Labeling, Arc text, curvetext, Civil 3D's Point object, or **Options** to change the masking update option.

In dialog box: Enter the new text and press OK to update the object.

Note: The next dialog box to appear depends on the object selected.
Note: When modifying the text string of a Reference Symbol the reference symbol will resize to accommodate the new string length.

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TEXT	AutoCAD's Edit Text dialog.
ATTRIBUTE	AutoCAD's Edit Attributes dialog.
MTEXT	AutoCAD's Multiline Text Editor dialog.
DIMENSION	AutoCAD's Multiline Text Editor dialog.
Labeling	Edit Text dialog.
ARCTEXT	Express Tools arctext edit dialog (if Express Tools are loaded).
C3D POINTS	Point Edit (if Civil 3D is loaded)
Area by Point and Area	Area Label Edit
SD POINTS	Point Edit
Point Label	Point Label Edit dialog
Point Elevation	Point Elevation Edit dialog
Label Coordinate	Label Coordinate Edit dialog
Label Section Views	Section View Label Edit dialog
Slope Label (One Point)	Slope Label Edit (One Point) dialog
Slope Label (Two Points)	Slope Label Edit (Two Points) dialog
SD Arc Text	Edit Text dialog
Dimension Arc	Dimension Arc Edit dialog
Line and Curve Labels	Labeling Edit dialog
Pipe Networks Pipes and Structures	Edit Name and Description

4.14.9.1 Point Edit

Edit point elevation and description

Note: If the selected point is a Civil 3D Survey Point in the drawing, only the Description can be edited.

Dialog Box Options

Edit Point Data

Number:	Display the point number of the point object to edit.
Elevation:	Current elevation, enter a new one to edit.
Description:	Current description, enter a new one to edit. Note: This is the Raw Description in Civil 3D.

4.14.10 Edit Multiple Labels

Modify multiple lines of selected text at once or selected blocks with attributes.

Edit multiple lines of regular text. The lines are listed in the order they are selected.

Edit multiple selected blocks with attributes one at a time.

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Button

Ribbon: SmartDraft ▸ Text panel ▸ Edit labels pull-down
Toolbar: Text Tools II on the Text Tools:
Menu: SmartDraft ▸ Text ▸ Multiple Strings / Attributes Editor
Command entry: **edd**
Video demonstration

Dialog Box Options

Text ?: The text string to edit.

 # text strings selected. Number of text strings selected.
Page # of #s Current page of the total number of pages of text strings selected.

Previous Change to the previous page of text strings.
Next Change to the next page of text strings.

Command:
Select multiple lines of text or blocks with attributes.
Select objects: Select text strings, and/or blocks and press ENTER. Command filters out any object not text.

4.14.11 Edit Text Properties

Modify the properties of text, Mtext and attributes within a block.



Button

Toolbar: Text Tools II on the Text Tools:
Menu: SmartDraft ▸ Text ▸ Edit Text Properties
Command entry: **te**
Video demonstration

Dialog Box Options

Find and Replace: Search for any text, such as phrases, words, or individual characters, in the selected objects. You can replace all occurrences of the text with other text, or you can delete the text.
Style and Properties: Change the text style, height, width and oblique angle.
Style: Select a text style from a list of all the text styles in the drawing.
Properties from Style: Select this option to use the text properties (height, width factor, and oblique angle) defined in the selected , all the selected text will change to the new style and take on the height, width and oblique angle. If you only wish to change the font of the selected text, do not check.
or set properties individually:
Height: Modify the height. If all the selected text has the same height, the size will be entered in the edit box.
Width factor: Modify the width factor.
Oblique Angle: Modify the oblique angle. Angle must be between -60 and 60.
Change Case: Check to change all characters to uppercase.

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Layer
Apply Layer Change: Check to apply the select layer to text , Mtext, and attributes with a block.
Layer: Select a layer from a list of all the layers in the drawing.

Command:
Edit text.
Select objects: Select text to be edited.

4.14.12 Erase Empty Strings

Erase empty text strings.

When creating and maintaining Customization Templates, new User Defined Blocks can be added to the template. Also, masking has been added to many blocks supplied with SmartDraft. To update the current drawing to use the currently defined blocks or User Defined Blocks type RB.


Button

Ribbon: SmartDraft ▸ Text panel ▸ Edit Labels pull-down
Toolbar: Text Tools II on the Text Tools:
Menu: SmartDraft ▸ Text ▸ Erase Empty Strings

Command:
Redefining masking blocks and moving to front.
Move to front with draworder or copy? [Copy/Draworder] <default>: Specify **C**opy to move the blocks to the front with a copy / erase, or **D**raworder to move the blocks to the front using draworder (recommended for AutoCAD 2004 or later), or enter to accept the current default.

4.14.13 Copy String (Match Text)

Copy / Match the source text string to target text string(s) or attribute value(s).


Button

Ribbon: SmartDraft ▸ Text panel ▸
Toolbar: Text Tools:
Menu: SmartDraft ▸ Text ▸ Copy String (Match)
Command entry: **mtt**
Video demonstration

Command:
Copy source text string.
Current settings: Adjust = <value>, Prefix = <value>, Suffix = <value>, Target = <Multiple/Single>, Numbers only = <Yes/No>

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Select source text or [Options]: Select the text string as source, **O**ptions to change the prefix and suffix, or press ENTER to end.

Select target text or [Undo]: Select the target text string, or press ENTER to end. Note: Each time a target text is selected, the last value is adjusted by the adjustment value.

Dialog Box Options

Adjust:	Enter a value to adjust the source text.
Prefix:	Prefix text to add. Leave blank for none.
Suffix:	Suffix text to add. Leave blank for none.
Target:	**Single:** Select to prompt for a single target text before prompting for the next source text. **Multiple:**Select to prompt for multiple target text before prompting for the next source text.
Numbers only:	The selected text string will return only the number, all alphabetic characters will be removed. When it is uncheck all characters are returned.
OK:	To accept values.

4.14.14 Swap Strings

Swap one text string for another.

Swap the string value of two text, mtext, attributes, and SmartDraft arc text.



Button

Ribbon: SmartDraft ▸ Text panel ▸ 

Toolbar: Text Tools II on Text Tools: 

Menu: SmartDraft ▸ Text ▸ Swap Strings

Command entry: **tsw**

Video demonstration

Command:

Select arc text, attribute, mtext, or text: Select text string or Enter to end.

Select next arc text, attribute, mtext, or text: Select second text string.

4.14.15 Adjust Numbers

Adjust or round the number(s) within text strings. For SmartDraft point blocks, Civil 3D's points, and BricsCAD Civil/Survey points adjust the elevation.

Adjusts numbers in TEXT, TEXT in a BLOCK, ATTRIBUTES, TEXT, and the elevation of COGO Points objects.

Warning: When MTEXT is selected, command will adjust every number in the MTEXT object. Command processes text formatted as station (11+34.50) as a single number. Command skips text formatted as bearings (N 12D45'30" W, NORTH 12 45 30 WEST, etc...).



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Button

Ribbon: SmartDraft ▸ Text panel ▸ Edit labels pull-down
Toolbar: Text Tools:
Menu: SmartDraft ▸ Text ▸ Adjust Numbers
Command entry: **tad**
Video demonstration

Command:
Current settings: Highlight = <Yes/No>, Adjust = <current>, Precision = <current>, Type = <operation type>

Select text / point or [Adjust/Highlight/Precision/Type/Window]: Select a text string or **W** to select multiple strings of text, **H** to toggle AutoCAD's highlight function on or off, **P** to specify the decimal precision, **T** to specify the function type (addition, multiplication, or division), **A** to change the adjustment value, (if by window, all the selected changes), or press ENTER to exit.

Adjust
Enter adjustment value <0.00>: Enter an adjustment value.

Type
Function type [Addition/Division/Multiplication/Truncate] <Addition>: Specify the function type.

Note: The "Truncate" type truncates the selected numbers to the precision value specified vs. rounding.

Precision
New precision [No Change/1/2/3/5/6/7/8] <No>: Specify a new precision or **N** to not change the current precision of the text string.

Window
Select objects: Select text / point objects to adjust, or press ENTER to change adjustment value.

If a block is selected by this option, a dialog will display the attribute tags, which can be modified. Select the desired attribute tags.

Select valid attribute tag(s): Highlight the attribute tag(s) to be adjusted.

If no number(s) is/are found in text string(s):
No number(s) in selected text string.

Example:
Adjust by -**0.4**

Text	Adjusted Text
123.12	122.72
FL 123.12	FL 122.72
123.12 IE	122.72 IE

4.14.16 Text Mathematics

Add, Subtract, Multiply, and/or Divide numeric values of selected text, mtext, arc text, attributes, point object elevations, and elevations of the Civil 3D surface elevation label objects.

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Note: If there are multiple numeric strings within the selected object, the command will use all of them for the calculation.



Button

Ribbon: SmartDraft ▸ Text panel ▾

Toolbar: Text Tools:

Menu: SmartDraft ▸ Text ▸ Text Mathematics

Command entry: **tmh**

Video demonstration

Command:

Current settings: Adjust = <value>, Output = <type>, <commas/no commas>, Precision = <current>

Select text or attribute to (operation) or [Exit/Options/Total/Window/Undo]>: Select text string to perform selected operation or, **Exit** to exit selection mod, **Options** to change the options, **Total** to display the total, **Window** to select multiple text strings, **Undo** to undo the last selection, or press ENTER to end.

After each selection:

Running total: xx.xx

If **Use Labeling Components** is set to **Yes**.

Dialog Box Options

Options:

Math Operation:

Math Operation: Select the math operation to be used on the selected numbers.

Adjustment Values:

Value: Enter an adjustment value. An selected number will be adjusted by this value. When the output option is screen the Text Output Options will be disabled.

Adjust Operation: Select the math operation to be used to adjust the selected number. Example: With an adjustment value and multiple, an elevation could be converted between metric and imperial units.

Prefix: Enter a prefix string to add to the output text. Note: To print a space between the Area and prefix add a space after the prefix.

Suffix: Enter a suffix string to add to the output text. Note: To print a space between the Area and suffix add a space before the suffix.

SmartDraft Labeling Components

Use: Select **Yes** to process the length/distance of SmartDraft Labeling.

Highlight:

Highlight: Select **Yes** to highlight selected number to indicate they have already been selected, or **No** for no highlighting.

Output:

Type: Select to **Text** to output a text string, **Replace** to select an existing text string to replace with the new value, or **Screen** to display the output only.

Commas: Select **Yes** to format the output with commas, or **No** to exclude commas in the output.

Precision:

Angular: Specify the angular precision for the output value.

Linear: Specify the decimal precision for the output value.

Layer: Select Default to user layer database, or *current* to use the current layer.

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Text Style: Select Default to use Planview Small, *current* to use the current text style, or any text style from the list.

Window option

Select objects: Select text objects to perform selected operation, or press ENTER

If a block is selected by this option, a dialog will display the attribute tags, which can be modified. Select the desired attribute tags.

Select valid attribute tag(s): Highlight the attribute tag(s) to be adjusted.

Output option

Output type [Replace/Screen/Text] <default>: Specify desired output type. Replace = option to select a text or attribute to replace its current value with the running sum.

If output type **Text**:

Specify start point of text: Select the insertion point of the text string.

Specify rotation angle of text <default>: Specify the rotation angle of the new text.

If output type **Replace**:

Select target text to replace with value xx.xx: Select the text, attribute, arced text, or polyline text to replace with the value.

If no number found in text string:

No number in text string.

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4.14.16.1 Select Number(s)

Select the number or numbers to include from a select text string

When a text string is selected for a number, if multiple numbers are within the text string the Select Number dialog will appear and allow the user to select the number or numbers from the text string to include.

Dialog Box Options

Numbers: List of numbers found in the text string.
Select a number or numbers from the list.
If multiple numbers are selected there values will be added together.
OK: Select to accept the selected value(s).
Cancel Returns no value

User can double-click to select a single number without having to select the OK button.

4.14.17 Import ASCII File

Import ASCII text file.

Import text from a standard ASCII text file.


Button


Ribbon: SmartDraft ▸ Text panel 
Toolbar: Text Tools II on the Text Tools: 
Menu: SmartDraft ▸ Text ▸ Import ASCII File...

Video demonstration

Command:
File dialog will appear: Specify file name, extension and location.
Convert all characters to uppercase? [Yes/No] <Yes>: Convert all character to upper case.
Specify start point: Select start point.
Specify text spacing <*current*>: Specify new text line spacing, or press ENTER.

4.14.18 Export Text to ASCII File

Export selected text to an ASCII file.

Export text to a standard ASCII text file. The text will be sorted by vertical location of the text or selection order.



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Button

Ribbon: SmartDraft ▸ Text panel

Toolbar: Text Tools II on the Text Tools:

Menu: SmartDraft ▸ Text ▸ Export Text to ASCII File...

Video demonstration

Command:
Current settings: Text Order = <Top-Down/Selection>
Select text or [Options]: Select text individually or with a crossing , or **O**ptions to change text sorting method.

File dialog will appear: Specify file name, extension and location.

Erase selected text [Yes/No] <Yes>: Specify to erase text selected to be exported.

Dialog Box Options

Text Order

Sort Top-Down: Selected text is sorted from top down no matter the order selected.
Selection Order: Selected text is processed in the order it is selected.
Format Option
Word-Warp Selected text will join into one string so it will warp in the MText limits.
Uncheck, each selected line of text will stay on a separate line.

4.14.19 Text, Arc Text, and Attribute Mask

Place a mask object behind selected text, mtext, arc text, pline text, or attributes. The mask is offset from the text by a specified value.

Supports AutoCAD's MTEXT and Dimension background masking.

Button

Ribbon: SmartDraft ▸ Text panel ▸ Text masking pull-down

Toolbar: Label Masking on the Text Tools and Labeling Tools:

Menu: SmartDraft ▸ Labeling ▸ Text, Arc Text, and Attribute Mask

Menu: SmartDraft ▸ Text ▸ Text, Arc Text, and Attribute Mask

Command entry: **am**

Video demonstration

Command:
Mask text, mtext, arc text, attributes, or dimensions
Current settings: Offset factor = <*current*>, Mask type = <*current*>, Mask color/Frame = <*current*>

Select text objects to mask or [Masktype/Offset]: Select text, arc text, attributes, **O**ffset to set offset factor, or **M**asktype to change masking object type.

If **Offset:**

Enter offset factor relative to text height <*current*>: Enter a new offset factor or press ENTER to accept current.

If Masktype:

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Use Wipeout/Solid for MTEXT versus Background Masking property? [Yes/No] <Current>: Enter the masking type for MTEXT. Note: The background masking property does not work if your plotter is set to Lines Merge. The wipeout object does masking with Lines Merge option.

If **Masktype wipeout:**

Wipeout frame [Current/OFF/ON] <Current>: Enter if the wipeout frame will be turned on, off, or remain the same (current).

If **Masktype solid:**
Select Color dialog box appears for color of mask object.

Note: The mask object is placed on the same layer as the selected text or attribute object. The selected text and arc text objects are grouped together with the mask objects so that they move, copy, or erase as one object. Attribute and mask objects are not grouped. The mask object is an AutoCAD Hatch. To mask text objects set the plotting to overwrite mode and the pen table's color to 0% screening.
Use Text, Arc Text, and Attribute Unmask to remove the mask objects.

Warning: We have found an issue with the masking command when the Annotative text is displayed in multiple viewports with different scales or Match orientation to layer set to Yes.

4.14.20 Text, Arc Text, and Attribute Unmask

Remove the mask objects from text, mtext, arc text, pline text, mtext, and attributes that have been masked with the Text, Arc Text, and Attribute Mask command.

Supports AutoCAD MTEXT and Dimension background masking.

Button
Ribbon: SmartDraft ▸ Text panel ▸ Text masking pull-down
Toolbar: Label Masking on the Text Tools and Labeling Tools:
Menu: SmartDraft ▸ Labeling ▸ Text, Arc Text, and Attribute Unmask
Menu: SmartDraft ▸ Text ▸ Text, Arc Text, and Attribute Unmask
Command entry: **au**
Video demonstration

Command:
Unmask text, mtext, arc text, attributes, or dimensions
Select objects: Select text, arc text, mtext, or attributes to unmask.

4.14.21 Text, Arc Text, and Attribute Mask to Layer

Place a mask object behind selected text, mtext, arc text, pline text, or attributes. The mask is offset from the text by a specified value.

Supports AutoCAD's MTEXT and Dimension background masking.

Command entry: **aml**

Command:

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Mask text, mtext, arc text, attributes, or dimensions to layer
Current settings: Offset factor = <*current*>, Mask type = <*current*>, Layer = <*current*>

Select text objects to mask or [Layer/Masktype/Offset]: Select text, arc text, attributes, **O**ffset to set offset factor, or **M**asktype to change masking object type.

If **Offset:**

Enter offset factor relative to text height <*current*>: Enter a new offset factor or press ENTER to accept current.

If Masktype:

Use Wipeout/Solid for MTEXT versus Background Masking property? [Yes/No] <Current>: Enter the masking type for MTEXT. Note: The background masking property does not work if your plotter is set to Lines Merge. The wipeout object does masking with Lines Merge option.

If **Masktype wipeout:**

Wipeout frame [Current/OFF/ON] <Current>: Enter if the wipeout frame will be turned on, off, or remain the same (current).

If **Masktype solid:**
Select Color dialog box appears for color of mask object.

Note: The mask object is placed on the same layer as the selected text or attribute object. The selected text and arc text objects are grouped together with the mask objects so that they move, copy, or erase as one object. Attribute and mask objects are not grouped. The mask object is an AutoCAD Hatch. To mask text objects set the plotting to overwrite mode and the pen table's color to 0% screening.
Use Text, Arc Text, and Attribute Unmask to remove the mask objects.

Warning: We have found an issue with the masking command when the Annotative text is displayed in multiple viewports with different scales or Match orientation to layer set to Yes.

4.14.22 Text, Arc Text, and Attribute Mask to Top

Change the draworder of objects masked using the Text, Arc Text, and Attribute Mask command.

Moves masked text, mtext, and blocks with attributes above the masking object.

Processes all masked objects in a drawing.


Button

Ribbon: SmartDraft ▸ Text panel ▸ Text masking pull-down
Toolbar: Label Masking to Top on the Text Tools and Labeling Tools:
Menu: SmartDraft ▸ Labeling ▸ Text, Arc Text, and Attribute Mask to Top
Menu: SmartDraft ▸ Text ▸ Text, Arc Text, and Attribute Mask to Top
Command entry: **amt**

4.14.23 Add Prefix / Suffix

Add a prefix and / or suffix string to existing text, mtext, SmartDraft arc text, dimensions, and attributes.

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Note: To have a space between the prefix or suffix and the existing text, remember to include it.



Button

Ribbon: SmartDraft ▸ Text panel ▸ Add Prefix / Suffix pull-down 

Toolbar: Text Prefix / Suffix on the Text Tools: 

Menu: SmartDraft ▸ Text ▸ Add Prefix / Suffix

Command entry: **tff**

Video demonstration

Note: Special Command entry versions of this command.

PREN	Add the prefix "(" and the suffix ")" to selected text.
PERN2	Add the prefix "((" and the suffix "))" to selected text.
P[	Add the prefix "[" and the suffix "]" to selected text.
P[[	Add the prefix "[[" and the suffix "]]" to selected text.
P<	Add the prefix "<" and the suffix ">" to selected text.
P<<	Add the prefix "<<" and the suffix ">>" to selected text.
P{	Add the prefix "{" and the suffix "}" to selected text.
P{{	Add the prefix "{{" and the suffix "}}" to selected text.

Dialog Box Options

Prefix:	Prefix text to add. Leave blank for none.
Suffix:	Suffix text to add. Leave blank for none.
Numbers Only:	When checked, the command will look for a single number in the selected text and only add the prefix / suffix to the number. i.e. TC 123.12 to TC (123.12). If there are no numbers, more than one number, or any formatting, such as commas, + sign, etc, it will ignore the numbers only option and add the prefix, and suffix to the beginning and ending of the text.
OK:	To select the text for adding the above prefix and suffix.

Command:

Current settings: Prefix = <default>, Suffix = <default>, Type = <All/Numbers Only>

Select text or [Options]: Select the text to add the prefix and suffix, **O**ptions to change the prefix / suffix or press ENTER to end.

Examples:

Selected text: **123.45**

Prefix: **EL**

Result: **EL 123.45**

Selected text: **254.32**

Suffix: **TC**

Result: **254.32 TC**

Selected text: **be**

Prefix: **Don't worry,**

Suffix: **happy!**

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Result: **Don't worry, be happy!**

4.14.24 Remove Prefix / Suffix

Remove the (), [], {}, and <> prefix and suffix from text, mtext, attributes, and dimension.

Button

Ribbon: SmartDraft ▸ Text panel ▸ Add Prefix / Suffix pull-down
Toolbar: Text Prefix / Suffix on the Text Tools:
Menu: SmartDraft ▸ Text ▸ Remove Prefix / Suffix
Command entry: **up**
Video demonstration

Dialog Box Options

Remove Parentheses:	Remove any parentheses in the selected text.
Remove Square Brackets:	Remove any parentheses in the selected text.
Remove Less and Greater Than:	Remove any parentheses in the selected text.
Remove Curly Braces:	Remove any parentheses in the selected text.
Remove from Line and Curve Labels:	Remove the full prefix or suffix added to Line and Curve Labels.
OK:	To select the text for removing the above prefixes and suffixes.

Command:

Current settings: Remove = <default>

Select text or [Options]: Select the text to add the prefix and suffix, **O**ptions to change the prefixes and suffixes to remove press ENTER to end.

Examples:

Selected text: (**123.45)**

Result: **123.45**

Selected text: <<**254.32>>**

Result: **254.32**

4.14.25 Text Respacing

Adjust the spacing between selected text strings.

Selected text is sorted by descending vertical position. DVIEW twist is honored when calculating the vertical position.

Button

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Ribbon: SmartDraft ▸ Text panel ▸ Text Spacing pull-down
Toolbar: Text Tools:
Menu: SmartDraft ▸ Text ▸ Text Respacing
Command entry: **trs**
Video demonstration

Command:
Change spacing between selected text.
Select objects: Select the text to adjust and press ENTER.
Specify new text spacing <xxxx>: Specify the new text spacing.

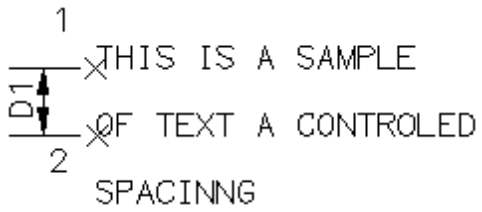
4.14.26 Text Spacing

Create text in the drawing with the option to adjust the line spacing.

Button
Ribbon: SmartDraft ▸ Text panel ▸ Text Spacing pull-down
Toolbar: Text Tools:
Menu: SmartDraft ▸ Text ▸ Text Spacing
Command entry: **tsg**
Video demonstration

Command:
Text spacing.
Specify start point: Specify a point (1).
Specify rotation angle <*current* >: Specify a point or a value.
Specify text spacing <*current* >: Specify a value (D1) or a point (2). The default value is the same as AutoCAD's default text line spacing.
Enter text: Enter the text and press ENTER.

Example



4.14.27 Fit Text

Forces selected text to fit between two points while maintaining the text height.

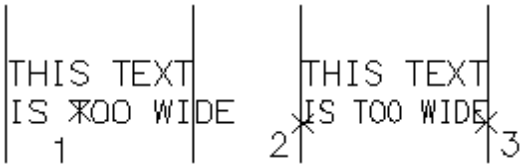
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Button

Ribbon: SmartDraft ▸ Text panel ▸ Text Spacing pull-down
Toolbar: Text Tools II on Text Tools:
Menu: SmartDraft ▸ Text ▸ Fit
Command entry: **tf**
Video demonstration

Command:
Fit text.
Select text: Select the text to modify (1).
Specify new start point: Select new starting point (2) of text.
Specify new end point: Select new ending point (3) of text.

Example



4.14.28 Text to Mtext

Convert text to Mtext

Selected text is sorted by descending vertical position or selection order. DVIEW twist is honored when calculating the vertical position when the Top-Down order option is selected.

Note: Command sets the MText justification to Top Left, Top Center, or Top Right based on the justification of the first selected text string.

Button

Ribbon: SmartDraft ▸ Text panel ▸ Text Spacing pull-down
Text Tools II toolbar on the Text Tools toolbar:
SmartDraft menu ▸ Text ▸ Text to Mtext
Command line: **tmt**

Command:
Convert Text to Mtext:
Current settings: Text Order = <Top-Down/Selection>, Word-Warp = <Yes/No>
Select text or [Options]: Select text objects, or Options to change text sorting method.

Dialog Box Options
Text Order
Sort Top-Down: Selected text is sorted from top down no matter the order selected.
Selection Order: Selected text is processed in the order it is selected.
Format Option

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Word-Warp Selected text will join into one string so it will warp in the MText limits. Uncheck, each selected line of text will stay on a separate line.

4.14.29 Text Vertical

Rotate text or blocks vertical to the bottom of the screen.

Supports Text, MText, Blocks, MLeader, and Civil 3D Point Object.

Button

Ribbon: SmartDraft ▸ Text panel ▸ Text Alignment pull-down

Toolbar: Text Tools:

Menu: SmartDraft ▸ Text ▸ Text or Block Vertical

Command entry: **tv**

Video demonstration

Command:
Rotate text or block vertical.
Select text or block or [Multiple]: Select text string (1) or enter **M**ultiple to select multiple text, mtext, or blocks at once.

Specify point: Select new insertion point (2).

Note: If the Multiple selection method is used, the insertion point is used and the Specify point: prompt will not appear.

Example



4.14.30 Text Horizontal

Rotate text or blocks horizontal to the bottom of the screen.

Supports Text, MText, Blocks, MLeader, and Civil 3D Point Object.

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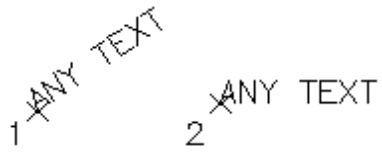
Button

Ribbon: SmartDraft ▸ Text panel ▸ Text Alignment pull-down
Toolbar: Text Tools:
Menu: SmartDraft ▸ Text ▸ Text or Block Horizontal
Command entry: **thz**
Video demonstration

Command:
Rotate text or block horizontal.
Select text or block or [Multiple]: Select text string (1) or enter **M**ultiple to select multiple text, mtext, or blocks at once.
Specify point: Select new insertion point (2).

Note: If the Multiple selection method is used, the insertion point is used and the Specify point: prompt will not appear.

Example



4.14.31 Attribute Tag 0 or 180

Rotate attribute tag in MLeader to 0 or 180 for MLeaders created by the Arc Leader, Straight Leader, or Reference Symbol commands.

Supports MLeader with a SmartDraft Reference Symbol

Supports:

AutoCAD Products:	Not always, since AutoCAD has a Readability Bias value which flips the attribute tag.
BricsCAD Pro:	Yes

Button

Ribbon: SmartDraft ▸ Text panel ▸ Attribute Tag 0 or 180 Alignment pull-down

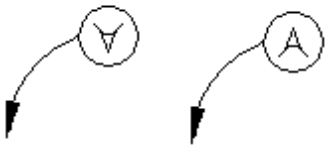
Command entry: **sm_mlrot**

Command:
BricsCAD Pro: Rotate attribute tags within MLeaders to <0.0 or 180.0>.

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Select MLeaders or [Flip]: Select MLeaders with a reference symbol with attribute or enter **F**lip to toggle between 0.0 and 180.0.

Example



4.14.32 Text Align Parallel or Tangent

Align text or blocks parallel to a line, or tangent to an arc.

Supports Text, MText, Blocks, MLeader, and Civil 3D Point Object.

Button

Ribbon: SmartDraft ▸ Text panel ▸ Text Alignment pull-down

Toolbar: Text Tools:

Menu: SmartDraft ▸ Text ▸ Align Parallel

Command entry: **tp**

Video demonstration

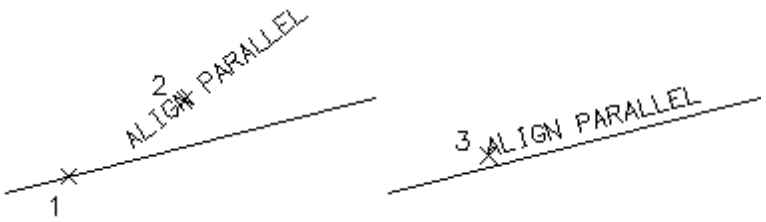
Command:
Align parallel or tangent.
Select text or block or [Multiple]: Select text or block to align (1) or enter **M**ultiple to select multiple text, mtext, or blocks at once.

Select alignment object: Select object to align with (2).

Specify point: Specify a point for new placement (3).

Note: If the Multiple selection method is used, the insertion point is used and the Specify point: prompt will not appear.

Example



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4.14.33 Text X-Align

Modify the horizontal alignment point of text along the vertical axis determined by the angle of the first selected text.

Modify the horizontal alignment point of selected text along the vertical axis determined by the angle of the first selected text object. The new justifications available are right, left, middle, or center.

Button

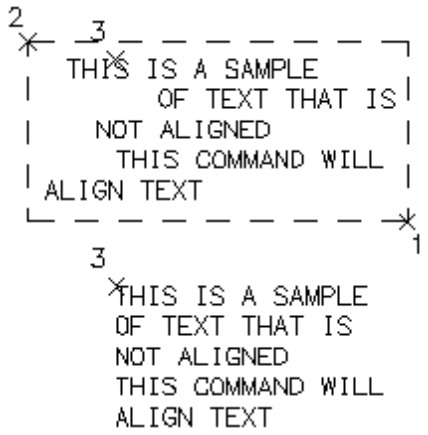
Ribbon: SmartDraft ▸ Text panel ▸ Text Alignment pull-down
Toolbar: Text Tools:
Menu: SmartDraft ▸ Text ▸ X Align
Command entry: **tl**
Video demonstration

Command:
Align text.
Select objects: Select text to modify. Example by crossing (1) and (2)

Specify alignment point: Select point (3) for alignment point.

Specify text justification [Right/Center/Middle/Left] <Left>: Specify alignment type, **R** for right justified, **M** for middle justified, **C** for center justified, or press ENTER for left justified.

Example



4.14.34 Text: Dialog

Dialog box interface to standard AutoCAD Text or MText command to select the style and justification.

Command entry: **td**
Video demonstration

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Dialog Box Options

Type:	Text or MText. Select the text type
Style:	Select the desired text style or double-click to start the Text or MText command with the selected style and justification.
Justification:	Select the desired justification. Left, Center, Middle, Right, BL, BC, BR, ML, MC, MR, TL, TC, TR, Fit, or Aligned
OK:	Start the Text or MText command with the selected style and justification.

Command:

<Standard AutoCAD specify point and rotation angle prompts>

4.15 View Panel Tools

Tools to twist and manage views, manage the crosshairs angle, and create, and manage viewports.

Click on the icon below to view a video demonstration.

Views

View Twist

View All

View Save All

Crosshairs

Crosshairs Horizontal to Screen

Crosshairs to 0

Crosshairs Align to Object

Viewports

Viewport Make

Viewport Zoom

Viewport Divide

Viewport Align

Viewport Move

vpu1	Move the contents of a viewport Up 1 unit.
vpu5	Move the contents of a viewport Up 5 units.
vpd1	Move the contents of a viewport Down 1 unit.
vpd5	Move the contents of a viewport Down 5 units.

4.15.1 View Twist

Twist the view so two selected points in the drawing become parallel to the bottom of the screen.

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Twist the view of the drawing by selecting two points for the new horizontal alignment. The crosshair angle is also twisted to match the new horizontal alignment. All linework remains in their correct coordinates. See DVIEW, TWist option.

Note: Any North Arrow inserted within the Layout and associated to the Viewport, using v8.0.0 or later, will rotate to match the new angle of the Viewport.

Button

Ribbon: SmartDraft ▸ View panel ▸ View pull-down

Toolbar: View I on the View Tools:

Menu: SmartDraft ▸ View ▸ View Twist

Command entry: **vt**

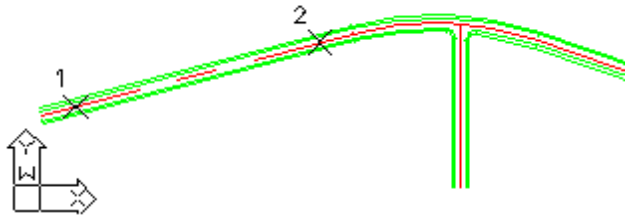
Video demonstration

Select two points along the desired horizontal line.

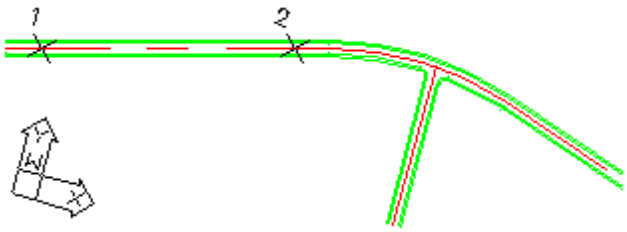
Specify first point (left first): Specify a point (1). *Default osnap is **NEA**rest.*

Specify second point: Specify a point (2). *Default osnap is **NEA**rest.*

Before View Twist



After View Twist



Note: To rotate the crosshairs to their default direction (northerly): View Menu: **Crosshairs to 0**.
To restore the view to AutoCAD's default twist: View Menu: **View Twist to 0**.

Button

Ribbon: SmartDraft ▸ View panel ▸ View pull-down

Toolbar: View Tools on the Drawing Tools:

Menu: SmartDraft ▸ View ▸ View Twist to 0

Command entry: **v0**

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4.15.2 View All

Restore named views, ALL or All-*.

A view is a portion of a drawing displayed in a viewport. Views are saved separately in modelspace and paperspace. When using this command, a different view name is saved for each viewport, layout, and modelspace. See below for the View Name which will be saved. This command is useful in saving views within mview viewports for later restoring.

Note: Any North Arrow inserted within the Layout and associated to the Viewport, using v8.0.0 or later, will rotate to match the new angle of the Viewport.


Button

Ribbon: SmartDraft ▸ View panel ▸ View pull-down

Toolbar: View I on the View Tools:

Menu: SmartDraft ▸ View ▸ View All

Command entry: **va**

Video demonstration

View name	Active viewport
ALL	TILEMODE = 1 modelspace
ALL-P1	TILEMODE = 0 and paperspace is active.
ALL-M?	TILEMODE = 0 and modelspace is active. Where ? is the current VIEWPORT.

This command works for views created with Create View All-?.

4.15.3 View Save All

Save named views, ALL or All-*.

A view is a portion of a drawing displayed in a viewport. Views are saved separately in modelspace and paperspace. When using this command, a different view name is saved for each viewport, layout, and modelspace. See below for the View Name which will be saved. This command is useful in saving views within mview viewports for later restoring.


Button

Ribbon: SmartDraft ▸ View panel ▸ View pull-down

Toolbar: View I on the View Tools:

Menu: SmartDraft ▸ View ▸ Create View All

Command entry: **vsa**

Video demonstration

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View name	Active viewport
ALL	TILEMODE = 1 modelspace
ALL-P1	TILEMODE = 0 and paperspace is active.
ALL-M?	TILEMODE = 0 and modelspace is active. Where ? is the current VIEWPORT.

This command creates the saved views that can be restored by the View All command.

4.15.4 Crosshairs Horizontal to Screen

Rotate the crosshairs to be parallel with the bottom of the screen.


Button

Ribbon: SmartDraft ▸ View panel ▸ Crosshairs pull-down 

Toolbar: View II on the View Tools: 

Menu: SmartDraft ▸ View ▸ Crosshairs Horizontal to Screen

Command entry: **uv**

Video demonstration


Rotate the crosshairs to point in a northerly direction.

UW Crosshairs to 0 (UCS World)

4.15.5 Crosshairs to 0

Rotate the crosshairs to point in a northerly direction.

Crosshairs to 0 (UCS World)


Button

Ribbon: SmartDraft ▸ View panel ▸ Crosshairs pull-down 

Toolbar: View II on the View Tools: 

Menu: SmartDraft ▸ View ▸ Crosshairs to 0

Command entry: **uw**

Video demonstration

4.15.6 Crosshairs Align to Object

Align crosshairs to a selected line or polyline.

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Align the crosshairs (snapang) to a selected line or polyline.


Button

Ribbon: SmartDraft ▸ View panel ▸ Crosshairs pull-down 

Toolbar: View II on the View Tools: 

Menu: SmartDraft ▸ View ▸ Crosshairs Align to Object

Command entry: **uo**

Video demonstration

Align crosshairs to object.
Select a line: Select a line or polyline.

Note: To rotate the crosshairs to their default direction (northerly): View Menu, or View Tools toolbar: **Crosshairs to 0**.
To restore the view to AutoCAD's default twist: View Menu, or View Tools toolbar: **View Twist to 0**.

4.15.7 Viewport Make

Create viewport by specifying a rectangular or clipped viewport area in modelspace.

Create a rectangular viewport in the Layout by specifying the two corners of the viewport, rotation angle (Twist), and ratio (scale). If you are in a layout when you start the command, it will switch to modelspace, and prompt for the location, angle, and scale. Once the perimeters have been specified, it changes back to the layout and prompts for the location of the new viewport in paperspace.


Button

Ribbon: SmartDraft ▸ View panel ▸ View pull-down 

Toolbar: Viewport Tools on the View Tools: 

Menu: SmartDraft ▸ Viewport ▸ Viewport Make

Command entry: **vpm**

Video demonstration

Note: The default ratio will be 1 over the horizontal scale of the drawing.

Command:

Make viewport. Current settings: Ratio = 1/<current value>, Type = <Center/Left>

Create paperspace viewport from within modelspace.

Specify lower left corner of viewport or [Boundary/Point/Ratio]: Specify the lower left corner point of the viewport area, **B**oundary to select a polyline to create a clipped viewport, **R**atio to change the paperspace to modelspace scale, or **P**oint to change the viewport placement setup point between Center and Left, or **D**imensions to specify the width and height of the viewport.
Specify upper right corner or [Dimensions]: Specify the upper right corner of the viewport.
Viewport options: [Dimensions/Move/Point/Ratio/Twist/End] <End>: Press enter to accept the location, ratio, and twist, or **D**imensions to specify the width and height of the viewport, **M**ove to change the location, **P**oint to

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change the control point from center to lower left corner, **R**atio to change the paperspace to modelspace scale ratio, or **T**wist to change the view twist of the viewport.
At this point, the command changes back to paperspace and prompts for the location to create the new viewport.

Specify lower left corner: Specify the lower left corner point of the new viewport.

If **D**imensions

Specify width for viewport <*default*>: Specify a value, and press ENTER.
Specify height for viewport <*default*>: Specify a value, and press ENTER.

If **M**ove

Specify viewport location: Specify a point for the new location of the viewport.

If **P**oint

Enter control point location [Center/Left] <Center>: Enter **C**enter or **L**eft (lower left) to indicate the control point for the Move and Twist options.

If **R**atio

Enter modelspace to paperspace ratio <40.00>: Enter the new modelspace to paperspace ration, or enter to accept the default.

If **T**wist

Specify viewport twist: Specify the viewport twist angle by selecting a point on the screen.

4.15.8 Viewport Zoom

Viewport zoom setup by selecting the viewport frame.

Select a viewport in paperspace, using a specified ratio and the size of the paperspace viewport, and position the viewport in modelspace.

Note: Any North Arrow inserted within the Layout and associated to the Viewport, using v8.0.0 or later, will rotate to match the new angle of the Viewport.
Does not support polygonal (clipped) viewports.


Button

Ribbon: SmartDraft ▸ View panel ▸ View pull-down 
Toolbar: Viewport Tools on the View Tools: 
Menu: SmartDraft ▸ Viewport ▸ Viewport Zoom
Command entry: **vpz**
Video demonstration

Note: The default ratio will be 1 over the horizontal scale of the drawing.

Command:

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Zoom viewport. Current settings: Ratio = 1/<current value>, Type = <Center/Left>

Select viewport or [Point/Ratio]: Select a viewport frame, **R**atio to change the paperspace to modelspace scale, or **P**oint to change the viewport placement setup point between Center and Left.
Specify viewport location: Specify a point to locate the viewport in modelspace.
Viewport options: [Move/Point/Ratio/Twist/End] <End>: Press enter to accept the location, ratio, and twist, or **M**ove to change the location, **P**oint to change the control point from center to lower left corner, **R**atio to change the paperspace to modelspace scale ratio, or **T**wist to change the view twist of the viewport.
At this point, the command changes back to paperspace and prompts for the location to create the new viewport.

Specify lower left corner: Specify the lower left corner point of the new viewport.

If **M**ove
Specify viewport location: Specify a point for the new location of the viewport.

If **P**oint
Enter control point location [Center/Left] <Center>: Enter **C**enter or **L**eft (lower left) to indicate the control point for the Move, Ratio, and Twist options.

If **R**atio
Enter modelspace to paperspace ratio <40.00>: Enter the new modelspace to paperspace ratio, or enter to accept the default. The viewport frame will resize to represent the size of the contents which will be displayed in the selected viewport at the entered ratio.

If **T**wist
Specify viewport twist: Specify the viewport twist angle by selecting a point on the screen.

4.15.9 Viewport Divide

Divide a viewport vertically or horizontally.

Divide an existing rectangular viewport horizontally or vertically. The new viewport will be scaled, rotated, and aligned to the original.


Button
Ribbon: SmartDraft ▸ View panel ▸ View pull-down
Toolbar: Viewport Tools on the View Tools:
Menu: SmartDraft ▸ Viewport ▸ Viewport Divide
Command entry: **vpd**
Video demonstration

Command:

Split viewport. Current settings: Type = <Horizontal/Vertical>

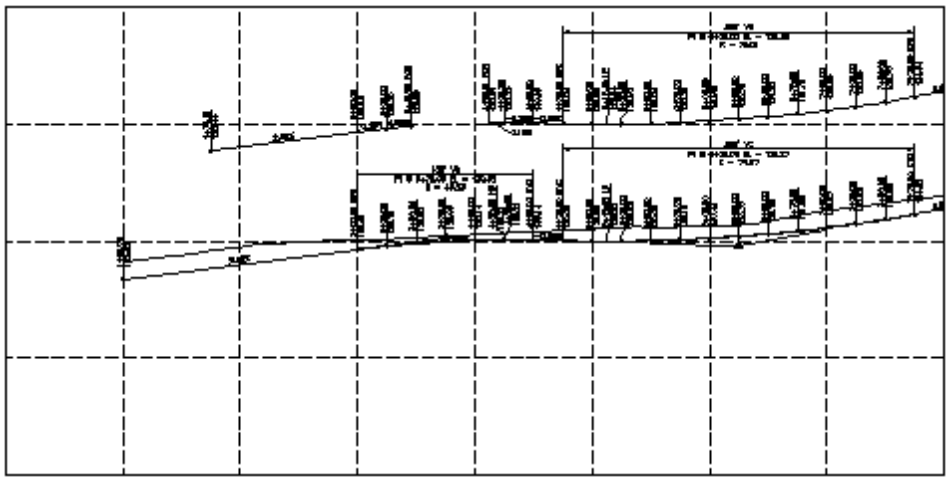
Select viewport or [Horizontal/Vertical]: Select the frame of the viewport to divide: **H**orizontal to divide it horizontally, or **V**ertical to divide it vertically.

Specify vertical divide point or [Horizontal]: Specify the point to divide the viewport, or **H**orizontal to divide it horizontally, or **V**ertical to divide it vertically.

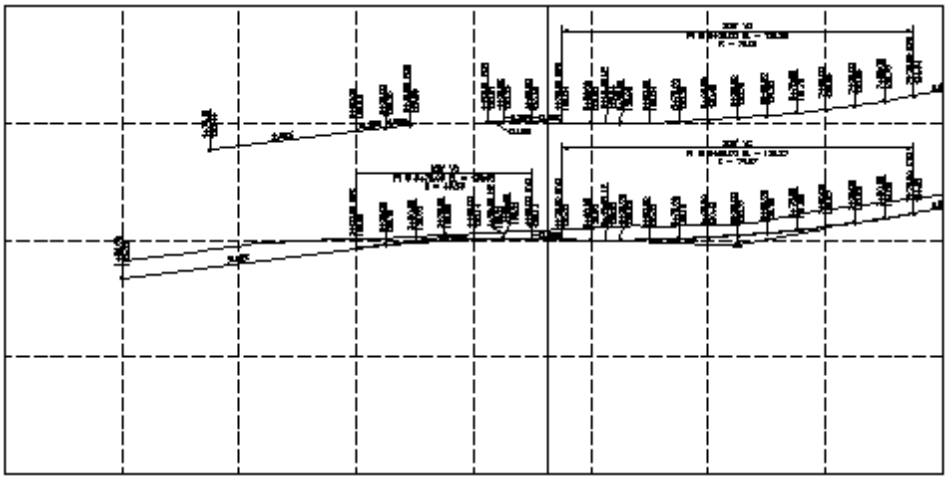
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Example:

Viewport before vertical divide



Viewport after vertical divide



4.15.10 Viewport Frame

Create a polyline of the viewport frame in modelspace.

Create a polyline of the viewport frame in modelspace. The polyline is created on the current layer, scale, view twist, and location of the viewport.

Button

Ribbon: SmartDraft ▸ View panel ▸ View pull-down

Toolbar: Viewport Tools on the View Tools:

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Menu: SmartDraft ▸ Viewport ▸ Viewport Frame

Command entry: **vpf**

Command:

Create viewport frame in Modelspace.

Select viewport: Select the frame of a viewport, a polyline of the viewport frame will be created in modelspace.

4.15.11 Viewport Align

Align selected viewports' content to a source viewport.

Change the scale, rotation, and position of the target viewports' content to match those of the source viewport. See example below.

Note: Any North Arrow inserted within the Layout and associated to the Viewport, using v8.0.0 or later, will rotate to match the new angle of the Viewport.

Button

Ribbon: SmartDraft ▸ View panel ▸ View pull-down

Toolbar: Viewport Tools on the View Tools:

Menu: SmartDraft ▸ Viewport ▸ Viewport Align

Command entry: **vpa**

Video demonstration

Command:

Align viewports.

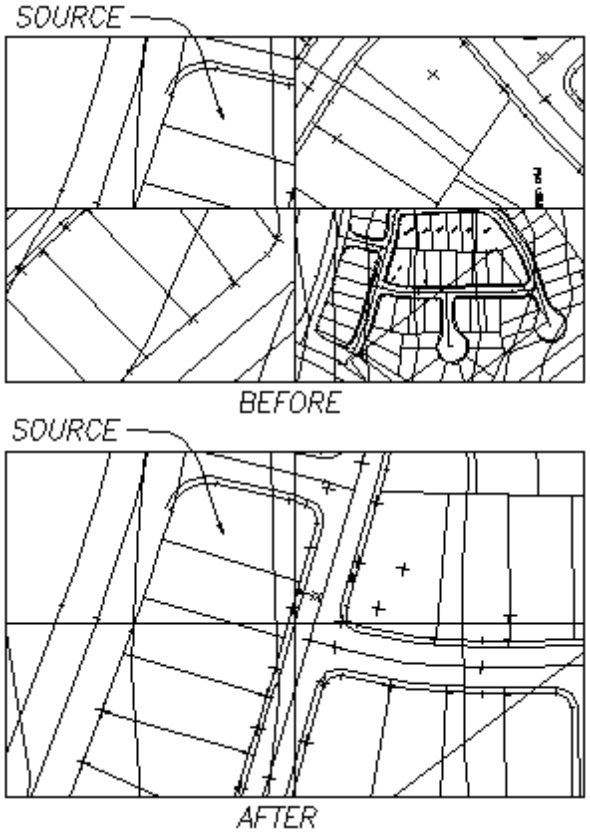
Select source viewport: Select the frame of the source viewport.

Select target viewports to be aligned with source viewport.

Select objects: Specify opposite corner: Select the frame(s) of the viewport(s) to align to the source.

Example:

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4.15.12 Viewport Align with Profile View

Align a profile view (vertical alignment view) within a selected viewport.

The selected Profile View's entered station and elevation will be aligned to the lower left corner of the selected viewport.

The modelspace within the selected viewport will be view twisted to align the profile view with the viewport, and scaled.

Button

Ribbon: SmartDraft ▸ View panel ▸ View pull-down

Toolbar: Viewport Tools on the View Tools:

Menu: SmartDraft ▸ Viewport ▸ Viewport Align with Profile View

Command entry: **vpapv**

Command:

Align Profile View within Viewport.

Select viewport to align Profile View: Select the frame of the viewport.

Select a profile view [LIst]: Select a profile view, or **LI**st to select the profile view from a list.

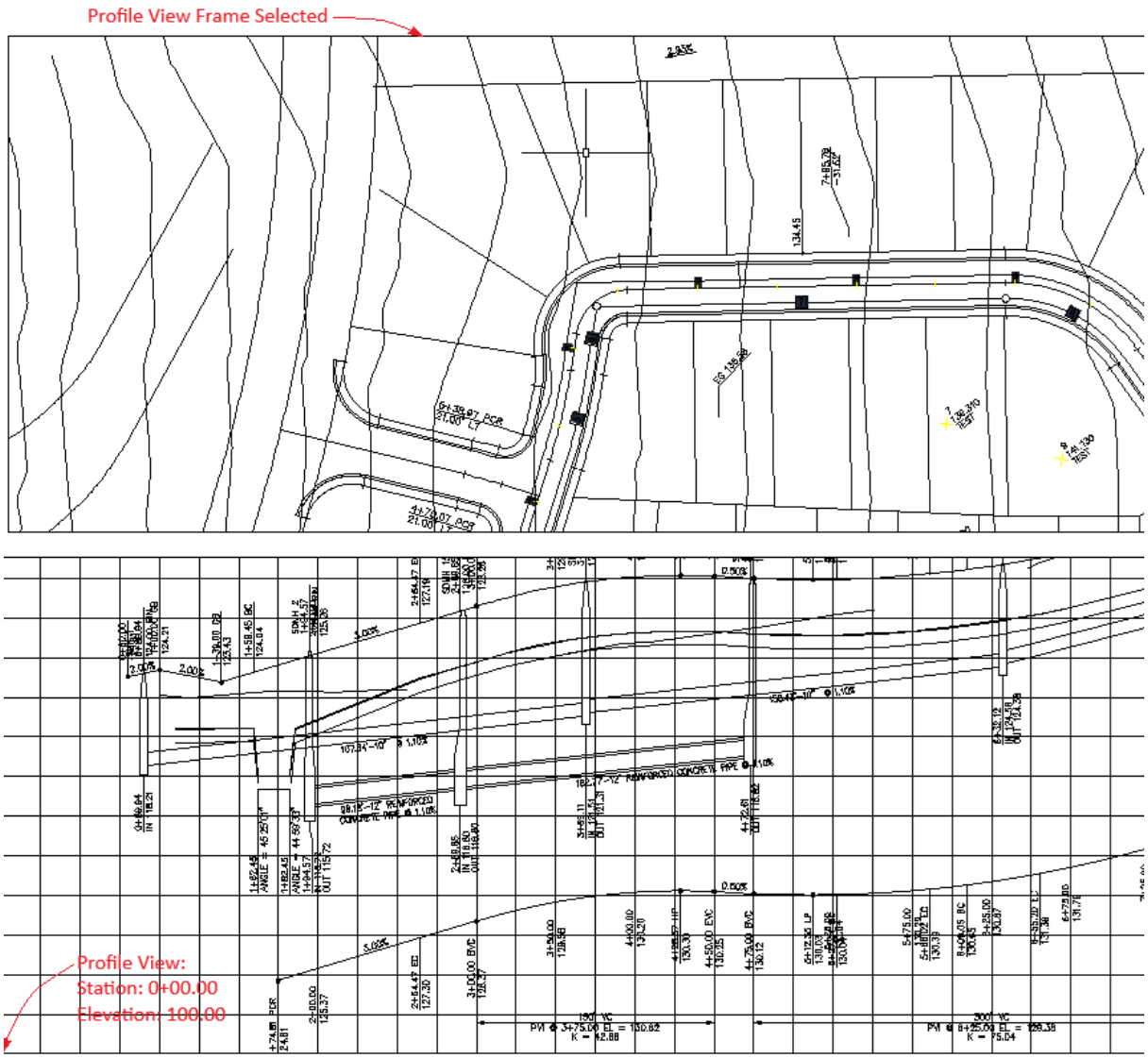
Enter viewport scale <Current Viewport Scale>: Enter the scale.

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Enter lower left station <Station>: Enter the profile view station to be aligned to the lower left corner of the viewport.

Enter lower left elevation <Elevation>: Enter the elevation value to be aligned to the lower left corner of the viewport.

Example:



Prompts for example

Align Profile View within Viewport

Select viewport to align Profile View: Profile view frame selected

Select a Profile View or [LIst]: LI > Selected the Profile View from a list in a dialog

Enter viewport scale <40>: Enter to accept default

Enter lower left station <0.00>: Enter to accept default

Enter lower left elevation <100.00>: Enter to accept default

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4.15.13 Viewport Move

Move the contents of a viewport vertically or horizontally by a given interval.

Note: One of the intended uses for this command is to help shift the contents of a profile viewport. See example below.
See Viewport Divide to divide an existing viewport at a given location.
When the Direction is set to Up or Down, the Vertical Scale value is multiplied by the interval for the true movement.


Button

Ribbon: SmartDraft ▸ View panel ▸ View pull-down

Toolbar: Viewport Tools on the View Tools:

Menu: SmartDraft ▸ Viewport ▸ Viewport Move

Command entry: **vpmv**

Video demonstration

Special Command entry Aliases related to this command:

vpu1 Move the contents of a viewport Up 1 unit.
vpu5 Move the contents of a viewport Up 5 units.
vpd1 Move the contents of a viewport Down 1 unit.
vpd5 Move the contents of a viewport Down 5 units.

Note: The default vertical scale will be the horizontal scale of the drawing divided by 10. Example: a 40-scale drawing would be 40 / 10 or 4.

Command:

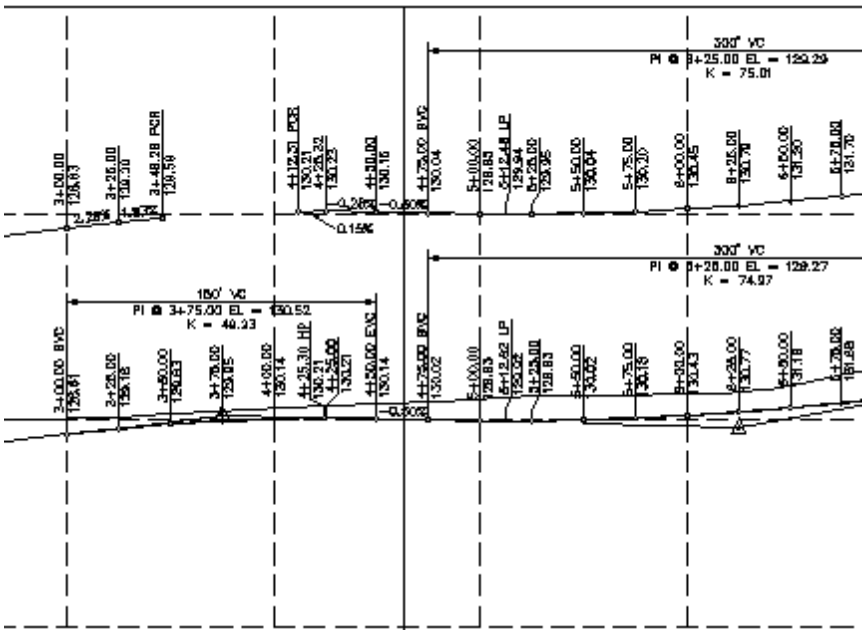
Current settings: Direction= <Right/LEft/Up/Down>, Vertical Scale = <current scale>, Interval = <current vale>

Select viewport to move or [Right/LEft/Up/Down/Interval/Vertical]:

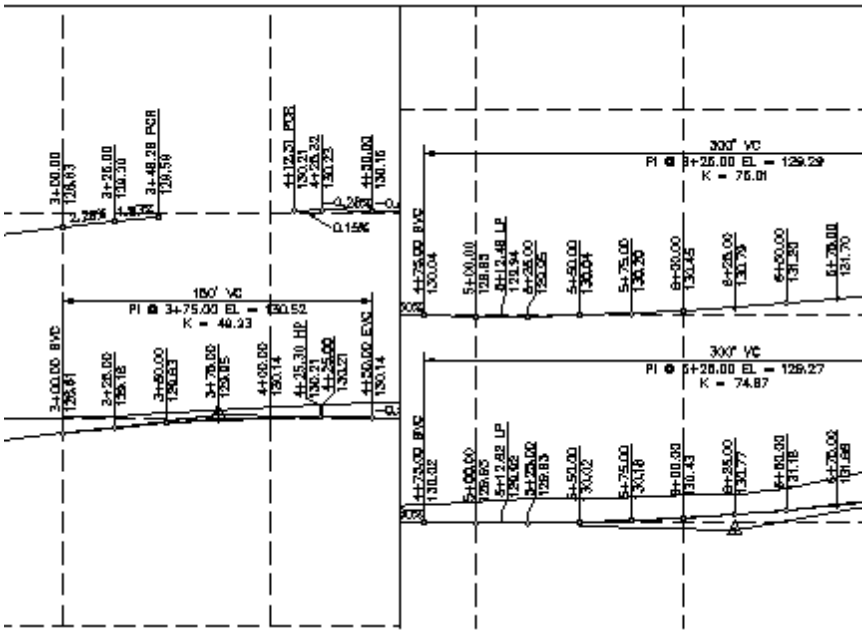
Example:

Viewports aligned and before moving the one on the right 10 units down (since direction is Down, the vertical scale is used along with the interval)

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Viewports after the one on the right has been moved down by 10 units



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4.15.14 Viewport Lock

Lock viewport

When within a viewport, the command will lock the current viewport.
When in a layout, the command will prompt the operator to select the viewport to lock.


Button
Ribbon: SmartDraft ▸ View panel ▸ View pull-down
Toolbar: Viewport Tools on the View Tools:
Menu: SmartDraft ▸ Viewport ▸ Viewport Lock
Command entry: **vl**

When in a layout:
Command:
Viewport Locking.
Select viewport: Select a viewport to lock.

When within a viewport:
Command:
Viewport Locked.

4.15.15 Viewport Lock All

Lock all viewports in the drawing

Command entry: **vla**

Command: **vla**
Locking all Viewports.
X viewports locked.

4.15.16 Viewport UnLock

Unlock viewport

When within a viewport, the command will unlock the current viewport.
When in a layout, the command will prompt the operator to select the viewport to unlock.

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VU
Button
Ribbon: SmartDraft ▸ View panel ▸ View pull-down VU
Toolbar: Viewport Tools on the View Tools: VU
Menu: SmartDraft ▸ Viewport ▸ Viewport Unlock
Command entry: **vu**

When in a layout:
Command:
Viewport Unlocking.
Select viewport: Select a viewport to unlock.

When within a viewport:
Command:
Viewport Unlocked.

4.15.17 Zoom Handle

Zoom to an object from the specified AutoCAD Handle of the object.

Command entry: **zh**

Command:
Enter handle: Enter the handle of the object to zoom to, and press ENTER.

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4.15.18 Toggle Tilemode

Toggle between Model tab and last Layout tab (paperspace).

Only changes from Modelscape to Paperscale (Layout)

Command entry: **tt**

4.16 SmartDraft Extra Tools

The SmartDraft Extra Tools are variable commands in SmartDraft that are no longer being developed and have been separated into their own menu file (CUI).

Some or all of these tools may not appear in a future version of SmartDraft.

The SmartDraft Extra Tools have been separated since they do not seem as necessary in Civil 3D.

To have access to these tools: CUILOAD SmartExtra.cuix

A license of the SmartDraft Suite is still required to use these Tools.

Note: We consider the SmartDraft Extra Tools retired, and we will no longer be enhancing them.

4.16.1 SmartDraft - Extra toolbar (SmartExtra.cuix)

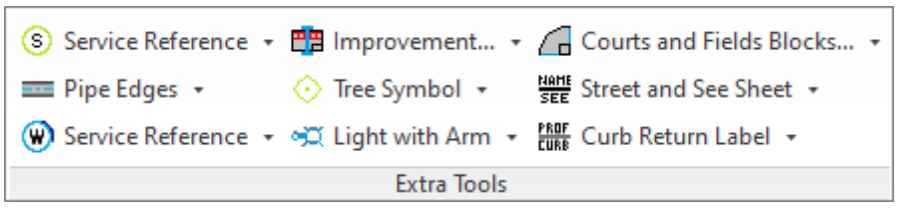
The SmartDraft Extra Tools have been separated into their own menu and have been removed from the main Suite menu.

To have access to these tools: CUILOAD SmartExtra.cuix

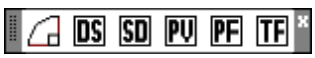
A license of the SmartDraft Suite is still required to use these Tools.

Note: We consider the SmartDraft Extra Tools retired, and only provide them as-is.

Extra Tools Panel of the SmartDraft Extra Ribbon



Block Manager Toolbar



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Border Toolbar



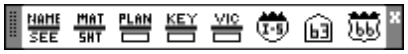
Miscellaneous Toolbar



Plants Toolbar



Planview Labeling Toolbar



Profile Toolbar



Sewer Toolbar



Storm Drain Toolbar



Water Toolbar



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4.16.1.1 Block Manager

Block Manager toolbar on the SmartDraft - Extra toolbar

Courts and Fields. Opens Block Manager dialog box.

Design Tools blocks. Opens Block Manager dialog box.

Detail blocks. Opens Block Manager dialog box.

Planview blocks. Opens Block Manager dialog box.

Profile blocks. Opens Block Manager dialog box.

Traffic blocks. Opens Block Manager dialog box.

4.16.1.2 Borders

Borders toolbar on the SmartDraft - Extra toolbar

Improvement Plan borders. Opens Block Manager dialog box.

Grading Plan borders. Opens Block Manager dialog box.

Water Plan borders. Opens Block Manager dialog box.

Sewer Plan borders. Opens Block Manager dialog box.

Mapping borders. Opens Block Manager dialog box.

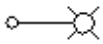
Miscellaneous borders. Opens Block Manager dialog box.

For information on the Block Manager dialog box.

4.16.1.3 Miscellaneous

Miscellaneous toolbar on the SmartDraft - Extra toolbar

Create light with arm block.

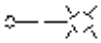


Create light block.



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Create light with arm (dashed) block.



Create light (dashed) block.



Create gas valve block.



Create gas meter block.



Create gas vault. See Vault

Create powerpole block.



Create guy-pole and tie. See Guy-pole

Create electric vault. See Vault

Create telephone pole block.



Create telephone manhole block.



Create telephone vault. See Vault

Miscellaneous blocks. Opens Block Manager dialog box.

4.16.1.4 Plants

Plants toolbar on the SmartDraft - Extra toolbar

Create a Tree Symbol with an attribute for size and/or type.

Create a Palm Tree Symbol with an attribute for size.

Create a free form tree line. See Free Form Tree or Brush Line

Create a free form brush line. See Free Form Tree or Brush Line

4.16.1.5 Planview Extras

Planview Labeling toolbar on the SmartDraft - Extra toolbar

Create a label for the Street name and See Sheet Number reference. See Street Name and See Sheet

Create a label for the Matchline and See Sheet Number reference. See Matchline and See Sheet

Create a label for the planview description. See Planview Descriptions

Label the key map description. See Key / Vicinity Map

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Label the vicinity map description. See Key / Vicinity Map

Create an Interstate freeway symbol.



Create a State highway symbol.



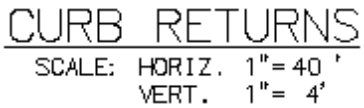
Create a US highway symbol.



4.16.1.6 Profile Extras

Profile Extra Tools toolbar on the SmartDraft - Extra toolbar

Create a curb return label.



Create profile stationing labels. See Profile Stationing

Create profile elevation labels. See Profile Elevations

4.16.1.7 Sewer

Sewer toolbar on the SmartDraft - Extra toolbar

Create service symbol block.



Create manhole block.



Create cleanout block.



Create plug block.



Sewer blocks. Opens Block Manager dialog box.

4.16.1.8 Storm Drain

Storm Drain toolbar on the SmartDraft - Extra toolbar

Offset pipe edges from centerline of pipe. See Storm Drain Pipe

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Create manhole block.



Create curb inlet block.



Create curb inlet with wing. See Curb Inlet with Wing(s)

Create curb inlet with two wings. See Curb Inlet with Wing(s)

Create catch basin 1 block.



Create catch basin 2 block.



Create area drain block. See Area Drain

Create cleanout block.



Create headwall block.

Create U-type headwall block.



Create wing-type headwall block.



Create L-type left headwall block.



Create L-type right headwall block.



Calculate, label, and create junction structure. See Junction Structure No 2

Storm Drain blocks. Opens Block Manager dialog box.

4.16.1.9 Water

Water toolbar on the SmartDraft - Extra toolbar

Create service symbol block.



Create fire hydrant block type 1.

Create fire hydrant block type 2.



Create gate valve block type 1.



Create gate valve block type 2.



Create meter block.



Create air release valve block.



Create air release valve with lateral.
See Air Release Valve

Create blowoff valve block.



Create blowoff valve with lateral.
See Blowoff Valve

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	Create thrust block.	
	Create plug block.	
	Create check valve block.	
	Water blocks. Opens Block Manager dialog box.	

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4.16.2 Block Manager

Insert a block or another drawing from a list.

Note: This tool has been retired but has been included in the SmartDraft - Extra menu for those operators still needing them.

Display the Block Manager dialog box which allows you to create a list of your custom Blocks for insertion from the menu. These blocks can be inserted on any layer in the layer database. Also, they can be inserted using a scale factor of 1 or the current horizontal scale.

Borders toolbar on the SmartDraft Extra Tools toolbar: 
Courts and Fields toolbar on the SmartDraft Extra Tools toolbar: 
Block Manager toolbar on the SmartDraft Extra Tools toolbar: 

Dialog Box Options

Description:	A list of blocks to insert. The Description list is sorted in alphabetical order.
Add:	Add a new block to the Description list.
Edit:	Edit the data associated to an entry in the Description list.
Remove:	Remove the selected block from the list.
OK:	Insert the selected block in the drawing. Save changes made to the list.

4.16.2.1 Block Manager Modify List

Modify the associated information when selecting the Add... or Edit... button of the Block Manager.

Dialog Box Options

Description:	Enter a description for the file. This description will display in the Description list. The description has been limited to 31 characters.
File:	Display the standard file selection dialog box. Select a filename, and press OK, or type the drive, sub-folder, and filename.
Layer Index:	Display the layers and layer database index numbers defined in the layer database. See Layer Database Index. If no layer database index number is specified, SmartDraft supplies index 0, which signifies the block will be inserted on layer 0.
Insertion Scale:	The scale at which the block will be inserted. 1 to insert the block with a scale factor of 1 and Drawing Scale to insert the drawing at the current horizontal scale. If the *Display in list* type is set to *Both* and the current unit type is Meters, the insert scale will be (current horizontal scale x 0.3048). If the block is inserted in paperspace, a scale of 1 will be used even if Drawing Scale is selected.
Insertion Type:	Specify if the file will be inserted as a Block or an Xref. For Xref specify either Xref Attach or Xref Overlay.
Display in List:	Specify if the block will be displayed if the unit type is set to Feet, Meters, or Both. Read Insertion Scale above for scale factor considerations when specifying Both.

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4.16.3 Plants

4.16.3.1 Tree Symbol

Create a tree symbol.

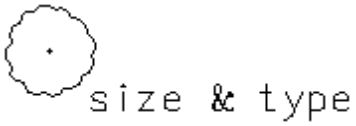
Plants toolbar on the Utility Tools toolbar:
SmartDraft menu ▸ Plants ▸ Tree Symbol

With an attribute for size and/or type.

Command:

Specify insertion point: Specify a point (1).
Specify rotation angle <current>: Specify a value, specify a point (2), or press ENTER to accept current.
SIZE & TYPE: Enter a value.

Example



4.16.3.2 Palm Tree Symbol

Create a palm tree symbol.

Plants toolbar on the Utilities Tools toolbar:
SmartDraft menu ▸ Plants ▸ Palm Tree Symbol

With an attribute for size and/or type.

Command:

Specify insertion point: Specify a point (1).
Specify rotation angle <current>: Specify a value, specify a point (2), or press ENTER to accept current.
SIZE & TYPE: Enter a value.

Example



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4.16.3.3 Free Form Tree or Brush Line

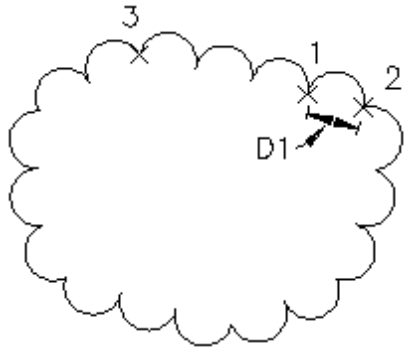
Create a free form tree or brush line on the plant layer with a uniform arc.

Plants toolbar on the Utilities Tools toolbar: , and
SmartDraft menu ▸ Plants ▸ Free Form Tree Line
SmartDraft menu ▸ Plants ▸ Free Form Brush Line

Command:

Specify arc distance <*default*>: Specify a distance (D1), two points (1, 2), or press ENTER to accept default.
Specify arc direction [Left/Right] <Right>: Specify **L** for left side as you draw, or press ENTER for the right side as you draw.
Specify from point: Specify a point (3).
Track points or [Close]: Move the cursor within graphic area to create arced line, **C** to close back to the start point (3), or press ENTER to end.

Example



4.16.4 Planview Extras

4.16.4.1 Planview Description

Create a label for the Planview description.

Planview Labeling Tools toolbar on the Planview Tools toolbar:
SmartDraft menu ▸ Planview ▸ Planview Description

Planview description prompts:

Command:

Specify insertion point: Specify a point (1).

Enter description: **STREET "A"** Enter a value.

Example

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4.16.4.2 Street Name and See Sheet

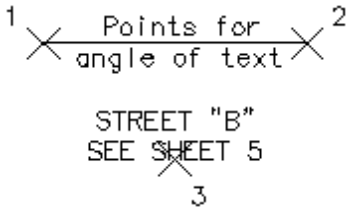
Create a label for the Street name and See Sheet Number reference.

Planview Labeling Tools toolbar on the Planview Tools toolbar:
SmartDraft menu ▸ Planview ▸ Street and See Sheet

Command:

Enter street name: **STREET "B"** Enter a value.
Enter "See Sheet" number [?]: **5** Enter a value or **?** to draw the text **See Sheet ?**.
Specify rotation angle: Select two points (1) and (2), to specify an angle, or enter value.
Specify insertion point: Specify a point (3).

Example



4.16.4.3 Matchline and See Sheet

Create a label for the Matchline and See Sheet Number reference.

Planview Labeling Tools toolbar on the Planview Tools toolbar:
SmartDraft menu ▸ Planview ▸ Matchline and Sheet

Command:

Current settings: Matchline = <Before/After>, Spacer = <" ">, See Sheet = <Above/After/Below>, Line = <Off/On>

Enter matchline station (512.87 = 5+12.87) or [Options]: **123.21** Enter a value in the format shown or **O**ptions to change the options.

Enter "See Sheet" number or [Above hereon/Below hereon/?]: **5** Enter a value, **A**bove hereon, **B**elow hereon, or **?** to draw the text **ABOVE HEREON**, **BELOW HEREON**, or **SEE SHEET ?**.

If **LINE** Off
Specify rotation angle: Select two points (1) and (2) to specify an angle or enter value.
Specify insertion point: Specify a point (3).

If **LINE** On

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Specify first point: Specify first point of matchline (1).

Specify next point: Specify next point of matchline (2).

Dialog Box Options

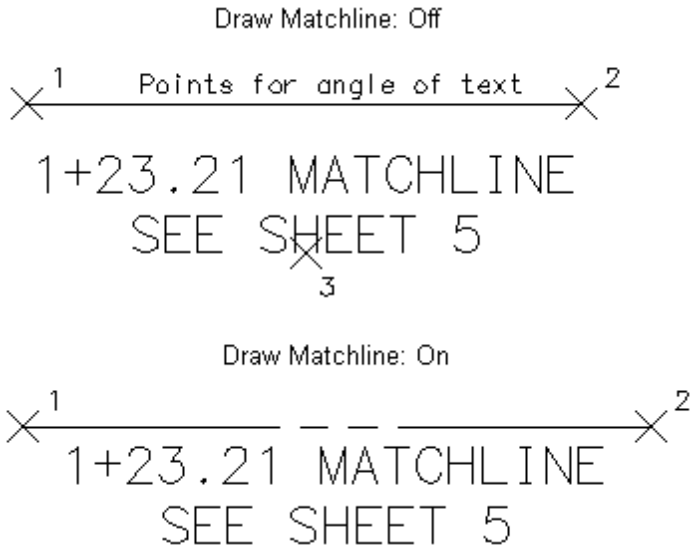
Text Options

Matchline Location:	Select if the Matchline text will be **After** or **Before** the Station text.
Station/Matchline Spacer Box:	Enter a default station/matchline spacer value.
See Sheet Location:	Select if the See Sheet text will be **Above, After,** or **Below** the Station/Matchline text.

Line Options

Draw Matchline:	Specify if the command will draw the matchline along with the label text.
Label Location:	Specify if the label will be **Above** or **Below** the matchline line.

Examples



4.16.4.4 Key / Vicinity Map

Label the key map and vicinity map description.

Planview Labeling Tools toolbar on the Planview Tools toolbar:
SmartDraft menu ▸ Planview ▸ Key Map Header

Planview Labeling Tools toolbar on the Planview Tools toolbar:
SmartDraft menu ▸ Planview ▸ Vicinity Map Header

Key Map Header prompts:

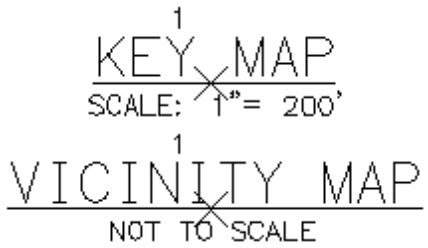
Command:
Specify insertion point: Specify a point (1).
Enter scale: Enter a scale for the Key Map label.

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Vicinity Map Header prompts:

Command:
Specify insertion point: Specify a point (1).

Example



4.16.5 Profile Extras

4.16.5.1 Profile Station Labels

Create profile stationing labels.

Overview

Label stations along the bottom of the profile.

Profile Tools toolbar on the SmartDraft Tools toolbar:
SmartDraft menu ▸ Profile ▸ Label Stations

Command:

Profile Setup Options dialog box will appear.

Select options.

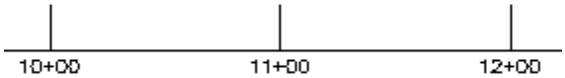
Settings used from profile setup: Profile Datum, and Labeling: Profile Location. All other settings are ignored.

Profile Name base station: <*datum station*>, elevation: <*datum elevation*>, and direction: <*Left to Right / Right to Left*>

Enter starting station <*default*>: Enter a station value, or press ENTER to accept default.
Enter station increment <100>: Enter a value, or press ENTER to accept default.
Remove "+00" from station label [Yes/No] <Yes>: **Y**es, or press ENTER to remove "+00" in stationing or **N**o to truncate hundreds (i.e., 8+00 as 8).
Add Station "*XX+XX*" [Yes/No/Undo] <Yes>: **Y**es, or press ENTER to create station text *XX+XX,* **N**o to end, or **U**ndo.

Example

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4.16.5.1.1 Profile Label Options

Create, modify, or select a Create Profile View (Profile Grid) and set drawing setting for profile creation.

The starting station, elevation location, vertical scale and direction are determined by the profile setup block. Multiple profiles can be created within one file, but each profile requires its own profile setup block.

Supports default profile view included with SmartDraft.

Note: The label is a Dynamic Block.

Dialog Box Options

Datum

Datum:	Select a Profile Datum (profile datum block).
New:	Create a new profile datum setup block.
Edit:	Modify the data of the selected profile datum setup block.
Erase:	Delete the selected profile datum block from the drawing. Does not delete the associated profile linework.

4.16.5.2 Profile Elevation Labels

Create profile elevation labels.

Overview

Label elevations within the profile grid.

Profile Tools toolbar on the SmartDraft Tools toolbar:
SmartDraft menu ▸ Profile ▸ Label Elevations

Command:

Profile Setup Options dialog box will appear.

Create or select a profile view

Select options.

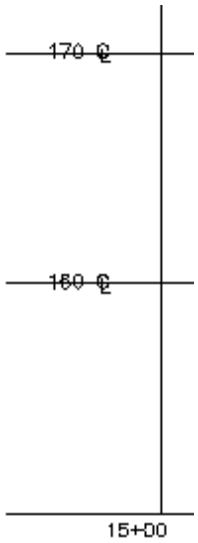
Settings used from profile setup: Profile Datum, Labeling: Profile Location, Elevation Prefix and Suffix. All other settings are ignored.

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Profile Name base station: <*datum station*>, elevation: <*datum elevation*>, and direction: <*Left to Right / Right to Left*>

Enter starting elevation <*default* >: Enter an elevation value, or press ENTER to accept default.
Enter elevation increment <10>: Enter a value, or press ENTER to accept default.
Station Location for First Column of Elevations <*XXX*>: Enter the station location to place the elevation text.
Station Location for Second Column of Elevations: Enter a second station location to place the elevation text.
Add Elevation "*XXX*" [Yes/No/Undo] <Yes>: **Y**es, or press ENTER to create elevation text *XXX,* **N**o to end, or **U**ndo.

Example



4.16.6 Utility Tools

4.16.6.1 Vault

Create vault.

Utility Miscellaneous toolbar on the Utility Tools toolbar: , , and
SmartDraft menu ▸ Utility Miscellaneous ▸ Gas Vault, Electric Vault, and Telephone Vault

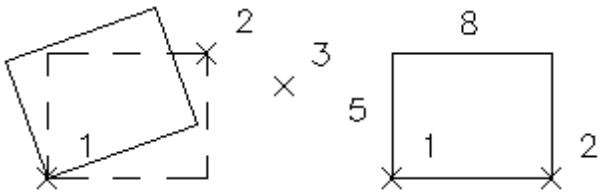
Command:

Specify first corner: Specify a point (1).
Specify other corner or [Dimensions]>: Specify a point (2) or **D** to specify a width and height.
Specify rotation angle: Select an angle by specifying a point (3).

By **Dimensions**
Specify width of rectangle: **8** Specify a value.
Specify length of rectangle <*current*>: **5** Specify a value.
Specify rotation angle: Select an angle by specifying a point (2).

Example

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4.16.6.2 Guy-pole

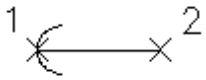
Create guy-pole and tie.

Utility Miscellaneous toolbar on the Utility Tools toolbar:
SmartDraft menu ▸ Utility Miscellaneous ▸ Guy-pole

Command:

Specify Guy-pole/wire location: Specify a point (1).
Select Powerpole: Specify a point (2).

Example



4.16.6.3 Storm Drain Pipe Edges

Offset pipe edges from centerline of pipe.

Utility Storm Drain toolbar on the Utility Tools toolbar:
SmartDraft menu ▸ Utility Storm Drain ▸ Pipe Edges
Command entry: **sdp**

Command:

Select All Storm Drain centerlines of equal diameter:

Select objects: Select pipeline centerline objects (1, 2, etc...), and press ENTER.

Enter pipe size in inches (millimeters, if metric drawing): Enter a value (D1).

Example



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4.16.6.4 Curb Inlet with Wings

Create curb inlet with wings.

Utility Storm Drain toolbar on the Utility Tools toolbar: and
SmartDraft menu ▸ Utility Storm Drain ▸ Curb Inlet one wing or two wings

Command:

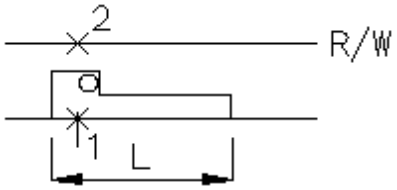
Specify intersection of Storm Drain and curb: Specify a point (1). *Default osnap is **INT**ersection.*

Select Right-of-way: Specify a point (2). *Default osnap is **PER**pendicular.*

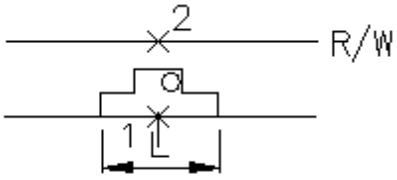
Specify L length: **15** Enter a length.

Specify Wing direction along Right-of-way. [Left/Right] <Right>: Specify a direction, or press ENTER to accept default.

Example



Example dual



4.16.6.5 Catch Basin

Create catch basin block.

Utility Storm Drain toolbar on the Utility Tools toolbar: and
SmartDraft menu ▸ Utility Storm Drain ▸ Catch Basin 1, or Catch Basin 2

Command:

Specify insertion point: Specify a point.

Specify rotation angle: Specify a point, or press ENTER for 0.

4.16.6.6 Area Drain

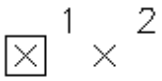
Create area drain block.

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Utility Storm Drain toolbar on the Utility Tools toolbar:
SmartDraft menu ▸ Utility Storm Drain ▸ Area Drain

Command:
Enter Width of CB (inches): **24** Enter a value.
Enter Depth of CB <*default*>: **24** Enter a value, or press ENTER to accept default.
Specify insertion point: Specify a point (1).
Specify rotation angle: Specify a point (2), or press ENTER for 0.

Example



4.16.6.7 Storm Drain Cleanout

Create clean out block.

Utility Storm Drain toolbar on the Utility Tools toolbar:
SmartDraft menu ▸ Utility Storm Drain ▸ Clean Out

Command:
Specify insertion point: Specify a point.
Specify rotation angle: Specify a point, or press ENTER for 0.

4.16.6.8 Junction Structure No 2

Calculate, label, and create Junction Structure No 2.

Command calculates required values, labels required values, and creates structure in planview.

Command for Riverside County, California - Junction Structure No. 2 (Standard Drawing JS227 - Dated 5/19/1972), City of Riverside Standard Drawing 421, and Los Angeles County Flood Control District Standard 2-D112.

Utility Storm Drain toolbar on the Utility Tools toolbar:
SmartDraft menu ▸ Utility Storm Drain ▸ Junction Structure No 2
Command entry: **js2**

Dialog Box Options

Junction Structure:

Station/Label: Specify a label or station to identify the structure.
Input Values

Elevation @ INT: Specify the elevation of the main at the intersection of the main and lateral.
A (DD.MMSS): Specify an angle or select button to get the angle from the drawing.

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B (Lateral):	Specify the diameter of the lateral.
T:	The T value is the table from the standard drawing table.
Slope %:	Specify the slope of the lateral.
D (Main):	Specify the diameter of the main.
Precision:	Specify the output precision.
Calculated Values:	See calculation methods and tables used to calculate J, C, E, F, G, L, Elevation R, and Elevation S.

Buttons

Run:	Calculate values based on input values.
Clear:	Clear specified input values.
Label:	Create text labels in the drawing based on input and calculated values.
Draw:	Create planview drawing of structure from input and calculated values.
Open:	Retrieve input values from a saved junction structure (.js) file.
Save:	Save input values to a junction structure file (.js).
Close:	Specify the output precision.

A (DD.MMSS): button

Specify intersection of main and lateral: Select the centerline intersection point of the main and lateral (P1). *Default osnap is **INT**ersection.*

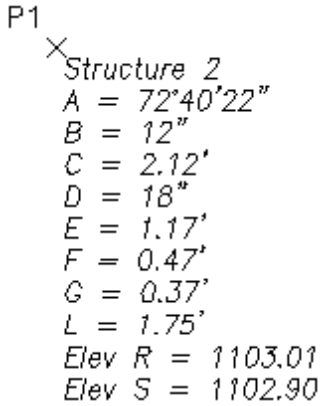
Specify point along main: Select a point on the main (P2). *Default osnap is **NEA**rest.*

Specify point along lateral: Select a point on the lateral (P3). *Default osnap is **NEA**rest.*

Angle calculated from the three points is entered into the A (DD.MMSS): edit box.

Label: button

Specify insertion point for upper left corner: Specify a point (P1)



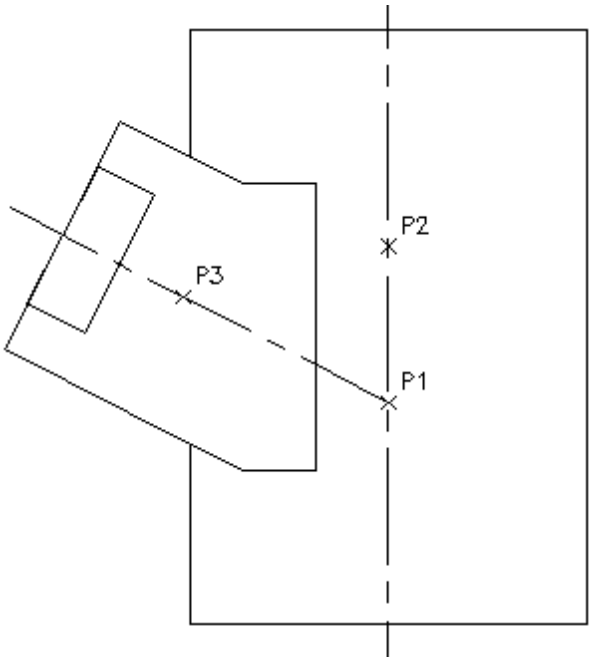
Draw:

Specify intersection of main and lateral: Select the centerline intersection point of the main and lateral (P1). *Default osnap is **INT**ersection.*

Specify point along main: Select a point on the main (P2). *Default osnap is **NEA**rest.*

Specify point along lateral: Select a point on the lateral (P3). *Default osnap is **NEA**rest.*

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4.16.6.8.1 Junction Structure: Tables

[Junction Structure](#)
[Calculation Methods](#)

Table of Values for T

B	T
12"	4"
15"	4 1/4"
18"	4 1/2"
21"	5"
24"	5 1/4"
27"	5 1/2"
30"	6"
33"	6 1/4"
36"	6 1/2"
39"	7

Pipe thickness values for Main pipe are read from the js2.ini file located in the <Program root>\LSP folder. Default wall thickness values are:

Pipe	Thickness inches	Thickness decimal
12	2	0.1667
15	2 1/4	0.1875
18	2 1/2	0.2083
21	2 3/4	0.2292
24	3	0.2500
27	3 1/4	0.2708
30	3 1/2	0.2917

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33	3 3/4	0.3125
36	4	0.3333
39	4 1/4	0.3542
42	4 1/2	0.3750
45	5 1/4	0.4375
48	5 3/4	0.4792
51	6	0.5000
54	6 1/4	0.5208
57	6 1/2	0.5417
60	6 3/4	0.5625
63	7	0.5833
66	7 1/4	0.6042
69	7 1/2	0.6250
72	7 3/4	0.6458
75	8	0.6667
78	8 1/4	0.6875
81	8 1/2	0.7083
84	8 3/4	0.7292
87	9	0.7500
90	9 1/4	0.7708
93	9 1/2	0.7917
96	9 3/4	0.8125

4.16.6.8.2 Junction Structure: Calculation Methods

Junction Structure
Tables

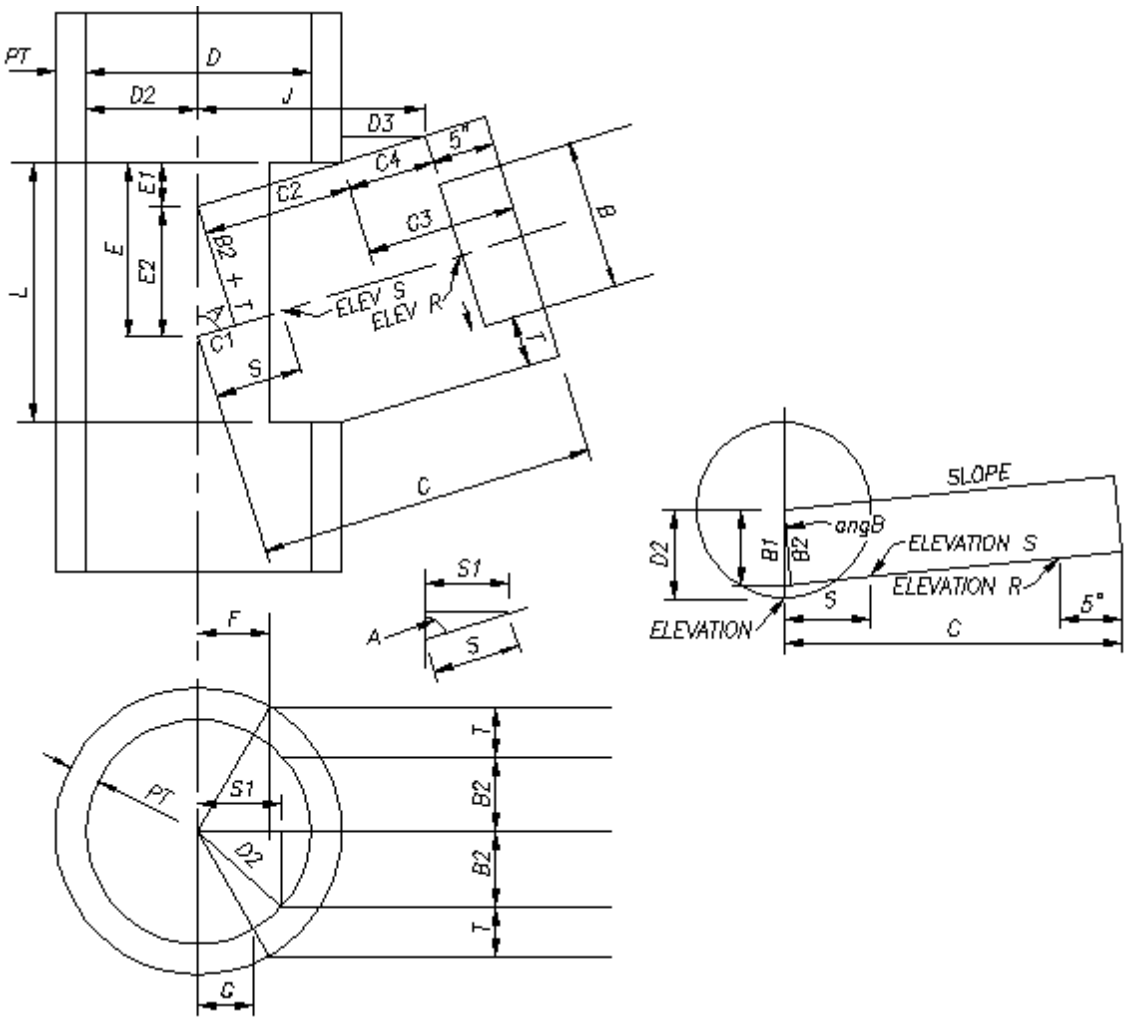
Input values:
angA, B, D, Slope, Elevation
B radius = B/2 = B2
D radius = D/2 = D2
D pipe thickness from table = PT
T from table
S = Distance from intersection point to Elevation S Point

Calculated Values: See figure below
C1 = (D2 + PT) / Sin angA
C2 = (B2 + T) / Tan angA
C3 = C4 + 0.4167 (5")
D3 = (J - (D2 + PT))
C4 = D3 / Sin angA
C = C1 + C2 + C3
angD = Acos ((B2 + T) / (D2 / PT))
E1 = (D2 + PT) / Tan angA
E2 = (B2 + T) / Sin angA
E = E1 + E2

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F = Square root ($(D2 + PT)^2 - (B2 + T)^2$))
G = (Sin angD) * D2
J = 7D / 12 + 0.5 (6")
L = E2 + E2

S1 = Square root ($D2^2 - B2^2$)
S = S1 / Sin angA
angB = Atan (Slope / 100)
B1 = B2 / Cos angB
Elevation S = (Elevation + D2 - B1) + (S * Slope)
Elevation R = (Elevation + D2 - B1) + ((C -S - 0.4167) * Slope)



4.16.6.9 Air Release Valve

Create air release valve with lateral.

Utility Water toolbar on the Utility Tools toolbar:
SmartDraft menu ▸ Utility Water ▸ Air Release Valve with lateral

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Command:

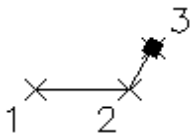
Specify point on main or [Arv/Bo]: Specify a point (1), or **A** to change to ARV block, **B** to change to BO block.

Specify next point: Specify a point (2).

Specify next point or <Enter to place symbol>: Specify a point (3).

Specify next point or <Enter to place symbol>: Specify a point (x), or press ENTER to insert the ARV symbol.

Example



4.16.6.10 Blowoff Valve

Create blowoff valve with lateral.

Utility Water toolbar:
SmartDraft menu ▸ Utility Water ▸ Blowoff Valve with lateral

Command:

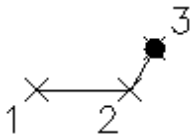
Specify point on main or [Arv/Bo]: Specify a point (1), or **A** to change to ARV block, **B** to change to BO block.

Specify next point: Specify a point (2).

Specify next point or <Enter to place symbol>: Specify a point (3).

Specify next point or <Enter to place symbol>: Specify a point (x), or press ENTER to insert the BO symbol.

Example



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4.16.6.11 Check Valve

Create check valve block.

Utility Water toolbar on the Utility Tools toolbar:
SmartDraft menu ▸ Utility Water ▸ Check Valve

Command:

Specify insertion point: Specify a point.

Specify rotation angle: Specify a point, or press ENTER for 0.

4.16.6.12 Sewer Cleanout

Create cleanout block.

Utility Sewer toolbar on the Utility Tools toolbar:
SmartDraft menu ▸ Utility Sewer ▸ Cleanout

Command:

Specify insertion point: Specify a point.

Specify rotation angle: Specify a point, or press ENTER for 0.

4.16.6.13 Sewer Manhole

Create manhole block.

Utility Sewer toolbar on the Utility Tools toolbar:
SmartDraft menu ▸ Utility Sewer ▸ Manhole

Command:

Specify insertion point: Specify a point.

Specify rotation angle: Specify a point, or press ENTER for 0.

4.16.6.14 Sewer Plug

Create plug block.

Utility Sewer toolbar on the Utility Tools toolbar:
SmartDraft menu ▸ Utility Sewer ▸ Plug

Command:

Specify insertion point: Specify a point.

Specify rotation angle: Specify a point, or press ENTER for 0.

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Part V

5 Customization

5.1 Customization Templates (Overview)

SmartDraft uses Customization Templates as a means to organize and maintain standard settings for associated drawings. These templates determine the basic drawing settings, such as decimal precision, dimension variables, text styles, and other settings. Likewise, they determine global settings, such as layer names and properties, block libraries, new drawing settings, and labeling styles. Template data files include the layer database, labeling styles, make layer list, point layer list, profile layer list, template description file, new drawing settings, special linetypes, user defined blocks, and block and AutoLISP Manager files. Also, templates allow user defined blocks to be substituted for the blocks used by SmartDraft and supplied during installation. Template data files are managed using the Customization Template Manager, Labeling Style Manager, Labeling Table Style Manager, and Block and Detail Manager.

Customization Templates

- Multiple drawings can be associated to the same template, even drawings from different projects.
- All drawings associated to a template share the same global settings such, as the layer database, new drawing settings, and user defined blocks.
- A drawing can only be associated to one template, but the associated template can be changed at any time using Drawing Setup.
- A drawing stays associated to the template originally assigned to it as long as the template remains in the Customization Template folder. If the associated template is deleted, moved, or renamed, SmartDraft uses the data files in the template named "DEFAULT."
- A new drawing is associated to the current User Customization Template. Each operator can set his own User Customization Template via User Options.
- The New Drawing Settings are copied to the drawing so they can be modified independently of any other drawing associated to the same template.
- Whenever you associate or reassociate a drawing to a Customization Template, the New Drawing Settings are copied to the drawing.
- The Customization Template's file location path is set using Program Options and by default is the sub-folder **\TEMPLATE** in SmartDraft's installation folder. When a new template is created, a sub-folder is created in the Customization Template location. For example, if you create a new template named **Water Department**, then the template folder will be **...\TEMPLATE\Water Department**.
- It is not recommended to use Windows Explorer to create Customization Template folders. Use the Customization Template Manager to ensure the proper data files are copied into the new template.
- To rename a template folder, use Windows Explorer. Do not rename a template folder once operators start associating drawings to it.
- The files created by the Customization Template Manager can be password protected. See Password Setup.

The Customization Template Manager is used to edit the following files:

Type:	File name:	
Template Description	project.ini	
Layer Database	layer.txt	See Layer Database Overview
Make Layer List	laycr.cly	See Layer Make
Offset Street Layer List	laycr.oly	See Offset Street
Profile Layer List	laycr.ply	See the Profile Layer list of the Profile Setup Options
Point Layer List	laycr.tly	See Point Options
New Drawing Settings	drawing.ini	For drawings with unit type set to Feet

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	drawingM.ini	For drawings with unit type set to Meters
User Defined Blocks	*.dwg	See User Defined Blocks
Files located in the sub-folder <Template Name>\LABELS		
Area Table Styles	*.asy	See Area Table Style Manager
Coordinate Table Styles	*.csy	See Coordinate Table Style Manager
Alignment Station and Offset Label Style	*.aosy	See Alignment Station and Offset Labels
PBlock Style	*.bsy	See PBlock Style Manager
Description Key Styles	*.dsy	See PConnect Description Key Style Manager
Templates	*.zsy	See PConnect Template Manager
Elevation Label Styles	*.esy	See Elevation Label
Planview Label Manual Styles	*.nsy	See Planview Label Manual
Labeling Styles	*.lsy	See Labeling Style Manager
Labeling Table Styles	*.tsy	See Labeling Table Style Manager
Offset Street Styles	*.osy	See Offset Street
Offset Street Fillet Styles	*.fsy	See Offset Street Fillet
Legal Description Options Styles	*.lgl	See Legal Description Options Style Manager

The Block Manager is used to edit the following files:

Block Manager	*.bdb
Details on Planview TB	details.bdb
Design Tools Blocks	design.bdb
Field and Courts	fields.bdb
Miscellaneous Utility Blocks	utmisc.bdb
Planview Blocks	planview.bdb
Profile Blocks	profile.bdb
Sewer Blocks	sewer.bdb
Storm Drain Blocks	storm.bdb
Traffic Blocks	traffic.bdb
Water Blocks	water.bdb

The Block and Detail Manager and Block and Detail Category File Manager

Folder Variable File	BKeeper.ini

Borders Toolbar

Improvement	border1.bdb
Grading	border8.bdb
Water	border6.bdb
Sewer	border7.bdb
Mapping	border2.bdb
Miscellaneous	border5.bdb

The AutoLISP Manager is used to edit the following files:

AutoLISP Manager	*.ldb

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Grading Tools	grade.ldb

Load customization template linetypes using Load Linetypes:

Custom Linetypes	custom linetypes

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5.2 Network Options

SmartDraft can be installed on a network drive and shared with all operators in an office (Site License Required). We recommend this installation method for companies with many operators. When SmartDraft is installed on a network drive, common customization templates can be shared with all operators on the network. Also, the default customization template, and default user options can be set. The CAD Manager can password protect the Program Options and Customization Template Manager.

Advantage of network installation:

- Can use site license to authorize all operators from a single location.
- Can update the program from a single location.
- Can set default customization template name.
- Can set default user options.

Site (Network) License:
Copy the provided license file (smartdraft12.lic) to SmartDraft's installation folder. The default installation folder is drv:\Program Files\SmartDraft. When this file is located on a network drive, it will provide the serial number and authorization to any operator loading the smartsuite.cuix menu.

Network Installation Note:

Customization Templates are located in SmartDraft's installation sub-folder \template. To create and maintain customization templates, the operator must have read and write access to this folder and its sub-folders. The ... \template folder can be moved and/or renamed. If the folder location is moved and/or renamed, the "Customization Template" path must be edited to reflect the correct folder. Use Program Options to edit the "Customization Template" path. This path is saved in the SmartDraftSetup.ini file in SmartDraft's installation folder.

Example of the customization template line in the SmartDraftSetup.ini file:

[Program]

TemplateFdlr=C:\PROGRAM FILES\SMARTDRAFT\TEMPLATE customization template folder location is after the =

Additional Network information:

To password protect SmartDraft's customization settings: See Password Setup.

To set up default network options: See Program Options.

To set up new customization templates or files within the template: See Customization Template Manager.

5.2.1 Password Setup

Add or change the password protection for customization templates, program setup, and default user options.

When you password-protect SmartDraft, no one can access the customization template manager, program options, or network defined default user options unless they know the password.

Note: Password is case sensitive.

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Command entry: **smartpw**

Dialog Box Options

Current: If there is a current password, type it to allow a new password to be entered.
New: Type a new password.
Confirm: Type the new password again to confirm.

5.2.2 Creating strong passwords

To help keep your SmartDraft customization templates more secure, you should use a strong password.

For a password to be strong, it should:

- Be at least seven characters long. Because of the way passwords are encrypted, the most secure passwords are seven or 14 characters long.
- Contain characters from each of the following three groups:

Group	Examples
Letters (uppercase and lowercase)	A, B, C... (and a, b, c...)
Numerals	0, 1, 2, 3, 4, 5, 6, 7, 8, 9
Symbols (all characters not defined as letters or numerals)	` ~ ! @ # $ % ^ & * ( ) _ + - = { } | [ ] \ : " ; ' < > ? , . /

- Include at least one symbol character in the second through sixth positions.
- Be significantly different from prior passwords.
- Not contain your name or user name.
- Not be a common word or name.

Passwords can be the weakest link in a computer security scheme. Strong, hard-to-guess passwords are important because the tools and computers that people use to guess passwords continue to improve. Network passwords that once took weeks to guess can now be guessed in hours.

Password-guessing software uses one of three approaches: intelligent guessing, dictionary attacks, and automation that tries every possible combination of characters. Given enough time, the automated method can guess any password. However, it can still take months to guess a strong password.

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5.3 Open Drawing Folder

Open Windows File Explorer to the folder of the current drawing

Command entry: **odf**

5.4 SmartDraft Tab

Display the SmartDraft Ribbon tab in the current workspace

Note: Does not display SmartDraft Ribbon tab if the current workspace is read-only.

Supports:

AutoCAD Products:	Yes
BricsCAD Pro:	No

Command entry: **smarttab**

Command: **smarttab**
Unloading: <menuname>
Reloading: <menuname>

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5.5 Change SmartDraft Menus

Change SmartDraft within AutoCAD

The following commands provide tools to change between SmartDraft menus after SmartDraft one of the SmartDraft menus has been loaded.

If the SmartDraft Ribbon tab is not displaying see SmartDraft Tab.

Command entry:

SmartSuite	Change to the SmartDraft Suite cuix which includes the optional tools PConnect, and HEC-RAS.
SmartSurvey	Change to the SmartDraft Survey cuix which includes the optional tool PConnect.
SmartCnote	Change to the SmartDraft Construction Notes cuix.

Once the menu has changed, we recommend closing and reopening AutoCAD / BricsCAD..

5.6 Customization Guide Appendix

Customization Layer and Block Guide.

This document lists the layer indexes and/or blocks associated to each SmartDraft command.

This document will help with customizing SmartDraft more quickly.

Use this information when modifying the Layer Database or creating user defined blocks.

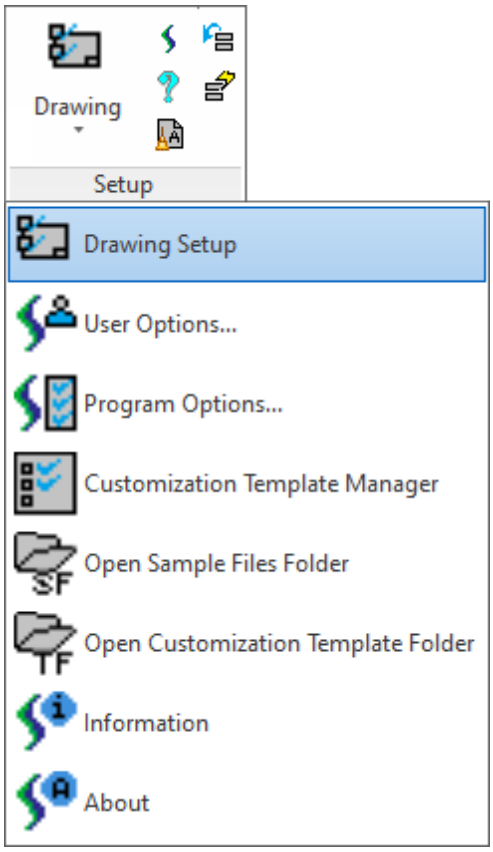
Use the Customization Template Manager to modify or print the Layer Database, Make Layer, Profile Layer, Point Layer, and Offset Street lists.

Setup Panel
Grading Panel
HEC-RAS Panel
Inquiry Panel
Labeling Panel
Labeling Override Tools Toolbar
Layer Panel
Layout Panel
Planview Panel
Points Panel
Polylines Panel
Profile Panel
Text Panel
View Panel

Details for each command on the panels:

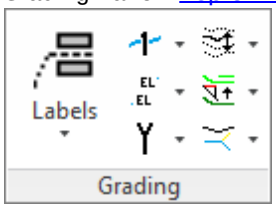
Setup Panel - Top of Page

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No layer indexes or block names for this panel.

Grading Panel - Top of Page



Command	Index(es)	Block name(s)	Style
Elevation Flag Manual	**Text**	PV-LABEL-X.dwg	Planview Small
	80 - Proposed	PV-LABEL-X-A (Annotative)	
	81 - Existing		
	80 - Demo		
	Leader		
	354 - Proposed, Demo		
	279 - Existing		
Elevation Label	**Text**	PV-LABEL-X.dwg	Planview Small
	80 - Proposed	PV-LABEL-X-A (Annotative)	
	81 - Existing		

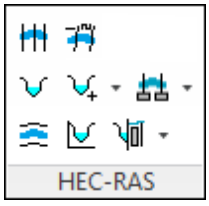
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	80 - Demo		
	Leader		
	354 - Proposed, Demo		
	279 - Existing		
Elevation Label - Lot Line Text	80 - Proposed	G-LABEL-LLX.dwg	Planview Small
	81 - Existing	G-LABEL-LLX-A (Annotative)	
	80 - Demo		
Label Slope Manual	80 - Proposed	G-SLPX.dwg	Planview Small
	81 - Existing	G-SLPX-A (Annotative)	
	80 - Demo		
Label Slope (One Point)	80 - Proposed	G-SLPX.dwg	Planview Small
	81 - Existing	G-SLPX-A (Annotative)	
	80 - Demo		
Label Slope (Two Point)	80 - Proposed	G-SLPX-2.dwg	Planview Small
	81 - Existing	G-SLPX-2-A (Annotative)	
	80 - Demo		
Spot Elevation	320 - Proposed	SPOT-EL.dwg	
	321 - Existing	SPOT-EL-A (Annotative)	
	320 - Demo		
Interpolate	301 - All types	INTERP.dwg	
Interpolate Contours	320 - Proposed	SPOT-EL.dwg	
	321 - Existing		
	320 - Demo		
Calculate Slope	**Spot**	SPOT-EL.dwg	
	320 - All types		
	Slope		Planview Small
	80 - Proposed		
	81 - Existing		
	80 - Demo		
Calculate Elevation			
	Spot	SPOT-EL.dwg	
	320 - All types		
	Point	POINT.dwg	
	Point layer set in point options		
	Text		Planview Small
	Current layer		

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Label Contours	78 - Proposed		Planview Small
	79 - Existing		
	78 - Demo		
Adjust Elevation			
Edit Object's Elevation			
Slope Symbol	292 - Proposed		
	293 - Existing		
	294 - Demo		
Toe of Slope	289 - Proposed		
	290 - Existing		
	291 - Demo		
FL Arrow	302 - All types	G-FLAR.dwg	
		G-FLAR-A.dwg (Annotative)	
Daylight	303 - All types	G-DL.dwg	
Cut / Fill	319 - All types	G-CF.dwg	
Brow Ditch	295 - All types	G-BD.dwg	

HEC-RAS Panel - Back to Customization Guide Appendix



Command	Index(es)	Block name(s)	Style
HEC Application Loader			
Create Sample Lines or Polylines along an alignment	214 - For all types		
Sample Lines Tool	Uses the Sample Line Style		
Create HEC-RAS Data			
Add Sections to a HEC-RAS Project			
Add River / Reach to a HEC-RAS Project			
Create HEC-RAS Planview Sections Lines and Labels	213 - For all types	PV-XSL.dwg	Planview Small
Create HEC-RAS Floodplain Lines	215 - For all types		
Create HEC-RAS Cross Sections	208 - Section Grid Text	P-HGL.dwg	
	209 - Section Grid Lines		

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	210 - Section Labels		
	211 - Section Ground		
	212 - Water Surface		
Create HEC-RAS Water Surface Profile	Uses the Profile Style		
Label HEC-RAS Water Surface Profile	Leader of Label		
	217 - All types	P-SLABEL.dwg	
	Text of Label		
	281 - For all types		Profile Small

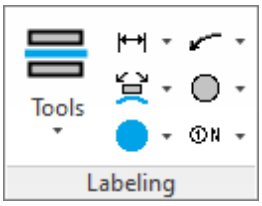
Inquiry Panel - Back to Customization Guide Appendix



Command	Index(es)	Block name(s)	Style type
Distance			
Measure Angle			
ID Points			
Inverse Points			
ID Elevation			
Length (Add)			
List			
Area	75 - Proposed		Planview Small
	76 - Existing		
	75 - Demo		
If index 75 / 76 are not defined	55 - Proposed		Planview Small
	56 - Existing		
	55 - Demo		
Area by Point	Same as above		
If Polyline to remain	Current layer		
List Object			
Tangency Report			

Labeling Panel - Back to Customization Guide Appendix

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Command	Index(es)	Block name(s)	Style type
Labeling	68 - Text		Planview Small
	73 - Leader		
Labeling Tags Tool			
Create Labeling Table			
73 - Leader			
65 - Table Lines	68 - Text		Planview Small

Command	Index(es)	Block name(s)	Style
Arc Leader	73 - Proposed		
	74 - Existing		
	73 - Demo		
Straight Leader	73 - Proposed		
	74 - Existing		
	73 - Demo		
Add Continuation Symbol	Layer of selected object	D-CTS.dwg	
		D-CTS-A (Annotative)	
Add Arrowhead	73 - Proposed	SM_ARR.dwg	
	74 - Existing	SM_ARR-A (Annotative)	
	73 - Demo		
Create a Break Symbol	Layer of selected object	D-B.dwg	
		D-B-A (Annotative)	
Pipe Crossing Symbol	Layer of selected object	D-PX.dwg	

Command	Index(es)	Block name(s)	Style
Radial Bearing	68 - All types	PV-LABEL-X.dwg	Planview Small
		PV-LABEL-X-A (Annotative)	
ALTA Labels	68 - All types		Planview Small

Command	Index(es)	Block name(s)	Style
Rotate along Arc			
Change Bearing Direction			
Change Label Direction			
Reposition Labels			

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Change Labeling Precision

Scale Labels

Command	Index(es)	Block name(s)	Style type
Circle	55 - Proposed 56 - Existing 55 - Demo	D-C1.dwg D-C1-A (Annotative)	Planview Small
Square	Same	D-S1.dwg D-S1-A (Annotative)	Planview Small
Triangle	Same	D-T1.dwg D-T1-A (Annotative)	Planview Small
Hexagon	Same	D-H1.dwg D-H1-A (Annotative)	Planview Small
Keyhole	Same	D-KH1.dwg D-KH1-A (Annotative)	Planview Small
Diamond	Same	D-D1.dwg D-D1-A (Annotative)	Planview Small
Oval	Same	D-O1.dwg D-O1-A (Annotative)	Planview Small
Pentagon	Same	D-P1.dwg D-P1-A (Annotative)	Planview Small
Star	Same	D-ST1.dwg D-ST1-A.dwg	Planview Small
Rectangle	Same	D-R1.dwg D-R1-A.dwg	Planview Small

Command	Index(es)	Block name(s)	
Crow's Feet - Automatic	61 - All types	Arrow in left	
		D-AL, D-AL2, and D-AL3	Position 1, 2, and 3
		Arrow in right	
		D-AR, D-AR2, and D-AR3	Position 1, 2, and 3
		Arrow out left	
		D-ALO, D-AL2O, and D-AL3O	Position 1, 2, and 3
		Arrow out right	
		D-ARO,D-AR2O, and D-AR3O	Position 1, 2, and 3

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		No arrow left	
		D-ALN, D-AL2N, and D-AL3N	Position 1, 2, and 3
		No arrow right	
		D-ARN, D-AR2N, and D-AR3N	Position 1, 2, and 3
Crow's Feet - Erase			
Crow's Feet - Manual	Same as Automatic	Same as Automatic	
Directional Arrow	61 - All types	D-A.dwg	Break type
		D-A1.dwg	No break

Command	Index(es)	Block name(s)
Solid Circle	166 - Proposed	FM-M1.dwg
	167 - Existing	FM-M1-A (Annotative)
	168 - Demo	
Half Circle	Same	FM-M2.dwg
		FM-M2-A (Annotative)
Open Circle	Same	FM-M3.dwg
		FM-M3-A (Annotative)
Double Circle	Same	FM-M4.dwg
		FM-M4-A (Annotative)
Double Circle Solid	Same	FM-M12.dwg
		FM-M12-A (Annotative)
Cross Circle	Same	FM-M10.dwg
		FM-M10-A (Annotative)
Solid Square	Same	FM-M5.dwg
		FM-M5-A (Annotative)
Open Square	Same	FM-M6.dwg
		FM-M6-A (Annotative)
Double Square	Same	FM-M7.dwg
		FM-M7-A (Annotative)
Double Square Solid	Same	FM-M13.dwg

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		FM-M13-A (Annotative)
Square Circle Solid	Same	FM-M14.dwg
		FM-M14-A (Annotative)
Cross Square	Same	FM-M11.dwg
		FM-M11-A (Annotative)
Solid Triangle	Same	FM-M8.dwg
		FM-M8-A (Annotative)
Open Triangle	Same	FM-M9.dwg
		FM-M9-A (Annotative)
Triangle Circle Solid	Same	FM-M15.dwg
		FM-M15-A (Annotative)

Command	Index(es)	Block name(s)	Style
Dimension	61 - All types		Dimension Text
Dimension Truncate	61 - All types		Dimension Text
Dimension with Prompt	61 - All types		Dimension Text
Dimension without Leader	61 - All types		Dimension Text
Dimension Outside	61 - All types		Dimension Text
Dimension Arc	61 - All types		Dimension Text
Dimension Text - Alternate Units	61 - All types		Dimension Text

Labeling Override Tools - Back to Customization Guide Appendix



Uses current label style's settings.

Command	Index(es)	Block name(s)	Style
Labeling Style Manager	Per Style		
Labeling Table Style Manager	Per Style		

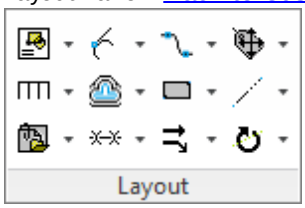
Layer Panel - Back to Customization Guide Appendix

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No layer indexes or block names for this panel.

Layout Panel - Back to Customization Guide Appendix



Command	Index(es)	Block name(s)	Style
Change Length			
Change Angle			
Line Tangent to Arc	Current layer		
Line Tangent Two Arcs	Current layer		
Line Perpendicular	Current layer		
Line Bisect	Current layer		
Line By Turned Angle	Current layer		
Arc Tangent to Line	Current layer		
Reverse Curves	Current layer		
Lot Lines	5 - Proposed		
	6 - Existing		
	7 - Demo		
Cul-De-Sac	**Right-of-way**		
	17 - Proposed		
	18 - Existing		
	19 - Demo		
	Curb		
	26 - Proposed		
	27 - Existing		
	28 - Demo		
	Centerline		
	23 - Proposed		
	24 - Existing		
	25 - Demo		
Knuckle	**Right-of-way**		
	17 - Proposed		

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	18 - Existing		
	19 - Demo		
	Curb		
	26 - Proposed		
	27 - Existing		
	28 - Demo		
Driveway Wing	237 - Proposed		
	238 - Existing		
	239 - Demo		
Pedestrian Ramp	46 - Proposed		
	47 - Existing		
	48 - Demo		

Command	Index(es)	Block name(s)	Style
Parking Spaces	32 - Proposed		
	33 - Existing		
	34 - Demo		
Parking Spaces along Polyline	Same as above		
Parking Spaces Count	Same as above or Current	D-SPC.dwg, TC-HC.dwg, and TC-HCS.dwg	
Laterals along Alignment	55 - Proposed		
	56 - Existing		
	55 - Demo		

Command	Index(es)	Block name(s)	Style
Offset Multiple			
Offset Current			
Offset Block			
Offset Street	Per layers in laycr.oly		
Offset 3D Polyline			

Command	Index(es)	Block name(s)	Style
Rectangle	Current layer		
Rectangle / Shadow Box	Current layer		

Command	Index(es)	Block name(s)	Style
Open Xref			
Xref Attach	276 - If <X> is in the name, the Xref will be substituted in its place. The default is X-<Xref filename>		

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Xref Overlay	276 - If <X> is in the name, the Xref will be substituted in its place. The default is X-<Xref filename>		
Xref Overlay2	276 - If <X> is in the name, the Xref will be substituted in its place. Default is Xref.		
Xref Overlay Multiple	276 - If <X> is in the name, the Xref will be substituted in its place. The default is X-<Xref filename>		
Xref Match XCLIP			
Xref Color Screen			

Command	Index(es)	Block name(s)	Style
Chainlink Fence	254 - Proposed	D-X.dwg	
	255 - Existing		
	256 - Demo		
Circle Symbol Fence	269 - Proposed	D-O.dwg	
	270- Existing		
	271 - Demo		
Retaining Wall	251 - Proposed		
	252 - Existing		
	253 - Demo		
Retaining Wall	251 - Proposed	D-RW.dwg	
	252 - Existing		
	253 - Demo		
Demolition Symbol	77 - All types	D-DEMO.dwg	
Abutment Symbol	20 - Proposed	FM-ABR.dwg	
	21 - Existing		
	22 - Demo		

Command	Index(es)	Block name(s)	Style
Arrows	52 - Proposed		
	53 - Existing		
	54 - Demo		
Word Signs	52 - Proposed		
	53 - Existing		
	54 - Demo		
Caution Signs	49 - Proposed		

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	50 - Existing	
	51 - Demo	
Warning Signs	49 - Proposed	
	50 - Existing	
	51 - Demo	
Regulatory Signs	49 - Proposed	
	50 - Existing	
	51 - Demo	
Barricade	272 - Proposed	TC-B.dwg
	273 - Existing	
	274 - Demo	
Cone	49 - Proposed	TC-D.dwg
	50 - Existing	
	51 - Demo	
Stop Sign	49 - Proposed	I-S3.dwg
	50 - Existing	
	51 - Demo	
Street Sign	49 - Proposed	I-S1.dwg
	50 - Existing	
	51 - Demo	
Guard Post	49 - Proposed	I-S2.dwg
	50 - Existing	
	51 - Demo	

Command	Index(es)	Block name(s)	Style
Fillet 3 Limits	Layer of first selected object		

Planview Panel - Back to Customization Guide Appendix



Command	Index(es)	Block name(s)	Style
Label Alignment Stationing	66 - All types	I-STA.dwg	Planview Small
Label Alignment Stations and Offsets	**Text**	PV-LABEL1-X.dwg	Planview Small
	80 - Proposed		
	81 - Existing		

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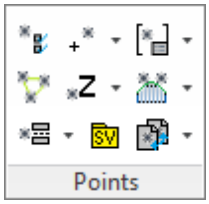
	80 - Demo		
	Leader		
Alignment Station Intersection Label	**Text**	PV-LABEL-X.dwg	Planview Small
	80 - Proposed	PV-LABEL-X-A (Annotative)	
	81 - Existing		
	80 - Demo		
	Leader		
	354 - Proposed, Demo		
	279 - Existing		
Laterals along Alignment	Current layer		
Planview Label Manual	**Text**	PV-LABEL-X.dwg	Planview Small
	80 - Proposed	PV-LABEL-X-A (Annotative)	
	81 - Existing		
	80 - Demo		
	Leader		
	354 - Proposed, Demo		
	279 - Existing		
Create 3D Polyline from Profile	206 - All types		
Endpoint Ticks	Layer of selected object	D-TM.dwg	
Label Coordinates	69 - All types		Planview Small
North Arrow	165 - All types	D-N.dwg	
		D-N-A.dwg (Annotative)	
		D-N1.dwg	
		D-N1-A.dwg (Annotative)	
		D-N2.dwg	
		D-N2-A.dwg (Annotative)	
		D-N3.dwg	
		D-N3-A.dwg (Annotative)	
Barscale	55 - Proposed	D-BS-4.dwg (4 units)	
	56 - Existing	D-BS-3.dwg (3 units)	
	55 - Demo	D-BS-2.dwg (2 units)	
		D-BS-1.dwg (1 units)	
Cross Section Label	67 - All types	D-SEC.dwg	

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	57 - All Types	D-SEC-A.dwg (Annotative) D-SEC-X.dwg D-SEC-X-A.dwg (Annotative)	Planview Medium
Detail Notes	67 - All types	D-SEC-L.dwg D-SEC-L-A.dwg (Annotative)	Planview Medium
Text of note	55 - Proposed 56 - Existing 55 - Demo		Planview Small
Grid Tick and Label	163 - All types	D-GTIC-X.dwg D-GTIC-X-A.dwg (Annotative)	Planview Small
Grid Label Display Update			
Grid Label Reposition			

Command	Index(es)	Block name(s)	Style
List Alignment Stations and Elevations			
Crossing Alignments Stations and Elevations			

Points Panel - Back to Customization Guide Appendix

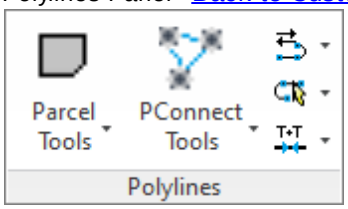


Command	Index(es)	Block name(s)	Style
Point Options			
Manual	Point layer set in options Default 340 - All types	POINT.dwg	
Coordinates	Point layer set in options	POINT.dwg	
Setbacks	Point layer set in options	POINT.dwg	
Along objects	Point layer set in options	POINT.dwg	
Station and Offset	Point layer set in options	POINT.dwg	
Traverse	Point layer set in options Linework to current layer	POINT.dwg	
Connect Points by Polyline	Current layer		

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Coordinate Table	70 - All types		Planview Small
Point Elevation			
Point Label	**Text**	PV-LABEL-X.dwg	Planview Small
	80 - Proposed	PV-LABEL-X-A.dwg (Annotative)	
	81 - Existing		
	80 - Demo		
	Leader		
	354 - Proposed, Demo		
	279 - Existing		
Survey Working Folder			
Label Northing and Easting Difference	69 - All types	G-LABEL-NEX.dwg	Planview Small
Point Merge			
Description Find and Replace			
Zoom To			
Points List Available			
Select by Range or All			
Point Import	Point layer set in options	POINT.dwg	
Point Export			
Point to Spot Label	320 - Proposed	SPOT-EL.dwg	Planview Small
	321 - Existing		
	320 - Demo		
Delete Point Group			

Polylines Panel - Back to Customization Guide Appendix



Parcel Tools

Command	Index(es)	Block name(s)	Style
Create an Area Table	70 - Text	Planview Small	
	65 - Table lines		
Define a Parcel			
Label Parcel	64 - Lot number	Planview Small	
	75 - Proposed	Planview Small	
	76 - Existing		

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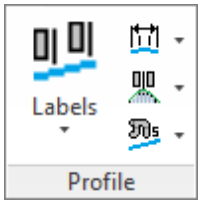
	75 - Demo		
If index 75 / 76 are not defined	55 - Proposed	Planview Small	
	56 - Existing		
	55 - Demo		
Create Reports			

PConnect Tools
Create layer per the Description Key File.

Polylines Tools
No layer indexes or block names for this panel except below

Command	Index(es)	Block name(s)	Style
Create 3D Polyline	206 - All types		
Create Polyline with Arcs - Tree or Brush Line	Current layer		

Profile Panel - Back to Customization Guide Appendix



Command	Index(es)	Block name(s)	Style
Station and Elevation	Text / Leader	P-LABEL.dwg	Profile Small
	175 - Proposed	D-PDM.dwg - Datum Metric	
	176 - Existing	D-PD.dwg - Datum Feet	
	175 - Demo		
	178 - All types		Profile Large
	Profile lines		
	Layer per profile layer setup and selection		
Distance and Elevation or Slope	Same as above	P-LABEL.dwg	Profile Small
Digitize	Same as above	P-LABEL.dwg	Profile Small
Profile: Station Label	Same as above	P-LABEL.dwg	Profile Small
Profile Label along the Alignment	66 - All types	I-STAPRF.dwg	
Create Alignment Labels along the Profile	Text / Leader		Profile Small
	175 - Proposed		
	176 - Existing		

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	175 - Demo		
Profile File from Points along Alignment			
Angle, Draw, Inquire, Label, and Pipe	Draw - Current		Profile Small
	Pipe - Layer of selected object		
Pipe Cut Away	Layer of selected object		
Pipe Crossing	Text / Leader		Profile Small
	175 - Proposed	D-PDM.dwg - Metric	
	176 - Existing	D-PD.dwg - Feet	
	175 - Demo		
	Pipe		
	Layer per profile layer setup		
Curb Return	Text / Leader		Profile Small
	175 - Proposed		
	176 - Existing		
	175 - Demo		
	Profile lines		
	Layer per profile layer setup and selection		
Label Cross Sections	175 - Proposed	P-LABEL.dwg	Profile Small
	176 - Existing		
	175 - Demo		
Arc Leader	175 - Proposed	SM_ARR.dwg	
	176 - Existing		
	175 - Demo		
Straight Leader	175 - Proposed	SM_ARR.dwg	
	176 - Existing		
	175 - Demo		
Profile Text	175 - Proposed		Profile Small
	176 - Existing		
	175 - Demo		
Profile Dimension	175 - Proposed		Profile Small
	176 - Existing		
	175 - Demo		
Profile Calculator			

Text Panel - Back to Customization Guide Appendix

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No layer indexes or block names for this panel except below.

Text Styles - Back to Customization Guide Appendix

Command	Index(es)	Block name(s)	Style type
SM Small Text	55 - Proposed		Planview Small
	56 - Existing		
	55 - Demo		
MD Medium Text	57 - Proposed		Planview Medium
	58 - Existing		
	57 - Demo		
LG Planview Large	59 - Proposed		Planview Large
	60 - Existing		
	59 - Demo		
FD Filled Text	322 - All types		Filled
S Shadow Text	321 - All types		Shadow
D Dashed Text	323 - All types		Dashed
SN Street Name	63 - All types		Planview Medium
L# Lot # Large	64 - All types		Planview Large
L# Lot # Shadow	64 - All types		Shadow
Text Symbols on Line	See Block Manager for info		
Text Mathematics	55 - Proposed		Planview Small
	56 - Existing		
	55 - Demo		

Masking: The masking object is placed on the layer of the object being masked.

View Panel - Back to Customization Guide Appendix



No layer indexes or block names for this panel except below.

Command	Index(es)	Block name(s)	Style

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Viewport Make	280 - All types

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5.6.1 Customization Guide Appendix Extra

Customization Layer and Block guide.

This documents the layer indexes and/or blocks associated to each SmartDraft Extra command. The document will help you customization SmartDraft more quickly. Use this information when modifying the database or creating user defined blocks.

Toolbars:
Block Manager Tools
Border Tools
Miscellaneous Tools
Planview Labeling Tools
Plants Tools
Profile Tools
Sewer Tools
Storm Drain Tools
Water Tools

Details for each command on a toolbar

Border Toolbar - Top of Page



Opens Block Manager

Block Manager Toolbar - Top of Page



Opens Block Manager

Miscellaneous Toolbar - Top of Page

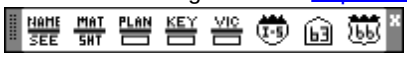


Command	Index(es)	Block name(s) or Style
Light with arm	148 - Proposed 149 - Existing 150 - Demo	SL-2.dwg
Light without arm	148 - Proposed 149 - Existing 150 - Demo	SL-1.dwg
Dashed Light with arm	148 - Proposed 149 - Existing 150 - Demo	SL-4.dwg
Dashed Light without arm	148 - Proposed 149 - Existing 150 - Demo	SL-3.dwg
Gas valve	157 - Proposed	G-V.dwg

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	158 - Existing	
	159 - Demo	
Gas service symbol	157 - Proposed	G-M.dwg
	158 - Existing	
	159 - Demo	
Gas vault	157 - Proposed	None
	158 - Existing	
	159 - Demo	
Powerpole	160 - Proposed	D-PP.dwg
	161 - Existing	
	162 - Demo	
Guypole	160 - Proposed	D-GP.dwg
	161 - Existing	
	162 - Demo	
Electric vaults	151 - Proposed	None
	152 - Existing	
	153 - Demo	
Telephone pole	154 - Proposed	T-P.dwg
	155 - Existing	
	156 - Demo	
Telephone manhole	154 - Proposed	T-MH.dwg
	155 - Existing	
	156 - Demo	
Telephone vault	154 - Proposed	None
	155 - Existing	
	156 - Demo	

Planview Labeling Toolbar - Top of Page



Command	Index(es)	Block name(s) or Style
Street and See Sheet	Street Name	Medium Text
	63 - All types	
	Sheet text	Small Text
	55 - All types	
Matchline	59 - Proposed	Large Text
	60 - Existing	
	59 - Demo	
	164 - For Matchline Line	
Planview Description	59 - Proposed	D-PH.dwg
	60 - Existing	

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	59 - Demo	
Key Map Header	55 - All types	Small Text
	59 - All types	Large Text
Vicinity Map Header	55 - All types	Small Text
	59 - All types	Large Text
Interstate	55 - All types	D-INTER.dwg
State	55 - All types	D-STATE.dwg
US	55 - All types	D-US.dwg

Plants Toolbar - Top of Page



Command	Index(es)	Block name(s) or Style
Tree symbols	304 - Proposed	D-TREE.dwg
	305 - Existing	
	304 - Demo	
Palm tree symbol	304 - Proposed	D-PALM.dwg
	305 - Existing	
	304 - Demo	
Tree line	304 - Proposed	None
	305 - Existing	
	304 - Demo	
Brush line	306 - Proposed	None
	307 - Existing	
	306 - Demo	

Profile Toolbar - Top of Page



Command	Index(es)	Block name(s) or Style
Curb Return Label	178 - All types	D-PH.dwg - Profile Large
	175 - Proposed	D-SC.dwg - Profile Small
	176 - Existing	
	175 - Demo	
Profile Stationing Label	175 - Proposed	Profile Medium
	176 - Existing	
	175 - Demo	
Profile Elevation Label	175 - Proposed	Profile Medium
	176 - Existing	
	175 - Demo	

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Sewer Toolbar - Top of Page



Command	Index(es)	Block name(s) or Style
Sewer service symbol	55 - Proposed	D-C1.dwg
	56 - Existing	
	55 - Demo	
Manhole	118 - Proposed	S-MH.dwg
	119 - Existing	
	120 - Demo	
Cleanout	118 - Proposed	S-CO.dwg
	119 - Existing	
	120 - Demo	
Plug	118 - Proposed	S-P.dwg
	119 - Existing	
	120 - Demo	

Storm Drain Toolbar - Top of Page

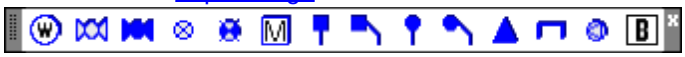


Command	Index(es)	Block name(s) or Style
Offset pipe edges	142 - Proposed	None
	143 - Existing	
	144 - Demo	
Manholes	145 - Proposed	SD-A4.dwg
	146 - Existing	
	147 - Demo	
Curb Inlets	145 - Proposed	SD-B.dwg
	146 - Existing	
	147 - Demo	
Curb Inlet with one wing	145 - Proposed	SD-B1.dwg
	146 - Existing	
	147 - Demo	
Curb Inlet with two wings	145 - Proposed	SD-B2.dwg
	146 - Existing	
	147 - Demo	
Catch Basin	145 - Proposed	SD-F.dwg
	146 - Existing	
	147 - Demo	
Catch Basin	145 - Proposed	SD-G.dwg
	146 - Existing	

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	147 - Demo	
Area Drains	145 - Proposed	SD-CB.dwg
	146 - Existing	
	147 - Demo	
Cleanouts	145 - Proposed	SD-CO.dwg
	146 - Existing	
	147 - Demo	
Straight Headwall	145 - Proposed	SD-SHW.dwg
	146 - Existing	
	147 - Demo	
U Headwall	145 - Proposed	SD-UHW.dwg
	146 - Existing	
	147 - Demo	
Winged Headwall	145 - Proposed	SD-WHW.dwg
	146 - Existing	
	147 - Demo	
L right headwall	145 - Proposed	SD-LLHW.dwg
	146 - Existing	
	147 - Demo	
L left headwall	145 - Proposed	SD-LRHW.dwg
	146 - Existing	
	147 - Demo	
Junction Structure 2	145 - Proposed	SD-LRHW.dwg
	146 - Existing	
147 - Demo		

Water Toolbar - Top of Page



Command	Index(es)	Block name(s) or Style
Water service symbol	55 - Proposed	D-C1.dwg
	56 - Existing	
	55 - Demo	
Hydrants	124 - Proposed	W-FH.dwg
	125 - Existing	
	126 - Demo	
Hydrants	124 - Proposed	W-FH1.dwg
	125 - Existing	
	126 - Demo	
Values	124 - Proposed	W-GV.dwg
	125 - Existing	

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	126 - Demo	
Values	124 - Proposed	W-GV1.dwg
	125 - Existing	
	126 - Demo	
Water meter	124 - Proposed	W-M.dwg
	125 - Existing	
	126 - Demo	
Air Release Valve	124 - Proposed	W-ARV.dwg
	125 - Existing	
	126 - Demo	
Air Release Valve	124 - Proposed	W-ARV1.dwg
	125 - Existing	
	126 - Demo	
Blow Off Valve	124 - Proposed	W-BO.dwg
	125 - Existing	
	126 - Demo	
Blow Off Valve	124 - Proposed	W-BO1.dwg
	125 - Existing	
	126 - Demo	
Thrust Block	124 - Proposed	W-TB.dwg
	125 - Existing	
	126 - Demo	
Plug	124 - Proposed	W-P.dwg
	125 - Existing	
	126 - Demo	
Check Valve	124 - Proposed	W-CV.dwg
	125 - Existing	
	126 - Demo	

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5.7 Layer Database Overview

SmartDraft's automatic layer making feature can increase drafting productivity by reducing the time it takes to learn and remember your company's layering standard. It can automatically create a layer before inserting a block, or drawing an object. It assists in creating multiple drawings with consistent layer names, colors and linetypes. If you work with multiple agencies or consultants, which require their own layering standards, Customization Templates are used to accommodate this need.

Layer database

- The layer database stores the layer name, color, linetype, lineweight, plot style, plot/no plot, and description of each layer used by SmartDraft commands.
- A different layer database is stored within each Customization Template.
- Layers can have three types, such as proposed, existing, demolition/vacate.
- Commands in SmartDraft are associated to the layer database via a unique layer index. Use the Customization Guide Appendix to find the index associate to a SmartDraft command.
- Before making changes to the layer database, first find the associated index number and modify the associated layer properties.
- Changing or removing layer index numbers will cause undesired results.
- To edit and maintain the layer database file, use the Customization Template Manager and select the Layer Database setting.
- Discipline specific layers are displayed in the Layer Make, Profile Setup Options, and Point Options commands. The Layer List Manager maintains these layer lists.
- Currently the layer database file is a standard text (ASCII) file.
- It is not recommended to use a text editor to modify the layer database, unless extreme caution is used to maintain the proper format of the file.
- To incorrectly edit the layer database file with a text editor could cause undesired results.

Layer Database Format

- The layer database file is a text (ASCII) file located in the customization template folder.
- The file name of the layer database is LAYER.TXT.
- The first two lines of the file contain header and version information.
- Do not edit the first two lines of the layer database file.
- Layer Index: A unique identifier used by SmartDraft commands to access a layer name and its properties.
- Indexes 1 through 354 are reserved for SmartDraft.
- Do not change or remove layer database index numbers between 1 and 354.
- Add non-command specific layers starting at the layer database index number 355.
- The first 5 characters are the layer database index number field.
- Characters 6 to 37 are the layer name field. If the layer name ***current*** is used, any command using the specified layer index will place new objects on the current layer.
- Characters 38 to 41are the layer color field.
- Valid color numbers are 1 through 255.
- Characters 42 to 73 are the linetype field.
- The specified linetype must be defined in either the ACAD.LIN or SMART.LIN file which is located in the Customization Template folder.
- Characters 74 to 105 are the description field.
- Characters 106 to 110 are the plot field.
- Characters 111 to 113 are the lineweight field.
- Characters 114 to 145 are the plot style field.

Layer Database example

1-5	6-38	39-41	42-73	74-105	106-110	111-113	114-145
Index	Name	Color	Linetype	Description	Plot	Lineweight	Plot Style

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1	0	7	CONTINUOUS	Layer 0	Yes	0	Normal
2	CURB	3	CONTINUOUS	Curb	Yes	0	Normal
3	EX-CURB	11	CONTINUOUS	Existing Curb	Yes	0	Normal
4	DEMO-CURB	7	CONTINUOUS	Demo of curb	Yes	0	Normal

Note: The default layer database was designed for plotting using the colors from the pen chart below. If your company modified the default layer database file, this pen width chart may not apply to you.

Color Number	Pen Width (mm)	Weight Screen (%)	Note
1	0.25	100%	
2	0.35	100%	
3	0.50	100%	
4	0.70	100%	
5	1.00	100%	
6	0.25	100%	
7	0.25	100%	
8	0.25	100%	
9	0.25	30%	
10	0.35	30%	
11	0.50	30%	
12	0.70	30%	
13	1.00	30%	
14	0.25	30%	
157	0.25	0%	Masking color

5.7.1 Layer Database Index

Layer Database Index: A unique identifier, within the layer database file, used by SmartDraft commands to access a layer name and its properties.

Dialog Box Options

Layer Index List

List box: List of all the layers in the layer database and their assigned layer database index number.
Filter: Filter the list of layers in the list box by description. Enter a value to filter the list.
Proposed: Select button to assign the selected layer's index number to the proposed layer value.
Existing: Select button to assign the selected layer's index number to the existing layer value.
Demolition: Select button to assign the selected layer's index number to the demolition layer value.

Proposed, Existing and Demolition are Layer Types. When SmartDraft creates a layer, it reads the layer database index number associated with the current layer type. To enter or select a layer database index number, it must already exist in the layer database file.

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5.8 Layer Database Manager (Enter Data)

Modify the layer names and properties of the layer database entering the name and properties.

Also see: Layer Database Manager (Match Layer)

Edit and maintain the layer database file within a Customization Template. See Layer Database Overview for additional information about the layer database.

Note: See Customization Guide Appendix for information on which layer indexes are assigned to which commands.

SmartDraft menu ▸ Options ▸ Customization Template Manager ▸ highlight Layer Database (Enter Data) and select Edit...

Dialog Box Options

Layer Database Manager (Enter Data)

Template Name

Name: Name of the customization template selected.

Description: Description of the current customization template.

Search

Edit Box: Enter the text to search for within the layer database

Search: Select the Search button to location the entered text within the layer database.

Output

Print: Print the layer database file to the Window's current default printer.

Layers

List Box: The list of layers defined in the layer database file. Select a layer from the list to edit its properties or select the New button to add a new layer.

Properties within the layer database:

Index: A unique identifier used by SmartDraft commands to access a layer name and its properties. The properties for a specific index can be modified, but the index must remain the same for SmartDraft commands to create the layer with the desired properties.

Name: The layer name created when a command accesses the layer database. Enter the desired layer name. The layer name has been limited to 31 characters in the database. If the layer name ***current*** is used, any command using the specified layer index will place new objects on the current layer.

Color: The color associated to the layer. To modify the color, select the Color button to display the Select Color dialog box.

Linetype: The linetype associated to the layer. Select the desired linetype from the list. The list is made up of all the linetypes defined in the custom linetype file and the ACAD.LIN file.

Lineweight: The lineweight associated to the layer. Select the desired lineweight from the list.

Plot Style: The plot style associated to the layer. Enter a value valid named plot styles. Note:

Plot: Controls whether the layer will be plotted. If set to No, AutoCAD does not plot the layer even if the layer is visible.

Description: A description associated to the layer, not used by AutoCAD. Used for reference and a note field.

Buttons

Apply: Save the changes back to the list of layer properties.

Color: Select to display the Select Color dialog box and change the color value.

New: Select to add a new layer to the end of the layer database file. A new unique index number will be created. This new layer will not be used by predefined commands.

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Delete: Delete the selected layer from the layer database. Layers with index numbers from 1 to 354 are reserved for SmartDraft and cannot be deleted.
Guide: Select the Guide button to open the help file displaying the Customization Guide Appendix
Save: Select to save changes back to the layer database file.
Discard: Select to discard any changes made.

5.9 Layer Database Manager (Match Layer)

Modify the layer names and properties of the layer database by matching a layer index to a layer in the current dwg or dwt.

Also see: Layer Database Manager (Enter Data)

Edit and maintain the layer database file within a Customization Template. See Layer Database Overview for additional information about the layer database.

Note: See Customization Guide Appendix for information on which layer indexes are assigned to which commands.

SmartDraft menu ▸ Options ▸ Customization Template Manager ▸ highlight Layer Database (Match Layer) and select Edit...

Dialog Box Options

Layer Database Manager (Match Layer)

Template Name
Name: Name of the customization template selected.
Description: Description of the current customization template.
Search
Edit Box: Enter the text to search for within the layer database
Search: Select the Search button to location the entered text within the layer database.
Drop-List: Select "In Database" to search the layer database, or "In Drawing" to search the drawing layers
Layers
Layer Database Layers List
List: The list of layers defined in the layer database file. Select a layer from the list to match the properties of the selected layer from the Drawing Layers List.
The **Index** is the unique identifier used by SmartDraft commands to access a layer name and its properties.
See Customization Guide Appendix for information on which indexes correspond to which commands.
Name: The layer name created when a command accesses the layer database.
Description: A description associated to the layer. Used for help the user identify a layer to a SmartDraft command.
Status: Indicates if a layer in the layer database is found in the current drawing and if the properties match.
- `-` Layer name not found in the drawing.
- `Found` Layer name found in the drawing, but the properties do not match.
- `Match` Layer name found in the drawing and the properties match.

Drawing Layers List
List: The list of layer name the current drawing or dwt. Select a layer from the list to match layer name and properties to the selected Layer Database index.
Guide: Select the Guide button to open the help file displaying the Customization Guide Appendix

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Match: Select the Match button to apply the selected drawing Layer name and properties to the selected Layer Database Index.

Buttons

Save: Select to save changes back to the layer database file.

Discard: Select to discard any changes made.

5.10 Layer List Manager

Determine which discipline specific layers from the layer database will be displayed in the Make Layer, Profile Setup Options, and Point Options commands. These lists associate a text description with the layer database index number for the proposed, existing, and demolition layer type.

Make layer list

Modify the list of layers displayed in the Layer Make command.

Profile layer list

Modify the list of layers displayed in the Profile Layer drop down list in the Profile Setup Options command.

Point layer list

Modify the list of layers displayed in the Point Options command.

Offset Street layer list

Modify the list of layers displayed in the Offset Street command.

SmartDraft menu ▸ Program Setup ▸ Customization Template Manager ▸ highlight the layer list type and select Edit...

Dialog Box Options

Layers: A list of the layers currently defined in either the Make, Profile or Point layer list file.

New: Display a dialog box to create a new layer definition to the Layers list.

Edit: Display a dialog box to modify the highlighted layer definition in the Layers list.

Delete: Remove the highlighted layer from the Layers list.

Print: Print the layer list file to the Window's current default printer.

Note: See Layer Database Overview for details on customizing SmartDraft's layering feature.

5.10.1 Layer List Add or Edit

Dialog to create a new or edit an existing layer in the description list.

Dialog Box Options

Description: Enter the description to be displayed in the Layers list. The description has been limited to 31 characters.

Layer Indexes:

Proposed: Specify the layer database index number for the *PROP* layer type.

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Existing:	Specify the layer database index number for the *EXIST* layer type.
Demolition:	Specify the layer database index number for the *DEMO* layer type.
Layer Index	Display the layers and layer database index numbers defined in the layer database file.

5.11 Custom Linetypes

The custom linetype file contains all the custom linetypes supplied with SmartDraft. It is a standard **AutoCAD** linetype file and name SMART.LIN.

If you have your own custom linetypes and want to use them with the automatic layer creation tools, they must be added to this file or the ACAD.LIN. This file is located in the root sub-folder of the customization template.

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5.12 New Drawing Settings

Drawing settings stored in the Customization Template, which are copied into the drawing.

These values are saved in the files DRAWING.INI for unit type FEET, and DRAWINGM.INI for unit type METERS, which is stored within the Customization Template folder. These settings are copied into the drawing so they can be modified independently of any other drawing associated to the same template.



SmartDraft menu ▸ Options ▸ Customization Template Manager ▸ highlight New Drawing Settings and select Edit...

Dialog Box Options

New Drawing Setup

Horizontal Enter the Horizontal Scale. This value controls the height of text, block insertion scale and arrow head size for these tools.

Architectur Specify if the listed commands honor architectural units. See Architectural Scale table.

Unit Type: Specify if the drawing units are Imperial or Metric.

Angle Type: Specify the output Angle Type.

Angular Specify the Angular Precision.

Linear Specify the Decimal, Linear Precision.

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Add Linear Distance Commas Check this option to add commas to linear distances for distance labels and command prompts.

Coordinate Specify the Coordinate Precision.

Elevation Specify the Elevation Precision.

Station Specify the position of the station delimiter.

Readability Specifies the angle counter clockwise off straight up at which label text flips 180 degrees to remain plan readable. Minimum -25.0 to 25.0.

Dimstyle Specify the dimension variables of SmartDraft's dimstyles. See Dimstyle Variables

Text Style: Specify the pre-defined text style values used throughout SmartDraft. See Text Styles.

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Create Annotative Blocks / Styles: Specify if the blocks inserted by SmartDraft commands or the styles created by SmartDraft will be annotative or not.

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5.13 User Defined Blocks

Block(s) defined, created, or modified by the operator to be substituted for the blocks used throughout SmartDraft and supplied during the installation.

Note: See Customization Guide Appendix for information on the block name assigned to each command.

User Defined Blocks

- Must have the same name as block used by SmartDraft.
- If the original block used by SmartDraft contains attributes, the user defined block must have the same number of attributes, and the attributes must be in the same order as the original block.
- When SmartDraft inserts a block, it checks the drawing to see if the block is already inserted. If so, it uses the block definition in the drawing. If the block has not already been inserted, it checks for a user defined block in the associated Customization Template, otherwise it uses the supplied blocks.
- The supplied blocks are located in the installation sub-folder \SYM.
- Do not change the supplied block in the original location. At times these blocks are updated and during the installation of the update, any changes you make could be lost.



SmartDraft menu ▸ Options ▸ Customization Template Manager ▸ highlight User Defined Blocks and select Edit...

Dialog Box Options

Block Names

Supplied Blocks:	List of supplied blocks in the \SYM folder. These blocks can be copied to a Customization Template and used as the base for User Defined Blocks.
User Defined Blocks:	List of User Defined Blocks in the Customization Template.
Copy:	Copy the selected Supplied Block(s) to the current Customization Template.
Open:	Open the selected User Defined Block.
Delete:	Delete the selected User Defined Block.

To create a User Define Block:

1. Find the name of the block SmartDraft uses. See Customization Guide Appendix for information on the block name assigned to each command.
2. Copy the supplied block from the Supplied Blocks list to the current Customization Template folder.
3. Open the user defined block via the User Defined Blocks Manager option of the Customization Template Manager. Edit as desired using the above rules and save the changes.

Examples:

Change the north arrow used by North Arrow

1. The north arrow block name is D-N.
2. Open the User Defined Blocks Manager.
3. Copy D-N.DWG from the Supplied Blocks list to the current Customization Template.
   or rename your current north arrow block to D-N.DWG and move it to the desired template folder.
4. Open D-N.DWG from the User Defined Blocks Manager option of the Customization Template Manager, edit as desired and save changes.
5. Confirm the drawing is associated to the correct Customization Template using Drawing Setup.
6. Use the Redefine Blocks command or command alias **RB** to update the block definition in the current drawing.

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7. Type: **NA** at the command prompt to start the North Arrow command. If the D-N block is not already in the drawing, the user defined north arrow will be used.

Change the perpendicular tick mark placed at the endpoints of lines, arcs, and polylines used by Endpoint Ticks.

The Endpoint Ticks command places the tick on the same layer as the selected object. The supplied endpoint tick block appears to be the same color as the selected object because the original tick block was created on layer 0 and color of the tick is set to byblock.

For this example, Modify the endpoint tick to be white no matter on which layer it is inserted.

1. The endpoint tick block name is D-TM.
2. Open the User Defined Blocks Manager.
3. Copy D-TM.DWG from the Supplied Blocks list to the current Customization Template.
4. Open D-TM.DWG from the User Defined Blocks Manager option of the Customization Template Manager. Double-click on the line object to open the Properties command. Change the color to White (7) and save changes.
5. Confirm the drawing is associated to the correct Customization Template using Drawing Setup.
6. Use the Redefine Blocks command or command alias **RB** to update the block definition in the current drawing.
7. Type: **TM** at the command prompt to start the Endpoint Ticks command and select an object. If the D-TM block is not already in the drawing, the user defined endpoint tick will be used.

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5.14 Monoplex.shx Font

SmartDraft comes with a custom font file named **MONOPLEX.SHX**. This font's characters look like those of AutoCAD's simplex.shx, but each character is evenly spaced like AutoCAD's monotxt.shx. This font is used so columns of numbers will line up correctly.

Includes the standard special characters:

Degree	%%D
Plus/Minus	%%P
Start/Stop Underline	%%U
Start/Stop Overscore	%%O
Diameter Symbol	%%C

Special added characters:

C/L	%%130
P/L	%%131
Delta Symbol	%%132
F/L	%%133
Angle Point Symbol	%%134
1/2	%%171
1/4	%%172
3/4	%%173

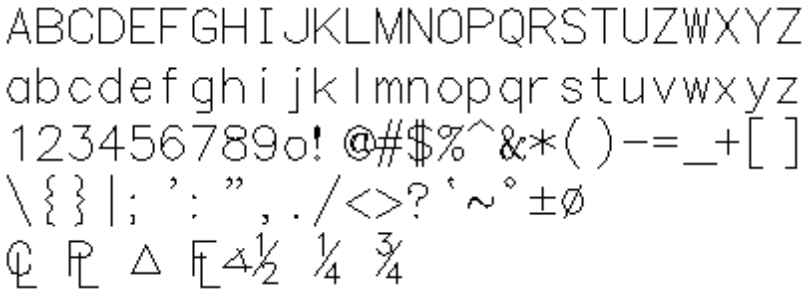
Unicode has been added to monoplex.shx as of 11/2/2002. The following special Unicode characters have been added:

When using the MTEXT command, use these codes.

C/L	\U+2104
P/L	\U+214A
Delta Symbol	\U+0394
F/L	\U+E101
Angle Point Symbol	\U+2220
1/2	\U+00BC
1/4	\U+00BD
3/4	\U+00BE

Subscript on	\U+00DE
Subscript off	\U+00DD
Superscript on	\U+00E4
Superscript off	\U+00E3

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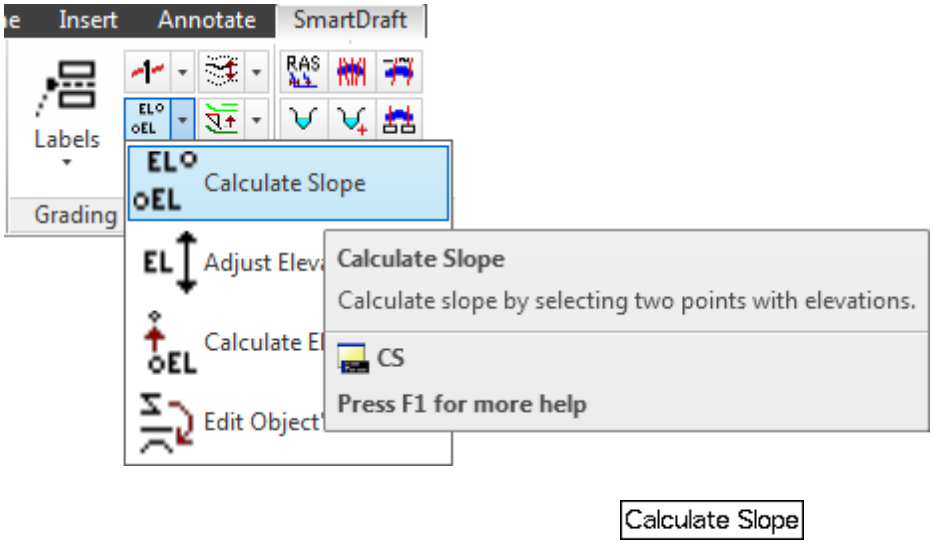
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Part VI

6 Examples

6.1 Calculate Driveway Slope Example

The scenario is to calculate the slope of driveways without going through the manual calculation process.



Calculate Slope

Given:

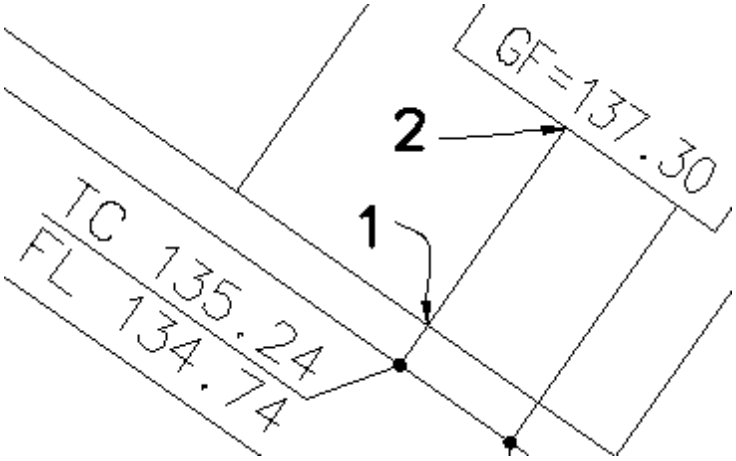
Top of Curb elevation at end of driveway

Garage Finish Floor elevation

Distance from TC to R/W: This example 7'

Slope from TC to R/W: This example 2%

Elevation difference from TC to R/W is 7' * 0.02 = 0.14"



Needed:

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Calculate driveway slope from garage finish floor to right of way.

The first step is to change the options for the Calculate Slope command.

Calculate slope.

Current settings: Point = Select, Type = Line, Output = SCreen, Adjust = 0.00/0.00

Select first elevation or [Adjust/Output/Point/Type]: **A** to change elevation adjustment.

Specify first elevation adjustment value <0.00>: **0.14** Elevation change from TC to RW

Specify second elevation adjustment value <0.00>: **0** No adjustment to GF elevation.

Current settings: Point = Select, Type = Line, Output = SCreen, Adjust = 0.14/0.00

Select first elevation or [Adjust/Output/Point/Type]: **O** to change output option.

Output type currently set to SCreen

Specify output type [SCreen/SLope/SPot] <SCreen>: **SL** to place a slope block.

Current settings: Point = Select, Type = Line, Output = SLope, Adjust = 0.14/0.00

Select first elevation or [Adjust/Output/Point/Type]: **T** to toggle type between line and arc

Current settings: Point = Select, Type = Line, Output = SLope, Adjust = 0.14/0.00

Select first elevation or [Adjust/Output/Point/Type]: **P** to toggle point select type between object and select. This example set to select.

Current settings: Point = Select, Type = Line, Output = SLope, Adjust = 0.14/0.00

See figure above for selection locations.

Select first elevation or [Adjust/Output/Point/Type]: Select the TC elevation text **TC 135.24**. Note this value will be adjusted by 0.14 to 135.38 as the RW (BW) elevation.

Select first point: **int** intersection osnap and select point **1** above.

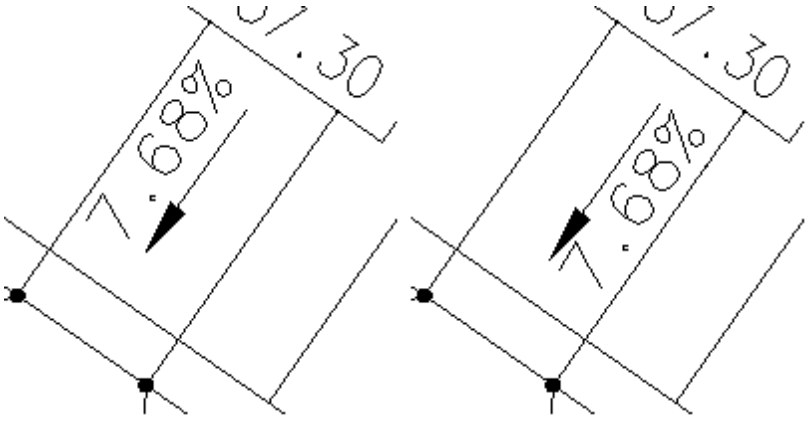
Select second elevation: Select the GF elevation text **GF = 137.30**. Note this value has not adjustment and will be 137.30.

Select second point: **int** intersection osnap and select point **2** above.

Distance <25.00>, Elev 1 <135.38>, Elev 2 <137.30>, Slope is <7.68%>.

Specify insertion point or [Options]: Specify the insertion point of the slope or **Options** to change the slope output options.

Note: To place the slope value under the leader, enter **O**ptions and select **Below**.



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Note: Always spot check the calculated values!

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6.2 Profile: 3-Line Profile Example

Some agencies require engineers to submit Street Profiles displaying the Centerline, Right Top of Curb, and Left Top of Curb profiles. These 3 profiles are displayed in a single profile grid. While the elevations of the 3 profiles are similar, the profiles are drawn at a different datum; one above and the other below the Centerline profile. This display arrangement is commonly called a 3 Line Profile.

Other agencies may require the Right and Left Top of Median Curb in addition to the 3 profiles above. The 5 profiles are also displayed in a single profile grid.

Creating 3 Line Profiles Step-by-Step

This help pages describes how to use the datum included with SmartDraft, **Create Profile / Full Profile**, or Civil 3D's profile view.

These three methods specify the centerline datum and work equally as will.

Method 1: SmartDraft Profile View

Method 2: Civil 3D Profile View

All three methods specify the centerline datum, and SmartDraft adds additional information used to specify the offset datum for Left and Right Curb Profiles.

Method 1 – SmartDraft Profile View

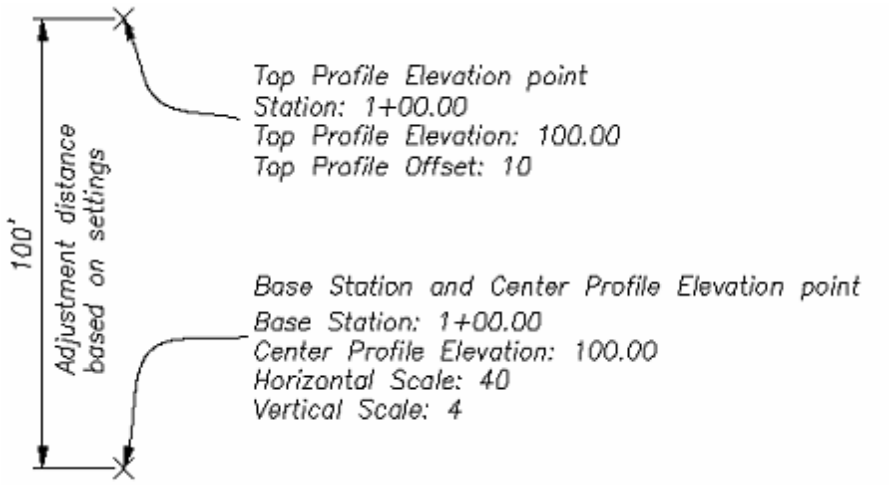
The following method assumes the operator has already created the Existing Ground profile information for Center, Left, and Right. It also assumes the operator has created the Finished Ground (Proposed) profile information for Center, L1, L2, R1, and R2.

1. Open a drawing to drawing the profile.
2. Zoom / Pan to the location to create the profile.
3. Select  on the **SmartDraft Tools toolbar** to open the Profile Tools toolbar.
4. Select  on the **Profile Tools toolbar** to start the **Profiles: Station and Elevation** command.
5. The **Profile: Setup Options** dialog box appears.
   Note: If there are no datum blocks in the current file, most if the dialog box will be disabled.
   If there are datum blocks or profile views in the current drawing, they will be listed in the Datum pop-up list at the top of the dialog box.

6. Select the **New** button to create a SmartDraft datum.
7. The **Create Profile View (Profile Grid)** dialog box appears.
   a. Specify a Profile Name. This can match the alignment name, but does not have to match.
   b. The Horizontal Scale will default to the drawing scale.
   c. Specify the desired Vertical Scale, it defaults to 1/10 the Horizontal Scale.
   d. Specify the Base Station value.
   e. Specify the **Center** Profile Elevation value.
   f. Specify a **Top Profile Offset** from the pop-up list (5, 10, 15, 20, 25, or 30). This value has to be set to for 3-line profile to work using this method in SmartDraft.

   Example:

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Top Profile Offset = 10
Horizontal Scale (HS) = 40
Vertical Scale (VS) = 4

SmartDraft adjusts the Top Profile Elevation point 100 units (Offset x HS / VS) upward from the selected *Select Base Station & Center Profile Elevation point:*. The elevation at the adjusted location is equal to the elevation value entered for the Center Profile or 100 for this example.

Therefore the Top Curb profile would be drawn and labels 10 units (taking into account the vertical exaggeration) above the Centerline Profile. This adjustment is made when the **Top** radio button is selected on the **Profile: Setup Options** dialog box.

g. Specify the **Bottom Profile Offset**. The same adjustment except downward applies to this settings.
h. Select the **Profile Direction**. Station increases Left to Right, or Right to Left.
i. Select the **Ok** button once all the settings have been made.
j. The command prompts the operator to select a point in the drawing which represents the Base Station and Center Profile Elevation point.
k. Once the "Base Point" has been selected, the command prompts the operator to place the SmartDraft datum block. Note: This block has to existing in the drawing for the Profile Tools commands to draw and label profile information. If the look does not meet the display standards of your company, we suggested you inserted it on a No Plot layer.

8. The **Profile: Setup Options** dialog box reappears. At this point profile linework can be added to the drawing, or the datum setting can be modified using the **Edit** button.

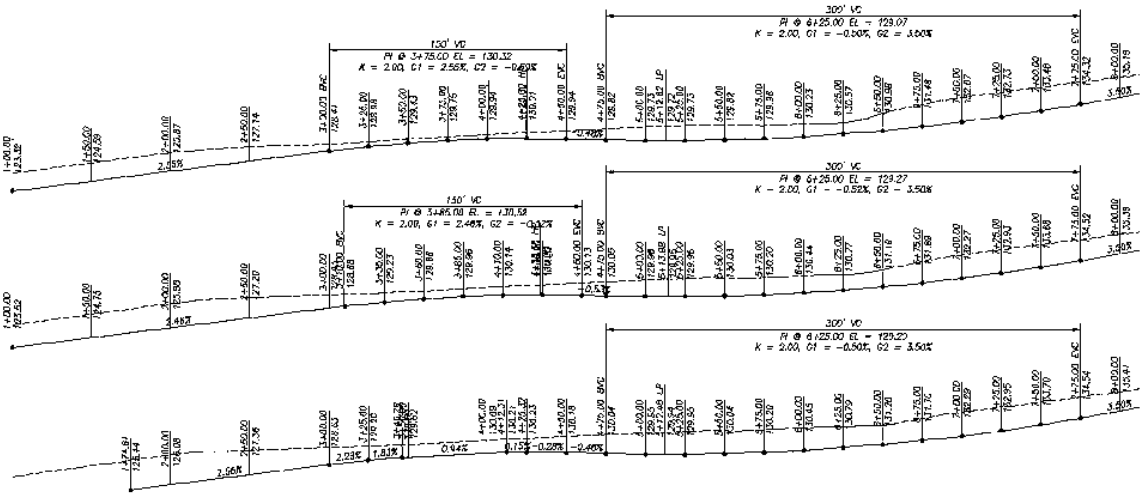
9. Draw the existing ground profile
   a. From the **Profile: Setup Options** dialog box select a datum block
   b. Select the **Center** radio button
   c. Select the Civil 3D alignment
   d. Select the **EG Center** Profile from the pop-up list.
   e. Select the **Profile Layer** "Ground" from the pop-up list
   f. Select the **Type** button until the Layer Type is ****Exist****.
   g. Select the **Leader Layer** on Default.
   h. Uncheck the **Leader** option so only the existing ground centerline is drawn and no station and elevation leader.
   i. Uncheck the **Grade Break Circle** option, so they are not drawn.
   j. Uncheck the **Slope** option, so the existing ground slopes are not drawn.
   k. Select the **OK** button to draw the existing ground centerline. It is drawn as a polyline.
   l. The command prompts the operator to enter the *Start profile stationing at <100.00>:*
   m. And to enter the *End profile stationing at <1375.97>:*

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n. Start the **Profiles: Station and Elevation** command again.
o. Select the **Top** radio button to offset the top profile by the specified offset distance.
p. Select the correct existing ground profile. **EG Left** if station direction is Left to Right, or **EG Right** if station direction is Right to Left.
q. Select the **Ok** button to draw the Top existing ground profile.
r. The command prompts the operator to enter the *Start profile stationing at <100.00>:*
s. And to enter the *End profile stationing at <1375.97>:*
t. Start the **Profiles: Station and Elevation** command again.
u. Select the **Bottom** radio button to offset the bottom profile by the specified offset distance.
v. Select the correct existing ground profile. **EG Right** if station direction is Left to Right, or **EG Left** if station direction is Right to Left.
w. Select the **Ok** button to draw the Bottom existing ground profile.
x. The command prompts the operator to enter the *Start profile stationing at <100.00>:*
y. And to enter the *End profile stationing at <1375.97>:*
z. Start the **Profiles: Station and Elevation** command again.
aa. Select the **Center** radio button
bb. Select the **FG Center** Profile from the pop-up list.
cc. Select the **Profile Layer** "Street" from the pop-up list
dd. Select the **Type** button until the Layer Type is ****Prop****.
ee. Select the **Leader Layer** on Default.
ff. Check the **Leader** option to draw station and elevation leader for the proposed design.
gg. If our company's CAD Standard's have the profile leader offset from the profile linework, check **Leader Offset**, otherwise uncheck it.
hh. Check the **Grade Break Circle** option to draw circles at each grade break, otherwise uncheck it.
ii. Select if you label the Station above Elevation, or Elevation above Station
jj. Check **Station** to include stations on the leaders.
kk. Enter a Prefix and / or Suffix if desired.
mm. Select the desired Station precision
nn. Check **Elevation** to include elevations on the leaders.
oo. Enter a Prefix and / or Suffix if desired.
pp. Select the desired Elevation precision
qq. **Profiles: Station and Elevation** can insert Station and Elevation Leader at a specified interval along long segments of straight grades. To include the interval stations, check **Interval.**
rr. If the **Interval** option was checked, select the desired interval from the pop-up list (25, 50, or 100).
ss. In include or remove the leader circle for the interval labels, check or uncheck the **Circle** option.
tt. In include the additional interval station within any vertical curve in the design, check **VC**.
uu. Check the **Slope** option to label the proposed street centerline grade.
vv. Enter a Prefix and / or Suffix if desired. Note: If Type: Percent is selected, the character **%** is added as a suffix to the calculated slope value. e.g. 1.00%
ww. Select the desired Slope precision
xx. Select the slope **Type** (Percent, Decimal)
yy. Select the slope **Placement** (Above, Below)
zz. To include or exclude a slope arrow, check or uncheck the **Arrow** option.
aaa. To include or exclude the **"-"** character in front of decreasing slopes, check or uncheck the **Minus Sign** options.
bbb. Select the **OK** button to draw the finished ground centerline profile.
ccc. The command prompts the operator to enter the *Start profile stationing at <100.00>:*
ddd. And to enter the *End profile stationing at <1375.97>:*
eee. If there are any Vertical Curve specify in the Finish Ground Center Profile, the **Profile: Vertical Curve Information** dialog box will appear. *(See Figure 1-3).*
fff. Enter the **Labeling Length** to insert station and elevation leaders within the vertical curve.
ggg. Check **K Value** to include this in the vertical curve length label
hhh. Check **G1 and G2** to include the vertical curve in and out slope values
iii. Check **Label High/Low Point** to include these labels if they existing for the specified vertical curve.
jjj. Select **Ok** to process the vertical curve
kkk. Repeat eee. through jjj. for each vertical curve along the design profile.
lll. Start the **Profiles: Station and Elevation** command again.

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mmm. Select the **Top** radio button
nnn. Select the correct finished ground profile. **FG Left 1** if station direction is Left to Right, or **FG Right 1** if station direction is Right to Left.
ooo. Confirm the other options are correct.
ppp. Select the **Ok** button to draw the finished ground top profile.
qqq. Repeat ccc. through kkk.
rrr. Start the **Profiles: Station and Elevation** command again.
sss. Select the **Button** radio button
ttt. Select the correct finished ground profile. **FG Right 1** if station direction is Left to Right, or **FG Left 1** if station direction is Right to Left.
uuu. Confirm the other options are correct.
vvv. Select the **Ok** button to draw the finished ground top profile.
www. Repeat ccc. through kkk.
xxx. 3 line profile complete. *(See example below)*



10. 5 or greater line profiles
    a. Add additional SmartDraft Datum using different Top/Bottom offset values, and a different name to clarify the additional datum.
    b. Repeat steps 1 -7 above to create the additional SmartDraft Datum.

Method 2 – Civil 3D Profile View

This method starts with the creation of a profile view using the Civil 3d **Create Profile View** command.

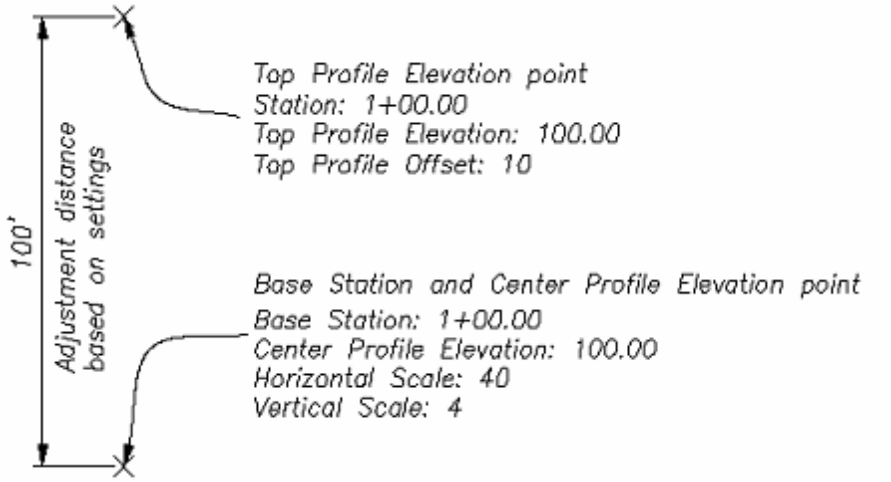
1. Open a drawing to drawing the profile.
2. Zoom / Pan to the location to create the profile.
3. Sample the Existing Ground Surface.
   a. Profile (C3D) ▸ Existing Ground ▸ Sample from Surface
   b. Check **Sample left/right**
   c. Enter the **Sample left offset** and S**ample right offset** distances to create the existing ground over the left and right curb.
4. Generate the Profile and Grid
   a. Profile (C3D) ▸ Create Profile ▸ Full Profile...
5. Select on the **SmartDraft Tools toolbar** to open the Profile Tools toolbar.
6. Select on the **Profile Tools toolbar** to start the **Profiles: Station and Elevation** command.

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7. The **Profile: Setup Options** dialog box appears.

8. Select the Civil 3D profile view from the profile view pop-up list. It will be the alignment name with (C3D) after it.
   a. Select the **Edit** button to modify /add additional SmartDraft information to the Land Desktop datum.
9. The **Create Profile View (Profile Grid)** dialog box appears.
   a. Enter a Description if there are multiple Civil 3D Profile Files with the same alignment name or you plan to add additional profiles in the drawing from the same alignment.
   b. Specify a **Top Profile Offset** from the pop-up list (5, 10, 15, 20, 25, or 30). This value has to be set to for 3-line profile to work using this method in SmartDraft.

      Example:

      Top Profile Offset = 10
      Horizontal Scale (HS) = 40
      Vertical Scale (VS) = 4

      SmartDraft adjusts the Top Profile Elevation point 100 units (Offset x HS / VS) upward from the selected *Select Base Station & Center Profile Elevation point:*. The elevation at the adjusted location is equal to the elevation value entered for the Center Profile or 100 for this example.

      Therefore the Top Curb profile would be drawn and labels 10 units (taking into account the vertical exaggeration) above the Centerline Profile. This adjustment is made when the **Top** radio button is selected on the **Profile: Setup Options** dialog box.

   d. Specify the **Bottom Profile Offset**. The same adjustment except downward applies to this settings.
   e. Select the **Ok** button once all the settings have been modified as needed.

10. The **Profile: Setup Options** dialog box reappears. At this point profile linework can be added to the drawing following the steps in Method 1 - SmartDraft Datum step 9.

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Part VII

7 History

7.1 SmartDraft Suite

Version 26.2.3 released - 11/9/2026

- Added Area Table Style Manager to the Ribbon, Toolbar, and Menu.
- Added Coordinate Table Style Manager (Points) to the Ribbon, Toolbar, and Menu.
- Added "Use Bank Polylines for calculation" for Overbank in Create HEC-RAS Data, Add a River / Reach to a HEC-RAS Project, and Add Sections to a HEC-RAS Project commands.
- Updated the prompt for the Adjust Numbers command to indicate the elevation of SmartDraft point blocks, Civil 3D's points, and BricsCAD Civil/Survey points are supported.
- Updated the point selection routine used throughout SmartDraft. Now it starts with Select points:, and enter to continue.
- Updated the Point Label command to use the new point selection routine.
- Fixed an error when using the SmartOptions, SmartInfo, and Traffic Symbols commands. ; error: bad argument value: positive 0. Introduced in 26.1.4
- Fixed an issue with Add a River / Reach to a HEC-RAS Project. Now allows adding more than a second reach.

Version 26.2.2 released - 10/21/2026

- Fixed an issue in BricsCAD when the unit type was set to US Survey Feet. SmartDraft commands would not work.
- Removed the "Beta" from the SmartDraft loading message in BricsCAD v27

Version 26.2.1 released - 10/20/2026

- Fixed an issue with the Elevation Label command. It was not working for alignments and profiles. Issue introduced in 26.2.0.

Version 26.2.0 released - 10/20/2026

- Added support for BricsCAD Pro v27.
- Added support for BricsCAD Pro String Line object to commands which support 3d polylines.
- Updated the Radial Lines command to start with selection option arc, which supports any object which looks like an arc, including an arc within multiple segment objects.

Version 26.1.3 released - 8/27/2026

- Fixed an issue with the Labeling command, when labeling lines and the Toggle Label Masking On / Off is turned on. The line label was not recognized as a SmartDraft label. Now the line label, with the Toggle Label Masking On / Off is turned on, is correctly recognized as a SmartDraft label.

Version 26.1.2 released - 8/19/2026

- Fixed loading in AutoCAD 2022.

Version 26.1.1 released - 8/18/2026

- No changes.

Version 26.1.0 released - 8/11/2026

- Added feature to the Construction Notes command. When placing the Tag and Note, and Note Only option, the placed not text will update, if the note text changes in the Construction Notes files. Only notes added with version 26.1.0 or later will have this new feature. Older notes would have to be erased and replaced with the new version of the command.
- Updated the Construction Notes List: Update command. The note text of Tag and Note, and Note Only notes placed with version 26.1.0 or later will also update when this command is run.

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- Updated the Viewport Align with Profile View command. The scale between the layout and modelspace is improved.
- Fixed an issue with the Construction Notes command. When placing the Tag and Note, and Note Only with the Type was MLeader, the note text would be at the wrong angle, if the viewport had a viewtwist.
- Fixed an issue with the Elevation Label Edit command. When selecting an older existing label with a suffix before the elevation, the suffix was being placed in both the prefix and suffix edit boxes. Issue introduced in version 26.0.6.
- Fixed an issue with the Point to Spot Label command. The elevation prefix is now saved correctly between uses of the command.

Version 26.0.15 released - 7/24/2026

- Fixed an issue by replacing code, removed in 26.0.9. Removing the code caused issues with the Elevation Label Edit, Slope Label Edit (One Point), Slope Label Edit (Two Points), and Point Elevation commands. The saved profile or surface name associated to an existing label was not displaying in edit dialog box. Issue introduced in version 26.0.9.

Version 26.0.14 released - 7/1/2026

- Fixed an issue with the Construction Notes Manager command. Remove button stopped working. Issue introduced in version 25.3.1.

Version 26.0.12 released - 7/1/2026

- Fixed an issue with the Create Reports > Legal Description Report and Legal Description from Polyline commands. Fixed a bearing rounding issue.

Version 26.0.11 released - 7/1/2026

- Fixed an issue with the Slope Symbol command. When selecting the 4th slope type, sometimes it would error with a 3d point error.

Version 26.0.10 released - 6/25/2026

- Fixed an issue with the PConnect command. It was not correctly processing the middle (.M), offset (.O), and template (.ZT) suffix codes.Issue introduced in version 25.3.1

Version 26.0.9 released - 6/1/2026

- Added command Viewport Align with Profile View and alias VPAPV.
- Added @ 20 / @2 to new version 2 Profile Views using the Create Profile View (Profile Grid) and Edit Profile View command.Does not support v1 SmartDraft Profile Grids
- Changed insertion scale for North Arrow, and Endpoint Ticks when Unit Type is Meters.
- Changed the Interval value in the Label Profile (Station and Elevation) command from a drop-down list of values to a edit box, so the user can enter a value.
- Changed the interval value in the Label Profile (Station and Elevation) command with separate values for Feet and Meters drawing setup unit type.
- Changed the interval value in the Label Alignment (Profile Geometry Data) command with separate values for Feet and Meters drawing setup unit type.
- Changed the Labeling, Create Reports, List, and Legal Description from Polyline commands to use a single code set to unify all labeling / reporting output.
- Fixed an issue with the Label Profile (Station and Elevation) command in BricsCAD. When a vertical curve type was "Curve" and there was no high / low point within the vertical curve, an Error: Exception is :Operation is not valid due to the current state of the object, and a dialog Error: No Profile Data.

Version 26.0.8 released - 5/18/2026

- Fixed an issue with the Calculate Slope command. Error: bad argument type: stringp 0.0 under some settings. Issue introduced in version 26.0.4.

Version 26.0.7 released - 5/11/2026

- Enhanced code to better work with noun / verb SmartDraft commands

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Version 26.0.6 released - 5/7/2026

- Fixed an issue with the Elevation Label Edit command. The suffix for the type "Note" is merged with the Prefix. Issue introduced in version 26.0.4.

Version 26.0.5 released - 5/5/2026

- Fixed an issue with the Label Profile (Note) command. When the Layer Type button in the options dialog was selected, it would error: No function SM:DIA:LT found.
- Fixed an issue in BricsCAD, the Text, Arc Text, and Attribute Mask and Dimension was not masking correctly. It correctly adds the background masking.
- Fixed an issue in BricsCAD, when selecting any of our command with a dialog, it would error: * Lisp (new_dialog) failed : DCL id = 1, dialog name 'xxxx'

Version 26.0.4 released - 5/4/2026

- Added "Specify point along alignment" option to the Laterals along Alignment command, when an alignment is selected.
- Added "Specify point, Create Pline" to the Define Parcels > Define Parcels Options.
- Added "Enter / Select" elevation option to Point Input Options. Change from Manual (Enter elevation only).
- Added "Prompt" option to Input for the Elevation Label command, The user will be prompted to enter elevation, or select elevation.
- Added Elevation Precision option of round to nearest 0.05, when unit type is feet, and 0.005, when unit type is Meters for the Elevation Label, Elevation Label (Manual), Calculate Slope, and Calculate Elevation commands.
- Restored the Tag List feature in the Adjust Numbers command, when using the Window option to select multiple blocks with attributes. Unintentionally removed in version 25.0.4.
- Fixed an issue with the Points at Station and Offset command. When using the Multiple option, the command when return "Error: bad argument type: 2D/3D point: <Entity name: ....>.
- Fixed an issue with the PBlock command. If the command was run a second time, and the description key file had layer names, vs layer indexes from the layer database. It was changing the layer properties of the layer to color: White, and linetype: Continuous. It no longer changes the properties of an existing layer.

Version 26.0.3 released - 4/28/2026

- Added the vertical curve radius as an option in the Label Profile (Station and Elevation) > Vertical Curve Information Label Options, and the Edit Profile Vertical Curve Information Label Options.
- Added a separate New Drawing Settings file for Meter and Feet drawings.
- Removed the Meter option from the installer. No longer needed.
- Fixed an issue for BricsCAD and AutoCAD, it now saves the Profile Geometry Station Text Options in the Profile labeling commands.
- Fixed an issue with the Planview Crossing Pipes Label commands. The Pressure Pipe diameter is labeled correctly

Version 26.0.1 released - 4/20/2026

- Added support for AutoCAD Civil 3D 2027, AutoCAD Map 3D 2027, and AutoCAD 2027.
- Removed support for AutoCAD based products 2020 and 2021.
- Removed support for BricsCAD v23
- Remove the command HEC Application Loader
- Added support for BricsCAD Pro Vertical Profiles to the Profile Copy and Adjust - Profile View command.
- Added option to create a BricsCAD Pro alignment from selected lines, arcs, and polylines to the Define / Edit Alignment command.
- Added support to create / edit BricsCAD Pro vertical alignments (Profiles) to the Define / Edit Profile command.

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- Added a prompt for abutment symbol spacing to the Abutment Symbol command.
- Added TTF option in the Text Styles > Browse option to select a font. For both the Drawing Setup > Text Styles... and Customization Template Manager > New Drawing Settings > Text Styles... commands.
- Added Turn off Spell Check option for the Construction Notes Manager command. On some workstations, users have experienced an error when selecting the Add and Edit buttons.
- Added the Adjust PVIs and Break Stations options to the Define / Edit Profile command.
- Added Grade In, Grade Out, Radius, and K value to the Add PVI and Edit PVI options of the Add / Edit Profile Design.
- Added Options to the Define / Edit Alignment command, to toggle between SmartDraft and BricsCAD alignments in BricsCAD Pro.
- Fixed an issue with the Label Profile (At Station) > Station by Interval. It correctly works for BricsCAD and SmartDraft Profiles.
- Fixed an issue with the Abutment Symbol command. If used with the Drawing Setup option **Create Annotative Blocks / Styles** checked or linework in paperspace, the default spacing would be too close.
- Fixed an issue when moving a COGO point with both a PBlock symbol and a Point Label. The Point Label now updates correctly.
- Fixed an issue when moving a COGO point with a PBlock symbol. The symbol updates correctly.
- Fixed an issue with Label Profile (Station and Elevation). It correctly adds the station suffix text when the station precision of the drawing does not match the selected station precision in the command.
- Fixed the Update Labels when updating Profile and Profile View labels when the profile, or profile view are not found. Now the labels are erased vs being prompted to select the missing profile or profile view.
- Fixed an issue with the Add and Copy options of the Define / Edit Profile command. The options work correctly now.
- Changed for BricsCAD Pro: Label Profile (Station and Elevation) correctly labels vertical curves in a BricsCAD Vertical Alignment View.
- Changed for BricsCAD Pro: Label Profile (Station and Elevation) now uses elementIds vs indexIds. This will require relabeling of Profiles, but the labels will be correctly associated to a fixed Id between edits.
- Changed for BricsCAD Pro: Label Profile (Station and Elevation) fixed distance calculation for labeling vertical curves, so the labels are not
- Changed for BricsCAD Pro: Create Planview 3D Polyline from Profile now uses the correct alignment stations.
- Changed for BricsCAD Pro: Label Alignment (Profile Geometry Data) - End of Vertical Curve Suffix updates correctly.
- Changed for BricsCAD v25 and later. Fixed the drawing variable to turn off vertical curves being added when using the Profile from Polyline - Profile View command.
- Fixed an issue when using the Civil 3D Surface Properties dialog and the surface has SmartDraft labels associated, Civil 3D would crash.
- Fixed an issue in PConnect when using the Offset, Middle, or Template Suffix Codes, and there were description keys like B and BB, it would drawing BB linework on the layer from B.
- Fixed an issue in PConnect when the Middle Suffix Code was used with the Begin Line code. It would draw linework from the BB.S.MI point to the BB.OT point incorrectly.
- Fixed an issue in PConnect when using the Offset Suffix Code. It some cases it would offset to the wrong side.
- Fixed an issue with the Create Existing Ground Profile command when selecting polylines as contour. Error: too few arguments.

SmartDraft full history

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7.2 SmartDraft Survey

Version 26.2.3 released - 11/9/2026

- Added Area Table Style Manager to the Ribbon, Toolbar, and Menu.
- Added Coordinate Table Style Manager (Points) to the Ribbon, Toolbar, and Menu.
- Updated the prompt for the Adjust Numbers command to indicate the elevation of SmartDraft point blocks, Civil 3D's points, and BricsCAD Civil/Survey points are supported.
- Updated the point selection routine used throughout SmartDraft. Now it starts with Select points:, and enter to continue.
- Updated the Point Label command to use the new point selection routine.
- Fixed an error when using the SmartOptions, SmartInfo, and Traffic Symbols commands. ; error: bad argument value: positive 0. Introduced in 26.1.4

Version 26.2.2 released - 10/21/2026

- Fixed an issue in BricsCAD when the unit type was set to US Survey Feet. SmartDraft commands would not work.
- Removed the "Beta" from the SmartDraft loading message in BricsCAD v27

Version 26.2.1 released - 10/20/2026

- No changes.

Version 26.2.0 released - 10/20/2026

- Added support for BricsCAD Pro v27.
- Added support for BricsCAD Pro String Line object to commands which support 3d polylines.
- Updated the Radial Lines command to start with selection option arc, which supports any object which looks like an arc, including an arc within multiple segment objects.

Version 26.1.3 released - 8/27/2026

- Fixed an issue with the Labeling command, when labeling lines and the Toggle Label Masking On / Off is turned on. The line label was not recognized as a SmartDraft label. Now the line label, with the Toggle Label Masking On / Off is turned on, is correctly recognized as a SmartDraft label.

Version 26.1.2 released - 8/19/2026

- Fixed loading in AutoCAD 2022.

Version 26.1.1 released - 8/18/2026

- Updated installer for missing dll for Pipe 2 Polyline command in SmartDraft Survey.

Version 26.1.0 released - 8/11/2026

- Added feature to the Construction Notes command. When placing the Tag and Note, and Note Only option, the placed not text will update, if the note text changes in the Construction Notes files. Only notes added with version 26.1.0 or later will have this new feature. Older notes would have to be erased and replaced with the new version of the command.
- Updated the Construction Notes List: Update command. The note text of Tag and Note, and Note Only notes placed with version 26.1.0 or later will also update when this command is run.
- Updated the Viewport Align with Profile View command. The scale between the layout and modelspace is improved.
- Fixed an issue with the Construction Notes command. When placing the Tag and Note, and Note Only with the Type was MLeader, the note text would be at the wrong angle, if the viewport had a viewtwist.
- Fixed an issue with the Point to Spot Label command. The elevation prefix is now saved correctly between uses of the command.

Version 26.0.15 released - 7/24/2026

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- Fixed an issue by replacing code, removed in 26.0.9. Removing the code caused issues with the Point Elevation command. The saved profile or surface name associated to an existing label was not displaying in edit dialog box. Issue introduced in version 26.0.9.

Version 26.0.14 released - 7/1/2026

- Fixed an issue with the Construction Notes Manager command. Remove button stopped working. Issue introduced in version 25.3.1.

Version 26.0.12 released - 7/1/2026

- Fixed an issue with the Create Reports > Legal Description Report and Legal Description from Polyline commands. Fixed a bearing rounding issue.

Version 26.0.11 released - 7/1/2026

- Fixed an issue with the Slope Symbol command. When selecting the 4th slope type, sometimes it would error with a 3d point error.

Version 26.0.10 released - 6/25/2026

- Fixed an issue with the PConnect command. It was not correctly processing the middle (.M), offset (.O), and template (.ZT) suffix codes.Issue introduced in version 25.3.1

Version 26.0.9 released - 6/1/2026

- Added command Viewport Align with Profile View and alias VPAPV.
- Changed insertion scale for North Arrow, and Endpoint Ticks when Unit Type is Meters.
- Changed the Labeling, Create Reports, List, and Legal Description from Polyline commands to use a single code set to unify all labeling / reporting output.
- Fixed the installer to include the SmartSMP2P26.dll and SmartSMP2P26-8.dll files for the Pipe 2 Polyline command.

Version 26.0.8 released - 5/18/2026

- Fixed an issue with the Calculate Slope command. Error: bad argument type: stringp 0.0 under some settings. Issue introduced in version 26.0.4.

Version 26.0.7 released - 5/11/2026

- Enhanced code to better work with noun / verb SmartDraft commands.

Version 26.0.6 released - 5/7/2026

- Fixed an issue with the Elevation Label Edit command. The suffix for the type "Note" is merged with the Prefix. Issue introduced in version 26.0.4.

Version 26.0.5 released - 5/5/2026

- Fixed an issue with the Label Profile (Note) command. When the Layer Type button in the options dialog was selected, it would error: No function SM:DIA:LT found.
- Fixed an issue in BricsCAD, the Text, Arc Text, and Attribute Mask and Dimension was not masking correctly. It correctly adds the background masking.
- Fixed an issue in BricsCAD, when selecting any of our command with a dialog, it would error: * Lisp (new_dialog) failed : DCL id = 1, dialog name 'xxxx'

Version 26.0.4 released - 5/4/2026

- Added "Specify point along alignment" option to the Laterals along Alignment command, when an alignment is selected.
- Added "Specify point, Create Pline" to the Define Parcels > Define Parcels Options.
- Added "Enter / Select" elevation option to Point Input Options. Change from Manual (Enter elevation only).
- Added "Prompt" option to Input for the Elevation Label command, The user will be prompted to enter elevation, or select elevation.

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- Added Elevation Precision option of round to nearest 0.05, when unit type is feet, and 0.005, when unit type is Meters for the Elevation Label, Elevation Label (Manual), Calculate Slope, and Calculate Elevation commands.
- Restored the Tag List feature in the Adjust Numbers command, when using the Window option to select multiple blocks with attributes. Unintentionally removed in version 25.0.4.
- Fixed an issue with the Points at Station and Offset command. When using the Multiple option, the command when return "Error: bad argument type: 2D/3D point: <Entity name: ....>.
- Fixed an issue with the PBlock command. If the command was run a second time, and the description key file had layer names, vs layer indexes from the layer database. It was changing the layer properties of the layer to color: White, and linetype: Continuous. It no longer changes the properties of an existing layer.

Version 26.0.3 released - 4/28/2026

- Added a separate New Drawing Settings file for Meter and Feet drawings.
- Removed the Meter option from the installer. No longer needed.

Version 26.0.1 released - 4/20/2026

- Added support for AutoCAD Civil 3D 2027, AutoCAD Map 3D 2027, and AutoCAD 2027.
- Removed support for AutoCAD based products 2020 and 2021.
- Removed support for BricsCAD v23
- Added option to create a BricsCAD Pro alignment from selected lines, arcs, and polylines to the Define / Edit Alignment command.
- Added Viewport tools Viewport Make, Viewport Zoom, Viewport Divide, Viewport Frame, Viewport Align, Viewport Move, Viewport Lock, and Viewport Unlock to the Ribbon.
- Fixed an issue with the Abutment Symbol command. If used with the Drawing Setup option **Create Annotative Blocks / Styles** checked or linework in paperspace, the default spacing would be too close.
- Added a prompt for abutment symbol spacing to the Abutment Symbol command.
- Added TTF option in the Text Styles > Browse option to select a font. For both the Drawing Setup > Text Styles... and Customization Template Manager > New Drawing Settings > Text Styles... commands.
- Added Turn off Spell Check option for the Construction Notes Manager command. On some workstations, users have experienced an error when selecting the Add and Edit buttons.
- Fixed an issue when moving a COGO point with both a PBlock symbol and a Point Label. The Point Label now updates correctly.
- Fixed an issue when moving a COGO point with a PBlock symbol. The symbol updates correctly.
- Fixed an issue when using the Civil 3D Surface Properties dialog and the surface has SmartDraft labels associated, Civil 3D would crash.
- Fixed an issue in PConnect when using the Offset, Middle, or Template Suffix Codes, and there were description keys like B and BB, it would drawing BB linework on the layer from B.
- Fixed an issue in PConnect when the Middle Suffix Code was used with the Begin Line code. It would draw linework from the BB.S.MI point to the BB.OT point incorrectly.
- Fixed an issue in PConnect when using the Offset Suffix Code. It some cases it would offset to the wrong side.
- Changed for BricsCAD Pro: Create Planview 3D Polyline from Profile now uses the correct alignment stations.

SmartDraft full history

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7.3 SmartDraft Construction Notes

Version 26.2.3 released - 11/9/2026

- Fixed an error when using the SmartOptions, SmartInfo, and Traffic Symbols commands. ; error: bad argument value: positive 0. Introduced in 26.1.4

Version 26.2.2 released - 10/21/2026

- Fixed an issue in BricsCAD when the unit type was set to US Survey Feet. SmartDraft commands would not work.
- Removed the "Beta" from the SmartDraft loading message in BricsCAD v27

Version 26.2.1 released - 10/20/2026

- No changes.

Version 26.2.0 released - 10/20/2026

- Added support for BricsCAD Pro v27.

Version 26.1.3 released - 8/27/2026

- No changes.

Version 26.1.2 released - 8/19/2026

- Fixed loading in AutoCAD 2022.

Version 26.1.1 released - 8/18/2026

- No changes.

Version 26.1.0 released - 8/11/2026

- Added feature to the Construction Notes command. When placing the Tag and Note, and Note Only option, the placed not text will update, if the note text changes in the Construction Notes files. Only notes added with version 26.1.0 or later will have this new feature. Older notes would have to be erased and replaced with the new version of the command.
- Updated the Construction Notes List: Update command. The note text of Tag and Note, and Note Only notes placed with version 26.1.0 or later will also update when this command is run.
- Fixed an issue with the Construction Notes command. When placing the Tag and Note, and Note Only with the Type was MLeader, the note text would be at the wrong angle, if the viewport had a viewtwist.

Version 26.0.15 released - 7/24/2026

- No changes.

Version 26.0.14 released - 7/1/2026

- Fixed an issue with the Construction Notes Manager command. Remove button stopped working. Issue introduced in version 25.3.1.

Version 26.0.12 released - 7/1/2026

- No changes,

Version 26.0.11 released - 7/1/2026

- No changes.

Version 26.0.10 released - 6/25/2026

- No changes.

Version 26.0.9 released - 6/1/2026

- No changes.

Version 26.0.8 released - 5/18/2026

- No changes.

Version 26.0.7 released - 5/11/2026

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- Enhanced code to better work with noun / verb SmartDraft commands.

Version 26.0.6 released - 5/7/2026

- No changes.

Version 26.0.5 released - 5/5/2026

- No changes.

Version 26.0.4 released - 5/4/2026

- No changes.

Version 26.0.3 released - 4/28/2026

- Added a separate New Drawing Settings file for Meter and Feet drawings.
- Removed the Meter option from the installer. No longer needed.

Version 26.0.1 released - 4/20/2026

- Added support for AutoCAD Civil 3D 2027, AutoCAD Map 3D 2027, and AutoCAD 2027.
- Removed support for AutoCAD based products 2020 and 2021.
- Removed support for BricsCAD v23
- Added TTF option in the Text Styles > Browse option to select a font. For both the Drawing Setup > Text Styles... and Customization Template Manager > New Drawing Settings > Text Styles... commands.
- Added Turn off Spell Check option for the Construction Notes Manager command. On some workstations, users have experienced an error when selecting the Add and Edit buttons.
- Fixed an issue when using the Civil 3D Surface Properties dialog and the surface has SmartDraft labels associated, Civil 3D would crash.

SmartDraft full history

7.4 SmartDraft Pipe 2 Polyline

Version 26.0.0 (released - 4/20/2026 (Autodesk Apps Store version changes since last released)

- Added support for AutoCAD Civil 3D 2027.
- Fixed an issue with the Pipe 2 Polyline command. For curved pipe segments equal to or less than 50 unit radius, the chord length value was not used. It now used the value.
- Released to Autodesk Apps Store.

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