

#### Best Practices In Creating Templates

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- Component naming is recommended to be consistent with the material type.
  - Used for displaying components
  - Component display rules
  - Displaying templates
  - Material quantities
  - Etc.

Name:	Pavement 🔶	Apply
Description:	Bituminous Surface Course	Close
Style:	Asphalt 🗸 🗸	< Previous
Parent Component:	· +	
Display Rules:		Next >



• Component names are used when viewing Surface Components.

Surface: SER_Proposed 👻			Apply
Component:			Close
Name	Style	De 🔦	0.000
Granular	Granular	E	Help
Granular1	Granular	1.00	
LAGGREGATE BASE	Aggregate Base		
LAggregate Base, Class 6	Aggregate Base		
LAggregate Base, Class 61	Aggregate Base		
LCONCRETE RAILING TYPE F (MOD.)	Concrete Barrier		

• Note: This option is currently only supported in InRoads.



• Component names are used when creating / using Component Display Rules.

Name:	Rule1		OK
Description:	DRaw Right Side Shoulder		Cancel
Type:	Component is Displayed	•	Help
Component:	Shoulder_RT	• +	
	Shoulder_RT		



 Component names are used within the Display Templates application for creating typical sections.

		1.0000		Apply
Use Alternate Slope	e if Slope Exceeds:	0.00%		Close
Display Controls				
	Precision	Format		Preference
Width:	0 -			Help
Slope:	0.12 💌	50% 👻		
Alternate Slope:	0.12 *	50% *		
Define End Conditio	ins			
parterel				
				10 C
and the second s			Contraction of the second s	Construction of the second s
0	N T			
0	- L			
0	H			$\mathbf{N}$
-1	H			
-1			FT I	
-1	-20 -15 -10	-5 0 5		25 30
-1 + - + - + + -+ =	-20 -15 -10	-5 0 5	10 15 20	25 30
-1 -1 + - :::::::::::::::::::::::::::::::::::	-20 -15 -10	-5 0 5	10 15 20	25 30
	-20 -15 -10	-5 0 5	10 15 20	25 30 ,
-1	-20 -15 -10	-5 0 5		25 30
	-20 -15 -10	-5 0 5		25 30



• Point names are used throughout Roadway Designer in many aspects.

Name: EOS		Add
Style: Edge of	paved shoulder 🔻	Close
	C	hange
<sup>2</sup> oints:		Help
Name	Style	
EOP	Edge of paved road	
EOS	Edge of paved shoul	der



• Point names are used to establish the feature names within the DTM model.

Surface:	SER_Proposed 🔹	A	ophy
Fence Mode:	Ignore 💌	a	ose
		Fil	ter.
		Edit	Styl
		E H	lelp
Features:	1830		1
Name	Style	Description	1
SER-L6	Granular	Created by roadway	
	Retaining Wall	Created by roadway	
SER-L7	a consider the real of a second	along a bliggeright	
SER-L7 SER-L8	Retaining Wall	Created by roadway	
SER-L7 SER-L8 SER-L9	Retaining Wall Granular	Created by roadway Created by roadway	
SER-L7 SER-L8 SER-L9 SER-LBC	Retaining Wall Granular LBC	Created by roadway Created by roadway Created by roadway	
SER-L7 SER-L8 SER-L9 SER-LBC SER-LBC1	Retaining Wall Granular LBC LBC	Created by roadway Created by roadway Created by roadway Created by roadway	
SER-L7 SER-L8 SER-L9 SER-LBC SER-LBC1 SER-LBC2	Retaining Wall Granular LBC LBC LBC	Created by roadway Created by roadway Created by roadway Created by roadway Created by roadway	
SER-L7 SER-L8 SER-L9 SER-LBC SER-LBC1 SER-LBC2 SER-LCG	Retaining Wall Granular LBC LBC LBC Curb	Created by roadway Created by roadway Created by roadway Created by roadway Created by roadway Created by roadway	
SER-L7 SER-L8 SER-L9 SER-LBC SER-LBC1 SER-LBC2 SER-LCG SER-LCG1	Retaining Wall Granular LBC LBC LBC Curb Curb	Created by roadway Created by roadway Created by roadway Created by roadway Created by roadway Created by roadway Created by roadway	
SER-L7 SER-L8 SER-L9 SER-LBC SER-LBC1 SER-LBC2 SER-LCG SER-LCG1 SER-LCG1	Retaining Wall Granular LBC LBC LBC Curb Curb LBC	Created by roadway Created by roadway	



- Point naming conventions should be standardized and compliance enforced within your organization.
- Example:
  - Component\_Type\_Location\_Quantity\_Display\_Misc



• Point naming consistency between templates allows transitions to complete automatically.





• Point names are vital to setting point controls.

Corridor: F Point: Mode () Horizor	Route1	CLRD_BC_Bot	Station Start:	Limits 12+34.00 <u>+</u> 75+12.80 <u>+</u>			Add Close Change
Control Type Horizontal A Use as \$ Priority:	e: Vignment: Secondary	Alignment HIGHWAY Alignment	Horizor Start: ( Stop: ( Vertica Start: [ Stop: (	ntal Offsets       0.0000       +       0.0000       +       0.0000       +       0.0000       +       0.0000       +			Help
Horizontal a	nd Vertica	Controls:					
Enabled	Priority	Name	Start Station	Stop Station	Mode	Туре	Control
× ×	1 1	L_EP_WC_Top R_EP_WC_Top	12+34.00 12+34.00	25+00.00 25+00.00	Vertical Vertical	Superelevation Superelevation	Section 1 CLRD_WC
× [				. 117			Delete



• Point name prefixes / suffixes should only used creating templates and not in the Point Name List.

Poin	t Name List			
Name:	EOP			Add
Style:	EP		•	Close
				Change
Points:			[	Help
Name		Style		
EOP		EP		
	No F	Prefix or S Here	Suffix	
1			(	Delete



#### **ITL Folder Library**

 Use the template library folder structure to organize the workflow and minimize the "search"





#### **ITL Folder Library**

- There are infinite possibilities and no right or wrong answer. Just keep it logical. Possible scenarios:
  - Organize by design speed
  - Organize by road classifications (rural, urban, highway, etc.)
  - Organize by design standards
  - etc



#### Organizer

• The organizer allows a user to copy templates from one template library to another





#### Organizer

• The organizer allows a user to copy templates from an IRD design file to ITL file



# **Styles – Symbology Control**

• Styles control the symbologies of components and plan view elements.

oint Prope	rties					X
Name:		EP		+ +	Apply	
Feature Nan	ne Override:	EP			Close	
Surface Fea	ture Style:	Edge of p	aved ro	ad 🔻	< Previo	US
Atemate Su	mace:			*	Next >	6
					Help	
			Type S	P 12.5 Wearing	Course	
Type:	Constra Slope	iint 1	•]	Constraint Horizontal	2	
Parent 1:	CL		• •	CL	•	ŧ
Parent 2:	Rollov	ver Values				
Value:	-2.00%			12.0000		
Label:	1		•	1	×	
		-				
Style C	onstraint:					
Style Co	onstraint: prizontal (	) Vertical	Ø	Both		
Style Colored Bang	onstraint: prizontal ( e: 0.000	) Vertical	Ø	Both		





# **Styles – Symbology Control**

 Component Property Styles control the symbologies of components in the cross section view.

Name:	Type SP 12.5 W	earing Cour	se I	+	Apply
Description:	Wearing Surface	(SPWEB44	40F)	1	Close
Style:	Asphalt	• [	V Close Shape		< Previous
Parent Component:		-			Nexts
Display Rules:			[	Edit	INCXT >





# **Styles – Symbology Control**

 Point Property Surface Feature Styles control the symbologies of DTM breaklines when plotted to plan view.

Point Properties	X			
Name: EP	+ Apply	······································	<b></b>	//////////////////////////////////////
eature Name Override: EP	Close		V/ &_##	
Surface Feature Style: Edge	e of paved road 🔻		\ <i>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</i>	
Atemate Surface:	× (****)			
	Next >			
	Help			
	Type SP 12.5 Wearing Course			
	-			
Constraints				
Constraint 1	Constraint 2			
Type: Slope	▼ Horizontal ▼	x <i>≡ \\</i> €		
Parent 1: CL	• • CL • •		I HACE -	
Parent 2: 🕅 Rollover Val	ues			
Value: -2.00%	12.0000			
Label:	•			
Style Constraint				
(@ Horizontal () Vert	tical 🕐 Both			
Range: 0.0000				
				Benile

#### **Feature Name Overrides**

• Point Property Feature Name Override changes the final design surface point name to a common name for different tie slopes.

		-				
Name:	Cut S	lope Tie	+ +	Apply		C ItSlope Th
eature Name	Override: Toe o	of Slope 🧹	V	Close	1	
Surface Featu	re Style: Tops	oil	-	Bassieus		/
Nternate Surfa	ace:		1			TSTORC
				Next >		
End Conditio	n Properties			Help		//
Check for	r Interception		stope		RS	NOT BTO
Place Poi	int at Interception	Tolora			RISETO BC	
✓ End Car	ht - 1. P- n				RSWH	X
Devot					RS	RIS WAS BO
Constinut	errides the	Original	Point		RISSIO	
Constinut N	errides the lame When	Original Building	Point the		RISHO	$\mathcal{L}$
Consaint N Type	rerrides the lame When Slope Sur	Original Building face	Point the Horizontal		RISHO	F III S lope T te
Consaint N Type Paren	rerrides the lame When <sub>Slope</sub> Sur RSWBTO	Original Building face	Point thenstra Horizontal RSWBTO	• • •	RISHO	E 11 Stope T te
Consair N Type Parent 2:	rerrides the lame When Slope Sur RSWBTO	Original Building face	Point I the <sub>nstra</sub> , 2 Horizont al RSWBTO	• +	RIEHO	FIII Stope The
Consair N Type Parent 2: Value: 3	rerrides the lame When Slope Sur RSWBTO C Rollover Valu 13.33%	e Original Building face	Point thenstra. Horizontal RSWBTO 3.0000	• • +	RISHO	TSTOBF
Consain N Type Parent 2: Value: 3 Label:	rerrides the lame When Slope Sur RSWBTO CRottover Valu 33.33%	• Original Building face	Point thenstra. 2 Horizontal RSWBTO	* +	RISHO	TSTOBF
Consain N Type Parent 2: Value: 3 Label: Style Con	straint:	e Original Building face	Point thenstra 2 Horizont al RSWBTO	• •	RIGHO	TSTO B F
Consain N Type Parent 2: Value: 3 Label: Style Con	straint:	e Original Building face	Point thenstra.2 Horizontal RSWBTO 3.0000	• +	RIGHO	TSTOBF
Consair N Type Parent 2: Value: 3 Label: Style Con	straint:	e Original Building face	Point thenstra	* *	BISHO	F III Slope T Ie
Consain N Type Parent 2: Value: 3 Label: 3 Label	straint: 0.0000	e Original Building face	Point thenstra 2 Horizont al RSWBTO 3.0000	• +	BIGHO	TSTOBF



# **Feature Name Overrides**

• Avoids end condition transition issues and keeping track of many tie point names.



• Right mouse clicks and Affixes are crucial to the template layout process.

Template Options	Mirror Ctrl-M Reflect Ctrl-R Cancel ESC	
Specify:     Help	Set Dynamic Origin Ctrl-D	
Points Seed Name:	Dynamic Settings           X:         -2.4000         Step:         0.1000           Y:         1.0000         Step:         0.1000           Point Name:	
Step Options           X:         0.1000         Y:         0.1000         Slope:         0.10%	hs= xy= dl= hs= vs= ol= os=	Bentleur

• Point name affixes should only be activated when composing a template. Intended to negate the need for left and right components.

Naming Options			ОК
Seed Name:			Cancel
From Style			Preference
Specify:	-		
	147 177	()	Help
Points			
Seed Name:		۲.	
Apply Affixes			
100000	Prefix	Suffix	
Left:	L		
Right:	R_		
Step Options			
V	v. 7	Cla	





• When creating individual components turn off apply affixes.

laming Options		ОК		******
Seed Name:		Cancel	EP.	
Specify:		Preferences		Gitter
Points Seed Name:	*			
Apply Affixes Left:	Prefix Suffix			
Right itep Options				
0.0000	Y: 0.0000 S	lope: 0.00%	CG	



• Using Dynamic Settings when creating components and templates provides precision input ability.

ynar	nic Settings		
X:	-2.4000	Step:	0.1000
Y:	1.0000	Step:	0.1000
Point	Name:	I.	
Point	Style:		•
VA	pply Affixes		
hs=	-		
xy= dl=		amic Orig	in
vs= ol= os=			



• Settings within the right mouse click while dragging and dropping components enables mirroring and reflecting.

Mirror	Ctrl-M	 			
Reflect	Ctrl-R				1
Cancel	ESC			1	 -
Set Dynamic Origin	Ctrl-D			-	
÷÷÷÷-					



# **Using Proper Constraints**

• Point constraints within the template confines set the "default" locations.

Manage		(Providence)			1
ivame:	12 1	IC_L		• +	Apply
Feature Nan	ne Override:	TC_L			Close
Surface Fea	ture Style:	Curb		•	< Previous
Alternate Su	nace:			•	Next >
			Membe	r of:	Help
			Curb a	nd Gutter L	
Constraints	5				
Constraints Type:	s Constra Horizontal	int 1	<b>-</b> ]	Constrain Vertical	t 2
Constraints Type: Parent 1:	s Constra Horizontal Gutter_L	int 1	• • +	Constrain Vertical Gutter_L	:2 • •
Constraints Type: Parent 1: Value:	s Constra Horizontal Gutter_L -0.1667	int 1	•) • +	Constraint Vertical Gutter_L 0.5000	:2 • <del>•</del> <del>•</del>
Constraints Type: Parent 1: Value: Label:	Constra Horizontal Gutter_L -0.1667	int 1	• • +	Constraint Vertical Gutter_L 0.5000	±2 • +
Constraints Type: Parent 1: Value: Label: Style Co	Constra Horizontal Gutter_L -0.1667	int 1	▼ ● <u>+</u> ▼	Constraint Vertical Gutter_L 0.5000	12 • • •
Constraints Type: Parent 1: Value: Label: Style Co	Constra Horizontal Gutter_L -0.1667 onstraint:	int 1	• •	Constraint Vertical Gutter_L 0.5000	2 • <del>•</del>
Constraints Type: Parent 1: Value: Label: Distyle Co Bang	Constra Horizontal Gutter_L -0.1667 onstraint: orizontal e: 0.000	int 1	• • •	Constraint Vertical Gutter_L 0.5000	2 • • •



#### **Parametric Labels**

• Second in priority, the Parametric Labels can override any template point constraint.

Name:		CL3		+	+	Apply
Feature Name Override:		CL3			E (	Close
Surface Feature Style:		Aggrega	te	•	l i	< Previous
Alternate Surface:				۲	í	Next >
			Membe	r of:	(	Help
			Aggreg	jate Base	R	
Constraint	s Constra	int 1		Cons	straint 2	
Parent 1:	CL2		• •	CL2	81	• <u>+</u>
Value:	-0.5000			0.0000		- N
Label:	AggBase D	epth	•	1		
E a la c	onstraint:				*	
Style C				0.4		
© Ha	nizontal (	🛛 Vertical		Both		

.omdor:	WS1		Station Limits			Add
Constraint Label:	AggBase Depth		Statt.	/5+00.00		Close
Start Value:	-0.7500	Î	Stop:	511+50.43	<u>+</u>	Change
Stop Value:	-0.7500					Cribinge
Override Values:						Help
Name	Start Value	Stop Value		Start Station	Stop S	tation
						a



# **Style Constraint Uses**

• Third in priority, the Style Constraint is intended to "target" alignments.

Name:	TC_L	+ +	Apply
Feature Name Overrid	e: TC_L		Close
Surface Feature Style	Curb	•	< Previous
Alternate Surface:		*	Next >
	Mem	hor of	Help
	Curt	and Gutter_L	
Constraints			
Constraints Cons Type: Horizont	straint 1	Constraint Vertical	2
Constraints Cons Type: Horizont Parent 1: Gutter_L	straint 1 al • ] • • ] <u>4</u>	Constraint Vertical	2 • •
Constraints Cons Type: Horizont Parent 1: Gutter_L Value: -0.1667	straint 1 al •	Constraint Vertical Gutter_L 0.5000	2 • •
Constraints Type: Horizont Parent 1: Gutter_L Value: -0.1667 Label:	straint 1 al • • •	Constraint Vertical Gutter_L 0.5000	2 • <u>+</u>
Constraints Type: Horizont Parent 1: Gutter_L Value: -0.1667 Label: Value Constraint:	straint 1	Constraint Vertical Gutter_L 0.5000	2 • <del>•</del>
Constraints Type: Horizont Parent 1: Gutter_L Value: -0.1667 Label: ✓ Style Constraint: ● Horizontal	straint 1 al • • • • •	Constraint Vertical Gutter_L 0.5000	2 • •



#### **Alternate Surfaces**

 Alternate Surface option used for creating surfaces for different steps in the construction process.

Name:		OS4		+ +	Apply
Feature Nan	ne Override:	OS4			Close
Surface Fea	ture Style:	OS		<u> </u>	< Previou
Alternate Su	iface:	Top Of Dirt		•	Next >
			Тор	Of Dirt	Help
		M	lembe	rof:	-
Constraints	s Constra	int 1		Constraint	2
Constraint: Type:	s Constra Vertical	int 1	]	Constraint : Horizontal	2
Constraint: Type: Parent 1:	s Constra Vertical OS3	int 1	  _ <del>+</del>	Constraint : Horizontal OS	2 •
Constraint: Type: Parent 1: Value:	s Vertical OS3 -0.2500	int 1 •	   <u>+</u>	Constraint 2 Horizontal OS 0.0000	2
Constraints Type: Parent 1: Value: Label:	s Constra Vertical OS3 -0.2500	int 1	   <del> </del>	Constraint 2 Horizontal OS 0.0000	2
Constraint: Type: Parent 1: Value: Label: Style Co	s Constra OS3 -0.2500 onstraint:	int 1 •	   <b>+</b>	Constraint 2 Horizontal OS 0.0000	2
Constraints Type: Parent 1: Value: Label: Style Co @ Ho	s Constraint OS3 -0.2500 onstraint:	int 1	   <b>+</b>	Constraint 2 Horizontal OS 0.0000	2



#### **Alternate Surfaces**

• Alternate Surface can't contain any vertical lines as with any DTM surface.





#### **Alternate Surfaces**

• Use common sense when creating your Alternate Surface...is it constructible?





#### **Template Documentation Link**

 Use the Template Documentation link to point to help files for each template. Remembered in the ITL File. Uses right mouse click.



# Avoid the "Super Template"

• The "Super Template" is your neighbor's worst nightmare. Remember you might not be the only one working on this project.





# **Avoid the "Super Template"**

• A "happy medium" should be considered between too few and too many options

• Too few options results in a lot of End Condition Exceptions

• Too many options results in an unmanageable template

• Just because "You Can" doesn't mean "You Should"



# **Testing Your Templates**

 Testing End Conditions is simple. Select the Test button to draw a surface and examine End Condition behavior.



# **Testing Your Templates**

 Temporarily delete constraints in your template to test super elevation and widening transitions by moving the point(s). Utilize the UNDO button.





#### **No Vertical Segments in Surfaces**

 Surfaces can't contain any vertical lines. Use the Triangulated Surface option to highlight the proposed surface.







# **Active Template Options**

 Active Template option allows for easy isolation of individual points or components. New to V8i, Parent – Child relationships.



Bentley

# **Display Template**

• Right mouse click on any template and select "Display" to draw the template to MicroStation creating an instant "Typical Section".

Create Template							
File Edit Add Tools							
Template Library:		Current Tem	plate				
C:\MNDOT\Roadway	Designer Da	Name:	2 Ln C&G				
Point Name List     Components     End conditions		Description:					
MN_DOT	000						
→ 2 Ln 8' Should	ers Rural	1-0					
× 2 Ln C&G	Set Active						
× 2 Ln Eart	Cut			Ctrl-X			
≻≕ 4 Lane	Сору			Ctrl-C			
→ 4 Lane w → 4 Ln Run	Paste			Ctrl-V			
≻ Junk Tort	Delete			Del			
	Rename			F2			
	Template D	ocumentatio	n Link				
	Display						
		1 2					





# **Display Template**

• MicroStation drawing of the template Display feature.





# **End Conditions Tips**

• In an "Infinite" end condition, avoid drawing the end condition excessively long.





# **End Conditions Tips**

• Avoid points on top of points when possible. This makes for a confusing situation.





# Questions?

