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Workshop - X5 Bentley Rail Track Design Tips

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Workshop 1 Template creation

Introduction

Bentley Rail Track offers many possibilities for defining templates, modeling ballast, sub grades etc.

But:

KEEP IT SIMPLE!

All templates are stored in template libraries. Templates are built up from components and these components are also stored in the template library.

Start Bentley Rail Track and open the file\01 Create Templates\HLProfil_101work.dgn.

Go to File > Project Defaults and load the configuration Workshop 1 Create Templates

All layers/level should be turned off, except Schotter, Tragschicht & PSS.

Open the file\01 Create Templates\Workshop1.rwk.

Go to Modeler > Create Template and create a new folder called HL

🗽 Create Templat	e		
File Edit Add To	ols		
New		×	Folder
Open	Ctrl+0		Template
Save	Ctrl+S		Template Library
Save As			Description.
Import TML Import Template			coditi
Close			

The easiest way to create a template is to import the template data from existing graphical information.

NOTE: - The templates for the upper components e.g. ballast, sub grade etc are usually closed shapes. Make sure only the levels below are displayed in the microstation file.

Schotter (Ballast)

PSS (Protection Layer)

Tragschicht (Sub Grade Layer)

Schiene-UIC (Rails)



Import templates from graphic

Select the layer Schotter (Ballast) using a Microstation selection set.





In template library go to File > Import Template





Import Template from Graphics							
Default Style:	Schotter 💌	Apply					
Type:	Template 💌	Close					
Vertical Exaggeration	Template and End Conditions Template	Help					
Minimum Chord Leng Elements:	End Condition						

Set the style to Schotter

Specify the type of the template, there are three options:

Template & End conditions

Template

End Conditions

Set then type to Template

Import Template from Graphics						
Default Style:	chotter	•	Apply			
Туре:	emplate	•	Close			
Vertical Exaggeration o	f Graphics: 1.000	000	Help			
Minimum Chord Length Elements:	of Curved 1.000	1000				

Click **Apply** and you will be prompted to select the origin if the template.

			▶ Mod	iel (Layo	ut1_/							
		Command	: prcc	md								
		Bentley	Rail	Track	XM Edi	tion>	DB:	Select	Origin,	RST:	Back:	
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Identify the track center. At this time it is insignificant whether you identify exactly the track center as this can be specified later.

Close the Import Template dialog box.

The template for the ballast is now imported into the library and given a default name (New Template).

Move the template to the **HL** folder (by using drag & drop).

Open the folder **HL** and right mouse click on the new template and select **Rename**.

Change the name to **101 Schotter** and double click on the template to see it in the Current Template view.





In the current template view right mouse click on the template and select Edit Component

E dit...

Help

Create Template					- 0
File Edit Add Tools					
Template Libray: F._Tuaning\RaiNBahrgnotleVV3 T Point Name List SAVE_HL Districtions Rail Painter Sector 5 Sector 5	Current Terroplate Namm: 107 Schotter Description:	Com Com Com	nponents C Constraints Slay Point Names Slay All Components		Close
DVB Training DVB Training Real Profess with Protecting Dr. Responsible Roads Intacks Training Water HL I (01) Schutter	-4.1 -6.2 -4.3		Add New Cateponent Template Documentation Check Polet Connectative Delete Components Change Template Origin Delete Constraints from	LURK	
	-0.4 -0.5 -0.5		Edit Components. Insert point University Component Po Set Component Deplay 9 Delete Component Set Develop Only	res tules	,
a Active Template	-07	15 10 05		10 15 20	25 3
	nerties			Y	Test
Component Pro	percies				
Name:	Schotter		+	Apply	
Description:	Schotter			Close	
Style:	Schotter 💌	🔽 Close Shape	•	< Previous	
Parent Component:		+		Marta	
Display Rules:			Edit	INEXt >	

For the component enter a name, description and style of Schotter.

Apply and close the dialog box.

Γ

Exclude from triangulation





Point **11** on the template is not necessary and can be deleted.

Right mouse click on point 11 and select Delete Point



The centre point on the template needs to have a known name assigned to it. Right mouse click on the centre point and select **Edit Point**.





Point Properties			×
Name:	SM	- +	Apply
Feature Name Override:	1		Close
Surface Feature Style:	Schotter	-	< Previous
Alternate Surface:		-	Next >
			Halp
	Member of		
	Schotter		
Constraints Constra Type: None	int 1	Constraint	2
Label: Style Constraint: C Horizontal Range: 0.000	C Vertical O Bo	y ath	

Key in the name **SM**

Apply and close the dialog box.

We need to change the Template Origin to **0,0**.

Right mouse click on the point SM and select Change Template Origin.

SM	Add New Component Template Documentation Link	• •••	
	Check Point Connectivity Delete Components		
	Change Template Origin	-in ka	
	Delete Constraints from All Po		
	Set Dynamic Origin	Ctri-D	

Save the template library.

Create a new template in the HL folder and give it the name **101 Rails**.



Turn on the Dynamic Settings.

-6 ○ ○ •• ◀	-4	-2
)n/Off Dynamic Se	ttings dialog box

Set the dynamic settings as follows:

Placing Null Points

Null Points are specific points of a component within a template. When used in modeling these points are objects in the DTM.

Right mouse click in the template window and select Add New Component > Null Point.

 Add New Component 🔹 🕨	Simple
 Set Dypamic Origin Ctrl-D	Constrained
Set Dynamic Origin Ctrip	Unconstrained
 	Null Point
- File State	End Condition



In the Dynamic Settings dialog box select the Style Schienen

Set the input to xy= and type in -0.718, 0

Data the enter key on the keyboard and point 1 is placed.

Repeat this procedure for the track centre and the right rail.

Track Centre xy=0,0

Right Rail xy=0.718, 0



Change the point names

We now need to change the point names.

 $1 \rightarrow SL$

11**→** GM

12**→** SR

Right mouse click on the point and select **Edit Point**, change the names to match those above.



Save the template library.

Constraints

Point Constraints are used to manage the behavior of template points. They are used so that if a point is moved in a template, either by the user editing the point or by the application of point controls during design processing, all the points related to the point being moved will behave in a predictable manner.

Set the template display to Constraints:



We need to add constraints to the rail points.



Right mouse click on point SL and select Add Constraint > Full Constraint



You are prompted to identify the Parent point.



Data the point **GM** and the following dialog box will appear.

Add Full Constraint	×
Horizontal Offset:	ОК
Vertical Offset:	Cancel
0.000000	Help
10.000000	

Accept with **OK**.



🐹 Create Template					_ _ _ _ ×
Eile Edit Add Tools					
Template Library: D:\Training\Bentley Institute 08.09. E Point Name ListSAVE_HLBahnprofile RailBischung/Einschnitt Endcodibi	Current Template Name: 101Rails Description:		Display Components Constraints Display Point Names Display All Components		Close Help
DVB DVB Training Rail Profiles with Protecting Ditc Regelprofile Roads tracks Training Veater	4				×
HL >< 101 Schotter T01Rais	2 0 SL	+	F M		"SR
Active Template	-2 -0.8 -0.6 + - ☆ क़ 4: -1 = # ा • ↔	-0.4 -0.2	-0.0 0.2	0.4 0.6	0.8
Pteview:					Text

You will now see the connection between point **GM** and **SL**. The point **SL** is connected with a Constraint (horizontal & vertical) (blue arrow).

Points that are fully constrained display as a red +.

Points that are only constrained in one direction will display as a yellow +.

Repeat this procedure for the point **SR** and save the template library.





Completing a templates

Create a new template in the HL folder and name it Profile 101.



Single click on the template **101 Schotter** to view the template in the preview window. (The profile is to appear only in the preview window).



Drag and drop the component **101 Schotter** from the preview window into the main window and place it at the **0,0** origin.

Toggle the display to **Components**.





Save the template library.

Single click now on the **101 Rails** component and drag and drop this into the main window. Place this just above the **101 Schotter** component.



Right mouse click on the point **GM** and select **Move Point**.

In the Dynamic Settings dialog box set the input to xy= and type in 0,0.17

Data the enter key on the keyboard and the component is moved.





We need to specify the new origin for the template, right mouse click in the template window and select **Change Template Origin**.







Save the template library and close the Create Template dialog box.

Create a new roadway library

Go to **Modeler > Roadway Designer** to open the roadway designer dialog box.

Go to **File > New** and type in the name **Hoesbach** for the roadway designer file name and data the save button.





Create a corridor

Select Corridor > Manage Corridors (or select from the toolbar)



Enter **Hoesbach** for the corridor name, data the **Add** button then close the dialog box.

🐺 Roadway Designer - D:\Training\Bentley Institute 08.09.00.00\Rail\Bahnprofile\Rail.ird		_ D ×
File Corridor Superelevation Tools		
	<u>C</u> lose	Help
■ ■ 252 250 250 246 246 244 242 240 240 238 236	Close	
300 234 232 + - \$ + + - = ■ 4 Conidor: Hoesbach K < 0+0000000 Station: K < 0+0000000 Station: K < 0+0000000 Station: K < 0+0000000	Display S	10 V Superelevation
Active suitace: Gelande Interval: 0.000000 Template:	Process 1	rcess All Visible Range

In the plan view click on fit view



Template placement

Select Corridor > Template Drops



Select the template **Profile 101**, set the interval to **25** and click the **Add** button.





The template is now visible in the cross section view.

Data the Process All button



Define Point Controls

Point controls are used to modify the behavior of points in a template. These controls take precedence (they override) over existing constraints on the point.

This command includes colored text to indicate a condition of the design data. Orange station text indicates there is a conflict between two or more point control stations. Red station text indicates the geometry of the alignment has been modified and the station value is no longer valid

Select Corridor > Point Controls



Change the dialog box to match the settings below.

Point Controls					_ 🗆 🗵
Corridor: Hoesbach Mode C Horizontal © Vertical	C Both	Station Lir Start: 0+(Stop: 5+(nits 100.0000 100.0000	+ +	Add Close Change
Control Type: Cant Horizontal Alamment: 5200G Cant: Ueberh Cant Center Point: GM Cant Left hoint: SL Cant Right Point: SF Priority: 1 Horizontal and Vetical Centers		Horizontal Start: 0.0 Stop: 0.0 Vertical 0 Start: 0.0 Start: 0.0 Start: 0.0	0ffsets 00000 00000 ffsets 00000 00000	* *	Help
En Prio Name	Start Station	Stop Station	Mode	Туре	Control
					Delete

Click the **Add** button.

Close the dialog box and save the Roadway Library.



Data the Process All button

	2	36		
2+000 + - A G +t -t - A K	4+000	-2	Ó	2 4
Corridor: Hoesbach	Station:	< 0+000.0000		Display Superelevation
Active Surface: Gelände	 ▼ Interval:	25.000000		Process All
	Template:	Profile 101		Process Visible Range

Using the station buttons you can scroll along the roadway. Note the template does not rotate to suit the cant this is because there are no constraints between the ballast and the rails.



Save the roadway designer library and close the dialog box.



Constraints within a compound template

Open the Template Library (Modeler > Create Template) and select the template Profile 101



Toggle the display to **Constraints**.

Right mouse click in the main window and select Delete Constraints from All Points.





Right mouse click on point SL and select Add Constraint > Full Constraint

You are prompted to identify the Parent point.

Data the point **GM** and Accept with **OK**.

Repeat for the **SR** point.



Right mouse click on the point SM and select Add Constraint > Full Constraint.



You will be prompted to identify the Parent Point .

DB: Select Parent Point, RST: Exit

Select the point **GM**.



	×
OK	
Cancel	
Help	
	OK Cancel Help

Click to OK.



We will now constrain GM to 16 and GM to 12 using a Vector Offset Constraint

Right mouse click on point 16 and select Add Constraint > Vector Offset



You will be prompted to select the parent point, data on point **SL** as the first parent point and **SR** as the second parent point.

Data the **OK** button on the Add Vector Constraint dialog box.

Right mouse click on point 12 and select Add Constraint > Vector Offset





You will be prompted to select the parent point, data on point **SR** as the first parent point and **SL** as the second parent point.

Data the **OK** button on the Add Vector Constraint dialog box.



The points **16** and **12** are constrained in one direction (They are able to move in the horizontal direction).

Right mouse click on point 16 and select Add Constraint > Horizontal

You will be prompted to select the parent point, data on point SM.

Data the **OK** button on the Add Horizontal Constraint dialog box.

Repeat this for point 12



Points **16** and **12** are now in **RED**. This indicates the points are fully Constrained.

The points **13**, **14** and **15** must now be connected with appropriate Constraints



Right mouse click on point ${\bf 15}$ and select ${\bf Edit}~{\bf Point}$

	1111	¥18_
-10 - ↓-↓□▲♀♀♀◀	Add New Component Template Documentation Link Check Point Connectivity Delete Components Change Template Origin Delete Constraints from All Points	•
	Move Point Edit Point Add Constraint	•
	Delete Point Delete From Components (Make Null) Set Dynamic Origin	Ctrl-D

Make the following settings:

Point Properties			×
Name:	15	• +	Apply
Feature Name Override	15		Close
Surface Feature Style:	Schotter	-	< Previous
Alternate Surface:		-	Next>
			Help
	Member	of:	
	Schotte	er	
- Constraints			
Const	aint 1	Constraint	2
Type: Slope	•	Slope	•
Parent 1: 16	▼ +	14	• +
Parent 2: 🔲 Rolla	ver Values	Rollover 1	/alues
Value: 66.66666	1%	5.000000%	
Label:	-		•
		T	
Style Constraint:	1		
Style Constraint: Horizontal	C Vertical C	Both	
Style Constraint: G Horizontal Range: 0.00	C Vertical C	Both	

Click on **Apply**.



Right mouse click on point 13 and select Edit Point

Make the following settings:

Point Properties			X
Name:	13	- +	Apply
Feature Name Override:	13		Close
Surface Feature Style:	Schotter		
Alternate Surface:			< Previous
	,		Next>
	Mor	wher of	Help
	Sc	hotter	
Constraints		Constraint	2
Type: Slope	aint i	Slope	-
Parent 1: 12		↓ 14	
Parent 2: Rollor	ver Values	- Rollover	Values
Value: -66.666667	7%	-4.999949%	
Label:	- -		_
Style Constraint:			
	1		
Horizontal	O Vertical	C Both	
Range: 0.00	0000		
L.			

Click on Apply

Save the template library.



If any changes are made to templates in the template library and these templates are being used in roadway designer then you can synchronize these changes.



Templ	ate Drops			
Corridor:	Hoesbach			Add
Station:	0+000.0000	+		Close
Interval:	25.000000	+		Change
Library Te	mplates:			
	_SAVE_HL		▲	Сору
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l 🗖	Rail Profiles with Protecting Ditch			
Current To	emplate Drops:	\frown		
Station	Interval	Template	Revised In	Library
0+000.00	00 25.000000	Profile 101	ITL	D:\Training
			-	
Synchro	nize with Library		Edit	Delete

Go to Modeler > Roadway Designer and go to Corridor > Template Drops.

The template Profile 101 appears in **RED**, because changes were made.

Select the template and data the **Synchronize with Library** button.

Close the dialog box.

In the Roadway Designer data the **Process All** button.



The template now follows the cant.

Save the roadway designer file and close the Roadway Designer.



Build a complete template

You can easily repeat this previous session with all other subgrade layers but to save time we are going to use some pre defined components.

Open the template library **Modeler > Create Template**.

In the template library you will see a folder called **HL SAVE** in this you will find subfolders **PSS** and **Tragschicht**, these folders contain the sub layer components.

Copy the templates 101 PSS & 101 Tragschicht to the HL Folder (use right mouse click to copy and paste)



Set the display to Components

Activate the template **Profile 101** and click on **101 PSS** so it appears in the Preview window.



Drag the template 101 PSS onto point 15 of the Profile 101 template





On the right hand side you will see some duplicate points, we must merge these points

Right mouse click on point **14** and select **Merge Points**.



Delete Point 121

Right mouse click on point 13 and select Merge Points



Delete Point 131





Right mouse click on the point 14 and select Edit Point

Set the Constraints as follows:

Point Properties				×
Name:	14		• +	Apply
Feature Name Override:	14			Close
Surface Feature Style:	Schotter		•	< Previous
Alternate Surface:			~	Next >
				Halp
	Me	ember of:		Help
	P	SS		
	5	cnotter		
Constraints Constr	aint 1	C	onstraint	2
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Data the target button next to the point name field and select point ${\bf 17}$

Set the Constraints as follows:

Point Properties			×
Name:	17	▼ +	Apply
Feature Name Override:	17		Close
Surface Feature Style:	PSS	•	< Previous
Alternate Surface:		-	Marita
		-	ivext >
	Member	r of:	Help
	PSS		
Constraints			
Type: Horizontal	int 1	Constraint 2	-
Parent 1: 1		1	-
1.		, ·	
Value: -0.162162		-0.108108	
Label:	-	, 	-
Style Constraint:		~	_
C Horizontal	C Vertical C	Both	
Range: 0.00	0000		

Data the target button next to the point name field and select point ${\bf 1}$

Set the Constraints as follows:

Point Properties		X
Name:	1	▼ ♦ Apply
Feature Name Override:	1	
Surface Feature Style:	PSS	CPrevious
Alternate Surface:		V Neut >
	Member o	of: Help
	PSS	
Constraints		Countraint 2
Type: Horizontal		Slope
Parent 1: 15	- + 1	5 • +
		Rollover Values
Value: -0.796735	5	5.000000%
Label:	•	•
Style Constraint:		Y
Horizontal G Horizontal G Horizontal G Horizontal G Horizontal Horizontal G Horizontal Horizontal	O Vertical C E	lath
Range: 0.000	0000	



Data the target button next to the point name field and select point **161**

Set the Constraints as follows:

Name: 161 ¥ Apply Feature Name Override: 161 Surface Feature Style: PSS ¥ Alternate Surface: Wender of: PSS Constraints Constraint 1 Type: Horizontal ¥ Parent 1: 14 ¥ 14 ¥ Value: 0.000000 -0.100000
Constraint 1 Constraint 2 Type: Horizontal Vertical Parent 1: 14 14 Value: 0.000000 -0.100000
Constraint 1 Constraint 2 Type: Horizontal Vertical Vertical Parent 1: 14 + 14 Value: 0.000000 -0.100000 -0.100000
Type: Horizontal Vertical Vertical Parent 1: 14 14 4 Value: 0.000000 -0.100000
Parent 1: 14 ▼ 14 ▼ ↓ Value: 0.000000 -0.1000000 -0.1000000 -0.100000 -0.1000000 -0.1000000 -0.1000000 -0.1000000 -0.1000000 -0.1000000 -0.1000000 -0.1000000 -0.1000000
Value: 0.000000 -0.100000
Label:

Close the Point Properties dialog box.

The result should look as follows:



Save the template library and close the create template dialog box

Go to Modeler > Roadway Designer and go to Corridor > Template Drops.

Select the template and data the **Synchronize with Library** button.

Close the dialog box.



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- And - Charles	264 263	
	262	
	261	
4	259	
	258	
300	256	
<u>2+000</u> 4+000 6+000 + — 去 ↔ ↔ □ ▲		
Corridor: Hoesbach 💌 : Active Surface: Gelände 💌 :	tation: k < 3+625.0000 > > ↓ ◆ nterval: 25.000000	Display Superelevation Process All
	emplate: Profile 101	Process Visible Range

In the Roadway Designer data the Process All button.

Save the roadway designer file and close the dialog box.

Go to Modeler > Create Template

Activate the template **Profile 101** and click on **101 Tragschicht** so it appears in the Preview window.

Drag the template 101 Tragschicht onto point 17 of the Profile 101 template



We need to create constraints for point **111**

Right mouse click on the point 111 and select Edit Point



Set the Constraints as follows:

Point Properties			X
Name:	111	▼ +	Apply
Feature Name Override:	111		Close
Surface Feature Style:	Tragschicht	-	< Previous
Alternate Surface:		-	Mouts
	Membe	r of:	нер
	Trags	chicht	
Constraints			
Constra	aint 1	Constraint 2	2
Type: Horizontal		Vertical	<u> </u>
Parent I: 17	_ ≠	17	<u>→</u> <u>+</u>
Malue:			
Value. 10.972973		0.648649	
		<u> </u>	-
Style Constraint:		v	
Horizontal	C Vertical C	Both	
Range: 0.00	0000		

We must merge the duplicate points (NOTE - This will not be needed in V8i)

plate Library	Current Terriciate	Display	These
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Bochurgen HL SAV PSS Regelprofit 101 Tragechet K 101 Tragechet K 101 Tragechet H 101 Tragechet H 101 Tragechet H 101 H BochurgetherHall Forder	-0.50 -0.55 -0.60		
DV8 Training HL HL 101 PSS 101 Rale 101 Schotter	-0.65 -0.70 -0.75	181 Add New Component. Template Economication Link	152 J8
Regeptotile Roads	-9.00 -0.05	Clead Park Connectinity Delete Consonants Change Template Origin Delete Constraints from All Points	
any Active Template	*=*****	Move Post Edit Post Add Constraint Mange Posts	Test
8		Delete Pont Delete From Components (Male Null)	
		Set Departy Owner Child	

Right mouse click on point 161 and select Merge Points

Delete	Point	
	121	
	161	

Delete **121**



Right mouse click on point 141 and select Merge Points



Delete **142**

Right mouse click on point 151 and select Merge Points



Delete **131**

Save the template library and close the Create Template dialog box.

Go to Modeler > Roadway Designer and go to Corridor > Template Drops.

Select the template and data the **Synchronize with Library** button.

Close the dialog box.

In the Roadway Designer data the Process All button.



Save the roadway designer file and close the Roadway Designer dialog box.



Open the template library **Modeler > Create Template**.

Activate the template **Profile 101**

On the right side of the template is a cable channel. We can use point symbology to make the channel display automatically as a cable channel in cross section.

Right mouse click on point 152 and select Edit

Excate Template		_101_
emplate Library D \Transing\Bentley Institute 08.05	Conset Tendote	Close
Field Name Let SAVE, M.L. Behrpother Rail Bockstang/Structuret Redoctile TVR VVR Training W.L. 101 PSG Kin Scholter TVI Scholter TVI Scholter Rail Polite 101 Rain Rain Polite 101 Rain Po	Name Name Feature Name Overdor Suitore Faster System Suitore Faster System Desce Suitore Faster System Desce Suitore Faster System Desce Neet 2 Neet 2 Nee	
Tranng Water	Constants Constant 1 1799: Romotod Power 1 141	171
turey Active Template	Value 0.270000 0.000000 4.0 4.5 Label Contract	50 -
	Chinam China Registration	

Change for the name to **CC** and the type of surface feature style to **Cable Channel**.

Click **Apply** and close the dialog box.

Save the template library and **close** the Create Template Dialog box.

Go to Modeler > Roadway Designer and go to Corridor > Template Drops.

Select the template and data the **Synchronize with Library** button.

Close the dialog box.

In the Roadway Designer data the Process All button.



End conditions

End conditions are template components which are used to model cut and fill treatments. They are added to the end of simple, constrained and unconstrained components.

End conditions consist of template points and individual components and appear as line segments. They are different to other components because they have the ability to target surfaces, elevations, alignments and surface features.

Open the template library **Modeler > Create Template**.

In the template library you will see a folder called **HL SAVE** in this you will find a subfolder called **End Conditions**.

Copy the template **101 Endcondition 1:1** to the **HL** Folder (use right mouse click to copy and paste)

Activate the template **Profile 101** and click on **101 Endcondition 1:1** so that it appears in the Preview window.







Drag the component 101 Endcondition 1:1 onto point 110 of the Profile 101 template

Fit the template view

Drag and drop the component **101 Endcondition 1:1** again but right mouse click whilst holding down the left mouse button and select **Reflect**, place the component on point **111**.

Create Template			-10) ×1
Die Edt Add Iools			
Template Library	Current Template	Display	Close
D \Training\Berdey Institute 08:09	Name: Profile 101	🧭 Conponents 🗂 Constrants	1000
SAVE ML	Description	Display Point Names	
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Boschung/Einschnitt Endcodis		11 11	
DVB Traning			11
HL HL	Score and the constraint of the		CONSIGNATION OF THE OWNER
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TOT Tragschicht	16 SL GMSR	18	California
Profile 101	16 15		
Ral Profiles with Protecting Ditc	И		
Tracka	-2 committee and a super-	The second s	and the second
Training			
Water	-3 Merce	CH/M	
	-4 Cascal	COPR -	A martine and a second
	Col Down	a over onto	
	-5	TO STORE OF STREET, ST	121
Libura Active Terrelate	1 2 0	2 4 6 1 10	12 14 14
[LEGRY MANY HOLDE	- Alexandre and a large	1	
FIENDIN.			Test
1			
1010			
1			

Fit the template view and Save the template library and close the create template dialog box.



Go to Modeler > Roadway Designer and go to Corridor > Template Drops.

Select the template and data the **Synchronize with Library** button.

Close the dialog box.

In the Roadway Designer data the Process All button.

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Active Surrace: Gelände	Template:	25.000000 Profile 101		Process V	isible Range

Delete components

Copy the template Profile 101 in the HL folder and rename it to Profile 101_1

Double click on template Profile 101_1 to make it the active template

Save the template library

Right mouse click in the active view and select Delete Components







Hold the left mouse button down and drag the drawn line over the **Cut** end condition components (only the **CUT** end conditions)



Template with a drainage channel

In the template library you will see a folder called **HL SAV** in this you will a find subfolder called **End Conditions**

Copy the templates **Drainage Channel** to the **HL** Folder (use right mouse click to copy and paste)

Activate the template **Profile 101_1** and click on **Drainage Channel** so it appears in the Preview window.

Drag the template **Drainage Channel** onto point **110** of the **Profile 101_1** template repeat for point **110** (remember to toggle off Reflect)





Test the template. Notice that the cut slope ends at approx 5 M. this is because the height was limited when the end condition was defined.

In order to change end conditions we must edit points **G15** and **G151**.

Right mouse click on point G151 and select Edit Point.

Toggle on End Condition is Infinite

Apply and close the dialog box.

Repeat for point **G15**.

Point Properties		×
Name:	G151	▼ ♦ Apply
Feature Name Override:	G151	Close
Surface Feature Style:	Graben	< Previous
Alternate Surface:		Viewt >
End Condition Propertie	ion Member o ception Drainage	f: Channel1
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Constraints		Constraint 2
Type: Slope		torizontal
Parent 1: G141		<u></u> 5141 ▼ +
Parent 2: Rollov	ver Values	
Value: -66.666700	1% 1	10.000000
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You can test now the process of the endconditions.





Creating Benches

In The **HL** folder create a template with the name Bench 5 m



Turn on the Dynamic Settings dialog box.

Right mouse click in the template view and select Add New Component > End Condition



For the component name type in Bench and set the style to Berme



Library Active Template	+-\$\$\$	-6 -4 ≝юα∲⊈	-2	Ó Ż
Preview:	Current Component Name: Bench		Style: Berme	
	Target Type:	Surface 💌	Priority:	1
	Surface	<active></active>	E Benching Count:	0
			From Datum:	0.000000
	Horizor	ntal Vertical	Step Elevation:	0.000000
	Offsets: 0.000000	0.000000	Rounding Length	0.000000
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In the dynamic settings dialog box set the input to xy= and type in **0**, **0** and **Enter** on the keyboard

Toggle on Bench Counting and set the counter to 4

Key in xy=**5, 5**

Enter

Key in HS=**2.2, 5%**

Enter

Right Mouse click and Select Finish

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Save the template library

Click the Test button and you will see 4 benches can be created.



Cases of endconditions/decision tables

Copy the template Bench 5M in the HL folder and rename it Bench 2/3

Make the template Bench 2/3 active

Right mouse click on point 11 and select Edit





Set the constraint to point 1 to be Slope and the value 2/3

Point Properties					×
Name:	11		-	+	Apply
Feature Name Override:	11				Close
Surface Feature Style:	Berme		-	-	< Previous
Alternate Surface:			-]	Next >
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Parent 1: 1		- - +	1		• +
Parent 2: Rollo	ver Values				
Value: 66.666667	%		5.0000	00	
Label:	1	•			•
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Apply the changes and close the dialog box.





Copy the template **Profile 101** in the **HL** folder and rename to **Profile 101_2** and set it to be the active template.



Add the template **Bench 2/3** to the left and right side at point **110** and **111**.





Edit point **112** and **11** and toggle OFF End Condition is Infinite.



Apply the changes and close the dialog box.

Use the Test button to check the endconditions.



To fix the problem click **OK**.

Go to Check Priorities.





Make sure that the Bench is set to priority 3 on both sides

Fix Priorities	×
Priority End Condition Component	OK
3 Bench	Cancel
Cut Cut	<u>H</u> elp
2 Fill	

Test the end conditions.



Close the dialog box.

Result: Benches are only used in this case if the cut height of the end condition 1:1 is exceeded.



End conditions with retaining walls.

In the template library you will see a folder called **HL SAV** in this you will find a subfolder called **End Conditions**.

Double click on the template Retaining wall

Toggle the view to Constraints.

Create Template			
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Right mouse click on point **P3** and select move.

Move the point to to see how the template is constrained.

Open the folder **HL SAV**

Copy the template **Profil 101 with Retaining wall Cable&Mast** to the **HL** Folder (use right mouse click to copy and paste)

Double click on the template Profil 101 with Retaining wall Cable&Mast





Component Display Rules

Component display rules make it possible to represent components under certain defined rules. That is a retaining wall is placed only if the end condition height is > 5m. Component display rules are defined on the components and stored in the template. If you delete the components the rules are not deleted, since they are stored in the template.

Right mouse click on the retaining wall component and select Set Component Display Rules





🐺 Component Display Condit	ional Expression		<u>- </u>
Conditional Expression for Stützt NOT Regel2 AND NOT Regel1	mauer1 Component		OK Cancel Help
Template Display Rules Name Type Recoll Component in Display	Expression	Test Value Re:	sult
Regel2 Component is Display	Auftrag	True True	
1	[Add]	Edit De	lete //

These Rules are driving the retaining wall and tell it when it appears or disappears.

Data the test button



Close the test window and save the template library.

Close the Create Template dialog box.



Go to Modeler > Roadway Designer and go to Corridor > Template Drops.

Highlight the original template drop and select the template **Profil 101 with Retaining wall Cable&Mast** for the HL directory.

Data the change button



Close the template drop dialog box



Data the process all button.

Save the roadway designer file.



Finally we can produce a new DTM.

Go to Corridor > Create Surface

Set the dialog box as below



Click Apply.

Close all dialog boxes.

In Microstation open the drawing xsect2008.dgn.

In Bentley Rail Track go to Evaluation > Create Cross Section

Leave the settings as default.

Apply and place the cross sections in the Microstation drawing

To add the train profile to the cross sections go to Evaluation > Place Cell/Block

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🐺 Place Cell/Bl	ock	_ 🗆 X
Cross <u>S</u> ection Se	t 5200G_1 💌 🛨	Apply
Station Range Start: Eng:	0+000.0001 • 5+000.0000 •	Close Filter
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Double click Cell/Block

🐺 Point Symbology 📃 🗌 🗙					
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Toggle on Display Cell and select the cell LRPROFIL.

Data OK & Apply.



From here you can proceed with annotation and volume calculation.



Workshop 2 Multi Track Template

You can design single or double tracks using the standard templates but how do we design a siding situation when the tracks from a single to a double tracks?

Start Bentley Rail Track and open the file\02 Multi Track\Data\Multi Track.dgn

Go to File > Project Defaults and load the configuration Workshop 2 Multi Track

Open the file\02 Multi Track\RWK\Multi Track.rwk

Go to **Modeler > Create Template** and in the typical sections folder double click on the template **Multi Track.**

Toggle on the Dynamic Settings

Right mouse click on the centerline of the rail point (LCL) and select **Move Point**, move the point to the left and notice the way the template moves.

Right mouse click to reset the template and close the Create Template dialog box

Go to Modeler > Roadway Designer

Select Process All and view the results.

Go to Corridor > Create Surface and Apply

Close the report and the create surface and roadway designer dialo

Create cross sections.



Workshop 3 Platform Setting Out Template

Using a template for the setting out of a new platfo

Start Bentley Rail Track and open the file\03 Platform Setting Out\Data\Platform Setting Out.dgn

Go to File > Project Defaults and load the configuration Workshop 3 Platform Setting Out

Open the file\03 Platform Setting Out\RWK\Platform Setting Out.rwk

Go to **Modeler > Create Template** and in the typical sections folder double click on the template **Rails** and **Platform**

Toggle on the Dynamic Settings

Double click on the point Rail Edge Left, note the Angle Distance constraint.

This constraint takes two parent points, a distance, and an angle. The selected point is then fully constrained to the location defined by the first parent, and the angle from the first parent relative to the vector defined by the two parent points. This constraint creates a rigid-body rotation which is ideal in this case for setting out a platform edge which must be at a fixed horizontal and vertical dimension but must also take into account the cant on the rails.

Close the Create Template dialog box.

We have loaded a surface called Rail level, this contains the features for the left and right rails, these were created using the View rails command. We will use the features as point controls for the left and right rail points on the template.

Go to **Modeler > Roadway Designer** and go to **Corridor > Point Controls** (Note the control type is set to feature).

Go to Corridor > Create Surface and Apply

Close the report and the create surface and roadway designer dialo

Create cross sections.



Workshop 4 Delivered V8i Templates

Start Bentley Rail Track and open the file\04 Delivered V8i Templates\Delivered V8i Templates.dgn

Go to File > Project Defaults and load the configuration Workshop 4 Delivered V8i Templates

Open the file\04 Delivered V8i Templates \ Delivered V8i Templates.rwk

Go to **Modeler > Create Template** and in the typical sections folder double click on the template **Rails** and **Platform**

Toggle on the **Dynamic Settings**

Double click on the template Double Track – Concrete Sleepers

Right mouse click in the template window and select **Template Documentation Link** click on the **Open Link** button

A pdf file will open giving design details of the template.

Close the pdf and the create template dialog box



Workshop 5 what's New in V8i

Let's look at some examples of some new functionality in V8i which may be interesting. Place Turnouts Move Turnouts (movie) Quick Regression (Movie) Turnout Healing (Movie) View Regression Points in mm View Stationing – Cant Multiple Regression – Edit Start and End Element, Geometric Freedoms maintained

Table Editor