

# Module BRIDGE

1. Define file of monolith sections widths in ground floor

creating file Example1.smk

While roadway has widening we define widths from situation.



### Polylines 1 to 6 must be drawn from left to right (in station direction)!



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#### 2. Define file of monolith sections heights in longitudinal section



Polylines 1 to 3 must be drawn from left to right (in station direction)! Recommendet is drawing in horizontal direction, which will be used as template for pressstressed cable lines drawing in longitudinal profile.



Define file of monolith sections heights from longitudinal section

1-10-1	1,2,		
÷ _ (			
			to the second seco

3. Draw 3D cross sections and model of deck construction Drawing cross axis in longitudinal section

Cross axis file Curent file *.pro C:\Primeri Moduli\Example 1.pro Replace file >> Marks and axis lines Mark insertion side © Left ORight Draw axis horizontal Step:	
Curent file *.pro C:\Primeri Moduli\Example 1.Example 1.pro Replace file >> Marks and axis lines Mark insertion side ① Left	
C: \Primeri Moduli \Example 1\Example 1.pro Replace file >> Marks and axis lines Mark insertion side © Left Draw axis horizontal Step:	
Replace file >>         Marks and axis lines         Mark insertion side         Image: I	
Marks and axis lines Mark insertion side © Left © Draw axis horizontal Step:	
Mark insertion side	
Left ORight      Draw axis horizontal  Step:	
☑ Draw axis horizontal Step:	
Step:	
Step:	
	1
Number prefix Prefix:	P
Avis line length [m]:	10.0
nve includger (n)	
Mark and station distance from axis lines [m]:	0.5
Line color	
Select color >>	
Text	
Style Height [mm]	
MOD Arial V 06.0 05.0 03.5	3.0
Color	
Select color >>	
ayer name: CROSS_AXIS1	
OK Cancel	
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3d drawing will be performed per segments according to cross section type: sections from 1 - 3 and 87-89, sections 4-5 and 85-86, and sections 6-84.



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#### 3.1 Draw in WCS coordinate system:

According to upper drawing we insert dates per particular sections.

At the same time are creating files of setting out points in sections Example1\_1.m3d, Example1\_2.m3d and Example1\_3.m3d and files of console cross sections Example1\_1.ppk, Example1\_2.ppk and Example1\_3.ppk.

Polyline (points 1 to 11) must be drawn in contraclockwise and closed (see picture on side 13)!

#### 3.1.1 Drawing from section 1 to 3 and 87 to 89

Draw 3D cross sections and model of deck construction

Section types			
	ОК	Cancel	

Files	×
3d roadway level file	
Current file *.o3d	
C:\Primeri Moduli\Example1\Example1.o3d	
Replace file >>	
Roadway file	
Current file *.voz	
C:\Primeri Moduli\Example1\Example1.voz	
Replace file >>	
Monolith construction sections height file	
Current file *.vmk	
C:\Primeri Moduli\Example1\Example1.vmk	
Replace file >>	
Monolith construction sections width file	
Current file *.smk	
C:\Primeri Moduli\Example1\Example1.smk	
Replace file >>	
OK Cancel	

×

	3 2 ∰ 4 pl % 5 6	1 11 10 1 8 pd % 9 1 8 7	
Section area			
	From-to     Single	Axis number:	1
Writte sections Draw hidroisola Draw 3D model Draw as sketch	vertex coordinates to file tion	Height of asphalt layers + hidroisolation - Ha [cm] Console under footway	8.0
Layers		Console LEFT	
Sections:	COCRETE_CONSTRUCTION_SECTIONS	Gradient - pl [%]	2.5
Model:	COCRETE_CONSTRUCTION_MODEL	Parallel with roadway	
Hidroisolation:	HIDROISOLATION_SECTIONS	Console RIGHT	
Colors		Gradient - pd [%]	2.5
Sections		Parallel with roadway	
	Select color >>		
3D model		Bottom construction border	
	Select color >>	Gradient [%]	2.5
Hidroicalation			2.5
	Colort color > >		
	JEIELL LUIUT >>	OK Cancel End	

3.1.2 Drawing from section 4 to 5 and 85 to 86 - equal as 3.1.1

## 3.1.3 Drawing from section 6 to 84

Draw 3D cross sections and model of deck construction		×
Section types		
OK	Cancel	

#### Files

3d roadway level file	
Current file *.o3d	
C:\Primeri Moduli\Example1\Example1.o3d	
Replace file >>	
Roadway file	
Current file *.voz	
C:\Primeri Moduli\Example1\Example1.voz	
Replace file >>	
Monolith construction sections height file	
Current file *.vmk	
C:\Primeri Moduli\Example1\Example1.vmk	
Replace file >>	
Monolith construction sections width file	
Current file *.smk	
C:\Primeri Moduli\Example1\Example1.smk	
Replace file >>	
OK Cancel	

×

×

Draw 3D cross sections and model of monolite deck construction

	3 <u>2</u> ₽ 4 pl % 5 6	1 11 10 pd % 9 7	
Section area	From-to     Single	Axis number:	1
Writte sections Draw hidroisola Draw 3D mode Draw as sketch Side angels of co	s vertex coordinates to file ation I n postruction	Height of asphalt layers + hidroisolation - Ha [cm] Console under footway Console LEFT	8.0
Equal     Layers     Sections:		Gradient - pl [%]	2.5
Model: Hidroisolation:	COCRETE_CONSTRUCTION_MODEL HIDROISOLATION_SECTIONS	Console RIGHT Gradient - pd [%]	2.5
Colors Sections		Parallel with roadway	
2D me del	Select color >>	Bottom border under slope	
3D model	Select color >>	Gradient [%]	2.5
Hidroisolation		Constant bottom border width	
	Select color >>	OK Cancel End	

Selected file .o3d: C:\Primeri Moduli\Example1\Example1.o3d Selected file .voz:C:\Primeri Moduli\Example1\Example1.voz Selected file .vmk: C:\Primeri Moduli\Example1\Example1.vmk Selected file .smk: C:\Primeri Moduli\Example1\Example1.smk Checking files ... finished. Select cross section CONTOUR: STARTING section number <85>: 6 ENDING section number <86>: 84



3.2 Draw as draft/sketch (horizontal) in local coordinate system

According to drawing on side 10 we insert dates for drawing per particular segments, simillar as in chapter 3.1, without drawing of model, defining axis number 2 and in name of layer adding 2. At the same time files of marking points in sections **Example1\_1\_sketch.m3d**, **Example1\_2\_sketch.m3d** and **Example1\_3\_sketch.m3d** are creating.

Example for sections 1 - 3 and 87-89:

Draw 3D cross se	ctions and model of monolite deck construc	tion	×
	32 ₽ , === , pl % 5	1 11 10 1 8 pd % 9	
Section area All	From-to     Single     vertex coordinates to file)	Ž Axis number:	2
Draw hidroisola	li	Height of asphalt layers + hidroisolation - Ha [cm] Console under footway Console LEFT	8.0
Sections:	COCRETE_CONSTRUCTION_SECTIONS2	Gradient - pl [%]	2.5
Model:	COCRETE_CONSTRUCTION_MODEL	Parallel with roadway	
Hidroisolation:	HIDROISOLATION SECTIONS	Console RIGHT	
Colors Sections	Calest cales > >	Gradient - pd [%]	2.5
	Select color >>	Bottom construction border	
3D model		Bottom border under slope	
	Select color >>	Gradient [%]	2.5
Hidroisolation		Slope parallel with roadway	
	Select color >>		
		OK Cancel End	

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- 4. Draw marking points and polyline in section vertexes of deck construction
  - 4.1 Draw in WCS coordinate system

From file Example1.m3d - added files Example1\_1.m3d to Example1\_3.m3d:

File type Monolith sections - *	.m3d OHollow sections - *.v3d	Colors Mark text
Section contour Outer	◯ Inner	Select color >>
Izrisi ☑ Coordinate syste orio	gin = WCS)	Height text
Draw points	Draw marks 🗹 Draw heights	Select color >>
Draw polyine in mo	del	Polyline
Connect vertexes	() 3d	
Draw polyline horiz	ontal 2d	Select color >>





4.2 Draw in local coordinate system and in 2d:

From file Example1\_sketch.m3d – added Example1\_1\_sketch.m3d to Example1\_3\_sketch.m3d

File type ● Monolith sections - *.m3d O Hollow sections - *.v3d	Colors Mark text
Outer     Outer	Select color >>
zrisi Coordinate syste origin = WCS	Height text
Draw points      Draw marks      Draw heights     Polyline	Select color >>
Draw polyine in model	Polyline
● 2d ○ 3d	Select color >>
Draw polyline horizontal 2d	





We can use drawing of longitudinal connection 2d points 1, 2, 3, 5, 6, 7, 8, 10, 11 in local coordinate system as ground floor sketch, that can be used by drawing of presstressed cable lines, especially in **examples**, **where objects are not linear, or roadways with expansions** ....

File type	Colors
Monolith sections - *.m3d O Hollow sections - *.v3d	Mark text
Section contour Outer Inner	Select color >>
Izrisi	Height text
Draw points Draw marks Draw heights	Select color >>
Connect vertexes	Polyline
	Select color >>
Draw polyline horizontal 2d	· · · · · · · · · · · · · · · · · · ·
OK Cancel	

- 5. Draw sections vertexes marking points table of deck construction
  - 5.1 Drawing in WCS coordinate system (from files Example1\_1.m3d to Example1\_3.m3d):

				Marking	points	
Draw sections vertexes marking po	ints table of deck construction	×	point	Y	Х	Н
File type			1_1	587789.003	140962.804	99.920
Monolith sections - *.m3d	O Hollow sections - *.v3d		1_2	587789.003	140965.904	99.998
Columns			1_3	587789.003	140966.804	100.020
Coloumn number of marks:		1	1_4	587789.003	140966.804	99.470
Coloumn number of Y-coordinates:		3	1_5	587789.003	140965.554	99.439
Coloumn number of elevation markey		5	1_6	587789.003	140965.554	98.739
coloumn number of elevation marks.			1_7	587789.003	140960.054	98.601
Colors			1_8	587789.003	140960.054	99.301
Title tout			1_9	587789.003	140958.804	99.315
inte text			1_10	587789.003	140958.804	99.865
Selec	t color >>		1_11	587789.003	140959.704	99.843
Text in rows			2_1	587789.203	140962.804	99.926
Selec	t color >>		2_2	587789.203	140965.904	100.004
			2_3	587789.203	140966.804	100.026
Vertical lines			2_4	587789.203	140966.804	99.476
Selec	t color >>		2_5	587789.203	140965.554	99.445
			2_6	587789.203	140965.554	98.745
Horizontal lines			2_7	587789.203	140960.054	98.607
Selec	t color >>		2_8	587789.203	140960.054	99.307
			2_9	587789.203	140958.804	99.321
			2_10	587789.203	140958.804	99.871
OK	Cancel		2_11	587789.203	140959.704	99.849

5.2 Drawing in local coordinate system (from files Example1\_1\_sketch.m3d to Example1\_3\_sketch.m3d):

		Marking	j points	
Draw sections vertexes marking points table of deck construction X	point	Y	Х	Н
File type	1_1	0.000	0.000	0.000
Monoliul secuons - 1.msu     O Hollow secuons - 1.vsu	1_2	0.000	3.100	0.078
Columns	1_3	0.000	4.000	0.100
Coloumn number of marks:	1_4	0.000	4.000	-0.450
Coloumn number of Y-coordinates: 3	1_5	0.000	2.750	-0.481
Coloumn number of elevation marks: 5	1_6	0.000	2.750	-1.181
	1_7	0.000	-2.750	-1.319
Colors	1_8	0.000	-2.750	-0.619
Title text	1_9	0.000	-4.000	-0.605
	1_10	0.000	-4.000	-0.055
Select color >>	1_11	0.000	-3.100	-0.078
Text in rows	2_1	0.200	0.000	0.000
Select color >>	2_2	0.200	3.100	0.078
	2_3	0.200	4.000	0.100
Vertical lines	2_4	0.200	4.000	-0.450
Select color >>	2_5	0.200	2.750	-0.481
	2_6	0.200	2.750	-1.181
Horizontal lines	2_7	0.200	-2.750	-1.319
Select color >>	2_8	0.200	-2.750	-0.619
	2_9	0.200	-4.000	-0.605
	2_10	0.200		-0.055
OK Cancel	2_11	0.200	-3.100	-0.078

### 6. Define file of border wreaths in ground floor

efine file of border wreaths	×
LEFT FOOTWAY	RIGHT FOOTWAY
Cross axis file Current file *.pro	
Replace file >>	
Input dates type Writting	O Polyline selction
Disposition	Sketch
Border wreaths width .EFT border wreath - <mark>SI [m]:</mark>	0.350 RIGHT border wreath - Sd [m]: 0.350
	OK Cancel

7. Draw 3D cross sections and model of kerbs, levelling layers and filling layers

Kerb is equal on whole object, so we can create all segments at once. 7.1 Draw on left side

raw 3D cross sections and model of footways, filling layers and 3D polyline	
	Height of asphalt layers + hidroisolation - Ha [cm]:       8.         Kerbs height in asphalt - Hr [cm]:       4.         Levelling layers width under kerbs - Si [cm]:       22.         Filling layers height by kerbs - Hb [cm]:       4.         Distance from LEFT border to break point of LEFT console A [cm]:       25.0         Distance from RIGHT border to break point of RIGHT console B [cm]:       25.0
ppk % ppk %	Drawings U Levelling layers Draw filing layers Draw filing layers Draw under console slope
files 3d roadway level file Current file *.03d Current file *.03d	Colors Kerbs Block Select color >>
Replace file >>	Model Select color >>
Roadway file Current file *.voz C: \Primeri Moduli\Example 1\Example 1.voz	Leveling and filing layers Block Select color >>
Slope console file Current file *.opk C:\Primeri Moduli\Example 1\Example 1.ppk	Model Select color >>
Replace file >> Section area Insertion side	Layer names Block: KERBS_LEFT
uxis number:	Model: KERBS_LEFT_MODE



## 7.2 Draw on right side

aw 3D cross sections and model of footways, filling layers and 3D polyline	
	Height of asphalt layers + hidroisolation - Ha [cm]:       8.0         Kerbs height in asphalt - Hr [cm]:       4.8         Levelling layers width under kerbs - Si [cm]:       20.1         Filling layers height by kerbs - Hb [cm]:       4.0         Distance from LEFT border to break point of LEFT console A [cm]:       25.0         Distance from RIGHT border to break point of RIGHT console B [cm]:       25.0         Drawings       0
ры 20 hhv 20	Leveling layers     Draw filing layers     Draw filing layers     Draw under console slope
lee .	Lolors Kerhs
es 3d roadway level file	Block
Current file *.o3d	
C:\Primeri Moduli\Example1\Example1.o3d	Select color >>
	Model
Replace file >>	
Baadway fla	Select color >>
Current file * voz	
C:\Primeri Moduli\Example1\Example1.voz	Levelling and filling layers
	Block
Replace file >>	Select color >>
Slope console file	ALL LO
Current file *.ppk	mouch
C:\Primeri Moduli\Example1\Example1.ppk	Select color >>
	N
Replace file >>	Laver names
	Block: KERBS RIGHT
ection area Insertion side	
	Model: KERBS_RIGHT_MODE
kis number:	OK Cancel





8. Draw 3D cross sections and model of footways, filling layers and 3D polyline

Footways are equall on whole object, so we can create all segments at once.

#### 8.1 Draw on left side:

		Section area	a 🔿 From-to	◯ Single	Section types Monolith	
LEFI Iz In ru	DETAIL "X" RIGHT	Footway sid	de O Right	Axi	s number:	1
		Polyline Tc 2 Polyline dist	ance from outer bo	rder of footway - L	[cm]: ertex coordinates to file	22.0
		4 3 Width [mm]:	on footway	8	>>	Draw filling layer
Layers Sections: Model:	CONCRETE_FOOTWAY_LEFT_SECT	ION Distance fro	om LEFT border to b om RIGHT border to	reaking point of LEF breaking point of R	T console A [cm]: IGHT console B [cm]:	25.0 25.0
Colors Footways Sections Select color >>	3D model Select color >>	Footway gra Gradient [% Parallel v Writte g	adient - pph 6]: with console gradier radients in file	nt - ppk [%]		2.5
Filling layer Sections Select color >>	3D model Select color >>	Writte ve O Writte o	ertex coordinates in oordinates of points way Draw 30	n file s 1,2,3 D model Drai	Writte coordinates     w under console gradie	of all points
		OK Cancel	End			

Draw 3D cross sections and model of footways	s, filling layers and 3D polylin	e

Files	×
3d roadway level file	
Current file *.o3d	
C:\Primeri Moduli\Example1\Example1.o3d	
Replace file >>	
Roadway file	
Current file *voz:	
C:\Primeri Moduli\Example1\Example1.voz	
Replace file >>	
Monolitnih sections widths files	
Current file *.smk	
C:\Primeri Moduli\Example1\Example1.smk	
Replace file >>	
Border wreaths section files	
Current file *.srv	
C:\Primeri Moduli\Example1\Example1.srv	
Replace file >>	
Console slope file	
Current file *.ppk	
C:\Primeri Moduli\Example1\Example1.ppk	
Replace file >>	
ОК	ancel

×

## File of footways coordinate vertexes is created - Example1\_footway\_left.m3d



#### 8.2 Draw on right side:

Draw 3D cross sections and model of footways, filling layers and 3D polyline				×
	Section area	◯ Single	Section types Monolith	
	Footway side O Left	Axis nu	mber:	1
2 TC → x 1 TL TD 1 x → TC 2 5 TD 1 x → TC 2	Polyline distance from outer border	er of footway - L [cm]	]: coordinates to file	22.0
		Select color >>		
3 4 4 3	Filling layer on footway Width [mm]: 8			🗹 Draw filling layer
Layers Sections: COCRETE_FOOTWAY_RIGHT_SECTIONS Model: COCRETE_FOOTWAY_RIGHT_MODEL	Distance from LEFT border to bread Distance from RIGHT border to bread	aking point of LEFT o	onsole A [cm]: T console B [cm]:	25.0 25.0
Colors	Footway gradient - pph			
Footways       Sections       Select color >>       Select color >>	Gradient [%]: Parallel with console gradient - Writte gradients in file	- ppk [%]		2.5
Filling layer Sections 3D model	Writte vertex coordinates in file	e ,2,3	Writte coordinates	of all points
Select color >> Select color >>	Draw footway Draw 3D m	nodel 🗌 Draw ur	ider console gradiei	nt in draining area

File of footways coordinate vertexes is created – Example1\_footway\_right.m3d





9. Draw 3D cross sections and model of roadway layers

Layers are equall on whole object, so we can create all segments at once.

Draw 3D cross sections and model of roadway layers					>
_ = = _	Section area	○ From-to	) Single	Draw 3D model	
	Layer over	hidroisolation	Draw under o	console slope in draining area	
	Layer height -	Hs [cm]: 7.0	Distance between vertical ali	nment and top of layer - dH [cm]:	0.0
Files 3d roadway level file Current file *.o3d C:\Primeri Moduli\Example1\Example1.o3d Replace file >>	Distance from Distance from	LEFT border to breaking RIGHT border to breaking	point of LEFT console A [cm]: ng point of RIGHT console B [cm	]:	25.0
Roadway file Current file *.voz C:\Primeri Moduli\Example 1\Example 1.voz	Layers Sections:	ASPHALT_SECTIONS	3D mo	del: ASPHALT_MODEL	
Replace file >> Console slope file Current file *.pok C:\Primeri Moduli\Example1\Example1.ppk	Colors Sections	Select color >>	30	nodel Select color >>	
Replace file >>	OK Can	cel		ß	
	Â				





#### 1. Draw 2D cross sections of deck construction

Files	
3d roadway level file	
Current file *.o3d	
C: Primeri Moduli Example 1 Example 1.03d	
Replace file >>	
Roadway file	
Current file *.voz	
C:\Primeri Moduli\Example1\Example1.voz	
Replace file >>	
Console slope file	
Current file *.ppk	
C:\Primeri Moduli\Example1\Example1.ppk	
Replace file >>	
Sections	Roadway drawing type in draining area
Section type	OUnder roadway gradient
Monolith     O Hollow	
Contraction database	Colors
	Section text marks
	Select color >>
Drawing type	
O Sketch   Normal	Elevation marks symbol
Drawing without roadway	Select color >>
	Elevation marks text
Axis number: 1	
Sections drawing step:	Select color >>
Distance between sections [m]:	Roadway
	Select color >>
Asphalt layer height [cm]: 8.0	
Asphalt layer height [cm]: 8.0	Axis
Asphalt layer height [cm]: 8.0 Views Views width [m]: 10.0	Axis

Breaking points distances in construction cross sections × side Right .ett side В pkd % % Dκ 25.0 Distance from LEFT border to breaking point of LEFT console A [cm]: 25.0 Distance from RIGHT border to breaking point of RIGHT console B [cm]: OK Cancel



2. Insert blocks in 2D cross sections of deck construction

#### 2.1 Insert hidroisolation

Insert blocks in 2D cross sections of construction



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×

2.2 Insert equal block – first on left side and then on the right side.

![](_page_19_Figure_1.jpeg)

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3. Draw longitudinal section in axis of monolite construction

If we do with upper procedure, **we don't need to draw object longitudinal section in object axis**, because this command is doing that.

Draw longitudinal section in axis of monolite construction	×
Files	
3d roadway level file	
Current file *.o3d	
C:\Primeri Moduli\Example1\Example1.o3d	
Replace file >>	
Monolith sections height file	
Current file *.vmk	
C:\Primeri Moduli\Example1\Example1.vmk	
Replace file >>	
.ength scale:	1.000
OK Cancel	

![](_page_20_Picture_3.jpeg)

![](_page_21_Picture_0.jpeg)

## **Module BRIDGE**

## **BRIDGE FENCES**

1. Draw longitudinal section from 3d polyline and calculating positions of segments

![](_page_22_Figure_1.jpeg)

Example for left footway fence:

Calculating segments	s position	IS	×
Segments lengths [m]:		6.00	
ОК	Cancel		

2d longitudinal profile from 3d polyline is drawing:

|--|

In command line appears claculation:

elect 3D polyline - rail axis:	
rawing ground floor 3d polyline projection finished.	
ick starting point position of rail longitudinal section:	
rawing longitudinal rail section finished.	
ail length = 79.400 m. Layout Left -> Right: 0.700 m + 13 x 6.000 m + 0.700 m; <- Middle ->: 0.700 m + 13 x 6.000 m + 0.700 u	n

2. Segments positioning and polyline drawing in X-direction of longitudinal section

We divide fence in 3 parts:

![](_page_22_Figure_10.jpeg)

- 3. Longitudinal draw of pipe vertical profiles
  - 3.1 In 1. segment we define in single option position of dilatation position to right side:

ER055 SECTION	I VIEW – DETAIL	
international design of the second se		
포 · Mediah 도 · Vertica	re tube 포 Mediate tube 또 Dilatation ins	tube sert
$\frac{1}{1}$	n tube	nsert
	Horizontal pipes	
height H [cm]:	120.0 Horizontal pipes Bottom pipes	
height H [cm]:	120.0 Horizontal pipes Bottom pipes Fi [mm]:	60.3
height H [cm]: ertikcal pipes Drawing option Single	Horizontal pipes 120.0 Bottom pipes Fi [mm]: Vertical distance to axis H1 [cm]:	60.3 18.0
height H [cm]: ertikcal pipes Drawing option Single O Multiple [mm]:	Horizontal pipes Bottom pipes Fi [mm]: Vertical distance to axis H1 [cm]: Fi of dilatations [mm]:	60.3 18.0 60.3
height H [cm]: ertikcal pipes Drawing option Single O Multiple [mm]: bosition number:	120.0       Horizontal pipes         Bottom pipes       Bottom pipes         Fi [mm]:       [         Vertical distance to axis H1 [cm]:       [         50.3       Fi of dilatations [mm]:         1       Intermediate pipes	60.3 18.0 60.3
height H [cm]: ertikcal pipes Drawing option Single O Multiple [mm]: bosition number: Bottom borders	120.0       Horizontal pipes         Bottom pipes       Fi [mm]:         Fi [mm]:       []         Vertical distance to axis H1 [cm]:       []         50.3       Fi of dilatations [mm]:         1       Intermediate pipes         Draw intermediate pipes       []	60.3 18.0 60.3
height H [cm]: ertikcal pipes Drawing option Single O Multiple [mm]: bosition number: Bottom borders Horizontal O Under angle	120.0       Horizontal pipes         Bottom pipes       Bottom pipes         Fi [mm]:       []         50.3       Fi of dilatations [mm]:         1       Intermediate pipes         Bottom pipes       []         Fi of dilatations [mm]:       []         Fi i firm]:       []         Fi i firm]:       []         Bottom pipes       []	60.3 18.0 60.3 48.3
I height H [cm]: ertikcal pipes Drawing option Single O Multiple [mm]: Disition number: Bottom borders Horizontal O Under angle	120.0       Horizontal pipes         120.0       Bottom pipes         Fi [mm]:       []         Vertical distance to axis H1 [cm]:       []         50.3       []         1       Intermediate pipes         Bottom pipes       []         Fi of dilatations [mm]:       []         e       []         Vertical distance to axis H2 [cm];       []	60.3 18.0 60.3 48.3 76.0
height H [cm]: ertikcal pipes Drawing option Single O Multiple [mm]: Exposition number: Bottom borders Horizontal O Under angle plors	120.0       Horizontal pipes         120.0       Bottom pipes         Fi [mm]:       []         Vertical distance to axis H1 [cm]:       []         50.3       Fi of dilatations [mm]:         1       Intermediate pipes	60.3 18.0 60.3 48.3 76.0 38.0
height H [cm]: ertikcal pipes Drawing option Single O Multiple [mm]: E position number: Bottom borders Horizontal O Under angle plors xis : Select color >>	120.0       Horizontal pipes         Bottom pipes       Bottom pipes         Fi [mm]:       []         50.3       Fi of dilatations [mm]:         1       Intermediate pipes         Bottom pipes       []         Fi of dilatations [mm]:       []         Vertical distance to axis H1 [cm]:       []         Vertical distance to axis H1 [cm]:       []         Praw intermediate pipes       []         Fi [mm]:       []         Vertical distance to axis H2 [cm]:       []         Fi of dilatations [mm]:       []         Dilatation position       []	60.3 18.0 60.3 48.3 76.0 38.0

In command line we define side of utorov drawing Left+Right for two first vertical profiles on 1. section:

Dilatation darwing side: Right Pick BOTTOM point in axis of LEFT profile/Side of dilatation/End: S Dilatation darwing side Left/Right/LeftRight: <R>LR Dilatation darwing side: Left+Right

![](_page_24_Picture_0.jpeg)

3.2 Drawing multiple profiles - 2. section; first profile is with dilatation , next two are without dilatation and so on to next to last:

![](_page_24_Figure_2.jpeg)

![](_page_25_Figure_0.jpeg)

3.3 Drawing multiple profiles - 3. section; first profile is with dilatation, next is without dilatation:

![](_page_25_Figure_2.jpeg)

After that we copy last profile in last poyline vertex.

![](_page_26_Picture_0.jpeg)

#### 4. Longitudinal draw of grips

#### 4.1 In 1. section are grips without dilatations:

![](_page_26_Figure_3.jpeg)

#### Draw dilatation LEFT: NO Pick segment LEFT point/Dilatation/None dilatation/Position number/End: Draw dilatation RIGHT: NO Pick segment RIGHT point/Dilatation/None dilatation: Draw dilatation LEFT: NO Pick segment LEFT point/Dilatation/None dilatation/Position number/End: p Position number of HORIZONTAL profiles <2>: 3 Draw dilatation LEFT: NO Pick segment LEFT point/Dilatation/None dilatation/Position number/End: Draw dilatation RIGHT: NO Pick segment RIGHT point/Dilatation/None dilatation: Draw dilatation LEFT: NO Pick segment LEFT point/Dilatation/None dilatation/Position number/End: e

33

![](_page_27_Picture_0.jpeg)

4.2 In 2. and 3. section are grip dilatations on right side at every 6.00 m, first dilatation is in first profile:

![](_page_27_Figure_2.jpeg)

			2.SECTION			
/r	2.000	¢	2.000	/r	2.000	/
				Ų		X
						Ш

![](_page_28_Picture_0.jpeg)

5. Longitudinal draw of horizontal profiles

#### 5.1 In 1. section are profiles without dilatations:

Horizontal profiles				×
Vertical profiles A = D/Fi [mm]: 60.3 Horizontal profiles B = D/Fi [mm]: 60.3	Dilatations C = D/Fi [mm]: Dilatation length L [mm]: Distance L1 [mm]:			51.0 190.0 60.0
Drawing option	Position number of dilatations:	5 Position num	ber by dilatations:	3
Position number: 2 Profiles with dilatations	CROSS SECTION		VIEW - DET AIL	
Colors Axis Select colors >> Profiles Select colors >> Dilatations Select colors >>	Vertical profile	DETAIL "A"	A vertical	. profile
	OK	Cancel		

![](_page_28_Picture_4.jpeg)

![](_page_29_Picture_0.jpeg)

#### 5.2 In 2. section profile dilatations will be on right side at every 6.00 m, first dilatation is in first profile:

![](_page_29_Figure_2.jpeg)

![](_page_29_Figure_3.jpeg)

5.3 In 3. section profile dilatation will be on right side in first profile.

![](_page_30_Figure_1.jpeg)

Longitudinal draw of ending profiles fillets
 Explode first vertical and horizontal profile in 1. section:

	Fillet of ending profiles	×
0 700	Profile	
, 0.700	A = D/Fi [mm]: 60.3	
	Outer radius Rout [mm]: 150.0	
<u></u>	Position number: 9	
	Colors	
<b>↓</b>	Select color >>	e A
	Select color	$\neq$
	Select color >>	
	OK Cancel	

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![](_page_31_Picture_0.jpeg)

Change layer nameame of first vertical axis with command Define layers of bridge fences profiles axis:

![](_page_31_Figure_2.jpeg)

Repeat the same procedure in 3. section.- explode last vertical and horizontal profile, fillet ending profiles, erase excessive objects and cahange layer name of last vertical axis.

7. Longitudinal draw of intermediate vertical profiles

Draw profiles in 1. section:

![](_page_31_Figure_6.jpeg)

![](_page_32_Figure_0.jpeg)

![](_page_32_Figure_1.jpeg)

#### Draw profiles in 2. section:

![](_page_32_Figure_3.jpeg)

```
Profiles will be drawn between current polyline vertexes.
Select polyline:
Bright openeing between INTERMEDIATE profiles in mm = <123.000>:
Bright openeing on start and end of segment = 127.9 mm.
Bright openeing on start and end of segment = 127.9 mm. Continue Yes/No/eXit <Y>:
Bright openeing on start and end of segment = 127.9 mm.
Bright openeing on start and end of segment = 127.9 mm.
```

![](_page_33_Figure_0.jpeg)

#### Draw profiles in 3. section:

![](_page_33_Figure_2.jpeg)

Profiles will be drawn between current polyline vertexes. Select polyline: Bright openeing between INTERMEDIATE profiles in mm = <123.000>: Bright openeing on start and end of segment = 127.9 mm. Bright openeing on start and end of segment = 127.9 mm. Continue Yes/No/eXit <Y>: Bright openeing on start and end of segment = 127.9 mm. Bright openeing on start and end of segment = 127.9 mm. Continue Yes/No/eXit <Y>: Bright openeing on start and end of segment = 127.9 mm. Bright openeing on start and end of segment = 103.3 mm. Bright openeing on start and end of segment = 103.3 mm.

![](_page_33_Figure_4.jpeg)

#### 8. Longitudinal draw of blocks

Draw block for anchor plate of vertical profiles in 1. section with horizontal insertion:

![](_page_34_Figure_2.jpeg)

![](_page_34_Figure_3.jpeg)

![](_page_34_Figure_4.jpeg)

![](_page_34_Figure_5.jpeg)

Move subsidiary lines – polylines to bottom border of filling layer:

![](_page_34_Picture_7.jpeg)

#### 9. Bridge fences dimension

#### 9.1 Mark dimension

Dimension marks in 1. segment:

	Dimension on linear polyline X
	Dimension option O Single O Multiple
	Dimension type O Distances Marks O Gradients Dimension dH segments values
	Number of simultaneous segments
Dimension of bridge rails X Dimension option On arc or circle On linear polyline On polyline	Dimension side O Left O Right O Horizontal
OK Cancel	OK Cancel
Dimension is between Select starting side Pick dimension line p Rail segments mark < Number of 1. segment Dimension betwe <u>en rai</u>	existing polyline vertexes! of polyline: position: RE >: < 1 >: il segments finished.

![](_page_35_Figure_4.jpeg)

Dimension on linear polyli	ne X
Dimension option Single Multiple	
Dimension type O Distances Marks O Gradients Dimension dH segments v	alues
Number of simultaneous segn	nents
Dimension side Left Right Horizontal	
OK Car	ncel

![](_page_36_Figure_2.jpeg)

#### Dimension in 3. section:

![](_page_36_Figure_4.jpeg)

Dimension distances between separate vertical profiles and than on the same sections as dimensions of marks:

Dimension on linear polyline	× Dimension on linear polyline
Dimension option	Dimension option
○ Single	◯ Single
Multiple	Multiple
Dimension type	Dimension type
Distances	Distances
Marks	OMarks
Gradients	Gradients
✓ Dimension dH segments values	Dimension dH segments values
Number of simultaneous segments	Number of simultaneous segments
	01
<b>OD</b>	$\bigcirc 2$
03	<u> </u>
<u> </u>	
Dimension side	Dimension side
OLeft	OLeft
	Right
Horizontal	Horizontal
OK Cancel	OK Cancel
	RE1
+ + 0.700	RE1       1.SECTION       2.000
, 0.700 0.700	2.000 RE1 1.SECTION 2.000 1 4.700 4.700 2.000 0.70
.000 .000 .000 .000 .000 .000	2.000 RE1 1.SECTION 2.000 4.700 4.700 2.000 0.70 0.70
, 0.700 , 1.700 , 1.7000 , 1.700 , 1.7000 , 1.700 , 1.7000 , 1.7000000 , 1.7000 , 1.7000 , 1.7000 , 1.7000 ,	2.000 RE1 1.SECTION 2.000 4.700 4.700 4.700 4.700 0.70 RE14
.000 .000 .000 .2.000 .2.000 .2.000 .2.000 .2.000 .2.000 .2.000	2.000 RE1 1.SECTION 2.000 4.700 4.700 2.000 4.700 2.000 RE14 0.70
0.700 0.7000 0.7000 0.7000 0.7000 0.7000 0.7000 0.7000 0.7000 0.7000	2.000 RE1 1.SECTION 2.000 4.700 2.000 4.700 2.0000 2.0000 2.000 2.000 2.000 2.000 2.000
000 000 2.000 13 2.000 2.000 2.000 2.000 2.000 2.000 2.000 2.000	2.000 RE1 1.SECTION 2.000 4.700 4.700 4.700 2.000 RE14 3.SECTION 2.000 0.70 RE14
000 000 2.000 E13 2.SECTION 2.000	2.000 RE1 1.SECTION 2.000 4.700 4.700 4.700 2.000 2.000 RE14 3.SECTION 2.000 0.70 RE14
000 000 000 2.000 E13 2.SECTION 2.000 1111111111111111111111111111111111	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
0.700 0.7000 0.7000 0.7000 0.7000 0.7000 0.7000 0.7000 0.7000 0.7000	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$

h

Dimension gradients and dH values between fence segments :

mension on linear polyline × Di mension option Single Multiple mension type Distances Marks Gradients Dimension dH segments values umber of simultaneous segments 1 2 3 mension side Left Right Horizontal OK Cancel $\sqrt[4]{(4)} = 3,000$ $\sqrt[4]{(4)} = 3,000$ $\sqrt[4]{(4)$	mension on linear polyline mension option ) Single ) Multiple mension type ) Distances ) Marks ) Gradients 2 Dimension dH segments values mber of simultaneous segments ) 1 ) 2 ) 3 mension side ) Left ) Right Horizontal OK Cancel	×
imension option ) Single ) Multiple imension type ) Distances ) Marks ) Gradients ] Dimension dH segments values umber of simultaneous segments ) 1 ) 2 ) 3 mension side ) Left ) Right ) Horizontal OK Cancel $\frac{4 \% = 3.000}{4 H = 8.1 cm}$ $\frac{2.700}{4 H = 8.1 cm}$ $\frac{2.700}{4 H = 8.1 cm}$	mension option ) Single ) Multiple mension type ) Distances ) Marks ) Gradients ] Dimension dH segments values mber of simultaneous segments ) 1 ) 2 ) 3 mension side ) Left ) Right Horizontal OK Cancel	
Single Multiple Multiple Multiple Distances Marks Gradients Dimension dH segments values umber of simultaneous segments 1 2 3 mension side Left Right Horizontal OK Cancel $\frac{4 1\% = 3.000}{dH = 8.1 cm}$ $\frac{2.700}{dH = 8.1 cm}$ $\frac{2.700}{dH = 8.1 cm}$ $\frac{2.700}{dH = 8.1 cm}$ $\frac{2.700}{dH = 8.1 cm}$	) Single Multiple mension type ) Distances ) Marks ) Gradients ] Dimension dH segments values mber of simultaneous segments ) 1 ) 2 ) 3 mension side ) Left ) Right ) Horizontal OK Cancel	
Multiple Multiple Multiple mension type Distances Marks Gradients Dimension dH segments values umber of simultaneous segments 1 2 3 mension side Left Right Horizontal OK Cancel $\frac{40\% = 3.000}{4H = 8.1 \text{ cm}}$ $\frac{2.700}{4H = 8.1 \text{ cm}}$	Multiple mension type Distances Marks Gradients Dimension dH segments values mber of simultaneous segments 1 2 3 mension side Left Right Horizontal OK Cancel	
Immension type       Distances         Distances       Marks         Gradients       Dimension dH segments values         Immension side       Immension side         Left       Right         Horizontal       OK         Cancel $4H = 8.1 \text{ cm}$ Immension side       Immension side         Immension	mension type ) Distances ) Marks ) Gradients ] Dimension dH segments values mber of simultaneous segments ) 1 ) 2 ) 3 mension side ) Left ) Right Horizontal OK Cancel	
Distances Marks Gradients Dimension dH segments values umber of simultaneous segments 1 2 3 mension side Left Right Horizontal OK Cancel $\frac{4 1\% = 3.000}{dH = 8.1 \text{ cm}}$ $\frac{1}{2}$ $\frac{1\% = 3.000}{dH = 8.1 \text{ cm}}$ $\frac{1}{2}$ $\frac{1\% = 3.000}{2.700}$ $\frac{1\% = 1000}{2.700}$ $\frac{1\% = 1000}{2.000}$ $\frac{1\% = 1000}{2.000}$ $\frac{1\% = 1000}{2.000}$	) Distances ) Marks ) Gradients ] Dimension dH segments values mber of simultaneous segments ) 1 ) 2 ) 3 mension side ) Left ) Right Horizontal OK Cancel	
Marks Gradients Dimension dH segments values umber of simultaneous segments 1 2 3 mension side Left Right Horizontal OK Cancel $\int \frac{\langle 1\% = 3.000}{dH = 8.1 \text{ cm}}$ 2.700 $\int \frac{\langle 1\% = 3.000}{dH = 8.1 \text{ cm}}$ 2.700 $\int \frac{RE1}{1.\text{SECTION}}$	) Marks Gradients Dimension dH segments values mber of simultaneous segments ) 1 ) 2 ) 3 mension side ) Left ) Right Horizontal OK Cancel	
Gradients   Dimension dH segments values   umber of simultaneous segments   1   2   3   mension side Left Right Horizontal OK Cancel    Image: Cancel    Image: Cancel  Image: Cance	DiGradients Dimension dH segments values mber of simultaneous segments ) 1 ) 2 ) 3 mension side ) Left ) Right Horizontal OK Cancel	
Dimension dH segments values umber of simultaneous segments 1 2 3 mension side Left Right Horizontal OK Cancel $\frac{4 \% = 3.000}{dH = 8.1 cm}$ $\frac{2 1\% = 3.000}{dH = 8.1 cm}$ $\frac{2 700}{2.000}$ $\frac{1000}{2.000}$ RE1 1.SECTION	Dimension dH segments values  The provide the segments of simultaneous segments  The provide the segments of simultaneous segments of simultaneous segments  The provide the segments of simultaneous segments of simultaneous segments  The provide the segments of simultaneous segments of simu	
umber of simultaneous segments 1 2 3 imension side ) Left ) Right ) Horizontal OK Cancel $\frac{100}{4} = 3.000$ $\frac{1}{6} = 3.000$ $\frac{1}{6$	mber of simultaneous segments ) 1 ) 2 ) 3 mension side ) Left ) Right Horizontal OK Cancel	
$\begin{bmatrix} 1 \\ 0 \\ 1 \\ 0 \\ 3 \end{bmatrix}$ $\begin{bmatrix} 1 \\ 0 \\ 0 \\ 1 \\ 0 \\ 0 \\ 1 \\ 0 \\ 0 \\ 0 \\$	) 1 ) 2 ) 3 mension side ) Left ) Right ) Horizontal OK Cancel	
Cancel	) 2 ) 3 mension side ) Left ) Right ) Horizontal OK Cancel	
$ \begin{array}{c} \hline & \\ \hline \\ \hline$	) 3 mension side ) Left ) Right ) Horizontal OK Cancel	
imension side ) Left Right Horizontal OK Cancel $\frac{\langle 1\% = 3.000}{dH = 8.1 \text{ cm}}$ $\frac{\langle 1\% = 3.000}{dH = 8.1 \text{ cm}}$ $\frac{\langle 1\% = 3.000}{2.700}$ $\frac{\langle 1\% = 3.000}{dH = 8.1 \text{ cm}}$ $\frac{\langle 1\% = 3.000}{(1 - 1)^2}$	mension side ) Left ) Right ) Horizontal OK Cancel	
Left Right Horizontal OK Cancel (4) (4) (5) (6)	) Left ) Right ) Horizontal OK Cancel	
Right       Image: Cancel         OK       Cancel         Image: Cancel       Image: Ca	) Right Horizontal OK Cancel	
Horizontal OK Cancel (4) = 3.000 (4) = 3.000 (4) = 8.1 cm (2.700) (7) = 0.700 (7) = 0.700	) Horizontal	
OK Cancel $4 - \frac{10}{3} = 3.000$ $4 - \frac{10}{3} = 3.$	OK Cancel	
$ \begin{array}{c}                                     $		
3.000 1.0 cm	<i% 3.000<br="" =="">dH = 14.1 cm</i%>	
	4.700	0
13	RE14	/ 0.
2.5101101	3.SECTION	
2.000 2.000	2.000	<mark>ب 0</mark> .

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![](_page_39_Figure_2.jpeg)

#### Select every position separate:

	Amount calculatio	on of bridge rail profiles	s X	
	Calculation type	Combined		
	Writte dates to file	e Cancel		
<pre>&lt; Select POSITION AXIS - line or Position number &lt; 1 &gt;: SElect LINES on corresponding ax Select entities: Opposite Corner: Entities in set: 40 Select entities: Weight g [kg/m1]: 1 = 6.819; 2 = Weight g [kg/m1]: 1 = 6.819; 2 = Weight g [kg/m1] = &lt; 1 &gt;: Position 1: Length = 1.170 m; g &lt; Select POSITION AXIS - line or Position number &lt; 2 &gt;: SElect LINES on corresponding ax Select entities: Opposite Corner: Entities in set: 2 Select entities: Weight g [kg/m1]: 1 = 6.819; 2 = Weight g [kg/m1] = &lt; 1 &gt;: 2 Position 2: Length = 0.583 m; g</pre>	<pre>arc for calculation &gt; is. 5.554; 3 = 4.636; 4 = = 6.819; 6 = 7.977; Pc arc for calculation &gt; is. 5.554; 3 = 4.636; 4 = = 5.554; 6 = 3.230; Pc</pre>	>/select Length/select = 1.578; 5 = writte val cs. number = 40; Weight >/select Length/select = 1.578; 5 = writte val	Blok/Writte dates/End: lue t = 319.088 kg; Total weight = 319.129 Blok/Writte dates/End: lue	kg.
Position 2: Length = 0.583 m; g < Select POSITION AXIS - line or	= 5.554; G = 3.239; Po arc for calculation >	cs. number = 2; Weight >/select Length/select	= 6.442 kg; Total weight = 325.605 kg Blok/Writte dates/End:'osnap	

11. Draw table of bridge fence profiles Example1.ogr

Colors	×	Pos	ition	Wgt. [kg]	Pieces	Sum [kg]
Title text			1	7.98	40	319.13
Select color >>			2	3.24	4	12.95
Delect color 777			3	11.11	2	22.23
Text in rows			4	0.70	13	9.04
Colort color > >			5	10.61	2	21.22
Select color >>			6	10.61	35	371.28
Outer lines			7	11.06	2	22.13
Outer lines	-		8	11.06	24	265.39
Select color >>			9	10.75	13	139.78
			10	0.88	13	11.45
Inner lines			11	1.03	4	4.11
Select color >>			12	4.17	2	8.33
			13	1.47	515	755.78
OK Can	cel	Sum	for 1	element		1962.82
Puuluul		Sum	for 1	elements		1962.82

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12. Ground floor and 3d drawing of vertical profiles

Copy and join longitudinal polyline between vertical profile distances. Copy axis of intermediate vertical profiles.

Ground floor and 3d drawing of vertical profiles	×
Drawing option () Ground floor drawing () 3d drawing () Ground floor and 3d drawing	
Join points to polyline Join 2d vertical profiles block insertion points Join 3d vertical profiles block insertion points Join 2d vertical profiles intermediate block insertion points Join 3d vertical profiles intermediate block insertion points	
OK Cancel	

Select new polyline in longitudinal profile, with vertexes in vertical profiles distances:

![](_page_40_Figure_4.jpeg)

Select polyline - 2d fence axis in ground floor:

![](_page_40_Picture_6.jpeg)

Select blocks for 2d and 3d vertical profiles:

![](_page_40_Picture_8.jpeg)

Select axis of intermediate vertical profile in longitudinal profile for layer, and then select all intermediate vertical profiles, for distance definition to draw in ground floor and 3d model and select corresponding 2d and 3d block:

![](_page_41_Figure_1.jpeg)

Ground floor drawing

![](_page_41_Figure_3.jpeg)

2d drawing - axonometry

![](_page_41_Figure_5.jpeg)

3d drawing - axonometry

![](_page_41_Figure_7.jpeg)

Copy 3d line of fence in vertical direction for 19.3 and 99 cm, from longitudinal profila transfer ending axis with fillets:

![](_page_42_Figure_1.jpeg)

With command Utilitys -> Loft 2D polyline - profiles on 3D polyline, we draw 3d holle pipe profiles:

Profile type	
O Monolith round	
Hollow round	
O Monolith optional	
O Hollow optional	

![](_page_42_Figure_4.jpeg)

### 13. Bridge fences dimension in ground floor

Dimension fence elements in ground floor – distances and marks, in the same procedure as in longitudinal profile:

For single distances between segments:

Dimension on linear polyline X
Dimension option Single Multiple
Dimension type Distances Marks Gradients Dimension dH segments values
Number of simultaneous segments
Dimension side Left   Right  Horizontal

In 1, 2. and 3. section

For 1. section 2 segments at once and in 2. and 3. section 3 segments at once.

	,		00	E1		<i>y</i>		RI	2		,
			2	70	,			6.0	00		
-	/	0.70	^	2.0	00	, 2.0	00	, 2.0	00	, 2.0	00
			1								
*	+		• • •	_	<b>`</b>	»		1		•	
	₽		• • • • • • • • • • • • • • • • • • •		<u>•</u> _		L	<u>.</u>	<u>•</u>		
_ (											
	K										
	Ρ										

![](_page_44_Picture_0.jpeg)

# **Modul BRIDGE**

## **CABLE PRESSTRESSING**

#### **CABLE PRESSTRESSING**

- 1. Define cable axis files in cross sections in draft/sketch ground floor and longitudinal section
  - 1.1 Draw cross axis horizontal with command Civil -> Cross axis -> Draw cross axis.

Cross axis file					
Curent file *.pro					
C:\Primeri Moduli\Example1\Exam	ple1.pro				
Replace file >>					
Marks and axis lines					
Mark insertion side					
● Left	C	Right			
☑ Draw axis horizontal					
Step:					1
Number prefix Prefix:					P
Number prefix Prefix:					P
Number prefix Prefix: Axis line length [m]:					P 30.0
Number prefix Prefix: Axis line length [m]: Mark and station distance from axis	s lines [m]:				P 30.0 1.0
Number prefix Prefix: Axis line length [m]: Mark and station distance from axis Line color	s lines [m]:				P 30.0 1.0
Number prefix Prefix: Axis line length [m]: Mark and station distance from axis Line color	s lines [m]: Select color >	>>			P 30.0 1.0
Number prefix Prefix: Axis line length [m]: Mark and station distance from axis Line color Text	s lines [m]: Select color >	>>			P 30.0 1.0
Number prefix Prefix: Axis line length [m]: Mark and station distance from axis Line color Text Style	s lines [m]: Select color >	>>	ım]		P 30.0 1.0
Number prefix Prefix: Axis line length [m]: Mark and station distance from axis Line color Fext Style MOD_Arial	s lines [m]: Select color >	>> Height [m ○6.0	ım] • 5.0	○3.5	P 30.0 1.0
Number prefix Prefix: Axis line length [m]: Mark and station distance from axis Line color Text Style MOD_Arial Color	s lines [m]: Select color > ~	Height [n 6.0	m]	03.5	P 30.0 1.0
Number prefix Prefix: Axis line length [m]: Mark and station distance from axis Line color Text Style MOD_Arial Color	s lines [m]: Select color > ~ Select color >	>> Height [n 0 6.0	m]	3.5	P 30.0 1.0 () 3.0
Number prefix Prefix: Axis line length [m]: Mark and station distance from axis Line color Text Style MOD_Arial Color	s lines [m]: Select color > Select color >	>> Height [n 0 6.0	im] () 5.0	○3.5	P 30.0 1.0 0 3.0

1.2 Draw cable axis in draft/sketch ground floor and longitudinal section. (see examples in appendix 12)

#### Longitudinal section and ground floor

![](_page_45_Figure_6.jpeg)

![](_page_45_Figure_7.jpeg)

![](_page_45_Figure_8.jpeg)

![](_page_45_Figure_9.jpeg)

![](_page_45_Picture_10.jpeg)

# 1.3 Define cable file Cable1.kal. Multiple cable drawing files must have the same cahracters to cable numbers in names! (Cable2.kal, Cable3.kal ...)

Define presstressing cable axis files in cross s	sections from	ground floor and longitudinal section	×
Cross axis file Current file *.pro C:\Primeri Moduli\Example1\Example1.pro			
Replace file >>			
Deltha stations [m]:			0.000
Fi cables [cm]:			10.8
Protecting concrete layer [cm]:			4.5
Delthafi [cm]:			3.2
	ОК	Cancel	

2. Draw cables in draft/sketch ground floor and longitudinal section

#### Multiple – longitudinal and ground floor cables

Colors, blocks and secti	on numbers		×	
Cross section file				
Current file *.pro				
C: \Primeri Moduli \Exam	nple1\Example1.pro			
Replace file >>				
Drawing option in ground	l floor			
Oraw axis and cable		🔿 Draw axis	○ None	
Drawing option in longitu	dinal section			
Oraw axis and cable		🔘 Draw axis	○ None	
Colors				
Cable axis				
0	:	Select color >>		
6.11				Table lines and text colors X
Cables	10	50 L L L 1808		Cable avis
		Select color >>		
Cable marks				Select color >>
	1	Select color >>		
				Text
Blocks				Select color >>
On cable startpoint				
Head		O Ancoring	○ None	Lines
On cable endpoint				
Head	◯ Clutch	Ancoring	○ None	Select color >>
Drawing option				
⊖ Single   Multiple	Cable numbers fi	om file 🛛 🖓 Draw table	Draw vertical assistance lines	Vertical inner lines
				Select color >>
Mark prefix:		Draw suffix for s	side	
				OK Cancel
		OK Cancel		Caricer
	_			

Block CABLE\_HEAD\_LEFT

Block CABLE\_HEAD\_RIGHT

![](_page_46_Picture_7.jpeg)

Selected cross section file: C:\Primeri Moduli\Example1\Example1.pro Checking dates in file finished. Select basic BLOCK for LEFT head: Select basic BLOCK for RIGHT head:
Pick AXIS position in ground floor:
Starting cable files text <k>: Cable</k>
STARTING cable number <1>:
ENDING cable number <1>: 10
File C:\Primeri Moduli\Example1\Cable1.kal not found. Cable line file:
C:\Primeri Moduli\Example1\Cable1.kal.
Longitudinal section processing
Section processing in ground floor finished.
Pick table X0Y origin point of cable. 1:
Draw table of 1. cable

### Longitudinal section and ground floor draft/sketch

![](_page_47_Figure_2.jpeg)

3. Draw cables in real ground floor 2d or 3d

2d draw

-				
Draw	cable	in rea	l around floor	

Draw cable in real grou	nd floor		×
Files			
3d roadway level file			
Current file *.03d			
C: \Primeri Moduli \Exa	ample1\Example1.o3d		
Replace file >>			
Roadway file			
Current file *.voz			
C: \Primeri Moduli \Exa	ample1\Example1.voz		
Replace file >>			
Drawing option			
O Single  Multiple			
Draw 3d Y- coordinat	res horizontal	Dra	w as sketch
Mark prefix:		Writte suffix for side	
	Colors and blocks Drawing option in gro  Draw axis and ca Colors Cable axis Cables Cables Select Sel	t color >>	
	Cable marks		
	Selec	ct color >>	
	Blocks On cable startpoint Head O Clut On cable endpoint Head O Clut	t ch () Ancoring () None ch () Ancoring () None	

Selected file *.o3d: C:\Primeri moduli\Example1\Example1.o3d Selected file *.voz:C:\Primeri moduli\Example1\Example1.voz Checking dates in files finished. Section checking finished. Select basic BLOCK for LEFT head: Select basic BLOCK for RIGHT head: Starting text of cable files <k>: CABLE Number of STARTING cable &lt;1&gt;: Number of ENDING cable &lt;1&gt;: 10</k>
Cable line drawing file:C:\Primeri moduli\Example1\CABLE1.kal. Section processing finished. Draw 1. cable finished.
Cable line drawing file:C:\Primeri moduli\Example1\CABLE2.kal. Section processing finished. Draw 2. cable finished.
Cable line drawing file:C:\Primeri moduli\Example1\CABLE3.kal.

![](_page_49_Figure_1.jpeg)

![](_page_49_Figure_2.jpeg)

	Colors and blocks X		
Draw cable in real ground floor X	<ul> <li>Drawing option in ground floor</li> <li>Draw axis and cable</li> <li>Draw axis</li> <li>None</li> </ul>		
Files 3d roadway level file Current file *.o3d C:\Primeri moduli\Example1\Example1.o3d Replace file >> Roadway file Current file *.voz C:\Primeri moduli\Example1\Example1.voz Replace file >>	Oraw axis and cable Oraw axis None Colors Cable axis Select color >> Cables Cables Cable marks Select color >>		
Drawing option O Single  Multiple O 2d O 3d	Blocks On cable startpoint Head Clutch Ancoring None On cable endpoint		
Draw 3d Y- coordinates horizontal Draw as sketch	Head O Clutch O Ancoring O None		
Mark prefix: Writte suffix for side	Mark prefix: Draw suffix for side		

Selected file \*.o3d: C:\Primeri moduli\Example1\Example1.o3d Selected file \*.voz:C:\Primeri moduli\Example1\Example1.voz Checking dates in files ... finished. Section checking ... finished. Select basic BLOCK for LEFT head: Select basic BLOCK for RIGHT head: Starting text of cable files <cable>: Number of STARTING cable <1>: Number of STARTING cable <1>: Cable line drawing file:C:\Primeri moduli\Example1\cable1.kal. Section processing ... finished. Draw 1. cable ... finished.

Block CABLE\_HEAD\_LEFT\_3D

#### Block CABLE\_HEAD\_RIGHT\_3D

![](_page_49_Picture_7.jpeg)

![](_page_49_Figure_8.jpeg)

![](_page_50_Picture_0.jpeg)

4. Draw cables in cross sections

Draw cables in cross sections	×
Leva stran 🛛 Desna stran	
	Draw cables in cross sections
Files 3d roadway level file Current file *.o3d C:\Primeri moduli\Example1\Example1.o3d	Mark prefix:
Replace file >>	Writte suffix for side
Roadway file	
Current file *.voz C:\Primeri moduli\Example1\Example1.voz	Mark insertion side
Replace file >>	○Left ○Center ○Right ○Top ●Bottom
Slope console file	Colors
Current file *.ppk C:\Primeri moduli\Example1\Example1.ppk	Cables
Replace file >>	Select color >>
Section type           Monolith         Hollow   Draw Y- coordinates borizontal	
Drawing option	Cable marks
O Single  Multiple Axis number:	Select color >>
Distance from LEET border to break point of LEET console A [cm]:	
Distance from RIGHT border to break point of RIGHT console R [chi]: 25.0	
	OK Cancel
OK Cancel	
<pre>Selected file *.o3d: C:\Razno\!Projekti Selected file *.voz:C:\Razno\!Projekti\ Selected file *.ppk: C:\Razno\!Projekti Preverjanje PREREZOV finished. Starting text of cable files <kabeleng> Number of STARTING cable &lt;1&gt;: Number of ENDING cable &lt;10&gt;: Cable line drawing file:C:\Razno\!Proje Section processing Draw cable finished.</kabeleng></pre>	\\Ponting\Nadvoz Ormož\OrmožENG.o3D \Ponting\Nadvoz Ormož\OrmožENG.voz \\Ponting\Nadvoz Ormož\OrmožENG.ppk >: ≳kti\Ponting\Nadvoz Ormož\kabeleng1.kal.

![](_page_51_Picture_0.jpeg)

5. Insert YOZ basis points in cross sections

Draw cable table in cross sections	×					
Section type Monolith O Hollow						
Drawing type O Sketch						
Y0Z Origin of coordinate system O Top axis point   Bottom axis p	point					
Axis number:	1					
Section views Width [m]:	10.0	Î		PP 5		â
Colors		100.123	i% = 2.500 >	100.039	i% = -2.500 >	99.968
Texst: Select color >>						
Lines: Select color >>					0 0 0 8 9 10	
OK Cancel						

6. Draw table of cable coordinates in cross sections

#### 6.1 Left side

Section type     Monolith     Hollow	Views Width [m]: 10.0
Drawing type	Height [m]: 10.0
O Sketch   Normal	Colors
Coordinate system Y0Z origin	Title text
○ Top axis point	Select color >>
Cable position for draw Left   Axis  Right	Text Select color >>
Axis number:	Outer lines Select color >>
Mark prefix:	Inner lines
Writte suffix for side	Select color >>

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![](_page_52_Figure_0.jpeg)

#### 6.2 Right side

Section type     Monolith     OHollow	Views Width [m]: 10.0
Drawing type O Sketch   Normal	Height [m]: 10.0
Coordinate system YOZ origin O Top axis point  Bottom axis point	Title text Select color >>
Cable position for draw O Left O Axis O Right	Text Select color >>
Axis number: 1	Outer lines Select color >>
Mark prefix:	Inner lines Select color >>

![](_page_52_Figure_3.jpeg)

#### 7. Draw table of cable specifications

#### 7.1 Left side

Draw table of cable specifications

X

Drawing are	•	3d	
Cable positio	on O Axis	() Rigl	nt
Textual date	Cable specifica	tion	
Mark prefix:	uffix for side		
Cable type:		19 x 150 m	nm2
Cable type: Cable weight	[kg]:	19 x 150 m	nm2 22.700
Cable type: Cable weight Colors Title text	[kg]:	19 x 150 m	nm2 22.700
Cable type: Cable weight Colors Title text	[kg]: Select color >:	19 x 150 m	1m2 22.700
Cable type: Cable weight Colors Title text	[kg]: Select color >:	19 x 150 m	1m2 22.700
Cable type: Cable weight Colors Title text	[kg]: Select color >: es Select color >:	> >>	1m2 22.700
Cable type: Cable weight Colors Title text Text in line Outer tab	[kg]: Select color >: Select color >: le lines	>>	1m2 22.700
Cable type: Cable weight Colors Title text	[kg]: Select color >> Select color >> le lines Select color >>	> >>	m2 22.700
Cable type: Cable weight Colors Title text Text in line Outer tabl	[kg]: Select color >: es Select color >: le lines Select color >: e lines	> >>	1m2 22.700

7.2 Right side
----------------

Draw table of cable specifications × Drawing area 🖲 3d O 2d Cable position Axis Right OLeft Textual dates Cable specifikation Titele text: Mark prefix: Writte suffix for side Cable type: 19 x 150 mm2 Cable weight [kg]: 22.700 Colors Title text Select color >> Text in lines Select color >> Outer table lines Select color >> Inner table lines Select color >> OK Cancel

Cable specifikation					
Mark	pcs	TYPE	L [m]	Wght [kg]	
1	1	19 x 150 mm2	79.2	1797.8	
2	1	19 x 150 mm2	79.2	1797.8	
3	1	19 x 150 mm2	79.2	1797.8	
4	1	19 x 150 mm2	79.2	1797.8	
5	1	19 x 150 mm2	79.2	1797.8	
Sum			396.0	8989.0	

Cable specifikation						
Mark	pcs	L [m]	Wght [kg]			
1	1	19 x 150 mm2	79.2	1797.8		
2	1	19 x 150 mm2	79.2	1797.8		
3	1	19 x 150 mm2	79.2	1797.8		
4	1	19 x 150 mm2	79.2	1797.8		
5	1	19 x 150 mm2	79.2	1797.8		
Sum		396.0	8989.0			