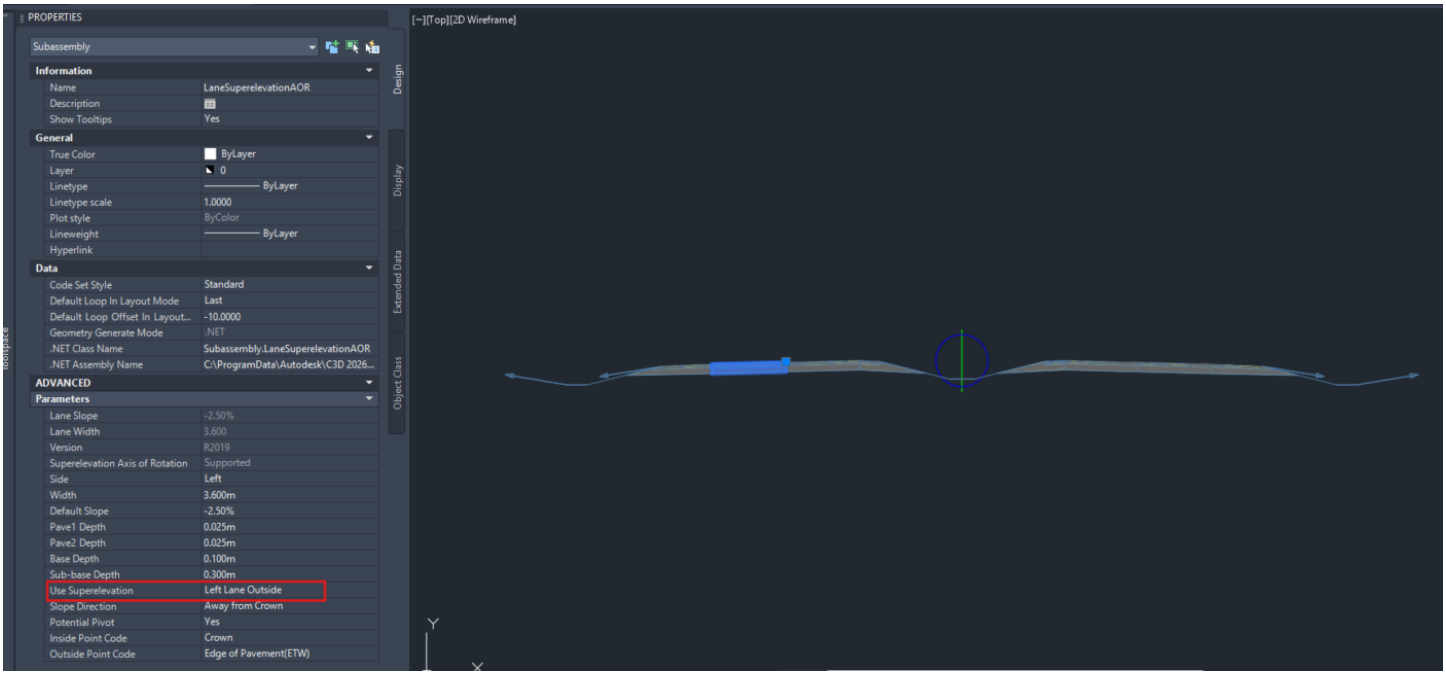
The Roles of Inside and Outside Parameters for Lanes and Shoulders in Superelevation

Road · https://civilwhiz.com/docs/the-roles-of-inside-and-outside-parameters-for-lanes-and-shoulders-in-superelevation/

Questions:

In Civil 3D, users need to set the **superelevation parameter** for subassemblies to *Inside* or *Outside*.



So, what does “Inside” or “Outside” refer to? And what do these options mean to your design?

Understanding Inside and Outside Parameters in Civil 3D

To better understand the parameters, we can refer to a sample dual-carriageway road model with a median ditch that separates the opposing traffic flows.

Sample Road Model here

Inside (Lane/Shoulder)	**Refer to the subassemblies positioned nearest to the median ditch. It can be a travel lane or a shoulder that is adjacent to the median**
Outside (Lane/Shoulder)	Refer to the subassemblies **located on the far right or left** of the roadway (away from the center), leading to the daylight.

To set the parameters, you may:

Select the subassemblies (i.e., shoulder or lanes) > Properties > Advanced Parameters > Use Superelevation > Choose from the dropdown (By default, it is set to No)

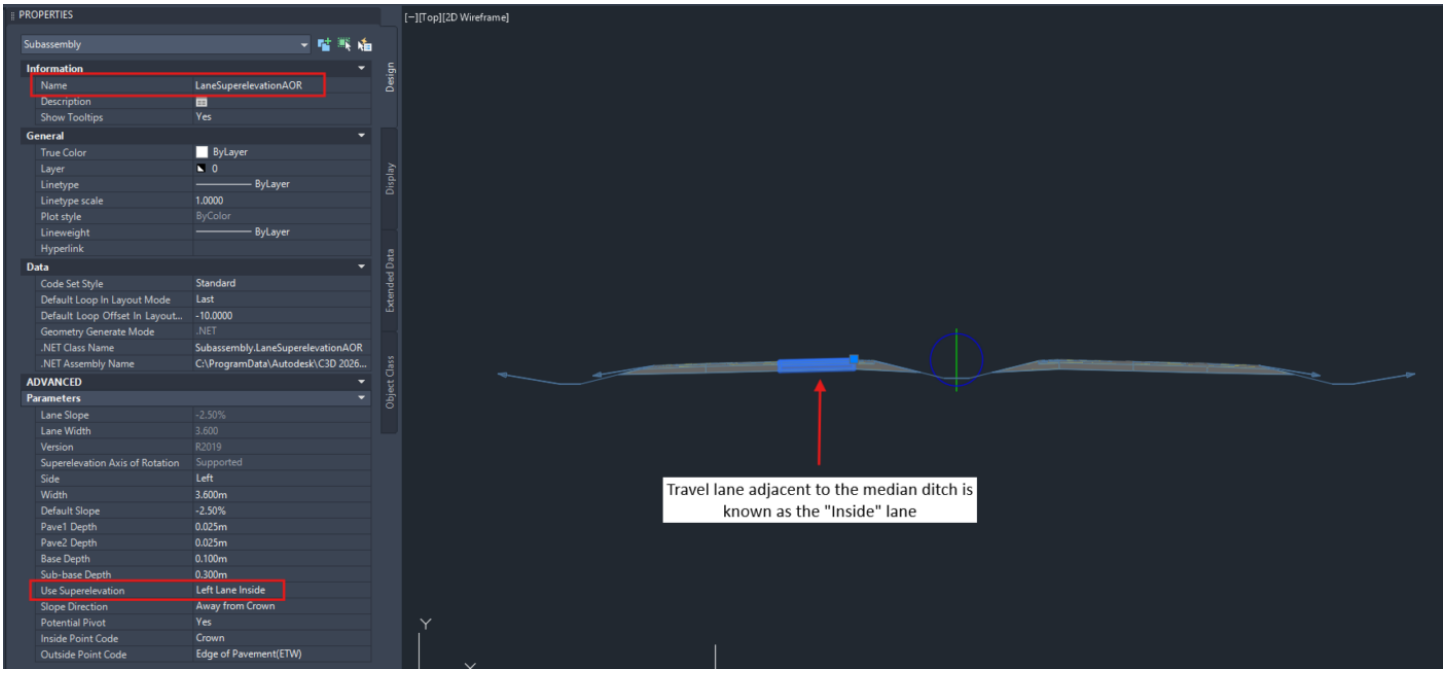


Figure 1: Example of Use Superelevation parameters for road lane

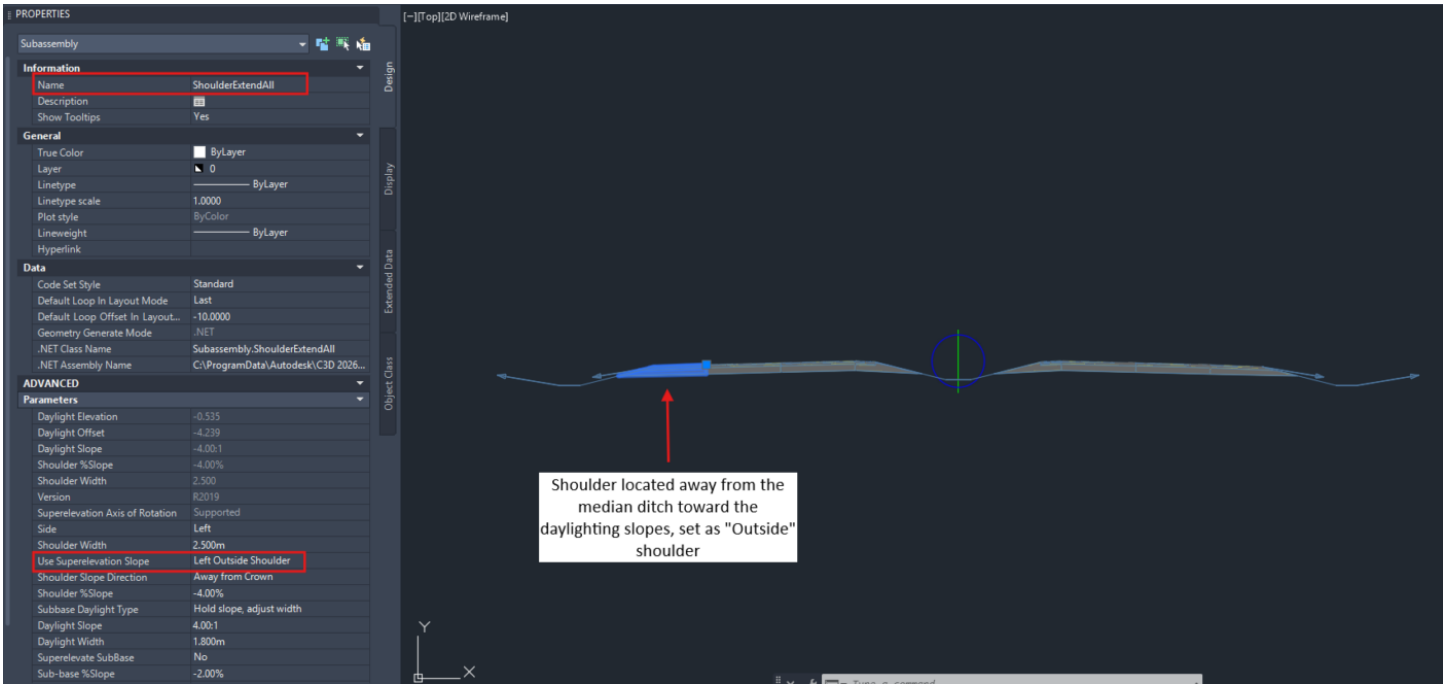


Figure 2: Example of Use Superelevation parameters for shoulder

Further information on the subassemblies and the required Input Parameters can be found in the ***Autodesk Civil 3D 2026 Help*** **here**.

Significance of Inside/Outside Lane Settings in Superelevation and Volume Accuracy

The subassemblies must be set correctly, as the inside or outside lane (following the correct side of the roadway), to ensure the road is superelevated at the curve.

The Inside/Outside Lane setting provides the software with information on the **positions of the subassemblies within the roadway** and which **slope from the computed superelevation should be applied**. Without this information, the carriageways and shoulders will remain, following the Normal Crown of -2.5% and -4% respectively, which will only reduce the safety and comfort of the drivers.


Information
Name
SHOULDER -LEFT
Description
Show Tooltips
Yes
General
True Color
ByLayer
Layer
0
Linetype
ByLayer
Linetype scale
1.0000
Plot style
ByColor
Lineweight
ByLayer
Hyperlink
Data
Code Set Style
02 JKR All Codes
Default Loop In Layout Mode
Last
Default Loop Offset In Layout...
-10.0000
Geometry Generate Mode
.NET
.NET Class Name
Subassembly.ShoulderExtendAll
.NET Assembly Name
C:\ProgramData\Autodesk\C3D 2026...
ADVANCED
Parameters
Daylight Elevation
-0.526
Daylight Offset
-3.783
Daylight Slope
-4.00:1
Shoulder %Slope
-4.00%
Shoulder Width
2.000
Version
R2019
Superelevation Axis of Rotation
Supported
Side
Left
Use Superelevation Slope
Left Outside Shoulder
Shoulder Slope Direction
Away from Crown
Shoulder %Slope
-4.00%
Subbase Daylight Type
Hold slope, adjust width
Daylight Slope
4.00:1
Daylight Width
1.800m
Superelevate SubBase
No
Sub-base %Slope
-2.00%
Information
Name
LANE -LEFT 1
Description
Show Tooltips
Yes
General
True Color
ByLayer
Layer
0
Linetype
ByLayer
Linetype scale
1.0000
Plot style
ByColor
Lineweight
ByLayer
Hyperlink
Data
Code Set Style
02 JKR All Codes
Default Loop In Layout Mode
Last
Default Loop Offset In Layout...
-10.0000
Geometry Generate Mode
.NET
.NET Class Name
Subassembly.LaneSuperelevationAOR
.NET Assembly Name
C:\ProgramData\Autodesk\C3D 2026...
ADVANCED
Parameters
Lane Slope
-2.50%
Lane Width
3.600
Version
R2019
Superelevation Axis of Rotation
Supported
Side
Left
Width
3.600m
Default Slope
-2.50%
Pave1 Depth
0.025m
Pave2 Depth
0.025m
Base Depth
0.100m
Sub-base Depth
0.300m
Use Superelevation
Left Lane Inside
Slope Direction
Away from Crown
Potential Pivot
Yes
Inside Point Code
Crown
Outside Point Code
Edge of Pavement(ETW)
Information
Name
LANE -RIGHT 1
Description
Show Tooltips
Yes
General
True Color
ByLayer
Layer
0
Linetype
ByLayer
Linetype scale
1.0000
Plot style
ByColor
Lineweight
ByLayer
Hyperlink
Data
Code Set Style
02 JKR All Codes
Default Loop In Layout Mode
Last
Default Loop Offset In Layout...
10.0000
Geometry Generate Mode
.NET
.NET Class Name
Subassembly.LaneSuperelevationAOR
.NET Assembly Name
C:\ProgramData\Autodesk\C3D 2026...
ADVANCED
Parameters
Lane Slope
-2.50%
Lane Width
3.600
Version
R2019
Superelevation Axis of Rotation
Supported
Side
Right
Width
3.600m
Default Slope
-2.50%
Pave1 Depth
0.025m
Pave2 Depth
0.025m
Base Depth
0.100m
Sub-base Depth
0.300m
Use Superelevation
Right Lane Inside
Slope Direction
Away from Crown
Potential Pivot
Yes
Inside Point Code
Crown
Outside Point Code
Edge of Pavement(ETW)
Information
Name
SHOULDER -RIGHT
Description
Show Tooltips
Yes
General
True Color
ByLayer
Layer
0
Linetype
ByLayer
Linetype scale
1.0000
Plot style
ByColor
Lineweight
ByLayer
Hyperlink
Data
Code Set Style
02 JKR All Codes
Default Loop In Layout Mode
Last
Default Loop Offset In Layout...
10.0000
Geometry Generate Mode
.NET
.NET Class Name
Subassembly.ShoulderExtendAll
.NET Assembly Name
C:\ProgramData\Autodesk\C3D 202
ADVANCED
Parameters
Daylight Elevation
-0.526
Daylight Offset
3.783
Daylight Slope
-4.00:1
Shoulder %Slope
-4.00%
Shoulder Width
2.000
Version
R2019
Superelevation Axis of Rotation
Supported
Side
Right
Shoulder Width
2.000m
Use Superelevation Slope
Right Outside Shoulder
Shoulder Slope Direction
Away from Crown
Shoulder %Slope
-4.00%
Subbase Daylight Type
Hold slope, adjust width
Daylight Slope
4.00:1
Daylight Width
1.800m
Superelevate SubBase
No
Sub-base %Slope
-2.00%
1.50:1
-2.00:1
Layout Mode
-2.00:1
1.50:1
Information
Name
LANE -LEFT 2
Description
Show Tooltips
Yes
General
True Color
ByLayer
Layer
0
Linetype
ByLayer
Linetype scale
1.0000
Plot style
ByColor
Lineweight
ByLayer
Hyperlink
Data
Code Set Style
02 JKR All Codes
Default Loop In Layout Mode
Last
Default Loop Offset In Layout...
-10.0000
Geometry Generate Mode
.NET
.NET Class Name
Subassembly.LaneSuperelevationAOR
.NET Assembly Name
C:\ProgramData\Autodesk\C3D 2026...
ADVANCED
Parameters
Lane Slope
-2.00%
Lane Width
3.600
Version
R2019
Superelevation Axis of Rotation
Supported
Side
Left
Width
3.600m
Default Slope
-2.00%
Pave1 Depth
0.025m
Pave2 Depth
0.025m
Base Depth
0.100m
Sub-base Depth
0.300m
Use Superelevation
Left Lane Outside
Slope Direction
Away from Crown
Potential Pivot
Yes
Inside Point Code
Crown
Outside Point Code
Edge of Pavement(ETW)
Information
Name
LANE -RIGHT 2
Description
Show Tooltips
Yes
General
True Color
ByLayer
Layer
0
Linetype
ByLayer
Linetype scale
1.0000
Plot style
ByColor
Lineweight
ByLayer
Hyperlink
Data
Code Set Style
02 JKR All Codes
Default Loop In Layout Mode
Last
Default Loop Offset In Layout...
10.0000
Geometry Generate Mode
.NET
.NET Class Name
Subassembly.LaneSuperelevationAOR
.NET Assembly Name
C:\ProgramData\Autodesk\C3D 2026...
ADVANCED
Parameters
Lane Slope
-2.00%
Lane Width
3.600
Version
R2019
Superelevation Axis of Rotation
Supported
Side
Right
Width
3.600m
Default Slope
-2.00%
Pave1 Depth
0.025m
Pave2 Depth
0.025m
Base Depth
0.100m
Sub-base Depth
0.300m
Use Superelevation
Right Lane Outside
Slope Direction
Away from Crown
Potential Pivot
Yes
Inside Point Code
Crown
Outside Point Code
Edge of Pavement(ETW)

Superelevation Curve	Start Station	End Station	Length	Overlap	Left Outside Should...	Left Outside Lane	Left Inside Lane	Right Inside Lane	Right Outside Lane	Right Outside Shou...
Curve.1										
Transition In Region	0+88.47m	1+48.58m	60.103m							
End Normal Crown (O...	0+88.47m				-2.94%	-2.50%	-2.50%	-2.50%	-2.50%	-2.50%
Level Crown	1+06.58m				-2.72%	-2.50%	-2.50%	0.00%	0.00%	0.00%
End Normal Crown (C...	1+24.68m				-2.50%	-2.50%	-2.50%	4.32%	4.32%	4.32%
Begin Curve	1+34.58m									
Begin Full Super	1+48.58m				-5.80%	-5.80%	-5.80%	5.80%	5.80%	5.80%
Transition Out Region	1+30.90m	1+91.01m	60.103m							
End Full Super	1+30.90m				-5.80%	-5.80%	-5.80%	5.80%	5.80%	5.80%
End Curve	1+44.90m									
Begin Normal Crown (...	1+54.80m				-2.50%	-2.50%	-2.50%	4.32%	4.32%	4.32%
Level Crown	1+72.90m				-2.50%	-2.50%	-2.50%	0.00%	0.00%	0.00%
Begin Normal Crown (...	1+91.01m				-2.50%	-2.50%	-2.50%	-2.50%	-2.50%	-2.50%
Curve.2										
Transition In Region	2+12.31m	2+70.17m	57.857m							
End Normal Crown (O...	2+12.31m				-2.50%	-2.50%	-2.50%	-2.50%	-2.50%	-2.50%
Level Crown	2+30.17m				0.00%	0.00%	0.00%	-2.50%	-2.50%	-2.50%
End Normal Crown (C...	2+48.02m				2.50%	2.50%	2.50%	-2.50%	-2.50%	-2.50%
Begin Full Super	2+70.17m				5.60%	5.60%	5.60%	-5.60%	-5.60%	-5.60%
Begin Curve	2+70.17m									
Transition Out Region	3+03.59m	3+61.45m	57.857m							
End Full Super	3+03.59m				5.60%	5.60%	5.60%	-5.60%	-5.60%	-5.60%
End Curve	3+03.59m									
Begin Normal Crown (...	3+25.73m				2.50%	2.50%	2.50%	-2.50%	-2.50%	-2.50%
Level Crown	3+43.59m				0.00%	0.00%	0.00%	-2.50%	-2.50%	-2.56%
Begin Normal Crown (...	3+61.45m				-2.50%	-2.50%	-2.50%	-2.50%	-2.50%	-2.61%

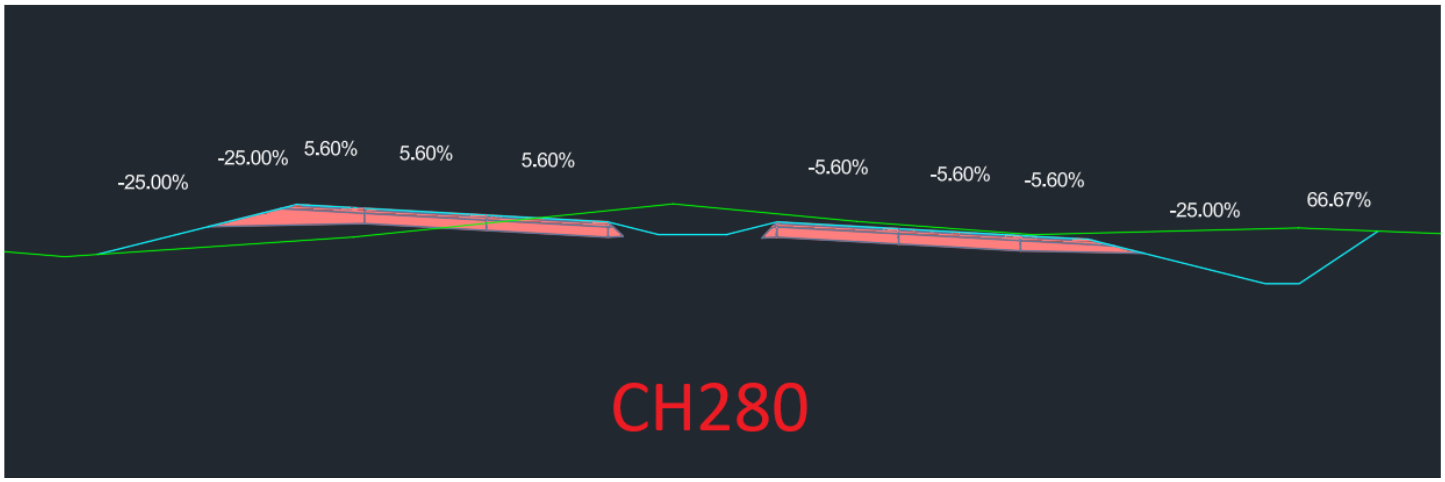


Figure 3 & 4: Results of accurate superelevation parameters for the subassemblies


Information
Name
SHOULDER -LEFT
Description
Show Tooltips
Yes
General
True Color
ByLayer
Layer
0
Linetype
ByLayer
Linetype scale
1.0000
Plot style
ByColor
Lineweight
ByLayer
Hyperlink
Data
Code Set Style
02 JKR All Codes
Default Loop In Layout Mode
Last
Default Loop Offset In Layout...
-10.0000
Geometry Generate Mode
.NET
.NET Class Name
Subassembly.ShoulderExtendAll
.NET Assembly Name
C:\ProgramData\Autodesk\C3D 2026...
ADVANCED
Parameters
Daylight Elevation
-0.526
Daylight Offset
-3.783
Daylight Slope
-4.00:1
Shoulder %Slope
-4.00%
Shoulder Width
2.000
Version
R2019
Superelevation Axis of Rotation
Supported
Side
Left
Use Superelevation Slope
No
Shoulder Slope Direction
Away from Crown
Shoulder %Slope
-4.00%
Subbase Daylight Type
Hold slope, adjust width
Daylight Slope
4.00:1
Daylight Width
1.800m
Superelevate SubBase
No
Sub-base %Slope
-2.00%
Information
Name
LANE -LEFT 1
Description
Show Tooltips
Yes
General
True Color
ByLayer
Layer
0
Linetype
ByLayer
Linetype scale
1.0000
Plot style
ByColor
Lineweight
ByLayer
Hyperlink
Data
Code Set Style
02 JKR All Codes
Default Loop In Layout Mode
Last
Default Loop Offset In Layout...
-10.0000
Geometry Generate Mode
.NET
.NET Class Name
Subassembly.LaneSuperelevationAOR
.NET Assembly Name
C:\ProgramData\Autodesk\C3D 2026...
ADVANCED
Parameters
Lane Slope
-2.50%
Lane Width
3.600
Version
R2019
Superelevation Axis of Rotation
Supported
Side
Left
Width
3.600m
Default Slope
-2.50%
Pave1 Depth
0.025m
Pave2 Depth
0.025m
Base Depth
0.100m
Sub-base Depth
0.300m
Use Superelevation
None
Slope Direction
Away from Crown
Potential Pivot
Yes
Inside Point Code
Crown
Outside Point Code
Edge of Pavement(ETW)
Subassembly
Information
Name
LANE -RIGHT 1
Description
Show Tooltips
Yes
General
True Color
ByLayer
Layer
0
Linetype
ByLayer
Linetype scale
1.0000
Plot style
ByColor
Lineweight
ByLayer
Hyperlink
Data
Code Set Style
02 JKR All Codes
Default Loop In Layout Mode
Last
Default Loop Offset In Layout...
10.0000
Geometry Generate Mode
.NET
.NET Class Name
Subassembly.LaneSuperelevationAOR
.NET Assembly Name
C:\ProgramData\Autodesk\C3D 2026...
ADVANCED
Parameters
Lane Slope
-2.50%
Lane Width
3.600
Version
R2019
Superelevation Axis of Rotation
Supported
Side
Right
Width
3.600m
Default Slope
-2.50%
Pave1 Depth
0.025m
Pave2 Depth
0.025m
Base Depth
0.100m
Sub-base Depth
0.300m
Use Superelevation
None
Slope Direction
Away from Crown
Potential Pivot
Yes
Inside Point Code
Crown
Outside Point Code
Edge of Pavement(ETW)
Information
Name
LANE -RIGHT 2
Description
Show Tooltips
Yes
General
True Color
ByLayer
Layer
0
Linetype
ByLayer
Linetype scale
1.0000
Plot style
ByColor
Lineweight
ByLayer
Hyperlink
Data
Code Set Style
02 JKR All Codes
Default Loop In Layout Mode
Last
Default Loop Offset In Layout...
10.0000
Geometry Generate Mode
.NET
.NET Class Name
Subassembly.LaneSuperelevationAOR
.NET Assembly Name
C:\ProgramData\Autodesk\C3D 2026...
ADVANCED
Parameters
Lane Slope
-2.50%
Lane Width
3.600
Version
R2019
Superelevation Axis of Rotation
Supported
Side
Right
Width
3.600m
Default Slope
-2.50%
Pave1 Depth
0.025m
Pave2 Depth
0.025m
Base Depth
0.100m
Sub-base Depth
0.300m
Use Superelevation
None
Slope Direction
Away from Crown
Potential Pivot
Yes
Inside Point Code
Crown
Outside Point Code
Edge of Pavement(ETW)
1.50:1
2.00:1
Layout Mode
-2.00:1
1.50:1
Information
Name
LANE -LEFT 2
Description
Show Tooltips
Yes
General
True Color
ByLayer
Layer
0
Linetype
ByLayer
Linetype scale
1.0000
Plot style
ByColor
Lineweight
ByLayer
Hyperlink
Data
Code Set Style
02 JKR All Codes
Default Loop In Layout Mode
Last
Default Loop Offset In Layout...
-10.0000
Geometry Generate Mode
.NET
.NET Class Name
Subassembly.LaneSuperelevationAOR
.NET Assembly Name
C:\ProgramData\Autodesk\C3D 2026...
ADVANCED
Parameters
Lane Slope
-2.50%
Lane Width
3.600
Version
R2019
Superelevation Axis of Rotation
Supported
Side
Left
Width
3.600m
Default Slope
-2.50%
Pave1 Depth
0.025m
Pave2 Depth
0.025m
Base Depth
0.100m
Sub-base Depth
0.300m
Use Superelevation
None
Slope Direction
Away from Crown
Potential Pivot
Yes
Inside Point Code
Crown
Outside Point Code
Edge of Pavement(ETW)
Information
Name
SHOULDER -RIGHT
Description
Show Tooltips
Yes
General
True Color
ByLayer
Layer
0
Linetype
ByLayer
Linetype scale
1.0000
Plot style
ByColor
Lineweight
ByLayer
Hyperlink
Data
Code Set Style
02 JKR All Codes
Default Loop In Layout Mode
Last
Default Loop Offset In Layout...
10.0000
Geometry Generate Mode
.NET
.NET Class Name
Subassembly.ShoulderExtendAll
.NET Assembly Name
C:\ProgramData\Autodesk\C3D 2026...
ADVANCED
Parameters
Daylight Elevation
-0.526
Daylight Offset
3.783
Daylight Slope
-4.00:1
Shoulder %Slope
-4.00%
Shoulder Width
2.000
Version
R2019
Superelevation Axis of Rotation
Supported
Side
Right
Shoulder Width
2.000m
Use Superelevation Slope
No
Shoulder Slope Direction
Away from Crown
Shoulder %Slope
-4.00%
Subbase Daylight Type
Hold slope, adjust width
Daylight Slope
4.00:1
Daylight Width
1.800m
Superelevate SubBase
No
Sub-base %Slope
-2.00%

Superelevation Curve	Start Station	End Station	Length	Overlap	Left Outside Should...	Left Outside Lane	Left Inside Lane	Right Inside Lane	Right Outside Lane	Right Outside Shou...
Curve.1										
Transition In Region	0+88.47m	1+48.58m	60.103m							
End Normal Crown (O...	0+88.47m				-2.94%	-2.50%	-2.50%	-2.50%	-2.50%	-2.50%
Level Crown	1+06.58m				-2.72%	-2.50%	-2.50%	0.00%	0.00%	0.00%
End Normal Crown (C...	1+24.68m				-2.50%	-2.50%	-2.50%	4.32%	4.32%	4.32%
Begin Curve	1+34.58m									
Begin Full Super	1+48.58m				-5.80%	-5.80%	-5.80%	5.80%	5.80%	5.80%
Transition Out Region	1+30.90m	1+91.01m	60.103m							
End Full Super	1+30.90m				-5.80%	-5.80%	-5.80%	5.80%	5.80%	5.80%
End Curve	1+44.90m									
Begin Normal Crown (...	1+54.80m				-2.50%	-2.50%	-2.50%	4.32%	4.32%	4.32%
Level Crown	1+72.90m				-2.50%	-2.50%	-2.50%	0.00%	0.00%	0.00%
Begin Normal Crown (...	1+91.01m				-2.50%	-2.50%	-2.50%	-2.50%	-2.50%	-2.50%
Curve.2										
Transition In Region	2+12.31m	2+70.17m	57.857m							
End Normal Crown (O...	2+12.31m				-2.50%	-2.50%	-2.50%	-2.50%	-2.50%	-2.50%
Level Crown	2+30.17m				0.00%	0.00%	0.00%	-2.50%	-2.50%	-2.50%
End Normal Crown (C...	2+48.02m				2.50%	2.50%	2.50%	-2.50%	-2.50%	-2.50%
Begin Full Super	2+70.17m				5.60%	5.60%	5.60%	-5.60%	-5.60%	-5.60%
Begin Curve	2+70.17m									
Transition Out Region	3+03.59m	3+61.45m	57.857m							
End Full Super	3+03.59m				5.60%	5.60%	5.60%	-5.60%	-5.60%	-5.60%
End Curve	3+03.59m									
Begin Normal Crown (...	3+25.73m				2.50%	2.50%	2.50%	-2.50%	-2.50%	-2.50%
Level Crown	3+43.59m				0.00%	0.00%	0.00%	-2.50%	-2.50%	-2.56%
Begin Normal Crown (...	3+61.45m				-2.50%	-2.50%	-2.50%	-2.50%	-2.50%	-2.61%

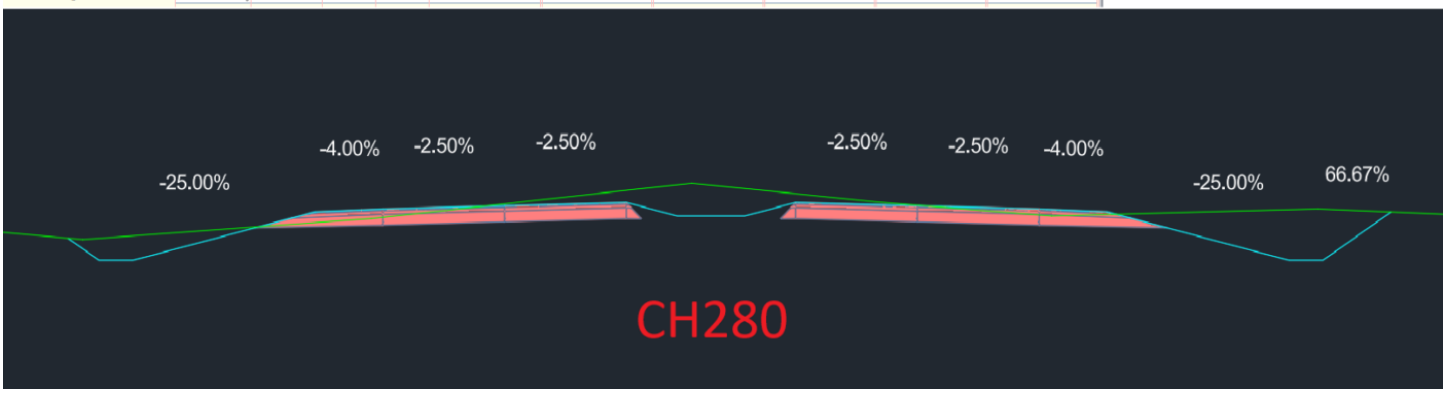


Figure 5: Results of incorrect superelevation parameters for the subassemblies

Additionally, the software will calculate how much cut and fill is needed based on the comparison between the Existing Ground surface and the Road Corridor Top Surface; incorrect shoulders and slopes will only result in an incorrect top surface, leading to incorrect earthwork volumes.



Ngu Soon Hui

My passion is in sharing knowledge — Civil 3D or otherwise– with the world.

I’m also the benevolent dictator for life at MES Innovation Sdn Bhd.