ACO PowerDrain SK100

Subassembly Installation and Reference Guide

User Guide for Autodesk AutoCAD Civil 3D files

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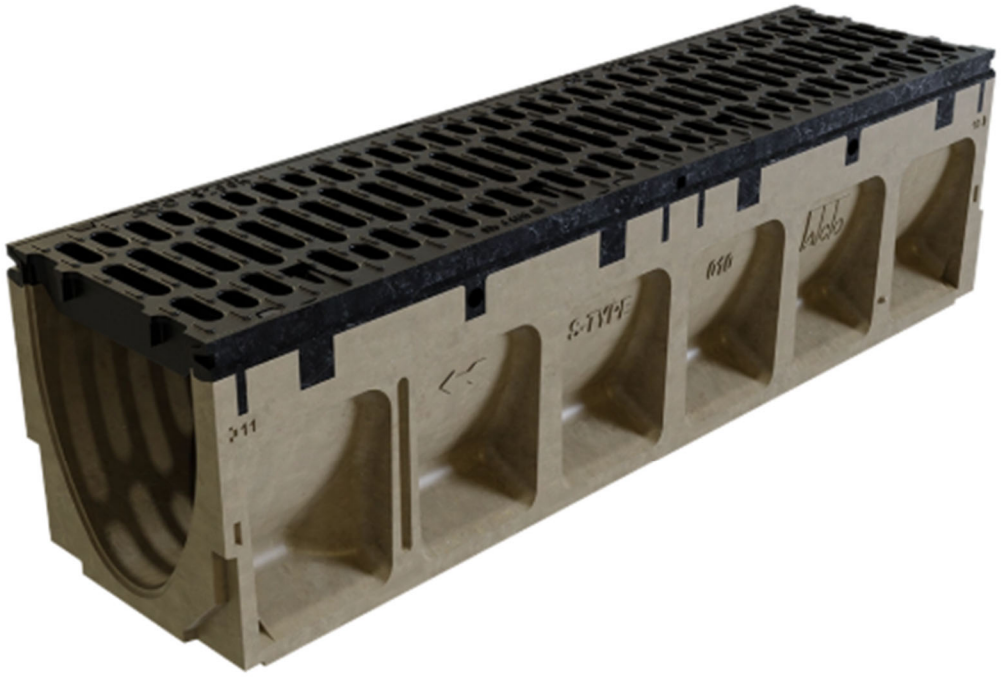
ACO Water Management:
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825 W. Beechcraft St.
Casa Grande, AZ 85122

website: Water Management Solutions - ACO SWM

1. Introduction

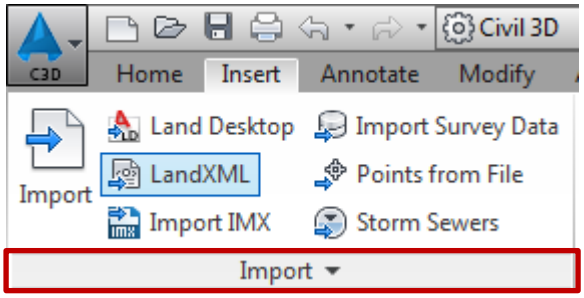
This document describes the installation, configuration and use of the ACO PowerDrain subassembly component for AutoCAD Civil 3D 2023.



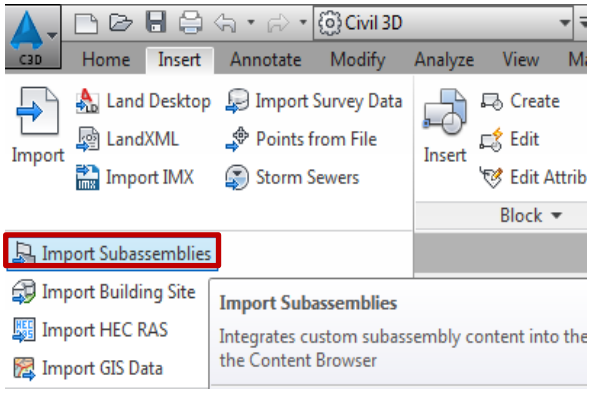
2. Installing the ACO PowerDrain subassembly

The PowerDrain sub-assembly is available as a .pkt file which contains the subassembly .dll file and associated configuration files for installing the subassembly in Civil 3D.

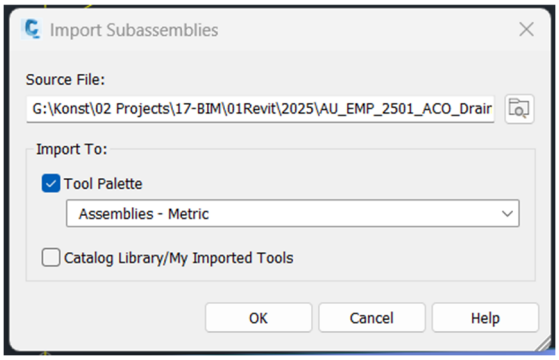
To install the subassembly, click on the Import panel title on the Insert ribbon.



Choose import subassemblies



Browse the location of the ACO PowerDrain SK100.pkt file, and choose a tool palette to import to, or create a new palette. The subassembly can also optionally be added to the user Catalog Library. The tool palette in civil 3D will now show the ACO PowerDrain SK100 subassembly. Note that by right-clicking in the tool palette, the palette can be customized by creating a separate item for the ACO PowerDrain SK100, as shown here.





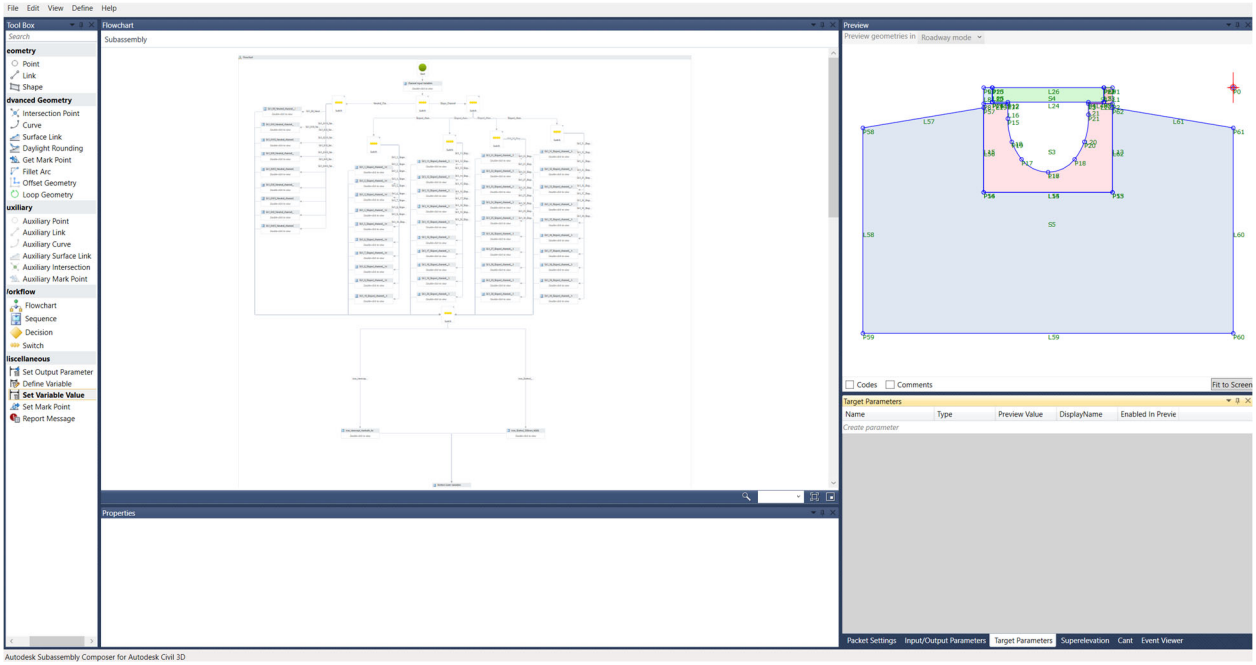
3. Using the ACO PowerDrain SK100 subassembly

The ACO PowerDrain subassembly includes definitions for the following Edge rail type:

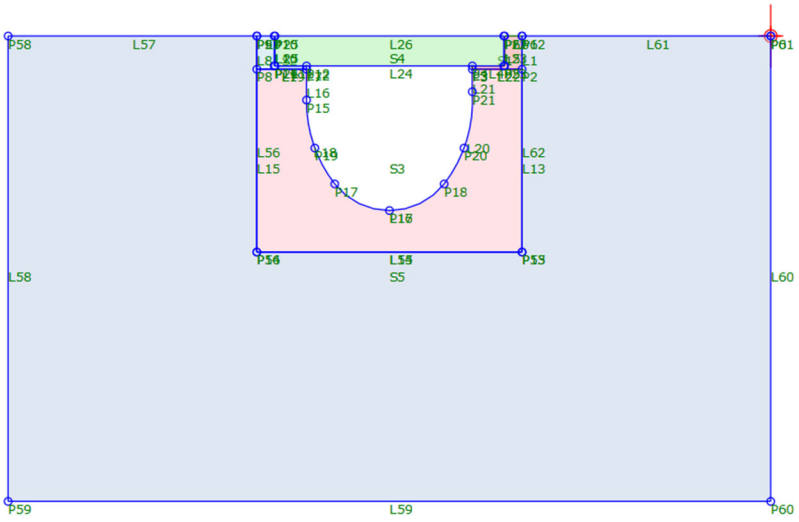
PowerDrain SK100 with Edge rail types:-

S100K Parts

SK1-00 Constant Depth Channel - 39.37" (1 m)*	**67041**
SK1-1 Sloped Channel - 39.37" (1 m)	**67001**
SK1-2 Sloped Channel - 39.37" (1 m)	**67002**
SK1-3 Sloped Channel - 39.37" (1 m)	**67003**
SK1-4 Sloped Channel - 39.37" (1 m)	**67004**
SK1-5 Sloped Channel - 39.37" (1 m)*	**67005**
SK1-6 Sloped Channel - 39.37" (1 m)	**67006**
SK1-7 Sloped Channel - 39.37" (1 m)	**67007**
SK1-8 Sloped Channel - 39.37" (1 m)	**67008**
SK1-9 Sloped Channel - 39.37" (1 m)	**67009**
SK1-10 Sloped Channel - 39.37" (1 m)*	**67010**
SK1-010 Constant Depth Channel - 39.37" (1 m)*	**67043**
SK1-0103 Constant Depth Channel - 19.69" (0.5 m)*	**67044**
SK1-11 Sloped Channel - 39.37" (1 m)	**67011**
SK1-12 Sloped Channel - 39.37" (1 m)	**67012**
SK1-13 Sloped Channel - 39.37" (1 m)	**67013**
SK1-14 Sloped Channel - 39.37" (1 m)	**67014**
SK1-15 Sloped Channel - 39.37" (1 m)*	**67015**
SK1-16 Sloped Channel - 39.37" (1 m)	**67016**
SK1-17 Sloped Channel - 39.37" (1 m)	**67017**
SK1-18 Sloped Channel - 39.37" (1 m)	**67018**
SK1-19 Sloped Channel - 39.37" (1 m)	**67019**
SK1-20 Sloped Channel - 39.37" (1 m)*	**67020**
SK1-020 Constant Depth Channel - 39.37" (1 m)*	**67045**
SK1-0203 Constant Depth Channel - 19.69" (0.5 m)*	**67046**
SK1-21 Sloped Channel - 39.37" (1 m)	**67021**
SK1-22 Sloped Channel - 39.37" (1 m)	**67022**
SK1-23 Sloped Channel - 39.37" (1 m)	**67023**
SK1-24 Sloped Channel - 39.37" (1 m)	**67024**
SK1-25 Sloped Channel - 39.37" (1 m)*	**67025**
SK1-26 Sloped Channel - 39.37" (1 m)	**67026**
SK1-27 Sloped Channel - 39.37" (1 m)	**67027**
SK1-28 Sloped Channel - 39.37" (1 m)	**67028**
SK1-29 Sloped Channel - 39.37" (1 m)	**67029**
SK1-30 Sloped Channel - 39.37" (1 m)*	**67030**
SK1-030 Constant Depth Channel - 39.37" (1 m)*	**67047**
SK1-0303 Constant Depth Channel - 19.69" (0.5 m)*	**67048**
SK1-31 Sloped Channel - 39.37" (1 m)	**67031**
SK1-32 Sloped Channel - 39.37" (1 m)	**67032**
SK1-33 Sloped Channel - 39.37" (1 m)	**67033**
SK1-34 Sloped Channel - 39.37" (1 m)	**67034**
SK1-35 Sloped Channel - 39.37" (1 m)*	**67035**
SK1-36 Sloped Channel - 39.37" (1 m)	**67036**
SK1-37 Sloped Channel - 39.37" (1 m)	**67037**
SK1-38 Sloped Channel - 39.37" (1 m)	**67038**
SK1-39 Sloped Channel - 39.37" (1 m)	**67039**
SK1-40 Sloped Channel - 39.37" (1 m)*	**67040**
SK1-040 Constant Depth Channel - 39.37" (1 m)*	**67049**
SK1-0403 Constant Depth Channel - 19.69" (0.5 m)*	**67050**



The subassembly also optionally includes haunching detail.



3.1 User Defined Parameter

Input/Output Parameters

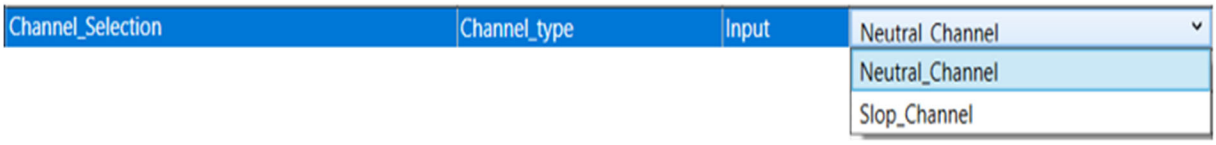
Name	Type	Direction	Default Value	DisplayName	Descripti
Side	Side	Input	Right		
Channel_Selection	Channel_type	Input	Neutral_Channel		
Neutral_channel_height_selection	Neutral_channel_Height	Input	SK1_00_Constant_depth_channel_1m_67041		
Slope_height_Range_Selection	Slope_channel_height_range	Input	Sloped_channel_105_To_150		
Slope_Channel_105_to_150	Sloped_Channel_105_to_150	Input	SK1_1_Sloped_channel__1m_67001		
Slope_Channel_155_to_200	Sloped_Channel_155_to_200	Input	SK1_11_Sloped_channel__1m_67011		
Slope_Channel_205_to_250	Sloped_Channel_205_to_250	Input	SK1_21_Sloped_channel__1m_67021		
Slope_Channel_255_to_300	Sloped_Channel_255_to_300	Input	SK1_31_Sloped_channel__1m_67031		
Gratings_selection	Gratings	Input	Load_Class_F_Bolt_Iron_99590		
Haunching	Yes\No	Input	Yes		
Haunching_class_selection	Haunch_Class	Input	Class_A_B_C		
Haunch_Class_A_B_C_selection	Haunch_Class_A_B_C	Input	SK100_iron_Edge_Rail_Class_C_Haunched_Paver_Pavement		
Haunch_Class_D_E_F_selection	Haunch_Class_D_E_F	Input	SK100_iron_Edge_Rail_Class_E_Haunched_Paver_Pavement		

All the default values of the parameter can be edited by end-user. User can be able to select their required PowerDrain, Grating and Haunch type.

3.2 PowerDrain SK100 with different Edge rail channel types

User can able to select their required PowerDrain channel by using the parameter PowerDrainType which has dropdown menu, with 49 different types of PowerDrain channel, which includes Neutral and Slop channel.

initially user needs to select Neutral or Slop channel in Input/Output parameter table. There is channel_selection parameter with drop down menu.



If users select Neutral channel for height selection there is parameter Neutral_channel_height_selection using this user can select their required height.

Neutral_channel_height_selection	Neutral_channel_Height	Input	SK1_00_Constant_depth_channel_1m_67041
Slope_height_Range_Selection	Slope_channel_height_range	Input	SK1_00_Constant_depth_channel_1m_67041
Slope_Channel_105_to_150	Sloped_Channel_105_to_150	Input	SK1_010_Constant_depth_channel_1m_67043
Slope_Channel_155_to_200	Sloped_Channel_155_to_200	Input	SK1_0103_Constant_depth_channel_0_5m_67044
Slope_Channel_205_to_250	Sloped_Channel_205_to_250	Input	SK1_020_Constant_depth_channel_1m_67045
Slope_Channel_255_to_300	Sloped_Channel_255_to_300	Input	SK1_0203_Constant_depth_channel_0_5m_67046
Gratings_selection	Gratings	Input	SK1_030_Constant_depth_channel_1m_67047
Haunching	Yes\No	Input	SK1_0303_Constant_depth_channel_0_5m_67048
Haunching_class_selection	Haunch_Class	Input	SK1_040_Constant_depth_channel_1m_67049
Haunch_Class_A_B_C_selection	Haunch_Class_A_B_C	Input	SK1_0403_Constant_depth_channel_0_5m_67050

If users select Slop channel for height selection there is parameter Slope_height_Range_Selection using this user needs to select their height range which between 105 to 150, 155 to 200, 205 to 255 and 255 to 300. Which because Autodesk sub assembly composer have enumeration restriction with max 16 nos.

Slope_height_Range_Selection	Slope_channel_height_range	Input	Sloped_channel_255_To_300
Slop_Channel_105_to_150	Sloped_Channel_105_to_150	Input	Sloped_channel_105_To_150
Slop_Channel_155_to_200	Sloped_Channel_155_to_200	Input	Sloped_channel_155_To_200
Slop_Channel_205_to_250	Sloped_Channel_205_to_250	Input	Sloped_channel_205_To_250
Slop_Channel_255_to_300	Sloped_Channel_255_to_300	Input	Sloped_channel_255_To_300

After selecting the height range by using drop down menu user can select their required height.

Slope_Channel_105_to_150	Sloped_Channel_105_to_150	Input	SK1_1_Sloped_channel__1m_67001
Slope_Channel_155_to_200	Sloped_Channel_155_to_200	Input	SK1_1_Sloped_channel__1m_67001
Slope_Channel_205_to_250	Sloped_Channel_205_to_250	Input	SK1_2_Sloped_channel__1m_67002
Slope_Channel_255_to_300	Sloped_Channel_255_to_300	Input	SK1_3_Sloped_channel__1m_67003
Gratings_selection	Gratings	Input	SK1_4_Sloped_channel__1m_67004
Haunching	Yes\No	Input	SK1_5_Sloped_channel__1m_67005
Haunching_class_selection	Haunch_Class	Input	SK1_6_Sloped_channel__1m_67006
Haunch_Class_A_B_C_selection	Haunch_Class_A_B_C	Input	SK1_7_Sloped_channel__1m_67007
Haunch_Class_D_E_F_selection	Haunch_Class_D_E_F	Input	SK1_8_Sloped_channel__1m_67008
			SK1_9_Sloped_channel__1m_67009
Create parameter			SK1_10_Sloped_channel__1m_67010

Slope_Channel_155_to_200	Sloped_Channel_155_to_200	Input	SK1_11_Sloped_channel__1m_67011
Slope_Channel_205_to_250	Sloped_Channel_205_to_250	Input	SK1_11_Sloped_channel__1m_67011
Slope_Channel_255_to_300	Sloped_Channel_255_to_300	Input	SK1_12_Sloped_channel__1m_67012
Gratings_selection	Gratings	Input	SK1_13_Sloped_channel__1m_67013
Haunching	Yes\No	Input	SK1_14_Sloped_channel__1m_67014
Haunching_class_selection	Haunch_Class	Input	SK1_15_Sloped_channel__1m_67015
Haunch_Class_A_B_C_selection	Haunch_Class_A_B_C	Input	SK1_16_Sloped_channel__1m_67016
Haunch_Class_D_E_F_selection	Haunch_Class_D_E_F	Input	SK1_17_Sloped_channel__1m_67017
			SK1_18_Sloped_channel__1m_67018
Create parameter			SK1_19_Sloped_channel__1m_67019
			SK1_20_Sloped_channel__1m_67020

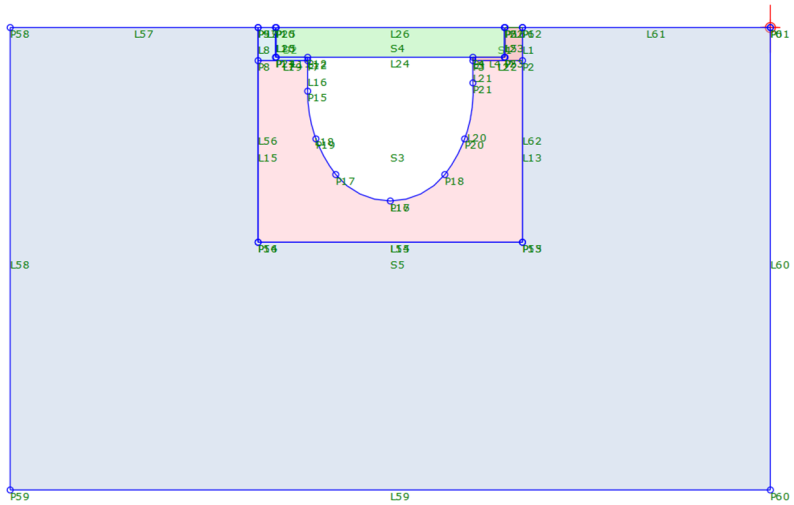
Slope_Channel_205_to_250	Sloped_Channel_205_to_250	Input	SK1_21_Sloped_channel__1m_67021
Slope_Channel_255_to_300	Sloped_Channel_255_to_300	Input	SK1_21_Sloped_channel__1m_67021
Gratings_selection	Gratings	Input	SK1_22_Sloped_channel__1m_67022
Haunching	Yes\No	Input	SK1_23_Sloped_channel__1m_67023
Haunching_class_selection	Haunch_Class	Input	SK1_24_Sloped_channel__1m_67024
Haunch_Class_A_B_C_selection	Haunch_Class_A_B_C	Input	SK1_25_Sloped_channel__1m_67025
Haunch_Class_D_E_F_selection	Haunch_Class_D_E_F	Input	SK1_26_Sloped_channel__1m_67026
			SK1_27_Sloped_channel__1m_67027
Create parameter			SK1_28_Sloped_channel__1m_67028
			SK1_29_Sloped_channel__1m_67029
			SK1_30_Sloped_channel__1m_67030

Slope_Channel_255_to_300	Sloped_Channel_255_to_300	Input	SK1_31_Sloped_channel__1m_67031
Gratings_selection	Gratings	Input	SK1_31_Sloped_channel__1m_67031
Haunching	Yes\No	Input	SK1_32_Sloped_channel__1m_67032
Haunching_class_selection	Haunch_Class	Input	SK1_33_Sloped_channel__1m_67033
Haunch_Class_A_B_C_selection	Haunch_Class_A_B_C	Input	SK1_34_Sloped_channel__1m_67034
Haunch_Class_D_E_F_selection	Haunch_Class_D_E_F	Input	SK1_35_Sloped_channel__1m_67035
			SK1_36_Sloped_channel__1m_67036
Create parameter			SK1_37_Sloped_channel__1m_67037
			SK1_38_Sloped_channel__1m_67038
			SK1_39_Sloped_channel__1m_67039
			SK1_40_Sloped_channel__1m_67040

3.3 PowerDrain SK100 grating types

User needs to select gratings using the parameter Gratings_ selection

Gratings_selection	Gratings	Input	Load_Class_F_Bolt_Iron_99590
Haunching	Yes\No	Input	Load_Class_F_Longitudinal_Iron_96096
Haunching_class_selection	Haunch_Class	Input	Load_Class_F_Slotted_Iron_96082
Haunch_Class_A_B_C_selection	Haunch_Class_A_B_C	Input	Load_Class_F_Bolt_Iron_99590



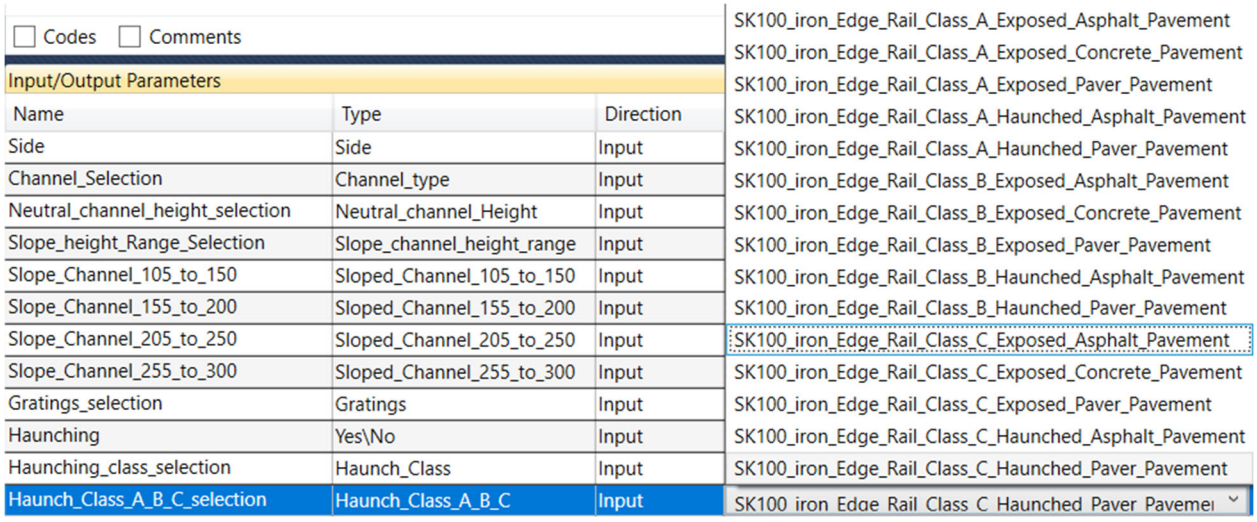
3.4 Haunch types

To include Haunching we have provided decision option so user can select Yes/or No from the parameter Haunching. There are six different classes for haunching we have splited those into two parameters A B C and D E F

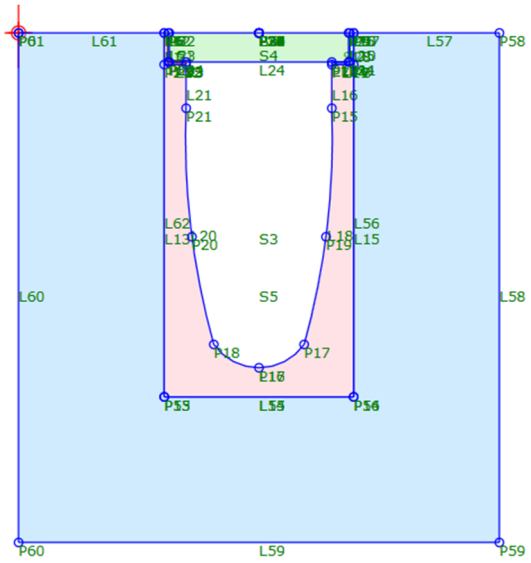
Haunching	Yes\No	Input	Yes

Haunch is divided into cateogart due to enumeration restriction,

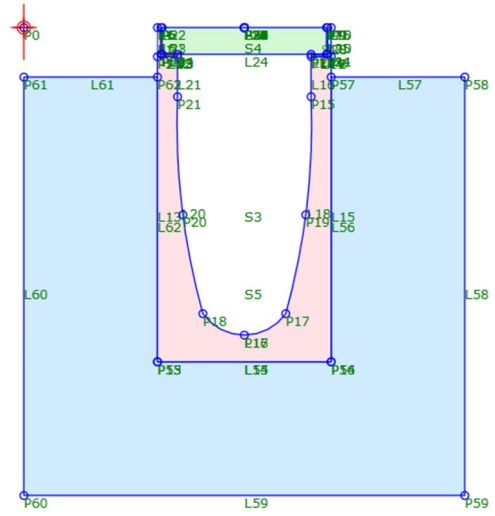
Haunching_class_selection	Haunch_Class	Input	Class A B C
Haunch_Class_A_B_C_selection	Haunch_Class_A_B_C	Input	Class_A_B_C
Haunch_Class_D_E_F_selection	Haunch_Class_D_E_F	Input	Class_D_E_F



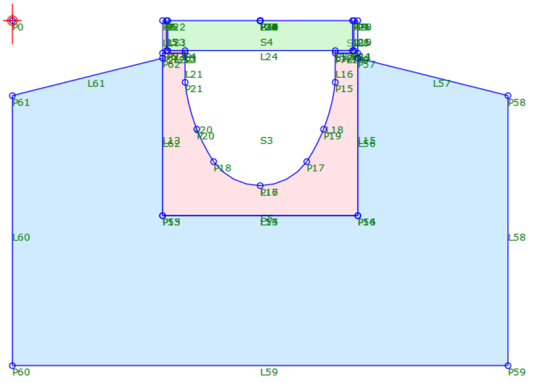
Name	Type	Direction	SK100_iron_Edge_Rail_Class_D_Exposed_Asphalt_Pavement
Side	Side	Input	SK100_iron_Edge_Rail_Class_D_Exposed_Concrete_Pavement
Channel_Selection	Channel_type	Input	SK100_iron_Edge_Rail_Class_D_Exposed_Paver_Pavement
Neutral_channel_height_selection	Neutral_channel_Height	Input	SK100_iron_Edge_Rail_Class_D_Haunched_Asphalt_Pavement
Slope_height_Range_Selection	Slope_channel_height_range	Input	SK100_iron_Edge_Rail_Class_D_Haunched_Paver_Pavement
Slope_Channel_105_to_150	Sloped_Channel_105_to_150	Input	SK100_iron_Edge_Rail_Class_E_Exposed_Asphalt_Pavement
Slope_Channel_155_to_200	Sloped_Channel_155_to_200	Input	SK100_iron_Edge_Rail_Class_E_Exposed_Concrete_Pavement
Slope_Channel_205_to_250	Sloped_Channel_205_to_250	Input	SK100_iron_Edge_Rail_Class_E_Exposed_Paver_Pavement
Slope_Channel_255_to_300	Sloped_Channel_255_to_300	Input	SK100_iron_Edge_Rail_Class_E_Haunched_Asphalt_Pavement
Gratings_selection	Gratings	Input	SK100_iron_Edge_Rail_Class_E_Haunched_Paver_Pavement
Haunching	Yes\No	Input	SK100_iron_Edge_Rail_Class_F_Exposed_Paver_Pavement_w_Concrete_Anchors
Haunching_class_selection	Haunch_Class	Input	SK100_iron_Edge_Rail_Class_F_Exposed_Concrete_Pavement_w_Concrete_Anchors
Haunch_Class_A_B_C_selection	Haunch_Class_A_B_C	Input	SK100_iron_Edge_Rail_Class_F_Exposed_Asphalt_Pavement_w_Concrete_Anchors
Haunch_Class_D_E_F_selection	Haunch_Class_D_E_F	Input	SK100_iron_Edge_Rail_Class_E_Haunched_Paver_Pavemer



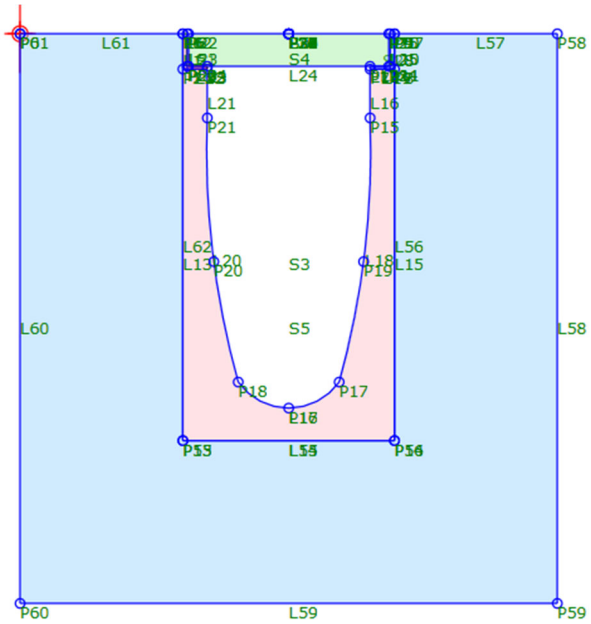
Exposed Asphalt pavement



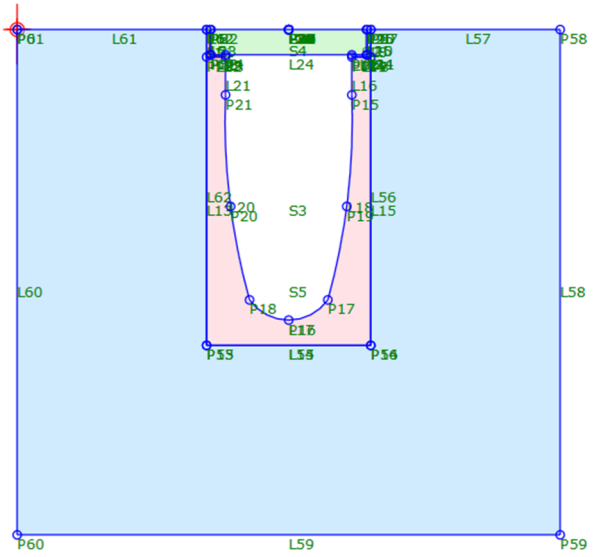
Haunched Paver Pavement



Haunched Asphalt Pavement



Exposed Concrete Pavement



Exposed Paver Pavement

3.5 Point Codes

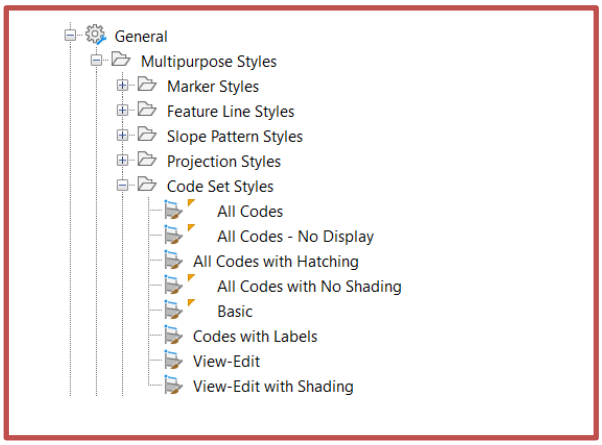
The point codes can be used in the code set styles to generate featurelines at the specific positions on the subassembly. The link codes can be used to display the outline of the subassembly in cross-sections, and also to create surface from the codes. The default values supplied with the subassembly include the standard codes of Top and Formation which are used universally to indicate a Top surface of the corridor model or a Formation surface of the corridor model respectively. The PowerDrain is indicated by the default link code of PowerDrain, and the default shape code of PowerDrain. The grating is indicated by the default link code of edge rail, and the default shape code of edge rail .The haunching is indicated by the default link code of Haunch, and the default shape code of Haunch. All of these codes can be over-ridden by the user. The shape codes are used to enable hatching to be applied in the cross-section views, and also to enable volumes of materials to be generated.



4. Code Set Styles

Code Set Styles are used to control the appearance and labeling of the individual point, link, and shape components of the subassemblies. The many styles required are grouped into Code Sets. Code Set settings are located in the General collection on the Settings tab of the Tool space.

Different code set styles used in the PowerDrain Code set style template as shown here.



4.1 Import Code Set Styles from one drawing to another

Open the drawing in which PowerDrain Code Set style has to be imported.

- Run command IMPORTSTYLESANDSETTINGS
- Browse to the location of PowerDrain Code Set Style template
- Select Styles as desired, check "Import Settings" toggle and click OK
- Warning will be displaying informing that duplicates styles may be overwritten
- Drawing will import styles and settings from PowerDrain Code Set Style template to this template