ACO PowerDrain SK300

Subassembly Installation and Reference Guide

User Guide for Autodesk AutoCAD Civil 3D files

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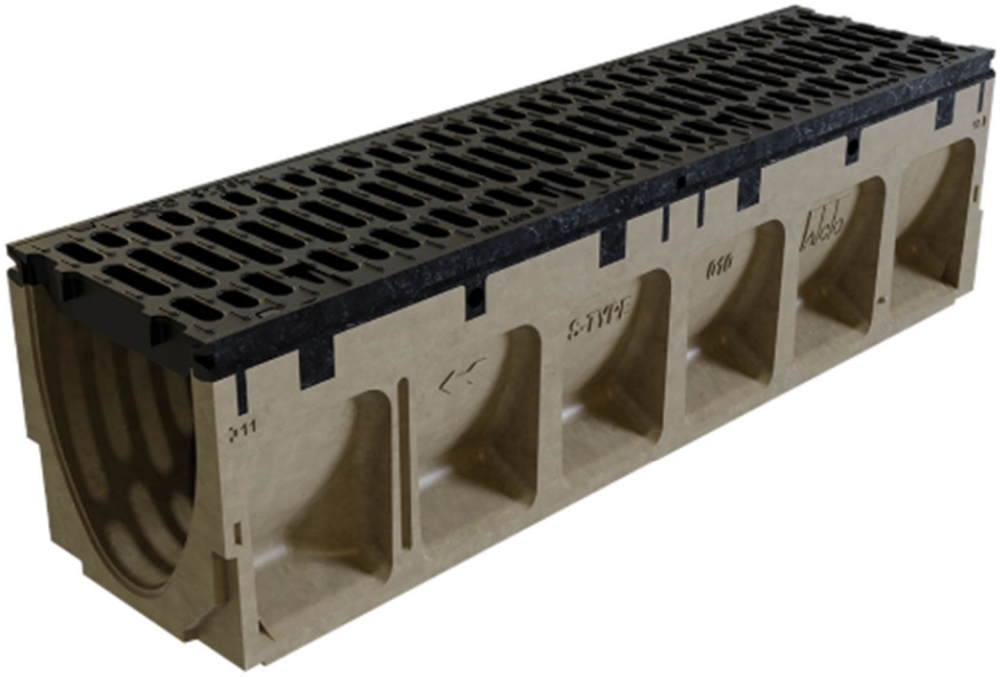
ACO Water Management:
Civils + Infrastructure

ACO USA
Corporate Office
825 W. Beechcraft St.
Casa Grande, AZ 85122

website: Water Management Solutions - ACO SWM

1. Introduction

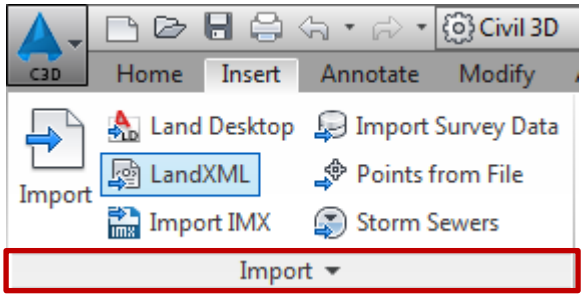
This document describes the installation, configuration and use of the ACO PowerDrain subassembly component for AutoCAD Civil 3D 2023.



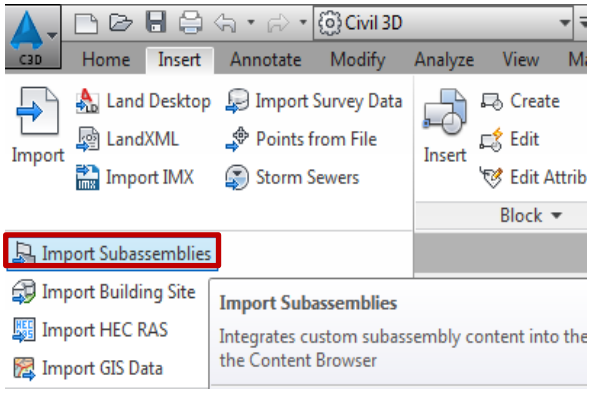
2. Installing the ACO PowerDrain subassembly

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.

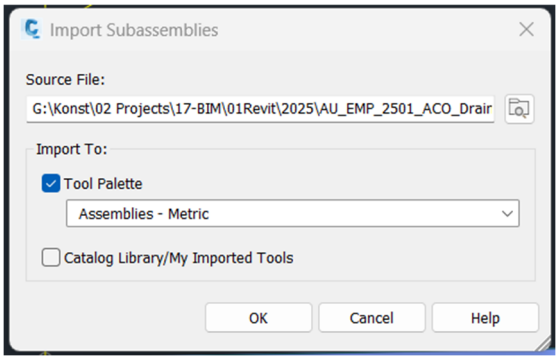
To install the subassembly, click on the Import panel title on the Insert ribbon.



Choose import subassemblies



Browse the location of the ACO PowerDrain SK300.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 SK300 subassembly. Note that by right-clicking in the tool palette, the palette can be customized by creating a separate item for the ACO PowerDrain SK300, as shown here.





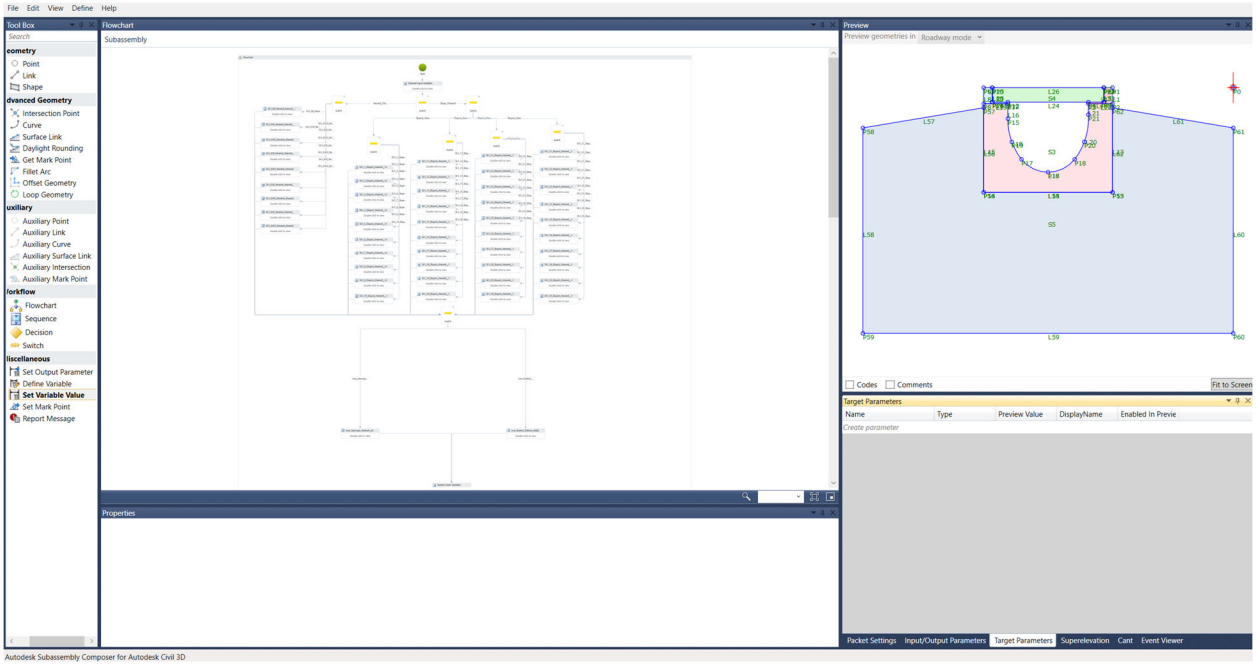
3. Using the ACO PowerDrain SK300 subassembly

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

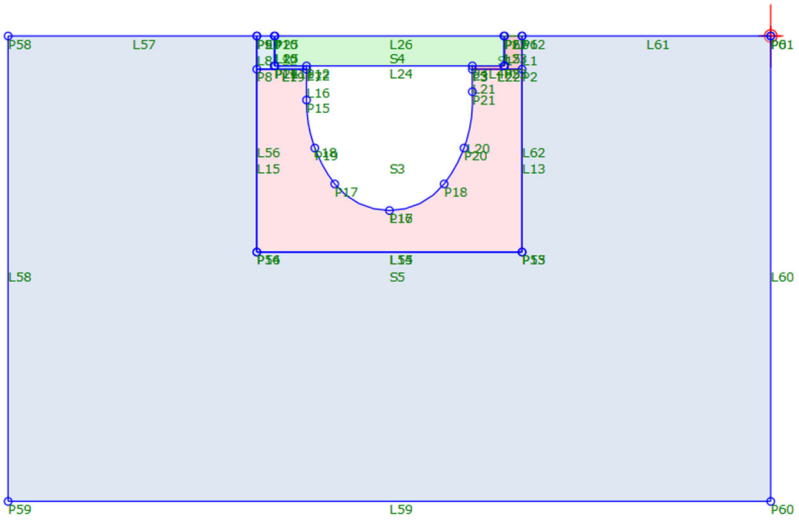
PowerDrain SK300 with Edge rail types:-

S300K Parts

SK3-00 Constant Depth Channel - 39.37" (1 m)*	69041
SK3-1 Sloped Channel - 39.37" (1 m)	69001
SK3-2 Sloped Channel - 39.37" (1 m)	69002
SK3-3 Sloped Channel - 39.37" (1 m)	69003
SK3-4 Sloped Channel - 39.37" (1 m)	69004
SK3-5 Sloped Channel - 39.37" (1 m)*	69005
SK3-6 Sloped Channel - 39.37" (1 m)	69006
SK3-7 Sloped Channel - 39.37" (1 m)	69007
SK3-8 Sloped Channel - 39.37" (1 m)	69008
SK3-9 Sloped Channel - 39.37" (1 m)	69009
SK3-10 Sloped Channel - 39.37" (1 m)*	69010
SK3-010 Constant Depth Channel - 39.37" (1 m)*	69042
SK3-0103 Constant Depth Channel - 19.69" (0.5 m)*	69045
SK3-11 Sloped Channel - 39.37" (1 m)	69011
SK3-12 Sloped Channel - 39.37" (1 m)	69012
SK3-13 Sloped Channel - 39.37" (1 m)	69013
SK3-14 Sloped Channel - 39.37" (1 m)	69014
SK3-15 Sloped Channel - 39.37" (1 m)*	69015
SK3-16 Sloped Channel - 39.37" (1 m)	69016
SK3-17 Sloped Channel - 39.37" (1 m)	69017
SK3-18 Sloped Channel - 39.37" (1 m)	69018
SK3-19 Sloped Channel - 39.37" (1 m)	69019
SK3-20 Sloped Channel - 39.37" (1 m)*	69020
SK3-020 Constant Depth Channel - 39.37" (1 m)*	69044
SK3-0203 Constant Depth Channel - 19.69" (0.5 m)*	69047
SK3-21 Sloped Channel - 39.37" (1 m)	69021
SK3-22 Sloped Channel - 39.37" (1 m)	69022
SK3-23 Sloped Channel - 39.37" (1 m)	69023
SK3-24 Sloped Channel - 39.37" (1 m)	69024
SK3-25 Sloped Channel - 39.37" (1 m)*	69025
SK3-26 Sloped Channel - 39.37" (1 m)	69026
SK3-27 Sloped Channel - 39.37" (1 m)	69027
SK3-28 Sloped Channel - 39.37" (1 m)	69028
SK3-29 Sloped Channel - 39.37" (1 m)	69029
SK3-30 Sloped Channel - 39.37" (1 m)*	69030
SK3-030 Constant Depth Channel - 39.37" (1 m)*	69046
SK3-0303 Constant Depth Channel - 19.69" (0.5 m)*	69049
SK3-31 Sloped Channel - 39.37" (1 m)	69031
SK3-32 Sloped Channel - 39.37" (1 m)	69032
SK3-33 Sloped Channel - 39.37" (1 m)	69033
SK3-34 Sloped Channel - 39.37" (1 m)	69034
SK3-35 Sloped Channel - 39.37" (1 m)*	69035
SK3-36 Sloped Channel - 39.37" (1 m)	69036
SK3-37 Sloped Channel - 39.37" (1 m)	69037
SK3-38 Sloped Channel - 39.37" (1 m)	69038
SK3-39 Sloped Channel - 39.37" (1 m)	69039
SK3-40 Sloped Channel - 39.37" (1 m)*	69040
SK3-040 Constant Depth Channel - 39.37" (1 m)*	69048
SK3-0403 Constant Depth Channel - 19.69" (0.5 m)*	69050



The subassembly also optionally includes haunching detail.



3.1 User Defined Parameter

Input/Output Parameters

Name	Type	Direction	Default Value
Side	Side	Input	Right
Channel_Selection	Channel_type	Input	Neutral_Channel
Neutral_channel_height_selection	Neutral_channel_Height	Input	SK3_00_Constant_depth_channel_1m_69041
Slope_height_Range_Selection	Slope_channel_height_range	Input	Sloped_channel_305_To_350
Slope_Channel_305_to_350	Sloped_Channel_305_to_350	Input	SK3_1_Sloped_channel_1m_69001
Slope_Channel_355_to_400	Sloped_Channel_355_to_400	Input	SK3_11_Sloped_channel_1m_69011
Slope_Channel_405_to_450	Sloped_Channel_405_to_450	Input	SK3_21_Sloped_channel_1m_69021
Slope_Channel_455_to_500	Sloped_Channel_455_to_500	Input	SK3_31_Sloped_channel_1m_69031
Gratings_selection	Gratings	Input	Load_Class_F_Bolt_Iron_99592
Haunching	Yes\No	Input	No
Haunching_class_selection	Haunch_Class_Selection	Input	Class_A_B_C
Haunch_Class_A_B_C_selection	Haunch_Class_A_B_C	Input	SK300_iron_Steel_Edge_Rail_Class_C_Haunched_Paver_Paveme
Haunch_Class_D_E_F_selection	Haunch_Class_D_E_F	Input	SK300_iron_Steel_Edge_Rail_Class_F_Exposed_Asphalt_Paveme

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 SK300 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	SK3_00_Constant_depth_channel_1m_69041
Slope_height_Range_Selection	Slope_channel_height_range	Input	SK3_00_Constant_depth_channel_1m_69041
Slope_Channel_305_to_350	Sloped_Channel_305_to_350	Input	SK3_010_Constant_depth_channel_1m_69042
Slope_Channel_355_to_400	Sloped_Channel_355_to_400	Input	SK3_0103_Constant_depth_channel_0_5m_69045
Slope_Channel_405_to_450	Sloped_Channel_405_to_450	Input	SK3_020_Constant_depth_channel_1m_69044
Slope_Channel_455_to_500	Sloped_Channel_455_to_500	Input	SK3_0203_Constant_depth_channel_0_5m_69047
Gratings_selection	Gratings	Input	SK3_030_Constant_depth_channel_1m_69046
Haunching	Yes\No	Input	SK3_0303_Constant_depth_channel_0_5m_69049
Haunching_class_selection	Haunch_Class_Selection	Input	SK3_040_Constant_depth_channel_1m_69048
Haunch_Class_A_B_C_selection	Haunch_Class_A_B_C	Input	SK3_0403_Constant_depth_channel_0_5m_69050

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 305 to 350, 355 to 400, 405 to 455 and 455 to 500. Which because Autodesk sub assembly composer have enumeration restriction with max 16 nos.

Slope_height_Range_Selection	Slope_channel_height_range	Input	Sloped_channel_305_To_350
Slope_Channel_305_to_350	Sloped_Channel_305_to_350	Input	Sloped_channel_305_To_350
Slope_Channel_355_to_400	Sloped_Channel_355_to_400	Input	Sloped_channel_355_To_400
Slope_Channel_405_to_450	Sloped_Channel_405_to_450	Input	Sloped_channel_405_To_450
Slope_Channel_455_to_500	Sloped_Channel_455_to_500	Input	Sloped_channel_455_To_500

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

Slope_Channel_305_to_350	Sloped_Channel_305_to_350	Input	SK3_1_Sloped_channel_1m_69001
Slope_Channel_355_to_400	Sloped_Channel_355_to_400	Input	SK3_1_Sloped_channel_1m_69001
Slope_Channel_405_to_450	Sloped_Channel_405_to_450	Input	SK3_2_Sloped_channel_1m_69002
Slope_Channel_455_to_500	Sloped_Channel_455_to_500	Input	SK3_3_Sloped_channel_1m_69003
Gratings_selection	Gratings	Input	SK3_4_Sloped_channel_1m_69004
Haunching	Yes\No	Input	SK3_5_Sloped_channel_1m_69005
Haunching_class_selection	Haunch_Class_Selection	Input	SK3_6_Sloped_channel_1m_69006
Haunch_Class_A_B_C_selection	Haunch_Class_A_B_C	Input	SK3_7_Sloped_channel_1m_69007
Haunch_Class_D_E_F_selection	Haunch_Class_D_E_F	Input	SK3_8_Sloped_channel_1m_69008
			SK3_9_Sloped_channel_1m_69009
Create parameter			SK3_10_Sloped_channel_1m_69010

Slope_Channel_355_to_400	Sloped_Channel_355_to_400	Input	SK3_11_Sloped_channel_1m_69011
Slope_Channel_405_to_450	Sloped_Channel_405_to_450	Input	SK3_11_Sloped_channel_1m_69011
Slope_Channel_455_to_500	Sloped_Channel_455_to_500	Input	SK3_12_Sloped_channel_1m_69012
Gratings_selection	Gratings	Input	SK3_13_Sloped_channel_1m_69013
Haunching	Yes\No	Input	SK3_14_Sloped_channel_1m_69014
Haunching_class_selection	Haunch_Class_Selection	Input	SK3_15_Sloped_channel_1m_69015
Haunch_Class_A_B_C_selection	Haunch_Class_A_B_C	Input	SK3_16_Sloped_channel_1m_69016
Haunch_Class_D_E_F_selection	Haunch_Class_D_E_F	Input	SK3_17_Sloped_channel_1m_69017
			SK3_18_Sloped_channel_1m_69018
Create parameter			SK3_19_Sloped_channel_1m_69019
			SK3_20_Sloped_channel_1m_69020

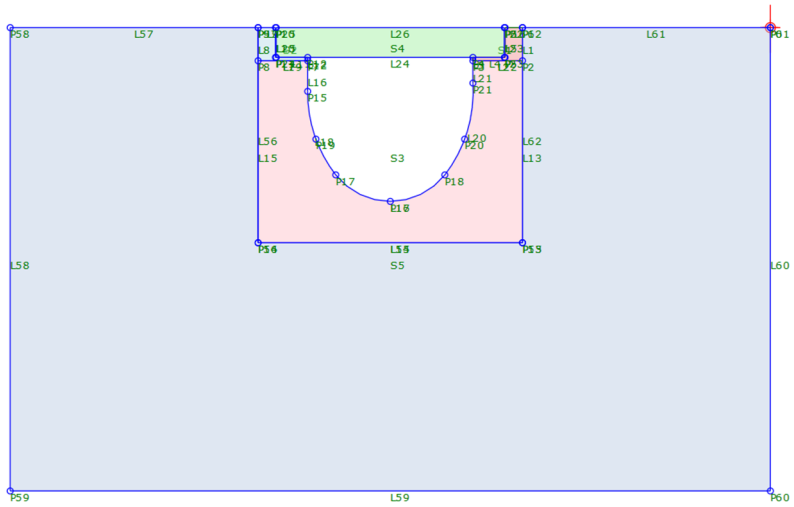
Slope_Channel_405_to_450	Sloped_Channel_405_to_450	Input	SK3_21_Sloped_channel_1m_69021
Slope_Channel_455_to_500	Sloped_Channel_455_to_500	Input	SK3_21_Sloped_channel_1m_69021
Gratings_selection	Gratings	Input	SK3_22_Sloped_channel_1m_69022
Haunching	Yes\No	Input	SK3_23_Sloped_channel_1m_69023
Haunching_class_selection	Haunch_Class_Selection	Input	SK3_24_Sloped_channel_1m_69024
Haunch_Class_A_B_C_selection	Haunch_Class_A_B_C	Input	SK3_25_Sloped_channel_1m_69025
Haunch_Class_D_E_F_selection	Haunch_Class_D_E_F	Input	SK3_26_Sloped_channel_1m_69026
			SK3_27_Sloped_channel_1m_69027
Create parameter			SK3_28_Sloped_channel_1m_69028
			SK3_29_Sloped_channel_1m_69029
			SK3_30_Sloped_channel_1m_69030

Slope_Channel_455_to_500	Sloped_Channel_455_to_500	Input	SK3_31_Sloped_channel_1m_69031
Gratings_selection	Gratings	Input	SK3_31_Sloped_channel_1m_69031
Haunching	Yes\No	Input	SK3_32_Sloped_channel_1m_69032
Haunching_class_selection	Haunch_Class_Selection	Input	SK3_33_Sloped_channel_1m_69033
Haunch_Class_A_B_C_selection	Haunch_Class_A_B_C	Input	SK3_34_Sloped_channel_1m_69034
Haunch_Class_D_E_F_selection	Haunch_Class_D_E_F	Input	SK3_35_Sloped_channel_1m_69035
			SK3_36_Sloped_channel_1m_69036
Create parameter			SK3_37_Sloped_channel_1m_69037
			SK3_38_Sloped_channel_1m_69038
			SK3_39_Sloped_channel_1m_69039
			SK3_40_Sloped_channel_1m_69040

3.3 PowerDrain SK300 grating types

User needs to select gratings using the parameter Gratings_ selection

Gratings_selection	Gratings	Input	Load_Class_F_Bolt_Iron_99592
Haunching	Yes\No	Input	Load_Class_E_Longitudinal_Iron_96833
Haunching_class_selection	Haunch_Class_Selection	Input	Load_Class_F_Slotted_Iron_02445
Haunch_Class_A_B_C_selection	Haunch_Class_A_B_C	Input	Load_Class_F_Bolt_Iron_99592



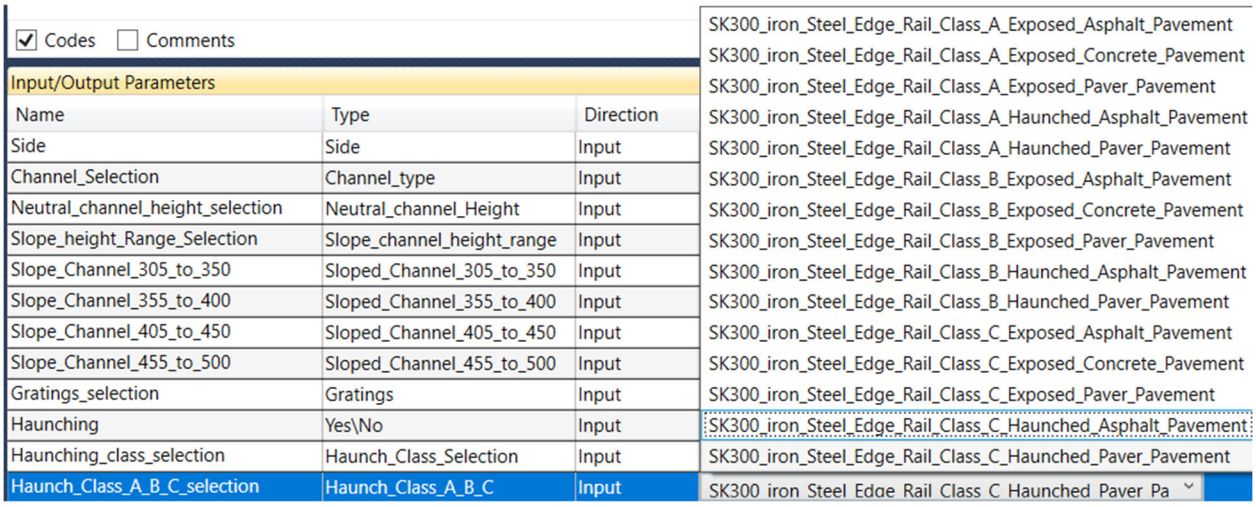
3.4 Haunch types

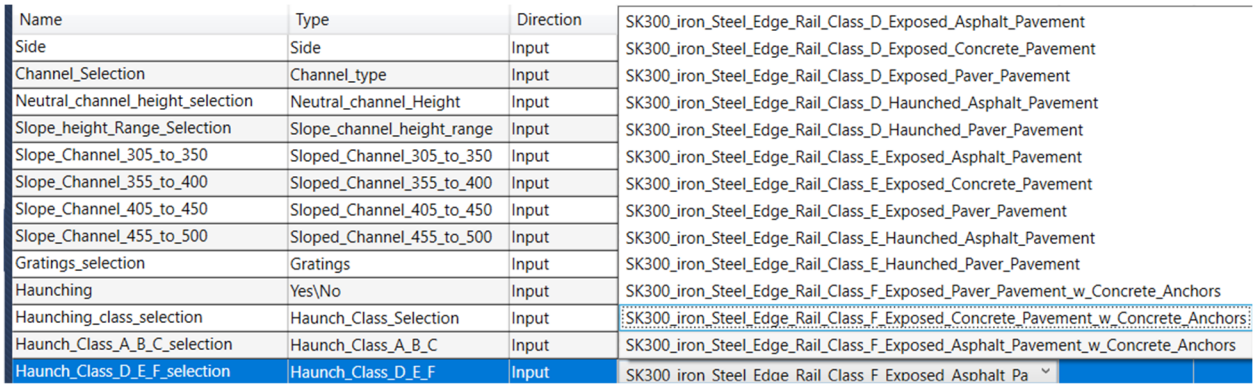
To include Haunching we have provided decision option so user can select Yes/or No from the parameter Haunching. There are six different classes for haunching we have splited those into two parameters A B C and D E F

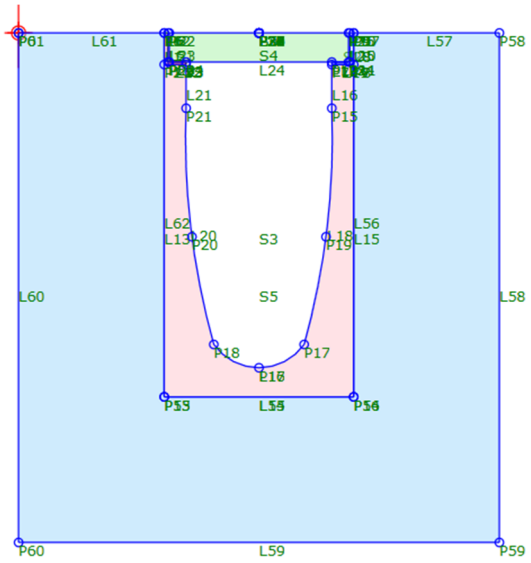
Haunching	Yes\No	Input	Yes

Haunch is divided into cateogart due to enumeration restriction,

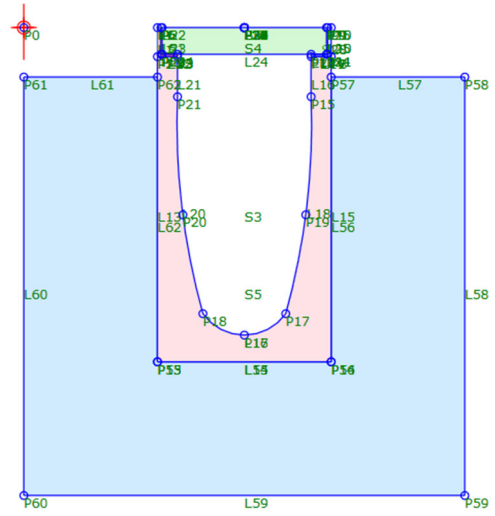
Haunching_class_selection	Haunch_Class	Input	Class A B C
Haunch_Class_A_B_C_selection	Haunch_Class_A_B_C	Input	Class_A_B_C
Haunch_Class_D_E_F_selection	Haunch_Class_D_E_F	Input	Class_D_E_F



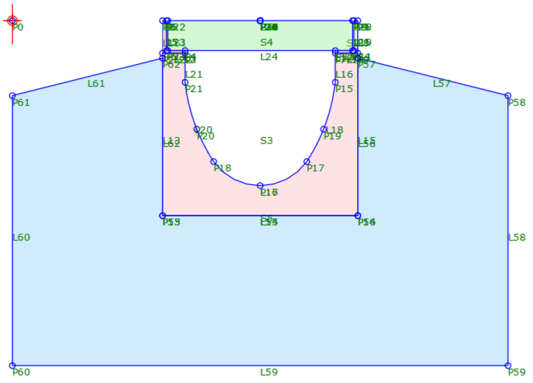




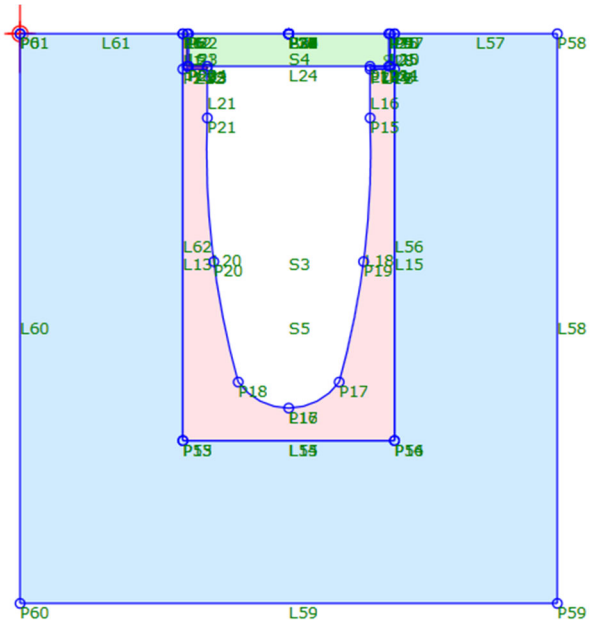
Exposed Asphalt pavement



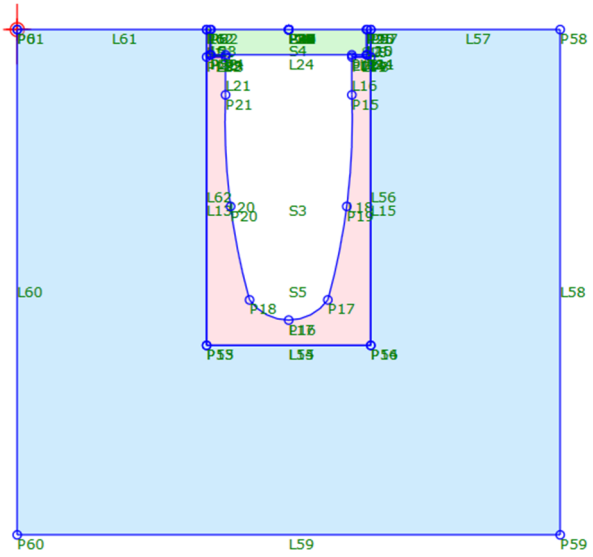
Haunched Paver Pavement



Haunched Asphalt Pavement



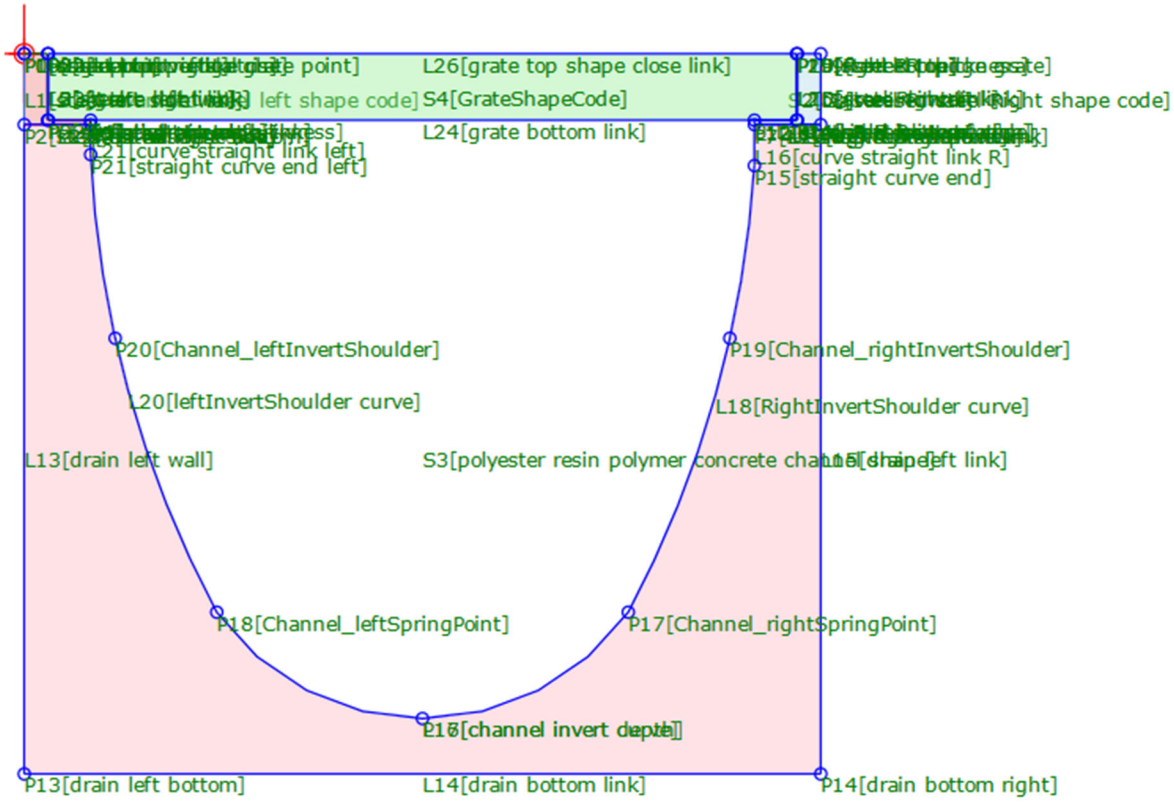
Exposed Concrete Pavement



Exposed Paver Pavement

3.5 Point Codes

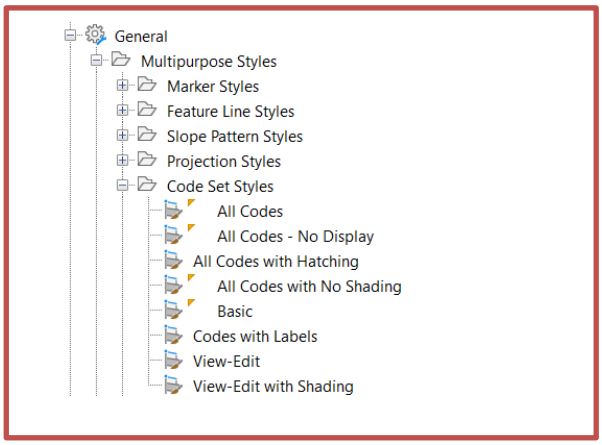
The point codes can be used in the code set styles to generate featurelines at the specific positions on the subassembly. The link codes can be used to display the outline of the subassembly in cross-sections, and also to create surface from the codes. The default values supplied with the subassembly 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