ACO PowerDrain SK200

Subassembly Installation and Reference Guide

User Guide for Autodesk AutoCAD Civil 3D files

Contents

1. Introduction 2
2. Installing the ACO PowerDrain subassembly 2
3. Using the ACO PowerDrain SK200 subassembly 4
3.1 User Defined Parameter 6
3.2 PowerDrain SK200 with different Edge rail channel types 6
3.3 PowerDrain SK200 grating types 8
3.4 Haunch types 9
3.5 Point Codes 12
4. Code Set Styles 13
4.1 Import Code Set Styles from one drawing to another 13

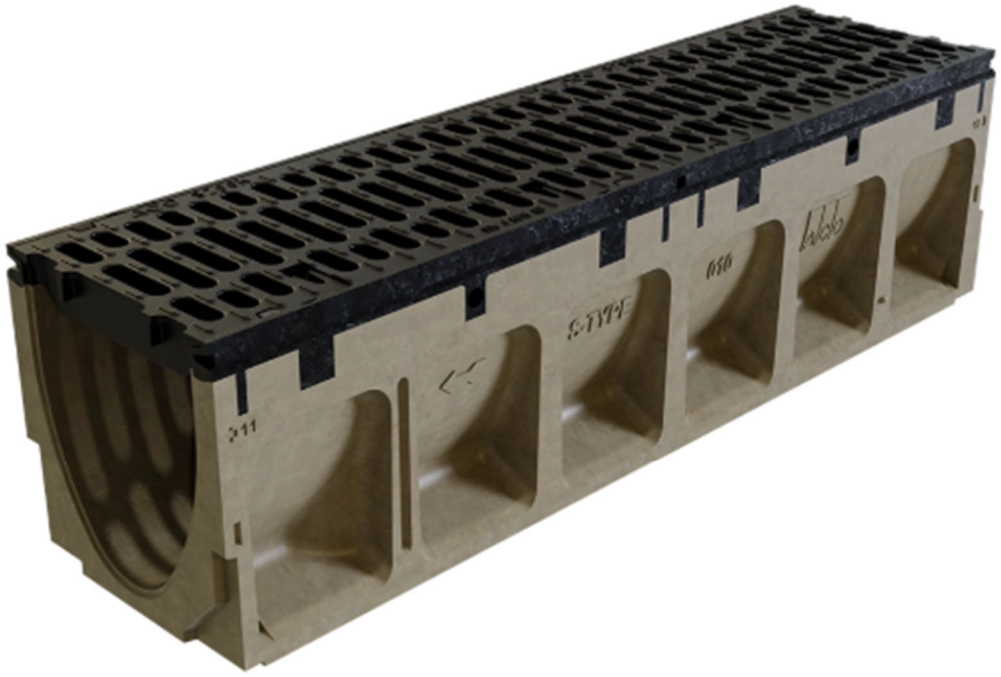
ACO Water Management:
Civils + Infrastructure

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

website: Water Management Solutions - ACO SWM

1. Introduction

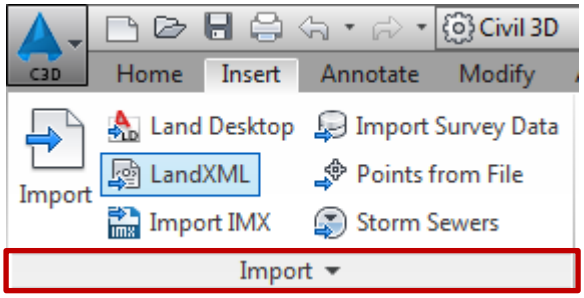
This document describes the installation, configuration and use of the ACO PowerDrain subassembly component for AutoCAD Civil 3D 2023.



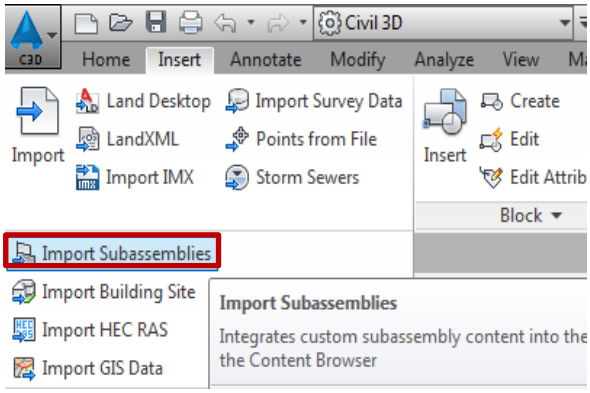
2. Installing the ACO PowerDrain subassembly

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.

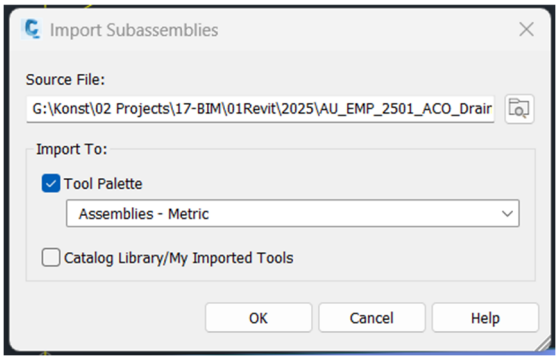
To install the subassembly, click on the Import panel title on the Insert ribbon.



Choose import subassemblies



Browse the location of the ACO PowerDrain SK200.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 SK200 subassembly. Note that by right-clicking in the tool palette, the palette can be customized by creating a separate item for the ACO PowerDrain SK200, as shown here.





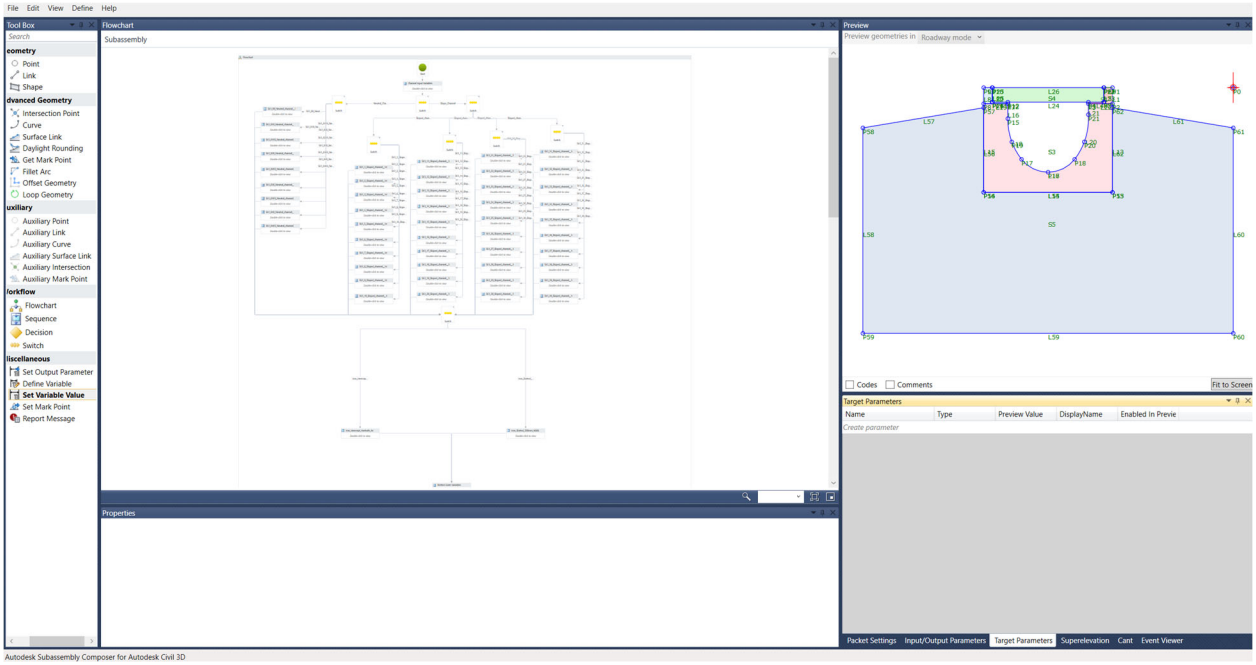
3. Using the ACO PowerDrain SK200 subassembly

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

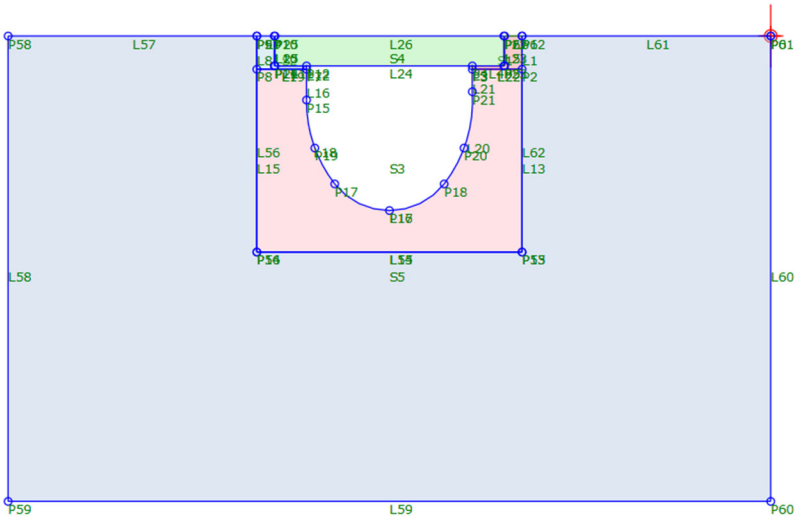
PowerDrain SK200 with Edge rail types:-

S200K Parts

SK2-00 Constant Depth Channel - 39.37" (1 m)*	68041
SK2-1 Sloped Channel - 39.37" (1 m)	68001
SK2-2 Sloped Channel - 39.37" (1 m)	68002
SK2-3 Sloped Channel - 39.37" (1 m)	68003
SK2-4 Sloped Channel - 39.37" (1 m)	68004
SK2-5 Sloped Channel - 39.37" (1 m)*	68005
SK2-6 Sloped Channel - 39.37" (1 m)	68006
SK2-7 Sloped Channel - 39.37" (1 m)	68007
SK2-8 Sloped Channel - 39.37" (1 m)	68008
SK2-9 Sloped Channel - 39.37" (1 m)	68009
SK2-10 Sloped Channel - 39.37" (1 m)*	68010
SK2-010 Constant Depth Channel - 39.37" (1 m)*	68043
SK2-0103 Constant Depth Channel - 19.69" (0.5 m)*	68044
SK2-11 Sloped Channel - 39.37" (1 m)	68011
SK2-12 Sloped Channel - 39.37" (1 m)	68012
SK2-13 Sloped Channel - 39.37" (1 m)	68013
SK2-14 Sloped Channel - 39.37" (1 m)	68014
SK2-15 Sloped Channel - 39.37" (1 m)*	68015
SK2-16 Sloped Channel - 39.37" (1 m)	68016
SK2-17 Sloped Channel - 39.37" (1 m)	68017
SK2-18 Sloped Channel - 39.37" (1 m)	68018
SK2-19 Sloped Channel - 39.37" (1 m)	68019
SK2-20 Sloped Channel - 39.37" (1 m)*	68020
SK2-020 Constant Depth Channel - 39.37" (1 m)*	68045
SK2-0203 Constant Depth Channel - 19.69" (0.5 m)*	68046
SK2-21 Sloped Channel - 39.37" (1 m)	68021
SK2-22 Sloped Channel - 39.37" (1 m)	68022
SK2-23 Sloped Channel - 39.37" (1 m)	68023
SK2-24 Sloped Channel - 39.37" (1 m)	68024
SK2-25 Sloped Channel - 39.37" (1 m)*	68025
SK2-26 Sloped Channel - 39.37" (1 m)	68026
SK2-27 Sloped Channel - 39.37" (1 m)	68027
SK2-28 Sloped Channel - 39.37" (1 m)	68028
SK2-29 Sloped Channel - 39.37" (1 m)	68029
SK2-30 Sloped Channel - 39.37" (1 m)*	68030
SK2-030 Constant Depth Channel - 39.37" (1 m)*	68047
SK2-0303 Constant Depth Channel - 19.69" (0.5 m)*	68048
SK2-31 Sloped Channel - 39.37" (1 m)	68031
SK2-32 Sloped Channel - 39.37" (1 m)	68032
SK2-33 Sloped Channel - 39.37" (1 m)	68033
SK2-34 Sloped Channel - 39.37" (1 m)	68034
SK2-35 Sloped Channel - 39.37" (1 m)*	68035
SK2-36 Sloped Channel - 39.37" (1 m)	68036
SK2-37 Sloped Channel - 39.37" (1 m)	68037
SK2-38 Sloped Channel - 39.37" (1 m)	68038
SK2-39 Sloped Channel - 39.37" (1 m)	68039
SK2-40 Sloped Channel - 39.37" (1 m)*	68040
SK2-040 Constant Depth Channel - 39.37" (1 m)*	68049
SK2-0403 Constant Depth Channel - 19.69" (0.5 m)*	68050



The subassembly also optionally includes haunching detail.



3.1 User Defined Parameter

Input/Output Parameters

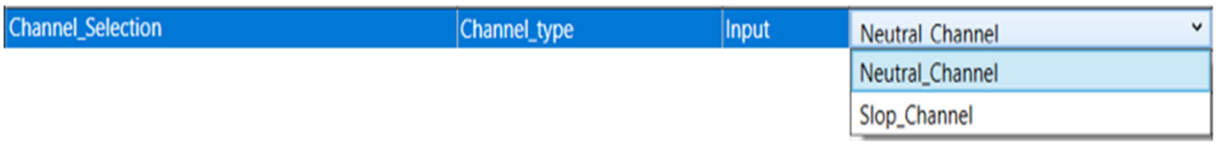
Name	Type	Direction	Default Value
Side	Side	Input	Right
Channel_Selection	Channel_type	Input	Slope_Channel
Neutral_channel_height_selection	Neutral_channel_Height	Input	SK2_00_Constant_depth_channel_1m_68041
Slope_height_Range_Selection	Slope_channel_height_range	Input	Sloped_channel_305_To_350
Slope_Channel_205_to_250	Sloped_Channel_205_to_250	Input	SK2_1_Sloped_channel_1m_68001
Slope_Channel_255_to_300	Sloped_Channel_255_to_300	Input	SK2_11_Sloped_channel_1m_68011
Slope_Channel_305_to_350	Sloped_Channel_305_to_350	Input	SK2_26_Sloped_channel_1m_68026
Slope_Channel_355_to_400	Sloped_Channel_355_to_400	Input	SK2_31_Sloped_channel_1m_68031
Gratings_selection	Gratings	Input	Load_Class_E_Longitudinal_Iron_72263
Haunching	Yes\No	Input	Yes
Haunching_class_selection	Haunch_Class	Input	Class_D_E_F
Haunch_Class_A_B_C_selection	Haunch_Class_A_B_C	Input	SK200_iron_Steel_Edge_Rail_Class_A_Exposed_Asphalt_Paveme
Haunch_Class_D_E_F_selection	Haunch_Class_D_E_F	Input	SK200_iron_Steel_Edge_Rail_Class_D_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 SK200 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	SK2_00_Constant_depth_channel_1m_68041
Slope_height_Range_Selection	Slope_channel_height_range	Input	SK2_00_Constant_depth_channel_1m_68041
Slope_Channel_205_to_250	Sloped_Channel_205_to_250	Input	SK2_010_Constant_depth_channel_1m_68043
Slope_Channel_255_to_300	Sloped_Channel_255_to_300	Input	SK2_0103_Constant_depth_channel_0_5m_68044
Slope_Channel_305_to_350	Sloped_Channel_305_to_350	Input	SK2_020_Constant_depth_channel_1m_68045
Slope_Channel_355_to_400	Sloped_Channel_355_to_400	Input	SK2_0203_Constant_depth_channel_0_5m_68046
Gratings_selection	Gratings	Input	SK2_030_Constant_depth_channel_1m_68047
Haunching	Yes\No	Input	SK2_0303_Constant_depth_channel_0_5m_68048
Haunching_class_selection	Haunch_Class	Input	SK2_040_Constant_depth_channel_1m_68049
Haunch_Class_A_B_C_selection	Haunch_Class_A_B_C	Input	SK2_0403_Constant_depth_channel_0_5m_68050

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 205 to 250, 255 to 300, 305 to 355 and 355 to 400. 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_205_to_250	Sloped_Channel_205_to_250	Input	Sloped_channel_205_To_250
Slope_Channel_255_to_300	Sloped_Channel_255_to_300	Input	Sloped_channel_255_To_300
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

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

Slope_Channel_205_to_250	Sloped_Channel_205_to_250	Input	SK2_1_Sloped_channel_1m_68001
Slope_Channel_255_to_300	Sloped_Channel_255_to_300	Input	SK2_1_Sloped_channel_1m_68001
Slope_Channel_305_to_350	Sloped_Channel_305_to_350	Input	SK2_2_Sloped_channel_1m_68002
Slope_Channel_355_to_400	Sloped_Channel_355_to_400	Input	SK2_3_Sloped_channel_1m_68003
Gratings_selection	Gratings	Input	SK2_4_Sloped_channel_1m_68004
Haunching	Yes\No	Input	SK2_5_Sloped_channel_1m_68005
Haunching_class_selection	Haunch_Class	Input	SK2_6_Sloped_channel_1m_68006
Haunch_Class_A_B_C_selection	Haunch_Class_A_B_C	Input	SK2_7_Sloped_channel_1m_68007
Haunch_Class_D_E_F_selection	Haunch_Class_D_E_F	Input	SK2_8_Sloped_channel_1m_68008
Create parameter			SK2_9_Sloped_channel_1m_68009
			SK2_10_Sloped_channel_1m_68010

Slope_Channel_255_to_300	Sloped_Channel_255_to_300	Input	SK2_11_Sloped_channel_1m_68011
Slope_Channel_305_to_350	Sloped_Channel_305_to_350	Input	SK2_11_Sloped_channel_1m_68011
Slope_Channel_355_to_400	Sloped_Channel_355_to_400	Input	SK2_12_Sloped_channel_1m_68012
Gratings_selection	Gratings	Input	SK2_13_Sloped_channel_1m_68013
Haunching	Yes\No	Input	SK2_14_Sloped_channel_1m_68014
Haunching_class_selection	Haunch_Class	Input	SK2_15_Sloped_channel_1m_68015
Haunch_Class_A_B_C_selection	Haunch_Class_A_B_C	Input	SK2_16_Sloped_channel_1m_68016
Haunch_Class_D_E_F_selection	Haunch_Class_D_E_F	Input	SK2_17_Sloped_channel_1m_68017
Create parameter			SK2_18_Sloped_channel_1m_68018
			SK2_19_Sloped_channel_1m_68019
			SK2_20_Sloped_channel_1m_68020

Slope_Channel_305_to_350	Sloped_Channel_305_to_350	Input	SK2_26_Sloped_channel_1m_68026
Slope_Channel_355_to_400	Sloped_Channel_355_to_400	Input	
Gratings_selection	Gratings	Input	
Haunching	Yes\No	Input	
Haunching_class_selection	Haunch_Class	Input	
Haunch_Class_A_B_C_selection	Haunch_Class_A_B_C	Input	
Haunch_Class_D_E_F_selection	Haunch_Class_D_E_F	Input	
Create parameter			

SK2_21_Sloped_channel_1m_68021
SK2_22_Sloped_channel_1m_68022
SK2_23_Sloped_channel_1m_68023
SK2_24_Sloped_channel_1m_68024
SK2_25_Sloped_channel_1m_68025
SK2_26_Sloped_channel_1m_68026
SK2_27_Sloped_channel_1m_68027
SK2_28_Sloped_channel_1m_68028
SK2_29_Sloped_channel_1m_68029
SK2_30_Sloped_channel_1m_68030

Slope_Channel_355_to_400	Sloped_Channel_355_to_400	Input	SK2_31_Sloped_channel_1m_68031
Gratings_selection	Gratings	Input	
Haunching	Yes\No	Input	
Haunching_class_selection	Haunch_Class	Input	
Haunch_Class_A_B_C_selection	Haunch_Class_A_B_C	Input	
Haunch_Class_D_E_F_selection	Haunch_Class_D_E_F	Input	
Create parameter			

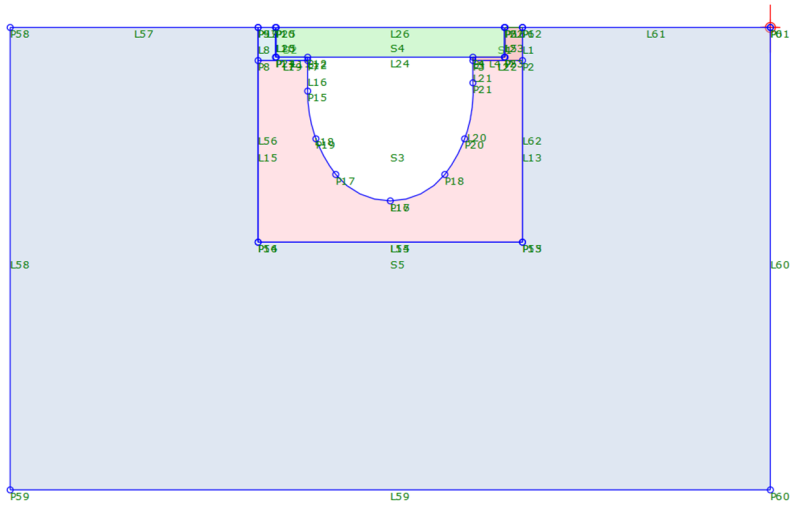
SK2_31_Sloped_channel_1m_68031
SK2_32_Sloped_channel_1m_68032
SK2_33_Sloped_channel_1m_68033
SK2_34_Sloped_channel_1m_68034
SK2_35_Sloped_channel_1m_68035
SK2_36_Sloped_channel_1m_68036
SK2_37_Sloped_channel_1m_68037
SK2_38_Sloped_channel_1m_68038
SK2_39_Sloped_channel_1m_68039
SK2_40_Sloped_channel_1m_68040

3.3 PowerDrain SK200 grating types

User needs to select gratings using the parameter Gratings_ selection

Gratings_selection	Gratings	Input	Load_Class_E_Longitudinal_Iron_72263
Haunching	Yes\No	Input	
Haunching_class_selection	Haunch_Class	Input	
Haunch_Class_A_B_C_selection	Haunch_Class_A_B_C	Input	

Load_Class_E_Longitudinal_Iron_72263
Load_Class_F_Slotted_Iron_02449
Load_Class_F_Bolt_Iron_99591



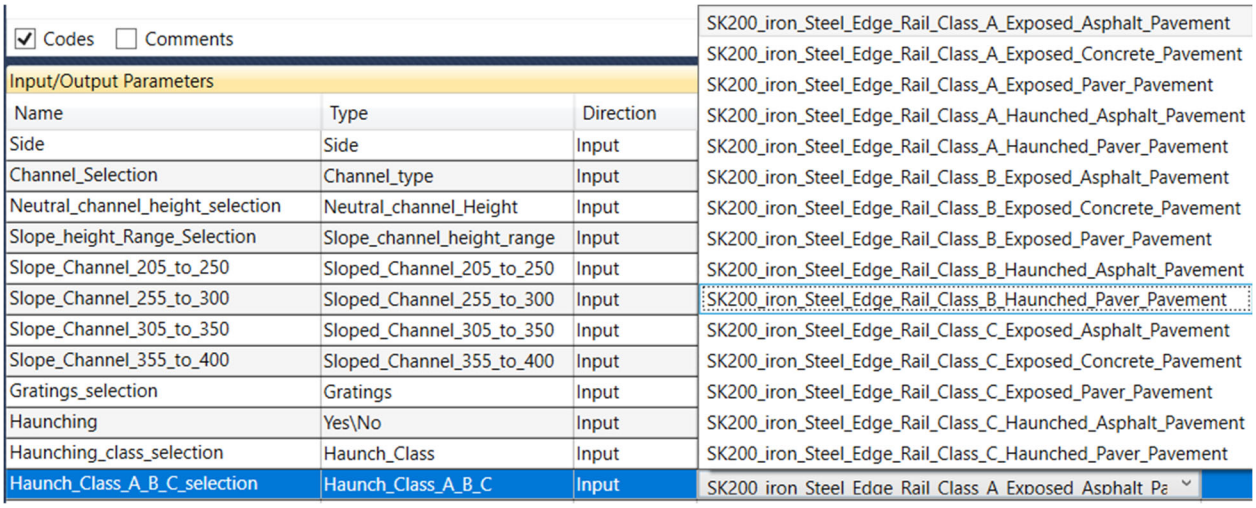
3.4 Haunch types

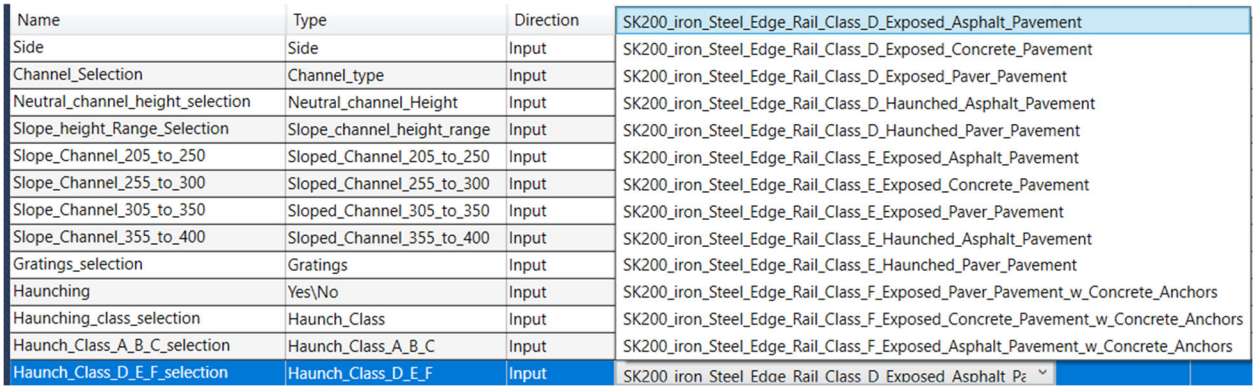
To include Haunching we have provided decision option so user can select Yes/or No from the parameter Haunching. There are six different classes for haunching we have splited those into two parameters A B C and D E F

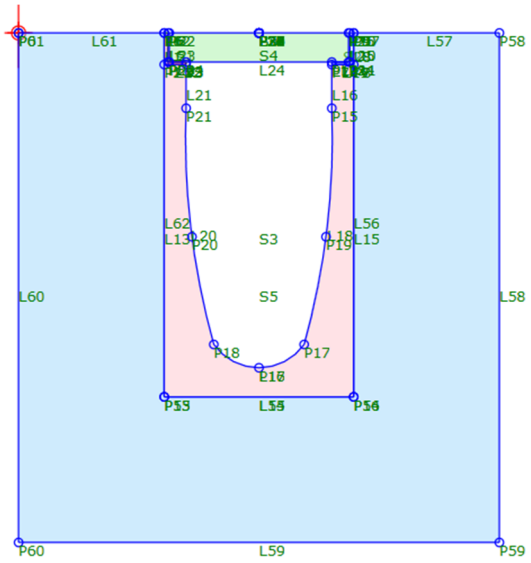
Haunching	Yes\No	Input	Yes

Haunch is divided into cateogart due to enumeration restriction,

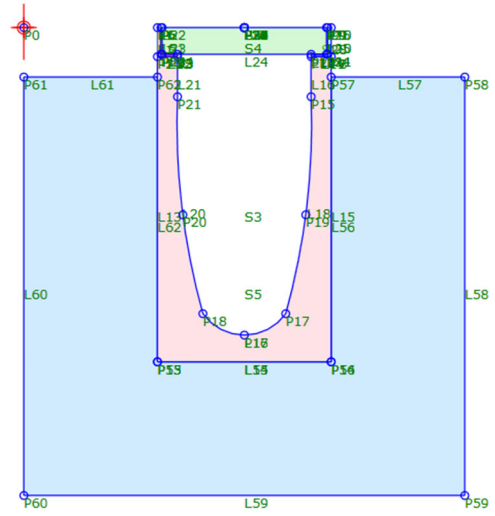
Haunching_class_selection	Haunch_Class	Input	Class A B C
Haunch_Class_A_B_C_selection	Haunch_Class_A_B_C	Input	Class_A_B_C
Haunch_Class_D_E_F_selection	Haunch_Class_D_E_F	Input	Class_D_E_F



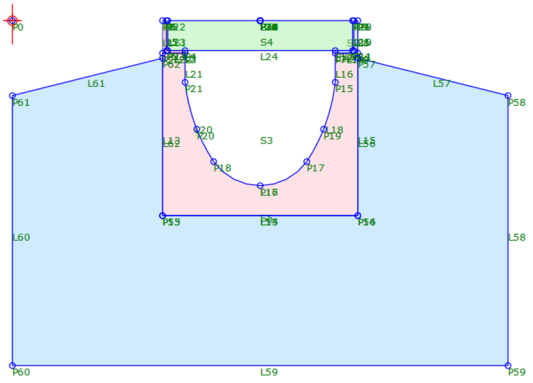




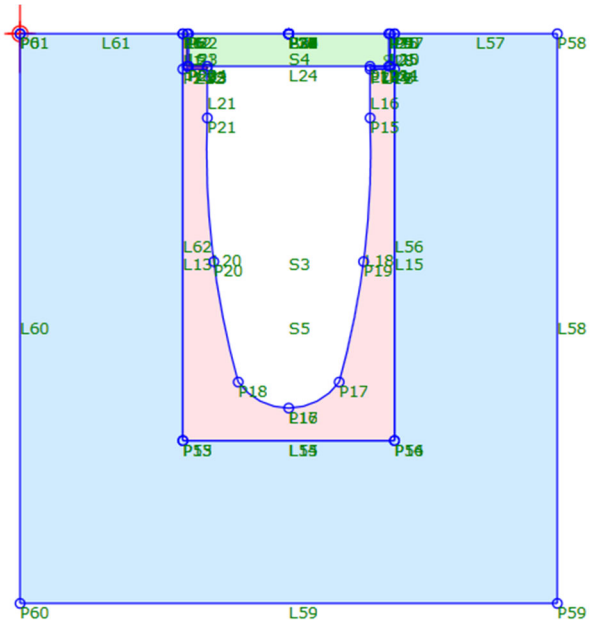
Exposed Asphalt pavement



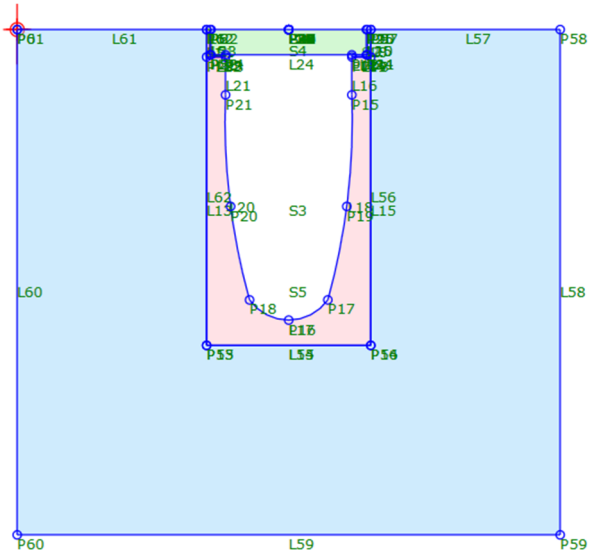
Haunched Paver Pavement



Haunched Asphalt Pavement



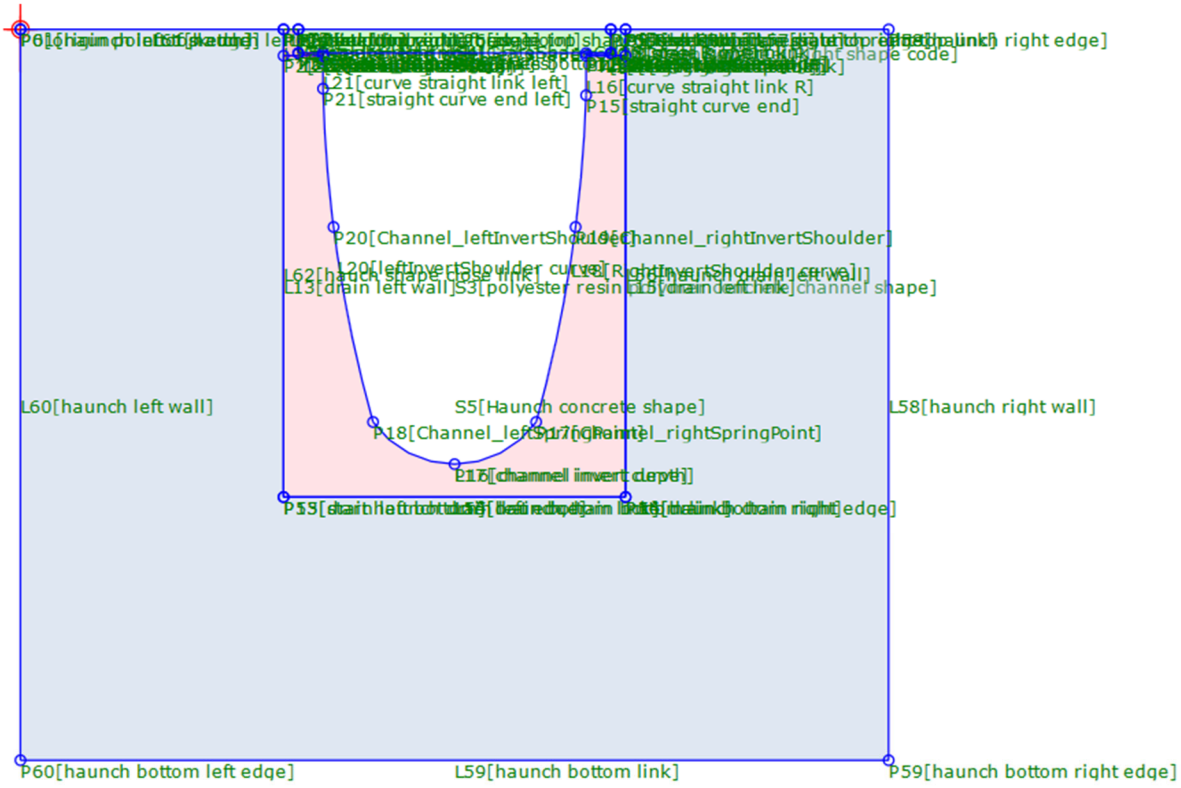
Exposed Concrete Pavement



Exposed Paver Pavement

3.5 Point Codes

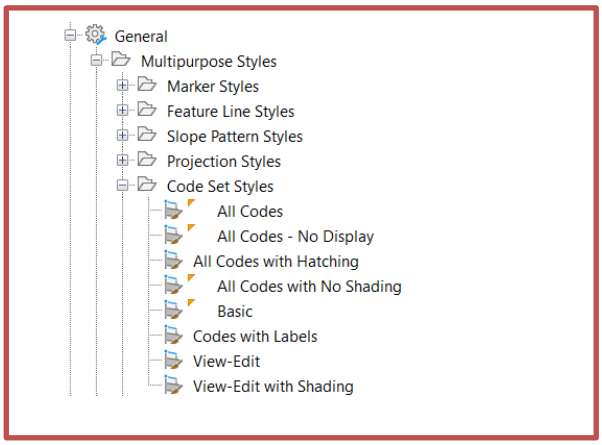
The point codes can be used in the code set styles to generate featurelines at the specific positions on the subassembly. The link codes can be used to display the outline of the subassembly in cross-sections, and also to create surface from the codes. The default values supplied with the subassembly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