

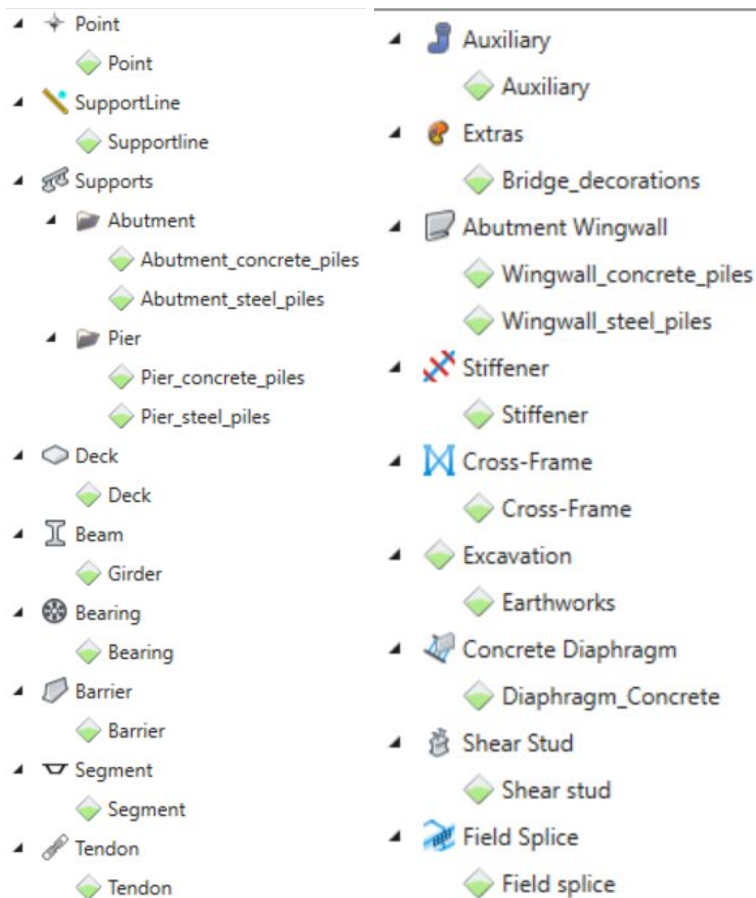
CONNECT Feature Definitions

The feature definitions used for CONNECT workspace projects are provided in various features and element templates libraries. The main library used for Bridge projects is IowaDOT_Bridge_Features_Levels_Elem Temp Imperial.dgnlib.

The main library used for pipe and culvert projects is IowaDOT_SU_Utility_FeatureDefinitions_ElementTemplates.dgnlib

The feature definitions are shown below through expanded views of the Feature Definitions in Explorer organized by library.

OpenBridge Modeler features for placement of the bridge components are listed below.



The feature symbology provided through the element templates and levels used are provided in the same dgnlib file.

Feature Symbology Default Element Template, Plan Element Template, and 3D Element Template are currently all the same element template for each feature.

Refer to [CONNECT Levels](#) for additional information on the levels used for the features in OpenBridge Modeler.

The feature symbology name, default element template, and associated level are provided in the tables below.

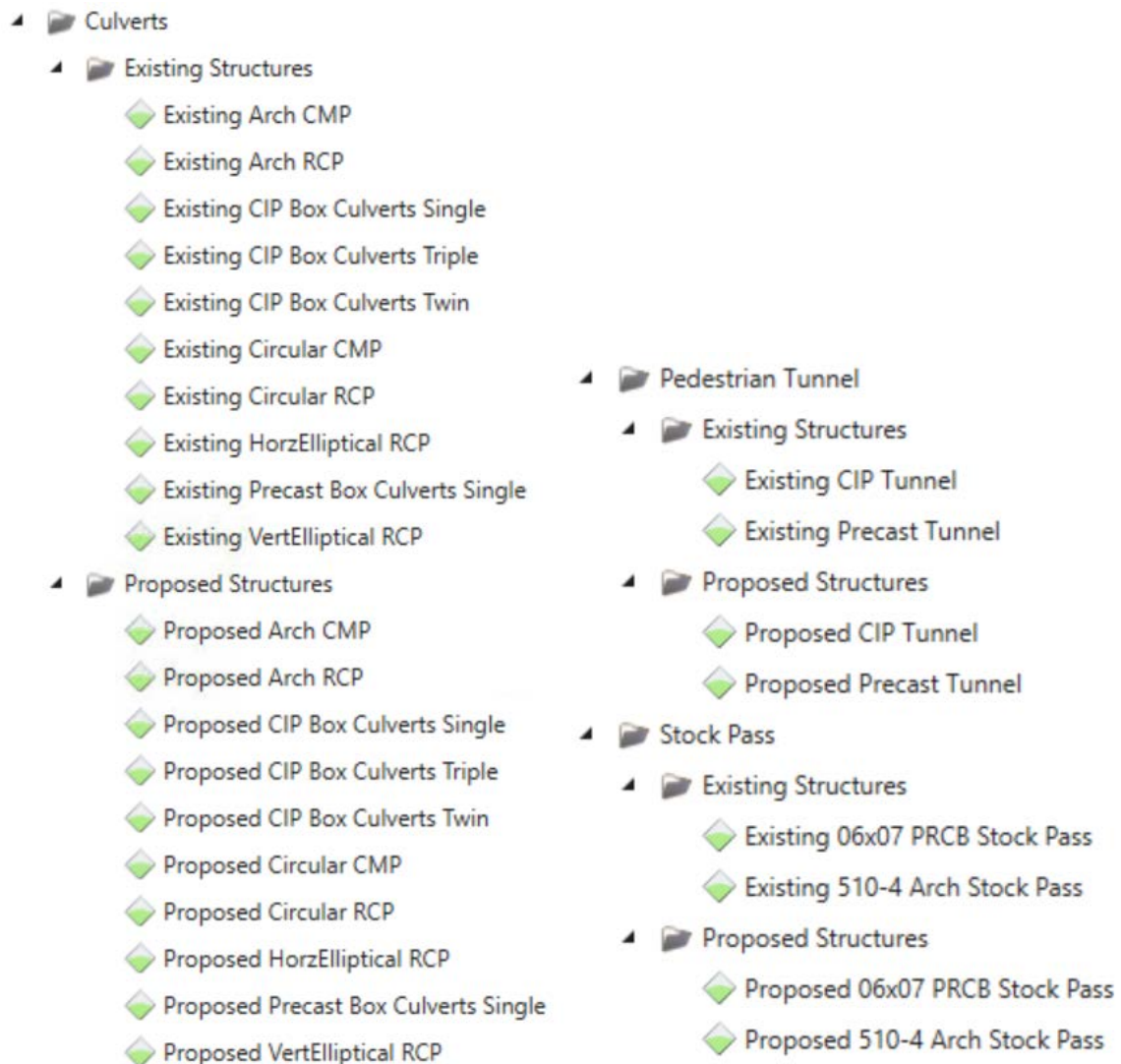
Feature Symbology Name	Solid Feature Symbology Default Element Template	Base Element Symbology - Level
Abutments	Abutments\Abutments	BridgeSubstructure
Caps	Abutments\Caps	BridgeSubstructure
Columns	Abutments\Columns	BridgeSubstructure
Footings	Abutments\Footings	BridgeSubstructure
Piles_concrete	Abutments\Piles_concrete	OBD_Bridge_Piling
Piles_steel	Abutments\Piles_steel	OBD_Bridge_Piling
Barrier	Auxiliary\Barriers\Barrier	OBD_Barrier
Bearings	Bearings\Bearings	BridgeSubstructure
GroutPad	Bearings\GroutPad	BridgeSubstructure
Seat	Bearings\Seat	BridgeSubstructure
CrossFrames	CrossFrames\CrossFrames	BridgeSuperStructure
Deck	Deck\Deck	BridgeSuperStructure
Diaphragm_Concrete	Diaphragms\Diaphragm_Concrete	BridgeSuperStructure
Bolt	Field splice\Bolt	OBD_Field_Splice
Field splice	Field splice\Field splice	OBD_Field_Splice
Filler plate	Field splice\Filler plate	OBD_Field_Splice
Plate	Field splice\Plate	OBD_Field_Splice
Concrete	Girder\Concrete	BridgeSuperStructure
Girder	Girder\Girder	BridgeSuperStructure
Haunch	Girder\Haunch	BridgeSuperStructure
Steel	Girder\Steel	BridgeSuperStructure
Wet Joint	Girder\Wet Joint	BridgeSuperStructure
Caps	Piers\Caps	BridgeSubstructure
Columns	Piers\Columns	BridgeSubstructure
Footings	Piers\Footings	BridgeSubstructure
Piers	Piers\Piers	BridgeSubstructure
Piles_concrete	Piers\Piles_concrete	OBD_Bridge_Piling
Piles_steel	Piers\Piles_steel	OBD_Bridge_Piling
Closure	Segments\Closure	BridgeSuperStructure
Expansion	Segments\Expansion	BridgeSuperStructure
PierSegment	Segments\PierSegment	BridgeSuperStructure
Segment	Segments\Segment	BridgeSuperStructure
Typical	Segments\Typical	BridgeSuperStructure
Shear stud	Shear stud\Shear stud	BridgeSuperStructure
Stiffeners	Stiffeners\Stiffeners	BridgeSuperStructure
Tendon	Tendons\Tendon	OBD_Tendon
Tendon_centerline	Tendons\Tendon_centerline	OBD_Tendon_Centerline
AbutmentWingwall	Wingwalls\AbutmentWingwall	BridgeSubstructure

Footing	Wingwalls\Footing	BridgeSubstructure
Piles_concrete	Wingwalls\Piles_concrete	OBD_Bridge_Piling
Piles_steel	Wingwalls\Piles_steel	OBD_Bridge_Piling
Wingwall	Wingwalls\Wingwall	BridgeSubstructure

Linear		
Feature Symbology Name	Feature Symbology Default Element Template	Base Element Symbology - Level
Barrier_outline	Decorations\Barrier_outline	OBD_D_Barrier_Outline
Beam_end	Decorations\Beam_end	OBD_D_Beam_End
Beam_layout	Decorations\Beam_layout	OBD_D_Beam_Layout
Beam_layout_text	Decorations\Beam_layout_text	OBD_D_Beam_Layout_Text
Beam_PL_offset	Decorations\Beam_PL_offset	OBD_D_Beam_PL_Offset
Bearing_Group	Decorations\Bearing_group	OBD_D_Sub
Bridge_decorations	Decorations\Bridge_decorations	OBD_D_Bridge_Decorations
CrossFrames	Decorations\CrossFrames	OBD_D_CrossFrames
Deck_outline	Decorations\Deck_outline	OBD_D_Super
Diaphragm_Concrete	Decorations\Diaphragm_Concrete	OBD_D_Super
Field splice	Decorations\Field splice	OBD_D_Field_splice
Reports_lines	Decorations\Reports_lines	OBD_D_Reports_Lines
Segmental_deck_outline	Decorations\Segmental_deck_outline	OBD_D_Segmental_Deck_Outline
Segmental_lines_text	Decorations\Segmental_lines_text	OBD_D_Segmental_Lines_Text
Shear studs	Decorations\Shear studs	OBD_D_Shear_studs
Stiffeners	Decorations\Stiffeners	OBD_D_Stiffeners
SupportLine_text	Decorations\SupportLine_text	OBD_D_Sub_Text
Unit_label	Decorations\Unit_label	OBD_D_Unit_Label
SupportLine	SupportLines\SupportLines	OBD_Support_Line
Surface		
Feature Symbology Name	Feature Symbology Default Element Template	Base Element Symbology - Level
Earthworks_Cut	Earthworks \Excavation	OBD_Excavation
Point		
Feature Symbology Name	Feature Symbology Default Element Template	Base Element Symbology - Level
Auxiliary	Auxiliary	Auxiliary
Point	Point	OBD_Point

OpenRoad Designer features used for pipe and culvert placement are provided under Conduit, StormWater feature definitions in IowaDOT_SU_Utility_FeatureDefinitions_ElementTemplates.dgnlib. Various types of culverts are provided as existing and proposed structures features.

Refer to the [Culvert Workflow documentation](#) for additional information on the use of the features in OpenRoad Designer.



























































Additional OpenRoad Designer features used for pipe and culvert placement are provided under Node, StormWater Node feature definitions. Various types of pipe aprons and culvert headwalls are provided as existing and proposed features.

Apron options include no apron. The pipe aprons are organized and named by type, shape, size, and standard.



































- ▲ Pipe Aprons
 - ▲ Aprons None
 - ▲ Existing Aprons None
 - ◆ E-Aprons None
 - ◆ E-Aprons None 30A
 - ◆ E-Aprons None 30B
 - ◆ E-Aprons None 45A
 - ◆ E-Aprons None 45B
 - ▲ Proposed Aprons None
 - ◆ P-Aprons None
 - ◆ P-Aprons None 30A
 - ◆ P-Aprons None 30B
 - ◆ P-Aprons None 45A
 - ◆ P-Aprons None 45B
-
- ▲ CMP Aprons
 - ▲ Arched Steel

<ul style="list-style-type: none"> ▲ Existing Steel Arched <ul style="list-style-type: none"> ◆ E-(15")17x13Steel Arch ◆ E-(18")21x15Steel Arch ◆ E-(21")24x18Steel Arch ◆ E-(24")28x20Steel Arch ◆ E-(30")35x24Steel Arch ◆ E-(36")42x29Steel Arch ◆ E-(42")49x33Steel Arch ◆ E-(48")57x38Steel Arch ◆ E-(54")64x43Steel Arch ◆ E-(60")71x47Steel Arch ◆ E-(66")77x52Steel Arch ◆ E-(72")83x57Steel Arch 	<ul style="list-style-type: none"> ▲ Proposed DR-204 Steel Arched <ul style="list-style-type: none"> ◆ P-(15")DR-204(17"x13")Steel Arch ◆ P-(18")DR-204(21"x15")Steel Arch ◆ P-(21")DR-204(24"x18")Steel Arch ◆ P-(24")DR-204(28"x20")Steel Arch ◆ P-(30")DR-204(35"x24")Steel Arch ◆ P-(36")DR-204(42"x29")Steel Arch ◆ P-(42")DR-204(49"x33")Steel Arch ◆ P-(48")DR-204(57"x38")Steel Arch ◆ P-(54")DR-204(64"x43")Steel Arch ◆ P-(60")DR-204(71"x47")Steel Arch ◆ P-(66")DR-204(77"x52")Steel Arch ◆ P-(72")DR-204(83"x57")Steel Arch
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- ▲  Beveled Pipe Guard
 - ▲  Existing Pipe Guard
 -  E-(12")DR-212 Pipe Guard
 -  E-(15")DR-212 Pipe Guard
 -  E-(18")DR-212 Pipe Guard
 -  E-(21")DR-212 Pipe Guard
 -  E-(24")DR-212 Pipe Guard
 - ▲  Proposed DR-212 Pipe Guard
 -  P-(12")DR-212 Pipe Guard
 -  P-(15")DR-212 Pipe Guard
 -  P-(18")DR-212 Pipe Guard
 -  P-(21")DR-212 Pipe Guard
 -  P-(24")DR-212 Pipe Guard

- ▲  Circular Steel
 - ▲  Existing Steel Circular
 -  E-(06")Steel Circular
 -  E-(08")Steel Circular
 -  E-(10")Steel Circular
 -  E-(12")Steel Circular
 -  E-(15")Steel Circular
 -  E-(18")Steel Circular
 -  E-(21")Steel Circular
 -  E-(24")Steel Circular
 -  E-(30")Steel Circular
 -  E-(36")Steel Circular
 -  E-(42")Steel Circular
 -  E-(48")Steel Circular
 -  E-(54")Steel Circular
 -  E-(60")Steel Circular
 -  E-(66")Steel Circular
 -  E-(72")Steel Circular
 -  E-(78")Steel Circular
 -  E-(84")Steel Circular
 -  E-(90")Steel Circular
 -  E-(96")Steel Circular
 - ▲  Proposed DR-203 Steel Circular
 -  P-(06")DR-203 Steel Circular
 -  P-(08")DR-203 Steel Circular
 -  P-(10")DR-203 Steel Circular
 -  P-(12")DR-203 Steel Circular
 -  P-(15")DR-203 Steel Circular
 -  P-(18")DR-203 Steel Circular
 -  P-(21")DR-203 Steel Circular
 -  P-(24")DR-203 Steel Circular
 -  P-(30")DR-203 Steel Circular
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 -  P-(42")DR-203 Steel Circular
 -  P-(48")DR-203 Steel Circular
 -  P-(54")DR-203 Steel Circular
 -  P-(60")DR-203 Steel Circular
 -  P-(66")DR-203 Steel Circular
 -  P-(72")DR-203 Steel Circular
 -  P-(78")DR-203 Steel Circular
 -  P-(84")DR-203 Steel Circular
 -  P-(90")DR-203 Steel Circular
 -  P-(96")DR-203 Steel Circular












The additional apron node features listed are not expanded for specific named features.

- ▲  RCP Aprons
 - ▲  Arched
 - ▲  Existing
 - ▷  Arched
 - ▷  Arched with end wall
 - ▷  Arched with guard
 - ▲  Proposed
 - ▷  Arched DR-202
 - ▷  Arched DR-202 with DR-213 guard
 - ▷  Arched DR-206 with end wall
- ▲  Circular
 - ▲  Existing
 - ▷  Circular Type1
 - ▷  Circular Type1 with end wall
 - ▷  Circular Type1 with guard
 - ▷  Circular Type2
 - ▷  Circular Type2 with end wall
 - ▷  Circular Type2 with guard
 - ▲  Proposed
 - ▷  Circular DR-201 Type1
 - ▷  Circular DR-201 Type1 with DR-213 guard
 - ▷  Circular DR-201 Type2
 - ▷  Circular DR-201 Type2 with DR-213 guard
 - ▷  Circular DR-205 Type1 with end wall
 - ▷  Circular DR-205 Type2 with end wall
- ▲  Ellipse
 - ▲  Existing
 - ▷  Ellipse
 - ▷  Ellipse with end wall
 - ▷  Ellipse with guard
 - ▲  Proposed
 - ▷  Ellipse DR-202
 - ▷  Ellipse DR-202 with DR-213 guard
 - ▷  Ellipse DR-206 with end wall

The reinforced concrete box headwalls are organized and named by number of barrels, type of wings, skew, and size. These features are not expanded for specific named features.

- ▲ RCB head walls
 - ▲ CIP
 - ▲ Single
 - ▲ Parallel Wing
 - ▲ 0 Skew
 - ▷ Existing
 - ▷ Proposed PWH 0
 - ▷ 15 Skew
 - ▷ 30 Skew
 - ▷ 45 Skew
 - ▲ Triple
 - ▲ Flared Wing
 - ▲ 0 Skew
 - ▷ Existing
 - ▷ Proposed
 - ▷ 15 Skew
 - ▷ 30 Skew
 - ▲ Twin
 - ▲ Flared Wing
 - ▲ 0 Skew
 - ▷ Existing
 - ▷ Proposed TWH 0
 - ▷ 15 Skew
 - ▷ 30 Skew

These features are expanded for specific named features.

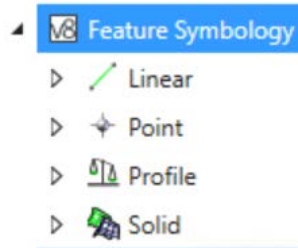
- ▲  Pedestrian Tunnel head walls
 - ▲  CIP
 - ▲  Flared Wing
 - ▲  0 Skew
 - ▲  Existing
 - ◆ E_CIP12x 10-4 Pedestrian Tunnel
 - ▲  Proposed
 - ◆ P_CIP12 x 10-4 Pedestrian Tunnel
- ▲  Stock Pass head walls
 - ▲  Precast
 - ▲  Parallel Wing
 - ▲  Existing
 - ◆ E-(4'x6')510-4 48"x72"Conc Arch Stock Pass
 - ◆ E-(5'x7')510-4 60"x84"Conc Arch Stock Pass
 - ◆ E_06x07_PRCB_SGL_PW_0_Stock Pass
 - ▲  Proposed 510-4
 - ◆ P-(4'x6')510-4 48"x72"Conc Arch Stock Pass
 - ◆ P-(5'x7')510-4 60"x84"Conc Arch Stock Pass
 - ◆ P_06x07_PRCB_SGL_PW_0_Stock Pass

These are not intended to be an all-inclusive lists of possible existing or proposed nodes. Several categories have been populated only as needed for active projects. Work continues to create features for what exists in our structure inventory and what we have for culvert standards.

The feature symbology provided through the element templates and levels used are provided in the same dgnlib file.

Refer to [CONNECT Levels](#) for additional information on the levels used for the features in OpenRoad Designer.

The feature symbology is organized by four main categories.



The pipe and culvert feature symbology for the main structure are provided under Linear, Conduit, StormWater and are named the same as the features. Each symbology specifies an element template for the Plan and the 3D model.

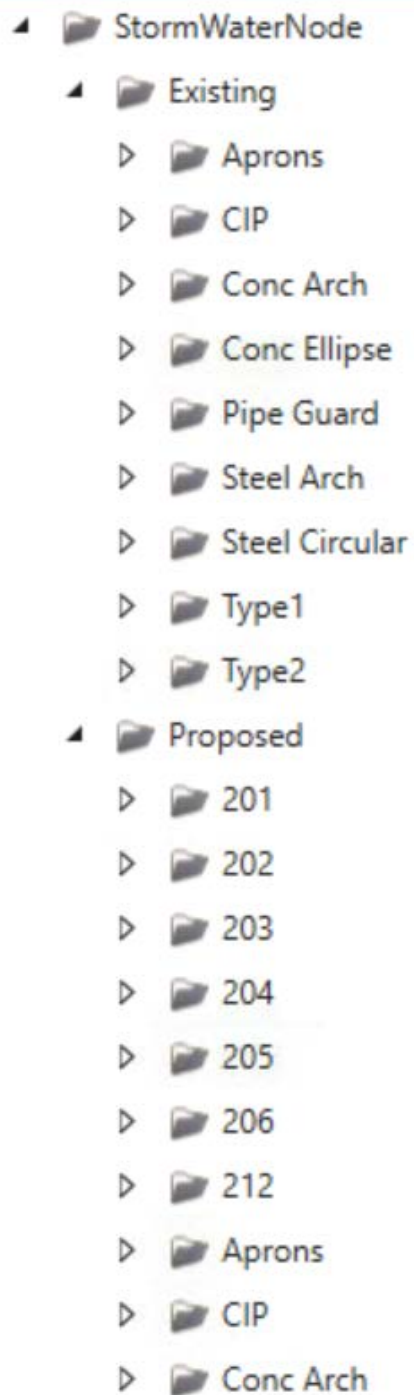
An example of properties settings is shown below.

A screenshot of the 'Existing CIP Box Culverts Single' properties dialog box. The dialog is organized into several sections, each with a blue header and an expand/collapse arrow on the right. The sections and their contents are as follows:

- Defaults**: Contains a single row with 'Default Element Template' set to 'None'.
- Plan**: Contains four rows: 'Annotation Group' set to 'None', 'Element Template' set to 'Culverts Conduits\CIP Box Culverts RCB\Existing\E_CIP_RCB_Plan', 'Arc Element Template' set to 'None', and 'Spiral Element Template' set to 'None'.
- Profile Intersection**: Contains a single row with 'Element Template' set to 'None'.
- 3D**: Contains two rows: 'Annotation Group' set to 'None' and 'Element Template' set to 'Culverts Conduits\CIP Box Culverts RCB\Existing\E_CIP_RCB_3D Concrete'.
- Dynamic Cross Section**: Contains a single row with 'Crossing Point Element Template' set to 'None'.


The pipe and culvert feature symbology for types of pipe aprons and culvert headwalls are provided under Point, Node, StormWaterNode and are named the same as the features.

These are organized by existing and proposed and then categorized by type of node.



Each symbology specifies an element template for the Plan and Profile.


An example of properties settings is shown below.

 P_10x04_CIP_TRH_FW_15_LA

Defaults		^
Default Element Template	None	
Plan		^
Annotation Group	None	
Element Template	Headwalls RCB\CIP\Triple\Flared Wing\15 Skew\Proposed\10X04\P_10x04_CIP_TRH_FW_LA_15 Plan	
Profile		^
Annotation Group	None	
Element Template	Storm Sewer Nodes\Drainage Node Profile	
3D		^
Element Template	None	

The pipe and culvert feature symbology for the structure profiles are provided under Profile, Conduit, StormWater and Profile, Node, StormWaterNode. These are named the same as the features. Each symbology specifies an element template for the Profile.

Examples of properties settings are shown below.

 Existing CIP Box Culverts Single

Annotation Group		^
Annotation Group	None	
Defaults		^
Default Element Template	None	
Profile Intersection		^
Element Template	None	
Profile Projection		^
Element Template	None	
Profile		^
Element Template	Culverts Conduits\CIP Box Culverts RCB\Existing\E_CIP_RCB_Profile	
Curve Element Template	None	

E_10x04_CIP_TRH_FW_15_LA

Annotation Group		^
Annotation Group	None	
Defaults		^
Default Element Template	None	
Profile Intersection		^
Element Template	None	
Profile Projection		^
Element Template	None	
Profile		^
Element Template	Storm Sewer Nodes\Drainage Node Profile	
Curve Element Template	None	

The pipe and culvert feature symbology for the solid category are provided under Solid, Conduit, StormWater and Solid, Node, StormWaterNode. These are named similar to the features. Each symbology specifies an element template for 3D modeling.

Proposed CIP Box Culverts Triple

Defaults		^
Default Element Template	None	
3D		^
Top Template	Culverts Conduits\CIP Box Culverts RCB\Proposed\P_CIP_RCB_3D Concrete	
Bottom Template	None	

P_10x04_CIP_TRH_FW_15_LA

Defaults		^
Default Element Template	None	
3D		^
Top Template	None	
Bottom Template	Headwalls RCB\CIP\Triple\Flared Wing\15 Skew\Proposed\10X04\P_10x04_CIP_TRH_FW_LA_15_3D	

The existing and proposed culvert features use the CulvertExisting and CulvertProposed levels for all features.

ProStructures is not a feature-based application.