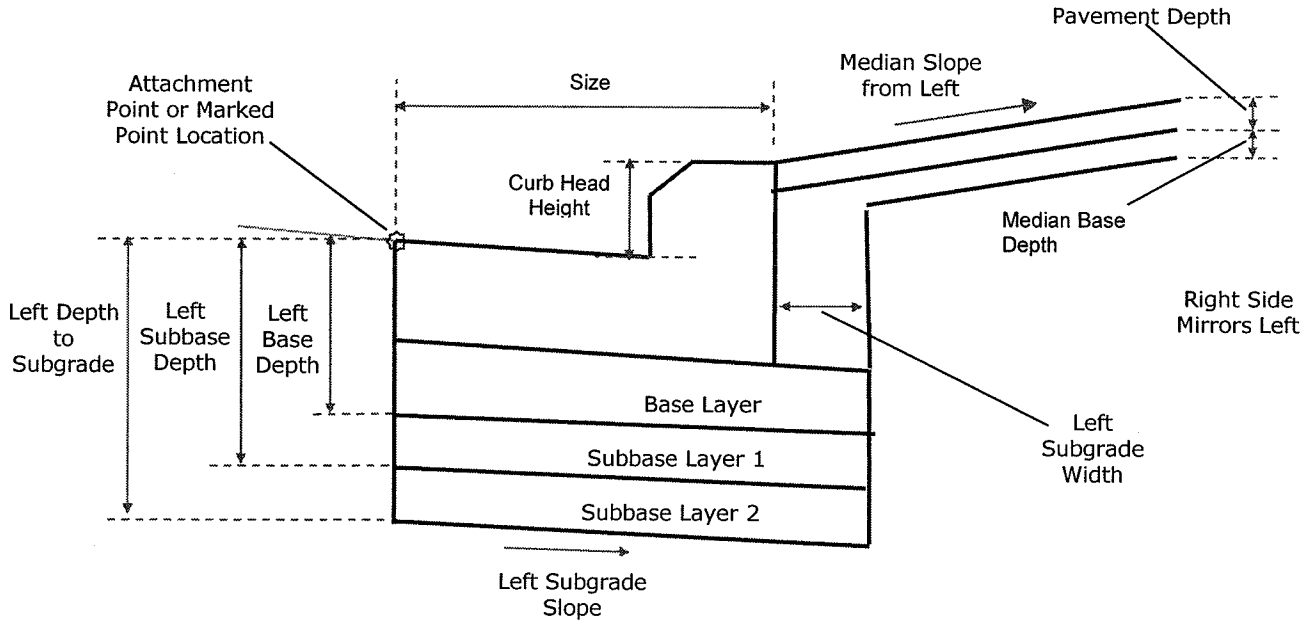
UrbMedian

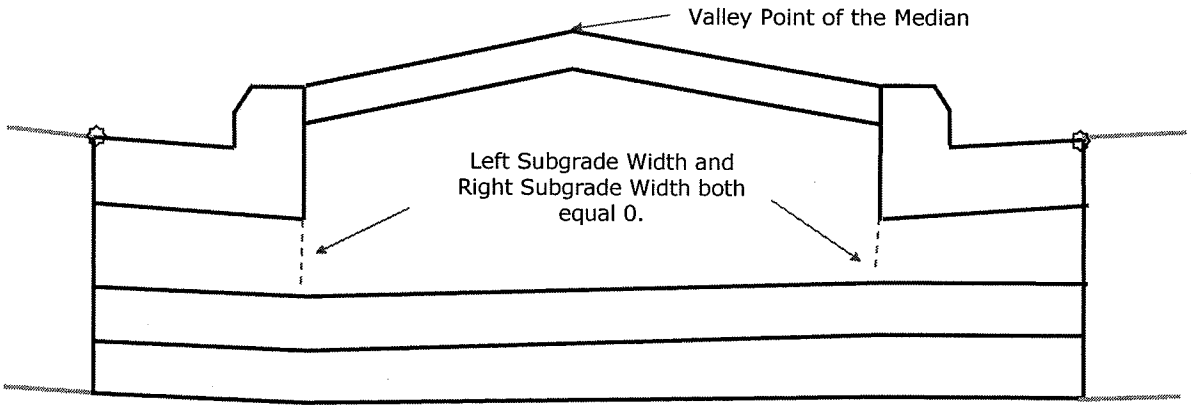
Description

The UrbMedian subassembly inserts links for a standard shape concrete curb and gutter with base course layers. Dimensions of the shape are controlled by curb and gutter types per WisDOT Standards. See WisDOT Standard Detail Drawings for further information on curb shape and dimensions.

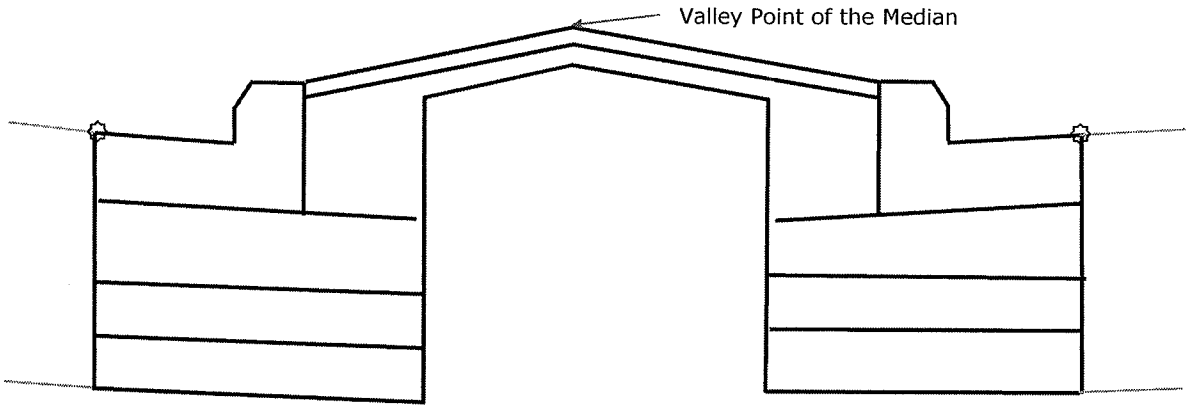
Gutter and Gutter



Both Sides Shown - Full Depth Subgrade Through Median is True



Both Sides Shown - Full Depth Subgrade Through Median is False



Attachment

The attachment point is at the flange point of the gutter on either the right or left side of the median.

Input Parameters

Note: All dimensions are in feet unless otherwise noted. Curb-and-gutter dimensions must be given in inches. All slopes are in run-over-rise form (for example 4:1) unless indicated as a percent slope with a "%" sign.

Parameter	Description	Type	Default
Side	Specifies which side to place the subassembly.	Left/Right	Right
Marked Point Name	Name of a previously defined marked point. Marked point must be found in the direction of the insertion side.	String	RT
Curb and Gutter Type	Type of curb and gutter to construct, "sloped" suffix indicates sloped curb head when it is an option for that curb type.	String, Combo List of options: a) A; b) A-sloped; c) D; d) D-sloped; e) G; f) J; g) K; h) L; i) R; k) T	A

Parameter	Description	Type	Default
Size (inches)	Curb and Gutter Size. Size is the horizontal distance from the back of curb to the flange of curb.	Numeric, List of options: a) 18; b)30; c)36	30
Curb Head Height (inches)	Vertical distance from the flowline to the top of the curb head.	Numeric, List of options: a) 4; b) 6	6
Integral Curb? (Y/N)	Assigns curb quantity to integral curb pay item when answered "Yes" . Integral curb is an option for Curb types D, J, and L only.	String, Combo List of options: a) Yes; b) No	No
Left Gutter Slope Method	Specifies method of gutter slope calculation for leftmost gutter. If using either Outside Lane SE or Inside Lane SE, slope in normal crown is equal to -6.25% and only changes when slope exceeds 2% on the high side. Remains -6.25% on low side.	String, Combo List of options: a) Use Right-Side Outside Lane SE; b) Use Right-Side Inside Lane SE; c) Use Left-Side Outside Lane SE; d) Use Left-Side Inside Lane SE; e) Fixed slope;	Use Right-Side Outside Lane SE
Left Gutter Slope	Specifies fixed gutter slope for the leftmost gutter. Depth from the flange point to the gutter flowline determined by this slope.	Slope	-6.25%
Left Base Depth	Distance to the bottom of the first base course layer on the left side. This measurement is taken from the top of the pavement. If there is no base course layer on the left, a zero depth should be used.	Numeric, positive	0.0
Left Subbase Depth	Distance to the bottom of the second base course layer on the left side. This measurement is taken from the top of the pavement. If there is no second base course layer on the left side, a zero depth should be used.	Numeric, positive	0.0

Parameter	Description	Type	Default
Left Depth to Subgrade	Depth to Subgrade Surface at the flange point on the left side. The depth specified here should be the depth to the bottom of the last base/subbase course layer.	Numeric, positive	1.5
Left Subgrade Width	Distance the base/subbase courses are extended beyond the back-of-curb on the left side. Use zero to terminate the base/subbase courses at the back-of-curb on the left side. If **Full Depth Subgrade Through Median** is True, this value is ignored.	Numeric, positive	1.0
Left Subgrade SE Method	Selects whether to use the superelevation definition for the baseline to define the slope of the subgrade surface or to set a fixed numeric % slope value. If Fixed Slope is specified, once an Assembly has been built, the user has the option to set a parameter reference in Assembly Properties and use the Subgrade Slope of an adjacent lane to define the subgrade slopes here.	String, Combo List of Options: a) Fixed Slope; b) Use Right-Side Outside Lane SE; c) Use Right-Side Inside Lane SE; d) Use Left-Side Outside Lane SE; e) Use Left-Side Inside Lane SE; f) Use Right-Side Outside Lane SE multiplied by -1; g) Use Right-Side Inside Lane SE multiplied by -1 ; h) Use Left-Side Outside Lane SE multiplied by -1; i) Use Left-Side Inside Lane SE multiplied by -1	Use Right-Side Outside Lane SE
Left Fixed Subgrade Slope	Cross slope of the subgrade surface on Left side. This value is used if Fixed Slope is the Left Subgrade SE Method selected, or SE is not defined for the baseline alignment.	Slope	-2%

Parameter	Description	Type	Default
Right Gutter Slope Method	Specifies method of gutter slope calculation for rightmost gutter. If using either Outside Lane SE or Inside Lane SE, slope in normal crown is equal to -6.25% and only changes when slope exceeds 2% on the high side. Remains -6.25% on low side.	String, Combo List of options: a) Use Right-Side Outside Lane SE; b) Use Right-Side Inside Lane SE; c) Use Left-Side Outside Lane SE; d) Use Left-Side Inside Lane SE; e) Fixed slope	Use Left-Side Outside Lane SE
Right Gutter Slope	Specifies fixed gutter slope for the rightmost gutter. Depth from the flange point to the gutter flowline determined by this slope.	Slope	-6.25%
Right Base Depth	Distance to the bottom of the first base course layer on the right side. This measurement is taken from the top of the pavement. If there is no base course layer on the right, a zero depth should be used.	Numeric	0.0
Right Subbase Depth	Distance to the bottom of the second base course layer on the right side. This measurement is taken from the top of the pavement. If there is no second base course layer on the right side, a zero depth should be used.	Numeric	0.0
Right Depth to Subgrade	Depth to Subgrade Surface at the flange point on the left side. The depth specified here should be the depth to the bottom of the last base/subbase course layer.	Numeric, positive	1.5

Parameter	Description	Type	Default
Right Subgrade Width	Distance the base/subbase courses are extended beyond the back-of-curb on the right side. Use zero to terminate the base/subbase courses at the back-of-curb on the right side. If **Full Depth Subgrade Through Median** is True, this value is ignored.	Numeric, positive	1.0
Right Subgrade SE Method	Selects whether to use the superelevation definition for the baseline to define the slope of the subgrade surface or to set a numeric % slope value. User also has the option to set a parameter reference and use the Subgrade Slope of an adjacent lane to define the subgrade slopes.	String, Combo List of Options: a) Fixed Slope; b) Use Right-Side Outside Lane SE; c) Use Right-Side Inside Lane SE; d) Use Left-Side Outside Lane SE; e) Use Left-Side Inside Lane SE; f) Use Right-Side Outside Lane SE multiplied by -1; g) Use Right-Side Inside Lane SE multiplied by -1 ; h) Use Left-Side Outside Lane SE multiplied by -1; i) Use Left-Side Inside Lane SE multiplied by -1	Use Left-Side Outside Lane SE
Right Fixed Subgrade Slope	Cross slope of the subgrade surface on Right side. This value is used if Fixed Slope is the Right Subgrade SE Method selected, or SE is not defined for the baseline alignment.	Slope	-2%

Parameter	Description	Type	Default
Median Slope Constraint	Determines whether the Slope from the Left Side, Slope from the Right Side or a computation for equal slopes should be used to define the links between the two backs of curb. When Equal Slopes is selected, Slope from Left Marked Point and Slope From Right Marked Point parameters are both ignored.	String Combo List of Options: Use Median Slope From Left, Use Median Slope From Right, Equal Slopes	Equal Slopes
Median Slope From Left	Slope of the link extending rightward from the top back of curb on the left side.	Slope	4%
Median Slope From Right	Slope of the link extending leftward from the top back of curb on the right side.	Slope	4%
Constraining Feature	Indicates whether an elevation or an offset should be used to constrain the valley point of the median.	String Combo List of Options: No, Elevation, Offset	No
Constraining Value	Numeric Elevation or Offset value from the baseline used as the constraint to define the valley point of the median. When Offset is specified as the Constraining Feature, a negative value indicates an offset to the left of the baseline.	Numeric	10.0
Full Depth Subgrade Through Median	When set to True, base/subbase course layers and the subgrade surface from the left side will connect with those layers on the right side, creating full-depth base course layers through the median. Described in more detail in Behavior section.	True / False	False

Parameter	Description	Type	Default
Pavement Depth	Depth of pavement. Runs between the back of the curb on the left side and back of curb on the right side. Measured from the top of the back of curb at the attachment side. Bottom of the Pavement will run parallel to the top of the pavement.	Numeric	0.0
Median Base Depth	Depth of Base in median, measured from top of median pavement. Only used when Full Depth Subgrade Through Median = False.	Numeric	0.0

Target Parameters

This section lists the parameters in this subassembly that can be mapped to a target object such as a surface, alignment, or profile object in a drawing. For more information, see Setting and Editing Targets in the AutoCAD Civil 3D User's Guide Help.

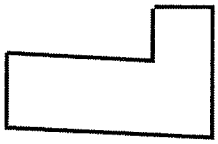
Parameter	Description	Status
Elevation Constraint for Median	Object that defines the elevation of the valley point of the median when Constraining Feature is set to Elevation ONLY. The following object types can be used as targets for specifying the elevations: profiles, 3D polylines, feature lines, or survey figures.	Optional
Offset Constraint for Median Center	Object that defines the horizontal location of the valley point of the median when Constraining Feature is set to Offset ONLY. The following object types can be used as targets for specifying the width: alignments, polylines, feature lines, or survey figures.	Optional

Behavior

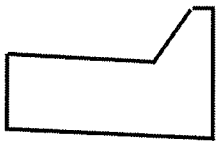
The location of the marked point is determined. The Marked Point specified must be found in the direction of the insertion side or the subassembly will not be inserted and an error will be logged in the event viewer. Links are extended inward between the attachment point and the marked point locations, with the curb and gutter links being inserted first. If the horizontal distance between the attachment point and the marked point is less than what is needed to construct the curbs, the subassembly will not be inserted and an error will be logged in the event viewer.

Curb shape and dimensions are derived from WisDOT standard detail drawings as shown in the WisDOT Facilities Development Manual. Curb selection from standard detail drawing is determined by inputs for Curb and Gutter Type, Size, and Curb Head Height.

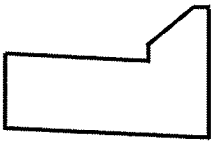
Type A, D, K, L



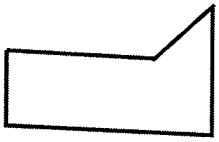
Type A, D sloped



Type G, J



Type R, T



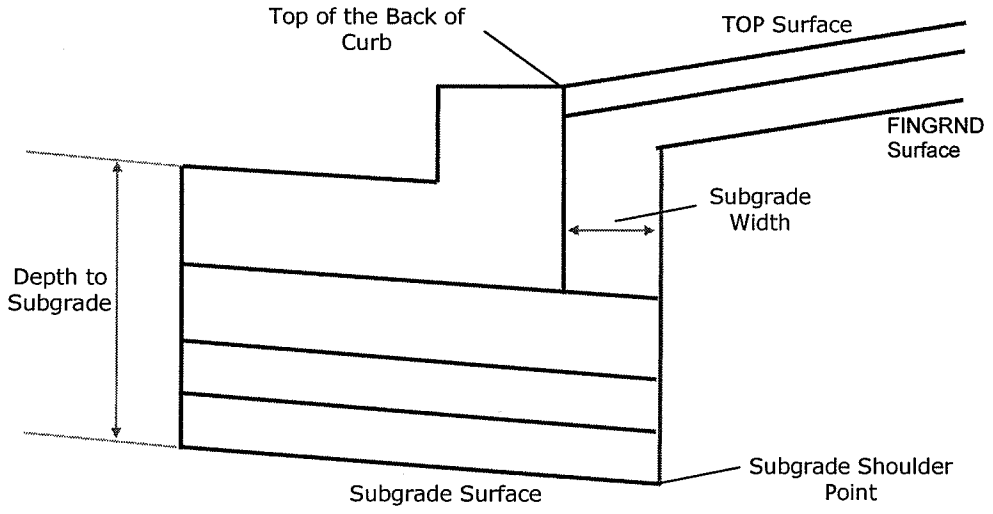
Integral Curb designationwill not affect subassembly construction of the curb, it is used for proper assignment to pay item in quantity takeoff.

If the Gutter Slope Method selected is Use Outside Lane SE (Left or Right-side) or Use Inside Lane SE (Left or Right-side), Dimension C, the depth from the flange point to the gutter flowline, is calculated based on a -6.25% slope in normal crown. The gutter slope only deviates from a slope of -6.25% when inserting the subassembly on a superelevated high side where the superelevation defined for the baseline alignment exceeds 2%. The methodology is further explained below.

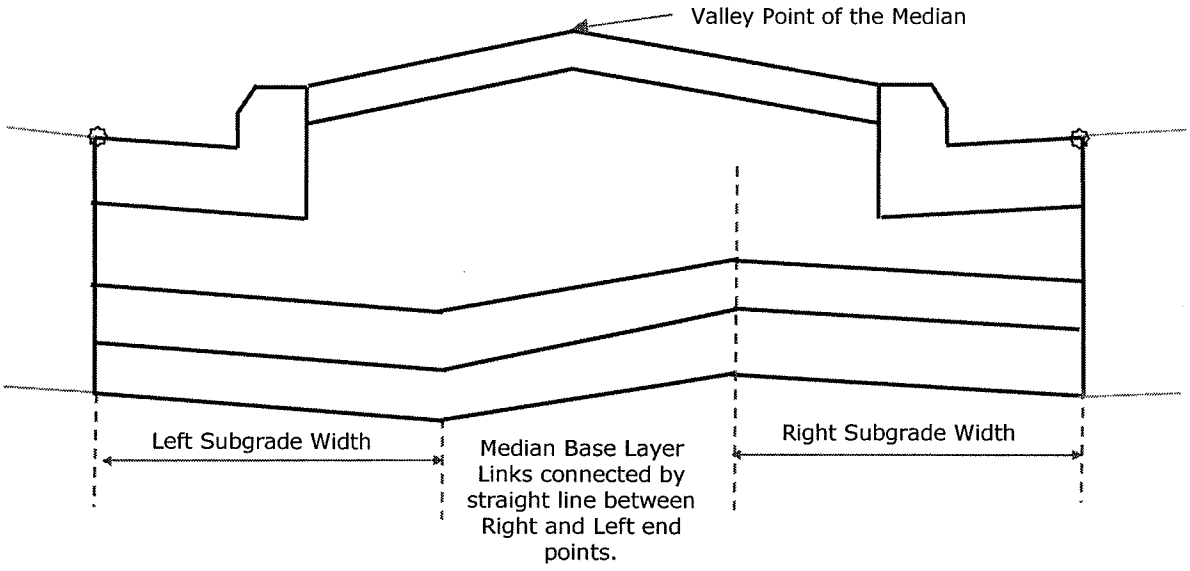
1. If **Left Gutter Slope Method** or **Right Gutter Slope Method** is set to *Use Right-Side Outside Lane SE or Use Right-Side Inside Lane SE*, the subassembly uses the baseline alignment's SE for the right-side to determine the gutter slope. The gutter slope for the side in question will be -6.25% unless the SE exceeds 2%. Where SE exceeds 2%, the gutter slope will equal the SE rate for the baseline alignment.
2. If **Left Gutter Slope Method** or **Right Gutter Slope Method** is set to *Use Left-Side Outside Lane SE or Use Left-Side Inside Lane SE*, the subassembly uses the baseline alignment's SE for the left-side to determine the gutter slope. The gutter slope for the side in question will be -6.25% unless the SE exceeds 2%. Where SE exceeds 2%, the gutter slope will equal the SE rate for the baseline alignment.
3. If **Left Gutter Slope Method** is set to *Fixed Slope*, the slope of the leftmost gutter will follow the value of the **Left Gutter Slope** parameter.
4. If **Right Gutter Slope Method** is set to *Fixed Slope*, the slope of the rightmost gutter will follow the value of the **Right Gutter Slope**
5. If **Left Gutter Slope Method** or **Right Gutter Slope Method** is set to *Fixed Slope*, once an Assembly has been built, the user has the option to set a parameter reference in Assembly Properties and use the Pavement Slope of an adjacent lane to define the gutter slope on the side in question.

Various base course layer depths can be defined for both the left and right sides. The **Left Depth to Subgrade** and **Right Depth to Subgrade** defines the depth to the bottom of the lowest base course layer for each side separately. If the **Left Base Depth** entered is greater then the **Left Subbase Depth** entered, then **Left Subbase Depth** is equal to the **Left Base Depth**. If the **Left Depth to Subgrade** input is less then either the **Left Base Depth** or the **Left Subbase Depth**, then the **Left Depth to Subgrade** will be equal to the greater of the two values. The same is true on the right side

When **Full Depth Subgrade Through Median** is *False, t*he subgrade surface is inserted to the back of curb, and continues for a distance defines by the **Subgrade Width** inputs for both left and right sides. From the subgrade shoulder point, a nearly vertical link (small constant width from the bottom to the top to allow it to be modeled in a surface - shown in red in the diagram below) is inserted up to the intersection with the FINGRND surface. All base course layer links extend to the intersection with this nearly vertical link, as shown in the diagram.



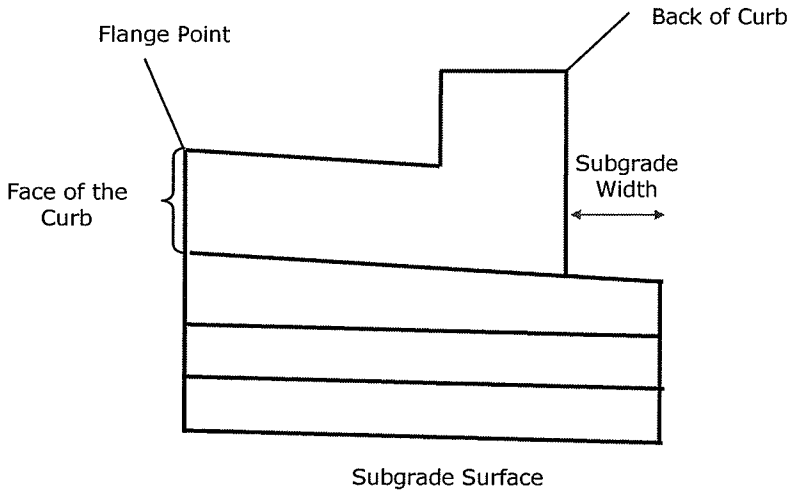
When **Full Depth Subgrade Through Median** is *True, t*he base, subbase and subgrade surface is inserted to the back of curb, and continues for a distance define by the **Subgrade Width** inputs for both left and right sides. From the end point of each base/subbase course layer and subgrade surface, a straight link is inserted.



User has the option of setting Parameter References for Base and Subbase course depths, as well as the Depth to the Subgrade Surface using the depths of these same surfaces output from the adjacent lanes.

Subgrade slope is controlled by the **Left Subgrade SE Method** and **Right Subgrade SE Method** parameters. User also has the option of entering a fixed slope to be used, following the using the Right-Side Outside Lane SE defined for the baseline alignment, using the Right-Side Inside SE defined for the baseline alignment, using the Left-Side Outside Lane SE defined for the baseline alignment, or using the Left-Side Inside Lane SE defined for the baseline alignment. When **Left Subgrade SE Method** and/or **Right Subgrade SE Method** is set to *Fixed* Slope, this slope(s) can be controlled using a Parameter Reference that sets the slope equal to that of the subgrade surface of an adjacent lane. In all situations, the slopes of all base course surfaces will follow the slope of the subgrade surface on the respective side.

On each side, the subassembly builds the shape for a simple curb and gutter, starting at the flange point. The bottom of the curb link is parallel to the gutter.



From the back of curb on each side, top of median links are extended inward at slopes defined by parameters **Median Slope Constraint, Median Slope From Left** and **Median Slope From Right**. When the **Median Slope Constraint** parameter is set to Equal, slopes coming from the left and right side are computed to be equal and **Slope From Left Marked Point** and **Slope from Right Marked Point** parameters are ignored. The other two options available are to use the **Median Slope From Left** parameter to define the slope of the median link extending from the left, thereby constraining the slope of the median link extending from the right side, or to use the **Median Slope From Right** to define the slope of the median link extending from the right, thereby constraining the slope of the median link extending from the left side.

When the **Median Slope Constraint** is set to *Use Median Slope From Left* or *Use Median Slope From Right,* the median links between the back of the right and left side curb and gutter are defined using the **Median Slope From Left** or **Median Slope From Right**, respectively AND either a constraining offset location for the peak of the median or a constraining elevation for the peak of the median. The **Constraining Feature** cannot be No when the **Median Slope Constraint** is either **Median Slope From Left** or **Median Slope From Right**. When using the *Equal Slopes* **Median Constraint** with no Constraining Feature, a link will be inserted from the back of the left side curb to the back of the right side curb in a straight line.

When a Pavement Depth is specified, these links are inserted parallel to top of the median links. When a Median Base Depth is specified, these links are also inserted parallel to the top of median links.

Output Parameters

None

Layout Mode Operation

In layout mode the subassembly displays the curb-and-gutter components based on the input parameters given. The subgrade and other base course layers are inserted

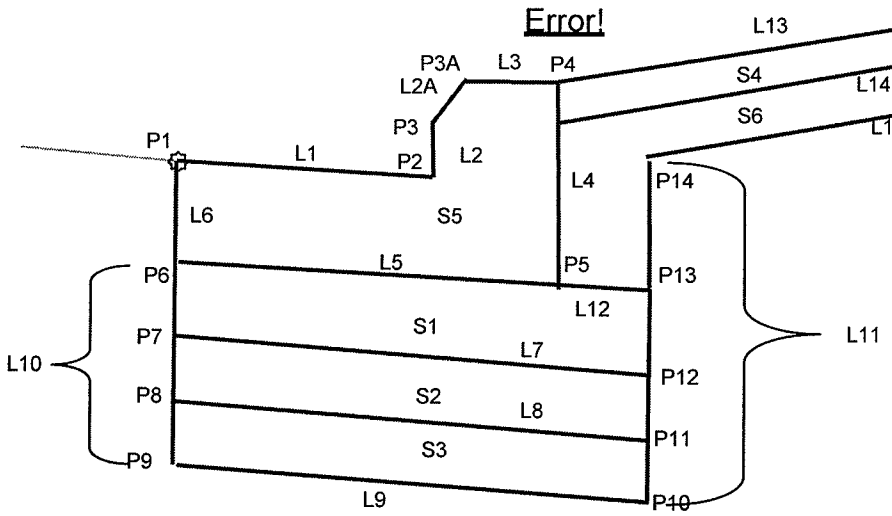
at a slope of -2% for both left and right side. The median between the back of the left side and right side curb and gutter is drawn with a 4% slope from both sides.

Point, Link, and Shape Codes

Point/Link	Codes	Description
P1	Flange_Med_Left or Flange_Med_Right	Flange point of the gutter
P2	Flowline_MedGutter_Left or Flowline_MedGutter_Right	Gutter flowline point
P2	(type)_(size)_(head ht)_(INT)	Feature line creator for identifying QTO pay item. 'INT' suffix is only added to the code when Integral Curb (Y/N) input is "Y".
P3, P3A	TopCurb_Med_Left or TopCurb_Med_Right	Top-of-curb
P4	BackCurb_Med_Left or BackCurb_Med_Right	Back-of-curb
P6	In_Pave1_CG_Med_Left or In_Pave1_CG_Med_Right	Inside Point at the bottom of the flanged portion of the curb and gutter
P7	In_Base1_CG_Med_Left or In_Base1_CG_Med_Right	Inside Point on Base Layer (optional)
P8	In_Base2_CG_Med_Left or In_Base2_CG_Med_Right	Inside Point on Base Layer (optional)
P9	In_Sub_CG_Med_Left or In_Sub_CG_Med_Right	Inside Point on top of subgrade
P10	ETW_Sub_CG_Med_Left or ETW_Sub_CG_Med_Right	Outside edge of subgrade under C&G
P11	ETW_Base2_CG_Med_Left or ETW_Base3_CG_Med_Right	Outside edge of Base 2 layer under C&G
P12	ETW_Base1_CG_Med_Left or ETW_Base1_CG_Med_Right	Outside edge of Base 1 layer under C&G
P13	ETW_Pave1_CG_Med_Left or ETW_Pave1_CG_Med_Right	Outside Edge of top of first base layer under C&G
P14	ETW_FINGRND_CG_Left Or ETW_FINGRND_CG_Right	When Full Depth Sugrade Thru Median is False, Outside Edge of the FINGRND surface behind C&G
P15	CG_Terrace_Med	Terrace Point behind curb and gutter
P16	None	
P17	Med_Subg_Crown	Crown point of fingrnd surface in median

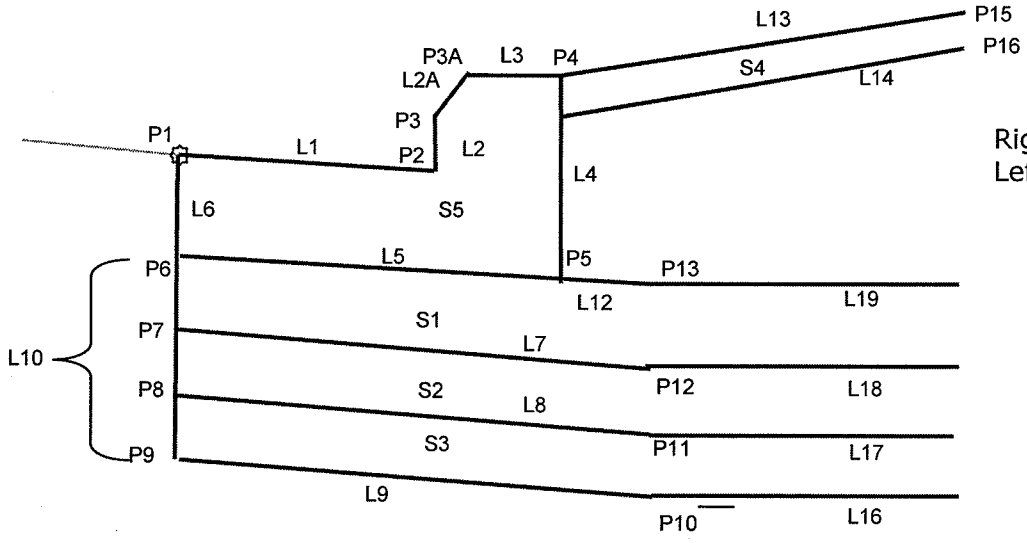
Point/Link	Codes	Description
L1 – L3	Top, Curb	Finish grade on the curb and gutter
L4	Curb FINGRND	
L5	Curb Pave1	
L6	Curb	
L7	Base1	
L8	Base2	
L9	FINGRND SUBG	
L10	None	
L11	SUBG FINGRND	When Full Depth Sugrade Thru Median is False, Link from point P10 to point P14
L12	Base1	
L13	FINGRND Top	When Full Depth Sugrade Thru Median is False and Pavement Depth = 0
L13	FINGRND Top PaveMed	When Full Depth Sugrade Thru Median is False and Pavement Depth > 0
L13	Top	When Full Depth Sugrade Thru Median is True and Pavement Depth = 0
L13	Top PaveMed	When Full Depth Sugrade Thru Median is True and Pavement Depth > 0
L14	Pave1	When Pavement Depth > 0
L15	FINGRND	When Full Depth Sugrade Thru Median is False and Median Base Depth > 0
L16	Base1	When Full Depth Sugrade Thru Median is True, connects left side to right
L17	Base1	When Full Depth Sugrade Thru Median is True, connects left side to right
L18	Base2	When Full Depth Sugrade Thru Median is True, connects left side to right
L19	FINGRND SUBG	When Full Depth Sugrade Thru Median is True, connects left side to right
S1	Base1	Only created when Base Depth > 0
S2	Base2	Only created when Base Depth and Subbase Depth are both > 0.
S3	Subbase	If Base Depth and Subbase Depth are 0, Subbase is only shape created.
S4	Pave1_Med	
S5	Curb	
S6	Base1	When Full Depth Sugrade Thru Median is False and when Median Base Depth > 0

Coding Diagram when Full Depth Subgrade Through Median = False



Right Side Mirrors
Left to Close

Coding Diagram when Full Depth Subgrade Through Median = True



Right Side Mirrors
Left to Close