What's New in Subsurface Utilities

......

Jonathan Smith



© 2019 Bentley Systems, Incorporated

Subsurface Utilities > Drainage and Utilities

- We have changed the name of the workflow to better reflect the functionality that's available
- "Subsurface Utilities" didn't make it obvious that drainage functionality is included
- Drainage and Utilities work may be done by different people, or different teams
- "Drainage" covers both storm and sanitary



Bentleu

Overview of enhancements

- Add a new Method to the Place Gutter tool "Start Node and Downstream Trace"
- Implement OpenFlows Gutter Sections functionality
- Add icons to call OpenFlows Catchment Delineation Settings and Gutter Section Settings dialogs
- Support Relative Rotation for a Node
- Culvert end needs to match slope of pipe
- Read databases from a reference
- Copy Correct Prototype and Catalog when the Feature Definition is not in SUDA_SEED_FILE
- Extend UDX functionality



Overview of enhancements

Include the latest OpenFlows version (10.02.02.04)

- Extend the Critical Scenario Analysis wizard to analyse flows as well as HGL's, and use mean and median values as well as maximums
- Support for a stop control structure in the SWMM solver (for online storage)



Place Gutter - Start Node and Downstream Trace

Request

- In practice, a gutter is located in the valley line of the road surface, such as between the road surface and the curb
- The Place Gutter tool links two catch basins with a straight line. You can add bends, but if you move one of the catch basins then you have to manually modify the gutter geometry

- Automatically traces the terrain model spatially correct
- Automatically updates when the start or stop nodes move

Intermediate Gutter Sections

Request

- We need to calculate spread widths along the gutter, because spread width is a function of longitudinal gradient and cross-slope, which can change between catch basins (e.g. superelevation development)
- We need to draw the spread widths in plan
- The OpenFlows products only used to calculate the spread width at the upstream face of the inlet. They now include new functionality for intermediate sections

- Automatically sections the terrain model along the path of the gutter
- Compute calculates the spread widths at the intermediate points
- Violation of maximum spread width is checked and displayed
- Makes it easy to see if the spread widths encroach on a running lane

Icons for Catchment Delineation and Gutter Section Settings

Add dialogs to control settings for these tools

	Tools Report Drawing Proc	Juction Drawing View	
	n Project i-model Defaults Configuration	t Catchment Delineation S ronize Drawing Gutter Section Settings tation Project Tools	
a Catchment Delineation Options	×	✓ Generate Gutter Cross-sections	×
-Catchment Boundary Scan Precision		Parameters	
Step size:	0.610 m	Minimum Spacing between sections: 4.572 m	
Step angle:	8.59 degrees	Maximum bank search height: 0.914 m	
Step reduction angle tolerance:	11.46 degrees	Maximum bank search distance: 12.192 m	
Catchment boundary closure tolerance:	0.006 m	Maximum inlet offset search distance: 0.610 m	
Adjacent catchment gap tolerance:	0.006 m		
Ignore pit/depression depths less than:	0.030 m	Gutters to generate cross-sections	
– 🗹 Simplify catchment boundary vertices 🛛 –			
Vertex removal tolerance:	0.006 m	Selection	
	Reset	O Selection Set	
	OK Cancel Help	OK Cancel Help	





Support Relative Rotation for a Node

Request

 If I place a catch basin (for example) then I probably want the rotation to be perpendicular to the linear element, and I want the rotation to update if I move the catch basin along the linear, using a snap or Civil AccuDraw

Bentleu

- Avoids having to rely on Civil AccuDraw compass point lock
- It updates when the reference element changes
- It updates when the node position changes
- Works with references





Culvert end to match slope of pipe

Request

 The slope of an endwall node should match the slope of the conduit that connects to it

- Avoids manual workflows to rotate the cell
- The 3D model is correct







Read databases from a reference

Request

- I want to annotate drainage and utilities data that's in a reference file
- Benefits
 - Avoids having to create annotation in the "design" file
 - You can view the properties of the referenced data (read-only)
- Limitations in this version
 - The active design file must have a utility project (this is the trigger to scan the references)
 - A maximum of four references (OpenFlows has a limit of 5 projects open at once)

Bentleu

- We'll look to remove these limitations in a future version







Copy Correct Prototype and Catalog

Request

- Bentley has workspaces that include Drainage and Utilities content. Where do I put my company/client/project content?
- Drainage content uses prototypes and catalogs that are stored in the DGNLib that is referred to in SUDA_SEED_FILE. What if I have content in another file?

- We now detect if a feature definition is in the SUDA_SEED_FILE or not
- If not, then we copy the prototype and catalog from the DGNLib that the feature definition is in
- This means you can put your own feature definitions in your own DGNLib





Extend UDX functionality

Request

 I want to assign UDX to a feature that are read-only, and also assign different default values, from a single UDX, to different feature definitions

Bentleu

- Avoids having multiple UDX for the same attribute
- Avoids manually setting the UDX value as a post process
- Avoids accidentally changing the UDX
- Improves efficiency



Extend Critical Scenario Analysis

Request

- I want to use Flow in conduits instead of HGL at nodes to determine the "critical" scenario
- I want to be able to use mean and median values, as well as the maximum



