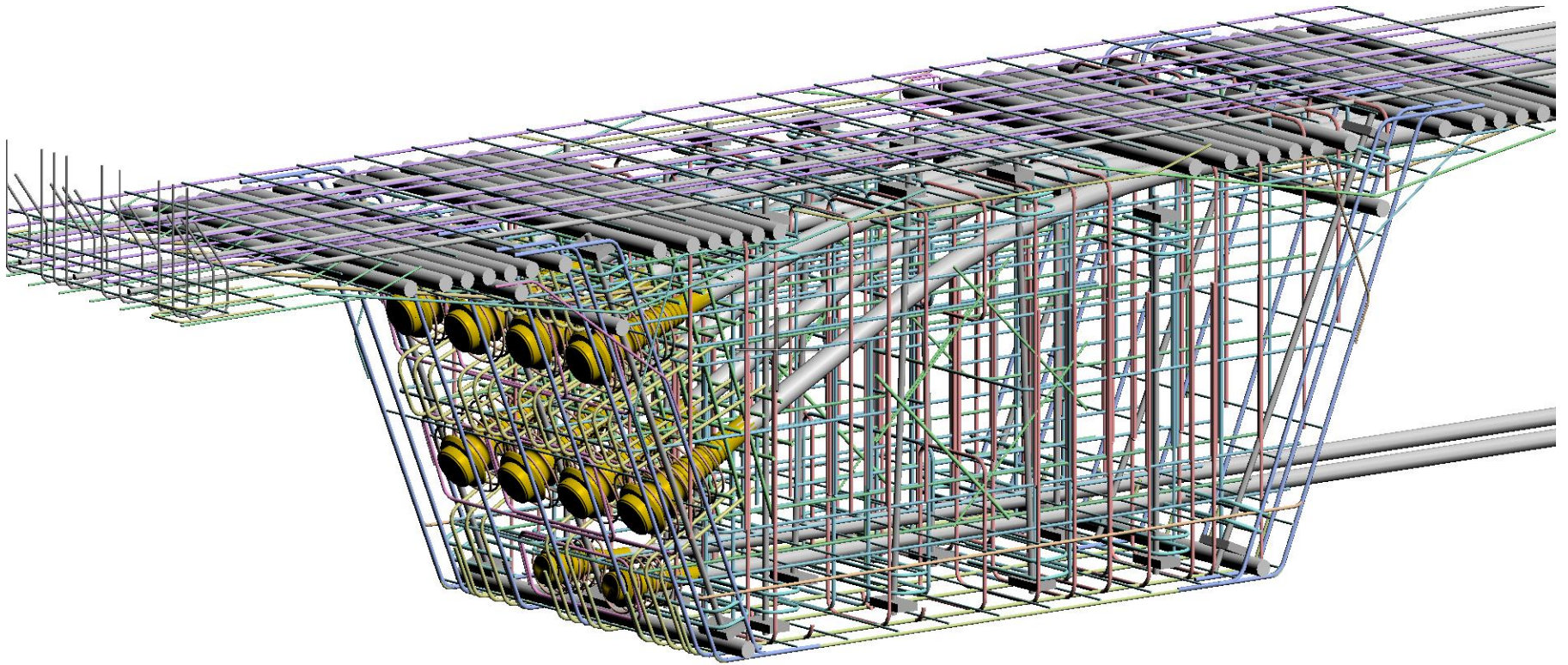


Subsurface Utility and Clash Detection

Robert Nice – Bentley Systems

Clash Detection

- How many conflicts are here?

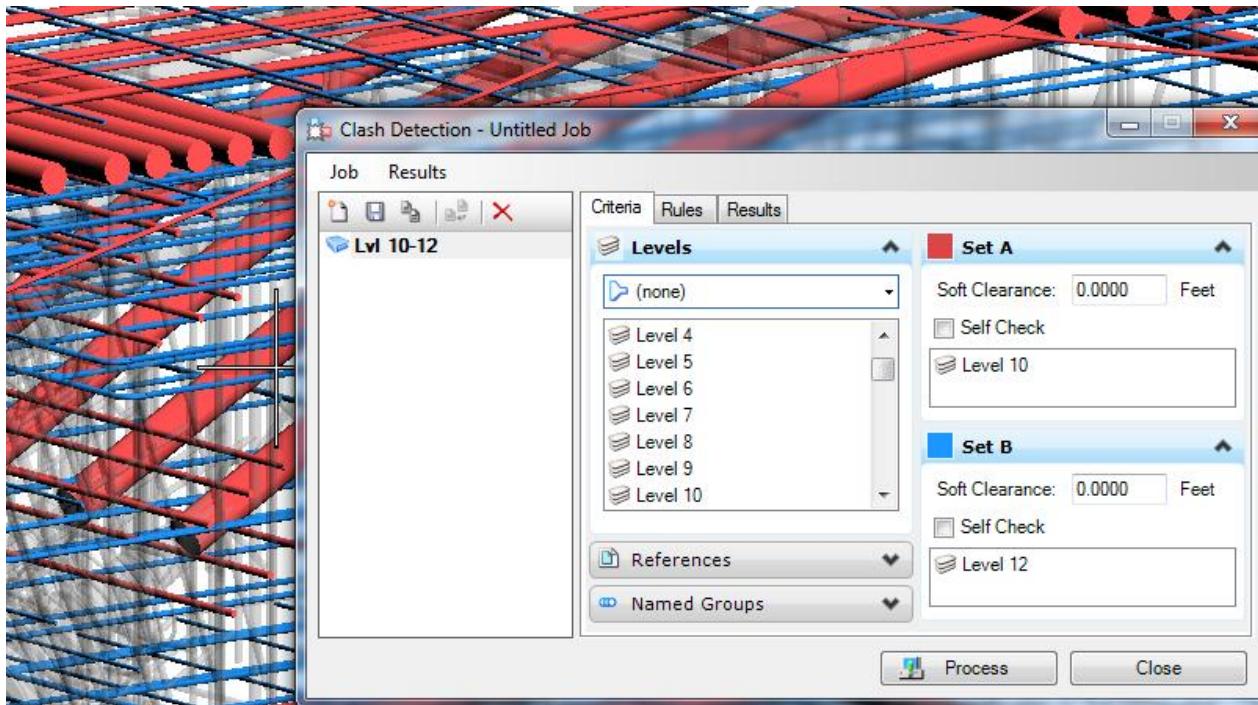


Clash Detection

- The real power of ProjectWise Navigator / MicroStation
- The clash detection tool allows you to identify sets of 3D graphical elements and to detect clashes between these 3D object element sets.
- Ability to interactively and graphically review these clashes, annotate or markup particular clashes, and assign them for follow-up.

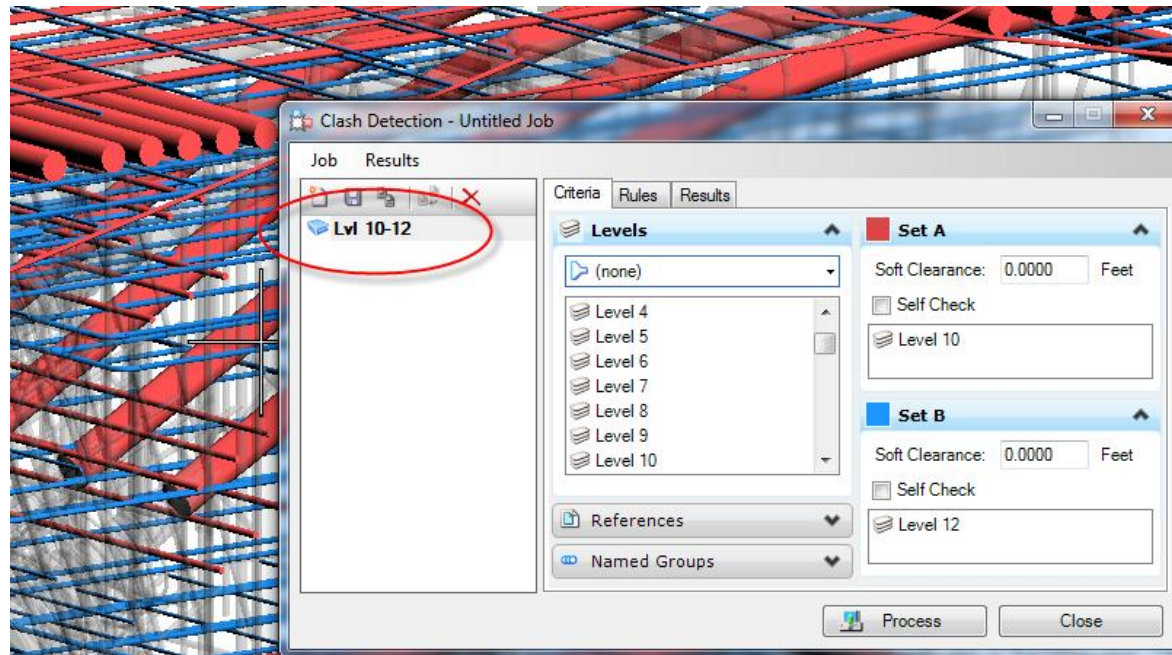
Clash Detection

- Clash Detection works by examining 2 separate groups of 3D data (i.e. Set A and Set B) to be used for the detection of physical clashes and clearance problems between the elements.



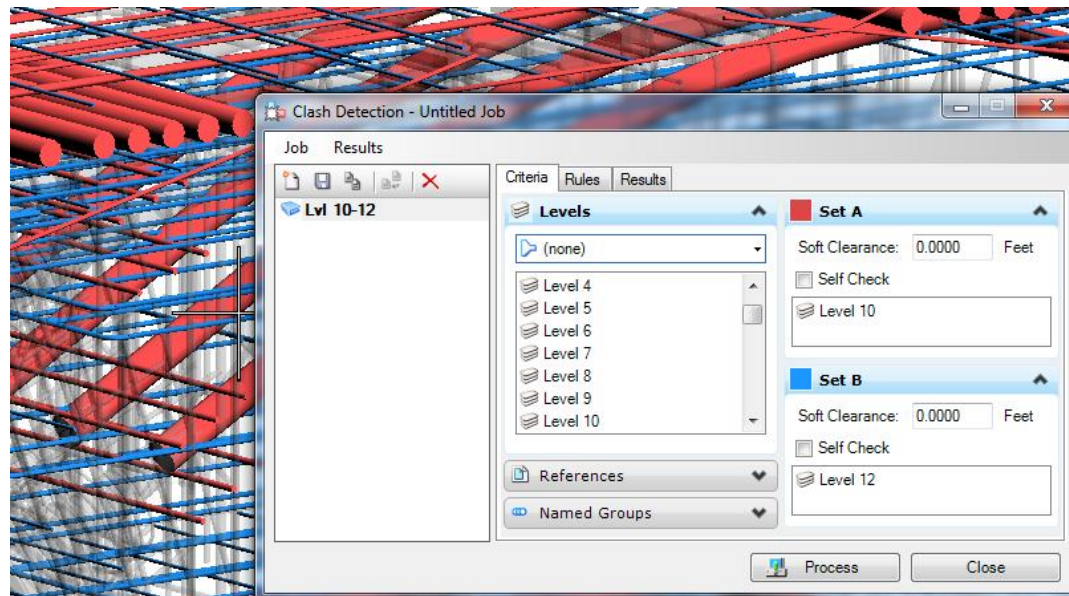
Clash Detection

- Each Clash analysis must be created as its own unique job.
- Each job will have a Set A group of elements and Set B group of elements



Clash Detection – Criteria Tab

- The Criteria tab is used to select Levels, References or Named Groups to be included in the clash detection job.
- Elements in Set A and Set B can be specified by dragging and dropping Levels, References or Named Groups into the appropriate set

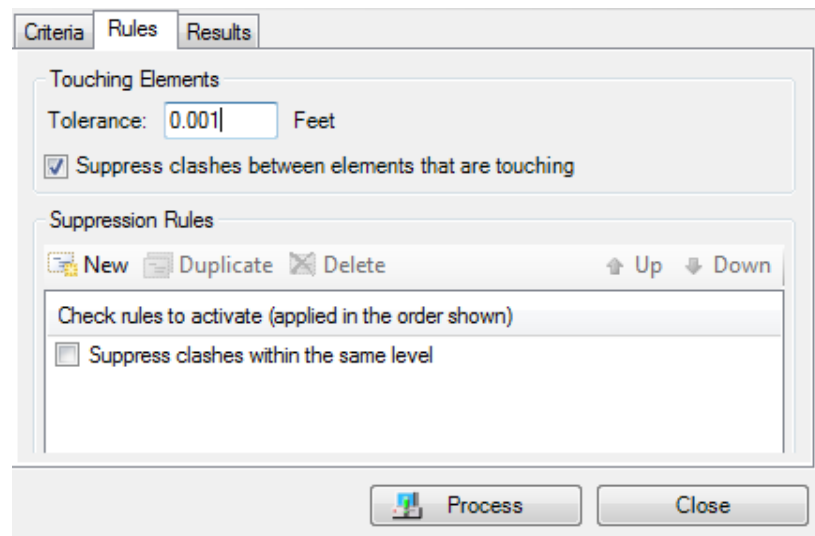


Clash Detection – Criteria Tab

- Soft Clearance specifies a “clearance window” around the 3D elements in Set A or Set B
- Example, if the elements in Set B get closer than the 200mm, soft clearance value set for Set A then a clash will be reported, this is considered a “clearance clash”
- If elements in Set B physically touch elements in Set A the clash is considered a “hard clash”

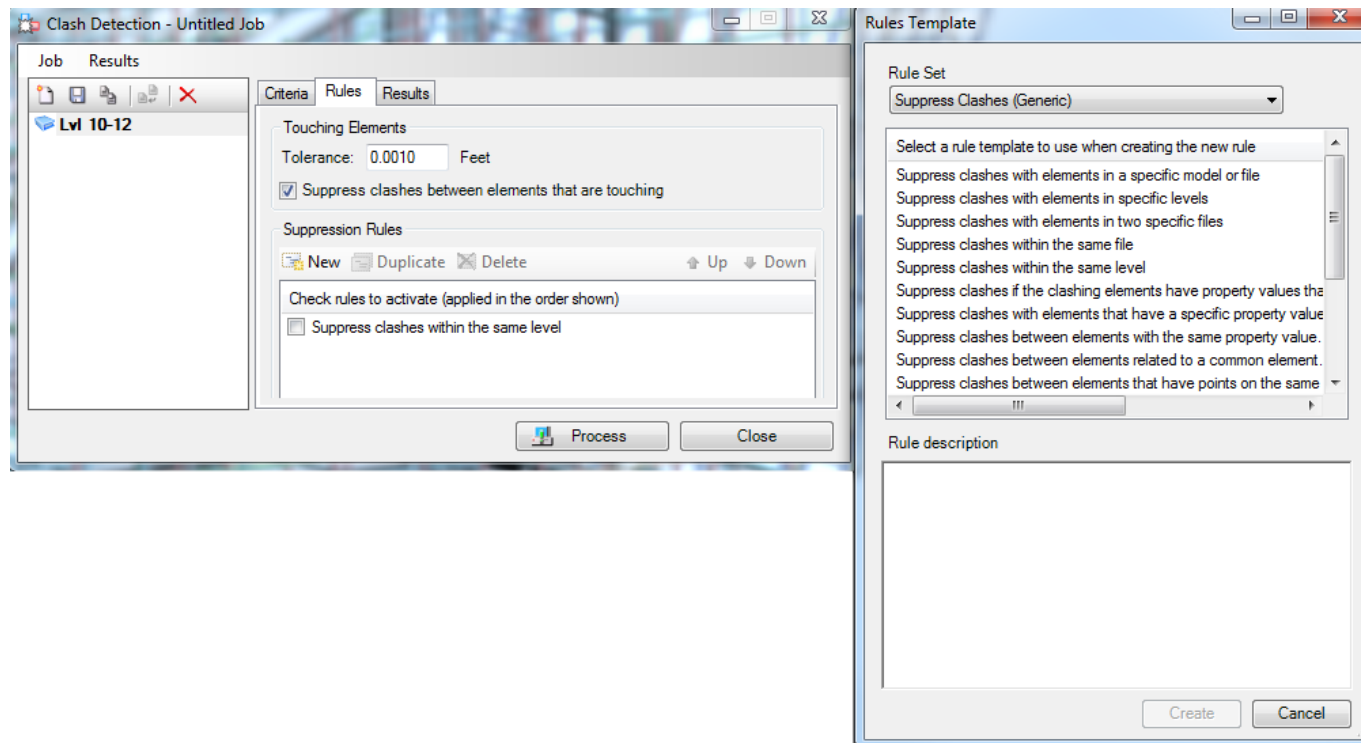
Clash Detection – Rules

- Tolerance -Sets the allowable distance used to eliminate interferences between components that only touch.
- Suppress Clashes between elements that are touching If on, ignores elements that are within the tolerance, such as when a bolt is connected to nut.



Clash Detection – Rules

- Suppression Rules -Used when a high number of clashes are found and more sophisticated analysis is needed to reduce the number of clashes.



Clash Detection - Results

- Any clash that is found is reported in the Results tab
- Each clash is named and classified by type, Clearance clash or Hard clash

The screenshot shows a software window titled "Clash Detection - pipes (4 clashes)". The window has a "Job Results" tab selected. On the left, there is a tree view showing "pipes". The main area displays a table with the following data:

Name	Status	Type	Clearance	Assigned To	Found By	Found On	Accepted
Clash1	New	Hard	Less Than...		Corey.Johnson	2010-10-1...	
Clash2	New	Hard	Less Than...		Corey.Johnson	2010-10-1...	
Clash3	New	Hard	Less Than...		Corey.Johnson	2010-10-1...	
Clash4	New	Hard	Less Than...		Corey.Johnson	2010-10-1...	

Below the table is an "Element Info" section with two panels:

- Element Info A:**
 - PointEntity2d
 - ID: P5
 - Width: 16.0000
 - Height: 16.0000
 - Shape: Circular
 - Slope: 2.116%
- Element Info B:**
 - PointEntity2d
 - ID: Wat offsite
 - Utility Name: Proposed Water
 - X Dimension: 12.0000
 - Y Dimension: 12.0000
 - Shape: Circle

At the bottom of the window are "Process" and "Close" buttons.

Clash Detection - Results

- Detailed information for conflicting elements is shown in the bottom portion of the dialog
- Notice, in this case a 16" (400mm) storm sewer pipe is clashing with an 12" (300mm) water line

Clash Detection - pipes (4 clashes)

Job Results

Criteria Rules Results

Name	Status	Type	Clearance	Assigned To	Found By	Found On	Accept
Clash1	New	Hard	Less Than...		Corey Johnson	2010-10-1...	
Clash2	New	Hard	Less Than...		Corey Johnson	2010-10-1...	
Clash3	New	Hard	Less Than...		Corey Johnson	2010-10-1...	
Clash4	New	Hard	Less Than...		Corey Johnson	2010-10-1...	

Element Info

Element Info A

PointEntity2d	
ID	P5
Width	16.0000
Height	16.0000
Shape	Circular
Slope	2.116%

Element Info B

PointEntity2d	
ID	Wat offsite
Utility Name	Proposed Water
X Dimension	12.0000
Y Dimension	12.0000
Shape	Circle

Process Close

Demonstration