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Workshop – X7

Civil Design Review: 3D Modeling and Clash Detection

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Preface

In this workshop, you will start by creating a roadway design using the Roadway Designer and display the 3D Components of that design in MicroStation. Then, you will use Bentley's civil design software to display the 3D graphics that represent the design of roadway drainage pipes and inlets. There is a conflict between the pipes and the roadway subgrade. You will use MicroStation's Clash Detection functionality to review the clashes. You will then publish an i-model and use Bentley Navigator to comment and markup locations of the clashes.

The workshop guide is yours to take with you. If you don't finish all the exercises, or just want to work with the dataset upon return to your office, the datasets (both initial and completed files) are provided on the Conference DVD. Many workshops will also have videos of all exercises on the DVD.

Note	Prerequisite Knowledge Level: Participant should have a basic understanding of road design principles and in the use of MicroStation and the native application (InRoads or GEOPAK) or one of the Power products.

Chapter 1: Model the Corridor and Drainage

GETTING STARTED

In this lesson, we will open the MicroStation Design file and open an InRoads Project file.

Exercise: Open the MicroStation File

Lesson Objective:

This exercise will guide you through the steps to start InRoads.

Procedure:

1. From the computer desktop double-click on the Power InRoads V8i icon.
2. When the **MicroStation Open** dialog appears navigate to the following directory. ***C:\2012_BT_Civil\BC2WK3 - Civil Design Review-3D Modeling and Clash Detection\DATA***
3. Highlight the file ***Corporate Drive.dgn*** and click **Open.**

Exercise: Open the InRoads Project File

Lesson Objective:

This exercise will guide you through the steps to open a Project file.

Procedure:

1. From the InRoads menus, select **File > Open**.
2. Select the Project file named ***Corporate Drive.rwk*** from the ***C:\2012_BT_Civil\BC2WK3 - Civil Design Review-3D Modeling and Clash Detection\DATA*** folder.
3. Click **Open**, and then **Cancel.**

This will open the following files:

Preference file:	Bentley Training.xin
Geometry Project:	Corporate Drive.alg

Existing Ground Surface:	Corporate Drive.dtm
Roadway Design:	Corporate Drive.ird
Drainage Database:	Corporate Drive.sdb
Template Library:	Template Standards.itl

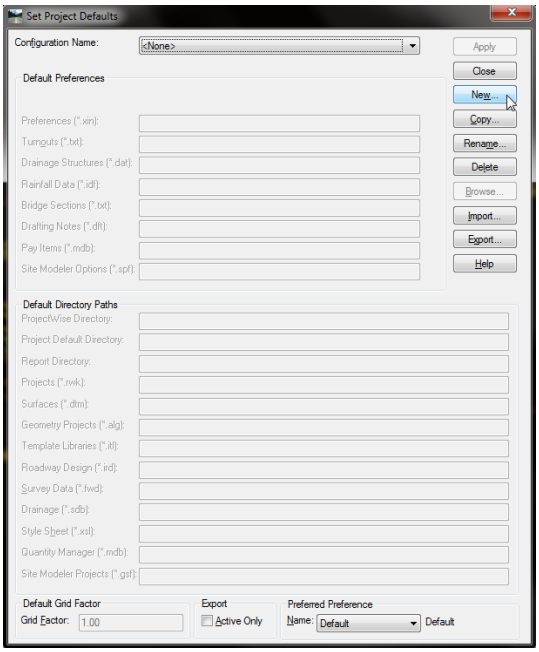
Exercise: Setup the Project Defaults

Lesson Objective:

This exercise will guide you through the steps to setup the Project Defaults.

Procedure:

1. From the InRoads menus, select **File > Project Defaults**.
2. Click the **New** button on the Project Defaults dialog.



3. Key in ***Corporate Drive*** for the Name and click **OK.**
4. Put your cursor Drainage Structures (*.dat) and click the **Browse** button.
5. Select ***InRoads Training Structures.dat*** from the ***C:\2012_BT_Civil\BC2WK3 - Civil Design Review-3D Modeling and Clash Detection\Data*** folder location and click **Open.**
6. Click **Apply** on the Project Defaults dialog.
7. Close the Project Defaults dialog.

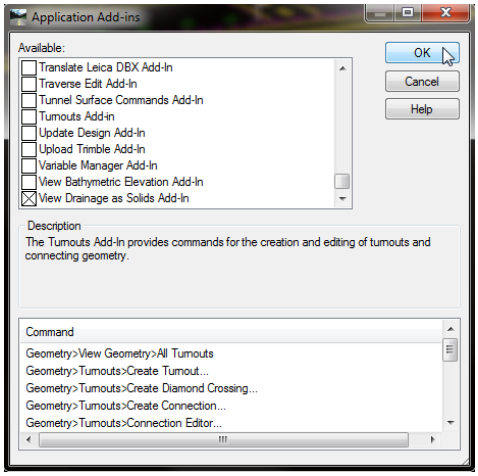
Exercise: Displaying 3D Drainage Graphics

Lesson Objective:

In this lesson, we will display 3D Drainage graphics using InRoads.

Procedure:

1. Select **Tools > Application Add-ins** from the InRoads menus.
2. Enable the **View Drainage as Solids Add-in** and click **OK.**



3. Select **Tools > Locks > Style Lock** from the InRoads menus.
4. Select **Drainage > View > Drainage as Solids.**

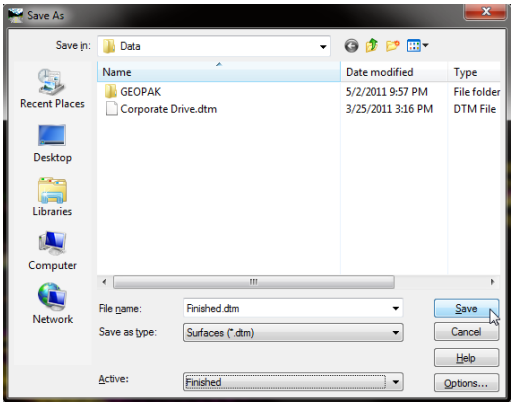
Exercise: Displaying Roadway Components

Lesson Objective:

In this lesson, we will display 3D Roadway Component graphics using InRoads.

Procedure:

1. Select **Tools > Locks > Style Lock** from the InRoads menus.
2. Select **Modeler > Roadway Designer.**
3. Review the roadway design using the Roadway Designer.
4. Select **Corridor > Create Surface** from the Roadway Designer dialog.
5. Enable the **Components** option in the Display in Plan View portion of the Create Surface dialog.
6. Key in **Finished** as the **Name** of the Surface.
7. Click **Apply** and then click **Close.**
8. Select **File > Save As.**
9. Change the **Save as type** to **Surfaces (*.dtm)**.
10. Change the **Active** to **Finished**.
11. Click the **Save** button.



12. Click **Cancel**.

Chapter 2: Clash Detection

CLASH DETECTION WORKFLOW IN MICROSTATION

In this lesson, we will detect clashes between the drainage pipes and asphalt road surface. We will also find pipes that are closer than 3 feet to the asphalt surface.

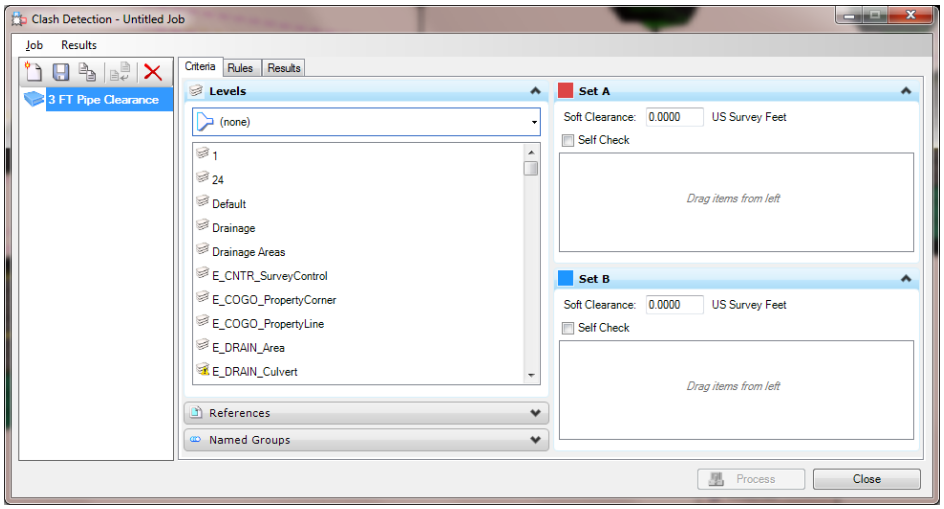
Exercise: Create a Clash Detection Job

Lesson Objective:

This exercise will guide you through the steps to create a Class Detection Job.

Procedure:

1. Select **File > Open** from the MicroStation menus.
2. Select **Corporate Drive Clash Detection.dgn** from the ***C:\2012_BT_Civil\BC2WK3 - Civil Design Review-3D Modeling and Clash Detection\Data*** folder location and click **Open.**
3. Select **Tools > Clash Detection > Clash Detection** from the MicroStation menus.
4. Select **Jobs > New** from the Clash Detection dialog.
5. Key in **3 FT Pipe Clearance** in the Name field.



Exercise: Define Clash Detection Criteria

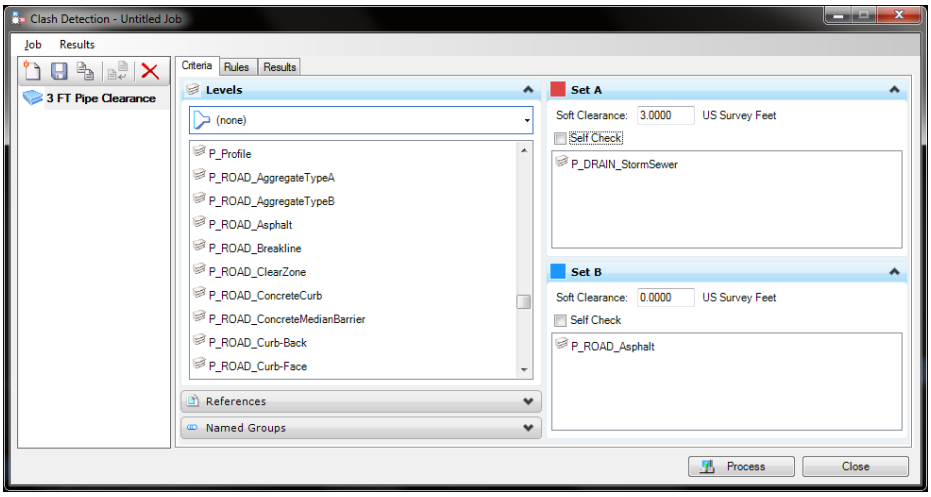
Lesson Objective:

This exercise will guide you through the steps to define Class Detection Criteria.

Procedure:

1. Select the level named **P_DRAIN_StormSewer** from the Levels list in the **Criteria** tab.
2. Drag and drop the level named **P_DRAIN_StormSewer** to the **Set A** field.
3. Review the CAD graphics.

4. Key in 3.00 for the **Soft Clearance** in **Set A**.
5. Select the level named **P_ROAD_Asphalt** from the Levels list in the **Criteria** tab.
6. Drag and drop the level named **P_ROAD_Asphalt** to the **Set B** field.



7. Review the CAD graphics.

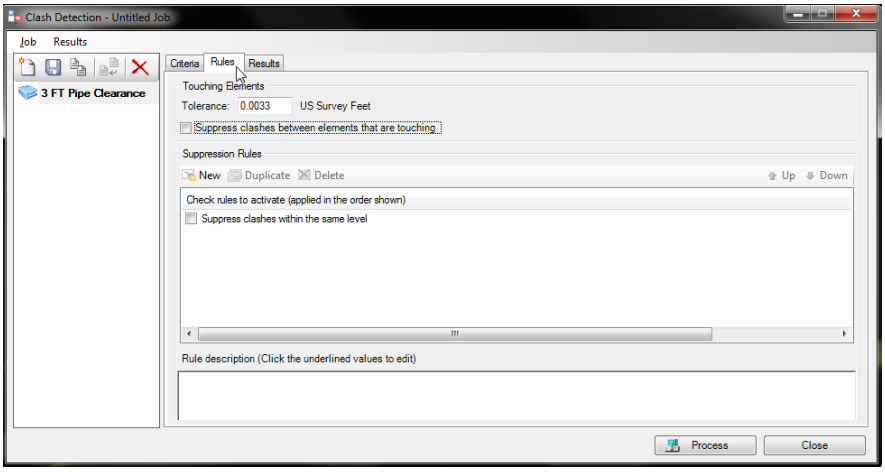
Exercise: Define Clash Detection Rules

Lesson Objective:

This exercise will guide you through the steps to define Class Detection Rules.

Procedure:

1. Select the **Rules** tab from the Clash Detection dialog.
2. Disable the **Suppress clashes between elements that are touching** option.



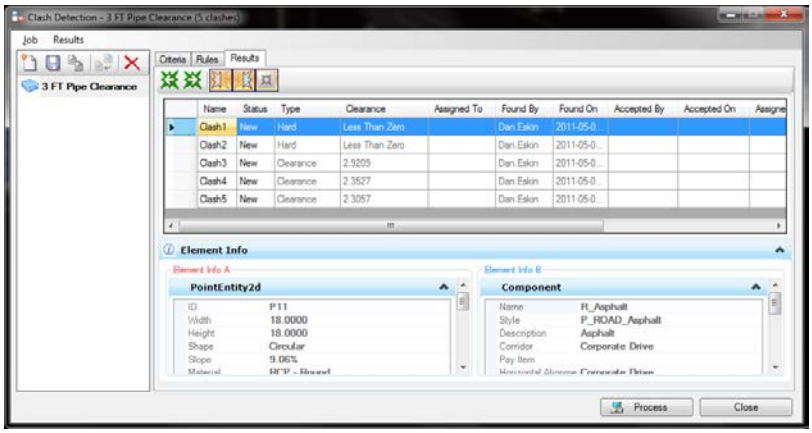
Exercise: Process and Review the Clash Detections

Lesson Objective:

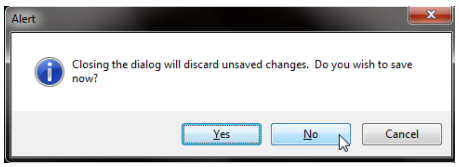
This exercise will guide you through the steps to process and review the Class Detections.

Procedure:

1. Select **Results > Display Settings > Animate Transitions** from the Clash Detection dialog (this should be checked On).
2. Click the **Process** button.
3. This should result in 5 clashes.



4. Click the **Show Background** button. 
5. Click the **Next Clash** button. 
6. Review the graphics.
7. Click the Show Element B button. 
8. Click the **Next Clash** button. 
9. Right-click on the **Clash3** and select **Add To Selection Set**.
10. Review the graphics.
11. Close the Clash Detection dialog.
12. This will bring up an Alert dialog.



13. Click No on the Alert dialog.

CLASH DETECTION WORKFLOW IN BENTLEY NAVIGATOR

In this lesson, we will use Bentley Navigator to markup clash detections.

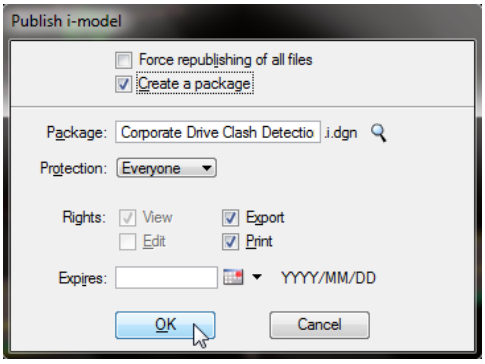
Exercise: Publish an i-model

Lesson Objective:

This exercise will guide you through the steps to publish an i-model.

Procedure:

1. Select **File > Publish i-model** from the MicroStation menus.
2. Enable the **Create a Package** option.
3. Click **OK** on the Publish i-model dialog.



4. Exit MicroStation.

Exercise: Start Bentley Navigator

Lesson Objective:

This exercise will guide you through the steps to start Bentley Navigator.

Procedure:

1. From the computer desktop double-click on the Bentley Navigator V8i (SELECTseries 4) icon.
2. When the **Bentley Navigator Open** dialog appears navigate to the following directory: ***C:\2012_BT_Civil*\BC2WK3 - *Civil Design Review-3D Modeling and Clash Detection\DATA***
3. Highlight the file ***Corporate Drive Clash Detection.i.dgn*** and click **Open.**
4. Select the Fit View icon at the top of the Bentley Navigator interface. 

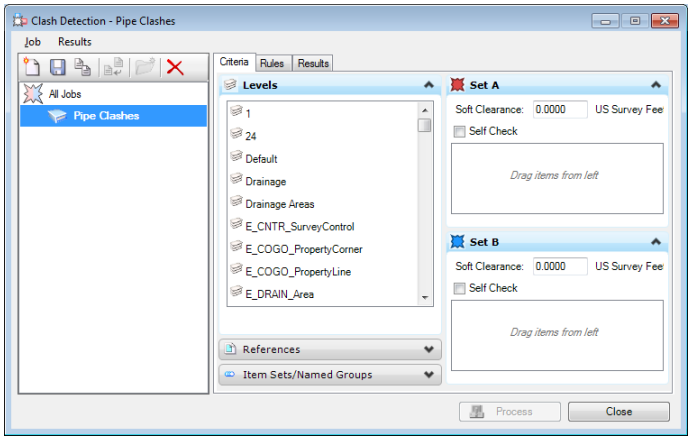
Exercise: Create a Clash Detection Job

Lesson Objective:

This exercise will guide you through the steps to create a Class Detection Job in Bentley Navigator.

Procedure:

1. Select **Tools > Clash Detection > Clash Detection** from the Bentley Navigator menus.
2. Select **Jobs > New** from the Clash Detection dialog.
3. Key in **Pipe Clashes** in the Name field.
4. Highlight the Job named **Pipe Clashes**.



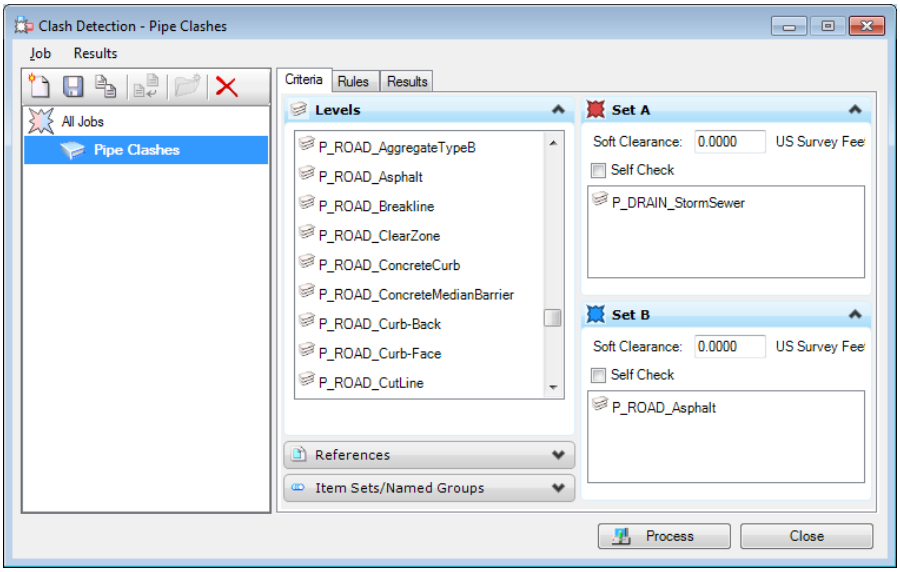
Exercise: Define Clash Detection Criteria

Lesson Objective:

This exercise will guide you through the steps to define Class Detection Criteria.

Procedure:

1. Select the level named **P_DRAIN_StormSewer** from the Levels list in the **Criteria** tab.
2. Drag and drop the level named **P_DRAIN_StormSewer** to the **Set A** field.
3. Review the CAD graphics.
4. Select the level named **P_ROAD_Asphalt** from the Levels list in the **Criteria** tab.
5. Drag and drop the level named **P_ROAD_Asphalt** to the **Set B** field.



6. Review the CAD graphics.

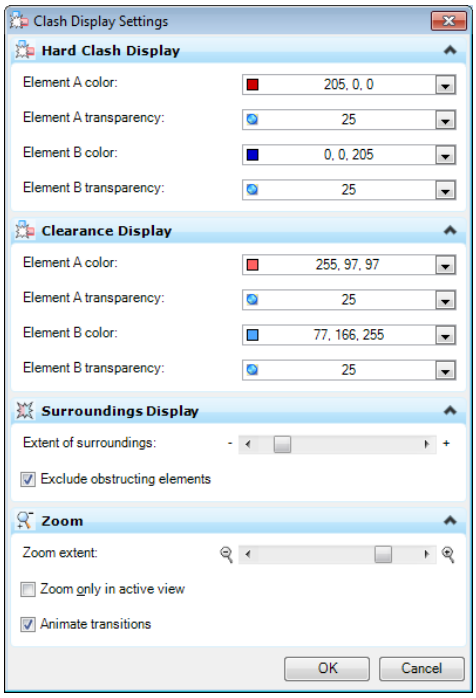
Exercise: Process and Review the Clash Detections

Lesson Objective:

This exercise will guide you through the steps to process and review the Class Detections.

Procedure:

1. Select **Results > Display Settings** from the Clash Detection dialog.
2. Enable the *Animate transitions* option.
3. Move the **Zoom extent** slider slightly to the right.
4. Click OK.



5. Click the **Process** button.
   Two clashes will result.

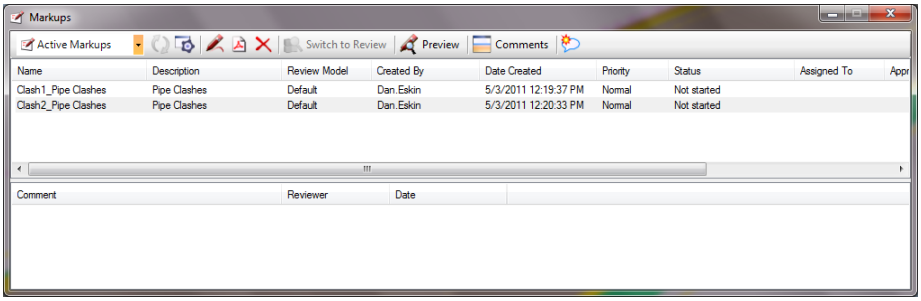
Exercise: Create Markups for Clash1 and Clash2

Lesson Objective:

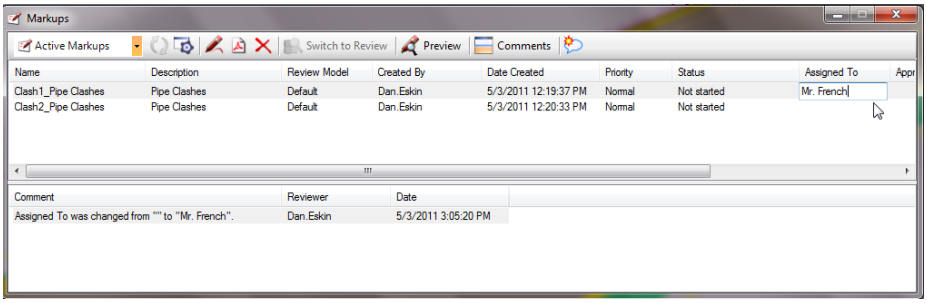
This exercise will guide you through the steps to markups for the Class Detections.

Procedure:

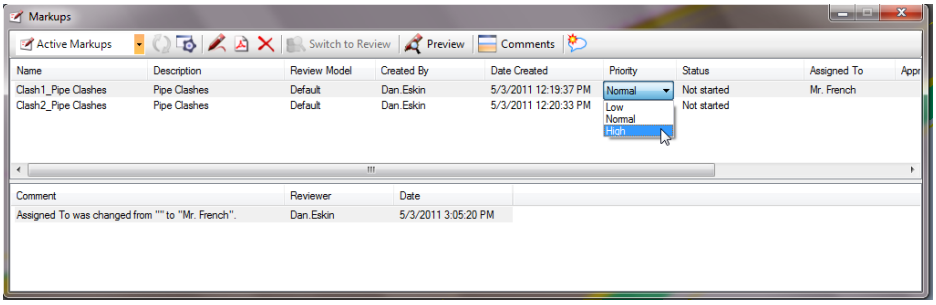
1. Ensure that **Clash1** is selected.
2. Click the **Show Background** button. 
3. Zoom in closer to the pipe clash in View 1.
4. Click the **Create a markup for Clash1** button. 
5. Click the **Next Clash** button. 
6. Zoom in closer to the pipe clash in View 1.
7. Click the **Create a markup for Clash2** button. 
8. Select **Job > Save Job** to save the Job.
9. Close the Clash Detection dialog.
10. Select **Review > Markup > Markups Dialog**.
    This will bring up the **Markups** dialog.



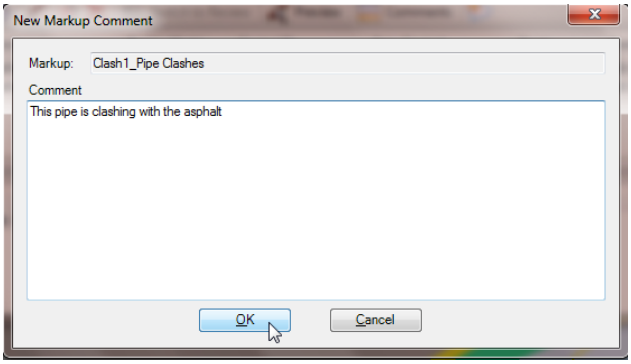
11. Put your cursor in the **Assigned To** field in the Clash1_Pipe Clashes row.
12. Key in **Mr. French** in the **Assigned To** field.



13. Change the **Priority** to from Normal to **High**.



14. Click the Comments button. 
15. Key in "**This pipe is clashing with the asphalt**" and click **OK**.



16. Right-click on the Clash1_Pipe Clashes row and select **Open**.

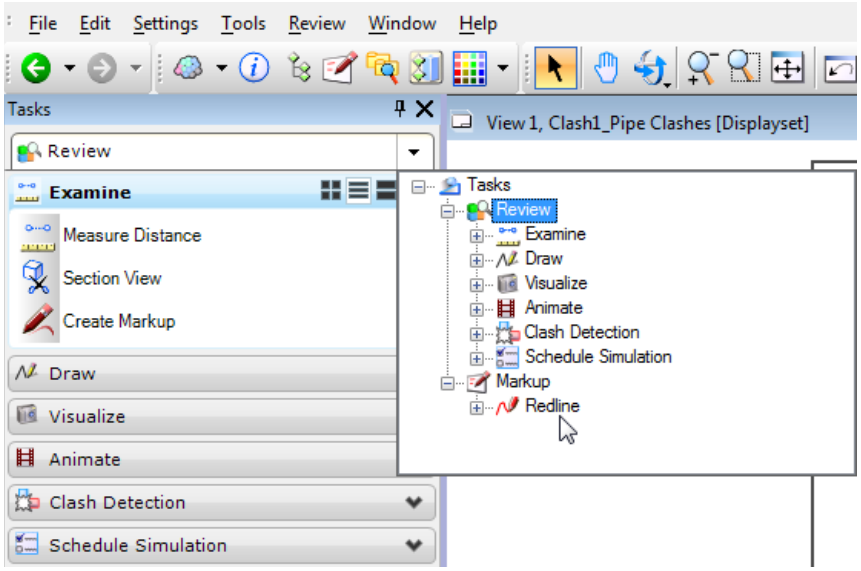
Exercise: Redline Clash1 and Clash2

Lesson Objective:

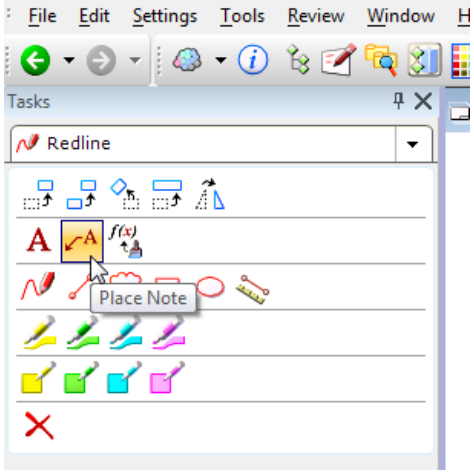
This exercise will guide you through the steps to redline the Class Detections.

Procedure:

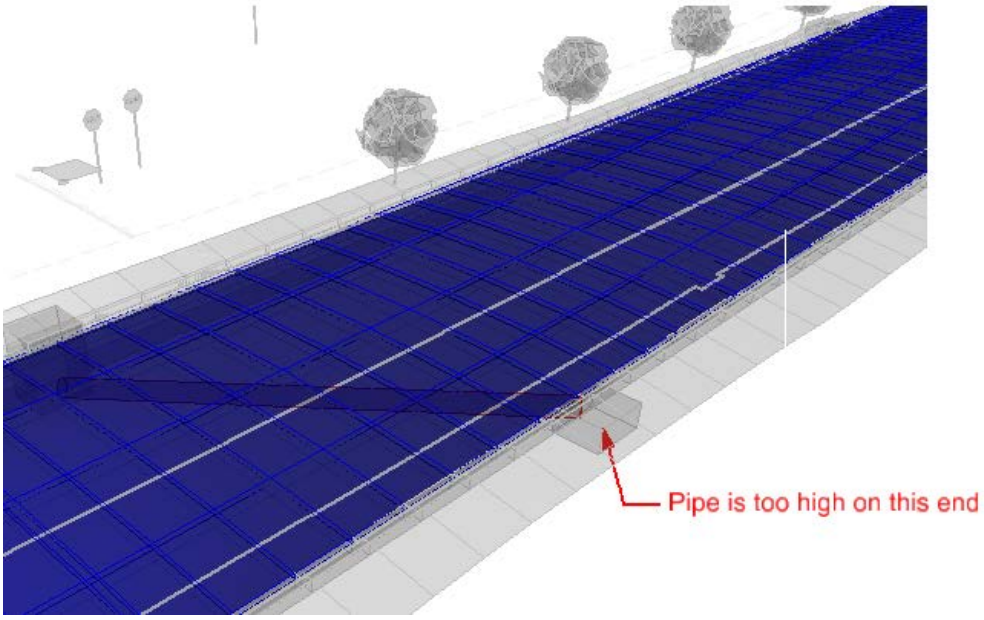
1. From the Task Menus, select the Redline tasks.



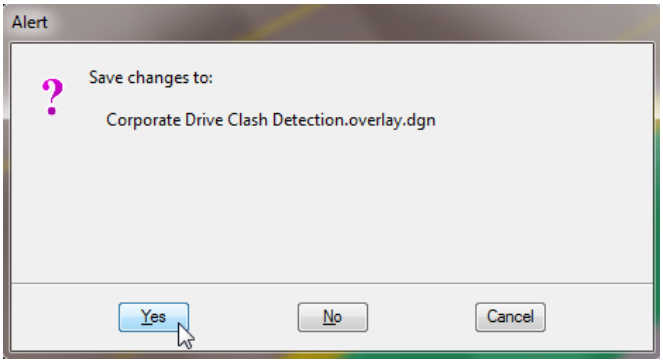
2. Select the **Place Note** command from the Redline menus.



3. Key in “Pipe is too high on this end” in the Text Editor dialog.
4. Click once near the pipe and click again to locate the text.



5. Repeat these steps for the Clash2.
6. Select **Review > Switch to Review** from the Bentley Navigator menus.
7. Exit Bentley Navigator.
8. This will bring up an Alert dialog.



9. Click **Yes** on the Alert dialog.
10. Click **Save** to save the Overlay file named **Corporate Drive Clash Detection.overlay.dgn**.