

Zoo Interchange CIM

A report of how 3D modeling is currently being utilized during design of the Zoo Interchange

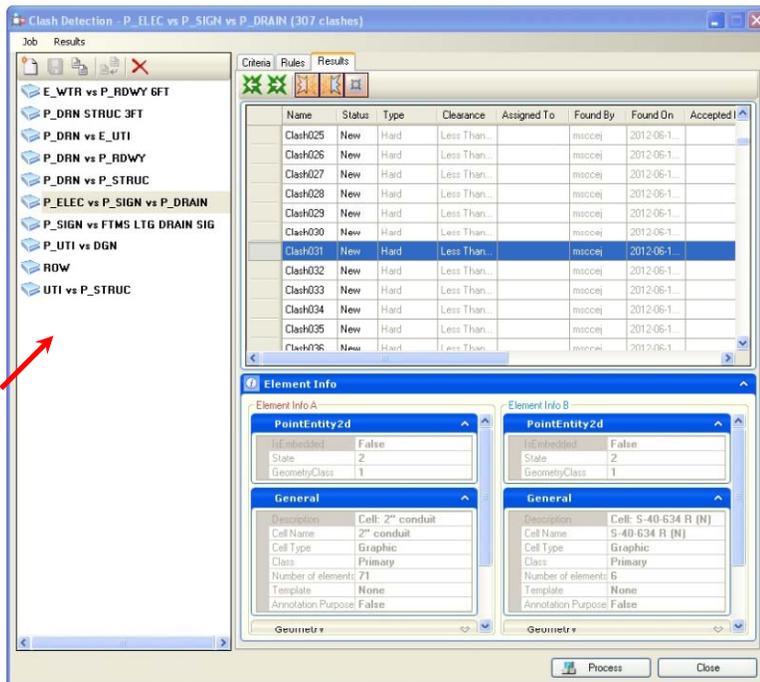
Agenda

1. Where we are at
2. How we got there

Results of Design Models

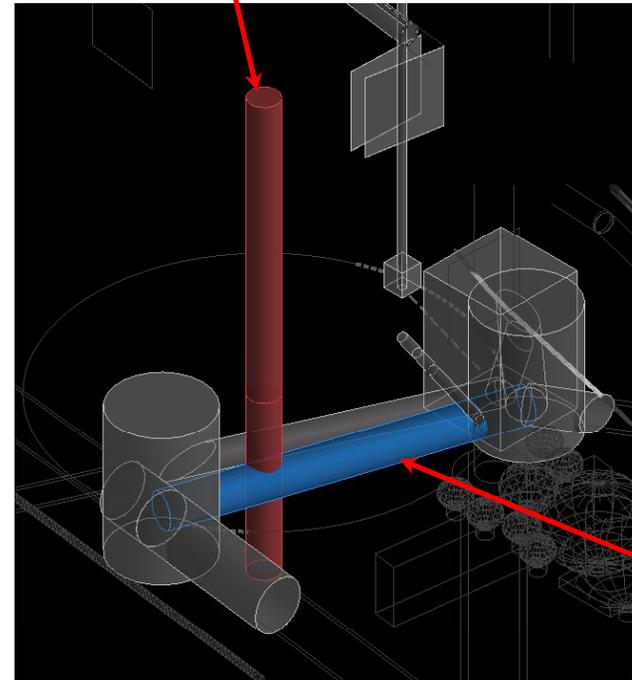
- Clash Detection Jobs
 - Automated processing of interferences between 3D elements

Clash Job Information



Clash Job Information

Element in set A

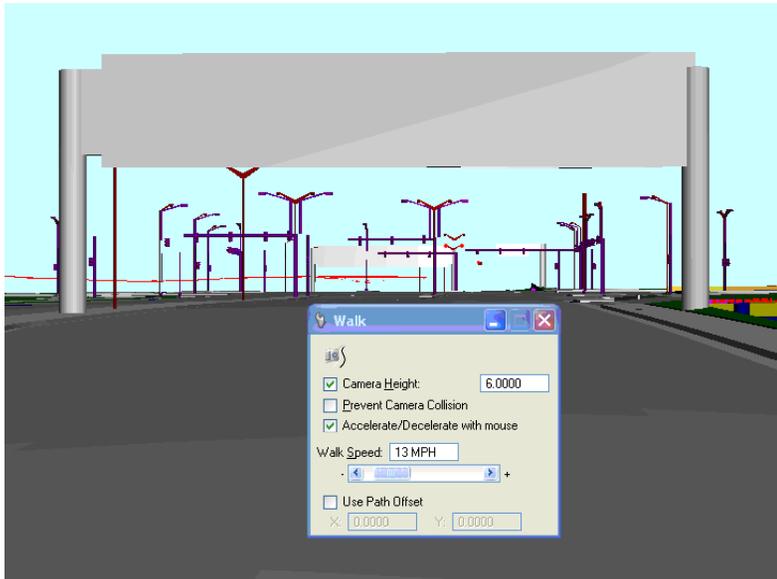


Element in set B

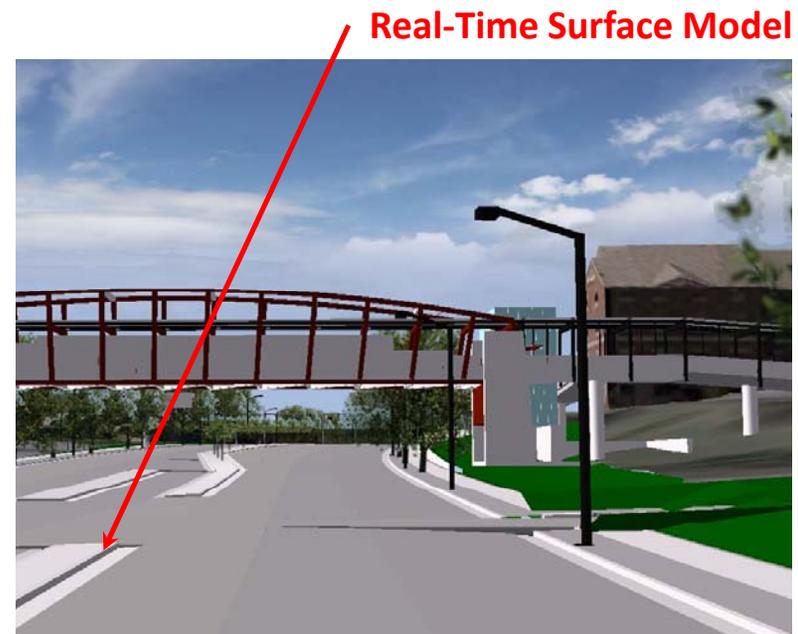
View of Element Clash

Results of Design Models

- 3D Visualizations
 - Live and scripted animations of rendered geometry



View of Live Walk-Thru



Frame from Drive-Thru Animation

Planting – STH 100 (Carolyn Stuessy)

DISCIPLINE 

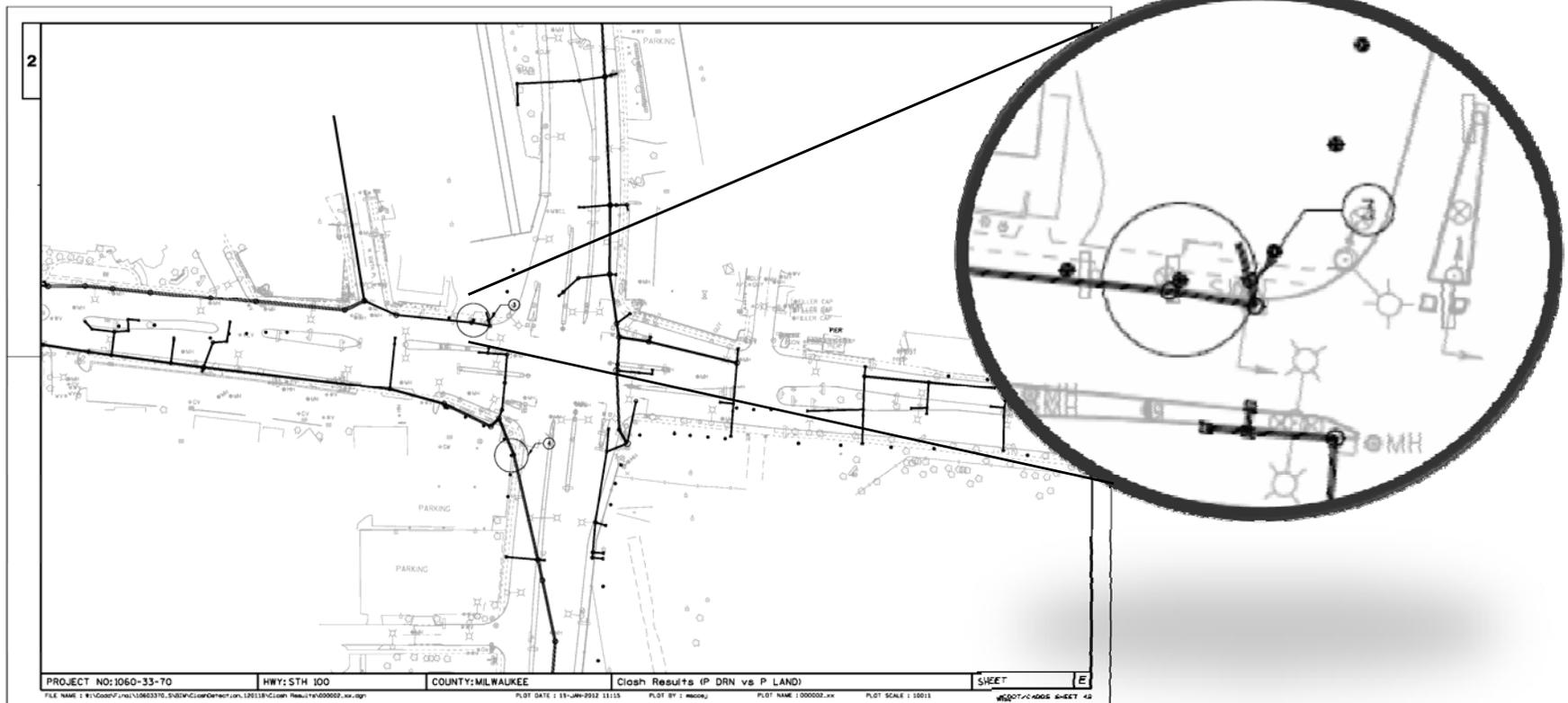
PROJECT 

RESPONDING DESIGNER(S) 

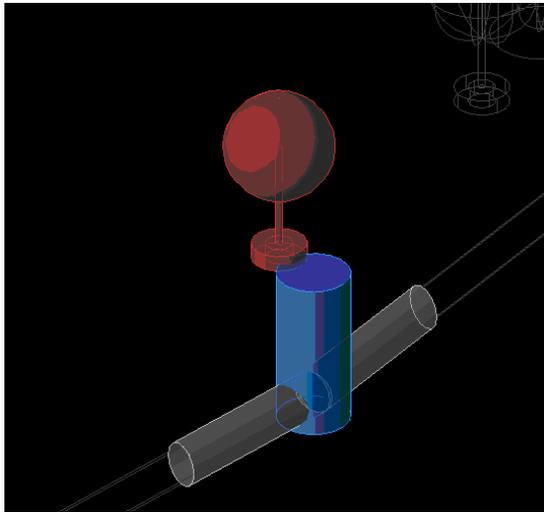
- January 18, 2012 Clash Detection Request
- Clash job between proposed planting and proposed storm sewer
- 9 clashes found
- 5 trees eliminated and 4 trees moved as a result

Planting – STH 100 (Carolyn Stuessy)

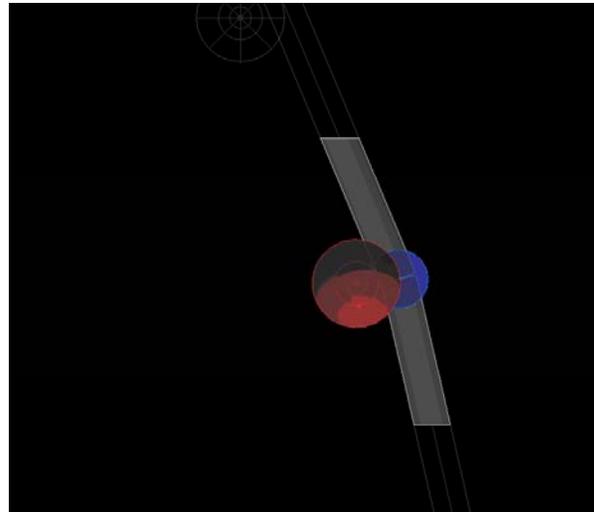
- Plan sheets generated to communicate conflicts



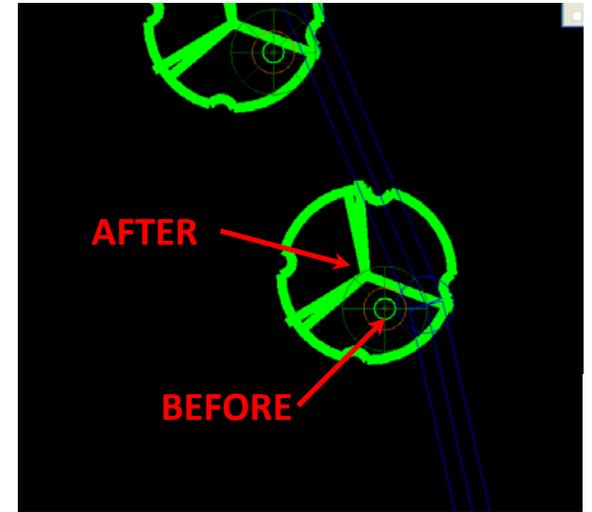
Planting – STH 100 (Carolyn Stuessy)



Isometric of clash



Plan view of clash



Wireframe of move

Above Ground – Watertown Plank

(Mariah Donnelly/FTMS, Carolyn Stuessy/Planting and Wayfinding Signs, Jason Matson/Signals, Dennis Fleischfresser/Lighting, Ryan Baumer/Pedestrian Bridge)

- April 17, 2012 Vision Study Request
- Drive through animation generated with planting, lighting, FTMS, wayfinding signs, signals, pedestrian bridge, roadway, and existing buildings
- Wayfinding sign locations were validated (to ensure sight of signals) and some signal monotubes were moved as a result

Above Ground – Watertown Plank

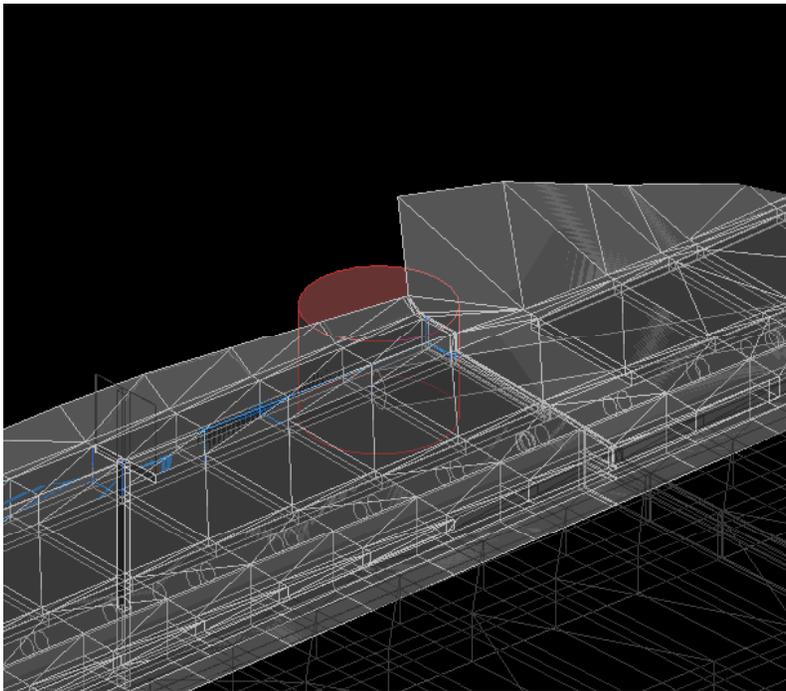
(Mariah Donnelly/FTMS, Carolyn Stuessy/Planting and Wayfinding Signs, Jason Matson/Signals, Dennis Fleischfresser/Lighting, Ryan Baumer/Pedestrian Bridge)



Roadway – STH 100 (Aaron Bubb)

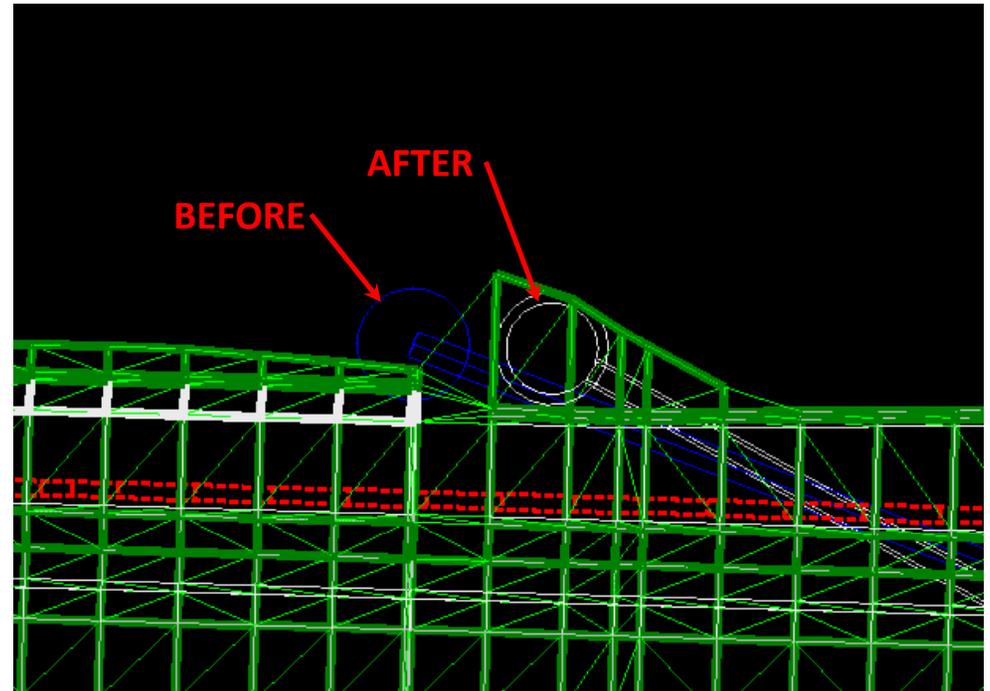
- June 19, 2012 Clash Detection Review Meeting
- Clash job between proposed drainage and proposed structures
- 2 clashes found, 2 identified as potential conflicts
- 2 drainage structures moved as a result

Roadway PM – STH 100 (Aaron Bubb)



Isometric of clash

Drainage Structure and Retaining Wall



Plan view of move

Roadway PM – STH 100 (Aaron Bubb)

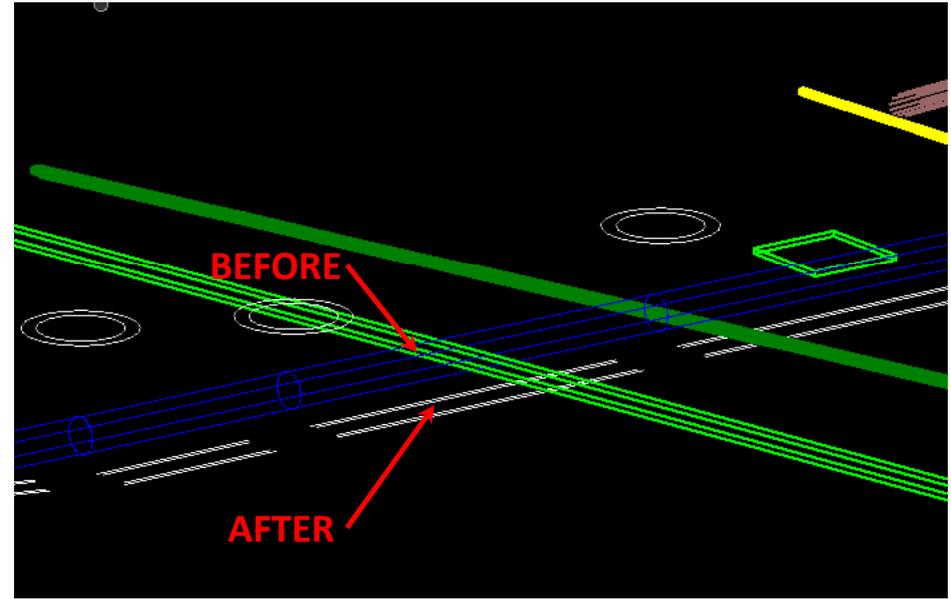
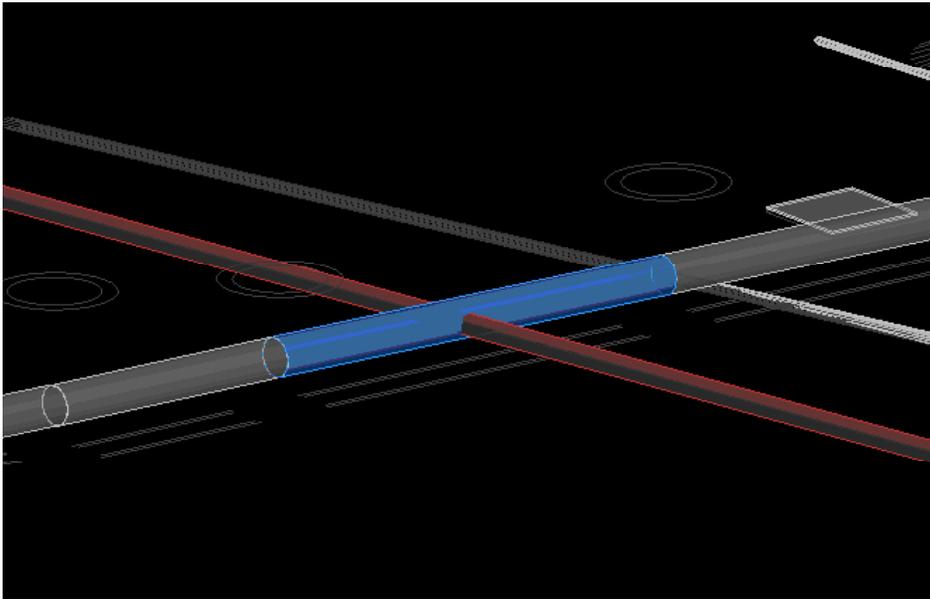


Plan view of move
Drainage Structure and Parapet

Drainage – STH 100 (Jason Feucht/Andy Bork)

- June 19, 2012 Clash Detection Review Meeting
- Clash job between proposed drainage and existing utilities
- 100 clashes found
- 9 drainage laterals were raised/lowered around sanitary as a result

Drainage – STH 100 (Jason Feucht/Andy Bork)



Isometric of clash

Drainage Lateral and Existing Sanitary Pipe

Plan view of lateral lowered

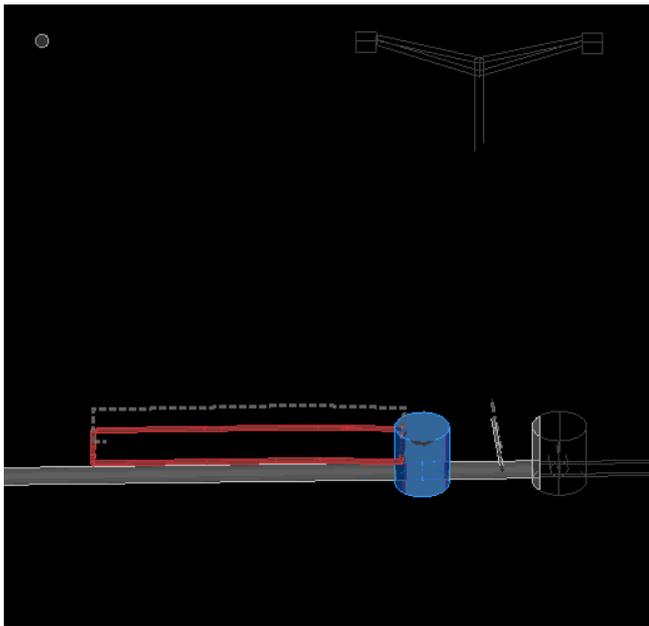
Utilities – STH 100 (Brandon Maas)

- June 19, 2012 Clash Detection Review Meeting
- Clash job between existing water and within 6' of top of proposed roadway
- 108 locations identified
- Information shared with city of Wauwatosa and further investigation by city as a result

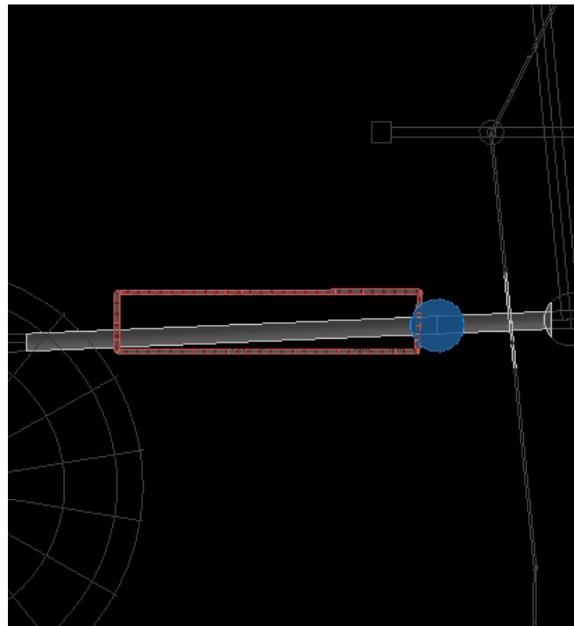
Permanent Signals – STH 100 (Jason Matson)

- June 19, 2012 Clash Detection Review Meeting
- Clash job between signals, FTMS, lighting, signing and drainage
- Clash between signal loop and drainage structure
- Signal loop location was moved as a result

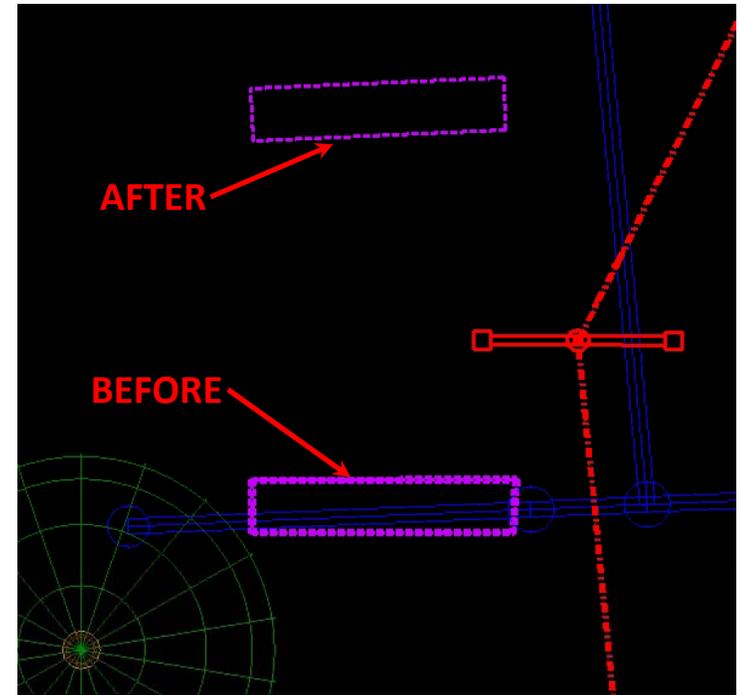
Permanent Signals – STH 100 (Jason Matson)



Isometric of clash



Plan view of clash

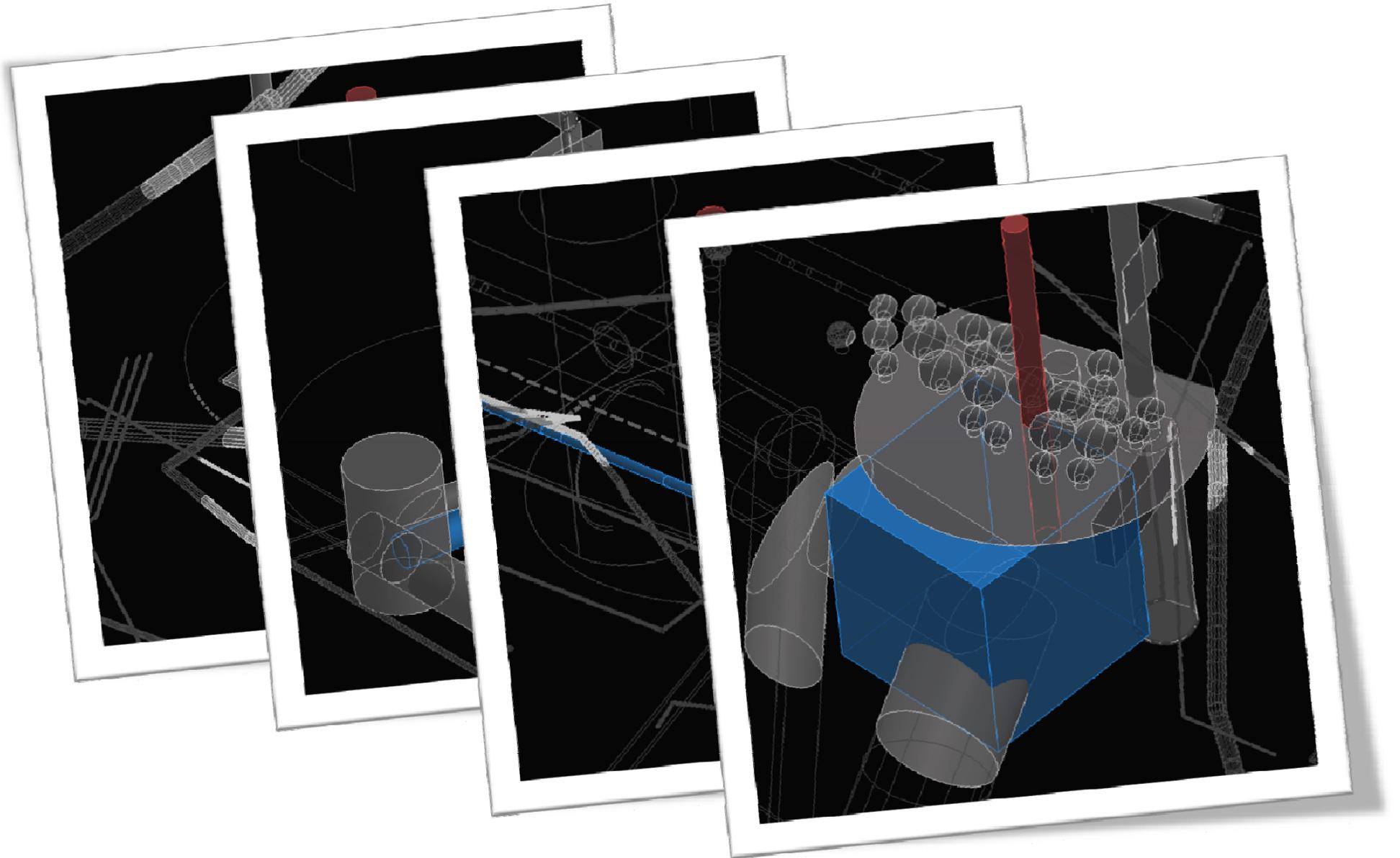


Wireframe of move

Temporary Signals – STH 100 (Josh Woller)

- July 11, 2012 Clash Detection Request
- Clash job between temporary signals, permanent signals, FTMS, lighting, signing, drainage, planting, existing and proposed utilities
- 14 clashes found, 4 identified as potential conflicts
 - 1 with existing electric and FO
 - 1 with permanent signal conduit
 - 1 with proposed drainage pipe
 - 1 with proposed drainage structure
 - 10 others were with items such as planting which could be made to work around the temporary poles)
- 3 pole locations moved and plan and spec changes were done as a result

Temporary Signals – STH 100 (Josh Woller)

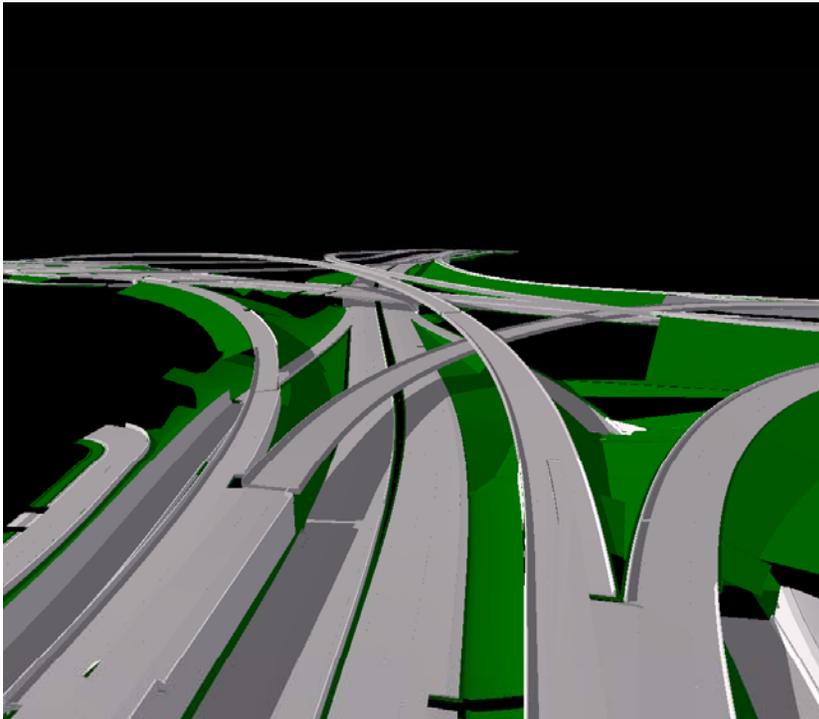


How We Got There

- How the models are generated
 - Native 3D designs
 - Roadway surface models [InRoads]
 - Drainage databases [InRoads]
 - Structure models [InRoads/LEAP/Revit]
 - Native 2D designs
 - 3D replacement of 2D cells draped/elevated on existing or proposed surfaces (leveraging automation)

How We Got There: Model Generation

- Native 3D design example: Roadway surfaces



Element Information

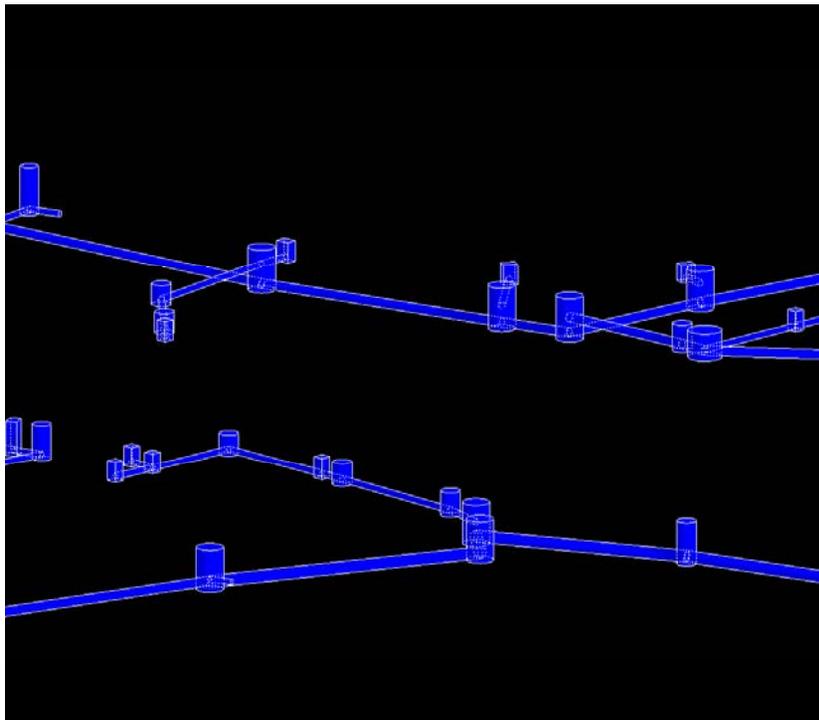
<Selection>
Mesh

Component	
Name	Concrete Pavement_Lane 1
Style	C_ConcretePavement
Description	
Corridor	EN
Pay Item	
Start Station	51421.560000000056
Stop Station	54265.619999999995

General	
Description	Mesh
Level	C_ConcretePavement
Color	191
Line Style	ByLevel (0)
Weight	ByLevel (0)
Class	Primary
Template	None
Transparency	0

How We Got There: Model Generation

- Native 3D design example: Drainage



Element Information

<Selection>
Smart Solid

General

Geometry

Extended

Raw Data

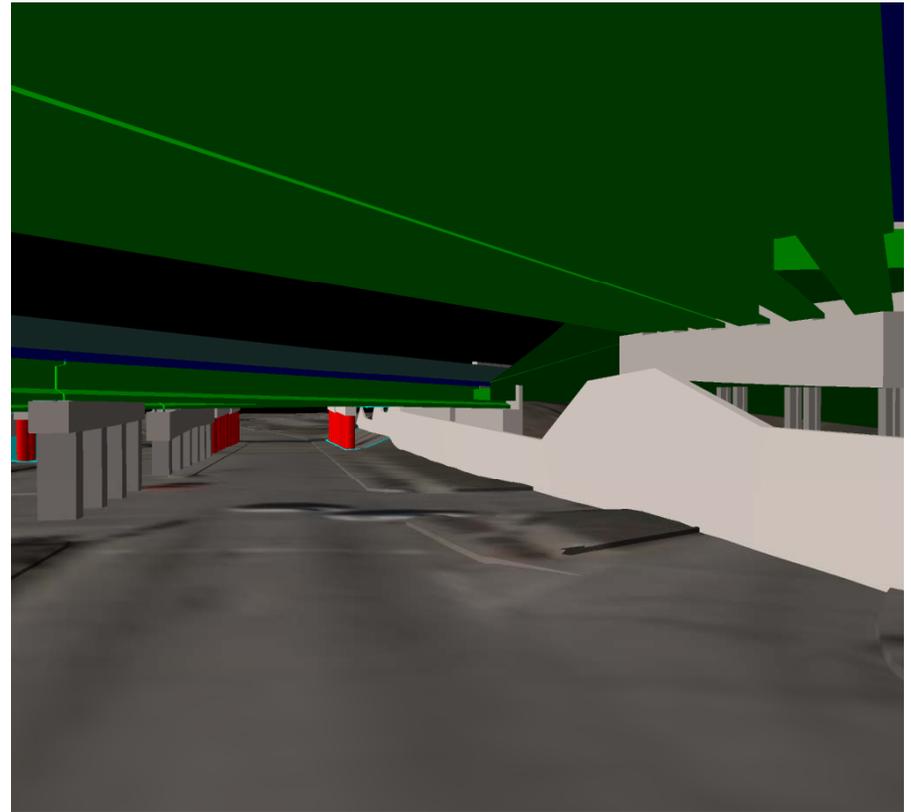
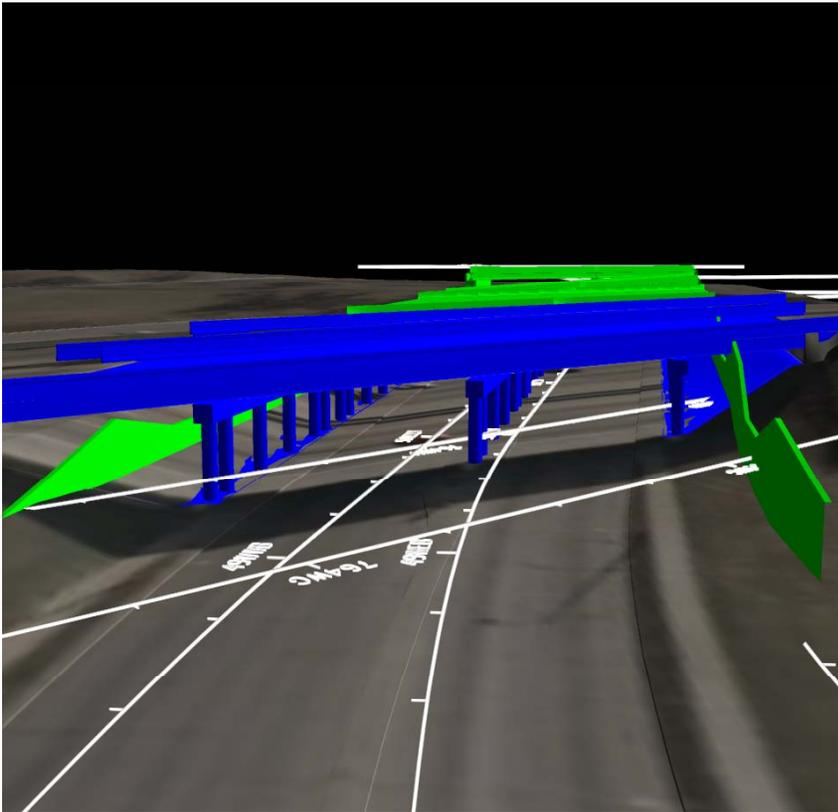
Material

Inlet

Pipe	
ID	P101
Width	30.0000
Height	30.0000
Shape	Circular
Slope	1.00%
Material	SS-RCP III
Plan Length	58.5544
Upstream ID	S101
Downstream ID	S102
Design Flow Rate	26.131
d / D	0.5796
Velocity	8.8512

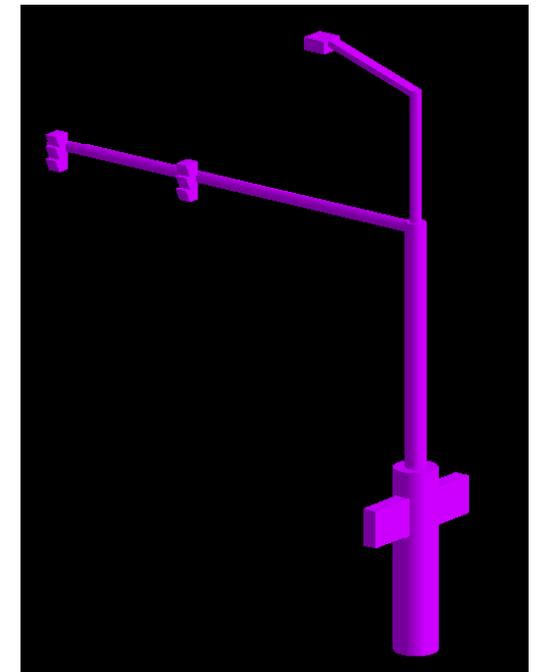
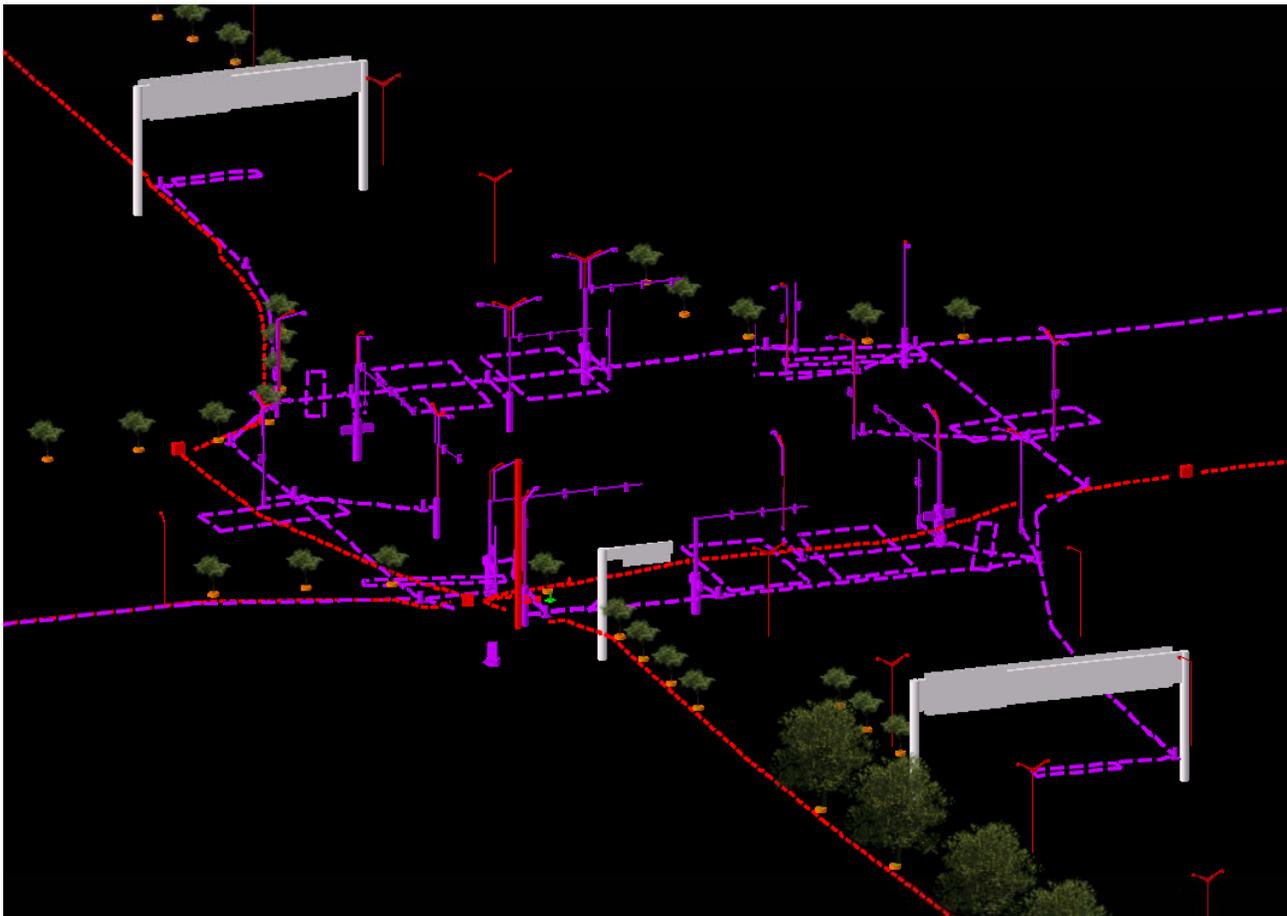
How We Got There: Model Generation

- Native 3D design example: Structures



How We Got There: Model Generation

- Native 2D design example: Planting, Lighting & Signals



How We Got There

- How the models are reviewed
 - What goes into a clash detection review meeting
 - Model source documentation
 - Who, what, when
 - Clash jobs processed
 - Prescribed “recipes”
 - Task lead representation
 - Identify and note potential clashes

How We Got There: Model Review

- Model source documentation example

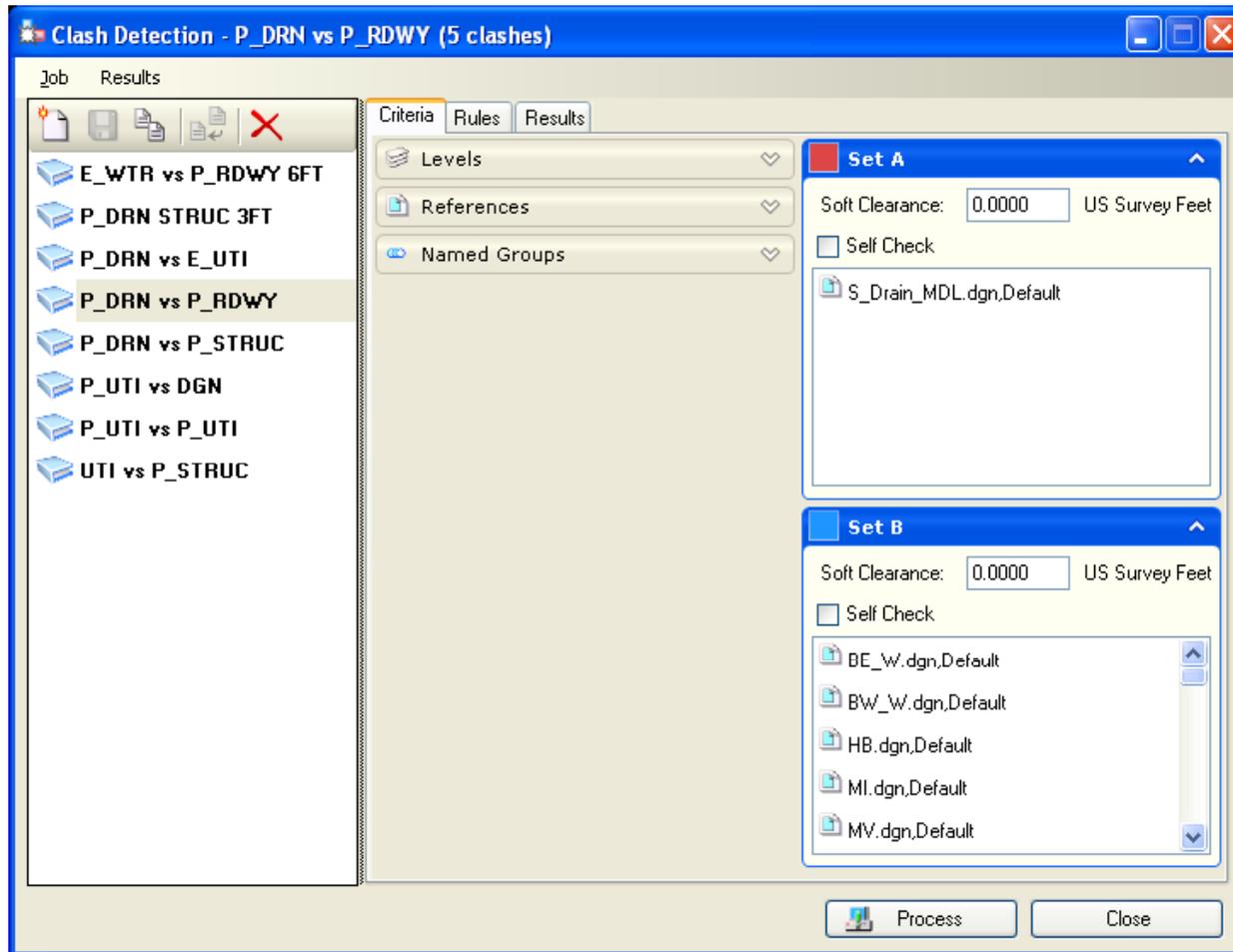
1060-33-70 Mayfair Road Clash Detection Review.xlsx
Model Sources

Project Name:	1060-33-70 Mayfair Road				
Review Date:	12/15/2011				
Next Submittal:	Internal Quality Review PS&E 3/21/2012				
Clash Component 1:	Existing Utilities	Model File:	W:\Cadd\References\Utilities\Model\Uti(3D).dgn	<u>Owner</u>	<u>Comments</u>
Code:	E_UTI	Source(s):	W:\Cadd\References\Utilities\3D\ExistingStormSewer.sdb	Chris Johnson	
			W:\Cadd\References\Utilities\3D\Uti.sdb	Prasad Narayan	(for all types) Drainage > U Pipes: Drainage > Vie Manholes: Drainage > Inlets: Drainage > Vie
				Kevin Cornell	

Clash Component 2:	Proposed Roadway	Last Updated:	Model File:	12/14/2011	Roadway Modelers	style, ad wren
Code:	P_RDWY	Source(s):	W:\Cadd\Final\10603370_S\Roads\eng\InRoads\ModeledSurfaces\#.dgn		Jason Feutch Jason Feutch Jason Feutch Jason Feutch Jason Feutch	level Displayed current surfaces Preference: WisDOT_Uti(3D).ain Style Lock: Off Drainage > View > Drainage > Preferences > Load "Existing Storm Sewer" Drainage > View > Drainage as Solids (all checked)
Clash Component 3:	Proposed Storm Sewer	Last Updated:	W:\Cadd\Final\10603370_S\Roads\eng\InRoads\SS\Blucumond Road East.sdb		Chris Johnson Roadway Modelers	Displayed current databases
Code:	P_DRN	Source(s):	W:\Cadd\Final\10603370_S\Roads\eng\InRoads\SS\Blucumond Road East.sdb W:\Cadd\Final\10603370_S\Roads\eng\InRoads\SS\STH100_SOUTH_AD.sdb W:\Cadd\Final\10603370_S\Roads\eng\InRoads\SS\WTP West.sdb W:\Cadd\Final\10603370_S\Roads\eng\InRoads\SS\SW AN_UNDER_Inr.sdb	12/14/2011	Elyse O'Callaghan Elyse O'Callaghan	Displayed current surface
Clash Component 4:	Proposed Utilities	Last Updated:	W:\Cadd\Final\10603370_S\Roads\eng\InRoads\ModeledSurfaces\ADT line.dgn	12/14/2011	Chris Johnson Dennis A. Fleischfresser	Copied current model file Cell Library: Itg Cell, Cells: PLS-30, PTWIN-30 (cells based on SDD 9E1-11D)
Code:	P_UTI	Source(s):	W:\Cadd\Final\10603370_S\Roads\eng\InRoads\ModeledSurfaces\ADT line.dgn		Chris Johnson	Dropped lighting cells on all proposed surfaces and replaced with 30 cells
Clash Component 5:	Proposed Signing	Last Updated:	W:\Cadd\Final\10603370_S\Roads\eng\InRoads\bas\5_SignP.dgn	12/14/2011	Chris Johnson	Dropped current base file on proposed surfaces
Code:	P_SGN	Source(s):	W:\Cadd\Final\10603370_S\Roads\eng\InRoads\bas\5_SignP.dgn		Chris Johnson	Cell Library: SIGNAL Cell Dropped signal cells on all proposed surfaces and replaced with 3D cells:
Clash Component 6:	Proposed Lighting	Last Updated:	W:\Cadd\Final\10603370_S\Roads\eng\InRoads\bas\5_LP.dgn	12/14/2011	Chris Johnson	Dropped conduit on proposed surfaces and elevated -3 ft, 12" dia. Lights
Code:	P_LP	Source(s):	W:\Cadd\Final\10603370_S\Roads\eng\InRoads\bas\5_LP.dgn		Chris Johnson	Dropped current base file on proposed surfaces
Clash Component 7:	Proposed Signals	Last Updated:	W:\Cadd\Final\10603370_S\Roads\eng\InRoads\bas\5_Sig.dgn	12/14/2011	Maria Donnelly	
Code:	P_SIG	Source(s):	W:\Cadd\Final\10603370_S\Roads\eng\InRoads\bas\5_Sig.dgn			

How We Got There: Model Review

- Clash job example



How We Got There: Model Review

- Clash job example

The screenshot displays a software window titled "Clash Detection - P_ELEC vs P_SIGN vs P_DRAIN (307 clashes)". The interface is divided into several sections:

- Job Results:** A tree view on the left lists various clash detection criteria, with "P_ELEC vs P_SIGN vs P_DRAIN" selected.
- Criteria Rules Results:** A tabbed interface showing a table of detected clashes.
- Element Info:** Two panels at the bottom provide detailed information for selected elements.

Name	Status	Type	Clearance	Assigned To	Found By	Found On	Accepted I
Clash025	New	Hard	Less Than...		msccej	2012-06-1...	
Clash026	New	Hard	Less Than...		msccej	2012-06-1...	
Clash027	New	Hard	Less Than...		msccej	2012-06-1...	
Clash028	New	Hard	Less Than...		msccej	2012-06-1...	
Clash029	New	Hard	Less Than...		msccej	2012-06-1...	
Clash030	New	Hard	Less Than...		msccej	2012-06-1...	
Clash031	New	Hard	Less Than...		msccej	2012-06-1...	
Clash032	New	Hard	Less Than...		msccej	2012-06-1...	
Clash033	New	Hard	Less Than...		msccej	2012-06-1...	
Clash034	New	Hard	Less Than...		msccej	2012-06-1...	
Clash035	New	Hard	Less Than...		msccej	2012-06-1...	
Clash036	New	Hard	Less Than...		msccej	2012-06-1...	

Element Info A:

PointEntity2d	
IsEmbedded	False
State	2
GeometryClass	1

General

Description	Cell: 2" conduit
Cell Name	2" conduit
Cell Type	Graphic
Class	Primary
Number of elements	71
Template	None
Annotation Purpose	False

Element Info B:

PointEntity2d	
IsEmbedded	False
State	2
GeometryClass	1

General

Description	Cell: S-40-634 R (N)
Cell Name	S-40-634 R (N)
Cell Type	Graphic
Class	Primary
Number of elements	6
Template	None
Annotation Purpose	False

Buttons: Process, Close

How We Got There: Model Review

- Task lead representation example

