



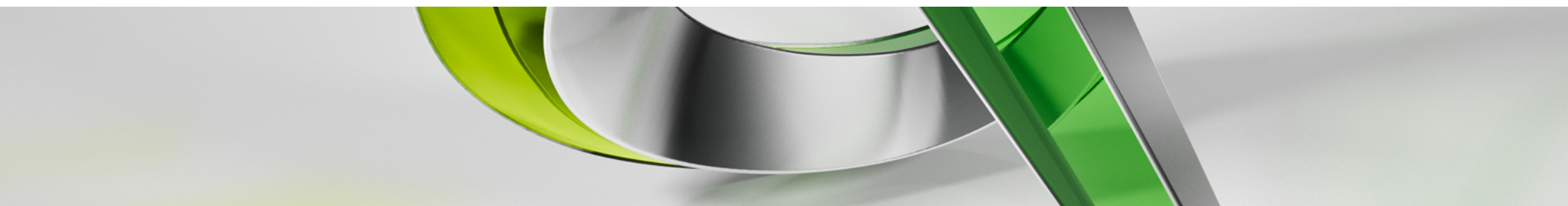
# Create Structural Shop Drawings for Concrete, Precast, and Steel Structures in Revit

Dan McCloskey, P.E.

Principal, MB BIM Solutions

Erich Bretz, P.E.

Principal, MB BIM Solutions



## Class summary

With the new tools added to Revit software in the last few years, it has become easier for structural engineers and detailers to create shop drawings and fabrication models for structural components. This class will demonstrate Building Information Modeling (BIM) workflows to take a Structural Design Team model into fabrication modeling and shop-drawings production for rebar, precast-concrete, structural-steel, and concrete-lift drawings. Attendees will learn new rebar modeling and annotation features for rebar shop-drawing creation. They will also learn how the new steel-connections tool works in Revit 2017 software and links with Advance Steel software; how to create precast-concrete erection (shop) and piece drawings in Revit software; and how to create detailed concrete-lift drawings in Revit software. We will also demonstrate add-ons that make shop-drawing production more efficient for each structural component type, and we'll discuss workflows and best practices. This session features Revit Structure and Advance Steel.

# Key learning objectives

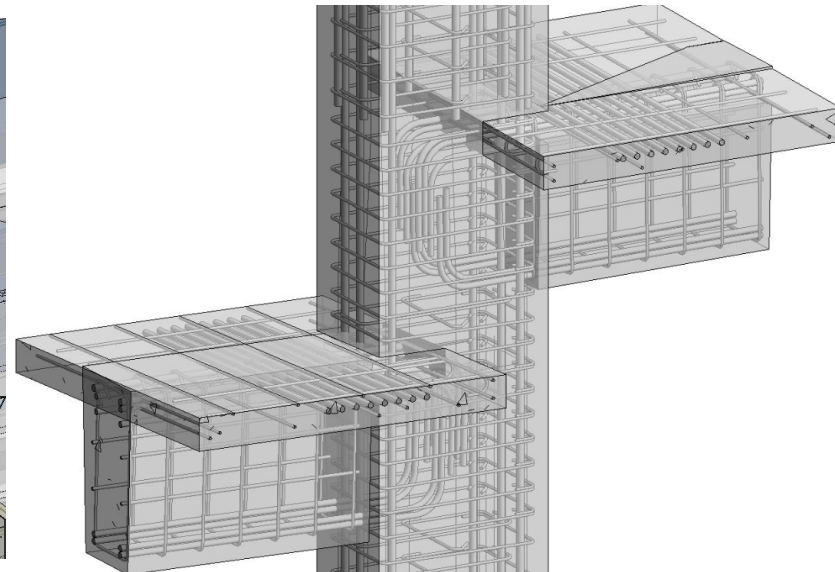
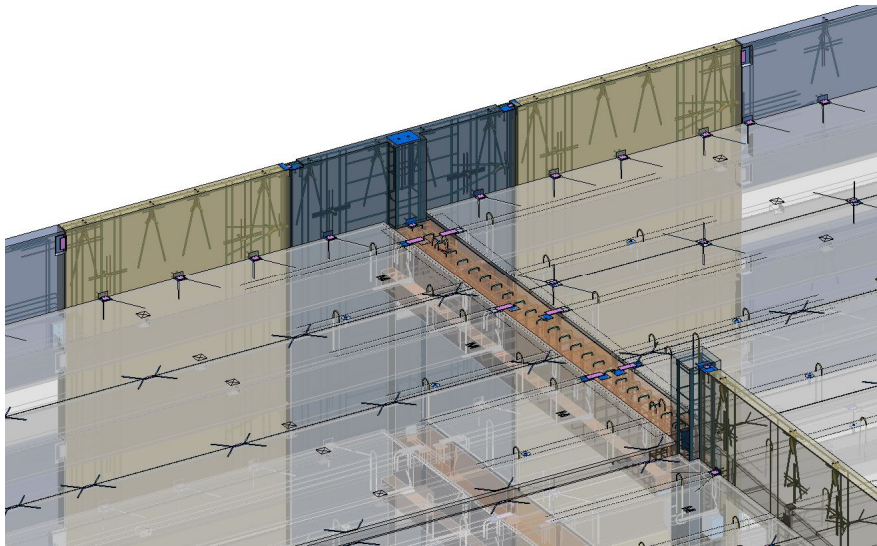
At the end of this class, you will be able to:

- Learn how rebar shops drawings can be created within Revit, and discover the new tools for rebar modeling and annotation
- See families and workflows that enable precast-concrete fabricators to create erection and piece drawings in Revit
- Learn how to create concrete-lift drawings in Revit to enhance coordination and improve field productivity
- Discover new steel connection tools in Revit 2017—and learn how to create steel shops in Revit and Advance Steel

# MB BIM Solutions

A Quick Overview of What We Do:

- Fabrication Level Models (and Shop Drawings from these models):
  - Rebar, Precast, Structural Steel and Miscellaneous Metals

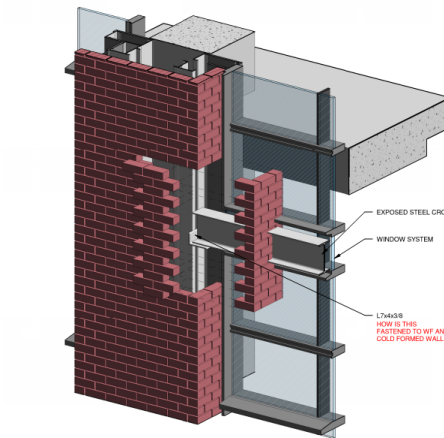
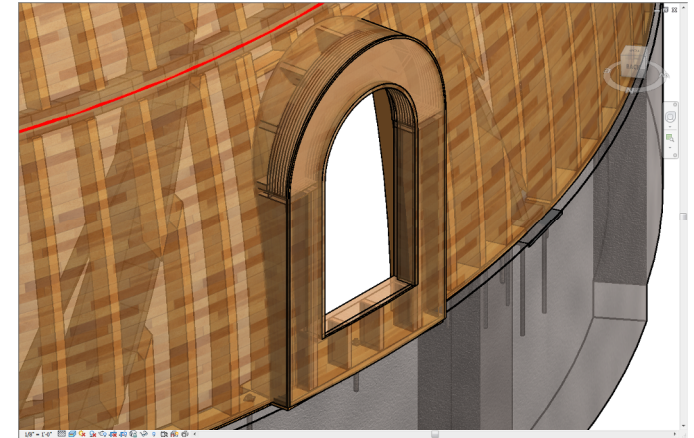
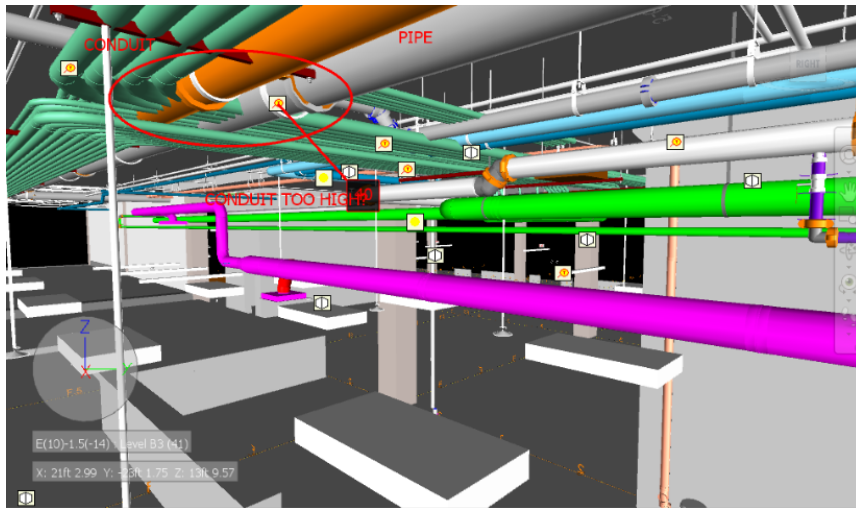




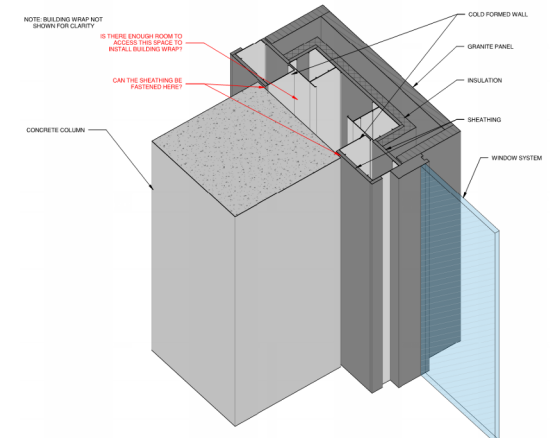
# MB BIM Solutions

## A Quick Overview of What We Do:

- Navisworks Coordination
- Custom Modeling
  - Virtual Mock-Ups, Constructability Studies



① 3D VIEW - EXPOSED STEEL CROSS CONNECTION

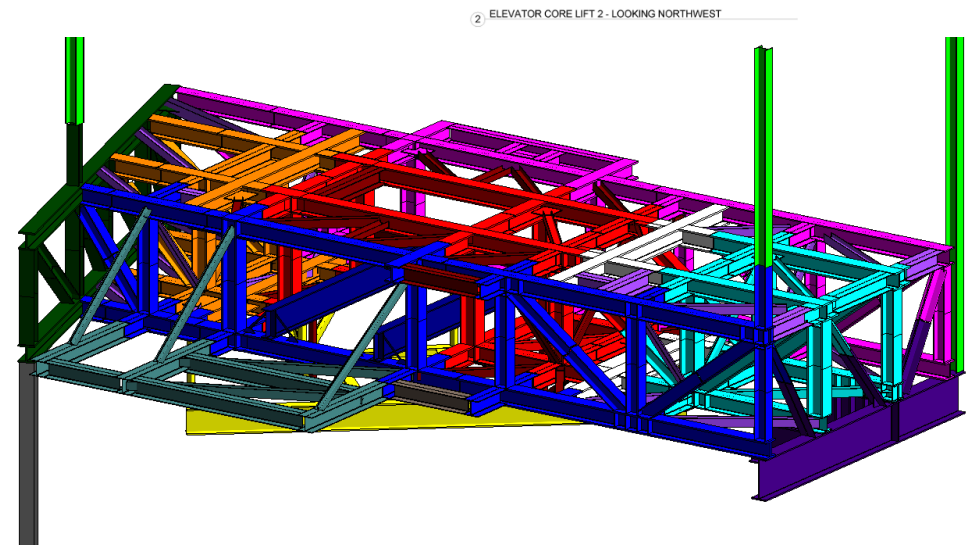
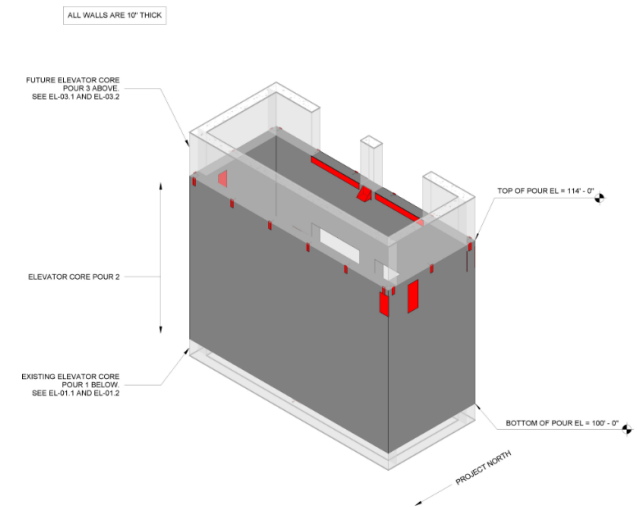


② CONSTRUCTION AT COLUMN BASE

# MB BIM Solutions

## A Quick Overview of What We Do:

- Concrete Lift Drawings
- Construction Sequence Modeling/Animations
- Model-Based Estimating



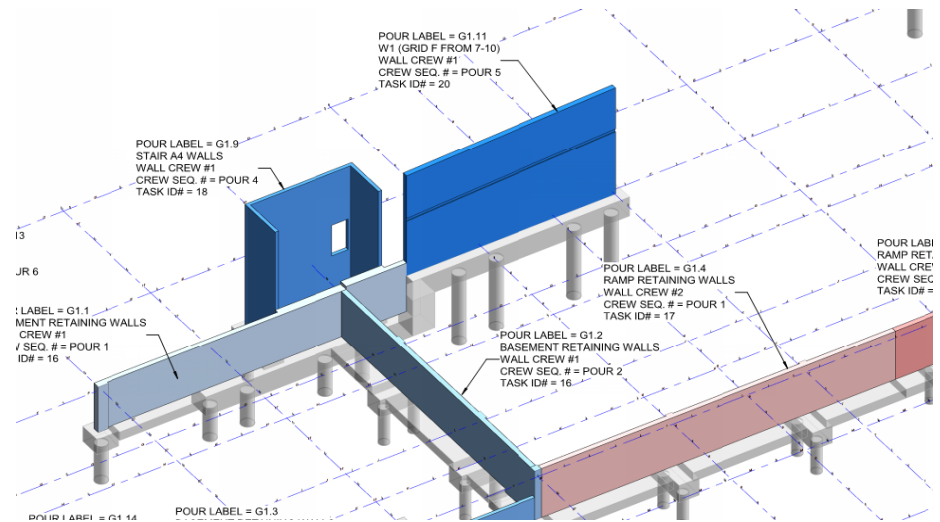
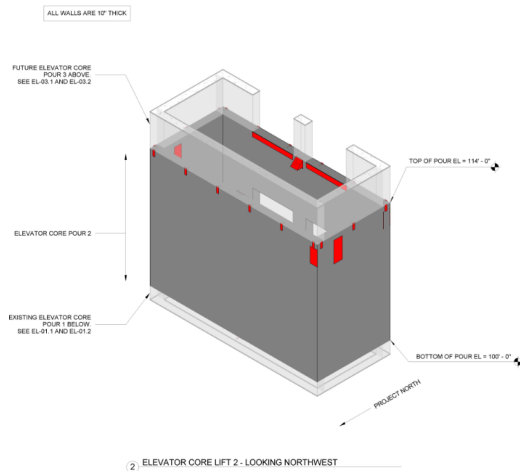
# Shop Drawings – ‘Who’, ‘When’, ‘How’ is Changing

- Prevent Drop-Off of Information and Knowledge into Construction
  - Enhance quality of the final built product
- BIM Tools Enabling Change in Workflow and Responsibilities
- Typical Design-Bid-Build Is Changing
  - Pros and Cons
- Who Realizes the Benefit?
  - Design Teams
  - Fabricators / Specialty Subs
  - GC's
  - Owners

# Concrete Lift (Line) Drawings

- Benefits:
  - Enhanced Productivity
  - Field Labor Visualization
  - Sharing of Models
  - Enhanced Coordination
  - Quantity Management
  - Schedule Management

SIZE	LENGTH
2"x8"	2'-1 5/8"
4"x8"	10'-4"
6"x8"	41'-7 1/8"
8"x16"	13'-5 1/2"
8"x16"	81'-2 1/4"
8"x16"	5'-4 3/4"
14"x8"	16'-0 1/4"
18"x18"	5'-4 1/4"
18.5"x10"	24'-0 1/8"

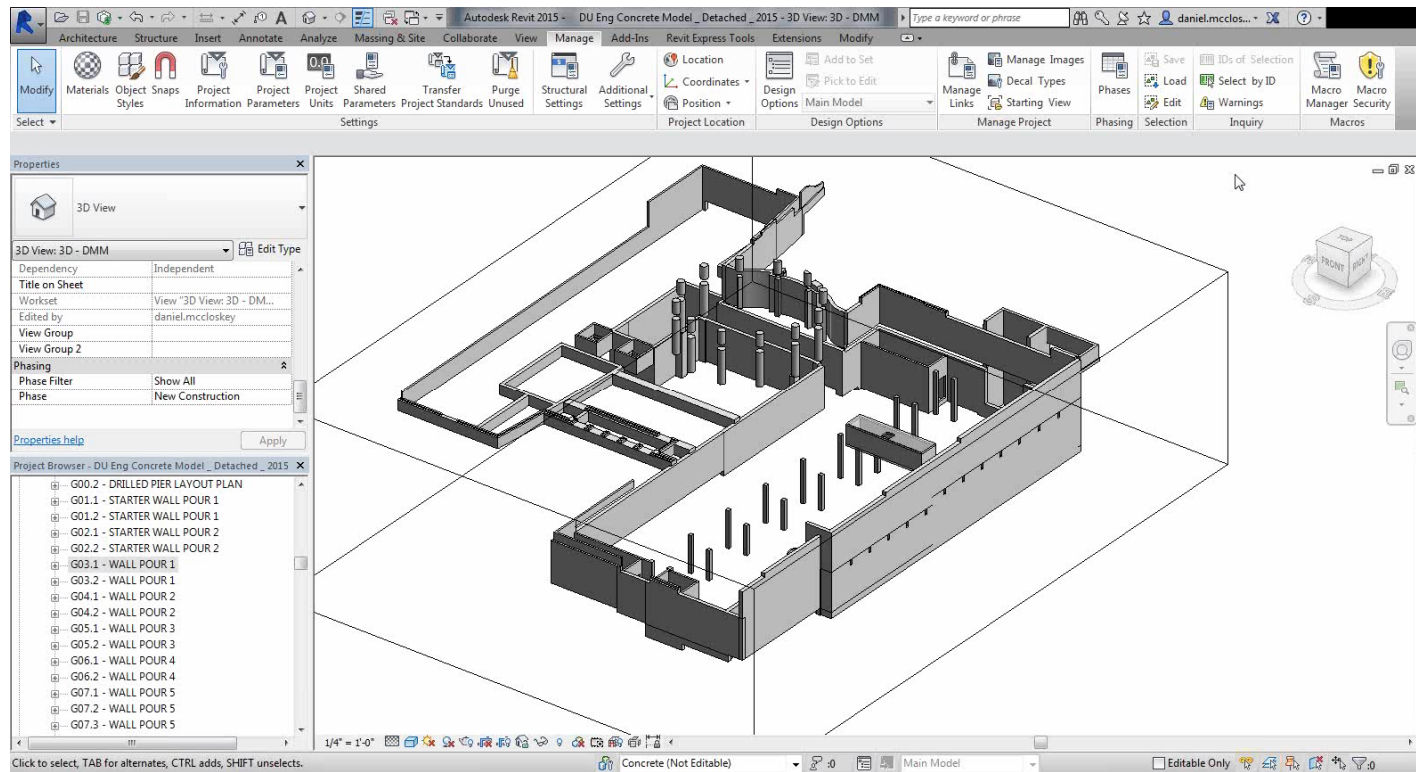


# Concrete Lift (Line) Drawings

- Modeling:

# Concrete Lift (Line) Drawings

- Modeling:



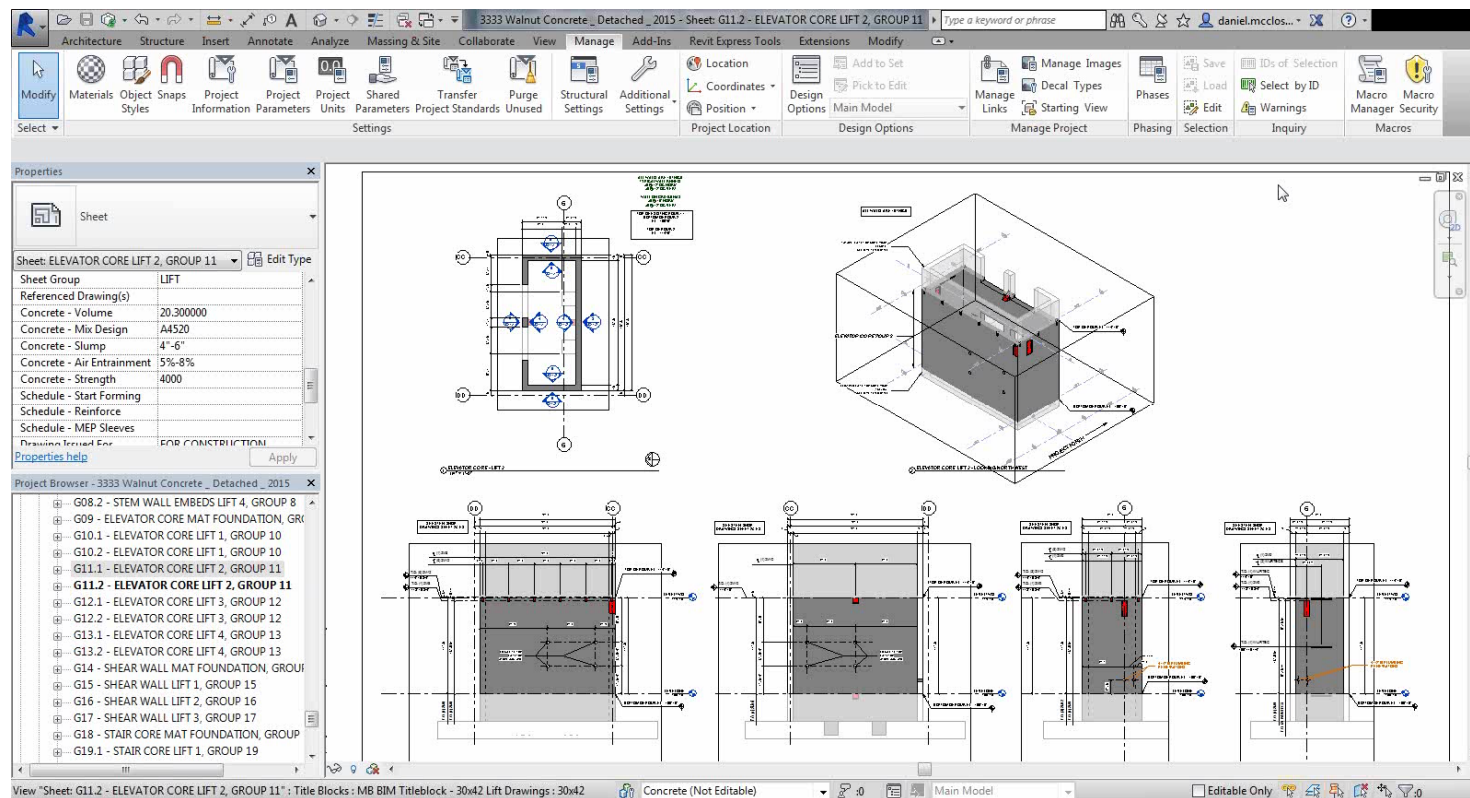


# Concrete Lift (Line) Drawings

- Annotation / Data:

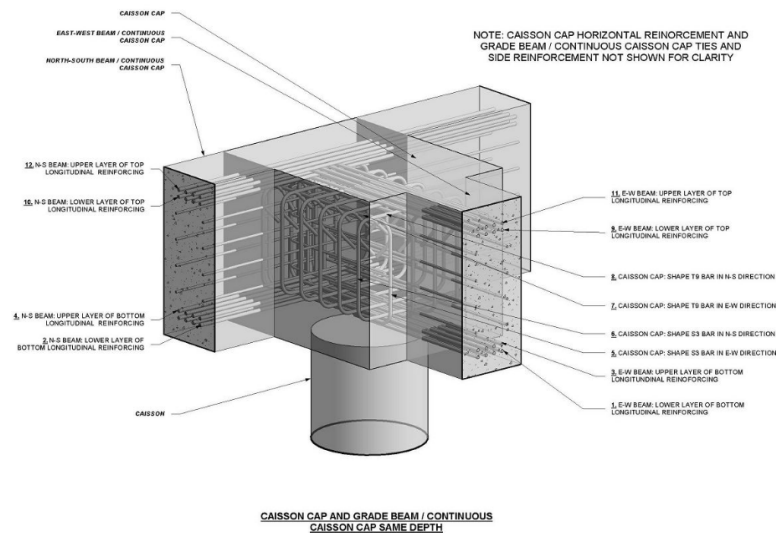
# Concrete Lift (Line) Drawings

- Annotation / Data:



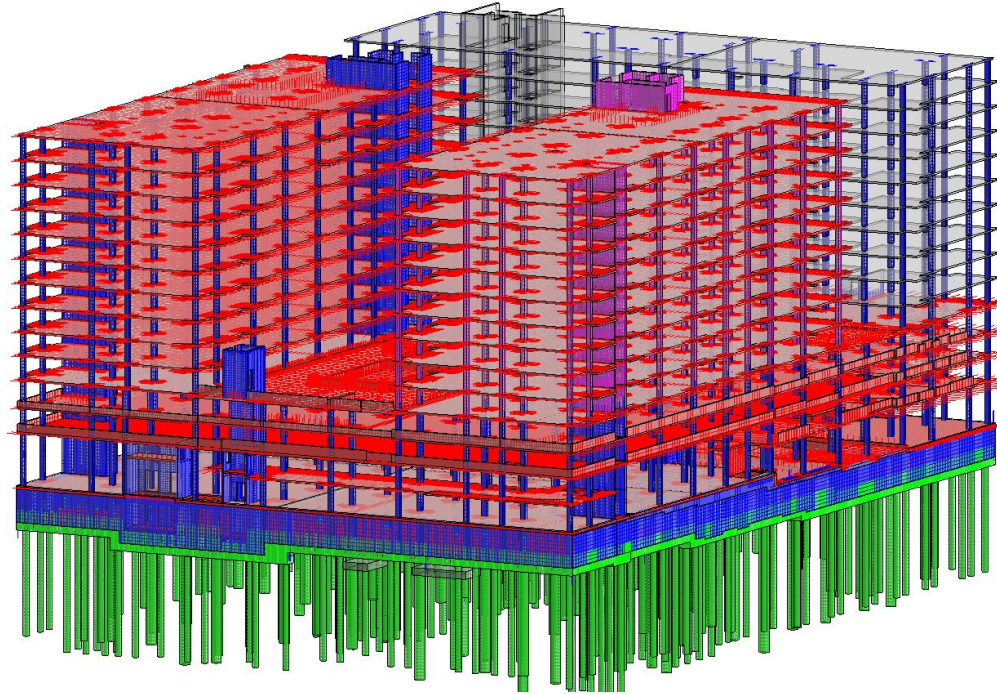
# Rebar Shop (Placing) Drawings

- Advantages:
  - Material Savings
  - Better Shops = Easier Installation
  - Enhanced Coordination
  - Reduced Congestion
  - Schedule!!



# General Model Set-Up

- Rebar Model and Design Models as a Single Model or Separate Models
- Using Design Team Models as a Starting Point for a Rebar Model
- Multiple Rebar Models?



# Rebar Parameter Management

- Purpose of and Goals for Parameters in Rebar Models
  - Sheet / view visibilities / filters
  - Bend schedules and bills of material (BOM's)
  - Tags
  - Assemblies
  - QC
  - Bar marking and numbering



# Rebar Parameter Management

- Parameters Used
  - Partition
  - Rebar Number

Reinforcement Numbers

Minimum number of digits for reinforcement numbers: 4

Filter partitions

Partition	Rebar Numbers		Fabric Numbers		Remove Gaps
	Start	In Use	Start	In Use	
K	1	0001-0003			<input type="checkbox"/>
KS	1	0001-0001			<input type="checkbox"/>
L	2	0002-0458 *			<input type="checkbox"/>
LS	1	0001-0434 *			<input type="checkbox"/>
M	2	0002-0202 *			<input type="checkbox"/>
MS	5	0005-0361 *			<input type="checkbox"/>
N	2	0002-0034 *			<input type="checkbox"/>
NS	1	0001-0031 *			<input type="checkbox"/>

\* One or more gaps exist in the number sequence

[How do these settings affect reinforcement numbering and partitions?](#)

OK Cancel Apply



# Rebar Parameter Management

- Parameters Used
  - Partition
  - Rebar Number
  - Pour
  - Delivery
  - Bar Comments

Properties

Rebar Bar #7

Structural Rebar (1) Edit Type

Construction

Partition C

Rebar Number 0055

Schedule Mark 7

POUR MS-W

BAR COMMENTS (DOWEL TO WALL)

DELIVERY TRUCK 1.6 \_ 4.14.15

Style Standard

Shape 02A

Shape Image <None>

Hook At Start Standard - 90 deg.

Hook At End None

Rounding Overrides Edit...

Rebar Set

USER BAR QUANTITY

ROUNDED UP SPACING

Layout Rule Maximum Spacing

Quantity 36

Spacing 0' 8"

Graphics

View Visibility States Edit...

Structural

Reinforcement Volume 2224.28 in<sup>3</sup>

Dimensions

Bar Length 8' 6 13/16" (8' - 6 3/4")

Total Bar Length 308' - 3"

A 1' 2" (1' - 2")

B 7' 7" (7' - 7")

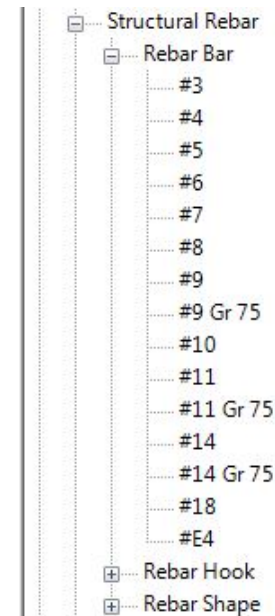
C 0' 0" (0' - 0")

<BAR COMMENTS>					
A	B	C	D	E	F
GRADE	BAR COMMENTS	R	J	O	Est. Tons
60		0'-0"		0'-0"	62.90
60		0'-0"	0'-0"	0'-0"	0.58
60	(2@8'-0") (B)	0'-0"	0'-0"	0'-0"	1.28
75	(ADD'L)(T)	0'-0"	0'-0"	0'-0"	0.45
75	(ADD'L)(T)(CNTRD ON GRID)	0'-0"	0'-0"	0'-0"	0.13
	(B)	0'-0"	0'-0"	0'-0"	241.51
75	(B) (ADD'L) (CENTER OVER SPA	0'-0"	0'-0"	0'-0"	0.99
60	(B) (ADD)	0'-0"	0'-0"	0'-0"	0.78
75	(B) (CENTER OVER SPAN)	0'-0"	0'-0"	0'-0"	1.43
60	(B) (EA. SLAB)	0'-0"	0'-0"	0'-0"	0.07
60	(B) (FIELD BEND)	0'-0"	0'-0"	0'-0"	0.05
60	(B) (TYP.)	0'-0"	0'-0"	0'-0"	0.69
60	(B) COL DOWELS	0'-0"	0'-0"	0'-0"	0.13
60	(B)(FIELD BEND)	0'-0"	0'-0"	0'-0"	0.15
60	(B)(POUR JOINT)	0'-0"	0'-0"	0'-0"	0.91
60	(B)(TH)	0'-0"	0'-0"	0'-0"	0.01
60	(BOT MAT)	0'-0"	0'-0"	0'-0"	146.90
60	(COL. BOT)	0'-0"	0'-0"	0'-0"	34.91
60	(CURB TOP)	0'-0"	0'-0"	0'-0"	0.71
60	(DOWEL E.F.)	0'-0"	0'-5"	0'-0"	0.86
60	(DOWEL TO BEAM)	0'-0"	0'-0"	0'-0"	0.00
60	(DOWEL TO CMU)	0'-0"		0'-0"	3.88
60	(DOWEL TO COLUMN)	0'-0"	0'-0"	0'-0"	0.21
60	(DOWEL TO KNEEWALL)	0'-0"	0'-4"	0'-0"	1.03
60	(DOWEL TO RAMP SLAB)	0'-0"	0'-0"	0'-0"	0.06
60	(DOWEL TO SLAB)	0'-0"	0'-0"	0'-0"	0.02
60	(DOWEL)	0'-0"		0'-0"	0.56
60	(DROP CAP)	0'-0"	0'-0"	0'-0"	0.16
60	(DWL)	0'-0"	0'-0"	0'-0"	7.26
60	(DWL)(B)	0'-0"	0'-0"	0'-0"	2.31
60	(DWL)(T)	0'-0"	0'-0"	0'-0"	2.23
60	(EACH FACE)	0'-0"	0'-0"	0'-0"	3.00
60	(EACH FACE)(HORIZ.)	0'-0"	0'-0"	0'-0"	0.65
60	(EACH FACE)(VERT.)	0'-0"	0'-0"	0'-0"	0.53
60	(HORIZ.)	0'-0"	0'-0"	0'-0"	4.52
60	(I.F.)	0'-0"	0'-0"	0'-0"	0.01
60	(M)	0'-0"	0'-0"	0'-0"	1.01
60	(O.F.)	0'-0"	0'-0"	0'-0"	0.01
60	(SIDE) (E.F.)	0'-0"	0'-0"	0'-0"	0.49
60	(SIDE) (E.F.) (CENTER OVER SPA	0'-0"	0'-0"	0'-0"	0.16
60	(SUPPORT BARS)	0'-0"	0'-0"	0'-0"	30.45
60	(T&B)	0'-0"	0'-0"	0'-0"	0.02
	(T)	0'-0"	0'-0"	0'-0"	187.32
	(T) (ADD'L)	0'-0"	0'-0"	0'-0"	0.76
60	(T) (FIELD BEND)	0'-0"	0'-0"	0'-0"	0.10
60	(T) (TYP.)	0'-0"	0'-0"	0'-0"	0.91
60	(T)(EA. SLAB)	0'-0"	0'-0"	0'-0"	0.05
60	(T)(EACH FACE)	0'-0"	0'-0"	0'-0"	0.04
60	(T)(FIELD BEND)	0'-0"	0'-0"	0'-0"	0.10
60	(T.O.W.)	0'-0"	0'-0"	0'-0"	2.59
60	(TH)	0'-0"	0'-0"	0'-0"	0.05



# Rebar Parameter Management

- Parameters Used
  - Partition
  - Rebar Number
  - Pour
  - Delivery
  - Bar Comments
  - User Bar Quantity
  - Epoxy Coated and GR75



# Rebar Parameter Management

- Use of Parameters Across Model Management
  - Bar Marking and Numbering

<BILL OF MATERIAL - TRUCK 2.74 \_ 11.12.15>

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
GRADE	COUNT	SIZE	BAR LENGTH		BAR MARK		BEND SHAPE											
60	272	#4	4'-8 3/4"	4	L	0381	18	0'-6"	3'-8"	0'-8"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-4"
60	887	#4	4'-0 3/4"	4	L	0454	18	0'-6"	3'-0"	0'-8"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-4"
60	54	#4	20'-0"	4	LS	0434	00	0'-0"	20'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"
60	228	#5	7'-2 1/2"	5	L	0453	18	0'-7"	5'-11"	0'-10"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-5"
60	6	#6	7'-6"	6	L	0458	18	0'-8"	6'-0"	1'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-6"

Schedule Properties

Fields Filter Sorting/Grouping Formatting Appearance

Available fields:

- Assembly Code
- Assembly Description
- Assembly Name
- BAR COMMENTS
- Bar Diameter
- Bar Type (T)
- Base Shape
- Bend Diameter
- Comments
- Cost
- Count
- Deformation
- Description
- Family
- Family and Type
- Hook At End

Scheduled fields (in order):

- GRADE
- Quantity
- Type
- Bar Length
- Partition
- Rebar Number
- Shape
- A
- B
- C
- D
- E
- F
- G
- H

Select available fields from:

Structural Rebar

☐ Include elements in links

Parameter Properties

Parameter Type

☐ Project parameter  
(Can appear in schedules but not in tags)

☒ Shared parameter  
(Can be shared by multiple projects and families, exported to ODBC, and appear in schedules and tags)

Select... Export...

Parameter Data

Name: BAR SIZE

Discipline: Common

Type of Parameter: Text

Group parameter under: Rebar Set

Tooltip Description: <No tooltip description. Edit this parameter to write a custom tooltip. Custom tooltips hav...

☒ Add to all elements in the selected categories

Categories

Filter list: <show all>

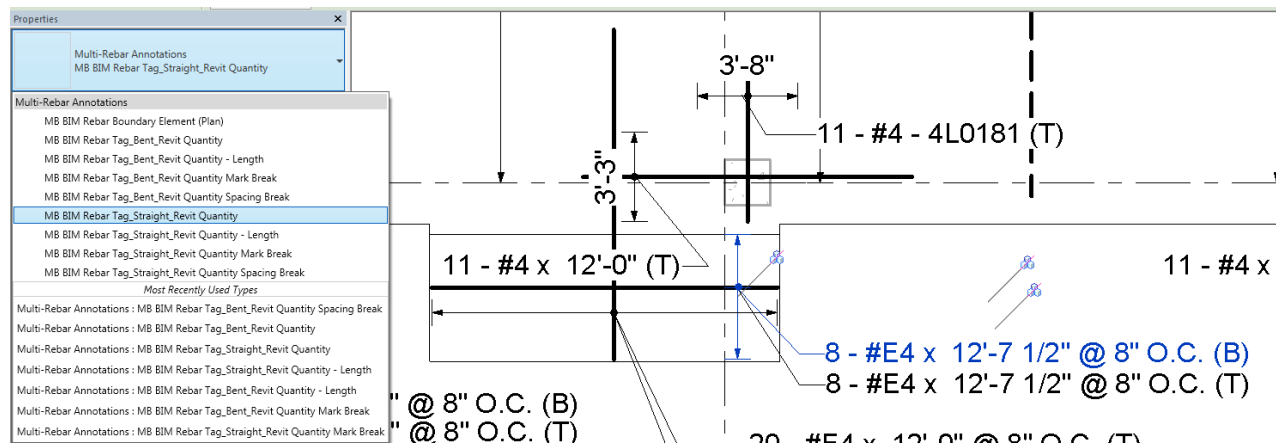
☐ Hide un-checked categories

- ☐ Air Terminals
- ☐ Analytical Links
- ☐ Assemblies
- ☐ Cable Tray Fittings
- ☐ Cable Tray Runs
- ☐ Cable Trays
- ☐ Casework
- ☐ Ceilings
- ☐ Columns
- ☐ Communication Devices
- ☐ Conduit Fittings
- ☐ Conduit Runs
- ☐ Conduits
- ☐ Curtain Panels
- ☐ Curtain Systems
- ☐ Curtain Wall Mullions
- ☐ Data Devices
- ☐ Detail Items
- ☐ Doors
- ☐ Duct Accessories

Check All Check None

# Rebar Parameter Management

- Use of Parameters Across Model Management
  - Bar Marking and Numbering
  - Sheets / Filters / View Templates and Visibilities
  - Bend Schedules and BOM's
  - Tags
  - QC Views and QC Schedules



# Exporting Data From Revit for Bar Bending and Cutting Software Import

- Why to Export and Manage Data
- Revit Export for Soule Import
- aSa-Revit Link

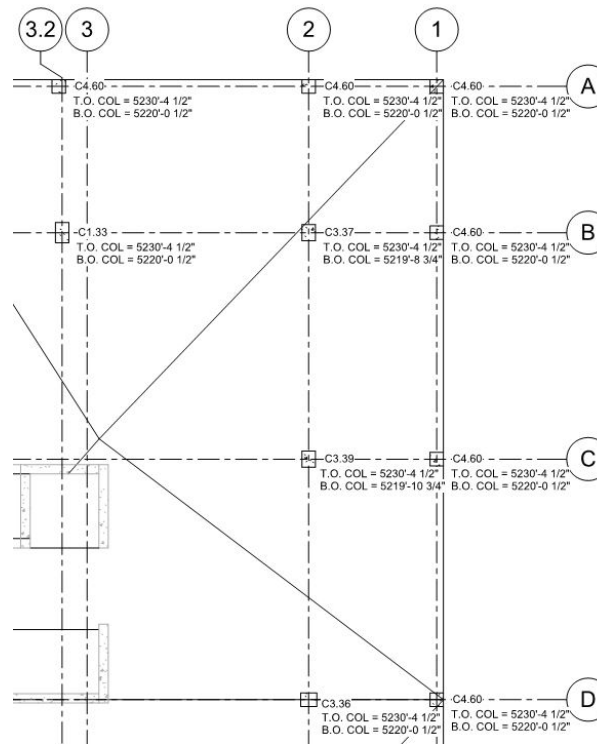
<BILL OF MATERIAL - TRUCK 2.33 _ 10.7.15>																															
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U											
GRADE	COUNT	SIZE	BAR LENGTH	BAR MARK		BEND SHAPE	A	B	C	D	E	F	G	H	K	R	J	O	Est. Tons												
60	8	#4	2'-0"	4	L	0049	D	0'-0"	0'-0"	0'-0"	2'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0.01											
60	96	#4	4'-6 3/4"	4	L	0179	02A	0'-8"	4'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0.15											
60	39	#4	6'-6 3/4"	4	L	0181	02A	0'-8"	6'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0.09											
60	6	#4	7'-6 3/4"	4	L	0428	02A	0'-8"	7'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0.02											
60	146	#4	10'-0"	4	LS	0002	00	0'-0"	10'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0.49											
60	202	#4	12'-0"	4	LS	0005	00	0'-0"	12'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0.81											
60	148	#4	4'-0"	4	LS	0010	00	0'-0"	4'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0.20											
60	16	#4	6'-0"	4	LS	0014	00	0'-0"	6'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0'-0"	0.03											
60	173	#4	30'-0"	4	LS	0		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
60	45	#4	11'-0"	4	LS	0		All items under this section are to be copied into Soule under order input-----																							
60	286	#4	23'-0"	4	LS	0																									
60	15	#4	7'-0"	4	LS	0																									
60	16	#5	9'-0"	5	LS	0																									
60	8	#5	9'-8"	5	LS	0																									
60	8	#5	10'-10"	5	LS	0																									
60	80	#6	6'-0"	6	LS	0																									
60	46	#E4	4'-6 3/4"	4	L	0																									
60	6	#E4	4'-10 3/4"	4	L	0																									
60	16	#E4	16'-2 1/2"	4	LS	0																									
60	3	#E4	4'-0"	4	LS	0																									
60	6	#E4	11'-7 1/2"	4	LS	0																									
60	6	#E4	12'-5 1/2"	4	LS	0																									
60	146	#E4	12'-0"	4	LS	0																									
60	16	#E4	12'-7 1/2"	4	LS	0																									
60	16	#E4	17'-2 1/2"	4	LS	0																									
1553																															

Placing Instructions  
L5 Slab Pour 1  
7.40 tons

Grade	Unit	Qty	Item	Type	Total	Part	Tot Lgt	Cut Lgt	Mark	Bend	A	B	C	D	E	F	G	H	K	R	J	O
60			1		8	4	2-0	2-0	4L0049	D				2-0								
			2		96	4	4-6.3	4-6.3	4L0179	02	0-8	4-0										
			3		39	4	6-6.3	6-6.3	4L0181	02	0-8	6-0										
			4		6	4	7-6.3	7-6.3	4L0428	02	0-8	7-0										
			5		146	4	10-0	10-0				10-0										
			6		202	4	12-0	12-0				12-0										
			7		148	4	4-0	4-0				4-0										
			8		16	4	6-0	6-0				6-0										
			9		173	4	30-0	30-0				30-0										
			10		45	4	11-0	11-0				11-0										
			11		286	4	23-0	23-0				23-0										
			12		15	4	7-0	7-0				7-0										
			13		16	5	9-0	9-0				9-0										
			14		8	5	9-8	9-8				9-8										
			15		8	5	10-10	10-10				10-10										
			16		80	6	6-0	6-0				6-0										

# Rebar Modeling and Annotation Efficiencies in Revit

- How to Model More Efficiently?
  - Model Groups
  - Assemblies



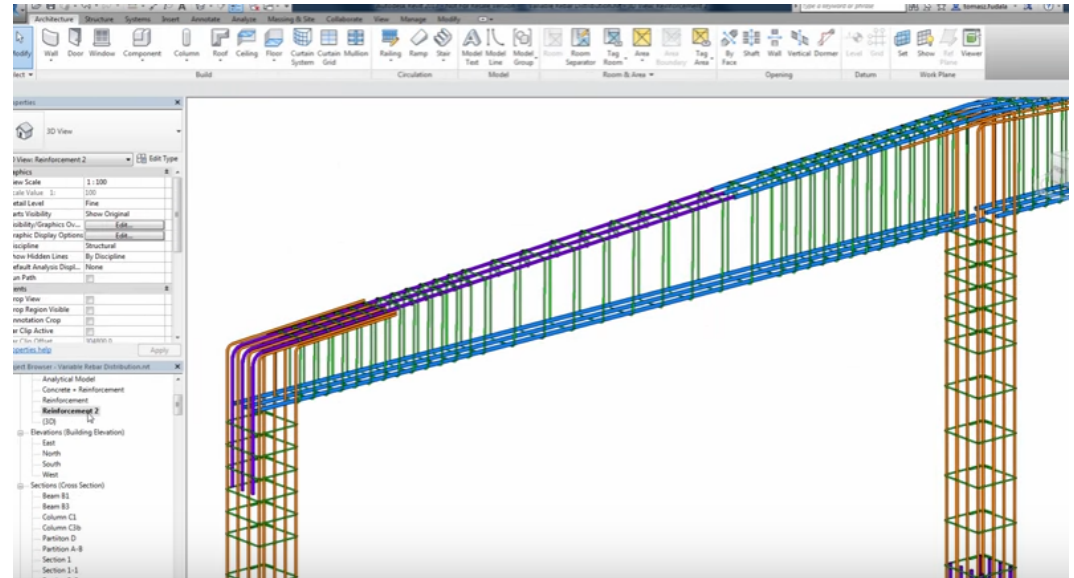
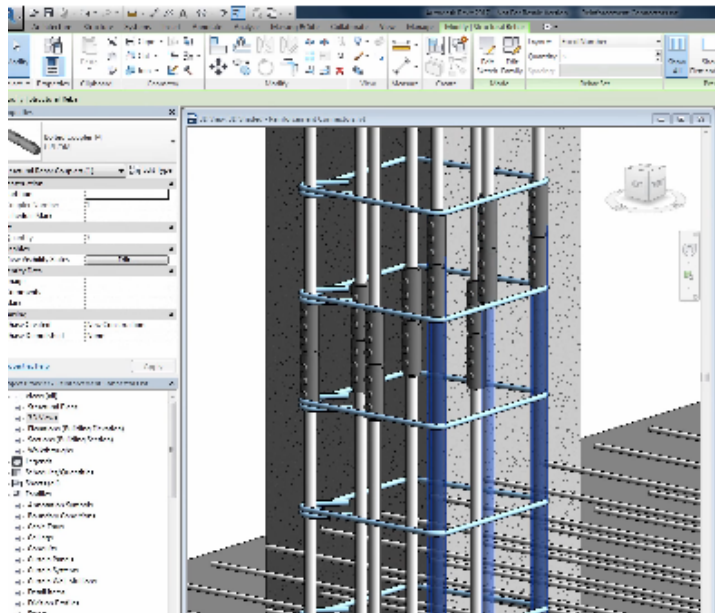
COLUMN REINF. SCHEDULE - SEG 2, LEVEL 03						
TIES PER COLUMN	VERTS PER COLUMN	BAR SIZE	BAR MARK	STRAIGHT BAR LENGTH	BAR USE	SPACING
C1.33	6	#11 Gr 75	11 G 0434		VERT	
	6	#11 Gr 75	11 G 0435		VERT	
5		#4	4 G 0006		TIES	16"
5		#4	4 G 0011		TIES	16"
5		#4	4 G 0013		TIES	16"
C1.36	6	#11 Gr 75	11 G 0398		VERT	
	6	#11 Gr 75	11 G 0419		VERT	
5		#4	4 G 0006		TIES	16"
5		#4	4 G 0011		TIES	16"
5		#4	4 G 0013		TIES	16"
C1C.13	6	#11 Gr 75	- - -	9'-9 3/4"	VERT	
	6	#11 Gr 75	11 G 0358		VERT	
8		#4	4 G 0013		TIES	16"
8		#4	4 G 0355		TIES	16"
	6	#10	- - -	9'-0"	DWL	
C2.23	4	#10	- - -	9'-8"	VERT	
	4	#10	10 G 0420		VERT	
7		#3	3 G 0005		TIES	20"
7		#3	3 G 0037		TIES	20"
	6	#9	- - -	8'-0"	DWL	
C2B.5	10	#10	- - -	9'-4"	VERT	
	2	#10	10 G 0302		VERT	
6		#3	3 G 0369		TIES	20"
6		#3	3 G 0370		TIES	20"
6		#3	3 G 0459		TIES	20"
	7	#9	- - -	8'-0"	DWL	
C3.36	6	#10	10 G 0302		VERT	
7		#3	3 G 0005		TIES	20"
7		#3	3 G 0037		TIES	20"
C3.37	6	#10	10 G 0303		VERT	
7		#3	3 G 0005		TIES	20"
7		#3	3 G 0037		TIES	20"
C3.39	6	#10	10 G 0107		VERT	
7		#3	3 G 0005		TIES	20"
7		#3	3 G 0037		TIES	20"
C4.60	4	#9	9 G 0297		VERT	
7		#3	3 G 0004		TIES	18"





# New Rebar Tools in Revit 2017

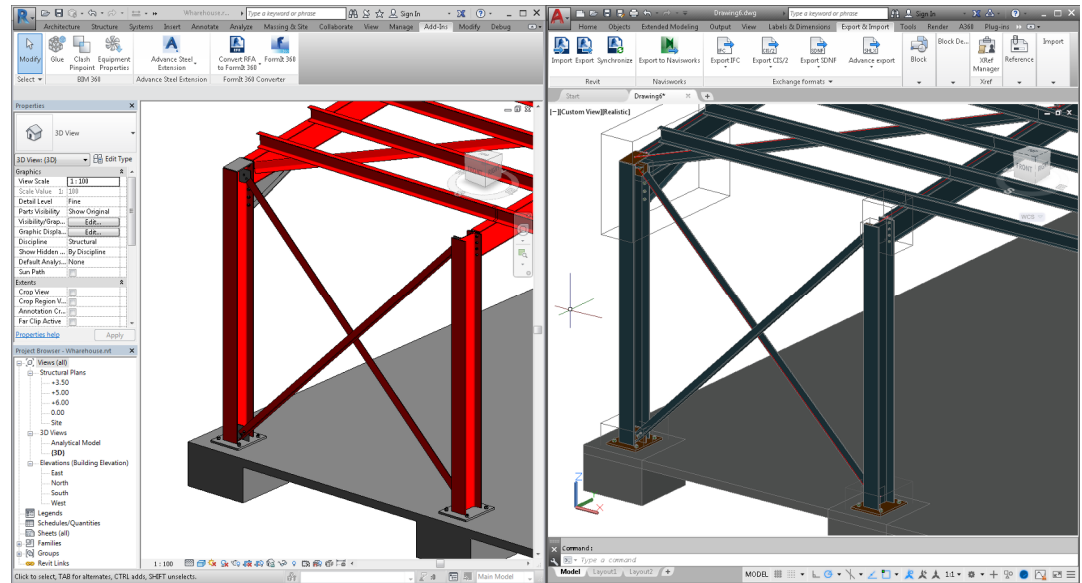
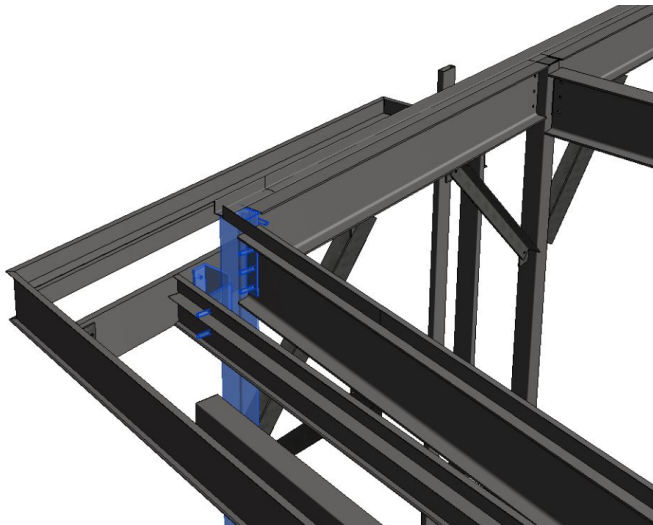
- Reinforcement Connectors
- Variable Rebar Distribution
- Rebar Constraints Enhancements



# Steel Shop Drawings (in Revit)

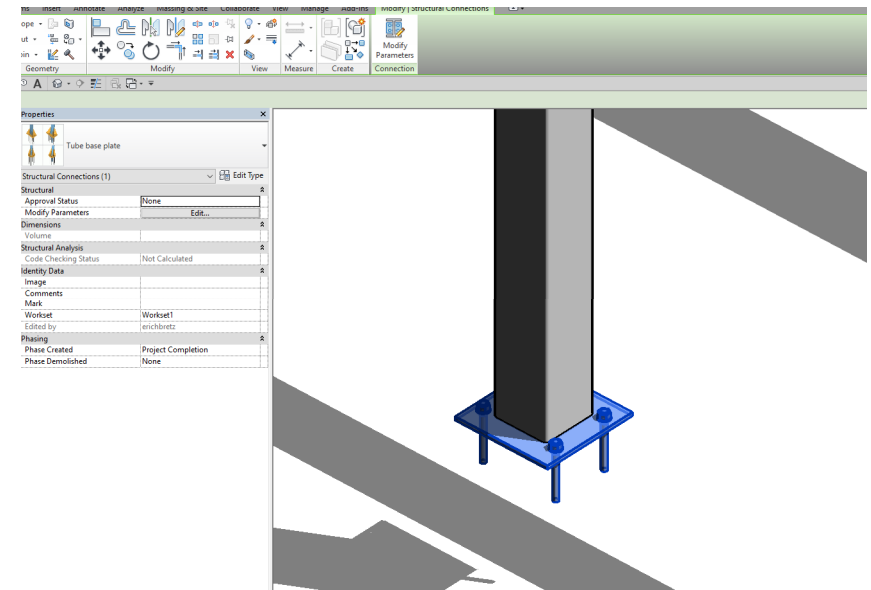
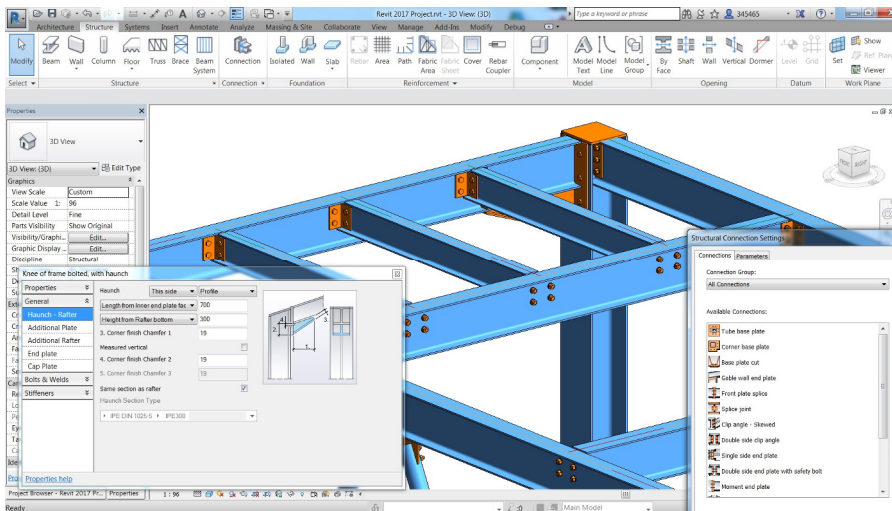
- Benefits:

- Reduces Lead Time on Steel
- Revit Integration with Advance Steel
  - Design Model sent to Detailing



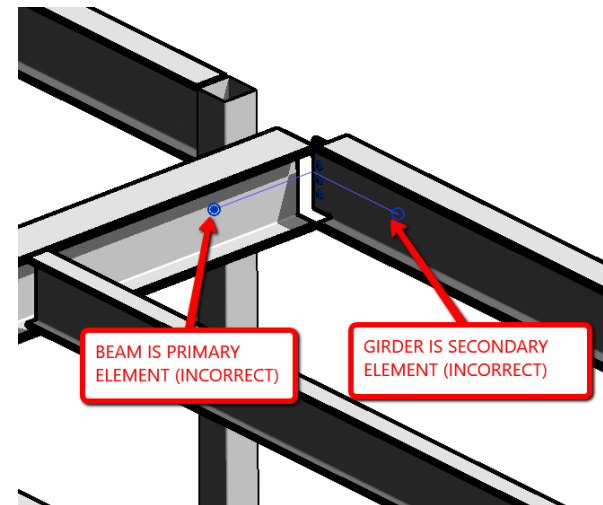
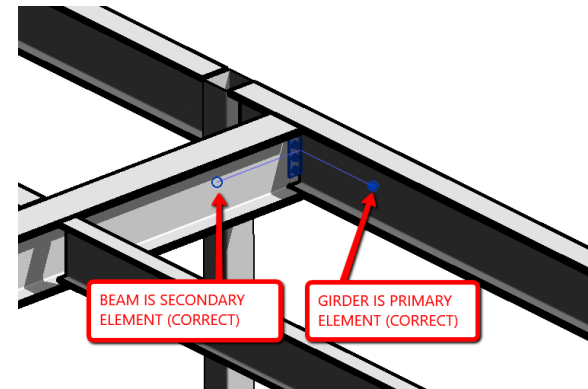
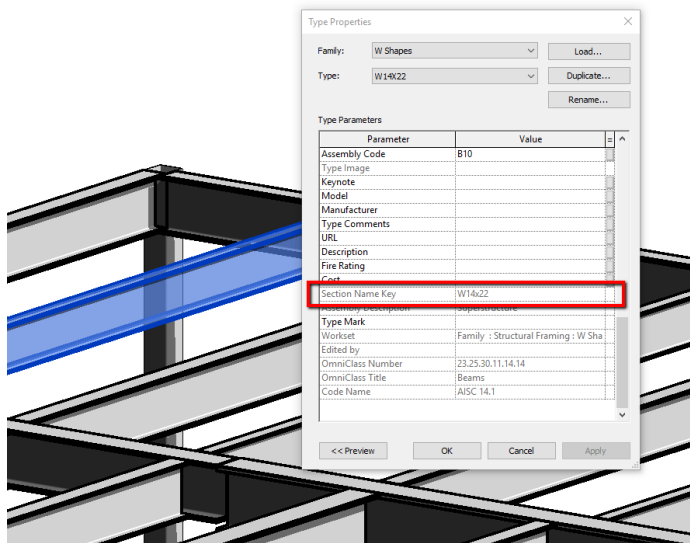
# Steel Shop Drawings (in Revit)

- Detriments:
  - Need for Single Part Sheets
  - No Automation of Repetitive Tasks (Dimensioning)
  - No CNC Output
  - Creating Complex Connections is Very Difficult
  - Complex Elements (Stairs) are Difficult to Model
  - Steel Connections Cannot be Added To Assemblies



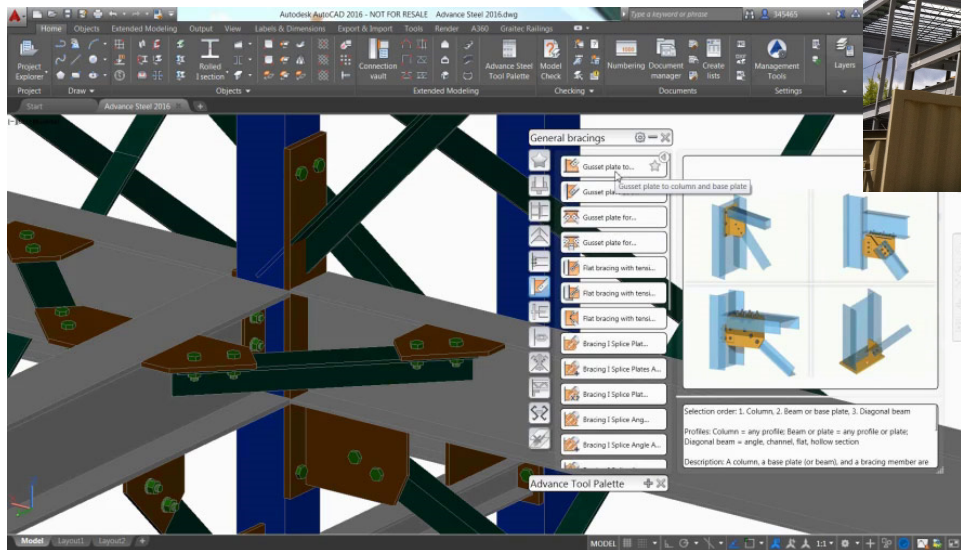
# Steel Shop Drawings – Connection Module

- New AISC Shapes
- Connection Library
- Common Errors
- Connections Exported to Advance Steel



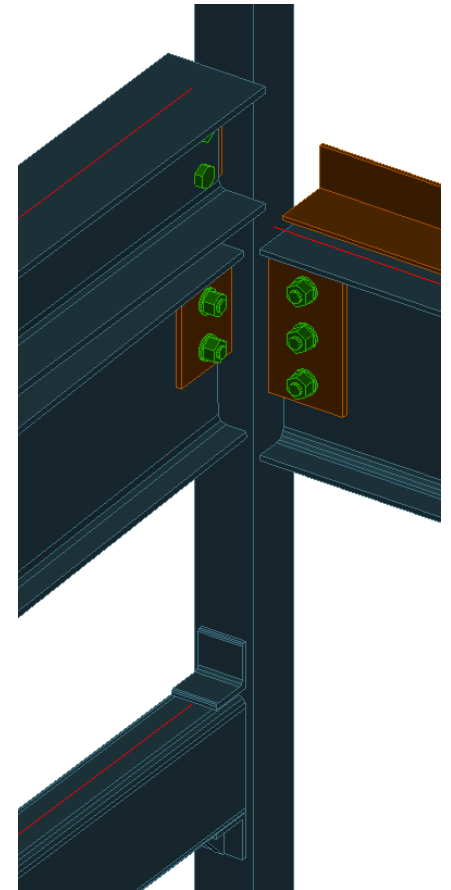
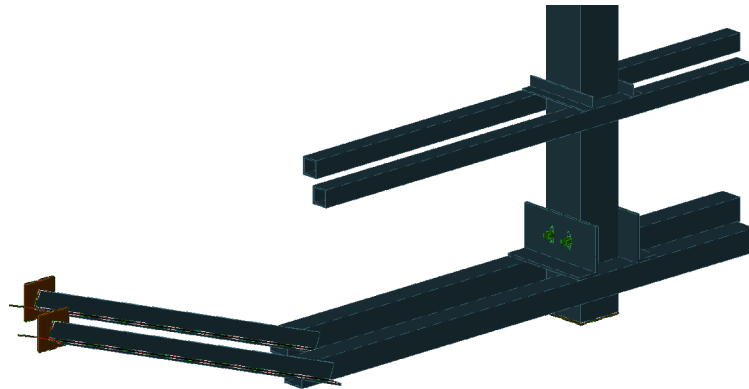
# Structural Steel Drawings

- Modeling / Documentation Requires:
  - Extreme Precision
  - Knowledge of Fabrication Techniques
  - Relationship with Fabricator



# Steel Shop Drawings – Advance Steel!

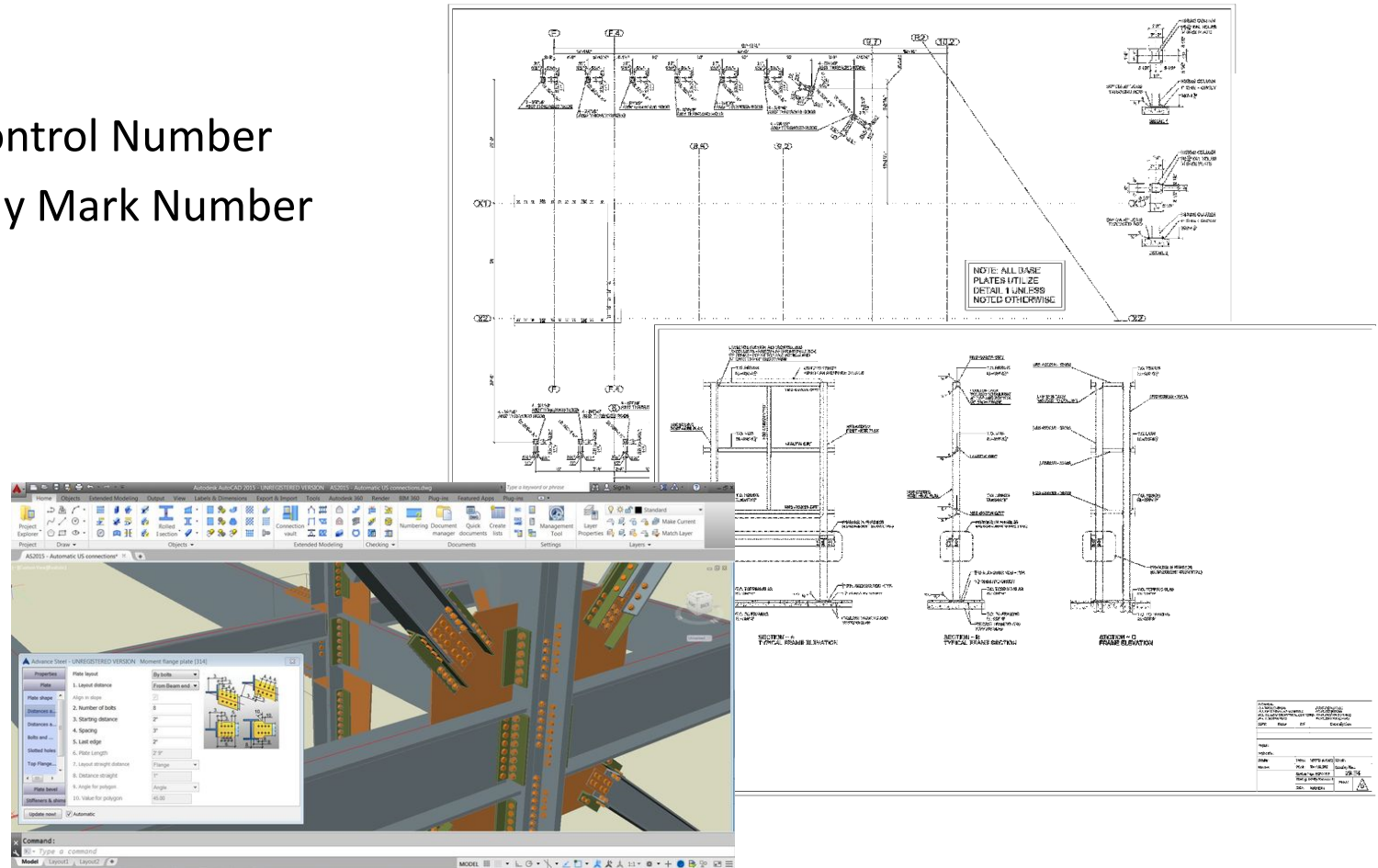
- True Steel Detailing Software
- Allows Extensive Customization of Drawings
- Custom Connection
- Automates Repetitive Tasks
- CNC Output
- Import Geometry and Connections from Revit Model





# Steel Shop Drawings – Misc Metals in Revit

- Parameters:
  - Piece Control Number
  - Assembly Mark Number
  - Host



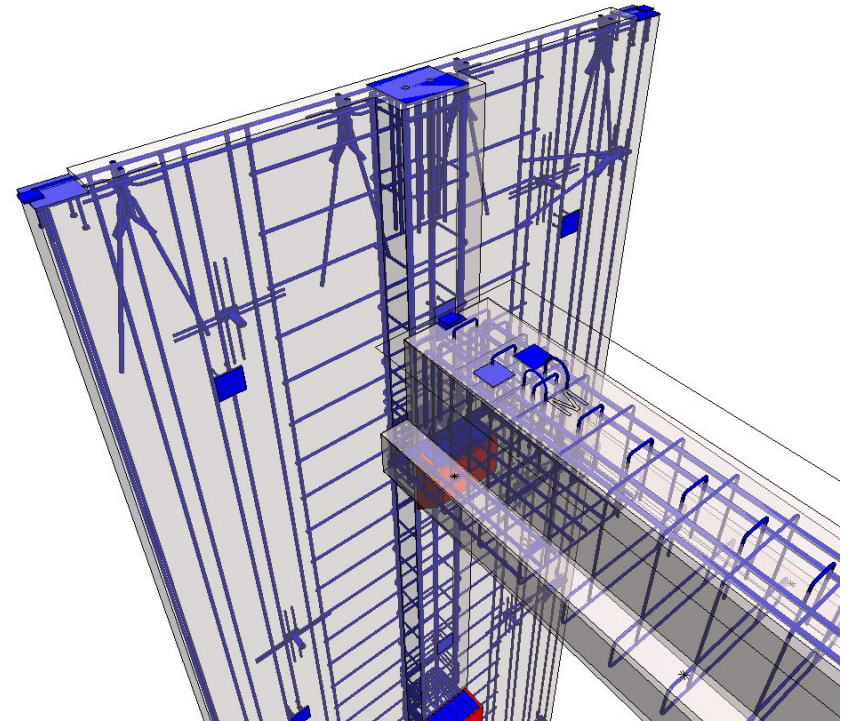
# Precast Concrete Shop Drawings

- Benefits:
  - Most Knowledgeable Entity Modeling Precast Element
  - Eliminate Duplication of Effort
  - Clash Detection with Actual Framing
  - Reduced Project Delivery Time
  - Improved Accuracy



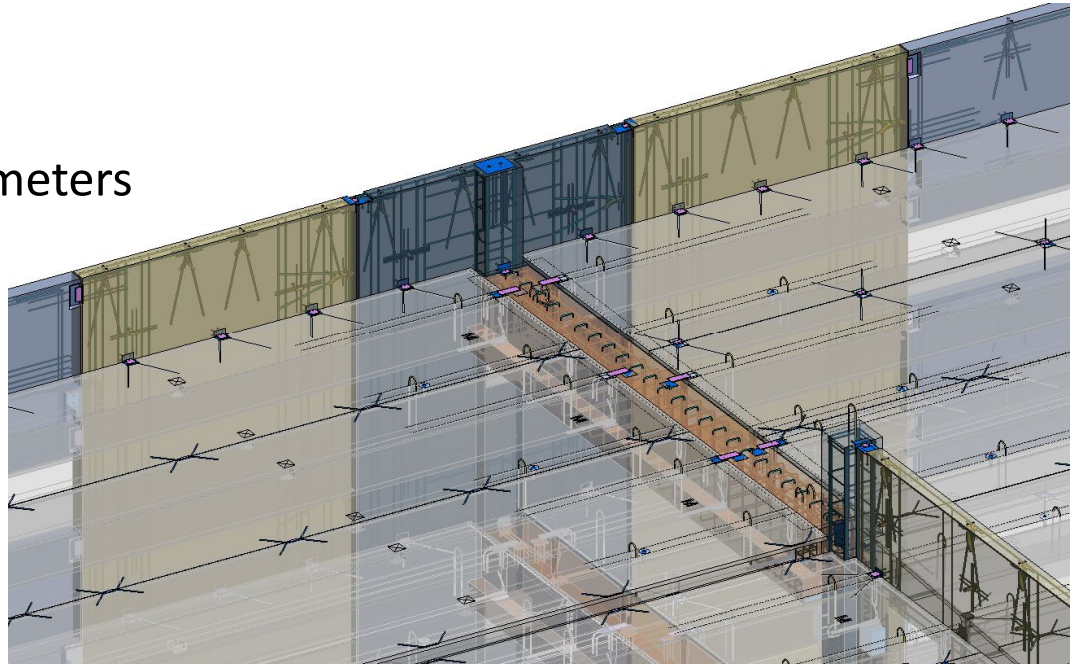
# Precast Concrete Shop Drawings – Assemblies

- Each Piece -> Assembly
  - Allows Independent Tagging, Scheduling, and Filtering
- Piece Drawings are Composed of:
  - Assembly Plan / Elevation / Section Views
  - Schedules (Note: not Assembly Schedules)
  - Legends



# Precast Concrete Shop Drawings – Parameters

- Piece Control Number
- Assembly Mark Number
- Plate Host
- Plate Category
- Piece Design Type
- Assembly Weight
- Various view parameters

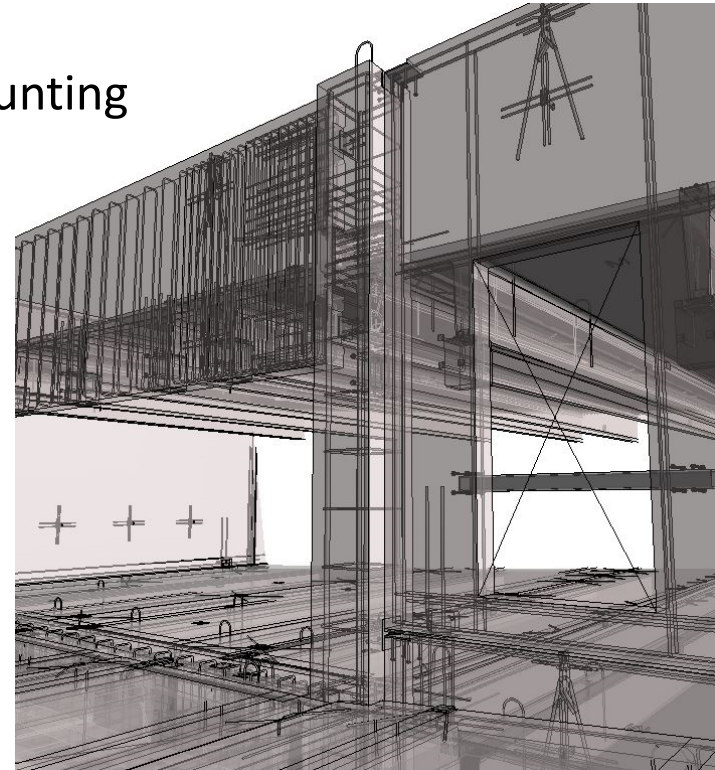




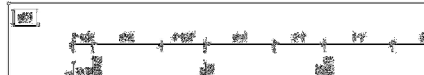
# Precast Concrete Shop Drawings – Schedules

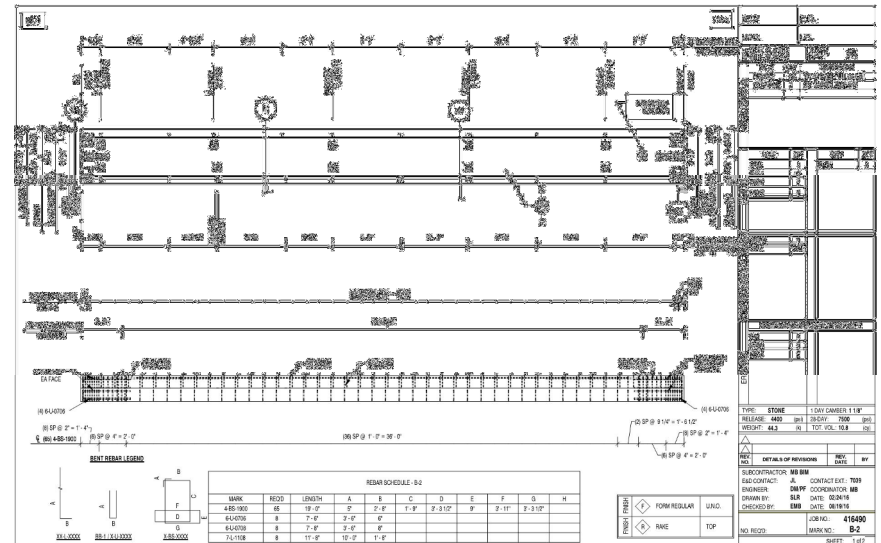
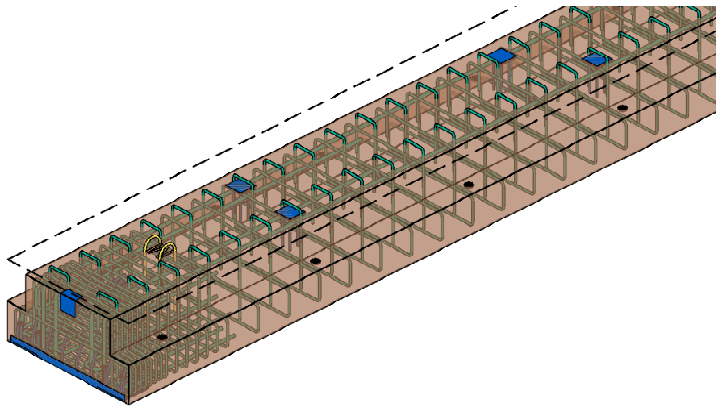
- Piece Drawing Data
- Material and Resource Planning / Piece Counting
- QA / QC
- Product Tracking

PLATES	MK #	QTY	MK #	QTY
	S-28	2	2L-24	4
	P-112	10		
	P-300	2		
STANDARD PLATES				
STRAIGHT AND STD. REBAR	8-3704	2		
	BB-1	43		
STANDARD REBAR				
FOR ENGINEERING AND FIELD USE ONLY				
ERECTION	E-4	2		
	E-48	2		
ERECTION MATERIAL				
TYPE: STONE 1 DAY CAMBER: 1"				



# Precast Concrete Shop Drawings – Legends

- Use for Items that are Used Over and Over
    - Typical piece details (used by several pieces in the project)
    - Rebar bend diagrams
    - Piece finish legends
    - Piece end indicators (end 1 – end 2)
    - Assembly view titles
- 





# Precast Concrete Shop Drawings – 3<sup>rd</sup> Party Tools

- Edge^Revit ([www.EdgeForRevit.com](http://www.EdgeForRevit.com))
- AGACAD ([www.AGA-CAD.com](http://www.AGA-CAD.com))

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