

Precast Concrete Construction – Why Should I Use Revit?

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Class summary

The delivery of precast concrete structures is facing a dramatic change in how these structures are documented, fabricated, and constructed. Due to the presence of highly effective 2D tools, the precast industry has been slow to adopt the use of Revit. At the same time, other structural systems that have adopted BIM have been able to achieve certain advantages in the marketplace. However, unique qualities of precast construction, most notably the speed of construction and the turnkey nature of the delivery of the structure, creates the ability for a precast concrete manufacturer to gain a significant advantage in the marketplace through the use of Revit and BIM in general. We will discuss the use of Revit in precast construction and explore how it can be used to service many aspects of the precast concrete process while improving service to Owners and Developers. Attendees will learn about Revit model creation strategies and workflows and 3rd party tools that can be used in this process.



Key learning objectives

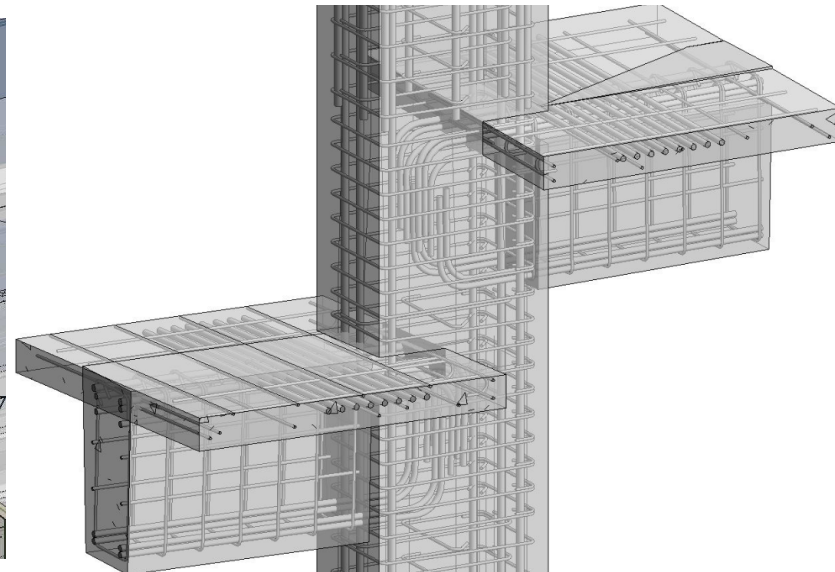
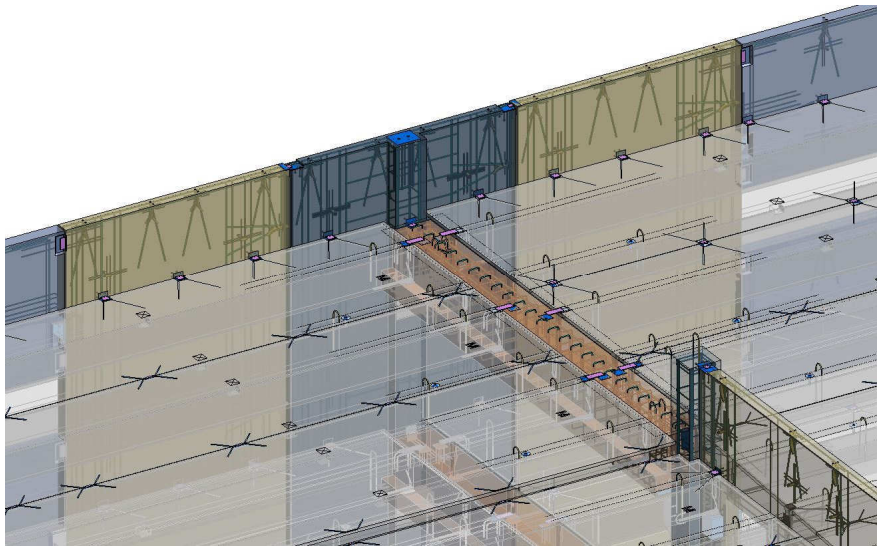
At the end of this class, you will be able to:

- Learn how workflows using Revit can be used to create more opportunities for precast concrete manufacturers in the marketplace for structural systems.
- Demonstrate strategies for delivering precast concrete projects using Autodesk Revit.
- Learn about market trends affecting the selection of structural systems, and how precast concrete can capitalize on these trends through the use of Revit.
- Learn about how data extracted from a fabrication model created in Revit can be used in many aspects of precast concrete delivery.

MB BIM Solutions

A Quick Overview of What We Do:

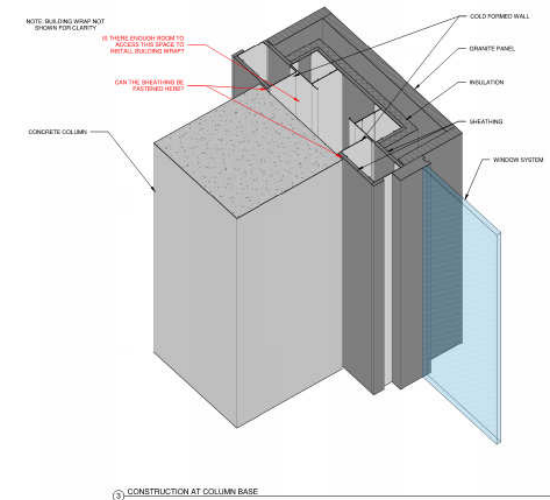
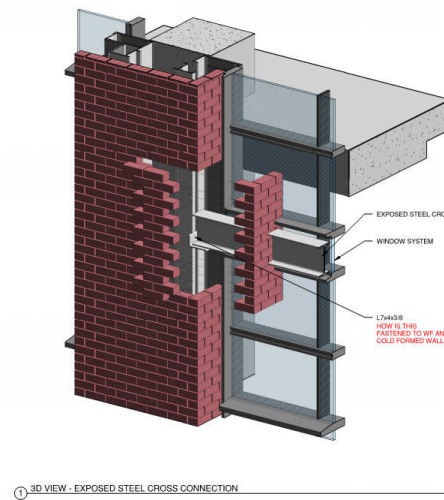
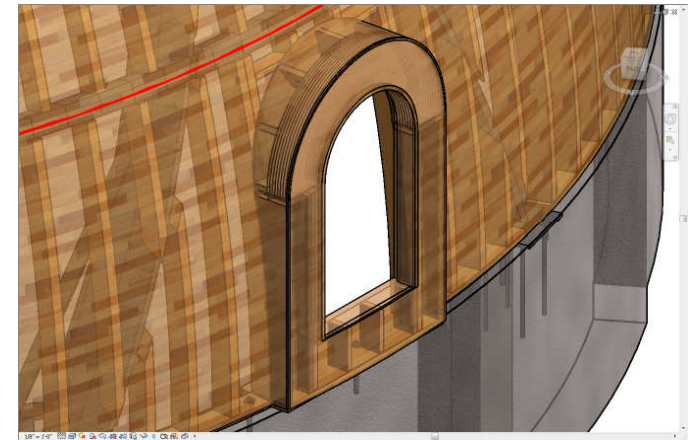
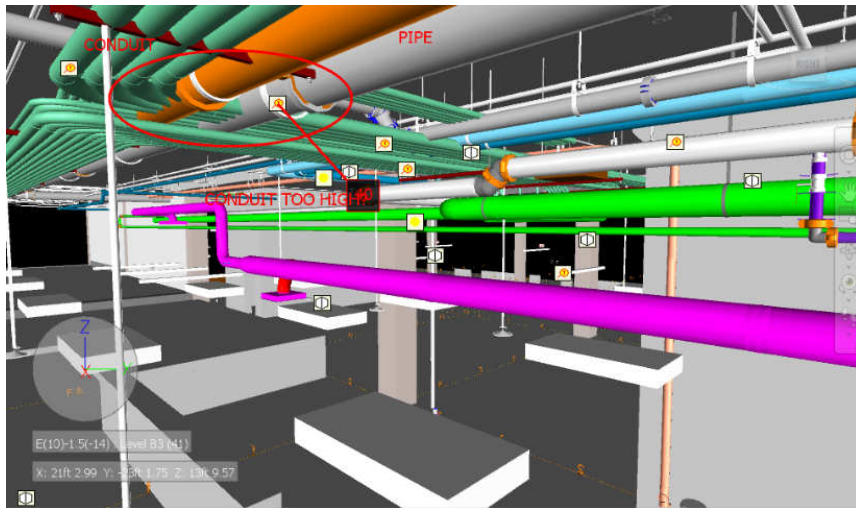
- Fabrication Level Models (and Shop Drawings from these models):
 - Rebar, Precast, Structural Steel and Miscellaneous Metals



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A Quick Overview of What We Do:

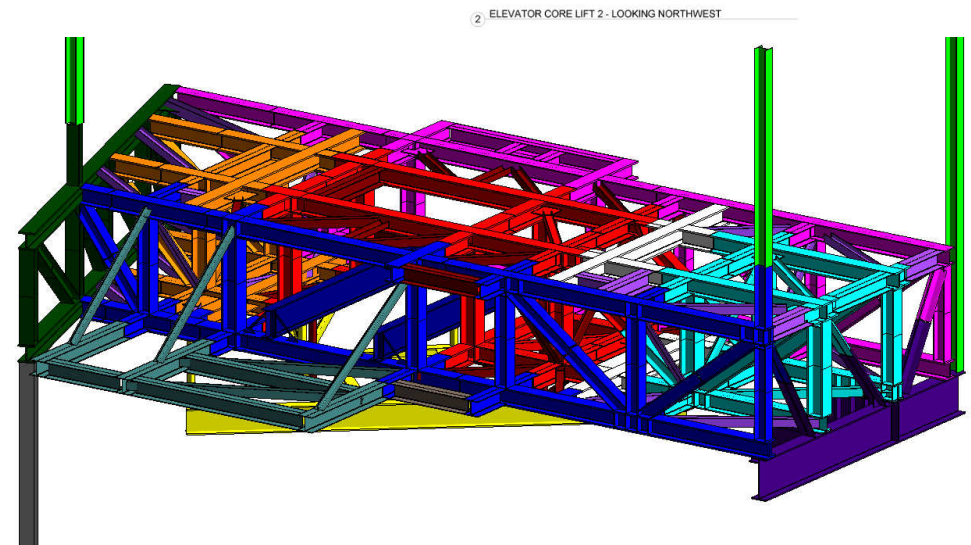
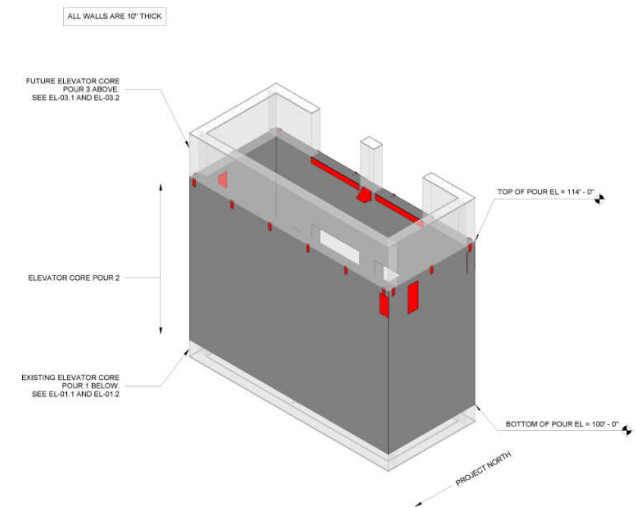
- Navisworks Coordination
- Custom Modeling
 - Virtual Mock-Ups, Constructability Studies



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A Quick Overview of What We Do:

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

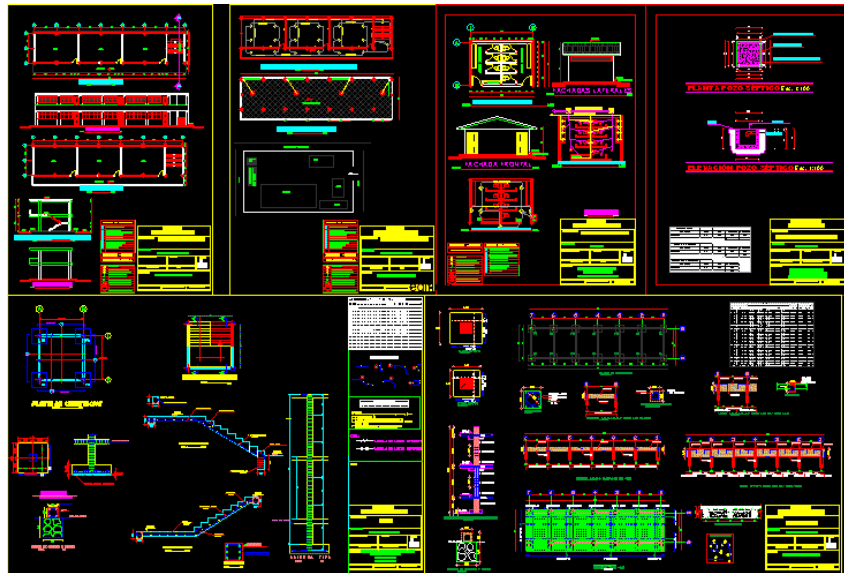
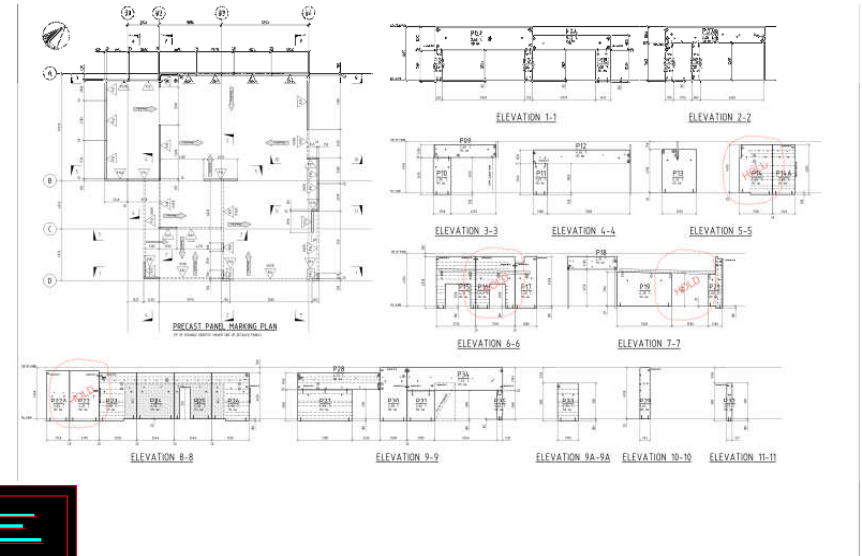


Summary

- Current AutoCAD-based Tools Used to Document Precast Concrete
 - Pros and Cons
- Market Trends Affecting Precasters
- How Precast Concrete Structures are Different than Other Structural Systems
- What Opportunities Does this Present?
- Revit Workflows and How They Are Different from AutoCAD WorkFlows
- Modeling Philosophy:
 - Assemblies
 - Parameters
 - Schedules
 - Legends
- 3rd Party Tools
- Future!

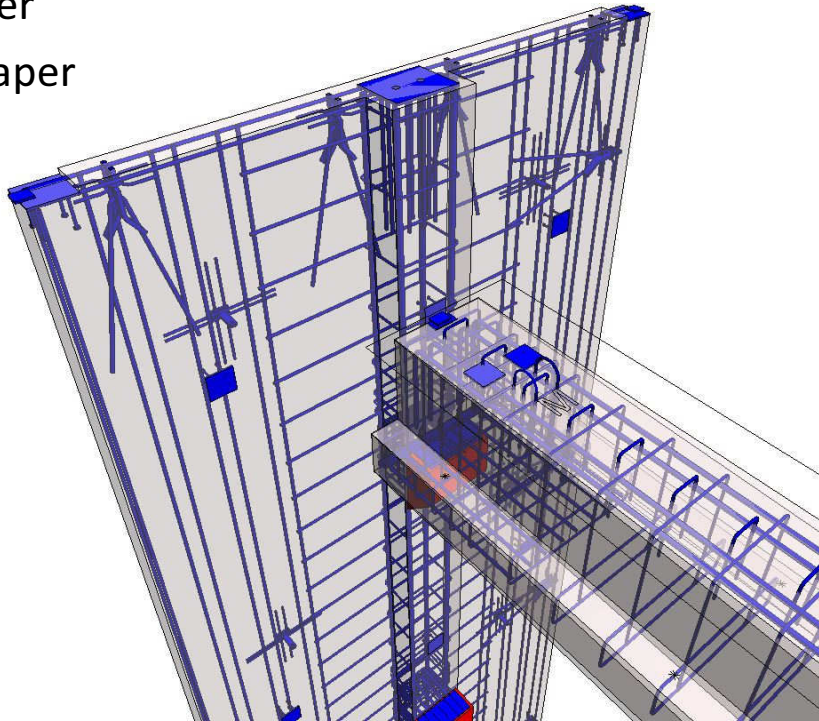
AutoCAD-Based Tools

- Automation
- Pseudo-3D / 3D 'Shadow'
- Link Between Erection Drawings and Piece Drawings
- Change Management



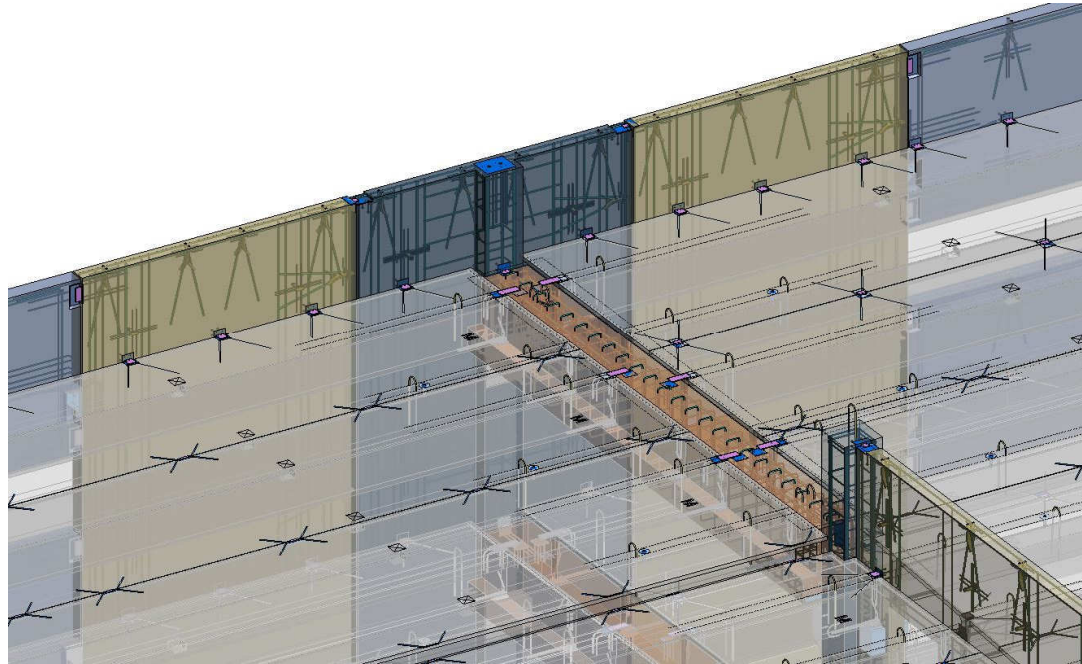
Post 'Great Recession' Trends

- Owners and General Contractors Demanding:
 - Faster
 - Better
 - Cheaper



How is Precast Concrete Different From Other Structural Systems?

- Proprietary System
 - Elements of Design and Construction
- Design Flexibility
 - Structure
 - Architecture
- Installation Speed
- Project Safety
- Better QC/QA



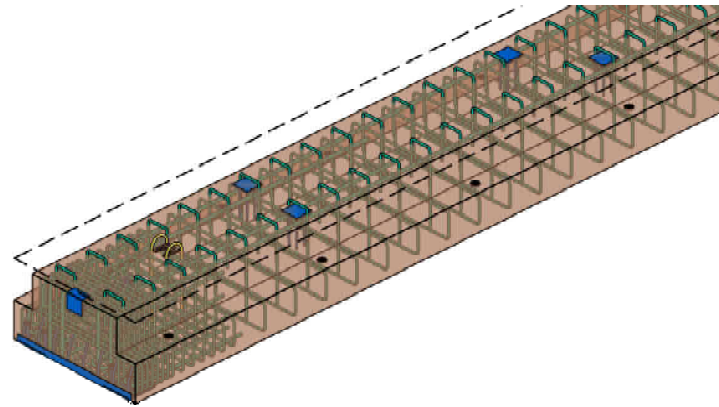
Opportunities For a Revit-Using Precaster

- Enhanced Communication with Designers
 - [SPEED] [QUALITY]
- Use of Revit Allows Construction Activities to Begin During Design / Reduced Time Between Design and Fabrication
 - [SPEED]
- Prevent Duplication of Work
 - [COST]
- Elements Modeled by Entity with the Most Knowledge of the System
 - [QUALITY] [COST]
- Active vs Passive Resolution of Issues
 - [QUALITY] [COST] [SPEED]
- Enhanced Coordination With Other Project Participants
 - [QUALITY]
- Precaster Becomes an Active Project Participant
 - [QUALITY] [COST]
- Improved Internal Processes / Greater Efficiency
 - [COST]



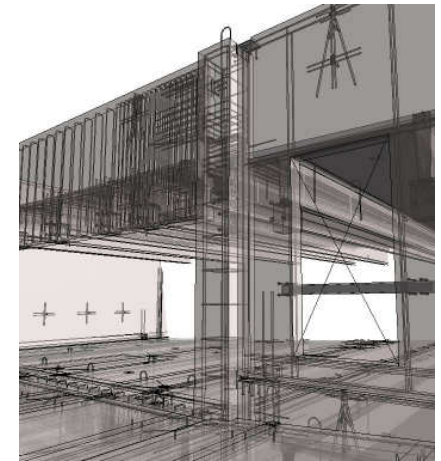
Residual Benefits To a Revit-Using Precaster

- Enhanced Role / Relationship with GCs and Owners
- Greater Service to Clients / Opportunity for Precaster to Add Value Elsewhere on Projects
- Data Collection
- Revit is Easier to Use Than AutoCAD



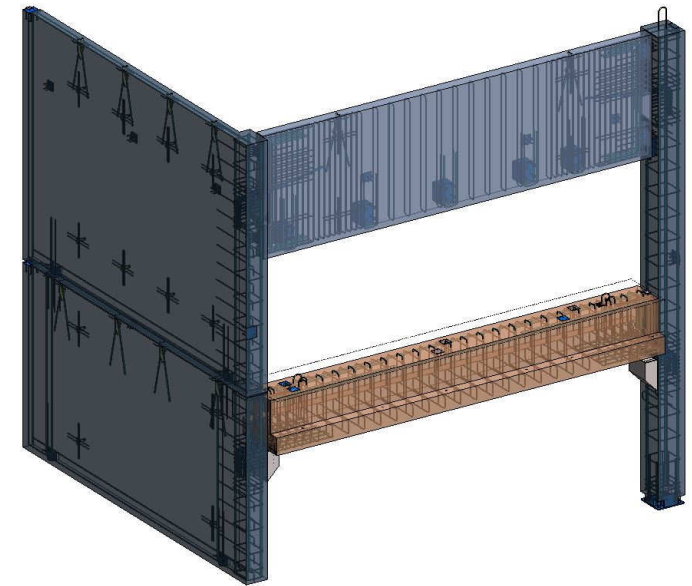
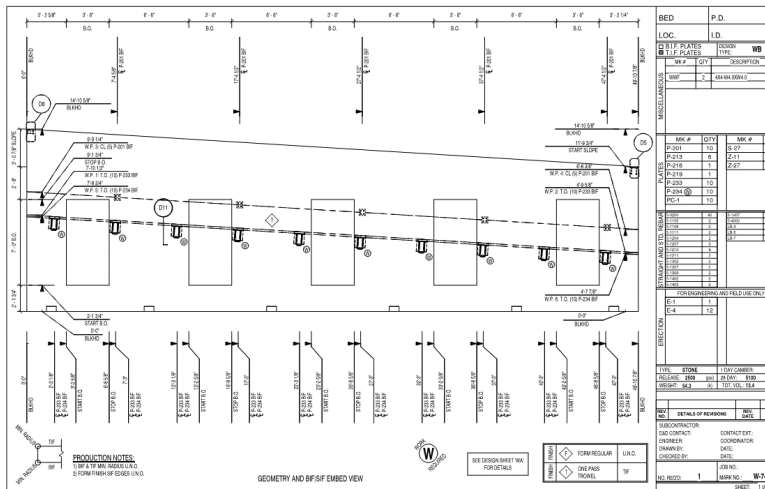
Precast Concrete Shop Drawings – General Workflow Strategy

- 3D vs 2D – What Workflows are Different?
 - Early Identification of Key Issues
- Communicate Proactively!
- Become Part of the Regular Design Team Model Exchange.
- Modeling:
 - What Are the Needs of Other Project Participants?
 - What Items are Likely to Change, and How Do We React to Those Changes?
 - What Items Will Be Difficult to Revise Later?
- Distribute Models and Drawings Regularly to Precaster



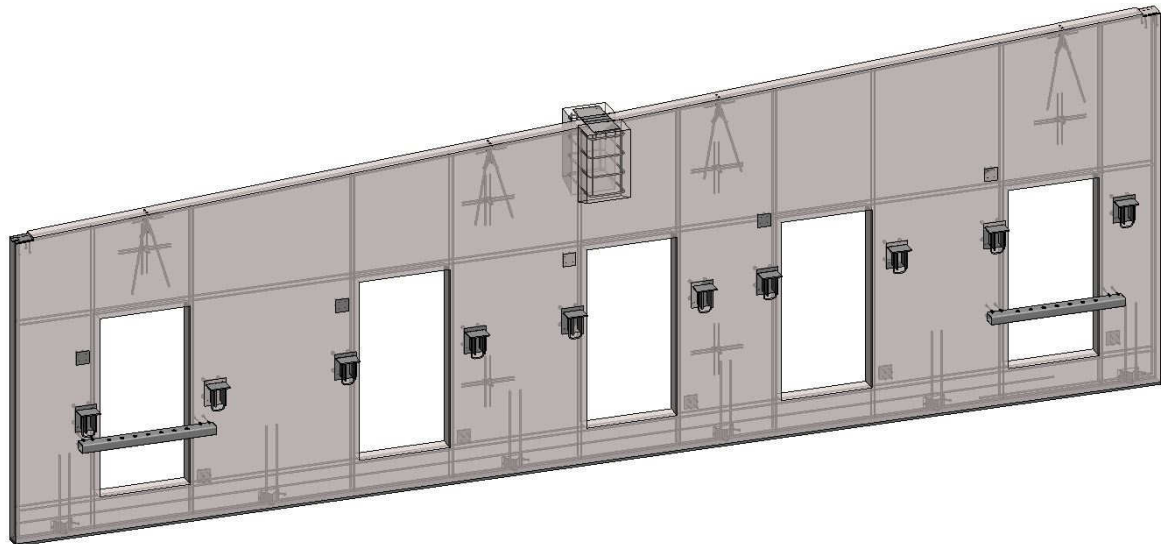
Precast Concrete Shop Drawings – Assemblies

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



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
- QC/QA
- Piece Marking
- Product Tracking

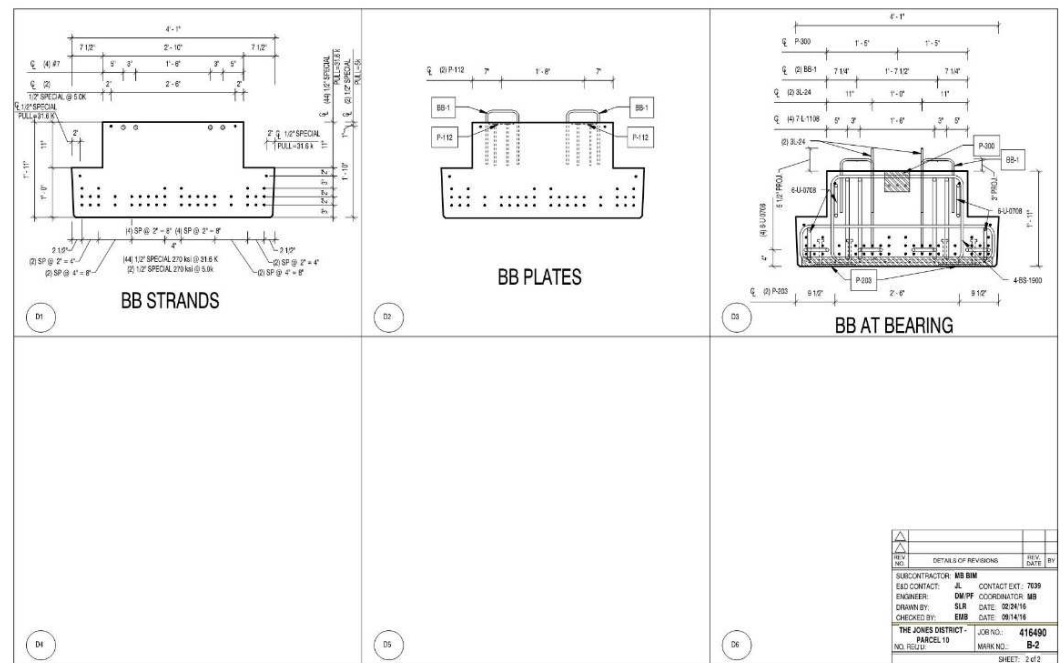
	MK #	QTY	MK #	QTY
PLATES	S-28	2	2L-24	4
	P-112	10		
	P-300	2		
STANDARD PLATES				
STRAIGHT AND STD. REBAR	8-3704	2		
	BB-1	43		
STANDARD REBAR				
FOR ENGINEERING AND FIELD USE ONLY				
ERECTION	E-4	2		
	E-48	2		
ERECTION MATERIAL				
TYPE: STONE 1 DAY CAMBER: 1"				

Rebar Bend Diagram - HU and U
 Rebar Bend Diagram - HV
 Rebar Bend Diagram - HV and HU
 Rebar Bend Diagram - L and CS
 Rebar Bend Diagram - L, HV and CS
 Rebar Bend Diagram - L, HV, HU and CS
 Rebar Bend Diagram - L, U
 Rebar Bend Diagram - L, U, and BS
 Rebar Bend Diagram - U
 Rebar Bend Diagram - U and CS
 SIF VIEW
 SP Detail - 1
 SP Detail - 2
 SP Detail - 3
 SP Detail - 4
 SP Detail - 5
 SP Detail - 6
 SP Detail - 7
 SP Detail - 8
 SP Detail - 9
 SP Detail - 10
 SP Detail - 11
 SP Detail - 12
 SP Detail - 13
 SP Detail - 14
 SP Detail - COVER
 SP Detail - COVER - 2
 ST Detail - 1
 ST Detail - 2
 ST Detail - 3
 ST Detail - A
 ST Detail - Production Notes
 ST Finish Legend
 STRUCTURAL DESIGN CRITERIA
 TITLE - GEOMETRY AND BIF/SIF/EMBED VIEW
 TITLE - GEOMETRY AND BIF/SIF/TIF EMBED VIEW
 TITLE - GEOMETRY AND SIF EMBED VIEW
 TITLE - GEOMETRY, LIFTING & EMBED VIEW
 TITLE - REINFORCING AND LIFTING VIEW
 TITLE - TIF EMBED VIEW
 TITLE - TIF VIEW
 W BEND DIAGRAM - COLUMN WALL
 W Detail - 1

Schedules/Quantities
 *ADVANCE MATERIALS - CONTRACTOR MATERIALS
 *CONCRETE VISION EXPORT - ALL PIECES
 *CONCRETE VISION EXPORT - ALL PLATES
 *CONCRETE VISION EXPORT - ERECTION PLATES
 *CONCRETE VISION EXPORT - PIECES WITH CONTROL NUM
 *EMB WORKING - PLATES
 *EMB WORKING - STRUCTURAL FRAMING
 *PRODUCT HOST QC
 *QC - ALL PIECES - BY CONTROL NUMBER
 *QC - ALL PIECES - GROUPED BY CONSTRUCTION PRODUC
 *QC - COLUMN - PIECE MARK NUMBERS
 *QC - DT - PIECE MARK NUMBER - SORT BY MARK
 *QC - DT - PIECE MARK NUMBER - SORT BY MARK - BAS
 *QC - DT - PIECE MARK NUMBER - SORT BY MARK Copy 1
 *QC - DT - PIECE MARK NUMBERS
 *QC - FLAT SLAB - PIECE MARK NUMBERS
 *QC - ITB - PIECE MARK NUMBERS
 *QC - SPANDRELS - PIECE MARK NUMBERS
 *QC - STAIR - PIECE MARK NUMBERS
 *QC - WALLS - PIECE MARK NUMBERS
 *RBP WORKING - FRAMING
 *RBP WORKING - PLATES
 *SLR WORKING - PLATES BOM
 *SLR WORKING - STRUCTURAL FRAMING
 _PIECE STATUS SCHEDULE
 Assembly Schedule
 BRICK TAKEOFF
 CAST IN MATERIAL FURNISHED BY PRECAST MANUFACTUR
 DRAWING LOG
 DRAWING LOG - ERECTION
 DRAWING LOG - FOUNDATION
 EPOXY SCHEDULE
 ERECTION MATERIAL FURNISHED BY PRECAST MANUFACTL
 Generic Model Schedule 3
 GROUT SCHEDULE
 KOROLATH FURNISHED BY PRECAST MANUFACTURER
 PRECAST CONCRETE PRODUCT SCHEDULE
 PRODUCT SCHEDULE - COLUMN
 PRODUCT SCHEDULE - DOUBLE TEE
 PRODUCT SCHEDULE - LITEWALL HORIZONTAL
 PRODUCT SCHEDULE - LITEWALL VERTICAL
 PRODUCT SCHEDULE - R BEAM

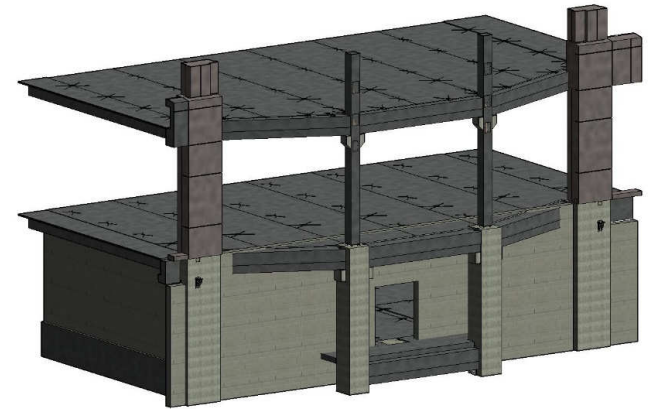
Precast Concrete Shop Drawings – Legends

- 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 (for example, end 1 – end 2)
 - Assembly view titles



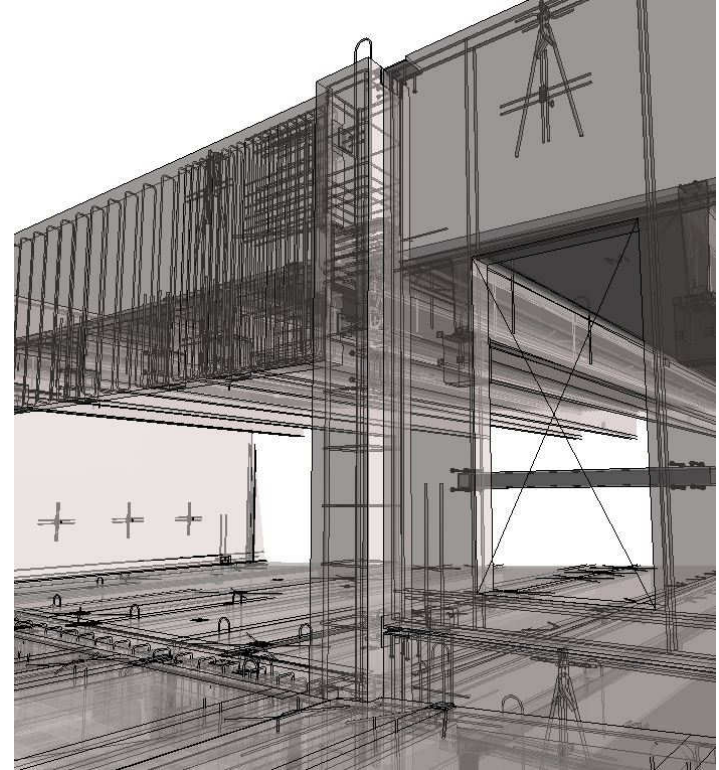
Precast Concrete Shop Drawings – Revit Template

- Standard Embed Families
- Whole Standard Connections
- Precast Product Families
- View Templates for Coordination Views, Erection Drawings, Piece Drawings, etc.
- Custom Parameters, Schedules, Legends, Filters
- Annotation Elements



Precast Concrete Shop Drawings – Advice

- Precision
- Coordination With Other Trades
- Template!
- Working Views



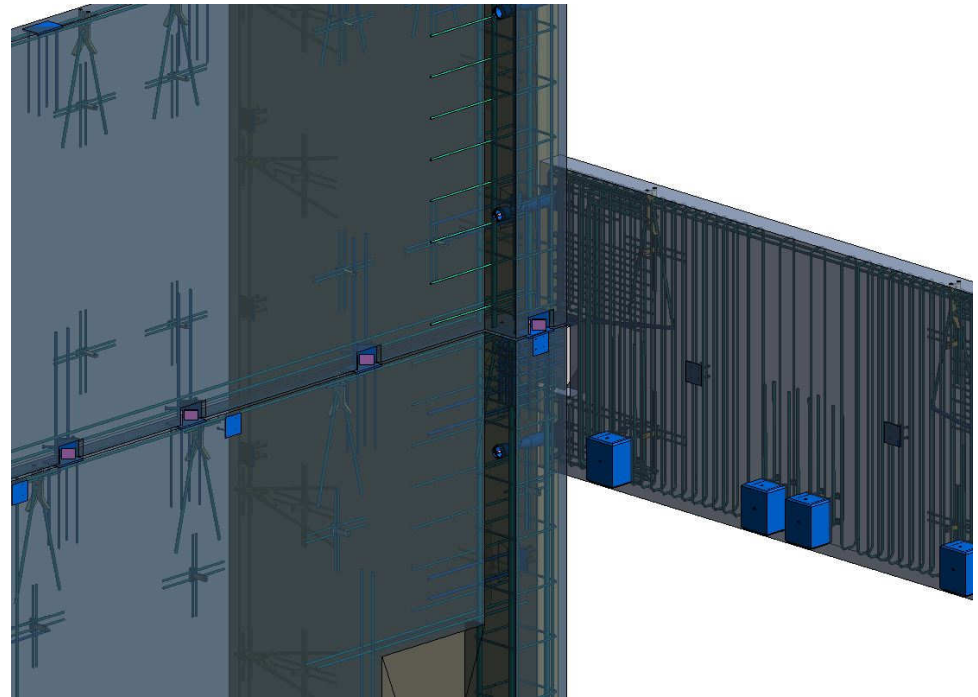
Precast Concrete Shop Drawings – 3rd Party Tools

- Edge^Revit (www.EdgeForRevit.com)
 - Structure for Creating PC Shop Drawings and Piece Drawings
 - Parameters, Schedules, Legends, etc
 - Automatic Creation of Single Assemblies
 - Automatic Creation of Assembly Sheets (View, Schedules, Legends, etc)
 - Ticketing Tools
- AGACAD (www.AGA-CAD.com)
 - Automatic Creation of Single Assemblies
 - Auto-generated Dimensions
 - Automatic Layout of Connections



Revit and Precast Concrete Shop Drawings – It is Not All Well!

- Wish List:
 - Automatic Piece Marking
 - Automatic Creation of Piece Drawings
 - Auto-Dimensioning
 - Single Parts



Precast Concrete Shop Drawings and Revit – Future!

- Estimating
- RFID
- Scheduling / Resource Planning
- Bed Optimization



How did I do?

- Your class feedback is critical. Fill out a **class survey** now.
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- Give feedback after each session.
- AU speakers will get feedback in real-time.
- **Your feedback results in better classes and a better AU experience.**





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