Devil in the detail – Trail blazing fabrication drawings from 3D models

Cécile Karouby

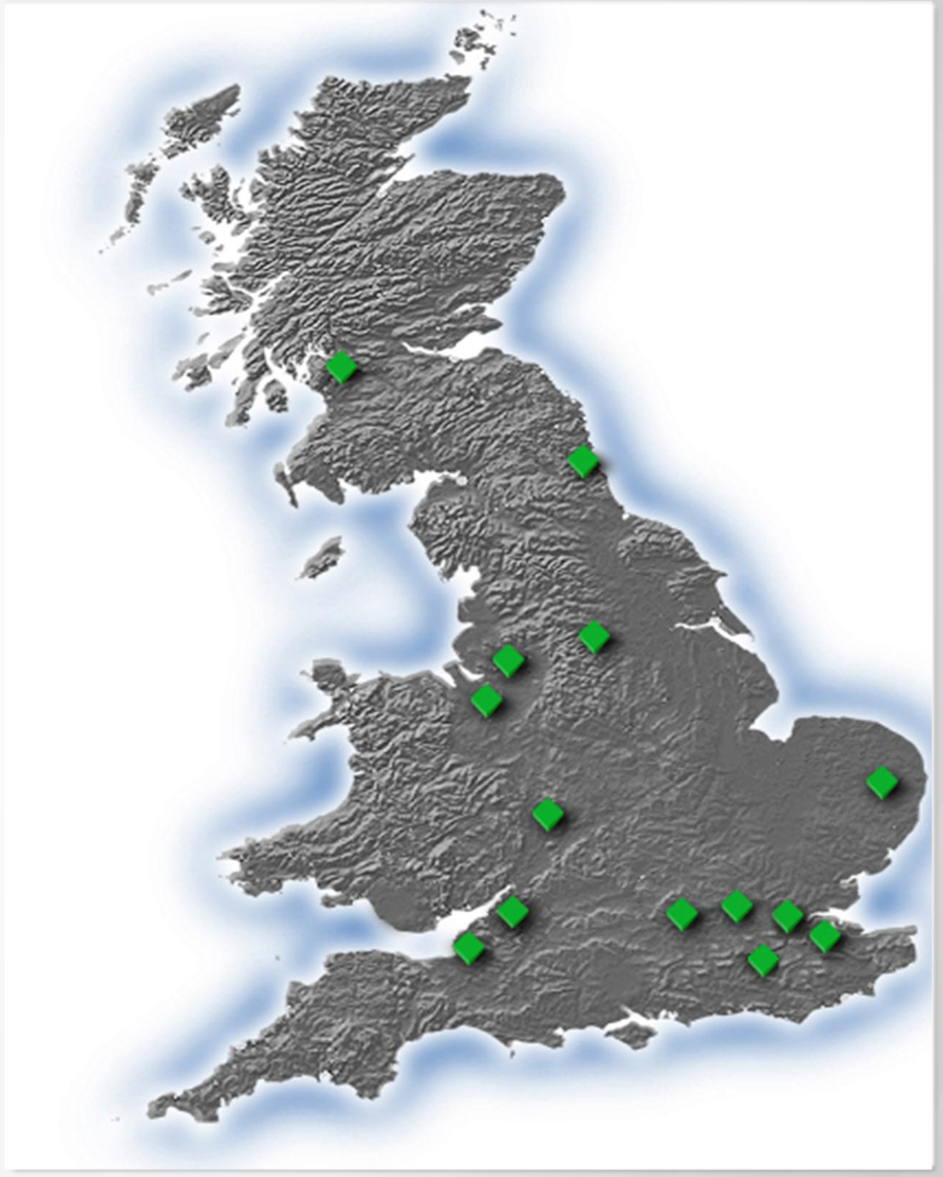
BIM Systems Sector Specialist

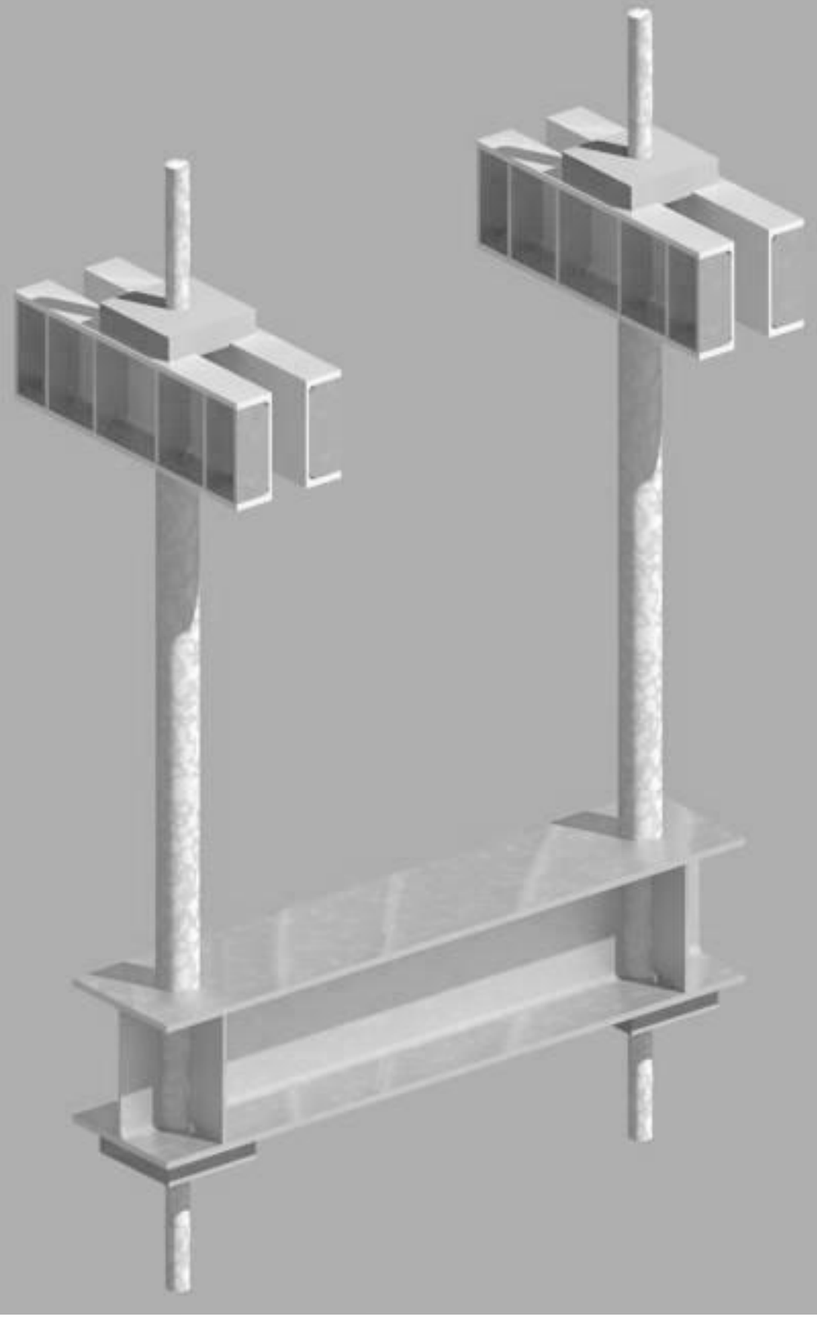
BAM Nuttall – UK

With thanks to: Ash Rahman, Alastair Barbrook

Company overview

- Royal BAM – €13 Billion turnover
- UK Group:
  - BAM Construct – € 1.2 Billion turnover
  - BAM Nuttall – € 1 Billion turnover
  - Operates in all sectors of the civil engineering market
  - More than 3,000 employees
  - Nationwide service through a network of regional offices, and specialist services





Class summary

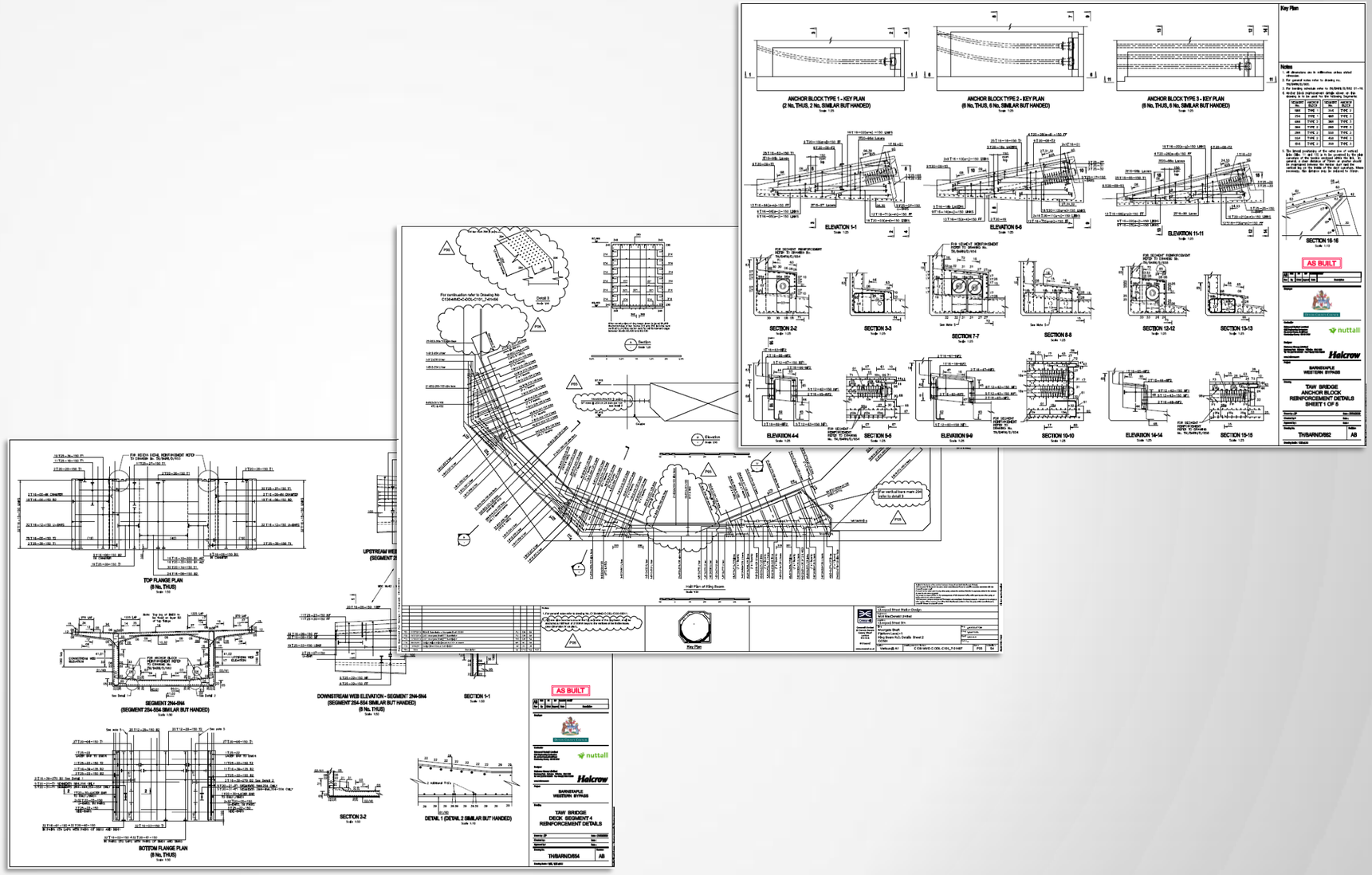
Challenges of new ways of working in design offices to improve the efficiency:

- Using Advance Steel
  - Bolted and welded joint steel fabrications
- Using Revit complementary software SOFiSTiK
  - Reinforced concrete detailing

Civil Infrastructure into the virtual world

Challenges

- Difficult to read
- Hidden clashes
- Missing information

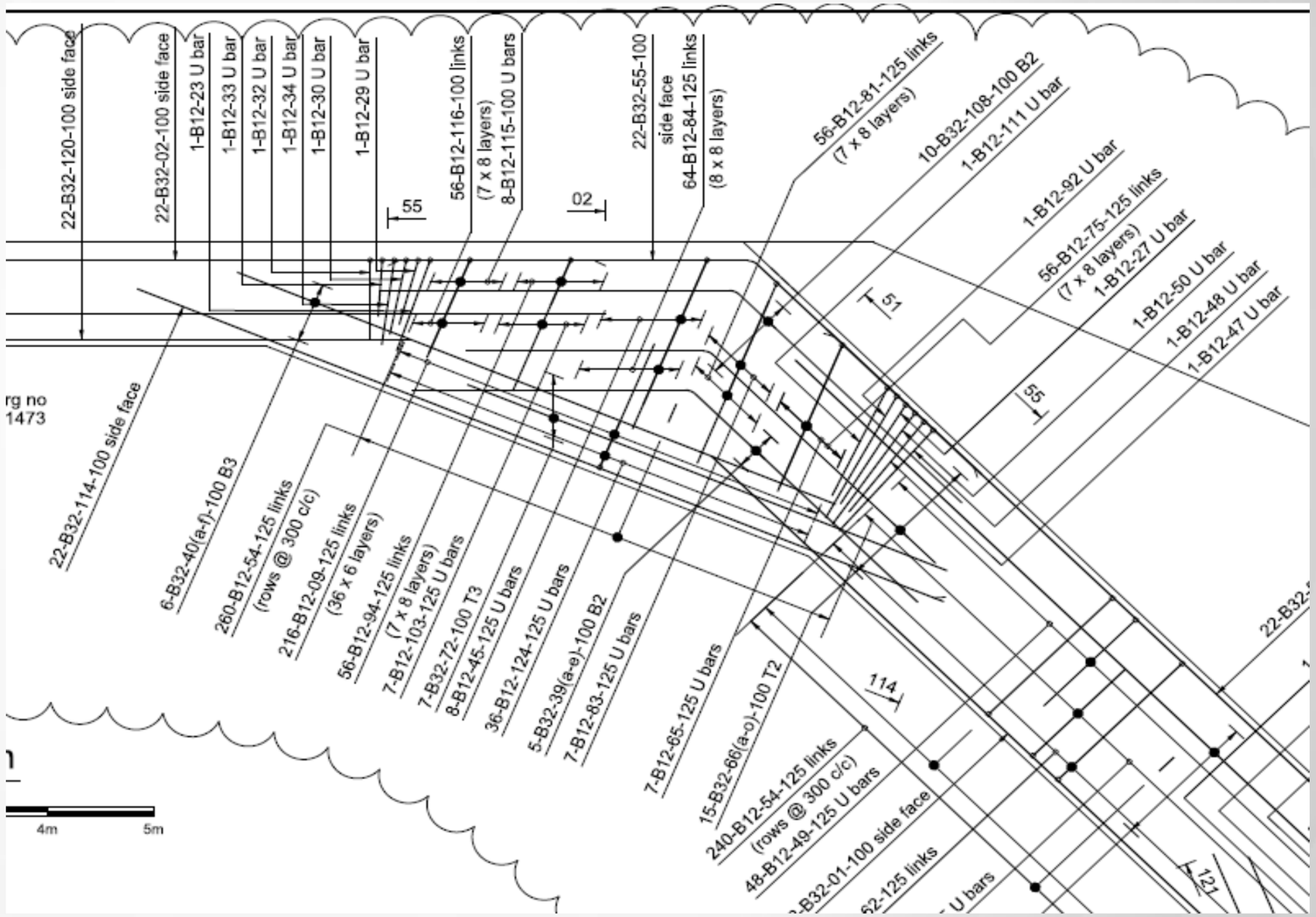


Moorgate Shaft

- What is the challenge?

Moorgate Shaft Ring Beam Reinforcement details

- The devil is in the detail

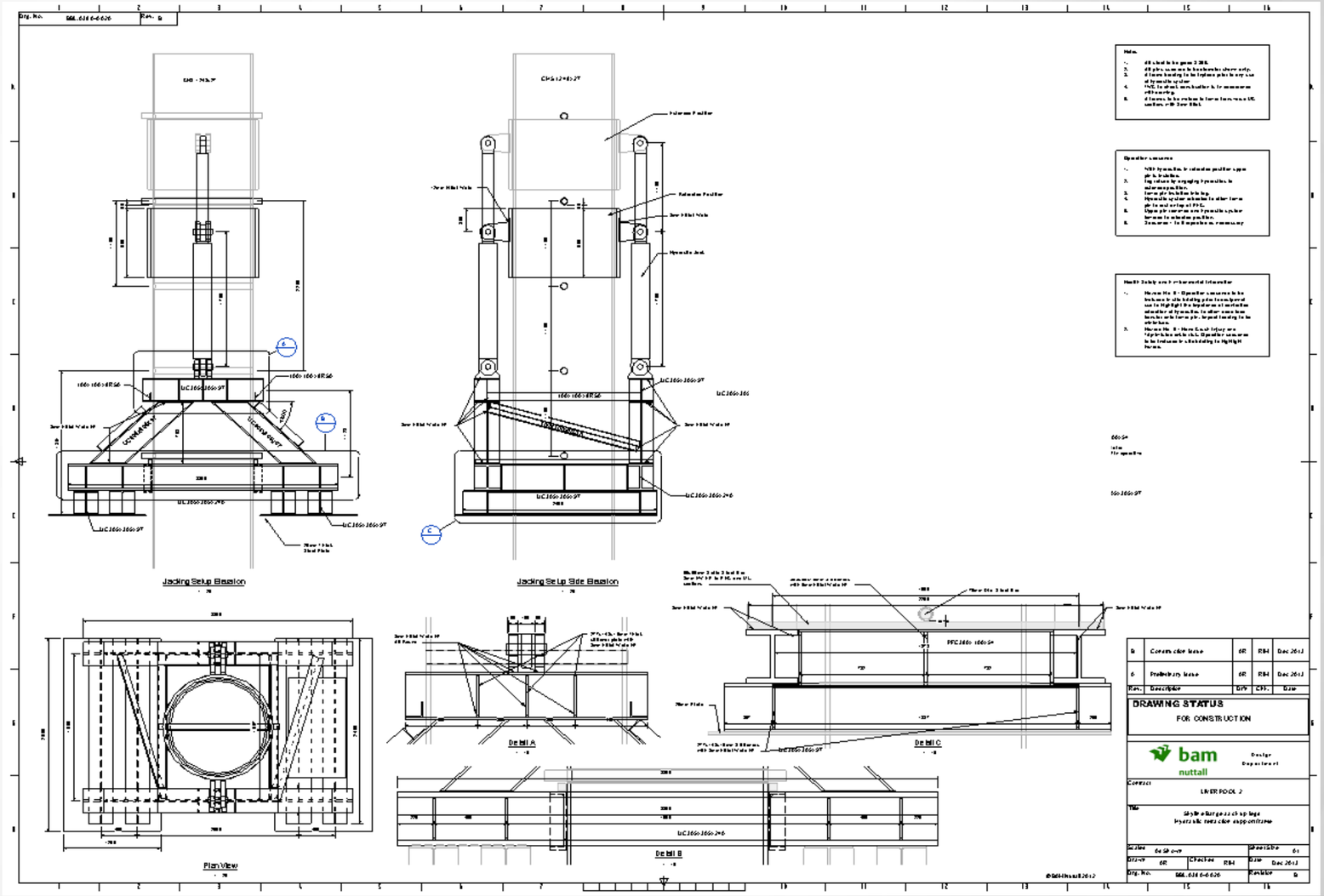


Moorgate Shaft Ring Beam Reinforcement details

- The devil is in the detail

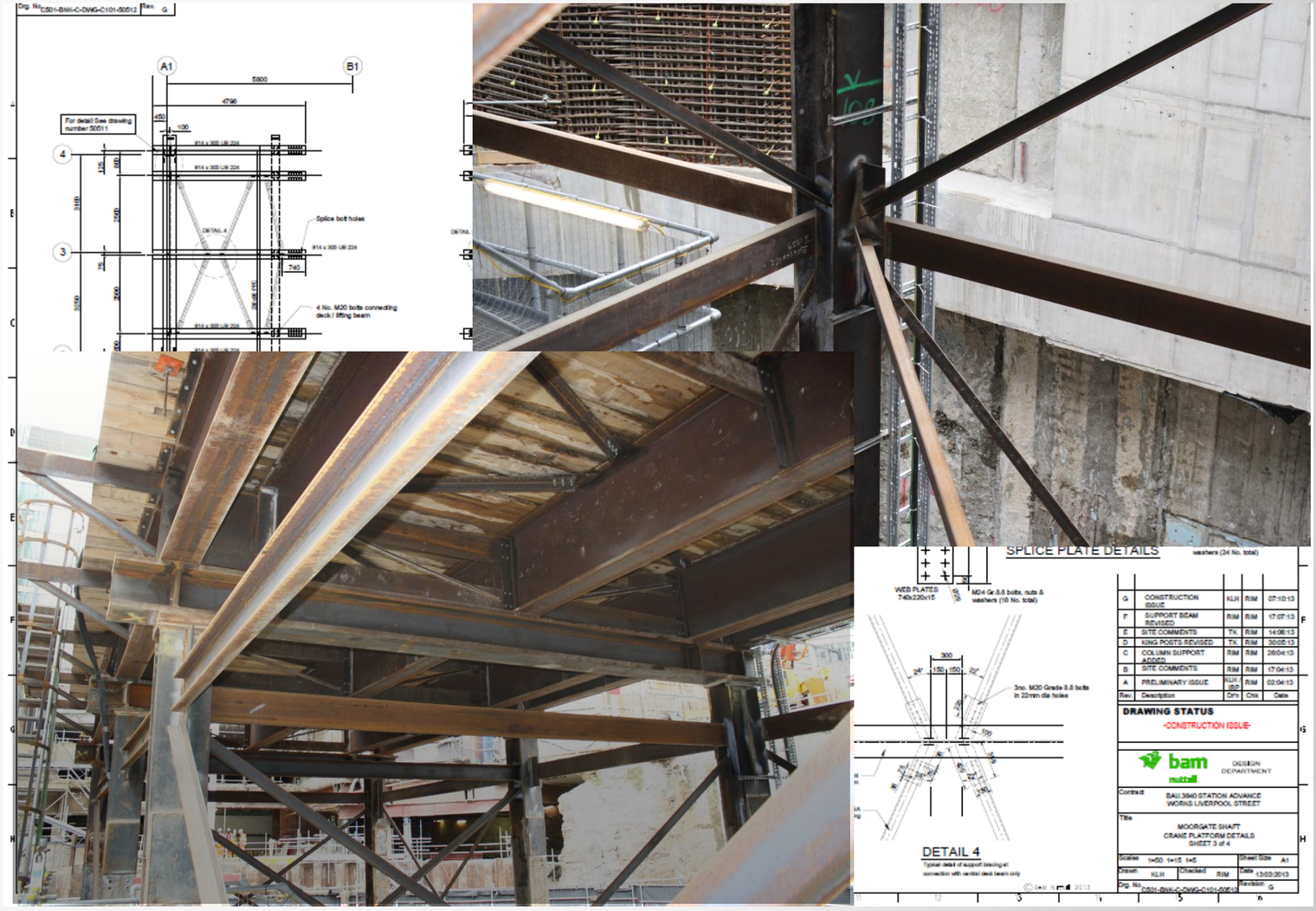
Communication in design

- Improve communication between design and construction teams
- Plenty of detail, but what the devil are we trying to create?



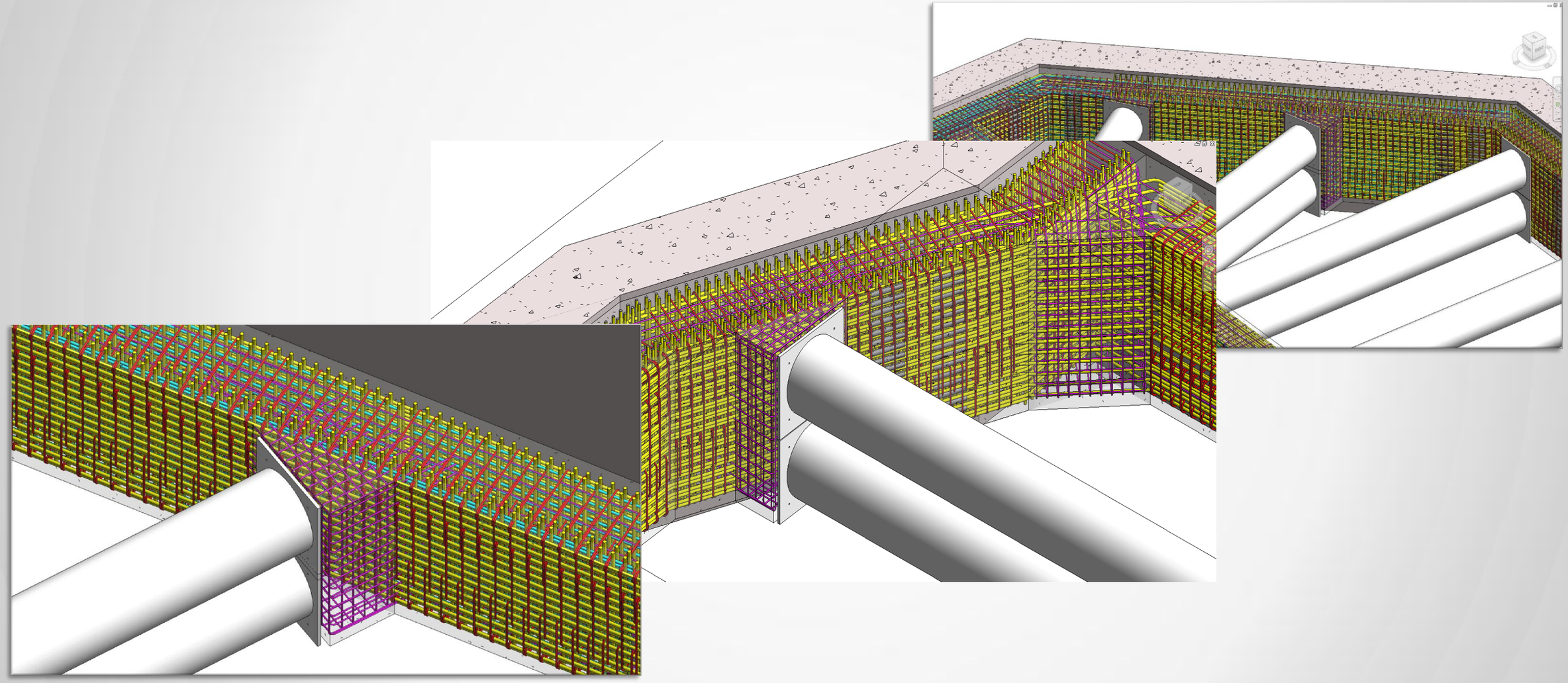
Moorgate Shaft crane platform details

- Understand how the steel sections can be prepared for welding
- Understand if there is access to complete the welding



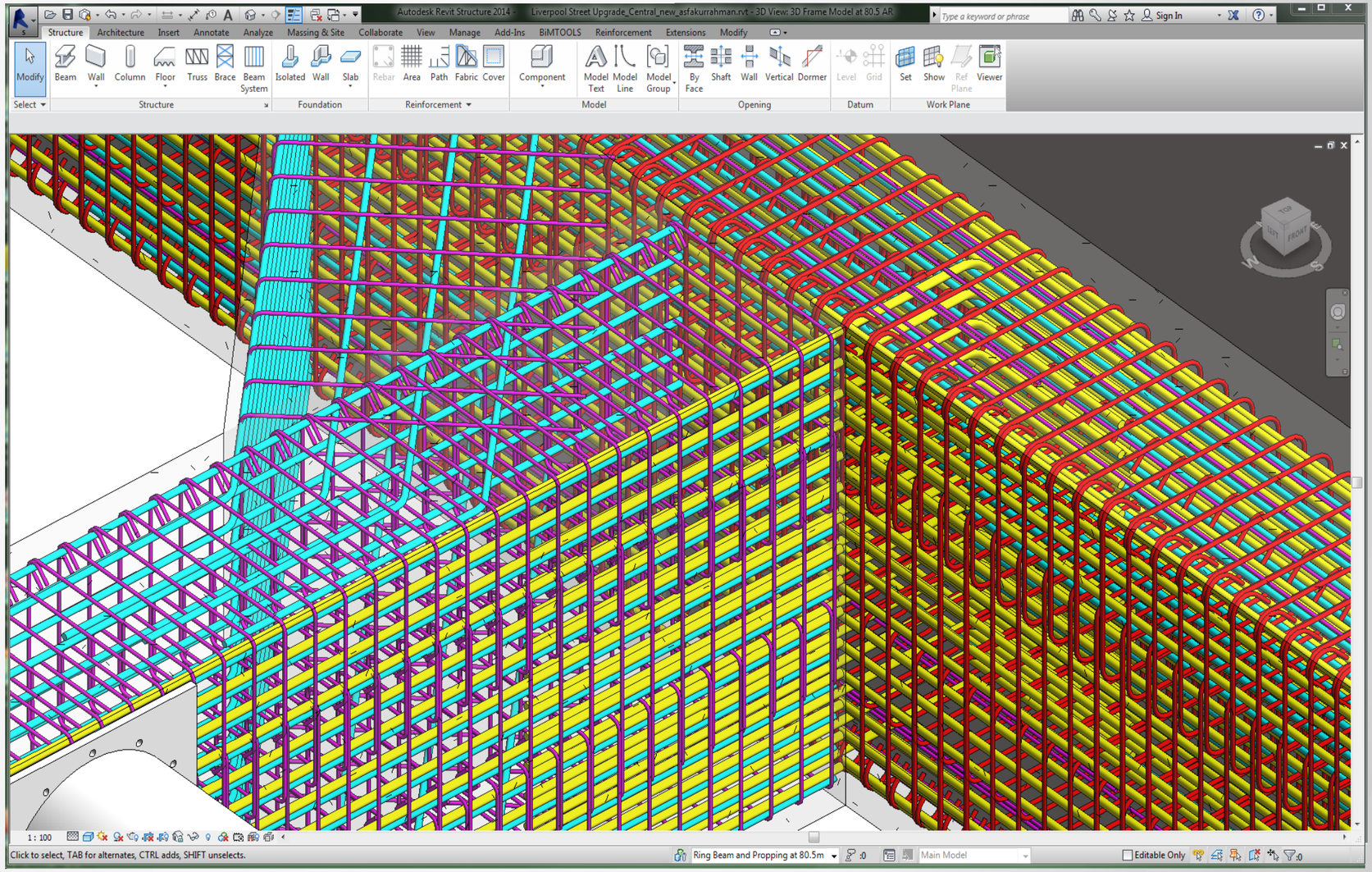
Reinforcement detailing with Revit

Reinforced Waling Beam at 80.5m



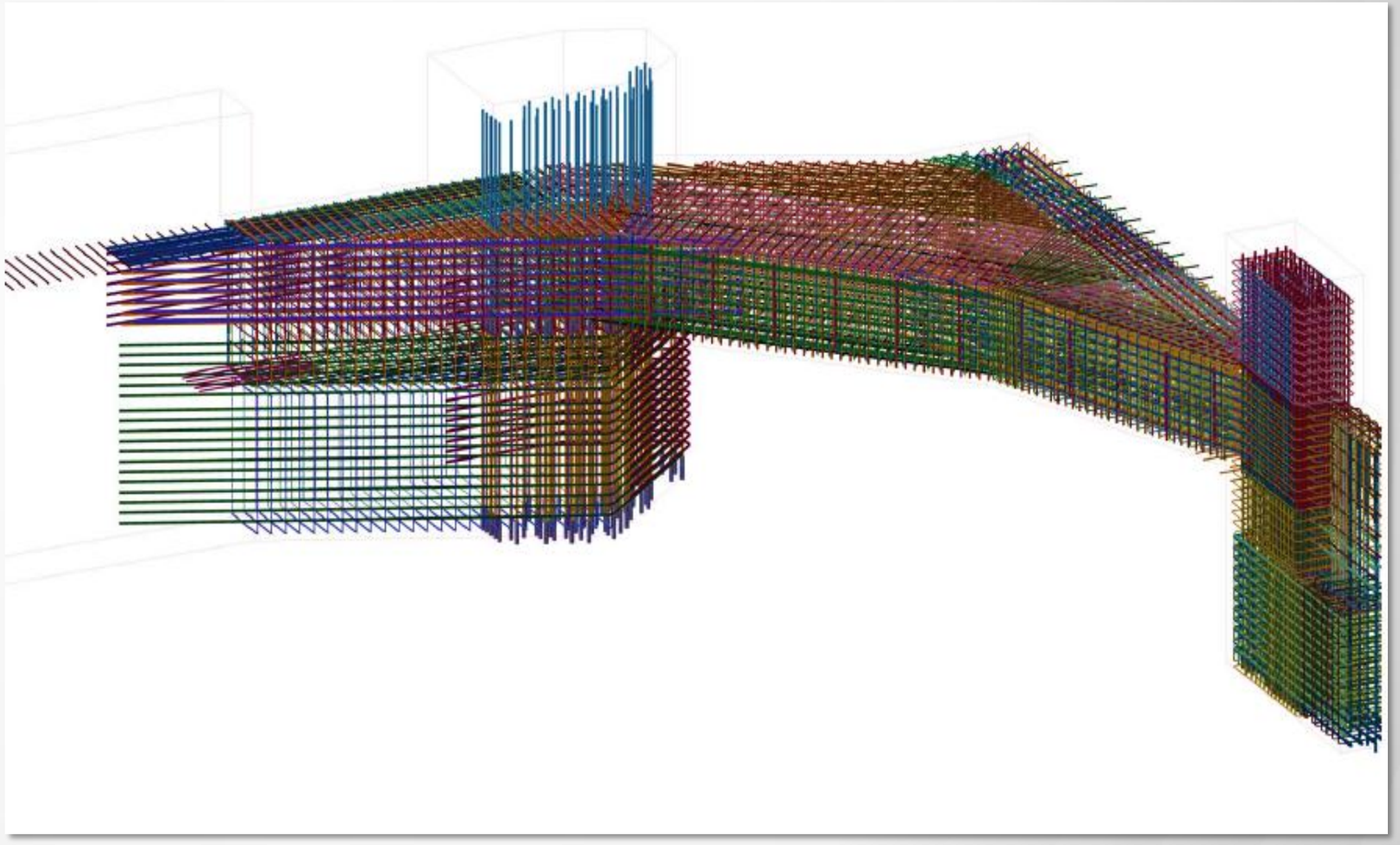
Temporary Waling Beam

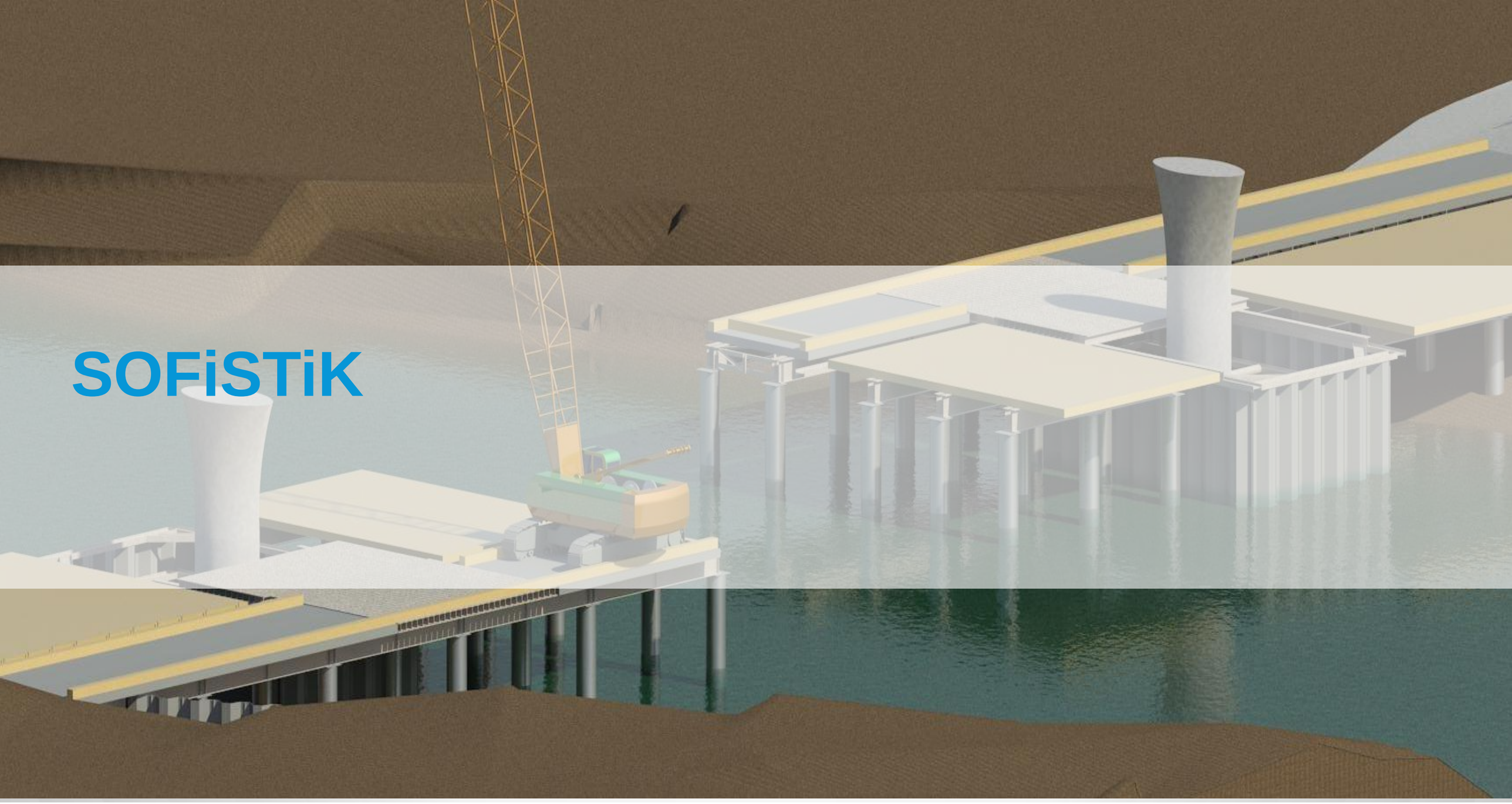
- Simple to detail the straight runs
- More complicated at joints and prop blisters



Addressing the issues

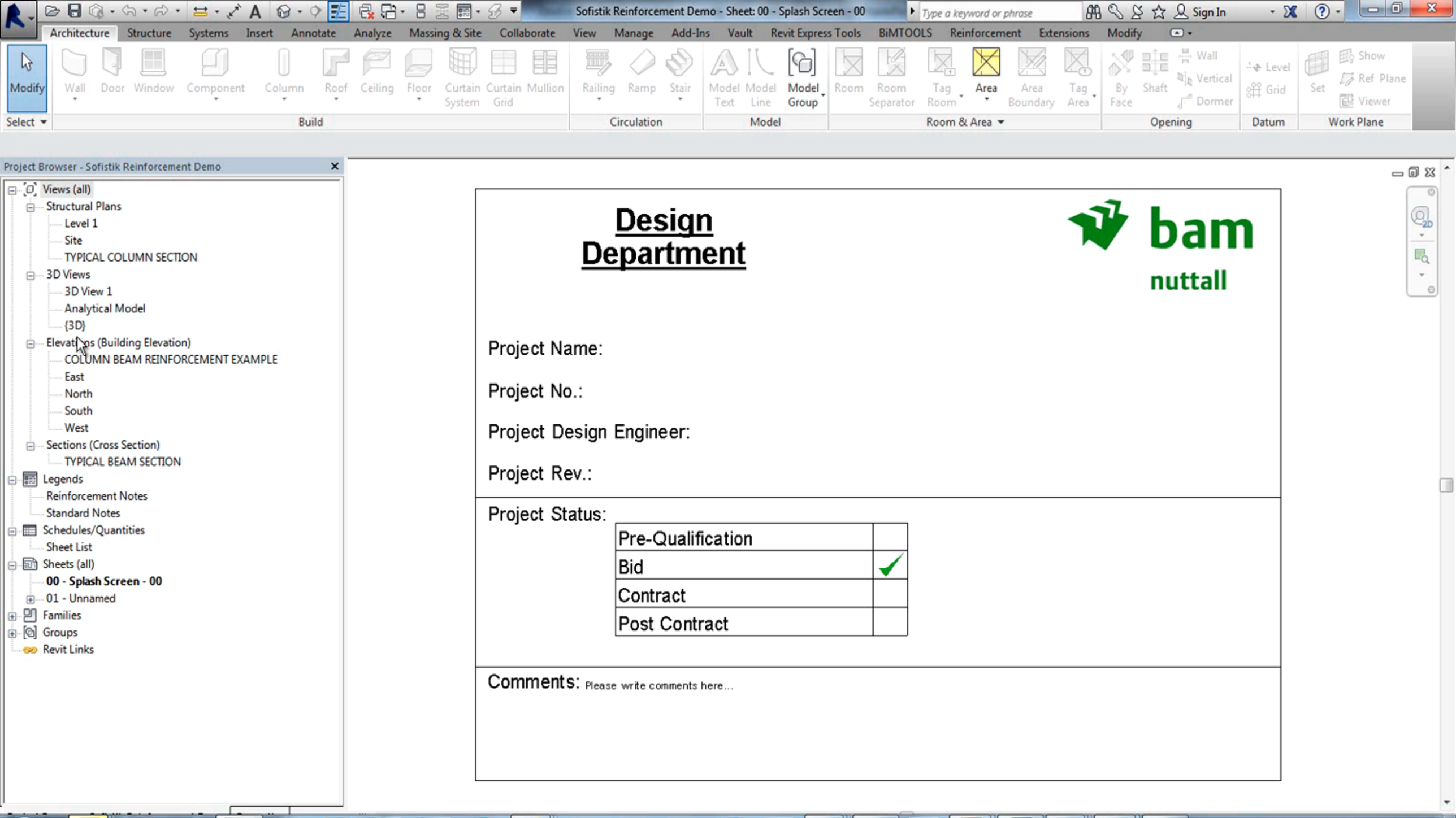
- The devil is in the detail, how do we:
  - Schedule rebar
  - Issue construction drawings




SOFiSTiK

SOFiSTiK

- Creation of reinforcement drawings out of Revit models
- Hide and tag rebar for annotation
- Creating of Bending Schedule of rebar and cut list for wire meshes
- Export rebar data to bending machine formats


Sofistik Reinforcement Demo - Sheet: 00 - Splash Screen - 00
Type a keyword or phrase
Sign In
Architecture
Structure
Systems
Insert
Annotate
Analyze
Massing & Site
Collaborate
View
Manage
Add-Ins
Vault
Revit Express Tools
BiMTOOLS
Reinforcement
Extensions
Modify
Modify
Wall
Door
Window
Component
Column
Roof
Ceiling
Floor
Curtain System
Curtain Grid
Mullion
Railing
Ramp
Stair
Model Text
Model Line
Model Group
Room
Room Separator
Tag Room
Area
Area Boundary
Tag Area
By Face
Shaft
Wall
Vertical
Dormer
Level
Grid
Set
Show
Ref Plane
Viewer
Select
Build
Circulation
Model
Room & Area
Opening
Datum
Work Plane
Project Browser - Sofistik Reinforcement Demo
Views (all)
Structural Plans
Level 1
Site
TYPICAL COLUMN SECTION
3D Views
3D View 1
Analytical Model
{3D}
Elevations (Building Elevation)
COLUMN BEAM REINFORCEMENT EXAMPLE
East
North
South
West
Sections (Cross Section)
TYPICAL BEAM SECTION
Legends
Reinforcement Notes
Standard Notes
Schedules/Quantities
Sheet List
Sheets (all)
00 - Splash Screen - 00
01 - Unnamed
Families
Groups
Revit Links
Design Department
bam
nuttall
Project Name:
Project No.:
Project Design Engineer:
Project Rev.:
Project Status:
Pre-Qualification
Bid
Contract
Post Contract
Comments: Please write comments here...

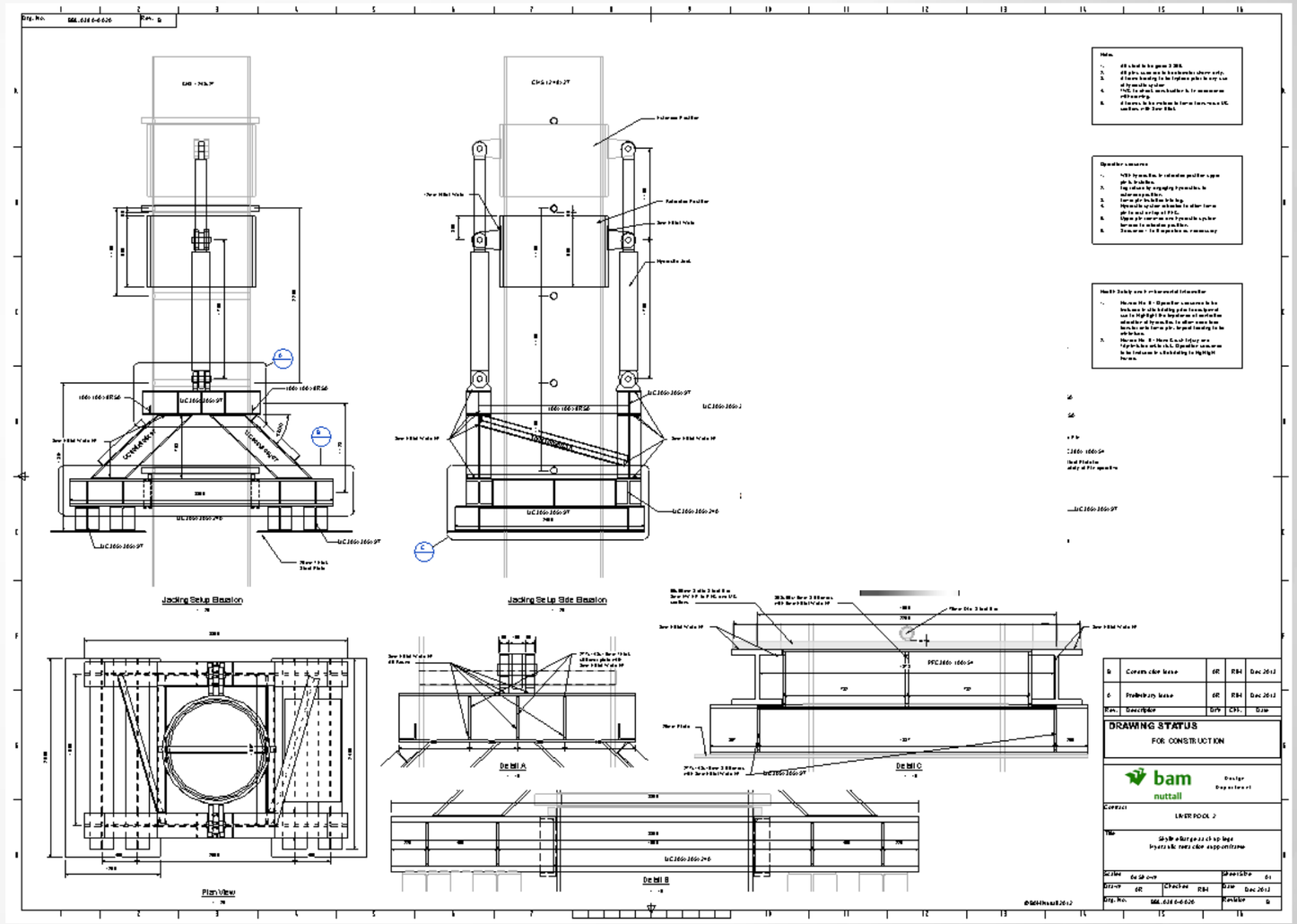
SOFiSTiK

- Improving checking time
- Management of change
- Helping steel fixers on site

Steel detailing with Revit

Liverpool 2 - Jack-Up barge

- Improve communication between design and construction teams
- 3D model of a jack-up leg

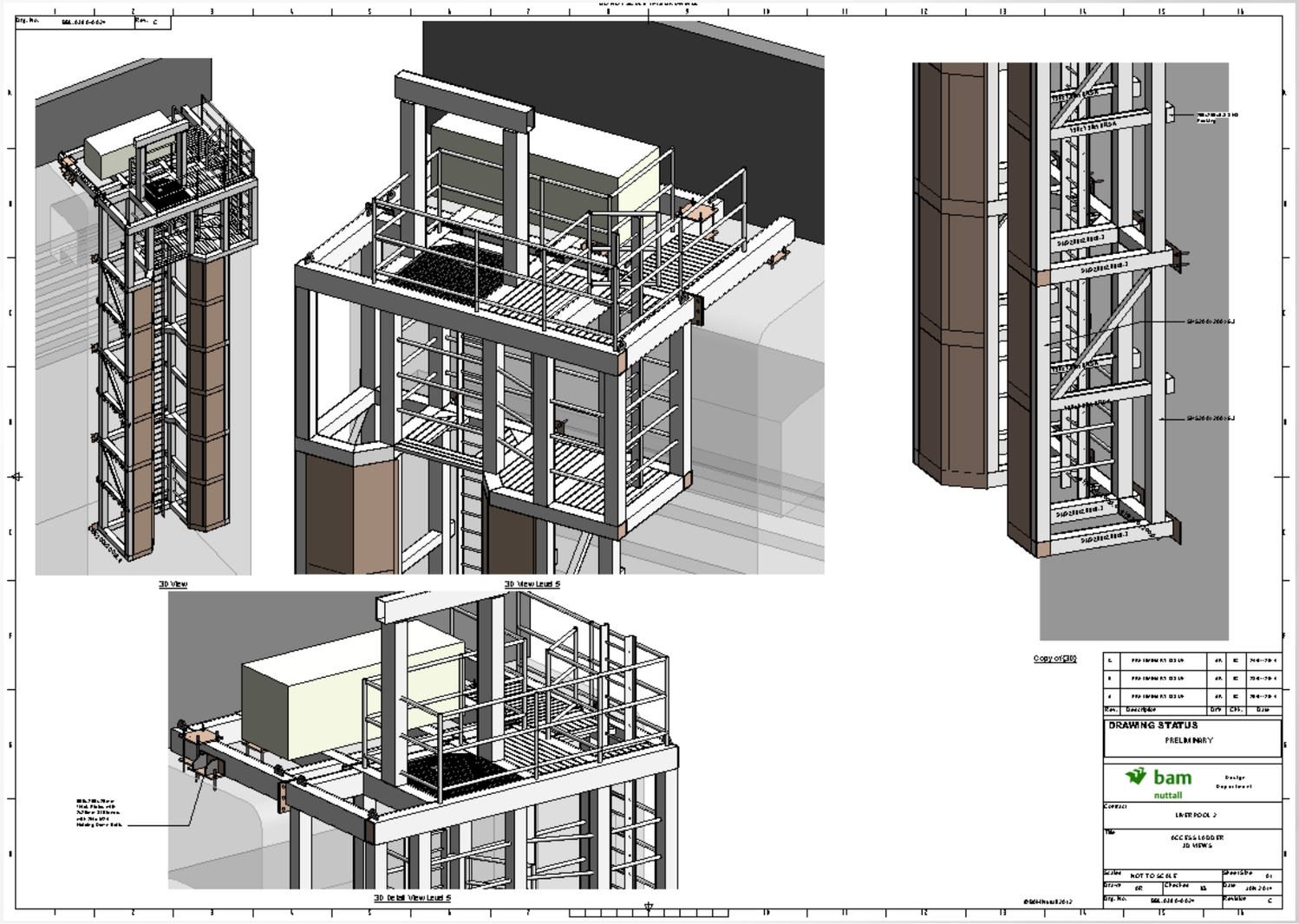


Liverpool 2 project

- Interactive design – Improving communication between design and construction teams

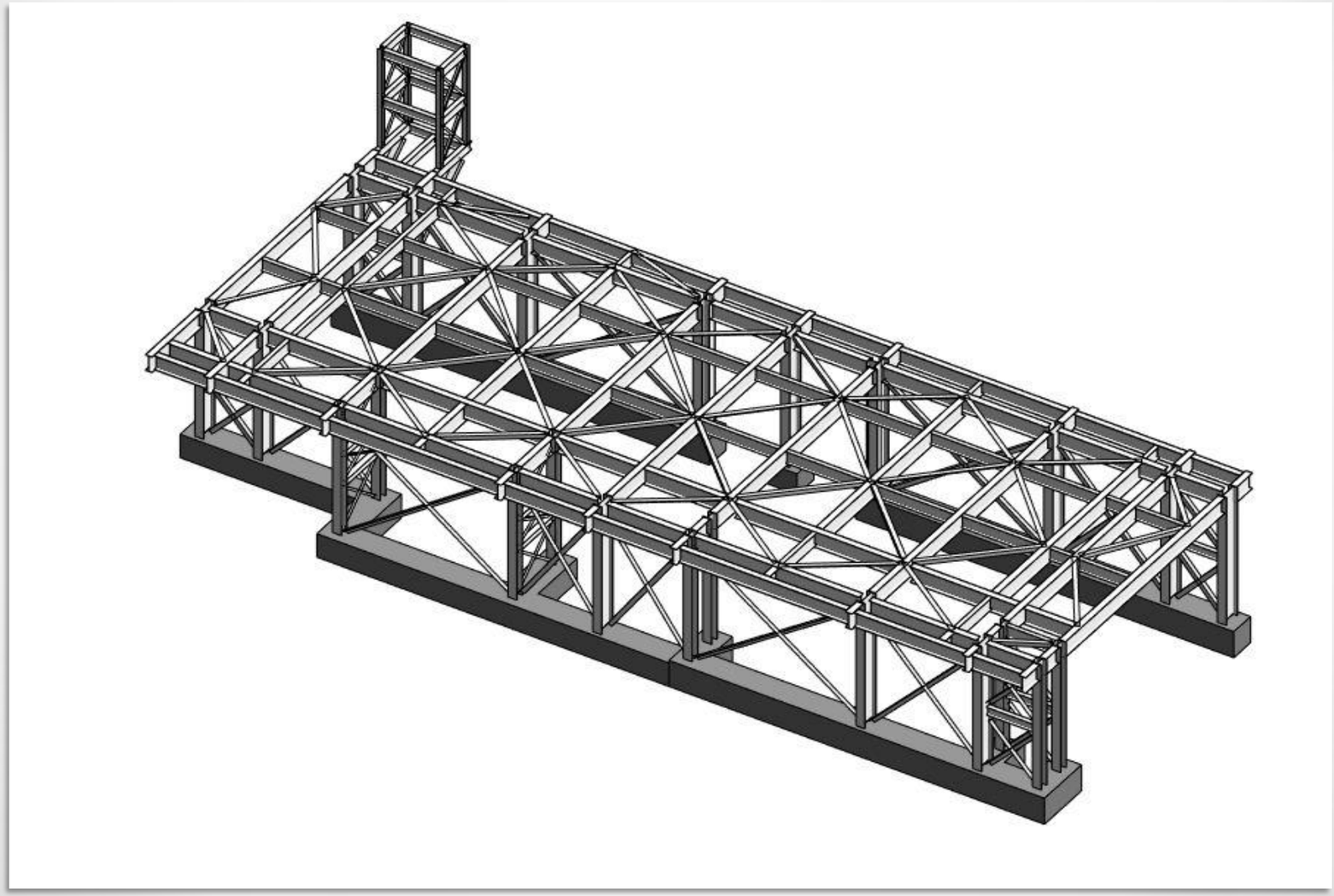
Liverpool 2 - Access ladder

- Interactive design- bringing everyone to a common understanding

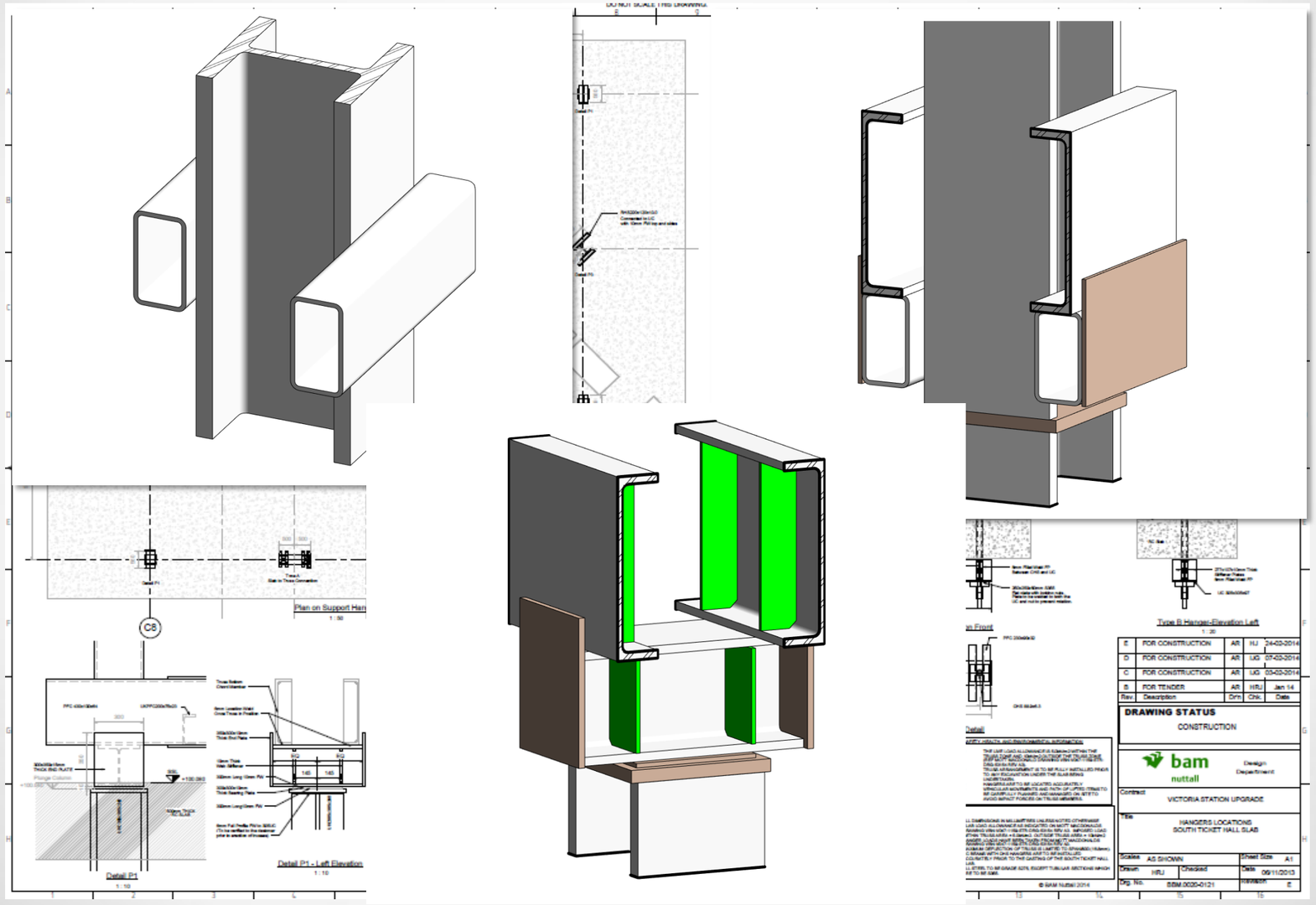


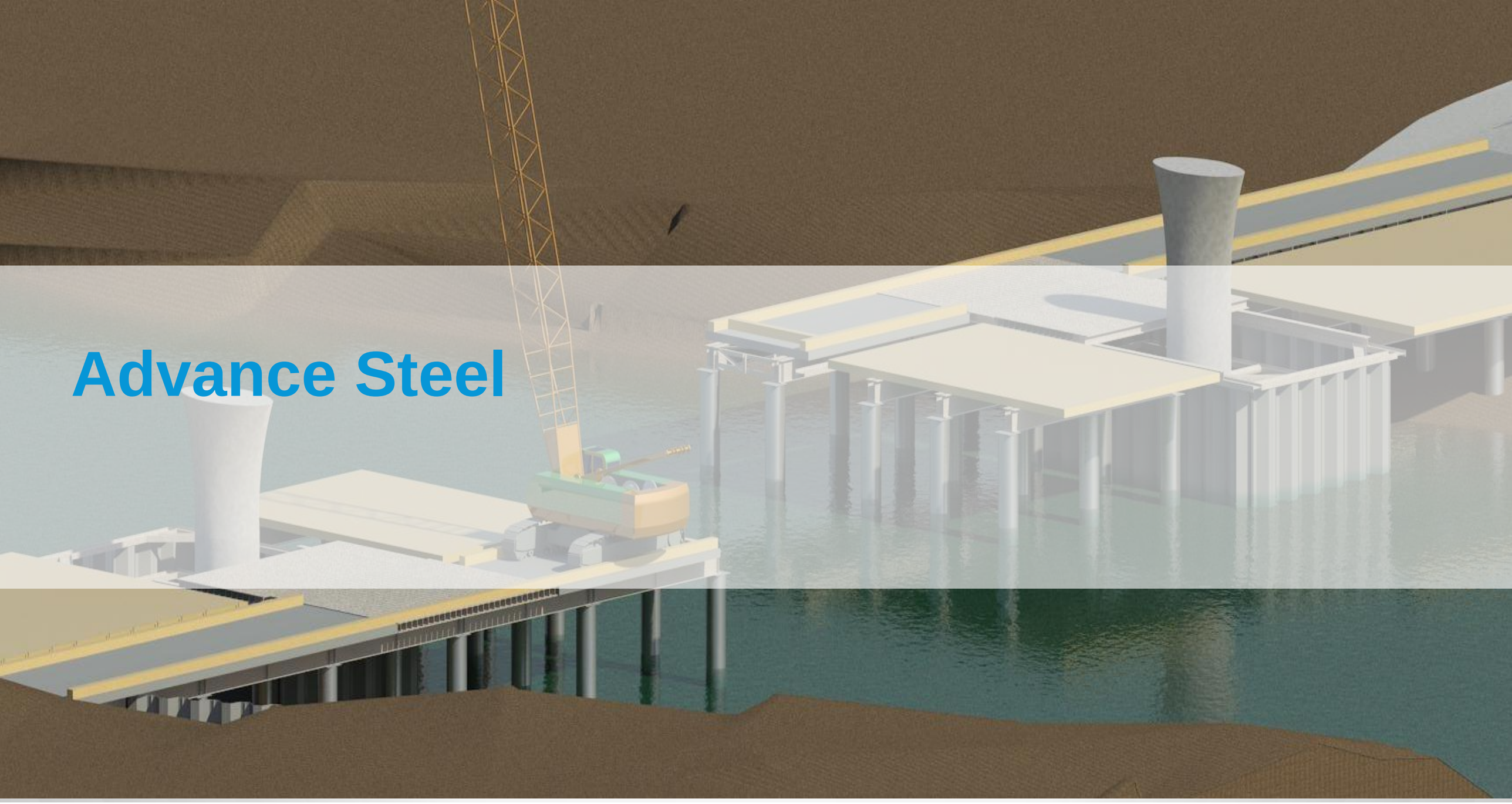
Case study: Victoria station cabin support

Victoria station cabin support



Victoria station





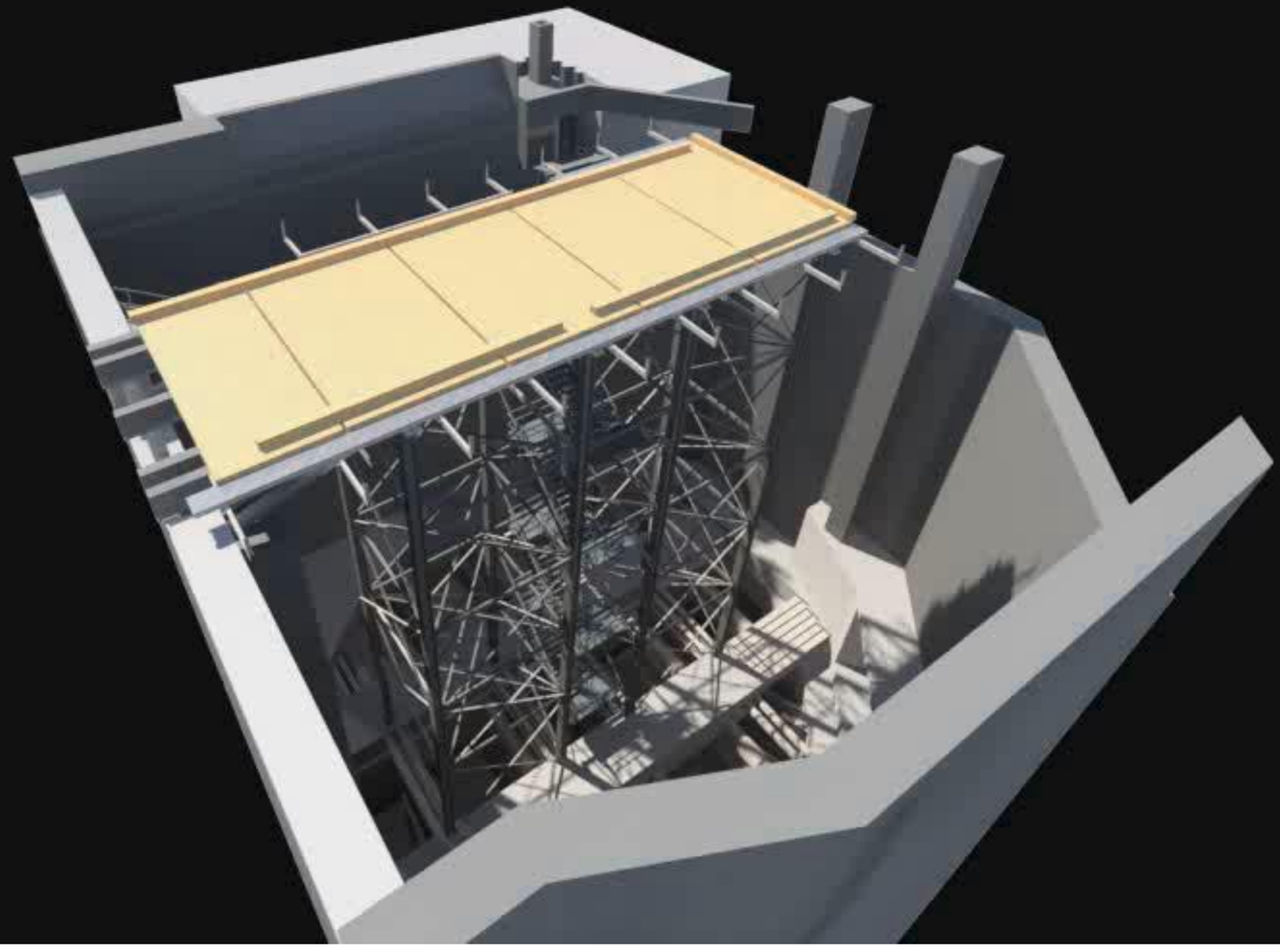
Advance Steel

Advance Steel

- Automatic connections via the Connection Vault
- From a model to full detail and documentation
- AutoCAD based platform
- Export to CNC machines

Advance Steel

- Real time design and checking
- An engineering tool – not a modelling tool
- Outputs directly to shop fabrication drawings



Session Feedback

- Via the Survey Stations, email or mobile device
- AU 2014 passes given out each day!
- Best to do it right after the session
- Instructors see results in real-time