Slide 1

BIM for Civil Engineering Contracts

Ir. Ronan Collins MHKIE, MHKIBIM, CEng
Representing CICES

INTELIBUILD
Virtual Design and Construction

Slide 2
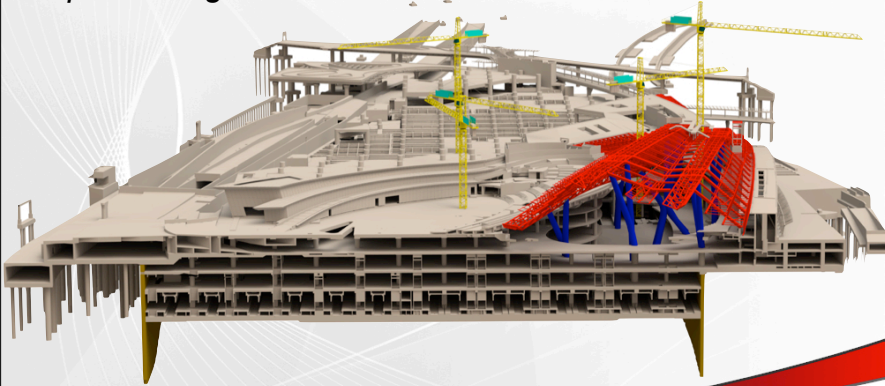
People = Leadership & Collaboration

Process = Project Execution Planning

Power = BIM software & hardware

INTELIBUILD
Virtual Design and Construction

Slide 3

WHO will manage the BIM process?

Is the purpose of BIM defined ?

HOW will BIM be implemented ?

WHEN will BIM start ?

INTELIBUILD
Virtual Design and Construction

Slide 4

BIM Project Manager

- Plan, develop and manage the BIM Standard.

- Provide quality control and checking procedures.

- Train project staff

- Provide guidance to the project team on how to review the models in order to resolve clashes etc,

- Organize workshops to explain findings to the designers and to assist them in understanding design issues.

- Provide technical support to the project staff

INTELIBUILD
Virtual Design and Construction

HKIBIM

Hong Kong Institute of
Building Information Mo...

BIM Project Specification

Supported event: HKIUD Co...

HKIUD confe...
URBAN DESI...
Date: 31st March 2012 –
Venue: Langham Place Bal...
555 Shanghai Stree...

HKIBIM supported the HKIUD conference...
- 31 Mar 2012 to 1 Apr 2012 – HKIUD Co...
- Event Flyer and registration form
  - Day 1 conference (31-Mar) with co...
  - Day 1 conference (31-Mar) with co...
  *The conference is free of charge

HKIBIM BIM Standard - BIM ...

Introduction
Building Information Modelling (BIM) is the...
during its life cycle. Typically, it uses thre...
software to increase productivity in buildi...
Building Information Model (alsoabbreviate...
spatial relationships,geographic informatio...
components.
HKIBIM BIM Standards

HKIBIM Specification (Rev 2.1)

INTELIBUILD
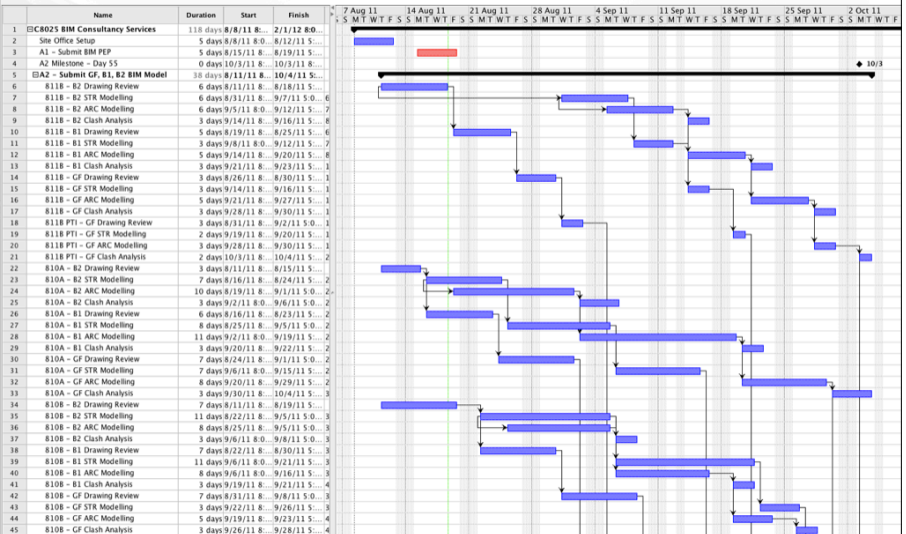Virtual Design and Construction

5

BIM - Level of Detail

- Design BIM vs Construction BIM

- Importance of BIM Specification

- Quantity Takeoff Accuracy

- Clash Analysis Process - Depends on LoD

- Coordination & Documentation

- Production of Fabrication Drawings
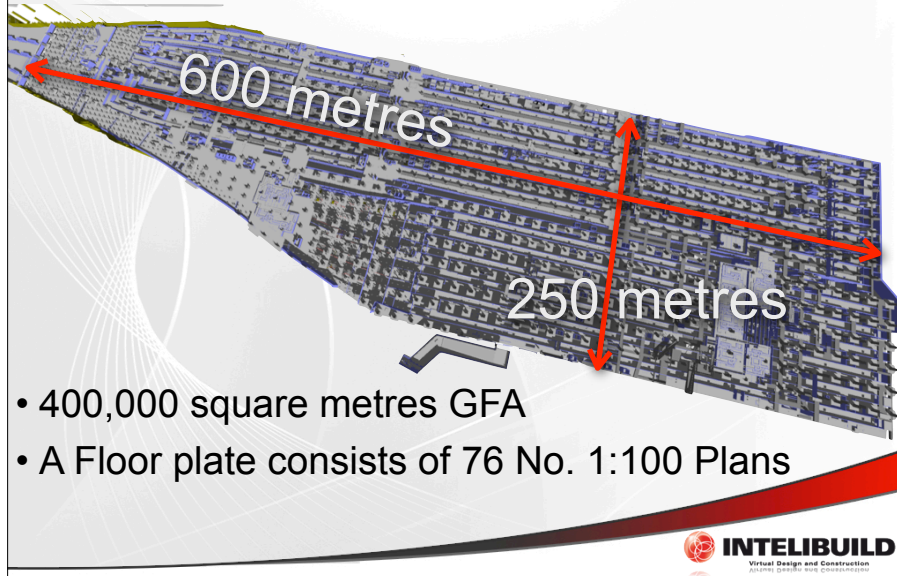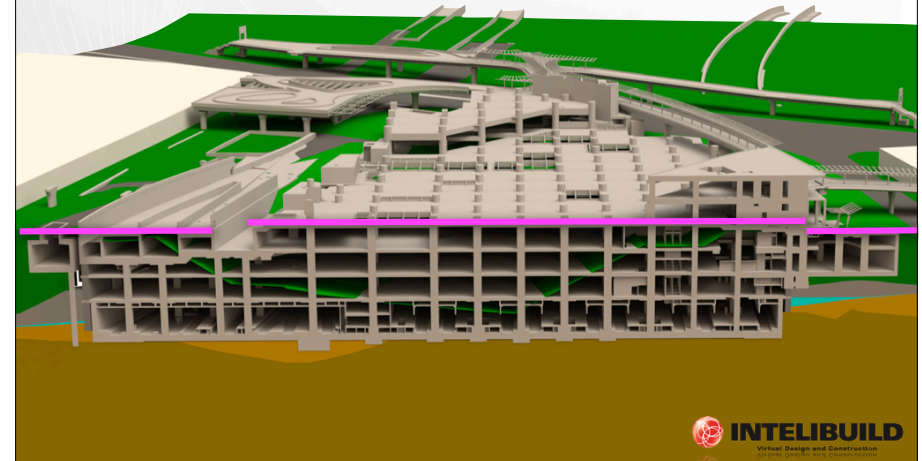
- Site Installation Management

INTELIBUILD
Virtual Design and Construction

6

BIM Team Organisation

Ir. Ronan Collins
BIM Project Director
Hong Kong

Mark Roberts
STR Project Manager
Hong Kong

Raymund Plastina
BIM Coord. Manager
Hong Kong

Stewart Belcher
ARC Project Manager
Hong Kong

| 811B STR | 810A STR | 810B STR | 811B ARC | 810A ARC | 810B ARC |

Dennis Sinalubong
STR Modeller
Hong Kong

Patrick Martin
STR Coordinator
Canada

Sebastian Magno
STR Modeller
Hong Kong

Yongmoo Hur
ARC Modeller
Hong Kong

Jess Ilasin
ARC Modeller
Hong Kong

Regalado Galupe
ARC Modeller
Hong Kong

George Simion
STR Modeller
Romania

Lap Yang
ARC Modeller
Hong Kong

Michael Custado
STR Modeller
Hong Kong

Randy Laurea
ARC Modeller
Hong Kong

Codruta Dima
STR Modeller
Romania

Paul Hitchock
ARC Modeller
Hong Kong

Steve Beaulieu
STR BIM Modeller
Canada

Victor Vajoi
ARC Modeller
India

Dermot Pearson
CAD Technician
Hong Kong

Ben Seib
Doc. Controller
Hong Kong

INTELIBUILD
Virtual Design and Construction

7

Planning

INTELIBUILD
Virtual Design and Construction

8

MTR West Kowloon Terminus

600 metres

250 metres

- 400,000 square metres GFA
- A Floor plate consists of 76 No. 1:100 Plans

Typical Cross Section

- 4 levels below ground level
- Integrated Highways Structures
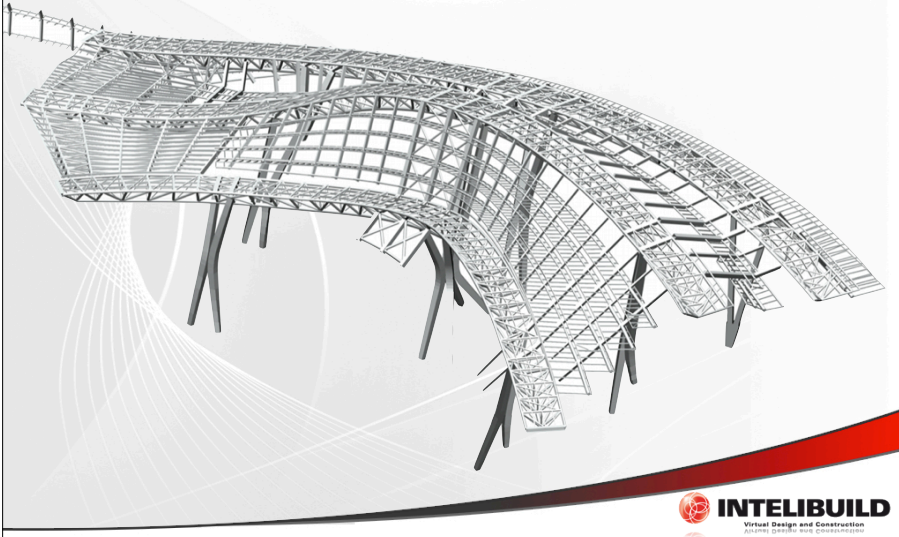
Feature Roof & South Facade
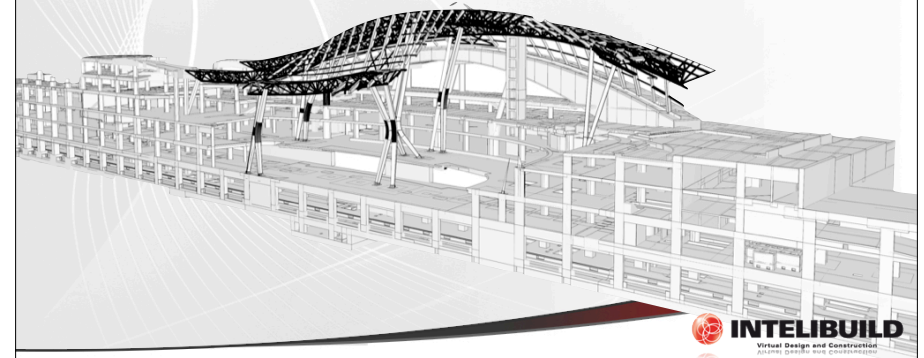
Entrance Building

Entrance Building Roof Geometry
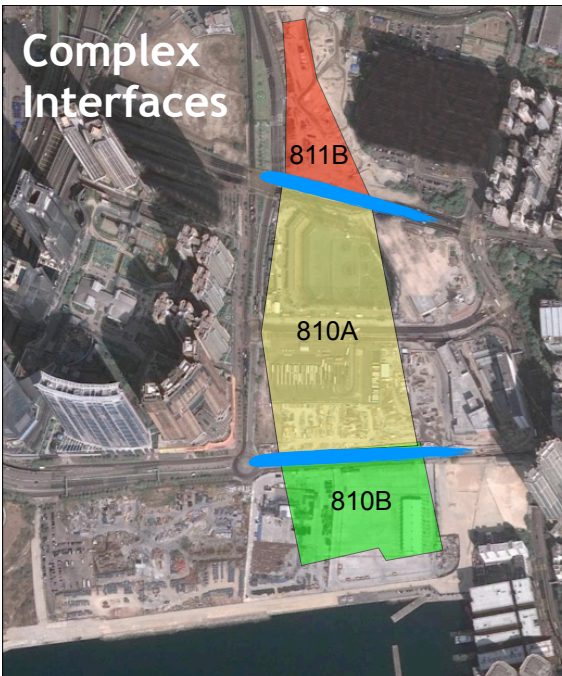
- 3 Primary Steel Trusses 175m long

Steel & Concrete interface

- Mega Columns from 3 different levels
- Roof supported by concrete Arch

Complex Interfaces

811B

810A

810B

- 3 Civils Contracts

- 4 Building Services
  ECS,
  Control,
  Elec,
  FPS & P&D

- 4 Systemwide
  Packages

Client Implementation of BIM by MTR

- de-risk the design and construction of WKT

- provide a collaboration and communication tool for MTR staff, designers, contractors and project partners

- identify & resolve missing, erroneous, inadequate design information

Scope of WKT BIM ... Everything !!

- 15,000 drawings
- All disciplines

INTELIBUILD
Virtual Design and Construction

17

Entrances

INTELIBUILD
Virtual Design and Construction
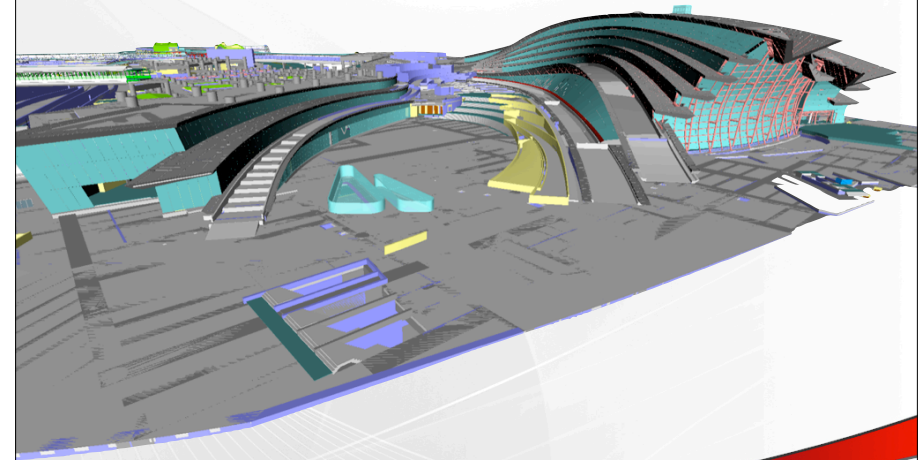
18
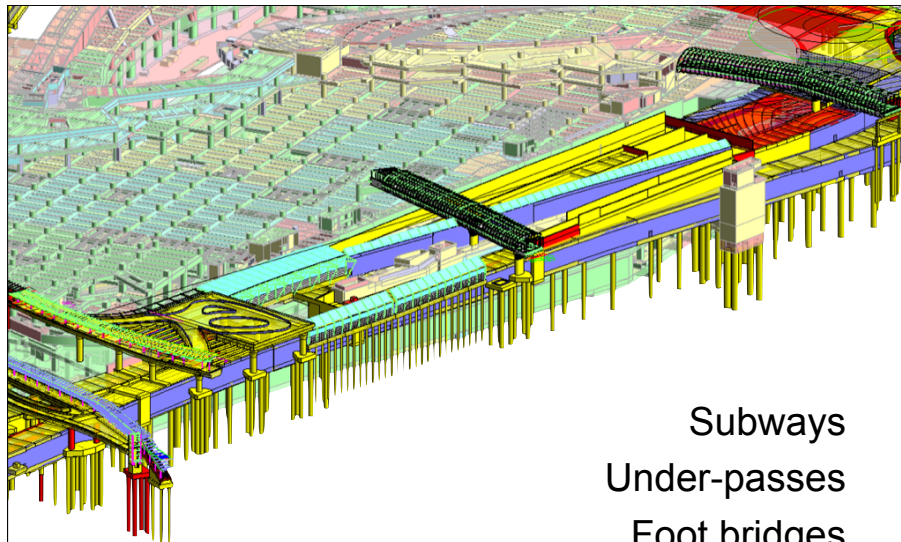
Subways
Under-passes
Foot bridges

Highways Structures

INTELIBUILD
Virtual Design and Construction

19

Building Spaces

- Delivery Routes
- Head Rooms
- Staircase Alignments
- Escalators

INTELIBUILD
Virtual Design and Construction
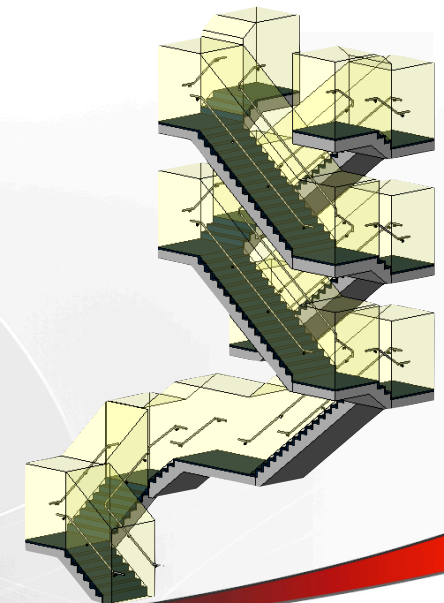
20

Structural Model

Cutting Sections Through Revit Model
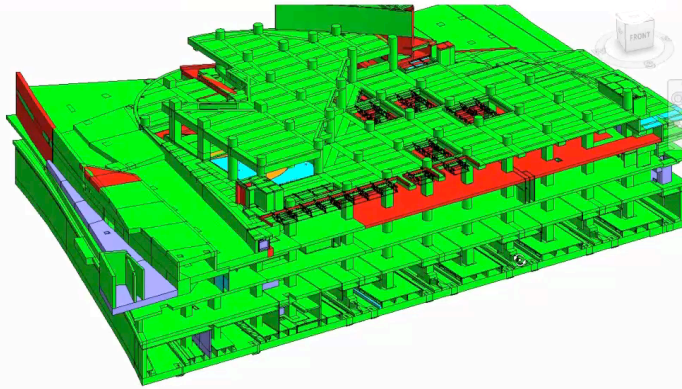
Architectural Model

810A - ARCHITECTURAL + STRUCTURAL REVIEW
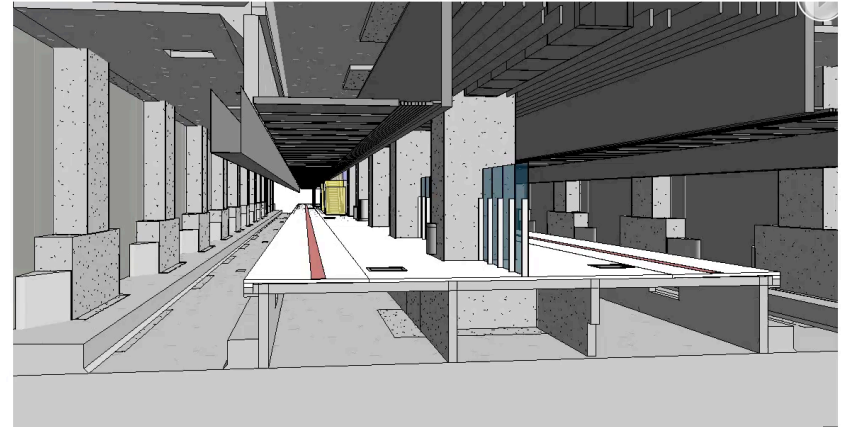
Building Services
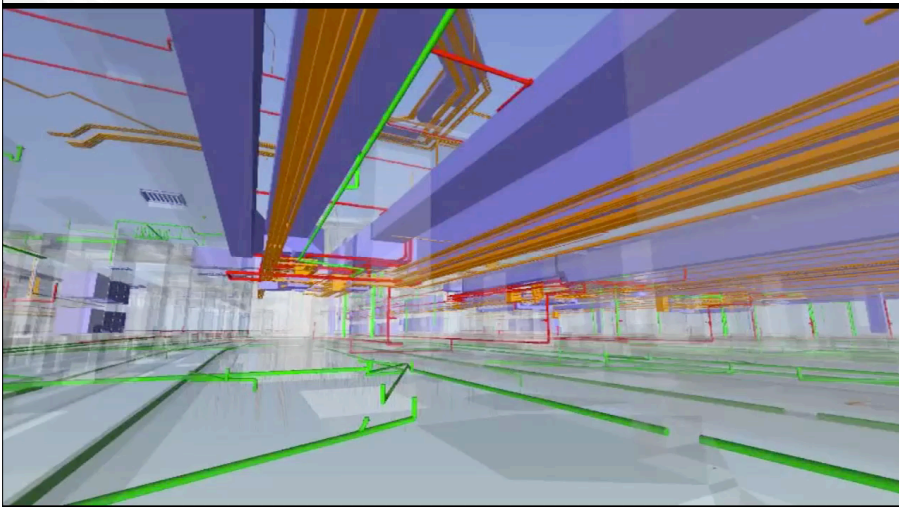
2D to 3D - BIM Review Process

- Reviewed 15,000 drawings

- Completed detailed clash analyses

- Identified over 2,500 RFI's with nearly 8,000 issues raised

Highways vs Vent Building Structures

SOLVED
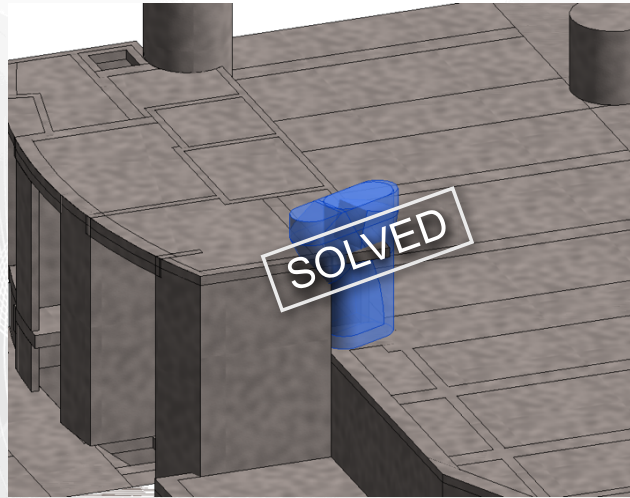
Civils Drainage vs Foundation Tie beams

SMH4E

SMH4B   PI-PTI-4

SMH4A

SMH4L

STMH-PTI-4
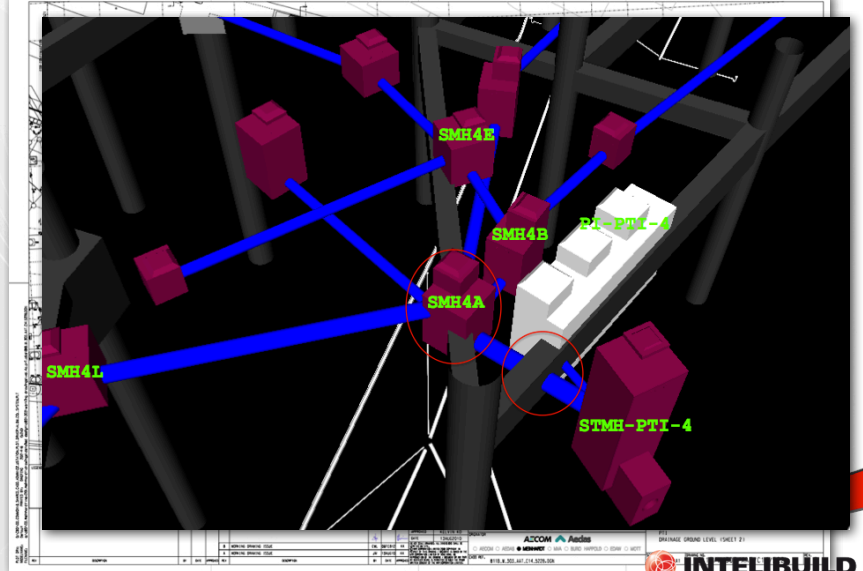
Ramp Headroom vs Structure

SOLVED
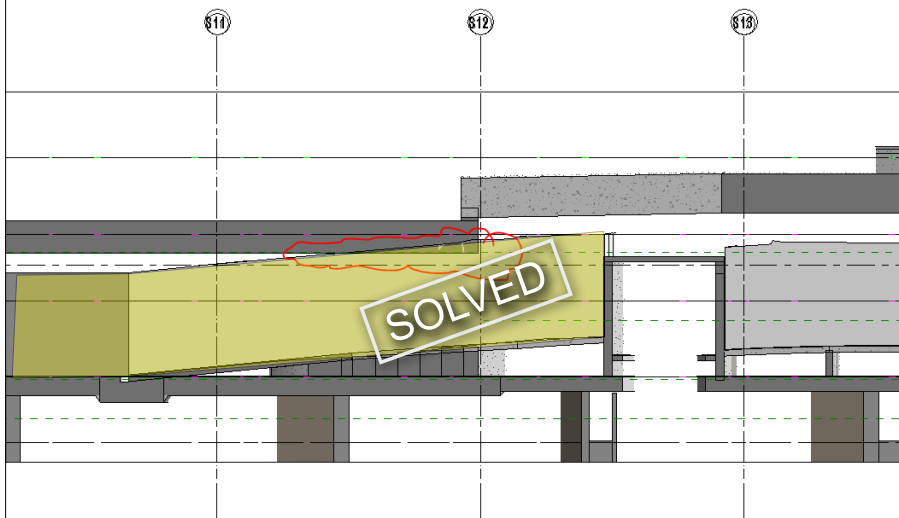
Cat Ladder vs Cladding Envelope

SOLVED
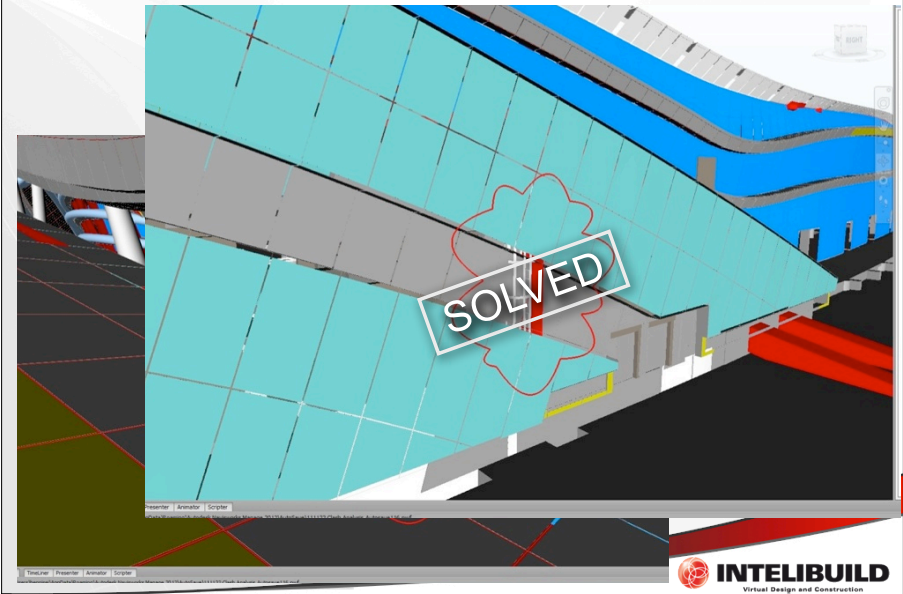
Structural Coordination
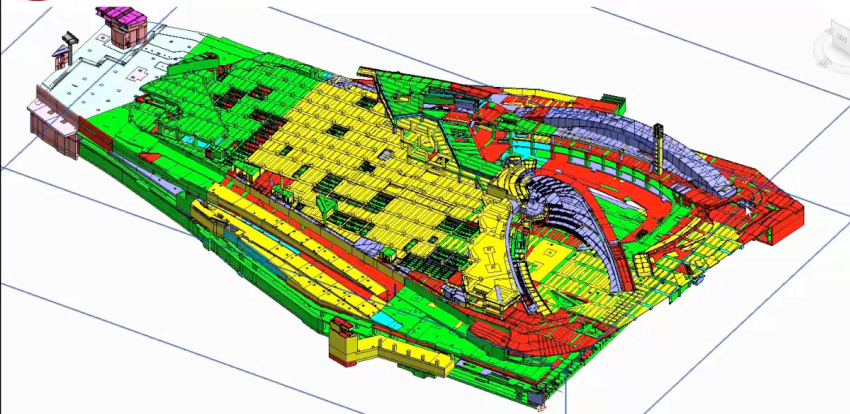
Typical Clash Analysis Report
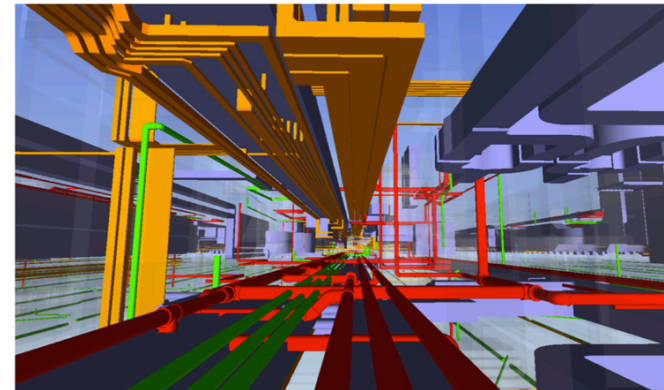
Technical Queries Process
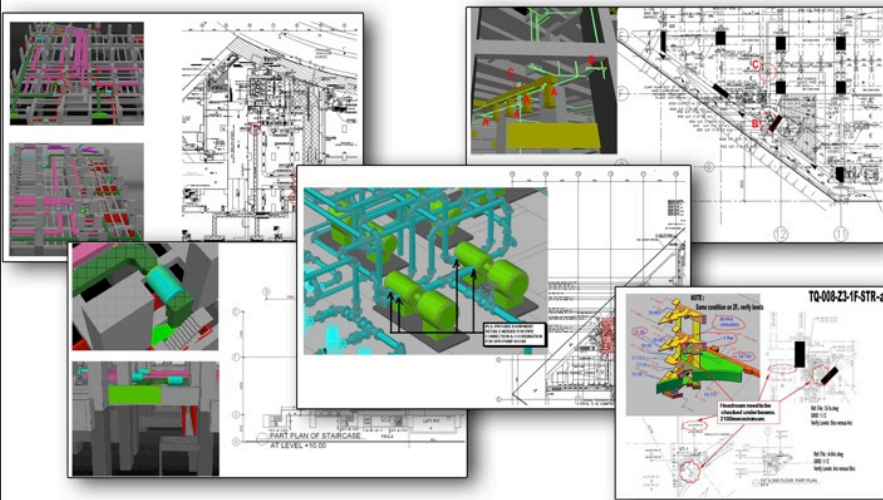
Engineering Co-Ordination Report
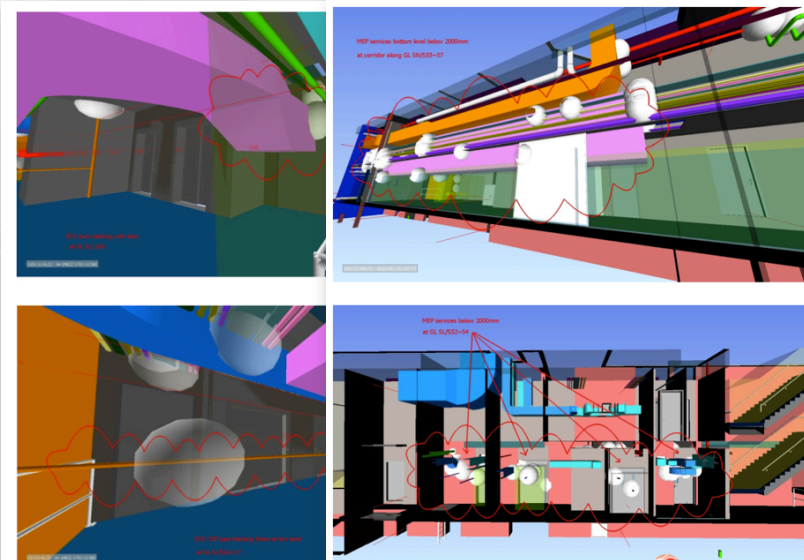
Make it Easy for Designers to Review...
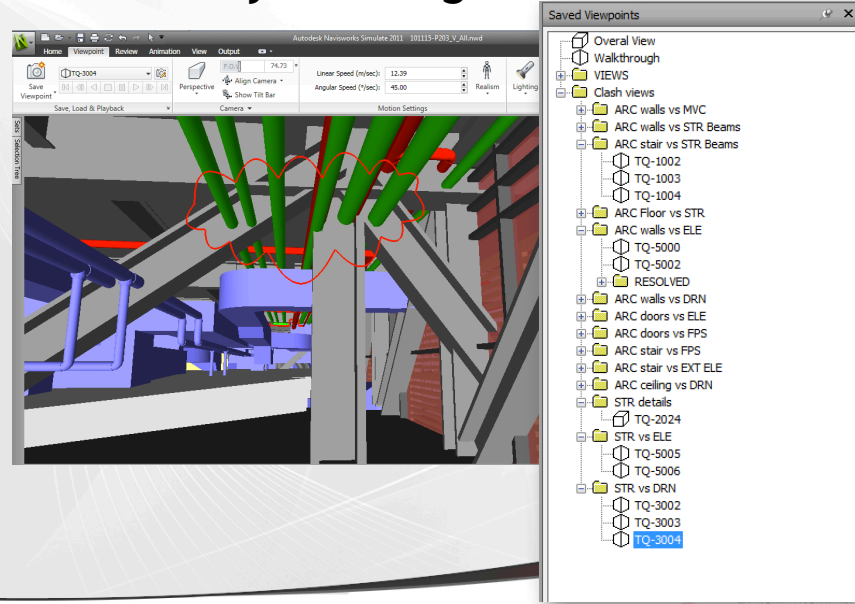
Collaboration Design Workshops

Contractor Use of BIM

- co-ordination of specialist sub-contractors.

- construction sequence planning, programme validation

- Co-ordinated Services Drawings management

- Quantity Take Off

- Laser Scanning

Steel Detailing - Alfasi
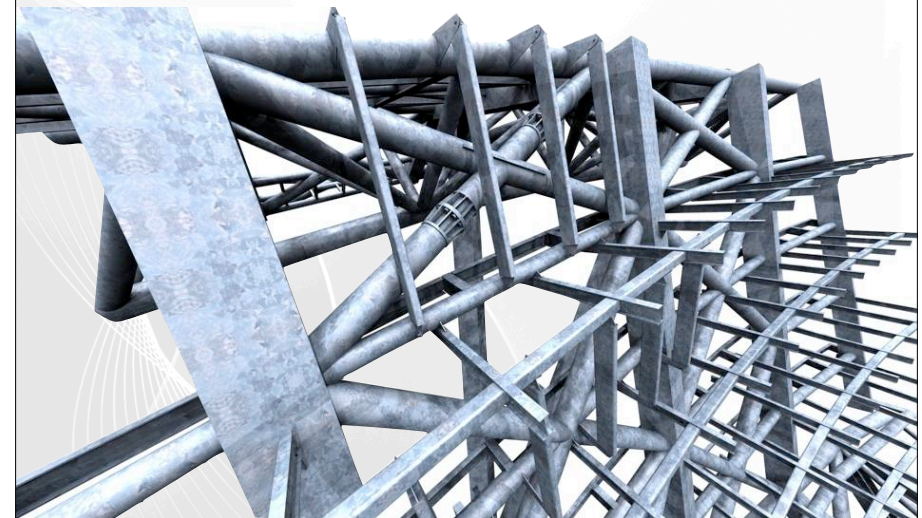
Glazing & Cladding - Gartner

Steel & Cladding Interface
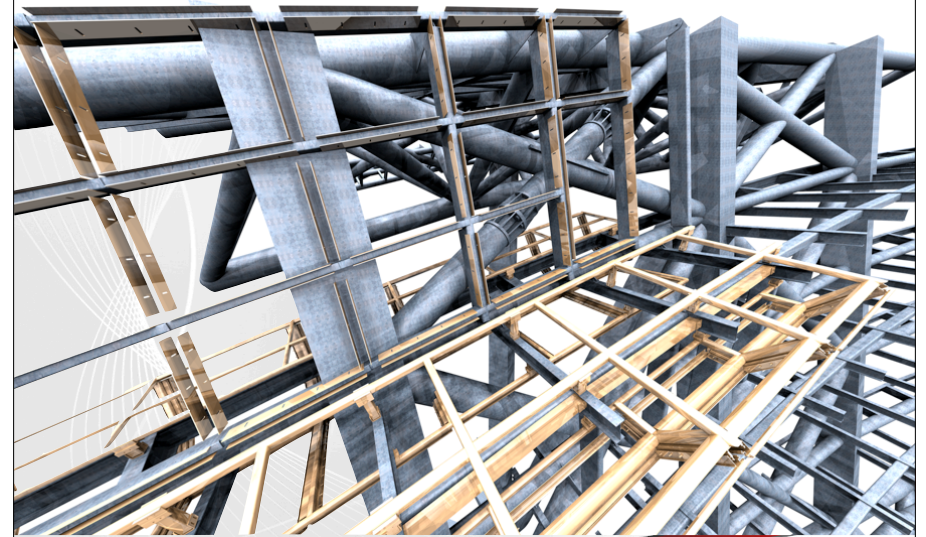
Construction Planning
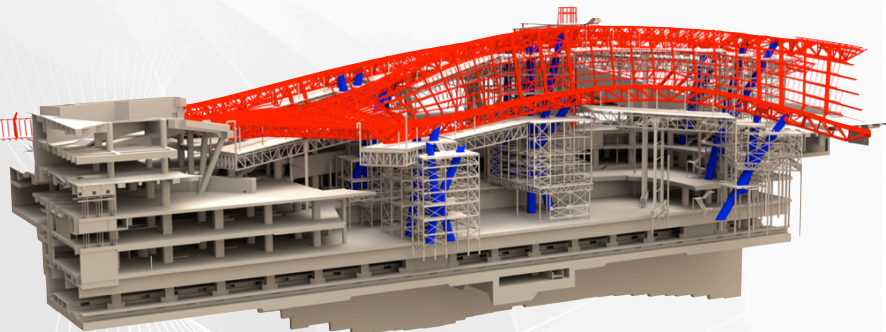
Construction Planning
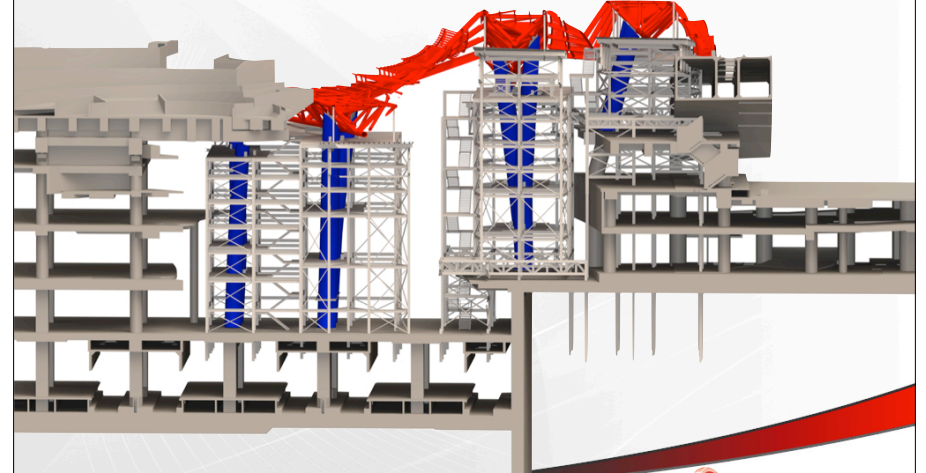
Excavation & Concrete Pour Sequence

Use of BIM for Site Surveys

Site Survey information …
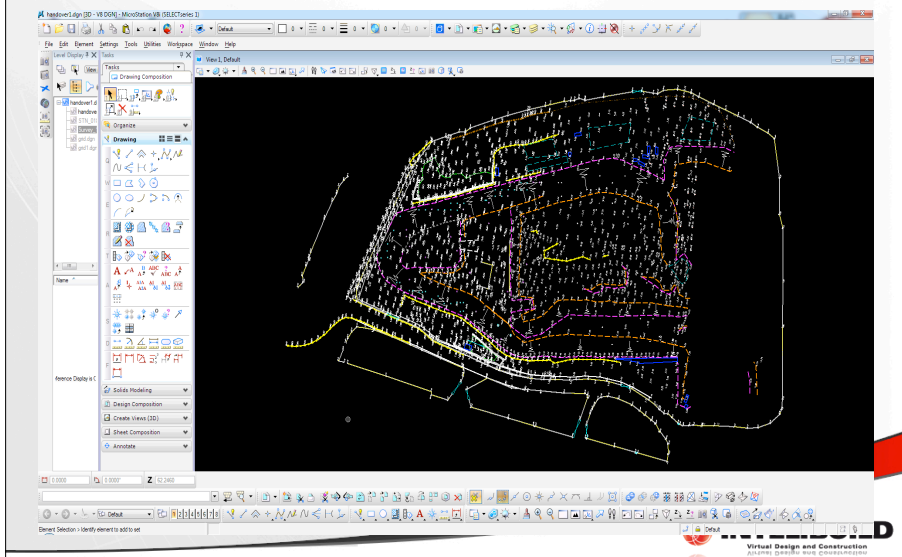
… 3D Points file.
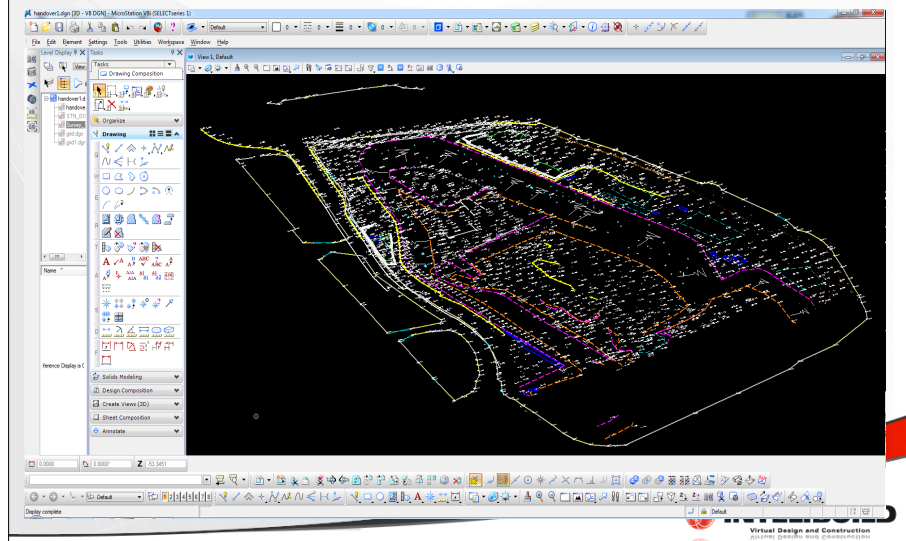
Surface Mesh Created from Survey.
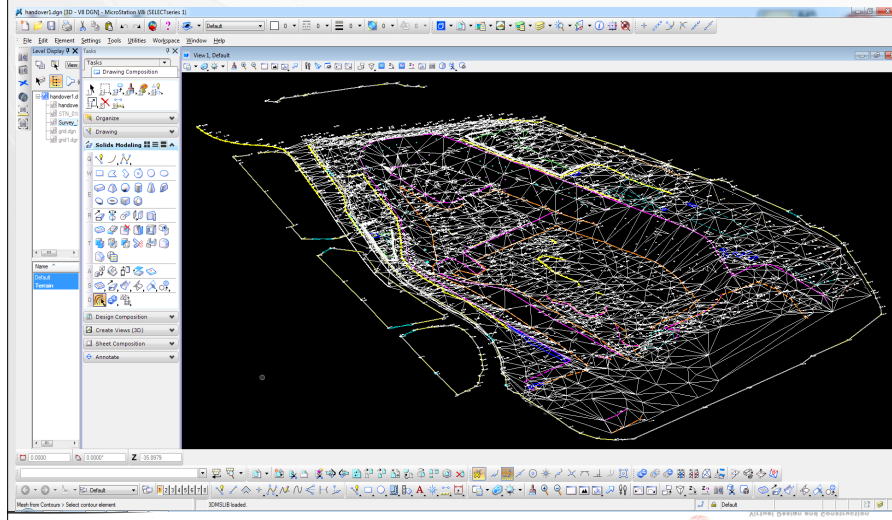
45

Rendered Mesh of Survey
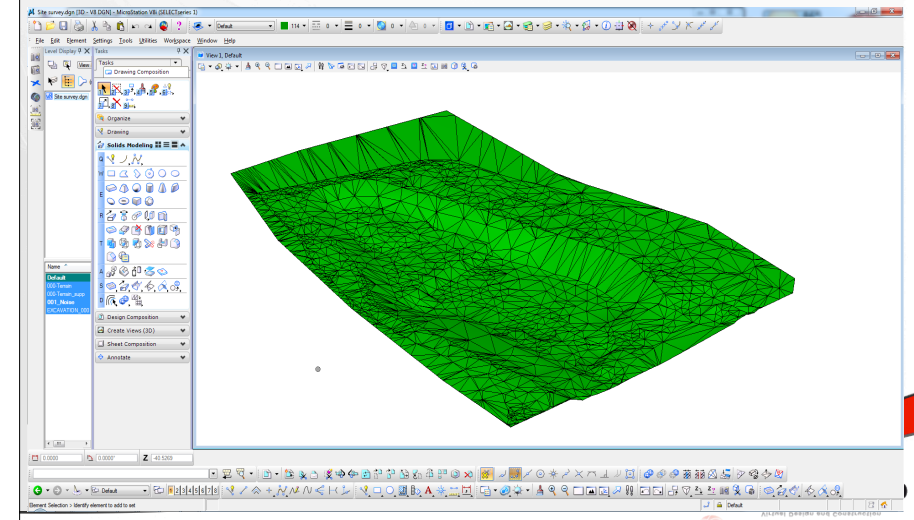
46

Survey mesh converted to 3D solid
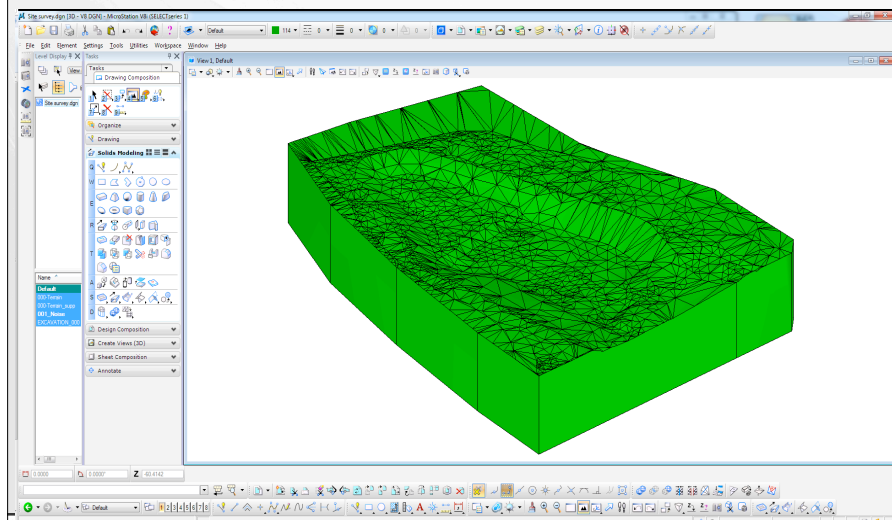
47

Marine deposit survey (2D)

48

Repeat for all strata.

MARINE DEPOSITS

ALLUVIUM

ROCKHEAD

DECOMPOSED GRANITE

Strata Volumes.

Marine Deposits = 197,513m3
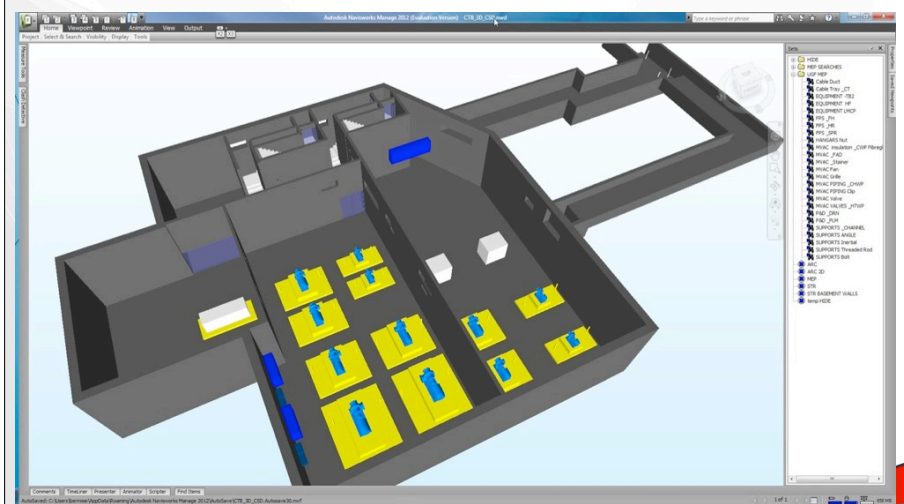
Alluvium = 115,208m3

Decomposed Granite = 366,472m3
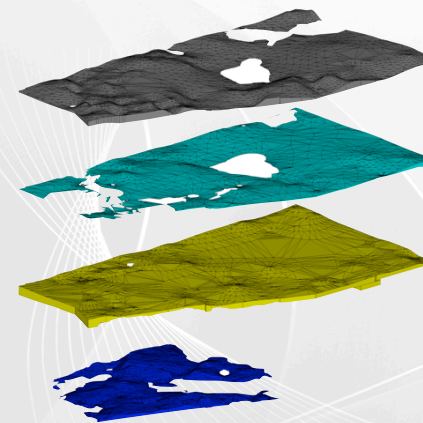
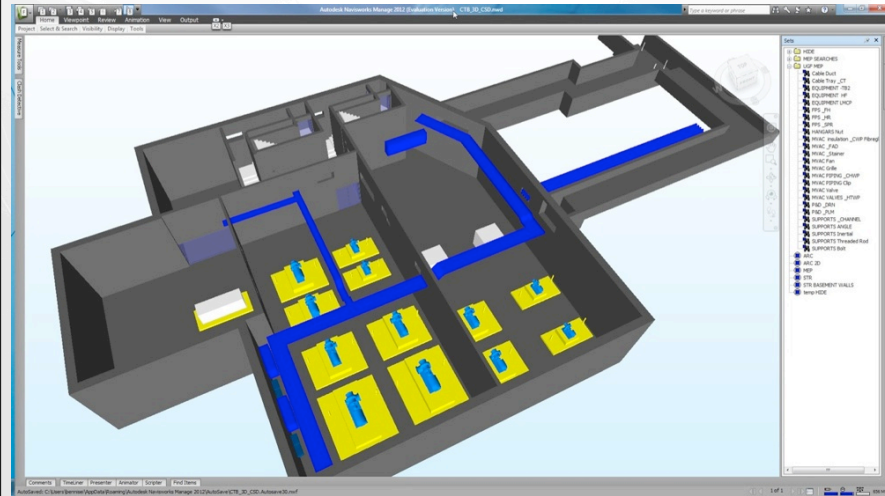Rockhead = 73,994m3

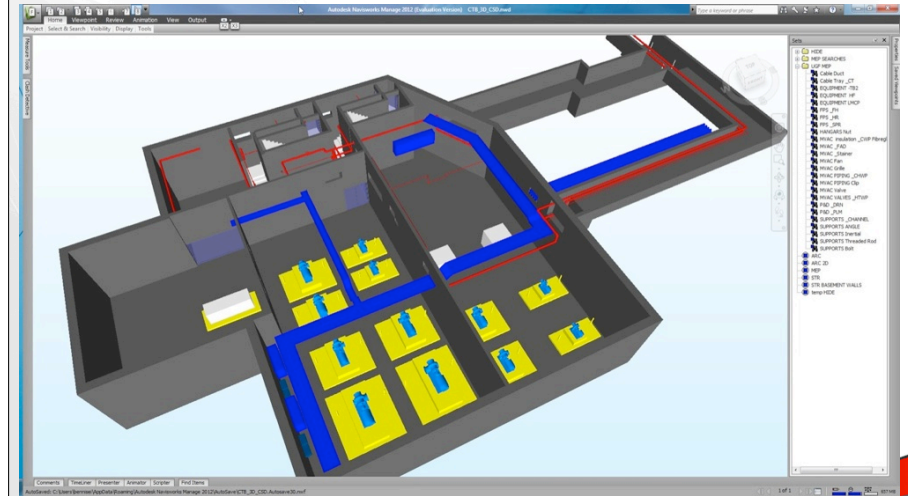## CSD & SEM Coordination
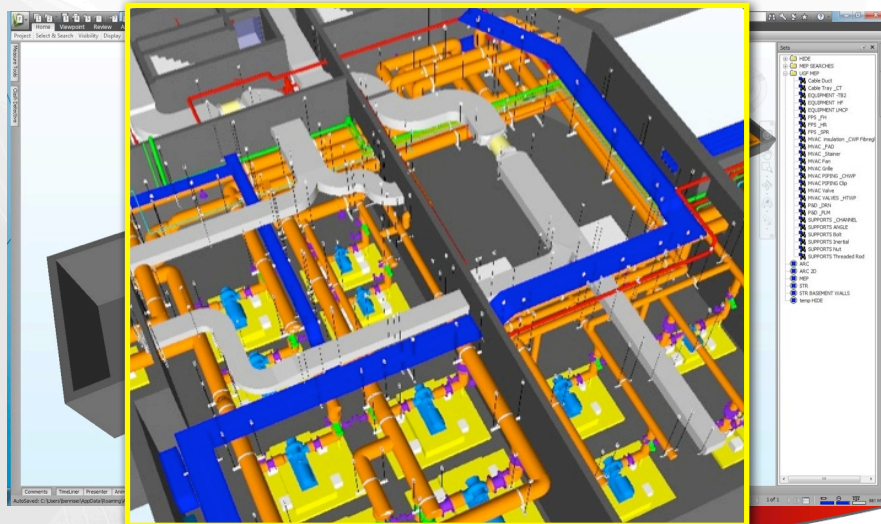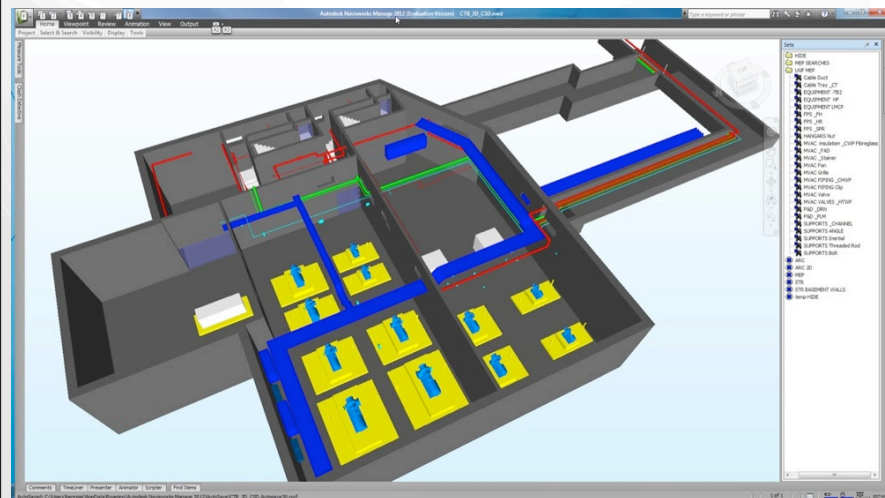
Chilled Water Plantroom
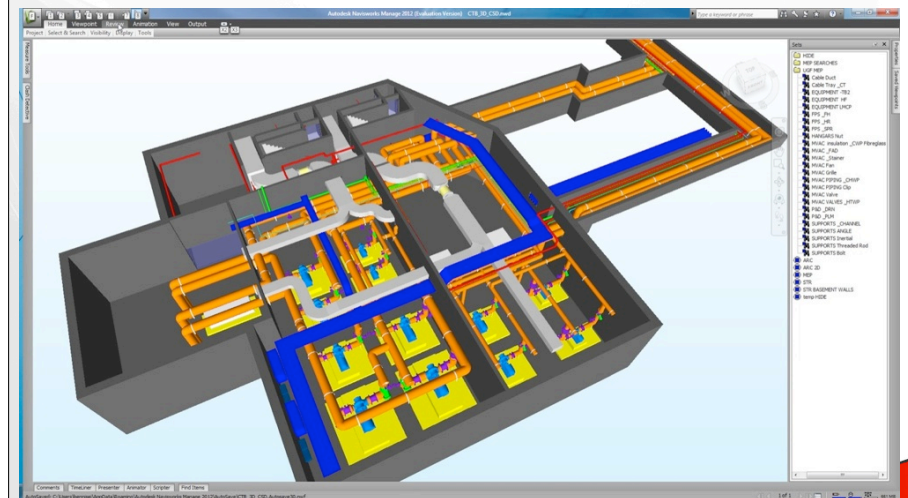
Electrical - Cable Trays
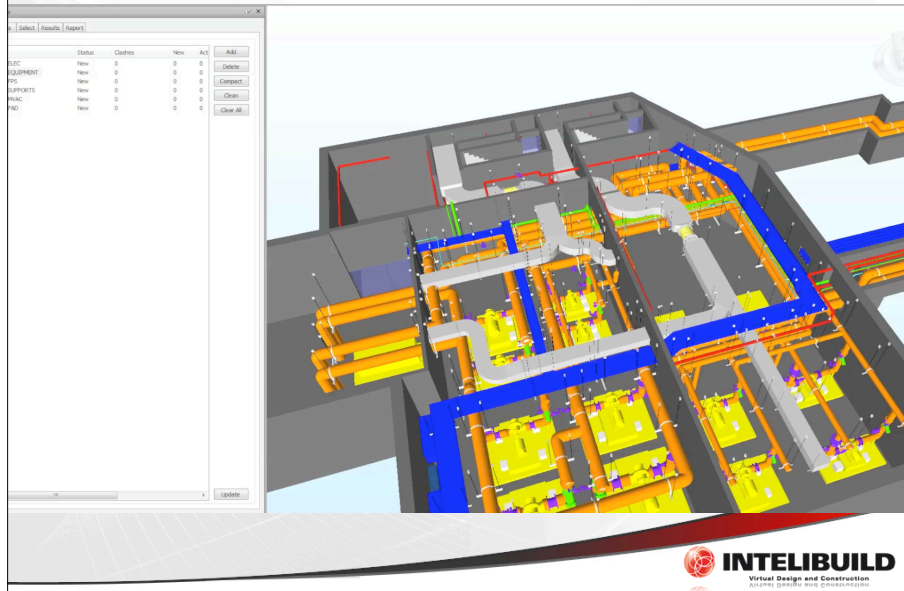
Fire Suppression

Plumbing & Drainage

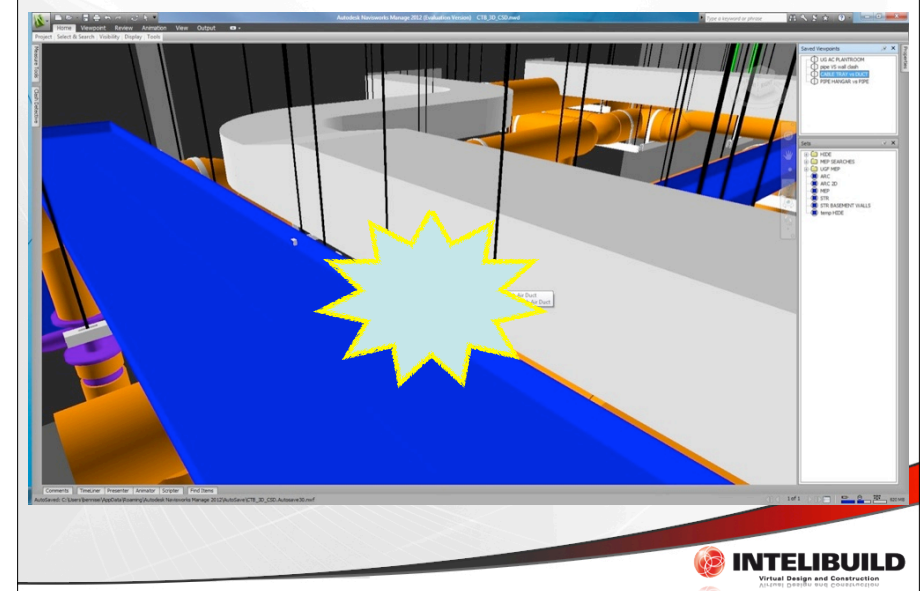## Chilled Water Pipework
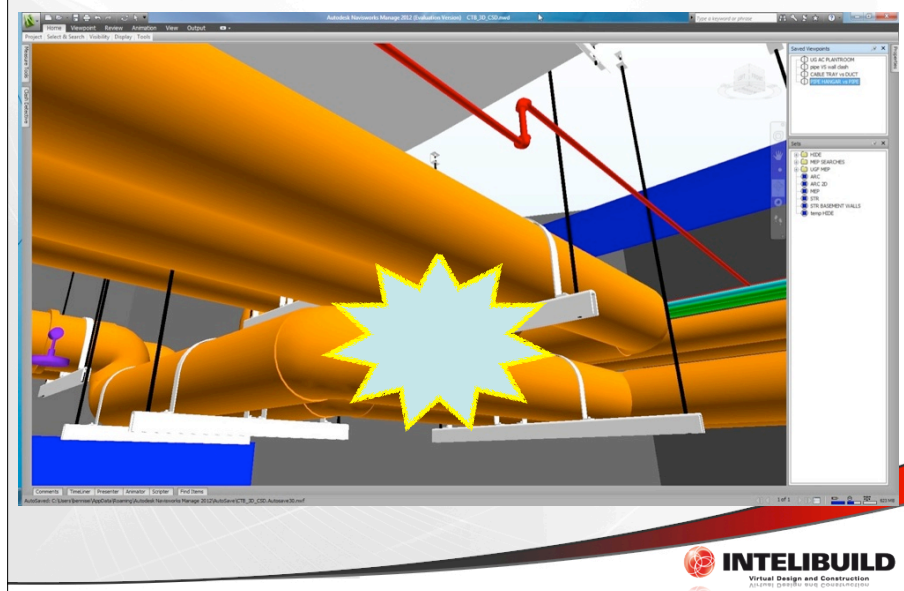
Clash Analysis - CSD Level

Cable Tray vs Ductwork

KEY IDEA - Add More Detail

Laser Scanning

Epic Scan Example

The BIM Co-ordination process must be;

Planned

Managed

Checked

INTELIBUILD
Virtual Design and Construction