

DIGITAL CONSTRUCTION & BIM IN GREECE

ΨΗΦΙΟΠΟΙΗΣΗ ΚΑΤΑΣΚΕΥΗΣ & ΜΟΝΤΕΛΟΠΟΙΗΣΗ ΚΑΤΑΣΚΕΥΑΣΤΙΚΩΝ ΠΛΗΡΟΦΟΡΙΩΝ (BIM) ΣΤΗΝ ΕΛΛΑΔΑ

ΜΑΝΟΣ ΒΡΑΪΛΑΣ

MANOS VRILAS

ΑΝΤΙΠΡΟΕΔΡΟΣ ΣΤΕΑΤ (ΣΥΝΔΕΣΜΟΣ ΕΤΑΙΡΙΩΝ ΑΝΩΤΕΡΩΝ ΤΑΞΕΩΝ)

VICE PRESIDENT OF STEAT (ASSOCIATION OF THE TECHNICAL COMPANIES OF THE HIGHEST CLASSES)

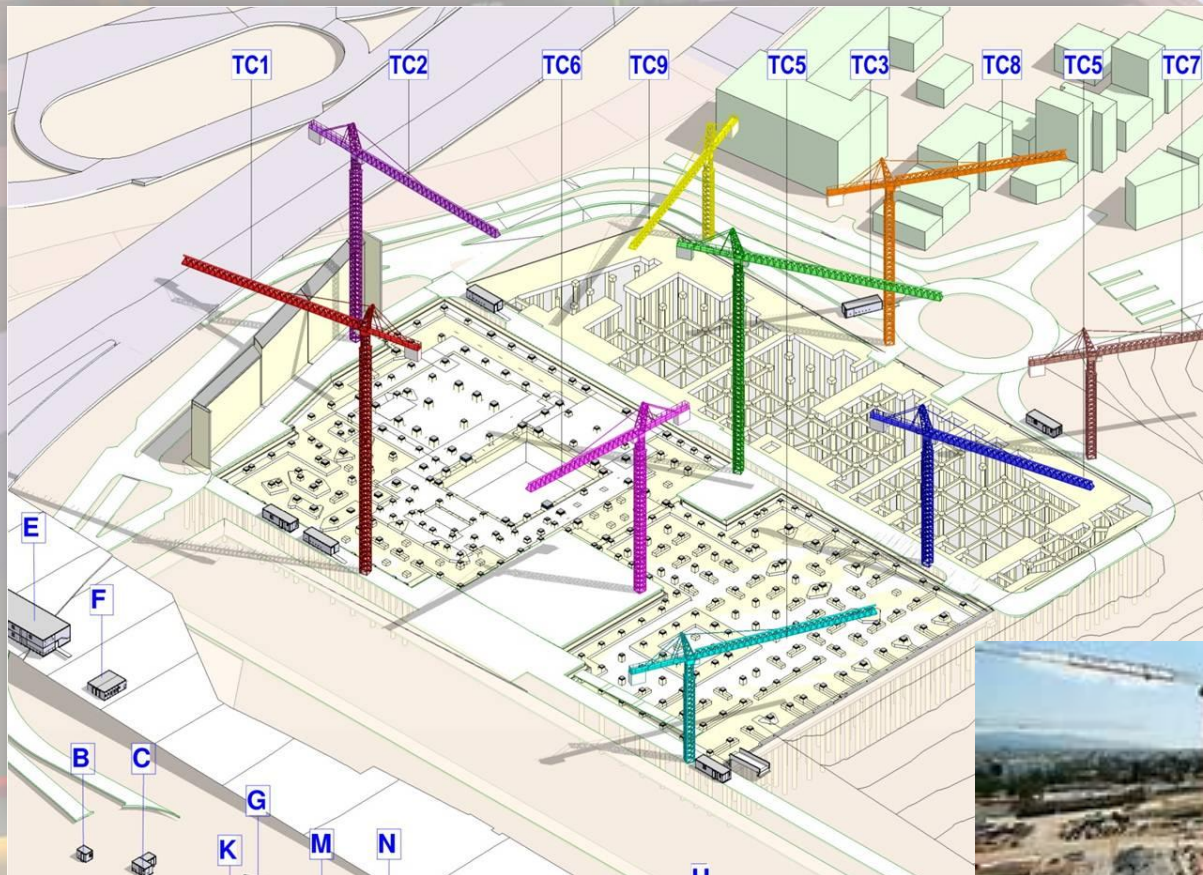
ΑΝΤΙΠΡΟΕΔΡΟΣ ΕΣΒΥΚ

(ΕΘΝΙΚΟ ΣΥΜΒΟΥΛΙΟ ΒΙΟΜΗΧΑΝΙΑΣ ΥΠΟΔΟΜΩΝ ΚΑΙ ΚΑΤΑΣΚΕΥΩΝ)

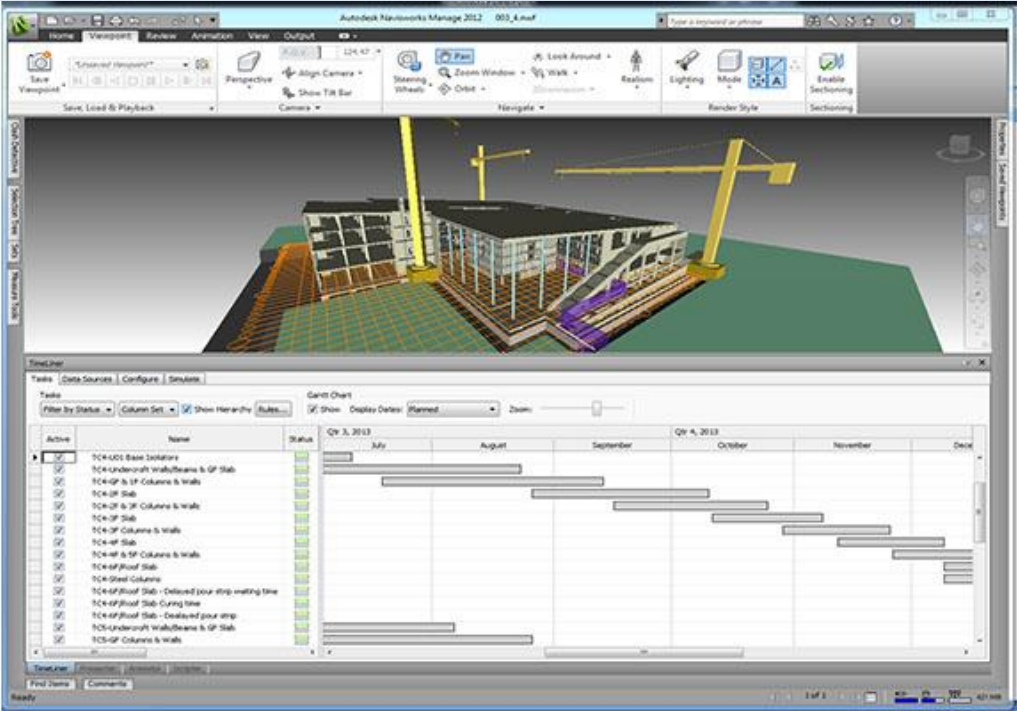
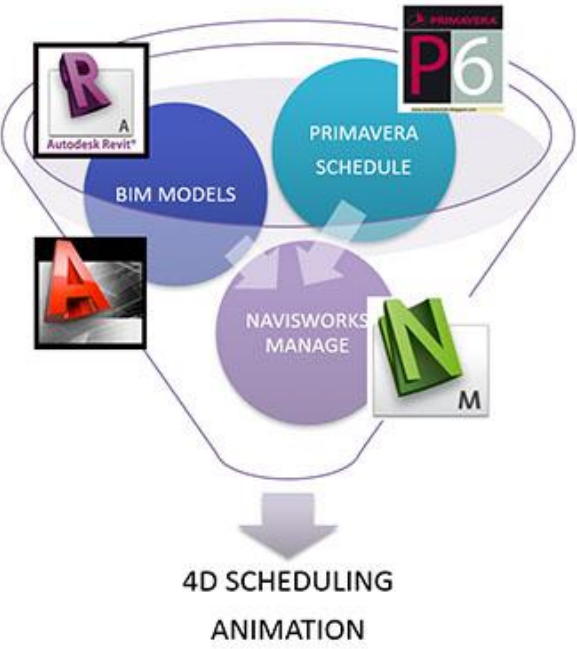
VICE PRESIDENT OF HCIC

(HELLENIC CONSTRUCTION INDUSTRY COUNCIL)

A hand-drawn sketch of a landscape. At the top left, a small sun with rays is drawn. Below it, a dark, jagged shape represents a hill or mountain. A horizontal line represents the horizon. Above the horizon, there are several handwritten notes in Spanish: "He visto" (I have seen) and "He visto" (I have seen). Below the horizon, there are more handwritten notes: "He visto" (I have seen), "He visto" (I have seen), and "He visto" (I have seen). The sketch is done in black ink on a white background.



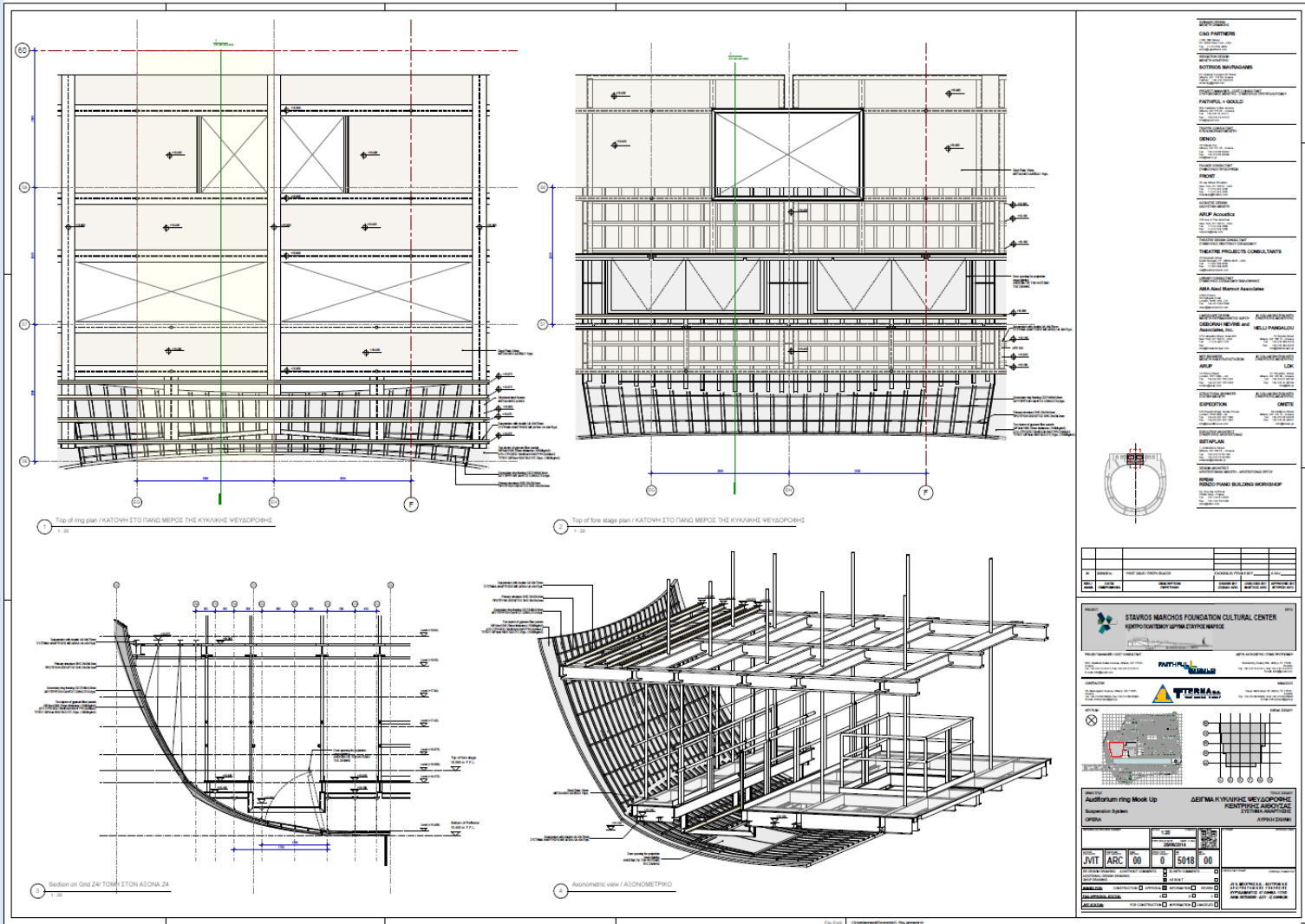
BIM FOR THE SNFCC PROJECT>> 4D SCHEDULING



BIM FOR THE SNFCC PROJECT>>

DEVELOPMENT OF THE ARCHITECTURAL DESIGN MODELS

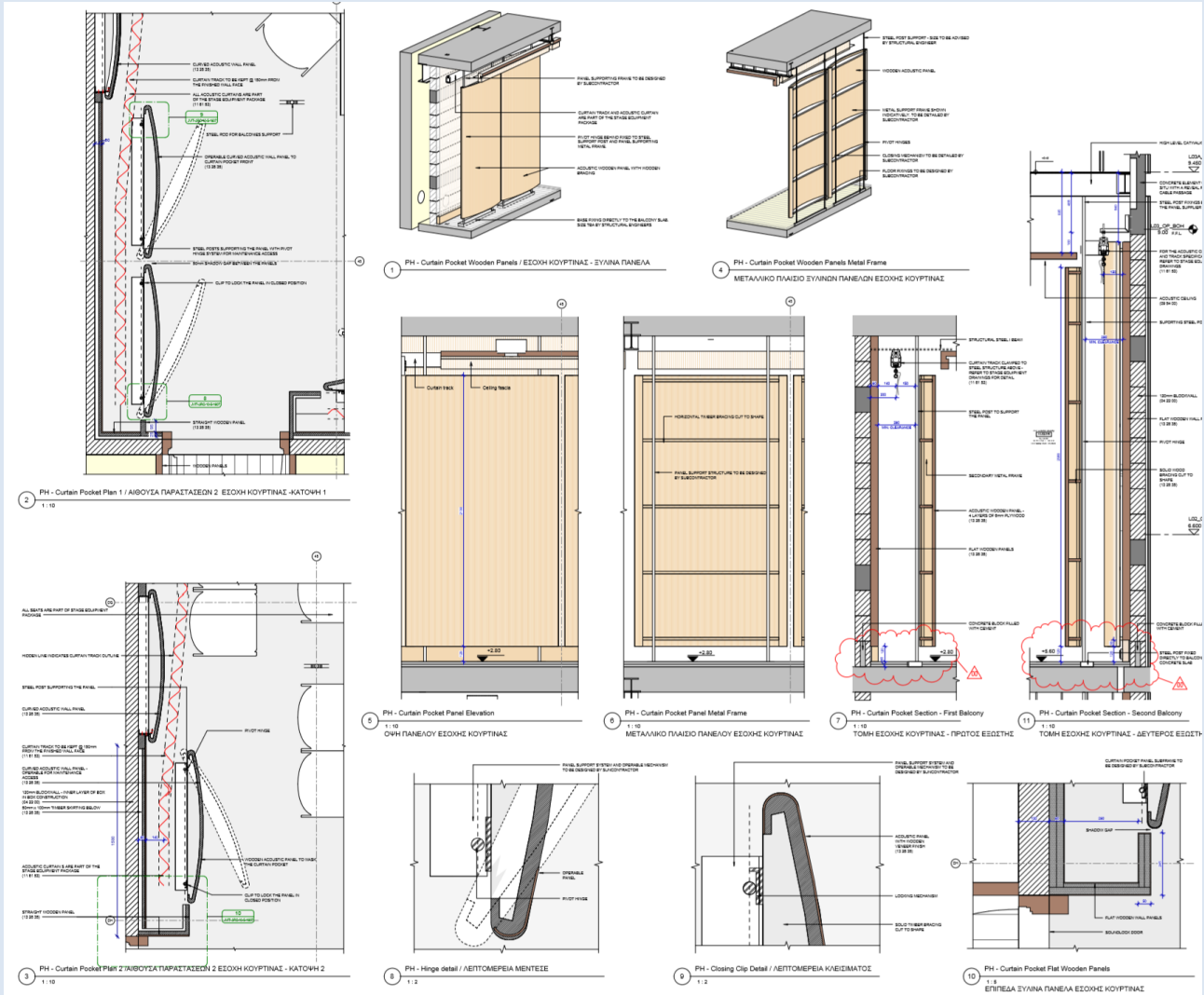
ARCHITECTURAL CONSTRUCTION/SHOP DRAWINGS



BIM FOR THE SNFCC PROJECT>>

DEVELOPMENT OF THE ARCHITECTURAL DESIGN MODELS

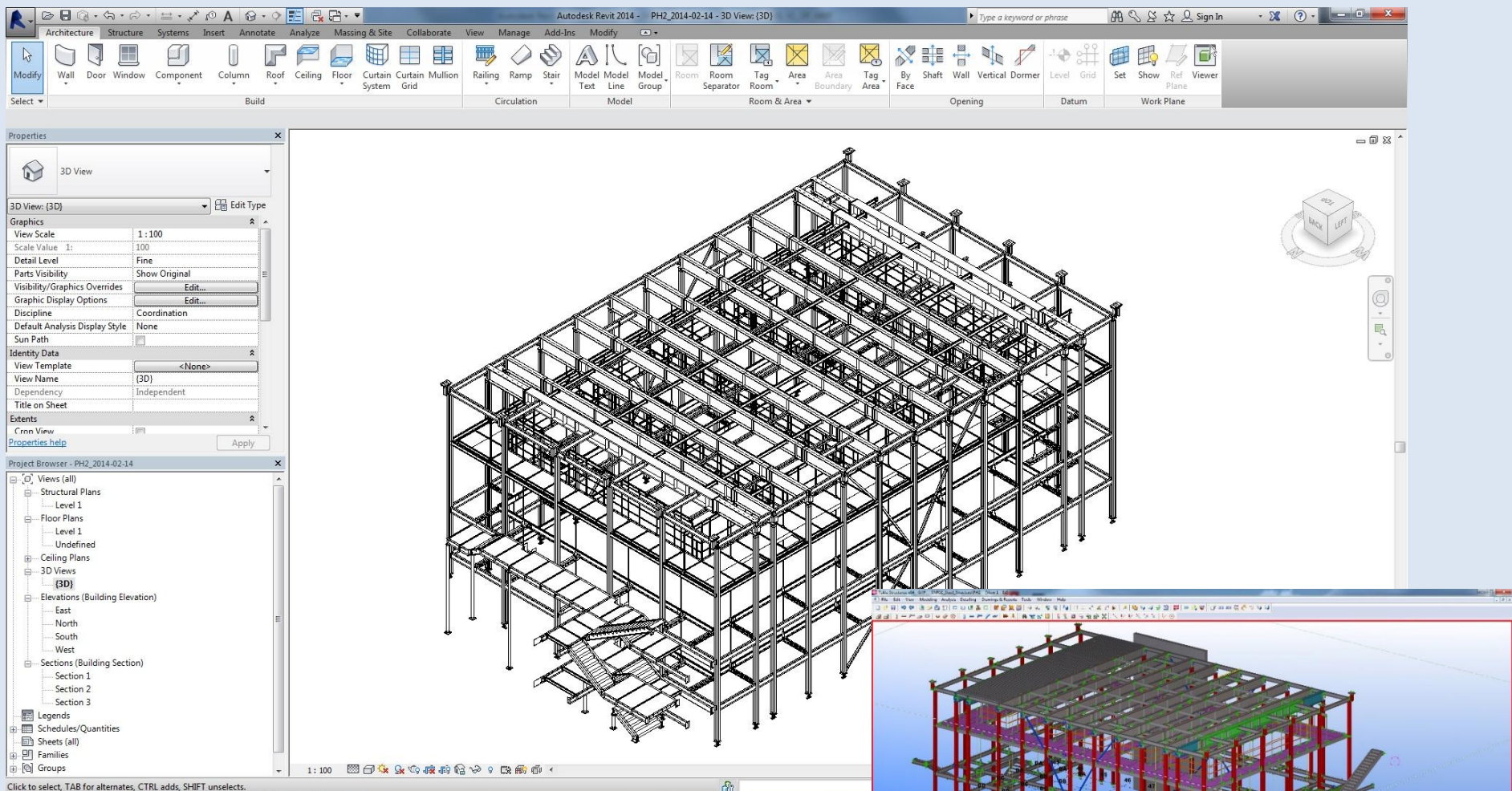
FIT-OUT MODELING & SHOP DRAWINGS



BIM FOR THE SNFCC PROJECT>>

DEVELOPMENT OF THE STRUCTURAL DESIGN MODELS

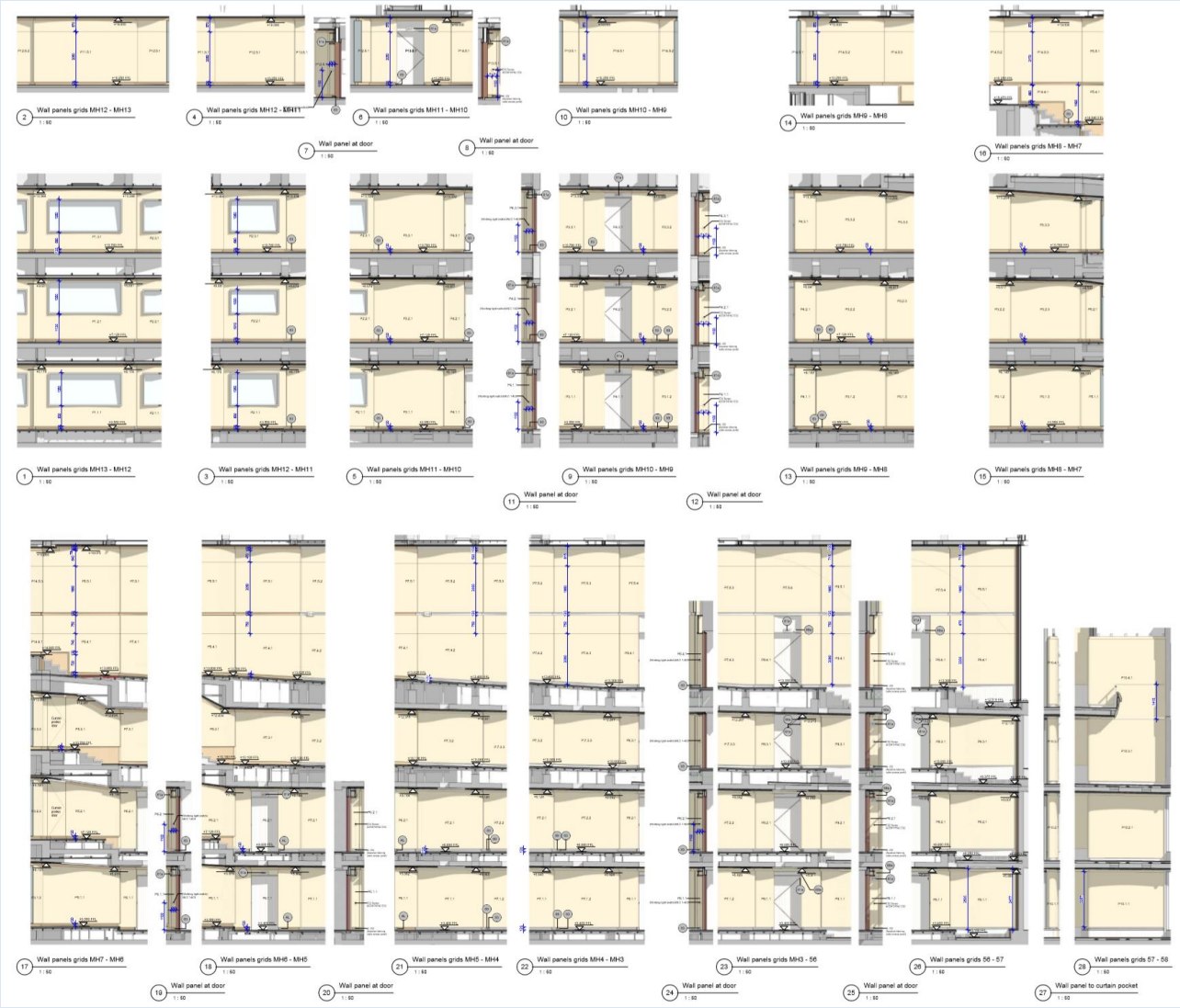
INCORPORATION OF THE SUB-CONTRACTORS IFC MODELS



BIM FOR THE SNFCC PROJECT>>

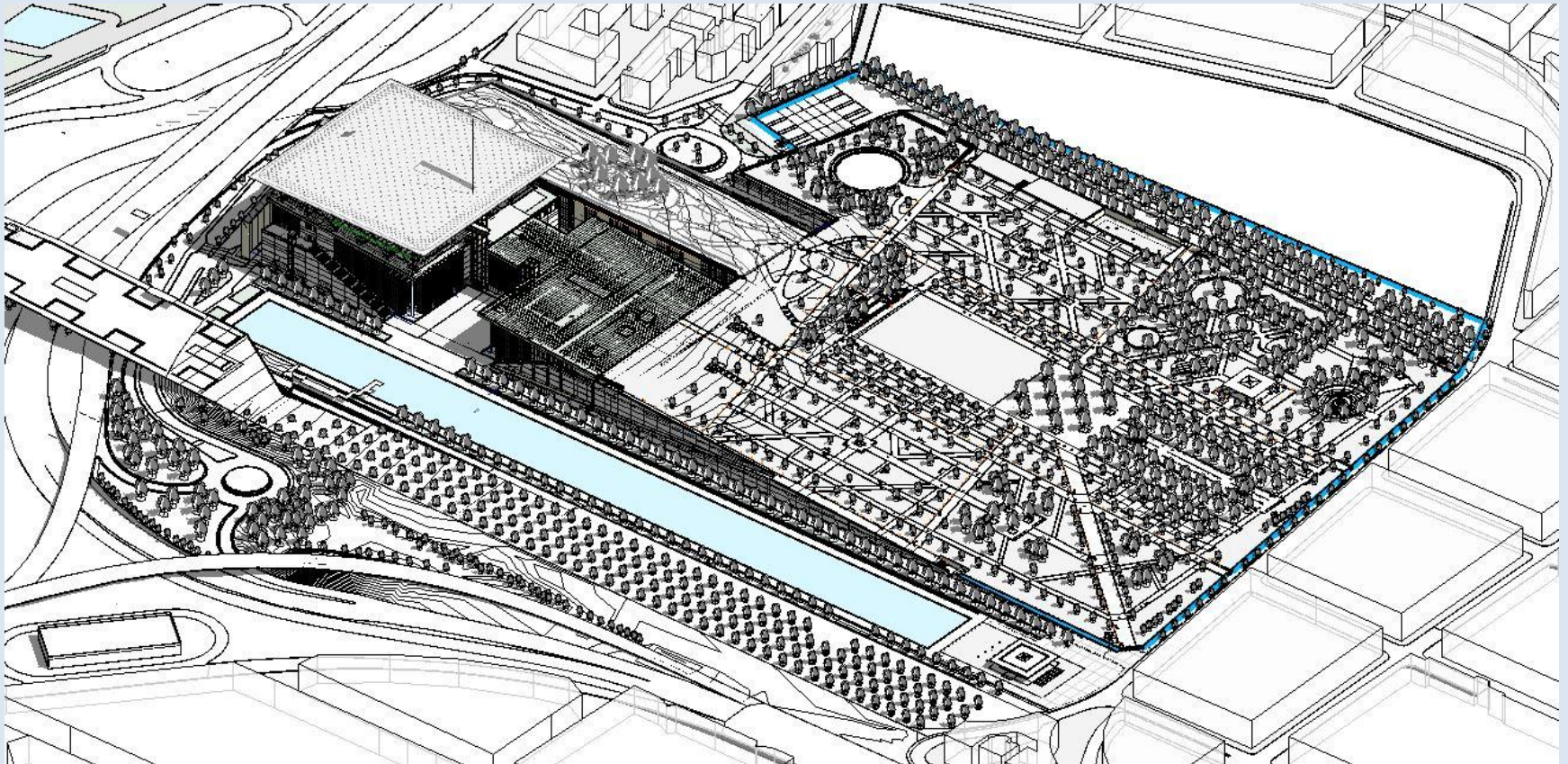
DEVELOPMENT OF THE STRUCTURAL DESIGN MODELS

BUILDER WORKS DRAWINGS



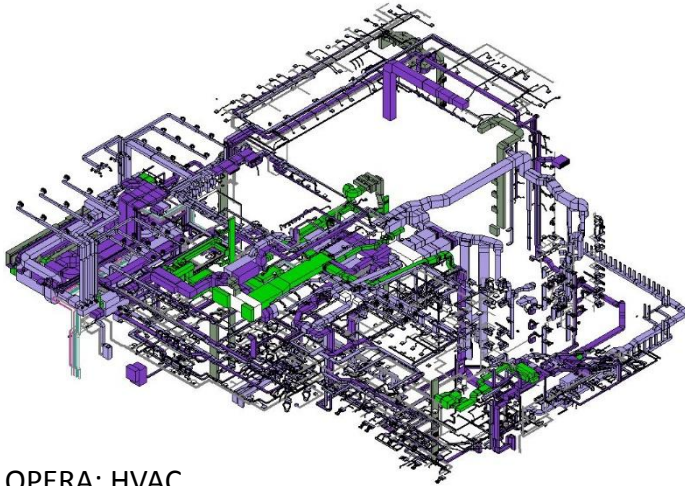
BIM FOR THE SNFCC PROJECT>>

BIM MODELING OF THE LANDSCAPED AREAS OF THE PROJECT

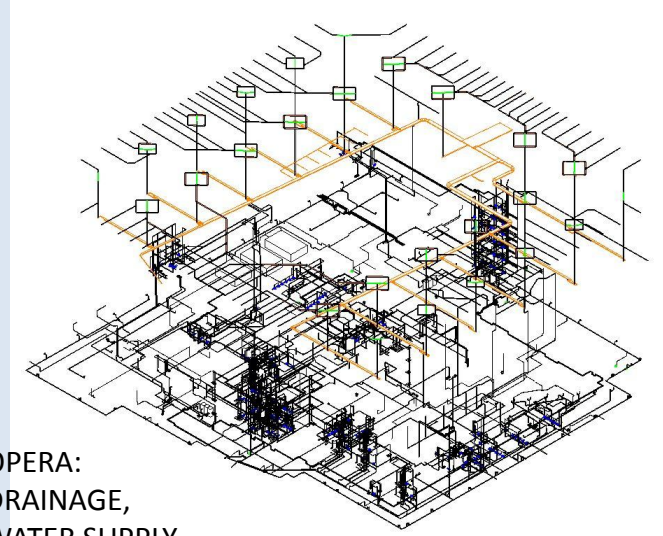


BIM FOR THE SNFCC PROJECT>>

BIM MODELING MEP SERVICES



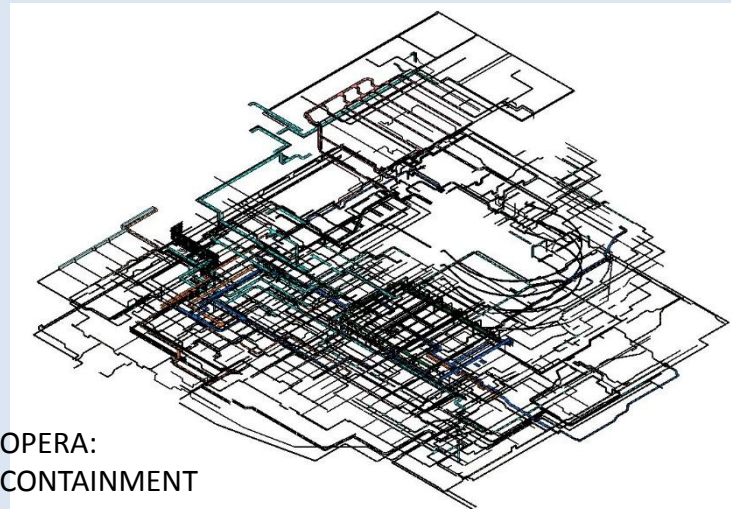
OPERA: HVAC



OPERA:
DRAINAGE,
WATER SUPPLY



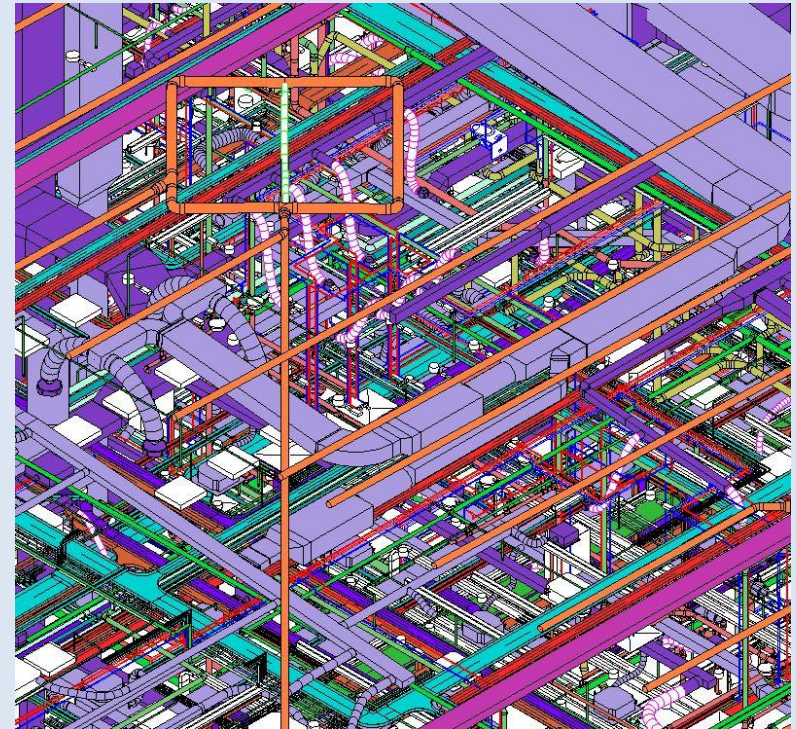
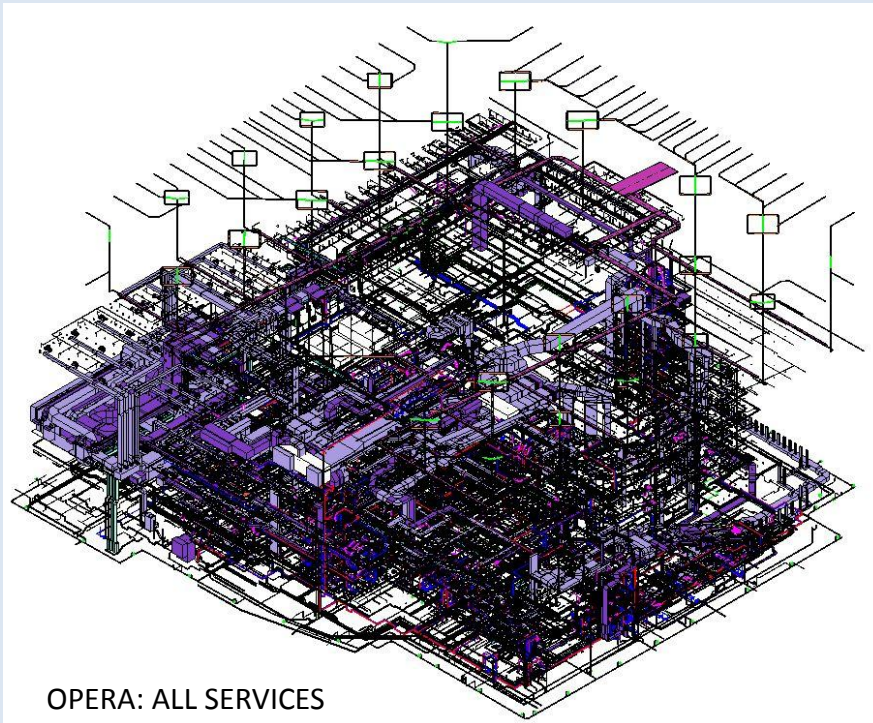
OPERA:
FIRE SUPPRESSION



OPERA:
CONTAINMENT

BIM FOR THE SNFCC PROJECT>>

BIM MODELING MEP SERVICES



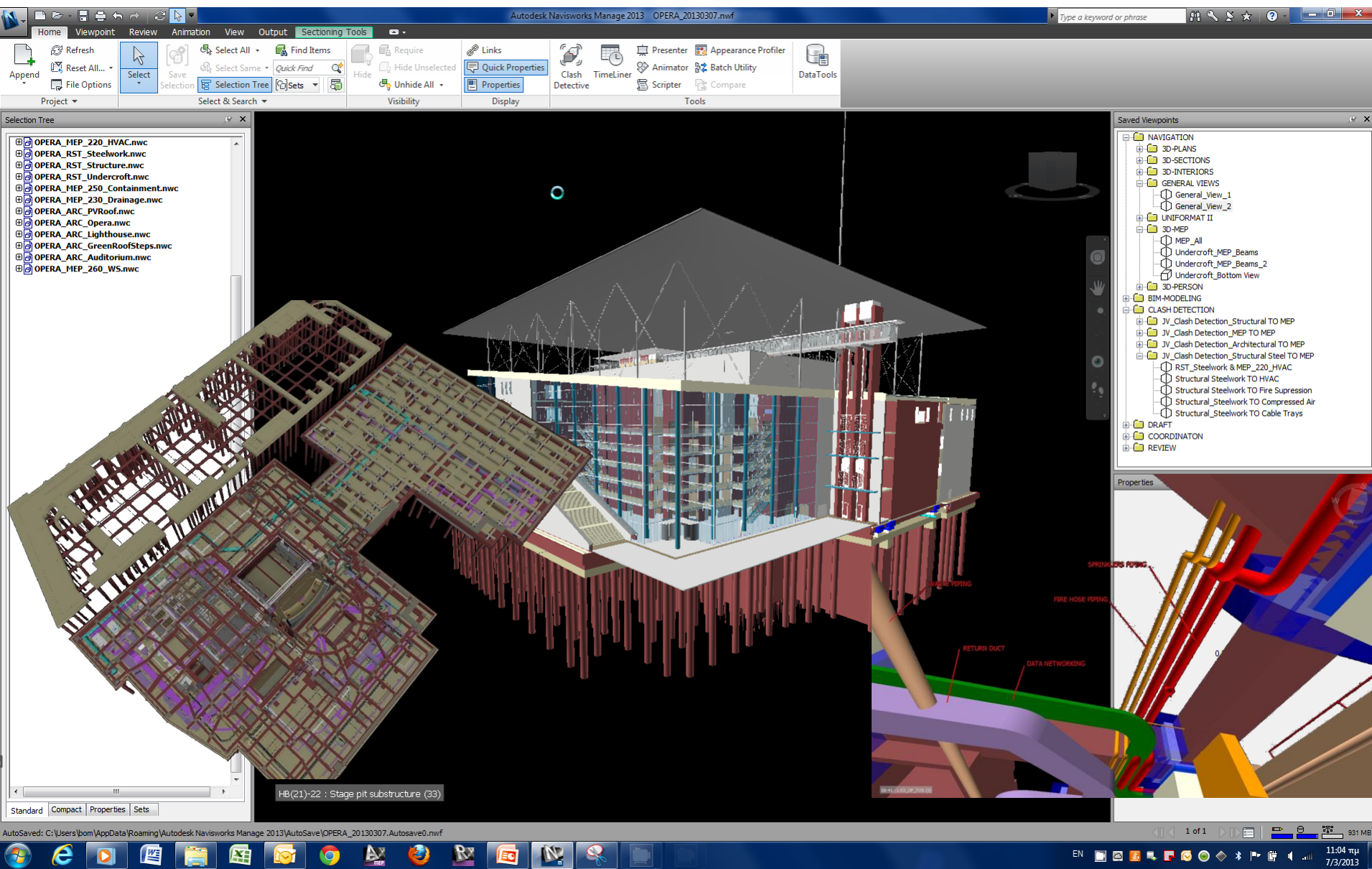
BIM FOR THE SNFCC PROJECT>>

BIM MODELING MEP SERVICES



CAR PARK: MEP BIM MODELING

BIM FOR THE SNFCC PROJECT>> FEDERATED NAVISWORKS MODEL

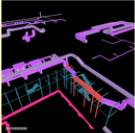


BIM FOR THE SNFCC PROJECT>>

BIM SUPPORTED MULTIDISCIPLINARY COORDINATION

Structural Steelwork TO HVAC Clash

Tolerance0.001m



Name

Distance*

Status*

Grid Location

A_Category

-0.11m

New

EC-61 : L-03_OP_TOS

Item 1*

Element ID

2495730

Revit Type Assembly Code*

B1010330

Revit Type Assembly Description*

Beams - Steel

Revit Type Name*

IPE200

Item 2*

Element ID

728732

Revit Type Assembly Code*

D3040100

Revit Type Assembly Description*

Air Distribution Systems

Revit Type Name*

JV_Radius Elbows / Taps_Supply



Name

Distance

Status

Grid Location

Date Created

Assigned To

Clash1

-0.11m

New

EC-61 : L-03_OP_TOS

2013/2/4 11:20:50

MEP

Item 1

Element ID

2495730

Revit Type Assembly Code

B1010330

Revit Type Assembly Description

Beams - Steel

Revit Type Name

IPE200

Item 2

Element ID

728732

Revit Type Assembly Code

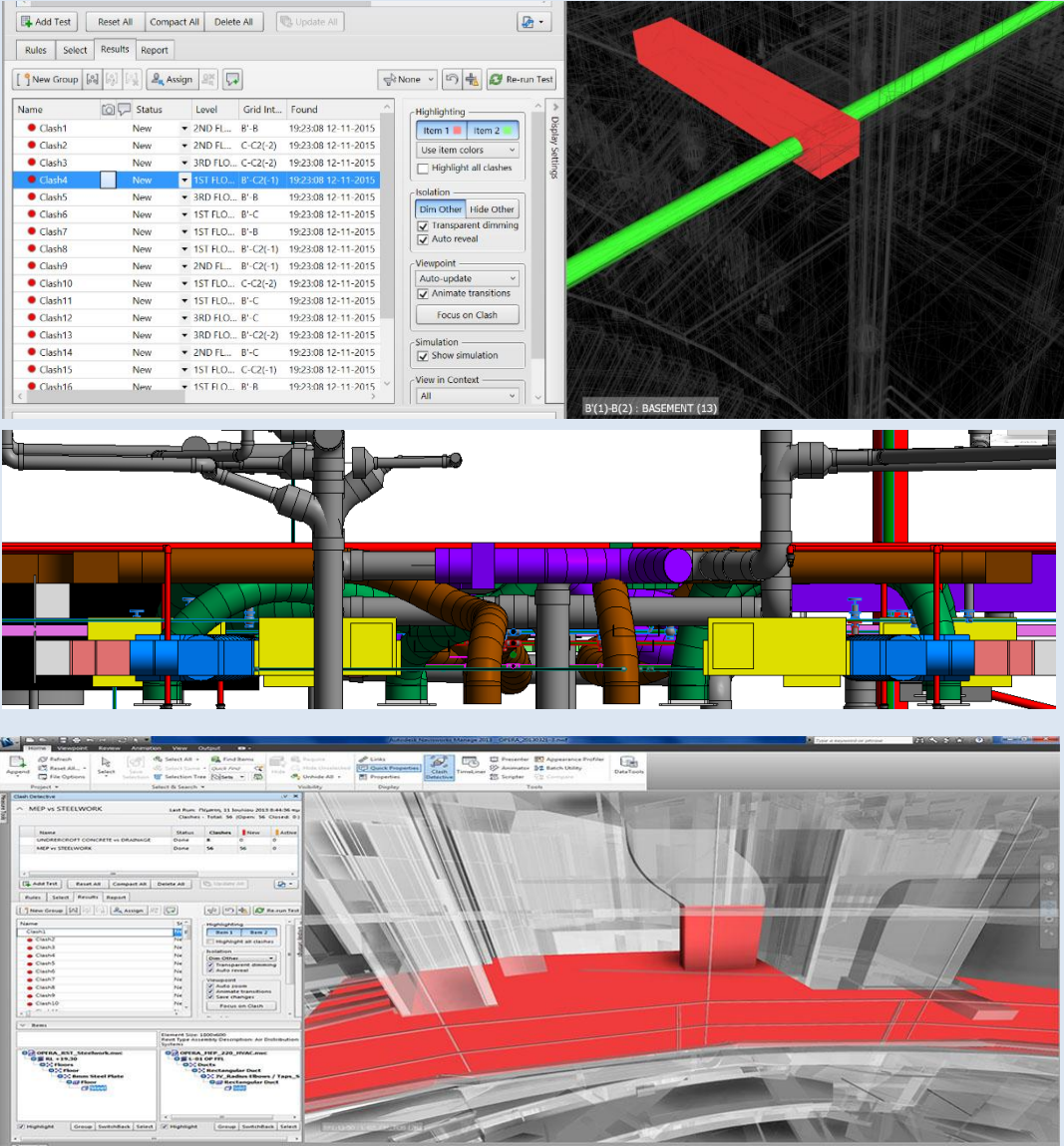
D3040100

Revit Type Assembly Description

Air Distribution Systems

Revit Type Name

JV_Radius Elbows / Taps_Supply

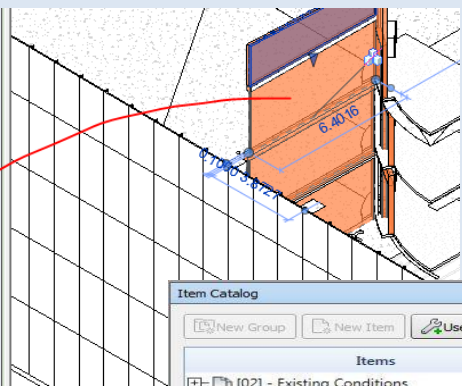


CLASH DETECTION IN NAVISWORKS

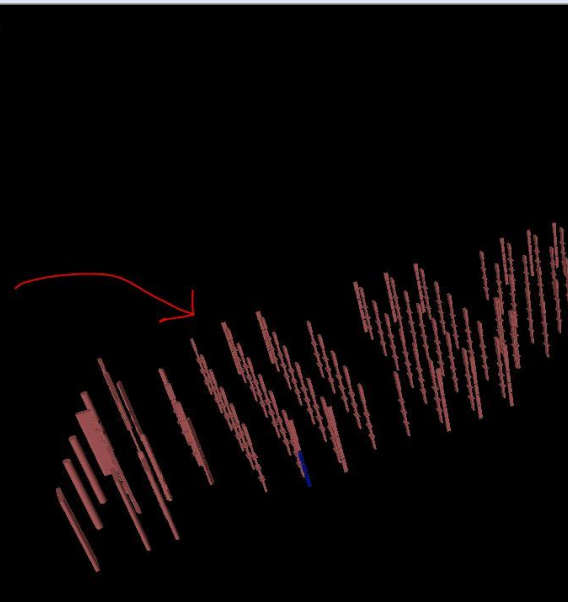
BIM FOR THE SNFCC PROJECT>>

BIM SUPPORTED QUANTIFICATION IN NAVISWORKS

Related to Model	
Structural	
Enable Analytical Model	
Structural Usage	Non-bearing
Dimensions	
Length	6.4016
Area	10.697 m ²
Volume	1.070 m ³
Identity Data	
Comments	
Mark	
MasterFormat_SoR_Code	09 21 16.14.04
Workset	FACADE
Edited by	
Design Option	Main Model
Phasing	
Phase Created	New Construction
Phase Demolished	None



Sets	
STRUCTURE	
UNIFORMITY	
DRAINAGE	
TEMP	
REVIT CATEGORIES	
Pavement Toposurface	
SoR	
03 - Concrete	
03 11 00 Concrete Forming	
03 30 00 Cast-in-Place Concrete	
03 30 00.01 Lean Concrete C12/15	
03 30 00.03 C30/37 with superplast...	
03 30 00.04 C30/37 in the same "col...	
03 30 00.04.01 In slabs	
03 30 00.04.02 In walls	
03 30 00.04.03 In columns	
03 30 00.04.04 In beams	
03 30 00.04.05 In ramps	
03 30 00.04.06 In stairs	
03 30 00.04.08 In slabs in grade (	
03 30 00.04.09 In Pavements and	
03 30 00.04.11 In L03 Staircase R...	
03 30 00.04.10 In Slab between c	
03 30 00.06 Seepage resistant concn	
03 30 00.09 Concrete C30/37	
04 - Masonry	
08 - Openings	
09 - Finishes	
21 - Fire Suppression	
23 - Heating, Ventilating, and Air Conditio	
26 - Electrical	

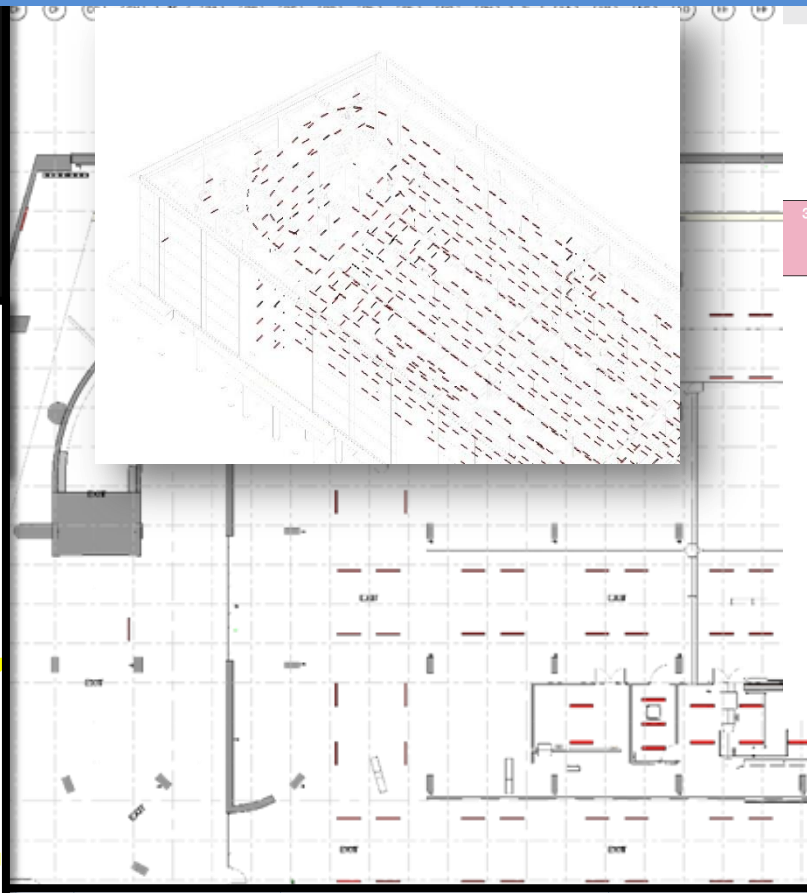


Item Catalog	
New Group	New Item
Use Resource	Delete
Resource Catalog	
Item Name	Work Breakdown St...
CF09	11
Description	
Object Appearance	
Color	Opaque Transparent
Item Calculations	
Vari...	Formula
Length	=ModelLength
Width	=ModelWidth
Thick...	=ModelThickness
Height	=ModelHeight
Perim...	=ModelPerimeter
Area	=ModelArea
Volume	=ModelVolume
Weight	=ModelWeight
Count	=1
Prima...	

BIM FOR THE SNFCC PROJECT>> BIM FOR O&M IMPLEMENTATION STRATEGY



Properties	
Lighting Fixture 100x150mm_CF02 D	
Lighting Fixtures (1)	Edit Type
Constraints	
Host	Basic Roof : Generic - 125mm
Elevation	3200.0
Electrical - Lighting	
Switch ID	
Calculate Coefficient of Utilization	☒
Coefficient of Utilization	
Electrical - Loads	
Panel	
Circuit Number	
Identify Data	
Comments	
Mark	23
MasterFormat_SoR_Code	
Phasing	
Phase Created	New Construction
Phase Demolished	None
Electrical - Circuits	
Electrical Data	120 V/1-40 VA
Data	
COBie	☒
COBie.CreatedBy	mbogris@ebarchitects.eu
COBie.CreatedOn	11-09-2014
COBie.ComponentName	CF02D_Room 2_1
COBie.ComponentSpace	Room 1
COBie.ComponentDescription	Lighting Fixture Ceiling Hosted
COBie.Component.SerialNumber	1234
COBie.Component.InstallationDate	05-05-2014
COBie.Component.WarrantyStartDate	05-05-2014
COBie.Component.TagNumber	n/a
COBie.Component.BarCode	n/a
COBie.Component.AssetIdentifier	n/a
COBie.Component.Area	
COBie.Component.Length	1.5



Digital DALI electronic ballasts for T5 fluorescent lamps



14-80 W 220-240 V, 50-60 Hz

- Digital DALI control
- Switch-Control
- Stand-by consumption 0.3 W
- Dimming range 1-100 % *
- Only 21 mm high
- Microprocessor controlled
- Standard & Side mounting
- User friendly, quick release connectors

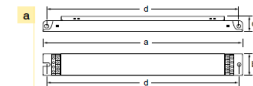


A1 BAT

Lamp type	Wattage	No. of lamps	Ballast	EEI	Dimensions	Connection	Weight	Circuit power	Mains current	Lamp power
					(p.35)		(g)	(W)	(A)	(W)
14	2	1	EL1x14-35Dim	A1 BAT	1	1	250	17	0.08-0.07	13.7
14	2	2	EL2x14-35Dim	A1 BAT	2	2	330	32.5	0.15-0.14	13.7
14	3	3	EL3x14Dim	A1 BAT	2	3	310	47.5	0.22-0.20	13.7
14	4	4	EL4x14Dim	A1 BAT	2	4	330	62	0.29-0.27	13.7
21	1	1	EL1x14-35Dim	A1 BAT	1	1	250	23.5	0.11-0.10	20.7
21	2	2	EL2x14-35Dim	A1 BAT	2	2	330	46	0.22-0.20	20.7
24	1	1	EL1x24Dim	A1 BAT	1	1	250	25.5	0.12-0.10	22.5
24	2	2	EL2x24Dim	A1 BAT	2	2	330	50.5	0.23-0.21	22.5
28	1	1	EL1x14-35Dim	A1 BAT	1	1	250	32	0.15-0.14	27.8
28	2	2	EL2x14-35Dim	A1 BAT	2	2	330	62	0.28-0.26	27.8
35	2	2	EL2x14-35Dim	A1 BAT	2	2	330	73.5	0.36-0.30	34.7
39	1	1	EL1x39Dim	A1 BAT	1	1	250	42.5	0.20-0.18	38
39	2	2	EL2x39Dim	A1 BAT	2	2	330	82.5	0.38-0.35	38
49	1	1	EL1x49Dim	A1 BAT	1	1	250	55	0.25-0.23	49.3
49	2	2	EL2x49Dim	A1 BAT	2	2	330	107.5	0.49-0.45	49.3
54	1	1	EL1x54Dim	A1 BAT	1	1	250	59	0.27-0.25	53.8
54	2	2	EL2x54Dim	A1 BAT	2	2	330	117	0.53-0.49	53.8
80	1	1	EL1x80Dim	A1 BAT	1	1	250	86	0.39-0.36	80
80	2	2	EL2x80Dim	A1 BAT	2	2	365	170	0.78-0.70	80

Note: See pages 35 - 37 for connection diagrams and additional characteristics.
* Dimming range 3-100 % for EL3x14Dim & EL4x14Dim

Dimensions	1	2
Length 'a' (mm)	360	430
Width 'b' (mm)	30	30
Height 'c' (mm)	21	21
'd' (mm)	350	420



Name	CreatedBy	CreatedOn	TypeName	Space	Description	ExtSystem	ExtObject	ExtIdentifier	SerialNumber	InstallationDate	WarrantyStartDate	TagNumber	BarCode	AssetIdentifier	Area	Length
CF07_Room 3_1	mbogris@ebarchitects.eu	11-09-2014	CF07	Room 2	Lighting Fixture Ceiling Hosted	Autodesk Revit 2014, Build: 20130308 1515(x64)	Autodesk Revit.DB.FamilyInstance	184974	5678	06-05-2014	06-05-2014	n/a	n/a	n/a	n/a	1.5
CF07_Room 3_1	mbogris@ebarchitects.eu	11-09-2014	CF07	Room 2	Lighting Fixture Ceiling Hosted	Autodesk Revit 2014, Build: 20130308 1515(x64)	Autodesk Revit.DB.FamilyInstance	185793	5678	06-05-2014	06-05-2014	n/a	n/a	n/a	n/a	1.5
CF07_Room 3_1	mbogris@ebarchitects.eu	11-09-2014	CF07	Room 2	Lighting Fixture Ceiling Hosted	Autodesk Revit 2014, Build: 20130308 1515(x64)	Autodesk Revit.DB.FamilyInstance	185855	5678	06-05-2014	06-05-2014	n/a	n/a	n/a	n/a	1.5
CF07_Room 3_1	mbogris@ebarchitects.eu	11-09-2014	CF07	Room 2	Lighting Fixture Ceiling Hosted	Autodesk Revit 2014, Build: 20130308 1515(x64)	Autodesk Revit.DB.FamilyInstance	185857	5678	06-05-2014	06-05-2014	n/a	n/a	n/a	n/a	1.5
CF07_Room 3_1	mbogris@ebarchitects.eu	11-09-2014	CF07	Room 2	Lighting Fixture Ceiling Hosted	Autodesk Revit 2014, Build: 20130308 1515(x64)	Autodesk Revit.DB.FamilyInstance	185917	5678	07-05-2014	06-05-2014	n/a	n/a	n/a	n/a	1.5
CF07_Room 3_1	mbogris@ebarchitects.eu	11-09-2014	CF07	Room 2	Lighting Fixture Ceiling Hosted	Autodesk Revit 2014, Build: 20130308 1515(x64)	Autodesk Revit.DB.FamilyInstance	185919	5678	07-05-2014	06-05-2014	n/a	n/a	n/a	n/a	1.5
CF07_Room 3_1	mbogris@ebarchitects.eu	11-09-2014	CF07	Room 2	Lighting Fixture Ceiling Hosted	Autodesk Revit 2014, Build: 20130308 1515(x64)	Autodesk Revit.DB.FamilyInstance	185920	5678	07-05-2014	06-05-2014	n/a	n/a	n/a	n/a	1.5
CF07_Room 3_1	mbogris@ebarchitects.eu	11-09-2014	CF07	Room 2	Lighting Fixture Ceiling Hosted	Autodesk Revit 2014, Build: 20130308 1515(x64)	Autodesk Revit.DB.FamilyInstance	185921	5678	07-05-2014	06-05-2014	n/a	n/a	n/a	n/a	1.5
CF07_Room 3_1	mbogris@ebarchitects.eu	11-09-2014	CF07	Room 2	Lighting Fixture Ceiling Hosted	Autodesk Revit 2014, Build: 20130308 1515(x64)	Autodesk Revit.DB.FamilyInstance	185938	5678	07-05-2014	06-05-2014	n/a	n/a	n/a	n/a	1.5
CF07_Room 3_1	mbogris@ebarchitects.eu	11-09-2014	CF07	Room 2	Lighting Fixture Ceiling Hosted	Autodesk Revit 2014, Build: 20130308 1515(x64)	Autodesk Revit.DB.FamilyInstance	185940	5678	07-05-2014	06-05-2014	n/a	n/a	n/a	n/a	1.5
CF07_Room 3_1	mbogris@ebarchitects.eu	11-09-2014	CF07	Room 2	Lighting Fixture Ceiling Hosted	Autodesk Revit 2014, Build: 20130308 1515(x64)	Autodesk Revit.DB.FamilyInstance	185941	5678	07-05-2014	06-05-2014	n/a	n/a	n/a	n/a	1.5

Τι πρέπει να γίνει στην Ελλάδα

1. Συμμόρφωση με τη στρατηγική της Ε.Ε. περί ψηφιακού μετασχηματισμού και στον τομέα της κατασκευής
2. Αξιοποίηση της δυνατότητας που παρέχεται από το άρθρο 22 παρ. 4 του ν. 4412/16 για δυνατότητα χρήσης ηλεκτρονικών εργαλείων μοντελοποίησης κτιριοδομικών πληροφοριών.
3. Άμεση νομοθετική παρέμβαση για υποχρεωτική χρήση ψηφιακών εργαλείων
 - Στις μελέτες που συντάσσονται πριν την παραλαβή τους
 - Στα έργα που κατασκευάζονται πριν την παράδοσή τους
4. Θέσπιση λογικής περιόδου προσαρμογής και κλιμάκωσης της χρήσης των σχετικών εργαλείων, με προτεραιότητα κατ' αρχήν στα έργα πολύ μεγάλου προϋπολογισμού και κλιμάκωση σταδιακή μέχρι τα έργα μικρού προϋπολογισμού.
5. Εντατικοποίηση και θέσπιση κινήτρων για την απαιτούμενη εκπαίδευση του τεχνικού κόσμου της χώρας δεδομένης της ανάγκης ανάπτυξης νέων δεξιοτήτων σε όλο το φάσμα των συντελεστών των έργων.

ΣΑΣ ΕΥΧΑΡΙΣΤΩ