

Digital Construction competition

**Modelling collaboratively, finding errors and correcting an
Information Model before setting up construction drawings
and visualisations to BS EN ISO:19650-1**

Project Number: WSUK19

Project Name: WSUK Head Office

Type: Commercial Office Complex

Facility Name: WorldSkillsUK Head Office

Site Name: Ravenscraig

To be issued 15 minutes before the competition (15 minutes reading time). Notes etc can be made in the document however at no point are candidates allowed access to a computer or other equipment

TASK: Modelling from AEC drawings and complying with a project BEP to create a Volume of the Structural and Architectural Project Information Models (PIM's)

Federating multidiscipline models in order to find and correct errors to complete the Project Information Models

Sheet up Construction Drawings and produce Visualisations

At all times, comply with the contractual BEP provided.

Status codes to be used for this project:

Status	Issue Purpose	Directory
S0	WIP	WIP
S1	Coordination	Shared
S2	Information	Shared

Time: _____ 5 hours. Refer to the BEP Section 3.3 for Project Deadlines

Structural Task A1.0

1. Within your own project area on the CDE, create a directory called Structural WIP (Work In Progress). Save to the Structural WIP area on the CDE unless otherwise specified for the remainder of task A
2. From your Resources directory, download & begin a new project with the 2019 WSUK Structural Revit Template provided.
3. This is to be volume 2 of the structural Project Information Model. Set up the project as a collaborative file to your Structural WIP directory on BIM 360 CDE and name it as per project requirements and adding _Structural Extension as the file description
4. Refer to the BEP for Workset naming protocols and create all Structural Worksets
5. On Site Level, link in the Geospatial Grids file from the resources directory.
6. Ensure the Project Base Point is located on the intersection of structural grids A - 10
7. Set the Project coordinates by acquiring the coordinates from the linked structural grids file
8. Copy and Monitor all structural grids into the structural PIM
9. Copy and Monitor all levels into the structural PIM and delete the default project levels and associated plan views.

10. Add the Structural Columns and Beams as per drawings provided

1. Column Base Level: Sub Level
2. Column Top Level: Roof Level

11. Add the structural floors at level 00 SSL, Level 01 SSL and Level 02 SSL as per drawings provided

12. Complete the validation checklist in the Resources directory and save this to your Admin directory.

13. Issue the PIM for Coordination

Architectural Task B1.0

1. From your Resources directory, download and open the Volume 2 conceptual Architectural PIM
2. This will be volume 2 of the Architectural Project Information Model. Set the project up as a collaborative file to the Architectural WIP directory on BIM 360 CDE and name it as per project requirements adding _Architectural Extension as the file description
3. Refer to the BEP for Workset naming protocols and create all Architectural Worksets

*Access to NBS toolkit permitted. NBS spreadsheet is available in resources directory (Use Ss codes only)

4. Create a new wall type called Wall_Exterior_WSUK as per the Wall Layer info on Drawing 27 – Foundation Detail, External Wall

NB: Structural Core element: 150 thick metal frame to be specified as Function type: Structure.

All other elements are to be specified as Function type: Finish

5. Make a new Floor Type called Ground_Bearing_WSUK with the following layers:

Thickness	Material
200mm	Concrete – Cast-in-Place Concrete
115mm	Kingspan K103 Floor Board

6. Create a new floor type called Raised_Access_WSUK with the following layers:

Thickness	Material
50mm	Deck
50mm	Pedestal

7. Link in Volume 2 structural PIM (from task A) into this PIM
8. Copy and Monitor the ground floor from the structural model to this model using the following Settings:

Original Type:	New Type:
Generic 450mm	Ground_Bearing_WSUK

9. Copy and Monitor the floors for Level 01 and Level 02 from the structural model to this model using the following Settings:

Original Type:	New Type:
Generic 300mm	Raised_Access_WSUK

10. Ensure all three new floors are set to the correct FFL Level with 0mm offset
11. Perform a Coordination Review on the structural linked file and Accept the changes in the floor elevation change
12. Change the North and East exterior walls of the project to type:
Wall_Exterior_WSUK
13. Create the Glazed South wall as per the Exhibit Drawing Z2-XX-M2-A-7030-0003-Elevation (3 of 3)
14. Update & add all internal walls, doors and windows for level 00 as per drawings provided
- NB: Use the Basic Wall – Interior 123mm Partition (1-hr) for all interior walls
15. Add ceilings to every room at 2600mm on level 00 (compound ceiling 600 x 600 grid)
16. Change the Room Area Computation setting to: At wall core layer

17. Change the Volume Computations setting to: Areas and Volumes

18. Place all rooms at level 00

19. Number & Tag all rooms at Level 00 ensuring client requirements are met as per BEP 6.6

20. Add classification information to the 3rd level to all elements below on Level 00 as per the BEP

1. Walls
2. Windows
3. Doors

21. Add the components below (from the Resources directory on CDE) to the WC on Level 00 as per the floor plan

1 x Plumbing_Fixtures_WC_Wall_Mounted_WSUK

1 x Plumbing_Fixtures_Basin_WSUK

22. Edit the Plumbing_Fixtures_WC_Wall_Mounted_WSUK family so that its location will be calculated as the room that it has been placed in

23. Ensure the required assets have the required COBie data populated on Level 00 – Refer to 5.3 and Appendix A.1 + A.2 in the project BEP for further details

24. Complete the validation checklist in the Resources directory and save this to your Admin directory

25. Issue the PIM for Coordination

Coordination Task C1.0

Clash Detection

1. Using Navisworks Manage, federate the following PIM's from the published directory:

1. Structural Volume 1
2. Staircase
3. Architectural Volume 1
4. Mechanical Volume 1

2. Perform the following **Hard Clash** Inspection at Level 00:

Search Set No 1	Search Set No 2	Stage 5
		Tolerance (mm)
UC Columns - UC254x254x73	Stairs	50

3. Evaluate any resulting clash, set the status to reviewed and add the comment Relocate Stair or accept it and add the comment No issue if you think the clash will not result in a problem

4. Perform the following **Clearance Type** Clash Inspection at Level 00:

Search Set No 1	Search Set No 2	Stage 5
		Tolerance (mm)
Doors - M_Single-Flush	UC Columns - UC254x254x73	500

5. If you detect a problem with any resulting clash, set the status to reviewed and add the comment Relocate Door or Relocate Column or accept it and add the comment No issue if you think the clash will not result in a problem

6. Perform the following **Hard Clash** Inspection at Roof Level:

Search Set No 1	Search Set No 2	Stage 5
		Tolerance (mm)
All Mechanical Equipment at Roof level	UB-Universal Beams at Roof Level	50

7. If you detect a problem with any resulting clash, set the status to reviewed and add the comment Relocate Element or accept it and add the comment No issue if you think the clash will not result in a problem

8. Export All Tests as per the BEP (separate) in HTML (tabular) format

9. Issue the federated model for Information as per the BEP

Quality Assurance task 1

10. Using BIM 360 Model Coordination tools, Quality Assure the project named *WAUK19-KPOINT-Z1-ZZ-CM-Z-XXXXXX-1001_CombinedModel* saved in the Published directory.

Quality Assure the rooms listed below on Level 00. Use the 2D Sheets & Views within BIM360 to identify the location of the rooms below:

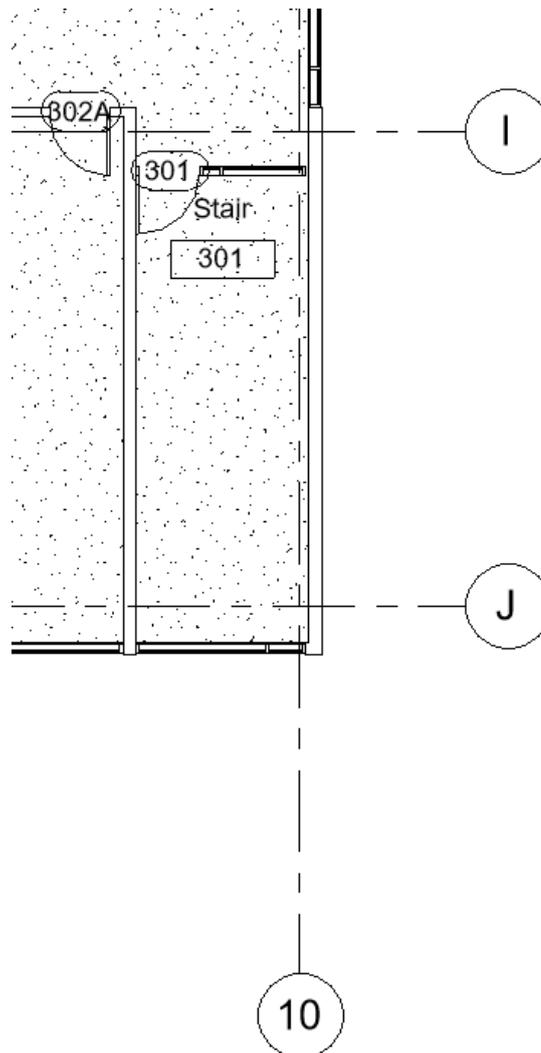
- 0103 – Conference
- 0104 Instruction
- 0111 – Lounge

For each new issue you find:

1. Create a new issue within the BIM 360 Environment
2. Add annotation describing the issue
3. Assign the Issue to the BIM manager on the project: Gary Hogg

Corrective Modelling Task D1.0

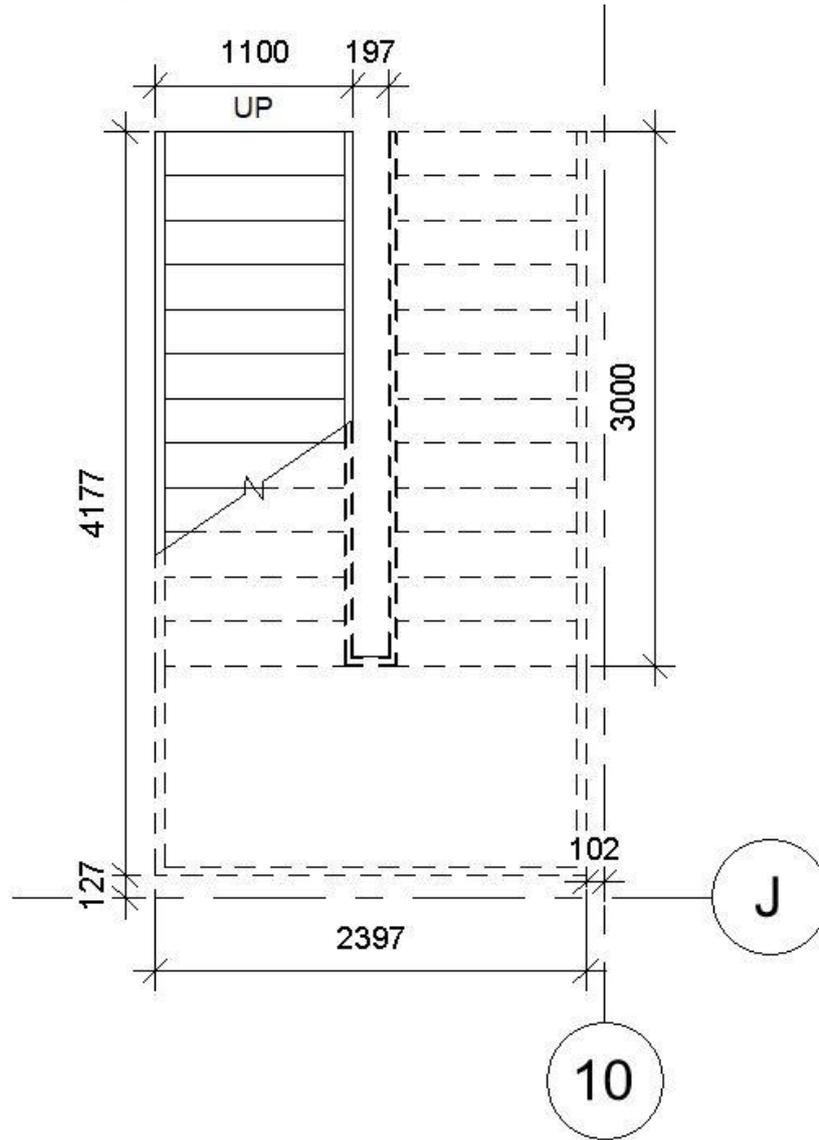
1. Open the Structural Volume 1 PIM from the Published directory
2. Remove any erroneous diagonal structural bracings through the stairwell room 301



3. Save project as per project requirements and Issue for Coordination

4. Open the Staircase PIM stored in the Published

5. Delete the staircase and create a new one using the dimensions as per the exhibit below:
NB: Ensure the new stair makes use of the type 2 handrail on the inner side



6. Issue the PIM for Coordination

7. Open the Architectural Volume 1 PIM stored in the Published directory

8. Link the Revit Staircase model you created in the previous step into this Revit project. Use the stair model to design and create a new shaft opening that cuts the required floors to allow vertical access through the building.

9. Issue the PIM for Coordination

Drawing Production Task E1.0

1. Open the Volume 2 Architectural project created in Task B
2. Produce dimensioned Floor Plan drawings @1:100 of Level00 on the provided A1 WSUK Template sheet

Make use of Crop View and other tools to ensure all drawings are produced to a professional standard

NB: Ensure the view name and scale are shown

3. Produce the following Elevations of the model @1:100 on the provided A1 WSUK Sheet
 - East
 - South
 - West

NB: Make use of Crop View and other tools to ensure all drawings are produced to a professional standard, and ensure the view name and scale are shown

4. Name all drawings as per project requirements

Visualisation Task F1.0

1. Create a representation of the federated Architectural Project Information Models for marketing purposes including:
 - 1 External View
 - 1 Internal View
 - 1 360 Degree View

There is a site topography model available to be used in the Resources directory if you wish

Use of composition, lighting, background, Placement of entourage and other components from the software library should all be considered.

USE OF COMPUTER:

Use of the computer is allowed from the beginning of the competition time.

OUTPUT:

- Software Modelled Structural Project Information Model Volume 2
- Software Modelled Architectural Project Information Model Volume 2
- Federated model as per BEP
- Assign Quality Assurance Issues (6 off)
- Corrected Structural Project Information Model Volume 1
- Corrected Staircase Information Model
- Corrected Architectural Project Information Model Volume 1
- COBie Data
- 1 (one) x Elevation drawing on A1 sheet uploaded to CDE.
 - Volume 2
- 1 (one) x Floor Plan drawing on A1 sheet uploaded to CDE.
 - Volume 2
- 1 (one) x External Render (.PNG)
- 1 (one) x Internal Render (.PNG)
- 1 (one) x 360° Render

NOTES:

- all work must be completed within the 5 hour competition time and meet the deliverables deadlines as specified in the BEP
- information missing from the provided drawings is to be completed at the competitor's discretion
- all files are to be appropriately named and saved to the correct directory on the CDE as specified in the BEP as per BS EN ISO19650-1.

MARKING

Total marks available is 100 and is broken down into the following objective marks.

Objective marks as follows:

Aspect	Max Mark
Structural Modelling	20.00
Architectural Modelling	40.00
Coordination	20.00
Corrective Architectural Modelling	12.00
Drawing Production	4.00
Visualisation	4.00
Total Marks	100.00