Assignment 02: Building Services / MEP Coordination

Building services / MEP (Mechanical, Electrical & Plumbing) coordination work refers to the spatial coordination of all building services (HVAC, pipework, public health and electrical systems) with other disciplines making up the building structure, architectural elements, fabric and external envelope (steel, concrete, false ceilings, etc.). This coordination work is increasingly being performed in a BIM environment for all the disciplines. By creating a virtual 3D model, designers and coordinators can benefit from the flexibility and power of BIM. To ensure successful coordination process, good workflow planning is required.

Objectives of this assignment

- To study the major issues and considerations for MEP coordination using BIM.
- To apply BIM software and other tools for MEP coordination and clash analysis.
- To learn the workflow for effective MEP coordination and planning.

Scenario

An engineering consulting company has decided to apply BIM to perform MEP coordination for a hospital building project in Hong Kong. As the BIM Manager of the company, you are responsible for developing and designing the workflow planning for the MEP coordination in this project. You are required to prepare a technical proposal to briefly describe the major issues and considerations for the MEP coordination based on BIM. You should explain the strategies for the coordination work and clearly indicate the recommended workflow for effective implementation of the MEP coordination process. The suggested software tools for this building project include:

(a) Autodesk Revit

This project used Revit to develop the discipline models in BIM (architecture, structure and MEP). It is expected that the 3D coordination will be carried out for clash avoidance and clash detection. The typical features for this task are shown below.

Under the "*Collaborate*" menu:
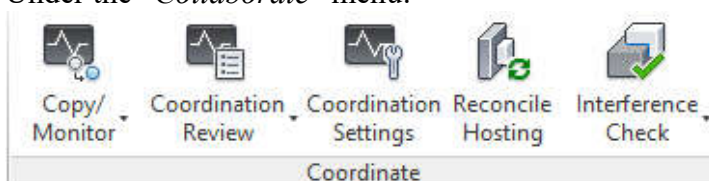
(b)   Navisworks

Autodesk Navisworks is a project review tool that supports 5D simulation, coordination, analysis, and communication of design intent and constructability. Multidisciplinary design data created in BIM can be combined into a single, integrated project model for management of clashes or interferences (under the Navisworks Manage) using the clash detective tool.

Clash Detective								✕

Test 1 — Clash Detective — Last Run: Monday, January 07, 2013 6:31:24 PM
Clashes - Total: 761 (Open: 761 Closed: 0)

Name	Status	Clashes	New	Active	Reviewed	Approved	Resolved
Test 1	Done	761	0	761	0	0	0

In the technical proposal you should provide the following information for planning the systematic organization of the coordination process.

- Major issues and considerations for the MEP coordination based on BIM
- Proposed strategies for the coordination work of the hospital building project
- Recommended workflow for the MEP coordination process (such as through flowcharts and process maps)
- Description of the coordination process and tasks using Revit and Navisworks

Examples of workflow diagram and process map are shown below.

Workflow diagram   Process map
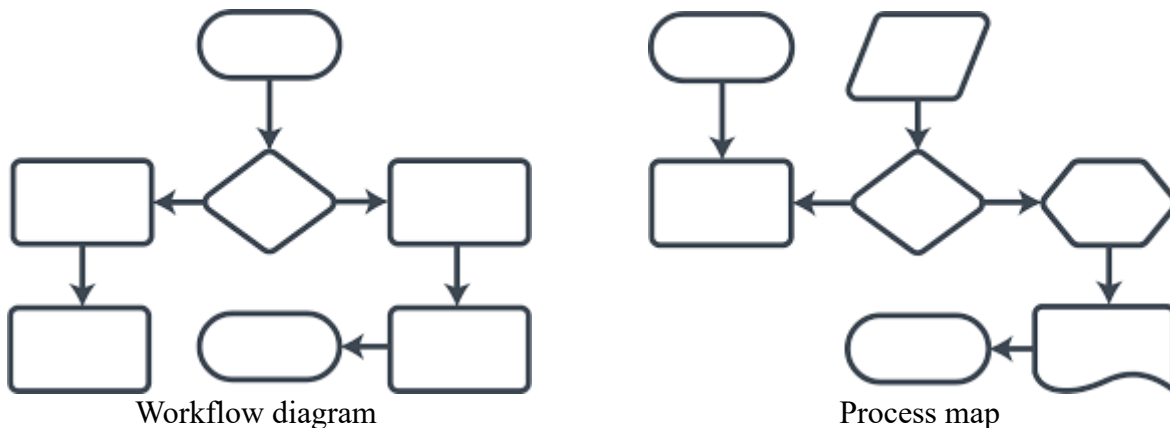
You may make reasonable assumptions for the hospital building project to illustrate the requirements of the coordination process. Other useful software and/or tools may also be suggested to support the coordination tasks.

Submission

Each student should prepare a technical proposal in the form of a written report which will be read by senior management of the company, the client of the project, and other stakeholders. The report should be not more than thirty (30) A4 pages including appendices. It should be neat and properly written and organized to communicate your thinking. Proper credit and referencing should be provided to the information sources. Students making direct copy of the information in other publications or sources (plagiarism), if found, will be disqualified.

The report electronic file should be submitted through the Moodle system. The assessment criteria include quality of the content, organization, clarity of thought, and report/proposal writing skills.

Submission deadline (via Moodle): **before 5 Dec 2018 (Wed)**

Resources

Workflow planning:
Workflow -- Wikipedia https://en.wikipedia.org/wiki/Workflow
What is a Workflow Diagram https://www.lucidchart.com/pages/workflow-diagram
How to Make a Process Map
https://www.lucidchart.com/pages/process-mapping/how-to-make-a-process-map

Autodesk Revit and Navisworks:
Multi-Discipline Coordination: Revit 2018 Learning
http://help.autodesk.com/view/RVT/2018/ENU/?guid=GUID-6324F0AF-48A7-4669-B1F7-D0B37440A29C
Navisworks 2019 Learning http://help.autodesk.com/view/NAV/2019/ENU/
Clash Detective User Guide : Navisworks 2019 Learning
http://help.autodesk.com/view/NAV/2019/ENU/?guid=GUID-91685EBB-97FD-4D4C-9C4C-7144F054C2B3
Building—MEP—Advanced coordination workflow with fabrication supports
https://knowledge.autodesk.com/search-result/caas/simplecontent/content/building-E2-80-94mep-E2-80-94advanced-coordination-workflow-fabrication-supports.html

References

BCA, 2013. *BIM Essential Guide for Collaborative Virtual Design and Construction*, Building and Construction Authority (BCA), Singapore. https://www.corenet.gov.sg/media/1588655/bim-essential-guide-for-collaborative-virtual-design-and-construction.pdf

CIC, 2015. *CIC Building Information Modelling Standards (Phase One)*, Construction Industry Council (CIC), Hong Kong. http://www.cic.hk/files/page/51/CIC%20BIM%20Standards_FINAL_ENG_v1.pdf

Quigley, D. E., 2013. *Achieving Spatial Coordination Through BIM: A Guide for Specialty Contractors*, a publication jointly developed by MCAA, NECA and SMACNA. https://mcac.ca/wp-content/uploads/2015/03/BIMSpecialtyGuide.pdf