

“Building Information Modelling For Clash Detection”

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RELEVANCE OF TOPIC

✚ To providing a strategic frame work with BIM leveraged approach.

✚ The key of this framework was the information generation, exchange, collection and management.

✚ This study has contributed to existing knowledge with an extensively list of key benefits to derived when BIM technologies are adopted in construction industry.

✚ It also points out the silent benefits which relate to sharing of project data.

✚ The study shows that BIM is not used thoroughly for sustainable projects including all building production processes due to lack of allocated budget for efficient BIM usage and qualified staff.

✚ The benefits provided by BIM software in the designing process are not yet realised by the designer contractor and owner.

✚ BIM technology is introduced into construction site material supply management and validates the value of BIM in field of material supply by establishing dynamic model.

✚ 4D application ensures timely scheme generation of whole process, which help manager to better solve site material supply problem.

✚ It identifies a new technology envisioned to enable the creation of information model for every kind of building currently in use.

✚ It describes the new methodology to develop bespoke information model for existing building based on the facilitates management strategy and building requirement.

✚ It proves that base model can be created without using costly and time-consuming technology.

✚ It describes the process consist of initial data analysis and collection step to develop base model.

✚ It allows flexibility to adapt the model to meet changing needs of building operation teams.

PRESENT THEORY & PRACTICES

➤ What is Building Information Modelling?

The process of creating and managing all the information about a project mostly associated with design and preconstruction, allows projects to be built virtually before they are physically completed. Eliminating many of the inefficiencies and problems that arise during construction process

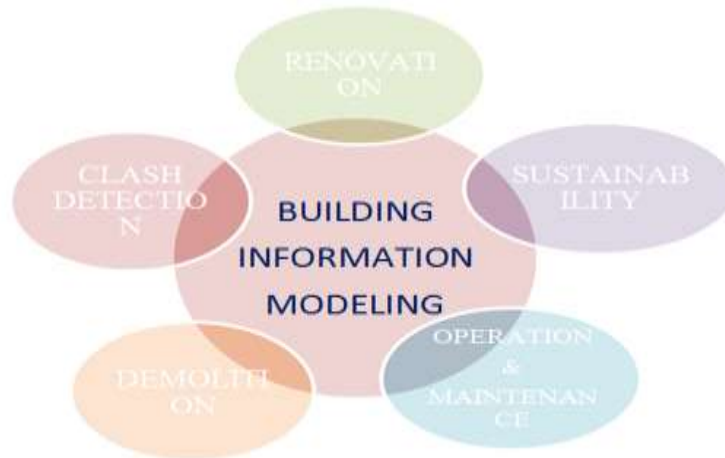
➤ BIM clash detection is an imperative aspect and broadly utilized element of Building information modeling.

➤ A BIM clash detection enhance the coordination and integration of building operation, prompt identification of errors and conflicts and error free assessment of cost, time and resource

Why BIM is used?

✚ Before the BIM was introduced the construction process was carried out using conventional planning methods in which the coordination between the agencies was not made.

✚ With BIM designers create digital 3D model that include data associated with physical and functional characteristics. Thus giving everyone better insight into how their work fit into overall project ultimately helping them to work more efficiently.



DEMOLITION OPERATION & MAINTENANCE

- ❖ Better collaboration and communication
- ❖ Model based cost estimation
- ❖ Reconstruction project visualization

- ❖ Improve coordination and clash detection
- ❖ Improve scheduling/sequencing
- ❖ Increase productivity and prefabrication

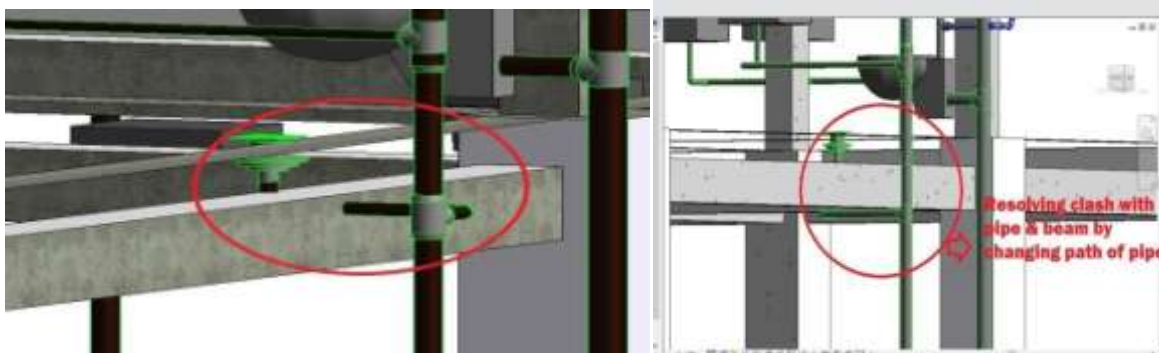
DIMENSION OF BIM



- Clash detection is a component of the Building Information Modelling (BIM) process and is the realization of conflicts or clashes, whether structural or MEP, through an automated and computerized approach.
- Clash detection can be carried out on multiple 3D models and is an invaluable tool for

designers, architects, builders, engineers and contractors to determine clashes or conflicts in the structures.

- Clash detection is used for checking completed/ongoing work and reduces the risk of human error during model inspection



Pipe position before clash resolving Re-solving clash between pipe & beam by changing length of pipe

GAPS ANALYSIS

By observing literature review, BIM system having various applications; in current study an attempt is made for the study of clash detection.

As compared to the other applications of BIM; Clash detection application has been found very important part for the execution of the building. An important application of BIM in design phase is the clash detection, which improves the collaboration and coordination among multiple agencies.

In this project, by using BIM system software such as Revit, and Autodesk Navisworks, architects, structural engineers, MEP engineers and other disciplines discovered design errors and omissions during the drawing review process. Clashes are resolved and costs are reduced and optimized. Scheduling of project is done by performing quality analysis. Generalised guidelines are to be prepared for the type of the building.

PROPOSED WORK

The proposed process consists of many steps and is just for the phase of clash detection, it does not cover the full workflow of a typical design coordination job. It is designed to run in a technical design phase, by the designer consultant of the concerned projects. This process is applicable in both cases when there is a Project Manager involved in the process or not. The clash detection team consists of a BIM Manager of the designer (BMa), BIM Coordinators (BCo) of the designers and its subcontractors (if any) who are responsible for each of the intra-disciplinary model, and the BIM Modelers (BMo), also the responsibility of each team role in the steps of the process. If the Project Manager participates in the process, he will be informed of all of the key steps. Though most of BIM models in construction projects in Vietnam now are created from existing 2D drawings, this process also is applicable to the cases where BIM models are developed directly with authoring software, not through an interim step of 2D drawings.

OBJECTIVES

- Analysis and Interpretation of all the data collected in BIM system and removal of the clashes encountered.
- Cost reduction through scheduling of project.
- To develop generalized guidelines to avoid clashes between various agencies during construction of a commercial building.

PROPOSED PROCESS DESIGN

Determination of the site

- The assortment of the information with the end goal of the task is completed for making a 3D model.
- The locales to be chosen is business working in Pune district.
- To accomplish the destinations of the undertaking; the information from the locales is gathered which have the accessibility the accompanying plans:
 - i. Architectural Plan
 - ii. Structural Plan
 - iii. Mechanical, Electrical and Plumbing Plans
- The site is chosen based on mechanical arrangements that is Ducting, electrical and plumbing. Each part of the MEP necessity ought to be present.

Steps for Clash Detection process

✚ The initial phase right now is to decipher the Architectural and MEP plans into the Revit and make a 3D model of the structure. At that point import all the Revit 2016 records for example MEP and design records into Nevis works which is used in Clash recognition process. For Clash recognition process in Nevis works, it is required to bring 3D Revit documents into Nevis works or save records from Revit to Nevis works.

✚ In the following stage in Clash identification process changes over all the as of late imported rvt documents into Nevis works record position that is .nwf record design.

✚ When all rvt records are changed into nwf document group we can be just opened in Navisworks programming and afterward Clash tests complete by utilizing rvt records.

✚ For performing Clash tests in Navisworks programming press the 'Clash Detective' instrument.

✚ After that we can essentially tap on to 'Select' tab that is situated inside Clash investigator apparatus in Navisworks programming.

✚ Following stage is click on 'Select' tab then two unique segments will show up on PC screen so select diverse model components which get the opportunities of clashing with one another. For instance basic component can meddle with MEP component, so in one segment we should choose 'auxiliary component' and in other segment we ought to pick

'MEP component' and afterward just snap on 'alright' to run Clash test.

✚ After the Clashes between auxiliary

component and MEP component can be handily perceived. After that for assessment its outcomes, we should go to Results tab.

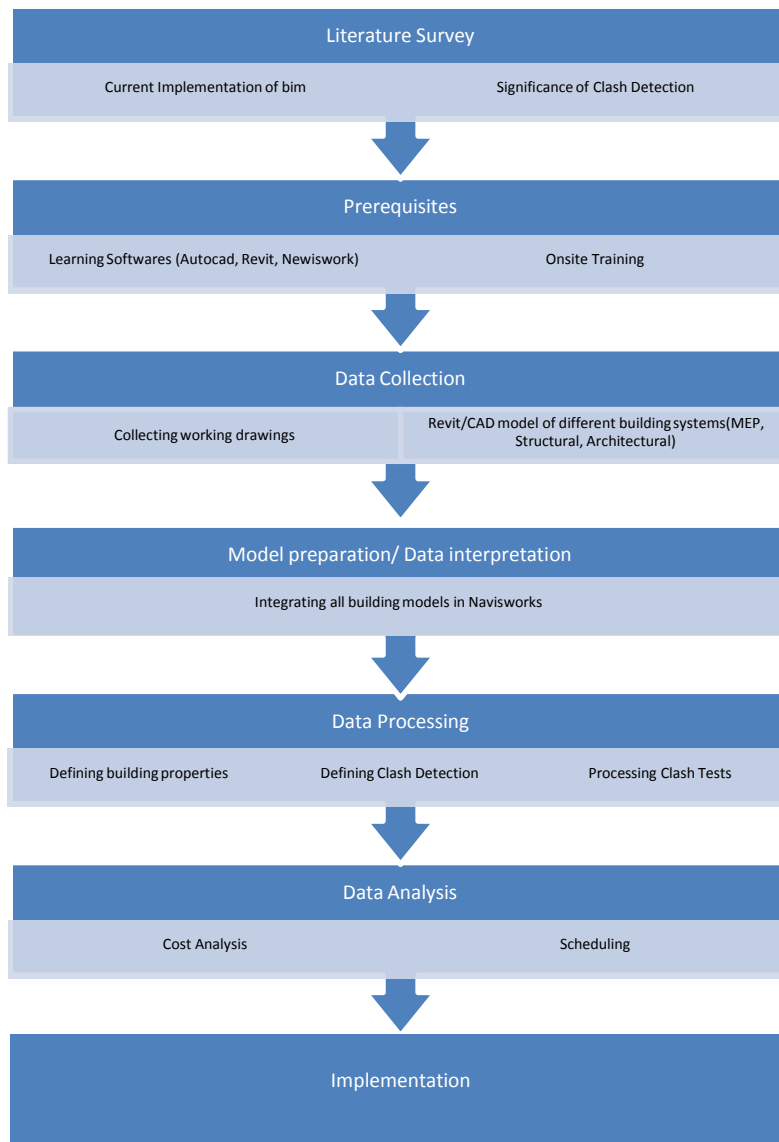
Autodesk Navisworks consequently gives a status to each Clash for some time later. Along these lines, after that the Clash Detective apparatus that continues refreshing the status of the Clashes after they are distinguished and are recorded inside Results tab.

Further, for making report of Clash test click on Report tab and making report on .XML record design.

Clashes can be settled by changing situation of

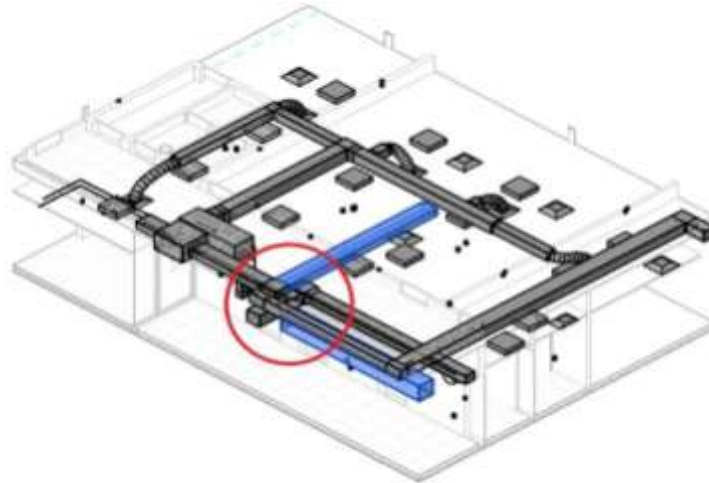
specific component for example figure no 8 indicated that Clash can be settled by changing slant of channel.

- ❖ The model framed will be contemplated and appropriate booking of undertaking will be shaped.
- ❖ Simplified and institutionalize answer for Clash discovery process must be accomplished by summing up rules for the business building.

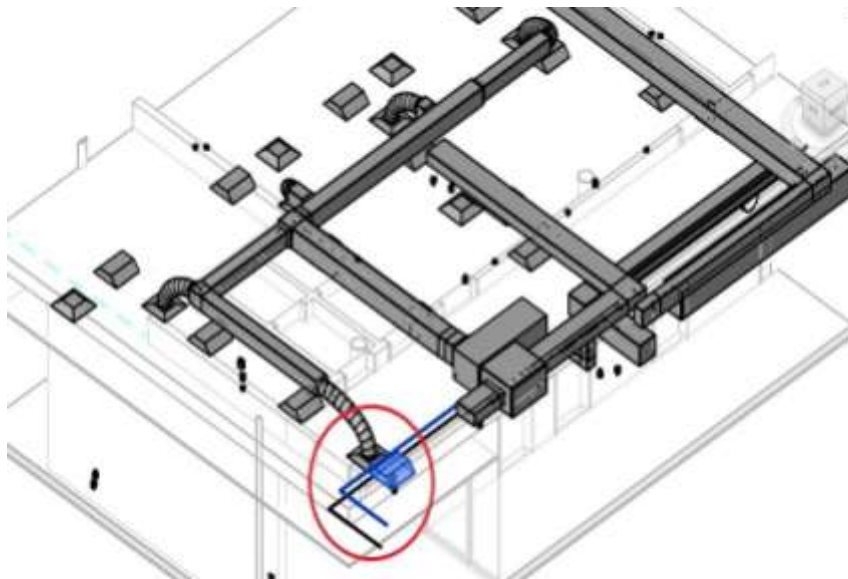


MODELLING & DESIGN

- ❖ **Clash of Structural member and MEP component: Clash between the beam and the duct.**



Clashes of MEP components: Clash has occurred between the AC inflow duct and the piping



EXPECTED OUTCOME

Building Information modelling shows great results on project in terms of performance, time and cost. Implementing of clash detection tools is useful to decrease coordination errors, human errors so that result in high level of accuracy of models. So this will avoid re-construction.

The first thing that should be done by Navisworks users before they go ahead with conducting a clash test is to effectively set up the elements or items that they would like to compare during clash detection in the Batch tab.

This can be done by accessing clash

detective tool from where Batch tab can be accessed by Navisworks users. One of the most important tasks of Navisworks users is to effectively recognize the clashes and then group them according to their similarity. When clashes are grouped together according to their potential to create obstacles for AEC professionals in construction, it becomes easy for them to understand the nature of the clashes.

PROBLEM STATEMENT

“To find out clashes occurring using BIM system, during designing phase and execution phase and

reducing cost through scheduling for a commercial building.”

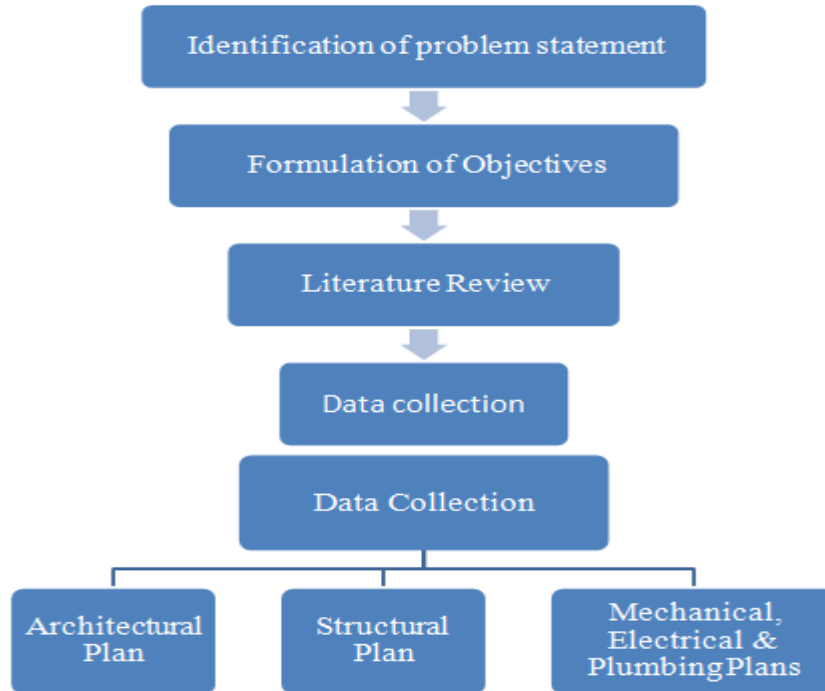
SCOPE OF WORK

To provide 3D representation of the structure for better understanding.

To decrease in rework by bringing out proper coordination which results in reduction of cost and time?

To provide simplified and standardize solution for clash detection process.

METHODOLOGY



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