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Application of Building Information Modelling in Construction Industry For quality Management.

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ABSTRACT: The potential of Building Information Modelling (BIM) to support a transformation of the processes of design and construction has been evident in the construction industry. Although BIM is considered helpful in improving design quality by eliminating conflicts and reducing rework, there has been little research in to using BIM throughout the project for construction quality control and efficient information utilization. Due to the consistency of design data with quality data and construction process with quality control process, the potential of BIM implementation in quality management lies in its ability to present multi-dimensional data including design data and time sequence. This research explores and discusses the advantagesof6D BIM for a quality application based on construction codes.

Keywords: Applications of INFORMATIVE BUILDING MODEL, Quality management.

I. INTRODUCTION:

Today many construction companies face many challenges and problems, such as "workmanship defects," delay and "cost overrun in complementing their projects in all over the industry. The globalization and competition are the most important reasons that each construction company needs to improve and correct its system for achieving its objectives by management tools. Successful project management can be defined as having achieved the project objectives as on time, within cost, and quality (scope) to meet client's requirement. Quality is themostsignificant factor in the success of construction projects. Nowadays, qualityhasnot just implicated on products and services in the organizations, it canberelated to the process, system, and management as well. Quality of construction project is a general philosophy by which process is carried in a total qualityinfrastructure. The total quality infrastructure consists of several key pieces. Thefirst, and one of the most important, is the quality system as a businessmanagement tool. The lack of enough evidence concerning howquality management actuallyeffects on organizational practices and performance (lack of awareness in benefits of QMS) is a big problem to motive owners and managersofconstruction companies in implementing QMS. Thus, this study was carried out with the aim of evaluating the impact of Quality Management by usingModernTools and Techniques for implementation and comparative study of Conventional Methods of Quality Management over the using of Modern tools like NAVISWORK for Quality Management. Find out effectiveness of NAVISWORK softwarefor the quality management by considering main elements of construction project.

1.1 Objectives of project

1. Determine the sector of problems arises to maintain the Quality Management on construction site.
2. To Study use of NAVISWORK for effective solutions for quality related issues on construction work.
3. Investigate the adoption and implementation of NAVISWORK for 'cost of quality' in construction work.
4. Evaluate the results obtained by using NAVISWORK for quality management.

II. 2.LITERATURE REVIEW

1. Mr. Swapnesh P. Raut. Raut. Raut. Raut' Improve the Productivity of Building Construction Project using Clash disclosure Application in Building Information Modelling 2017.

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The Clash Detection instrument is a boss among the most obliging use of BIM, which is significant for the coordination of frameworks to affect the assignments to time productive and sparing. In this paper we centre the framework included organizing conflict territory appraisal utilizing building data demonstrating programming. [1]

2. Dr. Rule Ali Al-Damen' The effect of Total Quality Management on hierarchical execution Case of Jordan Oil Petroleum Company' Jan 2017

This assessment expected to take a gander at the impact of TQMexecutionon progressive execution. The examination was driven in Jordan PetroleumRefinery Company (JPRC), the assessment test measure was (103) chairmenfrom different levels. The examiner depended upon fundamental anddiscretionary data. The results exhibit that TQM has constructive outcomeonhierarchical execution. Considering these disclosures, the examinationgaveacourse of action of proposals.[2]

3. Tom Rajan, Anju Paul, IMPLEMENTATION OF TOTAL QUALITYMANAGEMENT (TQM) IN CONSTRUCTION-A REVIEW,2017

To pass on the benefits of TQMtothe improvement business, more undertakings must be made to spreadthethoughts of TQM among the advancement specialists. Investigators perceiveddiverse obstruction factors for executing TQMbeing developed 11communicating the isolated thought of the business as the most basiccontrol. Studies have furthermore done in finding answer for the obstructionsanddraws out that banding together and BIM consolidated modelscansuccessfully execute TQM being developed Industry. [3]

4. By Allan F. Samuels,' Construction Facilities Audit: Quality System- Performance Control'2017

The basic objective of the survey is to control andimprovethe advancement quality-organization system. Definitions fromboththeimprovement and quality sciences are investigated for legitimacy totheadvancement office audit. The components of the workplace audit aredifferentiated and a cash related survey. [4]

5. P.M Diaz, ''Analysis of Benefits, Advantages and Challenges of BuildingInformation Modelling in Construction Industry'' 28 March 2016: Journal of Advances in designing science

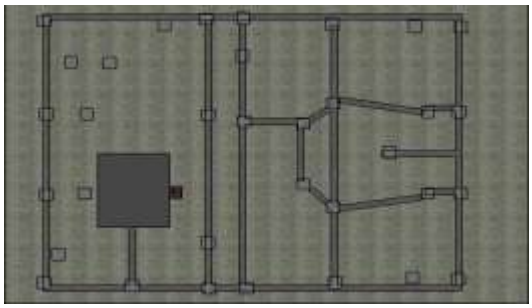
The advancement sectionsand booking progress are constrained by BIM based 4D booking whichrealizes incredible improvement masterminding. Besides, building informationshowingmechanical assemblies take a gander at the updated usage of 3D, 4Dandmodel arranging. This decides the obvious forward advancement of the improvement business close by BIM and BIM instruments. [5]

6. Ahmed N. El Hawary, Ayman H. Nassar, ''The Effect Of Building InformationModelling (BIM) On Construction Claims'' 12, DECEMBER2016

This paper investigates the effect of utilizing Building Information Modellingadvancement being developed stretches out on reducing or keepingupakey good way from the assorted purposes behind improvement ensures through a survey audit that was made. The made audit furthermore lookedinto the occasion repeat of different case causes, and their degree of duty inmakingimprovement claims. [6]

III. METHODOLOGY

Theabovecasestudymentionedisanalyzedas a4DBIMmodelinREVIT+NAVISWORKS software the two different drawings were prepared 1.plint drawing and plumbinglay out including underground septictank and underground water tank. The level difference between them was 0.3m .As per schedule septictank was constructed and after that plinth beam. But due to level difference cannot be maintained the plinth beam passes through the septictank and builder have reconstruct edit. The same case canbe solved in the NAVISWORKS process



Model prepared in REVIT

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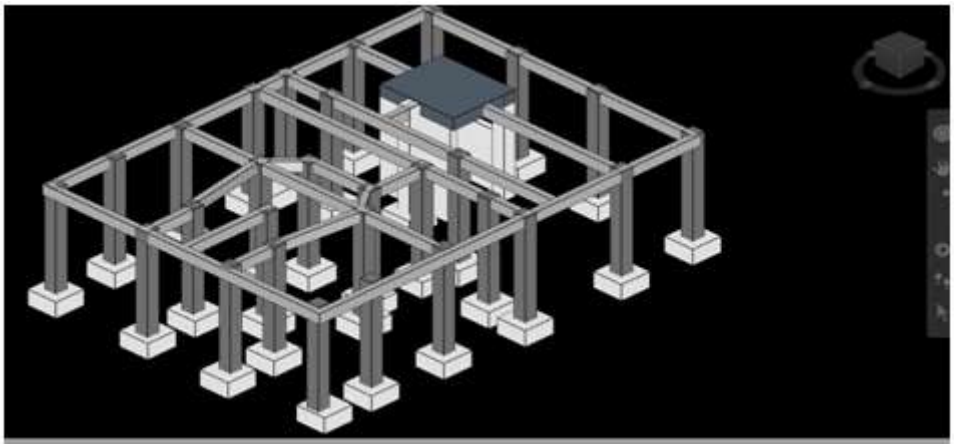


Model prepared in NAVISWORK

Step1: MODEL OPEN IN NAVISWORK

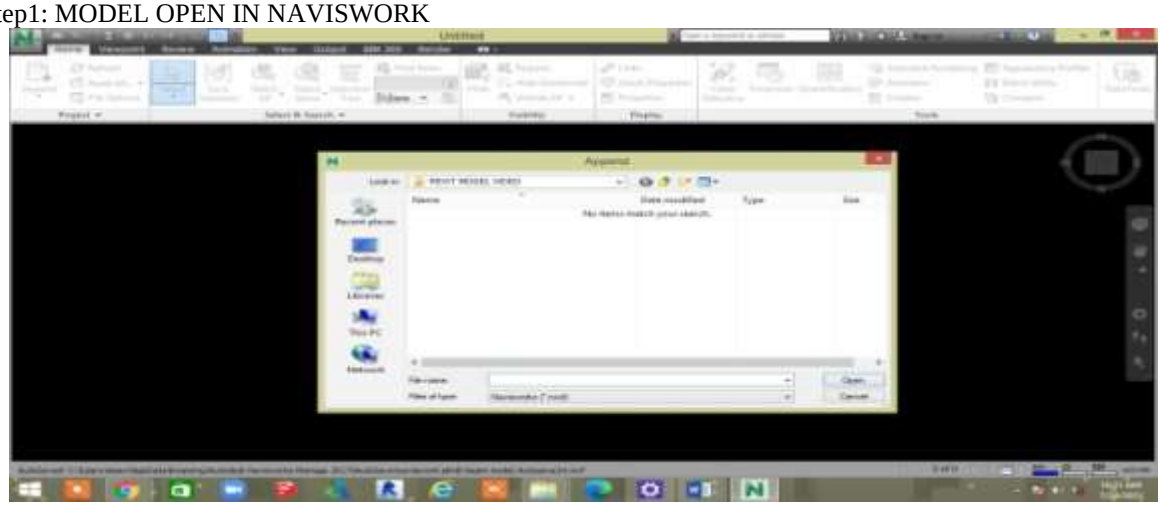
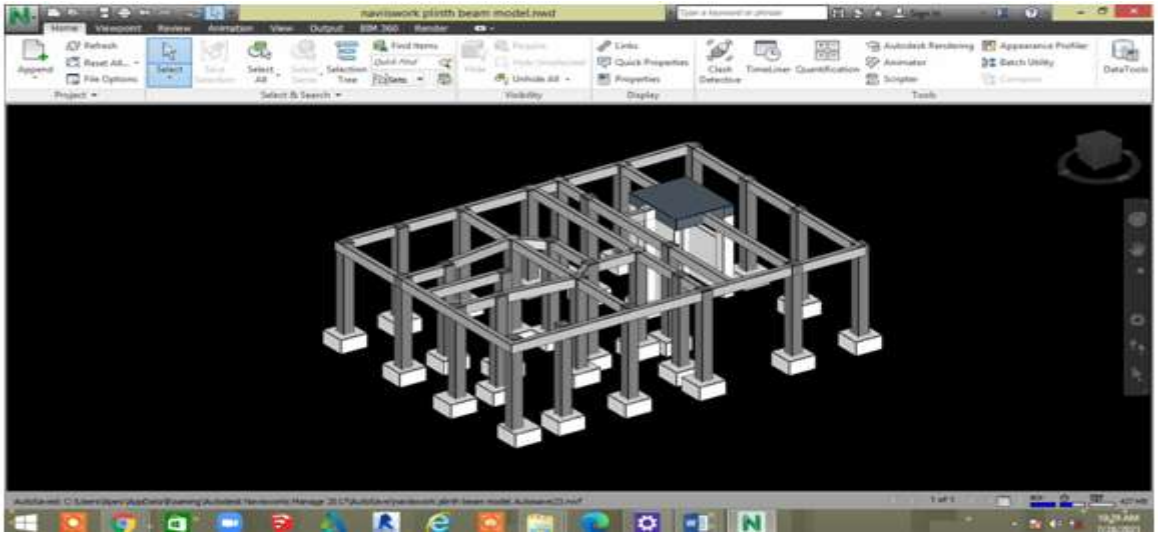


FIG.Model open in NAVISWORK

STEP 2:MODEL OPEN IN NAVISWORK



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Step 3

Fig 6.5A: Creating clash detection test

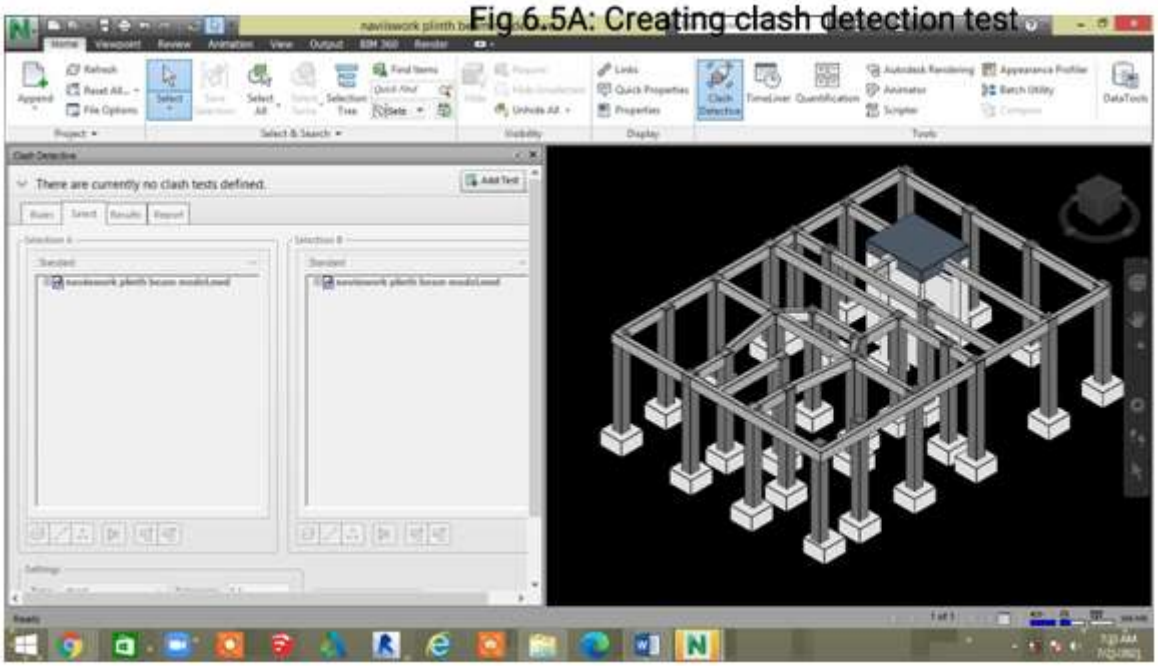

FIG: CREATING CLASH DETECTION TEST

STEP 4:

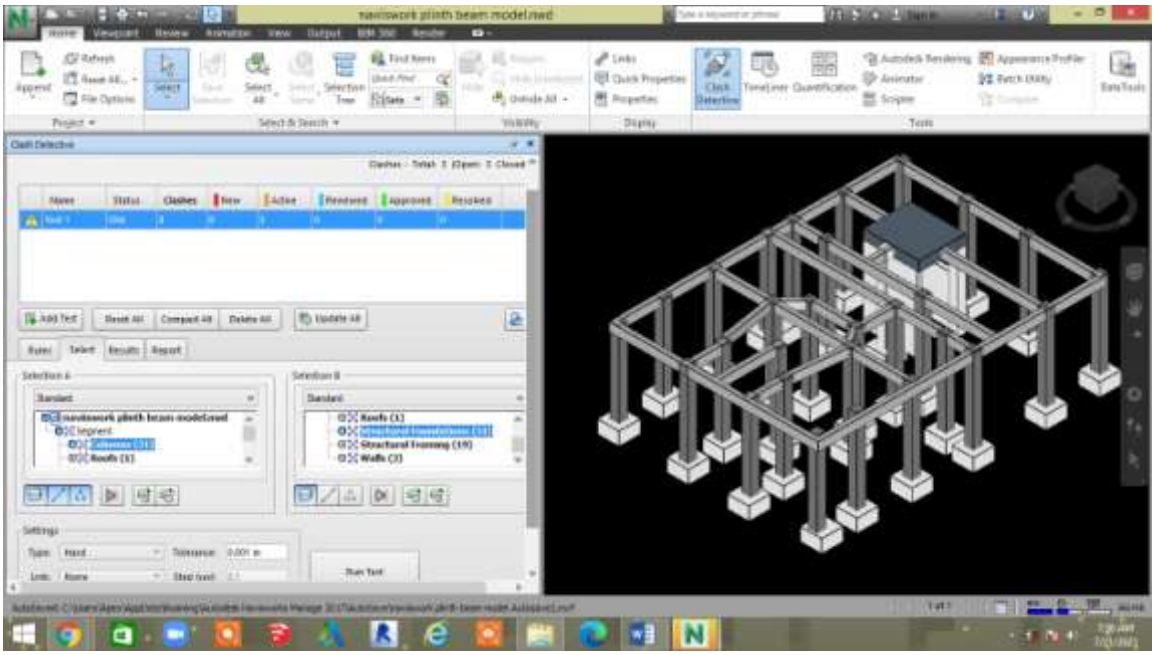

Fig 6.5B: clash detection test

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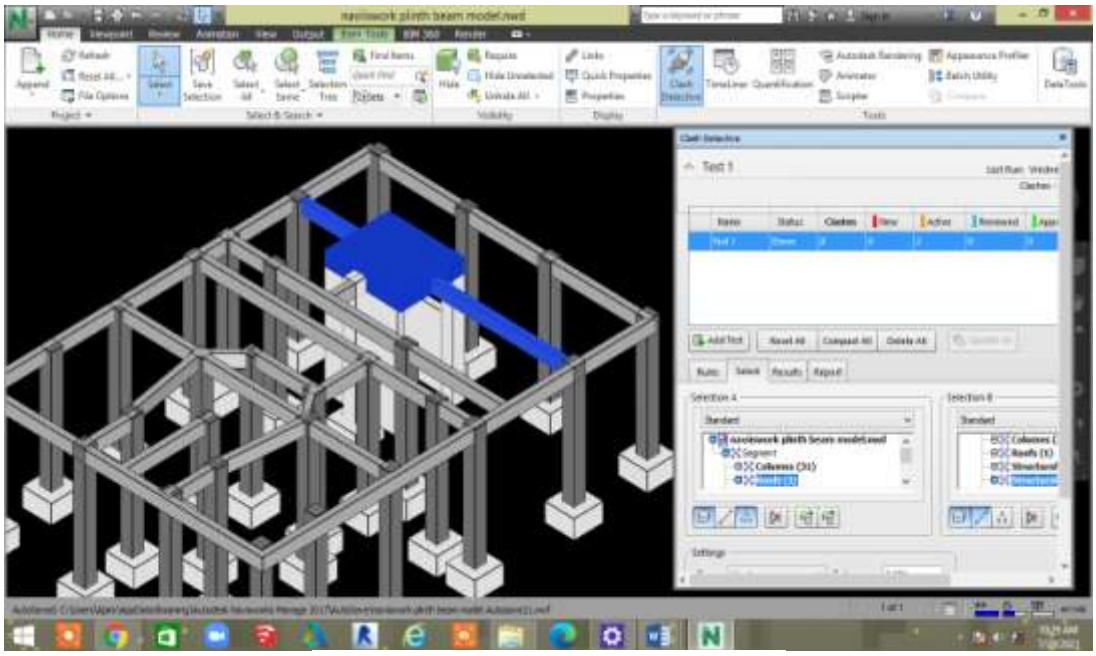
Step 5



Total cost expenditure on site

Results of clash detection test

TABLE OF TOTAL COST EXPENDITURE ON SITE

Totaldaystodemolish tank	2Days
Totaldaystoconstruct tank	15Days
Totaldelay	17Days
Direct cost	34 Days
Totaldem olishcost	Rs.4200
Totalconstruction cost	Rs.2,39,091
TotalDirect cost	Rs.2,43,291
Indirect cost	Rs.15000
Totaldirect andIndirectcost	Rs.2,58,291

TABLE WITH 4D PARAMETER

	BIM	Conventional
No.ofdays	436	453

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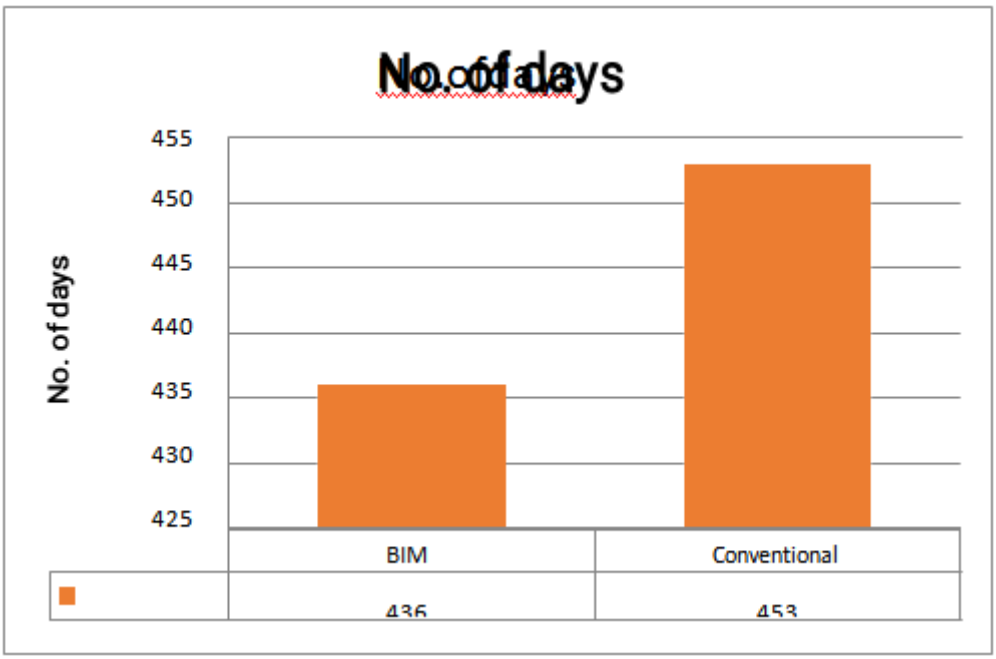
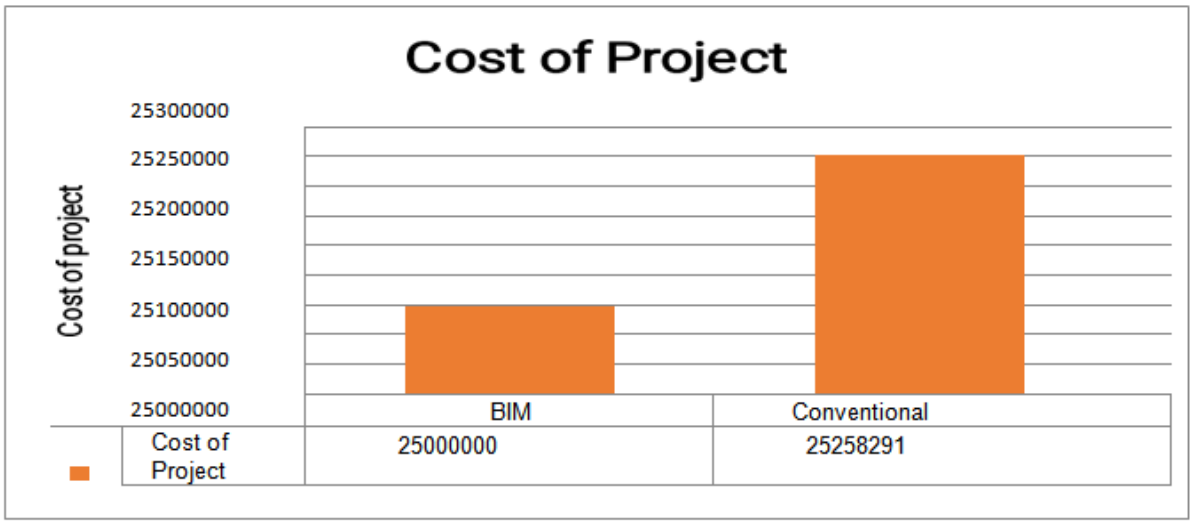


Demolish cost- JCB= 2,200, Transport= 1,000, Labor=1,000Indirectcost-Dewateringpump=500/day, Generator=500/day (Aboverates are taken from site)

4Dparameterisa3D+time.Aswecanseefromabovegraph,numberofdays



Required for BIM is 436 days and for Conventional it is 453 days. So we can conclude that if we use BIM method, duration of project is less as compared to the conventional method.

5D parameter is a 4D + cost. As we can see from above graph, cost of project required for BIM is Rupees 25000000/-and for Conventional it is Rupees 25258291/-. So we can conclude that if we use BIM method, cost of project is less as compared to the conventional method. Hence we can reduce the rework.

IV. CONCLUSION

- The main objective of this study is to understand the methodology of quality project planning.
- After studying the REVIT+NAVISWORK software, we find its importance and its implementation need in construction project management with cost analysis.
- AUTODESK NAVISWORK is most advanced software in construction industry for planning,

scheduling, monitoring, tracking of the construction project. The software is not only a visualization tool from which we can do simulation of construction site but also can be used for the quality management.

- The quality norms satisfied are setting out plan, concrete slab checking and cost of quality is maintained.

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