

## **BIM Concepts and Benefits :**

Coordination between construction trades can be challenging. The traditional 2D drawing-based process is often times difficult to follow for project participants. Identification and resolution of issues often requires a great deal of technical skill and experience. 3D Building Information Models and touch screen presentation technology makes process easy to understand for all project participants. The ease in which issues can be identified and presented helps to facilitate communication among the trades and leads to more proactive interference resolution. The Virtual Trade Coordination process is a valuable process that can be performed during the pre-construction process and during the MEP coordination process in the construction phase.

Designers and subcontractors create digital, 3D models of their respective scope of work based on their design documents. These models are then uploaded to a common server which then integrates the design, discipline and trade specific models into a consolidated 3D-model, and from this integrated model, creates Clash Reports. The model and the Clash Reports in coordination meetings with the designers and subcontractors, are reviewed and solutions to the identified problems are discussed. Based on these discussed solutions, the designers and subcontractors revise their designs and 3D-models and re-submit the 3D-models for the next iteration. This process is repeated until all involved parties have confidence in the constructability of the coordinated design.

The MEP-coordination process is non-linear, meaning that the subcontractors develop their models in parallel, beginning with vertical shafts, major pieces of equipment and trunk and main lines. Once these components are coordinated the subcontractors elaborate on branch lines and details. MEP Manager / Engineer determines the pace and sequence of coordination and elaborates the level of detail in the drawings.

BIM can be used to establish a comprehensive model of the quantities of a construction project. Model Based Estimating systems enable Estimators to assign properties to 3D building elements. By using Model Based Estimating system, Estimators can easily extract quantities, identify constructability issues and create cost estimates.

### **Main benefits of Model Based Estimating:**

- Transparently tie the scope and the quantities of a project to a price of the estimate
- It is easy to provide the scope and the elements visually represented in the 3D model are also represented in the estimate
- Model Based Estimating systems allow estimators to efficiently manage scope changes and ensure that the changed scope is then correctly represented in the estimate.

### **4D scheduling services:**

The term 4D is often used to refer to 3D models that are linked to a construction schedule. 4D models help to visualize the construction process and allow all project participants to review, understand and optimize the sequence of the construction operations and the project schedule.