COMPANY
Pinnacle Infotech

LOCATION
Durgapur, India

SOFTWARE
Autodesk® Revit®
Autodesk® Navisworks®

Intelligent modelling saves time, delivers efficiency

Using Autodesk Revit, Pinnacle eliminated the wastage that could have affected the actual construction in terms of time, cost, manpower and material.

Image courtesy: Pinnacle Infotech

"Autodesk BIM Software has automated our workflow pertaining to RFIs, submittals, mark-ups, document approvals and general communication and has made our team productive."

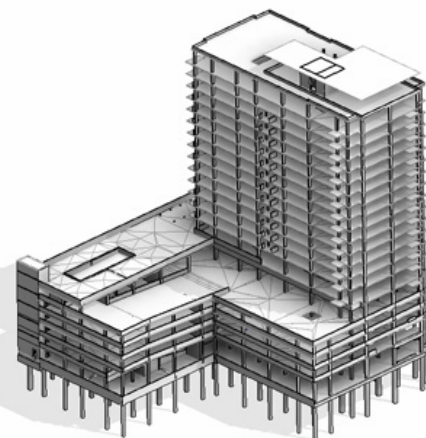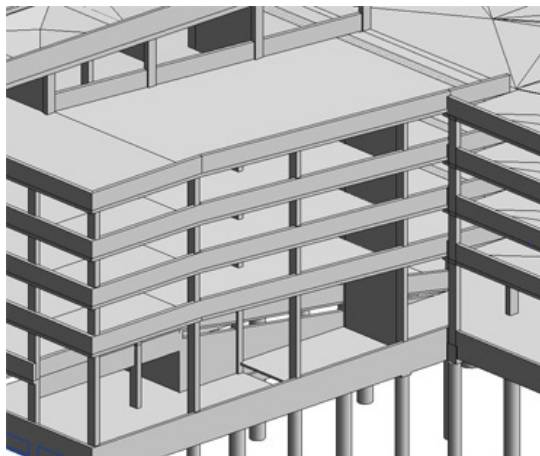—**Mr. Bimal Kumar Patwari**
President
Pinnacle Infotech

"Autodesk Revit has helped us reduce the time consumed and the project to move forward. I am satisfied that by managing project info through Revit, my team was able to complete the modeling within the strict deadline, focusing more on better engineering, construction oversight and client satisfaction."

—**Mr. Biswaroop Todi**
Vice President
Pinnacle Infotech

Headquartered in Durgapur, India and with offices in Houston (USA), London (UK), Dubai (UAE) and Calolziocorte (Italy) and Zurich (Switzerland), Pinnacle Infotech is catalyzing renaissance in the construction arena with BIM services. Pinnacle facilitates more than 1035 clients in over 32 countries, across 6 continents, collaborating across time zones with global delivery centers in India, USA, UAE, UK & Italy, comprising of more than 810 in-house BIM specialists, architects &engineers.

Being a leading provider of innovative BIM services to architectural, engineering &construction industries for over 18 years, Pinnacle has successfully executed more than 4500 landmark BIM projects across industries. Some of the significant BIM projects include Kingdom Tower in Jeddah – Saudi Arabia, Dubai International Airport, Muscat Airport, Delhi International Airport (T3), New York University, Julphar Pharmaceutical Plant, Msheireb Downtown Construction (Doha), Dubai Festival City, University of California Health Longmont Hospital, Santa Ana College, Kolter Hotel in Tampa, Florida, Ambuja Patna City Center and Rosslyn Central Place, Arlington County, USA among others.

Project Summary –Oak Park Station, Residential Project, Oak Park, USA

Pinnacle was responsible for reviewing the 3D BIM Models of the Oak Park Station (1 Building with 2 Towers - North & South), out of which the North Tower included 4-storey apartments above the ground retail space and the South Tower included 20-storey apartment and ground retail space. The two buildings are proposed to be connected by a pedestrian bridge. Pinnacle reviewed the BIM Model of South Tower consisting of 20 floors and the roof (the overall architectural height of which is 67.4m/221 ft and the floor height up to 20th level of which is 58.8m/193 ft) with parking space for 428 cars.

BIM Scope for Pinnacle

Pinnacle's scope of work was reviewing the 3D BIM model and preparing the shop drawings of wall, column & slab plans. Stud rail shop drawings had also been extracted from the model in this project.

- Trades Covered: Concrete Structure
- Software Used: Revit 2016
- LOD: 400

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Location of Structural walls, Pool slope direction, Floor drains position & Variable slopes on Structural slabs was done using Revit BIM.

Modeling Stages

Stage 1: Revit model of LOD 200 from client - Model review of Concrete elements - Caisson caps, Grade beams, Foundation walls, Elevator pits, Shear walls, Garage slab, Pour Strip, Crash walls & Ramp

Stage 2: DD & CD Stage modeling at LOD 350 - Shop drawing creation by using color coding of concrete elements at different elevations.
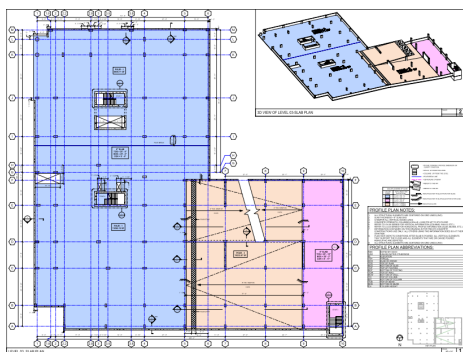
Image courtesy: Pinnacle Infotech

Stud Rail drawing creation with adequate information, which helped guys in the field to have a good idea of where they should be placed.
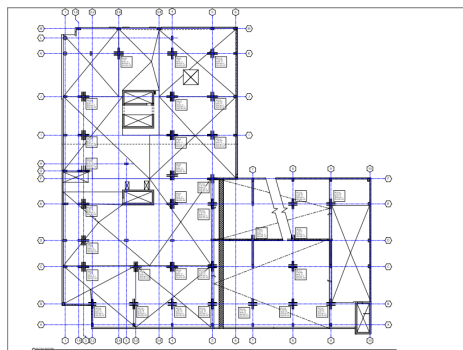
Image courtesy: Pinnacle Infotech

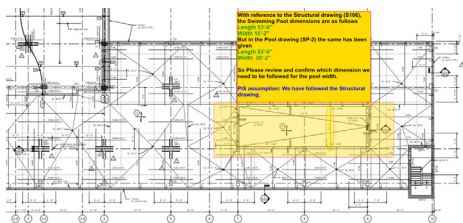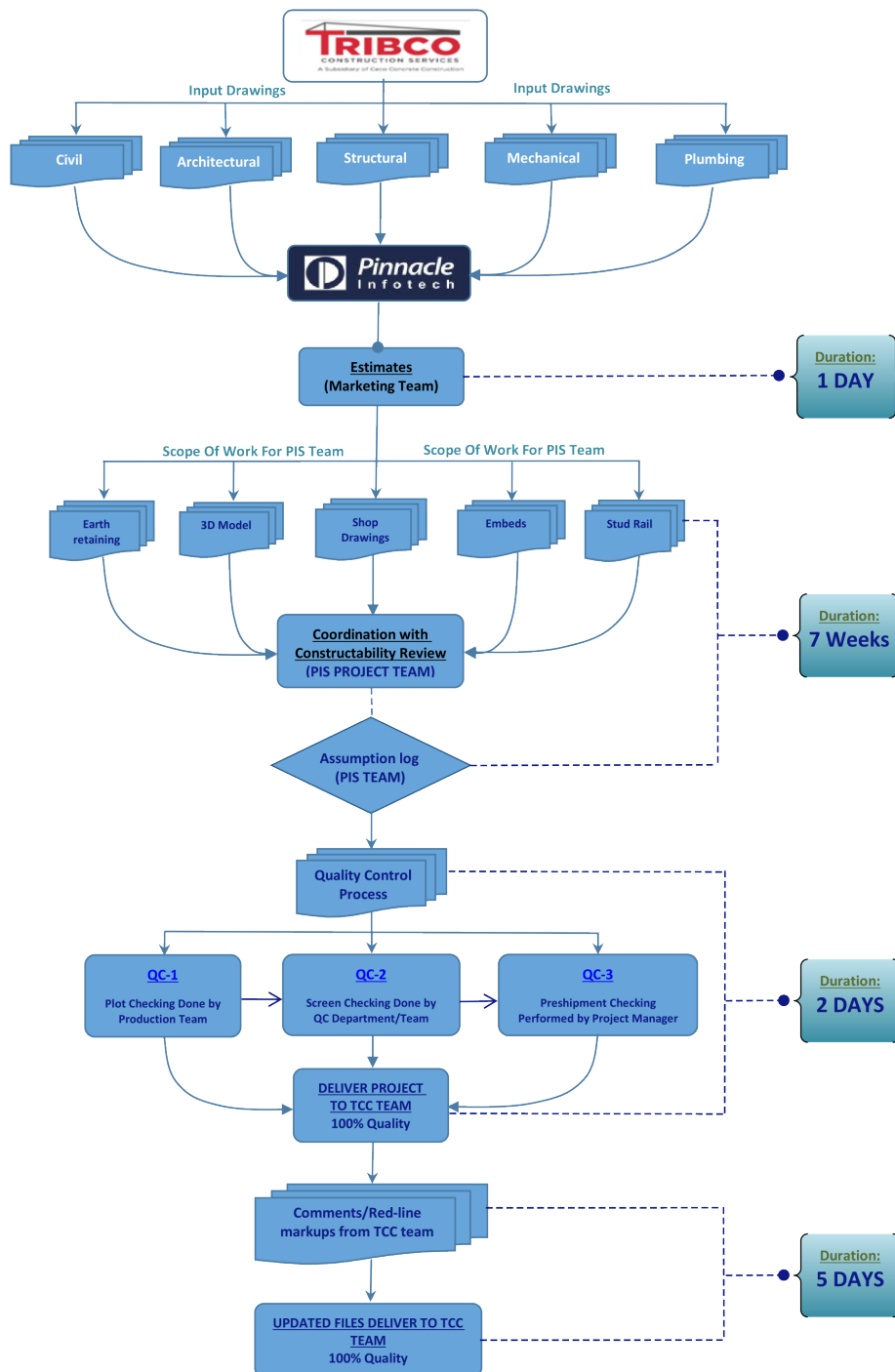### Stage 3: Constructability Review - Model updation to reflect changes resulting from Design changes & RFI updation.

Image courtesy: Pinnacle Infotech

BIM WORK FLOW & QC PROCES

Image courtesy: Pinnacle Infotech

Duration: 1 DAY

Duration: 7 Weeks

Duration: 2 DAYS

Duration: 5 DAYS

Challenges & Solutions:

- **Challenge:** Completion of the project within strict deadline and limited budget (**$9125**) where, as-built drawing as well as facility management amount was not considered.

Solution: Pinnacle engaged a team of Structural engineers with clearly defined targets to complete the project work within stipulated time frame. Senior team members provided technical guidance and quality check, whenever needed.

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Using Autodesk Revit, Pinnacle Infotech could plan and coordinate every aspect of the project design, detailing, construction and maintenance effectively.

- **Frequent Design Change -** Managing Design changes came across as a huge challenge in this project. Moreover, new details (Stud Rail) were required by the client to develop along with design changes.

  Solution: Issues were raised through RFIs and communicated to client through Webex and email for incorporating desired changes into the model and drawings.

BIM Simplified Pinnacle's Work Process:

1. **Input Challenges:** BIM helped to find inconsistency in input drawings.

2. **Incomplete Information:** Location of Structural walls, Pool slope direction, Floor drains position & Variable slopes on Structural slabs was done using BIM.
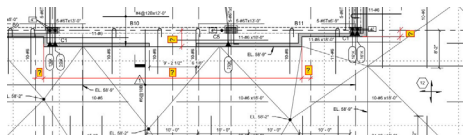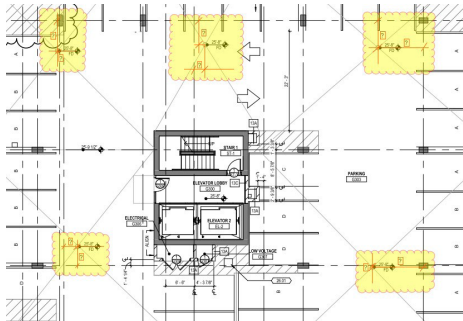
Image courtesy: Pinnacle Infotech

Image courtesy: Pinnacle Infotech

3. **Constructability Issues/ Reviews:** There were some conflicts between Architecture and Structure which could have affected the actual construction in terms of time, cost, manpower, material. BIM minimized those wastages.

4. **Coordinating /Design Issues Faced:** BIM coordination identified the clash and rose to consultants, which resulted in revision of design. The issues identified in drawings and resolved through drawing validation include the following:

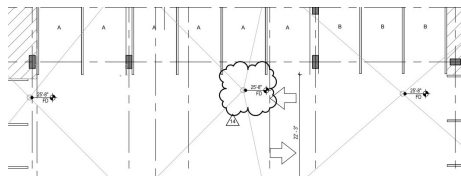   - **Due to significant clashing between 4" pipe and Supply air duct, the floor drain was relocated.**

Image courtesy: Pinnacle Infotech

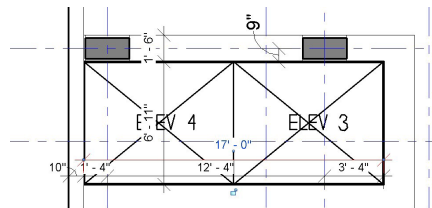- **Elevator was moved to the east due to clash of crash wall and upturn beam.**
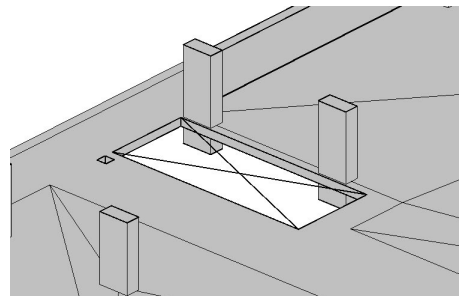
Image courtesy: Pinnacle Infotech

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- **In order to reduce the cost and space, Concrete crash walls were used at the edge of ramp instead of barrier cables.**
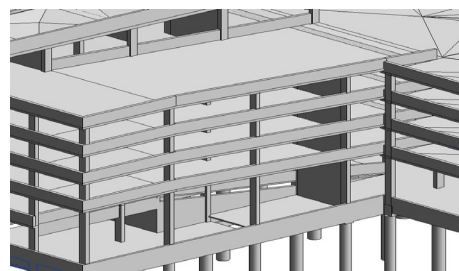
Image courtesy: Pinnacle Infotech

Pinnacle's Value Addition:

During the project execution stage Pinnacle raised 23 RFIs and received additional 59+ RFIs raised by the client. Pinnacle started the project based on the IFC documents and received SSK documents (structural sketches) and updated the model accordingly to extract the shop drawings.

Summary:

Autodesk Revit BIM helped Pinnacle Infotech to

plan using intelligent models and allowed the team to anticipate, plan and coordinate every aspect of the project design, detailing, construction and maintenance. It helped to identify constructability issues prior to construction by detecting the number of clashes, thus avoiding work stoppages, rework and wastage of time, material and manpower.

Client Testimonial: "The quality of the work is good and with an example of what's wanted, the end product (construction set of drawings) is very nice. Feedback was handled very well and incorporated into all drawings, not just the one that comments were made on, which was much appreciated."

Stacey, Tribco Construction Services, LLC - 4.33 out of 5.

Facts at a glance:

- **BIM Start Date:** May, 2016
- **BIM End Date:** August, 2016
- **Project Area:** 3,73,724 Sq ft
- **BIM Team Size:** 4 Structural Engineers
- **Architect:** Fitz Gerald Associates Architects
- **MEP Engineer:** WMA Consulting Engineers Ltd.
- **General Contractor:** Tishman Construction
- **Concrete Contractor:** Tribco Construction Services, LLC
- **Developer/Owner:** Lennar Multifamily Communities

"Using Autodesk BIM software, we could easily produce the models with various cutaways and complex geometry. We combined Revit 3D Model and fabrication models in Navisworks for project coordination and thus could avoid the cost of rework from the existence of clashes."

—Mr. Kunal Ghosh
Deputy Manager
Pinnacle Infotech

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