TEJJY
IMAGINATIONS DELIVERED

CASE STUDY

DESIGNING DREAMS, BUILDING RELATIONS!

+1 202-465-4830 info@tejjy.com www.tejjy.com

BIM Came in Handy for Northeast Water Purification Plant Expansion

Tejjy Inc. implemented Building Information Modeling (BIM)for the expansion of the Water Purification Plant in the City of Houston, USA.

About the Project: Expansion of Northeast Water Purification Plant

The city of Houston is expanding Northeast water purification plant from 80 million gallons per day to 400 mgd, enhancing its ability to support residential & commercial growth by reducing dependency on groundwater. The Houston Waterworks Team, a joint venture between CDM Smith & CH2M, is delivering this project in association with the city and the 4 authorities. The NEWPP project is a leading progressive design-build project presently under construction in the United States on the 90-acre site.

Project Facts at a Glance

- **Project Name:** Northeast Water Purification Plant Expansion (Building 213)
- **Project Location:** City of Houston, Houston Public Works, USA
- **Client Company:** Industrial and Municipal Supply
- **Company Location:** 2207 Hwy. 103 West Point, GA, USA 31833
- **Project Type:** Industrial
- **Trades Covered:** Steel Support, Piping, Fabrication
- **Materials Involved:** MS, Copper, PVC
- **Team Size of Tejjy Inc.:** 3 Engineers
- **Project Specialty:**
  - Small piping for process plant
  - Use of prefabricated modular construction technique through BIM
- **Unique Feature of the Project:** Development of Fabrication Drawings, Pipe Spool Drawings & Process Equipment
- **Purpose of Construction:** New process plant expansion for the city of Houston
- **Number of Buildings:** 4 Buildings with different process equipment
- **Levels of Building:** 2
- **Start Date of the Project:** 16th January 2020
- **End Date of the Project:** 28th February 2020
- **Start Date of the Actual Construction:** 21st February 2020
- **Date of the Final Construction:** On-going
- **Stakeholders Involved in the Project:** Houston Waterworks Team - A CH2M & CDM SMITH Joint Venture
- **Role of Client:** Pipe Subcontractor
- **Software Applications Used for the Project:** Revit, AutoCAD, PDF

Project Scope of Work Executed by Tejjy Inc.

Tejjy Inc. uses Revit for creating the 3D BIM Model to meet the project objectives like:

- 3D Revit Model Creation for Coordination and Shop Drawings
- Constructability Review (Model Update to reflect changes resulting from Design
- Changes, RFI Generation & Update)
- Clash Detection & Mitigation
- Coordination of Piping & Process Equipment
- Fabrication Drawing Preparation
- Spool Drawing for Pipes
- Quantity Take-off
- Pre-fabrication & Modularization

Project Challenges & Solution

Tejjy Inc. uses Revit for creating the 3D BIM Model to meet the project objectives like:

- **Challenge 1: Fabrication Drawing Creation**

  Solution: Team of Engineers at Tejjy Inc. developed a standard for executing the Fabrication Work.

- **Challenge 2: Coordination of Piping & Process Equipment**

  Solution: Engineers of Tejjy Inc. detected pipe clash in the pump room using 3D BIM Model and processed equipment with the pipe.

- **Challenge 3: Incomplete Information in the Model**

  Solution: Using BIM Constructability Review, the Engineers of Tejjy Inc. have found that the line & pinch valve are not updated in the model and don't have adequate space.

Benefits Obtained by the Project Owner from BIM Implementation

- Coordination of Piping & Process Equipment
- Generation of Exact Quantity of Pipes & Equipment for Order Placement
- Improved Understanding of the Fabrication Process
- Optimized Operational Efficiencies for Fabrication
- Dimension Correction as per P&ID (Piping & Instrument Diagram)
- Complete Information Management through BIM Model

Advantages to Owner from Using BIM Pre-fabrication & Modularization Approaches

Benefits to the Owner from Tejjy Inc.'s Pre-fabrication Technique

- Reduced construction costs & construction time on site
- Increased profitability & site productivity
- Completion on time & budget
- Reduced wastage in manufacturing & onsite
- Greater reliability and quality

Benefits to the Owner from Tejjy Inc.'s Modularization Technique

- Ease of Installation
- Increased Productivity
- Effective Coordination
- Standardization of Process
- Cost Reduction, Saving Time & Labor Cost
- Improvement of Construction Quality
- Reduction of Material Wastage
- Simplified Onsite Logistics
- Less Risk of Theft
- Protection from Weather Damage
- Less Disruption to the adjacent environment

ROI from BIM

Tejjy Inc. saved the time and money of the project owner throughout the building lifecycle by developing the perfect design and drawings through BIM. The technology helped to simplify the project work-flow using Revit BIM Model for coordination.

Tejjy Inc.'s Value Addition to the Project

Tejjy Inc. has completed the project within a month before the creation of actual fabrication, which resulted in saving time for the contractors to make the faster fabrication of pipe and process equipment.

Percentage of Benefits to the Owners (%), from BIM Implementation

- 100% Reduced Document Error
- 96 % Reduced Rework of the Fabricator
- 10 % Reduced Construction Cost by Not Ordering Excess Quantity
- 15% Faster Project Completion through Accurate Drawing Creation

Testimonial from Tejjy Inc.

"Revit helped to plan using intelligent 3D BIM models and allowed our team members to anticipate, plan and coordinate every aspect of project detailing. BIM helped us to identify constructability issues before construction, detect clashes, and avoid a work stoppage and wastage of time & material. I am satisfied that by managing the Northeast Water Purification Plant Expansion project through Revit, we can focus on improved engineering and client satisfaction." - Sukh Singh, COO, Tejjy Inc.

"BIM has automated our project workflow about RFIs, document approvals, and general communication and has made our team productive. It has slashed the time consumed for the project owners, helping the project move ahead." – Niraj Patel, BIM Project Manager, Tejjy Inc.

Result of BIM Implementation

- Using BIM, we could easily produce quality output with less effort
- Enhanced quantity of production at lesser time
- Detected accessibility issues, saving time for rework
- Identified space constraint and facilitated waste elimination
- Facilitated design disciplines to collaborate as a single information platform
- Improved work efficiency, reducing errors & verifying aesthetics
- Ensured ease of access for maintenance provisions & facility management
- Saved Money through Pre-fabricated Modular Construction Model

Bottom Line

Tejjy Inc. team benefitted in terms of accuracy, data integrity, revision management, quality of detailing and higher productivity. The BIM engineers can successfully generate coordinated models and allow the client company to check possible interference between building systems, leading to improved project planning, cutting down delay. Building Information Modeling played a crucial role in design optimization, coordination, and construction management. The BIM engineers worked in a coordinated manner, completing the project before the scheduled time.

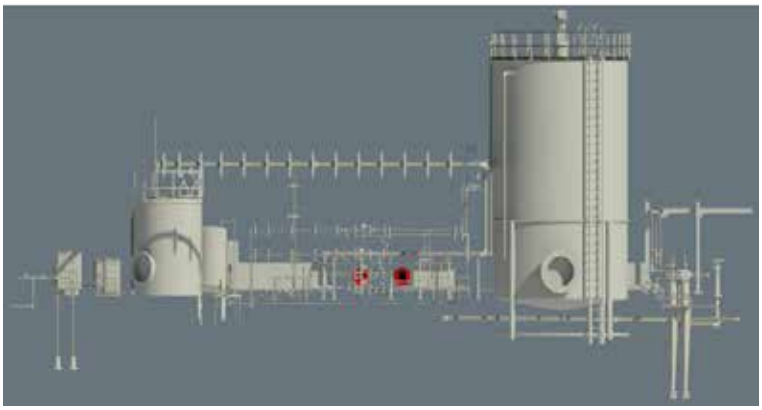
Road Ahead

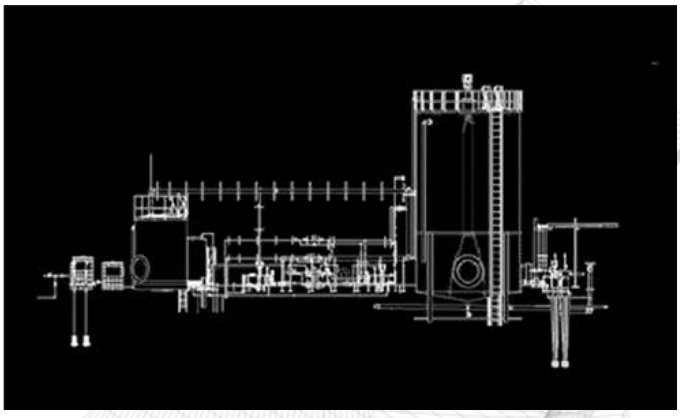
Revit BIM will help to streamline project operations in public, private & government sectors in the USA and across the world. Revit integrated BIM provides an effective project solution & collaboration through project information management, document control and resolution of design problems by RFI management. Hence, the BIM collaboration will be used for combining model & project information.

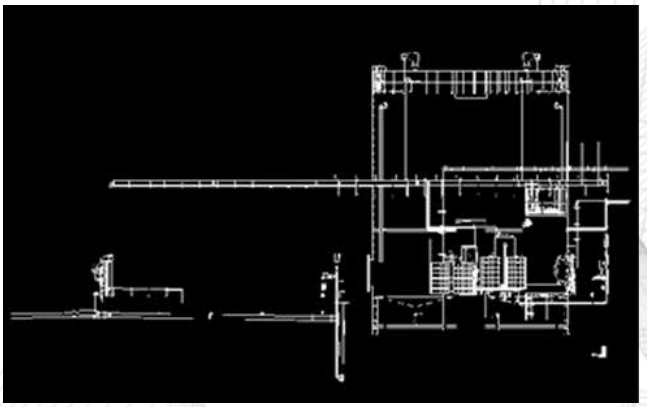
About Tejjy Inc.

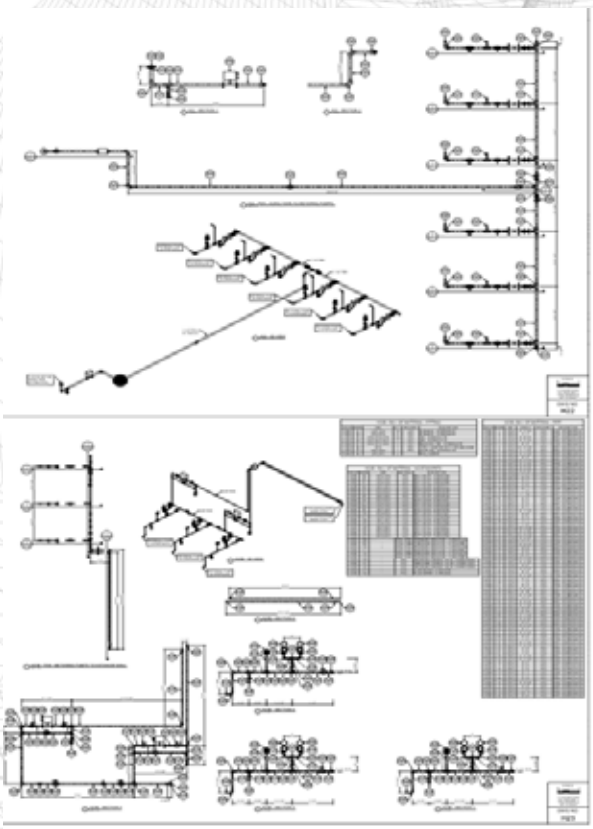
Tejjy Inc. is a leading BIM, Architectural, Engineering, Construction Management, Permit Expediting & Structural Design Firm in Washington DC, Baltimore, MD & Virginia areas of the USA. Call at 202-465-4830 or email at info@tejjy.com to discuss your project requirement. Visit - https://www.tejjy.com/about-us/ to read more about the company.

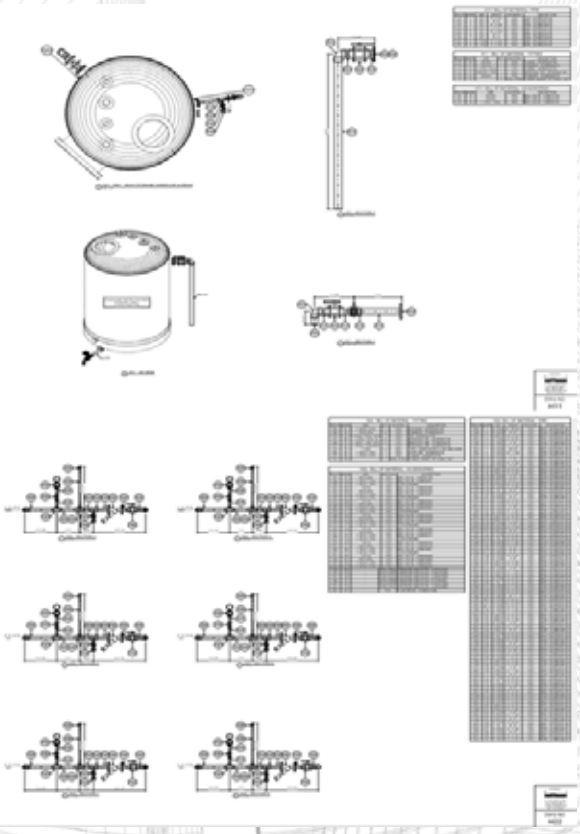
Project Snaps











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