BIM DESIGN DEVELOPMENT SERVICES
FOR MEP ENGINEERING FIRMS

- DESIGN ENGINEERING & DEVELOPMENT
- 3D MODELING & COORDINATION
- VALUE ENGINEERING & OPTIMIZATION
- CONSTRUCTION DOCUMENTATION
- QUANTITY TAKE-OFF
Maximizing client value by adopting the latest technologies and innovations

Improving project efficiency by streamlining workflow and providing high quality services

Saving time by using a large global team to leverage time zone advantages

Reducing client cost up to 30% by harnessing a highly experienced global work force

INDEX

- Revolutionizing MEP Designing Engineering 3
- Benefits of implementing BIM for MEP Design Firm 3
- BIM Services for MEP Design Firm 4
- Design Development & Coordination 4
  - Schematic Design 5
  - Design Engineering & Development 5
  - Detailed Design Development 7
  - Constructability Reviews 8
  - Clash Coordination & Optimization 8
- Construction Documents (CD Sets) 9
- Quantity Take-Off 9
- Why Pinnacle? 10
- Testimonials 11
Revolutionizing MEP Design Engineering

Proper planning and coordination are the keys to the successful execution of projects in the construction industry. Building Information Modeling (BIM) allows stakeholders to create and examine virtual representations of the Mechanical, Electrical and Plumbing (MEP) systems and other utilities. The virtual construction can be used to generate coordinated tender drawings (CD Set) for eliminating rework and change order.

Advancements in 3D technology and the advent of BIM have also revolutionized the Architectural, Engineering and Construction (AEC) industry.

Pinnacle Infotech has been acknowledged as the global leader in providing innovative BIM solutions. We have received several awards and recognition for our expertise from the government and trade associations, including excellence awards, innovation awards, top exporter and highest job creator awards. NASSCOM - the leading IT trade association has acknowledged Pinnacle among the Top IT innovators 3 years in a row in 2006, 2007 and 2008 and again in 2011.

The successful completion of more than 4000 BIM projects in 30 countries has provided Pinnacle with a deep understanding of international building codes and procedures. Our global delivery system allows us to maintain constant contact with our clients, making geographical separation meaningless.

We recognize the importance of effective work process management and regular communication while outsourcing services. We have developed an ideal mix of infrastructure, experience, global presence and commitment to excellence that has led to long-term relationship with more than 950 clients worldwide.

Benefits of implementing BIM for MEP Engineering Firm

- **COORDINATION:** MEP layout design with appropriate sizing and routing in coordination with architectural and structural elements. Streamlining communication with 3D visualization among all stakeholders for quick decision making during design phase.

- **EFFICIENCY:** Eliminating RFI's, work stoppages and rework by ensuring the accuracy of drawings.

- **QUALITY:** Improving Quality by producing accurate construction documents directly from the 3D BIM model which could also be used for pre-fabrication and quantity take-off.

- **SAVINGS:** Cost optimization and value engineering by using BIM and interfacing with various design analysis and simulation software.

- **PROJECT MANAGEMENT:** Seamless coordination with Owner, Architects, other Consultants and stakeholders for real time updated model during design phase.

*Our Clients have reported cost savings up to 30% by successfully implementing BIM.*
Pinnacle provides accurate and cost effective solutions for MEP Design firms. We work closely with design firms during the design development stages using an ISO 9001 certified process. Our team members work with a range of inputs, including conceptual drawings, hand-sketches, data sheets, design calculation excels, Red-Line Markups and Single-Line Diagram. We specialize in BIM modeling to validate the design for constructability, applicable codes, performance and maintenance. 3D visualization helps us to bring clarity in design objectives pertaining to performance parameters, clearance, tolerance, support systems for installation and ease of maintenance.

Different design options are simulated and analyzed to choose the most efficient solution. Our team uses advanced design software like Pipenet, ETAP, Dialux, Elite which seamlessly integrate with the BIM models. We are platform independent and work on major software applications like AutoCAD MEP, Revit MEP, Autodesk Fabrication, Navisworks, Bentley and SolidWorks. We follow all international standards like SMACNA, ASHRAE, IMC, ANSI, ASME, IPC, UPC, NFPA and local codes and standards as per project requirement / specifications.

Pinnacle’s BIM Services for MEP Design Firms include:

1. Design Development & Coordination
   A. Schematic Design
   B. Design Engineering & Validation
   C. Detailed Design Development
   D. Constructability Review
   E. Clash Coordination & Optimization

2. Construction Documents (CD Sets)
3. Quantity Take-off

1. Design Development & Coordination

Pinnacle has the experience and technology to assist MEP Design Firms in the design development process. Our experienced team of well qualified engineers interact regularly with Designers to understand their design which evolves from conceptual/schematic stage to construction document sets.

The inputs received by Pinnacle include any or all of the following:

- Conceptual Drawings and/or Models
- Red-Line Mark-ups
- Design Sheets
- Hand-sketches
- Single Line Diagram
- Design Basis Reports
- Calculation Excels
Pinnacle's engineering team translates designer’s thoughts, expressed through the aforesaid inputs into buildable information in the form of 3D coordinated models and 2D Drawings. We have a large database of building equipment and elements, fittings & accessories covering most of the manufacturers globally. We recognize the importance of communication, work process & documentation for successful collaboration. Our ISO 9001:2008 certified process follows detailed documentation process which is critical for collaboration.

The above process passes through one or more of the following stages of Design Evolution:

**A. Schematic Design**

Schematic design is an initial design scheme that seeks to define the general scope of the project, including scale and relationships between various building components. At this stage, the models are the dominant tools to provide a description of the proposed system. The description is a set of integrated ideas and concepts about what the proposed system should do, behave and look like, so that it is well understood by all the stakeholders. The sketches from the design firm interpret the client's desire which are translated into a model, corresponding roughly with the LOD 200 Revit model. We use LOD 200 Models for preliminary studies, based on location, orientation and overall systems.

**B. Design Engineering & Development**

Our engineering team builds intelligent BIM model to support your designing of complex building systems with improved efficiency. This gives all stakeholders a clear idea of design intent enabling them to modify the design to achieve the outcomes they want, thus minimizing risk of costly changes later. We follow SMACNA, ASHRAE, IPC and other appropriate standards for design work process. Different design options are simulated and analyzed to develop efficient and cost-effective solutions. Some of the design analysis includes:
**Design Development for Mechanical Ducting**

- Load analysis & CFM calculations
- Sizing ducts & terminals
- Air balancing, ESP calculation and pressure loss reports
- Designing equipment capacities
- Optimize duct routing
- Damper selection & placements
- Piping, sizing and layouts

**Design Development for Plumbing**

- Assigning fixture units
- Layout generation & pipe flow calculations
- Pipe sizing & pressure drop calculations
- Designing drainage, rain water & storm drain
- Pump head calculation & pump selection

**Design Development for Fire Fighting**

- Sprinkler design & layouts
- Designing the pipes as per pipe schedule recommended by NFPA
- Checking the obstructions to sprinkler spray pattern & providing adequate sprinklers below/near the obstructions as per NFPA
- Providing flushing valve & auto air release valves as per NFPA

**Design Development for Electrical**

**Lighting & Small Power:**

- Power & lighting circuit
- Ensuring lighting illumination as per specification
- Voltage drop calculation & cable sizing
- Load balancing & calculation
- DB & panel schedule

**Cable Tray Routes (MV & LV):**

- Providing Accumulative Voltage drop calculations
- Providing Cable tray sizes & routes

**Fire Alarm:**

- System connection & equipment/fixture schedule
- Layout & looping fire alarm speakers
- Providing Control Modules for Fans, Motorized Dampers & Pumps
- Providing Monitor Module for FHC & HRFHC
Detailed Design is the stage following schematic design where the schematic design decisions are worked out in greater details. The details get reflected in the model, corresponding roughly with the LOD 300 Revit model. This also enables the client to visualize the project. Analysis based on specific Systems can be performed and Quantities of all Materials can be extracted from the model. At LOD 300, the model is leveraged for the generation of traditional Construction Documents and Shop Drawings and is used for the analysis of Constructability, Clash & Cost.
D. Constructability Reviews

Virtual Construction of project in BIM enables Independent Review of the Construction Plans and Specifications. This identifies discrepancies in drawings and all constructability issues at the design stage. During the constructability review, our BIM team generates a series of RFI's to identify the following type of constructability and operational issues:

- Missing information / documents
- Input inconsistencies
- Conflicting data
- Operation clearance and accessibility issues
- Feasibility of support systems
- No Fly-zones

BIM model is updated based on RFI response. Status of all RFIs is maintained in a log and follow-up is done to resolve them. This ensures delivery of quality construction documentation.

E. Clash Coordination & Optimization

Our coordinated BIM models allow our clients to check possible interference among all building systems. They help design firms to visualize the entire building system before the beginning of construction, leading to better project planning. This eliminates rework during the construction phase, saving time and money. We resolve clashes among all trades including architectural, structural, mechanical, electrical, plumbing, fire protection, concrete and several other trades by sharing 3D clash Navis viewpoints or through WebEx meetings. We re-route utilities, change elevation and re-size elements for resolving clashes. Moreover, we provide Value Engineering for improving system efficiency, reducing costs and easier maintenance of construction. Coordinated models are used for making quantity takeoffs, estimation and location scheduling.
2. Construction Documents (CD Sets)

Construction documents are generated from the detailed BIM coordinated models. Our BIM Models represent the most comprehensive drawings, depicting each component with technical information.

- All construction documents are cohesive and consistent in spite of changes.
- Any change in the DD (Design Document) drawings, updates the model.
- Sections are generated seamlessly for any critical arrangement.

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3. Quantity Take-Off

During the design phase 3D model provides detailed material quantities of all items and enables accurate cost estimate to ascertain if the design meets the project budget. We produce accurate and timely estimate throughout a project for controlling costs. Using our BIM software tools, we help the designers to explore various design alternatives and make decisions to reduce cost and take energy saving options and project life cycle cost.
Why Pinnacle?

Pinnacle is a global leader in providing innovative BIM services. Our in-house team of more than 750 experienced Architects, Engineers and BIM professionals helps us provide end-to-end solutions to discerning clients around the world.

Our 3,28,364 sq ft, world-class production facility is equipped with high-end workstations, advanced servers with real time backup and a high speed data and voice network. There is a 24 x 7 uninterrupted power supply security system.

Fast Turnaround

Our skilled team of professionals can provide quick turnarounds on complex projects. Pinnacle has successfully completed several large-scale projects across multiple verticals including health care, hospitality, airports, university centers, data centers, retail centers, convention centers, commercial, industrial and residential projects.

Technical Strengths

Our engineers use the latest BIM software: Revit Software Suite (Revit, Revit MEP, Revit Architecture and Revit Structure), Microstation, Ecotect Analysis, NavisWorks, Inventor, Civil 3D, Plant Design Suite, Pro/Engineer, Tekla Structure, SolidWorks, Autodesk Fabrication Suite, Quickpen, Cadpipe, SketchUp, Bluebeam, and other software.

As we have a deep understanding of global and regional codes and standards, we have ensured that our Quality Management System is as per ISO 9001:2008.

Global Presence

Pinnacle has offices around the world (USA, India-Durgapur and Kolkata, UAE-Dubai, and Italy) enabling us to serve our clients around the clock.

Experienced in BIM Domain

We have a global experience of 17 years and have successfully collaborated with several leading contractors on BIM projects for specialty hospitals, stadiums, universities, dams, apartment complexes, hotels, casinos, large retail center, high school, airport, commercial buildings, convention center, high rise towers, and industrial projects.

Communication

Pinnacle’s Project Management team is available to clients through a number of communication channels including:

1. **Global telephone networks** for instant communication
2. **FTP** over a secured network for file transfers
3. **Email** for reports and interactions
4. **Video and teleconferencing** for presentations and conversations
5. **WebEx** conferences with US-based phone systems
6. **Newforma** project information management system
Testimonials

“We are thrilled to have found a group like yours that service all our MEP drafting needs, and at record response. We truly feel like you have met and exceeded everything we could have asked of your group. We look forward to a long and bright future together.”

Bobby Mayfield | MCC Group | Mechanical Contractor

“I was given exactly what I asked for. Everyone was very helpful and responsive. Thanks to everyone who worked on this for us. We were in a short turn around schedule and did not have the manpower to respond. I believe Pinnacle is a great resource for supplementing our force. Construction is unpredictable and keeping ample coordination manpower for all situations is difficult. Thanks again.”

Larry J. Randolph | TD Industries | Mechanical Contractor

“This was our first experience with Pinnacle, and we at Waldrop were satisfied with the level of performance by the Pinnacle team. We were under extreme pressure to deliver under a tight deadline and your team aided us in doing so. We appreciate your work and look forward to other successful projects together.”

Jamie Porterfield | Waldrop Mechanical Services | Mechanical Contractor

“Communication between different time zones has its challenges. One must be completely clear about what they want and offer. Considering the 11:30 hr difference I am very pleased with the results. The correspondence I received was cordial and concise. The product I received was prompt and well developed.”

Patrick Madrid | U.S. Engineering Company

“I am pretty happy with the product received from Pinnacle. We have been using Pinnacle’s services for quite a while now and working with them closely to get good outputs. The Bethesda Butler project had a pretty easy plan and spec job so it went smoothly.”

Jeremy Hanks | Grote Enterprises, LLC

“Pinnacle did a very good job meeting the fast paced schedule and requirements of the Kenwood IRC BIM project. They did a great job of identifying discrepancies between the project scheduled equipment and the equipment shown on the floor plans as well as pointing out areas where there was not enough space for the mechanical equipment.”

Greg Zurbuchen | North American Mechanical, Inc.

“We have been extremely happy with Pinnacle’s work to date on the PHMC. You have done a great job coming up with solutions to conflicts and your response time to our requests has been top notch. Thank you!”

Gary Smith | Schmolck Mechanical Contractors, Inc.

“This was our first project that required 3D coordination drawings. We entered this not knowing 100% on how we were going to handle this process. We have received many compliments on the professionalism of the drawings especially the clash reports. Pinnacle worked through the plans to solve the clashes detected and then only brought us into the process when a clash could not be resolved without further input. With their knowledge it allowed me to concentrate on other aspects of the project. I would highly recommend them to anyone required for coordination drawings.”

Fred Prezioso | Dan-Cel Co.

“This was my 2nd project with Pinnacle and I have been satisfied with Pinnacle’s problem-solving approach and quick turn-around. The project at this time was a bit unique and challenging, but the positive attitude by Pinnacle team mitigated the challenging conditions and delivered to us a high-quality product. More we work together easier we communicate especially on some unique protocols existing in Japanese construction industry. Thank you.”

Tatsuya Inokuchi | Obayashi

“Our experience with Pinnacle has been positive. Overall Pinnacle has proved to us that they can do the work we need and look forward working on more projects together.”

Steve Barnhill | IMC Fabrication