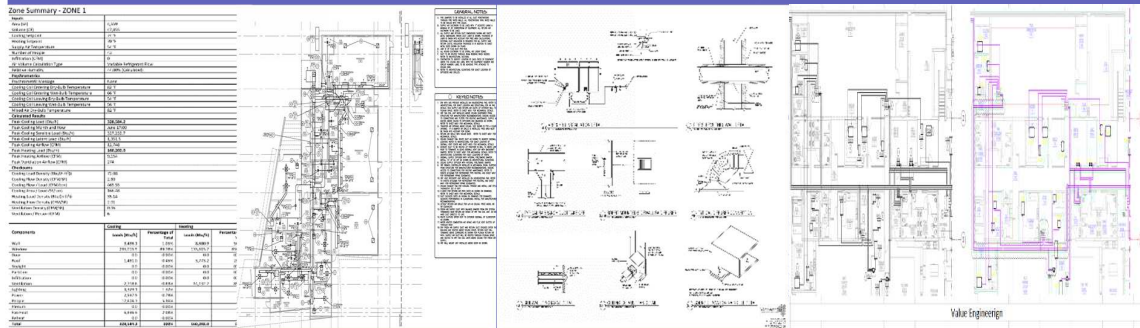


Pre-Construction BIM/CAD Services for MEP Systems

- MEP Engineering Calculations
- Value Engineering
- Production of Construction Document
- Constructability Review



D&D team is passionate to BIM services and committed to following goals for the customers:

- Maximize client value by adopting the latest technologies and innovations.
- Improve project efficiency by our best internationally tested workflow to provide high quality services.
- Save time by using team effort with skilled team members.
- Reduce client costs up to 25 % to 40% by harnessing a highly experienced work force.

INDEX

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MEP Pre -Construction Process

For each project construction process MEP systems plays vital role and each project execution process involved three stages as follows .

Pre – Construction – In this process includes the feasibility study , designing , planning and cover up to the project BID/Tender Stage .

In this stage basic involvement of Engineering firms or consultants .

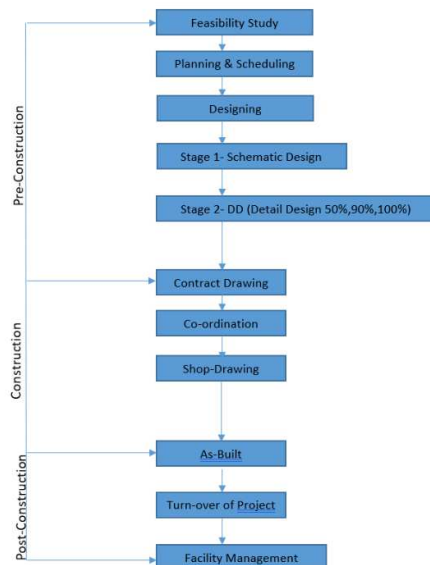


Fig: MEP Project construction process

Construction - This phase includes the co-ordination and production of shop drawing for installation of each accessories of MEP systems .

In this stage basic involvement of GC , Sub-contractors .

Post – Construction- This phase includes the turnover of projects (TOP) of documents and drawings and involvement of facility management (FM).

MEP Systems

MEP system consists of basically three systems Mechanical, Plumbing and Electrical including the Fire Protection system. In building, MEP engineering systems plays the major role parallel with the architect, structure

from conceptual planning, detail designing stage to execution stage. All individual systems have its own sub system as follows.

Mechanical System

Mechanical ducting : Mechanical ducting system consist of the mechanical equipment like AHU ,VAV ,CU , FCU ,RTU etc with duct , duct fitting , hangers ,dampers , access panel , access door etc. including all accessories.

Mechanical piping: - Mechanical piping system consists of mechanical pumps, chiller, piping with fitting, valves, hanger and all accessories.

Mechanical Ventilation: - Mechanical ventilation system consists of exhaust, supply fan with duct, fitting and dampers, access panel, access door etc. including all accessories.

Plumbing System

Plumbing Drainage System: - Plumbing drainage system consists of piping with fitting, valves, hangers with all necessary accessories.

Plumbing Water Supply system: - Plumbing water supply system consists of water pump, pipe with fittings, valves, hangers and necessary accessories.

Fire protection System

Fire Hydrant System: - Fire hydrant system consists of hydrant equipment like pump, hose box assembly, pipe with fitting, valve, hangers with necessary accessories.

Fire Sprinkler System: - Fire sprinkler system consists of equipment like pump, sprinkler, test valve assembly, pipe with fitting, valve, and hangers with necessary accessories.

Electrical System

Lighting System: - Lighting system consists of lighting panel, breaker, lighting conduit and lighting fixture, switches with necessary lighting accessories.

Power System: - Power system consist of power panel, power cable, power conduit Junction Box, power socked, receptacle and necessary power accessories.

Fire Alarm: - Fire alarm system consists of fire alarm panel, conduit, cable, junction box fire alarm devices with necessary accessories.

Signal /ELV System (Telephone, Data, signal, CCTV):- All the signal, CCTV and ELV system consists with necessary panel with devices and network cables.

External MEP System: - External MEP plumbing system consists with underground plumbing & electrical system .External plumbing system consists with pipe with fittings, channel, Chambers, Catch basin and manhole. External Electrical system consist of substation, Generator, main LV panel, Cable tray, Underground conduit

Specialized plumbing System :- In plumbing system Irrigation , Gas , Medical Gas , WTP (Water Treatment plant) , Sewage Treatment Plant (STP) , swimming pool systems considered as a specialized plumbing system .It consist with Pump ,valve and pipe with fitting and all accessories etc. .

MEP Codes and Standards we follow

MEP system contract/design drawings in strict compliance with contract specifications, technical submittals and the relevant codes which we use internationally.

Mechanical Codes - ASHRAE, ASME, ASTM, SMACNA , AS1668.2 – 2012, AS 4254.2-2012

Plumbing Codes- IPC , ASPE , AS3500

Electrical Codes NFPA70 – NEC

Fire Protection NFPA -1, 13, 14

Services we do MEP Engineering Calculation Thermal Load calculation

As per the international standard and guidelines ASHRAE, we do thermal load calculation through manually and through Autodesk Revit software which we use to provide for our US client.

Project Summary	
Client Name	2000 L&L, Mumbai, Maharashtra, India, New Mexico
Project Name	2000 L&L, Mumbai, Maharashtra, India, New Mexico
Project Type	2000 L&L, Mumbai, Maharashtra, India, New Mexico
Project Location	2000 L&L, Mumbai, Maharashtra, India, New Mexico
Project Size	2000 L&L, Mumbai, Maharashtra, India, New Mexico
Project Start Date	2000 L&L, Mumbai, Maharashtra, India, New Mexico
Project End Date	2000 L&L, Mumbai, Maharashtra, India, New Mexico
Project Status	2000 L&L, Mumbai, Maharashtra, India, New Mexico
Building Summary	
Building Name	2000 L&L, Mumbai, Maharashtra, India, New Mexico
Building Type	2000 L&L, Mumbai, Maharashtra, India, New Mexico
Building Location	2000 L&L, Mumbai, Maharashtra, India, New Mexico
Building Size	2000 L&L, Mumbai, Maharashtra, India, New Mexico
Building Start Date	2000 L&L, Mumbai, Maharashtra, India, New Mexico
Building End Date	2000 L&L, Mumbai, Maharashtra, India, New Mexico
Building Status	2000 L&L, Mumbai, Maharashtra, India, New Mexico

Duct Sizing & Flow measurement

As per the ASHRAE standard, our engineering team calculate the duct size a per constant velocity method. Our team having the capability to evaluate the flow as per the project requirement. We also provide the proposed duct size as per the standard velocity method for any missing duct size of contract drawing.

L-2 OA INTAKE CONDUIT WITH JOIST					
SR. NO	DESCRIPTION	NO OF DUCTS	OA DUCT SIZE	DUCT CROSS SECTIONAL AREA (SQ. INCH)	REMARKS
1	CURRENT SIZE	1	36"x110"	3860	
2	PROPOSED SOLUTION 1	2	38"x52"	3952	
3	PROPOSED SOLUTION 2	4	22"x48"	4048	

Plumbing drainage and water pipe sizing

As per IPC fixture chart and inline with friction chart, we do the drainage fixture calculation, drainage pipe size and water supply pipe sizing.

MAXIMUM ALLOWABLE HORIZONTAL DISTANCE BETWEEN VENT AND DRAIN FITTING FOR VENTED DRAINAGE SYSTEMS				
DIAMETER OF PIPE	1/4" (6.35mm)	1/2" (12.7mm)	3/4" (19.05mm)	1" (25.4mm)
1/4"	1	1	1	1
1/2"	1	1	1	1
3/4"	1	1	1	1
1"	1	1	1	1
1 1/4"	1	1	1	1
1 1/2"	1	1	1	1
2"	1	1	1	1
2 1/2"	1	1	1	1
3"	1	1	1	1
3 1/2"	1	1	1	1
4"	1	1	1	1
4 1/2"	1	1	1	1
5"	1	1	1	1
5 1/2"	1	1	1	1
6"	1	1	1	1
6 1/2"	1	1	1	1
7"	1	1	1	1
7 1/2"	1	1	1	1
8"	1	1	1	1
8 1/2"	1	1	1	1
9"	1	1	1	1
9 1/2"	1	1	1	1
10"	1	1	1	1
10 1/2"	1	1	1	1
11"	1	1	1	1
11 1/2"	1	1	1	1
12"	1	1	1	1
12 1/2"	1	1	1	1
13"	1	1	1	1
13 1/2"	1	1	1	1
14"	1	1	1	1
14 1/2"	1	1	1	1
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99"	1	1	1	1
99 1/2"	1	1	1	1
100"	1	1	1	1

Electrical Cable size and voltage drop Calculation

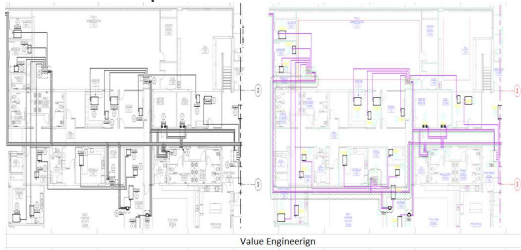
We do electrical cable size and voltage drop calculation as per the schematic inline with NEC

[illegible]

Value Engineering

Virtual Construction of project in BIM enables Independent Review of the contract drawing in-line with requirement and technical specification we do internal value engineering with the following steps.

- Proposed re-route with shortest distance for piping and ducting to reduce the material cost.
- Reduced the no of fitting and bends in the co-ordination.
- Optimization the design through constructability review.
- Reduce the duct size if require as per the specification and code.



Production of Construction documents

We produce permit Drawing/ Contract Drawing & design Models with the help of advance tools like Autodesk Revit in 3D and AutoCAD 2D process.

3D model creation process includes the following steps

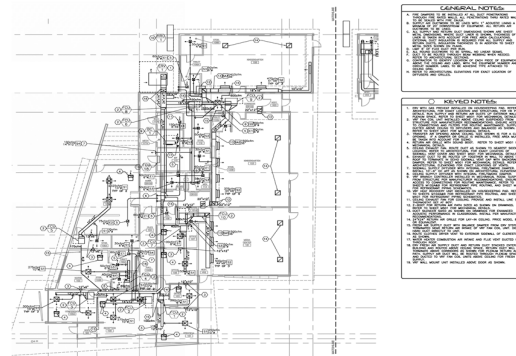
- 1) Creation of template as per the design inputs
- 2) 3D models of equipment
- 3) 3D model MEP Piping all accessories
- 4) Our 3D MEP team has expert in all kind of building system starting from residential, commercial etc.

We use to get the markup from PE engineers /Consultants of mechanical, plumbing system on the architect layout . Based on the

markups, our 3D team use to produce 3D permit drawing set.

MEP Contract drawing /document set consist of following for each system .

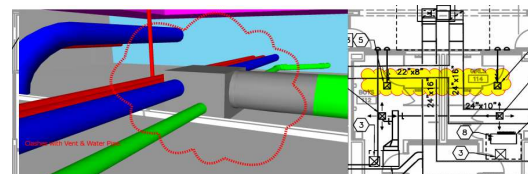
- 1) General drawing & Notes
- 2) Floor plans
- 3) Schematics
- 4) Detail Drawing



Our team has been trained for production of mechanical, plumbing and electrical system contract drawing.

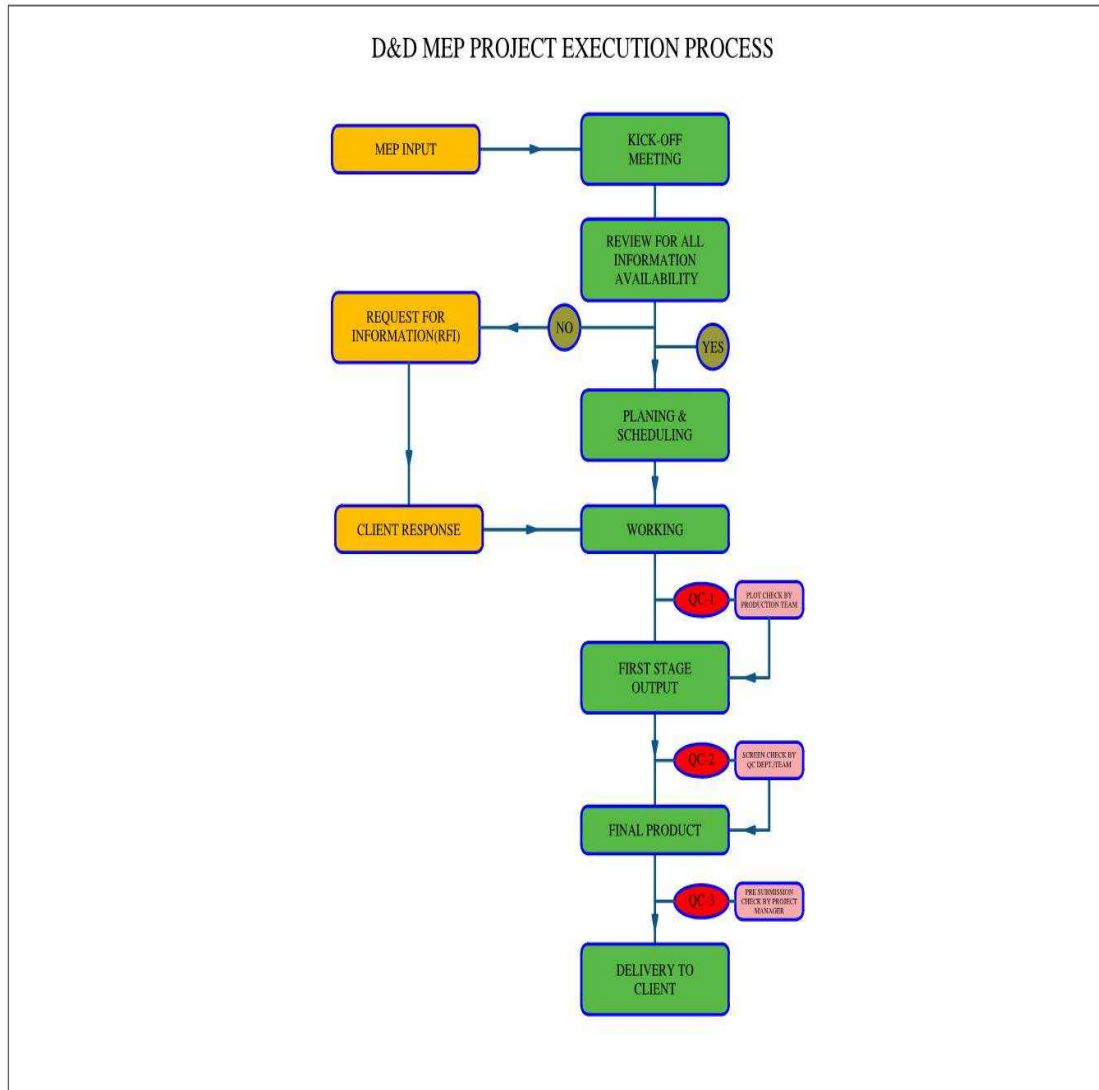
Constructability Review

The main purpose of the constructability review is to review all construction processes from start to finish during the pre-construction or at early design phase. This Constructability assessment helps to identify and solve different types of problems before the actual construction begins and helps to minimize errors, delays and overhead. 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 preconstruction stage. During the constructability review, our BIM team generates a series of RFI's to identify following type of constructability and operational issues:

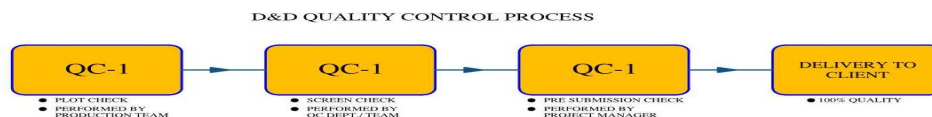


Process we follow

We have a standard BIM Process, which has been prepared, based on our experience & expertise, which we follow for all the MEP projects, unless the project has other requirements. Below is a simple flow chart, which explains the process in detail.



Quality control



The main objective of the quality control (QC) process is to detect errors and rectify it. Ensuring quality is a team effort which is led by a highly qualified and experienced MEP manager for Coordination and Quality Control. The entire QC process is handled in three phases

Quality Check 1

The model check is done by comparing with the original contract documents through Team Member.

Quality Check 2

Team performs a more detailed comparison of Specific Checklist is prepared to review/check the deliverables and main objective check the following Clashes (Old/New), Elevation, Routing, Fittings, etc.

Construction point of view,

Fly and No-Fly-Zones.

Attribute Checking (Pressure class, Pipe material, etc.)

Location of Equipment such as VAV, Sleeves, Hangers, Valves.

Equipment Connection details as per Schematic Drawings.

Equipment Models as per Technical Submittals.

Annotations & Dimensions,

Quality Check 3

The Project Manager conducts the pre-shipment check before sending them to the client.

Why Design and Drawing Solution

Communication

Our team is available to clients through a number of communication channels including:

3. **Email** for reports and interactions.
2. **Telephonic/WhatsApp** communication
4. **ZOOM Meeting** for online meetings, presentations and conversations.
5. **Dropbox** storage for FTP process.

Delivery in Time

Our skilled team of professionals can provide quick turnarounds on complex projects. D & D has successfully completed several large-scale commercial projects across multiple verticals including. Health Care, Airports, University Centers, Data Centers, Retail Centers, Convention Centers, Commercial, Industrial and Residential Projects

Skilled and Efficient Team Members

All team members are specialize in the latest BIM software's Revit Software Suite (Revit, Revit MEP, Revit Architecture and Revit Structure), NavisWorks, Autodesk Fabrication ,AutoCAD MEP .

Knowledge in US and World Standard BIM execution process.

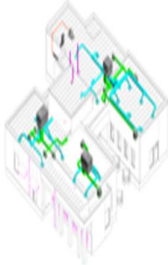
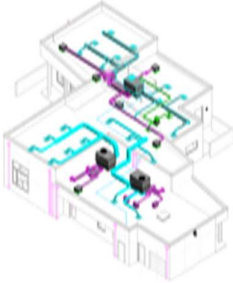
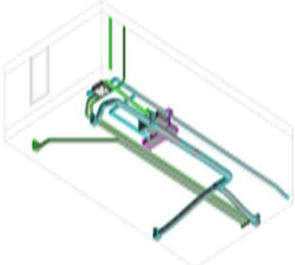
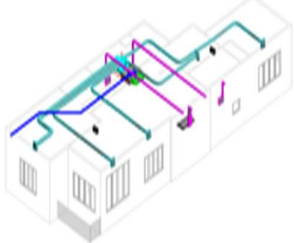

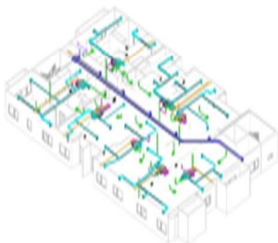
Our top management is having more than 10 years of experience in BIM execution US process and standards which leads the timely completion of complex projects.

Project Cost Optimization










D&D delivered a high quality product within a short timeline and provided coordination support. This allowed for a faster and more cost effective project completion.

Project Snaps

We have already delivered more than 100 BIM/CAD projects throughout the world basically in countries like USA, UK, Australia and New Zealand & India. Below are latest project details of BIM/CAD services for MEP pre-construction process.

	
Madera Apartments Meadows, USA Area:-100278 SF	Villa Sendero Beckner, USA Area:-70700SF
	
Sheridan Station Apartments Sheridan, USA Area:-29472 SF	Speer Apartment CO, USA Area:-24641 SF
	
TREMONT CO, USA Area:-7000 SF	York Street Apartment CO, USA Area:-48,500 SF

Contact us

Registered Office, Mumbai DESIGN AND DRAWING SOLUTION  DESIGN AND DRAWING SOLUTION ONE STOP ARCHITECTURE MEP BIM CAD SOLUTION Plot No X2/1, MIDC PH-II Dombivli East, Central Mumbai – 421203, Thane, MH, INDIA Kolkatta office:-  DESIGN AND DRAWING SOLUTION ONE STOP ARCHITECTURE MEP BIM CAD SOLUTION Geetanjali Apartment, 39, Bangur Avenue , C Block ,Lake Town , Kolkata-55 ,West Bengal , India		Channel Partner-USA Engineering Envioirement  Engineered Environments, LLC 9210 SAN MATEO BLVD NE ALBUQUERQUE, NEW MEXICO 87113, United State Barker Blue Inc  barkerblue 363 N Amphlett Blvd, San Mateo, CA 94401, United States	
US VOIP	(+1)-214-431-5193	    	Email - info@dndrawing.com / irshad@dndrawing.com
Office No	(+91)913-771-8446		
Whats App	(+91)913-771-8446		

