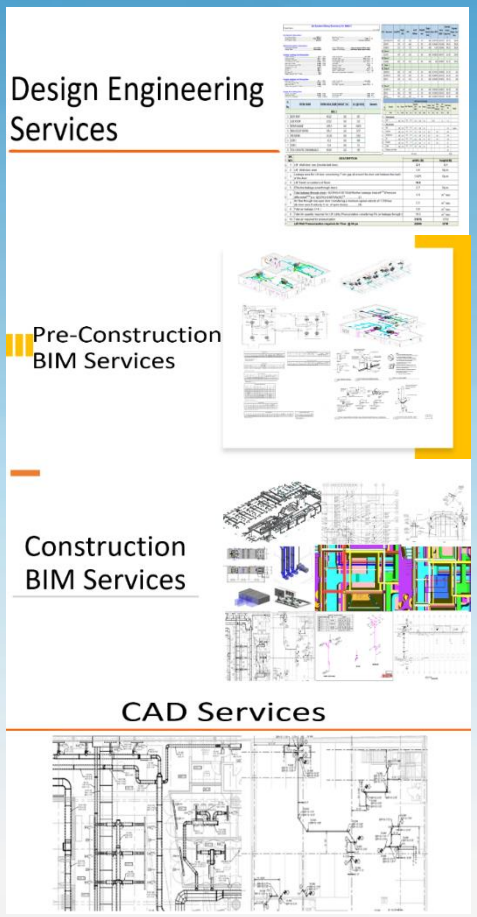
Year 2024-25

Design and Construction Services

For

MECHANICAL SYSTEM



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About us

DESIGN AND DRAWING SOLUTION offers construction documents for Mechanical systems. Our Mechanical team is having good knowledge of USA, Canada Mechanical systems design & construction document process & codes and guidelines.

|Mechanical – ASHRAE, SMACNA,

We are familiar all type of buildings i.e. from Interior Fit outs, single family apartment, high rise apartment, commercial office buildings, hotels, restaurant, hospitals, School, College including infrastructure construction like Airport, metro stains etc.

We are providing our services globally and specially in USA, Canada with MEP consulting engineers, Mechanical Contractors, general contractors.

Using our BIM and 2D CAD outsourcing services, our clients have numerous advantages i.e. including time and cost savings which are realized during the design phase and more importantly, during the installation and build stages of construction projects. We are certified Autodesk users and started in Mumbai, India from early 2018 and having our representative in US as well as channel Partner.

DESIGN AND DRAWING SOLUTION
ONE STOP BIM | CAD | MEP ENGINEERING SOLUTIONS

6+ Years' Experience

300+ Completed Projects

150+ Customer world wide

Building Types includes

- Interior Fit out for Commercial / Residential
- Bungalows /Residential Apartments
- High Rise Residential building
- Commercial IT / Banks
- Hotels
- Institutional Buildings like school, Libraries, Auditoriums
- Hospital
- Entertainment Zones, Malls and Multiplexe
- Data Centre
- Industrial ware house

Design Engineering Services

- Thermal Load Calculation
- Duct and Pipe Sizing
- Ventilation Design Calculation
- Lift Pressure Calculation
- Static Pressure Calculation

Pre-Construction BIM Services

- Design 3D Model (LOD 300)
- Design drawing

Construction BIM Services

- 3D Modelling – LOD 400
- BIM Co-ordination
- Shop Drawing
- Spool, Hanger & Insert Drawing
- As Built Model & Drawing (LOD 500)

CAD Services

- Shop Drawing
- As Built

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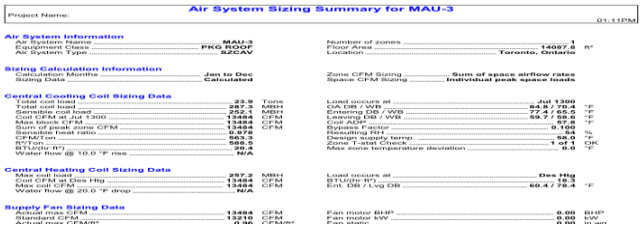
Design Engineering Services

Thermal Load Calculation

As per the international standard like ASHRAE guidelines, we do thermal load calculation through HAP which we use to provide for our existing client for the mechanical system design assistance.

Basic Consideration or important factors are as follows.

1. Building North & Location for Outdoor design
2. Indoor Design Condition
3. U values for building envelope
4. Ventilation requirement and light



Duct Sizing

As per the ASHRAE Standards, our engineering team use to calculate the duct size a per constant velocity method. Standard Recommendation are as follows:-

Recommended Velocity

Supply Duct & Return Duct:- 500 – 750 FPM

Exhaust Duct:- Shall be greater 500FM Upto 1500 fmp

R NO	Area name	Area(SFT)	Height (M)	CFM	No Of Diffuser	CFM/Diff user	Design Velocity (FPM)	Area (SFT)	Area (SQMT)	Calculated Duct Size (mm)	Proposed Design Duct Size
2	KITCHEN / PTY	303	2.7	536	3	179	600	0.297778	0.027675	187.76	200.00
3	ENTRY	324	2.7	606	3	202	600	0.336667	0.031289	199.65	200.00
4	FAMILY	413	2.7	732	4	183	600	0.305	0.028346	190.02	200.00
A2	Zone 2										
1	GUEST	149	2.7	263	1	263	600	0.438333	0.040737	227.80	250.00
A3	Zone 3										
1	GAMES	285	2.7	504	1	504	600	0.84	0.078067	315.35	350.00
B	Level - 2										
B1	Zone 4										
1	MASTER	383	2.7	679	3	226	600	0.377222	0.035058	211.33	250
2	RUMPUP 1	390	2.7	692	3	231	600	0.384444	0.035729	213.34	250
3	BED 4	136	2.7	242	2	121	600	0.201667	0.018742	154.52	200
B2	Zone 5										
1	RUMPUP 2	207	2.7	367	2	184	600	0.305833	0.028423	190.28	200
2	BED 2	164	2.7	290	2	145	601	0.241265	0.022422	169.01	200
3	BED 3	162	2.7	287	2	144	602	0.238372	0.022154	167.99	200

Pipe Sizing

As per ASHRAE standard , we use to calculate pipe size based on the constant velocity standard .

Recommended Velocity for Piping

Branch Pip 0.5 m/se

Branch Header 0.7-1 m/sec

Main Header 1- 2 m/sec

Based on the flow and standard recommended velocity, we use to calculate pipe size.

Ventilation Calculation

To calculate ventilation airflow, we use to follow recommended air changes per hour as per ASHRAE guidelines and based on the air changes, we calculate the ventilation airflow for proposed Zone.

Sr. No.	ROOM NAME	ROOM AREA (SQM)	HEIGHT (M)	L/s (@5 ACH)	Remarks
	MAU 2				
1	BODY SHOP	41.02	6.8	387	
2	LUBE ROOM	23.32	6.8	220	
3	REPAIR GARAGE	1699.5	6.8	16051	
4	SMALL EQUIP. REPAIR	395.7	6.8	3737	
5	TIRE REPAIR	141.04	6.8	1332	
6	CORR 1	43.2	6.8	408	
7	CORR 2	5.65	6.8	53	
8	TOOL LOCKUP & CONSUMMABLES	19.64	6.8	185	

Lift Well Pressure Calculation

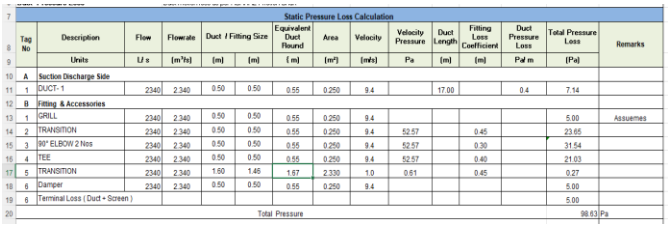
Its a mechanical ventilation system that controls the air pressure in a lift well and lobby to prevent smoke from entering and to make evacuation routes safer.

Based on the leakage and pressure difference airflow, we use to calculate the Lift pressure calculation.

SR. NO.	DESCRIPTION	width (M)	height(M)
1	Lift Well door size (Double leaf door)	2.1	2.1
2	Lift Well door area	4.6	Sq.m.
3	Leakage area for Lift door considering 7 mm gap all around the door and between two leafs of the door	0.075	Sq.m.
4	Lift Travel i.e.numbers of floors	10.0	
5	Effective leakage area through doors	0.7	Sq.m.
6	Total leakage through doors :Q(CFM)=0.827XA(Effective Leakage Area)xP^1/N (Pressure differential(inWG)).i.e. Q(CFM)=0.827xAx(50)^1/2 .....(I)	4.4	m^3 /sec
7	Air flow through one open door considering a minimum egress velocity of 1.2 M/sec (Q=door area X velocity X no. of open doors).....(II)	5.5	m^3 /sec
8	Total air leakage (I+II)	9.8	m^3 /sec
9	Total Air quantity required for Lift Lobby Pressurization considering 5% air leakage through c	10.3	m^3 /sec
10	Total air required for pressurization	21875	CFM
	Lift Well Pressurization required Air Flow @ 50 pa	22000	CFM

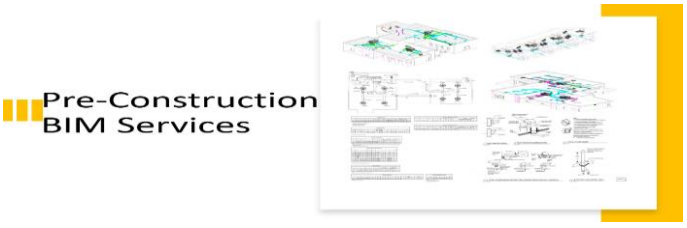
Static Pressure Calculation

Total static pressure for ducting is the static losses of duct due to friction and equivalent fitting loss including the end accessories like grill loases. Based on the ASHRAE standard fitting loases, we use to calculate actual Static Loses.



Static Pressure Loss Calculation

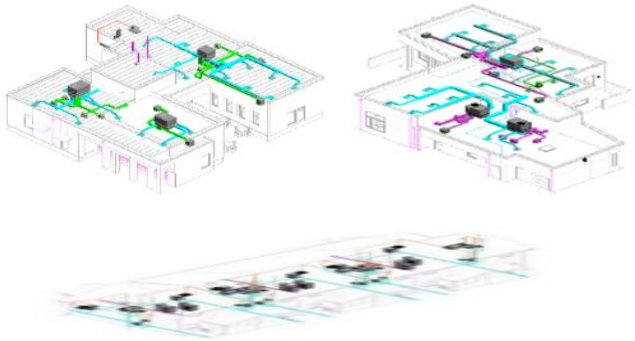
Tag No	Description	Flow	Flowrate	Duct / Fitting Size		Equivalent Duct Round	Area	Velocity	Velocity Pressure	Duct Length	Fitting Loss Coefficient	Duct Pressure Loss	Total Pressure Loss	Remarks
	Units	L/s	(m³/s)	(m)	(m)	(m)	(m²)	(m/s)	Pa	(m)	(m)	Pa/ m	(Pa)	
A	Suction Discharge Side													
1	DUCT- 1	2340	2.340	0.50	0.50	0.55	0.250	9.4		17.00		0.4	7.14	
B	Fitting & Accessories													
1	GRILL	2340	2.340	0.50	0.50	0.55	0.250	9.4					5.00	Assuemes
2	TRANSITION	2340	2.340	0.50	0.50	0.55	0.250	9.4	52.57		0.45		23.65	
3	90° ELBOW 2 Nos	2340	2.340	0.50	0.50	0.55	0.250	9.4	52.57		0.30		31.54	
4	TEE	2340	2.340	0.50	0.50	0.55	0.250	9.4	52.57		0.40		21.03	
5	TRANSITION	2340	2.340	1.60	1.46	1.67	2.330	1.0	0.61		0.45		0.27	
6	Damper	2340	2.340	0.50	0.50	0.55	0.250	9.4					5.00	
6	Terminal Loss (Duct + Screen)												5.00	
	Total Pressure												98.63	Pa



Design 3D Model-LOD 300

We are specialize in the virtual construction of 3D models of Mechanical, Hydraulic & Electrical systems i.e. duct, pipe, cable tray with fitting including all valves & accessories with all associated equipment and fixtures.

We produce 3D Models based on contract drawings, technical specifications, and manufacturer details to client standards.



Design Drawing

Based on the mark-ups, reference drawing, we produce the design drawing for MEP system and work out the detail branch duct, pipe sizes as per the schematic and produce the complete design drawings/Tender Drawing or Construction drawing.

Design drawing set will have following list of drawing

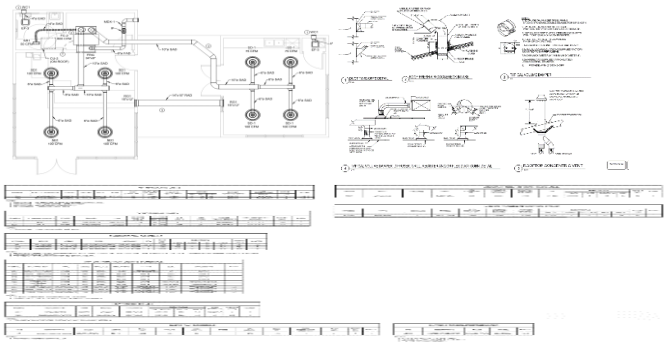
1.Legend, Notes & Specification

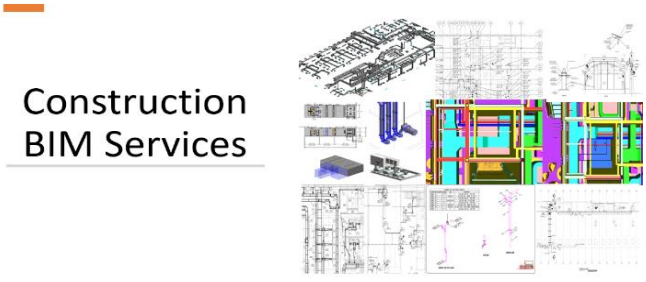
2.Floor Plans

3.Schematic/Isometric

4.Detail Sheet

5.Schedule





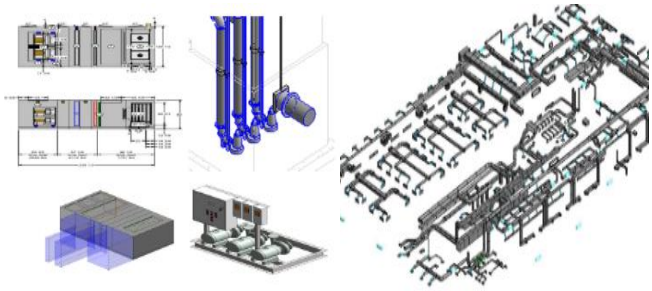
3D Modelling LOD 400

We are specialize in the virtual construction of 3D models @LOD 400 of Mechanical systems i.e. ducting, piping fitting including all valves & accessories with all associated equipment's and fixtures.

technical specifications, and manufacturer details to client standards.

Equipment Modeling

From the manufacturer's 2D drawings and inline with Mechanical schedules, we create a 3D model of all the M&P equipment such as PUMPS, AHU, RTU, CU, FCU, VAV, pumps, chiller fans, DG, panels, etc.

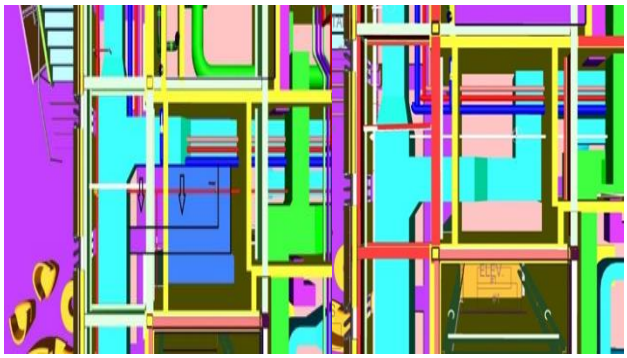


BIM Co-ordination

We generate a coordinated BIM model after resolving the clashes among all disciplines – Architectural, Structural, Concrete & Mechanical.

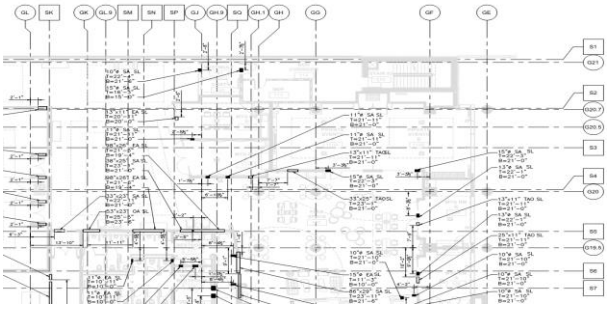
Clashes are resolved through video conference discussion regarding the 3D clash snapshot and multiple fix options such as rerouting utilities, changing elevations, and resizing.

Value engineering is also utilized to improve system efficiency, reduce costs, and provide for more efficient construction and maintenance.



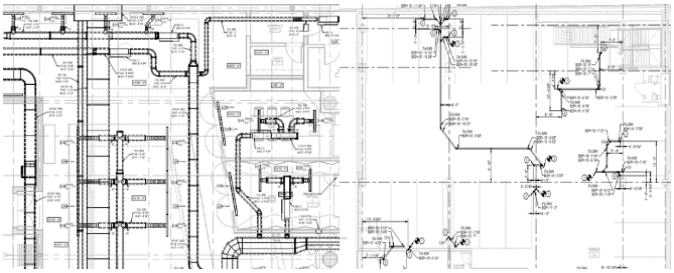
Penetration, Sleeve Drawing

Penetration, Sleeve Drawings are required before a contractor can start pouring concrete on the site. Penetration Drawings are created from the coordinated BIM model after alignment with the architectural grids. Our experienced team keeps the necessary clearances for the penetration as per the contract documents and Specification.



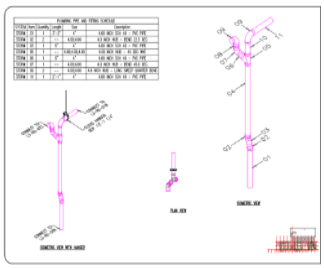
Shop Drawing

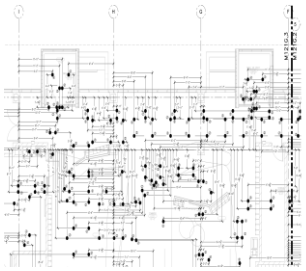
We produce Shop drawing after Co-ordination with utilizing coordinated BIM model or co-ordinated CAD drawings which are detailed enough for workshop fabrication and incorporated with sleeves and penetrations. We provide the dimensions, BOD, COP & BOP, annotations inline with client standard & requirement as per standard practice.



Spool, Hanger & Insert Drawing

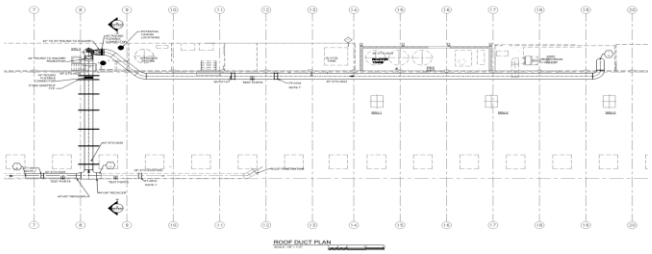
D & D produce the Spool drawings, Hanger & insert drawing with proper co-ordination of model and placing the hangers in line with specification. Hanger drawings shows the actual location of hangers with proper dimension from wall or grid. Insert are position of hangers insert points and D & D produce the proper insert drawing coordinating with actual hanger location in the model.

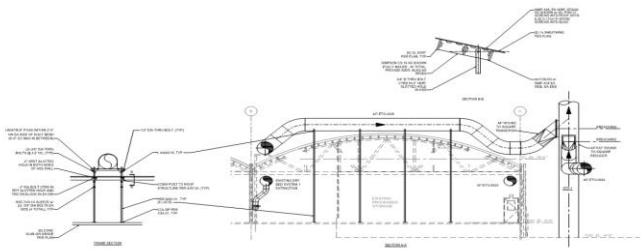




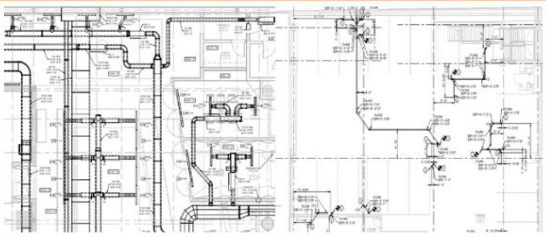
As Built Model & Drawing (LOD 500)

Based on the site mark-ups, we create as built 3D model & Drawing and prepare the as built set for project hand over and record.





CAD Services

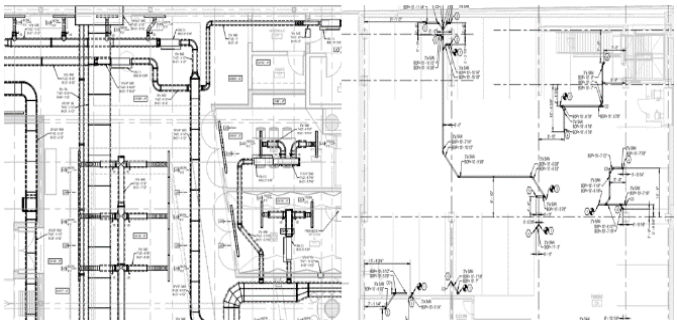


CAD Shop Drawing

Our cad team produce the shop drawing from CAD design drawing to incorporate the details of all fitting, accessories, details including as follows. Drawings shall be indicative of actual equipment purchased and shall show all offsets, transitions, fittings, dampers, valves, hanger locations.

Co-ordination:- Co-ordination with architectural, structural along with other services to fix the **BOP, BOD** with proper dimension and annotation.

Dimension and Annotation:- Providing proper dimensions and annotation inline with client standard or as per general standard shop drawing .



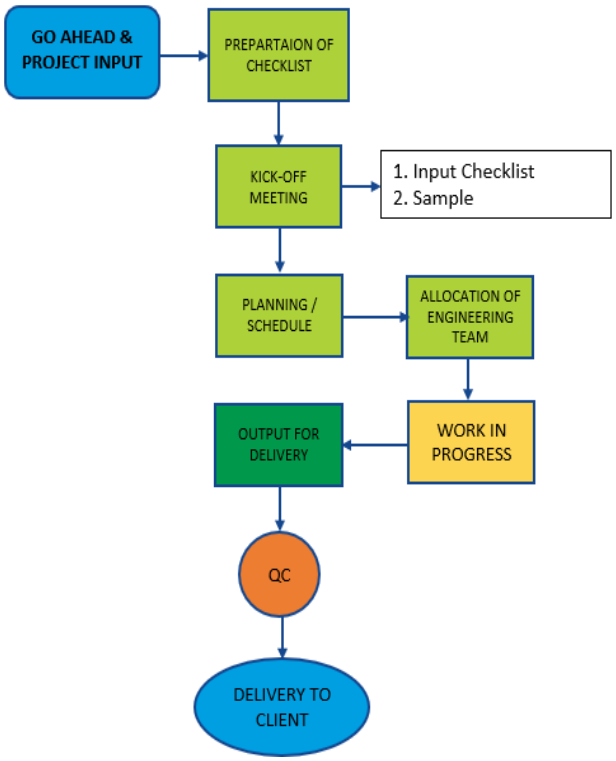
CAD As built Drawing:- Our cad team draft the CAD drawing from redline mar-ups and Our As-built/Redline Markup Service is ideal for creating your as-builts drawings or design modifications in AutoCAD.

Markups:

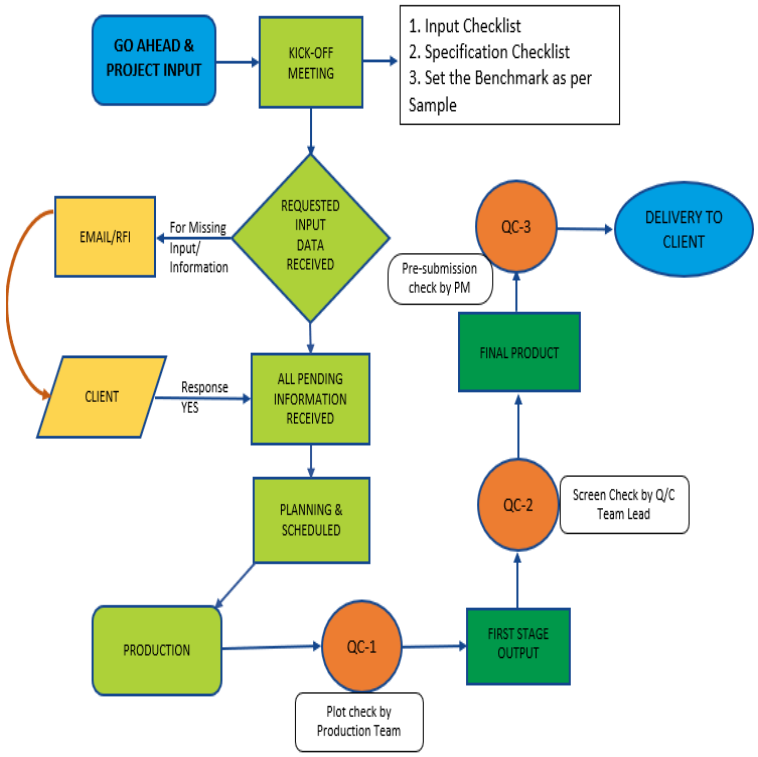
RED ink for drawing changes

D & D Project Execution

DESIGN ENGINEERING



BIM / CAD



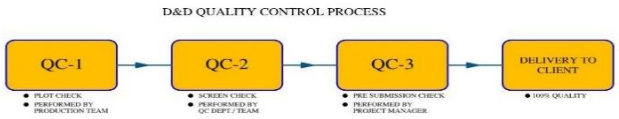
We use to implement our standard BIM/CAD execution process to deliver each and every project .

Stage 1: - We do kickoff meeting with our client for better understanding of the project to start.

Stage2: - We do project review, planning and prepare project specification checklist and delivery schedule and share with client.

Stage3: - We allocate our dedicated Team lead with team member inline with the services to start the production activities as per delivery schedule.

Final Stage: - We follow QC process in the execution process before delivered to the client. With the above process, we deliver the high-quality product to client.



Quality Check – 1

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

Quality Check – 2

Team performs a more detailed comparison with specific checklist and project checklist the deliverables and main objective check the following Clashes (Old/New), Elevation, Routing, Fittings, etc. Construction point of view.

Quality Check – 3

The Project manager conducts the pre- shipment check before sending them to client. With the above process, we deliver the high-quality product to client.

Core Team

Irshad Ali Shaikh
CE0 – Co-Founder

Mr. Irshad Ali is the co-owner & founder of DESIGN AND DRAWING SOLUTION. He is having more than 17 years of experience in Building services in construction Industry throughout AEC project execution process from Pre-construction, construction processes like MEP engineering consulting, Designing, installation and handover process of the project.

He has completed BE in Mechanical Engineering from Pune University with Post Graduation in Project Management (PGPPM) from NICMAR Pune, India. In his small journey, he has successfully delivered the more than hundred BIM/CAD project for his satisfied client with the best quality and unique team effort.

He has experienced in all kinds of projects i.e., starting from Residential township, Commercial IT buildings and parks, Malls, High rise building, Hotel, Hospital & Institutional building. Including building Infrastructure projects like metro, airports, globally i.e. USA, Australia, New Zealand & India.

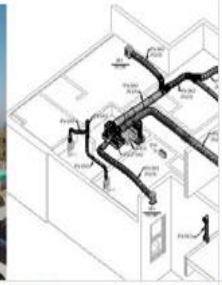
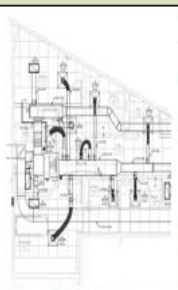
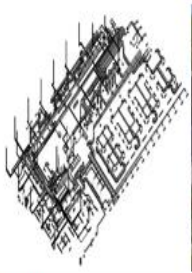
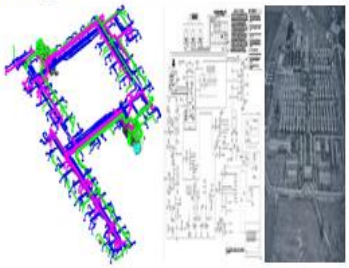
Karishma Bibi
Sales Head

She is the co-owner of DESIGN AND DRAWING SOLUTION and well experienced in offshore sales development initiatives. She is having a good knowledge of result-oriented sales development processes and customer retention. She is leading the complete sales team for B2B sales within the company and managing and monitoring the effectiveness of the entire sales cycle. She has implemented her interior design expertise to improve the technical expertise for client communication for offshore sales which helps her build a long-term relationship with new and existing clientele.

Rupam Mondal
Production Manager

He holds a Mechanical Engineering diploma form WBSCTE, India and having more than 7 years' experience in Building construction Industry for MEP engineering, Drafting , of 3D , 4D , 5D & 6D BIM service .
He is having expertise in MEP engineering calculation , with all Autodesk BIM/CAD tools like Revit , Fabrication, AutoCAD MEP ,Navis works and AutoCAD and has complete knowledge of engineering and drafting services for all stages (Pre/post) of construction process .
He is working in DESIGNING AND DRAWING SOLUTION since from starting period of the company . With a short period of time , He has gained the managing process of the company , client communication, project management process and assisting with innovative (R & D) solution of new process , tools for new requirement of clients.

Project References

Mechanical Design		Mechanical Construction	
 	 	 	 
Madera Apartments	VMC Mountain Clinic	Hilton	Bakers college
Santa FE	Steamboat Springs	Nashville	Royal Oak
New Mexico	Colorado	Tennessee	Michigan
Apartments	Healthcare Facility	Hotel	College
			
Laundromat	Sheridan Station Apartments	MCC SQ	MARTINSBURG VA MEDICAL CENTER
Tucson	Denver	Warren	Martinsburg
Arizona	Colorado	Michigan	West Virginia
Lundry	Apartments	Plant room	Healthcare Facility

Contact US

DESIGN AND DRAWING SOLUTION
ONE STOP BIM | CAD | MEP ENGINEERING SOLUTIONS

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