

Design and Construction Services For MECHANICAL SYSTEMS

Design Engineering Services



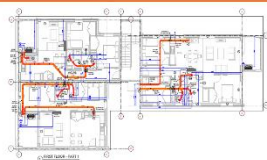
Pre-Construction BIM Services



Construction BIM Services



CAD Services



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About us

DESIGN AND DRAWING SOLUTION offers Construction documents for Mechanical systems. Our Mechanical team is having good knowledge of Australia & New Zealand Mechanical systems designs & construction document process & codes and guidelines.

| Mechanical – AS1668.2 – 2012, AS 4254.2-2012, 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 stations etc.

We are providing our services globally and specially in Australia & New Zealand 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.



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
- Spool, Hanger & Insert Drawing
- 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

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 500FPM

Upto 1500 fmp

R/R	Area name	Area(SFT)	Height (M)	CFM	No OF Diffuser	CFM/DIF user	Design Velocity (FPM)	Area (SFT)	Area (SQMT)	Calculate d Duct Size (mm)	Proposed Design Duct Size
2	KITCHEN / PTY	303	2.7	536	3	179	600	0.292728	0.027675	187.76	200.00
3	ENTRY	324	2.7	606	3	202	600	0.336667	0.031289	199.45	200.00
4	FAMILY	413	2.7	732	4	183	600	0.305	0.028346	190.02	200.00
A2	Room 2	149	2.7	263	3	263	600	0.438333	0.040737	227.80	250.00
B1	Room 3	285	2.7	504	3	504	600	0.84	0.078067	315.35	350.00
B1	Room 4	383	2.7	679	3	226	600	0.377222	0.035058	211.33	250.00
1	MASTER	390	2.7	692	3	231	600	0.384444	0.035729	213.34	250.00
2	BED 1	136	2.7	242	2	121	600	0.201887	0.018749	154.52	200.00
B2	Room 5	207	2.7	367	2	184	600	0.305833	0.028423	190.28	200.00
1	PUMPUP 2	164	2.7	290	2	145	600	0.241265	0.022422	169.03	200.00
2	BED 2	164	2.7	290	2	145	600	0.241265	0.022422	169.03	200.00
3	BED 3	162	2.7	287	2	144	600	0.238722	0.022154	167.99	200.00

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

It's 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.

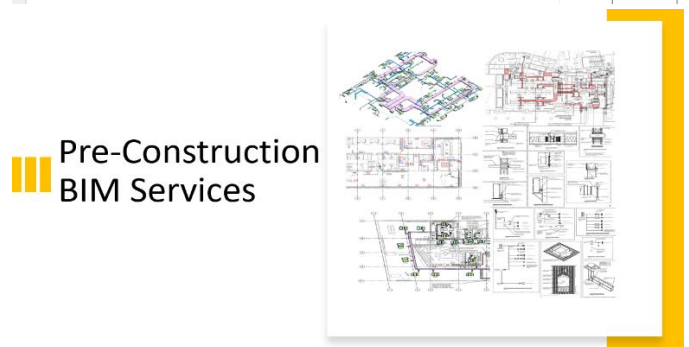
Sr. No.	DESCRIPTION	width (M)	height(M)
1	Lift Well door size (Double leaf door)	2.1	2.1
2	Lift Well door area	4.6	Sq.m.
3	Leakage area for Lift door considering 7 mm gap all around the door and between two leafs of the door	0.075	Sq.m.
4	Lift Travel i.e. numbers of floors	10.0	
5	Effective leakage area through doors	0.7	Sq.m.
6	Total leakage through doors $Q(CFM)=0.827KA(Effective Leakage Area) \times P^{0.65}$ (Pressure difference) $\times 2.8$ $Q(CFM)=0.827 \times 0.7 \times 10^{0.65}$	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)	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 doors	10.3	m ³ /sec
10	Total air required for pressurization	21876	CFM
11	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 leases.

Based on the ASHRAE standard fitting leases, we use to calculate actual Static Losses.

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	(m ³ /s)	(mm)	(mm)	(m ²)	(m/s)	(mm)	(m)		(Pa/m)	(Pa)	
A	Section Discharge Side												
1	DUCT-1	2340	2340	0.50	0.50	0.250	9.4		17.85	0.4	7.14		
B	Fitting & Accessories												
1	ORILL	2340	2340	0.50	0.50	0.250	9.4					5.00	Assumes
2	TRANSITION	2340	2340	0.50	0.50	0.250	9.4	52.57		0.45		23.85	
3	90° ELBOW 2 Nos	2340	2340	0.50	0.50	0.250	9.4	52.57		0.30		31.84	
4	TEE	2340	2340	0.50	0.50	0.250	9.4	52.57		0.40		21.03	
5	TRANSITION	2340	2340	1.00	1.00	1.00	1.0	5.81		0.45		0.27	
6	Damper	2340	2340	0.50	0.50	0.250	9.4					5.00	
7	Terminal Loss (Duct + Screen)											5.00	
Total Pressure												98.03 Pa	

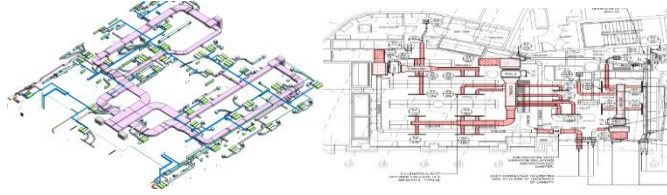


Pre-Construction BIM Services

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.

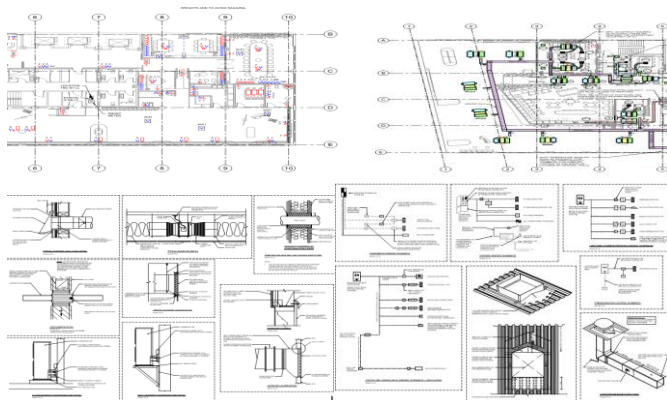


Design Drawing

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

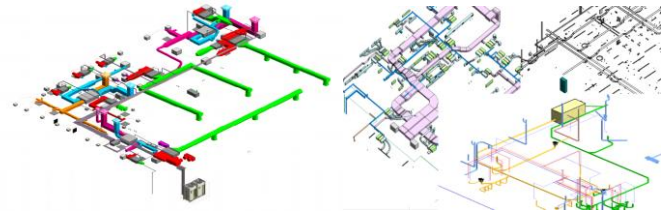
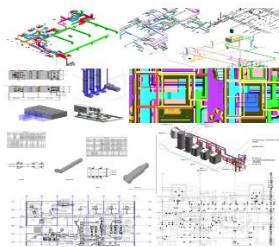


Construction BIM Services

3D Modelling LOD 400

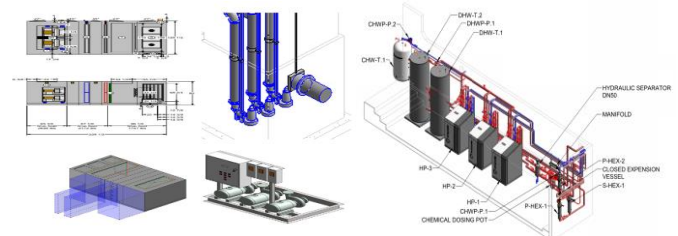
We are specialize in the virtual construction of 3D models @ LOD 400 of Mechanical systems i.e. ducting, piping with fitting including all valves & accessories with all associated equipment's and fixtures.

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



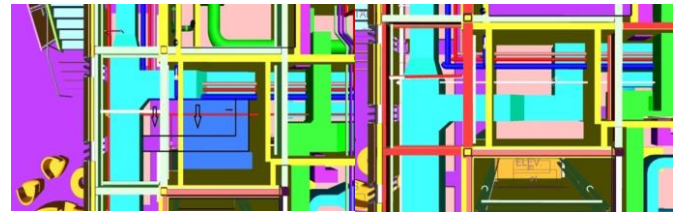
Equipment Modeling

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



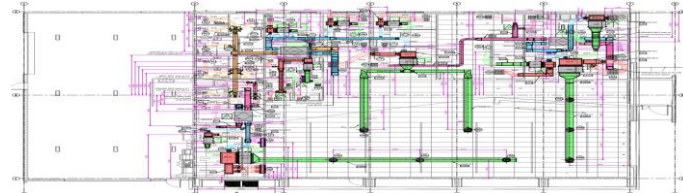
Construction BIM Co-Ordination

We generate a coordinated BIM model after resolving the clashes among all disciplines – Architectural, Structural, Concrete, & Mechanical. Clashes are resolved through video conference discussion with all stakeholders 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 & Shop Drawing

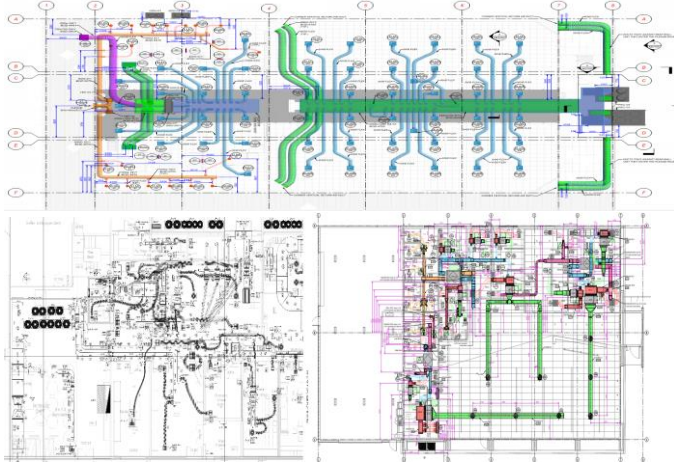
Penetration, Sleeve Drawings are required before a contractor can start pouring concrete on the site. Penetration Drawings are created from the coordinated BIM model after alignment with the architectural grids. Our experienced team keeps the necessary clearances for the penetration as per the contract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



Shop Drawing

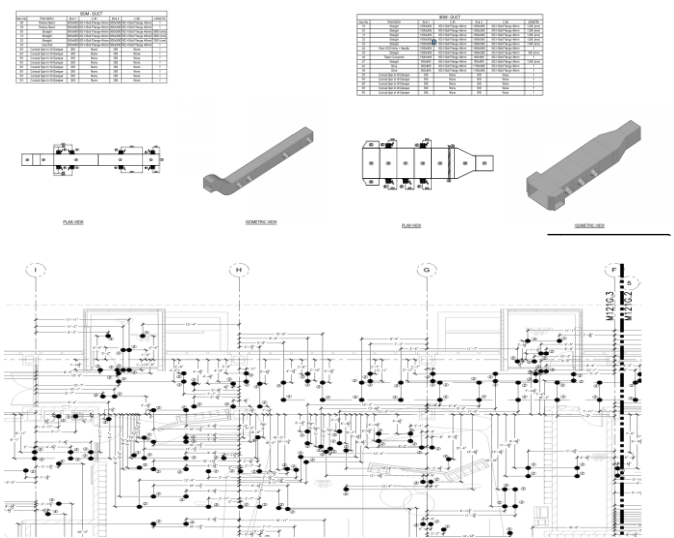
We produce Shop drawing after Co-ordination with utilizing coordinated BIM model or coordinated CAD drawings which are detailed enough for workshop fabrication and incorporated with sleeves and penetrations.

We provide the dimensions, BOD, COP & BOP, annotations inline with client standard & requirement as per standard practice.



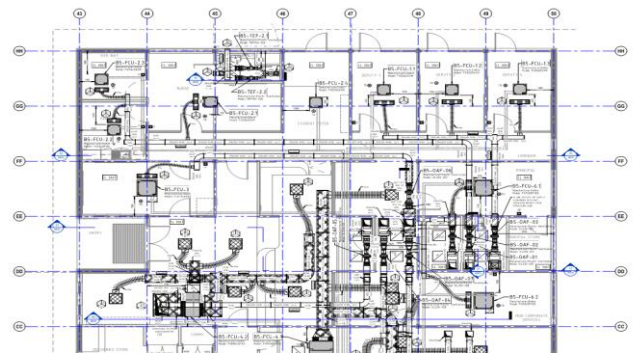
Spool, Hanger & Insert Drawing

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.

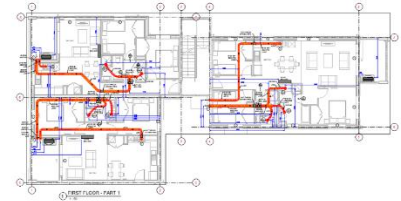


As Built Model & Drawing (LOD – 500)

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



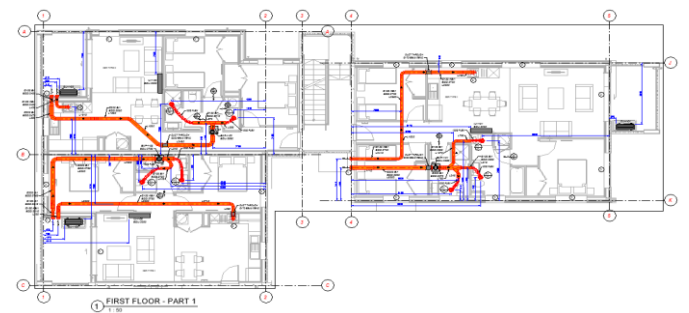
CAD Shop Drawing

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

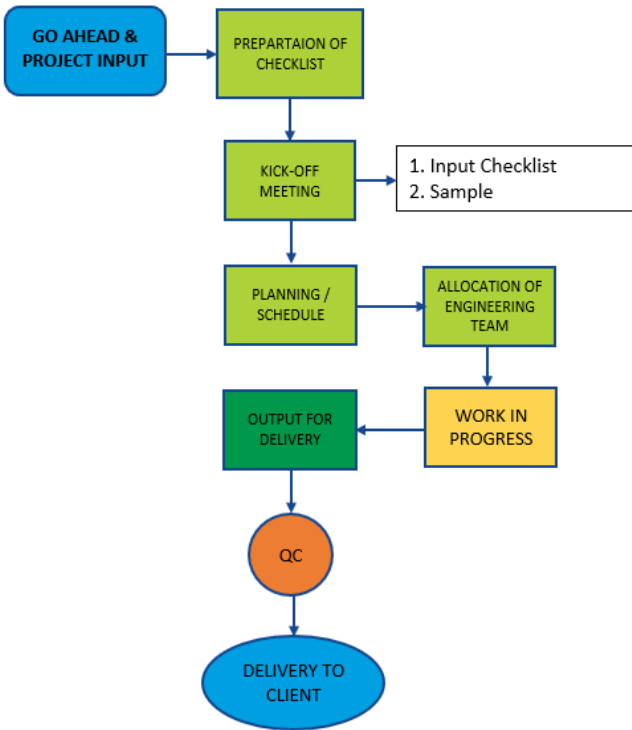
Our cad team draft the CAD drawing from redline mark-ups and Our As-built/Redline Markup Service is ideal for creating your as-builts drawings or design modifications in AutoCAD.

Markups:

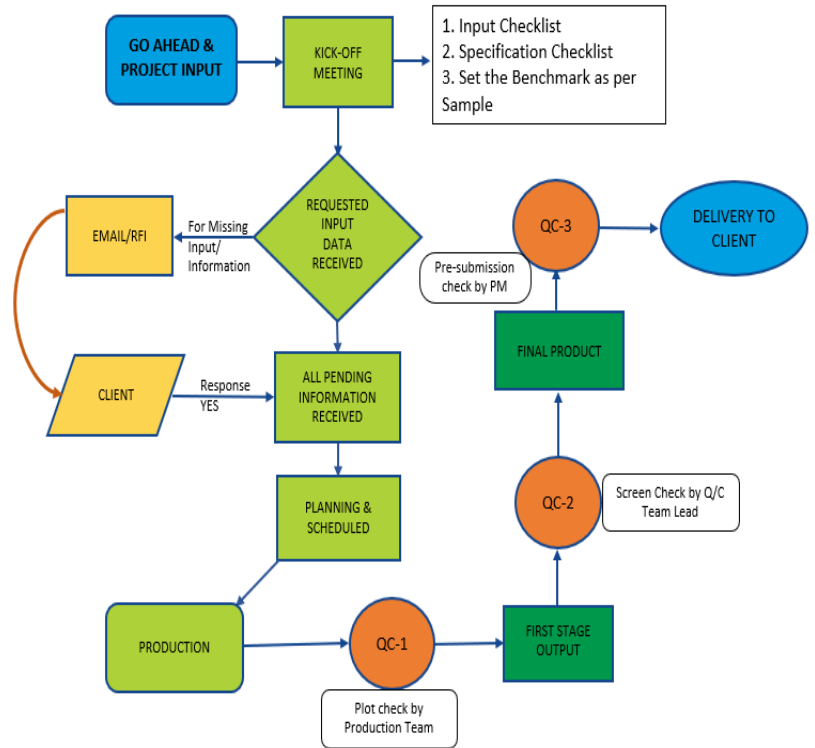
RED ink for drawing change

D & D Project Execution Process

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.

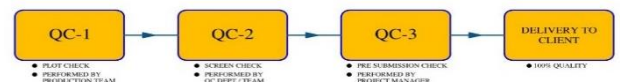
Stage2: - We do project review, planning and prepare project specification checklist and delivery schedule and share with client.

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.

D&D QUALITY CONTROL PROCESS



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.

Core Team

Irshad Ali Shaikh **CEO – Co-Founder**

Mr. Irshad Ali is the co-owner & founder of DESIGN AND DRAWING SOLUTION. He is having more than 15 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.

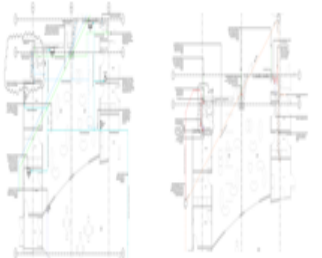
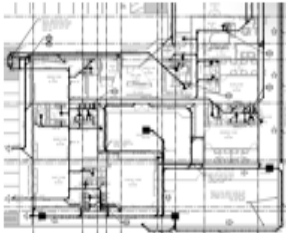
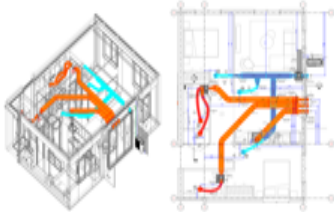
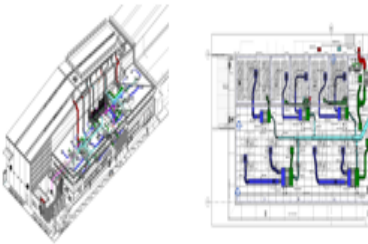

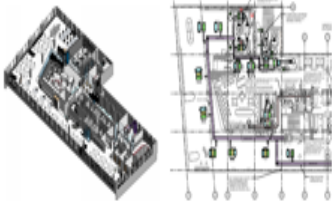
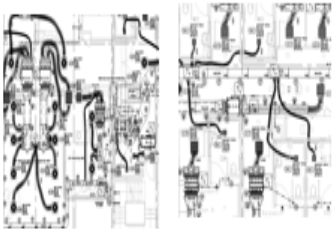
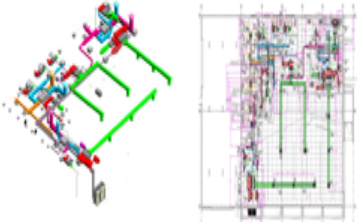
Rupam Mondal **Production Manager**

He holds a Mechanical Engineering diploma from 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	
			
St Mary's Hamilton	Jimboomba childcare	Rockfield Apartments	Giltrap Distribution Centre
49 Hiller Lane, Hamilton	River street	Auckland	Auckland
Australia	Australia	New Zealand	New Zealand
School	School building	Apartment	Wirehouse
			
Kokowai	Accenture fit out	Tricare	Lot 17 Mania Subdivision
Auckland	Auckland	Victoria	Christchurch
New Zealand	New Zealand	Australia	New Zealand
Appartment	Restaurant	Health care	Office

Contact US



DESIGN AND DRAWING SOLUTION
ONE STOP BIM | CAD | MEP
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