

BIM FOR FABRICATION

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Fabrication_HVAC Part-01

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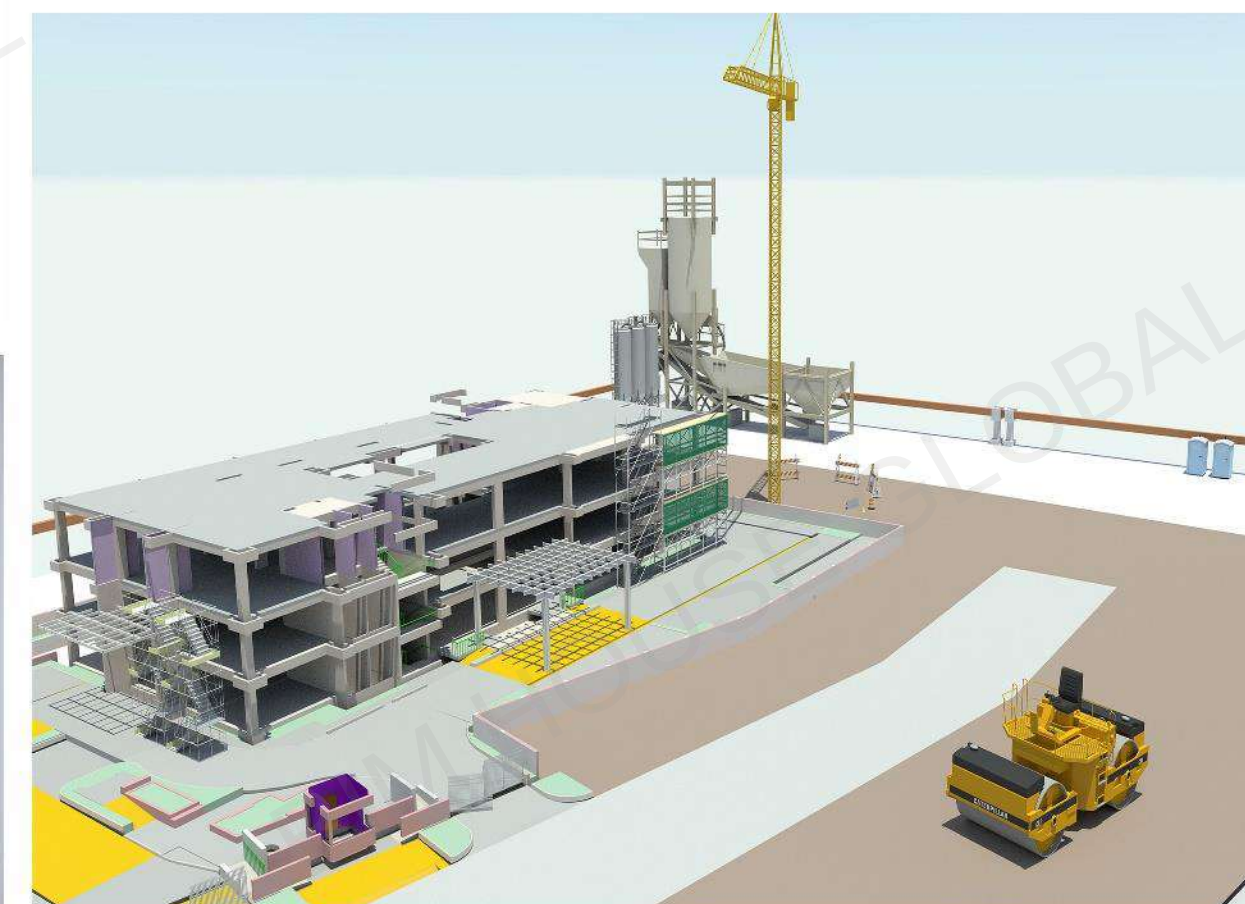
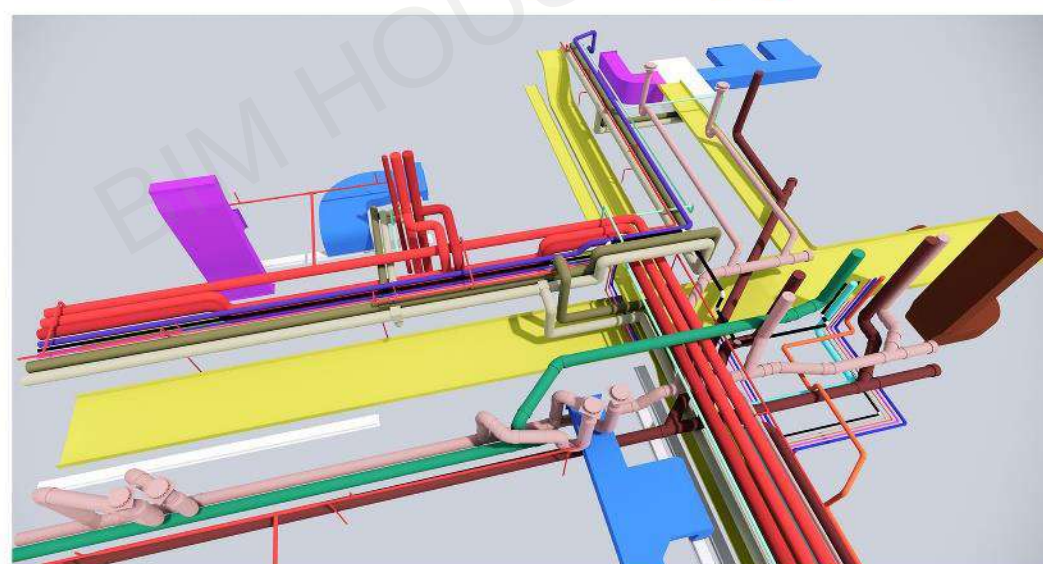
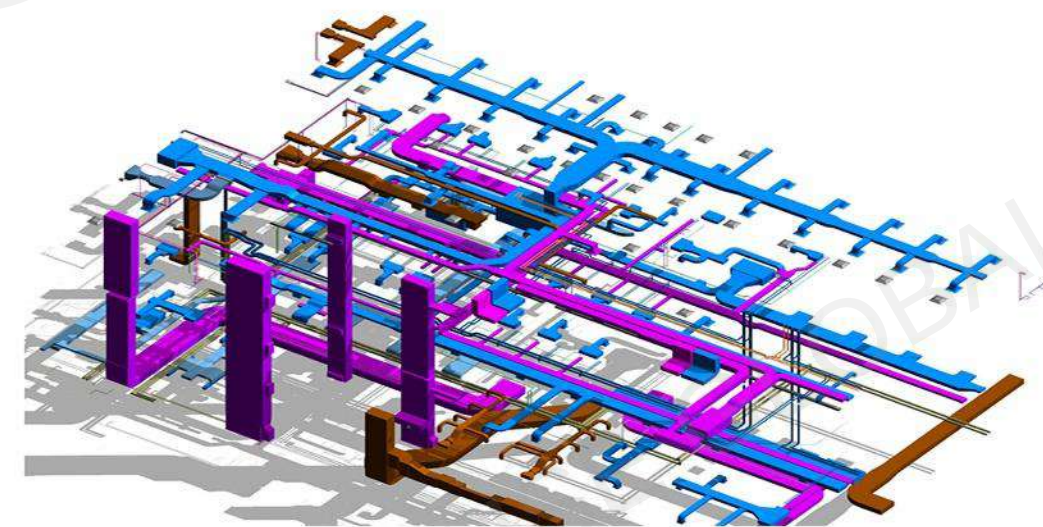
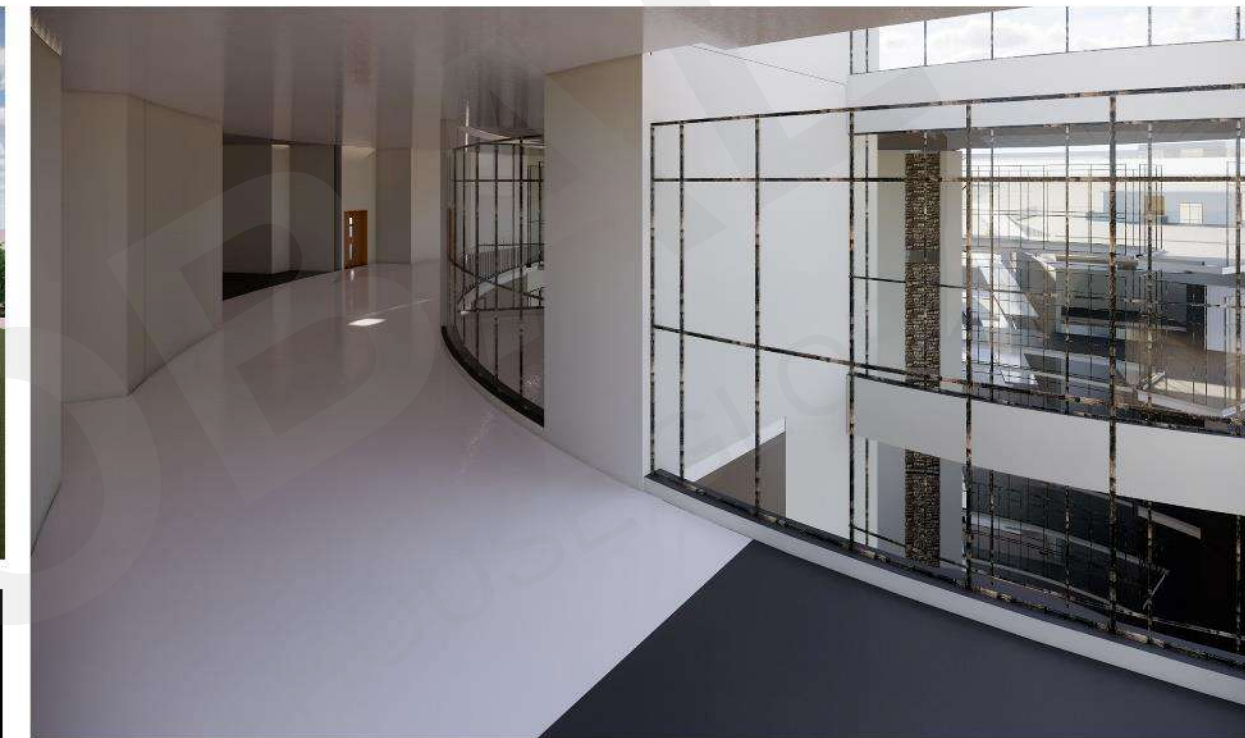
* Spool Drawing For Fabrication & Installation

Spool Drawing

3D View

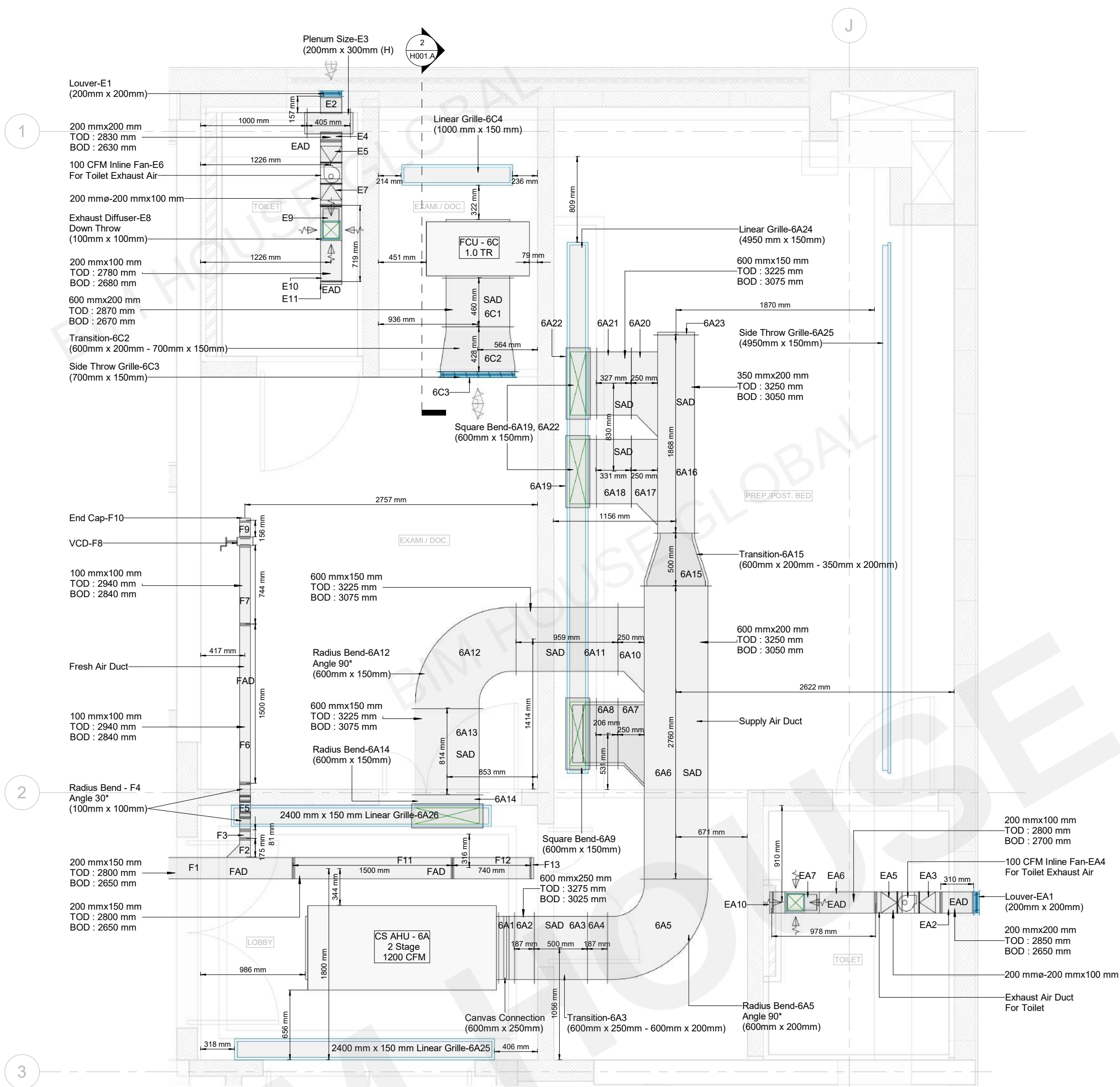
Elevation View

BOM of Spool Part





FABRICATION DRAWING: DUCT WORK



1 6th Floor_HVAC - Part 01
1 : 25

Service : 6A (Ducting for Pre. Post Bed :- 1200 CFM)

Sl.No.	Size	Description	Material	Length (RM)	Quantity (Nos)
1)	600mm x 250mm	Rectangular Duct - 6A2	26G Galvanized Sheet Steel Ducting	0.187	1
2)	600mm x 200mm	Rectangular Duct - 6A4	26G Galvanized Sheet Steel Ducting	0.187	1
3)	600mm x 200mm	Rectangular Duct - 6A6	26G Galvanized Sheet Steel Ducting	2.760	1
4)	600mm x 150mm	Rectangular Duct - 6A8	26G Galvanized Sheet Steel Ducting	0.206	1
5)	600mm x 150mm	Rectangular Duct - 6A11	26G Galvanized Sheet Steel Ducting	0.959	1
6)	600mm x 150mm	Rectangular Duct - 6A13	26G Galvanized Sheet Steel Ducting	0.814	1
7)	600mm x 150mm	Rectangular Duct - 6A18	26G Galvanized Sheet Steel Ducting	0.331	1
8)	600mm x 150mm	Rectangular Duct - 6A21	26G Galvanized Sheet Steel Ducting	0.327	1
9)	600mm x 150mm	Rectangular Duct (For Grille Connection)	26G Galvanized Sheet Steel Ducting	0.823	1
10)	350mm x 250mm	Rectangular Duct - 6A16	26G Galvanized Sheet Steel Ducting	1.868	1
TOTAL CARRIED TO SUMMARY				8.462	10

Quantity_Ducting Route 6A

1 : 50

Service : 6C (Ducting for Exami. / Doc. :- 1.0 TR)

Sl.No.	Size	Description	Material	Length (RM)	Quantity (Nos)
1)	600mm x 200mm	Rectangular Duct - 6C1	26G Galvanized Sheet Steel Ducting	0.460	1
TOTAL CARRIED TO SUMMARY				0.460	1

Quantity_Ducting Route 6C

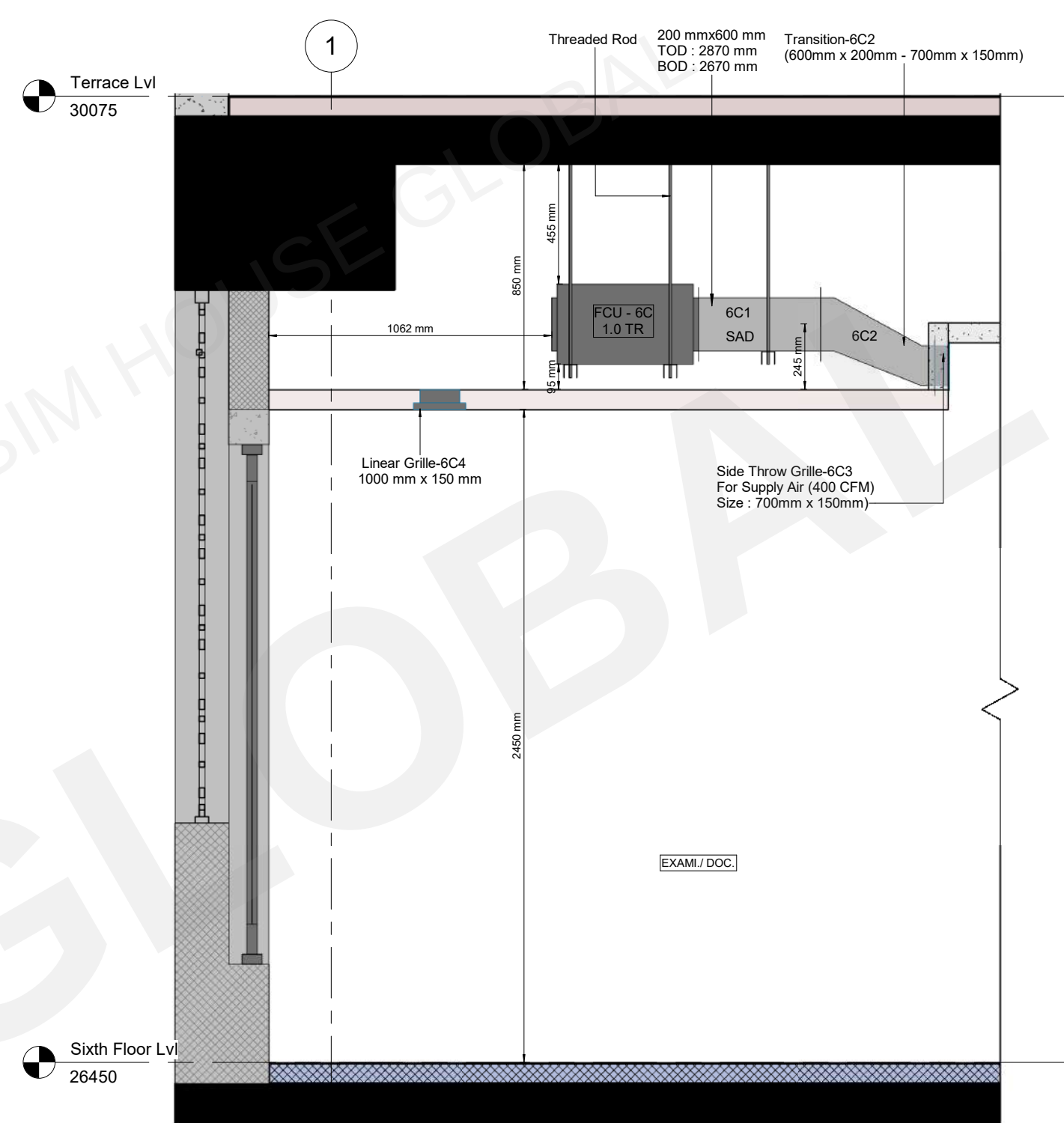
1 : 50

Service : E (Ducting for Toilet :- 100 CFM)

Sl.No.	Size	Description	Material	Length (RM)	Quantity (Nos)
1)	200mm x 300mm	Plenum Box - E3	26G Galvanized Sheet Steel Ducting	0.405	1
2)	200mm x 200mm	Rectangular Duct - E2	26G Galvanized Sheet Steel Ducting	0.160	1
3)	200mm x 300mm	Rectangular Duct - E4	26G Galvanized Sheet Steel Ducting	0.083	1
4)	200mm x 300mm	Rectangular Duct - E10	26G Galvanized Sheet Steel Ducting	0.719	1
TOTAL CARRIED TO SUMMARY				1.367	4

Quantity_Ducting Route E

1 : 50



2 Section 2
1 : 15



NOTES

Dimensions are not to be scaled.
All dimensions (if present) are in mm.
The purpose of this drawing is to only highlight coordination issues between Architectural, Structural & MEPF (Mechanical, Electrical, Plumbing & Fire-fighting) discipline, for the project design consultants to update their respective discipline drawings.
This drawing should not be referred for any other purpose.

No. Date By Description

Issues

No. Date By Description

Revisions

ABBREVIATION:

SAD :- Supply Air Duct
EAD :- Exhaust Air Duct
FAD :- Fresh Air Duct
FCU :- Fan Coil Unit
AHU :- Air Handling Unit
TOD :- Top of Duct
BOD :- Bottom of Duct
VCD :- Volume Control Damper

Client

Architects

Structural Consultant

MEP Consultant

BIM Consultant
BIM HOUSE GLOBAL Pvt. Ltd.
Projects | Consulting | Training
BC-108, Matrix Tower, Opp. Jaypee Hospital, Sector-132, Noida-201304

Project Title

Drawing Title
Fabrication_HVAC Part-01

Date dd/mm/yyyy Project No.
Drawn by Author Drawing No.
Checked by Checker H001.A
Approved by Approver



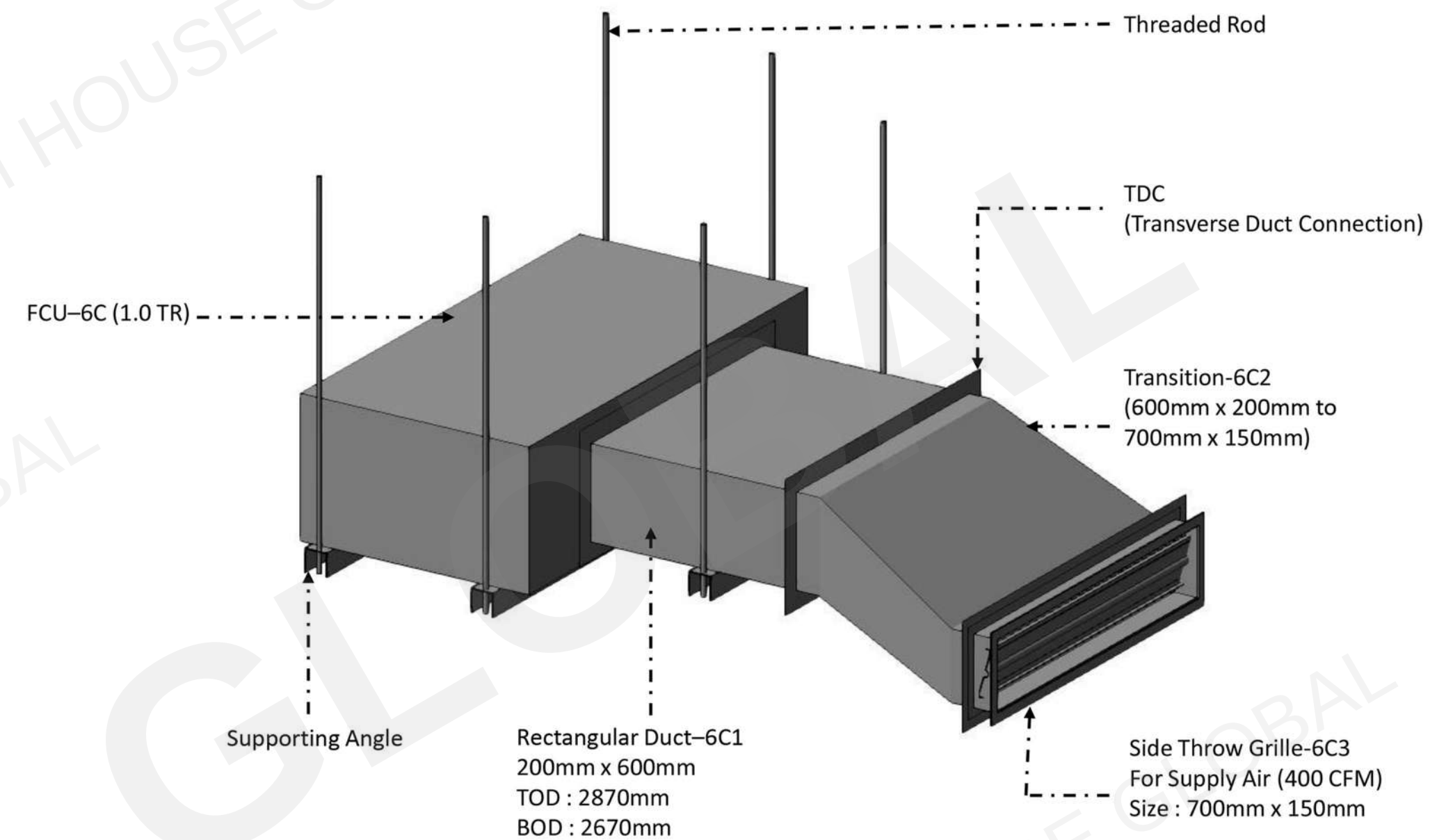
FABRICATION LEVEL MODEL TO CUTTING AND
ASSEMBLY AT FACTORY

Fabrication Modelling

Contents

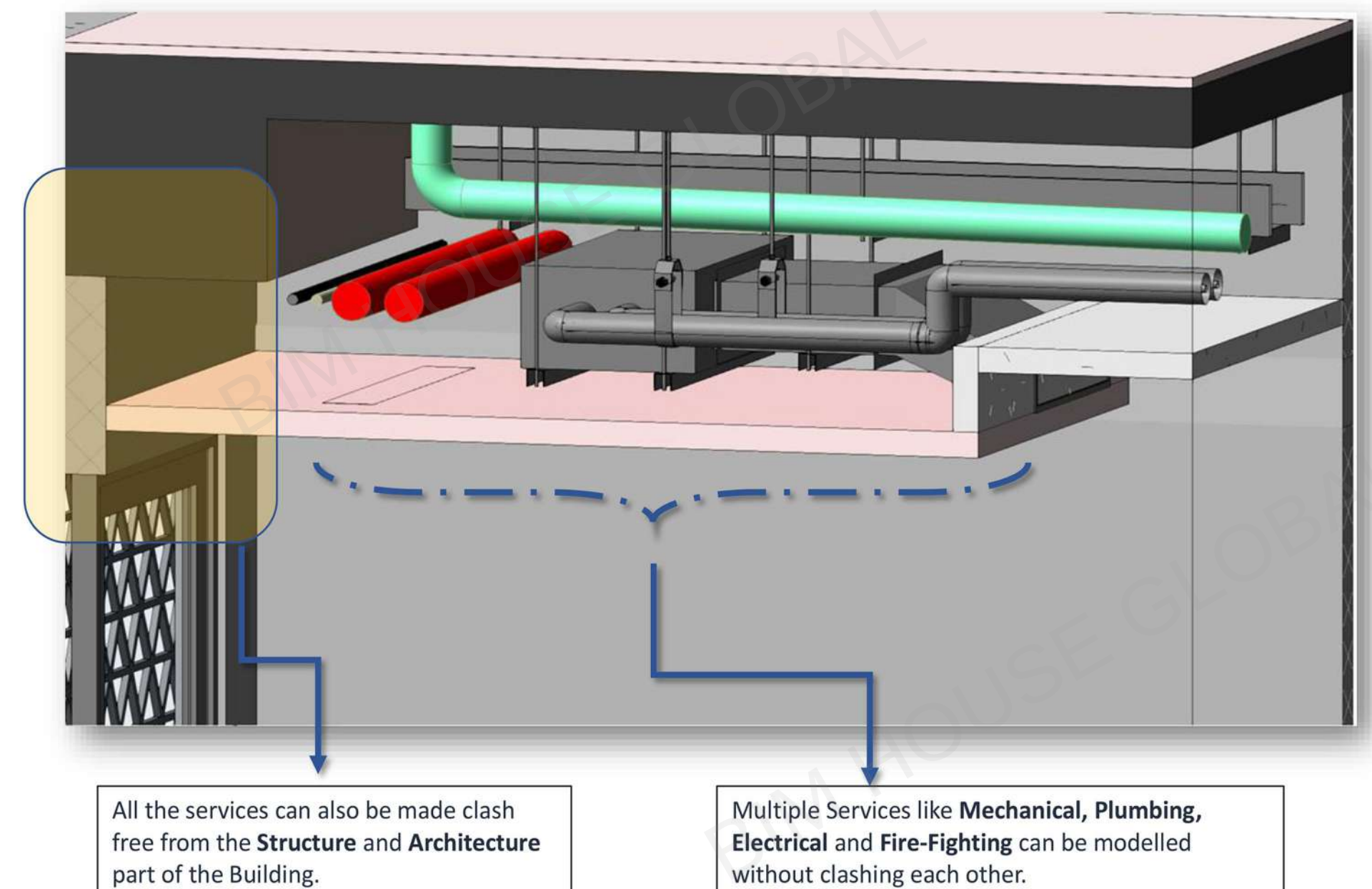
1. Process of Fabrication Modelling
2. Better Visualization for Client
3. Clash Free Model

2. Better Visualization for Client

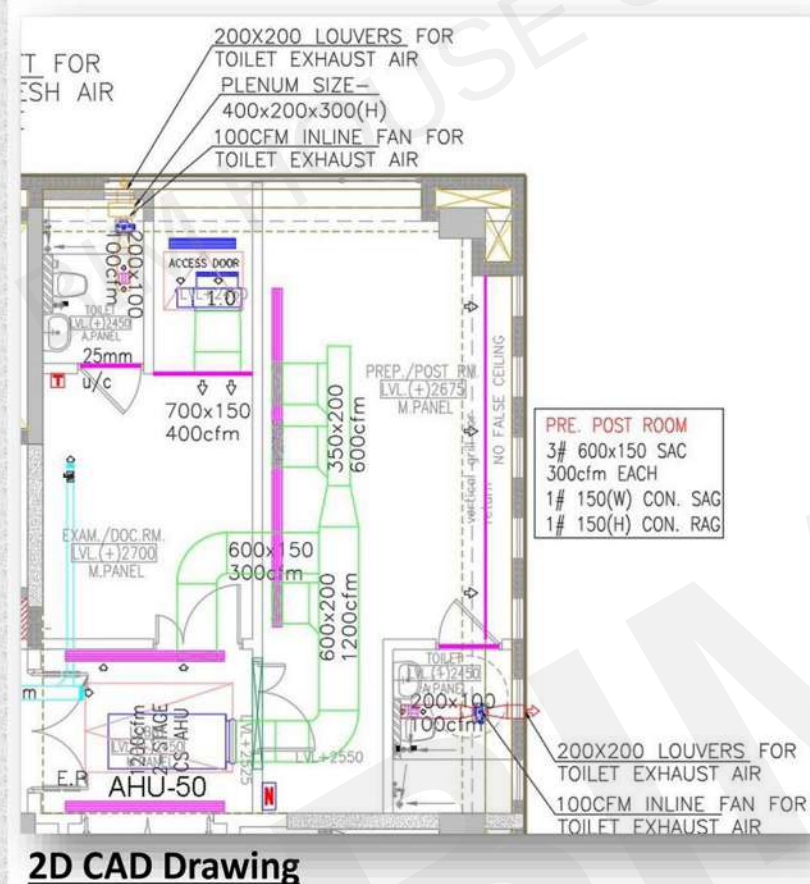


3. Clash Free Model

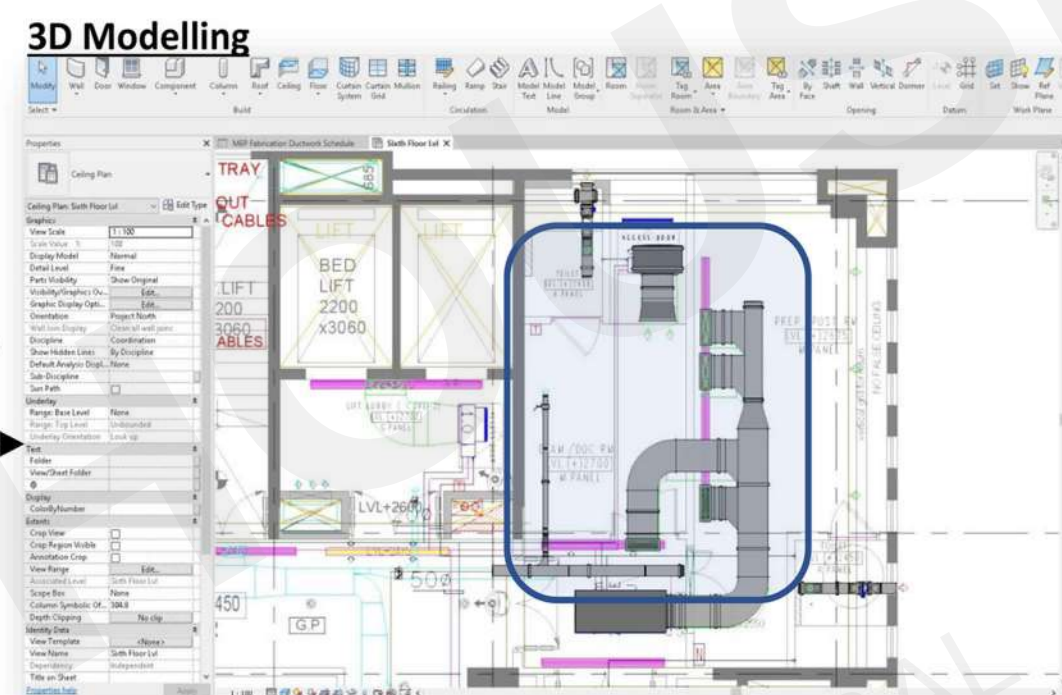
BIM clash detection with 3D coordination techniques, foresees clashes at the initial stage of the project to help improve interdisciplinary collaboration, reduce delays, material waste and costly construction rework.



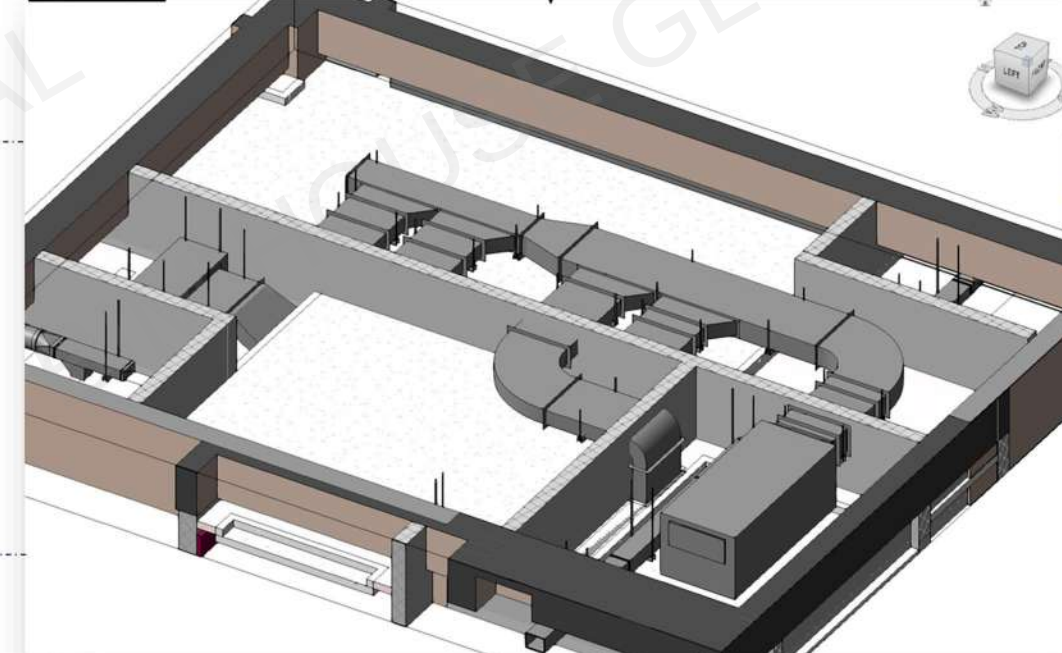
1. Process of Fabrication Modelling



2D CAD Plan to 3D Modelling



3D View



Better visualization for client

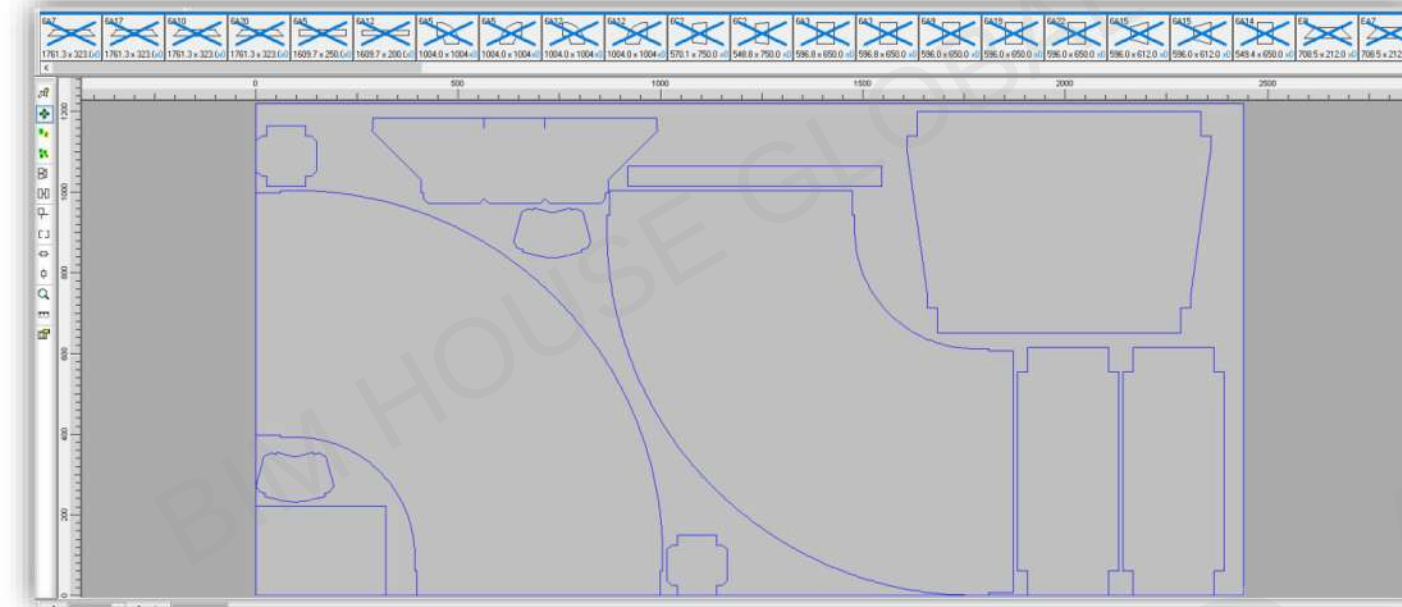
Clash free Model

NC Writing & CNC Plasma Cutting Machine

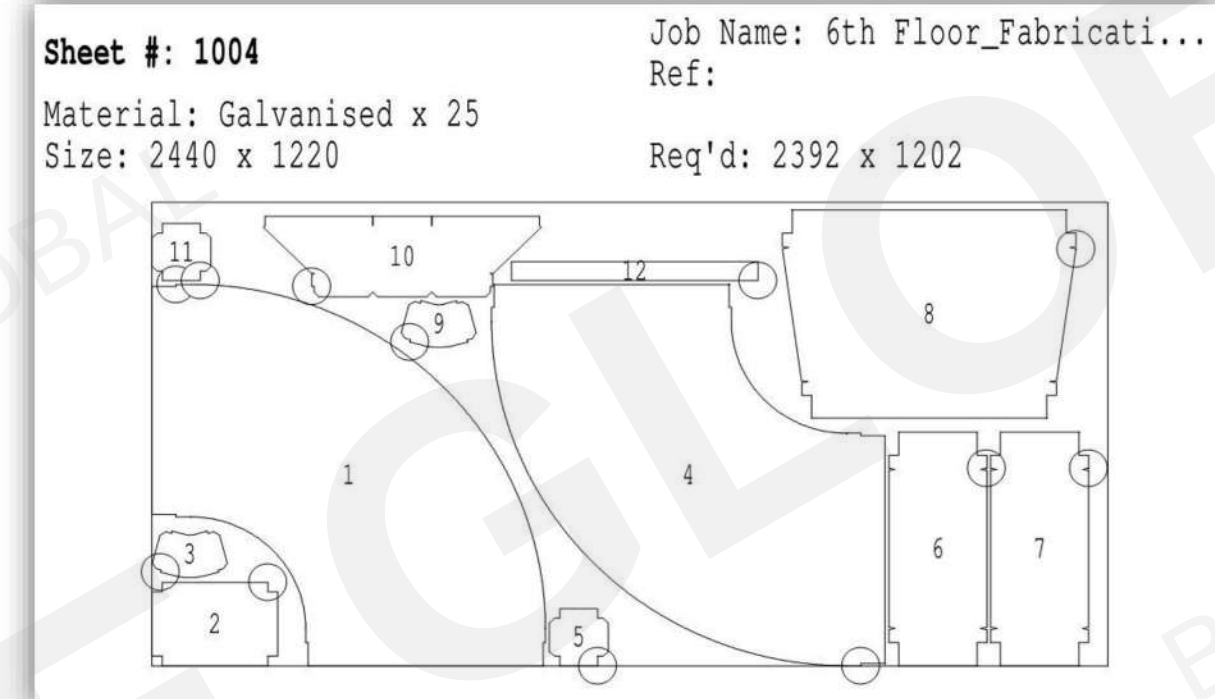
Contents

1. Work Flow of CNC Plasma Cutting Machine
2. Nesting Tool for CNC Plasma Cutting Machine
3. Details of Cutting Sheet Number
4. Details of Machine Cutting Item
5. Nest (CNC Machine) Report
6. Final Output of the CNC Plasma Machine by using Nesting Tool

2. Nesting Tool for CNC Plasma Cutting Machine



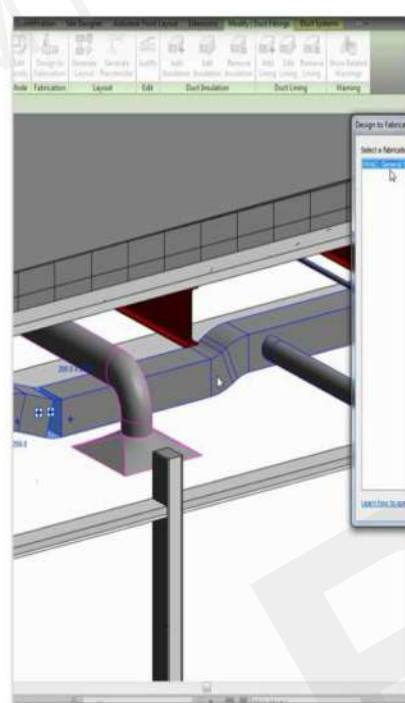
Use the automated nesting tool to nest each development for all items on a metal sheet, and then generate the NC files.



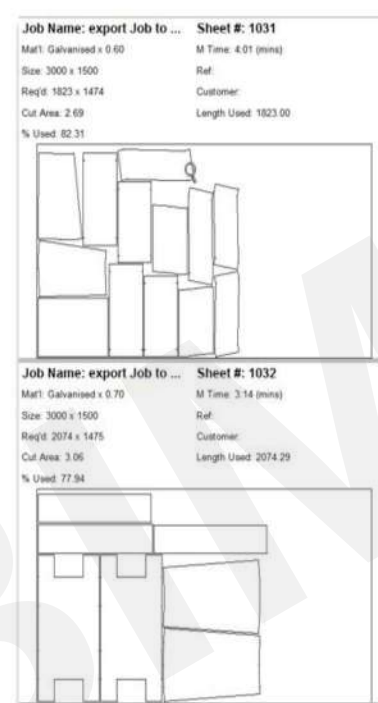
Nest sheet for fabrication + 

 Import file of CNC Machine

1. Work Flow of CNC Plasma Cutting Machine



Convert MEP systems
to Fabrication Parts



Review item list, and
nest developed part
and create NC File



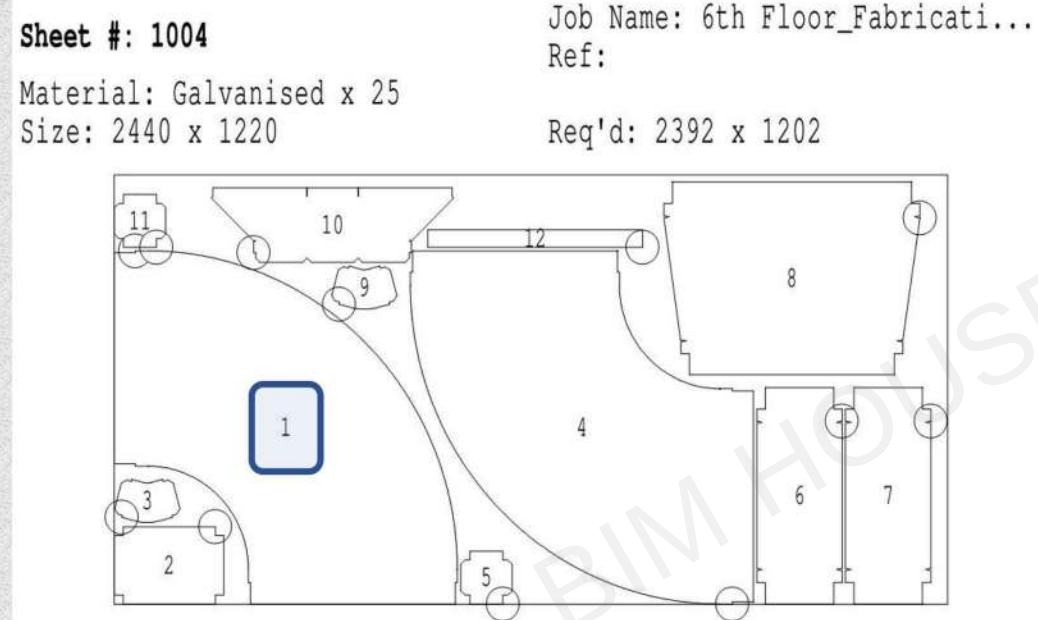
Fabricate elements



Track element during
delivery, installation
and commissioning

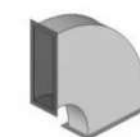
3. Details of Cutting Sheet Number

Cutting Sheet Number 1004



Cutting Item Number:- 1 Item Name:- 6A5 (Radius Bend)

6A5



Radius Bend
Galvanised x 25
6th Floor_Fabrication HVAC

Connectors

C1=TDC
C2=TDC

Dimensions

A=600 B=200 C=90
D=50 E=50 F=300

Detailing of Cutting Item Number

NC Program: 1004						
Cut	Item	Description	Blank Size	Area (sq m)	Weight (kg)	M Time (mins)
1	6A5	Radius Bend	1005 x 1005	0.695	3.323	4:03
2	EA10	Cap End TDC DM 35	321 x 221	0.068	0.325	1:22
3	F4A	Radius Bend	138 x 186	0.019	0.090	0:34
4	6A12	Radius Bend	1005 x 1005	0.695	3.323	4:03
5	F4A	Radius Bend	151 x 151	0.020	0.093	0:30
6	6A15	Transition	616 x 251	0.147	0.705	1:45
7	6A15	Transition	616 x 251	0.147	0.705	1:45
8	6C2	Transition	550 x 751	0.378	1.807	2:43
9	F4B	Radius Bend	138 x 186	0.019	0.090	0:34
10	E9	Shoe	709 x 213	0.119	0.570	1:59
11	F4B	Radius Bend	151 x 151	0.020	0.093	0:30
12	E5	Square to Round (Symmetrical)	629 x 51	0.031	0.150	1:43
				2.359	11.275	21:33

4. Details of Machine Cutting Item

NC Sheet for CNC Plasma cutting Machine

3D View of the Cutting Item number

Output

Fabricated Item Number:- 6A5
Item Number:- 6A5 (Radius Bend)

Item No: 6A5
Part: 1/4
Job Name: 6th Floor_Fabrication ...
Project: Radius Bend
Type: Radius Bend
C1: TDC
C2: TDC
C3: TDC
Size: 1004.000 x 1004.000

Item No: 6A5
Part: 2/4
Job Name: 6th Floor_Fabrication ...
Project: Radius Bend
Type: Radius Bend
C1: TDC
C2: TDC
C3: TDC
Size: 1004.000 x 1004.000

Item No: 6A5
Part: 3/4
Job Name: 6th Floor_Fabrication ...
Project: Radius Bend
Type: Radius Bend
C1: TDC
C2: TDC
C3: TDC
Size: 667.239 x 250.000

Item No: 6A5
Part: 4/4
Job Name: 6th Floor_Fabrication ...
Project: Radius Bend
Type: Radius Bend
C1: TDC
C2: TDC
C3: TDC
Size: 1609.717 x 250.000

4. Details of Machine Cutting Item

Sheet #: 1003
Material: Galvanised x 25
Size: 2440 x 1220
Job Name: 6th Floor_Fabricati...
Ref:
Req'd: 2417 x 1179

3D View of the Cutting Item number

Output

Fabricated Item Number:- 6A5
Item Number:- 6A5 (Radius Bend)

5. Nest (CNC Machine) Report

NC Program / NC Sheet Number

Sheet #: 1007
Material: Galvanised x 22
Size: 2440 x 1220
Job Name: 6th Floor_Fabricati...
Ref:
Req'd: 2412 x 1219

Material: Galvanised x 22

NC Program	Material	Gauge	Cut Area (sq m)	Part Area (sq m)	% Used	M Time (mins)
1007	Duct: Galvanised	22	2.937	2.824	96.151	30:48
1008	Duct: Galvanised	22	2.921	2.579	88.298	44:19
1009	Duct: Galvanised	22	2.905	2.734	94.111	31:00
1010	Duct: Galvanised	22	2.940	2.742	93.270	29:04
1011	Duct: Galvanised	22	2.897	2.736	94.434	30:25
1012	Duct: Galvanised	22	2.918	2.594	88.878	43:26
1013	Duct: Galvanised	22	1.025	0.948	92.493	16:13
			18.543	17.157		225:15

Material: Galvanised x 25

NC Program	Material	Gauge	Cut Area (sq m)	Part Area (sq m)	% Used	M Time (mins)
1001	Duct: Galvanised	25	2.852	2.514	88.135	30:24
1002	Duct: Galvanised	25	2.812	2.400	85.334	33:59
1003	Duct: Galvanised	25	2.849	2.385	83.718	37:47
1004	Duct: Galvanised	25	2.872	2.359	82.117	37:57
1005	Duct: Galvanised	25	2.842	2.334	82.133	42:23
1006	Duct: Galvanised	25	2.723	1.828	67.139	52:47
			16.951	13.820		235:17

Grand Totals:

Cut Area (sq m)	Part Area (sq m)	M Time (mins)
35.494	30.977	460:32

6. Final Output of the CNC Plasma Cutting Machine by using Nesting Tool

Sheet #: 1004
Material: Galvanised x 25
Size: 2440 x 1220
Job Name: 6th Floor_Fabricati...
Ref:
Req'd: 2392 x 1202

Use the automated nesting tool to nest each development for all items on a metal sheet, and then generate the NC files.

Nest sheet for fabrication / DXF File

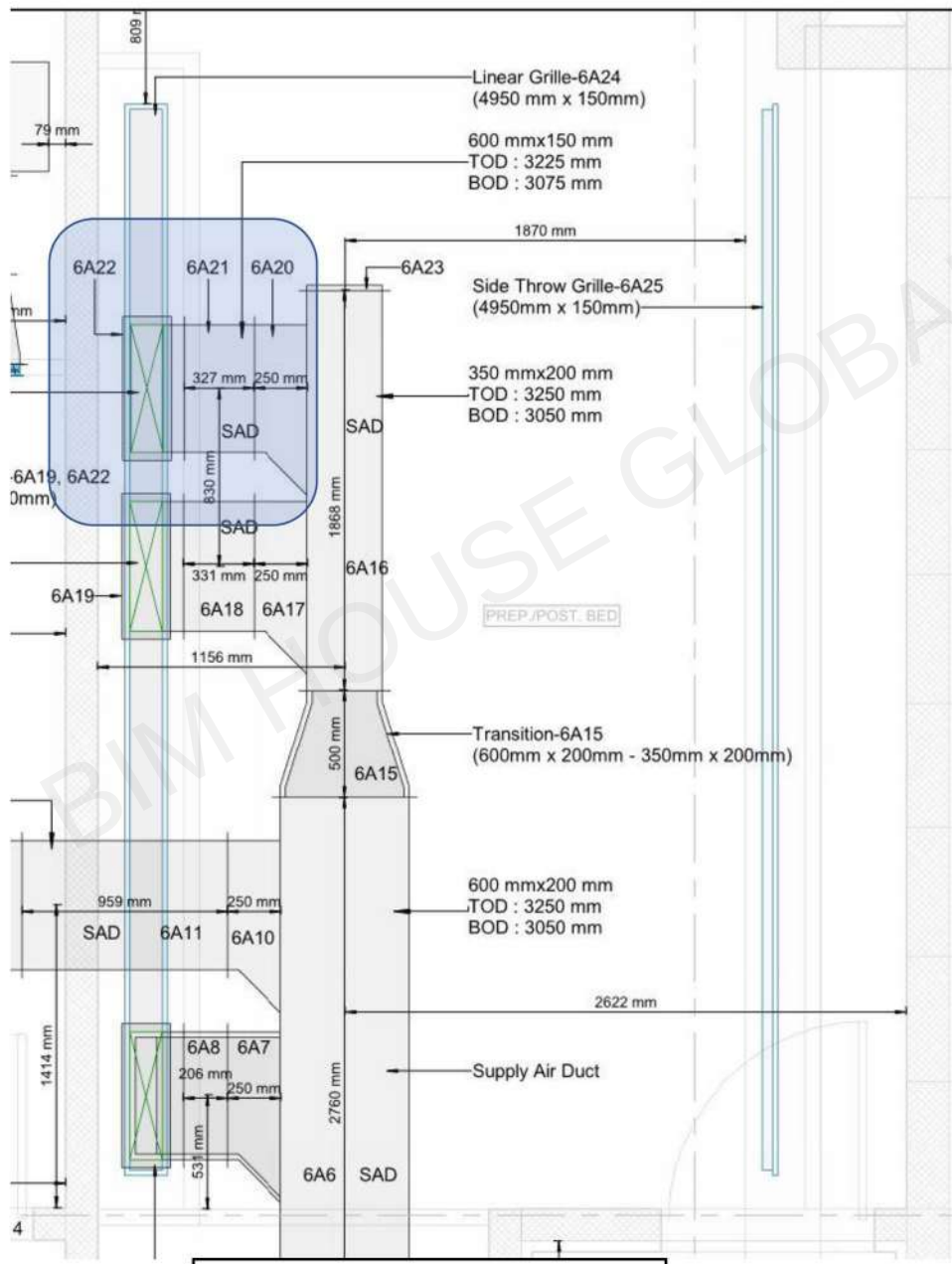
Import File in CNC Plasma Cutting Machine

Final Output

CNC Plasma Cutting Machine

https://www.youtube.com/watch?v=FVer9GHV_i4&t=26s

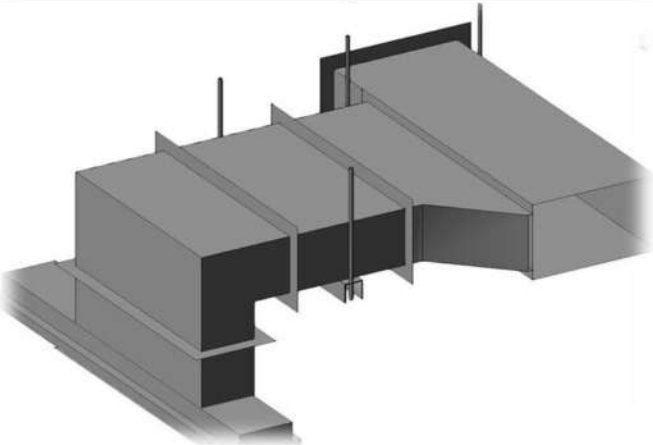
Documentation of Fabrication Item



Fabrication Drawing Sheet

Details Dimensions of Item Number 6A22

Name: Square Bend	
Material: Galvanised x 22	
Job Name: Fabrication_HVAC Parrrt 01	
Dimensions	
A=150 B=600 C=150 D=100 E=100	
Connectors	
C1=TDC C2=TDC	



Documentation of Fabrication Item

Project: 6th Floor_Fabrication HVAC
Job: 6th Floor_Fabrication HVAC
Name: Radius Bend
Scan Code: 6th Floor_Fabrication...

Notes:

Project: 6th Floor_Fabrication HVAC
Job: 6th Floor_Fabrication HVAC
Name: Square Bend
Scan Code: 6th Floor_Fabrication...

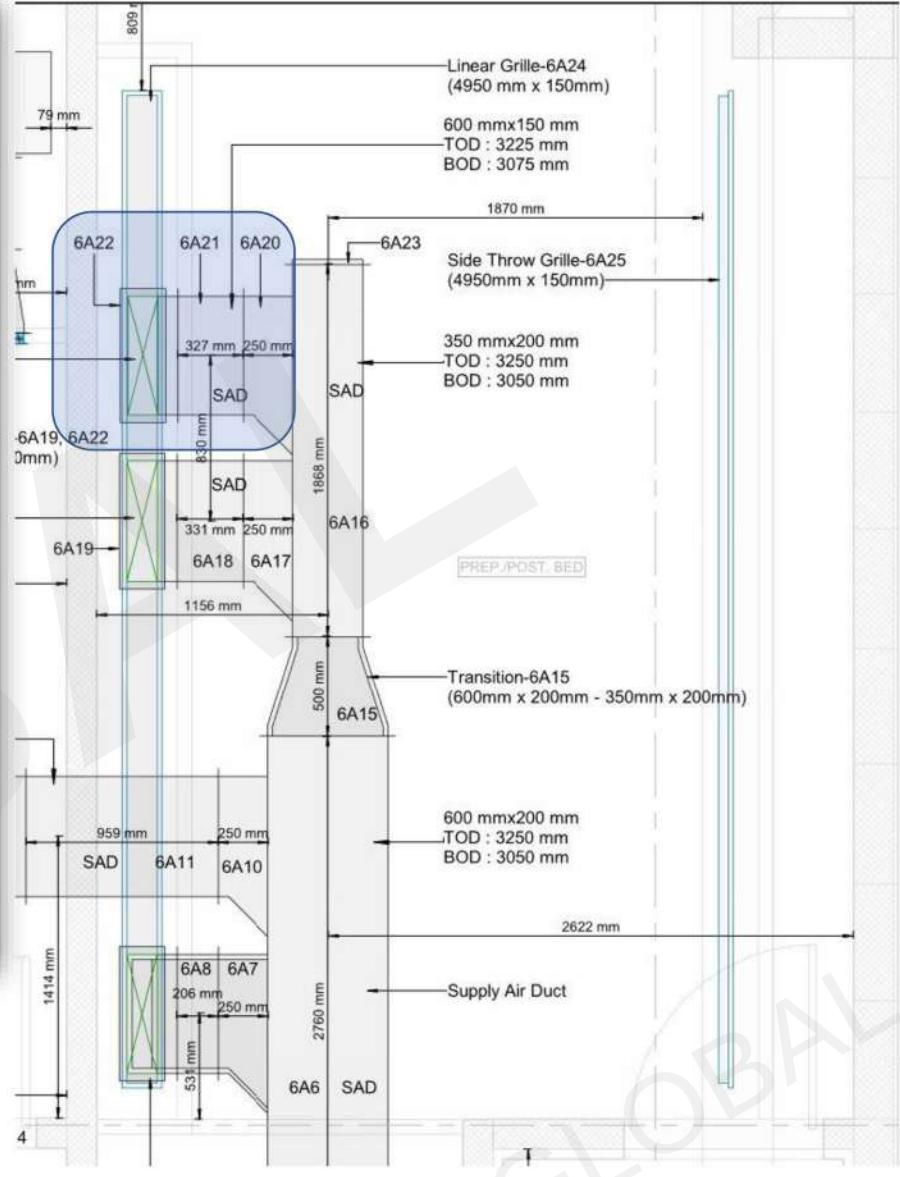
Notes:

Item label of Fabrication Item

Once the barcode / QR code is scanned, the corresponding information will appear on the screen.

6A8 6A9 6A11 6A12 6A13 6A14 6A15 6A17 6A18 6A19 6A20 6A22

Each item card shows: Project, Job, Name, Scan Code, Notes, and a small 3D model.



Fabrication Drawing Sheet

Part Type Report

Service Type: Rectangular Duct						
Qty/Length	Name	Size	Gauge	Connector 1 Type	Seam Type	Area (sq/m)
1	Cap End TDC DM 35	100 x 100	25			0.048
2	Cap End TDC DM 35	200 x 100	25			0.140
1	Cap End TDC DM 35	200 x 150	25			0.086
2	Cap End TDC DM 35	300 x 200	25			0.268
1	Cap End TDC DM 35	350 x 200	25			0.150
2	Radius Bend	100 x 100	25	DRIVE	SP	0.168
1	Radius Bend	600 x 200	25	TDC	SP	1.948
2	Radius Bend	600 x 150	25	TDC	SP	2.520
1	Shoe	100 x 100	25	DRIVE	SP	0.124
2	Shoe	150 x 150	25	DRIVE	SP	0.338
4	Shoe	600 x 150	25	TDC	LP	2.296
3	Square Bend	600 x 150	25	TDC	SP	2.127
1	Square to Round (Symmetrical)	200 x 100	25	DRIVE	SP	0.172
1	Square to Round (Symmetrical)	200 x 200	25	DRIVE	SP	0.198
1	Square to Round (Symmetrical)	200 x 100	25	DRIVE	SP	0.172
1	Square to Round (Symmetrical)	200 x 200	25	DRIVE	SP	0.198
2	Transition	600 x 200	25	TDC	SP	1.916
1	Transition	700 x 150	25	TDC	SP	0.967
2.657 (m)	Straight	100 x 100	22	DRIVE	SP	1.259
0.030 (m)	Straight	150 x 150	22	DRIVE	SP	0.064
0.978 (m)	Straight	200 x 100	22	DRIVE	SP	0.617
0.310 (m)	Straight	200 x 200	22	DRIVE	SP	0.283
0.719 (m)	Straight	200 x 100	22	DRIVE	SP	0.446
0.243 (m)	Straight	200 x 200	22	DRIVE	SP	0.241
3.740 (m)	Straight	200 x 150	22	DRIVE	SP	2.892
0.405 (m)	Straight	300 x 200	22	TDC	SP	0.524
1.868 (m)	Straight	350 x 200	22	TDC	SP	2.274
0.187 (m)	Straight	600 x 200	22	TDC	SP	0.463
3.459 (m)	Straight	600 x 150	22	TDC	SP	6.683
0.187 (m)	Straight	600 x 250	22	TDC	SP	0.492
3.219 (m)	Straight	600 x 200	22	TDC	SP	5.450
						35.524
Service Type: Duct Accessory						
Qty/Length	Name	Size	Gauge	Connector 1 Type	Seam Type	Area (sq/m)
1	Canvas Connection	600 x 250	22	TDC		0.000
Service Type: Hanger						
Qty/Length	Name	Size	Gauge	Connector 1 Type	Seam Type	Area (sq/m)
1	Strut Hanger	100 x 100	25			
2	Strut Hanger	200 x 100	25			
1	Strut Hanger	200 x 200	25			
1	Strut Hanger	200 x 100	25			
2	Strut Hanger	200 x 200	25			
3	Strut Hanger	200 x 150	25			
2	Strut Hanger	300 x 200	24			
2	Strut Hanger	350 x 200	24			
1	Strut Hanger	600 x 250	24			
3	Strut Hanger	600 x 200	24			
5	Strut Hanger	600 x 150	24			
1	Strut Hanger	600 x 200	24			
2	Strut Hanger	970 x 100	22			
						0.000
Service Type: Volume Damper						
Qty/Length	Name	Size	Gauge	Connector 1 Type	Seam Type	Area (sq/m)
1	Rectangular VCD	100 x 100	22	DRIVE		0.000
Grand Totals:						
Area (sq/m)						35.533

Bought Report

Description	Size	Qty/Length
Rectangular VCD	100 x 100	1
Canvas Connection	600 x 250	1

Rectangular Duct & Fitting with connector

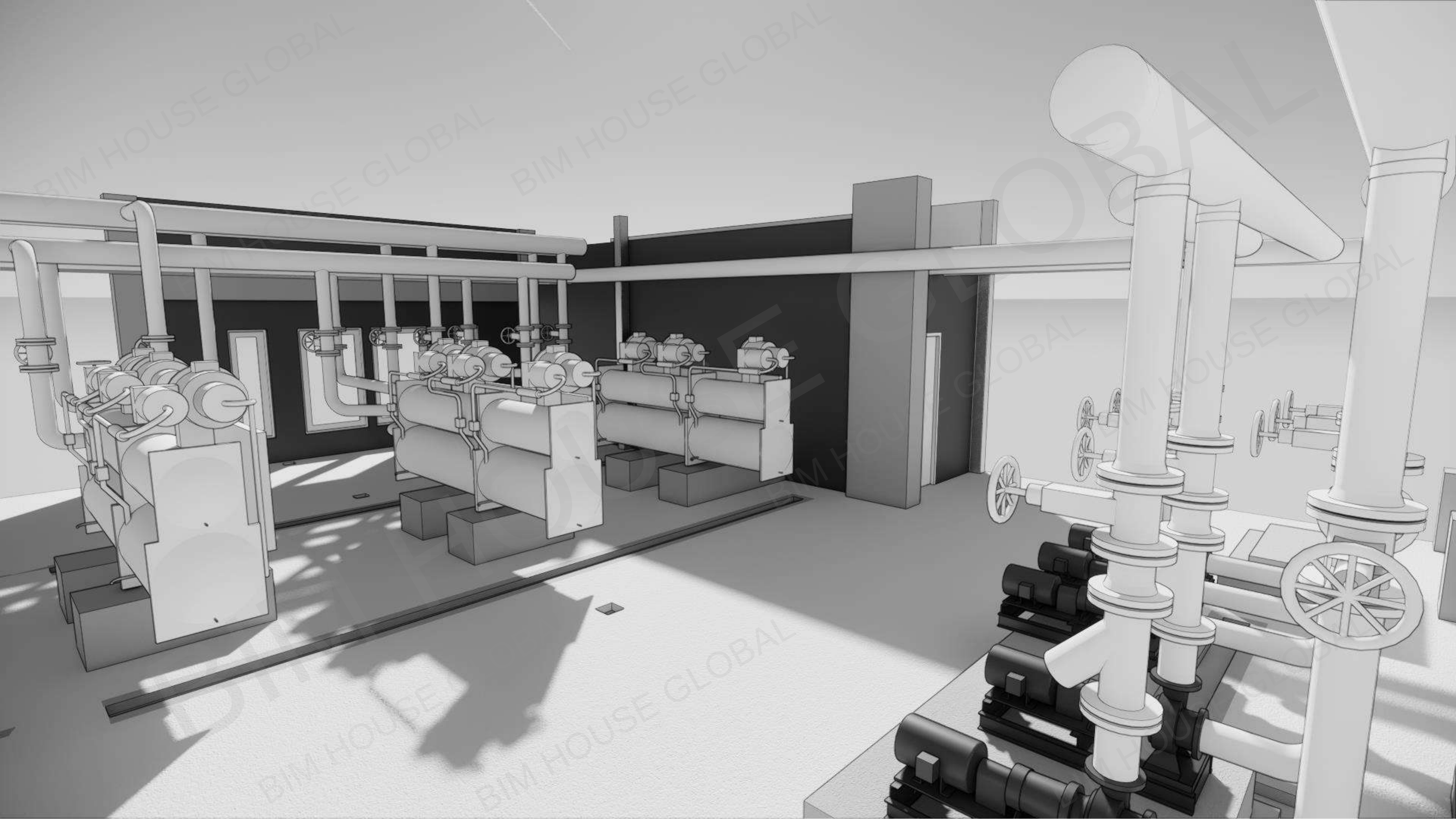
Duct Accessory

Hanger

Mechanical Equipment

List of Installation Material

Data Type: Airturn, Data Name: Small Double Aerofoil Vane						
Type	Name	Product ID	Qty	Length (mm)	Fab Time (hrs)	Install Time (hrs)
Airturn Tracks	Turning Vane Runner Twin		6	807 3/4"	0:00:00	0:00:00
Fixings	Rivet		6	0"	0:00:00	0:00:00
			12	807 3/4"	0:00:00	0:00:00
Data Type: Connector, Data Name: Duct - Flanged: TDC						
Type	Name	Product ID	Qty	Length (mm)	Fab Time (hrs)	Install Time (hrs)
Gasket	Gasket Tape 5x18		27	43250"	0:00:00	0:00:00
Clips	TDC Cleat		57	0"	0:00:00	0:00:00
Corners	TDC Corners		232	0"	0:00:00	0:00:00
Fixings	M10x25		116	0"	0:00:00	0:00:00
			432	43250"	0:00:00	0:00:00
Data Type: Connector, Data Name: Duct: DRIVE						
Type	Name	Product ID	Qty	Length (mm)	Fab Time (hrs)	Install Time (hrs)
Ancillary Materials	Drive Cleat Manuf		24.5	14100"	0:00:00	0:00:00
Corners	Drive Corners		98	0"	0:00:00	0:00:00
			122.5	14100"	0:00:00	0:00:00
Data Type: Support, Data Name: Duragal 50x50x5 M10 Rod						
Type	Name	Product ID	Qty	Length (mm)	Fab Time (hrs)	Install Time (hrs)
Ancillary Materials	Duragal Angle 50x50x5		43	25290"	27:49:21	23:23:42
Support Rods	M10 Rod		86	49450"	0:00:00	0:00:00
Fixings	Dynaset		86	0"	0:00:00	0:00:00
Fixings	M10 Rod Nuts		172	0"	0:00:00	0:00:00
			387	74740"	27:49:21	23:23:42
Data Type: Support, Data Name: Strap 20 Gauge						
Type	Name	Product ID	Qty	Length (mm)	Fab Time (hrs)	Install Time (hrs)
Support Rods	Strap 20 Gauge		30	19100"	0:00:00	0:00:00
Fixings	Dynaset		30	0"	0:00:00	0:00:00
Fixings	Tek Screws		60	0"	0:00:00	0:00:00
			120	19100"	0:00:00	0:00:00
Grand Totals:						
Qty	Length (mm)	Fab Time (hrs)	Install Time (hrs)	₹Cost		
1073.5	151997 3/4"	27:49:21	23:23:42	973.70		

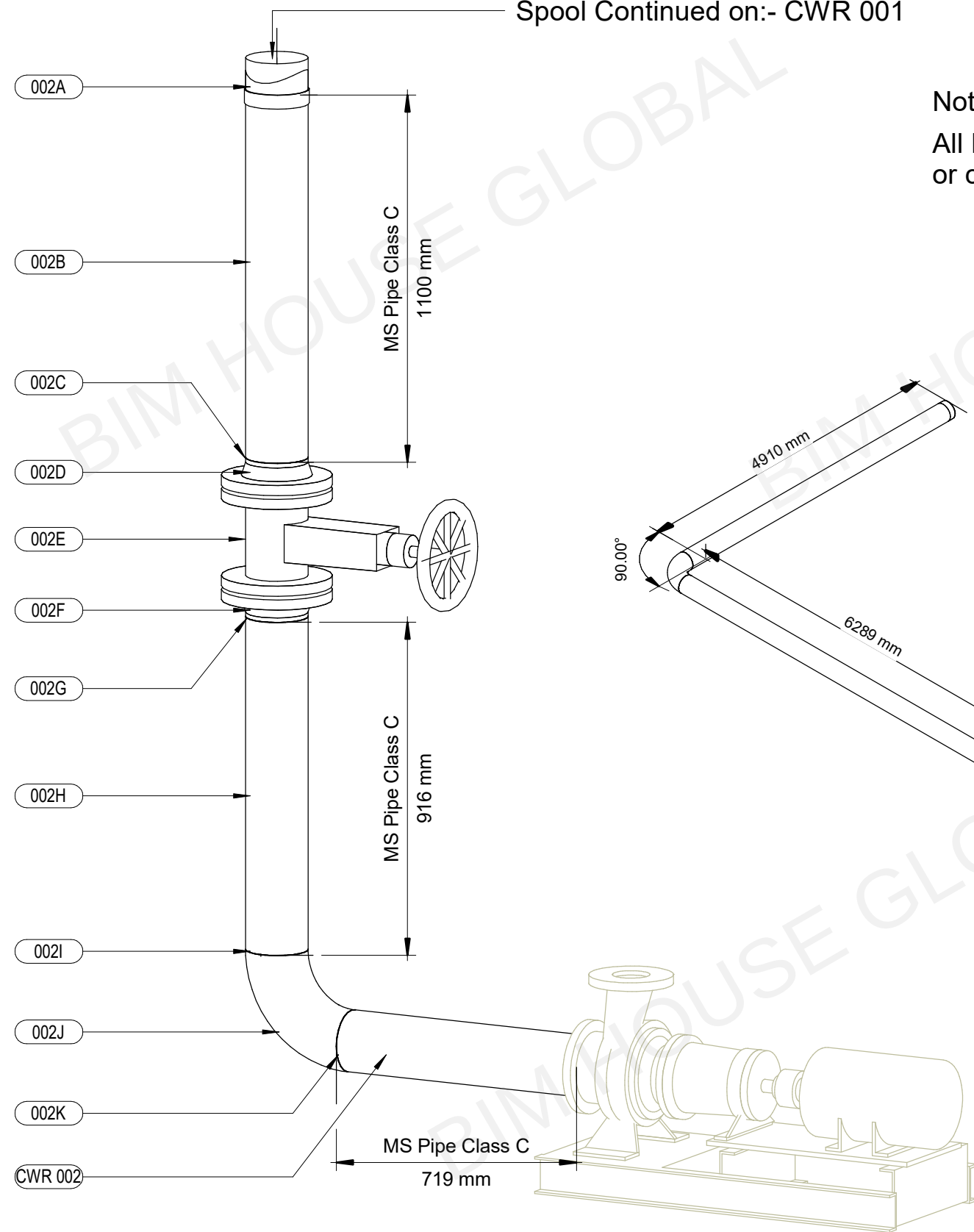


SPOOL DRAWING FOR FABRICATION &
INSTALLATION

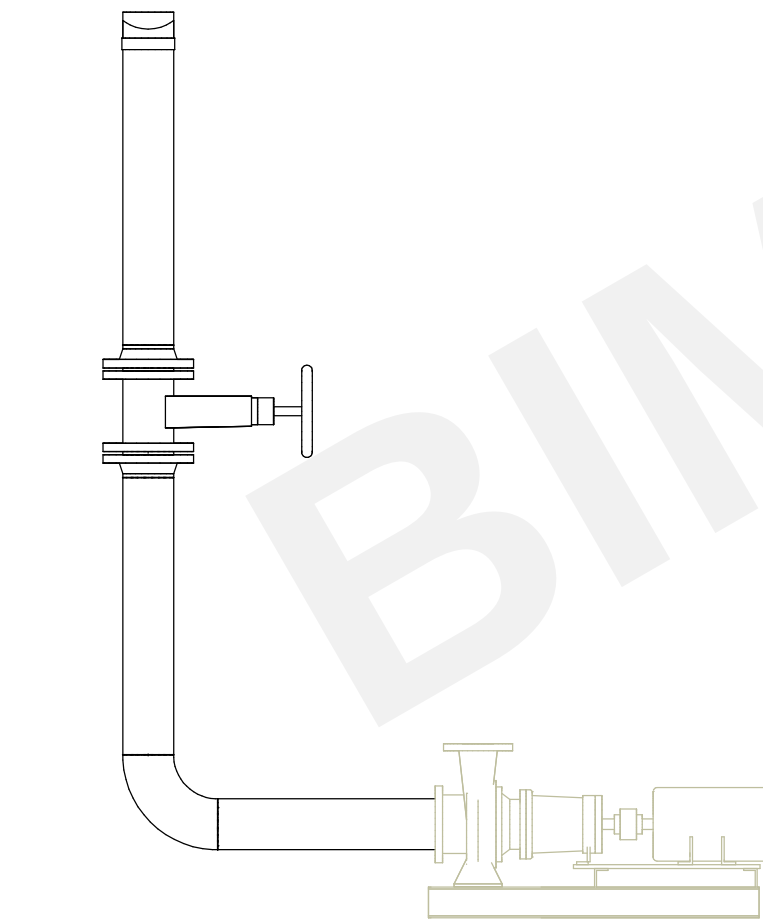
Spool Continued on:- CWR 001

Note:-

All Dimensions are to the end of pipe, face of flange, or centerline of fitting, unless otherwise noted.

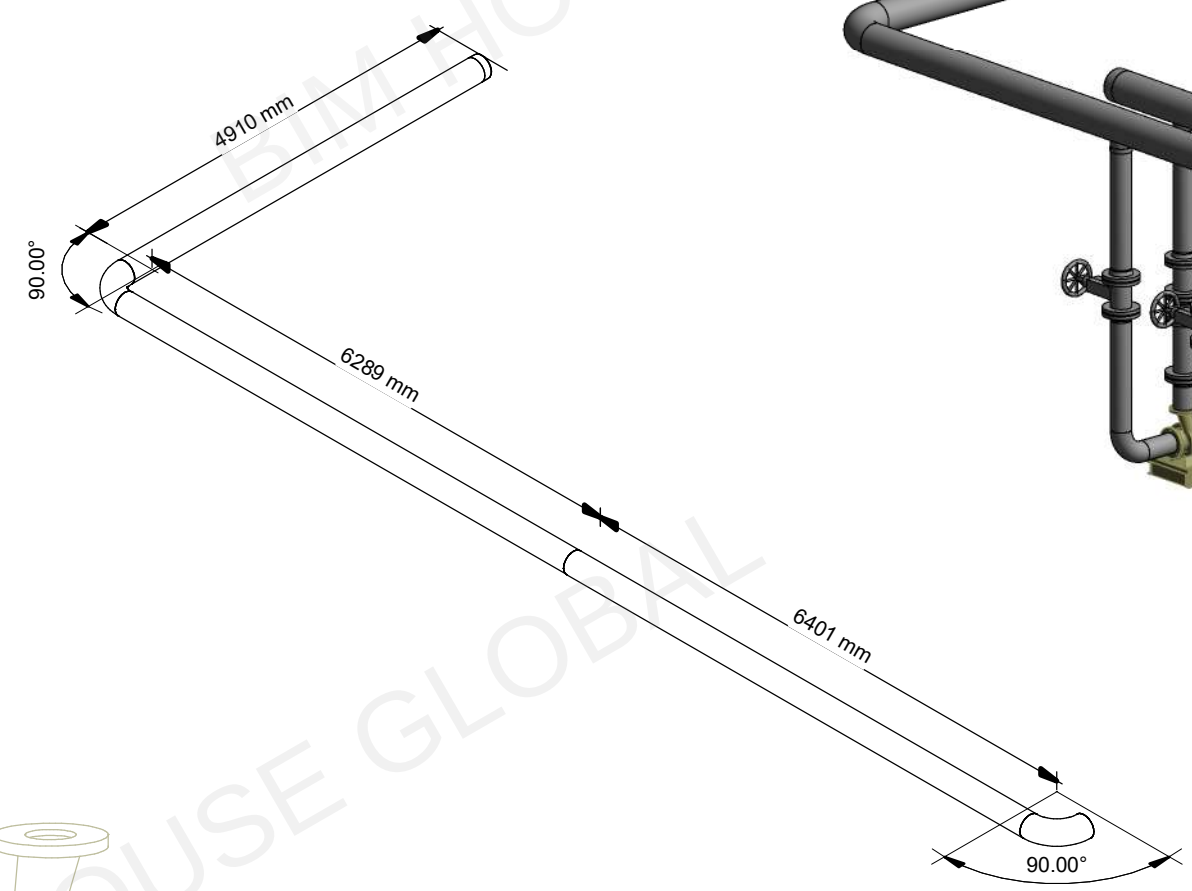


1 Spool_CWR 002

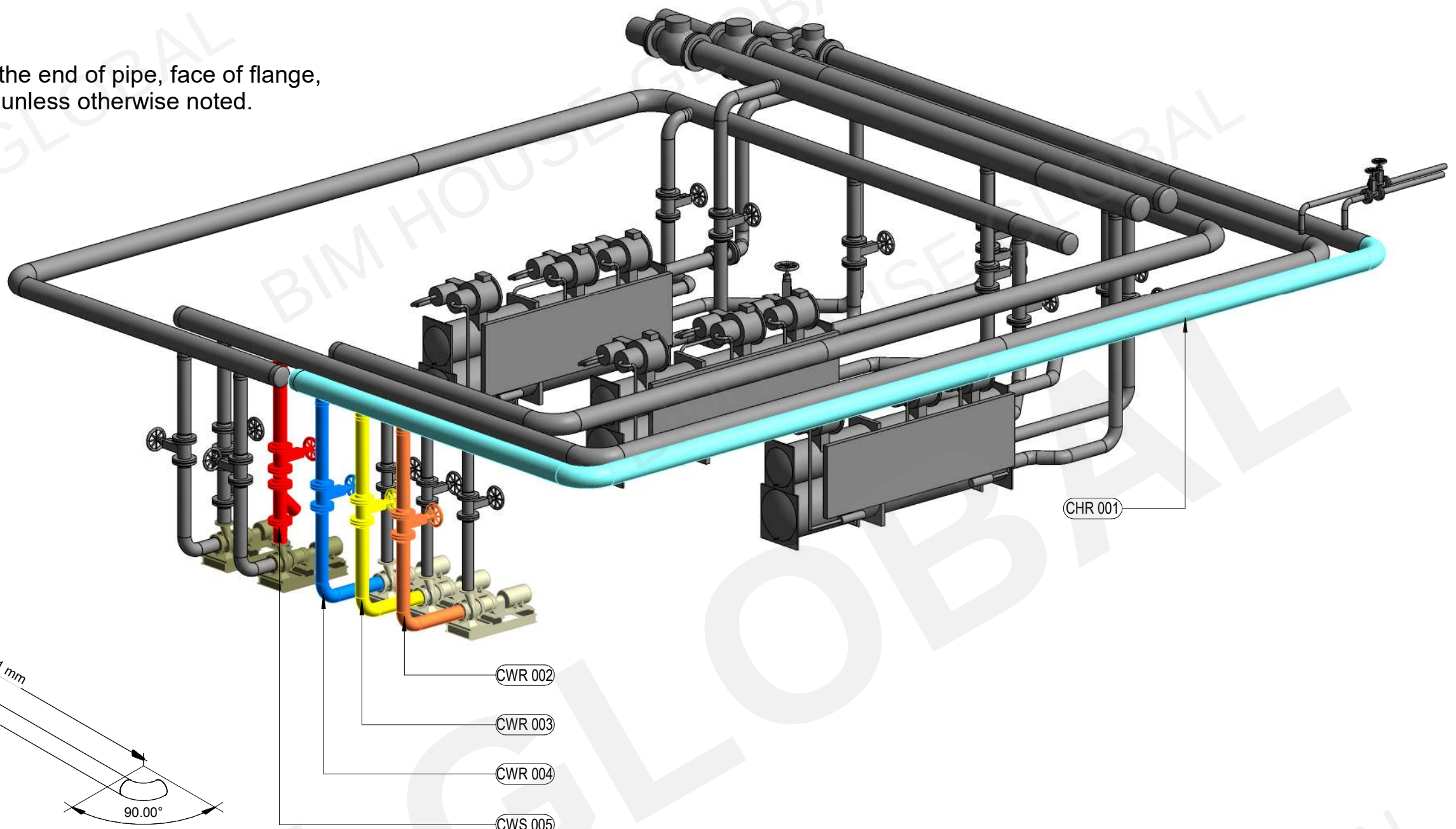


3 Spool_CWR 002_Elevation Front
1 : 25

4 Spool_CWR 001



2 3D View



Flange



Weld



Spool CWR 002 Bill of Material_Pipe

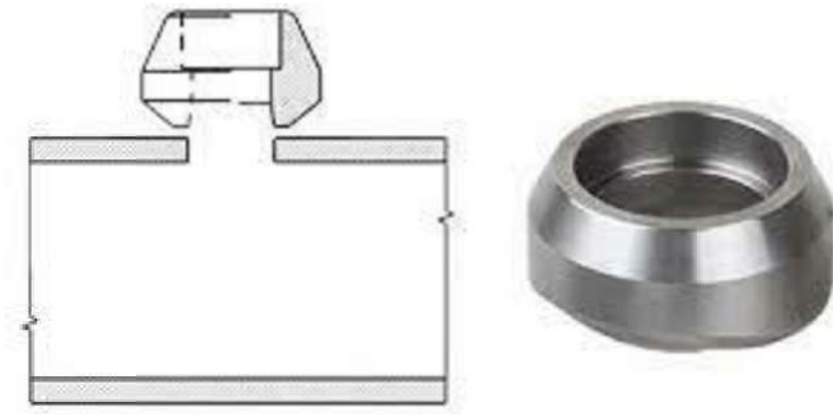
Mark	Qty	Size	Description	Length (meter)
002B	1	150mm Dia	MS Pipe Class C as per IS : 1239	1.100
002H	1	150mm Dia	MS Pipe Class C as per IS : 1239	0.916
CWR 002	1	150mm Dia	MS Pipe Class C as per IS : 1239	0.719
Total				2.735 meter

Spool CWR 002 Bill of Material_Fitting

Mark	Qty	Size	Description	Length (m)
002A	1	250mm-150mm Dia	Threadolet	0.166
002E	1	150mm Dia	Gate Valve	0.267
002F	1	150mm Dia	PN 25 Type 11 WN Flange	0.035
002D	1	150mm Dia	PN 25 Type 11 WN Flange	0.035
002J	1	150mm Dia	MS 90 deg Elbow	NA



Gasket



Threadolet

Spool CWR 002 Bill of Material_Weld

Mark	Qty	Size	Description	Length (m)
002I	1	150mm Dia	MS Field Weld Gap 3mm	0.003
002K	1	150mm Dia	MS Field Weld Gap 3mm	0.003
002G	1	150mm Dia	MS Field Weld Gap 3mm	0.003
002C	1	150mm Dia	MS Field Weld Gap 3mm	0.003

Spool CWR 002 Bill of Material_Bought

Mark	Qty	Size	Description	Length (m)
002F	4	150mm Dia	PN 25 Bolt	0.000
002D	4	150mm Dia	PN 25 Bolt	0.000
002F	1	150mm Dia	PN 25 Gasket	0.000
002D	1	150mm Dia	PN 25 Gasket	0.000

NOTES

Dimensions are not to be scaled.
All dimensions (if present) are in mm.
The purpose of this drawing is to only highlight coordination issues between Architectural, Structural & MEPF (Mechanical, Electrical, Plumbing & Fire-fighting) discipline, for the project design consultants to update their respective discipline drawings.
This drawing should not be referred for any other purpose.

No.

Date

By

Description

Issues

No.

Date

By

Description

Revisions

LEGEND

CWR:- Chilled Water Return

MS:- Mild Steel

Client

Architects

Structural Consultant

MEP Consultant

BIM CONSULTANT

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Project Title

Drawing Title

Spool Drawing

Date

dd/mm/yyyy

Project No.

Drawn by

Author

Drawing No.

Checked by

Checker

A101

Approved by

Approver

BIM HOUSE GLOBAL

THANK YOU