



END-TO-END BIM SOLUTIONS

INTEGRATED PRODUCT DELIVERY SOLUTIONS BY ESCA INC.



ESCA INCORPORATED
ENGINEERS • CONSULTANTS • PROJECT MANAGERS

TRADITIONAL AEC PROCESS ISSUES

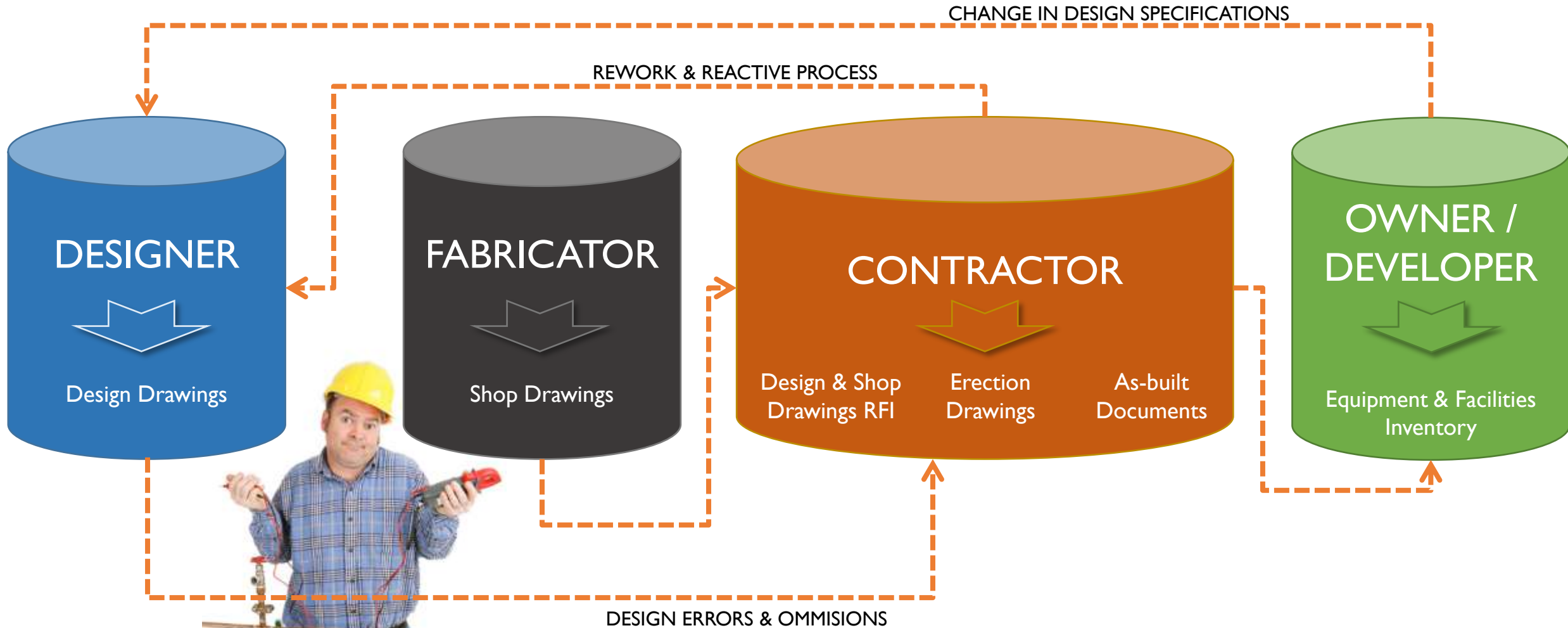
The only industry that does not test a complete design before its implementation



ESCA INCORPORATED
ENGINEERS • CONSULTANTS • PROJECT MANAGERS

TRADITIONAL AEC PROCESS ISSUES

WHAT REALLY HAPPENS



TRADITIONAL AEC PROCESS ISSUES

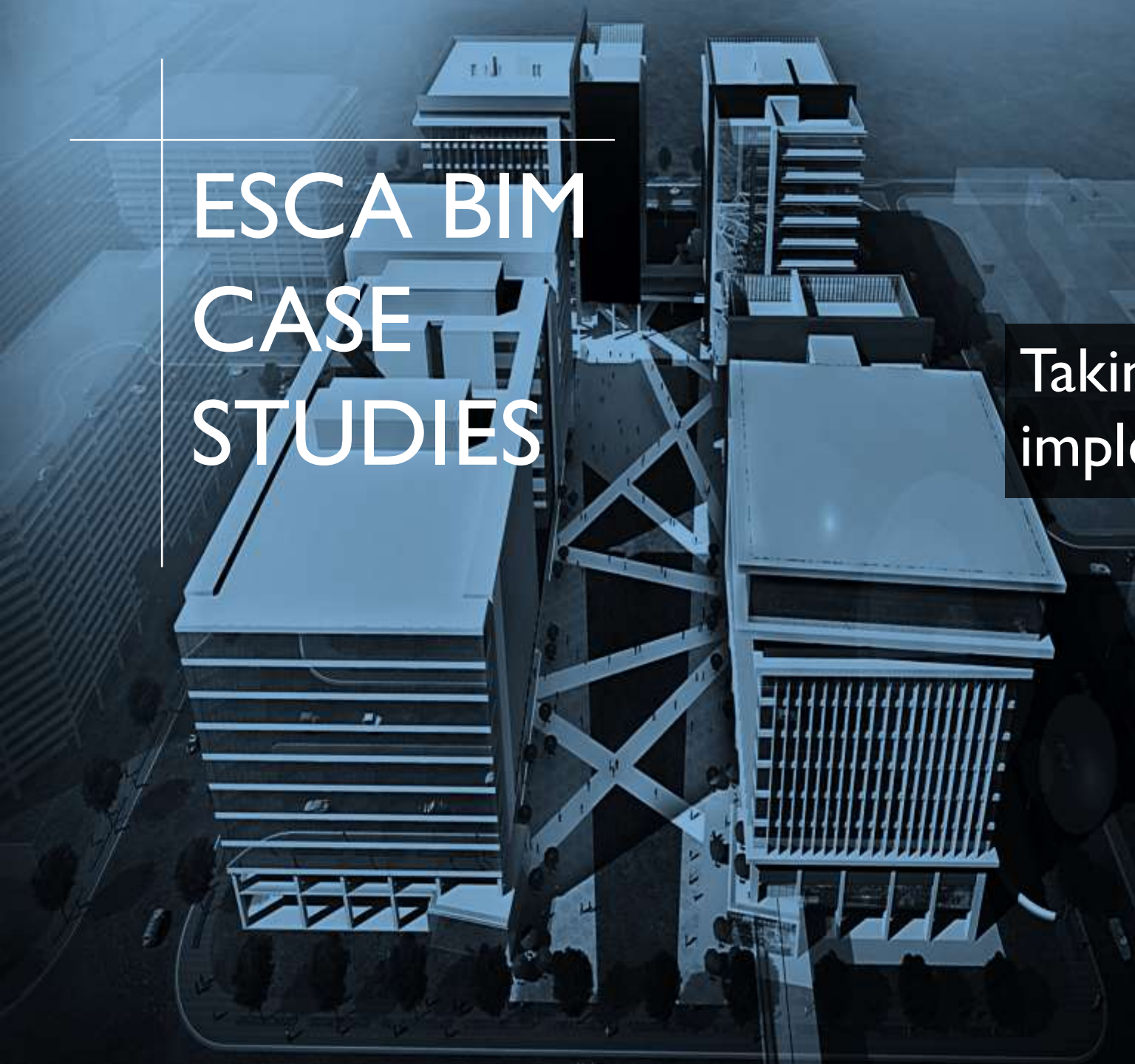
OWNERS ALWAYS SUFFER

COST OVERRUNS & CONSTRUCTION DELAYS

Most of the **waste** during a construction project **happens within the project delivery phase**, when steep material and labor costs are incurred.



ESCA INCORPORATED
ENGINEERS • CONSULTANTS • PROJECT MANAGERS



ESCA BIM CASE STUDIES

Taking concept to real-life
implementation and execution



ESCA INCORPORATED
ENGINEERS • CONSULTANTS • PROJECT MANAGERS

ESCA BIM CASE STUDIES – QUAD AERO PARK

PROJECT BACKGROUND

Location: Clark Economic Zone, Philippines

Description: Mixed-used building

Support to EPF contractor

Area: 117,300 square meters

Services:

- Modeling (Architectural, Structural, Mechanical, Plumbing, Electrical and Fire Protection)
- Clash detection and resolution
- Bill of Materials
- Pre-Construction to Post-Construction
LOD 300-LOD 500

Duration:

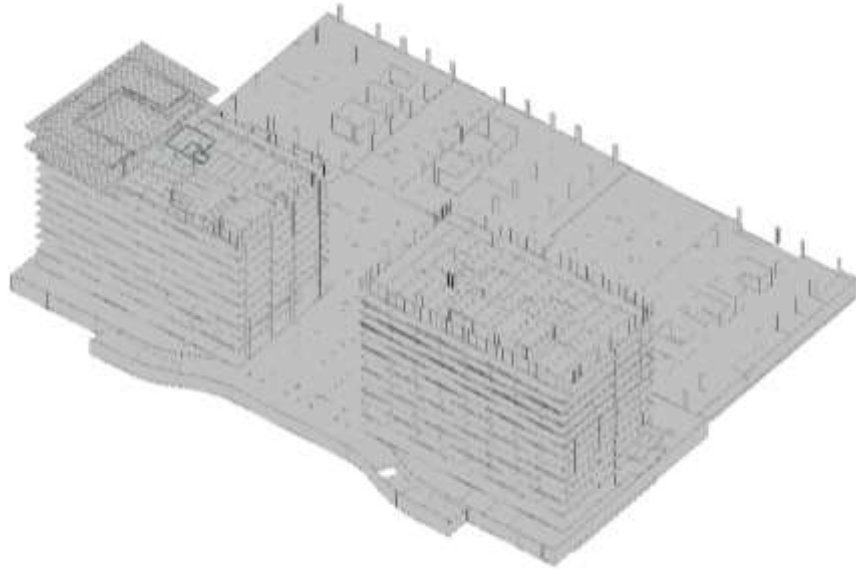
12 weeks Pre-Construction Phase

15 months Construction to Post-
Construction Phase



ESCA BIM CASE STUDIES – QUAD AERO PARK

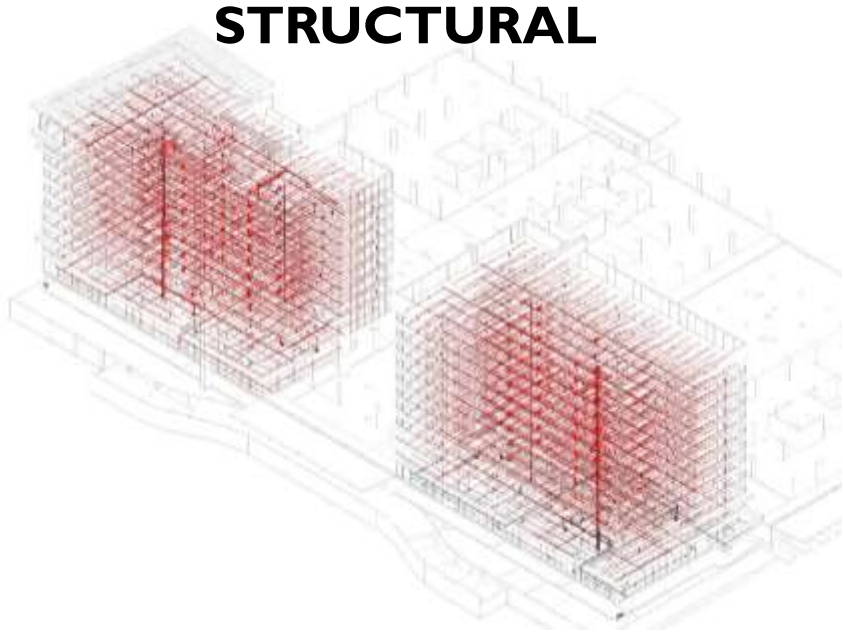
PRE-CONSTRUCTION STAGE – BIM MODELS



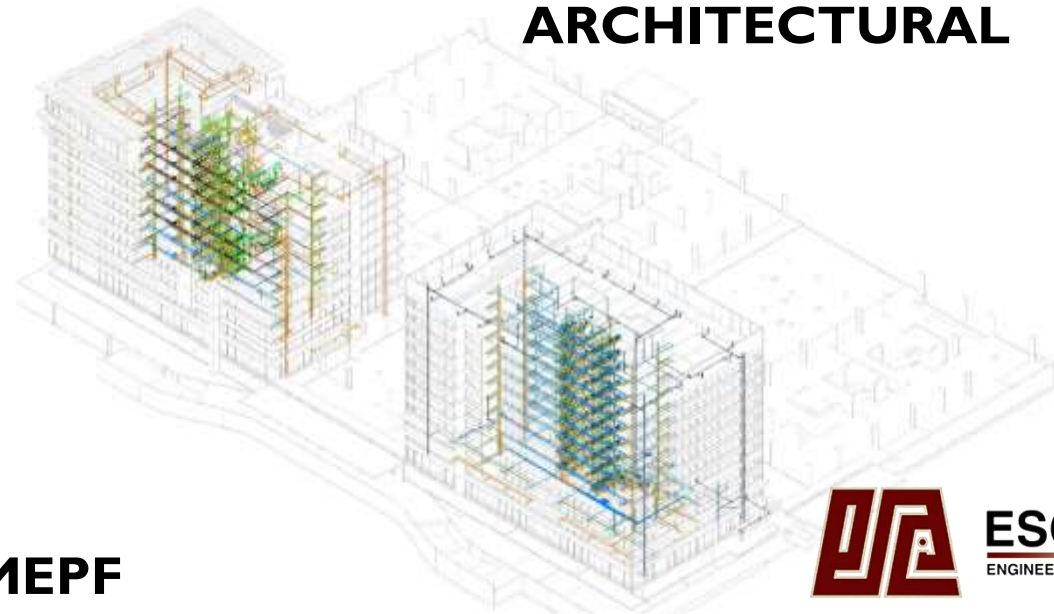
STRUCTURAL



ARCHITECTURAL



MEPF



ESCA BIM CASE STUDIES – QUAD AERO PARK

MODEL-TO-SITE FIDELITY

IF IT FITS IN THE MODEL, IT FITS ON SITE



ESCA INCORPORATED
ENGINEERS · CONSULTANTS · PROJECT MANAGERS

ESCA BIM CASE STUDIES – QUAD AERO PARK

MODEL-TO-SITE FIDELITY

IF IT FITS IN THE MODEL, IT FITS ON SITE



ESCA INCORPORATED
ENGINEERS • CONSULTANTS • PROJECT MANAGERS

ESCA BIM CASE STUDIES – QUAD AERO PARK

MODEL-TO-SITE FIDELITY

IF IT FITS IN THE MODEL, IT FITS ON SITE



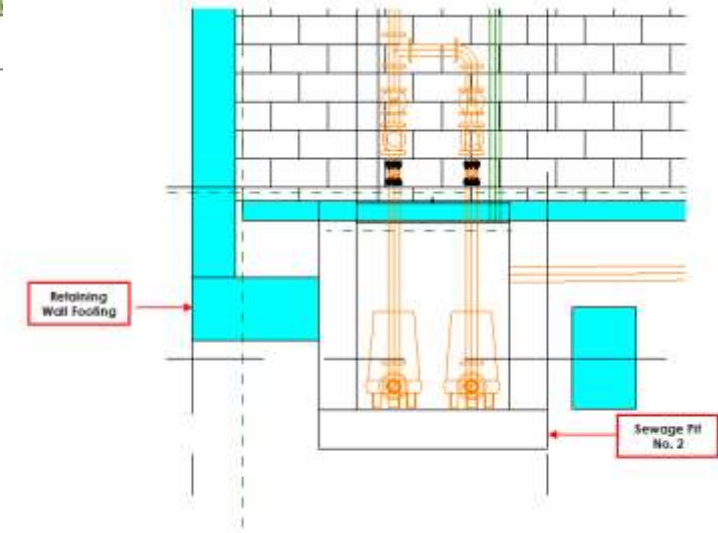
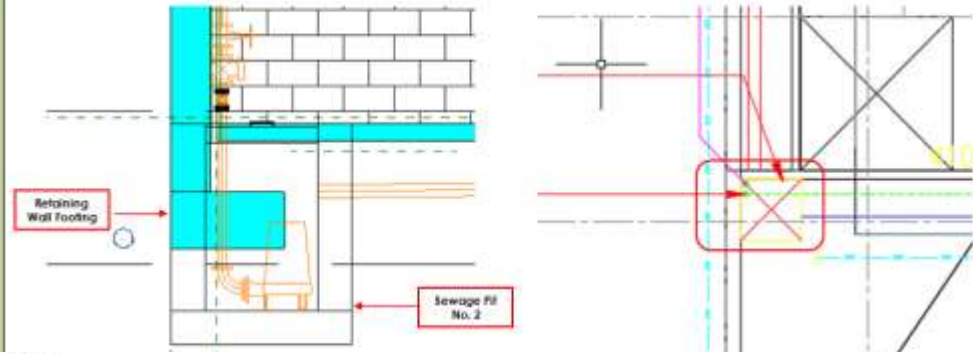
ESCA INCORPORATED
ENGINEERS · CONSULTANTS · PROJECT MANAGERS

ESCA BIM CASE STUDIES – QUAD AERO PARK

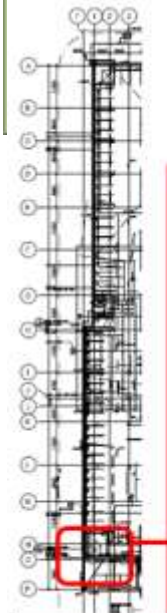
PRE-CONSTRUCTION STAGE – CLASH DETECTION AND RESOLUTION

Item No.	Description / Date	Reference Information	Remarks	Action Required / Party Responsible
033	BSMT LVL, GRID O/1 Sewage Pit clashes with Retaining Wall Footing	1246P1-01A BASEMENT I OVERALL PLUMBING LAYOUT FOUNDATION PLAN	RFA	STRUCTURAL PLUMBING

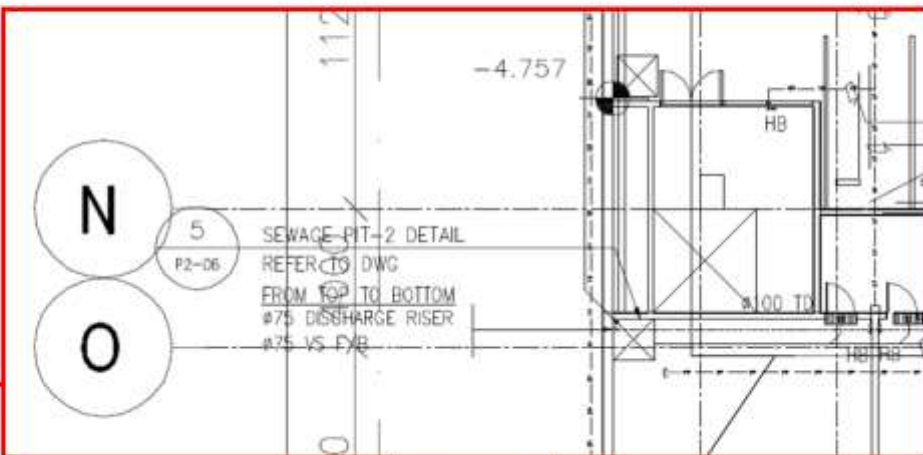
Images Reference



NEW POSITION OF SEWAGE PIT FOR APPROVAL



1246P1-01A KEY PLAN



1246P1-01A GRID O/1

ESCA BIM CASE STUDIES – QUAD AERO PARK

PRE-CONSTRUCTION STAGE – QUANTITY TAKE-OFF

2ND LEVEL		
FIRE PRO - Mechanical Equipments		
FIRE HOUSE CABINET - 40 mmø	set/s	4
FIRE HOUSE CABINET - 50 mmø	set/s	4
PORTABLE FIRE EXTINGUISHER	set/s	14
PORTABLE FIRE EXTINGUISHER - CO ²	set/s	4
10LBS HCFC 123 (CEILING TYPE)	set/s	2
FIRE PRO - PIPE ACCESSORIES		
GATE VAVLE - 50 mmø	assy.	2
GATE VAVLE - 65 mmø	assy.	1
FLOW CONTROL VALVE - 100 mmø	assy.	1
WATER FLOOR DETECTOR SWITCH	assy.	1
FIRE PRO - PIPE FITTINGS		
Coupling Concentric Reducing - B.I		
40 mmø-32 mmø	pc/s	31
50 mmø-15 mmø	pc/s	4
50 mmø-25 mmø	pc/s	1
50 mmø-32 mmø	pc/s	1
50 mmø-40 mmø	pc/s	8
65 mmø-50 mmø	pc/s	2
80 mmø-65 mmø	pc/s	3
100 mmø-40 mmø	pc/s	2
END CAP - 40 mmø	pc/s	1
END CAP - 50 mmø	pc/s	5
END CAP - 100 mmø	pc/s	3
Elbow - Threaded		
25 mmø-25 mmø	pc/s	78
32 mmø-32 mmø	pc/s	8
40 mmø-40 mmø	pc/s	49
50 mmø-50 mmø	pc/s	3
65 mmø-65 mmø	pc/s	2
100 mmø-100 mmø	pc/s	2

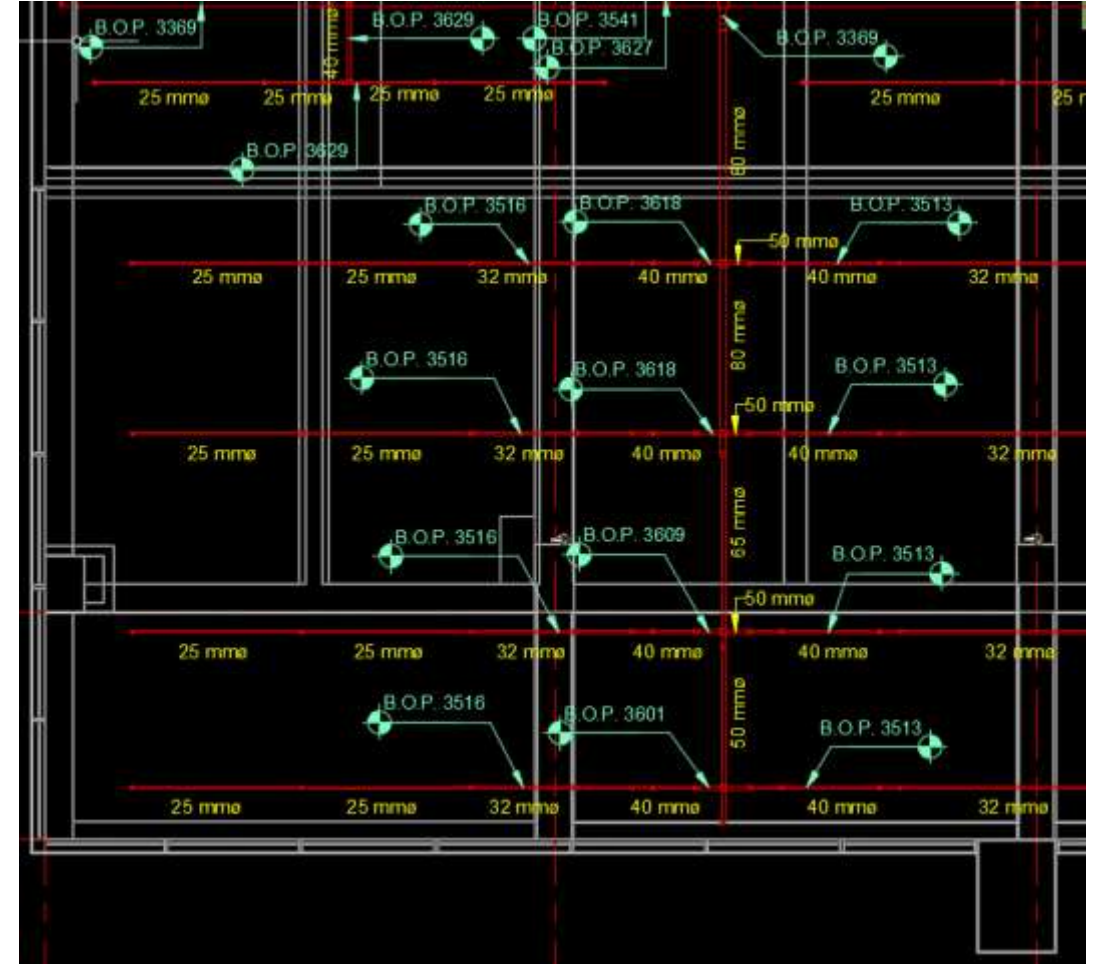
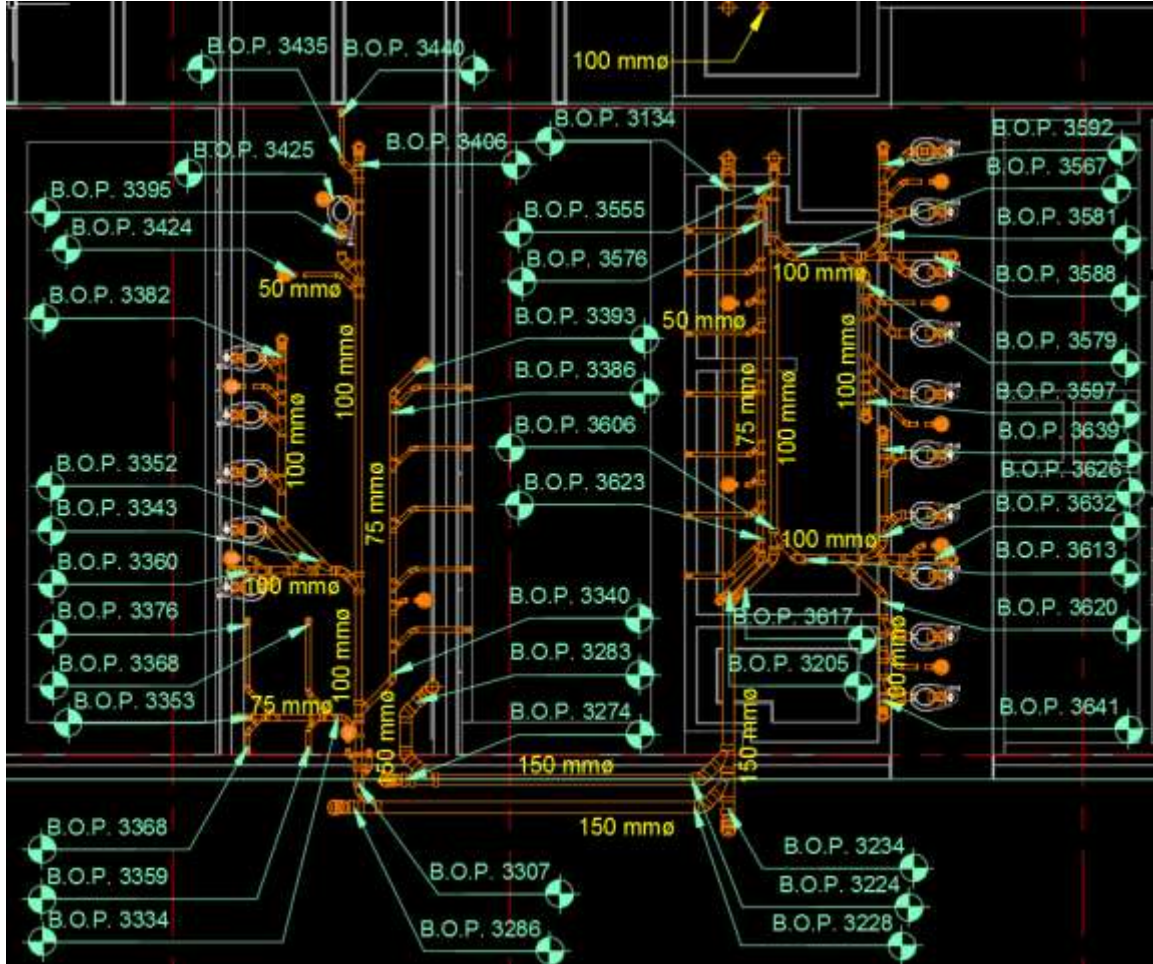
GROUND FLOOR		
PVC Wye - 50mm	pcs	9
PVC Wye - 75mm	pcs	10
PVC Wye - 100mm	pcs	5
PVC Wye Reducer - 50mm x 32mm	pcs	20
PVC Wye Reducer - 75mm x 50mm	pcs	10
PVC Wye Reducer - 100mm x 50mm	pcs	2
PVC Wye Reducer - 100mm x 75mm	pcs	5
PVC Double Wye - 100mm	pcs	1
PIPES		
PVC Pipe - 32mm	lms	9.44
PVC Pipe - 50mm	lms	139.27
PVC Pipe - 75mm	lms	347.82
PVC Pipe - 100mm	lms	113.56
SANITARY		
FIXTURE		
Sewage Manhole	pcs	18
Water Closet	pcs	14
Lavatory	pcs	14
Male Urinal	pcs	6
Floor Drain 50mm	pcs	14
PIPE FITTINGS		
PVC Floor Clean Out - 75mm	pcs	2
PVC Floor Clean Out - 100mm	pcs	11
PVC Floor Clean Out - 150mm	pcs	2
PVC Floor Clean Out - 200mm	pcs	1
PVC Ceiling Clean Out - 100mm	pcs	24

2ND FLOOR LEVEL		
1.1	ELECTRICAL CONDUITS	
WIRES		
#16 AWG 2IC TF Shielded wire (FIRE ALARM)	ln/s	600.74
#16/18 AWG 2IC TF Shielded wire (PUBLIC ADDRESS)	ln/s	268.24
#18 AWG 1F Shielded twisted pair (BMS)	ln/s	130.13
PIPES / CONDUITS		
PVC		
15mm ø PVC PIPE	ln/s	822.92
20mm ø PVC PIPE	ln/s	305.93
25mm ø PVC PIPE	ln/s	37.41
IMC		
25mm ø INTERMEDIATE METAL CONDUIT	ln/s	1006.68
FMC		
15mm ø FLEXIBLE METAL CONDUIT	ln/s	156.04
20mm ø FLEXIBLE METAL CONDUIT	ln/s	115.90
2.1	ELECTRICAL CONDUIT FITTINGS	
CONDUIT BODY - TYPE L (ALUMINUM)	pcs	254
JUNCTION BOX OCT 15mm (PVC)	pcs	258
JUNCTION BOX OCT 20mm (PVC)	pcs	30
JUNCTION BOX SQUARE 20mm (PVC)	pcs	7
JUNCTION BOX OCT 25mm (METAL)	pcs	117
FMC/FLEX PIPE CONNECTOR 20mm	pcs	160
FMC/FLEX PIPE CONNECTOR 15mm	pcs	465
3.1	ELECTRICAL EQUIPMENT	
CONSOLIDATION POINT	sets	14
4.1	ELECTRICAL FIXTURES	
SINGLE PORT UNIVERSAL OUTLET	pcs	6
DUAL PORT UNIVERSAL OUTLET	pcs	2



ESCA BIM CASE STUDIES – QUAD AERO PARK

CONSTRUCTION STAGE – FOR IMPLEMENTATION DRAWINGS 4D



ESCA BIM CASE STUDIES – QUAD AERO PARK

CONSTRUCTION STAGE – BILL OF MATERIALS WITH TIME DURATION

ITEM NO.	DESCRIPTION	UNIT	QTY	MANHOUR REQT.
BASEMENT				
COLD WATERLINE				
PPR - NP				
PIPES				
	15MMØ	lms.	301.46	24.12
	20MMØ	lms.	643.28	83.63
	25MMØ	lms.	459.68	101.13
	32MMØ	lms.	97.6	33.18
	40MMØ	lms.	68.13	36.11
	50MMØ	lms.	624.61	518.43
	100MMØ	lms.	9.32	10.81
	150MMØ	lms.	661.32	767.13
GLASS PIPE				
	15MMØ	lms.	14.23	
G.I. PIPE				
	50MMØ	lms.	9.17	42.64
	75MMØ	lms.	3.84	17.86
	100MMØ	lms.	217.81	2,533.13
	150MMØ	lms.	157.11	1,827.19
D.I. PIPE				
	250MMØ	lms.	7.24	101.00
STAINLESS STEEL PIPE				
	15MMØ	lms.	1.01	4.70
PIPE ACCESSORIES				
Gate Valve - PPR				
	15MMØ	PCS.	7	10.57
	32MMØ	PCS.	2	3.02
	40MMØ	PCS.	4	7.24
	50MMØ	PCS.	8	22.64
	100MMØ	PCS.	5	52.10
	150mmØ	PCS.	28	351.68

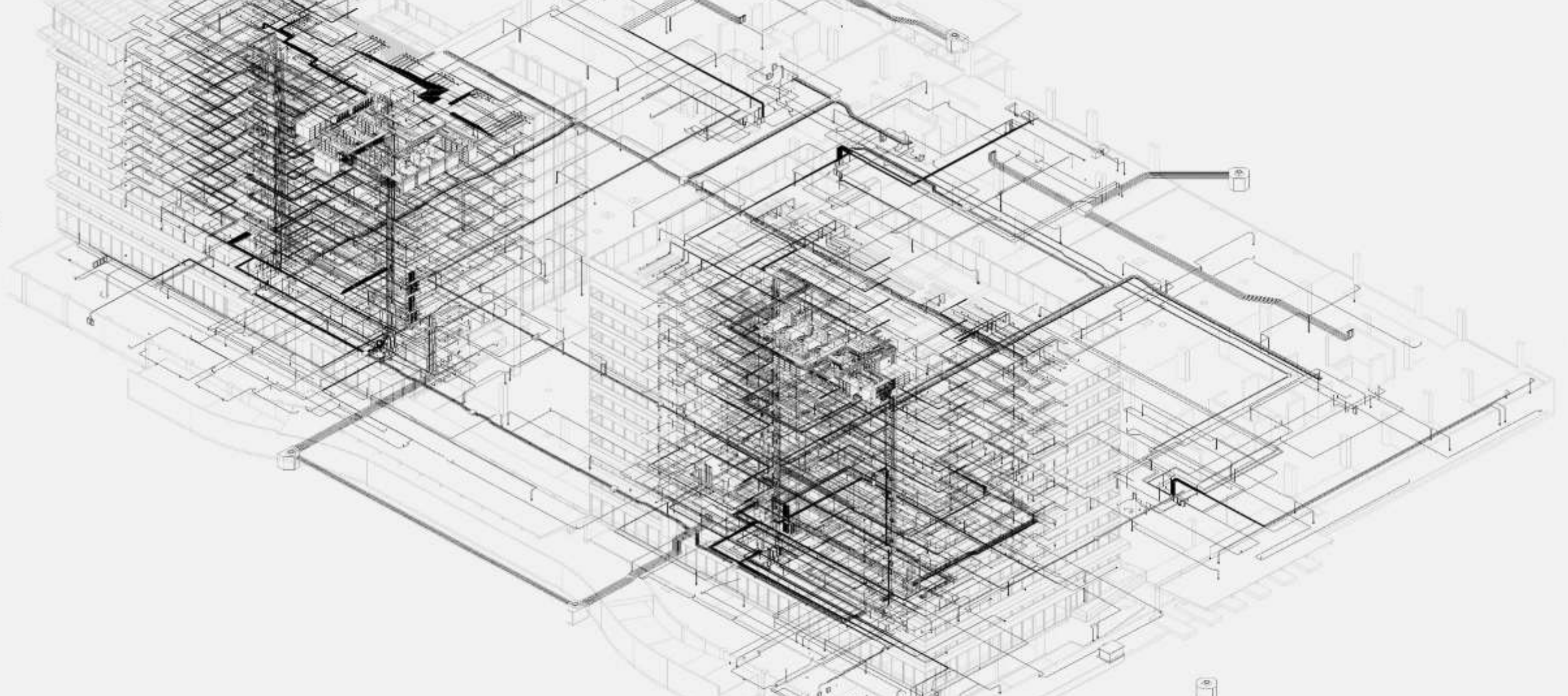
ITEM NO.	ITEM DESCRIPTIONS	UNIT	QTY	MANHOUR REQT.
ELECTRICAL WORKS				
BLDG A - SECOND FLOOR				
1.0 POWER				
1.1 Raceway and Boxes for Electrical Systems				
1.1.1 Pipes and Fittings				
X	1.1.1.1 PVC, 20mmØ	lm/s	1,161	383.13
X	1.1.1.2 PVC, 32mmØ	lm/s	461	202.84
*	1.1.1.3 PVC, 110mmØ	lm/s	164	224.68
*	1.1.1.4 IMC, 20mmØ	lm/s	64	21.12
*	1.1.1.5 IMC, 65mmØ	lm/s	27	20.79
*	1.1.1.6 IMC, 90mmØ	lm/s	46	51.06
1.1.2 Boxes and Pullboxes				
*	1.1.2.1 Octagonal Junction Box (PVC)	pc/s.	112	280.00
1.2 ELECTRICAL PANELBOARDS				
1.2.1 Low-Voltage Electrical Panelboards				
X	1.2.1.1 Pulling Box - NEMA	assy.	14	84.00
X	1.2.1.2 Pulling Box: 350AT - TAP OFF MCCB	assy.	2	3.18
X	1.2.1.3 Pulling Box: 400 x 400 x 200 Pull Box	assy.	2	5.00
X	1.2.1.4 Pulling Box: DP-GF-1	assy.	1	16.00
X	1.2.1.5 Pulling Box: ELP-GF-1	assy.	1	16.00
X	1.2.1.6 Pulling Box: MC-GF	assy.	1	18.00
X	1.2.1.7 Pulling Box: MTS	assy.	2	6.36

DESCRIPTION	UNIT	QTY.	MANHOUR REQT.
3rd LEVEL			
FIRE PRO - Mechanical Equipments			
Fire Hose Cabinet with Fire Extinguisher - 40mm	set/s	4	311.68
CO ² PORTABLE FIRE EXTINGUISHER	set/s	2	1.24
PORTABLE FIRE EXTINGUISHER	set/s	13	2.86
FIRE PRO - PIPE ACCESSORIES			
Gate Valve - 65mm	assy.	3	15.57
Flow Control Valve - 100mm	assy.	1	20.78
Water Flow Switch	assy.	1	1.3
FIRE PRO - PIPE FITTINGS			
Coupling Concentric Reducing - B.I			
25 mmØ-15 mmØ	pc/s	121	14.52
32 mmØ-15 mmØ	pc/s	58	7.54
32 mmØ-25 mmØ	pc/s	60	7.8
40 mmØ-15 mmØ	pc/s	51	9.69
40 mmØ-32 mmØ	pc/s	50	9.5
50 mmØ-25 mmØ	pc/s	4	1.28
50 mmØ-32 mmØ	pc/s	8	2.56
50 mmØ-40 mmØ	pc/s	52	16.64
Elbow - Threaded			
25 mmØ-25 mmØ	pc/s	174	20.88
32 mmØ-32 mmØ	pc/s	23	5.98
40 mmØ-40 mmØ	pc/s	35	11.2
50 mmØ-50 mmØ	pc/s	44	22.88
65 mmØ-65 mmØ	pc/s	2	1.04
100 mmØ-100 mmØ	pc/s	6	9.36
Elbow Reducing - Threaded			



ESCA BIM CASE STUDIES – QUAD AERO PARK

CONSTRUCTION STAGE – IMPLEMENTATION DESIGN WITH CONTRACTOR'S APPROVAL



**ELECTRICAL LAYOUT DESIGN BASED ON THE
DESIGNER'S LINE DIAGRAM**



ESCA INCORPORATED
ENGINEERS · CONSULTANTS · PROJECT MANAGERS

ESCA BIM CASE STUDIES – QUAD AERO PARK

BUSINESS VALUE

OPERATIONAL TARGET DATE

ORIGINAL SCHEDULE : **JULY 2017**
CURRENT SCHEDULE : **MAY 2017**

OPERATIONS MANPOWER

ORIGINAL DEPLOYMENT : **7 CAD OPERATORS**
CURRENT DEPLOYMENT : **2 CAD OPERATORS**

TURN-AROUND-TIME

ORIGINAL DRAWING TAT : **7 DAYS**
CURRENT DRAWING TAT : **2 DAYS**

DESIGN CONSULTANCY

DRAWING IMPLEMENTATION : **27-45DAYS**
DRAWING IMPLEMENTATION w/ BIM: **7-14 DAYS**



ESCA BIM CASE STUDIES – STUDIO 7

PROJECT BACKGROUND

Location: 807 EDSA, Diliman Quezon City

Description: Mixed-use structure composed of 3 basements, 3 podium floors, 22 floors BPO tower & 20 floors residential tower

Area: 89,058 square meters

Services:

- Modeling (Architectural, Structural, Mechanical, Plumbing, Electrical and Fire Protection)
- Clash detection and resolution
- Bill of Quantities
- Pre-Construction LOD 200 – LOD 300
- Coordinated Services drawings

Duration: 16 weeks Pre-Construction Phase

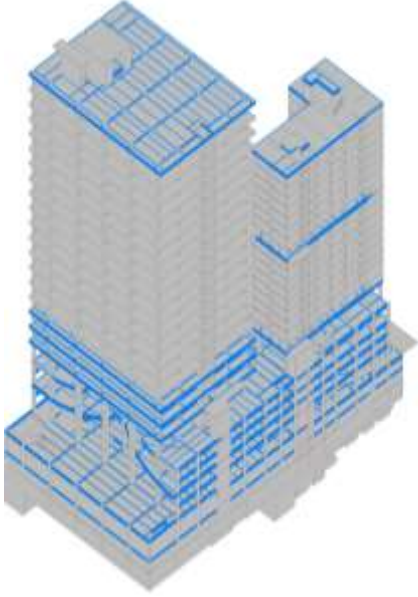


ESCA INCORPORATED
ENGINEERS • CONSULTANTS • PROJECT MANAGERS

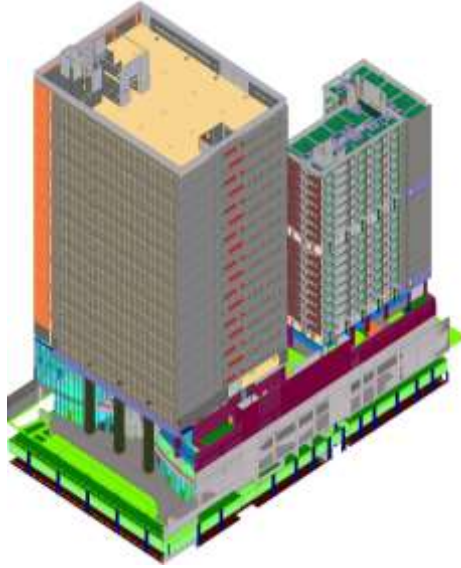
ESCA BIM CASE STUDIES – STUDIO 7

PRE-CONSTRUCTION STAGE – BIM MODELS

STRUCTURAL



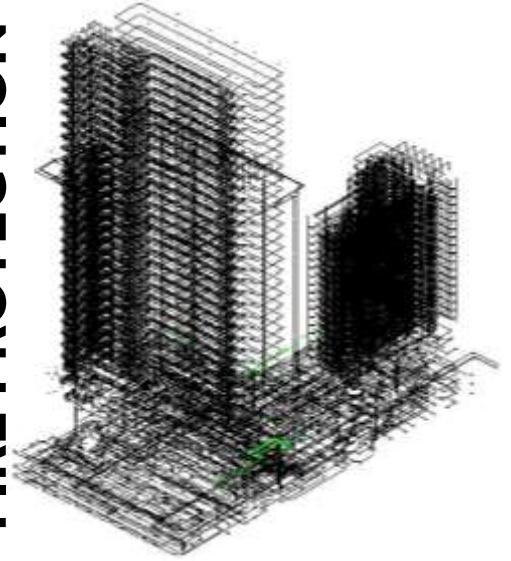
ARCHITECTURAL



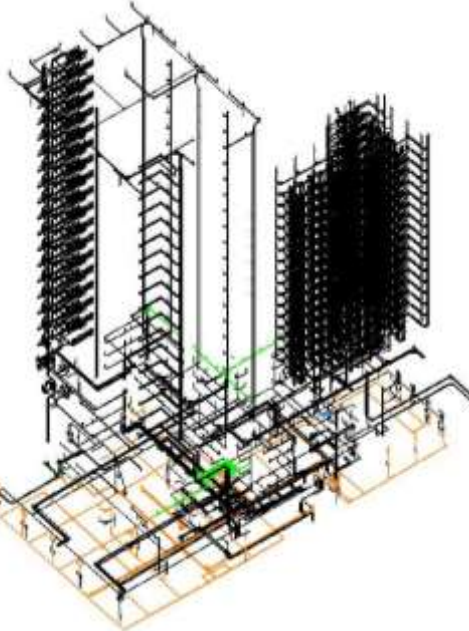
MECHANICAL



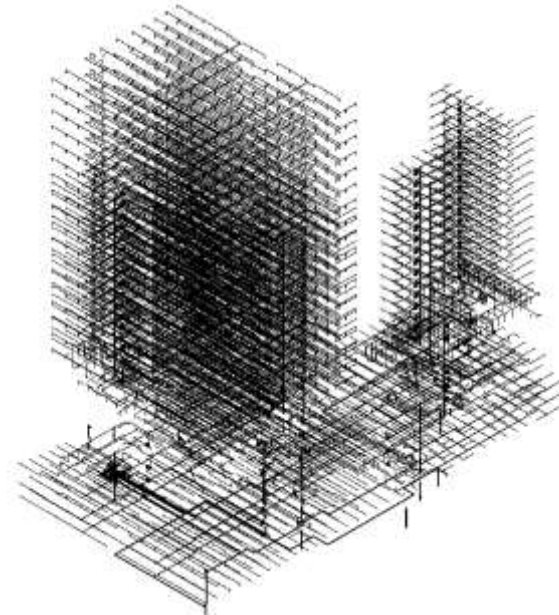
FIRE PROTECTION



PLUMBING



ELECTRICAL



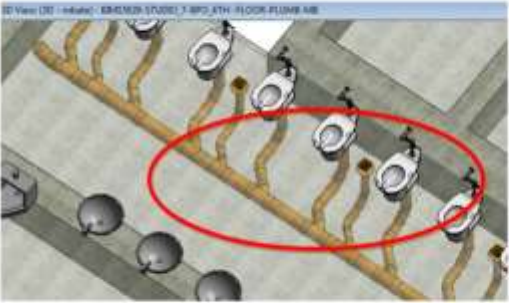
ESCA INCORPORATED
ENGINEERS • CONSULTANTS • PROJECT MANAGERS

ESCA BIM CASE STUDIES – STUDIO 7

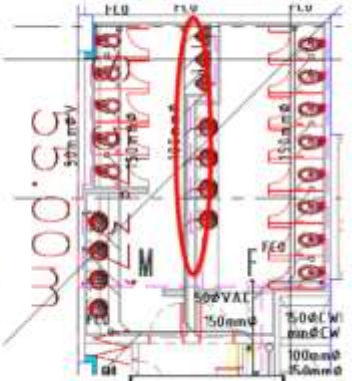
PRE-CONSTRUCTION STAGE – CLASH DETECTION AND RESOLUTION

Item No.	Description / Date	Reference Information	Remarks	Action Required / Party Responsible
077	BPO 4 th LEVEL PIPE SIZES NOT PROVIDED	4 th BPO PLUMBING LAYOUT	RFA PIPE SIZES: 80mm FOR FLOOR DRAINS 100mm FOR WATER CLOSETS 50mm FOR SINKS	PLUMBING

Images Reference



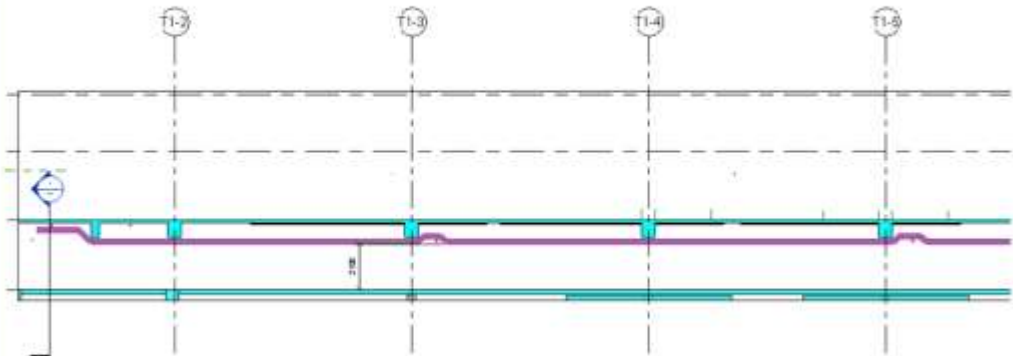
3D VIEW



FLOOR PLAN

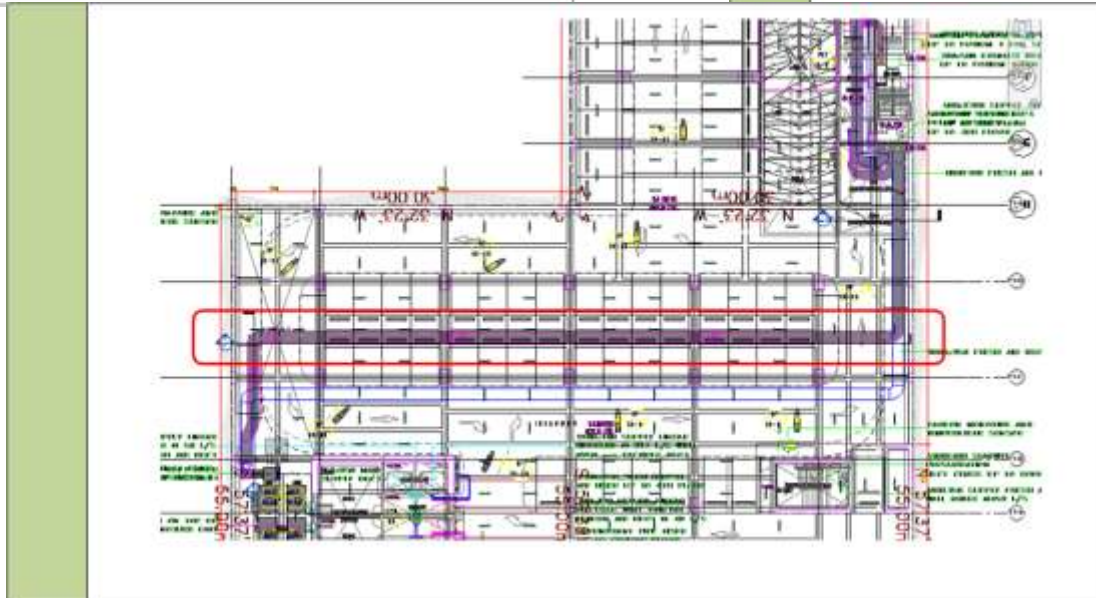
Item No.	Description / Date	Reference Information	Remarks	Action Required / Party Responsible
203	BASEMENT 3 – GRID T1-F TO T1-F/ T1-3 TO T1-7 PROPOSED DUCT LOCATION	A.2.04.2.03 BASEMENT 3 PLAN	RFA	MECHANICAL STRUCTURAL

Images Reference



SECTION VIEW

TOTAL ISSUES
REPORTED AND
RESOLVED – 308



ESCA BIM CASE STUDIES – STUDIO 7

COORDINATED SERVICES DRAWINGS

LEGEND :

MECHANICAL

-  : SUPPLY AIR
-  : RETURN AIR
-  : EXHAUST AIR
-  : PRESSURIZATION AIR
-  : REFRIGERANT PIPE
-  : FUEL OIL PIPE
-  : MECHANICAL EQUIPMET

PLUMBING

-  : SANITARY PIPE
-  : STORM DRAINAGE PIPE
-  : VENT PIPE
-  : COLD WATER LINE
-  : FIXTURES

ELECTRICAL

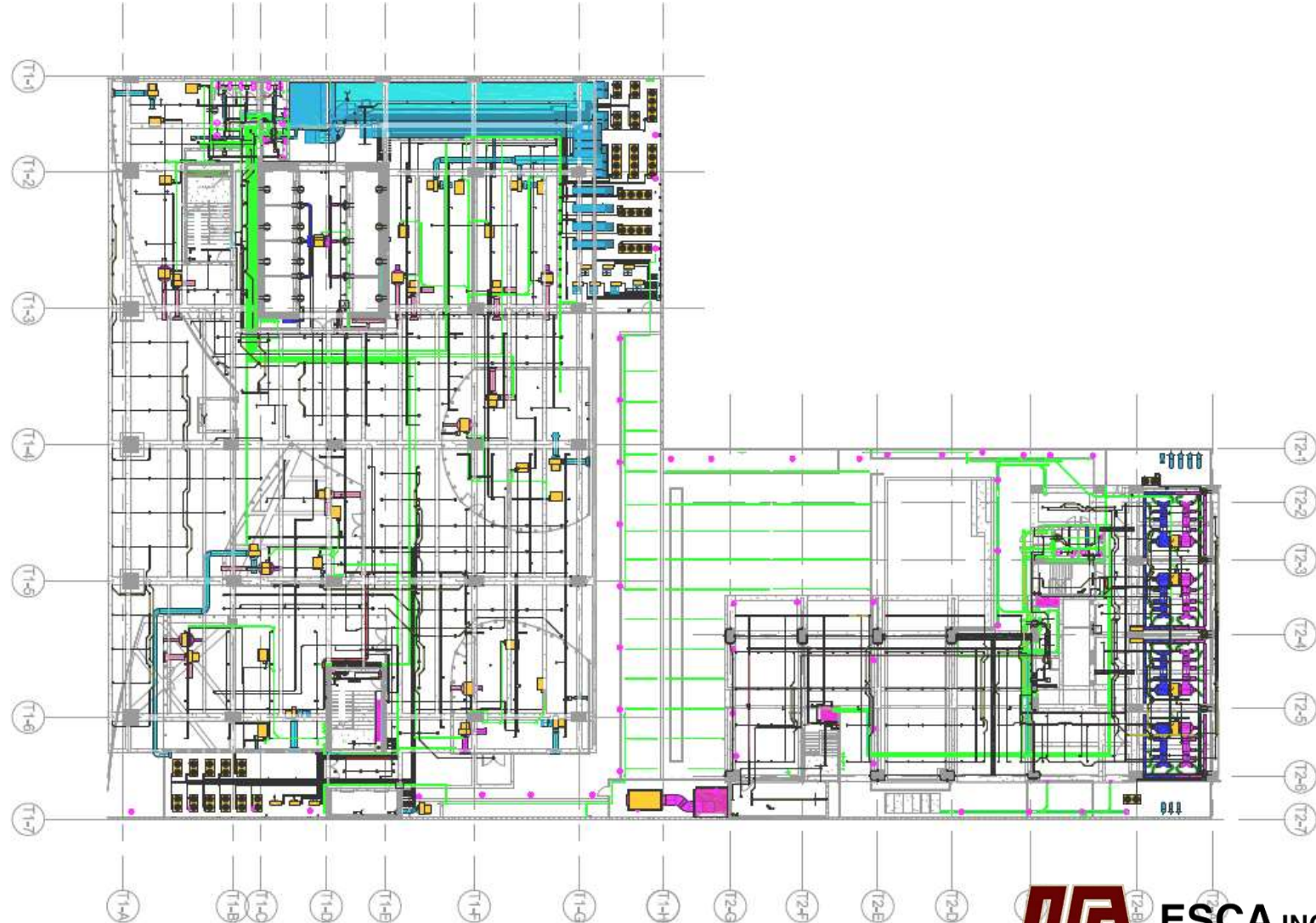
-  : LIGHTING
-  : POWER
-  : FDAS
-  : BMS
-  : TELE
-  : CATV
-  : CCTV
-  : PA
-  : SECURITY
-  : INTERCOM

FIRE ALARM

-  : FIRE PROTECTION

ARCH'L / STRUCTURAL

-  : ARCH'L / STRUCTURAL



ESCA BIM CASE STUDIES – STUDIO 7

COORDINATED INDIVIDUAL SERVICES DRAWINGS (MECHANICAL)

LEGEND :

MECHANICAL

-  : SUPPLY AIR
-  : RETURN AIR
-  : EXHAUST AIR
-  : PRESSURIZATION AIR
-  : REFRIGERANT PIPE
-  : FUEL OIL PIPE
-  : MECHANICAL EQUIPMT

PLUMBING

-  : SANITARY PIPE
-  : STORM DRAINAGE PIPE
-  : VENT PIPE
-  : COLD WATER LINE
-  : FIXTURES

ELECTRICAL

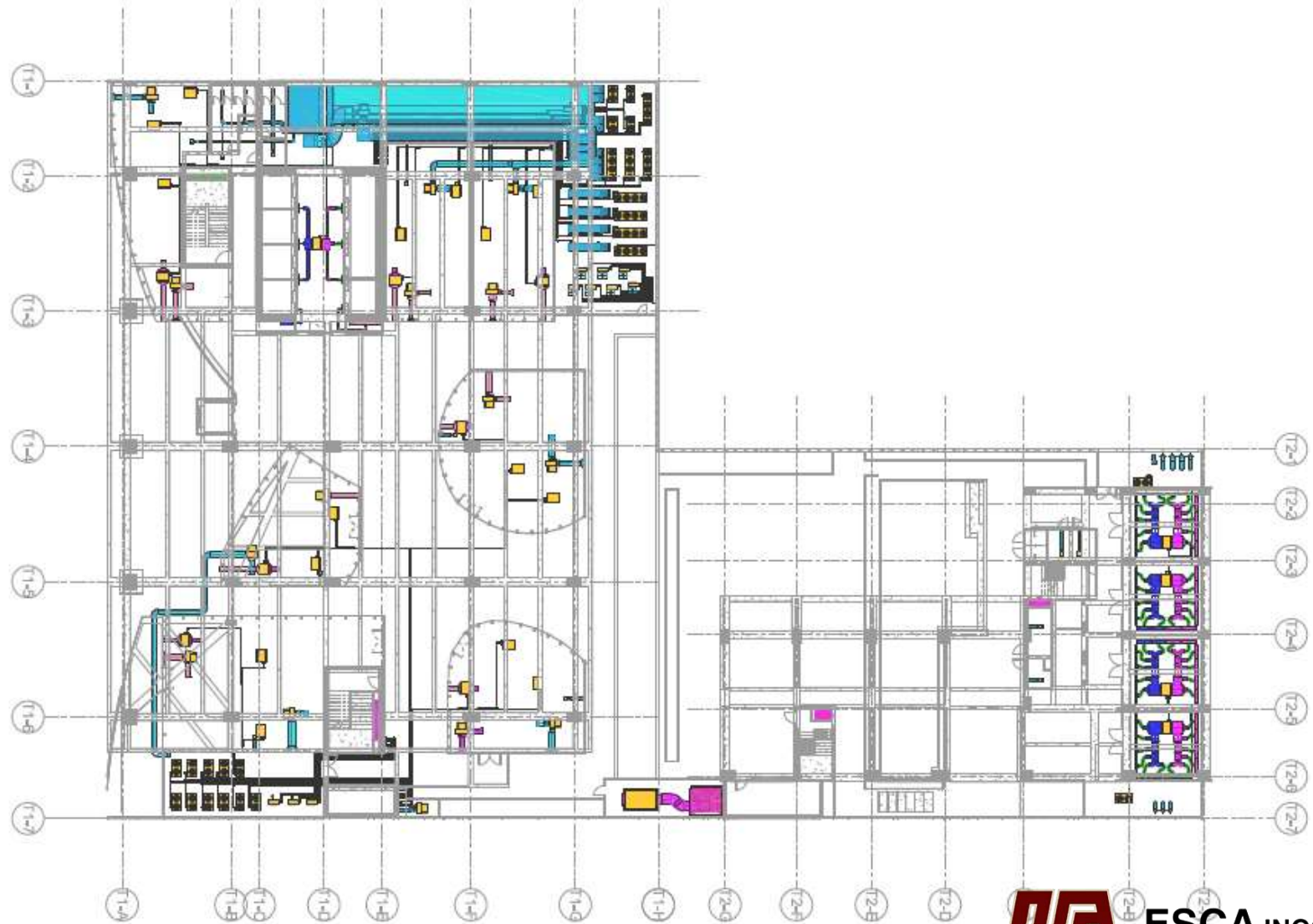
-  : LIGHTING
-  : POWER
-  : FDAS
-  : BMS
-  : TELE
-  : CATV
-  : CCTV
-  : PA
-  : SECURITY
-  : INTERCOM

FIRE ALARM

-  : FIRE PROTECTION

ARCH'L / STRUCTURAL

-  : ARCH'L / STRUCTURAL



ESCA BIM CASE STUDIES – STUDIO 7

COORDINATED INDIVIDUAL SERVICES DRAWINGS (PLUMBING)

LEGEND :

MECHANICAL

-  : SUPPLY AIR
-  : RETURN AIR
-  : EXHAUST AIR
-  : PRESSURIZATION AIR
-  : REFRIGERANT PIPE
-  : FUEL OIL PIPE
-  : MECHANICAL EQUIPMT

PLUMBING

-  : SANITARY PIPE
-  : STORM DRAINAGE PIPE
-  : VENT PIPE
-  : COLD WATER LINE
-  : FIXTURES

ELECTRICAL

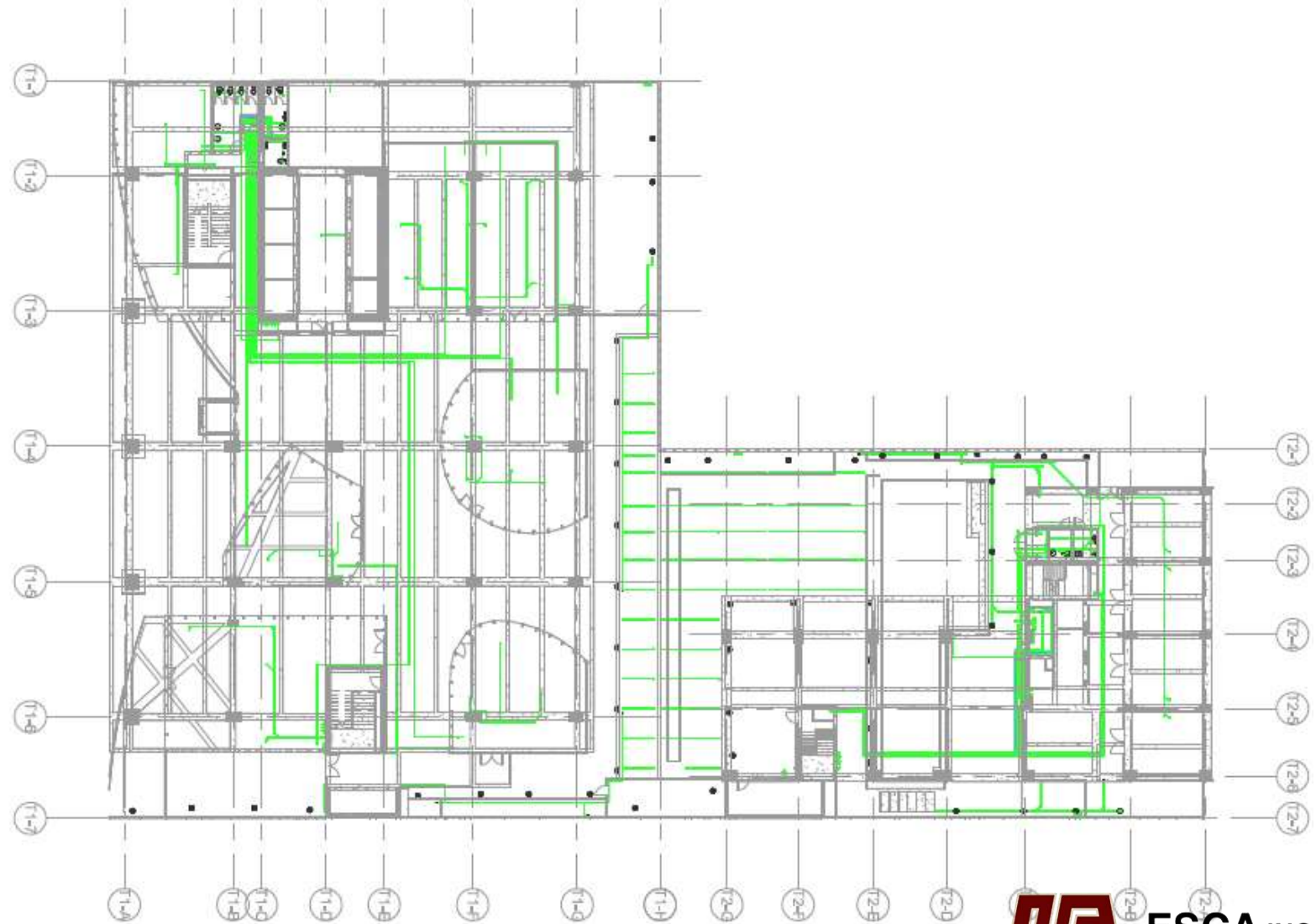
-  : LIGHTING
-  : POWER
-  : FDAS
-  : BMS
-  : TELE
-  : CATV
-  : CCTV
-  : PA
-  : SECURITY
-  : INTERCOM

FIRE ALARM

-  : FIRE PROTECTION

ARCH'L / STRUCTURAL

-  : ARCH'L / STRUCTURAL



ESCA BIM CASE STUDIES – STUDIO 7

COORDINATED INDIVIDUAL SERVICES DRAWINGS (ELECTRICAL)

LEGEND :

MECHANICAL

-  : SUPPLY AIR
-  : RETURN AIR
-  : EXHAUST AIR
-  : PRESSURIZATION AIR
-  : REFRIGERANT PIPE
-  : FUEL OIL PIPE
-  : MECHANICAL EQUIPMET

PLUMBING

-  : SANITARY PIPE
-  : STORM DRAINAGE PIPE
-  : VENT PIPE
-  : COLD WATER LINE
-  : FIXTURES

ELECTRICAL

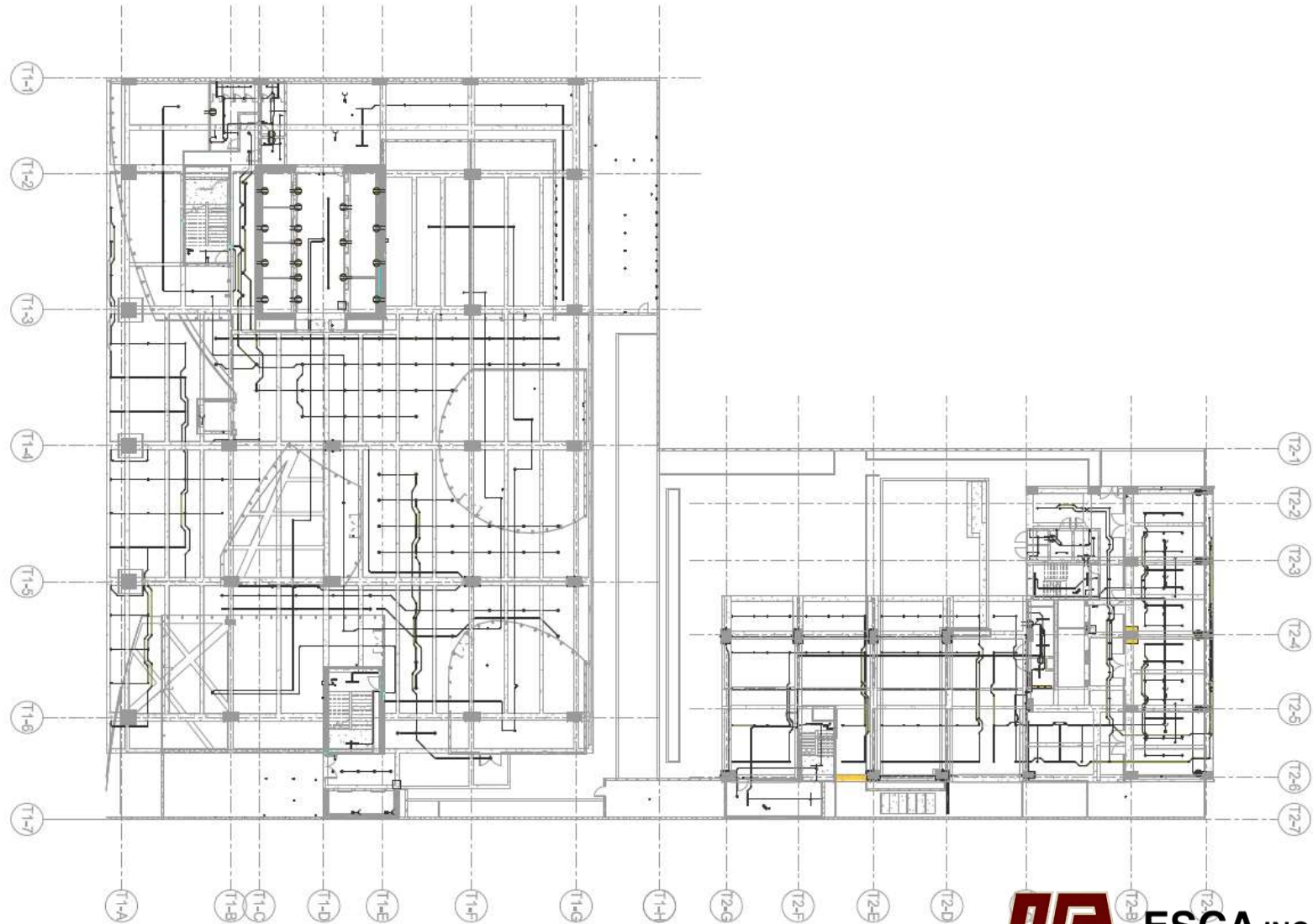
-  : LIGHTING
-  : POWER
-  : FDAS
-  : BMS
-  : TELE
-  : CATV
-  : CCTV
-  : PA
-  : SECURITY
-  : INTERCOM

FIRE ALARM

-  : FIRE PROTECTION

ARCH'L / STRUCTURAL

-  : ARCH'L / STRUCTURAL



ESCA BIM CASE STUDIES – STUDIO 7

COORDINATED INDIVIDUAL SERVICES DRAWINGS (FIRE PROTECTION)

LEGEND :

MECHANICAL

- : SUPPLY AIR
- : RETURN AIR
- : EXHAUST AIR
- : PRESSURIZATION AIR
- : REFRIGERANT PIPE
- : FUEL OIL PIPE
- : MECHANICAL EQUIPMT

PLUMBING

- : SANITARY PIPE
- : STORM DRAINAGE PIPE
- : VENT PIPE
- : COLD WATER LINE
- : FIXTURES

ELECTRICAL

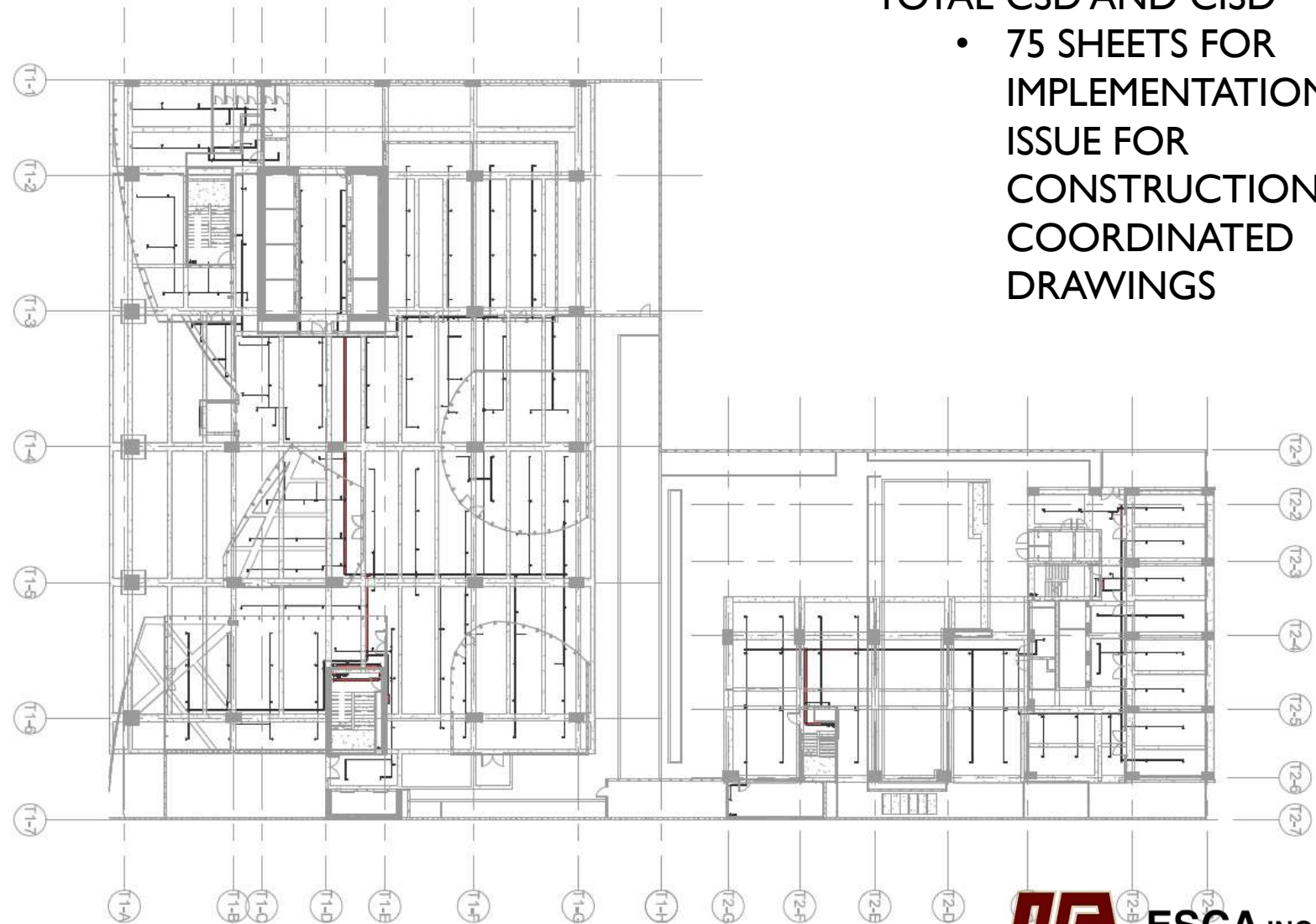
- : LIGHTING
- : POWER
- : FDAS
- : BMS
- : TELE
- : CATV
- : CCTV
- : PA
- : SECURITY
- : INTERCOM

FIRE ALARM

- : FIRE PROTECTION

ARCH'L / STRUCTURAL

- : ARCH'L / STRUCTURAL



TOTAL CSD AND CISD

- 75 SHEETS FOR IMPLEMENTATION / ISSUE FOR CONSTRUCTION COORDINATED DRAWINGS



ESCA BIM CASE STUDIES – STUDIO 7

BILL OF QUANTITIES – AS BASIS FOR BIDDING)

BASEMENT 2				
I.	CONCRETE WORKS			
	BEAM	660.51	cu.m	
	COLUMN	220.76	cu.m	
	STAIR	20.90	cu.m	
	RETAINING WALL	346.05	cu.m	
	SUSPENDED SLAB & RAMP	485.70	cu.m	
	SHEAR WALL	153.91	cu.m	
II.	FORMWORKS			
	BEAM	5201.00	sq.m	
	COLUMN	1200.00	sq.m	
	STAIR	229.00	sq.m	
	RETAINING WALL	1730.00	sq.m	
	SUSPENDED SLAB & RAMP	3752.00	sq.m	
	SHEAR WALL	866.00	sq.m	
III.	REINFORCEMENT			
	BEAM	60143.97	kgs	GRADE 60
		79772.31	kgs	GRADE 75
	COLUMN	65656.44	kgs	GRADE 60
		62393.33	kgs	GRADE 75
	STAIR	2324.62	kgs	GRADE 60
	RETAINING WALL	37512.27	kgs	GRADE 60
	SUSPENDED SLAB & RAMP	67431.04	kgs	GRADE 60
	SHEAR WALL	28630.91	kgs	GRADE 60
		9974.08	kgs	GRADE 75

BASEMENT 2			
1.1	MASONRY WORKS		
	100MM THK. CHB WALL	5q.m.	102.27
	150MM THK. CHB WALL	5q.m.	262.15
	200MM THK. CHB WALL	5q.m.	14.4
2.1	WALL & GLASS FINISHES		
	WF-04 - SMOOTH PLASTERED CEMENT WALL WITH PAINT FINISH	5q.m.	2121.81
	WF-05 - SMOOTH PLASTERED CEMENT WALL WITH SEMI-GLOSS LATEX PAINT FINISH AND GRAPHICS PAINTING. USE LOW VOC EPOXY PAINT.	5q.m.	59.93
	WF-07 - RC COLUMN/BEAM/WALL TO RECEIVE SKIM COAT, ONE COAT FINISH	5q.m.	612.12
3.1	FLOOR FINISHES		
	150MM THK. SIDEWALK/ISLAND FLOOR	5q.m.	20.38
	FF-03 - 600mm x 600mm x 10mm THK. HOMOGENEOUS FLOOR TILE IN NON-SKID MATTE FINISH. (CHINA BRAND, CLASS A)	5q.m.	3.23
	FF-05 - ANTI-SKID SURFACING SYSTEM, WAFFLE NON-SKID CONCRETE TILES OR APPROVED EQUIVALENT.	5q.m.	149.85
	PCF-01 - STRAIGHT TO FINISH FLOOR SLAB W/ NON-METALLIC FLOOR HARDENER	5q.m.	4633.666
	PCF-01a - PLAIN CEMENT IN NON-METALLIC FLOOR HARDENER IN EPOXY PAINT	5q.m.	25.94
	PCF-05 - EPOXY PAINT FOR TRAFFIC GRAPHIC SIGNS (USE LOW VOC EPOXY PAINT & COATING)	5q.m.	27.66

BASEMENT 2			
1.1	AIR TERMINALS		
	CEILING EXHAUST FAN 100MMØ	pcs.	1
	Exhaust Grille - 100x150	pcs.	1
	Exhaust Grille - 200x200	pcs.	2
	Exhaust Grille - 1500x800	pcs.	2
	Exhaust Grille - 3100x800	pcs.	1
	300x100 SUPPLY LINEAR DIFFUSER	pcs.	1
	150x150 Fresh Air Ceiling Diffuser	pcs.	2
	400x350 Fresh Air Wall Grille	pcs.	3
	Exhaust Grille - 1500x800	pcs.	1
	Exhaust Grille - 3100x800	pcs.	1
2.1	DUCT FITTINGS		
	Rectangular Elbow - Radius - 1.0 R/W		
	100 mmx100 mm-100 mmx100 mm	pcs.	40

BASEMENT 2			
1.1	CONDUITS		
	PIPES		
	2-1.6mmsq. Wiring in 20mmø IMC	lm/s.	287.99
	CAT-5E CABLE in 25mmø PVC	lm/s.	5.11
	CAT-6 in 25mmø PVC	lm/s.	729.81
	PVC 20mmø	lm/s.	2247.58
	PVC 63mmø	lm/s.	613.9
	TWISTED PAIR CABLE in 25mmø PVC	lm/s.	199.47
	25mmø FLEX PIPE	lm/s.	6.16
	20mmø FLEX PIPE	lm/s.	0.61



**BID PRICE TO
PROJECT
VALUE
OPTIMIZATION**

Project was awarded to contractor with take-off quantities closest to BIM extracted BOQ.

Coordinated Design between all trades

Re-routing according to design parameters verified using BIM

Electrical Room Study using actual commercial size



ESCA BIM CASE STUDIES – BURBANK

BUSINESS VALUE FOR PROJECT OWNER

CRITICAL DECISION- MAKING MADE EASY

BIM was leveraged for crucial budgetary decisions.

BIM was also used to validate and verify the as-built drawings to be used for the clients facilities management.

Co-relation between as-built/existing and design drawings



ESCA INCORPORATED
ENGINEERS • CONSULTANTS • PROJECT MANAGERS

ESCA BIM CASE STUDIES – OTHER PROJECTS

CONSTRUCTED PROJECT

PRINCETON MOLINO MALL

- 28,140.00 SQM COMMERCIAL
- 2 FLOORS
- FULL BIM MODELING
 - STRUCTURAL WITH REBAR
 - ARCHITECTURAL
 - MECHANICAL
 - ELECTRICAL
 - PLUMBING
 - FIRE PROTECTION
- CLASH DETECTION AND RESOLUTION
- BILL OF QUANTITIES
- 6 WEEKS DURATION



B-HOTEL

- 10 FLOORS HOTEL
- 12,442.00 SQM
- FULL BIM
 - ARCHITECTURAL
 - STRUCTURAL
 - MECHANICAL
 - PLUMBING
 - ELECTRICAL
 - FIRE PROTECTION
- CLASH DETECTION & RESOLUTION
- BILL OF QUANTITIES
- 8 WEEKS



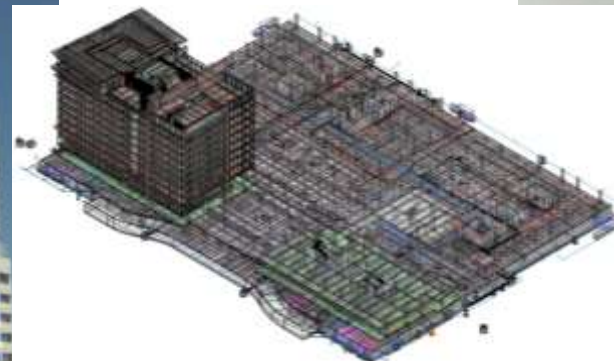
VINIA RESIDENCE + VERSAFLATS

- 35,302.00 SQM RESIDENTIAL/SOHO+COMMERCIAL
- 25 FLOORS
- FULL BIM MODELING
 - STRUCTURAL WITH REBAR
 - ARCHITECTURAL
 - MECHANICAL
 - ELECTRICAL
 - PLUMBING
 - FIRE PROTECTION
- CLASH DETECTION AND RESOLUTION
- BILL OF QUANTITIES



STUDIO A

- 26,500.00 SQM RESIDENTIAL+COMMERCIAL
- 35 FLOORS
- FULL BIM MODELING
 - STRUCTURAL WITH REBAR
 - ARCHITECTURAL
 - MECHANICAL
 - ELECTRICAL
 - PLUMBING
 - FIRE PROTECTION
- CLASH DETECTION AND RESOLUTION
- BILL OF QUANTITIES



ESCA INCORPORATED
ENGINEERS • CONSULTANTS • PROJECT MANAGERS

ESCA BIM CASE STUDIES – OTHER PROJECTS

DEVELOPERS



CASA SEVILLE

- 5 FLOORS RESIDENTIAL
- FULL BIM MODELING
 - STRUCTURAL WITH REBAR
 - ARCHITECTURAL
 - MECHANICAL
 - ELECTRICAL
 - PLUMBING
 - FIRE PROTECTION
- CLASH DETECTION AND RESOLUTION
- BILL OF QUANTITIES
- 6 WEEKS DURATION



ONE BINONDO

- 8 FLOORS PODIUM + 2 BASEMENT + 3 RESIDENTIAL TOWERS + 1 BPO TOWER)
- 350,000.00 SQM
- FULL BIM
 - ARCHITECTURAL
 - STRUCTURAL
 - MECHANICAL
 - PLUMBING
 - ELECTRICAL
 - FIRE PROTECTION
- SD TO CD PHASE
- CLASH DETECTION & RESOLUTION
- BILL OF QUANTITIES

SERULYAN

- 4 FLOORS PODIUM + 2 RESIDENTIAL TOWERS
- 20,618.00 SQM
- FULL BIM
 - ARCHITECTURAL
 - STRUCTURAL
 - MECHANICAL
 - PLUMBING
 - ELECTRICAL
 - FIRE PROTECTION
- SD TO CD PHASE
- CLASH DETECTION & RESOLUTION
- BILL OF QUANTITIES



- 40 FLOOR MIXED-USE STRUCTURE COMMERCIAL+RESIDENTIAL
- 47,866.27 SQM
- STRUCTURAL
- BILL OF QUANTITIES WITH REBAR
- DD TO CD



ACTIVA

- MIXED-USE STRUCTURE COMPOSED OF 7 BASEMENT, 5 FLOOR PODIUM, 13 FLOORS BPO TOWER & 29 FLOORS SOHO TOWER, 32 FLOOR RESIDENTIAL TOWER, 14 FLOORS HOTEL
- 143,240 SQM
- FULL BIM
 - ARCHITECTURAL
 - STRUCTURAL
 - MECHANICAL
 - PLUMBING
 - ELECTRICAL
 - FIRE PROTECTION
- CLASH DETECTION & RESOLUTION
- BILL OF QUANTITIES
- DD TO CD



NAKPIL DORMITORY

- 22 FLOORS DORMITORY
- 16,011.00 SQM
- FULL BIM
 - ARCHITECTURAL
 - STRUCTURAL
 - MECHANICAL
 - PLUMBING
 - ELECTRICAL
 - FIRE PROTECTION
- CLASH DETECTION & RESOLUTION
- BILL OF QUANTITIES
- 8 WEEKS



100 WEST

- 69,000.00 SQM
- 39 FLOORS MIXED USE COMMERCIAL, RESIDENTIAL, BPO
- FULL BIM
 - ARCHITECTURAL
 - STRUCTURAL
 - MECHANICAL
 - PLUMBING
 - ELECTRICAL
 - FIRE PROTECTION
- CLASH DETECTION & RESOLUTION
- BILL OF QUANTITIES

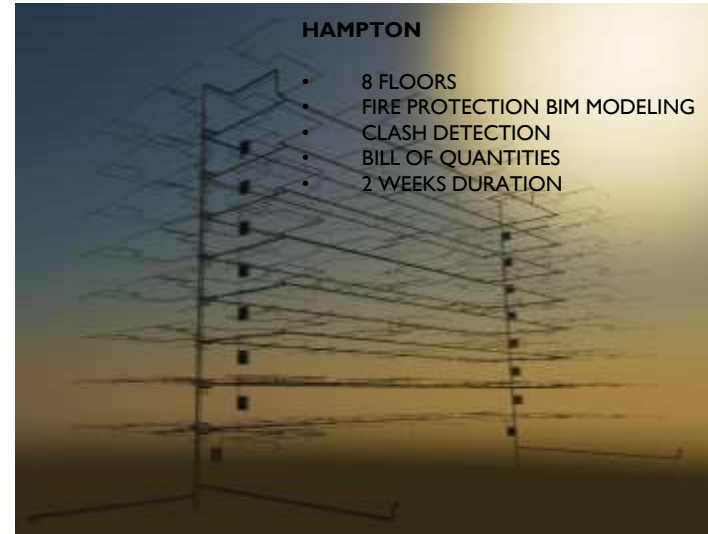
CASE STUDIES – OTHER PROJECTS

CONTRACTORS / BUILDERS



DOUBLE DRAGON PLAZA

- MIXED-USE COMMERCIAL BPO
- 54,195 SQM
- MEPP
 - CLASH DETECTION & RESOLUTION
 - CSD & ISD (FOR SITE IMPLEMENTATION DRAWINGS)
 - CONSTRUCTION SUPPORT



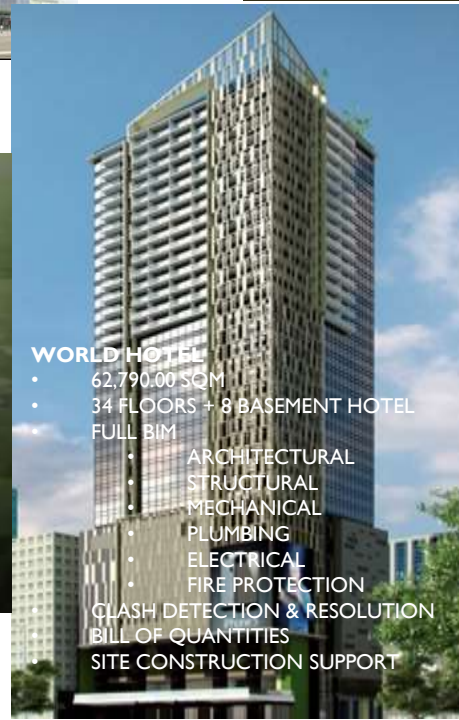
HAMPTON

- 8 FLOORS
- FIRE PROTECTION BIM MODELING
- CLASH DETECTION
- BILL OF QUANTITIES
- 2 WEEKS DURATION



QUAD 1 AERO PARK

- MIXED-USE COMMERCIAL+BPO
- 117,300.00 SQM
- FULL BIM
 - CLASH DETECTION & RESOLUTION
 - B.O.Q. PRECON AND POST CON
- CONSTRUCTION SUPPORT



WORLD HOTEL

- 62,790.00 SQM
- 34 FLOORS + 8 BASEMENT HOTEL
- FULL BIM
 - ARCHITECTURAL
 - STRUCTURAL
 - MECHANICAL
 - PLUMBING
 - ELECTRICAL
 - FIRE PROTECTION
- CLASH DETECTION & RESOLUTION
- BILL OF QUANTITIES
- SITE CONSTRUCTION SUPPORT



B-HOTEL

- 10 FLOORS HOTEL
- 12,442.00 SQM
- FULL BIM
 - ARCHITECTURAL
 - STRUCTURAL
 - MECHANICAL
 - PLUMBING
 - ELECTRICAL
 - FIRE PROTECTION
- CLASH DETECTION & RESOLUTION
- BILL OF QUANTITIES
- 8 WEEKS



BUSINESS VALUE

ALL ROADS LEAD TO THE BOTTOMLINE

Technology adaptors reap the combined benefits from all stakeholders

- ✓ Cost Savings
- ✓ Schedule Reduction
- ✓ Easier Design Comprehension
- ✓ On-Site Issue Mitigation
- ✓ Critical Decision Aid
- ✓ Reduced Manpower



ESCA INCORPORATED
ENGINEERS • CONSULTANTS • PROJECT MANAGERS

DR. DE CASTRO'S ADVOCACY
TRANSPARENCY AND QUALITY

ESCA ACADEMY





ESCA INCORPORATED

ENGINEERS • CONSULTANTS • PROJECT MANAGERS

ESCA Global Centre
8th Avenue, Murphy
Cubao, Quezon City
Metro Manila
Philippines 1109

Ernesto S de Castro, PhD
President

esdec@escaengineers.com