



e-Government Agency Data Center Upgrade

Mechanical System of 5&6 th Car park , 11 th Floor PLAN Phase II For Tender

01/07/2013



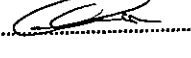
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SYMBOLS, ABBREVIATION AND DRAWING LIST

DRAWING LIST				AIR SIDE SYMBOL				VALVE AND ACCESSORIES SYMBOL	
DWG. NO.	DESCRIPTION	SYMBOLS	DESCRIPTION	SYMBOLS	DESCRIPTION	SYMBOLS	DESCRIPTION	SYMBOLS	DESCRIPTION
	งานระบบปรับอากาศและระบบอาคาร	LSR	LINEAR SLOT RETURN		FAN SWITCH CONTROL BY TEMPERATURE SENSOR		SUPPLY AIR GRILLE (ROUND AND SQUARE)		REDUCER CONCENTRIC
ME-01	DRAWING LIST & ABBREVIATION	LSD	LINEAR SLOT DIFFUSER	S	FAN SWITCH WITH INDICATING LAMP		SIDE WALL SUPPLY AIR GRILLE, WITH NECK SIZE, CFM CAPACITY		FLANGE
ME-02	AIR CONDITIONING SYSTEM EQUIPMENT SCHEDULE PHASE II	MAX	MAXIMUM	GD	GRAVITY DAMPER		SIDE WALL RETURN AIR GRILLE, WITH NECK SIZE, CFM CAPACITY		REMOVABLE CAP END
ME-03	(DEMOLITION) AIR CONDITIONING SYSTEM PHASE II (LEVEL 11)	MIN	MINIMUM	EAG	EXHAUST AIR GRILLE (WITH INSECT SCREEN)		SIDE WALL FRESH AIR GRILLE, WITH NECK SIZE, CFM CAPACITY		BLIND FLANGE END
ME-04	(DEMOLITION) AIR CONDITIONING SYSTEM LAYOUT PLAN PHASE II (LEVEL 6)	m.	METRE	EAR	EXHAUST AIR REGISTER (WITH VOLUME DAMPER)		DOOR LOUVER, SUPPLIED BY OTHER		CLEANOUT OR PLUG
ME-05	AIR CONDITIONING SYSTEM LAYOUT PLAN PHASE II (LEVEL 11)	mm.	MILLIMETRE	F	DEGREE FAHRENHEIT		VOLUME DAMPER		STRAINER WITH BLOW-OFF
ME-06	AIR CONDITIONING SYSTEM DUCTWORK LAYOUT PLAN PHASE II (LEVEL 11)	ND	NEAREST DRAIN	FAD	FRESH AIR DUCT		OPPOSED BLADE VOLUME DAMPER		COLD WATER PIPE
ME-07	VENTILATION SYSTEM DUCTWORK (GENERATOR ROOM) PHASE II (LEVEL 5)	RAD	RETURN AIR DUCT	FAG	FRESH AIR GRILLE (WITH INSECT SCREEN)		VOLUME DAMPER, BUTTERFLY TYPE		FIRE PROTECTION PIPE
ME-08	AIR CONDITIONING SYSTEM PIPING WORK LAYOUT PLAN PHASE II (LEVEL 11)	RAG	RETURN AIR GRILLE	FAR	FRESH AIR REGISTER (WITH VOLUME DAMPER)		MOTORIZED VOLUME DAMPER		SOIL PIPE
ME-09	SANITARY SYSTEM PIPING WORK PHASE II (LEVEL 11)	RAR	RETURN AIR REGISTER (WITH VOLUME DAMPER)	IN. WG.	INCH WATER GAUGE		ACCESS DOOR, INDICATED SIZE		WASTE PIPE
ME-10	(DEMOLITION) FIRE PROTECTION SYSTEM PHASE II (LEVEL 11)	SAD	SUPPLY AIR DUCT	kw.	KILOWATT		FIRE DAMPER AND SLEEVE		VENT PIPE
ME-11	WATER LEAK DETECTION SYSTEM PHASE II (LEVEL 11)	SAG	SUPPLY AIR GRILLE TWO DIRECTION ADJUSTABLE BLADE				SOUND ATTENUATOR		KITCHEN WASTE PIPE
ME-12	WATER LEAK DETECTION SYSTEM INSTALLATION DETAIL PHASE II (LEVEL 11)	SAR	SUPPLY AIR REGISTER (WITH VOLUME DAMPER)		FIRE PROTECTION SYMBOL		FLEXIBLE DUCT CONNECTION		RAIN LEADER PIPE
ME-13	VESDA SYSTEM PHASE II (LEVEL 11)	SP	SERVICE PANEL	SYMBOLS	DESCRIPTION		AIR FILTER		CHEMICAL FEED PIPE
ME-14	VESDA SYSTEM INSTALLATION DETAIL PHASE II (LEVEL 11)	TAD	TRANSFER AIR DUCT		DRY CHEMICAL EXTINGUISHER		COOLING COIL		VENT THROUGH ROOF
ME-15	FIRE PROTECTION SYSTEM OPERATION DIAGRAM	TAG	TRANSFER AIR GRILLE		CO2 PORTABLE EXTINGUISHER		SPLITTER DAMPER		FLOOR CLEANOUT
ME-16	FIRE PROTECTION SYSTEM SEVER ROOM LAYOUT PLAN (ABOVE RAISE FLOOR)	TAR	TRANSFER AIR REGISTER				INSIDE INSULATION OR DUCT LINER		FLOOR DRAIN
ME-17	FIRE PROTECTION SYSTEM SEVER ROOM LAYOUT PLAN (ABOVE CEILING)	T/B	TO BELOW				DUCT SLOPE 1:200		ROOF DRAIN
ME-18	FIRE PROTECTION SYSTEM SEVER ROOM LAYOUT PLAN (UNDER RAISE FLOOR)	VD	VOLUME DAMPER				EXHAUST FAN CEILING TYPE		WATER METER
ME-19	FIRE DETECTION SYSTEM SEVER ROOM LAYOUT PLAN (ABOVE RAISE FLOOR)	W/	WITH				EXHAUST FAN WALL TYPE		GATE VALVE
ME-20	FIRE DETECTION SYSTEM SEVER ROOM LAYOUT PLAN (ABOVE CEILING)	W/D	WITHOUT						GATE VALVE (NON-RISING STEM)
ME-21	FIRE DETECTION SYSTEM SEVER ROOM LAYOUT PLAN (UNDER RAISE FLOOR)	FD	FIRE DAMPER		AIR SIDE SYMBOL	SYMBOLS	DESCRIPTION		CHECK VALVE
ME-22	ISOMETRIC DIAGRAM FIRE PROTECTION FOR SEVER ROOM SHEET 1	FS	FLOW SWITCH	SYMBOLS	DESCRIPTION		MAN HOLE		BALL VALVE
ME-23	ISOMETRIC DIAGRAM FIRE PROTECTION FOR SEVER ROOM SHEET 2	GD	GRAVITY DAMPER		DUCT SIZE, FIRST SIZE SHOW, SECOND FIGURE SIZE NOT SHOWN		ELBOW 90 DEGREE		BUTTERFLY VALVE
ME-24	DETAIL FIRE PROTECTION SYSTEM FOR SEVER ROOM	AMCC	AIR CONDITIONING MOTOR CONTROL CENTER		DUCT SECTION, POSITIVE PRESSURE, FIRST FIGURE IS TOP SIDE		ELBOW 45 DEGREE		MECHANICAL FLOAT VALVE
		AV	AUTOMATIC AIR VENT		DUCT SECTION, NEGATIVE PRESSURE, FIRST FIGURE IS TOP SIDE		ELBOW, TURNED UP		MODULATING FLOAT VALVE
		BLDG	BUILDING		DUCT ELBOW UP		ELBOW, TURNED DOWN		PUMP
DT-01	AIR CONDITIONING SYSTEM TYPICAL DETAIL SHEET 1	C	DEGREE CELCIUS		DUCT ELBOW DOWN		LONG RADIUS ELBOW		LEVEL SWITCH ELECTRODE TYPE
DT-02	AIR CONDITIONING SYSTEM TYPICAL DETAIL SHEET 2	CD	CEILING DIFFUSER		ROUND ELBOW		TEE LOCKING UP		AIR CHAMBER
DT-03	AIR CONDITIONING SYSTEM TYPICAL DETAIL SHEET 3	CLG	CEILING		ROUND ELBOW WITH TURNING VANE		TEE LOCKING DOWN		AUTOMATIC AIR VENT
		cm.	CENTIMETRE		DUCT TRANSITION		CONNECTION TOP		BOTTOM OF PIPE
		D	DRAIN		2x3/4" LSD. 1.2 m. LONG (2=NO.OF SLOT, 3/4"WIDTH OF SLOT 1.20 m. LENGTH OF SLOT)		CONNECTION DOWN		BOOSTER PUMP
		DN	DOWN		EXHAUST AIR DUCT		TEE		VENT THROUGH ROOF
		EAD	EXHAUST AIR DUCT		EXHAUST AIR GRILLE, WITH VOLUME DAMPER		REDUCER		HOSE BIB
		Ⓞ	THERMOSTAT		RETURN AIR GRILLE				



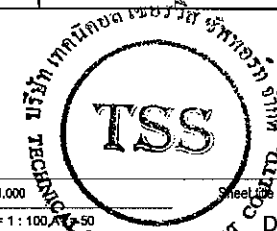
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EGA MAIN DATA CENTER UPGRADE PHASE II
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DRAWING LIST & ABBREVIATION & SYMBOL MECHANICAL SYSTEM

ME-01



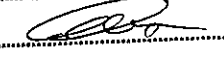
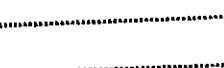
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AIR CONDITIONING EQUIPMENT SCHEDULE BUILDING 1&2																		
Floor	Equipment Number	Quantity (SET)	FAN COIL UNIT				Air Entering Temperature (C DB/C WB)	Compressor Type	SST (F)	Power Supply V/PH/Hz	Wiring & Conduit (A)	Wiring & Conduit (B)	Piping			Type	MODEL (OUTDOOR/INDOOR)	Note
			Net TC (BTUH)	Net SHC (BTUH)	Supply Air (CFM)	Power Supply V/PH/Hz							Drain W/Ins.	Suction Line W/Ins.	Liquid Line W/Ins.			
11 th	CRAC-01 - 06	6	> 174,0000	> 170,000	Manufacturer Standard	380/3/50	26.7/19.5	SCROLL	45	380/3/50	4-10/6mm2 THW., 1 1/4 C	4-10/6mm2 THW., 1 1/4 C	Manufacturer Standard	Manufacturer Standard	Manufacturer Standard	COMPUTER ROOM AIRCONDITIONER	Manufacturer Standard	
11 th	FCU-01	1	24000	19200	600	220/1/50	26.7/19.5	SCROLL / ROTARY	45	220/1/50	2-6/4mm2 THW., 3/4 C	2-4/2.5mm2 THW., 1/2 C	Manufacturer Standard	Manufacturer Standard	Manufacturer Standard	WALL MOUNTED	Manufacturer Standard	

EXHAUST FAN SCHEDULE							
PROJECT	Level	UNIT NO.	QUANTITY SET(S)	AIR FLOW @ (CFM.)	TYPE	POWER SUPPLY (V/PH/Hz)	CONTROL
EGA	5	V-6-01-04	4	3000	WALL MOUNTED	220/1/50	WITH TEMP CONTROL PANEL
EGA	11	V-11-01	1	500	CEILING MOUNTED	220/1/50	SWITCH ON/OFF
EGA	11	V-11-02	1	200	CEILING MOUNTED	220/1/50	INTERLOCK WITH LIGHTING
EGA	11	V-11-03	1	300	CEILING MOUNTED	220/1/50	INTERLOCK WITH LIGHTING

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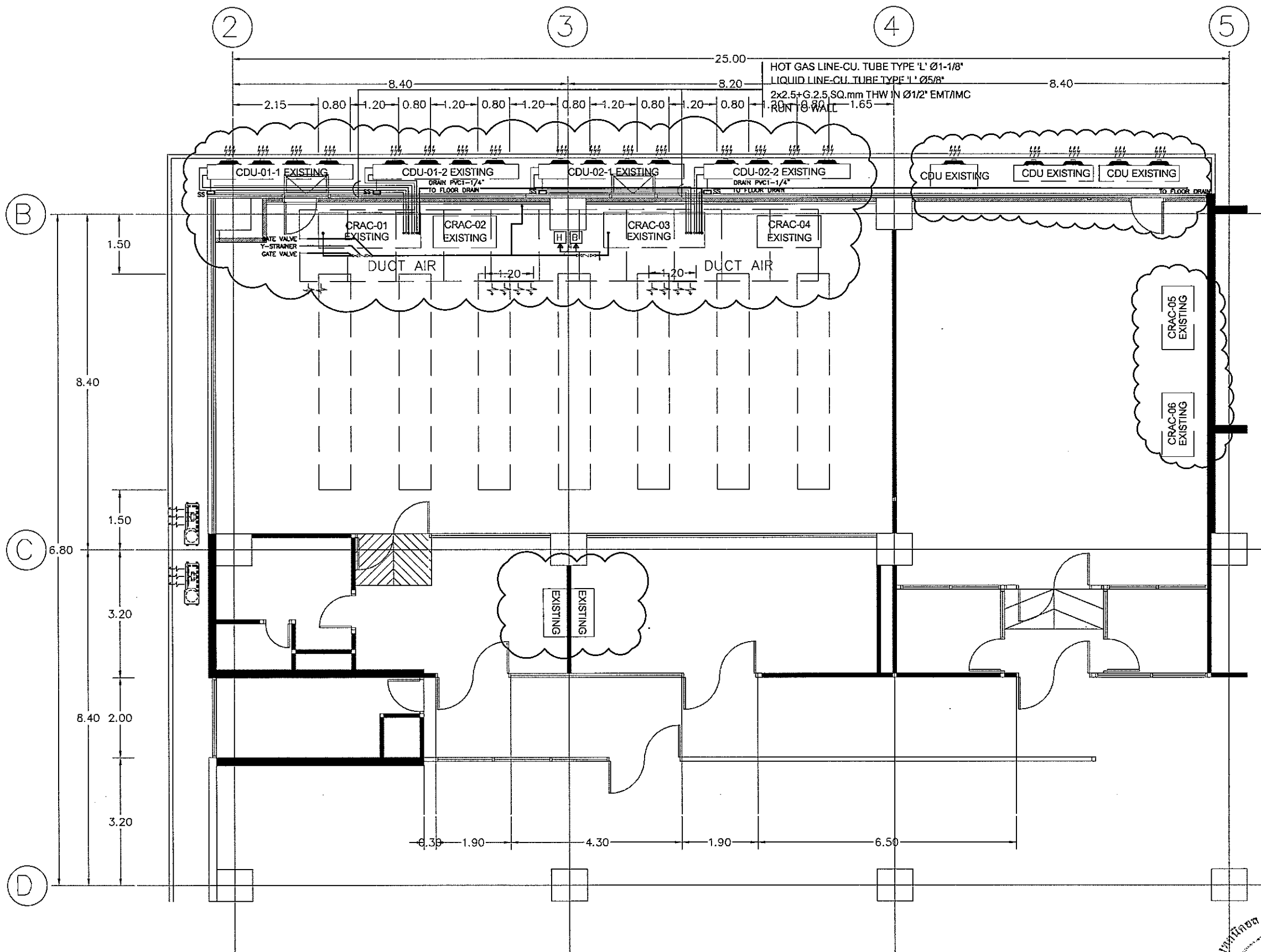
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AIR CONDITIONING SYSTEM
EQUIPMENT SCHEDULE
PHASE II

ME-02

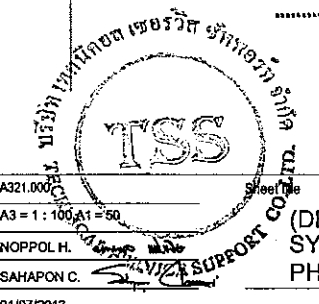
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- NOTE :
- THE CONTRACTOR SHALL REMOVE EXISTING CRAC EQUIPMENT AND PIPING SYSTEM AND HANDOVER TO EGA
 - THE CONTRACTOR SHALL SEAL ALL WALL PENETRATION TO AVOID ANY AIR INFILTRATION INTO THE ROOM
 - THE CONTRACTOR SHALL REMOVE EXISTING SPLIT TYPE AIR CONDITIONER AND PIPING FROM NOC AND STAGING ROOM AND RETURN TO EGA
 - THE CONTRACTOR SHALL REMOVE EXISTING DUCTWORK AND SUPPORT
 - THE CONTRACTOR SHALL REMOVE EXISTING CW PIPE UNDER RAISE FLOOR AND PLUG DURING CONSTRUCTION FOR FUTURE USE
 - THE CONTRACTOR SHALL REMOVE EXISTING CDU FOUNDATION AND CLEAN UP THE AREA

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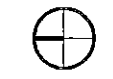
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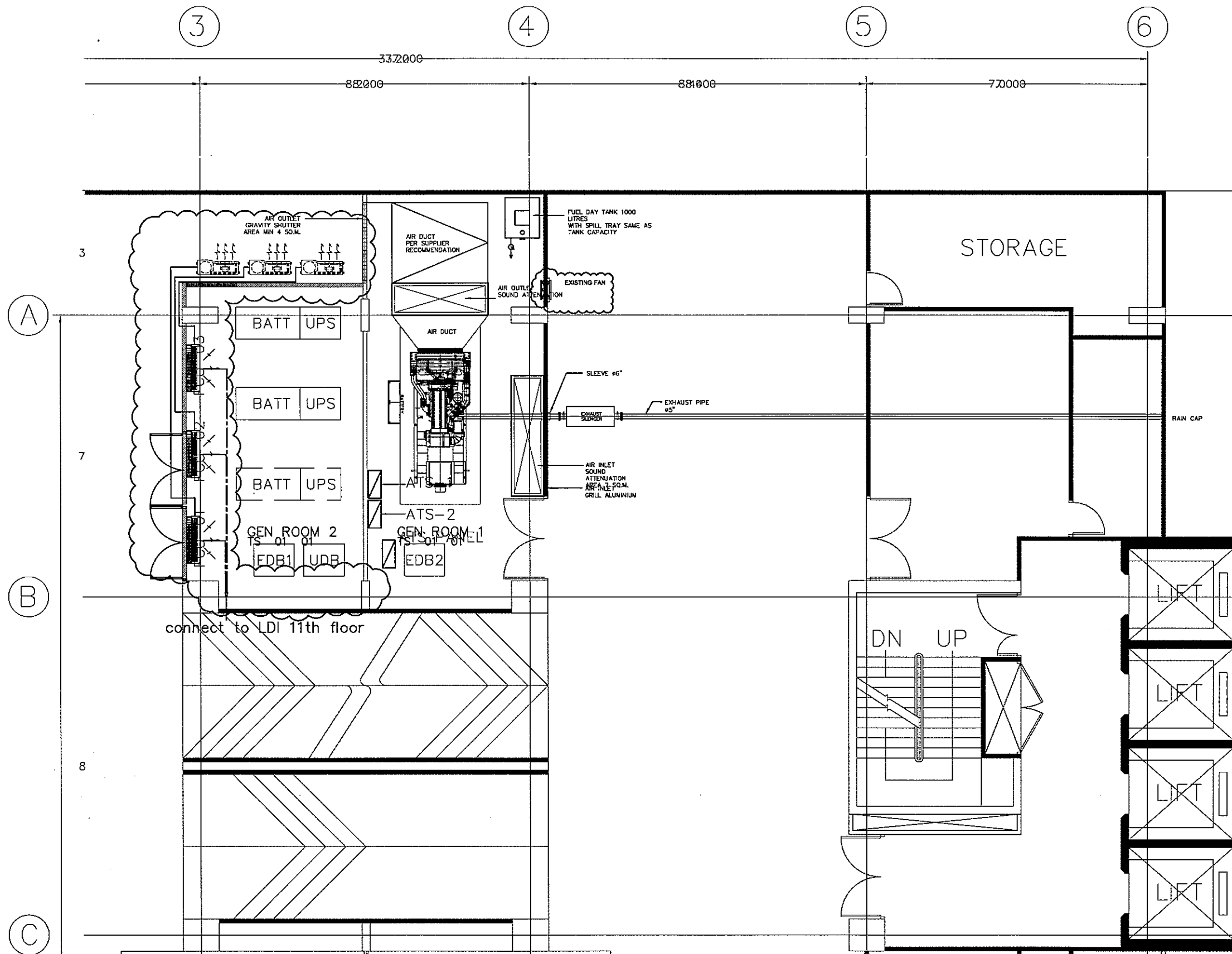
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(DEMOLITION) AIR CONDITION
 SYSTEM LAYOUT PLAN
 PHASE II (LEVEL 11)

ME-03



NOTE : THE CONTRACTOR SHALL REMOVE EXISTING SPLIT TYPE AIR CONDITIONER, CONTROL AND PIPING FROM UPS ROOM AND RETURN TO EGA
 : THE CONTRACTOR SHALL SEAL ALL WALL PENETRATION TO AVOID ANY AIR INFILTRATION INTO THE ROOM



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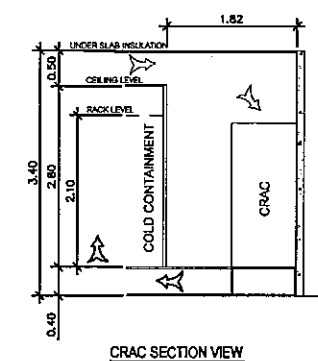
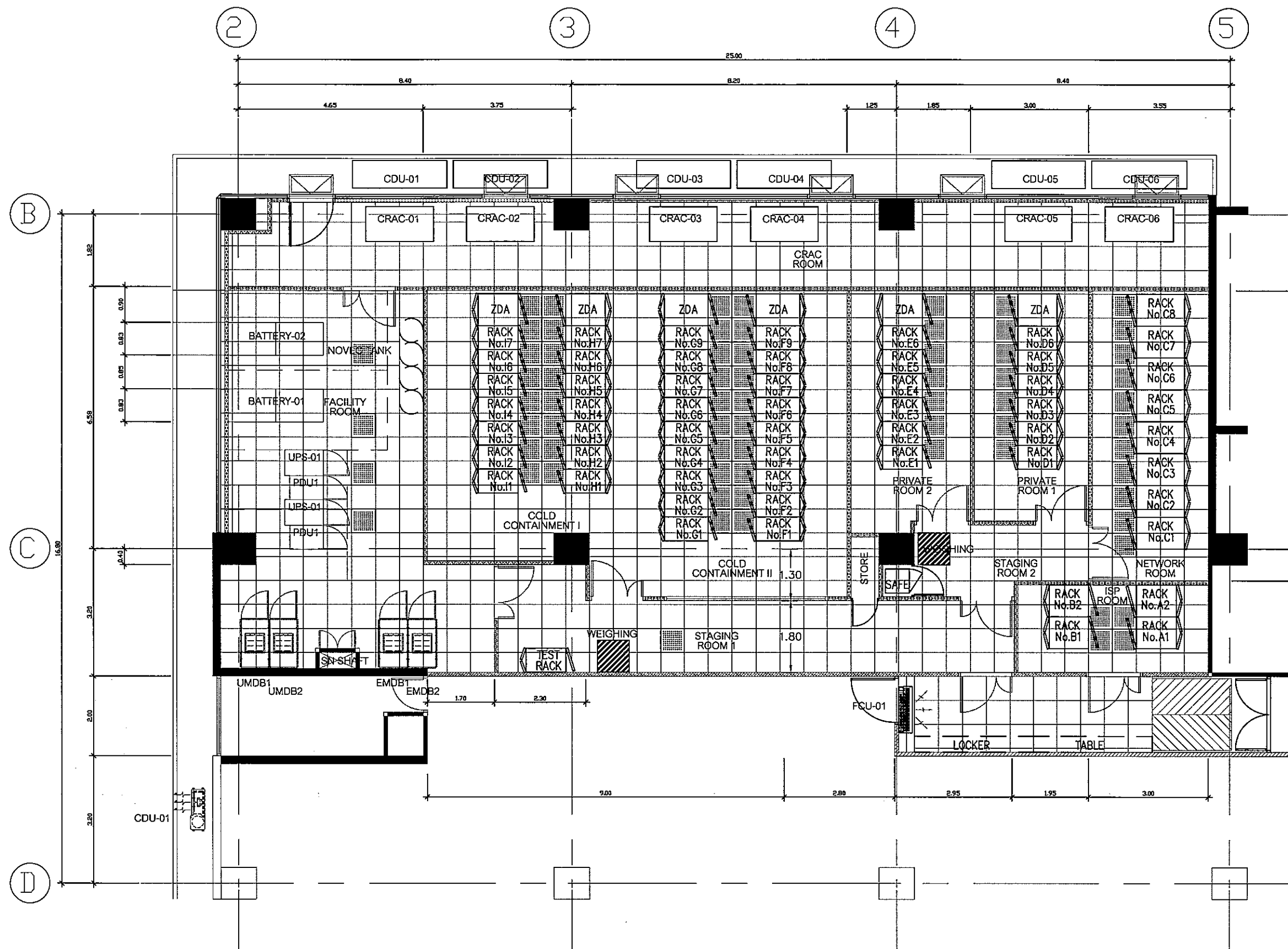


DEMOLITION) AIR CONDITION
 SYSTEM LAYOUT PLAN
 PHASE II (LEVEL 6)

ME-04



- NOTE :
- THE CONTRACTOR SHALL PROVIDE NEW EQUIPMENT SUPPORT
 - THE CONTRACTOR SHALL REMOVE EXISTING CRAC AND RETURN TO EGA FOR FURTHER ACTION
 - THE CONTRACTOR SHALL SUPPLY & INSTALL NEW PERFORATE TILE WITH VOLUME DAMPER
 - THE CONTRACTOR SHALL CLEAN UP BALCONY AFTER FINISH INSTALLATION



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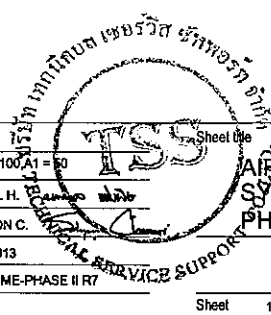


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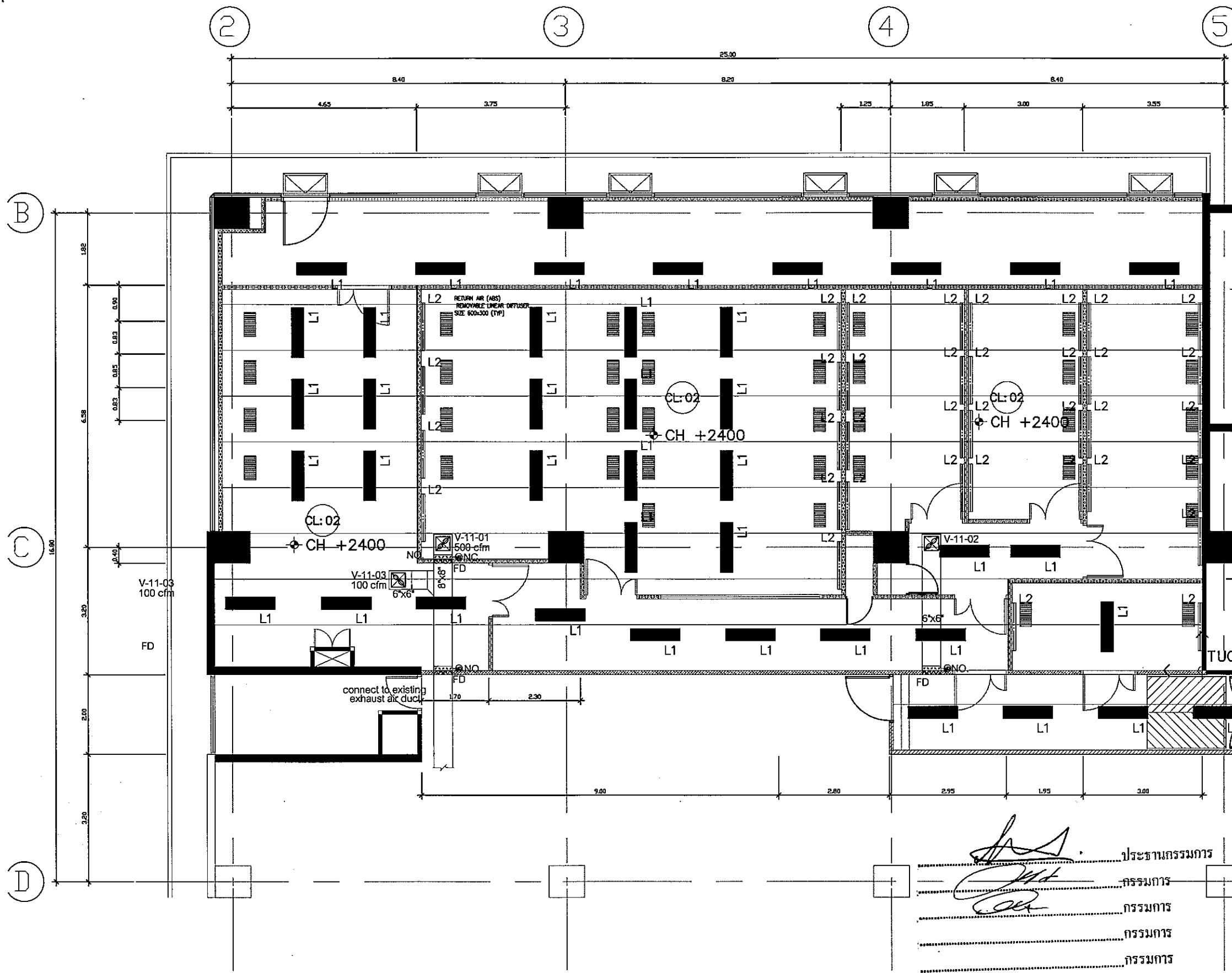
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AIR CONDITION
SYSTEM LAYOUT PLAN
PHASE II (LEVEL 11)

ME-05
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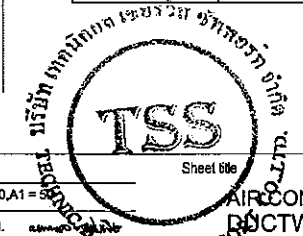




- NOTE :
- THE CONTRACTOR SHALL REMOVE MAIN HEADER DUCTWORK INSTALL IN PHASE I
 - THE CONTRACTOR SHALL INSTALL INSULATION FOR SLAB AND WALL ABOVE CEILING LEVEL WITH ELECTROMETRIC CLOSE CELL 1" THICK
 - THE CONTRACTOR SHALL INSTALL FIRE BARRIER FOR ANY PENETRATION OF FIRE WALL
 - THE CONTRACTOR SHALL INSTALL SILICONE FOR ANY PENETRATION THROUGH ANY COLD WALL AND COLD CEILING TO AVOID ANY AIR LEAKAGE

REFLECT CEILING & LIGHTING LEGEND	
SYMBOL	DESCRIPTION
+CH :+XXXX	CEILING HEIGHT
CL:EP	EXISTING SLAB PAINT IN BLACK
CL:01	ACOUSTIC CEILING TILE SIZE 600X1200MM.
CL:02	PLASTER BOARD CEILING
L1	SUSPENDED FLUORESCENT T5 2x28W
L1A	RECESSED FLUORESCENT T5 2x28W
L2	SURFACE MOUNTED FLUORESCENT T5 2x28W
L2	COMPACT FLUORESCENT DOWN LIGHT
S	1 WAY SWITCH
S ₂	2 WAY SWITCH
S _{AU}	AUTO ON/OFF SWITCH
SAG	SUPPLY AIR GRILL
RAG	RETURN AIR GRILL WITH VOLUME DAMPER
A/C	CONCEAL TYPE A/C WITH RETURN GRIL
A/C	WALL TYPE A/C
F	EXHAUST FAN

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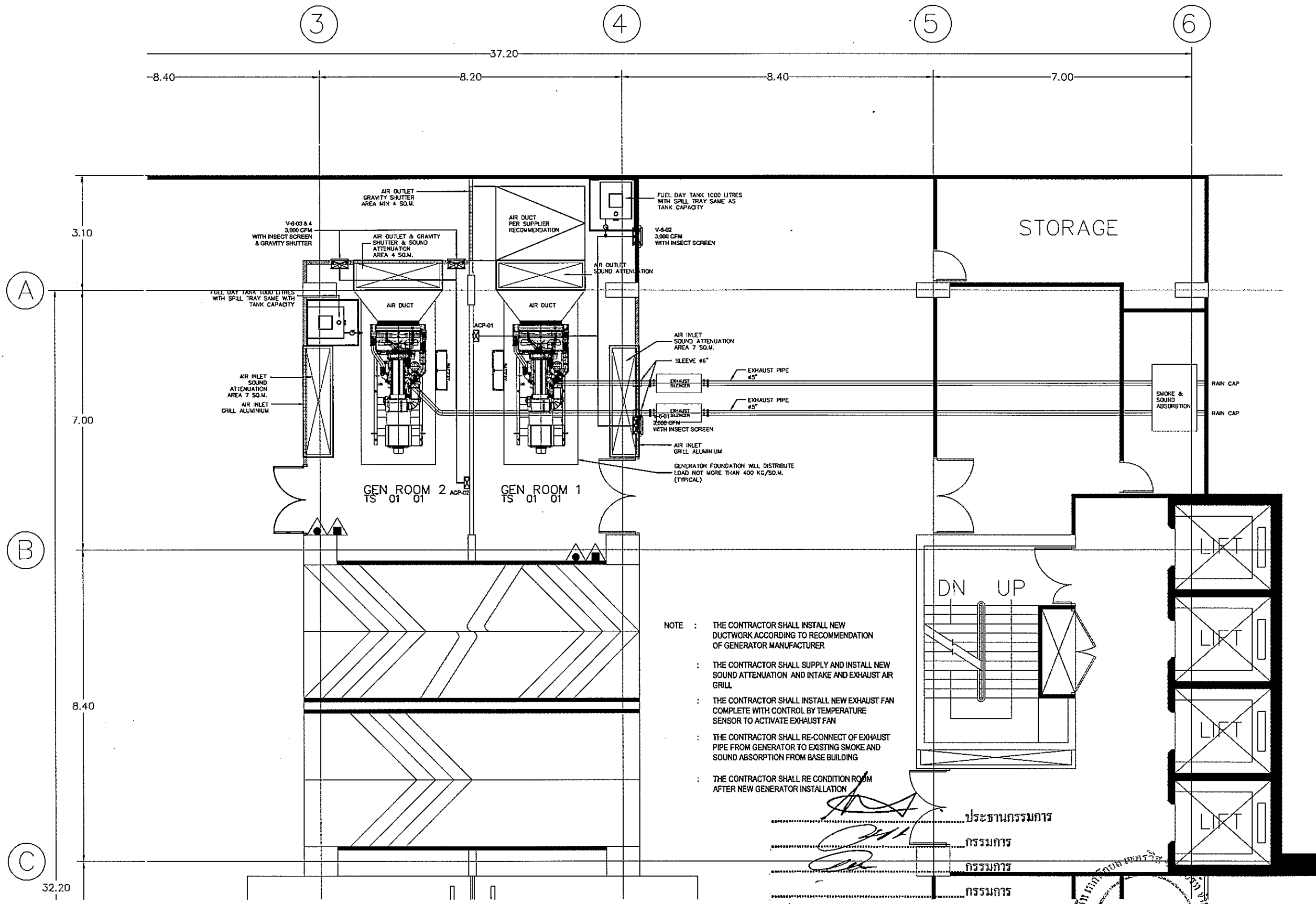
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AIR CONDITIONING SYSTEM
DUCTWORK LAYOUT PLAN
PHASE II (LEVEL 11)

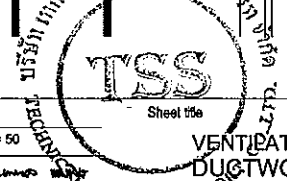
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- NOTE :
- THE CONTRACTOR SHALL INSTALL NEW DUCTWORK ACCORDING TO RECOMMENDATION OF GENERATOR MANUFACTURER
 - THE CONTRACTOR SHALL SUPPLY AND INSTALL NEW SOUND ATTENUATION AND INTAKE AND EXHAUST AIR GRILL
 - THE CONTRACTOR SHALL INSTALL NEW EXHAUST FAN COMPLETE WITH CONTROL BY TEMPERATURE SENSOR TO ACTIVATE EXHAUST FAN
 - THE CONTRACTOR SHALL RE-CONNECT OF EXHAUST PIPE FROM GENERATOR TO EXISTING SMOKE AND SOUND ABSORPTION FROM BASE BUILDING
 - THE CONTRACTOR SHALL RE CONDITION ROOM AFTER NEW GENERATOR INSTALLATION

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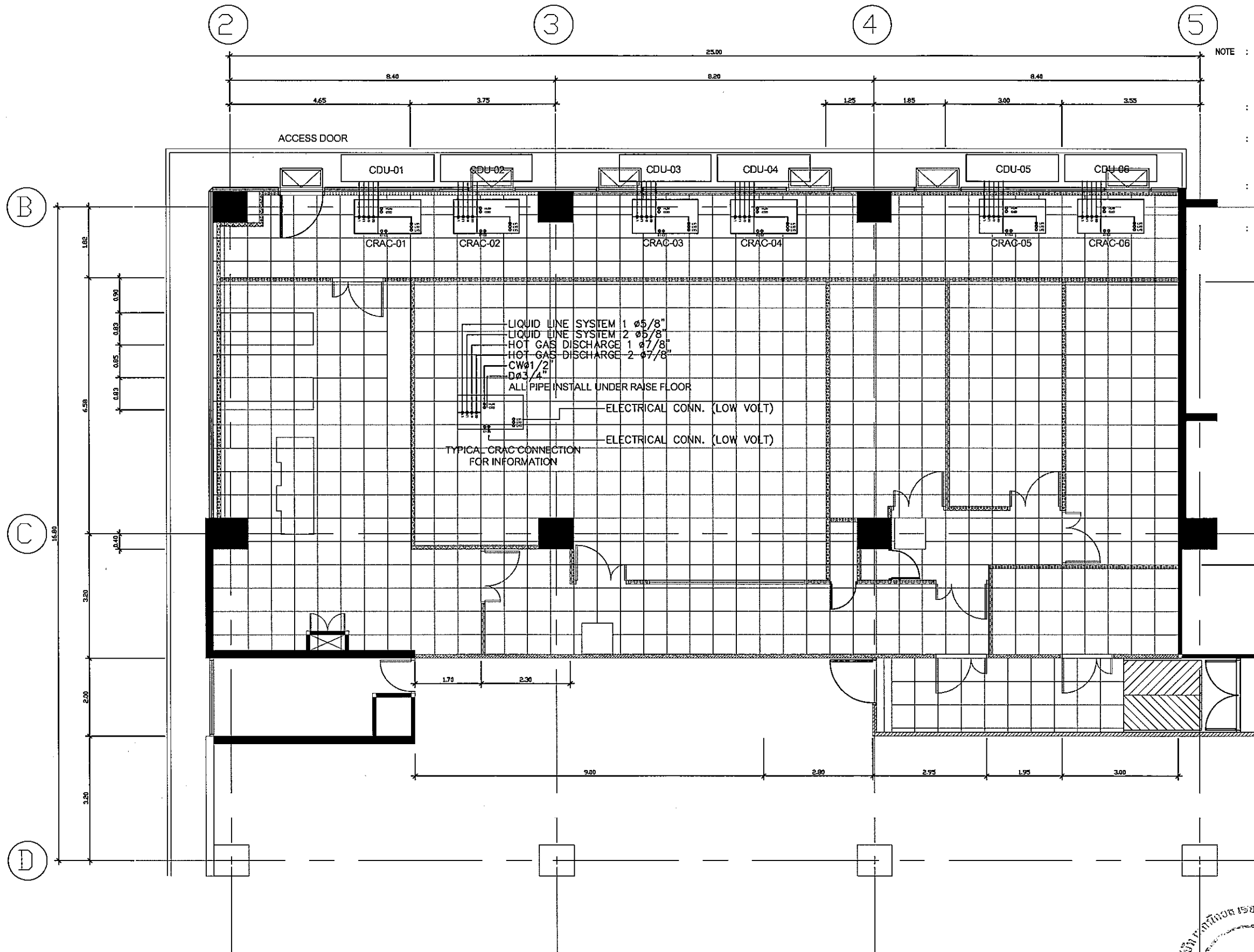
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**VENTILATION SYSTEM
 DUCTWORK (GENERATOR ROOM)
 UPGRADE PHASE II (LEVEL 5)**

ME-07

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- NOTE :
- THE CONTRACTOR SHALL SEAL ALL PIPE PENETRATION THROUGH WALL IN AVOIDING ANY AIR IN FILTRATION INTO THE ROOM.
 - THE CONTRACTOR SHALL INSULATE ALL COPPER PIPE INSIDE DATA CENTER
 - THE CONTRACTOR SHALL INSULATE ALL DRAIN PIPE AND PROVIDE P-TRAP TO AVOID ANY SMELL AND AIR FROM OUTSIDE CAN INFILTRATION INTO THE ROOM.
 - THE CONTRACTOR SHALL ENSURE DRAIN PIPE WILL BE PROPER SLOPE AND SHORTEST RUN
 - THE CONTRACTOR SHALL COVER PLATE FOR COPPER AND DRAIN PIPE

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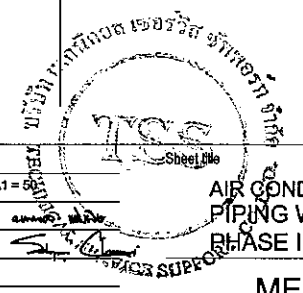


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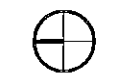
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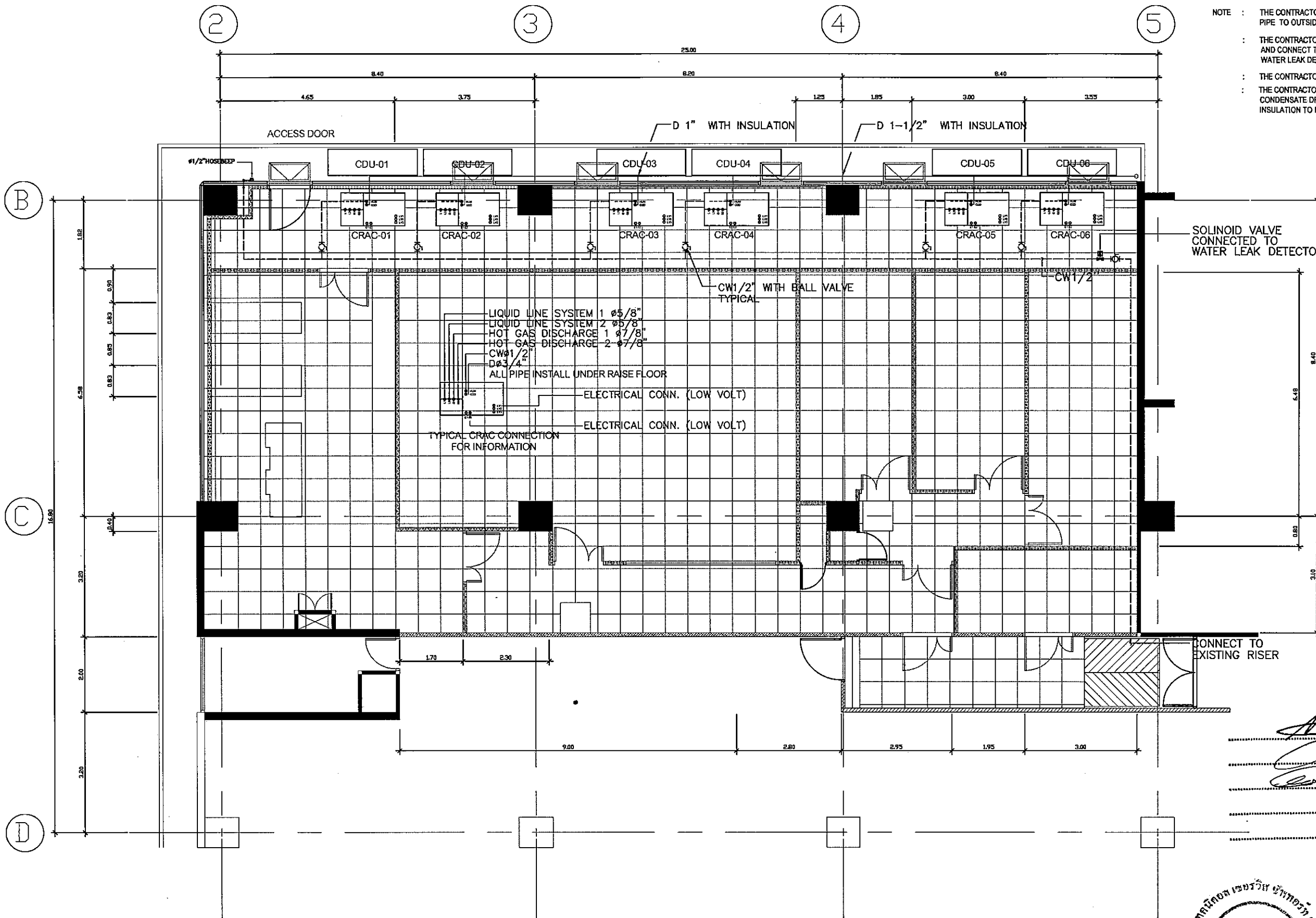
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AIR CONDITIONING SYSTEM
 PIPING WORK LAYOUT PLAN
 PHASE II (LEVEL 11)

ME-08





- NOTE :
- THE CONTRACTOR SHALL RELOCATE EXISTING COLD WATER PIPE TO OUTSIDE THE BUILDING AT BALCONY
 - THE CONTRACTOR SHALL INSTALL SOLENOID VALVE AND CONNECT TO WATER LEAK SYSTEM FROM WATER LEAK DETECTOR SYSTEM
 - THE CONTRACTOR SHALL TEST COLD WATER PIPE.
 - THE CONTRACTOR SHALL SUPPLY & INSTALL NEW CONDENSATE DRAIN PIPING COMPLETED WITH INSULATION TO NEAREST DRAIN

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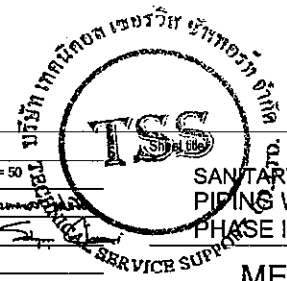


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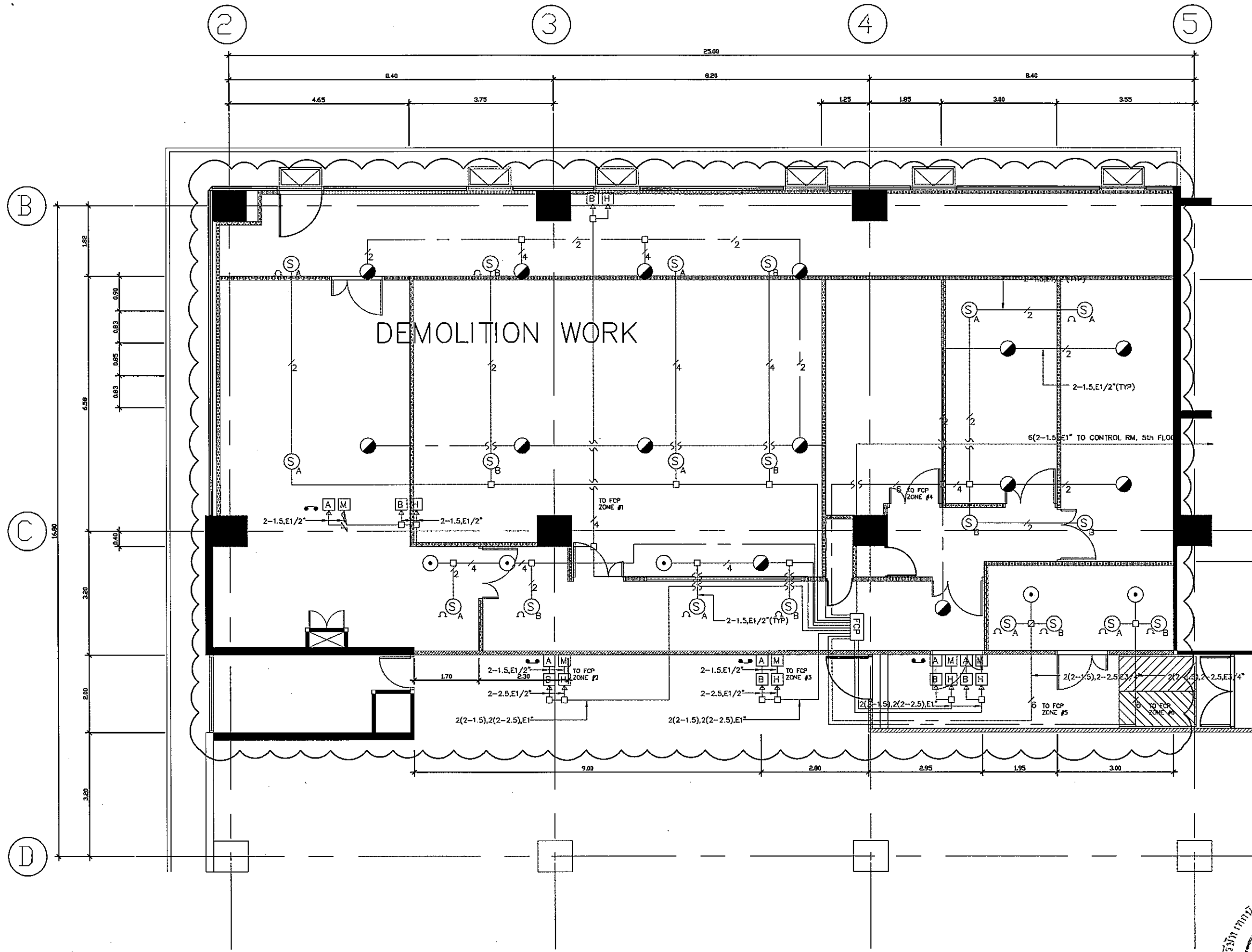
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SANITARY SYSTEM
 PIPING WORK
 PHASE II (LEVEL 11)

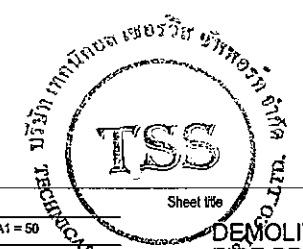
ME-09





- NOTE :
- THE CONTRACTOR SHALL REMOVE EXISTING SERVICE AS FOLLOWING:
PYROGEN SYSTEM AND ACCESSORIES
 - THE CONTRACTOR SHALL REMOVE ALL SUPPORTS AND PATCH UP ALL HOLE AT THE SLAB AND CLEAN UP ALL DUST
 - THE CONTRACTOR SHALL SEAL ALL OPEN TO AVOID ANY CONTAMINATION AND ANIMAL COME INSIDE THE DATA CENTER

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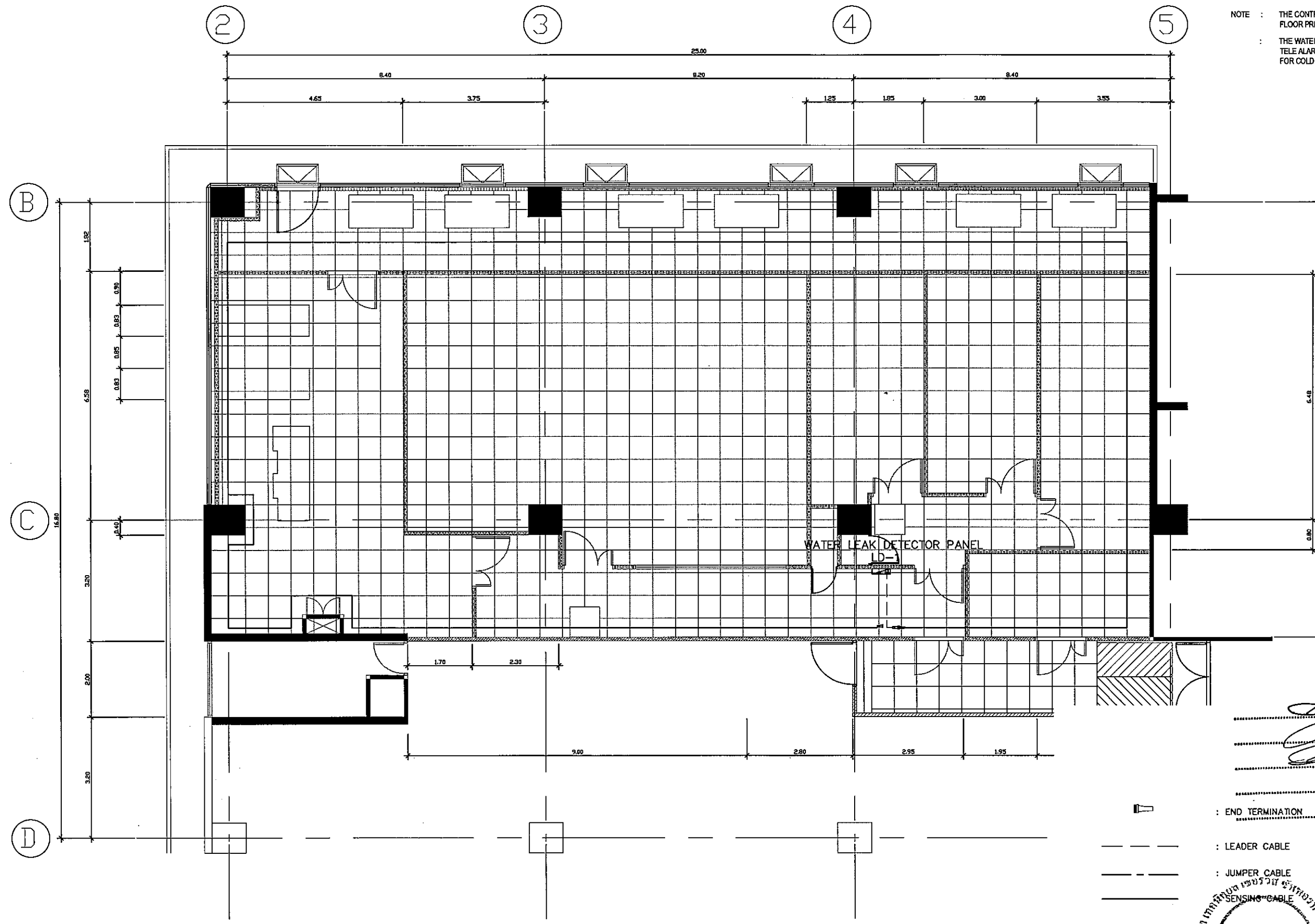
DEMOLITION PLAN
 FIRE PROTECTION SYSTEM
 PHASE II (LEVEL 11)

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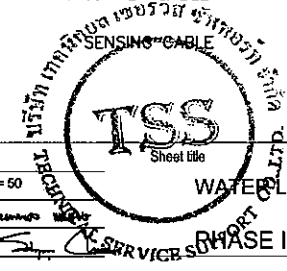


NOTE : THE CONTRACTOR SHALL CLEAN UP UNDER RAISE FLOOR PRIOR TO INSTALL SENSING CABLE
 : THE WATER LEAK SYSTEM SHALL SEND ALARM TO TELE ALARM SYSTEM AND SHUTDOWN SOLENIOD VALVE FOR COLD WATER SYSTEM



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: END TERMINATION
 : LEADER CABLE
 : JUMPER CABLE
 : SENSING CABLE



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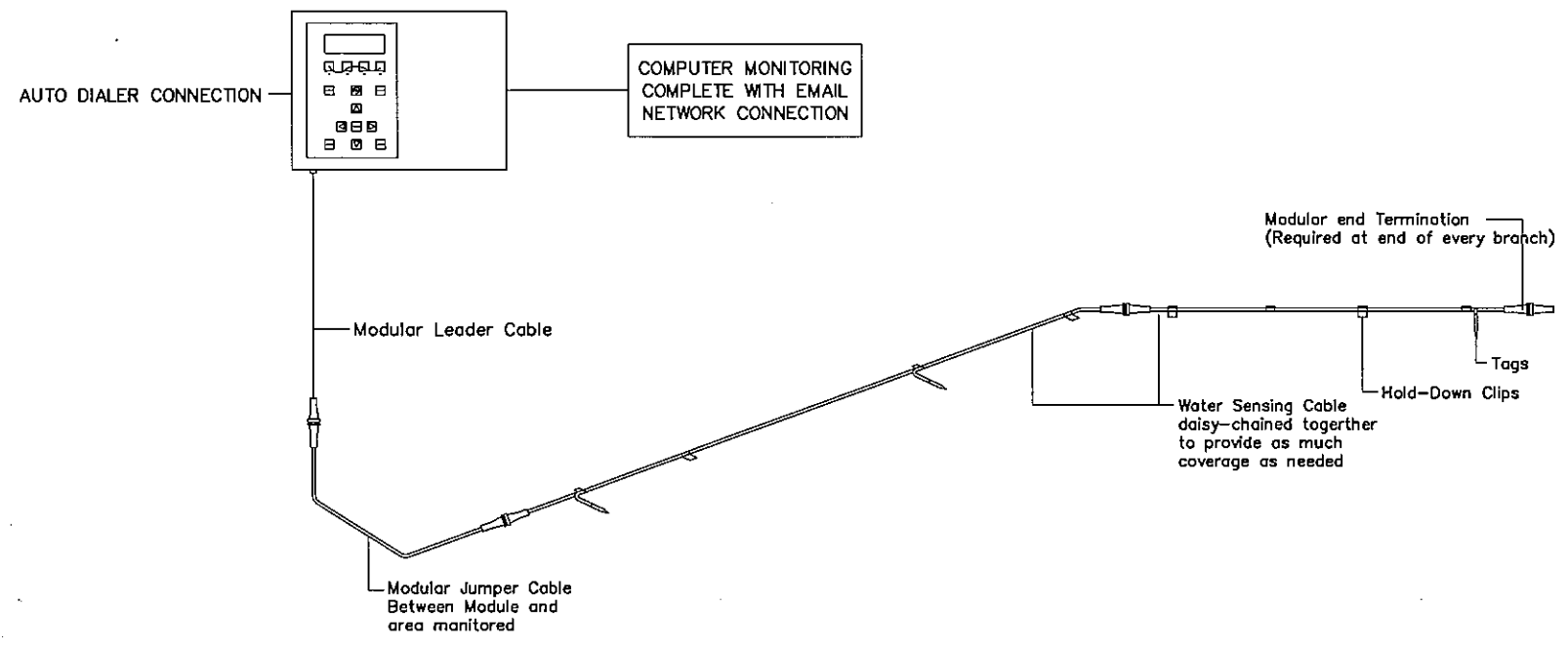
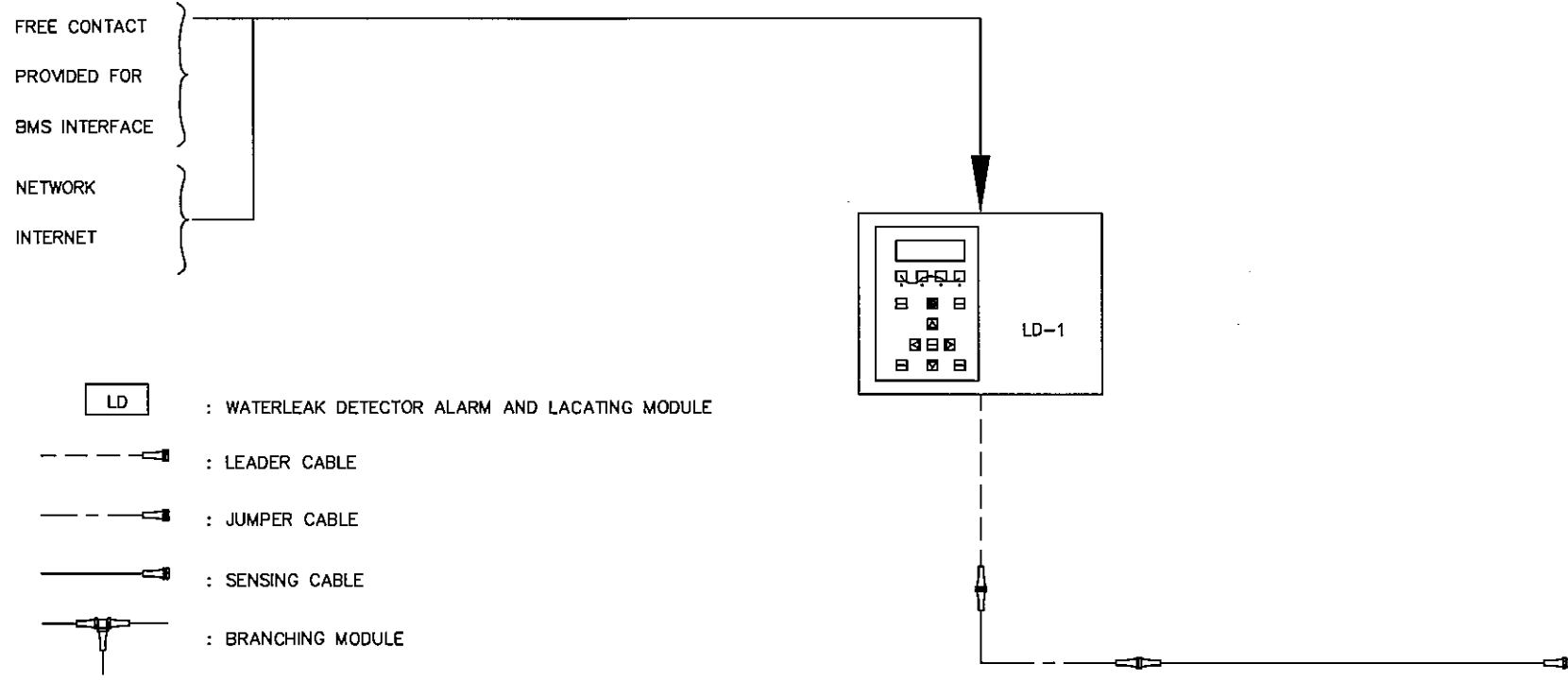
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WATER LEAK DETECTION SYSTEM
 PHASE II (LEVEL 11)
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- ⊥ : END TERMINATION
- : LEADER CABLE
- - - : JUMPER CABLE
- : SENSING CABLE

INSTALLATION DETAIL FOR WATER LEAK DETECTION SYSTEM



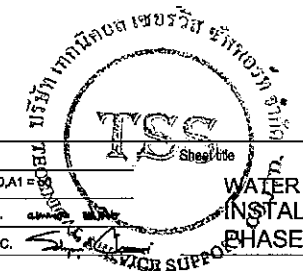
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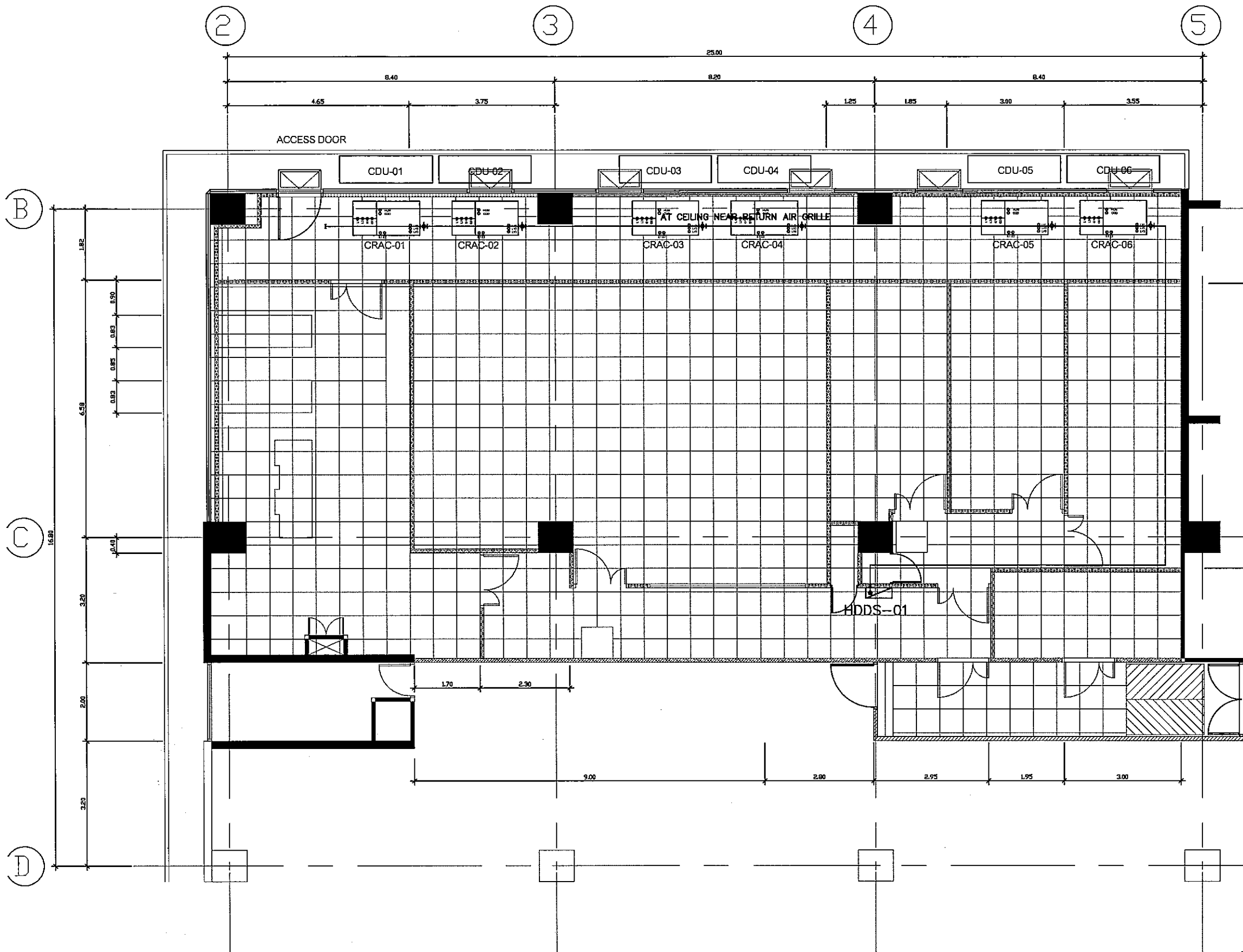


WATER LEAK SYSTEM
INSTALLATION DETAIL
PHASE II (LEVEL 11)

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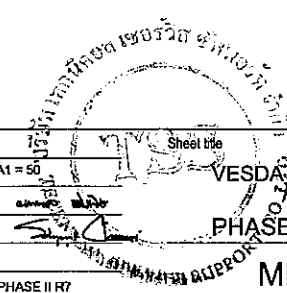
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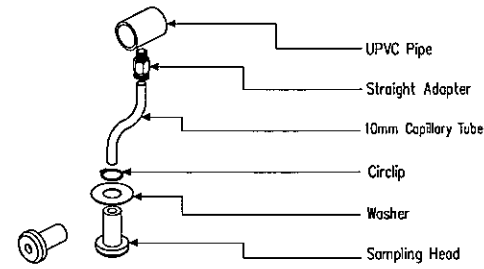
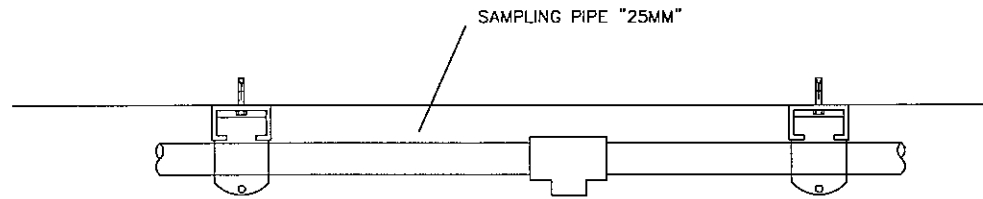


VESDA SYSTEM
 PHASE II (LEVEL 11)

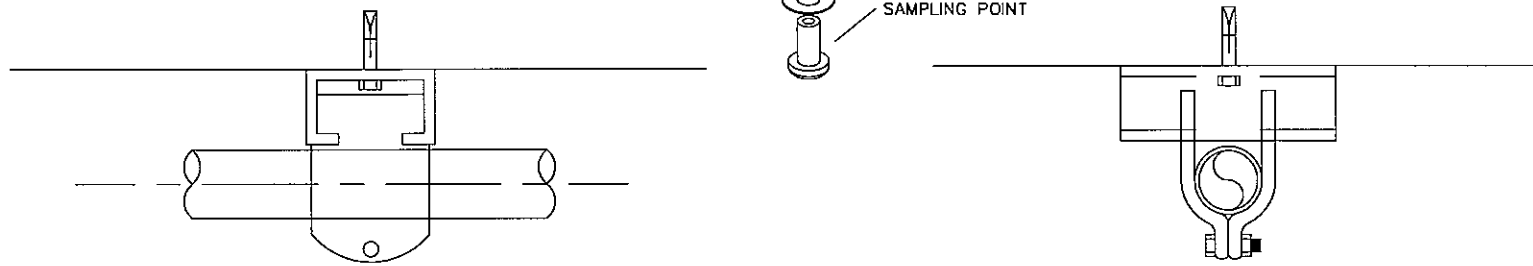
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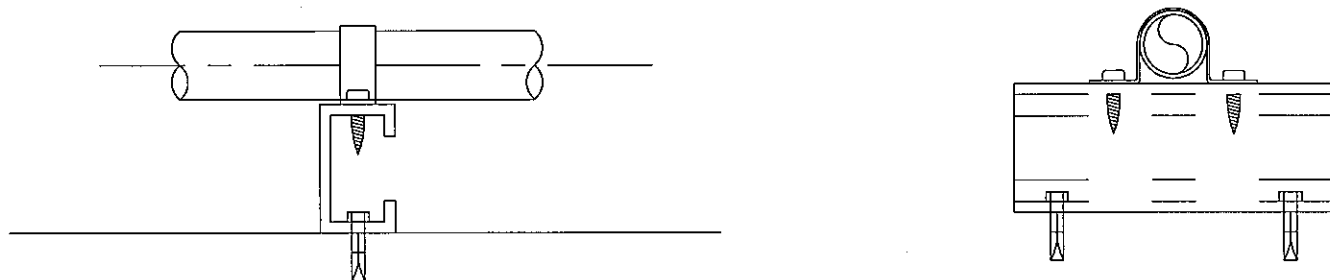




Detail A : Air Sampling Point Assembly



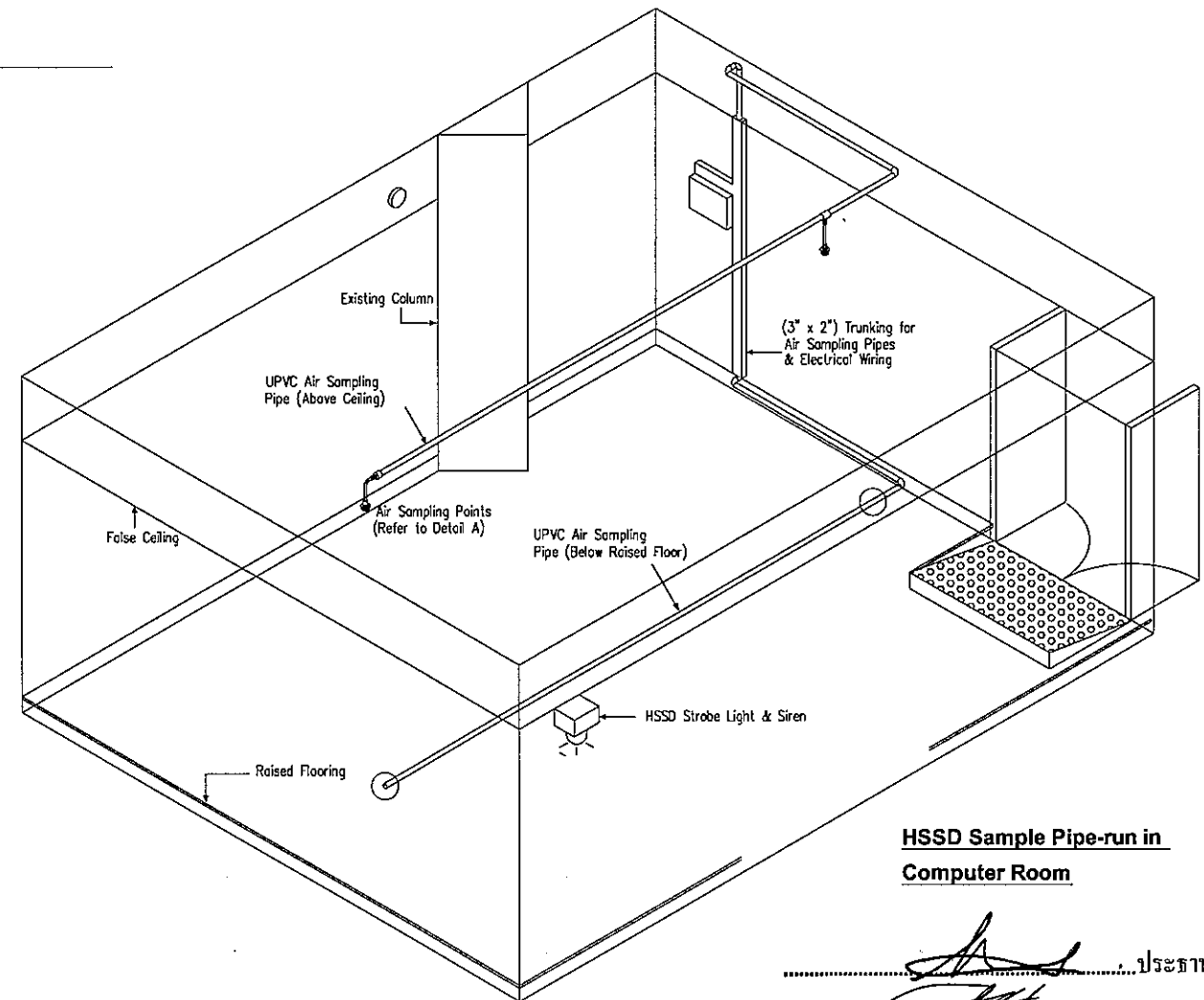
INSTALLATION SAMPLING PIPE SUPPORT OF ROOM AREA



INSTALLATION SAMPLING PIPE SUPPORT OF SUBFLOOR AREA

REMARKS

MATERIAL : STEEL C 100x50x2.8thk. (4"x2"x $\frac{1}{8}$ ")
 MATERIAL : PIPE "25MM"



HSSD Sample Pipe-run in Computer Room

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TYPICAL INSTALLATION SAMPLING PIPE SUPPORT
 SCALE NTS.

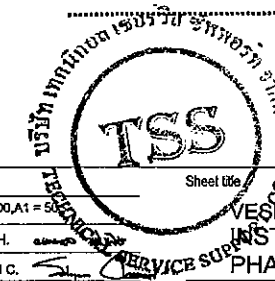


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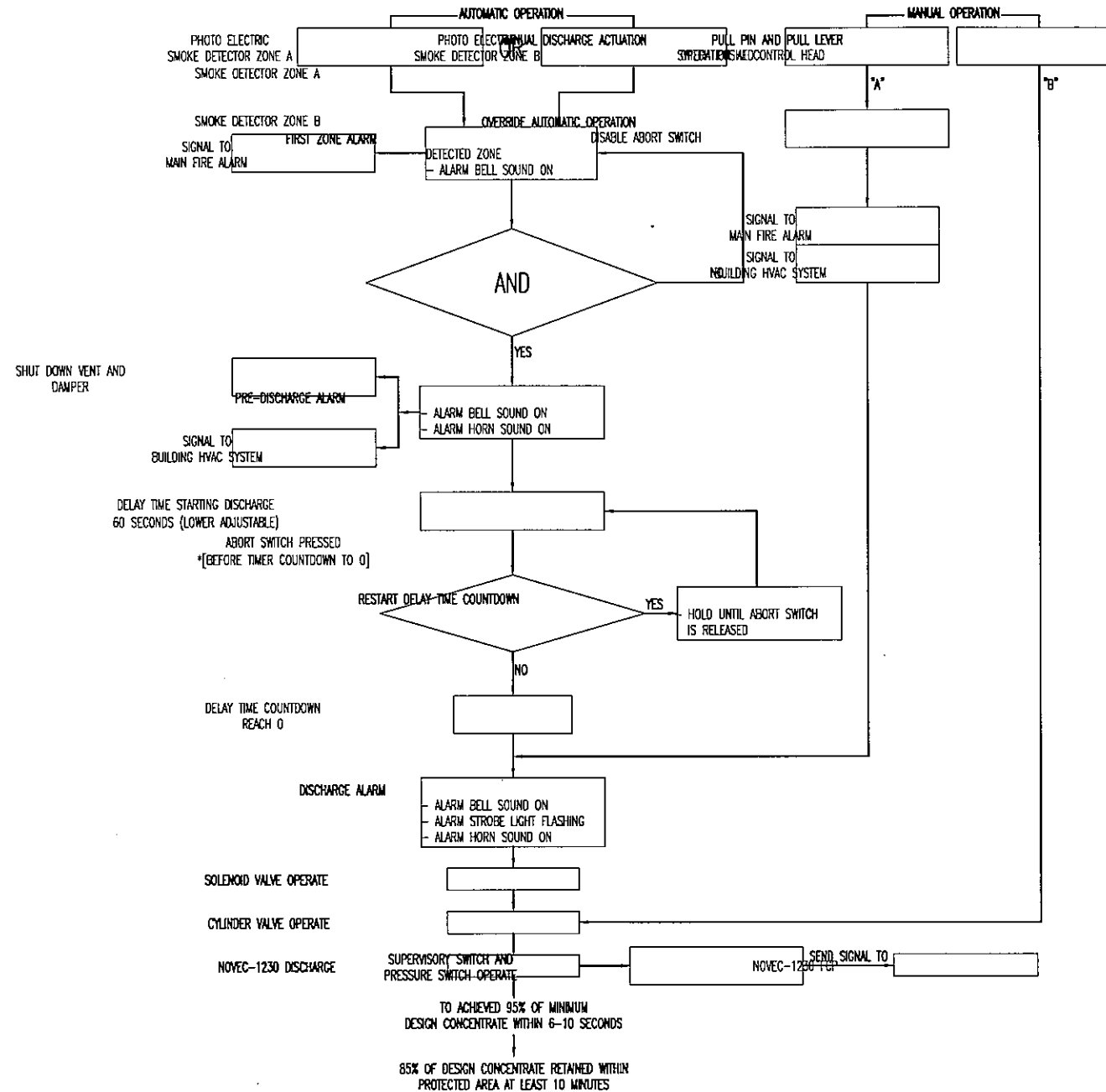


VESDA SYSTEM
 INSTALLATION DETAIL
 PHASE II (LEVEL 11)

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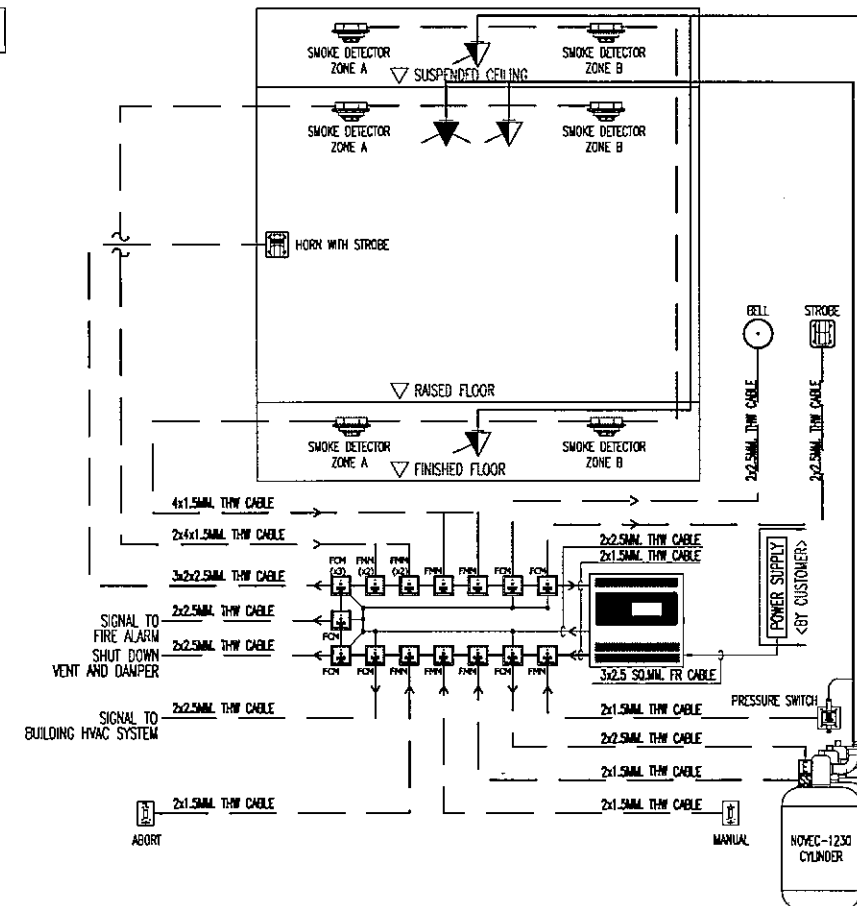


OPERATION DIAGRAM OF NOVEC-1230 FIRE SUPPRESSION SYSTEM

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NOTE :

- THE GAS SUPPRESSION SYSTEM SHALL BE CONFORMED TO NFPA 2001 "STANDARD ON CLEAN AGENT FIRE EXTINGUISHING SYSTEM"
- FLOODING FACTOR USED IN CALCULATION SHALL BE TOTAL FLOODING SURFACE FIRE OF C-CLASS FIRE ON 4.7 PERCENT DESIGN CONCENTRATION AT 21°C (70°F) CONCENTRATION AT 21°C (70°F) ACCORDING TO MANUFACTURER AND MAXIMUM CONCENTRATION EXPECTED AT 21°C (70°F) SHALL BE VERIFIED NOT TO EXCEED NOMINAL CONCENTRATION OF 10 PERCENT
 - NOVEC-1230 GAS PIPE SHALL BE ERW BLACK STEEL PIPE CONFORMED TO ASTM A53 GRADE A OR B SCHEDULE 40 FITTING SHALL BE CLASS 300 MALLEABLE DUCTILE IRON FOR PIPE SIZE 880MM AND SMALLER, 1000-b OR BETTER RATE DUCTILE IRON OR FORGED STEEL FITTING FOR PIPE SIZE GREATER THAN 880MM. INSTALLATION SETTING INITIATING DEVICE, NOTIFICATION APPLIANCE AND SIGNAL LINE CIRCUIT APPURTENANCES SHALL BE ACCORDING TO NFPA-72 NATIONAL FIRE ALARM AND SIGNALING CODE
 - BATTERY BACK UP SHALL BE CAPABLE OF OPERATING THE SYSTEM UNDER NORMAL LOAD CONDITION FOR 24 HOURS AND THEN BE CAPABLE OF OPERATING THE SYSTEM CONTINUOUSLY FOR FULL DISCHARGE CONDITION
 - SOUND LEVEL OF AUDIBLE NOTIFICATION APPLIANCE DEVICE SHALL NOT EXCEED 110 dBA AT MINIMUM HEARING DISTANCE
 - MINIMUM REQUIREMENT SETTING OF AUDIBLE NOTIFICATION APPLIANCE DEVICE SHALL BE AT LEAST 15 dBA ABOVE THE REDUCED AVERAGE AMBIENT SOUND LEVEL AND 5 dBA OF MAXIMUM AMBIENT SOUND LEVEL
 - BEFORE SYSTEM INSTALLATION SHALL SUBMIT FINAL HYDRAULIC CALCULATION, SHOP DWG. AND LIST OF EQUIPMENT (W/PART NUMBER) TO SUPERVISOR



WIRING DIAGRAM OF NOVEC-1230 FIRE SUPPRESSION SYSTEM

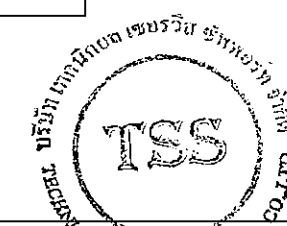
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ZONE NAME	SIZE (CL.M.)		DESIGN CONCENTRATE(%)	AGENT (lb)		CYLINDER MODEL
	AREA	HEIGHT		REQUIRE	ACTUAL	
RAISED FLOOR	292.64	0.40	4.7	176.28	355.0	SIGMA-600
SUSPENDED CEILING	292.64	0.40	4.7	176.28		
CRAC ROOM	52.36	2.40	4.7	187.27	270.0	GAMMA-400
NETWORK ROOM	21.11	2.40	4.7	76.31		GAMMA-250
STAGING ROOM II	7.16	2.40	4.7	23.01	192.0	
ISP ROOM	10.56	2.40	4.7	33.93		GAMMA-550
PRIVATE ROOM I	16.76	2.40	4.7	57.16	284.0	
PRIVATE ROOM II	17.79	2.40	4.7	60.58		GAMMA-550
SERVER ROOM	77.72	2.40	4.7	171.42	285.0	
COLD CONTAINMENT I	16.26	2.00	4.7	48.97		GAMMA-550
COLD CONTAINMENT II	20.10	2.00	4.7	60.53		
FACILITY ROOM	52.34	2.40	4.7	168.18		GAMMA-550
STAGING ROOM I	25.38	2.40	4.7	81.55		

NOVEC-1230 TANK SCHEDULE

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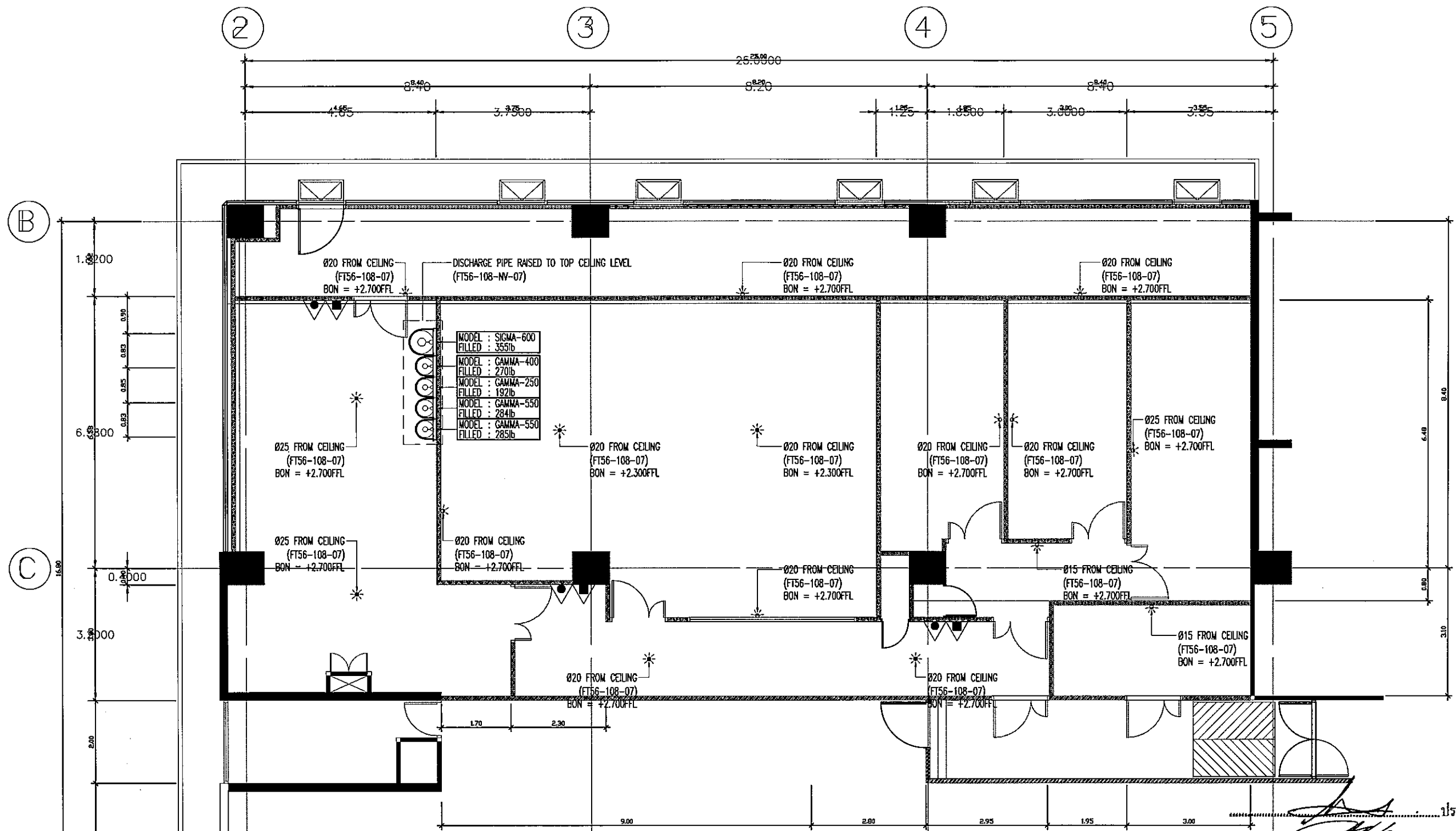
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FIRE PROTECTION SYSTEM OPERATION DIAGRAM FOR INFORMATION

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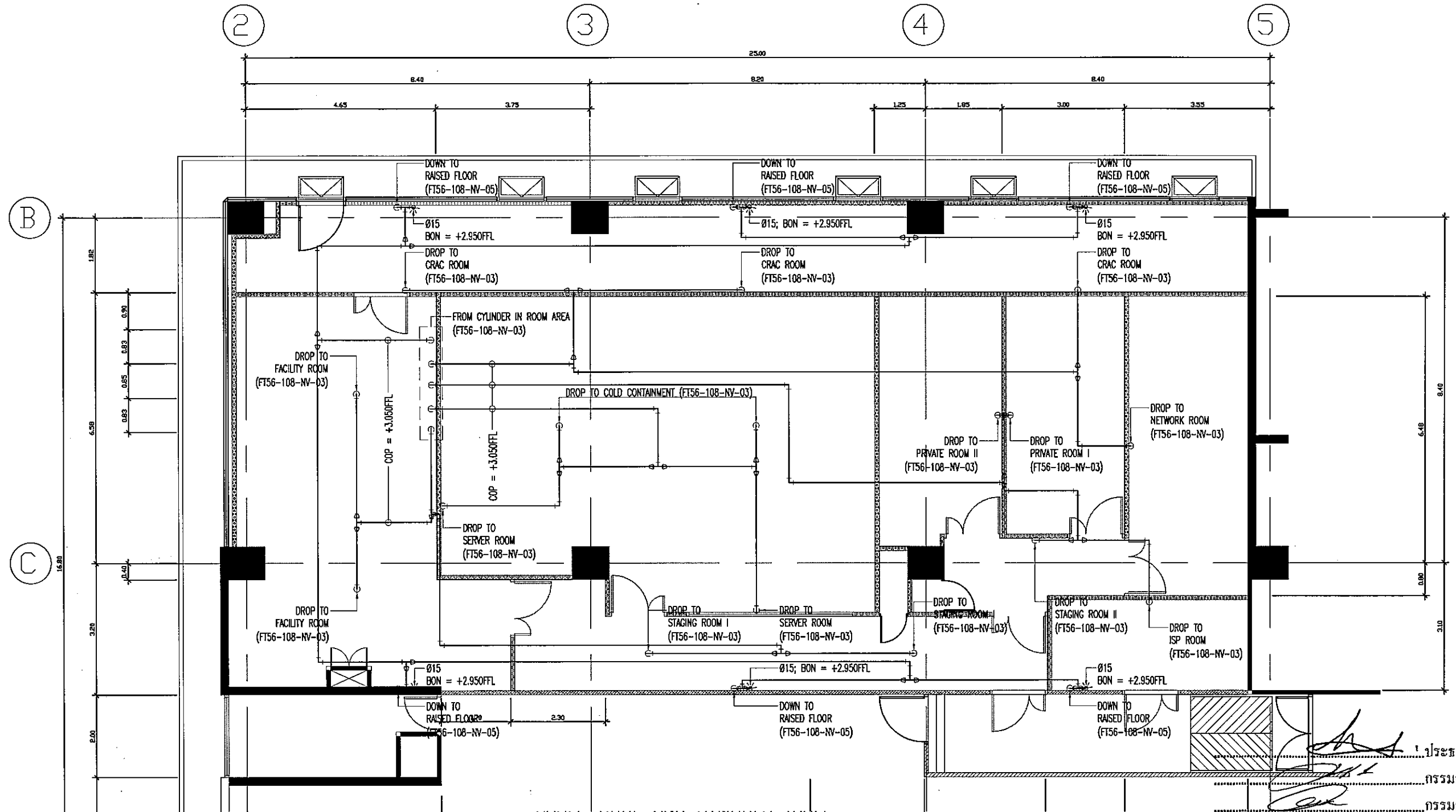
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CABLE CODE AND SYMBOLS TABLE

SYMBOLS	DESCRIPTIONS	SYMBOLS	DESCRIPTIONS	SYMBOLS	DESCRIPTIONS	SYMBOLS	DESCRIPTIONS
	4x1.5 SQ.MM. THW CABLE IN Ø15 MM. EMT CONDUIT		FCP CONTROL PANEL		ABORT STATION		ELBOW
	2x1.5 SQ.MM. THW CABLE IN Ø15 MM. EMT CONDUIT		MODULE		SOLENOID VALVE (ELECTRIC CONTROL HEAD)		TEE
	4x2.5 SQ.MM. THW CABLE IN Ø20 MM. EMT CONDUIT		ALARM BELL		PRESSURE SWITCH		DISCHARGE NOZZLE, 360°, 180°
	2x2.5 SQ.MM. THW CABLE IN Ø15 MM. EMT CONDUIT		ALARM HORN WITH STROBE LIGHT		SUPERVISORY SWITCH		REDUCER
	4x2.5, 2x1.5 SQ.MM. FR CABLE IN Ø20 MM. EMT CONDUIT		MANUAL STATION		CONVENTIONAL PHOTO ELECTRIC SMOKE DETECTOR		NOVEC-1230 CYLINDER



SYMBOLS	DESCRIPTIONS	SYMBOLS	DESCRIPTIONS	SYMBOLS	DESCRIPTIONS	SYMBOLS	DESCRIPTIONS
	4x1.5 SQ.MM. THW CABLE IN Ø15 MM. EMT CONDUIT		FCP CONTROL PANEL		ABORT STATION		ELBOW
	2x1.5 SQ.MM. THW CABLE IN Ø15 MM. EMT CONDUIT		MODULE		SOLENOID VALVE (ELECTRIC CONTROL HEAD)		TEE
	4x2.5 SQ.MM. THW CABLE IN Ø20 MM. EMT CONDUIT		ALARM BELL		PRESSURE SWITCH		DISCHARGE NOZZLE, 360°
	2x2.5 SQ.MM. THW CABLE IN Ø15 MM. EMT CONDUIT		ALARM HORN WITH STROBE LIGHT		SUPERVISORY SWITCH		REDUCER
	4x2.5, 2x1.5 SQ.MM. FR CABLE IN Ø20 MM. EMT CONDUIT		MANUAL STATION		CONVENTIONAL PHOTO ELECTRIC SMOKE DETECTOR		NOVEL-1230 CYLINDER

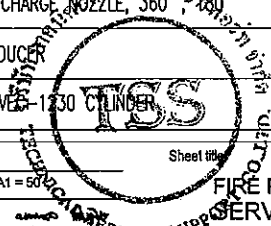


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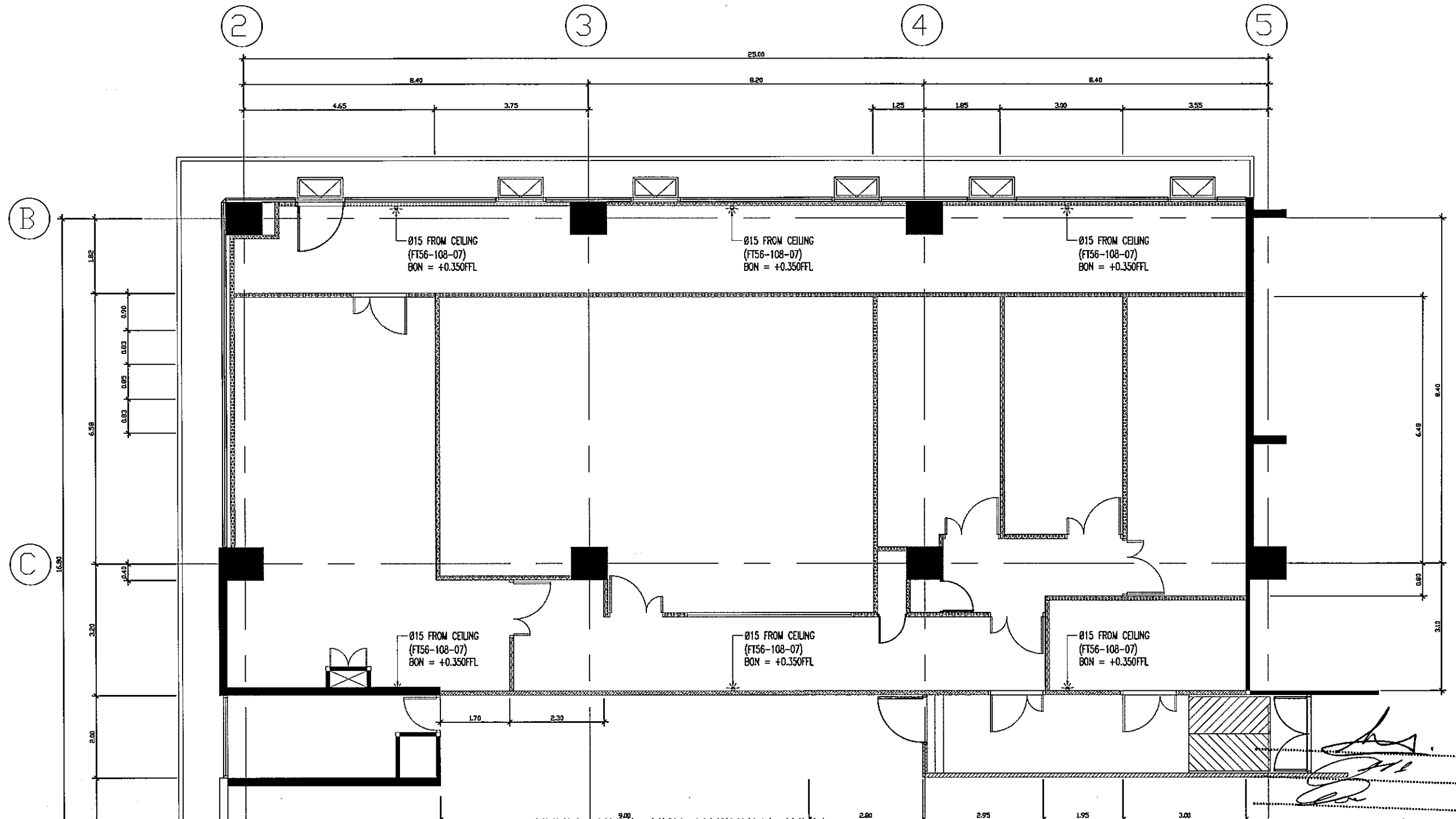
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FIRE PROTECTION SYSTEM
 SERVER ROOM LAYOUT PLAN
 ABOVE CEILING

ME-17



SYMBOLS	DESCRIPTIONS	SYMBOLS	DESCRIPTIONS	SYMBOLS	DESCRIPTIONS	SYMBOLS	DESCRIPTIONS
	4x1.5 SQ.MM. THW CABLE IN Ø15 MM. EMT CONDUIT		FCP CONTROL PANEL		ABORT STATION		ELBOW
	2x1.5 SQ.MM. THW CABLE IN Ø15 MM. EMT CONDUIT		MODULE		SOLENOID VALVE (ELECTRIC CONTROL HEAD)		TEE
	4x2.5 SQ.MM. THW CABLE IN Ø20 MM. EMT CONDUIT		ALARM BELL		PRESSURE SWITCH		DISCHARGE NOZZLE, 360°/180°
	2x2.5 SQ.MM. THW CABLE IN Ø15 MM. EMT CONDUIT		ALARM HORN WITH STROBE LIGHT		SUPERVISORY SWITCH		REDUCER
	4x2.5, 2x1.5 SQ.MM. FR CABLE IN Ø20 MM. EMT CONDUIT		MANUAL STATION		CONVENTIONAL PHOTO ELECTRIC SMOKE DETECTOR		NOVEC-1230 CYLINDER

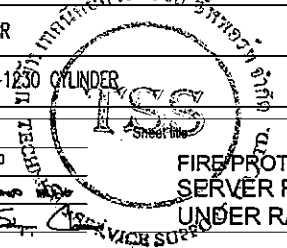


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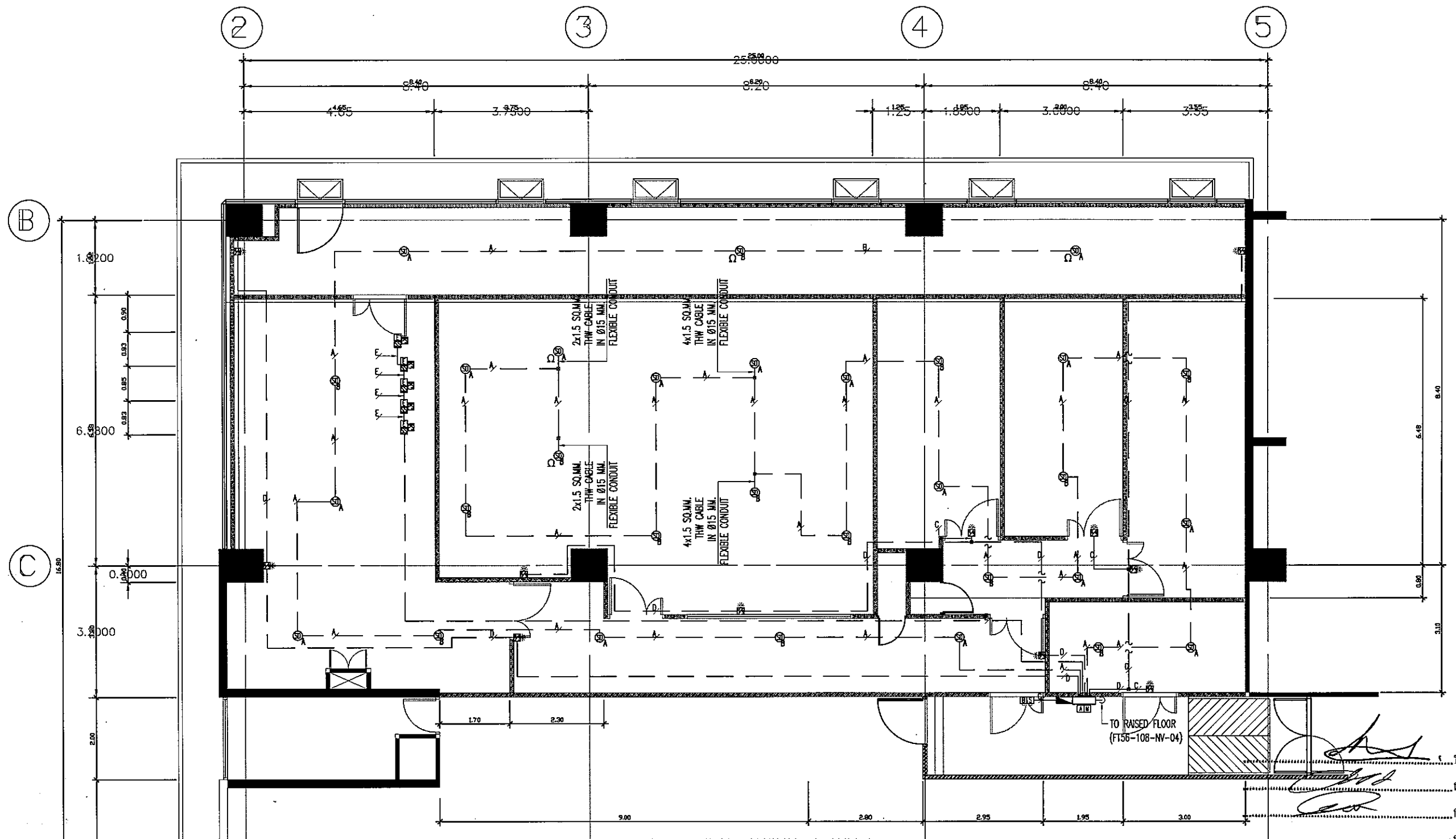
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FIRE PROTECTION SYSTEM
SERVER ROOM LAYOUT PLAN
UNDER RAISE FLOOR

ME-18





CABLE CODE AND SYMBOLS TABLE

SYMBOLS	DESCRIPTIONS	SYMBOLS	DESCRIPTIONS	SYMBOLS	DESCRIPTIONS	SYMBOLS	DESCRIPTIONS
<u>A</u>	4x1.5 SQ.MM. THW CABLE IN Ø15 MM. EMT CONDUIT		FCP CONTROL PANEL	<u>A</u>	ABORT STATION		ELBOW
<u>B</u>	2x1.5 SQ.MM. THW CABLE IN Ø15 MM. EMT CONDUIT		MODULE	<u>E</u>	SOLENOID VALVE (ELECTRIC CONTROL HEAD)		TEE
<u>C</u>	4x2.5 SQ.MM. THW CABLE IN Ø20 MM. EMT CONDUIT		ALARM BELL	<u>PS</u>	PRESSURE SWITCH		DISCHARGE NOZZLE, 360°, 180°
<u>D</u>	2x2.5 SQ.MM. THW CABLE IN Ø15 MM. EMT CONDUIT		ALARM HORN WITH STROBE LIGHT	<u>SS</u>	SUPERVISORY SWITCH		REDUCER
<u>E</u>	4x2.5, 2x1.5 SQ.MM. FR CABLE IN Ø20 MM. EMT CONDUIT		MANUAL STATION	<u>SD</u>	CONVENTIONAL PHOTO ELECTRIC SMOKE DETECTOR		NOVEC-1230 CYLINDER

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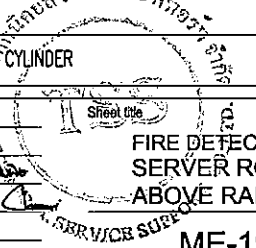


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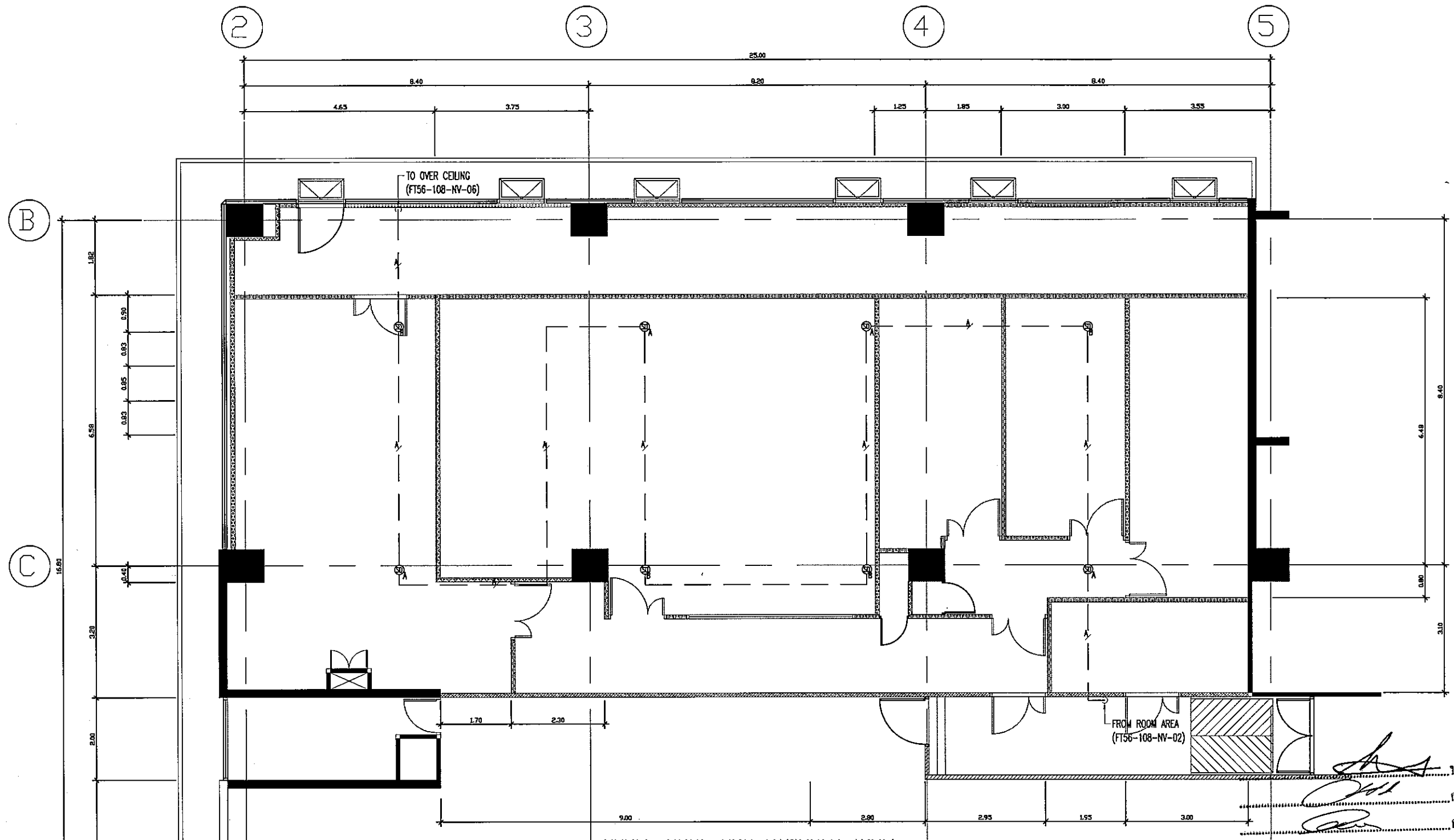
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FIRE DETECTION SYSTEM
 SERVER ROOM LAOUT PLAN
 ABOVE RAISE FLOOR

ME-19



SYMBOLS	DESCRIPTIONS	SYMBOLS	DESCRIPTIONS	SYMBOLS	DESCRIPTIONS	SYMBOLS	DESCRIPTIONS
	4x1.5 SQ.MM. THW CABLE IN Ø15 MM. EMT CONDUIT		FCP CONTROL PANEL		ABORT STATION		ELBOW
	2x1.5 SQ.MM. THW CABLE IN Ø15 MM. EMT CONDUIT		MODULE		SOLENOID VALVE (ELECTRIC CONTROL HEAD)		TEE
	4x2.5 SQ.MM. THW CABLE IN Ø20 MM. EMT CONDUIT		ALARM BELL		PRESSURE SWITCH		DISCHARGE NOZZLE 360° or 180°
	2x2.5 SQ.MM. THW CABLE IN Ø15 MM. EMT CONDUIT		ALARM HORN WITH STROBE LIGHT		SUPERVISORY SWITCH		REDUCER
	4x2.5, 2x1.5 SQ.MM. FR CABLE IN Ø20 MM. EMT CONDUIT		MANUAL STATION		CONVENTIONAL PHOTO ELECTRIC SMOKE DETECTOR		NOVEC-1230 CYLINDER

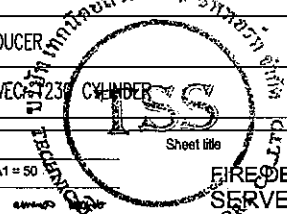


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Project
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 UPGRADE
 PHASE II
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Mark	Date	Description
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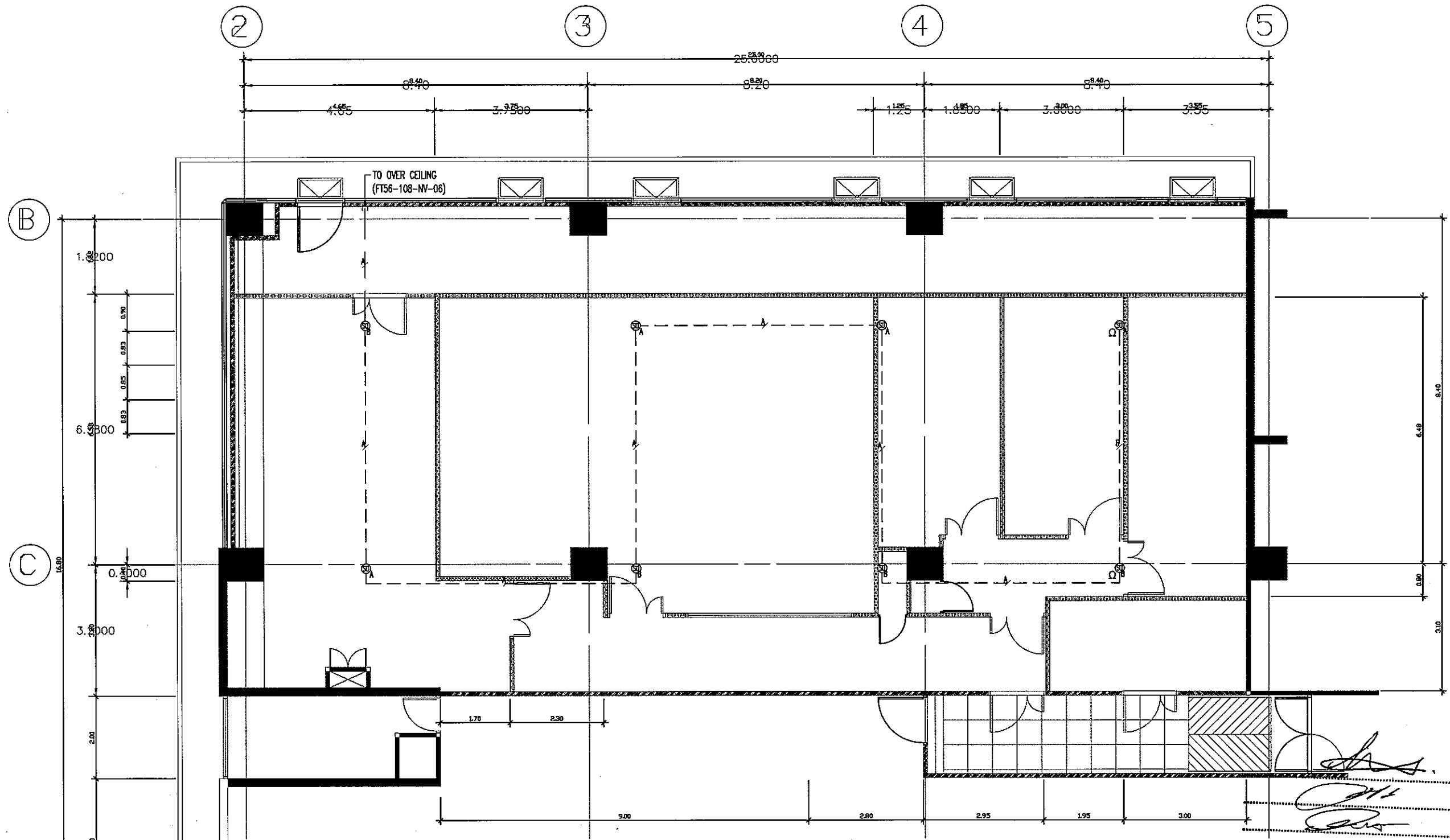
Project no. : A321.000
 Scale : A3 = 1:100, A1 = 50
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 Chk'd by : SAHAPON C.
 Plot date : 01/07/2013
 CAD dwg. file : 321.000-ME-PHASE II R7
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FIRE DETECTION SYSTEM
 SERVER ROOM LAOUT PLAN
 ABOVE CEILING

ME-20





SYMBOLS	DESCRIPTIONS	SYMBOLS	DESCRIPTIONS	SYMBOLS	DESCRIPTIONS	SYMBOLS	DESCRIPTIONS
A	4x1.5 SQ.MM. THW CABLE IN Ø15 MM. EMT CONDUIT	FCP CONTROL PANEL	FCP CONTROL PANEL	A	ABORT STATION	ELBOW	ELBOW
B	2x1.5 SQ.MM. THW CABLE IN Ø15 MM. EMT CONDUIT	MODULE	MODULE	E	SOLENOID VALVE (ELECTRIC CONTROL HEAD)	TEE	TEE
C	4x2.5 SQ.MM. THW CABLE IN Ø20 MM. EMT CONDUIT	ALARM BELL	ALARM BELL	PS	PRESSURE SWITCH	DISCHARGE NOZZLE, 360°, 180°	DISCHARGE NOZZLE, 360°, 180°
D	2x2.5 SQ.MM. THW CABLE IN Ø15 MM. EMT CONDUIT	ALARM HORN WITH STROBE LIGHT	ALARM HORN WITH STROBE LIGHT	SS	SUPERVISORY SWITCH	REDUCER	REDUCER
E	4x2.5, 2x1.5 SQ.MM. FR CABLE IN Ø20 MM. EMT CONDUIT	MANUAL STATION	MANUAL STATION	SD	CONVENTIONAL PHOTO ELECTRIC SMOKE DETECTOR	NOVEC-1230 CYLINDER	NOVEC-1230 CYLINDER

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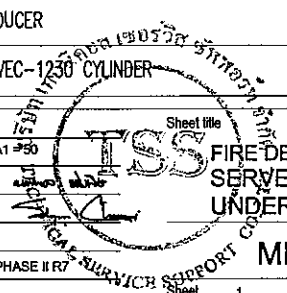
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Plot date : 01/07/2013
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FIRE DETECTION SYSTEM
SERVER ROOM LAOUT PLAN
UNDER RISE FLOOR

ME-21

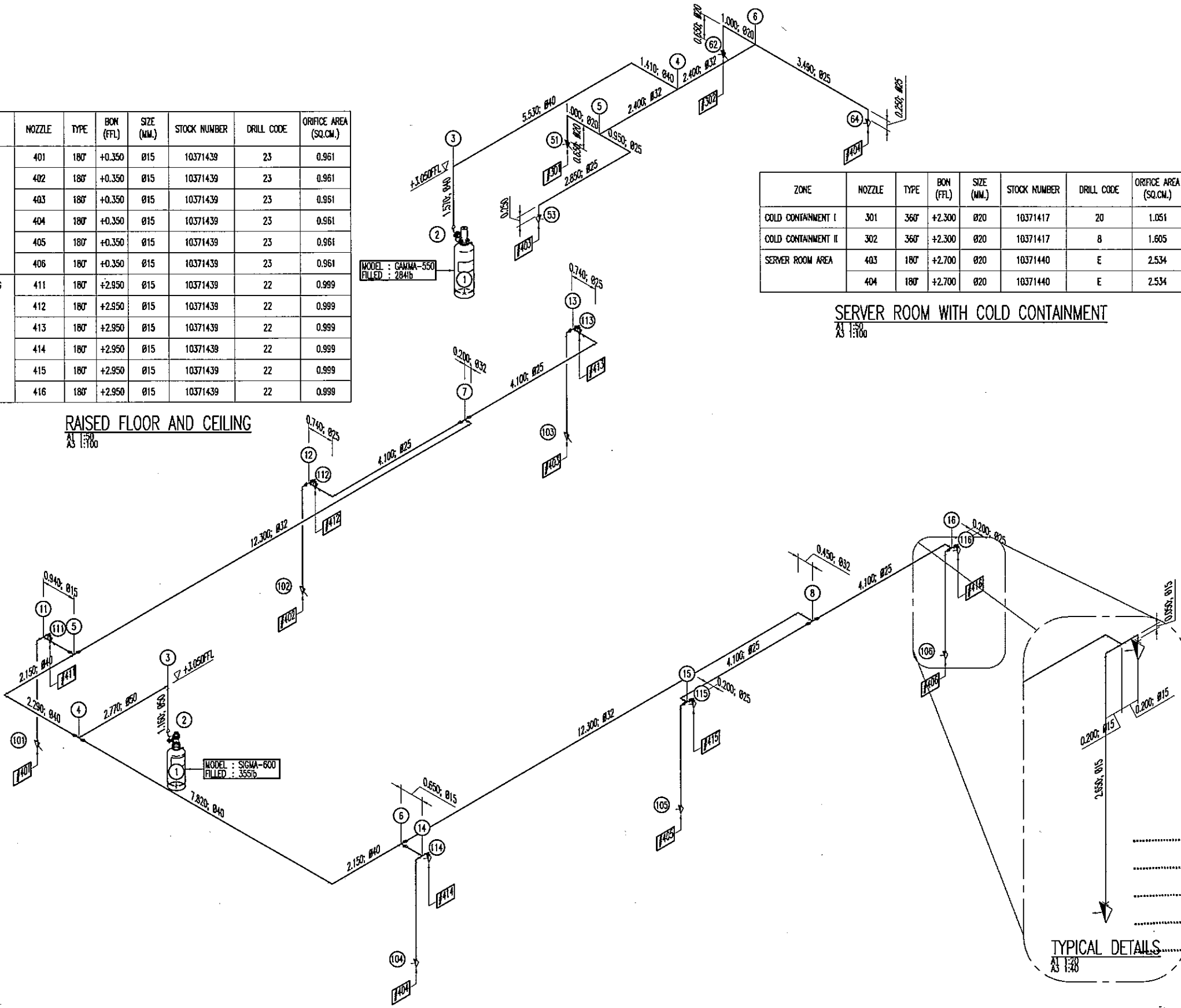


ZONE	NOZZLE	TYPE	BOM (FFL)	SIZE (MM.)	STOCK NUMBER	DRILL CODE	ORIFICE AREA (SQ.CM.)
RAISED FLOOR	401	180°	+0.350	Ø15	10371439	23	0.961
	402	180°	+0.350	Ø15	10371439	23	0.961
	403	180°	+0.350	Ø15	10371439	23	0.961
	404	180°	+0.350	Ø15	10371439	23	0.961
	405	180°	+0.350	Ø15	10371439	23	0.961
CEILING	411	180°	+2.950	Ø15	10371439	22	0.999
	412	180°	+2.950	Ø15	10371439	22	0.999
	413	180°	+2.950	Ø15	10371439	22	0.999
	414	180°	+2.950	Ø15	10371439	22	0.999
	415	180°	+2.950	Ø15	10371439	22	0.999
	416	180°	+2.950	Ø15	10371439	22	0.999

RAISED FLOOR AND CEILING
AS 1:700

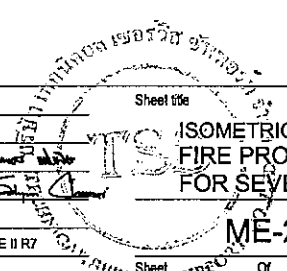
ZONE	NOZZLE	TYPE	BOM (FFL)	SIZE (MM.)	STOCK NUMBER	DRILL CODE	ORIFICE AREA (SQ.CM.)
COLD CONTAINMENT I	301	360°	+2.300	Ø20	10371417	20	1.051
COLD CONTAINMENT II	302	360°	+2.300	Ø20	10371417	8	1.605
SERVER ROOM AREA	403	180°	+2.700	Ø20	10371440	E	2.534
	404	180°	+2.700	Ø20	10371440	E	2.534

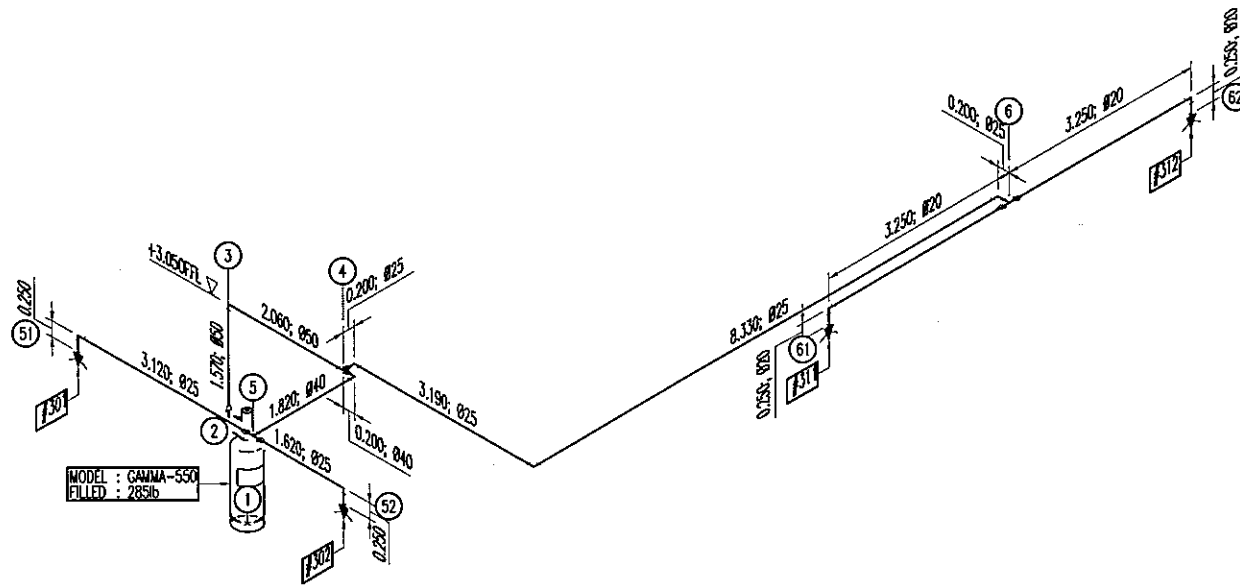
SERVER ROOM WITH COLD CONTAINMENT
AS 1:50
AS 1:700



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TYPICAL DETAILS
AS 1:30



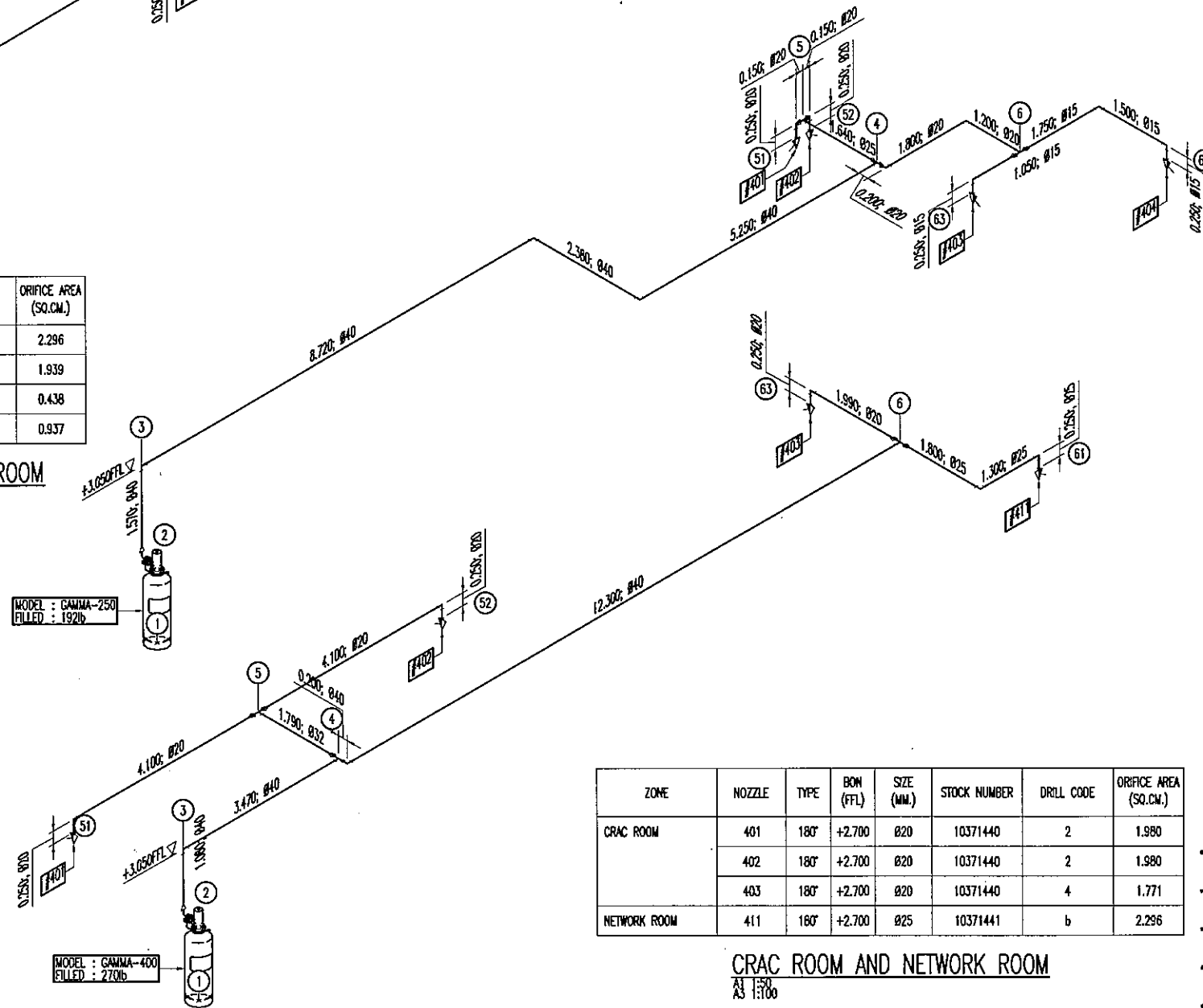


ZONE	NOZZLE	TYPE	BON (F.L)	SIZE (MM.)	STOCK NUMBER	DRILL CODE	ORIFICE AREA (SQ.CM.)
FACILITY ROOM	301	360°	+2.700	Ø25	10371418	2	1.980
	302	360°	+2.700	Ø25	10371418	2	1.980
STAGING ROOM I	311	360°	+2.700	Ø20	10371417	8	1.605
	312	360°	+2.700	Ø20	10371417	8	1.605

FACILITY ROOM AND STAGING ROOM I
AS 1:100

ZONE	NOZZLE	TYPE	BON (F.L)	SIZE (MM.)	STOCK NUMBER	DRILL CODE	ORIFICE AREA (SQ.CM.)
PRIVATE ROOM II	401	180°	+2.700	Ø20	10371454	b	2.296
PRIVATE ROOM I	402	180°	+2.700	Ø20	10371454	7/32	1.939
STAGING ROOM II	403	180°	+2.700	Ø15	10371453	37	0.438
ISP ROOM	404	180°	+2.700	Ø15	10371453	24	0.937

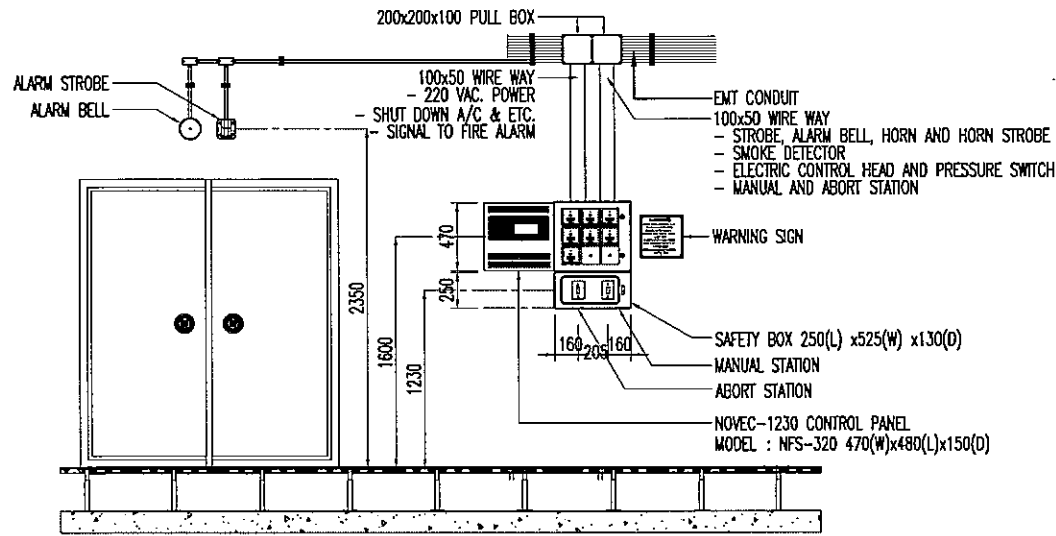
PRIVATE ROOM I-II, STAGING ROOM II AND ISP ROOM
AS 1:100



ZONE	NOZZLE	TYPE	BON (F.L)	SIZE (MM.)	STOCK NUMBER	DRILL CODE	ORIFICE AREA (SQ.CM.)
CRAC ROOM	401	180°	+2.700	Ø20	10371440	2	1.980
	402	180°	+2.700	Ø20	10371440	2	1.980
	403	180°	+2.700	Ø20	10371440	4	1.771
NETWORK ROOM	411	180°	+2.700	Ø25	10371441	b	2.296

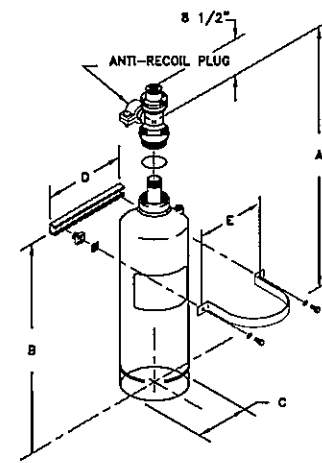
CRAC ROOM AND NETWORK ROOM
AS 1:100

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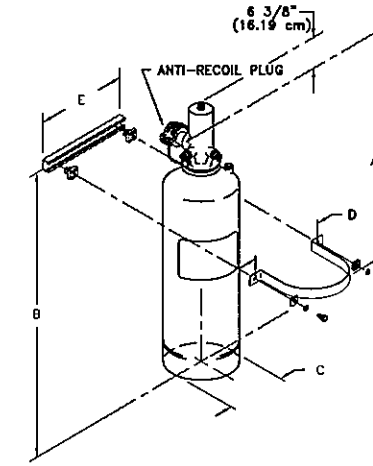
NOVEC-1230 CONTROL PANEL INSTALLATION DETAIL

A1 1:25
A3 1:50



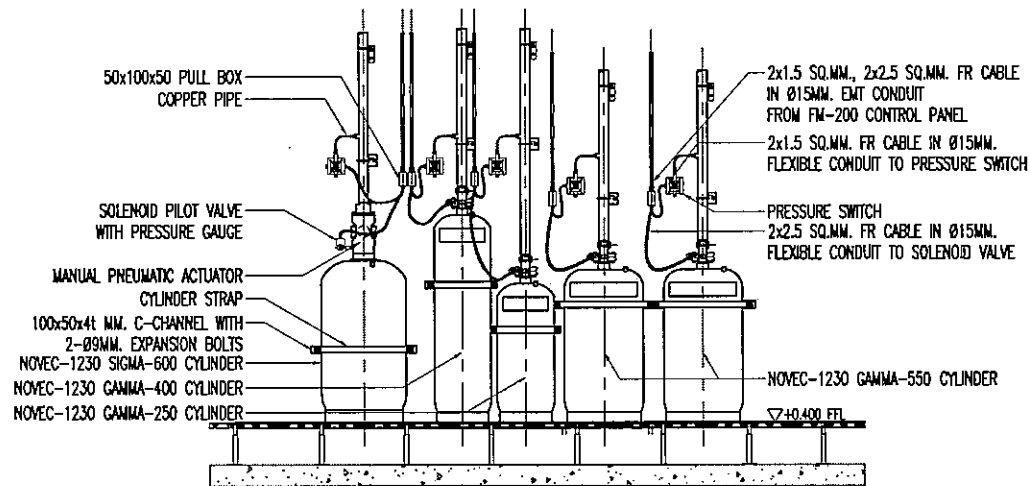
NOMINAL CYLINDER SIZE	A		B		C		D		E	
	in	cm	in	cm	in	cm	in	cm	in	cm
600 lb.	53.563	136.0	20.5	52.1	22	56	26	66.04	24.25	61.6

SIGMA CYLINDERS DETAIL



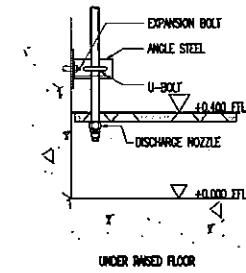
NOMINAL CYLINDER SIZE	A		B		C		D		E	
	in	cm	in	cm	in	cm	in	cm	in	cm
250 lb.	42.375	107.6	26	66.0	16	40.6	18.25	46.3	20	50.8
400 lb.	61.625	156.5	38.5	97.8	16	40.6	18.25	46.3	20	50.8
550 lb.	42.375	107.6	26	66.0	22	55.9	24.25	61.6	26	66.1

GAMMA CYLINDERS DETAIL

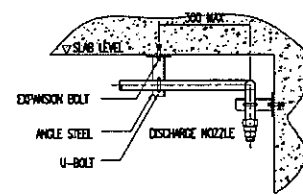
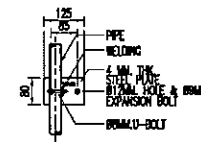


NOVEC-1230 CYLINDERS INSTALLATION

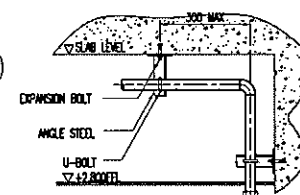
A1 1:50



UNDER RAISED FLOOR



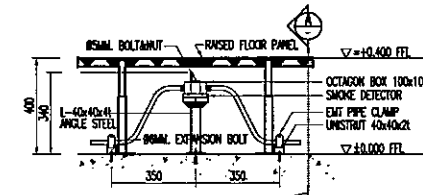
MOUNTING ON SLAB CEILING



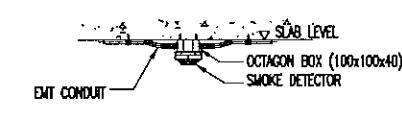
MOUNTING UNDER SUSPENDED CEILING

PIPE SUPPORT INSTALLATION DETAILS

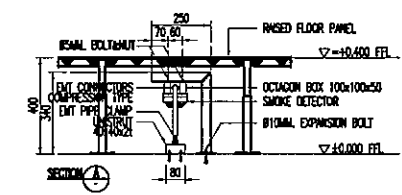
A1 1:50



UNDER RAISED FLOOR



MOUNTING ON SLAB CEILING



MOUNTING UNDER SUSPENDED CEILING

TYPICAL SMOKE DETECTOR INSTALLATION

A1 1:50

NOTE :

1. BELL SHALL BE MOUNTED SUCH THAT THEIR TOP SHALL AT LEAST THAN 2.29 M ABOVE FINISHED FLOOR AND SHALL BELOW THE FINISHED CEILING NOT LESS THAN 0.15 M
2. HORN STROBE SHALL BE MOUNTED SUCH THAT THE ENTIRE LENS WITHIN 2.29-2.44 M ABOVE FINISHED FLOOR AND THEIR TOP SHALL BELOW THE FINISHED CEILING NOT LESS THAN 0.15 M
3. STROBE SHALL BE MOUNTED SUCH THAT THE ENTIRE LENS WITHIN 2.03-2.44 M ABOVE FINISHED FLOOR
4. THE OPERATION PART OF MANUAL STATION SHALL BE BETWEEN 1.07-1.22 M ABOVE FINISHED FLOOR

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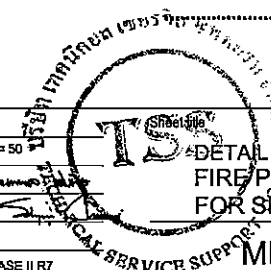
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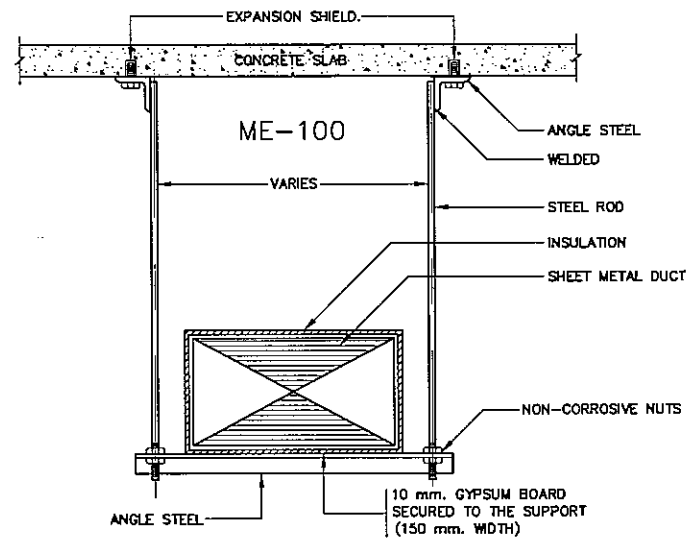
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ME-24

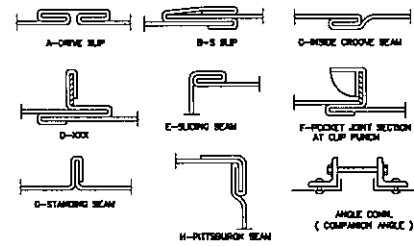
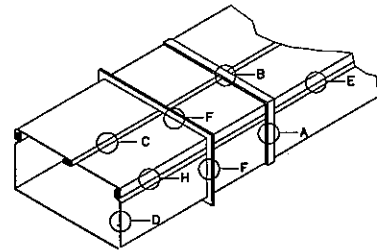
Sheet 1 Of 27



DIMENSION OF DUCT LONGEST SIZE	MAX HANGER SPACING	DIMENSION OF			REMARK
		ANGLE STEEL	STEEL ROD	C-CHANNEL	
UP TO 24"	8"	1"x1"x1/8"	3/8"	3/16"x1/4"	
24" TO 54"	8"	1/4"x1/4"x1/8"	1/2"	3/16"x1/4"	
54" AND OVER	8"	1/2"x1/2"x1/8"	1/2"	3/16"x1/4"	

NOTE
ALL STEEL HANGER ELEMENT SHALL BE COATED WITH ANTI RUST PAINT "PRIOR" TO INSTALLATION.

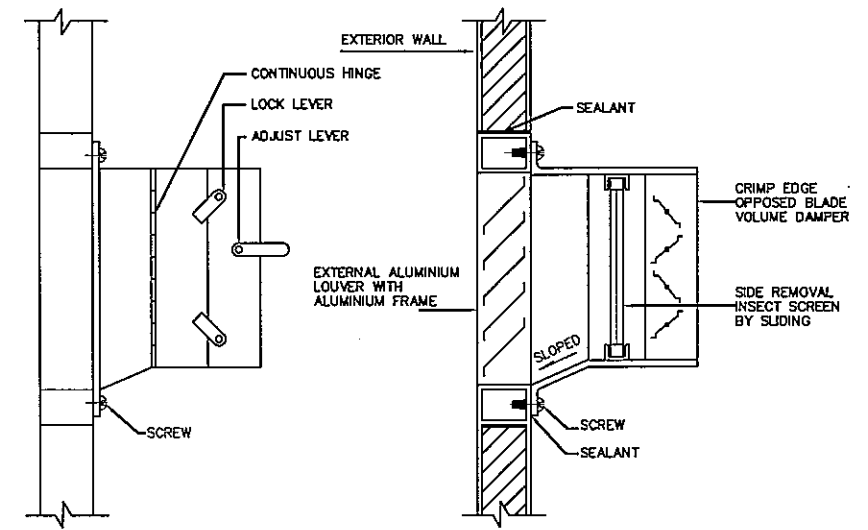
DUCT HANGERS AND SUPPORTS



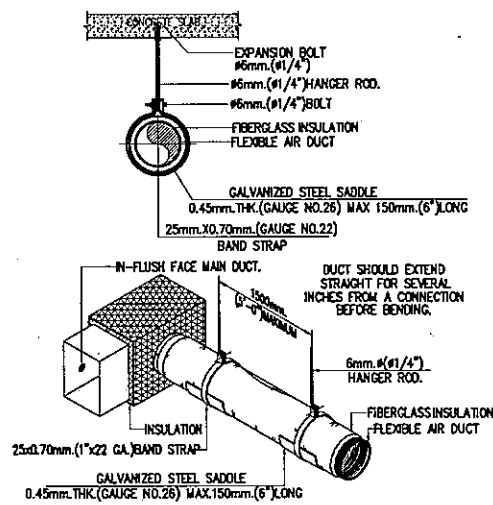
JOINTS AND SEAMS FOR LOW VELOCITY SYSTEMS

DUCT GAUGE & BRACING SCHEDULE (LOW VELOCITY)					
MAX. RISE IN FEET	DUCT GAUGE (GAGE NO. 26)	DUCT GAUGE (GAGE NO. 22)	TYPE TRANSVERSE JOINT CONNECTIONS	BRACING	
UP TO 13	26	24	S SLIP OR DRIP SLIP B & FT. G.C.	NONE	
13 TO 20	24	22	S SLIP OR DRIP SLIP B & FT. G.C.	NONE	
20 TO 24	22	20	ANGLE CONNECTION B FT. G.C. OR POCKET LOCK	1 1/2"X 1/2"X 1/4" L & FT. G.C.	
24 TO 34	20	18	ANGLE CORNER OR POCKET LOCK B FT. G.C.	1 1/2"X 1/2"X 1/4" L & FT. G.C.	
OVER 34	18	16	ANGLE CORNER OR POCKET LOCK B FT. G.C.	2"X1 1/2"X 1/4" L & FT. G.C.	

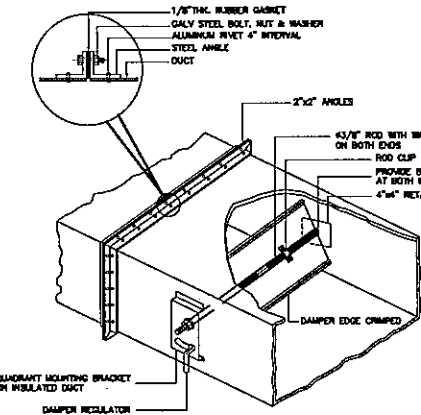
TYPICAL DUCT CONNECTION CROSS JOINTS DETAILS



FRESH AIR HOOD



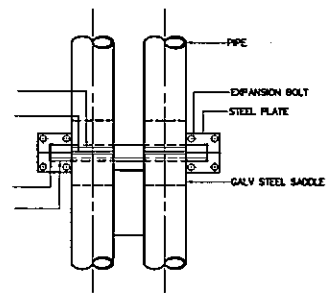
HANGING OF FLEXIBLE AIR DUCT



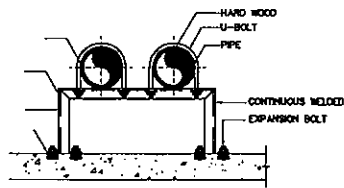
VOLUME DAMPER DETAILS

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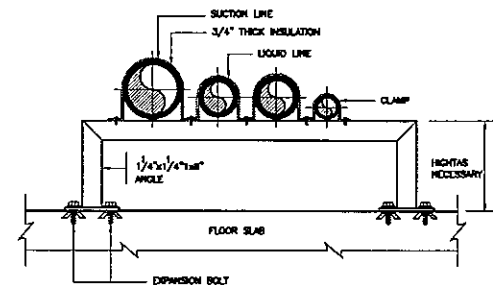
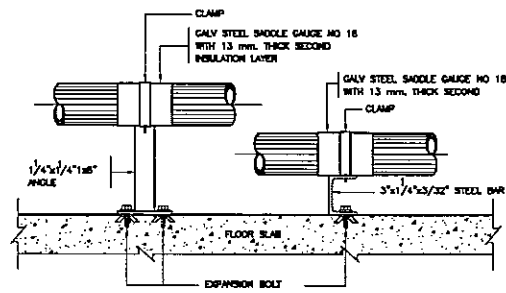


PLAN

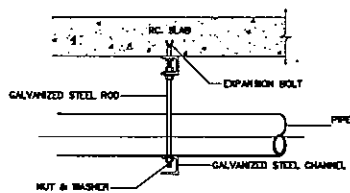


ELEVATION

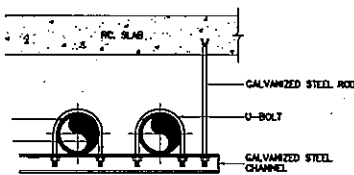
PIPE HANGER



PIPE SUPPORT

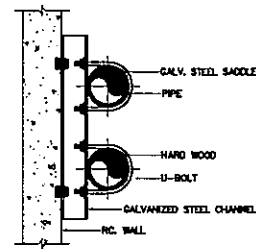


SIDE VIEW

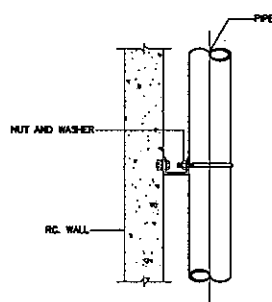


END VIEW

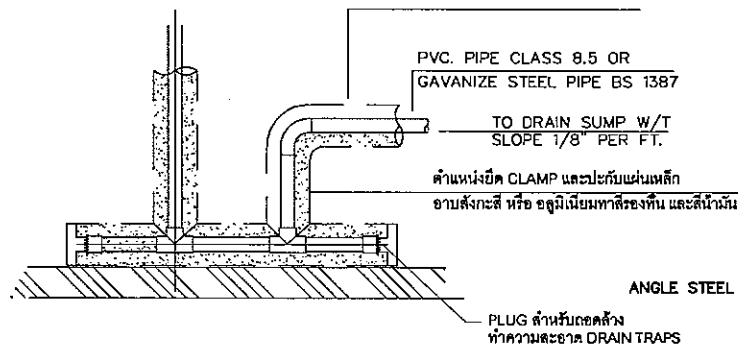
PIPE HANGER



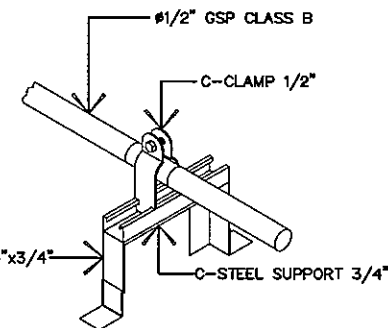
ELEVATION



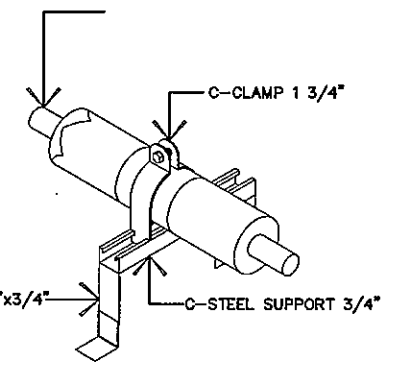
PIPE SUPPORT



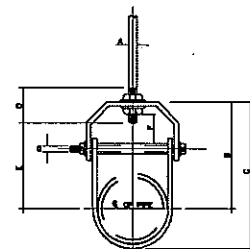
DETAIL OF DRAIN-TRAP



DETAIL OF WATER SUPPLY PIPE



DETAIL OF CONDENSATE DRAIN PIPE



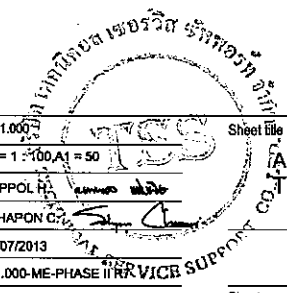
NOTE: Ø MEANS PIPE DIAMETER AND/OR PIPE DIAMETER PLUS INSULATION (IF ANY)

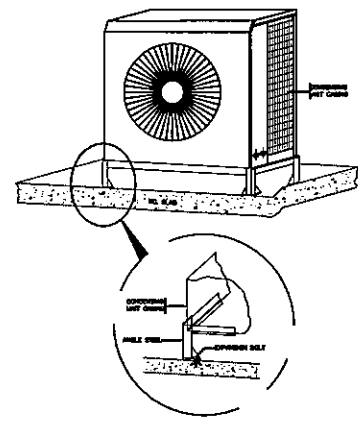
DIAMENSION OF ADJUSTABLE CLEVIS HANGER (mm.)

Ø	SIZE OF STEEL		A	B	C	D	E	adjustment F	G
	UPPER	LOWER							
2 1/2"	8 x 38	8 x 38	18	118	136	76	87	44	9
2"	8 x 28	8 x 28	12	130	147	70	86	44	9
4"	8 x 28	8 x 28	18	138	159	84	114	50	9
6"	8 x 28	8 x 28	18	157	188	98	130	44	12
8"	8 x 28	8 x 28	18	178	207	108	142	47	12
8"	8 x 32	8 x 44	22	212	240	108	178	54	18
10"	8 x 32	8 x 44	22	230	267	114	212	57	18
12"	8 x 32	8 x 50	22	280	317	138	258	78	18
14"	12 x 38	8 x 44	26	318	344	133	273	75	22
16"	12 x 38	8 x 53	26	357	384	158	318	87	26
18"	12 x 38	8 x 63	28	384	428	164	354	96	28
20"	15 x 28	8 x 75	28	428	488	178	397	108	32
24"	15 x 28	8 x 75	32	468	553	191	444	108	32
28"	18 x 32	8 x 75	32	548	628	198	498	118	32
30"	18 x 32	8 x 75	32	613	694	210	558	127	32

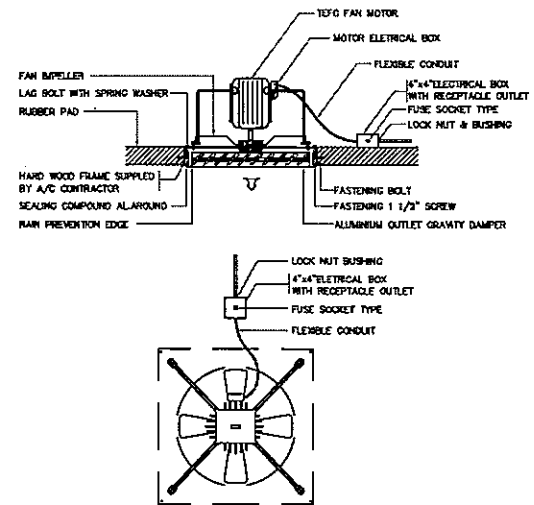
ADJUSTABLE CALVIS HANGER

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CONDENSING UNIT HANGER



SMALL WALL EXHAUST FAN MOUNTING DETAIL

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Project
EGA MAIN DATA CENTER
UPGRADE
PHASE II
Owner
E - Government Agency

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TYPICAL DETAIL SHEET 3

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