

STRUCTURAL PLAN

GENERAL NOTES:

1.0 GENERAL :

- 1.1 UNLESS NOTED OTHERWISE, ALL DIMENSIONS SHOWN ARE IN MILLIMETERS AND ELEVATIONS SHOWN ARE IN METERS.
1.2 THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AT THE SITE, AND SHALL NOTIFY THE ENGINEER OF DISCREPANCIES BETWEEN ACTUAL CONDITIONS AND INFORMATION SHOWN ON THE DRAWINGS BEFORE PROCEEDING WITH THE WORK.

2.0 STANDARDS AND REFERENCES :

- 2.1 AMERICAN CONCRETE INSTITUTE (ACI PUBLICATIONS) :
ACI 318-05 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
ACI 315-94 MANUAL OF STANDARD PRACTICE FOR DETAILS AND DETAILING OF CONCRETE REINFORCEMENT.

3.0 BASIC DESIGN LOADS :

- 3.1. DEAD LOADS (DL) :
3.1.1 CONCRETE 24.00 kN/m3
3.1.2 STEEL 77.00 kN/m3
3.1.3 SOIL 18.00 kN/m3

3.3. WIND LOAD (WL)

WIND LOADING ON MWFRS (MAIN WIND FORCE RESISTING SYSTEM) :

P = q_i(GC_p)-(GC_p))

WHERE :

- P= DESIGN WIND PRESSURE, KN/m2
q = VELOCITY PRESSURE, KN/m2
= 47.3 x 10^-4 Kz Kzt V^2 Iw
WHERE :
Kz = VELOCITY PRESSURE COEFFICIENT GIVEN IN NSCP TABLE 207.3 EXPOSURE B.

GC_p = PRODUCT OF INTERNAL PRESSURE & GUST EFFECT FACTOR IN NSCP TABLE 207-4.

3.4. SEISMIC LOAD , E
SEISMIC LOADS FOR BUILDING STRUCTURES ARE CALCULATED BASED ON THE FOLLOWING:

E = rho Eh + Ev
Em = Omega Eh

WHERE:

- E = EARTHQUAKE LOAD ON THE STRUCTURE
Eh = THE EARTHQUAKE LOAD DUE TO THE BASE SHEAR, V, OR THE DESIGN LATERAL FORCE Fp.
Em = THE ESTIMATED MAXIMUM EARTHQUAKE FORCE THAT CAN BE DEVELOPED IN THE STRUCTURE.

WHERE:

- r_max = THE MAXIMUM ELEMENT-STORY SHEAR RATIO. FOR A GIVEN DIRECTION OF LOADING, THE ELEMENT-STORY SHEAR RATIO IS THE RATIO OF THE DESIGN OF STORY SHEAR IN THE HEAVILY LOADED SINGLE ELEMENT DIVIDED BY THE TOTAL DESIGN STORY SHEAR.
FOR MOMENT FRAMES, IT SHALL BE TAKEN AS THE MAXIMUM OF THE SUM OF THE SHEARS IN ANY TWO ADJACENT COLUMNS IN A MOMENT FRAME BAY DIVIDED BY THE STORY SHEAR. FOR COLUMNS COMMON TO TWO BAYS, 70 PERCENT OF THE SHEAR IN THAT COLUMN MAY BE USED IN THE COLUMN SHEAR SUMMATION.

EARTHQUAKE BASE SHEAR, (V) :
THE TOTAL DESIGN BASE SHEAR IN A GIVEN DIRECTION SHALL BE DETERMINED FROM THE FOLLOWING FORMULA:

V = Cy I (W) / RT

AND NEED NOT EXCEED THE FOLLOWING:

V = 2.5 Ca I (W) / R

BUT SHALL NOT BE LESS THAN THE FOLLOWING:

V = 0.11 Ca I W

IN ADDITION FOR SEISMIC ZONE 4, THE TOTAL BASE SHALL ALSO BE NOT LESS THAN THE FOLLOWING:

V = 8.5 Z Nv I (W) / R

WHERE:

- SEISMIC ZONE FACTOR, Z = 0.40
IMPORTANCE FACTOR, I = 1.5
GLOBAL DUCTILITY CAPACITY, R = 8.5 (SMRF)
SEISMIC FORCE OVERSTRENGTH FACTOR, Omega_o = 2.8
SEISMIC SOURCE TYPE, = A
NEAR - SOURCE FACTOR, Nv = 1.6
NEAR - SOURCE TYPE, Na = 1.2

4.0 MATERIALS :

4.1 NORMAL WEIGHT CONCRETE :

- 4.1.1 CONCRETE USED IN THIS WORK SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH @ 28 DAYS AS FOLLOWS:
COLUMN, BEAM, SLAB, & OTHERS f'c = 28MPa (4,000 PSI)
FOOTING f'c = 21MPa (3,000 PSI)
4.1.2 ALL CONCRETE SHALL BE DEPOSITED, VIBRATED AND CURED IN ACCORDANCE WITH ACI STANDARD 318-2005.

4.2 REINFORCING BARS :

- 4.2.1 UNLESS OTHERWISE SPECIFIED ON PLANS, ALL REINFORCING BARS SHALL BE DEFORMED WITH A MINIMUM YIELD STRENGTH, fy = 414 MPa (60,000 PSI), FOR DIAMETER 12mm AND BELOW, USE fy = 275 Mpa (40,000 PSI)

- 4.2.2 ALL REINFORCING BARS SHALL BE CLEANED OF RUST, GREASE OR OTHER MATERIALS WHICH TEND TO IMPAIR BOND.
4.2.3 ALL REINFORCING BARS SHALL BE ACCURATELY AND SECURELY PLACED BEFORE POURING CONCRETE OR APPLYING MORTAR OR GROUT.
4.2.4 LAPPED SPLICES SHALL BE STAGGERED WHERE POSSIBLE.
4.2.5 UNLESS INDICATED OTHERWISE, SPlicing OF REINFORCEMENT SHALL BE IN ACCORDANCE WITH ACI 318-2005.

4.3 STRUCTURAL STEEL/ANCHOR BOLTS/BOLTS/WELDS & WELDMENTS

- 4.3.1 ALL STRUCTURAL STEEL SHALL HAVE A MINIMUM YIELD STRENGTH, Fy = 248 MPa (36 KSI) AND SHALL CONFORM TO ASTM A 36 SPECIFICATIONS.
4.3.2 ALL STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH THE AISC SPECIFICATIONS (9TH EDITION) AND CODE OF STANDARD PRACTICE AS AMENDED TO DATE.
4.3.3 ALL COLD FORMED STEEL SHALL HAVE A MINIMUM STRENGTH, Fy = 230 MPa (33 KSI)

4.4 CONCRETE MASONRY UNITS (CMU)

- 4.4.1 CMU USED IN THESE WORKS SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH @ 28 DAYS AS FOLLOWS :
100mm THICK NON-LOAD BEARING CMU, fm = 2.4 MPa (350 PSI)
150mm THICK NON-LOAD BEARING CMU, fm = 2.4 MPa (350 PSI)
4.4.2 ALL CELLS SHALL BE SOLIDLY FILLED WITH GROUT. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 13.80 MPa (2,000 PSI) @ 28 DAYS.

5.0 CONSTRUCTION JOINTS :

- 5.1 CONTRUCTION JOINTS NOT INDICATED ON PLANS SHALL BE MADE SO AS TO LEAST IMPAIR THE STRENGTH OF THE STRUCTURE AND SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.
5.2 UNLESS SHOWN OTHERWISE, SLAB ON GRADE SHALL HAVE CONTROL JOINTS @ 6.00m MAXIMUM CENTER TO CENTER.

6.0 NOTES ON BEAMS AND GIRDERS :

- 6.1 UNLESS OTHERWISE NOTED IN PLANS OR SPECIFICATIONS, CAMBER ALL BEAMS AND GIRDERS AT LEAST 0.006m FOR EVERY 4.50m OF SPAN EXCEPT CANTILEVERS FOR WHICH THE CAMBERS SHALL BE AS NOTED IN THE PLANS OR AS ORDERED BY THE DESIGNERS. BUT IN NO CASE LESS THAN .019m FOR EVERY 3.00m OF FREE SPAN.

- 6.2 IF THERE ARE TWO OR MORE LAYERS OF REINFORCING BARS , USE SEPARATORS OF SIZE NOT LESS THAN 25mm BARS SPACED ABOUT 1.00m ON CENTER AND PLACED DIAGONALLY. IN NO CASE SHALL THERE BE LESS TWO (2) SEPARATORS BETWEEN LAYERS OF BARS.
6.3 WHEN A BEAM CROSSES A GIRDER, REST BEAM BARS ON TOP OF GIRDER BARS. REINFORCING BARS SHALL BE SYMMETRICAL ABOUT THE CENTER LINE WHENEVER POSSIBLE. UPPER LAYER SHALL BE PLACED DIRECTLY ABOVE THOSE IN THE BOTTOM LAYER. SPACING OF BARS IN LAYER SHALL NOT BE LESS THAN 0.025m NOR ONE BAR DIAMETER.
6.4 GENERALLY, NO SPLICE SHALL BE PERMITTED ON BEAM AT POINT WHERE CRITICAL BENDING STRESSES OCCUR. WELDED SPLICES SHALL DEVELOP IN TENSION AT LEAST 125% OF THE SPECIFIED STRENGTH OF THE BAR, NOT MORE THAN 50% OF THE BARS AT ANY ONE SECTION SHALL BE ALLOWED TO BE SPLICED THEREIN.

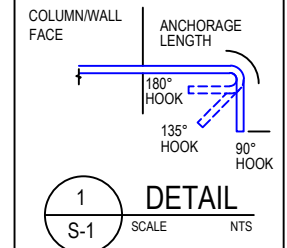
7.0 FOUNDATIONS :

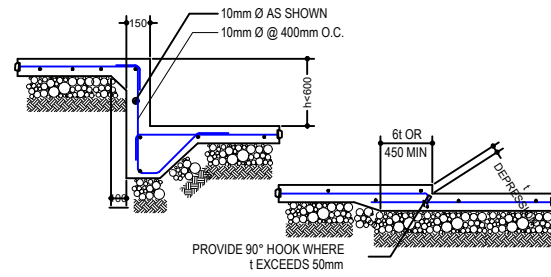
- 7.1 FOOTINGS WERE DESIGNED USING AN ASSUMED ALLOWABLE SOIL BEARING CAPACITY OF 150 kPa AT DEPTHS INDICATED IN THE DRAWING. IN CASE THE ACTUAL SOIL BEARING CAPACITY IS FOUND LESS THAN THE ASSUMED 150 kPa, NOTIFY THE STRUCTURAL ENGINEER FOR PROPER REVISION OF FOOTINGS.
7.2 CONFIRMATION OF ACTUAL SOIL BEARING CAPACITY SHALL BE PERFORMED PRIOR TO THE CONSTRUCTION OF THE FOUNDATION.
7.3 WHERE LOOSE/SMART MATERIAL IS ENCOUNTERED AT DEPTH OF FOOTING/FOUNDATION INDICATED, EXCAVATE TO FIRM LAYER AND REPLACE LOOSE/SMART MATERIALS UNDERNEATH THE FOOTING WITHIN THE FOOTING AREA PLUS 1/2 DEPTH OF SOIL MATERIAL ON ALL SIDES WITH SELECTED BACKFILL. COMPACT SELECTED BACKFILL TO 95% MAXIMUM DRY DENSITY (ASTM D1557).
7.4 ALL COLUMN FOOTINGS SHALL REST ON 100mm THK COMPACTED GRAVEL BASE COURSE, UNLESS OTHERWISE STATED.

LAP SPLICE & ANCHORAGE LENGTH TABLE

Table with 12 columns: BAR DIAMETER (mm), ANCHORAGE LENGTH (m), STANDARD HOOK (m) with sub-columns for 90, 180, 135 degrees, LAP SPLICE (m) with sub-columns for TENSION BAR and COMP. BAR, UNIT WEIGHT (kg/m), and MIN. LAP SPLICE LENGTH OF COL. REINF. INDIVIDUAL BARS with sub-columns for W/TIES and W/SPIRAL.

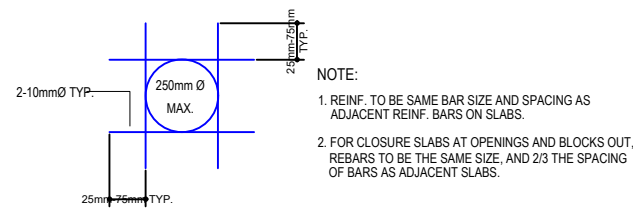
- NOTES:
1. ACI SECTION 12.4 STATES THAT DEVELOPMENT LENGTH OF INDIVIDUAL BARS W/IN A BUNDLE, IN TENSION OR COMPRESSION, SHALL BE THAT FOR THE INDIVIDUAL BAR, INCREASED 20% FOR THREE BAR BUNDLE, AND 33% FOR FOUR BAR BUNDLE.
2. FOR COLUMNS, AT ANY LEVEL NO MORE THAN ALTERNATE BARS SHOULD BE SPLICED. NOT MORE THAN 33% OF THE BARS SHALL BE SPLICED W/IN THE REQUIRED LAP LENGTH. MINIMUM DISTANCE BETWEEN TWO ADJACENT BAR SPLICES SHALL BE 600mm.



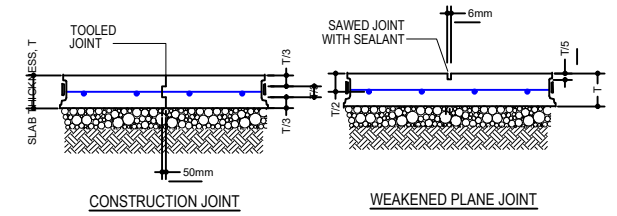


1
S-2 SCALE NTS
DEPRESSED SLAB & SLAB EDGE DETAILS

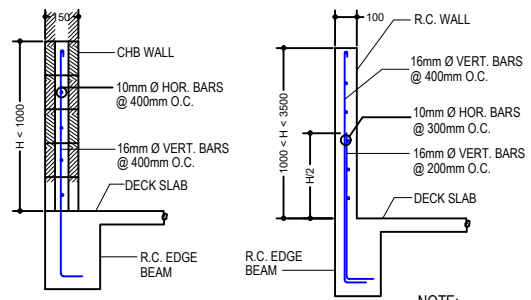
STANDARD DETAIL CONNECTION



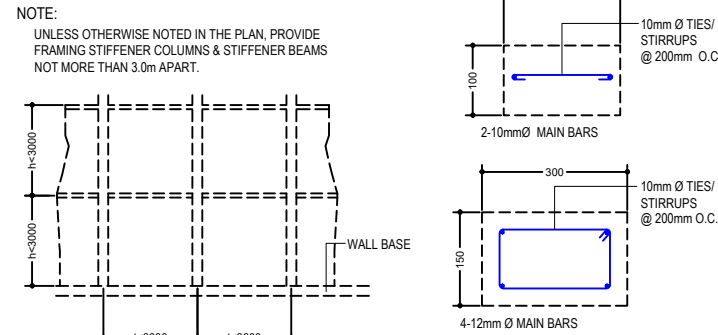
2
S-2 SCALE NTS
TYP. PIPE SLEEVE OPENING FOR SLABS



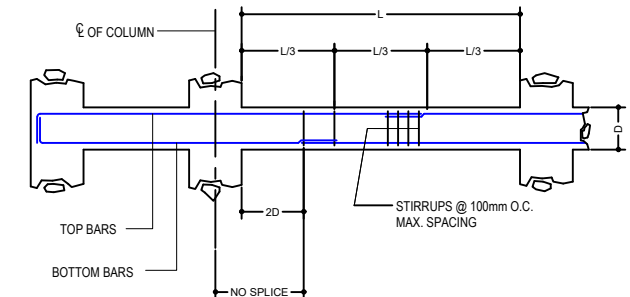
3
S-2 SCALE NTS
CONTROL JOINTS FOR SLAB-ON GRADE
NOTE:
1. CONTROL JOINTS CAN BE EITHER CONSTRUCTION JOINTS OR WEAKENED PLANE JOINTS.



4
S-2 SCALE NTS
TYPICAL DETAIL SECTION OF PARAPET

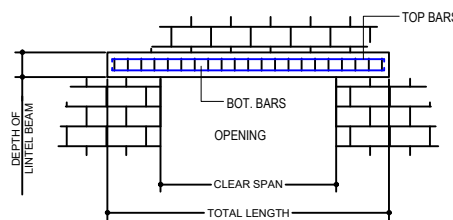


5
S-2 SCALE NTS
TYPICAL DETAIL OF STIFFENER BEAMS & COLUMNS

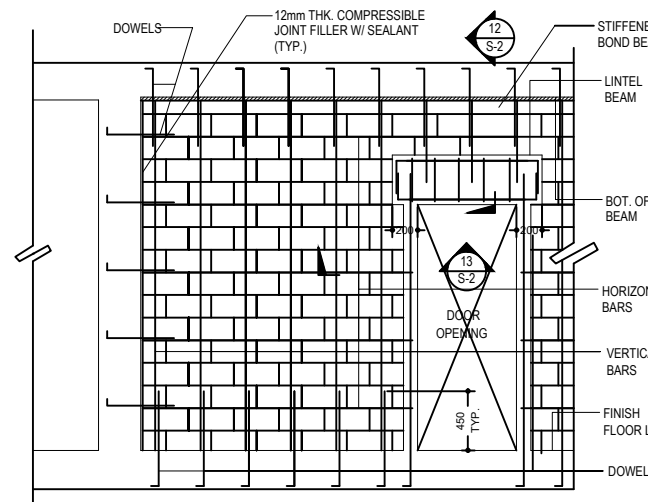


6
S-2 SCALE MTS
TYP. SPLICE DETAILS FOR BEAMS FRAMING INTO COLUMN

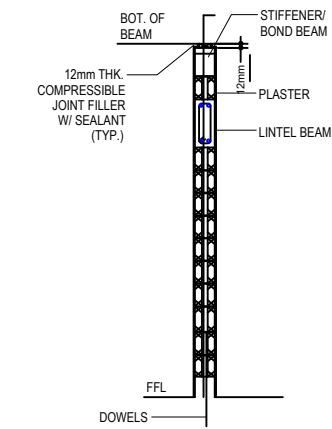
LINTEL IN BLOCK WALLS (SAME THICKNESS AS CMU)						
CLEAR SPAN L (mm)	TOTAL LENGTH mm	MIN. f _c Mpa	HEIGHT OF LINTEL BEAM (mm)	REINFORCEMENT		STIRRUPS
				BOTTOM	TOP	
1200	1800	13.8	200	2-10mm Ø	2-10mm Ø	10mm Ø @ 200
1500	2100	13.8	225	2-12mm Ø	2-12mm Ø	10mm Ø @ 200
1800	2400	13.8	250	2-16mm Ø	2-16mm Ø	10mm Ø @ 200
2100	2700	17.2	250	2-16mm Ø	2-16mm Ø	10mm Ø @ 200
2400	3000	17.2	300	2-16mm Ø	2-16mm Ø	10mm Ø @ 200
2700	3300	17.2	300	2-16mm Ø	2-16mm Ø	10mm Ø @ 200
3000	3800	17.2	350	3-16mm Ø	2-16mm Ø	10mm Ø @ 200
3300	4100	17.2	400	3-16mm Ø	2-16mm Ø	10mm Ø @ 200
3600	4400	17.2	450	4-16mm Ø	2-16mm Ø	10mm Ø @ 200



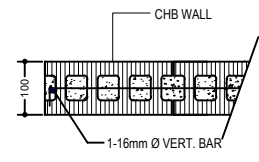
7
S-2 SCALE MTS
REINF. CONCRETE LINTEL BEAM IN CHB WALLS



8
S-2 SCALE MTS
TYP. CHB WALL ELEVATION



9
S-2 SCALE MTS
SECTION



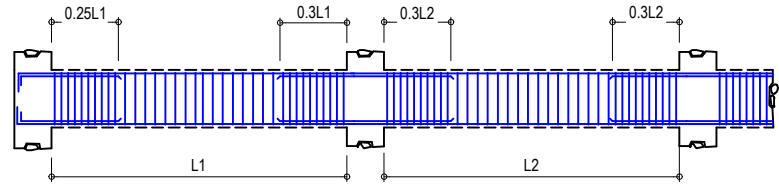
10
S-2 SCALE MTS
SECTION

SCHEDULE OF FOOTINGS

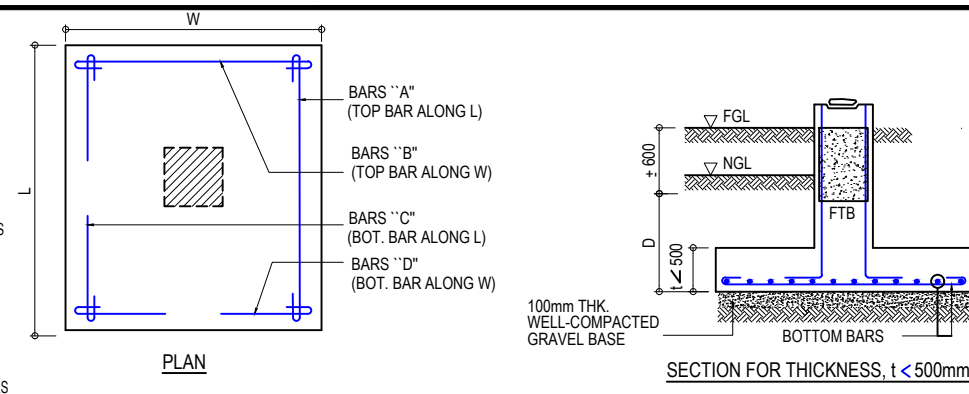
MARK	D (DEPTH) mm	t (THICK.) mm	L (LENGTH) mm	W (WIDTH) mm	REINFORCEMENT				REMARKS
					TOP		BOTTOM		
					"A"	"B"	"C"	"D"	
F1	700	300	1800	1800	-	-	9-20mm Ø	9-20mm Ø	ISOLATED FOOTING
F2	700	300	2000	2000	-	-	9-20mm Ø	9-20mm Ø	ISOLATED FOOTING
F3	700	300	2000	2000	-	-	9-20mm Ø	9-20mm Ø	ISOLATED FOOTING
F4	700	300	2500	2500	-	-	15-20mm Ø	15-20mm Ø	ISOLATED FOOTING

SCHEDULE OF FOOTING TIE BEAMS (FTB)

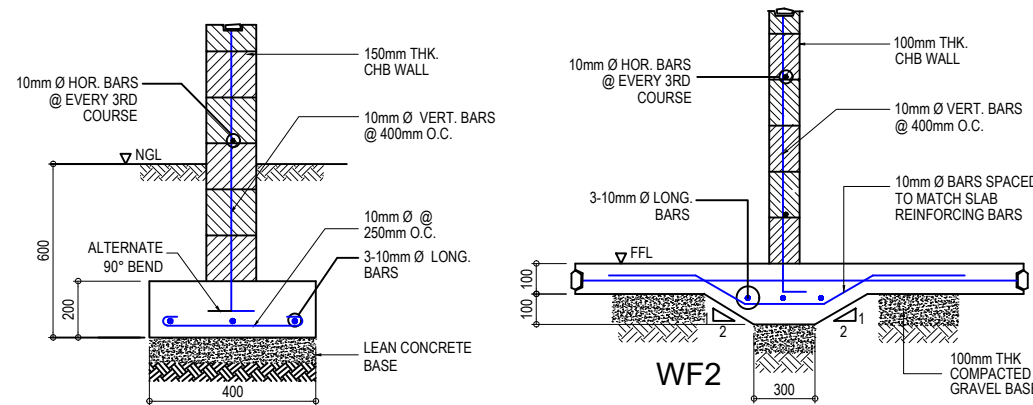
MARK	SIZES (mm)	REINFORCING BARS				ARRANGEMENT			STIRRUPS SIZE SPACING	REMARKS
		AT SUPPORT		AT MID-SPAN		AT EXT. SUPP.	AT MID SPAN	AT INT. SUPP.		
		TOP	BOTTOM	TOP	BOTTOM					
FTB1	250x350	4-20mm Ø	4-20mm Ø	3-20mm Ø	3-20mm Ø				10mm Ø STIRRUPS 1@ 50mm, 3@100mm, 3@150mm, REST@ 200mm O.C.	
FTB2	300x450	5-20mm Ø	5-20mm Ø	3-20mm Ø	3-20mm Ø				10mm Ø STIRRUPS 1@ 50mm, 3@100mm, 5@150mm, REST@ 200mm O.C.	



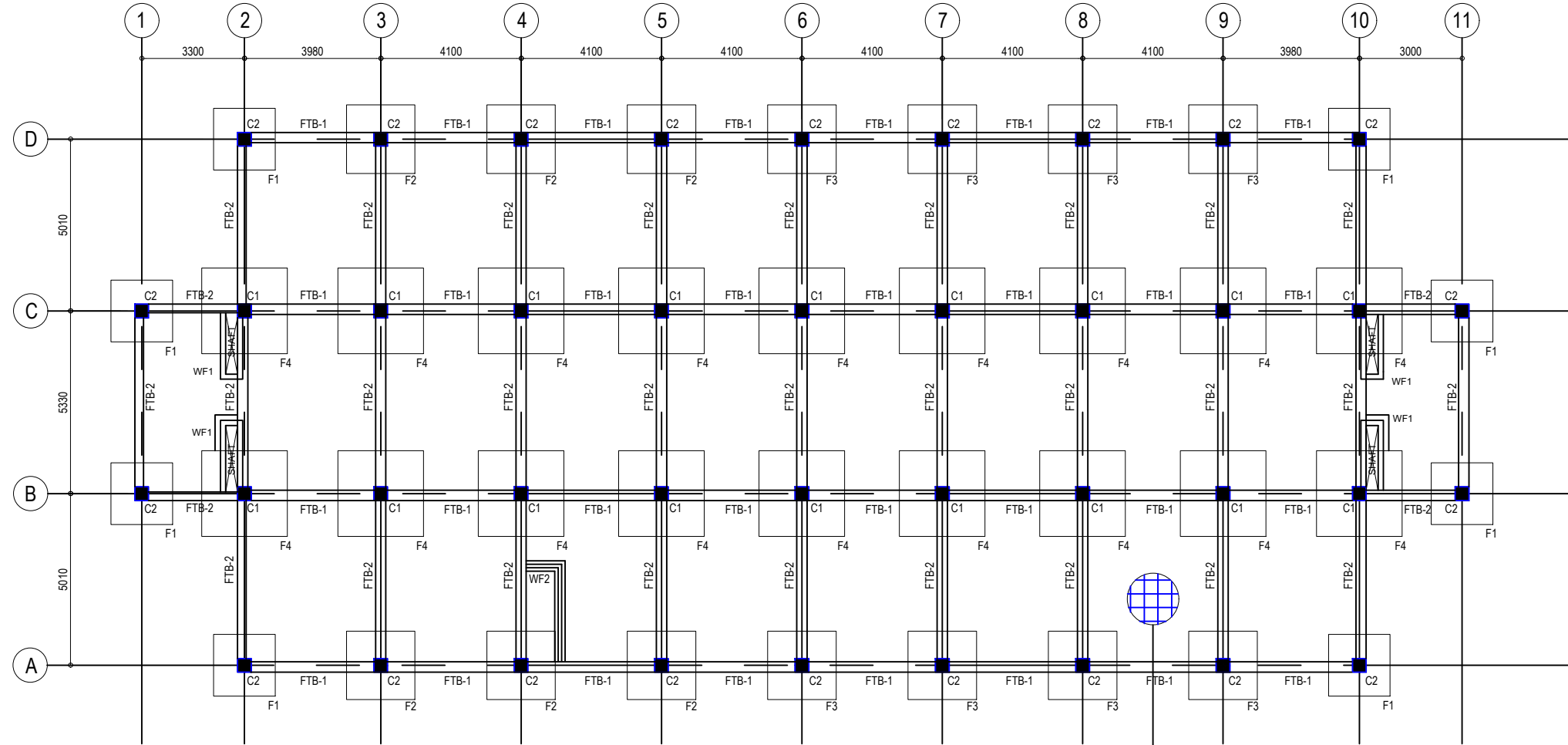
6 TYPICAL FOOTING TIE BEAM DETAIL
ST-3 NOT TO SCALE



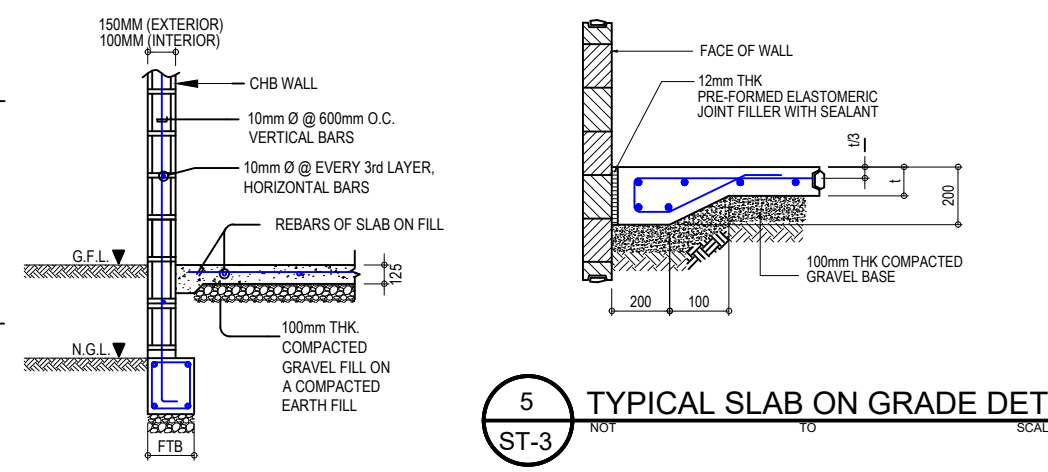
2 DETAIL REFERENCE OF FOOTINGS
ST-3 NOT TO SCALE



3 WALL FOOTING DETAIL
ST-3 NOT TO SCALE



1 LOWER GROUND FOUNDATION & FRAMING PLAN
ST-3 SCALE 1:100 M.



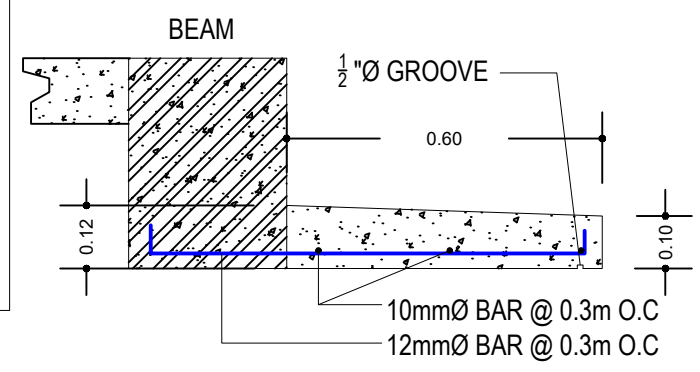
4 WALL ON FOOTING TIE BEAM
ST-3 NOT TO SCALE

5 TYPICAL SLAB ON GRADE DET.
ST-3 NOT TO SCALE

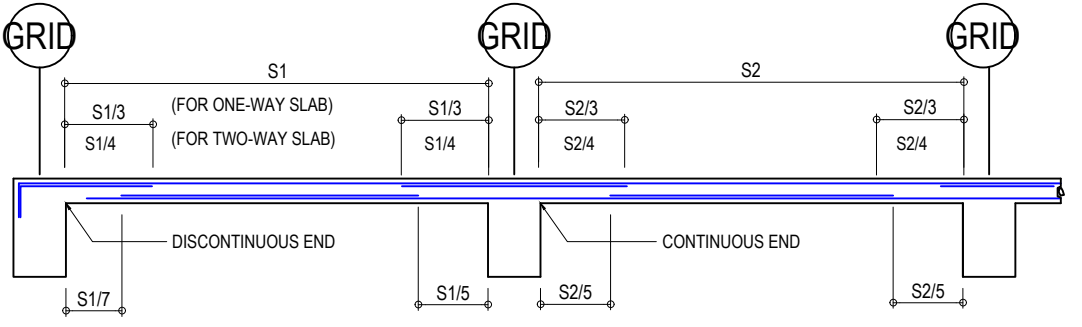
USE: 125mm THK SLAB ON FILL WITH 10mm Ø BARS SPACED @ 250mm O.C. BOTHWAYS

SCHEDULE OF SLABS

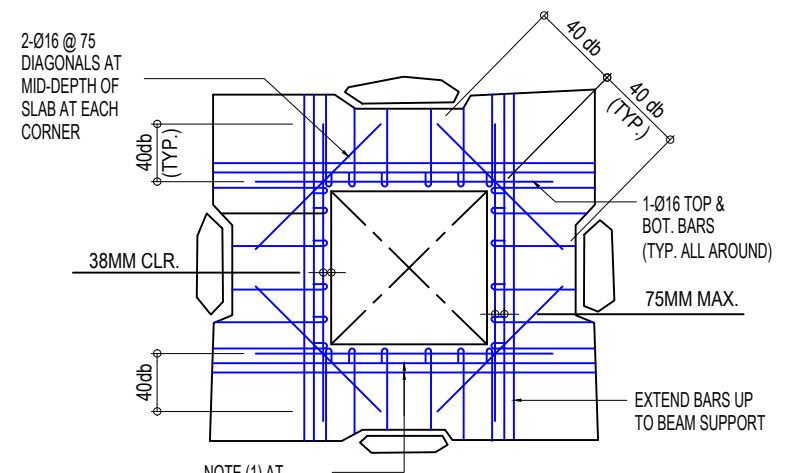
FLOOR LEVEL	MARK	THICKNESS (mm)	BAR LOCATION	BAR DIA.	REINFORCING BARS				REMARKS
					SHORT SPAN		LONG SPAN		
					END	MIDDLE	END	MIDDLE	
ALL	S-1	125	TOP	Ø10	200	200	200	200	TWO-WAY
			BOT.	Ø12	300	300	300	300	



5 TYPICAL CANOPY DETAIL
ST-4 NOT TO SCALE

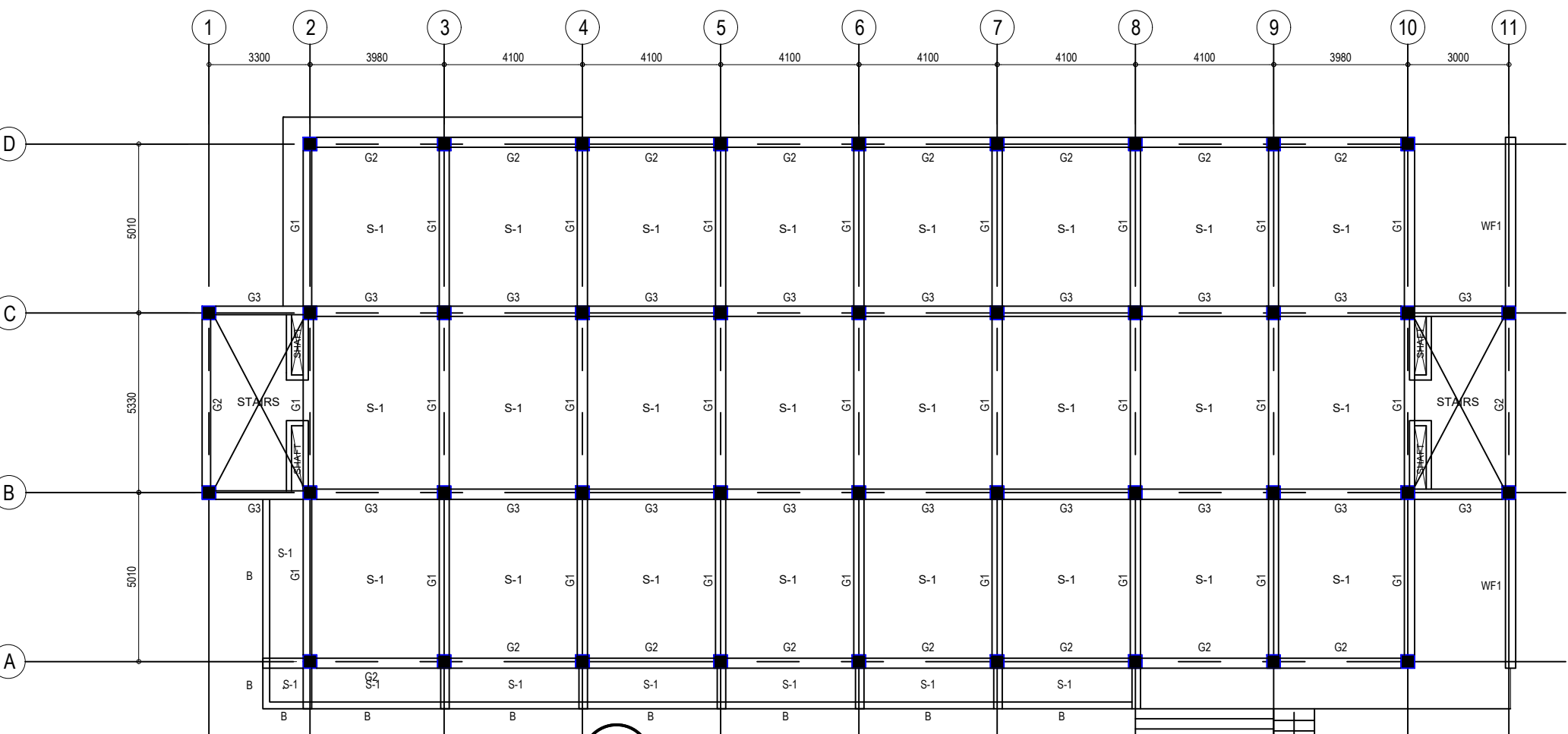


2 TYPICAL SLAB DETAIL
ST-4 NOT TO SCALE

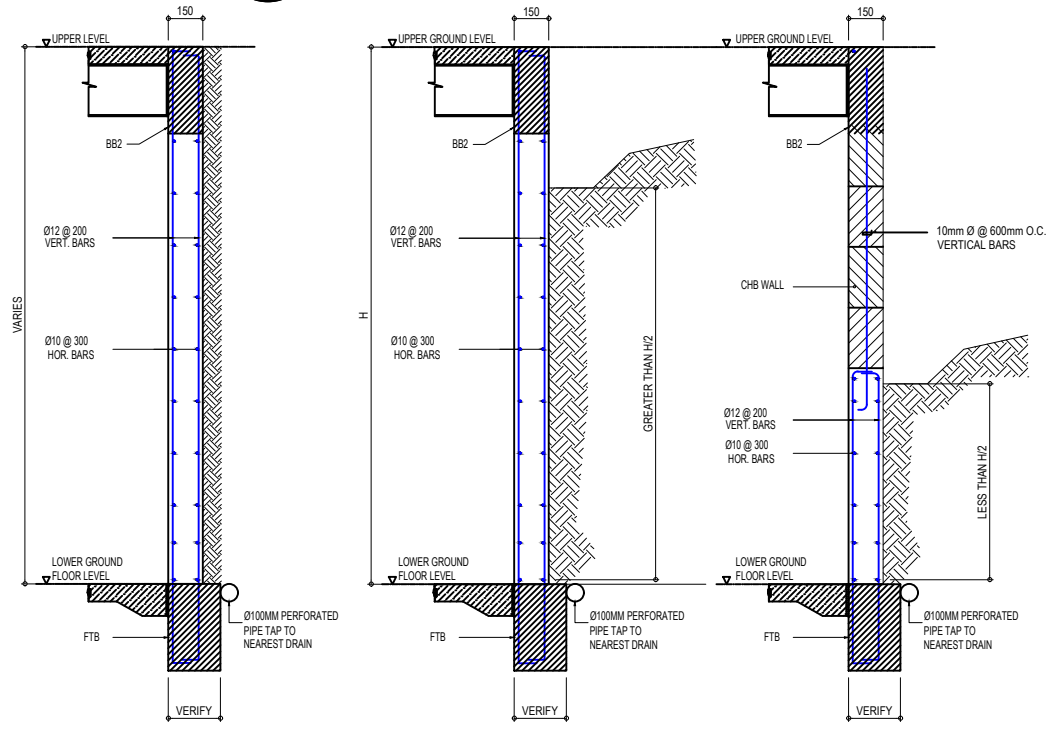


- NOTES:
- ALL TOP AND BOTTOM SLAB BARS INTERRUPTED BY OPENING SHALL BE REPLACED BY ADDITIONAL REINFORCING EQUAL TO THAT INTERRUPTED. PLACE HALF OF THE ADDITIONAL REINFORCING ON EACH SIDE OF OPENING AND EXTEND SAME LENGTH AS REQUIRED OR BAR LAP OF INTERRUPTED REINFORCING.
 - SEE ARCHITECTURAL & MECHANICAL PLANS FOR SLAB OPENING LOCATION.
 - OMIT TRIMMER BARS WHERE OPENING IS FRAMED BY BEAMS.
 - BOXED OUT OPENINGS, RECESSES AND PIPE SLEEVE CLUSTERS SHALL BE TREATED AS FRAMED SLAB OPENING.
 - MAXIMUM DIMENSION FOR EACH SIDE OF OPENING SHALL BE 1200MM. OPENINGS BEYOND THE SAID DIMENSION ARE SUBJECT TO THE APPROVAL OF THE ENGINEER.

3 TYPICAL SLAB OPENING DETAIL
ST-4 NOT TO SCALE



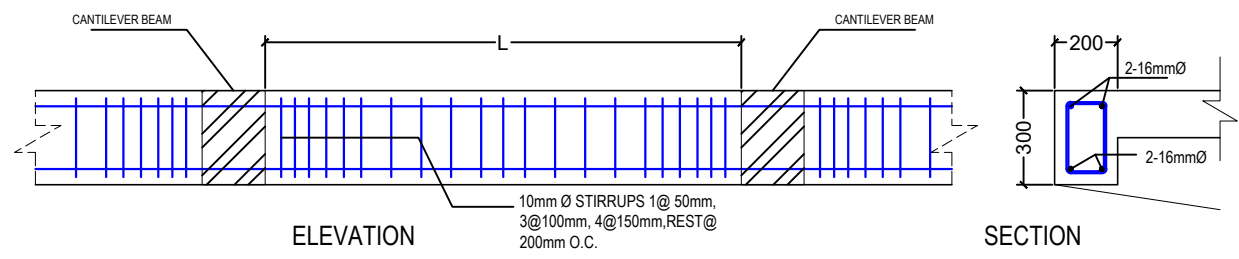
1 UPPER GROUND FRAMING PLAN
ST-4 SCALE 1:100 M.



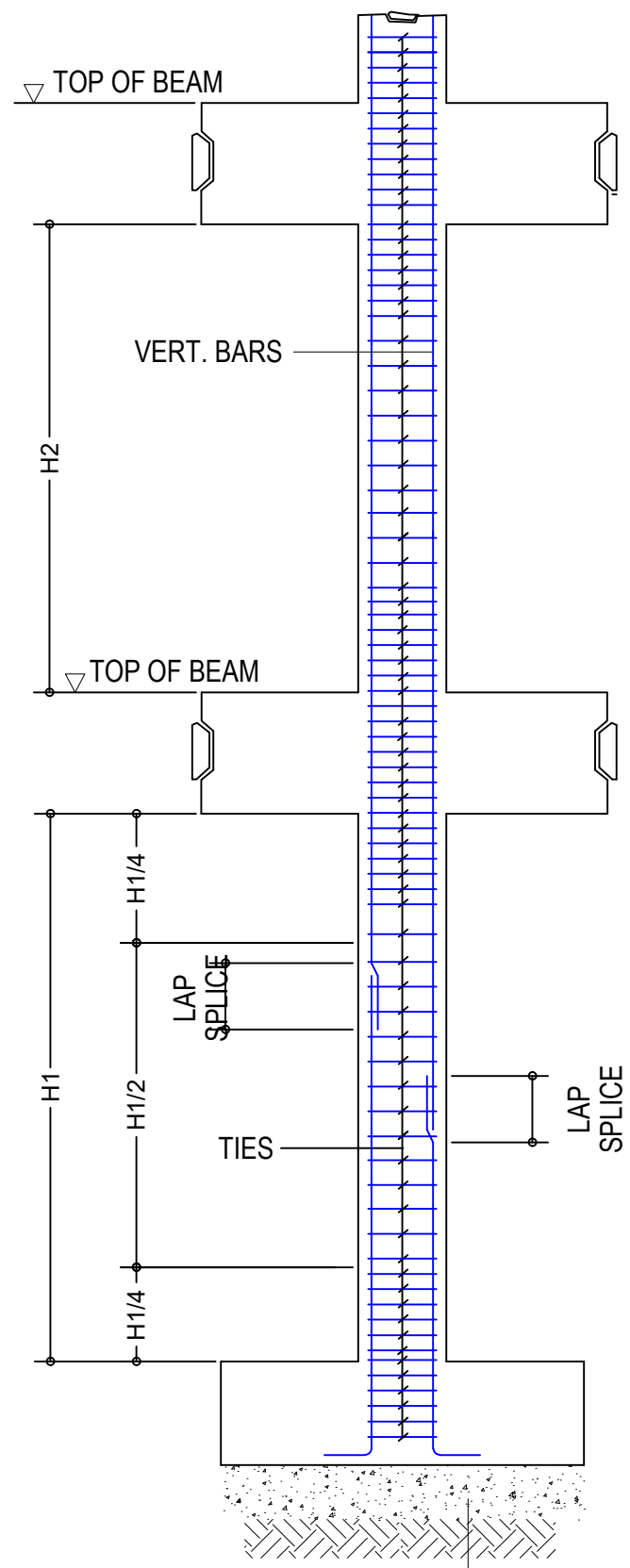
4 TYPICAL RETAINING WALL DETAIL
ST-4 NOT TO SCALE

SCHEDULE OF COLUMNS

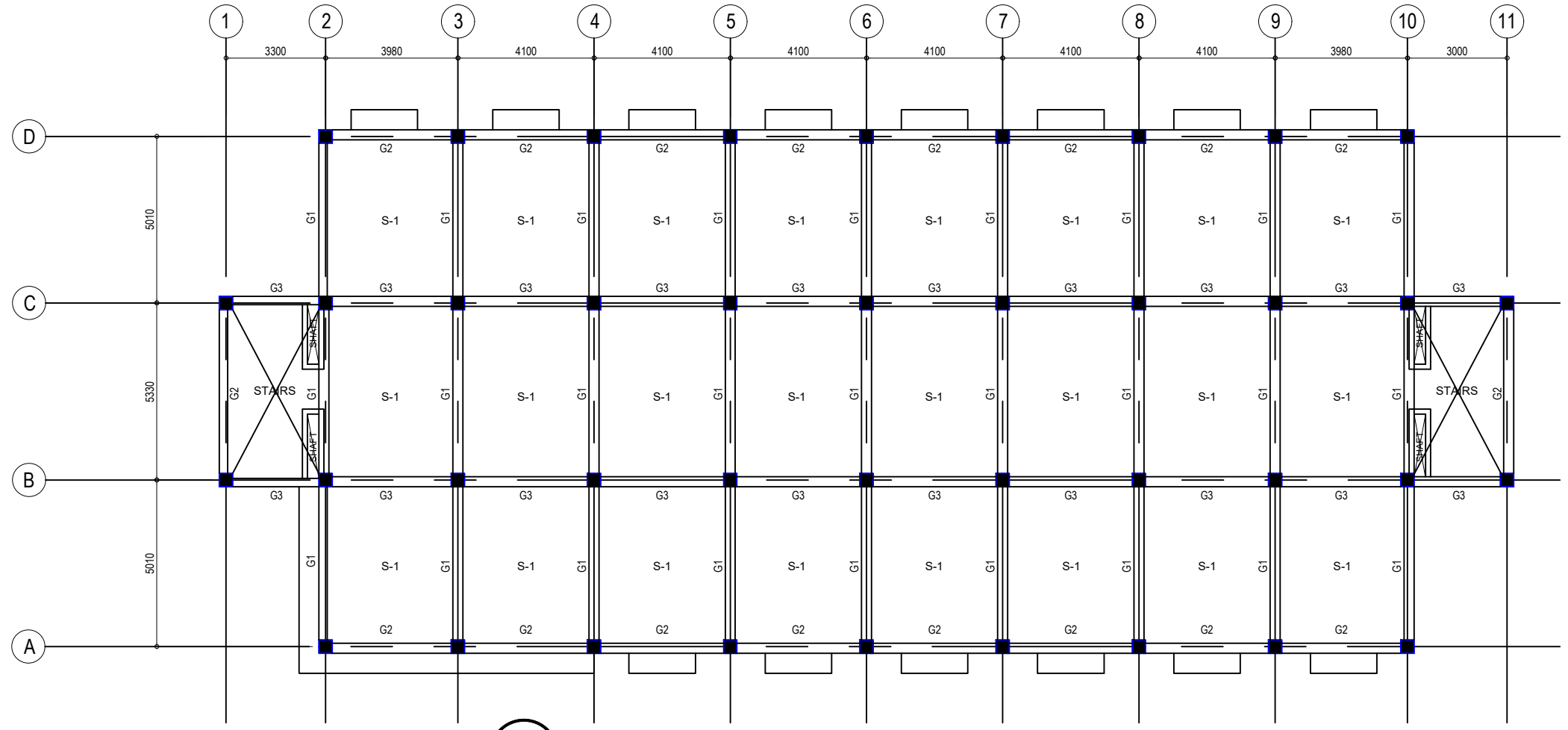
COL. MARK	C1	C2	COL. MARK	C1	C2
FOUNDATION TO SECOND FLOOR			THIRD FLOOR TO ROOF BEAM		
SIZE (mm)	400X400	350X350	SIZE (mm)	300X300	300X300
VERT. REINF.	4-25mm Ø & 4-20mm Ø	8-20mm Ø	VERT. REINF.	8-16mm Ø	8-16mm Ø
TIES	1@50mm, 2@100mm, 3@150mm, rest @ 200mm		TIES	1@50mm, 2@100mm, 3@150mm, rest @ 200mm	
SECOND FLOOR TO THIRD FLOOR					
SIZE (mm)	350X350	300X300			
VERT. REINF.	8-20mm Ø	8-20mm Ø			
TIES	1@50mm, 2@100mm, 3@150mm, rest @ 200mm				



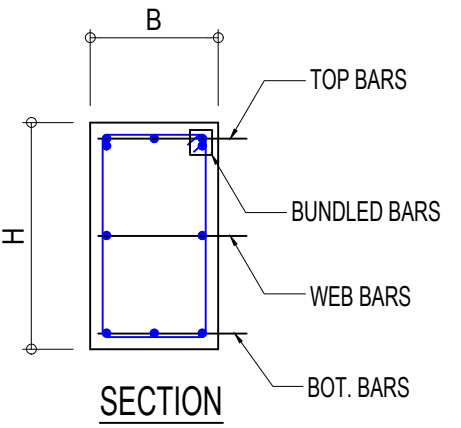
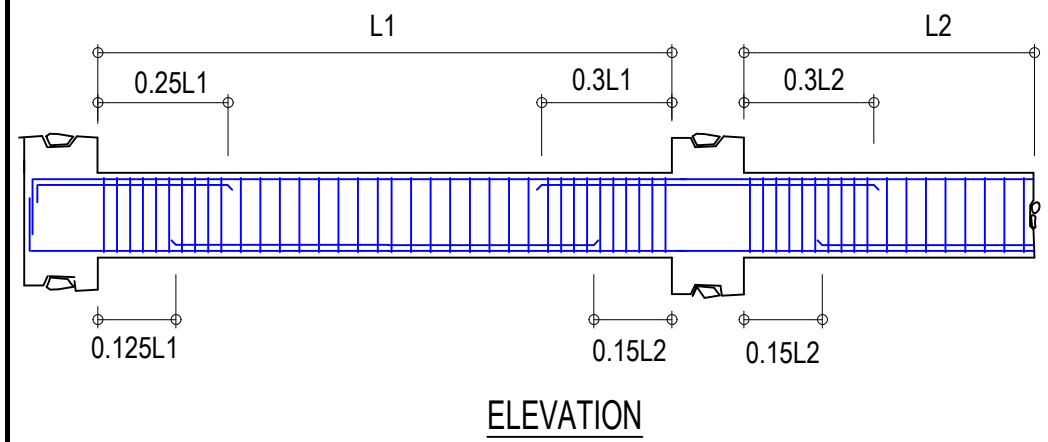
3 TYPICAL BEAM DETAIL (B)
ST-5 NOT TO SCALE



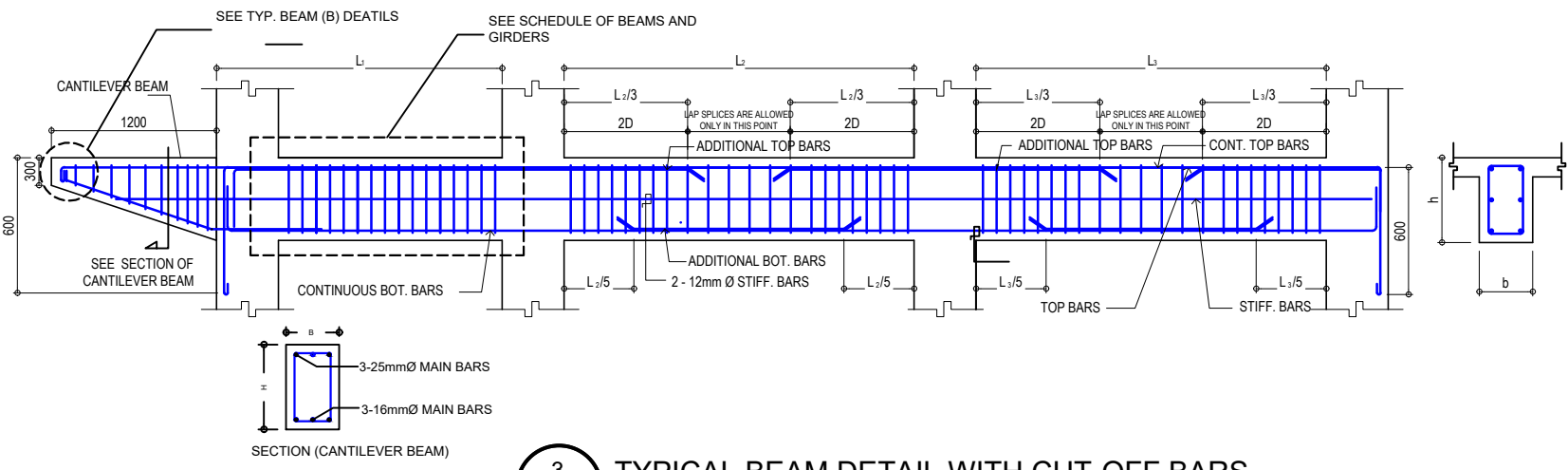
2 TYPICAL COLUMN DETAIL
ST-5 NOT TO SCALE
100mm THK COMPACTED GRAVEL BASE



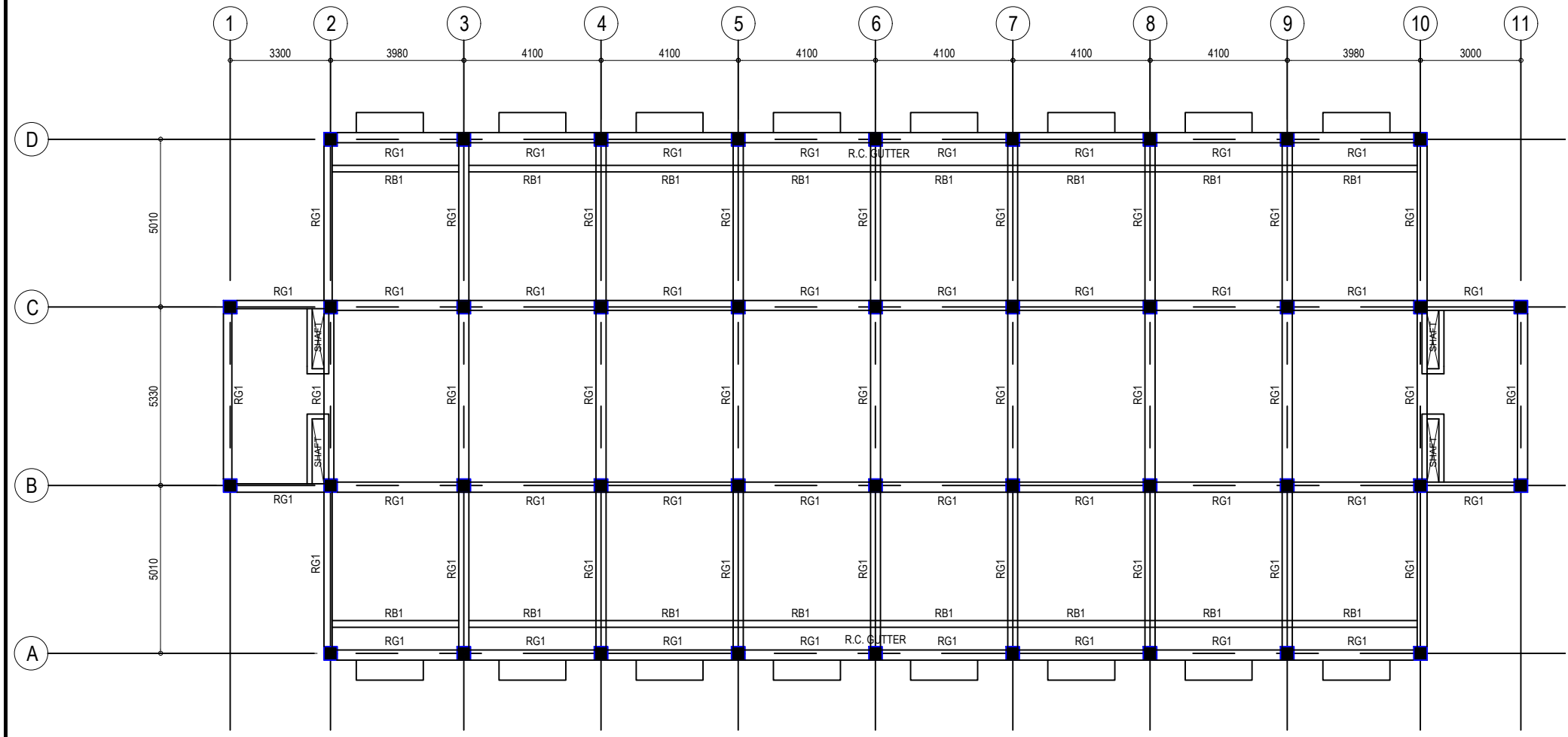
1 TYPICAL SECOND & THIRD FLOOR FRAMING PLAN
ST-5 SCALE 1:100 M.



2 TYPICAL BEAM DETAIL
ST-6 NOT TO SCALE

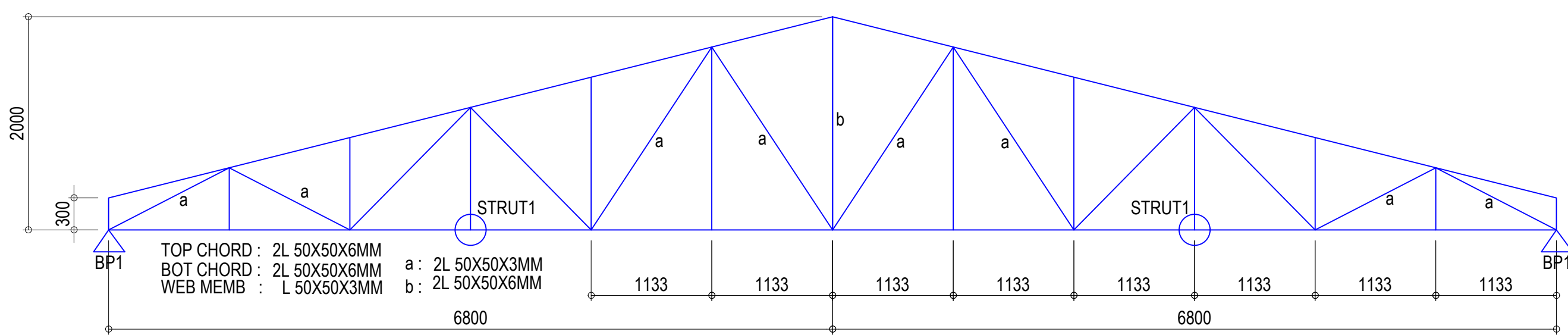


3 TYPICAL BEAM DETAIL WITH CUT-OFF BARS
ST-6 NOT TO SCALE

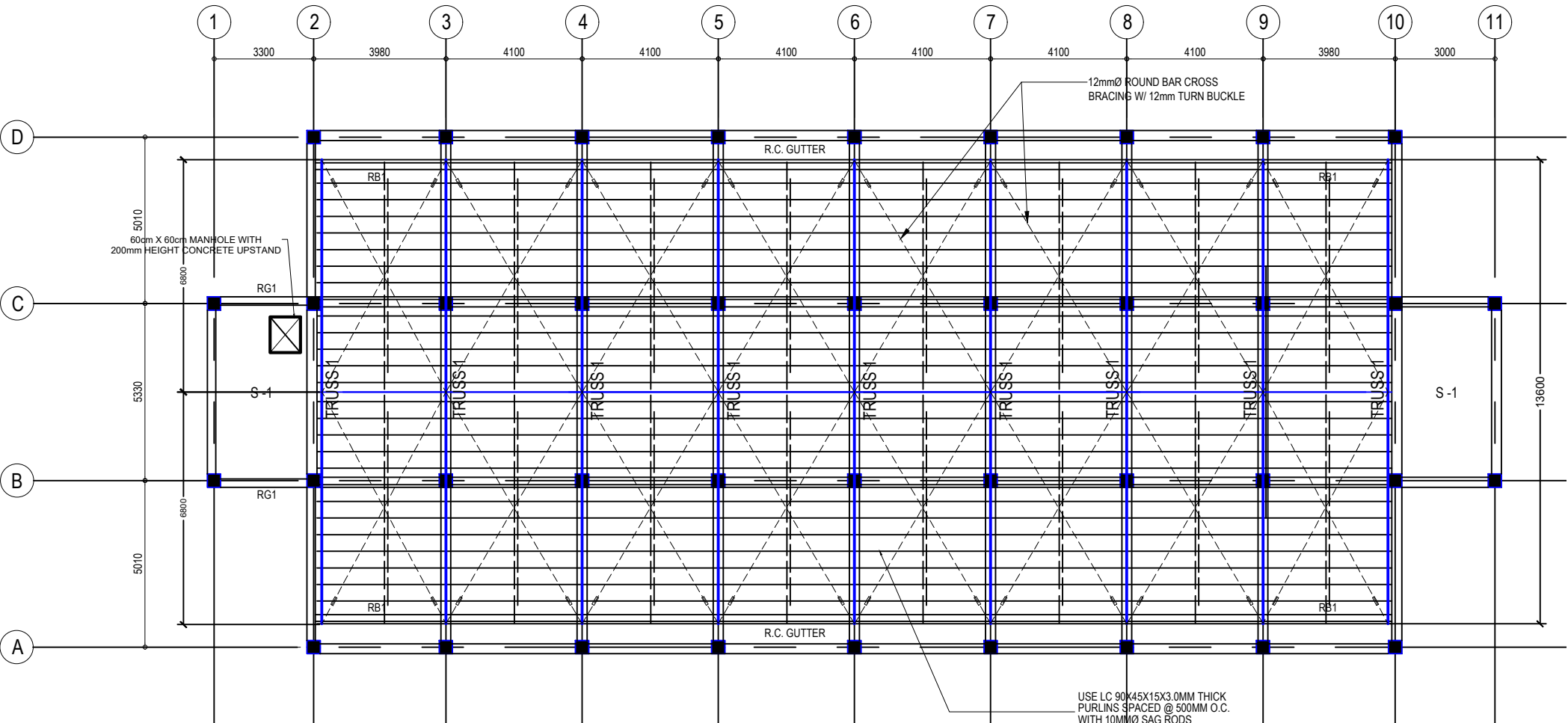


1 ROOF BEAM FRAMING PLAN
ST-6 SCALE 1:100 M.

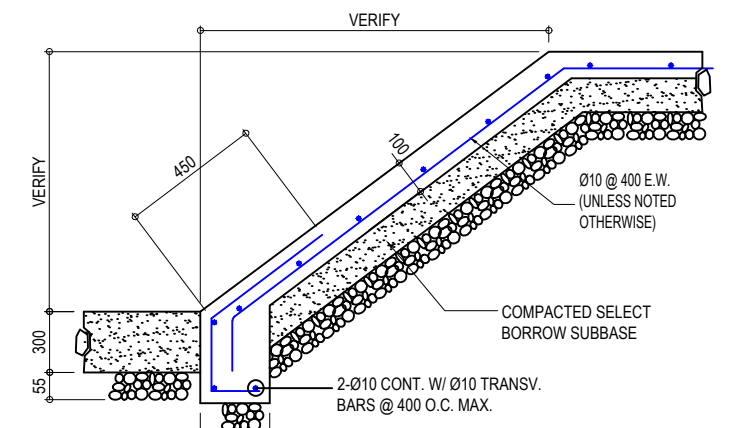
SCHEDULE OF BEAMS AND GIRDERS										
MARK	SIZES (mm)	REINFORCING BARS				ARRANGEMENT			STIRRUPS SIZE SPACING	REMARKS
		AT SUPPORT		AT MID-SPAN		AT EXT. SUPP.	AT MID SPAN	AT INT. SUPP.		
		TOP	BOTTOM	TOP	BOTTOM					
GROUND FLOOR										
G1	350X450	5-25mm Ø	3-25mm Ø	3-25mm Ø	3-25mm Ø				10mm Ø STIRRUPS 1@ 50mm, 3@100mm, 4@150mm, REST@ 200mm O.C.	
G2	300X400	4-20mm Ø	2-20mm Ø	2-20mm Ø	3-20mm Ø				10mm Ø STIRRUPS 1@ 50mm, 3@100mm, 4@150mm, REST@ 200mm O.C.	
G3	350X450	5-20mm Ø	3-20mm Ø	3-20mm Ø	4-20mm Ø				10mm Ø STIRRUPS 1@ 50mm, 3@100mm, 4@150mm, REST@ 200mm O.C.	
SECOND FLOOR										
G1	350X450	5-25mm Ø	3-25mm Ø	3-25mm Ø	3-25mm Ø				10mm Ø STIRRUPS 1@ 50mm, 3@100mm, 4@150mm, REST@ 200mm O.C.	
G2	300X400	4-20mm Ø	2-20mm Ø	2-20mm Ø	3-20mm Ø				10mm Ø STIRRUPS 1@ 50mm, 3@100mm, 4@150mm, REST@ 200mm O.C.	
G3	350X450	5-20mm Ø	3-20mm Ø	3-20mm Ø	4-20mm Ø				10mm Ø STIRRUPS 1@ 50mm, 3@100mm, 4@150mm, REST@ 200mm O.C.	
THIRD FLOOR										
G1	300X400	6-20mm Ø	3-20mm Ø	3-20mm Ø	4-20mm Ø				10mm Ø STIRRUPS 1@ 50mm, 3@100mm, 4@150mm, REST@ 200mm O.C.	
G2	300X400	4-16mm Ø	3-16mm Ø	2-16mm Ø	3-16mm Ø				10mm Ø STIRRUPS 1@ 50mm, 3@100mm, 4@150mm, REST@ 200mm O.C.	
G3	300X400	3-20mm Ø	2-20mm Ø	2-20mm Ø	3-20mm Ø				10mm Ø STIRRUPS 1@ 50mm, 3@100mm, 4@150mm, REST@ 200mm O.C.	
ROOF BEAM LEVEL										
RG1	250X300	3-16mm Ø	2-16mm Ø	2-16mm Ø	3-16mm Ø				10mm Ø STIRRUPS 1@ 50mm, 3@100mm, 4@150mm, REST@ 200mm O.C.	
RB1	250X300	2-16mm Ø	2-16mm Ø	2-16mm Ø	3-16mm Ø				10mm Ø STIRRUPS 1@ 50mm, 3@100mm, 4@150mm, REST@ 200mm O.C.	



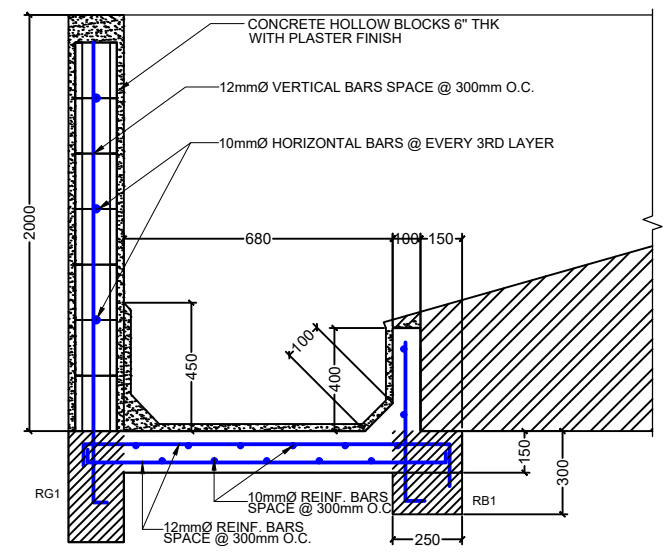
2 TRUSS 1 DETAIL
 ST-7 NOT TO SCALE



1 ROOF FRAMING PLAN
 ST-7 SCALE 1:100 M.



3 RAMP ON-FILL DETAIL
 ST-7 NOT TO SCALE

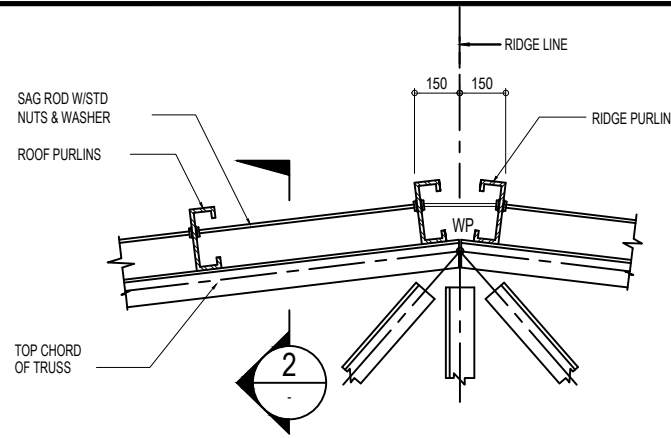
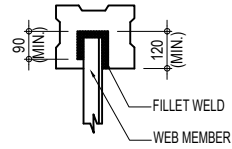


4 TYP. CON. GUTTER DETAILS
 ST-7 NOT TO SCALE

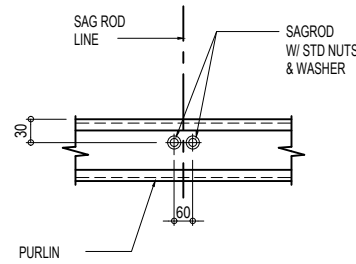
GUSSET PLATE THICKNESS (mm)	MEMBER THICKNESS (mm)	SIZE OF FILLET WELD, t (mm)
6	3.0	3.0
	5.0	3.0
10	6.0	4.5
	8.0	6.0

NOTE:

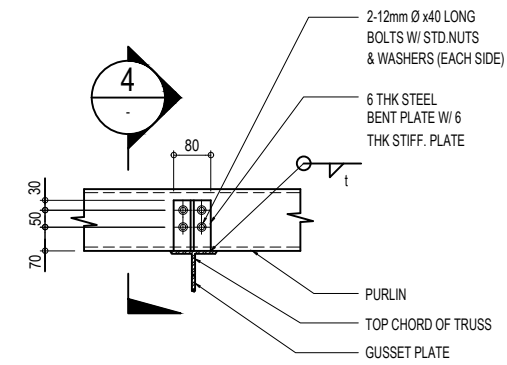
- GUSSET PLATE DIMENSION (WHERE REQ'D.) SHALL BE DICTATED BY THE MINIMUM REQUIRED LENGTH OF WELD.
- COLUMN JOINT GUSSET AND CONTINUITY PLATES SHALL HAVE 100% ULTRASONIC INSPECTION FOR DELAMINATION BEFORE AND AFTER WELDING.



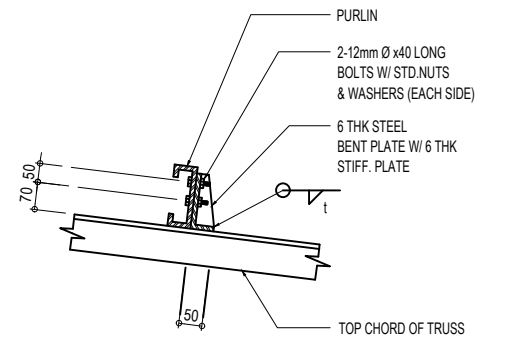
1 TYPICAL SAGROD CONNECTION DETAIL
S- SCALE NTS



2 SECTION
S- SCALE NTS

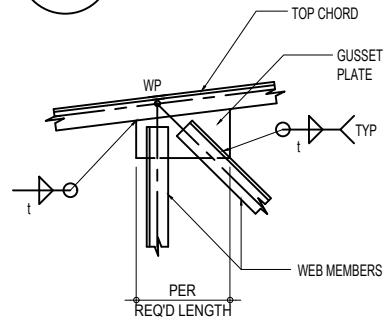


3 TYPICAL PURLIN CONNECTION DETAIL
S- SCALE NTS

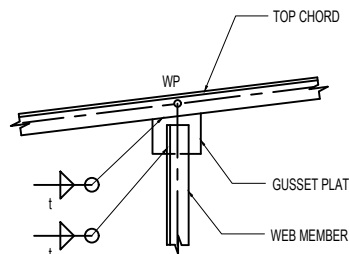


4 SECTION
S- SCALE NTS

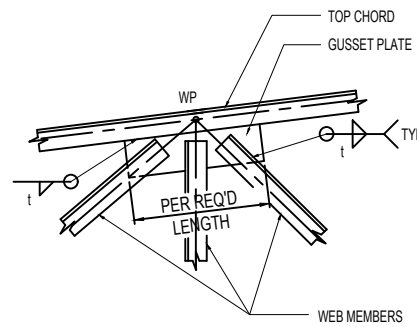
1 SCHEDULE OF WELDS
S-12 SCALE NTS



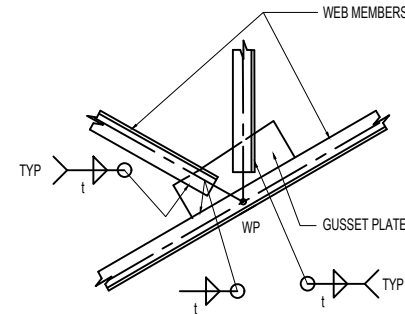
5 DETAIL
S- SCALE NTS



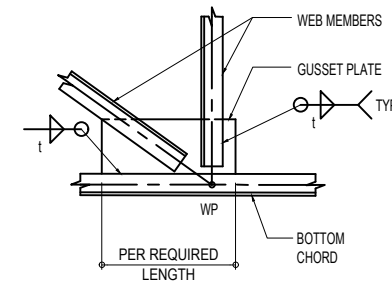
6 DETAIL
S- SCALE NTS



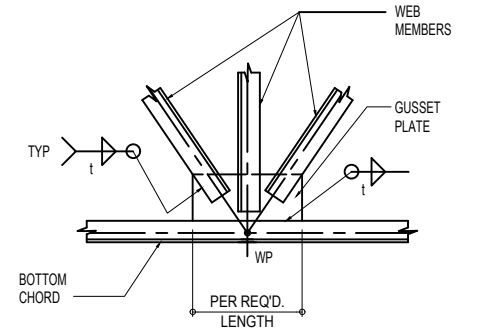
7 DETAIL
S- SCALE NTS



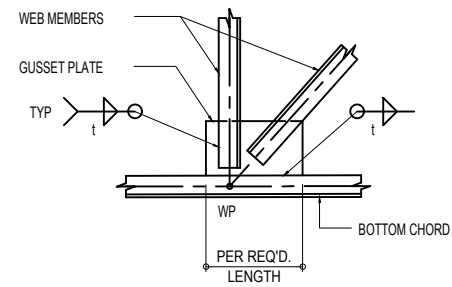
8 DETAIL
S- SCALE NTS



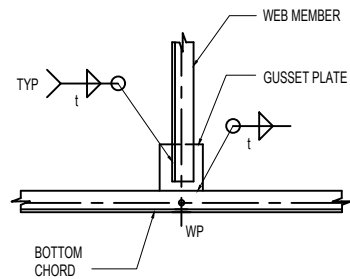
9 DETAIL
S- SCALE NTS



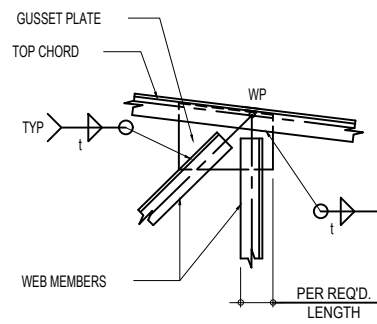
10 DETAIL
S- SCALE NTS



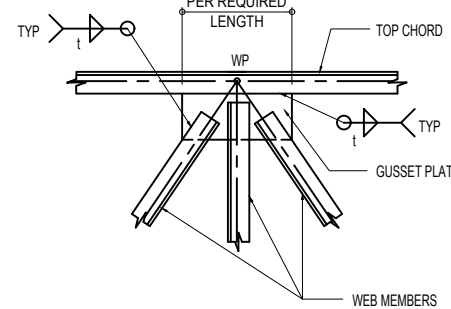
11 DETAIL
S- SCALE NTS



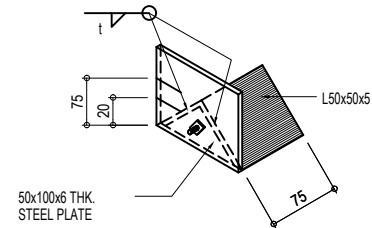
12 DETAIL
S- SCALE NTS



13 DETAIL
S- SCALE NTS

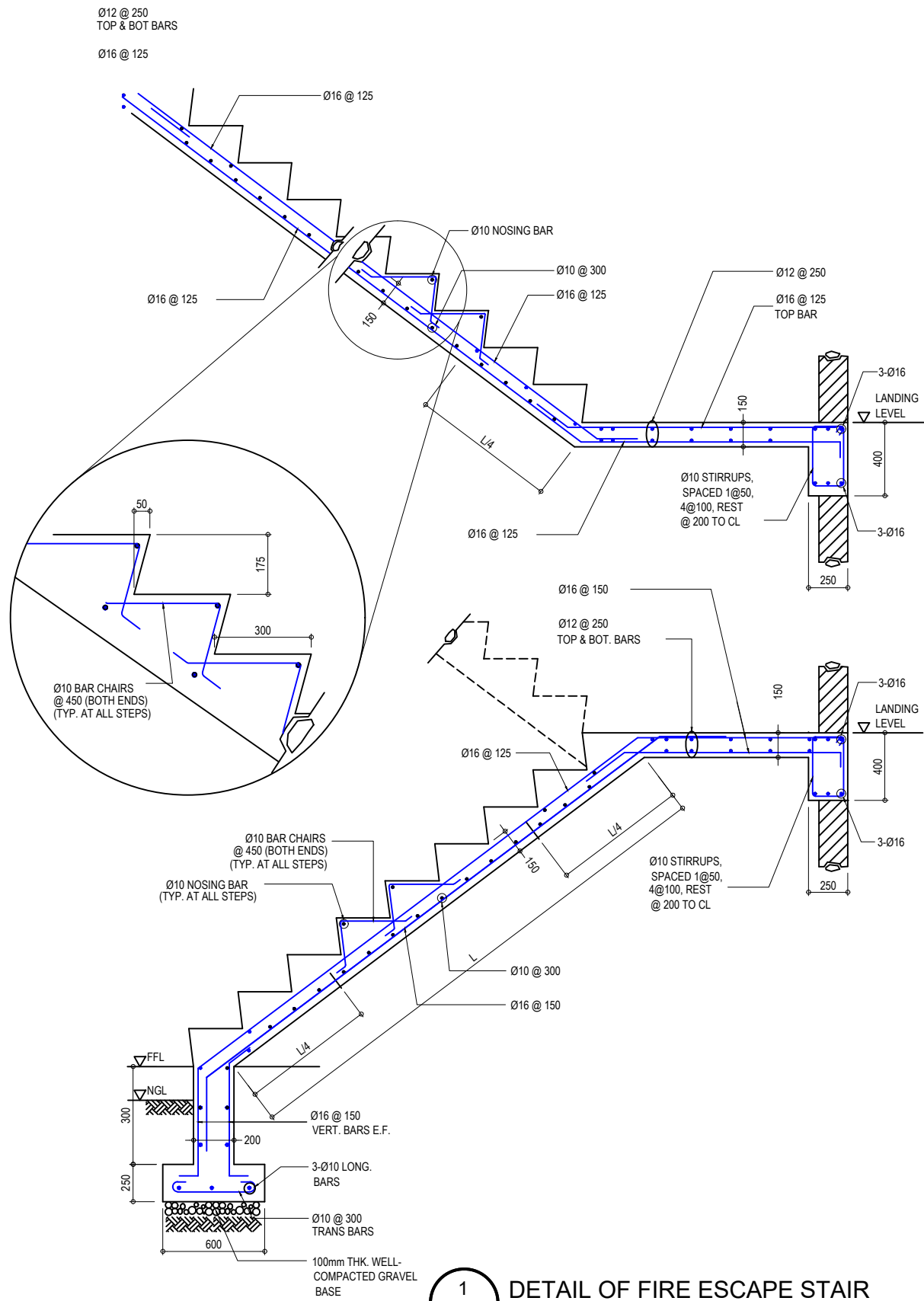


14 DETAIL
S- SCALE NTS

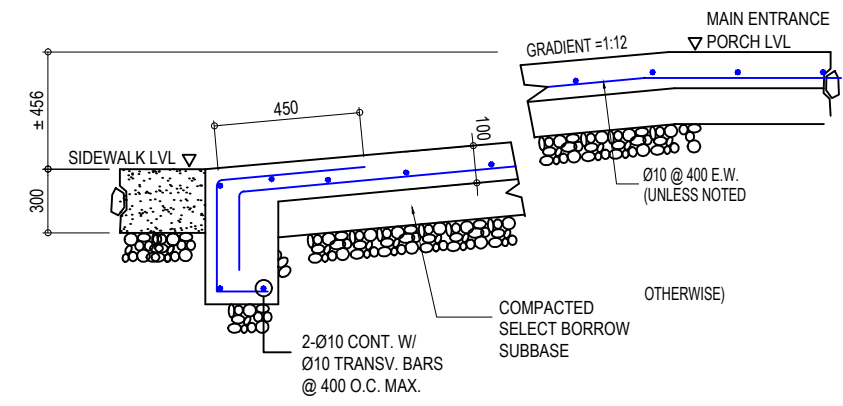


15 ANGULAR BUCKLE DETAIL
S- SCALE NTS

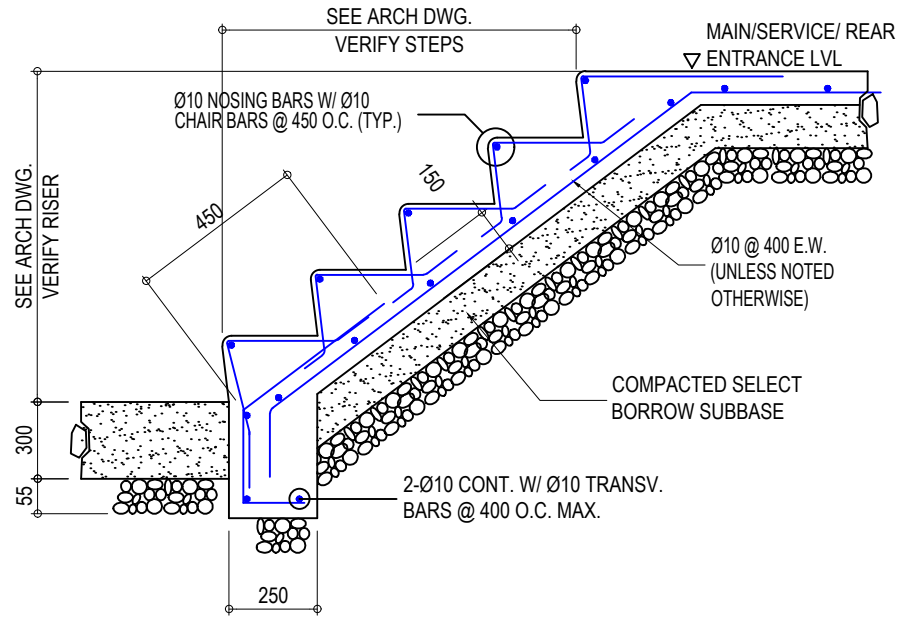
1 TRUSS CONNECTION DETAIL
ST-8 NOT TO SCALE



1 DETAIL OF FIRE ESCAPE STAIR
ST-9 NOT TO SCALE



2 DETAIL SECTION OF PWD RAMP
ST-9 NOT TO SCALE



3 DETAIL OF STAIR ON-FILL
ST-9 NOT TO SCALE

ELECTRICAL PLAN

GENERAL NOTES :

- ALL ELECTRICAL WORKS AND INSTALLATIONS SHALL CONFORM WITH THE LATEST EDITION OF THE PHILIPPINE ELECTRICAL CODE, NATIONAL ELECTRICAL CODE RULES AND REGULATIONS OF THE ENFORCING AUTHORITY AND POWER COMPANY.
- SERVICE ENTRANCE SHALL BE SINGLE - PHASE , 60 HZ. SYSTEM
- ALL CONDUITS SHALL BE IN POLYVINYL CHLORIDE (PVC) EXCEPT FOR MAIN SERVICE ENTRANCE WHICH IS RSC PIPE
- ALL WIRINGS SHALL BE INSTALLED IN CONDUIT PIPES EMBEDDED INSIDE HOLLOW BLOCK STRUCTURES, SLABS, WALLS, COLUMNS, PARTITIONS AND /OR RUN CONCEALED BETWEEN DOUBLE WALL WOODEN PARTITIONS AND INSIDE THE CEILING SPACES WHERE THE USE OF CONCEALED CONDUIT WIRING IS IMPRACTICABLE, SURFACE METAL WIRING MAY BE USED.
- UNLESS OTHERWISE SPECIFIED, THE SMALLEST WIRE AND CONDUIT PIPE TO BE USED SHALL BE NO. 3.5 MM² THW AND 20 MM² DIA. PVC, RESPECTIVELY.

- WHEREVER REQUIRED AND NECESSARY, JUNCTION BOXES AND FULL BOXES OF PROPER SIZES SHALL BE INSTALLED AT CONVENIENT AND INCONSPICUOUS LOCATION, ALTHOUGH SUCH BOXES ARE NOT SHOWN IN THE PLANS NOR MENTIONED IN THE SPECIFICATIONS.

- ALL WALL OUTLETS SHALL BE INSTALLED AT THE FOLLOWING HEIGHTS ABOVE THE FINISHED FLOOR LINE, UNLESS OTHERWISE NOTED :

WALL SWITCHES	1200 MM.
DUPLEX CONVENIENCE OUTLET	300 MM. OR 150 MM ABOVE WORKTABLE
AIRCONDITIONING UNIT OUTLET	AT CONV. HEIGHT NEAR THE EQPT.
TEL. & CABLE TV OUTLET	300 MM. OR 150 MM. ABOVE WORKTABLE
WATERHEATER OUTLET	AT CONV. HEIGHT NEAR THE EQPT.
PANEL BOARD	1800 MM. FROM CENTER OF PANEL TO F.F.L.

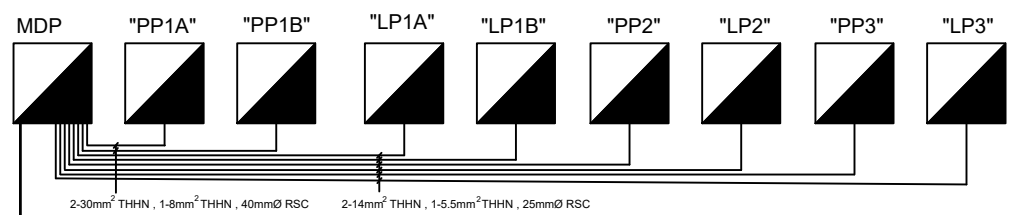
- ALL WORKS AND INSTALLATIONS SHALL BE DONE UNDER CLOSE SUPERVISION OF A REGISTERED ELECTRICAL ENGINEER.

ELECTRICAL SYMBOLS :

- KILOWATT HOUR METER
- SERVICE ENTRANCE
- BRANCH CIRCUIT HOMERUNTO PANELBOARD
- "LP"
- PANELBOARD
- PORCELAIN RECEPTACLE WITH 9 WATTS LED BULB
- PINLIGHT WITH LED BULB (5 WATTS)
- ENCLOSED AIR CIRCUIT BREAKER (RATED AS INDICATED ON THE PLANS)
- DUPLEX CONVENIENCE OUTLET
- AIRCONDITIONING OUTLET
- WEATHER PROOF OUTLET
- RANGE OUTLET
- REFRIGERATOR OUTLET
- WALL FAN OUTLET
- SWITCHES (LETTERS DENOTES NO. OF GANG)
- CABLE TV OUTLET
- TELEPHONE OUTLET
- FLOOR MOUNTED CONDUIT OUTLET
- WEATHERPROOF OUTLET
- RANGE OUTLET
- REFRIGERATOR OUTLET
- HAND DRYER
- EMBEDDED CONDUIT
- CONCEALED CONDUIT
- WALL LAMP
- CEILING MOUNTED EXHAUST FAN
- CCTV MONITOR
- P.B - PULL BOX / SQUARE BOX
- F.B - EXHAUST FAN
- C.F. - CEILING FAN (ORBIT TYPE)
- T5 CONCEALED FLOURESCENT

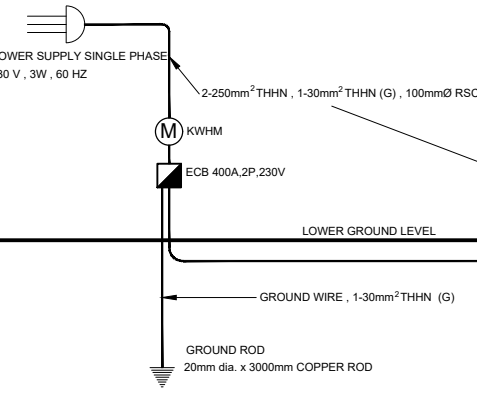
THIRD FLOOR LEVEL

SECOND FLOOR LEVEL

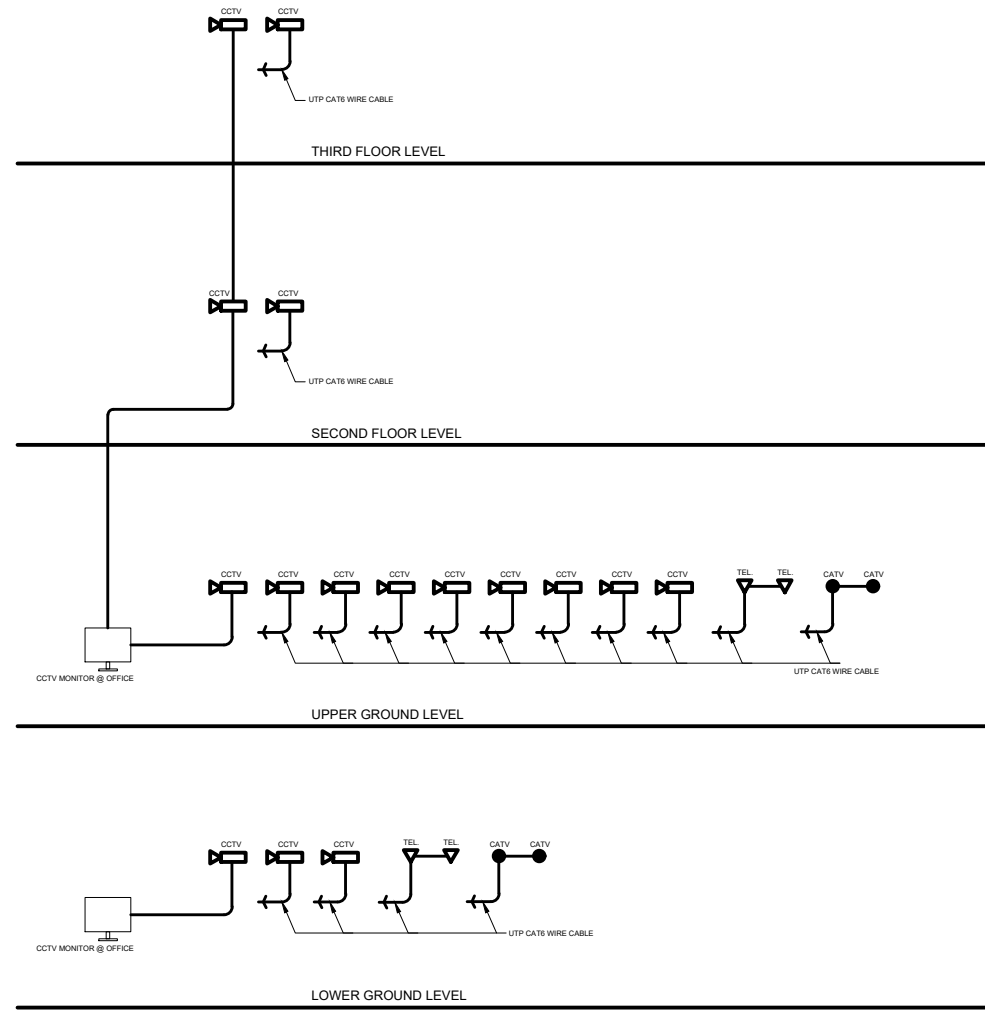


UPPER GROUND LEVEL (ELECTRICAL ROOM)

LOWER GROUND LEVEL



1 RISER DIAGRAM
EE-1 NOT TO SCALE



2 TELEPHONE, CATV & CCTV DIAGRAM
EE-1 NOT TO SCALE

SCHEDULE OF LOADS : MDP

CKT. NO.	LOAD DESCRIPTION	VA PER CKT.	VOLTS	BRANCH / CKT. BREAKER			SIZE OF HOMERUN (WIRES & CONDUITS)
				AF	P	AT	
1	PP1A	15760	230	100	2	100	2 - 30 mm ² THHN +1-8mm ² THHN (G) , 40 mm Ø PVC
2	PP1B	18440	230	100	2	100	2 - 30 mm ² THHN +1-8mm ² THHN (G) , 40 mm Ø PVC
3	LP1A	9600	230	60	2	100	2 - 14 mm ² THHN +1-5.5mm ² THHN (G) , 25 mm Ø PVC
4	LP1B	10700	230	60	2	100	2 - 14 mm ² THHN +1-5.5mm ² THHN (G) , 25 mm Ø PVC
5	LP2	14800	230	60	2	100	2 - 14 mm ² THHN +1-5.5mm ² THHN (G) , 25 mm Ø PVC
6	LP3	14800	230	60	2	100	2 - 14 mm ² THHN +1-5.5mm ² THHN (G) , 25 mm Ø PVC
7	PP2	10240	230	60	2	100	2 - 14 mm ² THHN +1-5.5mm ² THHN (G) , 25 mm Ø PVC
8	PP3	10240	230	60	2	100	2 - 14 mm ² THHN +1-5.5mm ² THHN (G) , 25 mm Ø PVC
TOTAL		104580					

TOTAL CONNECTED LOAD = 104580VA USE : 2 - 250 mm²THHN, 1-30 mm² THHN (G) IN 75 mmØ RSC.
 I @ 80 % D. F. = $\frac{104580(.80)}{230}$ = 363.76 AMPS. MCCB : 400AT, 2P, 230V, 400AF Use minimum of 10kAIC for all MCCB

SCHEDULE OF LOADS : LIGHTING "LP1A"

CKT. NO.	LOAD DESCRIPTION	VA PER CKT.	VOLTS	BRANCH / CKT. BREAKER			SIZE OF HOMERUN (WIRES & CONDUITS)
				AF	P	AT	
1	LIGHTING OUTLET	1700	230	50	2	20	2 - 3.5 mm ² THHN, 20 mm ØC PVC
2	↓	1700					↓
3	↓	1000					↓
4	↓	1200					↓
5	SPARE	1000					—
6	SPARE	1500					—
7	SPARE	1500					—
TOTAL		9600					

TOTAL CONNECTED LOAD = 9600 VA USE : 2 - 14 mm²THHN, 1-5.5 mm² THHN (G) IN 32 mmØ RSC.
 I @ 80 % D. F. = $\frac{9600(.80)}{230}$ = 33.39 AMPS. MCCB : 60AT, 2P, 230V, 100AF, BOLT ON TYPE Use minimum of 10kAIC for all MCCB

SCHEDULE OF LOADS : LIGHTING "LP1B"

CKT. NO.	LOAD DESCRIPTION	VA PER CKT.	VOLTS	BRANCH / CKT. BREAKER			SIZE OF HOMERUN (WIRES & CONDUITS)
				AF	P	AT	
1	LIGHTING OUTLET	1600	230	50	2	20	2 - 3.5 mm ² THHN, 20 mm ØC PVC
2	↓	1600					↓
3	↓	1400					↓
4	↓	1700					↓
5	↓	1400					↓
6	↓	1500					↓
7	SPARE	1500					—
TOTAL		10700					

TOTAL CONNECTED LOAD = 10700 VA USE : 2 - 14 mm²THHN, 1-5.5 mm² THHN (G) IN 32 mmØ RSC.
 I @ 80 % D. F. = $\frac{10700(.80)}{230}$ = 37.22 AMPS. MCCB : 60AT, 2P, 230V, 100AF, BOLT ON TYPE Use minimum of 10kAIC for all MCCB

SCHEDULE OF LOADS : TYPICAL LIGHTING "LP2" & "LP3"

CKT. NO.	LOAD DESCRIPTION	VA PER CKT.	VOLTS	BRANCH / CKT. BREAKER			SIZE OF HOMERUN (WIRES & CONDUITS)
				AF	P	AT	
1	LIGHTING OUTLET	1600	230	50	2	20	2 - 3.5 mm ² THHN, 20 mm ØC PVC
2	↓	1600					↓
3	↓	1600					↓
4	↓	1600					↓
5	↓	1600					↓
6	↓	1600					↓
7	↓	1600					↓
8	↓	1600					↓
9	↓	1000					↓
10	SPARE	1000					—
TOTAL		14800					

TOTAL CONNECTED LOAD = 14800 VA USE : 2 - 14 mm²THHN, 1-5.5 mm² THHN (G) IN 32 mmØ RSC.
 I @ 80 % D. F. = $\frac{14800(.80)}{230}$ = 51.48 AMPS. MCCB : 60AT, 2P, 230V, 100AF, BOLT ON TYPE Use minimum of 10kAIC for all MCCB

SCHEDULE OF LOADS : POWER "PP1A"

CKT. NO.	LOAD DESCRIPTION	VA PER CKT.	VOLTS	BRANCH / CKT. BREAKER			SIZE OF HOMERUN (WIRES & CONDUITS)
				AF	P	AT	
1	CONVENIENCE OUTLET	1620	230	50	2	20	2 - 3.5 mm ² THHN, 20 mm ØC PVC
2	↓	1260					↓
3	↓	1260					↓
4	EXHAUST FAN FULL BOX	1000					↓
5	CEILING FAN	600					↓
6	CEILING FAN	800					↓
7	SPLIT TYPE (1.5 TR)	3220				30	2 - 5.5 mm ² THHN, 1-3.5mm ² THHN, 25 mm ØC
8	MOTOR PUMP	3000				30	2 - 5.5 mm ² THHN, 1-3.5mm ² THHN, 25 mm ØC
9	MOTOR PUMP	3000				30	2 - 5.5 mm ² THHN, 1-3.5mm ² THHN, 25 mm ØC
10	SPARE						—
11	SPARE						—
TOTAL		15760					

TOTAL CONNECTED LOAD = 15760 VA USE : 2 - 30 mm²THHN, 1-8 mm² THHN (G) IN 40 mmØ RSC.
 I @ 80 % D. F. = $\frac{15760(.80)}{230}$ +.25 (14) = 58.32 AMPS. MCCB : 100AT, 2P, 230V, 100AF, BOLT ON TYPE Use minimum of 10kAIC for all MCCB

SCHEDULE OF LOADS : POWER "PP1B"

CKT. NO.	LOAD DESCRIPTION	VA PER CKT.	VOLTS	BRANCH / CKT. BREAKER			SIZE OF HOMERUN (WIRES & CONDUITS)
				AF	P	AT	
1	CONVENIENCE OUTLET	1620	230	50	2	20	2 - 3.5 mm ² THHN, 20 mm ØC PVC
2	↓	1620					↓
3	↓	1260					↓
4	↓	1080					↓
5	↓	1080					↓
6	↓	720					↓
7	SPLIT TYPE (1.5 TR)	3220				30	2 - 5.5 mm ² THHN, 1-3.5mm ² THHN, 25 mm ØC
8	SPLIT TYPE (1.5 TR)	3220				30	2 - 5.5 mm ² THHN, 1-3.5mm ² THHN, 25 mm ØC
9	SPLIT TYPE (1.5 TR)	3220				30	2 - 5.5 mm ² THHN, 1-3.5mm ² THHN, 25 mm ØC
10	CEILING FAN	700				20	—
11	CEILING FAN	700				20	—
12	SPARE						—
TOTAL		18440					

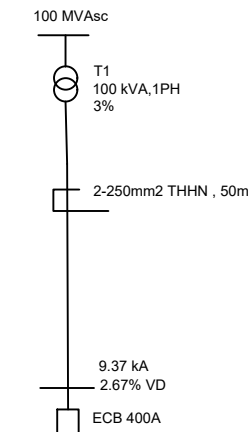
TOTAL CONNECTED LOAD = 18440 VA USE : 2 - 30 mm²THHN, 1-8 mm² THHN (G) IN 40 mmØ RSC.
 I @ 80 % D. F. = $\frac{18440(.80)}{230}$ +.25 (14) = 67.64 AMPS. MCCB : 100AT, 2P, 230V, 100AF, BOLT ON TYPE Use minimum of 10kAIC for all MCCB

SCHEDULE OF LOADS : TYPICAL POWER "PP2" & "PP3"

CKT. NO.	LOAD DESCRIPTION	VA PER CKT.	VOLTS	BRANCH / CKT. BREAKER			SIZE OF HOMERUN (WIRES & CONDUITS)
				AF	P	AT	
1	CONVENIENCE OUTLET	1620	230	50	2	20	2 - 3.5 mm ² THHN, 20 mm ØC PVC
2	↓	1620					↓
3	↓	1080					↓
4	↓	1620					↓
5	↓	1620					↓
6	↓	1080					↓
7	CEILING FAN	800					↓
8	CEILING FAN	800					↓
9	SPARE						—
TOTAL		10240					

TOTAL CONNECTED LOAD = 10240VA USE : 2 - 14 mm²THHN, 1-5.5 mm² THHN (G) IN 32 mmØ RSC.
 I @ 80 % D. F. = $\frac{10240(.80)}{230}$ +.25 (14) = 39.12 AMPS. MCCB : 60AT, 2P, 230V, 100AF, BOLT ON TYPE Use minimum of 10kAIC for all MCCB

VOLTAGE DROP & SHORT CIRCUIT CALCULATION



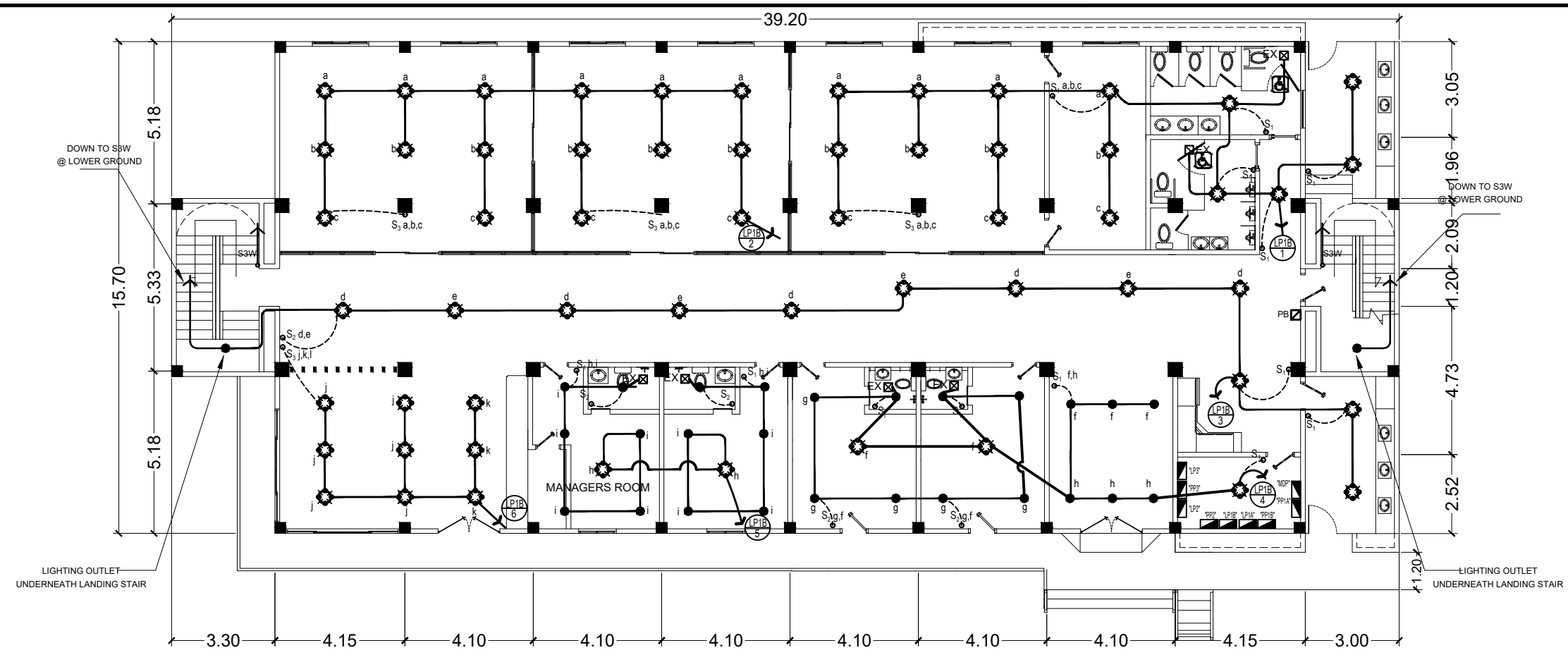
SHORT CIRCUIT CALCULATION

MVA_b = 100
 Calculate Short Circuit Fault at ECB:
 $X_u = \frac{MVA_b}{MVA_{sc}} = \frac{100}{100} = 1 \text{ p.u.}$
 $X_{T1} = \%Z_{T1} \times \frac{MVA_b}{MVA_{T1}} = 0.03 \times \frac{100}{0.10} = 30 \text{ p.u.}$
 $X_c = Z_c/305m \times L \times \frac{MVA_b}{kV^2} = 0.05/305 \times 50 \times \frac{100}{0.23^2} = 15.4 \text{ p.u.}$
 $Z_{th} = X_u + X_{T1} + X_c = 1 + 30 + 15.4 = 46.4 \text{ p.u.}$
 $I_{fsc} = \frac{MVA_b \times 10^6}{V \times Z_{th}} = \frac{100 \times 10^6}{230 \times 46.4} = 9,370 \text{ Amps or } 9.37 \text{ kA}$

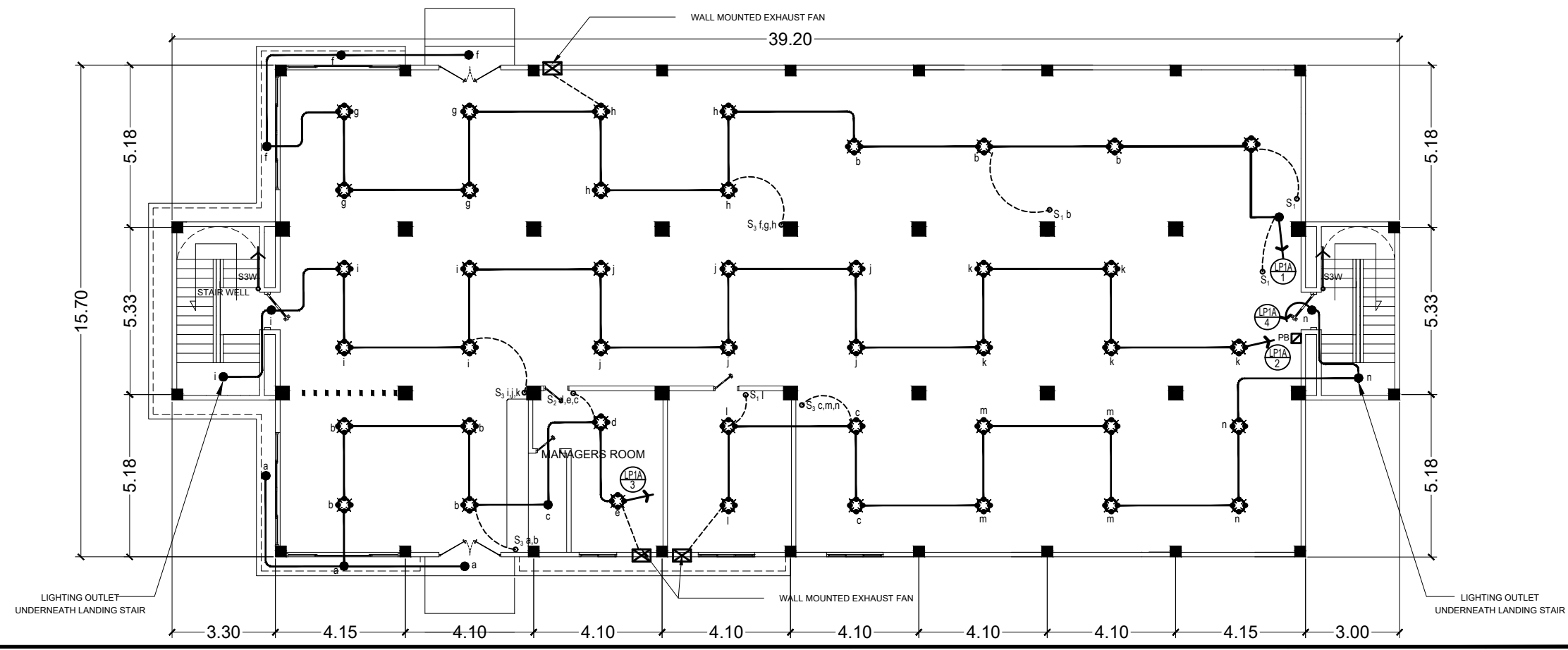
Calculate Votage Drop at ECB:

E = IR
 I = 363 Amp.
 Conductor : 250 mm² , Z = 0.050/305m (Table 9.1.1.9 PEC)
 Length - 50 m
 $R = 0.050/305m \times 50m = 0.0082 \text{ ohm}$
 $VD = 2 IR = 2 \times 374 \times 0.0082 = 6.13 \text{ volts}$
 $\%VD = \frac{6.13 \times 100}{230} = 2.67\%$

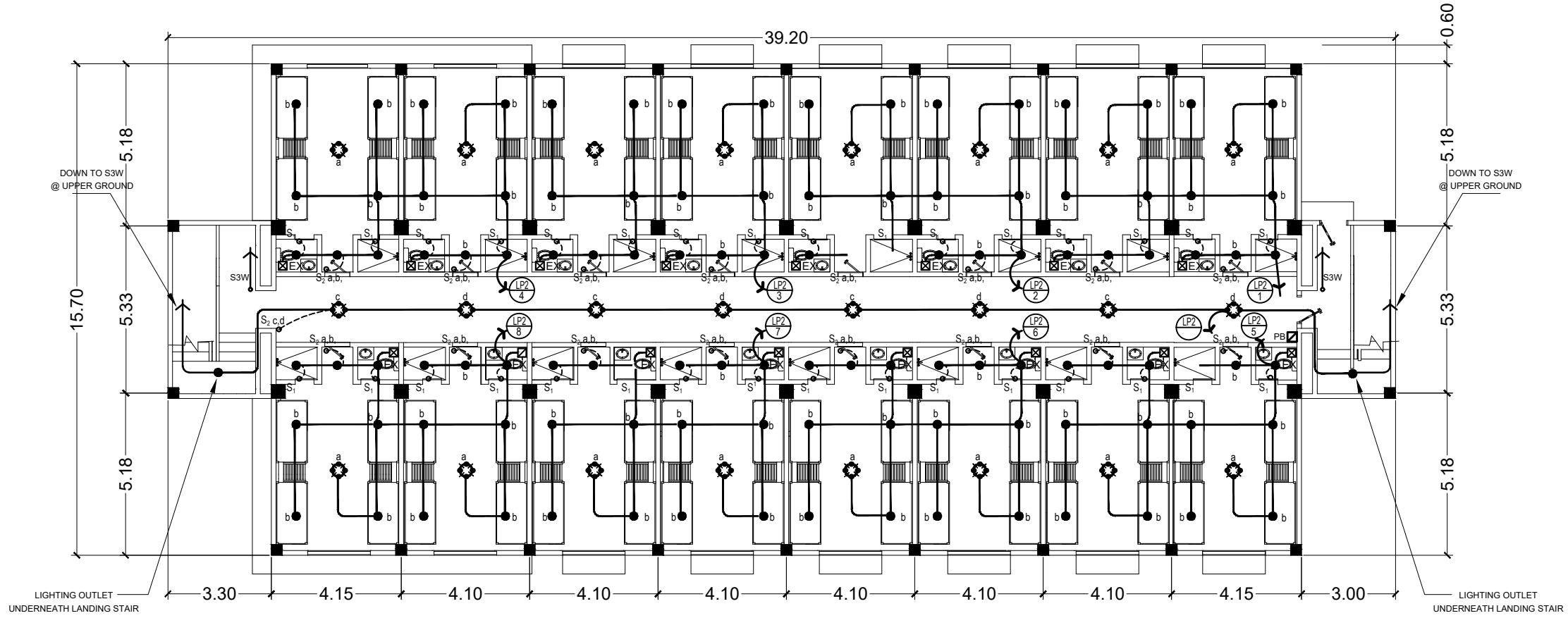
2 UPPER GROUND FLOOR LIGHTING LAYOUT
 EE-3 SCALE 1:100 M.



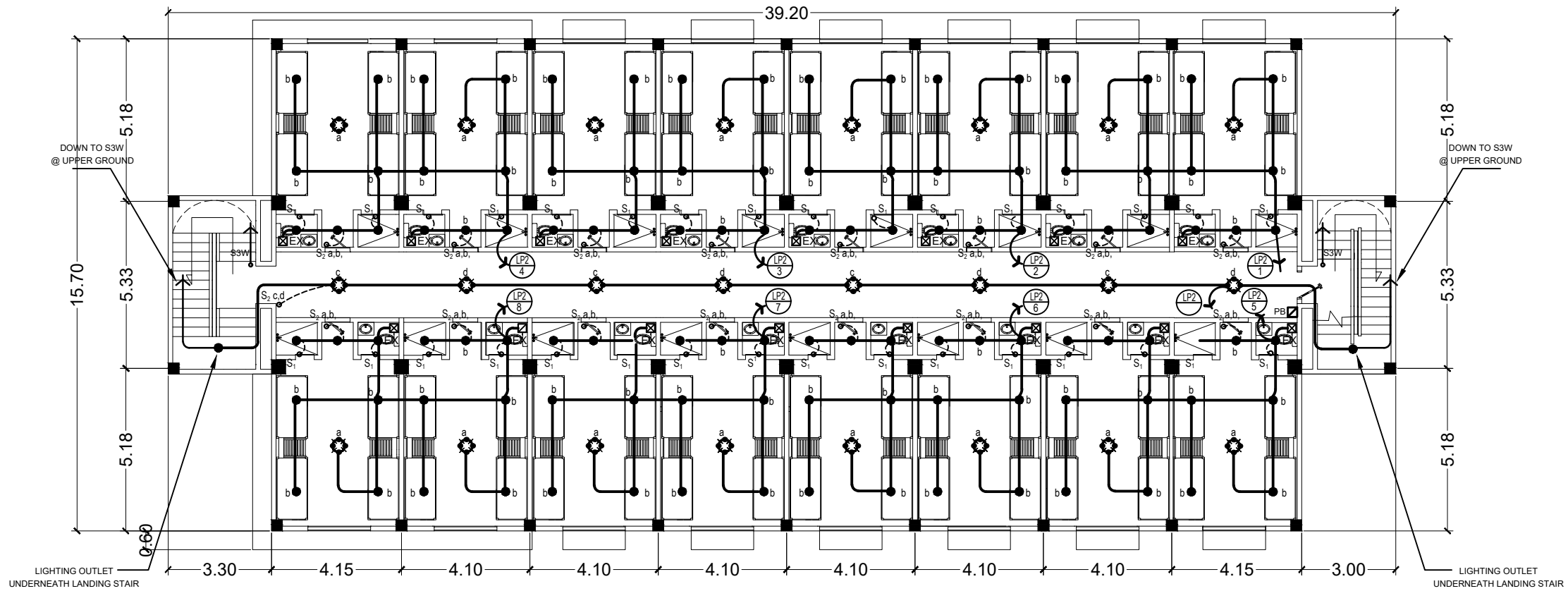
1 LOWER GROUND FLOOR LIGHTING LAYOUT
 EE-3 SCALE 1:100 M.



2 THIRD FLOOR LIGHTING LAYOUT
 EE-4 SCALE 1:100 M.

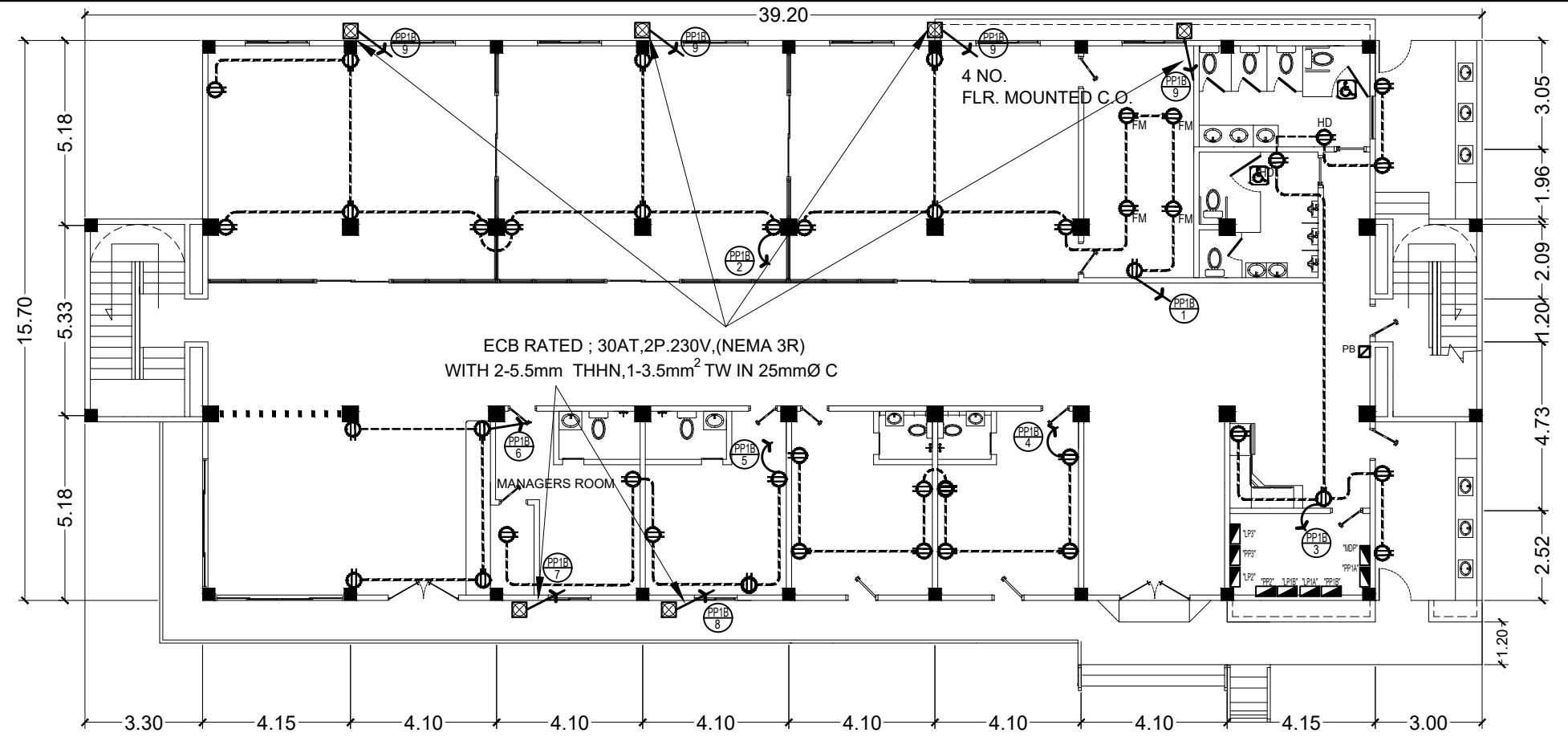


1 SECOND FLOOR LIGHTING LAYOUT
 EE-4 SCALE 1:100 M.

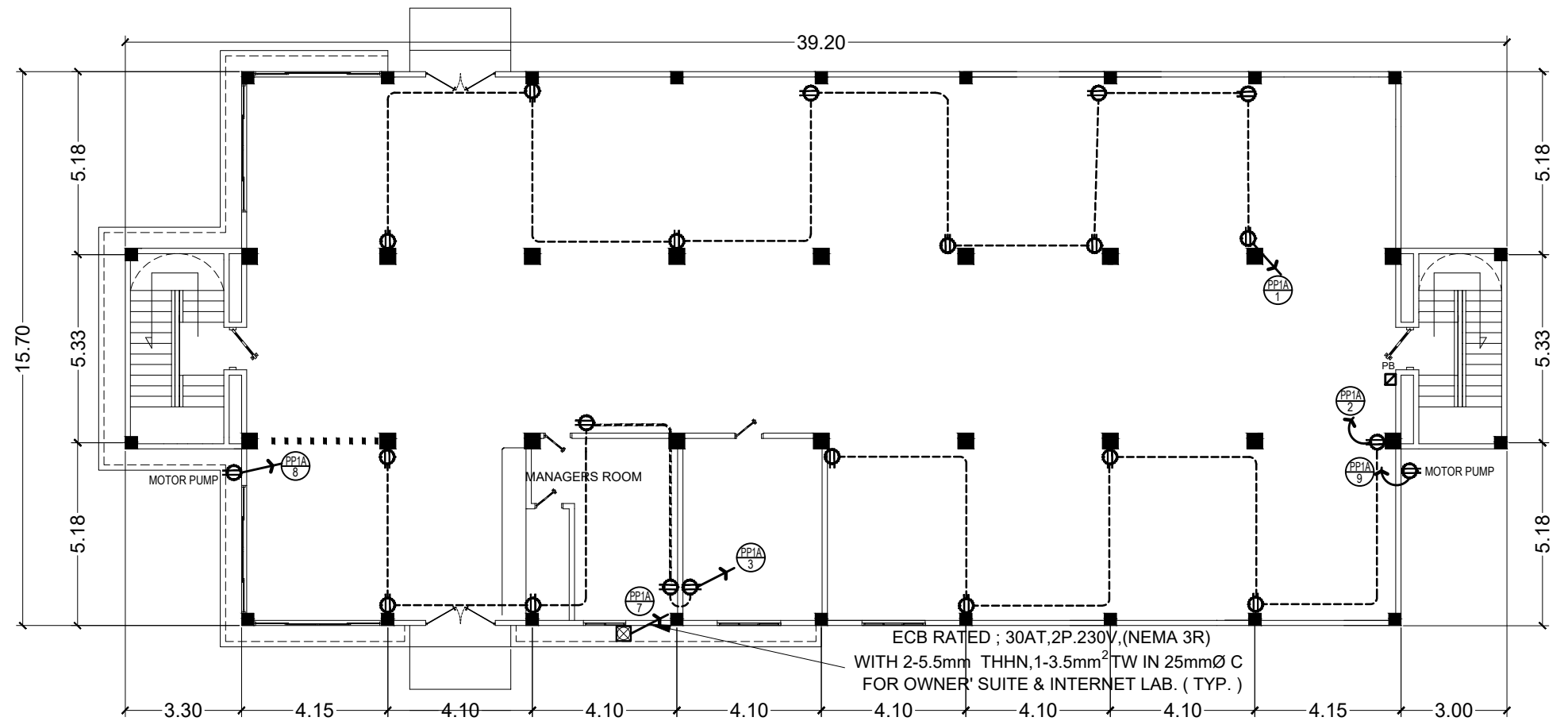


NOTES :

- IN EVERY BUNKBEDS AT THE DORMERS' ROOM(TWO OUTLETS),
1 @ THE STUDY TABLE AND 1 @ THE BED AREA.



2 UPPER GROUND FLOOR POWER LAYOUT
SCALE 1:100 M.
EE-5

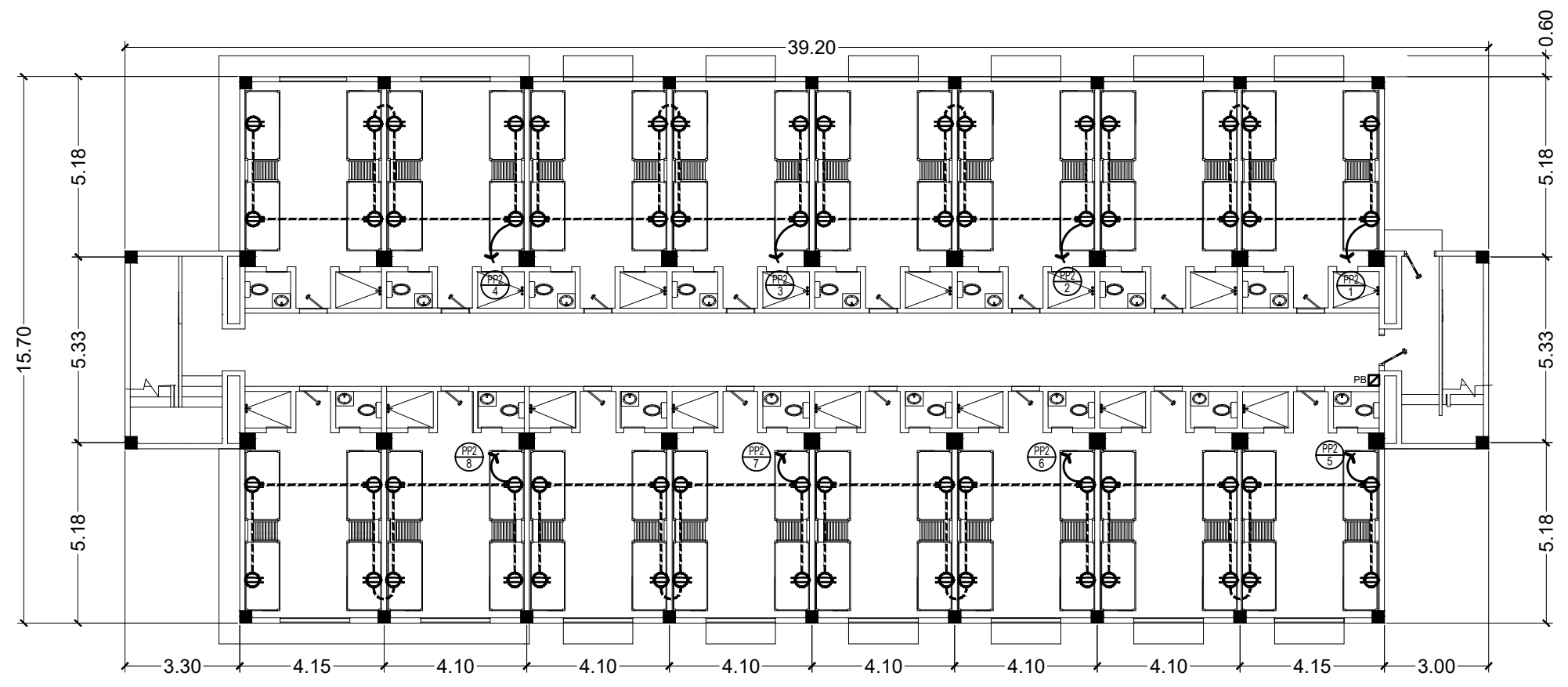


1 LOWER GROUND FLOOR POWER LAYOUT
SCALE 1:100 M.
EE-5

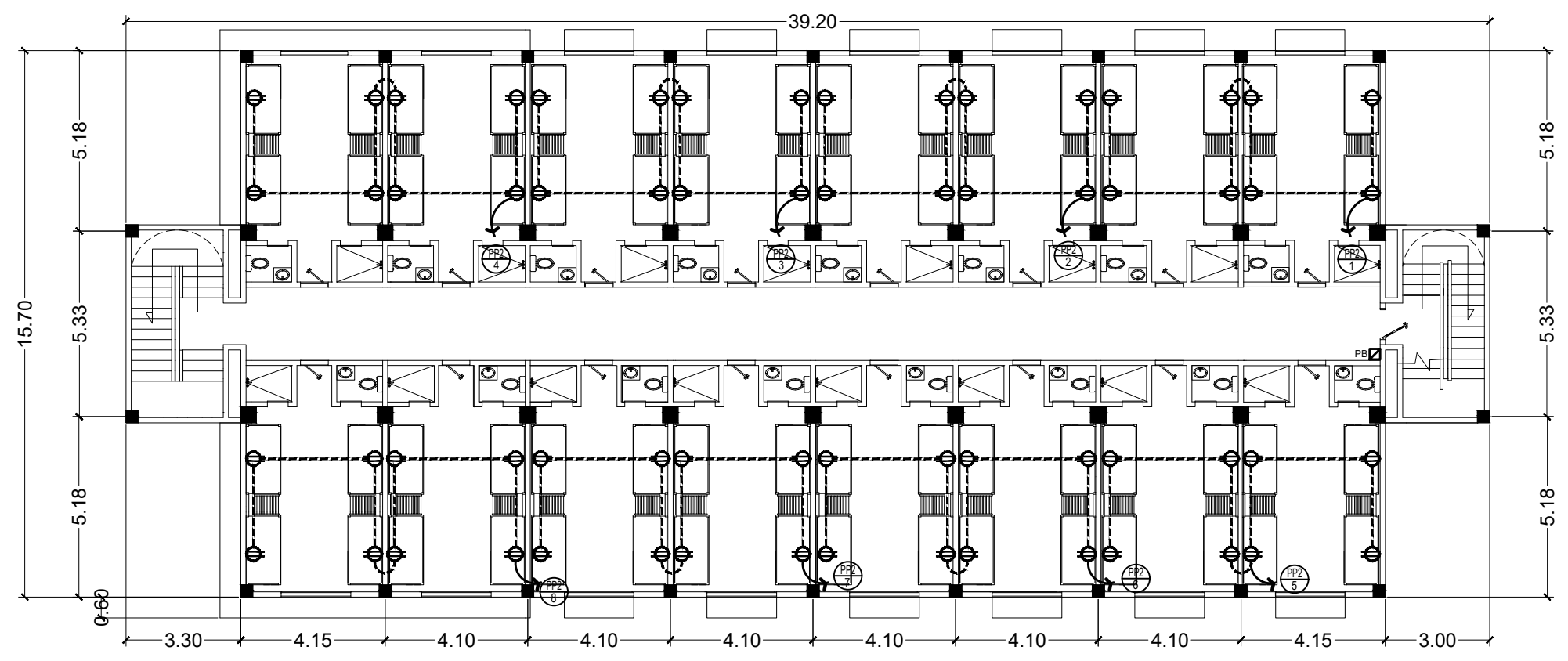
NOTES :

- IN EVERY BUNKBEDS AT THE DORMERS' ROOM(TWO OUTLETS),
1 @ THE STUDY TABLE AND 1 @ THE BED AREA.

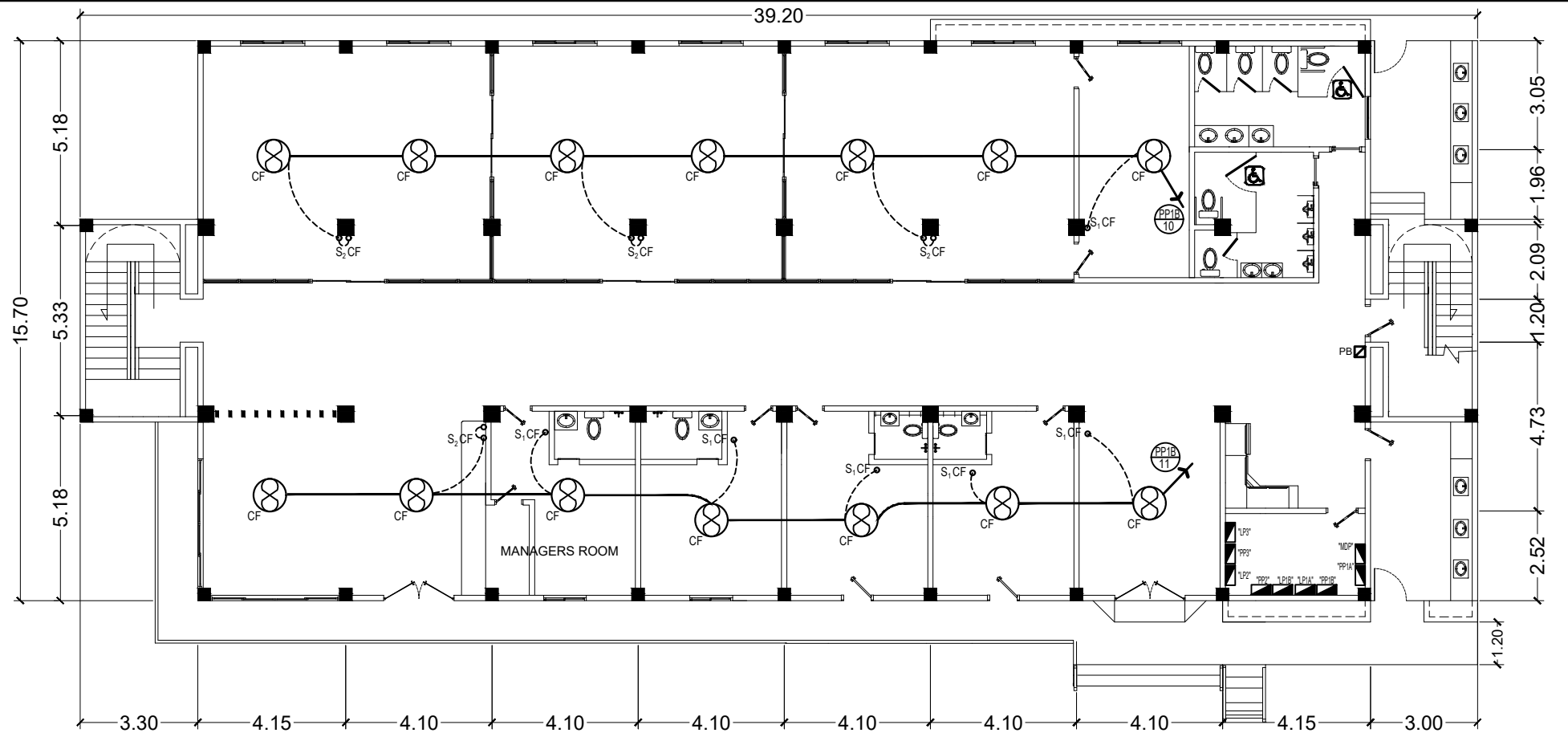
2 THIRD FLOOR POWER LAYOUT
EE-6 SCALE 1:100 M.



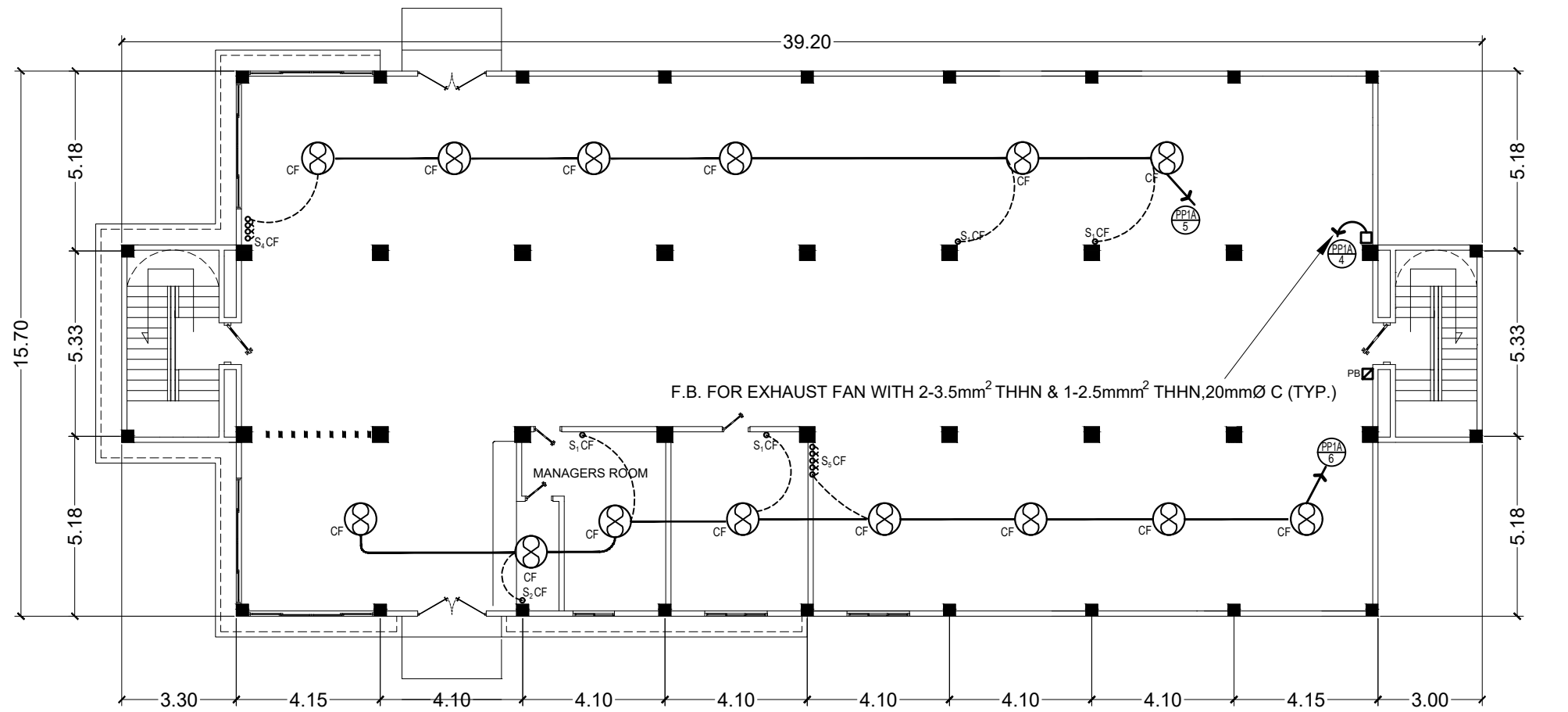
1 SECOND FLOOR POWER LAYOUT
EE-6 SCALE 1:100 M.



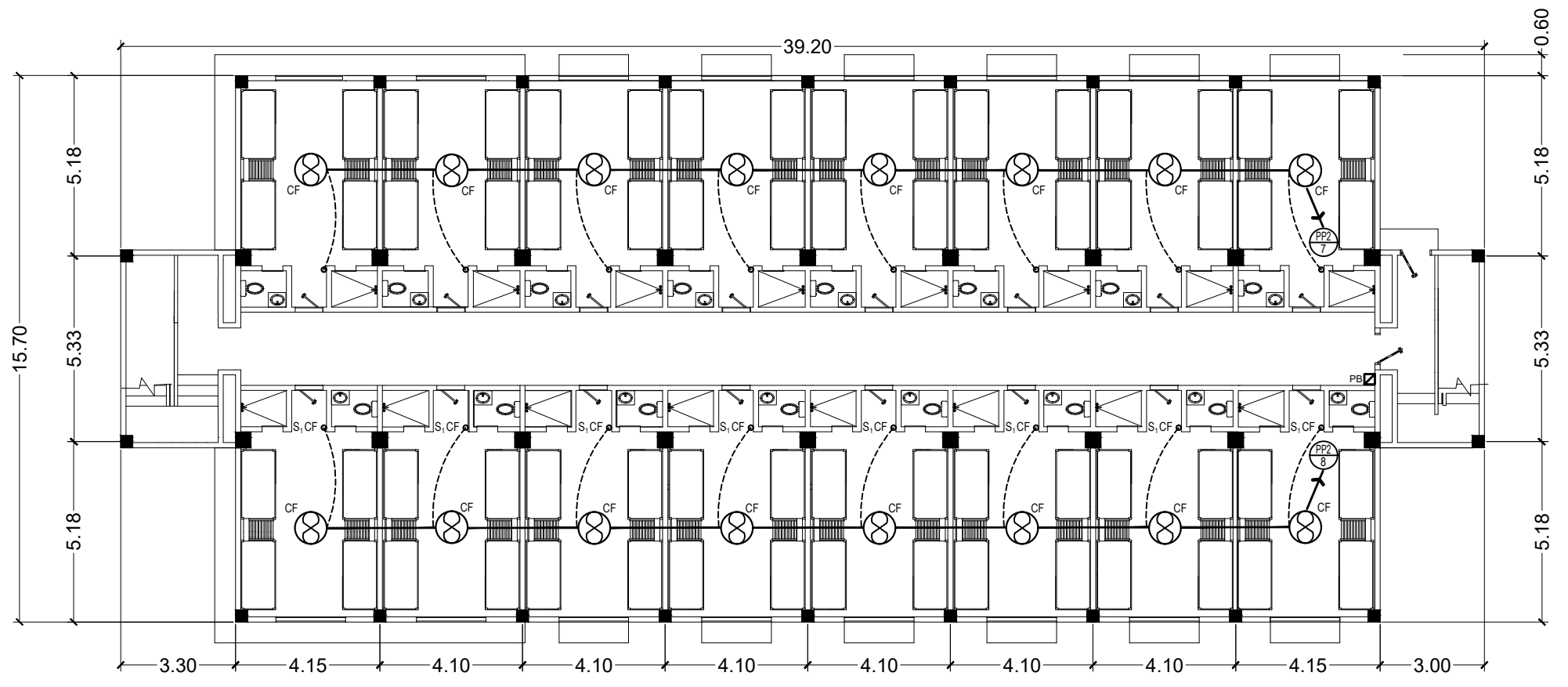
2 UPPER GROUND FLOOR CEILING FAN LAYOUT
 EE-7 SCALE 1:100 M.



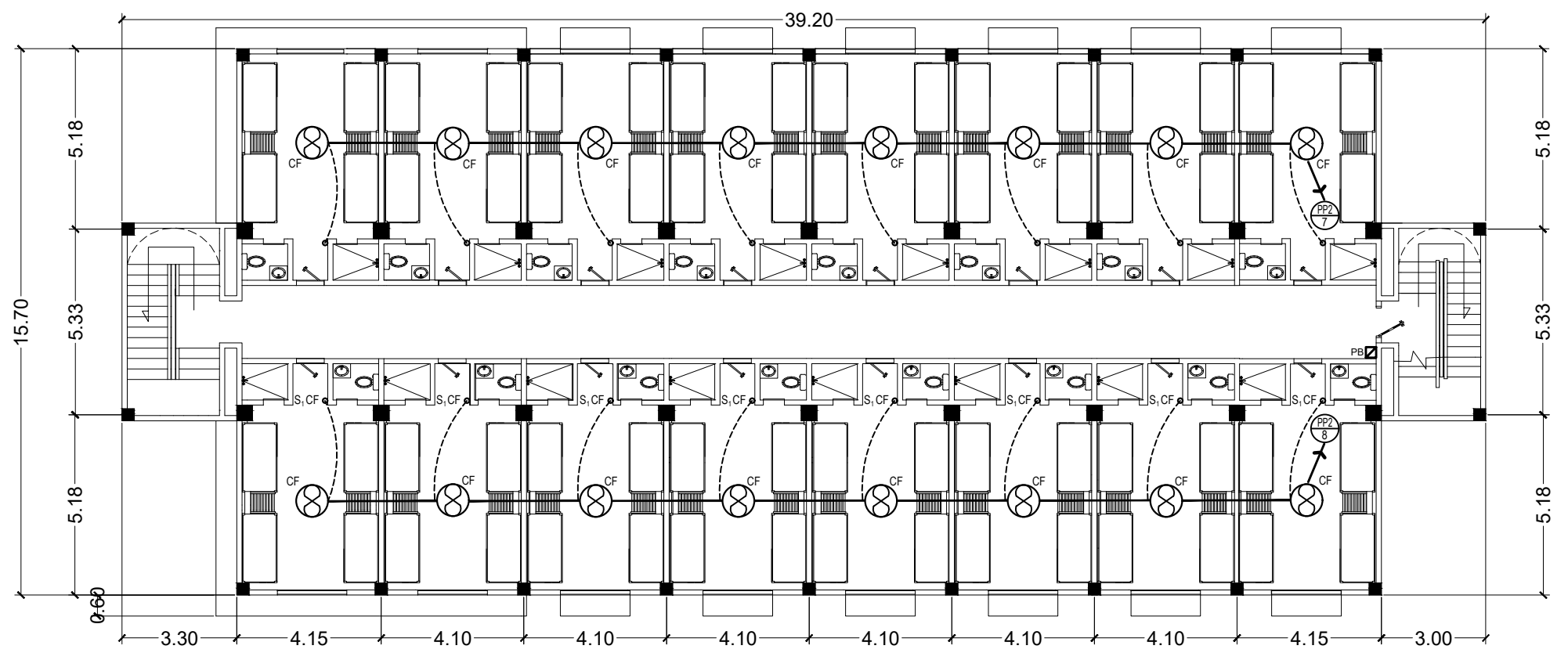
1 LOWER GROUND FLOOR CEILING FAN LAYOUT
 EE-7 SCALE 1:100 M.



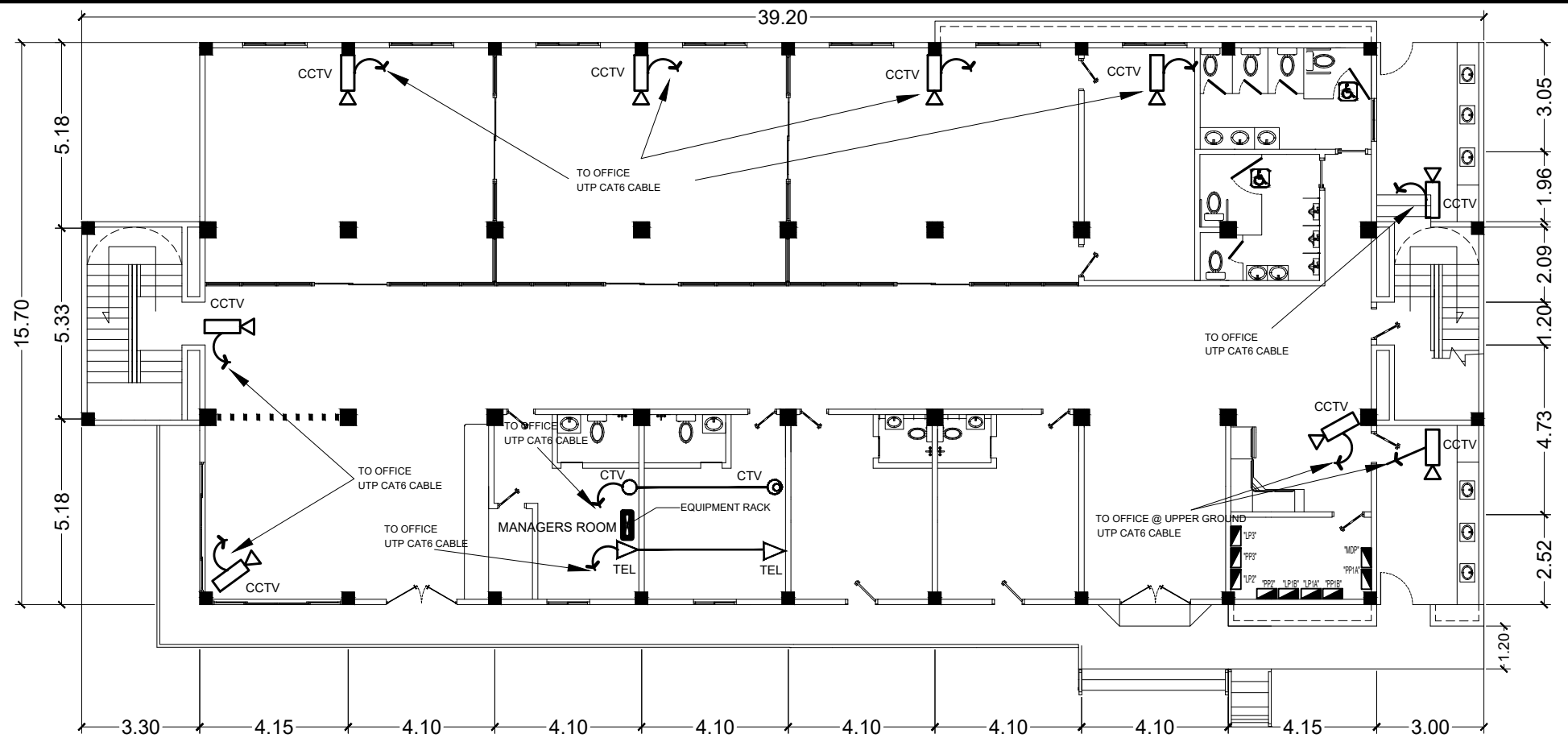
2 THIRD FLOOR CEILING FAN LAYOUT
 EE-8 SCALE 1:100 M.



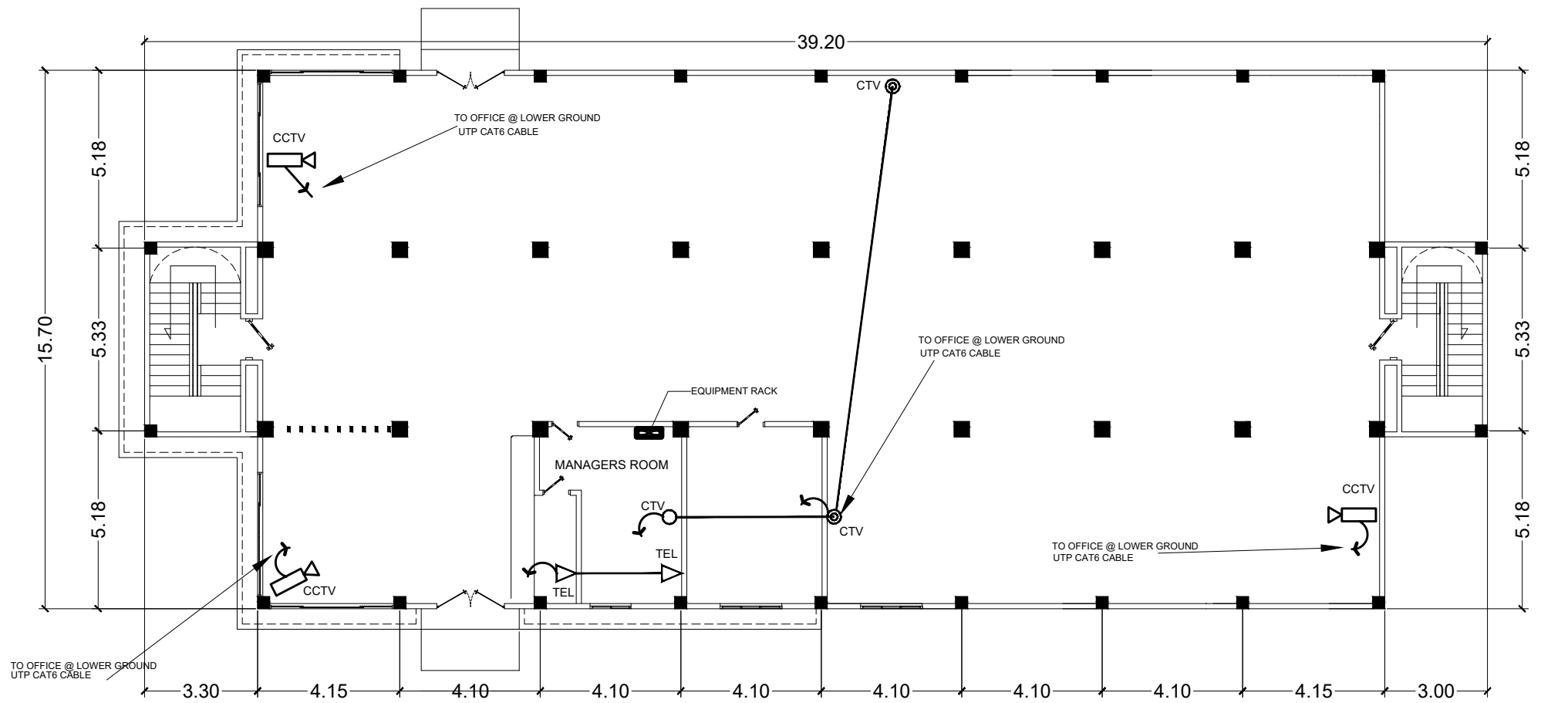
1 SECOND FLOOR CEILING FAN LAYOUT
 EE-8 SCALE 1:100 M.



NOTE:
 ●USE UTP CAT6 TO ALL CONNECTION CABLE.

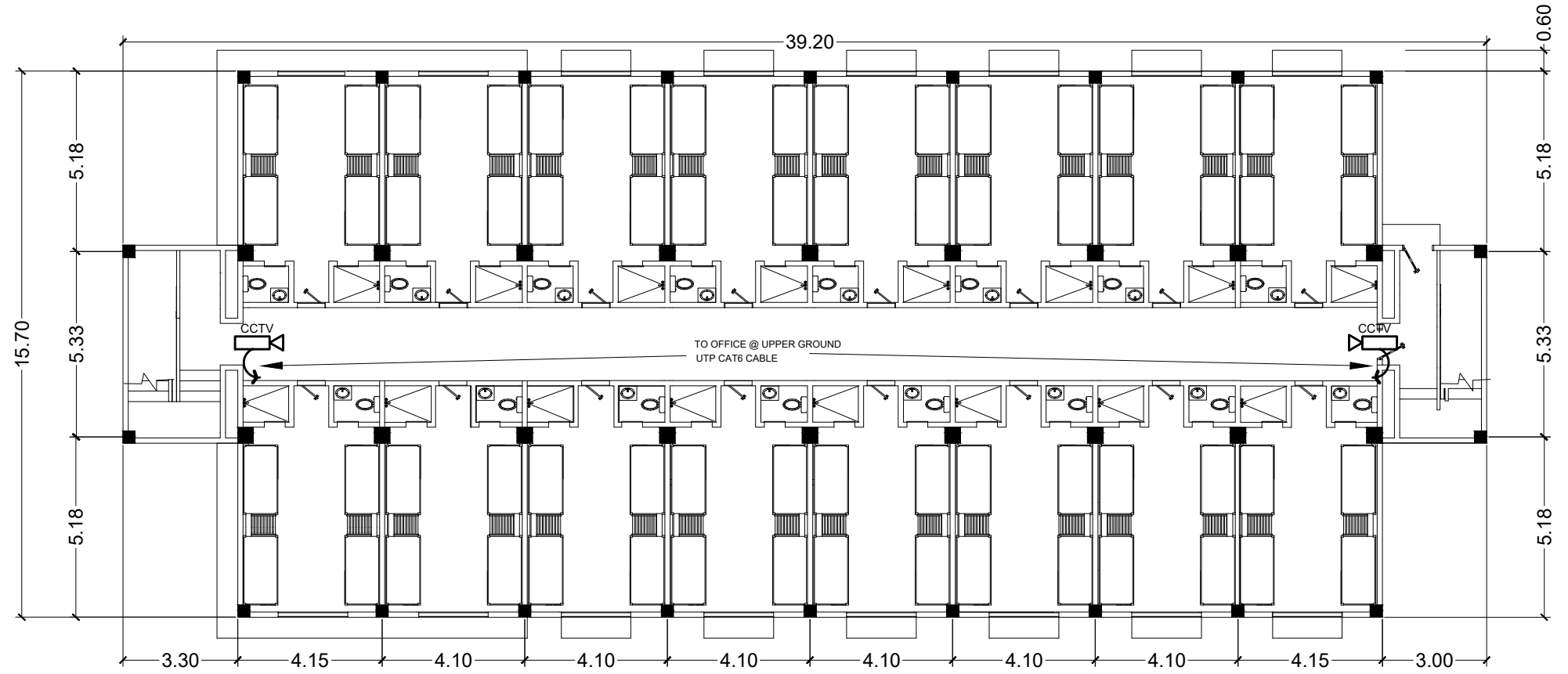


2 UPPER GROUND FLOOR TEL., CATV & CCTV LAYOUT
 AUX-1 SCALE 1:100 M.

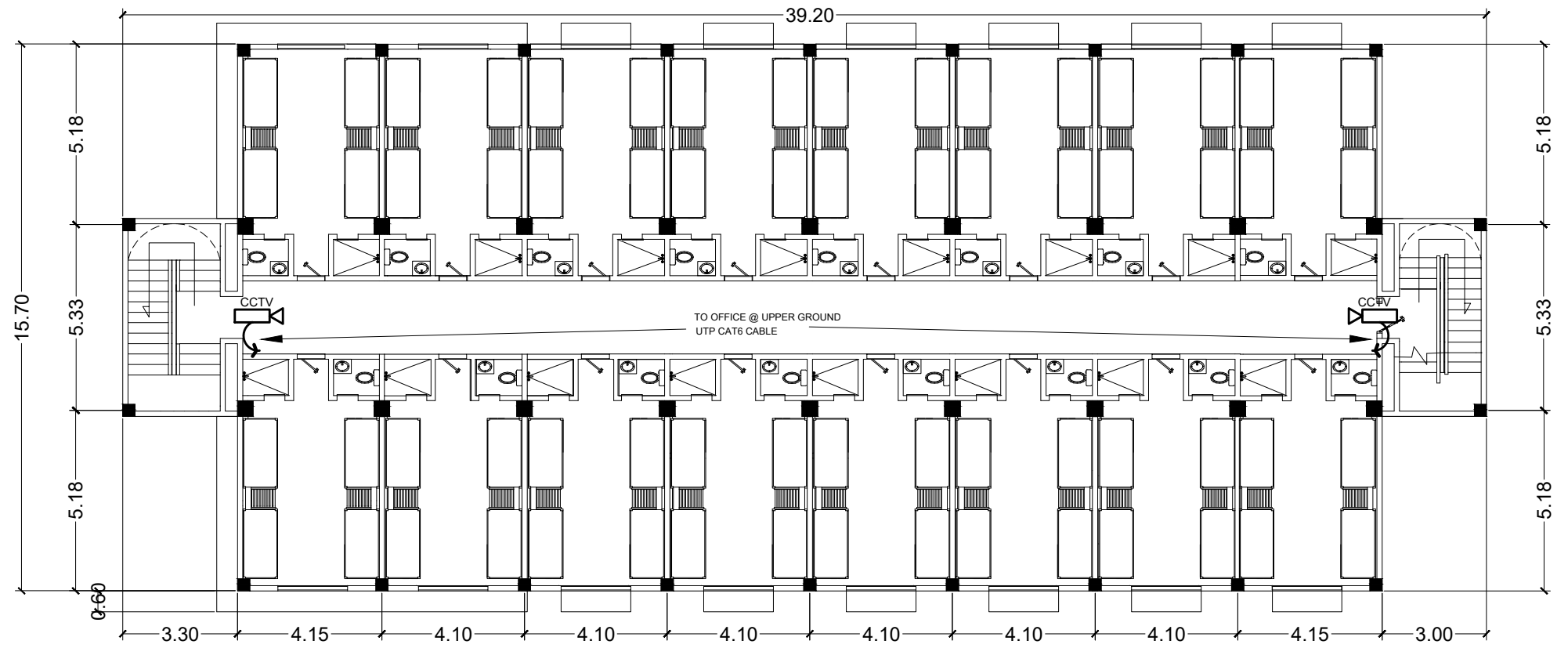


1 LOWER GROUND FLOOR TEL., CATV & CCTV LAYOUT
 AUX-1 SCALE 1:100 M.

NOTE:
 ● USE UTP CAT6 TO ALL CONNECTION CABLE.










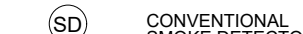



2 THIRD FLOOR TEL., CATV & CCTV LAYOUT
 AUX-2 SCALE 1:100 M.



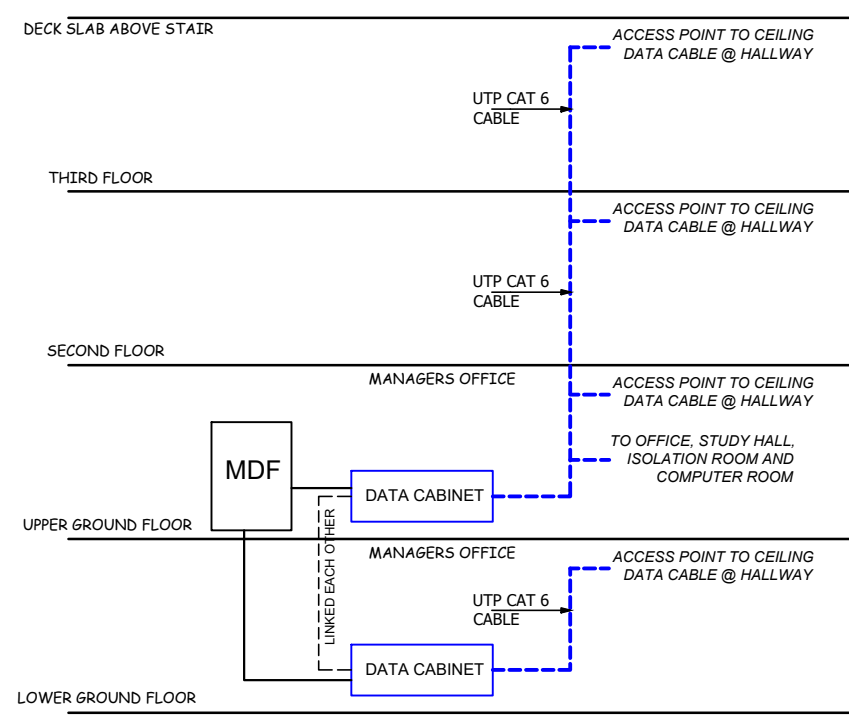
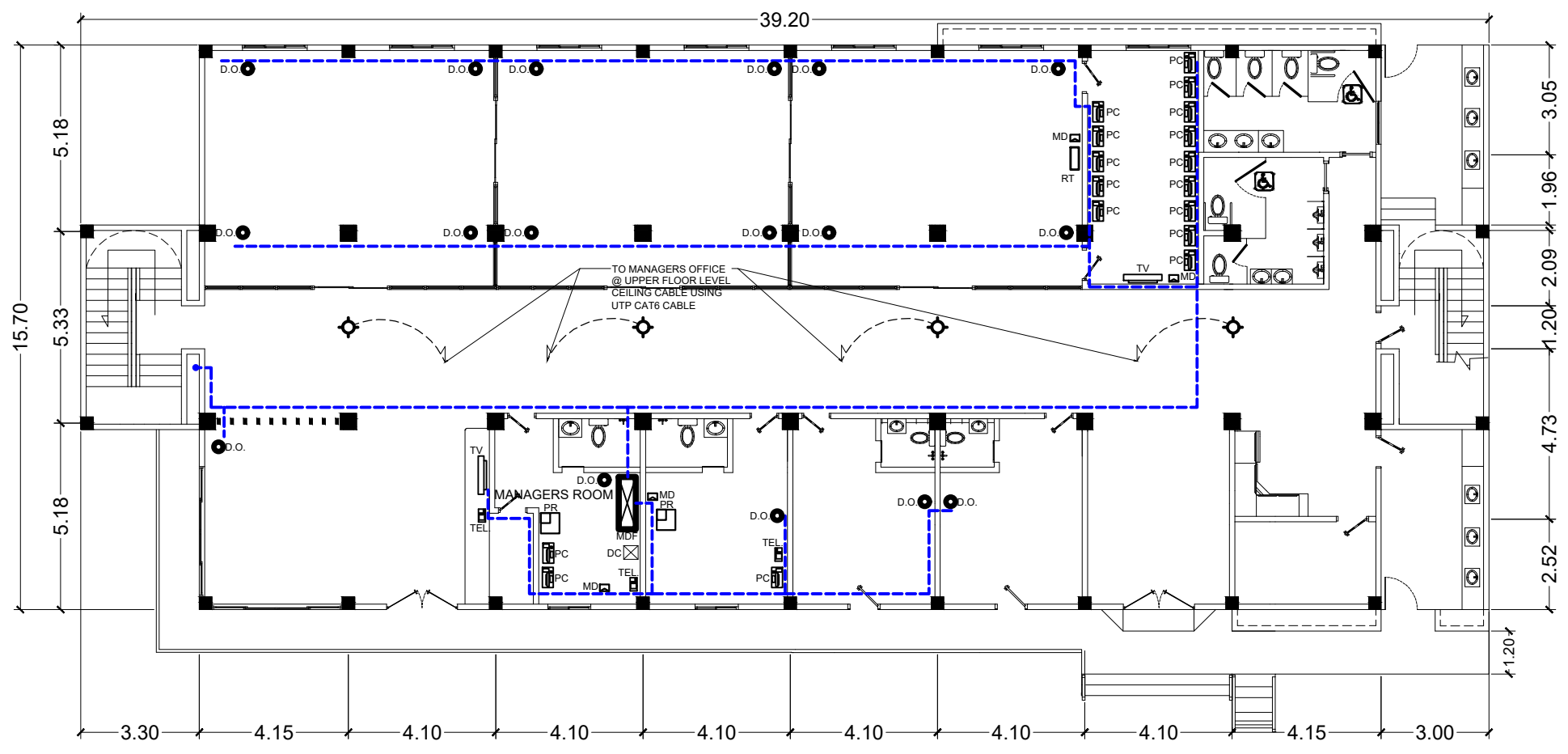
1 SECOND FLOOR TEL., CATV & CCTV LAYOUT
 AUX-2 SCALE 1:100 M.

LEGEND:

-  MDF MAIN DISTRIBUTION FRAME
-  DC DATA CABINET
-  D.O DUPLEX OUTLET
-  RT ROUTER
-  PR PRINTER
-  PC PERSONAL COMPUTER
-  MD MODEM
-  TV TELEVISION
-  ACCESS POINT
-  UTP CAT6 CABLE
-  SD CONVENTIONAL SMOKE DETECTOR

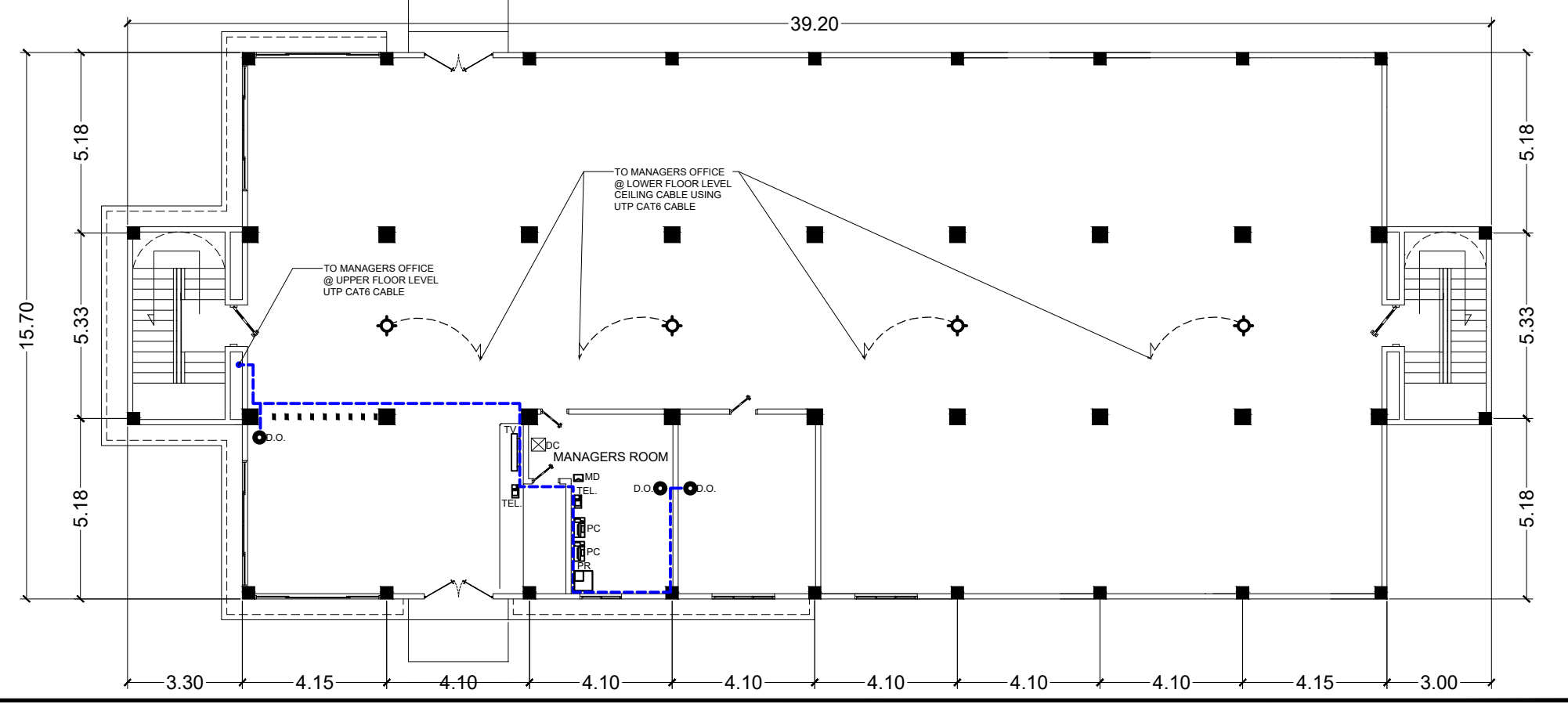
NOTE:
 ● USE UTP CAT6 TO ALL CONNECTION CABLE.

2 UPPER GROUND FLOOR NETWORK COMMUNICATION LAYOUT
 SCALE 1:100 M.














3 NETWORK COMMUNICATION DIAGRAM
 SCALE N.D.T.S.

1 LOWER GROUND FLOOR NETWORK COMMUNICATION LAYOUT
 SCALE 1:100 M.

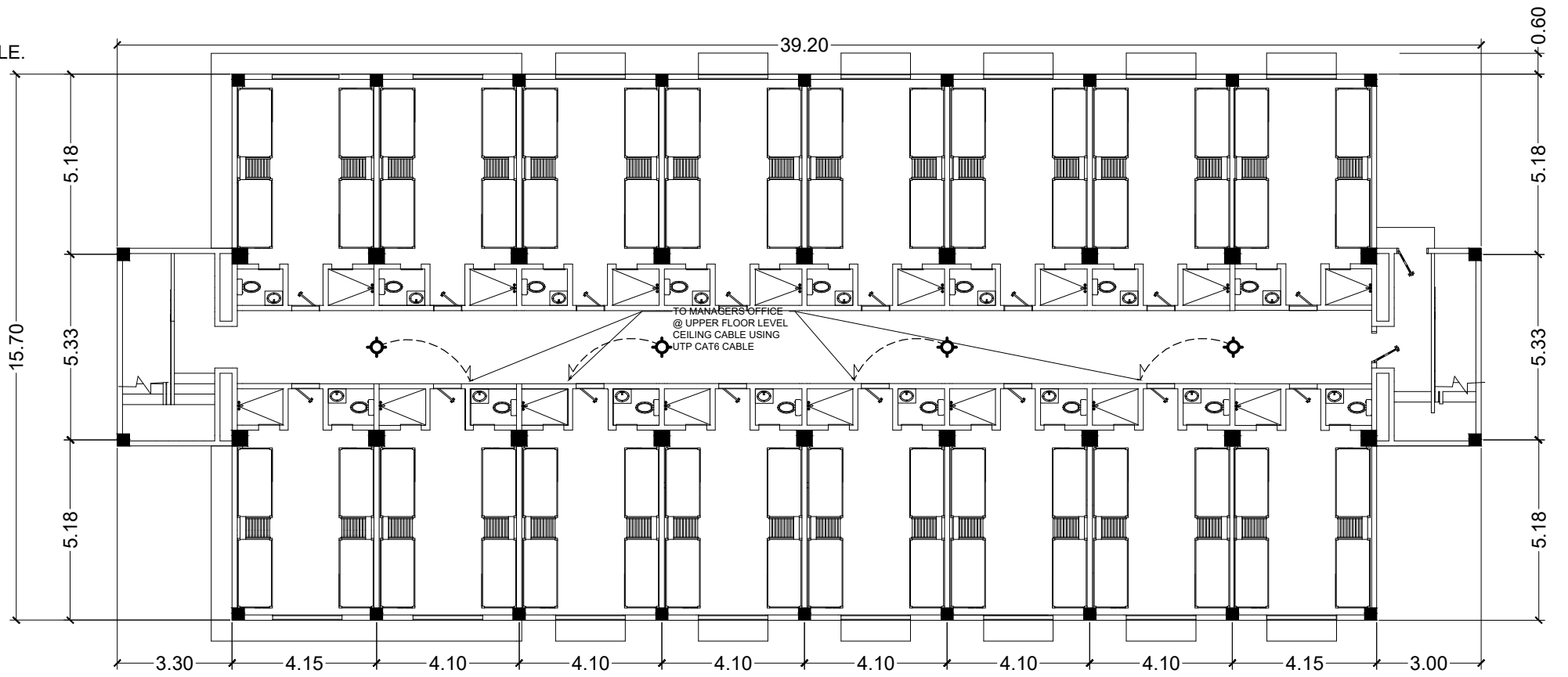


LEGEND:

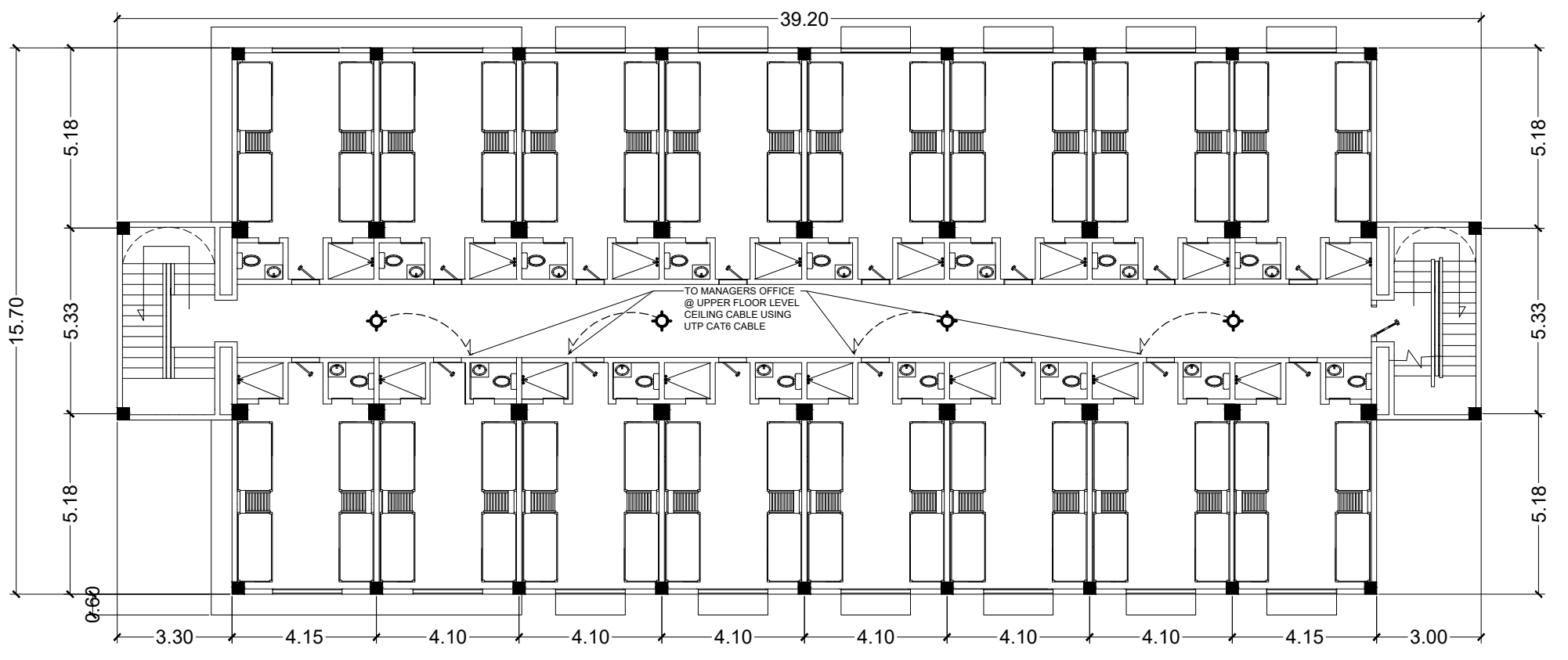
-  MDF MAIN DISTRIBUTION FRAME
-  DC DATA CABINET
-  D.O DUPLEX OUTLET
-  RT ROUTER
-  PR PRINTER
-  PC PERSONAL COMPUTER
-  MD MODEM
-  TV TELEVISION
-  ACCESS POINT
-  UTP CAT6 CABLE
-  CONVENTIONAL SMOKE DETECTOR

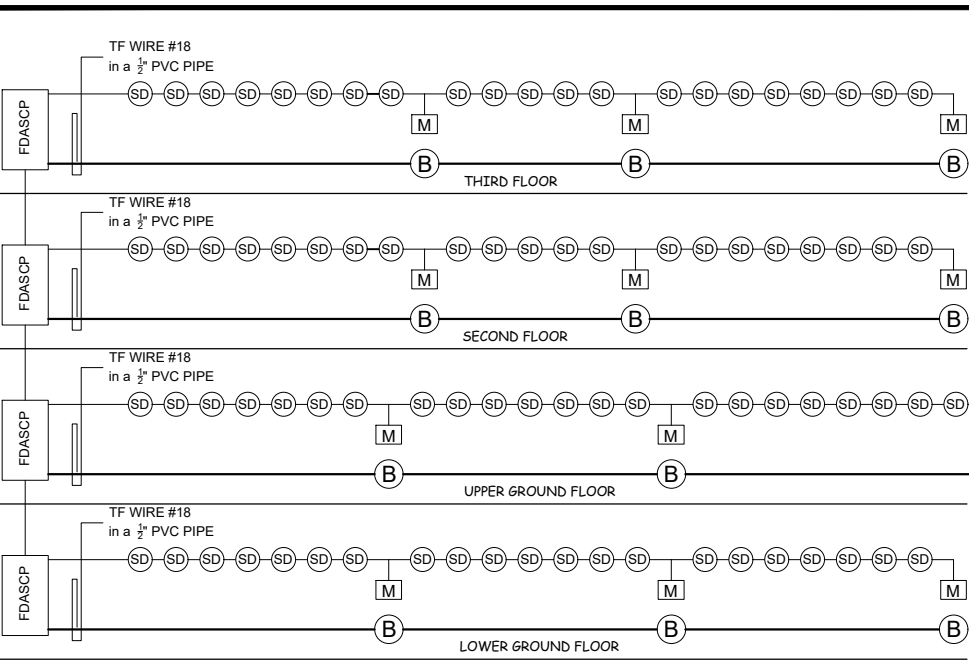
NOTE:
 ● USE UTP CAT6 TO ALL CONNECTION CABLE.

1 SECOND FLOOR NETWORK COMMUNICATION LAYOUT
 AUX-4 SCALE 1:100 M.



1 SECOND FLOOR NETWORK COMMUNICATION LAYOUT
 AUX-4 SCALE 1:100 M.

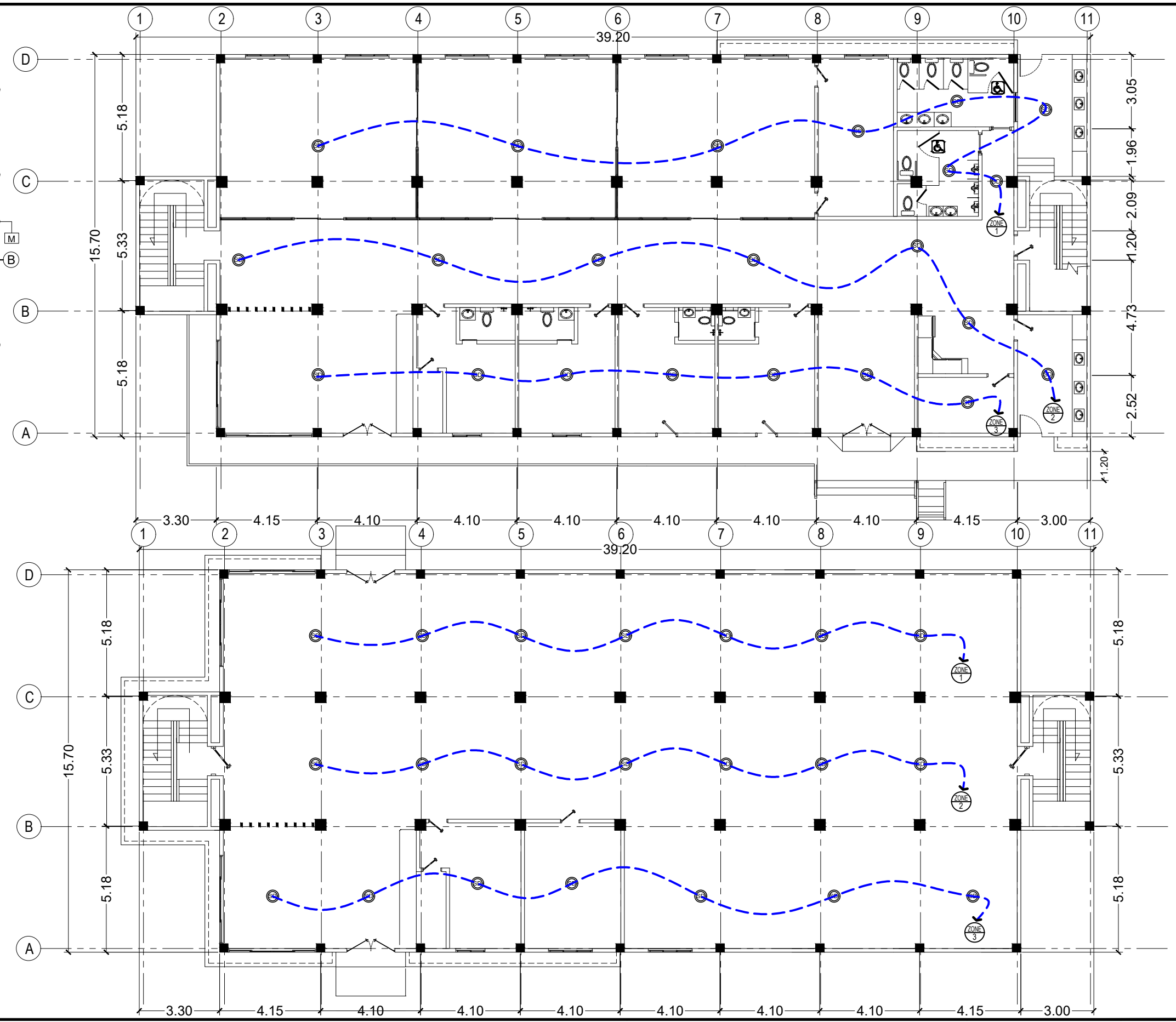




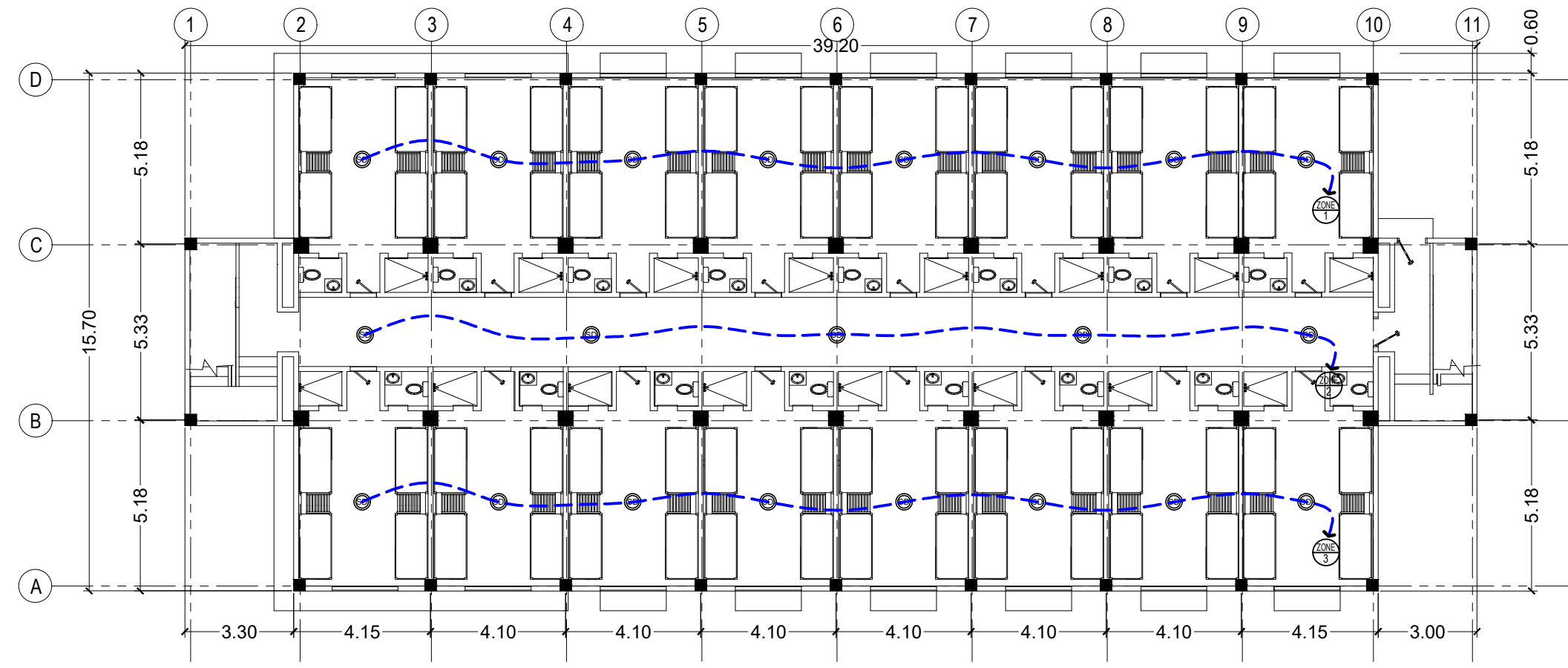
3 (FDAS) SINGLE LINE DIAGRAM
 AUX-5 SCALE NDTs

2 UPPER GROUND FLOOR LAYOUT (FDAS)
 AUX-5 SCALE 1:100 M.

1 LOWER GROUND FLOOR LAYOUT (FDAS)
 AUX-5 SCALE 1:100 M.



2 THIRD FLOOR LAYOUT (FDAS)
AUX-6 SCALE 1:100 M.



1 SECOND FLOOR LAYOUT (FDAS)
AUX-6 SCALE 1:100 M.

