REPUBLIC OF THE PHILIPPINES
CORDILLERA ADMINISTRATIVE REGION

Contract Reference Number: _____
Name of Project: **IMPROVEMENT OF AN EXISTING OFFICE INTO REGIONAL OPERATIONS CENTER**
Location of the Project: **#40 North Drive, Baguio City**

Standard Form Number SF-INFR-55

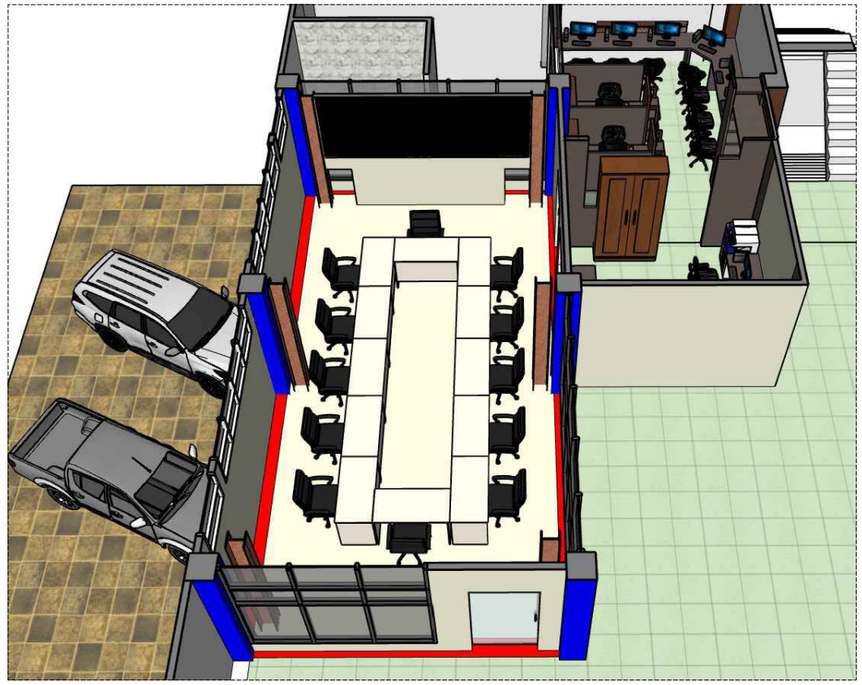
Revised on: August 11, 2004

BILL OF QUANTITIES

Columns 1, 2, 3, & 4 are to be filled up by the Procuring Entity				Columns 5 & 6 are to be filled by the bidders	
ITEM NO.	ITEM DESCRIPTION	UNIT	QTY.	UNIT PRICE (PESOS)	AMOUNT (PESOS)
	2	3	4	5	6
I	GENERAL REQUIREMENTS	lot	1.00		
	Mobilization / Demobilization				
	Temporary Facilities				
	Permits				
	Electrical and Water Consumption				
	Project Billboard and Safety Signages				
II	DEMOLITION OF ALL EXISTING STRUCTURES				
	Existing Partition Wall				
	Existing Ceiling				
	Existing Roof				
	Existing Slab				
III	EARTHWORK	lot	1.00		
	Excavation -				
	Backfill -				
	Hauling -				
IV	FORMWORKS AND SCAFFOLDINGS	sq.m.	148.50		
V	STEEL DECK	l.m.	118.80		
VI	STRUCTURAL STEEL WORKS	lot	1.00		
VII	REINFORCING STEEL BARS	kgs	1,959.06		
VIII	STRUCTURAL CONCRETE	cu.m.	17.59		
IX	MASONRY WORKS	lot	1.00		
	6" Exterior Walls - 47.16 sq.m.				
	4" Interior Walls - 45.48 sq.m.				
X	ARCHITECTURAL WORKS	lot	1.00		
	Painting Works				
	Tile Works				
	Glass and Aluminum				
	Doors and Windows				
	Carpentry Works				
XI	SANITARY WORKS	lot	1.00		
	Drainage System				
XII	ELECTRICAL WORKS	lot	1.00		
	Wires and Cables				
	Conduits				
	Lighting Fixtures and Switches				
	Device, Plates and Utilities				
	Panel Board				
XIII	CONSTRUCTION SAFETY AND HEALTH	lot	1.00		
TOTAL BID PRICE:					
TOTAL AMT. IN WORDS: (in words)					

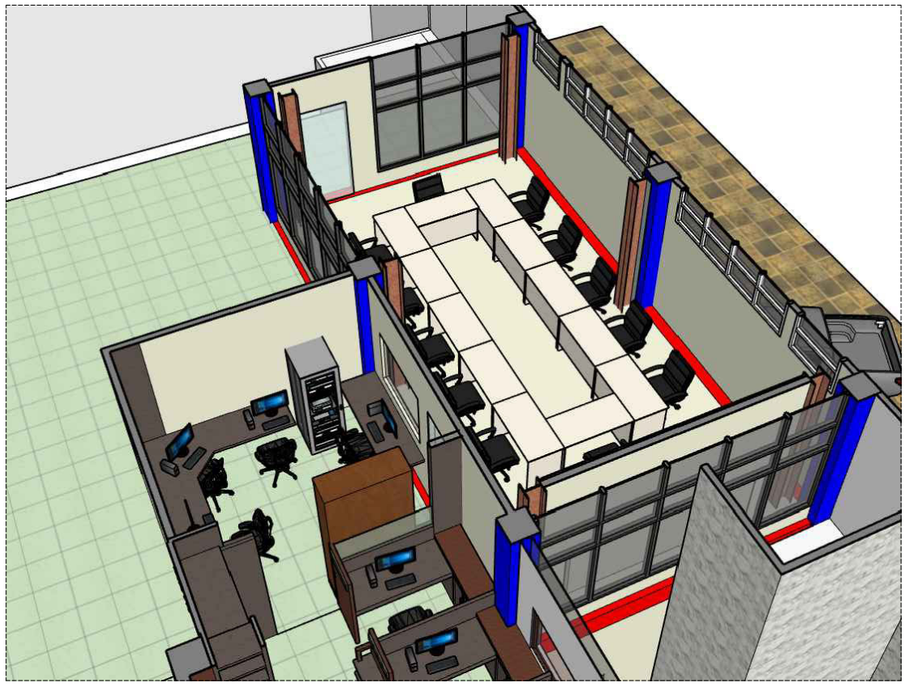
2 / A 1a — FOUNDATION PLAN

SACLE: 1 : 40 M



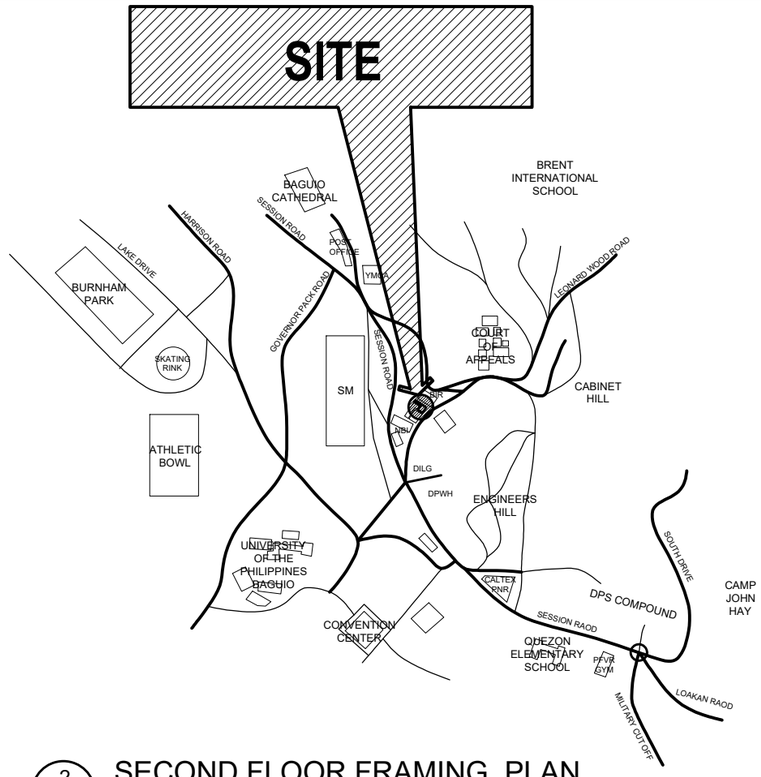
2 / A 1a — GROUND FLOOR FRAMING PLAN

SACLE: 1 : 40 M



2 / A 1a — UPPER BASEMENT FRAMING PLAN

SACLE: 1 : 40 M



2 / A 1a — SECOND FLOOR FRAMING PLAN

SACLE: 1 : 40 M

2 / A 1a — LOCATION MAP

DEPARTMENT OF SOCIAL WELFARE AND DEVELOPMENT - CAR

AD BGMS-004| REV 00

PROJECT NAME :

IMPROVEMENT OF AN EXISTING OFFICE INTO REGIONAL OPERATIONS CENTER

LOCATION :

#40 NORTH DRIVE, BAGUIO CITY

SHEET CONTENT :

AS SHOWN

APPROVED BY

ARNEL B. GARCIA, CESO II
Regional Director

CONFORMED BY

ENRIQUE H. GASCON JR.
OIC-Assistant Regional Director for Administration

CHECKED BY

RINA CLAIRE L. REYES
OIC Chief, Administrative Division

PREPARED BY

JOHN PHILLIP J. LAMSIS
ENGINEER - BGMS

PROJECT/TA No:

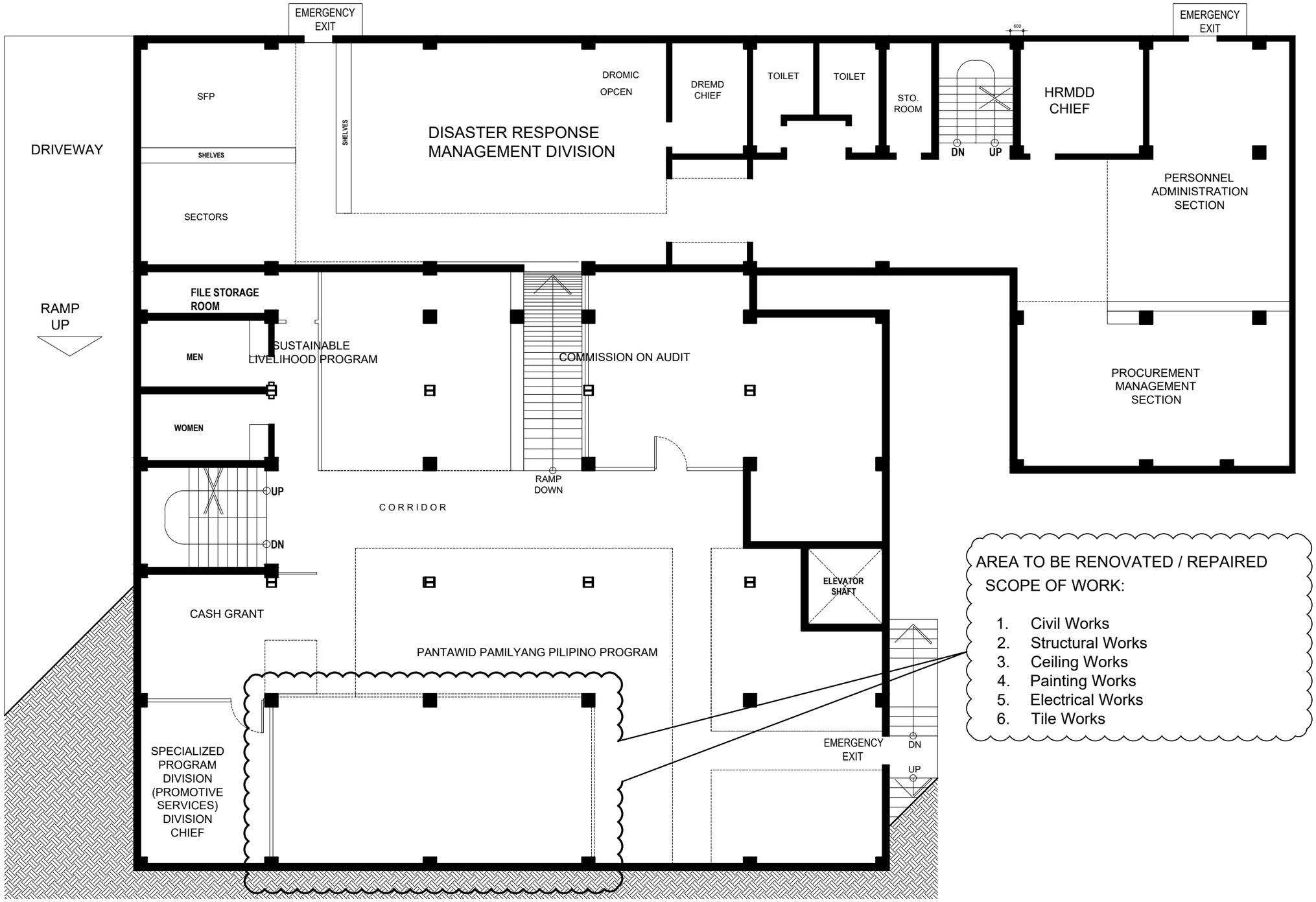
DATE SUBMITTED:

DRAWING STATUS

DATE	DESCRIPTION/REMARKS	BY

SHEET NUMBER: A 1 / 1

A3 SIZE



AREA TO BE RENOVATED / REPAIRED

SCOPE OF WORK:

1. Civil Works
2. Structural Works
3. Ceiling Works
4. Painting Works
5. Electrical Works
6. Tile Works

1 / A 1c UPPER BASEMENT FLOOR PLAN

SACLE: NTS

A 1 SCALE: NTS

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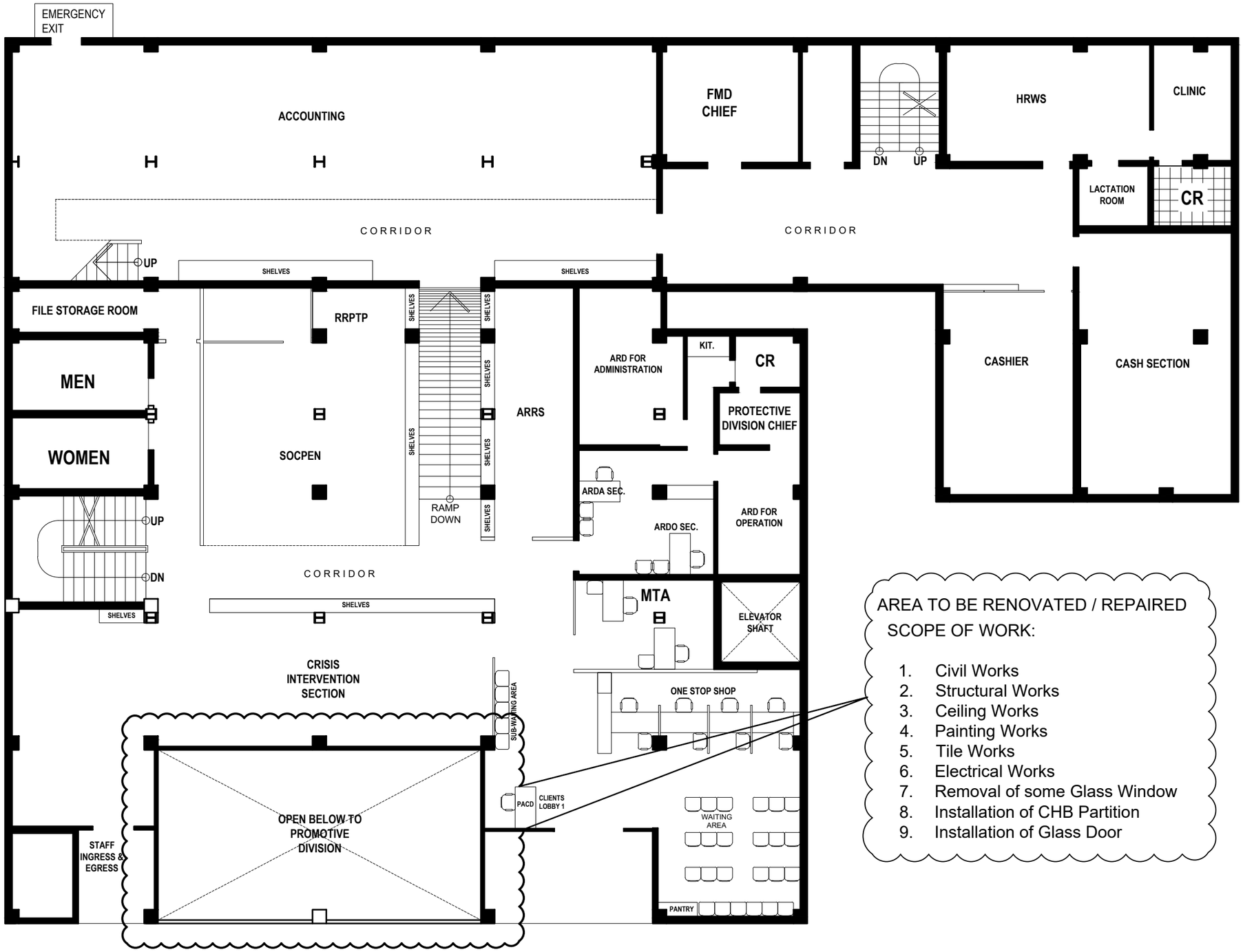
DATE SUBMITTED:

DRAWING STATUS

DATE	DESCRIPTION/REMARKS	BY

SHEET NUMBER A 1 / 3 — A3 SIZE



AREA TO BE RENOVATED / REPAIRED

SCOPE OF WORK:

1. Civil Works
2. Structural Works
3. Ceiling Works
4. Painting Works
5. Tile Works
6. Electrical Works
7. Removal of some Glass Window
8. Installation of CHB Partition
9. Installation of Glass Door

1 / A 1 GROUND FLOOR PLAN

SCALE: NTS

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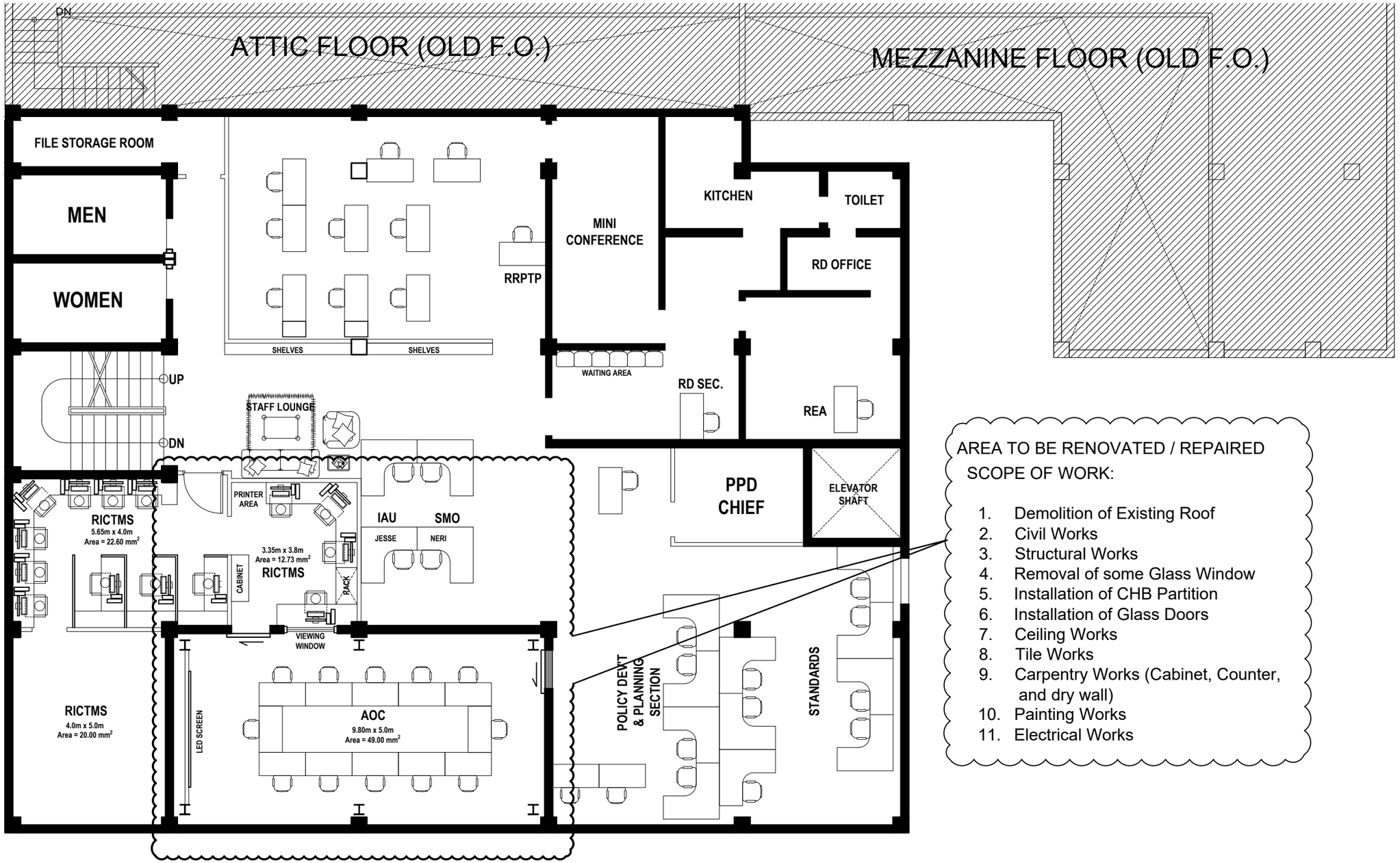
DRAWING STATUS

DATE	DESCRIPTION/REMARKS	BY

SHEET NUMBER A 2 / 3

A3 SIZE



AREA TO BE RENOVATED / REPAIRED

SCOPE OF WORK:

1. Demolition of Existing Roof
2. Civil Works
3. Structural Works
4. Removal of some Glass Window
5. Installation of CHB Partition
6. Installation of Glass Doors
7. Ceiling Works
8. Tile Works
9. Carpentry Works (Cabinet, Counter, and dry wall)
10. Painting Works
11. Electrical Works

1 / A 1

SECOND FLOOR PLAN

SCALE: NTS

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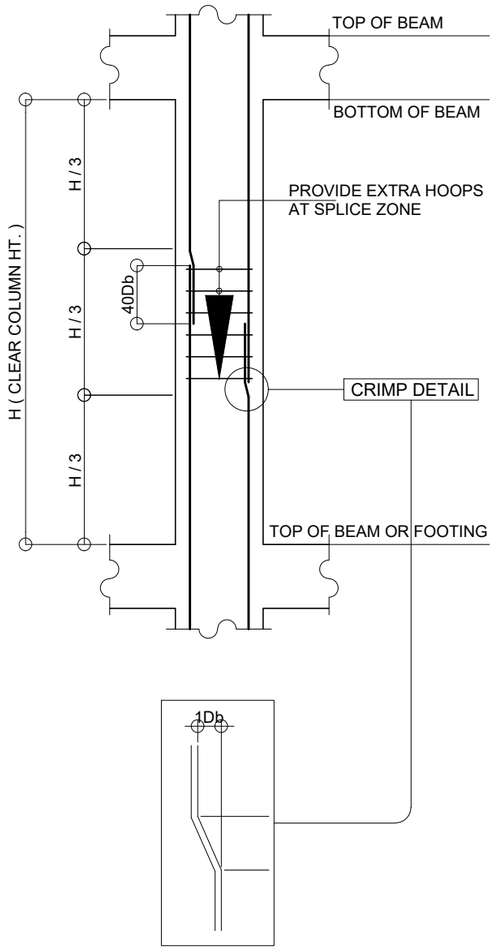
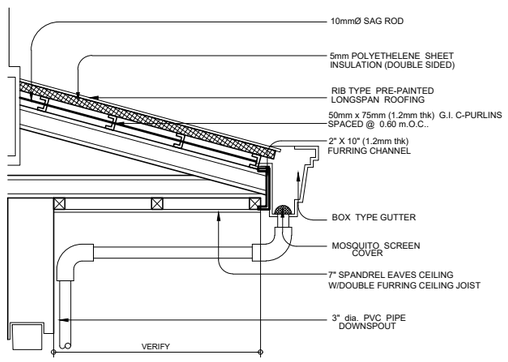
SHEET NUMBER A 3 / 3

A3 SIZE



TYPICAL COLUMN
SPLICE DETAIL



ROOF EAVES DETAILS

1. REINFORCED CONCRETE :

1.1 THE QUALITY AND DESIGN OF ALL REINFORCED CONCRETE CONSTRUCTION SHALL CONFORM TO THE BUILDING REQUIREMENT FOR REINFORCED CONCRETE (ACI - 318 - 7) AND MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES (ACI - 315 - 615).

1.2 THE CONTRACTOR SHALL SUBMIT THE SCHEDULE OF CONCRETE POURING AND LOCATION OF CONSTRUCTION JOINTS TO THE ENGINEER AT LEAST THREE (3) DAYS BEFORE POURING FOR APPROVAL. THE CONTRACTOR SHALL KEEP ALL CONCRETE MOIST FOR A MINIMUM OF TWENTY FOUR (24) HOURS AFTER THE CONCRETE HAS BEEN POURED.

1.3 TRIAL BATCHES FOR JOB MIXED CONCRETE SHALL BE PREPARED, CURED AND TESTED AT A REPUTABLE LABORATORY BY THE CONTRACTOR FOR APPROVAL OF THE STRUCTURAL ENGINEER.

1.4 WHEN POURING CONCRETE, A MECHANICAL VIBRATOR SHALL BE USED TO INSURE ITS CONSISTENCY. NO CONCRETE SHALL BE POURED WITH A VERTICAL DROP OF NO MORE THAN TWO (2) METERS OTHERWISE, CHUTES MUST BE USED TO MAINTAIN QUALITY AND CONSISTENCY OF CONCRETE.

2. REINFORCING STEEL BARS :

2.1 ALL REINFORCING STEEL BARS UNLESS OTHERWISE SHOWN ON PLANS SHALL BE BILLET STEEL IN ACCORDANCE WITH ASTM SPECIFICATION DESIGNATION A - 15 WITH DEFORMATION CONFORMING TO ASTM SPECIFICATION DESIGNATION A - 305.

2.2 UNLESS OTHERWISE NOTED ON PLAN, BARS 12 mm AND SMALLER SHALL BE STRUCTURAL GRADE (GRADE 33) , BARS 16 mm AND LARGER SHALL BE INTERMEDIATE GRADE (GRADE 40).

2.3 ALL SPLICES SHALL WIRED TOGETHER AND LAP SPLICES SHALL HAVE A MINIMUM LENGTH OF 40 TIMES BAR DIAMETER UNLESS OTHERWISE NOTED ON PLAN. NO MORE THAN FIFTY (50) PERCENT OF THE TOTAL NUMBER OF REINFORCING BARS SHALL BE SPLICED AT ANY ONE POINT FOR BEAMS AND COLS.

2.4 LAP SPLICE LOCATIONS SHALL BE ;

2.4.1 BEAMS AND GIRDERS : TOP BARS AT MIDSPAN AND BOTTOM BARS AT SUPPORT.

2.4.2 COLUMNS : AT MIDDLE THIRDS.

2.5 ALL REINFORCING BARS SHALL BE FREE FROM OIL, GREASE OR ANY OTHER SUBSTANCE BEFORE CONCRETE IS ALLOWED TO BE POURED TO INSURE PROPER BONDING OF CONCRETE AND STEEL.

2.6 THE MINIMUM CLEAR COVER FOR REINFORCING STEEL BARS SHALL BE AS FOLLOWS :

2.6.1 FOUNDATIONS : 75 mm
2.6.2 SLABS ON GRADE : 25 mm
2.6.3 SURFACE EXPOSED TO WEATHER : 50 mm FOR 20 mm DIA. AND LARGER BARS
2.6.4 COLUMNS : 40 mm
2.6.5 BEAMS AND GIRDERS : 40 mm
2.6.6 SUSPENDED SLAB AND STAIRS : 20 mm
2.6.7 R.C. WALLS AND SHEAR WALLS : 25 mm

2.7 ARRANGEMENT OF TWO - WAY SLAB REINFORCING BARS :

2.7.1 IN TWO -WAY SLAB DETAILING, THE BARS ALONG THE SHORT SPAN BE AT THE LOWER LAYER FOR BOTTOM BARS AND AT THE UPPER LAYER FOR TOP BARS SO THAT THE BARS ALONG THE SHORTER SHALL HAVE THE BIGGER EFFECTIVE DEPTH UNLESS OTHERWISE NOTED OR DETAILED DUE

2.7.2 IF THE CONTINUITY OF BARS FROM SPANS WITH DIFFERENT SUPPORT OF TWO ADJACENT SPANS ARE DIFFERENT, THE SMALLER SPACING SHALL BE FOLLOWED OR ADOPTED ON BOTH SLAB PANELS AT THAT COMMON SUPPORT.

2.8 UNLESS OTHERWISE SPECIFIED ON PLAN, REINFORCING BAR ARRANGEMENT SHALL BE SUCH THAT;

2.8.1 WHEN A BEAM CROSSES A GIRDER, REST BEAM BARS ON TOP OF GIRDER BARS. REINFORCING BARS SHALL BE SYMMETRICAL ABOUT THE CENTERLINE WHENEVER POSSIBLE AND UPPER LAYERS SHALL BE PLACED DIRECTLY ABOVE THOSE IN THE BOTTOM LAYER.

2.9 REINFORCING BAR PLACEMENT, ANCHOR BOLTS, DOWELLS AND OTHER INSERTS SHALL BE PROPERLY SECURED IN THEIR POSITIONS AND INSPECTED BY THE WORKS ENGINEER BEFORE ANY CONCRETING ACTIVITY IS ALLOWED.

3. CONCRETE MASONRY UNITS :

3.1 CELL CONTAINING REINFORCEMENTS SHALL BE SOLIDLY FILLED WITH GROUT IN LIFTS NOT EXCEEDING 1200 mm AND POURING SHALL BE STOPPED BELOW THE TOP OF THE COURSE SUCH THAT A KEY SHALL BE PROVIDED AT POURING JOINTS.

3.2 VERTICAL CELLS TO BE FILLED SHALL HAVE A VERTICAL ALLIGNMENT TO MAINTAIN A CONTINOUOS UN-OBSTRUCTED CELL AREA OF NOT LESS THAN 50 mm x 750 mm.

3.3 ALL VERTICAL BARS SHALL BE HELD IN POSITION BY SECURING THEM BY MEANS OF TIE WIRES AT TOP AND BOTTOM OF REINFORCEMENT AND AT INTERVALS NOT TO EXCEED 192 TIMES THE BAR DIAMETER.

4. FOUNDATION :

ALL FOOTINGS SHALL REST ON NATURAL UNDISTURBED SOIL.
UNLESS OTHERWISE SPECIFIED ON PLAN, THE MINIMUM DEPTH OF FOUNDATION SHALL BE 1500 mm REFERRED FROM THE FINISHED GRADE LINE TO THE TOP OF FOOTING.

5. FORMWORKS :

FORMS OF ADEQUATE SIZE AS TO SHAPE OF MEMBERS SHALL BE MAINTAINED AND SHORING SHALL BE IN-PLACE UNTIL CONCRETE HAS ATTAINED THEIR WORKING CONDITIONS AND STRENGTH.

SCHEDULE FOR THE REMOVAL OF FORMS SHALL BE AS FOLLOWS;
6.2.1 BEAMS, GIRDERS, AND SUSPENDED SLABS
6.2.2 COLUMNS AND BEARING WALLS
WHEN CONCRETE FLOOR IS TO BE POURED, AT LEAST TWO (2) FLOORS SHALL BE SHORED TO SUPPORT.

6. SIZES OF AGGREGATES TO BE USED :

6.1 THE FOLLOWING SHALL BE THE MAXIMUM SIZES OF AGGREGATES TO BE USED FOR VARIOUS PURPOSES OF CONCRETE CONSTRUCTION;

MINIMUM DIMENSIONS OF SECTIONS (mm)	REINFORCED WALLS, BEAMS AND COLUMNS (mm)	UN-REINFORCED WALLS (mm)	HEAVILY REINFORCED SLABS (mm)	LIGHTLY REINF. OR UN-REINF. SLABS (mm)
63.50 - 127.00	12.50 - 19.00	19.00	19.00 - 25.40	19.00 - 38.10
152.40 - 279.40	19.00 - 38.00	38.10	28.10	38.10 - 76.20
304.80 - 736.60	13.80 - 76.20	76.20	38.10 - 76.20	76.20
762.00 - OR MORE	12.70 - 76.20	152.40	38.10 - 76.20	76.20 - 152.60

7. STRUCTURAL STEEL SECTIONS :

7.1 STRUCTURAL STEEL PLATES AND SHAPES SHALL CONFORM TO ASTM DESIGNATION A - 36 WITH A MINIMUM SPECIFIED YEILD STRENGTH OF 248 MPa.

7.2 COLD - FORMED STEEL SHALL CONFORM TO ASTM DESIGNATION A - 611 WITH A MINIMUM SPECIFIED YIELD STRENGTH OF 248 MPa.

7.3 WELDING ELECTRODES FOR MANUAL SHIELDED METAL - ARC WELDING SHALL CONFORM TO E7018 AND TO THE AMERICAN WELDING SOCIETY (AWS) SPECIFICATIONS.

7.4 MINIMUM THICKNESS OF WELD SHALL BE 6.00 mm.

7.5 ALL ANCHOR BOLTS SHALL CONFORM TO ASTM A - 325 HIGH STRENGTH BOLTS, TYPE 1 OR TYPE 2.

8. REFERENCE TO OTHER DRAWINGS :

8.1 SEE ARCHITECTURAL DRAWINGS FOR KINDS OF FLOOR FINISH, DEPRESSIONS IN FLOOR SLABS, OPENINGS ON WALLS, SLBS, INTERIOR PARTITIONS, LOCATIONS OF DRAINS, ETC.

9. DIMENSIONS :

9.1 IN THE INTERPRETATION OF THESE DRAWINGS, INDICATED DIMENSIONS SHALL GOVERN AND DISTANCES OR SIZES OF STRUCTURAL MEMBERS SHALL NOT BE SCALED FOR USE IN CONSTRUCTION.

10. DISCREPANCIES :

10.1 STRUCTURAL DRAWINGS SHALL BE COMPARED WITH THE ARCHITECTURAL DRAWINGS AS TO LAYOUT, DIMENSIONS AND ELEVATIONS. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT OR ENGINEER FOR PROPER ACTION BEFORE EXECUTION OF THE WORK INVOLVED.

SHOP DRAWINGS :

THE CONTRACTOR SHALL SUBMIT TO THE ARCHITECT FOR APPROVAL SHOP OR SETTINGS DRAWING, TEMPLATES, OR PATTERNS BEFORE ANY ALTERATION, VARIATIONS OR CORRECTIONS FROM THE PLAN ARE EXECUTED OR IMPLEMENTED.

FOUNDATION:

THE WORK INCLUDED IN THIS DIVISION COMPRISES THE FURNISHING OF ALL LABOR, MATERIALS, AND OTHER FACILITIES AND THE SATISFACTORY PERFORMANCE OF ALL WORK NECCESSARY TO COMPLETE THE PREPARATION FOR FOUNDATION AND FOOTINGS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN.

CONCRETE WORKS:

CONCRETE FOR ALL FOUNDATION ELEMENTS SHALL HAVE A MINIMUM 20-DAY COMPRESSIVE STRENGHT OF 3,000 Psi. DETAILS ARE SPECIFIED ON PLANS.

CONCRETE CURING:

AFTER FINISHING SURFACES, CURING SHALL BE DONE BY KEEPING THE CONCRETE MOIST FOR AT LEAST ONE (1) WEEK AFTER POURING. FLOOR AND VERTICAL SURFACES MAY BE SPRAYED WITH AN APPROVED PREPARATION TO RETARD EVAPORATING WATER OR MOIST PROVIDED, SPRAYING IS NOT OBJECTIONABLE BECAUSE OF SUBSEQUENT FINISH. CURING SHALL BEGIN AS SOON AS CONCRETE HAS ATTAINED ITS INITIAL SET.

REPAIR OF CONCRETE:

REPAIR OF CONCRETE IMPERFECTION SHALL BE COMPLETED WITHIN TWENTY-
FOUR (24) HOURS AFTER REMOVAL OF FORMS.
PINE SHALL BE NEATLY
REMOVED FROM EXPOSED SURFACES.

CEMENT AND MASONRY WORKS:

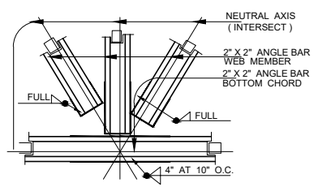
THE WORK INCLUDED IN THIS DIVISION SHALL INCLUDE LABOR, MATERIALS, EQUIPMENT AND OTHER FACILITIES FOR THE SATISFACTORY PERFORMANCE OF ALL NECCESSARY ACTIVITIES TO COMPLETE THE CEMENT AND MASONRY WORKS, WHICH ARE GIVEN IN THE DRAWINGS ARE SPECIFIED HEREIN.

M O R T A R:

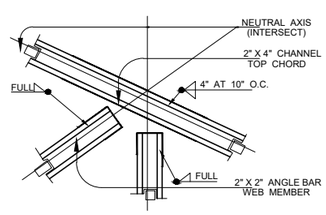
CEMENT MORTAR SHALL BE ONE (1) PART OF PORTYLAND CEMENT AND TWO (2) PARTS OF SAND BY VOLUME BUT NOT MORE THAN ONE (1) PART PORTLAND CEMENT AND THREE (3) PARTS OF SAND BY VOLUME MATERIAL.

REINFORCED CONCRETE:

THE CONTRACTOR SHALL FURNISH ALL LABOR AND MATERIALS TO COMPLETE CONCRETE WORKS INDICATED AS SPECIFIED HEREIN, OR BOTH. COOPERATE WITH OTHER TRADES REGARDING THE INSTALLATION OF EMBEDDED ITEMS. PORTLAND CEMENT SHALL BE USED AND SHALL CONFORM TO THE "SPECIFICATIONS FOR PORTLAND CEMENT" (ASTM C1 50 LATEST REVISION) FOR TYPE 1 PORTLAND CEMENT.



BOTTOM CHORD - WEB MEMBER CONNECTION



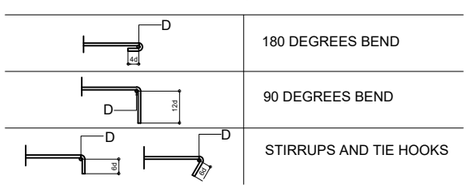
TOP CHORD - WEB MEMBER CONNECTION

REINFORCING BAR BENDING SPECIFICATION

MINIMUM BEND DIAMETER

BAR DIAMETER	MIN. INSIDE DIAMETER
d≤25	6d
25≤d≤35	8d
d>35	10d
d-16 USED FOR STIRRUPS TIE	10d

STANDARD HOOKS
d= NOMINAL DIAMETER OF BAR



GENERAL STRUCTURAL SPECIFICATIONS & STRUCTURAL NOTES

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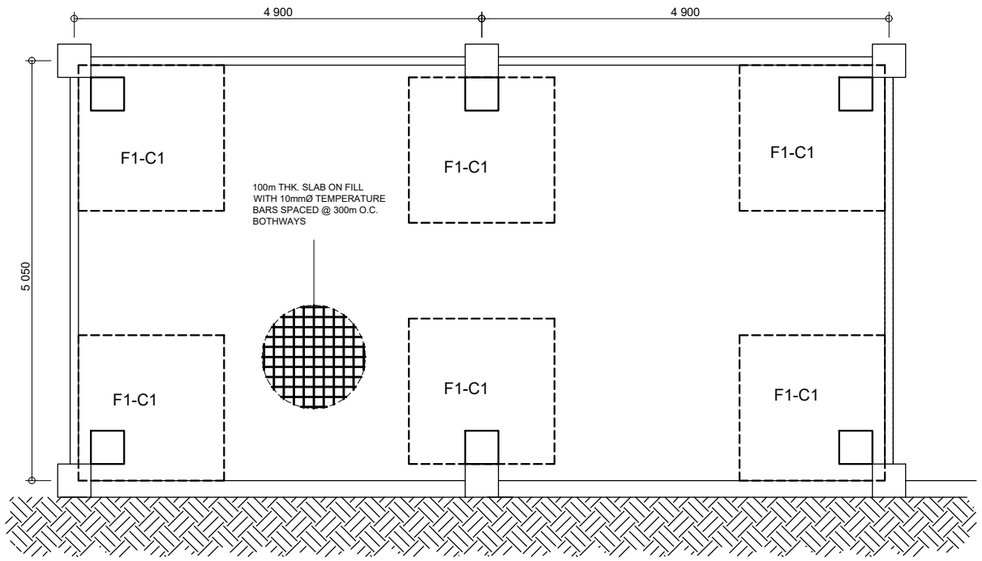
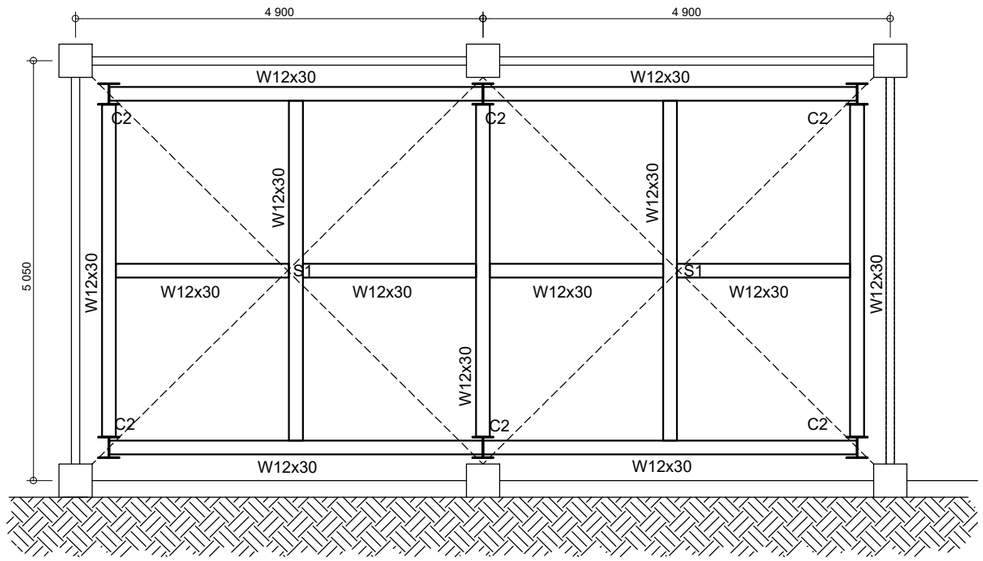
S | 1 / 4

A3 SIZE



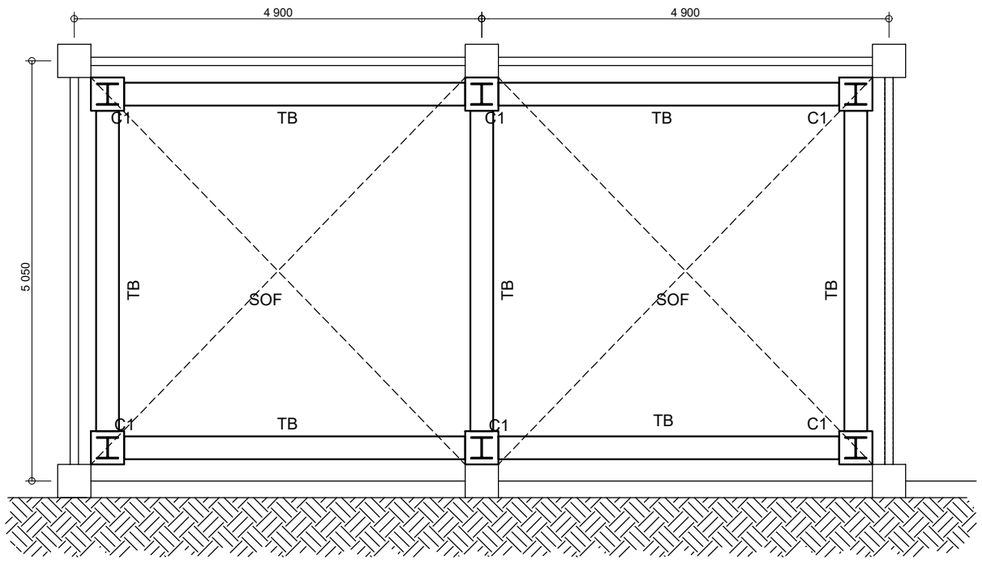
2 / A 1a FOUNDATION PLAN

SACLE: 1 : 40 M



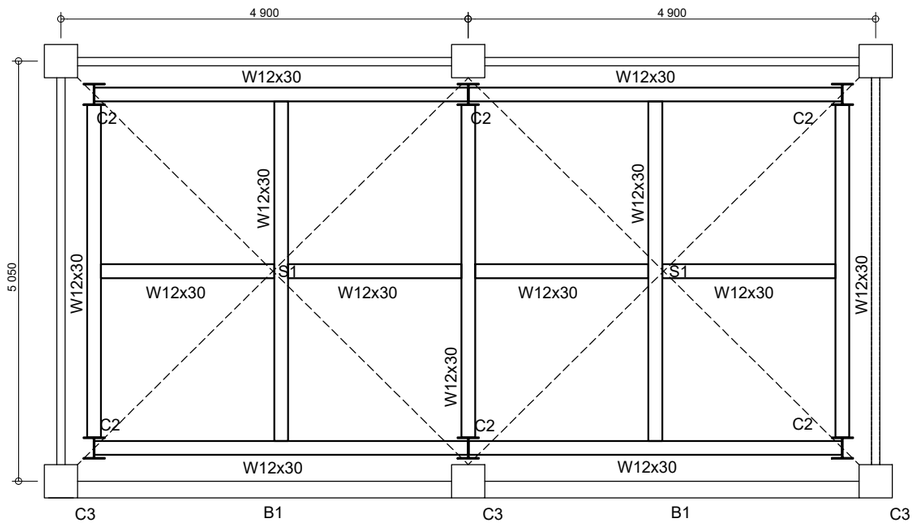
2 / A 1a GROUND FLOOR FRAMING PLAN

SACLE: 1 : 40 M



2 / A 1a UPPER BASEMENT FRAMING PLAN

SACLE: 1 : 40 M



2 / A 1a SECOND FLOOR FRAMING PLAN

SACLE: 1 : 40 M

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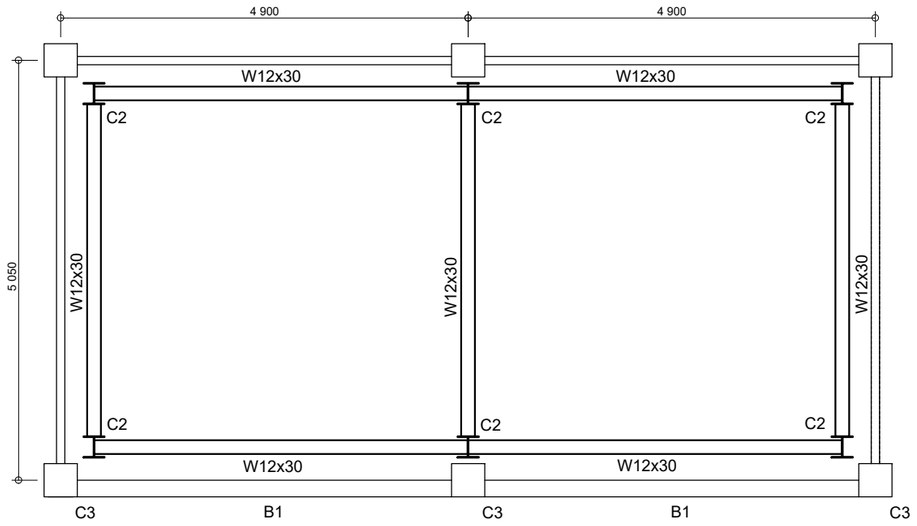
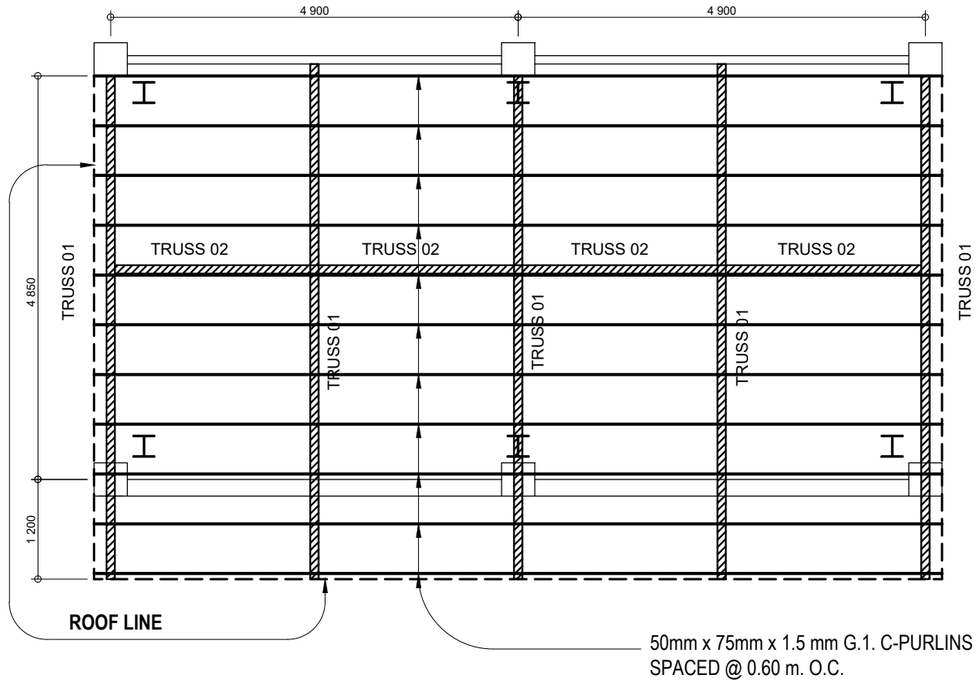


2 / A|1a ROOF DECK FRAMING PLAN

SACLE: 1 : 40 M



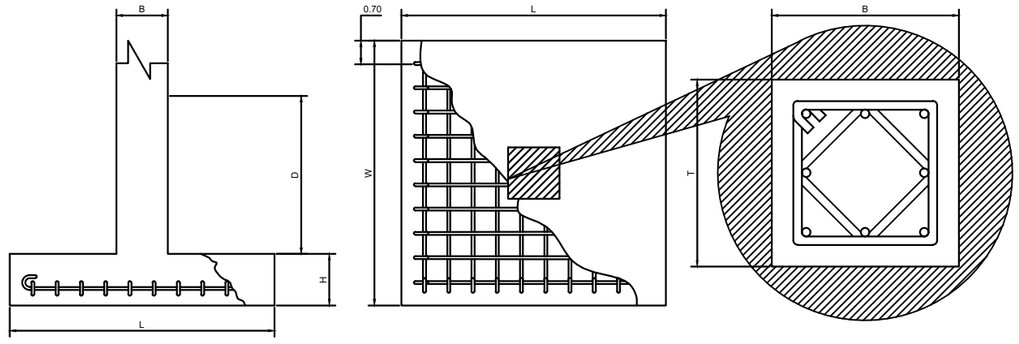
2 / A|1a ROOF FRAMING PLAN

SACLE: 1 : 40 M

FOOTING SCHEDULE

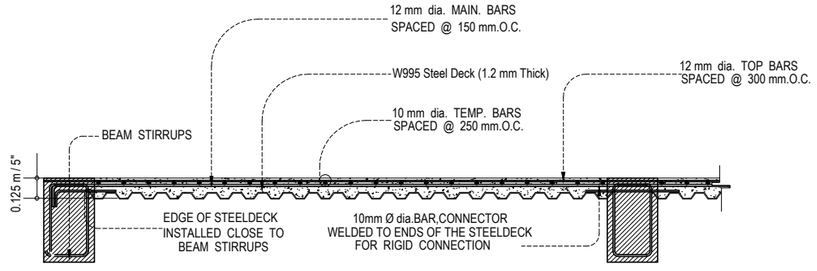
DESIGNATION	SIZE (MM.)				REINFORCEMENT	DESCRIPTION
	W	L	D	H		
F–1	1750	1750	2000	320	8 D20 MM. DIA. RSB BOTHWAYS	ISOLATED FOOTING SQUARE FOOTING

FOOTING SCHEDULE

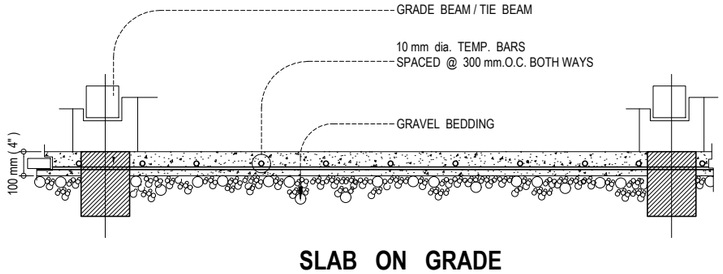


2 / A|1a SCHEDULE AND DETAIL OF FOOTING

SACLE: NTS



REINFORCED CONCRETE SLAB W/ STEEL DECKING



SLAB ON GRADE

2 / A|1a SLAB DETAILS

SACLE: NTS

DEPARTMENT OF SOCIAL WELFARE AND DEVELOPMENT - CAR

AD BGMS-004| REV 00

PROJECT NAME :

IMPROVEMENT OF AN EXISTING OFFICE INTO REGIONAL OPERATIONS CENTER

LOCATION :

#40 NORTH DRIVE, BAGUIO CITY

SHEET CONTENT :

AS SHOWN

APPROVED BY

ARNEL B. GARCIA, CESO II
Regional Director

CONFORMED BY

ENRIQUE H. GASCON JR.
OIC-Assistant Regional Director for Administration

CHECKED BY

RINA CLAIRE L. REYES
OIC Chief, Administrative Division

PREPARED BY

JOHN PHILLIP J. LAMSIS
ENGINEER - BGMS

PROJECT/TA No:

DATE SUBMITTED:

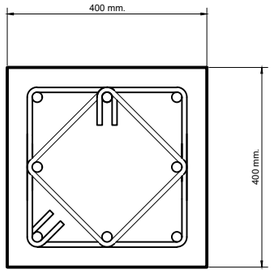
DRAWING STATUS

DATE	DESCRIPTION/REMARKS	BY

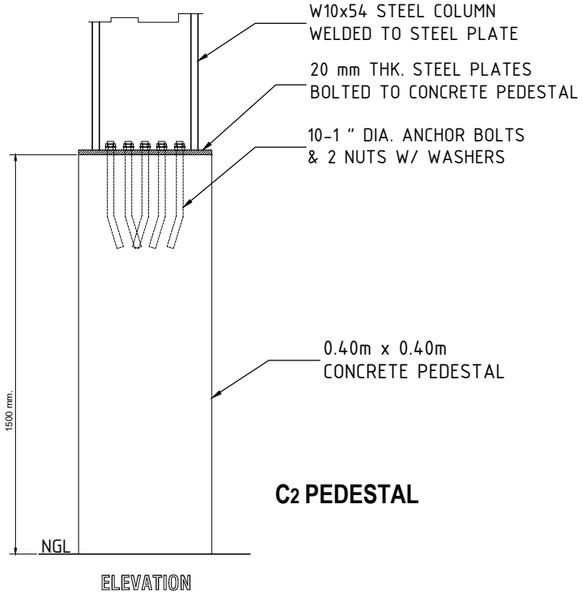
SHEET NUMBER: S 3 / 4

A3 SIZE

8 pcs - 20 mm Ø Main Bars with 10 mm Ø Lateral Ties and Inner Ties spaced @ 125 mm. O.C.



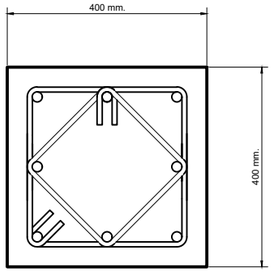
C1 DETAILS



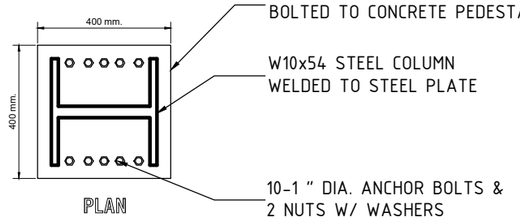
ELEVATION

C2 PEDESTAL

8 pcs - 20 mm Ø Main Bars with 10 mm Ø Lateral Ties and Inner Ties spaced @ 125 mm. O.C.



C3 DETAILS



PLAN

C2 DETAILS

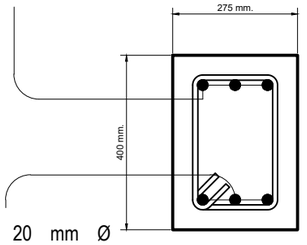
2 / A | 1a — SCHEDULE AND DETAIL OF COLUMN

SACLE: NTS

3 pcs - 20 mm Ø Continuous Top Bars

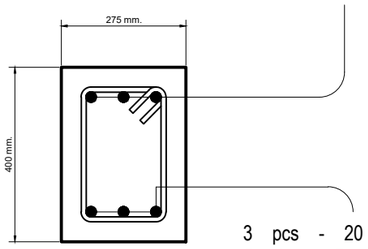
10 mm Ø Stirrups spaced @ 1 pc - 50 mm, 4 pcs - 75 mm, 5 pcs - 100 mm and 150 mm at rest

3 pcs - 20 mm Ø Continuous Top Bars



3 pcs - 20 mm Ø Continuous Bottom Bars

@ Sup.



@ Mid.

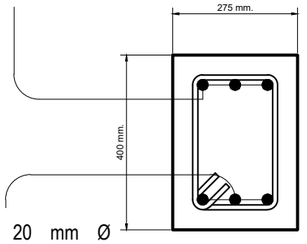
3 pcs - 20 mm Ø Continuous Bottom Bars

TB DETAILS

3 pcs - 20 mm Ø Continuous Top Bars

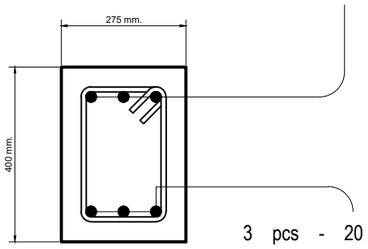
10 mm Ø Stirrups spaced @ 1 pc - 50 mm, 4 pcs - 75 mm, 5 pcs - 100 mm and 150 mm at rest

3 pcs - 20 mm Ø Continuous Top Bars



3 pcs - 20 mm Ø Continuous Bottom Bars

@ Sup.



@ Mid.

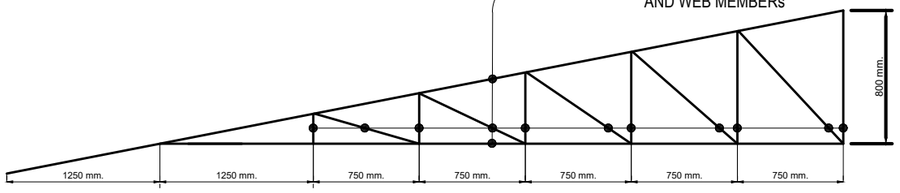
3 pcs - 20 mm Ø Continuous Bottom Bars

B1 DETAILS

2 / A | 1a — BEAM DETAIL

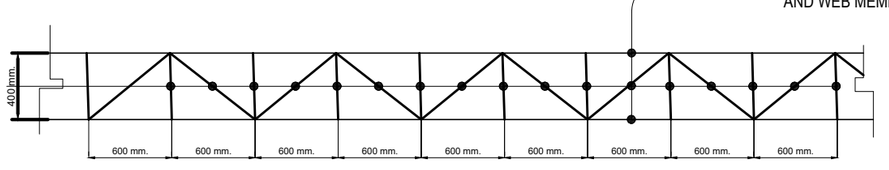
SACLE: NTS

50mm x 50mm x 6mm ANGLE BAR
TOP & BOTTOM CHORDS
AND WEB MEMBERs



TRUSS 01 DETAILS

50mm x 50mm x 6mm ANGLE BAR
TOP & BOTTOM CHORDS
AND WEB MEMBERs



TRUSS 02 DETAILS

2 / A | 1a — TRUSS DETAILS

SACLE: NTS

DEPARTMENT OF SOCIAL WELFARE AND DEVELOPMENT - CAR

AD BGMS-004| REV 00

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SHEET CONTENT :

AS SHOWN

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Regional Director

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JOHN PHILLIP J. LAMSIS
ENGINEER - BGMS

PROJECT/TA No:

DATE SUBMITTED:

DRAWING STATUS

DATE	DESCRIPTION/REMARKS	BY

SHEET NUMBER: S 4 / 4

A3 SIZE

1. ALL PLUMBING WORKS INCLUDED HEREIN SHALL BE EXECUTED IN ACCORDANCE TO THE REQUIREMENTS OF THE PHILIPPINE PLUMBING CODE.
2. COORDINATE THE DRAWING WITH OTHER RELATED DRAWINGS AND SPECIFICATIONS. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCY FOUND THEREIN.
3. THE PLUMBING LAYOUT IS ONLY DIAGRAMMATIC. PIPES CLEANOUTS AND CHECK VALVES SHALL BE CONCEALED.
4. ALL SLOPE OF HORIZONTAL BRANCHES (SEWER) MAINTAIN 1% A MINIMUM, UNLESS NOTED OTHERWISE.
5. AIR CHAMBER : ALL INDIVIDUAL BRANCHES TO FIXTURE OR GROUP OF FIXTURES AND/OR EQUIPMENT SHALL BE PROVIDED WITH AIR CHAMBER OF CAPPED VERTICAL PIPE EXTENSION OF DIMENSION AS SHOWN IN THE DETAIL.
6. ALL FLOOR DRAIN SHALL BE VENTED INDIVIDUALLY.
7. ALL CLEANOUTS SHALL BE FLUSH-MOUNTED TO WALL. DO NOT INSTALL FLOOR CLEANOUT EXCEPT AT LINES ON GRADE & SERVICE AREAS NOT SUBJECTED TO TRAFFIC.
8. ALL BRANCHES OF FIXTURE OR GROUP OF FIXTURES SHALL BE PROVIDED WITH AIR CHAMBER MADE OF CAPPED VERTICAL EXTENSION PIPE.
9. ALL UNDERGROUND GALVANIZED IRON (G.I.) INDIRECT CONTACT WITH SOIL SHALL BE PROVIDED WITH TWO(2) COATS OF TAR COVERING IN WRAPPED WITH JUTE CLOTH.
10. ALL PVC PIPE SHALL BE OF APPROVED QUALITY AND POLYPROPYLENE PIPES FOR WATER DISTRIBUTION SHALL BE TYPE 20
11. ALL PLUMBING WORKS THEREIN, SHALL BE UNDER THE DIRECT SUPERVISION OF A TRGISTERED MASTER PLUMBER AND OR A DULY LICENSED SANITARY ENGINEER.
12. WATER METER SHOULD BE LOCATED OUTSIDE THE PROPERTY LINE.
13. WATER SUPPLY FOR CISTERN AND SUPPLY LINE TO THE BUILDING MUST BE LOCATED ALONG PERIMETER FENCE 400m. HEIGHT ABOVE DRIVEWAY LEVEL WITH 3 LAYERS OF JUTE SACK AND BLACK COAL TAR.
14. WATER LINE LAYOUT FOR WASHROOM TO SUPPLY UNITS.
15. ALL WATER LINE SUPPLY FOR WASHROOMS SHALL NOT BE EMBEDDED IN SLAB, BLOCKS OUT SHALL BE PROVIDED FOR POSSIBLE DIRECTION OF PIPES.
16. ALL FINAL LOCATION OF TOILET FIXTURES SHALL BE BASED ON THE MODULAR SETTING OF TILES.
17. DOUBLE DRAINS FOR BATH TUBS.
18. DOWEL FOR DOWNSPOUTS AND REINFORCEMENT 100mm DIA. @ 600mm STAGGERED
19. PVC CEMENT FOR JOINTS WITH EPOXY OUTSIDE BONDING.
20. RISER SHOULD NOT CROSS MASTER'S BEDROOM OR OTHER MAIN AREAS.
21. GI. PIPE SHOULD BE PAINTED WITH RED LEAD OR BLACK COALTAR, IT SHOULD NOT BE EMBEDDED ON SLAB, SLEEVING OF PIPE IS REQUIRED ON BEAM. FOLLOW WATER LINE LAYOUT AS PER PLAN.

VENT & DOWNSPOUT
- 50 TO 150mm DIA. SHALL BE POLYVINYL CHLORIDE (PVC) PIPE

DRAINAGE LINE
- 50 TO 150mm DIA. SHALL BE POLYVINYL (PVC) PIPE. SERIES 1000. MANUFACTURED ACCORDING TO ASTM 2729

SEWER LINE
- 20 TO 150mm DIA. SHALL BE POLYVINYL CHLORIDE (PVC) PIPE. SDR- 35 MANUFACTURED ACCORDING TO ASTM 3034

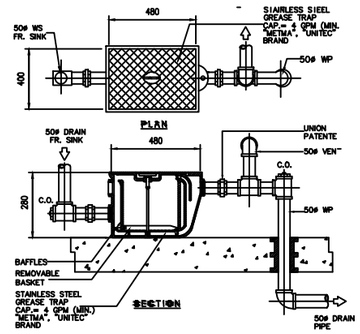
WATER LINE
- SHALL BE POLYPROPYLENE PIPES (PN20) "BOR PLUS", "UNITEC", OR "VESBO"

PIPE DIAMETER - ALL PIPE DIAMETERS INDICATED IN THE DRAWINGS ARE INSIDE DIAMETERS.

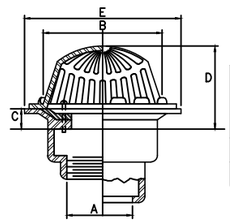
1 / P 1 GENERAL NOTES
SACLE: NTS

GV	GATE VALVE
M	WATER METER
CV	CHECK VALVE
———	WATER LINE
———	SOIL PIPE
———	WASTE PIPE
=:=:=:=:=	DRAINAGE PIPE
WP	WATER PIPE
HB	HOSE BIBB
KS	KITCHEN SINK
WC	WATER CLOSET
HVP	HORIZONTAL VENT PIPE
VTW	VENT THRU WALL
V WP	VERTICAL WASTE PIPE
VP	VENT PIPE
CO	CLEAN OUT
SP	SOIL PIPE
DP	DOWN SPOUT/ ROOF DRAIN
FD	FLOOR DRAIN
SFD	SHOWER FLOOR DRAIN
SH	SHOWER HEAD
CB	CATCH BASIN
SV	SEPTIC VAULT
GT	GREASE TRAP
L	LAVATORY
CT	CISTERN TANK
ST	SUMP TANK

2 / P 1 LEGEND & SYMBOLS
SACLE: NTS

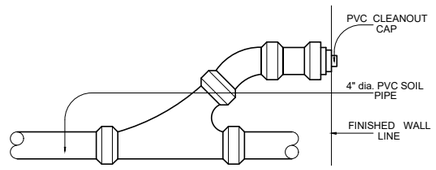


GREASE TRAP DETAIL
SCALE NTS

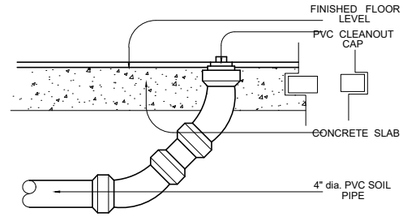


PIPE SIZE A(mm)	DIMENSION (MM) B	C	D	E	REMARKS TEXT
50	81	12.7	35	65	SIMILAR TO METMA MODEL M-319-56A OR APPROVED EQUAL
75	67	15.8	54	90	-DO-
100	84	12.7	64	108	-DO-

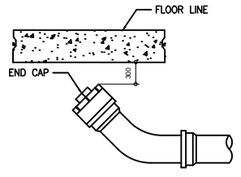
ROOF / DECK DRAIN DETAIL
SCALE NTS



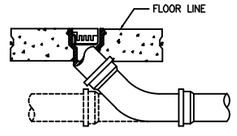
CLEANOUT AT WALL
SCALE NTS



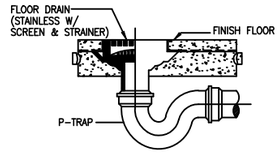
CLEANOUT AT GRADE
SCALE NTS



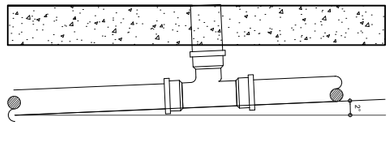
FLOOR CLEANOUT UNDER SLAB DETAIL
SCALE NTS



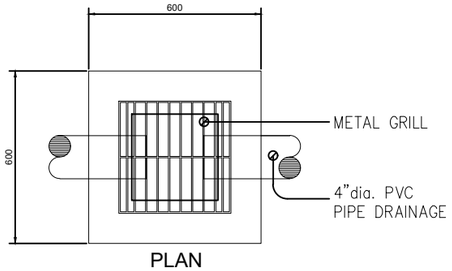
FLOOR CLEANOUT DETAIL
SCALE NTS



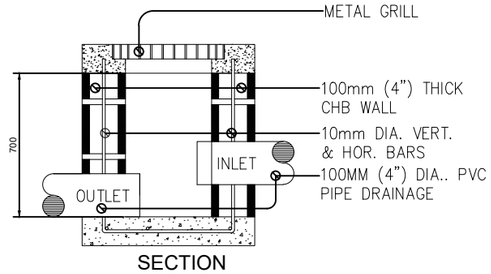
FLOOR DRAIN MOUNTING DETAIL
SCALE NTS



PITCH OF PIPE LINE
SCALE NTS



PLAN



SECTION

CATCH BASIN DETAIL
SCALE NTS

3 / P 1 PLUMBING DETAILS
SACLE: NTS

DEPARTMENT OF SOCIAL WELFARE AND DEVELOPMENT - CAR

AD BGMS-004| REV 00

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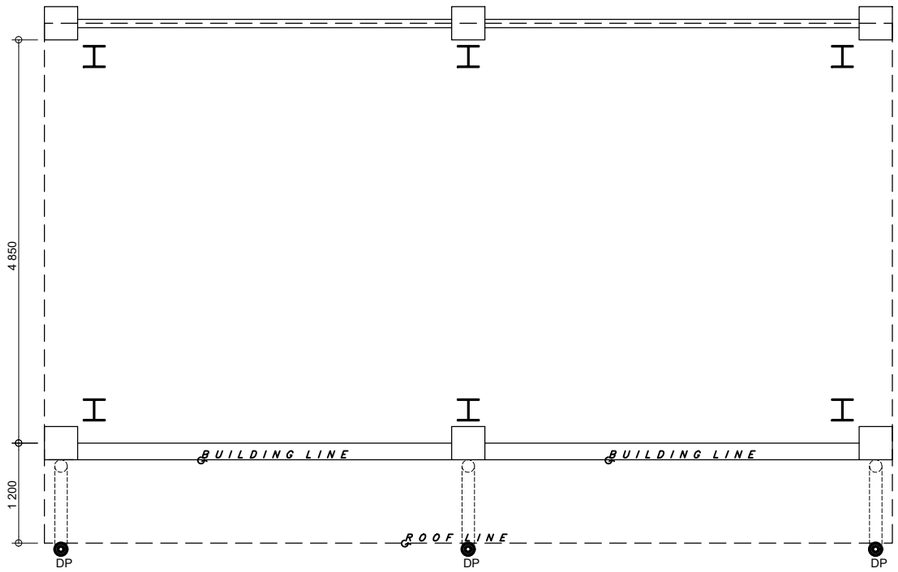
DRAWING STATUS

DATE	DESCRIPTION/REMARKS	BY

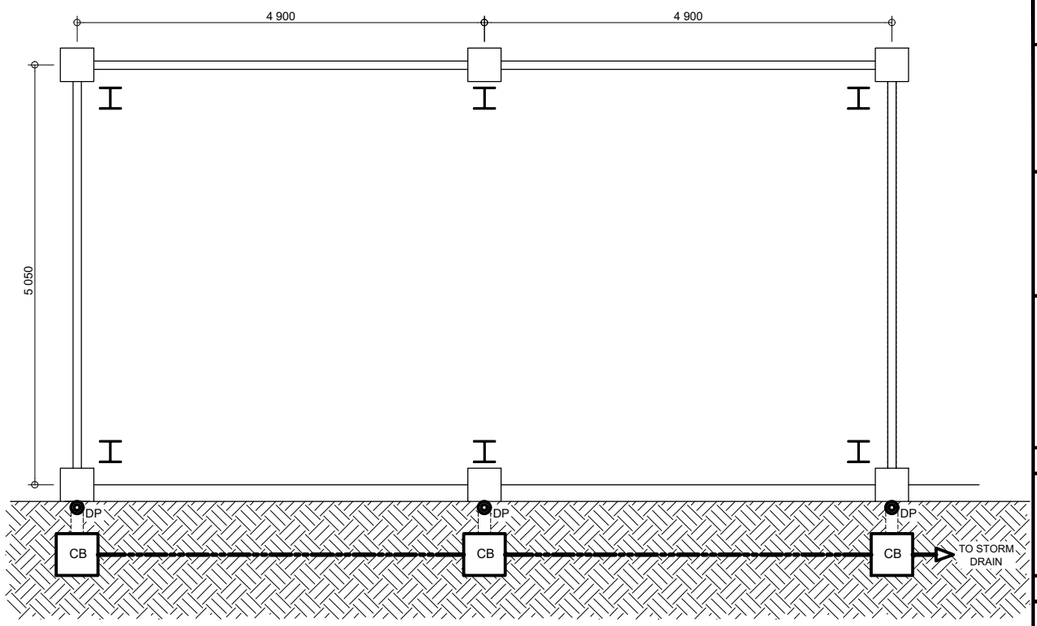
SHEET NUMBER P 1 / 2

A3 SIZE



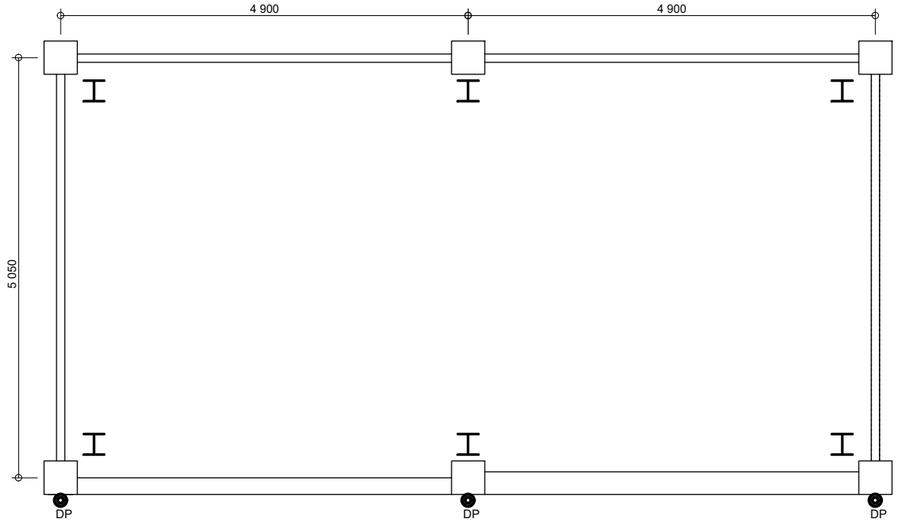
1 / P 2 ROOF STORM DRAIN LAYOUT

SACLE: 1 : 40 M



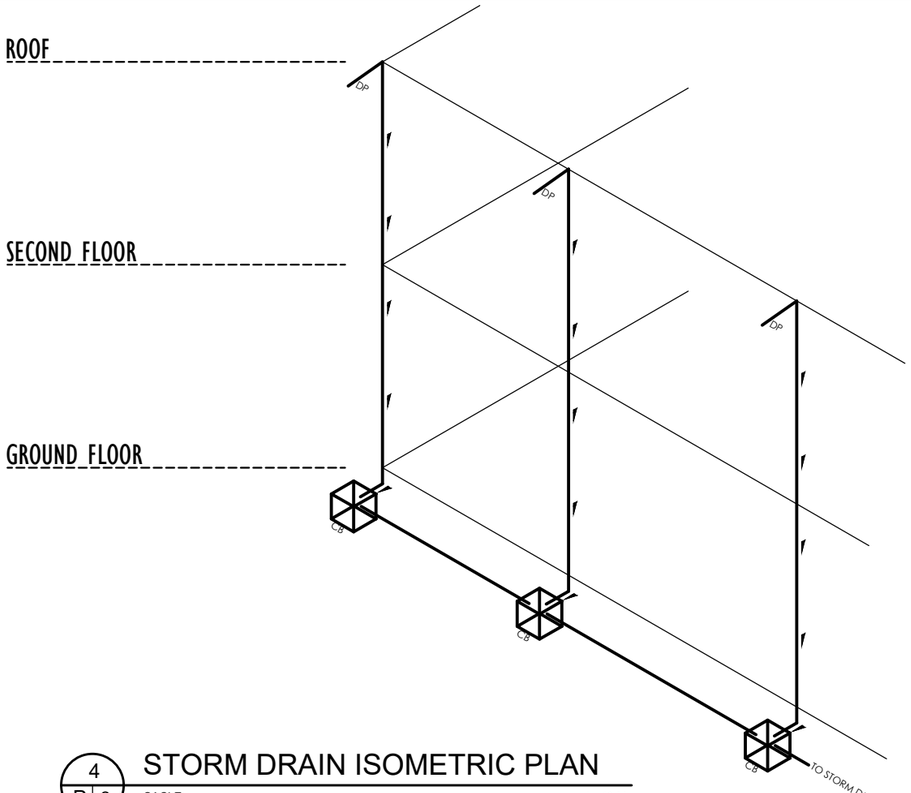
3 / P 2 GROUND FLOOR STORM DRAIN LAYOUT

SACLE: 1 : 40 M



2 / P 2 SECOND FLOOR STORM DRAIN LAYOUT

SACLE: 1 : 40 M



4 / P 2 STORM DRAIN ISOMETRIC PLAN

SACLE: 1 : 40 M

DEPARTMENT OF SOCIAL WELFARE AND DEVELOPMENT - CAR

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DRAWING STATUS

DATE	DESCRIPTION/REMARKS	BY

SHEET NUMBER

P 2 / 2

A3 SIZE

1. ALL ELECTRICAL WORKS AND INSTALLATIONS HEREIN SHALL BE DONE IN ACCORDANCE WITH THE PROVISIONS OF THE LATEST APPROVED EDITION OF PHILIPPINE ELECTRICAL CODE, WITH THE RULES AND REGULATIONS OF THE NATIONAL AND LOCAL AUTHORITIES CONCERNED IN THE ENFORCEMENT OF ELECTRICAL LAWS AND ORDINANCES AND WITH THE RULES AND REGULATIONS OF THE UTILITY COOPERATIVE CONCERNED.
2. POWER SERVICE TO THE BUILDING SHALL BE 230V, 3 PHASE, 4 WIRE, 60 HERTZ SYSTEM.
3. WIRING METHOD SHALL BE AS INDICATED IN THE SPECIFICATION.
4. UNLESS OTHERWISE SPECIFIED IN THE PLAN, MINIMUM SIZE OF WIRES AND CONDUITS SHALL BE # 3.5 mm THWN AND 13mm NOMINAL DIAMETER RESPECTIVELY. WIRES SHALL BE INSULATED FOR RATING SUITED FOR THE EQUIPMENT SERVED.
5. GENERAL USE RECEPTACLES SHALL BE RATED 10 AMPERES, 2 POLE, 250 VOLTS, GROUNDING TYPE WITH PARALLEL SLOTS, SPECIAL PURPOSE OUTLET SHALL BE THE TYPE RATING SUITED FOR THE EQUIPMENT SERVED
6. ALL ACCESSORIES, SPLICING DEVICES, TERMINATIONS AND OTHER APPURTENANCES FOR THE ENTIRE INSTALLATIONS SHALL BE OF THE APPROVED TYPE FOR BOTH LOCATION AND PURPOSE INTENDED.
7. ALL ELECTRICAL EQUIPMENT SHALL PROPERLY GROUNDED IN ACCORDANCE WITH THE REQUIREMENT OF THE LATEST EDITION OF THE PHILIPPINE ELECTRICAL CODE.
8. ALL MATERIALS TO BE USED SHALL BE NEW AND OF THE APPROVED TYPE FOR BOTH LOCATION AND EQUIPMENT SERVED.
9. OUTLET BOXES SHALL BE FABRICATED FROM 1.5 mm THK. GALVANIZED IRON SHEET OR PVC BOXES EQUIVALENT AS FOLLOWS:
   a. CEILING LIGHT OUTLETS 40mm DEEP, 100mm OCTAGONAL BOX FOR 1 OR 2 RACEWAY ENTRIES, 55mm DEEP, 100mm OCTAGONAL BOX FOR 3 OR MORE RACEWAY ENTRIES
   b. LIGHT CONTROL SWITCH 40mm DEEP, 50mm X 100mm DEEP UTILITY BOX FOR 1 OR 2 RACEWAY ENTRIES IN ONE STRAP, 55mm DEEP, 50mm X 100mm UTILITY BOX FOR 3 SWITHCHES IN ONE STRAP.
   c. CONVENIENCE OUTLETS - 55mm DEEP UTILITY BOX
   d. TELEPHONE AND TV OUTLETS - 55mm DEEP UTILITY BOX
10. MCC - MOTOR CONTROL CENTER SHOULD BE UNITIZED PANEL FOR ALL440 VOLTS EQUIPMENT INCLUDING FIVE(5) INGLE PHASE WELDING MACHINES.
11. PVC CONDUITS SHALL BE EMBEDDED IN CONCRETE SLABS OR WALLS.
12. A REMOVABLE CIRCUIT DIRECTORY SHALL BE PROVIDED FOR EACH PANEL BOARDS FOR FIELD MARKINGS OF FUNCTION AND NUMBER OF EACH BRANCH CIRCUIT. ALL DIRECTORIES SHALL BE OF INCORRODIBLE MATERIALWITH MATCHING CLEAR PLASTIC HOLDER OR JACKET.
13. ALL ELECTRICAL CIRCUITS SHALL BE WIRED ACCORDING TO THE PANEL BOARD LOAD SCHEDULE.
14. ANY ALTERATION IN THE DESIGN HOWEVER MINOR SHALL BE REPORTED TO THE DESIGN ENGINEER FOR APPROVAL AND RECORDS.
15. ALL ELECTRICAL WORKS HEREIN SHALL BE DONE UNDER THE DIRECT SUPERVISION OF A DULY LICENSED ELECTRICAL ENGINEER.

A. SERVICES:

1. POWER SUPPLY COMING FROM THE EXISTING **ELECTRIC POWER DISTRIBUTION SYSTEM** SHALL BE THREE-PHASE,THREE-WIRE PLUS GROUND, 230V AC,60HZ.

B. POWER SYSTEMS:

1. UNLESS OTHERWISE INDICATED ON DRAWINGS, ALL MOTOR SHALL BE FURNISHED, SET UP AND SECURE IN PLACE BY OTHERS TRADES.
2. UNLESS OTHERWISE INDICATED ON DRAWINGS, THE ELECTRICAL CONTRACTOR SHALL DO ALL WIRING FOR POWER, INCLUDING THE CONNECTION UP TO THE MOTORS AND SUCH AS LINE SWITCHES, MOTOR STARTERS, SPEED REGULATORS, CIRCUIT BREAKERS, COMPENSATORS OR ANY OTHER APPLIANCES THAT MAY BE FURNISHED WITH THE MOTORS. HE SHALL ALSO HAVE THERE THE PRESENCE OF HIS REPRESENTATIVE WHEN THE MOTORS ARE FIRST STARTED BY THE TRADE FURNISHING IT IN ORDER TO DETERMINE IF CORRECTLY DONE.

C. POWER AND LIGHTING DISTRIBUTION SYSTEM:

1. FURNISHED AND INSTALL THE LIGHTING RECEPTACLES AND POWER PANELS AS INDICATED ON PLANS AND PANELBOARD SCHEDULES.
2. FROM THE MAIN BREAKER, INSTALL FEEDERS TO THE VARIOUS OUTLYING PANELS, MOTORS OR EQUIPMENT AS SHOWN ON THE PLANS. FEEDERS SHALL BE UNDERGROUND IN REINFORCED CONCRETE ENCASEMENT UNLESS OTHERWISE NOTED.

1/E1 GENERAL NOTES
SACLE: NTS

18W 300mm Ø SURFACE MOUNTED ROUND DOWNLIGHT ULTRA- THIN LED PANEL.

CEILING RECESSED TYPE DUST PROOF 3-T836W DAYLIGHT 2-T10/40W, 220V DAYLIGHT LIGHTING FIXTURE WITH DIFFUSER

18W (300mm X 300mm X 50mm) SURFACE MOUNTED SQUARE DOWNLIGHT ULTRA-THIN LED PANEL.

CIRCUIT HOMERUN

SWITCH LINE

LIGHTING LINE/ POWER LINE

PANEL BOX (PB1, PB2, MDP)

S_1 SINGLE POLE SWITCH

S_2 DUPLEX (2 SINGLE POLE SWITCHES IN ONE SWITCH PLATE

S_3 TRIPLEX (3 SINGLE POLE SWITCHES IN ONE SWITCH PLATE

S_{3W} THREE WAY SWITCH

EL EMERGENCY LAMP

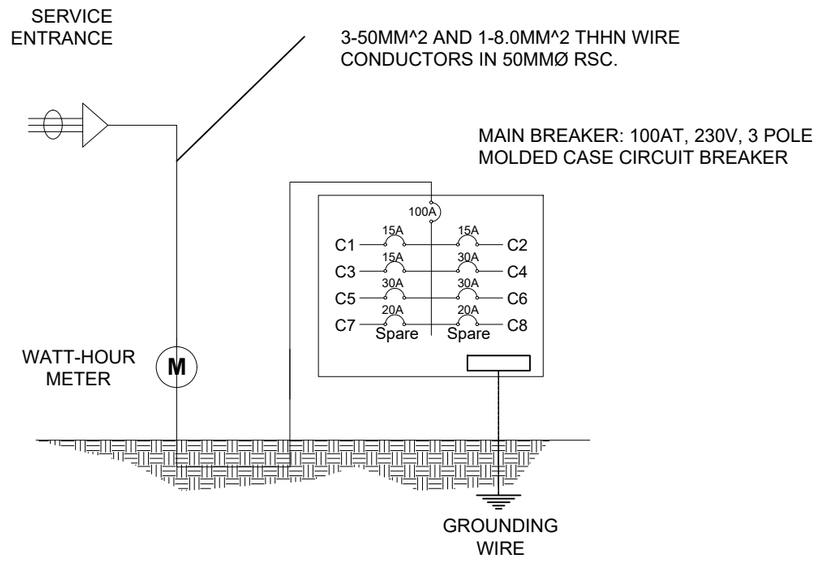
DUPLEX CONVENIENCE OUTLET

E.F. EXHAUST FAN OUTLET

WP WEATHERPROOF OUTLET

WH WATER HEATER-DUPLEX RECEPTACLE,FLUSH MOUNTED ON WALL

2/E1 LEGEND & SYMBOLS
SACLE: NTS



3/E1 SINGLE LINE DIAGRAM
SACLE: NTS

PANEL BOARD : PB 01

CIRCUIT NO.	LOAD DESCRIPTION	L.O.	SW	C.O.	COMPUTED TOTAL LOAD (VA)	VOLTS	AMPERES				PROTECTION			SIZE OF WIRE	CONDUIT SIZE
							AB	BC	CA	3PH	AT	AF	KAIC		
CKT. 1	LIGHTING OUTLETS	18	2		720	230	3.13				15 AT	50 A	10	2 - 3.5 mm^2 THHN CU. WIRE	20 mm dia. PVC
CKT. 2	LIGHTING OUTLETS	18	2		720	230	3.13				15 AT	50 A	10	2 - 3.5 mm^2 THHN CU. WIRE	20 mm dia. PVC
CKT. 3	LIGHTING OUTLETS	20	3		800	230	3.48				15 AT	50 A	10	2 - 3.5 mm^2 THHN CU. WIRE + 5.5MM^2 THHN CU. WIRE	20 mm dia. PVC
CKT. 4	CONVENIENCE OUTLETS			5	900	230	3.91				30 AT	50 A	10	2 - 3.5 mm^2 THHN CU. WIRE + 5.5MM^2 THHN CU. WIRE	20 mm dia. PVC
CKT. 5	CONVENIENCE OUTLETS			9	1620	230	7.04				30 AT	50 A	10	2 - 3.5 mm^2 THHN CU. WIRE + 5.5MM^2 THHN CU. WIRE	20 mm dia. PVC
CKT. 6	CONVENIENCE OUTLETS			12	2160	230	9.39				30 AT	50 A	10	2 - 3.5 mm^2 THHN CU. WIRE + 3.5MM^2 THHN CU. WIRE	20 mm dia. PVC
CKT. 7	SPARE				1000	230	4.35				20 AT	50 A	10	2 - 3.5 mm^2 THHN CU. WIRE + 3.5MM^2 THHN CU. WIRE	20 mm dia. PVC
CKT. 8	SPARE				1000	230	4.35				20 AT	50 A	10	2 - 3.5 mm^2 THHN CU. WIRE + 3.5MM^2 THHN CU. WIRE	20 mm dia. PVC
	T O T A L	**56**	**7**	**26**	**8 920**		**38.78**								

I_{TOTAL}= (38.78) (0.85 DF) = 32.96 A
PROTECTION: 100AT,230V, 1Ø, 3 POLE,10KAIC,100AF,MCB, BOLT ON TYPE IN NEMA 1 ENCLOSURE.
FEEDER: 2 - 50.0MM^2 THHN CU. WIRE + 1 - 8.0 MM^2 THHN CU WIRE IN 40MM Ø RSC

4/E1 LOAD SCHEDULE & COMPUTATION
SACLE: NTS

DEPARTMENT OF SOCIAL WELFARE AND DEVELOPMENT - CAR

AD BGMS-004| REV 00

PROJECT NAME :
IMPROVEMENT OF AN EXISTING OFFICE INTO REGIONAL OPERATIONS CENTER

LOCATION :
#40 NORTH DRIVE, BAGUIO CITY

SHEET CONTENT :
AS SHOWN

APPROVED BY
ARNEL B. GARCIA, CESO II
Regional Director

CONFORMED BY
ENRIQUE H. GASCON JR.
OIC-Assistant Regional Director for Administration

CHECKED BY
RINA CLAIRE L. REYES
OIC Chief, Administrative Division

PREPARED BY
JOHN PHILLIP J. LAMSIS
ENGINEER - BGMS

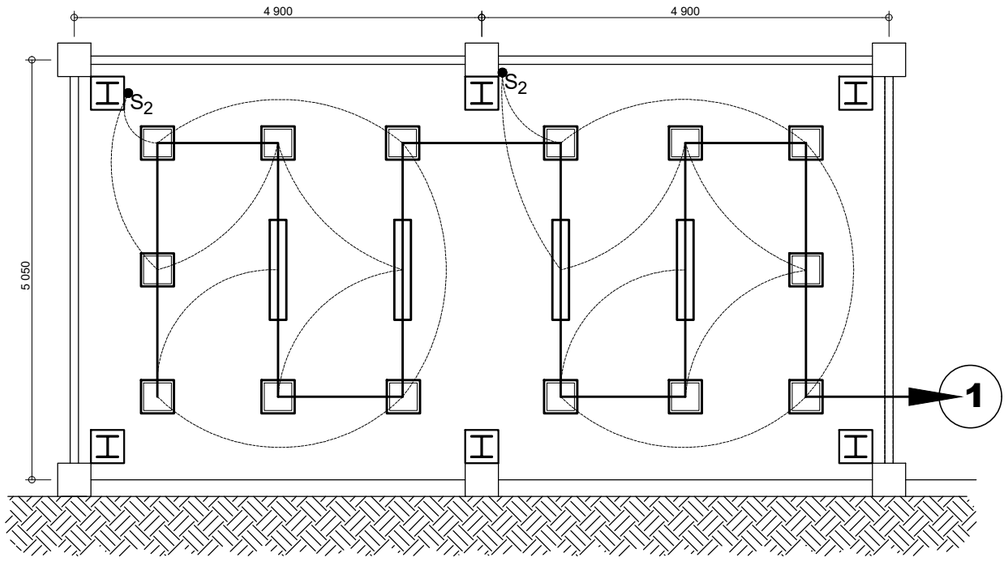
PROJECT/TA No:

DATE SUBMITTED:

DRAWING STATUS

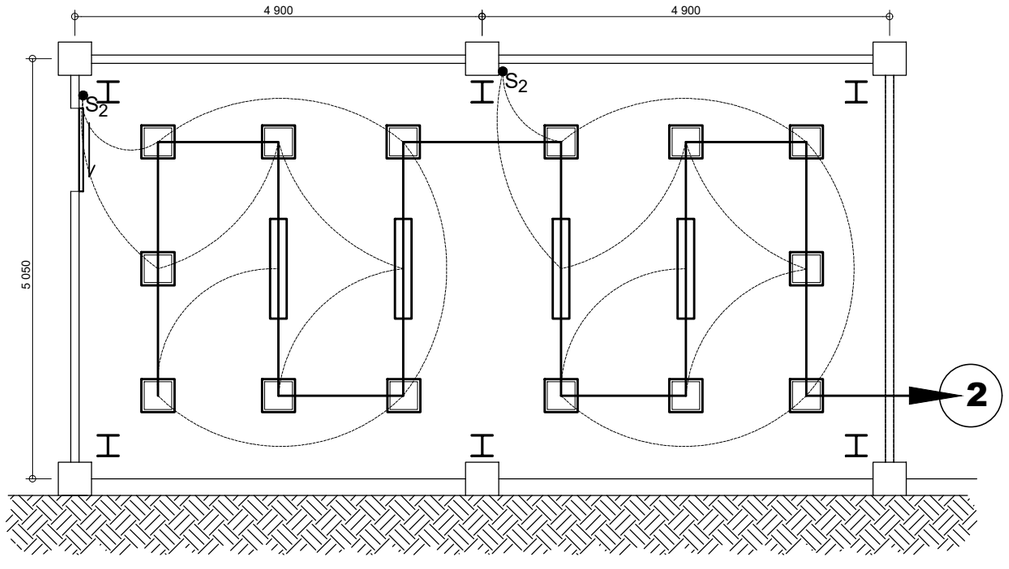
DATE	DESCRIPTION/REMARKS	BY

SHEET NUMBER
E 1 / 3
A3 SIZE



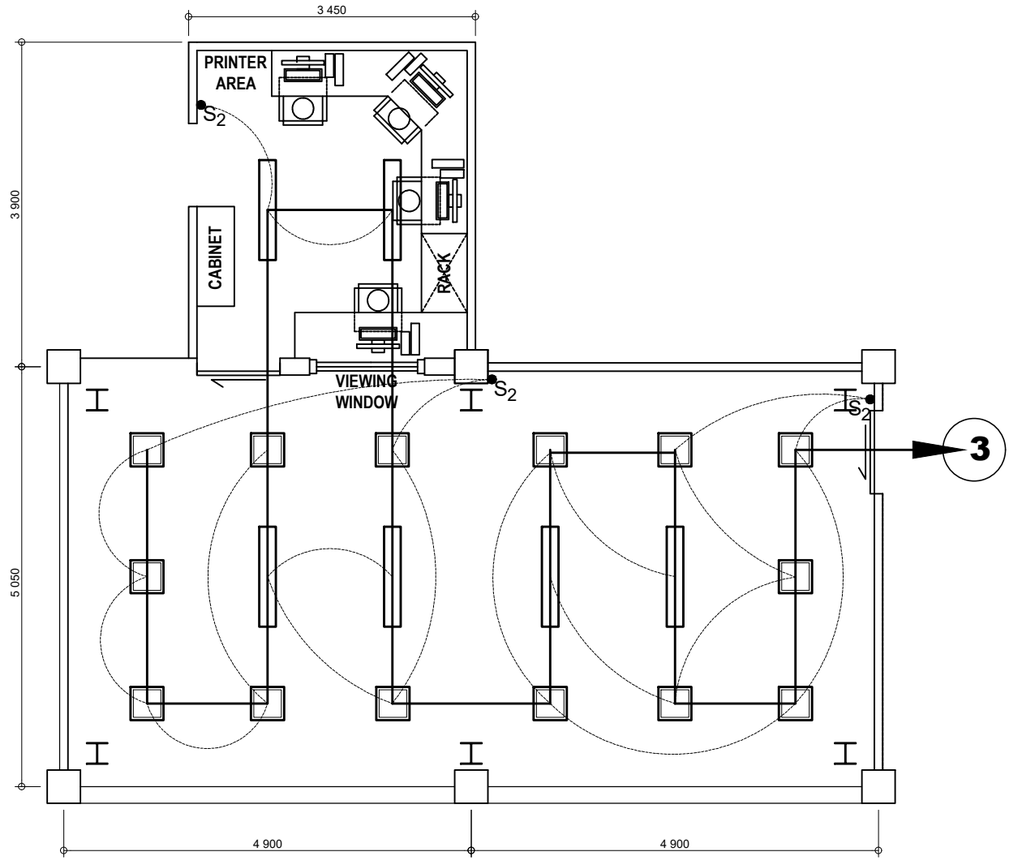
1 / E 2 UPPER BASEMENT LIGHTING LAYOUT

SACLE: 1 : 40 M



2 / E 2 GROUND FLOOR LIGHTING LAYOUT

SACLE: 1 : 40 M



3 / E 2 GROUND FLOOR STORM DRAIN LAYOUT

SACLE: 1 : 40 M

DEPARTMENT OF SOCIAL WELFARE AND DEVELOPMENT - CAR

AD BGMS-004| REV 00

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ENGINEER - BGMS

PROJECT/TA No:

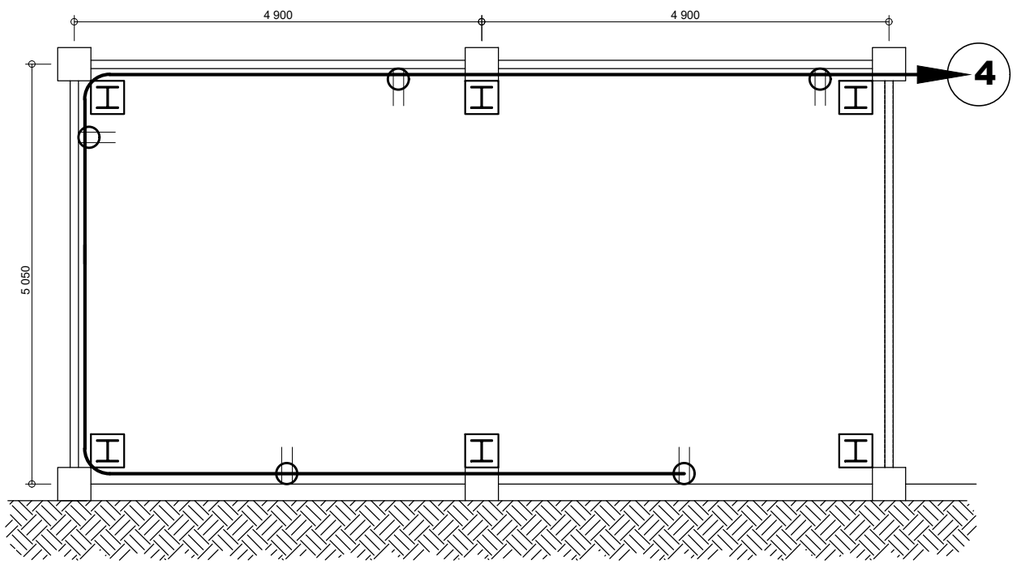
DATE SUBMITTED:

DRAWING STATUS

DATE	DESCRIPTION/REMARKS	BY

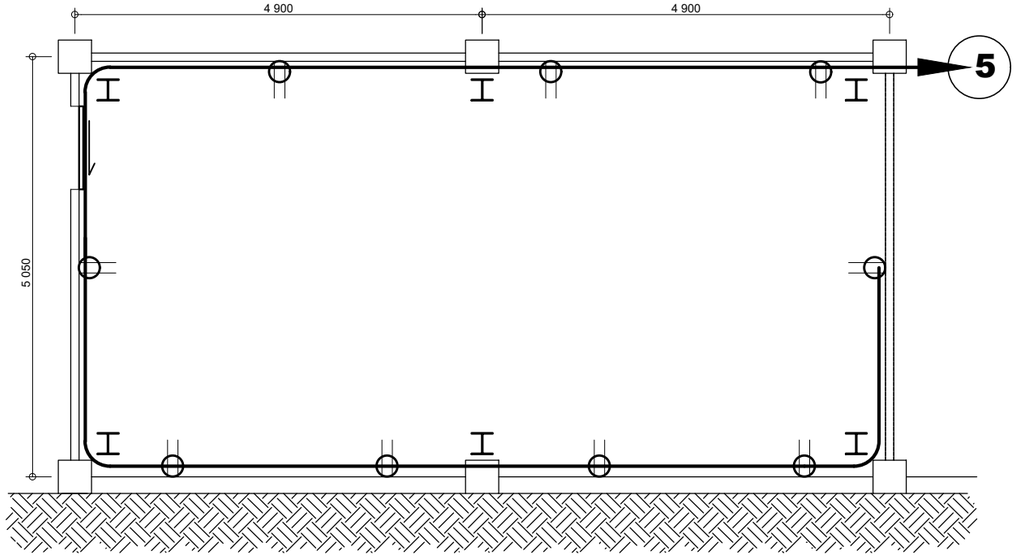
SHEET NUMBER E 2 / 3

A3 SIZE



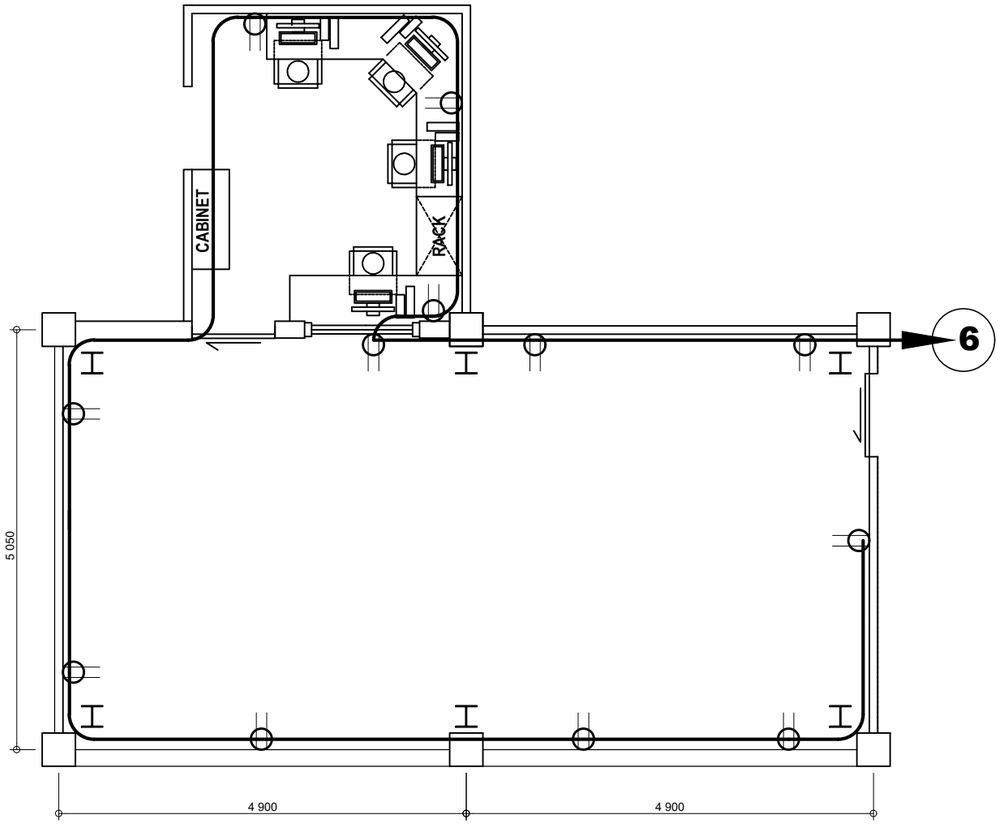
1 / E 3 UPPER BASEMENT POWER LAYOUT

SACLE: 1 : 40 M



2 / E 3 GROUND FLOOR POWER LAYOUT

SACLE: 1 : 40 M



3 / E 3 GROUND FLOOR STORM DRAIN LAYOUT

SACLE: 1 : 40 M

DEPARTMENT OF SOCIAL WELFARE AND DEVELOPMENT - CAR

AD BGMS-004| REV 00

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ENGINEER - BGMS

PROJECT/TA No:

DATE SUBMITTED:

DRAWING STATUS

DATE	DESCRIPTION/REMARKS	BY

SHEET NUMBER: E 3 / 3

A3 SIZE

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF SOCIAL WELFARE AND DEVELOPMENT
Cordillera Administrative Region
#40 North Drive, Baguio City

GENERAL SPECIFICATIONS

IMPROVEMENT OF AN EXISTING OFFICE INTO REGIONAL OPERATIONS CENTER

#40 NORTH DRIVE, BAGUIO CITY

Prepared by:

JOHN PHILLIP J. LAMSIS
Engineer III-BGMS

General Conditions

GC – 1. DEFINITIONS

i. The term "Owner" as used in these Specifications means the administration of the Department of Social Welfare and Development – Cordillera Administrative Region. (DSWD-CAR)

ii. The term "Construction Architect/Engineer" shall mean the person executing the contract on behalf of the Owner for the construction of the project and the said Construction Architect/Engineer's duly authorized assistants or representatives.

iii. The term "Contractor" means the entity that will provide all labor, materials, equipment, and perform all the work necessary for the completion of the project in accordance with the plans and specifications.

iv. The term "Consultants" means the designer and planner of the owner.

v. The term "Completion of Contract" shall mean full performance by the contractor of the contractor's obligations under the contract and all amendments and revisions thereof except the contractor's obligation concerning (1) release of liens and certificate of contractor, (2) other final documents. The term "completion" or "completion of the project" shall mean the contract and all amendments and revision thereof. The Certificate of Completion, signed by the Construction Architect/ Engineer and approved in writing by the Owner shall be the sole and conclusive evidence as to the date of completion.

vi. The term "default" used herein shall include any such failure by the contractor to make progress in the prosecution of work so as to endanger the completion of the project within the calendar days allotted.

vii. Wherever in the specifications or upon the drawings the words "directed", "required", "ordered", "designated", "prescribed", or words of like import are used, it shall be understood that the direction, requirement, designation, or prescription, of the Construction Architect/Engineer is intended; and similarly, the words "approved", "acceptable to", or satisfactory to" of the Designer unless otherwise expressly stated.

viii. Where "as shown", "as indicated", "as detailed", or words of similar import are used, it shall be understood that the reference is made to the drawings accompanying this contract unless stated otherwise. The word "provided", as used herein shall be understood to mean "provided complete in place", that is, furnished and installed.

GC – 2. DIVISION OF THE SPECIFICATION

These specifications are divided for convenience into sections as set forth in the Table of Contents preceding the General Conditions. Any mention in these sections or indications on the drawings of articles, materials, operations, or methods, requires that the contactor furnish each item so mentioned or indicated, of the kind, type or design and quality specified or shown on the drawings, and that the contractor furnish all labor, equipment, incidentals, and superintendence necessary to complete the work in accordance with the true meaning and intent of these specifications even though such mention of articles, materials, operations, methods, quality, qualifications, or condition is not expressed in complete sentences. The contractor shall coordinate the work covered in each section with the work of other sections. The necessary information – items, accessories, anchors, connections, patterns,

templates etc. – shall be delivered when required in order to prevent any delay in the progress and completion of work.

GC – 3. SPECIFICATIONS AND DRAWINGS

i. The contractor shall keep in the work place a copy of the drawings and specifications and shall at all times give the Construction Architect/Engineer access thereto. Anything mentioned in the specifications and not shown on the drawings, or shown on the drawings and not mentioned in the specifications, shall be like effect as if shown or mentioned in both. In case of difference between drawings and specifications the specifications shall govern. In case of discrepancy either in the figures, in the drawings, or specifications, the matter shall be promptly submitted to the Designing Architect who shall promptly make a determination in writing. Any adjustment by the contractor without such determination shall be at his risk and expense. The Consultants shall furnish from time to time such detailed drawings and other information as he may consider necessary, unless otherwise provided.

ii. Omissions and misdescription. Omissions from the drawings or specifications or misdescription of details of work which are manifestly necessary to carry out the intent of the drawings and specifications, or which are customarily performed, shall not relieve the contractor from performing such omitted or misdescribed details of work, but shall be performed as if fully and correctly set forth and described in the drawings and specifications.

iii. Deviations from the drawings and dimensions therein given, whether or not error is believed to exist, shall be made only after written authority is obtained from the Designing Architect/Engineer.

GC – 4. PROGRESS SCHEDULE.

The work shall be prosecuted with faithfulness and energy and in the order of precedence as directed by the Construction Architect/Engineer. The Contractor shall submit a progress schedule as follows:

i. The progress schedule shall be submitted within two weeks after the date of award of contract and shall be subjected to the approval of and/or modification by the Construction Architect/Engineer.

ii. The progress schedule shall be in Chart Form or Critical Path Method (CPM) and shall show the order in which the contractor proposes to carry on the work, the dates on which he will start the several salient features (including procurement of materials, plant and equipment) and the contemplated dates completing the same.

GC – 5. TAXES, LICENSES, PERMITS, AND FEES.

All taxes, licenses, permits and fees which may be due to the local and/or National Government on account of the performance and completion of the work stipulated herein and fees for testing materials and specimens shall be paid for and obtained by the contractor while the building and occupancy permits shall be paid for by the contractor and Owner respectively.

GC – 6. INSURANCE.

The contractor shall take out and maintain throughout the construction period insurance with the minimum requirements.

GC – 7. CHANGES IN SPECIFICATIONS AND DRAWINGS.

The owner may, from time to time, during the progress of the construction of the project, make such changes in, additions to, or subtractions from the specifications and construction drawings as condition may warrant: provided, however, that if the cost to the contractor shall be materially increased by any such change, or addition, the owner shall pay the contractor for the reasonable cost thereof in accordance with a construction contract amendment signed by the owner and the contractor, but no claim for additional compensation for any such change or addition will be considered unless the contractor shall have made a written request therefore to the owner prior to the commencement of work in connection with such change or addition. Written notification shall be made by the owner to the consultants or designing architect prior to any change in specifications and drawings.

GC – 8. SUPERVISION AND INSPECTION.

i. The contractor shall cause the construction work on the project to receive a constant supervision by a competent Project Architect/Engineer who shall be present at all times during the working hours where construction is being carried-on. The contractor shall employ, in connection with the construction of the project, capable, experienced, and reliable foremen and such skilled workmen as may be required for the various scope of work to be performed. Directions and instructions given to the Project Architect/Engineer by the owner shall be binding upon the contractor.
ii. The manner of performance of the work, and all equipment used therein shall be subject to the inspection, tests, and approval of the owner. The owner shall have the right to inspect data and records of the contractor relevant to the work. The contractor will provide all reasonable facilities necessary for such inspection and tests. The contractor shall have an authorized agent to accompany the inspector when the final inspection is made and, if requested by the owner, when any other inspection is made.

GC – 9. PROGRESS PHOTOGRAPHS.

i. The contractor, at his expense, shall furnish to the Construction Architect/Engineer progress photographs that shall be taken monthly starting when the work begins and continuing so long as the work is in progress, on the exterior or interior of the building, from the station points designated by the Construction Architect/Engineer.
ii. The contractor shall clearly identify in the photographs the scope of work completed.
iii. No partial payment shall be considered for approval without the above-mentioned photographs.

GC – 10. RELEASE OF LIENS.

Neither the final payment nor any part of the retained percentage shall become due until the contractor, if required shall deliver to the owner a complete release of all liens arising our of the contract, or receipts in full in lieu thereof and, if required in either case, an affidavit that so far as he has knowledge or information, the releases and receipts include all labor and materials for which a lien can be filed.

GC – 11. SUPERVISION.

All work shall meet with the approval of the Construction Architect/Engineer and shall be completed in conformity with the plans and specifications approved by, and on file with the owner, which plans and specifications will be made part of the contract to be entered into for the work referred herein. The contractor shall confer with the Construction Architect/Engineer before commencing any work under the contract. The contractor shall furnish all facilities for inspection at the construction site.

GC – 12. IDENTIFICATION OF EMPLOYEES.

The contractor shall be responsible for furnishing to each employee and for requiring each employee engaged in the work to display such identification as maybe approved and directed by the Construction Architect/Engineer.

GC – 13. SAMPLES.

The contractor shall submit 2 each of samples if required by the owner or Construction Architect/Engineer and these shall be properly identified with the contractor's name and manufacturer's name and catalog number, if applicable.

GC – 14. LIGHT, POWER, AND WATER.

The contractor shall furnish temporary water, light, and power, complete with connecting piping, wiring, lamps and similar equipment as required for the work. The contractor shall install, maintain, and remove his temporary line upon completion of the work. All expenses in connection with temporary services and facilities shall be paid by the contractor.

GC – 15. TEMPORARY OFFICE.

The contractor shall provide and maintain watertight office on the premises where directed for his own and sub-contractor's use and for the use of the Construction Architect/Engineer. This office shall be, provided with operating windows, doors with locks, tables, benches, racks for drawings and adequate electric lighting.

i. The ceiling shall be 2.7m high. Floor and wall shall be plywood or equivalent.
ii. The contractor shall provide janitorial services for these offices for the duration of the job.

GC – 16. STORAGE SHEDS.

The contractor shall provide and maintain on the premises where directed, watertight storage sheds for all materials which might be damaged by weather.

GC – 17. TEMPORARY TOILETS.

The contractor shall install and maintain in a sanitary condition suitable toilets and urinals for use of workmen. These toilets shall be in a location approved by the construction Architect/Engineer and connected to existing sewers, when feasible. There shall be a minimum of one (1) toilet for each multiple of thirty (30) contractor's employees or fractional part thereof, working at the job site.

GC – 18. LIGHTS, GUARDS, ETC.

The contractor shall provide such lights, guard, temporary fences, and warning signs as may be necessary for the safety during all the time from the execution of the contract until the final acceptance of the work, and shall be responsible for the installation and maintenance of lights, guards, fences and warning signs.

GC – 19. CLEANING.

Upon the completion of each part of the work as defined by the sections into which these specifications are divided or as separated by the various trades involved in the work, each area shall be cleaned of debris emanating from the work. The contractor shall remove remaining excess materials, waste, rubbish, debris, and his construction and installation equipments from the premises. Any dirt or stains caused by the work under the contract shall be removed from the surfaces of the structure and from the equipments and fixtures.

Miscellaneous Conditions

MP – 1. PROJECT SIGN.

The contractor shall provide a project sign fabricated to size.

MP – 2. USE OF OWNER FACILITIES BY CONTRACTOR.

The contractor will not be permitted to utilize any Owner's building or facility for his job-site office space or storage area for materials without prior written approval of the Construction Architect/Engineer.

MP – 3. INTERFERENCE WITH OWNER OPERATIONS.

The contractor shall establish work procedures and methods to avoid interference with existing operations within or adjacent to the construction area. Free passage into the adjoining or adjacent buildings not in the contract will not be permitted, except as approved by the Construction Engineer. Procedures and methods shall also provide for safe conduct of work and protection of property, which is to remain undisturbed.

ARCHITECTURAL

SECTION 1 CONSTRUCTION QUALITY CONTROL

1C.1. General. The contractor shall establish and maintain quality control for testing of materials to be furnished by him in accordance with the specifications and fro determination of densities as required in the specifications to assure compliance as specified. The testing agency shall be approved. Certified copies of detailed laboratory test reports, attesting compliance with the test requirements as prescribed in the applicable referenced publications shall be submitted in triplicate, together with the submission of samples for conformation testing by the owner as required, and shall contain the name and address of the testing laboratory and the dates of the test to which the report applies.

1C.2. Sampling and Testing. Unless otherwise specified, materials to be sampled, time of submittal of samples, and other requirements for sampling shall be as specified in the various sections of each division under which the materials will be furnished. All samples for testing shall be provided by the contractor at no additional cost to the owner.

1C.3. Maintenance of records. The contractor will maintain current records of all inspections and test performed on an appropriate format. These records will provide factual evidence that required inspections or tests have been performed, including type and number of inspections or tests involved; results of the inspections or tests, etc. Additional forms for specific operations may be required by the Construction engineer to supplement the daily inspection forms.

1C.4. Time reports and deficiencies. Records of jobsite material inspections must be received prior to installation or incorporation of materials into the contract work. The contractor will not be permitted to build upon or conceal any features of the work containing uncorrected defects. Payment on deficient items will be withheld until satisfactorily corrected or other action has been taken approved.

SECTION 2 EARTHWORK

General

Include cut and fill, compaction and grading to acquire finished grade as required in the plan.

2.1 EXCAVATION

Structural excavation, to indicate bearing value. Extra care should be practiced to protect adjoining properties and existing utility lines. Excavation of trenches for pipe lines shall conform to the typical sections as Shown on the plans.

2.2 SITE CLEARING

2.2.1 All obstacles within the premises shall be disposed and cleared as directed by the Project Architect/Engineer.

2.2.2 All obstruction obstructing the work shall be removed to the designated places, unless otherwise directed by the Project Architect/Engineer.

2.2.3 All plant roots shall be disposed.

2.3 BACKFILL & FILL

2.3.1 Backfill of suitable excavated soil shall be placed in horizontal layers of 30 cm thick, compacted by hand or mechanically as required density.

2.3.2 Fill shall be as shown in the drawings unless otherwise directed and shall be compacted by mechanical means to require density of 95% optimum.

2.3.3 Excess earth-surplus earth from cut portion shall be placed in lower ground as desired by the Project Engineer to the nearest depressed area.

SECTION 3 DEMOLITION, CLEARING AND GRUBBING

3.1 EXAMINATION OF SITE

The Contractor shall visit the site of the work and examine the premises so as to fully understand all of the existing conditions relative to the work. No increase in cost of extension in performance time will be considered for the failure to know its condition.

3.2 DEMOLITION

Demolition of work in general shall consist of the following:

3.2.1 Remove all existing structures (if there shall be)

3.2.2 Tap all existing water and electrical lines for reconnection to new construction.

3.3 PROTECTION OF STRUCTURES AND PROPERTY

3.3.1 Execute demolition work with such manner as to insure adjacent property and premises of building against damage which occur or might occur from falling debris or other cause.

3.3.2 Repair damage done to property of any person or persons on or off premises by reason of required work.

3.3.3 Provision of proper enclosure within the perimeter to insure safety to possible damage on adjacent properties.

3.3.4 Storage of any hazardous or flammable materials is strictly prohibited, that would cause danger to people, property and adjacent property.

3.4 DISPOSAL OF MATERIALS

Observe good housekeeping, all trash, rubbish, and other waste shall be immediately disposed. The contractor should provide garbage cans for proper disposal of his wastes.

3.5 DEBRIS

3.5.1 Remove as it accumulates, debris resulting from demolition operation may not be burned on site.

3.5.2 Wood and other debris resulting from demolition operation may not be burned on site.

3.6 CLEANING

3.6.1 Upon the completion of work, remove all barricades, tools, materials, apparatus and debris.

3.6.2 Leave premises clean, neat and orderly.

SECTION 4 FOUNDATION AND EXCAVATION WORKS

4.1 Gravel Bed – 4" thick compacted on bottom of foundation and or footing trenches or provide lean concrete.

4.2 Minimum depth of Excavation – From natural grade line.

4.3 All excavation work for foundation based on drawing shall be from natural grade, no foundation shall rest on fill.

SECTION 5 FILLING, GRADING AND SLABS ON FILLS

5.1 1-part escombro, 2-part lastillas or Barrow earth for filling job, done 6 layers, compacted. Filling shall be confined on building areas.

5.2 Second Basement and side walk slabs on fill – 0.15 m thick, reinforced with 12 mm diameter bars spaced at 0.35m on center both ways, 3,000 psi.

5.3 2" thick gravel bedding is used for slabs on fill. Do not use unsuitable organic filling materials.

SECTION 6 CONCRETE AND REINFORCED CONCRETE

6.1 Test – Steel bars, cement, gravel, sand and concrete samples, shall be tested. Sample materials for testing shall be properly signed by the Project Engineer with corresponding date before issuing to private testing company. Results shall be officially signed or stamp and to be photo copied for four. The Owner shall be furnished a copy of every testing results.

6.2 Schedule of Concrete

6.2.1 Footing, tie beams, reinforced walls, wall footings, columns, and pedestal;
f'c = 24.00 MPa (3500 psi) at 28 days

6.2.2 Suspended slabs, beams, girders, stairs;
f'c = 24.00 MPa (3500 psi) at 28 days

6.2.3 Ground Floor slab on fill;
f'c = 20.70 MPa (3,000 psi) at 28 days

6.2.4 Others not specified – f'c = 20.70 MPa (3,000 psi) at 28 days

6.2.5 Cement – approved brand. Portland cement

6.2.6 Gravel – G-1 crushed, ½" to ¾" in size

6.2.7 Sand – shall be river sand

6.2.8 Reinforcing Bars:

1. All mild reinforced bars shall be round deformed structural grade in accordance with ASTM A-615.
   16mm & larger rebars – fy = 275.79 MPa (40, 000 psi)
   12mm & smaller – fy = 275.79 MPa (40, 000 psi)
2. Verify Structural general notes. For specific grade of bars for specific use.

6.2.9 Forms – Use plywood or steel forms for all form works.

SECTION 7 MASONRY WORKS

7.1 Concrete Hollow Blocks – 6" thick for exterior wall, 3" or 4" thick for all interior partitions unless otherwise noted. Both 1" thick cement plastered. With compressive strength of 700 psi.

7.2 Reinforcement – 12mm dia. Bars at 0.40 m on center for vertical and every 3 layers of CHB for horizontal bars on all concrete hollow blocks wall.

7.3 Cement and other cement materials shall be delivered to the site and stored in unbroken bags, barrels, or other approved containers, plainly marked and labeled with the manufacturers name and brand. Concrete masonry units shall be handled with care to avoid chipping and breakage, and shall be stored as directed.

SECTION 8 STRUCTURAL STEEL WORKS

8.1 General. Connections for which details are not indicated shall be designed in accordance with the Steel Construction standard.

8.2 Handling, shipping and storing steel work. All Materials shall be handled, shipped, and stored in a manner that will prevent distortion or other damage. Materials shall be stored in a clean location and keep properly drained. All damaged materials shall be replaced or repaired by and the expense of the contractor.

8.3 Structural carbon steel for welded work shall conform to ASTM A36.

8.4 Submerged arc welding. Bare electrodes and flux for submerged arc welding shall conform to the requirements of AWS D1.0, and the grade of A36.

SECTION 9 DOORS AND WINDOWS

DOOR

See Architectural Plans for specifications.

WINDOW

See Architectural Plans for specifications.

SECTION 10 FLOOR FINISH SCHEDULE

See Architectural Plans for specifications.

SECTION 11 CEILING FINISH SCHEDULE

See Architectural Plans for specifications.

SECTION 12 PAINTING WORKS

12.1. Materials – Any Quality Paint or approved Equal.

12.2. Application – All applications and methods to be used shall follow strictly manufacturer's instructions and specifications.

12.3. SURFACE TREATMENT – All surface include masonry wall shall be thoroughly cleaned, puttied (masilla), sand papered rub and polish. All Masonry wall shall be treated first with penetrating sealer prior to painting.

12.4. SCHEDULE OF PAINTING FINISHES:

1. All masonry wall cemented finished surfaced – 3 coats Flat Top Coat.
2. Plywood surfaces or wood surfaces – 1 coat primer and 2 coats Semi-gloss Top Coat.
3. Hardiflex – 1 coat primer, 2 coats Flat Top Coat. Color White.
4. Steel and metal works. – 2 coats red oxide primer and 2 coats acqua epoxy or quick drying enamel.
5. Steel Trusses – 2 coats red oxide primer and two coats acqua epoxy topcoat.

12.5 Extra Coats – shall be applied to achieve desired finish.

PLUMBING WORKS

SECTION 1 GENERAL

1.1 DESCRIPTION

1.1.1 Applicable provisions of "General Conditions" govern work under this section.

1.1.2 All fittings, connections and piping embedded in concrete shall be subjected to inspection by the Construction Architect/Engineer and/or his representative before completion.

1.1.3 The Contractor shall provide all items, articles, materials, operation or method listed, mentioned of schedule of the drawings and/or herein, including labor. Materials, equipment's and incidentals necessary and required for their completion.

1.1.4 It is not intended that the drawings shall show every pipe, fitting, valve and appliance. All such items whether specifically mentioned or not, or indicated on the drawing shall be furnished and installed, if necessary, to complete the system in accordance with the best practice of plumbing trade and to the satisfaction of the construction engineer and the owner.

1.1.5 The plumbing contractor is required to refer to all architectural, structural, mechanical and electrical plans and specifications and shall investigate all possible interferences and conditions affecting his work.

1.1.6 Electrical system is not included in this division, but the plumbing contractor will provide all facilities and make provisions for the installation of the work as construction progresses.

1.2 SCOPE OF WORK

Work include under this section of the specifications consists in furnishing all labor, tools and equipment, appliances and materials necessary for complete installation, testing and operation of the plumbing system in accordance with the contract.

1.2.1 Sanitary drains from the building and their connections to the point of discharge as shown in the plans as verified at the jobsite.

1.2.2 Roof and ground storm drainage system and connections to the storm drainage system as shown in the plans as verified at the jobsite.

1.2.3 Soil, waste and vent pipe system within the building.

1.2.4 Cold water distribution and supply pipes to the fixtures.

1.2.5 Plumbing fixtures, trims and accessories.

1.2.6 Supply and installation of the standpipe system complete with the valves and fire department connection.

1.2.7 Water meter and water connections to cold water main and/or other sources as shown in the plan schemes.

1.2.8 The contractor shall provide necessary shop drawing as-built plans.

1.2.9 All other works described in other sections of this document necessary for the completion of this contract.

1.3 SUBMITTALS

1.3.1 Within fifteen (15) days after award of contract, the plumbing contractor shall submit for the construction engineer's approval four (4) copies of all complete list of manufacturer's name of all materials he proposes to use.

1.3.2 After approval of the above list and before purchase of any equipment or materials. The plumbing contractor shall submit to the construction engineer for approval four (4) complete sets of detailed information consisting of manufacturer's bulletins, shop drawings and part list of the materials to be provided under this contract.

1.3.3 The plumbing contractor shall assume the cost of entire responsibility of any change in the work as shown in the contract drawings which may necessary be occasioned by approval of materials other than these specified.

1.4 APPLICABLE CODE AND STANDARDS

1.4.1 All plumbing works to be done and sizes of pipes to be used shall be in accordance with the National Plumbing Code of the Philippines.

1.4.2 The plumbing contractor shall specify the above paragraphs with each section of the specifications and coordinate his work so that the General Contractor will understand clearly the intent of the work to be done.

SECTION 2 PRODUCTS

2.1 DESCRIPTION

All materials to be used shall conform to the standards specified. All classes listed are not necessarily required for this project, of classes listed; only those specifically called for under sections of this Division or shown shall be provided. Use of materials shall

further be governed by other requirements imposed on other sections of this specification. Materials shall be subjected to test necessary to ascertain their fitness if the Construction Architect/engineer so requires.

2.2 ALTERNATIVE MATERIALS

Use of any materials not specified in these specifications may be allowed, provided such alternate has been approved by the Construction Engineer, and provided further that a test, if required, shall be done by an approved agency in accordance with the generally accepted standards.

2.3 IDENTIFICATION OF MATERIALS

2.3.1 Each length of pipe, fittings, traps, fixtures and devices used in plumbing system have cast, stamped or indelibly marked on it in the manufacturer's trademark or name, the weight, type and classes of products when so required by the standards mentioned.

2.3.2 All materials and equipment mentioned in this specification, including all incidental items not specifically indicated but required to complete the contract shall be new and free from defects. If damaged during the course of construction, it shall be repaired or replaced as directed by the construction engineer at no additional cost to the owner.

2.4 STANDARD SPECIFICATION FOR MATERIALS AND EQUIPMENT

2.4.1 WATER LINE PIPES

All cold water lines inside the building shall be any brand but quality pipe for the purpose.

2.4.2 POLYVINYL CHLORIDE PIPE

1. Solvent Cement joint to ASTM D2564.
2. Series 1000 for downspouts, main vents and soil stacks including horizontal drain.
3. Series 600 for vent pipes and fittings.

SECTION 3 EXECUTION

3.1 PIPING INSTALLATION

3.1.1 General

1. Piping shall be installed as shown on the drawings, as recommended by the manufacturer and as directed during installation, straight and direct as possible, forming right angles or parallel lines with building walls, and other pipes, and neatly spaced. Erect pipe risers plumb and true, parallel with walls and other pipes neatly spaced.
2. All piping shall be properly supported or supported on stands, clamps, hangers or equivalent of approved design.

3. The arrangement positions and connections of pipes, fixtures, drains, valves and the like, indicated on the drawings shall be followed as closely as possible. The right is reserved by the construction engineer to change locations and elevations to accommodate conditions which may arise during the progress of the work, prior to installations, without additional compensation for such changes.
4. The responsibility for accurately laying out of the work and coordination of installation with other contracts rests with this contractor. Any field layout interferences that occur shall be reported immediately to the construction engineer.
5. All pipes shall be cut accurately to measurements and shall be worked into places without springing or forcing. Changes in pipe sizes shall be made with reducing fittings.
6. Roughing-in for pipes and fixtures shall be carried along the building construction. Correctly located openings of proper sizes shall be provided where required in the walls and floors for the passage of pipes. All items to be embedded in concrete shall be thoroughly cleaned and free from all rust, scale and paint.
7. Pipes shall not pass through columns, footings, beams or ribs, except where noted in the drawings.

3.1.2 Cold Water System

1. The piping shall be extended to all fixtures, outlets and equipments from the gate valves installed in the branch near the riser.
2. All piping above ground shall be parallel with the lines of the building unless otherwise shown in the plans.
3. **No water piping shall be buried in floors** unless specifically indicated in the drawings or approved by the construction Architect/Engineer.
4. All service pipe, valves and fittings shall be kept at sufficient distance from the other work permit finished covering not less than one-half inch from the different service.
5. Changes in pipe shall be made with reducing fittings.
6. No valve shall be installed with its stem below horizontal. All valves shall be gate valves unless otherwise specified or noted on the drawings.
7. Unions shall be concealed in walls, ceilings and partitions, except where they are enclosed in the metal frame box and cover.
8. All cold water line shall be tested at 150 Psi from a period of two hours before covering.

3.1.3 Vent Systems

1. All main vertical soil and waste stacks shall be extended full size to above roof line to act as vents, except where otherwise specifically indicated.
2. Vent pipes in roof spaces shall be run as close as possible to underside of roof with horizontal piping pitched down to stacks without forming traps.

Vertical vent pipes may be connected into the main vent riser above the highest vented fixtures.

3.1.4 Piping, Grades and Slopes

1. Keep all Horizontal runs of piping, except where concealed in partition, as high as possible and close the wall.
2. Piping shall be properly graded or pitched to insure easy circulation, drainage and prevent water hammer and noise. Slopes as follows unless otherwise indicated.
3. Cold water shall be pitched, up in the direction of flow at 1 inch 60 feet horizontal run.

ELECTRICAL WORKS

SECTION 1 GENERAL REQUIREMENT

1.1 GENERAL

1.1.1 General Description

1. The work to be done under this division of the specifications consist of the fabrication, finishing, delivery and installation, complete in all details of the Electric Work at the premises and all work materials incidental to the proper completion of the installation, except those portions of the work which are expressly stated to be done by others. All works shall be done in accordance with the governing Codes and Regulations and with the specifications. The specifications are intended to provide a broad outline of the required equipment, but are not intended to include all details of design and construction.
2. Under this Section of the Specifications, provide all labor, materials and equipment and performance of all work necessary for the complete execution of all the electrical works as shown in the electrical drawings except specifically indicated as to be provided by the other.

1.1.2 Codes , Inspections, Permits and Fees

1. The work under this contract is to be installed according to the requirements of the latest edition of the Philippine Electrical Code, the rules and regulations of the local authorities and the requirements of the local power utility and Telephone Company.
2. All permits and electrical fees required for this work shall be obtained by and at the expense of the contractor. The contractor shall furnish the Construction Engineer and the Owner final certificates electrical inspection and approval from the proper government authorities after completion of work. The Contractor shall prepare all as-built and all forms and documents required by the approving authority.

1.1.3 Guarantees

The contractor shall guarantee that the electrical systems are free from all grounds and from all defective workmanship and materials and will remain so

for a period of one year from date of acceptance of work. Any defects, appearing within aforesaid period, shall be remedied by the contractor at his own expense.

SECTION 2 INTERIOR WIRING SYSTEMS

2.1 GENERAL REQUIREMENTS

In each of the standards referred to herein, consider the advisory provisions to be mandatory, as though the word "shall" wherever it appears. Interpret reference in these standards to the "authority having jurisdiction", or words of similar meaning, to mean the Construction Engineer.

2.1 PRODUCTS

2.1.1 Conduits and Fittings:

1. All conduits shall be unplasticized Polyvinyl Chloride (uPVC) in heavy wall schedule unless indicated on plans.
2. EMT or IMC conduits shall be used in sizes 15mm, 20mm and 25mm diameters for indoor installations where PVC is not specified.

2.1.2 Outlets, Boxes and Fittings:

1. At all outlets of whatever kind, for all systems, there shall be provided suitable fitting, which shall be either a box or other device especially designed to receive the type of fitting to be mounted thereon.
2. At all outlets on concealed conduit work, provide galvanized pressed steel outlet boxes of standard make. These boxes shall be in all cases standard and where such boxes are not available on the market, special boxes shall be secured by the contractor at his own expense. In general outlet boxes shall be at least 100 mm in diameter, 53mm deep and No. 16 minimum gauge.

2.1.3 Junction and Pull boxes:

1. Junction and pull boxes, of Code gauge steel, galvanized shall be provided as indicated or as required for facilitating the pulling of wires and cables. Pull boxes in finished places shall be located and installed with permission and to the satisfaction of the Construction Engineer.
2. All junction and pull boxes on exposed conduit work shall be provided with hubs for threaded pipe entry and covers provided with neoprene gaskets.

2.3.4 Wires and Cables:

1. All wires shall be copper, soft-drawn and annealed, shall be of 98% conductivity, shall be smooth and true of a cylindrical form and shall be within 1% of the actual size called for.
2. All wires and cables shall comply with the requirements of the Underwriters Laboratories, the ASTM and ICEA as they apply to the particular usage.

3. All wires and cables shall be any quality brand or approved equal.
4. Wires and cables for power and lighting system shall be plastic insulated for 600 volts working pressure type “TW” unless otherwise noted on plans or specified.
5. Wires and cables for lighting systems installed or run throughout within the ballast compartment shall be plastic insulated for 600 volts working pressure type “THW” unless otherwise noted on plans or specified.
6. THHN/THWN wires can be used for the same size of wires provided the allowable current does not exceed that of TW/THW wires.

2.3.5 Wall Switches and Plates:

1. Wall switches shall be rated with ampere and voltage ratings as required. Switches shall be for flush mounting type and of the quiet type, spring operated. The type of switches shall be tumbler operation and the color, plating and appearance of wall plates shall be selected by the Consultants. Appropriate samples shall be submitted prior to the purchase of wall switches and face plates. Switches and plates shall be any quality brand, or approved equal.
2. All Utility boxes intended for switch devices shall be specially designed to receive the particular type of switch device to be mounted and should be deep enough to accept and fit the total number of conductors required as per drawings.

2.3.6 Wall Receptacles and Plates:

1. Receptacle outlets shall be 15 Ampere, 250 V, 2 pole, 3-wire parallel slot, grounding type. Parallel slot outlet rated 15A, 125V grounded type shall be acceptable for use with 250V system. Locking type and other special purpose receptacle outlets shall be as indicated in the drawings. Receptacle outlet and plates shall be as manufactured by any quality brand or approved equal.
2. Type and Color of receptacle outlet and plates shall be as selected by the Construction Architect/Engineer. Appropriate samples of outlets and plates shall be submitted prior to purchase of devices.
3. All utility boxes intended for receptacle outlet devices shall be specially designed to receive the particular type of receptacle outlet device to be mounted and should be deep enough to accept and fit the total number of conductors as required as per drawings.

2.3.7 Panels:

1. Standard panels and cabinets, as much as possible shall be used and assembled on job. All panels shall be dead front construction, furnished with trims for surface mounting. Cabinets shall be of Code gauge with gutters at least 100 mm wider if necessary. The trim for all

panels shall be finished in industrial grey enamel over a coat of trust inhibitor.

2. Lighting panels shall be equipped with branch air circuit breakers as required and mains as noted on Plans or panel schedule. All circuit breakers shall be any quality brand, or approved equal.

2.3.7 Individual Breakers and Switches:

1. Provide individual circuit breakers, safety switches and disconnect switches where indicated on plans. Voltage ratings shall be suitable in each case of service application. Enclosures shall be General Purpose, NEMA Type 1, except where specifically noted on plans or assembled on panel cabinets.
2. Circuit breakers shall consist of quick-make, quick-break type entirely trip-free operating mechanism with contacts, arc-interrupter, and thermal magnetic trip unit shall provide time-delayed overload protection, and in case of overload or short circuit current in any one pole. Circuit breaker shall be trip indicating, with the tripped position of breaker handle midway between “ON” and “OFF” positions.
3. All circuit breakers shall be bolt-on type unless noted otherwise. Plug-in circuit breakers are not acceptable.

SECTION 3 EXECUTION

3.1 GENERAL REQUIREMENTS:

Electrical installations shall conform to the requirements of the Code and to the requirements specified herein.

3.2 WIRING METHODS:

Wiring method shall be insulated conductors installed, except where specifically indicated or specified otherwise, or required by the Code to be installed otherwise. An insulated equipment grounding conductor shall be provided in all branch circuits, including lighting circuits.

3.3 CONDUITS INSTALLTION:

Unless indicated otherwise, conceal, conduit within finished wall, and floor. Install conduit panel with or at right angles to ceilings, walls, and structural members where located above accessible ceilings and where conduit will be visible after completion of project.

1. Where conduits rise through floor slabs, the curved portion of bends shall not be visible the finish slab.
2. Conduit Support: Support conduit by pipe straps, wall brackets, hangers or ceiling trapeze. Fasten by machine screws, welded threaded studs, or spring-tension clamps on steel works. Do not weld conduits or pipe straps to steel structures. The load applied to fasteners shall not exceed one-fourth of the proof test load. In partitions of light steel construction, use sheet-metal screws.

3. Make changes in direction of runs with symmetrical bends or cast-metal fittings. Make field-made bends and offsets with hickey or conduit-bending machine. Do not install crushed or deformed conduits. Avoid trapped conduits. Prevent plaster, dirt, or trash from lodging in conduits, boxes, fittings, and equipment during construction. Free clogged conduits of all obstructions.
4. Install pull wires in empty conduits in which wire is to be installed. The pull wire shall be No. 14 AWG zinc-coated steel or plastic having not less than 200 pound tensile strength. Leave not less than 300 mm of slack at each end of the pull wires.
5. Conduit installed in Concrete Floor Slabs – Locate so as not to adversely affect the structural strength of the slabs. Install conduit within the middle one-third of the concrete slab. Space conduits horizontally not closer than three diameters except at cabinet locations. Curved portions of bends shall not be visible above the finish slab. Increase slab thickness as necessary to provide a minimum 25 mm cover over conduit. Where embedded conduits cross expansion joints, provide suitable watertight expansion fittings and bonding jumpers. Conduits larger than 25 mm trade size shall be parallel with or at right angles to the main reinforcement, the conduit shall be close to one of the supports of the slab.
6. Fasten conduits to sheet metal boxes and cabinets with two lockouts where required by the code, where insulated bushings are used, and where bushings cannot be brought into firm contact with the box; otherwise, use at least a single lockout and bushing. Lockouts shall be the type with sharp edges for digging into the wall of metal enclosures. Install bushings on the ends of conduits and provide insulating type where required by Code.

3.4 SPLICES:

Make splices in accessible locations. Make splices in conductors 5.5 mm^2 and smaller with an insulated pressure type connector. Make splices in conductors 8 mm^2 and larger with a solderless connector and cover with an insulation material equivalent to the conductor.

SECTION 4 LIGHTING SYSTEMS

4.1 SCOPE OF WORK:

The work includes supply and installation of lighting fixtures.

4.2 SUBMITTALS:

1. Data, shop drawings, and reports shall employ the terminology, classifications, and method prescribed by the IES Lighting Handbook, applicable, for the lighting system specified.
2. Manufacturer's Data – Lighting fixtures, including lamps and ballast.

4.3 PRODUCTS:

4.3.1 Fluorescent Lamps:

Provide the number, type, and wattage indicated in the fixture schedule.

4.3.2 Florescent Ballasts:

Ballast shall be electronic type and shall be designed to operate on voltage system to which they are connected. Ballast shall have sound rating “A”. Fixtures and ballast shall be designed and constructed to limit the ballast case temperature to 90 degrees Celsius © when installed in an ambient temperature of 40 degrees C.

4.3.3 All fluorescent ballast shall be U.L. approved rapid start and energy saving type. Submit data and information for approval of the Owner of Construction Architect/Engineer.

4.3.3 Incandescent Lamps

Provide the number, type and wattage indicated or as required.

4.4 EXECUTION

4.4.1 Installation

Set lighting fixtures plumb, square and level with ceiling and walls, in alignment with adjacent lighting fixtures, and secure in accordance with manufacturer’s directions and approved shop drawings. Mounting heights specified or indicated shall be bottom of fixtures for ceiling mounted fixtures and to center of fixture wall-mounted fixtures.

4.4.2 Grounding

Grounding non current-carrying parts of equipment. Where the copper grounding conductor is connected to a metal other than copper, provide specially treated or lined connectors suitable for this purpose.