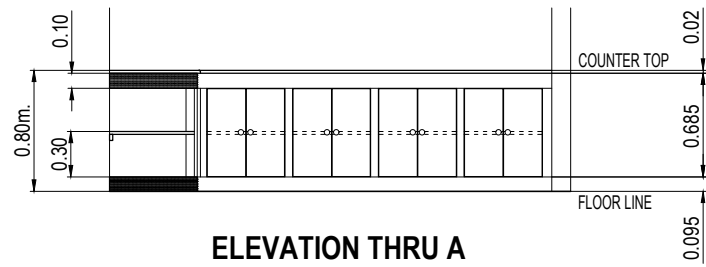


TYPICAL DETAIL OF CONCEALED HINGES



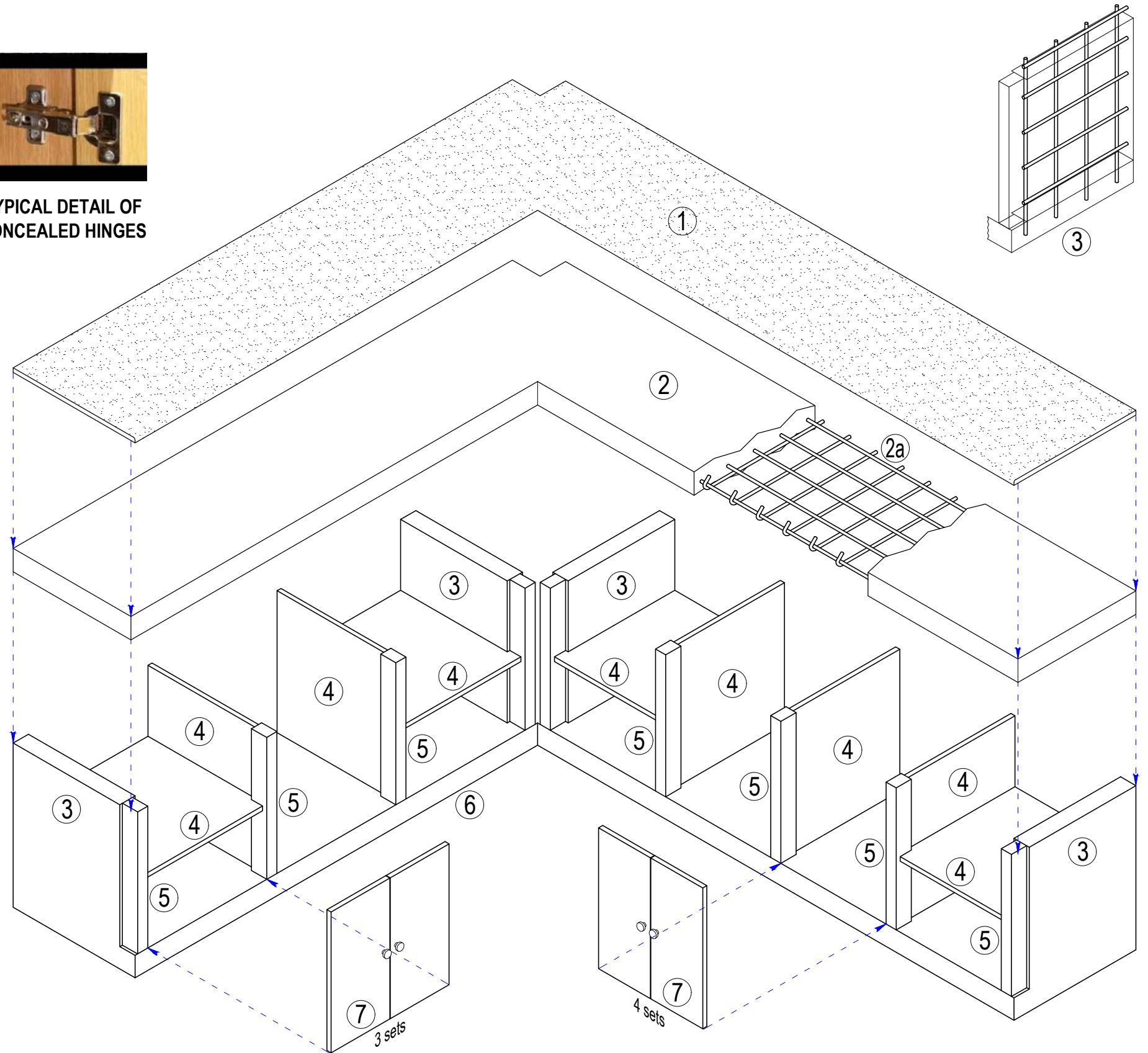
DETAIL OF COUNTER 9

SCALE: 1:50M.

C9

LEGEND:

- ① 20mm. thk. GRANITE COUNTER TOP
- ② 100mm. thk. CONCRETE SLAB
- ②a 12mm.Ø LONGITUDINAL REBAR AT 0.126m. O. C. WITH 12mm.Ø TRAVERSE REBAR AT 0.15m. O. C.
- ③ 75mm. thk. CONCRETE WALL WITH 12mm.Ø REBAR AT 0.15m. BOTH WAYS
- ④ 20mm. thk. MARINE PLYWOOD
- ⑤ 50mm. x 75mm. HARD WOOD
- ⑥ 95mm. thk. CONCRETE SLAB WITH 10mm.Ø TEMP. REBAR AT 0.50m. BOTH WAYS
- ⑦ 20mm. thk. MARINE PLYWOOD CABINET DOORS, PROVIDE CONCEALED HINGES (2pcs./door), MAGNETIC CATCHES AND PULLS



REVISIONS				
REV.	DATE	BY	DESCRIPTION	

PROJECT: PROPOSED LABORATORY RENOVATION, ZCWD WATER TREATMENT PLANT, ZAMBOANGA CITY

SHEET CONTENT: AS INDICATED

DRAWN BY: ARTHUR A. REYES
PRINCIPAL DRAFTSMAN B - DESIGN DIVISION

PREPARED BY: BUNNY L. DAMPIOS
SENIOR ENGINEER A - DESIGN DIVISION

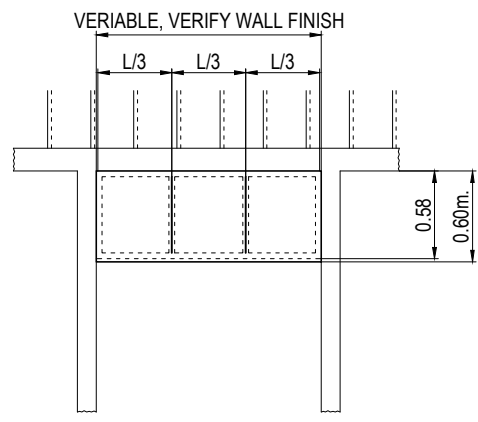
CHECKED & REVIEWED BY: REX D. SALE, JR.
SUPERVISING ENGINEER A - DESIGN DIVISION

REVIEWED AND SUBMITTED BY: EDITO M. BAUTISTA, JR.
OIC - DESIGN DIVISION

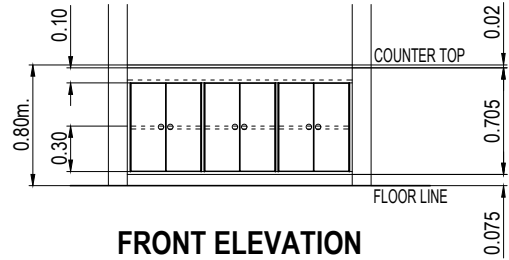
RECOMMENDING PROJECT IMPLEMENTATION: MARLI ACOSTA - DE FIESTA
DM A - ENGINEERING & CONSTRUCTION DEPARTMENT
OIC - TECHNICAL SERVICES GROUP

APPROVED FOR PROJECT IMPLEMENTATION: LEONARDO REY D. VASQUEZ
GENERAL MANAGER

SHEET NO. 29



PLAN

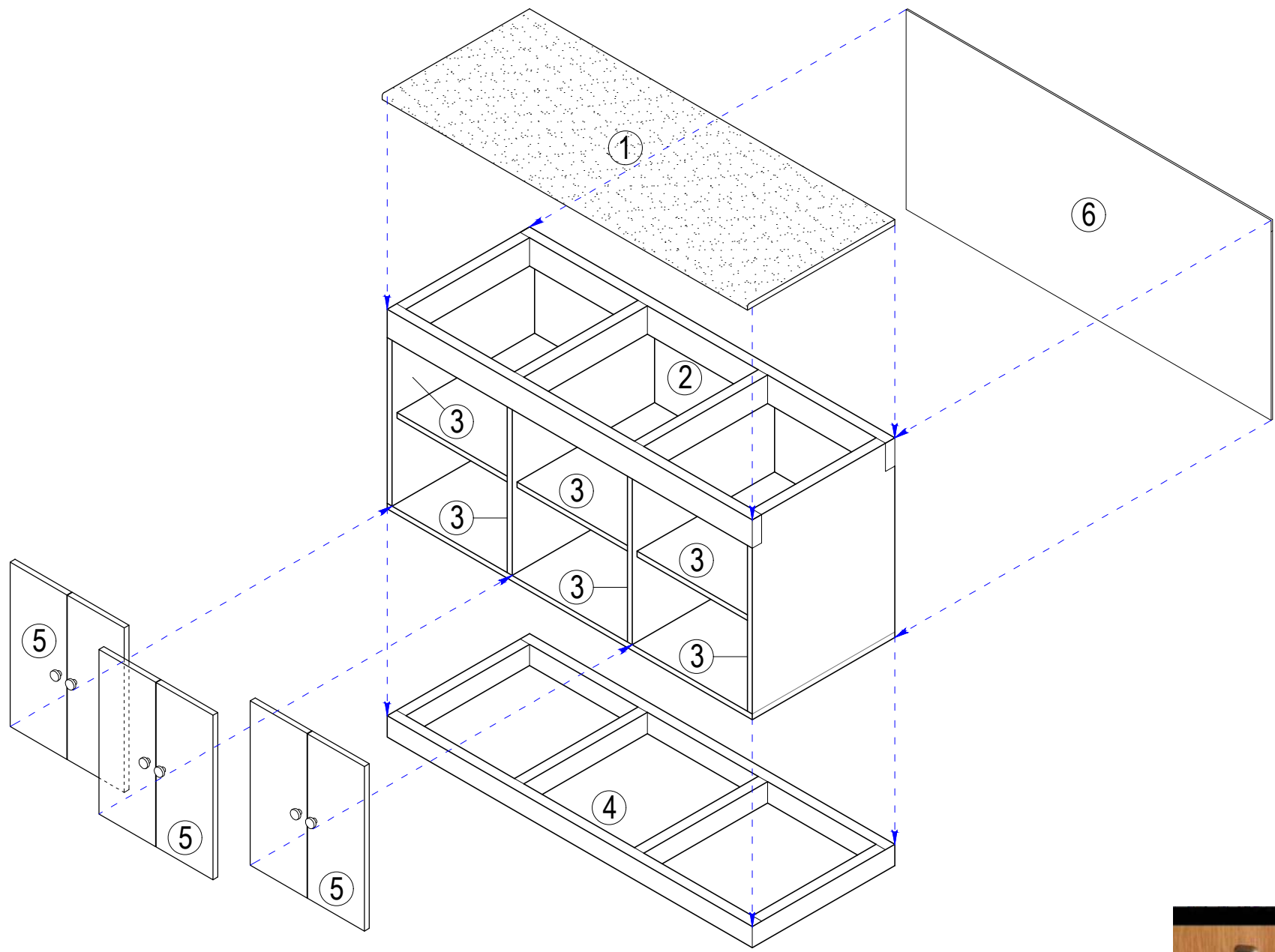


FRONT ELEVATION

DETAIL OF COUNTER 10
SCALE: 1:50M. C10

LEGEND:

- ① 20mm. thk. GRANITE COUNTER TOP
- ② 38mm. thk. x 100mm. HARD WOOD TOP FRAME
- ③ 20mm. thk. MARINE PLYWOOD
- ④ 38mm. thk. x 75mm. HARD WOOD BASE FRAME
- ⑤ 20mm. thk. MARINE PLYWOOD CABINET DOORS, PROVIDE CONCEALED HINGES (2pcs./door), MAGNETIC CATCHES AND PULLS
- ⑥ 6mm. thk. MARINE PLYWOOD BACK BOARD

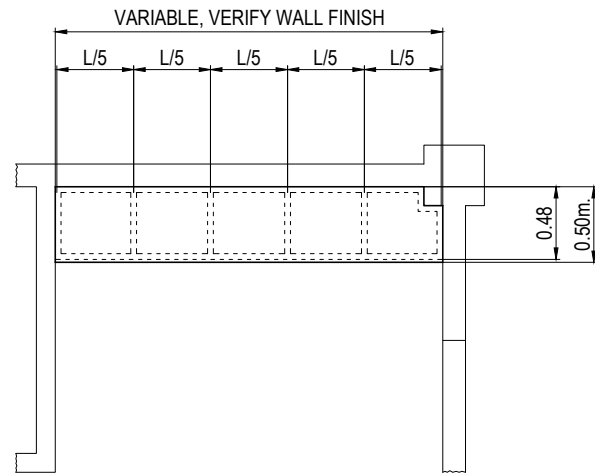


EXPLODED VIEW

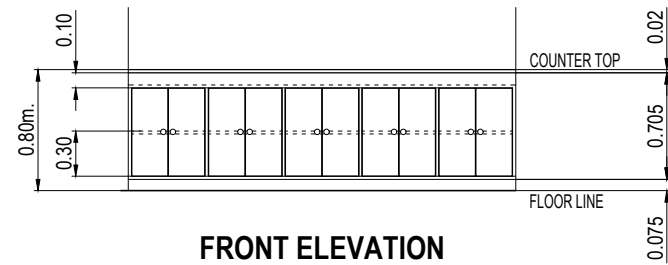


TYPICAL DETAIL OF CONCEALED HINGES

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	REVISIONS																											
REV.	DATE	BY	DESCRIPTION																									
SHEET CONTENT: AS INDICATED																												



PLAN



FRONT ELEVATION

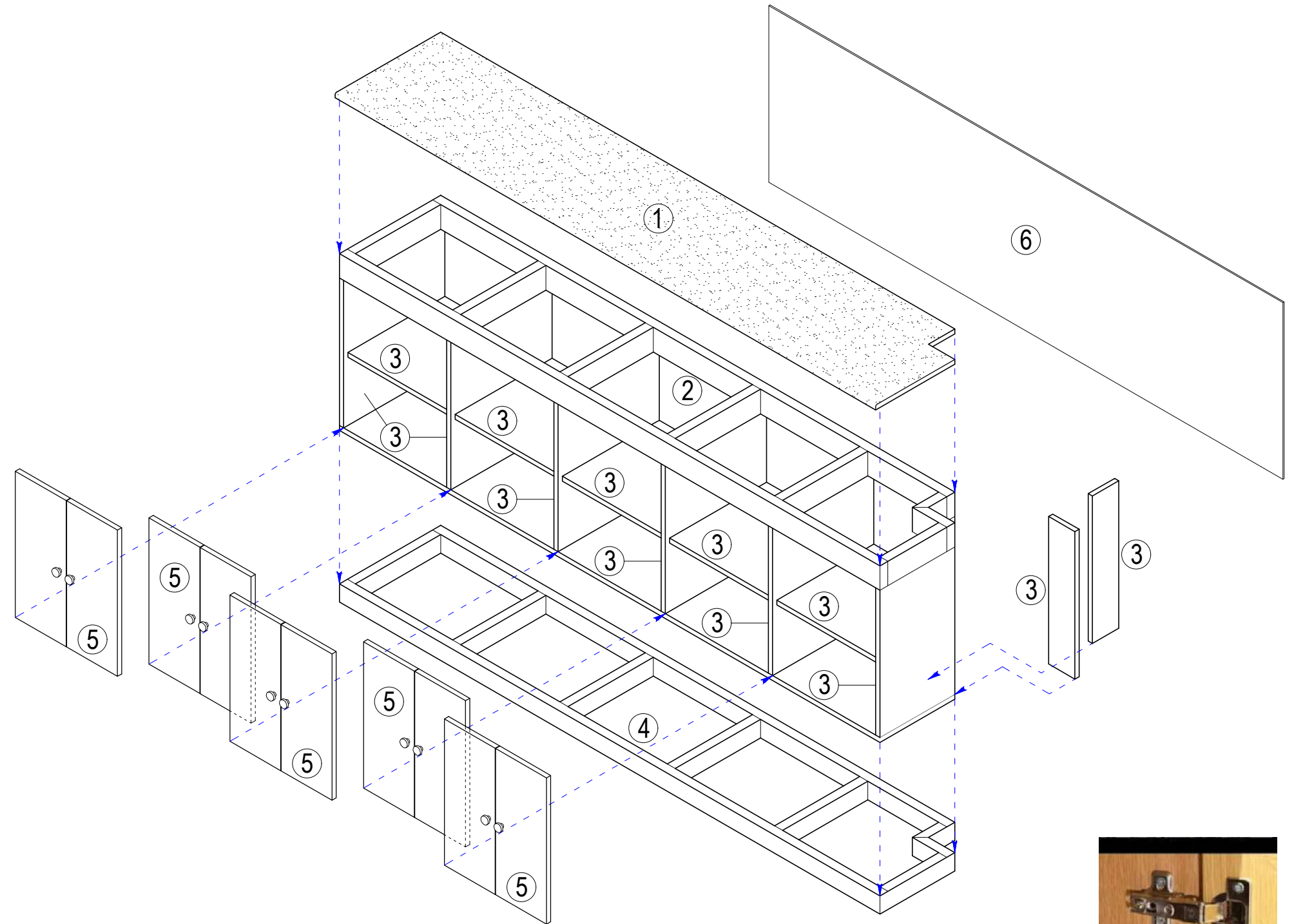
DETAIL OF COUNTER 11

SCALE: 1:50M.

C11

LEGEND:

- ① 20mm. thk. GRANITE COUNTER TOP
- ② 38mm. thk. x 100mm. HARD WOOD TOP FRAME
- ③ 20mm. thk. MARINE PLYWOOD
- ④ 38mm. thk. x 75mm. HARD WOOD BASE FRAME
- ⑤ 20mm. thk. MARINE PLYWOOD CABINET DOORS, PROVIDE CONCEALED HINGES (2pcs./door), MAGNETIC CATCHES AND PULLS
- ⑥ 6mm. thk. MARINE PLYWOOD BACK BOARD

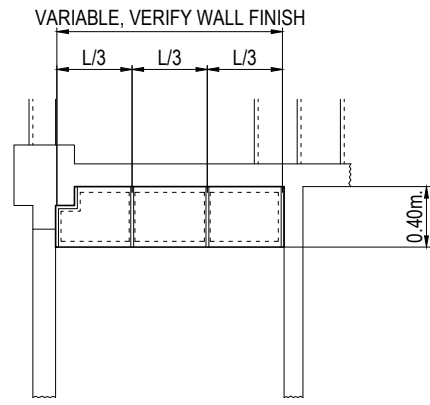


EXPLODED VIEW

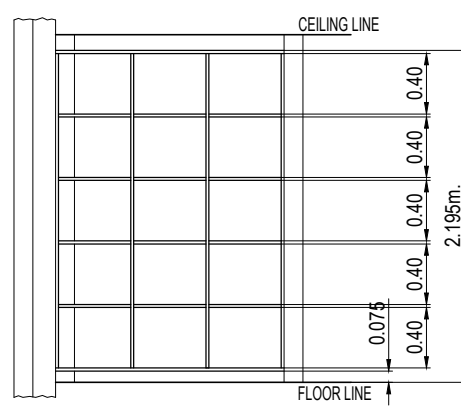


TYPICAL DETAIL OF CONCEALED HINGES

REV.	DATE	BY	REVISIONS		PROJECT:	DRAWN BY:	PREPARED BY:	CHECKED & REVIEWED BY:	REVIEWED AND SUBMITTED BY:	RECOMMENDING PROJECT IMPLEMENTATION:	APPROVED FOR PROJECT IMPLEMENTATION:	SHEET NO.
			DESCRIPTION									
					PROPOSED LABORATORY RENOVATION, ZCWD WATER TREATMENT PLANT, ZAMBOANGA CITY							31
SHEET CONTENT:					AS INDICATED	ARTHUR A. REYES PRINCIPAL DRAFTSMAN B - DESIGN DIVISION	BUNNY L. DAMPIOS SENIOR ENGINEER A - DESIGN DIVISION	REX D. SALE, JR. SUPERVISING ENGINEER A - DESIGN DIVISION	EDITO M. BAUTISTA, JR. OIC - DESIGN DIVISION	MARLI ACOSTA - DE FIESTA DM A - ENGINEERING & CONSTRUCTION DEPARTMENT OIC - TECHNICAL SERVICES GROUP	LEONARDO REY D. VASQUEZ GENERAL MANAGER	



PLAN



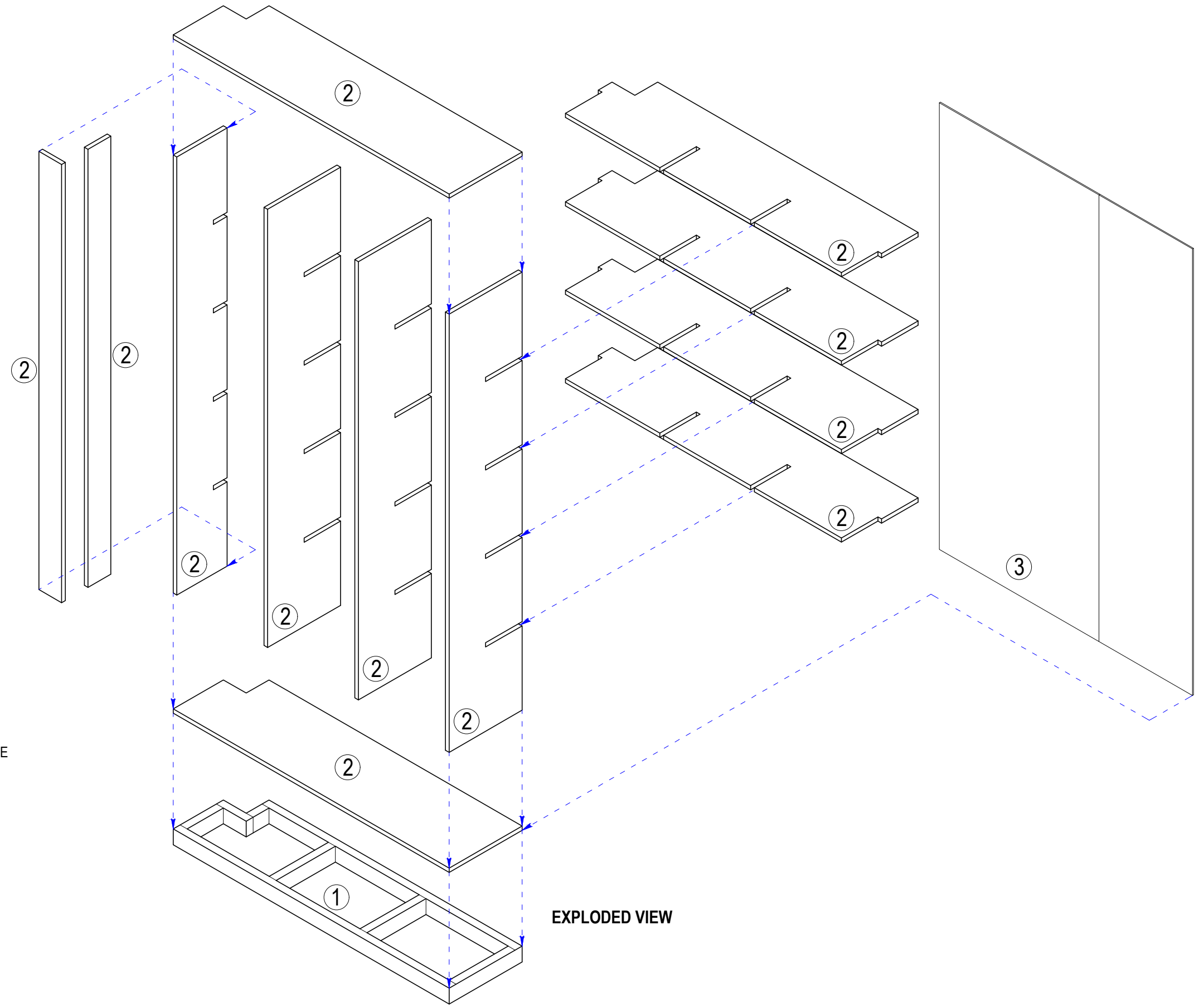
FRONT ELEVATION

DETAIL OF SHELF 1 (S1)

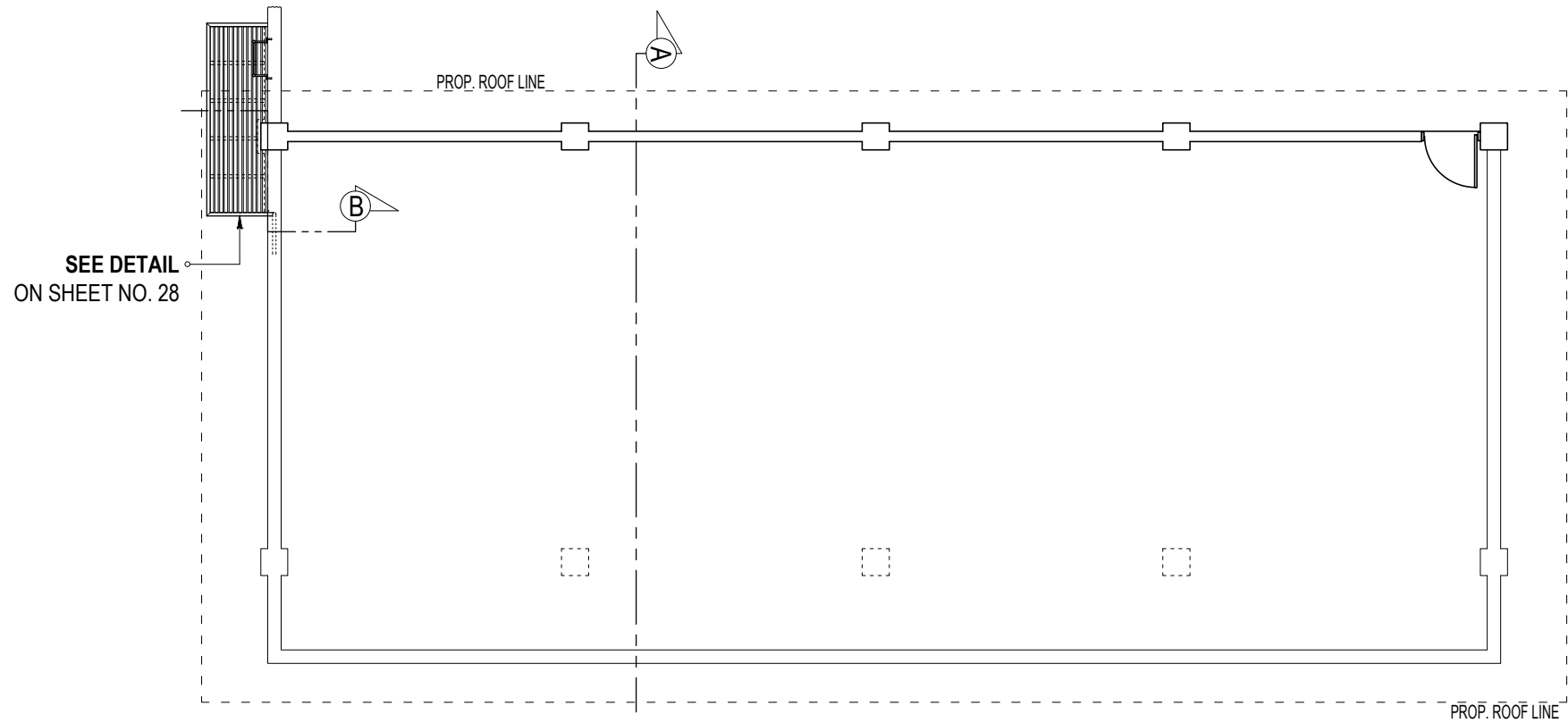
SCALE: 1:50M.

LEGEND:

- ① 38mm. thk. x 75mm. HARD WOOD BASE FRAME
- ② 20mm. thk. MARINE PLYWOOD
- ③ 6mm. thk. MARINE PLYWOOD BACK BOARD



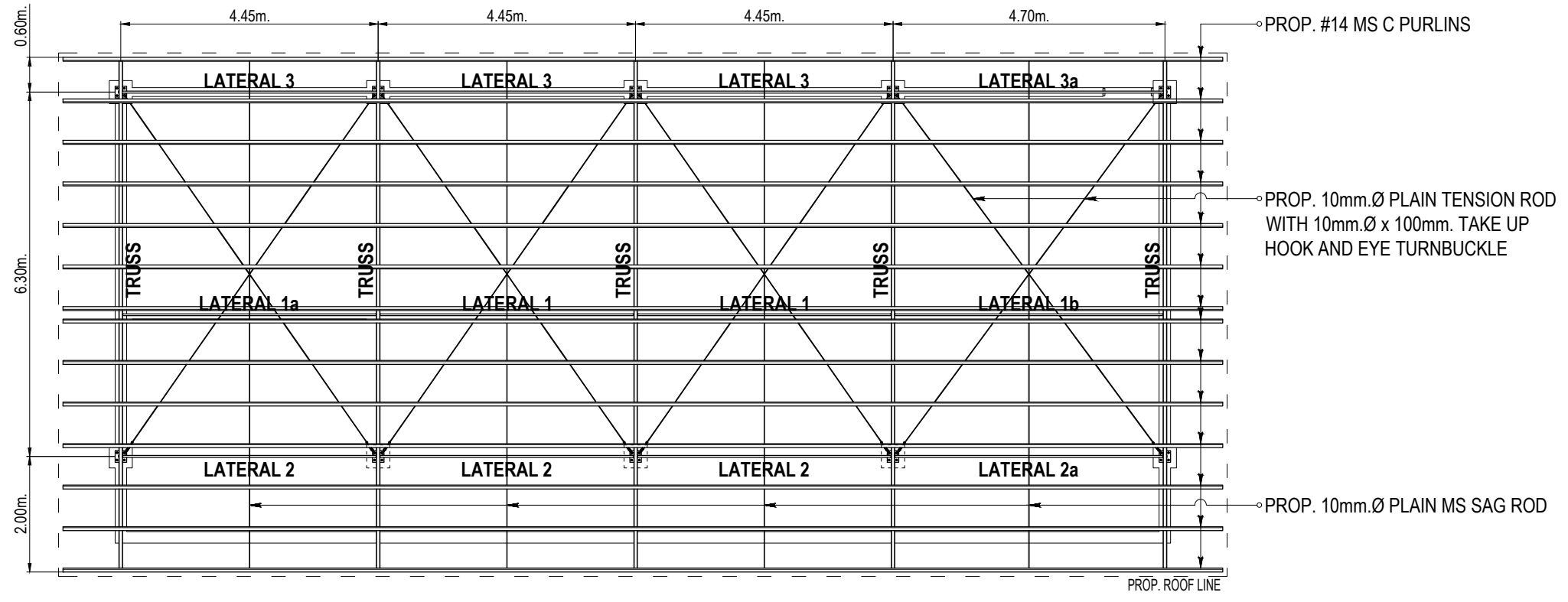
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	REV.	DATE	BY	DESCRIPTION																								
<p>SHEET CONTENT:</p> <p>AS INDICATED</p>																												



SEE DETAIL ON SHEET NO. 28

EXISTING ROOF DECK FLOOR PLAN

SCALE: 1:100M.



PROP. ROOF FRAMING PLAN

SCALE: 1:100M.



REVISIONS				
REV.	DATE	BY	DESCRIPTION	

PROJECT: PROPOSED LABORATORY RENOVATION, ZCWD WATER TREATMENT PLANT, ZAMBOANGA CITY

SHEET CONTENT: AS INDICATED

DRAWN BY: *Arthur A. Reyes*
ARTHUR A. REYES
 PRINCIPAL DRAFTSMAN B - DESIGN DIVISION

PREPARED BY: *Bunny L. Dampios*
BUNNY L. DAMPIOS
 SENIOR ENGINEER A - DESIGN DIVISION

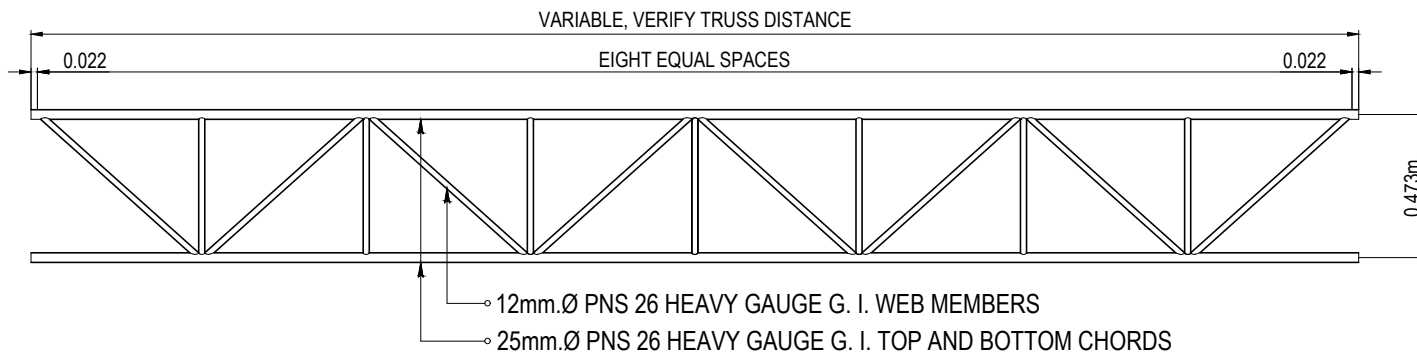
CHECKED & REVIEWED BY: *Rex D. Sale, Jr.*
REX D. SALE, JR.
 SUPERVISING ENGINEER A - DESIGN DIVISION

REVIEWED AND SUBMITTED BY: *Edito M. Bautista, Jr.*
EDITO M. BAUTISTA, JR.
 OIC - DESIGN DIVISION

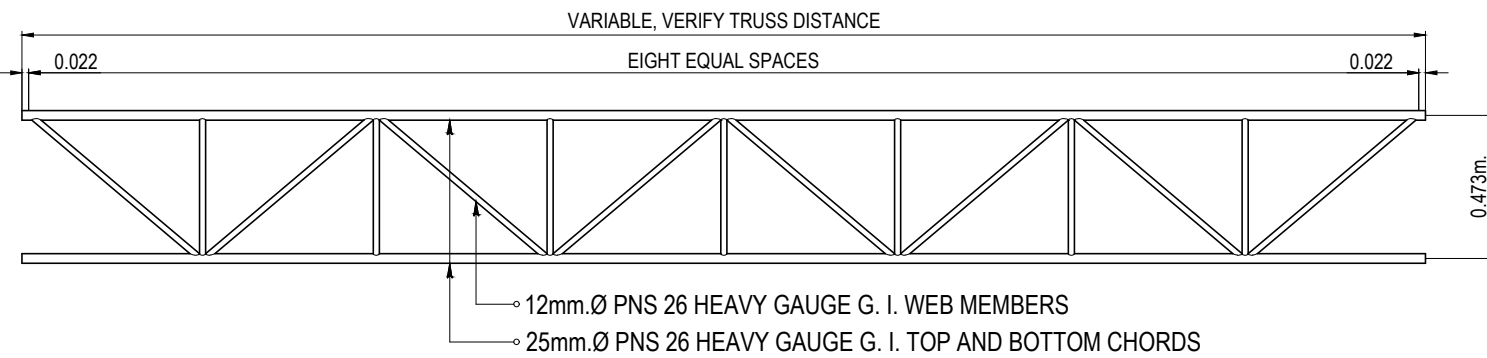
RECOMMENDING PROJECT IMPLEMENTATION: *Marli Acosta - De Fiesta*
MARLI ACOSTA - DE FIESTA
 DM A - ENGINEERING & CONSTRUCTION DEPARTMENT
 OIC - TECHNICAL SERVICES GROUP

APPROVED FOR PROJECT IMPLEMENTATION: *Leonardo Rey D. Vasquez*
LEONARDO REY D. VASQUEZ
 GENERAL MANAGER

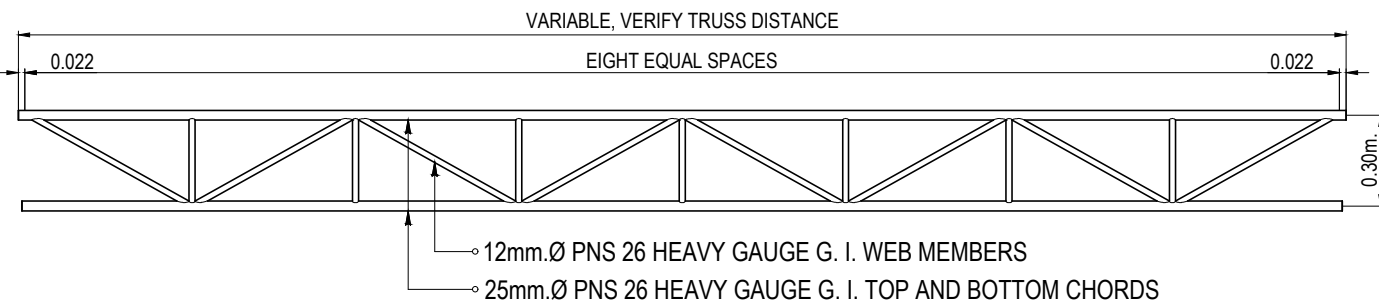
SHEET NO. 33



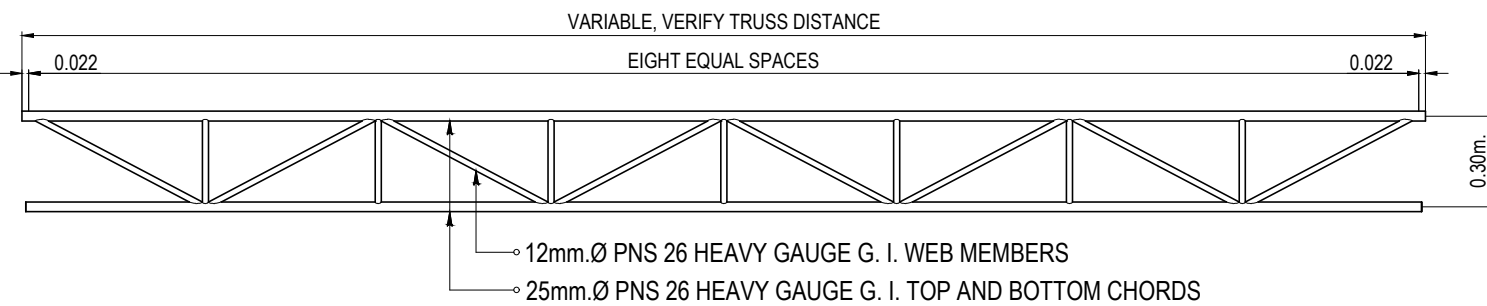
LATERAL 2



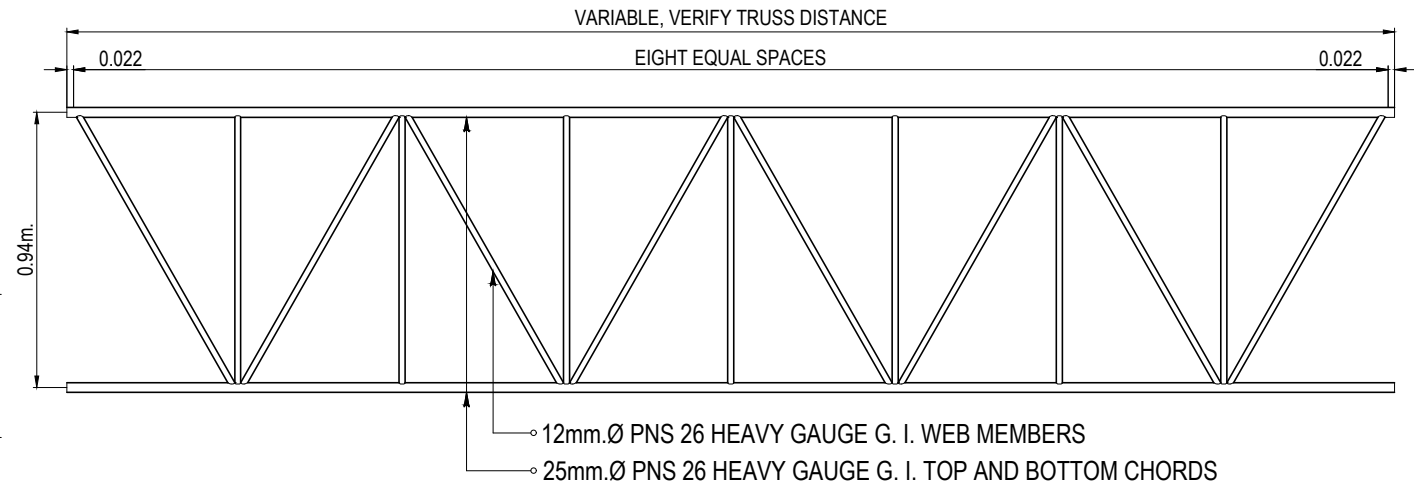
LATERAL 2a



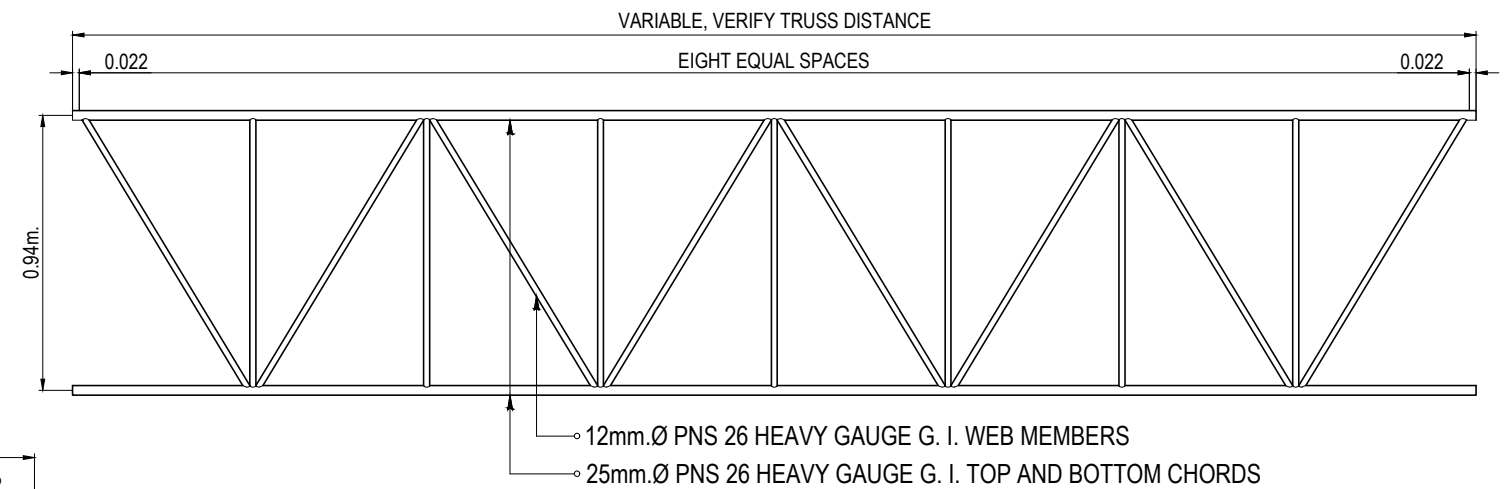
LATERAL 3



LATERAL 3a



LATERAL 1

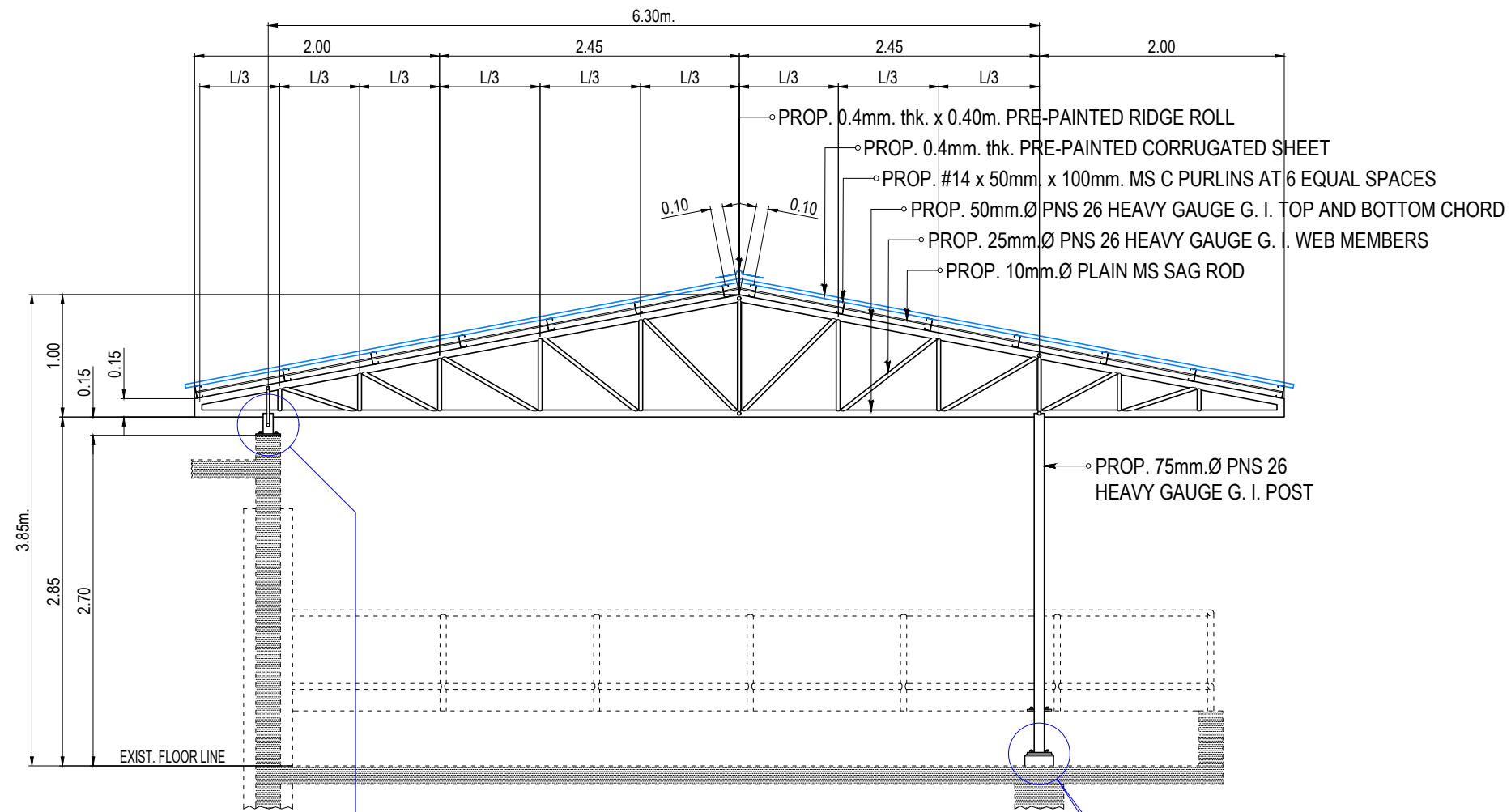


LATERAL 1a

DETAIL OF LATERALS

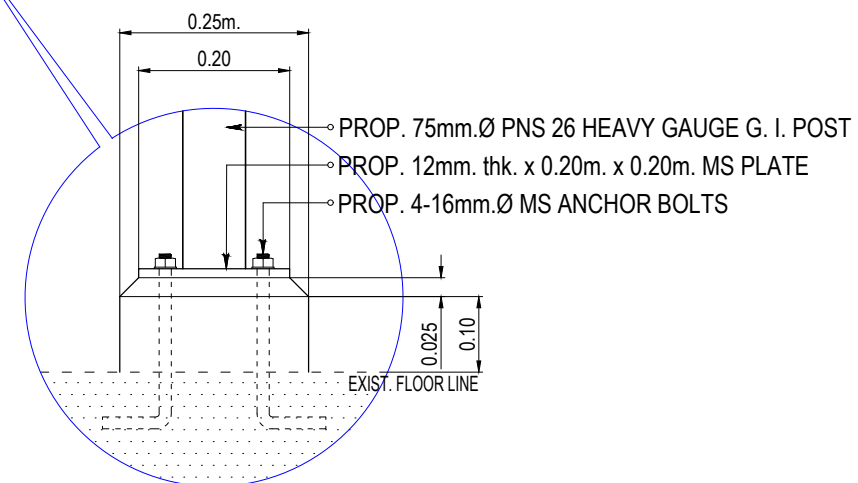
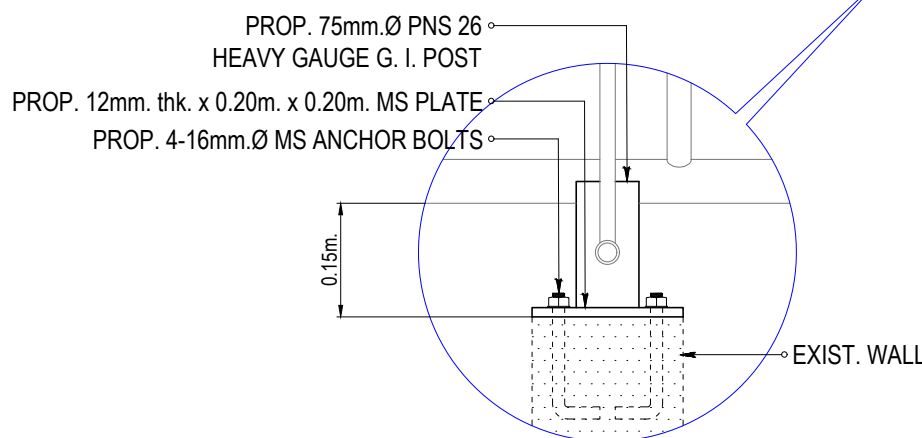
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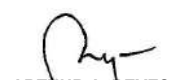
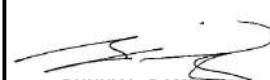

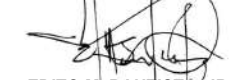

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REV.	DATE	BY	DESCRIPTION																													
SHEET CONTENT: AS INDICATED																																

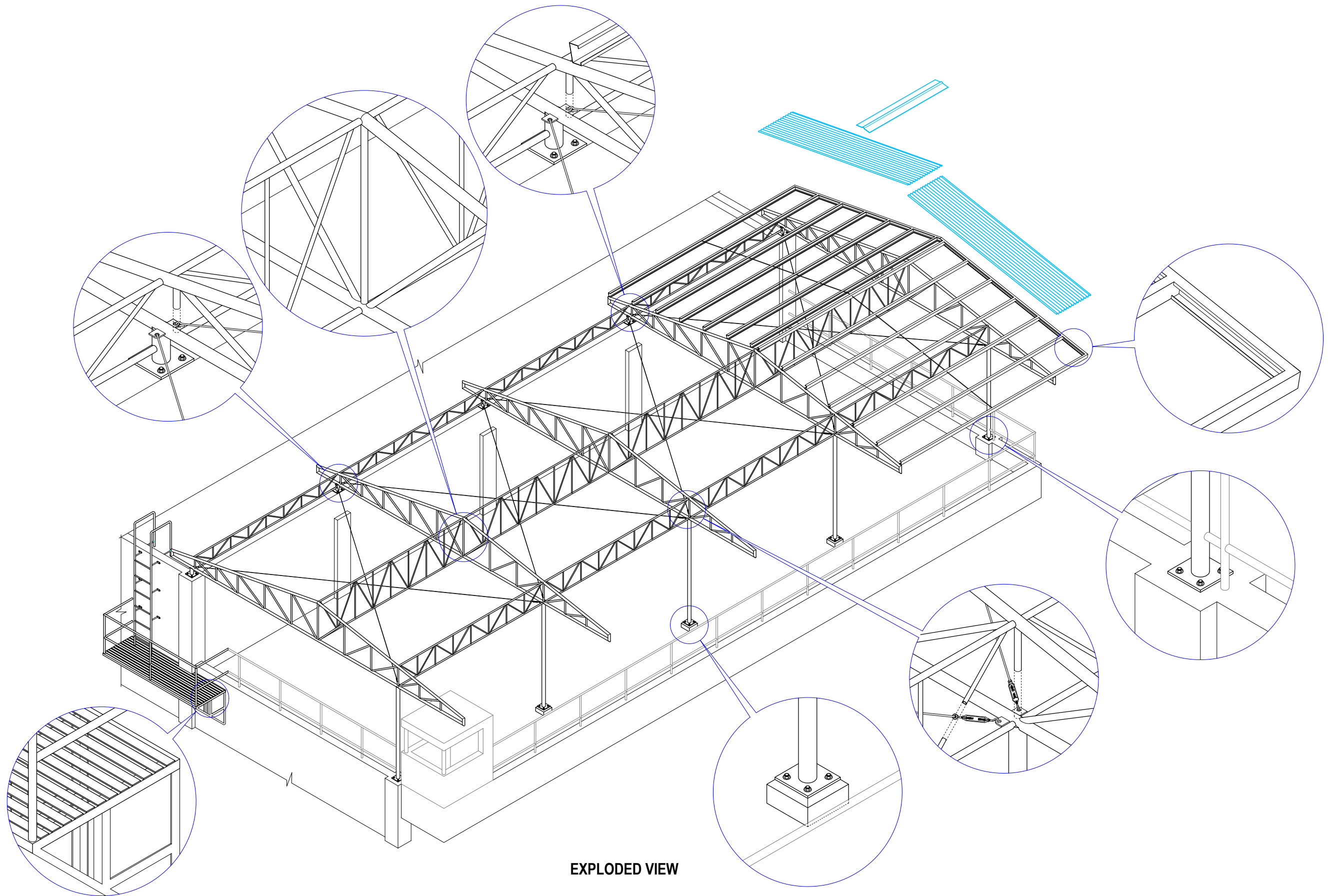


- PROP. 0.4mm. thk. x 0.40m. PRE-PAINTED RIDGE ROLL
- PROP. 0.4mm. thk. PRE-PAINTED CORRUGATED SHEET
- PROP. #14 x 50mm. x 100mm. MS C PURLINS AT 6 EQUAL SPACES
- PROP. 50mm.Ø PNS 26 HEAVY GAUGE G. I. TOP AND BOTTOM CHORD
- PROP. 25mm.Ø PNS 26 HEAVY GAUGE G. I. WEB MEMBERS
- PROP. 10mm.Ø PLAIN MS SAG ROD



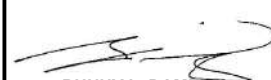

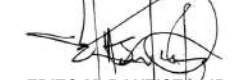

CROSS SECTION THRU A
SCALE: 1:50M.

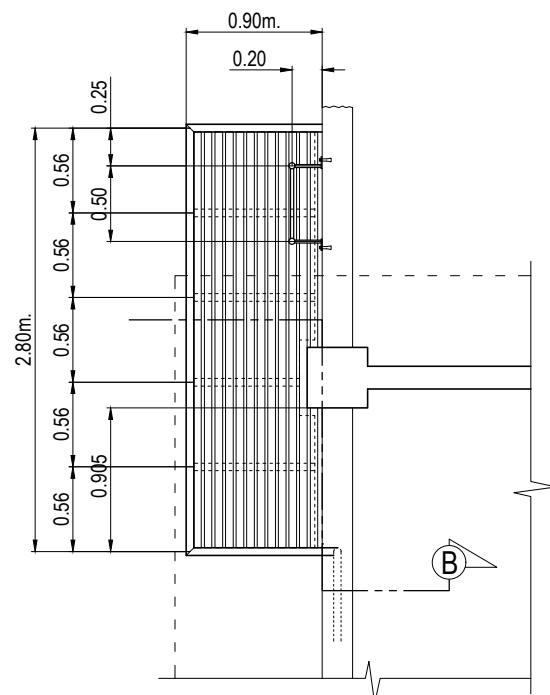


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	REVISIONS																											
REV.	DATE	BY	DESCRIPTION																									
SHEET CONTENT: AS INDICATED		Digitally signed by Acosta-De Fiesta Marli Patagoc Date: 2021.06.04 10:34:44 +0800																										

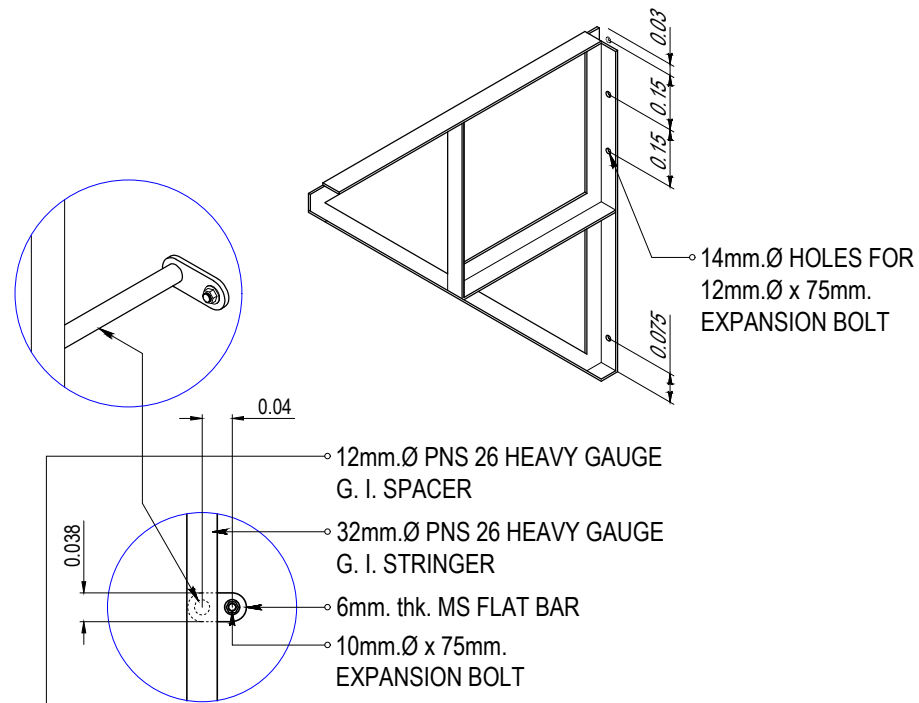


EXPLODED VIEW

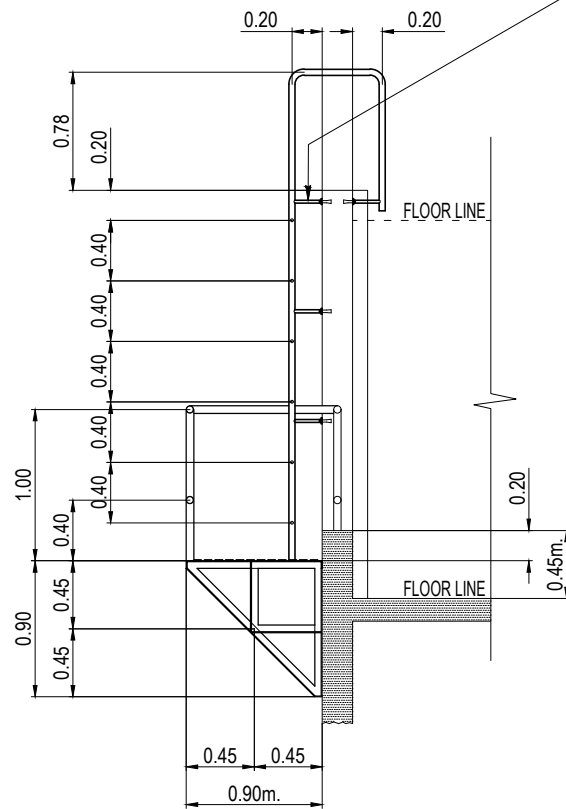
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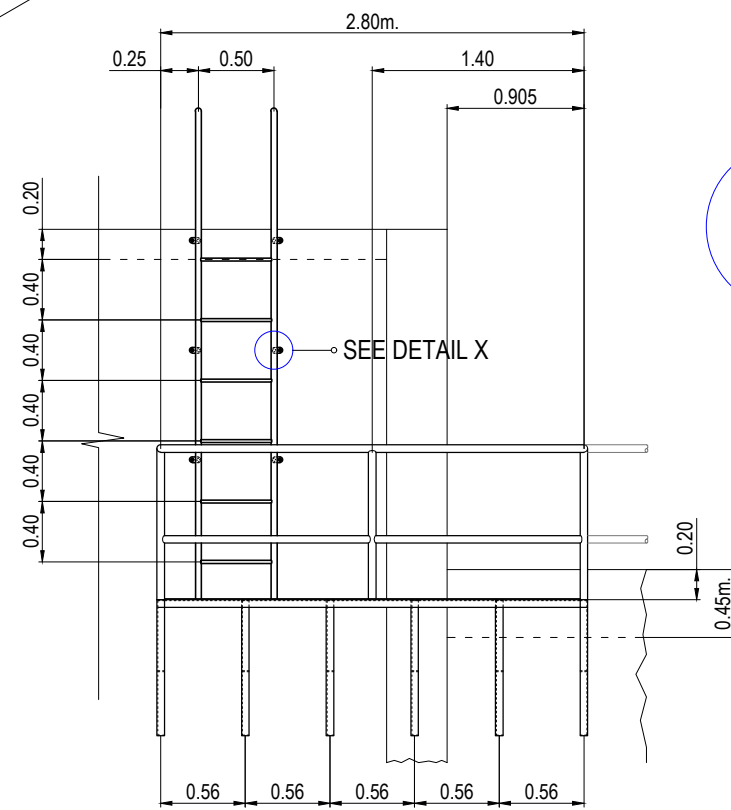
PLAN



DETAIL X



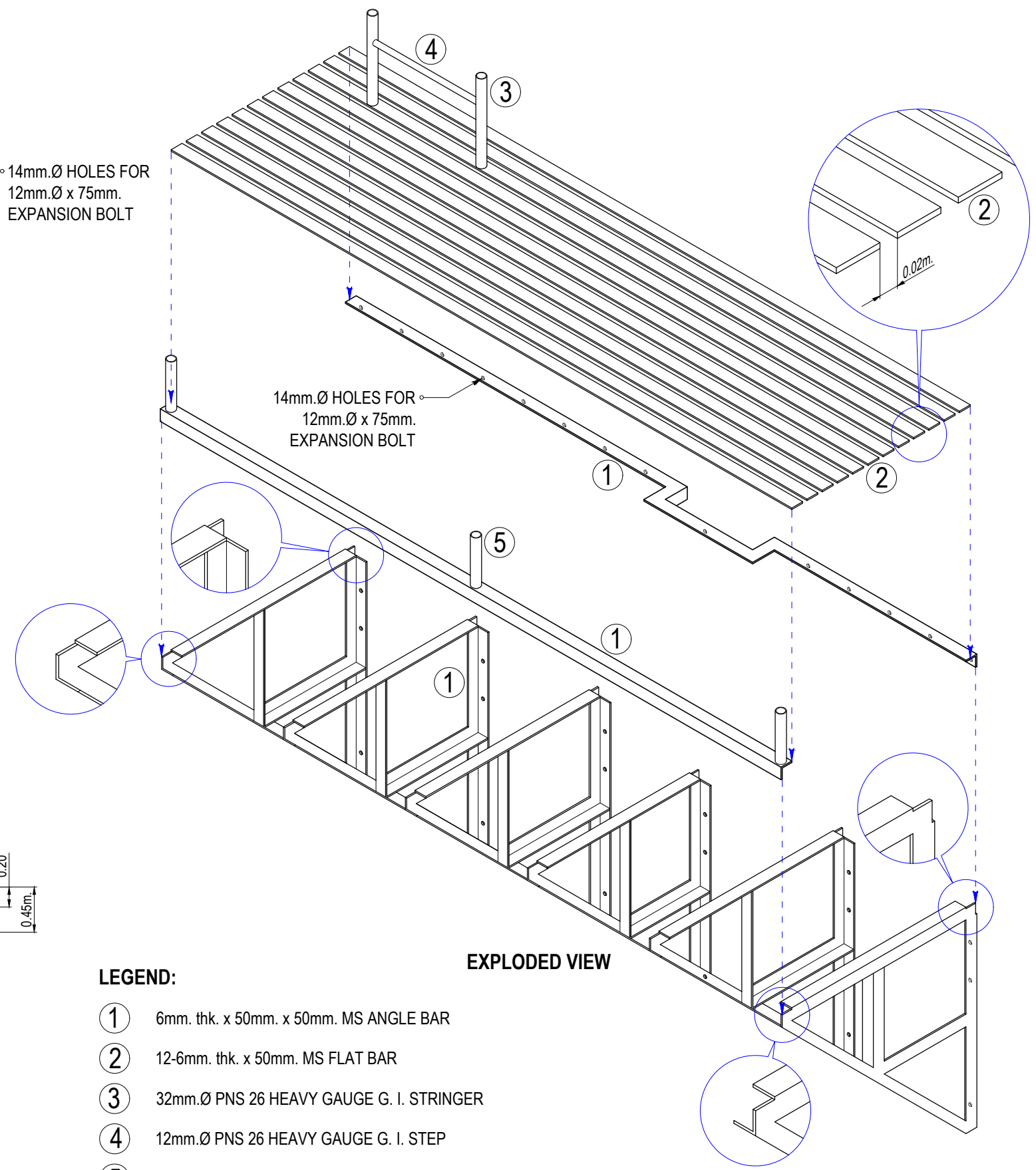
CROSS SECTION THRU B



LEFT SIDE ELEVATION

DETAIL OF FLAT FORM

SCALE: 1:50M.

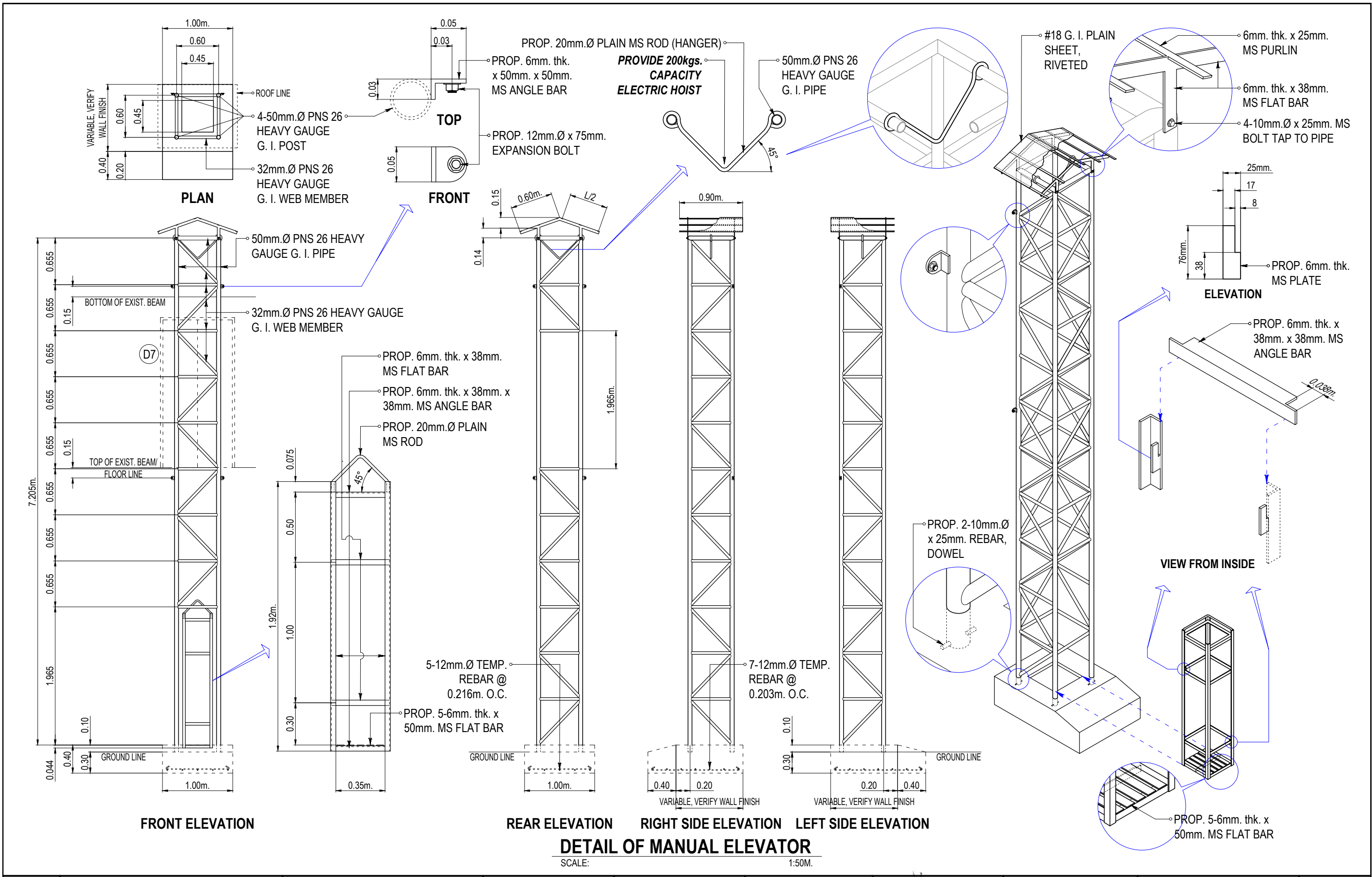


EXPLODED VIEW

LEGEND:



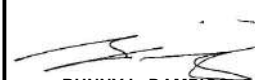
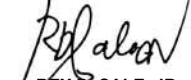


- ① 6mm. thk. x 50mm. x 50mm. MS ANGLE BAR
- ② 12-6mm. thk. x 50mm. MS FLAT BAR
- ③ 32mm.Ø PNS 26 HEAVY GAUGE G. I. STRINGER
- ④ 12mm.Ø PNS 26 HEAVY GAUGE G. I. STEP
- ⑤ 38mm.Ø PNS 26 HEAVY GAUGE G. I. RAILING

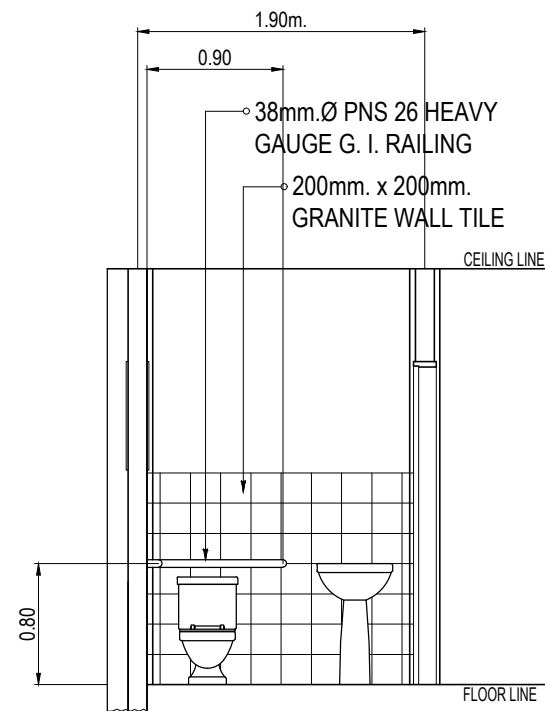
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REV.	DATE	BY	DESCRIPTION								
				PROPOSED LABORATORY RENOVATION, ZCWD WATER TREATMENT PLANT, ZAMBOANGA CITY	 ARTHUR A. REYES PRINCIPAL DRAFTSMAN B - DESIGN DIVISION	 BUNNY L. DAMPIOS SENIOR ENGINEER A - DESIGN DIVISION	 REX D. SALE, JR. SUPERVISING ENGINEER A - DESIGN DIVISION	 EDITO M. BAUTISTA, JR. OIC - DESIGN DIVISION	 MARLI ACOSTA - DE FIESTA DM A - ENGINEERING & CONSTRUCTION DEPARTMENT OIC - TECHNICAL SERVICES GROUP	 LEONARDO REY D. VASQUEZ GENERAL MANAGER	37
SHEET CONTENT:				AS INDICATED							



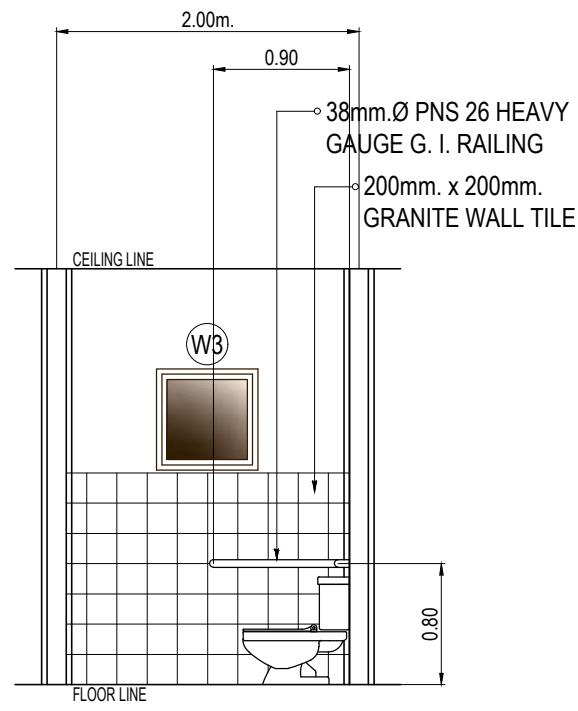
DETAIL OF MANUAL ELEVATOR

SCALE: 1:50M.

	REVISIONS REV. DATE BY DESCRIPTION				PROJECT: PROPOSED LABORATORY RENOVATION, ZCWD WATER TREATMENT PLANT, ZAMBOANGA CITY	DRAWN BY:  ARTHUR A. REYES PRINCIPAL DRAFTSMAN B - DESIGN DIVISION	PREPARED BY:  BUNNY L. DAMPIOS SENIOR ENGINEER A - DESIGN DIVISION	CHECKED & REVIEWED BY:  REX D. SALE, JR. SUPERVISING ENGINEER A - DESIGN DIVISION	REVIEWED AND SUBMITTED BY:  EDITO M. BAUTISTA, JR. OIC - DESIGN DIVISION	RECOMMENDING PROJECT IMPLEMENTATION:  MARLI ACOSTA - DE FIESTA DM A - ENGINEERING & CONSTRUCTION DEPARTMENT OIC - TECHNICAL SERVICES GROUP	APPROVED FOR PROJECT IMPLEMENTATION: LEONARDO REY D. VASQUEZ GENERAL MANAGER	SHEET NO. 38
	SHEET CONTENT: AS INDICATED											



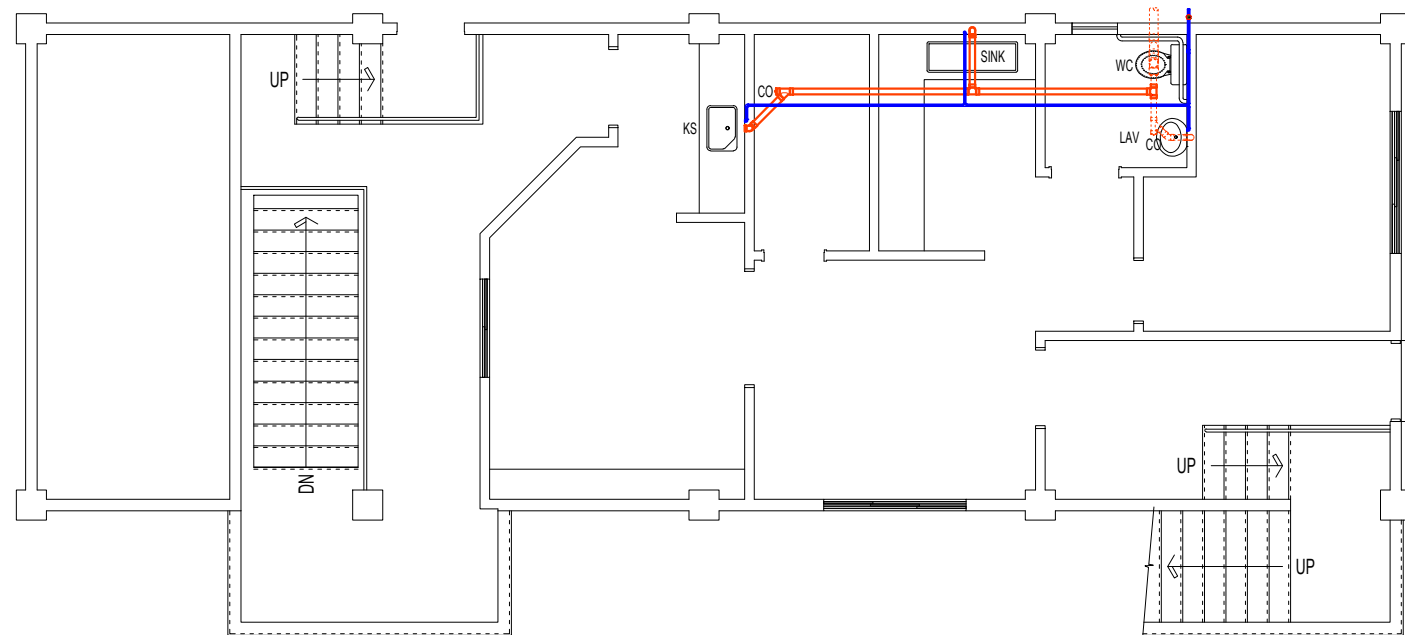
CROSS SECTION



LONGITUDINAL SECTION

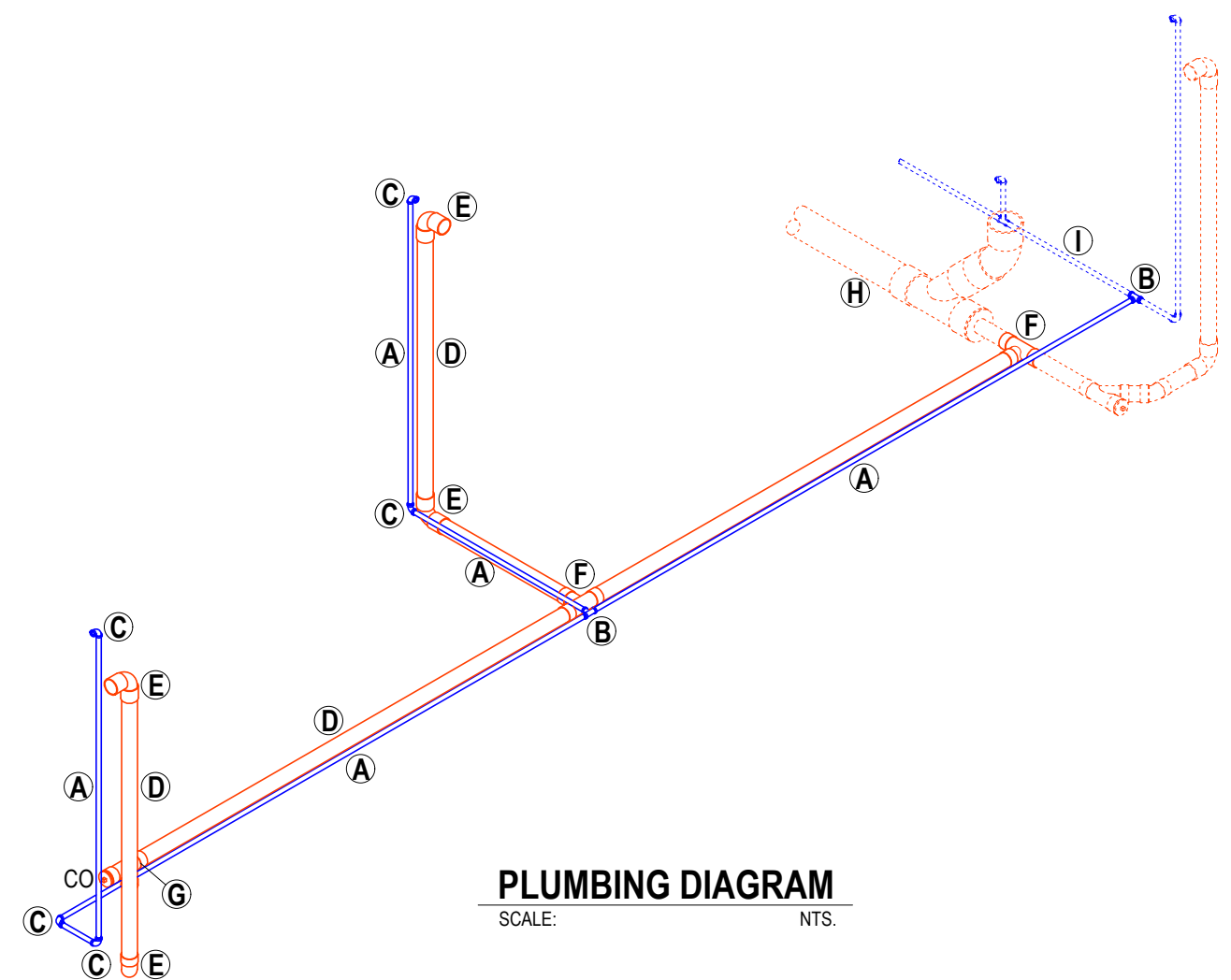
SECOND FLOOR REST ROOM

SCALE: 1:50M.



SECOND FLOOR PLUMBING LAYOUT PLAN

SCALE: 1:100M.










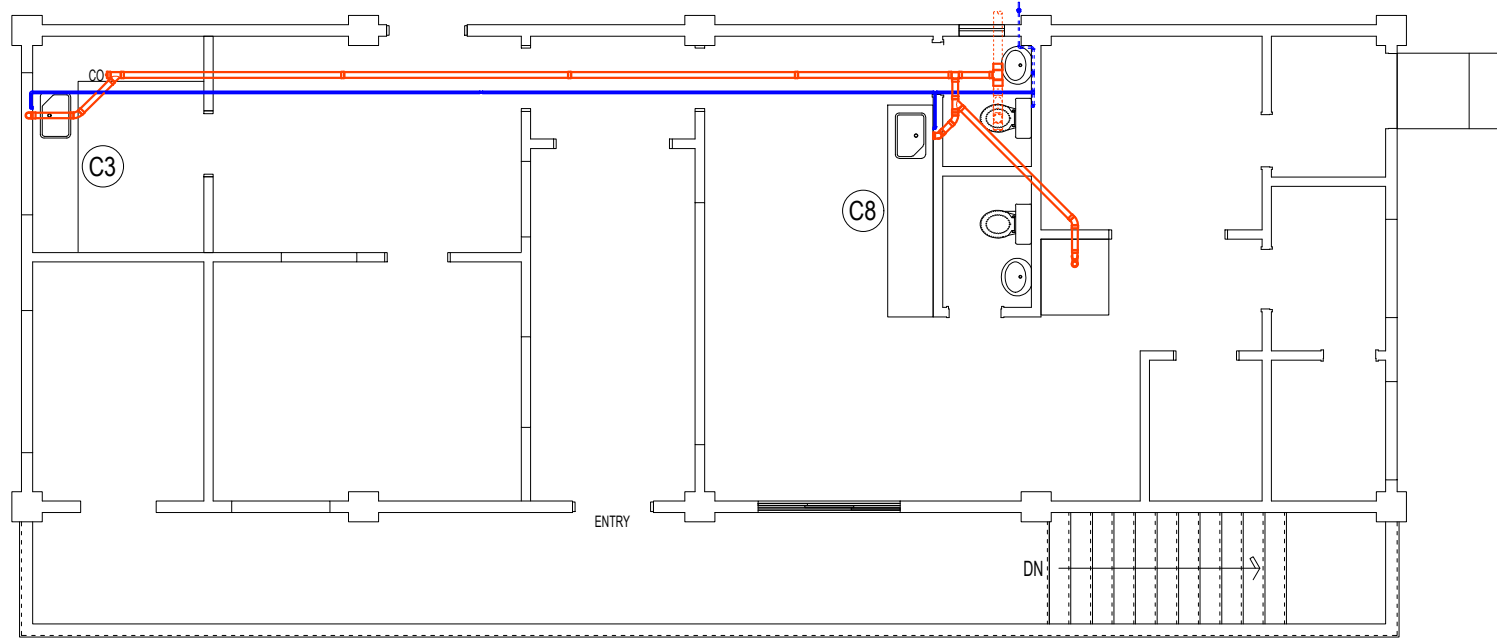
PLUMBING DIAGRAM

SCALE: NTS.

LEGEND:

- (A) 12mm.Ø PNS 26 HEAVY GAUGE G. I. PIPELINE
- (B) 12mm.Ø ANSI B16-3 CLASS 150 G. I. TEE
- (C) 12mm.Ø x 90° ANSI B16-3 CLASS 150 G. I. ELBOW
- (D) 75mm.Ø S1000 PVC PIPE
- (E) 75mm.Ø x 90° S1000 PVC ELBOW
- (F) 75mm.Ø x 75mm.Ø S1000 PVC TEE
- (G) 75mm.Ø x 75mm.Ø S1000 PVC WYE
- (H) EXISTING SANITARY PLUMBING SYSTEM
- (I) EXISTING WATER SYSTEM
- CO 75mm.Ø S1000 PVC CLEAN OUT

	<table border="1"> <thead> <tr> <th>REV.</th> <th>DATE</th> <th>BY</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>				REV.	DATE	BY	DESCRIPTION													PROJECT: PROPOSED LABORATORY RENOVATION, ZCWD WATER TREATMENT PLANT, ZAMBOANGA CITY	DRAWN BY:  ARTHUR A. REYES PRINCIPAL DRAFTSMAN B - DESIGN DIVISION	PREPARED BY:  BUNNY L. DAMPIOS SENIOR ENGINEER A - DESIGN DIVISION	CHECKED & REVIEWED BY:  REX D. SALE, JR. SUPERVISING ENGINEER A - DESIGN DIVISION	REVIEWED AND SUBMITTED BY:  EDITO M. BAUTISTA, JR. OIC - DESIGN DIVISION	RECOMMENDING PROJECT IMPLEMENTATION:  MARLI ACOSTA - DE FIESTA DM A - ENGINEERING & CONSTRUCTION DEPARTMENT OIC - TECHNICAL SERVICES GROUP	APPROVED FOR PROJECT IMPLEMENTATION:  LEONARDO REY D. VASQUEZ GENERAL MANAGER	SHEET NO. 39
	REV.	DATE	BY	DESCRIPTION																								
SHEET CONTENT: AS INDICATED																												

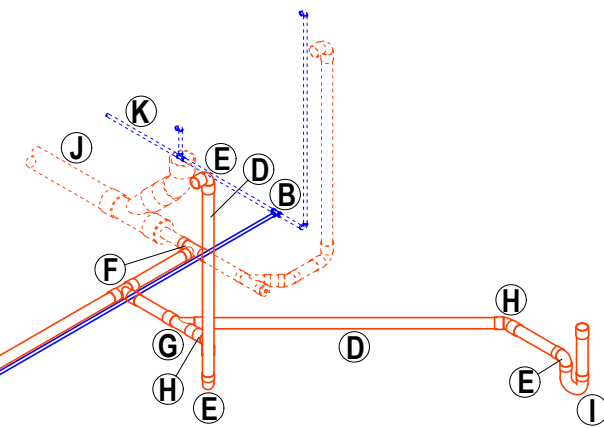


THIRD FLOOR PLUMBING LAYOUT PLAN

SCALE: 1:100M.

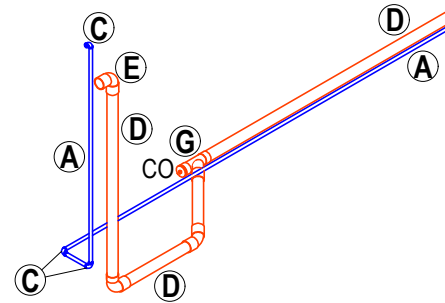
LEGEND:

- | | |
|---|---------------------------------------|
| (A) 12mm.Ø PNS 26 HEAVY GAUGE G. I. PIPELINE | (G) 75mm.Ø x 75mm.Ø S1000 PVC WYE |
| (B) 12mm.Ø ANSI B16-3 CLASS 150 G. I. TEE | (H) 75mm.Ø x 45° S1000 PVC BEND |
| (C) 12mm.Ø x 90° ANSI B16-3 CLASS 150 G. I. ELBOW | (I) 75mm.Ø S1000 PVC P TRAP |
| (D) 75mm.Ø S1000 PVC PIPE | (J) EXISTING SANITARY PLUMBING SYSTEM |
| (E) 75mm.Ø x 90° S1000 PVC ELBOW | (K) EXISTING WATER SYSTEM |
| (F) 75mm.Ø x 75mm.Ø S1000 PVC TEE | CO 75mm.Ø S1000 PVC CLEAN OUT |

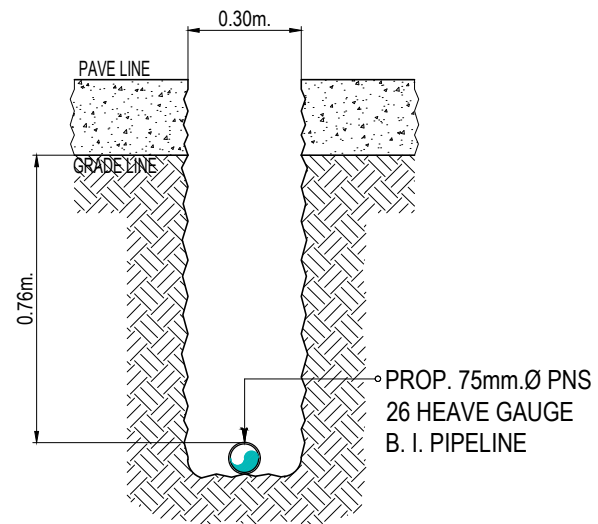


PLUMBING DIAGRAM

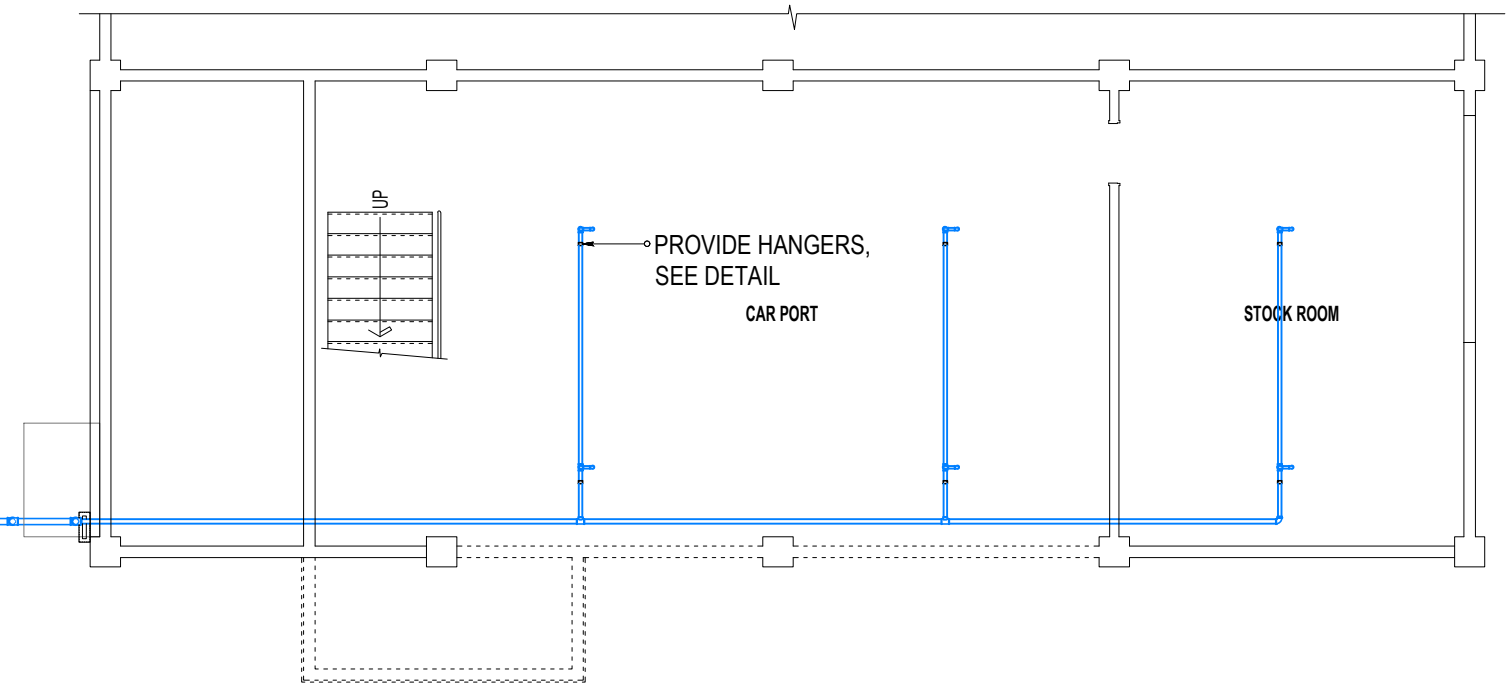
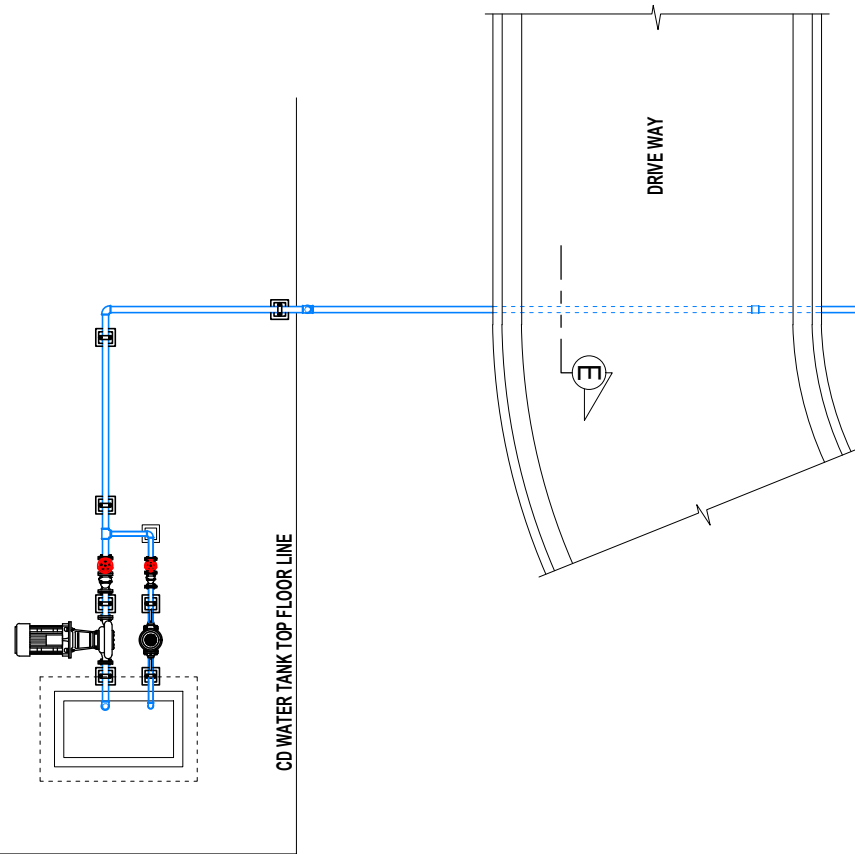
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REV.	DATE	BY	DESCRIPTION																				
SHEET CONTENT: AS INDICATED																							



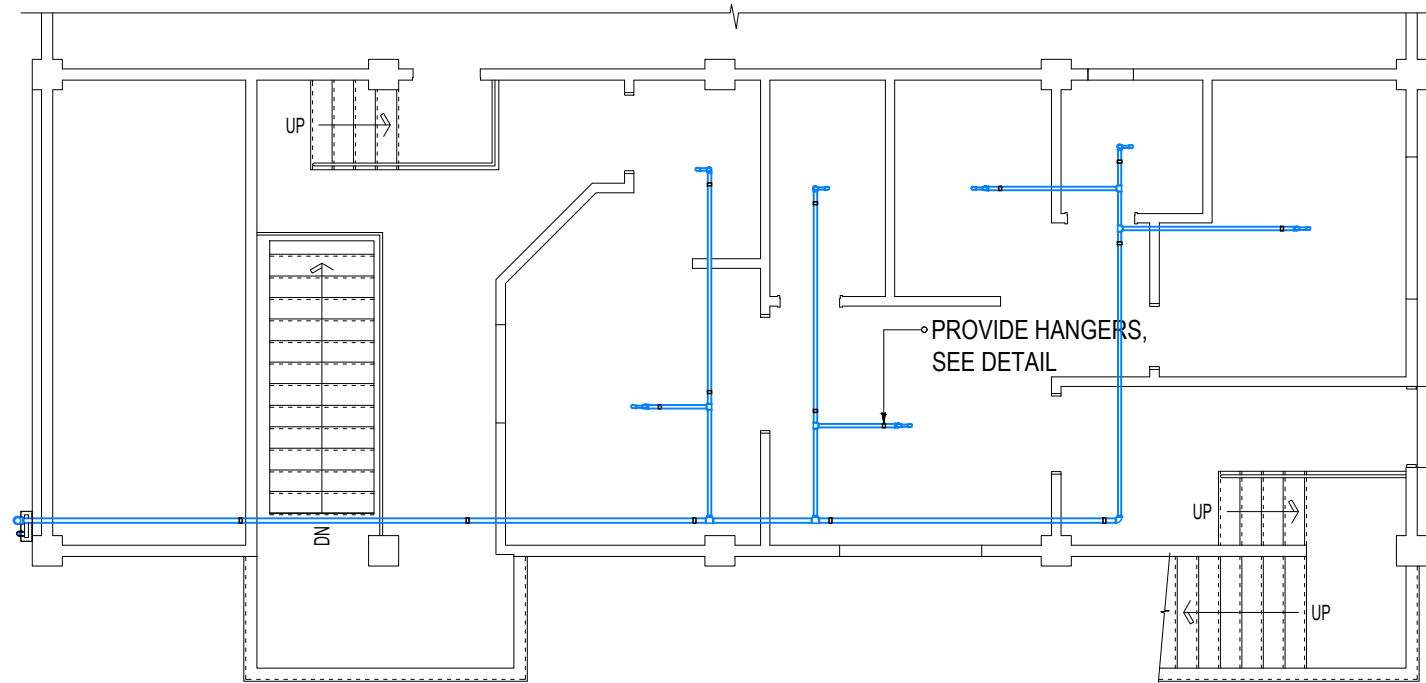
**DETAIL OF PIPELINE
INSTALLATION THRU E**



GROUND FLOOR FIRE SPRINKLER LAYOUT PLAN

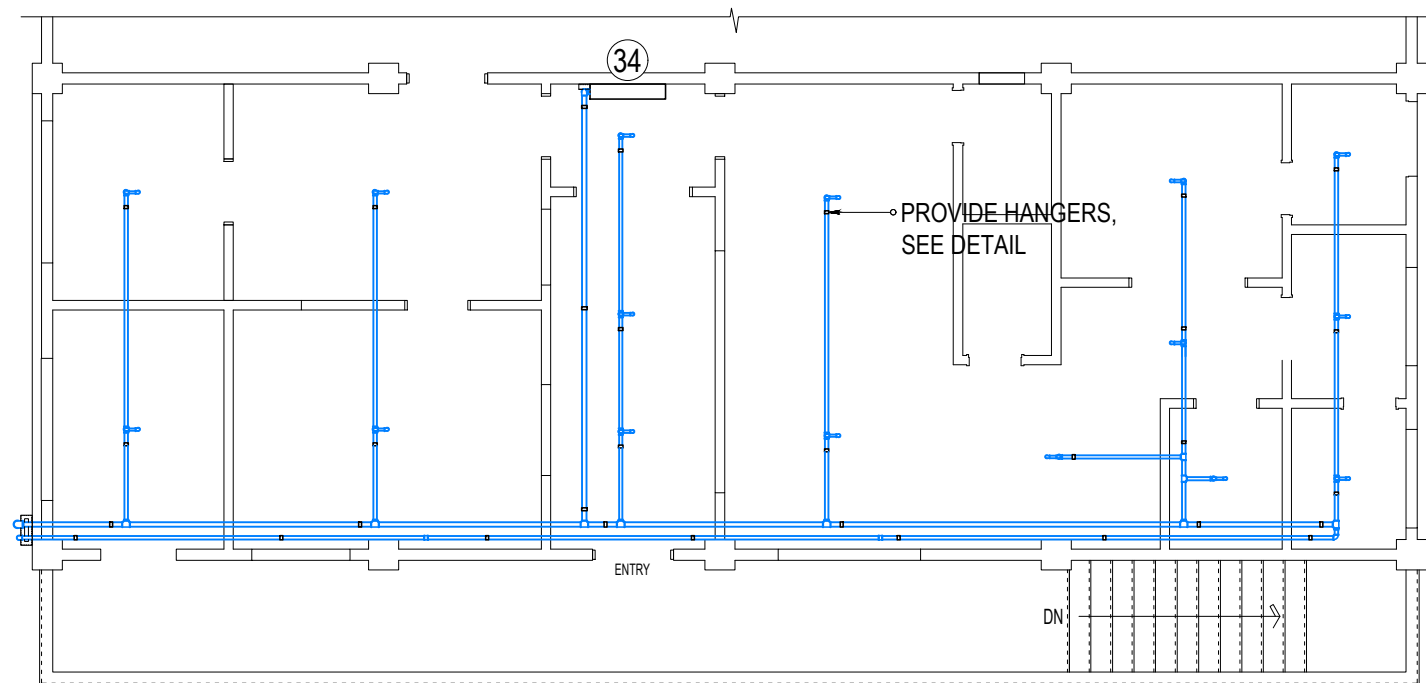
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	REVISIONS																															
REV.	DATE	BY	DESCRIPTION																													
SHEET CONTENT: AS INDICATED																																



SECOND FLOOR FIRE SPRINKLER LAYOUT PLAN

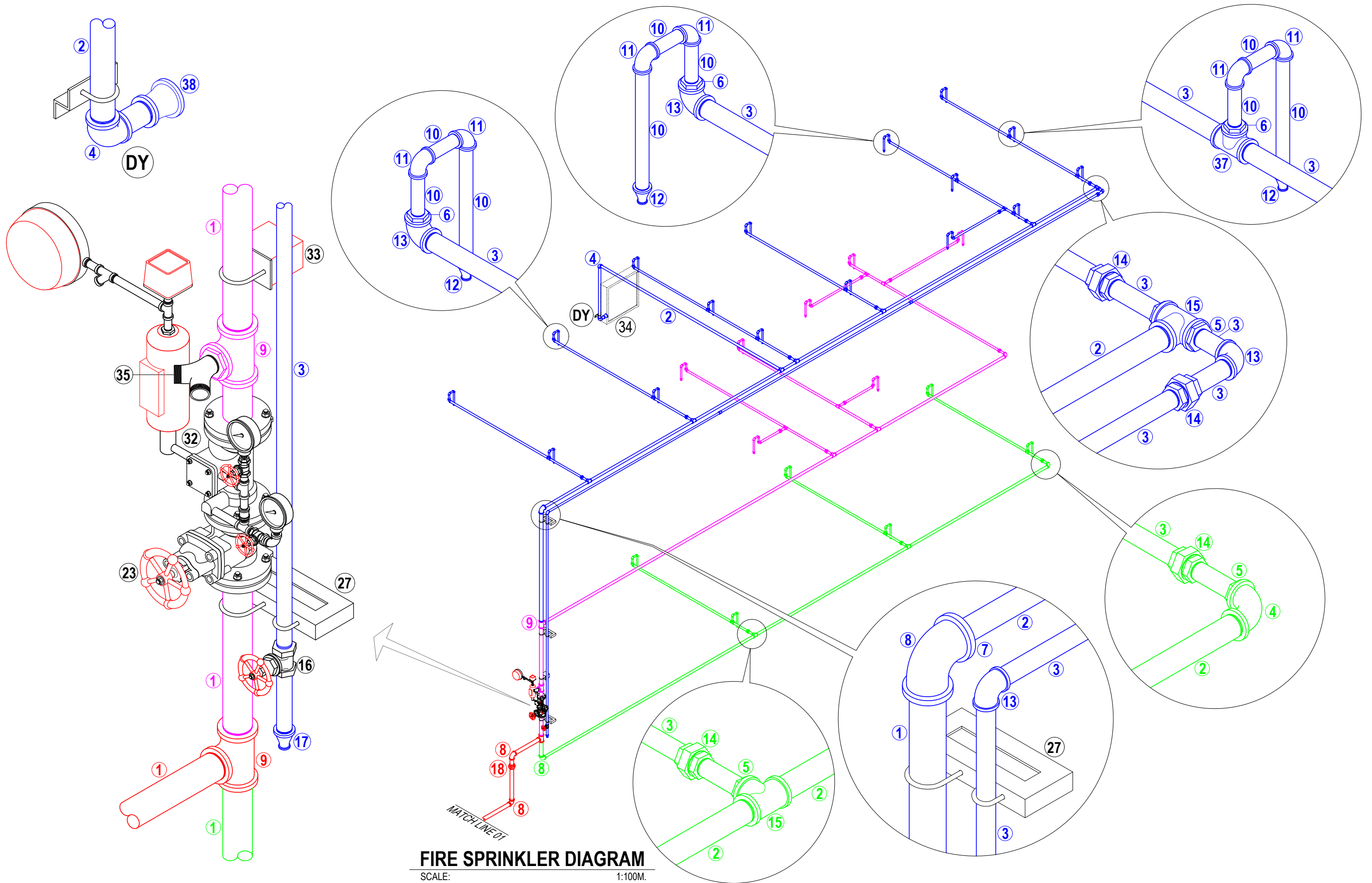
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THIRD FLOOR FIRE SPRINKLER LAYOUT PLAN

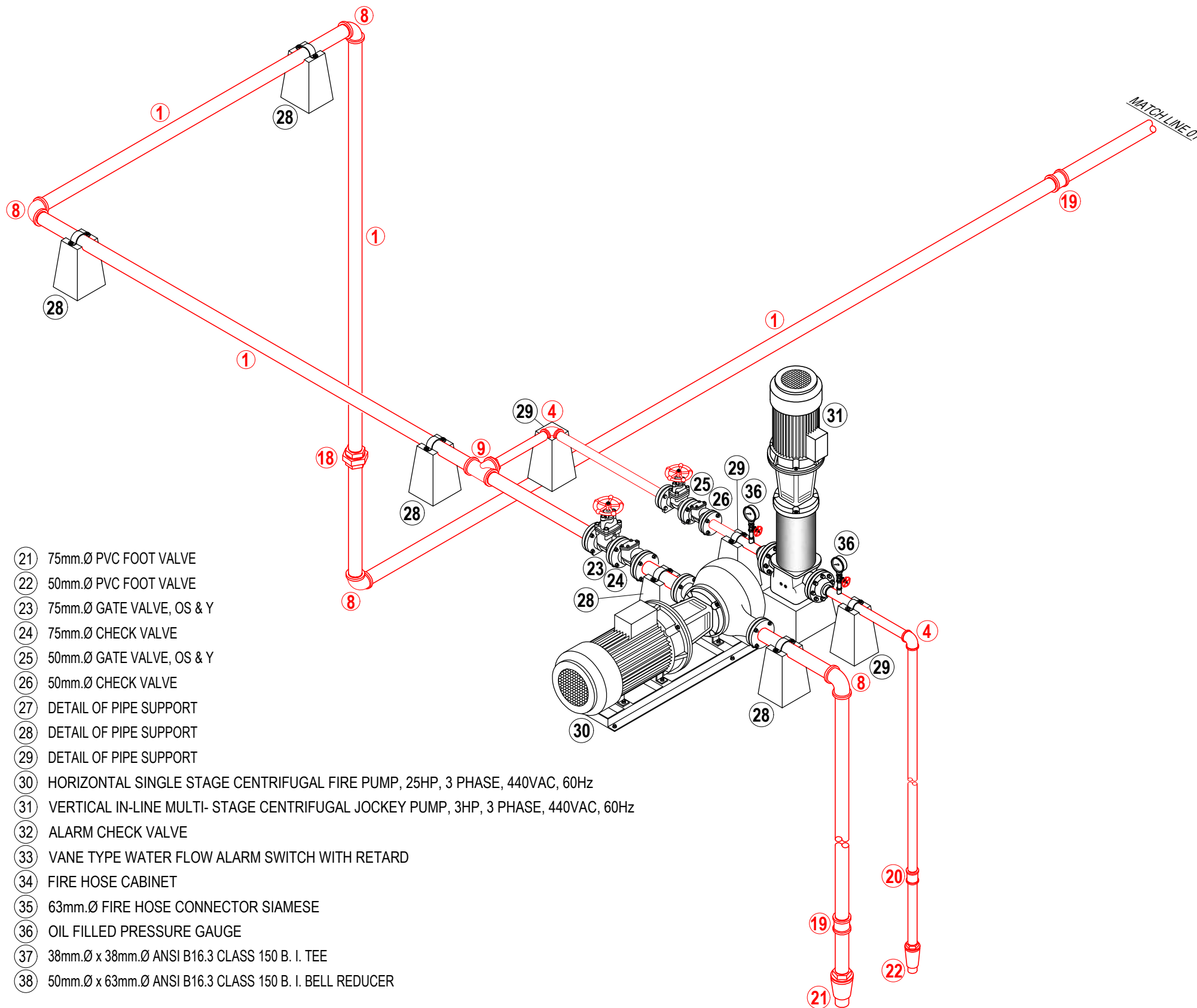
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	REVISIONS																															
REV.	DATE	BY	DESCRIPTION																													
SHEET CONTENT: AS INDICATED																																



FIRE SPRINKLER DIAGRAM
SCALE: 1:100M.

	REVISIONS REV. DATE BY DESCRIPTION				PROJECT: PROPOSED LABORATORY RENOVATION, ZCWD WATER TREATMENT PLANT, ZAMBOANGA CITY	DRAWN BY:  ARTHUR A. REYES PRINCIPAL DRAFTSMAN B - DESIGN DIVISION	PREPARED BY:  VERLIN ANN LACASTESANTOS - LORIA SENIOR ENGINEER A - DESIGN DIVISION	CHECKED & REVIEWED BY:  REX D. SALE, JR. SUPERVISING ENGINEER A - DESIGN DIVISION	REVIEWED AND SUBMITTED BY:  EDITO M. BAUTISTA, JR. OIC - DESIGN DIVISION	RECOMMENDING PROJECT IMPLEMENTATION:  Digitally signed by Acosta-De Fiesta Marli Patagoc Date: 2021.06.04 10:43:04 +08'00'	APPROVED FOR PROJECT IMPLEMENTATION:  LEONARDO REY D. VASQUEZ GENERAL MANAGER	SHEET NO. 43
	SHEET CONTENT: AS INDICATED											







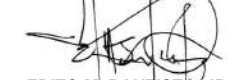
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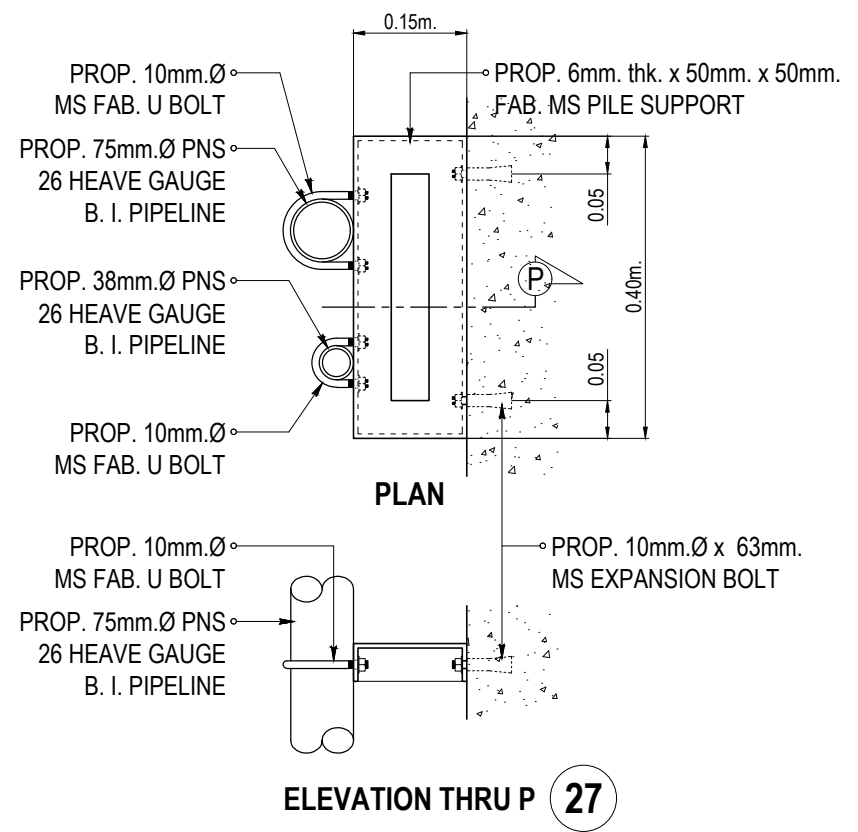
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| ① 75mm.Ø PNS 26 HEAVY GAUGE B. I. PIPELINE | ② 50mm.Ø PNS 26 HEAVY GAUGE B. I. PIPELINE | ③ 38mm.Ø PNS 26 HEAVY GAUGE B. I. PIPELINE | ④ 50mm.Ø x 90° ANSI B16.3 CLASS 150 B. I. ELBOW | ⑤ 50mm.Ø x 38mm.Ø ANSI B16.3 CLASS 150 B. I. BUSHING REDUCER | ⑥ 38mm.Ø x 25mm.Ø ANSI B16.3 CLASS 150 B. I. BUSHING REDUCER | ⑦ 75mm.Ø x 50mm.Ø ANSI B16.3 CLASS 150 B. I. BUSHING REDUCER | ⑧ 75mm.Ø x 90° ANSI B16.3 CLASS 150 B. I. ELBOW | ⑨ 75mm.Ø x 75mm.Ø ANSI B16.3 CLASS 150 B. I. TEE | ⑩ 25mm.Ø PNS 26 HEAVY GAUGE B. I. PIPELINE | ⑪ 25mm.Ø x 90° ANSI B16.3 CLASS 150 B. I. ELBOW | ⑫ 25mm.Ø x 12mm.Ø ANSI B16.3 CLASS 150 B. I. BELL REDUCER | ⑬ 38mm.Ø x 90° ANSI B16.3 CLASS 150 B. I. ELBOW | ⑭ 38mm.Ø ANSI B16.3 CLASS 150 B. I. UNION PATENT | ⑮ 50mm.Ø x 50mm.Ø ANSI B16.3 CLASS 150 B. I. TEE | ⑯ 38mm.Ø TEST AND DRAIN VALVE | ⑰ 38mm.Ø x 25mm.Ø ANSI B16.3 CLASS 150 B. I. BELL REDUCER | ⑱ 75mm.Ø ANSI B16.3 CLASS 150 B. I. UNION PATENT | ⑲ 75mm.Ø ANSI B16.3 CLASS 150 B. I. COUPLING | ⑳ 50mm.Ø ANSI B16.3 CLASS 150 B. I. COUPLING | ㉑ 75mm.Ø PVC FOOT VALVE | ㉒ 50mm.Ø PVC FOOT VALVE | ㉓ 75mm.Ø GATE VALVE, OS & Y | ㉔ 75mm.Ø CHECK VALVE | ㉕ 50mm.Ø GATE VALVE, OS & Y | ㉖ 50mm.Ø CHECK VALVE | ㉗ DETAIL OF PIPE SUPPORT | ㉘ DETAIL OF PIPE SUPPORT | ㉙ DETAIL OF PIPE SUPPORT | ㉚ HORIZONTAL SINGLE STAGE CENTRIFUGAL FIRE PUMP, 25HP, 3 PHASE, 440VAC, 60Hz | ㉛ VERTICAL IN-LINE MULTI- STAGE CENTRIFUGAL JOCKEY PUMP, 3HP, 3 PHASE, 440VAC, 60Hz | ㉜ ALARM CHECK VALVE | ㉝ VANE TYPE WATER FLOW ALARM SWITCH WITH RETARD | ㉞ FIRE HOSE CABINET | ㉟ 63mm.Ø FIRE HOSE CONNECTOR SIAMESE | ㊱ OIL FILLED PRESSURE GAUGE | ㊲ 38mm.Ø x 38mm.Ø ANSI B16.3 CLASS 150 B. I. TEE | ㊳ 50mm.Ø x 63mm.Ø ANSI B16.3 CLASS 150 B. I. BELL REDUCER |
|--|--|--|---|--|--|--|---|--|--|---|---|---|--|--|-------------------------------|---|--|--|--|-------------------------|-------------------------|-----------------------------|----------------------|-----------------------------|----------------------|--------------------------|--------------------------|--------------------------|--|---|---------------------|---|---------------------|--------------------------------------|-----------------------------|--|---|

FIRE SPRINKLER DIAGRAM

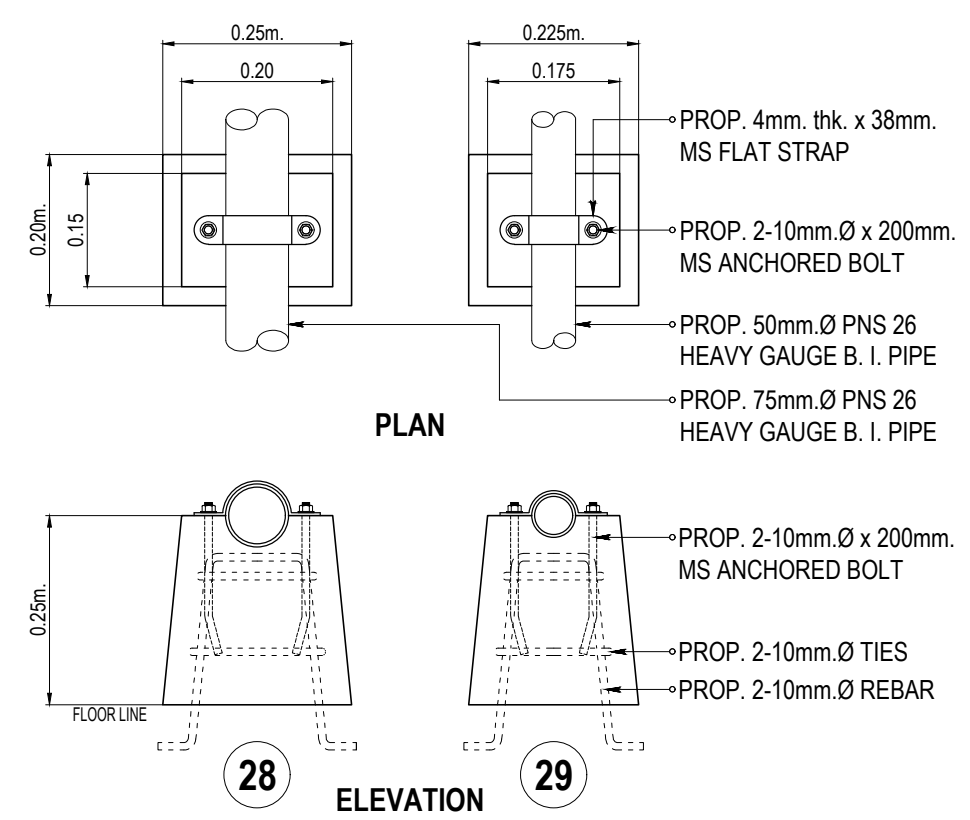
SCALE: _____ NTS.

PROVIDE 0.40m. CLEARANCE TO FLOORING

	REVISIONS REV. DATE BY DESCRIPTION			PROJECT: PROPOSED LABORATORY RENOVATION, ZCWD WATER TREATMENT PLANT, ZAMBOANGA CITY	DRAWN BY:  ARTHUR A. REYES PRINCIPAL DRAFTSMAN B - DESIGN DIVISION	PREPARED BY:  VERLIN ANN LACASTESANTOS - LORIA SENIOR ENGINEER A - DESIGN DIVISION	CHECKED & REVIEWED BY:  REX D. SALE, JR. SUPERVISING ENGINEER A - DESIGN DIVISION	REVIEWED AND SUBMITTED BY:  EDITO M. BAUTISTA, JR. OIC - DESIGN DIVISION	RECOMMENDING PROJECT IMPLEMENTATION:  MARLI ACOSTA - DE FIESTA DM A - ENGINEERING & CONSTRUCTION DEPARTMENT OIC - TECHNICAL SERVICES GROUP	APPROVED FOR PROJECT IMPLEMENTATION: LEONARDO REY D. VASQUEZ GENERAL MANAGER	SHEET NO. 44
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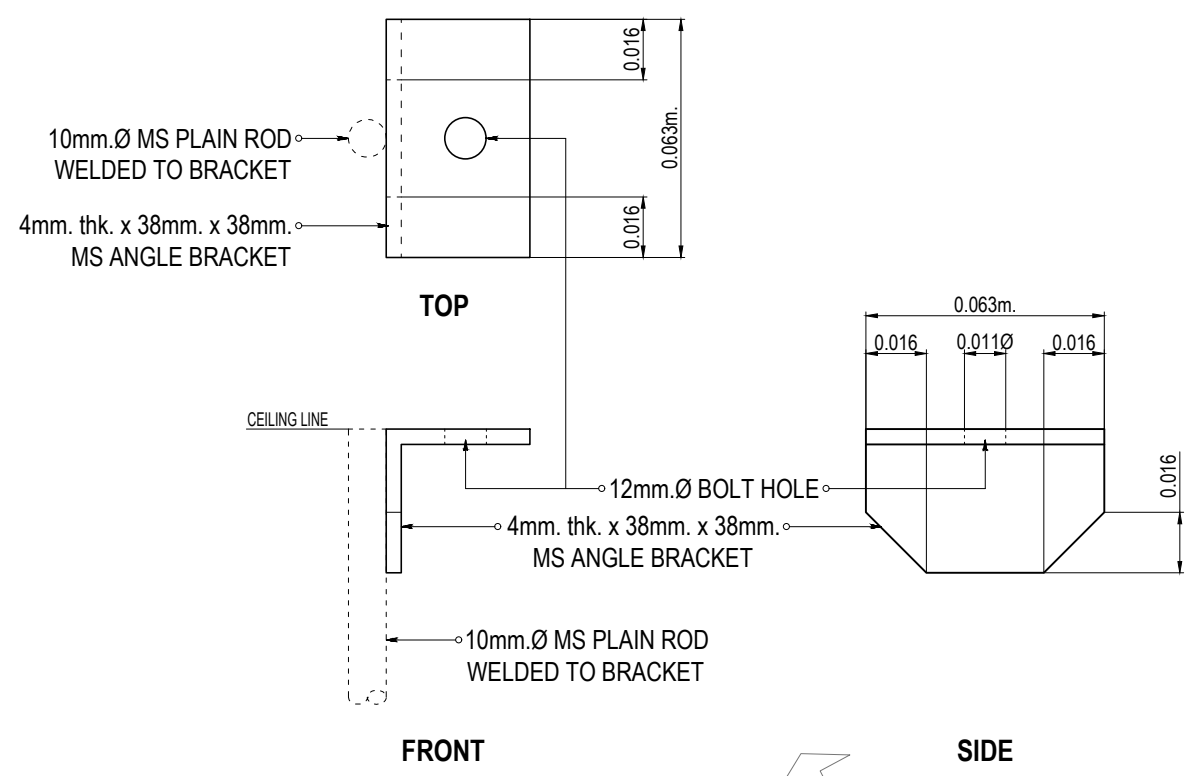


ELEVATION THRU P 27

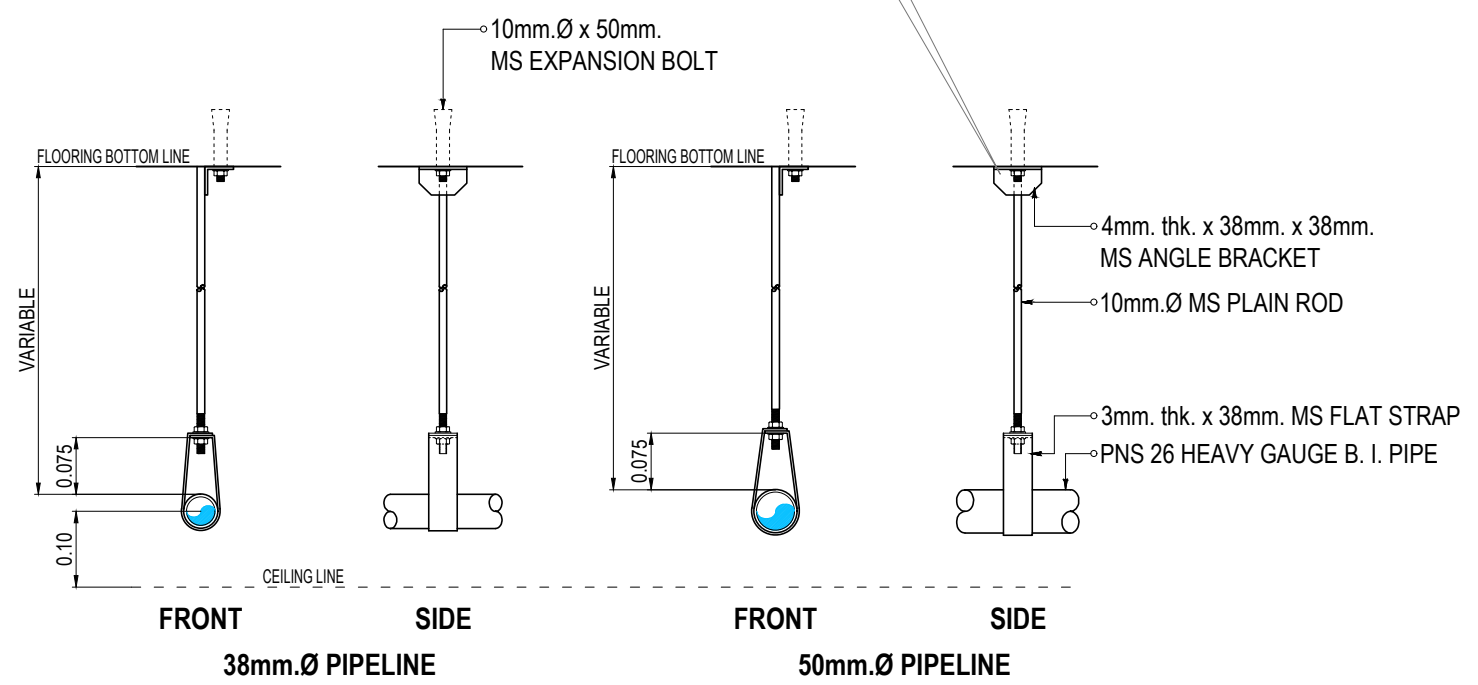


ELEVATION 28 29

DETAIL OF PIPE SUPPORT
SCALE: 1:10M.



TOP FRONT SIDE

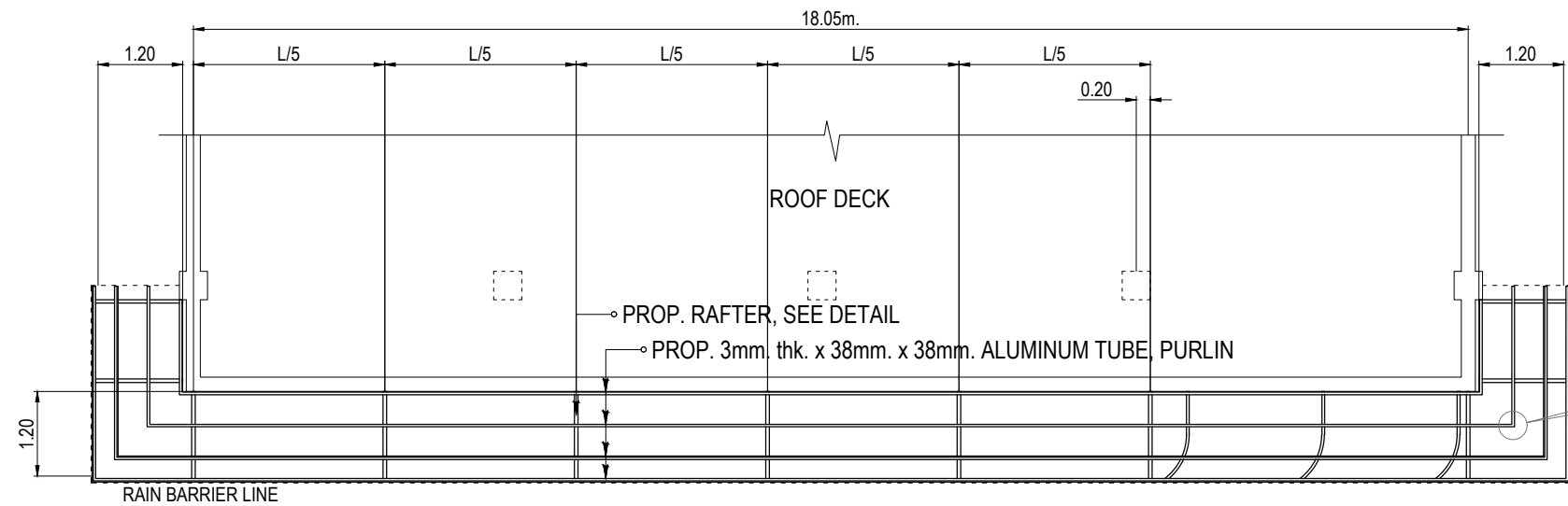


FRONT SIDE FRONT SIDE
38mm.Ø PIPELINE 50mm.Ø PIPELINE

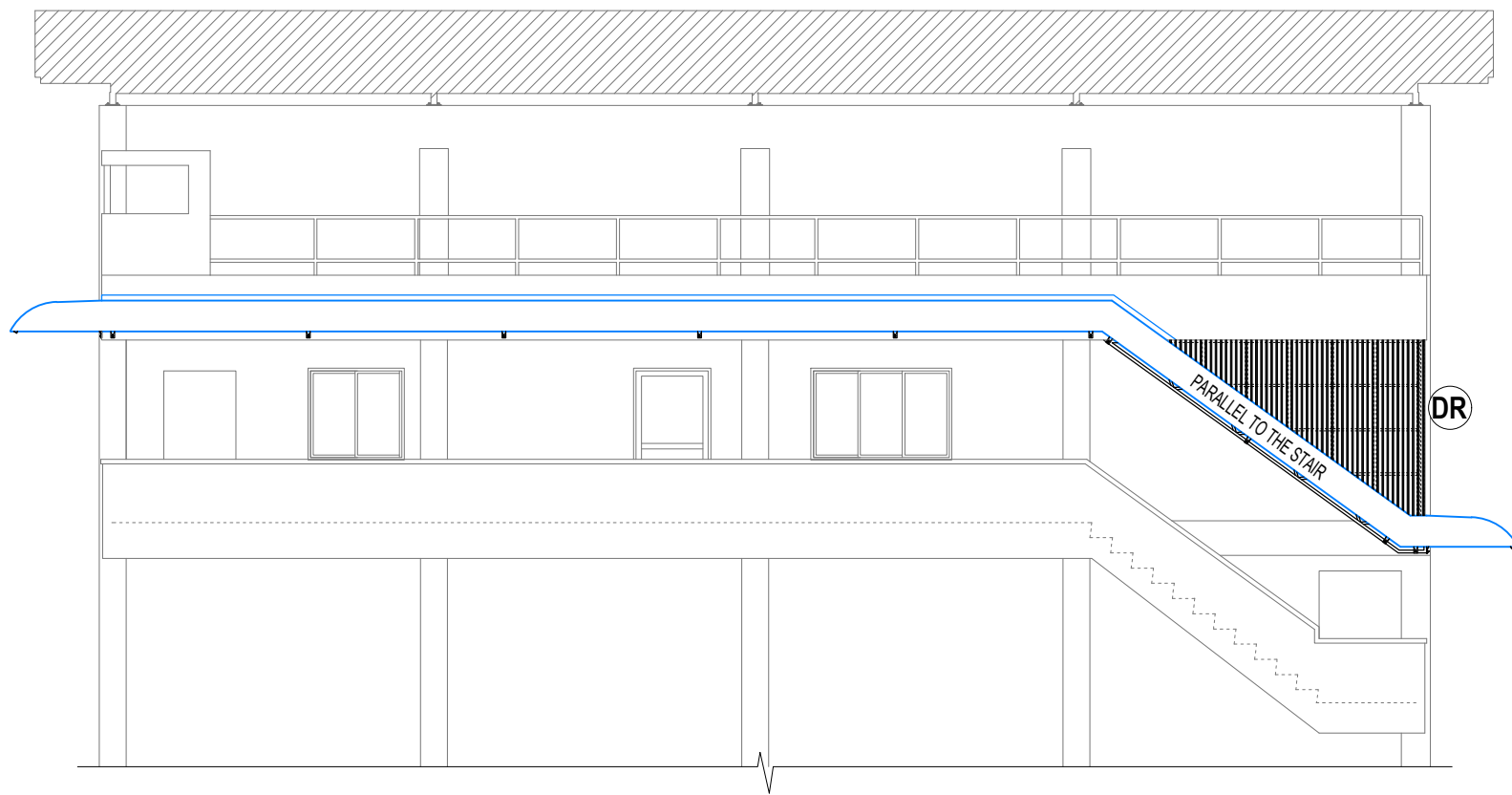
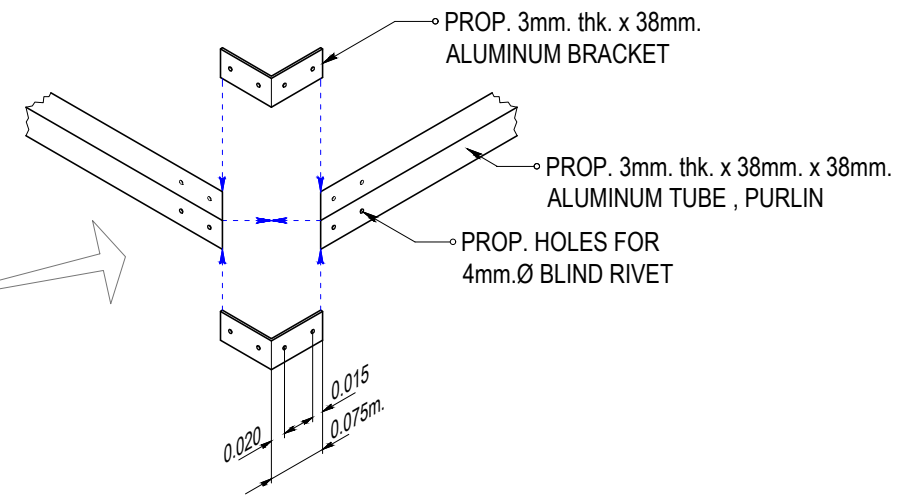
NOTE: PROVIDE HANGERS AS SHOWN IN THE PLAN

DETAIL OF FIRE SPRINKLER PIPE HANGER
SCALE: 1:10M.

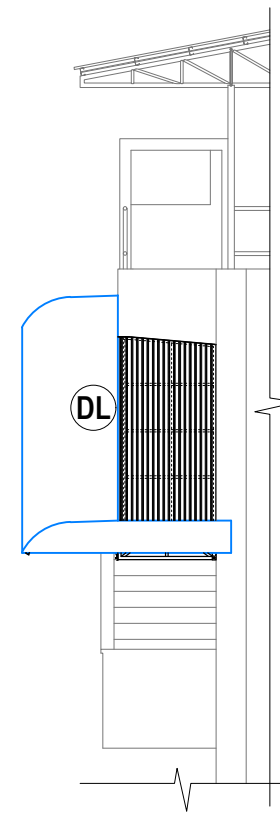
	<table border="1"> <thead> <tr> <th>REV.</th> <th>DATE</th> <th>BY</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REV.	DATE	BY	DESCRIPTION									PROJECT: PROPOSED LABORATORY RENOVATION, ZCWD WATER TREATMENT PLANT, ZAMBOANGA CITY	DRAWN BY: ARTHUR A. REYES PRINCIPAL DRAFTSMAN B - DESIGN DIVISION	PREPARED BY: VERLIN ANN LACASTANOS - LORIA SENIOR ENGINEER A - DESIGN DIVISION	CHECKED & REVIEWED BY: REX D. SALE, JR. SUPERVISING ENGINEER A - DESIGN DIVISION	REVIEWED AND SUBMITTED BY: EDITO M. BAUTISTA, JR. OIC - DESIGN DIVISION	RECOMMENDING PROJECT IMPLEMENTATION: MARLI ACOSTA - DE FIESTA DM A - ENGINEERING & CONSTRUCTION DEPARTMENT OIC - TECHNICAL SERVICES GROUP	APPROVED FOR PROJECT IMPLEMENTATION: LEONARDO REY D. VASQUEZ GENERAL MANAGER	SHEET NO. 45
	REV.	DATE	BY	DESCRIPTION																	
SHEET CONTENT: AS INDICATED																					



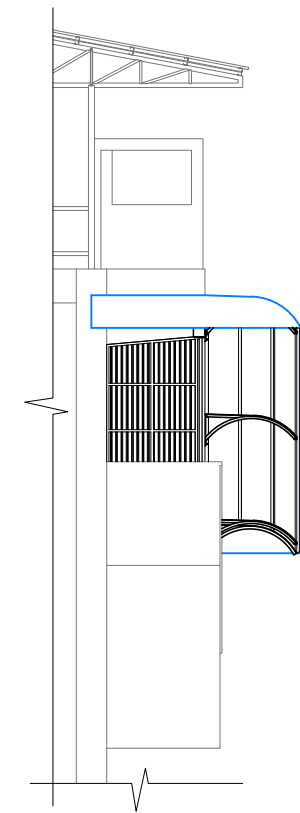
ROOF FRAMING PLAN



FRONT ELEVATION





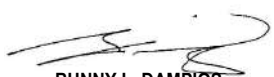



RIGHT SIDE ELEVATION

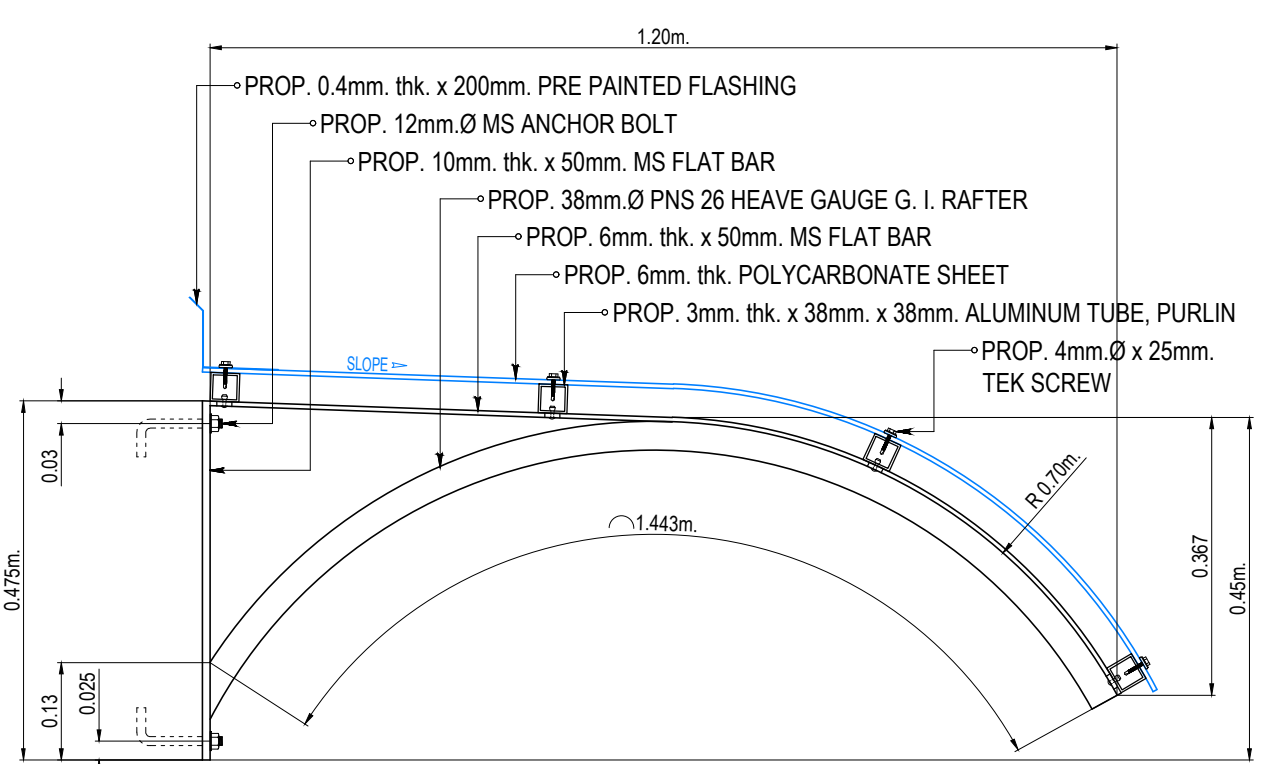
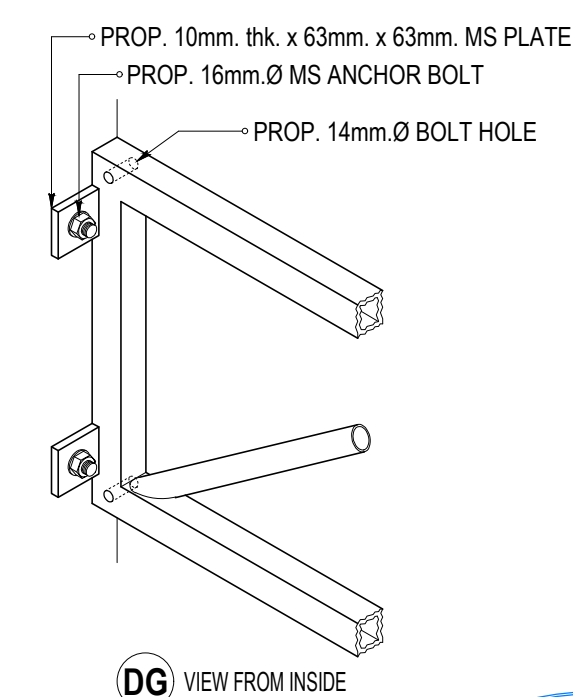
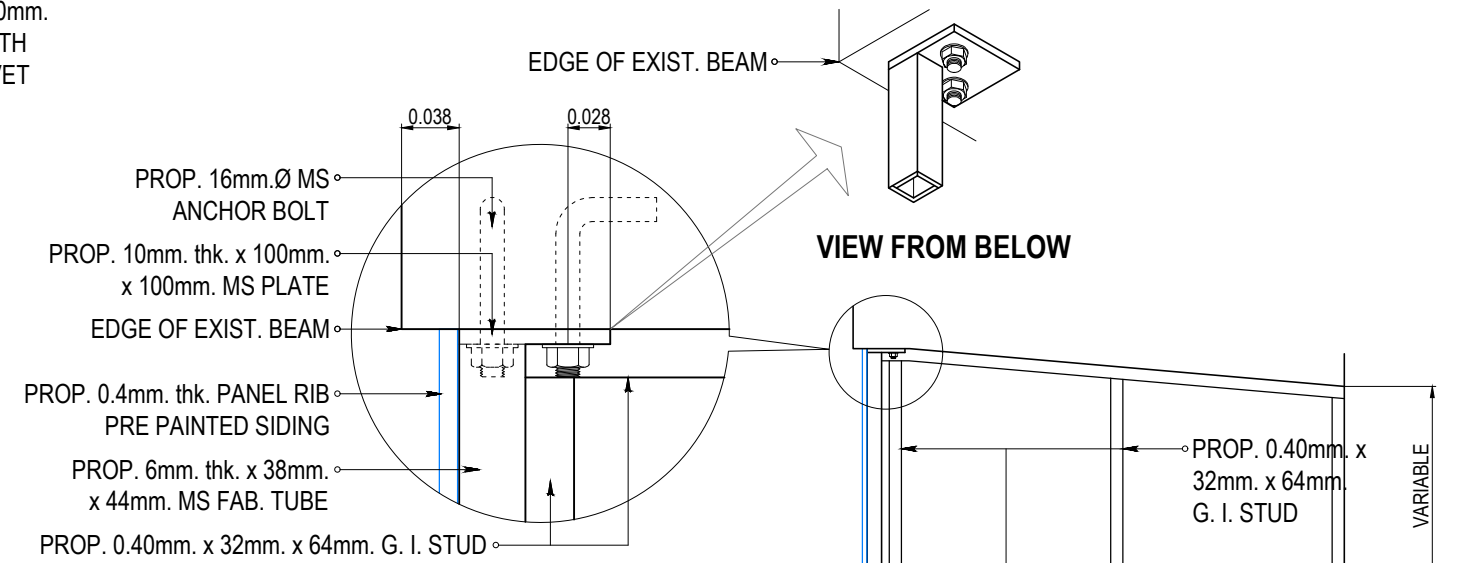
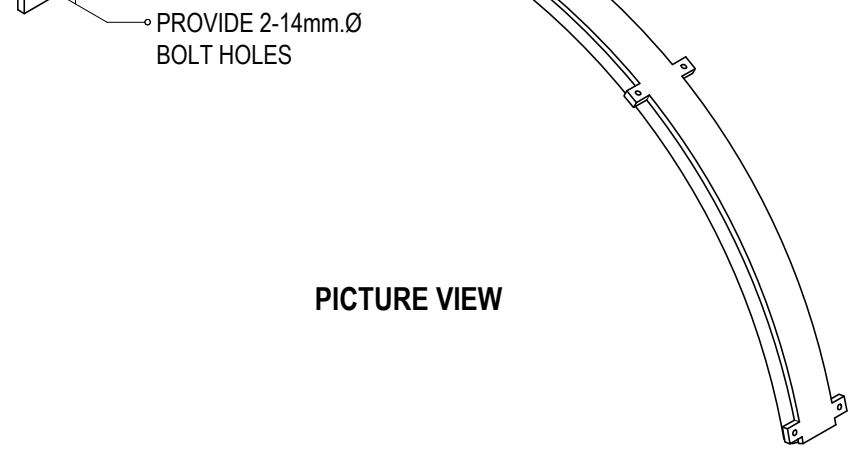
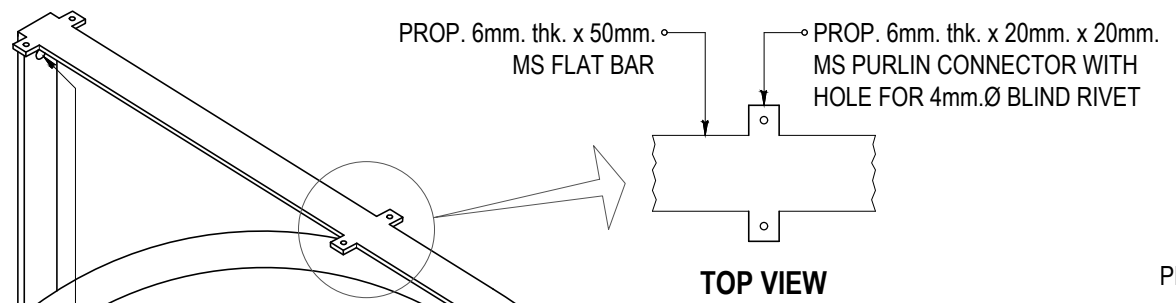


LEFT SIDE ELEVATION

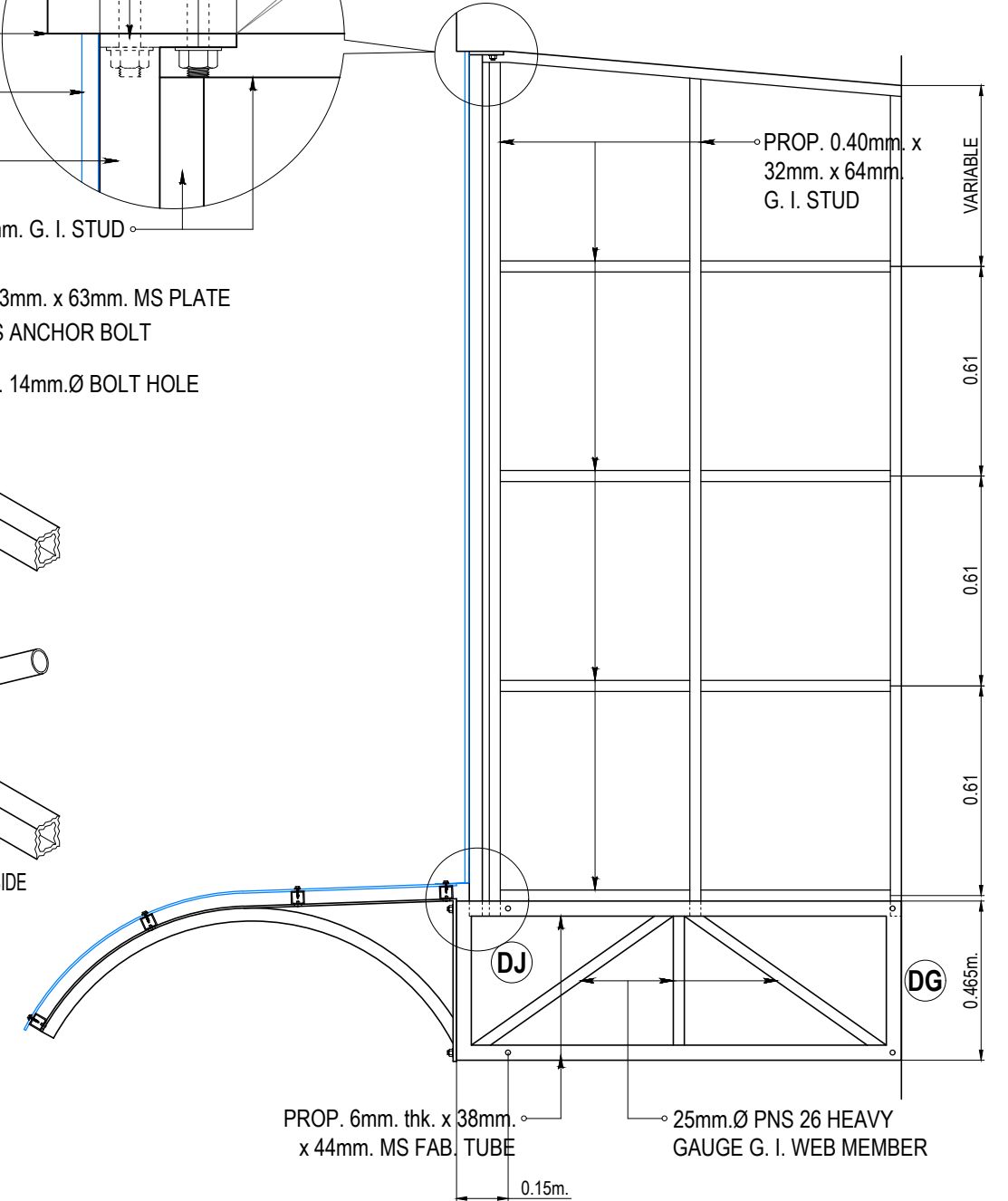
PROP. RAIN BARRIER

SCALE: 1:100M.

	REVISIONS REV. DATE BY DESCRIPTION				PROJECT: PROPOSED LABORATORY RENOVATION, ZCWD WATER TREATMENT PLANT, ZAMBOANGA CITY	DRAWN BY:  ARTHUR A. REYES PRINCIPAL DRAFTSMAN B - DESIGN DIVISION	PREPARED BY:  BUNNY L. DAMPIOS SENIOR ENGINEER A - DESIGN DIVISION	CHECKED & REVIEWED BY:  REX D. SALE, JR. SUPERVISING ENGINEER A - DESIGN DIVISION	REVIEWED AND SUBMITTED BY:  EDITO M. BAUTISTA, JR. OIC - DESIGN DIVISION	RECOMMENDING PROJECT IMPLEMENTATION:  Digitally signed by Acosta-De Fiesta Marli Patagoc Date: 2021.06.04 10:45:23 +08'00'	APPROVED FOR PROJECT IMPLEMENTATION: LEONARDO REY D. VASQUEZ GENERAL MANAGER	SHEET NO. 46
	SHEET CONTENT: AS INDICATED											

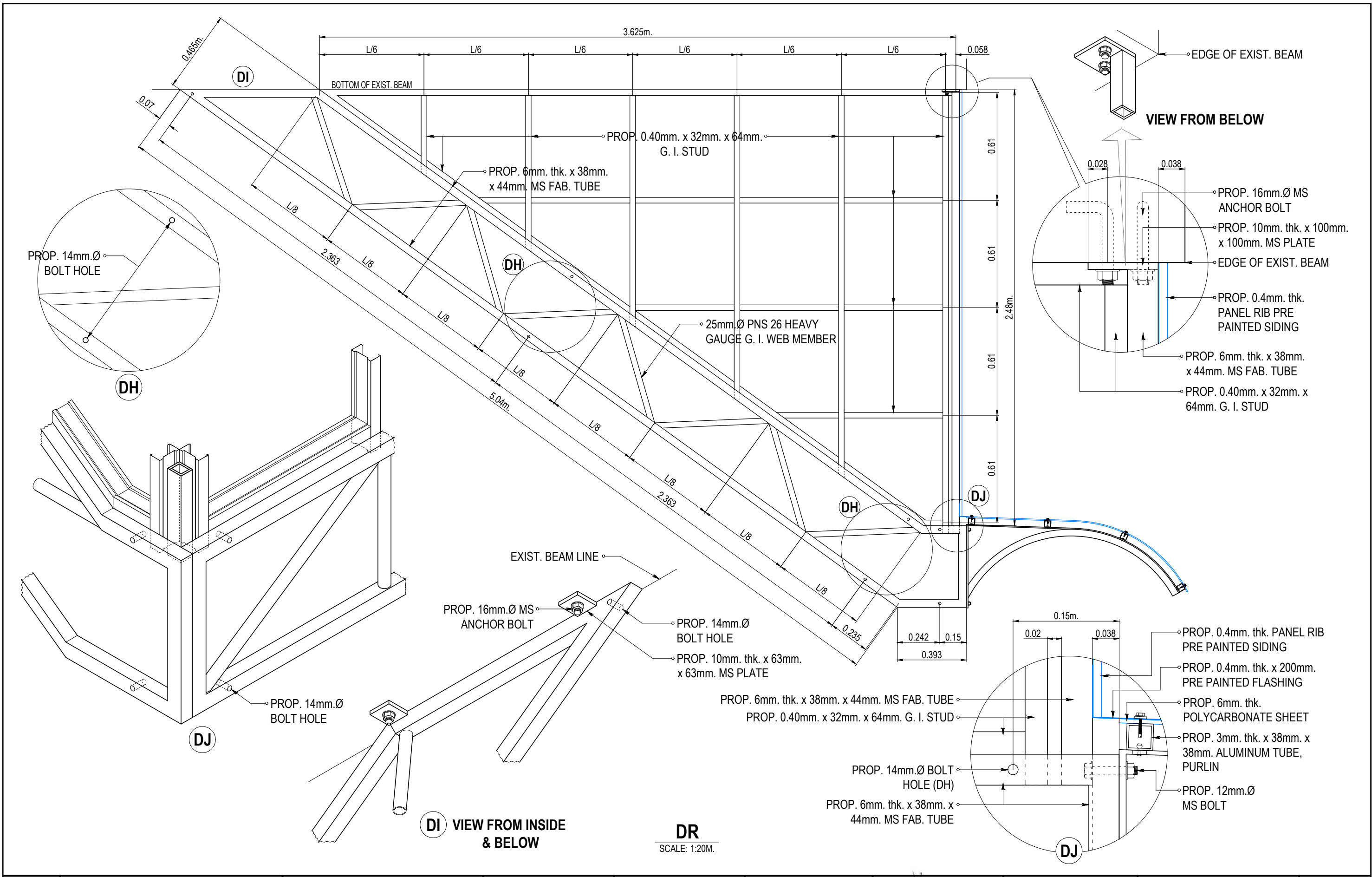


SCALE: 1:10M.



SCALE: 1:20M.

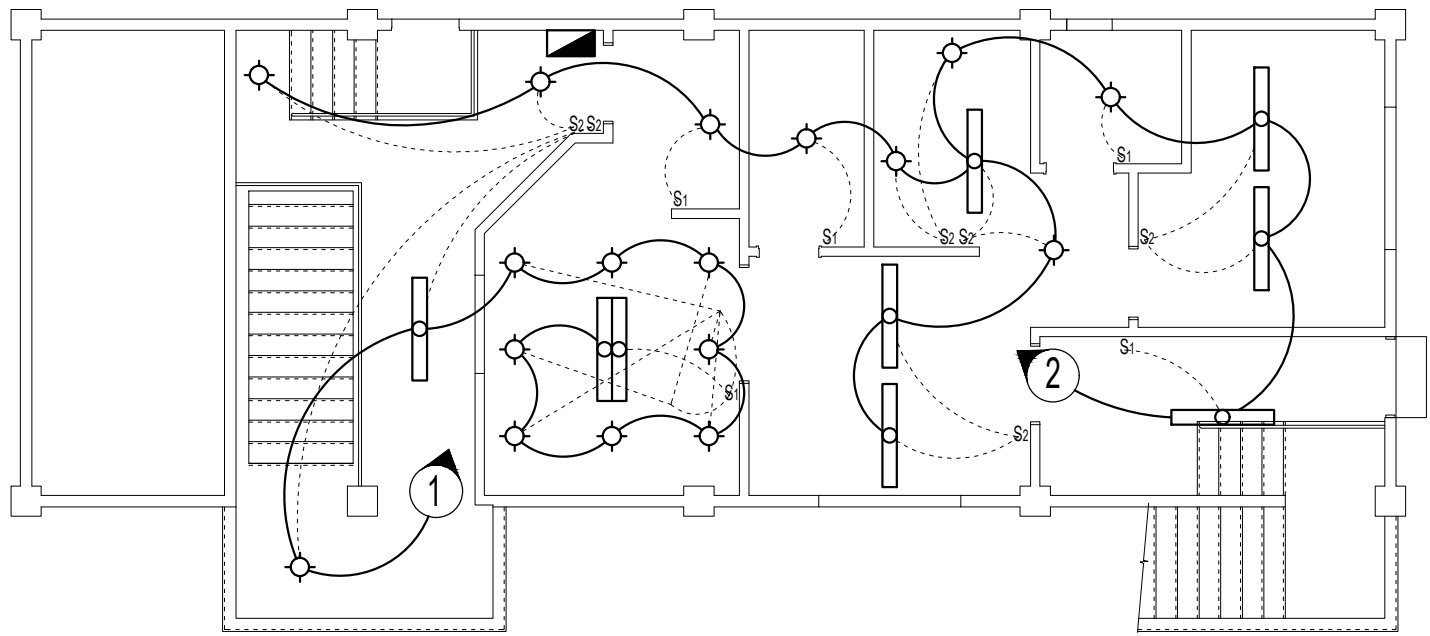
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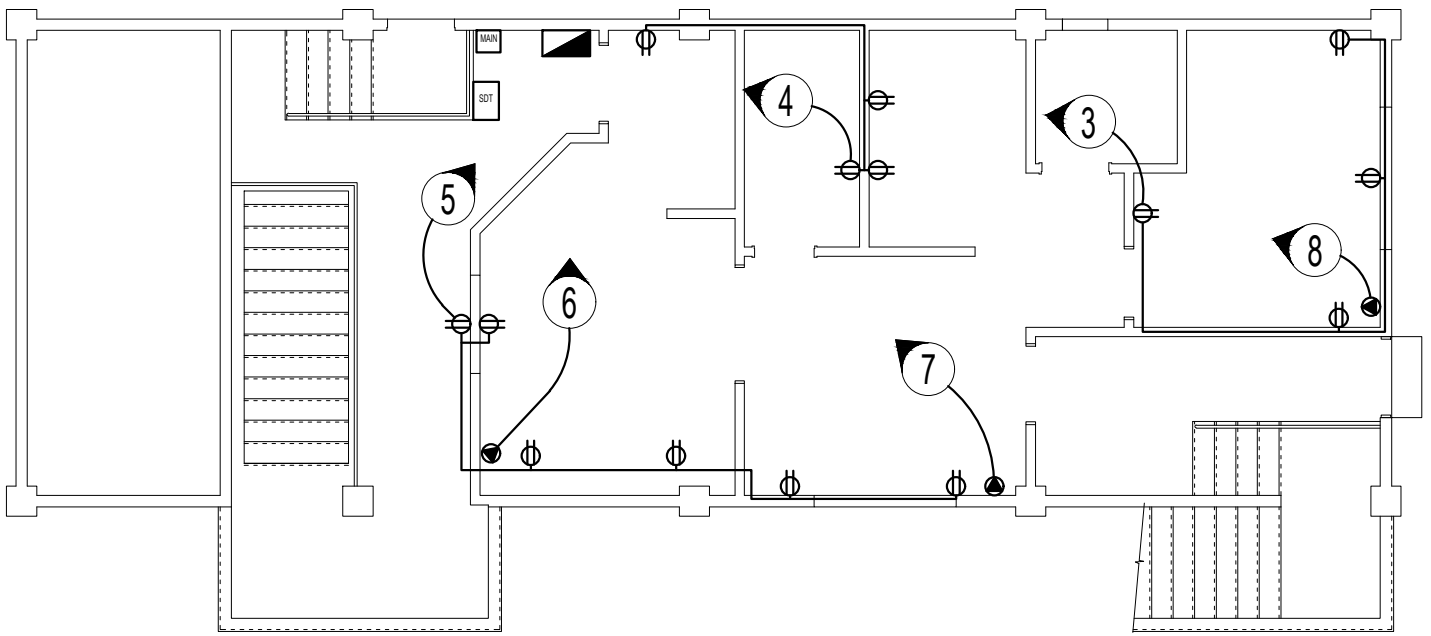
DI VIEW FROM INSIDE & BELOW

DR
SCALE: 1:20M.

REV.	DATE	BY	DESCRIPTION	PROJECT:	DRAWN BY:	PREPARED BY:	CHECKED & REVIEWED BY:	REVIEWED AND SUBMITTED BY:	RECOMMENDING PROJECT IMPLEMENTATION:	APPROVED FOR PROJECT IMPLEMENTATION:	SHEET NO.
				PROPOSED LABORATORY RENOVATION, ZCWD WATER TREATMENT PLANT, ZAMBOANGA CITY	 ARTHUR A. REYES PRINCIPAL DRAFTSMAN B - DESIGN DIVISION	 BUNNY L. DAMPIOS SENIOR ENGINEER A - DESIGN DIVISION	 REX D. SALE, JR. SUPERVISING ENGINEER A - DESIGN DIVISION	 EDITO M. BAUTISTA, JR. OIC - DESIGN DIVISION	 MARLI ACOSTA - DE FIESTA DM A - ENGINEERING & CONSTRUCTION DEPARTMENT OIC - TECHNICAL SERVICES GROUP	 LEONARDO REY D. VASQUEZ GENERAL MANAGER	48
SHEET CONTENT:				AS INDICATED							



SECOND FLOOR LIGHTING LAYOUT PLAN
SCALE: 1:100M.



SECOND FLOOR POWER OUTLET LAYOUT PLAN
SCALE: 1:100M.

SCHEDULE OF LOAD FOR LIGHTING AND POWER LOAD

CKT. NO.	LOAD DESCRIPTION	PF	W	VA	AMPS	LINE AMPS			CONDUCTOR SIZE	CONDUIT SIZE	BREAKER SIZE	VOLTAGE
						A	B	C				
C1	9 - 18 WATTS LED BULB DOWNLIGHT	0.80	1,200.00	1,500.00	6.52	6.52	6.52	2.0 sq. mm. TW	20 mm PVC	15 A	230 V	
	1 - 18 WATTS LED FLUORESCENT WITH SINGLE TYPE INDUSTRIAL LUMINAIRE											
	1 - 18 WATTS LED FLUORESCENT WITH DUPLEX TYPE INDUSTRIAL LUMINAIRE											
C2	8 - 18 WATTS LED BULB DOWNLIGHT	0.80	1,760.00	2,200.00	9.57	9.57	9.57	2.0 sq. mm. TW	20 mm PVC	15 A	230 V	
	6 - 18 WATTS LED FLUORESCENT WITH SINGLE TYPE INDUSTRIAL LUMINAIRE											
C3	4 - DUPLEX UNIVERSAL OUTLET	0.80	1,440.00	1,800.00	7.83	7.83	7.83	3.5 sq. mm. TW	20 mm PVC	20 A	230 V	
C4	4 - DUPLEX UNIVERSAL OUTLET	0.80	1,440.00	1,800.00	7.83	7.83	7.83	3.5 sq. mm. TW	20 mm PVC	20 A	230 V	
C5	6 - DUPLEX UNIVERSAL OUTLET	0.80	2,160.00	2,700.00	11.74	11.74	11.74	3.5 sq. mm. TW	20 mm PVC	20 A	230 V	
C6	1 - 3 HP AIR CONDITIONING UNIT	0.85	2,238.00	2,632.94	11.45	11.45	11.45	5.5 sq. mm. THW	20 mm PVC	30 A	230 V	
C7	1 - 3 HP AIR CONDITIONING UNIT	0.85	2,238.00	2,632.94	11.45	11.45	11.45	5.5 sq. mm. THW	20 mm PVC	30 A	230 V	
C8	1 - 3 HP AIR CONDITIONING UNIT	0.85	2,238.00	2,632.94	11.45	11.45	11.45	5.5 sq. mm. THW	20 mm PVC	30 A	230 V	
	AVERAGE/TOTAL (3-PHASE)	0.82	14,714.00	17,898.82	77.82	54.63	54.93	46.08				

SECOND FLOOR: 230 VOLTS

COMPUTATION:

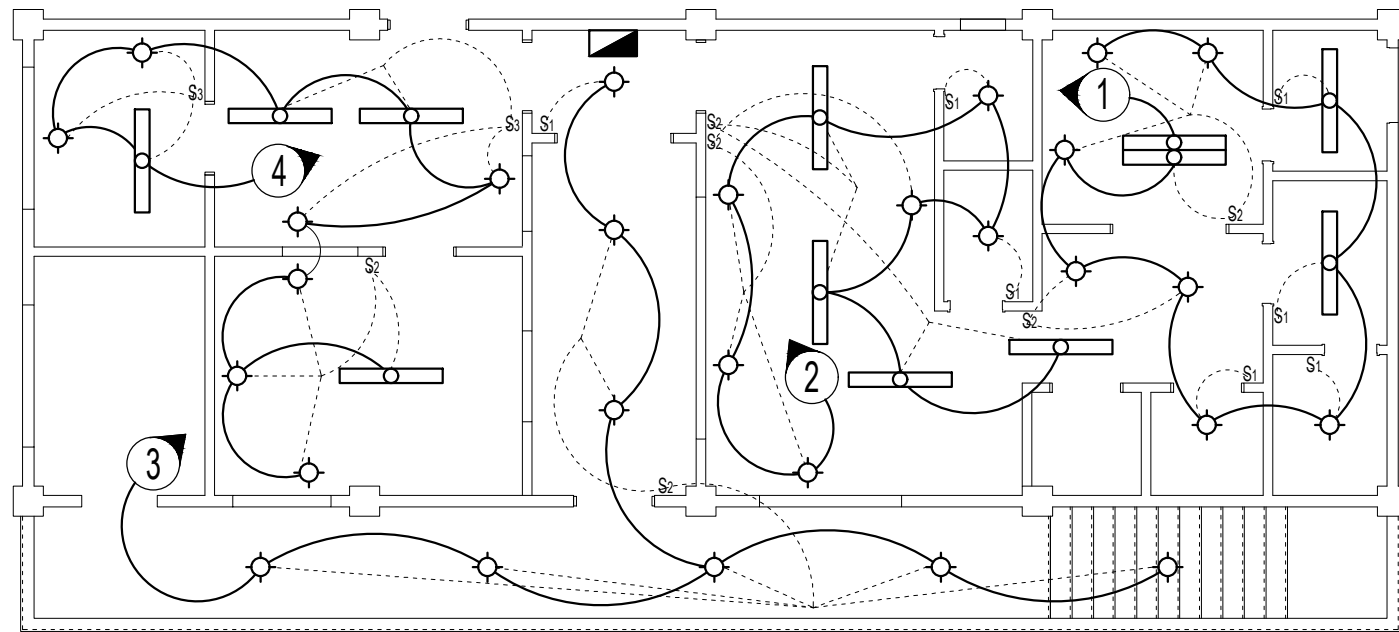
DETERMINE THE SERVICE FEEDER CONDUCTOR:
 APPLYING DEMAND FACTOR:
 TOTAL GENERAL LIGHTING AND OUTLET LOAD: 10,000.00 VA
 FIRST 3000 VA: = 3,000.00 VA
 REMAINING @ 35%: = 2,450.00 VA
 OTHER LOAD @ 100%: 2632.94 VA
 2632.94 VA
 13,348.82 VA
 EQUIVALENT LINE CURRENT = 35.20 AMPS
 USE: 3-14.0 SQ MM THW STRANDED WIRE
 1-3.5 SQ MM THW STRANDED GREEN GROUND WIRE
 32MM PVC CONDUIT

DETERMINE THE SERVICE EQUIPMENT FOR LIGHT AND POWER PANELBOARD:
 APPLYING DEMAND FACTOR:
 TOTAL GENERAL LIGHTING AND OUTLET LOAD: 10,000.00 VA
 FIRST 3000 VA: = 3,000.00 VA
 REMAINING @ 35%: = 2,450.00 VA
 OTHER LOAD @ 100%: 2632.94 VA
 2632.94 VA
 HIGHEST LOAD @ 250%: 6582.35 VA
 17,298.24 VA
 EQUIVALENT LINE CURRENT = 43.47 AMPS
 USE: 60 AMPS, 240 VOLTS, 3POLE, MAIN CIRCUIT BREAKER

LEGEND:

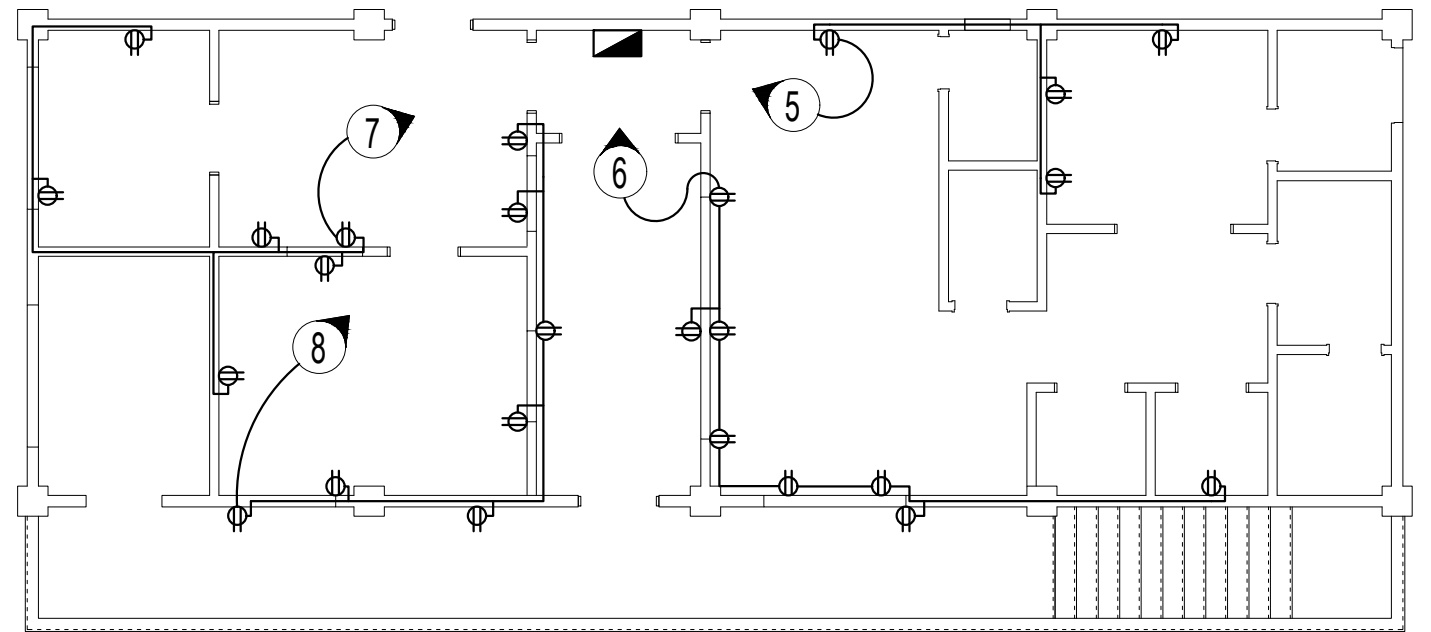
	DUPLEX OUTLET
	PANELBOARD
	CIRCUIT NUMBER
	CIRCUIT CONNECTION
	SWITCH CONNECTION
	1 GANG SWITCH
	2 GANG SWITCH
	SINGLE T8 LED FL.
	DUPLEX T8 LED FL.
	LED DOWNLIGHT

	<table border="1"> <thead> <tr> <th>REV.</th> <th>DATE</th> <th>BY</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REV.	DATE	BY	DESCRIPTION									PROJECT: PROPOSED LABORATORY RENOVATION, ZCWD WATER TREATMENT PLANT, ZAMBOANGA CITY	DRAWN BY: ARTHUR A. REYES PRINCIPAL DRAFTSMAN B - DESIGN DIVISION	PREPARED BY: ARIANN D. GODINEZ SENIOR ENGINEER A - DESIGN DIVISION	CHECKED & REVIEWED BY: REX D. SALE, JR. SUPERVISING ENGINEER A - DESIGN DIVISION	REVIEWED AND SUBMITTED BY: EDITO M. BAUTISTA, JR. OIC - DESIGN DIVISION	RECOMMENDING PROJECT IMPLEMENTATION: MARLI ACOSTA - DE FIESTA DM A- ENGINEERING & CONSTRUCTION DEPARTMENT OIC - TECHNICAL SERVICES GROUP	APPROVED FOR PROJECT IMPLEMENTATION: LEONARDO REY D. VASQUEZ GENERAL MANAGER	SHEET NO. 49
	REV.	DATE	BY	DESCRIPTION																	
SHEET CONTENT: AS INDICATED																					



THIRD FLOOR LIGHTING LAYOUT PLAN

SCALE: 1:100M.



THIRD FLOOR POWER OUTLET LAYOUT PLAN

SCALE: 1:100M.

SCHEDULE OF LOAD FOR LIGHTING AND POWER LOAD

CKT. NO.	LOAD DESCRIPTION	PF	W	VA	AMPS	LINE AMPS			CONDUCTOR SIZE	CONDUIT SIZE	BREAKER SIZE	VOLTAGE
						A	B	C				
C1	7 - 18 WATTS LED BULB DOWNLIGHT	0.80	1,100.00	1,375.00	5.98	5.98	5.98	2.0 sq. mm. TW	20 mm PVC	15 A	230 V	
	2 - 18 WATTS LED FLUORESCENT WITH SINGLE TYPE INDUSTRIAL LUMINAIRE											
	1 - 18 WATTS LED FLUORESCENT WITH DUPLEX TYPE INDUSTRIAL LUMINAIRE											
C2	6 - 18 WATTS LED BULB DOWNLIGHT	0.80	1,360.00	1,700.00	7.39	7.39	7.39	2.0 sq. mm. TW	20 mm PVC	15 A	230 V	
	4 - 18 WATTS LED FLUORESCENT WITH SINGLE TYPE INDUSTRIAL LUMINAIRE											
C3	8 - 18 WATTS LED BULB DOWNLIGHT	0.80	1,460.00	1,825.00	8.35	8.35	8.35	2.0 sq. mm. TW	20 mm PVC	15 A	230 V	
C4	8 - 18 WATTS LED BULB DOWNLIGHT	0.80	1,560.00	1,950.00	8.48	8.48	8.48	2.0 sq. mm. TW	20 mm PVC	15 A	230 V	
	4 - 18 WATTS LED FLUORESCENT WITH SINGLE TYPE INDUSTRIAL LUMINAIRE											
C5	4 - DUPLEX UNIVERSAL OUTLET	0.80	1,440.00	1,800.00	7.83	7.83	7.83	3.5 sq. mm. TW	20 mm PVC	20 A	230 V	
C6	8 - DUPLEX UNIVERSAL OUTLET	0.80	2,880.00	3,600.00	15.65	15.65	15.65	3.5 sq. mm. TW	20 mm PVC	20 A	230 V	
C7	5 - DUPLEX UNIVERSAL OUTLET	0.80	1,800.00	2,250.00	9.78	9.78	9.78	3.5 sq. mm. TW	20 mm PVC	20 A	230 V	
C8	8 - DUPLEX UNIVERSAL OUTLET	0.80	2,880.00	3,600.00	15.65	15.65	15.65	3.5 sq. mm. TW	20 mm PVC	20 A	230 V	
AVERAGE/TOTAL (3-PHASE)		0.80	14,180.00	17,725.00	77.07	53.59	51.63	48.91				

THIRD FLOOR: 230 VOLTS

COMPUTATION:

DETERMINE THE SERVICE FEEDER CONDUCTOR:

APPLYING DEMAND FACTOR:

TOTAL GENERAL LIGHTING AND OUTLET LOAD: 17,725.00 VA

FIRST 10000 VA: = 10,000.00 VA

REMAINING @ 40%: = 3,090.00 VA

13,090.00 VA

EQUIVALENT LINE CURRENT = 32.90 AMPS

USE: 3-14.0 SQ MM THW STRANDED WIRE

1-3.5 SQ MM THW STRANDED GREEN GROUND WIRE

32MM PVC CONDUIT

DETERMINE THE SERVICE EQUIPMENT FOR LIGHT AND POWER PANELBOARD:

APPLYING DEMAND FACTOR:

TOTAL GENERAL LIGHTING AND OUTLET LOAD: 17,725.00 VA

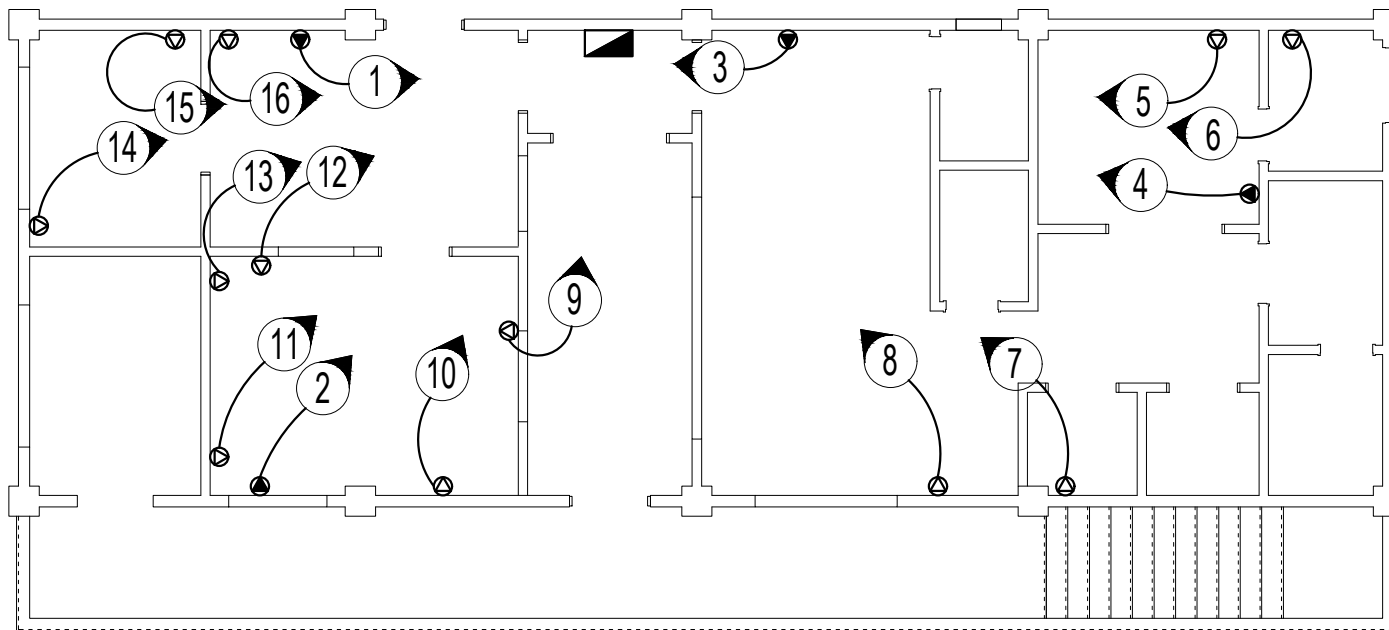
EQUIVALENT LINE CURRENT = 44.55 AMPS

USE: 60 AMPS, 240 VOLTS, 3POLE, MAIN CIRCUIT BREAKER

LEGEND:

	DUPLEX OUTLET		SINGLE T8 LED FL.
	PANELBOARD		DUPLEX T8 LED FL.
	CIRCUIT NUMBER		LED DOWNLIGHT
	CIRCUIT CONNECTION		
	SWITCH CONNECTION		
S ₁	1 GANG SWITCH		
S ₂	2 GANG SWITCH		
S ₃	3 GANG SWITCH		

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	REVISIONS																								
REV.	DATE	BY	DESCRIPTION																						
SHEET CONTENT: AS INDICATED																									



THIRD FLOOR SPECIAL OUTLET LAYOUT PLAN

SCALE: 1:100M.

SCHEDULE OF LOAD FOR LIGHTING AND POWER LOAD

THIRD FLOOR: 230 VOLTS

CKT. NO.	LOAD DESCRIPTION	PF	W	VA	AMPS	LINE AMPS			CONDUCTOR SIZE	CONDUIT SIZE	BREAKER SIZE	VOLTAGE
						A	B	C				
C1	1 - 3 HP AIR CONDITIONING UNIT	0.88	2,238.00	2,557.71	11.12	11.12			5.5 sq. mm. THW	20 mm PVC	30 A	230 V
C2	1 - 3 HP AIR CONDITIONING UNIT	0.88	2,238.00	2,557.71	11.12	11.12			5.5 sq. mm. THW	20 mm PVC	30 A	230 V
C3	1 - 3 HP AIR CONDITIONING UNIT	0.88	2,238.00	2,557.71	11.12		11.12	11.12	5.5 sq. mm. THW	20 mm PVC	30 A	230 V
C4	1 - 3 HP AIR CONDITIONING UNIT	0.88	2,238.00	2,557.71	11.12		11.12	11.12	5.5 sq. mm. THW	20 mm PVC	30 A	230 V
C5	1 - SPECIAL OUTLET	0.80	1,500.00	1,875.00	8.15	8.15	8.15		3.5 sq. mm. TW	20 mm PVC	30 A	230 V
C6	1 - SPECIAL OUTLET	0.80	1,500.00	1,875.00	8.15	8.15	8.15		3.5 sq. mm. TW	20 mm PVC	30 A	230 V
C7	1 - SPECIAL OUTLET	0.80	1,500.00	1,875.00	8.15		8.15	8.15	3.5 sq. mm. TW	20 mm PVC	30 A	230 V
C8	1 - SPECIAL OUTLET	0.80	1,500.00	1,875.00	8.15		8.15	8.15	3.5 sq. mm. TW	20 mm PVC	30 A	230 V
C9	1 - SPECIAL OUTLET	0.80	1,500.00	1,875.00	8.15	8.15		8.15	3.5 sq. mm. TW	20 mm PVC	30 A	230 V
C10	1 - SPECIAL OUTLET	0.80	1,500.00	1,875.00	8.15	8.15		8.15	3.5 sq. mm. TW	20 mm PVC	30 A	230 V
C11	1 - SPECIAL OUTLET	0.80	1,500.00	1,875.00	8.15	8.15	8.15		3.5 sq. mm. TW	20 mm PVC	30 A	230 V
C12	1 - SPECIAL OUTLET	0.80	1,500.00	1,875.00	8.15	8.15	8.15		3.5 sq. mm. TW	20 mm PVC	30 A	230 V
C13	1 - SPECIAL OUTLET	0.80	1,500.00	1,875.00	8.15		8.15	8.15	3.5 sq. mm. TW	20 mm PVC	30 A	230 V
C14	1 - SPECIAL OUTLET	0.80	1,500.00	1,875.00	8.15		8.15	8.15	3.5 sq. mm. TW	20 mm PVC	30 A	230 V
C15	1 - SPECIAL OUTLET	1.00	12,000.00	12,000.00	52.17	52.17		52.17	3.5 sq. mm. TW	20 mm PVC	60 A	230 V
C16	1 - SPECIAL OUTLET	1.00	12,000.00	12,000.00	52.17	52.17		52.17	3.5 sq. mm. TW	20 mm PVC	60 A	230 V
AVERAGE/TOTAL (3-PHASE)		0.91	47,952.00	52,980.86	230.35	175.50	109.70	175.50				

COMPUTATION:

DETERMINE THE SERVICE FEEDER CONDUCTOR:

HIGHEST LINE CURRENT = 175.50 AMPS
 TOTAL LOAD + 25% OF LARGEST MOTOR = 178.28 AMPS
 USE: 3-80.0 SQ MM THW STRANDED WIRE
 1-3.5 SQ MM THW STRANDED GREEN GROUND WIRE
 63MM PVC CONDUIT

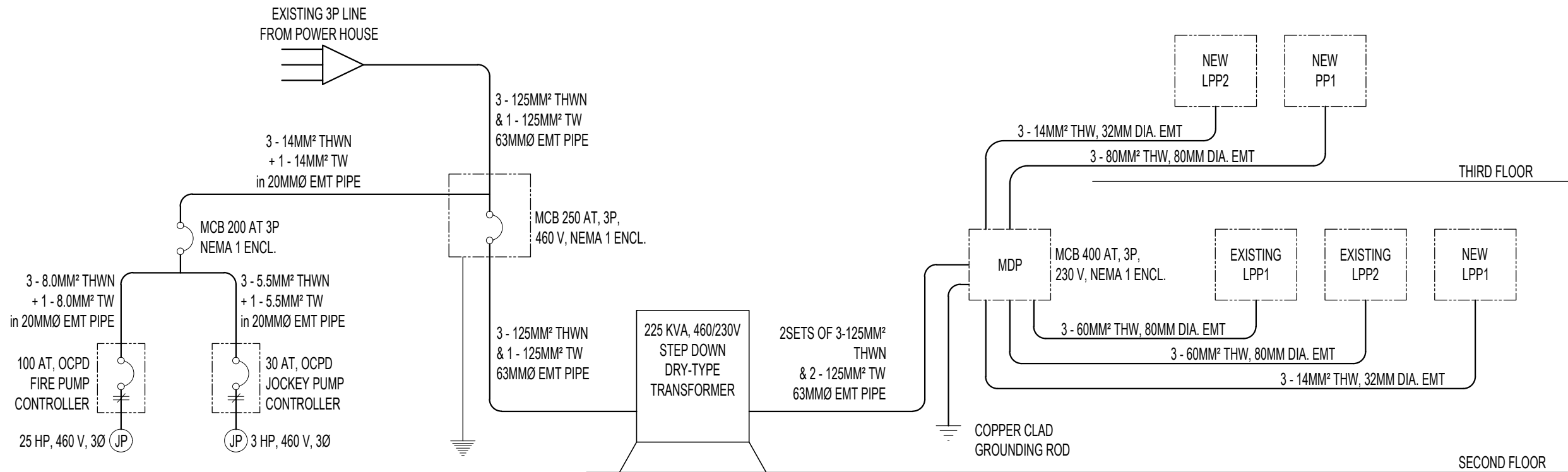
DETERMINE THE SERVICE EQUIPMENT FOR LIGHT AND POWER PANELBOARD:

TOTAL LOAD + 250% OF LARGEST MOTOR = 203.30 AMPS
 USE: 200 AMPS, 240 VOLTS, 3POLE, MAIN CIRCUIT BREAKER

LEGEND:

	PANELBOARD
	CIRCUIT NUMBER
	CIRCUIT CONNECTION
	SPECIAL/DEDICATED OUTLET
	ACU OUTLET
	MAIN DISTRIBUTION PANEL
	EXISTING LIGHT&POWER PANEBOARD
	NEW LIGHT&POWER PANEBOARD
	NEW POWER PANEBOARD

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	REV.	DATE	BY	DESCRIPTION																	
SHEET CONTENT: AS INDICATED																					



POWER SINGLE LINE DIAGRAM

SCALE: NTS

	REVISIONS REV. DATE BY DESCRIPTION				PROJECT: PROPOSED LABORATORY RENOVATION, ZCWD WATER TREATMENT PLANT, ZAMBOANGA CITY	DRAWN BY: ARTHUR A. REYES PRINCIPAL DRAFTSMAN B - DESIGN DIVISION	PREPARED BY: ARIANN D. GODINEZ SENIOR ENGINEER A - DESIGN DIVISION	CHECKED & REVIEWED BY: REX D. SALE, JR. SUPERVISING ENGINEER A - DESIGN DIVISION	REVIEWED AND SUBMITTED BY: EDITO M. BAUTISTA, JR. OIC - DESIGN DIVISION	RECOMMENDING PROJECT IMPLEMENTATION: MARLI ACOSTA - DE FIESTA DM A - ENGINEERING & CONSTRUCTION DEPARTMENT OIC - TECHNICAL SERVICES GROUP	APPROVED FOR PROJECT IMPLEMENTATION: LEONARDO REY D. VASQUEZ GENERAL MANAGER	SHEET NO. 52
	SHEET CONTENT: AS INDICATED											

FIRE PUMP AND PRESSURE MAINTENANCE PUMPS

A. FIRE PUMP: 25HP, 460VOLTS, 3 PHASE
 FULL LOAD CURRENT: 34 A
CONDUCTOR SIZE: NOT LESS 125%: 42.5 A
 USE: 3-8.0 SQ. MM. THW STRANDED COPPER WIRE
 CORRECTION FACTOR BASED ON 35°C AMBIENT TEMPERATURE:
 = 50 (0.94) A
 = 47 A
 USE: 20MM DIAMETER EMT
DISCONNECTING DEVICE
 NOT LESS 250%: 85 A
 USE: 100 AT, 460V, 3P, CIRCUIT BREAKER

B. JOCKEY PUMP: 3HP, 460VOLTS, 3 PHASE
 FULL LOAD CURRENT: 4.8 A
CONDUCTOR SIZE: NOT LESS 125%: 6 A
 USE: 3-5.5 SQ. MM. THW STRANDED COPPER WIRE
 CORRECTION FACTOR BASED ON
 35°C AMBIENT TEMPERATURE: 35 (0.94) A
 = 32.9 A
 USE: 20MM DIAMETER EMT
DISCONNECTING DEVICE
 NOT LESS 250%: 12 A
 USE: 30 AT, 460V, 3P, CIRCUIT BREAKER

C. MAIN CONDUCTOR AND PROTECTION
 FULL LOAD CURRENT FOR 25HP,
 460VOLTS, 3 PHASE: 34 A
 FULL LOAD CURRENT FOR 3HP,
 460VOLTS, 3 PHASE: 4.8 A
 38.8 A

TOTAL KVA REQUIREMENT:
 $(1.73 \times 460 \times 38.8 \times 1.25) / 1000 = 38.5963$ KVA
 USE: 3-14.0 SQ. MM. THW STRANDED COPPER WIRE
 1-14.0 SQ. MM. THW STRANDED COPPER GROUND WIRE
 20MM DIAMETER EMT

LOCKED ROTOR CURRENT FOR
 25HP, 460VOLTS, 3 PHASE: 183 A
 LOCKED ROTOR CURRENT FOR 3HP,
 460VOLTS, 3 PHASE: 32 A
 215 A

USE: 200 AT, 460V, 3P, OVERCURRENT PROTECTION

COMBINE LOAD:

A. FOR 460 VOLTS SIDE

FIRE PUMP: 38,596.30 VA
 Exist. LPP1: 35,811.00 VA
 Exist. LPP2: 41,779.50 VA
 LPP1: 13,348.82 VA
 LPP2: 13,090.00 VA
 LPP3: 52,980.86 VA
 195,606.48 VA

EQUIVALENT AMPERE: 245.80 A

USE: 3-125 SQ MM THWN STRANDED COPPER WIRE
 1-125 SQ MM TW STRANDED GREEN GROUND WIRE
 63MM EMT PIPE
 250 AMPS, 460 VOLTS, 3POLE, MAIN CIRCUIT BREAKER

B. FOR 230 VOLTS SIDE

Exist. LPP1: 35,811.00 VA
 Exist. LPP2: 41,779.50 VA
 LPP1: 13,348.82 VA
 LPP2: 13,090.00 VA
 LPP3: 52,980.86 VA
 157,010.18 VA








EQUIVALENT AMPERE: 394.60 A

USE: 2sets of 3-125 SQ MM THWN STRANDED WIRE
 1-125 SQ MM TW STRANDED GREEN GROUND WIRE
 2sets - 63MM PVC CONDUIT
 400 AMPS, 240 VOLTS, 3POLE, MAIN CIRCUIT BREAKER

C. TRANSFORMER SIZE

TOTAL KVA AT 240VOLT LOAD: 157.01 KVA
 @ 125% SAFETY FACTOR: 196.26 KVA

USE: 225 KVA, 3PHASE, 460V/230V STEP DOWN TRANSFORMER




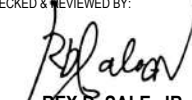



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					SHEET CONTENT: AS INDICATED							

SCHEDULE OF LOAD (IMPEDANCE PER PEC)

Cable No.	Conductor				Conduit		Current Amps	XL (REACTANCE) ohm/305m	R ohm/305m
	Description	mm ²	Type	Length (m)	mmØ	Type			
1	TRANSFORMER TO MDP	125	THWN	13	63	STEEL	394.60	0.052	0.054
2	MDP TO EXIST. LPP1	60	THW	9	50	STEEL	72.00	0.054	0.100
3	MDP TO EXIST. LPP2	60	THW	7	50	STEEL	84.00	0.054	0.100
4	MDP TO LPP1	14	THW	6	32	STEEL	35.20	0.064	0.490
5	MDP TO LPP2	14	THW	6	32	STEEL	32.90	0.064	0.490
6	MDP TO LPP3	80	THW	6	63	STEEL	178.28	0.052	0.079

SCHEDULE OF LOAD (POSITIVE IMPEDANCE)

Cable No.	Conductor	EQUIVALENT IMPEDANCE		BASES		PER UNIT IMPEDANCE			
		X (Ω)	R (Ω)	MVA	kV	X (pu)	R (pu)	Z	X/R
Z _t	TRANSFORMER	0.046	0.019	20.000	0.23	4.1262	1.6504	4.444	2.500
Z _{C1}	TRANSFORMER TO MDP	0.00222	0.00230	20.000	0.23	0.8380	0.8702	1.20805	0.963
Z _{C2}	MDP TO EXIST. LPP1	0.00159	0.00295	20.000	0.23	0.6024	1.1156	1.26789	0.540
Z _{C3}	MDP TO EXIST. LPP2	0.00124	0.00230	20.000	0.23	0.4686	0.8677	0.98614	0.540
Z _{C4}	MDP TO LPP1	0.00126	0.00964	20.000	0.23	0.4760	3.6444	3.67532	0.131
Z _{C5}	MDP TO LPP2	0.00126	0.00964	20.000	0.23	0.4760	3.6444	3.67532	0.131
Z _{C6}	MDP TO LPP3	0.00102	0.00155	20.000	0.23	0.3867	0.5876	0.70342	0.658

	REVISIONS <table border="1"> <thead> <tr> <th>REV.</th> <th>DATE</th> <th>BY</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>				REV.	DATE	BY	DESCRIPTION													PROJECT: PROPOSED LABORATORY RENOVATION, ZCWD WATER TREATMENT PLANT, ZAMBOANGA CITY		DRAWN BY:  ARTHUR A. REYES PRINCIPAL DRAFTSMAN B - DESIGN DIVISION	PREPARED BY:  ARIANN D. GODINEZ SENIOR ENGINEER A - DESIGN DIVISION	CHECKED & REVIEWED BY:  REX D. SALE, JR. SUPERVISING ENGINEER A - DESIGN DIVISION	REVIEWED AND SUBMITTED BY:  EDITO M. BAUTISTA, JR. OIC - DESIGN DIVISION	RECOMMENDING PROJECT IMPLEMENTATION:  MARLI ACOSTA - DE FIESTA DM A - ENGINEERING & CONSTRUCTION DEPARTMENT OIC - TECHNICAL SERVICES GROUP	APPROVED FOR PROJECT IMPLEMENTATION:  LEONARDO REY D. VASQUEZ GENERAL MANAGER	SHEET NO. 54
	REV.	DATE	BY	DESCRIPTION																									
SHEET CONTENT: AS INDICATED		Digitally signed by Acosta-De Fiesta Marli Patagoc Date: 2021.06.04 10:53:49 +08'00'																											

BASE IMPEDANCE

MVA base = 20 MVA
 kVbL = 0.23 kV
 $Z_{bL} = (kVbL)^2 / MVA_{b}$
 $Z_{bL} = (0.23 \text{ kVbL})^2 / 20 \text{ MVA}_{b}$
 $Z_{bL} = 0.002645 \text{ } \Omega$

BASE CURRENT

$I_b = 20\text{MVA} / (0.23 \text{ KV} * 1.732)$
 $I_b = 50205.84 \text{ A}$

PER UNIT COMPUTATION

$Z_{pu} = Z / Z_b$

Per unit impedance of 225 kVA Transformer

%Z = 5, X/R=2.5, at 0.46 kV primary voltage, R=0.019, X=0.046
 MVA base = 20 MVA
 Voltage base = 230 V

$Z_{tpu} = Z_o ((MVA_b^n * kV^{o2}) / (MVA_b^o * kV^{n2}))$
 $Z_{tpu} = 4.444$

$\theta = \arctan (X/R) = 68.2^\circ$

$Z_{tpu} = 4.444 / 68.2^\circ = 1.6504 + j4.1262$

FAULT -1

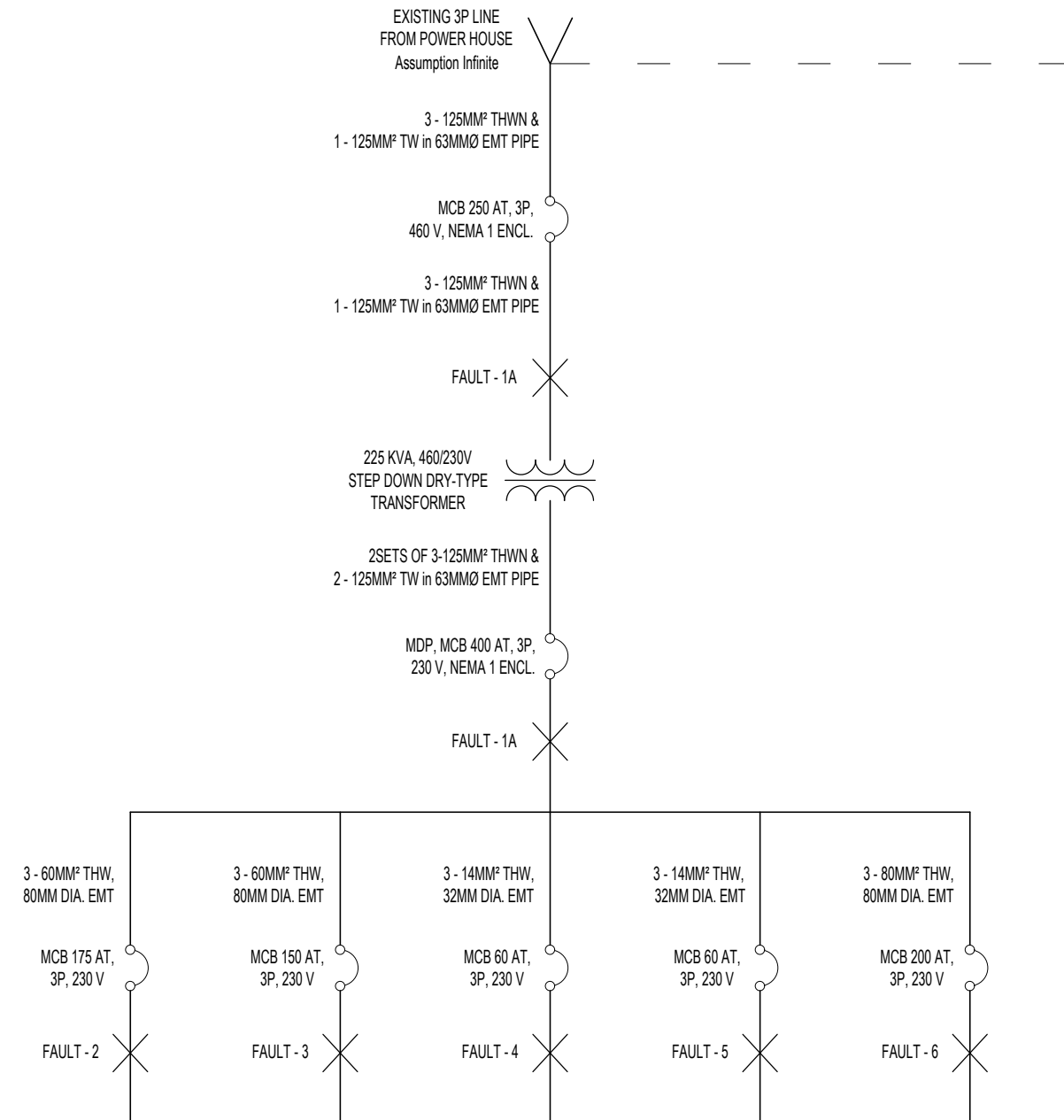
TOTAL Z = $Z_t + Z_{c1}$
 TOTAL Z = $(1.6504 + j4.1262) + (0.838 + j0.6607)$
 TOTAL Z = $5.652 / 62.53^\circ \text{ pu}$

$I_{f3\phi} = E_\phi / Z_{F-1}$

$I_{f3\phi} = 0.177 / -62.53^\circ \text{ pu}$




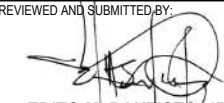


FOR 20MVA, 0.23KV BASE

$I_{3\phi} = 8882.762389 \text{ A}$



ONE LINE DIAGRAM

SCALE: NTS

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	SHEET CONTENT: AS INDICATED											

SCHEDULE OF FAULTS

FAULT NO.	TOTAL IMPEDANCE (Z)	3PHASE FAULT (A)	KAIC
FAULT-1A	5.65205	0.176926861	4.44
FAULT-1B	5.65205	0.176926861	8.88
FAULT-2	6.91994	0.144509895	7.26
FAULT-3	6.63819	0.15064351	7.56
FAULT-4	9.32737	0.107211337	5.38
FAULT-5	9.32737	0.107211337	5.38
FAULT-6	6.35547	0.157344653	7.90

VOLTAGE DROP CALCULATION

Cable No.	Conductor				Conduit		Current Amps	XL (REACTANCE) ohm/305m	R (RESISTANCE) ohm/305m	Voltage at Sending End Vs	Voltage Drop Vd	Voltage at Receiving End Vr	Percent Voltage Drop %
	Description	mm ²	Type	length (m)	mmØ	Type							
1	TRANSFORMER TO MDP	125	THW	13	63	STEEL	394.60	0.052	0.054	230.00	1.26	228.74	0.55%
2	MDP TO EXIST. LPP1	60	THW	9	50	STEEL	72.00	0.054	0.100	228.74	0.24	228.50	0.11%
3	MDP TO EXIST. LPP2	60	THW	7	50	STEEL	84.00	0.054	0.100	228.74	0.22	228.52	0.10%
4	MDP TO LPP1	14	THW	6	32	STEEL	35.20	0.064	0.490	228.52	0.34	228.18	0.15%
5	MDP TO LPP2	14	THW	6	32	STEEL	32.90	0.064	0.490	228.18	0.32	227.86	0.14%
6	MDP TO LPP3	80	THW	6	63	STEEL	178.28	0.052	0.079	227.86	0.33	227.53	0.15%

CONDUCTOR: 125 SQ. MM.

R 0.05 OHM PER 305 m
X 0.052 OHM PER 305 m

A. VOLTAGE DROP AT THE MAIN BREAKER

$$VD = I \sqrt{R^2 + X^2}$$

$$VD = 394.60 \sqrt{(0.05)^2 + (0.052)^2} \times (13/305)$$

$$VD = 1.26 \text{ VOLTS}$$

VOLTAGE AT PANEL BOARD

$$Vr = Vs - Vd$$

$$Vr = 230V - 1.26V$$


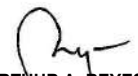




$$Vr = 228.74 \text{ VOLTS}$$

B. VOLTAGE DROP PERCENTAGE

$$\%VD = \frac{Vs - Vd}{Vs} \times 100$$

$$\%VD = ((230 - 228.74) / 230) \times 100$$

$$\%VD = 0.55\%$$

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