BIDS AND AWARDS COMMITTEE

SUPPLEMENTAL BID BULLETIN NO. 02

Repair of Jetty Structures

Invitation to Bid No. 2025-EPA-014

The PNOC Bids and Awards Committee hereby adopts the following amendments in the Philippine Bidding Documents:

1. **Revised Bill of Quantities attached (Annex A).**
2. **Detailed drawings / plans for Glass Fiber Reinforced Polymer (GFRP) bars related to Scope of Work # 1 attached (Annex B).**

Amendments/inclusions/clarifications made herein shall be considered an integral part of the Bidding Document.

For guidance and information of all concerned.

Issued this 16th day of December 2024.

ATTY. JOSEPHINE CASSANDRA J. CUI
Chairperson

ANNEX A

BILL OF QUANTITIES

Item	Description	Qty	Unit	Unit Price	Material Cost
A.	**Description**				
	Mobilization/Demobilization	1	lot		
B.	**Material Cost**				
	Scope of work 1:				
	16 mm glass fiber reinforced polymer (GFRP) main bars	278	pcs		
	10 mm glass fiber reinforced polymer (GFRP) dowel bars	1610	pcs		
	Welding rods, E6010	100	kg		
	10 mm glass fiber reinforced polymer (GFRP) ties	1658	pcs		
	#16 Galvanized Iron tie wires	410	kg		
	Glass fiber sheet for column forms	3233	m^2		
	Ready mix concrete	112	m^3		
	Petrolatum tape	1591.54	m^2		
	Mild Steel Plate (4' x 8' x 8mm thick)	66	pcs		
	Scope of work 2:				
	Rust remover/converter	10	gal		
	Structural epoxy injection (390mL/pc)	700	gal		
	Concrete Epoxy putty	900	gal		
	Cement	20	bags		
	Crushed sand	3	m^3		
	Scope of work 3:				
	1 set of 800mmH x 1500mmL rubber fender body. Energy absorption is 471kNm per pair, reaction force is 1200KN at deflection 52.5%.	1	set		
	1 set UHMW PE pad	1set	set		
	6 sets full threaded bolt M36 SS316 pad fixing	6	set		
	Chemical bolt for marine application	1	lot		
C	**Equipment Cost**				
	Diesel generator	1	Set		
	Diver tools	10	Set		

	Under water Welding Equipment	2	Set		
	Pump Crete	1	Unit		
	Concrete Mixer Truck	1	Unit		
	Diesel vibrator	1	Set		
	Chipping hammer	2	Pcs		
	Service Boat	1	Unit		
D	**Labor Cost**				
	Project Manager	1	Personnel		
	Site Engineer	1	Personnel		
	Safety Officer	1	Personnel		
	Foreman	2	Personnel		
	Underwater Welder	4	Personnel		
	Diver	6	Personnel		
	Skilled Worker	16	Personnel		
	Helper	8	Personnel		
E	**Total Direct Cost (A+B+C+D)**				
F	**Mark-Up**				
G	**Project Cost**				
H	**VAT (12%)**				
I	**Total Project Cost** (inclusive of VAT and all applicable taxes)				

Note: The materials shall not be limited to the provided Bill of Quantities.

Name of Company : _____

Authorized Representative : _____

Signature over printed name

PHILIPPINE NATIONAL OIL COMPANY

BRGY. BATANGAS DOS, MARIVELES, BATAAN

PNOC - JETTY FACILITY STRUCTURAL RETROFITTING

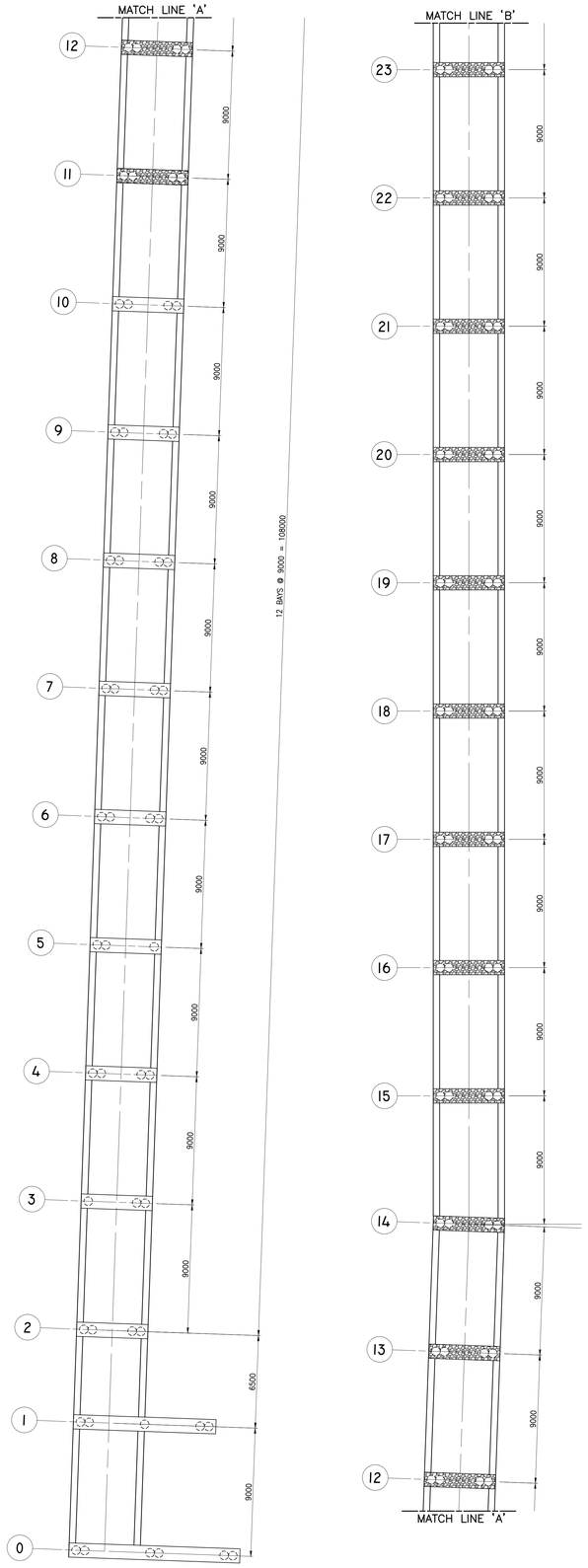
PROJECT TITLE

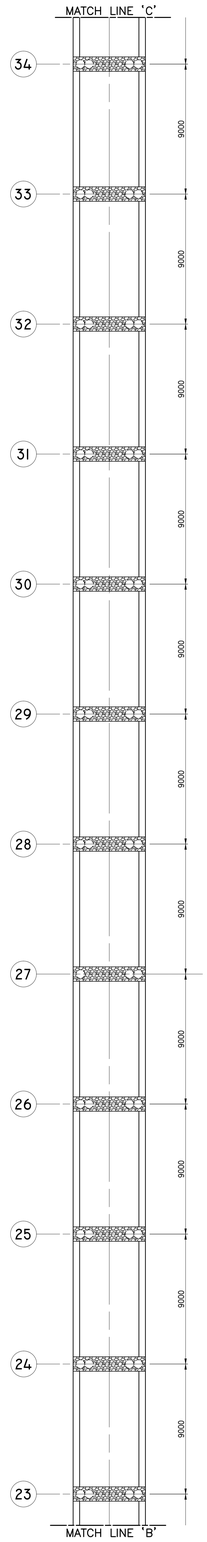
a.C.ONG CONSULTING INC.
Engineering + Management + Sustainability
6/f A.C. Ong Center, 1178 P. Ocampo Sr. Extension Brgy. Sta. Cruz, Makati City - Metro Manila
1799 P. Burgos St., Brgy. Lourdes Sur, Angeles City, Pampanga
Tel. Nos.: +63 2 8935827; 8124935
Email: acoconsulting@aco.com.ph Website: www.aco.com.ph

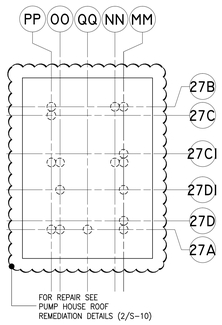
NOVEMBER 2023

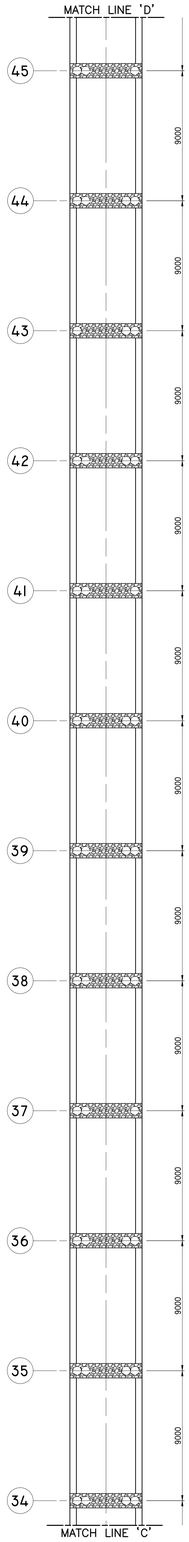
STRUCTURAL DRAWINGS

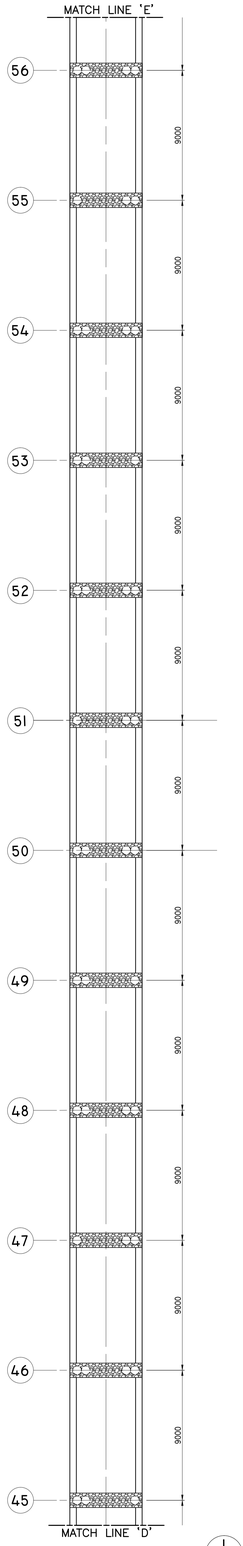
SHEET NO.	DESCRIPTION
S-01	PLAN SHOWING CONCRETE
	MEMBERS FOR REPAIR
S-02	PLAN SHOWING CONCRETE
	MEMBERS FOR REPAIR
S-03	PLAN SHOWING STEEL FLOOR FRAMES
	FOR REPAIR
S-04	PLAN SHOWING STEEL FLOOR FRAMES
	FOR REPAIR
S-05	PLAN FOR RETROFITTING
S-06	PLAN FOR RETROFITTING
S-07	PLAN FOR RETROFITTING
S-08	TYP. CONCRETE REPAIR DETAILS
	TYP. PILE RETROFITTING DETAILS
	TYP. STEEL COLUMN RETROFITTING DET.
	TYP. BP & GIRDER RETROFITTING DET.
	TYP. ADDITIONAL PIPE RACK DETAILS
S-09	TYP. DECK SLAB AND METAL PANEL DET.
	TYP. CATWALK REPLACEMENT DETAILS
S-10	STEEL RAILINGS AND
	STAIRS REMEDIATION DETAILS
	PUMP HOUSE ROOF REMEDIATION DETAILS
	LIGHT POST REPLACEMENT DETAILS

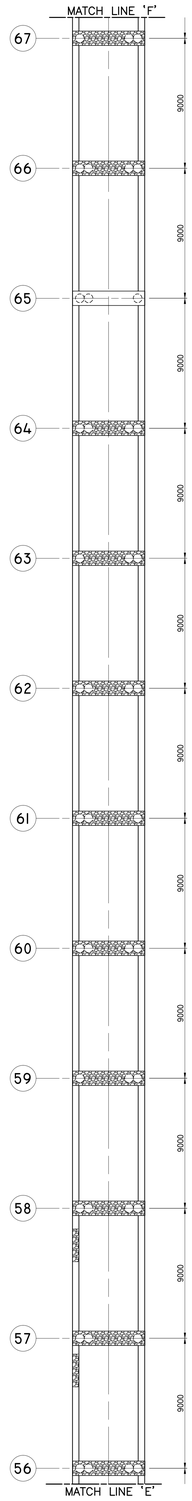


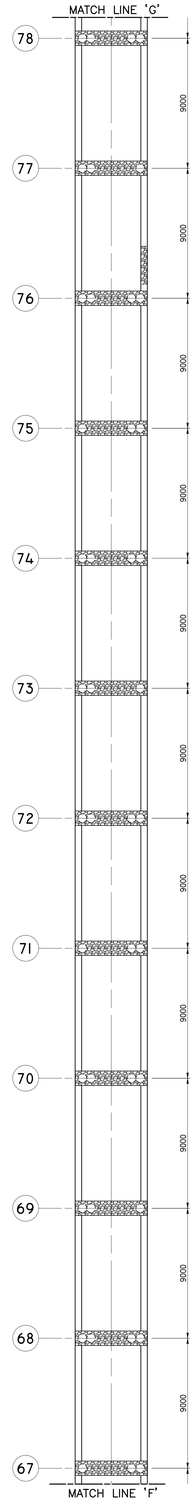


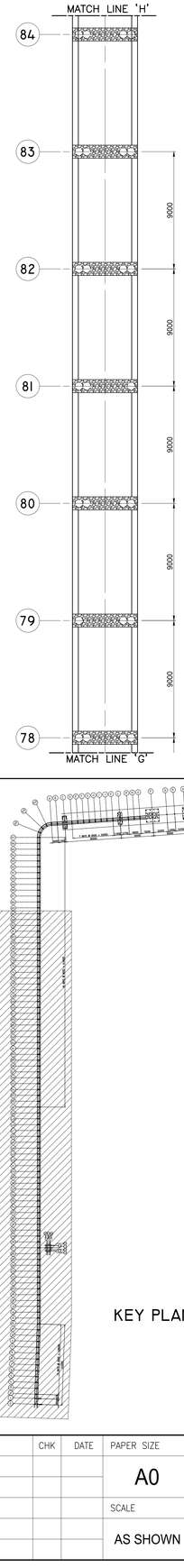












NOTE :

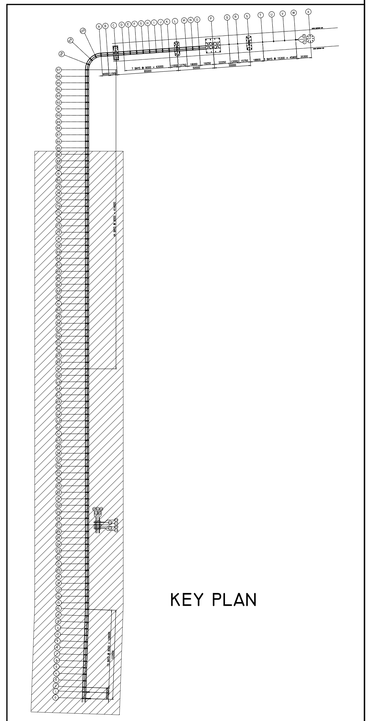
1. FOR GENERAL REPAIR:
   a. APPLY EPOXY PUTTY FOR CONCRETE MEMBERS WITH SPALLING.
   b. CLEAN ALL STEEL MEMBERS THAT SHOW SIGNS OF CORROSION THEN APPLY NEW CORROSION PROTECTION SYSTEM.

PLAN SHOWING CONCRETE MEMBERS FOR REPAIR

1 / S-01 SCALE 1:150M

LEGEND :

▨ – CONCRETE SPALLING LOCATION



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CERTIFIED BY

ALDEN C. ONG, M. Eng., ASEP
ENGINEER

REG. NO.: 68251
TIN NO. : 168-950-786
PTR NO. : 9565410
DATE : JANUARY 05, 2023
PLACE : MAKATI CITY

OWNER: PHILIPPINE NATIONAL OIL COMPANY (PNOC)
BRGY. BATANGAS DOS, MARIVELES, BATAAN

PROJECT TITLE/LOCATION: PNOC - JETTY FACILITY STRUCTURAL RETROFITTING
BRGY. BATANGAS DOS, MARIVELES, BATAAN

SHEET CONTENTS: PLAN SHOWING CONCRETE MEMBERS FOR REPAIR

R.A. 9266 SEC. 33
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RCI/AAP	NOV 2023				
DESIGNED	DATE				
CFF	NOV 2023				
APPROVED	DATE				
ACO	NOV 2023				

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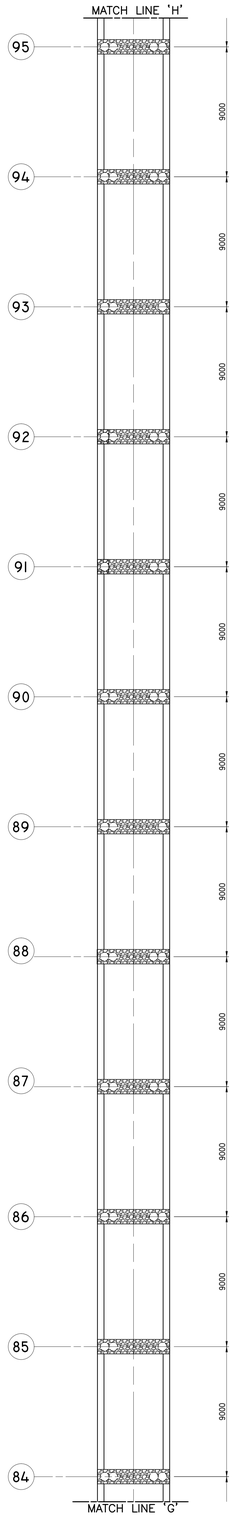
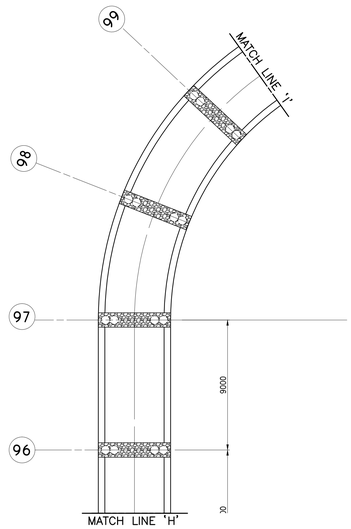
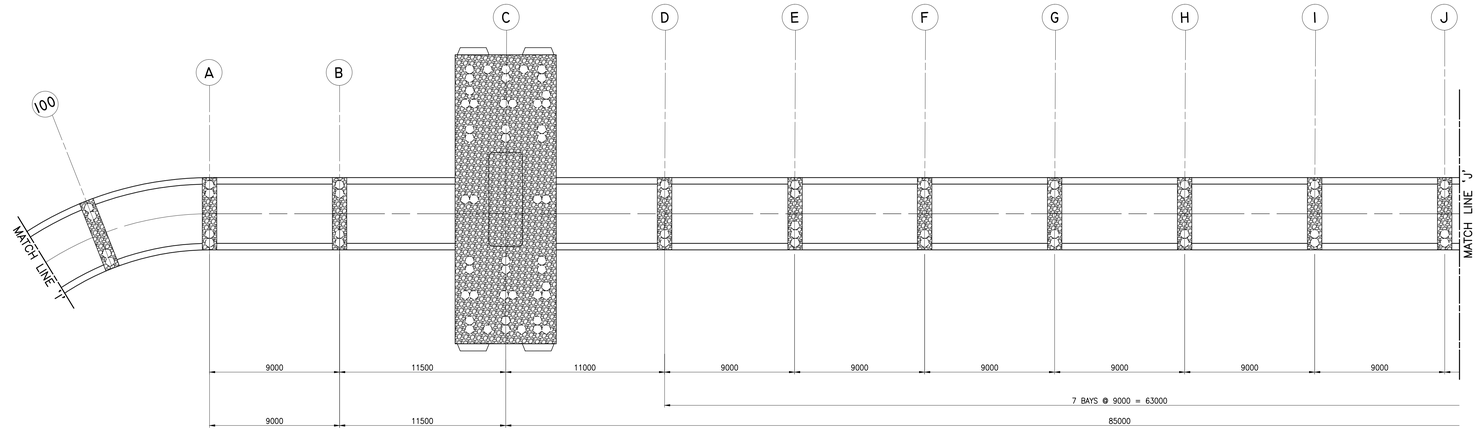
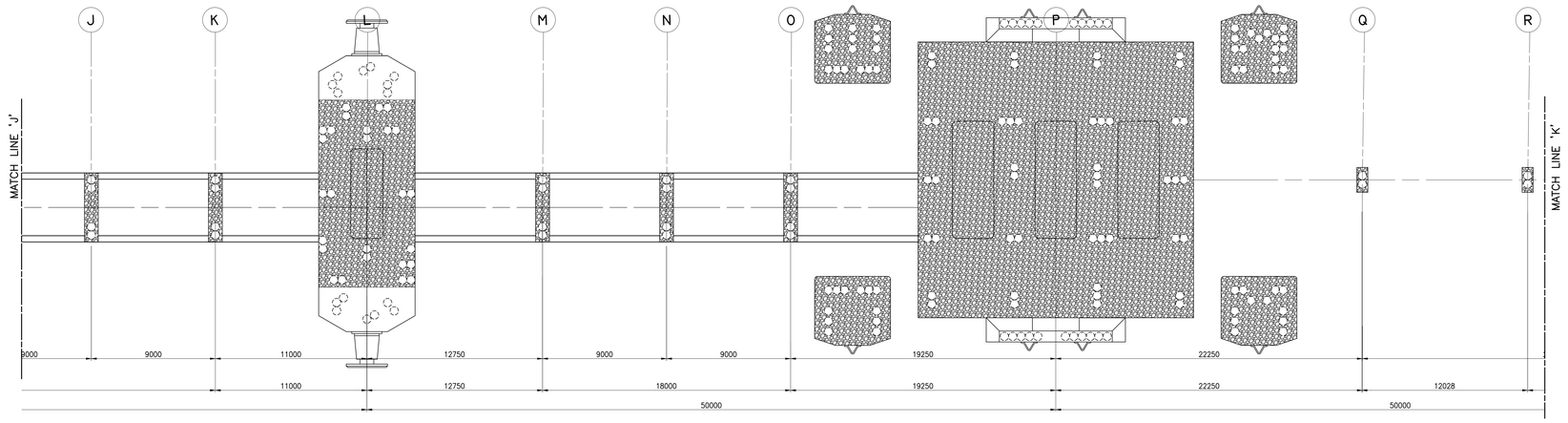
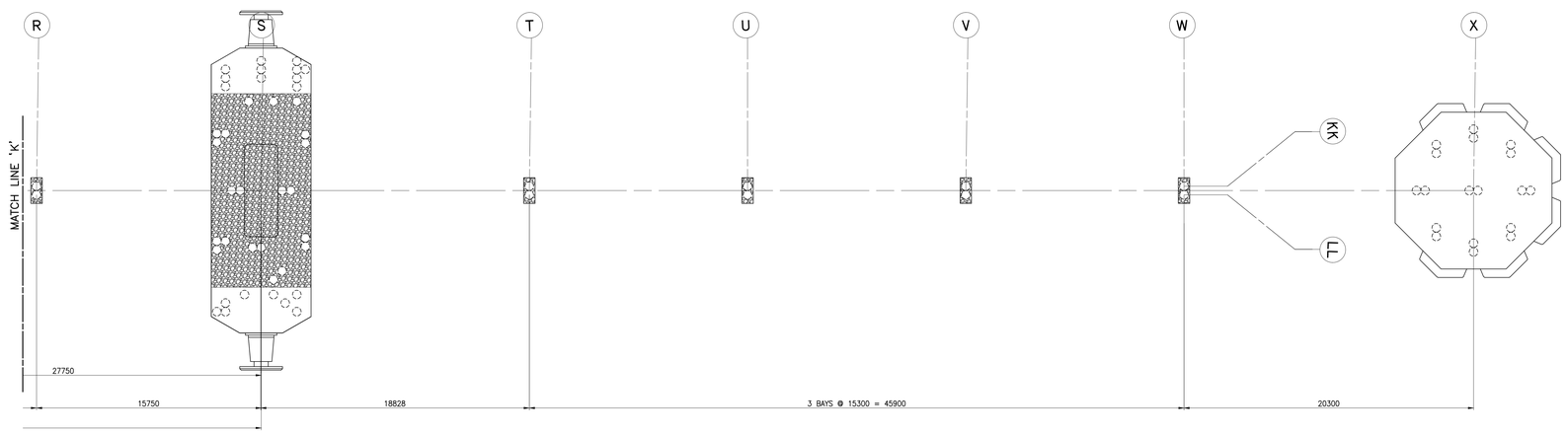
SCALE	PROJECT NO.
AS SHOWN	DE-G-23-012-00











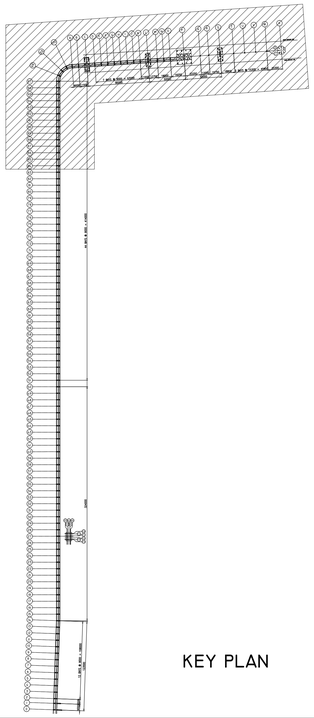
I
S-02 PLAN SHOWING CONCRETE MEMBERS FOR REPAIR
SCALE 1:150M

NOTE :

1. FOR GENERAL REPAIR:
   a. APPLY EPOXY PUTTY FOR CONCRETE MEMBERS WITH SPALLING.
   b. CLEAN ALL STEEL MEMBERS THAT SHOW SIGNS OF CORROSION THEN APPLY NEW CORROSION PROTECTION SYSTEM.

LEGEND :

– CONCRETE SPALLING LOCATION



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SHEET CONTENTS: PLAN SHOWING CONCRETE MEMBERS FOR REPAIR

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SCALE	PROJECT NO.
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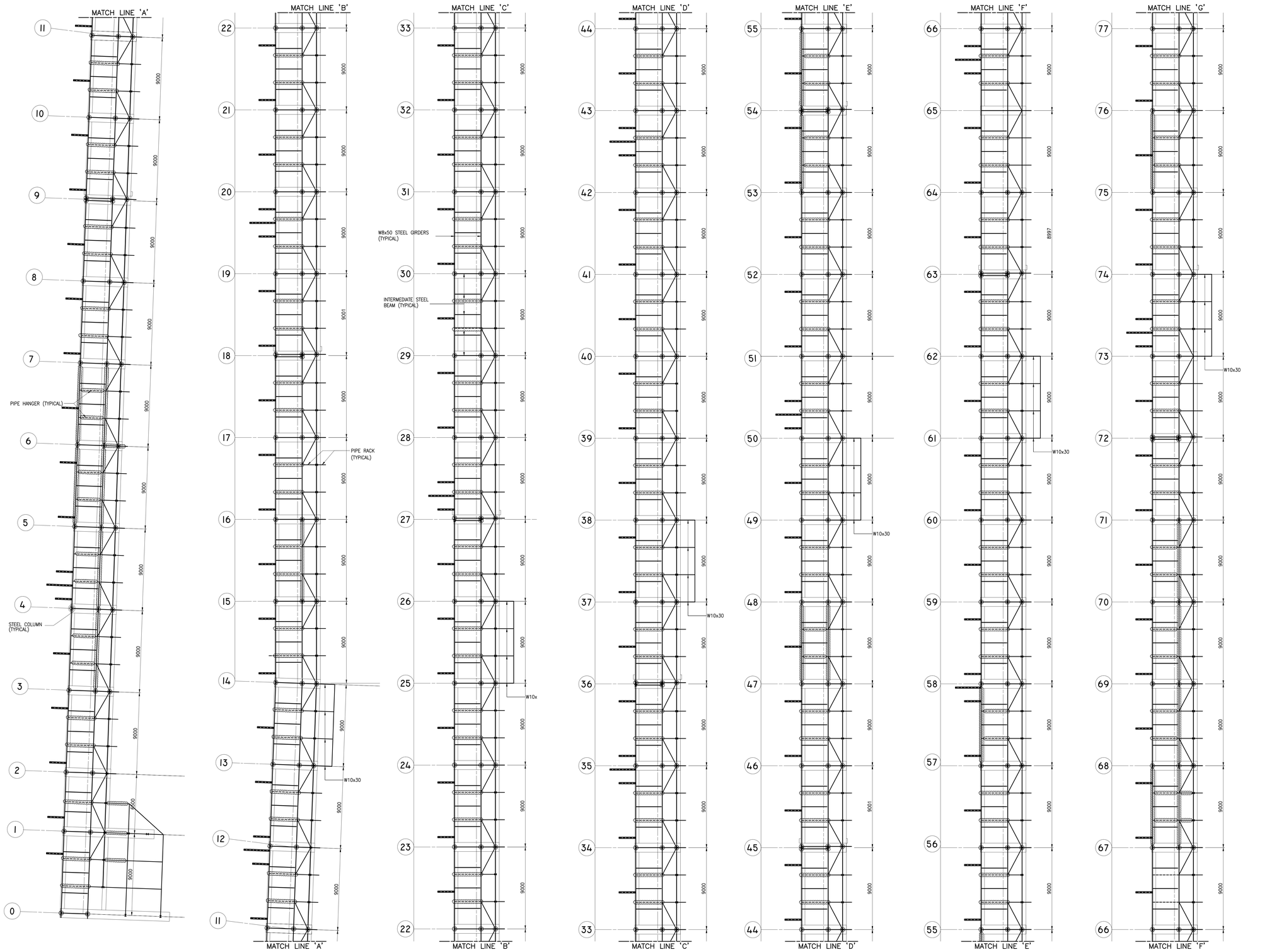

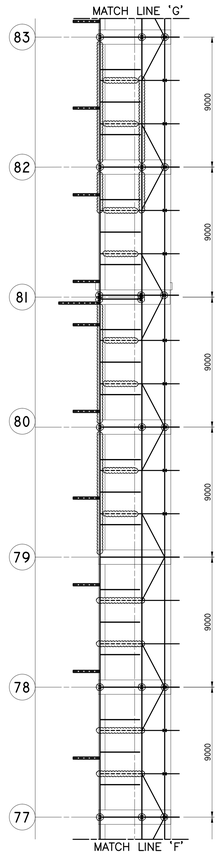

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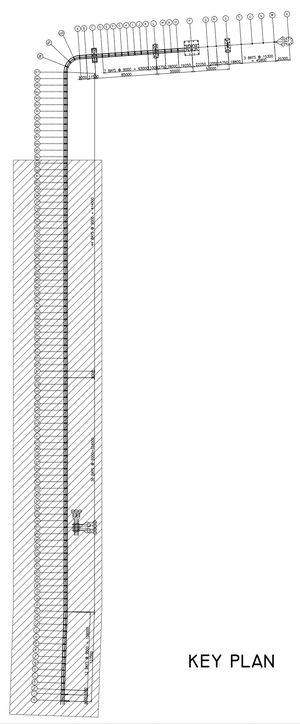

KEY PLAN

1 / S-03 PLAN SHOWING STEEL FLOOR FRAMES FOR REPAIR

SCALE 1:150M

LEGEND :

– CORRODED STEEL FRAME

a.C.ONG CONSULTING INC.

Engineering + Management + Sustainability

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BRGY. BATANGAS DOS, MARIVELES, BATAAN

PROJECT TITLE/LOCATION: PNOC - JETTY FACILITY STRUCTURAL RETROFITTING
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SHEET CONTENTS: PLAN SHOWING STEEL FLOOR FRAMES FOR REPAIR

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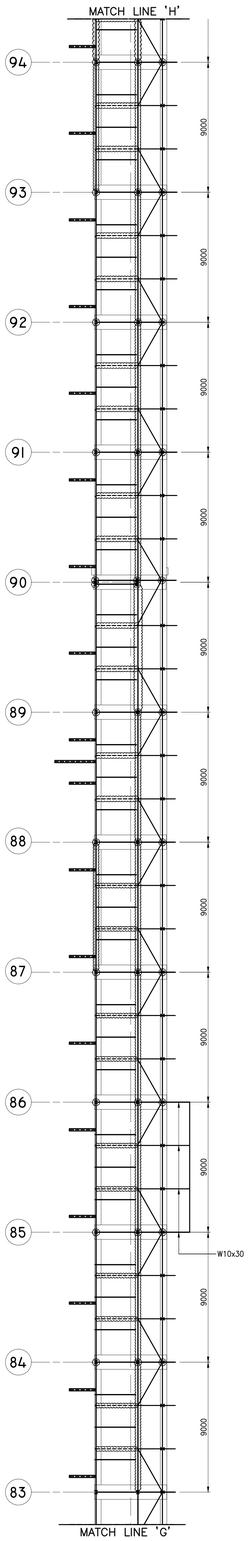

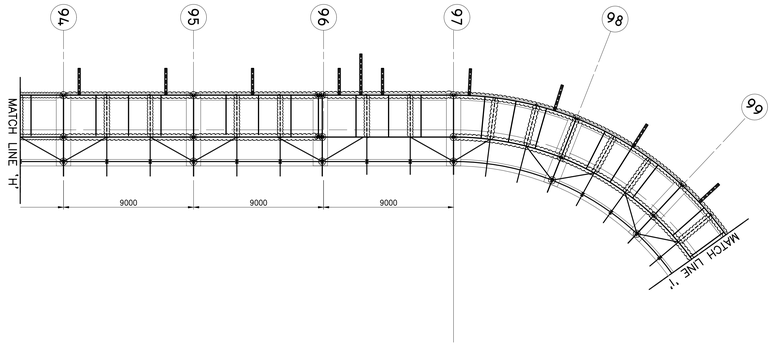

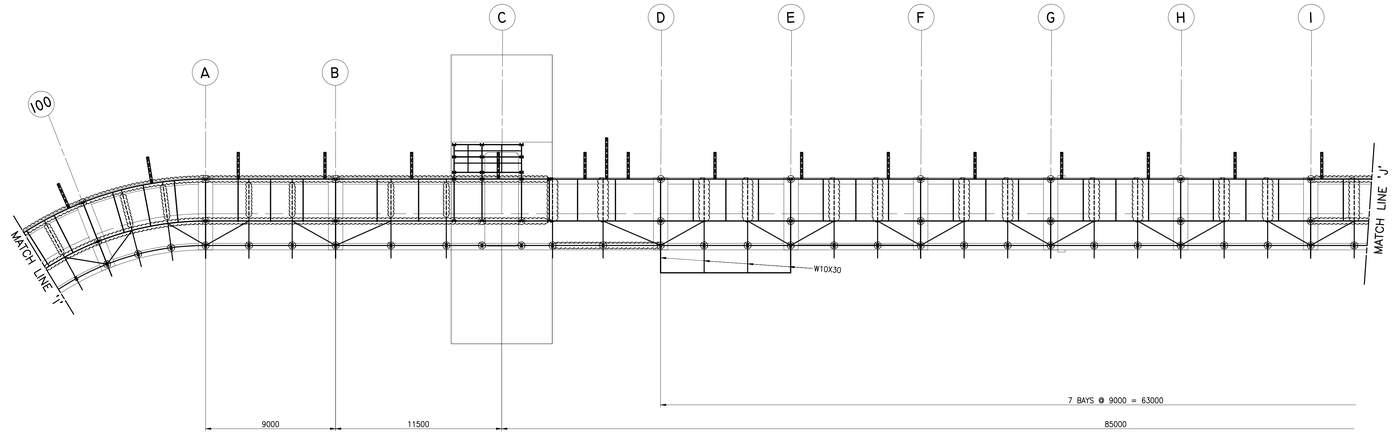

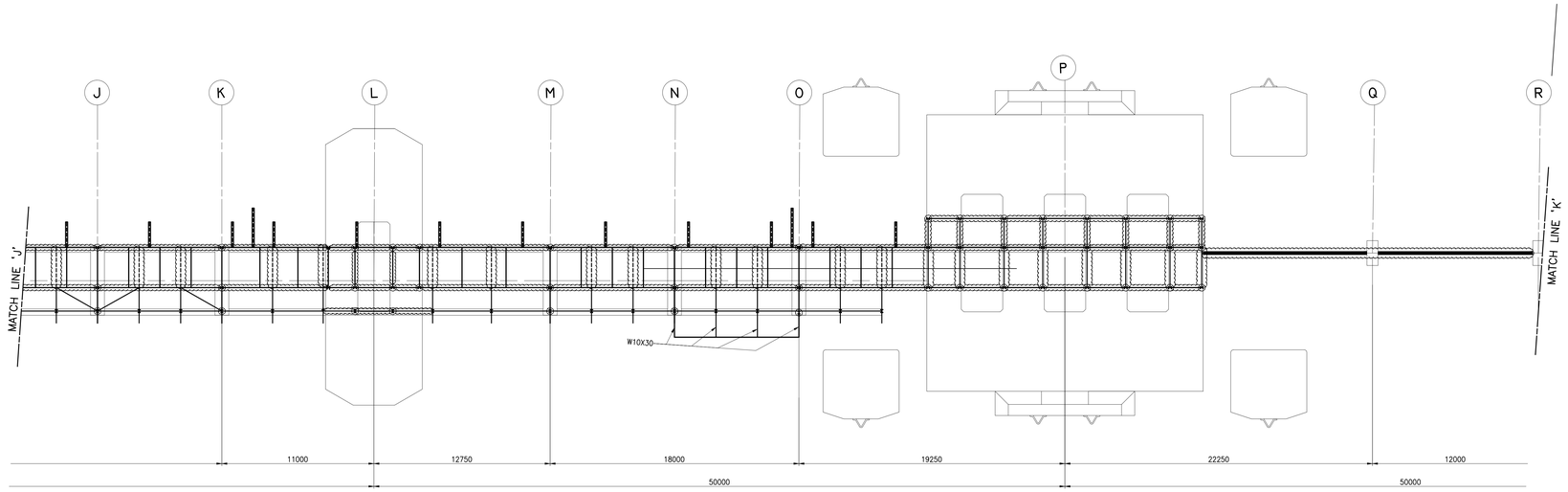

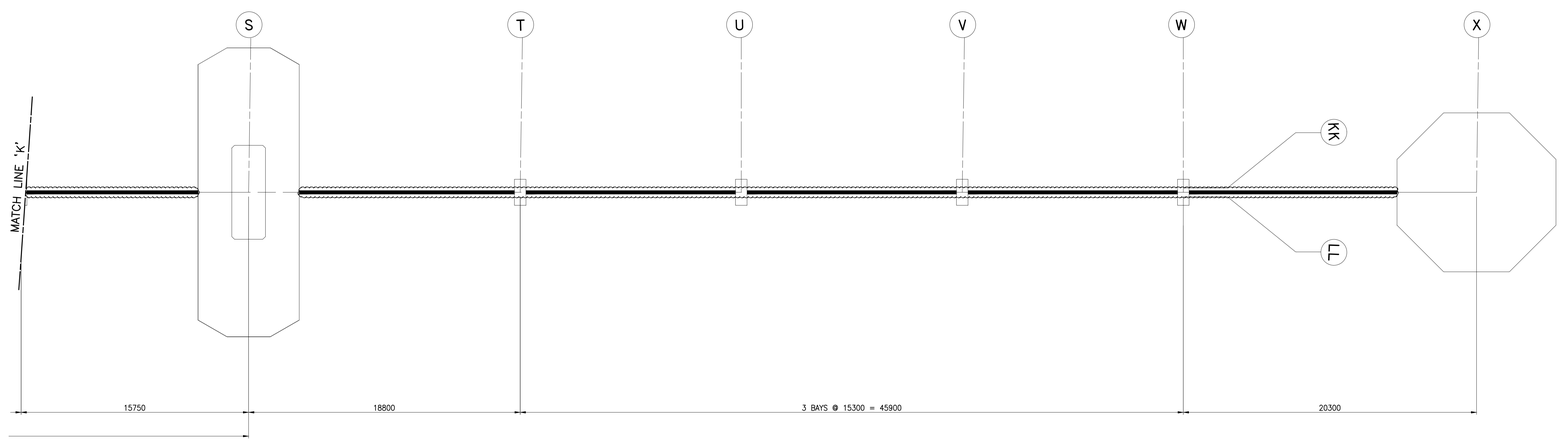

I
S-04
PLAN SHOWING STEEL FLOOR FRAMES FOR REPAIR
SCALE 1:150M

NOTE :

1. FOR GENERAL REPAIR:
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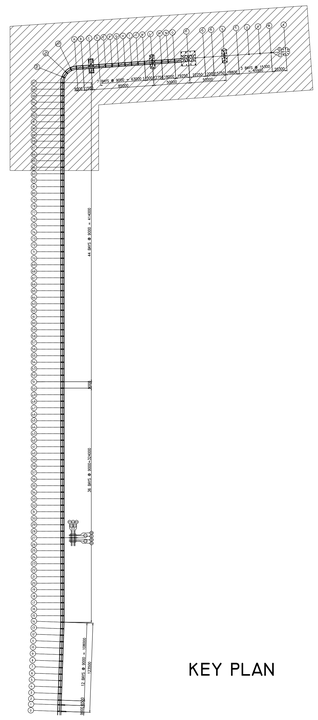
LEGEND :

– CORRODED STEEL FRAME



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SHEET CONTENTS: PLAN SHOWING STEEL FLOOR FRAMES FOR REPAIR

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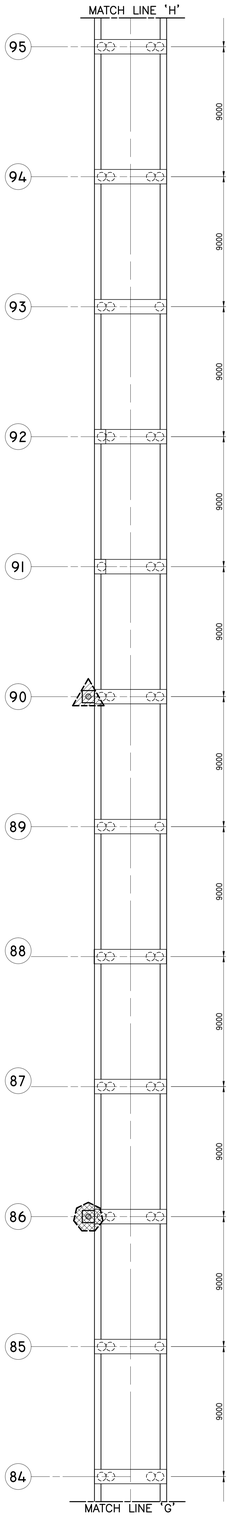
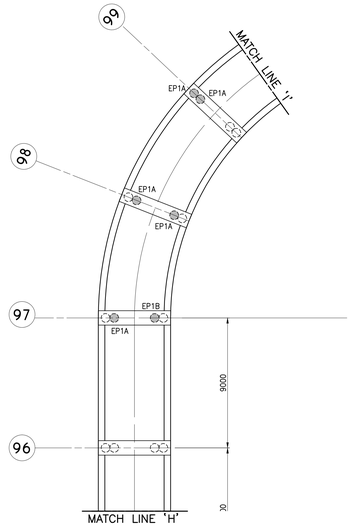
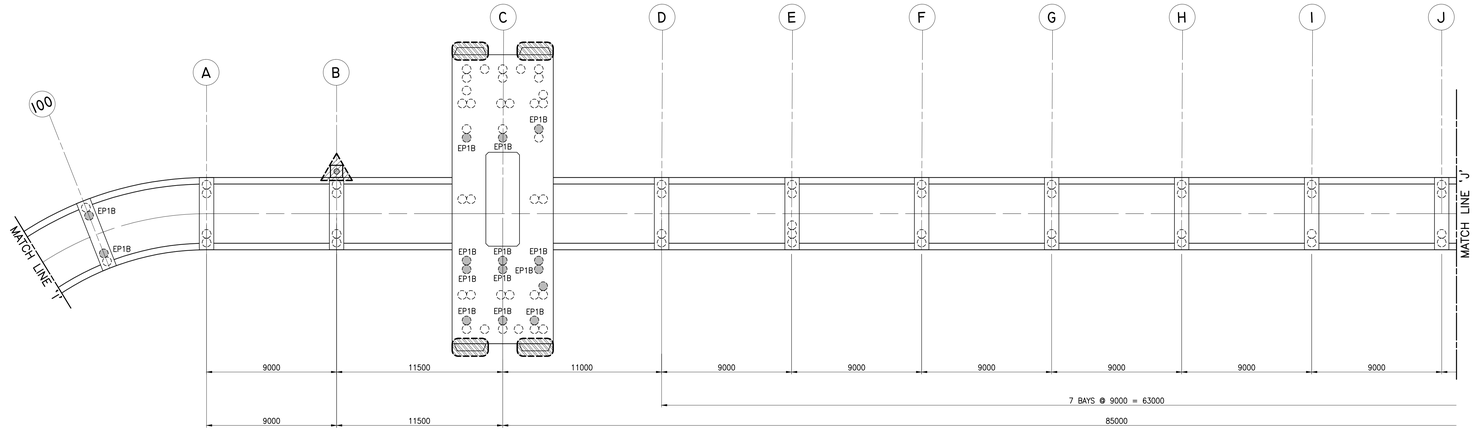
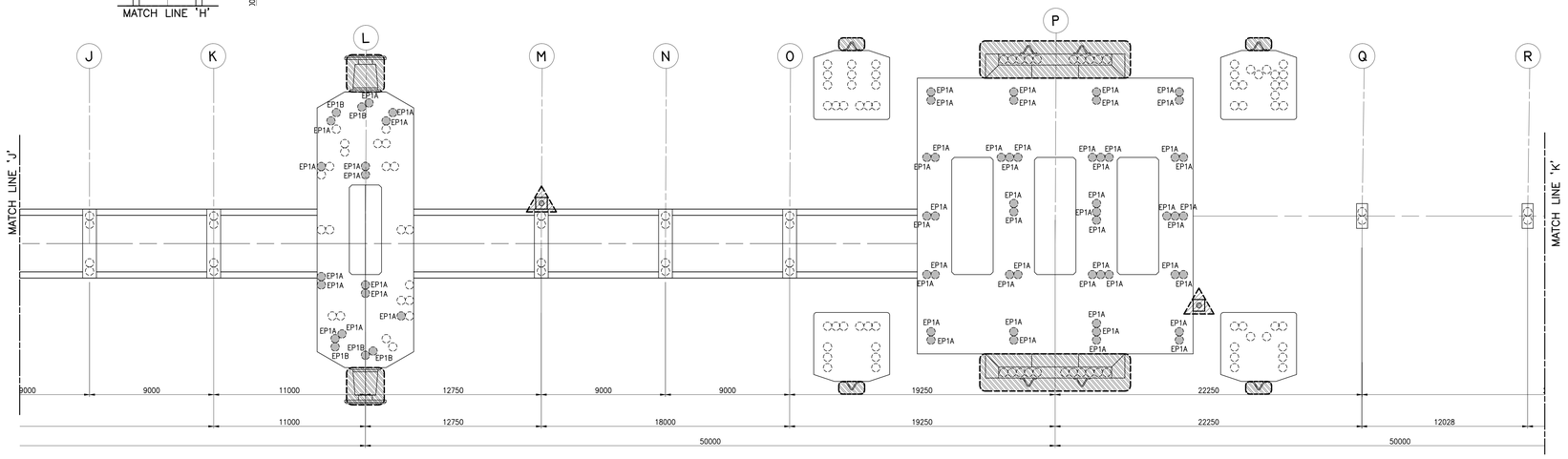
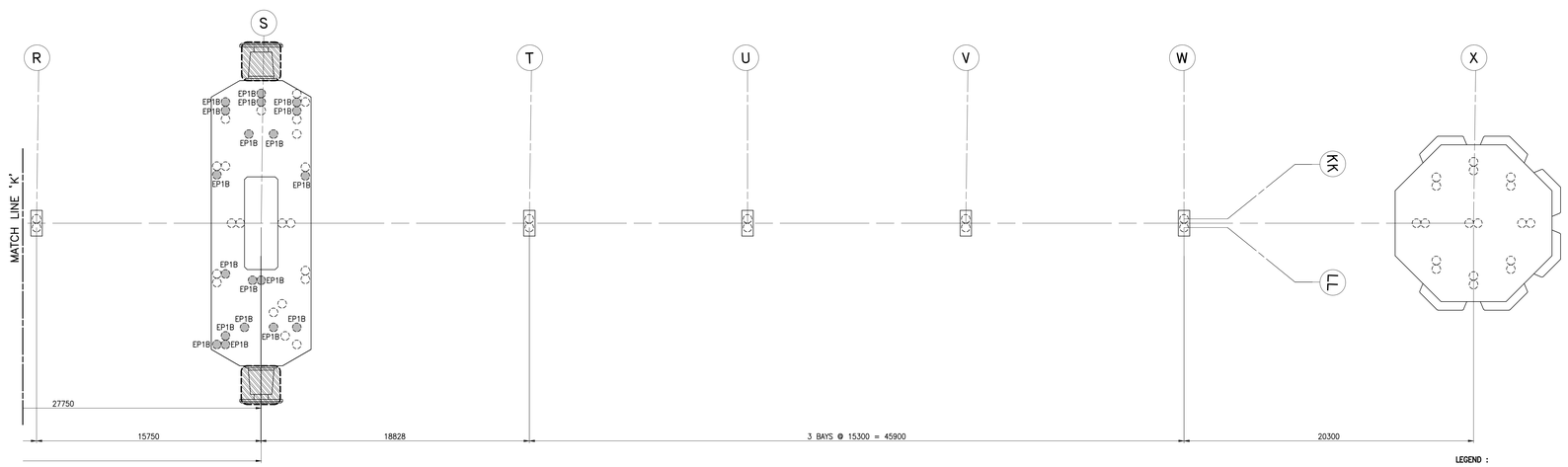






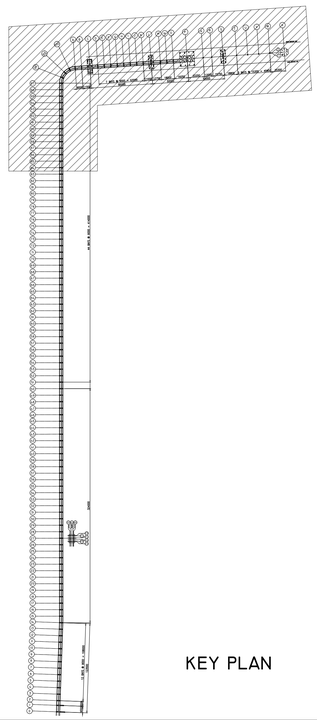




LEGEND :

- EP# – PILE FOR RETROFITTING
- LIGHT POST FOR REPLACEMENT
- MISSING LIGHT POST FOR REPLACEMENT
- RUBBER LEG FENDERS FOR REPLACEMENT

I S-05 PLAN FOR RETROFITTING
SCALE 1:150M



KEY PLAN

a.C.ONG CONSULTING INC.
Engineering + Management + Sustainability
6/f A.C. Ong Center, 1178 P. Ocampo Sr. Extension Brgy. Sta. Cruz, Makati City - Metro Manila
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CERTIFIED BY

ALDEN C. ONG, M. Eng., ASEP
ENGINEER

REG. NO.: 68251
TIN NO. : 168-950-786
PTR NO. : 9565410
DATE : JANUARY 05, 2023
PLACE : MAKATI CITY

OWNER: PHILIPPINE NATIONAL OIL COMPANY (PNOC)
BRGY. BATANGAS DOS, MARIVELES, BATAAN

PROJECT TITLE/LOCATION: PNOC - JETTY FACILITY STRUCTURAL RETROFITTING
BRGY. BATANGAS DOS, MARIVELES, BATAAN

SHEET CONTENTS: PLAN FOR RETROFITTING

R.A. 9266 SEC. 33
DRAWINGS AND SPECIFICATIONS AND CONTRACT DOCUMENTS DULY SIGNED, STAMPED OR SEALED AS INSTRUMENTS FOR SERVICE ARE THE INTELLECTUAL PROPERTY AND DOCUMENTS OF ARCHITECT, WHETHER THE OBJECT FOR WHICH THEY ARE MADE IS EXECUTED OR NOT. IT SHALL BE UNLAWFUL FOR ANY PERSON TO DUPLICATE OR TO MAKE COPIES OF SAID DOCUMENTS FOR USE IN THE REPETITION OF AND FOR OTHER PROJECTS OR BUILDINGS, WHETHER EXECUTED PARTLY OR IN WHOLE, WITHOUT THE WRITTEN CONSENT OF THE ARCHITECT OR AUTHOR OF SAID DOCUMENTS.

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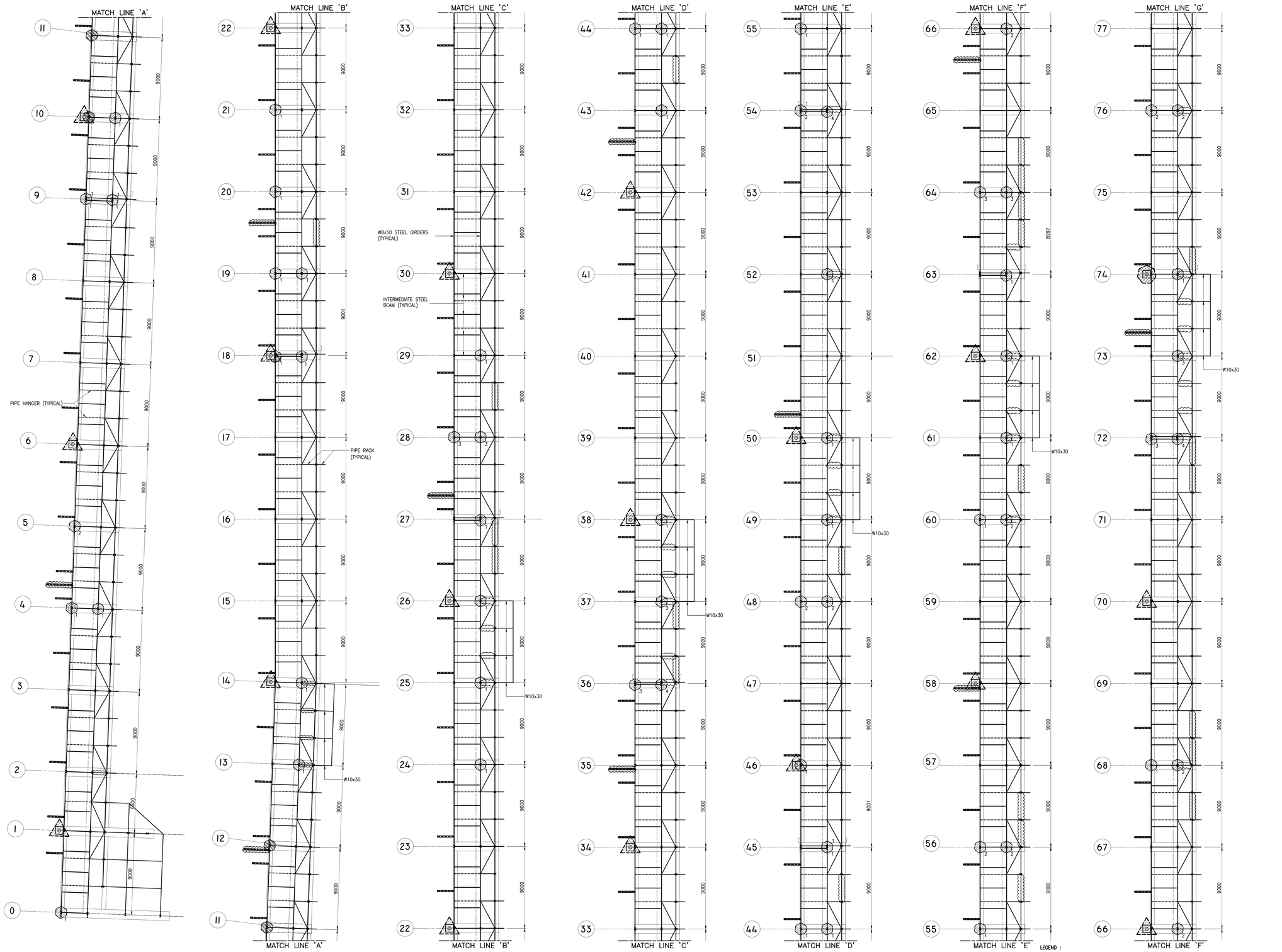
APPROVED	DATE				
ACO	NOV 2023				

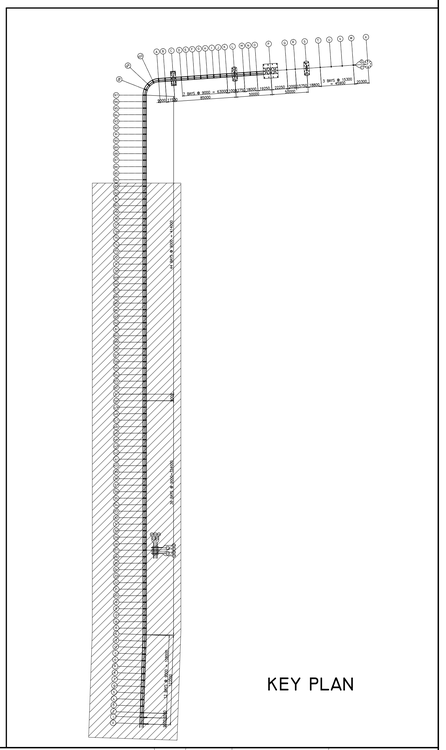
PAPER SIZE	SHEET NO.
A0	S-05
SCALE	PROJECT NO.
AS SHOWN	DE-G-23-012-00



1 PLAN FOR RETROFITTING
S-06 SCALE 1:150M

LEGEND :

CASE#
- STEEL COLUMNS FOR RETROFITTING
- BASEPLATE FOR RETROFITTING
- LIGHT POST FOR REPLACEMENT
- STEEL GIRDERS FOR RETROFITTING
- ADD'L. PIPE RACKS FOR RETROFITTING
- MISSING LIGHT POST FOR REPLACEMENT



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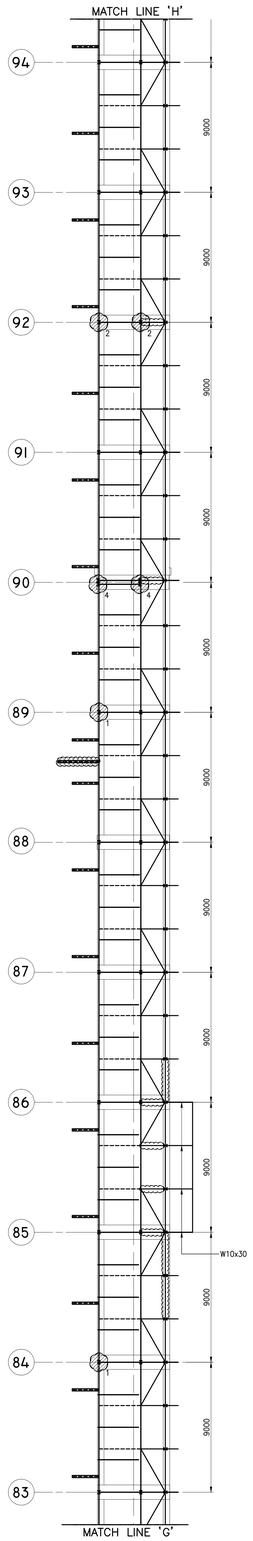
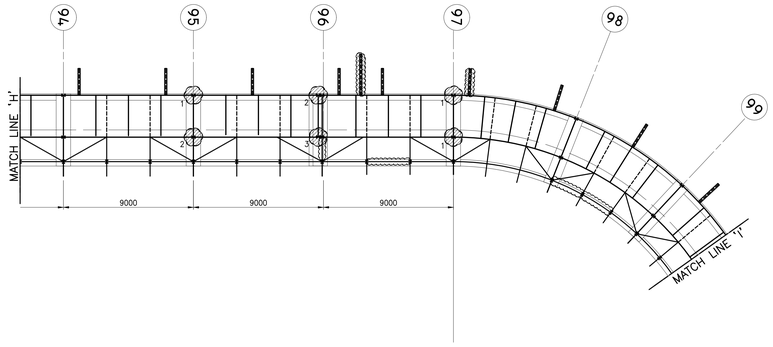
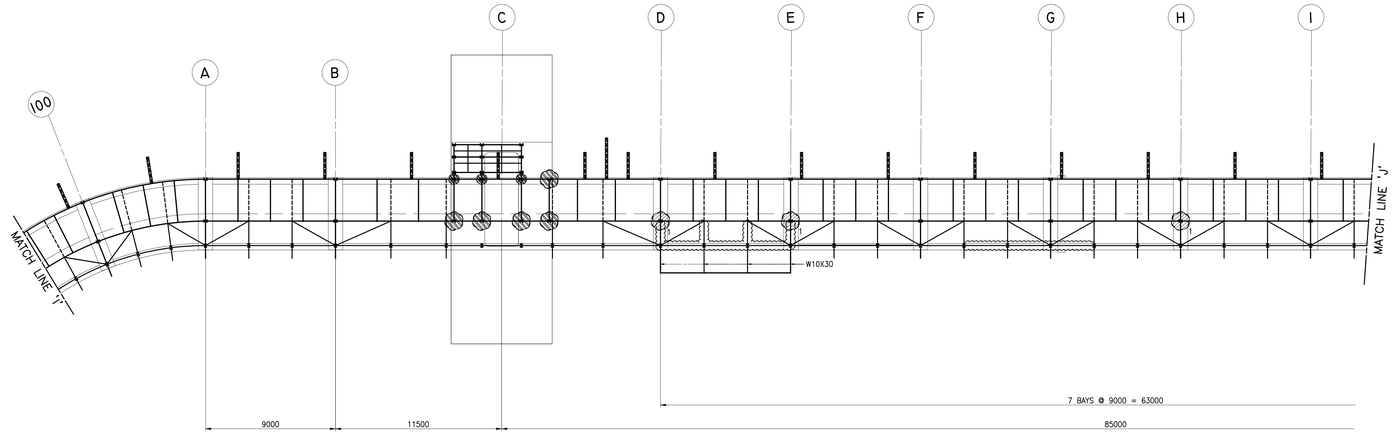
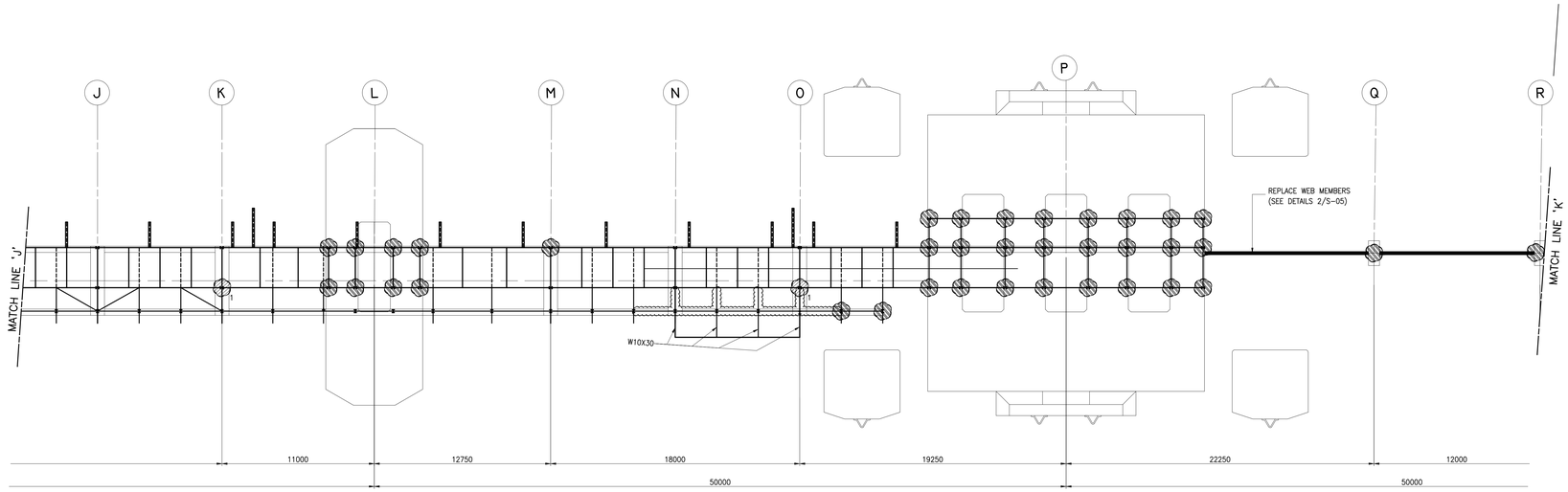
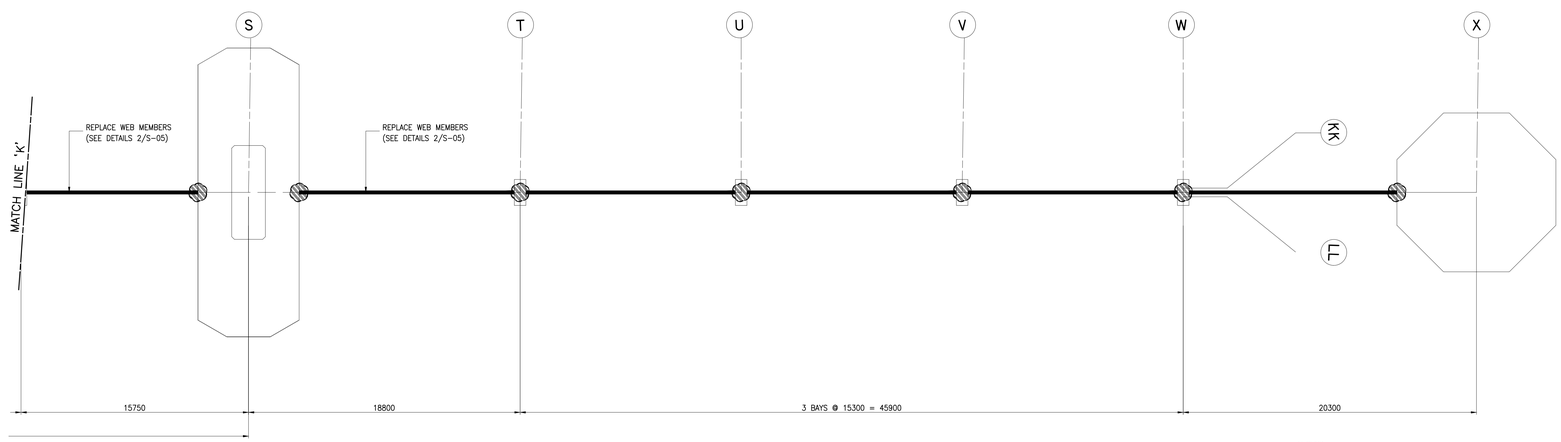








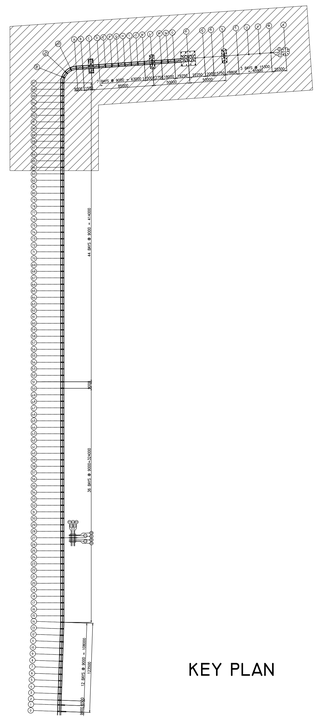


I
S-07
PLAN FOR RETROFITTING
SCALE 1:150M

LEGEND :

CASE#

- STEEL COLUMNS FOR RETROFITTING
- STEEL GIRDERS FOR RETROFITTING
- BASEPLATE FOR RETROFITTING
- ADD'L. PIPE RACKS FOR RETROFITTING



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GENERAL NOTES:

A. GENERAL

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS SPECIFIED.
2. ALL DRAWINGS SHALL BE USED IN CONJUNCTION WITH THE SPECIFICATIONS.
3. ALL DIMENSIONS SHALL TAKE PRECEDENCE OVER THE SCALE SHOWN ON PLANS, SECTIONS, AND DETAILS.
4. THE CONTRACTOR SHALL VERIFY ALL ACTUAL DIMENSIONS AND CONDITIONS AT THE SITE PRIOR TO CONSTRUCTION.
5. THE CONTRACTOR SHALL SUBMIT WORKING / SHOP DRAWINGS FOR ANY PROPOSED CHANGES TO SUIT ACTUAL FIELD CONDITIONS WHICH ARE SUBJECT FOR THE APPROVAL OF THE CONSULTANT.
6. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY SAFETY MEASURES AT THE SITE TO PROTECT LIVES, PROPERTIES, EXISTING STRUCTURES AND ENVIRONMENT.
7. NO STRUCTURE SHALL BE CONSTRUCTED UNTIL ALL PREPARATIONS HAS BEEN APPROVED BY THE CONSULTANT.

B. CONCRETE

1. MINIMUM COMPRESSIVE STRENGTH OF CONCRETE AT 28 DAYS PERIOD: f'c = 28 MPa
2. CONCRETE COVER TO STIRRUPS & TIES = 50MM (FOR PILE ENLARGEMENT)
3. ALL DEPOSITED CONCRETE SHALL BE COMPACTED USING VIBRATORS.
4. BEFORE CONCRETE IS POURED, CHECK WITH ALL TRADES TO ENSURE PROPER PLACEMENT OF ALL OPENINGS, SLEEVES, CURBS, CONDUITS, ETC. RELATIVE TO THE WORK.
5. WHEN CONCRETE WILL BE EXPOSED TO EXTERNAL SOURCES OF CHLORIDES IN SERVICES, SUCH AS DEICING SALTS, BRACKISH WATER, SEAWATER OR SPRAY FROM THESE SOURCES, CONCRETE MUST BE PROPORTIONED TO SATISFY THE SPECIAL EXPOSURE REQUIREMENTS OF ACI 318-14.
6. ALL CONCRETE SHALL BE KEPT MOIST FOR A MINIMUM OF 7 CONSECUTIVE DAYS IMMEDIATELY AFTER POURING BY THE USE OF WET BURLAP.

C. REINFORCING STEEL:

1. UNLESS OTHERWISE SPECIFIED ON PLANS, ALL REINFORCING BARS SHALL BEDEFORMED WITH A MINIMUM YIELD STRENGTH, fy = 414 MPa (40000 PSI) FOR ø12 AND ABOVE.
2. ALL REINFORCING BARS SHALL BE CLEANED OF RUST, GREASE OR OTHER MATERIALS WHICH TEND TO IMPAIR BOND.
3. ALL REINFORCING BARS SHALL BE ACCURATELY AND SECURELY PLACED BEFORE POURING CONCRETE OR APPLYING MORTAR OR GROUT.
4. LAPPED SPLICES SHALL BE STAGGERED WHERE POSSIBLE.
5. UNLESS INDICATED OTHERWISE, SPLICING OF REINFORCEMENT SHALL BE IN ACCORDANCE WITH ACI- 318-95.

D STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL SHALL HAVE A MINIMUM YIELD STRENGTH, Fy = 248 MPa (36 KSI) AND SHALL CONFORM TO ASTM A 36 SPECIFICATIONS.
2. ALL COLD FORMED STEEL SHALL HAVE A MINIMUM STRENGTH, Fy = 230 MPa (33 KSI)
3. NO STEEL SHALL BE FABRICATED OR ERECTED UNTIL SHOP DRAWINGS HAVE BEEN APPROVED BY THE STRUCTURAL ENGINEER.
4. ALL SHOP AND FIELD WELDING SHALL BE IN ACCORDANCE WITH AWS D.1.1-2000 AND PERFORMED BY QUALIFIED WELDERS.
5. UNLESS INDICATED OTHERWISE, WELDING ELECTRODES SHALL BE E70XX, MINIMUM THICKNESS OF WELD SHALL BE 3MM.

E. CONCRETE REPAIR

METHOD 1: CONCRETE REPAIR BY EPOXY PATCHING

1. IDENTIFY SPALLED AREAS.
2. CHIPPING-REMOVE LOOSE CONCRETE AND CHIP TILL GOOD CONCRETE IS REACHED.
3. PREPARE STRUCTURAL EPOXY 316 PUTTY AND APPLY TO SPALLED AREA. LET EPOXY PUTTY CURE.
4. GRIND PROTRUDING EPOXY PUTTY FLUSH TO CONCRETE SURFACE.

METHOD 2: CONCRETE REPAIR BY EPOXY INJECTION

1. IDENTIFY CRACKS
2. V-CUT ALONG CRACKS AND DRILL 1/2"ø HOLES TO A DEPTH OF APPROXIMATELY HALF THE STRUCTURES DIMENSION
3. CLEANING – REMOVE LOOSE CONCRETE AND CONCRETE POWDERS.
4. INSTALL1/4"ø COPPER TUBINGS INTO THE DRILLED HOLES.
5. APPLICATION OF STRUCTURAL EPOXY 316 PUTTY ON V-CUTS AND AROUND PERIPHERIES OF COPPER TUBINGS, AND ALLOW PUTTY TO CURE.
6. PRESSURE INJECT STRUCTURAL EPOXY 316 PUTTY THRU THE COPPER TUBES TO FILL CRACKS AND HONEYCOMBS (REPEAT #6 UNTIL ALL CRACKS AND HONEYCOMBS ARE FILLED WITH STRUCTURAL EPOXY 316 AND ALLOW EPOXY TO CURE).
7. GRIND PROTRUDING COPPER TUBES AND PUTTY FLUSH TO CONCRETE SURFACE.

F. TARGET PERFORMANCE LEVEL

1. THE TARGET PERFORMANCE LEVEL ASSOCIATED WITH THIS RETROFITTING DESIGN DRAWING IS "LIFE SAFETY".

LAP SPLICES IN TENSION FOR BEAMS, COLUMNS AND WALLS (MM)

BAR DIA. (MM)	fy (Mpa)	fy (ksi)	f'c = 21 MPa (3000 psi)		f'c = 28-35 MPa (4000-5000 psi)	
			TOP	OTHERS	TOP	OTHERS
10	275	40	300	300	300	300
12	275	40	300	300	300	300
12	414	60	525	400	450	350
16	414	60	775	600	675	525
20	414	60	1075	825	925	725
25	414	60	1800	1375	1550	1200
28	414	60	2075	1600	1800	1400
32	414	60	2475	1900	2150	1650
36	414	60	2900	2225	2500	1925

ANCHORAGE LENGTH TABLE

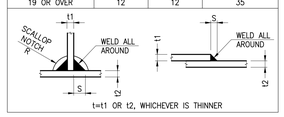
BAR DIAMETER (mm)	ANCHORAGE LENGTH (m)	STANDARD HOOK (m)		
		90°	180°	135°
10	0.50	0.15	0.13	0.10
12	0.50	0.20	0.15	0.12
16	0.60	0.25	0.18	0.14
20	0.60	0.30	0.20	0.20
25	0.68	0.40	0.28	0.26
28	0.86	0.48	0.38	–
32	1.12	0.56	0.43	–
36	1.43	0.61	0.48	–

1 S-08 DETAIL
SCALE NTS

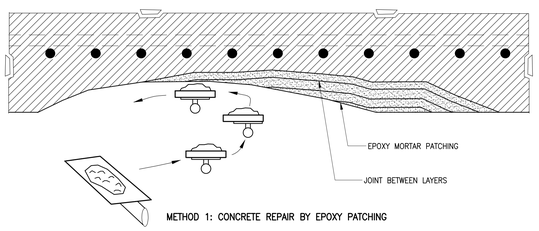
NOTES:
1. ACI SECTION 12.4 STATES THAT DEVELOPMENT LENGTH OF INDIVIDUAL BARS W/ IN A BUNDLE, IN TENSION OR COMPRESSION, SHALL BE THAT FOR THE INDIVIDUAL BAR, INCREASED 20% FOR THREE BAR BUNDLE, AND 33% FOR FOUR BAR BUNDLE.
2. FOR COLUMNS, AT ANY LEVEL NO MORE THAN ALTERNATE BARS SHOULD BE SPLICED. NOT MORE THAN 33% OF THE BARS SHALL BE SPLICED W/ IN THE REQUIRED LAP LENGTH. MIN. DISTANCE BETWEEN TWO ADJACENT BAR SPLICES SHALL BE 600MM. TOP BARS ARE HORIZONTAL BARS W/ MORE THAN 300MM DEPTH OF CONCRETE CAST BELOW THE REINFORCEMENT.
3. TOP BARS ARE HORIZONTAL BARS W/ MORE THAN 300MM DEPTH OF CONCRETE CAST BELOW THE REINFORCEMENT.
4. AS MUCH AS POSSIBLE, SPLICES SUBJECTED TO TENSILE STRESSES ARE DISCOURAGE, THESE SHOULD BE AVOIDED OR PROVIDED W/ STANDARD HOOKS.

FILLET WELD TABLE

PLATE THICKNESS T (MM)	WELD SIZE, S (MM)		SCALLOP NOTCH (MM)
	T JOINTS	LAP JOINTS	R
LESS THAN 6	S = t	S = t	25
6 TO 8	6	4	25
9 TO 11	6	6	25
12 TO 15	9	9	35
16 TO 18	9	9	35
19 OR OVER	12	12	35



NOTES:
1. UNLESS NOTED OTHERWISE, REPAIR METHOD(S) TO BE ADOPTED SHALL BE AS FOLLOWS:
   SPALLING OF CONCRETE/POOR WORKMANSHIP – METHOD 1
   CRACKING OF CONCRETE – METHOD 2
2. METHODS TO ADOPTED MAY VARY AS PER ENGINEER'S INSTRUCTION UPON CONFIRMATION OF ACTUAL CONDITION DURING REPAIR.
3. THE CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS SHOWING MAPPING PLAN FOR EACH METHOD USED IN THE REPAIR WORKS.



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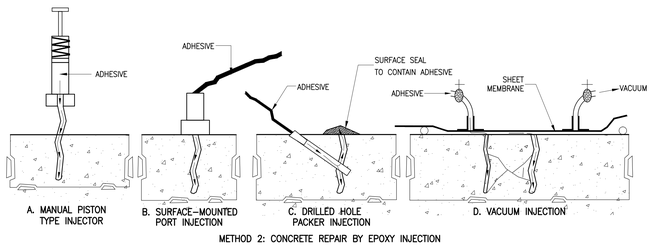
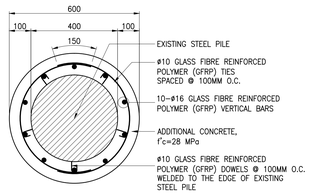
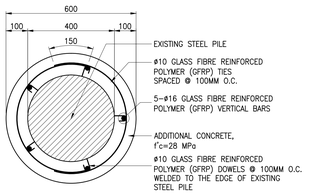


METHOD 2: CONCRETE REPAIR BY EPOXY INJECTION

2 S-08 TYPICAL CONCRETE REPAIR DETAILS
SCALE NTS



3A S-08 EPIA DETAILS
SCALE 1:10M



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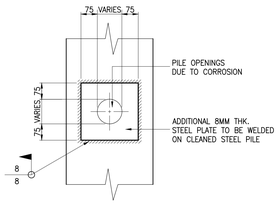
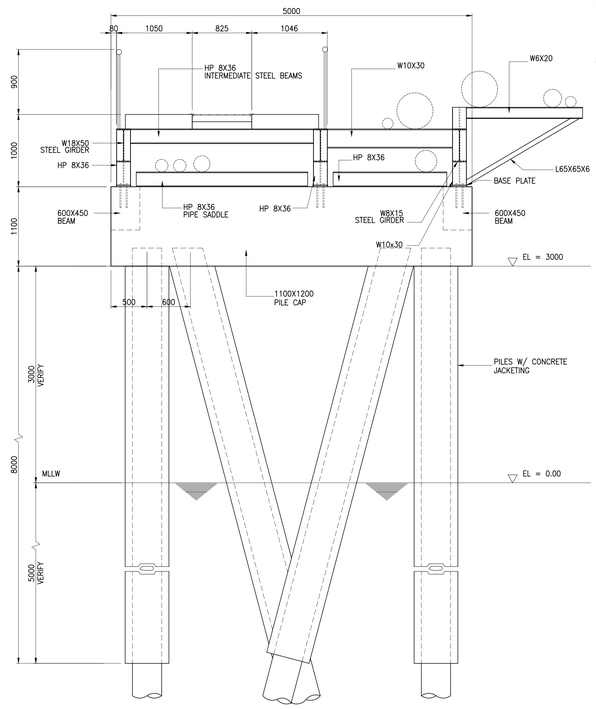


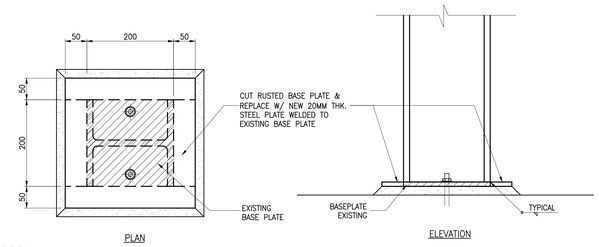
3C S-08 TYP. PILE PATCHING DETAIL
SCALE 1:10M

NOTE :
1. FULL UNDERWATER SURVEY NEEDED BEFORE IMPLEMENTATION OF RETROFITTING DRAWINGS.
   A. PILES FOR ENLARGEMENT
      1. REMOVE EXISTING FRP & CORROSION PROTECTION SYSTEM
      2. CLEAN EXISTING STEEL PILES
      3. ENLARGE EXISTING STEEL PILES BASED ON DETAIL
      4. APPLY PETROLATUM COATING FOR STEEL PILES' NEW CORROSION PROTECTION SYSTEM
   B. PILES NOT FOR ENLARGEMENT
      1. REMOVE EXISTING FRP & CORROSION PROTECTION SYSTEM
      2. CLEAN EXISTING STEEL PILES
      3. APPLY PETROLATUM COATING FOR STEEL PILES' NEW CORROSION PROTECTION SYSTEM

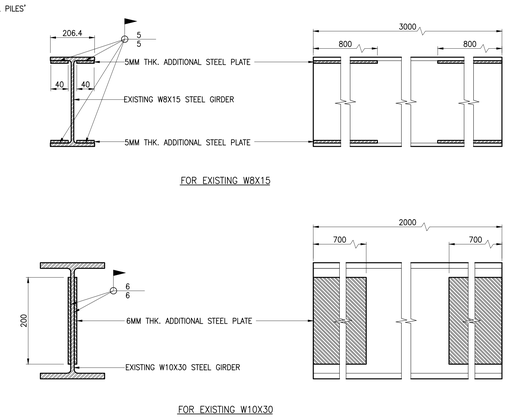


3D S-08 TYP. JETTY SECTION
SCALE NTS

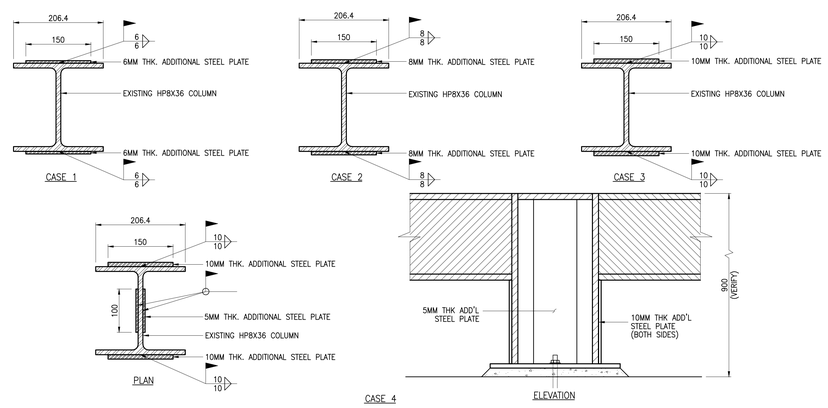
3 S-08 TYP. PILE RETROFITTING DETAILS
SCALE AS SHOWN



3 S-08 TYP. STEEL BASEPLATE RETROFITTING DETAIL
SCALE 1:5M.



4 S-08 TYP. STEEL GIRDER RETROFITTING DETAILS
SCALE 1:5



2 S-08 TYP. STEEL COLUMN RETROFITTING DETAILS
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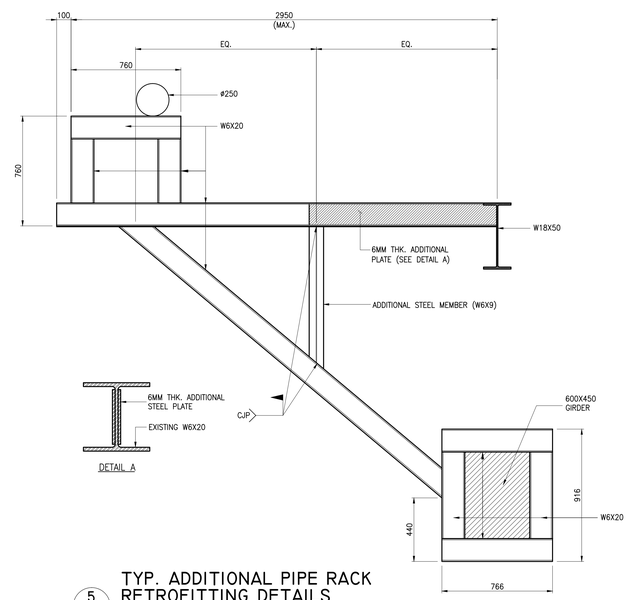

5 S-08 TYP. ADDITIONAL PIPE RACK RETROFITTING DETAILS
SCALE 1:15M

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ALDEN C. ONG, M. Eng., ASEP
ENGINEER
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TIN NO. : 168-950-786
PTR NO. : 9565410
DATE : JANUARY 05, 2023
PLACE : MAKATI CITY

OWNER: PHILIPPINE NATIONAL OIL COMPANY (PNOC)
BRGY. BATANGAS DOS, MARIVELES, BATAAN

PROJECT TITLE/LOCATION: PNOC - JETTY FACILITY STRUCTURAL RETROFITTING
BRGY. BATANGAS DOS, MARIVELES, BATAAN

SHEET CONTENTS
TYP. CONCRETE REPAIR DETAILS
TYP. PILE RETROFITTING DETAILS
TYP. STEEL COLUMN RETROFITTING DET.
TYP. BP & GIRDER RETROFITTING DET.
TYP. ADDITIONAL PIPE RACK DETAILS

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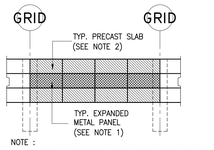
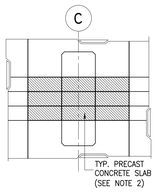
CFF	NOV 2023				
APPROVED	DATE				
ACO	NOV 2023				

PAPER SIZE	SHEET NO.
A0	S-08
SCALE	PROJECT NO.
AS SHOWN	DE-G-23-012-00

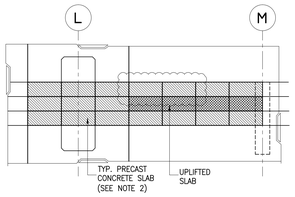


NOTE :
1. ALL EXISTING EXPANDED METAL WITH STEEL FRAMES ARE TO BE REHABILITATED.
2. ALL EXISTING ANGULAR FRAMES OF THE PRECAST CONCRETE SLAB ARE TO BE REHABILITATED.

IA S-09 TYP. SLAB LAYOUT
SCALE 1:150M



IB S-09 TYP. SLAB LAYOUT @ GRID LINE C
SCALE 1:150M



IC S-09 TYP. SLAB LAYOUT @ GRID LINE L - M
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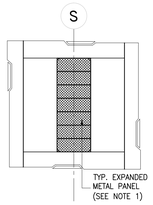
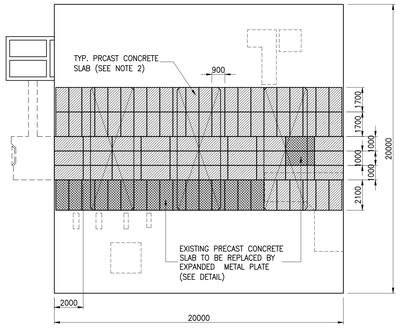
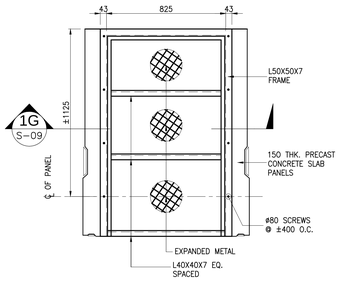


ID S-09 TYP. SLAB LAYOUT @ GRID LINE S
SCALE 1:150M



IE S-09 SLAB LAYOUT @ LOADING PLATFORM
SCALE 1:150M



IF S-09 TYPICAL EXPANDED METAL PANEL DETAILS
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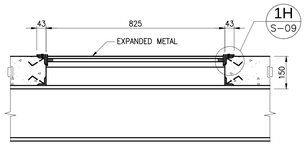
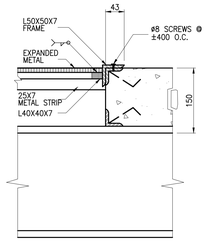


IG S-09 SECTION
SCALE 1:10M.



IH S-09 DETAIL
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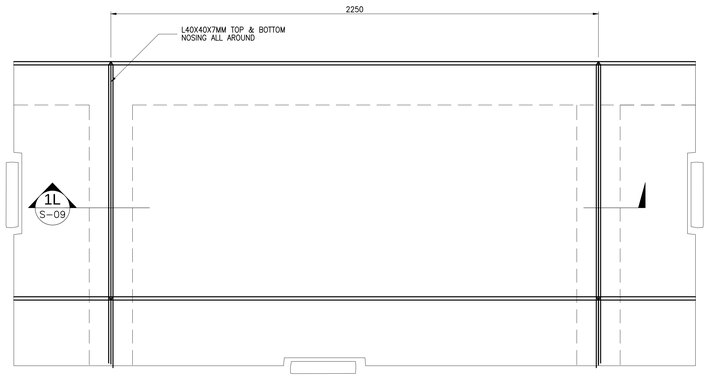
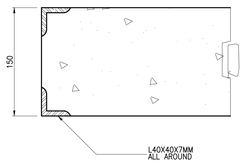
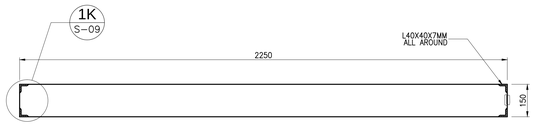


IJ S-09 EXISTING PRECAST SLAB PANEL PLAN
SCALE 1:10M.



IK S-09 DETAIL
SCALE 1:3M.



IL S-09 SECTION
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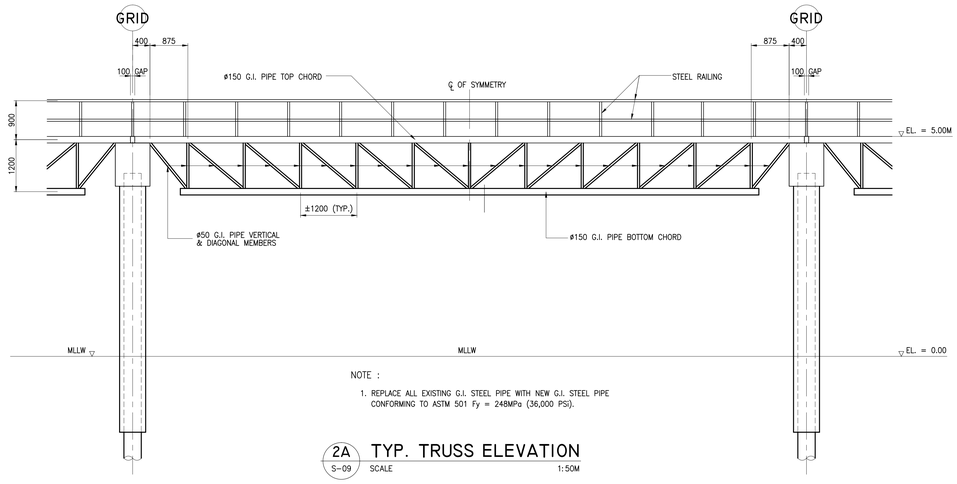
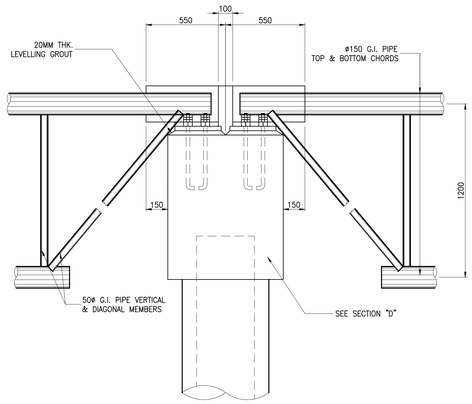
I S-09 TYP. DECK SLAB AND METAL PANEL REMEDIATION DETAILS
SCALE AS SHOWN



NOTE :
1. REPLACE ALL EXISTING G.I. STEEL PIPE WITH NEW G.I. STEEL PIPE CONFORMING TO ASTM 501 Fy = 248MPa (36,000 PSI).

2A S-09 TYP. TRUSS ELEVATION
SCALE 1:50M



2B S-09 TYP. TRUSS TO PILE CAP CONNECTION DETAIL
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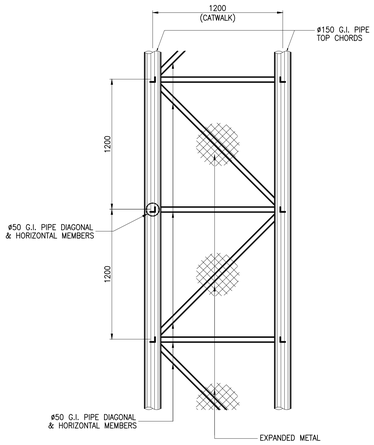
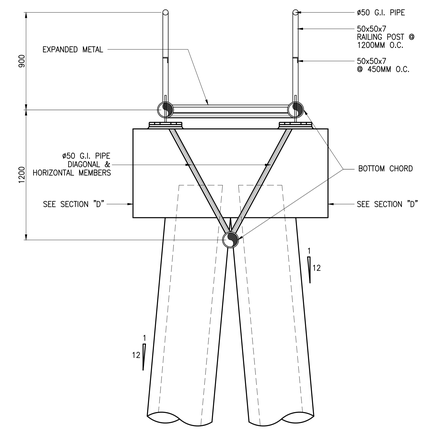


2C S-09 TYP. CATWALK PLAN
SCALE 1:20M



2D S-09 TYP. CATWALK SECTION
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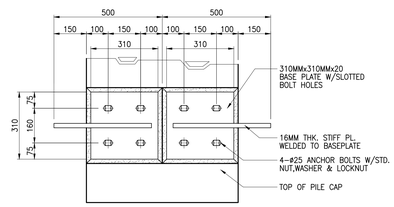
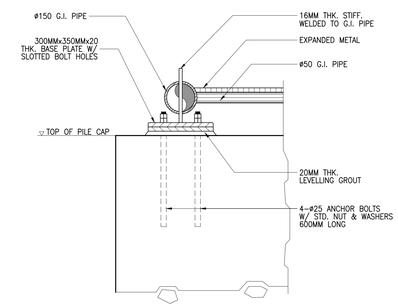


2E S-09 TYP. BASE PLATE DETAIL
SCALE 1:10M



2F S-09 TYP. BASE PLATE ELEVATION
SCALE 1:10M

2 S-09 TYP. CATWALK REPLACEMENT DETAILS
SCALE AS SHOWN

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ENGINEER
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TIN NO. : 168-950-786
PTR NO. : 9565410
DATE : JANUARY 05, 2023
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OWNER
PHILIPPINE NATIONAL OIL COMPANY (PNOC)
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TYP. CATWALK REPLACEMENT DETAILS

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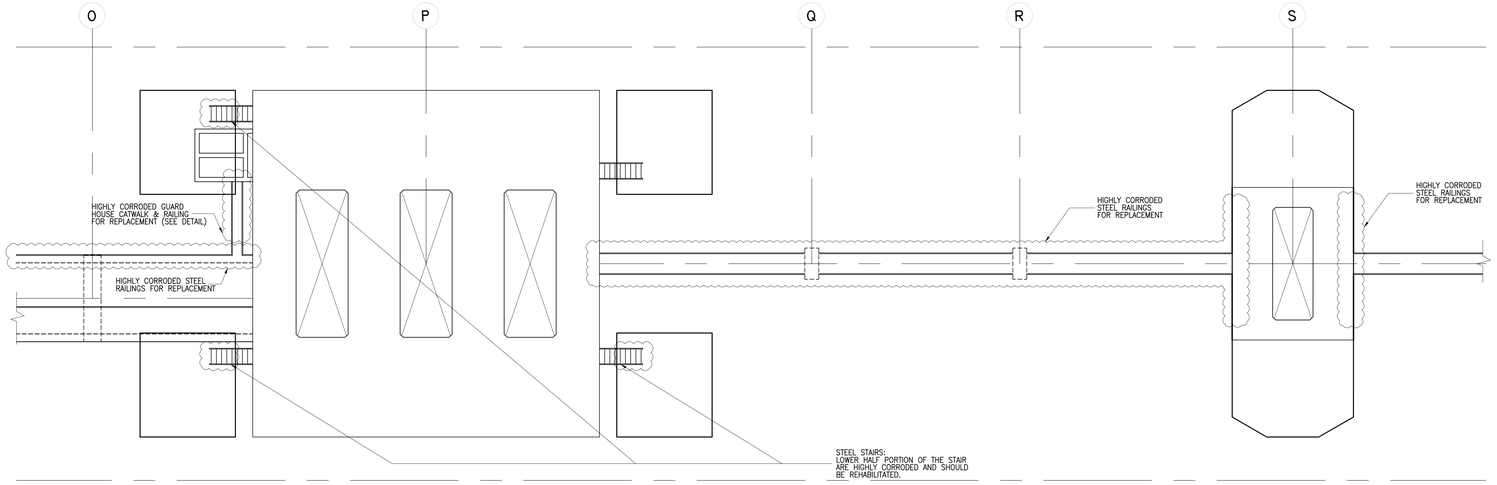
CFF	NOV 2023					SCALE: AS SHOWN
APPROVED	DATE					PROJECT NO.: DE-G-23-012-00
ACO	NOV 2023					



IA S-10 PLAN @ GRID P-S
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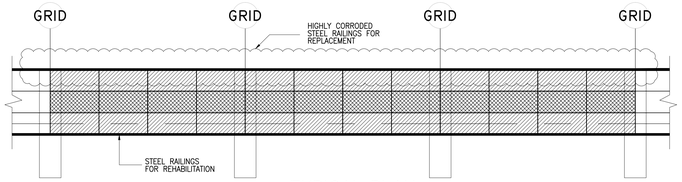

IB S-10 TYPICAL PLAN @ GRID 11-14 & L-P
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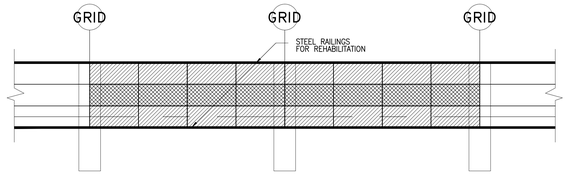

IC S-10 TYPICAL PLAN SHOWING STEEL RAILINGS
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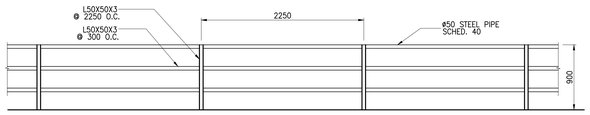

ID S-10 TYPICAL STEEL RAILING ELEVATION
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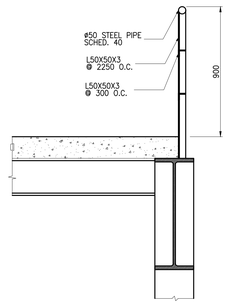

IE S-10 TYP. RAILING SECTION
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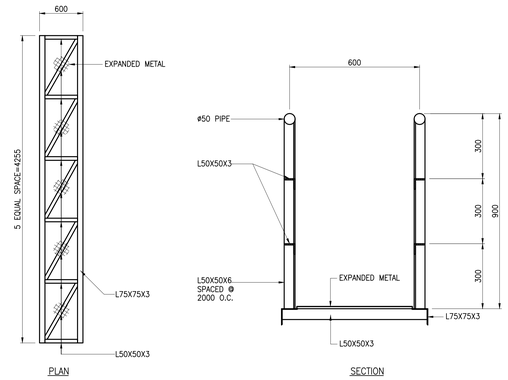
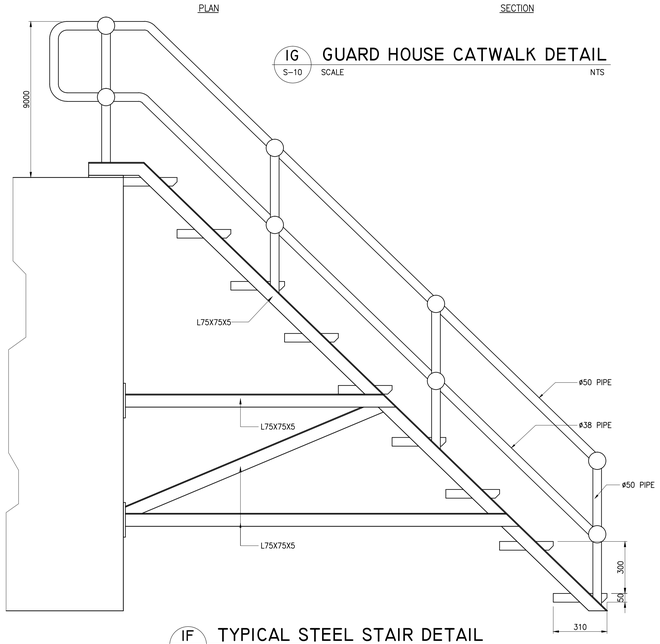


IG S-10 GUARD HOUSE CATWALK DETAIL
SCALE NTS



IF S-10 TYPICAL STEEL STAIR DETAIL
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I S-10 STEEL RAILINGS AND STAIRS REMEDIATION DETAILS
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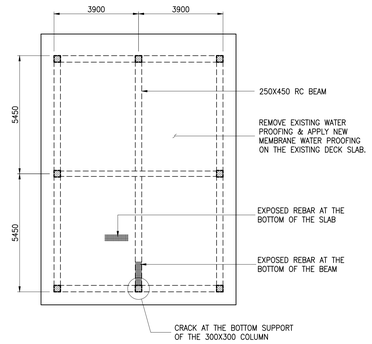

2 S-10 PUMP HOUSE ROOF REMEDIATION DETILS
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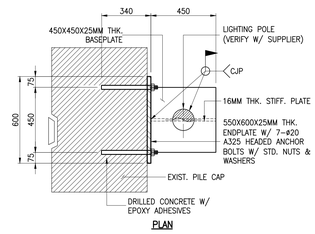

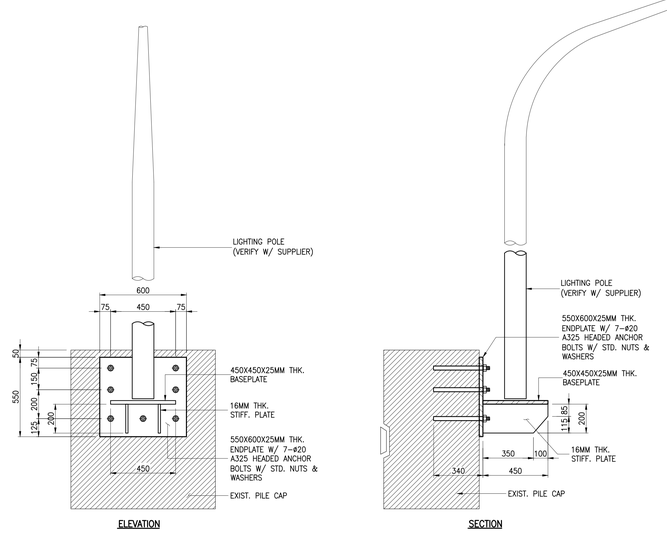

3 S-10 LIGHT POST REPLACEMENT DETAILS
SCALE 1:15M

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CERTIFIED BY		OWNER	PROJECT TITLE/LOCATION	SHEET CONTENTS
ALDEN C. ONG, M. Eng., ASEP ENGINEER	REG. NO.: 68251 TIN NO. : 168-950-786 PTR NO. : 9565410 DATE : JANUARY 05, 2023 PLACE : MAKATI CITY	PHILIPPINE NATIONAL OIL COMPANY (PNOC) BRGY. BATANGAS DOS, MARIVELES, BATAAN	PNOC - JETTY FACILITY STRUCTURAL RETROFITTING BRGY. BATANGAS DOS, MARIVELES, BATAAN	STEEL RAILINGS AND STAIRS REMEDIATION DETAILS PUMP HOUSE ROOF REMEDIATION DET. LIGHT POST REPLACEMENT DETAILS

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