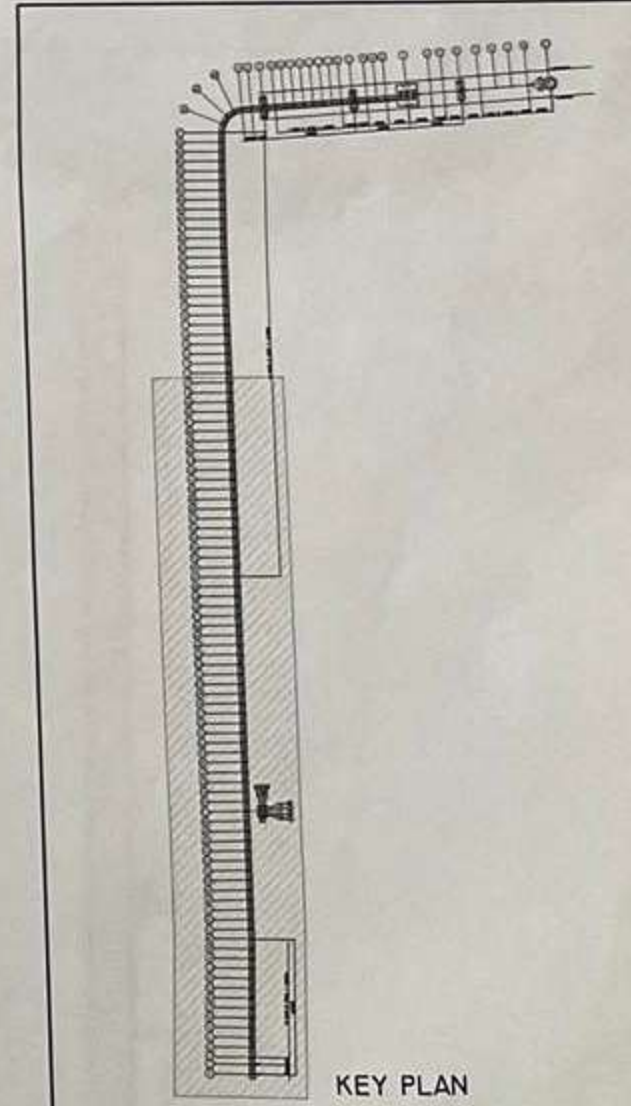


LEGEND :

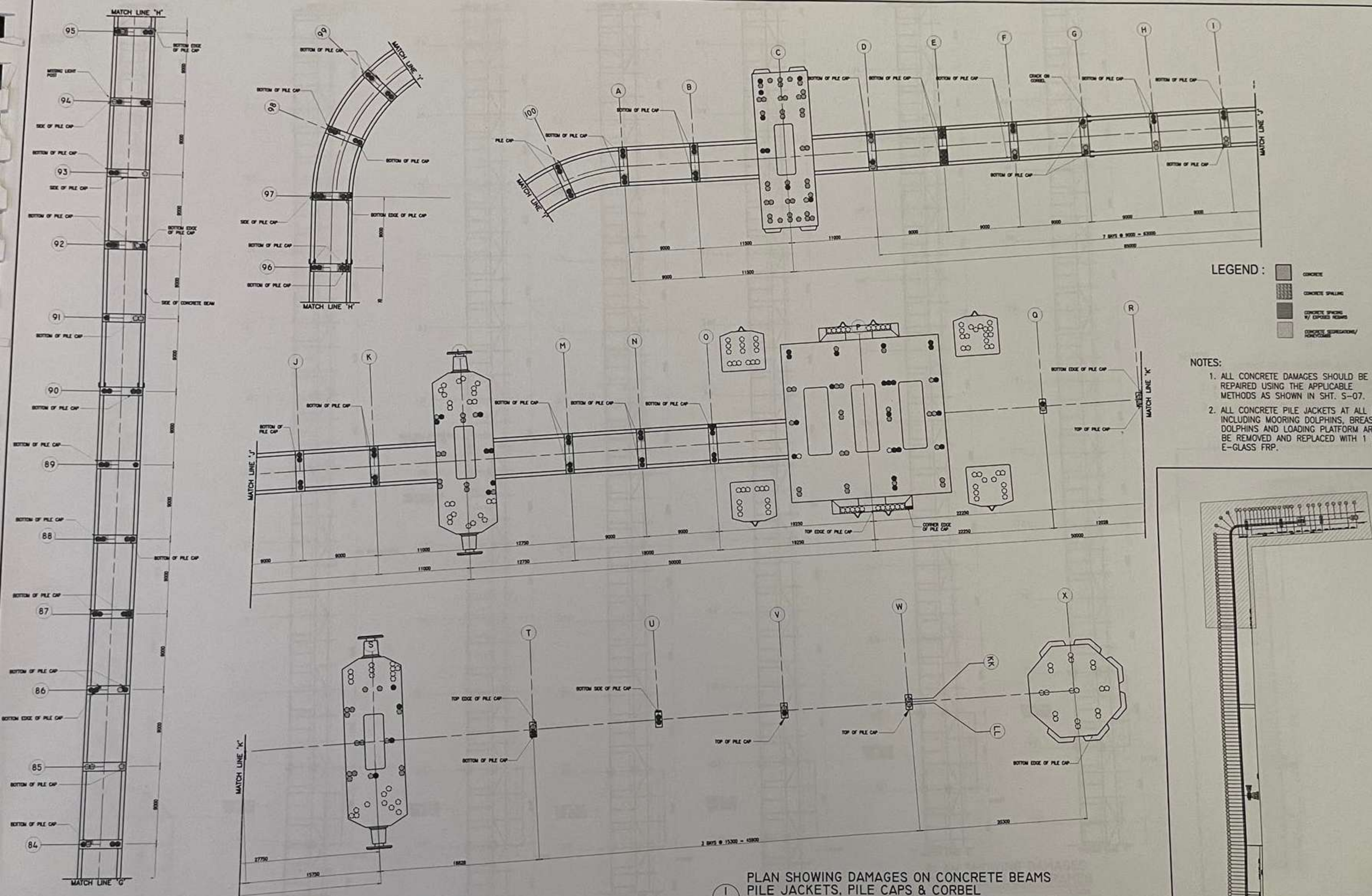
- CONCRETE
- CONCRETE SPALLING
- CONCRETE SPACING W/ EXPOSED REBAR
- CONCRETE SEPARATION/ HONEYCOMBS

- NOTES:**
1. ALL CONCRETE DAMAGES SHOULD BE REPAIRED USING THE APPLICABLE METHODS AS SHOWN IN SHT. S-07.
 2. ALL CONCRETE PILE JACKETS AT ALL BENTS INCLUDING MOORING DOLPHINS, BREASTING DOLPHINS AND LOADING PLATFORM ARE TO BE REMOVED AND REPLACED WITH 1 LAYER E-GLASS FRP.



PLAN SHOWING DAMAGES ON CONCRETE BEAMS PILE JACKETS, PILE CAPS & CORBELS

1
S-01 SCALE 1:5000



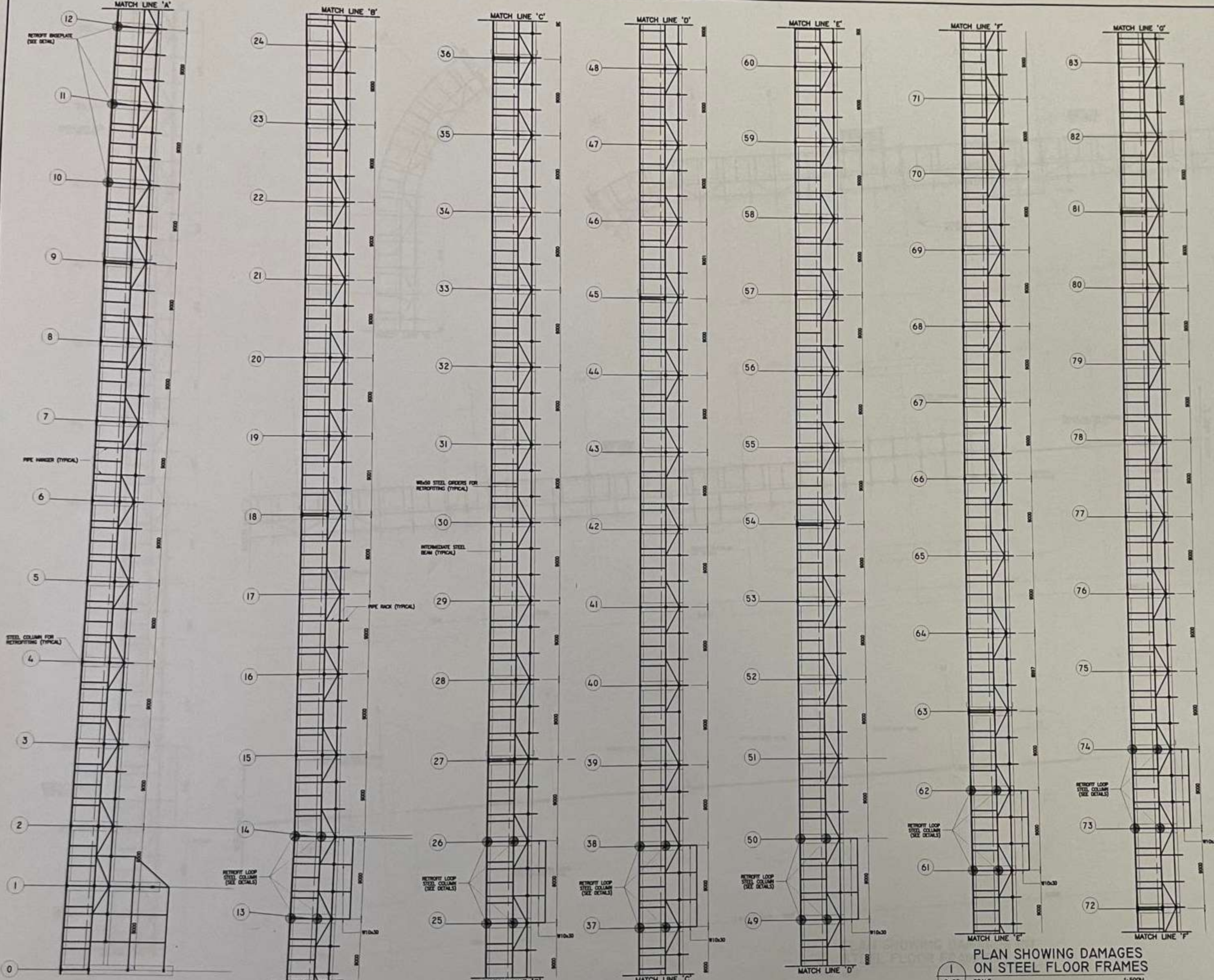
LEGEND :

- CONCRETE
- CONCRETE SPALLING
- CONCRETE SPALLING W/ EXPOSED REBAR
- CONCRETE SUBSTITUTION/ REINFORCEMENT

- NOTES:**
1. ALL CONCRETE DAMAGES SHOULD BE REPAIRED USING THE APPLICABLE METHODS AS SHOWN IN SHT. S-07.
 2. ALL CONCRETE PILE JACKETS AT ALL BENTS INCLUDING MOORING DOLPHINS, BREASTING DOLPHINS AND LOADING PLATFORM ARE TO BE REMOVED AND REPLACED WITH 1 LAYER E-GLASS FRP.

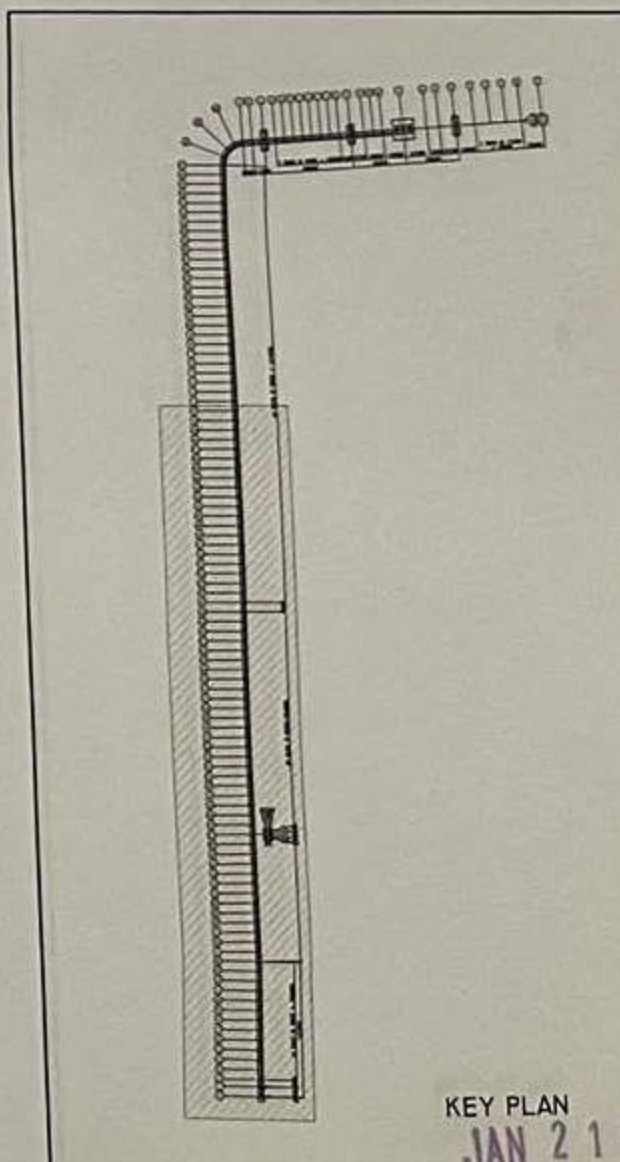
PLAN SHOWING DAMAGES ON CONCRETE BEAMS PILE JACKETS, PILE CAPS & CORBEL

I
S-02 SCALE 1:500M



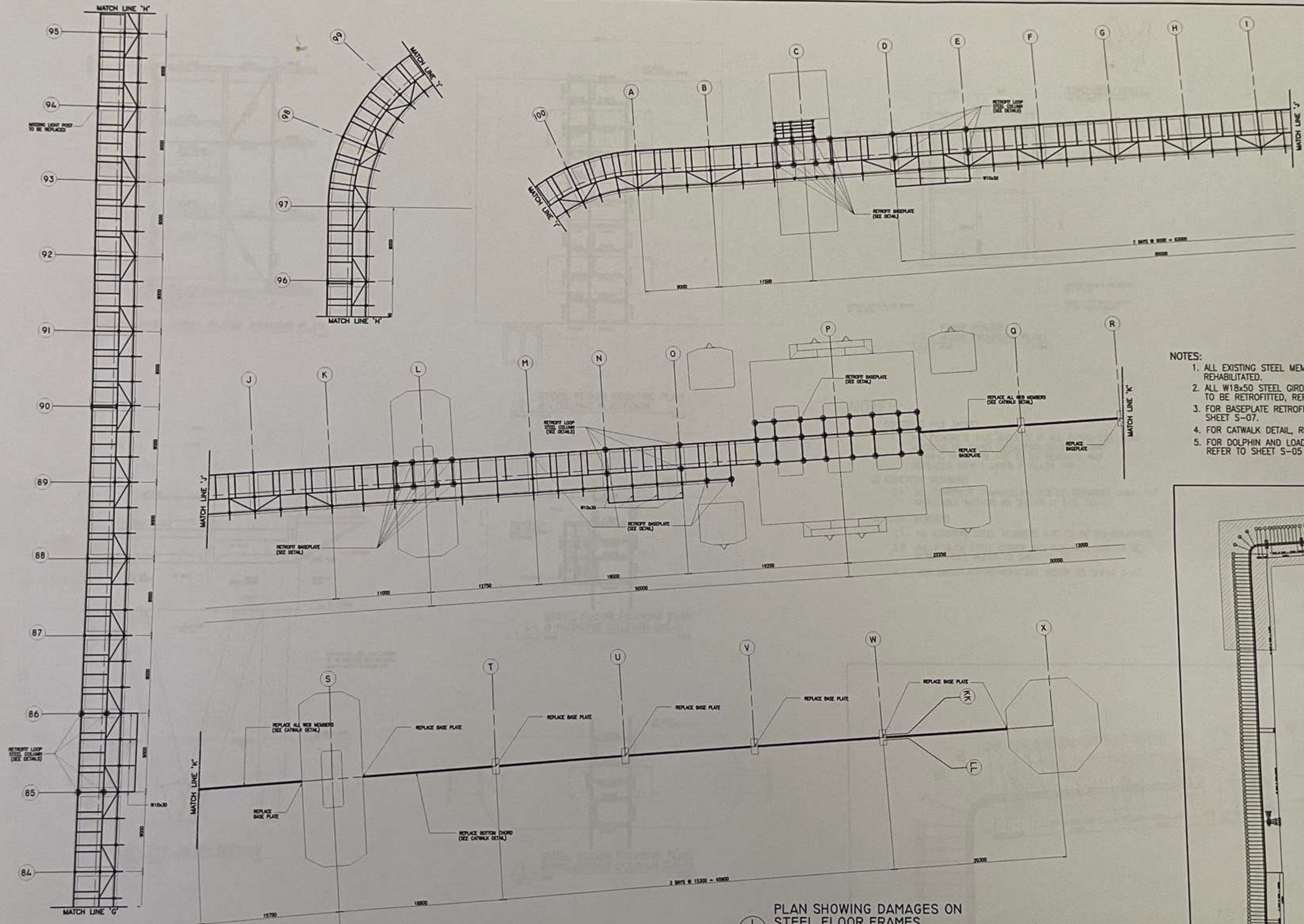
NOTES:

1. ALL EXISTING STEEL MEMBERS ARE TO BE REHABILITATED.
2. ALL W18x50 STEEL GIRDERS AND COLUMNS ARE TO BE RETROFITTED, REFER TO SHEET S-07.
3. FOR BASEPLATE RETROFITTING, REFER TO SHEET S-07.

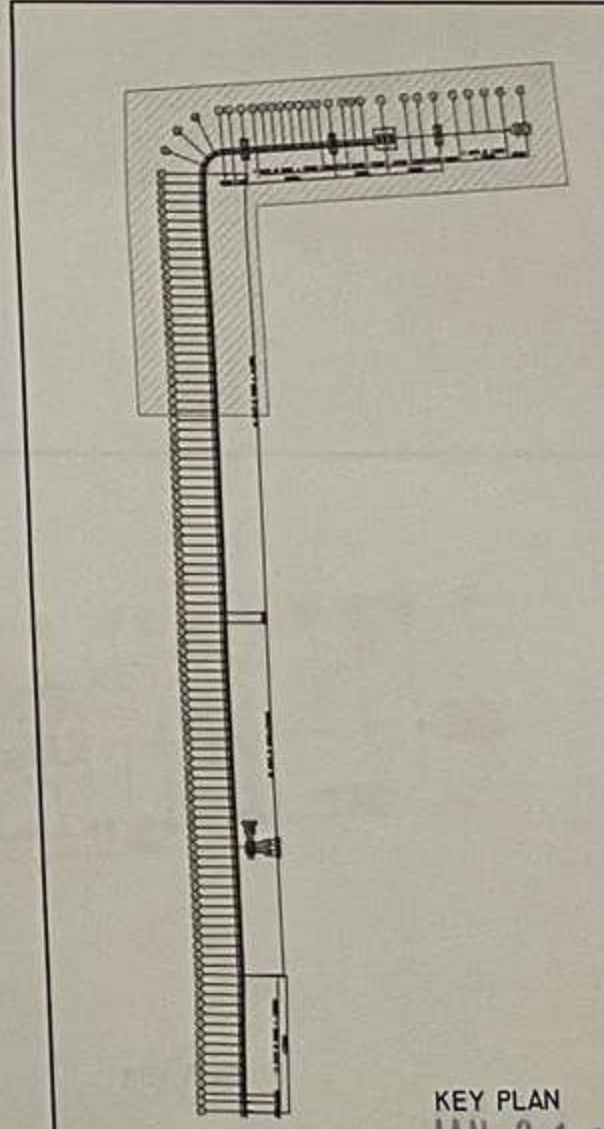


PLAN SHOWING DAMAGES ON STEEL FLOOR FRAMES

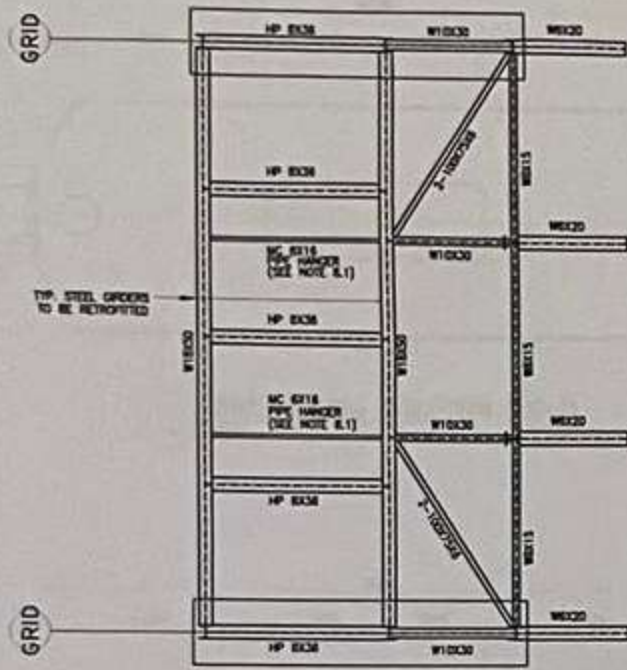
1
S-03 SCALE 1:500M



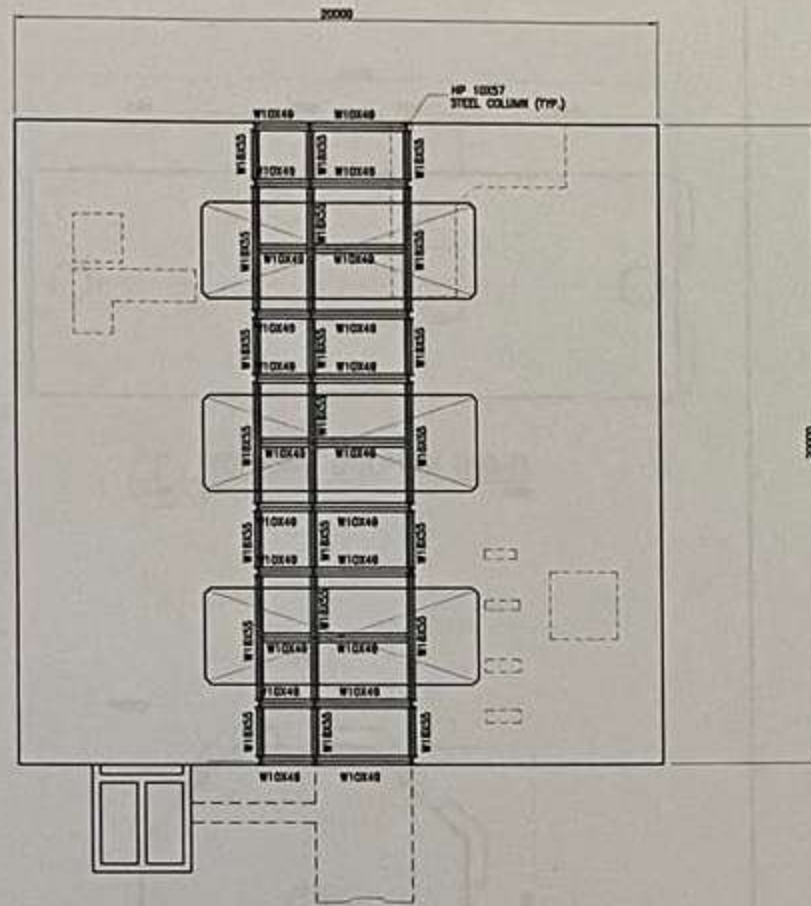
- NOTES:**
1. ALL EXISTING STEEL MEMBERS ARE TO BE REHABILITATED.
 2. ALL W18x50 STEEL GIRDER AND COLUMNS ARE TO BE RETROFITTED, REFER TO SHEET S-07.
 3. FOR BASEPLATE RETROFITTING, REFER TO SHEET S-07.
 4. FOR CATWALK DETAIL, REFER TO SHEET S-07.
 5. FOR DOLPHIN AND LOADING PLATFORM DETAILS, REFER TO SHEET S-05 AND S-06.



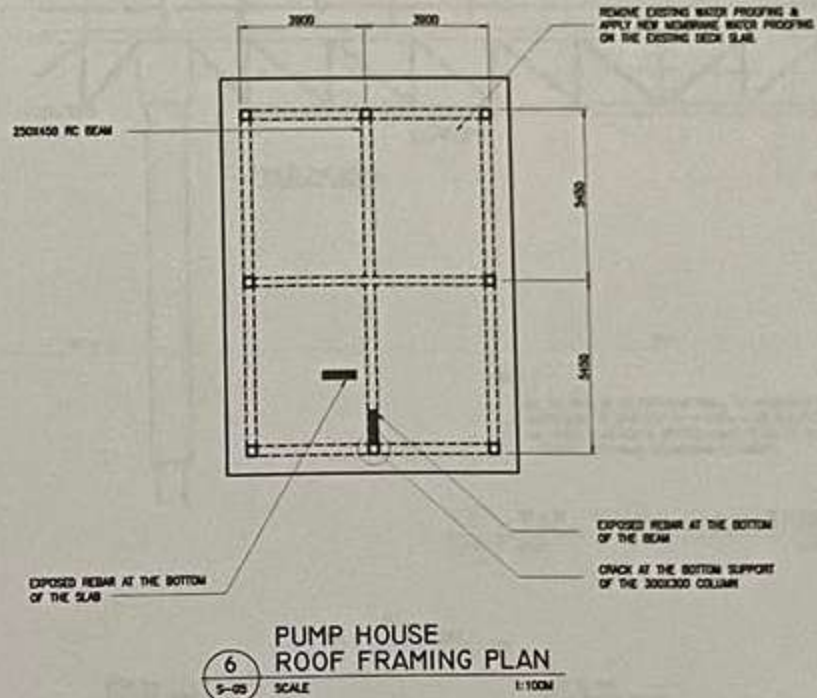
PLAN SHOWING DAMAGES ON STEEL FLOOR FRAMES
 S-04 SCALE 1:500M



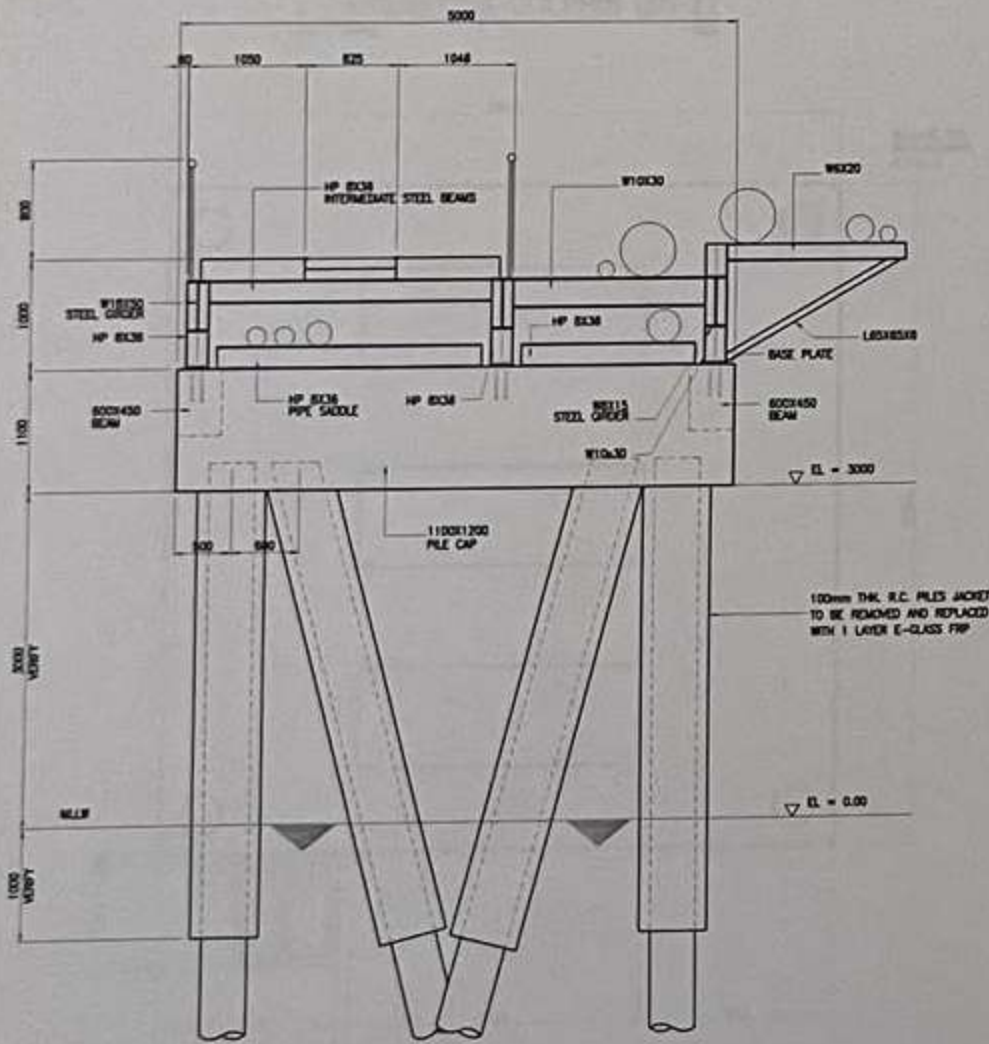
1 TYP. JETTY STEEL FLOOR FRAMING PLAN
S-05 SCALE WTS



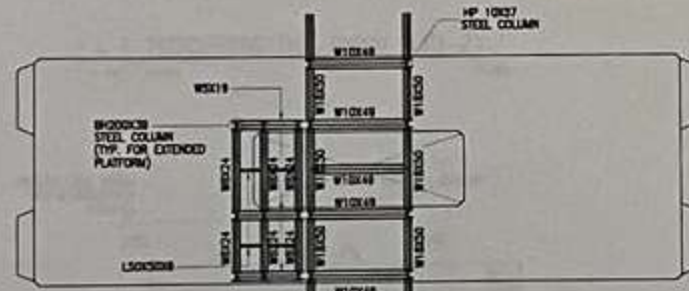
3 STEEL FLOOR FRAMING PLAN @ LOADING PLATFORM
S-05 SCALE 1:100M



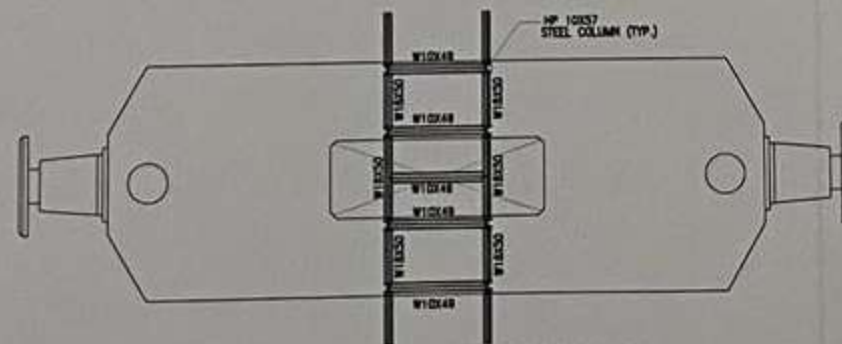
6 PUMP HOUSE ROOF FRAMING PLAN
S-05 SCALE 1:100M



2 TYP. JETTY SECTION
S-05 SCALE WTS



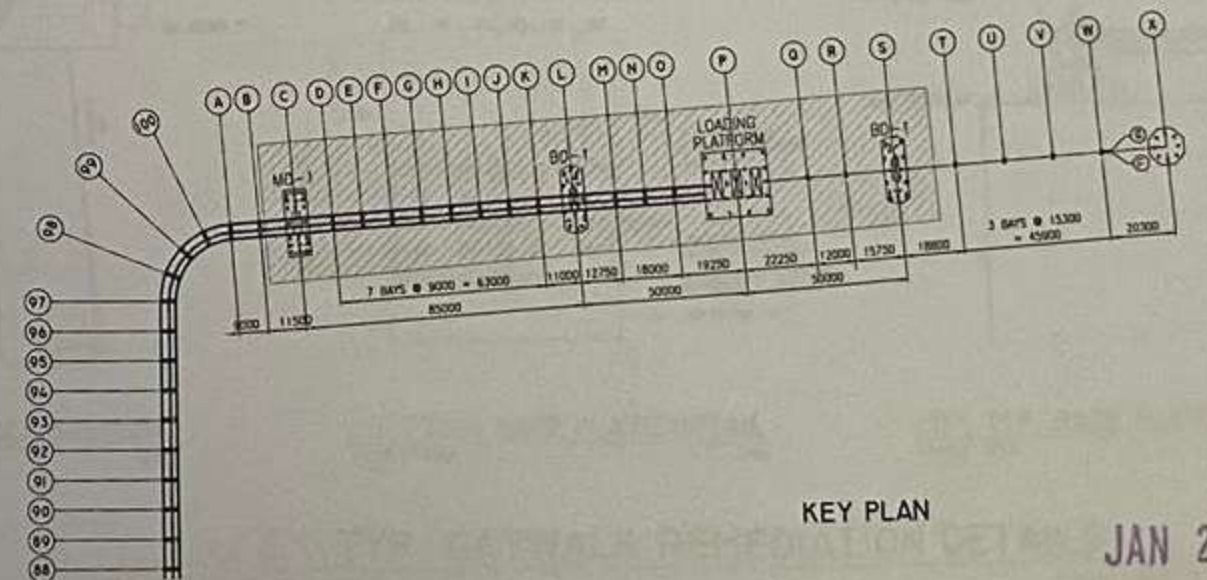
4 STEEL FLOOR FRAMING PLAN @ MOORING DOLPHIN (MD-1)
S-05 SCALE 1:100M



5 STEEL FLOOR FRAMING PLAN @ BREASTING DOLPHIN (BD-1)
S-05 SCALE 1:100M

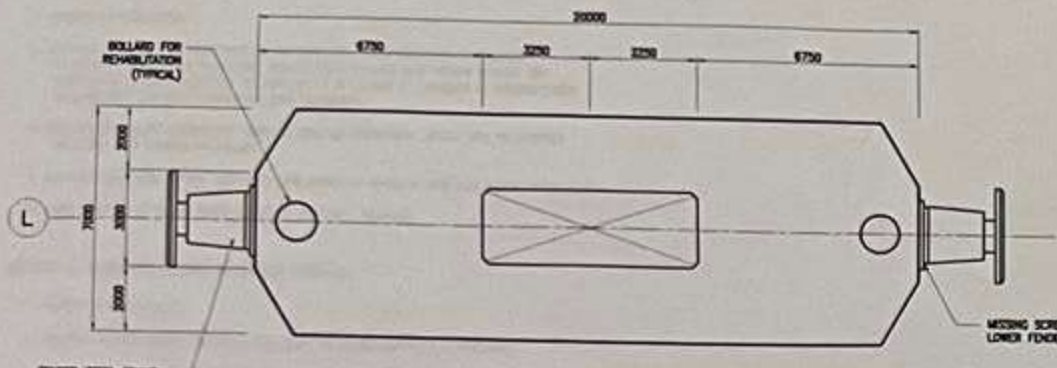
NOTES:

1. CONCRETE PILE JACKET
 - 1.1. ALL CONCRETE PILE JACKETS AT ALL BENTS INCLUDING MOORING DOLPHINS, BREASTING DOLPHINS AND LOADING PLATFORM ARE TO BE REMOVED AND REPLACED WITH 1 LAYER E-GLASS FRP.
2. CONCRETE MEMBERS
 - 2.1 ALL CONCRETE DAMAGES SHOULD BE REPAIRED USING THE APPLICABLE METHOD AS SHOWN IN SHT. S0-07.
3. STEEL MEMBERS
 - 3.1 ALL EXISTING STEEL MEMBERS ARE TO BE REHABILITATED.
 - 3.2 ALL W18x50 STEEL GIRDER AND COLUMNS ARE TO BE RETROFITTED, REFER TO SHEET S-07.
 - 3.3 FOR BASEPLATE RETROFITTING, REFER TO SHEET S-07.

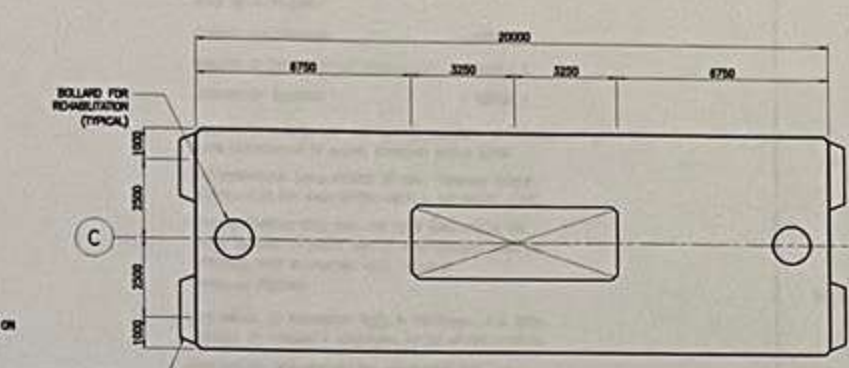


KEY PLAN

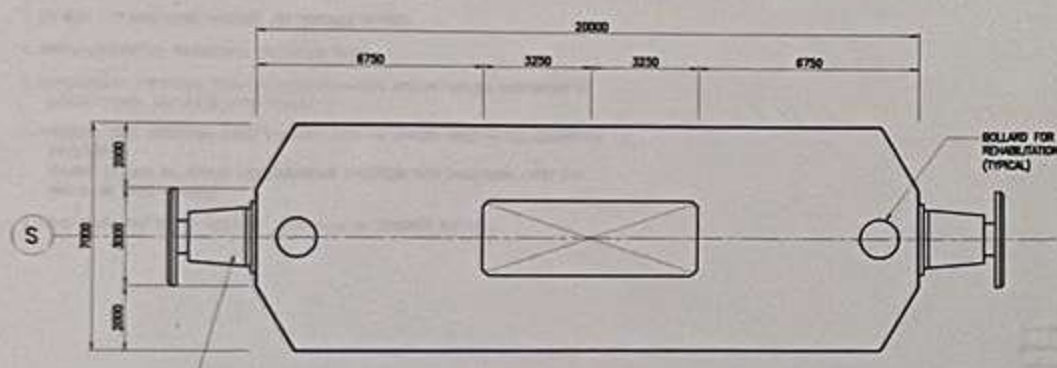
JAN 21 2009



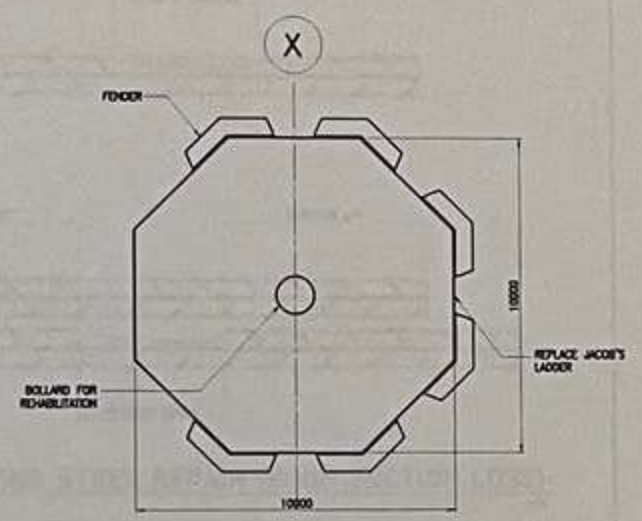
1 BREASTING DOLPHIN (BD-1)
5-06 SCALE 1:100M



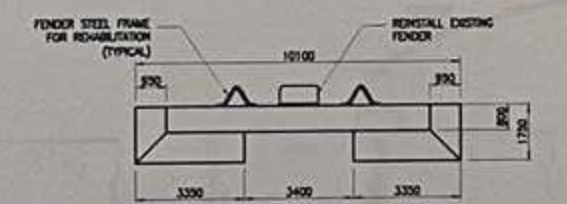
2 MOORING DOLPHIN (MD-1)
5-06 SCALE 1:100M



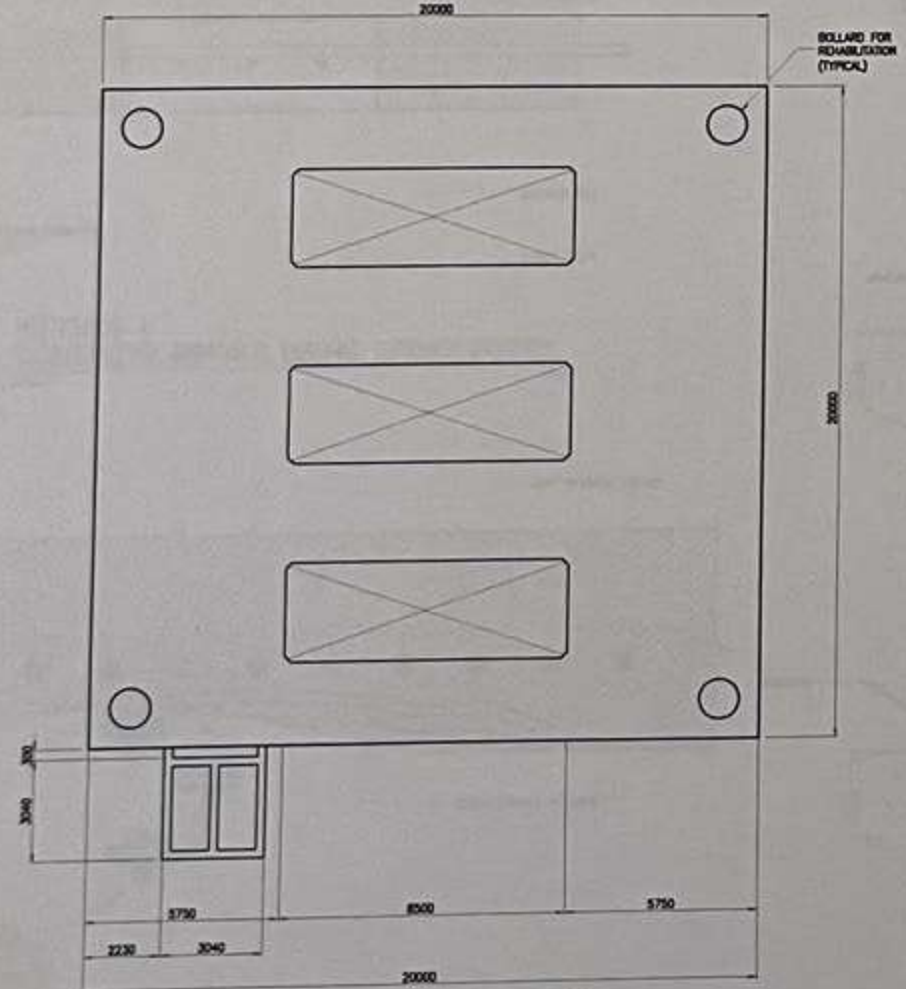
3 BREASTING DOLPHIN (BD-2)
5-06 SCALE 1:100M



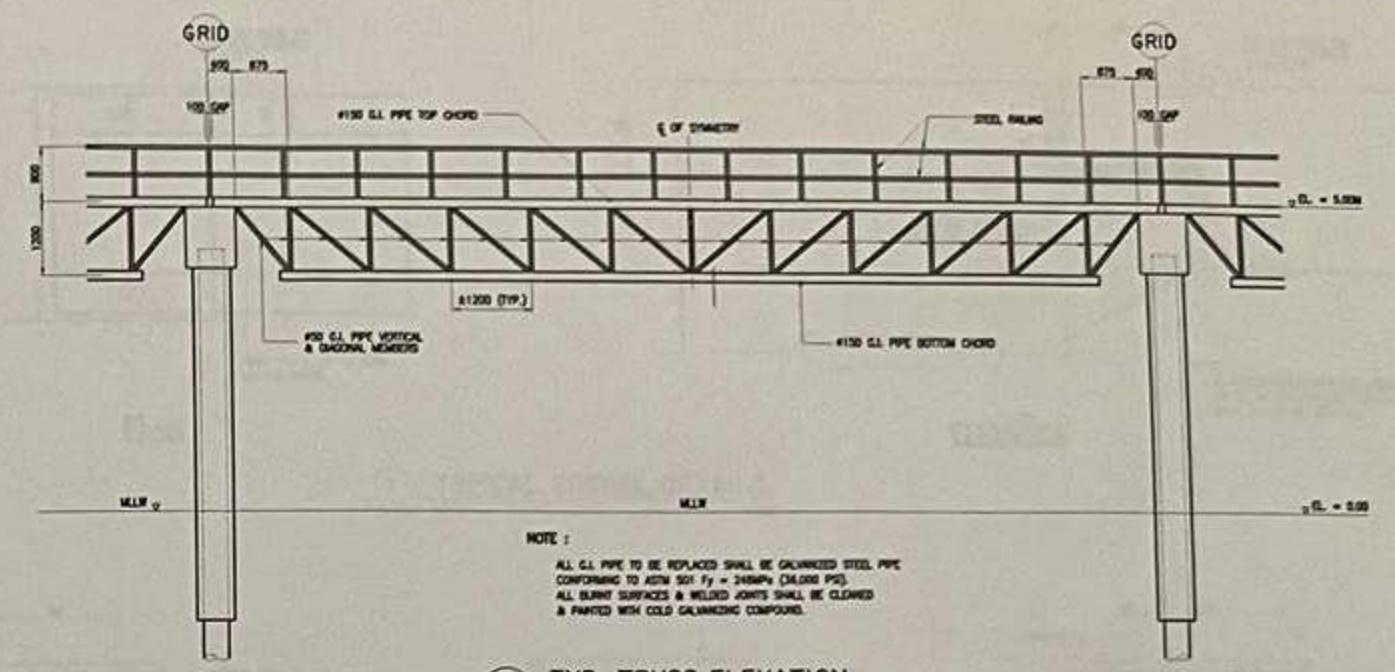
4 MOORING DOLPHIN (MD-2)
5-06 SCALE 1:100M



6 AUXILIARY BREASTING DOLPHIN (ABD-2)
5-06 SCALE 1:100M

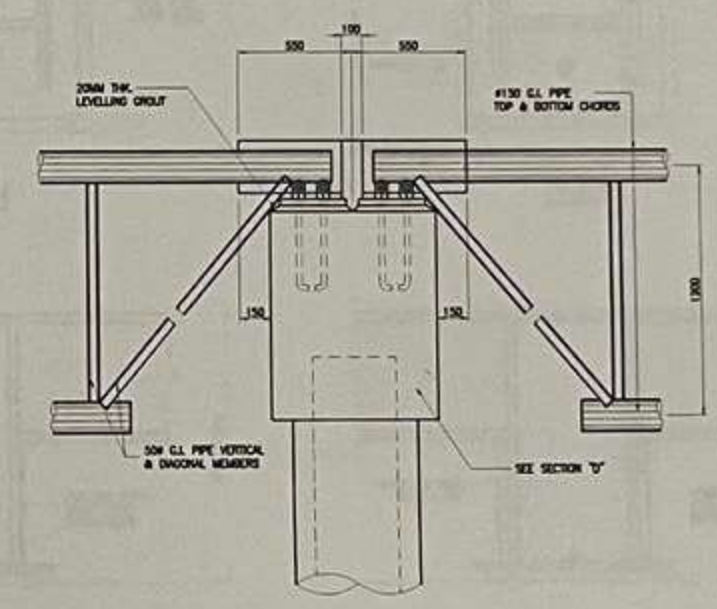


5 LOADING PLATFORM
5-06 SCALE 1:100M

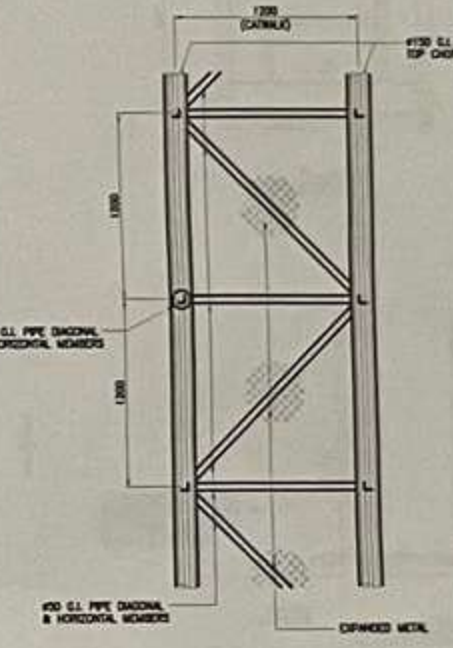


7 TYP. TRUSS ELEVATION
5-06 SCALE 1:50M

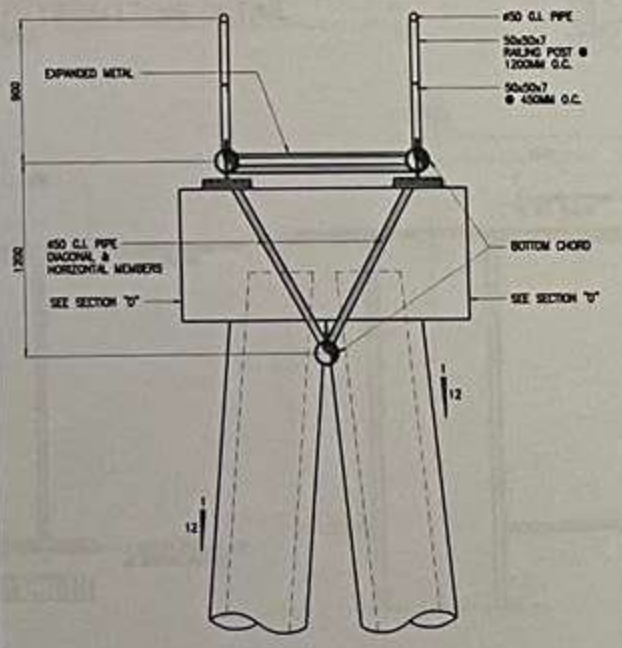
NOTE:
ALL G.I. PIPE TO BE REPLACED SHALL BE GALVANIZED STEEL PIPE CONFORMING TO ASTM 501 Fy = 248MPa (35500 PSI). ALL BLUNT SURFACES & WELDED JOINTS SHALL BE CLEANED & PAINTED WITH COLD GALVANIZING COMPOUND.



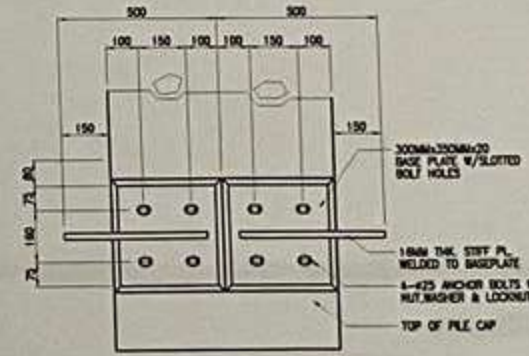
8 TYP. TRUSS TO PILE CAP CONNECTION DETAIL
5-06 SCALE 1:15M



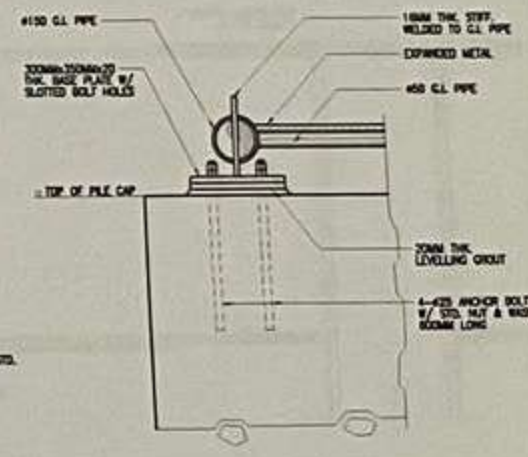
9 TYP. CATWALK PLAN
5-06 SCALE 1:20M



10 TYP. CATWALK SECTION
5-06 SCALE 1:20M



11 TYP. BASE PLATE DETAIL
5-06 SCALE 1:10M



12 TYP. BASE PLATE ELEVATION
5-06 SCALE 1:10M

A DOLPHIN AND LOADING PLATFORM REMEDIATION DETAILS
5-06 SCALE 1:100M

B TYP. CATWALK REMEDIATION DETAILS
5-06 SCALE 1:100M

JAN 21 2009

CONSTRUCTION PROCEDURE

METHOD 1: CONCRETE REPAIR USING PUTTY

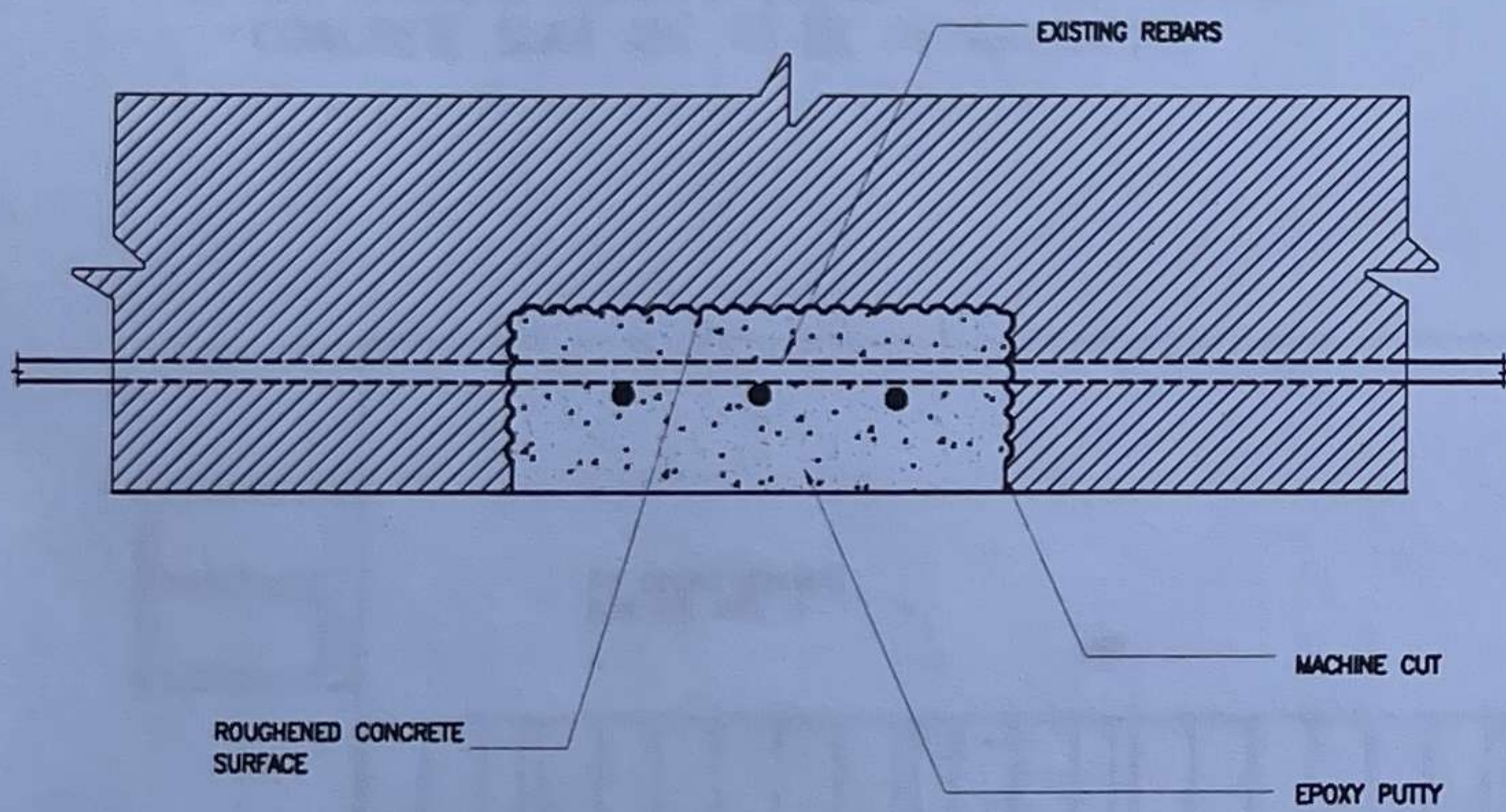
1. IDENTIFY SPALLED AREAS.
2. CHIPPING - REMOVE LOOSE CONCRETE AND CHIP TILL GOOD CONCRETE IS REACHED. IF EXPOSED REBARS ARE CORRODED, REMOVE RUST SCALES, WIRE BRUSH REBARS AND APPLY RUST CONVERTER (REFER TO NOTE NO. 2 IN (S-08) IF CORROSION IN REINFORCEMENT IS EXCESSIVE). LET RUST CONVERTER STAY OVERNIGHT.
3. WIRE BRUSH REBARS LIGHTLY AND APPLY A COAT OF STRUCTURAL EPOXY 316 ON CHIPPED AREA AND OVER REBARS AS PRIMER.
4. PREPARE STRUCTURAL EPOXY 316 PUTTY AND APPLY TO SPALLED AREA. LET EPOXY PUTTY CURE.
5. GRIND PROTRUDING EPOXY PUTTY FLUSH TO CONCRETE SURFACE.

METHOD 2: CONCRETE REPAIR BY EPOXY PATCHING

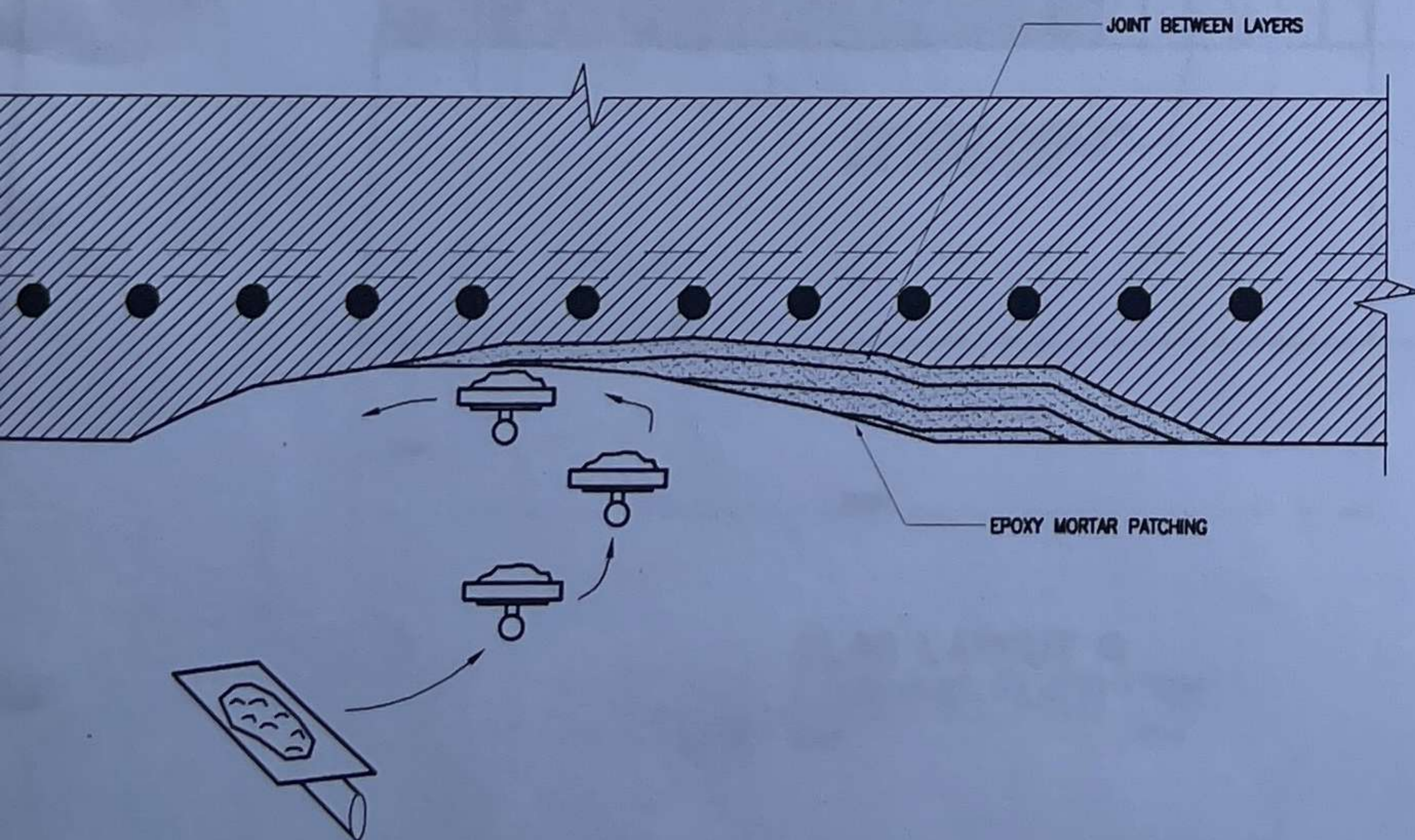
1. IDENTIFY SPALLED AREAS.
2. CHIPPING-REMOVE LOOSE CONCRETE AND CHIP TILL GOOD CONCRETE IS REACHED.
3. PREPARE STRUCTURAL EPOXY 316 PUTTY AND APPLY TO SPALLED AREA. LET EPOXY PUTTY CURE.
4. GRIND PROTRUDING EPOXY PUTTY FLUSH TO CONCRETE SURFACE.

METHOD 3: CONCRETE REPAIR BY EPOXY INJECTION

1. IDENTIFY CRACKS
2. V-CUT ALONG CRACKS AND DRILL 1/2" HOLES TO A DEPTH OF APPROXIMATELY HALF THE STRUCTURES DIMENSION
3. CLEANING - REMOVE LOOSE CONCRETE AND CONCRETE POWDERS
4. INSTALL 1/4" 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.



2 METHOD 1: CONCRETE REPAIR USING EPOXY PUTTY
S-07 SCALE NTS



3 METHOD 2: CONCRETE REPAIR BY EPOXY PATCHING
S-07 SCALE AS SHOWN

NOTES:

1. UNLESS NOTED OTHERWISE, REPAIR METHOD(S) TO BE ADOPTED SHALL BE AS FOLLOWS:

EXPOSED REINFORCEMENT	- METHOD 1
SPALLING OF CONCRETE/POOR WORKMANSHIP	- METHOD 2
CRACKING OF CONCRETE	- METHOD 3

METHODS TO ADOPTED MAY VARY AS PER ENGINEER'S INSTRUCTION UPON CONFIRMATION OF ACTUAL CONDITION DURING REPAIR.

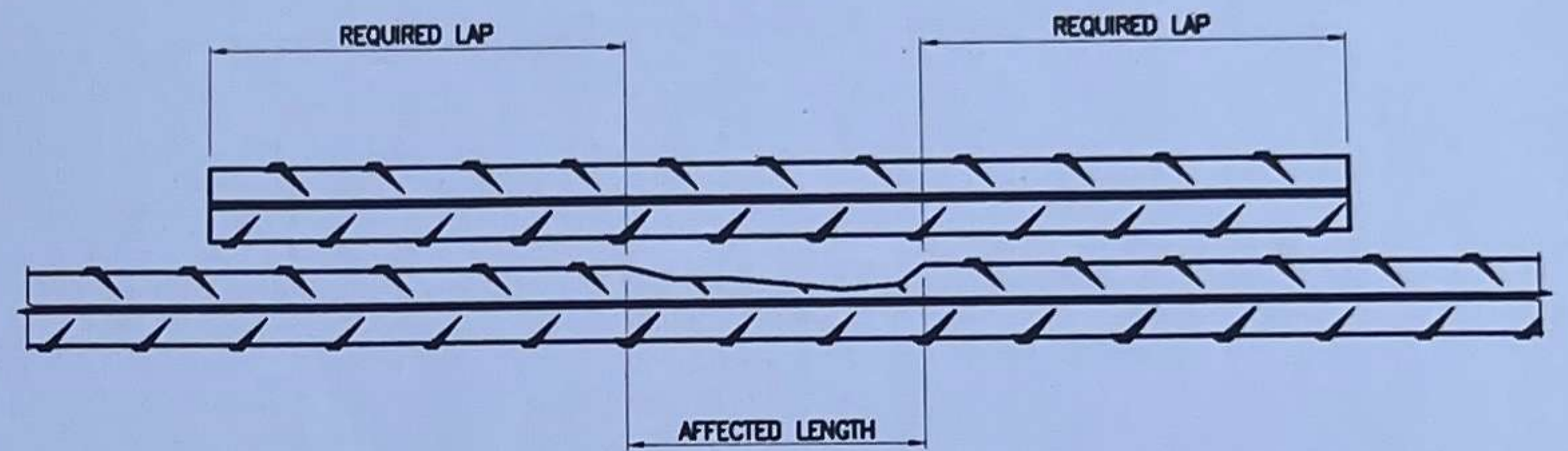
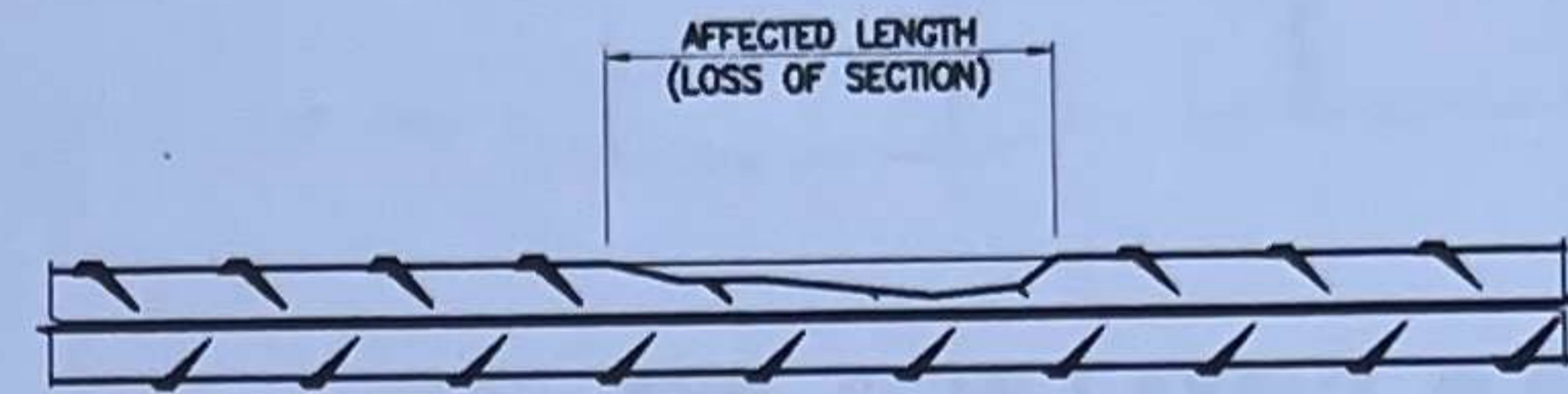
THE CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS SHOWING MAPPING PLAN FOR EACH METHOD USED IN THE REPAIR WORKS.

2. IF THE REINFORCING STEEL HAS LOST MORE THAN 25% OF ITS CROSS SECTION (OR 20% IF TWO OR MORE ADJACENT BARS ARE AFFECTED), THEN REINFORCING STEEL REPAIR IS GENERALLY REQUIRED

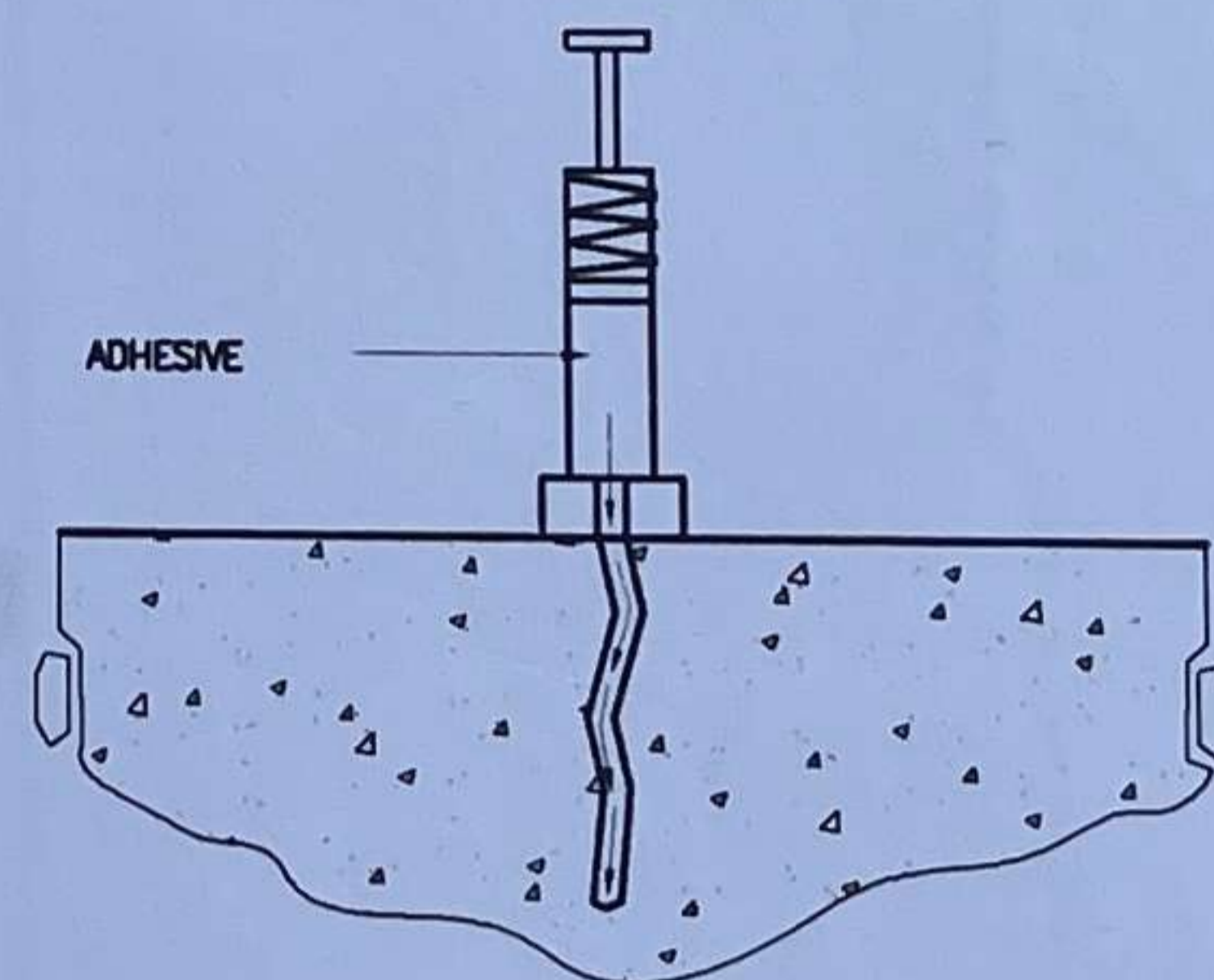
3. WHEN DAMAGE TO REINFORCING STEEL IS UNCOVERED, IT IS GOOD PRACTICE TO PERFORM A STRUCTURAL REVIEW OF THE SITUATION

4. IF REPAIRS ARE REQUIRED FOR THE REINFORCING STEEL, THE FOLLOWING METHOD SHOULD BE USED:

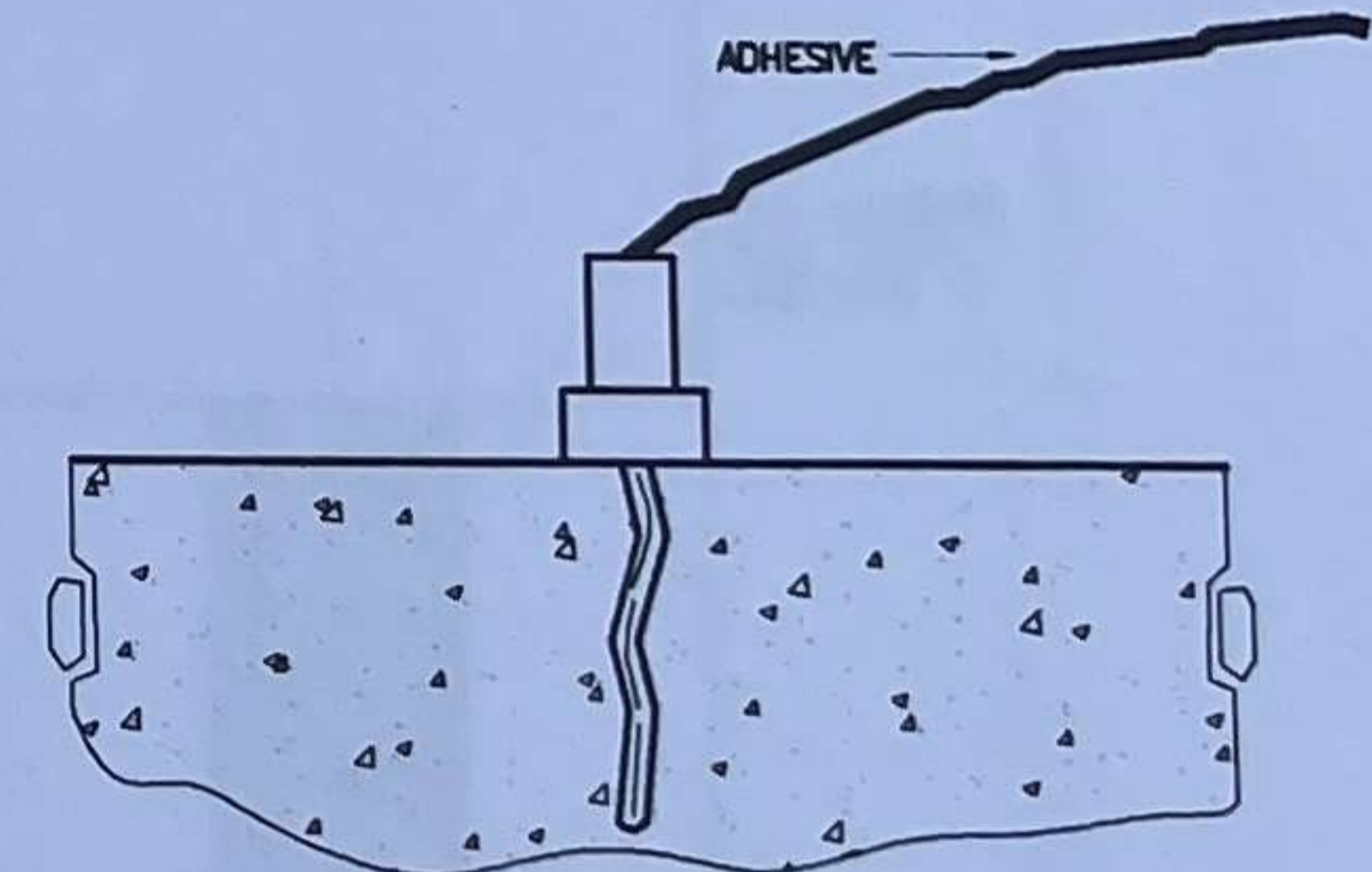
4.1 SUPPLEMENTAL BAR OVER AFFECTED LENGTH. NEW BAR MAY BE MECHANICALLY SPLICED TO AFFECTED BAR OR PLACED PARALLEL TO EXISTING BAR. (SEE DETAIL BELOW)



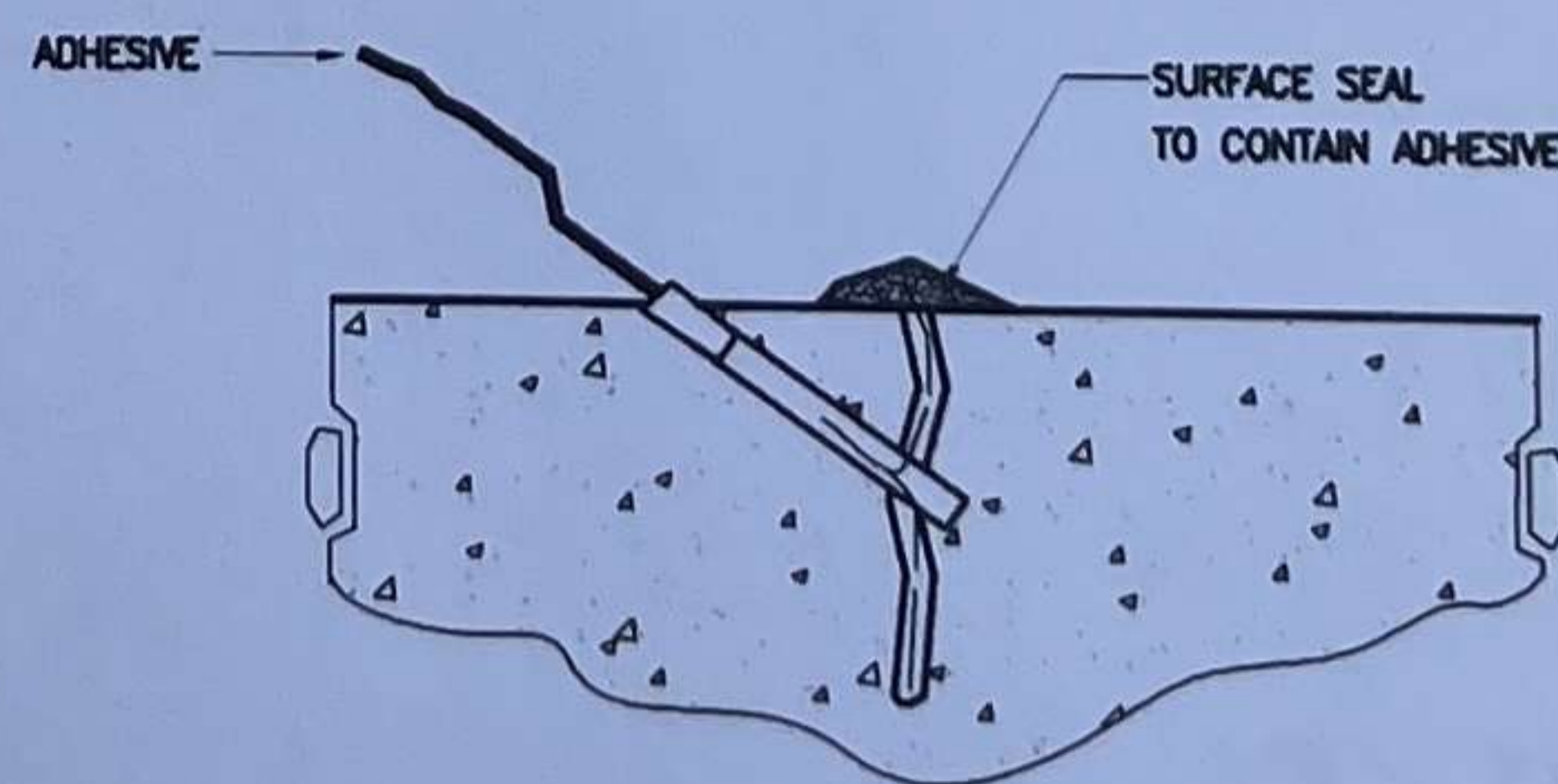
1 REINFORCING STEEL REPAIR (FROM SECTION LOSS)
S-07 SCALE NTS



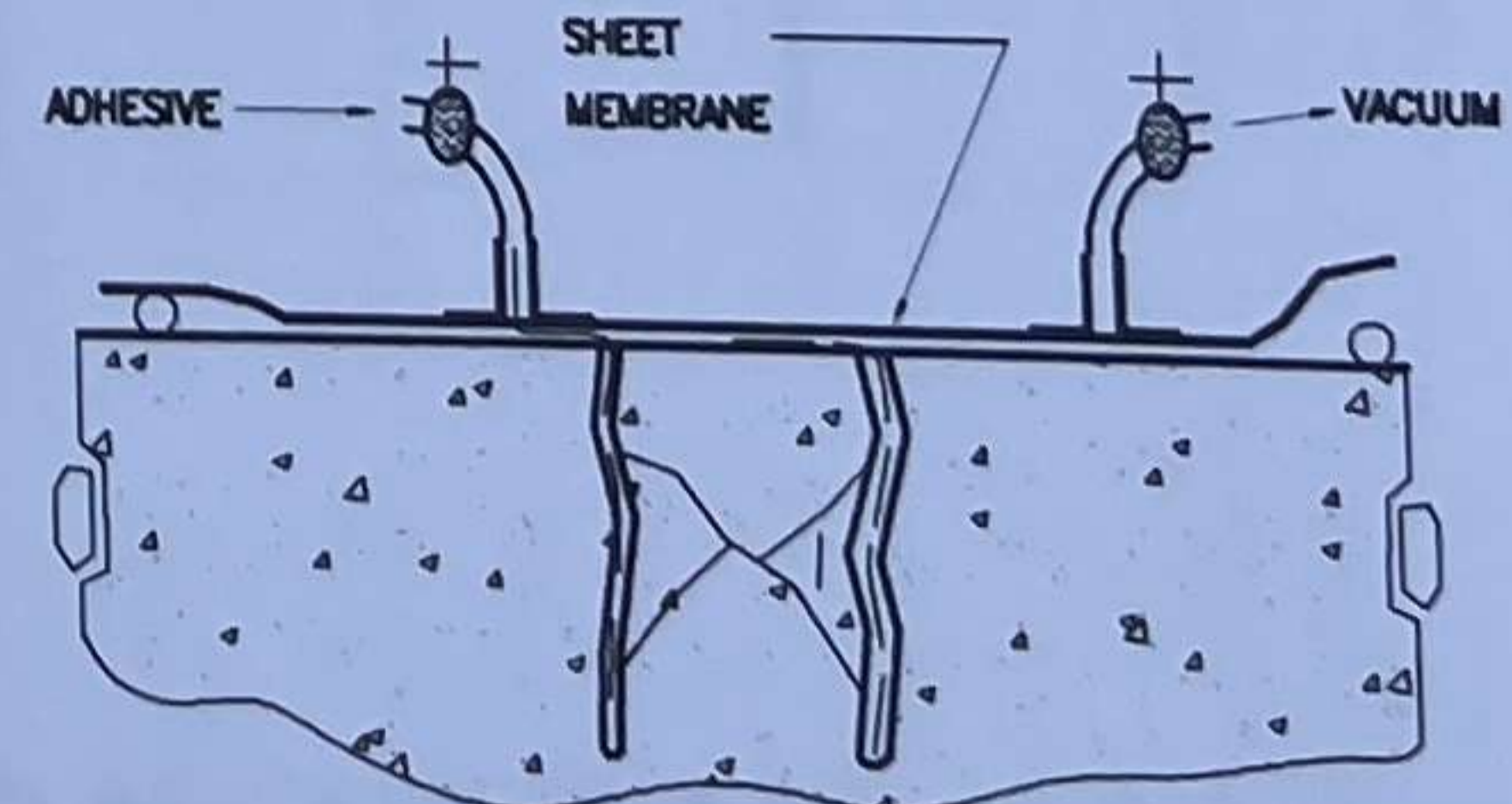
A. MANUAL PISTON TYPE INJECTOR



C. SURFACE-MOUNTED PORT INJECTION



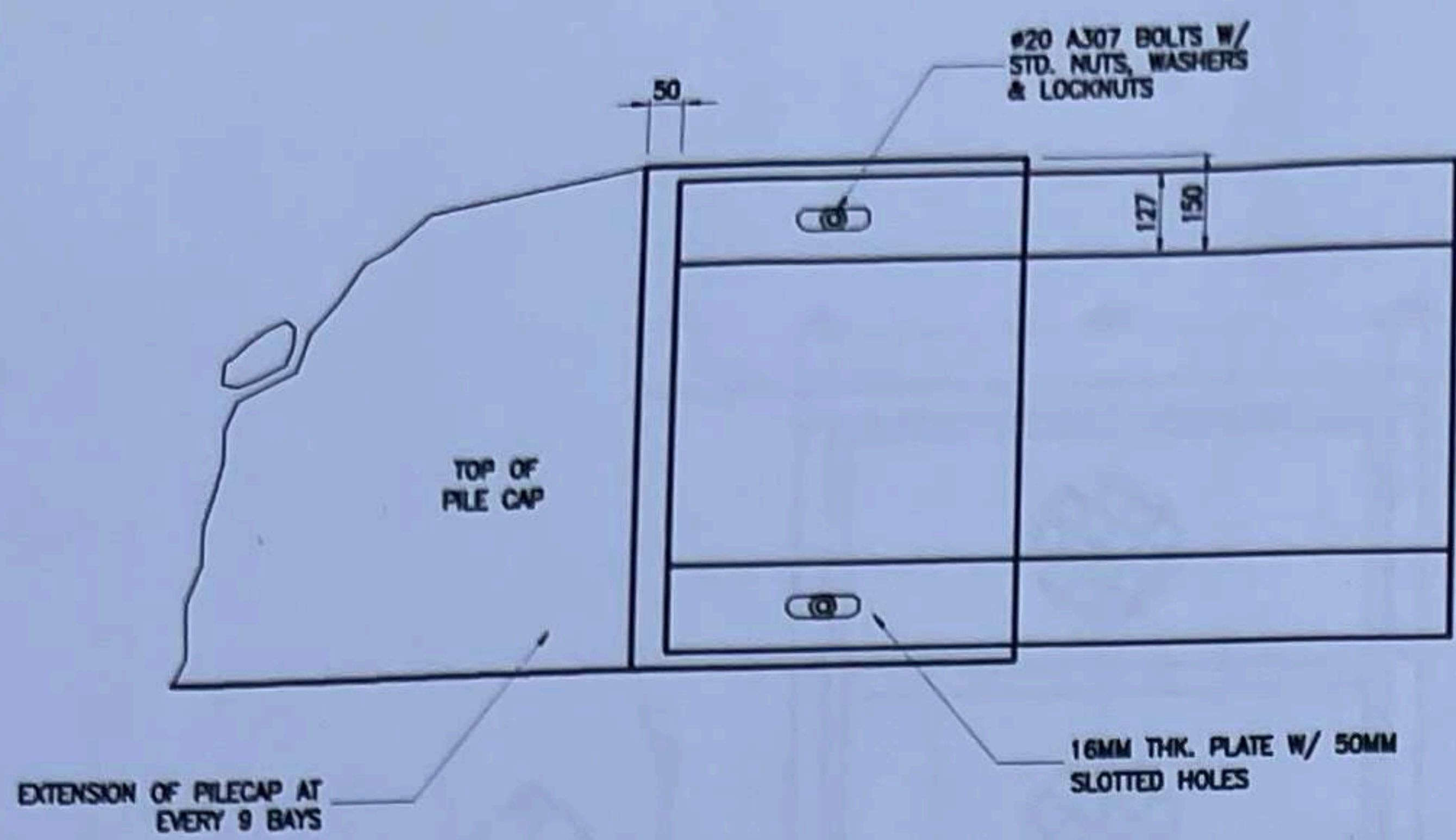
B. DRILLED HOLE PACKER INJECTION



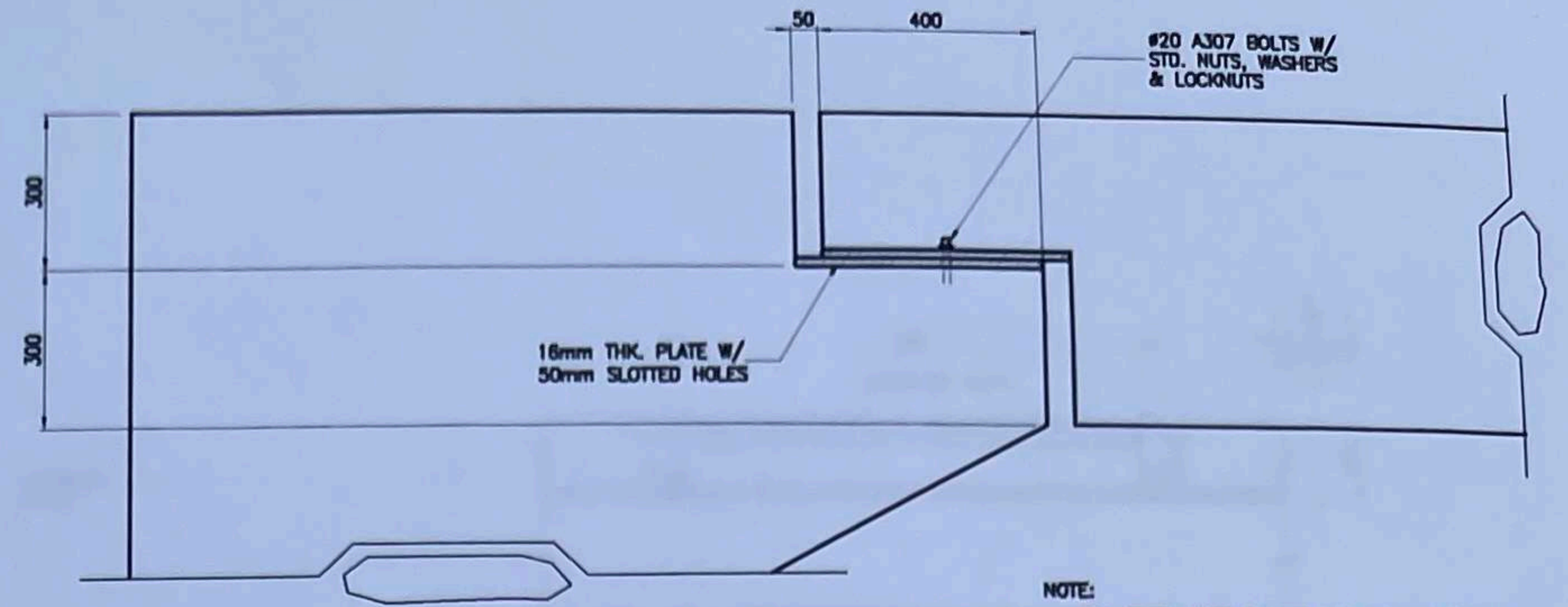
D. VACUUM INJECTION

4 METHOD 3: CONCRETE REPAIR BY EPOXY INJECTION
S-07 SCALE NTS

A TYP. CONCRETE REPAIR DETAILS
S-07 SCALE NTS



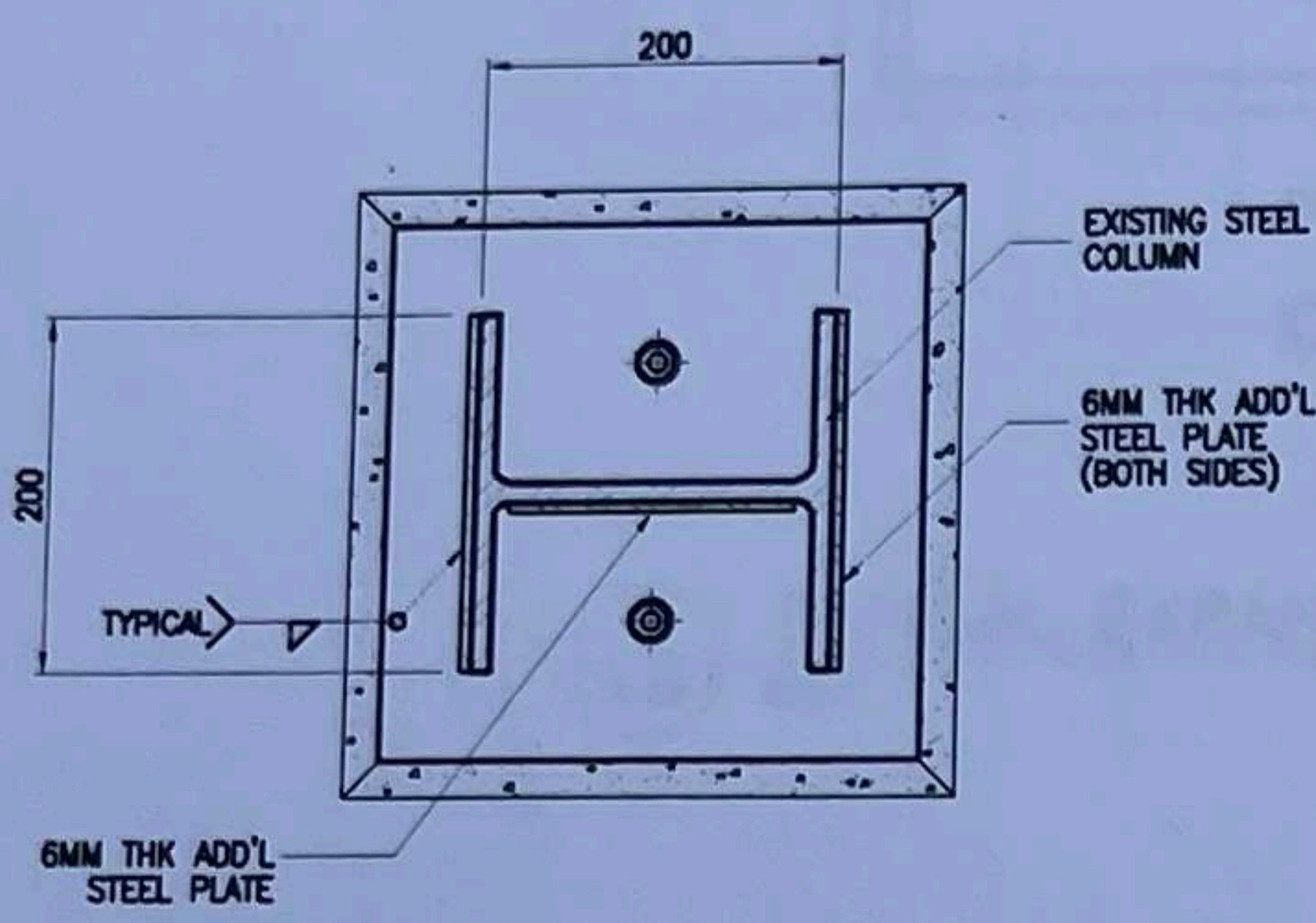
PLAN



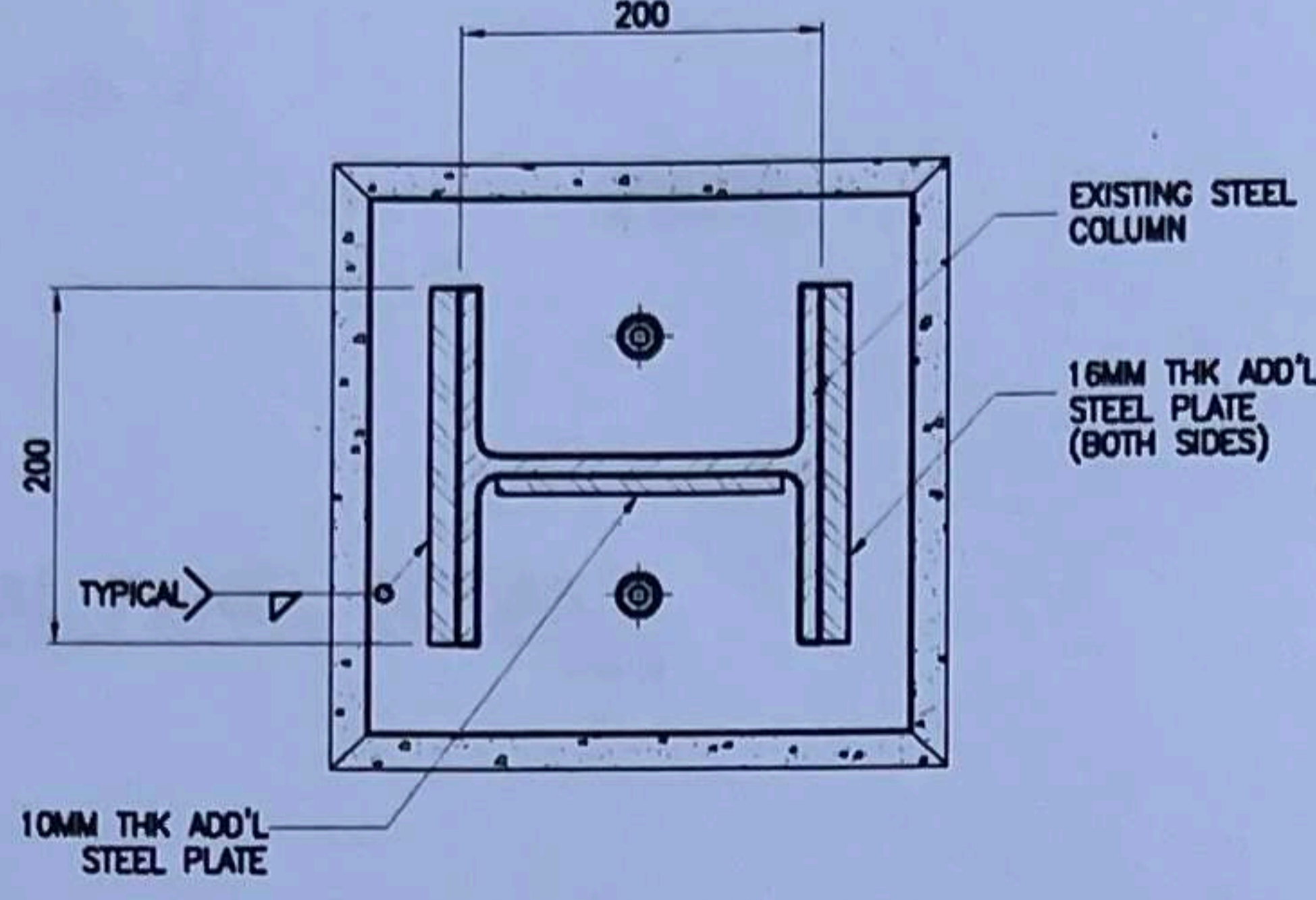
ELEVATION

NOTE:
ALL STEEL BASE PLATES AND ANCHOR BOLTS ARE TO BE REHABILITATED. MISSING ANCHOR BOLTS ARE TO BE REPLACED.

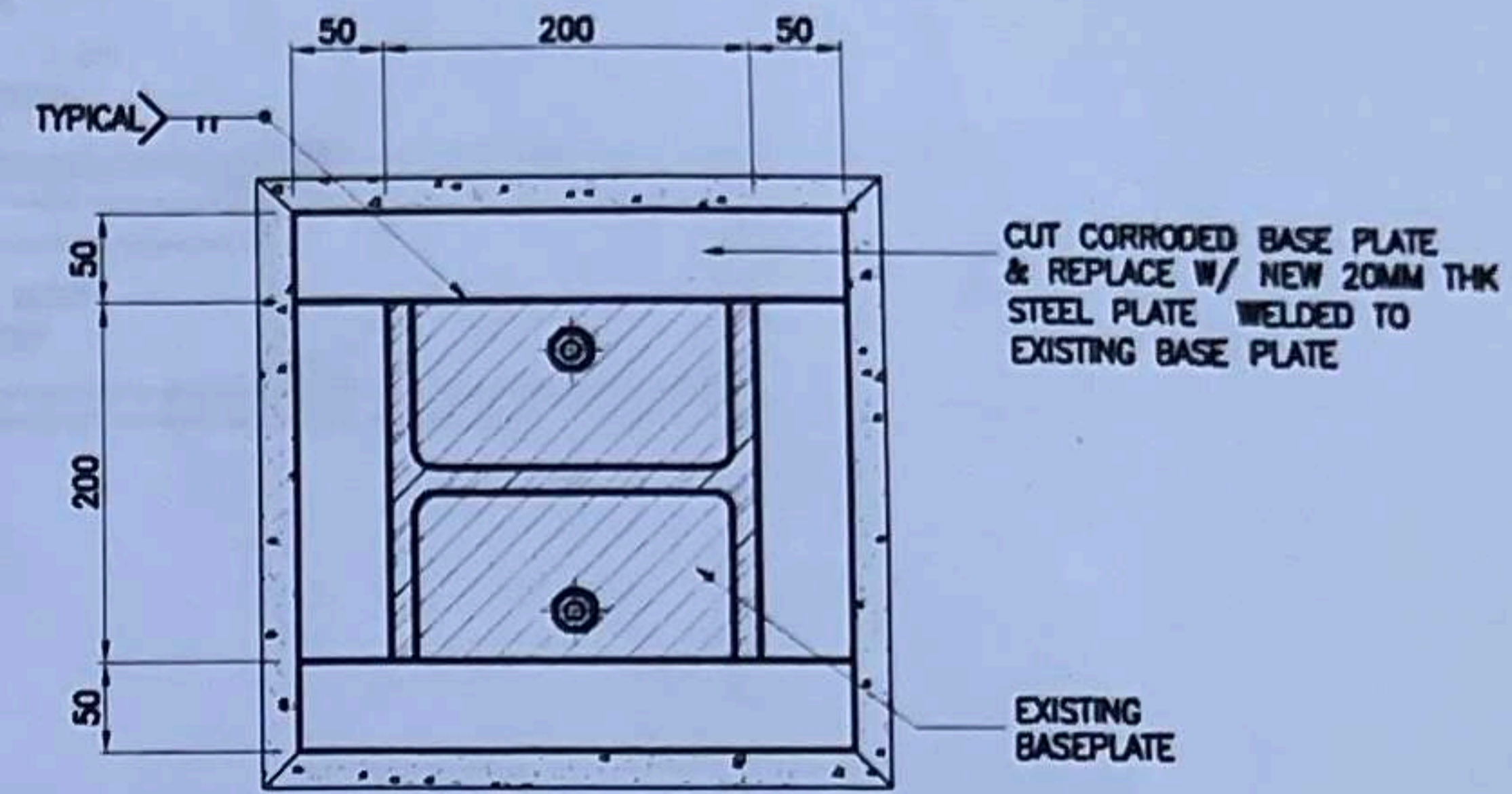
1 TYPICAL CORBEL DETAILS
S-07 SCALE 1:10M



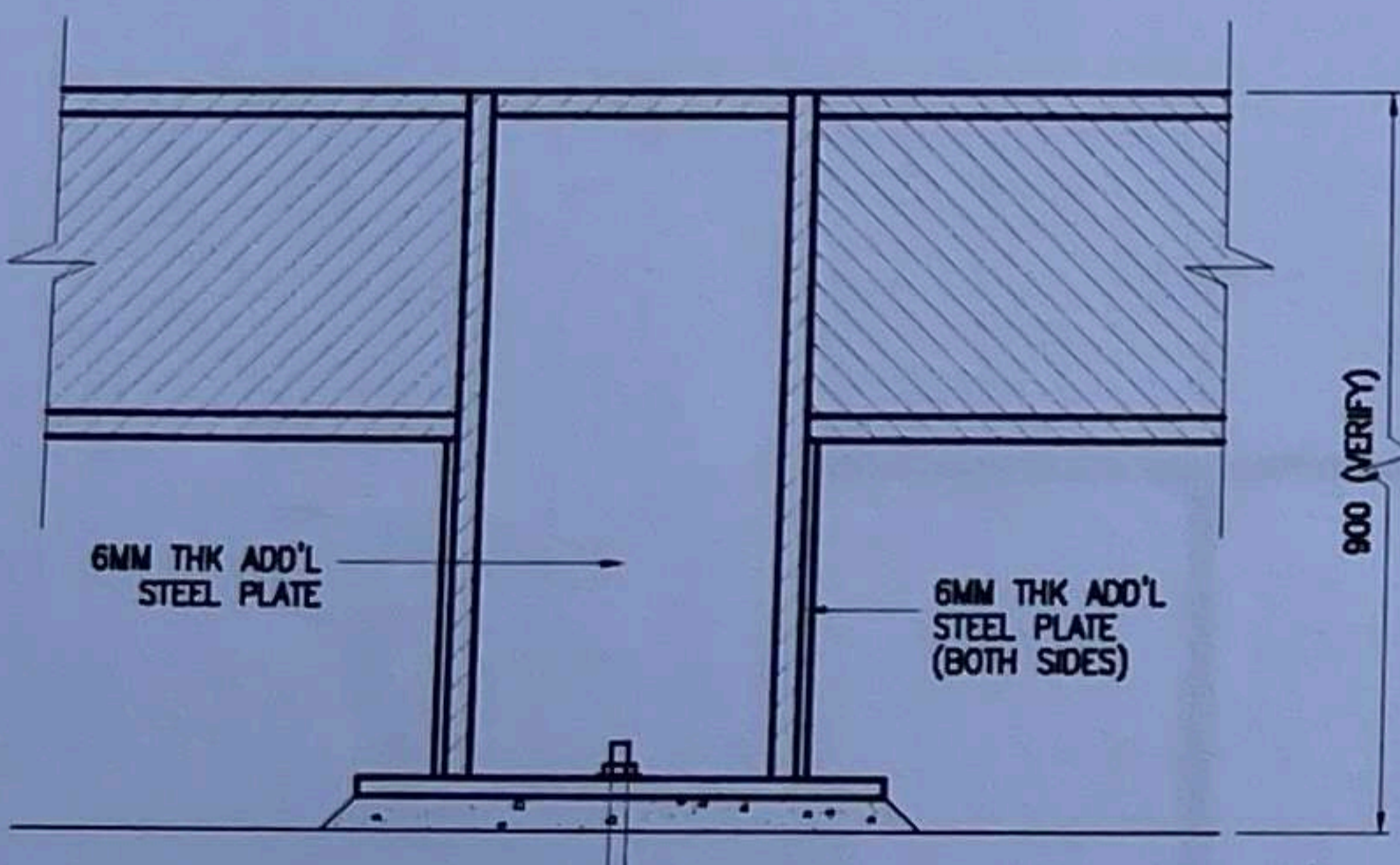
PLAN



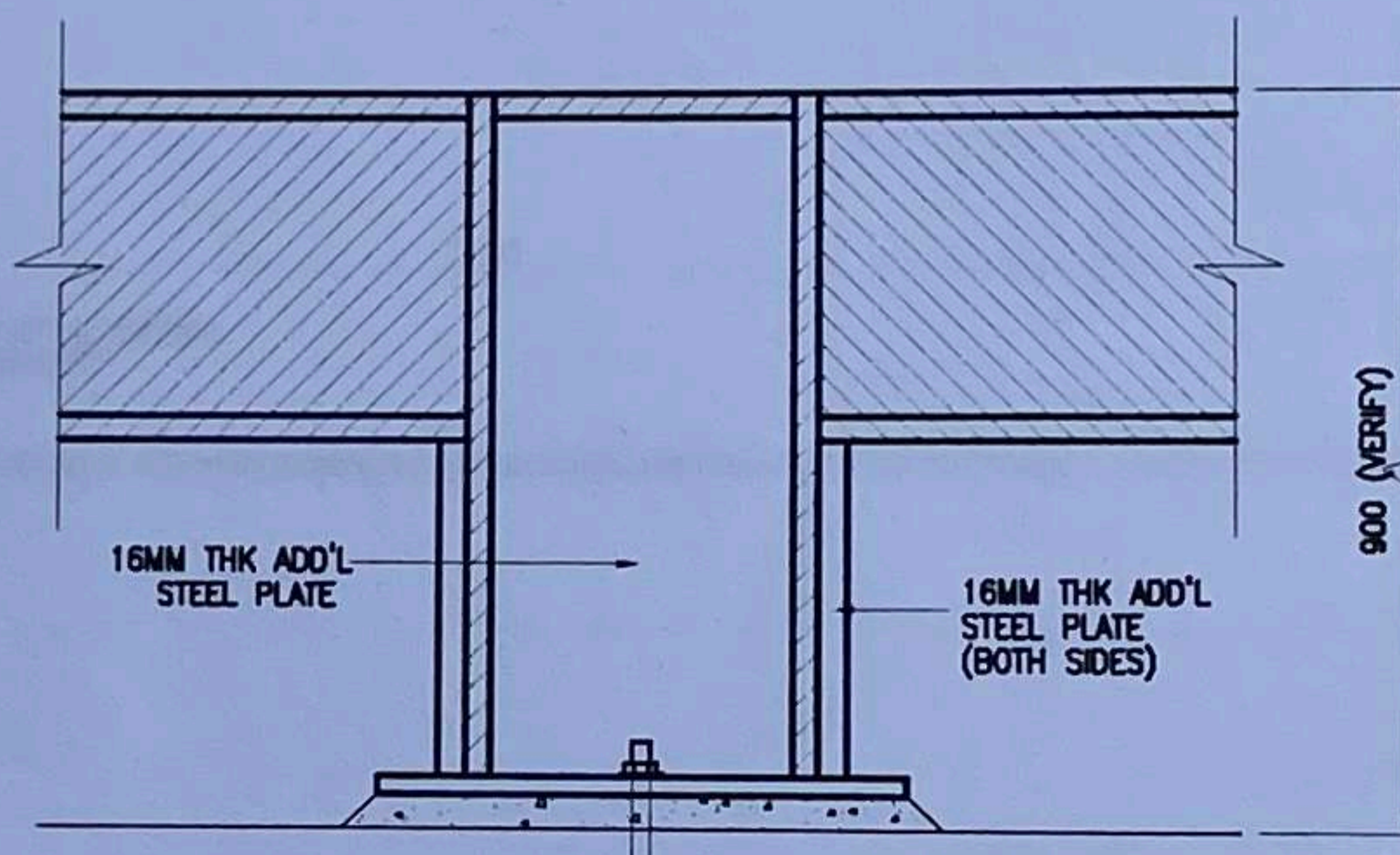
PLAN



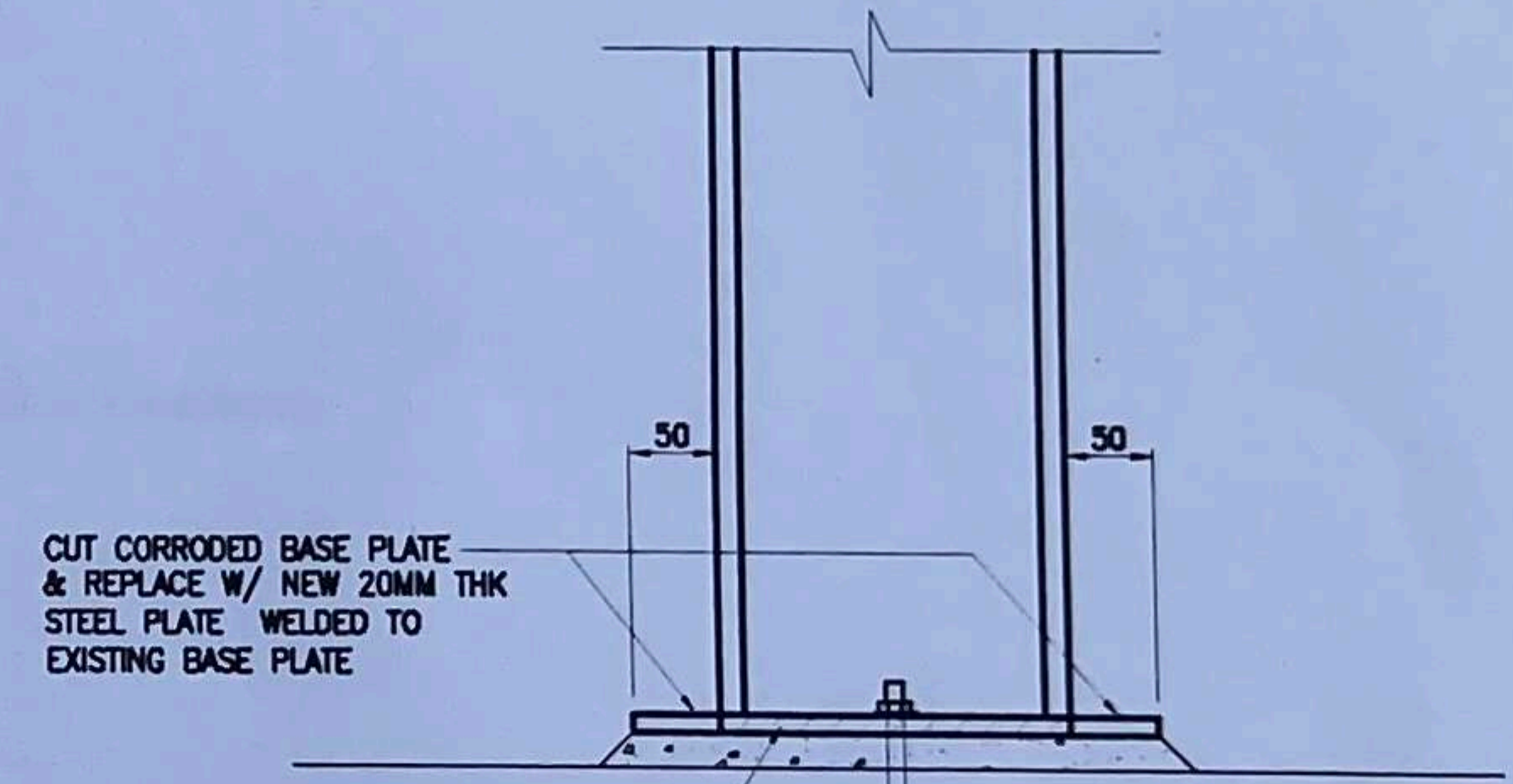
PLAN



ELEVATION



ELEVATION

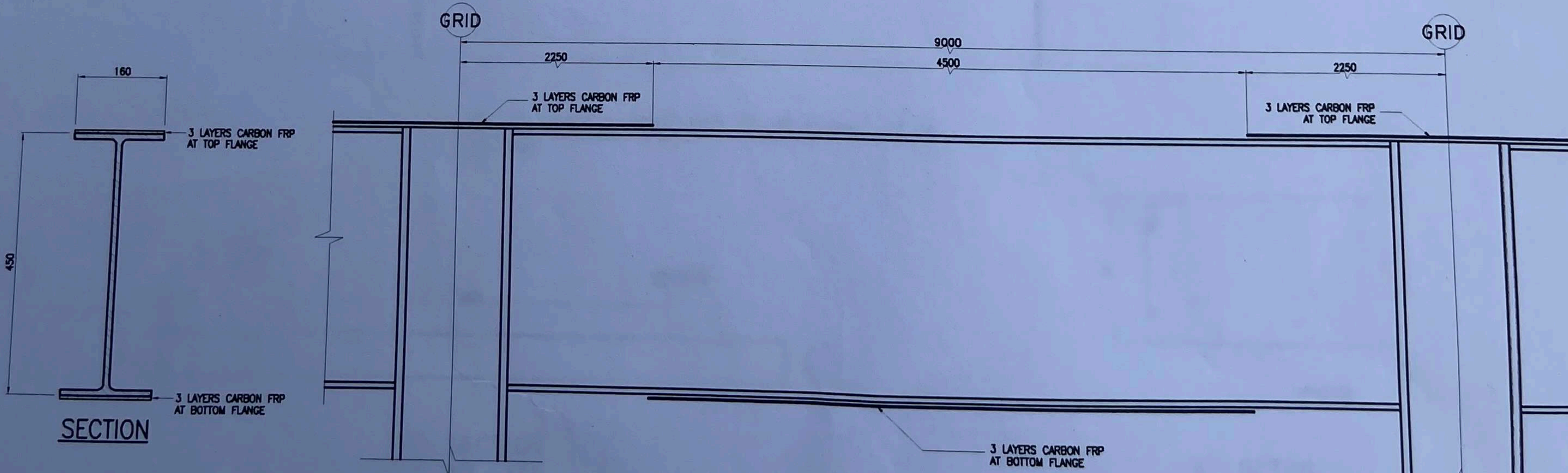


ELEVATION

2 TYP. STANDARD STEEL COLUMN RETROFITTING DETAIL
S-07 SCALE 1:5M

3 TYP. LOOP STEEL COLUMN RETROFITTING DETAIL
S-07 SCALE 1:5M

4 TYP. STEEL BASEPLATE RETROFITTING DETAIL
S-07 SCALE 1:5M



SECTION

ELEVATION

5 TYP. STEEL GIRDER RETROFITTING DETAIL
S-07 SCALE 1:5M

B TYP. STEEL RETROFITTING DETAILS
S-07 SCALE

AS SHOWN

JAN 21 2009

SHEET CONTENTS

TYP. CONCRETE REPAIR DETAILS
TYP. STEEL

CADD

DATE

NO.

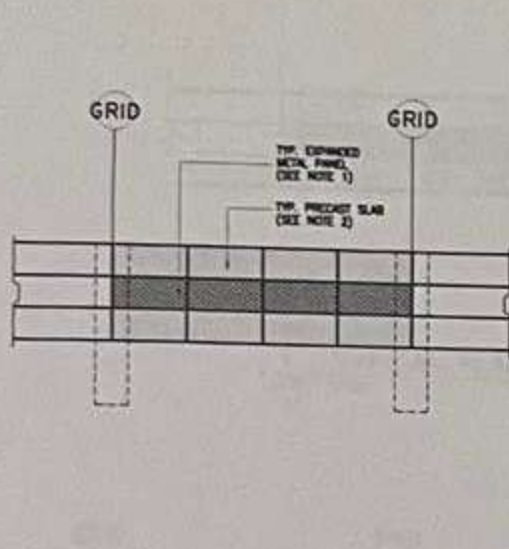
REVISIONS

CHECK

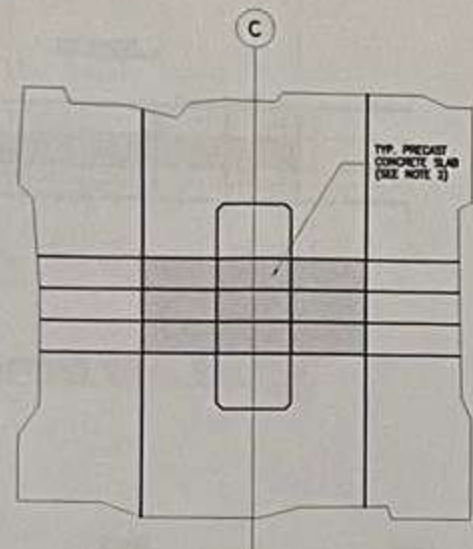
DATE

PAPER SIZE

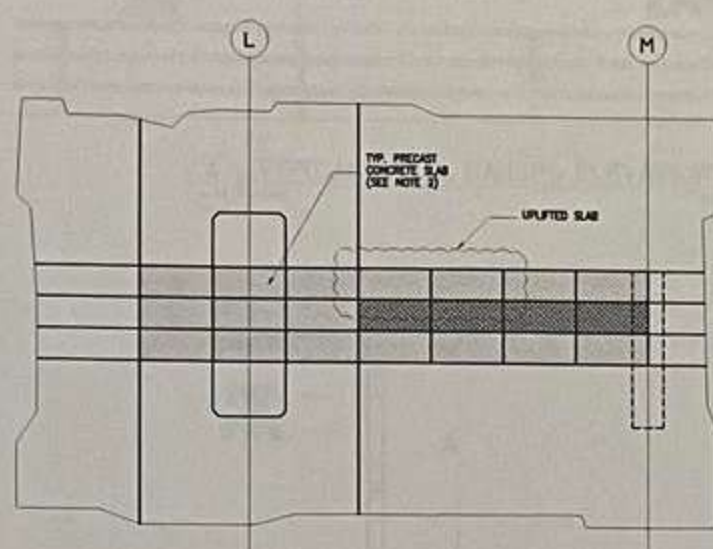
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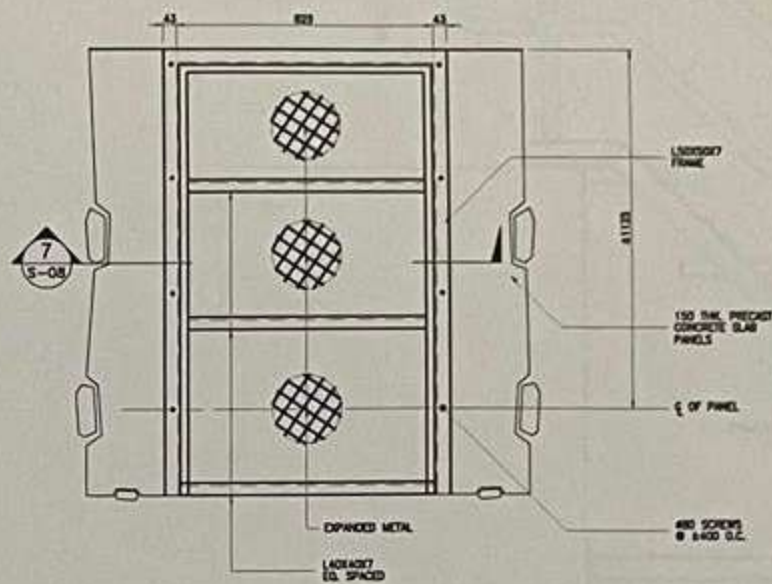
1 TYP. SLAB LAYOUT
S-08 SCALE 1:100M



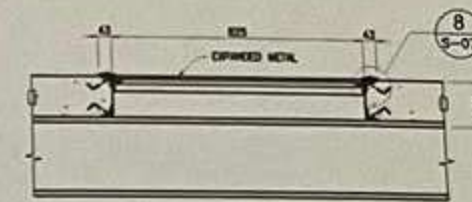
2 TYP. SLAB LAYOUT @ GRID LINE C
S-08 SCALE 1:100M



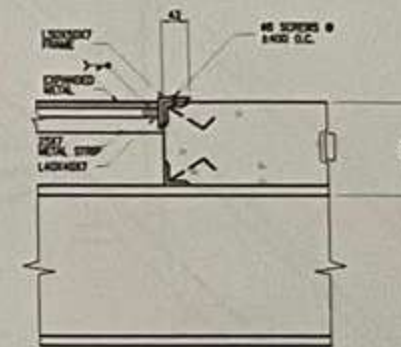
3 TYP. SLAB LAYOUT @ GRID LINE L - M
S-08 SCALE 1:100M



6 TYPICAL EXPANDED METAL PANEL DETAILS
S-08 SCALE 1:10 M



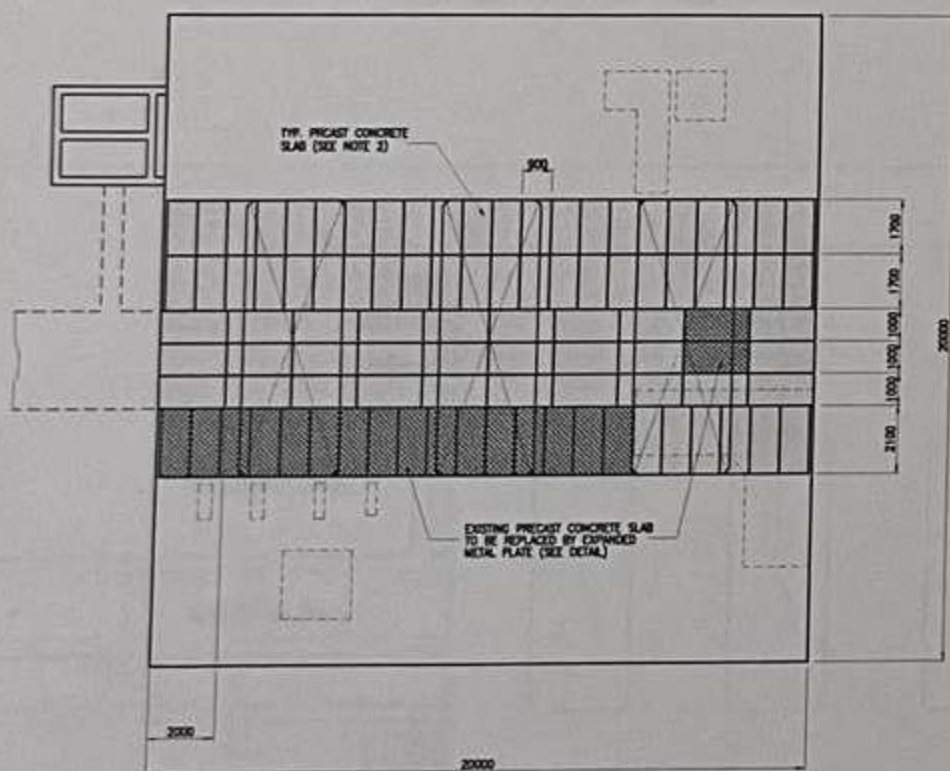
7 SECTION
S-08 SCALE 1:10 M



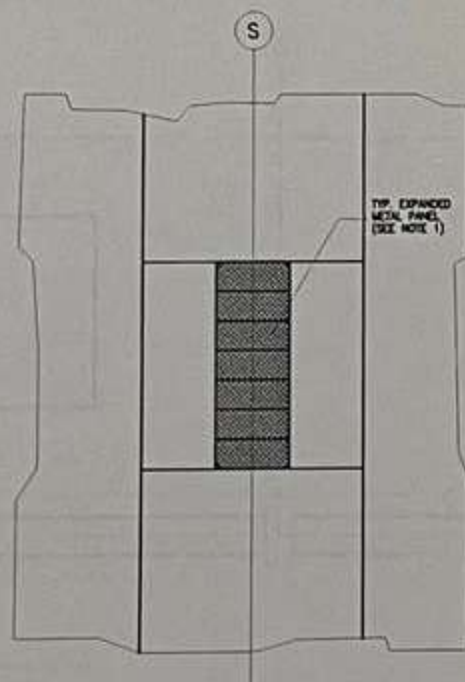
8 DETAIL
S-08 SCALE 1:5 M

NOTE :

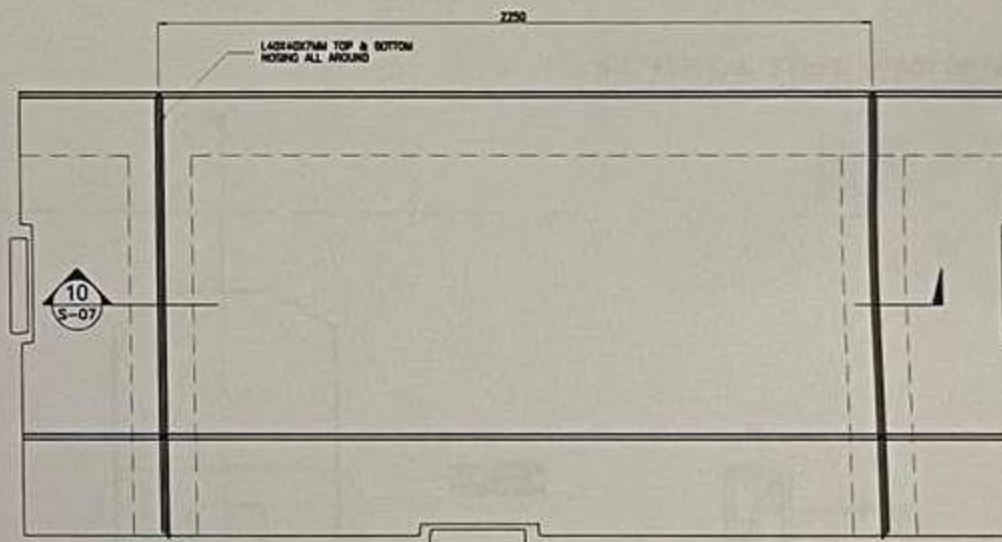
1. ALL EXISTING EXPANDED METAL WITH STEEL FRAMES ARE TO BE REHABILITATED.
2. ALL EXISTING ANGULAR FRAMES OF THE PRECAST CONCRETE SLAB ARE TO BE REHABILITATED.



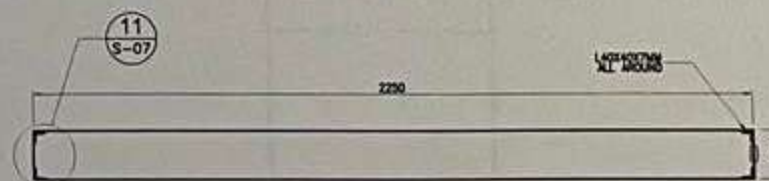
4 SLAB LAYOUT @ LOADING PLATFORM
S-08 SCALE 1:100M



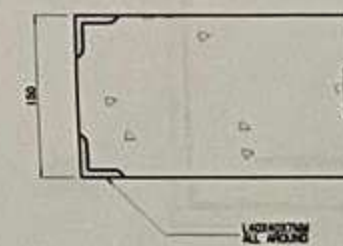
5 TYP. SLAB LAYOUT @ GRID LINE S
S-08 SCALE 1:100M



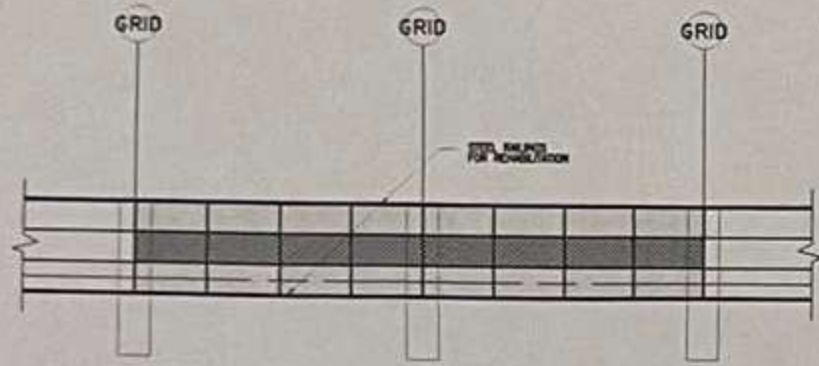
9 EXISTING PRECAST SLAB PANEL PLAN
S-08 SCALE 1:10 M



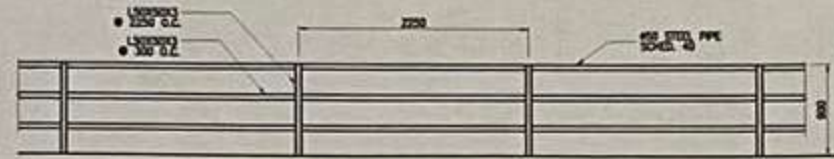
10 SECTION
S-08 SCALE 1:10 M



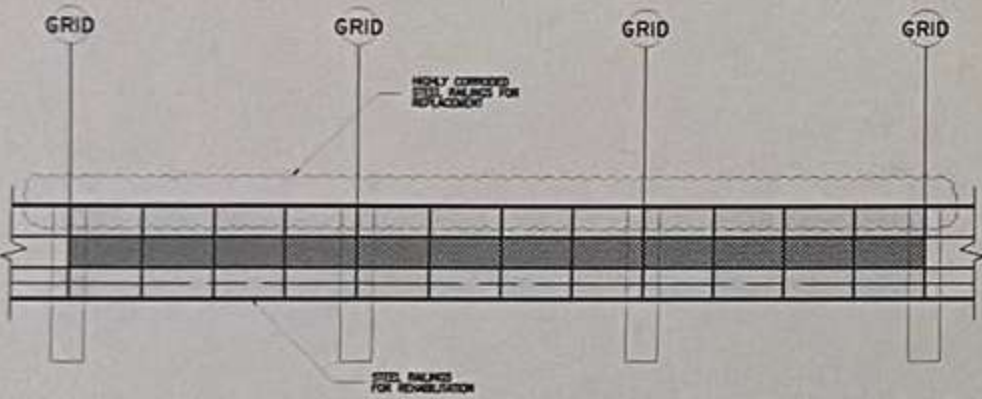
11 DETAIL
S-08 SCALE 1:3 M



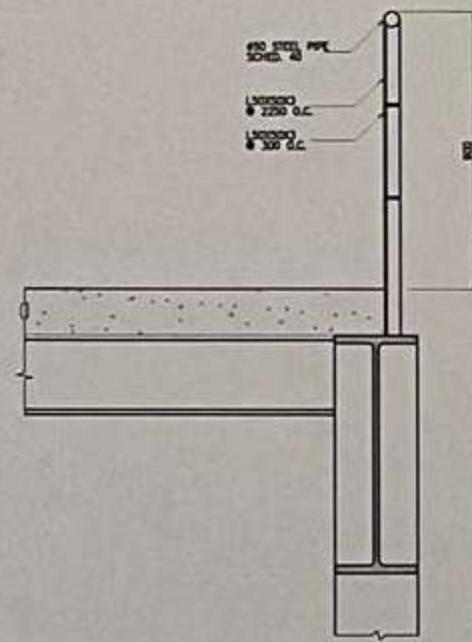
1 TYPICAL PLAN SHOWING STEEL RAILINGS
SCALE 1:100M



3 TYPICAL STEEL RAILING ELEVATION
SCALE 1:30M



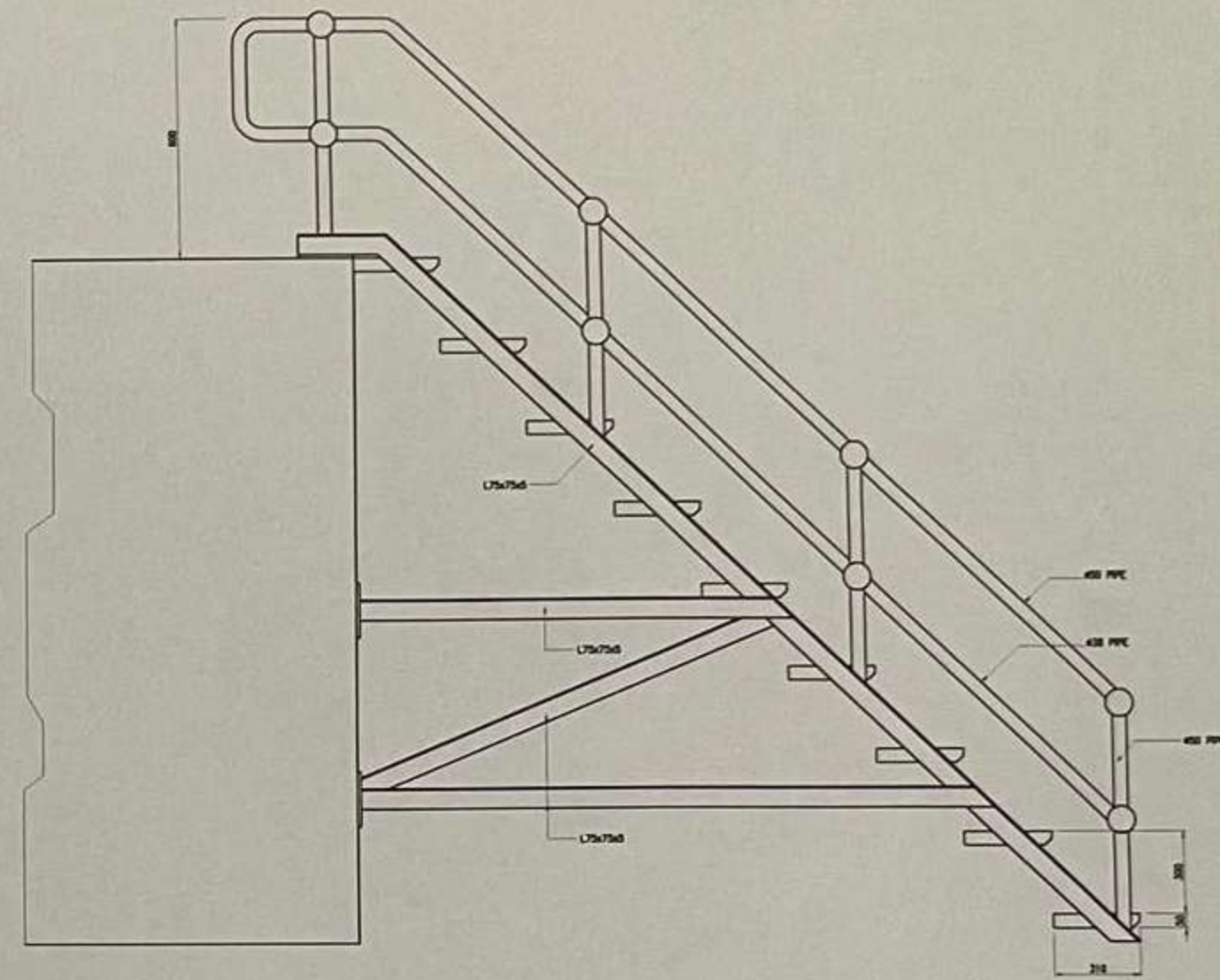
2 TYPICAL PLAN @ GRID 11-14 & L-P
SCALE 1:100M



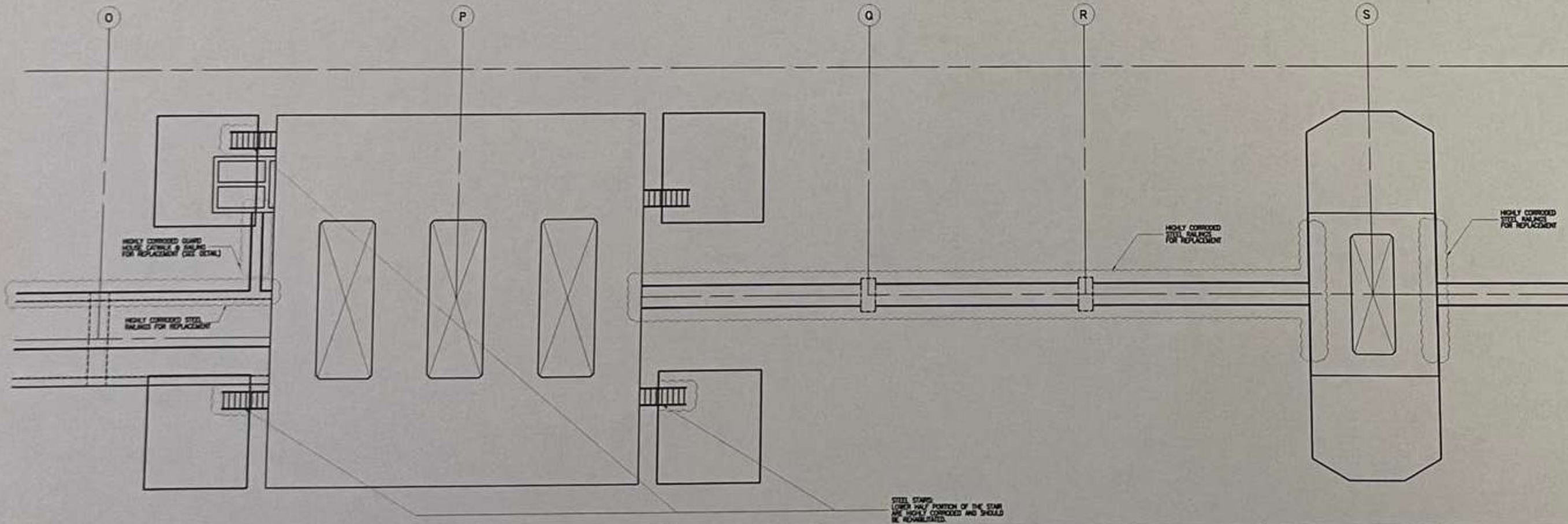
4 TYP. RAILING SECTION
SCALE 1:10M

NOTES ON STEEL RAILINGS:

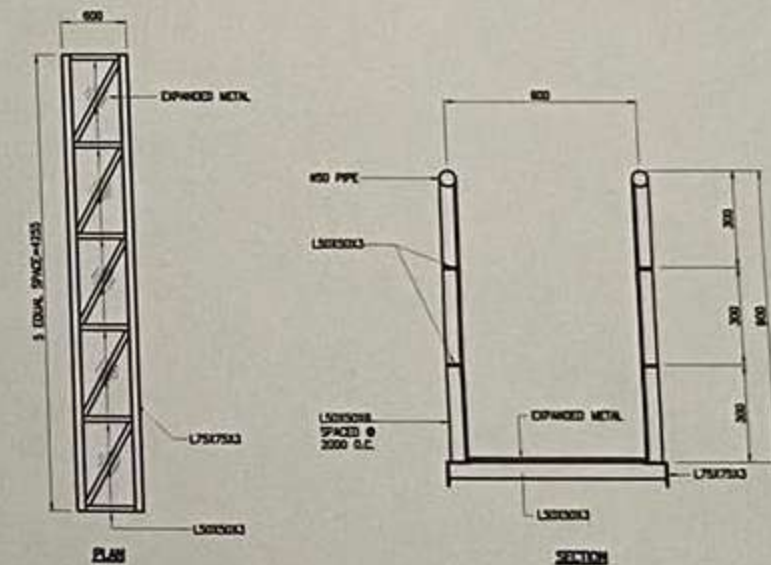
1. ALL STEEL RAILINGS INCLUDING RAILINGS @ PUMP HOUSE SHALL BE REHABILITATED.
2. RIGHT SIDE RAILING BETWEEN BENT 98 & 99 WAS DISCONNECTED AND SHOULD BE REPAIRED.



5 TYPICAL STEEL STAIR DETAIL
SCALE 1:100M



5 PLAN @ GRID P-S
SCALE 1:100M



6 GUARD HOUSE CATWALK DETAIL
SCALE 1:100M

A STEEL RAILINGS AND STAIRS REMEDIATION DETAILS
SCALE 1:100M

JAN 21 2009