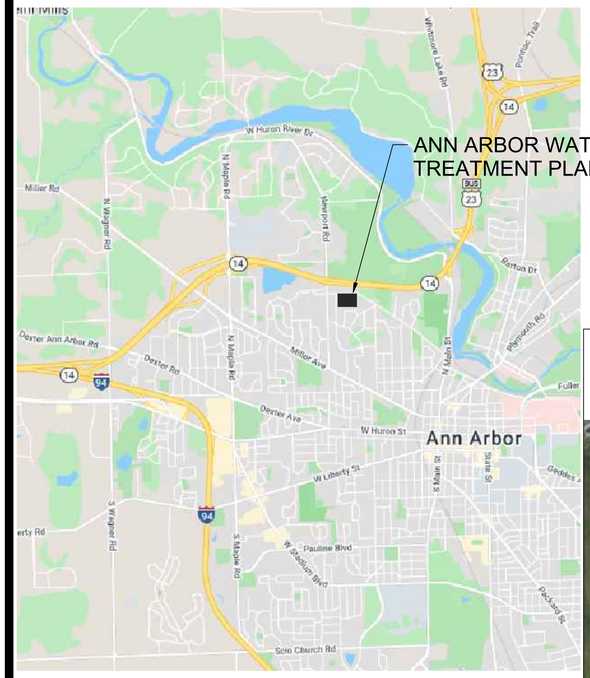
CITY OF ANN ARBOR, MICHIGAN
SODIUM HYPOCHLORITE
STORAGE TANK REPLACEMENT

710 AVIS DRIVE, SUITE 100
ANN ARBOR, MI 48108
Tel. 734.665.6000 Fax. 734.213.3003
www.tetratech.com

TETRA TECH



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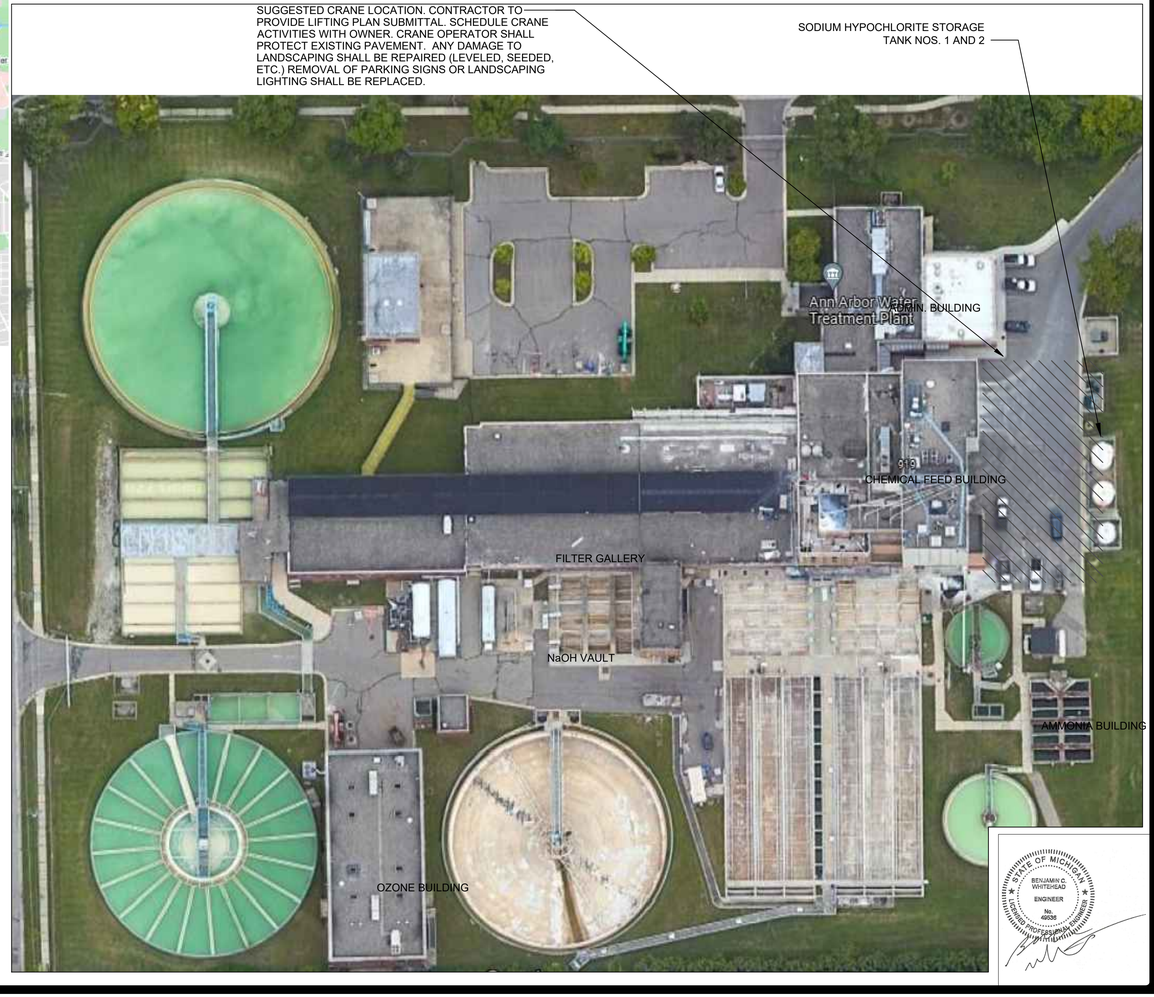


STATE OF MICHIGAN
BENJAMIN C. WHITEHEAD
ENGINEER
No. 49536
PROFESSIONAL ENGINEER

PROJECT LOCATION:

919 SUNSET ROAD
ANN ARBOR, MI 48103

CLIENT INFORMATION:

CITY OF ANN ARBOR
WATER TREATMENT SERVICES UNIT

Tt PROJECT No.:

200-31537-22003

CLIENT PROJECT No.:

RFP #: 22-43 FILE #: 22004

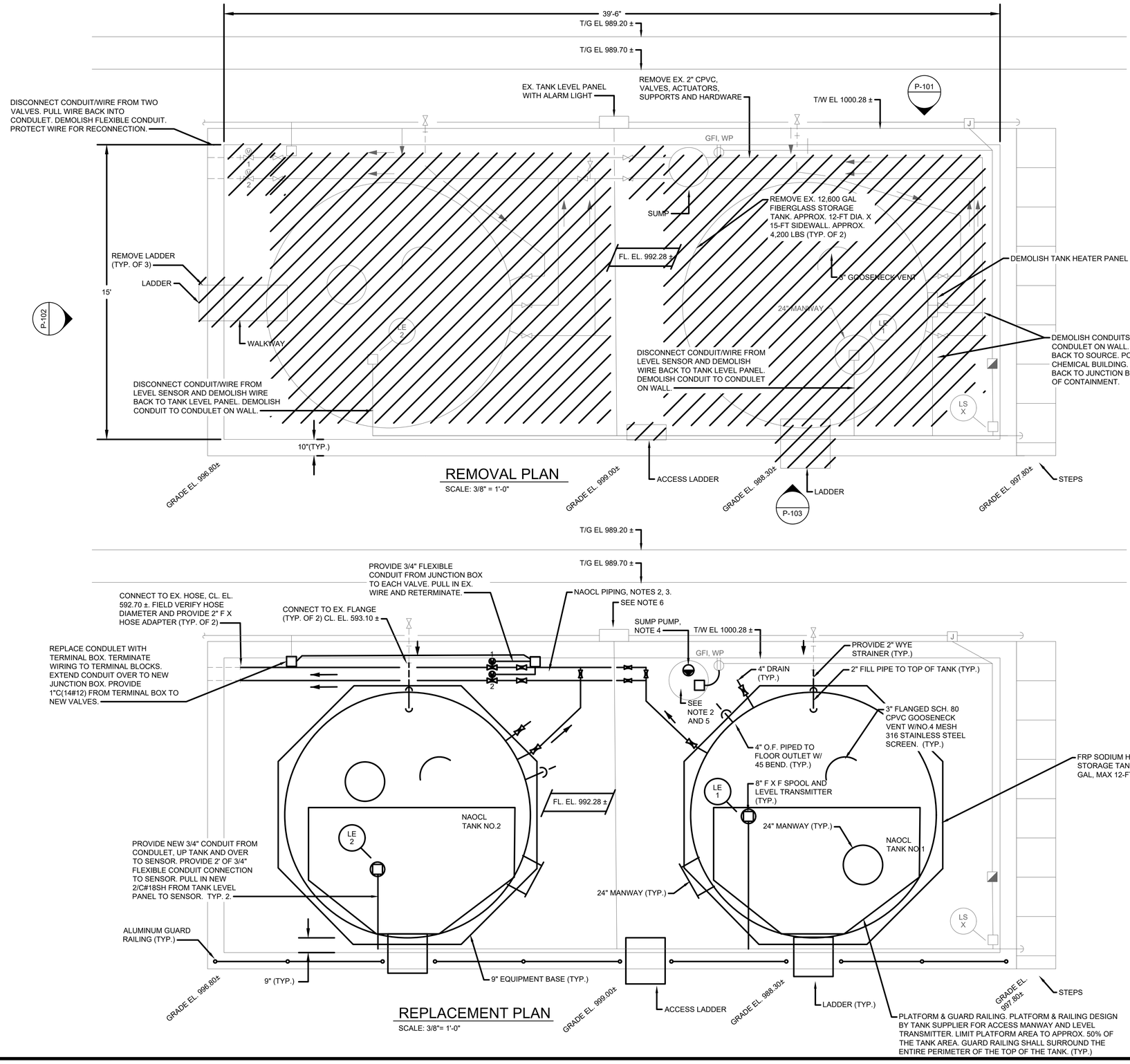
PROJECT DESCRIPTION / NOTES:

REMOVAL AND REPLACEMENT OF TWO EXISTING SODIUM HYPOCHLORITE BULK STORAGE TANKS AND RELATED PIPING, VALVES, ELECTRICAL AND INSTRUMENTATION EQUIPMENT WITHIN THE EXISTING CONTAINMENT AREA EAST OF THE CHEMICAL FEED BUILDING.

ISSUED:

05/02/2022 - ISSUED FOR BIDDING

VICINITY MAP:



REMOVAL NOTES:

1. PHOTOS P-101 THROUGH P-104 PROVIDED ON SHEET 2 FOR REFERENCE ONLY.
2. REMOVAL OF TANKS, LADDERS, PIPING, AND CONDUIT SHALL INCLUDE REMOVAL OF SUPPORTS. CUT ANCHORS FLUSH WITH CONCRETE.
3. SALVAGE TWO LEVEL SENSORS AND TURN OVER TO THE OWNER.
4. COORDINATE WITH OWNER TO PERFORM LOCKOUT/TAGOUT ON POWER FEEDS TO SHOWN EQUIPMENT, AND SCADA PROGRAMMING TO SILENCE ALARMS UNTIL INSTALLATION IS COMPLETE.

REPLACEMENT NOTES:

1. PIPING AND VALVES SHALL BE 2-INCH, SCH 80 CPVC UNLESS OTHERWISE NOTED. PIPING AND VALVES SHALL BE THREADED OR FLANGED. SOLVENT WELDED JOINTS SHALL NOT BE PROVIDED. PROVIDE UNIONS BETWEEN THREADED FITTINGS. UNLESS OTHERWISE NOTED, ALL VALVES SHALL BE DIAPHRAGM TYPE WITH THE ACTUATOR IN THE VERTICAL POSITION ON TOP OF THE PIPE.
2. PIPEWORK IS NOT TO SCALE. PROPOSED PIPING SCHEMATIC REFLECTS THE DESIGN INTENT AND MINIMUM REQUIREMENTS FOR VALVES AND END POINTS. COORDINATE PIPING LAYOUT WITH TANK SUBMITTAL. FIELD VERIFY DIMENSIONS, ELEVATIONS, AND LOCATIONS WHERE CONNECTING TO EXISTING PIPING AND SUBMIT PIPING LAYOUT DRAWINGS FOR REVIEW PRIOR TO INSTALLATION. PIPING SYSTEM SHALL INCLUDE BENDS AND FITTINGS AS REQUIRED TO MEET THE DESIGN INTENT. SLOPE PIPING AT 1/32-IN/FT DOWNWARD FROM TANKS TO EXISTING PIPING CONNECTIONS. PIPING SHALL NOT BE INSTALLED DIRECTLY ABOVE THE SUMP.
3. PIPE SUPPORTS NOT SHOWN. PROVIDE PIPE SUPPORTS AT MAXIMUM 5-FT SPACING. INSTALL PIPING SUPPORTS AND PIPING IN ACCORDANCE WITH THE LATEST EDITION OF THE ASME/ANSI POWER PIPING CODE B.31.1.
4. PROVIDE SUMP PUMP, ON/OFF FLOAT AND HIGH ALARM FLOAT. PUMP AND FLOAT MATERIALS SHALL BE SUITABLE FOR USE WITH 15% SODIUM HYPOCHLORITE SOLUTION, 120V VANTON SGK, OR EQUAL. PUMP COVER SUPPORT SHALL BE MOUNTED TO MAINTAIN A MINIMUM 3" CLEAR OPENING FROM THE FLOOR. COORDINATE PUMP INSTALLATION FOR USE WITH SUMP HEATER. CONNECT SUMP PUMP DISCHARGE TO EXISTING PIPING. FIELD VERIFY CONNECTION SIZE, TYPE, AND LOCATION.
5. SUMP PUMP AND SUMP PIT HEAT TRACE SHALL BE PROVIDED WITH STANDARD 120 VAC, 20 AMP PLUG. PLUG UNITS INTO THE EXISTING RECEPTACLE SHOWN.
6. AFTER INSTALLATION OF NEW LEVEL SENSORS AND RECONNECTION OF WIRING. UPDATE LEVEL INDICATORS AT THIS PANEL AND SCADA SCREENS FOR SET RANGE.
7. ANCHORS, FASTENERS, SUPPORTS, AND RELATED HARDWARE FOR CHEMICAL AND ELECTRICAL SYSTEMS SHALL BE 316 STAINLESS STEEL OR FRP. STORAGE TANK ANCHORS SHALL BE 316L STAINLESS STEEL.
8. FIELD COAT PIPING AND VALVES WITH 2 COATS EPOXY-POLYAMIDE OR POLYAMINE, MIN. DRY MILS PER COAT, COLOR YELLOW. DO NOT COAT THREADED JOINTS, VALVE ACTUATORS, OR MOVING PARTS. COAT FLANGES PRIOR TO INSTALLING HARDWARE. HARDWARE SHALL NOT BE COATED.

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MARK	DATE	DESCRIPTION	BY

CITY OF ANN ARBOR, MI

SODIUM HYPOCHLORITE STORAGE TANK REPLACEMENT

BULK STORAGE TANK REMOVAL AND REPLACEMENT PLAN

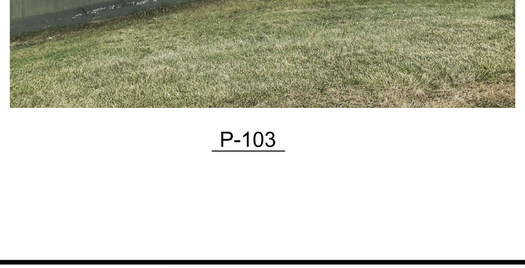
Project No.:	200-31537-22003
Designed By:	BCW/WAP
Drawn By:	VLM
Checked By:	JKK

1
OF 3

Bar Measures 1 inch

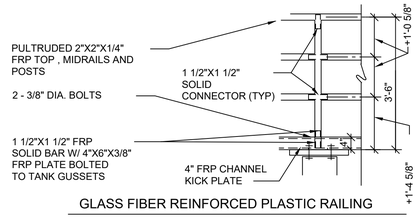
P-101

P-104



P-102

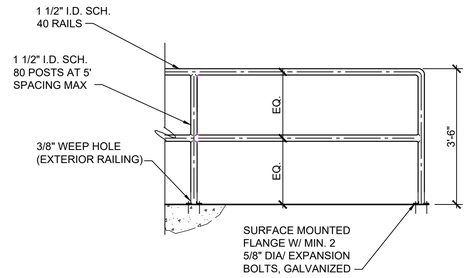
P-103



GLASS FIBER REINFORCED PLASTIC RAILING

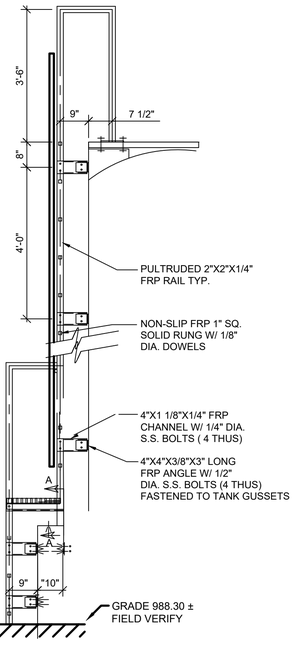
TYP. FRP RAILING DETAIL

SCALE: 1/2" = 1'-0"



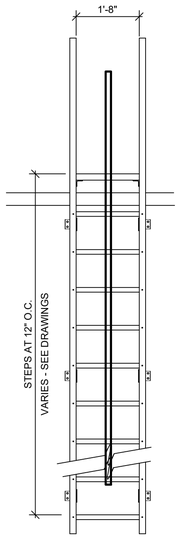
TYP. ALUMINUM GUARDRAIL DETAIL

SCALE: 1/2" = 1'-0"



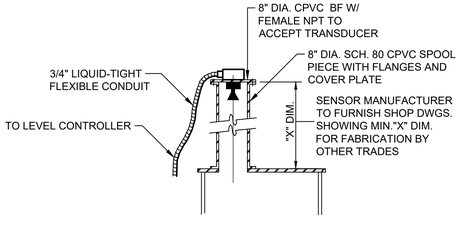
FRP TANK ACCESS LADDER DETAIL

SCALE: 1/2"=1'-0"



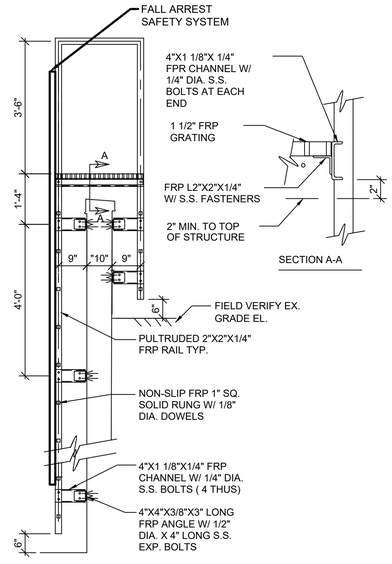
FRP LADDER TYPICAL

SCALE: 1/2"=1'-0"



LEVEL SENSOR-TANK TYPE

NO SCALE



FRP LADDER AT CONTAINMENT WALL

SCALE: 1/2"=1'-0"

NOTE:
1. TOP OF WALL TO BOTTOM OF WALL 8' ±. FIELD VERIFY.

GENERAL NOTES:

1. PHOTOS P-101 THROUGH P-104 PROVIDED FOR REFERENCE ONLY.
2. TANK ACCESS LADDERS SHALL BE BY TANK SUPPLIER. CONTAINMENT ACCESS LADDER BY CONTRACTOR. LADDERS SHALL MEET THE LADDER REQUIREMENTS OF THE CHEMICAL STORAGE TANK SECTION AND FRP FABRICATION SECTION.
3. FIELD VERIFY ELEVATIONS AND COORDINATE LADDER HEIGHT WITH TANK SUPPLIER AND LADDER SUPPLIER.
4. ANCHORS, FASTENERS, SUPPORTS, AND RELATED HARDWARE FOR CHEMICAL AND ELECTRICAL SYSTEMS SHALL BE 316 STAINLESS STEEL OR FRP.

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CITY OF ANN ARBOR, MI

SODIUM HYPOCHLORITE STORAGE TANK REPLACEMENT

DETAILS

Project No.:	200-31537-22003
Designed By:	BCW/WAP
Drawn By:	VLM
Checked By:	JKK

2

OF 3

Bar Measures 1 inch

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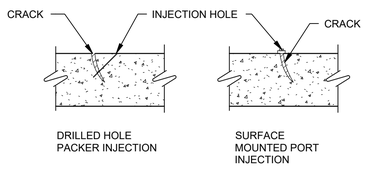
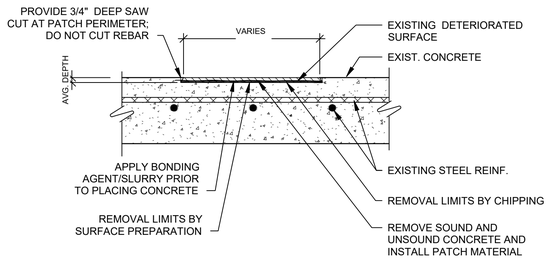


1. IDENTIFY CRACKS TO BE INJECTED. LOCATION OF CRACKS TO INJECTED ARE TO BE CONFIRMED AND APPROVED BY THE ENGINEER.
2. LOCATE REINFORCING STEEL IN CONCRETE STRUCTURE. LOCATE INJECTION HOLE POSITION AND WORK WITH CARE TO AVOID DAMAGE TO EXISTING REINFORCING STEEL. DRILL HOLE SIZED AS RECOMMENDED BY THE INJECTION MATERIAL MANUFACTURER, AT A 45 DEGREE ANGLE TO THE SURFACE, AND BEGINNING AT A DISTANCE AWAY FROM THE CRACK SO THAT THE DRILLED HOLE INTERCEPTS THE CRACK AT APPROXIMATELY ONE-HALF THE CONCRETE DEPTH.
3. INSERT INJECTION PACKERS AS RECOMMENDED BY THE INJECTION MATERIAL MANUFACTURER,INTO THE DRILLED HOLES AND TIGHTEN.
4. CLEAN CONCRETE SURFACE IN ACCORDANCE WITH SECTION 0393000.
5. PUMP INJECTOR MATERIAL THROUGH THE INJECTION PACKER UNTIL THE HOLE WILL NOT TAKE MORE MATERIAL, OR THE MATERIAL IS NO LONGER VISIBLE SEEPING OUT OF THE CRACKS.
6. INJECTION MAY BE HORIZONTAL, VERTICAL OR OVERHEAD.
7. AFTER EPOXY ADHESIVE HAS SET, REMOVE INJECTION PORTS AND GRIND SURFACES SMOOTH.

CONCRETE CRACK INJECTION

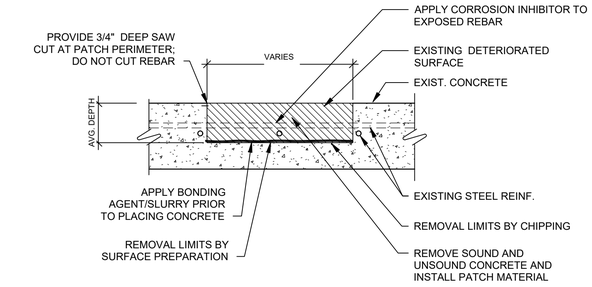
SCALE: NTS



1. THIS DETAIL APPLIES TO DETERIORATED AREAS THAT ARE NOT DEEP ENOUGH TO IMPACT STEEL REINFORCEMENT AND ARE LOCATED AT THE TOP SIDE HORIZONTAL SURFACE WHERE A TRAFFIC MEMBRANE WILL BE APPLIED, OVERHEAD OR VERTICAL SURFACES.
2. REMOVE ALL DETERIORATED SOUND AND UNSOUND CONCRETE IN HATCHED AREA PER SECTION 039300 TO FORM RECTANGULAR AREA.
3. PREPARE PATCH AREA PER SECTION 039300.
4. PATCH MATERIAL SHALL BE AS SPECIFIED IN SECTION 039300 AS APPROVED BY ENGINEER.

CONCRETE SHALLOW SPALL REPAIR

SCALE: NTS



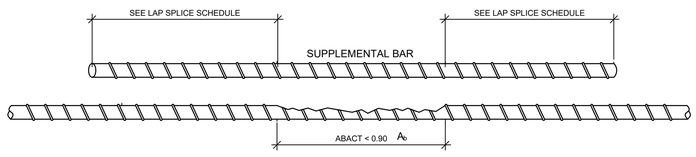
1. THIS DETAIL APPLIES TO DETERIORATED AREAS THAT ARE DEEP ENOUGH TO IMPACT STEEL REINFORCEMENT AND ARE LOCATED AT THE TOP SIDE HORIZONTAL SURFACE WHERE A TRAFFIC MEMBRANE WILL BE APPLIED, OVERHEAD OR VERTICAL SURFACES.
2. REMOVE ALL DETERIORATED SOUND AND UNSOUND CONCRETE IN HATCHED AREA PER SECTION 039300 TO FORM RECTANGULAR AREA.
3. PREPARE PATCH AREA PER SECTION 039300, INCLUDING CLEANING AND COATING OF REINFORCEMENT.
4. MINIMUM CLEAR DISTANCE BETWEEN REBAR AND CONCRETE DEMOS SHALL BE 3/4".
5. PATCH MATERIAL SHALL BE AS SPECIFIED IN SECTION 039300 AS APPROVED BY ENGINEER.
6. CHECK EXISTING REINFORCEMENT FOR DETERIORATION AND ADD ADDITIONAL REINFORCEMENT AS REQUIRED PER DETAIL.

CONCRETE DEEP SPALL REPAIR

SCALE: NTS

GENERAL NOTES:

1. CONCRETE MIX DESIGN REQUIREMENTS:
   SLUMP = 4" MAX.
   AIR CONTENT = 6% ± 1%
   CONCRETE STRENGTH: fc = 4.5 ksi
2. REINFORCING STEEL: Fy = 60 ksi
3. USE CURING COMPOUND CONFORMING TO ASTM C309.
4. USE 3/4" CHAMFER FOR ALL CONCRETE EDGES.
5. DO NOT WELD REINFORCEMENT.
6. PLACE CONCRETE IN ACCORDANCE WITH ACI 301.
7. USE MECHANICAL VIBRATORS TO CONSOLIDATE CONCRETE AFTER PLACEMENT.
8. COLD WEATHER CONCRETE SHALL CONFORM TO ACI 306/306R.
9. HOT WEATHER CONCRETE SHALL CONFORM TO ACI 305/305R.
10. THE FOLLOWING TEST SHALL BE PERFORMED ON THE CONCRETE ONCE PER 50 CUBIC YARDS POURED EACH DAY:
    CYLINDERS FOR COMPRESSION TESTS
    SLUMP TEST PER ASTM C143
    AIR CONTEST ER ASTM C231
11. A MINIMUM OF (4) CONCRETE CYLINDERS SHALL BE MADE FROM EACH TEST SAMPLE TO BE TESTED IN ACCORDANCE WITH ASTM C39. (2) CYLINDERS WILL BE BROKEN AT 7 DAYS AND (2) CYLINDERS WILL BE BROKEN AT 28 DAYS. ADDITIONAL CYLINDERS CAN BE MADE AT THE CONTRACTOR'S OPTION.



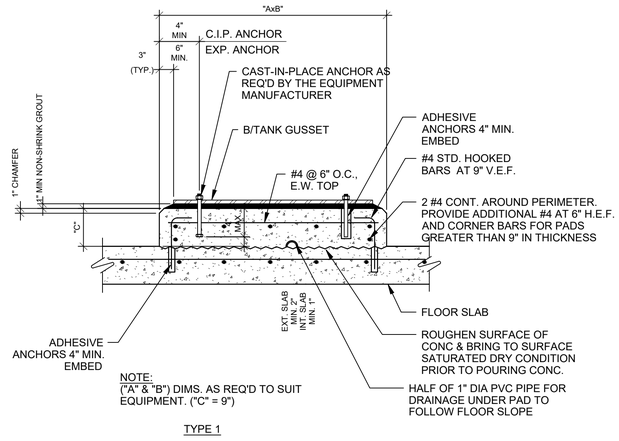
NOTES:

1. SUPPLEMENTAL BAR SHALL BE TIED TO EXISTING BAR (TYP.).
2. ABACT = EXISTING CROSS SECTIONAL AREA OF REBAR.
3. A_b = ORIGINAL CROSS SECTIONAL AREA OF REBAR.
4. CLASS B LAP SPLICE LENGTH BASED ON ACI 318.
5. CONTRACTOR TO USE MECHANICAL SPLICE CONNECTORS AS DIRECTED BY ENGINEER IN LIEU OF LAP SPLICE.

LAP SPLICE SCHEDULE LENGTH (IN)						
NOMINAL BAR #	DIAMETER OF BAR d_b (IN.)	DEPTH OF CONCRETE COVER OVER BAR $_b$C				
		C_b <1"	1" ≤ C_b <1.25"	1.25" ≤ C_b <1.5"	1.5" ≤ C_b <1.75"	1.75" ≤ C_b <2"
4	0.5	11	10	9	8	8
5	0.625	17	15	14	12	12
6	0.75	25	22	20	18	17
7	0.875	34	30	27	24	22
8	1	44	39	35	32	30

REPAIR OF DAMAGED OR DETERIORATED REINFORCEMENT

SCALE: NTS



NOTE:
("A" & "B") DIMS. AS REQ'D TO SUIT EQUIPMENT. ("C" = 9")

TYPE 1

CONCRETE EQUIPMENT BASE DETAIL

SCALE: NTS

NOTES:

1. STORAGE TANK ANCHORS SHALL BE CAST-IN-PLACE.
2. COORDINATE EQUIPMENT BASE DIMENSIONS AND DETAILED REQUIREMENTS FOR GROUT AND GUSSET ANCHORS WITH STORAGE TANK SUPPLIER.

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STORAGE TANK REPLACEMENT

STRUCTURAL DETAILS

Project No.:	200-31537-22003
Designed By:	AJF
Drawn By:	VLM
Checked By:	JKK

3
OF 3

Bar Measures 1 inch

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