

Village of Lions Bay

Harvey Tank Replacement Project

Contract Documents
Issued for Tender

Volume 2 of 3
Design Drawings

Prepared by:

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Prepared for:

Village of Lions Bay

400 Centre Road

Lions Bay, BC. V0N 2E0

Project Number:

60546407

Date:

September 2018

Village of Lions Bay
Harvey Tank Replacement Project

AECOM Canada Ltd.

330 – 3292 Production Way
Burnaby, British Columbia
September 2018

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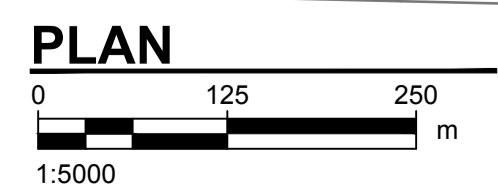
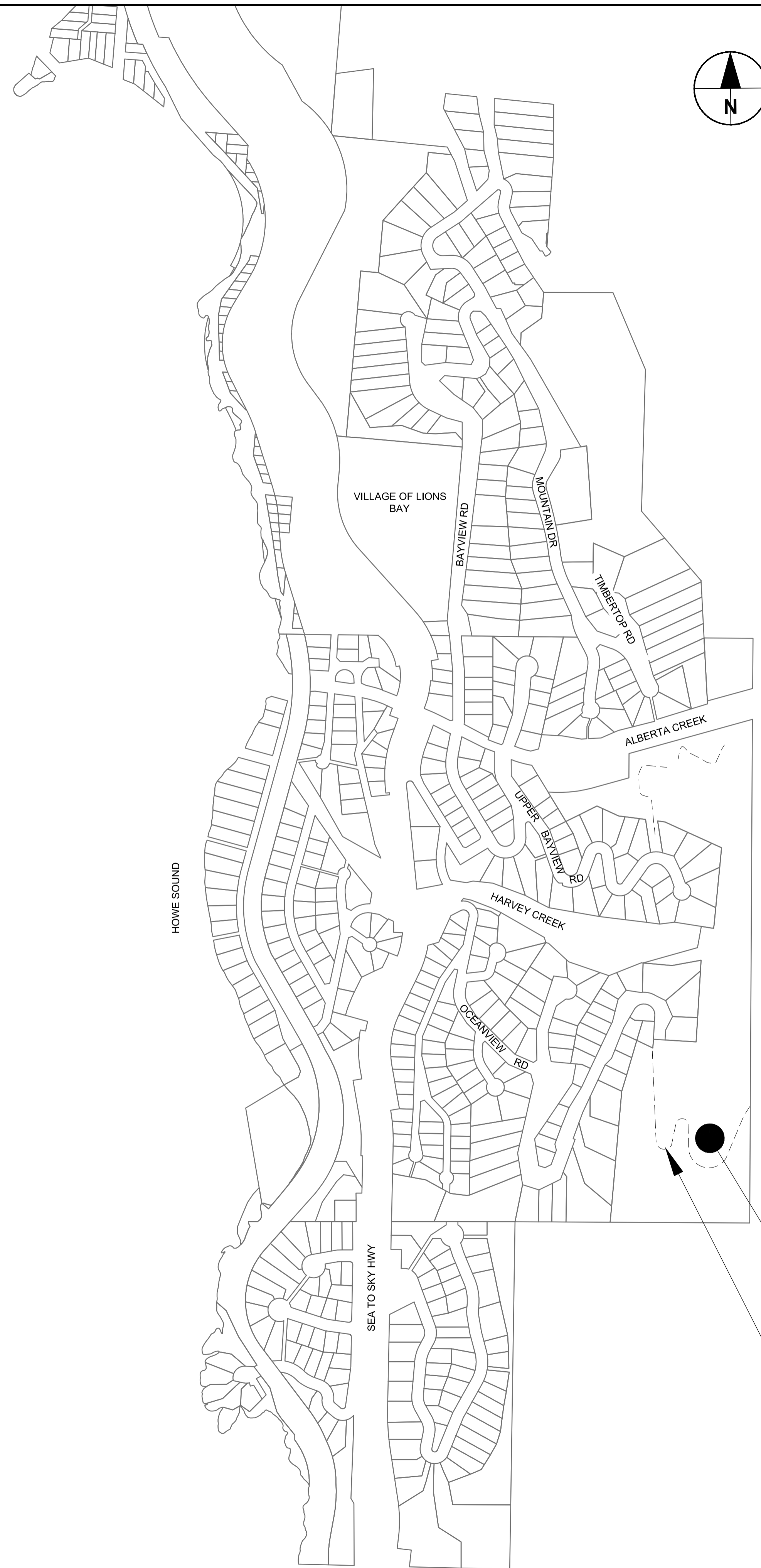
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DESIGN DRAWINGS



HARVEY TANK (TO BE REPLACED)
 AND PRV 200 CHAMBER
 (TO BE UPGRADED)

HARVEY CREEK
 WATERSHED
 ACCESS ROAD

DRAWING LIST

GENERAL

- G-01-000 COVER SHEET
- G-01-001 GENERAL NOTES
- G-01-002 CONSTRUCTION LAYDOWN AREA SITE PLAN

CIVIL

- C-01-101 HARVEY TANK DEMOLITION PLAN
- C-01-102 HARVEY TANK SITE PLAN - STEEL TANK OPTION
- C-01-103 HARVEY TANK OPTION SECTIONS AND TYPICAL DETAILS - STEEL OPTION
- C-01-104 STANDARD DETAILS
- C-01-105 STANDARD DETAILS

PROCESS

- P-01-000 INSTRUMENTATION LEGEND AND SYMBOLS
- P-01-001 EXISTING HARVEY TANK PRV 200 AND DISINFECTION FACILITY PROCESS AND INSTRUMENTATION DIAGRAM
- P-01-002 HARVEY TANK PROCESS AND INSTRUMENTATION DIAGRAM

MECHANICAL

- M-01-001 HARVEY TANK PRV 200 ACCESS MODIFICATIONS

STRUCTURAL

- S-01-001 GENERAL NOTES
- S-01-002 STANDARD DETAILS SHEET 1
- S-01-100 HARVEY TANK PRV CHAMBER MODIFICATION PLANS AND SECTIONS
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- E-01-001 ELECTRICAL SPECIFICATIONS 2 OF 2
- E-01-200 HARVEY TANK SERVICING PLAN



PROJECT

**HARVEY TANK
 REPLACEMENT
 PROJECT**

CLIENT

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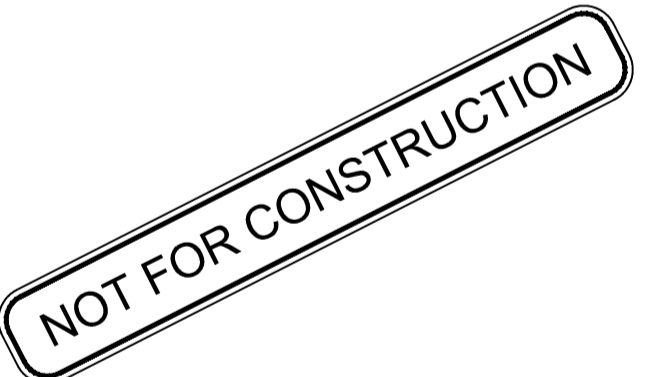
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I/R	DATE	DESCRIPTION
0	09/21/2018	ISSUED FOR TENDER

KEY PLAN

PROJECT NUMBER

60546407

SHEET TITLE

COVER SHEET

SHEET NUMBER

G-01-000

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GENERAL NOTES:

- THE GENERAL REQUIREMENTS, INSTRUCTIONS TO BIDDERS, SPECIFICATIONS AND DRAWINGS FORM PART OF THE CONTRACT DOCUMENTS AND SHALL BE READ IN CONJUNCTION WITH THEM. WORK SHALL INCLUDE THE FURNISHING OF ALL LABOUR AND MATERIALS UNLESS SPECIFICALLY NOTED OTHERWISE TO COMPLETE AND PUT INTO OPERATING CONDITION. ALL ELECTRICAL AND INSTRUMENTATION AND CONTROL SYSTEMS AS INDICATED ON THE DRAWINGS AND SPECIFICATIONS HEREIN.
- WORD "SUPPLY" SHALL MEAN THAT SO NOTED EQUIPMENT IS TO BE PURCHASED, ASSEMBLED, AND SHIPPED UNDAMAGED TO THE SITE. WHERE AN ITEM IS SUPPLIED BY THE OWNER, BY OTHERS OR BY ANOTHER DIVISION, THE WORK OF MOUNTING, CONNECTING AND COMMISSIONING THE ITEM.
- WORD "PROVIDE" SHALL MEAN THAT SO NOTED EQUIPMENT IS TO BE SUPPLIED, INSTALLED, CONNECTED, ADJUSTED, CALIBRATED, TUNED, CLEANED, COMMISSIONED, AND PLACED INTO FULL SERVICE.
- WORD "INSTALL" SHALL MEAN TO PUT THE SPECIFIED ITEM INTO FULL OPERATION, SECURELY FASTENED AND CONNECTED TO THE SYSTEM. THE CONTRACTOR SHALL PROVIDE ALL WORK AND MATERIAL WHICH IS NECESSARY TO SECURELY FASTEN AND GIVE A PRESENTABLE FINISHED APPEARANCE INCLUDING ALL NECESSARY CONNECTIONS AND CONDUCTORS, SUCH NOTED EQUIPMENT MUST BE FULLY CALIBRATED AND TESTED.
- CONTRACTOR TO MAKE BC ONE CALL TO CONFIRM LOCATION OF EXISTING UTILITIES AND PROVIDE ALL EXISTING UTILITIES AND CONNECTIONS BY TRIAL EXCAVATION PRIOR TO CONSTRUCTION. CONTRACTOR TO ADVISE ENGINEER OF ANY OF ANY POTENTIAL CONFLICTS MINIMUM 48 HOURS IN ADVANCE OF ANY WORK.
- SEDIMENT AND EROSION CONTROL WORKS TO REMAIN DURING THE ENTIRE DURATION OF CONSTRUCTION, AND UNTIL SUCH TIME THAT THE LANDSCAPING AND SURFACE VEGETATION IS RESTORED TO EXISTING CONDITIONS.
- PRIOR TO CONSTRUCTION, CONTRACTOR TO PROVIDE CONTRACT ADMINISTRATOR WITH SIEVE ANALYSIS (INCLUDING COMPARISON TO SPECIFICATIONS) AND PROCTORS OF ALL IMPORT MATERIALS. SIEVES AND PROCTORS MUST BE RECENT AND SAMPLED WITHIN THE PREVIOUS WEEK.
- CONTRACTOR IS RESPONSIBLE FOR MAINTAINING WATER DISTRIBUTION SERVICE TO VILLAGE OF LIONS BAY DURING DECOMMISSIONING AND CONSTRUCTION OF HARVEY TANK.

WATERMAIN NOTES:

- ALL DUCTILE IRON WATERMAINS SHALL BE CLASS 50 DUCTILE IRON PIPE, SATISFYING AWWA C104 AND NSF-61 SPECIFICATION WITH CEMENT MORTAR LINING. ALL DUCTILE IRON PIPES AND COMPONENTS TO BE POLYETHYLENE WRAPPED/BAGGED AS PER AWWA C105.
- ALL STEEL PIPES AND COMPONENTS (INTERIOR AND EXTERIOR TO CHAMBERS) INSIDE WETTED SURFACES TO BE SANDBLASTED AND COATED TO AWWA C-210 AND NSF-61 SPECIFICATION. FINISH COATING TO BE BLUE ENAMEL. ALL STEEL WATERMAINS SHALL BE 3/8" WALL UNLESS NOTE OTHERWISE.
- MAXIMUM PIPE DEFLECTION AT JOINT TO BE 2.5 DEGREES OR 1/2 MANUFACTURERS RECOMMENDATION, WHICHEVER IS LESS.
- CATHODIC ISOLATION TO BE PROVIDED AT STEEL TO DUCTILE IRON TRANSITION POINTS.
- TRANSITION COUPLINGS DI TO SS TO BE GEORG FISCHER WAGA N.V MULTI/JOINT 3000 PLUS MODEL 3007 OR ENGINEER APPROVED EQUIVALENT WITH EPOXY COATING AND STAINLESS STEEL HARDWARE.
- FITTINGS: COMPACT DUCTILE IRON FITTINGS TO AWWA C153 SUITABLE FOR PRESSURE RATINGS OF 2145 KPa, FUSION-BONDED EPOXY COATING TO AWWA C116.
- RESTRAINTS: RESTRAIN ALL (M) BENDS, JOINTS AND FITTINGS WITH MECHANICAL JOINT ON FITTING AND WEDGE RESTRAINERS. (TYT) FITTINGS AND JOINTS TO RESTRAINED WITH TIE RODS AND THRUST BLOCKS. RESTRAINTS TO BE RATED FOR MINIMUM 225 psi WORKING PRESSURE.
- ALL VALVES SHALL INCLUDE ALL APPURTENANCES WITH STAINLESS STEEL BOLTS AND NUTS.
- ALL OTHER GATE VALVES (OTHER THAN ABOVE VALVES) TO BE IRON BODY RESILIENT SEAT VALVES SUITABLE TO 1380KPa OPERATING PRESSURE AND MEET AWWA C509. APPROVED MANUFACTURERS: TERMINAL CITY AND CLOW. ALL DIRECT BURY GATE VALVES C/W VALVE BOX ASSEMBLY.
- COUPLERS: AWWA C219 COUPLERS SHALL BE EPOXY COATED WITH STAINLESS STEEL NUTS AND BOLTS.
- CONTRACTOR SHALL PROVIDE 48 HOURS NOTICE TO THE CONTRACT ADMINISTRATOR PRIOR TO DISINFECTING AND CONDUCTING PRESSURE TESTING OF THE WATERMAIN. TESTING TO CONFORM TO VILLAGE OF LIONS BAY AND AWWA REQUIREMENTS.
- ALL BURIED UNCOATED FITTINGS AND FASTENERS TO BE COATED WITH PRIMER AND PETROLATUM TAPE TO AWWA C217.
- ALL BOLTS AND NUTS TO ASTM A307, GRADE B STEEL HEX HEAD. PROTECT ALL BURIED NUTS AND BOLTS WITH DENSO TAPE (TYP.)
- ALL WATER MAINS SHALL HAVE A MINIMUM DEPTH OF COVER OF 1.5m TO OBVERT.
- CATHODIC PROTECTION SHALL BE REQUIRED FOR ALL BURIED METAL PIPES, VALVES, HYDRANTS AND APPURTENANCES.

LEGEND

EXISTING		PROPOSED
---	EDGE OF GRAVEL	---
---	RETAINING WALL	---
---	PROPERTY BOUNDARY	---
⊙	SURVEY MONUMENT CONTROL	---
-X-	CHAIN LINK FENCE	-X-
-D-	DRAIN DITCH	-D-
-D-	DRAIN	-D-
~	DRAIN MANHOLE	~
~	SWALE	~
---	TOP OF BANK	---
---	BOTTOM OF BANK	---
Y	CULVERT	Y
W	WATER VENT	W
W	WATER MAIN	W
W	WATER MAIN BLOWOFF	W
W	WATER THRUST BLOCK	W
W	WATER VALVE	W
W	FIRE HYDRANT	W
W	WATER REDUCER	W
W	WATER TEE	W
W	WATER CAP	W
W	WATER ROBAR COUPLING	W
W	WATER BEND FITTING	W
UE	UNDERGROUND ELECTRICAL LINE	UE
●	ELECTRICAL POLE	●
	ROAD BARRIER	
☀	TREE - CONIFEROUS	☀
☀	TREE - DECIDUOUS	☀
.....	VEGETATION LINE
SEED	SEED	SEED
CONCRETE PAD	CONCRETE PAD	CONCRETE PAD
EX GRAVEL	EX GRAVEL	EX GRAVEL
PROPOSED GRAVEL	PROPOSED GRAVEL	PROPOSED GRAVEL
TANK/STUCTURE REMOVAL	TANK/STUCTURE REMOVAL	TANK/STUCTURE REMOVAL
PIPE/FITTING REMOVAL	PIPE/FITTING REMOVAL	PIPE/FITTING REMOVAL



PROJECT

HARVEY TANK REPLACEMENT PROJECT

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KEY PLAN

PROJECT NUMBER

60546407

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

G-01-001

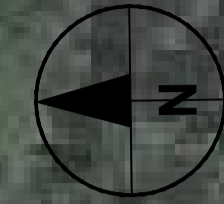
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 Checked: GW
 Designer: AI
 Project Management Initials:

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NOTE:
 CONTRACTOR TO ENSURE LAYDOWN AREAS
 DO NOT OBSTRUCT USE OF ACCESS ROAD



PROJECT
**HARVEY TANK
 REPLACEMENT
 PROJECT**

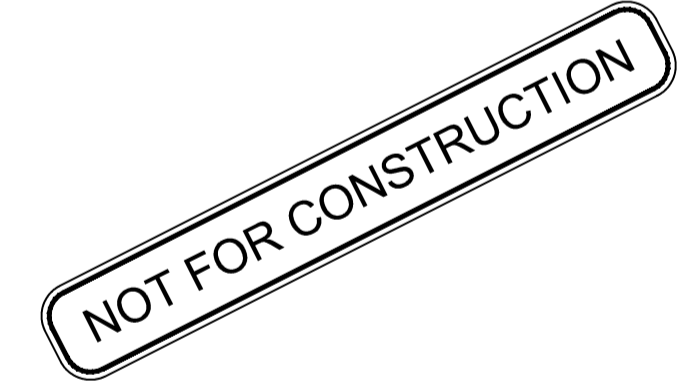
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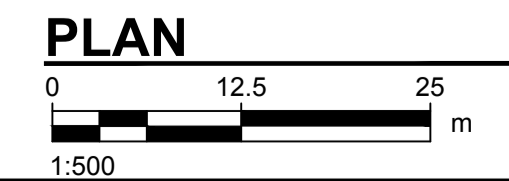


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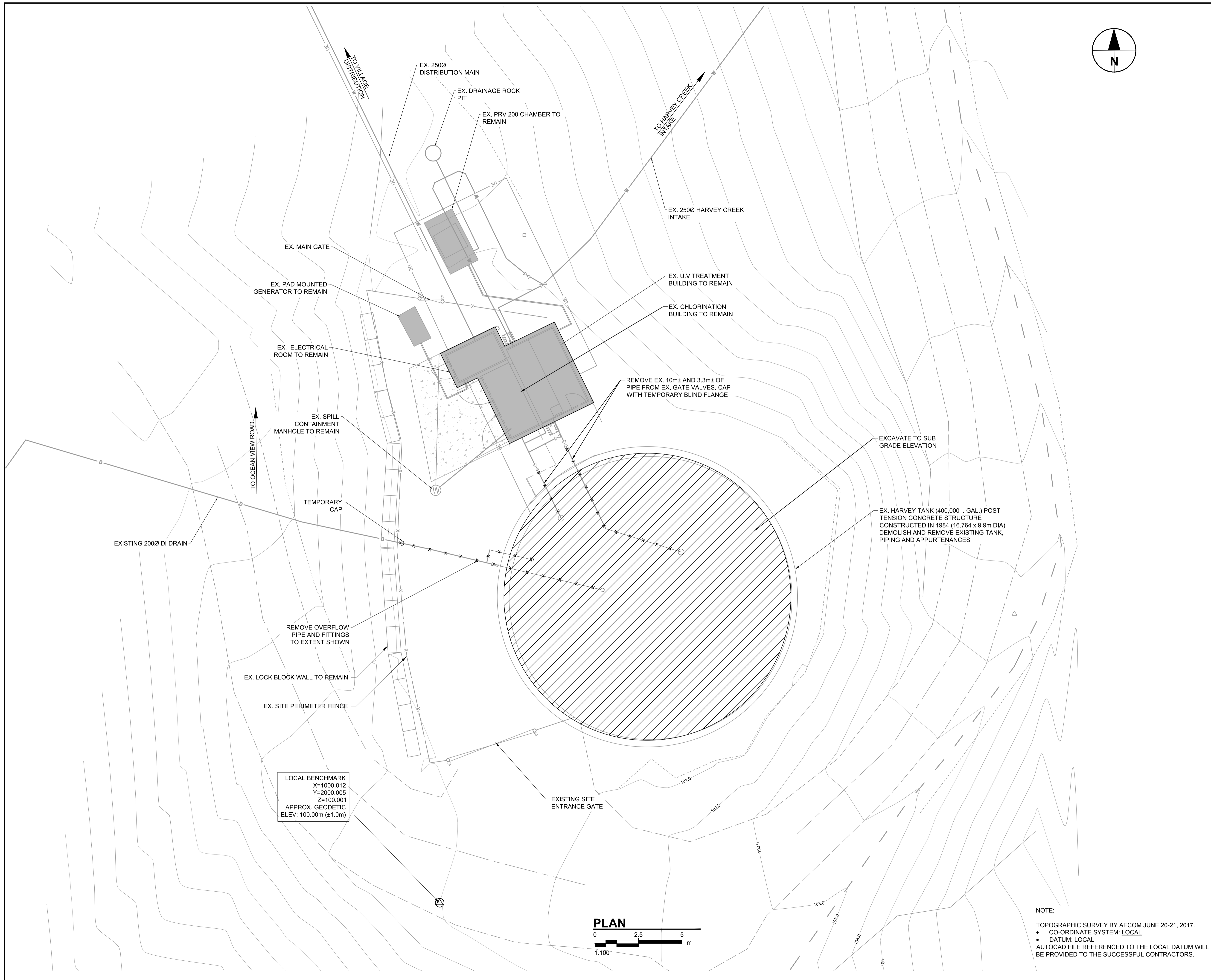
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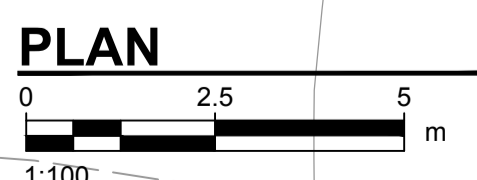
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SHEET TITLE
 CONSTRUCTION LAYDOWN AREAS
 SITE PLAN
SHEET NUMBER
 G-01-002



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LOCAL BENCHMARK
 X=1000.012
 Y=2000.005
 Z=100.001
 APPROX. GEODETIC
 ELEV: 100.00m (±1.0m)



NOTE:
 TOPOGRAPHIC SURVEY BY AECOM JUNE 20-21, 2017.
 • CO-ORDINATE SYSTEM: LOCAL
 • DATUM: LOCAL
 AUTOCAD FILE REFERENCED TO THE LOCAL DATUM WILL BE PROVIDED TO THE SUCCESSFUL CONTRACTORS.



PROJECT
**HARVEY TANK
 REPLACEMENT
 PROJECT**

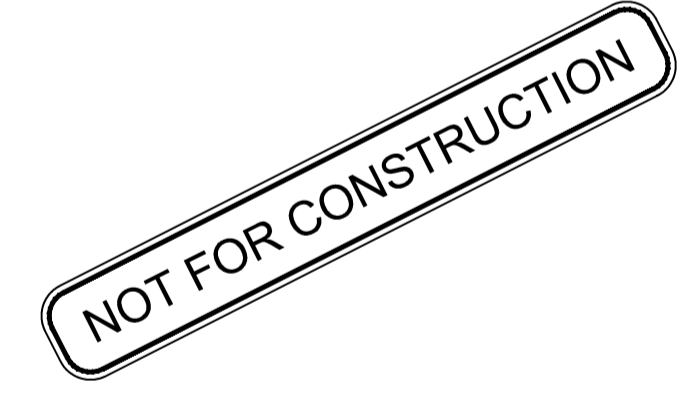
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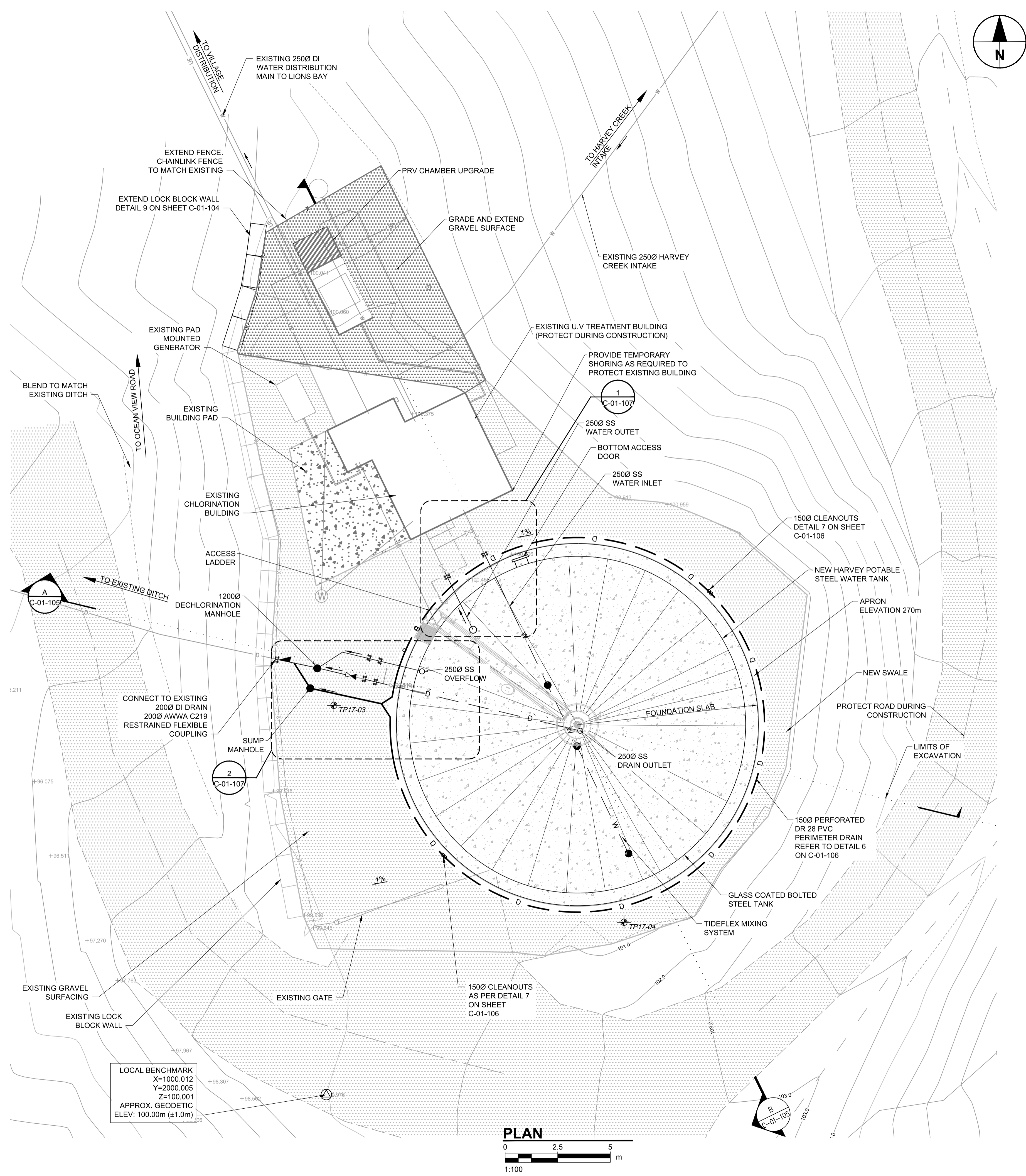
SHEET TITLE

HARVEY TANK
 DEMOLITION PLAN

SHEET NUMBER

C-01-101

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PROJECT
**HARVEY TANK
 REPLACEMENT
 PROJECT**

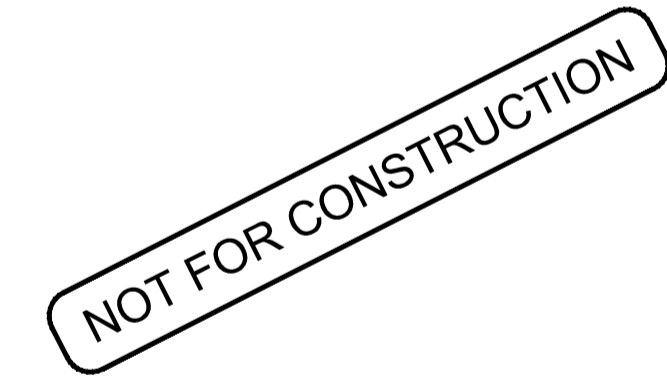
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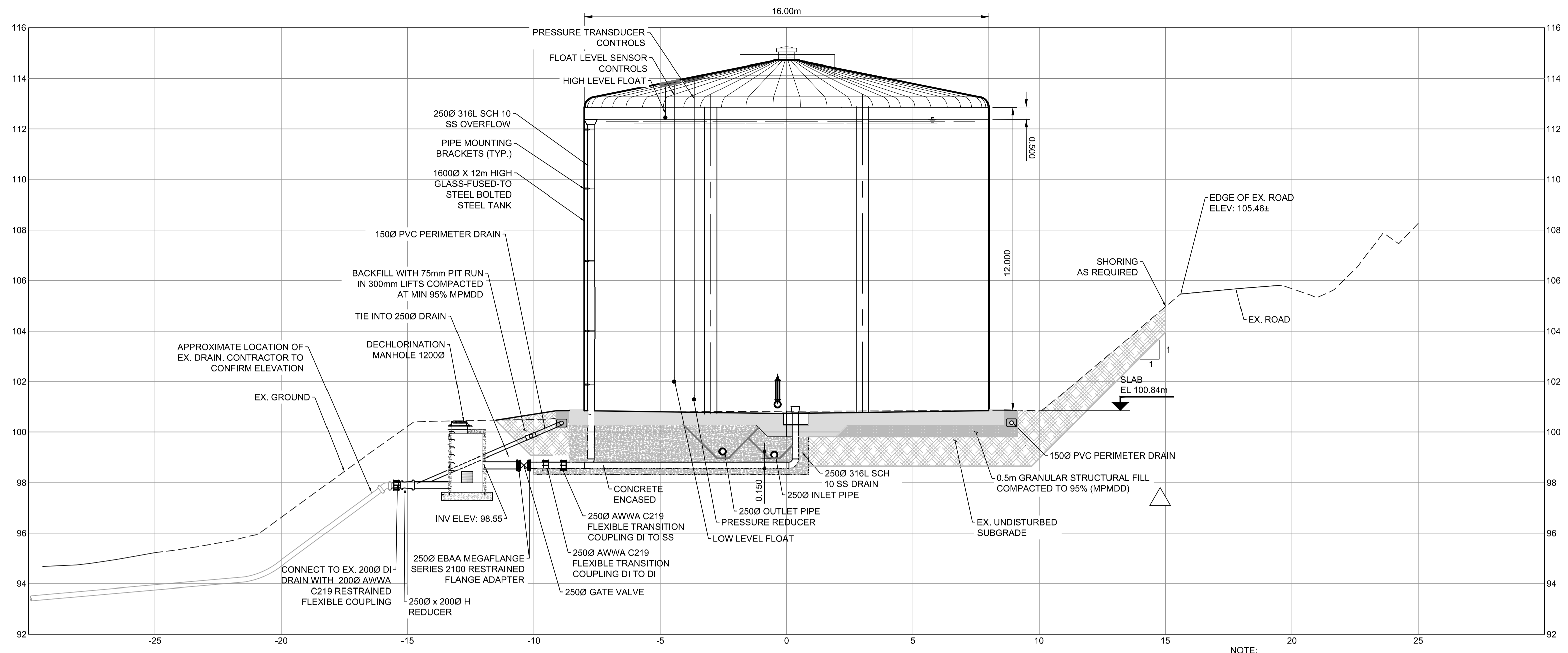
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KEY PLAN

PROJECT NUMBER
 60546407
SHEET TITLE
 HARVEY TANK - STEEL OPTION
 SITE PLAN
SHEET NUMBER
 C-01-102

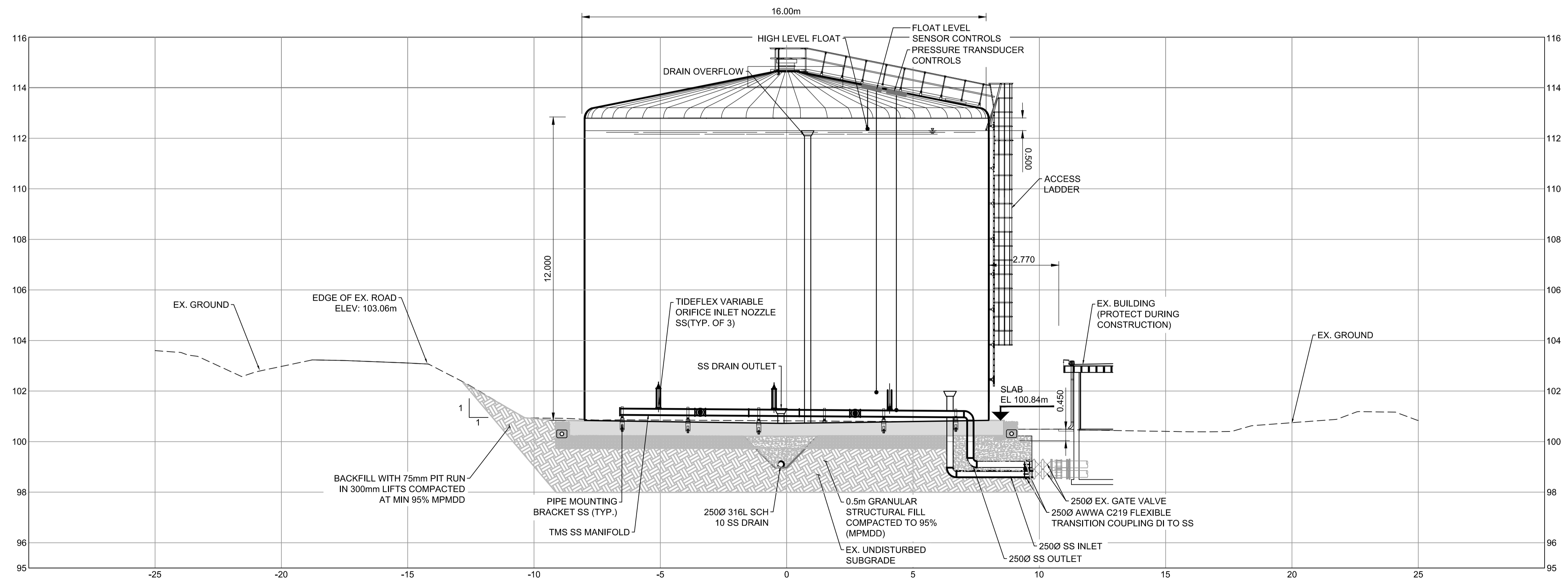
- NOTE:**
- TOPOGRAPHIC SURVEY BY AECOM JUNE 20-21, 2017.
 CO-ORDINATE SYSTEM: LOCAL
 DATUM: LOCAL
 - TIDEFLEX MIXING SYSTEM CONSISTS OF THREE VARIABLE ORFICE INLET NOZZLES. A MINIMUM DRAW DOWN OF 1.0m IS REQUIRED DAILY IN ORDER TO ACHIEVE A COMPLETE MIXING ON THE FILL CYCLE. THE REPRESENTATIVE VOLUME OF THE DRAW DOWN IS 0.2 ML OR APPROXIMATELY 8.5% OF THE TOTAL STORAGE CAPACITY.

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A SECTION
 C-102 Scale 1:100

NOTE:
 DETAILED DESIGN OF TANK AND PIPING, MOUNTING HARDWARE, FOUNDATION SLAB BETWEEN CONNECTION POINTS TO BE PROVIDED BY TANK SUPPLIER



B SECTION
 C-102 Scale 1:100

NOTE:
 1. TOPOGRAPHIC SURVEY BY AECOM JUNE 20-21, 2017. CO-ORDINATE SYSTEM: LOCAL DATUM: LOCAL DUE TO DISTANCE TO MONUMENT & POOR GPS SIGNAL LOCAL CONTROL ESTABLISHED.
 2. TIDEFLEX MIXING SYSTEM CONSISTS OF THREE VARIABLE ORFICE INLET NOZZLES. A MINIMUM DRAW DOWN OF 1.0m IS REQUIRED DAILY IN ORDER TO ACHIEVE A COMPLETE MIXING ON THE FILL CYCLE. THE REPRESENTATIVE VOLUME OF THE DRAW DOWN IS 0.2 ML OR APPROXIMATELY 0.5% OF THE TOTAL STORAGE CAPACITY.



PROJECT
 HARVEY TANK
 REPLACEMENT
 PROJECT

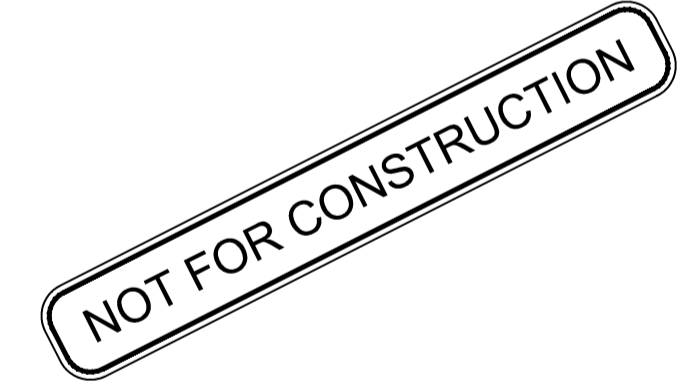
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REGISTRATION



ISSUE/REVISION

I/R	DATE	DESCRIPTION
0	09/21/2018	ISSUED FOR TENDER

KEY PLAN

PROJECT NUMBER

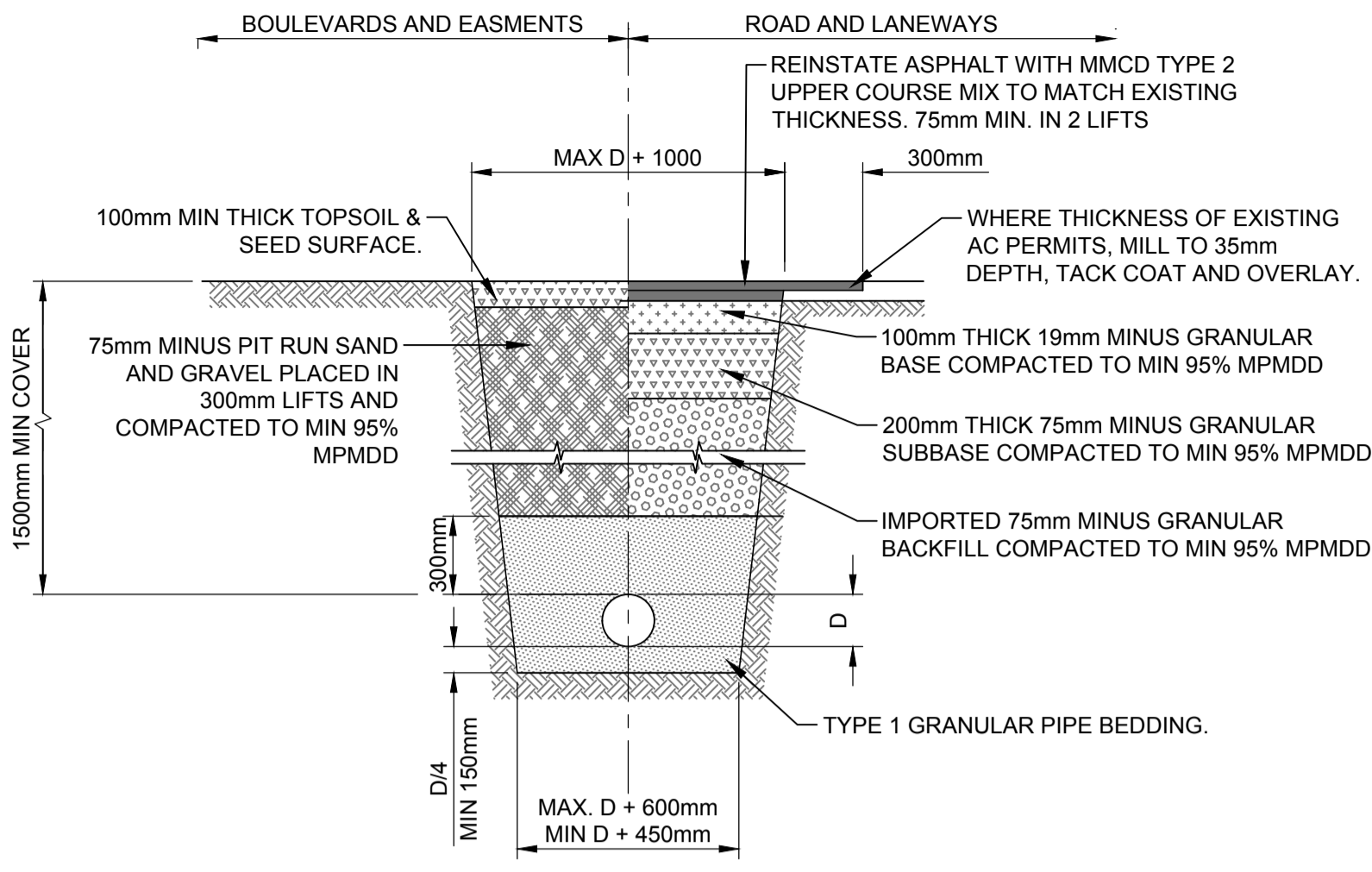
60546407

SHEET TITLE

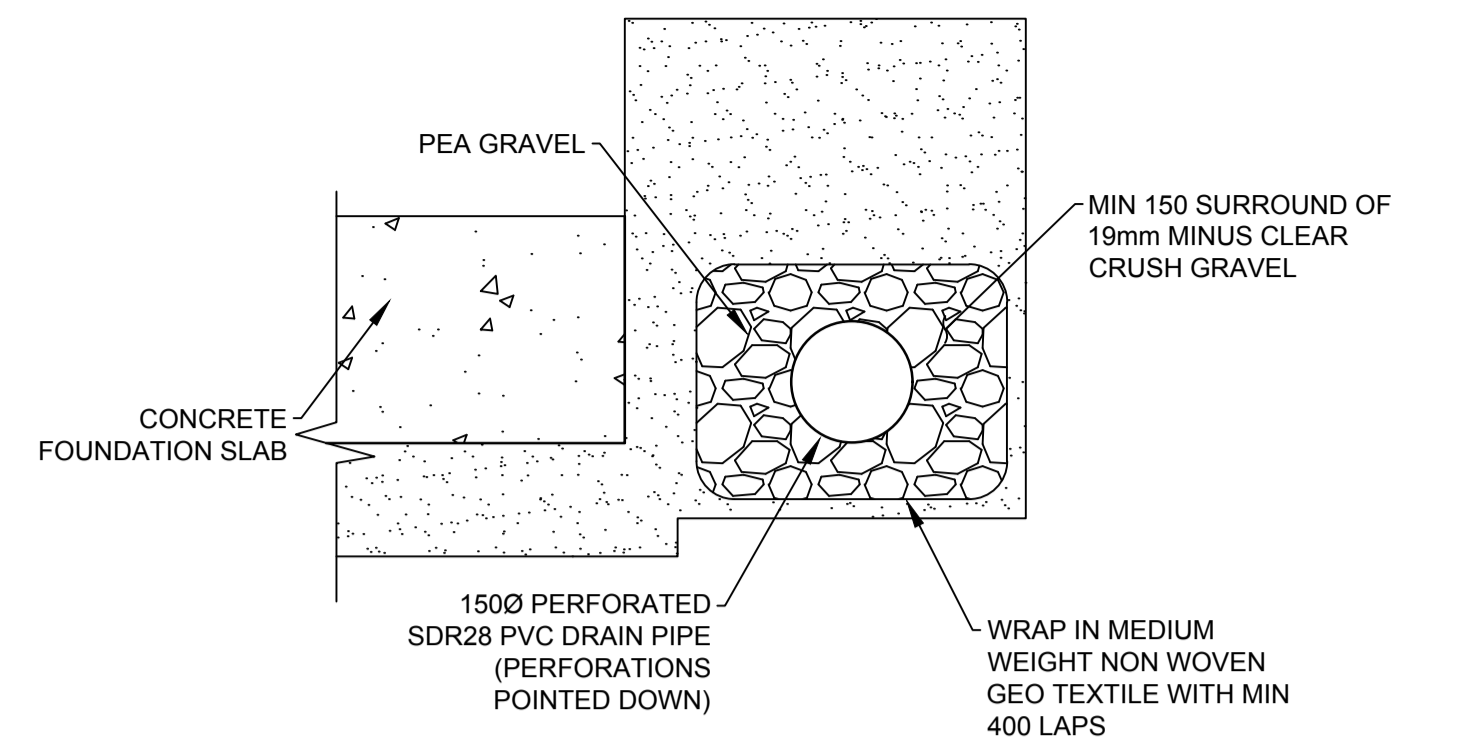
HARVEY TANK - STEEL OPTION
 SECTIONS AND TYPICAL DETAILS

SHEET NUMBER

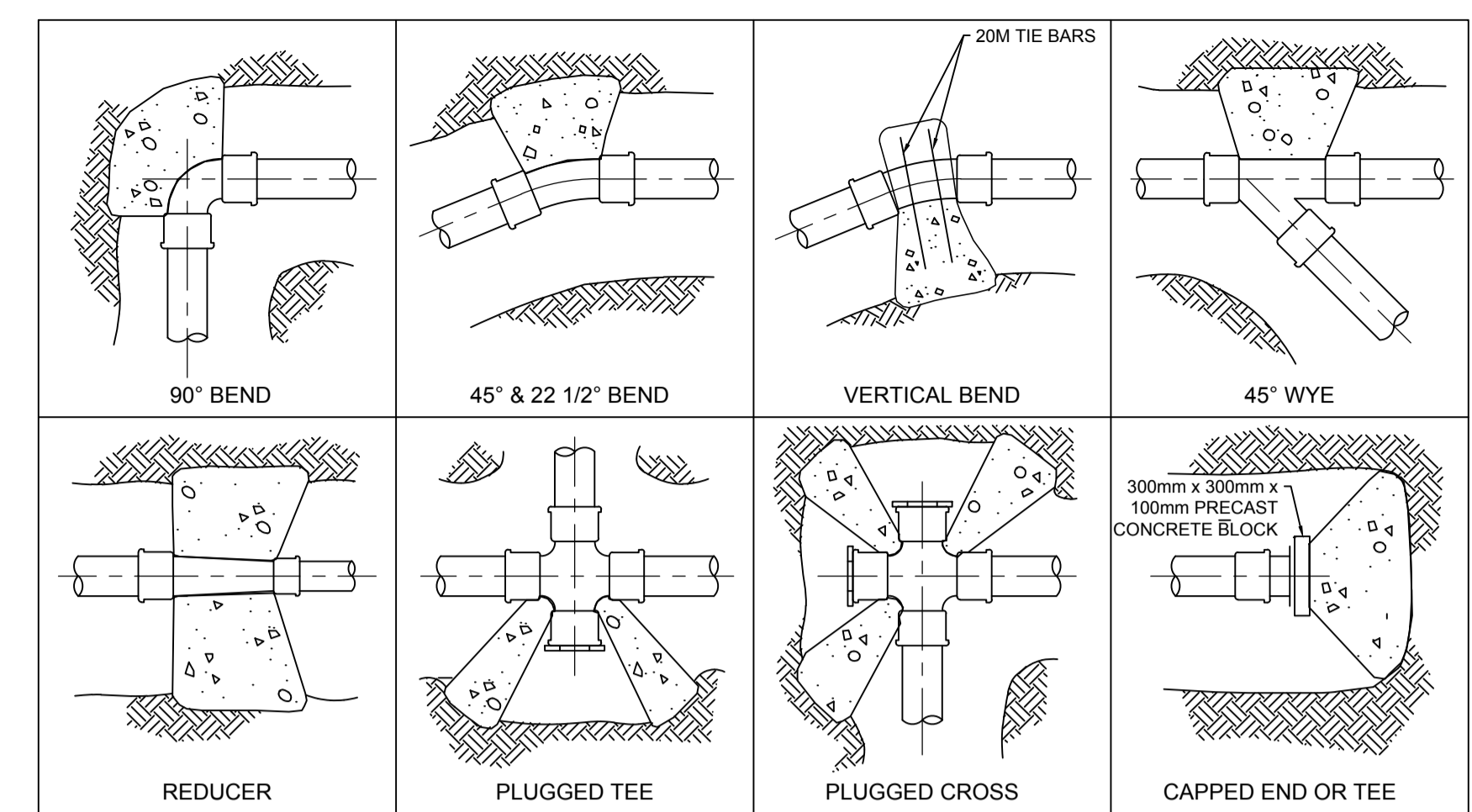
C-01-103



TYPICAL TRENCH DETAIL
 Scale: 1:25



HARVEY - PERFORATED PERIMETER DRAIN DETAIL
 Scale: N.T.S

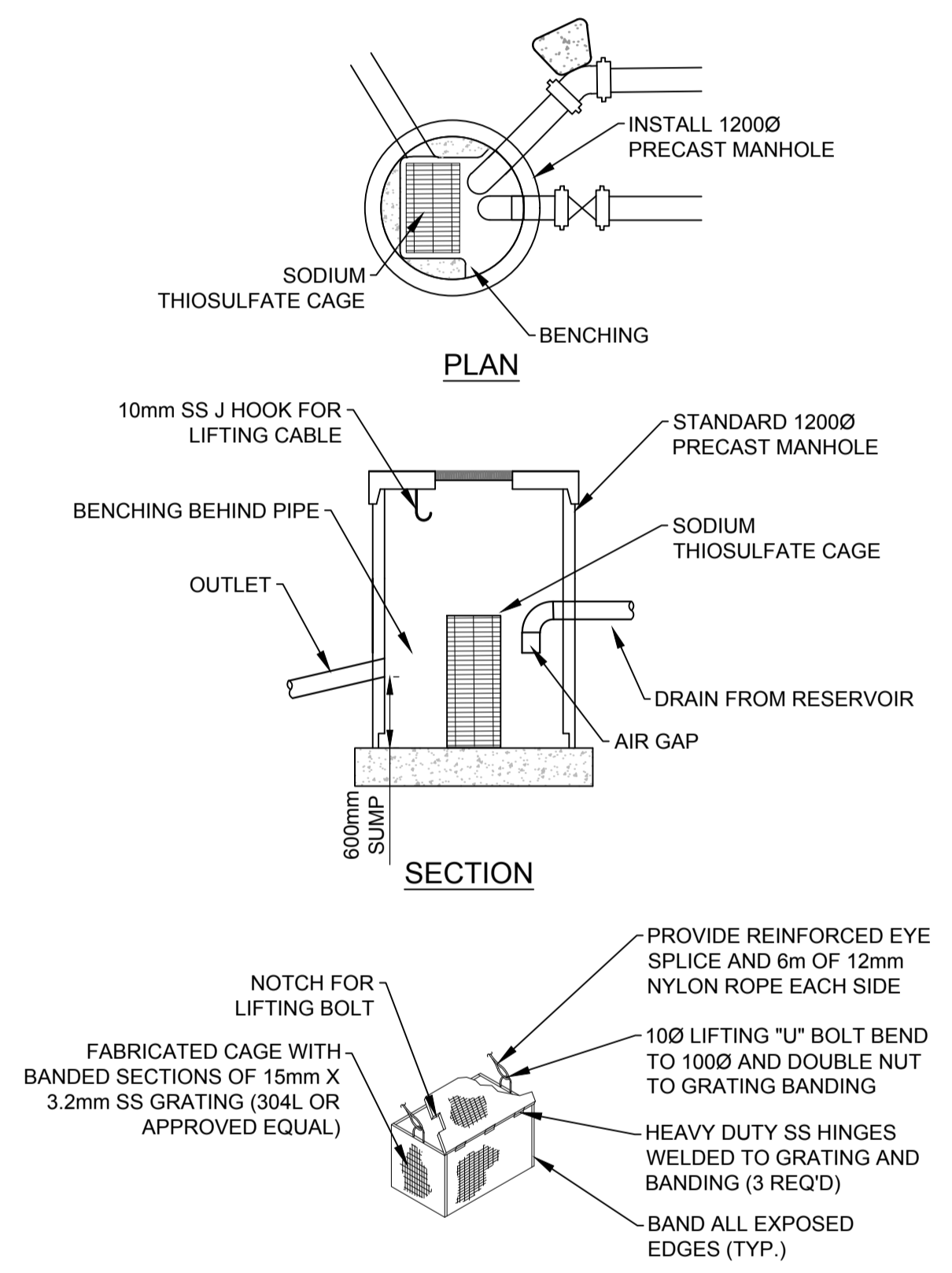


MIN. THRUST AREA BASED ON WATER PRESSURE OF 1380 KPa AND SOIL BEARING CAPACITY OF 50 KPa

FITTING	PIPE DIAMETER IN MILLIMETRES	MIN. THRUST AREA IN SQ. METRES	FITTING	PIPE DIAMETER IN MILLIMETRES	MIN. THRUST AREA IN SQ. METRES
90° BEND	100	0.4	22 1/2° BEND	100	0.2
	150	0.8		150	0.4
	200	1.4		200	0.6
	250	2.2		250	1.0
	300	3.2		300	1.0
45° BEND OR WYE	100	0.4	CAPPED END OR TEE	100	0.4
	150	0.6		150	0.6
	200	0.8		200	1.0
	250	1.2		250	1.6
	300	1.8		300	2.2

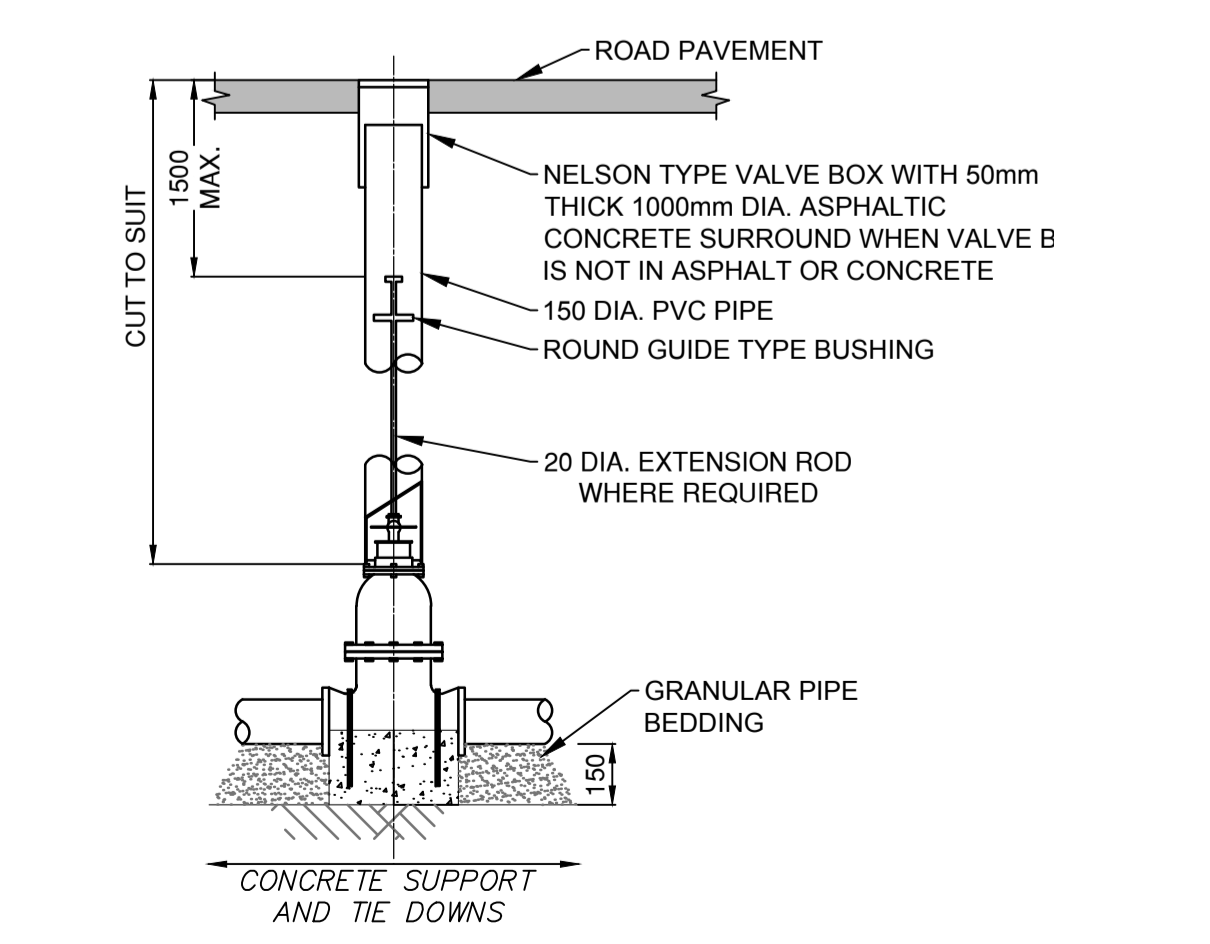
- NOTE:
- VALUES GIVEN IN TABLE ARE BASED ON A SOIL BEARING CAPACITY OF 50KPa. FOR SOFT CLAY AND SATURATED SAND-CLAY SOILS IN AN UNDISTURBED STATE.
 - FOR FIRM DRY CLAY OR COMPACT SAND OR GRAVEL, DIVIDE THRUST AREAS BY 2.0
 - FOR CROSSES USE 45° BEND VALUE IN EACH QUADRANT.
 - WHERE PIPE SIZE DIFFERS IN ANY ONE FITTING, USE THE VALUE FOR THE MAX. SIZE.
 - THRUST BLOCKS OF 15 MPa CONCRETE.
 - THRUST BLOCK CONCRETE SHALL NOT ENCRUCH ON THE PIPE, BUT SHALL BEAR ON THE FITTING ONLY.
 - FOR VOLUME OF ANCHOR BLOCKS FOR THE VERTICAL BEND, REFER TO PIPELINE DRAWINGS. USE 2-20m BAR PER m3 CONCRETE.

THRUST BLOCK DETAILS
 Scale: N.T.S

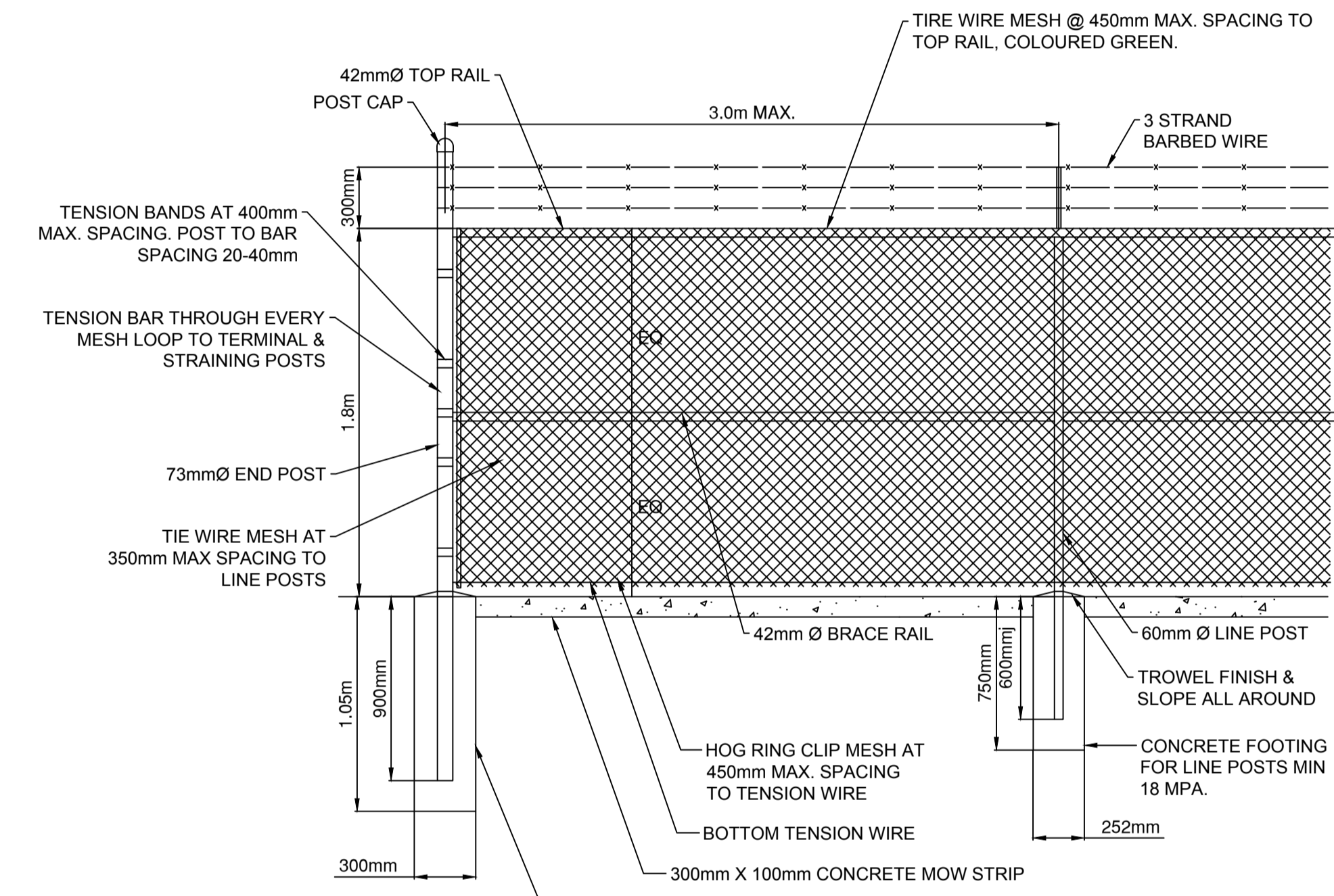


SODIUM THIOSULFATE CAGE SECTION

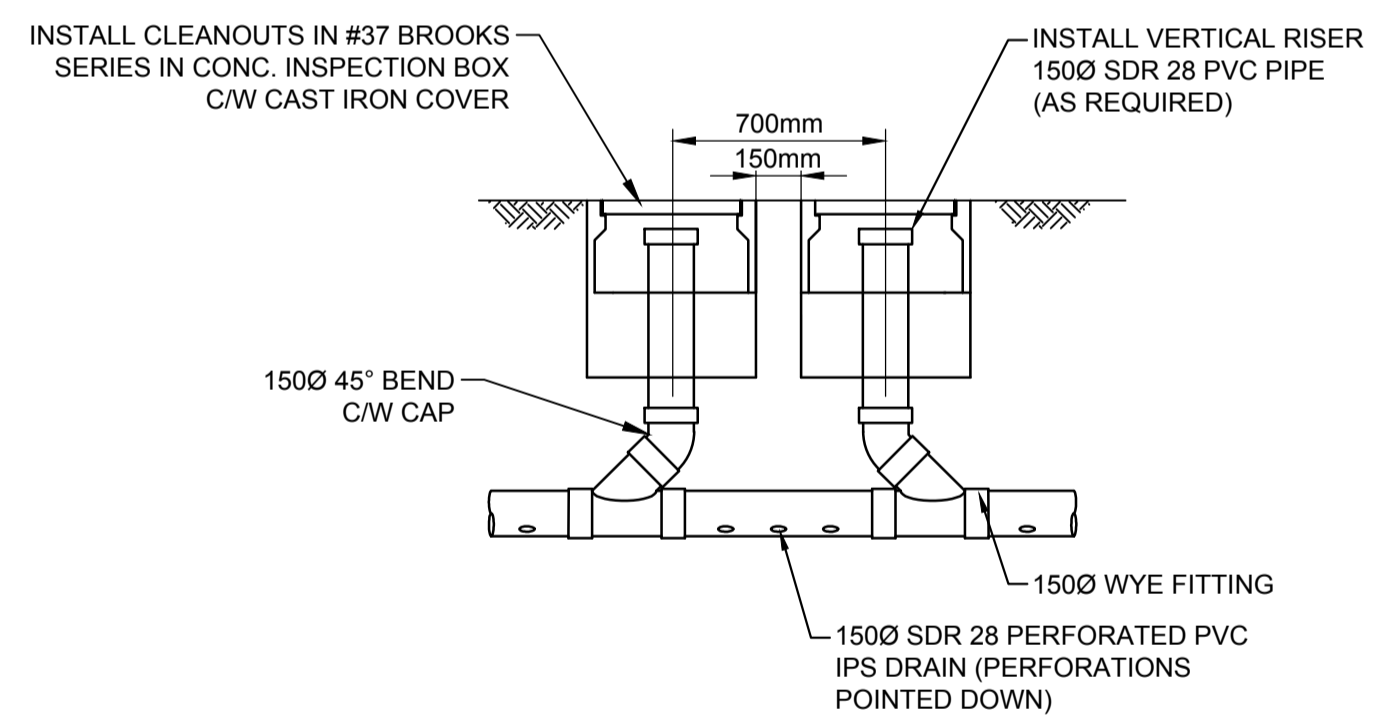
DECHLORINATION MANHOLE DETAILS
 Scale: N.T.S



GATE VALVE BOX DETAIL
 Scale: N.T.S



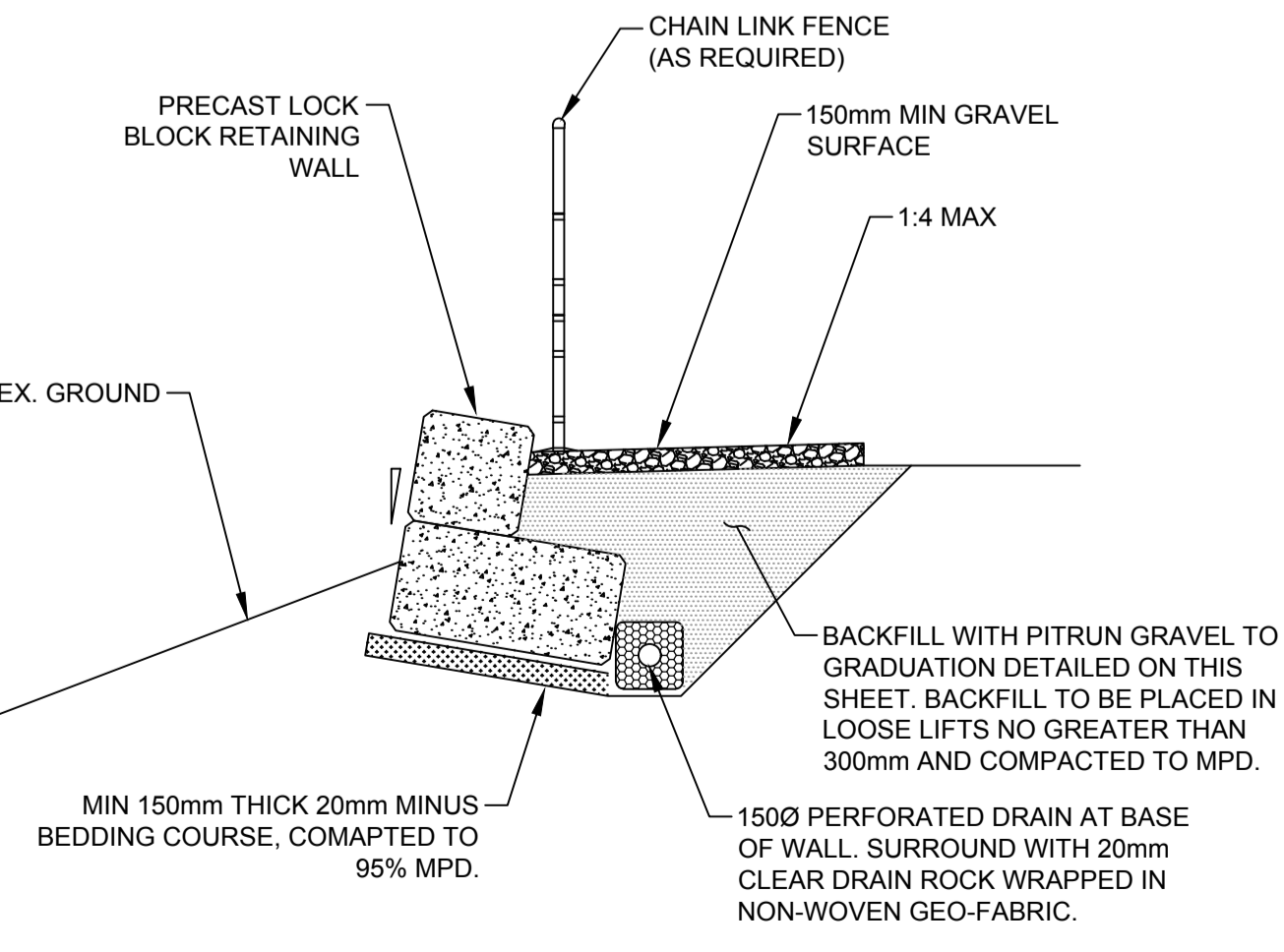
HARVEY SITE FENCE DETAIL
 Scale: 1:25



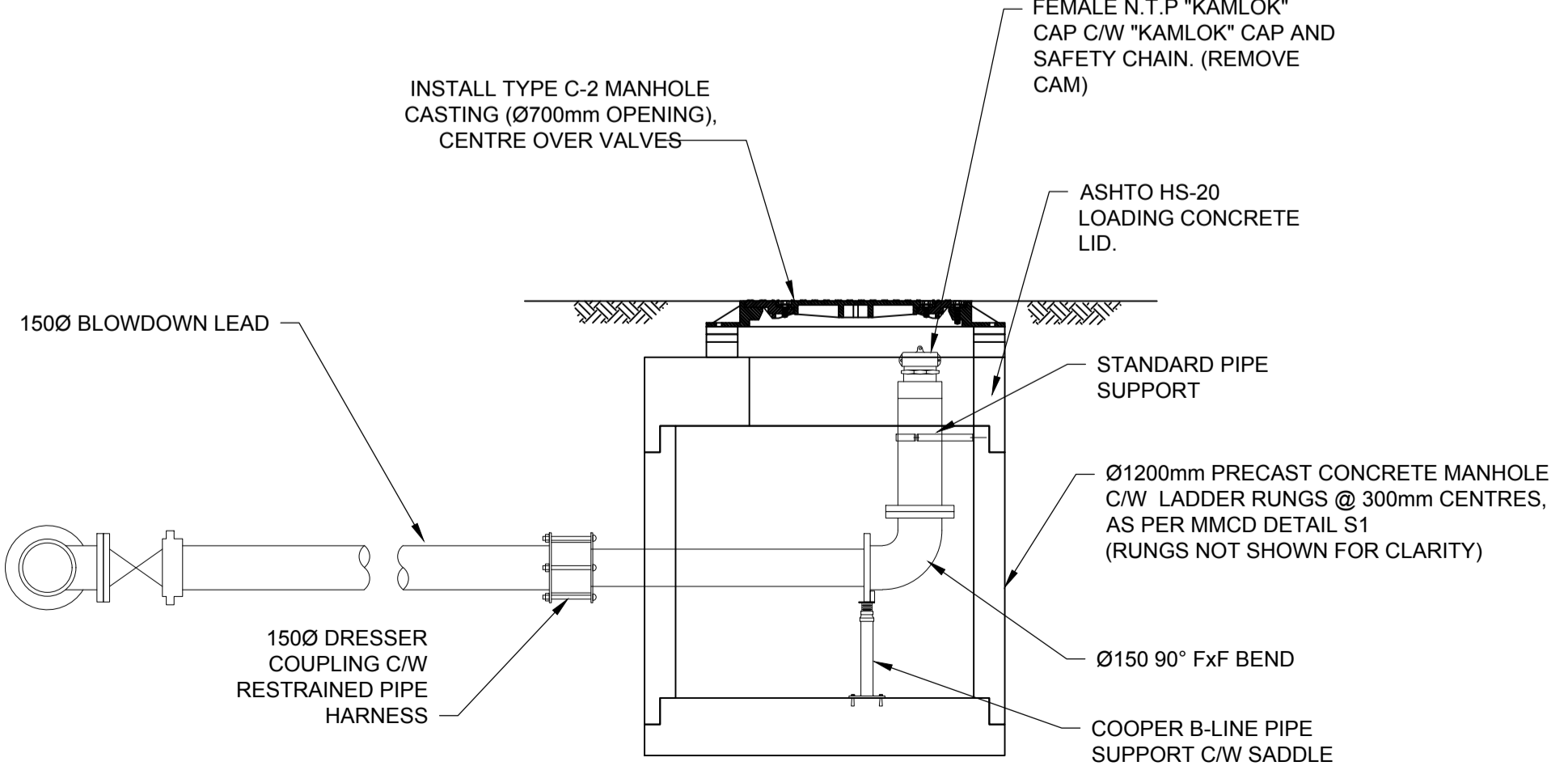
HARVEY TANK CLEANOUT DRAIN DETAIL
 Scale: 1:25

RETAINING WALL BACKFILL GRADATION

SIEVE SIZE (mm)	PERCENT PASSING
25	100
9.5	60-100
4.75 #4	40-100
2.36 #8	20-80
1.18 #16	0-65
0.3 #50	0-30
0.15 #100	0-10
0.075 #200	0-5



LOCK BLOCK WALL DETAIL
 Scale: 1:50



BLOWDOWN DETAIL
 Scale: N.T.S

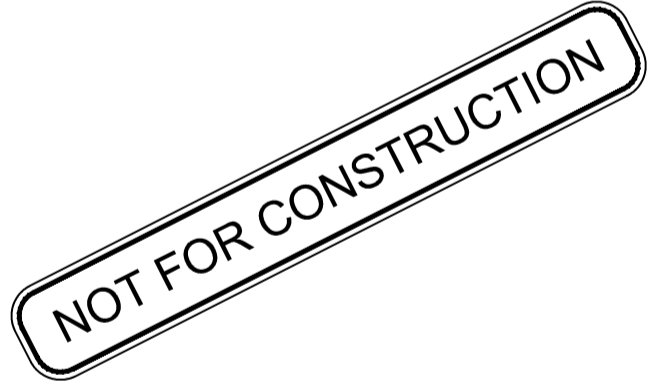
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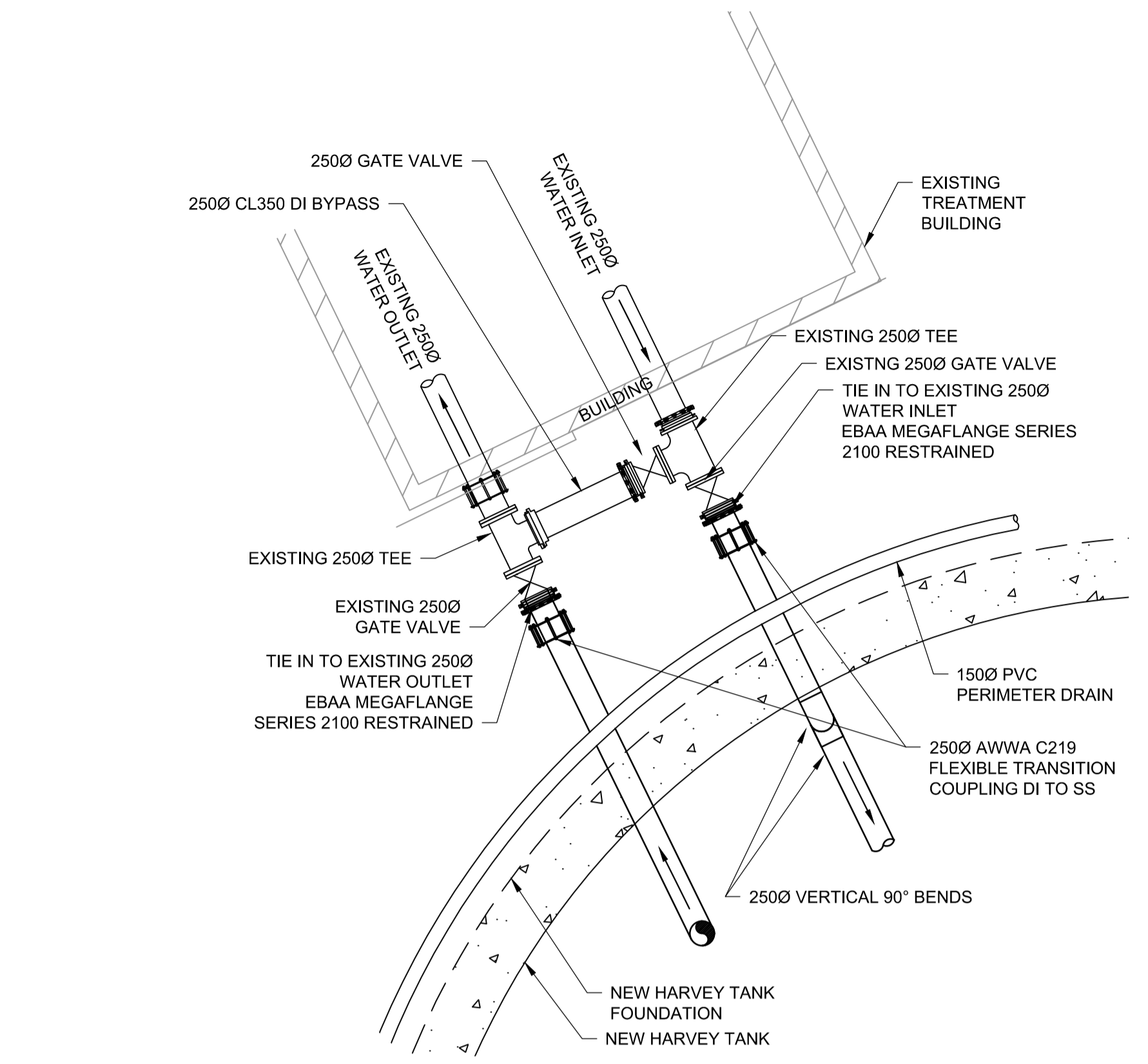
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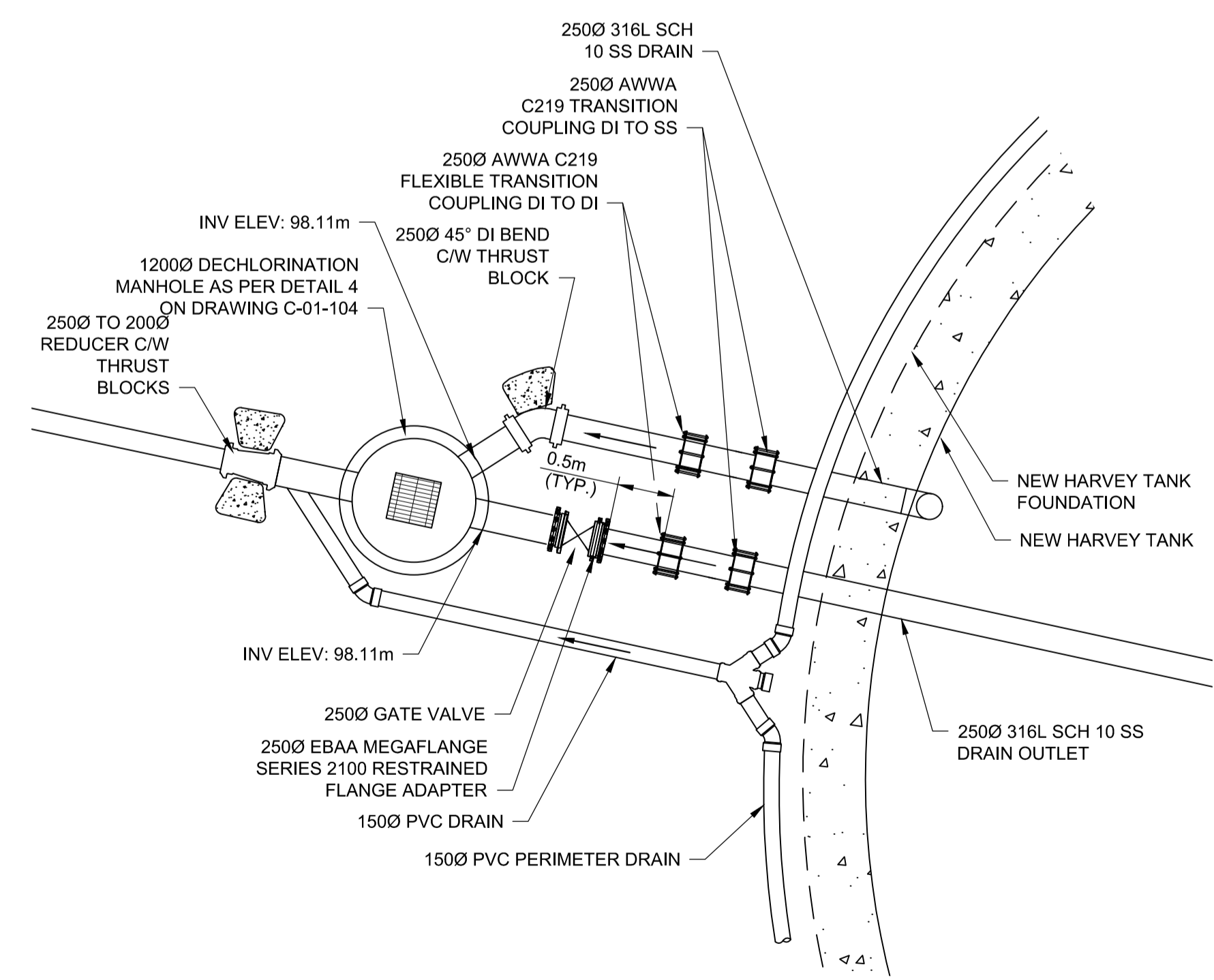
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DRAIN CONNECTION DETAIL 1
 Scale 1:50



DRAIN CONNECTION DETAIL 2
 Scale 1:50



PROJECT
HARVEY TANK REPLACEMENT PROJECT

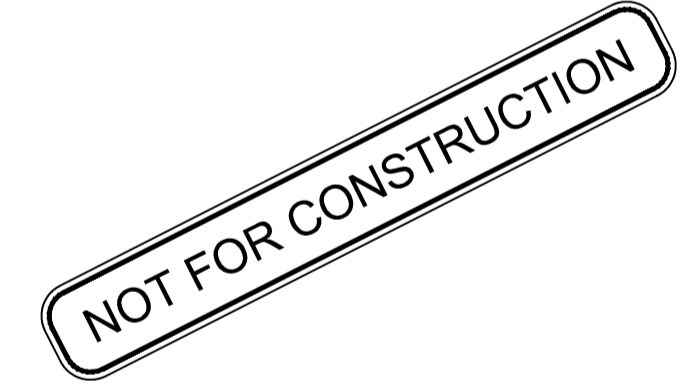
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KEY PLAN

PROJECT NUMBER
 60546407
SHEET TITLE
 STANDARD DETAILS
SHEET NUMBER
 C-01-105

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EQUIPMENT SYMBOLS	
	BIN
	BLOWER OR FAN
	BOILER
	BURNER, WASTE GAS
	CENTRIFUGE
	CHILLER
	COMPRESSOR
	CYCLONE
	DIFFUSER HEADER
	DISTILLATION TOWER
	GENERATOR
	GRINDER/MACERATOR
	GRIT CLASSIFIER
	HEAT EXCHANGER
	MIXER, INLINE
	MIXER, PROPELLER
	MOTOR
	ROTARY SCREEN
	ROTARY SEPARATOR
	SCREEN, BAR
	SCREEN, MANUAL
	SCREENING CONVEYOR
	SCREENING WASHER/COMPACTOR
	SCRUBBER
	SCUM COLLECTOR
	SILENCER
	SLUDGE SKIMMER
	TANK
	VESSEL
	VESSEL, JACKETED
	VESSEL (PRESSURE)
	WAS BOX

PUMP SYMBOLS	
	PUMP, CENTRIFUGAL
	PUMP, DIAPHRAGM
	PUMP, GEAR
	PUMP, METERING
	PUMP, PERISTALTIC
	PUMP, PLUNGER
	PUMP, PROGRESSING CAVITY
	PUMP, ROTARY LOBE
	PUMP, SUBMERSIBLE
	PUMP, VERTICAL
	PUMP, SUBMERSIBLE PROPELLER

PIPE LINE DEVICES	
	AIR GAP
	ANNUBAR
	BLIND FLANGE
	CALIBRATION CHAMBER
	CAP OR PLUG
	CONNECTION, PURGE OR FLUSHING
	CONNECTOR, QUICK
	DIFFUSER OR SPRAY NOZZLE
	DRAIN
	EXPANSION JOINT
	EYE WASH/SHOWER STATION
	FLAME ARRESTER
	FLEXIBLE CONNECTION
	FLOW STRAIGHTENING VANES
	FLUME
	INJECTOR
	IN-PIPE DIFFUSER W/ QUILL
	INSULATION AND HEAT TRACING
	LEVEL
	ORIFACE PLATE
	PRESSURE SENSOR, IN-LINE
	PULSATION DAMPENERS
	REDUCER
	SAMPLER, AUTOMATIC
	SAMPLE POINT, MANUAL
	SEPARATOR, AIR
	SEPARATOR, LIQUID
	SIGHT GLASS
	SPECTACLE BLIND
	STRAINER
	STRAINER, BASKET
	TRAP
	UTILITY CONNECTION, HARD PIPE
	UTILITY STATION
	VENT, AIR
	VENT, STEAM
	VENTURI
	WEIR
	FLOAT LEVEL SWITCH
	ULTRA SONIC LEVEL SENSOR

GENERAL ABBREVIATIONS	COMMODITY ABBREVIATIONS
B.O.P.A.	DR DRAIN
C/L	RW RAW WATER
EL.	TW TREATED WATER
HWL	O/F OVERFLOW
INV.	
LWL	
MAX.	
MIN.	
N.T.S.A.	
T.O.C.	

PROCESS LEGEND SHEET FOLLOWS ISA 5.1 (R1992) INSTRUMENTATION SYMBOLS AND IDENTIFICATION. ALL EQUIPMENT SHOWN ON THIS LEGEND SHEET ISN'T NECESSARILY USED FOR THIS PROJECT.

VALVE SYMBOLS	
	3 WAY VALVE
	4 WAY VALVE
	AIR RELEASE VALVE
	ANGLE VALVE
	BACKFLOW PREVENTER
	BACK PRESSURE REGULATOR VALVE - EXTERNAL PRESSURE TAP
	BACK PRESSURE REGULATOR VALVE - SELF CONTAINED
	BALANCING DAMPER, CIRCULAR
	BALL VALVE, CLOSED
	BALL VALVE, OPEN
	BALL CHECK VALVE
	BUTTERFLY VALVE
	CHECK VALVE
	CHECK VALVE, DOUBLE LEAF
	CHECK VALVE, DUCKBILL
	DIAPHRAGM VALVE
	FLOAT VALVE
	FOOT VALVE
	GATE VALVE
	GLOBE VALVE
	KNIFE GATE VALVE
	MUD VALVE
	NEEDLE VALVE
	PINCH VALVE
	PLUG VALVE
	PRESSURE REDUCING REGULATOR VALVE - EXTERNAL PRESSURE TAP
	PRESSURE REDUCING REGULATOR VALVE - SELF CONTAINED
	PRESSURE AND VACUUM RELIEF VALVE
	RUPTURE DISC PRESSURE RELIEF VALVE
	RUPTURE DISC VACUUM RELIEF VALVE
	PRESSURE RELIEF VALVE
	VACUUM RELIEF VALVE
	TELESCOPIC VALVE
	ELECTRICAL ACTUATED BUTTERFLY VALVE

VALVE ACTUATORS/OPERATOR	
	DIAPHRAGM (PRESSURE)
	DIAPHRAGM (SPRING)
	DIGITAL
	MOTOR
	PISTON
	SOLENOID

GATE SYMBOLS	
	FLAP GATE
	LEVEL CONTROL GATE
	SLIDE GATE
	SLUICE GATE
	STOP LOG
	WEIR GATE

PIPE IDENTIFICATION	
	XXX-YYY
	RAW WATER
	TREATED WATER
	SODIUM HYPOCHLORITE
	DRAIN
	NOMINAL DIAMETER (mm)

EQUIPMENT IDENTIFICATION	
	XX ZZZ
	EQUIPMENT ABBREVIATION
	LOCAL CONTROL PANEL
	PUMP
	UV REACTOR
	EQUIPMENT NUMBER
	XXX-ZZZ
	VALVE ABBREVIATION
	PRESSURE REDUCING VALVE
	VALVE NUMBER

PROCESS LINE IDENTIFICATION	
	XX1 XX2
	XXXX
	LIN1 LIN2
	DRAWING No.
	SOURCE OR DESTINATION

PROCESS LINE CODES	
	PRIMARY PROCESS LINE
	SECONDARY PROCESS LINE
	FUTURE PROCESS LINE
	AREA BOUNDARY
	VENDOR PACKAGE BOUNDARY
	EXISTING PIPING AND EQUIPMENT
	EXISTING PIPING AND EQUIPMENT TO BE REMOVED
	ENCLOSURE BOUNDARY
	PROCESS FLOW ARROW

NOTES:
1 REFER TO DRAWING I-00 FOR INSTRUMENTATION SYMBOLS AND ABBREVIATIONS.



PROJECT
HARVEY TANK REPLACEMENT PROJECT

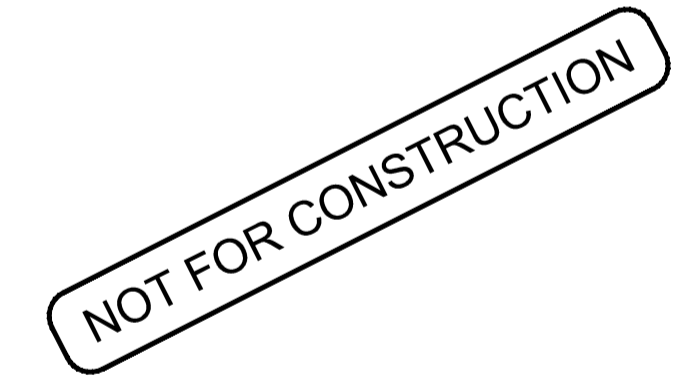
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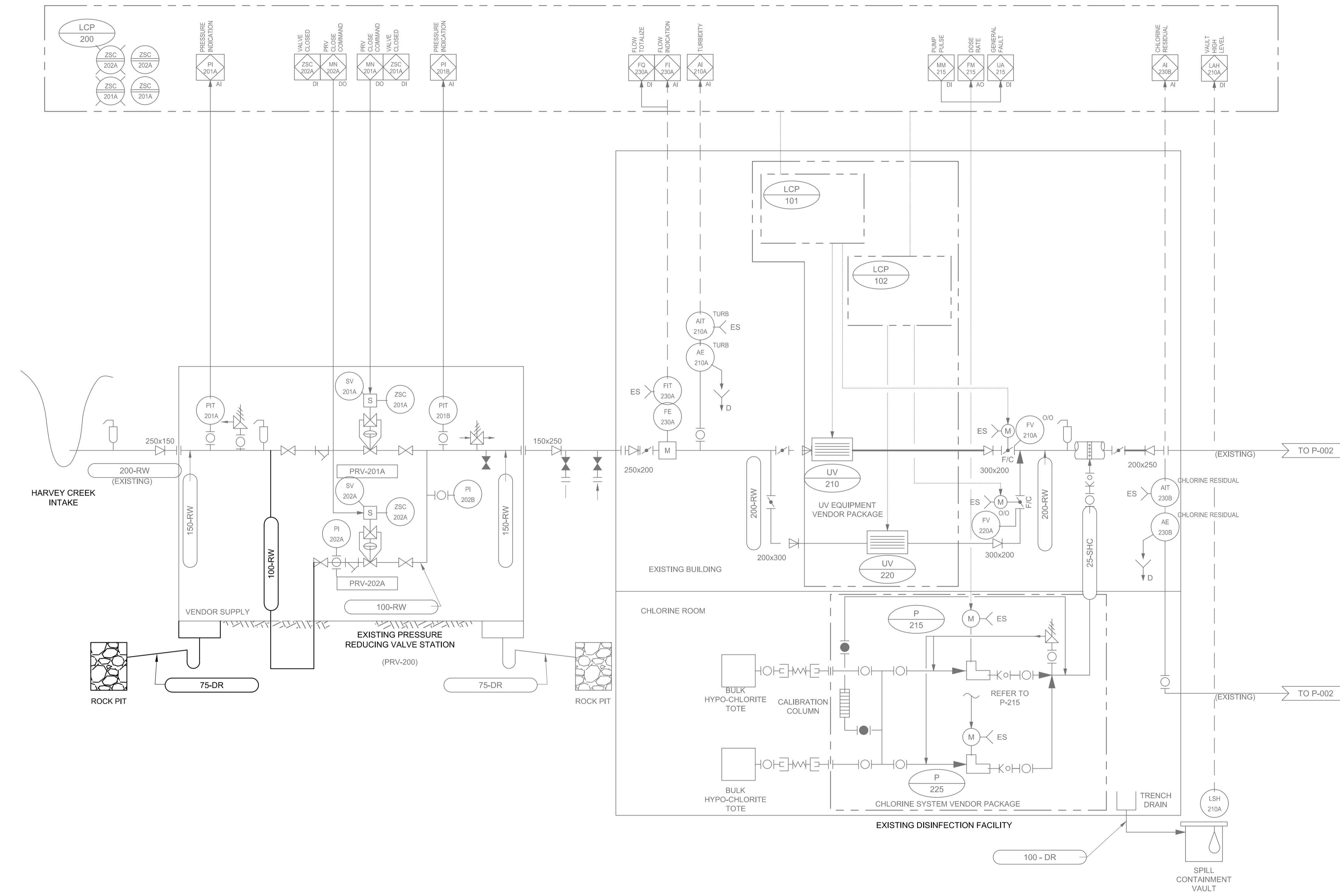
KEY PLAN

PROJECT NUMBER
60546407

SHEET TITLE
INSTRUMENTATION LEGEND AND SYMBOLS

SHEET NUMBER
P-01-000

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PRESSURE REDUCING VALVE STATION
 EQUIP No. PRV-200
 SPEC: 11300
 TYPE: PRESSURE REDUCING
 SIZE: 3.25ML/d (MAX. FLOW)



PROJECT
HARVEY TANK REPLACEMENT PROJECT

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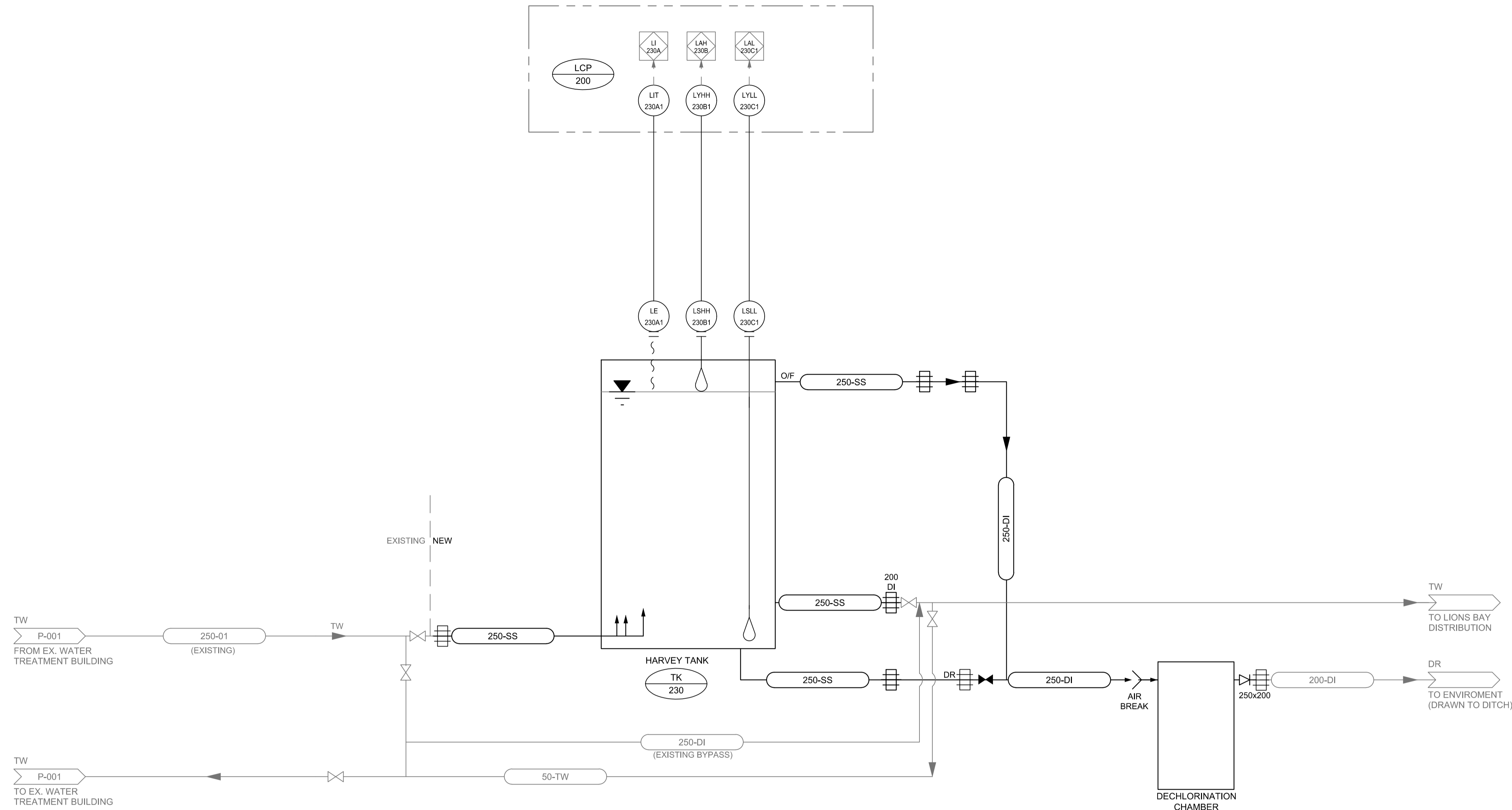
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KEY PLAN

PROJECT NUMBER
 60546407
SHEET TITLE
 EXISTING HARVEY PRV 200 AND DISINFECTION FACILITY PROCESS AND INSTRUMENTATION DIAGRAM
SHEET NUMBER
 P-01-001

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NOTE:
 LCP 200 IS LOCATED WITHIN EXISTING TREATMENT BUILDING.
 REFER TO ELECTRICAL DRAWING



PROJECT
**HARVEY TANK
 REPLACEMENT
 PROJECT**

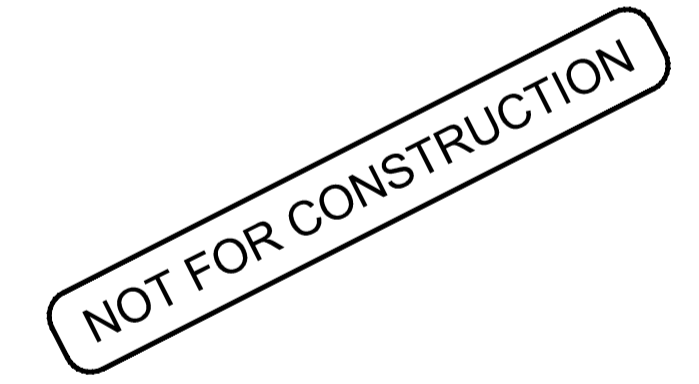
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PROJECT NUMBER
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SHEET TITLE
 HARVEY TANK
 PROCESS AND INSTRUMENTATION
 DIAGRAM
SHEET NUMBER
 P-01-002

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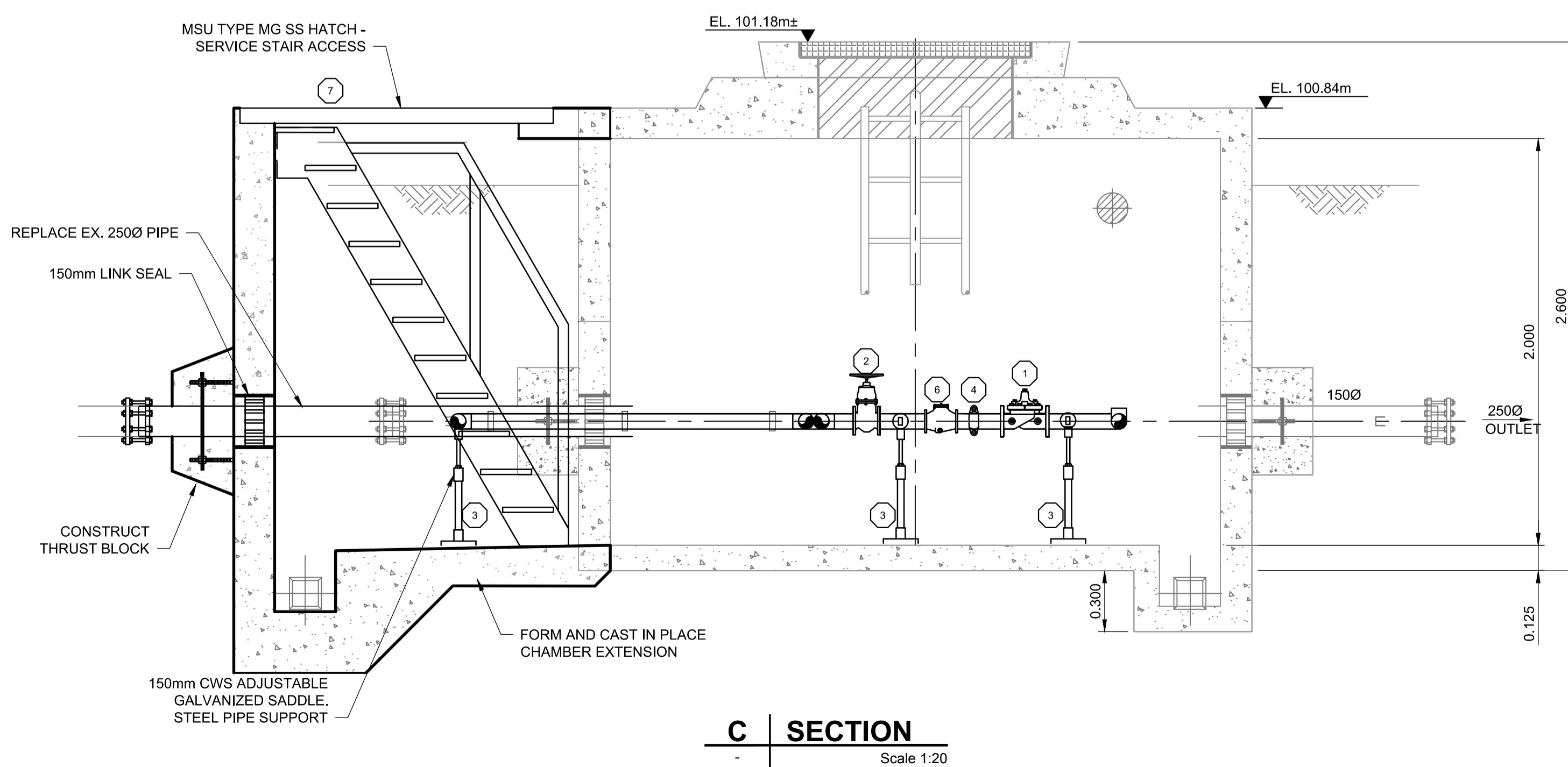
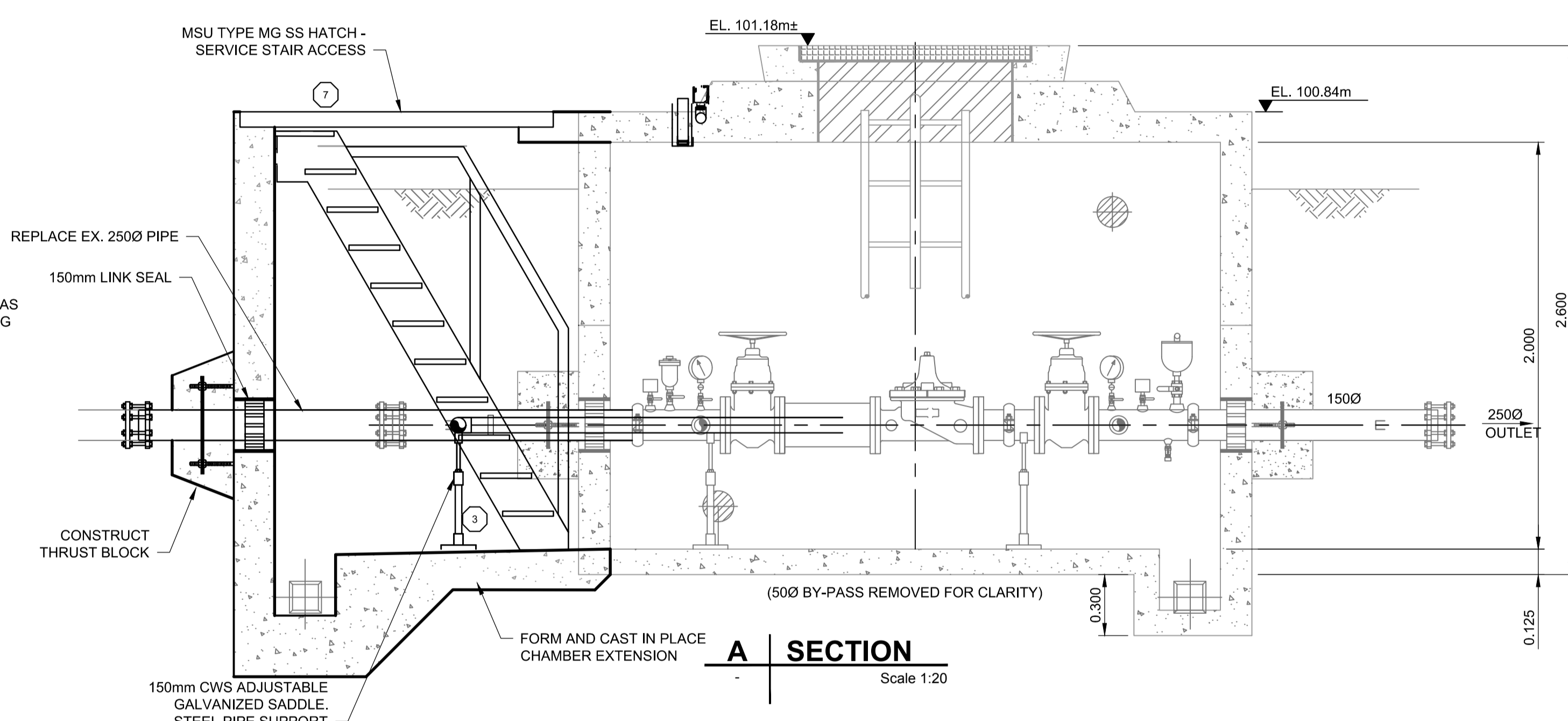
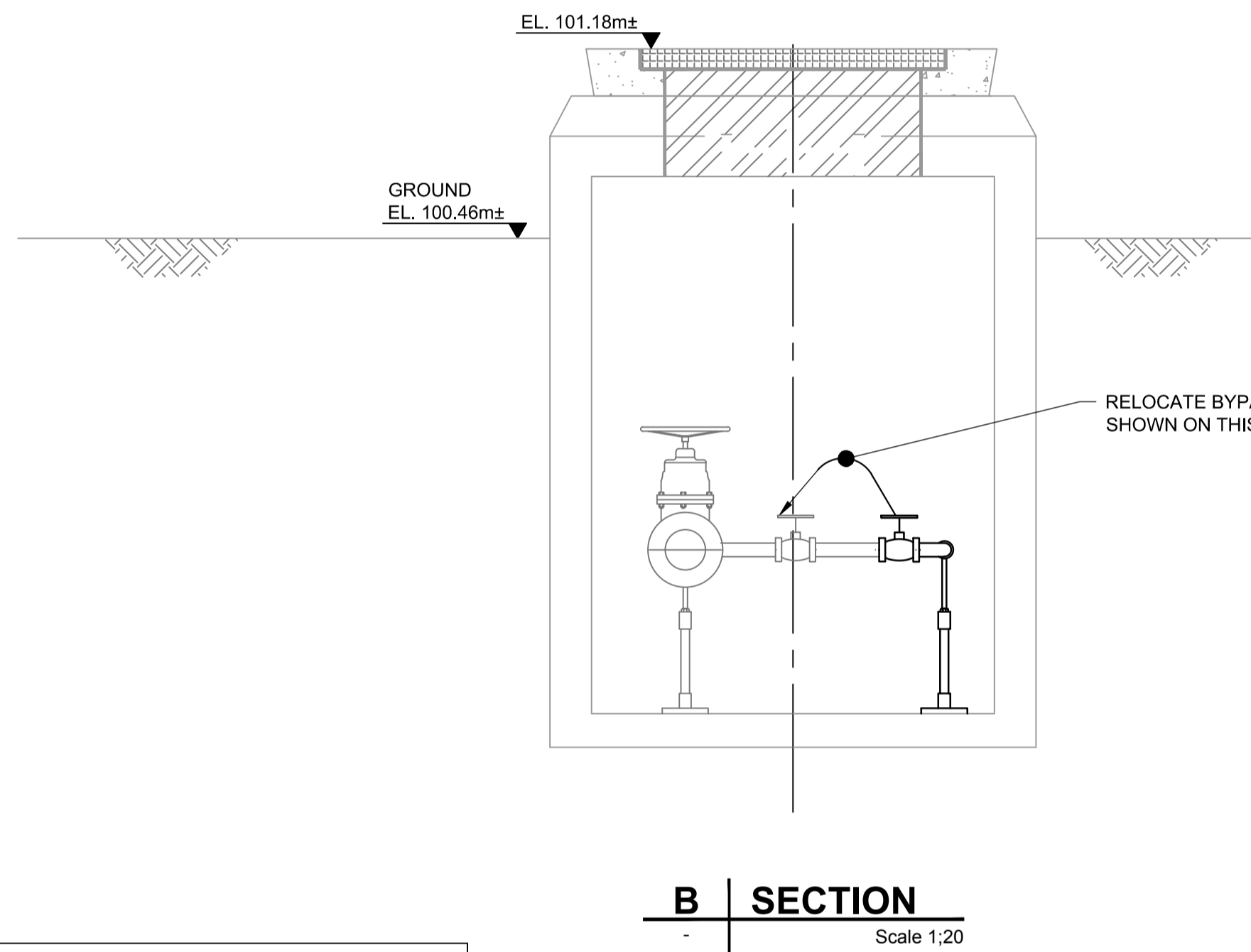
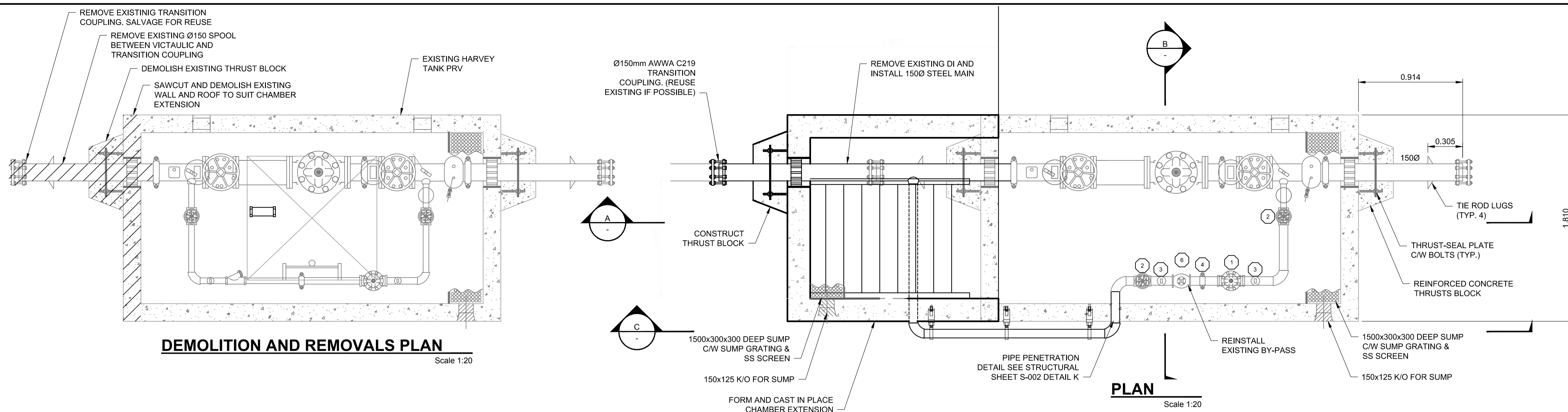
60546407

SHEET TITLE

HARVEY TANK
 PRV 200 ACCESS MODIFICATIONS

SHEET NUMBER

M-01-001

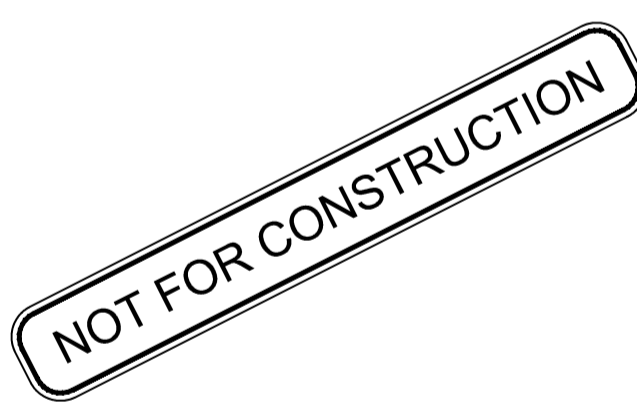


MATERIALS LIST		
ITEM	QTY	DESCRIPTION
1	1	100 CLA-VAL 90 - 01 BSYKC PRESSURE REDUCING VALVE C/W CLOSE POSITION INDICATOR, 120V SOLENOID VALVE AND 120V AC CONTACTOR - THREADED
2	2	100 MUELLER A2360-6W41 NRS GATE VALVE C/W HANDWHEEL - THREADED
3	3	GALVANIZED STEEL ADJUSTABLE PIPE SUPPORTS
4	1	275 VICTAULIC #07 ZERO FLEX COUPLING
5	1	100 MUELLER 11m CAST IRON Y STRAINER C/W BLOWDOWN VALVE - THREADED
6	1	75mm "H" STRAINER W/ EPOXY COATING AND BLOWDOWN VALVES, CLA-VAL, SINGER OR APPROVED ALTERNATIVE
7	1	MSU TYPE MG SS HATCH AND SERVICE STAIR ACCESS

NOTES:

- ALL 75mm DIA. AND LARGER PIPE, INSIDE WETTED SURFACES TO BE SANDBLASTED, EPOXY LINED AND COATED TO AWWA C-210 AND NSF-61 SPECIFICATION. FINISH COATING WILL BE BLUE ENAMEL.
- FABRICATED STEEL PIPE AND FITTINGS TO BE SCHEDULE NO. 40 STEEL PIPE FOR SIZES TO 250mm DIA.
- LOADING: H2O STATIC LOAD RATES

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GENERAL NOTES

- ALL WORK SHALL MEET OR EXCEED MINIMUM REQUIREMENTS OF THE CURRENT EDITION OF THE BRITISH COLUMBIA BUILDING CODE 2012, ASSOCIATED STANDARDS REFERENCED IN THAT CODE, ACI 350 OR AWWA D110 AND LOCAL STANDARDS AND BYLAWS AS APPLICABLE.
- CONFIRM SIZE AND LOCATIONS OF OPENINGS WITH MECHANICAL AND ELECTRICAL CONTRACTORS. REPORT ANY DISCREPANCIES TO CONSULTANT BEFORE PROCEEDING WITH WORK.

DESIGN CRITERIA

- DESIGN STANDARDS:
 - GENERAL: BRITISH COLUMBIA BUILDING CODE, 2012
 - CONCRETE:
 - ACI 350M-06
 - ACI 350.3-06
 - CAN/CSA A23.1, A23.2 AND A23.3
 - STEEL: CAN/CSA S16
- DESIGN LOADS:
 - IMPORTANCE CATEGORY: POST-DISASTER
 - LOCATION: SQUAMISH, BC.
 - DEAD LOADS: WEIGHT OF MATERIALS OF CONSTRUCTION
 - SNOW LOADS:
 - IMPORTANCE FACTOR: $I_s = 1.25$ (ULS)
 - $I_s = 0.9$ (SLS)
 - GROUND SNOW LOAD: $S_s = 2.8$ kPa
 - ASSOCIATED RAIN LOAD: $S_r = 0.7$ kPa
 - WIND LOADS:
 - IMPORTANCE FACTOR: $I_w = 1.25$ (ULS)
 - $I_w = 0.75$ (SLS)
 - REFERENCE WIND PRESSURE: $q(1/50) = 0.5$ kPa
 - $q(1/10) = 0.39$ kPa
 - SEISMIC LOADS:
 - LOCATION: LIONS BAY, BC
 - SITE CLASS: C
 - IMPORTANCE FACTOR: $I_e = 1.5$
 - SPECTRAL ACCELERATION:
 - $S_a(0.2) = 0.83$
 - $S_a(0.5) = 0.59$
 - $S_a(1.0) = 0.32$
 - $S_a(2.0) = 0.17$
 - PEAK GROUND ACCELERATION: $P_G A = 0.4$
 - RESERVOIR ROOF LIVE LOADS: $LL = 1.0$ kPa
 - UNIT WEIGHT OF SOIL: 20.0 kN/m³
 - SOIL BEARING CAPACITY: SLS 150 kPa, ULS 225 kPa

EXCAVATION AND BACKFILL

- REFER TO SPECIFICATION 31 23 02 - EXCAVATION AND BACKFILL FOR STRUCTURES.
- EXCAVATIONS SHALL BE IN ACCORDANCE WITH WORKSAFE B.C. GUIDELINES BY EITHER SLOPING OR USE OF TEMPORARY SHORING MATERIALS OR A COMBINATION OF BOTH. THE DESIGN OF THE TEMPORARY EXCAVATION WORK IS THE RESPONSIBILITY OF THE CONTRACTOR.
- ALL EXCAVATIONS GREATER THAN 1.5 METRES IN DEPTH SHALL BE SLOPED OR SHORED.
- SHALLOW EXCAVATIONS UP TO 3.0 METRES IN DEPTH SHALL BE CUT BACK WITH SIDE SLOPES OF 1 HORIZONTAL TO 1 VERTICAL. A FLATTER SLOPE OF 2:1 SHOULD BE USED IF GROUND WATER IS ENCOUNTERED.
- THE EXPOSED SUBGRADE SHALL BE PROTECTED FROM WETTING AND DISTURBANCE. TEMPORARY PROTECTION MAY COMPRISE OF A THIN LAYER, 50mm MINIMUM THICKNESS MUD SLAB. ALTERNATIVELY, A NON-WOVEN GEOTEXTILE (NILEX 4545 OR EQUIVALENT) SHALL BE PLACED ON THE EXPOSED SUBGRADE AND COVERED WITH AT LEAST 150mm OF MINUS 19mm CLEAR CRUSH GRAVEL COMPACTED WITH SUITABLE EQUIPMENT.
- MAINTAIN SITE DRAINAGE THROUGHOUT ALL STAGES OF CONSTRUCTION.
- KEEP CONSTRUCTION MATERIAL AND EXCAVATED SOIL 3.0 METRES BACK FROM EDGE OF SLOPE.
- DO NOT BACKFILL AGAINST RESERVOIR UNTIL THE RESERVOIR ROOF CONCRETE SLAB HAS BEEN CAST AND CURED FOR 14 DAYS AND TANK HAS BEEN TESTED FOR LEAKAGE.
- BACKFILL AGAINST RESERVOIR WALLS TO CONSIST OF FREE DRAINAGE GRAVEL FILL LIGHTLY COMPACTED IN LOOSE LIFTS NOT EXCEEDING 200mm IN THICKNESS.

CAST-IN-PLACE CONCRETE

- REFER TO SPECIFICATION SECTION 03 30 00 - CAST-IN-PLACE CONCRETE
- CAST-IN-PLACE CONCRETE WORK SHALL BE IN ACCORDANCE WITH CAN/CSA A23.1.
- GROUT TO BE PREMIXED, NON-SHRINK, NON-METALLIC GROUT WITH MINIMUM STRENGTH AT 4 DAYS OF 20MPA AND AT 28 DAYS OF 40 MPA.
- PORTLAND CEMENT SHALL CONFORM TO THE REQUIREMENTS OF CSA CAN3-A5 "PORTLAND CEMENTS".
- HOT AND COLD WEATHER REQUIREMENTS SHALL BE CARRIED OUT IN ACCORDANCE WITH CAN/CSA A23.1.
- CONCRETE FINISHING, PLACING, CURING AND PROTECTION SHALL BE CARRIED OUT IN ACCORDANCE WITH CAN/CSA A23.1.
- UNLESS OTHERWISE NOTED, CONSTRUCTION JOINTS SHOWN ARE OPTIONAL. CONSTRUCTION JOINTS NOT SHOWN ON THE DRAWINGS SHALL BE APPROVED BY ENGINEER.
- BEFORE CONCRETE IS PLACED, CONSTRUCTION JOINTS SHALL BE ROUGHENED TO -5mm, CLEANED AND LAITANCE REMOVED AND SURFACE WETTED. STANDING WATER SHALL BE REMOVED.
- CONCRETE MIXES SHALL BE DESIGNED TO MEET THE FOLLOWING PERFORMANCE CRITERIA IN ACCORDANCE WITH CAN/CSA-A23.1.
 - TYPE A: CONCRETE, CHAMBER WALLS, SLABS AND ROOFS
 - EXPOSURE CLASSIFICATION: F2
 - MIN. 28 DAY COMPRESSIVE STRENGTH: 35 MPa AT 28 DAYS
 - W/C RATIO: 0.4
- CONCRETE TESTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING AGENCY ACCEPTABLE TO THE CONSULTANT AND APPOINTED AND PAID FOR BY THE CONTRACTOR.
- NOTIFY THE CONSULTANT AND TESTING AGENCY AT LEAST 24 HOURS PRIOR TO EACH CONCRETE POUR.

CONCRETE REINFORCING

- REFER TO SPECIFICATION SECTION 03 20 00 - CONCRETE REINFORCING.
- CONCRETE REINFORCING WORK SHALL BE IN ACCORDANCE WITH CAN/CSA A23.1, CAN/CSA A23.3, ACI315 AND THE RISC REINFORCING STEEL MANUAL OF STANDARD PRACTICE.
- ALL REINFORCING TO BE CONTINUOUS. SPLICE ONLY AS DETAILED OR APPROVED BY THE ENGINEER. ALL LAP SPLICES SHALL BE CLASS B TENSION SPLICES UNLESS DETAILED OTHERWISE. SEE TABLE BELOW FOR DEVELOPMENT AND SPLICE LENGTH FOR COMPRESSIVE STRENGTH OF CONCRETE $f'_c = 35$ MPa. LENGTH IN mm.

BAR SIZE	BARS IN COMPRESSION		BARS IN TENSION			
	DEVELOPMENT LENGTH	SPLICE LENGTH	DEVELOPMENT LENGTH		SPLICE LENGTH	
			TOP BARS	OTHER BARS	TOP BARS	OTHER BARS
10M	200	330	390	300	500	390
15M	280	470	550	420	710	550
20M	360	590	680	530	890	680
25M	450	740	1080	830	1400	1080
30M	540	880	1280	990	1670	1280
35M	630	1040	1530	1170	1980	1530

TOP BARS : HORIZONTAL REINFORCEMENT PLACED IN SUCH A WAY MORE THAN 300mm OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE DEVELOPMENT LENGTH OR SPLICE.

REINFORCING BAR DEVELOPMENT AND SPLICE LENGTH SCHEDULE

- REINFORCING STEEL SHALL, WHERE NOT OTHERWISE SHOWN, BE PROTECTED BY CONCRETE COVER AS FOLLOWS:
 - CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH: 75 mm
 - OTHERWISE : 50 mm
- MATERIAL SHALL CONFORM TO THE FOLLOWING:
 - REINFORCING STEEL : CAN/CSA G30.18, GRADE 400, PLAIN FINISH, DEFORMED BARS
- SHOP DRAWINGS SHALL BE PREPARED BY THE CONTRACTOR AND SUBMITTED TO THE CONSULTANT FOR REVIEW PRIOR TO FABRICATION.
- ALL HOOKED BARS TO BE STANDARD HOOKS IN ACCORDANCE WITH CAN/CSA A23.3 UNLESS NOTED OTHERWISE.

MISCELLANEOUS METALS

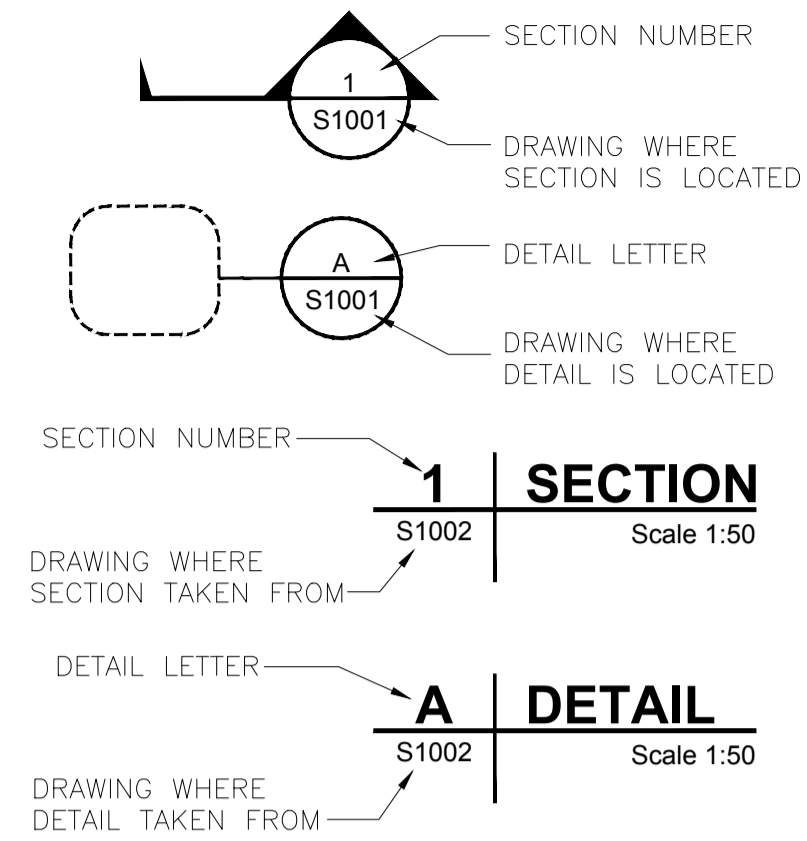
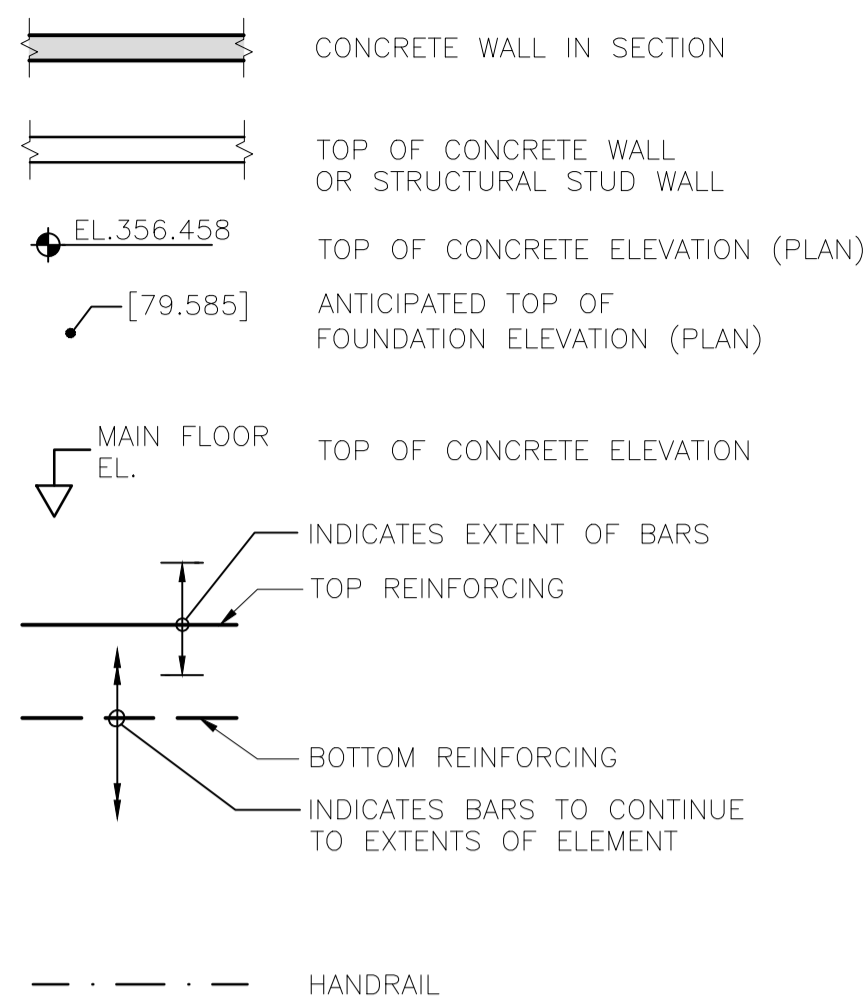
- REFER TO SPECIFICATION SECTION 05 50 00 - METAL FABRICATION.
- FABRICATION AND ERECTION SHALL BE IN ACCORDANCE WITH CAN/CSA S16.
- MATERIALS SHALL CONFORM TO THE FOLLOWING:
 - ALUMINUM SHAPES AND PLATES: ALLOY 6061-T6 OR 6063-T6
 - STAINLESS STEEL SHAPES:
 - INTERIOR SUBMERGED: AISI, TYPE 316
 - FOR WELDING: AISI, TYPE 316
 - SHAPES AND BARS: ASTM A276
 - PLATE, SHEET AND STRIP: ASTM A240
 - CONNECTION BOLTS:
 - STAINLESS STEEL MEMBERS: AISI, TYPE 316
 - ANCHOR BOLTS:
 - INTERIOR SUBMERGED: AISI, TYPE 316
- WELDING SHALL BE IN ACCORDANCE WITH CAN/CSA W59 & W47.1 AND WITH AWS D1.6 FOR STAINLESS STEEL.
- ALL METALS INSIDE OF THE WATER RETAINING STRUCTURES INCLUDING LADDERS, STAIRS, THREADS, HANDRAILS, PLATFORM FRAMES AND GRATINGS SHALL BE STAINLESS STEEL CONSTRUCTION.
- ALL METALS IN EXTERIOR USE OR INSIDE OF NON-WATER RETAINING STRUCTURES INCLUDING LADDERS, STAIRS, TREADS, HANDRAILS, GRATINGS SHALL BE ALUMINUM CONSTRUCTION.

GRATING

- ALL GRATING TO BE DESIGNED FOR LIVE LOAD OF 4.8 kPa, UNLESS NOTED OTHERWISE.
- GRATING MATERIAL SHALL BE STAINLESS STEEL ALLOY TYPE 316 WITHIN WATER RETAINING STRUCTURES AND ALUMINUM 6061-T6 ANYWHERE ELSE.

SYMBOLS

ON SMALL SCALE PLANS



PROJECT

HARVEY TANK REPLACEMENT PROJECT

CLIENT

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REGISTRATION

ISSUE/REVISION

I/R	DATE	DESCRIPTION
0	09/21/2018	ISSUED FOR TENDER

KEY PLAN

PROJECT NUMBER

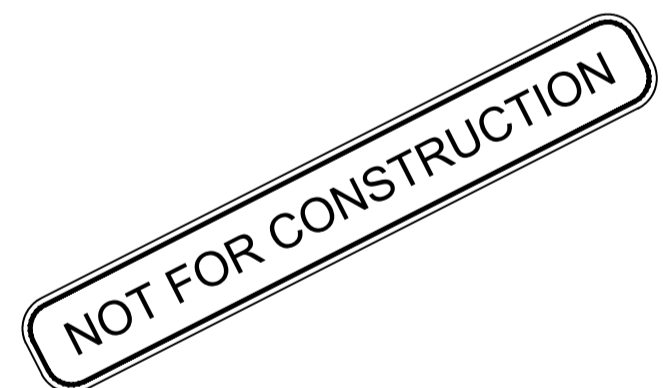
60546407

SHEET TITLE

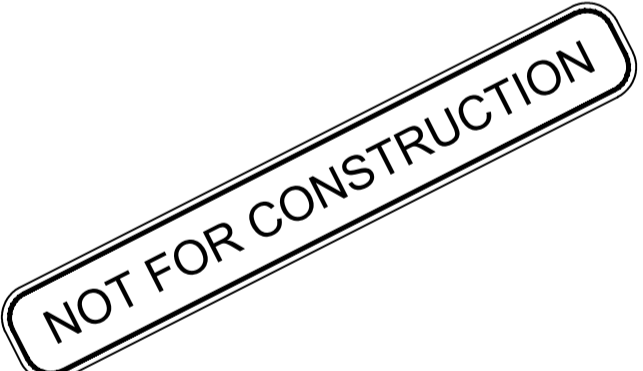
GENERAL NOTES

SHEET NUMBER

S-01-001



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ISSUE/REVISION

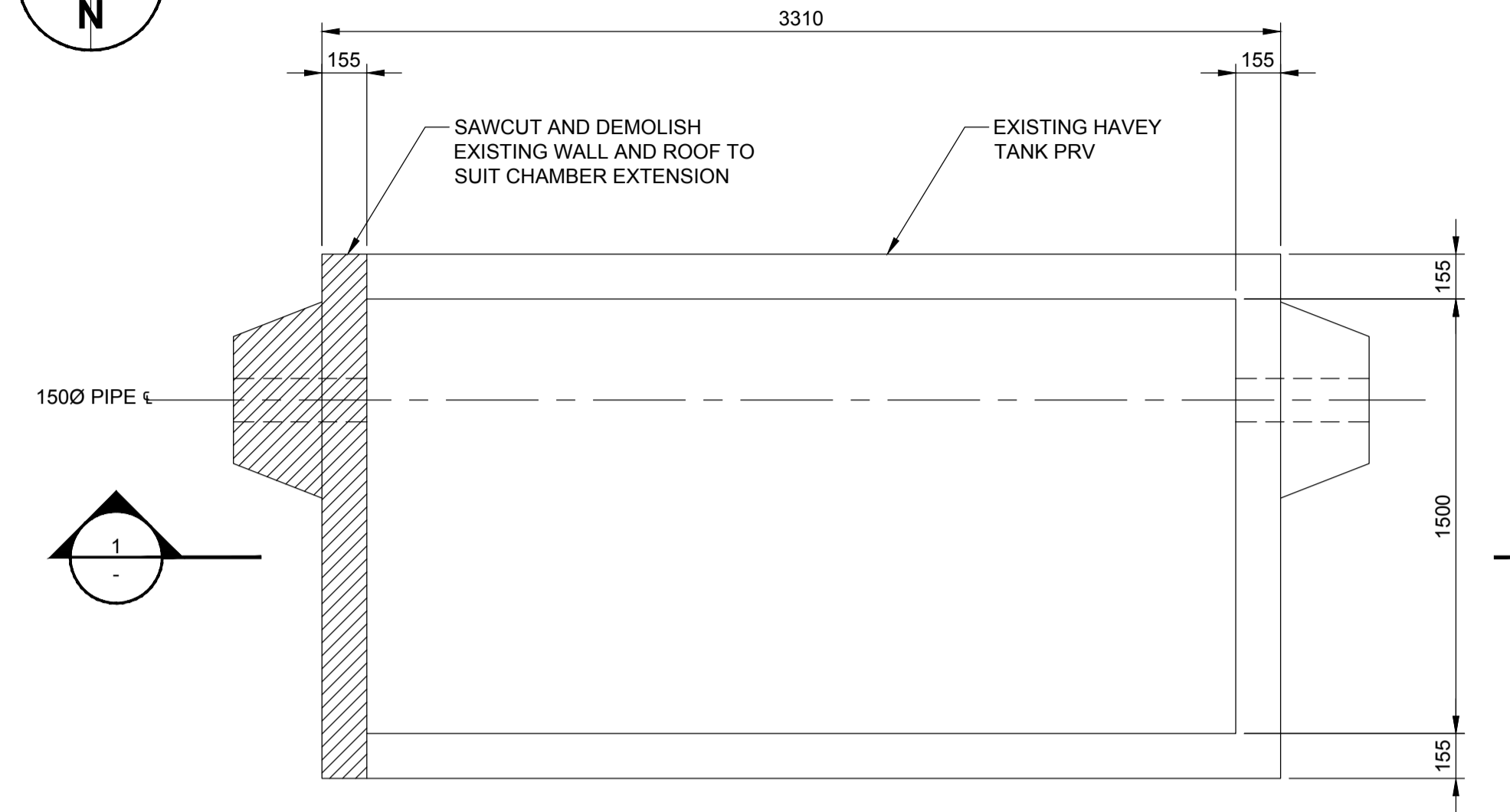
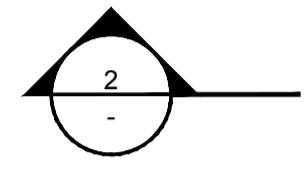
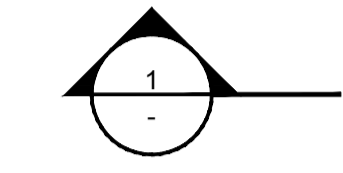
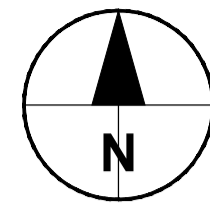
I/R	DATE	DESCRIPTION
0	09/21/2018	ISSUED FOR TENDER

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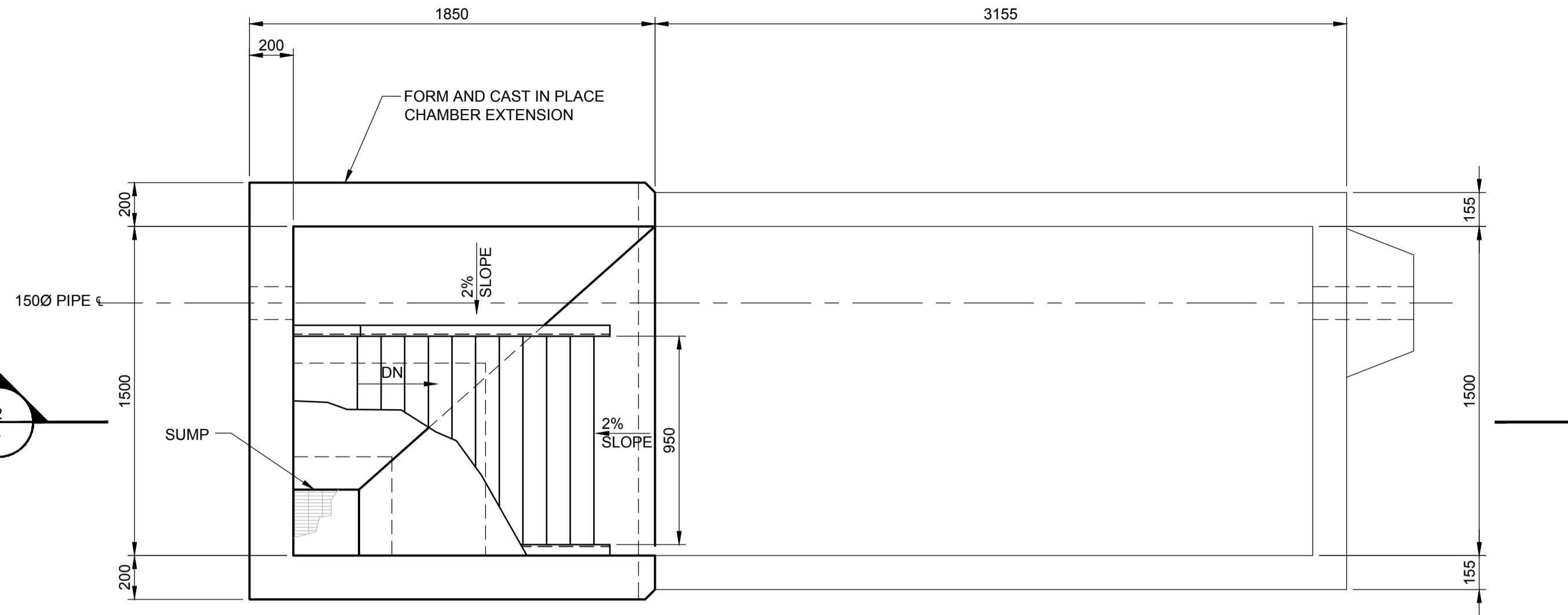
PROJECT NUMBER
60546407

SHEET TITLE
HARVEY TANK
PRV CHAMBER MODIFICATION
PLANS AND SECTIONS

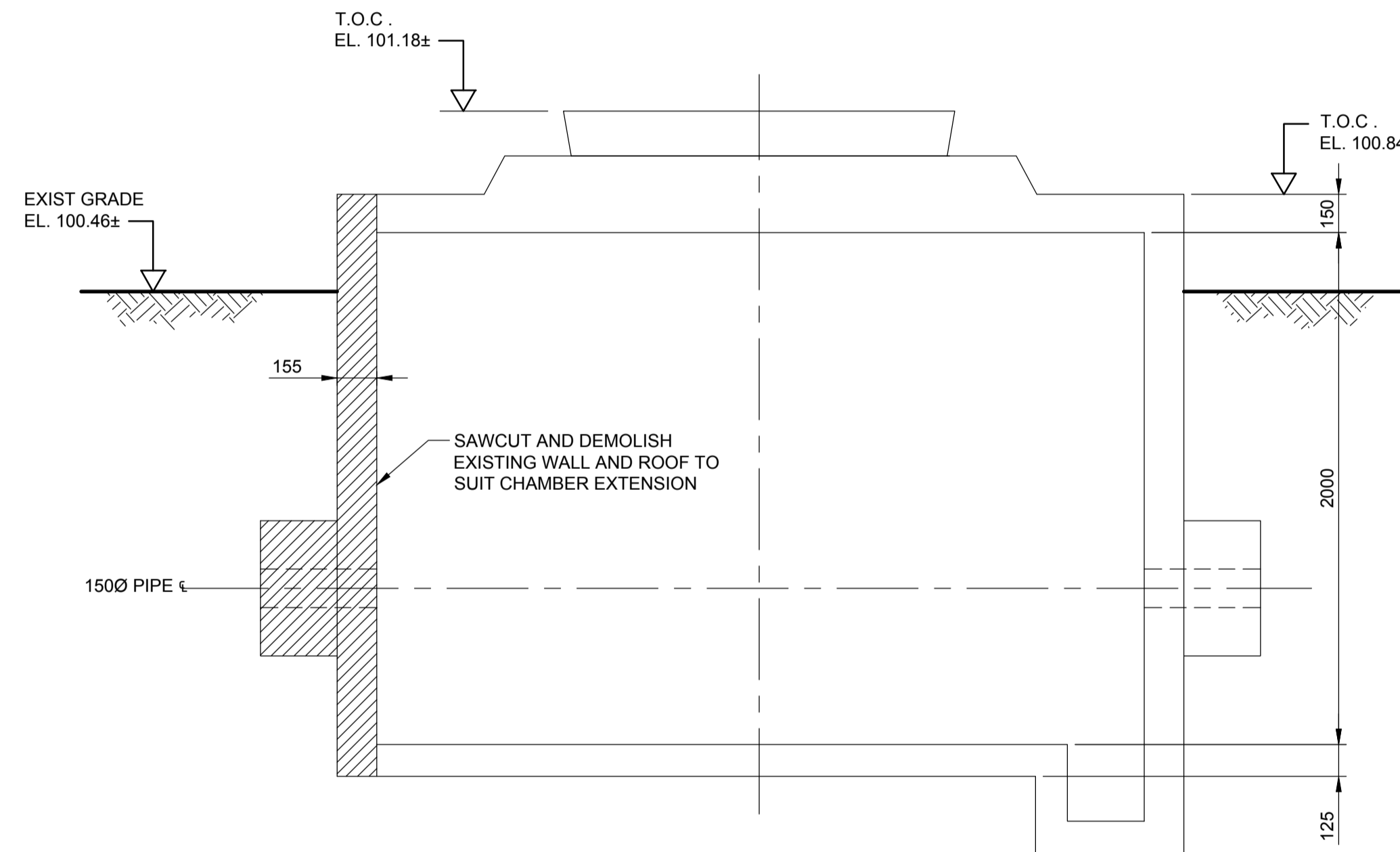
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S-01-100



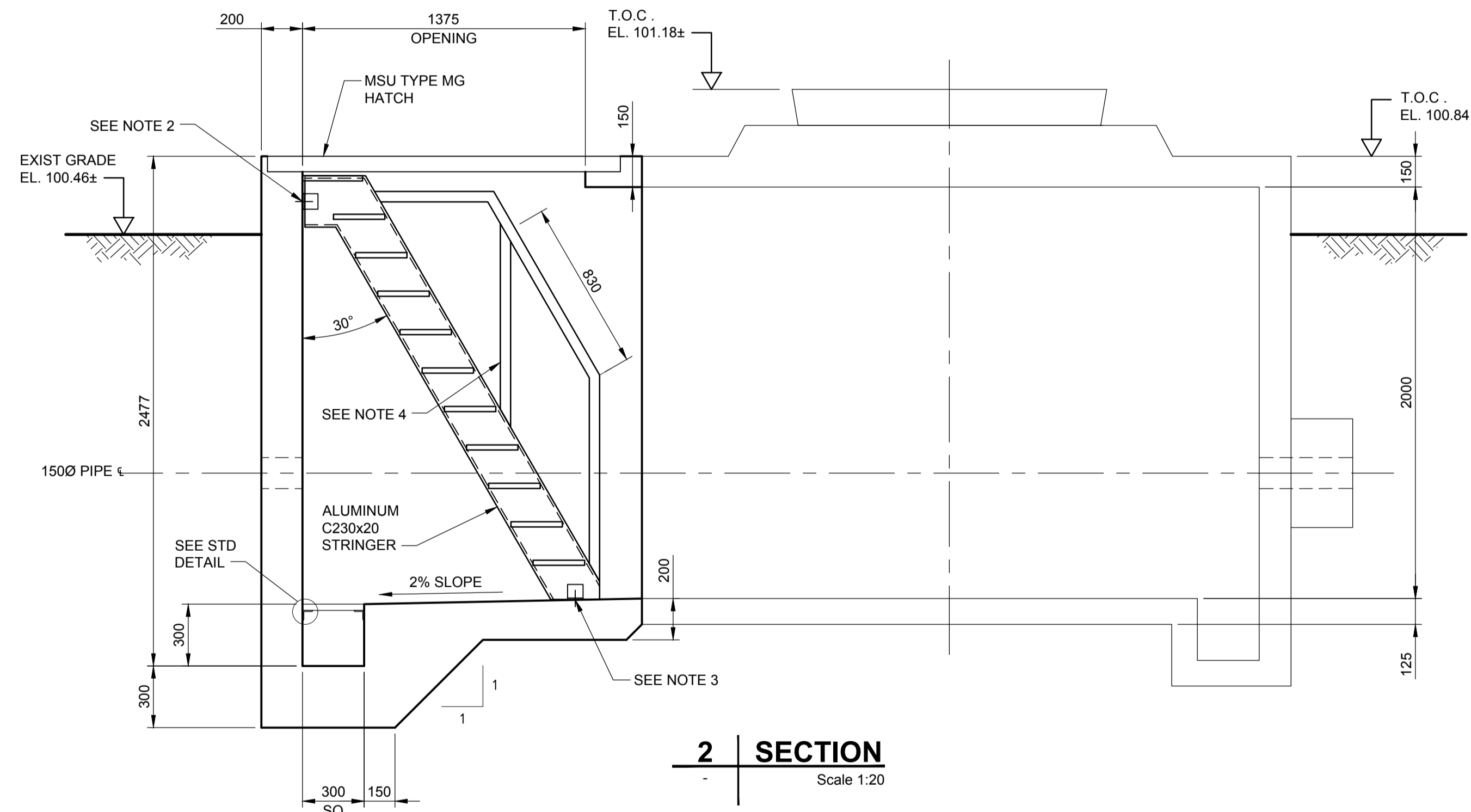
DEMOLITION PLAN
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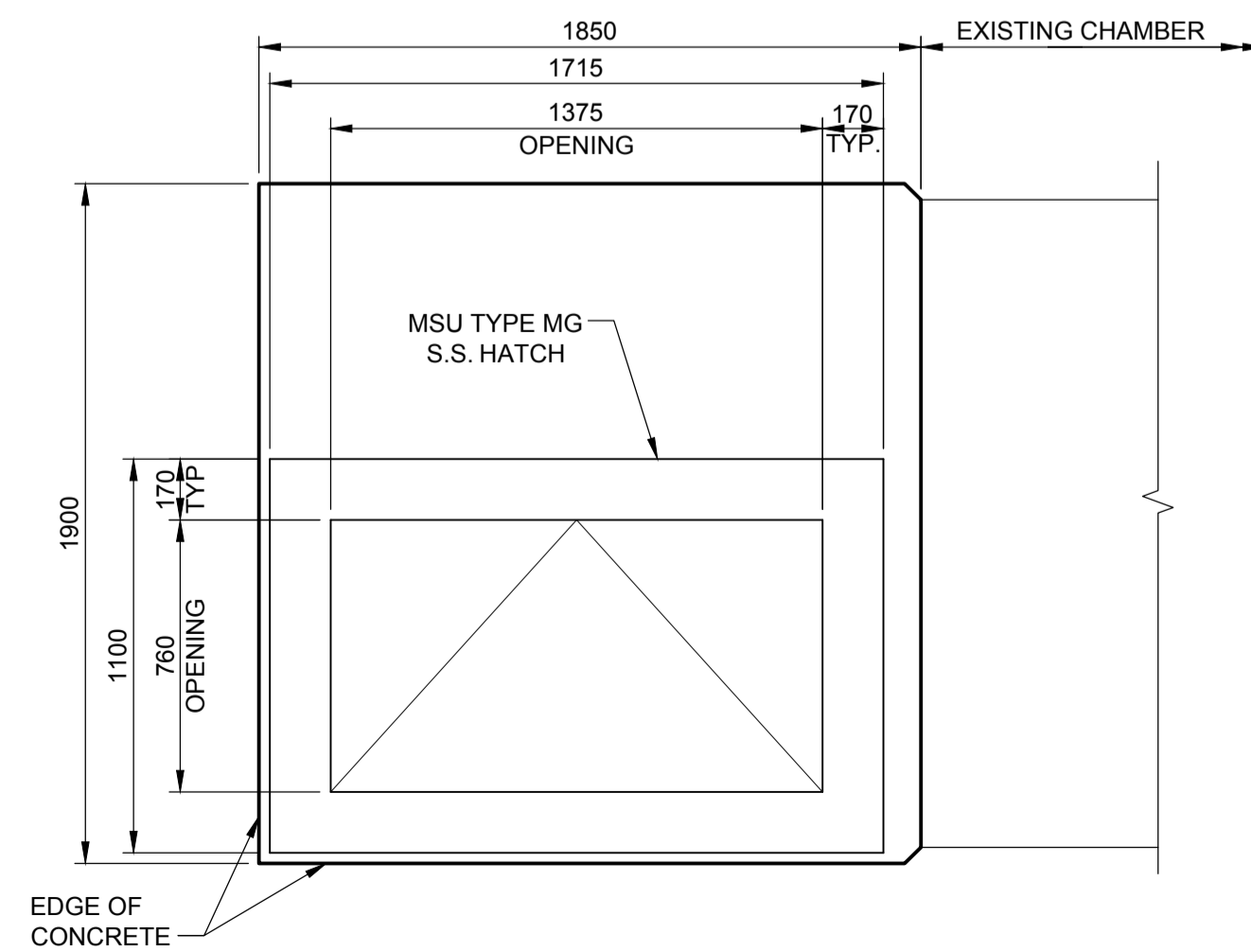
MODIFICATION FLOOR PLAN
Scale 1:20



1 SECTION
Scale 1:20



2 SECTION
Scale 1:20



MODIFICATION - PARTIAL ROOF PLAN
Scale 1:20

NOTES:

1. ALUMINUM SHIP'S LADDER WITH HANDRAILS.
2. ALUMINUM L89x89x9.5x90mm LONG C/W 19Ø S.S. HILTI HIT HY200 ANCHOR WITH 150 EMBEDMENT.
3. ALUMINUM L89x89x9.5x90mm LONG TYP. C/W 22x40 HORIZ. SLOTTED HOLE FOR 19Ø S.S. HILTI HIT HY200 ANCHOR WITH 150 EMBEDMENT.
4. ALUMINUM HANDRAIL, SEE STANDARD DETAIL.

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1.0 GENERAL CLAUSES

- .1 THE GENERAL REQUIREMENTS, INSTRUCTIONS TO BIDDERS, SPECIFICATIONS AND DRAWINGS FORM PART OF THE CONTRACT DOCUMENTS AND SHALL BE READ IN CONJUNCTION WITH THEM. WORK SHALL INCLUDE THE FURNISHING OF ALL LABOUR AND MATERIALS UNLESS SPECIFICALLY NOTED OTHERWISE TO COMPLETE AND PUT INTO OPERATING CONDITION ALL ELECTRICAL AND INSTRUMENTATION AND CONTROL SYSTEMS AS INDICATED ON THE DRAWINGS AND SPECIFICATIONS HEREIN.
- .2 WORD "SUPPLY" SHALL MEAN THAT SO NOTED EQUIPMENT IS TO BE PURCHASED, ASSEMBLED, AND SHIPPED UNDAMAGED TO THE SITE. WHERE AN ITEM IS SUPPLIED BY THE OWNER, BY OTHERS OR BY ANOTHER DIVISION, THE WORK OF MOUNTING, CONNECTING AND COMMISSIONING THE ITEM SHALL BE INCLUDED IN THE CONTRACT UNLESS SPECIFICALLY NOTED OTHERWISE.
- .3 WORD "PROVIDE" SHALL MEAN THAT THE SO NOTED EQUIPMENT IS TO BE SUPPLIED, INSTALLED, CONNECTED, ADJUSTED, CALIBRATED, TUNED, CLEANED, COMMISSIONED, AND PLACED INTO FULL SERVICE.
- .4 WORD "INSTALL" SHALL MEAN TO PUT THE SPECIFIED ITEM INTO FULL OPERATION, SECURELY FASTENED AND CONNECTED TO THE SYSTEM. THE CONTRACTOR SHALL PROVIDE ALL WORK AND MATERIAL WHICH IS NECESSARY TO SECURELY FASTEN AND GIVE A PRESENTABLE FINISHED APPEARANCE INCLUDING ALL NECESSARY CONNECTIONS AND CONDUCTORS. SUCH NOTED EQUIPMENT MUST BE FULLY CALIBRATED AND TESTED.
- .5 THE DRAWINGS AND SPECIFICATIONS ARE ALL INCLUSIVE.
- .6 RESPONSIBILITY AS TO WHICH TRADE PROVIDES REQUIRED ARTICLES OR MATERIALS RESTS SOLELY WITH THE GENERAL CONTRACTOR. EXTRAS WILL NOT BE CONSIDERED BASED ON GROUNDS OF DIFFERENCE OF INTERPRETATION OF SPECIFICATIONS AS TO WHICH TRADE INVOLVED SHALL PROVIDE CERTAIN SPECIALTIES OR MATERIALS.
- .7 PRIOR TO SUBMITTING TENDER, ELECTRICAL TRADE TO CAREFULLY EXAMINE THE SITE AND ASCERTAIN ALL CONDITIONS WHICH MAY AFFECT HIS TRADE. NO EXTRAS WILL BE ALLOWED FOR WORK RESULTING FROM CONDITIONS THAT WOULD HAVE BEEN EVIDENT UPON A THOROUGH EXAMINATION OF SITE.
- .8 DRAWINGS AND SPECIFICATIONS ARE COMPLEMENTARY EACH TO THE OTHER AND WHAT IS CALLED FOR BY ONE TO BE BINDING AS IF CALLED FOR BY BOTH.
- .9 SHOULD ANY DISCREPANCY APPEAR BETWEEN DRAWINGS AND SPECIFICATIONS WHICH LEAVES ELECTRICAL TRADE IN DOUBT AS TO TRUE INTENT AND MEANING, OBTAIN RULING BEFORE SUBMITTING TENDER. IF THIS IS NOT DONE, IT WILL BE ASSUMED THAT THE MOST EXPENSIVE ALTERNATE HAS BEEN FIGURED.
- .10 THIS CONTRACTOR TO EXAMINE CAREFULLY ALL DRAWINGS AND WORK OF OTHER TRADES AND BE SATISFIED THAT THE WORK UNDER THIS CONTRACT CAN BE SATISFACTORILY CARRIED OUT WITHOUT CHANGES. SHOULD ANY DIFFICULTY ARISE SHOWING CONFLICT WITH, OR REQUIRING ADDITIONAL WORK BEYOND THE WORK OF THESE DRAWINGS, BRING THIS MATTER TO THE ATTENTION OF THE ENGINEER BEFORE SUBMITTING TENDER.

1.1 SCOPE

- .1 PROVIDE ALL ITEMS, MATERIALS, EQUIPMENT AND LABOUR AS REQUIRED FOR A COMPLETE AND AN OPERATIONAL SYSTEMS AS MENTIONED HEREIN, OR INDICATED ON THE DRAWINGS.
- .2 THE WORK SHALL INCLUDE BUT NOT BE LIMITED TO:
 - .1 PROVIDE A NEW 78mm RPVC DBII UNDERGROUND CONDUIT FROM THE RESERVOIR ELECTRICAL ROOM TO TELUS POINT OF INTERFACE NEAR THE ACCESS GATE AT OCEANVIEW ROAD. PROVIDE A NEW CATSE CABLE FROM THE RESERVOIR CONTROL ROOM THROUGH THE NEW CONDUIT TO THE TELUS POINT OF INTERFACE. INSTALL CATSE CABLE DETERMINATE TO RE-ESTABLISH COMMUNICATIONS APPROX. 300m. 450mm (min.) NATIVE COVER
 - .2 OBTAIN FROM EXISTING LEVEL TRANSMITTER ANY AND ALL PARAMETERS CONFIGURED FROM DEFAULT. SURVEY EXISTING INSTALLATION LEVEL SWITCH ELEVATIONS. REMOVE THE EXISTING INSTRUMENTS FROM THE EXISTING HARVEY RESERVOIR AND TURN OVER TO OWNER.
 - .3 PROVIDE A NEW LEVEL INDICATING TRANSMITTER AND LEVEL FLOAT SWITCHES. INSTALL NEW LEVEL TRANSMITTER IN UV BUILDING (REPLACE EXISTING). CONNECT NEW LEVEL INSTRUMENTS TO THE EXISTING PLC IN THE UV BUILDING ELECTRICAL ROOM CONTROL PANEL. INSTALL ULTRASONIC TRANSDUCER AND FLOAT SWITCH (AND HANGER) IN RESERVOIR IN CLOSE PROXIMITY TO ACCESS HATCH AND LADDER FOR MAINTENANCE PURPOSES.
 - .4 PROVIDE LIMIT SWITCH FOR EACH RESERVOIR ACCESS HATCH. CONNECT NEW LIMIT SWITCH TO EXISTING PLC SPARE DIGITAL INPUT IN THE UV BUILDING. PROGRAM SECURITY ALARM POINT INTO STATION PLC AND WORKS YARD SCADA STATION (FACTORYTALK VIEW SE). CONFIGURE WORKS YARD PLC TO COMMUNICATE WITH ALARM DIALOUT MODEM FOR "HARVEY RESERVOIR SECURITY BREACH"
 - .5 PROVIDE 4C #14 TECK90 FROM UV BUILDING CONTROL PANEL TO RESERVOIR ACCESS HATCH JUNCTION BOX FOR LEVEL SWITCH & LIMIT SWITCH.
 - .6 PROVIDE FIELD COMMISSIONING, ADJUSTMENT AND CERTIFIED MANUFACTURERS ACCEPTANCE REPORTS FOR ALL ELECTRICAL AND CONTROL AND INSTRUMENTATION EQUIPMENT AND SYSTEMS.
 - .7 PROVIDE SHOP DRAWINGS FOR PULL BOXES, LEVEL TRANSMITTER, LEVEL FLOAT SWITCH.
 - .8 PROVIDE O&M MANUALS FOR THE COMPLETE ELECTRICAL SYSTEM. O&M MANUAL WILL INCLUDE, BUT NOT LIMITED TO, ALL MAINTENANCE MANUALS, DETAILED LIST OF ANY COMPONENT PARAMETER(S) THAT HAS BEEN CONFIGURED FROM DEFAULT.
 - .9 THE CONTRACTOR SHALL BE FULLY QUALIFIED AND EQUIPPED TO CARRY OUT THE TESTING OF ALL ELECTRICAL, CONTROL AND INSTRUMENTATION EQUIPMENT AND SYSTEMS OR AS AN ALTERNATIVE, SHALL PROVIDE THE SERVICES OF A QUALIFIED MANUFACTURER'S REPRESENTATIVE TO CARRY OUT TESTING.
 - .10 THE CONTRACTOR SHALL COORDINATE WITH THE VENDOR TO INSTALL ANY ELECTRICAL ITEMS SHIPPED LOOSE.
 - .11 CONTRACTOR SHALL CONDUCT A 4 HOUR (minimum) ON-SITE TRAINING SESSIONS FOR OWNER.
 - .12 CONTRACTOR (OR SUBCONTRACTOR) HAS EXPERIENCE WITH AND IS PROFICIENT WITH ROCKWELL SOFTWARE LOGIX5000 (STUDIO 5000) AND FACTORYTALK VIEW.

1.2 DISCREPANCY

- .1 VIEW PLANS, VISIT SITE AND CHECK PLANS AGAINST EXISTING CONDITIONS. SHOULD ANY DISCREPANCY EXIST BETWEEN THE SPECIFICATION AND DRAWINGS FOR THE ACTUAL CONDITIONS ON JOB SITE, A RULING SHALL BE OBTAINED FROM THE ENGINEER BEFORE THE FINAL PRICE IS SUBMITTED.

1.3 CODE, PERMITS AND INSPECTION

- .1 ELECTRICAL TRADE TO OBTAIN ALL PERMITS REQUIRED AND AFTER COMPLETION OF THE WORK FURNISH TO THE ENGINEER A CERTIFICATE OF FINAL INSPECTION AND APPROVAL FROM THE ELECTRICAL INSPECTION DEPARTMENT.
- .2 ALL WORK SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE CANADIAN ELECTRICAL CODE AND LOCAL BUILDING BYLAW, AS AMENDED AND ADAPTED BY THE LOCAL AUTHORITY. OBTAIN ALL NECESSARY PERMITS AND LICENSES AND PAY ALL FEES IN CONNECTIONS WITH THE WORK.

1.4 DAMAGES

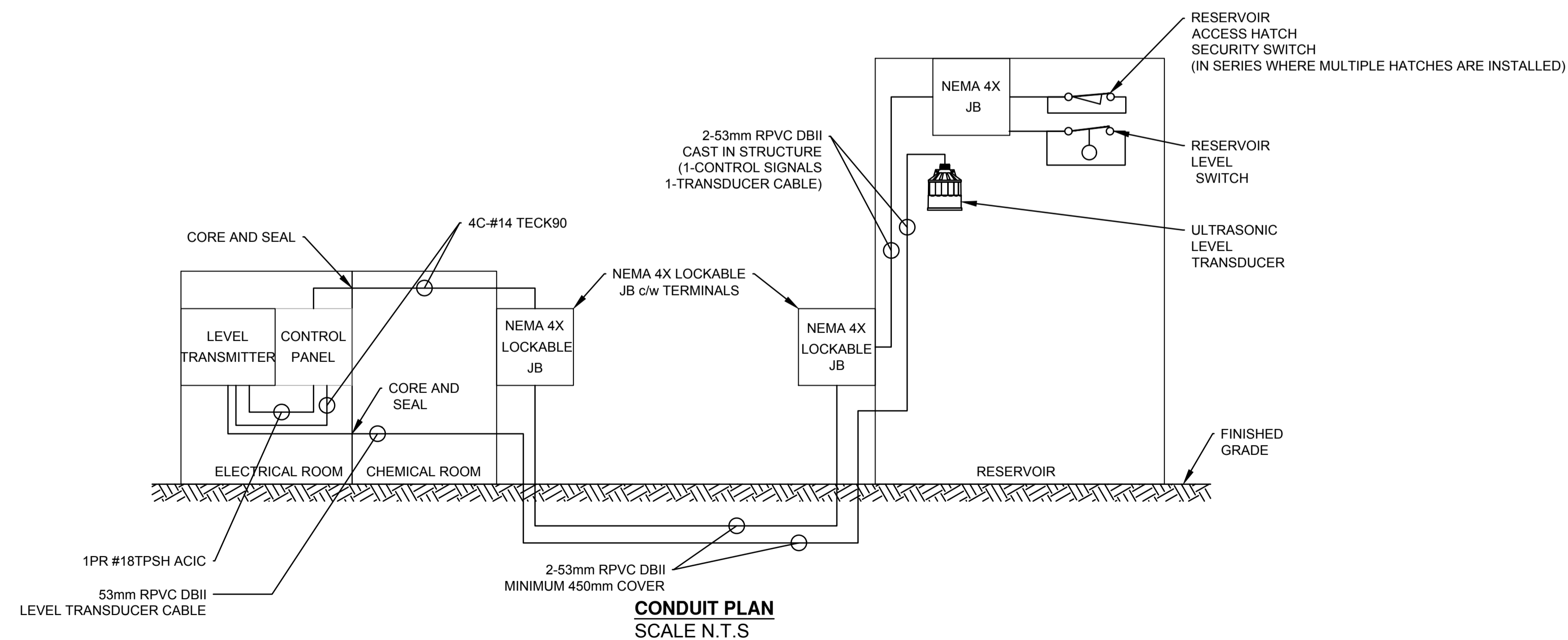
- .1 MAKE GOOD ANY DAMAGES TO EXISTING STRUCTURES AND EQUIPMENT CAUSED BY WORK UNDER THIS CONTRACT, AT NO EXTRA COST TO THE OWNER, EMPLOY QUALIFIED PERSONNEL ONLY.

1.5 IDENTIFICATION

- .1 IDENTIFY ALL EQUIPMENT WITH LAMICOID NAME PLATES. IDENTIFY FEEDERS AND CIRCUIT WIRES AS PER CODE AND CONTRACT REQUIREMENTS.
- .2 PROVIDE LAMICOID NAME PLATE ON THE PANEL COVER TO IDENTIFY THE VOLTAGE AND PANEL NUMBER.

1.6 RECORD DRAWINGS (AS-BUILT)

- .1 OBTAIN A COPY OF CLEAN FULL SIZE DRAWING AND MAKE ALL AS BUILT CHANGES ON CLEAN DRAWING. PROVIDE A COPY OF AS BUILT DRAWINGS TO ENGINEER FOR THE RECORD FILES SUBMIT ALL DRAWINGS TO PROJECT MANAGER AT TIME OF COMPLETION.
- .2 ELECTRICAL TRADE TO PRODUCE AT THEIR OWN EXPENSE A SET OF PROJECT RECORD DOCUMENTS IN ELECTRONIC AND 3 SETS OF HARD COPY PRINTS INCLUDING ALL CHANGES TO THE ORIGINAL TENDER DRAWINGS COVERED BY ADDENDA, CHANGE ORDERS, FIELD CHANGES, JOB CONDITIONS, ETC. AND TURN THESE OVER TO THE ENGINEER. COMPLETED RECORD DRAWINGS TO BE CLEARLY MARKED "RECORD DRAWINGS".
- .3 ALL RECORD DRAWINGS SHALL BE DONE IN AUTOCAD 2014 FORMAT OR NEWER. PROVIDE A CD ROM OF ALL RECORD DRAWINGS TO THE OWNER.
- .4 SHOW ALL MAJOR PULL BOXES, JUNCTION BOXES, CONDUITS AND CIRCUIT NUMBERS ON RECORD DRAWINGS.
- .5 MATERIALS AND INSTALLATION
 - .1 ALL MATERIALS SHALL BE NEW.
 - .2 ALL MATERIALS SHALL BE CSA APPROVED WITH CSA STAMP.
 - .3 ALL INSTALLATION SHALL BE CONSISTENT WITH EXISTING FACILITY INSTALLATION STANDARDS. UTILIZE SAME GRADE OF MATERIALS AS PER EXISTING INSTALLATION.
 - .4 PROVIDE SHOP DRAWINGS FOR ALL NEW EQUIPMENT INSTALLED.
 - .5 EXTEND ALL CONDUITS AND TECK CABLES TO ACCESSIBLE SPACE AS REQUIRED. DO NOT SPLICE NEW CABLES.
 - .6 UNLESS OTHERWISE SPECIFIED, UNIFORMITY OF MANUFACTURE TO BE MAINTAINED FOR ANY PARTICULAR ITEM THROUGHOUT.
 - .7 ONLY CORROSION RESISTANT HARDWARE IS PERMITTED FOR MOUNTING IN THE RESERVOIR.
- .6 SETTING OUT OF THE WORK
 - .1 ELECTRICAL TRADE TO BE RESPONSIBLE FOR CORRECTING ALL WORK COMPLETED CONTRARY TO INTENT OF DRAWINGS AND SPECIFICATIONS AND BEAR ALL COST FOR SAME. WHERE INTENT OF DRAWINGS AND SPECIFICATIONS IS NOT CLEAR, OBTAIN CLARIFICATION BEFORE PROCEEDING WITH WORK.
 - .2 ELECTRICAL TRADE TO GIVE WORK HIS PERSONAL SUPERVISION. LAY OUT HIS OWN WORK. DO ALL NECESSARY LEVELING AND MEASURING OR EMPLOY A COMPETENT ENGINEER TO DO SO. FIGURES, FULL SIZE AND DETAIL DRAWINGS TO TAKE PRECEDENCE OVER SCALE MEASUREMENTS.
 - .3 WHERE ANY EQUIPMENT SUPPLIED BY ELECTRICAL TRADE MUST BE BUILT IN WITH WORK OF OTHER CONTRACTORS, THIS CONTRACTOR TO BE RESPONSIBLE FOR SUPPLYING OF EQUIPMENT TO BE BUILT IN OR MEASUREMENTS TO ALLOW NECESSARY OPENINGS TO BE LEFT SO AS NOT TO HOLD UP WORK.
 - .4 ELECTRICAL TRADE TO BE RESPONSIBLE FOR ANY DAMAGE CAUSED OWNER OR ANY OTHER TRADE BY IMPROPER LOCATION OR CARRYING OUT OF HIS WORK.
 - .5 ELECTRICAL TRADE, IN SETTING OUT OF HIS WORK, TO MAKE REFERENCE TO ARCHITECTURAL, STRUCTURAL AND MECHANICAL DRAWINGS. CONSULT WITH RESPECTIVE TRADES IN SETTING OUT LOCATIONS FOR CONDUIT RUNS, LIGHTING FIXTURES, PANEL ASSEMBLIES, ETC., SO THAT CONFLICTS ARE AVOIDED AND SYMMETRICAL SPACING IS MAINTAINED.



PROJECT

HARVEY TANK REPLACEMENT PROJECT

CLIENT

VILLAGE OF LIONS BAY

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NOTICE:
 THE EXISTENCE, LOCATION AND ELEVATION OF UTILITIES AND/OR CONCEALED STRUCTURES AT THE PROJECT SITE ARE NOT GUARANTEED BY AECOM CANADA LTD.

THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE EXISTENCE, LOCATION AND ELEVATION OF ALL SUCH UTILITIES AND/OR STRUCTURES AND IS RESPONSIBLE FOR NOTIFYING THE APPROPRIATE COMPANY, DEPARTMENT OR PERSON(S) OF ITS INTENTION TO CARRY OUT ITS OPERATIONS.

REGISTRATION



ISSUE/REVISION

I/R	DATE	DESCRIPTION
0	09/21/2018	ISSUED FOR TENDER

KEY PLAN

PROJECT NUMBER

60546407

SHEET TITLE

ELECTRICAL SPECIFICATIONS SHEET 1 OF 2

SHEET NUMBER

E-01-000

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2. GROUNDING

- .1 SUPPLY AND INSTALL COMPLETE GROUNDING SYSTEM AS INDICATED ON DRAWINGS, AND AS REQUIRED BY CANADIAN ELECTRICAL CODE AND ELECTRICAL INSPECTION DEPARTMENT. ALL COMPONENTS TO BE SECURELY AND ADEQUATELY GROUNDED AND WHERE REQUIRED TO ACCOMPLISH THIS, GROUNDING JUMPERS, GROUNDING STUDS AND BUSHINGS TO BE USED.
- .2 PROVIDE A DEDICATED ISOLATED GROUND CONDUCTOR FOR EACH ISOLATED GROUND CIRCUIT.
- .3 PROVIDE ALL BONDING TO NON-ELECTRICAL METALLIC ITEMS AS REQUIRED. BONDING SHALL BE PROVIDED TO ALL ACCESS HATCHES, FENCING, GUARD RAILS, ETC. RELATED TO THE RESERVOIR.
- .4 UNLESS NOTED OTHERWISE, MINIMUM BONDING CONDUCTOR TO BE #6 AWG BARE COPPER.
- .5 UNLESS NOTED OTHERWISE, MINIMUM GROUNDING CONDUCTOR TO BE 2/0 AWG.
- .6 PROVIDE A CONTINUITY TEST FOR BONDING AND GROUNDING CONDUCTORS TO EXISTING MAIN GROUND BUS.

3. SPECIFIC CLAUSES

- .1 POWER AND CABLES
 - .1 ALL INSTALLATION TO BE IN CONDUIT OR TECK90 CABLE AS NOTED.
 - .2 CONDUCTORS USED TO BE COPPER TECK90 600V, MINIMUM #12AWG, EXCEPTION; CONTROL WIRING MINIMUM SIZE #14 TECK90 XLPE
 - .3 ANALOG CABLES SHALL BE TPSH #18 MIN. AND ACIC
 - .4 ALL SENSOR CABLES SHALL BE CONTINUOUS BETWEEN THE SENSOR AND THE KIOSK. CONTRACTOR TO FIELD VERIFY ALL CABLE LENGTHS.
 - .5 PROVIDE A DEDICATED NEUTRAL CONDUCTOR FOR EACH I.G. POWER CIRCUIT.
 - .6 PROVIDE A DEDICATED GROUND CONDUCTOR FOR EACH CIRCUIT.
- .2 SUPPLY AND INSTALL POWER FEEDERS AND CONTROL WIRING TO ACHIEVE THE WIRING CONNECTION SHOWN ON DRAWINGS AND PROVIDE ALL CONNECTORS, JUNCTION BOXES, CABLE SUPPORTS AND ALL ACCESSORIES AS REQUIRED.
- .3 PROVIDE IDENTIFICATION TAG WITH CABLE AND CIRCUIT NUMBER FOR FEEDERS, JUNCTION BOXES AND PANELS. USE P-TOUCH MACHINE TO LABEL WIRING DEVICES AND TERMINATIONS ASSEMBLIES.
- .4 EXACT ROUTING FOR ALL CABLES, CONDUITS AND FEEDERS TO BE CONFIRMED ONSITE TO SUIT SITE CONDITIONS.
- .5 APPROVED TECK 90 CONNECTORS SHALL BE UTILIZED.
- 4. EQUIPMENT INSTALLATION
 - .1 SUPPLY AND INSTALLATION OF PIPING AND EQUIPMENT ANCHORING BY GENERAL CONTRACTOR.
 - .2 MAINTAIN MINIMUM WORKING SPACE AROUND COMPONENTS ACCORDING TO MANUFACTURER'S RECOMMENDATION AND CEC.
 - .3 CONTRACTOR SHALL COORDINATE AND CONDUCT, IN CONJUNCTION WITH ENGINEER AND OWNER THE SITE ACCEPTANCE TESTING. THIS TESTING SHALL CONSIST OF FUNCTIONAL AND OPERATIONAL TESTS, AND COMMISSIONING OF THE OVERALL SYSTEM.
 - .4 CONTRACTOR SHALL ENSURE PROPER INSTALLATION AND DEMONSTRATION OF PROPER OPERATION OF EQUIPMENT.
 - .5 SHOULD SYSTEM FAIL TO MEET TEST REQUIREMENTS, MAKE NECESSARY REPAIRS WITH HELP/ASSISTANCE FROM EQUIPMENT SUPPLIER, AND REPEAT SITE TEST FOR AT LEAST 24 HOUR DURATION.
 - .6 CONTRACTOR SHALL MAINTAIN SITE TEST RECORD LOG/SHEETS WHICH RECORD TEST CONDITIONS AND LOGGED DATA, RECORDING AND TEST RECORDING FORMAT TO BE SUPPLIED BY MANUFACTURER.

5. INSTRUMENTS

- .1 LEVEL INDICATING TRANSMITTER
 - .1 PROVIDE A LEVEL INSTRUMENT SUITABLE FOR DRINKING WATER
 - .2 INSTRUMENT IS SIEMENS MULTIRANGER 200
 - .3 INSTRUMENT SHALL BE PROVIDED WITH 4-20mA SIGNAL
 - .4 INSTRUMENT SHALL HAVE LOCAL INTEGRAL DISPLAY
 - .5 INSTRUMENT SHALL BE PROVIDED WITH REMOTE PROGRAMMING UNIT AND CONFIGURATION SOFTWARE.
- .2 LEVEL SWITCHES
 - .1 PROVIDE LEVEL SWITCHES SUITABLE FOR DRINKING WATER
 - .2 INSTRUMENT IS XYLEM ENM-10
 - .3 PROVIDE FLOAT SWITCH HANGER FOR MAINTENANCE AND EASE OF ACCESS.
- .3 LIMIT SWITCH
 - .1 PROVIDE LIMIT SWITCH ON ACCESS HATCH TO RESERVOIR. WHERE THERE ARE MULTIPLE ACCESS POINTS TO RESERVOIR, PROVIDE LIMIT SWITCH ON EACH ACCESS POINTS, SIGNALS TO BE WIRED IN SERIES.
 - .2 LIMIT SWITCH TO BE ALLEN-BRADLEY 802MC-AY5 C/W STAINLESS STEEL ROD LEVER.

7. SHOP DRAWINGS & MANUALS

- .1 ELECTRICAL TRADE TO SUBMIT TO THE ENGINEER FOR REVIEW, SHOP DRAWINGS OF ELECTRICAL COMPONENTS AS INDICATED.
- .2 ALL DRAWINGS TO BE SUBMITTED IN QUANTITIES OF 5 WITH THREE COPIES WILL BE RETURNED TO THE ELECTRICAL TRADE. SUBMIT ADDITIONAL COPIES FOR APPROVAL AS MAY BE REQUIRED.
- .3 ENGINEER'S REVIEW OF SHOP DRAWINGS TO BE FOR GENERAL DESIGN ONLY AND WILL NOT RELIEVE ELECTRICAL TRADE OR SUPPLIERS FROM RESPONSIBILITY FOR ERRORS, PROPER FITTING, CONSTRUCTION OF WORK AND FURNISHING OF MATERIALS. REVIEW WILL NOT BE CONSTRUED AS APPROVING DEPARTURES FROM CONTRACT DOCUMENT REQUIREMENTS IF SUCH DEPARTURES ARE NOT SPECIFICALLY NOTED. ELECTRICAL TRADE TO BE RESPONSIBLE FOR VERIFYING ALL DIMENSIONS
- .4 UPON COMPLETION OF PROJECT, THREE (3) MAINTENANCE MANUALS SHALL BE SUBMITTED IN 3-RING BINDERS. THE MANUAL SHALL CONSIST OF THE FOLLOWING INFORMATION: DESCRIPTION OF OPERATIONS, SHOP DRAWING OF ALL EQUIPMENT, EXTENDED WARRANTIES, MAINTENANCE AND OPERATION INSTRUCTIONS, LIST OF MANUFACTURER CONTACTS, COPIES OF AS-BUILT DRAWINGS, INSPECTION REPORTS, SEISMIC LETTERS AND APPLICABLE FIRE ALARM VERIFICATION REPORTS.

8. BOXES

- .1 SUPPLY AND INSTALL PULLBOXES AS REQUIRED TO SUIT JOB CONDITIONS. PULLBOXES TO CONFORM TO CANADIAN ELECTRICAL CODE REQUIREMENTS AND BE FINISHED IN ENAMEL OVER CORROSION-RESISTANT PRIMER WITH SCREW-ON OR HINGED COVER. IN REMOVABLE CEILING AREAS, PULLBOXES ARE TO BE INSTALLED ABOVE THE CEILING.
- .2 PROVIDE JUNCTION BOXES AS REQUIRED. PROVIDE TWO NEMA 4X NON-METALLIC JUNCTION BOXES IN RESERVOIR CHAMBER IN CLOSE PROXIMITY TO ACCESS HATCH, BUT NOT IN A LOCATION THAT WILL RESTRICT ACCESS. JUNCTION BOX COVER WILL NOT ATTACH TO BOX WITH SCREWS. THE COVER WILL BE CONNECTED TO THE BOX IN SUCH A WAY THAT, WHEN OPEN, CANNOT FALL INTO RESERVOIR.

9. CONDUIT

- .1 CONDUIT TO BE RIGID THREADED GALVANIZED STEEL, OR WHERE PERMITTED BY CODE AND ELECTRICAL INSPECTION DEPARTMENT, ELECTRIC METALLIC TUBING. UTILIZE RIGID GALVANIZED STEEL CONDUIT FOR ALL EXPOSED RUNS BELOW 7 FEET OF FLOOR. WHERE IN JUDGEMENT BY THE ELECTRICAL INSPECTION AUTHORITY IS SUBJECT TO MECHANICAL DAMAGE.
- .2 SURFACE MOUNTED CONDUITS TO BE INSTALLED PARALLEL TO STRUCTURAL LINES AND WHERE BENDS OCCUR IN PARALLEL RUNS, THEY SHALL BE CONCENTRIC.
- .3 CONDUITS TO BE INSTALLED FREE FROM DENTS AND BRUISES AND HAVE ENDS PLUGGED TO PREVENT ENTRANCE OF DIRT OR MOISTURE.
- .4 ALL CONDUITS, EXCEPT WHERE OTHERWISE TO BE SIZED IN ACCORDANCE WITH CANADIAN ELECTRICAL CODE.
- .5 FLEXIBLE CONDUIT CONNECTIONS TO MOTORS, CONTROL, ETC., TO BE FLEXIBLE PLASTIC JACKETED, SEAL TIGHT OR APPROVED EQUAL. FLEXIBLE CONDUIT CONNECTIONS ARE REQUIRED TO ALL MOTORS FROM STUB-UPS OR JUNCTION BOXES.

13. TESTS

- .1 ALL PORTIONS OF ELECTRICAL WORK TO BE TESTED AND CHECKED FOR SATISFACTORY OPERATION.
- .2 BEFORE ENERGIZING ANY PORTION OF ELECTRICAL SYSTEM, PERFORM MEGGER TESTS ON ALL FEEDERS AND BRANCH CIRCUITS. RESULTS OF SUCH TESTS TO CONFORM TO REQUIREMENTS OF CANADIAN ELECTRICAL CODE AND BE TO SATISFACTION OF AUTHORIZED INSPECTION AGENCY AND THE ENGINEER.
- .3 CONTRACTOR TO PROVIDE RESISTANCE TO EARTH MEASUREMENT.

14. DEMOLITION

- .1 CONTRACTOR TO PROVIDE DEMOLITION OF EXISTING ELECTRICAL SERVICES IN WORK AREA. CONTRACTOR TO TURN OVER TO BUILDING OWNER MATERIALS AS NOTED.
- .2 IN AREAS WHERE DEMOLITION OCCURS AND EXISTING ELECTRICAL SERVICES ARE SHOWN TO REMAIN OR ARE REQUIRED FOR SERVICING OF ADJACENT AREAS, CONTRACTOR TO REROUTE AND REFEED AS REQUIRED TO RECONNECT.
- .3 CONTRACTOR SHALL REMOVE ALL EXISTING UNUSED CONDUIT AND WIRING BACK TO SOURCE.
- .4 CONTRACTOR SHALL REMOVE ALL EXISTING ALL ELECTRICAL DEVICES ON WALLS SLATED FOR DEMOLITION. REFER TO ARCHITECTURAL DEMOLITION DWGS. FOR THE SCOPE OF DEMOLITION.

16. STANDARDS OF MATERIAL AND WORKMANSHIP

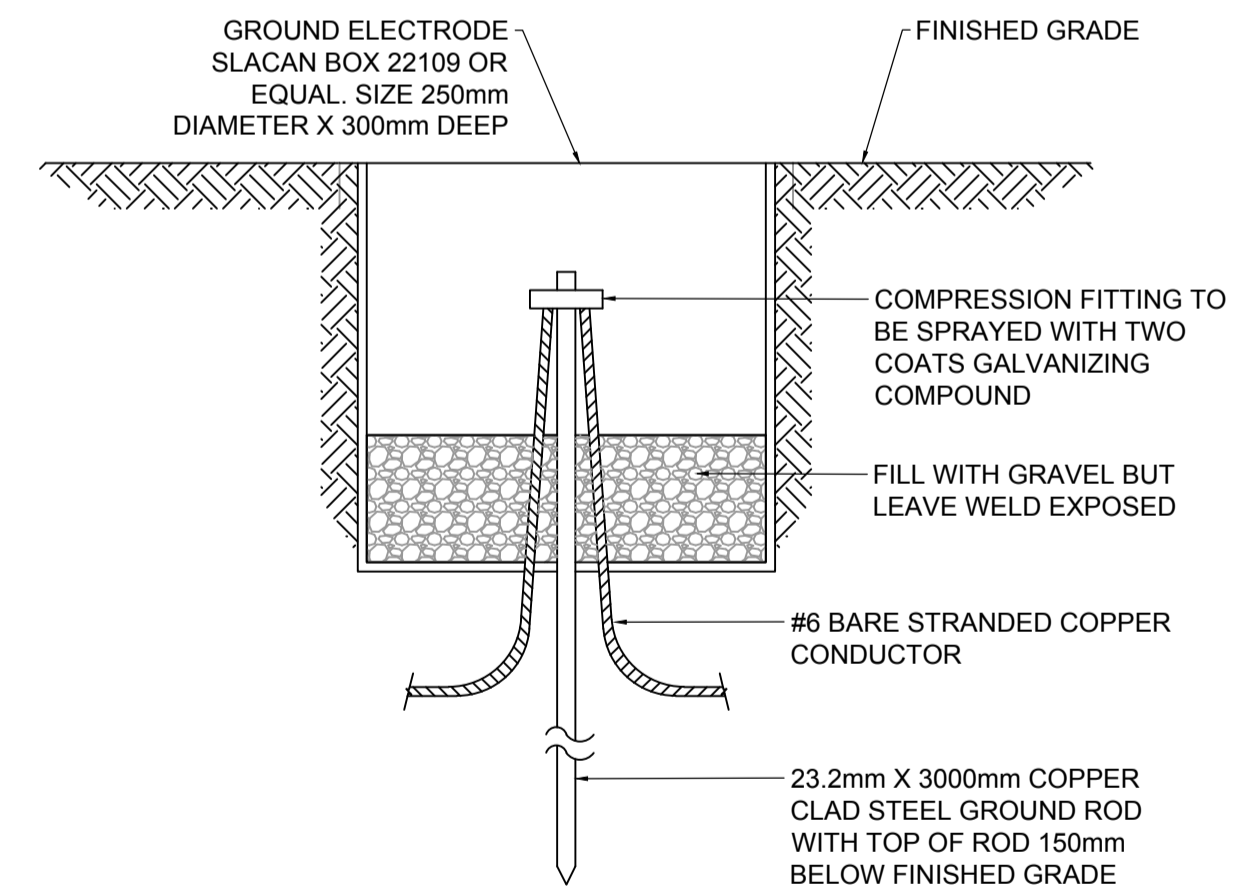
- .1 ALL MATERIALS TO BE NEW AND OF THE QUALITY SPECIFIED AND CONFORM TO THE STANDARDS OF CSA. WHERE EQUIPMENT OR MATERIALS ARE SPECIFIED BY TECHNICAL DESCRIPTION ONLY, THEY SHALL BE OF THE BEST COMMERCIAL QUALITY OBTAINABLE FOR THE PURPOSE.
- .2 ALL WORK TO BE EXECUTED IN A NEAT AND WORKMANLIKE MANNER BY QUALIFIED TRADESMEN. ELECTRICAL TRADE TO KEEP A COMPETENT FOREMAN AND NECESSARY ASSISTANTS ON THE JOB DURING THE PROGRESS OF THE WORK.

17. GENERAL

- .1 COORDINATE AND GET APPROVAL FROM BUILDING OWNER FOR ALL CORING AND CUTTING OF BUILDING STRUCTURE, FIRE STOPPED OPENINGS AFTER INSTALLATION. COORDINATE LOCATION ON SITE PRIOR TO CORING.
- .2 CLEAN UP AND REMOVE ALL UNUSED WIRING AND CONDUITS.
- .3 REWIRE EXISTING LIGHTING AND POWER THAT ARE AFFECTED BY THIS CONSTRUCTION.
- .4 CORE, DRILL AND SAWCUT AS REQUIRED. EXERCISE CARE IN ALL CORING, DRILLING AND SAWCUTTING IN ORDER NOT TO DAMAGE THE STRUCTURAL COMPONENTS IN THE SLAB. X-RAY FOR ALL SUCH WORK AND OBTAIN CONSULTANT'S APPROVAL. WHERE THE SIZE OF SLOTS CANNOT BE ACCOMMODATED DUE TO STRUCTURAL REASONS CUT SMALLER SLOTS WITH AT LEAST SAME AREA. PAY ALL ASSOCIATED FEES.
- .5 ELECTRICAL TRADE AND HIS SUBTRADES TO AT ALL TIMES DURING CONSTRUCTION, KEEP SITE FREE OF ALL DEBRIS, BOXES, PACKING, ETC., RESULTING FROM WORK OF THIS TRADE.
- .6 UPON COMPLETION OF WORK, ELECTRICAL INSTALLATION TO BE LEFT IN A CLEAN AND FINISHED CONDITION TO SATISFACTION OF THE ENGINEER.

18. GUARANTEE WARRANTY

- .1 FURNISH A WRITTEN GUARANTEE WARRANTY COUNTERSIGNED AND GUARANTEED BY GENERAL CONTRACTOR TRADE STATING:
 - .1 THAT ALL WORK EXECUTED UNDER THIS CONTRACT WILL BE FREE FROM DEFECTS OF MATERIAL AND WORKMANSHIP FOR A PERIOD OF 1 YEAR FROM DATE OF FINAL ACCEPTANCE.
 - .2 THE ABOVE PARTIES FURTHER AGREE TO, AT THEIR OWN EXPENSE, REPAIR AND REPLACE ALL SUCH DEFECTIVE WORK AND OTHER WORK DAMAGED THEREBY WHICH FAILS OR BECOMES DEFECTIVE DURING THE TERM OF THE GUARANTEE WARRANTY PROVIDED THAT SUCH FAILURE IS NOT DUE TO IMPROPER USAGE.
 - .3 PERIOD OF THE GUARANTEE SPECIFIED TO IN NO WAY SUPPLANT ANY OTHER GUARANTEE OF A LONGER PERIOD BUT BE BINDING ON WORK NOT OTHERWISE COVERED.



**GROUND ROD DETAIL AND TEST/INSPECTION PIT
SCALE N.T.S**



PROJECT

**HARVEY TANK
REPLACEMENT
PROJECT**

CLIENT

**VILLAGE OF
LIONS BAY**

Village of Lions Bay Municipal Hall
PO Box 141 – 400 Centre Rd
Lions Bay, BC V0N 2E0
(604) 921-9333
www.lionsbay.ca



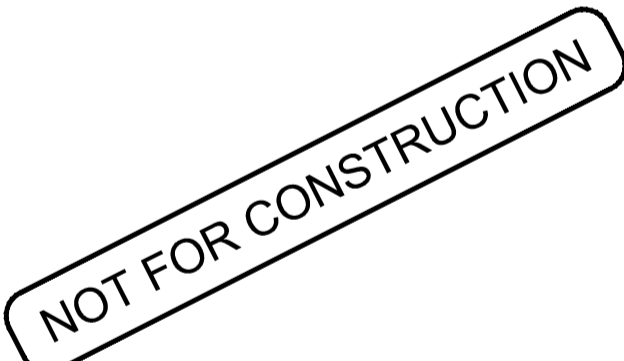
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60546407

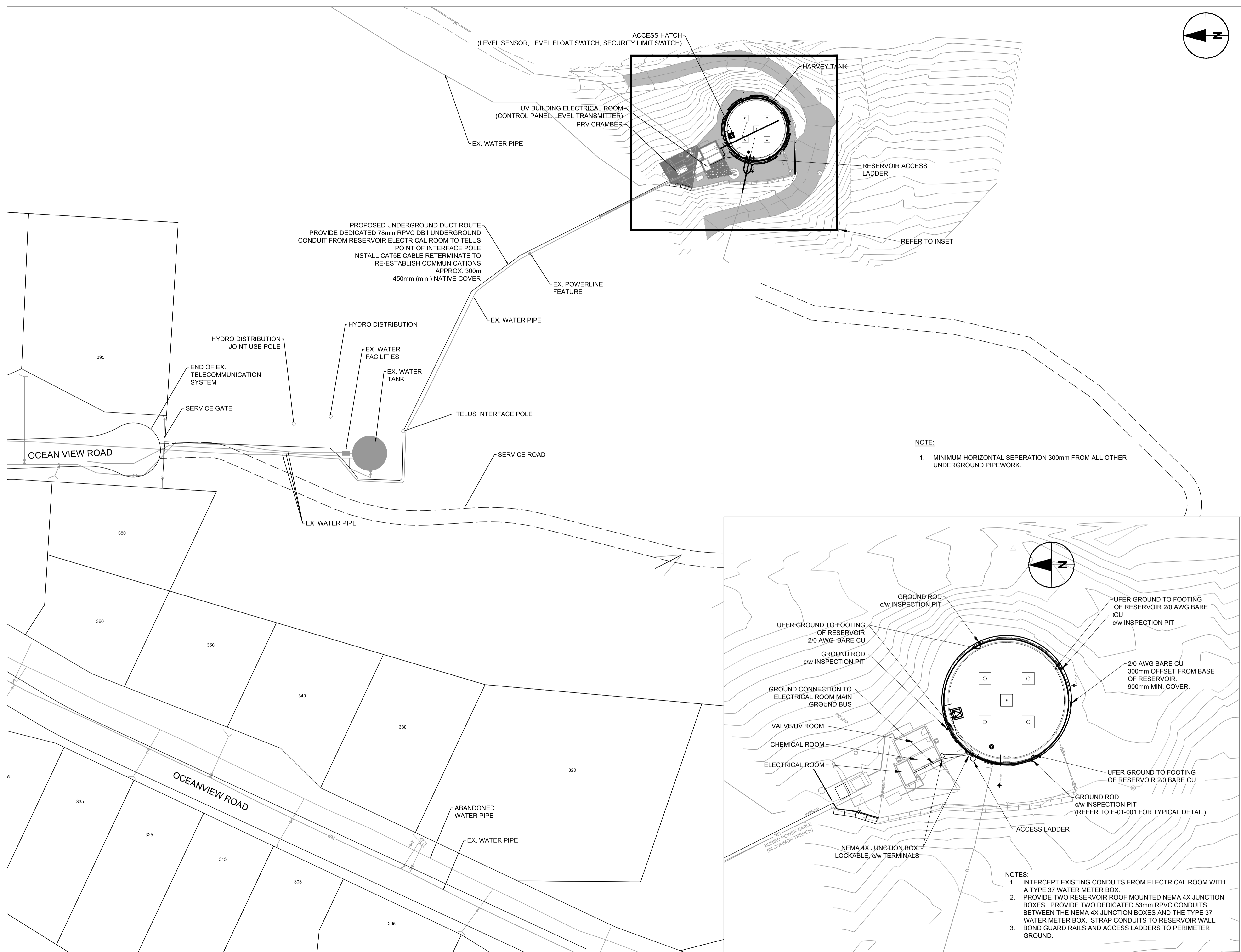
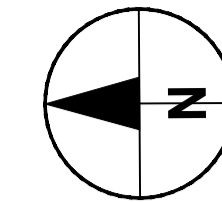
SHEET TITLE

ELECTRICAL SPECIFICATIONS
SHEET 2 OF 2

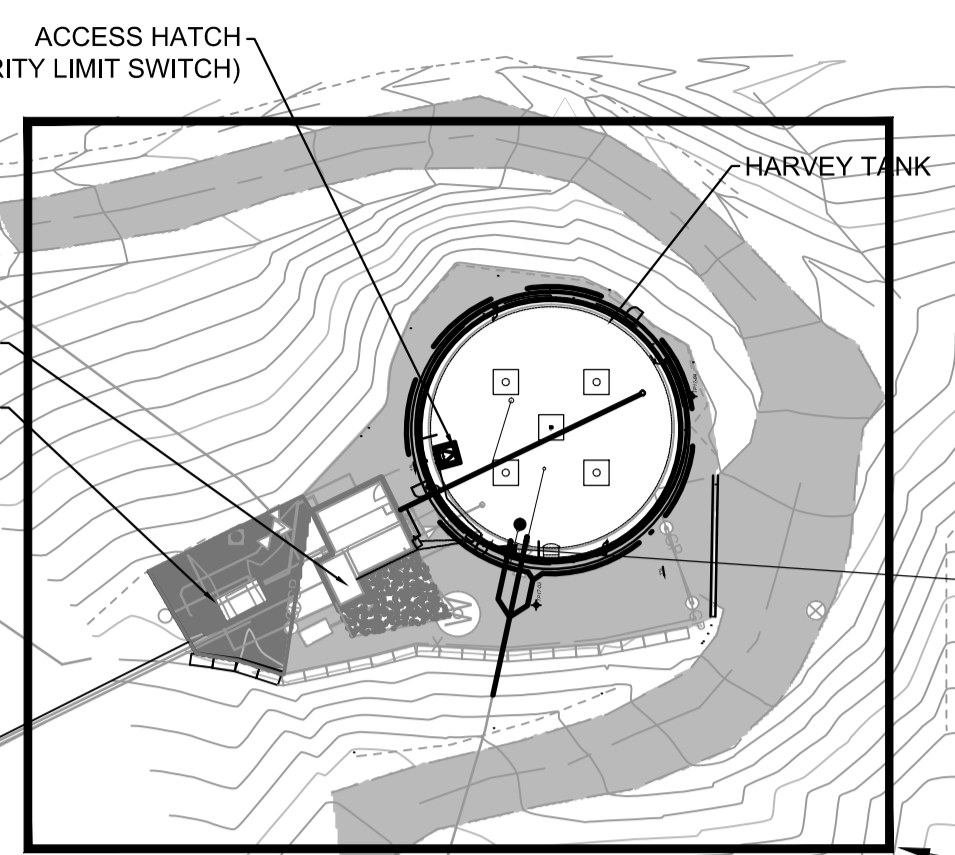
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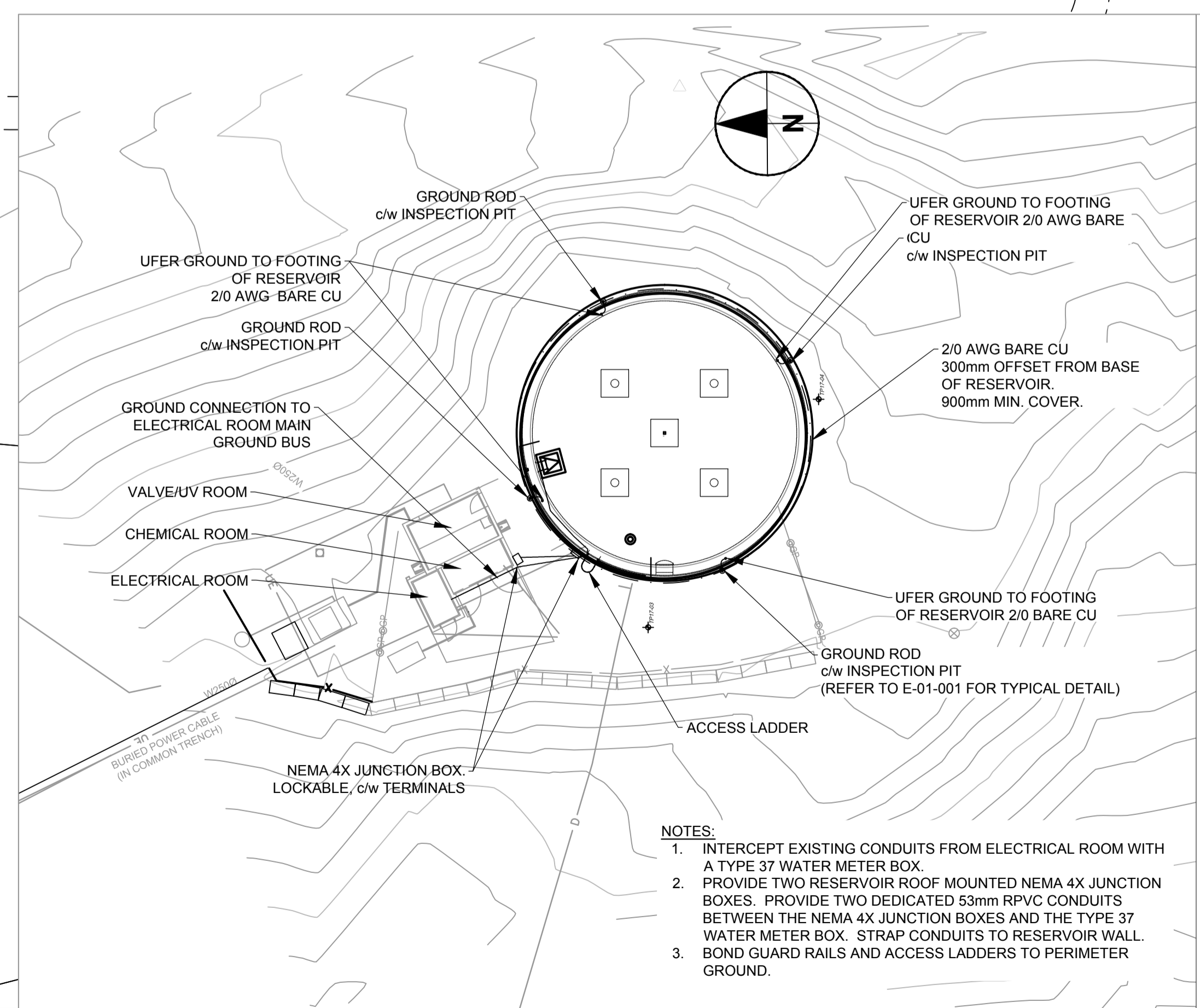
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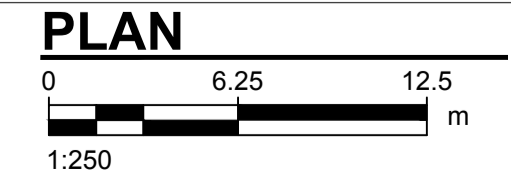
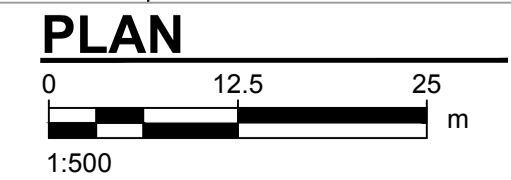
PROPOSED UNDERGROUND DUCT ROUTE
 PROVIDE DEDICATED 78mm RPVC DBII UNDERGROUND
 CONDUIT FROM RESERVOIR ELECTRICAL ROOM TO TELUS
 POINT OF INTERFACE POLE
 INSTALL CAT5E CABLE RETERMINATE TO
 RE-ESTABLISH COMMUNICATIONS
 APPROX. 300m
 450mm (min.) NATIVE COVER



NOTE:
 1. MINIMUM HORIZONTAL SEPERATION 300mm FROM ALL OTHER
 UNDERGROUND PIPEWORK.



NOTES:
 1. INTERCEPT EXISTING CONDUITS FROM ELECTRICAL ROOM WITH
 A TYPE 37 WATER METER BOX.
 2. PROVIDE TWO RESERVOIR ROOF MOUNTED NEMA 4X JUNCTION
 BOXES. PROVIDE TWO DEDICATED 53mm RPVC CONDUITS
 BETWEEN THE NEMA 4X JUNCTION BOXES AND THE TYPE 37
 WATER METER BOX. STRAP CONDUITS TO RESERVOIR WALL.
 3. BOND GUARD RAILS AND ACCESS LADDERS TO PERIMETER
 GROUND.



PROJECT
**HARVEY TANK
 REPLACEMENT
 PROJECT**

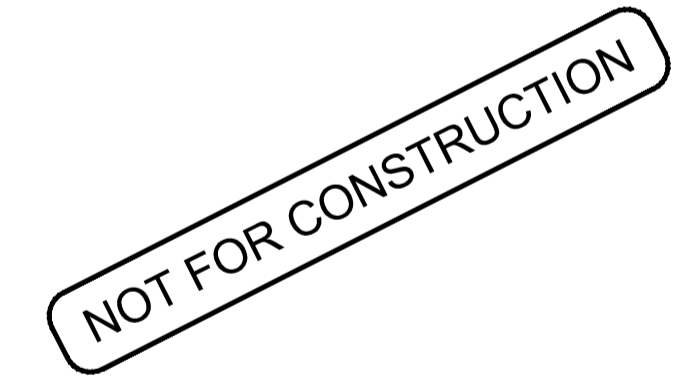
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KEY PLAN

PROJECT NUMBER
 60546407
SHEET TITLE
 HARVEY TANK
 SERVICING PLAN
SHEET NUMBER
 E-01-200

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