

THE CITY OF WILLOUGHBY LAKESHORE EAST EQUALIZATION BASIN PHASE II LAKE COUNTY, OHIO

CITY OF WILLOUGHBY OFFICIALS:

MAYOR	ROBERT FIALA
SERVICE DIRECTOR	RICH PALMISANO
FINANCE DIRECTOR	CHER HOFFMAN
LAW DIRECTOR	MIKE LUCAS

CITY OF EASTLAKE OFFICIALS:

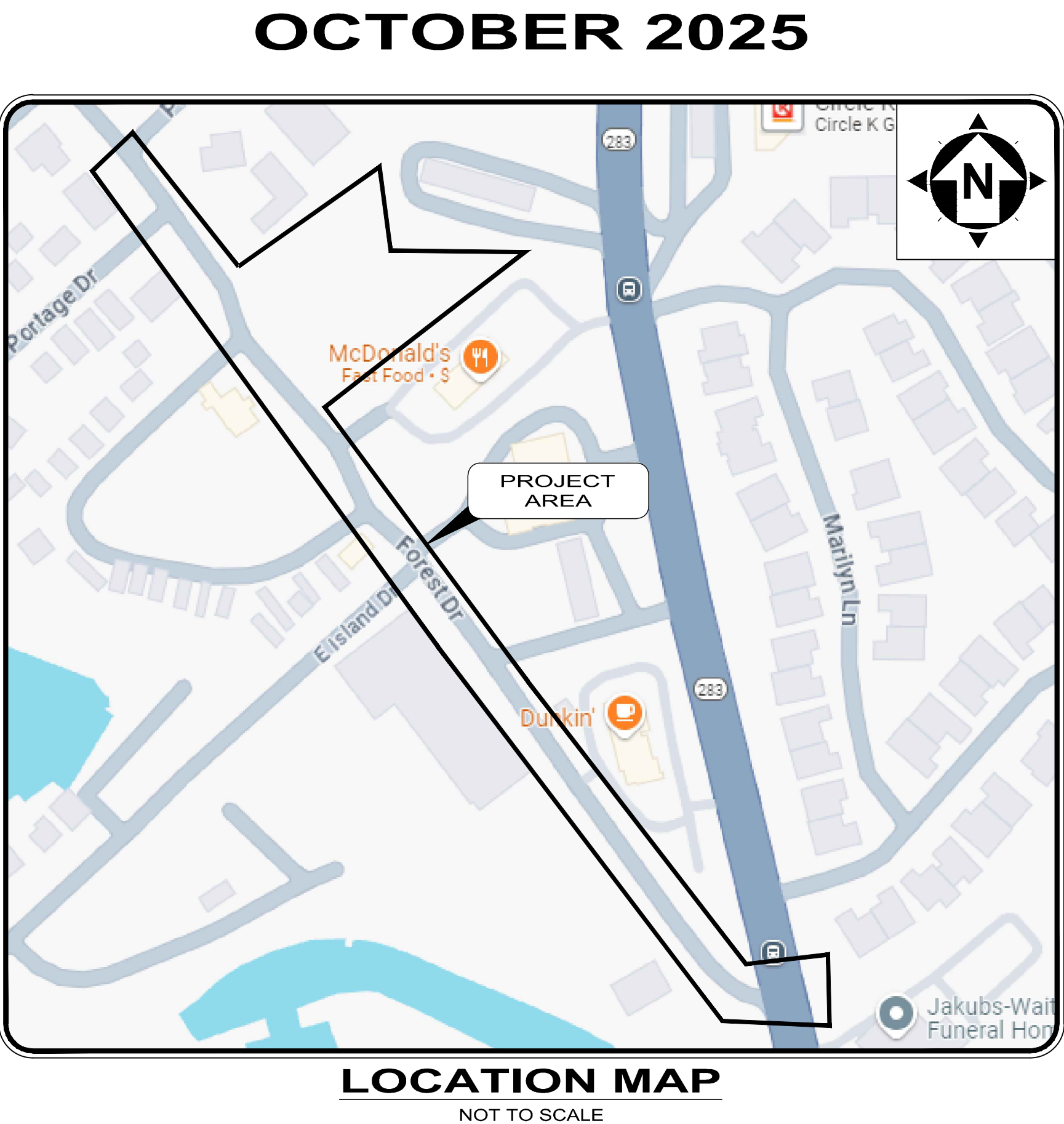
MAYOR	JIM OVERSTREET
SERVICE DIRECTOR	ROBERT GORENTZ
FINANCE DIRECTOR	CAROL-ANN SCHINDEL, CPA

CITY OF WILLOUGHBY COUNCIL:

WARD 1	KRISTIE SIEVERS
WARD 2	KEN J. KARY
WARD 3 / VICE PRESIDENT	JOHN TOMASELLI
WARD 4 / PRESIDENT OF COUNCIL	ROBERT E. CARR
WARD 5	MIKE L. MERHAR
WARD 6	DANIEL J. GARRY
COUNCIL AT LARGE	DANIEL J. ANDERSON

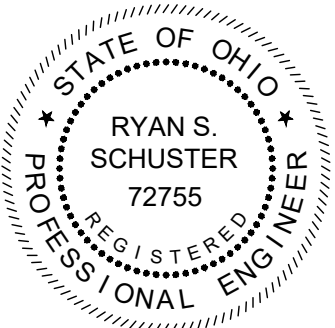
CITY OF EASTLAKE COUNCIL:

WARD 1 / PRESIDENT OF COUNCIL	JAMES OVERSTREET
WARD 2 / VICE PRESIDENT	JOHN MEYERS
WARD 3	JASON KASUNICK
WARD 4	DANYIELL KOSTELNIK
COUNCIL AT LARGE	ANGELA R. SCHMIDT
COUNCIL AT LARGE	CHRIS KRAJNYAK
COUNCIL AT LARGE	MICHAEL D. SEMICK



ENGINEER:

VERDANTAS, LLC
8150 STERLING COURT
MENTOR, OHIO 44060



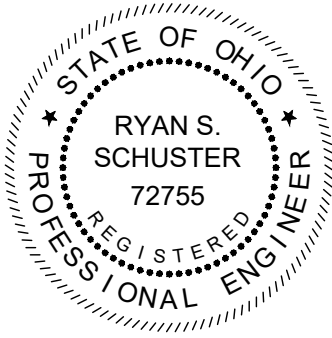
- UNDERGROUND BUILDING SERVICE UTILITY LINES ARE NOT SHOWN ON THE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING, MAINTAINING AND REPLACING AS NECESSARY TO ENSURE CONTINUAL SERVICE TO BUILDINGS.
- THE CONTRACTOR IS RESPONSIBLE TO CALL OHIO UTILITIES PROTECTION SERVICE @ 1-800-362-2764, THREE WORKING DAYS PRIOR TO CONSTRUCTION.

ENGINEER'S PROJECT No.230264

Ryan S. Schuster
RYAN SCHUSTER, P.E.

P.E. No. 72755

10/3/2025
DATE



ISSUED FOR:	REVIEW	NO	REVISION	DATE
ISSUE DATE:	10/3/2025			
SCALE:	AS NOTED			
DESIGNED BY:	CAS			
DRAWN BY:	CAS			
CHECKED BY:	RSS			

CITY OF WILLOUGHBY LAKE COUNTY	WILLOUGHBY, OHIO
LAKESHORE EAST EQ BASIN PHASE II	
GENERAL - 00 SERIES COVER SHEET	

PROJECT NO. 230264	
DISCIPLINE GENERAL	
SHEET NAME 00-G-01	
SHEET 1	OF 48

EXISTING SYMBOLS	
SANITARY MANHOLE	
SANITARY CLEANOUT	
SANITARY LINE CAP	
SANITARY LINE PAINT MARKING	
SANITARY STRUCTURE NUMBER	
SANITARY VENT PIPE	
STORM MANHOLE (SOLID LID)	
STORM MANHOLE (OPEN GRATE)	
CURB INLET	
CURB INLET (DOUBLE)	
CATCH BASIN	
CATCH BASIN (ROUND LID)	
CATCH BASIN (DOME)	
CATCH BASIN (SIDE INLET)	
DRAIN	
DOWNSPOUT	
STORM CLEANOUT	
STORM LINE CAP	
STORM ENDWALL	
STORM HEADWALL	
STORM LINE PAINT MARKING	
STORM STRUCTURE NUMBER	
ROCK CHANNEL PROTECTION	
SURFACE DRAINAGE FLOW	
STORM FLOOD ROUTING ARROW	
FIRE HYDRANT	
WATER SIAMESE CONNECTION	
WATER VALVE	
WATER VALVE BOX	
WATER METER	
WATER METER PIT	
WATER LINE REDUCER	
WATER LINE CAP	
WATER LINE PLUG	
WATER WELL	
WATER LINE PAINT MARKING	
WATER LINE MARKER	
POST INDICATOR VALVE	
WATER MANHOLE	
WATER CORPORATION STOP	
WATER FLUSHING ASSEMBLY	
WATER FIXTURE	
WATER FITTING (TEE)	
WATER FITTING (CROSS)	
WATER FITTING (45° WYE)	
WATER FITTING (11.25°)	
WATER FITTING (22.50°)	
WATER FITTING (45°)	
WATER FITTING (90°)	
IRRIGATION SPRINKLER HEAD	
IRRIGATION CONTROL BOX	
IRRIGATION BOX	
STEAM MANHOLE	
STEAM VENT	
COMBINED SEWER MANHOLE	
GAS LIGHT POST (YARD)	
GAS MANHOLE	
GAS VALVE	
GAS VALVE BOX	
GAS _____	
GAS METER	
GAS REGULATOR	
GAS VENT PIPE	
GAS LINE MARKER	
GAS LINE PAINT MARKING	
GAS LINE FIXTURE	
GAS _____	
ELECTRIC LIGHT POST (YARD)	
ELECTRIC MANHOLE	
ELECTRIC PULL BOX	
ELECTRIC CONTROL BOX	
ELECTRIC JUNCTION BOX	
ELECTRIC VAULT BOX	
ELECTRIC METER	
ELECTRIC PEDESTAL	
ELECTRIC RISER BOX	
ELECTRIC TRANSFORMER	
ELECTRIC HVAC UNIT	
ELECTRIC GROUND LIGHT	
ELECTRIC LINE PAINT MARKING	
CABLE TV MANHOLE	
CABLE TV PEDESTAL	
CABLE TV SATELLITE DISH	
CABLE TV PAINT MARKING	

EXISTING SYMBOLS	
TELEPHONE MANHOLE	
TELEPHONE PULL BOX	
TELEPHONE PEDESTAL	
TELEPHONE RISER BOX	
TELEPHONE LINE PAINT MARKING	
TELEPHONE PAY PHONE	
FIBER OPTIC CABLE MANHOLE	
FIBER OPTIC CABLE PAINT MARKING	
FIBER OPTIC CABLE MARKER	
TRAFFIC CONTROL MANHOLE	
TRAFFIC CONTROL BOX	
TRAFFIC CONTROL PAINT MARKING	
TRAFFIC PULL BOX	
TRAFFIC SIGNAL PEDESTAL	
UNKNOWN, PULL BOX	
UNKNOWN, CLEANOUT	
UNKNOWN, MANHOLE	
UNKNOWN, VALVE	
UNKNOWN, PEDESTAL	
UNKNOWN, UTILITY END NOT LOCATED	
MONITORING WELL	
TEST WELL	
WATER WELL	
SOIL BORING	
SWAMP	
POLE, ELECTRIC	
POLE, TELEPHONE	
POLE, LIGHT	
POLE, LIGHT, DECORATIVE	
POLE, LIGHT-OVERHEAD	
POLE, CABLE TV	
POLE, UTILITY	
POLE, GENERAL	
POLE, TRAFFIC CONTROL	
POLE, GUY	
POLE, BRACE	
POLE, ELECTRIC/TELEPHONE	
POLE, ELECTRIC W/LIGHT	
POLE, ELECTRIC/CABLE TV	
POLE, ELECTRIC/TELEPHONE/LIGHT	
POLE, ELECTRIC/TELEPHONE/CABLE TV	
POLE, ELEC./TELE./LIGHT/CABLE TV	
POLE, TELEPHONE/LIGHT	
POLE, TELEPHONE/CABLE TV	
POLE, TELEPHONE/LIGHT/CABLE TV	
POLE, CABLE TV W/LIGHT	
POLE, GUY WIRE	
SIGN	
SIGN, DOUBLE-SIDED	
SIGN, DUAL POST	
SIGN, RAILROAD	
POST	
BOLLARD	
DELINEATOR POST	
PARKING BUMPER BLOCK	
HANDICAP PARKING SYMBOL	
HANDICAP PARKING SYMBOL	
HANDICAP DETECTABLE WARNING	
MAILBOX	
PAPERBOX	
PARKING METER	
GRAVE HEADSTONE	
EX. BARBEQUE GRILL	
VACUUM	
FUEL PUMP	
FLAG POLE	
RAISED PAVEMENT MARKER	
GUARDRAIL, CENTER POST	
GUARDRAIL, TERMINAL POST	
GUARDRAIL, BOTTOM POST	
GUARDRAIL, TOP POST	
FENCE POST	
PICNIC TABLE	
BENCH	
DECIDUOUS TREE	
EVERGREEN TREE	
STUMP	
BUSH	

EXISTING SYMBOLS	
PVMT. MARKING, LANE ARROW	
PVMT. MARKING, LANE ARROW	
PVMT. MARKING, LANE ARROW	
PVMT. MARKING, LANE ARROW	
PVMT. MARKING, LANE ARROW	
PVMT. MARKING, BICYCLE LANE	
PVMT. MARKING, SYMBOL	
PVMT. MARKING WORD, BICYCLE	
PVMT. MARKING WORD, LANE	
PVMT. MARKING WORD, ONLY	
PVMT. MARKING WORD, RAILROAD	
PVMT. MARKING WORD, SCHOOL	
IRON PIN FOUND	
SOLID IRON PIN FOUND	
IRON PIPE FOUND	
DRILL HOLE FOUND	
CHISELED "X" FOUND	
MONUMENT BOX FOUND	
MONUMENT CONCRETE FOUND	
MONUMENT RIGHT-OF-WAY FOUND	
PK NAIL FOUND	
MAG NAIL FOUND	
SPIKE FOUND	
HUB FOUND	
AXLE FOUND	
WOOD POST FOUND	
CORNER STONE FOUND	
AERIAL TARGET FOUND	
GPS CONTROL FOUND	
BENCHMARK FOUND	

PROPOSED SYMBOLS	
SANITARY MANHOLE	
SANITARY MANHOLE, ADJUST	
SANITARY CLEANOUT	
SANITARY LINE CAP	
SANITARY STRUCTURE NUMBER	
SANITARY VENT PIPE	
STORM MANHOLE (SOLID GRATE)	
STORM MANHOLE (OPEN GRATE)	
STORM MANHOLE, ADJUST	
CURB INLET	
CURB INLET (DOUBLE)	
CURB INLET, ADJUST	
CURB INLET (DOUBLE), ADJUST	
CATCH BASIN	
CATCH BASIN (SOLID)	
CATCH BASIN, ADJUST	
CATCH BASIN (SIDE INLET)	
DRAIN	
DOWNSPOUT	
STORM CLEANOUT	
STORM LINE CAP	
STORM HEADWALL	
STORM STRUCTURE NUMBER	
ROCK CHANNEL PROTECTION	
SURFACE DRAINAGE FLOW	
SURFACE DRAINAGE FLOW	
STORM FLOOD ROUTING ARROW	
FIRE HYDRANT	
FIRE HYDRANT, ADJUST	
WATER SIAMESE CONNECTION	
WATER VALVE	
WATER VALVE BOX	
WATER METER	
WATER LINE REDUCER	
WATER LINE CAP	
WATER LINE PLUG	
WATER WELL	
WATER LINE MARKER	
POST INDICATOR VALVE	
WATER MANHOLE	
WATER CORPORATION STOP	
WATER FLUSHING ASSEMBLY	
WATER FITTING (TEE)	
WATER FITTING (CROSS)	
WATER FITTING (45° WYE)	
WATER FITTING (11.25°)	
WATER FITTING (22.50°)	
WATER FITTING (45°)	
WATER FITTING (90°)	
IRRIGATION SPRINKLER HEAD	
IRRIGATION CONTROL BOX	
WATER METER	
GAS LIGHT POST (YARD)	
GAS MANHOLE	
GAS VALVE	
GAS METER	
GAS REGULATOR	
GAS VENT PIPE	
ELECTRIC LIGHT (GROUND)	
ELECTRIC LIGHT POST (YARD)	
ELECTRIC MANHOLE	
ELECTRIC MANHOLE, ADJUST	
ELECTRIC PULL BOX	
ELECTRIC CONTROL BOX	
ELECTRIC JUNCTION BOX	
ELECTRIC VAULT BOX	
ELECTRIC METER	
ELECTRIC PEDESTAL	
ELECTRIC TRANSFORMER	
ELECTRIC AIR CONDITION UNIT	
POLE, ELECTRIC	
POLE, TELEPHONE	
POLE, LIGHT	
POLE, LIGHT, DECORATIVE	
POLE, LIGHT-OVERHEAD	
POLE, CABLE TV	
POLE, UTILITY	
POLE, GENERAL	

PROPOSED SYMBOLS	
POLE, TRAFFIC CONTROL	
POLE, GUY	
POLE, BRACE	
POLE, ELECTRIC/TELEPHONE	
POLE, ELECTRIC W/LIGHT	
POLE, ELECTRIC/CABLE TV	
POLE, ELEC./TELE./LIGHT	
POLE, ELEC./TELE./CABLE TV	
POLE, TELEPHONE/LIGHT	
POLE, TELEPHONE/CABLE TV	
POLE, TELE./LIGHT/CABLE TV	
POLE, CABLE TV W/LIGHT	
POLE, FLAG	
GUY WIRE	
POST, SIGN (SINGLE SIDED)	
POST, SIGN (DOUBLE SIDED)	
POST, SIGN (DUAL POST)	
POST (GENERAL)	
BOLLARD	
DELINEATOR POST	
FENCE POST	
PARKING COUNT	
PARKING BUMPER BLOCK	
HANDICAP PARKING SYMBOL	
HANDICAP DETECTABLE WARNING	
MAILBOX	
PAPERBOX	
PARKING METER	
STREET SIGN	
TELEPHONE MANHOLE	
TELEPHONE MANHOLE (ADJ)	
TELEPHONE PEDESTAL	
CABLE MANHOLE	
CABLE MANHOLE (ADJUSTED)	
CABLE PEDESTAL	
CABLE SATELLITE	
TRAFFIC CONTROL MANHOLE	
TRAFFIC CONT. MANHOLE (ADJ)	
TRAFFIC CONTROL BOX	
TRAFFIC PULL BOX	
TRAFFIC SIGNAL PEDESTAL	
INLET PROTECTION	
STRAW BALE CHECK DAM	
TREE (DECIDUOUS)	
TREE (EVERGREEN)	
BUSH	
PVMT. MARKING, LANE ARROW	
PVMT. MARKING, LANE ARROW	
PVMT. MARKING, LANE ARROW	
PVMT. MARKING, LANE ARROW	
PVMT. MARKING, LANE ARROW	
PVMT. MARKING, LANE ARROW	
PVMT. MARKING, LANE ARROW	
PVMT. MARKING, CHEVRON	
PVMT. MARKING, ONE WAY	
PVMT. MARKING WORD, LANE	
PVMT. MARKING WORD, ONLY	
PVMT. MARKING WORD, RAILROAD	
PVMT. MARKING WORD, SCHOOL	

ABBREVIATIONS	
ABANDONED	ABAN.
ADJUST	ADJ.
AGGREGATE	AGG.
ASBESTOS PIPE	ASB.
ASPHALT	ASPH.
BACK TO BACK	B/B
BASEMENT FLOOR ELEVATION	BFE
BETWEEN	BTW.
BOTTOM OF CURB ELEVATION	BC
BOTTOM OF FOOTING ELEVATION	FTG.
BOTTOM OF WALL ELEVATION	BWE
BUILDING	BLDG.
BULKHEAD	BHD.
CABLE TELEVISION	CATV
CAST IRON PIPE	CIP
CATCH BASIN	CB
CENTERLINE	C/L
CENTER TO CENTER	C/C
CHAIN LINK FENCE	CLF
CHEMICAL STABILIZATION	CHEM. STABL.
CONCENTRIC	CON.
CONCRETE	CONC.
CONNECTION	CONN.
CONTROL JOINT	CJ
COPPER PIPE	COP.
CORRUGATED METAL PIPE	CMP
DEMOLITION	DEMO.
DEPRESSED	DEP.
DOWNSPOUT	DS
DROP MANHOLE	DMH
DUCTILE IRON PIPE	DIP
DUMPSTER	DUMP.
ECCENTRIC	ECC.
EDGE OF PAVEMENT ELEVATION	EP
ELECTRIC	ELEC.
ENCLOSURE	ENCL.
EXISTING	EX.
FACE TO FACE	F/F
FINISHED FLOOR ELEVATION	FFE
FIRE HYDRANT	FH
FOUNDATION	FNDN.
FULL DEPTH RECLAMATION	FDR
FUTURE	FUT.
GAS	G
GALVANIZED PIPE	GP
GRADE BREAK ELEVATION	GB
GRAVEL	GVL.
GROUND ELEVATION	GND.
GUTTER ELEVATION	GUT.
HANDICAP (E.G. ACCESSIBLE)	HC
HIGH-DENSITY POLYETHYLENE PIPE	HDPE
HIGH POINT ELEVATION	HP
HORIZONTAL	HOR.
INSTALL	INSTL.
IRRIGATION	IRR.
JOINT	JT
JOINT FILLER	JF
JUNCTION	JCT.
KNOCKOUT	KO
LATERAL	LAT.
LOW POINT ELEVATION	LP
MAINTAIN	MAINT.
MATERIAL	MATL.
MOUNTED	MTD.
MISCELLANEOUS	MISC.
NOT TO SCALE	N.T.S.
ORNAMENTAL	ORN.
OUT TO OUT	O/O
OVERHEAD	OH
OXYGEN LINE	O
PARKING	PKG.
PAVEMENT	PVMT.
PEDESTAL	PED.
PERFORATE	PERF.
PIPE INVERT ELEVATION	INV.
POLYVINYL CHLORIDE PIPE	PVC
PREFORMED JOINT FILLER	PJF
PROPOSED	PR.
PULL BOX	PB
RAILROAD	RR
REINFORCED	REINF.
REINFORCED CONCRETE PIPE	RCP
REMOVE	RMV.
RETAINING WALL	RET.WALL

ABBREVIATIONS	
ROOF LEADER	RL
SALVAGE	SALV.
SANITARY SEWER	SAN.
SERVICE	SERV.
SLEEVE	SLV.
STABILIZATION	STABL.
STEAM PIPE	STEA.
STEEL PIPE	STL.
STORM SEWER	STM.
SUMP PUMP	SP
TELEPHONE	TEL.
TEMPORARY	TEMP.
THICKENED	THK.
TOP OF CURB ELEVATION	TC
TOP OF HEADWALL ELEVATION	THW
TOP OF STRUCTURE ELEVATION	RIM
TOP OF WALL ELEVATION	TW
TRENCH DRAIN	TD
TYPICAL	TYP.
UNDERDRAIN	UD
UNDERGROUND	UG
VERTICAL	VERT.
VITRIFIED CLAY PIPE	VCP
WATER MAIN	W.
WINDOW ELEVATION	WIN.
WIRE MESH	WM
WOOD	WD.
YARD HYDRANT	YH

STATE OF OHIO
REGISTERED
PROFESSIONAL ENGINEER
RYAN S. SCHUSTER
72755

verdantas

8150 STERLING COURT
MENTOR, OHIO 44060
(440) 951-9000

ISSUED FOR:	REVIEW	NO	REVISION	DATE
	10/3/2025			
SCALE:	N/A			
DESIGNED BY:	ELE			
DRAWN BY:	ELE			
CHECKED BY:	RSS			

CITY OF WILLOUGHBY
LAKESHORE EAST EQ BASIN
LAKE COUNTY

WILLOUGHBY, OHIO
PHASE II

GENERAL - 00 SERIES
SITE LEGEND

PROJECT NO.
230264

DISCIPLINE
GENERAL

SHEET NAME
00-G-03

SHEET
3

GENERAL

1.

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REVIEW THE PLANS AND TECHNICAL SPECIFICATIONS, VISIT THE PROJECT SITE AND NOTIFY IN WRITING THE PROJECT ENGINEER OF ANY DISCREPANCIES IN THE PLANS OR SPECIFICATIONS PRIOR TO CONSTRUCTION.
2.

ANY REVISIONS TO THE ACCEPTED CONSTRUCTION PLANS SHALL BE REVIEWED AND APPROVED BY THE ENGINEER PRIOR TO IMPLEMENTATION IN THE FIELD.
3.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING A CURRENT SET OF "AS BUILT" DRAWINGS.
4.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION LAYOUT AND SHALL NOTIFY ENGINEER IN WRITING OF ANY DISCREPANCIES.
5.

NO WORK MAY COMMENCE WITHOUT AN EXECUTED NOTICE TO PROCEED.
6.

THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR COMPLYING WITH OSHA SAFETY REQUIREMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF ALL VISITORS, EMPLOYEES AND WORKERS ON THE CONSTRUCTION SITE.
7.

THE CONTRACTOR SHALL CONSTRUCT THIS PROJECT IN COMPLIANCE WITH FEDERAL, STATE AND LOCAL BUILDING CODES.
8.

ALL SEDIMENT AND EROSION CONTROL PRACTICES SHALL BE INSTALLED PRIOR TO ANY MAJOR SOIL DISTURBANCE, IN THEIR PROPER SEQUENCE, AND MAINTAINED UNTIL PERMANENT PROTECTION IS ESTABLISHED.
9.

ANY DISTURBED AREAS NOT SCHEDULED FOR CONSTRUCTION ACTIVITIES WITHIN SEVEN DAYS OF DISTURBANCE SHALL BE TEMPORARILY STABILIZED.
10.

ALL POLLUTANTS OTHER THAN SEDIMENT THAT OCCUR ON-SITE DURING CONSTRUCTION SHALL BE HANDLED AND LEGALLY DISPOSED OF IN A MANNER THAT DOES NOT CAUSE CONTAMINATION OF STORM OR SURFACE WATERS. POLLUTANTS OF CONCERN INCLUDE, BUT ARE NOT LIMITED TO, FUELS, LUBRICANTS, SOLVENTS, CONCRETE BI-PRODUCTS AND CONSTRUCTION MATERIALS.
11.

THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE SECURITY OF ALL STORED MATERIALS ON OWNER'S SITE.
12.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR BARRICADING AND/OR FENCING AREAS THAT ARE DEEMED UNSAFE BY OWNER, ENGINEER.
13.

THE CONTRACTOR SHALL COORDINATE WITH OWNER THE STORAGE OF STORED MATERIALS AND REMOVED EXISTING EQUIPMENT TO BE RETAINED.
14.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN PEDESTRIAN, LOCAL ROADWAY AND DRIVEWAY ACCESS AT ALL TIMES.
15.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION SIGNING AND TRAFFIC CONTROL AS DIRECTED BY THE LOCAL MUNICIPALITY. ALL SIGNS AND MATERIAL USED SHALL CONFORM TO THE SPECIFICATIONS SET FORTH IN THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
16.

THE CONTRACTOR SHALL PROVIDE A PRE-CONSTRUCTION VIDEO TAPE SURVEY OF THE ENTIRE PROJECT AREA. ALL COSTS ASSOCIATED FOR THIS WORK, INCLUDING THE VIDEO TAPE SURVEY, SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR MOBILIZATION, AS PER PLAN.
17.

THE CONTRACTOR IS RESPONSIBLE FOR SECURING THE SITE AT ALL TIMES DURING WORK. SITE SHALL BE SECURE EVEN AT TIMES OF NO WORK.
18.

ROOF DRAINS, FOUNDATION DRAINS, AND OTHER CLEAN WATER CONNECTIONS TO THE SANITARY SEWER SYSTEM ARE PROHIBITED.
19.

THE PROJECT IS FEDERALLY FUNDED AND MUST FOLLOW FEDERAL PROCUREMENT AND PREVAILING WAGE REQUIREMENTS. THE CONTRACTOR IS SOLELY RESPONSIBLE TO MEET THESE REQUIREMENTS AS DETAILED IN THE BID AND CONTRACT DOCUMENTS.
20.

BOOSTER PUMPS SHALL NOT BE PROVIDED ON WATER SERVICES.

UNDERGROUND UTILITIES

1.

THE CONTRACTOR SHALL NOTIFY UTILITY COMPANIES AT LEAST THREE (3) WORKING DAYS, EXCLUDING SATURDAYS, SUNDAYS AND LEGAL HOLIDAYS, PRIOR TO CONSTRUCTION TO HAVE UTILITIES STAKED, MARKED OR OTHERWISE DESIGNATED IN THE CONSTRUCTION AREA IN SUCH A MANNER OR LOCATING SHALL BE COORDINATED TO STAY APPROXIMATELY THREE (3) DAYS AHEAD OF THE PLANNED CONSTRUCTION.
2.

THE CONTRACTOR SHALL EXPOSE ALL UTILITIES OR STRUCTURES PRIOR TO CONSTRUCTION TO VERIFY THE VERTICAL AND HORIZONTAL LOCATION OF THE UTILITY OR STRUCTURE AND ITS EFFECT ON THE PROPOSED CONSTRUCTION. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH THE UTILITY OWNER.
3.

OSHA STANDARDS PROHIBITING CRANE OR BACKHOE OPERATIONS WITHIN SET DISTANCES OF ENERGIZED PRIMARY CONDUCTORS SHALL BE OBSERVED. TEMPORARY RELOCATION OF ELECTRICAL UTILITIES, INCLUDING RESTRAINT POLES, RELOCATION OF POLES AND RUBBER COVERING OF ENERGIZED CONDUCTORS MAY BE REQUIRED. THE COORDINATION AND COST OF THESE SERVICES IS THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR MAY RESTRAIN POLES IF THE METHOD OF SUPPORT HAS BEEN SUBMITTED TO AND APPROVED BY THE UTILITY OWNER.
4.

THE CONTRACTORS SHALL EXPOSE BY PRE-EXCAVATING ALL UTILITIES OR STRUCTURES PRIOR TO CONSTRUCTION TO VERIFY THE VERTICAL AND HORIZONTAL EFFECT ON THE PROPOSED CONSTRUCTION, AND SHALL MAKE ADJUSTMENTS IN ELEVATIONS AS DIRECTED BY THE ENGINEER TO PROVIDE SUFFICIENT CLEARANCE BETWEEN THE PROPOSED AND EXISTING UTILITIES.

EXISTING UTILITIES

1.

THE LOCATIONS OF THE UNDERGROUND UTILITIES ARE PLOTTED ACCORDING TO THE INFORMATION FURNISHED BY THE UTILITIES CONCERNED AND THE CITY DOES NOT GUARANTEE THE ACCURACY THEREOF. CONTRACTOR TO CALL OUPS (1-800-362-2764) "48 HOURS BEFORE YOU DIG" AND CALL OIL & GAS PRODUCERS PROTECTIVE (1-800-925-0988), CONTRACTOR ALSO TO COORDINATE HIS WORK WITH THE DOMINION EAST OHIO GAS COMPANY, THE ILLUMINATING COMPANY, AMERITECH COMPANY AND CABLE TV FOR GAS LINE AND/OR POLE RELOCATION.
2.

IN THE EVENT OF DAMAGE TO EXISTING PUBLIC AND/OR PRIVATE UTILITIES, THE AGENCY CONCERNED SHALL BE NOTIFIED IMMEDIATELY AND ALL REPAIR WORK SHALL BE EXECUTED IN ACCORDANCE WITH THE SPECIFICATIONS OF THE RESPECTIVE AGENCY AT NO ADDITIONAL EXPENSE TO THE CITY INCLUDING ANY INSPECTION FEES OR MAINTENANCE CREWS. CABLE (CEI, AT&T & TV) RELOCATION AND SUPPORT.
3.

WHERE EXISTING POWER OR TELEPHONE POLES ARE IN CLOSE PROXIMITY TO WORK, THE CONTRACTOR SHALL COORDINATE HIS WORK EFFORTS WITH THOSE OF THE UTILITY COMPANIES SUCH THAT THEIR EXISTING FACILITIES CAN BE MAINTAINED AND PROTECTED DURING THE TIME WORK IS GOING ON ADJACENT TO THE POLE. THE COST FOR ANY REQUIRED PROTECTION OR RELOCATION OF EXISTING POWER OR TELEPHONE POLES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND NOT BE THE RESPONSIBILITY OF THE CITY.
4.

WHERE EXCAVATION CROSSES EXISTING UTILITIES, THE CONTRACTOR SHALL USE EXCAVATION TECHNIQUES AND EQUIPMENT TO EXPOSE SUCH CROSSINGS PRIOR TO INSTALLATION OF THE RELIEF SEWER.

THE UTILITY OWNERSHIPS ARE AS FOLLOWS:

DEPARTMENT OF PUBLIC SERVICES 35150 LAKESHORE BOULEVARD EASTLAKE, OHIO 44095 PHONE: (440) 951-2200 KEVIN KOSTELNIK	LAKE COUNTY UTILITIES DEPARTMENT 105 MAIN STREET PAINESVILLE, OHIO 44077 PHONE: (440) 350-2652 RANDALL J. ROTHLSBERGER
THE ILLUMINATING COMPANY 6896 MILLER RD. - SUITE 101 BRECKSVILLE, OHIO 44141 PHONE: (440) 546-8748	DOMINION EAST OHIO GAS 320 SPRINGSIDE DRIVE SUITE 320 AKRON, OHIO 44333 PHONE: (330) 664-2409
AT&T 13630 LORAIN AVE. CLEVELAND, OHIO 44111 PHONE: (216) 476-6142	TIME WARNER CABLE 1100 E. 222ND ST. EUCLID, OHIO 44117 PHONE: (216) 531-6188

PROTECTION OF EXISTING UTILITIES AND PIPES

1.

THE CONTRACTOR SHALL BE REQUIRED, AT HIS EXPENSE, TO DO EVERYTHING NECESSARY TO PROTECT, SUPPORT AND SUSTAIN ALL SANITARY SEWERS, STORM DRAINS, WATER, PROCESS OR GAS PIPES, SERVICE PIPES, ELECTRIC LIGHTS, POWER AND TELEPHONE POLES, CONDUIT AND OTHER FIXTURES LAID ACROSS OR ALONG THE SITE OF THE WORK. THE ENGINEER AS WELL AS THE COMPANY OR CORPORATION OWNING SAID PIPES, POLES OR CONDUITS MUST BE NOTIFIED OF THE SAME BY THE CONTRACTOR, BEFORE ANY SUCH FIXTURES ARE REMOVED OR DISTURBED. IN CASE ANY OF THE SAID SEWER, DRAIN, GAS, PROCESS OR WATER PIPES, SERVICE PIPES, ELECTRIC LIGHT, POWER AND TELEPHONE POLES, CONDUITS OR OTHER FIXTURES, IN OR OUTSIDE THE CONSTRUCTION LIMITS, ARE DAMAGED THEY SHALL BE REPAIRED BY THE AUTHORITIES HAVING CONTROL OF THE SAME AND THE EXPENSE OF SAID REPAIRS SHALL BE DEDUCTED FROM THE MONIES WHICH ARE DUE OR TO BECOME DUE THE CONTRACTOR UNDER THIS CONTRACT.
2.

SHOULD IT BECOME NECESSARY TO CHANGE THE POSITION OR TEMPORARILY REMOVE ANY STORM DRAIN, SANITARY SEWER, ELECTRIC CONDUITS, WATER PIPES, GAS PIPES, PROCESS OR OTHER PIPES OR WIRES IN ORDER TO PERMIT THE CONTRACTOR TO USE A PARTICULAR METHOD OF CONSTRUCTION OR IN ORDER TO CLEAR THE STRUCTURES BEING BUILT, THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF THE LOCATION AND CIRCUMSTANCES IMMEDIATELY
3.

NO SURFACE, GROUND OR TRENCH WATER SHALL BE ALLOWED TO FLOW INTO EXISTING SANITARY SEWERS.
4.

CONTRACTOR SHALL MAINTAIN FLOW THROUGH THE EXISTING BYPASS AS IS PRACTICAL. WHERE WORK IS PARTIALLY COMPLETE NECESSITATING TRENCH ABANDONMENT IN THE EVENT OF STORM EVENT CONTRACTOR SHALL STABILIZE EXCAVATION AND PROTECT THE UNFINISHED WORK. CONTRACTOR SHALL SUBMIT SUCH A PLAN FOR ENGINEER REVIEW.

LAKE COUNTY DEPARTMENT OF UTILITIES GENERAL WATER NOTES BENCH MARKS

1.

THE INSTALLATION OF THE WATER LINE SHALL MEET THE REQUIREMENTS OF THE COUNTY OF LAKE UTILITIES DEPARTMENT RULES AND REGULATIONS, CURRENT EDITION.
2.

2" AND LARGER TAPS MUST BE SCHEDULED WITH WEST END SERVICE CENTER (440-918-3416) A MINIMUM OF 48 HOURS IN ADVANCE.
3.

ONLY WATER/SEWER CONTRACTORS LICENSED BY THE LAKE COUNTY BOARD OF COMMISSIONERS MAY INSTALL WATER MAINS.
4.

THIS APPROVAL BY THE LCDU SHALL EXPIRE IF THE WATERLINE CONSTRUCTION HAS NOT BEEN INITIATED BY A DEVELOPER WITHIN (12) MONTHS OF THE EFFECTIVE APPROVAL DATE AS SHOWN ON THE ORIGINALLY SUBMITTED FOR APPROVAL BLUEPRINT COPY. (THIS IS NOT TO BE CONSTRUED AS THE DATE THAT IS SHOWN ON THE ORIGINAL MYLAR TITLE SHEET.)
5.

THE CONTRACTOR SHALL NOTIFY THE LCDU AT LEAST 48 HOURS IN ADVANCE OF ANY WORK IN THEIR SYSTEMS.
6.

THE LCDU SHALL PERFORM INSPECTION SERVICES. THE COST OF INSPECTION SHALL BE INCLUDED AS PART OF THIS CONSTRUCTION PROJECT AT THE CURRENT BASE RATE AS ESTABLISHED BY THE LAKE COUNTY BOARD OF COMMISSIONERS. (SEE SECTION 7 FEE SCHEDULE) COST FOR LAKE COUNTY INSPECTION FEE AND OTHER FEES SHALL BE INCLUDED IN THE UNIT PRICES BID FOR OTHER WATERLINE ITEMS.
7.

WATERLINE WORK SHALL NOT BEGIN UNTIL THE AREAS OF CONSTRUCTION ARE ROUGH GRADED.
8.

ALL WATERLINES ON THIS PROJECT SHALL BE LAID AT THE ELEVATIONS AND GRADES SHOWN ON THE DRAWINGS. HIGH POINTS IN THE WATERLINE MUST OCCUR AT THE STATIONED HYDRANT TEE LOCATIONS.
9.

ALL HYDRANTS SHALL BE POSITIONED SO THAT THE STEAMER NOZZLES POINT IN THE DIRECTION SHOWN ON THE PLANS.
10.

THE PROPOSED WATERLINE SHALL HAVE 5' MINIMUM COVER OVER THE TOP OF PIPE AT ALL PLACES, EXCEPT AT SPECIFIC HYDRANT TEE LOCATIONS AS SHOWN ON THE PLANS.
11.

ALL BOLTS SHALL BE STAINLESS STEEL TYPE 304 OR 316. WITH ANTI-GALLING AGENT.
12.

ALL SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR PRELIMINARY CHECKING. THE ENGINEER SHALL FORWARD CHECKED SHOP DRAWINGS TO THE LCDU FOR FINAL CHECKING AND APPROVAL.
13.

THE LCDU SHALL PROVIDE WATER FOR THE NEW WATER MAIN WITHOUT COST FOR THE INITIAL OPERATION. ALL WATER FOR FLUSHING OPERATIONS SHALL BE PAID FOR BY THE CONTRACTOR AT CURRENT RATES AS ESTABLISHED BY THE LAKE COUNTY BOARD OF COMMISSIONERS PER 100 CUBIC FEET OF WATER USED. (SEE SECTION 7 FEE SCHEDULE)
14.

ALL WATER MAIN PIPE SHALL BE AN APPROVED MATERIAL AS SHOWN ON THE APPROVED PLANS.
15.

LOCATION OF STERILIZATION AND TESTING CONNECTIONS SHALL BE AS DIRECTED BY THE LCDU AND ALL COSTS ASSOCIATED WITH PLACING AND UTILIZING SAID STERILIZATION AND TESTING CONNECTIONS SHALL BE INCLUDED IN THE PRICE BID PER LINEAL FOOT OF THE WATER MAINS. NO BACTERIA SAMPLES ARE TO BE TAKEN FROM FIRE HYDRANTS.
16.

LCDU WILL MAKE THE NECESSARY NEW SERVICE CONNECTION TAPS ON EXISTING LCDU MAINS FOR THE CONTRACTOR AT CURRENT RATES AS ESTABLISHED BY THE LAKE COUNTY BOARD OF COMMISSIONERS PER 8" AND GREATER TAPS WITHIN RIGHT OF WAY. (SEE SECTION 7 FEE SCHEDULE) SERVICE CONNECTIONS TO EXISTING BUILDINGS SHALL BE MADE BY THE CONTRACTOR.
17.

NO WATER SERVICE CONNECTIONS TO ANY BUILDING SHALL BE PERMITTED PRIOR TO FINAL ACCEPTANCE BY THE LCDU INCLUDING RECTIFICATION OF ALL PUNCH LIST ITEMS.
18.

ALL CURB STOP BOXES, VALVE BOXES, ETC. TO BE SET AS SHOWN ON THE PLANS. RIMS WILL BE RAISED OR LOWERED AND BOXES PLUMBED BY THE CONTRACTOR AT TIME OF HOUSE CONSTRUCTION WHEN FINAL YARD GRADING IS COMPLETED.
19.

ALL PROJECT HYDRANTS SHALL HAVE A FIELD COAT OF APPROVED PAINT APPLIED BY THE CONTRACTOR WITH THE EXCEPTION OF HYDRANTS THAT ARE FACTORY PAINTED WITH A ONE COAT UV RESISTANT HIGH GLOSS 2-PART POLYURETHANE ENAMEL, COLOR AS SPECIFIED. IF THE COATING ON THE HYDRANT IS DAMAGED BEFORE INSTALLATION THE HYDRANT MUST BE PAINTED.
20.

THE CONTRACTOR SHALL NOTIFY THE FIRE DEPARTMENT PRIOR TO ANY PRESSURE TESTING.
21.

ALL PROPOSED WATER LINES SHALL BE LAID OUT BY A REGISTERED SURVEYOR WITH GRADE STAKES AT A MINIMUM OF EVERY 50' AND AT ALL FITTINGS AND A CUT SHEET PROVIDED PRIOR TO CONSTRUCTION.
22.

THE CONTRACTOR/DEVELOPER SHALL SUBMIT A THREE YEAR MAINTENANCE BOND TO THE COMMISSIONERS BY DEVELOPER IN THE AMOUNT OF TEN PERCENT OF THE FINAL CONSTRUCTION COSTS AS CERTIFIED BY THE DEVELOPER'S ENGINEER, FOR PUBLIC EXTENSION PROJECTS.

EXCAVATION AND COMPACTION REQUIREMENT

1.

THE SOIL BORING REPORT IS AVAILABLE FOR REVIEW.
2.

THE OWNER AND ENGINEER DO NOT GUARANTEE THE SUITABILITY OR SUGGEST THAT THE EXISTING EXCAVATED MATERIAL IN ITS PRESENT STATE WILL CONSIST OF THE PROPER MOISTURE CONTENT TO ACHIEVE THE REQUIRED COMPACTION ON WITHOUT DRYING OR ADDING WATER TO THE MATERIAL UPON REQUEST THE OWNER WILL PROVIDE ACCESS TO THE SITE FOR THE CONTRACTOR TO CONDUCT SUCH INVESTIGATIONS AND TESTS DEEMED NECESSARY TO MAKE HIS DETERMINATION. ALL EXCAVATION, TRENCHING, AND COMPACTION REQUIREMENTS SHALL BE IN ACCORDANCE WITH 310000.
3.

THE ENGINEER SHALL DETERMINE THE DEPTH OF THE COMPACTED LAYERS OF BACKFILL ACCORDING TO THE COMPACTION EQUIPMENT BEING USED BY THE CONTRACTOR. THEY MAY ORDER THE REMOVAL, REFILLING, RECOMPACTION AND RETESTING OF ALL BACKFILL NOT MEETING THE REQUIREMENTS OF THE CONTRACT.

MATERIAL DISPOSAL AND TEMPORARY SURFACES

1.

THE REMOVAL AND DISPOSAL OF ALL SURPLUS EXCAVATED MATERIAL AND CONSTRUCTION DEBRIS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR THE DISPOSAL OF ALL CONSTRUCTION DEBRIS SHALL BE AT AN APPROVED LANDFILL THE DISPOSAL OF ALL "CLEAN" WASTE MATERIAL SHALL BE AT APPROVED LANDFILL, AND/OR OTHER SITES APPROVED BY THE OWNER AND ENGINEER. THE DISPOSAL OF EXISTING PIPELINE AND TANK SEDIMENTS AND WASTEWATER SLUDGE SHALL BE AT AN APPROVED LANDFILL. THE CONTRACTOR SHALL OBTAIN ALL APPROVAL, PERMITS, LICENSES, ETC. FROM LOCAL STATE AND FEDERAL AGENCIES AND/OR PRIVATE LANDOWNERS. THE CONTRACTOR SHALL FURNISH THE ENGINEER A COPY OF ALL APPROVALS OR WRITTEN PERMISSION PRIOR TO DISPOSING OF ANY WASTE AT SAID SITE.
2.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COMPLETE RESTORATION OF ALL MATERIAL WASTE AND TEMPORARY STORAGE AREAS USED IN THE COURSE OF THIS CONTRACT. THE RESTORATION WORK SHALL INCLUDE CLEANUP, SHAPING AND GRADING AND ESTABLISHMENT OF VEGETATIVE COVER BY SEEDING AND MULCHING IN ACCORDANCE WITH O D.O.T. SPEC FICTION NO. 559 THE FINAL GRADING OF WASTE AREAS SHALL BE PROPERLY SLOPED TO PROVIDE DRAINAGE RUNOFF.
3.

TEMPORARY SURFACES WHERE EXCAVATION IS LOCATED IN STREETS, DRIVES AND PARKING AREAS SHALL BE FURNISHED AND PLACED BY THE CONTRACTOR (PER TEMPORARY SURFACE DETAIL) AND SHALL BE FULLY MAINTAINED TO MINIMIZE INCONVENIENCE TO THE PUBLIC AT NO ADDITIONAL COST TO THE OWNER.
4.

THE CONTRACTOR IS RESPONSIBLE FOR REMOVING ALL UNUSED EXCAVATIONS SO THAT THE ORIGINAL SITE CONTOURS ARE PRESERVED UNLESS NOTED OTHERWISE. WASTING ON SITE SHALL NOT BE ANTICIPATED.
5.

DUMP BITES MUST BE APPROVED BY THE OWNER AND THE ENGINEER

MONUMENTS, PROPERTY CORNERS AND BENCH MARKS

1.

MONUMENTS, PROPERTY CORNER MARKERS AND BENCH MARKS SHALL NOT BE DISTURBED BY THE CONTRACTOR. IN THE EVENT THAT IT IS NECESSARY TO REMOVE MONUMENTS, PROPERTY CORNER MARKERS OR BENCH MARKS FOR THE CONSTRUCTION OF THE WORK, THE CONTRACTOR SHALL HAVE A REGISTERED LAND SURVEYOR PROPERLY REFERENCE THE POINTS AND SHALL HAVE SAME RESET AFTER THE CONSTRUCTION HAS PASSED THE AREA.
2.

IF THE PROJECT IS LOCATED WITHIN THE RANGE OF THE FEDERALLY-ENDANGERED INDIANA BAT (MYOTIS SODALIS) AND TREES MUST BE CUT, THIS MUST OCCUR BETWEEN SEPTEMBER 30 AND APRIL 1. INDIANA BATS ARE HIGHLY-DEPENDENT UPON TREES INCLUDING DEAD AND DYING TREES OF SPECIES WITH EXFOLIATING BARK, CREVICES, OR CAVITIES IN UPLAND AREAS OR RIPARIAN CORRIDORS AND LIVING TREES OF THE SPECIES LISTED ABOVE WITH EXFOLIATING BARK, CAVITIES, OR HOLLOW AREAS FORMED FROM BROKEN BRANCHES OR TOPS. IF SUITABLE TREES MUST BE CUT DURING THE PROHIBITED TIME PERIOD, A NET SURVEY MUST BE CONDUCTED TO DETERMINE THE PRESENCE OR ABSENCE OF INDIANA BATE PRIOR TO CUTTING.

CLEARING AND GRUBBING

1.

THE CONTRACTOR SHALL INCLUDE ALL NECESSARY PRECAUTIONS TO PROTECT AND SAVE ALL TREES WHICH ARE ADJACENT TO THE LINE OF WORK AND SHALL REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED FOR REMOVAL ON THE PLANS OR DIRECTED BY THE ENGINEER. TREE ROOTS AND OVERHANGING BRANCHES SHALL BE CUT, EXCEPT WITH SPECIAL PERMISSION OF THE ENGINEER. WHEN REQUIRED, THE CUTTING OF ROOTS AND BRANCHES SHALL BE DONE IN A MANNER TO LEAVE A SMOOTH END WITHOUT SPLITTING OR CRUSHING. THE CUT END SHALL BE NEATLY TRIMMED. ALL DAMAGE SHALL BE REPAIRED BY THE CONTRACTOR AT HIS OWN EXPENSE TO THE SATISFACTION OF THE ENGINEER. WHERE MISCELLANEOUS SMALL TREES AND SHRUBS ARE NOTED TO BE REMOVED AND RESET, THE COST OF SUCH WORK SHALL BE CONSIDERED INCIDENTAL TO THE COMPLETION OF THE PROJECT.
2.

IF THE PROJECT IS LOCATED WITHIN THE RANGE OF THE FEDERALLY-ENDANGERED INDIANA BAT (MYOTIS SODALIS) AND TREES MUST BE CUT, THIS MUST OCCUR BETWEEN SEPTEMBER 30 AND APRIL 1. INDIANA BATS ARE HIGHLY-DEPENDENT UPON TREES INCLUDING DEAD AND DYING TREES OF SPECIES WITH EXFOLIATING BARK, CREVICES, OR CAVITIES IN UPLAND AREAS OR RIPARIAN CORRIDORS AND LIVING TREES OF THE SPECIES LISTED ABOVE WITH EXFOLIATING BARK, CAVITIES, OR HOLLOW AREAS FORMED FROM BROKEN BRANCHES OR TOPS. IF SUITABLE TREES MUST BE CUT DURING THE PROHIBITED TIME PERIOD, A NET SURVEY MUST BE CONDUCTED TO DETERMINE THE PRESENCE OR ABSENCE OF INDIANA BATE PRIOR TO CUTTING.

STATE OF OHIO
RYAN S. SCHUSTER
72755
REGISTERED
PROFESSIONAL ENGINEER

verdantas

8150 STERLING COURT
MENTOR, OHIO 44060
(440) 951-9000

DATE	REVISION	NO	REVIEW	ISSUED FOR	ISSUE DATE	SCALE	DESIGNED BY:	DRAWN BY:	CHECKED BY:
			10/3/2025		10/3/2025	N/A	CAS	CAS	RSS

CITY OF WILLOUGHBY
LAKESHORE EAST EQ BASIN
LAKE COUNTY

WILLOUGHBY, OHIO
PHASE II

GENERAL - 00 SERIES
GENERAL NOTES

PROJECT NO.
230264

DISCIPLINE
GENERAL

SHEET NAME
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4

OF
48

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TREES/VEGETATION PROTECTION

1. TREE REMOVAL WILL BE LIMITED TO THAT NECESSARY FOR CONSTRUCTION AND WILL BE LIMITED FURTHER TO THE PERMANENT EASEMENT WHENEVER POSSIBLE.
2. SOIL AND OTHER MATERIAL WILL NOT BE STORED NEXT TO OR WITHIN THE DRIP-LINE OF TREES.

USE OF ROADS

1. ALL PROJECT VEHICLES, INCLUDING THOSE HAULING EQUIPMENT AND/OR MATERIALS TO OR FROM THE SITE SHALL UTILIZE STATE ROUTES ONLY. THE USE OF LOCAL ROADS BY THE CONTRACTOR IS PROHIBITED.

EXCAVATION PUMPING AND DEWATERING

1. CONVEY ANY TURBID WATER REMOVED FROM EXCAVATIONS IN A CLOSED CONDUIT TO A SETTLING POND OR FILTERING DEVICE, BEFORE RELEASE FROM THE CONSTRUCTION SITE OR ASSOCIATED DISTURBED AREAS. DO NOT USE TRENCH EXCAVATIONS AS TEMPORARY DRAINAGE CHANNELS.
2. PRIOR TO INSTALLING GROUNDWATER DEWATERING WELLS, CONTACT THE OHIO DEPARTMENT OF NATURAL RESOURCES, DIVISION OF WATER (614-265-6740) FOR REPORTING REQUIREMENTS AND ABANDONMENT OF DEWATERING WELLS.
3. GROUNDWATER WHICH DOES NOT CONTAIN SEDIMENT OR OTHER POLLUTANTS IS NOT REQUIRED TO BE TREATED PRIOR TO DISCHARGE FROM THE CONSTRUCTION SITE. SEDIMENT FREE WATER SHALL NOT BE DIRECTED TO THE CONSTRUCTION STORM WATER TREATMENT SYSTEM.
4. DISCHARGE SEDIMENT FREE GROUNDWATER TO STABILIZED SITES, SUCH AS UNCUT GRASSED SWALES, STREAMS OR STORM SEWERS. DO NOT DISCHARGE FLOWS ONTO DISTURBED AREAS, EXPOSED SOILS IN DRAINAGES OR STREAM BANKS, OR ANY OTHER SITE WHERE THE FLOW COULD CAUSE EROSION.
5. WRITTEN PERMISSION OF THE PROPERTY OWNER AND THE CONSENT OF THE ENGINEER MUST BE OBTAINED TO RUN WELL POINT OR PUMP DISCHARGE LINES THROUGH PRIVATE PROPERTY, PUBLIC PROPERTY OR RIGHTS-OF-WAY.

PROHIBITED CONSTRUCTION ACTIVITIES

1. THE USE OF EXPLOSIVES WITHIN CITY LIMITS, UNLESS A PERMIT IS ISSUED BY THE CITY.
2. PUMPING OF SEDIMENT-LADEN WATER FROM TRENCHES OR OTHER EXCAVATIONS DIRECTLY INTO ANY SURFACE WATERS, STREAM CORRIDORS, OR STORM SEWERS; ALL SUCH WATER WILL BE PROPERLY FILTERED OR SETTLED TO REMOVE SILT PRIOR TO RELEASE.
3. DISCHARGING POLLUTANTS SUCH AS CHEMICALS, FUELS, LUBRICANTS, BITUMINOUS MATERIALS, RAW SEWAGE, OR ANY OTHER HARMFUL WASTE INTO OR ALONGSIDE OF RIVERS, STREAMS, IMPOUNDMENTS OR INTO NATURAL OR MAN-MADE CHANNELS LEADING THERETO.
4. OPEN BURNING OF PROJECT DEBRIS WITHOUT A PERMIT.
5. STORING CONSTRUCTION EQUIPMENT AND VEHICLES AND/OR STOCKPILING CONSTRUCTION MATERIALS ON PROPERTY, PUBLIC OR PRIVATE, NOT PREVIOUSLY SPECIFIED ON THE PLANS BY THE ENGINEER FOR SUCH PURPOSES;
6. RUNNING WELL POINT OR PUMP DISCHARGE LINES THROUGH PRIVATE OR PUBLIC PROPERTY AND RIGHTS-OF-WAY WITHOUT PERMISSION OF THE PROPERTY OWNER AND THE CONSENT OF THE ENGINEER;
7. OPERATION ENTAILING THE USE OF VIBRATORY HAMMERS OR COMPACTORS OUTSIDE THE THE HOURS OF 8:00 AM AND 5:00 PM OR OUTSIDE THE HOURS ALLOWED BY LOCAL ORDINANCES OR REGULATIONS;
8. CLOSING OFF CLEAR ACCESS TO ANY PUBLIC ALLEY, STREET, ROAD, AVENUE OR BOULEVARD WITHOUT THE PRIOR CONSENT OF MUNICIPAL OFFICIALS AND THE ENGINEER AND CLOSING CLEAR ACCESS:

- BY FIRE PROTECTION EQUIPMENT AND EMERGENCY VEHICLES;

- BY THE PUBLIC TO ANY COMMERCIAL OR PROFESSIONAL PLACE OF BUSINESS, QUASI-PUBLIC OR PUBLIC ESTABLISHMENT, OR PLACE OF RESIDENCE

- BY VEHICLES TO DRIVEWAYS WITHOUT THE PROVISION OF ALTERNATIVE MEANS OF BUILDING INGRESS AND EGRESS.

SANITARY BYPASS PUMPING

1. BYPASS PUMPING SHALL BE PROVIDED WHENEVER FLOW IN ANY SEWER IS DISRUPTED BY THE CONSTRUCTION OF NEW SEWER REPLACEMENTS, LATERALS, MANHOLES, OR ASSOCIATED ACTIVITIES.
2. CONTRACTOR SHALL PROVIDE A DETAILED BYPASS PUMPING PLAN AND SCHEDULE TO THE OWNER FOR REVIEW PRIOR TO BEGINNING ANY WORK.
3. BYPASS PUMPING IS REQUIRED WHENEVER FLOW IN ANY SEWER IS DISRUPTED BY THE CONSTRUCTION OR REPLACEMENT OF NEW SEWER SEGMENTS, LATERALS, MANHOLES,OR ASSOCIATED ACTIVITIES. BYPASSING OF SEWERS MUST PROVIDE FOR POTENTIAL FLOWS THAT MAY TYPICALLY BE EXPECTED DURING THE SEASON THAT THE WORK IS IN PROGRESS, INCLUDING RAINFALL AND PEAK FLOW EVENTS.
4. METERING OF FLOWS HAS NOT BEEN PERFORMED. THE CONTRACTOR MAY ASSUME FULL PIPE CONDITIONS FOR SIZING BYPASS PUMPING REQUIREMENTS.
5. BECAUSE OF THE HIGH FLOWS POSSIBLE IN THESE SEWERS, THE CONTRACTOR SHALL HAVE A CONTINGENCY PLAN TO PREVENT DAMAGE DURING HIGH FLOWS. THE OWNER WILL NOT BE RESPONSIBLE FOR DAMAGES DUE TO HIGH FLOWS.
6. CONTRACTOR SHALL REVIEW AND COORDINATE WITH THE MAINTENANCE OF TRAFFIC PLANS PRIOR TO SUBMITTING THE BYPASS PUMPING PLAN.
7. PUMPS SHALL BE FULL AUTOMATIC, SELF PRIMING PUMPS. PUMPS AND GENERATORS, IF APPLICABLE, SHALL BE CRITICALLY SILENCED. ALL SUCTION AND DISCHARGE PIPING SHALL BE FREE OF LEAKS.
8. ACCESS TO ALL RESIDENCES AND BUSINESSES SHALL BE MAINTAINED AT ALL TIMES, INCLUDING ACCESS FOR MAIL, SCHOOL, POLICE, FIRE, AND EMERGENCY VEHICLES.
9. PRIOR TO NOTIFICATION OF SHORT DURATION INTERRUPTIONS TO SERVICE SHALL BE COORDINATED A MINIMUM OF 48 HOURS IN ADVANCE, EXCLUDING WEEKENDS AND HOLIDAYS, WITH THE OWNER AND ALL AFFECTED RESIDENTS AND BUSINESSES.

SANITARY SEWER NOTES

1. SANITARY SEWERS SHALL MAINTAIN A MINIMUM OF 18" VERTICAL AND 10' HORIZONTAL FROM ANY WATER MAIN.
2. SANITARY SEWER MUST BE A MINIMUM OF 4' HORIZONTALLY, MEASURED EDGE-TO-EDGE, FROM STORM SEWERS AND GAS LINES AND MUST MAINTAIN A MINIMUM 18" VERTICAL CLEARANCE AT ANY UTILITY LINE.
3. SANITARY SEWER AND MANHOLE TESTING REQUIREMENTS:
 - LEAKAGE TESTING SHALL BE HYDROSTATICALLY TESTED IN ACCORDANCE WITH SPECIFICATION SECTION 013319 AND RSFW 33.93 AND 33.94.
 - DEFLECTION TESTING SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 013319 AND RSFW 33.85.
 - MANHOLES SHALL BE VACUUM TESTED IN ACCORDANCE WITH SPECIFICATION SECTION 013319 AND RSFW 34.7.
4. TRENCHING, BEDDING, AND BACKFILL SPECIFICATIONS SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 333100 AND CONSTRUCTION DETAILS.
5. SANITARY SEWER FOR OPEN CUT SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 331100.
6. CONTRACTOR SHALL INSTALL DROP STRUCTURES IF INVERTS ARE MODIFIED AND PIPE INLET INVERT ABOVE THE MANHOLE INVERT IS 24" OR GREATER.
7. WHEN EMPTY DURING CONSTRUCTION, THE STRUCTURES MAY BECOME BUOYANT. IN THE EVENT THAT THE EXCAVATIONS BECOME FLOODED, THE STRUCTURES MUST BE FILLED WITH WATER TO PREVENT FLOTATION OR THE EXCAVATION IS TO BE KEPT DEWATERED.

MAINTENANCE OF TRAFFIC

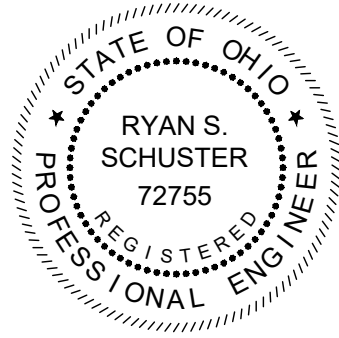
1. IT IS THE CONTRACTORS RESPONSIBILITY TO MAINTAIN PEDESTRIAN AND LOCAL ROADWAY ACCESS AT ALL TIMES. THE CONTRACTOR SHALL FURNISH AND INSTALL TEMPORARY STONE DRIVES WITH A MATERIAL WHICH IS APPROVED IN WRITING BY THE ENGINEER. THE CONTRACTOR SHALL INSTALL TEMPORARY TRENCH TOPPING(SEE DETAIL) IN ALL ROADS AS PART OF THE BACKFILLING OPERATION. THE TEMPORARY PAVEMENT AND STONE DRIVES SHALL BE MAINTAINED TO THE SATISFACTION OF THE ENGINEER. COST FOR ALL MATERIALS, LABOR AND EQUIPMENT FOR CONSTRUCTION MAINTENANCE AND SUBSEQUENT REMOVAL SHALL BE INCLUDED IN THE UNIT PRICES FOR ALL ITEMS OF THE PROPOSAL.
2. ALL TRAFFIC CONTROL SHALL BE IN ACCORDANCE WITH THE "OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES", AS A MINIMUM THE CONTRACTOR SHALL SUBMIT A PROPOSED TRAFFIC CONTROL PLAN FOR REVIEW AND ACCEPTANCE BY THE ENGINEER PRIOR TO BEGINNING WORK.
3. ACCESS MUST BE MAINTAINED FOR RESIDENCES, EMERGENCY VEHICLES AND PEDESTRIANS, INCLUDING PERSONS WITH DISABILITIES, AT ALL TIMES.
4. AT ALL EXCAVATION LOCATIONS THE CONTRACTOR SHALL PROVIDE SUITABLE FLASHERS, BARRICADES, AND TRAFFIC CONTROL DEVICES AS DEEMED NECESSARY BY THE ENGINEER AND IN ACCORDANCE WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
5. THE CONTRACTOR SHALL PHASE CONSTRUCTION SUCH THAT AT A MINIMUM, ONE ACCESS LANE IS AVAILABLE FOR LOCAL VEHICULAR TRAFFIC. THE PAVEMENT SURFACE SHALL HAVE A UNIFORM SURFACE TO THE SATISFACTION OF THE OWNER. THE SAME ACCESS SHALL BE MAINTAINED TO ALL DRIVEWAYS. ALL OTHER AREAS SHALL BE CLOSED TO TRAFFIC WITH SIGNS AND BARRICADES TO ODOT STANDARDS. THE SURFACES SHALL CONSIST OF THE FOLLOWING MATERIALS:
 - EXISTING PAVEMENT SURFACE.
 - ODOT 304 LIMESTONE TEMPORARY TRENCH TOPPING

NOISE CONTROL AND AIR POLLUTION PRACTICES AND REQUIREMENTS

1. CONSTRUCTION ACTIVITIES WILL BE LIMITED TO WEEKDAY DAYTIME HOURS, UNLESS APPROVED IN ADVANCE BY THE OWNER.
2. CONSTRUCTION EQUIPMENT WILL BE PROVIDED WITH INTAKE SILENCERS AND MUFFLERS, AS REQUIRED BY SAFETY STANDARDS.
3. PERIODICALLY CHECK EQUIPMENT AND MACHINERY FOR PROPER TUNING TO MINIMIZE EXHAUST EMISSIONS AND NOISE.
4. ALL CONSTRUCTION VEHICLES SHOULD BE EQUIPPED WITH PROPER EMISSIONS CONTROL EQUIPMENT.
5. UNPAVED AREAS WILL BE WET DOWN (AS NECESSARY) DAILY OR AS NECESSARY DURING CONSTRUCTION TO MINIMIZE DUST GENERATION.
6. STREET SWEEPING WILL BE REQUIRED ON A WEEKLY BASIS FOR DUST CONTROL. NO SEPARATE PAYMENT SHALL BE MADE.

EROSION AND SEDIMENT CONTROL

1. THE CONTRACTOR IS RESPONSIBLE FOR SUBMITTING AN APPROVED EROSION CONTROL AND STORMWATER POLLUTION CONTROL PLAN FOR ALL IMPROVEMENTS. THIS SHALL INCLUDE SUBMITTAL OF A NOTICE OF INTENT PERMIT TO OHIO EPA. THIS SHALL BE INCLUDED AS A PART OF THE WORK DETAILED WITHIN THE CONTRACT AND NO ADDITIONAL PAYMENT SHALL BE MADE.
2. ALL MATERIALS TO BE DISPOSED OF OFF-SITE MUST BE DISPOSED OF IN AN ENVIRONMENTALLY SOUND MANNER IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS AT A SITE APPROVED BY THE ENGINEER. NO EXCESS MATERIALS ARE TO BE DISPOSED OF IN ANY WETLAND, FLOODPLAIN, SURFACE WATER, OR OTHER ENVIRONMENTALLY SENSITIVE AREAS. EROSION CONTROL MEASURES AT THE DISPOSAL SITE MUST BE INSTALLED AND MAINTAINED UNTIL DISPOSAL IS COMPLETE AND THE DISPOSAL SITE IS PERMANENTLY STABILIZED. GIVING EXCAVATED SOIL AWAY DOES NOT RELIEVE THE CONTRACTOR OR ENGINEER OF THIS RESPONSIBILITY.
3. PROPERLY INSTALL EROSION CONTROLS (E.G., SILT FENCES, STRAW BALES, ETC.) ON SLOPES, ALONG STREAMS AND DRAINAGE WAYS, AROUND DRAINAGE STRUCTURES, WETLANDS AND ANYWHERE ELSE THAT EXPOSED SOIL COULD RUN OFF. ALL SEDIMENT CONTROL MEASURES SHALL BE IN PLACE PRIOR TO STARTING CONSTRUCTION.
4. NO MORE THAN 200 FEET OF TRENCH SHALL BE OPEN AT ANY GIVEN TIME. TRENCH OPENING, PIPE LAYING, AND BACKFILLING SHOULD OCCUR SO AS TO MINIMIZE THE AMOUNT OF DISTURBED AREA.



verdantas

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ISSUED FOR:	REVIEW	NO	REVISION	DATE
ISSUE DATE:	10/3/2025			
SCALE:	N/A			
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CITY OF WILLOUGHBY
LAKESHORE EAST EQ BASIN
LAKE COUNTY
PHASE II
WILLOUGHBY, OHIO

GENERAL - 00 SERIES
GENERAL NOTES

PROJECT NO. 230264	
DISCIPLINE GENERAL	
SHEET NAME 00-G-05	
SHEET 5	OF 48



8150 STERLING COURT
MENTOR, OHIO 44060
(440) 951-9000

ISSUED FOR:	REVIEW	NO	REVISION	DATE
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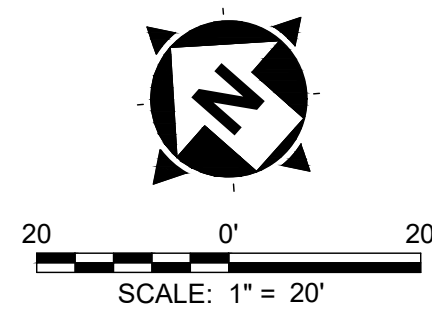
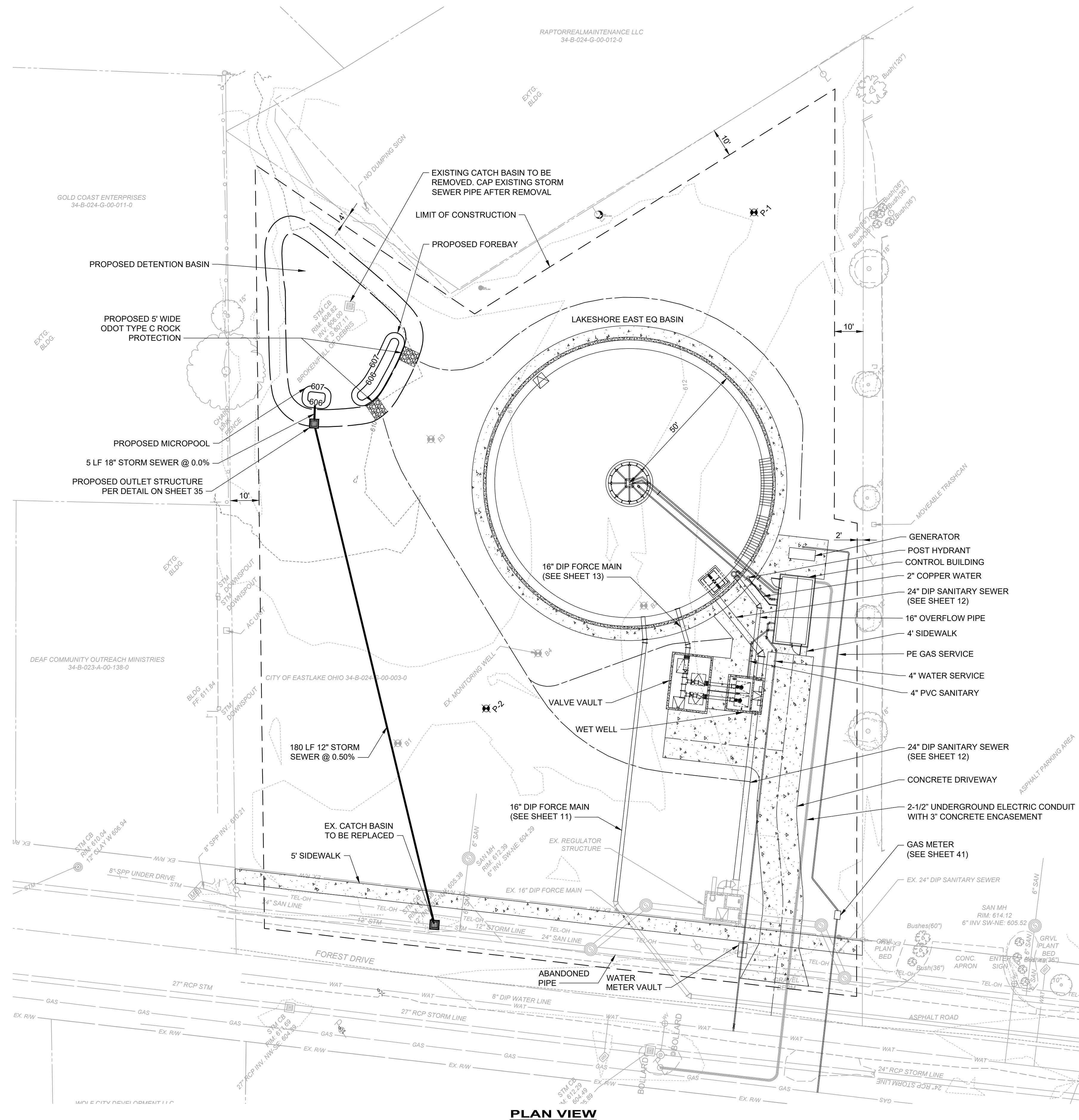
**CITY OF WILLOUGHBY
LAKESHORE EAST EQ BASIN
PHASE II**

WILLOUGHBY, OHIO

SITE IMPROVEMENT - 01 SERIES

EXISTING SITE PLAN

PROJECT NO.	
230264	
DISCIPLINE	
CIVIL	
SHEET NAME	
01-C-01	
SHEET	OF
6	48



8150 STERLING COURT
MENTOR, OHIO 44060
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ISSUE DATE:	10/3/2025			
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DESIGNED BY:	CAS			
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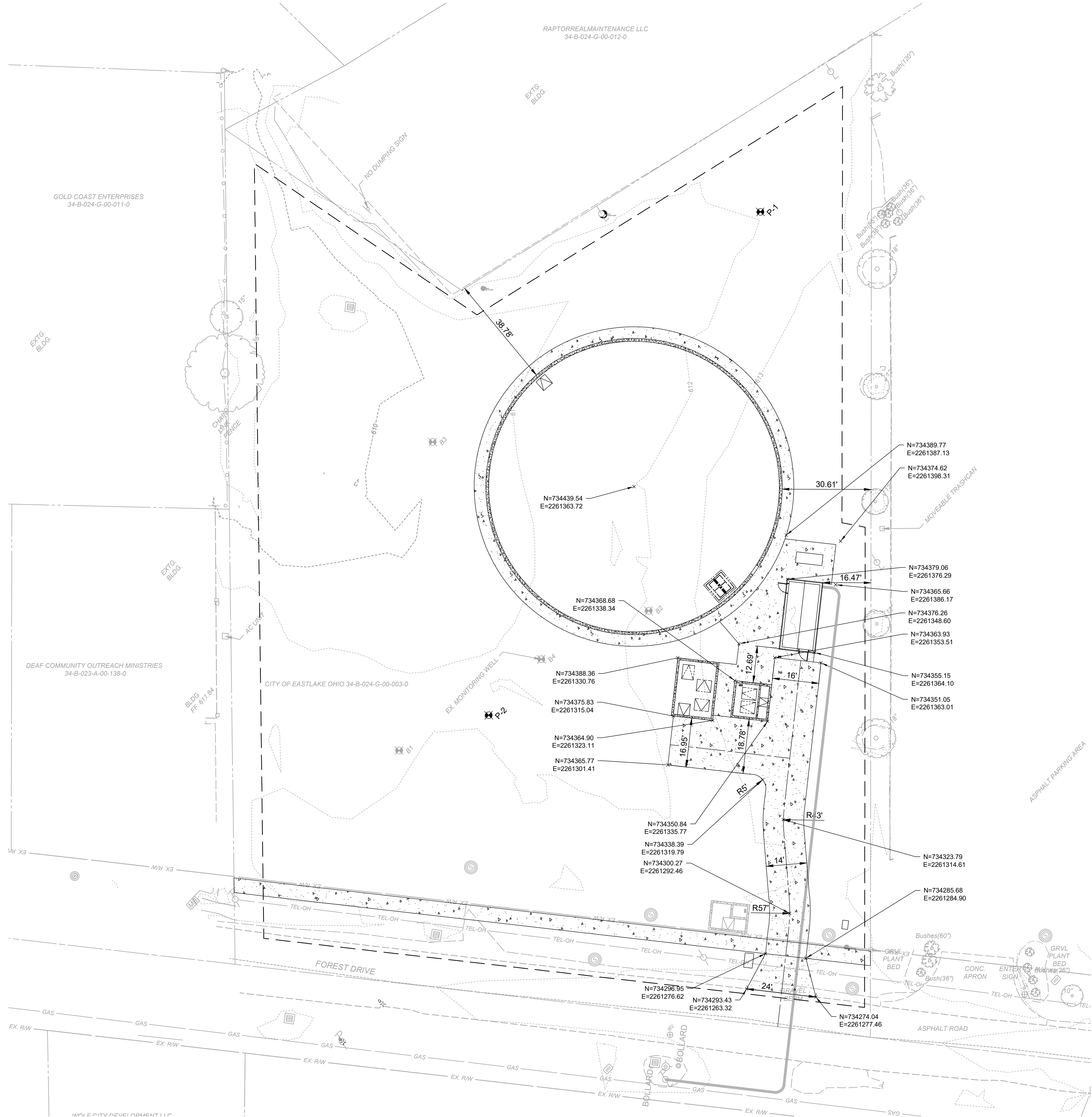
**CITY OF WILLOUGHBY
LAKESHORE EAST EQ BASIN
PHASE II**

LAKE COUNTY **WILLOUGHBY, OHIO**

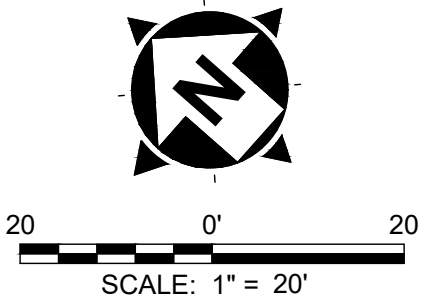
SITE IMPROVEMENT - 01 SERIES

PROPOSED UTILITY PLAN

PROJECT NO.	
230264	
DISCIPLINE	
CIVIL	
SHEET NAME	
01-C-02	
SHEET	OF
7	48



PLAN VIEW



STATE OF OHIO
RYAN S. SCHUSTER
72755
REGISTERED PROFESSIONAL ENGINEER

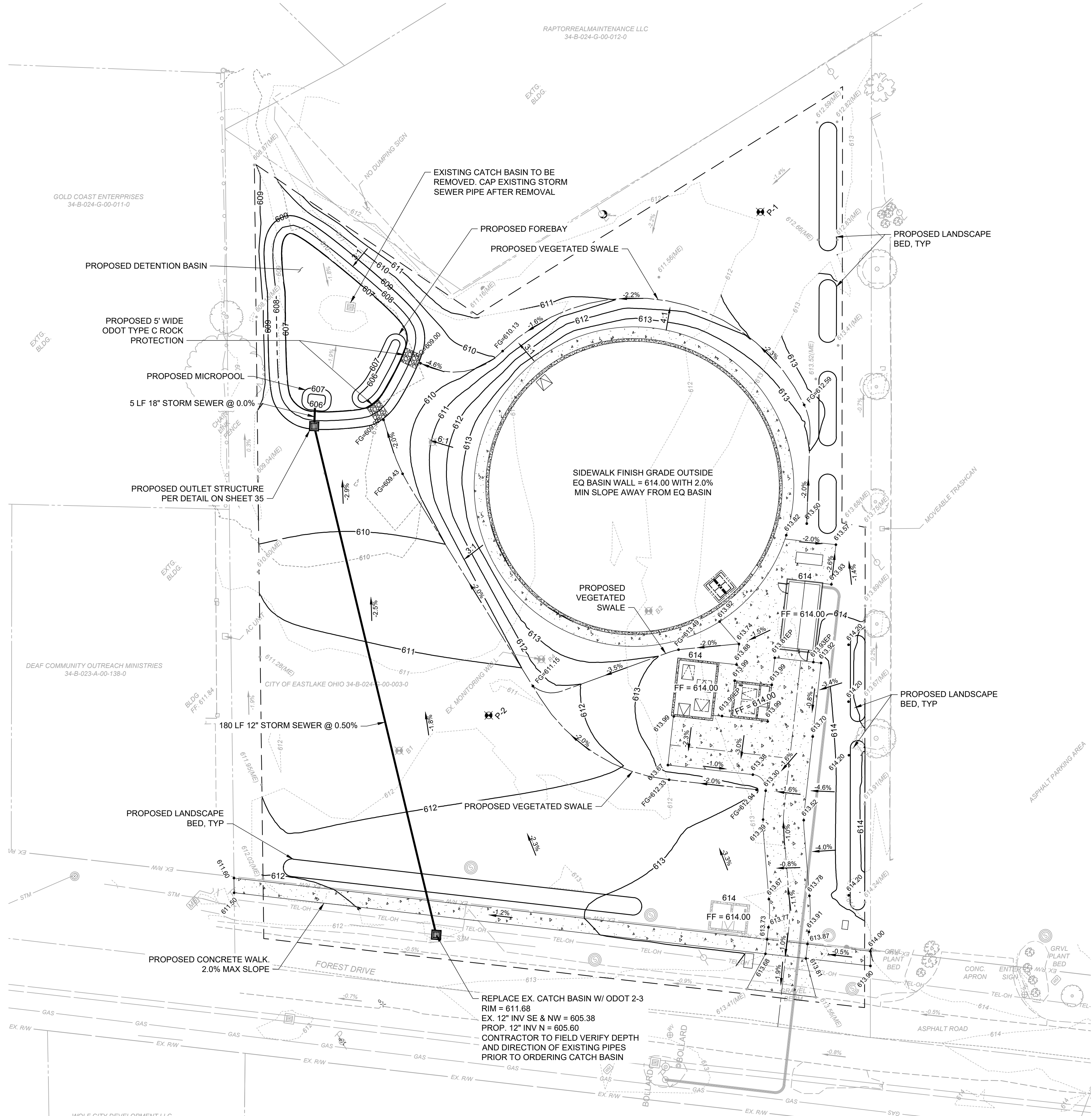
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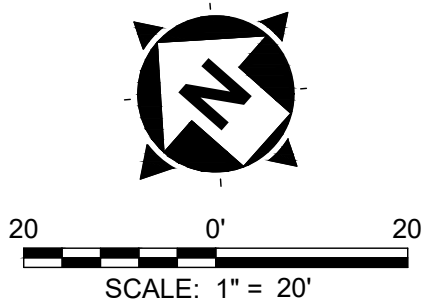
CITY OF WILLOUGHBY
LAKESHORE EAST EQ BASIN
PHASE II
LAKE COUNTY
WILLOUGHBY, OHIO
SITE IMPROVEMENT - 01 SERIES
PROPOSED SITE PLAN

PROJECT NO.	230264
DISCIPLINE	CIVIL
SHEET NAME	01-C-03
SHEET	8
OF	48



PLAN VIEW

- NOTE:
- ALL SPOT GRADES SHOWN ARE FINISH SURFACE ELEVATIONS UNLESS NOTED OTHERWISE.
 - THE CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY THE EXISTENCE AS WELL AS THE ACTUAL LOCATION, ALIGNMENT, AND ELEVATIONS OF ALL EXISTING UTILITIES/FACILITIES WITHIN AND/OR ADJACENT TO THE GENERAL LIMITS OF THESE IMPROVEMENTS INCLUDING WATERLINES, SANITARY AND STORM SEWERS, GAS LINES, COMMUNICATION LINES/BANKS, ELECTRIC LINES, ETC. THIS MAY REQUIRE EXPLORATORY EXCAVATIONS TO BE PERFORMED BY THE CONTRACTOR FOR WHICH HE WILL NOT BE REIMBURSED. THE CONTRACTOR SHALL NOT ASSUME THAT EXISTING UTILITIES/CONDUITS WERE INSTALLED AT TYPICAL/STANDARD DEPTHS OR AT UNIFORM SLOPES/GRADES/DEPTHS BETWEEN ACCESS POINTS (CATCH BASINS, MANHOLES, JUNCTION CHAMBERS, ETC.)



STATE OF OHIO
RYAN S. SCHUSTER
72755
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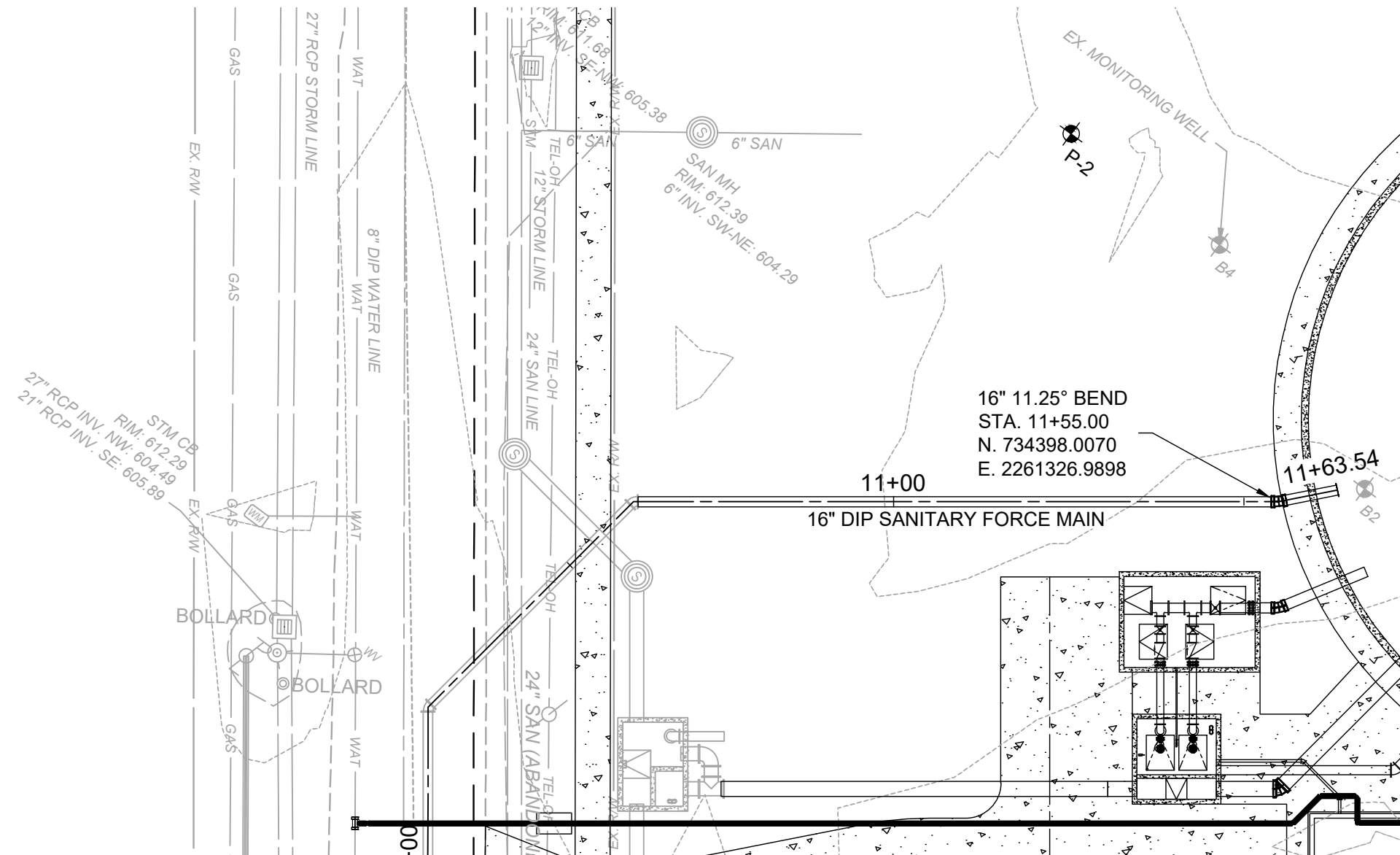
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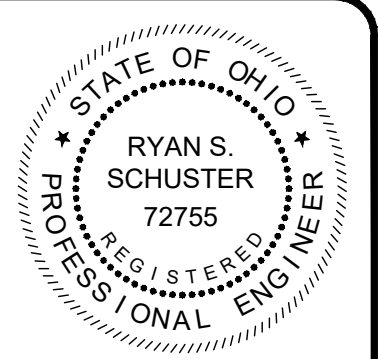
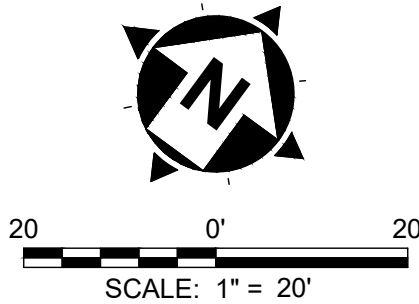
CITY OF WILLOUGHBY
LAKESHORE EAST EQ BASIN
PHASE II

WILLOUGHBY, OHIO
LAKE COUNTY
SITE IMPROVEMENT - 01 SERIES
PROPOSED GRADING PLAN

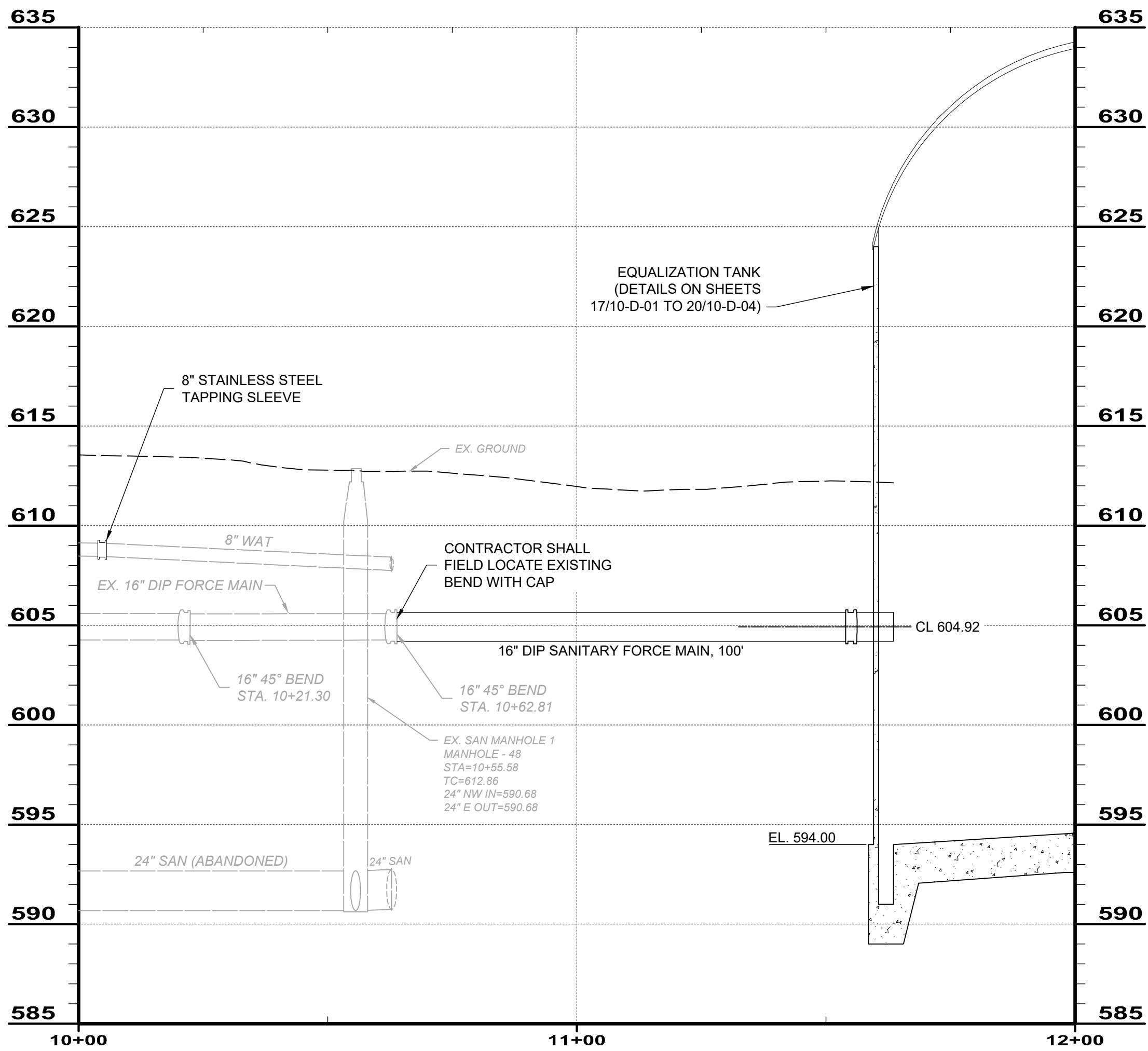
PROJECT NO.	230264
DISCIPLINE	CIVIL
SHEET NAME	01-C-04
SHEET	9
OF	48



- GENERAL NOTES:
- FORCE MAIN SHALL BE CONSTRUCTED FLAT OR SLOPED TO THE TANK TO ALLOW FOR DRAINING OF THE FORCE MAIN.
 - CONTRACTOR SHALL FIELD LOCATE EXISTING 16" FORCE MAIN. REMOVE CAP, AND CONNECT NEW FORCE MAIN.



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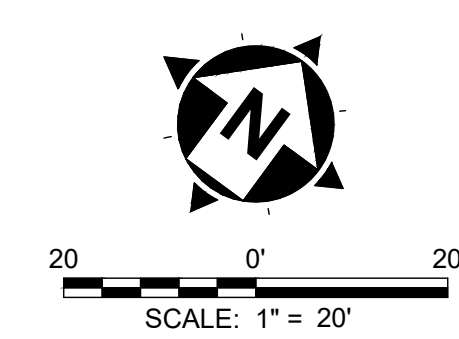


16" FORCE MAIN 10+00 - 12+00
SCALE: HORIZ. 1" = 20'
VERT. 1" = 5'

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CITY OF WILLOUGHBY LAKESHORE EAST EQ BASIN PHASE II LAKE COUNTY	WILLOUGHBY, OHIO
	SITE IMPROVEMENT - 01 SERIES
	16" FORCE MAIN PLAN & PROFILE STA 10+00 - 12+00

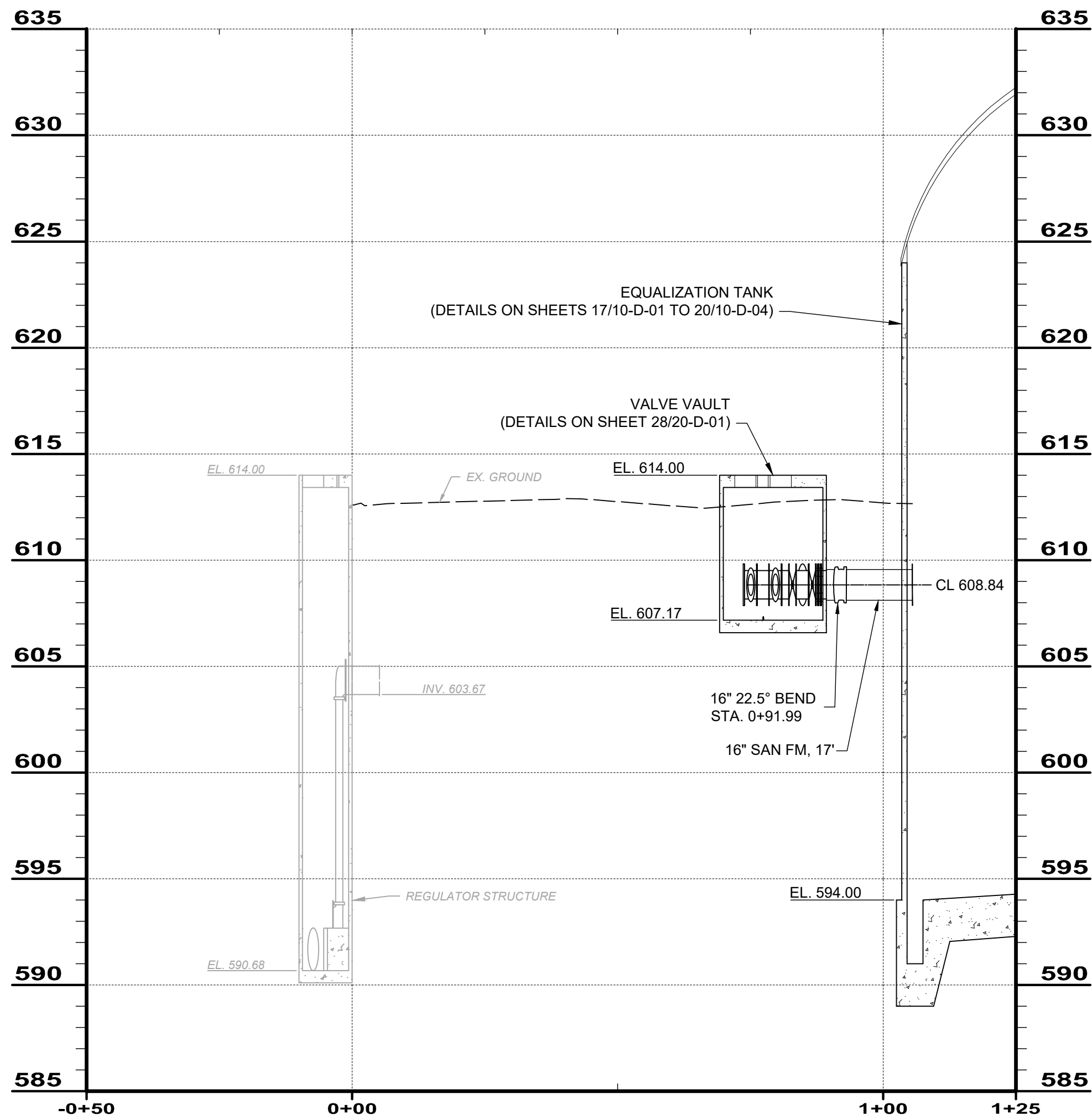
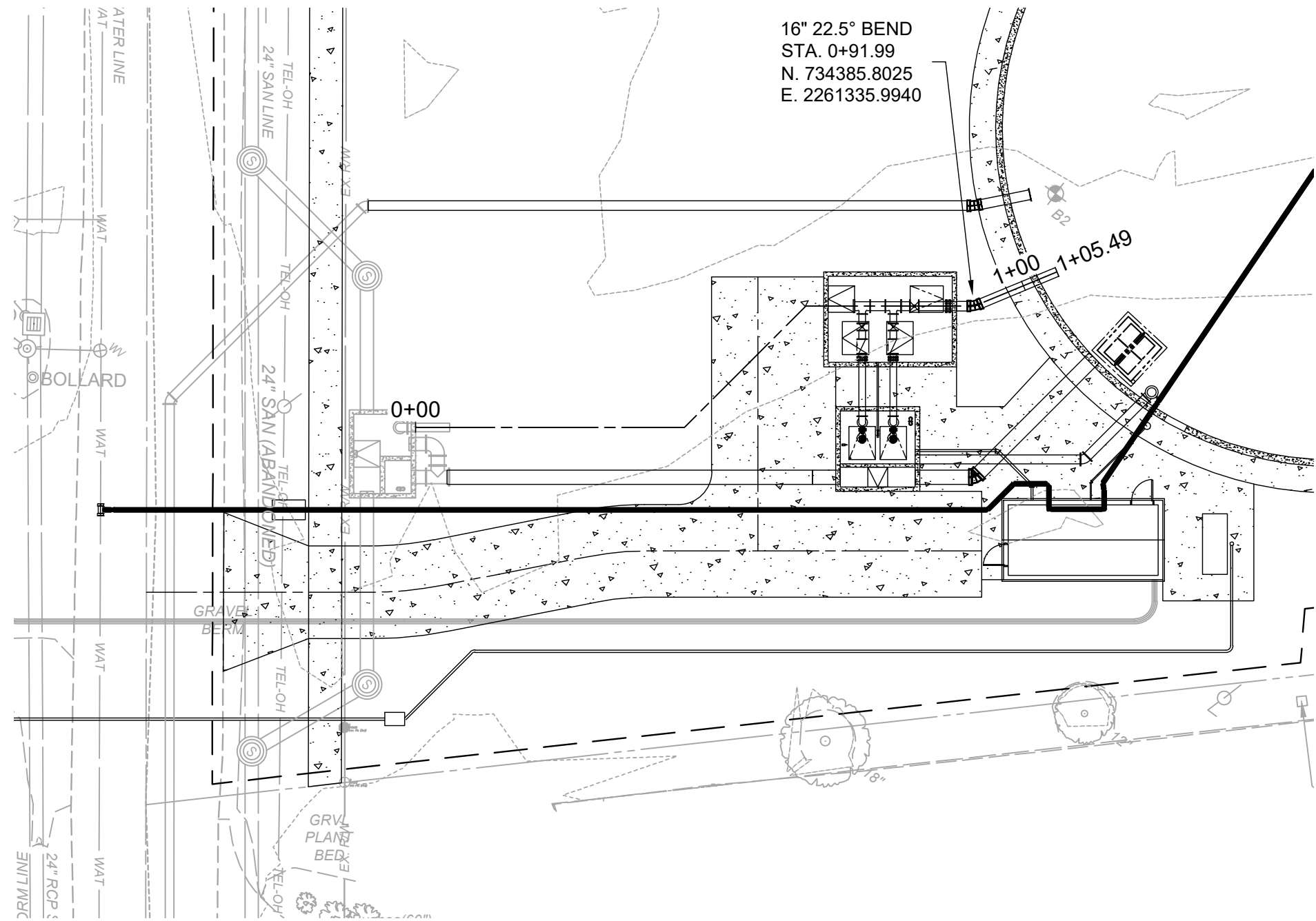
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230264	
DISCIPLINE	
CIVIL	
SHEET NAME	
01-C-06	
SHEET	OF
11	48



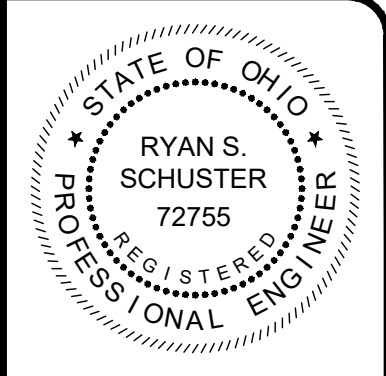
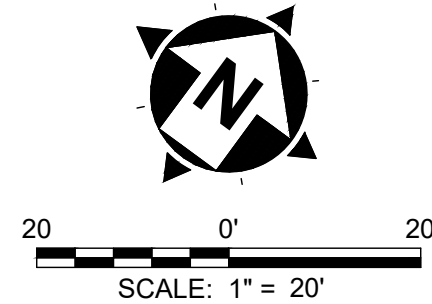
- GENERAL NOTES:
1. THE CONTRACTOR SHALL BRACE ANY EXISTING UTILITIES, ABOVE OR BELOW THE SURFACE, THAT INTERSECT OR ARE AFFECTED BY THE CONSTRUCTION OF ANY OF THE WORK WITHIN THE PROJECT LIMITS. UTILITY SUPPORT DETAIL FOR SUBSURFACE UTILITIES THAT INTERSECT WITHIN THE TRENCH IS INCLUDED IN THE CONSTRUCTION DETAILS.
 2. 24" GRAVITY SEWER FROM REGULATOR STRUCTURE TO WET WELL AND WET WELL TO THE LAKESHORE EAST EQ BASIN SHALL BE CL 52 DIP WITH BOLTLESS PUSH-ON JOINTS.
 3. CONTRACTOR SHALL FIELD LOCATE EXISTING 24" SANITARY SEWER. REMOVE CAP, AND CONNECT NEW SEWER.



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16" FORCE MAIN TO EQ TANK
SCALE: HORIZ. 1" = 20'
VERT. 1" = 5'

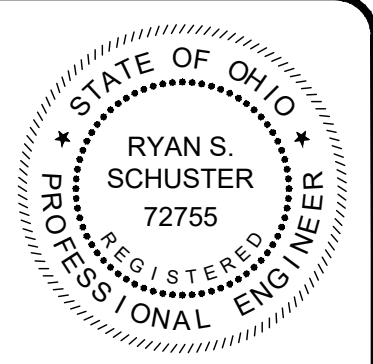
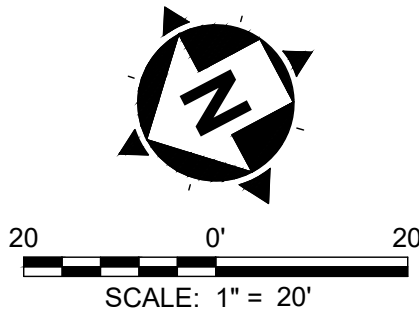
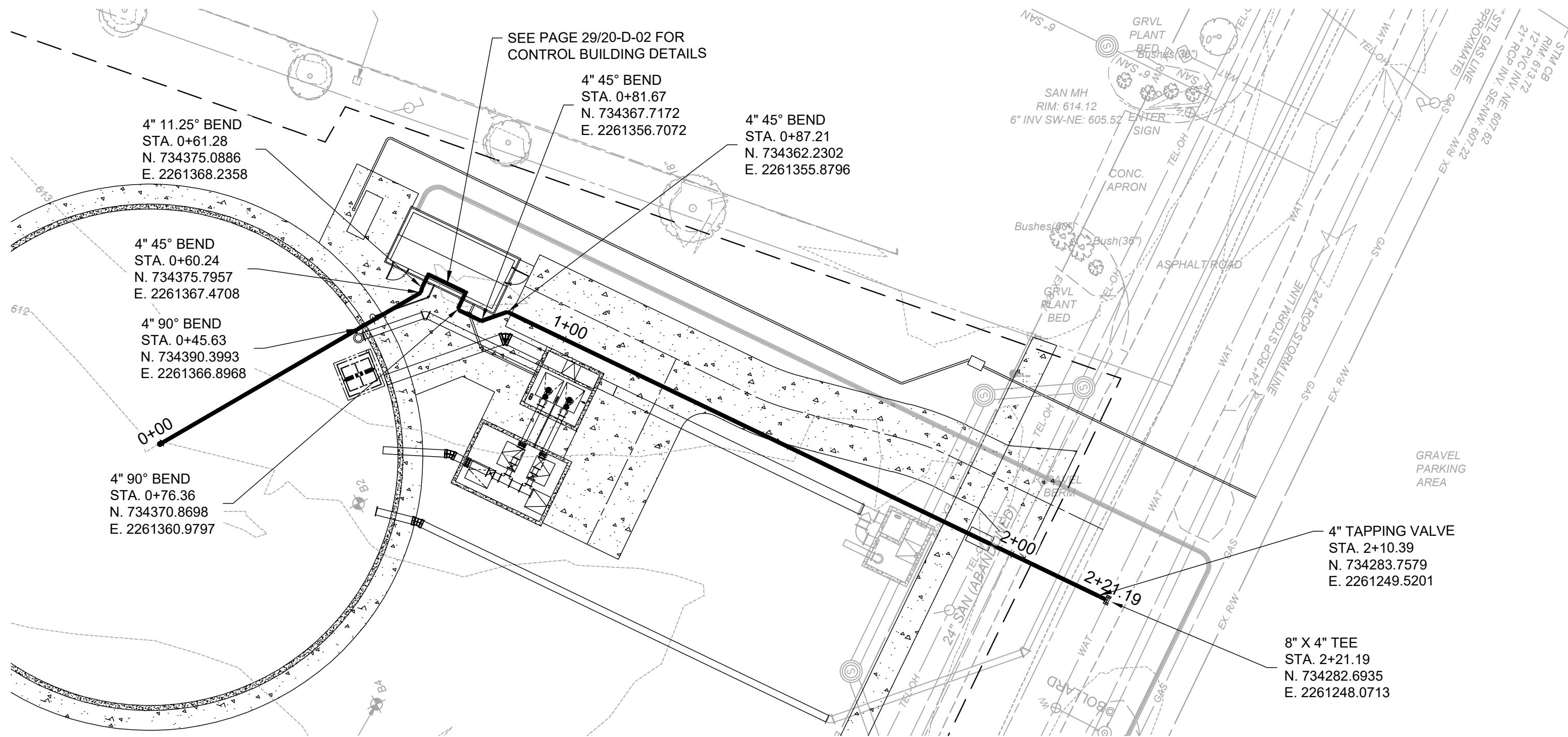


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CHECKED BY:	RSS			

CITY OF WILLOUGHBY	WILLOUGHBY, OHIO
LAKESHORE EAST EQ BASIN	
PHASE II	
LAKE COUNTY	
SITE IMPROVEMENT - 01 SERIES	
16" FORCE MAIN TO EQ TANK PLAN & PROFILE	

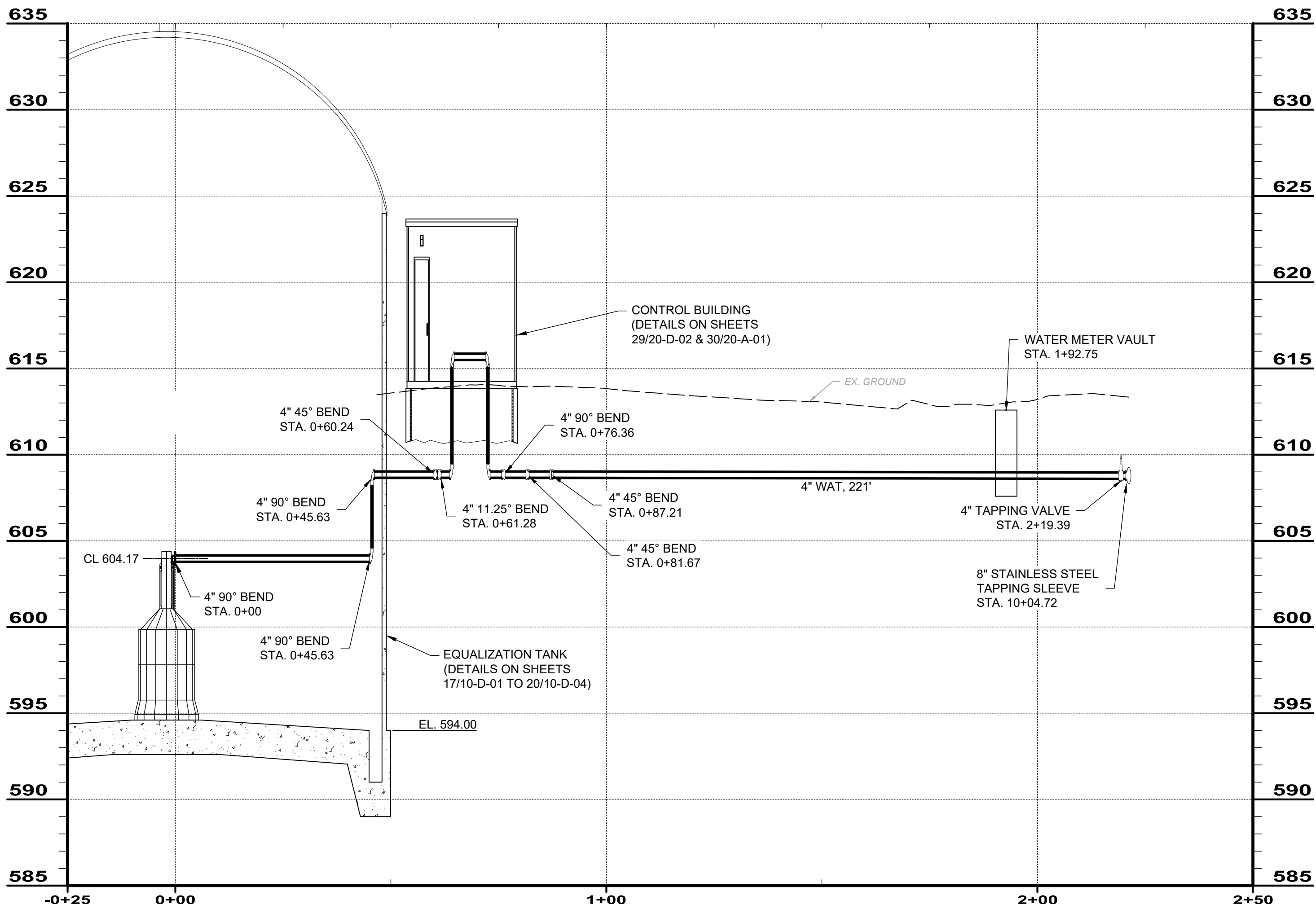
PROJECT NO.	230264
DISCIPLINE	CIVIL
SHEET NAME	01-C-08
SHEET	OF
13	48



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CHECKED BY:	RSS			



4" WATER SERVICE LINE

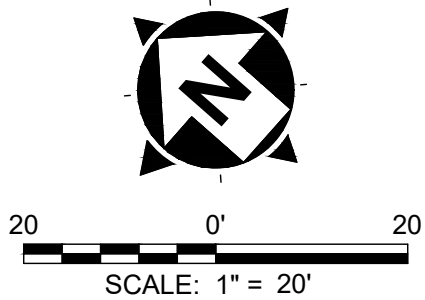
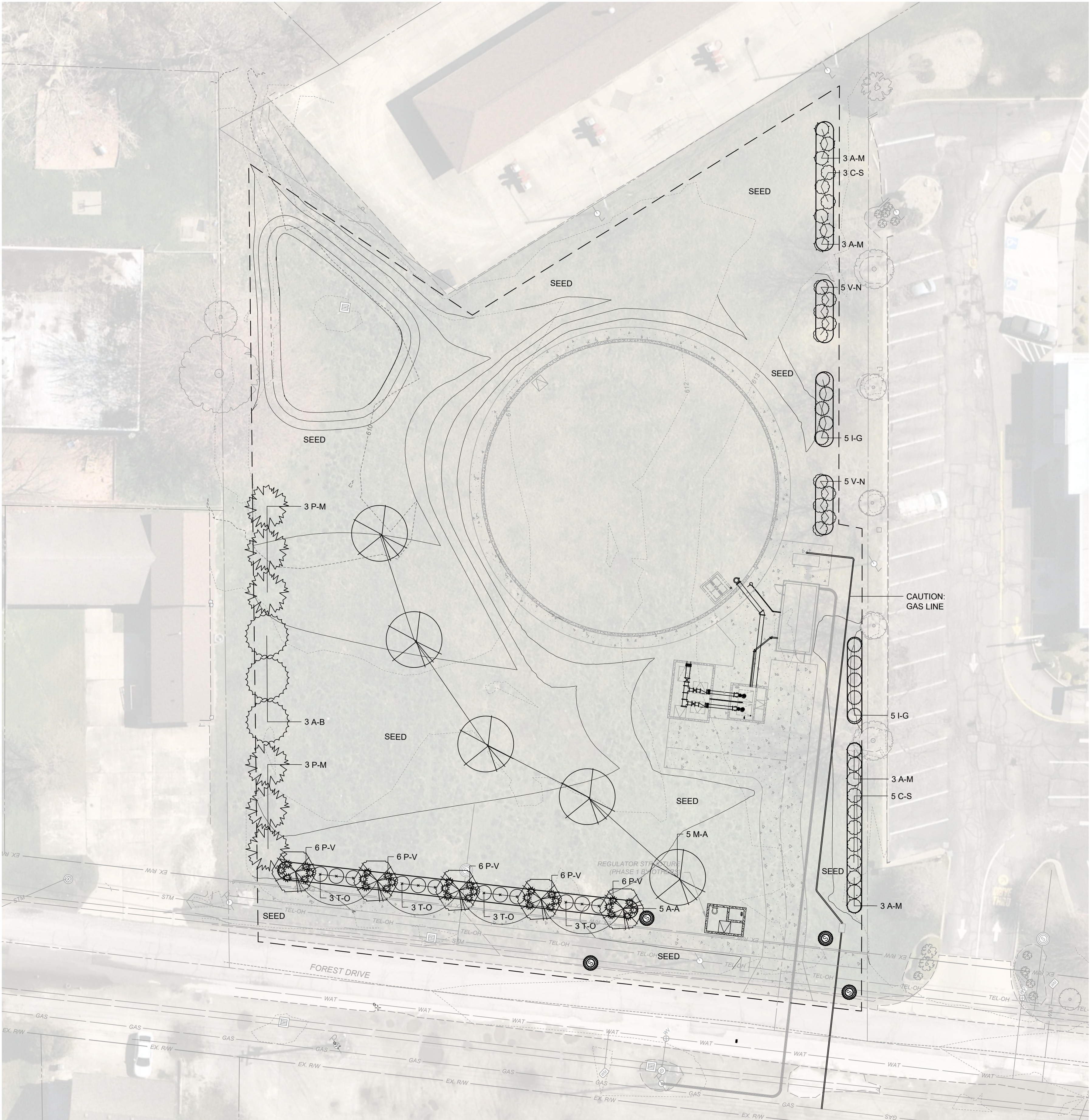
SCALE: HORIZ. 1" = 20'
VERT. 1" = 5'

CITY OF WILLOUGHBY
LAKECOUNTY

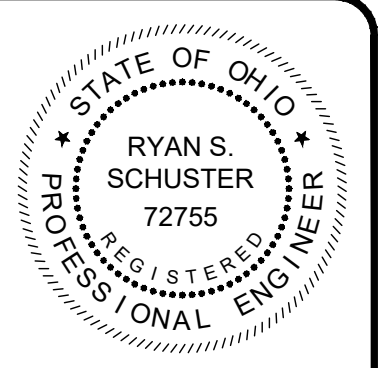
WILLOUGHBY, OHIO
PHASE II

SITE IMPROVEMENT - 01 SERIES
4" WATER SERVICE LINE PLAN & PROFILE

PROJECT NO.	230264
DISCIPLINE	CIVIL
SHEET NAME	01-C-09
SHEET	OF
14	48



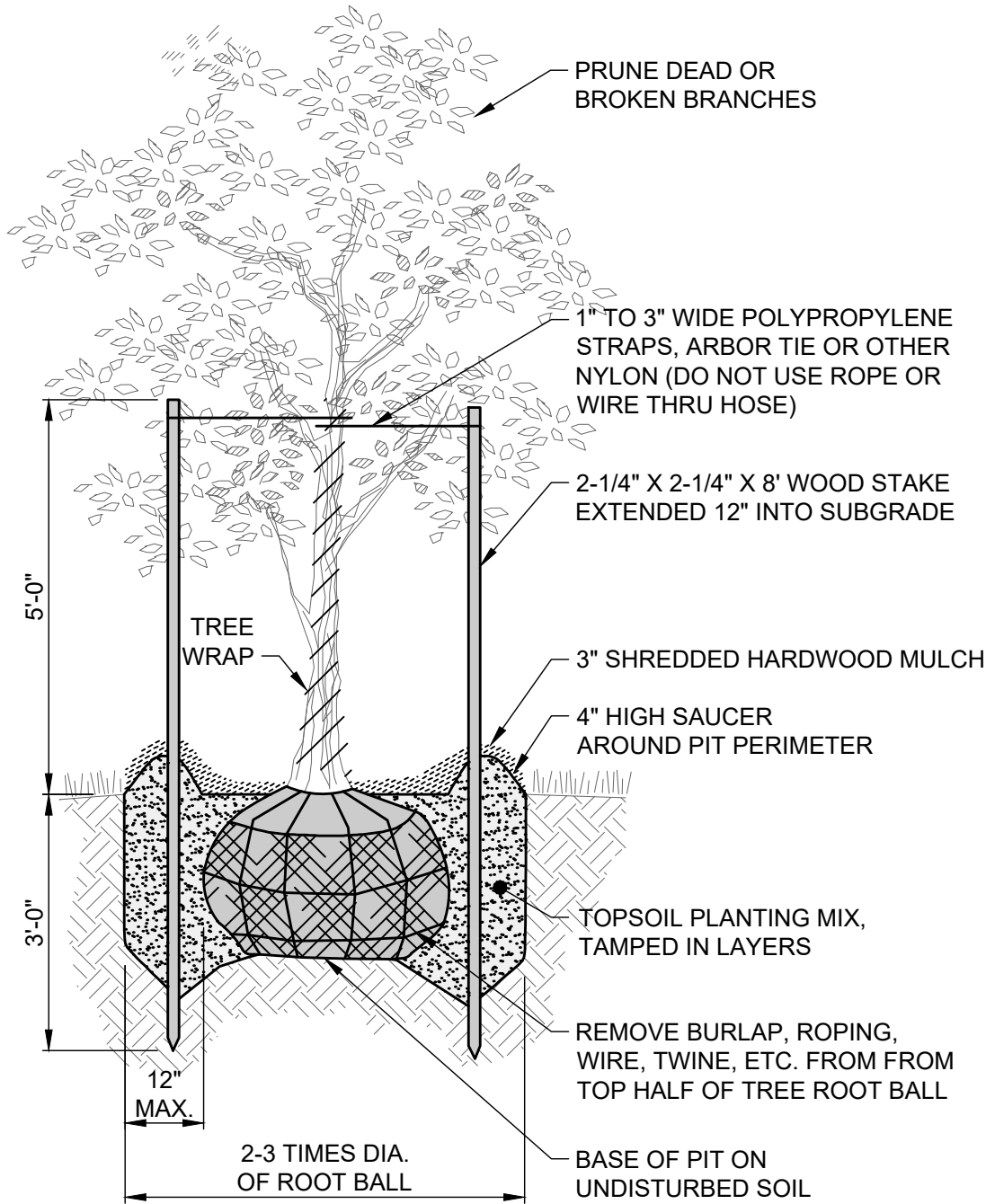
NATIVE PLANT MATERIAL LIST					
QTY.	KEY	BOTANICAL NAME	COMMON NAME	SIZE	NOTES
SHADE TREES					
5	M-A	MAGNOLIA ACUMINATA	CUCUMBERTREE MAGNOLIA	6"	#10 CONT.
ORNAMENTAL TREES					
5	A-A	AMELANCHIER X G. 'A BRILLIANCE'	AUTUMN BRILLIANCE SERVICEBERRY	5.5' CLUMP	MULTI-STEM
EVERGREEN TREES					
3	A-B	ABIES CONCOLOR	WHITE FIR	6' HT	B&B
6	P-M	PSEUDOTSUGA MENZIESII	DOUGLAS FIR	6' HT	B&B
SHRUBS					
12	A-M	ARONIA MELANOCARPA	IROQUOIS BEAU. BLACK CHOKECHERRY	36"	#5 CONT.
8	C-S	CORNUS STOLONIFERA 'ARTIC FIRE'	ARCTIC FIRE DOGWOOD	36"	#5 CONT.
10	I-G	ILEX G. 'DENSEA'	DENSA COMPACT INKBERRY	36"	#5 CONT.
12	T-O	THUJA O. 'WOODWARDII'	WOODWARD GLOBE ARBORVITAE	36"	#5 CONT.
10	V-N	VIBURNUM N. 'WINTERTHUR'	WINTERTHUR VIBURNUM	36"	#5 CONT.
PERENNIALS					
30	P-V	PANICUM V. 'SHENANDOAH'	SHENANDOAH RED SWITCH GRASS	CLUMP	#2 CONT.



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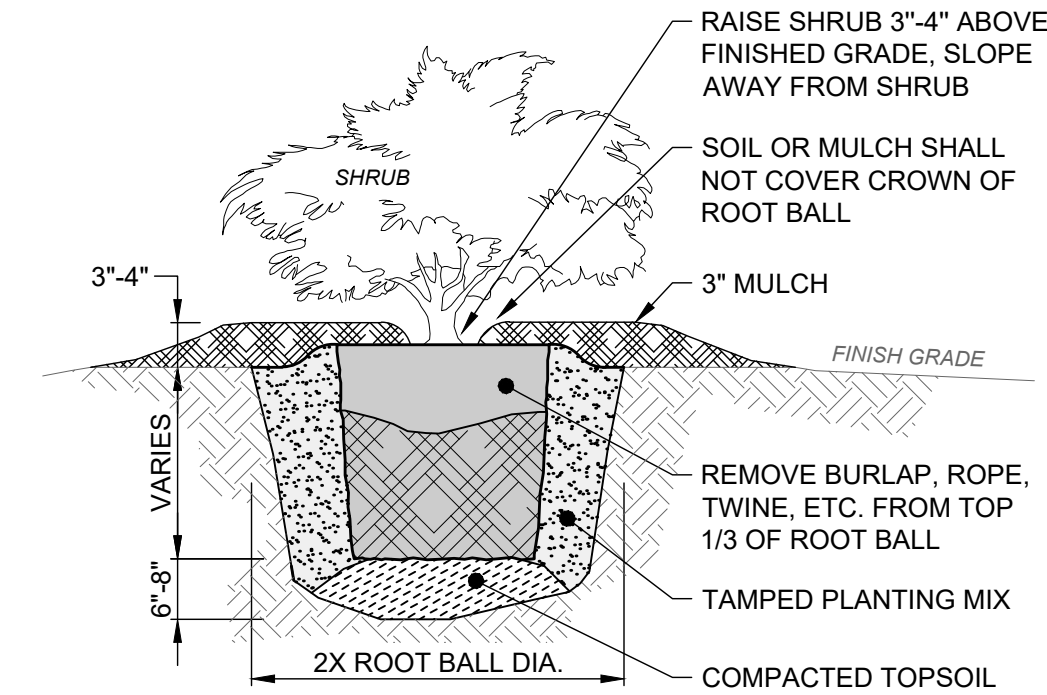
CITY OF WILLOUGHBY LAKESHORE EAST EQ BASIN PHASE I	WILLOUGHBY, OHIO	
	LAKE COUNTY	
	SITE IMPROVEMENT -- 01 SERIES	
LANDSCAPE PLAN		

PROJECT NO.	
230264	
DISCIPLINE	
CIVIL	
SHEET NAME	
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SHEET	OF
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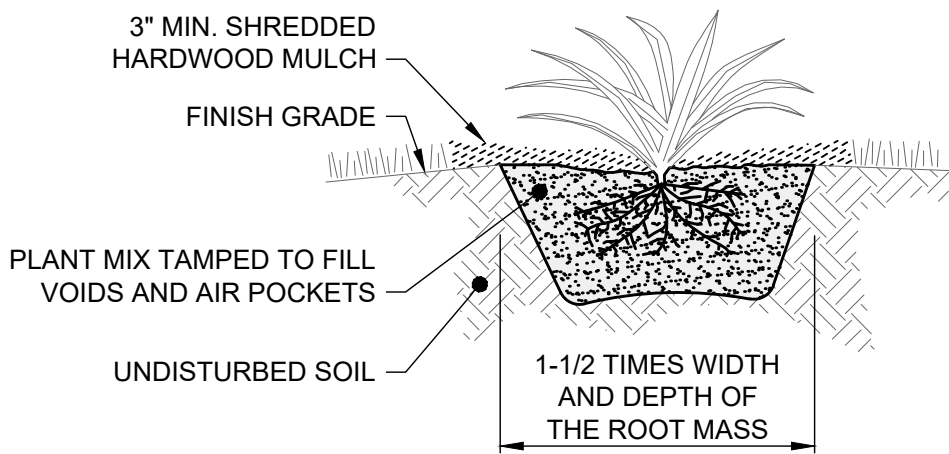


- NOTES:
- CROWN OF ROOT BALL TO BEAR THE SAME RELATION TO FINISH GRADE WHICH IT WAS GROWN AT THE NURSERY.
 - DO NOT DAMAGE ROOTS OR DESTROY ROOT BALL WHEN INSTALLING TREE STAKES.
 - REMOVE TREE RINGS, TREE WRAP AND STAKES 1 YEAR AFTER INSTALLATION. NOTIFY OWNER PRIOR TO REMOVAL.

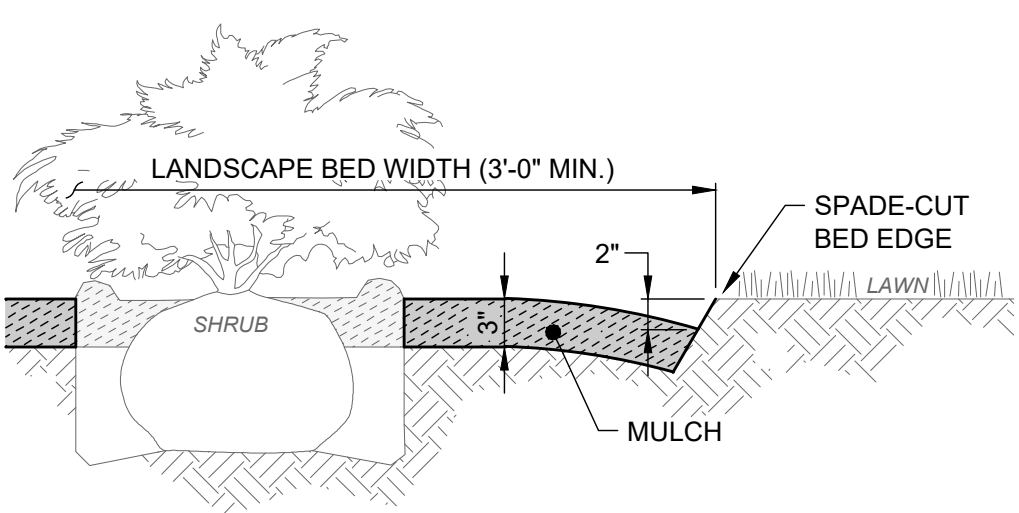
TREE PLANTING DETAIL
SCALE: NONE



SHRUB PLANTING DETAIL
SCALE: NONE

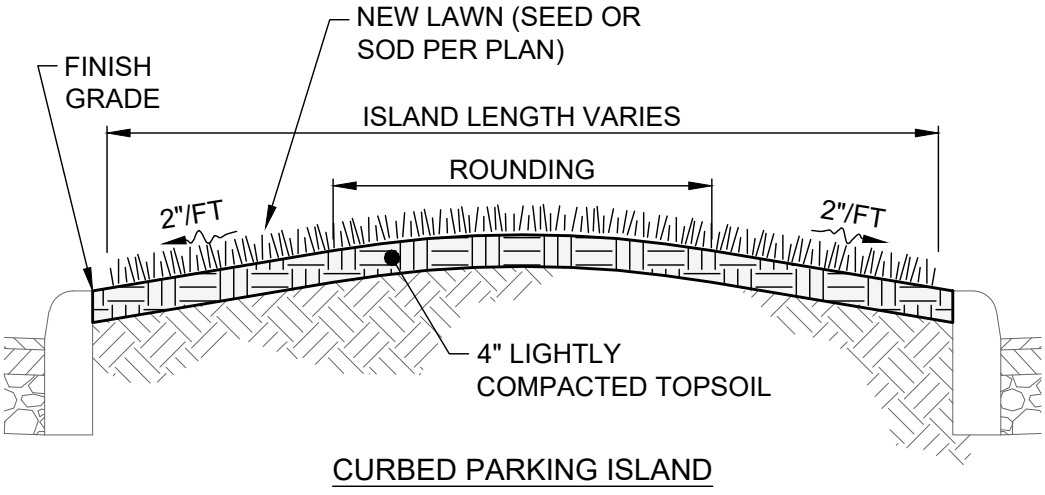


ANNUAL & PERENNIAL PLANTING DETAIL
SCALE: NONE

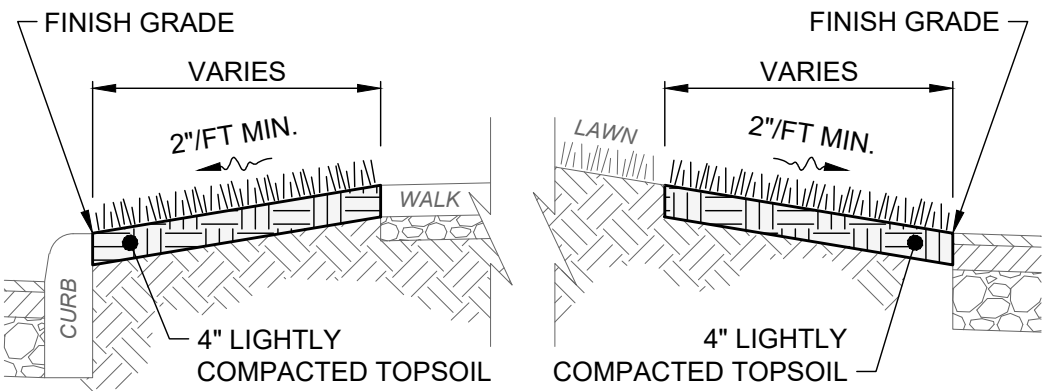


- NOTES:
- MULCH SHALL BE DOUBLE SHREDDED HARDWOOD BARK MULCH, DARK BROWN OR BLACK COLOR PER OWNER CHOICE, EXTRA FINE WITH TEXTURE AT 1-1/2" OR LESS FREE OF WEEDS, CHAFF OR OTHER FOREIGN MATERIAL.
 - MULCH SHALL BE PLACED IN ALL PLANTING AREAS SPREAD TO A SMOOTH, UNIFORM SURFACE PLANE WITH CRISP STRAIGHT AND SMOOTH CURVED MULCH BED EDGES. BED EDGES SHALL BE CUT IN "V" SHAPE WITH 60° ANGLE TO GROUND.
 - THIS DETAIL SHOWS A SHRUB FOR REFERENCE ONLY. SEE LANDSCAPE PLAN FOR ACTUAL PLANT TYPES AND LOCATIONS, AND CONFIGURATION OF BEDS.

MULCH BED DETAIL
SCALE: NONE



CURBED PARKING ISLAND

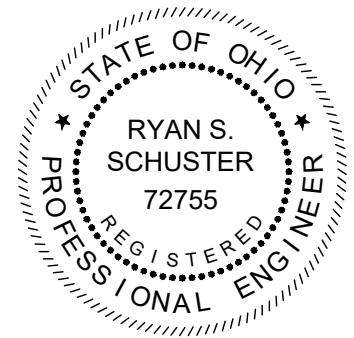


CURBED TREE LAWN

EDGE PAVEMENT

- NOTES:
- PLACE TOPSOIL TO TOP OF CURB OR EDGE OF SIDEWALK AND FINE GRADE TO A SMOOTH FINISH, FREE OF LUMPS AND DEPRESSIONS.
 - LAWN AREAS, AFTER LIGHT ROLLING, SHALL MEET THE GRADES, ELEVATIONS AND SLOPES SHOWN ON THE GRADING PLANS.

LAWN PLANTING DETAIL
SCALE: NONE



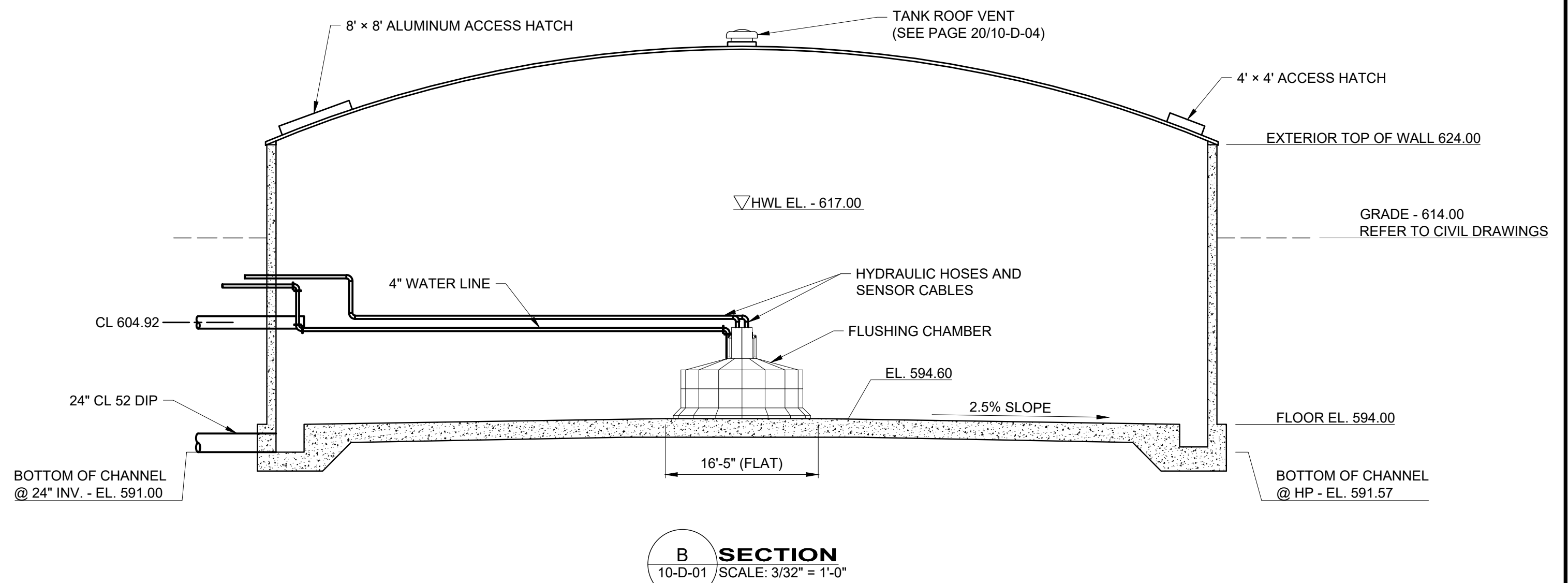
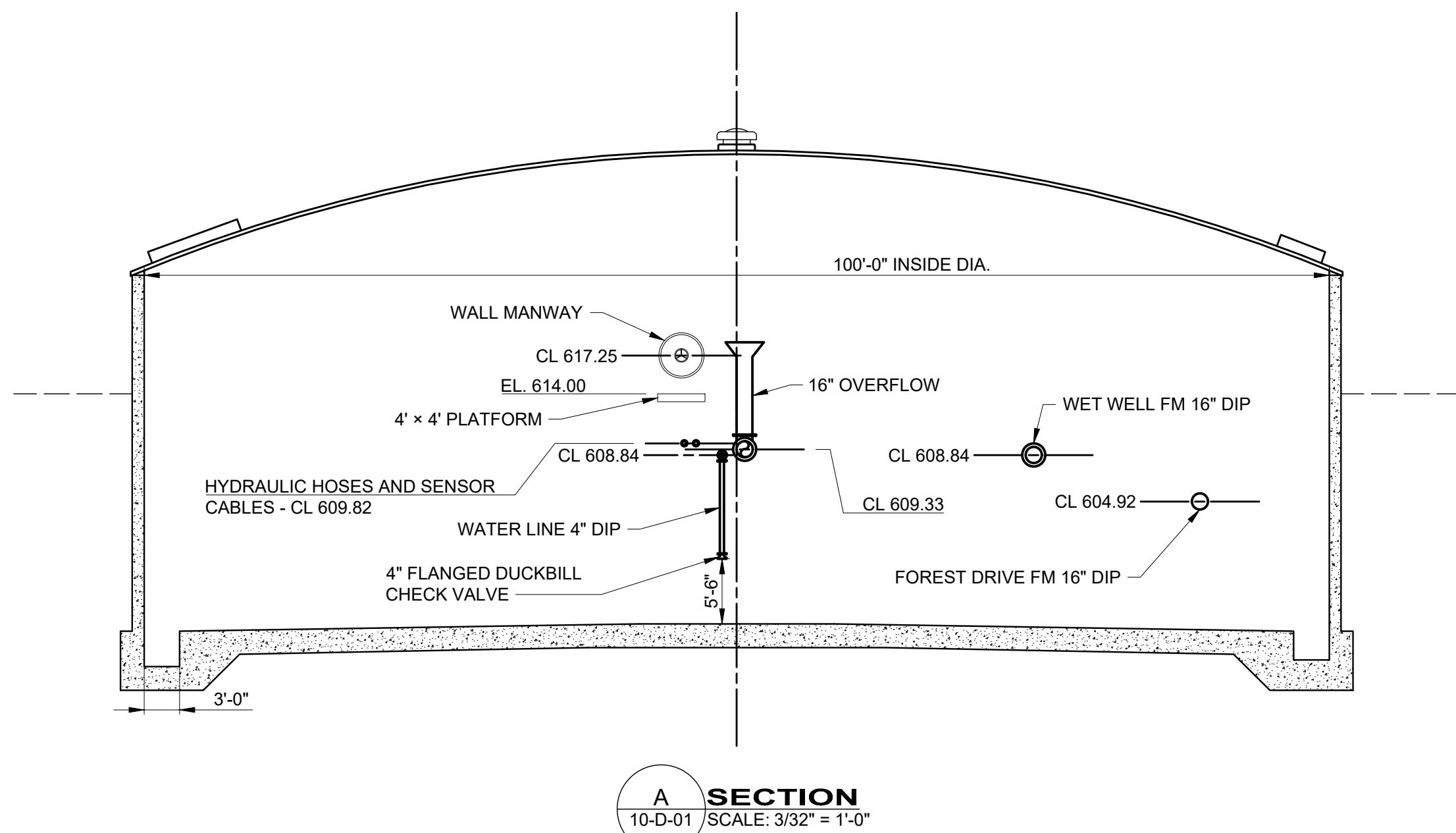
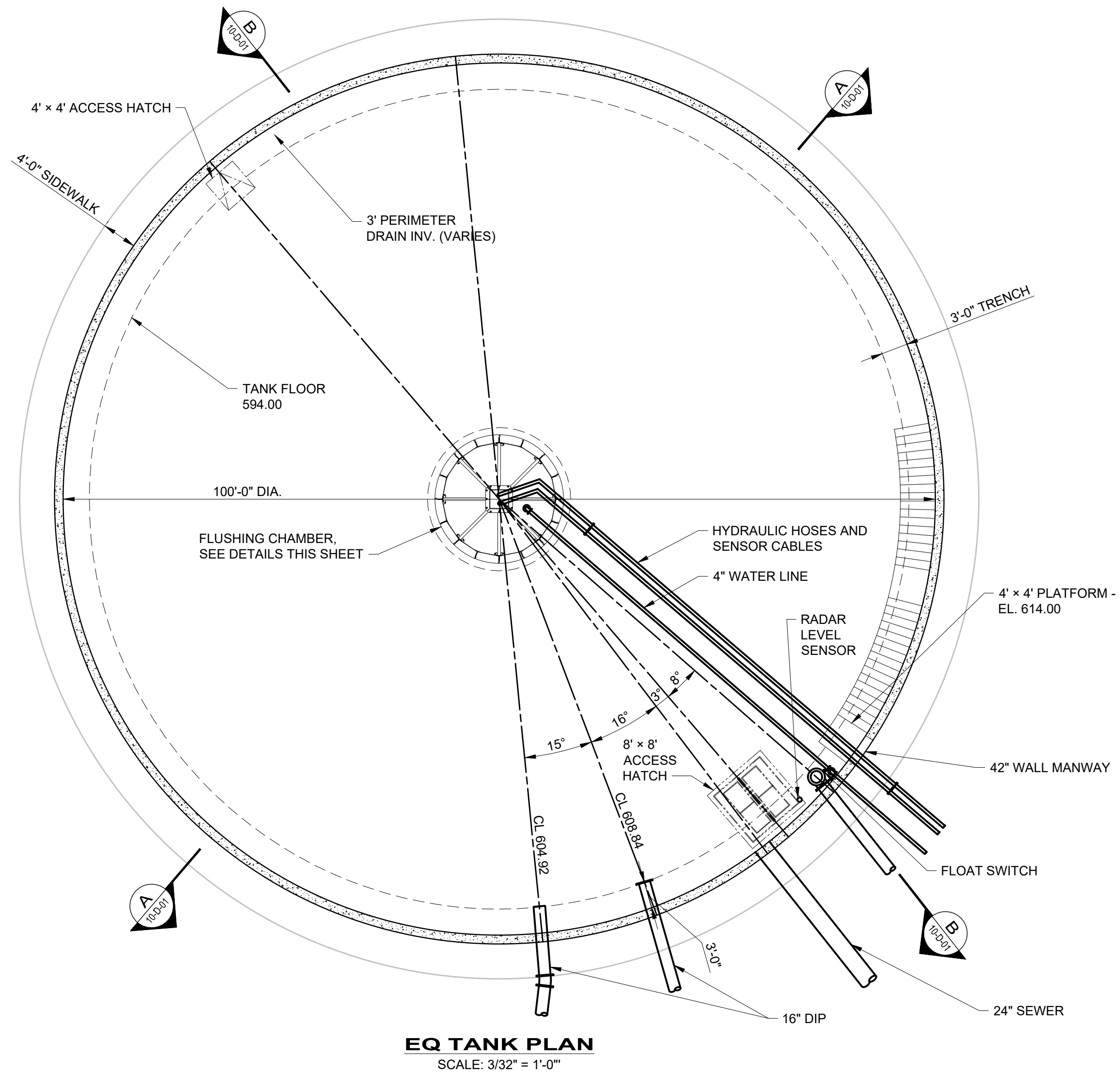
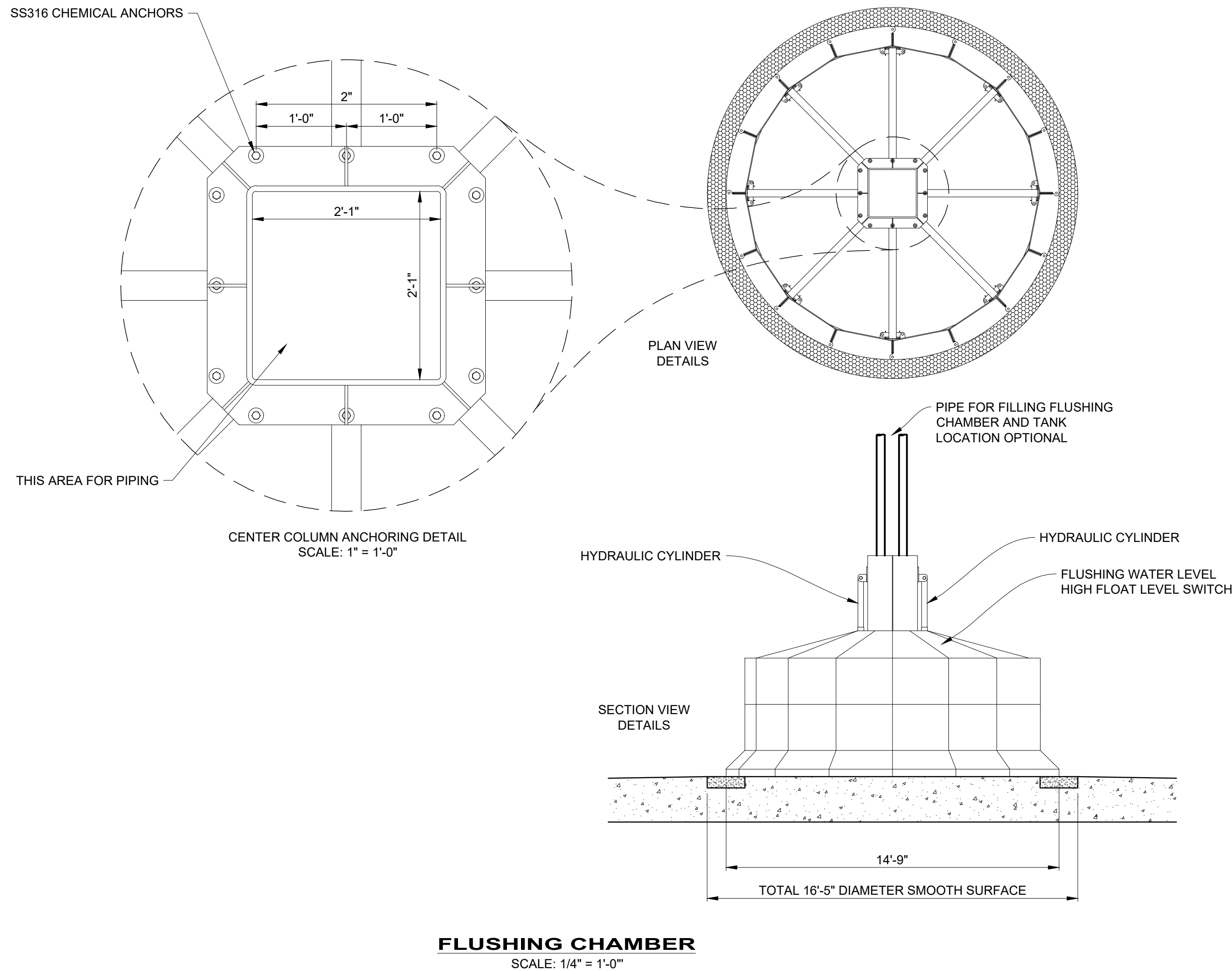
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MENTOR, OHIO 44060
(440) 951-9000

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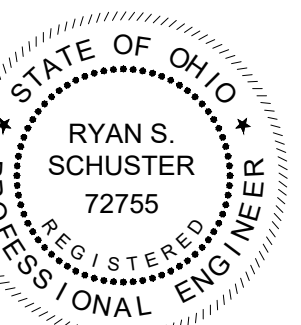
CITY OF WILLOUGHBY	WILLOUGHBY, OHIO
LAKESHORE EAST EQ BASIN	
PHASE I	
LAKE COUNTY	
SITE IMPROVEMENT - 01 SERIES	
LANDSCAPE DETAIL	

PROJECT NO.	230264
DISCIPLINE	CIVIL
SHEET NAME	01-C-11
SHEET	OF
16	48



NOTES:

- CONTRACTOR TO PLACE HYDRAULIC LINES AND CONTROL WIRES FOR THE FLUSHING CHAMBER IN SEPARATE SCH 40 PVC CONDUIT. SCH 40 PVC CONDUIT SHALL BE SEALED AT THE END OF THE CONDUIT. CONDUIT SHALL BE A MINIMUM OF 2" GREATER IN DIAMETER THAN THE O.D. OF THE CARRIER LINE INCLUDING JOINTS, UPSIZING THE CONDUIT TO THE NEXT GREATER DIAMETER. ALL FITTINGS SHALL BE LONG SWEEP DESIGN.
- CONTRACTOR TO PROVIDE STAINLESS STEEL PIPE SUPPORTS TO SUPPORT ALL PIPE LINES AND CONDUIT FROM THE TANK WALL TO THE CENTER FLUSHING SYSTEM. A MINIMUM OF TWO SUPPORTS PER PIPE SHALL BE PROVIDED.
- CONTRACTOR SHALL SLOPE ALL PIPES WITHIN THE EQ TANK TO THE DISCHARGE POINT TO ALLOW FOR DRAINING.
- CONTRACTOR SHALL COORDINATE THE FINAL LOCATIONS OF THE HYDRAULIC HOSES, SENSOR CABLES, AND WATER LINE WITH THE CENTER FLUSHING SYSTEM TO AVOID CONFLICTS AND CONTACT THAT WOULD IMPACT THE OPERATION AND MAINTENANCE OF ANY SYSTEM.



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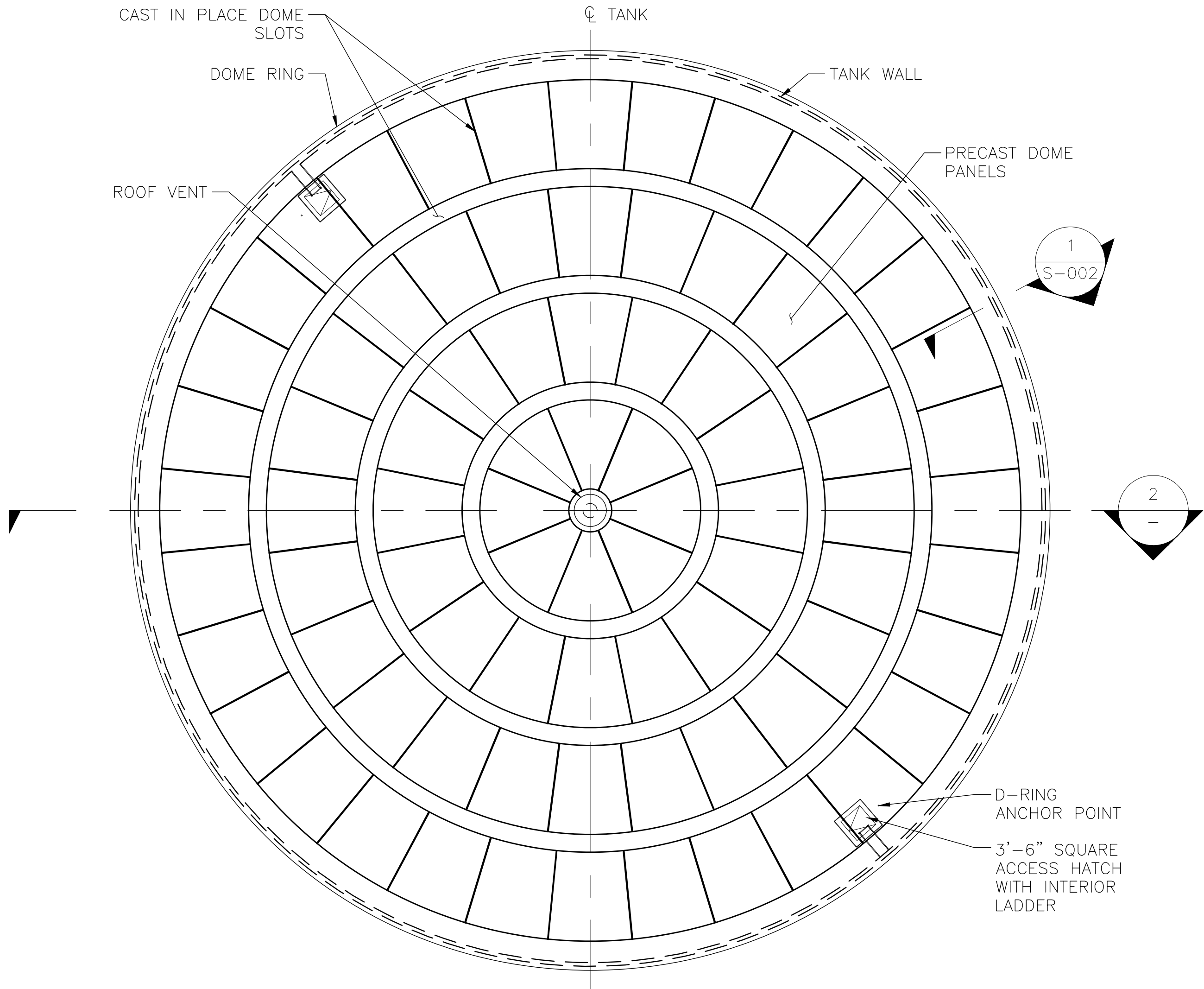
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10/3/2025	10/3/2025			
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DESIGNED BY:	CAS			
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CITY OF WILLOUGHBY
LAKESHORE EAST EQ BASIN

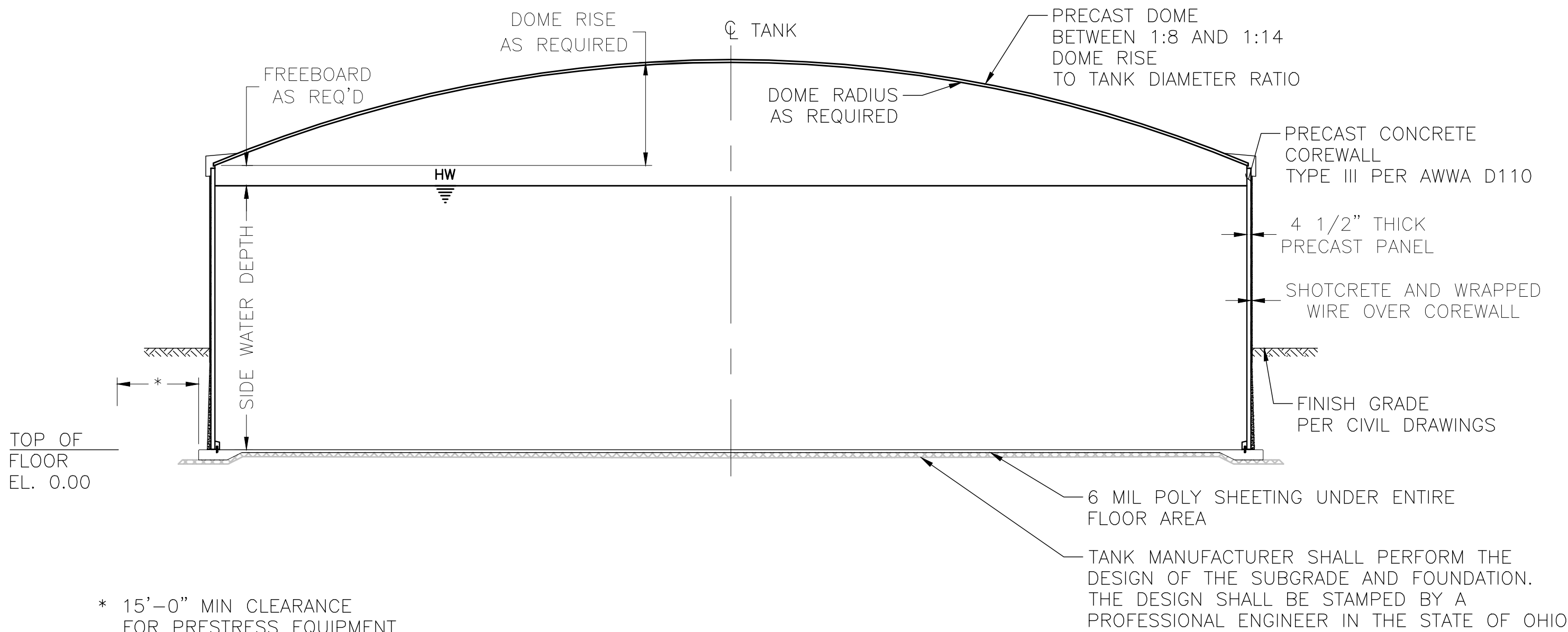
PHASE II

LAKE COUNTY
WILLOUGHBY, OHIO
SITE STRUCTURES - 20 SERIES
EQ TANK PLAN & SECTION

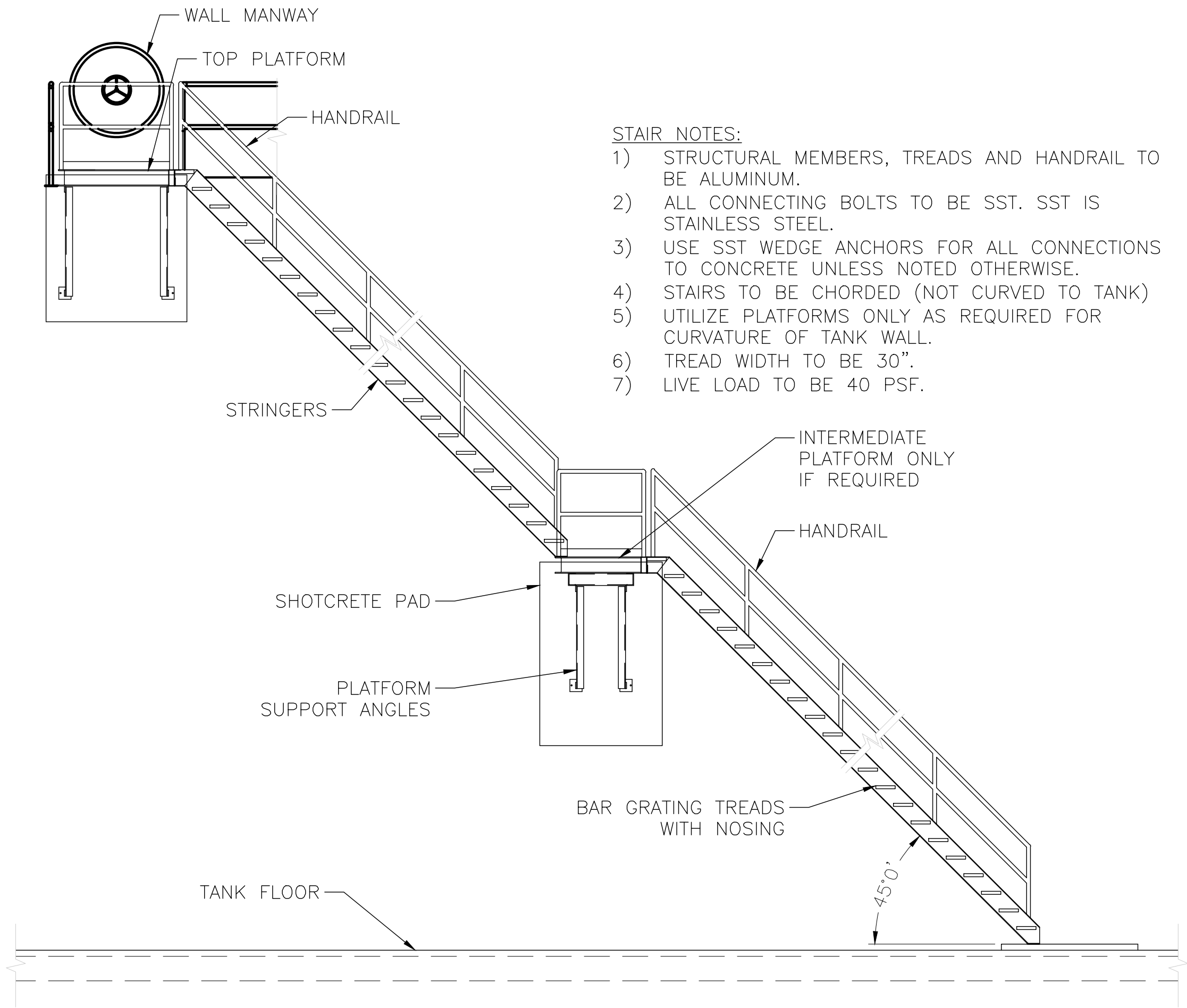
PROJECT NO.	230264
DISCIPLINE	PROCESS
SHEET NAME	10-D-01
SHEET	17
OF	48



ROOF PLAN



TANK SECTION



INTERIOR STAIRS

GENERAL NOTES:

*ALL DIMENSIONS SHOWN ARE MINIMUM REQUIREMENTS. TANK CONTRACTOR, AS DEFINED IN THE SPECIFICATIONS, TO VERIFY DIMENSIONS WITH STRUCTURAL CALCULATIONS.

- A. DESIGN LOADS
- | | |
|---|---|
| 1. ROOF LOAD | : 20.0 PSF LIVE; SNOW |
| 2. LIQUID (WATER) | : 62.4PCF |
| 3. R_i , IMPULSIVE STRUCTURAL RESPONSE COEFFICIENT | : 3.25 (ASCE 7 WITH CABLES) 1.50 (ASCE 7 W/O CABLES) 3.50 (AWWA WITH CABLES) 1.50 (AWWA W/O CABLES) |
| 4. R_c , CONVECTIVE STRUCTURAL RESPONSE COEFFICIENT | : 1.0 |
| 5. ANALYSIS PROCEDURE USED | : EQUIVALENT LATERAL FORCE ANALYSIS BASED ON AWWA D110 AND ACI 350.3 |
- B. CONCRETE AND SHOTCRETE
- | | |
|--|------------|
| 1. FLOOR, AND FOOTINGS | : 4500 PSI |
| 2. DOME, DOME RING AND DOME SLOTS | : 4500 PSI |
| 3. PRECAST WALL | : 4500 PSI |
| 4. SHOTCRETE FOR WIRE COVER (1C:3S) AND COVER COAT (1C:4S) | : 4500 PSI |
| 5. SEE TECHNICAL SPECIFICATION FOR COMPLETE MIX DESIGN INFORMATION INCLUDING MINIMUM CEMENT CONTENT, MAXIMUM WATER-CEMENT RATIO, AGGREGATE SIZE AND ACCEPTABLE ADMIXTURES. | |
| 6. SEE TECHNICAL SPECIFICATION FOR CONCRETE PLACING AND FORMING PROCEDURES. | |
- C. METALS
- | | |
|---|--|
| 1. ALL STAINLESS STEEL (SST) TO BE 304L UNLESS OTHERWISE NOTED. | |
|---|--|
- D. REINFORCING STEEL
- | | |
|--|--|
| 1. ALL REINFORCING IN TANK SHALL CONFORM TO ASTM A615 GRADE 60 UNLESS OTHERWISE NOTED ON THESE DRAWINGS. | |
| 2. REINFORCING STEEL CALLED OUT AS GALVANIZED SHALL HAVE A CLASS 1 COATING IN ACCORDANCE WITH ASTM A767, WITHOUT CHROMATE. | |
- E. EARTHWORK REQUIREMENTS
- | | |
|---|--|
| 1. MINIMUM COMPACTION OF CRUSHED ROCK AND SUBGRADE UNDER AND AROUND PIPE BLOCKS AND UNDER FLOOR AND FOOTINGS SHALL EQUAL 95% RELATIVE COMPACTION AS DETERMINED IN ACCORDANCE WITH ASTM D1557. | |
| 2. COMPACTION OF BACKFILL AROUND TANK SHALL EQUAL 90% RELATIVE COMPACTION AS DETERMINED IN ACCORDANCE WITH ASTM D1557. USE ONLY HAND HELD COMPACTION EQUIPMENT WITHIN 5' OF TANK WALL AND LIGHTWEIGHT EQUIPMENT (15,600 LBS MAX) BEYOND THE 5' AND WITHIN 15' OF THE TANK SO AS NOT TO DAMAGE THE WALL. BRING UP THE BACKFILL AROUND THE TANK IN UNIFORM LIFTS WHEN POSSIBLE. DIFFERENCE IN BACKFILL HEIGHTS DURING INSTALLATION SHALL NEVER EXCEED THE FINAL DIFFERENCE IN BACKFILL HEIGHTS. | |

THE DETAILS ON THIS SHEET ARE TYPICAL DETAILS AND ARE SUBJECT TO FINAL DESIGN OF THE TANK MANUFACTURER AND APPROVAL OF ENGINEER.

STATE OF OHIO
RYAN S. SCHUSTER
72755
REGISTERED
PROFESSIONAL ENGINEER

verdantas

8150 STERLING COURT
MENTOR, OHIO 44060
(440) 951-9000

NO	REVISION	DATE

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ISSUE DATE:	SCALE:	DESIGNED BY:	DRAWN BY:	CHECKED BY:
10/3/2025	NTS	CAS	FLST	RSS

CITY OF WILLOUGHBY
LAKESHORE EAST EQ BASIN
PHASE II

LAKE COUNTY

WILLOUGHBY, OHIO

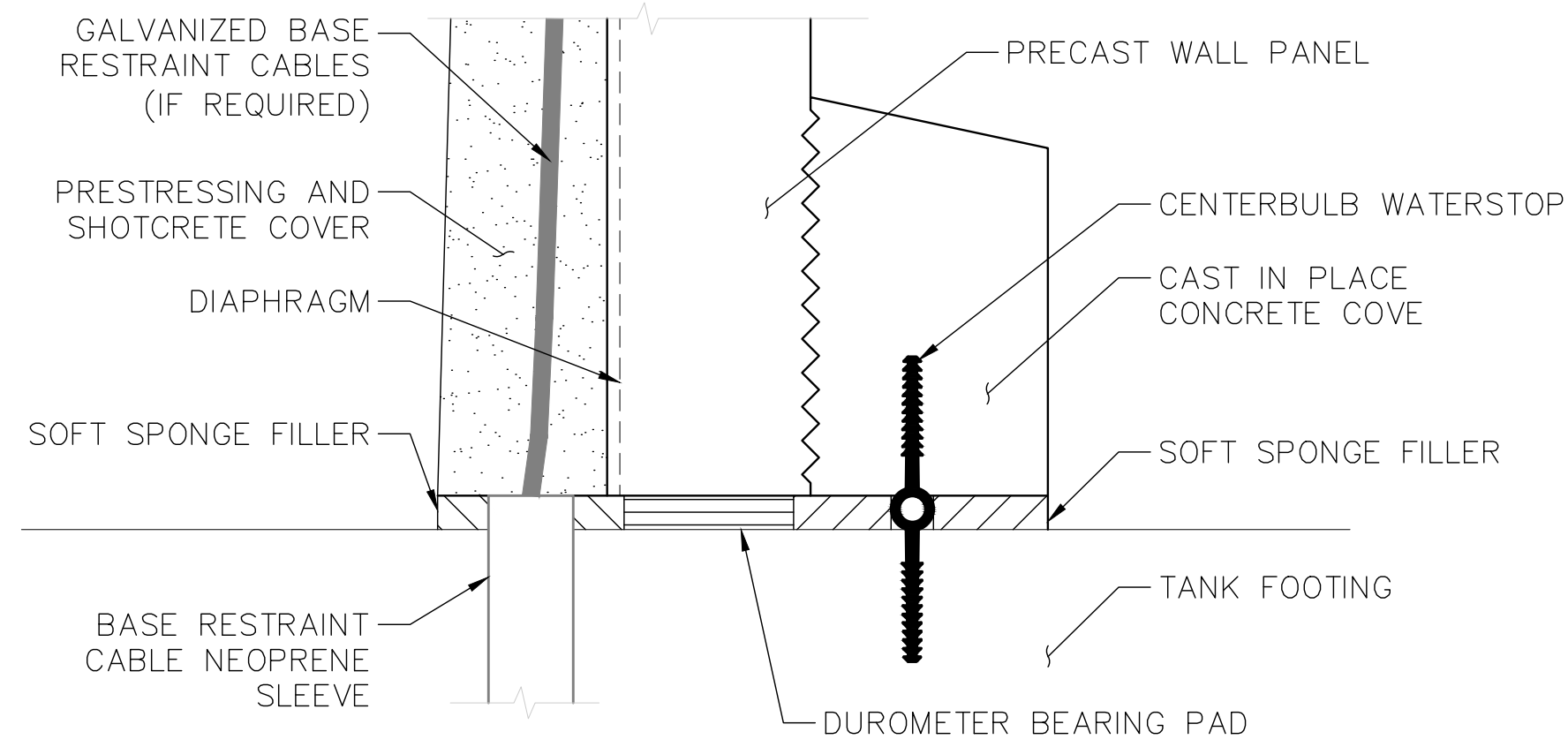
EQUALIZATION BASIN - 10 SERIES

EQ TANK DETAILS

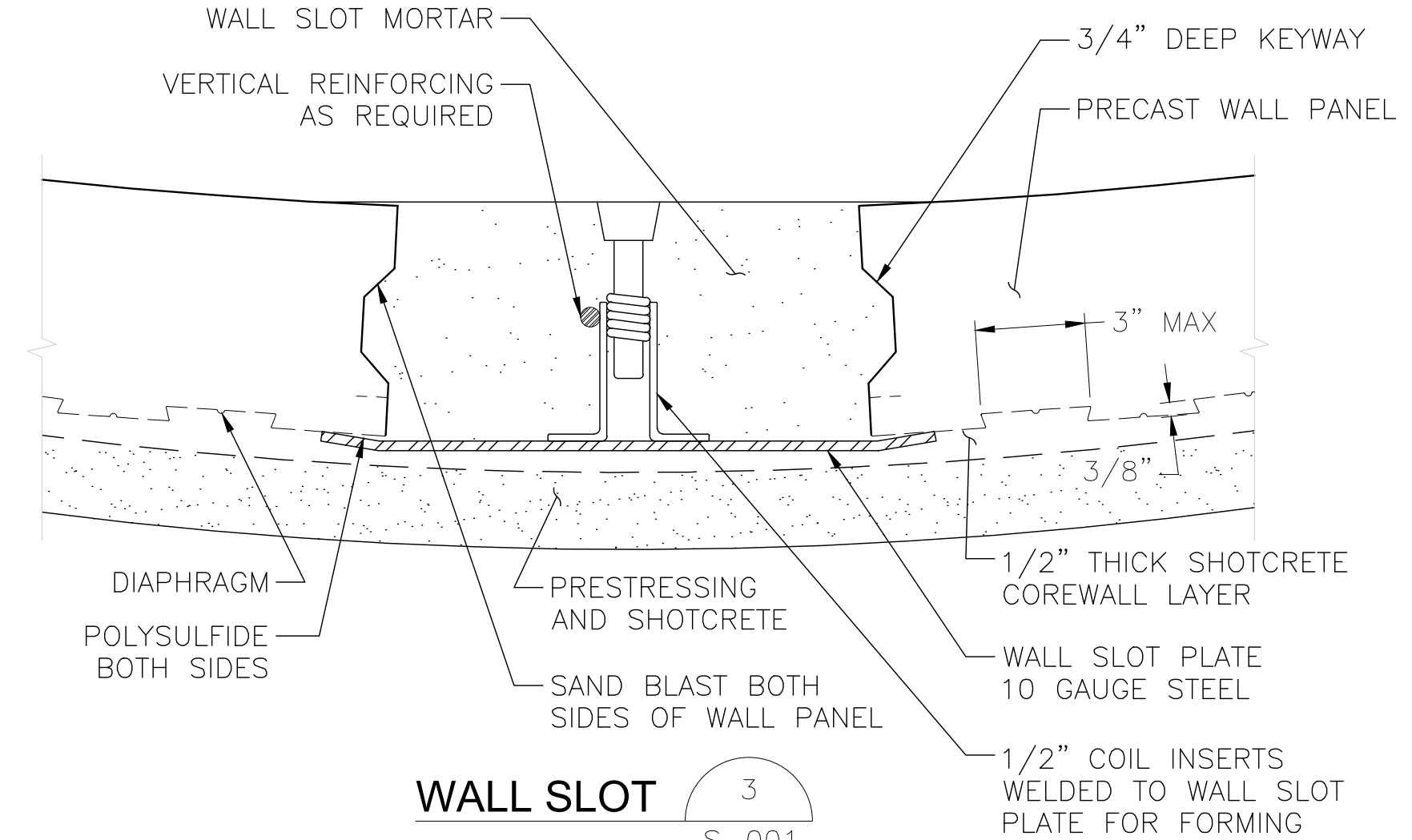
PROJECT NO. 230264	
DISCIPLINE PROCESS	
SHEET NAME 10-D-02	
SHEET 18	OF 48

NOTES:

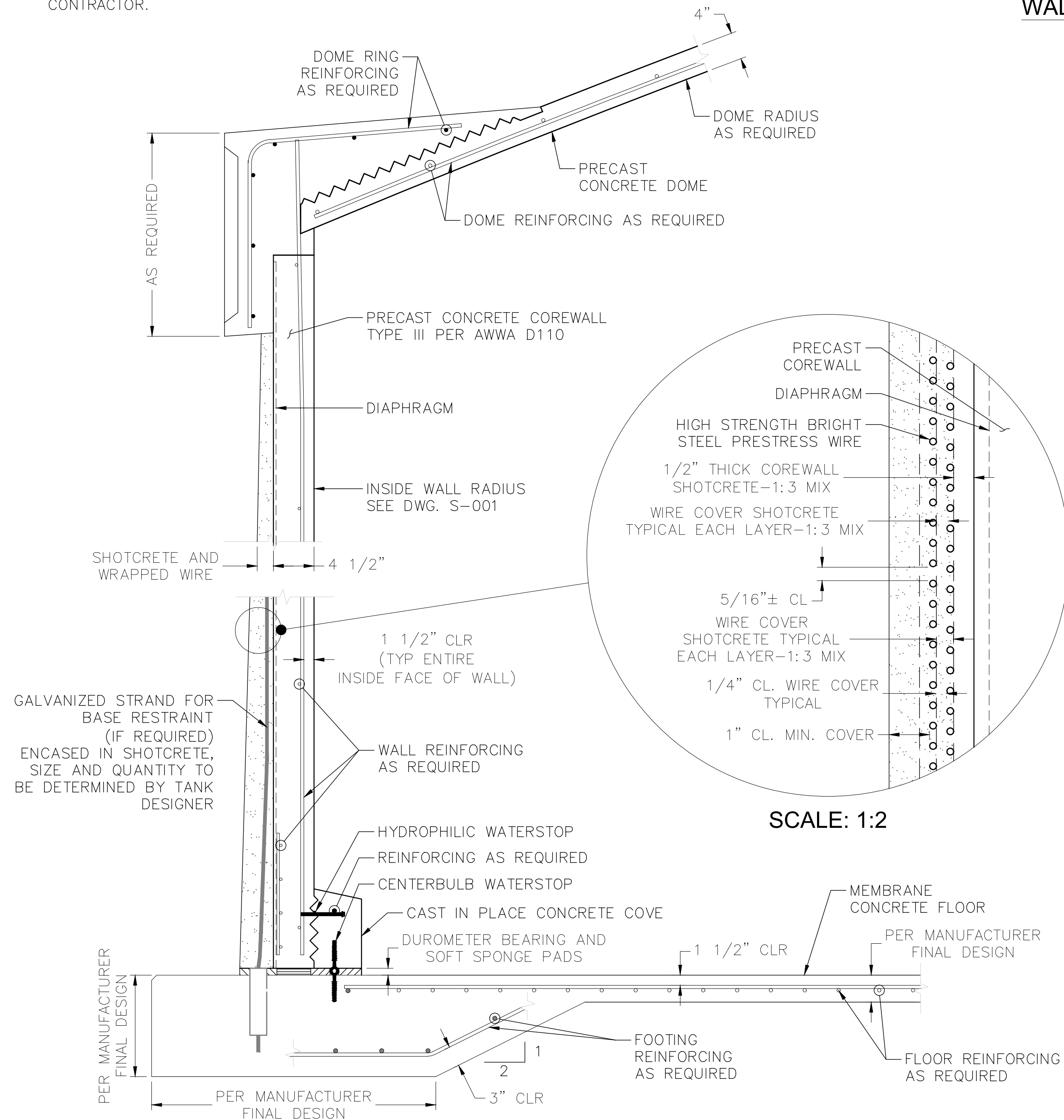
- 1) FOOTING AND FLOOR TO BE FINISHED PER SPECIFICATIONS.
- 2) MAINTAIN CLEARANCE BETWEEN THE INDIVIDUAL STRANDS IN THE BASE RESTRAINT CABLE SETS (DO NOT BUNDLE). CABLES MAY TOUCH WITHIN 2' OF THE BOOT.
- 3) THE COMBINED FLOOR AND WALL FOOTING SHALL BE POURED MONOLITHICALLY UNLESS APPROVED BY THE ENGINEER.
- 4) BASE RESTRAINT CABLES MAY BE BENT PRIOR TO INSTALLATION.
- 5) BASE RESTRAINT CABLE DESIGN REQUIREMENTS TO BE DETERMINED BY TANK CONTRACTOR.



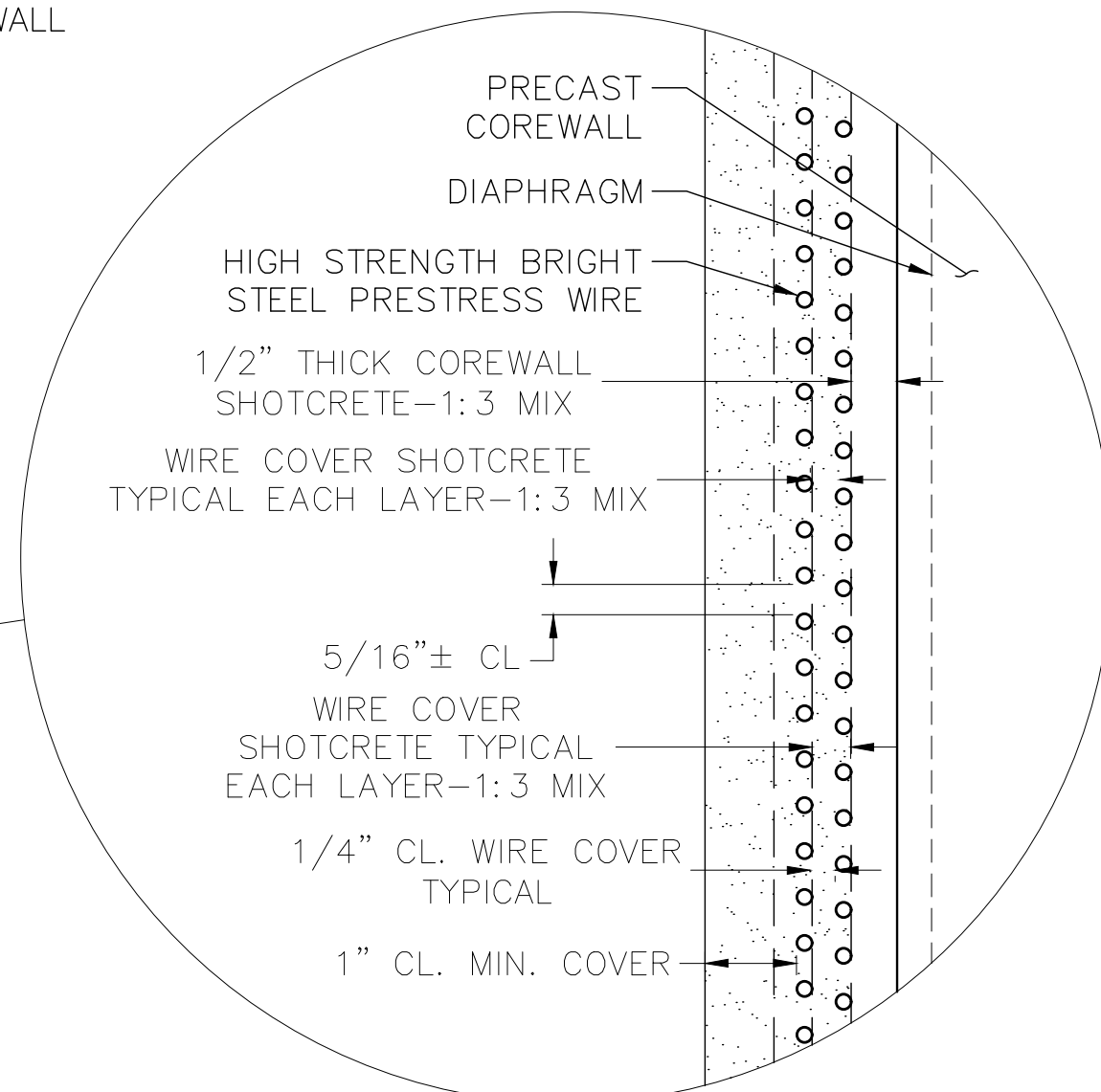
WALL BASE 2



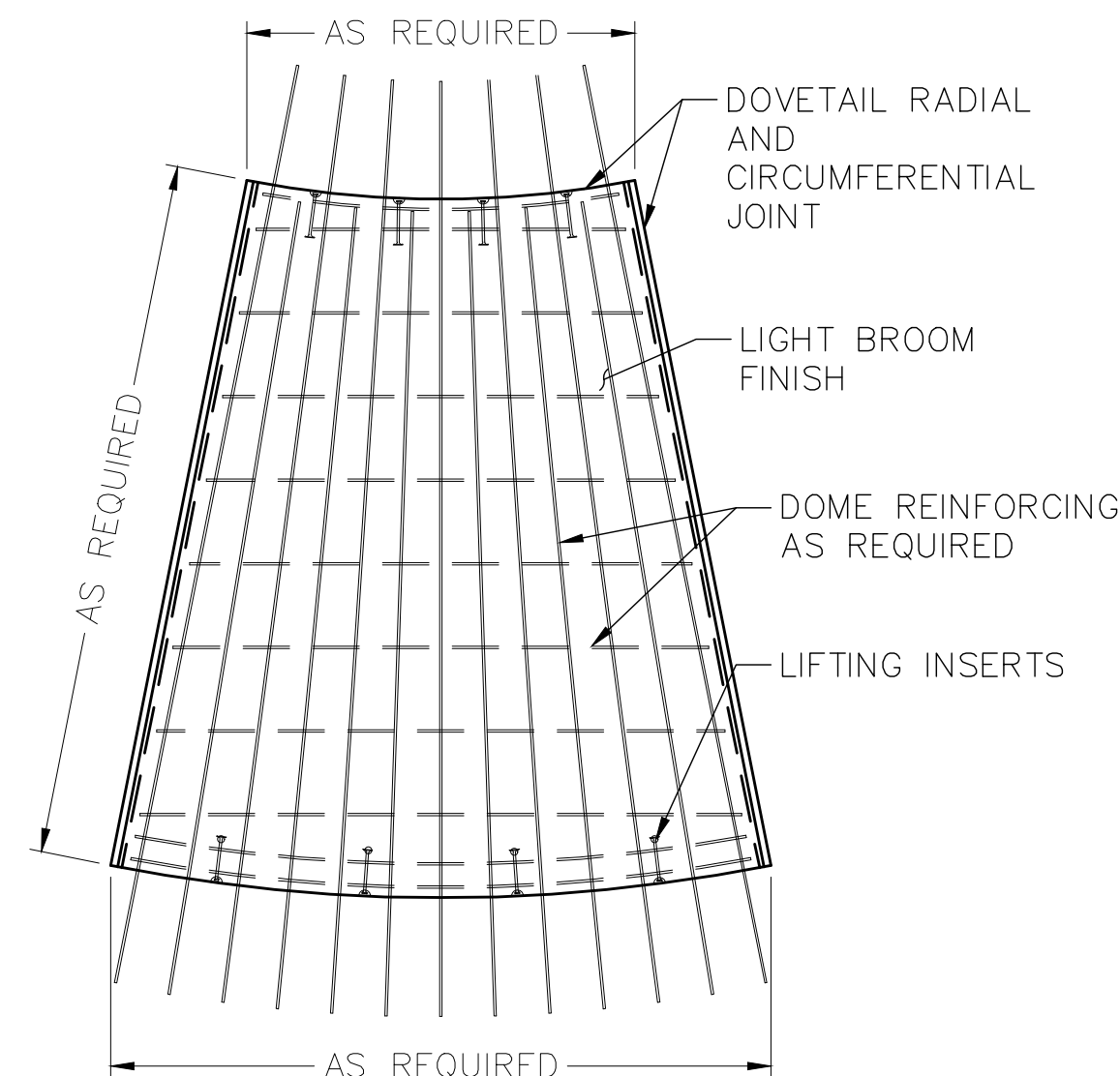
WALL SLOT 3
S-001



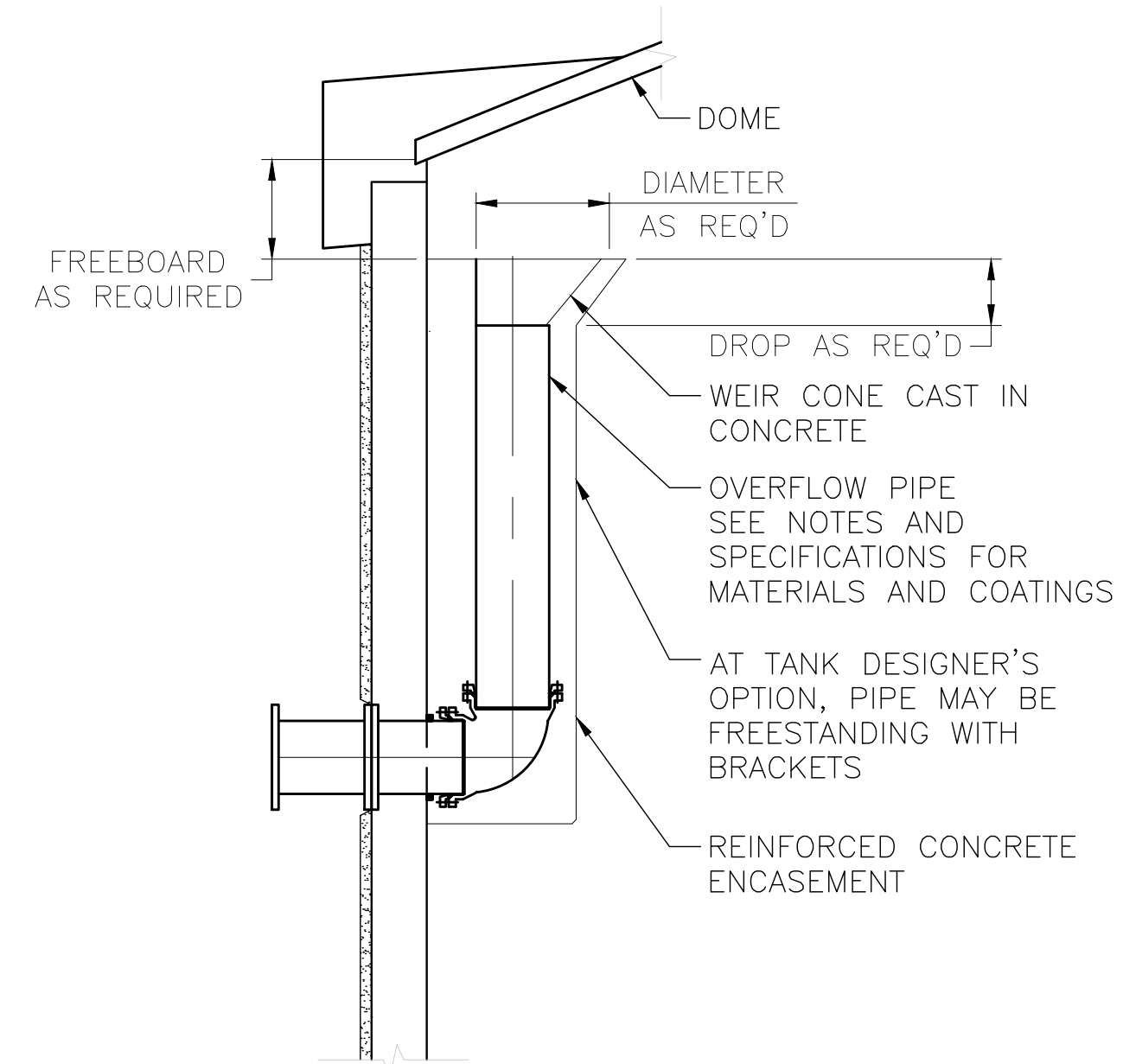
FOOTING, WALL AND ROOF SECTION 1
S-001



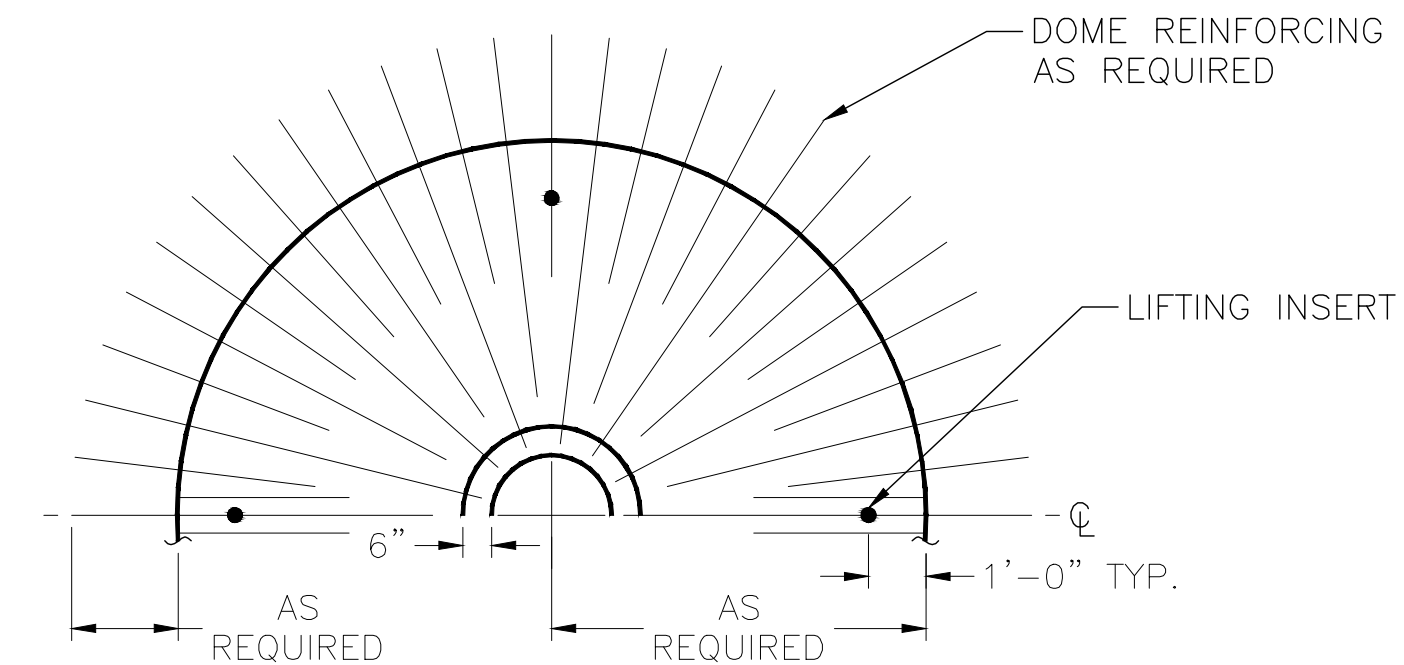
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PRECAST DOME PANEL 5
QTY. AS REQ'D

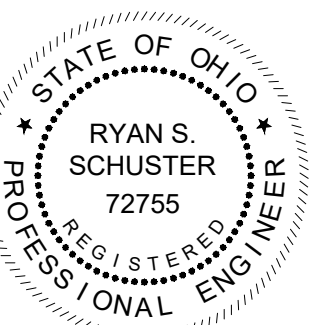


OVERFLOW PIPE 4
S-001



CENTER DOME PANEL - HALF SECTION 6
1 REQ'D

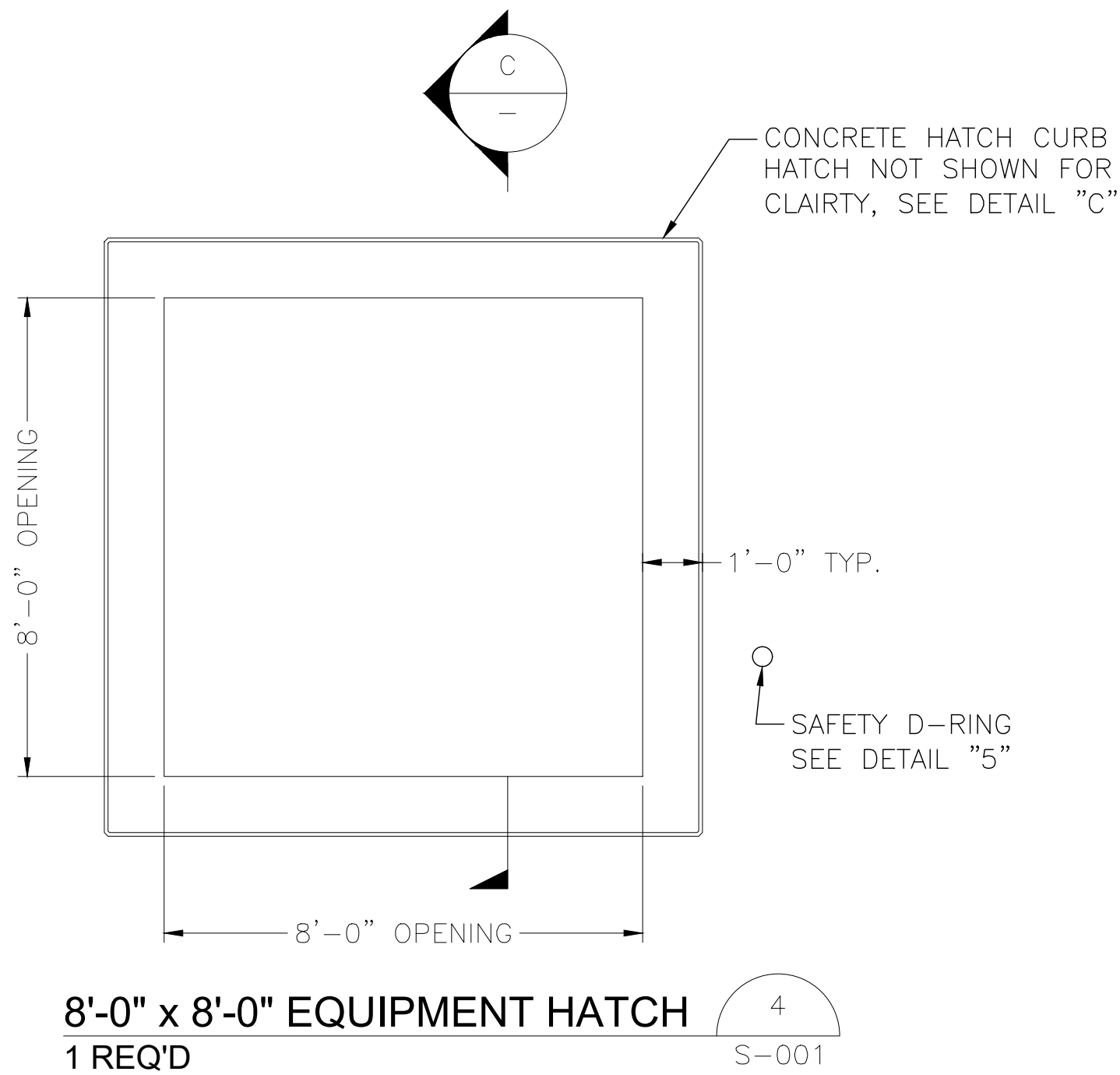
THE DETAILS ON THIS SHEET ARE TYPICAL DETAILS AND ARE SUBJECT TO FINAL DESIGN OF THE TANK MANUFACTURER AND APPROVAL OF ENGINEER.



DATE	REVISION	NO	REVIEW	ISSUED FOR
			10/3/2025	
			NTS	
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			FLST	
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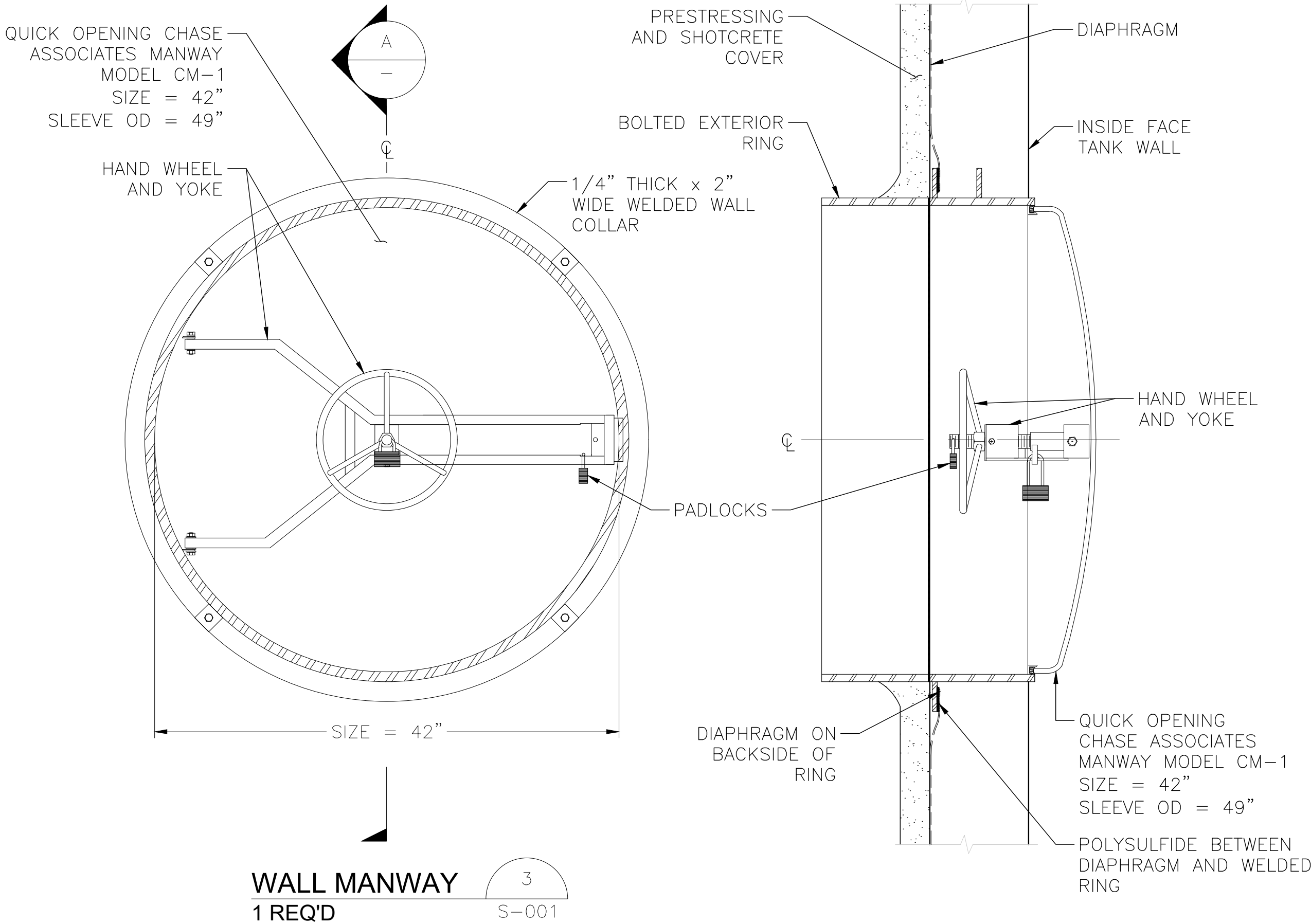
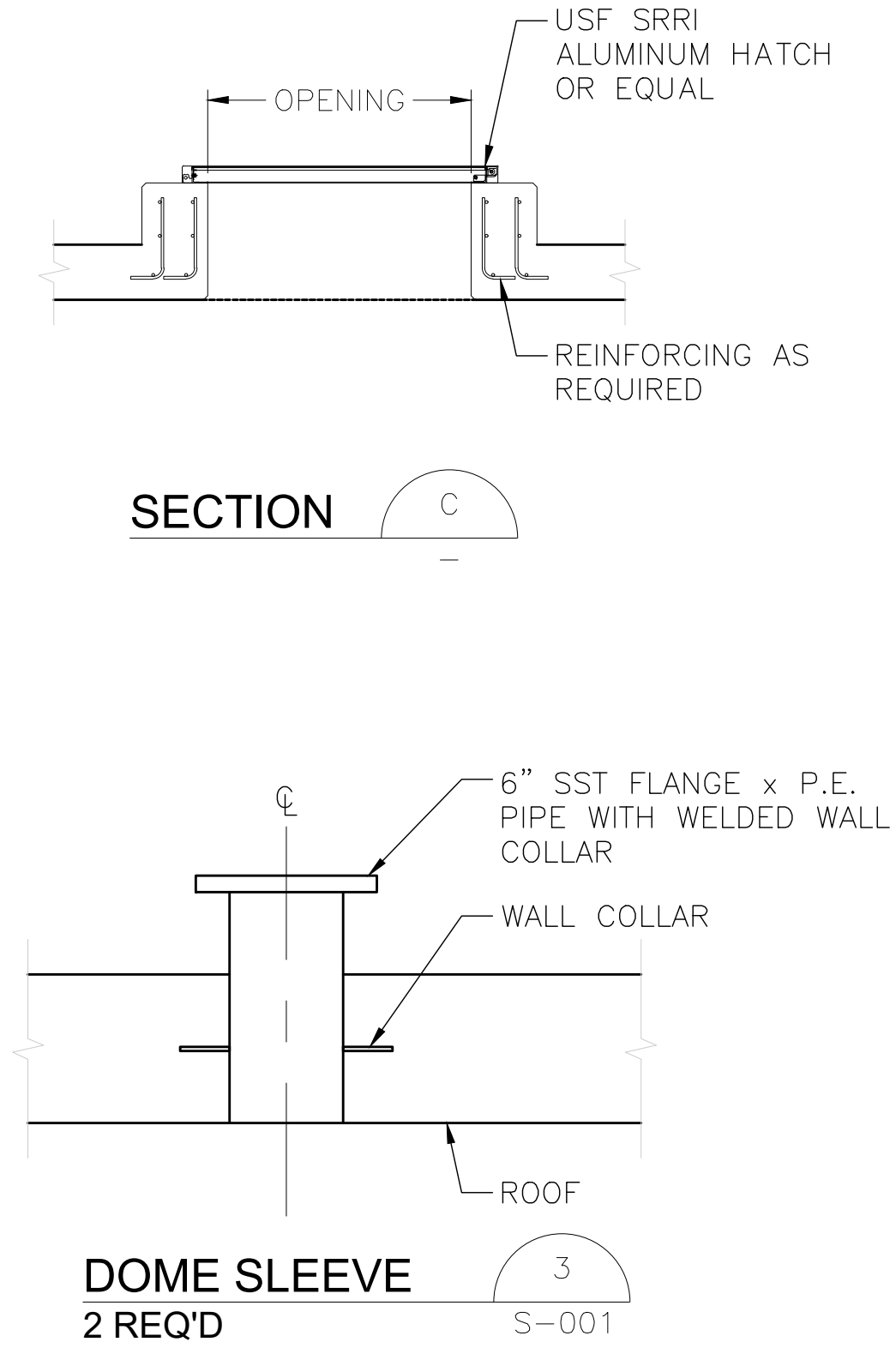
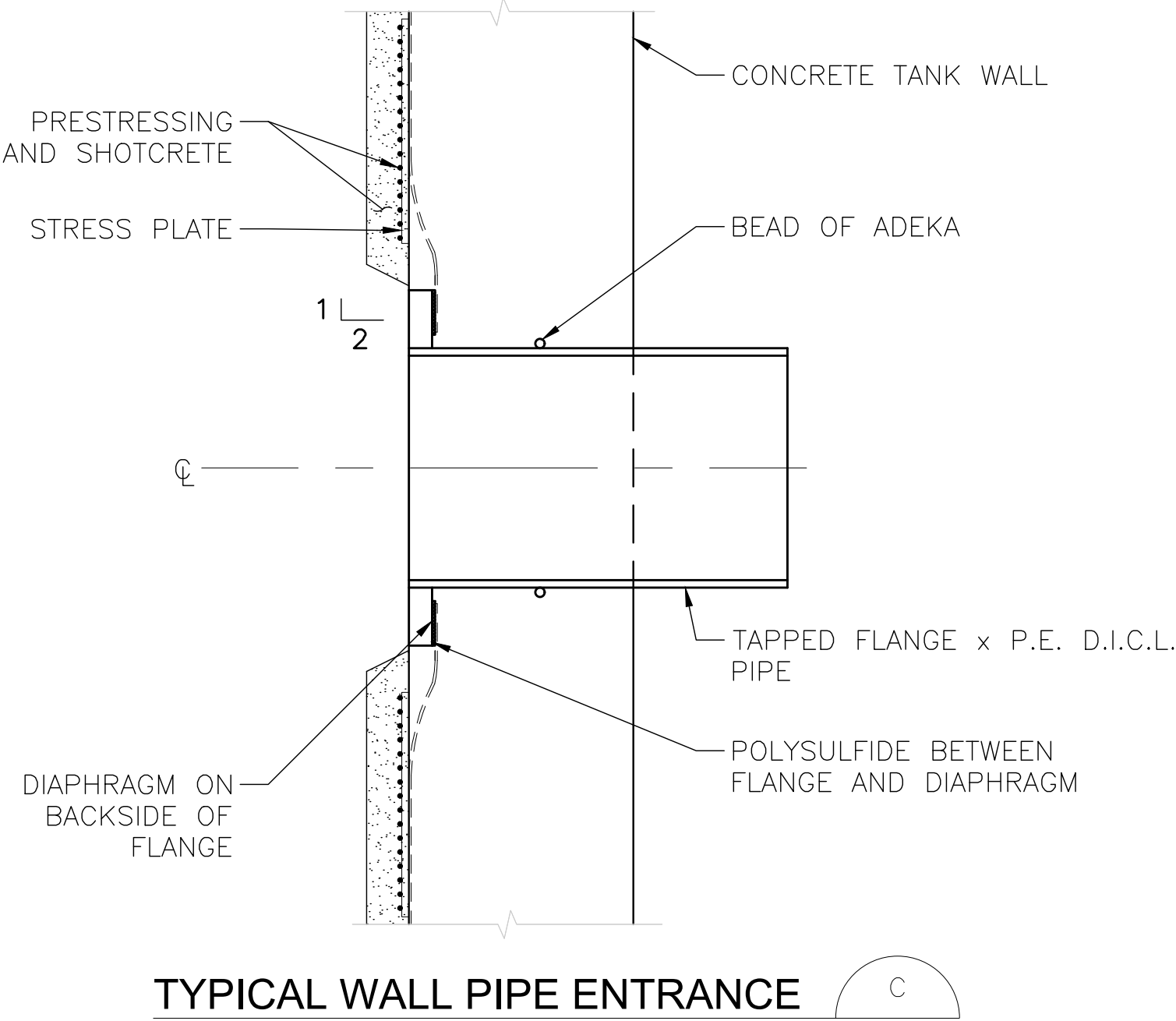
CITY OF WILLOUGHBY	WILLOUGHBY, OHIO
LAKESHORE EAST EQ BASIN	
PHASE II	
LAKE COUNTY	EQUALIZATION BASIN - 10 SERIES
	EQ TANK DETAILS

PROJECT NO.	230264
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SHEET	19
OF	48



ROOF HATCHES NOTES:

- 1) HATCHES TO BE SINGLE LEAF USF SRRI ALUMINUM HATCHES OR EQUAL.
- 2) ALL ALUMINUM IN CONTACT WITH CONCRETE MUST BE COATED WITH A HEAVY BITUMASTIC COATING, EPOXY PAINT OR SHIMMED USING PVC.
- 3) USE SST WEDGE ANCHORS FOR ALL CONNECTIONS TO CONCRETE UNLESS NOTED OTHERWISE.
- 4) WHERE SST BOLTS ARE IN CONTACT WITH DISSIMILAR METALS, USE INSULATING SLEEVES AND PHENOLIC WASHERS TO ELECTRICALLY ISOLATE THE BOLTS.

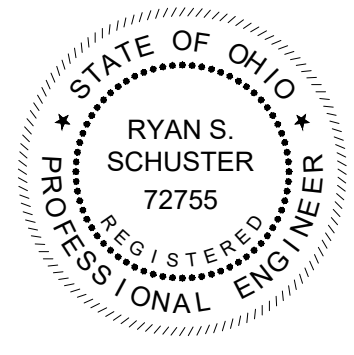
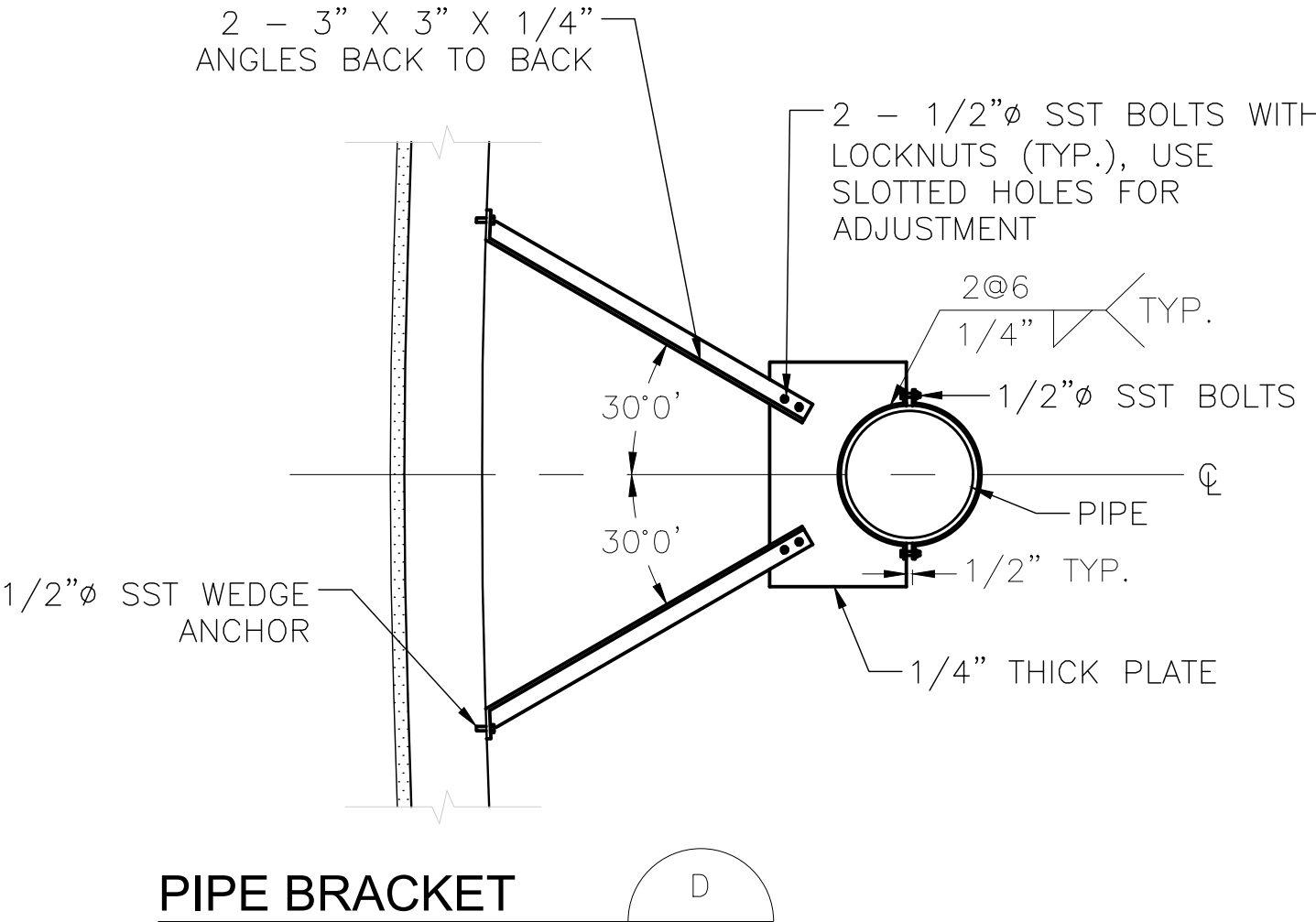
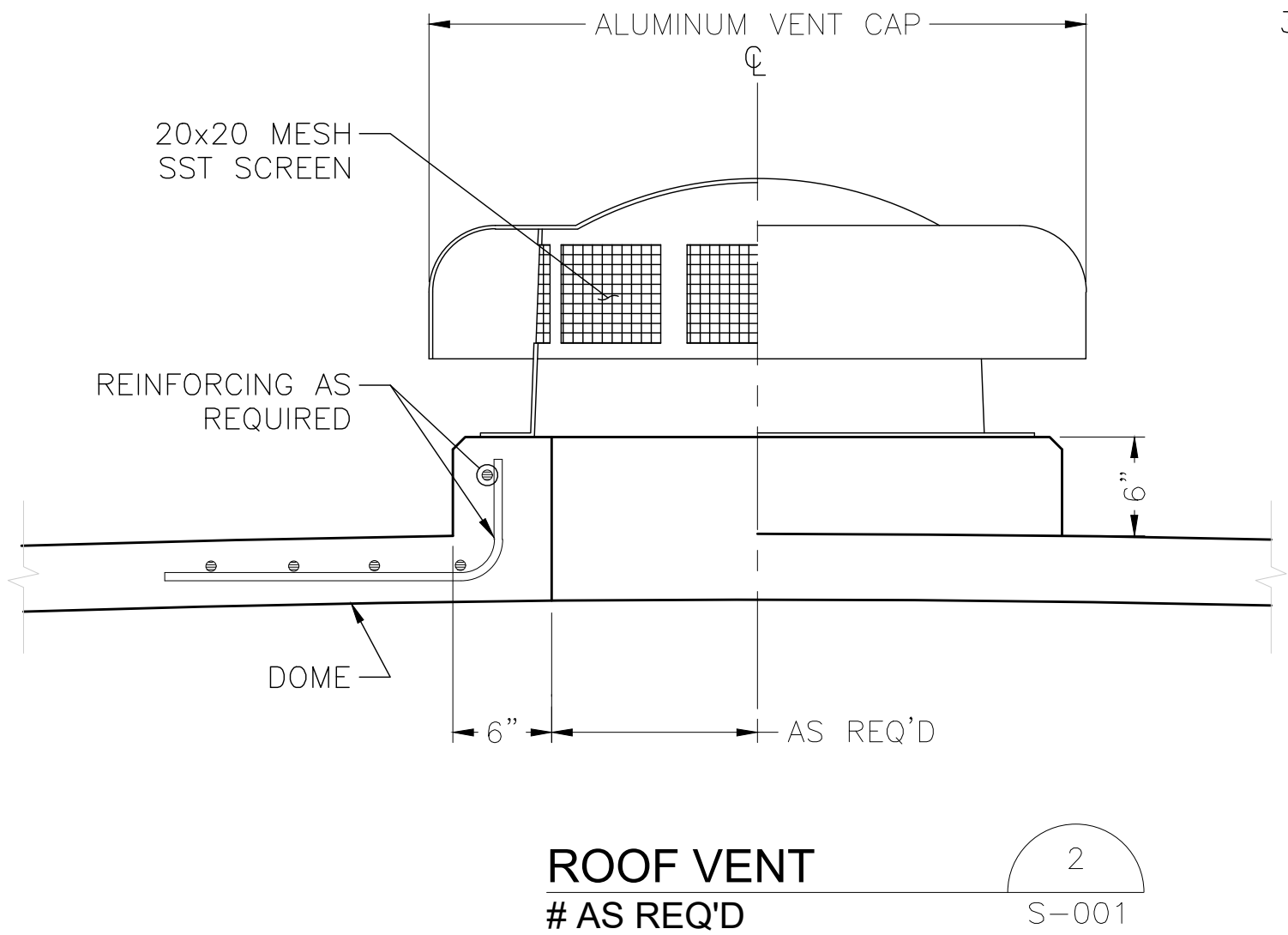


WALL MANWAY NOTES:

- 1) MANWAY MATERIAL TO BE SST.
- 2) THE MANWAY WILL BE CAST INTO THE WALL AND THE EXTERIOR MANWAY RING WILL BE BOLTED ON AFTER TANK PRESTRESSING IS COMPLETE, PRIOR TO FINAL COVERCOAT PLACEMENT.

ROOF VENT NOTES:

- 1) VENT TO BE ALUMINUM.
- 2) SIZE PER PROJECT VENTING RATES.
- 3) USE SST WEDGE ANCHORS FOR ALL CONNECTIONS TO CONCRETE UNLESS NOTED OTHERWISE.



verdantas

8150 STERLING COURT
MENTOR, OHIO 44060
(440) 951-9000

ISSUED FOR:	REVIEW	NO	REVISION	DATE
10/3/2025	10/3/2025			
SCALE:	NTS			
DESIGNED BY:	CAS			
DRAWN BY:	FLAST			
CHECKED BY:	RSS			

CITY OF WILLOUGHBY	WILLOUGHBY, OHIO
LAKESHORE EAST EQ BASIN	
PHASE II	
LAKE COUNTY	EQUALIZATION BASIN - 10 SERIES
	EQ TANK DETAILS

PROJECT NO.	230264
DISCIPLINE	PROCESS
SHEET NAME	10-D-04
SHEET	20
OF	48

THE DETAILS ON THIS SHEET ARE TYPICAL DETAILS AND ARE SUBJECT TO FINAL DESIGN OF THE TANK MANUFACTURER AND APPROVAL OF ENGINEER.

GENERAL:

1. THE GENERAL NOTES AND TYPICAL DETAILS ARE GENERAL AND APPLY TO THE ENTIRE PROJECT EXCEPT WHERE THERE ARE SPECIFIC INDICATIONS TO THE CONTRARY. THE WORK SHALL BE IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS, CONSTRUCTION SPECIFICATIONS AND THE LATEST EDITION OF THE APPLICABLE LOCAL AND STATE BUILDING CODES.
- A. WHERE CONFLICT IS FOUND TO EXIST BETWEEN THE SPECIFICATIONS AND THESE NOTES, THE REQUIREMENTS OF THE SPECIFICATIONS SHALL GOVERN.
- B. ALL WORK SHALL CONFORM TO THE MINIMUM REQUIREMENTS OF THE OHIO BUILDING CODE LATEST EDITION) OR THESE DOCUMENTS - WHICHEVER IS MORE STRINGENT.
2. THESE NOTES ARE GENERAL REQUIREMENTS. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
3. UNLESS SHOWN OR NOTED OTHERWISE ON THE CONTRACT DRAWINGS OR IN THE SPECIFICATIONS, THE FOLLOWING NOTES SHALL APPLY TO THE MATERIALS LISTED HEREINAFTER FOR USE ON THIS PROJECT.
4. IF MATERIALS, QUANTITIES, STRENGTHS OR SIZES INDICATED BY THE DRAWINGS OR SPECIFICATIONS ARE NOT IN AGREEMENT WITH THESE NOTES, THE CONTRACTOR SHALL CONTACT THE ARCHITECT/ENGINEER FOR CLARIFICATION.
5. TYPICAL DETAILS MAY NOT NECESSARILY BE CUT ON THE PLANS BUT APPLY UNLESS NOTED OTHERWISE.
6. SHOP DRAWINGS PREPARED BY SUPPLIERS AND SUBCONTRACTORS SHALL BE REVIEWED AND APPROVED BY THE GENERAL CONTRACTOR PRIOR TO SUBMISSION TO THE ENGINEER/ARCHITECT.
7. SHOP DRAWINGS PREPARED BY THE CONTRACTORS, SUPPLIERS, ETC., WILL BE REVIEWED BY THE ENGINEER/ARCHITECT ONLY FOR CONFORMANCE WITH DESIGN CONCEPT. NO WORK AFFECTED BY THE SHOP DRAWINGS SHALL BE STARTED WITHOUT SUCH REVIEW.
8. THE GENERAL CONTRACTOR SHALL COORDINATE ALL REVISIONS, CORRECTIONS, AND COMMENTS INDICATED ON THE SHOP DRAWINGS BY THE ARCHITECT/ENGINEER.
9. ALL DIMENSIONS AND ELEVATIONS SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE VERIFIED BY THE CONTRACTOR AND SHALL CONFORM TO THOSE SHOWN ON THE ARCHITECTURAL DRAWINGS. DIMENSIONS AND ELEVATIONS MARKED "REF" ARE FOR REFERENCE ONLY AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO USING THEM FOR ANY CONSTRUCTION.
10. THE STRUCTURAL CONTRACT DOCUMENTS DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES. OBSERVATION VISITS TO THE SITE BY THE ENGINEER SHALL NOT INCLUDE INSPECTIONS OF THE PROTECTIVE MEASURES OR THE CONSTRUCTION PROCEDURES.
11. ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY OTHERS. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER ARE SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH THE CONSTRUCTION DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
12. ALL REQUIRED MATERIAL TESTING SHALL BE PERFORMED AT THE EXPENSE OF CONTRACTOR AND PERFORMED BY AN APPROVED TESTING AGENCY OR LABORATORY. TEST RESULTS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.
13. THE OWNER SHALL EMPLOY A TESTING AGENCY TO PERFORM SPECIAL INSPECTIONS. CONTRACTOR SHALL ADHERE TO THE STRUCTURAL QUALITY ASSURANCE PLAN AS PER SECTION 17 OF THE IBC 2018. THE CONTRACTOR SHALL COORDINATE WITH THE SPECIAL INSPECTOR.
14. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR REPAIR OR REPLACEMENT OF ANY WORK THAT IS DAMAGED OR IS NON-COMPLIANT IN ACCORDANCE WITH THE GOVERNING CODE OR AS INDICATED IN THE CONTRACT DOCUMENTS OR AS DEMANED BY THE BUILDING OFFICIAL, ARCHITECT OR ENGINEER OF RECORD.
15. ALL STRUCTURES ARE DESIGNED TO BE STABLE AND SELF-SUPPORTING AT THE COMPLETION OF CONSTRUCTION. CONTRACTOR SHALL HAVE SOLE RESPONSIBILITY FOR THE DESIGN, ADEQUACY, AND SAFETY OF ERECTION BRACING, SHORING, AND TEMPORARY SUPPORTS OF THE STRUCTURE SO THAT IT WILL BE STABLE DURING ALL STAGES OF CONSTRUCTION. THE STRUCTURE IS DESIGNED FOR A COMPLETED CONDITION ONLY AND THEREFORE MAY REQUIRE ADDITIONAL SUPPORT TO MAINTAIN STABILITY BEFORE COMPLETION. PROVIDE TEMPORARY SHORING FOR EXISTING CONSTRUCTION UNTIL NEW CONSTRUCTION IS IN PLACE AND PROPERLY ANCHORED IN FINAL FORM.
16. BELOW GRADE CAST-IN-PLACE CONCRETE STRUCTURES SHALL NOT BE BACKFILLED UNTIL THE CONCRETE BASE SLAB, WALLS AND STRUCTURAL SLAB HAVE REACHED A 28 DAY CONCRETE STRENGTH (F'C = 4.5 KSI).
- A. EXCEPTION, TALL BELOW GRADE STRUCTURES MAY BE PARTIALLY BACKFILLED AFTER THE CONCRETE BASE SLAB AND WALLS HAVE REACHED A 28 DAY CONCRETE STRENGTH (F'C = 4.5 KSI). BACKFILL SHALL HELD BELOW THE TOP OF WALL BY AT LEAST TWICE THE WIDTH OR TWICE THE LENGTH OF THE LARGER DISTANCE. THE REMAINDER OF THE STRUCTURES SHALL NOT BE BACKFILLED UNTIL THE CONCRETE STRUCTURAL SLAB HAVE REACHED A 28 DAY CONCRETE STRENGTH (F'C = 4.5 KSI).
17. CAST-IN-PLACE CONCRETE STRUCTURAL SLAB(S) SHALL BE SHORED UNTIL THE STRUCTURAL SLAB HAS REACHED A 28 DAY CONCRETE STRENGTH (F'C = 4.5 KSI).
18. SHORING LOADS FOR EXISTING STRUCTURE ARE SHOWN IN THE DOCUMENTS. SHORING SHALL BE DESIGNED AND CERTIFIED BY AN ENGINEER LICENSED IN THE STATE OF OHIO.
19. ALL MATERIALS AND EQUIPMENT FURNISHED WILL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
20. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK.
21. COORDINATE WITH THE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR MISCELLANEOUS STEEL ITEMS, LINTELS, METAL PAN STAIRS, SIZE AND LOCATION OF FLOOR SLOPES, DEPRESSED AREAS, FINISH FILLS, CHAMFERS, GROOVES, RAILING SLEEVES, ROOF EDGES, INSERTS, ETC.
22. COORDINATE WITH CIVIL, MECHANICAL, PROCESS, AND ELECTRICAL DRAWINGS FOR PIPE SLEEVES, FLOOR DRAINS, ROOF DRAINS, INSERTS, HANGERS, TRENCHES, PITS, WALL AND SLAB OPENINGS, CONDUIT RUNS IN WALLS AND SLABS, SIZE AND LOCATION OF MACHINE OR EQUIPMENT SUPPORTS, BASE AND ANCHOR BOLTS, RAILING, ETC. THE CONTRACTOR SHALL PROVIDE THESE OPENINGS IN ACCORDANCE WITH THE OTHER CONTRACT DRAWINGS. REINFORCEMENT AROUND OPENINGS FOR NEW WALLS AND SLABS SHALL BE PER THE STANDARD DETAILS. UNLESS OTHERWISE SHOWN, SEE STANDARD DETAILS FOR CONSTRUCTION OF OPENINGS IN EXISTING WALLS AND SLABS.
23. COORDINATE WITH SITE, ARCHITECTURAL, ELECTRICAL, MECHANICAL, AND CIVIL DRAWINGS FOR RETAINING WALLS, PADS, PAVEMENT AND OTHER SITE STRUCTURES.
24. EARTHWORK, FOUNDATION DRAINS, WATERPROOFING, PERIMETER INSULATION, MASONRY AND OTHER REQUIRED NON-STRUCTURAL ITEMS ARE NOT SHOWN ON THE STRUCTURAL DRAWINGS. COORDINATE WITH CIVIL/SITE AND ARCHITECTURAL DRAWINGS.
25. THE CONTRACTOR SHALL COORDINATE ALL CONSTRUCTION ACTIVITIES WITH THE OWNER TO AVOID SYSTEM/OPERATION INTERRUPTIONS.
26. MATERIALS AND EQUIPMENT NECESSARY TO COMPLETE THE WORK SHALL BE STORED AT OWNER'S DESIGNATED LOCATIONS.
27. THE CONTRACTOR SHALL AT ALL TIMES KEEP THE WORK AREA AND SURROUNDING PREMISES FREE OF WASTE, SURPLUS MATERIALS, RUBBISH, AND DEBRIS RESULTING FROM THE WORK.
28. ALL CONTRACTORS SHALL CONFORM TO THE SAFETY REQUIREMENTS OF THE OWNER, AIA DOCUMENTS A201, OSHA SAFETY AND HEALTH STANDARDS, OWNERS SAFETY REGULATIONS, AND ANY OTHER LOCAL AUTHORITY IN CONNECTION WITH THE PROJECT. ALL EXCAVATIONS SHALL BE PROPERLY SHORED IN ACCORDANCE WITH OSHA STANDARDS AND REQUIREMENTS. ENGINEER DOES NOT ASSUME ANY RESPONSIBILITY FOR CONSTRUCTION SITE SAFETY.
29. LIVE LOAD SIGNS SHALL BE PROVIDED IN AREAS DESIGNATED BY THE ARCHITECT, ENGINEER OR REQUIRED BY THE BUILDING OFFICIAL. SIGNS SHALL BE AS REQUIRED IN THE SPECIFICATIONS.
30. SLOPE DRAINAGE SURFACES UNIFORMLY TO DRAIN. SLOPE SHALL BE 1/8" TO 1/4" PER FOOT EXCEPT WHERE NOTED OTHERWISE ON THE PLANS .
31. NO SUBSTITUTIONS OF MATERIAL WILL BE ALLOWED WITHOUT WRITTEN PERMISSION FROM THE ENGINEER.

GOVERNING CODES AND STANDARDS:

THE FOLLOWING CODES AND STANDARDS SHALL BE UTILIZED BY THE CONTRACTOR TO ESTABLISH MINIMUM LEVELS OF QUALITY AND CONSTRUCTION TECHNIQUES. UNLESS NOTED OTHERWISE, REFERENCE THE BUILDING CODE AND/OR ASCE FOR THE REFERENCED STANDARD'S EDITION.

OBC	- OHIO BUILDING CODE, 2018 EDITION (OBC) AND THE INTERNATIONAL BUILDING CODE (IBC) 2018 EDITION, LOCALLY AMENDED. THE ABOVE SHALL GOVERN EXCEPT WHERE OTHER APPLICABLE CODES OR CONTRACT PROVISIONS ARE MORE RESTRICTIVE.
IEBC	- INTERNATIONAL EXISTING BUILDING CODE, 2018 EDITION
ASCE 7	- MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES, 2016 EDITION
ACI 318	- BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
ACI 350	- CODE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES
ACI 350.3	- SEISMIC DESIGN OF LIQUID-CONTAINING CONCRETE STRUCTURES
ACI 350.1	- TIGHTNESS TESTING OF ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES
ACI 301	- SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS
ACI 302	- RECOMMENDED PRACTICE FOR CONCRETE FLOOR AND SLAB CONSTRUCTION
ACI 544	- GUIDE FOR SPECIFYING, PROPORTIONING, MIXING, PLACING, AND FINISHING STEEL FIBER REINFORCED CONCRETE
ACI 347	- GUIDE TO FORMWORK FOR CONCRETE
ACI 345R	- HOT WEATHER CONCRETING
ACI 306R	- COLD WEATHER CONCRETING
ACI 207	- GUIDE TO MASS CONCRETE
ACI 211.1	- SELECTING PROPORTIONS FOR NORMAL, HEAVY WEIGHT AND MASS CONCRETE
ACI 217.4R	- COOLING AND INSULATING SYSTEMS FOR MASS
ACI SP-66	- ACI DETAILING MANUAL
PCA	- DESIGN AND CONTROL OF CONCRETE MIXTURES
MSF-2	- MANUAL OF STANDARD PRACTICE
MNL 120	- PRECAST/PRESTRESSED CONCRETE INSTITUTE DESIGN HANDBOOK
PCI	- DESIGN HANDBOOK FOR PRECAST AND PRESTRESSED CONCRETE
AISC 360	- LOAD AND RESISTANCE FACTOR DESIGN SPECIFICATIONS FOR STRUCTURAL STEEL BUILDINGS
AISC 341	- SEISMIC PROVISIONS FOR STRUCTURAL STEEL BUILDINGS
AISC DESIGN GUIDE 27	- STRUCTURAL STAINLESS STEEL
ADM1	- ALUMINUM DESIGN MANUAL
AWS D1.1	- STRUCTURAL WELDING CODE - STEEL
AWS D1.2	- STRUCTURAL WELDING CODE - ALUMINUM
AWS D1.3	- STRUCTURAL WELDING CODE - SHEET STEEL
AWS D1.4	- STRUCTURAL WELDING CODE - REINFORCING STEEL
AWS D1.6	- STRUCTURAL WELDING CODE - STAINLESS STEEL
AWS D1.8	- STRUCTURAL WELDING CODE - SEISMIC SUPPLEMENT
NAAMM MGB 531	- METAL BAR GRATING MANUAL
NAAMM MGB 532	- HEAVY DUTY METAL BAR GRATING MANUAL

SUBMITTALS

1. SHOP DRAWINGS AND SUBMITTALS
- A. REPRODUCTION OF STRUCTURAL DRAWINGS FOR SHOP DRAWINGS IS NOT PERMITTED.
- B. ELECTRONIC DRAWING FILES WILL NOT BE PROVIDED TO THE CONTRACTOR.
- C. REVIEW OF SHOP DRAWINGS WILL BE FOR CONFORMANCE WITH THE CONSTRUCTION DOCUMENTS REGARDING ARRANGEMENT AND SIZES OF MEMBERS AND THE CONTRACTOR'S INTERPRETATION OF THE DESIGN LOADS, IF APPLICABLE, AND CONSTRUCTION DOCUMENT DETAILS. SUCH REVIEW SHALL NOT RELIEVE THE CONTRACTOR OF THE FULL RESPONSIBILITY TO COMPLY WITH THE CONSTRUCTION DOCUMENTS.
2. SUBMITTALS
- A. THE STRUCTURAL QUALITY ASSURANCE PLAN AND SPECIFICATIONS IDENTIFY THE REQUIRED SUBMITTALS. PRIOR TO (OR WITH) THE FIRST SUBMITTAL, CONTRACTOR SHALL SUBMIT A LIST OF ALL REQUIRED SUBMITTALS FOR ENGINEER'S REVIEW.
3. DEFERRED SUBMITTALS
- A. DEFERRED SUBMITTALS INCLUDE THOSE PORTIONS OF THE PROJECT THAT ARE FURNISHED BY THE CONTRACTOR AND DESIGNED BY SOMEONE OTHER THAN THE ENGINEER OF RECORD AND ARE SUBMITTED AT THE TIME OF THE APPLICATION. DEFERRED SUBMITTALS SHALL BE SUBMITTED TO THE BUILDING OFFICIAL PRIOR TO FABRICATION AND INSTALLATION.
- B. SUBMITTAL DOCUMENTS FOR DEFERRED SUBMITTALS:
- a. SHALL BE INCLUDED IN THE CONTRACTOR'S SCOPE OF SERVICES AND SHALL BE SEALED BY AN ENGINEER LICENSED IN THE PROJECT STATE. DESIGN OF DEFERRED SUBMITTALS SHALL BE IN ACCORDANCE WITH THE GOVERNING BUILDING CODE INDICATED ABOVE.
- b. SHALL BE SUBMITTED TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE WHO SHALL REVIEW AND FORWARD THEM TO THE BUILDING OFFICIAL WITH A NOTATION INDICATING THE DEFERRED SUBMITTAL DOCUMENTS HAVE BEEN REVIEWED AND THAT THEY HAVE BEEN FOUND IN GENERAL CONFORMANCE WITH THE DESIGN OF THE BUILDING. DEFERRED SUBMITTAL ITEMS SHALL NOT BE INSTALLED UNTIL THE DESIGN AND SUBMITTAL DOCUMENTS HAVE BEEN APPROVED BY THE BUILDING OFFICIAL.
- c. SUBMITTAL DOCUMENTS MAY ALSO INCLUDE SUBSTANTIATING CALCULATIONS, WHEN REQUIRED.
- C. THE FOLLOWING SHALL BE CONSIDERED DEFERRED SUBMITTALS:
- a. TEMPORARY/PERMANENT SHORING AND UNDERPINNING
- b. AGGREGATE PIER SOIL REINFORCEMENT
- c. GROUND IMPROVEMENT METHODS
- d. STRUCTURAL PRECAST CONCRETE
- e. ARCHITECTURAL PRECAST CONCRETE
- f. ENGINEERED BRICK LINTELS
- g. STEEL CONNECTIONS - SEE "STRUCTURAL STEEL" SECTION
- h. COLD-FORMED METAL FRAMING
- i. PREFABRICATED COLD-FORMED STEEL TRUSSES
- j. STEEL STAIRS AND HANDRAILS
- k. SHOP-FABRICATED WOOD TRUSSES
- l. CURTAIN WALL/WINDOW WALL SYSTEMS
- m. SKYLIGHTS
- n. METAL BUILDING SYSTEM
- o. ELEVATORS
- p. SLOTTED CHANNEL STRUT FRAMING (E.G. UNISTRUT)
- q. SEISMIC ANCHORAGE AND BRACING OF MPE EQUIPMENT

DESIGN LOADS:

1. LIVE LOADS: (REDUCIBLE PER GOVERNING CODE)	UNIFORM (PSF)	CONCENTRATED (LBS)
A. ROOF		
1. TYPICAL AREA	20	300
2. HVAC MECHANICAL EQUIPMENT AREAS	150	2,000
B. FIRST FLOOR	100	2,000
C. ELECTRICAL CONTROL ROOM	250	3,000
D. PROCESS AREA		
1. SLAB-ON-GRADE	400	3,000
2. STRUCTURAL FLOOR	300	3,000
3. ELECTRICAL AND CONTROL ROOM FLOOR	300	3,000
4. ELEVATED GRATING FLOORS (FOOT TRAFFIC ONLY)	100	2,000
5. NON-EGRESS WALKWAYS/CATWALKS	100	2,000
E. TRUCK ACCESS AREAS		
USE AASHTO STANDARD SPECIFICATION FOR HIGHWAY BRIDGES FOR IMPACT FORCES DUE TO MOVING WHEEL LOADS	AASHTO HL93 LOADING	
2. SNOW LOADS:		
RISK CATEGORY	III	
GROUND SNOW LOAD, P _g	30 PSF	
FLAT ROOF SNOW LOAD, P _f	23 PSF	
SNOW EXPOSURE FACTOR, C _e	1.0	
SNOW LOAD IMPORTANCE FACTOR, I _s	1.1	
THERMAL FACTOR, C _t	1.0	
3. WIND LOADS		
ULTIMATE DESIGN WIND SPEED (3-SECOND GUST), MPH	116	
RISK CATEGORY	III	
WIND EXPOSURE	C	
INTERNAL PRESSURE COEFFICIENT (ENCLOSED)	±0.18	
COMPONENTS AND CLADDING WIND EXPOSURE	C	
DESIGN WIND PRESSURE FOR COMPONENTS AND CLADDING SHALL BE COMPUTED PER GOVERNING BUILDING CODE		
4. EARTHQUAKE DESIGN DATA:		
OCCUPANCY RISK CATEGORY	III	
SEISMIC IMPORTANCE FACTOR, I _s	1.25	
MAPPED SPECTRAL RESPONSE ACCELERATIONS	S _s = 0.156 S ₁ = 0.049	
SITE CLASS	D	
DESIGN SPECTRAL RESPONSE ACCELERATIONS	S _{ss} = 0.167 S _{d1} = 0.079	

DESIGN SPECTRAL RESPONSE ACCELERATIONS S_{ss} = 0.167
S_{d1} = 0.079
B

SEISMIC DESIGN CATEGORY
BASIC SEISMIC REINFORCING SYSTEM:
SEISMIC RESPONSE COEFFICIENT
RESPONSE MODIFICATION COEFFICIENT
ANALYSIS PROCEDURE USED:
* TO BE DETERMINED BY DELEGATED DESIGN ENGINEER

FOUNDATIONS:

1. FOUNDATION DESIGN IS BASED ON RECOMMENDATIONS IN THE GEOTECHNICAL REPORT NO. 230264, PREPARED BY CT CONSULTANTS, INC., DATED SEPTEMBER 14, 2023. CONTRACTOR SHALL REVIEW GEOTECHNICAL REPORT PRIOR TO CONSTRUCTION AND ADHERE TO THE RECOMMENDATIONS.
2. FOUNDATIONS ARE DESIGNED TO BEAR ON UNDISTURBED NATURAL SOILS OR PROPERLY COMPACTED ENGINEERED FILL WITH A GROSS ALLOWABLE BEARING CAPACITY OF 2750 PSF. SEE GEOTECHNICAL REPORT.
- A. OTHER SOIL LOADING AND BEARING CHARACTERISTICS ARE DESCRIBED IN THE REPORT. BEARING CAPACITY OF DEEP FOUNDATIONS, SEE NOTES SPECIFIC TO THE DEEP FOUNDATION SYSTEM.
- B. REFERENCE GEOTECHNICAL REPORT FOR FROST DEPTH (OR FROST DEPTH IS 40"). EXTERIOR FOOTINGS SHALL BEAR AT FROST DEPTH, OR DOWN TO ACCEPTABLE SOILS, WHICHEVER IS DEEPER.
3. TOPSOIL, FILL, AND/OR OTHER DELETERIOUS MATERIALS ENCOUNTERED DURING THE SITE PREPARATION MUST BE REMOVED AND REPLACED WITH SELECT ENGINEERED FILL COMPACTED TO 95% PER ASTM D698 (STANDARD PROCTOR) AND MEETING THE SPECIFIED DESIGN BEARING CAPACITY. (SEE GEOTECHNICAL REPORT FOR MORE INFORMATION).
4. OWNER SHALL EMPLOY A SOILS TESTING LABORATORY APPROVED BY THE ENGINEER TO PERFORM TESTING SERVICES AS REQUIRED BY THE SPECIFICATIONS AND TO INSPECT ALL BEARING SURFACES OF SLABS AND FOUNDATIONS.
5. NOTIFY ENGINEER IF FOUNDATION CONDITIONS ENCOUNTERED DIFFER FROM SOILS EXPLORATION INFORMATION MADE AVAILABLE TO THE CONTRACTOR.
6. EXCAVATIONS FOR FOUNDATIONS SHOULD BE OBSERVED BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF REINFORCING STEEL AND CONCRETE. UNDERCUT UNSUITABLE SOILS AND BACKFILL AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
7. REMOVE ALL EXISTING PAVEMENT, STRUCTURES AND FOUNDATIONS, AND TOPSOIL, UNSUITABLE FILLS AND ORGANIC SOILS ENCOUNTERED WITHIN AND BELOW THE AREA TO BE OCCUPIED BY SLABS ON GRADE AND FOUNDATIONS. THESE MATERIALS SHALL NOT BE USED FOR FILL WITHIN OR ADJACENT TO THE BUILDING. AFTER EXCAVATING THE EXPOSED NATURAL SOIL, SHALL BE THOROUGHLY COMPACTED PRIOR TO PLACEMENT OF FILL OR AS DIRECTED BY THE GEOTECHNICAL REPORT.
8. BACKFILL AND BACKFILL PLACEMENT SHALL BE AS PER THE GEOTECHNICAL ENGINEERS RECOMMENDATIONS. IN LIEU OF GEOTECHNICAL ENGINEERS RECOMMENDATIONS BACKFILL SHALL BE CLEAN, CRUSHED STONE (#57 STONE) OR SELECT ENGINEERED FILL AND SHALL BE PLACED IN MAXIMUM 8" LIFTS AND COMPACT AS PER THE GEOTECHNICAL.
9. CONTRACTOR SHALL KEEP ALL FREE-STANDING WATER OUT OF EXCAVATIONS. CONTRACTOR SHALL PROVIDE DEWATERING MEASURES AS NECESSARY PRIOR TO PLACING CONCRETE. WATER SHOULD BE REMOVED FROM THE FOUNDATION BOTTOMS BEFORE CONCRETE OR REINFORCING STEEL IS PLACED.
10. CHANGES IN ELEVATION OF WALL FOOTING SHALL BE MADE IN STEPS NOT MORE THAN 2'-0" HIGH AND AT LEAST 4'-0" APART, UNLESS DETAILED OTHERWISE. SEE TYPICAL FOOTING STEP DETAIL.
11. THE CONTRACTOR IS RESPONSIBLE FOR AND SHALL PROVIDE TEMPORARY SHORING, BRACING, UNDERPINNING, AND OTHER MEASURES NECESSARY TO INSURE STABILITY AND SAFETY DURING ERECTION AND CONSTRUCTION AND TO PREVENT MOVEMENT OF SOIL THAT COULD DAMAGE EXISTING STRUCTURES, PAVEMENT, UTILITIES, ETC.
12. CENTER FOOTINGS UNDER COLUMNS AND WALLS UNLESS NOTED.
13. THE DIFFERENCE IN ELEVATION OF THE BACKFILL ON THE INSIDE AND OUTSIDE OF WALLS SHALL NOT EXCEED TWO FEET UNTIL THE FIRST FLOOR STRUCTURE SUPPORTING THE WALLS IS IN PLACE, UNLESS THE WALL IS BRACED TO PREVENT MOVEMENT.
14. UNLESS NOTED OTHERWISE ON THE CIVIL/SITE DRAWINGS, PROVIDE A MINIMUM 2% GRADE WITHIN 10-FEET OF THE PERIMETER OF THE FOUNDATION SYSTEM TO ALLOW SURFACE WATER TO DRAIN AWAY.
15. DO NOT PLACE FILL OR CONCRETE ON FROZEN GROUND.

REINFORCEMENT

1. ALL DETAILING, FABRICATION AND ERECTION OF REINFORCING BARS, UNLESS OTHERWISE NOTED SHALL BE IN ACCORDANCE WITH MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES (ACI-315, LATEST EDITION) AND MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES (CRSI, LATEST EDITION). REINFORCING STEEL SHALL NOT BE HEATED OR WELDED AND MUST BE DRY AND FREE OF CONTAMINANTS SUCH AS RUST, DIRT, GREASE, AND PROTECTIVE COATINGS.
2. ALL REINFORCING STEEL SHALL CONFORM TO ASTM A615 GRADE 60. ALL REINFORCING USED IN SEISMIC DESIGN CATEGORY (SDC) D AND HIGHER OR REINFORCING TO BE WELDED SHALL CONFORM TO ASTM A706 GRADE 60. REINFORCING STEEL SHALL NOT BE HEATED OR WELDED AND MUST BE DRY AND FREE OF CONTAMINANTS SUCH AS RUST, DIRT, GREASE, AND PROTECTIVE COATINGS.
3. WHERE GRADE BEAMS OR STRIP FOOTINGS INTERSECT COLUMN FOUNDATIONS, EXTEND GRADE BEAM OR STRIP FOOTING REINFORCEMENT CONTINUOUSLY THROUGH THE COLUMN FOUNDATION.
4. ALL WELDED WIRE REINFORCING SHALL CONFORM TO ASTM A185, A1064 PROVIDED IN FLAT SHEETS.
5. PROVIDE DOWELS FROM FOUNDATIONS TO MATCH COLUMN, PIER AND WALL VERTICAL REINFORCING. WHERE SHOWN, PROVIDE DOWELS OUT OF WALLS TO MATCH SLAB REINFORCING. PROVIDE ADEQUATE BOLSTERS, HI-CHAIRS, SUPPORT BARS, ETC., TO MAINTAIN SPECIFIED CLEARANCES FOR THE ENTIRE LENGTH OF ALL REINFORCING BARS. SUPPORTS THAT BEAR DIRECTLY ON EXPOSED SURFACES SHALL BE A CRSI CLASS 1. STRUCTURAL SLABS SHALL UTILIZE A CRSI CLASS 2 SUPPORTS.
6. ALL DEVELOPMENT AND SPLICE LENGTHS SHALL BE PER ACI 318 WITH CLEAR SPACING GREATER OR EQUAL TO 3 BAR DIAMETER. PROVIDE CLASS "B" TENSION LAP SPLICE OR FULL MECHANICAL SPLICE (ACI 318, SECT. 25.4.2) FOR ALL REINFORCING STEEL IN WALLS, COLUMNS, AND SLABS. SEE LAP SCHEDULE ON SHEET SD-S-02 FOR LAP LENGTHS, UNO.
7. LAP SPLICES SHALL NOT BE MADE AT POINTS OF MAXIMUM STRESS AS DETERMINED BY THE ENGINEER. LAP SPLICES FOR CONTINUOUS SLAB OR LONGITUDINAL BEAM BARS, WITH DOUBLE MAT OF REINFORCING, SHALL BE LOCATED IN THE MIDDLE 1/3 OF THE SPAN FOR TOP BARS AND CENTERED OVER THE SUPPORT FOR THE BOTTOM BARS. LAP SPLICE IN BEAMS, CONTINUOUS SLABS AND WALLS SHALL BE STAGGERED. CENTERLINE OF STAGGERS SHALL BE A MINIMUM OF A SPLICE LENGTH APART.
8. A TOP BAR IS A HORIZONTAL BAR WHERE MORE THAN 12 INCHES OF FRESH CONCRETE IS CAST DIRECTLY BELOW THE BAR. HORIZONTAL WALL BARS ARE CONSIDERED TOP BARS. FOR EPOXY-COATED REINFORCEMENT, MULTIPLY THE TABULATED VALUES BY 1.5 FOR 'REGULAR BARS' AND 1.3 FOR 'TOP BARS'.
9. SUBMIT REINFORCING SHOP DRAWINGS FOR REVIEW. AT A MINIMUM, THESE DRAWINGS SHALL SHOW THE GENERAL PLACEMENT OF REINFORCING, CONSTRUCTION JOINTS, CONTROL JOINTS, EXPANSION JOINTS, CONCRETE MEMBER DIMENSIONS, DOWELS, BAR LENGTHS, SPLICE LENGTH, AND REINFORCING BEND TABLES.
10. TACK WELDING OR WELDING OF REBAR SHALL NOT BE PERMITTED UNLESS OTHERWISE CALLED FOR OR APPROVED BY THE ENGINEER. IF APPROVED, REINFORCING MAY BE WELDED IN ACCORDANCE WITH AWS SPECIFICATION D1.4. ALL REINFORCING TO BE WELDED SHALL CONFORM TO ASTM A706.
11. IN ADDITION TO NORMAL ACCESSORIES USED TO HOLD REINFORCING STEEL FIRMLY IN POSITION, EXTRA ACCESSORY BARS SHALL BE USED AS FOLLOWS:
A. IN SLABS, #5 RAISER BARS AT 36" ON CENTER MAXIMUM TO SUPPORT TOP REINFORCING STEEL.
B. IN WALLS WITH TWO CURTAINS, #3 U OR Z-SHAPE SPACERS AT 6'-0" ON CENTER EACH WAY.

12. CONCRETE CONSTRUCTION SHALL BE REINFORCED CONCRETE EXCEPT WHERE PLAIN CONCRETE IS INDICATED ON THE DRAWINGS. UNLESS OTHERWISE NOTED, MINIMUM REINFORCING STEEL SHALL BE PROVIDED IN ACCORDANCE WITH THE FOLLOWING SCHEDULES:

SLAB THICKNESS	SIZE	SPACING E.W.	LOCATION
4"	#3	12"	CENTERED
5"	#4	12"	CENTERED
6"	#4	12"	CENTERED
8"	#4	12"	T & B
9"	#4	12"	T & B
10"	#4	12"	T & B
12"	#5	12"	T & B

WALL THICKNESS	SIZE	SPACING E.W.	LOCATION
6"	#4	12"	CENTERED
8"	#5	12"	CENTERED
10"	#4	12"	E F
12"	#5	12"	E F
14"	#5	12"	E F
16"	#6	12"	E F
18"	#6	12"	E F

MASS CONCRETE SHALL BE REINFORCED WITH #6 @ 12" E.W. MINIMUM IN ALL FACES. HIGHER MINIMUM STEEL IS PROVIDED IN WATER CONTAINING STRUCTURES.

14. ALL HOOKS SHALL BE ACI STANDARD HOOKS UNLESS DIMENSIONED OTHERWISE. BARS ENDING IN RIGHT ANGLE BENDS OR HOOKS SHALL CONFORM TO THE REQUIREMENTS OF ACI 318, SECT. 25.3. IN CASES WHERE REINFORCING BARS CANNOT BE EXTENDED AS REQUIRED TO PROVIDE SPECIFIED DEVELOPMENT LENGTH DUE TO AN ADJACENT STRUCTURE, EXTEND AS FAR AS POSSIBLE AND END IN STANDARD HOOKS.

15. LAP SPLICE WELDED WIRE FABRIC ONE SPACE PLUS 2 INCHES AT EDGES AND ENDS AND PROVIDE ADDITIONAL REINFORCING WHERE SHOWN ON DRAWINGS. PLACE MESH 2 INCHES FROM TOP OF SLAB FOR SLABS ON GROUND AND 1 INCH FROM TOP OF SUPPORTED SLABS UNLESS NOTED OTHERWISE.

16. FIBER REINFORCING SHALL CONFORM TO ASTM C1116. FIBER REINFORCEMENT SHALL BE MACRO FIBER UNIFORMLY DISPERSED IN THE CONCRETE MIXTURE PER THE MANUFACTURER'S RECOMMENDATION, BUT NOT LESS THAN A RATE OF 4.0 lb/cu yd AND 1.5 INCHES LONG.

CAST-IN-PLACE CONCRETE:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH ACI 318 AND ACI 350.
2. CONCRETE SHALL HAVE THE FOLLOWING 28-DAY COMPRESSIVE STRENGTHS:
CAST-IN-PLACE CONCRETE: 4,500 PSI
FILL CONCRETE: 1,500 PSI
3. USE 6% ±1.5%, ENTRAINED AIR PER ASTM C260 FOR ALL CONCRETE EXPOSED TO WEATHER.
4. ADMIXTURES SHALL CONTAIN NO MORE THAN 0.05% CHLORIDE IONS BY WEIGHT OF CEMENT WHEN TESTED IN ACCORDANCE WITH AASHTO T260.
5. CONCRETE SHALL BE PROPORTIONED, BATCHED, MIXED, PLACED, CONSOLIDATED, AND CURED IN ACCORDANCE WITH ACI 301,304,308,309 AND 318. ALL CONCRETE SHALL BE MECHANICALLY VIBRATED IN ACCORDANCE WITH ACI 304 AND ACI 309.
6. CONTRACTOR SHALL KEEP A COPY OF "FIELD REFERENCE MANUAL: STANDARD SPECIFICATIONS FOR STRUCTURAL CONCRETE ACI 301 WITH SELECTED ACI REFERENCES", (ACI PUBLICATION SP-15) AT THE PROJECT FIELD OFFICE.
7. ALL REINFORCING DETAILS SHALL CONFORM TO THE ACI DETAILING MANUAL, SP-66, UNLESS DETAILED OTHERWISE ON THE STRUCTURAL DRAWINGS.
8. SUBMIT FOR APPROVAL CONCRETE MIX DESIGN AND CERTIFICATION OF CONCRETE MATERIALS CONFORMING TO THE FOLLOWING EXPOSURE CATEGORIES:

CATEGORY	FOOTINGS, INTERIOR	SLAB-ON-GRADE	PIERS, WALLS, EXTERIOR SLABS
	NON-AIR ENTRAINED CLASS:	AIR ENTRAINED CLASS:	
FREEZE AND THAWING	F0	F3	
SULFATE	S1	S1	
IN CONTACT WITH WATER	W1	W1	
CORROSION PROTECTION	C2	C2	

9. THE CONTRACTOR SHALL EMPLOY A TESTING LABORATORY APPROVED BY THE ENGINEER/ARCHITECT TO PERFORM THE TESTING SPECIFIED PER PARAGRAPH 1.6.4 OF ACI 301. THE TESTING LABORATORY SHALL MEET THE REQUIREMENTS OF ASTM E329. TESTING SHALL BE MADE BY AN ACI CONCRETE FIELD-TESTING TECHNICIAN GRADE 1 OR APPROVED EQUIVALENT. A TECHNICIAN GRADE 1 SHALL BE PRESENT DURING ALL CONCRETE PLACEMENT.
10. ALL SLABS SHALL BE POURED MONOLITHICALLY, EXCEPT FOR THE REQUIRED CONSTRUCTION JOINTS, CONTROL JOINTS, AND/OR EXPANSION JOINTS.
11. PROVIDE PERIMETER INSULATION AGAINST EXTERIOR FOUNDATION WALLS AND GRADE BEAMS AND UNDER THE SLAB ADJACENT TO THE EXTERIOR OF THE BUILDING AS SHOWN ON THE ARCHITECTURAL DRAWINGS.
12. PROVIDE 3/4 INCH CHAMFER ON ALL EXPOSED CORNERS OF SLABS UNLESS OTHERWISE INDICATED ON THE ARCHITECTURAL DRAWINGS. MINIMUM CLEARANCES FOR REINFORCING STEEL SHALL BE MAINTAINED. CHAMFERS SHALL EXTEND 2'-0", MINIMUM, BELOW GRADE.
13. CURE ALL CONCRETE FOR A MINIMUM 7-DAYS. APPLY CURING COMPOUND AT THE MAXIMUM COVERAGE RATE OF 300 SQUARE FEET PER GALLON. USE PRODUCT IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. SEE SPECIFICATIONS.
14. DO NOT BACKFILL WATERHOLDING STRUCTURES UNTIL THE CONCRETE HAS REACHED A 28-DAY CONCRETE STRENGTH.
15. CONTRACTOR SHALL PROVIDE BONDING AGENT TO ALL SURFACES BETWEEN EXISTING AND FRESH CONCRETE. BONDING AGENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. PRIOR TO APPLICATION OF BONDING AGENT, THE EXISTING CONCRETE BASE SURFACE SHALL BE THOROUGHLY CLEANED TO REMOVE ANY GREASE, OIL OR OTHER CONTAMINANTS THAT MAY PREVENT ADEQUATE BOND TO THE EXISTING CONCRETE. REMOVE WEAK OR DETERIORATED CONCRETE.
16. THE CONCRETE INTERFACE OF ALL CONSTRUCTION JOINTS SHALL BE ROUGHEN TO 1/4", MINIMUM, AMPLITUDE. PRIOR TO CASTING AGAINST THE GREEN CONCRETE, APPLY BONDING AGENT (OR GREEN CONCRETE SHALL BE SATURATED SURFACE DRY. WET GREEN CONCRETE FOR A MINIMUM OF 8". REMOVE ANY STANDING WATER).
17. CONTRACTOR SHALL SUBMIT PROPOSED LOCATIONS OF CONSTRUCTION JOINTS NOT INDICATED ON THE DRAWINGS FOR REVIEW BY THE ENGINEER/ARCHITECT.
18. ALUMINUM OR DISSIMILAR METALS IN CONTACT WITH CONCRETE SHALL BE COATED WITH GRAY EPOXY PRIMER. EPOXY PRIMER SHALL BE PRE-APPROVED BY THE ENGINEER.
19. FORMWORK, FOR ALL CONCRETE THAT WILL BE EXPOSED IN THE COMPLETED STRUCTURE, SHALL BE CONSTRUCTED FROM A METAL OR SUITABLE SURFACE PLYWOOD THAT WILL PRODUCE AN ACCEPTABLY SMOOTH SURFACE. SEE SPECIFICATIONS.
20. PITCH CONCRETE SLABS TO FLOOR DRAINS, SUMP PITS, OR STORM SEWER INLETS, COORDINATE WITH MECHANICAL, CIVIL OR ARCHITECTURAL DRAWINGS. SLOPE EXPOSED EXTERIOR SLABS TO SHED WATER. INTERIOR BASE SLABS, WITHOUT DRAINS OR SUMP PITS, SHALL BE MONILITHICALLY SLOPED TOWARD WALL WHERE PRIMARY ENTRY HATCH IS LOCATED.
21. FORM TIES SHALL BE FACTORY-FABRICATED SNAP-OFF GLASS-FIBER-REINFORCED PLASTIC OR METAL FORM TIES DESIGNED TO RESIST LATERAL PRESSURE DURING CONCRETE PLACEMENT. FORM TIES SHALL HAVE PLASTIC CONE AND, WHEN USED IN AN ENVIRONMENTAL STRUCTURE, HAVE A WATERSTOP LOCATED AT THE CENTER. FORM TIE UNITS, AFTER BREAKBACK, SHALL BE AT LEAST 1 INCH FROM THE FACE OF THE CONCRETE SURFACE.
22. CONCRETE EMBEDS AND PENETRATIONS - PIPES AND CONDUITS EMBEDDED IN OR PASSING THROUGH STRUCTURAL ELEMENTS SHALL CONFORM TO ACI 318-6.3

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DATE	REVISION	NO	REVIEW	ISSUED FOR:	ISSUE DATE:	SCALE:	DESIGNED BY:	DRAWN BY:	CHECKED BY:
					10/3/2025	AS NOTED	BAS	TLM	BF

CITY OF WILLOUGHBY

LAKESHORE EAST EQ BASIN

PHASE II

LAKE COUNTY

WILLOUGHBY, OHIO

SITE STRUCTURES - 20 SERIES

GENERAL NOTES

PROJECT NO.

230264

DISCIPLINE

STRUCTURAL

SHEET NAME

20-S-01

SHEET

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OF

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23. CONCRETE PROTECTION (CLEAR COVER) FOR REINFORCEMENT BARS SHALL BE AS FOLLOWS UNLESS NOTED OTHERWISE:
- A. FOOTINGS AND FOUNDATION MATS CAST ON GROUND:
- 3 INCHES, BOTTOM AND UNFORMED EDGES
 - 2 INCHES, FORMED EDGES
 - 2 INCHES, EXPOSED TO EARTH, WATER OR WEATHER
 - 2 INCHES, BOTTOM, ON CONCRETE MUDMAT
- B. CONCRETE IN CONTACT WITH SEWAGE OR WATER:
- SLABS AND WALLS
 - 2 INCHES
 - COLUMNS AND BEAMS
 - 2-1/2 INCHES, PRINCIPAL REINFORCEMENT
 - 2 INCHES, STIRRUPS & TIES
- C. CONCRETE IN CONTACT WITH GROUND OR WEATHER:
- SLABS AND WALLS
 - 2 INCHES
 - COLUMNS AND BEAMS
 - 2-1/2 INCHES, PRINCIPAL REINFORCEMENT
 - 2 INCHES, STIRRUPS & TIES
- D. CONCRETE NOT TO BE EXPOSED TO GROUND, WEATHER OR LIQUID
- SLABS AND WALLS
 - 3/4 INCHES, BARS GREATER THAN #5
 - 1/2 INCHES, BARS #6 OR LESS
 - COLUMNS AND BEAMS
 - 1-1/2 INCHES, PRINCIPAL REINFORCEMENT
- E. 1 INCHES, STIRRUPS & TIES
24. ANCHOR BOLTS SHALL BE ASTM F1554-55 UNLESS OTHERWISE NOTED. EMBEDMENT, EDGE DISTANCES AND ALLOWABLE LOADS SHALL CONFORM TO BS TABLE 1912.2 OR AS NOTED ON THE DRAWINGS. CONFORM TO ADDITIONAL REQUIREMENTS IN SPECIFICATION 05 SECTION AS APPLICABLE.
25. PROVIDE ANCHORAGE INSERTS WHERE SHOWN ON CONCRETE WALLS AND CONCRETE CEILINGS IN GALLERIES, PIPE CHASES, TUNNELS AND AS REQUIRED BY PROCESS, MECHANICAL, AND ELECTRICAL INSTALLATIONS.
26. ENVIRONMENTAL STRUCTURES SHALL HAVE WATERSTOPS AT CONCRETE JOINTS. WATERSTOPS SHALL BE CONTINUOUS AND LOCATED AT ALL JOINTS.
- A. WATERSTOPS SHALL BE PVC, UNLESS NOTED OTHERWISE.
- B. PVC WATERSTOP INTERSECTIONS SHALL BE ASSEMBLED AND BONDED IN THE FACTORY. DO NOT MAKE INTERSECTIONS IN THE FIELD.
- C. PVC WATERSTOPS SHALL BE PROPERLY SUPPORTED AND WIRED TO REINFORCING TO REMAIN STRAIGHT AND TRUE. HEAT AT JOINTS ALL JOINTS PER MANUFACTURER'S RECOMMENDATIONS.
- D. WATERSTOP FOR CONSTRUCTION JOINTS SHALL BE PVC SERRATED TYPE WITHOUT CENTER BULB, NOT LESS THAN 6" WIDTH AND 3/8" THICK, UNO.
- E. WATERSTOP FOR EXPANSION JOINTS SHALL BE PVC SERRATED TYPE, WITH CENTER BULB NOT LESS THAN 9" WIDTH AND 3/8" THICK, UNO.
- F. NON-PVC WATERSTOPS FOR NON-MOVING JOINTS SHALL BE USED IN APPROVED APPLICATIONS.
- G. NON-PVC WATERSTOPS SHALL BE A HYDROPHILIC RUBBER STRIP THAT IS ADHERED TO THE SMOOTH CONCRETE SURFACE. THE WATERSTOP SHALL BE LOCATED BETWEEN REINFORCING MATS OR LOCATED WITH 3" MINIMUM, OF CLEAR CONCRETE COVER. INSTALL AND UTILIZE PER MANUFACTURER'S RECOMMENDATIONS.
27. PROVIDE A MASS CONCRETE TEMPERATURE CONTROL PLANS. THE PROGRAM SHALL MANAGE CURING HEAT FROM HYDRATION FOR MASS CONCRETE THAT WILL MINIMIZE VOLUME AND PROVIDE ACCEPTABLE STRENGTH AND CRACK CONTROL. THE PLAN SHALL INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
- A. A COPY OF THE APPROVED MIX DESIGN AND PROPOSED MODIFICATIONS TO MIXES IF FIELD TEMPERATURES EXCEED ALLOWABLE LIMITS
- B. PROPORTIONS OF FINE AND COARSE AGGREGATES MAY BE ADJUSTED TO PRODUCE THE DESIRED WORKABILITY AND A SOMEWHAT HIGHER PROPORTION OF FINE AGGREGATE THAN WOULD BE USED FOR NORMAL CONDITIONS.
- C. IDENTIFYING THE MASS CONCRETE ELEMENTS AND SHOWING THE LOCATIONS OF TEMPERATURE MONITORING DEVICES.
- D. CORRECTIVE ACTION, IN THE FIELD, IF THE TEMPERATURE DIFFERENTIAL EXCEEDS THE MASS PLAN PREVENTATIVE TEMPERATURE

WATERTIGHT STRUCTURES:

1. WATERSTOPS SHALL BE PVC, UNLESS NOTED OTHERWISE. WATERSTOPS SHALL BE CONTINUOUS AND LOCATED AT ALL JOINTS. CONTROL JOINTS SHALL HAVE A BULB TYPE WATERSTOP. ALL PVC WATERSTOP INTERSECTIONS SHALL BE ASSEMBLED AND BONDED IN THE FACTORY. DO NOT MAKE INTERSECTIONS IN THE FIELD.
2. THE ALLOWABLE LEAKAGE RATE OF STRUCTURES SHOULD NOT EXCEED 0.1% OF THE WATER VOLUME IN 24 HOURS, AFTER ABSORPTION AND STABILIZATION. VISIBLE LEAKAGE AND DAMPNESS WILL NOT BE ACCEPTABLE. THE WATERTIGHTNESS TEST SHALL BE PERFORMED FOLLOWING THE RECOMMENDATIONS GIVEN IN ACI-350.1.
- A. THE STRUCTURES SHALL BE CONSTRUCTED WITH ALL WALL OPENINGS SEALED TO PREVENT LOSS OF WATER. BACKFILL OR WATERPROOFING SHALL BE PLACED AGAINST OR APPLIED TO THE WALLS AFTER THE TIME OF TESTING SO THAT VISIBLE LEAKAGE MAY BE OBSERVED.
- B. THE TEST SHALL COMMENCE THREE (3) DAYS AFTER THE STRUCTURES ARE FILLED TO HIGH WATER ELEVATION TO ALLOW FOR STABILIZATION. CONCRETE SHALL BE AT SPECIFIED DESIGN STRENGTH.
- C. THE TEST WILL BE CONTINUED FOR A PERIOD OF TIME SUFFICIENT TO PRODUCE AT LEAST A THREE-EIGHTHS INCH DROP IN THE WATER SURFACE BASED ON THE LEAKAGE OCCURRING AT THE MAXIMUM ALLOWABLE RATE GIVEN ABOVE. THE TEST DURATION FOR EACH STRUCTURE IS CALCULATED TO BE THE NUMBER OF DAYS WITH A WATER ELEVATION GIVEN ABOVE. TEST RESULTS TO BE CORRECTED FOR OBSERVATIONS FOR THE GAIN OF WATER DUE TO PRECIPITATION OR THE LOSS OF WATER DUE TO EVAPORATION. A PARTIALLY FILLED, CALIBRATED, TRANSPARENT, FLOATING, OPEN CONTAINER SHALL BE POSITIONED IN THE CONTAINMENT STRUCTURE. THE CONTAINER SHALL BE POSITIONED AWAY FROM THE SIDES OF THE STRUCTURE AND ANY OVERHEAD MEMBERS THAT MAY SHIELD OR SHADE THE CONTAINER. THE CONTAINER SHOULD HAVE SUFFICIENT FREEBOARD TO ACCOMMODATE THE PRECIPITATION FROM NORMAL RAINFALL AND NOT BE OVERTOPPED BY WAVES GENERATED BY THE WIND.
- D. IF THE LEAKAGE RATE AT THE END OF THE TEST PERIOD IS DETERMINED TO EXCEED THE ALLOWABLE RATE, THE STRUCTURE SHALL BE CONSIDERED TO HAVE FAILED THE TEST. ALSO, IF WATER IS OBSERVED FLOWING FROM THE STRUCTURE OR IF MOISTURE OTHER THAN FROM PRECIPITATION OR CONDENSATION CAN BE TRANSFERRED TO THE DRY HAND FROM EXTERIOR SURFACES, THE STRUCTURE WILL HAVE FAILED THE TEST.
- E. THE CONTRACTOR SHALL MAKE NECESSARY REPAIRS TO THE STRUCTURE IN ACCORDANCE WITH SECTION 033000 OF THE SPECIFICATIONS USING EVALUATION, REPAIR MATERIALS AND PROCEDURES. THE REPAIRS MAY INCLUDE EPOXY INJECTION OR CHEMICAL INJECTION WITH A MOISTURE REACTIVE HYDROPHILIC POLYURETHANE FOAM GROUT. THE CONTRACTOR'S PROPOSED REPAIR METHODS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO ANY REPAIR WORK.
- F. AFTER ACCEPTABLE REPAIRS ARE MADE, THE STRUCTURE MUST BE FILLED WITH WATER AND TESTED FOR WATERTIGHTNESS A SECOND TIME. THE STRUCTURE MUST PASS THE TEST BEFORE FINAL WORK AND ANY WATERPROOFING MAY PROCEED.
- G. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THE REPAIRS TO MAKE THE STRUCTURE WATERTIGHT AND ACCEPTABLE TO THE ENGINEER.
- H. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THE FILLING AND DEWATERING OF THE STRUCTURE. THE CONTRACTOR MAY OBTAIN WATER FROM THE PLANT EFFLUENT SYSTEM. THE CONTRACTOR SHALL SUPPLY ALL EQUIPMENT, HOSES, LABORS TO FILL AND DEWATER THE TANK. DEWATERING CAN BE ACCOMPLISHED BY DRAINING THE TANK THROUGH PROCESS DRAIN PIPES IF INSTALLED.

BUOYANT STRUCTURES:

1. WHEN EMPTY DURING CONSTRUCTION, THE STRUCTURES MAY BECOME BUOYANT. IN THE EVENT THAT THE EXCAVATIONS BECOME FLOODED, THE STRUCTURES MUST BE FILLED WITH WATER TO PREVENT FLTATION OR THE EXCAVATION IS TO BE KEPT DEWATERED.
2. THE STRUCTURES ARE DESIGNED TO RESIST BUOYANCY WHEN COMPLETE AND EMPTY.

POST-TENSIONED CONCRETE:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 318 AND THE POST TENSIONED INSTITUTE'S "POST-TENSIONING MANUAL, SIXTH EDITION," OR ANY MORE STRINGENT REQUIREMENTS PRESENTED BY THE AUTHORITY HAVING JURISDICTION.
2. CONTRACTOR SHALL ENGAGE A QUALIFIED PROFESSIONAL ENGINEER TO DESIGN THE POST-TENSION STRUCTURE INCLUDING THE POST-TENSION STRUCTURAL ITEMS, CAST-IN-PLACE STRUCTURAL ITEMS, STRUCTURAL PRECAST ITEMS, METAL STRUCTURAL ITEMS, AND OTHER STRUCTURAL ITEMS. THE ENGINEER SHALL DESIGN A WHOLE AND COMPLETE STRUCTURE. THE DELEGATED ENGINEER SHALL DETERMINE LATERAL AND VERTICAL LOADS BASED ON THE SITE CONDITIONS, SOIL PROPERTIES, WIND LOADING, AND SEISMIC LOADING.
3. CONTRACTOR SHALL ENGAGE A QUALIFIED PROFESSIONAL ENGINEER TO DESIGN THE POST-TENSION REINFORCEMENT ALONG WITH THE MILD REINFORCEMENT INCLUDING CONSTRUCTION JOINT, POUR STRIP, AND PUNCHING SHEAR REQUIREMENTS. THE DELEGATED POST-TENSION ENGINEER SHALL DETERMINE LATERAL AND VERTICAL LOADS BASED ON THE SITE CONDITIONS, SOIL PROPERTIES, WIND LOADING, AND SEISMIC LOADING.
4. IF PROVIDED, POST-TENSION IS AS INDICATED ON THE DRAWINGS. IT IS THE RESPONSIBILITY OF THE POST TENSION SUPPLIER TO PROVIDE POST-TENSION PLACEMENT DRAWINGS THAT COMPLY WITH THESE DRAWINGS.
5. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND CALCULATIONS SIGNED AND SEALED BY AN ENGINEER REGISTERED IN THE STATE WHERE THE PROJECT IS LOCATED. DRAWINGS AND CALCULATIONS SHALL BE FOR A WHOLE AND COMPLETE STRUCTURE. REFER TO OTHER SECTIONS OF THE GENERAL NOTES, AS NEEDED.
6. SHOP DRAWINGS SHALL INCLUDE, BUT NOT BE LIMITED TO, TENDON LAYOUTS AND PROFILES, STRESSING AND FIXED END ANCHORAGE DETAILS, STRESSING SEQUENCE, EFFECTIVE FORCE PER TENDON, OPENINGS, AND OTHER RELATED DETAILS. CALCULATIONS OF AFFECTIVE TENDON FORCES SHALL INCLUDE ALL SHORT AND LONG TERM LOSSES, AND BE SUBMITTED TO ARCHITECT/STRUCTURAL ENGINEER FOR REVIEW. PLEASE SEE SPECIFICATIONS.
7. THE CONTRACTOR SHALL COORDINATE THE SHOP DRAWINGS BETWEEN THE REINFORCING STEEL FABRICATOR AND THE POST-TENSIONING FABRICATOR PRIOR TO SUBMITTING TO STRUCTURAL ENGINEER FOR REVIEW. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL FIELD CONDITIONS AND DIMENSIONS.
8. POST-TENSION INSTALLER SHALL HAVE A FULL TIME PROJECT SUPERINTENDENT WHO HAS SUCCESSFULLY COMPLETED PTTS LEVEL 1 FIELD FUNDAMENTALS COURSE OR EQUIVALENT VERIFIABLE EXPERIENCE AND KNOWLEDGE ACCEPTABLE TO ARCHITECT.
9. SPECIAL INSPECTOR PERFORMING FIELD INSPECTIONS AND MEASURING ELONGATION SHALL HAVE SUCCESSFULLY COMPLETED PTTS LEVEL 1 FIELD FUNDAMENTALS COURSE OR EQUIVALENT VERIFIABLE EXPERIENCE AND KNOWLEDGE ACCEPTABLE TO ARCHITECT.
10. TENDONS SHALL BE MANUFACTURED AND DELIVERED IN SEQUENCE AND QUANTITY TO AVOID LENGTHY JOB SITE STORAGE. TENDONS SHALL BE PROTECTED FROM CORROSION AT ALL TIMES BY AN APPROVED SHEATHING AND COATING. SHEATHING SHALL HAVE TENSILE STRENGTH AND RESISTANCE SUFFICIENT TO RESIST DAMAGE AND DETERIORATION DURING TRANSPORT, STORAGE AT JOB SITE, AT INSTALLATION, AND SHALL BE CAPABLE OF PREVENTING THE PENETRATION OF CEMENT PASTE. TEARS IN SHEATHING SHALL BE REPAIRED BY A SYSTEM APPROVED BY THE ENGINEER OF RECORD. THE COATING SHALL NOT BECOME BRITTLE OR FLUID, AND SHALL BE CHEMICALLY STABLE, NON-REACTIVE, NON-CORROSIVE, AND IMPERVIOUS TO MOISTURE.
11. FOR CONCRETE AND NON-PRESTRESSED STEEL BARS, SEE CONCRETE AND REINFORCEMENT SECTION OF THESE NOTES.
12. THE SPECIAL INSPECTOR (THRESHOLD INSPECTOR) AND ARCHITECT SHALL BE NOTIFIED 48 HOURS IN ADVANCE BEFORE CONCRETE IS PLACED. CONCRETE SHALL NOT BE PLACED UNTIL PLACEMENT OF TENDONS AND NON-PRESTRESSED STEEL REINFORCEMENT HAS BEEN INSPECTED BY THE SPECIAL INSPECTOR (THRESHOLD INSPECTOR).
13. THE CONTRACTOR SHALL SUPERVISE ALL TENDON STRESSING OPERATIONS AND RECORD TENDON FORCES AND ELONGATIONS UNDER THE OBSERVATION OF THE SPECIAL INSPECTOR (THRESHOLD INSPECTOR).
14. THE MINIMUM CONCRETE COVER SHALL FOLLOW THE REQUIREMENTS OF ACI 318, UNLESS NOTED OTHERWISE.
15. THE CONTRACTOR SHALL TAKE MEASURES TO ENSURE COMPLETE CONSOLIDATION AND DENSIFICATION OF CONCRETE, PARTICULARLY BEHIND ALL POST-TENSIONING ANCHOR POINTS.
16. CONTRACTOR SHALL NOT CUT STRAND TAILS OR COVER ANCHORAGES UNTIL STRESSING RECORDS HAVE BEEN REVIEWED AND APPROVED BY ARCHITECT.
- PRECAST CONCRETE:**
1. ALL PRECAST MEMBERS SHALL BE DESIGNED AND FABRICATED IN ACCORDANCE WITH ACI 318, "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;" ACI 301, "SPECIFICATIONS FOR STRUCTURAL CONCRETE;" PCI 116-13, "MANUAL FOR QUALITY CONTROL FOR PLANTS AND PRODUCTION OF PRECAST PRESTRESSED PRODUCTS;" AND PCI 135-00, "TOLERANCE MANUAL FOR PRECAST AND PRESTRESSED CONCRETE CONSTRUCTION;" AND "THE PCI DESIGN HANDBOOK."
2. THE MANUFACTURER OF THE PRECAST CONCRETE MEMBERS SHALL BE CERTIFIED BY THE "PRECAST CONCRETE INSTITUTE" (PCI) BY THE BID DATE. THE CERTIFICATION GROUP SHALL BE GROUP "C" FOR STRUCTURAL MEMBERS.
3. PRECAST CONCRETE MEMBERS SHALL CONFORM TO THE APPLICABLE "CONCRETE AND REINFORCEMENT" NOTES.
4. THE FIELD ERECTION CREW FOR PRECAST MEMBERS SHALL BE QUALIFIED BY PCI'S CERTIFICATE OF COMPLIANCE TO ERECT CATEGORY S1- SIMPLE STRUCTURAL SYSTEMS.
5. CONTRACTOR SHALL ENGAGE A QUALIFIED PROFESSIONAL ENGINEER TO DESIGN THE PRECAST STRUCTURE INCLUDING THE PRECAST STRUCTURAL ITEMS, CAST-IN-PLACE STRUCTURAL ITEMS, METAL STRUCTURAL ITEMS, AND OTHER STRUCTURAL ITEMS. THE ENGINEER SHALL DESIGN A WHOLE AND COMPLETE STRUCTURE. THE DELEGATED ENGINEER SHALL DETERMINE LATERAL AND VERTICAL LOADS BASED ON THE SITE CONDITIONS, SOIL PROPERTIES, WIND LOADING, AND SEISMIC LOADING.
6. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND CALCULATIONS SIGNED AND SEALED BY AN ENGINEER REGISTERED IN THE STATE WHERE THE PROJECT IS LOCATED. DRAWINGS AND CALCULATIONS SHALL BE FOR A WHOLE AND COMPLETE STRUCTURE. REFER TO OTHER SECTIONS OF THE GENERAL NOTES, AS NEEDED.
7. PRECAST MANUFACTURER SHALL SUBMIT SHOP DRAWINGS WITH DESIGN CALCULATIONS SIGNED AND SEALED BY A REGISTERED ENGINEER IN THE STATE OF THE PROJECT FOR REVIEW PRIOR TO MANUFACTURING. SHOP DRAWINGS SHALL BE PREPARED IN ACCORDANCE WITH THE PCI "DRAFTING HANDBOOK - PRECAST AND PRESTRESSED CONCRETE, SECOND EDITION, MNL-119-90."
8. SHOP DRAWINGS SHALL BE COORDINATED BY THE CONTRACTOR WITH ARCHITECTURAL, MECHANICAL, PLUMBING AND OTHER DRAWINGS AS REQUIRED FOR EQUIPMENT WEIGHTS, PADS, OPENINGS, CONSTRUCTION JOINTS AND OTHER DETAILS PRIOR TO SUBMITTAL TO THE ARCHITECT/ENGINEER FOR REVIEW.
9. PRECAST CONCRETE MEMBERS SHALL BE DESIGNED AND CONSTRUCTED UTILIZING THE FOLLOWING MATERIALS, UNLESS NOTED OTHERWISE:
- A. CONCRETE:
- COMPRESSIVE STRENGTH AT 28 DAYS: 5,000 PSI
 - COMPRESSIVE STRENGTH AT RELEASE: 3,500 PSI
 - TILT-UP WALL PANELS: 3,000 PSI AT LIFTING
 - 5,000 PSI AT 28 DAYS
- B. REINFORCING STEEL:
- DEFORMED BARS: ASTM A615, GRADE 60
 - ASTM A706, GRADE 60 FOR REINFORCING TO BE WELDED
 - ASTM A996, GRADE 60 FOR RAIL/AXLE STEEL
 - TENDONS: ASTM A416, GRADE 250
10. PRECAST MANUFACTURER SHALL PROVIDE 3/4 INCH MINIMUM COVER FOR ALL REINFORCING STEEL.
11. PRECAST MANUFACTURER SHALL PROVIDE CAST-IN-PLACE ANCHORS, INSERTS, ETC., WITH SUFFICIENT ANCHORAGE AND EMBEDMENT FOR THE SPECIFIED DESIGN REQUIREMENTS. AIR RELIEF HOLES SHALL BE PROVIDED IN THE HORIZONTAL SURFACES OF ALL CAST-IN PLATES AND ANGLES OVER 3" IN WIDTH WHEN SUCH SURFACES ARE ABOVE THE BOTTOM OF THE PRECAST MEMBER IN THE CASTING POSITION.

10. ELASTOMERIC MATERIALS OF A STRUCTURAL (NON-COMMERCIAL) GRADE CONFORMING TO THE REQUIREMENTS OF SECTION 18, DIVISION 2, OF THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES 17TH EDITION HAVING A MINIMUM DUROMETER HARDNESS OF 70 SHOULD BE USED UNDER BEARING SURFACES OF PRECAST FLOOR AND ROOF PLANKS. ALL MATERIAL SHALL BE NEW WITH NO RECLAIMED MATERIAL INCORPORATED IN THE FINISHED BEARING PAD.
11. PRECAST INSTALLER SHALL SET UNITS LEVEL AND SQUARE, KEEPING UNITS TIGHT AND IN PROPER ALIGNMENT WITH SUPPORTS. MAXIMUM DIFFERENTIAL CAMBER BETWEEN ADJACENT ELEMENTS SHALL NOT EXCEED 1/4" PER 10'-0" OF LENGTH BUT NOT GREATER THAN 3/4". CONTRACTOR SHALL TAKE ALL MEASURES NECESSARY TO CONFORM TO THESE TOLERANCES INCLUDING, BUT NOT LIMITED TO THE ADJUSTMENT OF BEARING HEIGHTS.
12. PRECAST CONCRETE SLABS AND TEES SHALL HAVE A MINIMUM BEARING SURFACE OF 3" ON ALL SUPPORTING ELEMENTS, UNLESS NOTED OTHERWISE.
13. PRECAST INSTALLER SHALL WELD MEMBERS TO SUPPORTS, AS SHOWN ON THE DRAWINGS. ALL WELDS SHALL BE PERFORMED IN ACCORDANCE WITH AWS D1.1.
14. PRECAST MANUFACTURER SHALL PROVIDE STANDARD SHEAR CONNECTORS IN THE FLANGES OF PRECAST TEES AS SHOWN ON DETAILS. FIELD WELD AS INDICATED IN ACCORDANCE WITH AWS D1.1 SECTION 7.
15. REINFORCING STEEL THAT MAY BE SHOWN IN DETAILS IS FOR IN-PLACE CONDITION. ALL INSERTS, BRACES, STRONGBACKS AND OTHER REQUIRED ACCESSORIES SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR, AND SHALL BE LOCATED IN ACCORDANCE WITH THE RECOMMENDATIONS OF RICHMOND BULLETIN NO. 8, "PRODUCTS FOR PRECAST/PRESTRESSED CONCRETE CONSTRUCTION." THE CONTRACTOR IS ALSO RESPONSIBLE FOR PROVIDING SPECIAL REINFORCING ELEMENTS THAT MAY BE REQUIRED TO PREVENT FLEXURAL CRACKS FROM OCCURRING IN THE PANELS DURING LIFTING AND HANDLING OPERATIONS.
16. THE CONTRACTOR SHALL GROUT PRECAST MEMBERS AS OUTLINED BELOW:
- A. BETWEEN SLAB EDGES: FILL GROUT KEYS FULL AND STRIKE OFF FLUSH WITH TOP SURFACE. REMOVE ANY GROUT WHICH SEEPS THROUGH TO UNDERSIDE OF UNITS BEFORE IT HARDENS. CLEAN EXCESS FROM FACES AND FLOORS BELOW.
- B. AT SLAB ENDS: WHERE END GROUTING IS SHOWN ON THE DRAWINGS, PROVIDE SUITABLE END CAP OR DAM IN VOIDS.
17. PRECAST MANUFACTURER/DESIGNER AND CONTRACTOR SHALL COORDINATE WITH OTHER TRADES IN PERMITTING THE INSERTION OF ANCHORS, HANGERS, ELECTRICAL OUTLETS, ETC.
18. PRECAST MANUFACTURER AND GENERAL TRADES CONTRACTOR SHALL COORDINATE SIZE AND LOCATION OF ALL HOLES AND OPENINGS REQUIRED THROUGH THE HOLLOW CORE SLABS WITH THE TRADES REQUIRING THE OPENINGS.
19. NOT ALL HOLES AND OPENINGS ARE SHOWN ON THE STRUCTURAL DRAWINGS. THOSE WHICH ARE SHOWN SHALL BE CAST-IN OR CUT-IN BY THE MANUFACTURER. ALL OPENINGS LARGER THAN ONE SLAB WIDTH ARE TO BE FRAMED WITH CONCRETE OR STRUCTURAL STEEL HEADERS, DESIGNED AND PROVIDED BY THE MANUFACTURER. ADJACENT UNITS SHALL BE DESIGNED TO SUPPORT THE ADDITIONAL LOAD.
20. OPENINGS NOT SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE FIELD CUT BY THE GENERAL TRADES CONTRACTOR AT THE EXPENSE OF THE TRADE REQUIRING THE OPENING. THE MANUFACTURER, HOWEVER, IS RESPONSIBLE FOR DESIGNING THE AFFECTED HOLLOW CORE PLANKS TO ACCOMMODATE THESE OPENINGS BY PROVIDING NECESSARY ADDITIONAL REINFORCING IN UNIT WITH OPENING AND IN ADJACENT UNITS. FIELD CUT HOLES MAY BE DRILLED OR CUT AND TRIMMED WITH A CHISEL. CUT OUTLINE OF HOLE THROUGH LOWER PORTION OF SLAB FROM UNDERSIDE, AFTER WHICH THE TOPSIDE MAY BE REMOVED FROM ABOVE. DO NOT CUT PRESTRESSING STRANDS WITHOUT APPROVAL OF THE MANUFACTURER AND THE ARCHITECT.

STRUCTURAL STEEL:

1. STEEL SHALL BE FABRICATED BY A FABRICATOR HAVING AN AISC QUALITY CERTIFICATION CATEGORY: "STANDARD FOR STEEL BUILDING STRUCTURES (STD)."
2. STRUCTURAL STEEL WORK SHALL CONFORM TO THE "STEEL CONSTRUCTION MANUAL, AISC 360."
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF MEMBERS AND CONNECTIONS FOR ANY PORTION OF THE STRUCTURE NOT INDICATED ON THE PLANS. ALL SPECIAL CONDITIONS AND CONNECTIONS SHALL BE CAREFULLY AND COMPLETELY DETAILED AND SUBMITTED FOR APPROVAL.
4. CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND SIZE OF ALL OPENINGS FOR MECHANICAL EQUIPMENT WITH THE MECHANICAL CONTRACTOR PRIOR TO FABRICATION OF MATERIALS.
5. ANY STEEL SHOWN ON DRAWINGS FOR SUPPORTING OR CONNECTING MECHANICAL, ELECTRICAL, OR PLUMBING EQUIPMENT IS FOR BID PURPOSES ONLY. CONTRACTOR SHALL COORDINATE EXACT SIZE AND LOCATION PRIOR TO PROCEEDING WITH CONSTRUCTION.
6. UNLESS SHOWN ON STRUCTURAL DRAWINGS, CONTRACTOR SHALL NOT CUT ANY HOLES IN STRUCTURAL STEEL MEMBERS WITHOUT WRITTEN PERMISSION FROM THE STRUCTURAL ENGINEER.
7. ALL STEEL BEAMS SHALL BE FABRICATED AND ERECTED WITH THE NATURAL CAMBER (WITHIN THE MILL TOLERANCE) LOCATED ABOVE THE HORIZONTAL CENTERLINE BETWEEN THE END CONNECTIONS.
8. THE STEEL FRAME AS DESIGNED IS A NON-SELF SUPPORTING STEEL FRAME. CONTRACTOR SHALL COORDINATE THE ERECTION WITH THE INSTALLATION OF OTHER BUILDING ELEMENTS REQUIRED FOR THE STRUCTURES STABILITY. THESE ELEMENTS INCLUDE, BUT ARE NOT LIMITED TO, SLABS, METAL DECK, MASONRY WALLS, AND CONCRETE WALLS.
9. STEEL SHALL CONFORM TO THE FOLLOWING UNLESS OTHERWISE NOTED:
- A. W-SHAPES: ASTM A992
- B. ANGLES, PLATES, RODS, ETC: ASTM A36
- C. CHANNELS: ASTM A36 (A572, GRADE 50)
- D. PIPES: ASTM A53, GRADE B
- E. STRUCTURAL TUBING: ROUND - ASTM A500, GRADE B, 42 KSI
- SQUARE & RECTANGULAR, ASTM A500, GRADE B, 46 KSI
- F. ANCHOR RODS: ASTM F1554, GRADE 36
- G. SHEAR STUD CONNECTORS: ASTM A108
10. WELDED CONNECTIONS SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICAN WELDING SOCIETY, AWS D1.1. WELDING ELECTRODE MATERIAL SHALL BE E70XX.
11. WELDING OF SHEAR STUD CONNECTORS SHALL CONFORM TO AWS D1.1 SECTION 7.
12. ALL WELDED CONNECTIONS SHALL BE DESIGNED TO BE FULLY EQUIVALENT IN STRENGTH TO BOLTED CONNECTIONS FOR THE SAME SIZE BEAM.
13. MINIMUM WELDS, WHERE NOT SHOWN ON DRAWINGS, SHALL BE 3/16 INCH FILLET WELD, ALL AROUND.
14. IN GENERAL, IT IS THE INTENT OF THESE PLANS AND SPECIFICATIONS THAT ALL SHOP CONNECTIONS BE WELDED OR BOLTED AND ALL FIELD CONNECTIONS BE BOLTED EXCEPT WHERE NOTED OTHERWISE.
15. ALL CONNECTIONS SHALL BE MADE WITH 3/4-INCH ASTM A325 BOLTS TIGHTENED TO SNUG-TIGHT CONDITION UNLESS OTHERWISE NOTED.
16. ALL CONNECTIONS NOT DETAILED ON THE DRAWINGS SHALL BE DESIGNED AND DETAILED BY THE FABRICATOR UTILIZING THE REQUIREMENTS IN AISC 360, AND THE CONTRACT DOCUMENTS. THE FABRICATOR SHALL USE LOAD AND RESISTANCE FACTOR DESIGN, ALLOWABLE STRESS DESIGN METHODOLOGY TO COMPLETE ALL CONNECTION DESIGNS INCLUDING THE FOLLOWING GUIDELINES.
- A. DETAIL ALL BOLTED CONNECTIONS AS BEARING TYPE CONNECTIONS WITH THREADS IN THE SHEAR PLANE, EXCEPT THE FOLLOWING CONNECTIONS, WHICH SHALL BE DESIGNED AS SLIP-CRITICAL CONNECTIONS:
- ALL CONNECTIONS IN DIRECT TENSION.
 - THE WEB SHEAR CONNECTION OF ALL MOMENT CONNECTIONS.
 - ALL BEAM OR GIRDER CONNECTIONS USING OVERSIZED HOLES OR LONG SLOTS.
 - ANY CONNECTION NOTED ON THE CONTRACT DRAWINGS AS SLIP-CRITICAL CONNECTION.
- B. NON-COMPOSITE BEAM CONNECTIONS SHALL BE DESIGNED TO DEVELOP 55% OF THE LOAD CAPACITY OF THE MEMBER AS TABULATED IN BEAM TABLE 3-6, PART 3, OF THE AISC "MANUAL OF STEEL CONSTRUCTION", UNLESS THE REACTION IS SHOWN ON THE DRAWINGS.
- C. COMPOSITE BEAM CONNECTIONS SHALL BE DESIGNED TO DEVELOP 75% OF THE LOAD CAPACITY OF THE MEMBER AS TABULATED IN THE BEAM TABLES, BUT NOT LESS THAN THE STANDARD "V/I" VALUE (MAXIMUM END REACTION FOR 3-1/2" BEARING AS SHOWN IN BEAM TABLE 3-6, PART 3, OF THE AISC "MANUAL OF STEEL CONSTRUCTION", UNLESS THE REACTION IS SHOWN ON THE DRAWINGS.

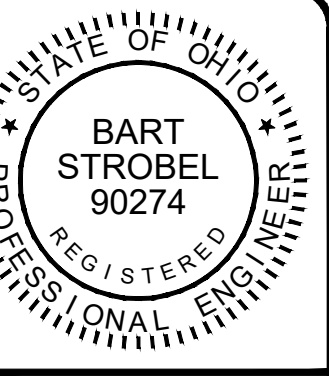
17. IN NO CASE SHALL THE MINIMUM NUMBER OF ROWS OF BOLTS FOR THE GIVEN BEAM SIZE BE LESS THAN THAT WHICH IS SHOWN IN TABLE 10-1, PART 10, OF THE AISC "MANUAL OF STEEL CONSTRUCTION".
18. ALL SHELF ANGLES AND LINTELS IN EXTERIOR WALLS, INCLUDING BEARING PLATES AND ANCHOR RODS, SHALL BE GALVANIZED AFTER FABRICATION.
19. ALL STEEL AND CORRESPONDING CONNECTIONS EXPOSED TO WEATHER SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123 AND A153, RESPECTIVELY.
20. ALL STEEL, AND ANCHOR RODS THAT WILL BE GALVANIZED, ENCASED IN CONCRETE, OR RECEIVE SPRAYED ON FIREPROOFING SHALL NOT BE PAINTED.
21. PROVIDE 3/8-INCH DIAMETER WEEP HOLES AT BASE OF HSS AND PIPE COLUMNS AND IN BOTTOM OF CAPPED HSS BEAMS.
22. PROVIDE 1/4" MIN CLOSURE PLATES TO ALL HOLLOW STRUCTURAL SECTIONS WITH A 1/4" FILLET WELD ALL AROUND.
23. SET COLUMN BASE PLATES UPON NON-METALLIC, SHRINK RESISTANT GROUT CONFORMING TO ASTM C1107.
24. PROVIDE HARDENED STEEL WASHERS CONFORMING TO ASTM F436 AND HEAVY HEX NUTS ON ANCHOR RODS.
25. STEEL THAT EXTENDS BELOW GRADE SHALL BE ENCASED IN CONCRETE WITH A MINIMUM OF 3- INCHES OF CLEAR COVER.
26. CONNECTIONS FOR BRACING SHALL DEVELOP THE TENSILE CAPACITY OF THE BRACING MEMBER.
27. ALL STEEL COLUMNS AND BEAMS ARE TO RECEIVE SPRAYED FIREPROOFING TO ACHIEVE THE RESTRAINED FIRE RESISTANCE RATING AS SPECIFIED IN THE ARCHITECTURAL DRAWINGS.

ALUMINUM:

1. ALUMINUM MEMBERS SHALL BE FABRICATED, TRANSPORTED, AND ERECTED PER THE ALUMINUM DESIGN MANUAL BY THE ALUMINUM ASSOCIATION, INC.
2. ALUMINUM MEMBERS SHALL BE CUT BY SHEARING, SAWING, NIBBLING, ROUTING, ARC CUTTING, LASER OR ABRASIVE WATER JET. OXYGEN CUT SHALL BE PROHIBITED.
3. CONTRACTOR SHALL NOT WELD ALUMINUM MEMBERS WITHOUT WRITTEN PERMISSION FROM THE STRUCTURAL ENGINEER OF RECORD.
4. ALUMINUM MEMBERS SHALL CONFORM TO THE FOLLOWING UNLESS OTHERWISE NOTED:
- A. PLATES: ALUMINUM ALLOY 6061-T6, ASTM B209
- MINIMUM TENSILE STRESS = 42 KSI
 - MINIMUM YIELD STRESS = 35 KSI
- B. TUBING: ALUMINUM ALLOY 6061-T6, ASTM B308
- MINIMUM TENSILE STRESS = 42 KSI
 - MINIMUM YIELD STRESS = 35 KSI
- C. SOLID BAR: ALUMINUM ALLOY 6061-T651, ASTM B211
- MINIMUM TENSILE STRESS = 38 KSI
 - MINIMUM YIELD STRESS = 35 KSI
- D. BOLTS: ALUMINUM ALLOY 2024-T4, ASTM F468 OR STAINLESS STEEL, ASTM F593
5. WHERE ALUMINUM IS IN CONTACT WITH OR FASTENED TO STEEL, WOOD, FIBERBOARD, CONCRETE OR MASONRY, A COMPATIBLE, NONPOROUS ISOLATOR BETWEEN THE ALUMINUM AND OTHER MATERIAL SHALL BE SUPPLIED.
6. A COMPATIBLE, NONPOROUS ISOLATER SHALL CONSIST OF EITHER A HEAVY COATING OF ALKALI RESISTANT BITUMINOUS PAINT OR AN APPROVED ALTERNATIVE METHOD.
7. ALUMINIZED, HOT-DIP GALVANIZED OR ELECTRO-GALVANIZED STEEL IN CONTACT WITH ALUMINUM NEED NOT BE PAINTED.
8. ALL BOLTS SHALL BE INSTALLED TO A SNUG-TIGHT CONDITION, UNLESS NOTED OTHERWISE.
9. ALL BOLTS SHALL BE PROVIDED WITH LOCK WASHERS, PALNUTS, OR LOCK NUTS.

POST-INSTALLED FASTENERS:

1. POST-INSTALLED ANCHORS SHALL BE USED ONLY WHERE SPECIFIED ON THE STRUCTURAL DRAWINGS.
2. ACI/CRSI ADHESIVE ANCHOR INSTALLER CERTIFICATION IS REQUIRED FOR ALL INSTALLERS OF ADHESIVE ANCHORS IN HORIZONTAL OR UPWARDLY INCLINED ORIENTATION. THIS CERTIFICATION CAN BE OBTAINED THROUGH ACI OR APPROVED EQUIVALENT.
3. FASTENERS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS, AS INCLUDED IN THE ANCHOR PACKAGING IN COORDINATION WITH INFORMATION HEREIN. THE STRUCTURAL ENGINEER SHALL BE NOTIFIED IF CONFLICTS EXIST BETWEEN THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS AND THE REQUIREMENTS HEREIN.
4. REINFORCEMENT STEEL SHALL NOT BE CUT. PRIOR TO DRILLING THE CONCRETE, THE REINFORCING SHALL BE LOCATED WITH A MAGNETIC BAR LOCATOR. POST-INSTALLED BOLTS AND FASTENERS SHALL BE INSTALLED TO MISS REINFORCEMENT STEEL IN CONCRETE. EXISTING REINFORCING BARS IN THE CONCRETE STRUCTURE MAY CONFLICT WITH SPECIFIC ANCHOR LOCATIONS.
5. DRILL HOLES USING ROTARY PERCUSSION DRILL WITH A DEPTH GAGE. DO NOT DRILL THROUGH FULL THICKNESS OF CONCRETE. USE OF A DIAMOND CORE BIT WITH ROUGHENING TOOL FOR ANCHOR HOLES MUST BE APPROVED BY THE STRUCTURAL ENGINEER OF RECORD PRIOR TO DRILLING, UNLESS OTHERWISE SHOWN IN THE DRAWINGS. ALL HOLES SHALL BE DRILLED PERPENDICULAR TO THE CONCRETE SURFACE. CLEAN HOLES IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS. IF CONCRETE IS DAMP, BLOW DRY HOLE WITH OIL-FREE COMPRESSED AIR. CLEAN HOLE WITH WATER ONLY IF RECOMMENDED BY MANUFACTURER. ADHESIVE ANCHORS MAY NOT BE SET IF WATER IS SEEPING INTO HOLE AND THE STRUCTURAL ENGINEER, OF RECORD SHALL BE NOTIFIED.
6. ANCHOR SUBSTITUTION REQUESTS FOR ALTERNATE PRODUCTS MUST BE SUBMITTED AND APPROVED IN WRITING BY THE STRUCTURAL ENGINEER OF RECORD PRIOR TO USE. CONTRACTOR SHALL PROVIDE DOCUMENTATION DEMONSTRATING THAT THE SUBSTITUTED PRODUCT IS CAPABLE OF MEETING THE PERFORMANCE OF THE SPECIFIED PRODUCT. SUBSTITUTIONS WILL BE EVALUATED BY THEIR HAVING AN ICC ESR SHOWING COMPLIANCE WITH THE RELEVANT BUILDING CODE FOR ITS USE, LOAD RESISTANCE, INSTALLATION CATEGORY, AND AVAILABILITY OF COMPREHENSIVE INSTALLATION INSTRUCTIONS. ADHESIVE ANCHOR EVALUATION WILL ALSO CONSIDER CREEP, IN-SERVICE TEMPERATURE, INSTALLATION TEMPERATURE, MOISTURE CONDITION OF CONCRETE, AND DRILLING METHODS.
7. THE CONTRACTOR SHALL ARRANGE AN ANCHOR MANUFACTURER'S REPRESENTATIVE TO PROVIDE ONSITE INSTALLATION TRAINING FOR ALL ANCHOR PRODUCTS SPECIFIED. THE STRUCTURAL ENGINEER OF RECORD MUST RECEIVE DOCUMENTED CONFIRMATION THAT ALL PERSONNEL WHO INSTALL ANCHORS ARE TRAINED PRIOR TO THE COMMENCEMENT OF ANCHOR INSTALLATION.
8. ANCHOR CAPACITY IS DEPENDENT UPON SPACING BETWEEN ADJACENT ANCHORS AND PROXIMITY OF ANCHORS TO EDGE OF CONCRETE. INSTALL ANCHORS IN ACCORDANCE WITH SPACING AND EDGE CLEARANCES INDICATED ON THE DRAWINGS. CONTRACTOR SHALL CONTACT STRUCTURAL ENGINEER SHOULD THE LAYOUT OF THE ANCHOR, EMBEDMENT, SPACING OR EDGE DISTANCES, IS MODIFIED.

	
	
8150 STERLING COURT MENTOR, OHIO 44060 (440) 951-9000	
DATE	REVISION
NO	NO
REVIEW	10/3/2025
ISSUED FOR:	AS NOTED
SCALE:	BAS
DESIGNED BY:	TLM
DRAWN BY:	BF
CHECKED BY:	
CITY OF WILLOUGHBY LAKESHORE EAST EQ BASIN PHASE II LAKE COUNTY WILLOUGHBY, OHIO	
SITE STRUCTURES - 20 SERIES GENERAL NOTES	
PROJECT NO. 230264	
DISCIPLINE STRUCTURAL	
SHEET NAME 20-S-02	
SHEET 22	OF 48

9. EXCEPT WHERE INDICATED ON THE DRAWINGS, POST-INSTALLED ANCHORS SHALL CONSIST OF THE FOLLOWING ANCHOR TYPES:

A. ANCHORAGE TO CONCRETE:

- ADHESIVE ANCHORS:
 - HILTI HIT-HY 200 SAFE SET SYSTEM WITH HILTI HIT-Z ROD
 - HILTI HIT-HY 200 SAFE SET SYSTEM INSTALLED USING HILTI HOLLOW DRILL BIT AND VACUUM WITH HAS-V-36 GRADE 36 THREADED ROD
 - HILTI HIT-RE 500v3 SAFE SET SYSTEM INSTALLED USING HILTI HOLLOW DRILL BIT AND VACUUM WITH HAS THREADED ROD
 - SIMPSON SET-XP WITH ASTM A36 THREADED ROD
 - SIMPSON SET-XP INSTALLED USING SIMPSON SPEED CLEAN DXS SYSTEM WITH ASTM A36 THREADED ROD
 - APPROVED EQUAL
 - MECHANICAL ANCHORS:
 - HILTI KWIK HUS-EZ (KH-EZ), KH-EZ CRC, KH-EZ SS316, KH-EZ C, KH-EZ E, KH-EZ I, AND KH-EZ P SCREW ANCHOR SAFE SET SYSTEM INSTALLED USING HOLLOW DRILL BIT AND VACUUM
 - HILTI KWIK BOLT-1 EXPANSION ANCHOR
 - HILTI KWIK BOLT-T22 EXPANSION ANCHOR
 - SIMPSON TITEN HD SCREW ANCHOR
 - SIMPSON STRONG-BOLT 2 WEDGE ANCHOR
 - APPROVED EQUAL
 - REBAR DOWELING INTO CONCRETE:
 - HILTI HIT-HY 200 SAFE SET SYSTEM INSTALLED USING HILTI HOLLOW DRILL BIT AND VACUUM WITH CONTINUOUSLY DEFORMED REBAR
 - HILTI HIT-HY 500v3 SAFE SET SYSTEM INSTALLED USING HILTI HOLLOW DRILL BIT AND VACUUM WITH CONTINUOUSLY DEFORMED REBAR
 - SIMPSON SET-XP WITH CONTINUOUSLY DEFORMED REBAR
 - SIMPSON SET-XP INSTALLED USING SIMPSON SPEED CLEAN DXS SYSTEM WITH CONTINUOUSLY DEFORMED REBAR
 - APPROVED EQUAL
- B. ANCHORAGE TO SOLID GROUTED MASONRY:
- ADHESIVE ANCHORS:
 - HILTI HIT-HY 270 SAFE SET SYSTEM INSTALLED USING HILTI HOLLOW DRILL BIT AND VACUUM WITH HILTI HAS CONTINUOUSLY THREADED ROD OR DEFORMED REBAR.
 - SIMPSON SET-XP WITH ASTM A36 THREADED ROD OR CONTINUOUSLY DEFORMED REBAR
 - SIMPSON SET-XP INSTALLED USING SIMPSON SPEED CLEAN DXS SYSTEM WITH ASTM A36 THREADED ROD OR CONTINUOUSLY DEFORMED REBAR
 - APPROVED EQUAL
 - MECHANICAL ANCHORS USE:
 - HILTI KWIK BOLT-1 EXPANSION ANCHOR
 - HILTI KWIK BOLT-T22 EXPANSION ANCHOR
 - HILTI KH-EZ, KH-EZ CRC, KH-EZ SS316, KH-EZ C, AND KH-EZ P SCREW ANCHORS
 - SIMPSON STRONG-BOLT 2 WEDGE ANCHOR
 - SIMPSON WEDGE-ALL WEDGE ANCHOR
 - APPROVED EQUAL

C. ANCHORAGE TO HOLLOW / MULTI-WYTHE MASONRY:

- ADHESIVE ANCHORS USE:
 - HILTI HIT-HY 270 SAFE SET SYSTEM INSTALLED USING THE APPROPRIATE SIZE SCREEN TUBE PER THE ADHESIVE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS AND A HILTI HOLLOW DRILL BIT AND VACUUM WITH HILTI HAS CONTINUOUSLY THREADED ROD OR DEFORMED REBAR.
 - SIMPSON SET-XP THE APPROPRIATE SIZE SCREEN TUBE PER THE ADHESIVE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS WITH ASTM A36 THREADED ROD
 - SIMPSON SET-XP INSTALLED USING SIMPSON SPEED CLEAN DXS SYSTEM WITH ASTM A36 THREADED ROD
- APPROVED EQUAL

SPECIAL INSPECTIONS:

PER THE IBC SECTION 1705, SPECIAL INSPECTIONS ARE REQUIRED FOR THE FOLLOWING ITEMS:

1. DUTIES AND RESPONSIBILITIES OF THE SPECIAL INSPECTOR:

- THE SPECIAL INSPECTOR SHALL OBSERVE THE WORK DESIGNATED TO ASSURE IT IS CONSTRUCTED IN CONFORMANCE TO THE APPROVED CONSTRUCTION.
- THE SPECIAL INSPECTOR SHALL SUBMIT INSPECTION REPORTS AND TESTS TO THE BUILDING OFFICIAL AND REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE.
- DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF THE DISCREPANCIES ARE NOT CORRECTED, THE DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE BUILDING OFFICIAL AND THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE PRIOR TO THE COMPLETION OF THAT PHASE OF THE WORK.
- A FINAL REPORT DOCUMENTING REQUIRED SPECIAL INSPECTIONS AND TESTS, AND CORRECTION OF ANY DISCREPANCIES NOTED IN THE INSPECTIONS OR TESTS, SHALL BE SUBMITTED WITHIN THE AGREED UPON TIME TO THE BUILDING OFFICIAL PRIOR TO THE START ISSUANCE OF A CERTIFICATE OF OCCUPANCY.
- PRIOR TO START OF CONSTRUCTION, THE CONTRACTOR SHALL SUBMIT A STATEMENT OF RESPONSIBILITY ACKNOWLEDGING THE AWARENESS OF THE SPECIAL INSPECTION REQUIREMENTS CONTAINED IN THE STATEMENT OF SPECIAL INSPECTIONS.

2. STRUCTURAL STEEL:

- PRIOR TO WELDING:
 - WELDER QUALIFICATION RECORDS AND CONTINUITY RECORDS. (PERIODIC)
 - WELDING PROCEDURE SPECIFICATION (WPS) AVAILABLE. (CONTINUOUS)
 - MANUFACTURER CERTIFICATIONS FOR WELDING CONSUMABLES AVAILABLE. (CONTINUOUS)
 - MATERIAL IDENTIFICATION -TYPE/GRADE (PERIODIC)
 - WELDER IDENTIFICATION SYSTEM MAINTAINED BY FABRICATOR OR ERECTOR TO IDENTIFY WHICH WELDER HAS WELDED A JOINT OR MEMBER. (PERIODIC)
 - FIT UP OF GROOVE WELDS INCLUDING JOINT GEOMETRY (PERIODIC)
 - JOINT PREPARATIONS
 - DIMENSIONS (ALIGNMENT, ROOT OPENING, ROOT FACE, BEVEL)
 - CLEANLINESS (CONDITION OF STEEL SURFACES)
 - TACKING (TACK WELD QUALITY AND LOCATION)
 - BACKING TYPE AND FIT, IF APPLICABLE.
 - FIT UP OF COMPLETE JOINT PENETRATION WELDS OF HSS T-, Y- AND K- JOINTS WITHOUT BACKING INCLUDING JOINT GEOMETRY (PERIODIC)
 - JOINT PREPARATIONS
 - DIMENSIONS (ALIGNMENT, ROOT OPENING, ROOT FACE, BEVEL)
 - CLEANLINESS (CONDITION OF STEEL SURFACES)
 - TACKING (TACK WELD QUALITY AND LOCATION)
 - CONFIGURATION AND FINISH OF ACCESS HOLES (PERIODIC)
- FIT UP OF FILLET WELDS (PERIODIC)
 - DIMENSIONS (ALIGNMENT, GAPS AT ROOT)
 - CLEANLINESS (CONDITION OF STEEL SURFACES)
 - TACKING (TACK WELD QUALITY AND LOCATION)
- CHECK WELDING EQUIPMENT
- DURING WELDING
 - CONTROL AND HANDLING OF WELDING CONSUMABLES (PERIODIC)
 - PACKAGING
 - EXPOSURE CONTROL
 - NO WELDING OVER CRACKED TACK WELDS (PERIODIC)
 - ENVIRONMENTAL CONDITIONS (PERIODIC)
 - WIND SPEED WITHIN LIMITS
 - PRECIPITATION AND TEMPERATURE
 - WPS FOLLOWED (PERIODIC)
 - SETTINGS ON WELDING EQUIPMENT
 - TRAVEL SPEED
 - SELECTED WELDING MATERIALS
 - SHIELDING GAS TYPE/FLOW RATE
 - PREHEAT APPLIED
 - INTERPASS TEMPERATURE MAINTAINED (MIN/MAX)
 - PROPER POSITION (F, V, H, OH)
- WELDING TECHNIQUES (PERIODIC)
 - INTERPASS AND FINAL CLEANING
 - EACH PASS WITHIN PROFILE LIMITATIONS
 - EACH PASS MEETS QUALITY REQUIREMENTS
 - PLACEMENT AND INSTALLATION OF STEEL HEADED STUDS. (CONTINUOUS).

C. AFTER WELDING:

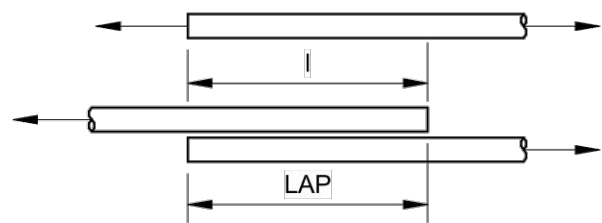
- WELDS CLEANED (PERIODIC)
 - SIZE, LENGTH AND LOCATION OF WELDS (CONTINUOUS)
 - WELDS MEET VISUAL ACCEPTANCE CRITERIA (CONTINUOUS)
 - CRACK PROHIBITION
 - WELD BASE-METAL FUSION
 - CRATER CROSS-SECTION
 - WELD PROFILES
 - WELD SIZE
 - UNDERCUT POROSITY
 - ARC STRIKES (CONTINUOUS)
 - K-AREA (CONTINUOUS)
 - WELD ACCESS HOLES IN ROLLED HEAVY SHAPES AND BUILT-UP HEAVY SHAPES (CONTINUOUS)
 - BACKING REMOVED AND WELD TABS REMOVED, IF REQUIRED (CONTINUOUS)
 - REPAIR ACTIVITIES (CONTINUOUS)
 - DOCUMENT ACCEPTANCE OR REJECTION OF WELDED JOINT OR MEMBER (CONTINUOUS)
 - NO PROHIBITED WELDS HAVE BEEN ADDED WITHOUT THE APPROVAL OF THE STRUCTURAL ENGINEER OF RECORD (PERIODIC)
- D. PRIOR TO BOLTING:
- MANUFACTURER'S CERTIFICATIONS AVAILABLE FOR FASTENER MATERIALS (CONTINUOUS)
 - FASTENERS MARKED IN ACCORDANCE WITH ASTM REQUIREMENTS (PERIODIC)
 - CORRECT FASTENER SELECTED FOR THE JOINT DETAIL INCLUDING GRADE, TYPE, BOLT LENGTH IF THREADS ARE TO BE EXCLUDED FROM SHEAR PLANE (PERIODIC)
 - CORRECT BOLTING PROCEDURE SELECTED FOR JOINT DETAIL (PERIODIC)
 - CONNECTING ELEMENTS, INCLUDING THE APPROPRIATE FAYING SURFACE CONDITION AND HOLE PREPARATION, IF SPECIFIED, MEET APPLICABLE REQUIREMENTS (PERIODIC)
 - PRE-INSTALLATION VERIFICATION TESTING BY INSTALLATION PERSONNEL OBSERVED AND DOCUMENTED FOR FASTENER ASSEMBLIES AND METHODS USED. (PERIODIC)
 - PRTOECTED STORAGE PROVIDED FOR BOLTS, NUTS, WASHERS AND OTHER FASTENER COMPONENTS (PERIODIC)
- E. DURING BOLTING:
- FASTENER ASSEMBLIES PLACED IN ALL HOLES AND WASHERS AND NUTS ARE POSITIONED AS REQUIRED. (PERIODIC)
 - JOINT BROUGHT TO THE SNUG-TIGHT CONDITION PRIOR TO THE PRE-TENSIONING OPERATION (PERIODIC)
 - FASTENER COMPONENT NOT TURNED BY THE WRENCH PREVENTED FROM ROTATING. (PERIODIC)
 - FASTENERS ARE PRE-TENSIONED IN ACCORDANCE WITH THE RCSC SPECIFICATION, PROGRESSING SYSTEMATICALLY FROM THE MOST RIGID POINT TOWARD THE FREE EDGES. (PERIODIC)
- F. AFTER BOLTING:
- DOCUMENT ACCEPTANCE OR REJECTION OF BOLTED CONNECTIONS. (CONTINUOUS)
- G. INSPECTION OF GALVANIZED STRUCTURAL STEEL MAIN MEMBERS AND EXPOSED CORNERS OF RECTANGULAR HSS FOR CRACKS SUBSEQUENT TO GALVANIZING (PERIODIC)
- H. SPECIAL INSPECTIONS ARE NOT REQUIRED FOR WORK DONE ON THE PREMISES OF A FABRICATOR REGISTERED AND APPROVED TO PERFORM SUCH WORK WITHOUT SPECIAL INSPECTIONS. APPROVAL SHALL BE BASED UPON REVIEW OF THE FABRICATOR'S WRITTEN PROCEDURAL AND QUALITY CONTROL MANUALS AND PERIODIC AUDITING OF FABRICATION PRACTICES BY A BOARD RECOGNIZED INDUSTRY TRADE ASSOCIATION CERTIFICATION PROGRAM OR A BOARD RECOGNIZED FABRICATOR INSPECTION AGENCY.

3. CONCRETE:

- INSPECT REINFORCEMENT, INCLUDING PRESTRESSING TENDONS, AND VERIFY PLACEMENT. (PERIODIC)
- REINFORCING BAR WELDING:
 - VERIFY WELDABILITY OF REINFORCING BARS OTHER THAN ASTM A706. (PERIODIC)
 - INSPECT SINGLE-PASS FILLET WELDS, MAXIMUM 5/16" (PERIODIC)
 - INSPECT ALL OTHER WELDS (CONTINUOUS)
- INSPECT ANCHORS CAST IN CONCRETE (PERIODIC)
- INSPECT ANCHORS POST-INSTALLED IN HARDENED CONCRETE MEMBERS:
 - ADHESIVE ANCHORS INSTALLED IN HORIZONTALLY OR UPWARDLY INCLINED ORIENTATIONS TO RESIST SUSTAINED TENSION LOADS. (CONTINUOUS)
 - MECHANICAL ANCHORS AND ADHESIVE ANCHORS NOT DEFINED ABOVE. (PERIODIC)
- VERIFY USE OF REQUIRED MIX DESIGN. (PERIODIC)
- PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE. (CONTINUOUS)
- INSPECT CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES. (CONTINUOUS)
- VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES. (PERIODIC)
- INSPECT PRESTRESSED CONCRETE FOR:
 - APPLICATION OF PRESTRESSING FORCES. (CONTINUOUS)
 - GROUTING OF BONDED PRESTRESSING TENDONS. (CONTINUOUS)
- INSPECT ERECTION OF PRECAST CONCRETE MEMBERS. (PERIODIC)
- VERIFY IN-SITU CONCRETE STRENGTH, PRIOR TO STRESSING OF TENDONS IN POST-TENSIONED CONCRETE AND PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS. (PERIODIC)
- INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED. (PERIODIC)
- NO INSPECTION IS REQUIRED FOR SLABS-ON-GRADE.

4. SOILS:

- VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY. (PERIODIC)
- VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL. (PERIODIC)
- PERFORM CLASSIFICATION AND TESTING OF CONTROLLED FILL MATERIALS. (PERIODIC)
- VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESS DURING PLACEMENT AND COMPACTION OF COMPACTED FILL. (CONTINUOUS)
- PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT THE SITE HAS BEEN PROPERLY PREPARED. (PERIODIC)



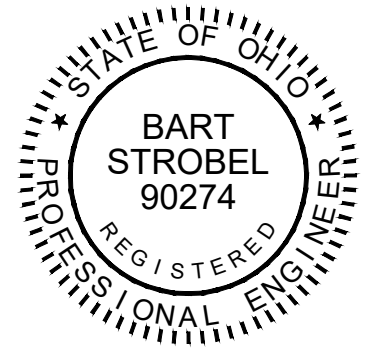
LAP TABLE (f'c = 4,500 PSI)					
BAR SIZE	LAP CLASS	UNCOATED BARS			
		TOP BARS		OTHER BARS	
		CASE 1	CASE 2	CASE 1	CASE 2
#3	A	18	26	14	20
	B	23	34	18	26
#4	A	23	35	18	27
	B	30	45	23	35
#5	A	29	44	23	34
	B	38	56	29	44
#6	A	35	53	27	40
	B	45	68	35	53
#7	A	51	87	39	59
	B	66	100	51	77
#8	A	58	88	45	67
	B	76	114	58	88

NOTES:

- TABULATED VALUES ARE BASED ON A MINIMUM YIELD STRENGTH OF 60,000 PSI. LENGTHS ARE IN INCHES.
- CASES 1 AND 2, WHICH DEPEND ON THE TYPE OF STRUCTURAL MEMBER, CONCRETE COVER, AND OC SPACING OF THE BARS ARE DEFINED AS:
 - BEAMS AND COLUMNS
 - CASE 1: CONCRETE COVER AT LEAST 1.0d_b AND OC SPACING AT LEAST 2.0 d_b
 - CASE 2: CONCRETE COVER LESS THAN 1.0d_b OR OC SPACING AT LESS THAN 2.0 d_b
 - OTHER BARS
 - CASE 1: CONCRETE COVER AT LEAST 1.0d_b AND OC SPACING AT LEAST 3.0 d_b
 - CASE 2: CONCRETE COVER LESS THAN 1.0d_b OR OC SPACING AT LESS THAN 3.0 d_b
- TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12 INCHES OF CONCRETE CAST BELOW THE BARS.

STRUCTURAL DRAWING ABBREVIATIONS

ADDL	ADDITIONAL	NO or #	NUMBER
ADJ	ADJACENT	NOM	NOMINAL
ARCH	ARCH EXPOSED STRUCTURAL STEEL	NS	NEAR SIDE
ALT	ALTERNATE	NTS	NOT TO SCALE
&	AND		
APPROX	APPROXIMATELY	OC	ON CENTER
ARCH	ARCHITECT or ARCHITECTURAL	OD	OUTSIDE DIAMETER
@	AT or SPACING	OF	OUTSIDE FACE
		O/OOUT	TO OUT
B/	BOTTOM OF	OPNG	OPENING
BL	BUILDING LINE	OPP	OPPOSITE
BLDG	BUILDING		
BLKG	BLOCKING	PAF	POWDER ACTUATED FASTENERS
BM	BEAM	PAR	PARALLEL
BRDG	BRIDGING	PC	PRECAST
BRG	BEARING	PERP	PERPENDICULAR
BTWN	BETWEEN	PL	PLATE
BOT	BOTTOM	PLF	POUNDS PER LINEAL FOOT
		PLYWD	PLY WOOD
CANT	CANTILEVER	PREFAB	PREFABRICATED
CL	CENTERLINE		
CLR	CLEAR	PSF	POUNDS PER SQUARE FOOT
CLSM	CONTROLLED LOW STRENGTH MATERIAL	PSI	POUNDS PER SQUARE INCH
CTR	CENTER	PT	POST TENSIONED
COL	COLUMN	PTFE	POLYTETRAFLUOROETHYLENE
CONC	CONCRETE	PTR	PRESSURE TREATED
CONN	CONNECTION		
CONST	CONSTRUCTION	QL	SEISMIC LOAD
CONT	CONTINUOUS	QTY	QUANTITY
CJ	CONTROL/CONSTRUCTION JOINT		
CMU	CONCRETE MASONRY UNIT	RAD	RADIUS
CONT	CONTINUOUS	REF	REFERENCE
CUBF	CUBIC FEET	REINF	REINFORCEMENT, REINFORCING, REINFORCED
CY	CUBIC YARDS	REOD	REQUIRED
		SCHED	SCHEDULE
DBL	DOUBLE	SECT	SECTION
DBA	DEFORMED BAR ANCHOR	SER	STRUCTURAL ENGINEER OF RECORD
DEG or °	DEGREE	SF	SQUARE FOOT
DEMO	DEMOLITION	SHT	SHEET
DET	DETAIL	SIM	SIMILAR
DF	DOUGLAS FIR LARCH	SOG	SLAB-ON-GRADE
DIAG	DIAGONAL	SPA	SPACING
DIA or ø	DIAMETER	SPEC(S)	SPECIFICATION(S)
DIM	DIMENSION	SPF	SPRUCE PINE FIR
DO	DITTO	SQ	SQUARE
DN	DOWN	SS	STAINLESS STEEL
DP	DEEP	STD	STANDARD
DWG	DRAWING	STIFF	STIFFENER
DWL	DOWEL	STL	STEEL
		STR	STRUCTURAL
EA	EACH	STRUCT	STRUCTURAL
EF	EACH FACE	SUP	SUPPORT
EJ	EXPANSION JOINT	SYM	SYMMETRICAL
EL	ELEVATION	SYP	SOUTHERN YELLOW PINE
ELEC	ELECTRIC		
EMBED	EMBEDDED, EMBEDMENT	T	TOP
EQ	EQUAL	T/	TOP OF
EQUIP	EQUIPMENT	T&B	TOP AND BOTTOM
ES	EACH SIDE	T&G	TONGUE AND GROOVE
EW	EACH WAY	TEMP	TEMPERATURE STEEL
EX	EXISTING	THD	THREAD
EXIST	EXISTING	THK	THICK
(EXP	EXPANSION	THRU	THROUGH
EXT	EXTERIOR	TOL	TOLERANCE
		TRANS	TRANSVERSE
		TYP	TYPICAL
FAB	FABRICATE		
FDN	FOUNDATION	UN or UNO	UNLESS NOTED (OTHERWISE)
FV	FIELD VERIFY		
FINISH	FINISH		
FLG	FLANGE	VERT	VERTICAL
FLR	FLOOR	VIF	VERIFY IN FIELD
FS	FARSIDE		
FT	FOOT, FEET	w/	WITH
FTG	FOOTING	w/o	WITHOUT
		WD	WOOD
		WP	WORKPOINT
		WT	WEIGHT
		WWF	WELDED WIRE FABRIC
GA	GAGE		
GAL	GALLON		
GALV	GALVANIZED		
GC	GENERAL CONTRACTOR		
GEN	GENERAL		
GLB	GLUE LAMINATED BEAM		
GR	GRADE		
GYP BD	GYPSUM BOARD		
HC	HOLLOW CORE		
HORIZ	HORIZONTAL		
HP	HIGH POINT		
HS	HIGH STRENGTH		
HT	HEIGHT		
HVY	HEAVY		
ID	INSIDE DIAMETER		
IF	INSIDE FACE		
IN	INCH		
INFO	INFORMATION		
INT	INTERIOR		
INV	INVERT		
JST	JOIST		
JT	JOINT		
K	KIPS		
KSF	KIPS PER SQUARE FOOT		
KSI	KIPS PER SQUARE INCH		
L	ANGLE		
LBS	POUNDS		
LF	LINEAL FEET		
LG	LONG		
LL	LIVE LOAD		
LLH	LONG LEG HORIZONTAL		
LLV	LONG LEG VERTICAL		
LOC	LOCATION		
LONG	LONGITUDINAL		
LP	LOW POINT		
LSH	LONG SIDE HORIZONTAL		
LSV	LONG SIDE VERTICAL		
LT WT	LIGHT WEIGHT		
MANUF	MANUFACTURER		
MAS	MASONRY		
MATL	MATERIAL		
MAX	MAXIMUM		
MECH	MECHANICAL		
MEZZ	MEZZANINE		
MFR	MANUFACTURER		
MIN	MINIMUM		
MISC	MISCELLANEOUS		
MK	MARK		
MO	MASONRY OPENING		
MTL	METAL		



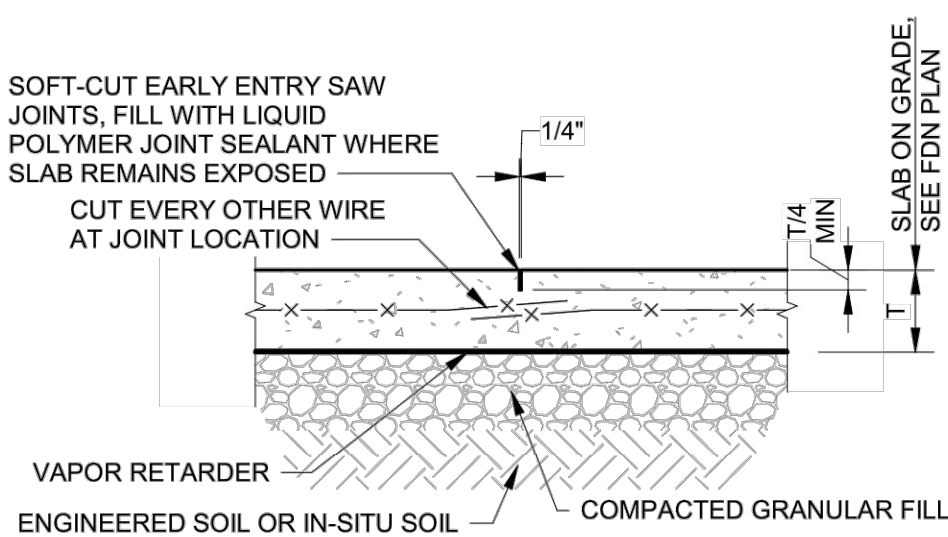
verdantas

8150 STERLING COURT
MENTOR, OHIO 44060
(440) 951-9000

DATE	REVISION	NO	REVIEW	ISSUED FOR	ISSUE DATE	SCALE	DESIGNED BY:	DRAWN BY:	CHECKED BY:
					10/3/2025	AS NOTED	BAS	TLM	BF

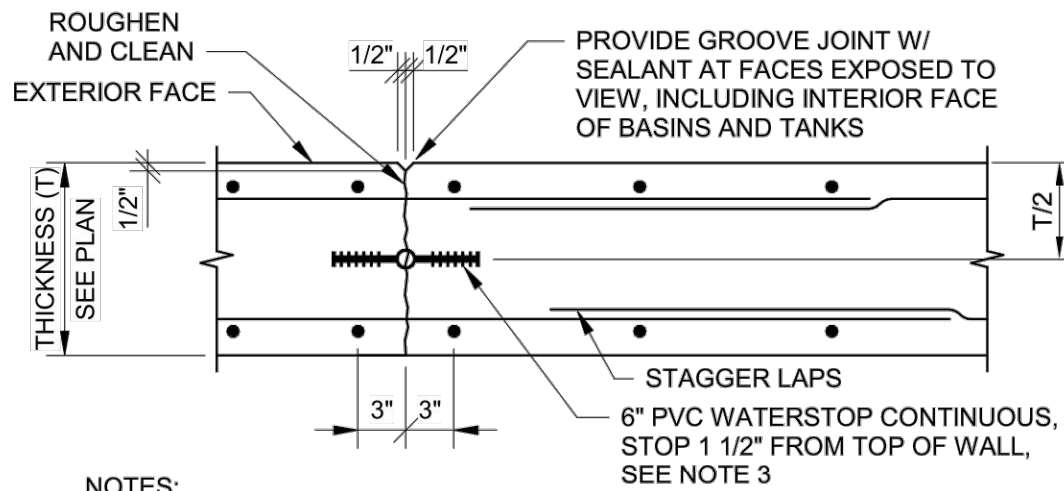
CITY OF WILLOUGHBY	WILLOUGHBY, OHIO
LAKESHORE EAST EQ BASIN	
PHASE II	
LAKE COUNTY	
SITE STRUCTURES - 20 SERIES	
GENERAL NOTES	

PROJECT NO.	230264
DISCIPLINE	STRUCTURAL
SHEET NAME	20-S-03
SHEET	OF
23	48



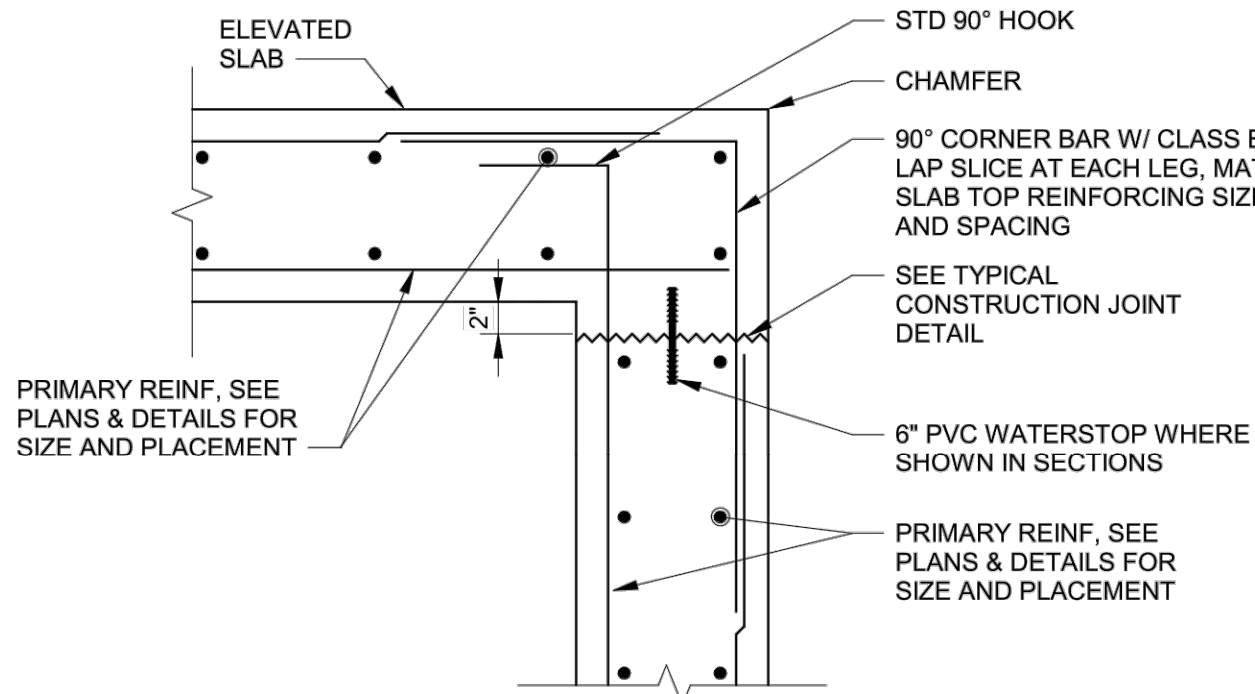
- NOTES:
- JOINTS TO BE LOCATED ON COLUMN CENTER LINES AND AT INTERMEDIATE LOCATIONS AS REQUIRED TO MAINTAIN A MAXIMUM SPACING OF (30 x SLAB THICKNESS) L/12 IN EACH DIRECTION, UNO.
 - PROVIDE TOOLED JOINTS IN FRESH CONCRETE EACH SIDE OF WALLS WHERE SLAB POURS THRU DOORWAYS.

1 CONTROL JOINT DETAIL
SDS-04 NTS

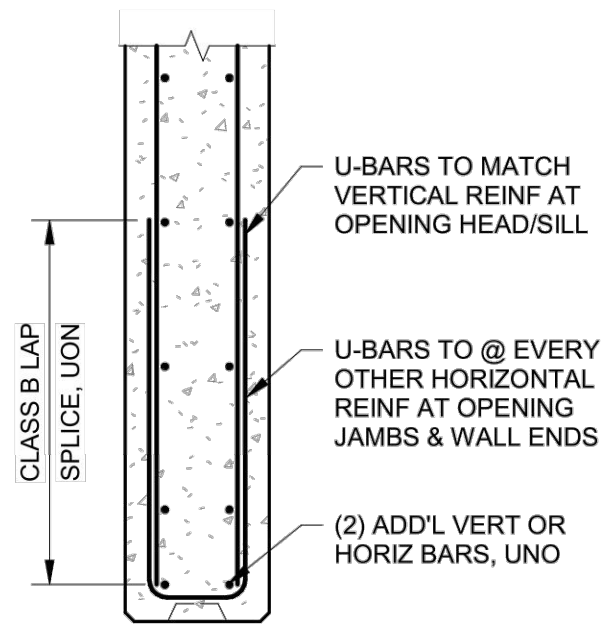


- NOTES:
- CONSTRUCTION JOINT FOR WALLS, STRUCTURAL SLABS, AND BASE SLAB OF WATER HOLDING STRUCTURE.
 - ALL REINFORCING SHALL BE CONTINUOUS THROUGH JOINT.
 - WATERSTOP REQUIRED AT LIQUID HOLDING BASINS AND TANKS, AND BELOW GRADE WALLS, UNO.
 - PROVIDE CONTROL JOINTS OR CONSTRUCTION JOINTS IN WALLS AT THE LESSER OF 25' OR 1.5x WALL HEIGHT.
 - JOINT LOCATION AND DETAILS SHALL BE APPROVED BY ARCHITECT AND STRUCTURAL ENGINEER

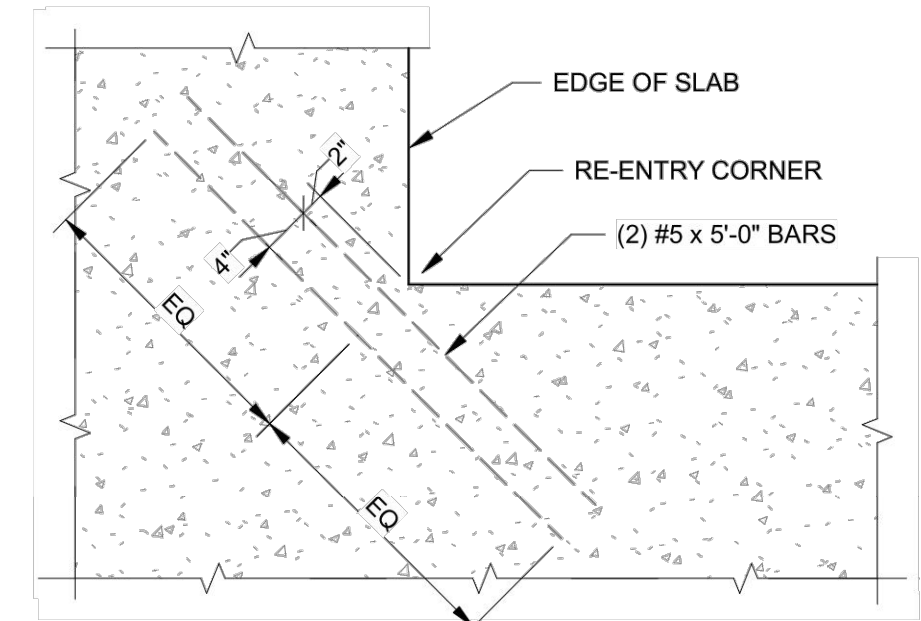
2 CONSTRUCTION JOINT
SDS-04 NTS



3 WALL TO ELEVATED SLAB INTERSECTION
SDS-04 NTS

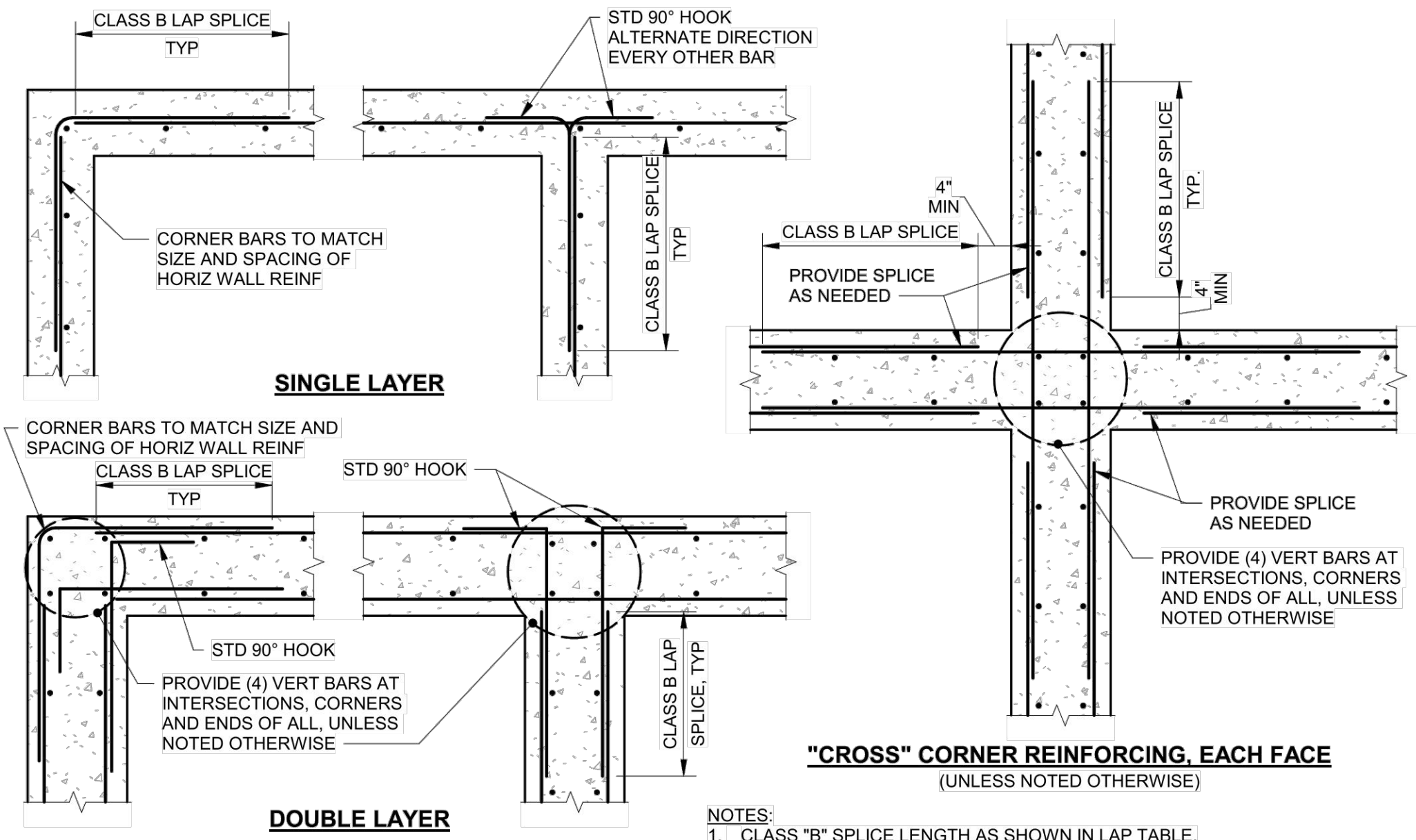


4 WALL END AND HEAD/SILL/JAMB OF OPENINGS
SDS-04 NTS

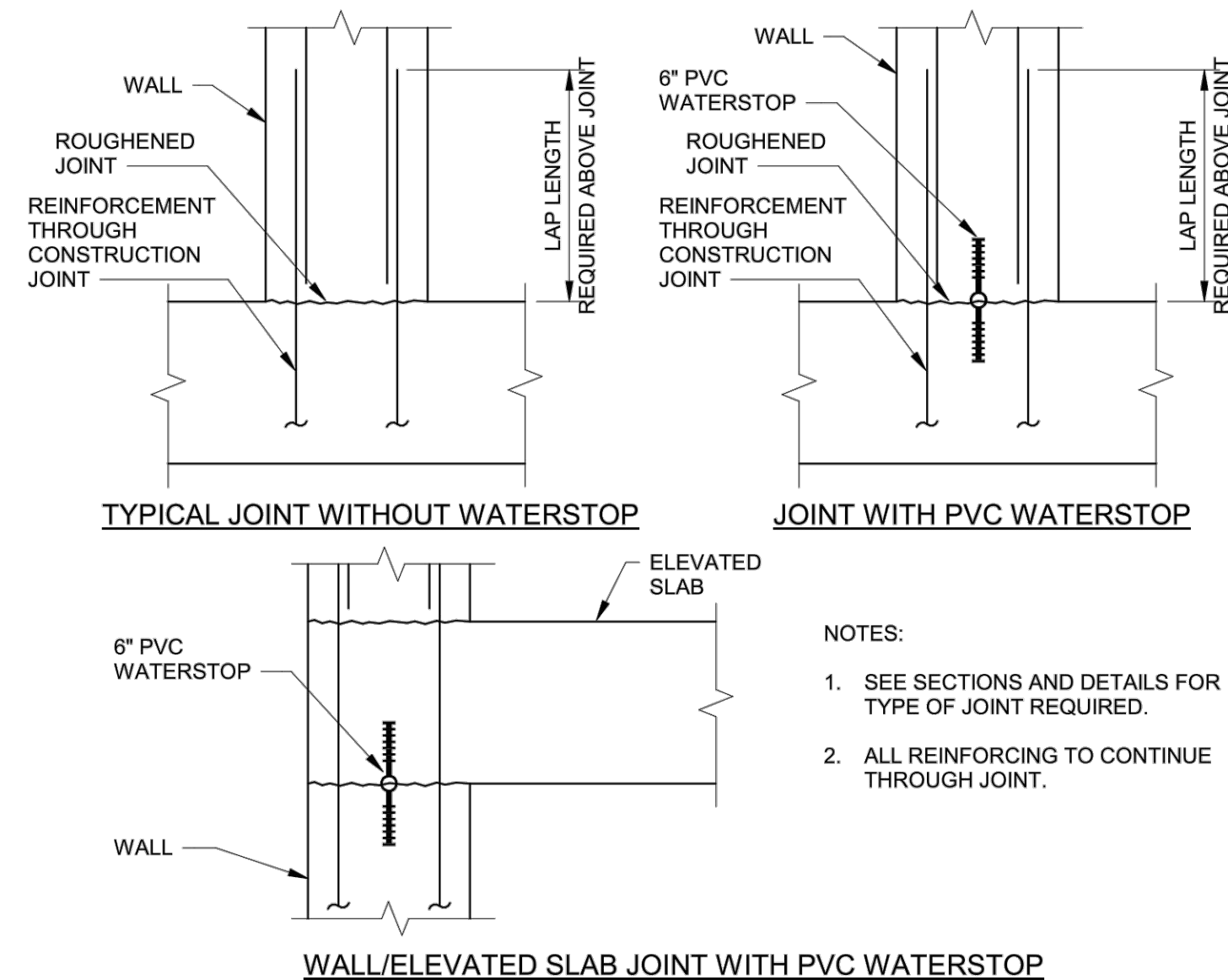


- NOTE:
- PROVIDE RE-ENTRY REINFORCING AT ALL RE-ENTRY CORNERS.
 - PROVIDE STD HOOK IS AT INTERFACE.
 - PROVIDE REINFORCING AS SHOWN AT ALL CORNERS IN SLAB.

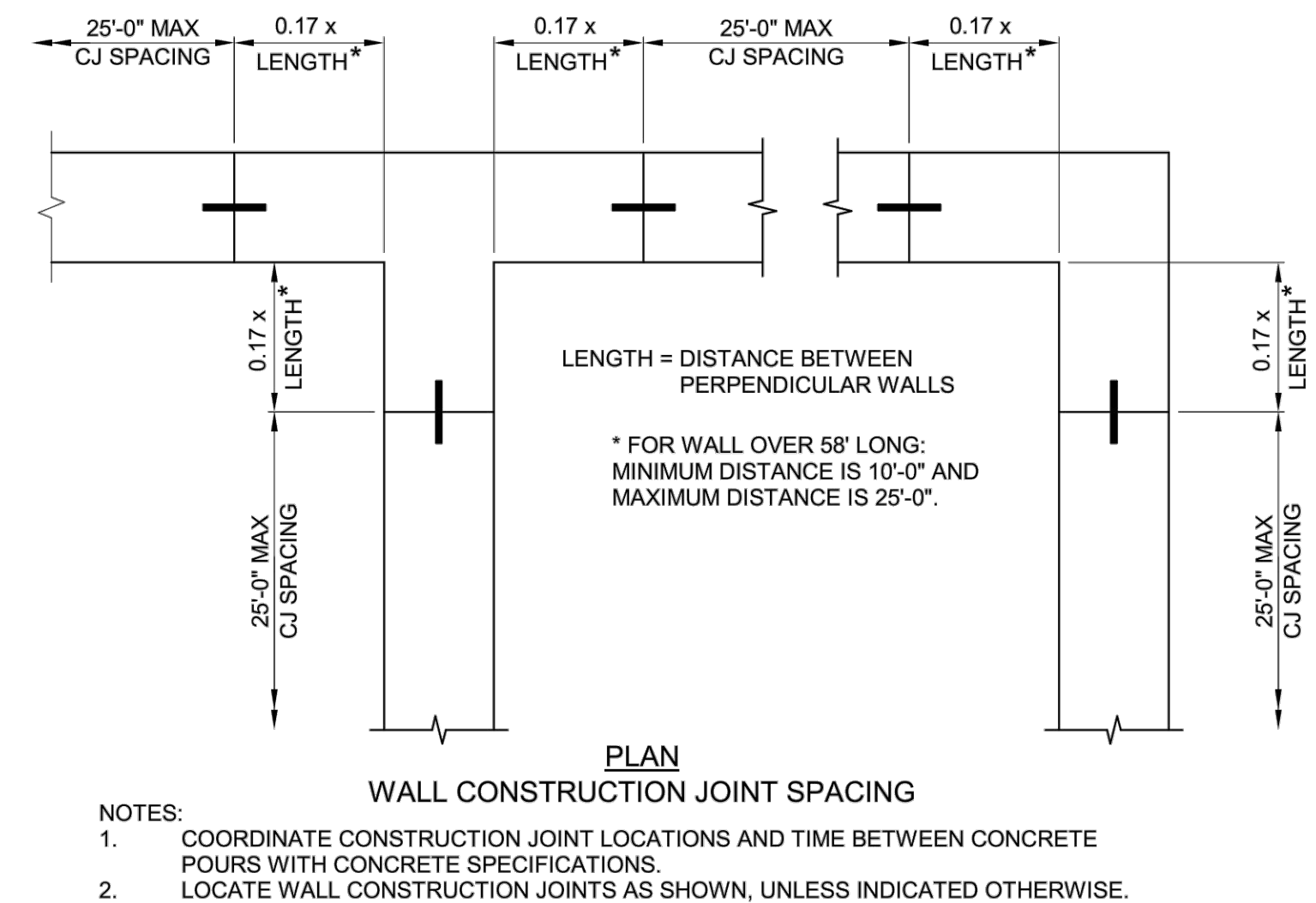
5 CONCRETE REINF AT RE-ENTRANT CORNERS DETAIL
SDS-04 NTS



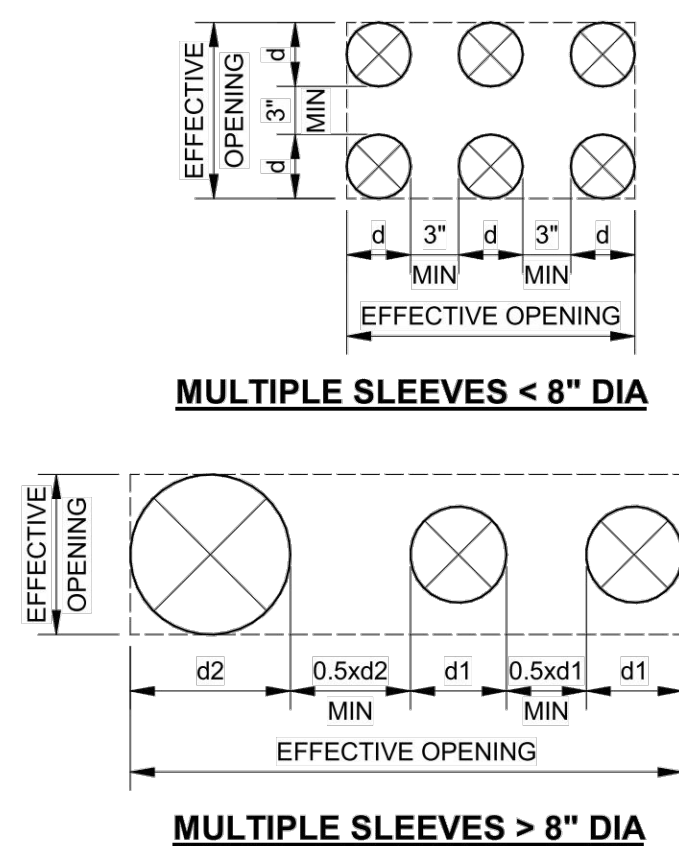
6 CONCRETE WALL CORNER DETAILS
SDS-04 NTS



7 HORIZONTAL WALL JOINT
SDS-04 NTS

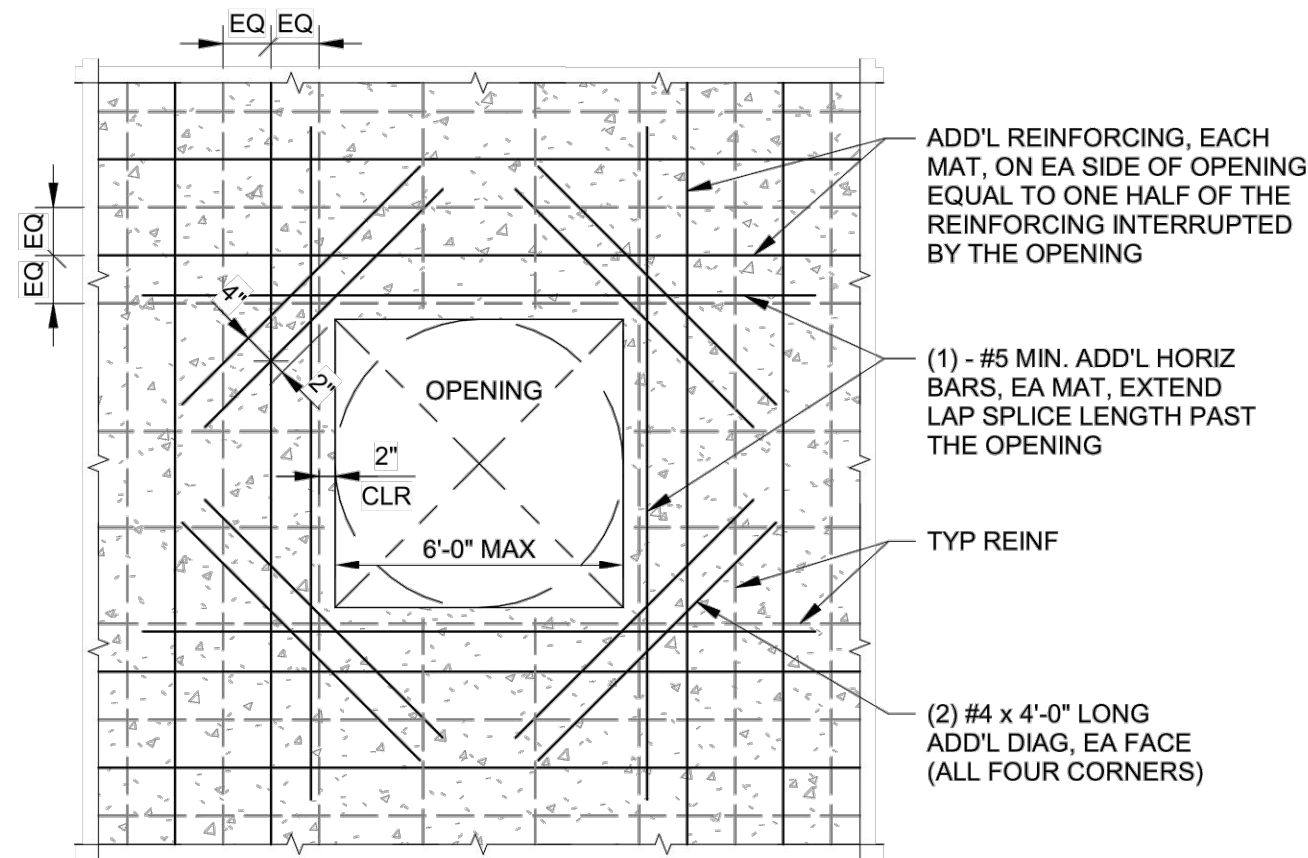


8 WALL CONSTRUCTION JOINT SPACING
SDS-04 NTS



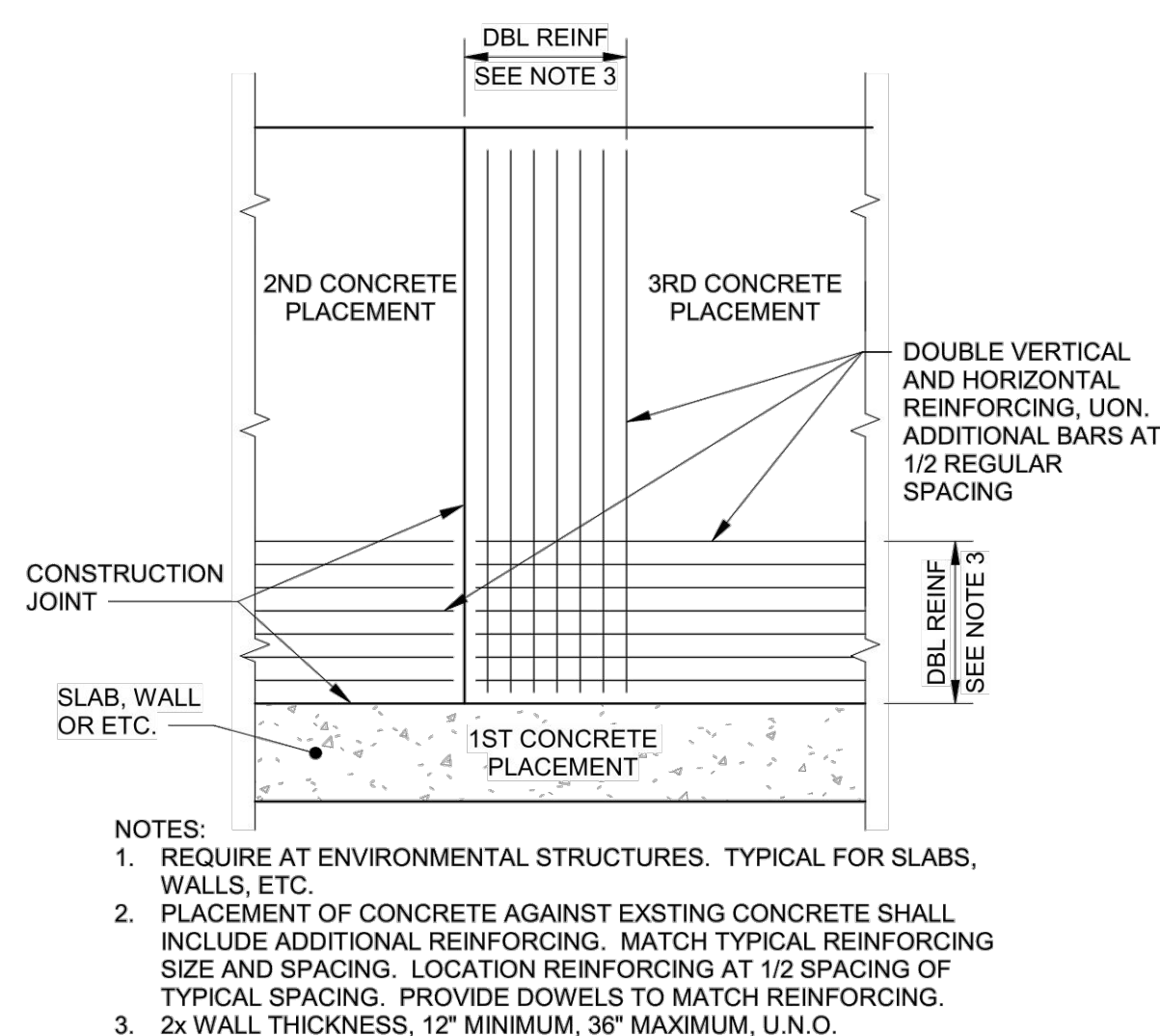
- NOTES:
- OPENINGS SMALLER THAN 16"x16" AND INDIVIDUAL PIPE SLEEVES ≤ 16"ø REQUIRE NO ADDITIONAL REINFORCING STEEL. WORK THE REINF STEEL AROUND THE SLEEVES.
 - RECTANGULAR OPENING SHOWN; ADDITIONAL REINFORCING STEEL AROUND INDIVIDUAL ROUND OPENINGS > 16"ø SIMILAR.
 - SPACE GROUPED SLEEVES PER DETAILS "1" & "2" ABOVE AND TREAT AS A SINGLE EFFECTIVE RECTANGULAR OPENING. PROVIDE ADDITIONAL REINFORCING STEEL AROUND EFFECTIVE OPENING (AS SHOWN FOR SINGLE OPNG) AND INSTALL REQUIRED HORIZONTAL AND VERT REINF STEEL UNINTERRUPTED BETWEEN SLEEVES.
 - COORDINATE ALL OPENING SIZE & LOCATION WITH ARCH, MECH, ELEC & PLUMBING REQUIREMENTS.

9 OPENINGS IN CONCRETE WALL WITH MULTIPLE SLEEVES
SDS-04 NTS



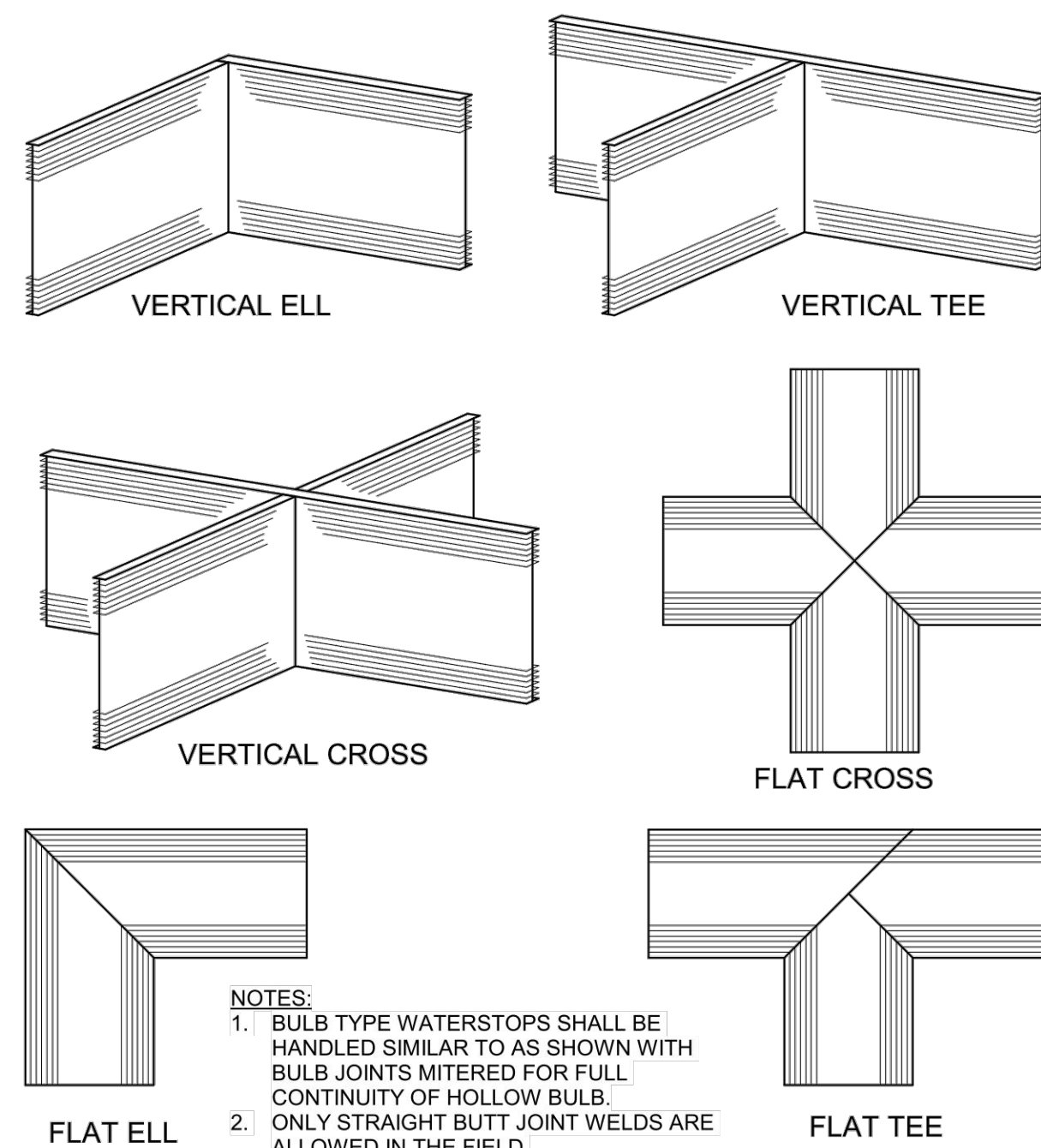
- NOTES:
- PROVIDE ADDITIONAL REINFORCING, AT EACH MAT, ON EACH SIDE OF OPENING EQUAL TO ONE HALF OF THE REINFORCING INTERRUPTED BY THE OPENING, PROVIDE AT LEAST (2) ADDITIONAL BARS ON EACH SIDE.
 - ADDITIONAL REINFORCING SHALL EXTEND BEYOND THE OPENING, AT LEAST, THE WIDTH OF THE OPENING (PERPENDICULAR TO THE BAR) PLUS A DEVELOPMENT LENGTH.
 - ADDITIONAL REINFORCING SHALL MATCH EXISTING REINFORCING SIZE AND SPACING. ADDITIONAL REINFORCING SHALL BE LOCATED AT MID-SPACING OF TYPICAL MAT REINFORCING.
 - APPLIES TO OPENINGS UP TO 6'-0" MAXIMUM DIMENSION IN ANY DIRECTION, UNLESS OTHERWISE NOTED. OPENINGS LESS THEN 12" DO NOT REQUIRE ADDITIONAL REINFORCING. ADDITIONAL REINFORCEMENT MAY BE OMITTED WHERE OPENING IS FRAMED BY BEAMS OR WALLS. RE-ENTRY REINFORCING IS REQUIRED.
 - REINFORCING THAT IS PERPENDICULAR TO THE OPENING LARGER THEN 3'-0", SHALL TERMINATE AT THE OPENING WITH A STANDARD 90 DEGREE OR 180 DEGREE HOOK, UNO.
 - OPENINGS ARE NOT ALL SHOWN ON STRUCTURAL DRAWINGS: PROVIDE OPENINGS IN ACCORDANCE WITH ARCHITECTURAL, MECHANICAL, PLUMBING, ELECTRICAL, CIVIL, AND OTHER CONTRACT DRAWINGS.
 - OPENINGS SPACED CLOSER THAN THE MINIMUM SPACING SHALL BE REINFORCED AS A SINGLE OPENING.
 - OPENINGS LARGER THAN ALLOWED ON THIS DETAIL REQUIRE CONSULTATION WITH THE SER.

10 REINF AT ROUND OR SQUARE OPENINGS
SDS-04 NTS



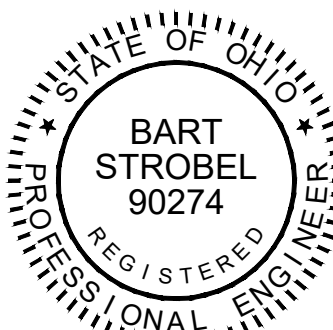
- NOTES:
- REQUIRE AT ENVIRONMENTAL STRUCTURES. TYPICAL FOR SLABS, WALLS, ETC.
 - PLACEMENT OF CONCRETE AGAINST EXSTING CONCRETE SHALL INCLUDE ADDITIONAL REINFORCING. MATCH TYPICAL REINFORCING SIZE AND SPACING. LOCATION REINFORCING AT 1/2 SPACING OF TYPICAL SPACING. PROVIDE DOWELS TO MATCH REINFORCING.
 - 2x WALL THICKNESS, 12" MINIMUM, 36" MAXIMUM, U.N.O.

11 ADDITIONAL REINFORCEMENT
SDS-04 NTS



- NOTES:
- BULB TYPE WATERSTOPS SHALL BE HANDLED SIMILAR TO AS SHOWN WITH BULB JOINTS MITERED FOR FULL CONTINUITY OF HOLLOW BULB.
 - ONLY STRAIGHT BUTT JOINT WELDS ARE ALLOWED IN THE FIELD.

12 SHOP FABRICATED WATERSTOP
SDS-04 NTS



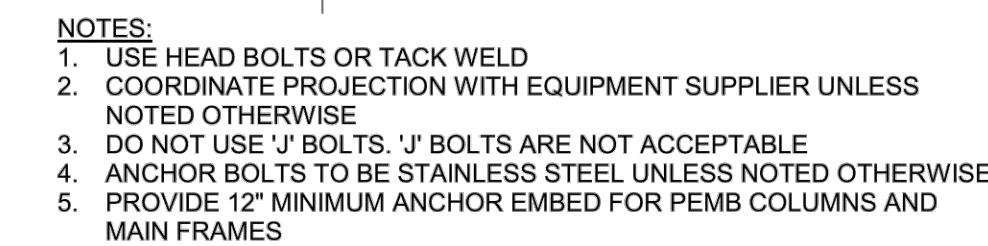
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8150 STERLING COURT
MENTOR, OHIO 44060
(440) 951-9000

ISSUED FOR:	REVIEW	NO	REVISION	DATE
ISSUE DATE:	10/3/2025			
SCALE:	AS NOTED			
DESIGNED BY:	BAS			
DRAWN BY:	TLM			
CHECKED BY:	BF			

CITY OF WILLOUGHBY
LAKESHORE EAST EQ BASIN
PHASE II
LAKE COUNTY
WILLOUGHBY, OHIO
SITE STRUCTURES - 20 SERIES
STANDARD DETAILS

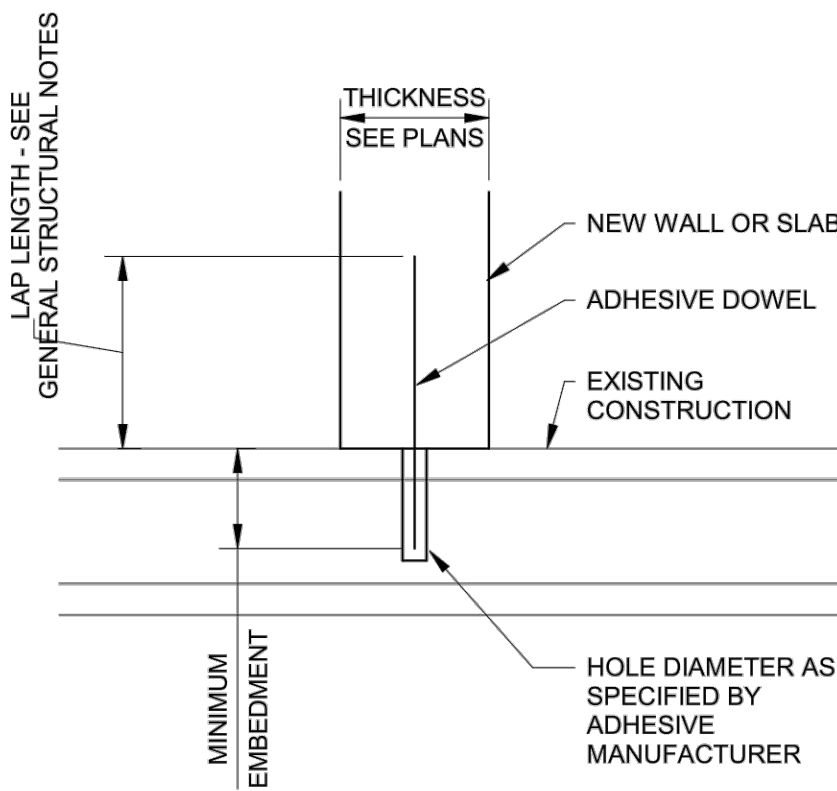
PROJECT NO.	230264
DISCIPLINE	STRUCTURAL
SHEET NAME	20-S-04
SHEET	24
OF	48



SDS-05	NTS
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SDS-05 NTS



SDS-05 NTS

- NOTES:**
1. EMBEDMENT LENGTH IS BASED ON DOWELS SET WITH HILTI HIT-RE 500-V3 ADHESIVE ANCHOR SYSTEM. SEE ICC EVALUATION SERVICE REPORT (ES REPORT) IF ALTERNATE PRODUCT IS PROPOSED.
 2. INSTALL DOWELS IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS AND ICC ES REPORT ESR-3814.
 3. LOCATE DOWELS CENTERED IN WALL OR SLAB UNLESS NOTED OTHERWISE ON DRAWINGS. WHERE 2 ROWS OF DOWELS ARE INDICATED, STAGGER SPACING AND LOCATE ALTERNATING DOWELS AT MINIMUM EDGE DISTANCE FROM OPPOSITE FACES.
 4. SPECIAL INSPECTION IS REQUIRED FOR ADHESIVE DOWEL INSTALLATION.

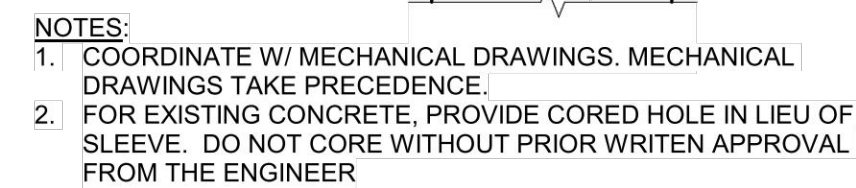
EXPANSION ANCHOR

MINIMUM EMBEDMENT LENGTH, L		
DIAMETER	ADHESIVE ANCHOR	EXPANSION ANCHOR
3/8"	4 1/2"	3 1/2"
1/2"	6"	4 3/4"
5/8"	7 1/2"	5 1/2"
3/4"	9"	6 1/2"
7/8"	10 1/2"	-
1"	12"	-

- NOTES:

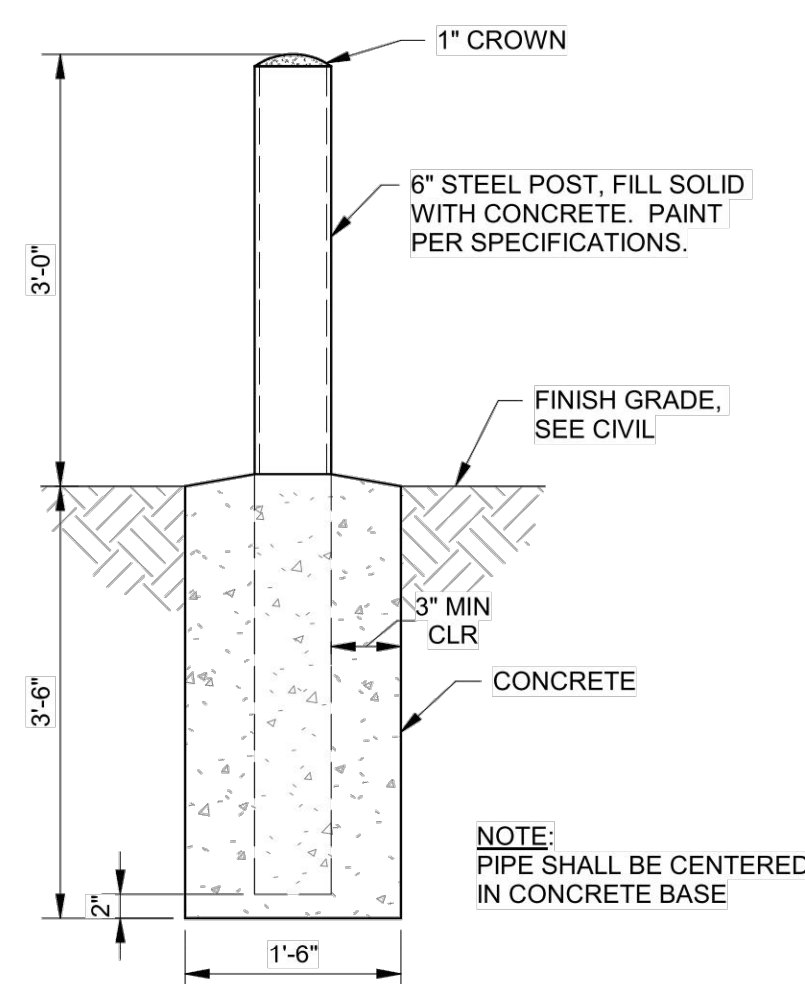
1. CONFORM TO ICC EVALUATION SERVICE REPORT (ES REPORT) REQUIREMENTS AND MANUFACTURER'S RECOMMENDATIONS FOR INSTALLATION.
2. PROVIDE TYPE 316 STAINLESS STEEL ALL-THREAD ROD MATERIAL.
3. PROVIDE HOLE DIAMETER IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION.
4. EXPANSION ANCHOR SHALL BE STAINLESS STEEL ANCHORS.
5. EXPANSION ANCHOR EMBEDMENT LENGTHS ARE BASED ON HILTI KWIK BOLT TZ STAINLESS STEEL ANCHORS. SUBMIT ICC EVALUATION SERVICE REPORT (ES REPORT) FOR ALTERNATE PRODUCTS.
6. ADHESIVE ANCHOR EMBEDMENT LENGTHS ARE BASED ON HILTI HIT-RE 500-V3 ADHESIVE. SUBMIT ICC ES REPORT FOR ALTERNATE PRODUCTS.

SDS-05 NTS

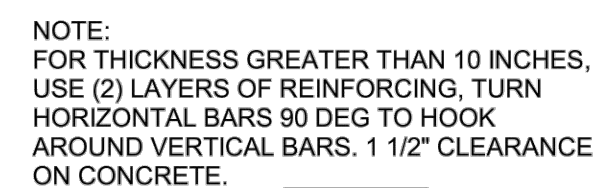
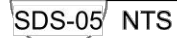


COMPRESSIVE RUBBER LINK TYPE

5 TH
SDS-05 NTS

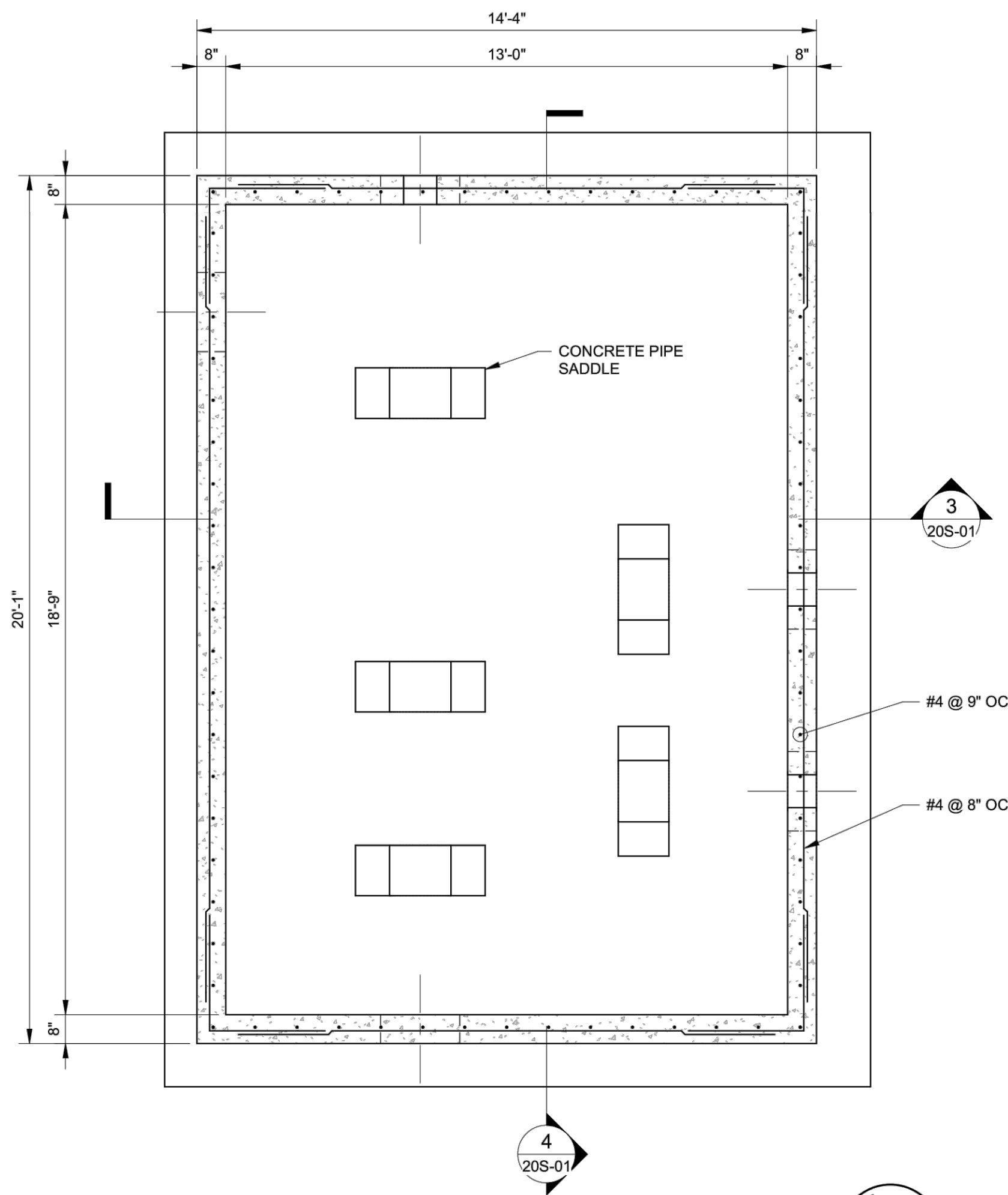


SDS-05 NTS

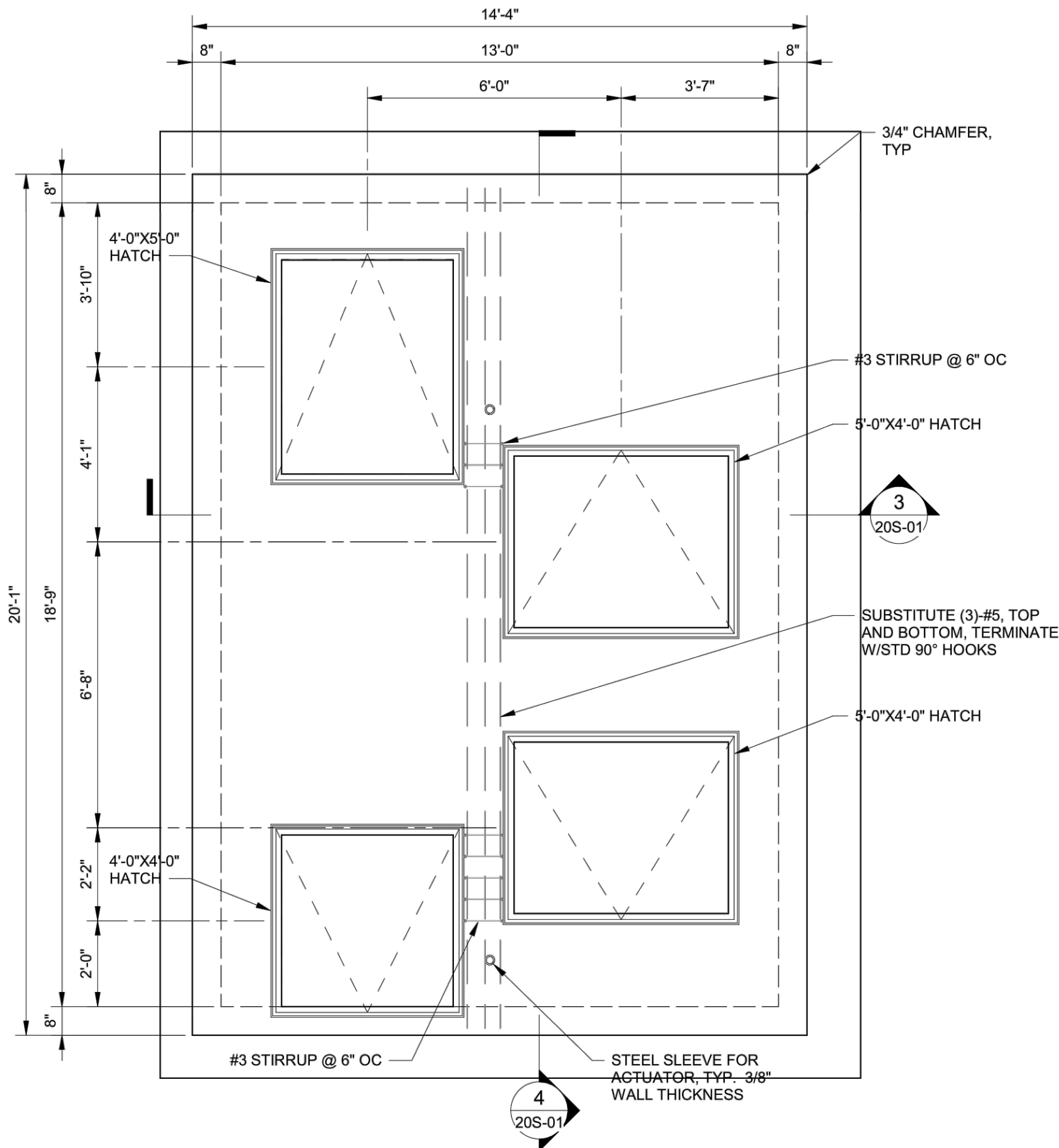


PIPE SIZE	DIMENSIONS					
	A	B	C	D	T	U
6" - 12"	1/4"	2"	3/4"	3"	8"	3/16"
14" - 18"	1/4"	4"	3/4"	3"	9"	1/4"
20" - 36"	3/8"	5"	3/4"	3"	10"	3/8"
42" - 54"	3/8"	6"	1"	4"	12"	3/8"
60" - 72"	3/8"	6"	1 1/8"	5"	16"	1/2"

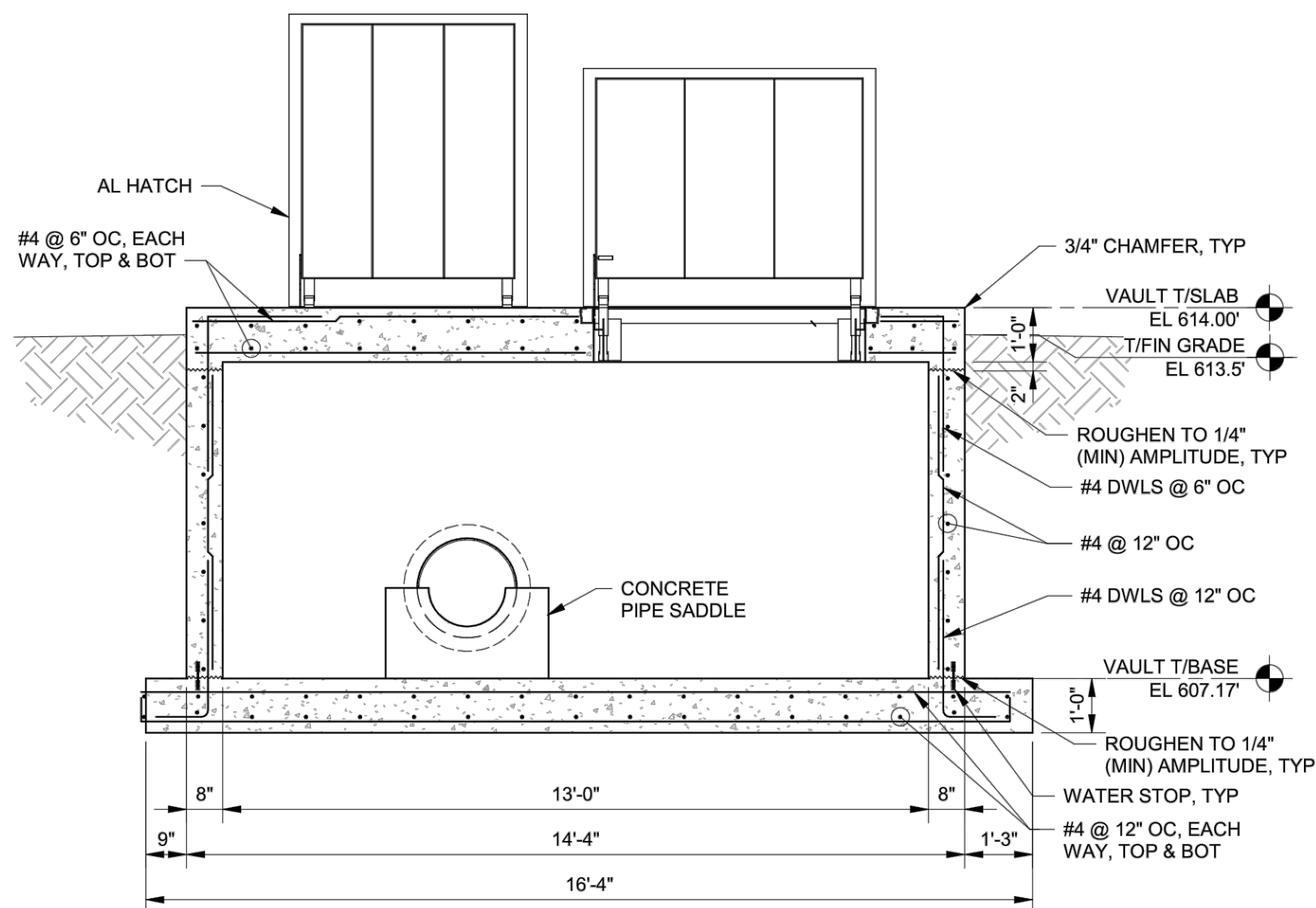
10 PI
SDS-05 NTS



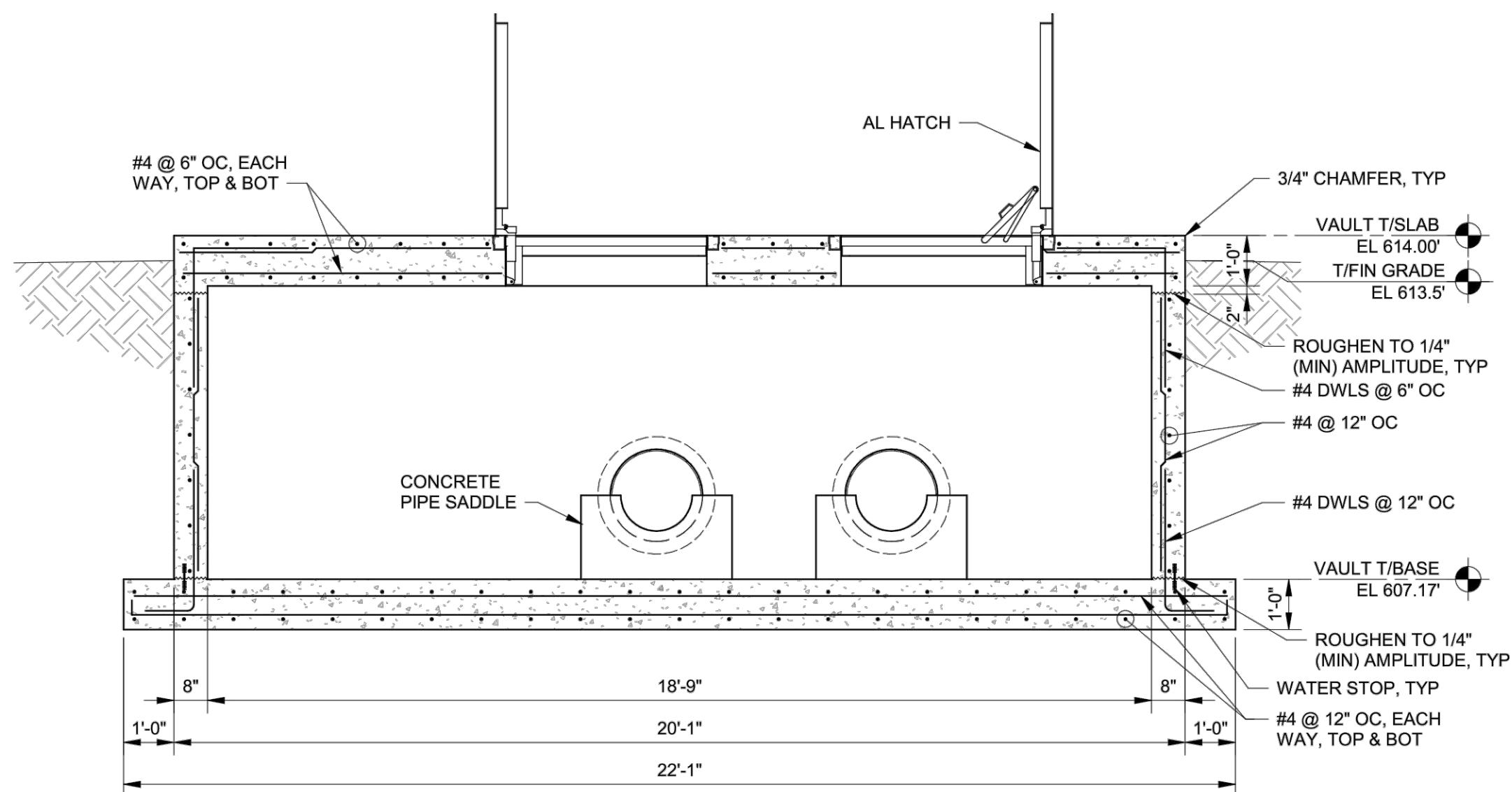
1 BASE SLAB
20S-01 3/8" = 1'-0"



2 TOP SLAB
20S-01 3/8" = 1'-0"



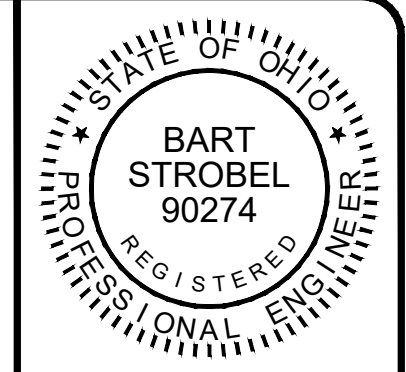
3 SECTION
20S-01 3/8" = 1'-0"



4 SECTION
20S-01 3/8" = 1'-0"

VALVE VAULT PLAN NOTES:

- SEE SHEETS SD-S-01 THRU SD-S-04 FOR GENERAL STRUCTURAL NOTES.
- SEE SHEET SD-S-05 AND SD-S-06 FOR TYPICAL DETAILS.
- COORDINATE DIMENSIONS NOT SHOWN WITH PROCESS MECHANICAL AND CIVIL DRAWINGS. DIMENSIONS SHALL CONFORM TO THE PROCESS DRAWINGS.
- COORDINATE LOCATION AND SIZE OF PENETRATIONS AND OPENINGS WITH PROCESS. MECHANICAL, ELECTRICAL, AND CIVIL DRAWINGS. TYP. OPENING SHALL BE PER PROCESS MECHANICAL AND CIVIL STANDARDS FOR SIZE AND SEALING REQUIREMENTS.
- TOP OF GRADE SHALL BE 6" BELOW THE STRUCTURE, UNO, TO PREVENT STORM WATER SEDIMENT FROM IMPACTING THE HATCH DRAIN CHANNELS.
- TOP OF STRUCTURAL SLAB ELEVATION SHALL BE AS INDICATED ON PLAN AND SECTIONS, UNO.
- TOP OF WALL ELEVATION SHALL BE AS INDICATED ON PLAN AND SECTIONS, UNO.
- TOP OF BASE SLAB ELEVATION SHALL BE AS INDICATED ON PLAN AND SECTIONS, UNO.
- BOTTOM OF FOOTING DETAILS SHOWN ARE BASED UPON FOUNDATIONS BEARING ON MATERIALS AS LISTED IN FOUNDATION GENERAL NOTES. BEARING ELEVATIONS HAVE BEEN ESTABLISHED FROM THE GRADING PLAN AND SOILS REPORT. FOUNDATION BEARING SURFACES MUST BE INSPECTED AND APPROVED IN ACCORDANCE WITH FOUNDATION GENERAL NOTES AND BOTTOM OF FOOTING ELEVATIONS ADJUSTED ACCORDINGLY.
- ADDITIONAL BASE MATERIAL, ALL SLABS AND FOOTINGS SHALL BEAR ON, AT LEAST, 6" COMPACTED ENGINEERED GRANULAR MATERIAL.
- PROVIDE STANDARD HOOKS AS SHOWN
- REINFORCING IN 8" WALLS SHALL BE CENTERED IN THE WALL.
- PROVIDE WATERSTOPS AT ALL CONSTRUCTION JOINTS. WATERSTOPS NOT REQUIRED WITHIN 12" FROM TOP OF GRADE OR AT WEIR WALL JOINTS
- HATCHES SHALL BE ALUMINUM WITH RECESSED HASPS AND REMOVABLE HANDLES. HATCHES WITHIN FENCED AREAS SHALL HAVE A 300 PSF LOAD RATING. HATCHES WITHIN ROW SHALL HAVE AN HS-20/RL-93 LOAD RATING.
- CHAMFER AT TOP SLAB SHALL RUN DOWN VERTICAL EXTERIOR CORNER TO, AT LEAST 12" BELOW GRADE.
- CONTRACTOR SHALL EXERCISE EXTREME CAUTION SO AS NOT TO UNDERMINE, DISTURB, DAMAGE OR, IN ANY WAY, CAUSE UNDESIRABLE MOVEMENT, CRACKING, AND/OR SETTLEMENT OF THE ADJACENT STRUCTURES OR CONSTRUCTION.
- PROVIDE RE-ENTRY REINFORCING AT ALL RE-ENTRY CORNERS.
- REFERENCE DETAIL 6 AND 7 ON 20S-02 FOR STIRRUP AND REINFORCE ARRANGEMENT AT NARROW STRIP BETWEEN HATCHES.



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DESIGNED BY:	TLM			
DRAWN BY:	BF			
CHECKED BY:				

CITY OF WILLOUGHBY
LAKESHORE EAST EQ BASIN
PHASE II

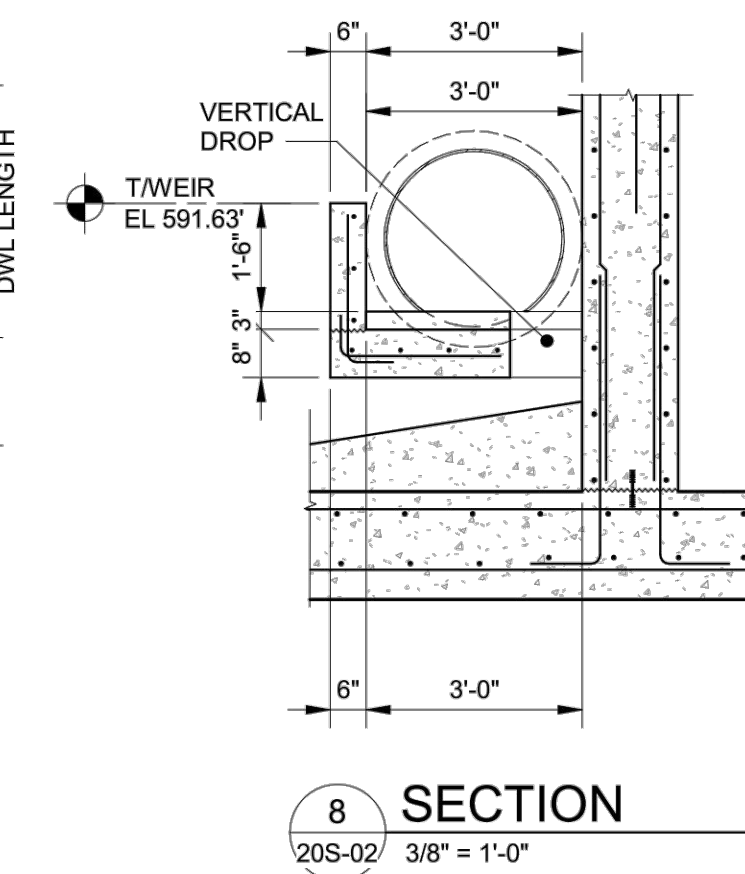
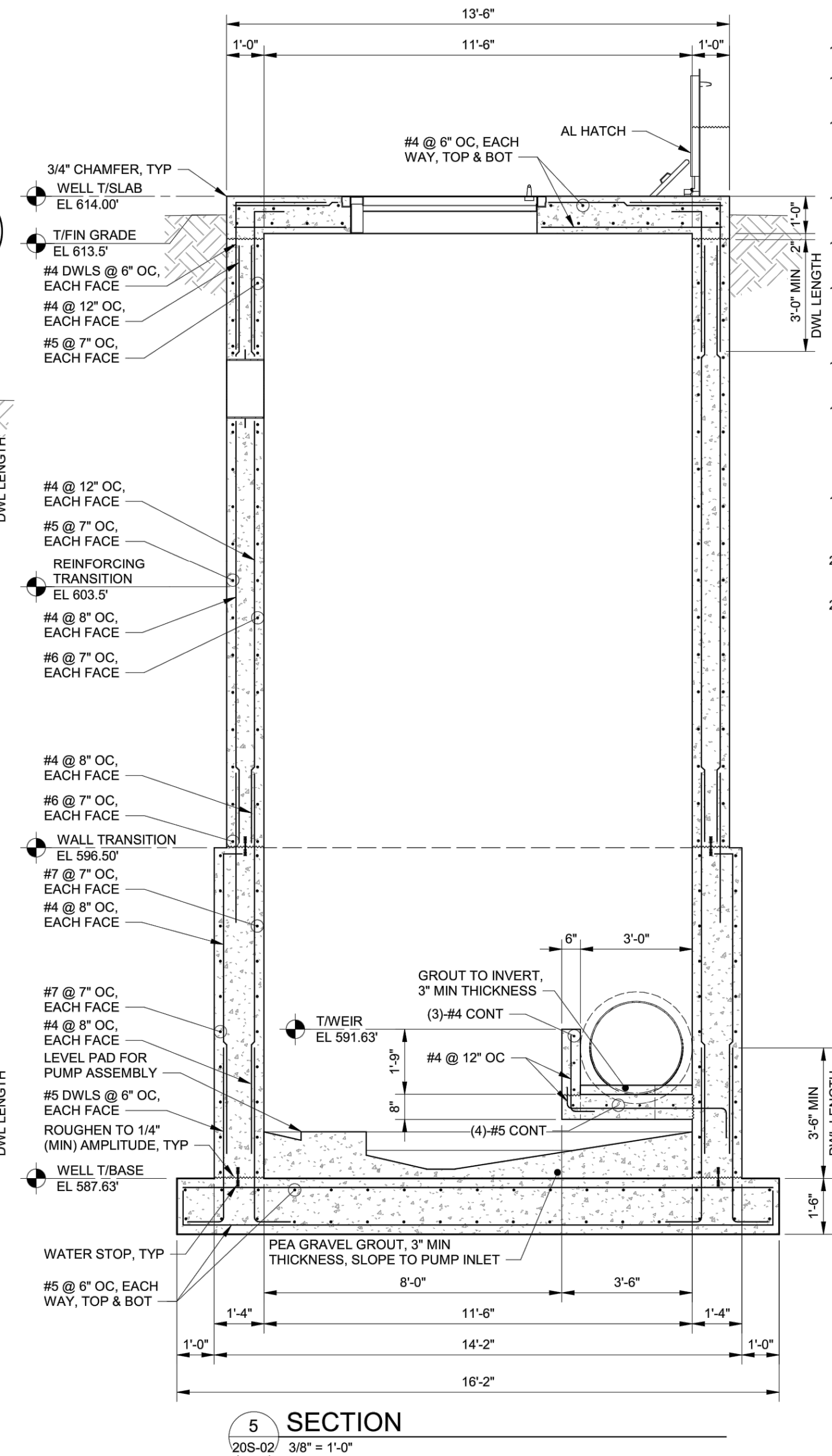
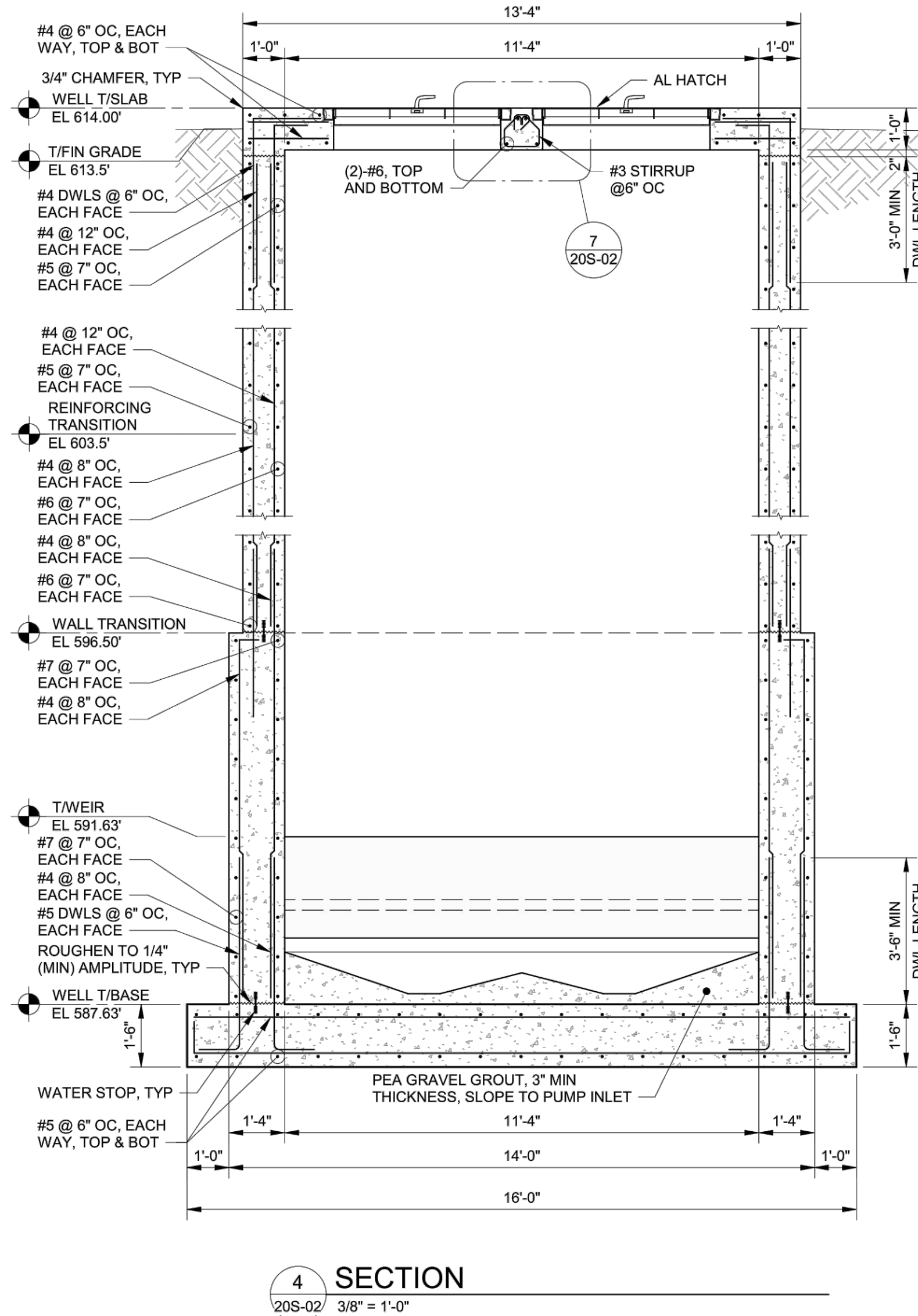
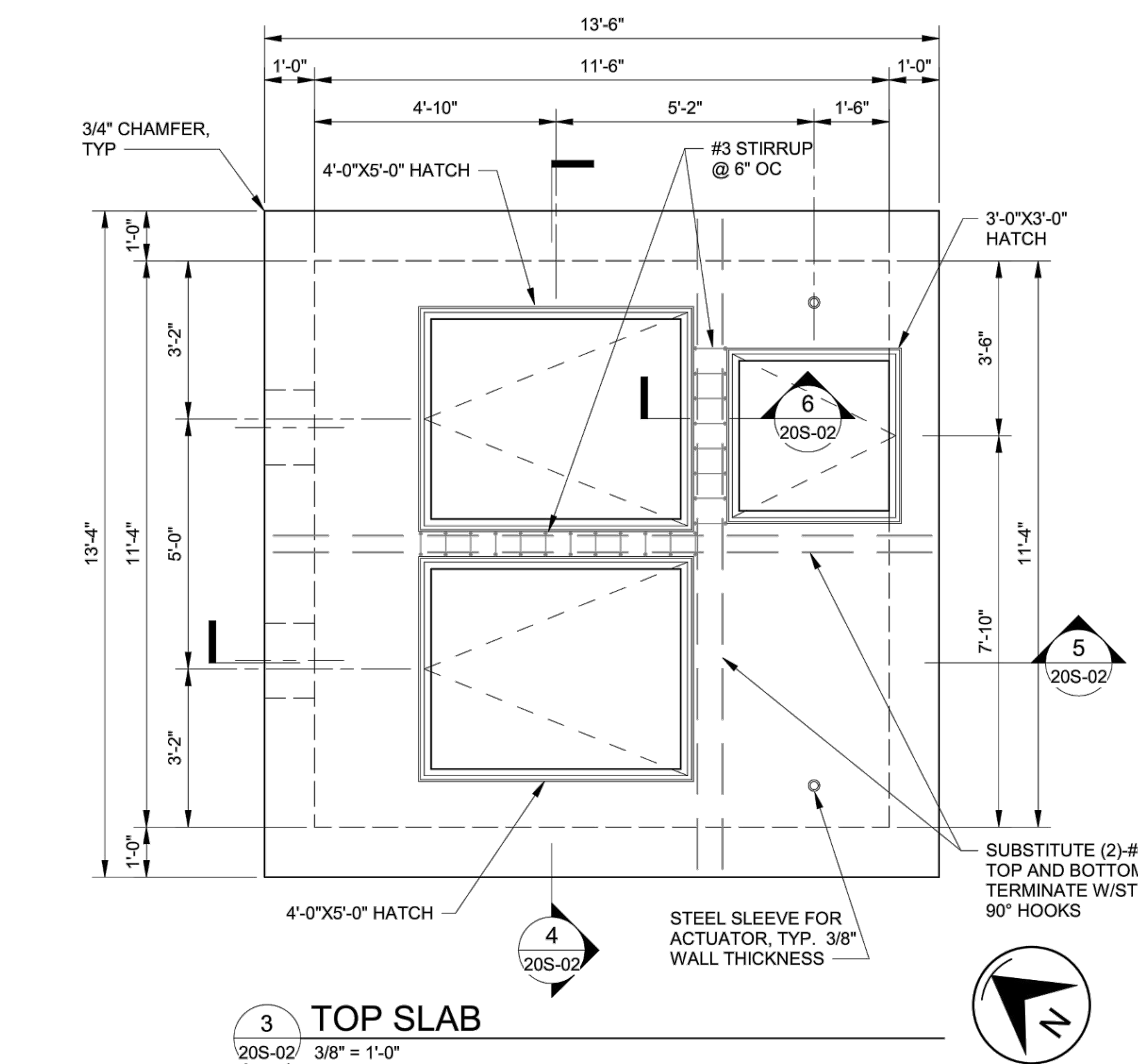
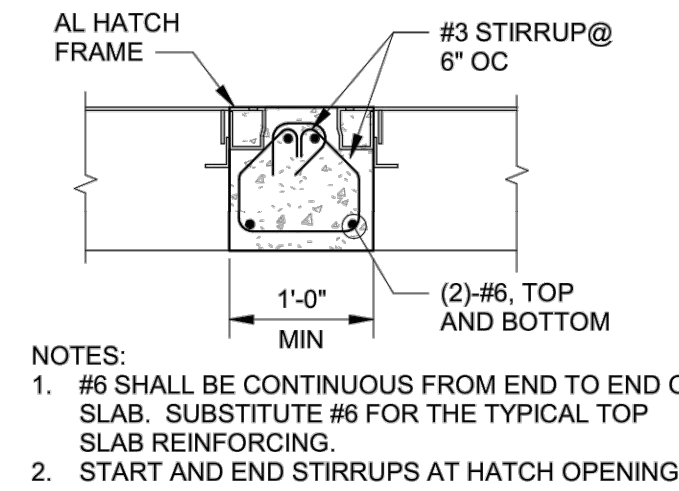
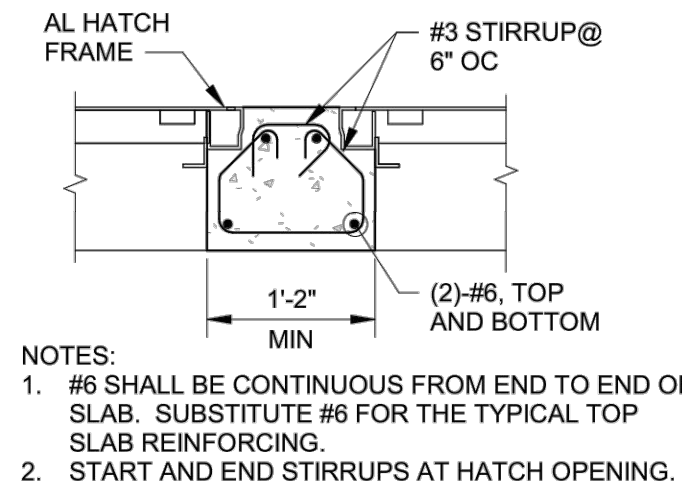
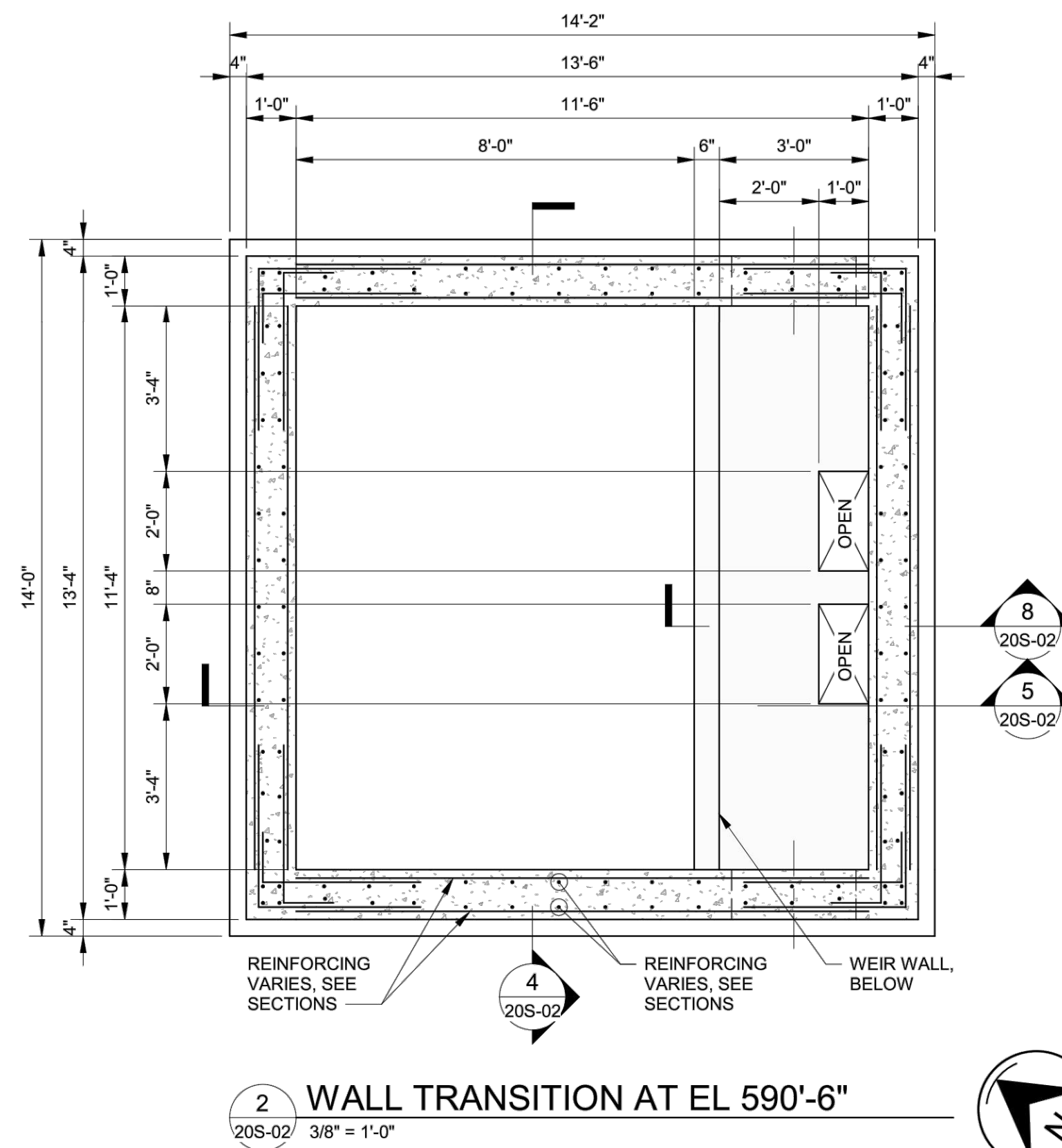
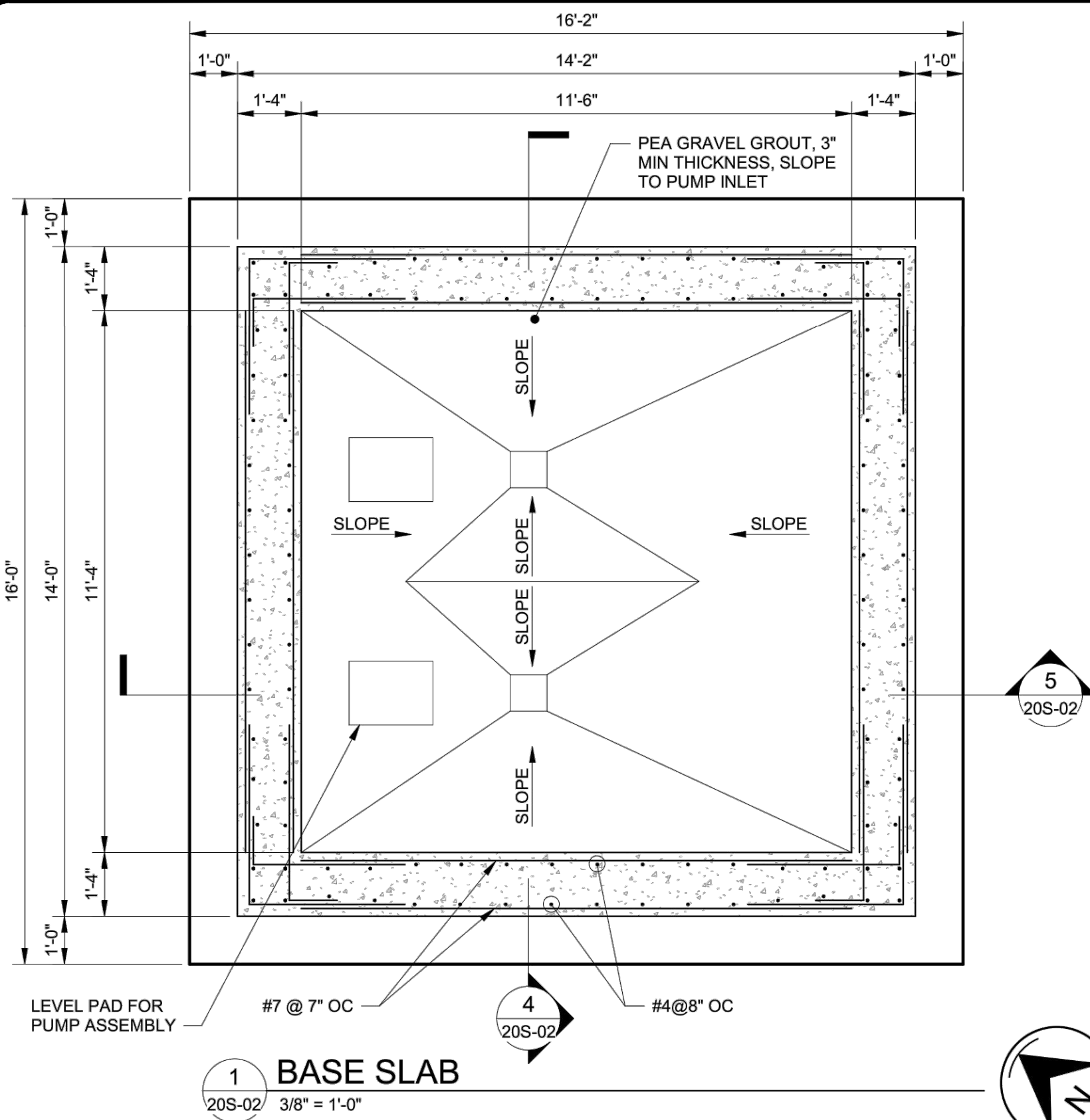
WILLOUGHBY, OHIO

LAKE COUNTY

SITE STRUCTURES - 20 SERIES

VALVE VAULT

PROJECT NO.	
230264	
DISCIPLINE	
STRUCTURAL	
SHEET NAME	
20-S-06	
SHEET	OF
26	48



- WETWELL PLAN NOTES:**
- SEE SHEETS SD-S-01 THRU SD-S-04 FOR GENERAL STRUCTURAL NOTES.
 - SEE SHEET SD-S-05 AND SD-S-06 FOR TYPICAL DETAILS.
 - COORDINATE DIMENSIONS NOT SHOWN WITH PROCESS MECHANICAL AND CIVIL DRAWINGS. DIMENSIONS SHALL CONFORM TO THE PROCESS DRAWINGS.
 - COORDINATE LOCATION AND SIZE OF PENETRATIONS AND OPENINGS WITH PROCESS. MECHANICAL, ELECTRICAL, AND CIVIL DRAWINGS. TYP. OPENING SHALL BE PER PROCESS MECHANICAL AND CIVIL STANDARDS FOR SIZE AND SEALING REQUIREMENTS.
 - TOP OF GRADE SHALL BE 6" BELOW THE STRUCTURE, UNO, TO PREVENT STORM WATER SEDIMENT FROM IMPACTING THE HATCH DRAIN CHANNELS.
 - TOP OF STRUCTURAL SLAB ELEVATION(S) SHALL BE AS INDICATED ON PLAN AND SECTIONS, UNO.
 - TOP OF WALL ELEVATION(S) SHALL BE AS INDICATED ON PLAN AND SECTIONS, UNO.
 - TOP OF BASE SLAB ELEVATION SHALL BE AS INDICATED ON PLAN AND SECTIONS, UNO.
 - BOTTOM OF FOOTING DETAILS SHOWN ARE BASED UPON FOUNDATIONS BEARING ON MATERIALS AS LISTED IN FOUNDATION GENERAL NOTES. BEARING ELEVATIONS HAVE BEEN ESTABLISHED FROM THE GRADING PLAN AND SOILS REPORT. FOUNDATION BEARING SURFACES MUST BE INSPECTED AND APPROVED IN ACCORDANCE WITH FOUNDATION GENERAL NOTES AND BOTTOM OF FOOTING ELEVATIONS ADJUSTED ACCORDINGLY.
 - ADDITIONAL BASE MATERIAL, ALL SLABS AND FOOTINGS SHALL BEAR ON, AT LEAST, 6" COMPACTED ENGINEERED GRANULAR MATERIAL.
 - PROVIDE STANDARD HOOKS AS SHOWN
 - REINFORCING IN 8" WALLS SHALL BE CENTERED IN THE WALL.
 - PROVIDE PVC WATERSTOPS AT ALL CONSTRUCTION JOINTS. WATERSTOPS NOT REQUIRED WITHIN 12" FROM TOP OF GRADE OR AT WEIR WALL AND 8" SLAB AT WEIR WALL JOINTS
 - INSTALL PEA GRAVEL GROUT AT BASE SLAB PRIOR TO BACKFILLING STRUCTURE.
 - REINFORCING FOR WEIR AND 8" SLAB AT WEIR WALL SHALL DOWEL INTO WETWELL WALLS.
 - HATCHES SHALL BE ALUMINUM WITH RECESSED HASPS AND REMOVABLE HANDLES. HATCHES WITHIN FENCED AREAS SHALL HAVE A 300 PSF LOAD RATING. HATCHES WITHIN ROW SHALL HAVE AN HS-20/RL-93 LOAD RATING.
 - CHAMFER AT TOP SLAB SHALL RUN DOWN VERTICAL EXTERIOR CORNER TO, AT LEAST 12" BELOW GRADE.
 - CONTRACTOR SHALL EXERCISE EXTREME CAUTION SO AS NOT TO UNDERMINE, DISTURB, DAMAGE OR, IN ANY WAY, CAUSE UNDESIRABLE MOVEMENT, CRACKING, AND/OR SETTLEMENT OF THE ADJACENT STRUCTURES OR CONSTRUCTION.
 - DO NOT ALLOW GROUND WATER TO ACCUMULATE WITHIN EXCAVATION. STRUCTURE REQUIRES SOILS WEIGHT TO RESIST BUOYANCY.
 - PROVIDE RE ENTRY REINFORCING AT ALL RE-ENTRY CORNERS.
 - REFERENCE DETAIL 6 AND 7 ON 20S-02 FOR STIRRUP AND REINFORCE ARRANGEMENT AT NARROW STRIP BETWEEN HATCHES.

STATE OF OHIO

BART STROBEL

90274

REGISTERED PROFESSIONAL ENGINEER

verdantas

8150 STERLING COURT

MENTOR, OHIO 44060

(440) 951-9000

NO	REVISION	DATE

ISSUED FOR	REVIEW	DATE	SCALE	DESIGNED BY	DRAWN BY	CHECKED BY

CITY OF WILLOUGHBY

LAKESHORE EAST EQ BASIN

PHASE II

LAKE COUNTY

WILLOUGHBY, OHIO

SITE STRUCTURES - 20 SERIES

WET WELL

PROJECT NO.

230264

DISCIPLINE

STRUCTURAL

SHEET NAME

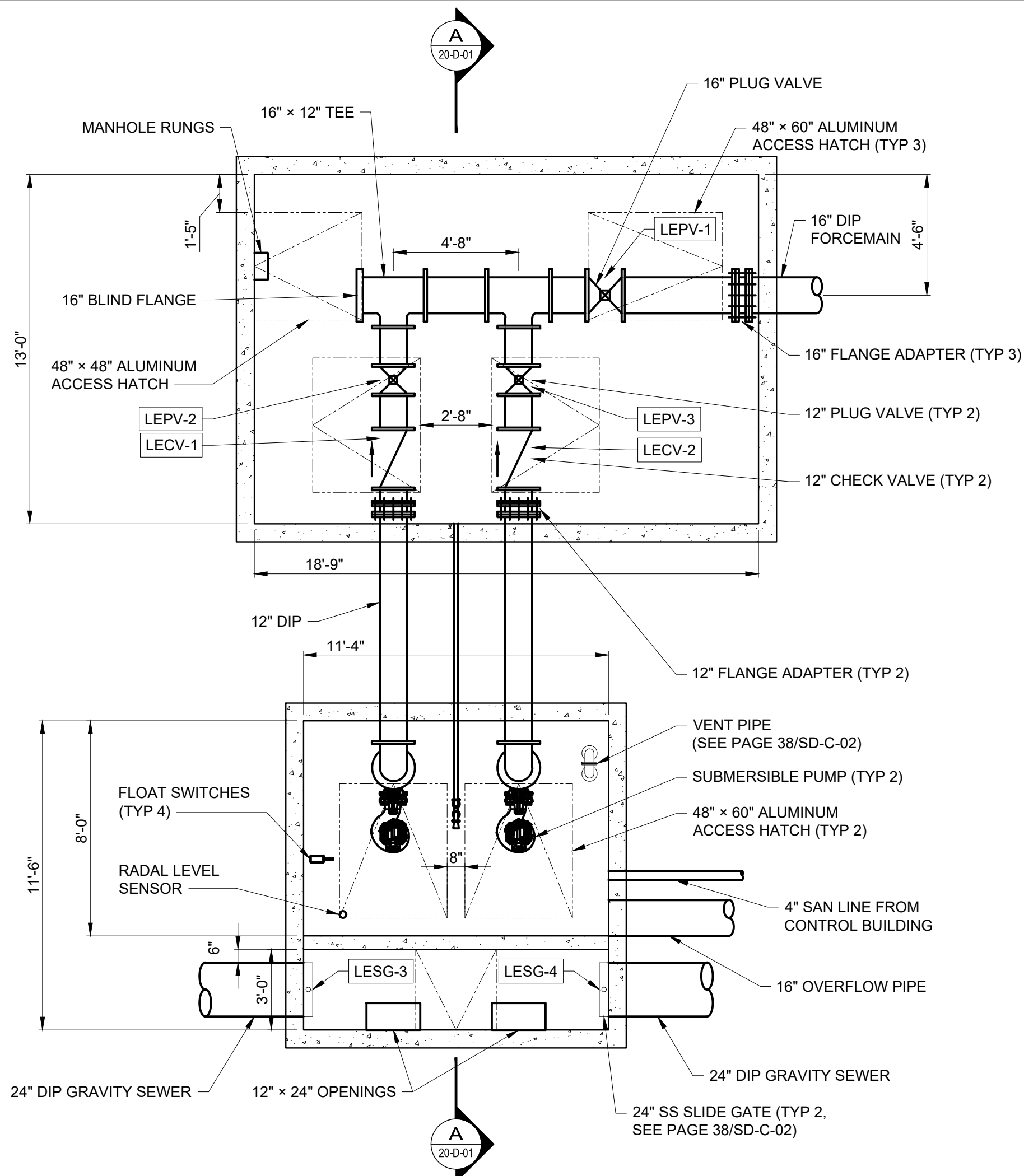
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SHEET

27

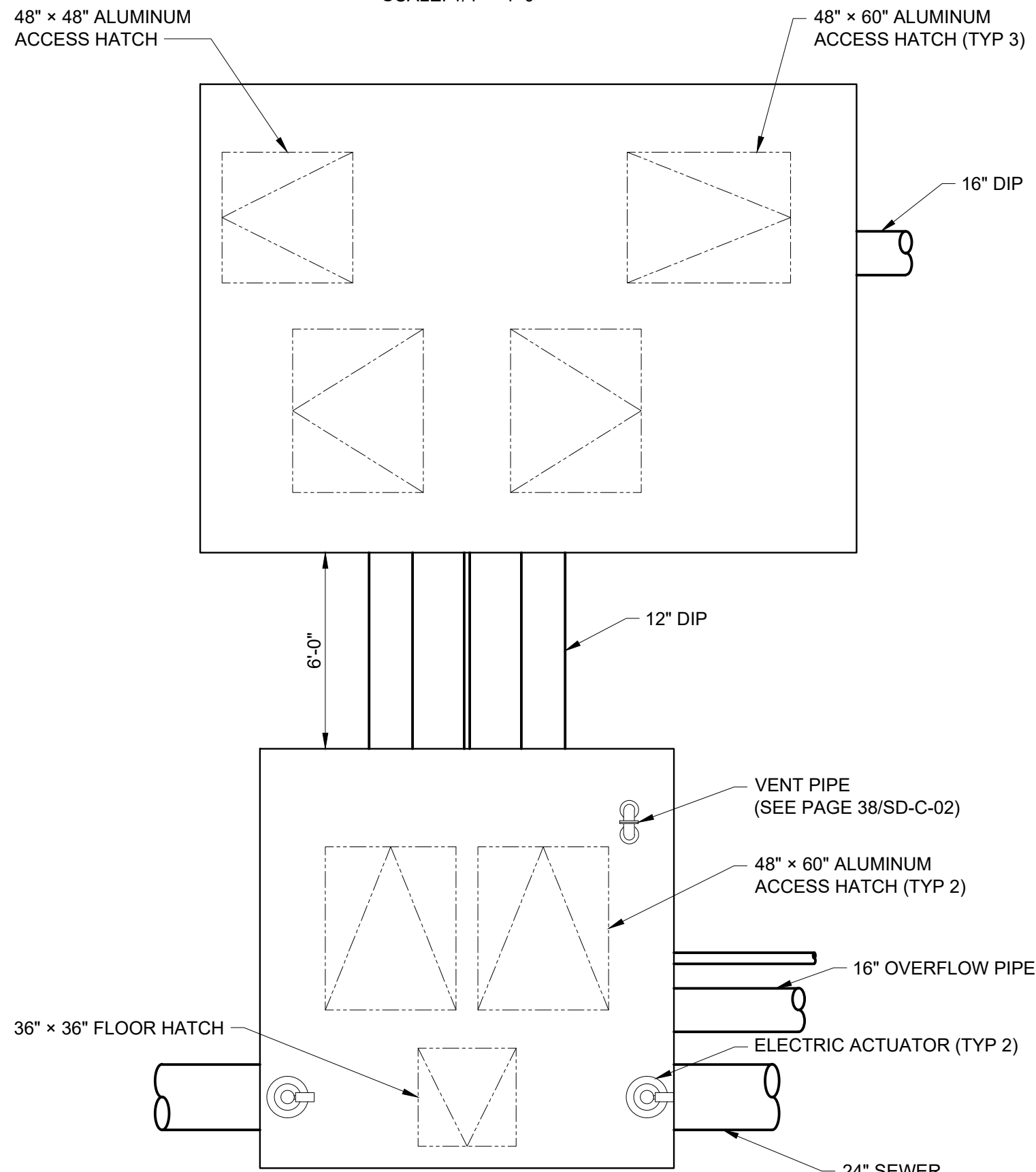
OF

48



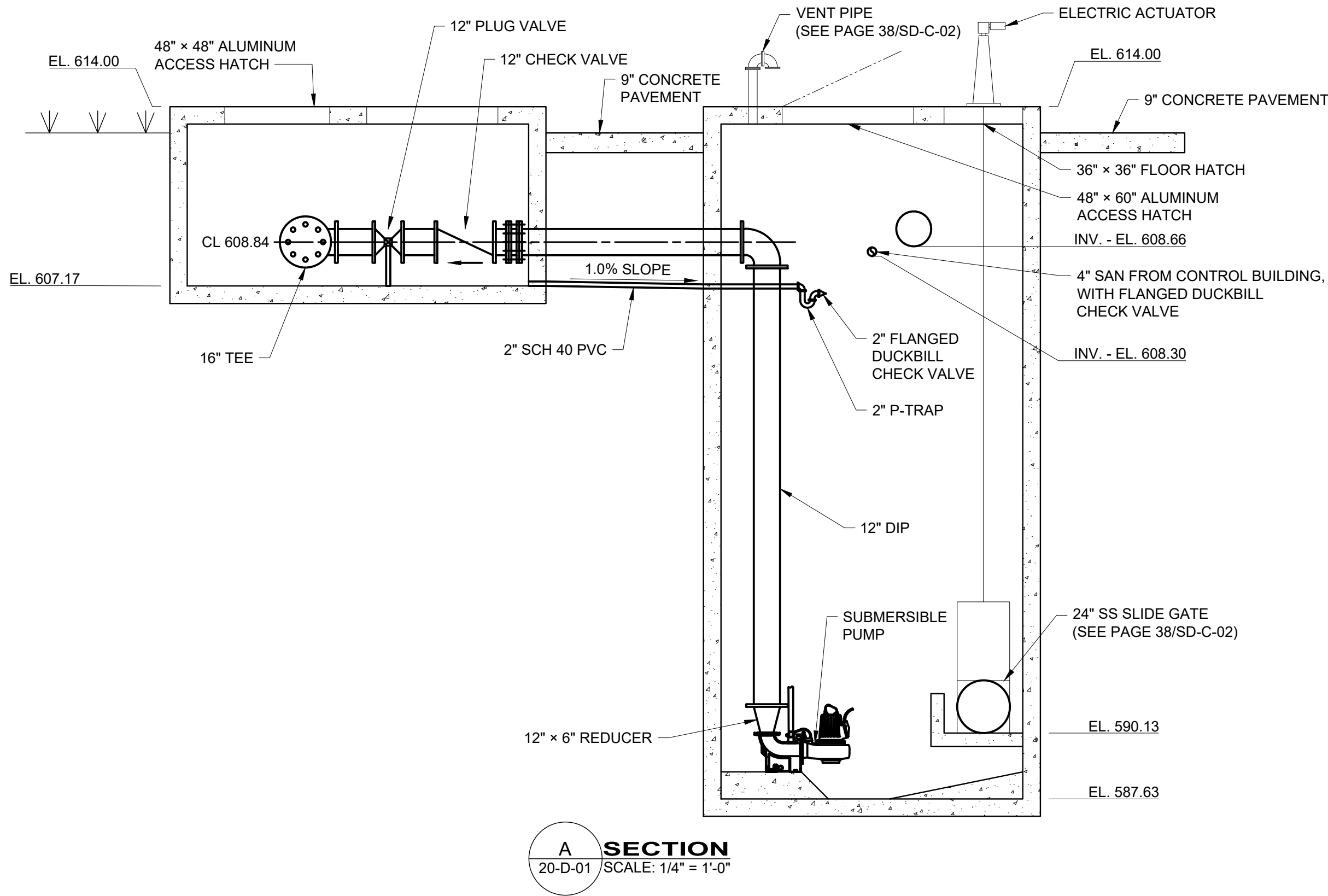
VALVE VAULT & WET WELL (PLAN VIEW)

SCALE: 1/4" = 1'-0"



VALVE VAULT & WET WELL (TOP PLAN VIEW)

SCALE: 1/4" = 1'-0"

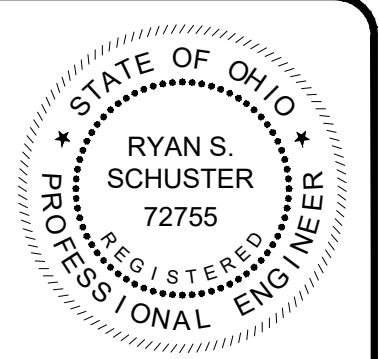


SECTION A
SCALE: 1/4" = 1'-0"

VALVE SCHEDULE						
TAG #	TYPE	SIZE	END TYPE	OPERATOR	SERVICE	REMARKS
LECV-1	CV	12"	FL	OWL	VALVE VAULT	
LECV-2	CV	12"	FL	OWL	VALVE VAULT	
LEPV-1	PV	16"	FL	ON	VALVE VAULT	
LEPV-2	PV	12"	FL	ON	VALVE VAULT	
LEPV-3	PV	12"	FL	ON	VALVE VAULT	

GATE SCHEDULE						
TAG #	TYPE	HEIGHT	WIDTH	OPERATOR	SERVICE	REMARKS
LESG-3	SG	24"	24"	EM	WET WELL	FLOOR PEDALSTAL WITH VANDAL RESISTANT COVER ON EM
LESG-4	SG	24"	24"	EM	WET WELL	FLOOR PEDALSTAL WITH VANDAL RESISTANT COVER ON EM

PUMP SCHEDULE												
DESCRIPTION	TYPE OF PUMP	PUMPED LIQUID	DESIGN CAPACITY, GPM	TDH, FT	MOTOR HORSEPOWER	MOTOR SPEED	POWER REQUIREMENTS	DISCHARGE SIZE, IN	HIGH WATER ALARM	PUMP 1 ON	PUMP 2 ON	PUMPS OFF
LAKESTORE EAST PUMP #1	SUBMERSIBLE	WASTEWATER	1,000	28	12	1800	3PH/60 HZ/460V	6	608.30	590.13	594.13	588.66
LAKESTORE EAST PUMP #2	SUBMERSIBLE	WASTEWATER	1,000	28	12	1800	3PH/60 HZ/460V	6	608.30	590.13	594.13	588.66



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	AS NOTED	CAS	CAS
CHECKED BY:		RSS	

CITY OF WILLOUGHBY
LAKESTORE EAST EQ BASIN
PHASE II

WILLOUGHBY, OHIO

LAKE COUNTY

SITE STRUCTURES - 20 SERIES

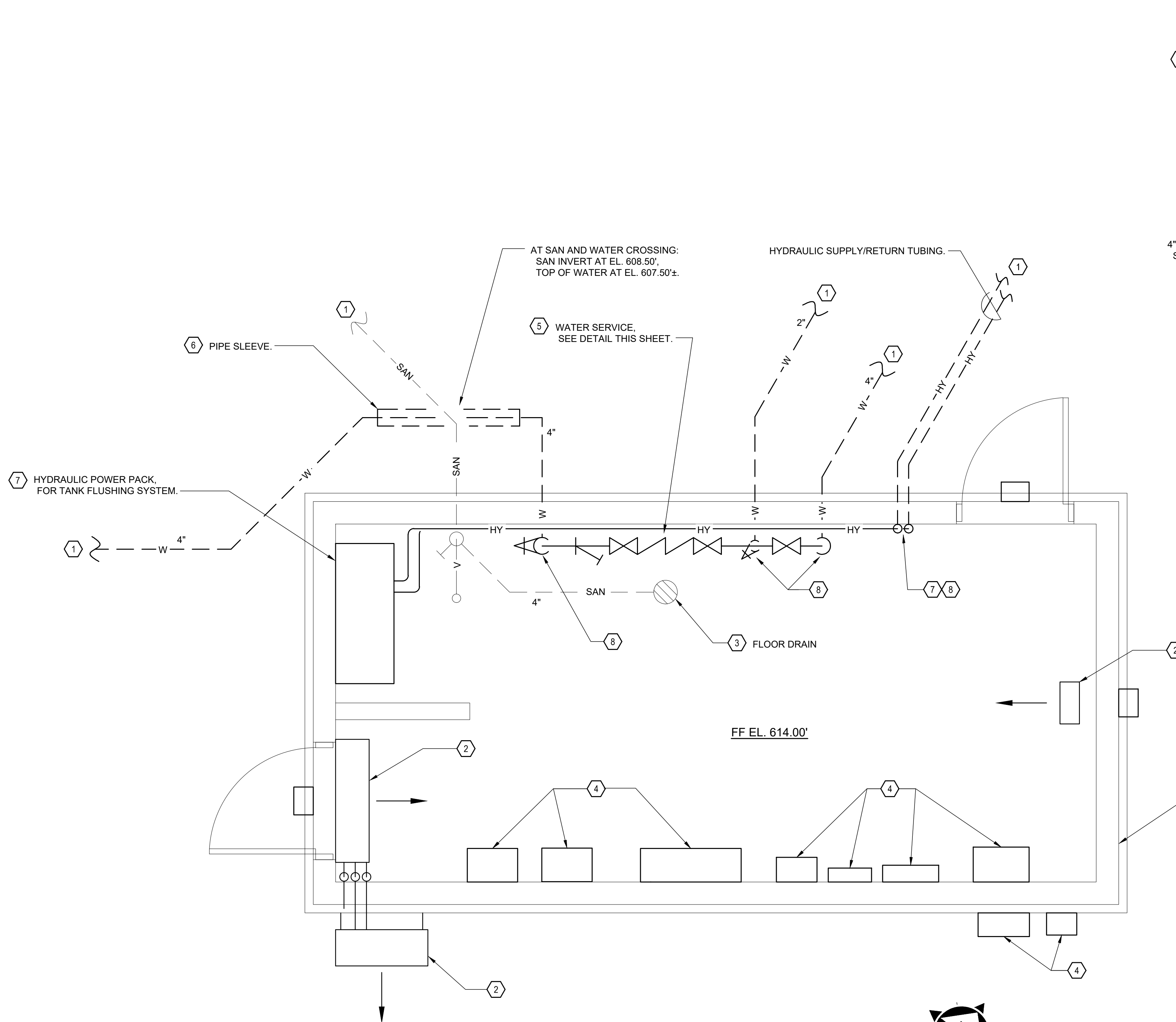
WET WELL & VALVE VAULT DETAILS

PROJECT NO.
230264

DISCIPLINE
PROCESS

SHEET NAME
20-D-01

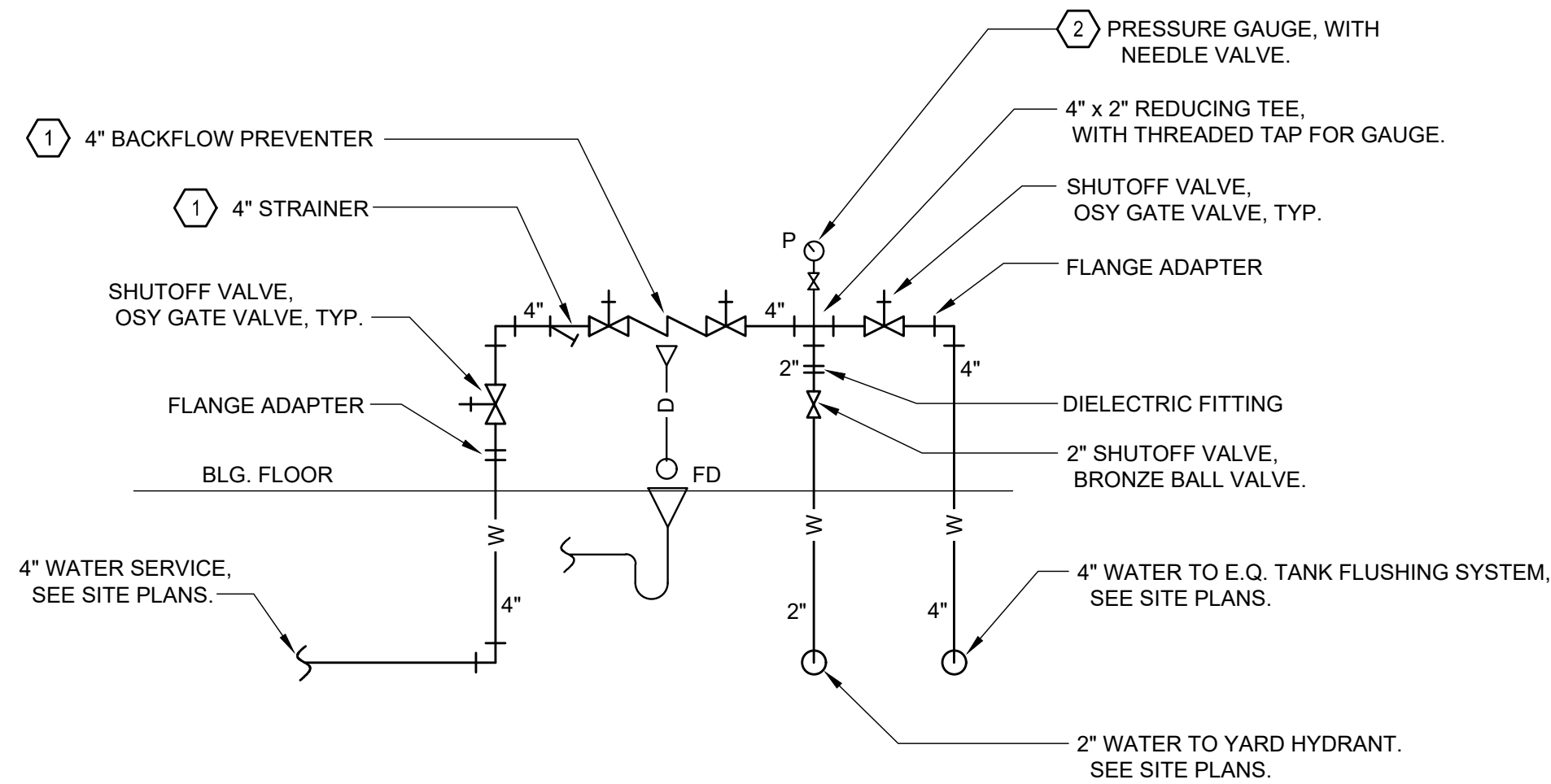
SHEET 28 OF 48



CONTROL BUILDING PROCESS PLAN
SCALE: 1/2" = 1'-0"

CODED NOTES:

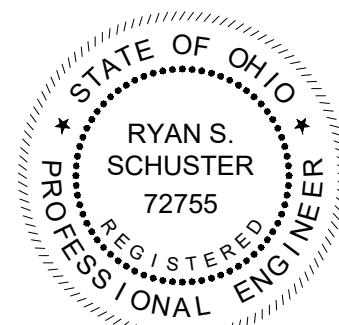
1. SEE SITE SITE PLANS FOR CONTINUATION.
2. HVAC EQUIPMENT. SEE MECHANICAL DRAWINGS.
3. FLOOR DRAIN, SANITARY/VENT PIPING. SEE MECHANICAL DRAWINGS.
4. ELECTRICAL EQUIPMENT (CONCEPTUAL ONLY). SEE ELECTRICAL DRAWINGS.
5. WATER SERVICE. SEE DETAIL THIS SHEET.
6. PROVIDE PIPE SLEEVE OVER 4" DUCTILE IRON WATER SERVICE LINE; PER OHIO PLUMBING CODE #603.2. PIPE SLEEVE TO BE SCHEDULE 40 PVC, 6" MINIMUM SIZE (OR LARGER TO SUIT WATER LINE JOINTS). PIPE SLEEVE TO BE AS LONG AS CONSTRUCTABLE AND EXTEND FROM ELBOW TO ELBOW. GROUT PIPE SLEEVE ENDS.
7. HYDRAULIC POWER PACK, FOR TANK FLUSHING SYSTEM. ROUTE HYDRAULIC LINES ALONG WALL, THEN DOWN THROUGH FLOOR UNDERGROUND TO TANK. UNDERGROUND HYDRAULIC TUBING TO BE INSTALLED IN PVC CONTAINMENT PIPES. SEE SPECIFICATION #464614 FOR ADDITIONAL INFORMATION.
8. BUILDING IS PRE-CAST CONCRETE. COORDINATE ALL PRE-CAST OPENINGS (FOR PIPING, ETC.) WITH GENERAL TRADES CONTRACTOR AND BUILDING MANUFACTURER. TYPICAL FOR ALL.



WATER SERVICE DETAIL
NOT TO SCALE

CODED NOTES:

1. BACKFLOW PREVENTER TO BE WATTS #994-FS-OSY-S, OR EQUAL. BACKFLOW PREVENTER TO BE REDUCED PRESSURE ZONE TYPE, WITH STAINLESS STEEL MAIN BODY, TORSION SPRING NORYL CHECK VALVES, UL/FM OUTSIDE STEM & YOKE RESILIENT SEATED GATE VALVES, STAINLESS STEEL INTERNAL METAL PARTS, STAINLESS STEEL RELIEF VALVE. PROVIDE WITH CAST IRON STRAINER, SENSOR ON RELIEF VALVE FOR FLOOD DETECTION, AND AIR GAP FITTING. EQUALS BY AMES, FEBCO, ZURN/WILKINS. EXTEND DRAIN LINE FROM AIR GAP FITTING TO FLOOR DRAIN, INDIRECT CONNECTION.
2. PRESSURE GAUGE TO DIRECT MOUNTING, DIAL TYPE, WITH CAST ALUMINUM 4.5" CASE, BOURDON TUBE ELEMENT, ALUMINUM DIAL, GLASS WINDOW, 1/4" NPS BRASS CONNECTION. PROVIDE WITH NPS 1/4" BRASS OR STAINLESS STEEL NEEDLE VALVE. PRE-CAST CONCRETE BUILDING



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SCALE:	JRM/RSS			
DESIGNED BY:	JRM			
DRAWN BY:	JRM			
CHECKED BY:	JRM/RSS			

CITY OF WILLOUGHBY
LAKESHORE EAST EQ BASIN
PHASE II

LAKE COUNTY
WILLOUGHBY, OHIO
SITE STRUCTURES - 20 SERIES
CONTROL BUILDING PLAN & DETAILS

PROJECT NO.	
230264	
DISCIPLINE	
PROCESS	
SHEET NAME	
20-D-02	
SHEET	OF
29	48

2024 OHIO BUILDING CODE			
CODE COMPLIANCE			
X	NEW CONSTRUCTION		
CONSTRUCTION TYPE	1B	RISK CATEGORY	III
OCCUPANT LOAD	2		
USE GROUP	U	DESCRIPTION	UTILITY BUILDING
PLUMBING: 2024 OPC	MECHANICAL: 2024 OMC	ELECTRIC: NEC 2023	ENERGY: ASHRAE 90.1-19
BUILDING HEIGHT	9'-10"	BUILDING AREA	338 SQ. FT.
REMARKS			
ACCESSIBILITY COMPLIANCE	ICC / ANSI A117.1- 2017		

OBC SECTION 108.2.14 INDUSTRIALIZED UNIT (I.U.) INSPECTIONS.

INSPECTION OF ON-SITE CONSTRUCTION TO COMPLETE INSTALLATION OF APPROVED INDUSTRIALIZED UNITS IS THE RESPONSIBILITY OF THE BUILDING DEPARTMENT WITH JURISDICTION. SUCH INSPECTIONS INCLUDE:

- CONNECTION TO ON-SITE CONSTRUCTION, INTERCONNECTION OF MODULES, AND CONNECTION TO UTILITIES. THE INSPECTIONS AND CONDUCTING OF REQUIRED TESTS ARE NOT TO REQUIRE THE DESTRUCTION OR DISASSEMBLY OF ANY FACTORY CONSTRUCTED COMPONENT AUTHORIZED BY THE BOARD.
- INSPECTION OF THE UNIT FOR DAMAGE RESULTING FROM TRANSPORTATION, IMPROPER PROTECTION OF EXPOSED PARTS FROM INCLEMENT WEATHER OR OTHER CAUSES. DAMAGE IS TO BE REPAIRED AS REQUIRED BY THE BUILDING OFFICIAL TO COMPLY WITH THE APPLICABLE PROVISIONS OF THE RULES OF THE BOARD.
- INSPECTION OF THE UNIT TO DETERMINE IF IT IS MARKED BY AN INSIGNIA FURNISHED BY THE BOARD.
- INSPECTION OF THE UNIT TO DETERMINE IF THE FLOOR PLAN, EXTERIOR ELEVATIONS, & EXPOSED DETAILS ARE IN CONFORMANCE WITH THE PLANS APPROVED BY THE BOARD.
- MANUFACTURER SHALL PROVIDE OHIO PE STAMPED DRAWINGS OF THE BUILDING AND FOUNDATION.

OBC SECTION 108.2

INSPECTIONS FOR SITE INSTALLED WORK FOR INDUSTRIALIZED UNITS, AND BUILDING SERVICES EQUIPMENT, ARE WITHIN THE RESPONSIBILITY OF THE BUILDING DEPARTMENT HAVING JURISDICTION.

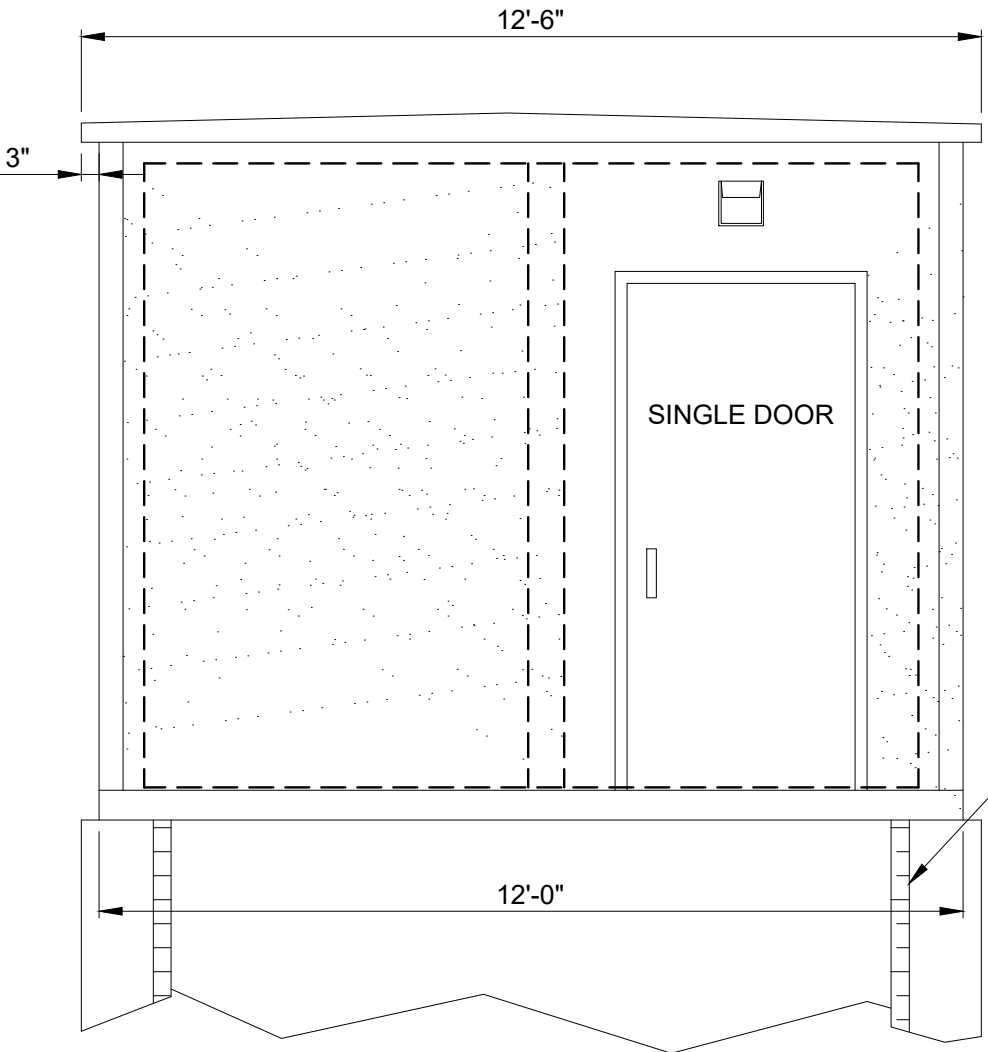
108.6.4 INDUSTRIALIZED UNITS, OBSERVATIONS OF NONCOMPLIANCE.

IF A UNIT OF CLOSED CONSTRUCTION DOES NOT BEAR AN INSIGNIA ISSUED BY THE BOARD, THE UNIT HAS NOT BEEN APPROVED BY THE BOARD AND THEREFORE IS WITHIN THE JURISDICTION OF THE BUILDING DEPARTMENT. UNITS NOT APPROVED BY THE BOARD AND PLACED ON-SITE ARE WORK WITHOUT APPROVAL AND THE BUILDING OFFICIAL IS TO PROCEED IN ACCORDANCE WITH SECTION 109.

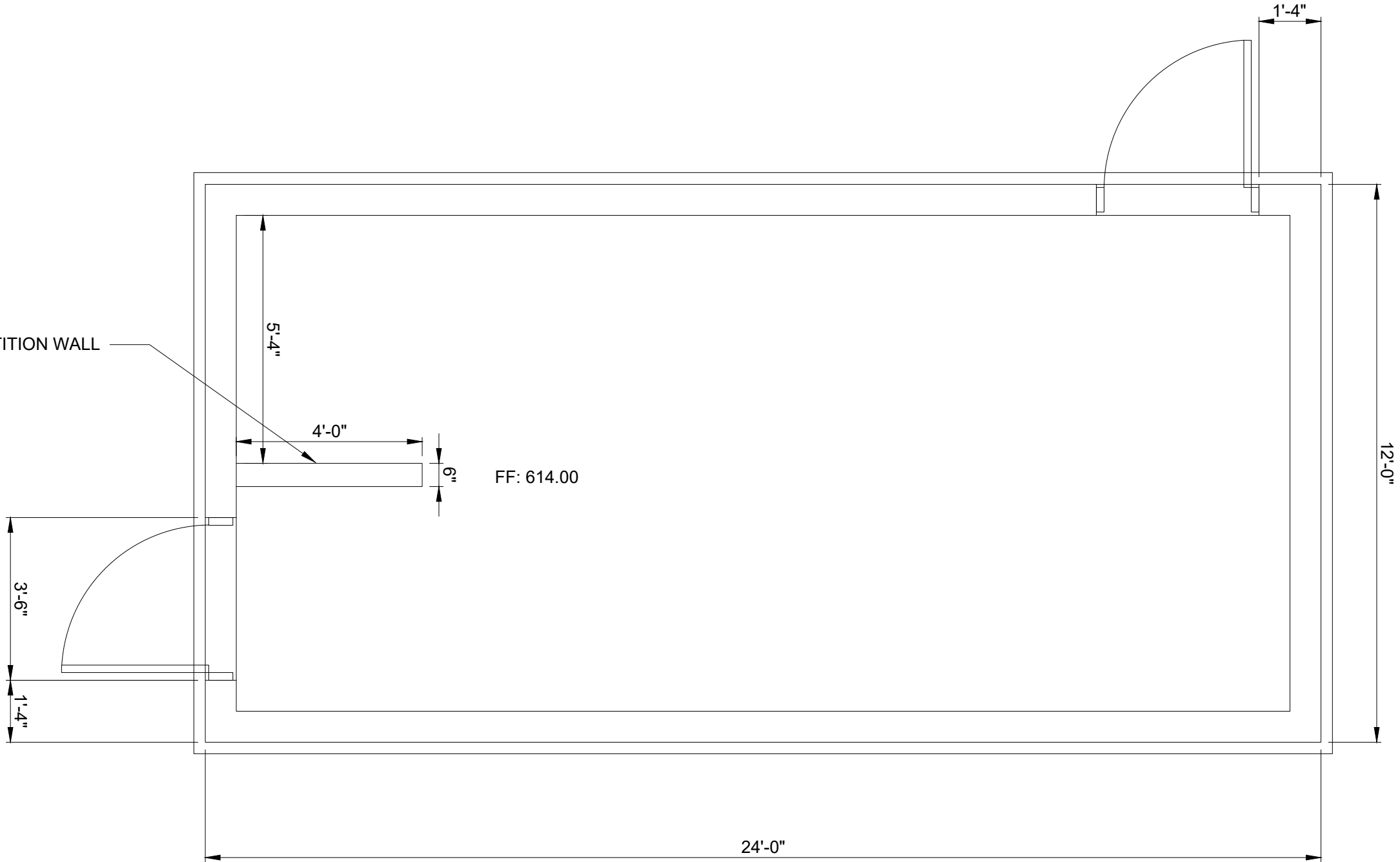
THE BUILDING OFFICIAL IS TO NOTIFY THE BOARD OF AN VARIANCE OF FLOOR PLAN, EXTERIOR ELEVATIONS, AND EXPOSED DETAILS WITH THE PLANS APPROVED BY THE BOARD OR PLACEMENT OF A UNIT WITHOUT AN INSIGNIA.

OBC SECTION 113.1 INDUSTRIALIZED UNITS.

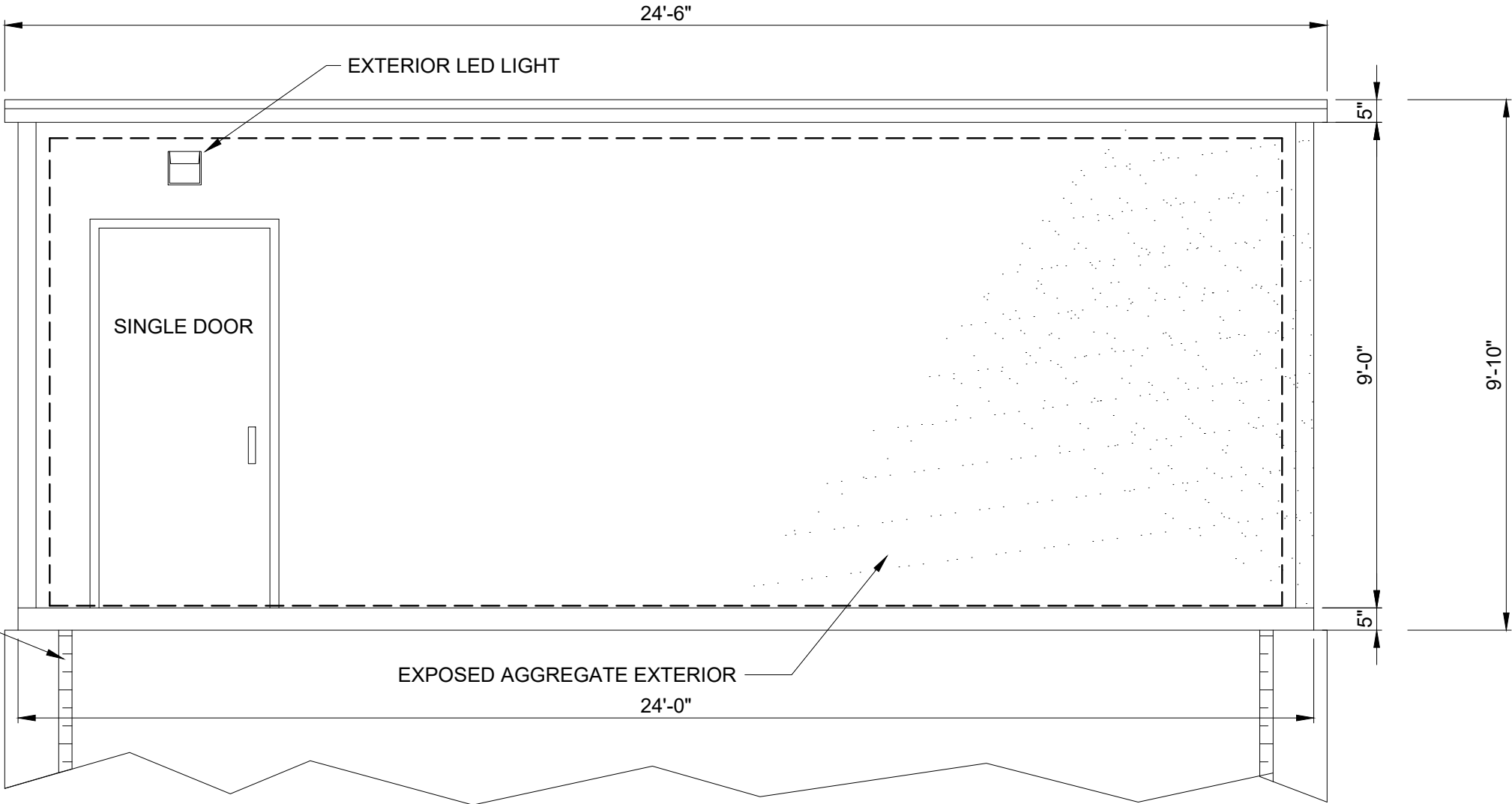
REFER TO DIVISION 4101:10 OF THE ADMINISTRATIVE CODE FOR REQUIREMENTS OF INDUSTRIALIZED UNITS.



SIDE ELEVATION
SCALE: 3/8" = 1'-0"



PLAN
SCALE: 3/8" = 1'-0"

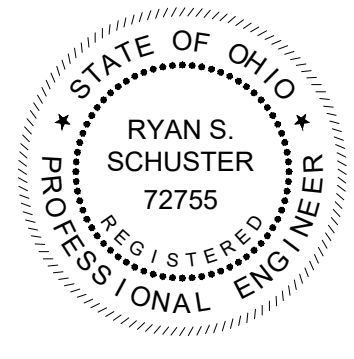
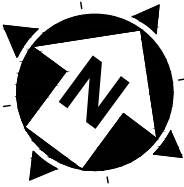


FRONT ELEVATION
SCALE: 3/8" = 1'-0"

GENERAL NOTES

**MANUFACTURER SHALL PROVIDE OHIO P.E. STAMPED DRAWINGS OF THE BUILDING AND THE FOUNDATION.

- CONCRETE: 5000 PSI @ 28 DAYS
- AIR: 6% +/- 2%
- REINFORCING: ASTM A615 GRADE 60
- WALLS PRECAST CONCRETE
- ROOF PRECAST CONCRETE
- FLOOR PRECAST CONCRETE
- CONCRETE MIX DESIGN AND PLACEMENT PER ACI-318-14
- MINIMUM REQUIRED FIRE SEPARATION IS 10'-0"
- BUILDING SHALL NOT BE PLACED WITHIN 60'-0" OF AN UNLIMITED AREA STRUCTURE
- BUILDING IS A STAND ALONE STRUCTURE
- EXTERIOR EGRESS COMPONENTS ARE TO BE SITE INSTALLED.
- PROVIDE COMCHECK, OR STATE THAT IT WILL BE PROVIDED AS A PART OF THE IU DWGS.



verdantas

8150 STERLING COURT
MENTOR, OHIO 44060
(440) 951-9000

ISSUED FOR:	REVIEW	NO	REVISION	DATE
ISSUE DATE:	10/3/2025			
SCALE:	AS NOTED			
DESIGNED BY:	RSS			
DRAWN BY:	CAS			
CHECKED BY:	RSS			

CITY OF WILLOUGHBY	WILLOUGHBY, OHIO
LAKESHORE EAST EQ BASIN	
LAKE COUNTY	PHASE II
SITE STRUCTURES - 20 SERIES	
CONTROL BUILDING PLAN, ELEVATIONS & CODE DATA	

PROJECT NO.	
230264	
DISCIPLINE	
ARCHITECTURAL	
SHEET NAME	
20-A-01	
SHEET	OF
30	48

PROJECT INFORMATION

CONSTRUCTION ACTIVITIES LOCATED AT:
LAKE SHORE EAST EQ BASIN
FOREST DRIVE, CITY OF EASTLAKE, LAKE COUNTY, OHIO 44095
LATITUDE: 41.6775°N LONGITUDE: -81.4283°W

SWP3 PREPARED FOR:
CITY OF WILLOUGHBY, 1 PUBLIC SQUARE, WILLOUGHBY, OHIO 44095
CONTACT: RICH PALMISANO
EMAIL: RPALMISANO@WILLOUGHBYOHIO.COM

SWP3 PREPARED BY SITE-CIVIL ENGINEER:
VERDANTAS LLC
8150 STERLING COURT, MENTOR, OHIO 44060
CONTACT: LENE C. HILL, PE
PHONE: 440-951-9000
EMAIL: LHILL@VERDANTAS.COM

GENERAL CONTRACTOR INFORMATION:

BUSINESS NAME

STREET ADDRESS

CITY

STATE

ZIP CODE

PERSON RESPONSIBLE FOR AMENDING SWP3:

NAME

PHONE

EMAIL

ESTIMATED PROJECT CONSTRUCTION START DATE: 04/01/2026
ESTIMATED PROJECT CONSTRUCTION COMPLETION DATE: 12/01/2026

DESCRIPTION OF PROJECT:
CONSTRUCTION OF A NEW EQ TANK, PUMP BUILDINGS WITH DRIVEWAYS, UTILITIES AND LANDSCAPING.

SOIL DISTURBING ACTIVITIES INCLUDE:
EROSION AND SEDIMENT CONTROL INSTALLATION; REMOVAL OF VEGETATION, TOPSOIL, EARTHWORK GRADING AND INSTALLATION OF NEW TANK, UTILITIES AND PAVEMENTS.

DESCRIPTION OF PRIOR AND EXISTING LAND USE:
VACANT LOT WITH MOWED GRASS.

SITE AREA INFORMATION:

TOTAL PROPERTY BOUNDARY AREA =	1.43	AC.
CONSTRUCTION LIMIT AREA =	1.26	AC.
TOTAL SOIL DISTURBANCE AREA =	1.26	AC.
EXISTING IMPERVIOUS AREA =	0	AC.
PROPOSED IMPERVIOUS AREA =	0.31	AC.
INCREASE OR DECREASE IMPERVIOUS AREA =	25	%

NAME OF IMMEDIATE RECEIVING STREAM, SURFACE WATER OR MS4:
CITY OF EASTLAKE MS4 TO THE CHAGRIN RIVER TO LAKE ERIE.

DESCRIPTION OF ON-SITE WETLANDS:
THERE ARE NO WETLANDS ON-SITE.

DESCRIPTION OF QUALITY OF STORM WATER DISCHARGE FROM SITE:
UNKNOWN

DESCRIPTION OF ON-SITE CONTAMINATED SOILS:
THERE IS NO KNOWN OR PROBABLE CONTAMINATED SOIL.

SEQUENCE OF MAJOR CONSTRUCTION ACTIVITIES

1.

INSTALL SILT FENCE, FILTER SOCK, INLET PROTECTION AND CONSTRUCTION ENTRANCE.
2.

INSTALL OTHER TEMPORARY EROSION AND SEDIMENT CONTROL ITEMS AS SOON AS POSSIBLE, BUT NO LATER THAN 7 DAYS AFTER SOIL DISTURBANCE.
3.

INSPECT AND MAINTAIN BMPs FOR THE PROJECT DURATION UNTIL UPSLOPE AREAS ARE PERMANENTLY STABILIZED.
4.

BEGIN CLEARING AND GRUBBING.
5.

INSTALL DEWATERING MEASURES.
6.

BEGIN EXCAVATING, GRADING AND OTHER EARTHWORK OPERATIONS.
7.

APPLY TEMPORARY SEED.
8.

INSTALL UTILITIES AND EQ BASIN.
9.

INSTALL PAVING.
10.

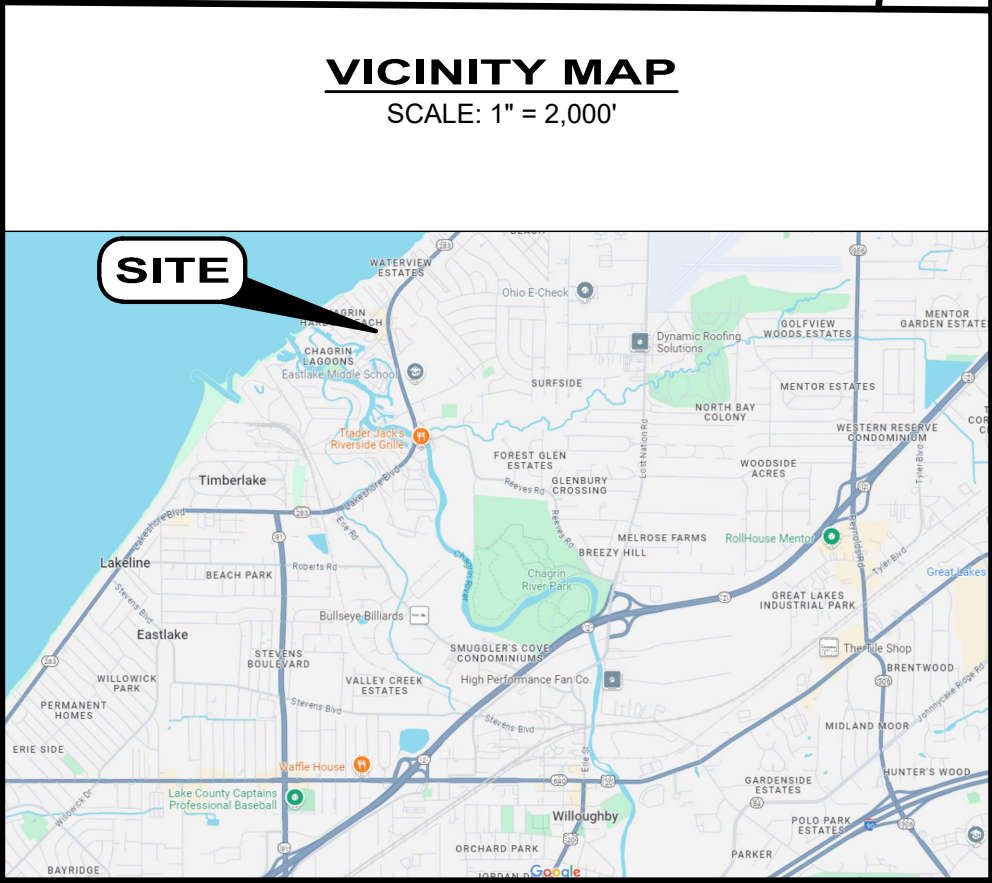
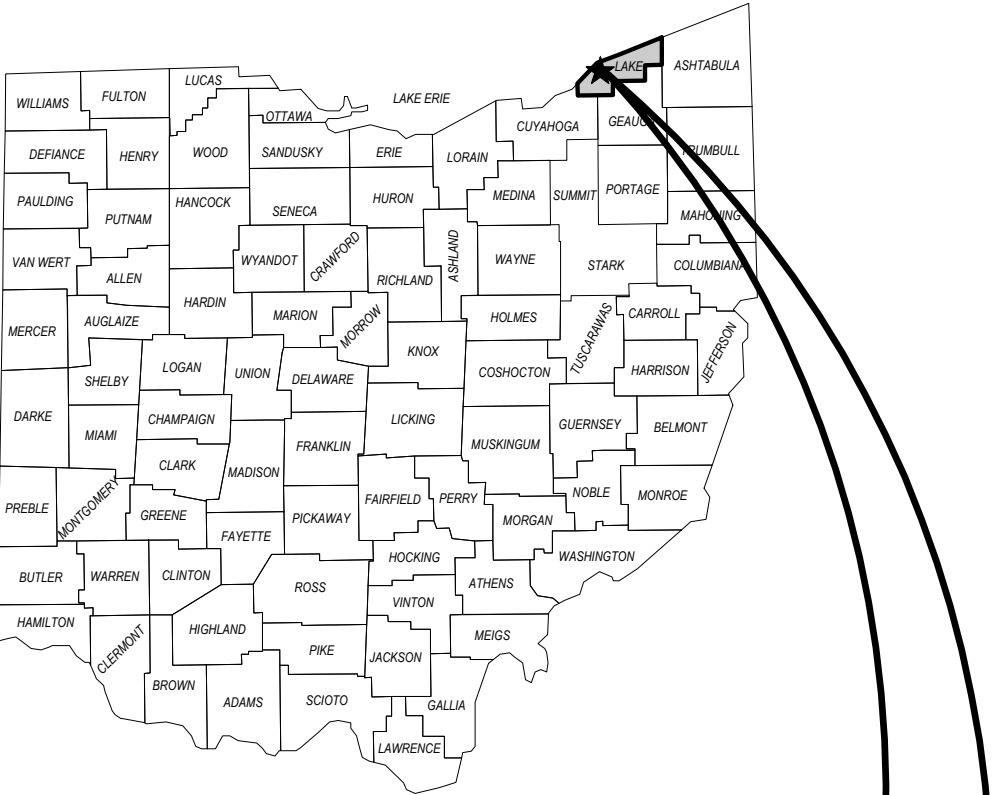
APPLY PERMANENT SEED.
11.

INSTALL LANDSCAPING.
12.

CONTINUE INSPECTIONS, MAINTENANCE, RECORD KEEPING, AND SITE POSTING UNTIL FINAL STABILIZATION ACHIEVED.
13.

REMOVE TEMPORARY BMPs.
14.

DISPOSE OF ALL DEBRIS AND WASTE MATERIAL.



SOIL TYPES

SOIL ABBRV.	SOIL NAME	% AREA
CiB	CONNEAUT SILT LOAM	100%

GENERAL NOTES

1.

THIS SWP3 HAS BEEN PREPARED SHOWING THE ITEMS LISTED BELOW, BUT THE CONTRACTOR MAY NEED TO MOVE OR ADD ITEMS AS CONSTRUCTION PROGRESSES OR DURING THE VARIOUS STAGES OF CONSTRUCTION. SOME SWP3 ITEMS MAY ALREADY BE SHOWN ON THE SWP3, BUT MOVED TO BETTER SUIT THE CONTRACTOR'S MEANS AND METHODS.

LIMITS OF EARTH DISTURBING ACTIVITY

CONSTRUCTION ENTRANCE

EROSION AND SEDIMENT CONTROL MEASURES

INLET PROTECTIONS

CONCRETE WASHOUT PITS

EQUIPMENT STAGING

FUEL STORAGE AND VEHICLE FUELING AREA

CONSTRUCTION TRAILER

SANITATION FACILITY

MATERIAL STOCKPILE LOCATION

CHEMICAL COMPOUND MIXING AND STORAGE AREA

ANY OTHER EROSION CONTROL REQUIRED

2.

ALL WORK REQUIRED TO IMPLEMENT THE SWP3 INCLUDING INSPECTION FEES, MAINTENANCE AND REPAIRS SHALL BE DONE BY AND AT THE EXPENSE OF THE CONTRACTOR.

3.

THE CONTRACTOR SHALL AMEND THE SWP3 WHEN THERE IS A CHANGE IN DESIGN, CONSTRUCTION, OPERATION OR MAINTENANCE THAT HAS A SIGNIFICANT POTENTIAL FOR DISCHARGE OF POLLUTANTS TO SURFACE WATERS OF THE STATE.

4.

ADDITIONAL OR DIFFERENT BMPs MAY BE NEEDED AS CONSTRUCTION PROGRESSES OR REQUIRED BY THE OWNER AND LAKE COUNTY SWCD.

5.

NO CONDITION OF THE SWP3 PERMIT SHALL RELEASE THE CONTRACTOR OF THEIR RESPONSIBILITY OR REQUIREMENTS UNDER ANY OTHER ENVIRONMENTAL STATUE OR REGULATION.

ADMINISTRATIVE NOTES

1.

THE CONTRACTOR SHALL FOLLOW THE PRACTICES AND REQUIREMENTS PROVIDED IN THE OHIO EPA NPDES CONSTRUCTION SITE STORMWATER GENERAL PERMIT OHC000006, THE ODNR RAINWATER AND LAND DEVELOPMENT MANUAL AND THE CITY OF EASTLAKE ORDINANCE CHAPTER 906 SOIL SEDIMENT POLLUTION CONTROL.
2.

ALL PROCEDURES AND REQUIREMENTS CONTAINED IN THE SWP3 APPLY TO ALL GENERAL AND SUBCONTRACTORS. THE CONTRACTOR SHALL IMPLEMENT, INFORM, REQUIRE AND ENFORCE ALL ASPECTS AND PROCEDURES OF THE SWP3.
3.

EROSION AND SEDIMENT CONTROL WORK SHALL BE SUBJECT TO INSPECTION BY THE OWNER'S REPRESENTATIVE AND LAKE COUNTY SWCD.

MAINTENANCE REQUIREMENTS

1.

QUALIFIED INSPECTION PERSONNEL SHALL INSPECT BMPs AFTER ANY STORM EVENT GREATER THAN 1/2-INCH OF RAIN PER 24-HOUR PERIOD BY THE END OF THE NEXT CALENDAR DAY, EXCLUDING NON-WORKING WEEKENDS AND HOLIDAYS, AND AT LEAST EVERY 7 CALENDAR DAYS.
2.

INSPECTION FREQUENCY MAY BE REDUCED TO ONCE PER MONTH FOR DORMANT SITES IF THE ENTIRE SITE IS TEMPORARILY STABILIZED OR RUNOFF IS UNLIKELY DUE TO WINTER CONDITIONS FOR EXTENDED PERIODS OF TIME (I.E. SNOW COVER OR GROUND IS FROZEN). A WAIVER OF INSPECTION REQUIREMENTS IS AVAILABLE UNTIL 1 MONTH BEFORE THAWING CONDITIONS ARE EXPECTED IF ALL THE FOLLOWING CONDITIONS ARE MET:

A.

FROZEN CONDITIONS ARE ANTICIPATED TO CONTINUE FOR EXTENDED PERIODS OF TIME (I.E. MORE THAN 1 MONTH).

B.

SOIL DISTURBANCE ACTIVITIES HAVE BEEN SUSPENDED.

C.

BEGINNING AND ENDING DATES OF THE WAIVER PERIOD ARE DOCUMENTED IN THE SWP3.
3.

AREAS TO BE INSPECTED SHALL INCLUDE DISTURBED AREAS, BMPs, EROSION AND SEDIMENT CONTROLS, DISCHARGE LOCATIONS, MATERIAL STORAGE AREAS, VEHICLE ENTRANCE/EXIT LOCATIONS, ETC.
5.

ANY NON-COMPLIANCE INCIDENTS SHALL BE IDENTIFIED AND MAINTENANCE OR REPAIR MUST BE COMPLETED WITHIN 3 DAYS, AND SEDIMENT POND MAINTENANCE OR REPAIR WITHIN 10 DAYS, OF THE INSPECTION.
6.

WHEN AN INSPECTION REVEALS A BMP IS NOT EFFECTIVE AND A MORE APPROPRIATE BMP IS REQUIRED, THE ABBREVIATED SWP3 SHALL BE AMENDED AND THE NEW BMP INSTALLED WITHIN 10 DAYS OF THE INSPECTION.
7.

WHEN AN INSPECTION REVEALS A REQUIRED BMP HAS NOT BEEN INSTALLED, THE BMP MUST BE INSTALLED PRIOR TO THE NEXT STORM EVENT OR WITHIN 10 DAYS FROM THE INSPECTION.
8.

IF AN INSPECTION REVEALS A REQUIRED BMP IS NOT NEEDED, THE RECORD SHALL CONTAIN AN EXPLANATION AS TO WHY NOT.
9.

BMPs SHALL BE MAINTAINED IN GOOD WORKING ORDER UNTIL ALL UPSLOPE AREAS THEY CONTROL ARE STABILIZED.
10.

ONCE A DEFINABLE AREA HAS BEEN FULLY STABILIZED, IT MAY BE MARKED ON THE SWP3 AND NO FURTHER INSPECTION REQUIREMENTS ARE REQUIRED FOR THAT AREA OF THE SITE.

SWP3 CERTIFICATION STATEMENT

I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHERED AND EVALUATED THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS.

10/01/2025

LENE HILL, PE (PREPARED SWP3)
SENIOR PROJECT MANAGER
DESIGN ENGINEER: VERDANTAS LLC

FIRST & LAST NAME (NPDES PERMITTEE)
TITLE:
OWNER: CITY OF WILLOUGHBY

NAME (IMPLEMENT SWP3)

TITLE

CONTRACTOR:

GOOD HOUSEKEEPING AND OTHER WASTE CONTROL NOTES

1.

MATERIALS OR SUBSTANCES LISTED BELOW ARE ANTICIPATED TO BE PRESENT ON-SITE DURING CONSTRUCTION:

(X) CONCRETE

(X) FERTILIZER

(X) CLEANING SOLVENT

() ASPHALT

(X) TAR

(X) DETERGENT

(X) CMU BLOCK

(X) PAINT

(X) PETROLEUM BASED PRODUCT
2.

STORE ONLY ENOUGH PRODUCT REQUIRED TO DO THE JOB. ALL MATERIALS STORED ON-SITE SHALL BE STORED IN AN ORDERLY MANNER IN APPROPRIATE CONTAINERS AND, IF POSSIBLE, UNDER A ROOF OR OTHER ENCLOSURE.
3.

PRODUCTS SHALL BE KEPT IN ORIGINAL CONTAINERS WITH THE ORIGINAL MANUFACTURER LABEL UNLESS NOT RESEALABLE. PETROLEUM PRODUCTS SHALL BE STORED IN TIGHTLY SEALED CONTAINERS AND CLEARLY LABELED.
4.

ALL OF A PRODUCT SHALL BE USED BEFORE DISPOSING OF THE CONTAINER WHENEVER POSSIBLE. DO NOT MIX PRODUCTS WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER.
5.

DAILY INSPECTION SHALL OCCUR TO ENSURE PROPER USE AND DISPOSAL OF MATERIALS.
6.

SAFETY DATA SHEETS (SDS) SHALL BE KEPT ON-SITE.
7.

SPILL CONTROL PRACTICES:

A.

MANUFACTURER RECOMMENDED METHODS FOR SPILL CLEANUP MUST BE POSTED AND SITE PERSONNEL MADE AWARE OF THE PROCEDURES, LOCATION OF THE INFORMATION AND LOCATION OF CLEANUP SUPPLIES.

B.

SPILL CLEANUP SUPPLIES (I.E. DUST PANS, BROOMS, MOPS, RAGS, GLOVES, GOGGLES, TRASH CONTAINERS, ETC.) AND MATERIALS (I.E. SAWDUST, KITTY LITTER, SAND, ABSORBENT MATERIAL, ETC.) SHALL BE KEPT IN AN ON-SITE MATERIAL STORAGE AREA.

C.

SPILLS SHALL BE CLEANED IMMEDIATELY AFTER DISCOVERY AND PERSONNEL SHALL WEAR APPROPRIATE PROTECTIVE CLOTHING. SMALL PETROLEUM PRODUCT SPILLS (LESS THAN 25 GALLONS) SHALL BE CLEANED PER MANUFACTURER RECOMMENDED METHODS AND DISPOSED WITH THE TRASH. LARGE PETROLEUM PRODUCT SPILLS (25 OR MORE GALLONS) OR ANY TOXIC OR HAZARDOUS MATERIAL SPILL, REGARDLESS OF SIZE, MUST BE REPORTED TO THE APPROPRIATE FEDERAL GOVERNMENT AGENCY, OHIO EPA SPILL HOTLINE (800-282-9378), LOCAL FIRE DEPARTMENT AND LOCAL EMERGENCY PLANNING COMMITTEE (LEPC) WITHIN 30 MINUTES OF THE SPILL. SPILLS THAT RESULT IN CONTACT WITH WATERS OF THE STATE, REGARDLESS OF SIZE OR TYPE, MUST BE REPORTED TO THE OHIO EPA SPILL HOTLINE.

D.

ON-SITE VEHICLES SHALL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE THE CHANCE OF LEAKAGE
8.

IT IS PROHIBITED TO BURN, BURY OR POUR ONTO THE GROUND OR INTO STORM INLETS OR SURFACE WATERS OF THE STATE ANY LIQUID OR SOLID WASTE (I.E. CONSTRUCTION AND DEMOLITION DEBRIS (C&DD), TRASH, BUILDING MATERIALS, SOLVENTS, PAINTS, FUELS, MOTOR OIL, ANTIFREEZE, HYDRAULIC FLUIDS, CURING COMPOUNDS, FORM RELEASE OILS, OTHER TOXIC OR HAZARDOUS WASTE, ETC.).
9.

TRASH AND C&DD SHALL BE COLLECTED IN A SECURELY LIDDED AND LEAK-PROOF DUMPSTER, HAULED OFF-SITE AND EMPTIED AS NECESSARY, AND DISPOSED IN AN OHIO EPA APPROVED LANDFILL. ALL OTHER WASTE MATERIALS SHALL BE DISPOSED IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS OR AS SPECIFIED BY THE MANUFACTURER.
10.

CONTAMINATED SOILS MUST BE TREATED AND/OR DISPOSED IN AN OHIO EPA APPROVED SOLID WASTE MANAGEMENT FACILITY OR HAZARDOUS WASTE TREATMENT, STORAGE OR DISPOSAL FACILITY. THE FOLLOWING PRACTICES SHALL BE USED AS APPROPRIATE TO PREVENT CONTAMINATION FROM SPREADING:

A.

BERMS, TRENCHES AND PITS TO COLLECT CONTAMINATED RUNOFF.

B.

RUNOFF PUMPED INTO A CONTAINER FOR TRANSPORT TO A FACILITY.

C.

CONTAMINATED AREA COVERED WITH TARP OR OTHER METHODS THAT PREVENT STORM WATER CONTACT.
11.

FUEL STORAGE TANKS SHALL BE STORED IN DIKED AREAS WITH A VOLUME OF AT LEAST 110% OF THE LARGEST TANK. A DIKED AREA IS NOT NECESSARY IF A SELF-CONTAINED SPILL PROOF TANK IS USED. AREAS USED FOR FUEL STORAGE TANK STORAGE, FUELING OR VEHICLE MAINTENANCE SHALL NOT BE LOCATED NEAR STORM INLETS, WATERCOURSES OR SURFACE WATERS OF THE STATE.
12.

APPLY FERTILIZER ONLY IN THE MINIMUM AMOUNTS RECOMMENDED BY THE MANUFACTURER. ONCE APPLIED, FERTILIZER SHALL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORM WATER. CONTENTS OF PARTIALLY USED BAGS OF FERTILIZER SHALL BE TRANSFERRED TO A SEALABLE PLASTIC BIN TO AVOID SPILLS.
13.

CONCRETE TRUCKS ARE PROHIBITED TO WASH OUT OR DISCHARGE SURPLUS CONCRETE OR DRUM WASH WATER ONTO THE GROUND OR INTO STORM INLETS OR SURFACE WATERS OF THE STATE. ALL EXCESS CONCRETE AND WASHOUT, INCLUDING FROM HAND MIXERS AND LIGHT EQUIPMENT, MUST BE DISPOSED IN A CONCRETE WASHOUT AREA.
14.

TEMPORARY SANITARY FACILITIES SHALL BE PROVIDED ON-SITE, SERVICED BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR, AND COLLECTED AT LEAST ONCE PER WEEK.
15.

OFF-SITE VEHICLE TRACKING OF SEDIMENT AND DUST SHALL BE MINIMIZED. ADJACENT OFF-SITE PAVED STREETS SHALL BE SWEEP DAILY, OR MORE OFTEN AS NECESSARY, TO REMOVE MUD, DIRT OR ROCK TRACKED FROM THE SITE. DUST CONTROL SHALL BE PROVIDED WITH WATER OR CALCIUM CHLORIDE DUST PALLIATIVE AS NECESSARY. USED OIL MAY NOT BE USED. DUMP TRUCKS HAULING MATERIAL OFF-SITE MUST BE COVERED WITH A TARPULIN.

EROSION & SEDIMENT CONTROL NOTES

1.

SPECIAL MEASURES SHALL BE TAKEN TO STABILIZE DRAINAGE CHANNELS AND STORM WATER OUTFALLS.
2.

PHASE CONSTRUCTION ACTIVITIES TO MINIMIZE LAND DISTURBED AT ANY ONE TIME AND LEAVE EXISTING VEGETATION IN PLACE AS LONG AS POSSIBLE.
3.

STORMWATER DIVERSION PRACTICES SHALL BE USED TO KEEP SURFACE RUNOFF AWAY FROM DISTURBED AREAS AND STEEP SLOPES WHERE PRACTICABLE.
4.

STABILIZATION OF DISTURBED AREAS SHALL, AT A MINIMUM, BE INITIATED WITHIN THE TIME FRAMES IN THE FOLLOWING TABLES:

PERMANENT STABILIZATION	
AREA REQUIRING PERMANENT STABILIZATION	TIME FRAME TO APPLY EROSION CONTROLS
ANY AREAS TO LIE DORMANT FOR 1 YEAR OR MORE.	WITHIN 7 DAYS OF MOST RECENT DISTURBANCE.
ANY AREAS WITHIN 50 FEET OF A SURFACE WATER OF THE STATE (*) AND AT FINAL GRADE.	WITHIN 2 DAYS OF REACHING FINAL GRADE.
OTHER AREAS AT FINAL GRADE.	WITHIN 7 DAYS OF REACHING FINAL GRADE.

TEMPORARY STABILIZATION	
AREA REQUIRING TEMPORARY STABILIZATION	TIME FRAME TO APPLY EROSION CONTROLS
ANY DISTURBED AREAS WITHIN 50 FEET OF A SURFACE WATER OF THE STATE (*) AND NOT AT FINAL GRADE.	WITHIN 2 DAYS OF MOST RECENT DISTURBANCE IF TO REMAIN IDLE MORE THAN 14 DAYS.
ANY DISTURBED AREAS TO BE DORMANT FOR MORE THAN 14 DAYS, BUT LESS THAN 1 YEAR, AND NOT WITHIN 50 FEET OF A SURFACE WATER OF THE STATE (*).	FOR RESIDENTIAL SUBDIVISION, DISTURBED AREAS MUST BE STABILIZED AT LEAST 7 DAYS PRIOR TO TRANSFER OF PERMIT COVERAGE FOR INDIVIDUAL LOT(S).
DISTURBED AREAS THAT WILL BE IDLE OVER WINTER.	PRIOR TO ONSET OF WINTER WEATHER.

(*) SURFACE WATERS OF THE STATE INCLUDE WETLANDS, STREAMS, LAKES, PONDS, MARSHES, WATERCOURSES, WELLS, SPRINGS, IRRIGATION SYSTEMS, DRAINAGE SYSTEMS, AND OTHER ACCUMULATIONS OF WATER, SURFACE AND UNDERGROUND, NATURAL OR ARTIFICIAL.

5.

INLET PROTECTION AND SEDIMENT CONTROLS MUST BE INSTALLED PRIOR TO CLEARING AND GRUBBING.
6.

SEDIMENT PONDS, TEMPORARILY MODIFIED PERMANENT PONDS AND PERIMETER SEDIMENT BARRIERS MUST BE INSTALLED AS THE FIRST STEP OF GRADING AND WITHIN 7 DAYS FROM THE START OF CLEARING AND GRUBBING, AND CONTINUE TO FUNCTION UNTIL ALL DISTURBED UPLAND AREAS ARE STABILIZED.
7.

SEDIMENT CONTROLS MUST POND RUNOFF TO BE CONSIDERED FUNCTIONAL.
8.

SEDIMENT-LADEN TRENCH OR GROUND WATER MUST PASS THROUGH A SEDIMENT-SETTLING POND OR BE DEWATERED IN-PLACE USING A SUMP PIT, FILTER BAG OR OTHER COMPARABLE METHOD PRIOR TO DISCHARGE FROM THE SITE. TRENCH AND GROUND WATER FREE FROM SEDIMENT OR OTHER POLLUTANTS MAY BE DISCHARGED WITHOUT TREATMENT, PROVIDED THIS WATER DOES NOT BECOME POLLUTANT-LADEN BY TRAVERSING OVER DISTURBED SOILS OR OTHER POLLUTANT SOURCES.
9.

SEDIMENT BARRIERS SHALL NOT EXCEED THEIR DESIGN CAPACITIES. INSTALLING SEDIMENT BARRIERS IN PARALLEL SERIES DOES NOT INCREASE THE DESIGN CAPACITY.
10.

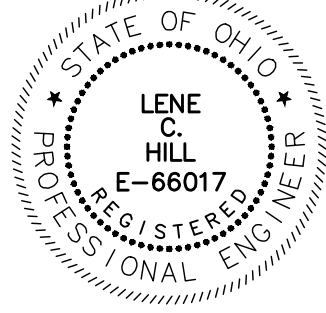
SETTLED MATERIAL SHALL BE DISPOSED IN A LOCATION WHERE IT WILL NOT BE CARRIED OFF-SITE OR INTO A STORM SEWER BY RAINFALL.
11.

SOIL STOCKPILES SHALL BE RINGED WITH SILT FENCE ALONG THE BOTTOM FOOTPRINT. IF THE STOCKPILE WILL BE INACTIVE FOR 14 DAYS OR MORE, THE SURFACE SHALL BE SEEDED OR STABILIZED WITHIN 7 DAYS OF LAST DISTURBANCE.

EROSION CONTROL TIMETABLE

DESCRIPTION	CALENDAR YEAR											
STABILIZATION TYPE	J	F	M	A	M	J	J	A	S	O	N	D
TEMPORARY SEEDING				O	O	☼	☼	☼	☼	O	O	
PERMANENT SEEDING					O	☼	☼	☼	☼	O	O	
MATTING	O	O	O	O	O	O	O	O	O	O	O	O
SODDING				☼	☼	☼	☼	☼	☼	☼		
MULCHING	O	O	O	O	O	O	O	O	O	O	O	O
PAVING					O	O	O	O	O	O		

☼ IRRIGATION NEEDED



verdantas

8150 STERLING COURT
MENTOR, OHIO 44060
(440) 951-9000

ISSUED FOR:	REVIEW	NO	DATE	REVISION
CITY OF WILLOUGHBY	10/3/2025			
LAKE COUNTY	AS NOTED			
WILLOUGHBY, OHIO	LCH			
STANDARD DETAILS - SD SERIES	LCH			
SWPPP COVER	RSS			

CITY OF WILLOUGHBY
LAKE SHORE EAST EQ BASIN
LAKE COUNTY
WILLOUGHBY, OHIO
PHASE II

PROJECT NO.	
230264	
DISCIPLINE	
EROSION	
SHEET NAME	
30C-01	
SHEET	OF
31	48

ADMINISTRATIVE NOTES

1.

AN OHIO EPA NPDES PERMIT IS REQUIRED WHERE CONSTRUCTION ACTIVITIES (I.E. CLEARING, GRUBBING, GRADING, EXCAVATING, FILLING AND/OR TRENCH DEWATERING) AND/OR SUPPORT ACTIVITIES (I.E. CONCRETE OR ASPHALT BATCH PLANT, EQUIPMENT STAGING YARD, MATERIAL STORAGE AREA, AND ON-SITE OR OFF-SITE BORROW AREA OR SOIL DISPOSAL AREA) DISTURB 1 OR MORE ACRES OF LAND, OR SMALLER SITES LESS THAN 1 ACRE THAT ARE PART OF A LARGER COMMON DEVELOPMENT. DISTURBED LAND IS LAND IN WHICH SOILS ARE EXPOSED TO STORM WATER.
2.

A NOI IS REQUIRED FOR THIS PROJECT AND MUST BE FILED WITH THE OHIO EPA AT LEAST 21 DAYS PRIOR TO THE START OF CONSTRUCTION BECAUSE THE TOTAL LAND DISTURBANCE IS GREATER THAN 1 ACRE
3.

THE CONTRACTOR SHALL FOLLOW THE PRACTICES AND REQUIREMENTS PROVIDED IN THE OHIO EPA NPDES CONSTRUCTION SITE STORMWATER GENERAL PERMIT OHC000006 AND THE ODNR RAINWATER AND LAND DEVELOPMENT MANUAL, AND BE RESPONSIBLE FOR ALL NPDES TERMS AND CONDITIONS UNTIL A NOT IS FILED.
4.

NO CONSTRUCTION ACTIVITIES MAY BEGIN UNTIL ALL OF THE FOLLOWING OCCUR:

•

OHIO EPA NPDES AUTHORIZATION LETTER RECEIVED.

•

THE CONTRACTOR FILES A CO-PERMITTEE APPLICATION TO THE OHIO EPA.

•

THE CONTRACTOR ATTENDS A PRE-CONSTRUCTION MEETING WITH THE SWCD TO DISCUSS OHIO EPA NPDES PERMIT REQUIREMENTS.
5.

OHIO EPA APPLICATION FORMS (I.E. NOI, NOT, CO-PERMITTEE NOI/NOT, INDIVIDUAL LOT NOI/NOT AND PERMIT TRANSFER) ARE ONLY ACCESSIBLE ELECTRONICALLY VIA THE OHIO EPA STREAMS APPLICATION SUBMITTAL SYSTEM USING AN INDIVIDUAL EBUSINESS CENTER ACCOUNT. VISIT THE OHIO EPA'S ELECTRONIC BUSINESS SERVICES WEBSITE (HTTPS://EBIZ.EPA.OHIO.GOV/) FOR MORE INFORMATION, GUIDANCE AND REPORTING QUESTIONS.
6.

THE CONTRACTOR SHALL SELECT QUALIFIED INSPECTION PERSONNEL KNOWLEDGEABLE IN THE PRINCIPLES AND PRACTICES OF EROSION AND SEDIMENT CONTROLS FOR INSPECTIONS, MAINTENANCE, REPAIRS, AND COMPLETING INSPECTION AND MAINTENANCE REPORTS. THE CONTRACTOR SHALL COMPLETE A "DELEGATION OF AUTHORITY FOR STORMWATER POLLUTION PREVENTION PLAN".
7.

ALL PROCEDURES AND REQUIREMENTS CONTAINED IN THE SWP3 APPLY TO ALL GENERAL AND SUBCONTRACTORS. THE CONTRACTOR SHALL IMPLEMENT, INFORM, REQUIRE AND ENFORCE ALL ASPECTS AND PROCEDURES OF THE SWP3. THE CONTRACTOR SHALL HAVE ALL SUBCONTRACTORS THAT ARE OR MAY BE ENGAGED IN ACTIVITIES THAT COULD IMPACT STORMWATER COMPLETE A "SUBCONTRACTOR AGREEMENT FOR EROSION AND SEDIMENT CONTROL" TO ACKNOWLEDGE THEY REVIEWED AND UNDERSTOOD THE SWP3.
8.

ALL NPDES PERMITS, NOI, SWP3, INSPECTION LOGS, REPORTS AND CERTIFICATIONS MUST BE SIGNED, KEPT ON-SITE AND IMMEDIATELY AVAILABLE UPON REQUEST BY THE OWNER, SWCD, MS4 OR OHIO EPA.
9.

EROSION AND SEDIMENT CONTROL WORK SHALL BE SUBJECT TO INSPECTION BY THE OWNER, SWCD, MS4 AND OHIO EPA.

PERMIT CLOSURE REQUIREMENTS

1.

FINAL STABILIZATION MEANS ALL THE FOLLOWING HAVE OCCURRED:

A.

SOIL DISTURBING ACTIVITIES HAVE BEEN COMPLETED.

B.

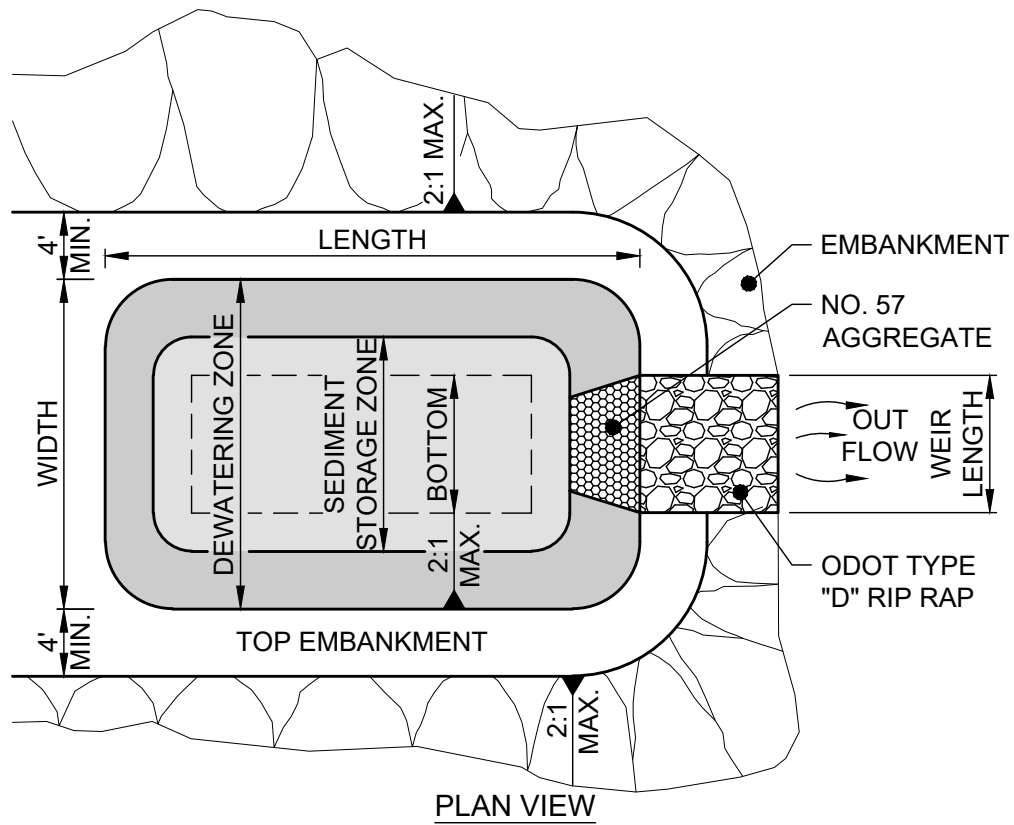
ALL TEMPORARY EROSION AND SEDIMENT CONTROLS HAVE BEEN REMOVED, DISPOSED OFF-SITE AND SEDIMENT TRAPPED BY THOSE CONTROLS IS PERMANENTLY STABILIZED.

C.

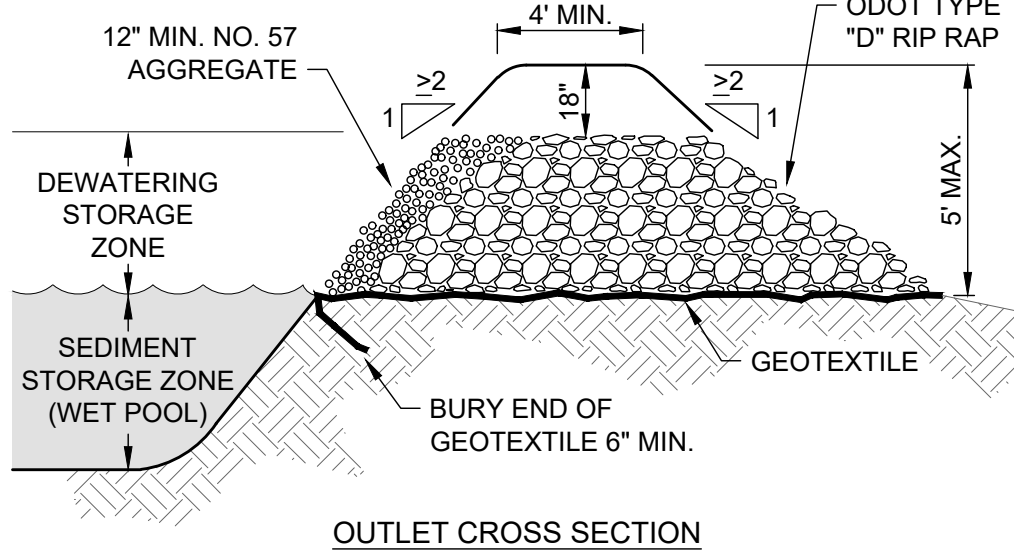
A UNIFORM PERENNIAL VEGETATIVE COVER (I.E. EVENLY DISTRIBUTED WITHOUT LARGE BARE AREAS) WITH A DENSITY OF AT LEAST 70% COVER HAS BEEN ESTABLISHED ON ALL UNPAVED AREAS AND AREAS NOT COVERED BY PERMANENT STRUCTURES.
2.

ONCE THE SITE REACHES FINAL STABILIZATION, THE CONTRACTOR MUST COMPLETE A "FINAL CERTIFICATION AND NOTIFICATION FOR EROSION AND SEDIMENT CONTROL" AND FILE A NOT WITH THE OHIO EPA WITHIN 45 DAYS TO TERMINATE NPDES PERMIT COVERAGE.
3.

THE CONTRACTOR SHALL MAINTAIN ALL NPDES PERMITS, NOI, NOT, SWP3, INSPECTION LOGS, REPORTS AND CERTIFICATIONS FOR 3 YEARS AFTER THE NOT IS FILED, AND PROVIDE DIGITAL COPIES TO THE OWNER FOR THE SAME RECORD KEEPING REQUIREMENT.



DRAINAGE AREA	WEIR LENGTH
< 1 AC.	4 FT.
< 2 AC.	6 FT.
< 3 AC.	8 FT.
< 4 AC.	10 FT.
< 5 AC.	12 FT.



NOTES:

1.

WORK SHALL CONSIST OF INSTALLATION, MAINTENANCE AND REMOVAL OF SEDIMENT TRAP.
2.

SEDIMENT TRAP MUST BE CONSTRUCTED AND OPERATIONAL PRIOR TO UPSLOPE LAND DISTURBANCE.
3.

THE AREA BENEATH THE EMBANKMENT SHALL BE CLEARED, GRUBBED AND STRIPPED OF VEGETATION TO A MINIMUM DEPTH OF 6". THE POOL SHALL BE CLEARED AS NEEDED TO FACILITATE SEDIMENT CLEANOUT.
4.

EMBANKMENT FILL SHALL BE FREE OF ROOTS OR OTHER WOODY VEGETATION, LARGE ROCKS, ORGANICS OR OTHER OBJECTIONABLE MATERIALS. FILL MATERIAL SHALL BE PLACED IN 6" LIFTS AND COMPACTED. CONSTRUCTION SHALL NOT BE PERMITTED IF THE FILL OR COMPACTION SURFACE IS FROZEN.
5.

DIKES DIRECTING WATER TO THE TRAP SHALL BE HIGHER THAN THE HEIGHT OF THE EMBANKMENT.
6.

67 C.Y. OF STORAGE VOLUME IS REQUIRED BELOW THE OUTLET CREST FOR EACH 1 AC. OF CONTRIBUTING DRAINAGE AREA. THIS STORAGE VOLUME IS ACHIEVED BY THE DIMENSIONS SHOWN ON THE PLANS.
7.

ESTABLISH TEMPORARY SEEDING ON ALL NON-SUBMERGED AREAS AND MAINTAIN OVER THE LIFE OF THE SEDIMENT TRAP.
8.

WHERE GEOTEXTILE IS USED, OVERLAPS SHALL BE 2' MINIMUM WITH THE UPPER MOST LAYER PLACED LAST.
9.

WARNING SIGNS AND SAFETY FENCE SHALL BE PLACED AROUND THE ENTIRE SEDIMENT TRAP AND MAINTAINED UNTIL THE SEDIMENT TRAP IS REMOVED.
10.

REMOVE SEDIMENT AND RESTORE THE SEDIMENT TRAP TO ITS ORIGINAL DIMENSIONS WHEN SEDIMENT HAS FILLED 40% OF THE TRAP'S ORIGINAL DEPTH. SPREAD REMOVED SEDIMENT IN A SUITABLE AREA AND STABILIZED SO IT WILL NOT ERODE.
11.

AFTER UPSLOPE SEDIMENT PRODUCING AREAS HAVE BEEN PERMANENTLY STABILIZED, THE SEDIMENT TRAP AND ALL SEDIMENT SHALL BE REMOVED, BACKFILLED AND SEEDED.

SEDIMENT TRAP DETAIL

SCALE: NONE

WATER QUALITY VOLUME (WQv)

TYPE OF CONSTRUCTION:
(X) NEW () REDEVELOPMENT

TYPE OF EXTENDED DETENTION POST-CONSTRUCTION PRACTICE:
(X) DRY EXTENDED DETENTION BASIN WITH FOREBAY & MICROPOOL

PER OHIO EPA NPDES CGP #OHC000006, WATER QUALITY VOLUME FOR POST-CONSTRUCTION BMPs SHALL BE DETERMINED USING EQUATIONS:

$$WQv = Rv * P * A_{TOT} / 12$$
$$Rv = 0.05 + (0.9 * i)$$

STEP 1: DETERMINE POST-VOLUMETRIC RUNOFF COEFFICIENT

$$A_{TOT} = 1.26 \text{ AC}$$
$$A_{MP} = 0.31 \text{ AC}$$
$$i = A_{MP} / A_{TOTAL}$$
$$= 0.31 \text{ AC} / 1.26 \text{ AC} = 0.25$$
$$Rv = 0.05 + (0.9 * i)$$
$$= 0.05 + [0.9 * 0.25] = 0.27$$

STEP 2: DETERMINE WATER QUALITY VOLUME

$$WQv = Rv * P * A_{TOT} / 12$$
$$= 0.27 * 0.90 \text{ IN} * [(1.26 \text{ AC}) / (12 \text{ IN/FT})]$$
$$= 0.026 \text{ AC-FT} = 1.117 \text{ CF}$$

STEP 3: DETERMINE SEDIMENT STORAGE VOLUME

$$V_{SED} = 0.20 * WQv$$
$$= 0.20 * 1.117 \text{ CF} = 223 \text{ CF}$$

STEP 4: DETERMINE TOTAL WATER QUALITY VOLUME

$$WQv_{TOT} = WQv + V_{SED}$$
$$= 1.117 \text{ CF} + 223 \text{ CF} = 1.340 \text{ CF}$$

STEP 5: DETERMINE FOREBAY VOLUME

$$V_{FORE} = 0.10 * WQv$$
$$= 0.10 * 1.117 \text{ CF} = .112 \text{ CF}$$

STEP 6: DETERMINE MICROPOOL VOLUME

$$V_{MICRO} = 0.10 * WQv$$
$$= 0.10 * 1.117 \text{ CF} = .112 \text{ CF}$$

STEP 7: DETERMINE WATER QUALITY VOLUME AVERAGE RELEASE RATE

$$Q_{AVG} = WQv_{TOT} / t_b$$
$$= 1.117 \text{ CF} / [(48 \text{ HR}) * (3,600 \text{ S/HR})]$$
$$= 0.01 \text{ CFS}$$

STEP 8: ESTIMATE OUTLET ORIFICE AREA

$$H_{AVG} = H_{MAX} / 2$$
$$= 0.57 \text{ FT} / 2$$
$$= 0.28 \text{ FT}$$
$$C = 0.6 \text{ (SHARP-EDGE ORIFICE)}$$
$$A_{ORIF} = Q_{AVG} / [C * (2 * g * H_{AVG})^{0.5}]$$
$$= (0.01 \text{ CFS}) / [0.6 * (2 * 32.2 \text{ FT/S}^2 * 0.28 \text{ FT})^{0.5}]$$
$$= 0.003 \text{ SF} = 0.36 \text{ SQ IN}$$

STEP 9: DETERMINE ORIFICE DIMENSIONS FOR CIRCULAR ORIFICE:

$$D_{ORIF} = [(4 * A_{ORIF}) / \pi]^{0.5}$$
$$= [(4 * 0.38 \text{ SF}) / 3.14159]^{0.5}$$
$$= 0.06 \text{ FT} = 0.68 \text{ IN}$$

USE $D_{ORIF} = 0.70 \text{ IN}$

WHERE:

A_{MP} = IMPERVIOUS AREA DRAINING INTO BMP (AC)
 A_{ORIF} = ORIFICE AREA (SF)
 A_{TOT} = TOTAL AREA DRAINING INTO BMP (AC)
 C = COEFFICIENT OF DISCHARGE
 D_{ORIF} = ORIFICE DIAMETER (IN)
 g = ACCELERATION OF GRAVITY (32.2 FT/S²)
 H_{AVG} = $H_{MAX} / 2$ = AVERAGE HYDRAULIC HEAD (FT)
 H_{MAX} = (BRIMFUL WQv ELEVATION) - (WQv OUTLET ELEVATION)
 i = FRACTION OF POST-CONSTRUCTION IMPERVIOUS AREA
 i = IMPERVIOUS FRACTION
 P = PRECIPITATION DEPTH (0.90 IN)
 Q_{AVG} = AVERAGE DISCHARGE RATE (CFS)
 Rv = VOLUMETRIC RUNOFF COEFFICIENT
 t_b = MINIMUM DRAIN TIME (HR)
 V_{FORE} = FOREBAY VOLUME (CF)
 V_{MICRO} = MICROPOOL VOLUME (CF)
 V_{SED} = SEDIMENT STORAGE VOLUME (CF)
 WQv = WATER QUALITY VOLUME (AC-FT)
 WQv_{TOT} = TOTAL WATER QUALITY VOLUME WITH 20% SEDIMENT (AC-FT)



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8150 STERLING COURT
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(440) 951-9000

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10/3/2025	AS NOTED			
DESIGNED BY:	LCH			
DRAWN BY:	LCH			
CHECKED BY:	RSS			

CITY OF WILLOUGHBY
LAKESHORE EAST EQ BASIN
PHASE II

LAKE COUNTY

WILLOUGHBY, OHIO

STANDARD DETAILS - SD SERIES

SWPPP NOTES AND CALCS

PROJECT NO.

230264

DISCIPLINE

EROSION

SHEET NAME

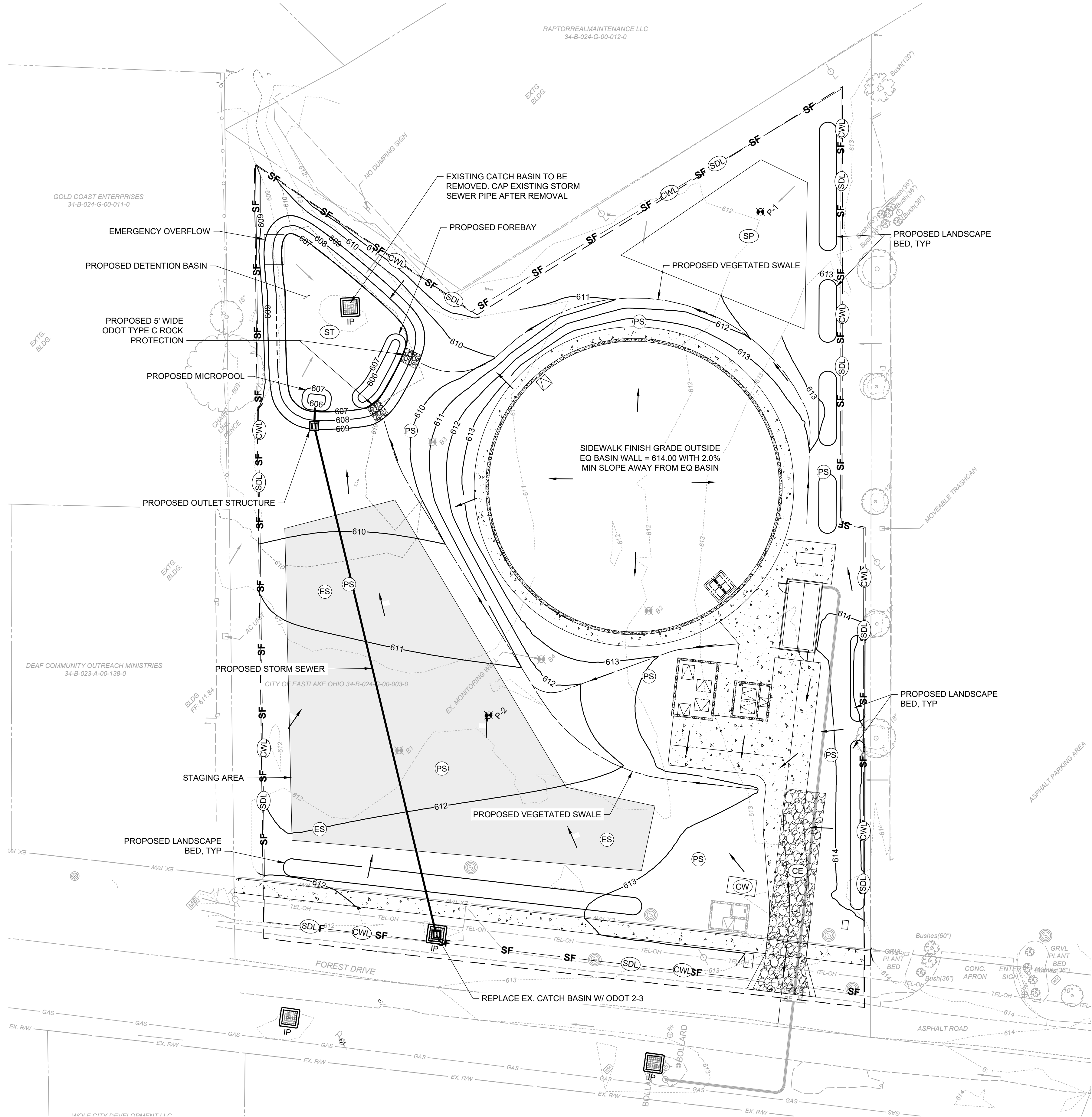
30C-02

SHEET

32

OF

48



PLAN VIEW

LEGEND

CWL

CONSTRUCTION WORK LIMIT

SDL

SOIL DISTURBANCE LIMIT

ES

EQUIPMENT STAGING

SF

SILT FENCE

PS

PERMANENT SEEDING

IP

INLET PROTECTION

CE

CONSTRUCTION ENTRANCE

SP

STOCKPILE AREA

ST

SEDIMENT TRAP

CW

CONCRETE WASHOUT PIT

STAGING AREA

STATE OF OHIO

LENE C. HILL

E-66017

REGISTERED PROFESSIONAL ENGINEER

verdantas

8150 STERLING COURT
MENTOR, OHIO 44060
(440) 951-9000

ISSUED FOR:	REVIEW	NO	REVISION	DATE
10/3/2025	AS NOTED			
DESIGNED BY:	LCH			
DRAWN BY:	LCH			
CHECKED BY:	RSS			

CITY OF WILLOUGHBY

LAKESHORE EAST EQ BASIN

PHASE II

LAKE COUNTY

WILLOUGHBY, OHIO

SITE IMPROVEMENT - 01 SERIES

SWPPP PLAN

PROJECT NO.

230264

DISCIPLINE

EROSION

SHEET NAME

30C-03

SHEET

33

OF

48

DELEGATION OF AUTHORITY FOR
EROSION AND SEDIMENT CONTROL

PROJECT NAME: _____

PROJECT ADDRESS: _____

I, _____, HEREBY DESIGNATE
THE PERSON OR DESCRIBED POSITION BELOW TO BE A DULY AUTHORIZED REPRESENTATIVE FOR
THE PURPOSE OF OVERSEEING COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS, INCLUDING
THE OHIO EPA NPDES CONSTRUCTION GENERAL PERMIT, AT THE DESIGNATED PROJECT. THE
DESIGNEE IS AUTHORIZED TO SIGN REPORTS, STORM WATER POLLUTION PREVENTION PLANS (SWP3)
AND OTHER DOCUMENTS AS REQUIRED BY THE NPDES PERMIT.

NAME OF QUALIFIED PERSON AND/OR POSITION

COMPANY NAME PHONE NO.

STREET ADDRESS

BY SIGNING THIS AUTHORIZATION, I CERTIFY UNDER THE PENALTY OF LAW THAT ALL REQUIRED
DOCUMENTS WILL BE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A
SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE
INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON(S) WHO MANAGES THE SYSTEM
OR IS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION TO BE
SUBMITTED WILL BE, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE AND
COMPLETE. I AM AWARE THERE ARE SUBSTANTIAL PENALTIES FOR SUBMITTING FALSE
INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS.

COMPANY NAME PHONE NO.

STREET ADDRESS

PRINT NAME AND TITLE

SIGNATURE DATE

SUBCONTRACTOR AGREEMENT FOR
EROSION AND SEDIMENT CONTROL

PROJECT NAME: _____

PROJECT ADDRESS: _____

BY SIGNING THIS AGREEMENT, I CERTIFY UNDER THE PENALTY OF LAW THAT I HAVE READ AND
UNDERSTAND THE TERMS AND CONDITIONS OF THE STORM WATER POLLUTION PREVENTION PLAN
(SWP3) FOR THE DESIGNATED PROJECT AND AGREE TO FOLLOW THE PRACTICES DESCRIBED. AS A
SUBCONTRACTOR, I AM REQUIRED TO COMPLY WITH THE SWP3 FOR ANY WORK I PERFORM AT THE
PROJECT. IT IS MY RESPONSIBILITY TO OBTAIN A COPY OF THE SWP3 FROM THE CONTRACTOR AND
TO ADVISE MY EMPLOYEES WORKING ON THIS PROJECT OF THE REQUIREMENTS. I AM AWARE THERE
ARE SUBSTANTIAL PENALTIES OR LOSS OF CONTRACT FOR VIOLATING ANY CONDITION OF THE SWP3,
INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS.

COMPANY NAME PHONE NO.

STREET ADDRESS

PRINT NAME AND TITLE

SIGNATURE DATE

DESCRIPTION OF CONSTRUCTION SERVICE(S) I AM TO PROVIDE:

FINAL CERTIFICATION AND NOTIFICATION
FOR EROSION AND SEDIMENT CONTROL

PROJECT NAME: _____

PROJECT ADDRESS: _____

I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED
UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE
THAT QUALIFIED PERSONNEL PROPERLY GATHERED AND EVALUATED THE INFORMATION SUBMITTED
FOR THE DESIGNATED PROJECT. BASED ON MY INQUIRY OF THE PERSON(S) WHO MANAGED THE
SYSTEM OR DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION
SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE AND COMPLETE. I AM
AWARE THERE ARE SUBSTANTIAL PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE
POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS.

COMPANY NAME PHONE NO.

STREET ADDRESS

PRINT NAME AND TITLE

SIGNATURE DATE

GRADING AND STABILIZATION ACTIVITY LOG

PROJECT NAME: _____ SHEET NO.: _____

PROJECT ADDRESS: _____

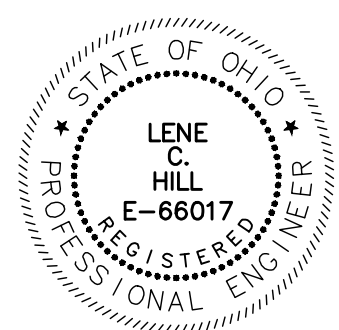
DATE GRADING ACTIVITY INITIATED	DESCRIPTION OF GRADING ACTIVITY	DATE GRADING ACTIVITY CEASED	STABILIZATION MEASURE INITIATED		DESCRIPTION OF STABILIZATION MEASURE AND LOCATION (ATTACH SKETCH IF NECESSARY)
			DATE	TYPE	
				☐ TEMP. ☐ PERM.	
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EROSION AND SEDIMENT CONTROL AMENDMENT LOG

PROJECT NAME: _____ SHEET NO.: _____

PROJECT ADDRESS: _____

AMENDMENT NO.	DATE OF AMENDMENT	DESCRIPTION OF AMENDMENT	DESCRIPTION OF STABILIZATION MEASURE AND LOCATION (ATTACH SKETCH IF NECESSARY)



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MENTOR, OHIO 44060
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ISSUE DATE: 10/3/2025	AS NOTED			
SCALE:	PTV			
DESIGNED BY:	PTV			
DRAWN BY:	RSS			
CHECKED BY:				

CITY OF WILLOUGHBY
LAKESHORE EAST EQ BASIN
LAKE COUNTY
WILLOUGHBY, OHIO
PHASE II

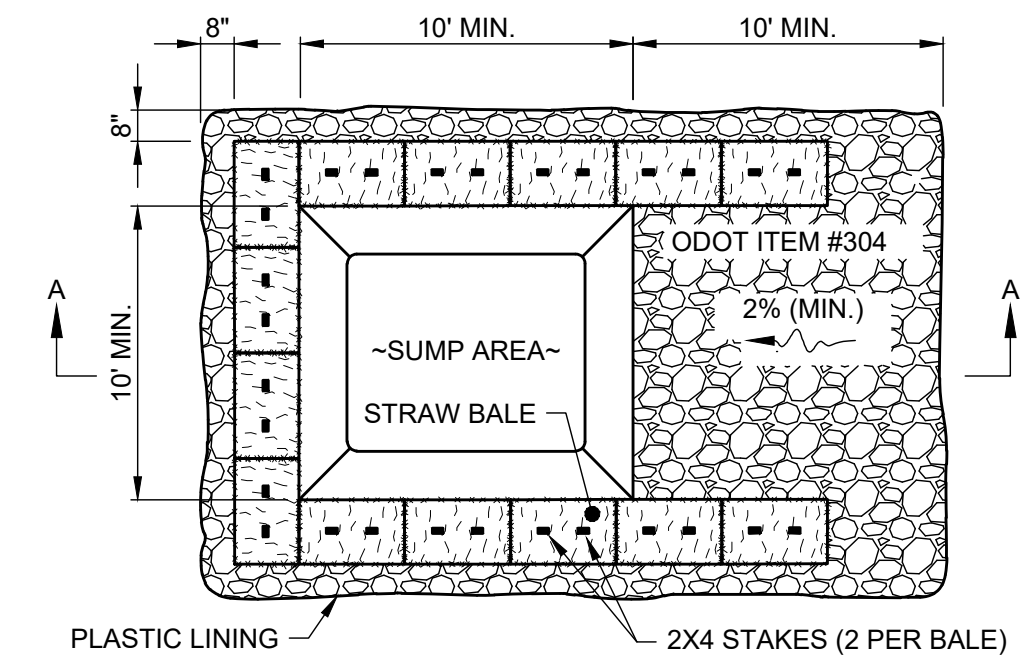
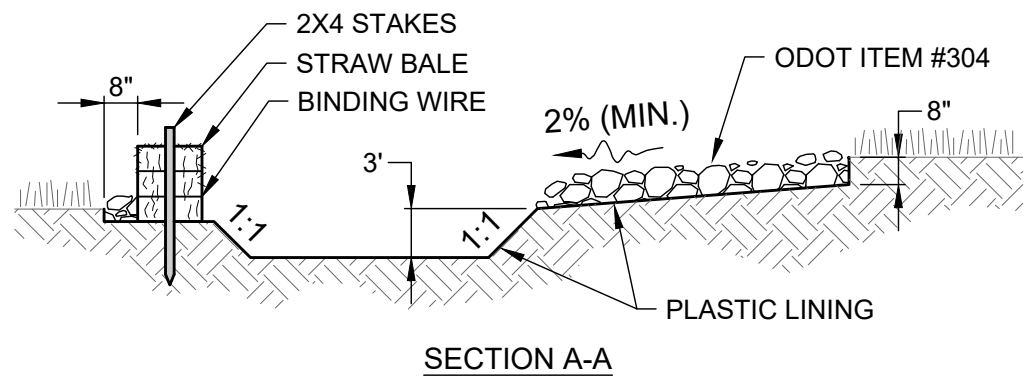
STANDARD DETAILS - SD SERIES
SWPPP FORMS

PROJECT NO.
230264

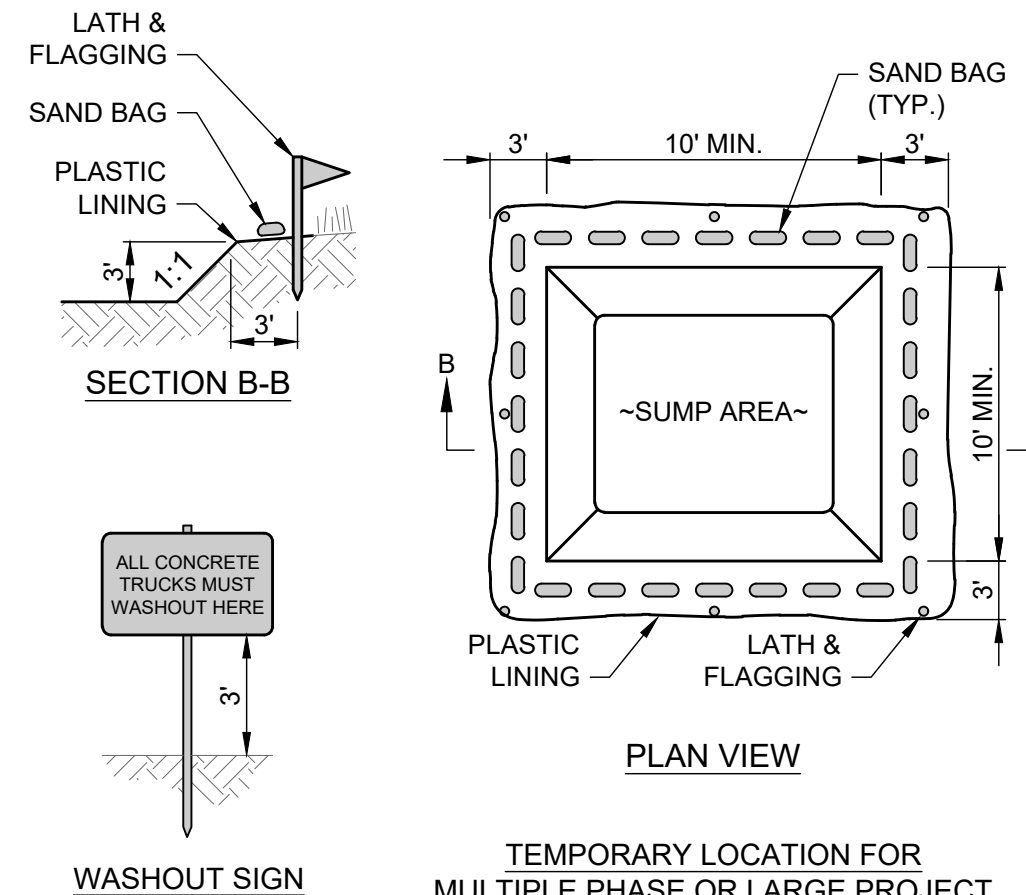
DISCIPLINE
EROSION

SHEET NAME
30C-04

SHEET OF
34 48



SINGLE LOCATION FOR SMALL PROJECT



TEMPORARY LOCATION FOR MULTIPLE PHASE OR LARGE PROJECT

NOTES:

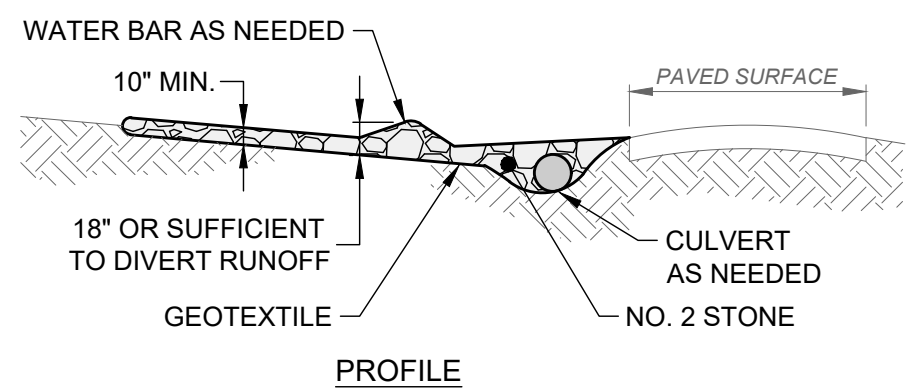
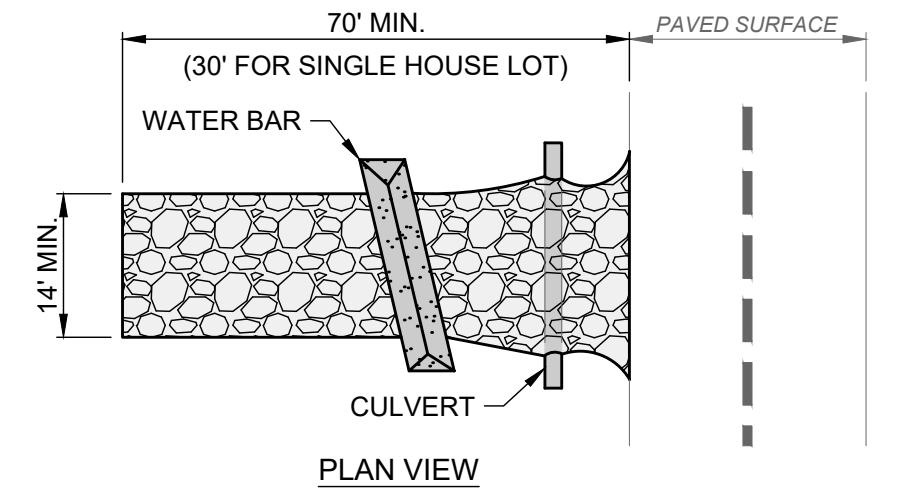
1. CONCRETE WASHOUT AREA SHALL BE LOCATED A MINIMUM OF 100' FROM STORM SEWER INLETS, STREAMS, WETLANDS OR ANY OTHER SURFACE WATERS OF THE STATE.
2. IF CONCRETE WASHOUT AREA IS LOCATED AWAY FROM A PAVED SURFACE, CONSTRUCT A GRAVEL ACCESS ROUTE EQUAL IN COMPOSITION TO A CONSTRUCTION ENTRANCE.
3. CONCRETE WASHOUT AREA SHALL BE SUFFICIENT SIZE TO CONTAIN CONCRETE WASTE GENERATED. LARGE SITES MAY REQUIRE MULTIPLE CONCRETE WASHOUT AREAS.
4. PLASTIC LINING SHALL BE DOUBLE-LINED, CONTINUOUS 10-ML POLYETHYLENE SHEETING FREE OF HOLES, TEARS OR OTHER DEFECTS INSTALLED ON A SMOOTH, LEVEL SURFACE, FREE OF LARGE ROCKS AND DEBRIS.
5. CONCRETE WASHOUT SIGNAGE SHALL BE CLEARLY VISIBLE AND LOCATED WITHIN 30 FEET OF EACH WASHOUT AREA.
6. CONCRETE WASHOUT AREA SHALL BE COVERED DURING INCLEMENT WEATHER TO PREVENT OVERFLOW.
7. PREFABRICATED, PORTABLE AND RE-USABLE CONCRETE WASHOUT CONTAINERS ARE ACCEPTABLE.
8. CONCRETE WASHOUT AREA SHALL BE INSPECTED DAILY TO CHECK FOR DAMAGE AND DETERMINE IF IT NEEDS CLEANED OR REPLACED. ANY DAMAGE TO THE SIDEWALLS OR PLASTIC LINING SHALL BE REPAIRED IMMEDIATELY. REPLACE THE ENTIRE CONCRETE WASHOUT AREA WHEN IT IS 75% FULL.

CONCRETE WASHOUT DETAIL
SCALE: NONE

1. THE SEED BED SHALL BE PULVERIZED AND LOOSE TO ENSURE THE SUCCESS OF ESTABLISHING VEGETATION.
2. SOIL AMENDMENTS MAY BE REQUIRED TO ESTABLISH VEGETATION. PERFORM SOIL TESTS TO PREDICT THE NEED FOR LIME OR FERTILIZER. IN LIEU OF A SOIL TEST, APPLY LIME AT 2 TONS/AC. OR FERTILIZER AT 500 LB/AC. OF 10-10-10 OR 12-12-12 ANALYSIS
3. APPLY SEED UNIFORMLY. COVER BROADCASTED SEED BY RAKING OR DRAGGING, AND LIGHTLY TAMPING INTO PLACE.
4. MULCH SHALL BE APPLIED IMMEDIATELY AFTER SEEDING.
5. INSPECT FOR SOIL EROSION OR VEGETATION LOSS AND REPAIR BARE OR SPARSE AREAS, FILL GULLIES, RE-FERTILIZE, RE-SEED AND RE-MULCH AS NEEDED.

TEMPORARY SEEDING SPECIES SELECTION			
DATES	SPECIES	LB/1,000 SF	LB/AC.
MARCH 1 - AUGUST 15	OATS	3	128
	TALL FESCUE	1	40
	PERENNIAL RYEGRASS	1	40
AUGUST 16 - OCTOBER 31	PERENNIAL RYEGRASS	2	40
	TALL FESCUE	1	40
	RYE	3	112
	TALL FESCUE	1	40
	PERENNIAL RYEGRASS	1	40
NOVEMBER 1 - FEBRUARY 28	WHEAT	3	120
	TALL FESCUE	1	40
	PERENNIAL RYEGRASS	1	40
	PERENNIAL RYEGRASS	2	40
	TALL FESCUE	1	40
ONLY MULCH OR DORMANT SEEDING.			

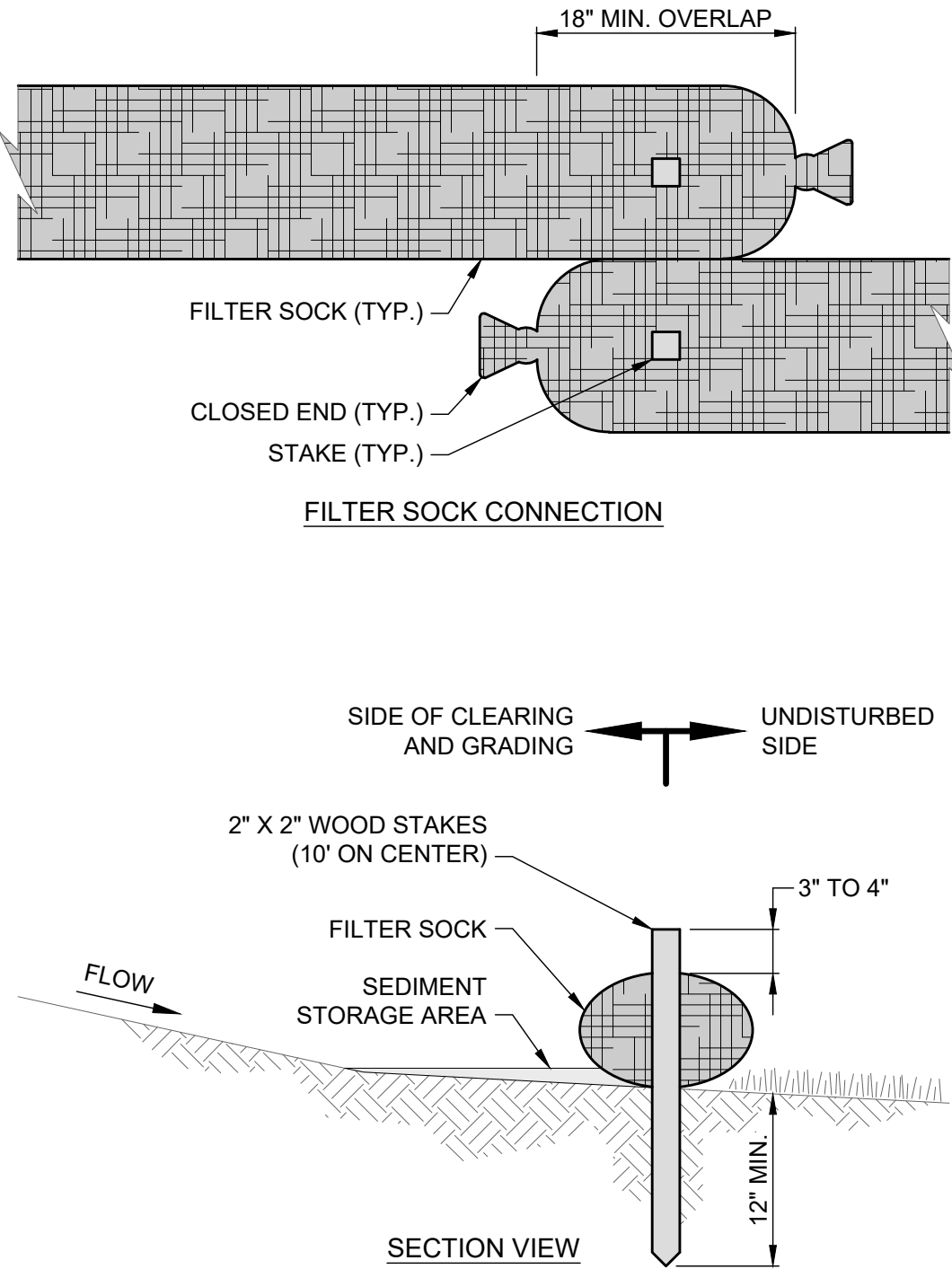
TEMPORARY SEEDING NOTES



NOTES:

1. GEOTEXTILE SHALL BE COMPOSED OF STRONG ROT-PROOF POLYMERIC FIBERS MEETING THE FOLLOWING:
2. INSTALL WATER BAR, AS NEEDED, TO PREVENT SURFACE RUNOFF FROM FLOWING OUT ONTO PAVEMENT.
3. APPLY ADDITIONAL STONE AS CONDITIONS DEMAND, REPLENISH STONE WHEN THE DEPTH IS LESS THAN 6", AND REPLACE IF STONES BECOMES MUD-LADEN.
4. IMMEDIATELY REMOVE MUD DROPPED, WASHED OR TRACKED ONTO ROADS OR ANY SURFACE WHERE RUNOFF IS NOT CHECKED BY SEDIMENT CONTROLS BY SCRAPING OR SWEEPING.
5. CONSTRUCTION ENTRANCE SHALL NOT BE RELIED UPON TO REMOVE MUD FROM VEHICLES OR PREVENT OFF-SITE TRACKING. VEHICLES THAT ENTER AND LEAVE THE SITE SHALL BE RESTRICTED FROM MUDDY AREAS.
6. CONSTRUCTION ENTRANCE SHALL REMAIN UNTIL THE DISTURBED AREA IS STABILIZED OR REPLACED WITH A PERMANENT ROADWAY.

CONSTRUCTION ENTRANCE DETAIL
SCALE: NONE



NOTES:

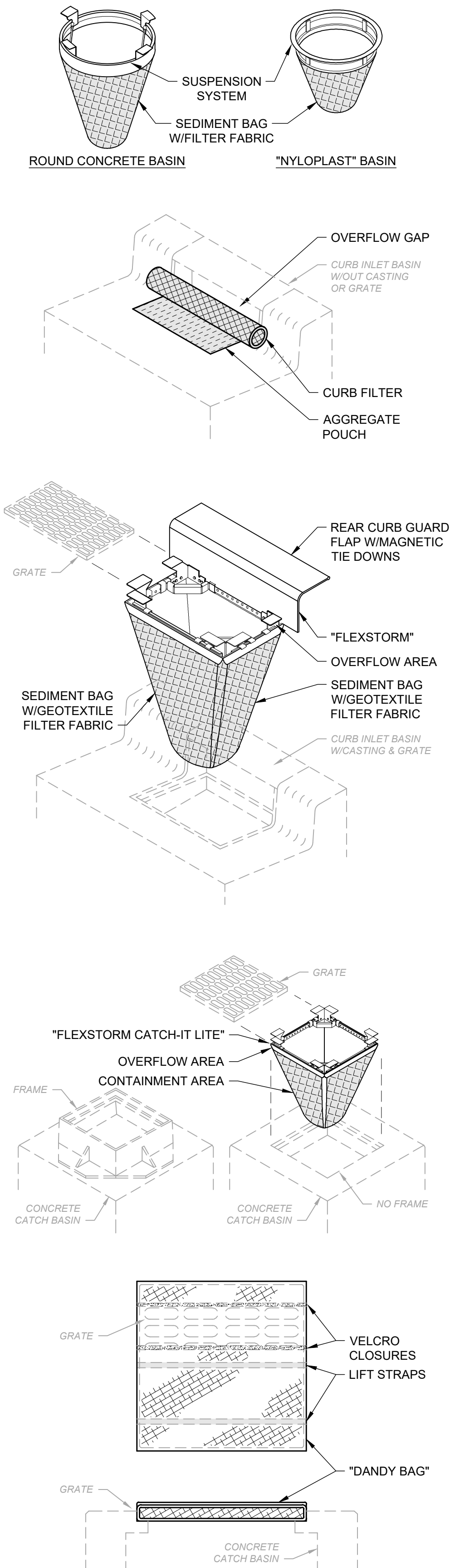
1. FILTER SOCKS SHALL BE CONTINUOUS, TUBULAR, HDPE KNITTED MESH NETTING MATERIAL, FILLED WITH COMPOST.
2. COMPOST SHALL BE WEED, PATHOGEN AND INSECT FREE, FREE OF REFUSE, CONTAMINANTS OR MATERIALS TOXIC TO PLANT GROWTH, BE DERIVED FROM A WELL-DECOMPOSED SOURCE OF ORGANIC MATTER, AND CONSIST OF PARTICLES RANGING FROM 3/8" TO 2".
3. FILTER SOCKS SHALL BE PLACED ON A LEVEL LINE ACROSS SLOPES PARALLEL TO THE BASE OF THE SLOPE. ON SLOPES APPROACHING 2:1, ADDITIONAL SOCKS SHALL BE PROVIDED AT THE TOP AND MID-SLOPE.
4. THE FLAT DIMENSION OF THE SOCK SHALL BE AT LEAST 1.5 TIMES THE NOMINAL DIAMETER.
5. FILTER SOCKS SHALL BE PLACED AT LEAST 5' FROM THE TOE OF SLOPE FOR SEDIMENT DEPOSIT.
6. TRAFFIC SHALL NOT BE PERMITTED TO CROSS FILTER SOCKS.
7. BUILT UP SEDIMENT SHALL BE REMOVED WHEN IT HAS REACHED 1/3 THE FILTER SOCK HEIGHT.
8. BIODEGRADABLE FILTER SOCKS SHALL BE REPLACED AFTER 6 MONTHS; PHOTODEGRADABLE SOCKS AFTER 1 YEAR. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
9. WHEN A FILTER SOCK IS NO LONGER REQUIRED, IT SHALL BE DISPERSED ON-SITE.
10. THE MAXIMUM DRAINAGE AREA PER 100 FEET OF FILTER SOCK IS 1/2 ACRE AND IS DEPENDENT ON THE SLOPE PER THE CHARTS BELOW:

MAX. DRAINAGE AREA (AC.) PER 100-FT OF FILTER SOCK (*)	RANGE OF SLOPE PER INDIVIDUAL DRAINAGE AREA
0.50 AC.	<2% (50H:1V)
0.25 AC.	≥2% (50H:1V) BUT <20% (5H:1V)
0.125 AC.	≥20% (5H:1V) BUT <50% (2H:1V)

(*) FILTER SOCK CANNOT BE USED FOR SLOPES ≥50% (2H:1V).

MAX. SLOPE LENGTH ABOVE FILTER SOCK				
SLOPE (%)	RATIO (H:V)	12"	18"	24"
0% TO <2%	0 TO <50:1	250'	300'	350'
≥2% TO <10%	≥50:1 TO <10:1	125'	200'	25'
≥10% TO <20%	≥10:1 TO <5:1	100'	150'	200'
≥20% TO <50%	≥5:1 TO ≥2:1	50'	75'	100'

FILTER SOCK DETAIL
SCALE: NONE



NOTES:

1. ALL NEW AND EXISTING STORM INLET BASINS WITHIN THE WORK LIMITS SHALL HAVE INLET PROTECTION INSTALLED.
2. INLET PROTECTION SHALL BE INSTALLED AS EACH STORM INLET IS CONSTRUCTED.
3. NOT ALL ITEMS SHOWN MAY APPLY OR DIFFERENT TYPES OR CONFIGURATIONS MAY BE REQUIRED. THE CONTRACTOR SHALL MEASURE EACH INLET TO CONFIGURE AND ASSEMBLE CUSTOMIZED INLET FILTERS.

INLET PROTECTION DETAIL
SCALE: NONE

1. MULCH SHALL CONSIST OF ONE OF THE FOLLOWING:
 - A. UNROTTED SMALL GRAIN STRAW SPREAD UNIFORMLY AT 2 TONS/AC. (2 TO 3 BALES).
 - B. WOOD-CELLULOSE FIBER (I.E. HYDROSEEDING) APPLIED AT 1 TON/AC.
 - C. ROLLED EROSION CONTROL PRODUCT OR MULCH MATTING APPLIED PER MANUFACTURER RECOMMENDATION.
 - D. WOOD MULCH OR CHIPS APPLIED AT 6 TONS/AC.
2. MULCH SHALL BE ANCHORED IMMEDIATELY BY ONE OF THE FOLLOWING METHODS:
 - A. PUNCH OR ANCHOR THE MULCH MATERIAL INTO THE SOIL USING A DISK, CRIMPER OR SIMILAR TOOL.
 - B. NETTING PER MANUFACTURER RECOMMENDATION IN CONCENTRATED RUNOFF AREAS OR CRITICAL SLOPES.
 - C. SYNTHETIC BINDERS AT MANUFACTURER RATE.
 - D. WOOD-CELLULOSE FIBER BINDER AT A NET DRY WEIGHT OF 750 LB/AC., MIXED WITH WATER, AND CONTAIN 50 LB/100 GAL. MAX. OF WOOD CELLULOSE FIBER.

MULCHING NOTES

1. SUBSOILING SHALL OCCUR WHEN SOIL MOISTURE IS LOW ENOUGH TO ALLOW THE SOIL TO CRACK OR FRACTURE. SUBSOILING IS NOT PERMITTED ON SLIP-PRONE AREAS.
2. THE SEED BED SHALL BE PREPARED BY APPLYING AGRICULTURAL GROUND LIME OR FERTILIZER AS RECOMMENDED BY A SOIL TEST. IN LIEU OF A SOIL TEST, APPLY LIME AT 2 TONS/AC. OR FERTILIZER AT 500 LB/AC. OF 10-10-10 OR 12-12-12 ANALYSIS. LIME AND FERTILIZER SHALL BE WORKED INTO THE SOIL TO A DEPTH OF 3".
3. APPLY SEED UNIFORMLY ON FIRM, MOIST SEED BED BETWEEN MARCH 1 AND MAY 31 OR AUGUST 1 AND SEPTEMBER 30. TILLAGE FOR SEEDBED PREPARATION SHALL OCCUR WHEN THE SOIL IS DRY ENOUGH TO CRUMBLE AND NOT FORM RIBBONS WHEN COMPRESSED BY HAND. SEEDING SHOULD NOT BE APPLIED BETWEEN OCTOBER 1 AND NOVEMBER 20 BECAUSE SEEDS MAY GERMINATE, BUT WILL NOT SURVIVE THE WINTER. IF SEEDING MUST OCCUR, INCREASE THE SEEDING RATE BY 50% AND ANCHOR. APPLY ADDITIONAL MULCH AND IRRIGATION AS REQUIRED TO ENSURE GERMINATION.
4. MULCH SHALL BE APPLIED IMMEDIATELY AFTER SEEDING.
5. SEEDING SHALL INCLUDE IRRIGATION TO ESTABLISH VEGETATION DURING DRY OR HOT WEATHER OR ON ADVERSE SITE CONDITIONS.
6. SEEDING SHALL NOT BE CONSIDERED ESTABLISHED FOR AT LEAST 1 FULL YEAR FROM THE TIME OF SEEDING. DURING THIS PERIOD INSPECT FOR SOIL EROSION OR VEGETATION LOSS AND REPAIR BARE OR SPARSE AREAS, FILL GULLIES, RE-FERTILIZE, RE-SEED AND RE-MULCH AS NEEDED.
7. ADEQUATE PERMANENT VEGETATION SHALL BE GROUND COVER DENSE ENOUGH TO COVER 80% OF THE SOIL SURFACE BASED ON VISUAL INSPECTION.

PERMANENT SEEDING FERTILIZATION AND MOWING CHART			
MIXTURE	FORMULA	LB/ AC.	TIME
CREeping RED FESCUE DOMESTIC RYEGRASS KENTUCKY BLUEGRASS	10-10-10	500	FALL, YEARLY, OR AS NEEDED
TALL FESCUE	10-10-10	500	>3"
TURF-TYPE FESCUE	10-10-10	500	>4"
CROWN VETCH FESCUE	0-20-20	400	SPRING, AND YEARLY AFTER ESTABLISHED
FLAT PEA FESCUE	0-20-20	400	DO NOT MOW

PERMANENT SEEDING SPECIES SELECTION		
SEED MIX	SEED RATE LB/AC.	NOTES:
GENERAL USE		
CREeping RED FESCUE	20 - 40	FOR CLOSE MOWING AND WATERWAYS WITH <2.0 FT./SEC. VELOCITY
DOMESTIC RYEGRASS	10 - 20	
KENTUCKY BLUEGRASS	20 - 40	
TALL FESCUE	40 - 50	
TURF-TYPE FESCUE	90	
STEEP BANKS OR CUT SLOPES		
TALL FESCUE	40 - 50	
CROWN VETCH TALL FESCUE	10 - 20	DO NOT SEED LATER THAN AUGUST
FLAT PEA TALL FESCUE	20 - 30	
ROAD DITCHES AND SWALES		
TALL FESCUE	40 - 50	
TURF-TYPE FESCUE	90	
KENTUCKY BLUEGRASS	5	
LAWN		
KENTUCKY BLUEGRASS	100 - 120	FOR SHADED AREAS
PERENNIAL RYEGRASS	100 - 120	
KENTUCKY BLUEGRASS	100 - 120	
CREeping RED FESCUE	100 - 120	

PERMANENT SEEDING NOTES



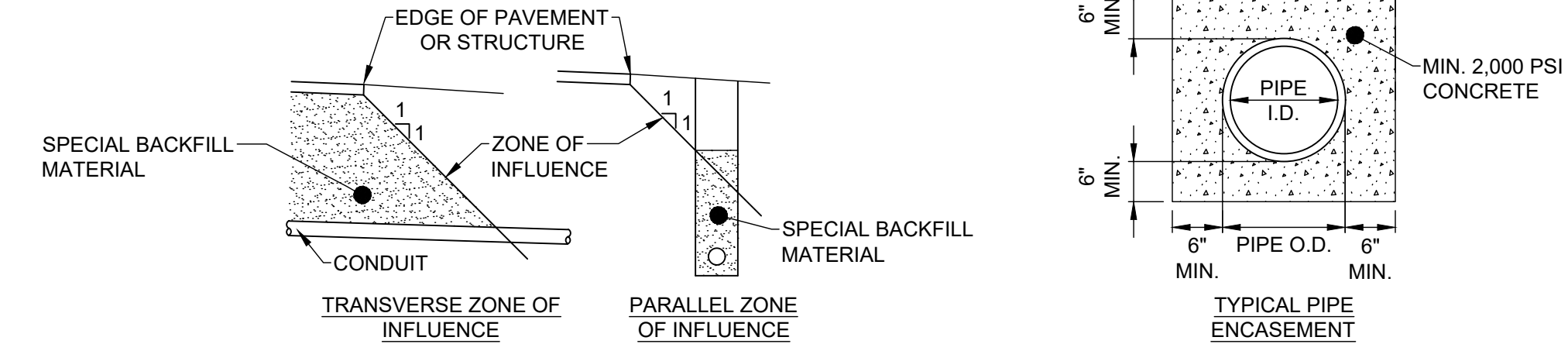
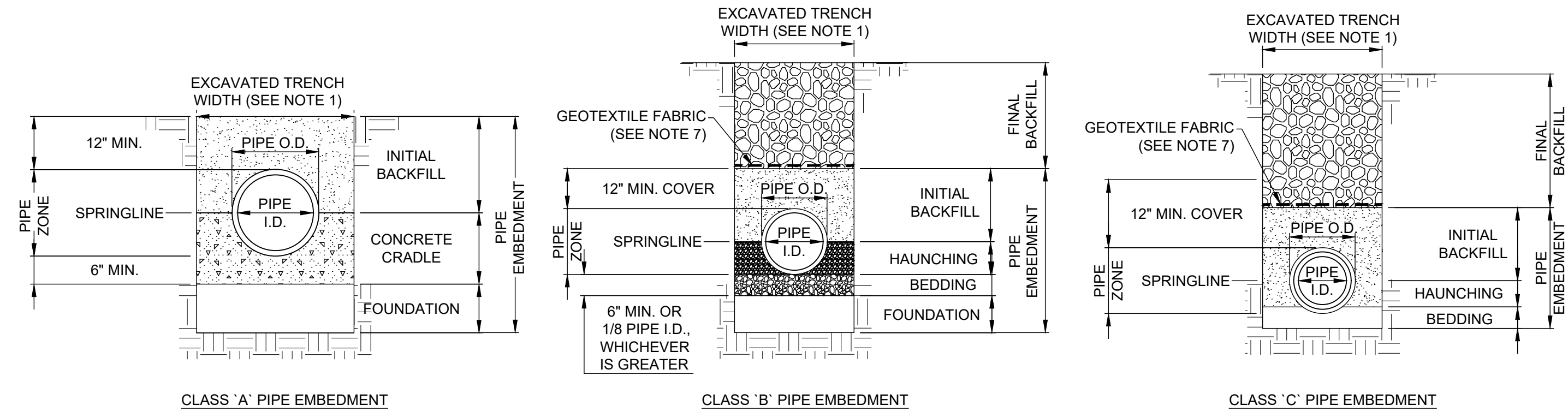
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MENTOR, OHIO 44060
(440) 951-9000

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					10/3/2025	AS NOTED	LCH	LCH	RSS

CITY OF WILLOUGHBY
LAKESHORE EAST EQ BASIN
WILLOUGHBY, OHIO
LAKE COUNTY
PHASE II
STANDARD DETAILS - SD SERIES
SWPPP DETAILS

PROJECT NO. 230264	
DISCIPLINE EROSION	
SHEET NAME 30C-06	
SHEET 36	OF 48

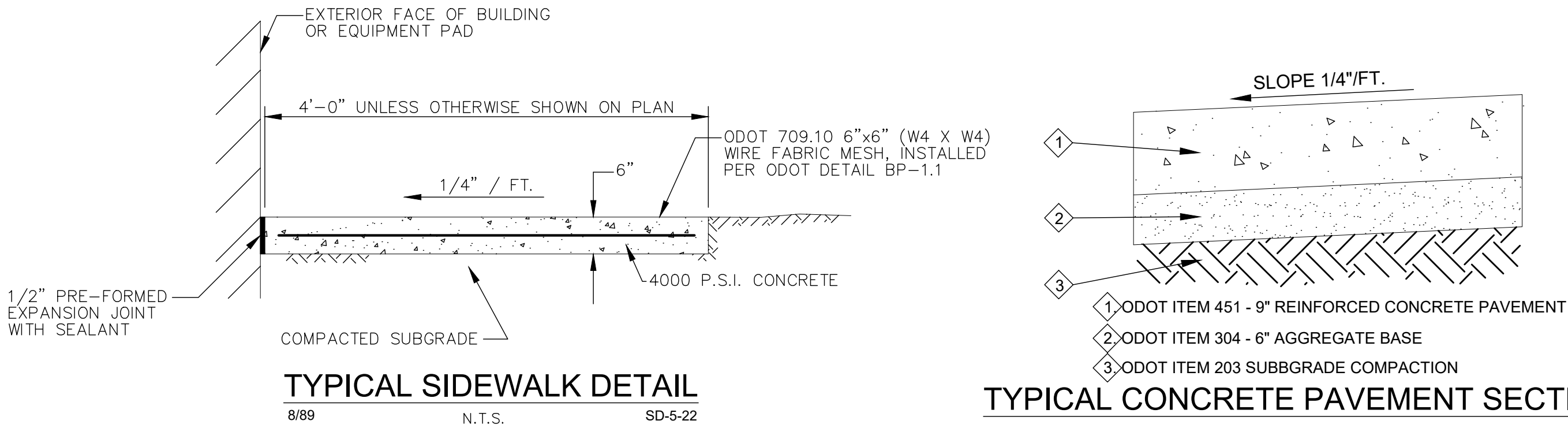


NOTES:

- MAXIMUM EXCAVATED TRENCH WIDTH: THE MAXIMUM EXCAVATED TRENCH WIDTH FROM THE BOTTOM OF THE TRENCH TO 12" OVER THE TOP OF THE PIPE (WITHIN PIPE EMBEDMENT) SHALL BE O.D. + 24" FOR ALL PIPES UP TO AND INCLUDING 24" I.D. + 30" FOR PIPE FROM 24" I.D. TO 54" I.D. AND O.D. + 48" FOR PIPES SIZES 60" I.D. AND OVER.
- FOUNDATION: REQUIRED FOR THIS PROJECT. AS PER THE GEOTECHNICAL REPORT, THE CONTRACTOR SHALL EXCAVATE AND REMOVE AN ADDITIONAL 12" OF MATERIAL AND REPLACE WITH A LAYER OF 6" OF AASHTO NO. 1 AND NO. 2 CRUSHED LIMESTONE, FOLLOWED BY A LAYER OF 6" OF AASHTO NO. 57 GRANULAR LIMESTONE.
- PIPE EMBEDMENT:
CLASS A: CLASS A PIPE EMBEDMENT SHALL BE USED FOR ALL PIPING UNDER PAVEMENT OR STRUCTURES WITH LESS THAN 12 INCHES OF PIPE COVER TO THE SUBGRADE. THE CONCRETE CRADLE SHALL BE IN ACCORDANCE WITH ODOT ITEM 499, CLASS "C". THE INITIAL BACKFILL SHALL BE AASHTO NO. 57 LIMESTONE GRANULAR PIPE EMBEDMENT.
CLASS B: CLASS B PIPE EMBEDMENT SHALL BE USED FOR ALL PIPING UNLESS OTHERWISE NOTED ON THE PLANS OR AUTHORIZED BY THE ENGINEER. THE HAUNCHING SHALL BE AASHTO NO. 57 LIMESTONE GRANULAR PIPE EMBEDMENT. IN ALL AREAS UNDER PAVEMENT, STRUCTURES OR WITHIN THE ZONE OF INFLUENCE, THE INITIAL BACKFILL SHALL BE AASHTO NO. 57 LIMESTONE GRANULAR PIPE EMBEDMENT. IN ALL AREAS OUTSIDE OF PAVEMENT, STRUCTURES OR THE ZONE OF INFLUENCE, THE INITIAL BACKFILL SHALL BE SUITABLE ON-SITE MATERIAL APPROVED BY THE ENGINEER FOR ONLY REINFORCED CONCRETE PIPE AND DUCTILE IRON PIPE. THE INITIAL BACKFILL FOR ALL OTHER PIPES SHALL BE AASHTO NO. 57 LIMESTONE GRANULAR PIPE EMBEDMENT.
CLASS C: CLASS C PIPE EMBEDMENT SHALL ONLY BE USED FOR DUCTILE IRON WATER MAIN, DUCTILE IRON FORCE MAINS OR AS AUTHORIZED BY THE ENGINEER. THE PIPE EMBEDMENT SHALL BE AASHTO NO. 57 LIMESTONE GRANULAR PIPE EMBEDMENT IN ALL AREAS UNDER PAVEMENT, STRUCTURES OR WITHIN THE ZONE OF INFLUENCE. THE PIPE EMBEDMENT SHALL BE SUITABLE ON-SITE MATERIAL APPROVED BY THE ENGINEER IN ALL AREAS OUTSIDE OF PAVEMENT, STRUCTURES OR THE ZONE OF INFLUENCE. WHERE ROCK OR SHALE IS ENCOUNTERED, A MINIMUM 6-INCHES OF AASHTO NO. 57 LIMESTONE GRANULAR PIPE BEDDING OR SAND BEDDING SHALL BE PLACED AS DIRECTED BY THE ENGINEER.
- FINAL BACKFILL: IN ALL AREAS UNDER PAVEMENT, STRUCTURES OR WITHIN THE ZONE OF INFLUENCE THE FINAL BACKFILL SHALL BE SPECIAL BACKFILL MATERIAL. IN ALL AREAS OUTSIDE OF PAVEMENT, STRUCTURES OR THE ZONE OF INFLUENCE, THE FINAL BACKFILL SHALL BE SUITABLE ON-SITE MATERIAL APPROVED BY THE ENGINEER. LSM SHALL BE USED IN PLACE OF SPECIAL BACKFILL MATERIAL WHEN TOP OF PIPE IS WITHIN 5' OF PAVEMENT OR WITHIN CITY RIGHT-OF-WAY OR UNLESS INDICATED ON DRAWINGS
- SPECIFICATIONS: ALL TRENCHING, PIPE EMBEDMENT AND BACKFILL MATERIALS SHALL BE IN ACCORDANCE WITH SPECIFICATION 310000 - EARTHWORK.
- CLAY TRENCH DAMS: CLAY TRENCH DAMS SHALL BE REQUIRED FOR EACH LATERAL, UPSTREAM OF EVERY MANHOLE, AS SHOWN ON THE DRAWINGS, AND AS DIRECTED BY THE ENGINEER.
- GEOTEXTILE FABRIC: INSTALL A GEOTEXTILE FABRIC IN ACCORDANCE WITH ODOT 712.09, TYPE A, AFTER ALL INITIAL BACKFILL CONSISTING OF AASHTO NO. 57 LIMESTONE GRANULAR PIPE EMBEDMENT.
- TYPICAL PIPE ENCASEMENT, AS PER PLAN OR AS DIRECTED BY THE ENGINEER.

TRENCHING, BEDDING, AND BACKFILL DETAIL

NOT TO SCALE

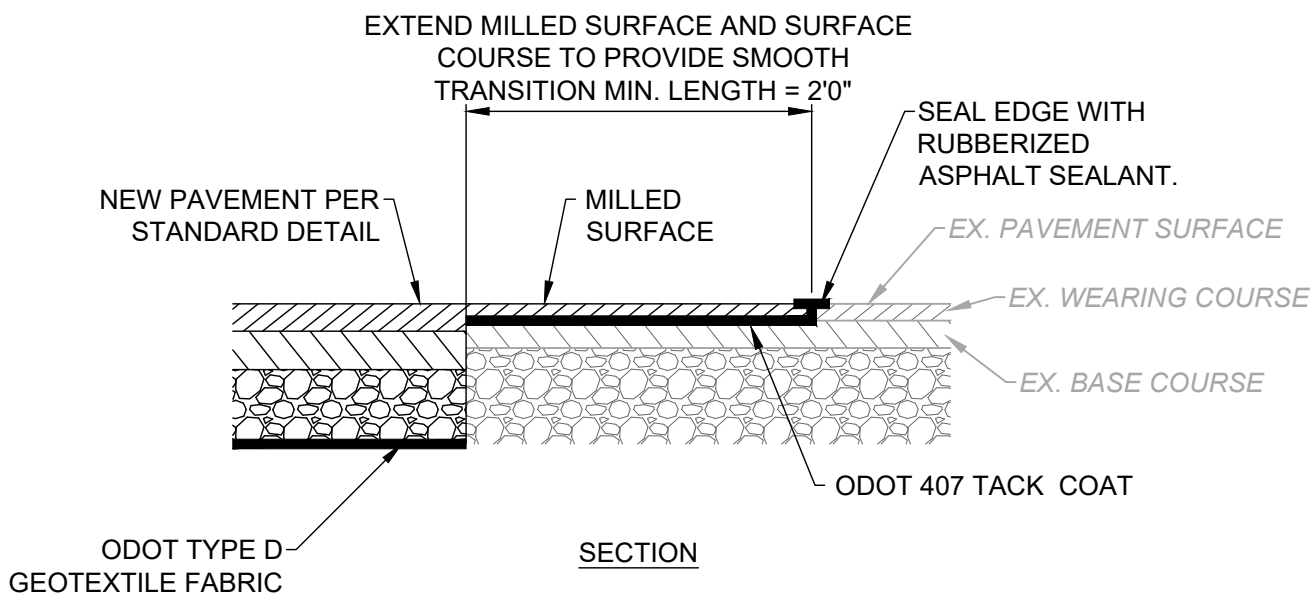


TYPICAL SIDEWALK DETAIL

8/89 N.T.S. SD-5-22

NOTES:

SIDEWALK SHALL BE SLOPED 1/4" / FT. SLOPE SHALL BE SLOPED AWAY FROM BUILDINGS AND EQUIPMENT PADS.



BUTT JOINT DETAIL

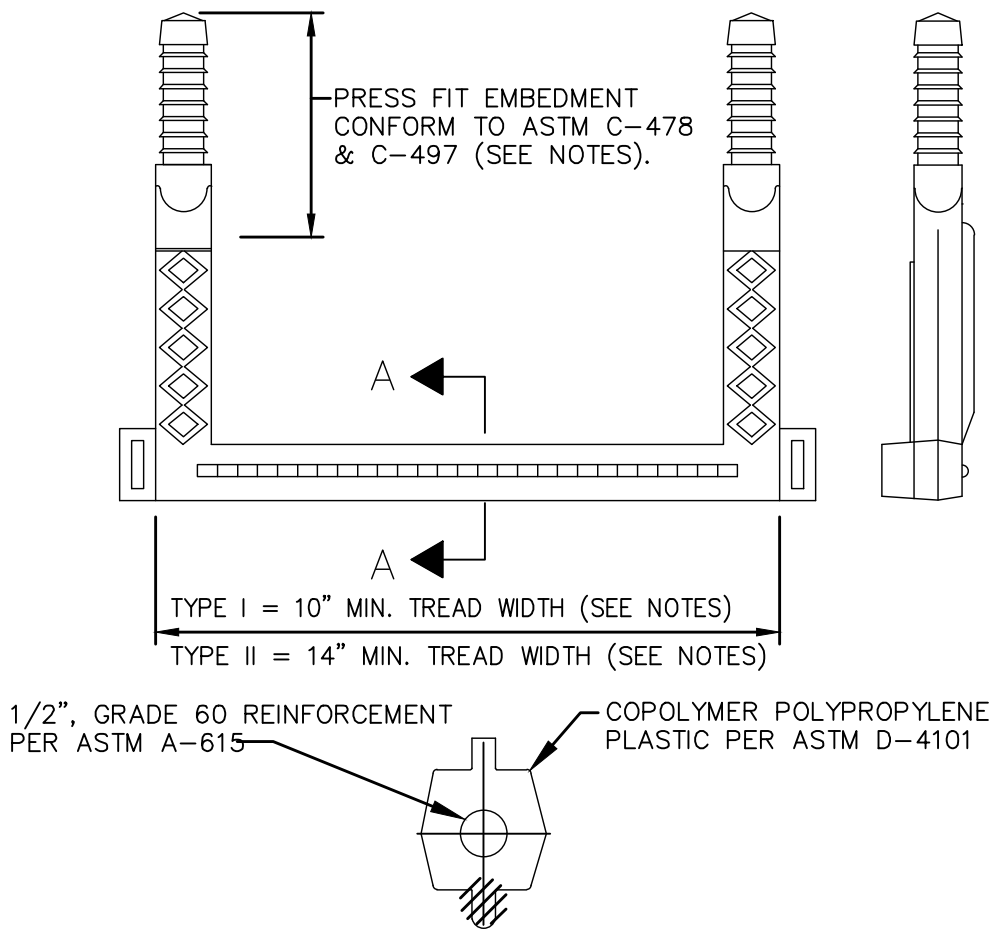
NOT TO SCALE

SIZING SCHEDULE		BEARING FACE (X & Y) IN SQ. FT. CONCRETE VOLUME IN CU. FT.					
		22" BEND SOIL BEARING CAPACITY			45" BEND SOIL BEARING CAPACITY		
PIPE SIZE		1000 P.S.F.	3000 P.S.F.	5000 P.S.F.	1000 P.S.F.	3000 P.S.F.	5000 P.S.F.
4		1.40	0.46	0.26	2.70	0.90	0.54
		0.14	0.09	0.06	0.12	0.06	0.06
6		2.80	0.93	0.56	5.50	1.83	1.10
		1.15	0.10	0.07	0.15	0.10	0.07
8		4.80	1.60	0.96	9.60	3.20	1.92
		0.20	0.13	0.09	0.23	0.15	0.09
10		7.90	2.63	1.96	15.70	5.23	3.14
		0.53	0.34	0.22	0.34	0.20	0.13
12		11.30	3.76	2.26	22.30	7.43	4.46
		0.62	0.40	0.26	0.75	0.49	0.32
14		15.30	5.10	3.06	30.20	10.06	6.04
		0.74	0.48	0.31	0.98	0.64	0.42
16		19.80	6.60	3.96	39.10	13.03	7.82
		1.17	0.76	0.49	1.21	0.79	0.51
		90° BEND SOIL BEARING CAPACITY			TEE OR DEAD END SOIL BEARING CAPACITY		
		1000 P.S.F.	3000 P.S.F.	5000 P.S.F.	1000 P.S.F.	3000 P.S.F.	5000 P.S.F.
4		4.90	1.63	0.96	3.50	1.16	0.70
		0.14	0.09	0.06	0.12	0.06	0.06
6		10.20	3.40	2.04	7.20	2.40	1.44
		0.22	0.14	0.09	0.17	0.11	0.07
8		17.70	5.54	3.54	12.50	4.16	2.50
		0.35	0.23	0.15	0.25	0.16	0.14
10		28.90	9.60	5.76	20.40	6.80	4.06
		0.54	0.35	0.23	0.38	0.25	0.16
12		41.10	13.70	8.22	29.10	9.70	5.82
		1.31	0.85	0.55	0.97	0.63	0.42
14		55.80	18.60	11.16	39.50	13.16	7.90
		1.70	1.11	0.72	1.22	0.79	0.51
16		72.20	24.06	14.44	51.10	17.03	10.22
		2.14	1.39	0.90	1.54	1.00	0.65

11/88

THRUST BLOCKING DETAIL

SD-4-6



SECTION A - A

NOTES:

- USE TYPE I STEP FOR MANHOLES OR CIRCULAR STRUCTURES OF 5'-0" DIA. OR LESS - USE 16" C/C SPACING.
- USE TYPE II STEP FOR FLAT WALL STRUCTURES SUCH AS VAULTS, WELLS, ETC. OR CIRCULAR STRUCTURES OVER 5'-0" DIA. - USE 12" C/C SPACING.
- MOUNTING REQUIREMENTS SHALL BE IN ACCORDANCE WITH MFR'S RECOMMENDATIONS.

TYPICAL MANHOLE STEP DETAIL

7/91 (N.T.S.) SD-3-27E



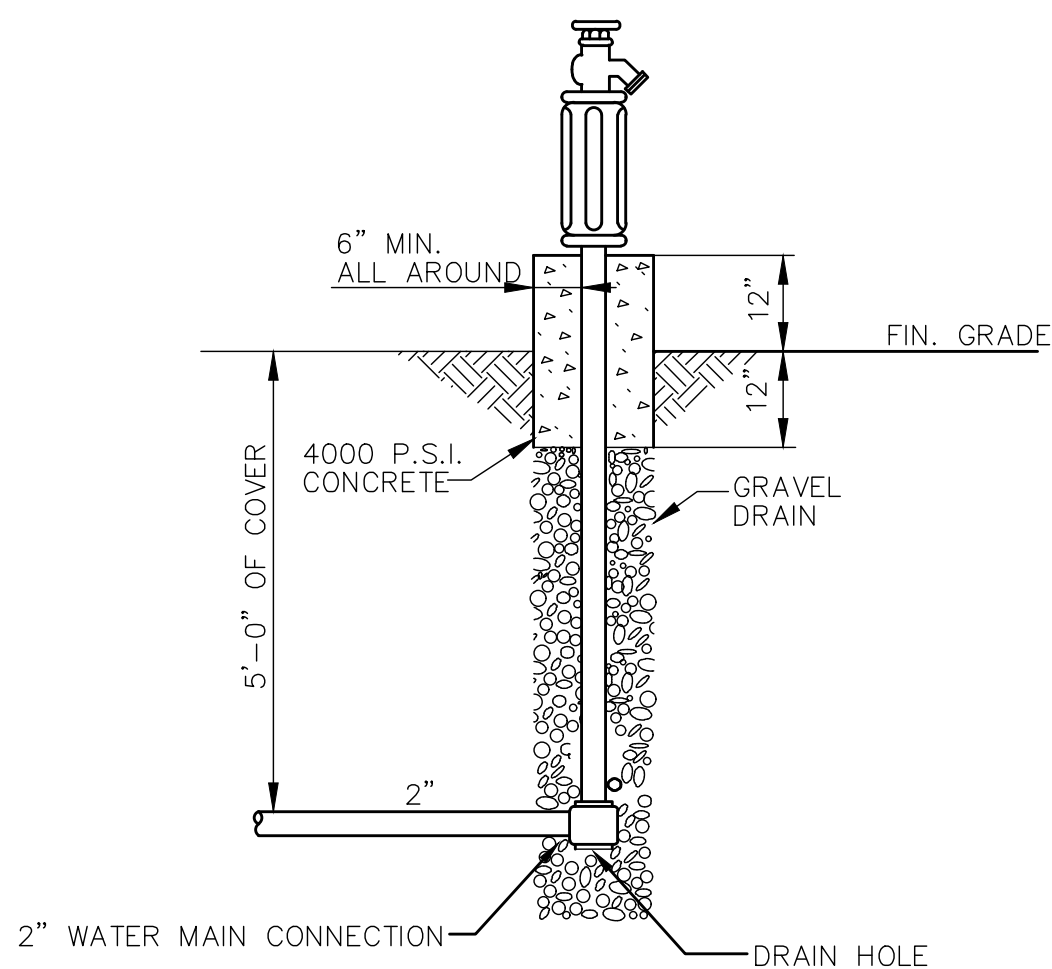
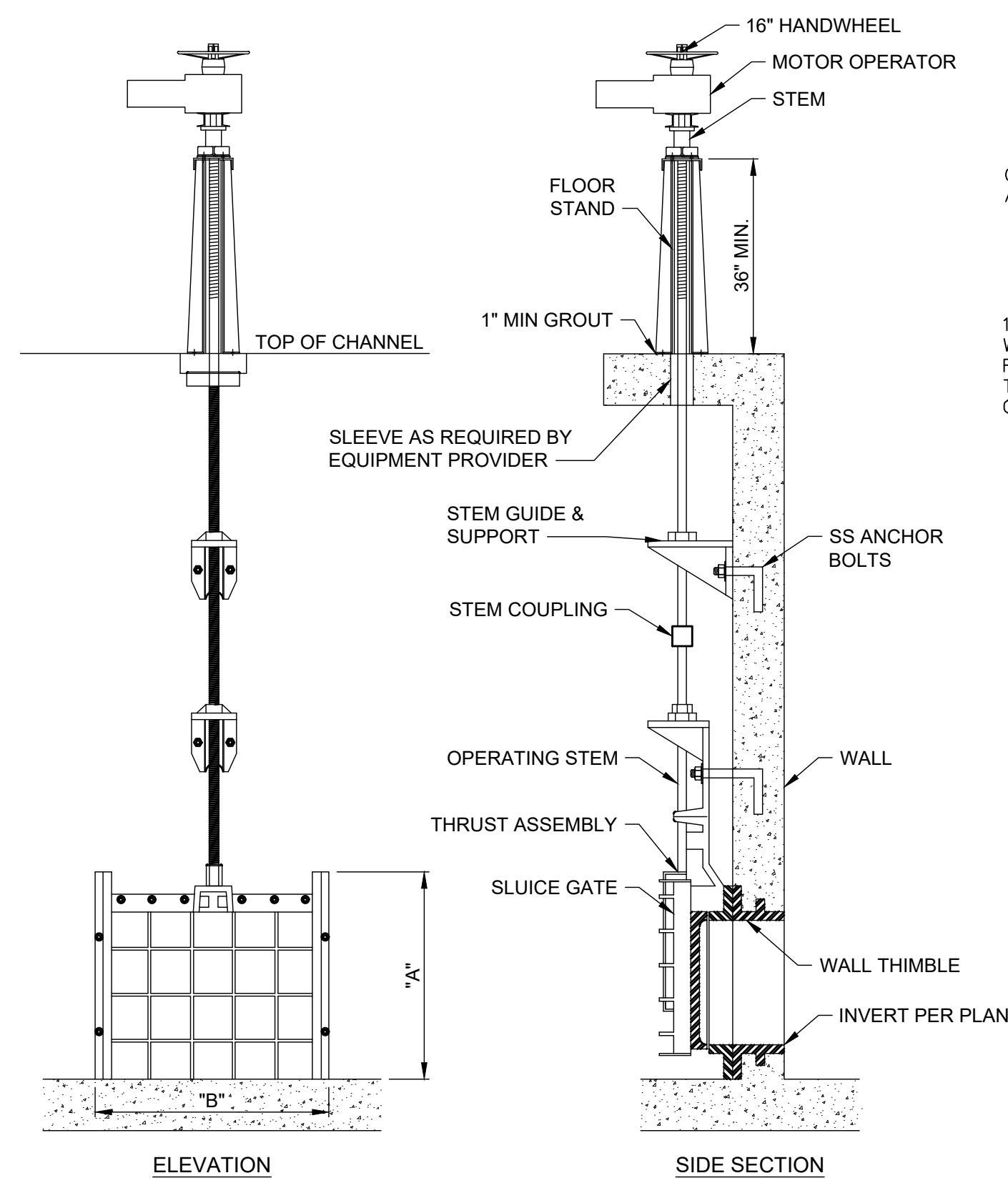
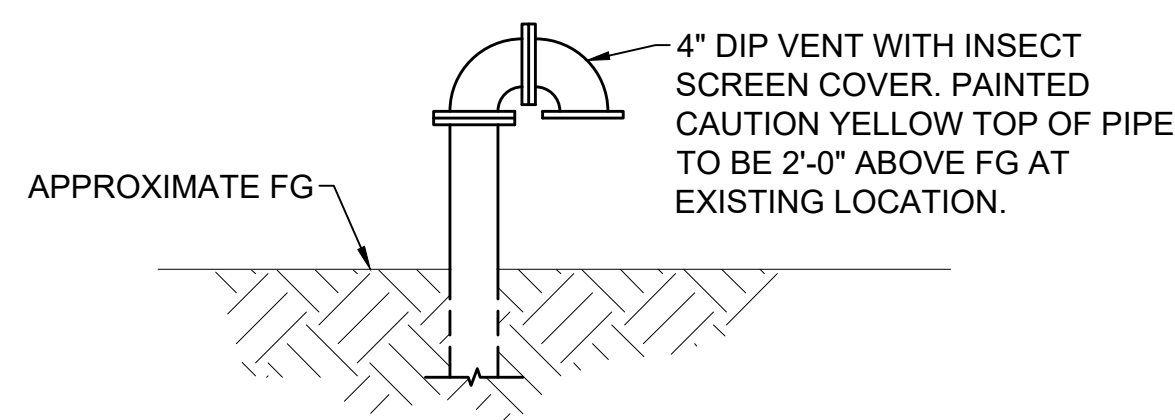
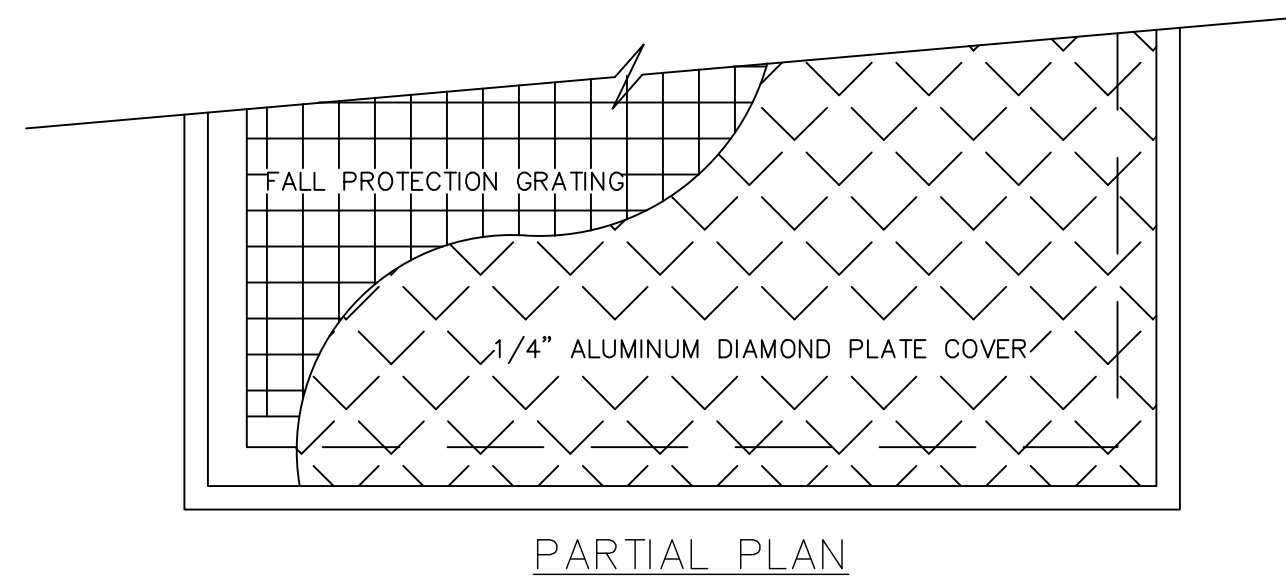
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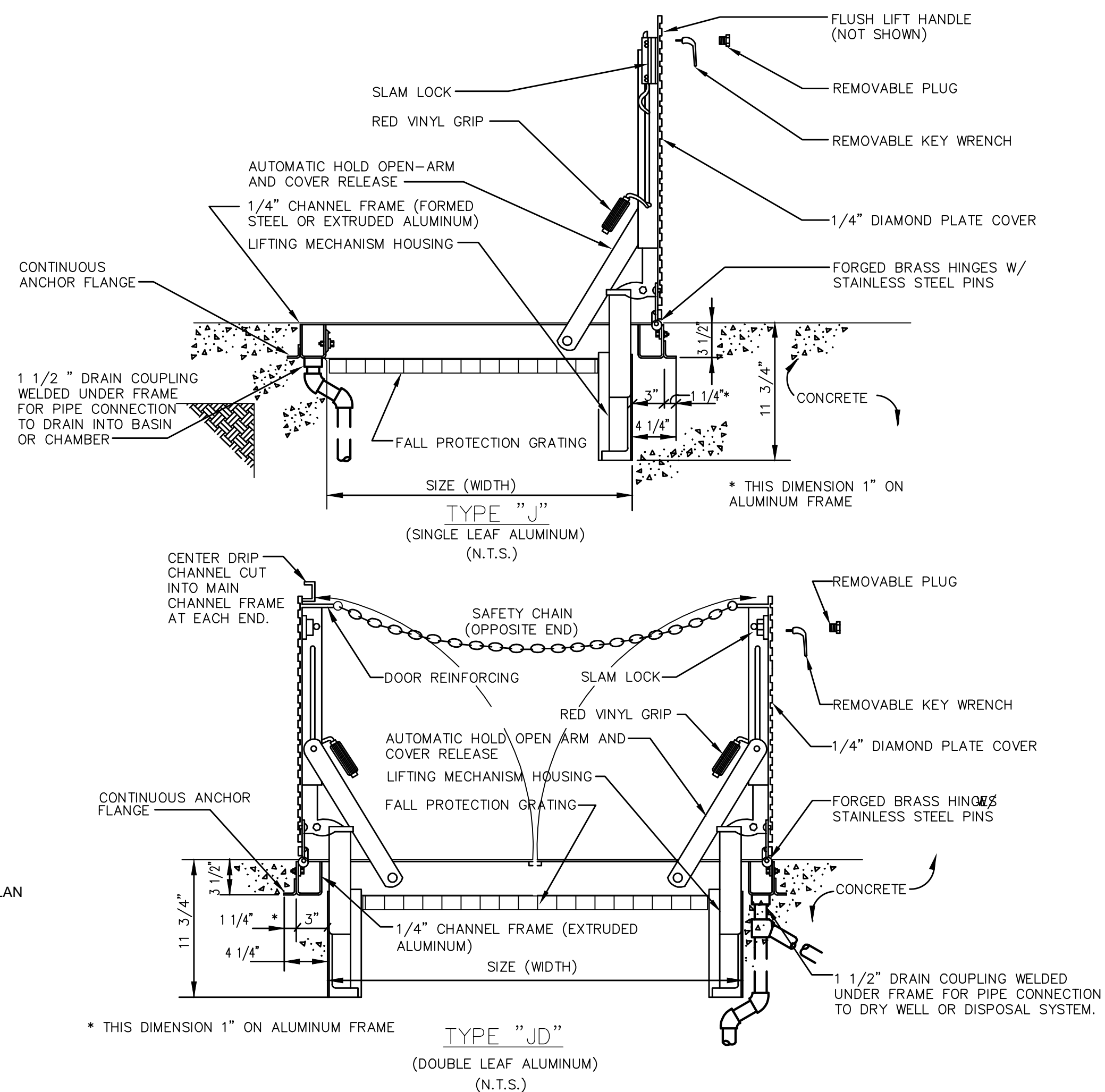
CITY OF WILLOUGHBY LAKESHORE EAST EQ BASIN LAKE COUNTY	WILLOUGHBY, OHIO PHASE II STANDARD DETAILS - SD SERIES
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PROJECT NO. 230264	DISCIPLINE CIVIL
SHEET NAME SD-C-01	SHEET 37
OF 48	

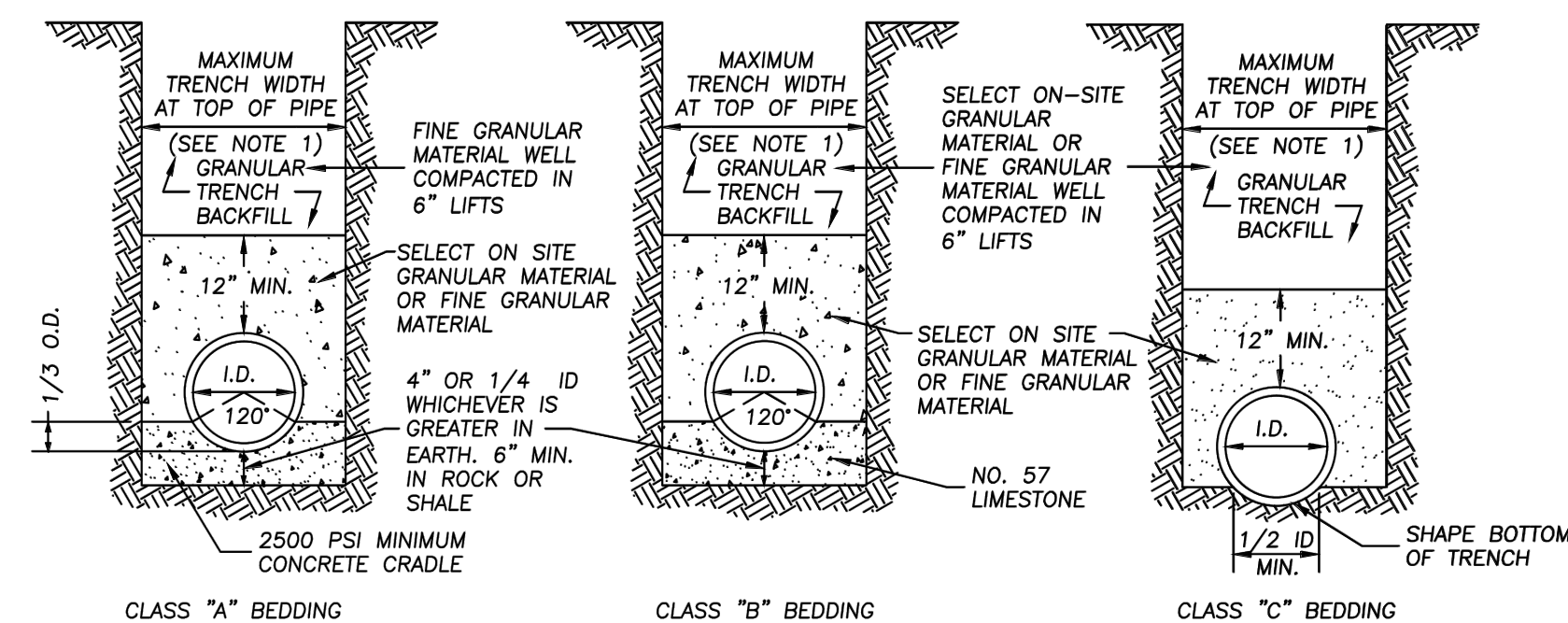


- ## NOTES

1. HYDRANT TO BE KUPFERLE "ECLIPSE #2" POST HYDRANT, OR APPROVED EQUAL, SELF-DRAINING AND NON-FREEZING. HYDRANT TO HAVE COATED CAST IRON CASING, EPOXY COATED STEEL PIPE, WITH HANDWHEEL OPERATOR, SINGLE OUTLET, 2-INCH INLET & OUTLET. PROVIDE WITH VANDAL-PROOF TOP SCREW AND SIDE CAP.
2. POST HYDRANT SHALL BE STENCILED WITH THE WORDS "UNSAFE WATER - DO NOT DRINK". STENCILED LETTERS SHALL BE 1-INCH, LOCATED ON THE TOP STOCK SECTION.



NOTE:
PROVIDE SAFETY CHAIN OR OTHER
FALL PROTECTION SYSTEM W/ ALL
ACCESS HATCHES



- NOTES:

1. MAXIMUM TRENCH WIDTH AT TOP OF PIPE SHALL BE O.D. +24" FOR ALL PIPE SIZES UP TO AND INCLUDING 24" I.D., AND O.D. +30" FOR PIPE LARGER THAN 24" I.D.
2. GRANULAR TRENCH BED SHALL BE MINIMUM OF 30" FOR ALL STRUCTURES SHALL BE ODOT 304 LIMESTONET AND BEDDED TO TOP OF RENCH. SECTION 224 FOR COMPACTION REQUIREMENTS. THE BACKFILL MATERIAL SHALL EXCEED A MINIMUM OF THREE- FEET BEYOND EACH EDGE OF PAVEMENT OR STRUCTURE. IN AREAS OUTSIDE OF PAVEMENT, SELECT ON-SITE GRANULAR MATERIAL APPROVED BY LAKE COUNTY SANITARY ENGINEER MAY BE USED FOR BEDDING FOR PIPE BACKFILL ABOVE BEDDING.
3. ALL BEDDING SHALL BE CLASS "C" UNLESS OTHERWISE NOTED ON THE PLANS OR REQUIRED BY THE SANITARY ENGINEER.
4. CLAG SHALL NOT BE USED FOR BEDDING OR BACKFILL.
5. RECYCLED CONCRETE SHALL NOT BE USED.
6. CLAY DAMS SHALL BE REQUIRED WHEN AND WHERE NECESSARY PER THE SOLE DISCRETION OF THE LCDU.
7. ALL CONSTRUCTION SHALL MEET MINIMUM REQUIREMENTS AND ARE SUPERSEDED BY THE REQUIREMENTS OF THE LOCAL AUTHORITY WITH JURISDICTION OVER THE ROADWAY, WHEN APPLICABLE.

FIG 2.22.1

FOR WATER ONLY
SEE FIG. 3.17.1 FOR SANITARY

LAKE COUNTY DEPARTMENT OF UTILITIES		
TRENCH AND BEDDING DETAILS		
DATE: 6-16	DRAWN BY: DDB	SCALE: NONE

ISSUED FOR:	REVIEW	NO	REVISION	DATE
ISSUE DATE:	10/3/2025			
SCALE:	AS NOTED			
DESIGNED BY:	ELE			
DRAWN BY:	ELE			
CHECKED BY:	RSS			

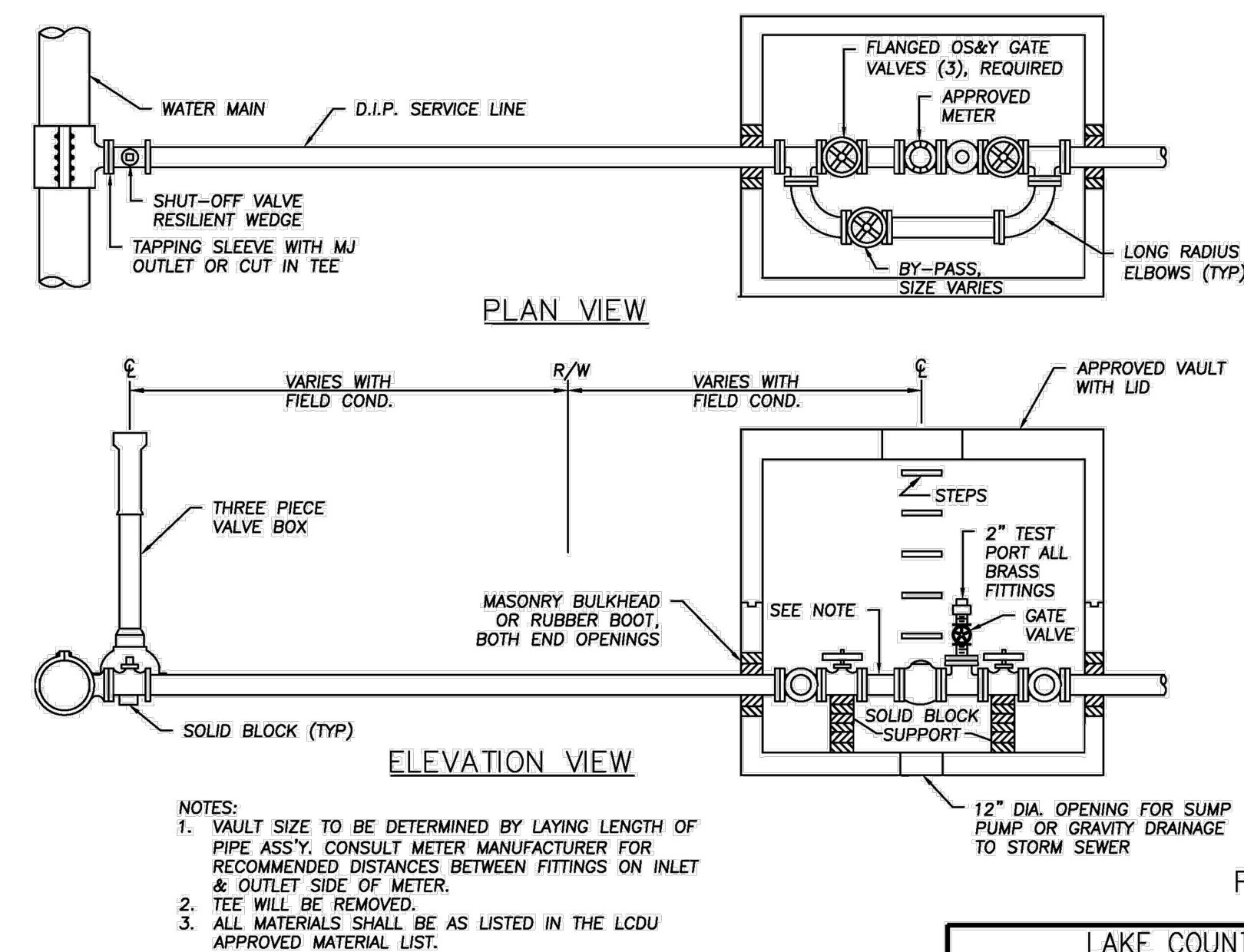
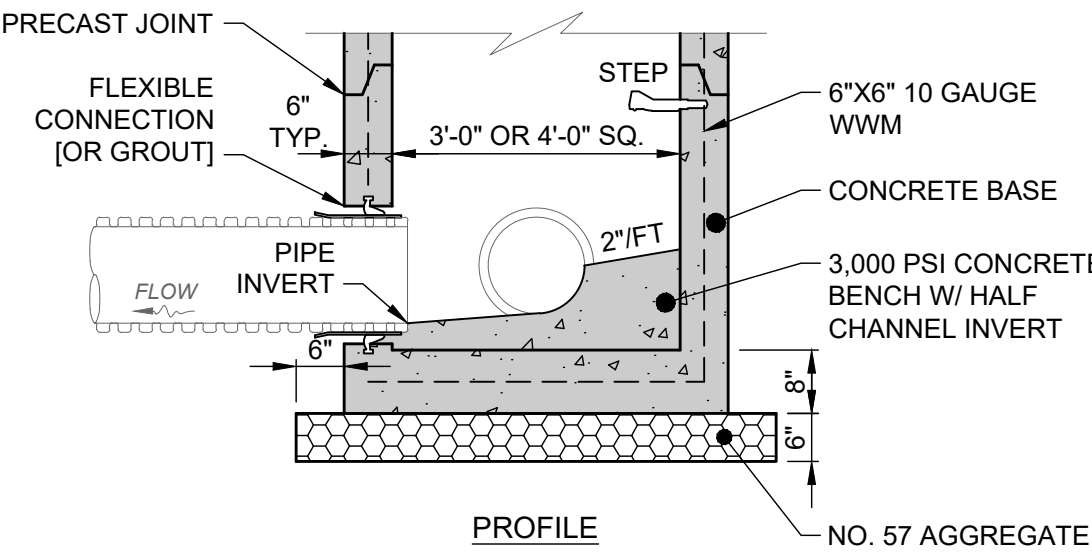
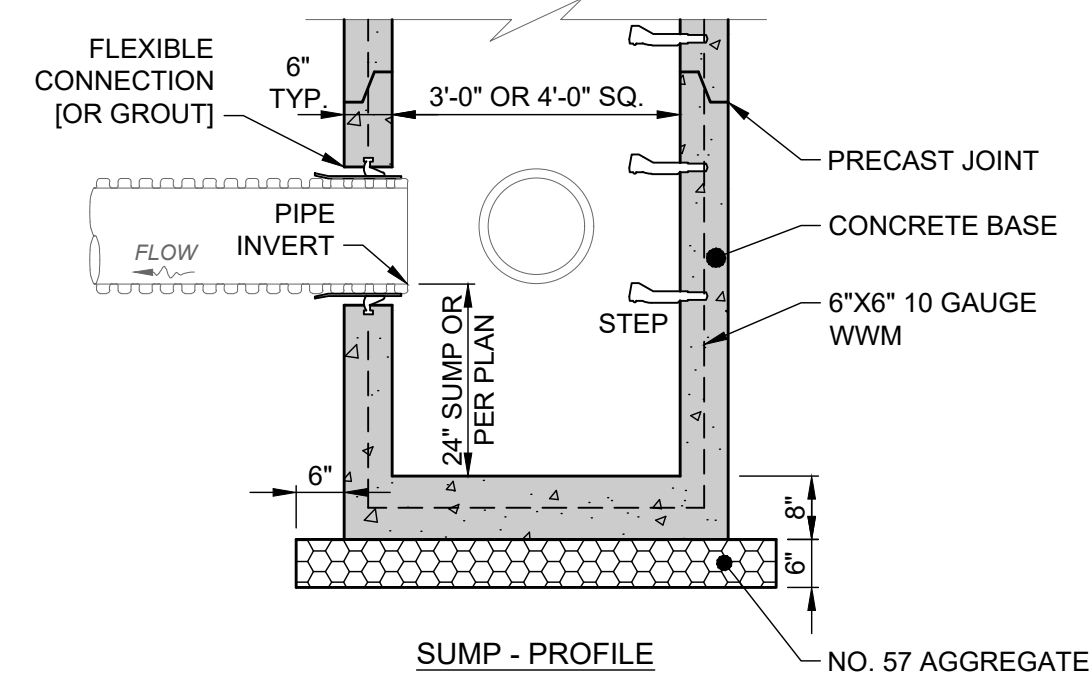
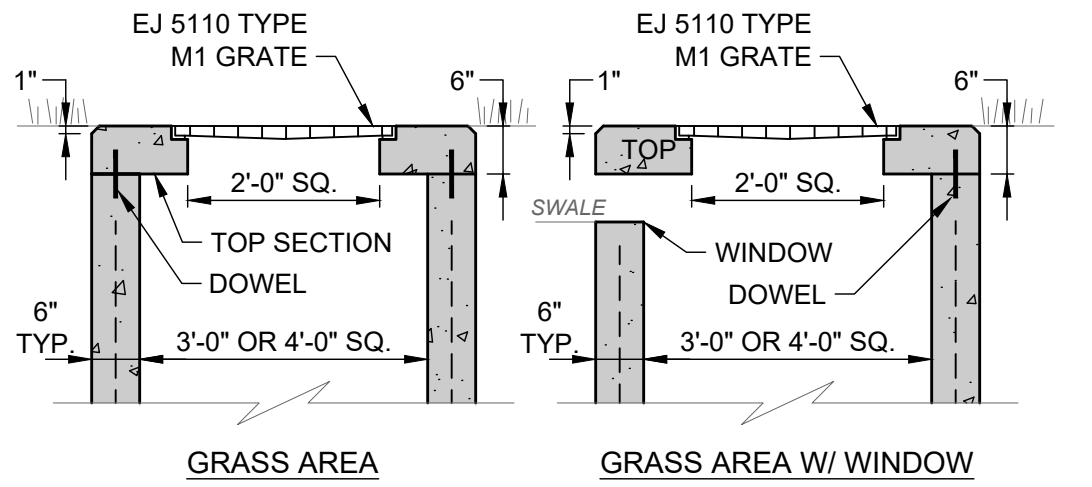


FIG 2.25.6

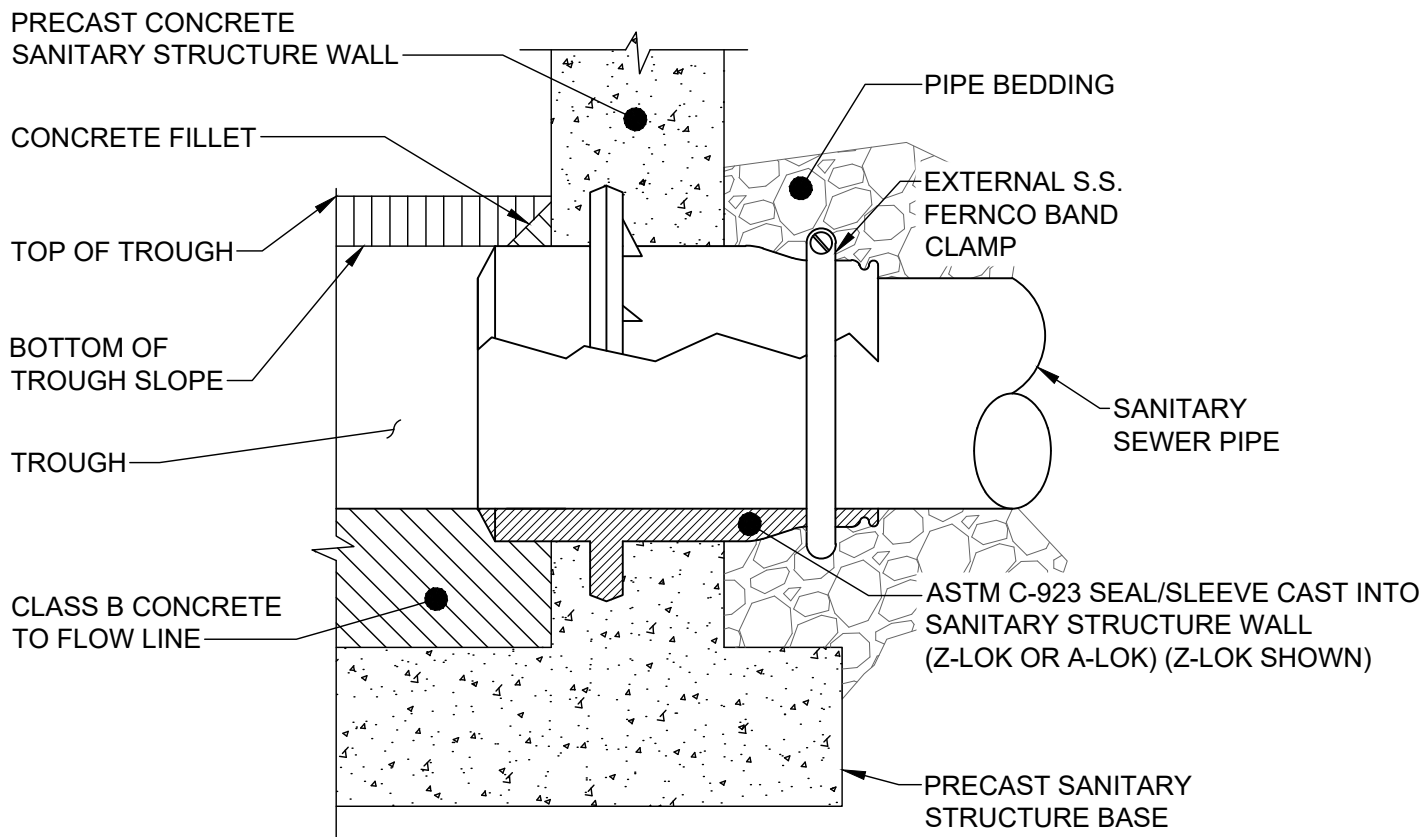
LAKE COUNTY DEPARTMENT OF UTILITIES		
OUTSIDE METER SETTING 4" & LARGER, DOMESTIC ONLY		
DATE: 6-16	DRAWN BY: DDB	SCALE: NONE

CITY OF WILLOUGHBY LAKESHORE EAST EQ BASIN PHASE II LAKE COUNTY WILLOUGHBY, OHIO	PROJECT NO.	
	230264	
	DISCIPLINE	
	CIVIL	
	SHEET NAME	
SD-C-02		
SHEET	OF	
38	48	



- NOTES:
- CONCRETE SHALL BE ODOT ITEM 499, CLASS QC-1.
 - STRUCTURE SHALL MEET H-20 LOADING.
 - INSTALL STEPS IF STRUCTURE IS MORE THAN 4' DEEP. USE REINFORCED PLASTIC MANHOLE STEPS. FIRST STEP SHALL NOT BE MORE THAN 2'-0" BELOW TOP OF FRAME.
 - PRECAST KNOCKOUT SIDES FOR CURB DRAIN AND PIPE CONNECTION HOLES, AS REQUIRED. PIPE OPENINGS SHALL BE O.D. OF PIPE PLUS 2", AND ALL PIPE OPENINGS MUST BE PRECAST WITH FLEXIBLE CONNECTIONS (Z-LOK OR A-LOK) PER ASTM C-923.]
 - IF TOP SECTION IS A SEPARATE CAST PIECE, 1/2"Ø X 6" L DOWELS SHALL BE USED AT EACH CORNER TO ATTACH THE TOP TO THE BOTTOM SECTIONS OF BASIN.
 - GRATE MUST INCLUDE LETTERING "DUMP NO WASTE" AND FISH IMAGE.
 - THIS DETAIL IS FOR REFERENCE AND DIMENSION CONTROL ONLY; SEE UTILITY PLAN FOR ACTUAL PIPE SIZES AND ELEVATIONS.

**PRECAST CONCRETE
ODOT 2-3 & 2-4
INLET BASIN DETAIL**
SCALE: NONE



**PIPE CONNECTION TO NEW
STRUCTURE DETAIL**

NOT TO SCALE
CONTRACTOR SHALL REFER TO MANUFACTURER DETAILS AND SPECIFICATIONS FOR SPECIFIC REQUIREMENTS NOT EXPLICITLY NOTED ON THESE DETAILS FOR INSTALLING NEW PIPE INTO AN EXISTING OR NEW PRE-CAST CONCRETE STRUCTURE.



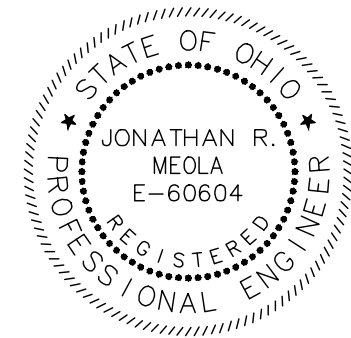
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ISSUE DATE:	10/3/2025			
SCALE:	AS NOTED			
DESIGNED BY:	ELE			
DRAWN BY:	ELE			
CHECKED BY:	RSS			

CITY OF WILLOUGHBY	WILLOUGHBY, OHIO
LAKESHORE EAST EQ BASIN	
LAKE COUNTY	PHASE II
STANDARD DETAILS - SD SERIES	STANDARD DETAILS

PROJECT NO.	230264
DISCIPLINE	CIVIL
SHEET NAME	SD-C-03
SHEET	OF
39	48



verdantas

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			JRM	
			JRM	
			JRM	

CITY OF WILLOUGHBY LAKESHORE EAST EQ BASIN PHASE II	WILLOUGHBY, OHIO
	LAKE COUNTY
	MECHANICAL - M SERIES
CONTROL BLDG. - MECH PLANS & SCHEDULES	

PROJECT NO. 230264	
DISCIPLINE MECHANICAL	
SHEET NAME M-01	
SHEET 40	OF 48

MECHANICAL EQUIPMENT SCHEDULE

SYMBOL	QUANT.	AREA SERVED	DESCRIPTION	ACCESSORIES	ELECTRICAL REQUIREMENTS
ACU-1	1	CONTROL BUILDING	MITSUBISHI AIR CONDITIONING UNIT HEAT PUMP, DUCTLESS SPLIT SYSTEM, R-454B REFRIGERANT, HIGH WALL EVAPORATOR, POLYSTYRENE CABINET, 22 SEER, VARIABLE SPEED INVERTER-DRIVEN COMPRESSOR, NOM. 1.5 TONS COOLING (5.2 MBH MIN., 22 MBH MAX.), 477 CFM; 18.0 MBH RATED CAPACITY, 14.2 MBH SHC, 0.79 SENSIBLE HEAT FACTOR #MSZ-GX18NL INDOOR UNIT, 208V/230/1 (1.0A, WIRED FROM OUTDOOR UNIT), #MUZ-GX18NL CONDENSING UNIT, 208V/230/1, 23 MCA, 25A CB	WIRED LOW VOLTAGE WALL THERMOSTAT REFRIGERANT LINE SETS CONDENSER WALL MOUNTING BRACKETS: STAINLESS STEEL CONDENSER BASEPAN HEATER	208/230/1/60 23 MCA, 25A CB
UH-1	1	CONTROL BUILDING	MARKEL #P3P5105CA1N UNIT HEATER ELECTRIC, HEAVY DUTY, HORIZONTAL DISCHARGE, FAN FORCED, 5,000 WATTS, 17,100 BTH	24V WALL THERMOSTAT DISCONNECT SWITCH MOUNTING BRACKETS	480/3/60 5.0 KW

NOTES:

- QUANTITIES ARE SHOWN FOR GENERAL REFERENCE ONLY. CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL EQUIPMENT SHOWN ON PLANS AND DETAILS.
- CHARACTERISTICS (RPM, HP, IMPELLERØ, PRESSURE DROP) SHALL NOT VARY BY MORE THAN 10% OF SPEC'D UNITS. SOUND VALUES SHALL NOT EXCEED THE VALUES INDICATED.

SEQUENCE OF OPERATION

- ACU-1 AIR CONDITIONING UNIT (CONTROL BUILDING):
UNIT SHALL BE A HEAT-PUMP TYPE. UNIT SHALL BE PROVIDED WITH A WIRED WALL THERMOSTAT,
24V LOW VOLTAGE, TO ENERGIZE THE FAN AND COMPRESSOR UPON A CALL FOR COOLING.
FAN AND HEAT MODE SHALL BE ENERGIZED UPON A CALL FOR HEATING.
- UH-1 UNIT HEATER (CONTROL BUILDING):
HEATER SHALL BE CONTROLLED VIA A 24V WALL HEATING THERMOSTAT TO ENERGIZE THE FAN AND
HEATING ELEMENTS UPON A CALL FOR HEATING.
HEATER CAN BE USED AS "PRIMARY" HEAT, OR AS "BACKUP" HEAT FOR ACU-1 HEAT PUMP DESCRIBED ABOVE,
AS DESIRED.

DRAIN SCHEDULE

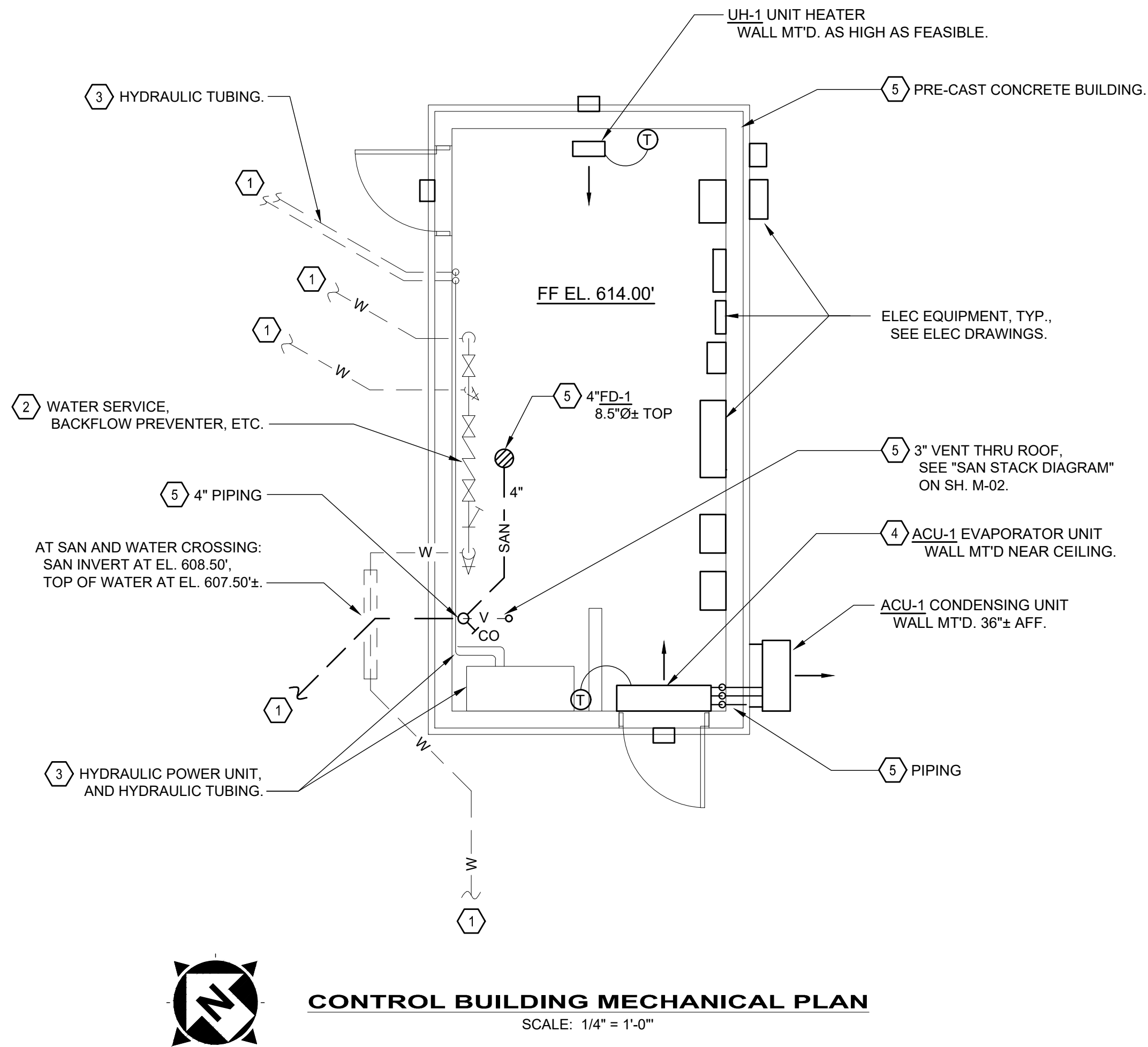
SYMBOL	DESCRIPTION
FD-1	J.R. SMITH #2310-Y-L FLOOR DRAIN MEDIUM DUTY, WITH CAST IRON BODY, 8.5"Ø ROUND ADJUSTABLE TOP, CAST IRON SLOTTED GRATE, FLASHING COLLAR, SPEED-SET. WITH #2692 "QUAD CLOSE" ELASTOMERIC TRAP SEAL DEVICE.

NOTES:

- EQUALS BY: JOSAM CO., WATTS IND., ZURN IND..

MECHANICAL GENERAL NOTES:

- BUILDING IS PRE-CAST CONCRETE. COORDINATE ALL PRE-CAST OPENINGS (PIPING, FLOOR DRAIN, ETC.)
WITH GENERAL TRADES CONTRACTOR AND BUILDING MANUFACTURER.
- COORDINATE EXACT LOCATIONS OF ALL PIPES, DUCTS AND EQUIPMENT, SO AS TO NOT INTERFERE WITH DOORS, LIGHTS,
ELECTRICAL EQUIPMENT, PROCESS EQUIPMENT, PROCESS PIPING, ETC.
- ALL INTERIOR AND EXTERIOR HANGERS, RODS, SUPPORTS, CLAMPS, ETC. TO BE CORROSION RESISTANT.
INTERIOR HANGERS, RODS, ETC. TO BE GALVANIZED STEEL.
EXTERIOR HANGERS, RODS, ETC. TO BE TYPE #304 OR #316 STAINLESS STEEL.
- MAKE FINAL GAS CONNECTIONS WITH GAS VALVE, UNION, AND DIRT LEG.
- INSTALL PERMANENT SIGN OF CORROSION RESISTANT MATERIALS, WITH PICTOGRAPH AT ALL HOSE BIBS THAT READS
AS FOLLOWS: "CAUTION: NONPOTABLE WATER - DO NOT DRINK."
- ALL MOUNTING HEIGHTS ARE REFERENCED TO THE BOTTOM OF EQUIPMENT, UNLESS NOTED OTHERWISE.
- SEE ELECTRICAL DRAWINGS FOR POWER WIRING SYSTEMS FOR MECHANICAL EQUIPMENT.
- PROVIDE TEMPERATURE CONTROL WIRING IN CONDUITS IN ACCORDANCE WITH DIV. 26 SPECIFICATIONS.

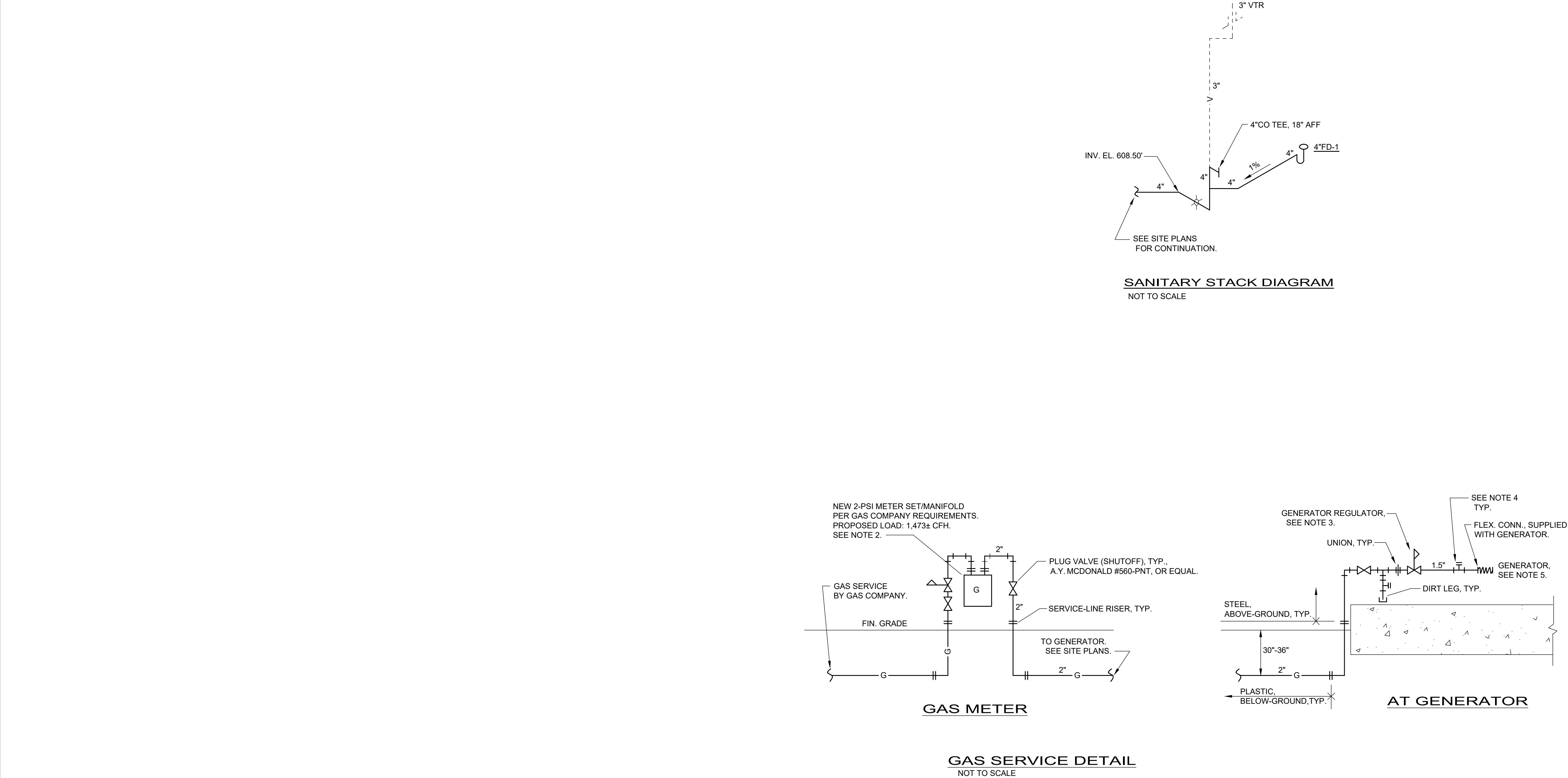


CONTROL BUILDING MECHANICAL PLAN

SCALE: 1/4" = 1'-0"

CODED NOTES:

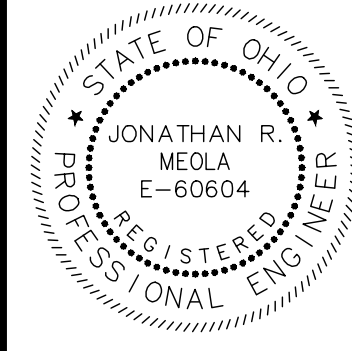
- SEE SITE SITE PLANS FOR CONTINUATION.
- WATER SERVICE, BACKFLOW PREVENTER, ETC. SEE PROCESS PLANS & DETAILS.
- HYDRAULIC POWER UNIT & HYDRAULIC TUBING ALONG WALL. SEE PROCESS PLANS & DETAILS.
- ROUTE PIPING DOWN ALONG INSIDE OF WALL, WITH REFRIGERANT LINES TO CONDENSING UNIT,
AND CONDENSATE OUT WALL 12" AFF, OPEN END.
- BUILDING IS PRE-CAST CONCRETE. COORDINATE ALL PRE-CAST OPENINGS (PIPING, FLOOR DRAIN, ETC.)
WITH GENERAL TRADES CONTRACTOR AND BUILDING MANUFACTURER.



NOTES:

- SEE SPECIFICATION #335100 NATURAL GAS DISTRIBUTION FOR ADDITIONAL INFORMATION.
- THE CONTRACTOR SHALL COORDINATE INSTALLATION OF NEW METER MANIFOLD WITH GAS COMPANY. VERIFY ALL CHARACTERISTICS PRIOR TO STARTING ANY WORK. PROVIDE PIPE INCREASERS/DECREASERS AS REQUIRED. TOTAL CONNECTED LOAD: 1,437± CFH. OPERATING PRESSURE: 2-PSI.
- GENERATOR REGULATOR TO BE ROOTS(ITRON) B34-R (OR EQUAL), COMMERCIAL GRADE, WITH INTERNAL RELIEF. PIPE/BODY SIZE, SPRING, AND ORIFICE SELECTIONS BY MANUFACTURER/REP WITH 2-PSI INLET PRESSURE, AND 9-INCH± OUTLET PRESSURE. CONNECTED LOAD: 1,473 CFH±. NOTE: TYPICAL OPERATING PRESSURE 7-11 INCHES. CONFIRM WITH GENERATOR MANUFACTURER.
- PROVIDE CAPPED 1/2" TEE FITTING, TO ALLOW CONNECTION OF PRESSURE MEASURING INSTRUMENT, UPSTREAM AND DOWNSTREAM OF REGULATOR, PER INTERNATIONAL FUEL GAS CODE. DOWNSTREAM TEE FITTING TO BE A MINIMUM OF 10 PIPEØ FROM REGULATOR.
- LOCATE VALVES, PIPING, ETC. SO AS NOT TO INTERFERE WITH GENERATOR ACCESS. FIELD LOCATE RISER LOCATION AT GENERATOR TO BEST SUIT ACTUAL GENERATOR INSTALLED, CONSIDERING GENERATOR LOCATION, CONFIGURATION, CONCRETE PAD, ETC.

CONTACT: DOMINION EAST OHIO GAS
AKRON, OH PHONE: 330-664-2409



verdantas

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MENTOR, OHIO 44060
(440) 951-9000

ISSUED FOR:	REVIEW	NO	REVISION	DATE
	10/3/2025			
SCALE:	AS NOTED			
DESIGNED BY:	JRM			
DRAWN BY:	JRM			
CHECKED BY:	JRM			

CITY OF WILLOUGHBY	WILLOUGHBY, OHIO
LAKESHORE EAST EQ BASIN	
PHASE II	
LAKE COUNTY	MECHANICAL - M SERIES
	MECHANICAL DETAILS

PROJECT NO.	
230264	
DISCIPLINE	
MECHANICAL	
SHEET NAME	
M-02	
SHEET	OF
41	48

ELECTRICAL SYMBOLS - PLAN:

	HOME RUN TO PANEL
	MOTOR
	MOTOR CONTROLLER
	FUSIBLE SAFETY SWITCH
	NON-FUSIBLE DISCONNECT SWITCH
	SIMPLEX RECEPTACLE, EXPLOSION PROOF
	DUPLEX RECEPTACLE
	QUADPLEX RECEPTACLE
	DATA PORT, RJ45
	SPECIAL RECEPTACLE, NEMA TYPE NOTED
	SINGLE-POLE SWITCH, "3" INDICATES 3-WAY, "OS" INDICATES OCCUPANCY SENSING
	DRY-TYPE TRANSFORMER
	PUSHBUTTON STATION
	LOUVER OPERATOR
	JUNCTION BOX
	SOLENOID VALVE
	LIMIT SWITCH
	FLOW: SWITCH, SENSOR, TRANSMITTER W / DISPLAY
	LEVEL: SWITCH, SENSOR, TRANSMITTER W / DISPLAY
	PRESSURE: SWITCH, SENSOR, TRANSMITTER W / DISPLAY
	TEMPERATURE: SWITCH, SENSOR, TRANSMITTER W / DISPLAY
	OTHER SENSOR / INDICATING TRANSMITTER AS NOTED
	HAZARDOUS AREA LIGHT FIXTURE
	OUTDOOR CANOPY LIGHT FIXTURE
	EXTERIOR WALL-PACK LIGHT FIXTURE
	HIGH BAY LIGHT FIXTURE
	LINEAR LED LIGHT FIXTURE
	EXIT SIGN
	EMERGENCY REMOTE HEAD
	EMERGENCY WALL-PACK
	FIRE ALARM PULL STATION, STROBE, HORN-STROBE
	FIRE ALARM AREA SMOKE DETECTOR

ELECTRIC SYMBOLS - UTILITIES:

EX:	PR:
	AIR CONDITIONING UNIT
	ELECTRIC CONTROL BOX
	ELECTRIC JUNCTION BOX
	ELECTRIC PULL BOX
	ELECTRIC RISER BOX
	ELECTRIC VAULT BOX
	ELECTRIC LIGHT - GROUND
	ELECTRIC LIGHT - POST
	ELECTRIC MARKER POST
	ELECTRIC METER
	ELECTRIC MANHOLE - 48"
	ELECTRIC MANHOLE - 48" - ADJUST
	ELECTRIC MANHOLE - LID
	ELECTRIC PAINT MARK
	ELECTRIC PEDESTAL
	ELECTRIC TRANSFORMER

SINGLE LINE, ELEMENTARY, & INTERCONNECTION DIAGRAMS (ONLY) SYMBOLOGY:

	DISCONNECT SWITCH - AMP RATING		N.O. LIMIT SWITCH		CONTACT - NORMALLY OPEN
	FUSE - AMP RATING		N.O. FLOW SWITCH		CONTACT - NORMALLY CLOSED
	CIRCUIT BREAKER - AMP RATING		N.O. LEVEL SWITCH		SOLENOID COIL
	TRANSFORMER		N.O. PRESSURE SWITCH		PILOT LIGHT - PUSH TO TEST (COLOR)
	MOTOR W / HORSEPOWER INDICATED		N.O. TEMPERATURE SWITCH		GROUND
	AMMETER		N.O. TIME DELAY AFTER ENERGIZATION		CAPACITOR
	VOLT METER		N.C. TIME DELAY AFTER ENERGIZATION		2 POSITION SELECTOR SWITCH
	POWER FACTOR METER		N.C. TIME DELAY AFTER DE-ENERGIZATION		3 POSITION SELECTOR SWITCH
	GROUND FAULT RELAY		N.O. TIME DELAY AFTER DE-ENERGIZATION		EQUIPMENT FIELD TERMINAL
	RELAY COIL		N.O. SWITCH (GENERAL)		START PUSHBUTTON NORMALLY OPEN
	TIMING RELAY COIL		STOP PUSHBUTTON NORMALLY CLOSED		
	MOTOR STARTER COIL				
	ELAPSED TIME TOTALIZER				
	GROUNDING BUS				
	TRANSIENT VOLTAGE SURGE SUPPRESSOR				

ABBREVIATIONS:

A	AMPS	IAW	IN ACCORDANCE WITH	PT	POTENTIAL TRANSFORMER
AF	AMPERE FRAME	ICP	INSTRUMENTATION & CONTROL PANEL	R	RELAY
AI	ANALOG INPUT (PLC)	IPP	INSTRUMENT POWER PANEL	RCP	REINFORCED CONCRETE PIPE
AL	ALUMINUM	JB	JUNCTION BOX	RL	RUN LIGHT
AM	AMMETER	JBC	JUNCTION BOX-CONTROL	SCP	SURGE CONTROL PANEL
AO	ANALOG OUTPUT (PLC)	JBM	JUNCTION BOX-METERING	SCR	SILICON-CONTROLLED RECTIFIER
AP	ALARM PANEL	JBP	JUNCTION BOX-POWER	SEC	SECONDARY
AT	AMPERE TRIP	KCM	KILO (1000) CIRCULAR MILL	SF	SUPPLY FAN
AWG	AMERICAN WIRE GAUGE	kVA	KILOVOLT AMPERES	SHLD	SHIELDED
C	CONDUIT	KVAR	KILOVOLT AMPERES-REACTIVE	SP	SHEAR PIN SWITCH
CAP	CAPACITOR	kW	KILOWATT	SPK	SPEAKER
CB	CIRCUIT BREAKER	LA	LIGHTNING ARRESTOR	SS	SELECTOR SWITCH OR STAINLESS STEEL
CJB	CONTROL JUNCTION BOX	LGT	LIGHT	SSOR	SOLID STATE OVERLOAD RELAY
CP	CONTROL PANEL	LOR	LOCAL/OFF/REMOTE SELECTOR SWITCH	SSPB	START/STOP PUSHBUTTON
CPT	CONTROL POWER TRANSFORMER	LP	LIGHTING PANEL	SSS	SOLID STATE STARTER
CR	CORROSION RESISTANT	LS	LEVEL SWITCH	STD	STANDARD
CS	CONTROL STATION	MCC	MOTOR CONTROL CENTER	STP	SHIELDED TWISTED PAIR
CT	CURRENT TRANSFORMER	MCP	MOTOR CIRCUIT PROTECTOR	STR	STARTER
CU	COPPER	MDP	MAIN DISTRIBUTION PANEL	SV	SOLENOID VALVE
DB	DUCT BANK	MJB	METERING JUNCTION BOX	SW	SWITCH
DI	DIGITAL INPUT (PLC)	NEC	NATIONAL ELECTRICAL CODE	T	TELEPHONE
DO	DIGITAL OUTPUT (PLC)	NEMA	NATIONAL ELECTRICAL MFR ASSOC.	TB	TERMINAL BOARD
EAG	ELECTRICALLY ACTUATED GATE	NEU	NEUTRAL	TC	TIME CLOCK
EAV	ELECTRICALLY ACTUATED VALVE	NFDS	NON-FUSED DISCONNECT SWITCH	TD	TRENCH DUCT
EF	EXHAUST FAN	OCSS	OPEN/CLOSE SELECTOR SWITCH	TEB	TELEPHONE EQUIPMENT BACKBOARD
ESPB	EMERGENCY STOP PUSHBUTTON (MAINTAINED)	OL	OVERLOAD	TEMP	TEMPERATURE
ETT	ELAPSED TIME TOTALIZER	OOSS	ON/OFF SELECTOR SWITCH	TOR	THERMAL OVERLOAD RELAY
EWD	ELEMENTARY WIRING DIAGRAM	OS	OCCUPANCY SENSING	TR	TIMING RELAY
FDS	FUSED DISCONNECT SWITCH	OT	OVER TORQUE SWITCH	TSTAT	THERMOSTAT
FLA	FULL LOAD AMPERES	P	POLE	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
FS	FLOW SWITCH	PB	PUSHBUTTON	UH	UNIT HEATER
FVC	FULL VOLTAGE CONTACTOR	PBC	PULLBOX-CONTROL	UON	UNLESS OTHERWISE NOTED
FVNR-1	FULL VOLTAGE NON-REVERSING STARTER SIZE 1	PBM	PULLBOX-METERING	UPS	UNINTERRUPTIBLE POWER SUPPLY
GFI	GROUND FAULT INTERRUPTER	PBP	PULLBOX-POWER	UTP	UNSHIELDED TWISTED PAIR
GND	GROUND	PC	PHOTO CONTROL	V	VOLTS
GFR	GROUND FAULT RELAY	PF	POWER FACTOR	VC	VOLUME CONTROL
HOA	HAND/OFF/AUTO SELECTOR SWITCH	PH	PHASE	VFD	VARIABLE FREQUENCY DRIVE
HP	HORSEPOWER	PLC	PROGRAMMABLE LOGIC CONTROLLER	VM	VOLT METER
HT	HIGH TORQUE SWITCH	PJB	POWER JUNCTION BOX	XP	EXPLOSION PROOF
HTR	HEATER	PP	POWER PANEL	XFMR	TRANSFORMER
Hz	HERTZ	PRI	PRIMARY	WP	WATERPROOF
		PS	PRESSURE SWITCH	ZS	LIMIT SWITCH

ELECTRICAL LINE SYMBOLOGY:

PROPOSED:

_____	_____	_____	CONDUIT AND WIRE RUN EXPOSED
_____	_____	_____	CONDUIT AND WIRE BELOW GRADE
_____ELEC_____	_____ELEC_____	_____ELEC_____	ELECTRIC LINE
_____ELEC-OH_____	_____ELEC-OH_____	_____ELEC-OH_____	ELECTRIC LINE - OVERHEAD
_____ELEC-UG_____	_____ELEC-UG_____	_____ELEC-UG_____	ELECTRIC LINE - UNDERGROUND
_____ELEC_____	_____ELEC_____	_____ELEC_____	ELEC SERVICE
_____ELEC-OH_____	_____ELEC-OH_____	_____ELEC-OH_____	ELEC SERVICE - OVERHEAD
_____ELEC-UG_____	_____ELEC-UG_____	_____ELEC-UG_____	ELEC SERVICE - UNDERGROUND
_____LIGHT-OH_____	_____LIGHT-OH_____	_____LIGHT-OH_____	ELEC LIGHTING - OVERHEAD
_____LIGHT-UG_____	_____LIGHT-UG_____	_____LIGHT-UG_____	ELEC LIGHTING - UNDERGROUND

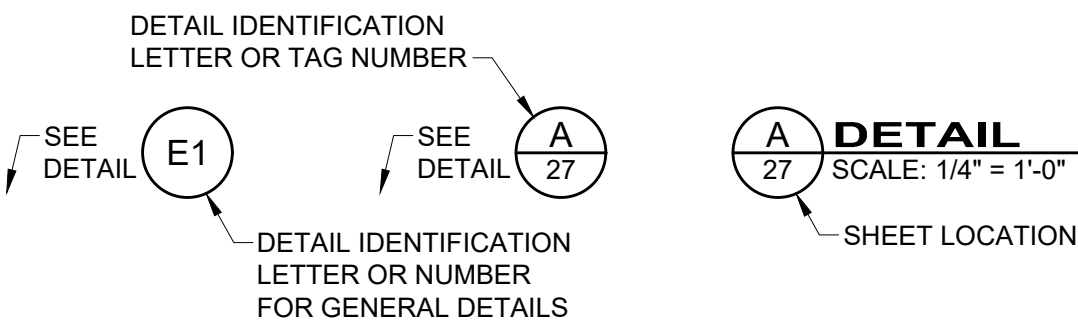
EXISTING:

_____ELEC_____	_____ELEC_____	_____ELEC_____	ELECTRIC LINE
_____ELEC-ABAN_____	_____ELEC-ABAN_____	_____ELEC-ABAN_____	ELECTRIC LINE - ABANDONED
_____ELEC-OH_____	_____ELEC-OH_____	_____ELEC-OH_____	ELECTRIC LINE - OVERHEAD
_____ELEC-UG_____	_____ELEC-UG_____	_____ELEC-UG_____	ELECTRIC LINE - UNDERGROUND
_____ELEC_____	_____ELEC_____	_____ELEC_____	ELECTRIC SERVICE
_____ELEC-OH_____	_____ELEC-OH_____	_____ELEC-OH_____	ELECTRIC SERVICE - OVERHEAD
_____ELEC-UG_____	_____ELEC-UG_____	_____ELEC-UG_____	ELECTRIC SERVICE - UNDERGROUND
_____LIGHT-OH_____	_____LIGHT-OH_____	_____LIGHT-OH_____	ELECTRIC LIGHTING - OVERHEAD
_____LIGHT-UG_____	_____LIGHT-UG_____	_____LIGHT-UG_____	ELECTRIC LIGHTING - UNDERGROUND
_____	_____	_____	ELECTRIC DUCT

ELECTRICAL CODED NOTES:

	NEW WORK - NOTE 1		DEMOLITION - NOTE 1		REVISION - NOTE 1
	NEW WORK - NOTE 2		DEMOLITION - NOTE 2		REVISION - NOTE 2
	NEW WORK - NOTE 3		DEMOLITION - NOTE 3		REVISION - NOTE 3

ELECTRICAL DETAIL REFERENCE:



ELECTRICAL GENERAL NOTES:

- ALL ELECTRICAL EQUIPMENT AND MATERIALS WILL BE SELECTED AND INSTALLED IN COMPLIANCE WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL FIRE CODES, INCLUDING BUT NOT LIMITED TO ALL PERTINENT NFPA REGULATIONS. IT IS THE ELECTRICAL CONTRACTOR'S RESPONSIBILITY TO ENSURE COMPLIANCE WITH THESE CODES.
- DO NOT INSTALL DEVICES SCALED FROM THESE DRAWINGS. ALL DEVICES SHALL BE INSTALLED AT LOCATIONS SHOWN IN THE APPROVED CONDUIT/DEVICE LAYOUT DRAWINGS AND WITH DIMENSIONS TAKEN IN THE FIELD.
- ELECTRICIAN TO VISIT SITE AND VERIFY ALL EXISTING CONDITIONS PRIOR TO BID.
- NO DUCTWORK OR PIPING TO BE RUN ABOVE ELECTRICAL PANELS OR THROUGH ELECTRICAL EQUIPMENT ROOMS. ELECTRICIAN SHALL COORDINATE WITH ALL TRADES FOR EQUIPMENT LAYOUTS PRIOR TO ROUGH-IN OF ALL SYSTEMS.
- MANUFACTURERS AND CATALOG NUMBERS SHOWN IN THE LIGHT FIXTURE SCHEDULE ARE PROVIDED TO INDICATE DESIRED LIGHT FIXTURE CHARACTERISTICS. IT IS THE INTENT OF THE DOCUMENTS TO ALLOW ALTERNATE MANUFACTURERS TO PROVIDE LIGHTING PRODUCTS FOR THE PROJECT, AS LONG AS PROPOSED ALTERNATES PROVIDE THE SAME GENERAL DESIGN AND LIGHTING CHARACTERISTICS AS NOTED IN THE LIGHT FIXTURE DESCRIPTION.
- ELECTRICIAN TO CONFIRM LOCATIONS OF ALL ELECTRICAL EQUIPMENT AND ELECTRICAL CHARACTERISTICS OF PROCESS EQUIPMENT PROVIDED BY OTHER TRADES PRIOR TO INSTALLING ROUGH-INS AS SHOWN ON THE ELECTRICAL PLANS. ALL SHOP DRAWING REQUIREMENTS WILL BE CONSIDERED AS THE MEANS AND METHODS OF INSTALLATION.
- THIS PROJECT INVOLVES WORK AT AN INDUSTRIAL FACILITY AND THE CONTRACTOR IS EXPECTED TO PROVIDE CRAFTSMANSHIP REFLECTING THE NATURE OF THE FACILITY. CONDUITS IN PROCESS AREAS ARE TO BE SURFACE MOUNTED RIGID GALVANIZED STEEL (RGS). IN CLASSIFIED AREAS SEAL ALL CONDUITS TO RESTRICT THE PASSAGE OF GASSES AND VAPORS, AND ARRANGE SEALING FITTING DRAINS IN CONDUIT SYSTEMS TO PREVENT ACCUMULATION OF CONDENSATE ABOVE SEALS. ALL CONDUITS ENTERING OR LEAVING A MOTOR CONTROL CENTER, CONTROL PANEL, VALVE ACTUATOR, INSTRUMENT, A BUILDING, OR A PANELBOARD SHALL BE MADE WATERTIGHT USING AN INFLATABLE SEALED BLADDER DUCT SEALING SYSTEM, RAYCHEM 'RAYFLATE' DUCT SEALING SYSTEM RDSS OR APPROVED EQUAL. ALL HARDWARE IS TO BE STAINLESS STEEL UNLESS OTHERWISE DIRECTED.
ALL ENCLOSURES ARE TO BE RATED AS FOLLOWS (UON):
 - OUTDOORS: NEMA 4X (STAINLESS STEEL)
 - CLASSIFIED AREAS: NEMA 7
 - INDOORS (CORROSIVE AREAS): NEMA 4X (STAINLESS STEEL)
 - INDOORS (CONTROLLED ENVIRONMENT) NEMA 12
- ELECTRICIAN SHALL REVIEW ALL OTHER TRADES' CONSTRUCTION DOCUMENTS AND/OR COORDINATE WITH OTHER TRADES AND VERIFY IF THERE ARE ANY ADDITIONAL ELECTRICAL REQUIREMENTS NOT SHOWN ON ELECTRICAL DRAWINGS. COST FOR WORK SHOWN ON OTHER TRADES' DRAWINGS SHALL BE INCLUDED IN BASE BID. ALL FIELD WIRING AND TERMINATIONS OF PROCESS EQUIPMENT AND INSTRUMENTATION AND CONTROLS SHALL BE THE RESPONSIBILITY OF THE ELECTRICIAN. ALL CABLES AND WIRES PROVIDED BY VENDORS SHALL BE INSTALLED AND TERMINATED BY THE ELECTRICIAN. WIRE ALL MISCELLANEOUS POWER AND CONTROLS AS REQUIRED TO PROVIDE A COMPLETE FUNCTIONING SYSTEM
- A 4-20mA SIGNAL IS AN ANALOG SIGNAL USED TO TRANSMIT DATA (LEVEL, FLOW, ETC.) FOR PROCESS CONTROLS. THE ELECTRICIAN SHALL PROVIDE, INSTALL, AND TERMINATE SHIELDED TWISTED PAIRS (STP) WIRING IN RIGID GALVANIZED STEEL CONDUIT (RGS). RGS IS USED IN AN ATTEMPT TO REDUCE THE DISTORTION AFFECT FROM EMI AND RFI. BELOW GRADE CONDUITS SHALL BE PVC SCHED-40. PARALLEL RUNS OF DATA CONDUITS AND POWER CONDUITS SHALL BE SEPARATED BY 2 FEET. THE STP SHIELD SHALL BE GROUNDED AT THE CONTROL PANEL ONLY (DO NOT GROUND AT BOTH ENDS).
- THE ELECTRICIAN SHALL BE RESPONSIBLE FOR LAYOUT AND COORDINATION OF OPENINGS AND CHASES AND SHALL PERFORM ALL CUTTING AND PATCHING AS REQUIRED TO INSTALL THEIR WORK. ALL CONCRETE HOUSE KEEPING PADS SHALL BE FRAMED AND POURED BY THE ELECTRICIAN. PADS SHALL HAVE A 45 DEGREE, 1" CHAMFER AROUND UPPER EDGE.
- THE ELECTRICIAN SHALL INSTALL & DISTRIBUTE TEMPORARY POWER SERVICE FOR THE DURATION OF THIS PROJECT AS DEFINED IN DIVISION 1 SPECIFICATIONS. ALL COSTS ASSOCIATED WITH THE INSTALLATION, DISTRIBUTION AND MAINTENANCE OF THE TEMPORARY POWER IS THE RESPONSIBILITY OF THE ELECTRICIAN. THERE SHALL BE 480/277V, 3PH, 4W; 208/120V, 3PH, 4W; AND 120/240V, 1PH, 3W POWER AVAILABLE AT ALL LOCATIONS OF CONSTRUCTION AS DIRECTED IN FIELD AND AS SPECIFIED. ALL TEMPORARY EQUIPMENT, CONDUITS & CONDUCTORS SHALL BE COMPLETELY REMOVED AT COMPLETION OF PROJECT.
- ALL ELECTRICAL EQUIPMENT, DEVICES, LIGHTING FIXTURES, CONDUIT, AND WIRING SHOWN ON THE ELECTRICAL DRAWINGS IS NEW UNLESS CLEARLY CALLED OUT AS EXISTING. ALL EXISTING ELECTRICAL EQUIPMENT THAT IS CALLED OUT TO BE REUSED SHALL BE INSPECTED IN THE FIELD BY THE ELECTRICIAN AND THE CONSTRUCTION MANAGER TO DETERMINE ITS CONDITION PRIOR TO STARTING ANY WORK. PROVIDE DOCUMENTATION TO OWNER INDICATING CONDITION OF THE EXISTING EQUIPMENT, AND REUSE EXISTING EQUIPMENT ONLY IF ALL PARTIES AGREE THE CONDITION IS ACCEPTABLE. ALL EXISTING EQUIPMENT DETERMINED TO BE UNUSABLE SHALL BE REPLACED WITH LIKE KIND AS DIRECTED BY THE OWNER. ANY OF THE OWNERS EQUIPMENT DETERMINED TO BE REUSED THAT IS DAMAGED BY ANY CONTRACTOR DURING SWITCHOVER SHALL BE REPLACED BY THAT CONTRACTOR. ALL EXISTING EQUIPMENT IS THE PROPERTY OF THE OWNER (NOT THE CONTRACTOR) AND SHALL BE TREATED ACCORDINGLY.
- THE ELECTRICIAN SHALL BE HELD RESPONSIBLE TO ENSURE ALL CONTROLLERS TO BE INSTALLED ARE CAPABLE OF LOCKOUT / TAGOUT PRIOR TO INSTALLATION.
- CONFORM TO THE NEC, OSHA, FIRE MARSHAL, BUILDING DEPARTMENT AND OTHER APPLICABLE CODES AND REGULATIONS. OBTAIN PERMITS, PAY ALL FEES, AND ARRANGE FOR REQUIRED INSPECTIONS.
- ALL LIGHTING AND RECEPTACLE WIRING TO BE #12 XHHW WITH EQUIPMENT GROUND IN 3/4" C UNLESS OTHERWISE NOTED.
- DO NOT MOUNT ANY LIGHT FIXTURE DIRECTLY OVER PIPING OR EQUIPMENT THAT WILL INTERFERE WITH NORMAL LIGHTING DISTRIBUTION.
- SIZE JUNCTION BOXES AS REQUIRED PER NEC. PROVIDE BARRIER TYPE TERMINAL STRIPS, AND ALL WIRING TO BE IN CONDUIT.
- SIZE PULL BOXES (PB) AS REQUIRED PER NEC.
- PROVIDE SEPARATE PB'S FOR CONTROL AND POWER.
- MOTOR OVERLOAD SETTING SHALL BE FIELD SELECTED PER MOTOR NAME PLATE CURRENT AND INSTALLED ACCORDINGLY.
- MOUNT LOCAL CONTROLS AND SERVICE DISCONNECTS ON WALL NEAREST EQUIPMENT WHERE POSSIBLE. (MAXIMUM 60" ABOVE FINISHED FLOOR OR FINAL GRADE, MAXIMUM LATERAL DISTANCE FROM WALL TO EQUIPMENT - 10 FEET).
- ALL FEEDERS RUN BELOW GRADE SHALL BE RUN IN PVC CONDUIT AT MINIMUM 3'-0" BELOW FINISHED GRADE. TRANSITION TO ABOVE GRADE SHALL BE MADE USING FACTORY PVC COATED RIGID STEEL CONDUIT SWEEPS.

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MENTOR, OHIO 44060
(440) 951-9000

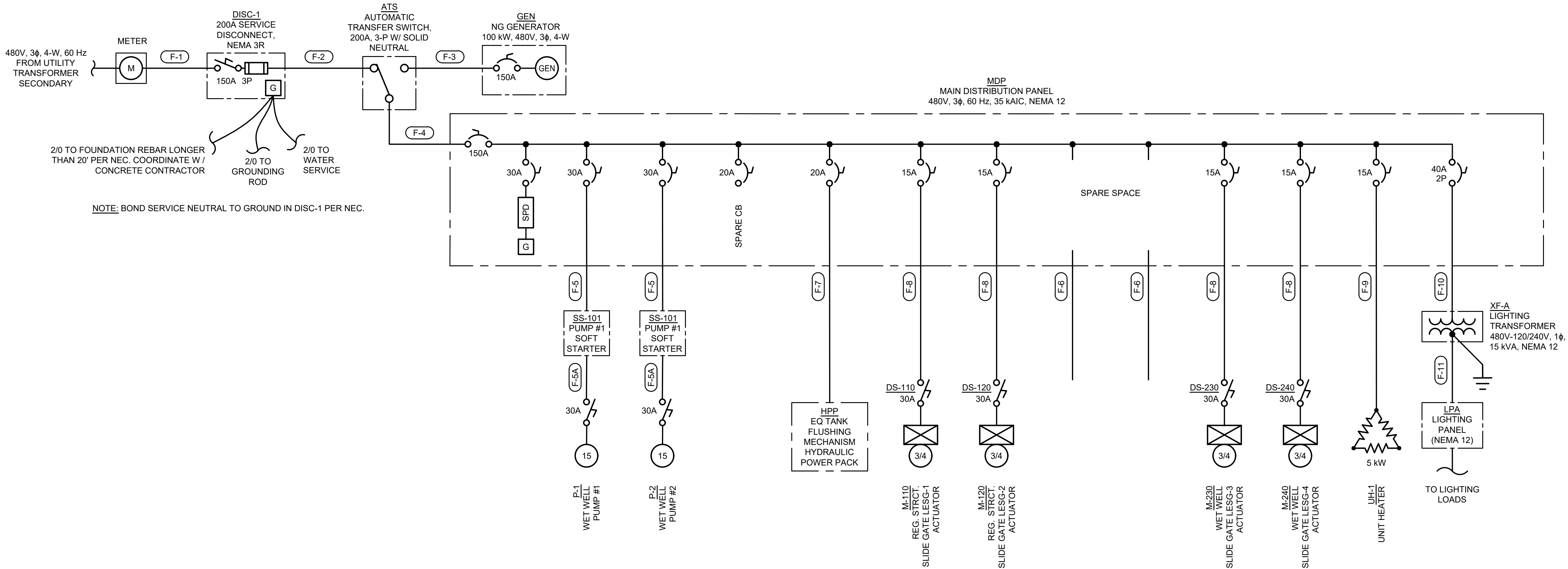
DATE	REVISION	NO	REVIEW	ISSUED FOR:	ISSUE DATE:	SCALE:	DESIGNED BY:	DRAWN BY:	CHECKED BY:
					10/3/2025	N/A	ELE	ELE	JPB

CITY OF WILLOUGHBY
LAKESHORE EAST EQ BASIN
PHASE II

LAKE COUNTY
WILLOUGHBY, OHIO
ELECTRICAL - E SERIES

ELECTRICAL LEGEND & GENERAL NOTES

PROJECT NO.	
230264	
DISCIPLINE	
ELECTRICAL	
SHEET NAME	
E-01	
SHEET	OF
42	48



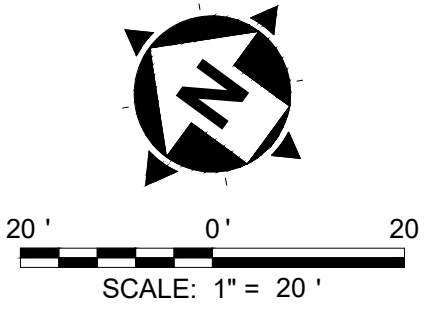
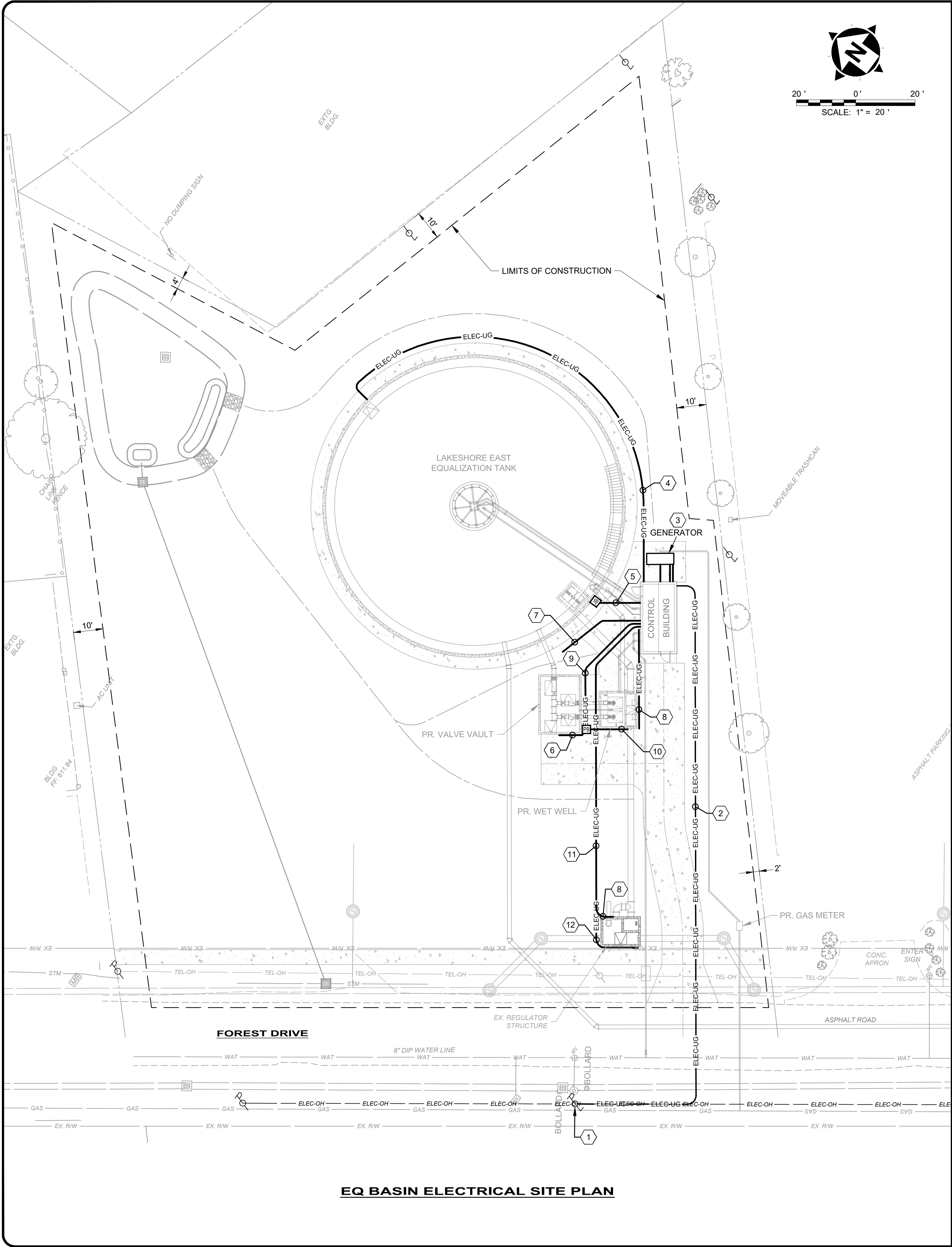
EQ BASIN ONE-LINE DIAGRAM

POWER & CONTROL FEEDER SCHEDULE					
TAG	EQUIPMENT	POWER SOURCE	CONDUCTOR SIZE + GND	CONTROL WIRE DESTINATION	CONTROL WIRES
F-1	SERVICE DISCONNECT SWITCH, <u>DISC-1</u>	UTILITY TRANSFORMER	(3) 3/0 + (1) 3/0 NEU IN 2-1/2"C	N/A	N/A
F-2	AUTOMATIC TRANSFER SWITCH, <u>ATS</u>	DISC-1	(3) 3/0 + (1) 3/0 NEU + (1) #4 GND IN 2-1/2"C	N/A	N/A
F-3	AUTOMATIC TRANSFER SWITCH, <u>ATS</u>	GEN	(3) 1/0 + (1) 1/0 NEU IN 4"C + (1) #4 GND IN 2-1/2"C	GEN	(2) 2-CS RS-485 CABLE [1 SP] IN 3/4"C
F-4	MAIN DISTRIBUTION PANEL, <u>MDP</u>	ATS	(3) 1/0 + (1) 1/0 NEU IN 4"C + (1) #4 GND IN 2-1/2"C	N/A	N/A
F-5 (TYP OF 2)	WET WELL PUMP SOFT STARTERS, <u>SS-101</u> & <u>SS-102</u>	MDP	(3) #10 + (1) #12 GND IN 3/4"C	SCTP	(16) #14 IN 3/4"C
F-5A (TYP OF 2)	WET WELL PUMPS, <u>P-1</u> & <u>P-2</u>	SS-101, SS-102	(3) #10 + (1) #12 GND IN 3/4"C	SS-101 & SS-102	(1) 2-CSC IN 3/4"C
F-6 (TYP OF 2)	SPARE PLUG VALVE ACTUATOR FEEDER	MDP	EMPTY 3/4"C	SCTP	EMPTY 3/4"C
F-7	EQ TANK HYDRAULIC POWER CENTER, <u>HPP</u>	MDP	(3) #12 + (1) #12 GND IN 3/4"C	N/A	N/A
F-8 (TYP OF 4)	SLIDE GATE ACTUATORS REGULATOR STRUCTURE: <u>M-101</u> & <u>M-102</u> WET WELL: <u>M-201</u> & <u>M-202</u>	MDP	(3) #12 + (1) #12 GND IN 3/4"C	SCTP	(3) 2-CSC IN 3/4"C + (8) #14 IN 3/4"C
F-9	ELECTRICAL UNIT HEATER, <u>UH-1</u>	MDP	(3) #12 + (1) #12 GND IN 3/4"C	N/A	N/A
F-10	LIGHTING TRANSFORMER, <u>XF-A</u>	MDP	(2) #8 + (1) #8 GND IN 3/4"C	N/A	N/A
F-11	LIGHTING PANEL - <u>LPA</u>	XF-A	(2) #4 + (1) #4 NEU + (1) #8 GND IN 1"C	N/A	N/A

ISSUED FOR:	REVIEW	NO	REVISION	DATE
ISSUE DATE:	10/3/2025			
SCALE:	AS NOTED			
DESIGNED BY:	ELE			
DRAWN BY:	ELE			
CHECKED BY:	JPB			

CITY OF WILLOUGHBY LAKESHORE EAST EQ BASIN PHASE II	WILLOUGHBY, OHIO	
	LAKE COUNTY	
	ELECTRICAL - E SERIES	
SINGLELINE DIAGRAM & SCHEDULES		

PROJECT NO.	
230264	
DISCIPLINE	
ELECTRICAL	
SHEET NAME	
E-02	
SHEET	OF
43	48



GENERAL NOTES:

1. ELECTRICAL UTILITY OF RECORD IS THE ILLUMINATING COMPANY, A FIRSTENERGY COMPANY. ALL SERVICE EQUIPMENT AND INSTALLATION MEANS & METHODS TO MEET THEIR REQUIREMENTS.
2. PROPOSED UNDERGROUND SERVICE DUCT BANKS TO UTILIZE 36" SWEEPS, MINIMUM; ALL OTHERS TO UTILIZE 24" SWEEPS, MINIMUM.
3. MINIMUM SIZE OF UNDERGROUND DUCT BANK CONDUIT IS 1-1/4". TRANSITION TO SMALLER CONDUIT ON FEEDER SCHEDULE ONCE ABOVEGROUND.
4. ALL DUCT BANKS SHOWN ARE DIAGRAMMATIC AND SHOULD NOT BE USED SOLELY FOR INSTALLATION. SEE DETAIL DRAWINGS FOR FULL ACCOUNTING OF DUCT BANK CONDUIT & CONDUCTORS.
5. COORDINATE CONDUIT PENETRATIONS INTO CONTROL BUILDING WITH PROCESS AND MECHANICAL CONTRACTORS TO AVOID INTERFERENCES WITH UNDERGROUND PIPING, ESPECIALLY BETWEEN BUILDING AND EQ TANK.
6. ALL CONDUIT ENTERING ROAD RIGHT-OF-WAY SHALL CONFORM TO ODOT STANDARDS.

CODED NOTES:

1. EXISTING POWER POLE, UTILITY TO INSTALL TRANSFORMERS FOR 480V / 3 ϕ / 4-W / 200A SERVICE. INSTALL 20' AERIAL CONDUIT WITH WEATHERCAP & SEAL, TRANSITION TO UNDERGROUND CONDUIT RUNNING PARALLEL TO FOREST DR. ROADWAY.
2. ELECTRICAL SERVICE FEEDER, CONTRACTOR TO INSTALL 2-1/2" SCH-40 PVC CONDUIT, UTILITY TO INSTALL (4) #3/0 CONDUCTORS. SECTION BENEATH FOREST DR. TO MEET ODOT STANDARDS, ALL OTHERS TO FOLLOW VERDANTAS SPECIFICATION DIVISION 26 REQUIREMENTS.
3. NATURAL GAS-FUELED BACKUP GENERATOR, 100 kW. SEE SHEET E-04 FOR DETAILS.
4. DUCT BANK FOR CONVENIENCE RECEPTACLE INSTALLED AT EQ TANK NORTH ACCESS HATCH. ROUTE AROUND OUTSIDE OF SIDEWALK SURROUNDING TANK. FASTEN VERTICAL TRANSITION TO CONCRETE TANK WALL PER SPECIFICATIONS BEFORE POURING SIDEWALK CONCRETE. INSTALL RECEPTACLE 18" ABOVE TOC.
5. EQ TANK LEVEL SENSORS OVERHEAD CONDUIT, ROUTE IN OVERHEAD RACK PER SPECIFICATION SECTION 260529 AT A HEIGHT TO FACILITATE CONDUIT ENTRY INTO TOP OF CONTROL BUILDING WALL. CONTAINS THE FOLLOWING INSTRUMENT FEEDERS, EACH ONE RUN IN 3/4"C:
 - 5.1. FLUSHING CHAMBER HIGH WATER LEVEL SWITCH, (2) #14 TO HPP
 - 5.2. TANK HIGH WATER OVERFLOW SWITCH, (2) #14 TO SCTP
 - 5.3. TANK LEVEL TRANSMITTER, (1) 2-CSC TO SCTP
6. SPARE PLUG VALVE FEEDER "F-6" DUCT BANK, (2) 1-1/4"C. INSTALL CONDUIT PER DETAILS ON SHEET E-05 ABOVE TOC, CAP AND LEAVE IN PLACE.
7. SPARE PLUG VALVE FEEDER "F-6" DUCT BANK, (2) 1-1/4"C. INSTALL CONDUIT UNDERGROUND TO LOCATION SHOWN, CAP, AND LEAVE IN PLACE WITHOUT VERTICAL TRANSITION TO ABOVEGROUND. MARK CONDUIT END BY DRIVING 3'-LG #8 REBAR VERTICALLY TO SAME DEPTH OF CONDUIT.
8. SLIDE GATE ACTUATOR FEEDER "F-8" DUCT BANK, (3) 1-1/4"C. SEE FEEDER SCHEDULE ON SHEET E-02 FOR CONDUCTORS, TYPICAL OF (3).
9. COMBINED DUCT BANK FOR FEEDERS (2) "F-5A" & (1) "F-6" + WET WELL SENSORS JUNCTION BOX, (8) 1-1/4"C. SEE FEEDER SCHEDULE ON SHEET 01-E-02 FOR CONDUCTORS. SEE SHEET 01-E-05 FOR INSTALLATION DETAILS.
10. WET WELL SENSORS JUNCTION BOX DUCT BANK, (12) #14 IN 1-1/4"C + (2) 2-CSC IN 1-1/4"C. SEE SHEET E-05 FOR INSTALLATION DETAILS.
11. REGULATOR STRUCTURE DUCT BANK, (2) SLIDE GATE FEEDERS "F-8" + WATER LEVEL TRANSMITTER "LIT-100", (4) 1-1/4"C
12. COMBINED SLIDE GATE LESG-1 FEEDER "F-8" & LEVEL TRANSMITTER LIT-100 DUCT BANK, (3) #12 + (1) #12 GND & (4) 2-CSC, EACH IN (1) 1-1/4"C; (2) 1-1/4"C TOTAL.

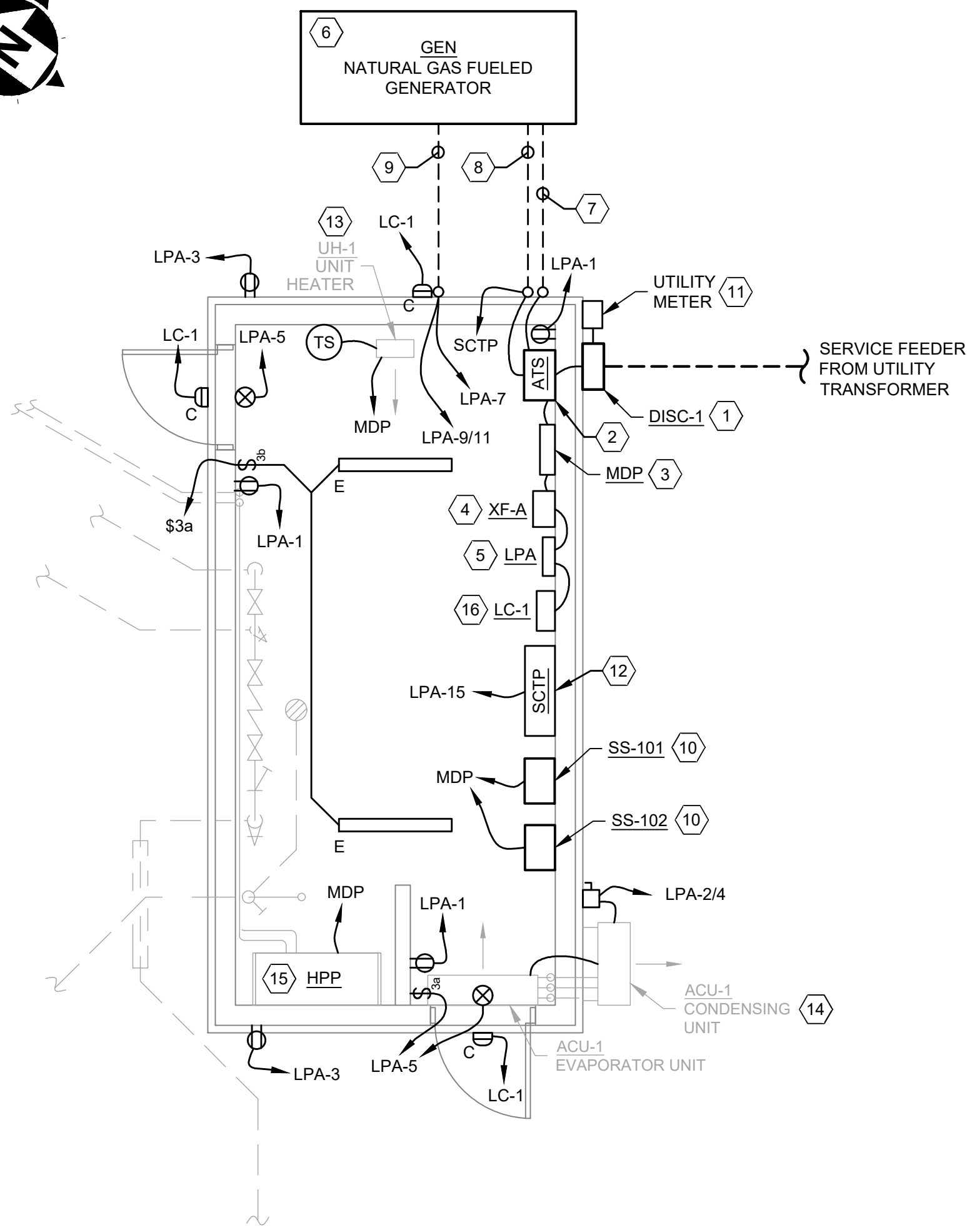
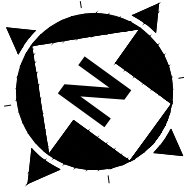
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8150 STERLING COURT
MENTOR, OHIO 44060
(440) 951-9000

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DRAWN BY:	JPB			
CHECKED BY:	RSS			

CITY OF WILLOUGHBY	WILLOUGHBY, OHIO
LAKESHORE EAST EQ BASIN	
PHASE II	
LAKE COUNTY	ELECTRICAL - E SERIES
	ELECTRICAL SITE PLAN

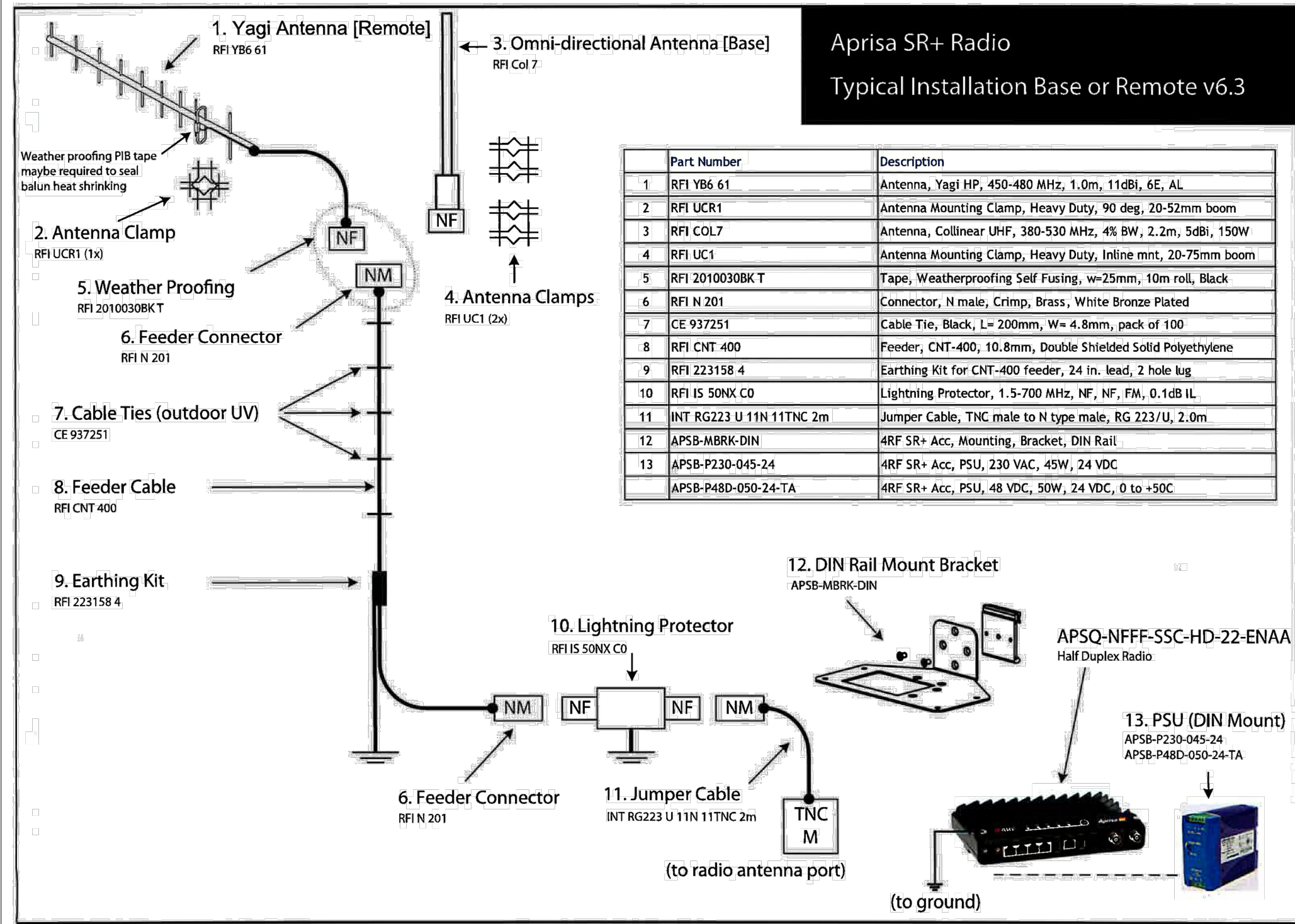
PROJECT NO.	230264
DISCIPLINE	ELECTRICAL
SHEET NAME	E-03
SHEET	OF
44	48



CONTROL BUILDING ELECTRICAL PLAN
SCALE: 1/4" = 1'-0"

CODED NOTES:

- 480V, 3 ϕ , 200A SERVICE DISCONNECT SWITCH DISC-1, FUSED AT 150A, NEMA 3R ENCLOSURE
- 480V, 3 ϕ , 200A AUTOMATIC TRANSFER SWITCH ATS, 3-POLE WITH SOLID NEUTRAL, NEMA 12 WALL-MOUNTED ENCLOSURE
- 480V, 3 ϕ , 200A MAIN DISTRIBUTION PANEL MDP, NEMA 12 FLOOR-MOUNTED ENCLOSURE
- 480V - 120/240V, 15 kVA TRANSFORMER XF-A, 1 ϕ , NEMA 12 FLOOR-MOUNTED ENCLOSURE
- LIGHTING PANEL LPA, 120/240V, 1 ϕ , 3-W, NEMA 12 WALL-MOUNTED ENCLOSURE. SEE SCHEDULE THIS SHEET FOR DETAILS.
- NATURAL GAS FUELED BACKUP GENERATOR GEN, 100 kW, 480/277V, 3 ϕ , 60 Hz, 150A LCB, W/SOUND ATTENUATING WEATHER PROOF ENCLOSURE. SEE SPECIFICATION SECTION 263213.16 FOR DETAILS.
- UNDERGROUND FEEDER (F-3) FROM GENERATOR TO ATS. SEE SCHEDULE ON SHEET #43, E-02 FOR DETAILS.
- UNDERGROUND GENERATOR CONTROL WIRING TO ATS & SCTP. SEE FEEDER (F-3) SCHEDULE ON SHEET 43, E-02 FOR DETAILS.
- GENERATOR BLOCK HEATER & BATTERY CHARGER FEEDERS FROM LPA, (2) SETS OF (2) #12 + (1) #12 GND IN COMMON 1-1/4".
- WET WELL PUMPS 1&2 SOFT STARTERS SS-101 & SS-102, WALL-MOUNTED NEMA 12 ENCLOSURE, 480V / 3 ϕ / 60 Hz / 15 HP
- 200A METER SOCKET PER UTILITY STANDARDS, NEMA 3R ENCLOSURE
- SCADA/TELEMETRY PANEL SCTP, NEMA 12 WALL-MOUNTED ENCLOSURE, 10" TOUCHSCREEN HMI, 6-PORT (RJ45) ETHERNET SWITCH, AND RADIO COMMUNICATIONS DEVICES TO INTERFACE WITH DIVERSION STRUCTURE CONTROL PANEL FROM PHASE I (DETAILS THIS SHEET). SEE FEEDER SCHEDULE ON SHEET #43, E-02 FOR FIELD WIRING REQUIREMENTS.
- UNIT HEATER UH-1 WITH REMOTE TEMPERATURE SWITCH, 480V / 3 ϕ / 60 Hz / 5 kW. SEE MECHANICAL PLAN & SCHEDULE SHEET #40, M-01 FOR DETAILS.
- SPLIT AIR CONDITIONING UNIT ACU-1, 240V / 1 ϕ / 60 Hz. INSTALL 30A, 2-P, NEMA 3R, LOCAL DISCONNECT ON EXTERIOR WALL NEAR CONDENSING UNIT & EXTEND (2) #12 + (1) #12 GND IN 3/4" TO INDOOR EVAPORATOR UNIT. SEE MECHANICAL PLAN & SCHEDULE SHEET #40, M-01 FOR DETAILS.
- EQ TANK HYDRAULIC POWER PACK HPP, VENDOR SUPPLIED, CONTRACTOR INSTALLED, 480V / 3 ϕ / 60 Hz FEEDER (F-7). SEE SCHEDULE ON SHEET #43, E-02 FOR DETAILS. SEE CIRCULAR TANK FLUSHING SYSTEM SPEC SECTION 464614 FOR FIELD WIRING REQUIREMENTS. COORDINATE CONDUIT PENETRATIONS WITH GENERAL CONTRACTOR.
- EXTERIOR LIGHTING CONTACTOR LC-1 WITH REMOTE PHOTOEYE CONTROLS, H-O-A SWITCH, AND OVERRIDE TIMER IN WALL-MOUNTED NEMA 12 ENCLOSURE



RADIO COMMUNICATIONS EQUIPMENT SETUP DETAIL
NOT TO SCALE

GENERAL NOTES:

- ALL INTERIOR EQUIPMENT ENCLOSURES TO BE NEMA 12, WALL-MOUNTED, UON.
- ALL LIGHTING PANEL CIRCUITS TO BE (2) #12 + (1) #12 GND IN 3/4"C, UON.
- ALL EXTERIOR RECEPTACLES TO BE INSTALLED WITH WEATHERPROOF IN-USE COVERS.
- MAINTAIN 42" OF CLEAR WORKING SPACE IN FRONT OF ALL 480V PANELS PER NEC.
- ALL FLOOR-MOUNTED PANELS TO BE INSTALLED ON A 4" HOUSEKEEPING PAD PER NOTES ON SHEET# 42, E-01. EXTEND PADS 2" PAST THE OVERALL FOOTPRINT OF THE RESPECTIVE PANEL.

Aprisa SR+ Radio
Typical Installation Base or Remote v6.3

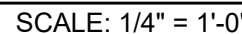
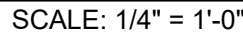
Part Number	Description
1 RFI YB6 61	Antenna, Yagi HP, 450-480 MHz, 1.0m, 11dBi, 6E, AL
2 RFI UCR1	Antenna Mounting Clamp, Heavy Duty, 90 deg, 20-52mm boom
3 RFI COL7	Antenna, Collinear UHF, 380-530 MHz, 4% BW, 2.2m, 5dBi, 150W
4 RFI UC1	Antenna Mounting Clamp, Heavy Duty, Inline mnt, 20-75mm boom
5 RFI 2010030BK-T	Tape, Weatherproofing Self Fusing, w=25mm, 10m roll, Black
6 RFI N 201	Connector, N male, Crimp, Brass, White Bronze Plated
7 CE 937251	Cable Tie, Black, L= 200mm, W= 4.8mm, pack of 100
8 RFI CNT 400	Feeder, CNT-400, 10.8mm, Double Shielded Solid Polyethylene
9 RFI 223158 4	Earthing Kit for CNT-400 feeder, 24 in. lead, 2 hole lug
10 RFI IS 50NX C0	Lightning Protector, 1.5-700 MHz, NF, FM, 0.1dB IL
11 INT RG223 U 11N 11TNC 2m	Jumper Cable, TNC male to N type male, RG 223/U, 2.0m
12 APSB-MBRK-DIN	4RF SR+ Acc, Mounting, Bracket, DIN Rail
13 4RF SR+ Acc, PSU, 230 VAC, 45W, 24 VDC	
APSB-P48D-050-24-TA	4RF SR+ Acc, PSU, 48 VDC, 50W, 24 VDC, 0 to +50C

LIGHT FIXTURE SCHEDULE			
DESIGNATION	DESCRIPTION	MANUFACTURER/MODEL	NOTES
C	EXTERIOR LED WALL-PACK W/ COLD WEATHER EMERGENCY BATTERY BACKUP	HOLOPHANE W4PLED-10C-700-40K-T3M-120-ELCW-BKSDP	4000K COLOR, 2200 LUMENS, VERIFY FINISH WITH ARCHITECT
E	LINEAR LED FIXTURE, GASKETED, VAPOR-TIGHT, LOW PROFILE, FROSTED LENSE W/ EMERGENCY BATTERY BACKUP	HOLOPHANE EMS-LA9-6000LM-LPPFL-WD-MVOLT-40K-80CRI-E10WMCP	4000K COLOR, 6000 LUMENS
EXIT	EXT SIGN, WHITE THERMOPLASTIC BODY W/ RED LETTERS, NICKEL-CADMIUM EMERGENCY BATTERY BACKUP	LITHONIA LHQM-LED-R-SD	SELF-DIAGNOSTICS

LIGHTING FIXTURE SCHEDULE

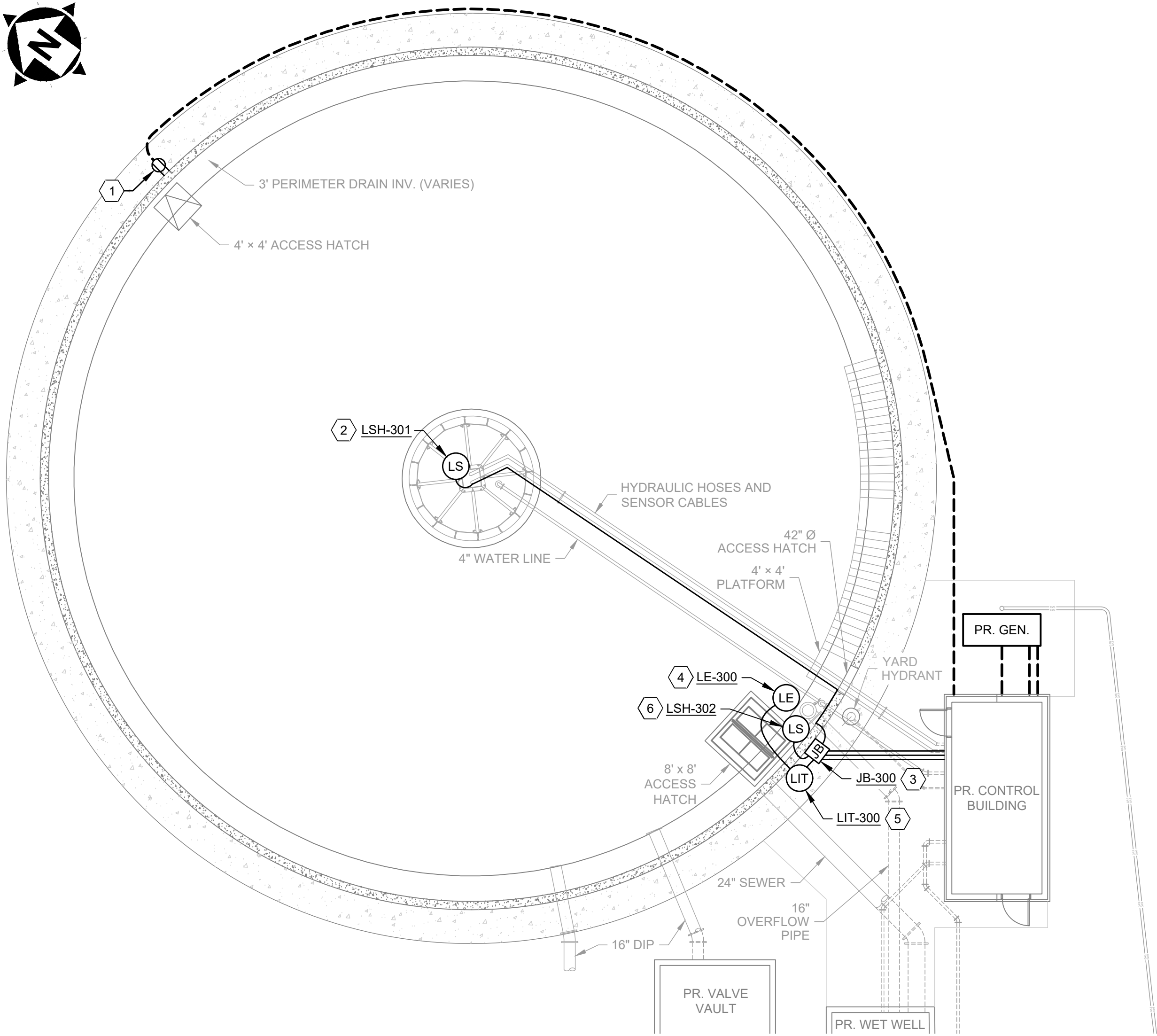
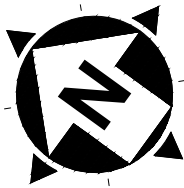
NOTE: ALL FIXTURES WITH BATTERY BACKUP SHALL BE CAPABLE OF PROVIDING 100% OUTPUT FOR 90 MINUTES DURING POWER LOSS

PANELBOARD		LPA							
PANEL TYPE		NQOD OR EQUAL							
NEMA TYPE		NEMA 12							
VOLTAGE		240V/120V		PHASE				1	
OCPD		80A		WIRE				3	
MOUNTING		SURFACE		BUSS				100A	
						</			



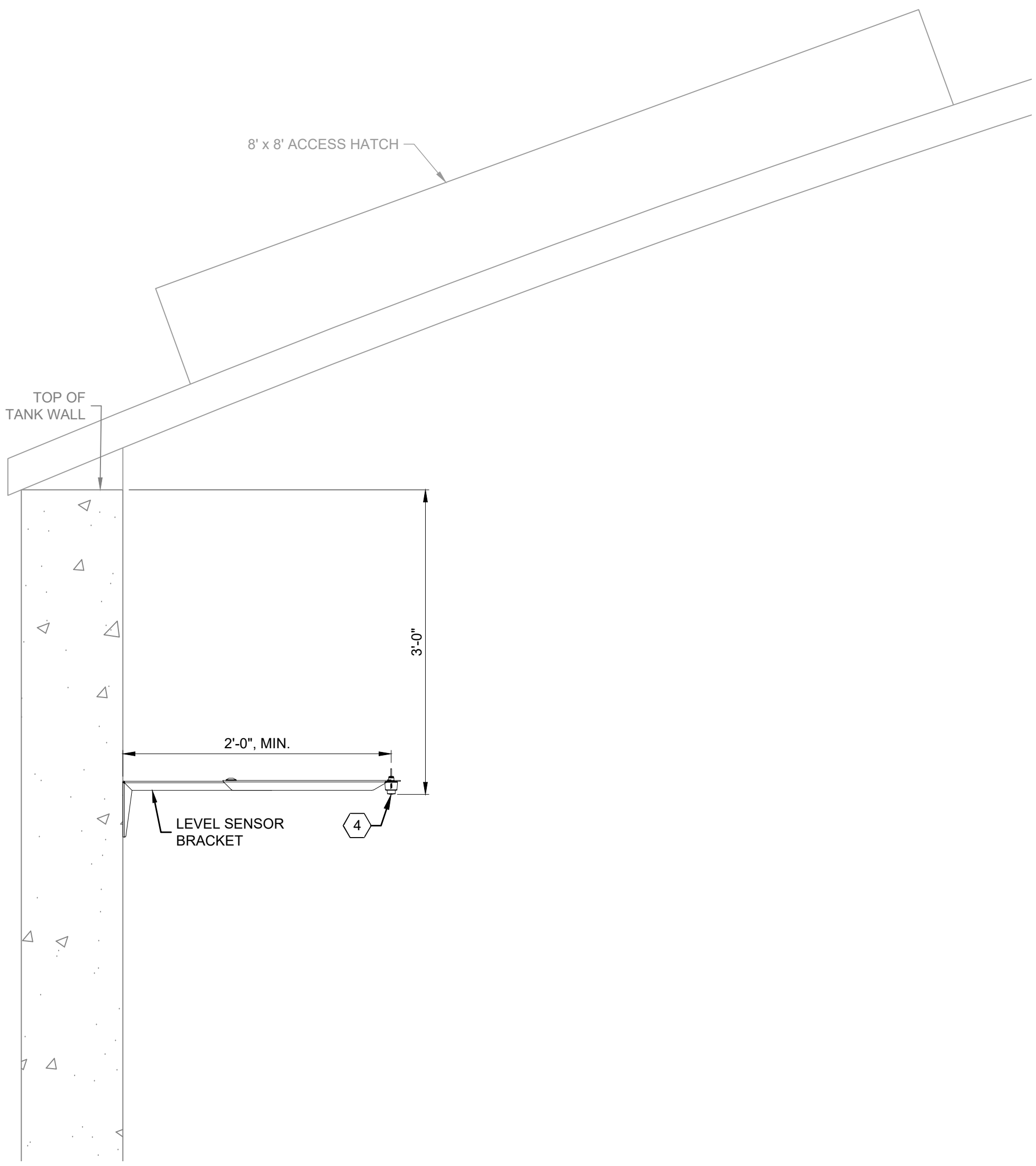
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46 48



EQ BASIN TANK LIGHTING & INSTRUMENTATION PLAN

SCALE: 3/32" = 1'-0"



EQ BASIN TANK LEVEL SENSOR INSTALLATION DETAILS

NOT TO SCALE

GENERAL NOTES:

- ELECTRICAL UTILITY OF RECORD IS THE ILLUMINATING COMPANY, A FIRSTENERGY COMPANY. ALL SERVICE EQUIPMENT AND INSTALLATION MEANS & METHODS TO MEET THEIR REQUIREMENTS.
- PROPOSED UNDERGROUND SERVICE DUCT BANKS TO UTILIZE 36" SWEEPS, MINIMUM; ALL OTHERS TO UTILIZE 24" SWEEPS, MINIMUM.
- ALL UNDERGROUND CONDUIT TO BE SCH-40 PVC, 1-1/4" MINIMUM. ALL EXPOSED CONDUIT TO BE SS OR FLEXIBLE NON-METALLIC. WHEREVER CONDUIT TRANSITIONS TO ABOVE GRADE, UTILIZE A SS 90° SWEEP AND EXPANDERS/REDUCERS TO MATCH THE SIZE LISTED IN THE FEEDER SCHEDULE.
- ALL DUCT BANKS SHOWN ARE DIAGRAMMATIC AND SHOULD NOT BE USED SOLELY FOR INSTALLATION. SEE DETAIL DRAWINGS FOR FULL ACCOUNTING OF DUCT BANK CONDUIT & CONDUCTORS.
- COORDINATE CONDUIT PENETRATIONS INTO CONTROL BUILDING WITH PROCESS AND MECHANICAL CONTRACTORS TO AVOID INTERFERENCES WITH UNDERGROUND PIPING, ESPECIALLY BETWEEN BUILDING AND EQ TANK.
- HAZARDOUS AREA CLASSIFICATIONS:
 - TANK
 - INTERIOR: CLASS I, DIVISION 1
 - VENT, WITHIN 3' RADIUS OF OPENING: CLASS I, DIVISION 1
 - VENT, 2' RADIUS EXTENSION: CLASS I, DIVISION 2
 - HATCH, WITHIN 3' OF EDGE TO HEIGHT OF 18": CLASS I, DIVISION 2
 - VALVE VAULT
 - INTERIOR: CLASS I, DIVISION 2

CODED NOTES:

- EQ BASIN CONVENIENCE RECEPTACLE, GFCI, INSTALL CONDUIT AND SUPPORTS PER DETAILS THIS SHEET TO MAINTAIN 6" CLEARANCE FROM BOTTOM OF RECEPTACLE TO FINISHED GRADE. INSTALL IN NEMA 4X GANG BOX WITH WEATHERPROOF IN-USE COVER. MAINTAIN 3' CLEARANCE FROM HATCH EDGES TO AVOID HAZARDOUS AREA.
- EQ TANK FLUSHING RESERVOIR HIGH WATER LEVEL SWITCH "LSH-301", SUPPLIED BY VENDOR AND INSTALLED CONTRACTOR PER VENDOR'S REQUIREMENTS. RUN MFR'S CABLE THROUGH SS 3/4" CONDUIT WITH EXPLOSION-PROOF SEAL TO JUNCTION BOX MOUNTED ON EXTERIOR TANK WALL.
- EQ TANK RESERVOIR LEVEL SENSOR JUNCTION BOX "JB-300", NEMA 4X, MOUNT AT A HEIGHT TO FACILITATE ROUTING CONDUIT OVERHEAD TO CONTROL BUILDING. MAINTAIN 3' CLEARANCE FROM HATCH EDGES TO AVOID HAZARDOUS AREA
- RADAR LEVEL SENSOR "LE-300", VEGA MODEL# VEGAPULS C 21, 4-20 mA LOOP POWERED, MOUNTED TO TANK WALL 27" ABOVE BOTTOM OF TANK VIA SS ADJUSTABLE BRACKET CAT# MBD.AC TO EXTEND SENSOR 24" AWAY FROM WALL AND AT LEAST 12" FROM ROOF ACCESS HATCH EDGE. BE SURE TO AVOID ANY PROCESS PIPING OR OTHER OBSTRUCTIONS BETWEEN SENSOR FACE AND BOTTOM OF TANK. ORDER WITH MANUFACTURER'S CABLE LONG ENOUGH TO REACH LIT-300. USE SS EXPLOSION-PROOF CONDUIT BODIES & SEAL TO ROUTE CABLE THROUGH TANK WALL BEFORE TERMINATING IN LEVEL TRANSMITTER WITH NEMA 4X CABLE GLAND. SEE DETAIL THIS SHEET FOR INSTALLATION REFERENCE.
- WALL-MOUNTED NEMA 4X LEVEL INDICATING TRANSMITTER, "LIT-300", VEGA MODEL# VEGADIS 82. INSTALL ON EXTERIOR TANK WALL SO THAT DISPLAY IS 62" ABOVE TOC. ROUTE 2-C SHIELDED SIGNAL CABLE TO JB-300.
- EQ TANK HIGH WATER OVERFLOW LEVEL SWITCH "LSH-302", SEE PROCESS SERIES FOR DETAILS AND INSTALLATION ELEVATION. ROUTE CABLE THROUGH CONCRETE TANK WALL TO JB-300 VIA 3/4"C WITH EXPLOSION-PROOF CONDUIT BODIES/SEAL.

ISSUED FOR:	REVIEW	NO	REVISION	DATE
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CHECKED BY:	GTZ			

PROJECT NO.

230264

DISCIPLINE

ELECTRICAL

SHEET NAME

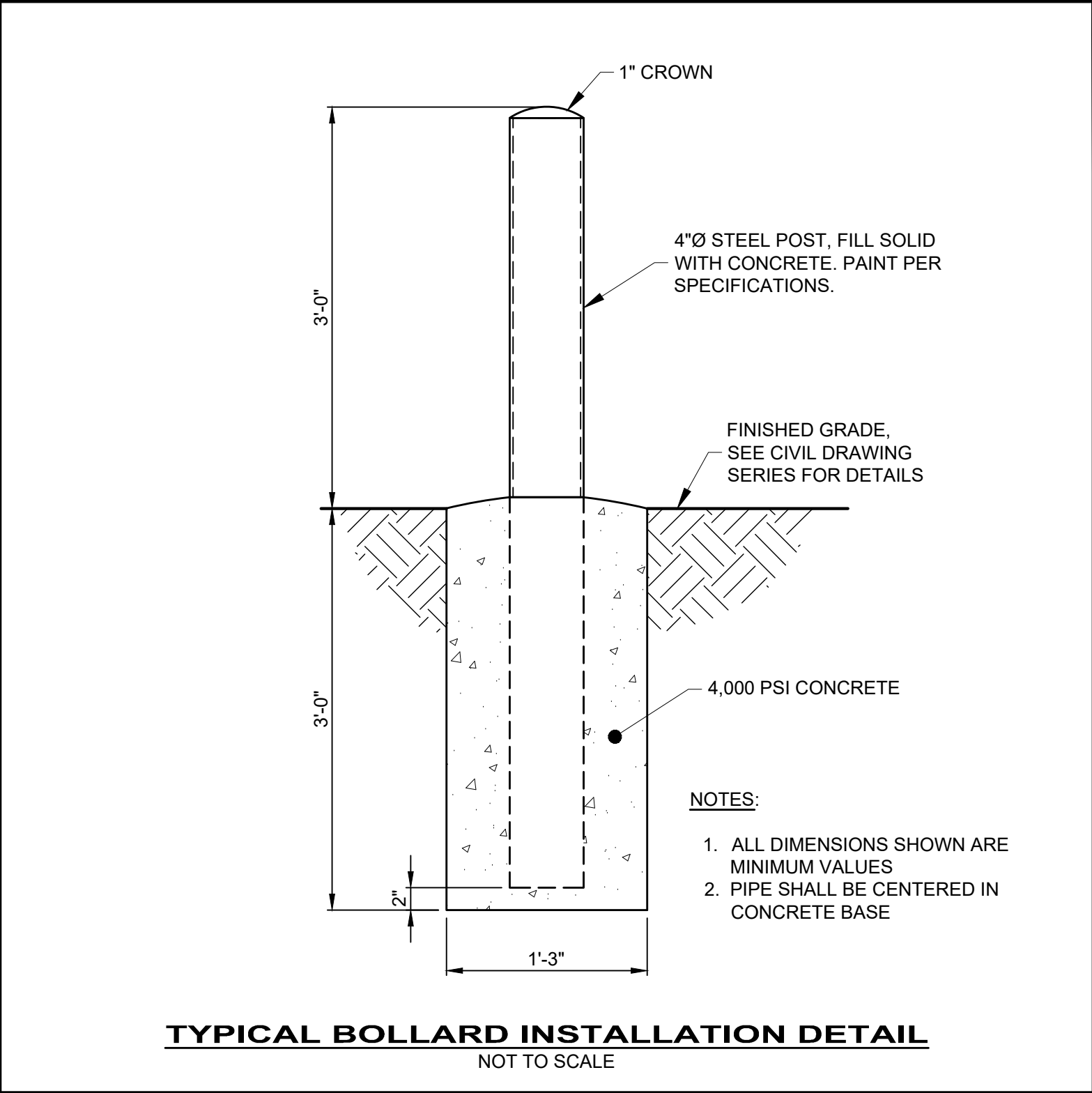
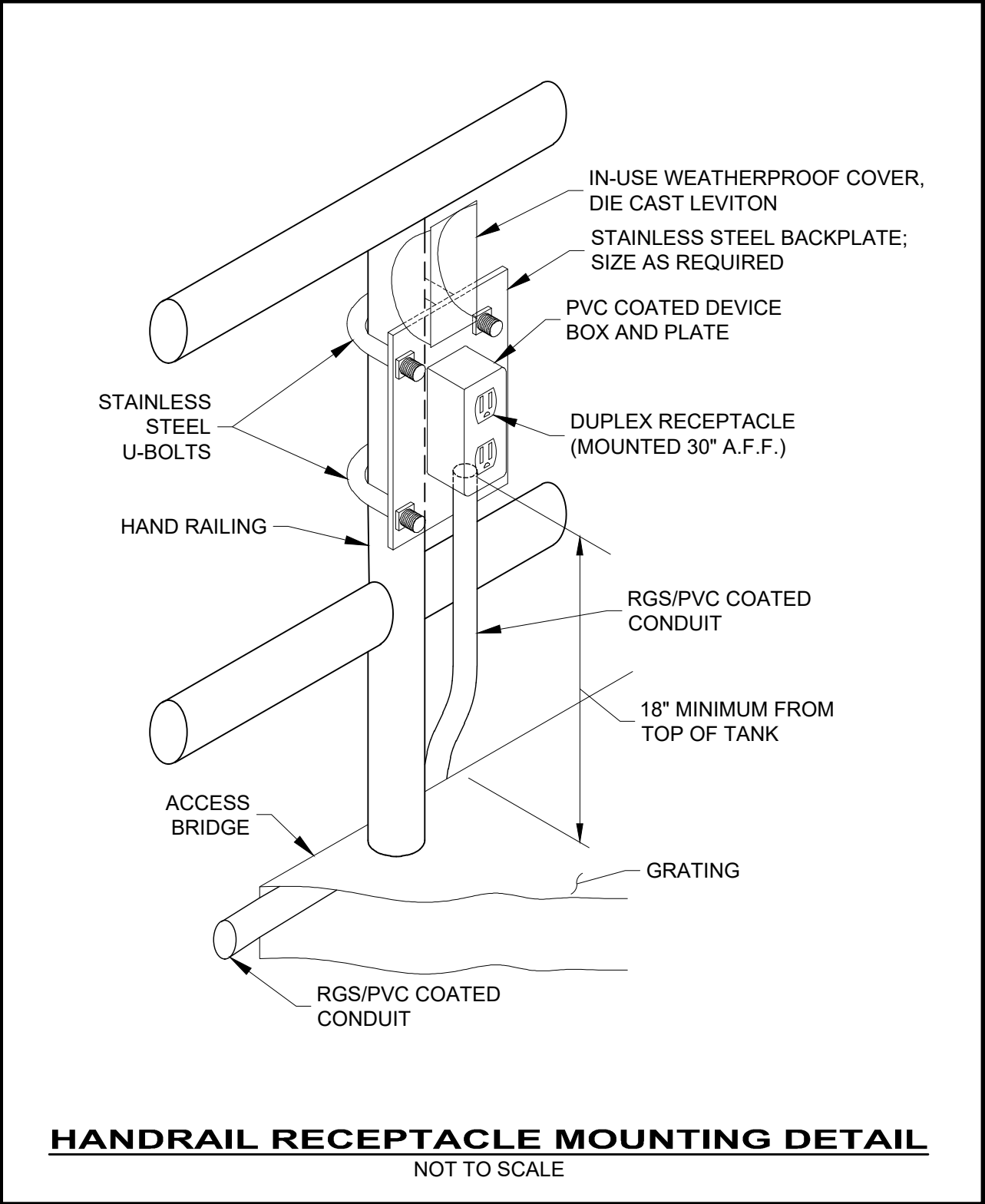
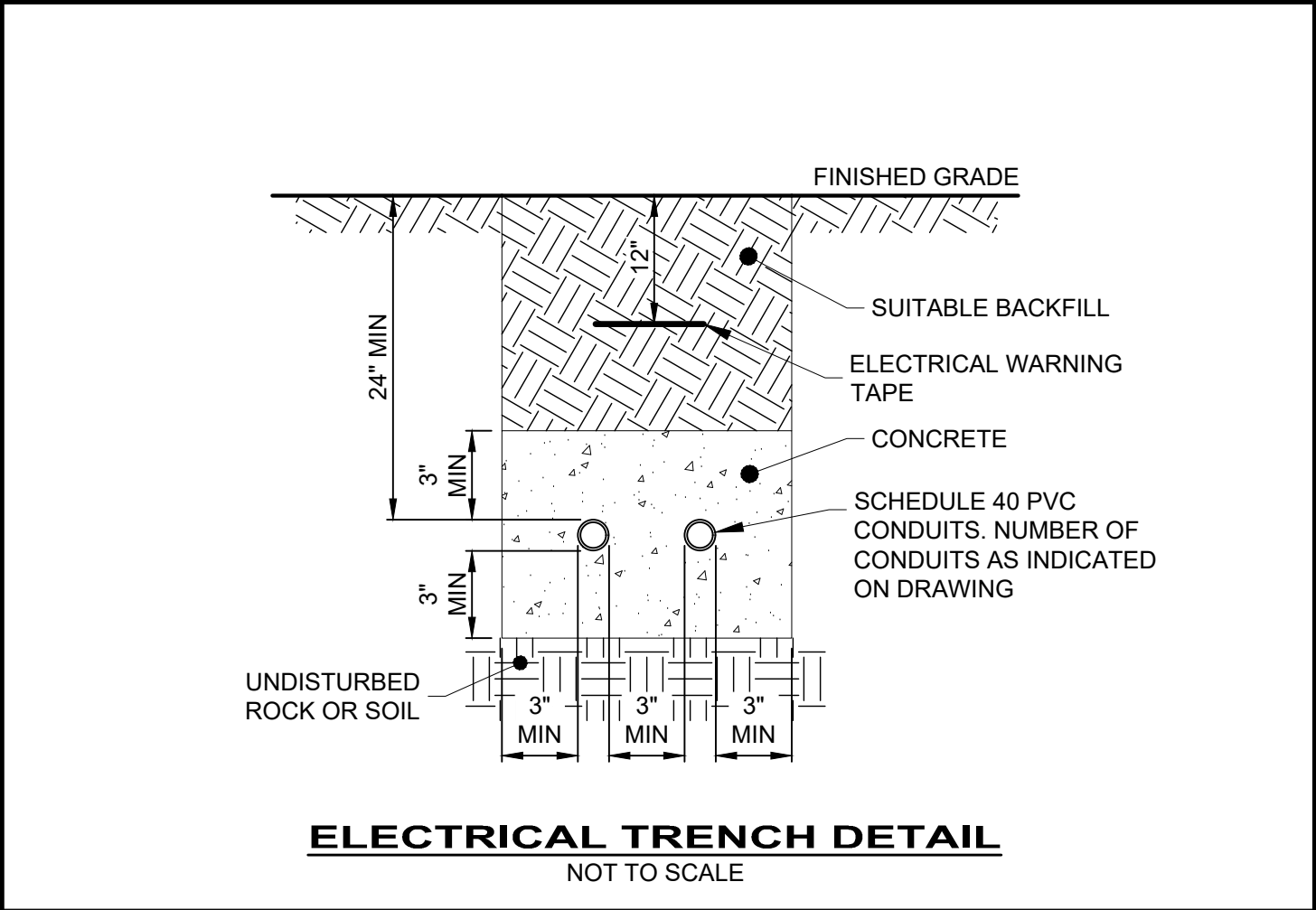
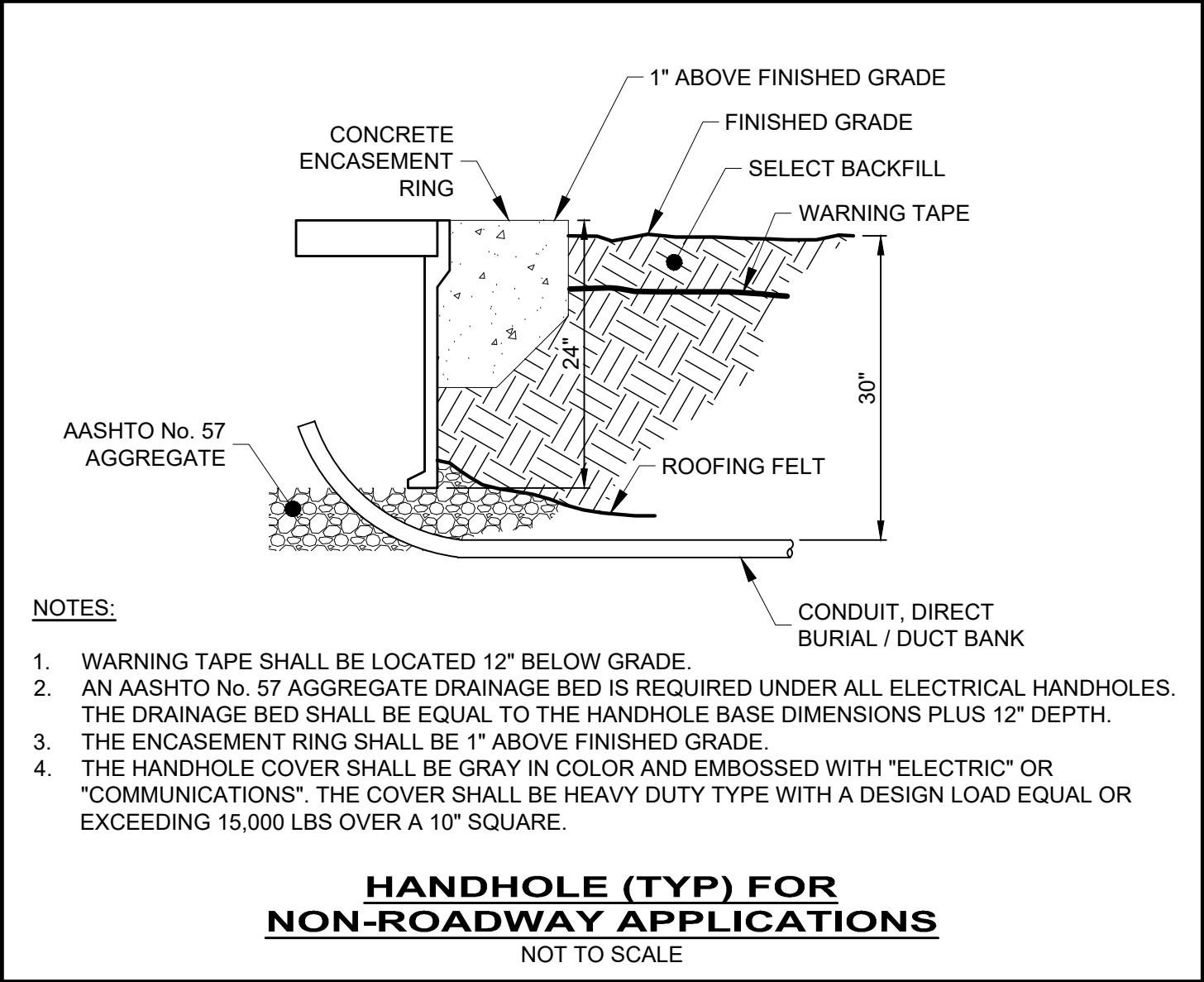
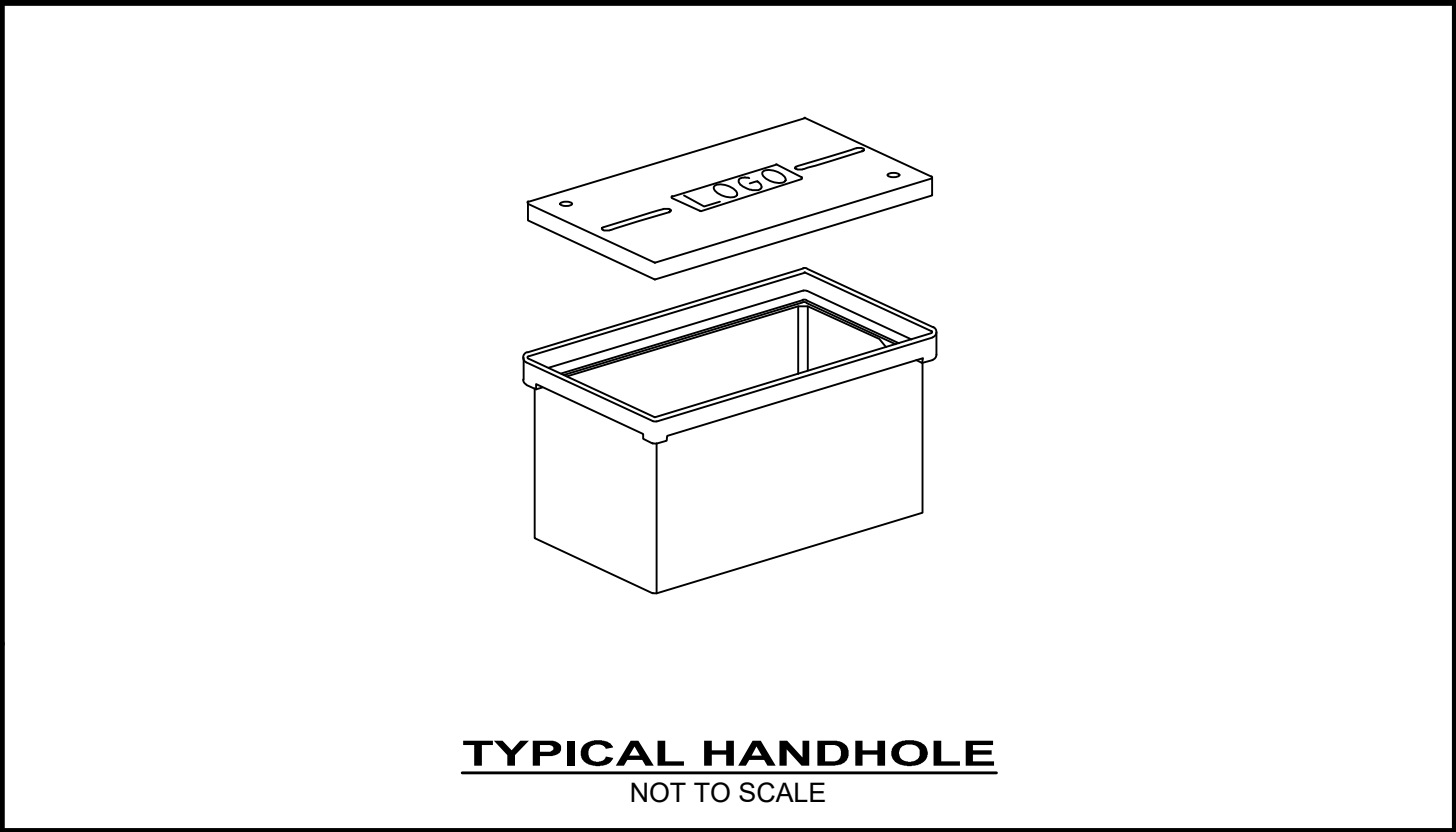
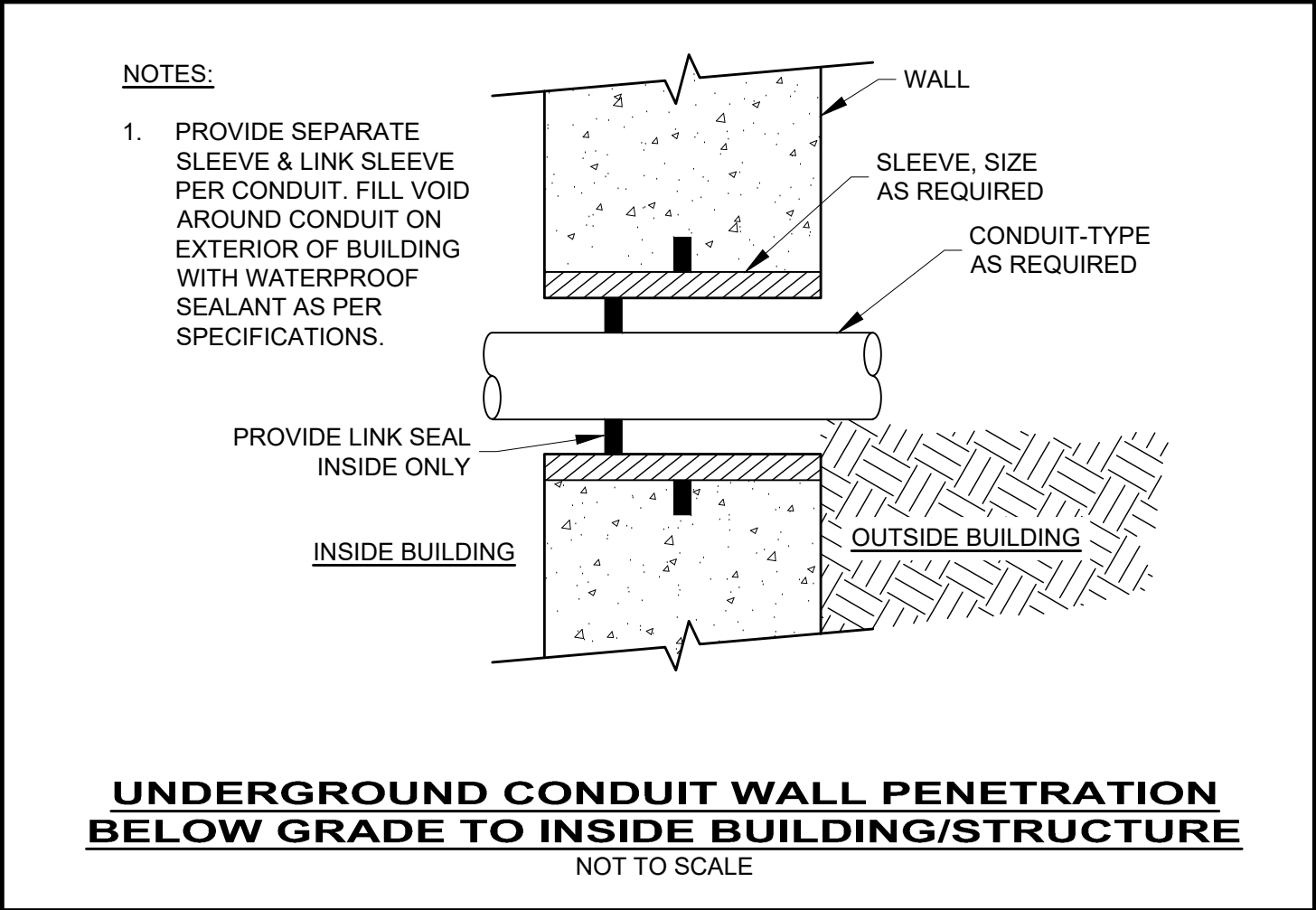
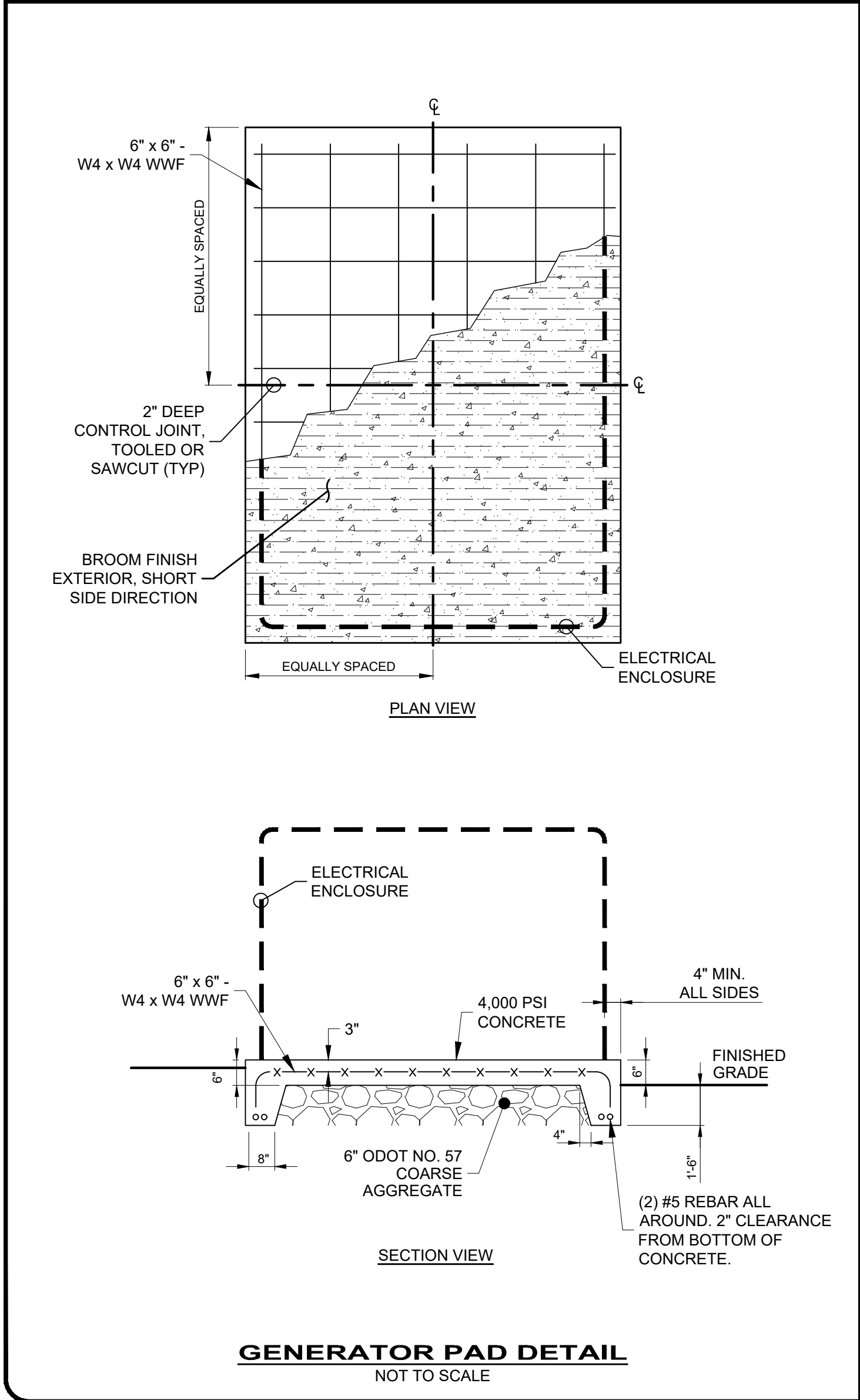
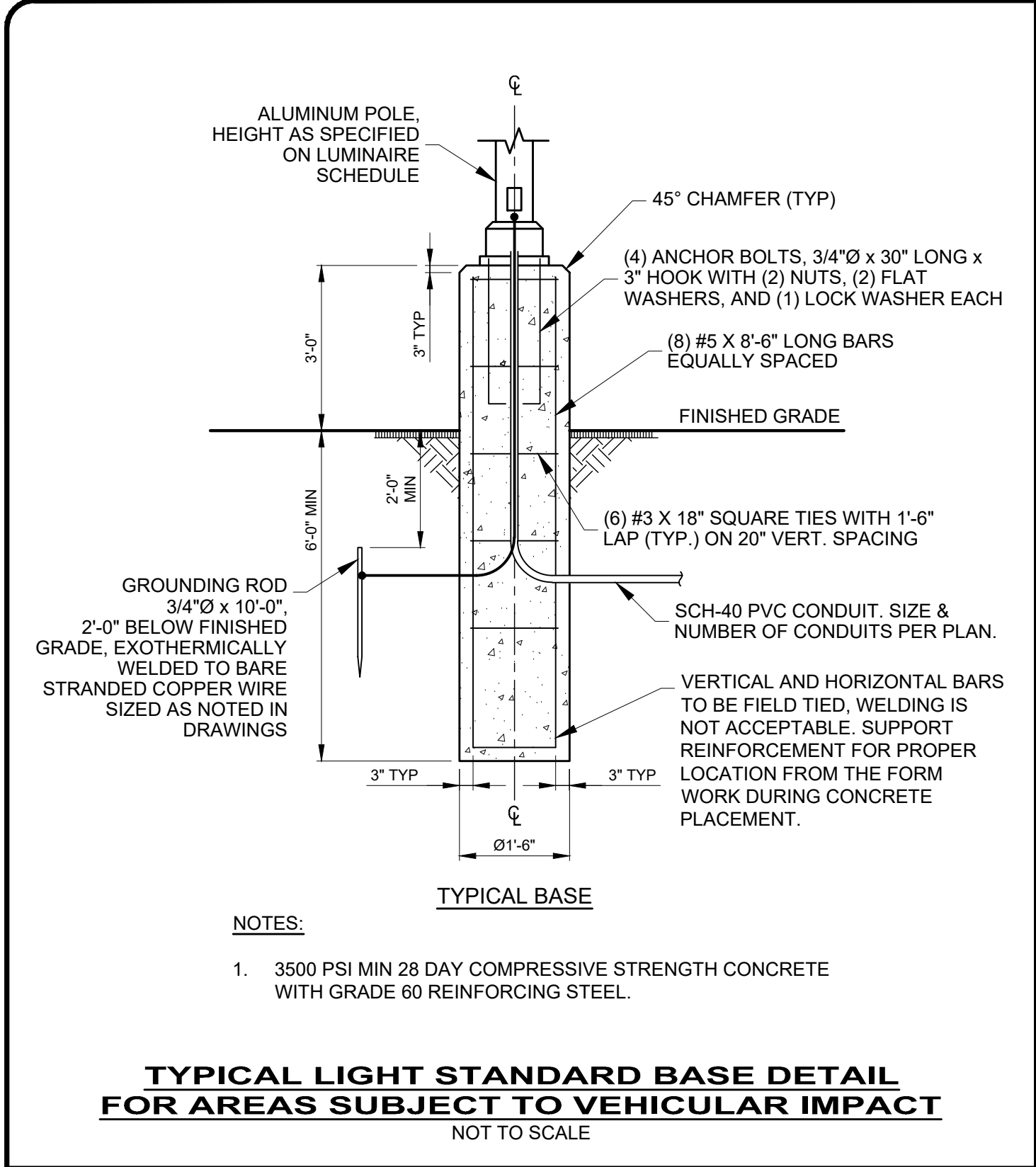
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OF

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DRAWN BY:	JPB		
CHECKED BY:	RSS		
CITY OF WILLOUGHBY LAKESHORE EAST EQ BASIN PHASE II		WILLOUGHBY, OHIO LAKE COUNTY ELECTRICAL - E SERIES	
STANDARD ELECTRICAL DETAILS			
PROJECT NO.		230264	
DISCIPLINE		ELECTRICAL	
SHEET NAME		E-07	
SHEET	OF		
48	48		