

Contract Administration Richard Mutterback, Director

306 East Jackson Street, 4N Tampa, FL 33602

> Office (813) 274-8116 Fax: (813) 274-7368

ADDENDUM 3 Via E-Mail DATE: July 20, 2023

Contract: 22-C-00046; Northwest Ground Storage Tank Improvements

City of Tampa

Jane Castor, Mayor

Bidders on the above referenced project are hereby notified that the following addendum is made to the Contract Documents. BIDS TO BE SUBMITTED SHALL CONFORM TO THIS NOTICE.

Item 1: The Bid Opening date is hereby changed to August 1, 2023.

Item 2: Replace PlansU with PLANSUR1 (Mar 2023)

Item 3: 22-C-00046 SECTION 16000 - 16950

Item 4: Questions and Answers

- 1. On Bid Item 4: Investigation Beneath Tank Floors, is the intent to produce a report similar in fashion and scope to the previous investigation at Morris Bridge, should this investigation survey the entire floor?
- a. The entire floor should be surveyed. See prior addendum regarding the investigation at Morris Bridge.
- 2. Is the city covering the cost for the lead/asbestos testing? If not please specify a line item to carry the amount on the bid form.
- a. The standard "upfront" documents for the City of Tampa speak to testing being performed by the City unless otherwise noted (G-5.01). We note otherwise within Specific Provision 18 Testing on Page SP-3 which states that all testing required shall be borne by the Contractor. If lead/asbestos testing is required, the cost shall be borne by the contractor.
- 3. What is the anticipated start date on the project?
- a. The specifications included in the advertisement speak to required timing for topics such as the pre-construction meeting, mobilization, and substantial completion.
- 4. Please provide as built or quantify the linear feet of pipe requiring coatings of the Northwest GST Building carried in Line Item 21 of the Bid Form.
- a. See Appendix A.

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- 5. Please specify which permits/ authorizations are required for the project.
- a. See G-1.02 WORK INCLUDED. Please note that this project site is within Hillsborough County's Jurisdiction, and they determined that no building permit is required. The specifications included in this advertisement speak to other testing and clearance requirements.
- 6. I do not see any advertisement for a prebid meeting. I assume there was not a mandatory prebid meeting. Also, is it possible to schedule a site visit to see the exterior of the tank?
- a. No.
- 7. I assume there is no requirement for Davis Bacon Wage Rates. If so please attached wage determination.
- a. No.
- 8. In spec section 09920 Table 3.07-1 Coating Systems for Interior Concrete, the DFT was not indicated. Please specify the required milage of each coating.
- a. Adhere to Manufacturer Requirements.
- 9. Please revise bid form quantities to reflect the omission of the East GST at Morris Bridge PS.
- a. The specific quantities associated with this comment are not clear.
- 10. Should the lead/asbestos testing prove their presence, will abatement costs be covered by the contingency fund?
- a. Yes.
- 11. Is the existing coating and age known?
- a. This information is not available. However, we do not believe the interior has been coated.
- 12. Please provide dimensions on the Northwest GST building- the height is needed to price lifts, etc.
- a. Issued for Bid Plans dated March 2022 were included in the original advertisement. Please see the Issued for Bid Set dated March 2023.
- 13. Please indicate what electrical work is required per Bid Item 26.
- a. See plans and note the addendum which includes Division 16 specifications which were accidentally omitted when the project was originally advertised.
- 14. 120 days is a short time frame for the work. Please allow an additional 60 days to compensate for repairs within the tank.
- a. The 120-day requirement will remain due to operational constraints.

- Will the tank be taken offline, drained, and cleaned by the city before the NTP? 15.
- After the pre-construction meeting and prior to mobilization to the site, the tank will be a. taken offline and drained as much as possible.

All other provisions of the Contract Documents and Specifications not in conflict with this Addendum shall remain in full force and effect. Questions are to be e-mailed to ContractAdministration@tampagov.net.

Jim Greiner, P.E., Contract Management Supervisor

NORTHWEST GROUND STORAGE TANK GROUND STORAGE TANK IMPROVEMENTS

CITY OF TAMPA WATER DEPARTMENT

City of Tampa Water Department 306 E. Jackson Street, 5N Tampa, FL 33602

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Set:				
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Sheet				
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are	REV	DATE	DESCRIPTION	ΒY

CONSTRUCTION DRAWINGS FOR THE

MORRIS BRIDGE SECTION 23 TOWNSHIP 27 RANGE 19 NORTHWEST SECTION 30 TOWNSHIP 28 RANGE 18 TAMPA, HILLSBOROUGH COUNTY, FLORIDA

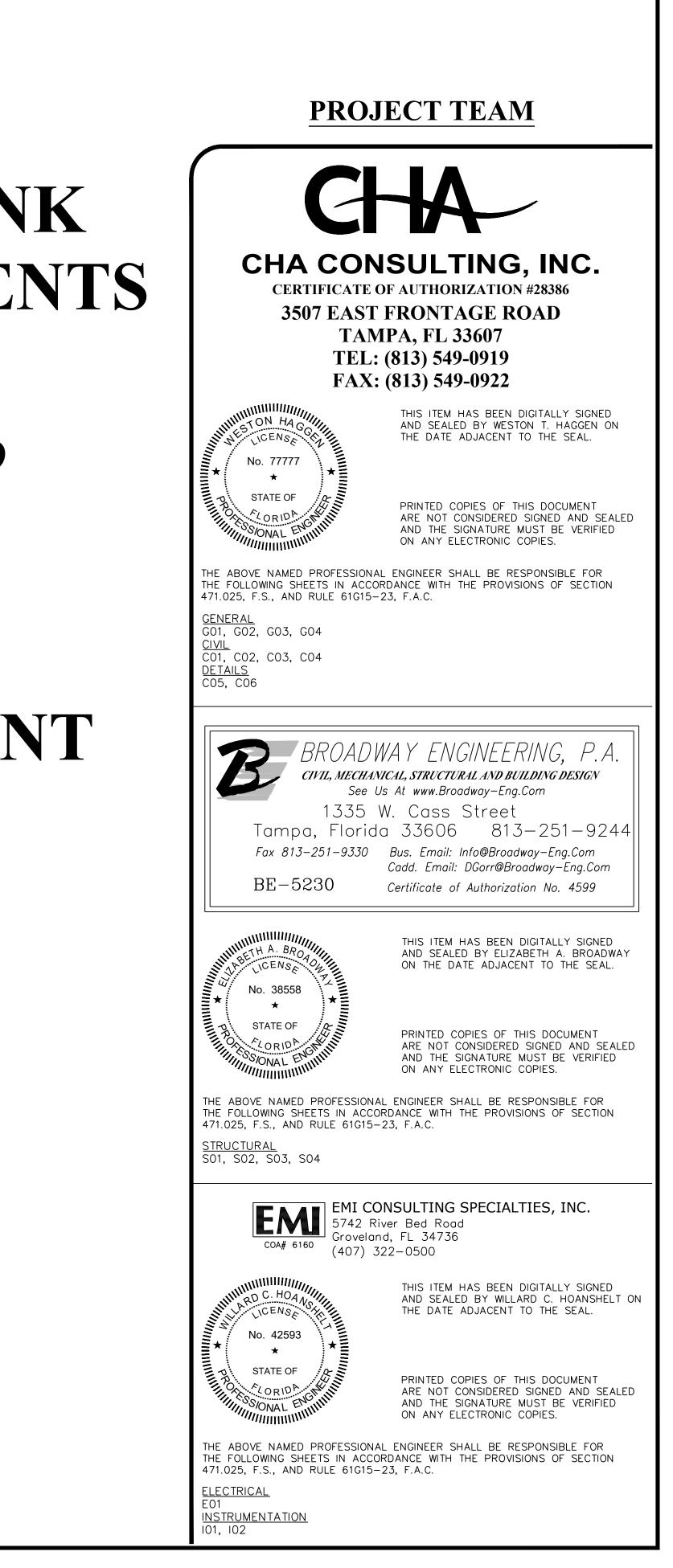
PREPARED FOR



ISSUED FOR BID

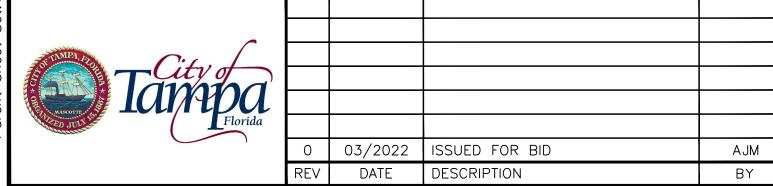
MARCH 2023

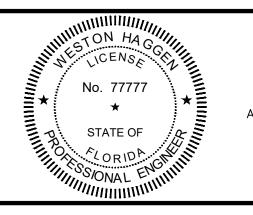
REI Project No. 0818



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9.	UNDER	THIS CONTRACT.									
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14.	CONSTR	R/INSPECTOR. UCTION OF POTAE									
		NSTRUCTION. CON NATE/SCHEDULE A									
15	MINIMUM	OF 10 WORKING	DAYS PRIOR TO) THE PLANN	NED CONSTR	UCTION.					
	THE CO	NTRACTOR WILL B BE RESPONSIBLE F	E RESPONSIBLE	FOR SALVA	GING EXISTIN	IG INFRASTR	RUCTURE	TO THE CIT	TY IF REQUESTE	D. THE CO	NTRACTOR
17.		CTOR SHALL CON									
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				DR	AWIN	IG IN	DEX				
		SHEET	DRAWING	DESCRIF							
		GENERAL									
		01	G01	COVER							
		02	G02	LOCATIO	ON MAP, GE	NERAL NOTE	S, AND [DRAWING IN	DEX		
		03	G03	ABBREV	IATIONS						
		04	G04	SYBMOL	S AND LEG	INDS					
		CIVIL									
		05	C01	EXISTIN	G SITES						
		06	C02	NORTHW	VEST GST DE	MOLITION P	LAN AND	PROFILE			
		07	C03	NORTHW	VEST GST PL	AN AND PR	OFILE				
		08	C04	NORTH	VEST GST S	ORAGE TAN	K COATIN	NG PLAN AI	ND SECTION		
		DETAILS									
		09	C05	DETAILS	5						
		10	C06	DETAILS	5						
		STRUCTUR	۹L								
		11	S01	STORAG	E TANK ST	RUCTURAL R	EPAIR PL	AN			
		12	S02	STORAG	E TANK ST	RUCTURAL P	LAN & E	LEVATIONS			
		13	S03	STORAG	E TANK ST	RUCTURAL D	ETAILS				

S04 14 STORAGE TANK STRUCTURAL GENERAL NOTES ELECTRICAL NORTHWEST GST PLANS 15 E01 INSTRUMENTATION & CONTROLS SYMBOLS 101 15 17 GST P&ID 102



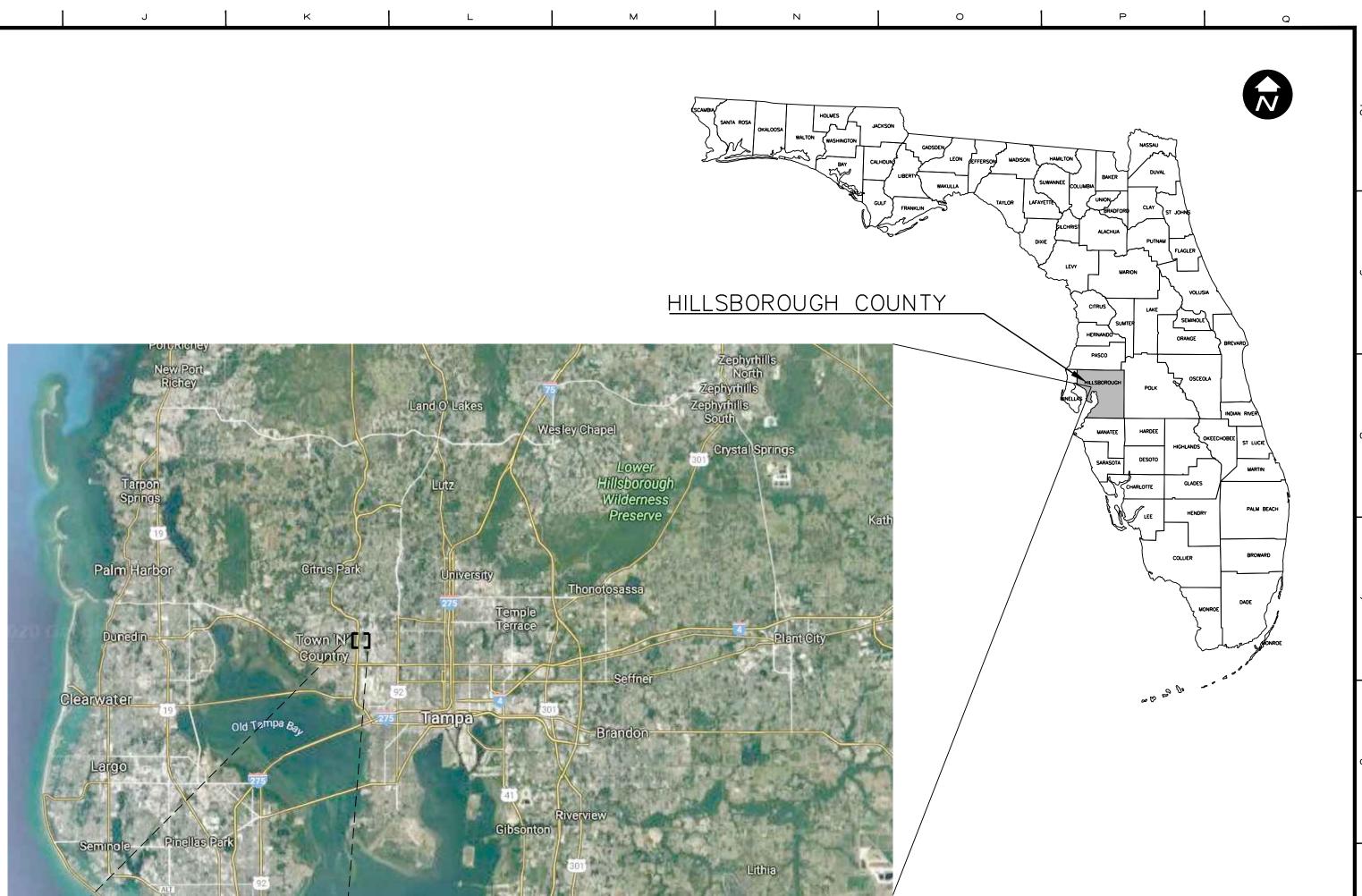


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WORK





NORTHWEST GST 5600 W SITKA ST TAMPA, FL 33614



CITY OF TAMPA WATER DEPARTMENT Designed <u>ESW</u> Drawn <u>PFH</u> GROUND STORAGE TANKS IMPROVEMENTS THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY WESTON T. HAGGEN. PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES. Checked <u>WTH</u> GENERAL Reviewed <u>GWD</u> Approved <u>WTH</u> LOCATION MAP, GENERAL NOTES, AND DRAWI FULL SIZE

LOCATION MAP

	PROJECT NO .:		
S	08	18	
	scale: NOTED	REVISION:	CHA CONSULTING, INC. CERTIFICATE OF AUTH. 28386
WING INDEX	DRAWING NO.	SHEET NO .:	3507 EAST FRONTAGE ROAD
	G02	02 _{of} 17	SUITE 180 TAMPA, FL 33607 (813) 549–0919

_	А	В			С	C	0		E	F
	A	ACID, AIR				DBL	DOU			
	AB ABAN	ANCHOR BOLT ABANDON(ED)				DEG DEPT		ARTMENT		
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	ACCMP ACP	ASPHALT-COATED ASBESTOS CEMENT	CORRUGA	TED MET	AL PIPE	DI DIA		P INLET, DU(1eter	CTILE IRON	
	ADD	ADDITIONAL	FIFE			DIFF DIM	DIFF	USER		
	ADH ADJ	ADHESIVE ADJUSTABLE, ADJA	ACENT			DIP	DUC	TILE IRON PI	PE	
	ADMIN AFF	ADMINISTRATION ABOVE FINISH FLO	OR			DISCH DISP	DISP	CHARGE ENSER		
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	APPR APPROX	APPROACH APPROXIMATE, (LY)			DN DO	DOW	'N	DISSOLVED OX	YGEN
	ARCH ARV	ARCHITECTURAL AIR RELEASE VALV				DRN DS	DRA			
	ARVV ASSY	AIR RELEASE AND ASSEMBLY	VACUUM	VALVE		DV DW	DRA		APHRAGM VAL	√E
	AUTO AUX	AUTOMATIC AUXILIARY				DWG(S)	DRA	WING(S)		
	AVS AWG	AUTOMATIC VALVE AMERICAN WIRE GA				DWL(S) DWV		'EL(S) IN, WASTE, A	AND VENT	
	BC	BEGIN CURVE				E	FAS	T(ING), ELEC	TRICAL	
	BCV BF	BALL CHECK VALV BLIND FLANGE	E			EA EC	EAC			
	BFP	BACKFLOW PREVEN				ECC	ECCI	ENTRIC	WASH	
	BFV BGO	BUTTERFLY VALVE BURIED GEAR OPE				EEW EF	EAC	RGENCY EYE H FACE	WADU	
	BI BIP	BLACK IRON BLACK IRON PIPE				EFF EGO	ELE	UENT /ATED GEAR		
	BITUM BKR	BITUMINOUS BREAKER				EJ EL	ELE	ANSION JOIN /ATION	I	
	BLDG BLK	BUILDING BLOCK				ELAST ELEC		STOMERIC CTRIC, (AL)		
	BM BOC	BENCHMARK BACK OF CURB				ELEV ELL	ELE۱	ATOR	BING SMALLER	
	BOF BOS	BOTTOM OF FOOTIN BOTTOM OF SLAB,			F	EMER	EME	RGENCY	SING SWALLEN	IIIAN 4
	BOT	BOTTOM	BOTTOW	UF SLUPI	L	ENC ENCL	ENC	ASEMENT LOSURE		
	BRG B&S	BEARING BELL AND SPIGOT				ENT EOL	END	RANCE OF LINE		
	BSMT BSP	BASEMENT BLACK STEEL PIPE				EOP EPDM		E OF PAVEM YLENE PROP`	ENT YLENE DIENE M	ONOMER
	BTU BTUH	BRITISH THERMAL BRITISH THERMAL		R		EQ EQUIP	EQU. EQU	AL IPMENT		
	BU BV	BELL-UP BALL VALVE				EST EVA		MATE CTRIC VALVE	ACTUATOR	
	BVC BWW	BEGIN VERTICAL C BACKWASH WATER				EW EWEF		Н WAY Н WAY EACH	I FACE	
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File F	CFS C&G	CUBIC FEET PER S CURB AND GUTTER	SECOND			FCA	FLAN	NGED COUPL	ING ADAPTER	SNIKOL
	СНКД	CHECKERED				FCV FD	FLO	•	OUNDATION DR	AIN
Individual	CI CIMH	CAST IRON, CUBIC CAST IRON MANHO)LE			FDN FE	FILT	NDATION ER EFFLUENI	Г	
ln di	CIMHS CIP	CAST IRON MANHO CAST IRON PIPE				FF FG		SH FLOOR RGLASS		
	CISP CJ	CAST IRON SOIL P CONSTRUCTION JOI				FH FIG	FIRE FIGU	HYDRANT RE		
AM	CJT CL	CONTROL JOINT CENTERLINE				FIN FL	FINIS FLO	SH DR, FLOW LIN	١E	
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/ 202	CO COD	CLEAN OUT, COMP CHEMICAL OXYGEN	ANY			FOT FPM	FLA ⁻	T ON TOP T PER MINUT		
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	CPLG CPP	COUPLING CONCRETE PRESSU	IRF PIPF			GAL GALV	GALI			
MILLEK,	CFF CPVC CS	CHLORINATED POLY CHLORINE SOLUTIO	YVINYL CH	LORIDE		GC/MS GEN	GAS		GRAPH/MASS S Rator	PECTROMETER
by: M	CTR(S)	CENTER(S)	· v			GIP GJ	GAL	VANIZED IRO OVE JOINT		
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BS	ACRYLONITRILE BUTADIENE STYRENE	DET DF	DETAIL DIESEL FUEL	HDPE HE	HIGH-DENSITY POLYETHYLENE HEAT EXCHANGER	NBC	NAIL IN BOTTLE CAP	SCH SCV	SCHEDULE SILENT CHECK VALVE
/C CCMP	AIR CONDITIONER, (ING) ASPHALT-COATED CORRUGATED METAL PIPE	DI	DROP INLET, DUCTILE IRON	HEX	HEXAGONAL	N.C. NE	NORMALLY CLOSED NORTHEAST	SD	STORM DRAIN
	ASBESTOS CEMENT PIPE ADDITIONAL	DIA DIFF	DIAMETER DIFFUSER	HF HFA	HOSE FAUCET HYDROFLUOSILICIC ACID	NF N.I.C.	NANOFILTRATION NOT IN CONTRACT	SE SEC	SOUTHEAST SECOND
NDH	ADHESIVE	DIM DIP	DIMENSION DUCTILE IRON PIPE	HFCA HH	HARNESSED FLANGED COUPLING ADAPTER HANDHOLE	N.O.	NORMALLY OPEN	SECT SEFF	SECTION SECONDARY EFFLUENT
.DJ .DMIN	ADJUSTABLE, ADJACENT ADMINISTRATION	DISCH	DISCHARGE	HLS	HIGH LEVEL SWITCH	NO.(S) NOM	NUMBER(S) NOMINAL	SF	SQUARE FOOT
\FF \HU	ABOVE FINISH FLOOR AIR HANDLING UNIT	DISP DIST	DISPENSER DISTRIBUTION	HMC HMJ	HARNESSED MECHANICAL COUPLING HARNESSED MECHANICAL JOINT	NORM NP T	NORMAL NATIONAL PIPE TAPER	SG SHT	SLUICE GATE SHEET
LT	ALTERNATE, (IVE)	DIV DJ	DIVISION DISMANTLING JOINT	HORIZ HP	HORIZONTAL HIGH POINT, HORSEPOWER	NPW	NONPOTABLE WATER	SIM SL	SIMILAR SLUDGE
	ALUMINUM ANGLE OF DEFLECTION	DM	DAMPER MOTOR	HPA	HIGH PRESSURE AIR	NS N.T.S.	NEAR SIDE NOT TO SCALE	SM	SHEET METAL
\P \PPR	ACCESS PANEL APPROACH	DMH DMJ	DROP MANHOLE DOUBLE MECHANICAL JOINT	HR HS	HOUR, HANDRAIL HIGH STRENGTH	NW	NORTHWEST	SP SPA	SUMP PUMP SPACING, SPACES
PPROX	APPROXIMATE, (LY)	DN DO	DOWN DOOR OPENING, DISSOLVED OXYGEN	HSP HT	HIGH SERVICE PUMP HEIGHT	OC	ON CENTER, ODOR CONTROL	SPEC(S)	SPECIFICATION(S)
RCH RV	ARCHITECTURAL AIR RELEASE VALVE	DRN	DRAIN	ΗV	HOSE VALVE	OD OF	OUTSIDE DIAMETER OUTSIDE FACE, OVERFLOW	SPLY SQ	SUPPLY SQUARE
RVV	AIR RELEASE AND VACUUM VALVE	DS DV	DOWNSPOUT Drain valve, diaphragm valve	HVA HVAC	HYDRAULIC VALVE ACTUATOR HEATING, VENTILATING AND AIR CONDITIONING	ОН	OVERHEAD	SS SSE	SANITARY SEWER SUBSTANDARD EFFLUENT
SSY UTO	ASSEMBLY AUTOMATIC	DW	DISINFECTED WATER	НW	HOT WATER	O&M OP	OPERATION AND MAINTENANCE ORIFICE PLATE	SST	STAINLESS STEEL
UX VS	AUXILIARY AUTOMATIC VALVE STATION	DWG(S) DWL(S)	DRAWING(S) DOWEL(S)	HWL HWY	HIGH WATER LEVEL HIGHWAY	OPER OPNG	OPERATING OPENING	ST STA	SELF TAPPING STATION
WG	AMERICAN WIRE GAGE	DWV	DRAIN, WASTE, AND VENT	HYD HYDRO	HYDRAULIC HYDROPNEUMATIC	OPP	OPPOSITE	STD STL	STANDARD STEEL
C	BEGIN CURVE	E	EAST(ING), ELECTRICAL			OPT OZ	OP TIONAL OUNCE	STM	STORMWATER
CV	BALL CHECK VALVE BLIND FLANGE	EA EC	EACH END CURVE	I ID	INDICATOR INSIDE DIAMETER	PBV	PLASTIC BALL VALVE	STOR STR	STORAGE STRAIGHT
SFP	BACKFLOW PREVENTER	ECC	ECCENTRIC	IF IN	INSIDE FACE INCH(ES)	PC	POINT OF CURVE	STRUC SV	STRUCTURAL Shutoff valve, solenoid valve
IFV IGO	BUTTERFLY VALVE BURIED GEAR OPERATOR	EEW EF	EMERGENCY EYEWASH EACH FACE	INC	INCORPORATED	PCC PCCP	POINT OF COMPOUND CURVATURE PRESTRESSED CONCRETE CYLINDER PIPE	SVC	SERVICE
	BLACK IRON BLACK IRON PIPE	EFF EGO	EFFLUENT ELEVATED GEAR OPERATOR	INCL INCR	INCLUDING INCREASE	PE PEP	PLAIN END POLYETHYLENE PIPE	SVW SW	SERVICE WATER SOUTHWEST
BITUM	BITUMINOUS	EJ	EXPANSION JOINT	INF	INFLUENT	PERM	PERMEATE	SWD SWR	SIDE WATER DEPTH
KR NDG	BREAKER BUILDING	EL ELAST	ELEVATION ELASTOMERIC	INST INSUL	INSTRUMENT, (ATION) INSULATE, (ED), (ING)	PG PH	PRESSURE GAUGE PIPE HANGER, POST HYDRANT	SWS	SEWER SEAL WATER SOLENOID
SLK	BLOCK	ELEC	ELECTRIC, (AL)	INT	INTERIOR, INTERNAL INVERT	PI PIVC	POINT OF INTERSECTION POINT OF INTERSECTION ON VERTICAL CURVE	SY SYM	SQUARE YARD SYMBOL
SM SOC	BENCHMARK BACK OF CURB	ELEV ELL	ELEVATOR ELBOW – PLUMBING SMALLER THAN 4"	IP	IRON PIPE	PJ	PUSH-ON JOINT	SYMM	SYMMETRICAL
BOF BOS	BOTTOM OF FOOTING BOTTOM OF SLAB, BOTTOM OF SLOPE	EMER ENC	EMERGENCY ENCASEMENT	IPS IR	INTERNATIONAL PIPE STANDARD INTERNAL RECYCLE	P/L PL	PROPERTY LINE PLATE	SYS	SYSTEM
OT	BOTTOM	ENCL	ENCLOSURE	IW	IRRIGATION WATER	PM	PROCESS MECHANICAL	T TAN	TELEPHONE, TOP TANGENT
RG B&S	BEARING BELL AND SPIGOT	ENT EOL	ENTRANCE END OF LINE	JB	JUNCTION BOX	PNL(S) PNV	PANEL(S) PINCH VALVE	T&B	TOP AND BOTTOM
SMT SP	BASEMENT BLACK STEEL PIPE	EOP EPDM	EDGE OF PAVEMENT ETHYLENE PROPYLENE DIENE MONOMER	JF JT	JOINT FILLER JOINT	POB POI	POINT OF BEGINNING POINT OF INTERSECTION	TB TBE	TERMINAL BOX THREAD BOTH ENDS
STU	BRITISH THERMAL UNIT	EQ	EQUAL	KGV	KNIFE GATE VALVE	POLY	POLYMER	TBM TC	TEMPORARY BENCHMARK TOP OF CURB
STUH SU	BRITISH THERMAL UNIT-HOUR BELL-UP	EQUIP EST	EQUIPMENT ESTIMATE	KO	KNOCK OUT	PPD PPM	POUNDS PER DAY PARTS PER MILLION	TDH	TOTAL DYNAMIC HEAD
SV SVC	BALL VALVE BEGIN VERTICAL CURVE	EVA EW	ELECTRIC VALVE ACTUATOR EACH WAY	1	LEVEL, LOUVER	PROP PRS	PROPOSED PRESSURE REDUCING STATION	TEL TEMP	TELESCOPING TEMPERATURE, TEMPORARY
SWW	BACKWASH WATER	EWEF	EACH WAY EACH FACE	LAB	LABORATORY	PRV	PRESSURE REDUCING VALVE	TERM TH	TERMINAL TEST HOLE
:/C	CENTER TO CENTER	EXCH EXIST	EXCHANGER EXISTING	LAM LAT	LAMINATE(D) LATERAL	PRW PS	PROCESS WATER PIPE SUPPORT, PUMP STATION	ТНК	THICK, THICKNESS
ATV	CABLE TELEVISION	EXP EXT	EXPANSION, EXPOSED EXTENSION, EXTERIOR, EXTERNAL	LAV LB(S)	LAVATORY POUNDS	PSF PSI	POUNDS PER SQUARE FOOT	THRD TJ	THREADED TIED JOINT
SB SB	COMBINATION AIR VALVE CATCH BASIN		EXTENSION, EXTERIOR, EXTERNAL	LF	LINEAR FEET	PT	POUNDS PER SQUARE INCH POINT, POINT OF TANGENCY	TOB TOC	TOP OF BANK TOP OF CONCRETE
CC F	CHLORINE CONTACT CHAMBER CUBIC FOOT	F/F FAB	FACE TO FACE FABRICATED	LG LH	LENGTH, LONG LEFT HAND	PV PVC	PLUG VALVE POLYVINYL CHLORIDE	TOF	TOP OF FOOTING
SFM SFS	CUBIC FEET PER MINUTE CUBIC FEET PER SECOND	FC	FLEXIBLE CONNECTION, FLOW CONTROL	LHDPE	LINEAR HGH-DENSITY POLYETHYLENE	PVC-D	POLYVINYL CHLORIDE (DOUBLE CONTAINED)	TOS TRANS	TOP OF SLAB TRANSFORMER, TRANSMITTER, TRAI
&G	CURB AND GUTTER	FCA FCV	FLANGED COUPLING ADAPTER FLOW-CONTROL VALVE	LIN LO	LINEAL, LINEAR LOUVER OPENING	PVCP PVDF	POLYVINYL CHLORIDE PIPE POLYVINYLIDENE FLUORIDE (KYNAR)	TS TV	THICKENED SLUDGE TELEVISION
CHKD	CHECKERED CAST IRON, CUBIC INCH	FD FDN	FLOOR DRAIN, FOUNDATION DRAIN FOUNDATION	LR LS	LONG RADIUS LIFT STATION	PVMT PW	PAVEMENT POTABLE WATER	TWP	TOWNSHIP
	CAST IRON MANHOLE	FE	FILTER EFFLUENT	LT	LEFT			TYP	TYPICAL
CIMHS CIP	CAST IRON MANHOLE STEPS CAST IRON PIPE	FF FG	FINISH FLOOR FIBERGLASS	LWL	LOW WATER LEVEL	QTY	QUANTITY	UD UDM	UNDERDRAIN ULTRASONIC DENSITY METER
SISP SJ	CAST IRON SOIL PIPE CONSTRUCTION JOINT	FH FIG	FIRE HYDRANT FIGURE	MACH MAINT	MACHINE MAINTENANCE	R RAS	RADIUS, RISER RETURN ACTIVATED SLUDGE	UG	UNDERGROUND
ĴT	CONTROL JOINT	FIN	FINISH	MAN	MANUAL	RAW	RAW WATER	UGE UNO	UNDERGROUND ELECTRIC UNLESS NOTED OTHERWISE
,L ;LF	CENTERLINE CHAIN LINK FENCE	FL FLEX	FLOOR, FLOW LINE FLEXIBLE	MAX MC	MAXIMUM MECHANICAL COUPLING	RCB RCCP	REINFORCED CONCRETE BOX REINFORCED CONCRETE CYLINDER PIPE	USGS UTC	UNITED STATES GEOLOGICAL SURVE
:LR :MP	CLEAR, (ANCE) CORRUGATED METAL PIPE	FLG FM	FLANGE Force Main, Flow Meter	MCC MECH	MOTOR CONTROL CENTER MECHANICAL	RCHEP RCP	REINFORCED CONCRETE HORIZONTAL ELLIPTICAL PIPE REINFORCED CONCRETE PIPE	UTIL	UNDERGROUND TELEPHONE CABLE UTILITY
:MU	CONCRETE MASONRY UNIT	FOB	FLAT ON BOTTOM	MED	MEDIUM	RCW	RECLAIM WATER	UV	ULTRAVIOLET
:0 :0D	CLEAN OUT, COMPANY Chemical Oxygen Demand	FOT FPM	FLAT ON TOP FEET PER MINUTE	MET MES	METAL MITERED END SECTION	RD RECIRC	ROOF DRAIN, ROAD RECIRCULATING	V	VALVE, VENT
OMB COMB SWR	COMBINATION COMBINED SEWER	FPS FRP	FEET PER SECOND FIBERGLASS REINFORCED PLASTIC	MF MFM	MICROFILTRATION MAGNETIC FLOWMETER	RECP	RECEPTACLE	VAC VB	VACUUM VALVE BOX
COMB SWR	COMPRESSOR, (ED)	FS	FAR SIDE, FLOOR SLEEVE, FLOAT SWITCH	MFR(S)	MANUFACTURER(S)	RED REEW	REDUCER, REDUCING REUSE EFFLUENT WATER	VC VCD	VERTICAL CURVE, VICTAULIC COUPI VERTICAL CONTROL DAMPER
ONC ONN	CONCRETE	F T FURN	FOOT FURNISH, FURNISHED	MG MGD	MILLION GALLONS MILLION GALLONS PER DAY	REG REF	REGULATOR, REGULATING REFERENCE	VCP	VITRIFIED CLAY PIPE
ONSTR	CONSTRUCT, CONSTRUCTION	FV	FLAP VALVE	MH	MANHOLE	REINF	REINFORCING	VERT VF	VERTICAL VACUUM FILTER
ONT OP	CONTINUOUS(LY), CONTINUATION COPPER PIPE	FW FWD	FINISHED WATER FORWARD	MIN	MILE MINIMUM, MINUTE	REJ REM	REJECT REMOVABLE	VFD VIB	VARIABLE FREQUENCY DRIVE VIBRATION
COR CORR	CORNER CORRIDOR, CORRUGATED	G	GAS	MISC MJ	MISCELLANEOUS MECHANICAL JOINT	REQD RET	REQUIRED RETURN	VS	VARIABLE SPEED
P	CONCRETE PIPE	GA	GAUGE	MJRG	MECHANICAL JOINT RETAINER GLAND	REV	REVISION, REVISED, REVERSED	VTR VV	VENT THROUGH ROOF VENT VALVE
PLG PP	COUPLING CONCRETE PRESSURE PIPE	GAL GALV	GALLON GALVANIZED	MJTR ML	MECHANICAL JOINT WITH TIE ROD MIXED LIQUOR	REW RG	RETURN EFFLUENT WATER RETAINER GLAND	VVB	VACUUM BREAKER
PVC	CHLORINATED POLYVINYL CHLORIDE	GC/MS	GAS CHROMATOGRAPH/MASS SPECTROMETER GENERAL, GENERATOR	MO MP	MASONRY OPENING, MOTOR OPERATED METERING PUMP	RJ	RESTRAINED JOINT (BELL)		
:S :TR(S)	CHLORINE SOLUTION CENTER(S)	GEN GIP	GALVANIZED IRON PIPE	MPH	MILES PER HOUR	RMJ RNG	RESTRAINED MECHANICAL JOINT RANGE		
TRL	CONTROL CHECK VALVE	GJ GM	GROOVE JOINT GAS METER	MRPP MSL	METAL REINFORCED PLASTIC PIPE MEAN SEA LEVEL	RO ROC	REVERSE OSMOSIS RADIUS OF CURVATURE		
Ŵ	COLD WATER	GND	GROUND	MTD	MOUNTED MATERIAL	RPM	REVOLUTIONS PER MINUTE		
Ϋ́	CUBIC YARD	GO GPD	GEAR OPERATED GALLONS PER DAY	MTL MTR	MOTOR	RPZBP RR	REDUCED PRESSURE ZONE BACKFLOW PREVENTER RAILROAD		
		GPH GPM	GALLONS PER HOUR GALLONS PER MINUTE	M∨ MW	MOTORIZED VALVE MANWAY	RS RT	RAW SLUDGE, RAW SEWAGE RIGHT		
		GPS	GALLONS PER SECOND	MWL	MEAN WATER LEVEL	R/W	RIGHT OF WAY		
		GR GS	GRADE GALVANIZED STEEL			RŴW	RAW WASTEWATER		

NOTE:

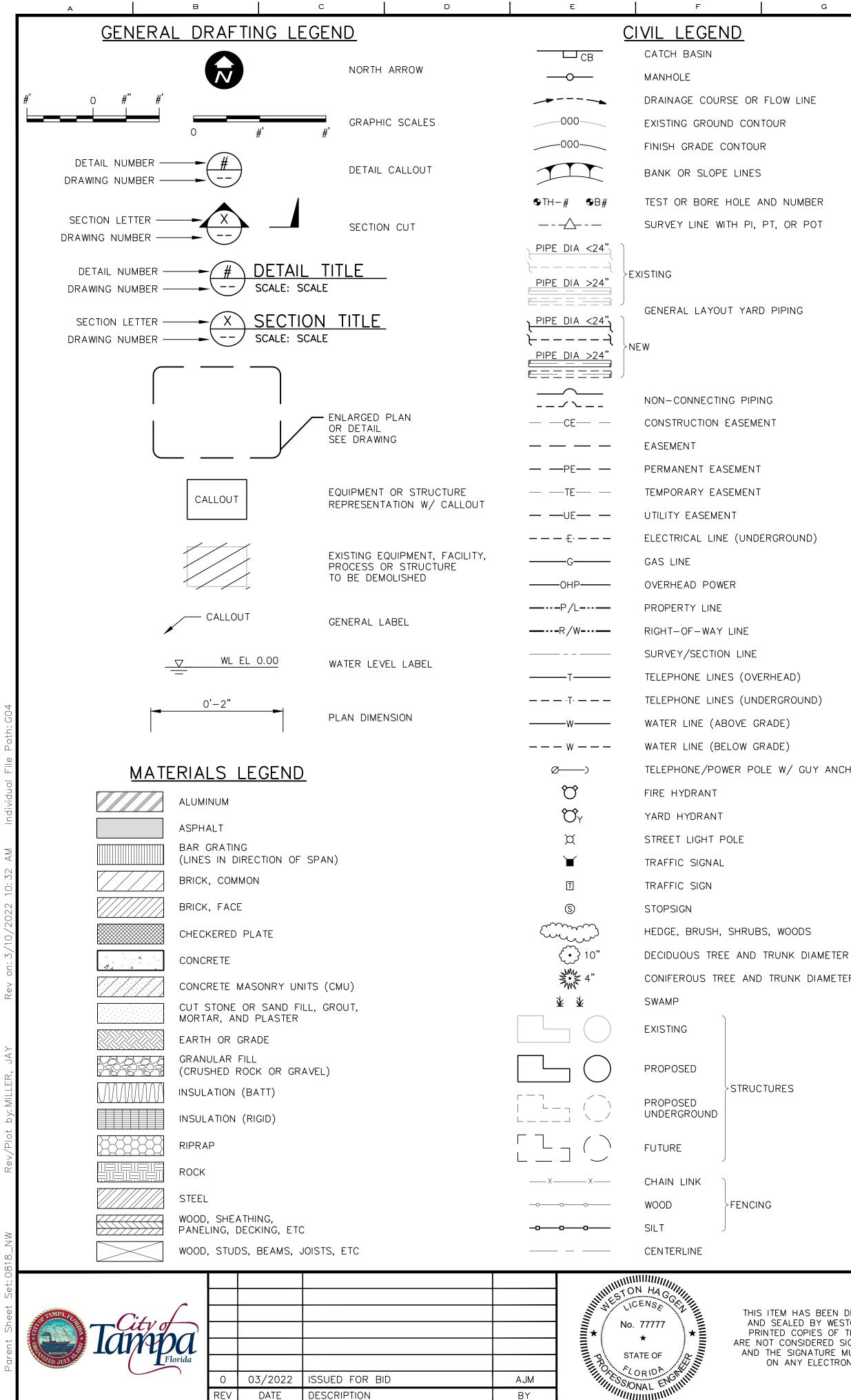
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FULL SIZE

0 Р Q SOUTH WEST, WIDE, WATER W SAMPLE LINE W/ WITH SANITARY WASTE ACTIVATED SLUDGE WAS SCHEDULE WOOD, WIDTH WD SILENT CHECK VALVE WF WALL FITTING, WIDE FLANGE STORM DRAIN WΗ WALL HYDRANT, WATER HEATER SOUTHEAST WL WATER LEVEL SECOND WATER METER, WATER MAIN WM SECTION WO WINDOW OPENING SECONDARY EFFLUENT W/O WITHOUT SQUARE FOOT WATERPROOF, WORKING POINT WΡ SLUICE GATE WASTE RECEPTACLE WR SHEET WS WATERSTOP SIMILAR WELDED STEEL PIPE WSP SLUDGE WΤ WEIGHT SHEET METAL WTF WATER TREATMENT FACILITY SUMP PUMP WTP WATER TREATMENT PLANT SPACING, SPACES WET WELL, WASH WATER WW SPECIFICATION(S) WELDED WIRE FABRIC WWF SUPPLY WELDED WIRE MESH WWM SQUARE WASTEWATER TREATMENT FACILITY WWTF SANITARY SEWER WWTP WASTEWATER TREATMENT PLANT SUBSTANDARD EFFLUENT STAINLESS STEEL BY, TIMES х SELF TAPPING XLHDPE CROSS LINKED HIGH-DENSITY POLYETHYLENE STATION STANDARD YD YARD STEEL ΥH YARD HYDRANT STORMWATER YR YEAR STORAGE STRAIGHT AND & STRUCTURAL ΑT 0 SHUTOFF VALVE, SOLENOID VALVE DEFLECTION ANGLE L SERVICE GREATER THAN > SERVICE WATER LESS THAN < SOUTHWEST NUMBER SIDE WATER DEPTH PERCENT % SEWER SEAL WATER SOLENOID SQUARE YARD SYMBOL SYMMETRICAL SYSTEM TELEPHONE, TOP TANGENT TOP AND BOTTOM TERMINAL BOX THREAD BOTH ENDS TEMPORARY BENCHMARK TOP OF CURB TOTAL DYNAMIC HEAD TELESCOPING TEMPERATURE, TEMPORARY TERMINAL TEST HOLE THICK, THICKNESS THREADED TIED JOINT TOP OF BANK TOP OF CONCRETE TOP OF FOOTING TOP OF SLAB TRANSFORMER, TRANSMITTER, TRANSFER THICKENED SLUDGE **TELEVISION** TOWNSHIP TYPICAL UNDERDRAIN ULTRASONIC DENSITY METER UNDERGROUND UNDERGROUND ELECTRIC UNLESS NOTED OTHERWISE UNITED STATES GEOLOGICAL SURVEY UNDERGROUND TELEPHONE CABLE UTILITY ULTRAVIOLET VALVE, VENT VACUUM VALVE BOX VERTICAL CURVE, VICTAULIC COUPLING VERTICAL CONTROL DAMPER VITRIFIED CLAY PIPE VERTICAL VACUUM FILTER VARIABLE FREQUENCY DRIVE VIBRATION VARIABLE SPEED VENT THROUGH ROOF VENT VALVE VACUUM BREAKER

CITY OF TAMPA WATER DEPARTMENT GROUND STORAGE TANKS IMPROVEMENTS	project no.: 08	18	
GENERAL	scale: NOTED	REVISION: O	CHA CONSULTING, INC. CERTIFICATE OF AUTH. 28386
ABBREVIATIONS	drawing no.	sheet no.: 03 _{of} 17	3507 EAST FRONTAGE ROAD SUITE 180 TAMPA, FL 33607 (813) 549–0919



G	н	J	к	L	м	N O	F	P Q	
<u>)</u>				<u>PIPING SYSTEMS LEGE</u>	<u>ND</u>				
		EXISTING PIPING	CRW	CHEMICAL RESISTANT ACID WASTE	————HWR———	HEATING SYSTEM WATER RETURN	——	RAW WATER	
		PROPOSED PIPING	— — — CRV— — —	CHEMICAL RESISTANT ACID WASTE VENT	——HWS——	HEATING SYSTEM WATER SUPPLY	——	REFRIGERANT	1 0
E OR FLOW LINE		PROPOSED PIPING (UNDERGROUND)	CW	COLD WATER	IA	INSTRUMENT AIR	SA	SODA ASH	
CONTOUR		FUTURE PIPING	CWR	CHILLED WATER RETURN	LIME	LIME		SANITARY SEWER	
NTOUR	——————————————————————————————————————	AIR (COMPRESSED)	CWS	CHILLED WATER SUPPLY	N	NITROGEN	SG	SLUDGE GAS	_
	ACET	ACETYLENE	DW	DISTILLED WATER	NaOCI	SODIUM HYPOCHLORITE	SI	SILICA	
LINES	ALUM	ALUMINUM SULFATE – (ALUM)	F	FIRE PROTECTION WATER SYSTEM	——NaOH——	SODIUM HYDROXIDE	CD	SODIUM HEXAMETAPHOSPHATE	
OLE AND NUMBER	——AMM (G)——	AMMONIA GAS	FeCl	FERRIC CHLORIDE	NO	NITROUS OXIDE		(PHOSPHATE)	Q
H PI, PT, OR POT	——AMM (S)——	AMMONIA SOLUTION	FeS	FERRIC SULFATE	NPW	NON-POTABLE WATER	ST	STORM DRAIN	
	AR	ARGON	FL	FLUORIDE	NPHW	NON-POTABLE HOT WATER	V	VENT	
	——————————————————————————————————————	BLENDED WATER	FOR	FUEL OIL RETURN	OF	OVERFLOW	VAC	VACUUM	
	C	CARBON SLURRY	FOS	FUEL OIL SUPPLY	OX	OXYGEN	W	WATER	
	CDWR	CONDENSER WATER RETURN	——FOV——	FUEL OIL VENT	OZ	OZONE			
YARD PIPING	CDWS	CONDENSER WATER SUPPLY	G	GAS (NATURAL)	PA	PHOSPHORIC ACID			
	——————————————————————————————————————	CHLORINE GAS	H	HYDROGEN	PD	SUMP PUMP DISCHARGE			00
	CI (L)	CHLORINE LIQUID	——Не——	HELIUM	PERM	POTASSIUM PERMANGANATE			
	——————————————————————————————————————	CHLORINE SOLUTION	———HP———	HYDROGEN PEROXIDE	PG	LP GAS (PROPANE)			
PIPING	——CO2 (G)——	CARBON DIOXIDE GAS	———HW———	HOT WATER (POTABLE)	POLY	POLYMER SOLUTION			
ASEMENT	CO2 (S)	CARBON DIOXIDE SOLUTION	——Н₩С——	HOT WATER CIRCULATING	——————————————————————————————————————	POTABLE WATER			

TELEPHONE/POWER POLE W/ GUY ANCHOR

Ч	BEND
-+-)	BEND DOWN
— +⊙	BEND UP
	BLIND FLANGE
	CAP OR PLUG
o ^{CO}	CLEANOUT
+<u>T</u>+	CROSS
<u>[</u>]	DIAPHRAGM SEAL
Y	DRAIN OR BELL-U
	DRIP TRAP
-(ГМ)	ELECTROMAGNETIC ULTRASONIC FLOW
	EXPANSION COMPE
—⊨≎=——	EXPANSION JOINT
	FLEXIBLE CONNEC

3 WAY VALVE

4 WAY VALVE

ANGLE VALVE

BALL VALVE

DIAPHRAGM VALVE

Р	DEND
+->	BEND DOWN
 0	BEND UP
11	BLIND FLANGE
	CAP OR PLUG
o ^{CO}	CLEANOUT
	CROSS
<u>[</u>]	DIAPHRAGM SEAL
Y	DRAIN OR BELL-UP
DT	DRIP TRAP
—-(ГМ)	ELECTROMAGNETIC/ ULTRASONIC FLOWMETER
	EXPANSION COMPENSATOR
— -F \$ --	EXPANSION JOINT
	FLEXIBLE CONNECTOR
$-+$ \sim +-	FLEXIBLE HOSE OR TUBING
FM-	FLOW METER

AUTOMATIC DRAIN TRAP

PIPING ACCESSORIES LEGEND

	HOSE CONNECTION	 	UNION
ШĻ	HOSE REEL	今	VENT
<u> </u>	INJECTOR, EDUCTOR, BLENDER	\	VENT SCREENED
	ORIFICE PLATE		VENTURI
	PIPE GUIDE	——————————————————————————————————————	WALL SLEE
II	QUICK COUPLING	+ <u>\</u>	WYE
——Þ——	REDUCER		WYE STRAI
Q	ROTAMETER		WYE STRAI
	RUPTURE DISK	S#	W/ BLOWO
S	SEDIMENT TRAP		CALIBRATIN
—— <u>©</u> —	SIGHT FLOW INDICATOR	Ţ	COLUMN
<u>S</u>	STRAINER		
<u> </u>	SURGE CHAMBER	<u>S</u>	
, T,	TEE	5	STRAINER
	TEE LINE DOWN	—	
+ © +	TEE LINE UP	F	FILTER
	TRAP		

CONIFEROUS TREE AND TRUNK DIAMETER

STRUCTURES

FENCING

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FULL SIZE

VALVE LEGEND		<u>ACTUA</u>	TOR LEGEND
VALVE LEGEND EXPLOSION RELIEF VALVE FLAME ARRESTER VALVE GATE VALVE GLOBE VALVE H HOSE FAUCET H HOSE VALVE W/HOSE NIPPLE INLINE PRESSURE RELIEF VALVE KNIFE GATE VALVE PINCH VALVE PLUG VALVE, ECCENTRIC	PRESSURE REGULATING VALVE PRESSURE SUSTAINING OR MAINTAINING VALVE PRESSURE VACUUM RELIEF VALVE SAFETY RELIEF VALVE THERMAL SHUTOFF VALVE THROTTLING VALVE VACUUM BREAKER	ACTUA (A) (A) (A) (A) (A) (A) (A) (A	AIR AIR/OIL TANDEM DIAPHRAGM ELECTRIC FLOAT HAND MOTOR SOLENOID
		Т	

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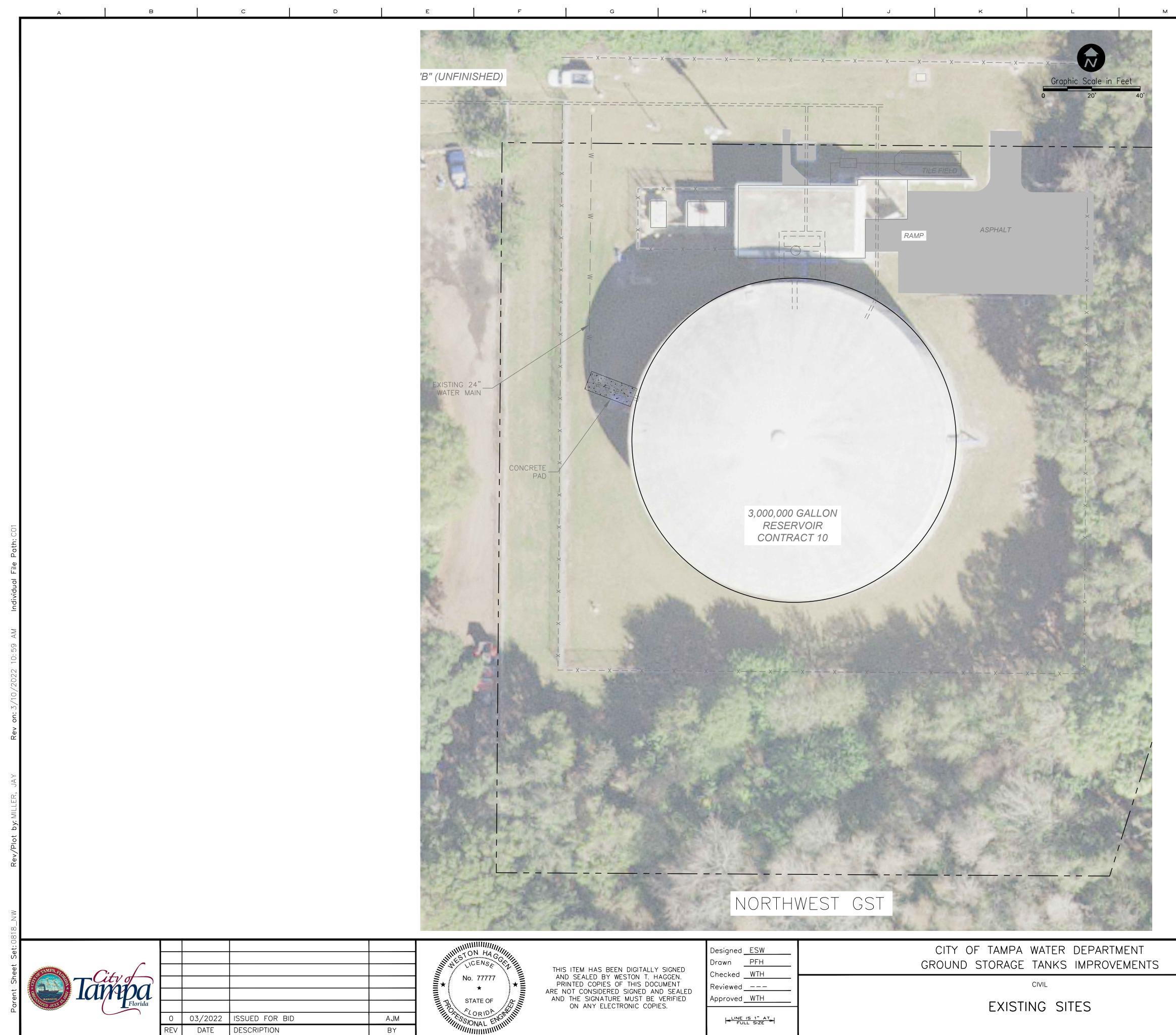
GENERAL

SYBMOLS AND LEGENDS

ON T		PIPE DIFFUSER
T EENED	F	PITOT TUBE
TURI .L SLEEVE	P X	PRESSURE GAUGE W/SNUBBER
STRAINER		SET STOP METER
BLOWOFF	-	SUCTION DIFFUSER
IBRATING UMN		TEMPERATURE INDICATOR
LEX AINER	Q	THERMOMETER
NE ER		TURBINE OR PROPELLOR FLOWMETER

<u>MISCELLANEOUS</u> EQUIPMENT LEGEND				
	BAR SCREEN			
<u> </u>	CENTRIFUGE			
\vee \vee \vee \vee	CHANNEL DIFFUSER			
Q	EXPANSION TANK			
	PUMP			
Ţ	SIGHT GLASS			
[-0-]	SLIDE GATE			
\boxtimes	SLUICE GATE			
	STATIC MIXER			
[—]	STOP PLATE			
	VERTICAL MIXER			

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0818		
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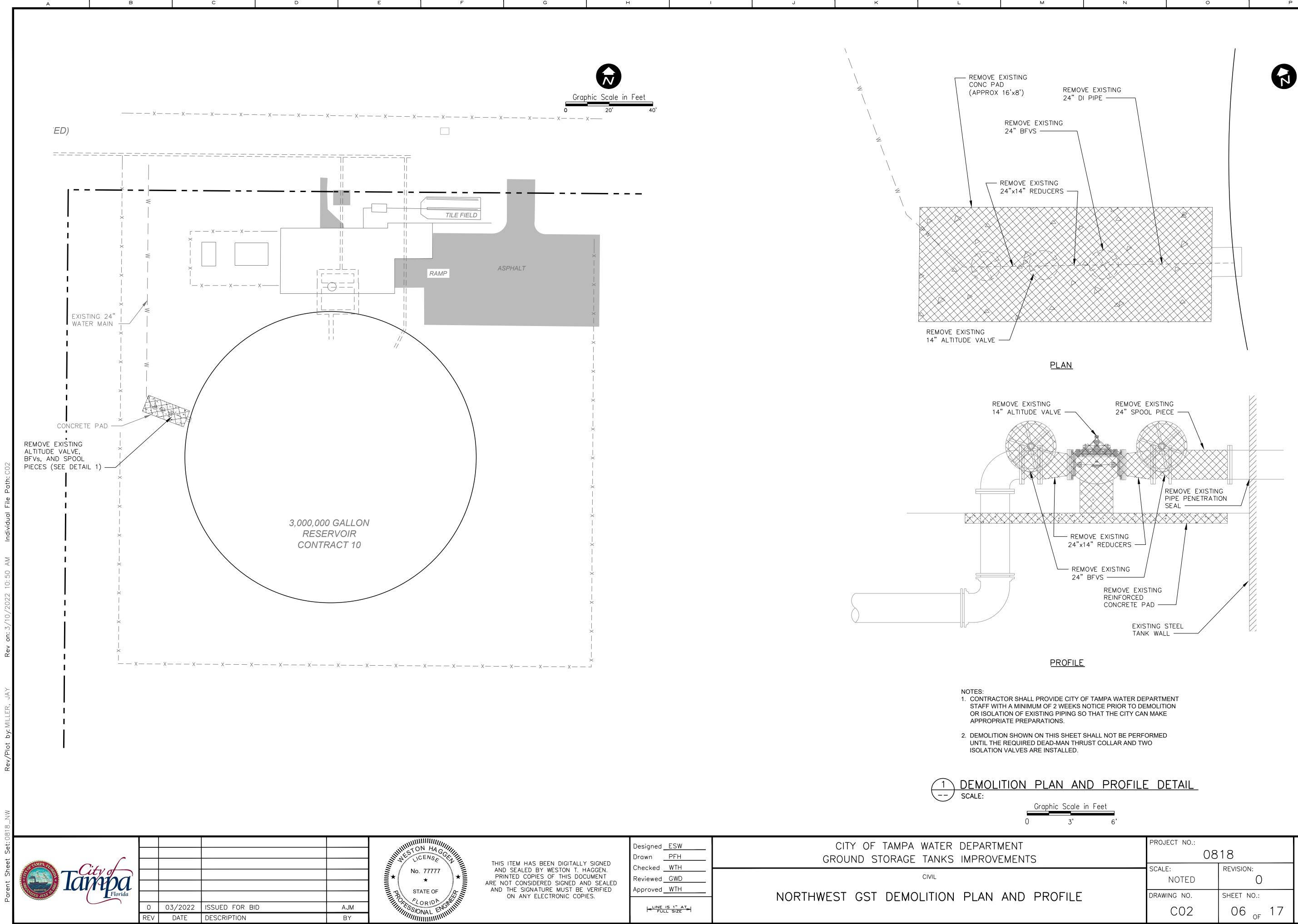
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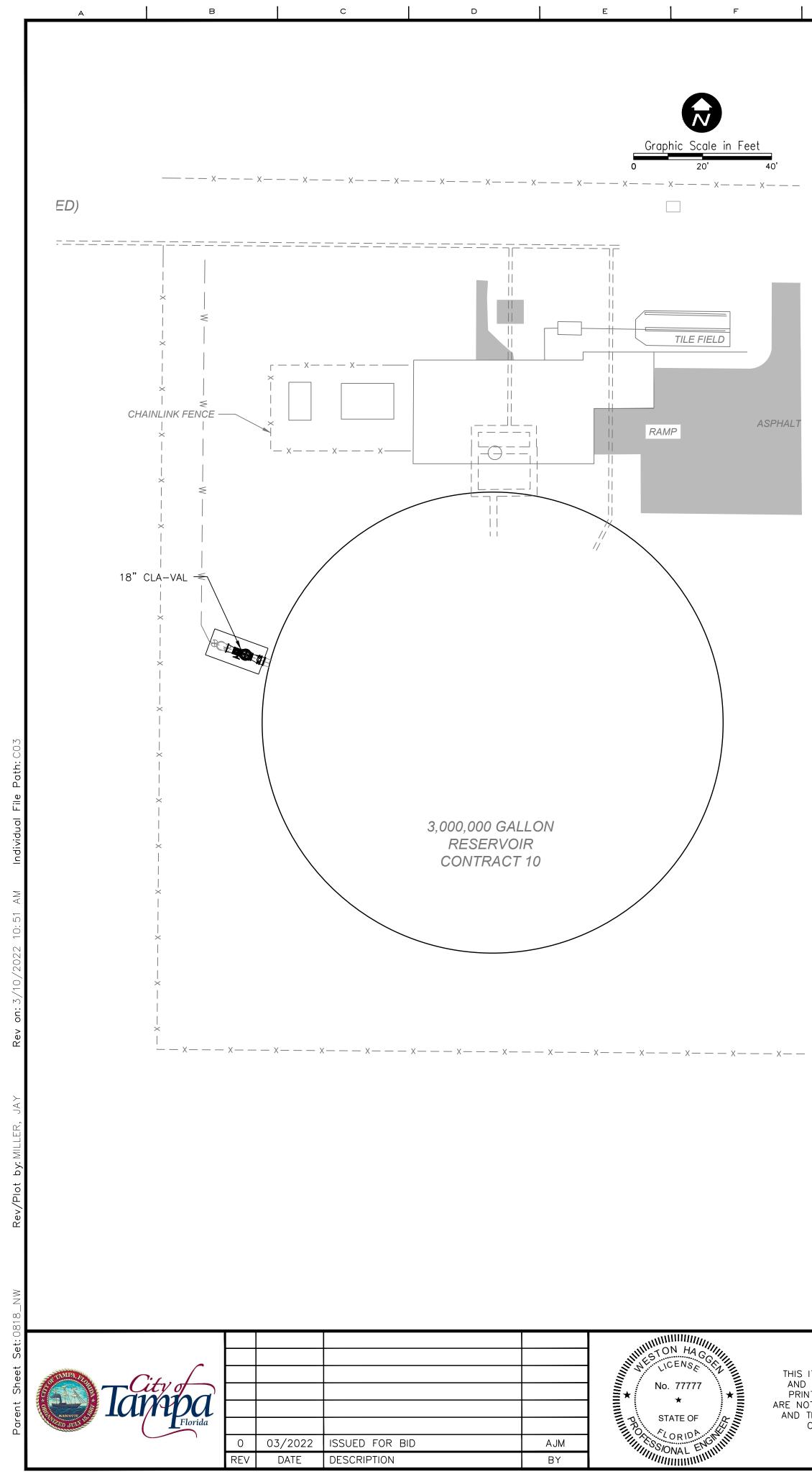
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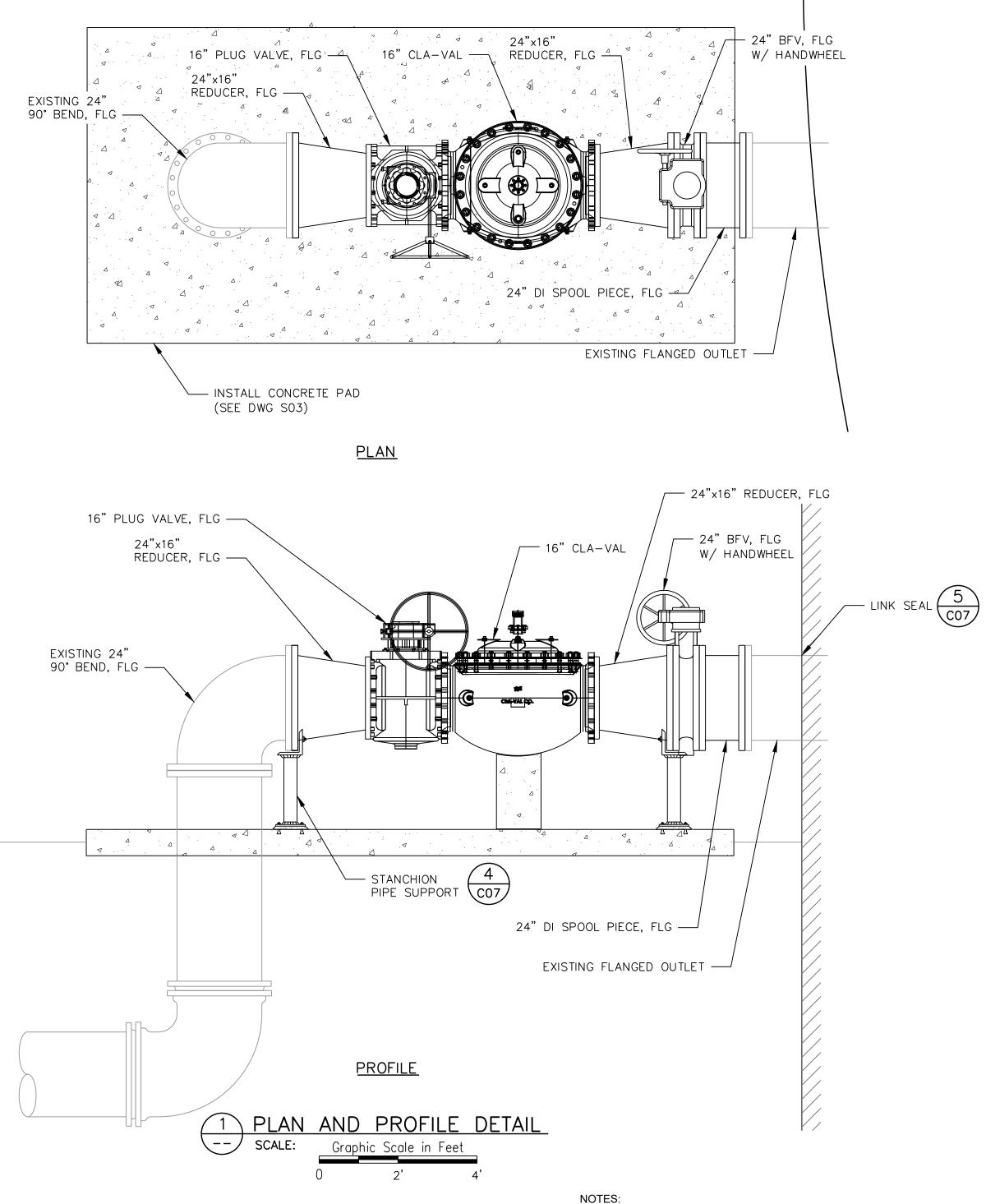
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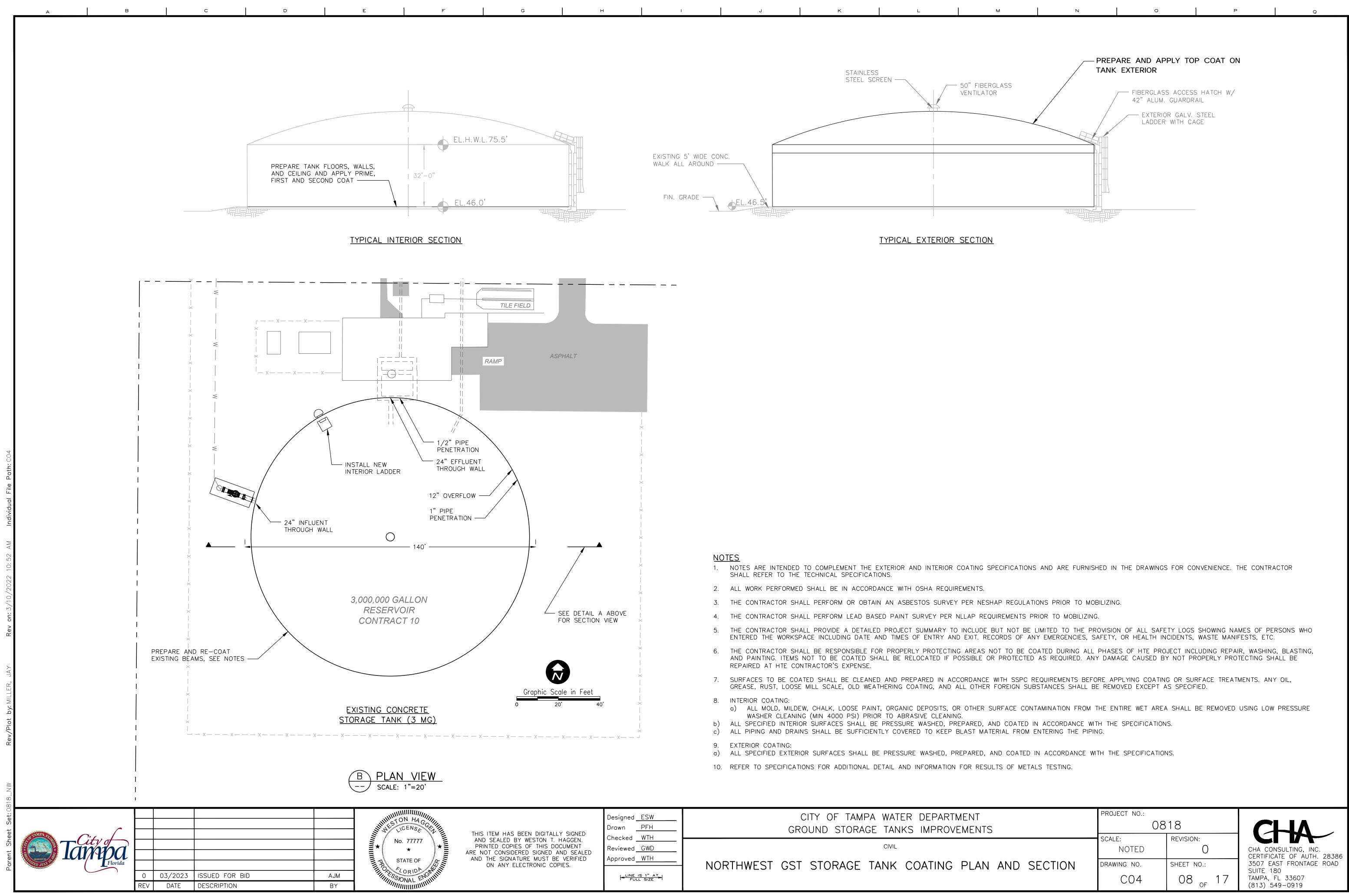


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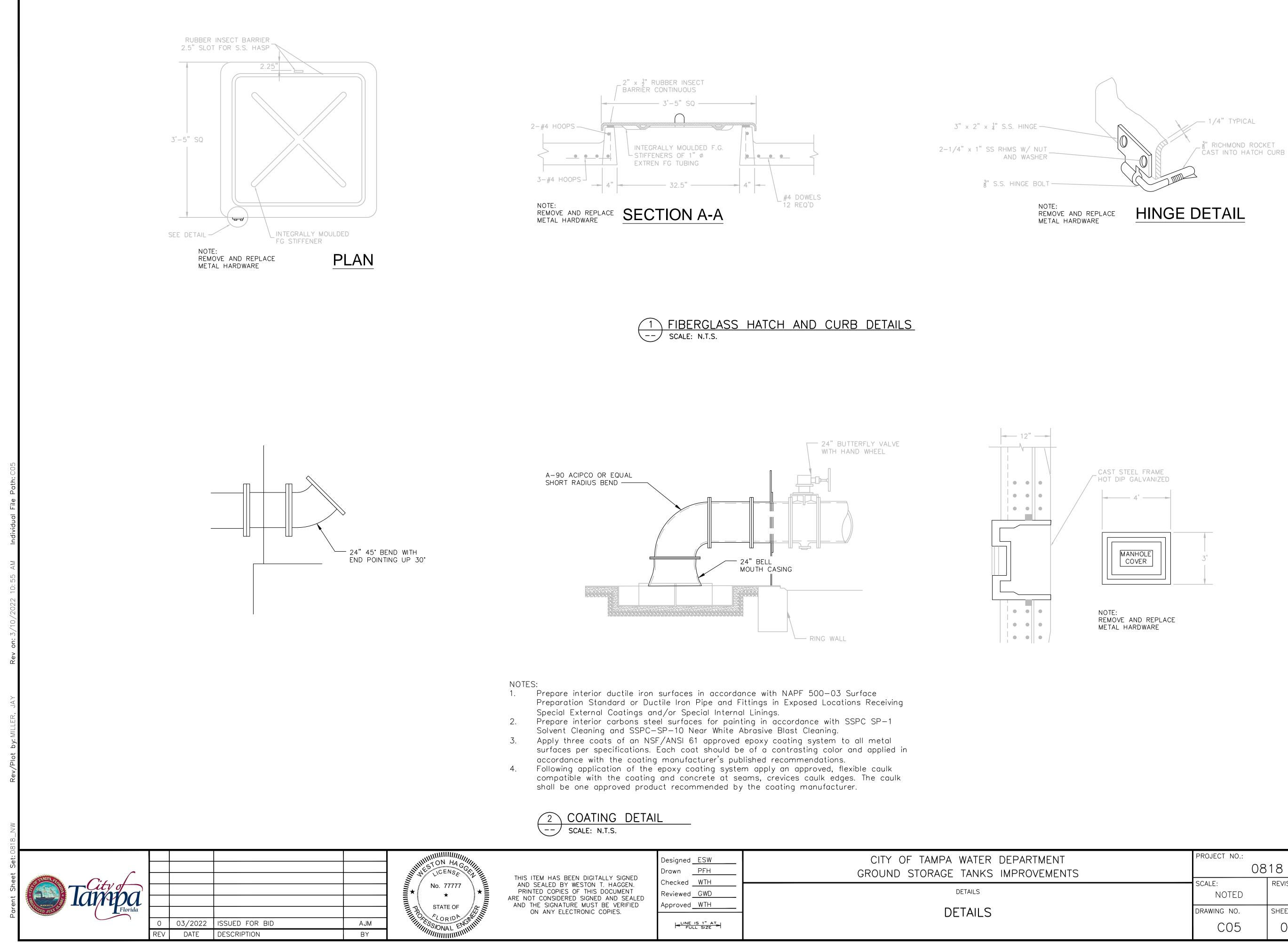
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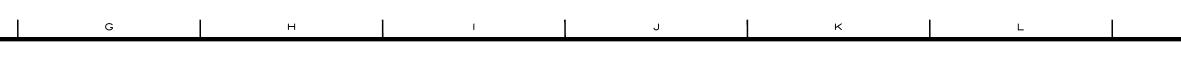
- 1. CONTRACTOR SHALL PROVIDE THE TAMPA WATER DEPARTMENT STAFF WITH A MINIMUM OF 2 WEEKS NOTICE PRIOR TO DEMOLITION OR ISOLATION OF EXISTING PIPING SO THAT THE CITY CAN MAKE APPROPRIATE PREPARATIONS.
- 2. CONCRETE THRUST COLLAR SHALL BE INSTALLED AND DEEMED FULLY FUNCTIONAL PRIOR TO
- COMMENCEMENT OF ANY EXCAVATION OR PIPE MODIFICATION. 3. ALL BELOW GRADE JOINTS SHALL BE MECHANICAL JOINT AND RESTRAINED. ALL ABOVE GRADE JOINTS S HALL BE FLANGED UNLESS OTHERWISE NOTED.
- 4. ALL BURIED DUCTILE IRON PIPE SHALL BE POLY WRAPPED AS PER THE SPECIFICATIONS. 5. ALL ABOVE GRADE PIPING, FITTING AND ISOLATION VALVES SHALL BE FACTORY PRIMED COATED AND PAINTED IN FIELD PER THE SPECIFICATIONS.



	Drawn
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2	COATING	DETAIL

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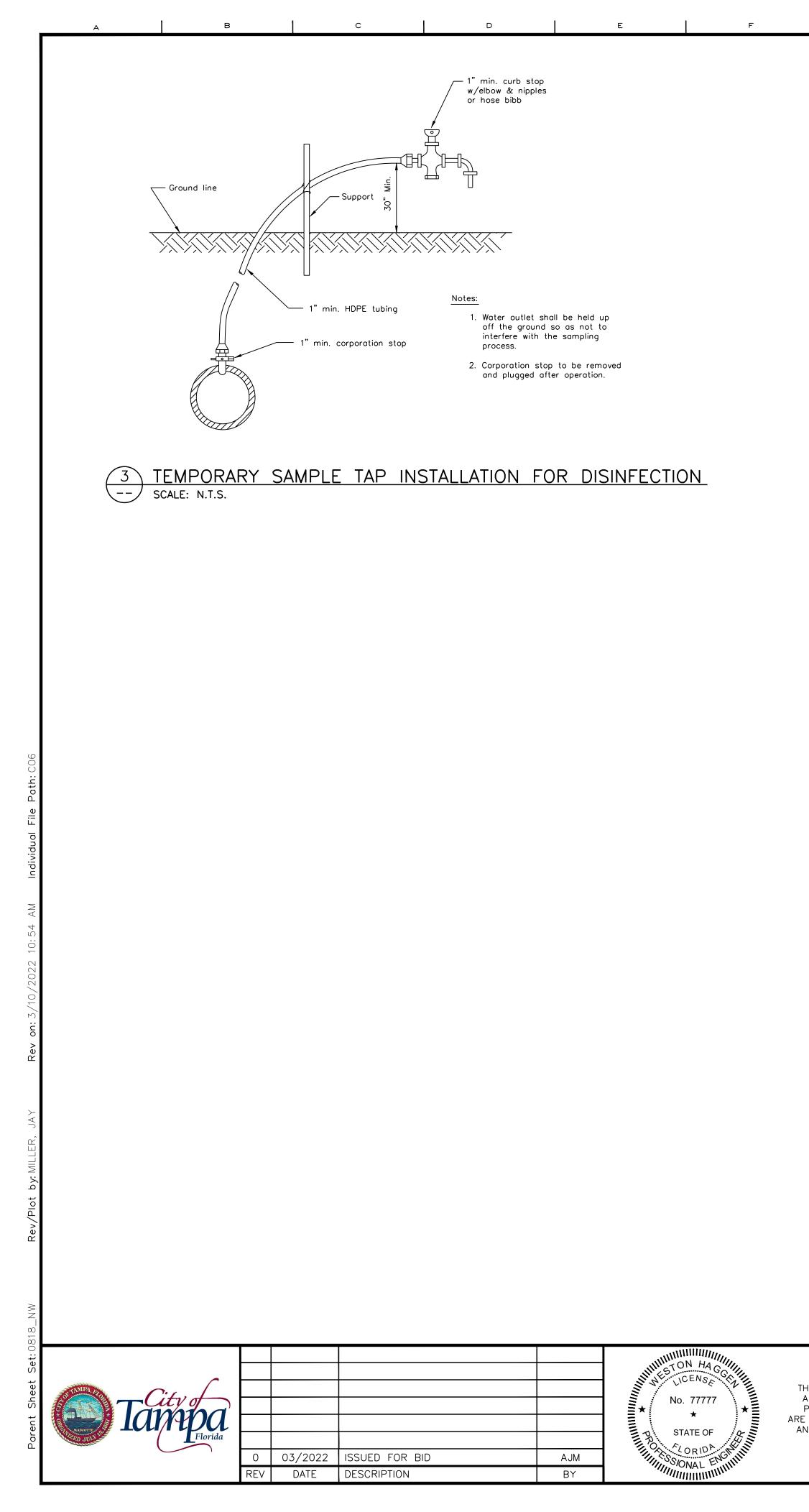
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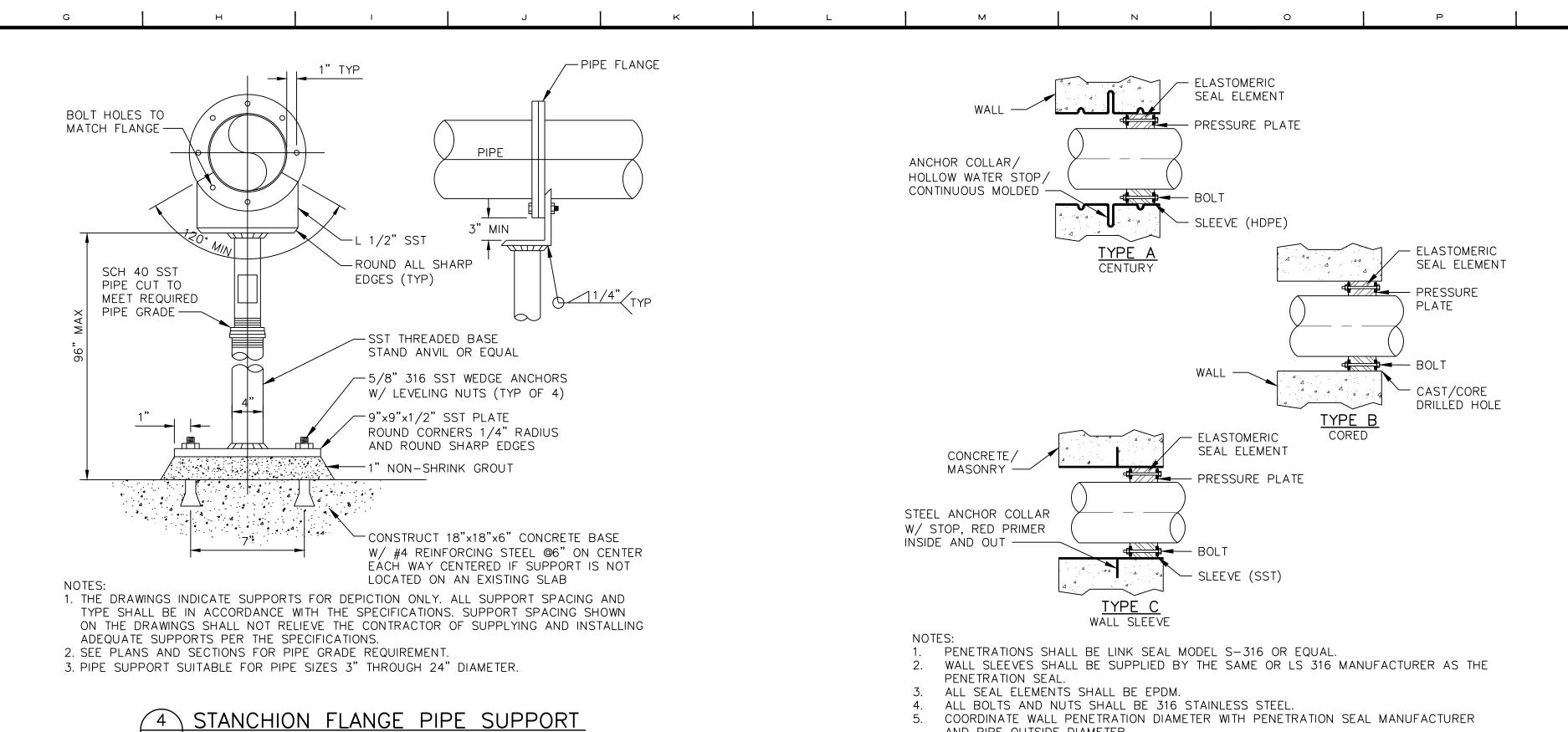
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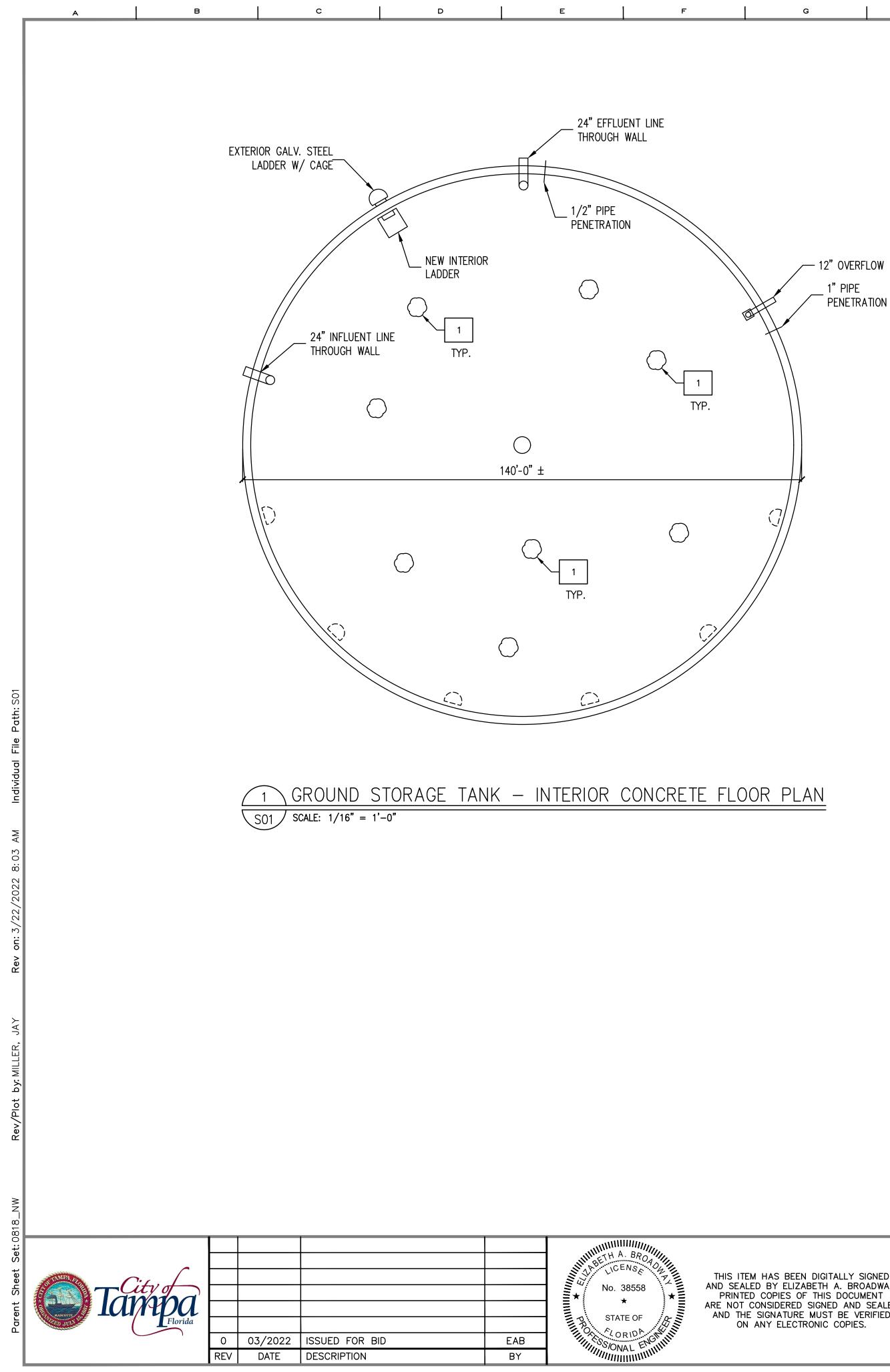
CO3 SCALE: N.T.S.

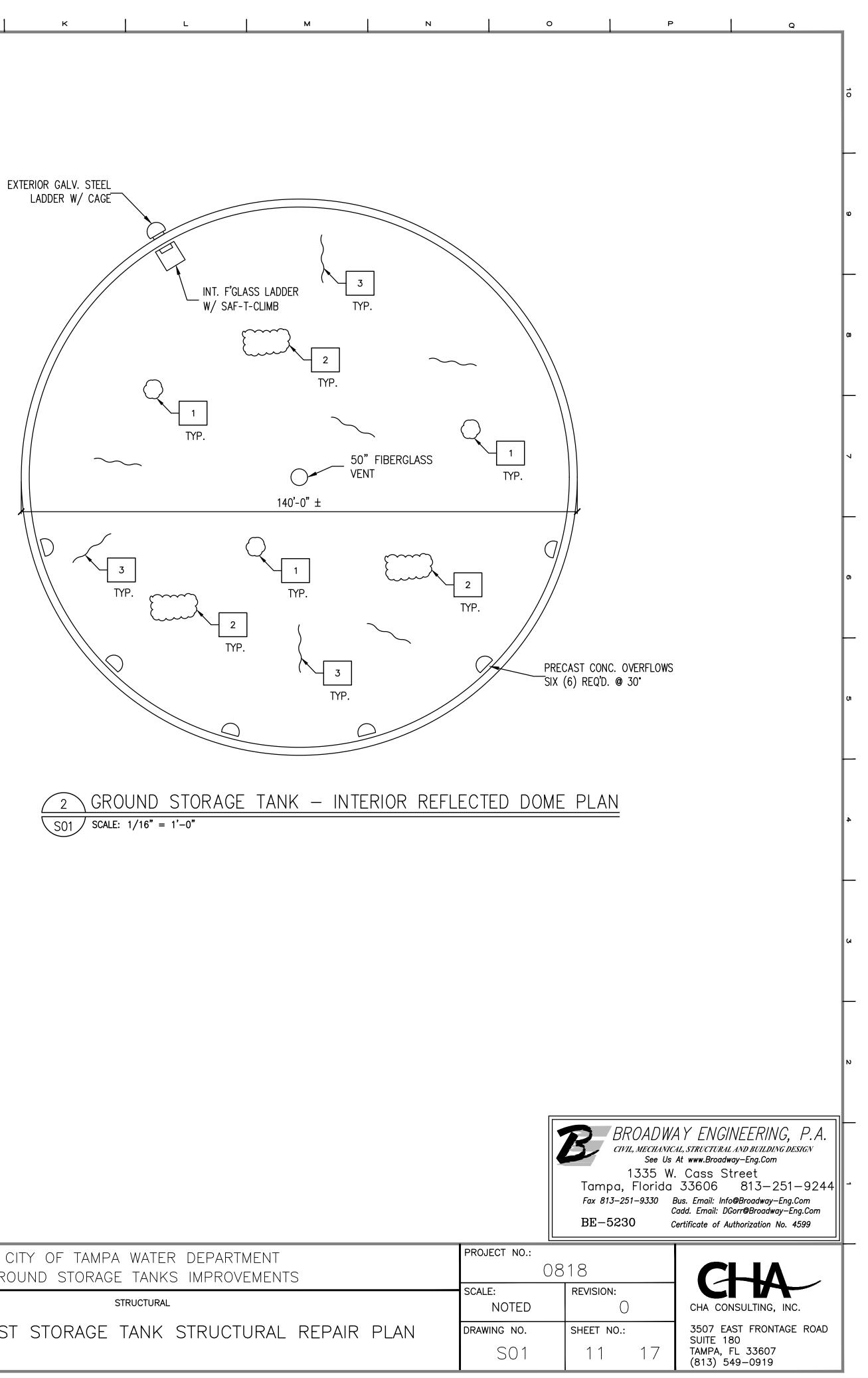
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	Approved WTH	DETAILS	drawing no.	sheet no.: 10 _{of} 17	

Q

AND PIPE OUTSIDE DIAMETER.

5 WALL PENETRATION DETAILS CO3 SCALE: N.T.S.





<u>KEY NOTES</u>



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AREAS REQUIRING PATCHING – SEE CONCRETE PATCHING NOTES

AREAS REQUIRING RESTORATION -SEE CONCRETE RESTORATION NOTES

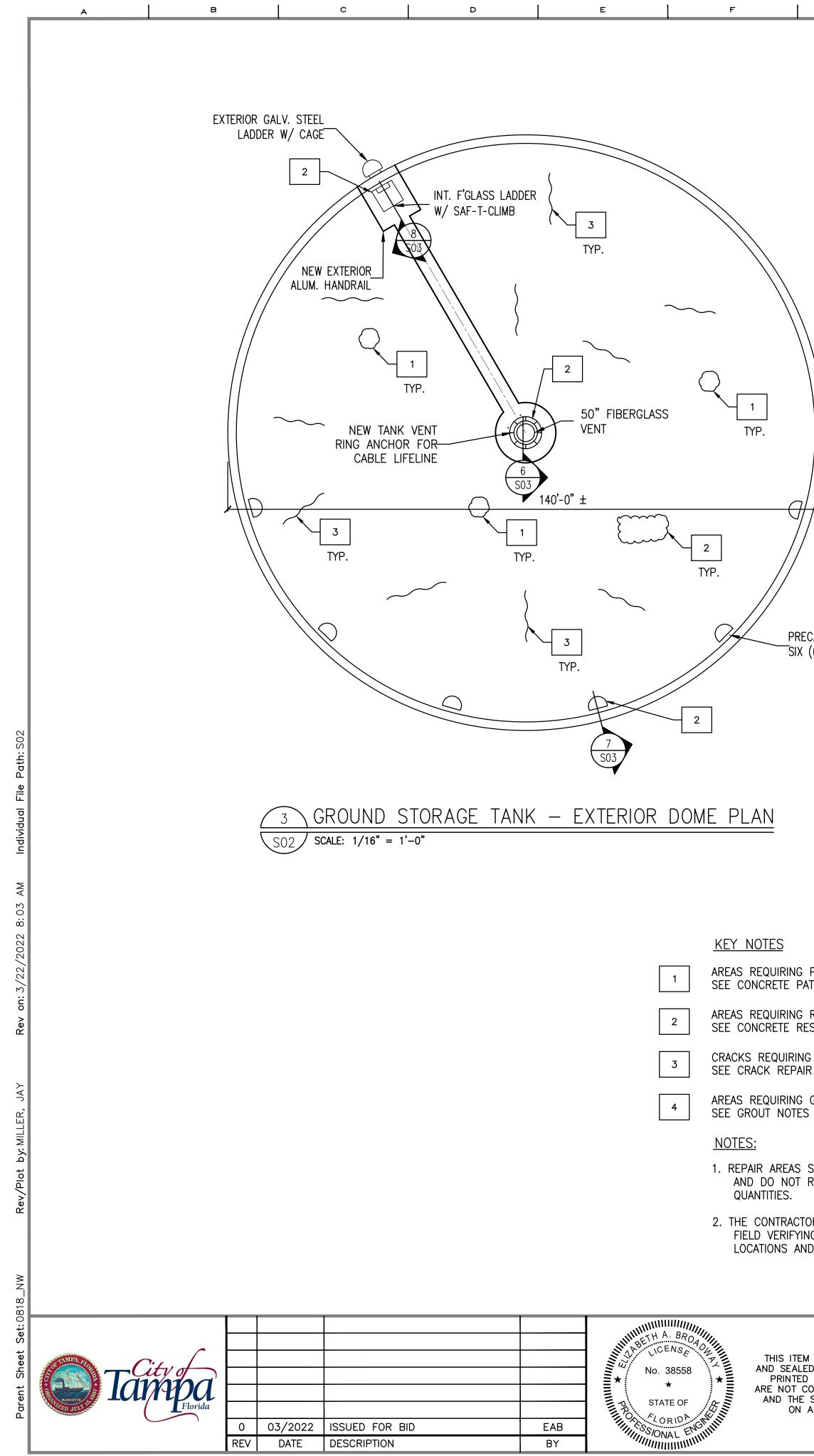
CRACKS REQUIRING REPAIR – SEE CRACK REPAIR NOTES

AREAS REQUIRING GROUT – SEE GROUT NOTES

NOTES:

- 1. REPAIR AREAS SHOWN ARE FOR REFERENCE ONLY AND DO NOT REPRESENT ACTUAL LOCATIONS AND QUANTITIES.
- 2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING ALL TYPES OF REPAIRS, LOCATIONS AND QUANTITIES.

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	Reviewed <u>EAB</u>	structural NORTHWEST GST STORAGE TANK STRUCTURAL F
	INE IS 1" AT FULL SIZE ►	NORTHWEST GST STORAGE TANK STRUCTURAL I



с н		I	J	к	L L	N
PRECAST CONC. OVERFLOWS	F	5' WIDE	CONC. WALK ALL AROUND		V TANK VENT RING ANCHOR FOR CABLE LIFELINE 3 TYP. 1 1 TYP. 1 1 1 1 1 1 1 1 1 1	САNК –
SIX (6) REQ'D. @ 30' NG PATCHING – PATCHING NOTES NG RESTORATION – RESTORATION NOTES RING REPAIR – PAIR NOTES NG GROUT – TES AS SHOWN ARE FOR REFERENCE ONLY DT REPRESENT ACTUAL LOCATIONS AND COT REPRESENT ACTUAL LOCATIONS AND COTOR SHALL BE RESPONSIBLE FOR FYING ALL TYPES OF REPAIRS, AND QUANTITIES.		5' WIDE	EL.46.5')2 SCALE: 1/16" = 1'-0'	2 TYP.

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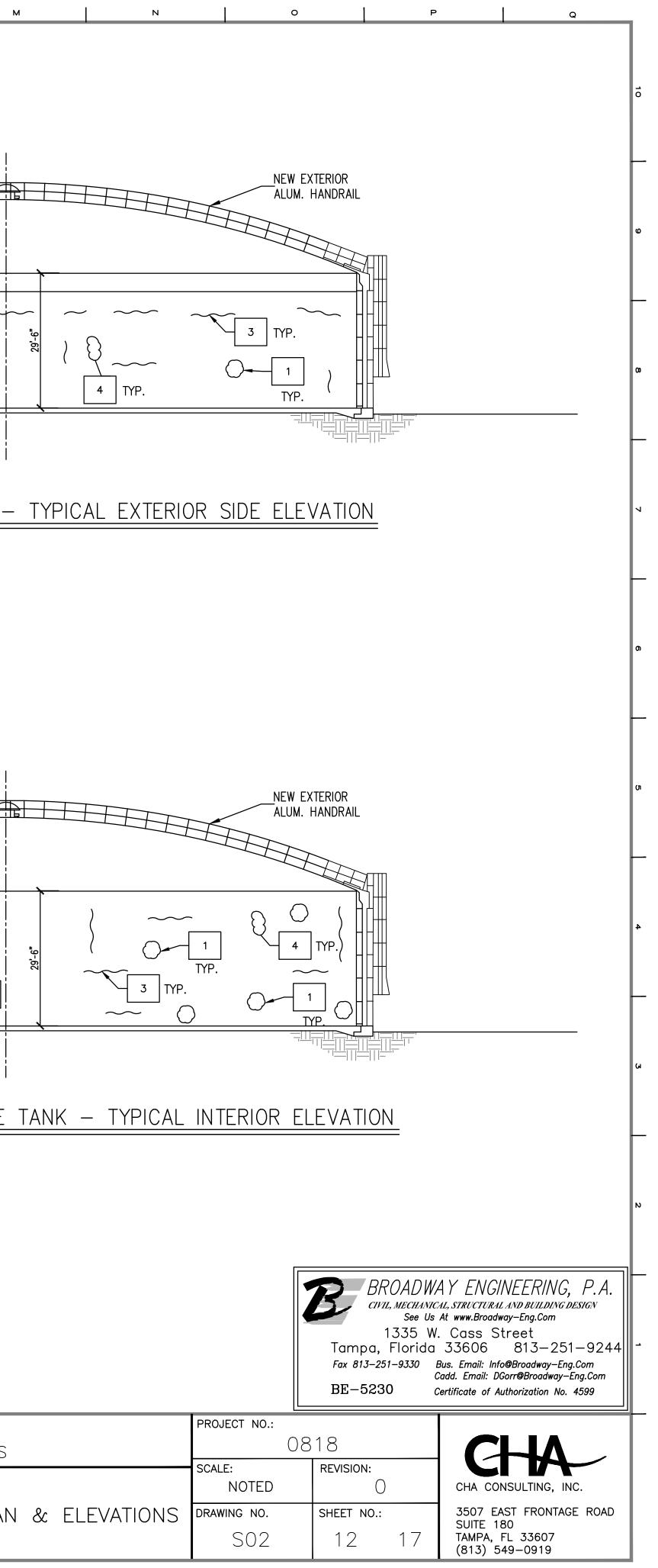
SCALE: NOTED NORTHWEST GST STORAGE TANK STRUCTURAL PLAN & ELEVATIONS DRAWING NO.

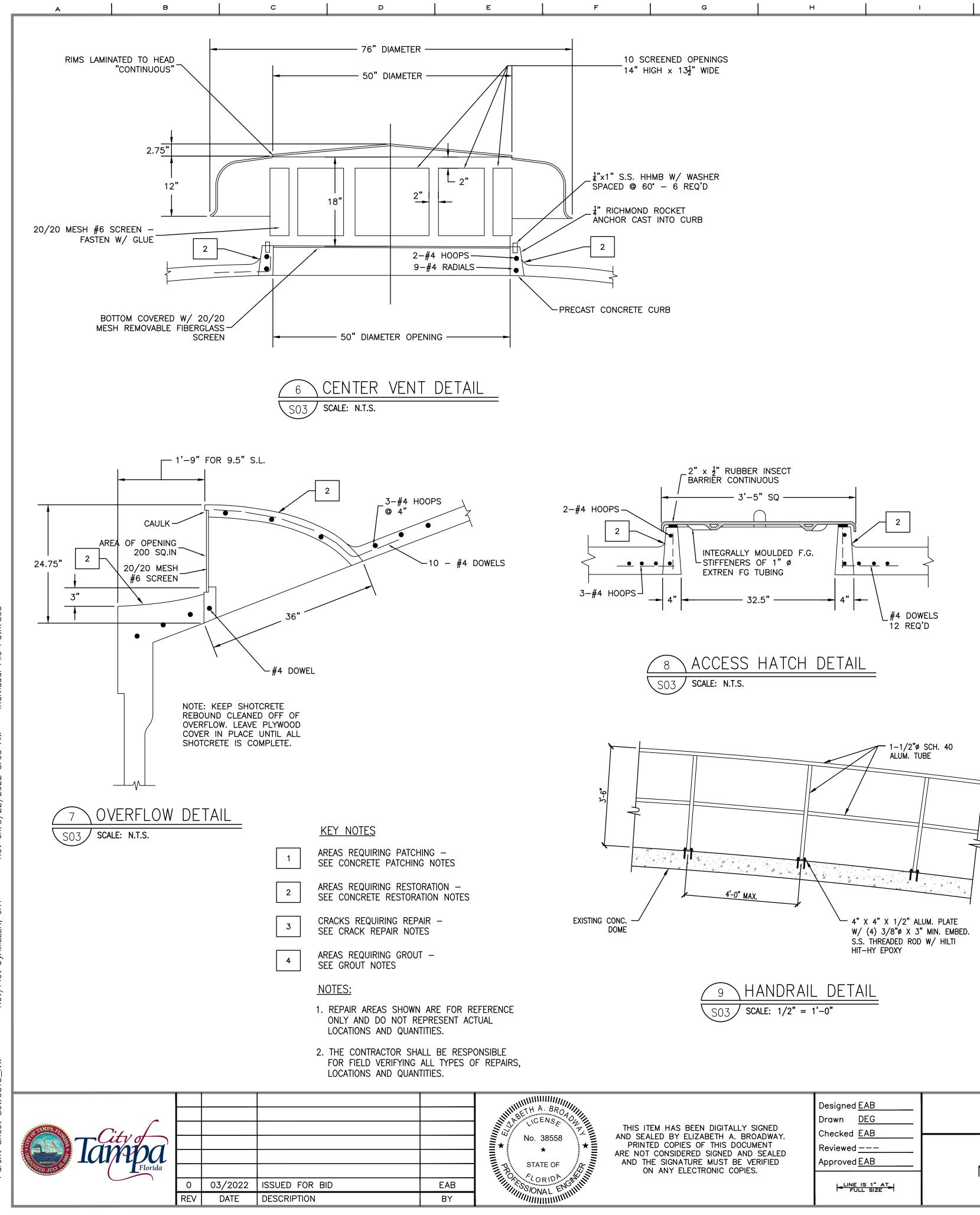
GULL SIZE SIZE

Checked <u>EAB</u>

Reviewed ____

Approved EAB

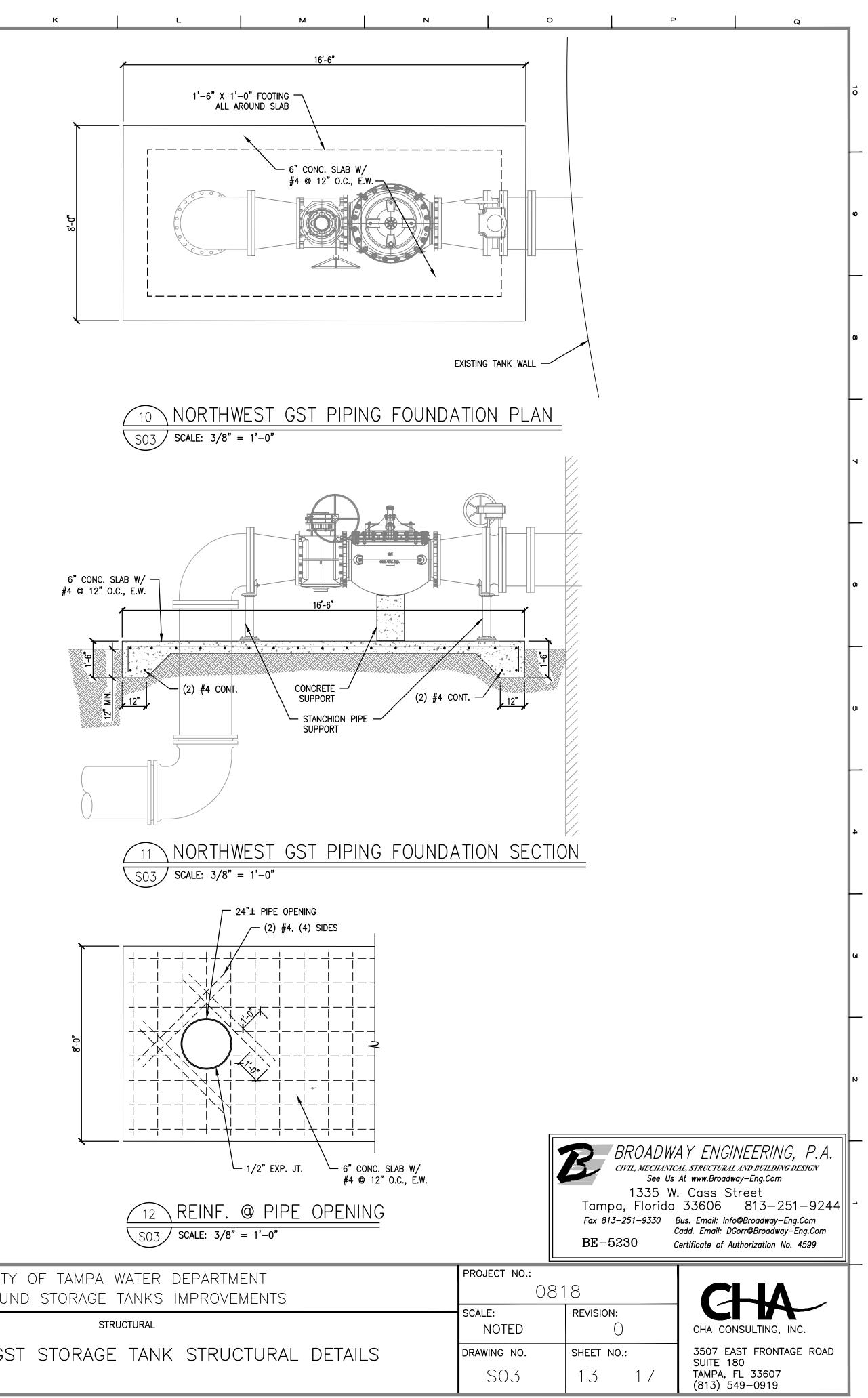


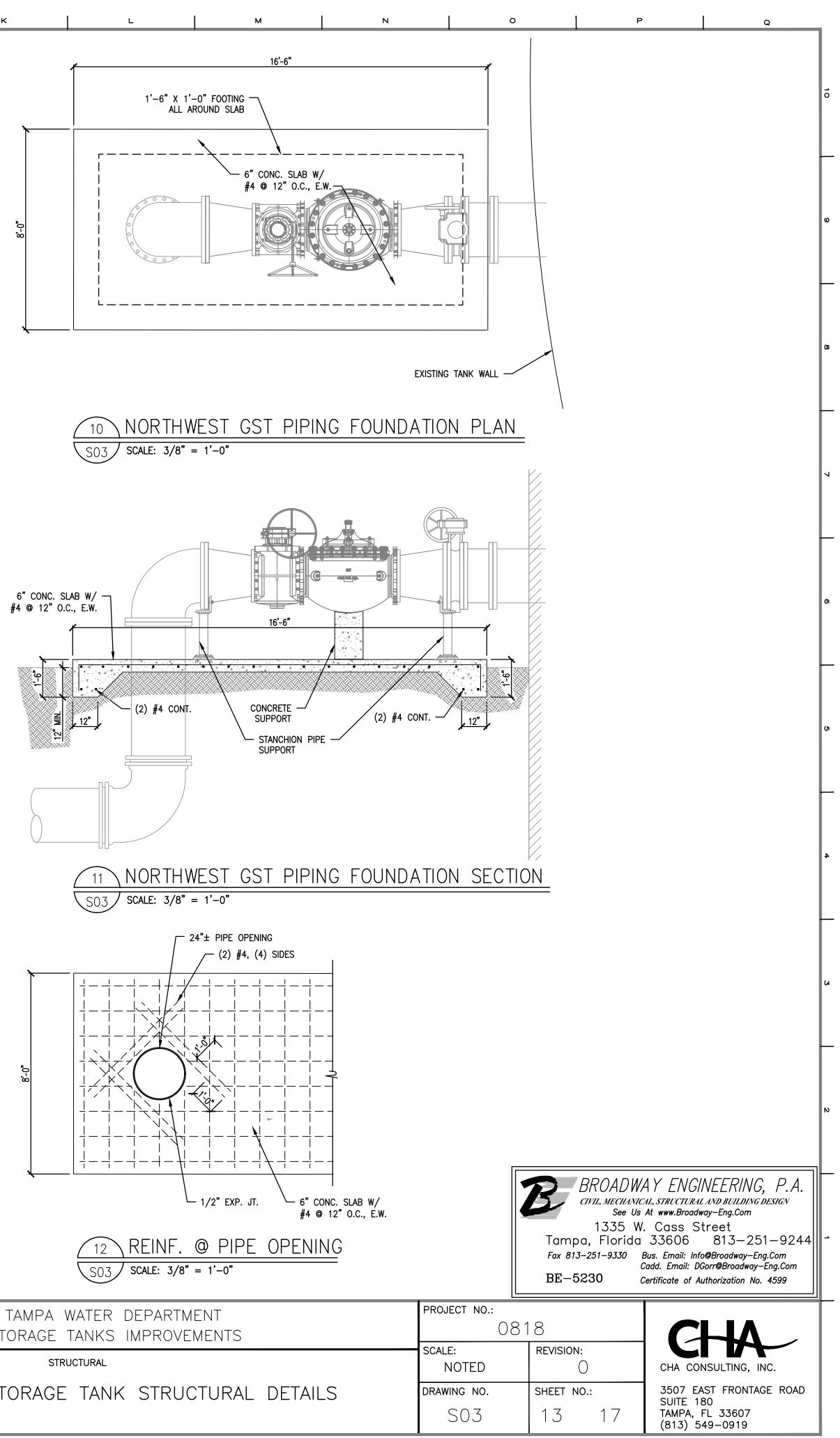


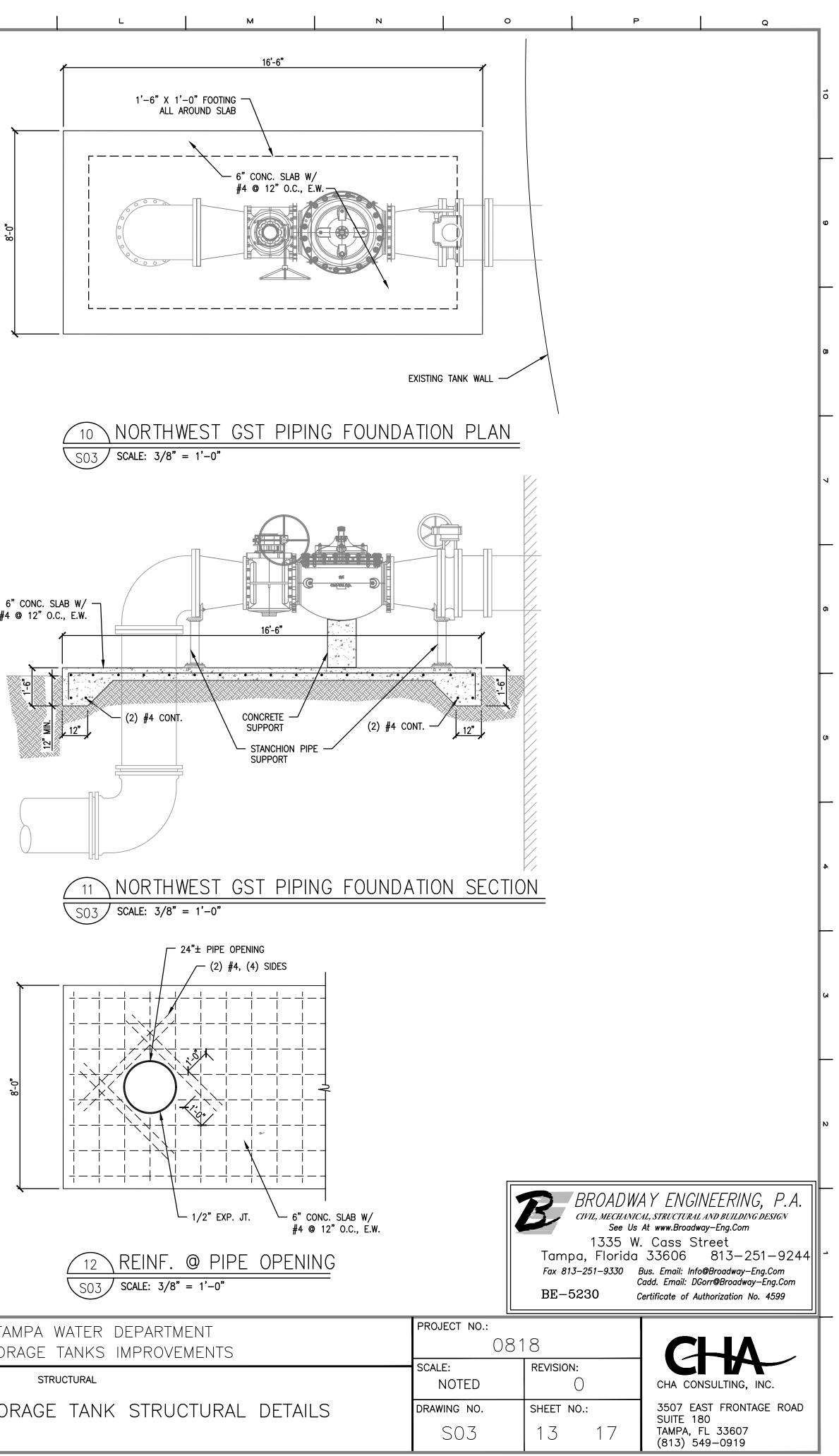
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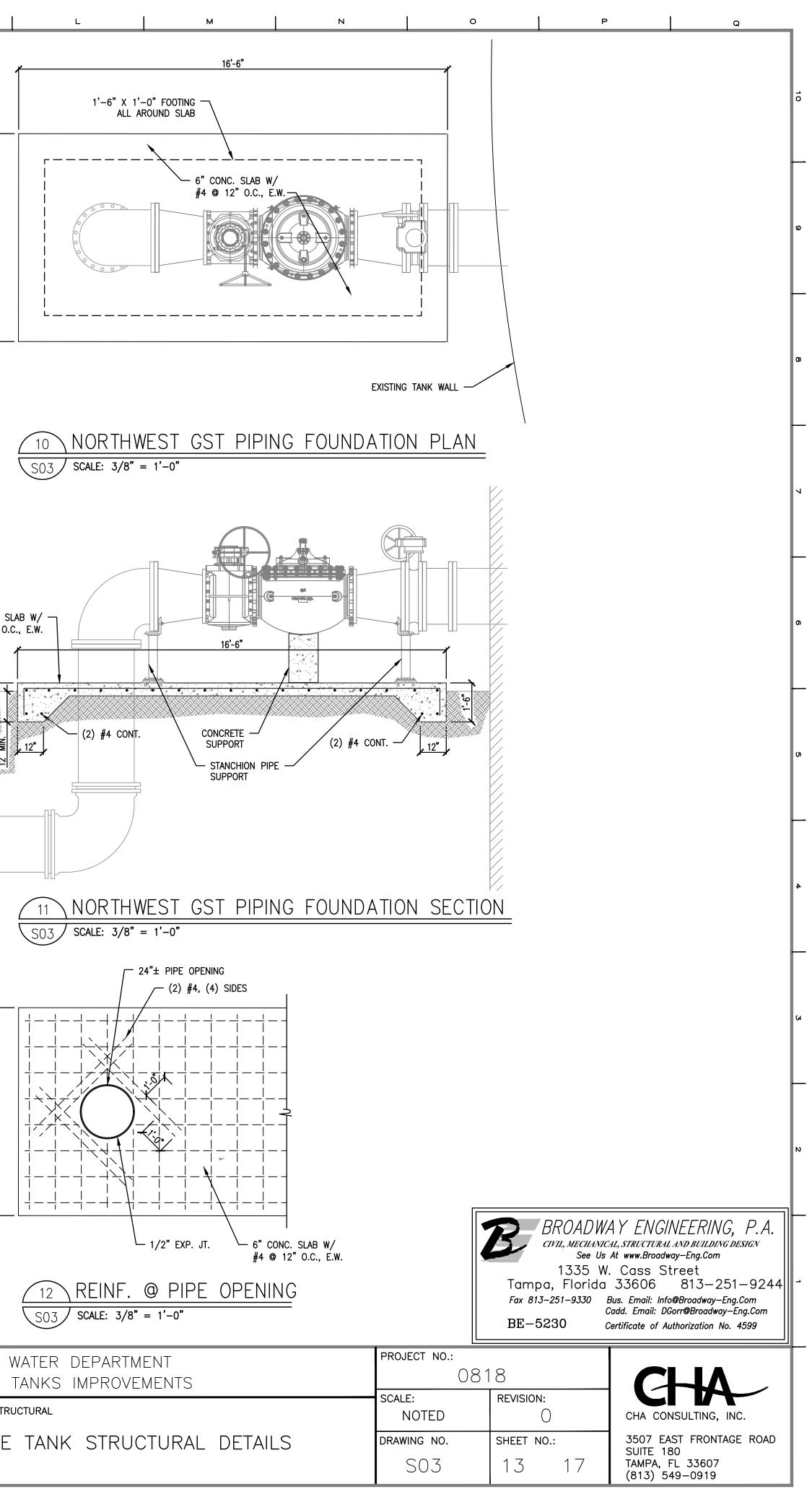
		S03 SCALE: $3/8" = 1'-0"$
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	Reviewed <u></u> Approved <u>EAB</u>	structural NORTHWEST GST STORAGE TANK STRUCTURAL
	INE IS 1″AT FULL SIZE	

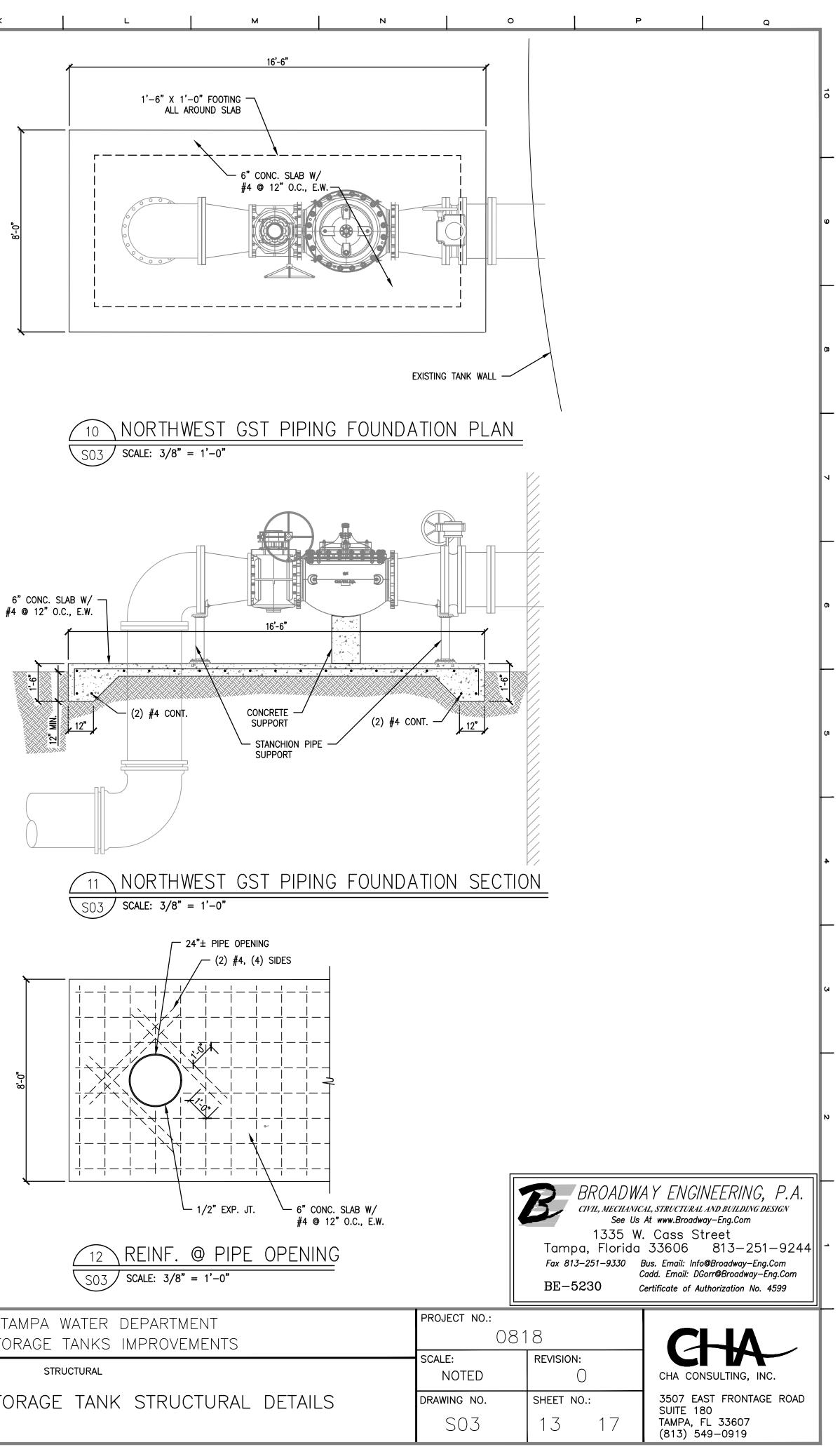
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 ALL DRAWINGS SHALL BE USED IN CONJUNCTION WITH EACH OTHER TO COORDINATE WITH MECHANICAL, ELECTRICAL, PLUMBING AND SITE PLANS. CHECK ALL SHOP DRAWINGS FOR SLEEVES, DEPRESSIONS, AND PLUMBING DETAILS NOT SHOWN ON THESE DRAWINGS. AS A MINIMUM, CONSTRUCTION SHALL COMPLY WITH CITY OF TAMPA, THE 2020 (7TH ED.) FLORIDA BUILDING CODE, AND LATEST ACI SPECIFICATIONS. 	 CONCRETE PATCHING SHALL AS AREAS OF CONCRETE O EXTERIOR, THAT ARE CHIPP CONCRETE RESTORATION PR
PLUMBING DETAILS NOT SHOWN ON THESE DRAWINGS. 3.– AS A MINIMUM, CONSTRUCTION SHALL COMPLY WITH CITY OF TAMPA, THE 2020 (7TH ED.) FLORIDA BUILDING CODE, AND LATEST ACI	
THE 2020 (7TH ED.) FLORIDA BUILDING CODE, AND LATEST ACI	2 CONCRETE RESTORATION PR BY BASF OR APPROVED EQ
	3 BONDING AGENT FOR CONCI ADH 326 AS MANUFACTURE
4.— ALL DETAILS AND SECTIONS SHOWN ON THE DRAWINGS ARE INTENDED TO BE TYPICAL AND SHALL BE CONSTRUED TO APPLY TO ANY SIMILAR SITUATION ELSEWHERE ON THE PROJECT, EXCEPT WHERE A DIFFERENT DETAIL IS SHOWN.	4 SURFACES TO BE REPAIRED RESTORATION PRODUCT MAI BUT NOT BE LIMITED TO, T
5.– ALL DIMENSIONS AND CONDITIONS MUST BE VERIFIED IN THE FIELD. DO NOT SCALE THE DRAWINGS. FOLLOW WRITTEN DIMENSIONS ONLY. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE	A. SAW CUT THE PERIM SQUARE OR RECTAN B. THE SURFACE MUST
ENGINEER PRIOR TO PROCEEDING WITH THE AFFECTED PART OF THE WORK. 6.— ALL EXISTING STRUCTURES NOT DESIGNED BY BROADWAY ENGINEERING	OR GREASE. 5 BONDING AGENT SHALL BE
ARE ASSUMED TO BE ADEQUATE AND NOT THE RESPONSIBILITY OF BROADWAY ENGINEERING.	WITH THE MANUFACTURER'S 6 CONCRETE RESTORATION PR
7.— CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO MINIMIZE DAMAGE TO EXISTING STRUCTURES. ANY DAMAGE CAUSED BY CONTRACTOR SHALL BE REPAIRED AT NO EXTRA COST TO OWNER.	MANUFACTURER'S INSTRUCT 7 CONCRETE RESTORATION PR MANUFACTURER'S INSTRUCT
8 MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES, AND SAFETY PRECAUTIONS ARE SOLELY THE RESPONSIBILITY OF THE CONTRACTOR.	8 CONCRETE RESTORATION PR RECOMMENDED BY THE MAI
9.– FIELD VERIFY EXISTING CONDITIONS, DIMENSIONS, SIZE, VOLTAGE, AND LOCATION OF UTILITIES PRIOR TO NEW OR REMODELING WORK.	BE APPLIED OUTSIDE OF TI 9 ALLOW CONCRETE RESTORAT
10 DEVIATIONS FROM DRAWINGS SHALL BE APPROVED BY THE ENGINEER.	9.– ALLOW CONCRETE RESTORAT MANUFACTURER'S INSTRUCT
11 INFORM ENGINEER OF CONSTRUCTION CONFLICTS FOUND AMONG TRADES FOR ANY REQUIRED CHANGES FROM THESE DRAWINGS.	<u>CONCRETE REST</u>
12 REFER TO "TANK INSPECTION REPORT" PREPARED BY CROM ENGINEERING & CONSTRUCTION SERVICES, DATED MAY 13, 2016, FOR ADDITIONAL INFORMATION.	1.— CONCRETE RESTORATION SH AREAS OF CONCRETE ON THAT ARE CHIPPED OR SP
<u>Shop drawing review</u>	2.— CONCRETE RESTORATION PF BY BASF OR APPROVED E
1.— SHOP DRAWINGS SHALL BE REVIEWED FOR GENERAL COMPLIANCE WITH THE DESIGN INTENT OF THE CONTRACT DOCUMENTS ONLY.	3 PRIMER FOR STEEL REINFO SUCH AS MASTERPROTECT
2 IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY COMPLIANCE WITH THE CONTRACT DOCUMENTS AS TO QUANTITY, LENGTH, ELEVATIONS, DIMENSIONS, ETC.	4.— BONDING AGENT FOR CONC ADH 326 AS MANUFACTUR
3 IN ALL INSTANCES, THE CONTRACT DOCUMENTS SHALL GOVERN THE SHOP DRAWINGS UNLESS OTHERWISE SPECIFIED IN WRITING BY THE ENGINEER.	5.— SURFACES TO BE REPAIRED RESTORATION PRODUCT AN INCLUDE, BUT NOT BE LIM
<u>FORMWORK</u> (if required)	A. SAW CUT THE PERI SQUARE OR RECTA
1.– FORMWORK, SHORING, AND BRACING FOR ALL CONCRETE BEAMS, SLABS, COLUMNS, AND WALLS SHALL BE DESIGNED AND CONSTRUCTED IN	B. FULLY EXPOSE ANY
ACCORDANCE WITH AC1 347, "RECOMMENDED PRACTICE FOR CONCRETE FORMWORK".	C. REMOVE ALL LOOSE PARTICULAR ATTEN
<u>REINFORCING STEEL</u> (IF REQUIRED)	D. MECHANICALLY ABR/ CORROSION FROM
1.— REBAR SHALL BE ASTM A615 GRADE 60 DEFORMED BARS, FREE FROM OIL, SCALE, AND RUST.	E. THE SURFACE MUST RUST, OR GREASE.
2 REINFORCING BARS SHALL BE PLACED IN ACCORDANCE WITH THE	6 PRIMER SHALL BE MIXED I
TYPICAL BENDING DIAGRAM AND PLACING DETAILS OF THE ACI STANDARDS AND SPECIFICATIONS.	7 PRIMER SHALL BE APPLIED
3 HORIZONTAL AND VERTICAL BARS SHALL LAP A MINIMUM OF 5 X BAR NO. = INCHES, (40 BAR DIAMETERS) UNLESS OTHERWISE NOTED.	8.— PRIMER SHALL BE ALLOWEI RESTORATION PRODUCT.
WELDED WIRE MESH FIBERS (IF REQUIRED)	9.— CONCRETE RESTORATION PF 7 DAYS OF THE PRIMER A
1 WELDED WIRE MESH IF USED, SHALL BE ASTM A185, GRADE 65, FREE FROM OIL, SCALE, AND RUST.	10.— BONDING AGENT SHALL BE WITH THE MANUFACTURER'S
2 WIRE MESH SHALL BE PLACED IN ACCORDANCE WITH ACI DETAILS. 3 MINIMUM WIRE MESH LAP SHALL BE ONE WIRE SPACE PLUS TWO INCHES.	11 CONCRETE RESTORATION F MANUFACTURER'S INSTRUC

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	City					No. 38558
<u>ה</u>	Tampa					
5	Florida					TO STATE OF
		0	03/2022	ISSUED FOR BID	EAB	SOMAL ENGINI
L		REV	DATE	DESCRIPTION	BY	

GENERAL NOTES

CHING

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- BE PERFORMED AT LOCATIONS THAT ARE DEFINED ON THE FLOOR, WALLS, OR DOME, INTERIOR OR PED OR SPALLED WITHOUT EXPOSED REBAR OR WIRE MESH.
- RODUCT SHALL BE MASTEREMACO N424 AS MANUFACTURED QUAL.
- RETE SHALL BE LIQUID EPOXY SUCH AS MASTEREMACO ED BY BASF OR APPROVED EQUAL.
- SHALL BE PREPARED IN ACCORDANCE WITH CONCRETE NUFACTURER'S RECOMMENDATIONS AND SHALL INCLUDE, THE FOLLOWING:
- METER OF THE AREA BEING REPAIRED INTO A NGLE WITH A MINIMUM DEPTH OF 1/4".
- BE CLEAN AND FREE OF ALL DUST, DIRT,
- APPLIED TO CONCRETE PRIOR TO PATCHING IN ACCORDANCE INSTRUCTIONS.
- RODUCT SHALL BE MIXED IN ACCORDANCE WITH THE TIONS.
- RODUCT SHALL BE APPLIED IN ACCORDANCE WITH THE TIONS.
- RODUCT SHALL BE APPLIED WITHIN THE TEMPERATURE RANGE NUFACTURER. FOLLOW ACI 305 AND 306 IF PRODUCT WILL THE MANUFACTURER'S RECOMMENDED TEMPERATURE RANGE.
- TION PRODUCT TO CURE IN ACCORDANCE WITH THE TIONS PRIOR TO SANDING, COATING, OR PAINTING.

FORATION

- HALL BE PERFORMED AT LOCATIONS THAT ARE DEFINED AS THE FLOOR, WALLS, OR DOME, INTERIOR OR EXTERIOR, PALLED AND HAVE EXPOSED REBAR OR WIRE MESH.
- RODUCT SHALL BE MASTEREMACO N424 AS MANUFACTURED EQUAL.
- DRCEMENT SHALL BE ONE-COMPONENT ZINC-RICH EPOXY P8100AP AS MANUFACTURED BY BASF OR APPROVED EQUAL.
- CRETE SHALL BE LIQUID EPOXY SUCH AS MASTEREMACO RED BY BASF OR APPROVED EQUAL.
- D SHALL BE PREPARED IN ACCORDANCE WITH CONCRETE ND PRIMER MANUFACTURER'S RECOMMENDATIONS AND SHALL MITED TO, THE FOLLOWING:
- IMETER OF THE AREA BEING REPAIRED INTO A ANGLE WITH A MINIMUM DEPTH OF 1/4".
- CORRODED STEEL IN THE REPAIR AREA.
- SCALE AND CORROSION DEPOSITS, PAYING ITION TO THE BACK OF EXPOSED STEEL.
- ADE ALL EXPOSED STEEL TO REMOVE PITS AND IMPERFECTIONS WITHIN THE SURFACE.
- BE CLEAN AND FREE OF ALL DUST, DIRT,
- IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
- IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
- ED TO COMPLETELY DRY PRIOR TO APPLYING CONCRETE
- RODUCT SHALL BE APPLIED TO EXPOSED STEEL WITHIN APPLICATION.
- E APPLIED TO CONCRETE PRIOR TO PATCHING IN ACCORDANCE 'S INSTRUCTIONS.
- PRODUCT SHALL BE MIXED IN ACCORDANCE WITH THE TIONS.

- 12.- CONCRETE RESTORATION PRODUCT SHALL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
- 13.- CONCRETE RESTORATION PRODUCT SHALL BE APPLIED WITHIN THE TEMPERATURE RANGE RECOMMENDED BY THE MANUFACTURER. FOLLOW ACI 305 AND 306 IF PRODUCT WILL BE APPLIED OUTSIDE OF THE MANUFACTURER'S RECOMMENDED TEMPERATURE RANGE.
- 14.- ALLOW CONCRETE RESTORATION PRODUCT TO CURE IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS PRIOR TO SANDING, COATING, OR PAINTING.

CRACK REPAIR

- 1.- CRACK REPAIR SHALL BE PERFORMED AT LOCATIONS THAT ARE DEFINED AS AREAS OF CONCRETE ON THE FLOOR, WALLS, OR DOME, INTERIOR OR EXTERIOR, THAT ARE CRACKED LESS THAN 1/4" WIDE WITHOUT EXPOSED REBAR OR WIRE MESH.
- 2.- EPOXY CAULK SHALL BE SIKADUR AS MANUFACTURED BY SIKA OR APPROVED EQUAL.
- 3.- SURFACES TO BE REPAIRED SHALL BE PREPARED IN ACCORDANCE WITH CAULK MANUFACTURER'S RECOMMENDATIONS AND SHALL INCLUDE, BUT NOT BE LIMITED TO. THE FOLLOWING:
 - A. ROUT ALL CRACKS TO A SMOOTH EVEN FINISH.
 - THE SURFACE MUST BE CLEAN AND FREE OF ALL DUST, DIRT, R. OR GREASE.
- 4.- CAULK SHALL BE MIXED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
- 5.- CAULK SHALL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
- 6.- ALLOW CAULK TO CURE IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS PRIOR TO COATING OR PAINTING.

GROUT

- 1.- GROUTING SHALL BE PERFORMED AT LOCATIONS THAT ARE DEFINED AS AREAS OF CONCRETE ON THE WALLS THAT HAVE VOIDS WHERE THE SHOTCRETE HAS DELAMINATED.
- 2.- EPOXY GROUT SHALL BE MASTERFLOW 647 AS MANUFACTURED BY BASF OR APPROVED EQUAL.
- 3.- SURFACES TO BE REPAIRED SHALL BE PREPARED IN ACCORDANCE WITH GROUT MANUFACTURER'S RECOMMENDATIONS AND SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING:
 - A. THE CONCRETE MUST BE AS CLEAN, SOUND, AND AS OIL- AND WATER-FREE AS POSSIBLE.
- 4.- GROUT SHALL BE MIXED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
- 5.- GROUT SHALL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
- 6.- CONCRETE RESTORATION PRODUCT SHALL BE APPLIED WITHIN THE TEMPERATURE RANGE RECOMMENDED BY THE MANUFACTURER.
- 7.- ALLOW GROUT TO CURE IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

ALUMINUM HANDRAIL

- 1.- THE MATERIAL, FABRICATION, AND ERECTION OF STRUCTURAL ALUMINUM SHALL COMPLY WITH THE ALUMINUM DESIGN MANUAL BY THE ALUMINUM ASSOCIATION.
- 2.- STRUCTURAL ALUMINUM PIPE SHALL BE MIN. ASTM B529, 6063-T5 ALLOY, Fty = 16 KSI.
- 3.- THREADED ROD ANCHOR BOLTS SHALL BE AISI 316 STAINLESS STEEL.
- 4.- WELDING SHALL BE DONE BY AWS CERTIFIED WELDERS USING THE MOST RECENT AWS APPROVED TECHNIQUES.
- 5.- HANDRAIL DESIGN SHALL COMPLY WITH THE REQUIREMENTS OF 2017 (6TH ED.) FLORIDA BUILDING CODE, CHAPTER 16, TO RESIST A LINEAR LOAD OF 50 PLF AND A CONCENTRATED LOAD OF 200 LB. HANDRAIL SHALL ALSO COMPLY WITH ALL APPLICABLE OSHA REQUIREMENT

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ON ANY ELECTRONIC COPIES.

Designed	EAB
Drawn	DEG
Checked	EAB
Reviewed	
Approved	EAB

LINE IS 1" AT FULL SIZE

CITY OF TAMPA WATER DEPARTMENT GROUND STORAGE TANKS IMPROVEMENTS

STRUCTURAL

NORTHWEST GST STORAGE TANK STRUCTURAL GI

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1.- CONCRETE SHALL ACHIEVE MINIMUM 28 DAY COMPRESSIVE STRENGTHS AS LISTED BELOW:

Q

4000 PSI FOR SLABS ON GRADE, AND FOOTINGS.

- 2.- CONCRETE SLUMP SHALL NOT EXCEED 4"±1" (EXCEPT FOR GROUTS).
- 3.- CONCRETE SHALL COMPLY WITH ALL THE REQUIREMENTS OF ACI 301 AND ASTM C94 FOR MEASURING, MIXING, TRANSPORTING, ETC.
- 4.- CONCRETE TICKETS SHALL BE STAMPED WHEN CONCRETE IS BATCHED.
- 5.- THE MAXIMUM TIME ALLOWED FROM THE TIME THE WATER IS ADDED TO CONCRETE UNTIL IT IS DEPOSITED IN ITS FINAL POSITION SHALL NOT EXCEED ONE AND ONE-HALF (1-1/2) HOURS.
- 6.- IF FOR ANY REASON THERE IS A LONGER DELAY THAN THAT STATED ABOVE, THE CONCRETE SHALL BE DISCARDED.
- 7.- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR'S RETAINED TESTING LAB TO NOTIFY THE OWNER'S REPRESENTATIVE AND THE ENGINEER OF ANY NONCOMPLIANCE WITH THE ABOVE.
- 8.- ALL CONCRETE SHALL BE CURED USING CURING COMPOUND MEETING ASTM STANDARD C309 TYPE 1 AND SHALL HAVE A FUGITIVE DYE.
- 9.- THE CURING COMPOUND SHALL BE PLACED AS SOON AS THE FINISHING IS COMPLETED OR AS SOON AS THE VISIBLE WATER HAS LEFT THE UNFINISHED CONCRETE.
- 10.- ALL SCUFFED OR BROKEN AREAS IN THE CURING MEMBRANE SHALL BE RECOATED DAILY.
- 11.- CALCIUM CHLORIDES SHALL NOT BE UTILIZED; OTHER ADMIXTURES MAY BE USED ONLY WITH THE APPROVAL OF THE ENGINEER.
- 12.- REQUIRED CONCRETE COVERAGE OVER REBAR SHALL BE AS FOLLOWS:
 - A: 3" FOR CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH.
 - B: FOR CONCRETE EXPOSED TO EARTH AND/OR WEATHER: 1-1/2" FOR #5 AND SMALLER 2" FOR #6 AND LARGER

C: FOR CONCRETE NOT EXPOSED TO EARTH OR WEATHER: 3/4" FOR SLABS, WALLS, AND JOISTS 1-1/2" FOR BEAM AND COLUMN PRIMARY REINF., TIES, AND STIRRUPS.



	PROJECT NO .:		
	08	18	
	SCALE:	REVISION:	
	NOTED	0	CHA CONSULTING, INC.
ENERAL NOTES	DRAWING NO.	SHEET NO.:	3507 EAST FRONTAGE ROAD SUITE 180
	S04	14 17	TAMPA, FL 33607 (813) 549–0919



<u> </u>	HOME RUN TO PANELBOARD. NO. OF ARROWS INDICATE NO. OF CIRCUITS, HASH MARKS INDICATE NO. OF #12 AWG. CONDUCTORS. NO HASH MARKS INDICATE 2 #12 CONDUCTORS.
\frown	CONDUIT CONCEALED IN WALL OR ABOVE CEILING.
/~	CONDUIT CONCEALED IN OR BELOW FLOOR OR UNDERGROUND
	CONDUIT RUN EXPOSED. RUN PARALLEL OR PERPENDICULAR TO STRUCTURE OR WALL.
0	FLEXIBLE CONDUIT WITH EQUIPMENT CONNECTION.
	FUSE MOLDED CASE CIRCUIT BREAKER

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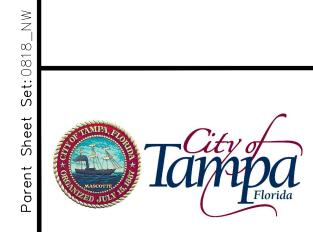
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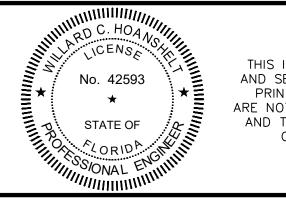
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<u>GENERAL NOTES</u>

- 1. ALL WORK SHALL COMPLY WITH 2017 N.E.C. AND LOCAL CODES.
- 2. REFER TO EQUIPMENT SHOP DRAWINGS
- FOR EXACT LOCATION OF CONDUITS. 3. INSTALL BOND WIRE IN ALL RACEWAYS PER 2017 N.E.C.
- 4. DO NOT SCALE THE ELECTRICAL DRAWINGS. REFER TO THE MECHANICAL, CIVIL AND STRUCTURAL DRAWINGS FOR DETAILED LOCATIONS OF ALL PIPING AND EQUIPMENT.



0	08/2022	ISSUED FOR BID	WCH
REV	DATE	DESCRIPTION	BY



ABBREVIATIONS

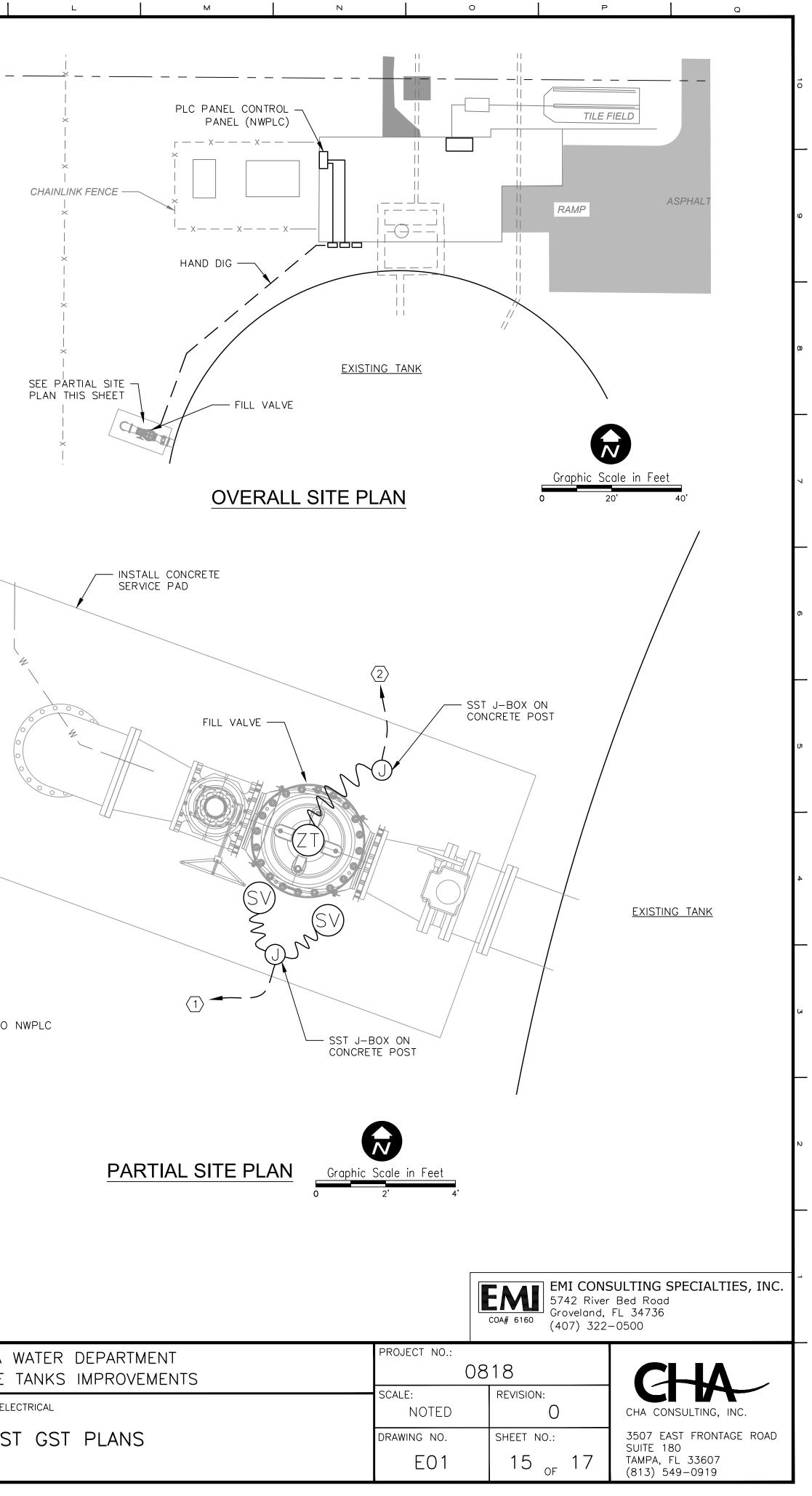
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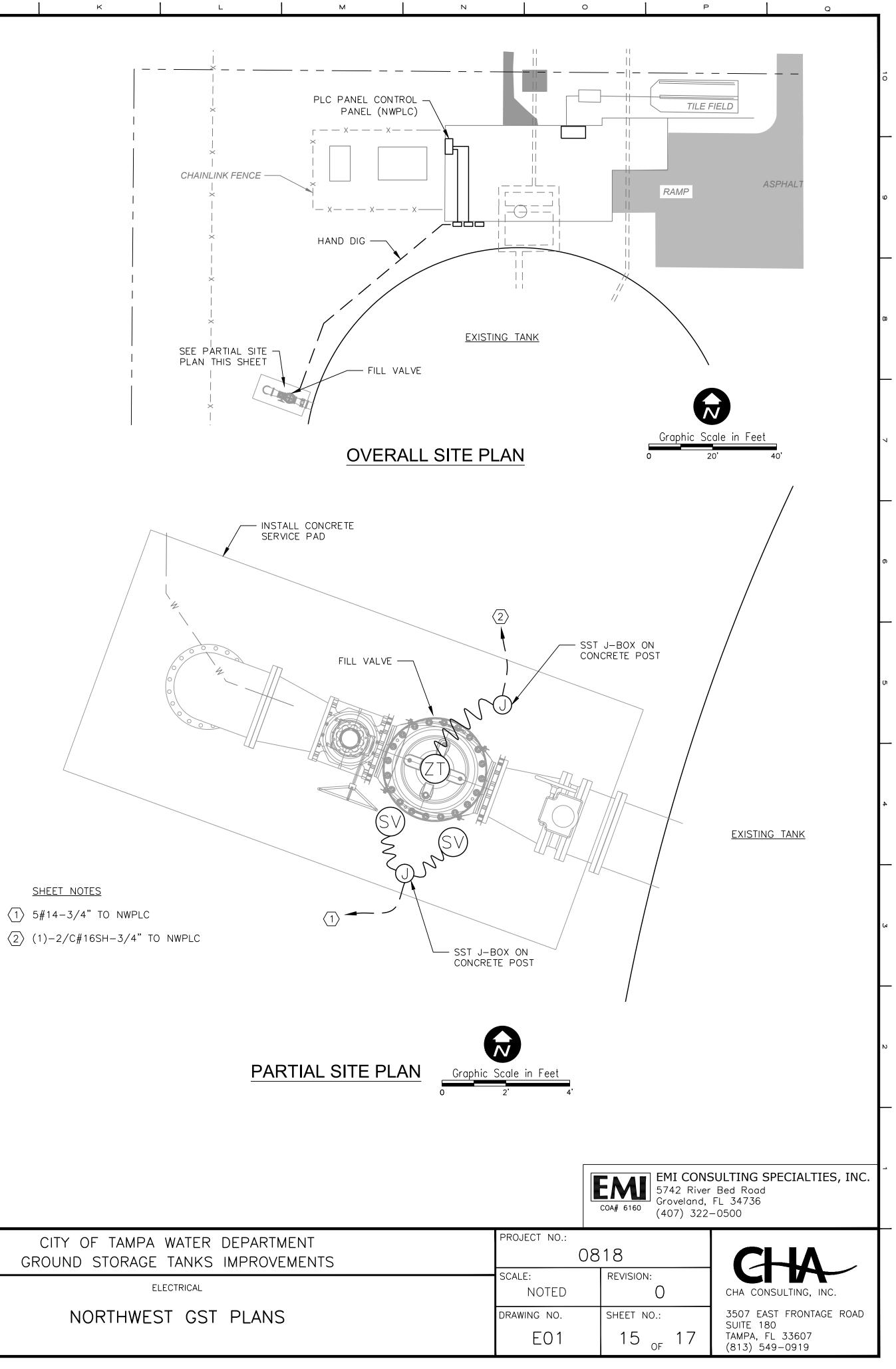
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	C. HUANSHELL	ELECTRICAL
UN ANT ELECTRUNIC CUPIES.	INE IS 1" AT FULL SIZE	NORTHWEST GST FLANS

	A	ВС		DE	F
	XX XX	SCADA DISPLAY OR CONTROL		GLOBE VALVE	
		PANEL MOUNTED (MAIN OR REMOTE)	M	BALL VALVE HALF SIZE BALL VALVE	C DOUBLE LEAF CHEC
	$\begin{array}{c} \underline{XX} \\ \underline{XX} \\ \underline{XX} \\ \underline{XX} \end{array}$	PANEL BEHIND (MAIN OR REMOTE)	\bowtie	GATE VALVE	WYE STRAINER
		PANEL MOUNTED (LOCAL)		PLUG VALVE	VIC COUPLING
	XX XX XX	LOCALLY MOUNTED		CHECK VALVE	
	(xx)	SINGLE LINE TAG	⊽	NEEDLE VALVE PINCH VALVE	J-WAY VALVE
		MOUNTED BEHIND PANEL (LOCAL)	₩	FOOT VALVE	4-WAY VALVE
	C			DIAPHRAGM	-C - HOSE CONNECTION
		PILOT LIGHT		BUTTERFLY VALVE	VENT WITH SCREEN
	$\sum_{x \neq x} \sum_{x \neq x}$	PANEL PILOT LIGHT	「N 人		F
	xx>	SHEET NOTE	D	FILL VALVE	LEVEL GAUGE
	XX	CONTROL TYPE (DI, DO, AI, AO)		REDUCER Flexible connector	
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		PILOT OPERATED PRESSURE REGULATOR		W/ELECTRIC_STROKE ADJUSTMENT	G	USERS CHOICE	
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		BACKPRESSURE REGULATOR	$\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{$		J	POWER/TORQUE	SCAN
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PNEUMATIC

PF PULSE FREQUENCY

PD PULSE DURATION

POT POTENTIOMETER

RESISTANCE

PLANATION IS SHOWN ADJACENT TO MBOL. SEE ABBREVIATIONS AND

TRANSDUCER SUBSCRIPTS

А	ANALOG

- DIGITAL D
- VOLTAGE Е
- FREQUENCY F
- HYDRAULIC Н

EXAMPLE:

CURRENT TO PNEUMATIC TRANSDUCER (BACK OF PANEL, IN A FLOW LOOP)



AIT ANALYSIS INDICATING TRANSMITTER WITH THE SUBSCRIPT SHOWING THE TYPE, SUCH AS pH, TURBIDITY, CI RESIDUAL, ETC.

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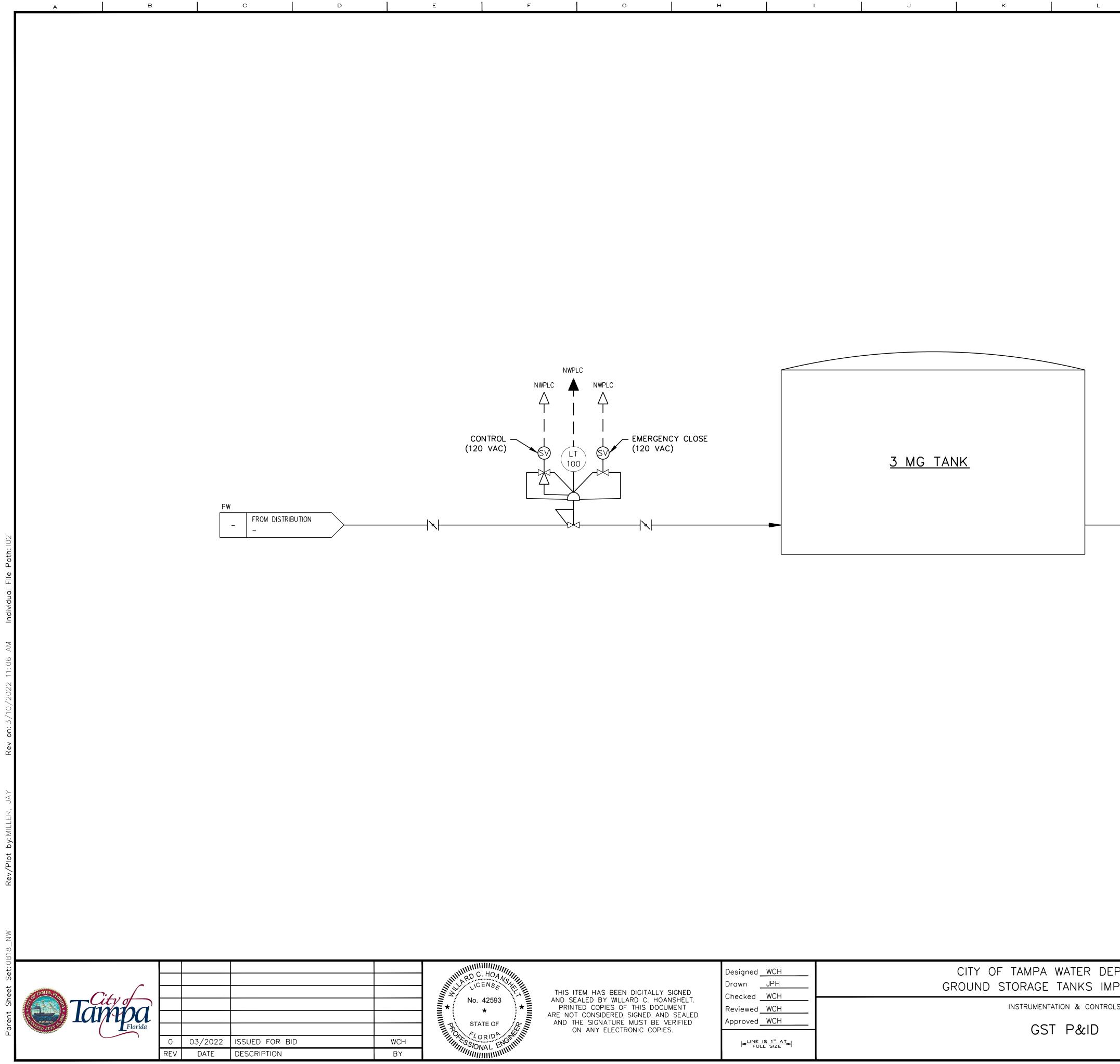
DEVICES FURNISHED BY OTHER THAN SYSTEM SUPPLIER OR EXISTING

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SECTION 16000 BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Work included in Section 16 consists of furnishing all labor, materials, equipment and transportation and performing all testing and demonstration operations of all system features required for electrical work in accordance with these specifications and drawings which includes, but is not limited to the following:
 - 1. Complete electrical wiring of power and control as shown on the drawings and herein specified.
 - 2. Electrical permits, fees, tests, inspection and guarantees.
 - 3. Connection of all electrical equipment, including complete ground system.
 - 4. Submit shop drawings.
 - 5. Provide record drawings.

1.02 PROPRIETARY NAMES

A. For convenience of description and as a standard for grade, type, quality, and performance characteristics, proprietary names are included with some descriptions. This does not imply preference to specific manufacturers (except where multiple choice is specified), but minimum requirements with approval to be made by the Engineer.

1.03 QUALITY ASSURANCE

- A. Standards: All materials shall be new and free of defects, and shall be U.L. listed, bear the U.L. label of be labeled or listed with an approved, nationally recognized Electrical Testing Agency. Where no labeling or listing service is available for certain types of equipment, test data shall be submitted to prove to the Engineer that equipment meets or exceeds available standards.
- B. Codes: Install in accordance with latest edition of the National Electric Code and the regulations of governing local, State, County, and other applicable codes, including the Utilities Company. Pay for all required licenses, fees, and inspections.
- C. Contract Documents: The drawings are generally diagrammatic; therefore, the Contractor shall make use of all the data in all of the contract documents and shall verify all information at the site. During execution of the contract, the location of

electrical apparatus shall be coordinated with the owner. Owner or his representative prior to installation shall approve all questionable locations.

- D. Inspections: During the course of construction, the engineer will observe the work. The Contractor shall call for inspections by the local building inspector during the normal phases of installation and, following each inspection phase, the engineer shall be furnished with Certificates of Inspection from all authorities having jurisdiction. After the completion of the work, the Contractor shall deliver all certifications or letters of approval from such bodies to the engineer. Following the successful completion of the final inspection, furnish the owner with a certificate of final approval.
- E. Tests: The Contractor shall provide all necessary instruments and special apparatus to conduct any test that may be required to insure system performance and that control wiring and power cables are free of all improper grounds and short circuits. These tests shall be conducted in the presence of the owner's representative prior to final acceptance.
- F. After service, feeders, and mechanical equipment feeder wires or cables are in place, but before being connected to devices and equipment, the system shall be tested for shorts, opens, intentional and unintentional grounds by means of an approved type of constant "megger". All wires in conduit that are shorted or unintentionally grounded shall be replaced.
- G. With the system energized, line-to-line voltage and line current measurements shall be made under full load conditions. Should measured values deviate ± 10 % from the nameplate rating, the condition shall be corrected. Notify the engineer immediately should deviations occur.
- H. The resistance between ground and absolute earth shall not exceed 5 ohms and shall be measured by the Electrical Contractor before equipment is placed in operation. Testing shall be performed on all ground rod installations. Testing shall be three-(3) point method in accordance with IEEE recommended practice.

1.04 SUBMITTAL

A. Shop Drawings:

1. Before submittal to the Engineer, all shop drawings shall be perused, corrected and verified by signature, or stamp and signature as approved by the applicable subcontractor to be in accordance with the requirements of the drawings and specification. Shop drawings that have not been signed or stamped and signed as approved but have not been perused for compliance with the drawings and specifications and have not been coordinated with other equipment and other trades, will be returned to the Contractor without being reviewed by the engineer. All component manufacturers' names shall be clearly visible on each submittal sheet. Dimensions, material lists, wiring diagrams, capacities, catalog numbers/cuts and other such pertinent data shall be submitted for approval of all equipment, disconnect switch, including circuit breakers, safety switches, and controls, and all wiring and control devices. Approval of material will be based on the manufacturer's published ratings or on test results where specified. All data shall be submitted in a single package. No partial list will be reviewed.

- 2. If any required items are omitted from this submittal, the engineer shall select each such item indicating manufacturer, model, etc., and such decision shall be final. The term "Per Specifications" will not be acceptable. Samples shall be required as requested by the engineer to further substantiate any substitutions.
- 3. Any deviation from the specifications pertinent to shop drawings shall be listed separately and submitted with shop drawings. Failure to list all deviations in this manner shall be grounds for requiring removal of such items and installation of new items in exact accordance with specifications at no extra cost to the owner. No material shall be purchased or installed before written approval of any submission.
- 4. In addition to the shop drawings, which must be submitted for approval before ordering equipment, the Contractor shall furnish four copies of complete installation drawings, instruction books, maintenance manuals, and parts lists for each major item of electrical equipment, and similar data on minor items of equipment if requested by the engineer. This information must be submitted before the installation of the equipment.
- B. Permits, Fees, Inspection Certificates, and Tests:
 - 1. Permits: All required permits, fees and inspection certificates shall be obtained, paid for, and be made available by the Contractor during the progress of the work.
 - 2. The Contractor shall perform or secure such tests as may be required, supplying all labor and instruments needed, or paying such costs as may be involved.
 - 3. All tests required establishing the adequacy and quality of all systems shall be made by this Division in the presence of and to the satisfaction of the engineer.
 - 4. All concealed work must remain uncovered until approved. All tests shall be made in strict accordance to code requirements. Defects disclosed by tests shall be made good and the defective materials replaced without additional cost to the owner. Tests shall be repeated after repairs or replacements have been made.
- C. Record Drawings:
 - 1. During the progress of the work, the job superintendent for this Division shall record daily on his complete field set of electrical drawings the exact location as

installed of all underground and otherwise concealed conduits that were not installed exactly as shown on the contract drawings.

2. This work must be kept up-to-date and verified by the engineer's field representative before the payment is made. The complete marked set shall be delivered to the owner before the final acceptance of the work.

1.05 GUARANTEE

- A. All equipment materials and workmanship shall be guaranteed to conform with the specifications and accepted alternates. Parts, defective or not in accordance with the specifications or accepted alternates, shall be replaced in the system and tested free of cost to the owner; and for a period of one year after final acceptance of the completed system, shall be fully guaranteed.
- B. In the event that a repetition of any one material defect occurs, indicating the probability of repeated failures which can be traced to faulty manufacture, manufacturer's design of material or item, or Contractor's method of installation, the Contractor shall not continue to replace with the same material, part or method, but shall take steps to remedy the fault through replacement of all such defective material or revise completely the method of installation.
- C. Manufacturer's guarantees, which extend beyond the guarantee period specified, shall be transferred to the owner before request for final payment.
- D. All equipment, accessories and connections shall be guaranteed to operate without undue heating, noise or voltage drop; and the Contractor shall correct or adjust any items, should such conditions be found to exist after system has been put into operation. The engineer shall decide whether or not a condition or noise is objectionable.
- E. Certification must be provided stating that all materials and equipment used on the project are new.

1.06 SUPERVISION AND WORKMANSHIP

- A. All work under this Division shall be performed under the immediate direction of fully qualified foremen. Insofar as possible and unless approved by the engineer, there shall be no change in supervision during the course of construction.
- B. All workmanship shall be of the highest quality, and the right to require immediate removal from the project of any personnel for cause is reserved to the engineer.
- C. It is the intent and of the essence of the specifications that all personnel furnished for this Division shall cooperate with all other personnel at all times to insure the furnishing of highest quality workmanship.

PART 2 – PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. General: All electrical materials and equipment shall be new, of recent manufacture, shall bear the manufacturer's name, date of manufacture, trademark and be approved by the Underwriters' Laboratories, Inc., except as otherwise specified herein. Material or equipment damaged in the course of installation or test shall be replaced or repaired in a manner meeting with the approval of the engineer. All equipment shall be complete and in operating condition unless otherwise specified herein, fusible equipment shall be equipped with fuses, a 100-percent of spare fuses of each type shall be supplied. Equipment and materials shall be delivered to the site and stored in original containers, suitably sheltered from the elements, but readily accessible for inspection.
- B. Raceways:
 - 1. PVC conduit shall be schedule 40 composed of High Impact PVC (polyvinyl) chloride (C-200 Compound), and shall conform to industry standards, and be UL listed in accordance with Article 347 of National Electrical Code for underground and exposed use. Materials must have tensile strength of 55 PSI, at 70 degrees F, flexural strength of 11,000 PSI, compression strength of 8600 PSI. Manufacturer shall have five years' extruding PVC experience.
 - 2. ALUM conduit shall contain less than 0.1-percent copper and conform to Federal Specification WW-C-540C.
 - 3. Liquidtight flexible conduits shall be aluminum cord, PVC coated with aluminum fittings.
 - 4. All mounting hardware shall be 316 stainless steel, anchors shall be expansion type, 316 stainless steel
- C. Conductors:
 - 1. All power conductors shall be copper Type THHW cross-linked polyethylene, 600 volts insulation, or approved equal. No. 10 and smaller may be single strand. No. 9 through No. 2 shall be 7 strands and No. 1 through 4/0 shall be 19 strands. 250 MCM through 500 MCM shall be 37 strands.
 - 2. Connectors and lugs shall be Burndy series YA, YS YSV, applied with Burndy recommended tools. Taps in gutters shall be Burndy KSU, tin-plated. All connectors shall be insulated with PVC tape and made watertight. Scotchlock insulated spring type connectors shall be used for fixture connections.

- 3. Pull compound, if used, shall conform to the recommendations of the wire manufacturer.
- D. Nameplates: The following items shall be equipped with nameplates: All safety switches, motors, and control panels. Special electrical systems shall be identified at junction and pull boxes, and equipment and cable racks. Nameplates shall adequately describe the function of the particular equipment involved. Nameplates for panel shall include the panel designation, voltage, and phase of the supply. For example, "Pump Control Panel, 240V, 3-phase, 3-wire". The name of the machine on the nameplates for a particular machine shall be the same as the one used on all motor starters and for that machine branch circuit breakers. Nameplates shall be laminated phenolic plastic, black front and back with white core, with lettering etched through the outer covering. White engraved letters on black background. Attach with plated self-tapping screws or brass bolts.
- E. Boxes: All outlet and switch boxes and fittings used throughout the job, except where electric metallic tubing is permitted, shall be 316 stainless steel. Boxes shall be minimum size as required by the National Electric Code and large enough to permit a satisfactory installation of the required conductors.
- F. Ground Rod: Ground rods shall be a copper clad steel rod 5/8-inch diameter by 20 feet long, approved for that use.
- G. Lightning Arrestors: Secondary lightning protection shall be provided on each phase on the line side of main service as shown on the Drawings.

PART 3 - EXECUTION

3.01 INSTALLATIONS

- A. All work shall be executed in a neat and workmanlike manner by experienced and licensed and certified electricians so as to present a neat installation upon completion. Electrical work shall be coordinated so as not to interfere with other construction operations. All work under each section of this Division shall be laid out and installed in advance of pouring concrete floors or walls.
- B. The Contractor shall perform or be responsible for all necessary cutting, sleeving, excavating and backfilling and compacting for the installation of the equipment and the patching thereafter. Metal conduits installed underground or in concrete slabs shall be coated with two coats of asphalt paints.
- C. The Contractor shall furnish and install all inserts, and hangers required to support conduit, cables, pull boxes, etc. The Contractor shall furnish and install all sleeves or openings through floors or walls required for passage of all conduits or ducts installed. Sleeves shall be of 18-gauge galvanized sheet steel rigidly supported and suitably packed to prevent ingress of wet concrete. If sleeves, hangers, inserts, etc.,

are improperly installed, all necessary cutting and patching to rectify such error shall be performed.

- D. The Contractor shall permanently and effectively ground service neutral and all raceways, devices, and utilization equipment in accordance with requirements of National Electrical code, and as shown or required. All grounding electrodes shall have rigid clamp jaws.
- E. The Contractor shall install control devices furnished by equipment manufacturers with their equipment and complete the wiring in accordance with manufacturer's recommendations and approved wiring diagrams.
- F. Feeders and Branch Circuitry: Sizing of main feeders and branch feeders is fully delineated on the drawings. The Contractor shall provide all feeders in accordance with the indications of the drawings and shall connect them for correct phase sequence and the proper operation of the equipment they serve.
- G. Conductors: Conductors pulled in raceways shall be greased to reduce strains on the conductor and on the insulation. Conductors that are nicked or scarred during installation shall be removed. The raceways will be cleaned and freed from any burrs or abrasions and new conductors installed. Conductors shall be laced and trained in all panelboards, control panels, and terminal cabinets. Color coding of conductors is mandatory. The phase conductors of all feeder circuits and the control conductors of all control circuits shall be grouped as such, laced, and identified where installed in the pull boxes.
- H. Grounding:
 - 1. In general, all electrical equipment (metallic conduit, motor frames, panelboards, etc.) shall be bonded together with a green insulated or bare copper systemgrounding conductor in accordance with specific rules of Article 250 of the NEC. Bonding conductor through the raceway system shall be continuous from main panel grounding bar to branch circuit equipment and devices.
 - 2. Equipment grounding conductors shall be so installed as to permit shortest and most direct path from equipment to ground and be installed in conduit with both conductor and conduit bonded at each end and have connections accessible for inspection and be made with approved solderless connectors brazed (or bolted) to the equipment or structure to be grounded. Equipment grounding conductors in <u>NO</u> case be a current carrying conductor, have green jacket. The grounding electrode conductor shall be exothermically welded to grounding electrode.
 - 3. All contact surfaces shall be thoroughly cleaned before connections are made to insure good metal-to-metal contact.

- 4. Mechanical lugs or wire terminals shall be used to bond ground wires together or to junction boxes and panel cabinets and shall be manufactured by Anderson, Buchanan, Thomas and Betts Co., or Burndy.
- 5. All exterior grade mounted equipment shall have their enclosures grounded directly to a separate driven ground at the equipment.
- 6. All raceways shall have an insulated copper system ground conductor throughout the entire length of circuit installed within conduit in strict accordance with NEC.
- I. Raceways:
 - 1. General: All above grade conduits shall be aluminum, below grade shall be PVC-40. Conduits shall be installed to insure against the collection of trapped condensation, and all runs shall be arranged to be devoid of all traps wherever possible. Precautions shall be taken to prevent the lodging of dirt, plaster, or trash in conduit, tubing, fittings, and boxes during construction. A run that has been or becomes clogged shall be entirely cleared or replaced. All metallic conduits installed in concrete or below grade shall be painted with two coats of black asphalt paint. Where conduits leave or enter a slab, a flush coupling shall be installed.
 - 2. Size: Minimum size for all conduits is ³/₄-inch.
 - 3. Rigid Aluminum Conduit: Rigid conduit shall be securely fastened to all enclosures; care being taken to see that the full number of threads project into the hub. All field cut threads shall be coated with a zinc compound.
 - 4. Flexible Conduit: 18 inches maximum
- J. Devices: Devices shall be set plumb with the footing or floor and at locations indicated. Where devices must be moved because of conflict, approval of the engineer shall be obtained prior to relocation.
- K. Electrical Work Required for the Installation of Equipment Under Other Divisions of these Specifications: The Contractor shall provide all conduit, conductors, boxes, safety switches, and all necessary hardware required for the installation of equipment.
- L. Surfaces disturbed during the installation of duct, conduit or direct burial cable shall be restored to their original elevation and condition and for new work to new elevations and conditions specified. Sod or topsoil shall be preserved carefully and replaced after the backfilling is completed. Sod that is damaged shall be replaced by sod of quality equal to that removed. Where the surface is disturbed in a newly seeded area, the restored surface shall be re-seeded with the same quantity and formula of seed as that used in the original seeding.

- M. Backfilling around and below structures shall consist of earth, loam, sand-clay or sand and gravel, free from large clods of earth or stones over one inch in size. Backfill materials shall be placed symmetrically on all sides in loose layers not more than nine inches deep. Each layer shall be moistened, if necessary, and compacted with mechanical or hand tampers to 95 percent compaction (AASHTO T- 180 proctor).
- N. All electric service support channels shall be manufactured by a reputable firm having experience in rating and construction of such equipment. All support channels, hereinafter called strut, shall be cold worked roll formed A.I.S.I. Type 316 stainless steel or extruded 6063-T6 Aluminum. The minimum allowable stainless-steel strut shall be 1-5/8" x 1-5/8", 12-gauge thickness. The stainless strut shall have no holes drilled larger than 5/8" and no closer than 1-1/2" in spacing. No holes shall be drilled or enlarged in pre-punched strut. All attachments to the stainless struts shall be made with the appropriate clamping devices, made of Type 316 stainless steel. The minimum allowable aluminum strut shall be 1-5/8" x 2-3/8". Attachments to aluminum strut shall be made with appropriate clamping devices made of 5052-H32 alloy. All loading of strut materials shall have a 15 percent load safety factor.

END OF SECTION

SECTION 16950 CONTROL DESCRIPTIONS

A. SUMMARY

1. Furnish and install a one-way flow altitude high level shutoff valve, with solenoid electrical control and back pressure throttling while filling. Cla-Val model 16" 210-13BPCY KCO DS SSB 150AG. Provide sensing line to the CDS6A altitude pilot and provide percent open of valve. The Contractor shall provide conduit and wire to provide power and tie to SCADA. The Tampa Water Department will provide programing for the Cla-Val.

2. Emergency System

a. The control shall include a relay system that will close the fill valve. The relay system shall be independent of the PLC operation. The relay system will detect the emergency high level and will close the fill valve utilizing the fill valve emergency solenoid valve. A local manual reset will be required to restore automatic control. The control system shall maintain utility voltage to the emergence close solenoid valve. Upon loss of voltage i.e., loss of utility voltage, the emergency solenoid shall close the fill valve.

B. FUNCTIONAL DESCRIPTIONS

- 1. General:
 - a. The existing 3.0 MG ground storage tank shall be programed for automatic filling by a local PLC. The working volume of the tank is 0-30 feet. Currently the tank level is monitored by a single level transducer. The proposed fill valve is hydraulically operated with pilot controls. The pilot controls utilize a 3-way solenoid and emergency close solenoid valves.
- 2. Ground Storage Tank Control Description
 - a. The PLC programming shall allow for automatic filling of the ground storage tank as a function of time, level, and operator adjustable setpoints. The sequence of automatic control shall be as follows:
 - 1) The operator sets the time for filling over 24 hours, 7 days.
 - 2) The operator sets the start fill level.
 - 3) The operator sets the stop fill level.
 - 4) The operator sets the restore pumping level.
 - 5) The operator sets the impending low-level alarm setpoint.
 - 6) The operator sets the impending high-level alarm setpoint.
 - 7) The operator sets the emergency low-level alarm setpoint.
 - 8) The operator sets the emergency high-level alarm setpoint

- 9) The operator sets the tank fill system, Manual/Off/Auto selector switch in the AUTO position.
- 10) After operator prompt to start, the control system shall confirm equipment status and shall prompt the operator if there is a condition where automatic control is not possible. The control system shall provide error messages to alert the operator of a problem. If the control system determines acceptable operating parameters, the control system shall automatically control the tank level to maintain setpoints.
- b. Automatic Operation
 - 1) The SCADA system shall keep the tank full as directed by operator level and time of day setpoints.
- c. Manual Operation
 - 1) The PLC programming shall allow the manual operation of the GSR. The sequence of control shall be as follows:
 - a. The operator sets the Manual/Off/Auto selector switch in the MANUAL position.
 - b. For opening, operator sets the OPEN/OFF/CLOSE selector switch in the OPEN position. An operator prompt is required for confirmation, once confirmed, the valve will open.
 - c. For closing, operator sets the OPEN/OFF/CLOSE selector switch in the CLOSE position. An operator prompt is required for confirmation, once confirmed, the valve will close.
- d. Interlocks
 - 1) On emergency ground storage tank high level: Close the fill valve
 - 2) On emergency ground storage tank low level: Stop all booster pumps
 - 3) On retore pump level setpoint: Restart booster pumps.
 - 4) Upon loss of a healthy GSR level signal: Close the fill valve
 - 5) On loss of utility power: Close the fill valve the fill valve.
- e. Alarms
 - 1) Emergency High Wetwell Level
 - 2) Emergency Low Wetwell Level
 - 3) Impeding High Wetwell Level
 - 4) Impeding Low Wetwell Level
 - 5) Fill valve Failed to Move
 - 6) Loss of GST Level Signal
 - 7) Loss of Communication
- f. Emergency System:

- 1) The control shall include a relay system that will close the fill valve. The relay system shall be independent of the PLC operation. The relay system will detect the emergency high level and will close the fill valve utilizing the fill valve emergency solenoid valve. A local manual reset will be required to restore automatic control.
- 2) The control system shall maintain utility voltage to the emergence close solenoid valve. Upon loss of voltage i.e., loss of utility voltage, the emergency solenoid shall close the fill valve.
- g. Furnish one HMI display page for this system.
- h. Fill Valve PLC I/O
 - 1) DO: Fill Valve Open/Close Command
 - 2) AI: Fill Valve Position (0-100%)

Questions and Answers

- 1. On Bid Item 4: Investigation Beneath Tank Floors, is the intent to produce a report similar in fashion and scope to the previous investigation at Morris Bridge, should this investigation survey the entire floor?
- a. The entire floor should be surveyed. See prior addendum regarding the investigation at Morris Bridge.
- 2. Is the city covering the cost for the lead/asbestos testing? If not please specify a line item to carry the amount on the bid form.
- The standard "upfront" documents for the City of Tampa speak to testing being performed by the City unless otherwise noted (G-5.01). We note otherwise within Specific Provision 18 Testing on Page SP-3 which states that all testing required shall be borne by the Contractor. If lead/asbestos testing is required, the cost shall be borne by the contractor.
- 3. What is the anticipated start date on the project?
- a. The specifications included in the advertisement speak to required timing for topics such as the pre-construction meeting, mobilization, and substantial completion.
- 4. Please provide as built or quantify the linear feet of pipe requiring coatings of the Northwest GST Building carried in Line Item 21 of the Bid Form.
- a. See Appendix A.
- 5. Please specify which permits/ authorizations are required for the project.
- a. See G-1.02 WORK INCLUDED. Please note that this project site is within Hillsborough County's Jurisdiction, and they determined that no building permit is required. The specifications included in this advertisement speak to other testing and clearance requirements.
- 6. I do not see any advertisement for a prebid meeting. I assume there was not a mandatory prebid meeting. Also, is it possible to schedule a site visit to see the exterior of the tank?
- a. No.
- 7. I assume there is no requirement for Davis Bacon Wage Rates. If so please attached wage determination.
- a. No.

- 8. In spec section 09920 Table 3.07-1 Coating Systems for Interior Concrete, the DFT was not indicated. Please specify the required milage of each coating.
- a. Adhere to Manufacturer Requirements.
- 9. Please revise bid form quantities to reflect the omission of the East GST at Morris Bridge PS.
- a. The specific quantities associated with this comment are not clear.
- 10. Should the lead/asbestos testing prove their presence, will abatement costs be covered by the contingency fund?
- a. Yes.
- 11. Is the existing coating and age known?
- a. This information is not available. However, we do not believe the interior has been coated.
- 12. Please provide dimensions on the Northwest GST building- the height is needed to price lifts, etc.
- a. Issued for Bid Plans dated March 2022 were included in the original advertisement. Please see the Issued for Bid Set dated March 2023.
- 13. Please indicate what electrical work is required per Bid Item 26.
- a. See plans and note the addendum which includes Division 16 specifications which were accidentally omitted when the project was originally advertised.
- 14. 120 days is a short time frame for the work. Please allow an additional 60 days to compensate for repairs within the tank.
- a. The 120-day requirement will remain due to operational constraints.
- 15. Will the tank be taken offline, drained, and cleaned by the city before the NTP?
- a. After the pre-construction meeting and prior to mobilization to the site, the tank will be taken offline and drained as much as possible.