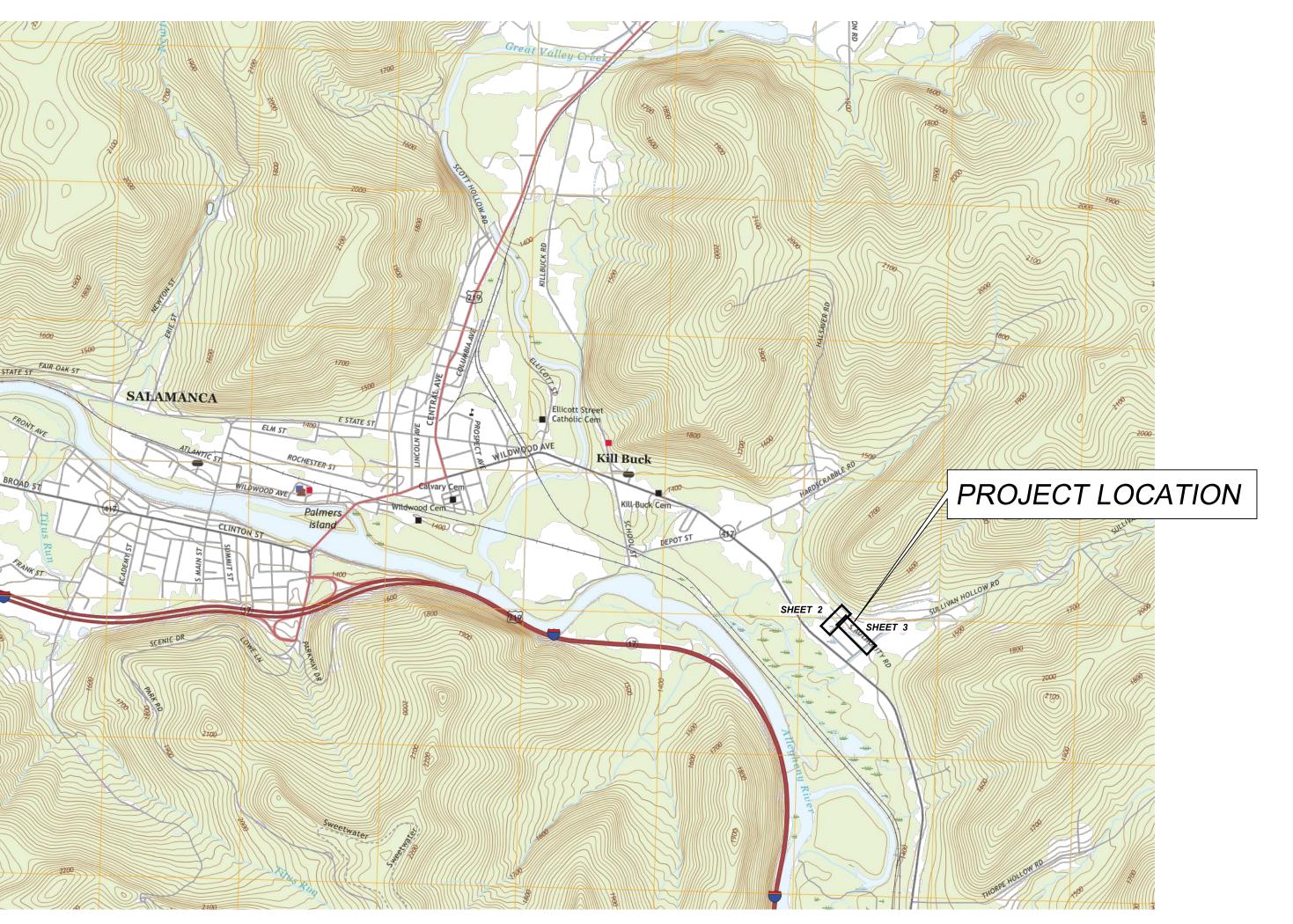
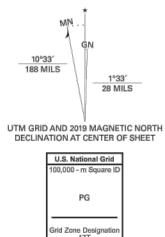
1	L	EGEND
— BC —		BURIED CABLE
BH#	\bullet	TEST BORE W/ ELEVATION
CABLE UG	С	UNDERGROUD CABLE MARKER
		CHECK DAM
со	<u></u>	MAINLINE CLEANOUT
CONC		CONCRETE
CP	\bigtriangleup	PRIMARY CONTROL POINT
DI		DRAINAGE INLET
DMH	© 0	STORM DRAINAGE MANHOLE
EM	E	ELECTRIC METER
EOP		EDGE OF PAVEMENT
EOR		EDGE OF UNPAVED ROAD
EOS		EDGE OF SHOULDER
EPS		EDGE OF PAVED SHOULDER
CLF	_ <u>_</u>	FENCE LINE - CHAIN LINK
WFL/IFL		FENCE LINE - WOOD/STEEL
GAS	 	GAS METER
- <i>G</i>	Ľ	GAS LINE
_	ଜ	
GLM	⊌ ▲	GAS LINE MARKER
GP/POST		GUARD POSTS
0.5-		GUIDE RAIL
GRD	-	GARDEN
	¢	BUSH
	×	SHRUB
	Ð	STUMP
	*	TREE CONIFEROUS
	÷	TREE DECIDUOUS
	\bigcirc	PROTECT TREE
	\otimes	REMOVE TREE
GV	X	GAS VALVE
GW	\rightarrow	GUY WIRE
FH	ş	HYDRANT
MB	M	MAIL BOX
	Ô	NATIONAL GRID RISER
— ОН —		OVERHEAD WIRES
sco	0	SEWER CLEANOUT
—SA—		EXISTING SANITARY LINE
SAMH	S	SANITARY MANHOLE
SFL		STOCKADE FENCE
	d	DOUBLE SIGN
	d d	SIGN
1414		
MM		MILE MARKER
	× 552.4	SPOT ELEVATION
	-\$	LIGHT STANDARD
— <i>ST</i> —		STORM LINE
SW/		SIDEWALK
		SELECT FILL
TEL	1	TELEPHONE MANHOLE/ UG BOX
UG TEL		UNDERGRND TELEPHONE FLAG
TRANS	(E)	TRANSFORMER
	T	TEST / POTHOLE*
—- <i>UG</i> —	Ą	UNDERGROUND WIRES
UP	Ś	UTILITY POLE
UPL	0-	UTILITY POLE W/ LIGHT
— <i>UT</i> —		UNDERGROUND TELEPHONE
· ·		WATER (CREEK, STREAM, POND
— w —		WATER MAIN
	C	WATER END CAP
		WATER REDUCER FITTING
	*50	
	WV	WATER SHUT OFF
	\bowtie	WATER VALVE, EXISTING
	~	
	8	WATER VALVE, PROPOSED
	××××	WATER VALVE, PROPOSED WELL WETLAND



Produced by the United States Geological Survey North American Datum of 1983 (NAD83) World Geodetic System of 1984 (WGS84). Projection and 1 000-meter grid: Universal Transverse Mercator, Zone 17T This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands. .NAIP, October 2017 - December 2017 Imagery.. Names. National Hydrography Dataset, 1899 - 2019 Hydrography.. ...National Elevation Dataset, 1999 - 2018 Boundaries sources: see metadata file 2017

Wetlands...



2018

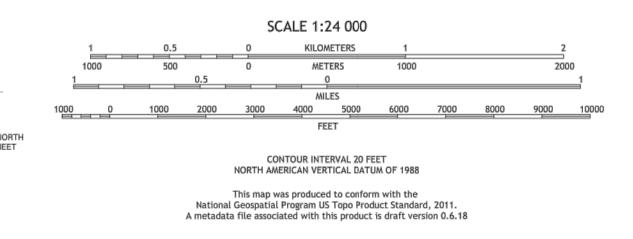
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SENECA NATION OF INDIANS SULLIVAN HOLLOW WATER TREATMENT PLANT UPGRADES

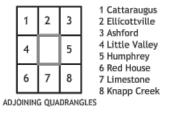
SENECA NATION OF INDIANS 12837 ROUTE 438 IRVING, NEW YORK 14081



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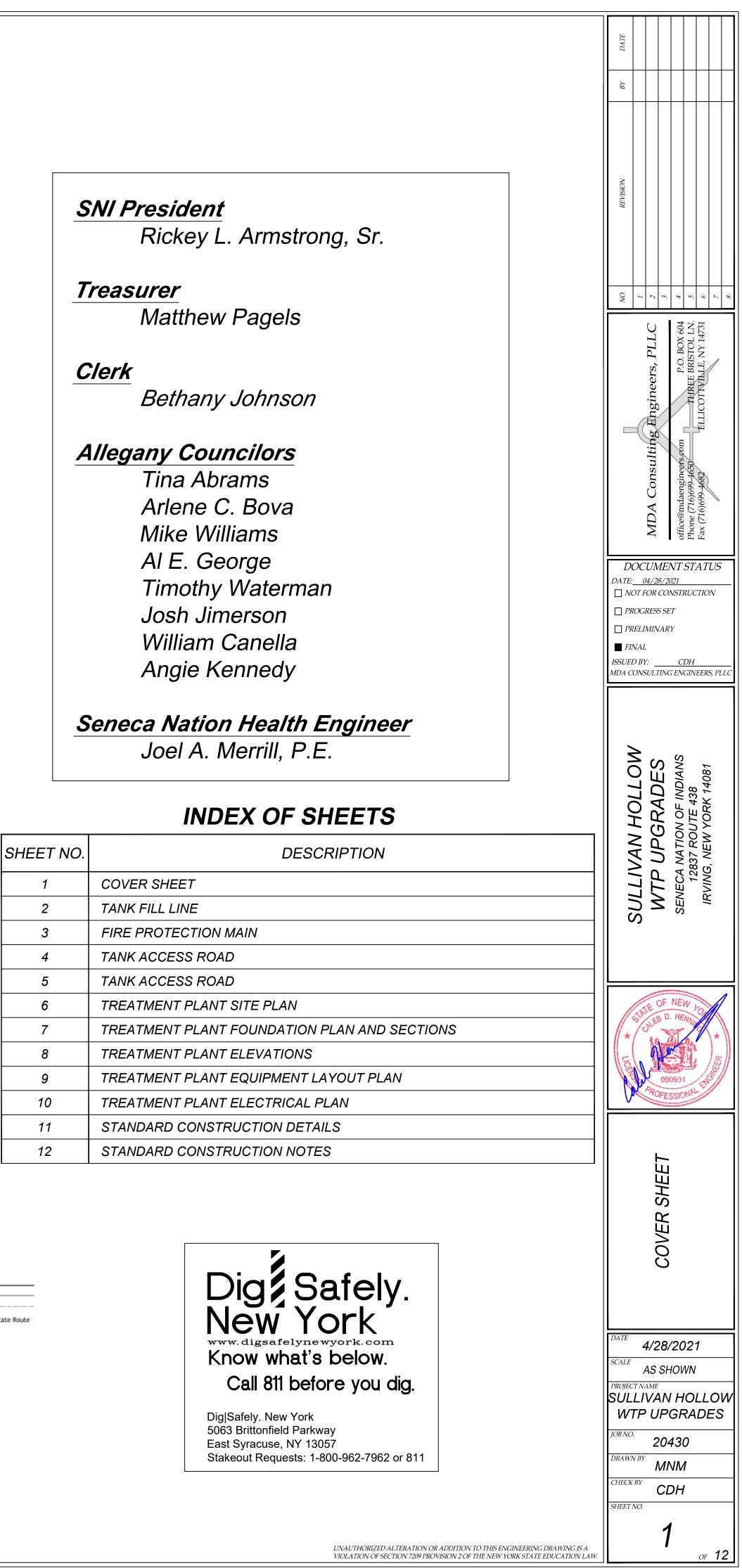


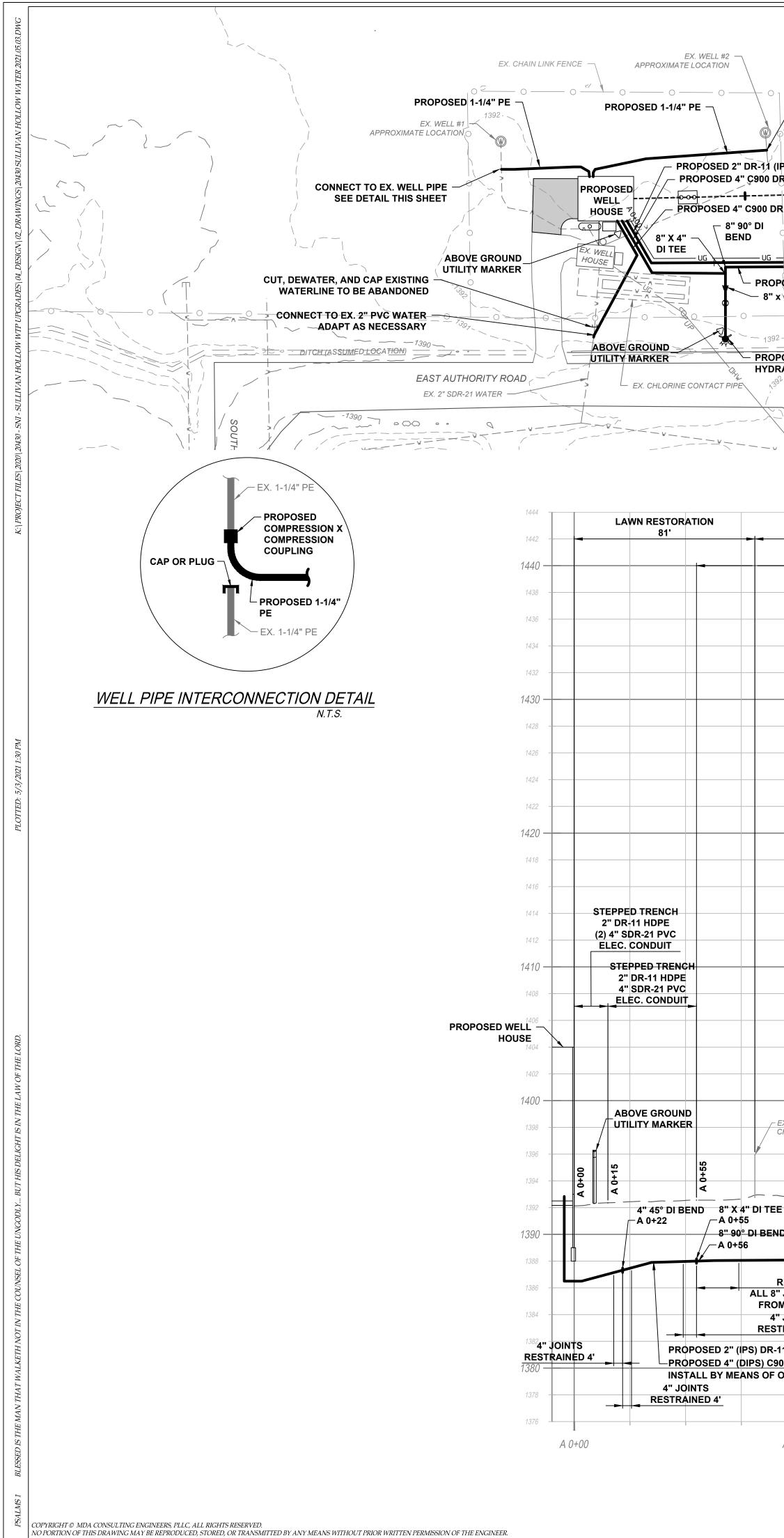
NEW YORK
QUADRANGLE LOCATION



	ROAD CLAS	SIFICATION	
Expressway	e	Local Conne	ctor
Secondary Hwy		Local Road	
Ramp		4WD	
Interstate	Route	US Route	State Route

SALAMANCA, NY 2019

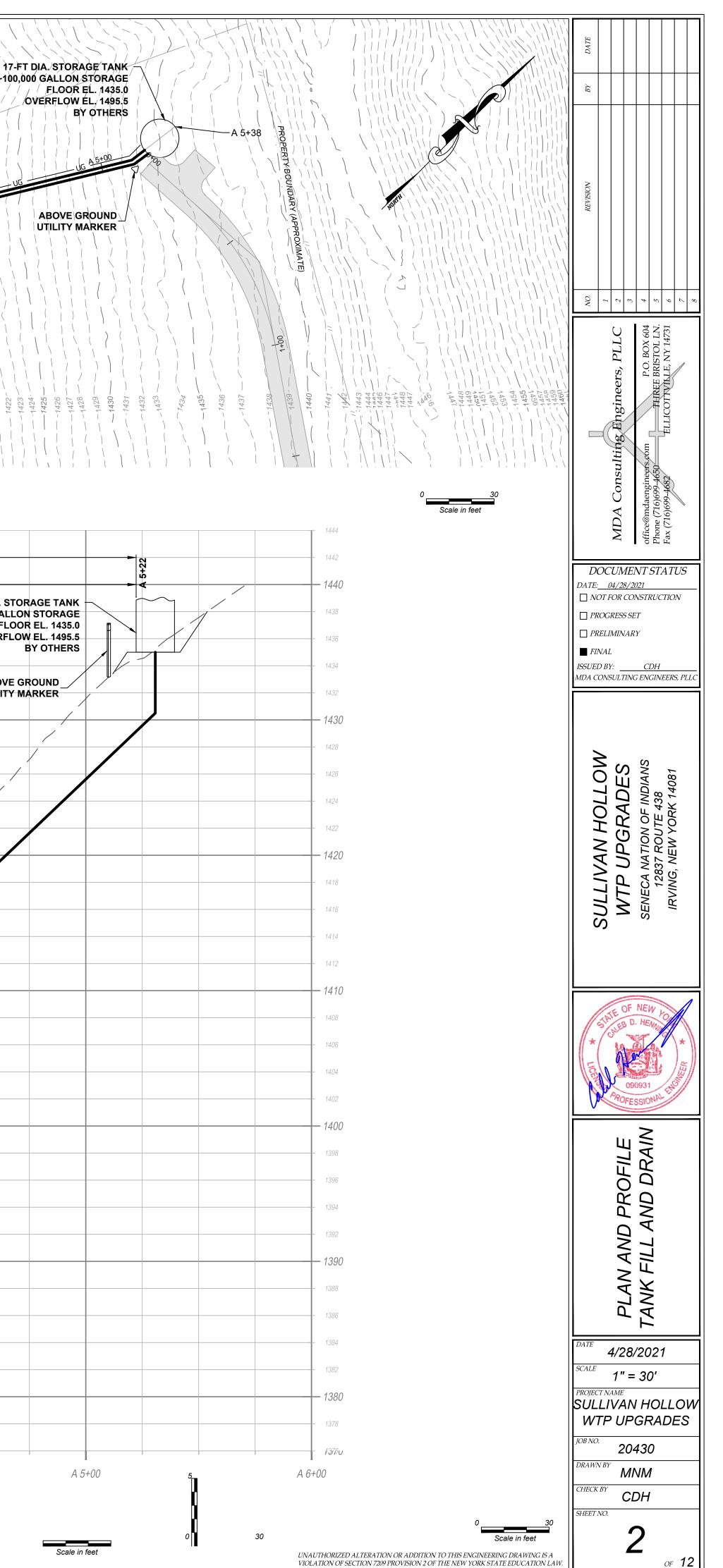


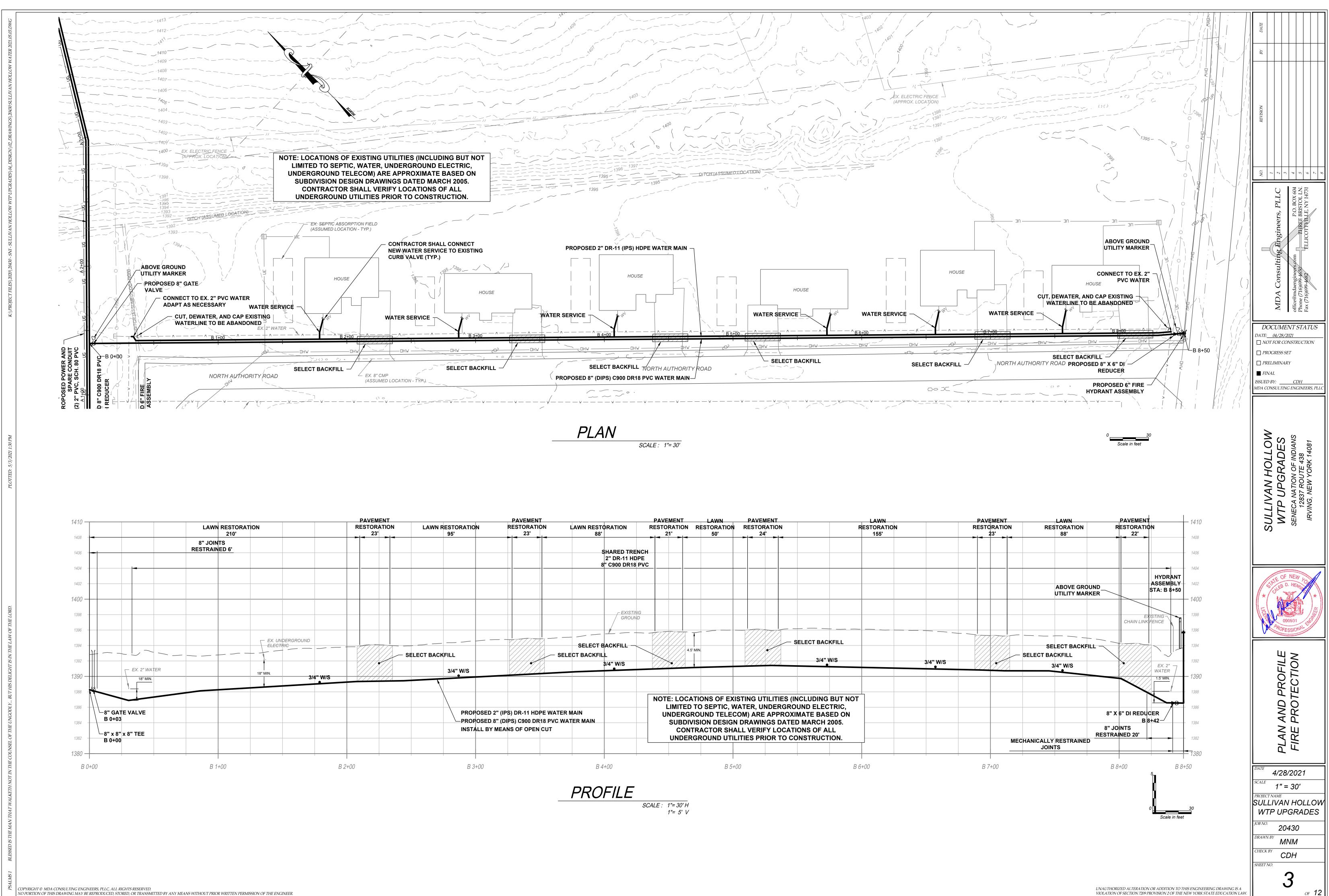


CONNECT TO EX. WELL PIPE SEE DETAIL THIS SHEET (IPS) HDPE (FINISHED WATER FILL LINE) DR18 PVC (BOOSTER PUMP SUCTION LINE)		POSED 2" DR-11 (IP\$) HDPE			
PPOSED 8" C900 DR18 PVC x 6" DI REDUCER PPOSED 6" FIRE RANT ASSEMBLY WATER CONNECT TI ADAPT AS N WATER RANT ASSEMBLY	A2+00 UG UG ABOVE GROUND UTILITY MARKER	A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3+00 A3	$ \begin{array}{c} 1404 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2802 \\ 2$		
	F	SCALE : 1"= 30' IELD RESTORATION 441'			
		STEPPED TRENCH 2" DR-11 HDPE			
		8" C900 DR18 PVC _ECTRICAL CONDUIT		PROPOSED 1 ~1	17-FT DIA. \$ 100,000 GA FI OVERF
					ABOV
Image: Sector	ABOVE GROUND ELECT				
ND	4.5' MIN.				
8" JOINTS RESTRAINED 19' 8" x 8" x 8" x 8" TEE 3" JOINTS RESTRAINED OM TEE TO HYDRANT " JOINTS STRAINED 6' -11 HDPE WATER MAIN 900 DR18 PVC WATER MAIN OPEN CUT	900 DR18 PVC WATER MAIN				
A 1+00 A 2+0		A 3+00 ROFILE		A 4+00	

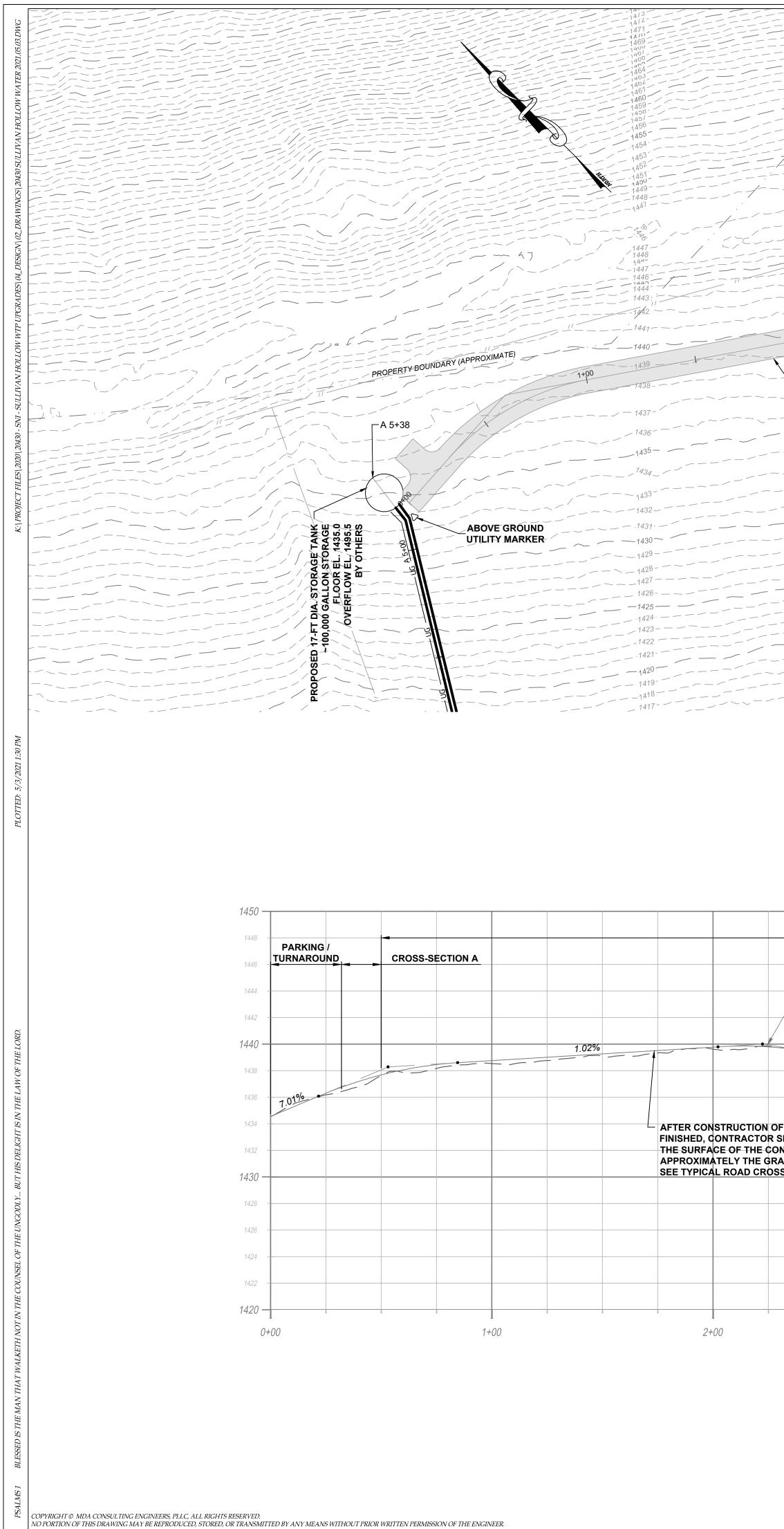
SCALE : 1"= 30' H

1"= 5' V





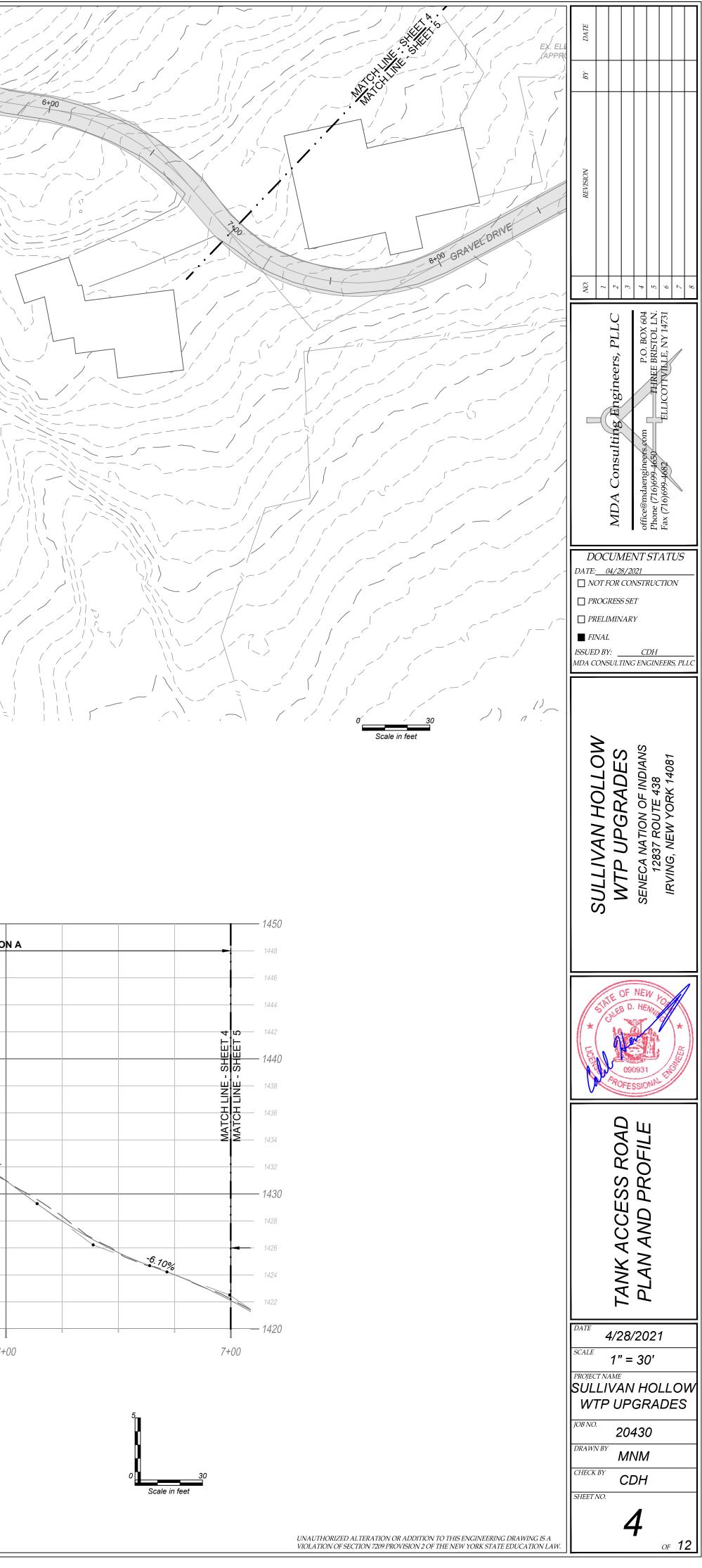
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		SHARED TRI 2" DR-11 HI						
		8" C900 DR18						
		EXISTI 						
		SELECT BACKFILL -	4.5	T MIN.	SE	LECT BACKFILL		
3/4" W/S	SEI	ECT BACKFILL 3/4" W/S				3/4" W/S		3/4
					STING UTILITIES (INC			
	2" (IPS) DR-11 HDPE WATER 3" (DIPS) C900 DR18 PVC W		LIMITED	TO SEPTIC, W ROUND TELEC	ATER, UNDERGROU OM) ARE APPROXIM	ND ELECTRIC, IATE BASED ON		
	MEANS OF OPEN CUT		CON	TRACTOR SHA	I DRAWINGS DATED ALL VERIFY LOCATIC ITIES PRIOR TO COM	INS OF ALL		
B 3+00		B 4+00		B 5+0	00	B 6+	00	

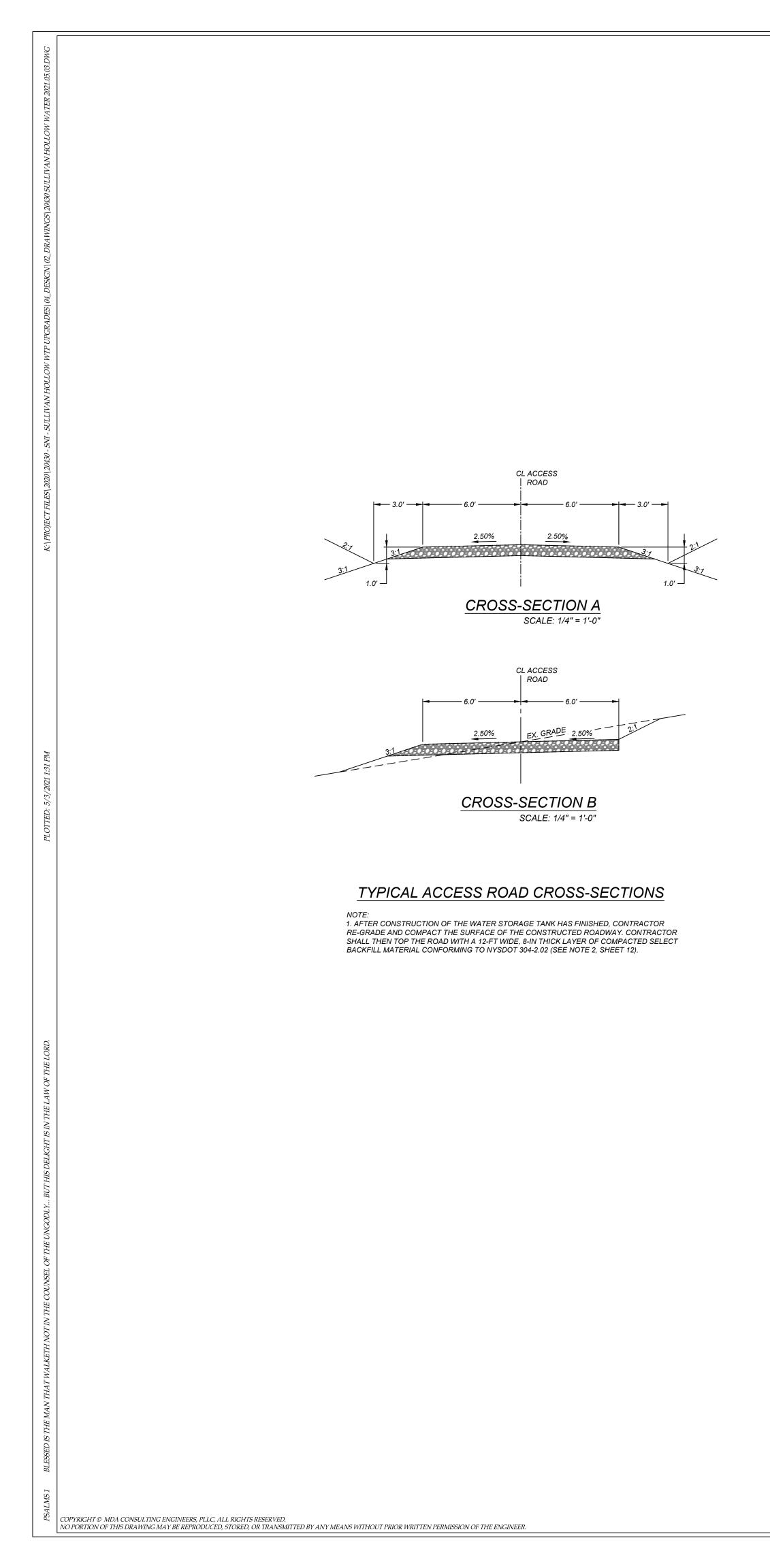


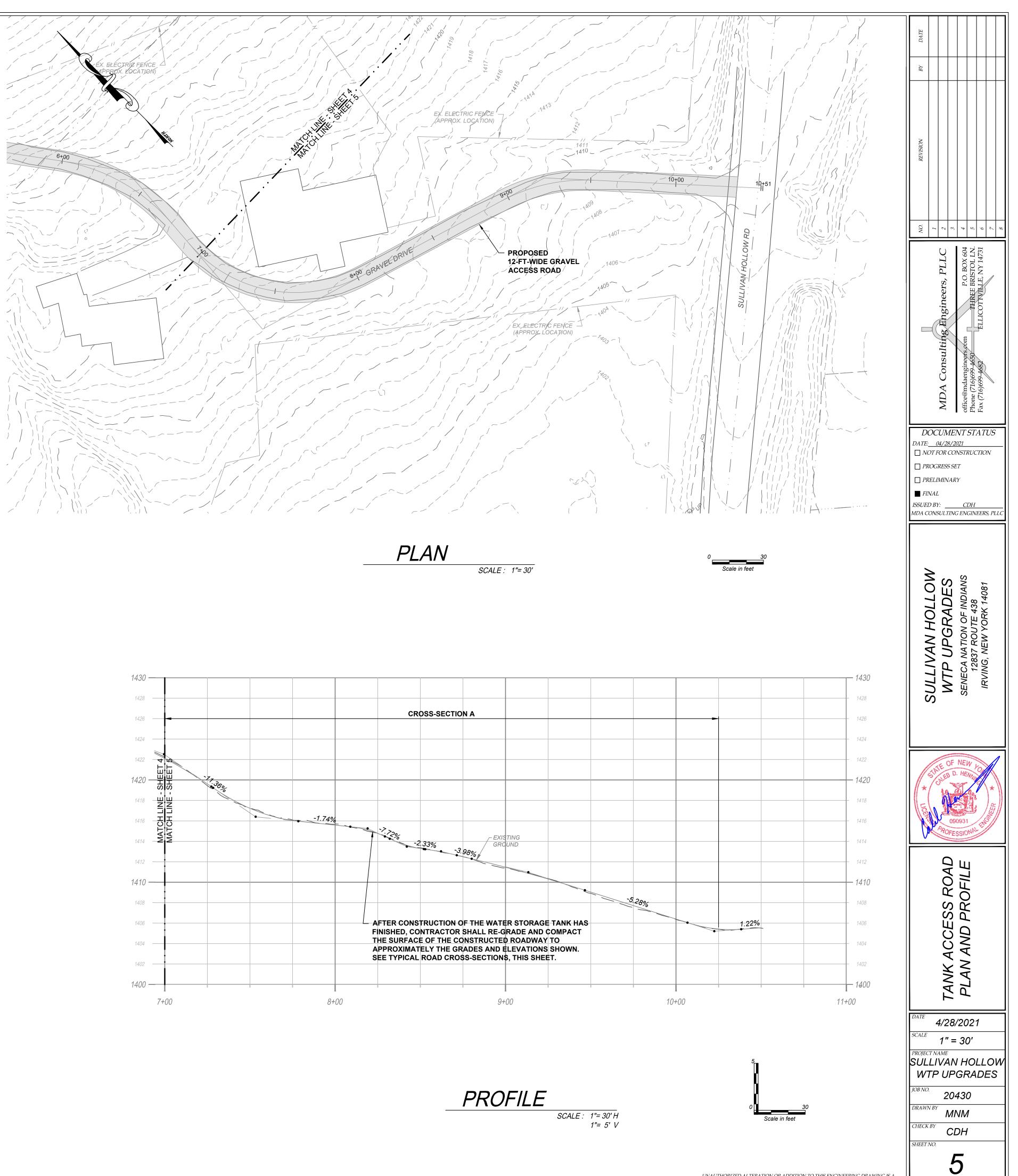
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SCALE : 1"= 30'		

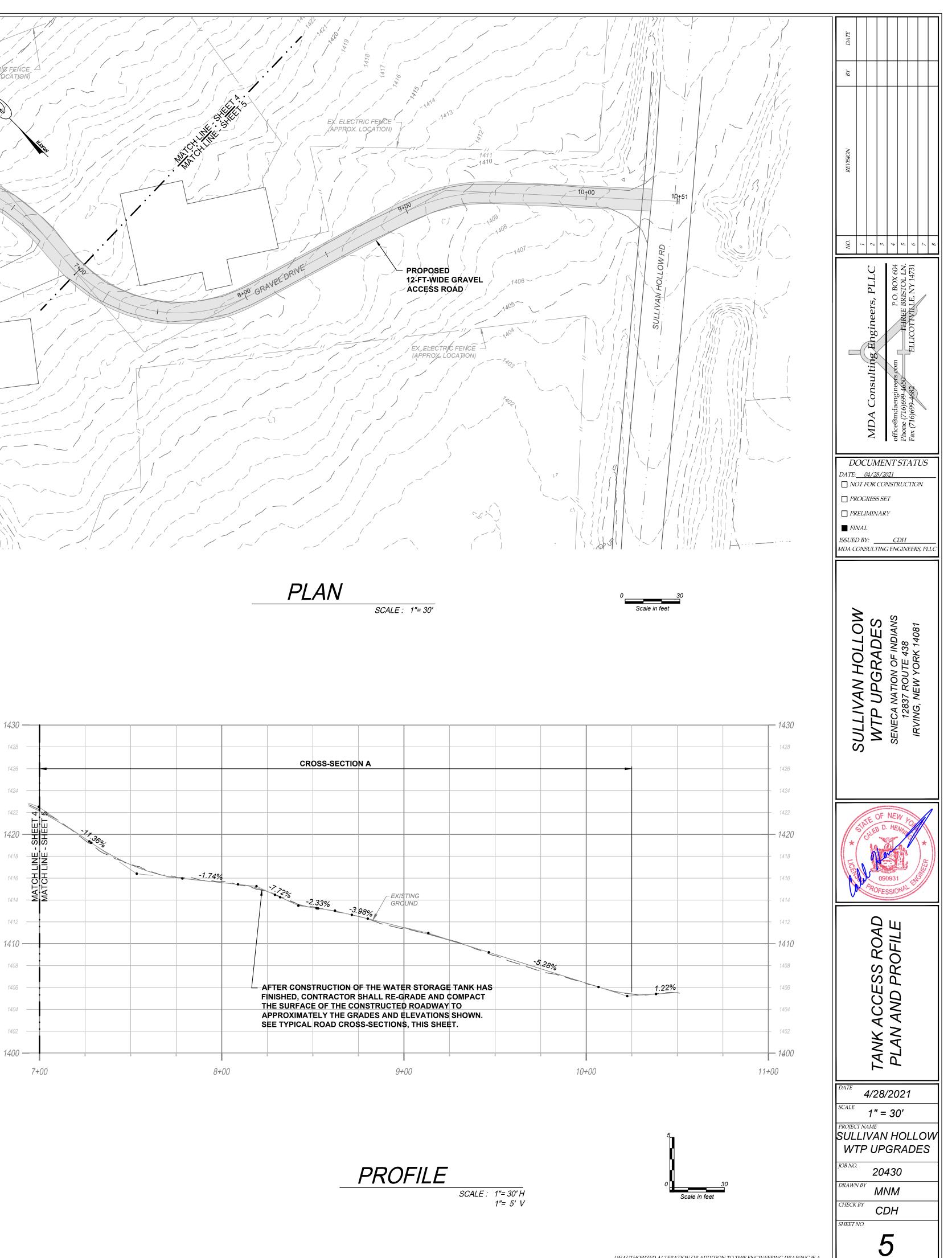
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PROFILE SCALE : 1"= 30' H 1"= 5' V



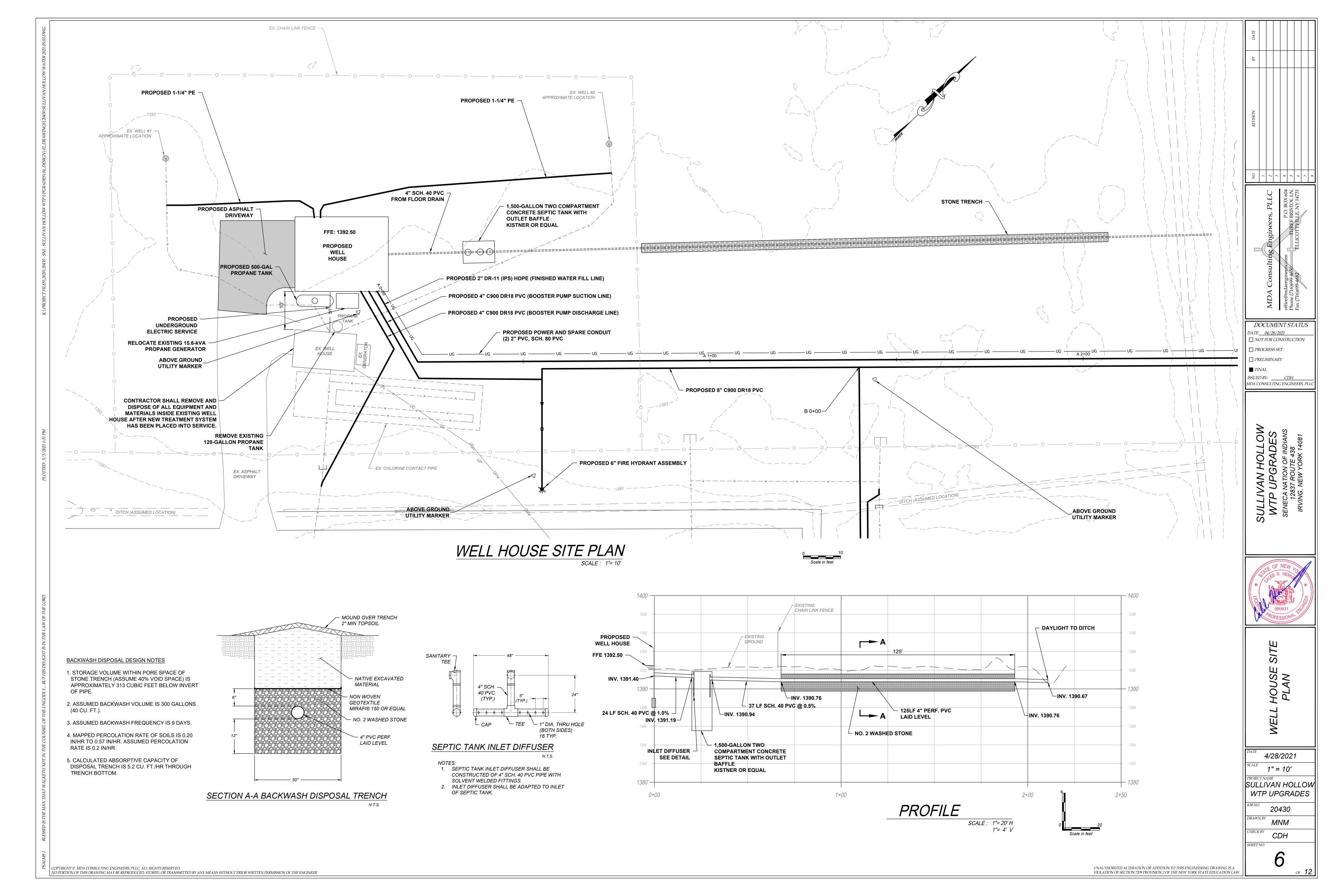


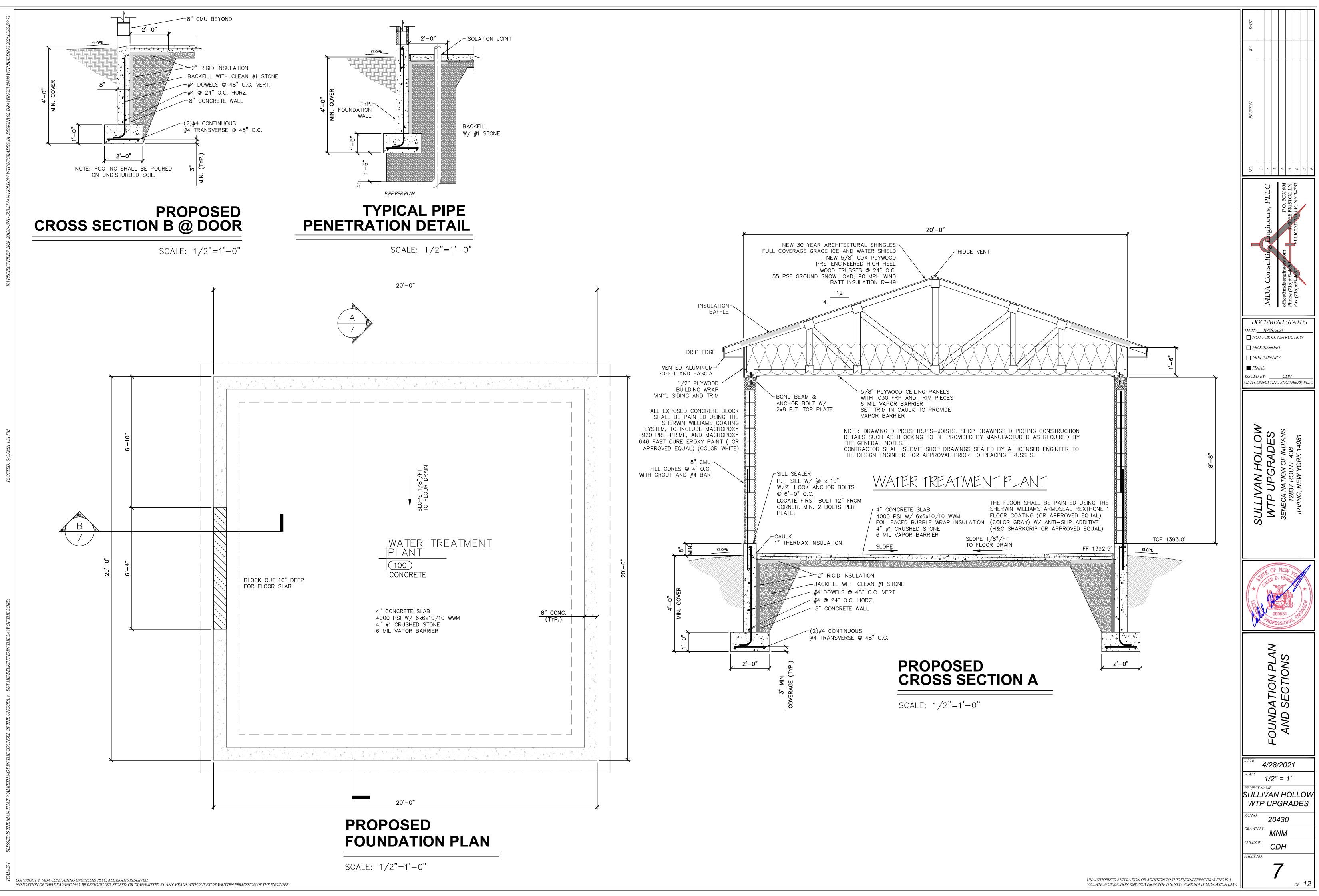


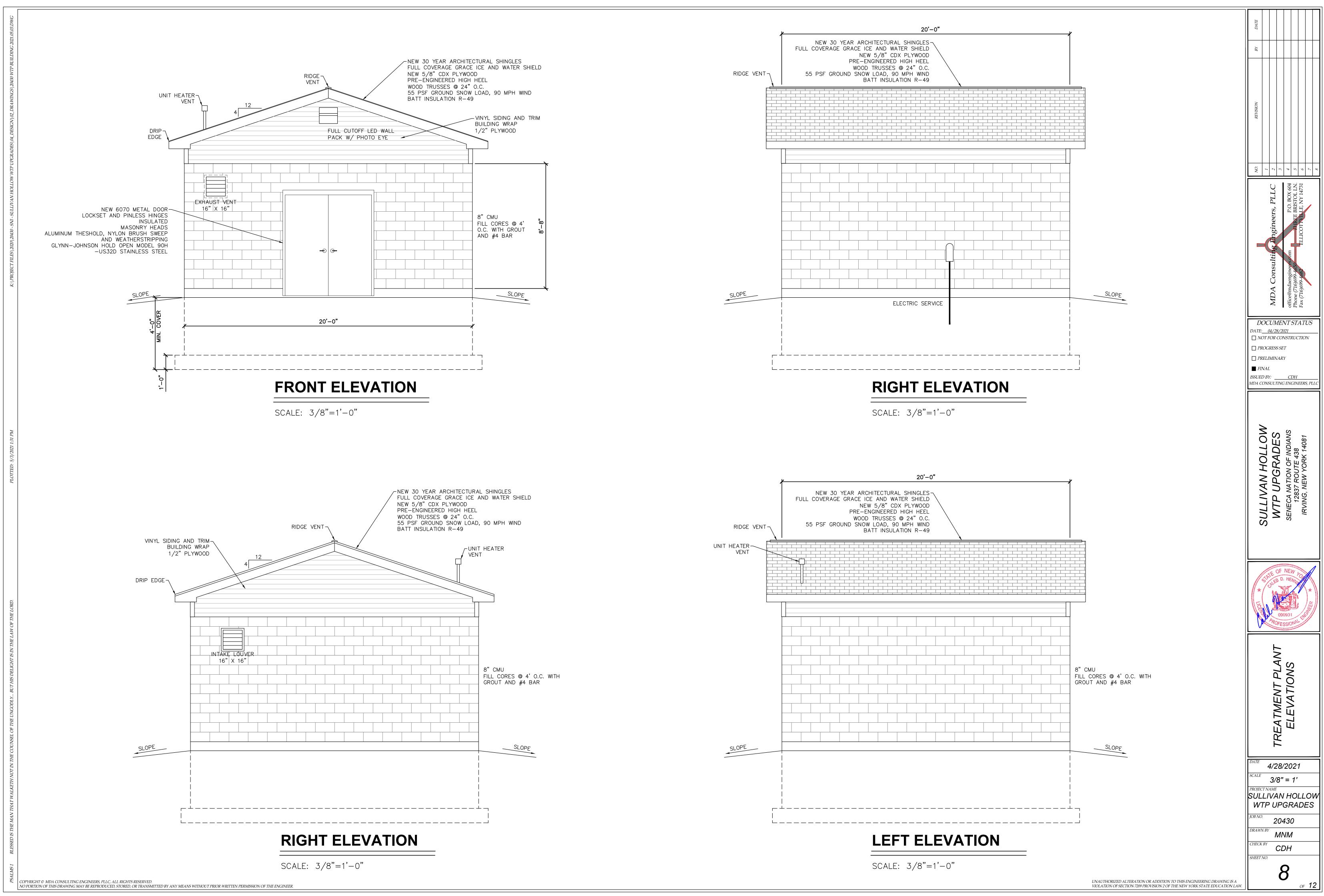


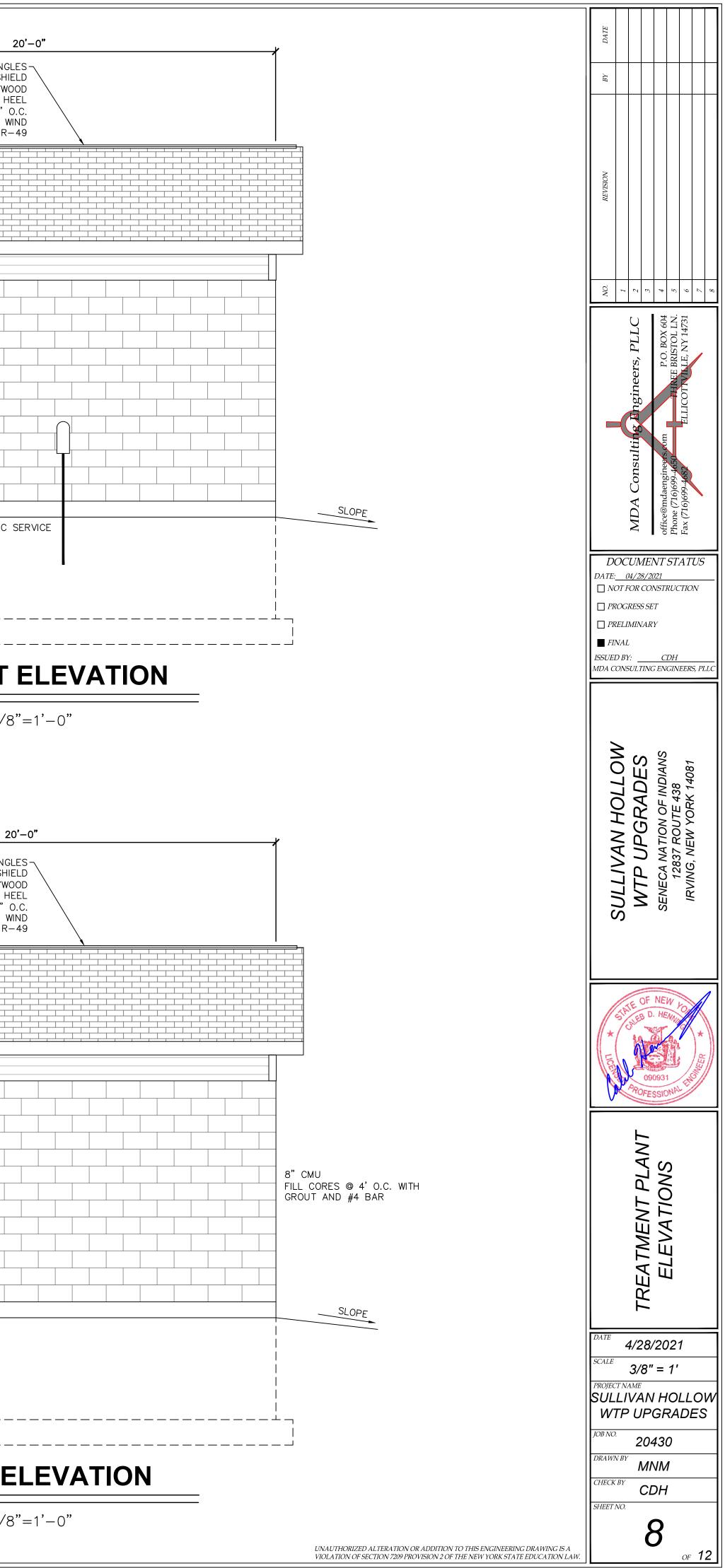
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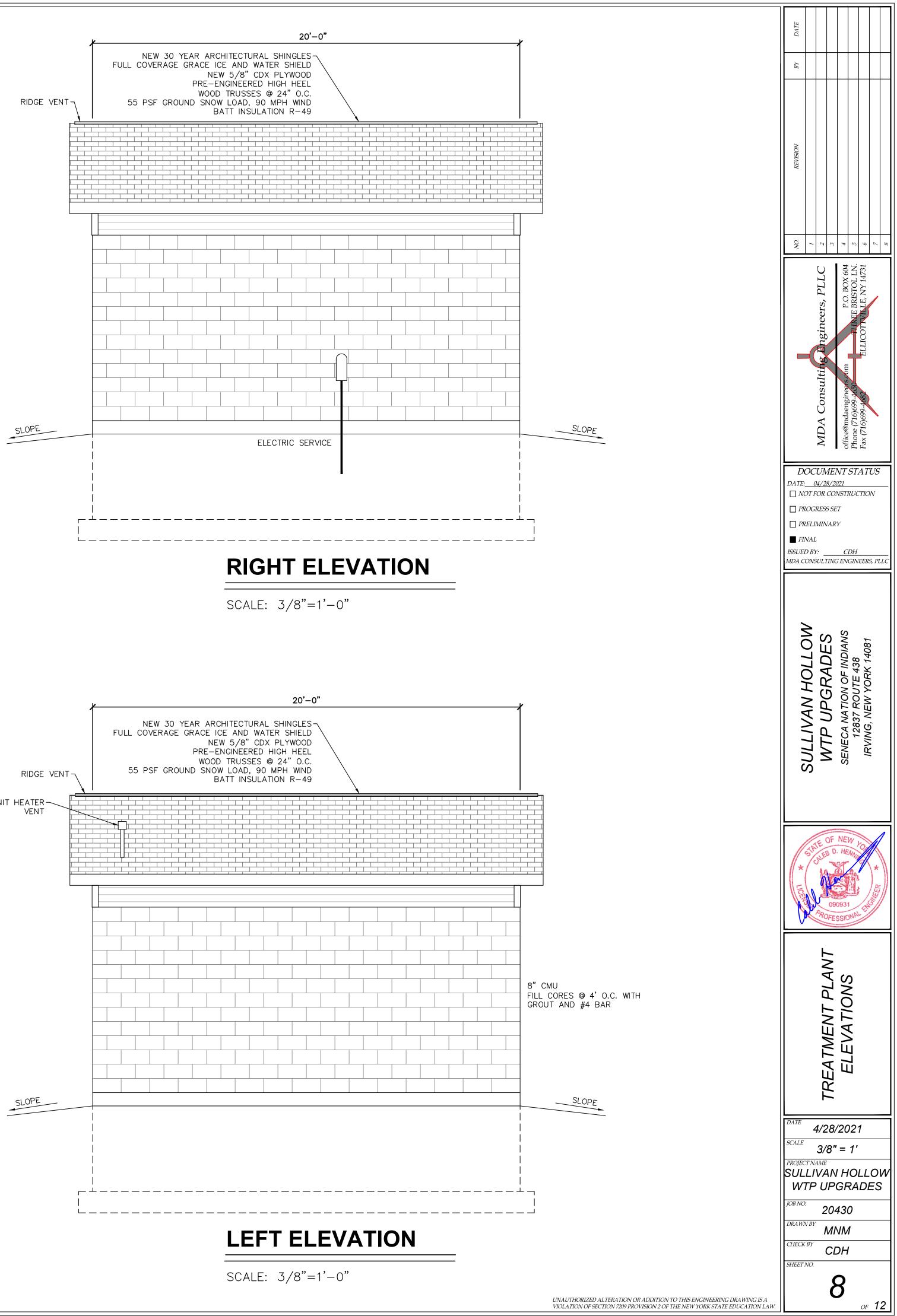
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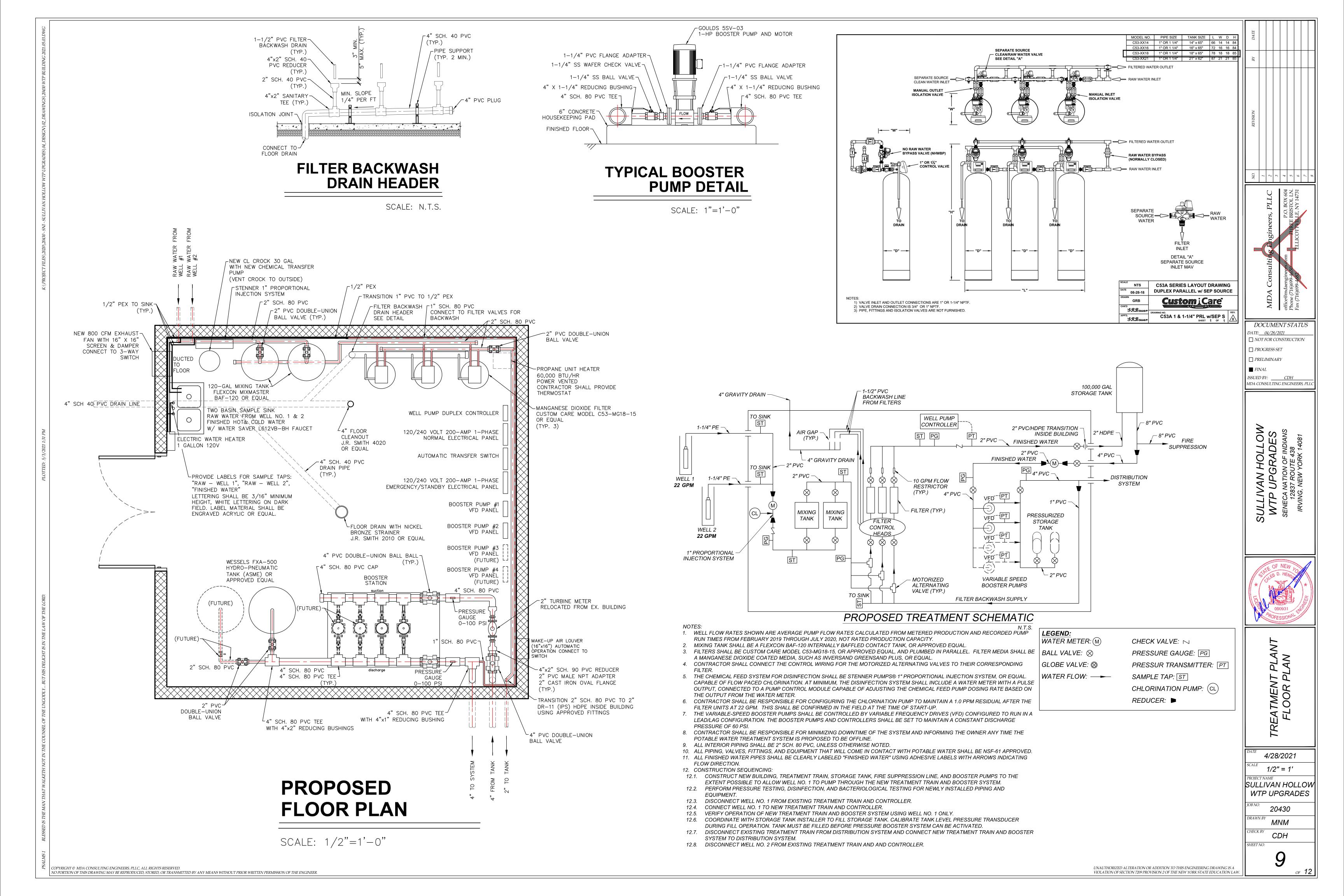












1.1.	THE WELL PUMPS ARE INTEN TREATMENT TRAIN, AND INTO				
1.2.	LINE. THE WELL PUMPS SHALL BE C	CONTROLLED BY A TANK LEV			CIR
1.3. 1.3.1.	THE 2-INCH FILL LINE INSIDE 1 MATERIALS THE WELL PLIMP CONTRO		E-PHASE DUPLEX ALTERNAT		1
1.3.1.	PANEL CAPABLE OF OPER		EVEL PRESSURE TRANSDUC		5
1.3.1	1.1.NEMA 4X RATED END1.2.MINIMUM ONE OUTPU	LOSURE JT FOR ALARM BEACON			7
1.3.1 1.3.1		TANK LEVEL PRESSURE TRA	ANSDUCER. TANK LEVELS AB		11
1.3.1	(TANK OVERFLOW).	TCH FOR EACH PUMP	FROM 42.5 FEET (TANK FLOOI	R) 10 103 FEET	13
1.3.1 1.3.2	1.6. AUTOMATIC PUMP AL				15
1.3.2	MANUFACTURER'S R		NTROL PANEL SHALL BE CO		19
			UMPS, BASED ON INPUT FRO THE 2-INCH FILL LINE INSIDE		21
1.3.2	2.2. THE PRESSURE TRAN REFLECT THE ACTUA	L TANK LEVELS WHILE ONE	BE CALIBRATED AT INSTALL (1) WELL PUMP IS RUNNING.	THE PRESSURE	
	WELL PUMP IS RUNN	NG AND THE TANK IS HALF-	LEVEL SHALL BE RECORDED FULL AND WHILE THE WELL F		
1.3.2			H NO PUMPS RUNNING AND C	CORRELATED TO	
2. ВО	OSTER PUMP CONTROLS	S WHEN THE TANK IS HALF-	FOLL AND FOLL.		
2.1.	THE BOOSTER PUMPS ARE IN			IRE OF 60 PSI	
2.2.	AT VARYING FLOWRATES UP THE BOOSTER PUMPS SHALL	BE GOULDS® 5SV-03, OR EG		O MEET THE	
2.2.1. 2.2.2.		FEET			
	TDH: 40 TO 85 FEET				
2.3.	THE BOOSTER PUMP CONTRO SIZED TO BE COMPATIBLE WI	TH THE BOOSTER PUMPS.	AQUAVAR IPC, OR EQUAL, A	ND SHALL BE	
2.3.1. 2.3.2. 2.4.		E PER PUMP		STER DI IMDS	
<i>2.</i> 4.	BASED ON INPUT FROM PRES BOOSTER PUMPS.				
. TAN	K POWER SERVICE				
3.1.	CONTRACTOR SHALL PROVID				
3.2.	100,000-GALLON STORAGE TA CONDUIT SHALL BE A SPARE. CONTRACTOR SHALL PROVID				
3.3.	FOR FUTURE USE. CONDUCTO				
J.J.			K SITE AND TERMINATED WIT		
3.4.	FUTURE POWER SERVICE SH 50-AMP SAFETY DISCONNECT SPARE CONDUIT SHALL BE IN FEET OF EXCESS PULL STRIN EXISTING UTILITY POLE	ALL BE STUBBED UP AT TAN SWITCH, NEMA 3R ENCLOS STALLED WITH NYLON PULL	URE. STRING FOR FUTURE USE. A		
3.4.	FUTURE POWER SERVICE SH 50-AMP SAFETY DISCONNECT SPARE CONDUIT SHALL BE IN FEET OF EXCESS PULL STRIN	ALL BE STUBBED UP AT TAN SWITCH, NEMA 3R ENCLOS STALLED WITH NYLON PULL	URE. STRING FOR FUTURE USE. A ACH END.	A MINIMUM OF 30	
3.4.	FUTURE POWER SERVICE SH 50-AMP SAFETY DISCONNECT SPARE CONDUIT SHALL BE IN FEET OF EXCESS PULL STRIN	ALL BE STUBBED UP AT TAN SWITCH, NEMA 3R ENCLOS STALLED WITH NYLON PULL	URE. STRING FOR FUTURE USE. A		_
3.4.	FUTURE POWER SERVICE SH 50-AMP SAFETY DISCONNECT SPARE CONDUIT SHALL BE IN FEET OF EXCESS PULL STRIN	ALL BE STUBBED UP AT TAN SWITCH, NEMA 3R ENCLOS STALLED WITH NYLON PULL	URE. STRING FOR FUTURE USE. A ACH END.	A MINIMUM OF 30 EXISTING DISTRIBUTION PANEI	2" CONDUI
3.4.	FUTURE POWER SERVICE SH 50-AMP SAFETY DISCONNECT SPARE CONDUIT SHALL BE IN FEET OF EXCESS PULL STRIN	ALL BE STUBBED UP AT TAN SWITCH, NEMA 3R ENCLOS STALLED WITH NYLON PULL	URE. STRING FOR FUTURE USE. A ACH END. EXISTING ELECTRIC METER	A MINIMUM OF 30 EXISTING DISTRIBUTION PANEL	2" CONDUI
3.4.	EXISTING UTILITY POLE	ALL BE STUBBED UP AT TAN SWITCH, NEMA 3R ENCLOS STALLED WITH NYLON PULL G SHALL BE PROVIDED AT E	URE. STRING FOR FUTURE USE. A ACH END. EXISTING ELECTRIC METER	A MINIMUM OF 30 EXISTING DISTRIBUTION PANEL NEW 200 AMP BREAKER	2" CONDUI / 3/0 COP
3.4.	EXISTING UTILITY POLE	ALL BE STUBBED UP AT TAN SWITCH, NEMA 3R ENCLOS STALLED WITH NYLON PULL G SHALL BE PROVIDED AT E	URE. STRING FOR FUTURE USE. A ACH END. EXISTING ELECTRIC METER	A MINIMUM OF 30 EXISTING DISTRIBUTION PANEL NEW 200 AMP BREAKER	2" CONDUI / 3/0 COP
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3.4.	EXISTING UTILITY POLE	ALL BE STUBBED UP AT TAN SWITCH, NEMA 3R ENCLOS STALLED WITH NYLON PULL G SHALL BE PROVIDED AT E	URE. STRING FOR FUTURE USE. A ACH END. EXISTING ELECTRIC METER	A MINIMUM OF 30 EXISTING DISTRIBUTION PANEL NEW 200 AMP BREAKER	2" CONDUI / 3/0 COP
3.4.	EXISTING UTILITY POLE	ALL BE STUBBED UP AT TAN SWITCH, NEMA 3R ENCLOS STALLED WITH NYLON PULL G SHALL BE PROVIDED AT E	URE. STRING FOR FUTURE USE. A ACH END. EXISTING ELECTRIC METER	A MINIMUM OF 30 EXISTING DISTRIBUTION PANEL NEW 200 AMP BREAKER	2" CONDUI / 3/0 COP
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3.4.	EXISTING UTILITY POLE	ALL BE STUBBED UP AT TAN SWITCH, NEMA 3R ENCLOS STALLED WITH NYLON PULL G SHALL BE PROVIDED AT E	URE. STRING FOR FUTURE USE. A ACH END. EXISTING ELECTRIC METER	A MINIMUM OF 30 EXISTING DISTRIBUTION PANEL NEW 200 AMP BREAKER	2" CONDUI / 3/0 COPF
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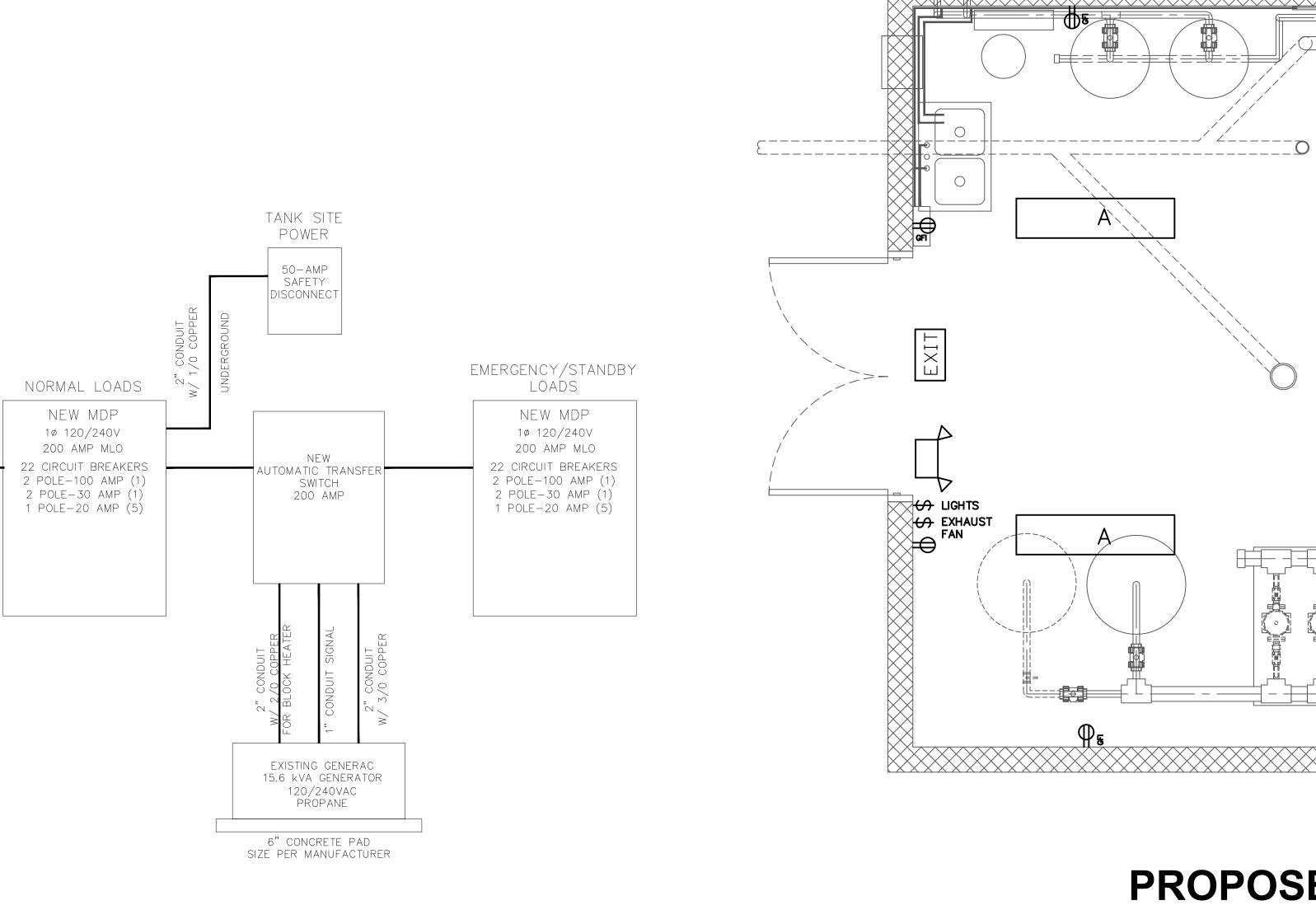
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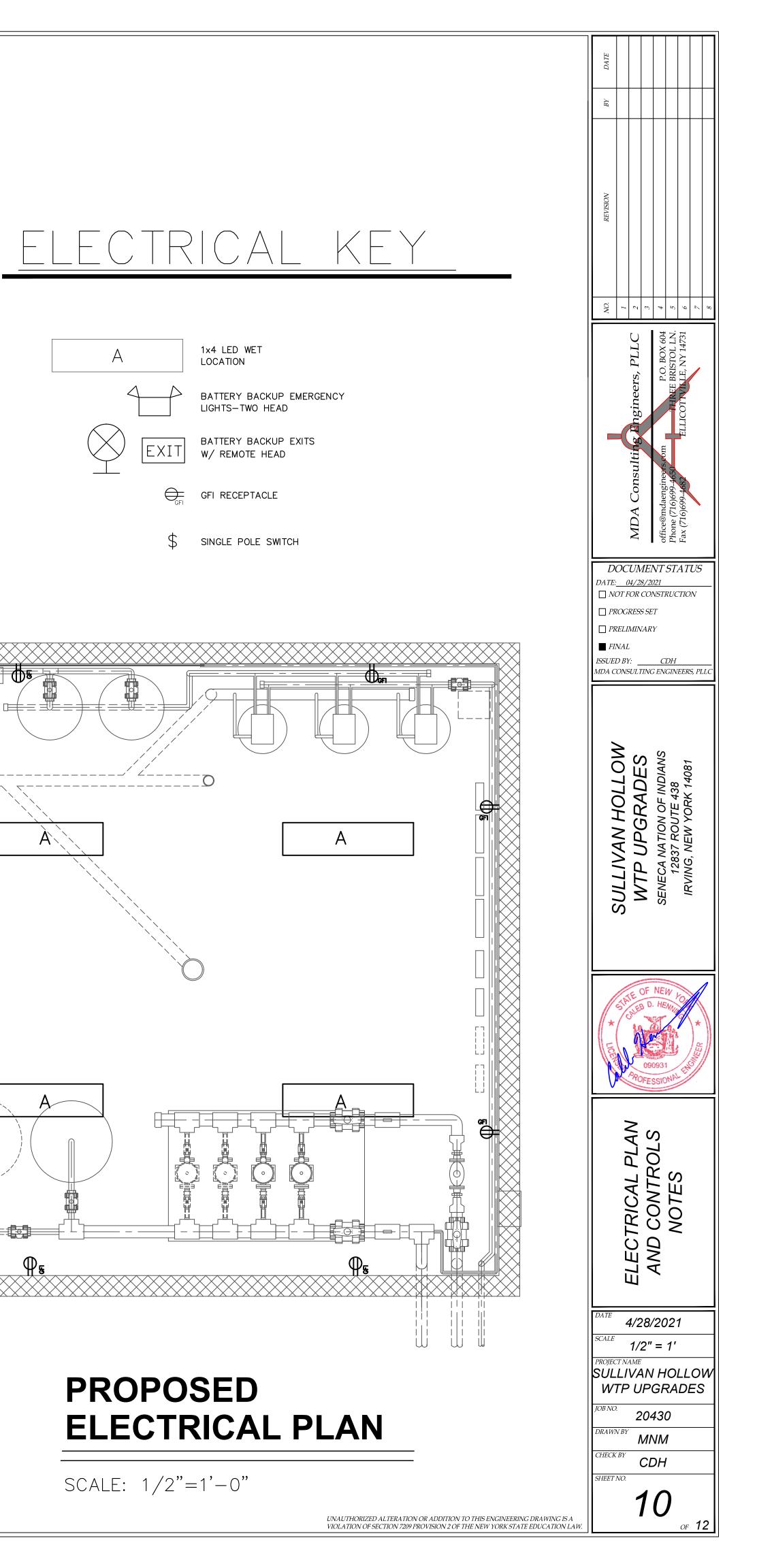
CIR DESCRIPTION 1 20 AMP WELL PUMP 3 20 AMP WELL PUMP 5 20 AMP LIGHTING 7 20 AMP RECEPTACL 9 11 13 15 17 19 21 23

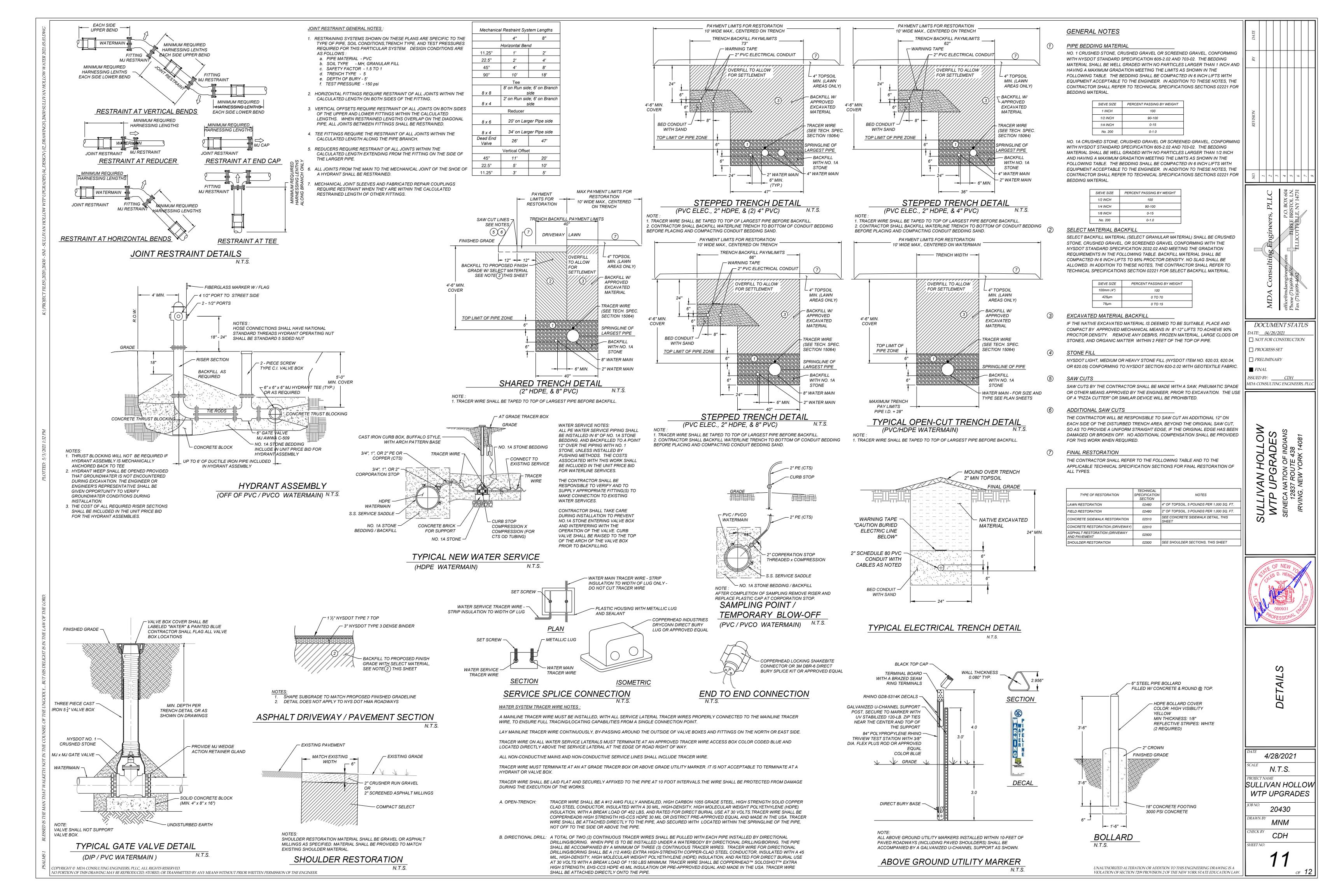
<u>one line diagram</u>

NORM	AL LOA	DS
IRCUIT	DIRECT	ORY
Ø 120/24	40V 100	AMP
	CIR	DESCRIPTION
P #1	2	50 AMP TANK POWER SVC
P #2	4	SUAME TANK FOWER SVC
	6	20 AMP WATER FILTERS
LES	8	
	10	
	12	
	14	
	16	
	18	
	20	
	22	
	24	

	EMERGENCY/S	TANDI	BY LOADS
	CIRCUIT D	IRECT	TORY
	1Ø 120/240	V 100	AMP
CIR	DESCRIPTION	CIR	DESCRIPTION
1	20 AMP PUMP #1	2	20 AMP PUMP #2
3	20 AMP PUMP #3 (FUTURE)	4	20 AMP PUMP #4 (FUTURE)
5	20 AMP LIGHTING, EXIT/ EMERGENCY	6	20 AMP PROPANE HEATER
7	20 AMP OUTSIDE LIGHTING	8	
9		10	
11		12	
13		14	
15		16	
17		18	
19		20	
21		22	
23		24	







	THEREOF ARE ON SITE, UNLESS OTHERWISE APPROVED BY THE ENGINEER. THE SUPERINTENDENT SHALL BE THE ENGINEERS AND OWNERS CONTACT PERSON IN THE FIELD, AND SHALL BE AVAILABLE 24 HOURS A DAY, 7 DAYS A WEEK, WHILE WORK IS BEING PERFORMED. THE SUPERINTENDENT SHALL BE RESPONSIBLE TO MAKE SURE THAT ALL WORK IS PERFORMED IN ACCORDANCE WITH THE CONTRACT	2e
	DOCUMENTS, AND ALL DIRECTION PROVIDED BY THE RESIDENT FIELD OBSERVER, ENGINEER, OR OWNER. THE SUPERINTENDENT SHALL BE RESPONSIBLE FOR THE SAFETY OF ITS WORKERS, AND THAT ALL WORK IS PERFORMED IN ACCORDANCE WITH ALL APPLICABLE OSHA REGULATIONS. THE SUPERINTENDENT	20.
	SHALL BE RESPONSIBLE FOR ANY AND ALL ACTIONS AS WELL AS THE CONDUCT OF ITS WORKERS, SUBCONTRACTORS, OR ANY OTHER REPRESENTATIVE THEREOF. THE ENGINEER AND OWNER SHALL RESERVE THE RIGHT TO HAVE ANY REPRESENTATIVE OF THE CONTRACTOR BARRED FROM PERFORMING	27.
-	ANY WORK ASSOCIATED WITH THIS CONTRACT, DUE TO INAPPROPRIATE BEHAVIOR AND/OR CONDUCT. THE SUPERINTENDENT SHALL BE REQUIRED TO ATTEND ALL PROGRESS MEETINGS. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR VERIFYING THE EXACT LOCATION OF ALL	28.
	EXISTING FACILITIES (BELOW & ABOVE GROUND). THE APPROXIMATE LOCATION OF EXISTING FACILITIES KNOWN TO THE ENGINEER AT THE TIME IN WHICH THE PLANS WERE ASSEMBLED HAVE BEEN DEPICTED ON THE DRAWINGS FOR THE SOLE PURPOSE OF MAKING THE CONTRACTOR AWARE OF THEIR EXISTENCE.	29.
	AND SHALL IN NO WAY BE CONSIDERED EXACT/ACCURATE. IT SHALL BE THE CONTRACTORS SOLE RESPONSIBILITY TO PERFORM ALL WORK NECESSARY AND REQUIRED TO BECOME AWARE OF THE EXACT TYPE AND LOCATION OF ALL FACILITIES WHICH MAY IMPACT THE WORK, AND TO PERFORM ALL WORK	
	NECESSARY AND REQUIRED TO REMEDY ANY CONFLICTS. NO SEPARATE OR ADDITIONAL PAYMENT WILL BE AWARDED FOR THIS WORK WHEN REQUIRED. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE SAFETY OF THE GENERAL PUBLIC, AND TO	
	PROTECT THEM FROM ITS OPERATIONS AND THE WORK BEING PERFORMED. THE CONTRACTOR SHALL UTILIZE ANY AND ALL APPROVED TRAFFIC AND CONSTRUCTION SAFETY DEVICES AS NECESSARY AND REQUIRED, AND AS MAY BE FURTHER REQUESTED BY THE ENGINEER, TO PERMIT THE UNINTERRUPTED	30.
	FLOW OF TRAFFIC THROUGHOUT THIS PROJECT, WHILE WORK IS BEING PERFORMED. THE AMOUNT OF OPEN EXCAVATION SHALL BE KEPT TO A MINIMUM, AND SHALL BE PLATED AND/OR FENCED WHENEVER LEFT UNATTENDED. ALL EQUIPMENT AND MATERIAL STOCK PILES SHALL BE FENCED OFF WHEN LEFT	31.
	UNATTENDED. ALL ROADS, SIDEWALKS, AND DRIVEWAYS SHALL BE KEPT CLEAN OF ANY DEBRIS, AND SHALL BE WETTED TO PREVENT DUST POLLUTION DURING DRY WEATHER. THE ENGINEER RESERVES THE RIGHT TO SUSPEND ALL WORK IF THE CONTRACTOR DOES NOT ADHERE TO THESE REQUIREMENTS,	
	AND/OR THE ENGINEER FEELS THAT THE PUBLIC IS IN DANGER DUE TO THE CONTRACTORS ACTIONS. THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN ALL VEHICULAR AND PEDESTRIAN TRAFFIC CONTROL FOR THE DURATION OF THE PROJECT, IN PARTICULAR, UNTIL ALL CONCRETE HAS PROPERLY CURED.	32.
	THE CONTRACTOR SHALL BE REQUIRED TO SUBMIT A MAINTENANCE AND PROTECTION OF TRAFFIC PLAN TO THE ENGINEER FOR APPROVAL. ALL M&PT DEVICES SHALL BE APPROVED DEVICES FROM THE NEW YORK MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (NYMUTCD).	
	THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE TO MAKE ALL ARRANGEMENTS NECESSARY AND REQUIRED FOR THE ESTABLISHMENT OF STAGING AND DISPOSAL AREAS. ALL PROPOSED DISPOSAL AREAS MUST BE APPROVED BY THE ENGINEER PRIOR TO USE BY THE CONTRACTOR. ALL STAGING AND DISPOSAL AREAS SHALL BE DESTORED TO THEIR ORIGINAL CONDITIONS OF AS OTHERWISE DIRECTOR PRIOR	33.
	DISPOSAL AREAS SHALL BE RESTORED TO THEIR ORIGINAL CONDITIONS, OR AS OTHERWISE DIRECTED BY THE ENGINEER, AND PRIOR TO RELEASE OF FINAL PAYMENT. NO DIRECT PAYMENT WILL BE MADE FOR THIS WORK. BURNING OF ANY WASTE MATERIAL WILL BE STRICTLY PROHIBITED. BURYING OF ANY WASTE MATERIAL	34.
	ON-SITE WILL BE STRICTLY PROHIBITED. THE CONTRACTOR SHALL PROTECT ALL EXISTING CULVERTS WHERE REQUIRED TO COMPLETE THE WORK. IN SOME CASES, THE CONTRACTOR MAY BE REQUIRED TO REMOVE AND REINSTALL EXISTING	35
	CULVERTS TO COMPLETE THE WORK. IN ALL CASES, THE CONTRACTOR SHALL BE REQUIRED TO PERFORM ALL WORK NECESSARY AND REQUIRED TO PROTECT AND/OR REPLACE EXISTING CULVERTS IN THE EVENT THAT THEY IMPACT THE WORK, OR ARE DAMAGED BY THE CONTRACTORS ACTIONS. NO. 1A	
	STONE SHALL BE PLACED UNDER ANY FULLY EXPOSED CULVERT TO PROPERLY SUPPORT IT DURING BACKFILL. NO ADDITIONAL COMPENSATION FOR THIS WORK WILL BE PROVIDED, UNLESS OTHERWISE NOTED ON THE DRAWINGS, OR AS DIRECTED BY THE ENGINEER.	37.
	ALL SURVEY WORK REQUIRED BY THE CONTRACTOR TO COMPLETE THE WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, AT THE CONTRACTORS EXPENSE. THE CONTRACTOR SHALL BE REQUIRED TO COMPLETE ALL WORK WITHIN THE HIGHWAY RIGHT OF WAY, OR WITHIN ANY EASEMENT	
	AREAS. THE CONTRACTOR SHALL BE REQUIRED TO LAYOUT EACH DAY'S WORK, AT LEAST ONE DAY IN ADVANCE, SUCH THAT IT CAN BE REVIEWED AND APPROVED BY THE RESIDENT FIELD OBSERVER PRIOR TO THE PERFORMANCE OF THE WORK. THIS WILL PROVIDE AN OPPORTUNITY TO DETECT ANY POSSIBLE	
	CONFLICTS WITH THE PROPOSED ALIGNMENT, AND TO REMEDY THEM PRIOR TO THE ADVANCEMENT OF THE INSTALLATION CREW. THE CONTRACTOR SHALL BE REQUIRED TO TAKE DIGITAL PHOTOS OF ALL WORK AREAS BEFORE, DURING,	
).	AND AFTER ALL WORK HAS BEEN COMPLETED. A DISK OR FLASH DRIVE OF SAID PHOTOS SHALL BE PROVIDED TO THE OWNER AND THE ENGINEER PRIOR TO RELEASE OF FINAL PAYMENT. THE CONTRACTOR SHALL TAKE CARE NOT TO DAMAGE ROADWAY SURFACES DURING CONSTRUCTION.	
1	THE CONTRACTOR SHALL BE REQUIRED TO REPAIR ANY ROADWAY SURFACES DAMAGED AS A RESULT OF THE CONTRACTOR'S ACTIVITIES, AS DIRECTED BY THE ENGINEER AND/OR OWNER, AT THE CONTRACTOR'S SOLE EXPENSE. THE CONTRACTOR SHALL CONSTRUCT AND MAINTAIN A STABILIZED CONSTRUCTION ENTRANCE	
1.	WHEREVER CONSTRUCTION EQUIPMENT WILL BE REGULARLY ENTERING A PUBLIC ROADWAY FROM A NON-PAVED AREA SUCH AS A STAGING AREA OR DISPOSAL AREA. THE PURPOSE OF THE STABILIZED CONSTRUCTION ENTRANCE IS TO PREVENT SEDIMENT AND DEBRIS FROM BEING DEPOSITED ON THE	
2.	PUBLIC ROADWAYS. ANY SIGNS THAT MUST BE DISTURBED AS A RESULT OF CONSTRUCTION ACTIVITIES SHALL BE CAREFULLY SET ASIDE DURING CONSTRUCTION AND REPLACED UPON THE COMPLETION OF CONSTRUCTION	
3.	ACTIVITIES. NO ADDITIONAL COMPENSATION SHALL BE PROVIDED FOR DAMAGED SIGNS REQUIRED TO BE REPLACED. WHERE POSSIBLE, THE CONTRACTOR SHALL AVOID DISTURBING MAILBOXES OR PRIVATE FENCING. IF IT	
	BECOMES NECESSARY TO REMOVE A MAILBOX OR PRIVATE FENCING DURING CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL CAREFULLY SET IT ASIDE AND REPLACE IT UPON THE COMPLETION OF CONSTRUCTION ACTIVITIES. ANY MAILBOX OR PRIVATE FENCING THAT IS DAMAGED AS A RESULT OF	
	CONSTRUCTION ACTIVITIES SHALL BE REPLACED TO THE SATISFACTION OF THE HOMEOWNER. NO ADDITIONAL COMPENSATION SHALL BE PROVIDED FOR MAILBOXES OR PRIVATE FENCING REQUIRED TO BE REPLACED.	
4. 5.	PIPE SHALL BE LAID AT A MINIMUM DEPTH OF COVER OF 5 FEET UNLESS NOTED OTHERWISE. CONTRACTOR SHALL REMOVE ALL TREES NOTED TO BE REMOVED ON THE PLANS AND DISPOSE OF OFF-SITE IN A MAN CONSISTENT WITH STANDARD PRACTICES. THE CONTRACTOR SHALL MARK ALL TREES PROPOSED FOR REMOVAL AND VERIFY WITH ENGINEER BEFORE REMOVAL BEGINS. CONTRACTOR SHALL	
	REMOVE TREE IN A PROFESSIONAL MANNER. CONTRACTOR SHALL TAKE CARE NOT TO DAMAGE LAWNS, SIDEWALKS, HOUSES, UTILITIES, ETC. DURING TREE REMOVAL. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE AS A RESULT OF THE CONTRACTOR'S ACTIONS IN REMOVING TREES AND CONTRACTOR	
	SHALL MAKE RESTITUTION AS DIRECTED BY THE ENGINEER AND/OR OWNER, AT THE CONTRACTOR'S SOLE EXPENSE. TREE REMOVAL SHALL NOT BE ALLOWED BETWEEN APRIL 1 AND OCTOBER 31 IN AN EFFORT TO PREVENT THE DESTRUCTION OF HABITAT FOR THE NORTHERN LONG EARED BAT.	
δ.	CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING TREES, SHRUBS, BUSHES, PLANTINGS, AND LANDSCAPING ALONG THE PROPOSED WATER MAIN ROUTE. THE CONTRACTOR SHALL LIMIT DISTURBANCES IN THE VICINITY OF LANDSCAPING NOTED TO BE PROTECTED ON THE PLANS. THE	
	CONTRACTOR SHALL BE REQUIRED TO REPLACE DISTURBED LANDSCAPING DAMAGED AS A RESULT OF CONSTRUCTION ACTIVITIES TO THE SATISFACTION OF THE ENGINEER, OWNER, AND PROPERTY OWNER. NO ADDITIONAL COMPENSATION SHALL BE PROVIDED FOR THE REPAIR OR REPLACEMENT OF DISTURBED	
7.	LANDSCAPING. CONTRACTOR SHALL PROVIDE CERTIFIED PERSONNEL AND PROPER EQUIPMENT FOR THE BUTT FUSION OF HDPE AND FITTINGS. THE CONTRACTOR SHALL FOLLOW THE LATEST BUTT FUSION JOINING	
	PROCEDURES AS PUBLISHED BY THE PLASTICS PIPE INSTITUTE (PPI) TR -33, ASTM F2620, OR THE PIPE MANUFACTURER. FUSION JOINTS SHALL BE MADE BY QUALIFIED FUSION TECHNICIANS PER PPI TN-42. A COPY OF THE PPI GENERIC BUTT FUSION JOINING PROCEDURE FOR FIELD JOINING OF POLYETHYLENE	
3.	PIPE (TR-33) CAN BE FOUND ONLINE AT WWW.PLASTICPIPE.ORG. CONTRACTOR SHALL PROVIDE CERTIFIED PERSONNEL AND PROPER EQUIPMENT FOR THE ELECTROFUSION OF HDPE PIPE AND FITTINGS. ELECTROFUSION JOINING SHALL BE DONE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDED PROCEDURE. OTHER SOURCES OF	
	ELECTROFUSION JOINING INFORMATION ARE ASTM F 1290 AND PPI TN 34. THE PROCESS OF ELECTROFUSION REQUIRES AN ELECTRIC SOURCE, A TRANSFORMER, COMMONLY CALLED AN ELECTROFUSION BOX THAT HAS WIRE LEADS, A METHOD TO READ ELECTRONICALLY (BY LASER)OR	
	OTHERWISE INPUT THE BARCODE OF THE FITTING, AND A FITTING THAT IS COMPATIBLE WITH THE TYPE OF ELECTROFUSION BOX USED. THE ELECTROFUSION BOX MUST BE CAPABLE OF READING AND STORING THE INPUT PARAMETERS AND THE FUSION RESULTS FOR LATER DOWNLOAD TO A RECORD FILE.	
	QUALIFICATION OF THE FUSION TECHNICIAN SHALL BE DEMONSTRATED BY EVIDENCE OF ELECTROFUSION TRAINING WITHIN THE PAST YEAR ON THE EQUIPMENT TO BE UTILIZED FOR THIS PROJECT. A COPY OF THE PPI TN-34 CAN BE FOUND ONLINE AT WWW.PLASTICPIPE.ORG.	
9.	CONTRACTOR SHALL CAP EXISTING WATER SERVICE TO HYDRANT WITH A MJ CAP OR PLUG AND RESTRAIN. PROPOSED FIRE HYDRANTS SHALL BE KEPT BAGGED UNTIL THEY ARE PUT INTO SERVICE. EXISTING FIRE HYDRANTS SHALL BE BAGGED ONCE TAKEN OUT OF SERVICE UNTIL THEY ARE PROPERLY	
Э.	REMOVED AND DISPOSED OF. THE CONTRACTOR SHALL BE REQUIRED TO REMOVE AND DISPOSE OF THE ENTIRE EXISTING CONCRETE SIDEWALK AND CURBING WHERE THE NEW CONCRETE SIDEWALK, CURBING, AND GUTTER ARE	
1.	PROPOSED. WHEREVER EXCAVATION IS REQUIRED IN EXISTING PAVEMENT, SIDEWALK, OR PAVED PARKING, THE CONTRACTOR SHALL BE REQUIRED TO SAW-CUT ALONG THE LIMITS OF THE PROPOSED EXCAVATION DEPOSE TO MARKING SAME TO PROVIDE TO PROVIDE A DEPOSE WITH WHICH TO PRO-	
	PRIOR TO MAKING SAID EXCAVATION IN ORDER TO PROVIDE A NEAT CLEAN EDGE WITH WHICH TO PLACE RESTORATION MATERIAL AGAINST. IN CASES WHERE THIS EDGE HAS BECOME DAMAGED DUE TO THE CONTRACTORS ACTIONS, THE CONTRACTOR WILL BE REQUIRED TO CUT THE EDGE BACK AGAIN, UNTIL A NEAT CLEAN EDGE IS PROVIDED. THE CONTRACTOR WILL BE REQUIRED TO PAY FOR ALL WORK	
2.	NEAT CLEAN EDGE IS PROVIDED. THE CONTRACTOR WILL BE REQUIRED TO PAY FOR ALL WORK NECESSARY AND REQUIRED BEYOND THE PAYMENT LIMITS SHOWN ON THE PLANS, UNLESS OTHERWISE APPROVED AND DIRECTED BY THE ENGINEER. ALL SEAMS BETWEEN EXISTING ASPHALT AND PROPOSED SHALL BE SEALED WITH AN APPROVED	
2. 3.	ASPHALTIC SEALER. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE TO MAKE SURE THAT AT LEAST FIVE (5) CONCRETE TEST CYLINDERS ARE TAKEN WITH EACH DAYS POUR.	
4.	THE CONTRACTOR SHALL NOTE THAT THEY ARE RESPONSIBLE FOR ANY DEWATERING NECESSARY OR REQUIRED TO PERFORM THE WORK. THE CONTRACTOR SHALL SUBMIT A DEWATERING PLAN TO THE ENGINEER FOR REVIEW PRIOR TO IMPLEMENTING IT. THE CONTRACTOR WILL NOT BE PERMITTED TO	
	PUMP DIRTY/MUDDY WATER INTO ANY OF THE STREAMS, AND MUST PERFORM ALL DEWATERING IN ACCORDANCE WITH THE SWPPP. WHEN REQUIRED, THE COST OF THIS WORK, TO INCLUDE ALL TOOLS, EQUIPMENT, LABOR, MATERIALS, POWER, AND ALL ELSE WHICH MAY BE NECESSARY OR REQUIRED, SHALL DEVINE DATE OF THIS DESCRIPTION.	
	BE INCLUDED IN THE VARIOUS UNIT PRICES BID FOR THIS PROJECT. NO SEPARATE OR ADDITIONAL PAYMENT WILL BE AWARDED FOR THIS WORK.	

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INTRACTOR SHALL TAKE NOTE OF ALL ENVIRONMENTAL CONTROLS AND CONDITIONS GOVERNING TO BE PERFORMED UNDER THIS CONTRACT. ALL DIRTY/MUDDY WATER MUST BE FILTERED BY DS APPROVED BY THE ENGINEER, AND ALL SUPER-CHLORINATED WATER USED FOR DISINFECTION E NEUTRALIZED BY METHODS APPROVED BY THE ENGINEER. THE ENGINEER RESERVES THE RIGHT PEND ALL WORK IF THE CONTRACTOR DOES NOT ADHERE TO THESE REQUIREMENTS. WORK PROCEED WHEN SNOW REMOVAL IS REQUIRED, THE CONTRACTOR SHALL BE NSIBLE FOR ANY AND ALL SNOW REMOVAL UNABLE TO BE PERFORMED BY LOCAL PERSONAL DUE

- CONTRACTORS ACTIVITIES. NO ADDITIONAL COMPENSATION WILL BE PROVIDED FOR THIS WORK REQUIRED ONG SIDE WATER SERVICES SHALL BE PUSHED OR DIRECTIONALLY DRILLED. OPEN-CUT ATION OF LONG SIDE SERVICES WILL BE PROHIBITED UNLESS OTHERWISE AUTHORIZED BY THE
- ACT LOCATION OF ALL EXISTING AND PROPOSED WATER SERVICES SHALL BE VERIFIED IN THE T THE TIME OF CONSTRUCTION BY THE CONTRACTOR. LOCATIONS AND ALIGNMENTS SHOWN ON ANS HAVE BEEN DONE SO FOR THE SOLE PURPOSE OF MAKING THE CONTRACTOR AWARE THAT A E IS REQUIRED, BUT IN NO WAY SHALL BE CONSIDERED EXACT/ACCURATE. INTRACTOR SHALL NOTE THAT SULLIVAN HOLLOW IS CURRENTLY SERVICED BY AN EXISTING RUTION SYSTEM IT IS THE INTENT OF THIS DESIGN THAT ANY REPLACEMENT PIPING BE RUCTED WITHOUT INTERRUPTION TO THE EXISTING SYSTEM (AND ASSOCIATED WATER MERS), EXCEPT FOR THOSE INTERRUPTIONS REQUIRED TO COMPLETE INTERCONNECTIONS. AS THE CONTRACTOR SHALL BE REQUIRED TO KEEP THE AFFECTED EXISTING PIPING OPERATIONAL HE NEW PIPING CAN BE PUT INTO SERVICE. AS SUCH, THE CONTRACTOR SHALL TAKE CARE TO T THE EXISTING PIPING WHILE CONSTRUCTING THE PROPOSED PIPING. IN THE EVENT THAT THE
- G PIPING IS DAMAGED DUE TO THE CONTRACTOR'S ACTIONS, THE CONTRACTOR SHALL BE ED TO MAKE ANY AND ALL NECESSARY AND REQUIRED REPAIRS TO THE EXISTING PIPING AT THE ACTOR'S EXPENSE INTRACTOR SHALL NOTE THAT TRACE WIRE, NOT TAPE, MUST BE INSTALLED WITH ALL PLASTIC O INCLUDE MAINLINE PIPE AND SERVICES. THE CONTRACTOR WILL NOT RECEIVE CREDIT FOR IT FOR ANY PLASTIC PIPING INSTALLED WITHOUT OPERATIONAL TRACER WIRE.
- NTRACTOR SHALL TAKE NOTE OF THE MAXIMUM PAYMENT LIMITS FOR ALL WORK. IN PARTICULAR STORATION AND SELECT BACKFILL WORK. THE CONTRACTOR WILL NOT RECEIVE COMPENSATION ORK PERFORMED OUTSIDE OF THESE MAXIMUM PAYMENT LIMITS, UNLESS OTHERWISE APPROVED ENGINEER. INTRACTOR SHALL BE REQUIRED TO PROVIDE ALL WATER REQUIRED FOR COMPLETION OF THE THE CONTRACTOR SHALL NOTE THAT THE VILLAGE SHALL MAINTAIN THE RIGHT TO CHARGE FOR
- USED FOR FLUSHING AND DISINFECTION, OR ANY OTHER CONSTRUCTION OPERATIONS. IN THE THAT THE CONTRACTOR OBTAINS WATER FROM THE OWNER THE CONTRACTOR SHALL MAKE THE PRIATE ARRANGEMENTS WITH THE OWNER FOR USE OF ITS WATER. THE CONTRACTOR WILL NOT E ANY ADDITIONAL COMPENSATION FOR COSTS ASSOCIATED WITH THE OBTAINMENT OF WATER ED FOR COMPLETION OF THE PROPOSED WORK.
- INTRACTOR SHALL PROVIDE AT LEAST 48 HOURS ADVANCED NOTICE TO THE ENGINEER, THE , AND ANY AFFECTED WATER CUSTOMERS (VIA A WRITTEN FLYER) PRIOR TO ANY SHUT DOWN OF TER MAIN OR ANY SYSTEM INTERRUPTION MPORARY SHUT-DOWNS AND SERVICE INTERUPTIONS SHALL BE LIMITED TO A MAXIMUM DURATION
- DURS. THE WATER MAIN ALONG BOWEN ROAD SERVES AS A CONDUIT FOR THE MAIN SOURCE OF SUPPLY TO THE WATER SYSTEM. CARE SHALL BE TAKEN TO ENSURE THE WATER MAIN CAN CT WATER FROM THE RESERVOIR ROAD SOURCE TO THE WATER SYSTEM AND THAT NO DEAD RE CREATED AS A RESULT OF THE PROPOSED WORK ACTOR SHALL INSTALL AND MAINTAIN BEST MANAGEMENT PRACTICES PER THE NYS STANDARDS & CATIONS FOR EROSION AND SEDIMENT CONTROL "BLUE BOOK".
- ACTOR IS SOLELY RESPONSIBLE FOR THE IMPLEMENTATION AND MAINTENANCE OF ALL EROSION EDIMENT CONTROL PRACTICES NECESSARY AND REQUIRED DURING CONSTRUCTION.NO NT-LADEN RUNOFF WILL BE ALLOWED TO LEAVE THE SITE DURING CONSTRUCTION. ACTOR SHALL INSTALL SILT FENCE FILTER OUTLETS AT LOW POINTS ALONG THE PERIMETER OF T FENCE TO FILTER OUT SEDIMENT AND GIVE THE RUNOFF AN OUTLET.

TESTING & DISINFECTION NOTES PART 1 - GENERAL

1.01 WORK SPECIFIED

- A. TESTING AND DISINFECTION OF ALL PRESSURE PIPING SYSTEMS. TO INCLUDE THOSE CONSTRUCTED OF DUCTILE IRON. PIPE (DIP), POLYVINYL CHLORIDE (PVC) PIPE, MOLECULARLY ORIENTED POLYVINYL CHLORIDE (PVCO) PIPE, AND HIGH DENSITY POLYETHYLENE (PE) PIPE 1. THE CONTRACTOR SHALL FURNISH ALL SUPERVISION, COORDINATION, LABOR, EQUIPMENT, TEST CONNECTIONS,
- VENTS, WATER AND MATERIALS NECESSARY FOR CARRYING OUT THE PRESSURE AND LEAKAGE TESTS AS SPECIFIED AND REQUIRED. 2. THE WORK SPECIFIED SHALL INCLUDE ALL LABOR, MATERIAL, EQUIPMENT, SERVICES AND INCIDENTALS NECESSARY TO FILL, CLEAN, CHLORINATE, FLUSH, AND TEST ALL PIPELINES WHICH WILL CARRY OR HOLD POTABLE WATER.
- 1.02 RELATED WORK SPECIFIED ELSEWHERE
- A SECTION 15062 DUCTILE IRON PIPE FITTINGS AND ACCESSORIES SECTION 15064 HIGH DENSITY POLYETHYLENE (HDPE) PIPE 4 IN THROUGH 63 IN
- C. SECTION 15110, VALVES, HYDRANTS AND APPURTENANCES 1.03 COORDINATION
- A PERMISSION SHALL BE OBTAINED FROM THE OWNER OF THE WATER SYSTEM BEFORE THE USE OF WATER FROM ANY EXISTING SYSTEM. THE CONTRACTOR SHALL CONFORM TO THE REQUIREMENTS OF THE OWNER.
- PAY ALL COSTS CONNECTED WITH THE TAKING OR USE OF WATER FOR ANY TESTING OR RETESTING GIVE NOTICE AT LEAST 24 HOURS BEFORE THE USE OF WATER FOR ANY REASON.
- B ALL WORK UNDER THIS SECTION SHALL BE PERFORMED IN THE PRESENCE OF THE ENGINEER, A REPRESENTATIVE OF THE PUBLIC HEALTH AUTHORITY HAVING JURISDICTION MUST ALSO BE PRESENT. JE REQUIRED CHI ORINATION SHALL BE SCHEDULED SUCH THAT SAMPLING AND FLUSHING WILL BE PERFORM BUSINESS HOURS

1.04 REFERENCE STANDARDS A. AWWA B300, STANDARD FOR HYPOCHLORITES

- AWWA B301, STANDARD FOR LIQUID CHLORINE AWWA C104, CEMENT-MORTAR LINING FOR DUCTILE IRON PIPE AND FITTINGS FOR WATER AWWA C301, PRESTRESSED CONCRETE PRESSURE PIPE, STEEL-CYLINDER TYPE FOR WATER AND OTHER LIQUIDS AWWA C502, STANDARD FOR DRY-BARREL FIRE HYDRANTS
- AWWA C504, STANDARD FOR RUBBER SEATED BUTTERFLY VALVES 3. AWWA C600, STANDARD FOR INSTALLATION OF DUCTILE IRON WATERMAINS AND THEIR CONSTRUCTION
- H. AWWA C651, STANDARD FOR DISINFECTING WATER MAINS AWWA C900 POLYVINYL CHLORIDE (PVC) PRESSURE PIPE, 4-INCH THROUGH 12-INCH FOR WATER DISTRIBUTION
- STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, LATEST EDITION 1996 SAFE DRINKING WATER ACT K. AWWA C605-94, UNDERGROUND INSTALLATION OF POLYVINYL CHLORIDE (PVC) PRESSURE PIPE AND FITTINGS FOR WATER
- AWWA M23, MANUAL OF WATER SUPPLY PRACTICES, PVC PIPE DESIGN AND INSTALLATION M. ASTM F2164, STANDARD PRACTICE FOR FIELD LEAK TESTING OF POLYETHYLENE (PE) PRESSURE PIPING SYSTEMS
- USING HYDROSTATIC PRESSURE N. ANSI/AWWA C906-99, POLYETHYLENE (PE) PRESSURE PIPE AND FITTINGS, 4 IN. THROUGH 63 IN FOR WATER
- DISTRIBUTION. ANSI/AWWA C901-02, POLYETHYLENE (PE) PRESSURE PIPE AND TUBING, ½ IN. THROUGH 3 IN. FOR WATER SERVICE
- P. ASTM F2164, STANDARD PRACTICE FOR FIELD LEAK TESTING OF POLYETHYLENE (PE) PIPING SYSTEMS USING HYDROSTATIC PRESSURE
- AWWA MANUAL M23, PVC PIPE DESIGN AND INSTALLATION AWWA MANUAL M55. PE PIPE - DESIGN AND INSTALLATION S. AWWA C652, DISINFECTION OF WATER-STORAGE FACILITIES

1.05 SUBMITTALS

- A. THE CONTRACTOR SHALL SUBMIT PROPOSED MATERIALS, METHODS, AND OPERATIONS REGARDING TESTING AND DISINFECTION TO THE ENGINEER FOR REVIEW PRIOR TO THE START OF TESTING. B. CONTRACTOR MUST PROVIDE A SKETCH TO THE ENGINEER OF THE SAMPLING LOCATIONS IDENTIFYING AT MINIMUM THE FOLLOWING: STREET NAMES
- NORTH ARROW SAMPLING LOCATIONS (STATION NUMBER
- HOUSE NUMBERS OF NEAREST BUILDINGS TO SAMPLING LOCATIONS. OTHER DISTINGUISHABLE LANDMARKS.
- ANY OTHER INFORMATION AS REQUESTED BY ENGINEER. OWNER, OR COUNTY HEALTH DEPARTMENT. QUALIFICATIONS OF LABORATORY ANALYZING BIOLOGICAL SAMPLES SHALL BE NEW YORK STATE ELAP CERTIFIED CHAIN-OF-CUSTODY FORMS ARE TO BE FURNISHED FOR ALL BIOLOGICAL SAMPLES TAKEN.
- THE CONTRACTOR SHALL SUBMIT CERTIFICATION THAT ALL BACKFLOW PREVENTERS (REDUCED PRESSURE ZONE ATTACHMENTS) AND PRESSURE GAUGES HAVE BEEN TESTED AND CERTIFIED WITHIN THE LAST YEAR.

PART 2 - PRODUCTS

- 2.01 MATERIALS
- A. ALL MATERIALS MUST BE SUITABLE FOR USE IN A POTABLE WATER SYSTEM AND NSF-60 CERTIFIED. ALL PIPING, VALVES, ETC SHALL BE NSF-61 CERTIFIED. B. CHLORINATION SHALL BE BY THE USE OF A SOLUTION OF WATER AND LIQUID CHLORINE, CALCIUM HYPOCHLORITE, OR SODIUM HYPOCHLORITE AND THE SOLUTION SHALL BE CONTAINED IN THE PIPE OR STRUCTURE AS SPECIFIED.

PART 3 - EXECUTION 3.01 GENERAL

- A. FLUSH, TEST AND DISINFECT PRIOR TO CONNECTION TO EXISTING WATERMAINS AS SPECIFIED BELOW, EXCEPT AS OTHERWISE AUTHORIZED BY THE ENGINEER. ALL TESTS SHALL BE CONDUCTED IN THE PRESENCE OF THE ENGINEER
- NOTIFY THE ENGINEER 72 HOURS IN ADVANCE OF TESTING D. THE LENGTH OF PIPING AND SECTIONS INCLUDED IN THE TESTS SHALL MEET THE APPROVAL OF THE ENGINEER;
- HOWEVER, THE LENGTH SHALL NOT EXCEED 2,000 FEET IN ANY CASE. PRESSURE TEST OF PIPE SECTION SHALL BE FROM VALVE TO VALVE REGARDLESS OF WATERMAIN SIZE. THE CONTRACTOR SHALL HAVE SUFFICIENT PERSONNEL AT THE SITE FOR THE ENTIRE DURATION OF ALL TESTS.
- WHEN PIPING IS TO BE INSULATED OR CONCEALED IN A STRUCTURE, TESTS SHALL BE MADE BEFORE THE PIPE IS G. WHERE CONNECTIONS TO EXISTING LINES ARE CALLED FOR, ONLY ONE SUCH CONNECTION WILL BE ALLOWED.
- I. WHEN TESTING ABSORBENT PIPE MATERIALS SUCH AS CEMENT OR CONCRETE, THE PIPELINE SHALL BE FILLED WITH WATER AT LEAST 24 HOURS BEFORE THE TEST IS MADE.
- TESTING AND DISINFECTION RESULTS SHALL BE ACCEPTED BY THE HEALTH DEPARTMENT FOR THE INSTALLED SECTION OF PIPING. BEFORE ANOTHER CONNECTION IS MADE.
- THE CONTRACTOR MUST SUPPLY ALL MATERIALS AND MANPOWER TO PERFORM THE TESTS AS SPECIFIED HEREIN. K. THE CONTRACTOR SHALL BE REQUIRED TO SUBMIT TO THE ENGINEER A PLAN FOR FLUSHING, TESTING AND DISINFECTING DURING THE SHOP DRAWING SUBMITTAL PROCESS.

3.02 TESTS ON PRESSURE PIPING FOR POTABLE WATER

- A. GENERAL (DIP, PVC / PVCO PIPE, AND HDPE/PE PIPE) EQUIPMENT IN OR ATTACHED TO THE PIPES BEING TESTED SHALL BE PROTECTED. ANY DAMAGE TO SUCH EQUIPMENT DURING THE TEST SHALL BE REPAIRED BY THE CONTRACTOR AT HIS EXPENSE.
- PROVIDE OUTLETS TO FLUSH LINE, EXPEL AIR, AND TO PERFORM SPECIFIED TESTS. ALL FITTINGS, HYDRANTS AND APPURTENANCES MUST BE PROPERLY BRACED AND HARNESSED BEFORE THE PRESSURE IS APPLIED. THRUST BLOCKING AND MECHANICAL RESTRAINING DEVICES WHICH WILL BECOME A PART OF THE SYSTEM MUST ALSO BE TESTED AT THE TEST PRESSURE.

4. IF THE OWNER IS ALSO THE OWNER AND OPERATOR OF THE WATER SUPPLY USED FOR FLUSHING, TESTING AND DISINFECTION THEN THE OWNER SHALL BE RESPONSIBLE FOR WATER COSTS DURING THE INITIAL TESTING AND DISINFECTION OF THE WATERLINE, SHOULD FURTHER TESTING AND DISINFECTION BE REQUIRED TO PASS HEALTH DEPARTMENT STANDARDS. THE OWNER RESERVES THE RIGHT TO CHARGE THE CONTRACTOR FOR ADDITIONAL WATER USE

- B. INITIAL FLUSHING (DIP, PVC/PVCO PIPE, AND HDPE/PE PIPE) THE CONTRACTOR SHALL FILL AND FLUSH NEW MAIN TO REMOVE DIRT AND MISCELLANEOUS DEBRIS FROM THE INSIDE OF THE WATERMAIN
 - THE CONTRACTOR IS RESPONSIBLE FOR REMOVING ALL ENTRAPPED AIR DURING FLUSHING. LINES SHOULD BE FILLED SLOWLY WITH A MAXIMUM VELOCITY OF 2 FPS (FEET PER SECOND), PREFERABLY AT 1 FPS, WHILE
- VENTING ALL AIR. TAPS SHALL BE MADE IF NECESSARY AT THE POINT OF HIGHEST ELEVATION, AND AFTER THE COMPLETION OF THE TEST, THE TAPS SHALL BE TIGHTLY PLUGGED, UNLESS OTHERWISE DIRECTED
- FLUSHING MUST HAVE SUFFICIENT FLOW RATE TO ACHIEVE A FLUID VELOCITY OF 2.5 FPS. A MINIMUM 2" TAP IS REQUIRED FOR PROPER FLUSHING OF ALL WATERMAINS HAVING A DIAMETER OF 8 INCHES
- OR LESS, HOWEVER, MULTIPLE TAPS OR LARGER TAPS MAY BE REQUIRED. REFER TO AWWA C651, FOR NUMBER OF TAPS REQUIRED TO OBTAIN THE MINIMUM 2.5 FEET PER SECOND FLOW
- VELOCITY IN PIPES LARGER THAN 8 INCHES IN DIAMETER. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A WATER SOURCE FOR FLUSHING. WITH THE PERMISSION OF THE WATER SUPPLIER, EXISTING WATERMAINS MAY BE USED AS A WATER SOURCE, HOWEVER, THE FOLLOWING RESTRICTIONS APPLY:
- a. THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING AN APPROVED BACKFLOW PREVENTION DEVICE , SUCH AS A REDUCED-PRESSURE ZONE (RPZ) DEVICE. TO THE EXISTING WATER SUPPLY, PRIOR TO FLUSHING, THE RPZ MUST BE TESTED WITHIN ONE (1) YEAR AND APPROVED PRIOR TO USAGE b. THE CONTRACTOR IS NOT ALLOWED TO OPERATE ANY VALVES OR HYDRANTS OR OPERATE ANY COMPONENTS WHICH BELONG TO THE WATER SUPPLIER.
- WATER FROM FLUSHING PROCEDURES MUST BE DISPOSED OF PROPERLY. WATER MAY BE PIPED OR GRAVITY-FED TO AN EXISTING STORM SEWER WITH THE PERMISSION OF THE OWNER AND ENGINEER IF PROPER EROSION CONTROL METHODS TO MINIMIZE SEDIMENT BUILD-UP ARE USED. DISCHARGE OF WATER INTO A ROADWAY IS STRICTLY PROHIBITED. WATER DISCHARGING OPERATIONS SHALL NOT CAUSE DAMAGE TO ANY PUBLIC OR PRIVATE PROPERTY.
- THE CONTRACTOR SHALL PARTIALLY OPEN AND CLOSE VALVES AND HYDRANTS SEVERAL TIMES UNDER EXPECTED LINE PRESSURE TO FLUSH FOREIGN MATERIAL OUT OF THE VALVES AND HYDRANTS 8. FLUSHING SHALL CONTINUE UNTIL THREE PIPE VOLUMES HAVE PASSED THROUGH THE NEW WATERLINE AND THE WATER APPEARS SEDIMENT-FREE
- 3.02B POLYVINYL CHLORIDE (PVC) / MOLECULARLY ORIENTED POLYVINYL CHLORIDE (PVCO) PIPE
- A. HYDROSTATIC TESTING THE FOLLOWING PROCEDURE IS BASED ON THE ASSUMPTION THAT THE PRESSURE AND LEAKAGE TESTS WILL BE PERFORMED AT THE SAME TIME
- TESTING OF PVC/PVCO PIPE PRESSURE SYSTEMS SHALL CONFORM TO ALL AWWA C605-94 SPECIFICATIONS, LATEST EDITION.
- 3. THE TEST METHODS DESCRIBED IN THIS SECTION ARE SPECIFIC FOR WATER-PRESSURE TESTING. THESE METHODS SHOULD NOT BE APPLIED FOR AIR-PRESSURE TESTING TESTS SHALL BE MADE ONLY AFTER COMPLETION OF BACKFILL, AND AT LEAST 36 HOURS AFTER THE LAST
- CONCRETE THRUST OR REACTION BLOCKING HAS BEEN CAST WITH HIGH EARLY STRENGTH CONCRETE OR AT LEAST SEVEN (7) DAYS AFTER THE LAST CONCRETE THRUST OR REACTION BLOCKING HAS BEEN CAST WITH STANDARD CONCRETE.
- ALONG THE TEST SECTION. THE TEST PRESSURE SHALL NOT EXCEED PIPE OR THRUST-RESTRAINT DESIGN PRESSURES.
- TEST PRESSURE SHALL BE HELD ON THE PIPING FOR A PERIOD OF AT LEAST 2 HOURS, UNLESS A LONGER PERIOD IS REQUESTED BY THE ENGINEER. PRESSURE SHOULD NOT FLUCTUATE BY MORE THAN 5 PSI DURING TESTING. AFTER THE PIPE HAS BEEN LAID ALL NEWLY LAID PIPE OR ANY VALVED SECTION THEREOF SHALL BE SUBJECTED. TO A HYDROSTATIC PRESSURE OF AT LEAST 1.5 TIMES THE WORKING PRESSURE AT THE POINT OF THE TEST, OR
- 150 PSI, WHICHEVER IS GREATER. THE SYSTEM SHOULD BE ALLOWED TO STABILIZE AT THE TEST PRESSURE BEFORE CONDUCTING THE HYDROSTATIC TEST PRESSURE GAUGE MUST BE IN GOOD WORKING CONDITION AND MUST BE DEMONSTRATED TO BE ACCURATE TO
- THE ENGINEER PRIOR TO ANY TESTING. GAUGE MUST HAVE PROPER LABELING TO ALLOW ENGINEER TO ACCURATELY DISTINGUISH THE CHANGE IN PRESSURE. GAUGE MUST HAVE MARKINGS AT NO GREATER THAN 2 PSI INCREMENTS TO ALLOW ACCURATE
- READINGS 11. ENGINEER MAY TAP PRESSURE GAUGE AT EACH READING TO ENSURE NEEDLE IS MEASURING PRESSURE
- ACCURATELY. 12. ENGINEER SHALL RECORD PRESSURE AT 15 OR 30 MINUTE INTERVALS TO HELP DETERMINE IF THE PRESSURE LOSS IS STABILIZING
- THE CONTRACTOR WILL INFORM THE ENGINEER WHEN TO BEGIN THE TEST. THE PIPELINE SHALL BE SLOWLY FILLED WITH WATER AND THE SPECIFIED TEST PRESSURE, MEASURED AT THE PUMP, SHALL BE APPLIED BY MEANS OF A PUMP CONNECTED TO THE PIPE IN A MANNER SATISFACTORY TO THE ENGINEER. THE PUMP, PIPE CONNECTION, GAUGES, DAMPERS, AND ALL NECESSARY CONNECTIONS AND APPARATUS SHALL BE FURNISHED BY THE CONTRACTOR.
- ANY EXPOSED PIPE, FITTINGS, VALVES, HYDRANTS, AND JOINTS SHALL BE CAREFULLY EXAMINED DURING THE TESTING. ANY DAMAGE OR DEFECTIVE PIPE, FITTINGS, VALVES, HYDRANTS, OR JOINTS THAT ARE DISCOVERED FOLLOWING THE PRESSURE TEST SHALL BE REPAIRED OR REPLACED, AND THE TEST SHALL BE REPEATED UNTIL SATISFACTORY RESULTS ARE OBTAINED. WHEN HYDRANTS ARE IN THE TEST SECTION, THE TEST SHALL BE MADE AGAINST THE MAIN VALVE IN THE
- HYDRANT THE TESTING ALLOWANCE SHALL BE DEFINED AS THE QUANTITY OF MAKEUP WATER THAT MUST BE SUPPLIED INTO THE NEWLY LAID PIPE OR ANY VALVED SECTION THEREOF TO MAINTAIN PRESSURE WITHIN 5 PSI OF THE
- SPECIFIED TEST PRESSURE AFTER THE PIPE HAS BEEN FILLED WITH WATER AND THE AIR HAS BEEN EXPELLED. TESTING ALLOWANCE SHALL NOT BE MEASURED BY A DROP IN PRESSURE IN A TEST SECTION OVER A PERIOD OF 18. NO PIPE INSTALLATION WILL BE ACCEPTED UNLESS THE LEAKAGE IS LESS THAN THE NUMBER OF GALLONS PER
- REFERENCE TO TABLE 3, REPRINTED HEREIN. *THESE FORMULAS ARE BASED ON AN ALLOWABLE LEAKAGE OF 10.5 GPD/MI/IN. OF NOMINAL DIAMETER AT A 3.03 DISINFECTION (DIP, PVC/PVCO PIPE, PE/HDPE PIPE)

PRESSURE OF 150 PSI L = (ND (P)1/2) / 7,400

- I = ALLOWABLE LEAKAGE IN GALLONS PER HOUR
- NUMBER OF JOINTS IN THE LENGTH OF PIPELINE TESTED D = NOMINAL DIAMETER OF THE PIPE. IN INCHES
- P = AVERAGE TEST PRESSURE DURING THE LEAKAGE TEST, IN POUNDS PER SQUARE INCH (PSI) (GAUGE)

TABLE 3: ALLOWABLE LEAKAGE PER 50 JOINTS OF PVC PIPE - GPH Avg. Test Nominal Pipe Diameter, in.

Pressure	4	6	8	10	12	14	16	18	20	
psi	4	0	0	10	12	14	10	10	20	
300	0.47	0.70	0.94	1.17	1.40	1.64	1.87	2.11	2.34	2
275	0.45	0.67	0.90	1.12	1.34	1.57	1.79	2.02	2.24	2
250	0.43	0.64	0.85	1.07	1.28	1.50	1.71	1.92	2.14	4
225	0.41	0.61	0.81	1.01	1.22	1.42	1.62	1.82	2.03	2
200	0.38	0.57	0.76	0.96	1.15	1.34	1.53	1.72	1.91	2
175	0.36	0.54	0.72	0.89	1.07	1.25	1.43	1.61	1.79	2
150	0.33	0.50	0.66	0.83	0.99	1.16	1.32	1.49	1.66	,
125	0.30	0.45	0.60	0.76	0.91	1.06	1.21	1.36	1.51	1
100	0.27	0.41	0.54	0.68	0.81	0.95	1.08	1.22	1.35	
75	0.23	0.35	0.47	0.59	0.70	0.82	0.94	1.05	1.17	1
50	0.19	0.29	0.38	0.48	0.57	0.67	0.76	0.86	0.96	

*IF THE PIPELINE UNDER TEST CONTAINS SECTIONS OF VARIOUS DIAMETERS, THE ALLOWABLE LEAKAGE WILL BE THE SUM OF THE COMPUTED LEAKAGE FOR EACH SIZE

- 19. LEAKAGE VALUES DETERMINED BY THE ABOVE FORMULA ARE PRESENTED IN TABLE 3 BELOW: 20. WHEN TESTING AGAINST CLOSED METAL-SEATED VALVES. AND ADDITIONAL LEAKAGE PER CLOSED VALVE OF
- 0.078 GPH/IN. OF NOMINAL VALVE SIZE SHALL BE ALLOWED IF THE TESTING ALLOWANCE IS GREATER THAN THAT DESCRIBED ABOVE, THE CONTRACTOR SHALL EXPLORE FOR THE CAUSE OF THE EXCESSIVE LEAKAGE AND AFTER REPAIRS HAVE BEEN MADE, THE LINE SHALL BE RETESTED. THIS PROCEDURE SHALL BE REPEATED UNTIL THE TESTING ALLOWANCE IS LESS THAN THE MAXIMUM 3.04 FINAL FLUSHING (DIP. PC/PVCO PIPE, PE/HDPE PIPE)
- ALLOWABLE 22. AFTER EACH TEST, THE CONTRACTOR MUST DEMONSTRATE THAT THE TEST APPARATUS, INCLUDING THE PRESSURE GAUGE, IS FULLY FUNCTIONAL AND ACCURATE. INACCURATE GAUGES OR NON-SATISFACTORY EQUIPMENT WILL BE GROUNDS FOR TEST FAILURE, REGARDLESS OF TEST RESULTS. CONTRACTOR WILL RE-SUPPLY PROPER EQUIPMENT AND RETEST. AT HIS EXPENSE.
- 23. THE RATE OF LEAKAGE SHALL BE DETERMINED AT 15 MINUTE INTERVALS BY MEANS OF VOLUMETRIC MEASUREMENT OF THE MAKEUP WATER ADDED TO MAINTAIN THE TEST PRESSURE a. AT THE COMPLETION OF THE TEST THE PRESSURE SHALL BE RELEASED AT THE
- URTHERMOST POINT FROM THE POINT OF APPLICATION. THE CONTRACTOR SHALL PROVIDE A METER CERTIFIED WITHIN THE LAST YEAR OR A SOURCE-WATER 3.05 BACTERIOLOGICAL TESTING (DIP, PVC/PVCO PIPE, PE/HDPE PIPE) TANK/BARREL OF SMALL ENOUGH CROSS SECTION SO THAT MEASURABLE CHANGES IN WATER DEPTH CAN BE ACCURATELY RECORDED. IF THE CHANGE IN WATER DEPTH CANNOT BE PROPERLY MEASURED, THE ENGINEER MAY REQUIRE THE TEST TO BE RUN MORE THAN 2 HOURS UNTIL AN ACCURATE DEPTH CHANGE CAN BE RECORDED AND THE ENGINEER IS SATISFIED WITH THE RESULTS.

3.02C POLYETHYLENE (PE) / HIGH DENSITY POLYETHYLENE (HDPE) PIPE

- HYDROSTATIC TESTING TESTING OF POLYETHYLENE (PE/HDPE) PRESSURE PIPE SYSTEMS SHALL CONFORM TO ALL AWWA M55 SPECIFICATIONS, THE PLASTIC PIPE INSTITUTE (PPI) SPECIFICATIONS, AND ALL SPECIFICATIONS OF THE PIPE
- MANUFACTURER THE TEST METHODS DESCRIBED IN THIS SECTION ARE SPECIFIC FOR WATER-PRESSURE TESTING. PNEUMATIC
- (COMPRESSED GAS) LEAK TESTING OF PE/HDPE PIPE SYSTEMS WILL BE STRICTLY PROHIBITED TESTS SHALL BE MADE ONLY AFTER COMPLETION OF BACKFILL, AND AT LEAST 36 HOURS AFTER THE LAST CONCRETE THRUST OR REACTION BLOCKING HAS BEEN CAST WITH HIGH EARLY STRENGTH CONCRETE OR AT
- LEAST SEVEN (7) DAYS AFTER THE LAST CONCRETE THRUST OR REACTION BLOCKING HAS BEEN CAST WITH STANDARD CONCRETE. 4. THE TEST PRESSURE SHALL NOT BE LESS THAN 1.25 TIMES THE WORKING PRESSURE AT THE HIGHEST POINT
- ALONG THE TEST SECTION. THE TEST PRESSURE SHALL NOT EXCEED PIPE OR THRUST-RESTRAINT DESIGN PRESSURES, AND THE
- APPLICATION SERVICE TEMPERATURE. AFTER THE PIPE HAS BEEN LAID, ALL NEWLY LAID PIPE OR ANY VALVED SECTION THEREOF SHALL BE SUBJECTED
- 150 PSI, WHICHEVER IS GREATER. PE/HDPE PIPE HAS A REDUCED STRENGTH AT ELEVATED TEMPERATURES. TEST PRESSURE MUST BE REDUCED WHEN THE TEST SECTION IS AT ELEVATED TEMPERATURE EITHER FROM SERVICE CONDITIONS OR FROM ENVIRONMENTAL CONDITIONS SUCH AS BEING WARMED BY THE SUN. MULTIPLY THE TEST PRESSURE BY THE

TABLE 1 - ELEVATED TEMPERATURE MULTIPLIER										
Test Section Temperature °F	≤ 80	≤ 90	≤ 100	≤ 110	≤ 120	≤ 130				
Multiplier	1.00	0.90	0.80	0.75	0.65	0.60				

*USE THE 80°F MULTIPLIER FOR 800F AND LOWER TEMPERATURES

PRESSURE GAUGE MUST BE IN GOOD WORKING CONDITION AND MUST BE DEMONSTRATED TO BE ACCURATE TO

PE/HDPE PIPE REQUIRES AN INITIAL EXPANSION PERIOD. GRADUALLY PRESSURIZE THE TEST SECTION TO THE TEST PRESSURE, AND MAINTAIN TEST PRESSURE FOR 3 HOURS. DURING THIS INITIAL EXPANSION PERIOD, POLYETHYLENE PIPE WILL EXPAND SLIGHTLY. ADDITIONAL TEST LIQUID WILL BE REQUIRED TO MAINTAIN

SYSTEM.

THE ENGINEER PRIOR TO ANY TESTING

READINGS.

HYDRANT

ACCURATELY

LOSS IS STABILIZING.

THE TEST PRESSURE SHALL NOT BE LESS THAN 1.25 TIMES THE WORKING PRESSURE AT THE HIGHEST POINT

HOUR, AS DETERMINED IN AWWA STANDARD C-605-94, AS DETERMINED BY THE FOLLOWING FORMULA, AND IN

TO A HYDROSTATIC PRESSURE OF AT LEAST 1.5 TIMES THE WORKING PRESSURE AT THE POINT OF THE TEST, OR

TABLE 1 (BELOW) MULTIPLIER TO DETERMINE THE ALLOWABLE ELEVATED TEMPERATURE TEST PRESSURE.

0.50

PRESSURE. IT IS NOT NECESSARY TO MONITOR THE AMOUNT OF WATER ADDED DURING THE INITIAL EXPANSION

WHEN TESTING PE/HDPE PIPE AT PRESSURES ABOVE SYSTEM DESIGN, PRESSURE UP TO 1.5 TIMES THE SYSTEM DESIGN PRESSURE, THE MAXIMUM TEST DURATION IS EIGHT (8) HOURS INCLUDING TIME TO PRESSURIZE, TIME FOR INITIAL EXPANSION, TIME AT TEST PRESSURE, AND TIME TO DEPRESSURIZE THE TEST SECTION. IF THE TEST IS NOT COMPLETED DUE TO LEAKAGE, EQUIPMENT FAILURE, OR FOR ANY OTHER REASON, DEPRESSURIZE THE TEST SECTION COMPLETELY, AND ALLOW IT TO RELAX FOR AT LEAST EIGHT (8) HOURS BEFORE PRESSURIZING THE TEST SECTION AGAIN. TESTING AT EXCESSIVE PRESSURE OR FOR EXCESSIVE TIME MAY DAMAGE THE PIPING 3.07 CERTIFICATION

TABLE 2 - MAKE-UP WATER ALLOWANCE FOR TEST PHASE - TEST PRESSURE IS 1.5 TIMES SYSTEM DESIGN PRESSURE Make-up Water Allowance - U.S. Gal/100ft of pipe 1-Hour Test 2-Hour Test 3-Hour Test 1.25 0.06 0.10 0.16 0.17 1.5 0.07 0.10 0.11 0.19 0.10 0.15 0.25 0.13 0.25 0.40 5.375 0.19 0.38 0.58 0.2° 0.41 0.62 0.30 0.60 0.90 7.125 0.40 0.70 1.00 1.00 0.50 1.50 1.30 0.80 2.10 1.10 2.30 3.40 13.375 1.20 2.50 3.70 1.40 2.80 4.20 1.70 3.30 5.00 4.30 6.50 5.50 2.80 8.00 7.00 3.50 10.50 4.50 8.90 13.30 10.00 5.00 15.00 11.10 5.5016.80 6.30 12.70 19.20 14.30 7.00 21.50 8.00 16.20 24.30 18.00 9.00 27.00 23.10 12.0035.30 15.0043.00 22.00 31.40 51.70

. GAUGE MUST HAVE PROPER LABELING TO ALLOW ENGINEER TO ACCURATELY DISTINGUISH THE CHANGE IN

14. THE CONTRACTOR WILL INFORM THE ENGINEER WHEN TO BEGIN THE TEST.

APPARATUS SHALL BE FURNISHED BY THE CONTRACTOR.

SATISFACTORY RESULTS ARE OBTAINED

PRESSURE. GAUGE MUST HAVE MARKINGS AT NO GREATER THAN 2 PSI INCREMENTS TO ALLOW ACCURATE

19. TEST PRESSURE SHALL BE HELD ON THE PIPING FOR A PERIOD OF AT LEAST 2 HOURS, UNLESS A LONGER PERIOD IS REQUESTED BY THE ENGINEER. PRESSURE SHOULD NOT FLUCTUATE BY MORE THAN 5 PSI DURING TESTING. 20. IF THE TESTING ALLOWANCE IS GREATER THAN THAT DESCRIBED ABOVE, THE CONTRACTOR SHALL EXPLORE FOR THE CAUSE OF THE EXCESSIVE LEAKAGE AND AFTER REPAIRS HAVE BEEN MADE, THE LINE SHALL BE RETESTED. THIS PROCEDURE SHALL BE REPEATED UNTIL THE TESTING ALLOWANCE IS LESS THAN THE MAXIMUM ALLOWABLE.

21. AFTER EACH TEST, THE CONTRACTOR MUST DEMONSTRATE THAT THE TEST APPARATUS. INCLUDING THE PRESSURE GAUGE, IS FULLY FUNCTIONAL AND ACCURATE. INACCURATE GAUGES OR NON-SATISFACTORY EQUIPMENT WILL BE GROUNDS FOR TEST FAILURE, REGARDLESS OF TEST RESULTS. CONTRACTOR WILL RE-SUPPLY PROPER FOUIPMENT AND RETEST AT HIS EXPENSE 22. THE RATE OF LEAKAGE SHALL BE DETERMINED AT 15 MINUTE INTERVALS BY MEANS OF VOLUMETRIC MEASUREMENT OF THE MAKEUP WATER ADDED TO MAINTAIN THE TEST PRESSURE

23. AT THE COMPLETION OF THE TEST THE PRESSURE SHALL BE RELEASED AT THE FURTHERMOST POINT FROM THE POINT OF APPLICATION. 24. THE CONTRACTOR SHALL PROVIDE A METER CERTIFIED WITHIN THE LAST YEAR OR A SOURCE-WATER FANK/BARREL OF SMALL ENOUGH CROSS SECTION SO THAT MEASURABLE CHANGES IN WATER DEPTH CAN BE ACCURATELY RECORDED. IF THE CHANGE IN WATER DEPTH CANNOT BE PROPERLY MEASURED, THE ENGINEER

MAY REQUIRE THE TEST TO BE RUN MORE THAN 2 HOURS UNTIL AN ACCURATE DEPTH CHANGE CAN BE RECORDED AND THE ENGINEER IS SATISFIED WITH THE RESULTS. A. BEFORE DISINFECTION. THE LINE SHALL BE CLEANED AND FLUSHED WITH CLEAN WATER AS DEFINED IN THE INITIAL FLUSHING SECTION. CONTRACTOR SHALL PROVIDE OUTLETS AS REQUIRED. B. THE CHLORINE SOLUTION SHALL BE ADMITTED TO PIPELINES THROUGH CORPORATION STOPS PLACED IN THE HORIZONTAL AXIS OF THE PIPE, TO STRUCTURES BY MEANS OF TUBING EXTENDING DIRECTLY INTO THE STRUCTURE

OR OTHER APPROVED METHODS. C. THE CHLORINATION METHOD USED SHALL BE IN CONFORMANCE WITH ANSI/AWWA C-651, BY THE CONTINUOUS FEED D. ALTERNATE METHODS OF DISINFECTION, IF PROPOSED BY THE CONTRACTOR, SHALL BE BY AN AWWA APPROVED METHOD. SHALL NOT BE PERMITTED THE PROPOSED PIPING SHALL BE TESTED IN ALL RESPECTS, PRIOR TO CONNECTING THE SECOND END OF THE PIPE TO THE EXISTING SYSTEM OR PRIOR TO CONNECTING SERVICE CONNECTIONS TO THE NEW WATERMAIN ALL VALVES TO EXISTING MAINS MUST BE CLOSED DURING THE CHLORINATION PROCESS. WHILE THE CHLORINATED WATER IS BEING ADDED, ALL APPURTENANCES ON THE MAIN SHALL BE OPERATED SO AS TO COMPLETELY DISINFECT THE NEW WORK. THE OPERATION SHALL BE REPEATED AS NECESSARY TO PROVIDE COMPLETE DISINFECTION.

G. CHLORINATED WATER FROM HYDRANTS AND TAPS MUST BE PROPERLY COLLECTED AND DISPOSED OF BY THE CONTRACTOR. DISCHARGE OF CHLORINATED WATER INTO THE EXISTING STORM SEWER OR A NATURAL WATER BODY HALL NOT BE ALLOWED H. THE CHLORINE TREATED WATER SHALL BE RETAINED IN THE PIPE OR STRUCTURE AT LEAST 24 HOURS, UNLESS OTHERWISE DIRECTED, IN WHICH A CHLORINE RESIDUAL OF NOT LESS THAN 10 MG/L MUST BE MAINTAINED. DURING THE RETENTION PERIOD ALL VALVES AND HYDRANTS WITHIN THE TREATED SECTIONS SHALL BE OPERATED. WHEN DISINFECTING PE/HDPE PIPE, DISINFECTING SOLUTIONS MUST NOT EXCEED 12% ACTIVE CHLORINE BECAUSE

GREATER CONCENTRATION CAN CHEMICALLY ATTACK AND DEGRADE POLYETHYLENE. WHEN MAKING REPAIRS TO OR WHEN SPECIFIED. STRUCTURES AND PORTIONS OF PIPELINES SHALL BE CHLORINATED BY A CONCENTRATED CHLORINE SOLUTION CONTAINING BETWEEN 200 PPM (MG/L) AND 300 PPM (MG/L) OF FREE CHLORINE. THE SOLUTION SHALL BE APPLIED WITH A BRUSH OR SPRAYED ON THE ENTIRE INNER SURFACE OF THE EMPTY PIPES OR STRUCTURES. THE SURFACES DISINFECTED SHALL REMAIN IN CONTACT WITH THE STRONG CHLORINE SOLUTION FOR AT LEAST 30 MINUTES. THE CONTRACTOR MUST USE AN APPROVED TEST METHOD TO DETERMINE CHLORINE LEVELS. TEST STRIPS WILL BE

ALLOWED FOR TESTING CHLORINE LEVELS IF THE KIT IS NEW, IN THE ORIGINAL BOTTLE, AND HAS A COLOR CODED SCALE ON THE SIDE WITH LEGIBLE CONCENTRATIONS DEFINED. SENDING SAMPLES TO AN APPROVED LABORATORY IS ALSO ACCEPTABLE.

UPON COMPLETION OF EACH DISINFECTING OPERATION, THE CONTRACTOR WILL BE REQUIRED TO EITHER EMPTY THE CONTENTS OF THE PIPE INTO A TANK TRUCK, OR TO APPLY A NEUTRALIZING CHEMICAL TO THE CONTENTS, AND DISCHARGE APPROPRIATELY. DUMPING INTO A SEWER WILL ONLY BE ALLOWED WITH APPROVAL FROM THE LOCAL OVERNING BODY. IN NO INSTANCE WILL CHLORINATED TESTING OR FLUSHING WATER BE EMPTIED ONTO THE ROADWAYS, IN DITCHES, CULVERTS, STORM SEWERS, STREAMS, WETLANDS, OR ANY OTHER NATURAL WATER BODY. B. THE FLUSHING SHALL OCCUR UNTIL THE CHLORINE CONCENTRATION AT EACH SAMPLING TAP IS NO HIGHER THAN 1.

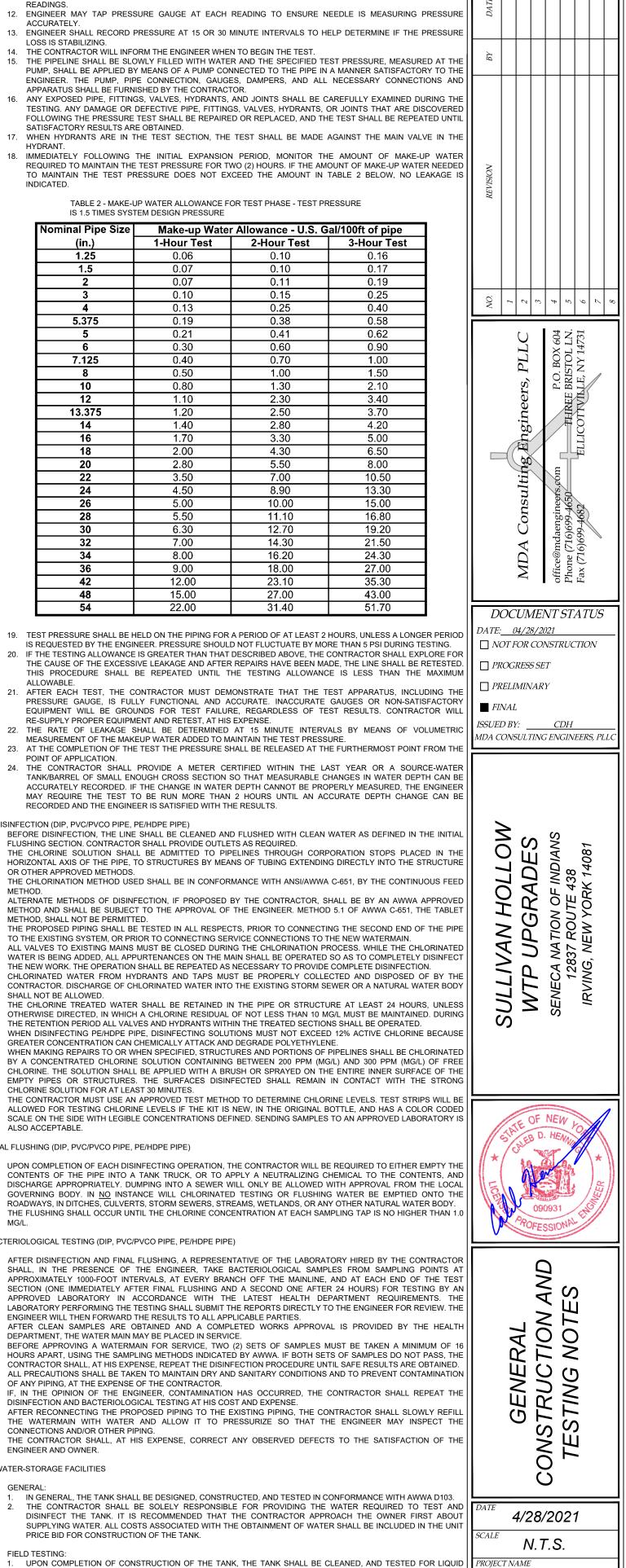
- AFTER DISINFECTION AND FINAL FLUSHING, A REPRESENTATIVE OF THE LABORATORY HIRED BY THE CONTRACTOR SHALL, IN THE PRESENCE OF THE ENGINEER, TAKE BACTERIOLOGICAL SAMPLES FROM SAMPLING POINTS AT APPROXIMATELY 1000-FOOT INTERVALS, AT EVERY BRANCH OFF THE MAINLINE, AND AT EACH END OF THE TEST SECTION (ONE IMMEDIATELY AFTER FINAL FLUSHING AND A SECOND ONE AFTER 24 HOURS) FOR TESTING BY AN APPROVED LABORATORY IN ACCORDANCE WITH THE LATEST HEALTH DEPARTMENT REQUIREMENTS. THE LABORATORY PERFORMING THE TESTING SHALL SUBMIT THE REPORTS DIRECTLY TO THE ENGINEER FOR REVIEW. THE ENGINEER WILL THEN FORWARD THE RESULTS TO ALL APPLICABLE PARTIES. AFTER CLEAN SAMPLES ARE OBTAINED AND A COMPLETED WORKS APPROVAL IS PROVIDED BY THE HEALT DEPARTMENT, THE WATER MAIN MAY BE PLACED IN SERVICE. BEFORE APPROVING A WATERMAIN FOR SERVICE, TWO (2) SETS OF SAMPLES MUST BE TAKEN A MINIMUM OF 10 HOURS APART. USING THE SAMPLING METHODS INDICATED BY AWWA. IF BOTH SETS OF SAMPLES DO NOT PASS. THE CONTRACTOR SHALL, AT HIS EXPENSE, REPEAT THE DISINFECTION PROCEDURE UNTIL SAFE RESULTS ARE OBTAINED. ALL PRECAUTIONS SHALL BE TAKEN TO MAINTAIN DRY AND SANITARY CONDITIONS AND TO PREVENT CONTAMINATION OF ANY PIPING, AT THE EXPENSE OF THE CONTRACTOR. IF, IN THE OPINION OF THE ENGINEER, CONTAMINATION HAS OCCURRED, THE CONTRACTOR SHALL REPEAT 1 ISINFECTION AND BACTERIOLOGICAL TESTING AT HIS COST AND EXPENSE. AFTER RECONNECTING THE PROPOSED PIPING TO THE EXISTING PIPING, THE CONTRACTOR SHALL SLOWLY REFILI
- THE WATERMAIN WITH WATER AND ALLOW IT TO PRESSURIZE SO THAT THE ENGINEER MAY INSPECT THE CONNECTIONS AND/OR OTHER PIPING THE CONTRACTOR SHALL, AT HIS EXPENSE, CORRECT ANY OBSERVED DEFECTS TO THE SATISFACTION OF THE ENGINEER AND OWNER

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- IN GENERAL, THE TANK SHALL BE DESIGNED, CONSTRUCTED, AND TESTED IN CONFORMANCE WITH AWWA D10 THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR PROVIDING THE WATER REQUIRED TO TEST AND DISINFECT THE TANK. IT IS RECOMMENDED THAT THE CONTRACTOR APPROACH THE OWNER FIRST ABOUT SUPPLYING WATER. ALL COSTS ASSOCIATED WITH THE OBTAINMENT OF WATER SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONSTRUCTION OF THE TANK.
- B. FIELD TESTING: UPON COMPLETION OF CONSTRUCTION OF THE TANK, THE TANK SHALL BE CLEANED, AND TESTED FOR LIQUID PROJECT NAME UPON COMPLETION OF CONSTRUCTION OF THE TANK, THE TANK OTALL DE OLEVILLO, AND THE TANK TO ITS OVERFLOW ELEVATION. ANY LEAKS OBSERVED SHALL BE REPAIRED BY SULLIVAN HOLLOW 2. THE OWNER SHALL PROVIDE THE WATER FOR INITIAL TESTING AT NO COST TO THE CONTRACTOR. IF ADDITIONAL TESTING IS REQUIRED AFTER THE INITIAL TEST, THE OWNER RESERVES THE RIGHT TO CHARGE THE CONTRACTOR FOR ADDITIONAL WATER USE DURING SUBSEQUENT TESTING.
- DISINFECTION THE TANK SHALL BE DISINFECTED AT THE TIME OF TESTING BY METHODS OF CHLORINATION IN ACCORDANCE WITH AWWA C652-02, LATEST REVISION CHI ORINATION METHODS 1 2 AND 3 SHALL BE ACCEPTABLE SODIUM HYPOCHLORITE IS THE PREFERRED FORM OF CHLORINE TO BE UTILIZED FOR DISINFECTION.
- THE TANK SHALL NOT BE DISINFECTED UNTIL THE TANK SEALANT IS FULLY CURED, APPROXIMATELY 10-12 DAYS AT 73OF AND 50% RELATIVE HUMIDITY.

AN ENGINEER'S CERTIFICATION OF COMPLETED WORKS MUST BE ISSUED, AND ACCEPTED/APPROVED BY THE NYSDOH. PRIOR TO PLACING ANY SECTION OF THE PROPOSED WATER SYSTEM INTO SERVICE.

> UNAUTHORIZED ALTERATION OR ADDITION TO THIS ENGINEERING DRAWING IS A VIOLATION OF SECTION 7209 PROVISION 2 OF THE NEW YORK STATE EDUCATION LAW



WTP UPGRADES

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