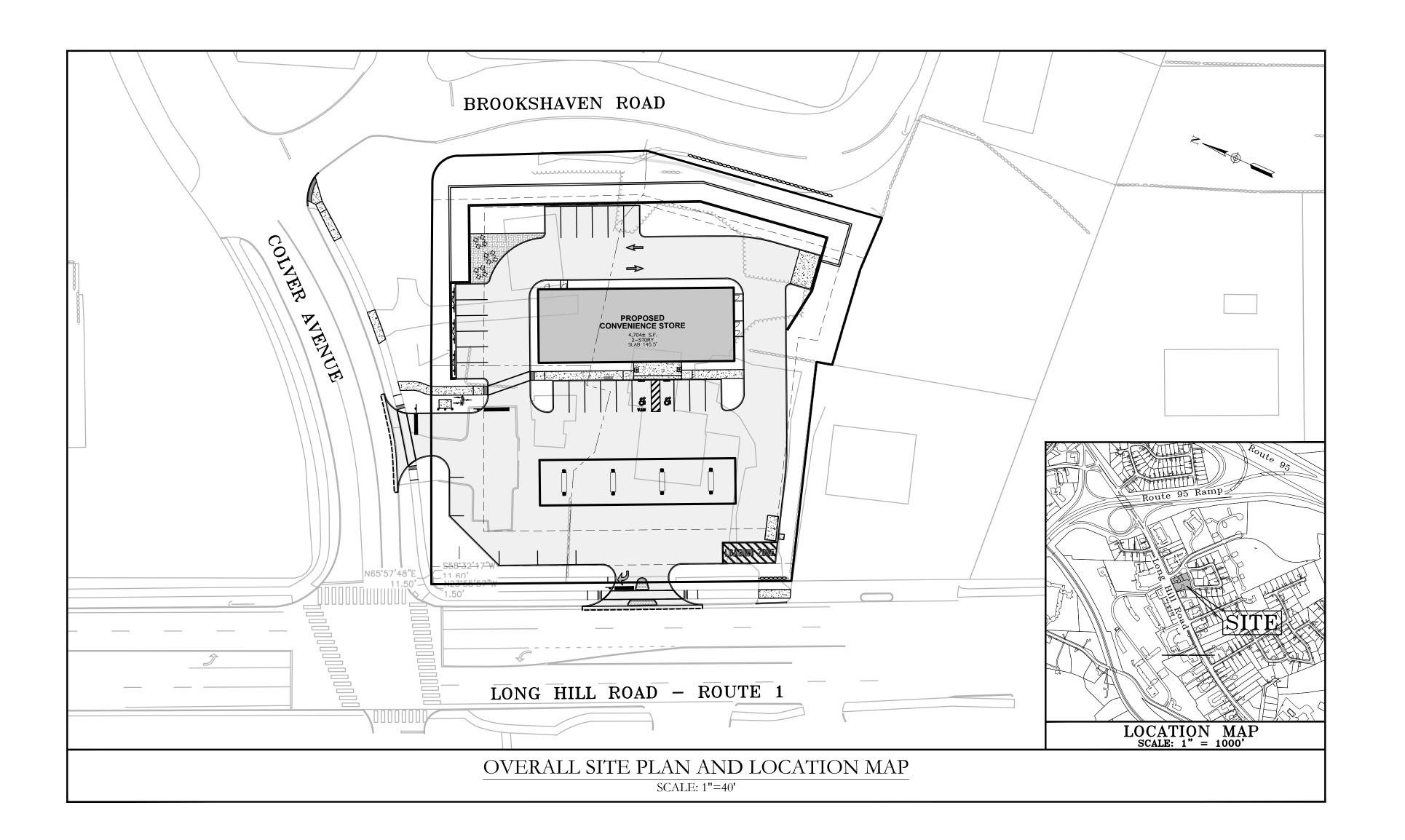
FUEL DISPENSING STATION & CONVENIENCE STORE

388-390 LONG HILL ROAD 17 BROOKSHAVEN ROAD ASSESSOR ID 0476, 1389 & 1591 GROTON, CONNECTICUT

ISSUED FOR PERMITTING

PREPARED FOR AR ENERGY LLC

DATE ISSUED: MAY 2024



SHEET INDEX

- C-0 COVER SHEET
- C-1 LEGEND & GENERAL NOTES
- C-2 OVERALL PLAN
- C-3 LAYOUT & MATERIALS PLAN
- C-4 GRADING & DRAINAGE PLAN

 C-5 SOIL EPOSION SEDIMENT CONTROL BLA
- C-5 SOIL EROSION SEDIMENT CONTROL PLAN
- C-6 UTILITY PLAN
- C-7 SITE DETAILS 1
- -8 SITE DETAILS 2
- -9 SITE DETAILS 3
- 10 TOWN OF GROTON UTILITIES TECHNICAL STANDARDS
- C-11 TOWN OF GROTON WATER DETAILS

SUPPLEMENTAL SHEETS

SV-1 EXISTING CONDITIONS

LP-1 LIGHTING PLAN

EX-1 FUTURE CARWASH ABUTTER EXHIBIT

EX-2 SITE PREPARATION EXHIBIT

S-101 PROPOSED FUELING STATION AND TANKS SITE PLAN

SG-101 PROPOSED FUELING CANOPY AND SIGNAGE

ISSUED FOR REVIEW

APPLICANT/OWNER
AR ENERGY LLC
C/O MOHAMMAD RAYYASHI
170 HAWTHORNE MEAD DR.
GLASTONBURY, CT 06033



Environmental Engineers

FUEL DISPENSING STATION & CONVENIENCE STORE 388 & 390 LONG HILL ROAD 17 BROOKSHAVEN ROAD ASSESSOR'S ID 476, 1389 & 1591 GROTON, CONNECTICUT

CA JOB #223022



Civil Engineers
Land Surveyors
Land Use Planners

99 Mechanic St.
Pawcatuck, CT 06379
Tel: 860.629.6500
Fax: 860.599.6090

P.O. Box 513 Westerly, RI 02891 Tel: 401.596.7747

www.cherenzia.com

GENE)					1.	<u>IERAL NOTES</u> THESE PLANS AND THE
EXIST	PROP		EXIST	PROP		l	DOCUMENTS, INCLUDING
							INSTRUMENTS OF PROFUSED IN WHOLE OR IN
7.65 TC 7.15 BC×	27.65 TC 27.15 BC×	TOP/BOTTOM CURB ELEVATION			SUBJECT PROPERTY LINE	-	THE DEVELOPMENT OF WRITTEN CONSENT OF
21.25×	21.25×	SPOT GRADE			ABUTTERS PROPERTY LINE		UNAUTHORIZED USE, R
⊕ SB-1	⊕ SB−1	SOIL BORING LOCATION			EASEMENT	-	THIS DATA SHALL BE THE PART OF CHEREN
<u>+</u> → TH−1	↑ TH-1	TEST HOLE LOCATION	BUILDING SETBACK		BUILDING SETBACK	2.	UPON AWARD OF THE
→ MW−1	⊕ MW−1	MONITORING WELL			CURB	-	CONSTRUCTION, THE CONSTRUCTION
 △BM #1	 △BM #1	BENCHMARK			LIMIT OF CURB TYPE	-	AND LOCAL FEES REL
©	 ⊘ DMH	DRAIN MANHOLE			SAWCUT	-	DRAWINGS, THE CONST
СВ	∠ СВ	CATCH BASIN			MATCHLINE	3.	THE CONTRACTOR SHA
DCB	DCB	DOUBLE CATCH BASIN			STOP BAR	١,	BUSINESS HOURS PRICALL CONSTRUCTION SI
FES >		FLARED END SECTION			GUARD RAIL	4.	APPROVED PLANS AND
		DRAINAGE LINE		53986539	STONE DUST PATH		SPECIFICATIONS ARE N ADHERE TO LOCAL MU
		UNDERDRAIN PIPE	.~~.	.~~~			DEPARTMENT OF TRAN
		STONE TRENCH	_xx	_xx			APPLICABLE. WORK ADHERE TO LOCAL MU
o/h ——		OVERHEAD WIRE	.0000000.	.0000000	1 - 11 - 1		RIGHTS-OF-WAY SHAL WHERE A DISCREPANCE
w —	w	WATER LINE			RETAINING WALL	-	STANDARD SHALL APP
w —	**	FIRE PROTECTION LINE	sf	SF	SILT FENCE	5.	REFERENCE MADE TO
g ——	**	GAS LINE	sw	sw	STRAW WATTLE		STANDARD SPECIFICAT "CONNDOT STANDARDS
e —		UNDERGROUND ELECTRIC	344	—_LOD —	LIMIT OF DISTURBANCE		"CONNECTICUT DEPAR"
t		UNDERGROUND TELEPHONE		O	LOD STAKE		AND SPECIFICATIONS"
fa	•	FIRE ALARM	2	4	MINOR CONTOUR	6.	ANY WORK NOT MEET REMOVED IMMEDIATELY
atv —		CABLE TV		10	MAJOR CONTOUR	_	NO COST TO THE OWN
	E.	PLUG/STUB			BUILDING	7. 	THE CONTRACTOR SHA SECURITY AND JOB SA
3)	⊘ SMH	SEWER MANHOLE			BUILDING DOOR	-	AND REGULATIONS OF ADMINISTRATION (OSHA
3 —	s	GRAVITY SEWER LINE	0		BOLLARD	8.	THE CONTRACTOR SHA
m —	—— FM ——	FORCE MAIN SEWER LINE	D		DUMPSTER PAD		MAINTENANCE AND PR TRAFFIC INCLUDING AN
<		WATER GATE	•		SIGN		REQUIRED TEMPORARY
/	TSV▶	TAPPING SLEEVE, VALVE, & BOX	<u> </u>	=	DOUBLE SIGN		LANE CLOSURES SHAL "MANUAL OF UNIFORM
5-	•	FIRE HYDRANT		(10)	PARKING COUNT	9.	THE CONTRACTOR SHA
))	<u> </u>	WELL			CONC. PAVEMENT		SIDEWALKS, OR FIRE NECESSARY PERMITS
0		GAS GATE			PAVEMENT	10.	ADA ACCESSIBLE ROU
0		ELECTRIC MANHOLE			PERMEABLE PAVERS		RAMPS SHALL BE CO
- *	-	SINGLE LIGHT POLE			GRAVELPAVE/GRASSPAVE		FEDERAL "AMERICANS AND STATE STANDARD
(T)	0	TELEPHONE MANHOLE		<u>3</u>	ADA PARKING		MORE RESTRICTIVE ST
j i		UTILITY PAD	— 100' URA —		100 FT UPLAND REVIEW AREA	111.	THE LIMITS-OF-WORK AS SHOWN ON THESE
<u>-</u>	<u>□ 1840</u>	UTILITY POLE	△WF #1		WETLAND FLAG		THESE DEFINED LIMITS
0-	•-	GUY POLE			WETLAND EDGE		CONTRACTOR TO THEIR CONTRACTOR'S EXPEN
-			<u>*</u>		WETLAND SYMBOL		RESTORED WITH 4 INC
			=		DRAINAGE DIVIDE DURING CONTRUCTION	12.	SHOULD THE CONTRAC
						ł	EXCAVATION, THE CON
					ALLOWABLE STAGING/STOCKPILING AREA	1	IN THE SUSPECTED AF APPROPRIATE ACTIONS
			ļ	1	FLOW DIRECTION	J _{1.3}	UNLESS OTHERWISE N

	VIATIONS	_	
	ABANDON		MAXIMUM
	ADJUST		MINIMUM
	AREA SUBJECT TO STORM FLOWAGE		MONOLITHIC CONCRETE CURB
ASTM	AMERICAN SOCIETY FOR TESTING & MATERIALS	МН	MANHOLE
ADA	AMERICANS WITH DISABILITIES ACT	NTS	NOT TO SCALE
	APPROXIMATE	ос	ON CENTER
BIT	BITUMINOUS	PVC	POLYVINYLCHLORIDE PIPE
BCLC/BCC	BITUMINOUS CONCRETE CURB	PCC	PRECAST CONCRETE CURB
BW	GRADE AT THE BOTTOM OF THE WALL	PL	PROPERTY LINE
BWL	BROKEN WHITE LINE	PROP	PROPOSED
BYL	BROKEN YELLOW LINE	R	RADIUS
CCB	CAPE COD BERM	RCP	REINFORCED CONCRETE PIPE
СВ	CATCH BASIN	R&D	REMOVE AND DISPOSE
СМР	CORRUGATED METAL PIPE	R&R	REMOVE AND RESET
COL	COLUMN	R&S	REMOVE AND STORE
CONC	CONCRETE	SMH	SEWER MANHOLE
CONST	CONSTRUCTION	SESC	SOIL EROSION SEDIMENT CONTROL
CPP	CORRUGATED PLASTIC PIPE	SWL	SINGLE WHITE LINE
CY	CUBIC YARD	SWCL	SINGLE WHITE CHANNELIZING LINE
DBL	DOUBLE	SYL	SINGLE YELLOW LINE
DCB	DOUBLE CATCH BASIN	SYCL	SINGLE YELLOW CHANNELIZING LINE
DYL	DOUBLE YELLOW LINE	SF	SQUARE FEET
DMH	DRAIN MANHOLE	STD	STANDARD
DI	DUCTILE IRON	SDR	STANDARD DIMENSION RATIO
DIPS	DUCTILE IRON PIPE SIZE	STA	STATION
ELEV	ELEVATION	ТМН	TELECOMMUNICATION MANHOLE
EOP	EDGE OF PAVEMENT	TSV	TAPPING SLEEVE, VALVE AND BOX
EXIST	EXISTING	TF	TOP OF FRAME
FT	FEET	TRANS	TRANSITION
FES	FLARED END SECTION	TW	ELEVATION OF TOP OF THE WALL
GDE	GARAGE DOOR ELEVATION	TYP	TYPICAL
HDPE	HIGH DENSITY POLYETHYLENE	UP	UTILITY POLE
HYD	HYDRANT	VGC	VERTICAL GRANITE CURB
INV	INVERT ELEVATION	WG	WATER GATE
LA	LANDSCAPE AREA	WF	WETLAND FLAG
LOD	LIMIT OF DISTURBANCE		

- HESE PLANS AND THEIR CORRESPONDING ELECTRONIC OCUMENTS, INCLUDING CAD FILES FOR THE PROJECT, ARE NSTRUMENTS OF PROFESSIONAL SERVICE AND SHALL NOT BE ISED IN WHOLE OR IN PART FOR ANY OTHER PURPOSE THAN HE DEVELOPMENT OF THIS PROJECT WITHOUT THE EXPRESSED, VRITTEN CONSENT OF CHERENZIA & ASSOCIATES, LTD. ANY INAUTHORIZED USE, RE-USE, ALTERATION, OR MODIFICATION OF
- HIS DATA SHALL BE AT THE USER'S RISK WITH NO LIABILITY ON HE PART OF CHERENZIA. IPON AWARD OF THE CONTRACT AND PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR BTAINING ALL PERMITS AND BONDS AND PAYING ALL STATE AND LOCAL FEES RELATING TO THE WORK SHOWN ON THESE
- RAWINGS, THE CONSTRUCTION SPECIFICATIONS, AND CONTRACT OCUMENTS.
- THE CONTRACTOR SHALL NOTIFY DIG-SAFE AT LEAST 72 BUSINESS HOURS PRIOR TO INITIATING ANY EXCAVATION WORK. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE PPROVED PLANS AND SPECIFICATIONS. WHERE SITE SPECIFICATIONS ARE NOT PROVIDED. THE CONTRACTOR SHALL DHERE TO LOCAL MUNICIPAL STANDARDS OR THE CONNECTICUT PEPARTMENT OF TRANSPORTATION SPECIFICATIONS, AS PPLICABLE. WORK WITHIN LOCAL RIGHTS-OF-WAY SHALL DHERE TO LOCAL MUNICIPAL STANDARDS: WORK WITHIN STATE RIGHTS-OF-WAY SHALL ADHERE TO STATE HIGHWAY STANDARDS. WHERE A DISCREPANCY EXISTS, THE MORE RESTRICTIVE STANDARD SHALL APPLY.
- REFERENCE MADE TO "STATE HIGHWAY STANDARDS," "STATE TANDARD SPECIFICATIONS." "STANDARD SPECIFICATIONS." OR "CONNDOT STANDARDS" SHALL MEAN AND BE DEFINED AS
- "CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS" ANY WORK NOT MEETING THE APPROVED STANDARDS SHALL BE REMOVED IMMEDIATELY AND REPLACED BY THE CONTRACTOR AT
- NO COST TO THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SITE SECURITY AND JOB SAFETY AND SHALL CONFORM TO THE RULES IND REGULATIONS OF THE OCCUPATIONAL SAFETY AND HEALTH
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE AND PROTECTION OF PEDESTRIAN AND VEHICUI AR RAFFIC INCLUDING ANY REQUIRED POLICE PROTECTION. ANY REQUIRED TEMPORARY CONSTRUCTION SIGNS, BARRICADES AND ANE CLOSURES SHALL BE IN CONFORMANCE WITH THE LATEST 'MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD). THE CONTRACTOR SHALL NOT OBSTRUCT PUBLIC ROADWAYS, SIDEWALKS, OR FIRE HYDRANTS WITHOUT FIRST OBTAINING THE
- NECESSARY PERMITS TO DO SO. ADA ACCESSIBLE ROUTES, PARKING SPACES, SIDEWALKS, AND AMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE FEDERAL "AMERICANS WITH DISABILITIES ACT (ADA)" AND LOCAL AND STATE STANDARDS. WHERE A DISCREPANCY EXISTS, THE IORE RESTRICTIVE STANDARD SHALL APPLY.
- THE LIMITS-OF-WORK (A.K.A. "LIMIT OF DISTURBANCE") SHALL BE IS SHOWN ON THESE PLANS. AREAS DISTURBED BEYOND HESE DEFINED LIMITS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE. LANDSCAPE AREAS SHALL BE RESTORED WITH 4 INCHES OF LOAM AND SEED.
- SHOULD THE CONTRACTOR ENCOUNTER SUSPECTED CONTAMINATED SOIL, GROUNDWATER, OR OTHER MATERIAL DURING XCAVATION, THE CONTRACTOR SHALL IMMEDIATELY STOP WORK N THE SUSPECTED AREA AND NOTIFY THE OWNER SO THAT PPROPRIATE ACTIONS AND TESTING CAN TAKE PLACE. JNLESS OTHERWISE NOTED ON THE PLANS, ALL UNPAVED/ ANDSCAPE AREAS SHALL RECEIVE FOUR (4) INCHES OF LOAM AND SEED WITHIN THE LIMITS OF WORK SHOWN ON THESE PLANS. LOAM SHALL BE EVENLY SPREAD, SMOOTHED, AND
- 14. PRIOR TO START OF CONSTRUCTION, THE CONTRACTOR SHALL VERIFY EXISTING PAVEMENT FLEVATIONS AT THEIR PROPOSED INTERFACE WITH PROPOSED PAVEMENTS TO ENSURE PROPER TRANSITIONS BETWEEN EXISTING AND PROPOSED FACILITIES.
- 15. HORIZONTAL AND VERTICAL DATUMS ARE PROVIDED ON THE SURVEY PLANS.

COMPACTED PRIOR TO SEEDING.

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH ALL UTILITY COMPANIES AND WORK TRADES ASSOCIATED

- 2. PRIVATE UTILITIES a. SERVICES SHALL BE APPROVED BY AND CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATIONS AND REQUIREMENTS OF PRIVATE UTILITY SERVICE PROVIDERS (WATER, SEWER, GAS, TELEPHONE, ELECTRIC, FIRE ALARM, CABLE, FIOS, ETC.)
- b. THE GAS COMPANY SHALL INSTALL ALL GAS LINES AND APPURTENANCES; THE CONTRACTOR SHALL ONLY BE RESPONSIBLE FOR EXCAVATION AND BACKFILL OF GAS TRENCHES IN ACCORDANCE WITH GAS COMPANY REQUIREMENTS. c. CONTRACTOR SHALL FURNISH EXCAVATION, INSTALLATION, AND
- BACKFILL OF ALL ELECTRIC WORK. THE CONTRACTOR SHALL ALSO FURNISH AND INSTALL CONCRETE ENCASEMENT FOR DUCT BANKS, IF REQUIRED BY THE ELECTRIC COMPANY. PULLING OF ELECTRICAL CONDUIT SHALL BE BY THE ELECTRIC
- 3. EXISTING UTILITIES ARE SHOWN IN THEIR APPROXIMATE LOCATION BASED ON BEST AVAILABLE INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY THE LOCATION, SIZE, MATERIAL(S). AND ELEVATION OF ALL EXISTING UTILITIES WITHIN THE LIMIT OF WORK PRIOR TO ORDERING OR INSTALLING THESE MATERIALS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES OR UTILITY CONFLICTS
- PRIOR TO CONSTRUCTION. WHERE AN EXISTING UTILITY IS FOUND TO BE IN CONFLICT WITH THE PROPOSED WORK, OR WHERE EXISTING CONDITIONS DIFFER FROM THE INFORMATION SHOWN ON THESE PLANS, SUCH THAT THE WORK CAN NOT BE COMPLETED AS INTENDED. THE CONTRACTOR SHALL IMMEDIATELY IDENTIFY AND PROVIDE THE ENGINEER WITH THE LOCATION, ELEVATION, AND SIZE OF THE UTILITY IN CONFLICT. THE CONTRACTOR SHALL NOT CONTINUE WORK IN THIS AREA UNTIL THE APPROPRIATE REMEDIAL ACTION IS AGREED UPON BY THE OWNER AND ENGINEER.
- 5. THE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR ANY DAMAGE TO OVERHEAD AND/OR UNDERGROUND UTILITIES. WHETHER OR NOT SHOWN ON THESE PLANS THROUGHOUT WORK
- 6. UTILITY PIPING SHALL BE CONSTRUCTED OF THE FOLLOWING MATERIALS, UNLESS OTHERWISE NOTED ON THE PLANS: a. SANITARY SEWER PIPES SHALL BE SDR35 POLYVINYL CHLORIDE (PVC) b. STORM DRAINAGE PIPES SHALL BE HIGH-DENSITY
- POLYETHYLENE (HDPE) 8. ALL DRAINAGE AND SANITARY SEWER MANHOLE DIAMETERS SHALL BE A MINIMUM OF FOUR (4) FEET AND AS DETERMINED BY THE MANHOLE MANUFACTURER(S), BASED ON THE PIPE CONFIGURATIONS SHOWN ON THESE PLANS AND LOCAL
- MUNICIPAL STANDARDS. 9. ALL STRUCTURES UNDER PAVED AREAS SHALL BE DESIGNED TO MEET HS-20 TRUCK LOAD.
- 10. WATER LINES SHALL BE COORDINATED WITH THE POQUONNOCK BRIDGE FIRE DEPARTMENT, THE GROTON UTILITIES WATER
- DEPARTMENT AND MEP. 11. IF A GROUND MOUNTED TRANSFORMER SHALL BE REQUIRED IT SHALL BE SCREENED IN ACCORDANCE WITH THE TOWN REGULATIONS AND ADEQUATE ACCESS FOR THE UTILITY COMPANY SHALL BE PROVIDED.

LAYOUT AND MATERIALS NOTES

- 1. THE CONTRACTOR SHALL NOT RELY SOLELY ON ELECTRONIC VERSIONS OF PLANS, SPECIFICATIONS, AND DATA FILES THAT ARE OBTAINED FROM THE DESIGNERS, BUT SHALL VERIFY LOCATION OF PROJECT FEATURES IN ACCORDANCE WITH PAPER COPIES OF THE PLANS AND SPECIFICATIONS THAT ARE SUPPLIED AS PART
- OF THE CONTRACT DOCUMENTS. 2. SYMBOLS AND LEGENDS OF PROJECT FEATURES ARE GRAPHIC REPRESENTATIONS AND ARE NOT NECESSARILY SCALED TO THE ACTUAL DIMENSIONS OR LOCATIONS ON THE DRAWINGS. THE CONTRACTOR SHALL REFER TO THE DETAIL SHEET DIMENSIONS, MANUFACTURERS' LITERATURE, SHOP DRAWINGS AND FIELD MEASUREMENTS OF SUPPLIED PRODUCTS FOR LAYOUT OF THE PROJECT FEATURES.

- 3. DIMENSIONS ARE TO/FROM FACE OF CURB. FACE OF BUILDING. FACE OF WALL, AND CENTER LINE OF PAVEMENT MARKINGS. UNLESS OTHERWISE NOTED ON THESE PLANS.
- PROPOSED BOUNDS AND ANY OTHER EXISTING PROPERTY LINE MONUMENTATION DISTURBED DURING CONSTRUCTION SHALL BE SET OR RESET BY A PROFESSIONAL LICENSED SURVEYOR.
- THE CONTRACTOR SHALL PROVIDE TEMPORARY BITUMINOUS PATCH FOR ANY TRENCH WORK WITHIN PAVEMENT OR SIDEWALK AREAS IN PUBLIC RIGHTS-OF-WAY UNTIL PERMANENT PATCHING
- CURBING SHALL BE PRECAST CONCRETE CURB (PCC) WITH A 3-FT RADIUS (3'R), UNLESS OTHERWISE NOTED ON THE PLANS.

- WITHIN THE LIMIT OF WORK/DISTURBANCE, THE CONTRACTOR SHALL CLEAR AND GRUB ALL EXISTING VEGETATION AND STOCKPILE AND SCREEN TOPSOIL FOR RE-USE IN LANDSCAPE AREAS. THE CONTRACTOR SHALL ALSO REMOVE AND DISPOSE OF ALL EXISTING MANMADE FEATURES, INCLUDING BUT NOT LIMITED TO BUILDINGS, STRUCTURES, PAVEMENTS, SLABS, CURBING, WALLS, FENCES, UTILITIES (BOTH OVERHEAD AND UNDERGROUND),
- SIGNS, ETC., EXCEPT AS OTHERWISE NOTED ON THESE PLANS. WITHIN THE PROPOSED BUILDING ENVELOPE AND TO A DISTANCE OF 10 FFFT AROUND THE BUILDING PERIMETER. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL UNSUITABLE MATERIALS AND SHALL FURNISH AND INSTALL GRAVEL FILL TO THE PROPOSED BUILDING SUBGRADE.
- 3. THE CONTRACTOR SHALL DISPOSE OF ALL MATERIALS OFF-SITE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS.
- 4. THE EXTENT OF DEMOLITION DEPICTED ON THESE PLANS IS INTENDED TO AID THE CONTRACTOR IN BIDDING THE PROJECT AND IS NOT NECESSARILY INTENDED TO DEPICT EACH AND EVERY ELEMENT OF DEMOLITION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE FULL EXTENTS OF THE DEMOLITION WORK PRIOR TO CONTRACT AWARD AND SHALL NOT BE COMPENSATED FOR UNFORESEEN CONDITIONS ONCE THE WORK HAS COMMENCED.
- EXISTING UTILITIES SHALL BE TERMINATED IN CONFORMANCE WITH APPLICABLE FEDERAL, STATE, LOCAL, AND SERVICE PROVIDER
- 6. UNLESS OTHERWISE SPECIFICALLY PROVIDED ON THESE PLANS. THE ENGINEER HAS NOT PREPARED PLANS FOR THE DISCOVERY, REMOVAL, ABATEMENT, OR DISPOSAL OF ANY HAZARDOUS OR TOXIC MATERIALS FOUND DURING CONSTRUCTION.

OPERATION AND STORMWATER MAINTENANCE:

- THE FOLLOWING MAINTENANCE AND OPERATION PLAN APPLIES TO THE PROPOSED SITE DEVELOPMENT FOR SOURCE CONTROL AND POLLUTION PREVENTION AND TO ASSURE THAT THE BMPS CONTINUE TO FUNCTION TO REMOVE OIL AND GREASE, FLOATABLE DEBRIS, AND TSS. THE GOAL OF THIS SECTION IS TO INFORM PROPERTY MANAGERS ABOUT SYSTEM OPERATIONS AND WHAT MAINTENANCE IS NECESSARY TO PROTECT CRITICAL AREAS FROM POLLUTANTS POTENTIALLY ASSOCIATED WITH STORMWATER RUNOFF FROM THE SITE. THE PROPERTY OWNERS OR THEIR ASSIGNED AGENT WILL BE RESPONSIBLE FOR MAINTAINING THE STORMWATER MANAGEMENT SYSTEM. ULTIMATELY, THE PROPERTY OWNER IS RESPONSIBLE FOR ALL STORMWATER MAINTENANCE.
- 1. <u>SYSTEM COMPONENTS</u> THE STORMWATER MANAGEMENT SYSTEM HAS SEVERAL MAJOR COMPONENTS; EACH DESIGNED IN ACCORDANCE WITH LOCAL AND STATE REGULATIONS TO TREAT STORMWATER RUNOFF QUANTITY AND QUALITY, AS FOLLOWS AND SHOWN ON THE PLAN SET: <u>UNDERGROUND ISOLATOR ROWS AND STORMTECH INFILTRATION SYSTEM ARE UNDERGROUND CHAMBERS THAT WHICH CREATE A</u> VOLUME THAT TEMPORARILY STORES STORM WATER DURING STORM EVENTS. THE SYSTEM FUNCTIONS TO REDUCE PEAK DISCHARGE RATES AND PROTECT DOWNSTREAM PROPERTIES AND NATURAL FEATURES FROM POTENTIAL ADVERSE WATER QUALITY THROUGH TREATMENT OF THE FIRST FLUSH FROM RAINFALL EVENTS AND MANAGEMENT OF LARGER STORM FLOWS. FOR THIS PROJECT, THE ISOLATOR ROWS PROVIDES PRETREATMENT PRIOR TO THE REMAINDER OF THE UNDERGROUND STORMTECH SYSTEM.

2. <u>SYSTEM MAINTENANCE</u>

- a. PRETREATMENT DEVICES SHOULD BE INSPECTED AND CLEANED AT LEAST TWICE A YEAR.
- b. FOR THE FIRST FEW MONTHS AFTER CONSTRUCTION. STORMWATER STRUCTURES SHOULD BE INSPECTED AFTER EVERY MAJOR STORM. INSPECTIONS SHOULD FOCUS ON THE DURATION OF STANDING WATER, PONDING WATER AFTER 48 HOURS INDICATES THAT THE BOTTOM OF THE STRUCTURE MAY BE CLOGGED. IF THE BOTTOM OF THE STRUCTURE BECOMES CLOGGED, ALL OF THE MATERIAL MUST BE REMOVED AND REPLACED WITH NEW MATERIAL.
- c. AFTER THE FIRST FEW MONTHS OF OPERATION, MAINTENANCE SCHEDULES FOR STORMWATER PRACTICES SHOULD BE BASED ON FIELD OBSERVATIONS, ALTHOUGH INSPECTIONS SHOULD BE PERFORMED AT LEAST TWICE PER YEAR. OBSERVATIONS SHOULD INCLUDE CHECKING FOR ACCUMULATED SEDIMENT. LEAVES AND DEBRIS IN THE PRETREATMENT DEVICE. CLOGGING OF INLET AND OUTLET PIPES, AND PONDED WATER INSIDE OF THE STRUCTURE.
- d. LEVEL SPREADER SHALL BE INSPECTED AND CLEARED OF ANY VEGETATION MAKING SURE THAT NO DEBRIS OR ROOT MASSES ARE COMPROMISING ITS FUNCTIONALITY.
- e. PARKING LOTS AND DRIVES SHALL BE SWEPT A MINIMUM OF TWICE PER YEAR (SPRING AND FALL).
- f. CATCH BASIN SUMPS SHALL BE INSPECTED ON A REGULAR BASIS (AT LEAST TWICE PER YEAR) AND SEDIMENT WILL BE REMOVED AS NECESSARY (A MINIMUM OF ONCE PER YEAR TO ENSURE FUNCTION OF SYSTEM UTILIZING A VACUUM TRUCK).
- a. THE COLLECTION SYSTEM PIPES SHALL INSPECTED AT SIX-MONTH INTERVALS. REGULAR MAINTENANCE INCLUDES THE FOLLOWING ITEMS:
- INSPECTION OF OUTLET TO ENSURE THEY ARE NOT - CHECKING OUTLETS FROM THE DRAINAGE SYSTEM ARE CLEAR AND NOT ERODING.
- REMOVING PAPER AND DEBRIS FROM INSIDE THE BASIN. I. ISOLATOR ROWS SHALL BE INSPECTED A MINIMUM OF TWICE A YEAR. CLEAN OUT IS REQUIRED WHEN SEDIMENT DEPTH EXCEEDS 3". ALL OIL SLUDGE, SEDIMENT, SOLIDS, TRASH, AND OTHER DEBRIS SHALL BE REMOVED USING JETVAC MAINTENANCE EQUIPMENT. CARE SHOULD BE TAKE TO AVOID TEARING THE FILTER FABRIC OR REMOVING ANY CRUSHED
- STONE WHEN THE SEDIMENT IS REMOVED. m. ALL TRASH WILL BE CONTAINED WITHIN THE BUILDING UNITS AND SHALL BE BROUGHT TO THE ROADSIDE AS REQUIRED FOR PICKUP. ALL TRASH WILL BE COLLECTED ON A REGULAR BASIS AND DISPOSED OF LEGALLY OFF SITE.
- n. THERE WILL BE NO OUTDOOR STORAGE OF HAZARDOUS CHEMICALS. FERTILIZERS, PESTICIDES, OR HERBICIDES ANYWHERE AT THE FACILITY.

STORMWATER NOTE

1. THE DESIGN ENGINEER OF RECORD SHALL PROVIDE INSPECTION SERVICES AND CERTIFY TO THE CONSTRUCTION OF STORMWATER MANAGEMENT IMPROVEMENTS TO ENSURE COMPLIANCE WITH DESIGN SPECIFICATIONS. AS-BUILT DRAWINGS SHALL BE PROVIDED AND CERTIFIED BY A LICENSED PROFESSIONAL ENGINEER FOR ALL DRAINAGE IMPROVEMENTS.

EROSION CONTROLS/CONSTRUCTION SEQUENCING

- PRIOR TO THE START OF CONSTRUCTION OF ANY EARTHWORK ACTIVITIES, THE CONTRACTOR SHALL NOTIFY ALL APPLICABLE AGENCIES AND INSTALL THE EROSION CONTROL MEASURES SHOWN ON THESE PLANS IN ACCORDANCE WITH ALL FEDERAL STATE, AND LOCAL PERMITS PERTAINING TO THIS PROJECT. AS PART OF THE TOWN PERMITS, TOWN OF STONINGTON STAFF SHALL BE NOTIFIED AFTER EROSION CONTROLS ARE INSTALLED PRIOR TO START OF CONSTRUCTION TO INSPECT SEDIMENT/EROSION CONTROL MEASURES.
- 2. THE CONTRACTOR SHALL KEEP A COPY OF THE "SOIL EROSION AND SEDIMENTATION CONTROL PLAN" (SESC) AND THE APPROVED PLAN SET AT THE CONSTRUCTION SITE AT ALL
- 3. THE CONTRACTOR SHALL INSTALL ALL EROSION AND SEDIMENTATION (E&S) CONTROL MEASURES SHOWN ON THE PLAN SET IN ACCORDANCE WITH THE MOST RECENT EDITION OF THE "CONNECTICUT GUIDELINES FOR SOIL EROSION AND
- SEDIMENT CONTROL." 4. THE CONTRACTOR SHALL BE RESPONSIBLE TO MAINTAIN AND/OR UPGRADE THESE MEASURES, AS NECESSARY, THROUGHOUT CONSTRUCTION. TO MEET THE REQUIREMENTS OF ALL RELATED PERMITS FOR THE PROJECT.
- THE CONTRACTOR SHALL PREPARE AND MAINTAIN A RED-LINED COPY OF THE SESC PLAN SHOWING INTENDED AREAS FOR STAGING, STOCKPILING, WASHOUT, SOLID WASTE CONTAINMENT CONSTRUCTION ENTRANCE/EXIT AND TEMPORARY SEDIMENTATION CONTROL AREAS. ALL SUCH AREAS SHALL BE LOCATED OUTSIDE OF REGULATED WETLAND AREAS OR AREAS INTENDED FOR INFILTRATION PRACTICES.
- 6. EROSION CONTROL DEVICES a. AT LEAST ONE STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE INSTALLED FOR ACCESS TO THE PROJECT B CONSTRUCTION VEHICLES. THE CONSTRUCTION ENTRANCE SHALL BE INSTALLED BEFORE CONSTRUCTION VEHICLES WILL BE ALLOWED TO ENTER THE CONSTRUCTION SITE ADDITIONAL ENTRANCES/EXITS SHALL BE INSTALLED, IF MORE THAN ONE ACCESS POINT IS ANTICIPATED BY THI CONTRACTOR. A WASH OUT PAD MAY ALSO BE INSTALLED
- TO WASH CONSTRUCTION VEHICLES EXITING THE SITE. b. ROADS ADJACENT TO THE CONSTRUCTION SITE SHALL BE CLEAN AT THE END OF EACH WORK DAY.
- c. TEMPORARY SEDIMENT TRAPS MAY BE EXCAVATED OR BERMED/HAYBALED AND SHALL BE SIZED IN ACCORDANCE WITH THE "CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL" DISCHARGE LOCATION FROM THESE BASINS SHALL BE STABILIZED TO PREVENT EROSION.
- STRAW WATTLE AND/OR SILT SACKS SHALL BE INSTALLED AT ALL DOWN-GRADIENT CATCH BASINS WITHIN THE LIMIT OF WORK TO CONTROL EROSION AND SEDIMENTATION AND TO PROTECT OFF-SITE AREAS. THESE DEVICES SHALL BI INSTALLED AS SHOWN ON THE SOIL EROSION SEDIMENT CONTROL PLAN PRIOR TO INITIATION OF MAJOR SITE WORK ACTIVITIES AND SHALL BE MAINTAINED/REPAIRED UNTIL FINAL STABILIZATION OF ALL DISTURBED AREAS.
- e. SILT FENCE SHALL BE INSTALLED AROUND ALL EARTH ALL OTHER EROSION CONTROL DEVICES SHOWN ON THESE
- PLANS SHALL BE IN ACCORDANCE WITH THE "CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENTATION THE EROSION CONTROL MEASURES SHOWN ON THESE PLANS
- ARE INTENDED TO BE THE MINIMUM NECESSARY AT THE START OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE TO MAINTAIN AND SUPPLEMENT THESE EROSION CONTROLS, AS NECESSARY THROUGHOUT CONSTRUCTION, TO PREVENT DAMAGE TO WETLANDS AND/OR SURROUNDING PROPERTIES.
- THE CONTRACTOR SHALL PREVENT DUST, DEBRIS, SEDIMENTS FROM LEAVING THE SITE DURING CONSTRUCTION AND SHALL RE RESPONSIBLE TO REPAIR CLEAN LIP OR TAKE OTHER CORRECTIVE ACTION IMMEDIATELY OR NO LATER THAN 24 HOURS AFTER ANY ISSUE ARISES.
- a. THE CONTRACTOR SHALL LIMIT THE AMOUNT OF EXPOSED SOIL BY PHASING CONSTRUCTION AS NECESSARY TO REDUCE THE AREA OF LAND DISTURBED AT A TIME AND UTILIZE STABILIZATION MEASURES AS SOON AS POSSIBLE. b. THE CONTRACTOR SHALL MAINTAIN AS MUCH OF THE NATURAL VEGETATION AS PRACTICABLE.
- c. THE CONTRACTOR SHALL IDENTIFY AND ADDRESS SOURCES OF DUST GENERATED BY CONSTRUCTION ACTIVITIES CONTRACTOR SHALL LIMIT CONSTRUCTION TRAFFIC PREDETERMINED ROUTES. PAVED SURFACES REQUIRE MECHANICAL SWEEPERS TO REMOVE SOIL THAT HAS BEEN DEPOSITED OR TRACKED ONTO THE PAVEMENT, ON UNPAVED TRAVELWAYS AND TEMPORARY HAUL ROADS, USE ROAD CONSTRUCTION STABILIZATION MEASURES AND/OR WATER AS NEEDED TO KEEP SURFACE DAMP STATIONARY SOURCES OF DUST SHALL USE FINE WATER SPRAYS TO CONTROL DUST IF WATER IS EXPECTED TO BE NEEDED FOR DUST CONTROLS, IDENTIFY THE SOURCE OF WATER IN ADVANCE.
- THE CONTRACTOR SHALL IDENTIFY AND ADDRESS SOURCES OF WIND GENERATED DUST. CONTRACTOR SHALL PROVIDE SPECIAL CONSIDERATION TO HILL TOPS AND LONG REACHES OF OPEN GROUND WHERE SLOPES MAY BE EXPOSED TO HIGH WINDS. CONSIDER BREAKING UP LONG REACHES WITH TEMPORARY WINDBREAKS CONSTRUCTED FROM BRUSH PILES. GEOTEXTILE SILT FENCES OR HAY BALES. SLOPES SHALL BE STABILIZED EARLY. WHEN USED, MULCH FOR SEED SHALL REQUIRE ANCHORING.
- e. THE CONTRACTOR SHALL CONSIDER WATER QUALITY WHEN SELECTING THE METHOD AND/OR MATERIALS USED FOR
- THE CONTRACTOR SHALL CONTROL CONSTRUCTION STORMWATER RUNOFF IN SUCH A MANNER AS TO PREVENT DAMAGE TO DOWN-GRADIENT PROPERTIES; ANY PROPERTIES SO DAMAGED SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
- 10. THE CONTRACTOR SHALL INSPECT ALL EROSION CONTROL DEVICES ON A WEEKLY BASIS AND WITHIN 12 HOURS AFTER A RAINFALL EVENT. THE CONTRACTOR SHALL IMMEDIATELY REPAIR DAMAGED DEVICES AND SHALL REMOVE ACCUMULATED SEDIMENTS IN ACCORDANCE WITH LOCAL REQUIREMENTS AND PERMITS, WHEN APPLICABLE. ACCUMULATED SEDIMENTS SHALL BE REMOVED FROM THE SITE OR PLACED AWAY FROM WETLANDS AND CLOSED DRAINAGE SYSTEMS.
- . THE CONTRACTOR SHALL MAKE EVERY EFFORT TO PERFORM EARTHWORK IN PHASES THAT ALLOW FOR STABILIZATION OF THESE AREAS IN A RELATIVELY SHORT TIME PERIOD AND TO DISCOURAGE EROSION AND SEDIMENTATION. ANY EXPOSED SOILS INTENDED TO REMAIN FOR MORE THAN 14 DAYS SHALL BE STABILIZED WITH MULCH, OR TEMPORARY SEED AND WATERED TO ENCOURAGE VEGETATION.
- 12. THE CONTRACTOR SHALL INSTALL PERMANENT SEEDING BETWEEN APRIL 15TH AND JUNE 15TH AND/OR AUGUST 15TH TO OCTOBER 15TH. 13. THE CONTRACTOR SHALL APPLY PERMANENT SOIL STABILIZATION
- MEASURES TO ALL GRADED AREAS WITHIN SEVEN (7) DAYS OF ESTABLISHING FINAL GRADE. 14. THE CONTRACTOR SHALL PERFORM A FINAL INSPECTION OF ALL EXISTING CATCH BASINS, DRAINAGE PIPING, AND ASSOCIATED
- DRAINAGE STRUCTURES WITHIN THE PROJECT LIMITS TO ENSURE THAT ALL SEDIMENTS HAVE BEEN REMOVED BEFORE WORK IS DEEMED COMPLETE. A FORMAL FINAL INSPECTION REPORT SHALL BE FURNISHED TO TOWN STAFF 15. ANY AND ALL DEFERRED MAINTENANCE SHALL BE ADDRESSED
- PRIOR TO THE CLOSE OF CONSTRUCTION (CLEARING OF DEBRIS, REMOVAL OF ACCUMULATED SEDIMENT, REMOVAL OF TREES AND VEGETATION, ANY RECONSTRUCTION REQUIRED, ETC.). 16. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL SESC MEASURES ONLY AFTER FINAL PAVEMENT IS PLACED AND

VEGETATION IN LANDSCAPE AREAS IS WELL ESTABLISHED.

Isolator Row® Operation, Maintenance, and **Management Inspection Checklist**

Location: Site Status Date

MAINTENANCE ITEM	SATISFACTORY/ UNSATISFACTORY	COMMENTS
Debris Cleanout (Semi-annua)	ally, After Major Storms)	
Contributing areas clean of debris		
No dumping of yard wastes into practice		
Litter (branches, etc.) have been removed		
2. Sediment Deposition (Semi-annu	ually, After Major Storms)	
Sedimentation noted		
Sediment cleanout when depth of sediments reaches 3 inches		
3. Flow Diversion Manhole (Semi-an	nually, After Major Storms	·)
Good condition, no need for repair		
No evidence of any blockages		

Actions to be Taken:

Infiltration System Operation, Maintenance, and

Management Inspection Checklist

Project: Location

Site Status:

Inspector

	MAINTENANCE ITEM	SATISFACTORY/ UNSATISFACTORY	COMMENTS		
1.	Debris Cleanout (Annual)				
	Trench/chamber or basin surface clear of debris				
	Inflow pipes clear of debris				
	Overflow spillway clear of debris				
	Inlet area clear of debris				
2.	Sediment Traps or Forebays (Annual)				
	Obviously trapping sediment				
	Greater than 50% of storage volume remaining				
3.	Dewatering (Annual)				
	Trench/chamber or basin dewaters between storms				
4.	Sediment Cleanout of Trench/Char	mber or Basin (Annual)			
	No evidence of sedimentation in trench/chamber or basin				
	Sediment accumulation doesn't yet require cleanout				
5.	Inlets (Annual)				
	Good condition				

	MAINTENANCE ITEM	SATISFACTORY/ UNSATISFACTORY	COMMENTS
	No evidence of erosion		
6.	Outlet/Overflow Spillway (Annual)		
	Good condition, no need for repair		
	No evidence of erosion		
7.	Aggregate Repairs (Annual)		
	Surface of aggregate clean		
	Top layer of stone does not need replacement		
	Trench/Chamber or basin does not need rehabilitation		

Actions to be Taken:

PLAN REVISIONS

Pawcatuck, CT 06379

Tel: 860.629.6500

Fax: 860.599.6090

Civil Engineers

Land Surveyors

Land Use Planners

Environmental Engineers

Westerly, RI 0289

Tel: 401.596.7747

www.cherenzia.com

DATE DESCRIPTION 1/25/24 TOWN COMMENTS SETB | SF 3/19/24 TOWN COMMENTS SETB SF 5/3/24 TOWN COMMENTS SETB SE

ISSUED FOR REVIEW

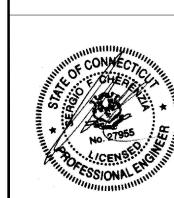
DRAWN BY: SETB

CHECK BY: SFC

Legend & General Notes

FUEL DISPENSING STATION & CONVENIENCE STORE 388 & 390 LONG HILL ROAD 17 BROOKSHAVEN ROAD ASSESSOR'S ID 476, 1389 & 1591 GROTON, CONNECTICUT

> PREPARED FOR AR ENERGY LLC

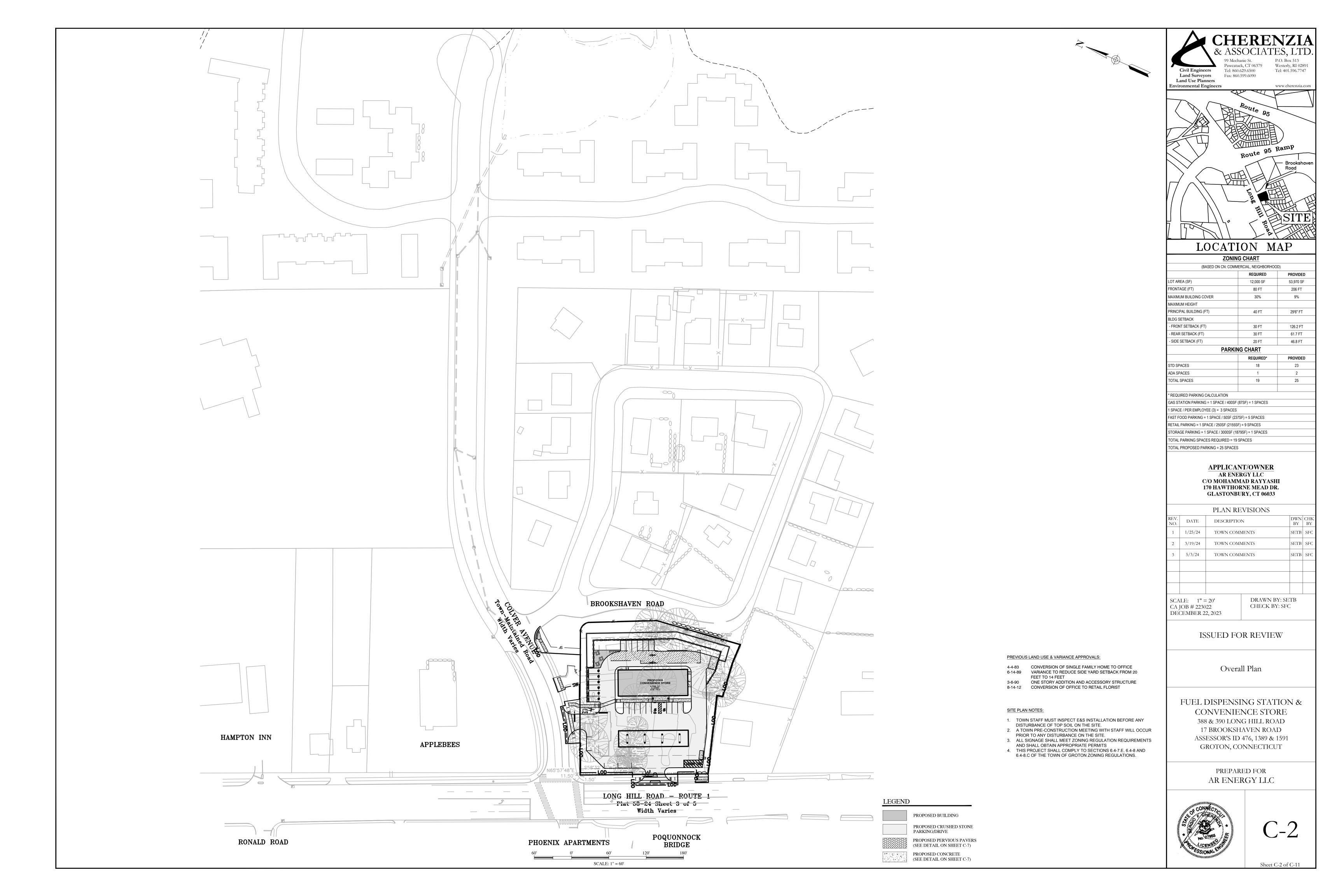


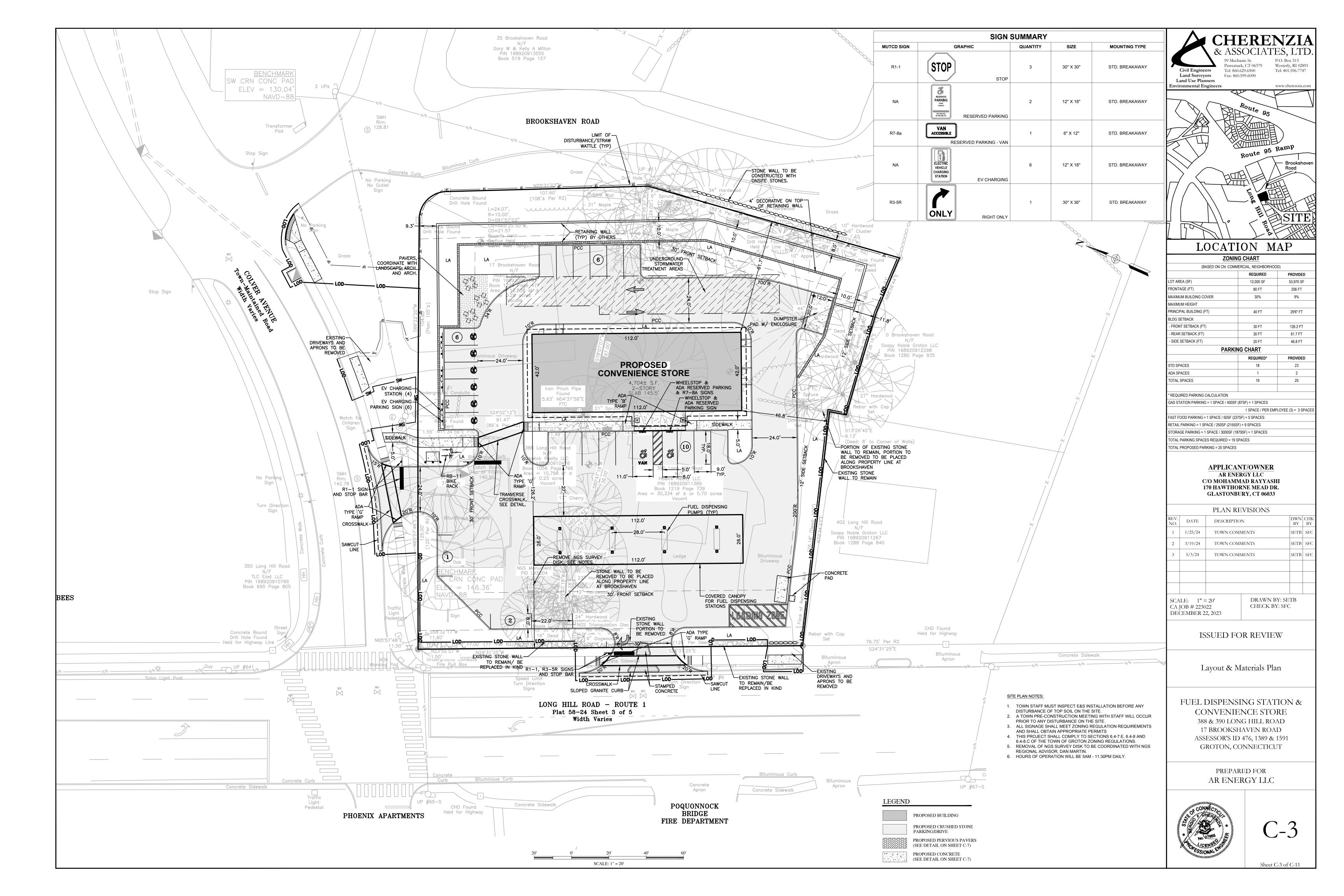
CALE: NTS

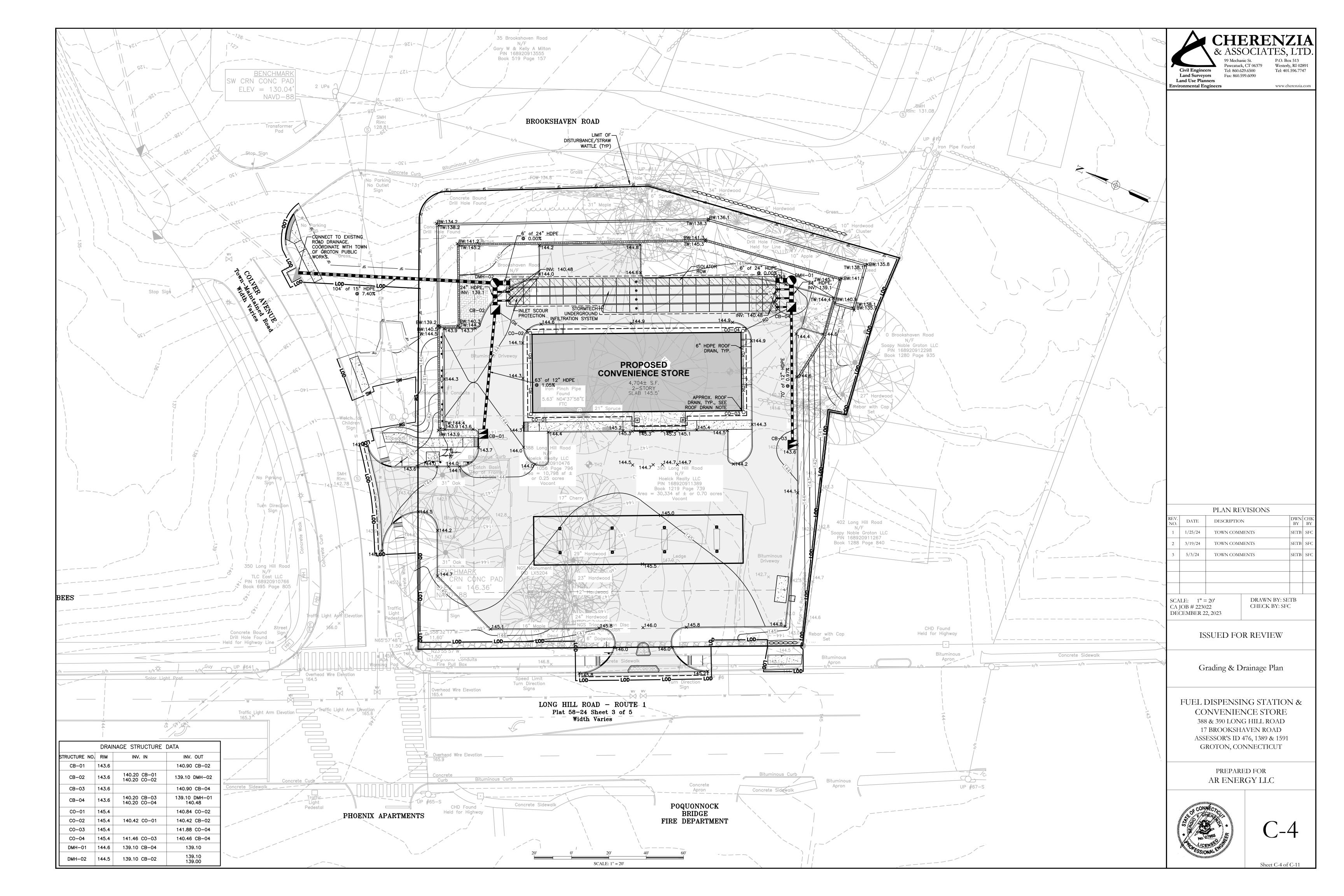
CA JOB # 223022

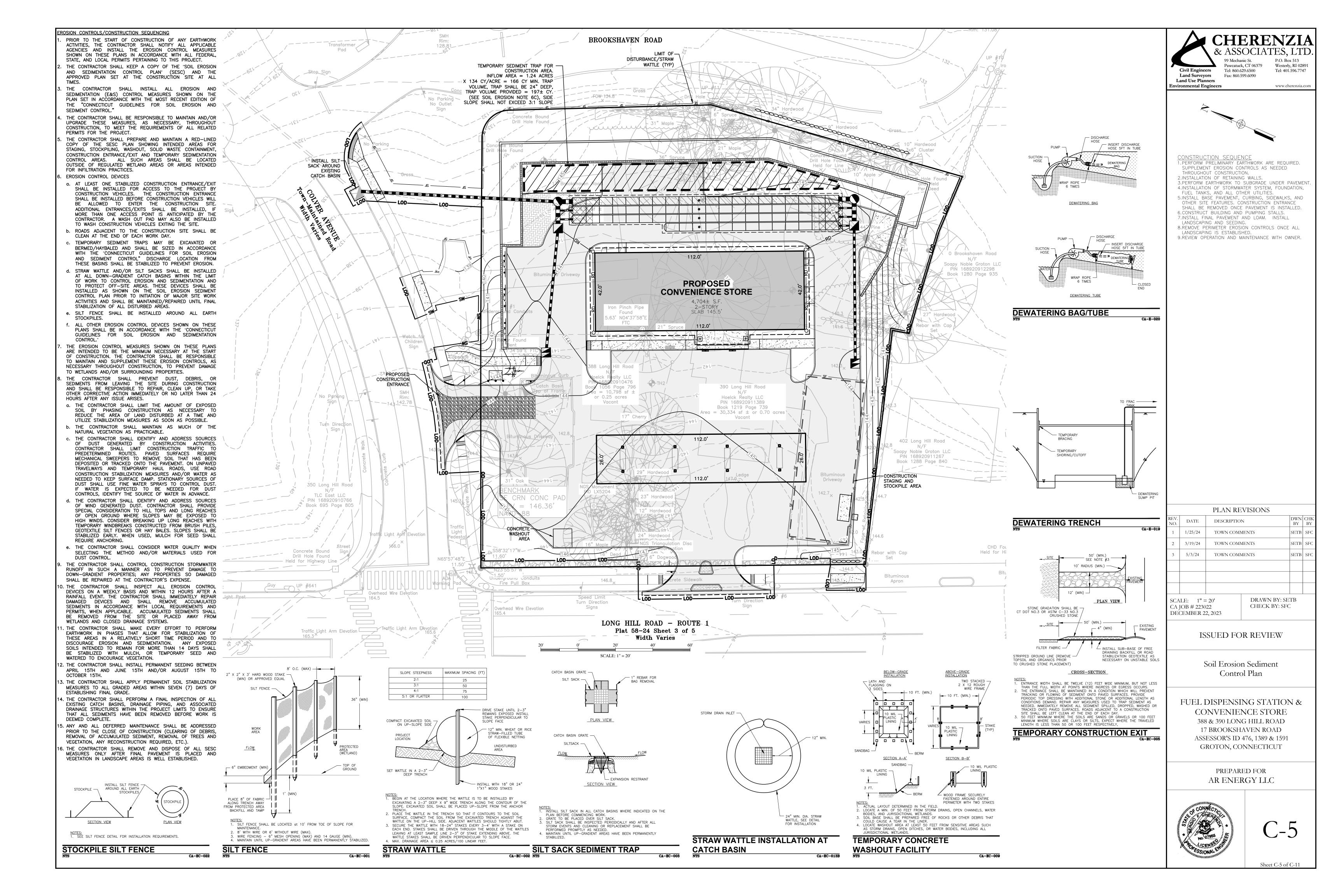
DECEMBER 22, 2023

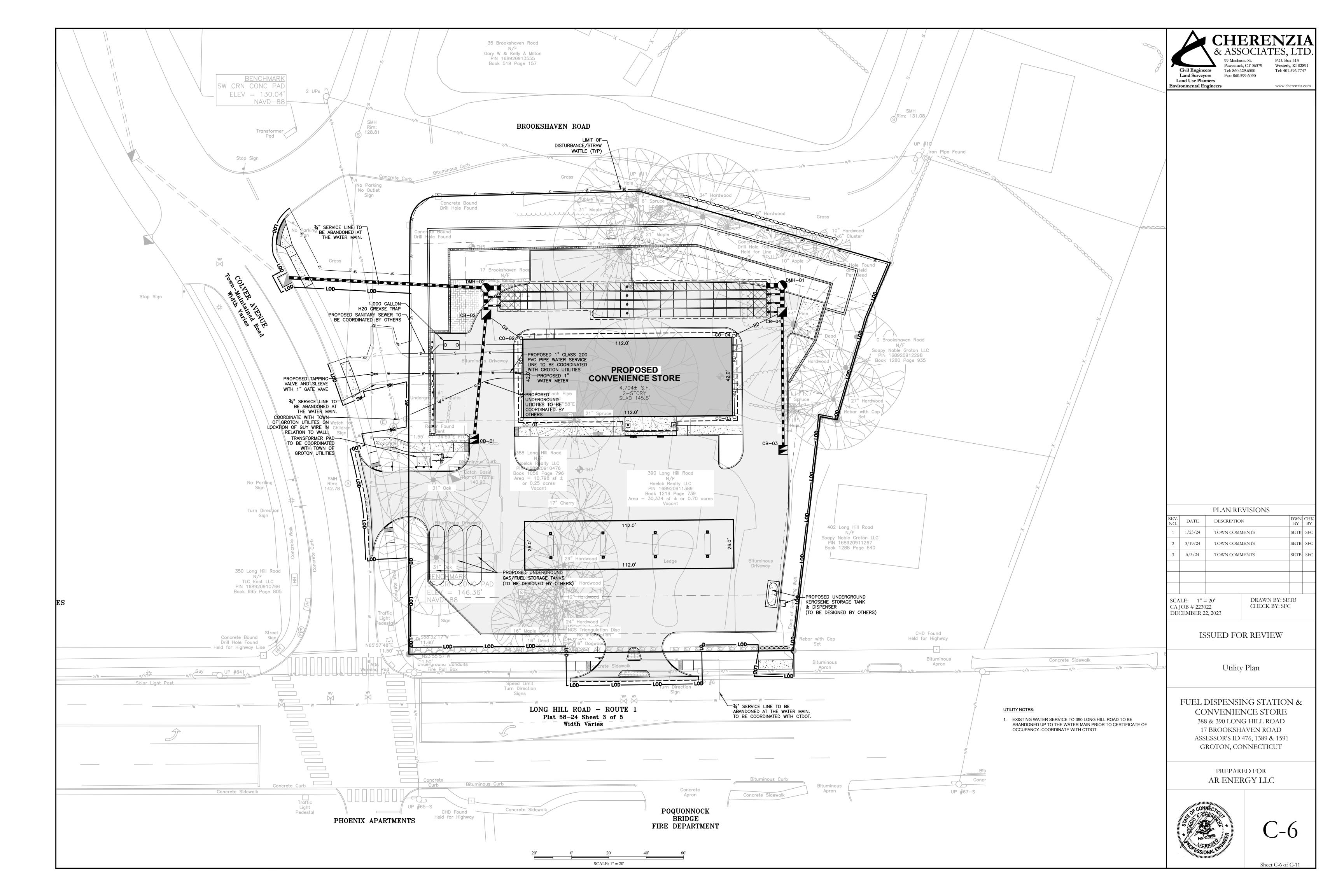
Sheet C-1 of C-11

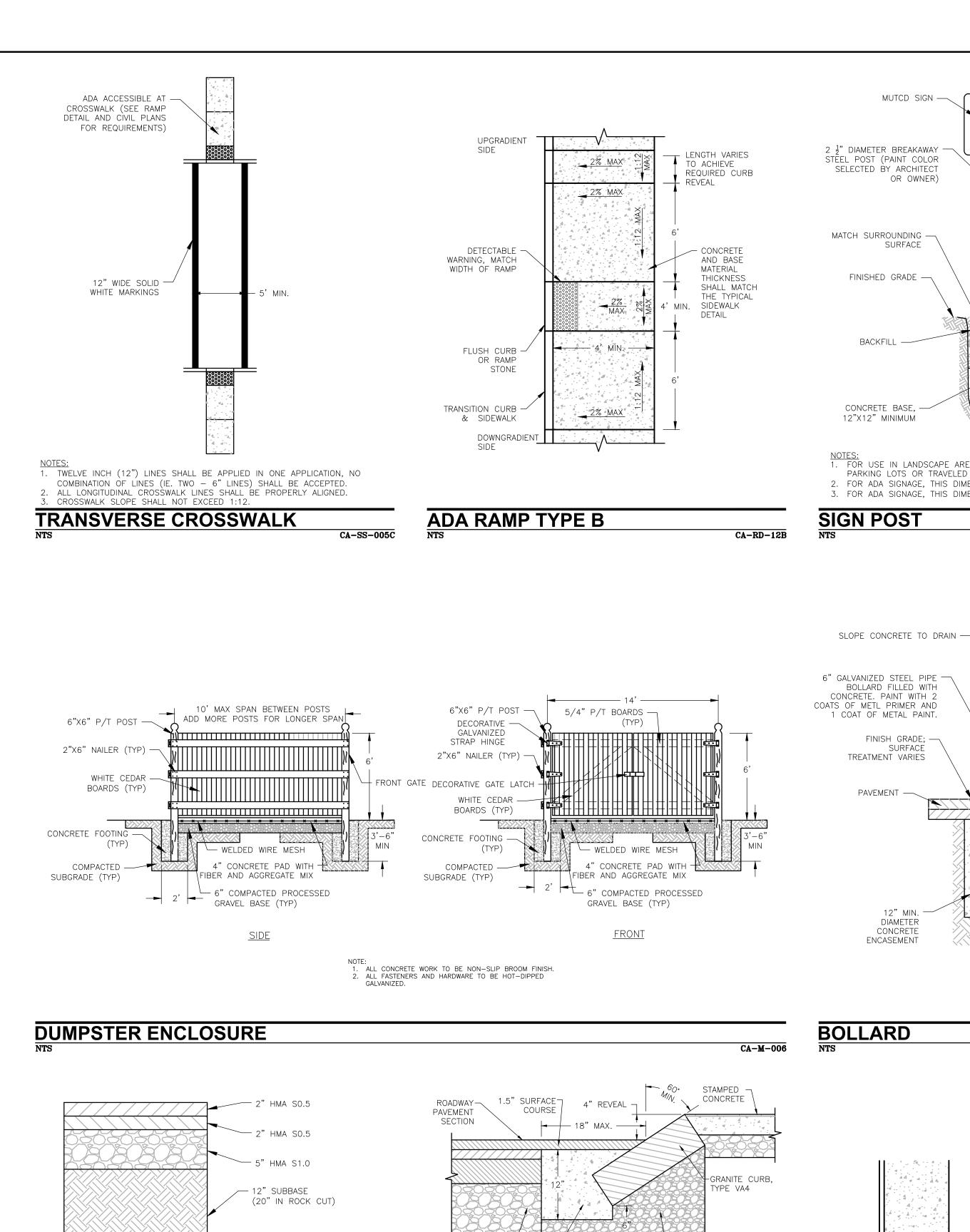












GRAVEL BASE AS-

EXISTING — SUBBASE

REQUIRED

EXISTING -PAVEMENT

ZHIGH EARLY STRENGTH CRUSHED STONE BASE

CA-RD-004A

CA-RD-024

- PROPOSED

PAVEMENT

CONCRETE BASE

SAWCUT -

APPLY JOINT SEAL MATERIAL FILLING FROM THE BOTTOM UP.

THE FINAL APPEARANCE WILL PRESENT A NEAT LINE.

3. THE HOT-SEAL MATERIAL SHALL COMPLETELY FILL THE SAWCUT SUCH THAT

4. CARE SHALL BE TAKE DURING THE SEALING OPERATION TO INSURE THAT

AFTER COOLING THE LEVEL OF THE SEALER WILL NOT BE GRATER THAN \$

SLOPED GRANITE CURB

NOTES:

CLEAN SAWED JOINTS WITH COMPRESSED AIR.

INCH BELOW THE PAVEMENT SURFACE.

PAVEMENT SAWCUT

THICKNESSES SHALL BE INCREASED AS REQUIRED TO MATCH EXISTING ROAD STRUCTURE.

CA-RD-032

— 1.5" BITUMINOUS SURFACE

2.5" BITUMINOUS BINDER

AGGREGATE BASE (PER CT DOT

10" COMPACTED GRAVEL SUBBASE

(PER CT DOT FORM 816 SECTION

CA-RD-001

FORM 816 SECTION M.05.01)

COURSE (CLASS 1)

COURSE (CLASS 1)

6" COMPACTED PROCESS

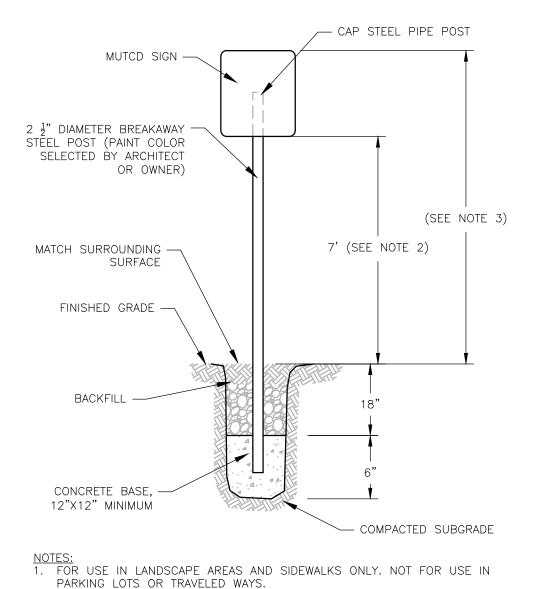
- COMPACTED SUB GRADE

CTDOT BITUMINOUS PAVEMENT

NOTE: MATERIALS SHALL BE PER CT DOT SPECIFICATIONS FORM 816 LATEST

STANDARD DUTY PAVEMENT

EDITION UNLESS DIRECTED OTHERWISE FROM PROJECT AND/OR TOWN ENGINEER



2. FOR ADA SIGNAGE, THIS DIMENSION SHALL BE 5' (MIN.) 3. FOR ADA SIGNAGE, THIS DIMENSION SHALL BE 8' (MAX.)

SIGN POST CA-SS-001

FINISH GRADE; -

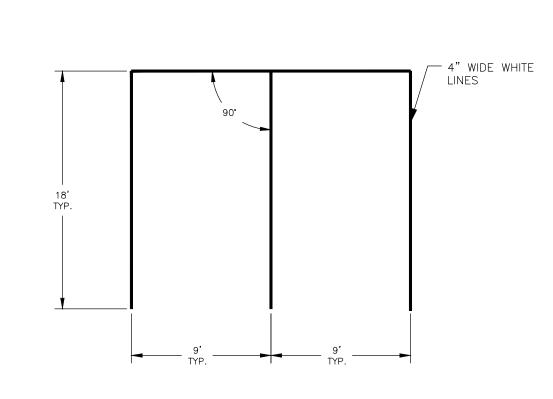
DIAMETER

CONCRETE

ENCASEMENT

PAVEMENT —

SURFACE



1. ALL DIMENSIONS TO CENTER OF 4" PAVEMENT STRIPING. 2. ALL PARKING SPACE STRIPING SHALL BE 4" WIDE SOLID WHITE PAVEMENT MARKINGS UNLESS OTHERWISE NOTED.

BRICK CONCRETE PAVER 9"X4.5"X3.2"

- SWEPT SAND VOIDS

ALLOWING WATER

SWEPT SAND JOINTS

- CAST-IN TABS ALLOW

WATER INFILTRATION

-SAND SWEPT JOINTS

2" COMPACTED MASONS SAND

-5" COMPACTED CRUSHED STONE

5" COMPACTED PROCESSED GRAVEL BASE MATERIAL

- COMPACTED ORIGINAL

 \angle 6 x 6 - W1.4 x W1.4 \longrightarrow COMPACTED SUBGRADE

WELDED WIRE FABRIC

SIDEWALK SLOPE SHALL BE A MIN. OF 1% AND A MAX. OF <2%.

∠ CONCRETE SIDEWALK

CONCRETE SHALL BE MIN. 4,000 P.S.I., TYPE II.

<u>SECTION</u>

3. BROOM FINISH PERPENDICULAR TO CURB OR TRAFFIC PATH.

4. PROVIDE A ½" WIDE EXPANSION JOINT WHERE SIDEWALK MEETS FACE—OF—BUILDING OR OTHER FIXED OBJECT.

PROCESSED GRAVEL BASE

1½" MAX. STONE SIZE

AGGREGATE 1/8"-1" SIZE. INFILTRATION

CA-RD-010

BRICK PAVER

SUB-BASE

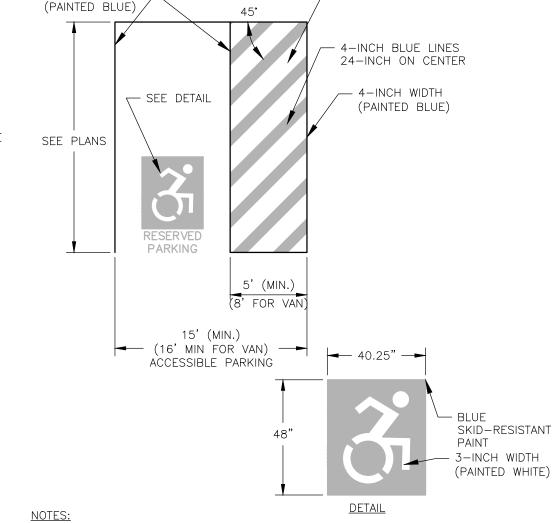
PAVERS TO SPACE FROM

EACH OTHER ALLOWING

INFILTRATION

PARKING SPACES

PERVIOUS PAVING DETAIL



ACCESS AISLE -

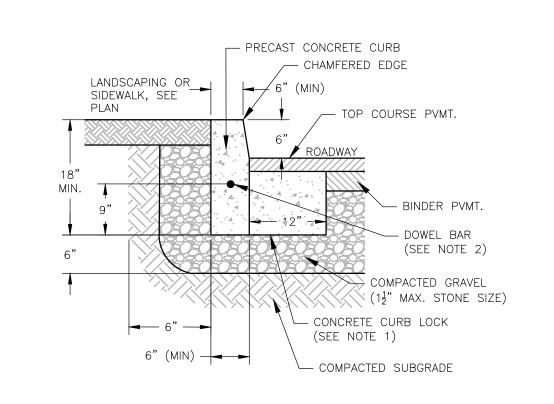
NOTES:

1. ALL DIMENSIONS MEASURED FROM CENTER TO CENTER OF 4-INCH PAVEMENT 2. 8-FOOT STALL WIDTH REFERS TO 8-FEET BETWEEN CENTER LINE OF PAVEMENT 3. ALL SLOPES THROUGHOUT THE ACCESSIBLE PARKING AND AISLE AREAS SHALL

ADA SPACES

4-INCH WIDTH -

CA-SS-004CT



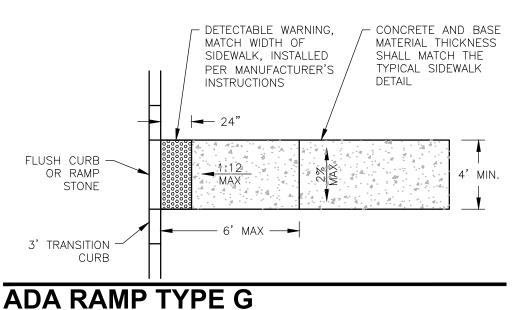
NOTES:

1. 4000 P.S.I. CONCRETE SHALL BE REQUIRED ONLY WHEN THE CURB IS SET AFTER BASE AND/OR BINDER COURSES ARE IN PLACE. WHERE CONCRETE IS NOT REQUIRED, THE GRAVEL SHALL BE BROUGHT UP TO THE BOTTOM OF THE PAVEMENT BASE COURSE.

PRECAST CONCRETE CURB

OF 2" BEYOND CURB SECTION.

CA-RD-003



ADA RAMP TYPE G

CA-RD-12G

2. DOWEL BAR SHALL BE $1\frac{1}{2}$ " x 4" x 4' LONG (MIN.) AND PROJECTING A MIN. 3/19/24

DATE

1/25/24

5/3/24 SETB SF TOWN COMMENTS DRAWN BY: SETB SCALE: N.T.S. CHECK BY: SFC CA JOB # 223022 **DECEMBER 22, 2023**

PLAN REVISIONS

DESCRIPTION

TOWN COMMENTS

TOWN COMMENTS

DWN CHK

BY BY

SETB SF

SETB SF

ISSUED FOR REVIEW

Westerly, RI 02891

www.cherenzia.com

Tel: 401.596.7747

Pawcatuck, CT 06379

Tel: 860.629.6500

Civil Engineers

Land Use Planners

Environmental Engineers

Land Surveyors Fax: 860.599.6090

Site Details 1

FUEL DISPENSING STATION & CONVENIENCE STORE 388 & 390 LONG HILL ROAD 17 BROOKSHAVEN ROAD ASSESSOR'S ID 476, 1389 & 1591

> PREPARED FOR AR ENERGY LLC

GROTON, CONNECTICUT



Sheet C-7 of C-11

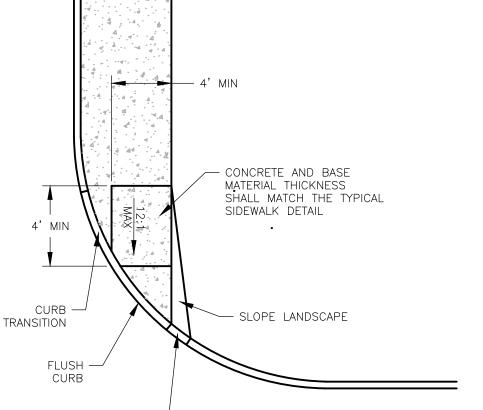
CA-RD-011A

CONCRETE A — A — A — A — D SIDEWALK - CONSTRUCTION JOINT: 1/2" PREMOLDED BITUMINOUS $\stackrel{\textstyle \sim}{}$ construction joint: EXPANSION JOINT SEALANT (1" DEEP) 1/2" PREMOLDED BITUMINOUS EXPANSION JOINT SEALANT <u>PLAN</u> 4' 4' 28'

1-1/2" CLEAR —

COMPACTED SUBGRADE

CA-M-004

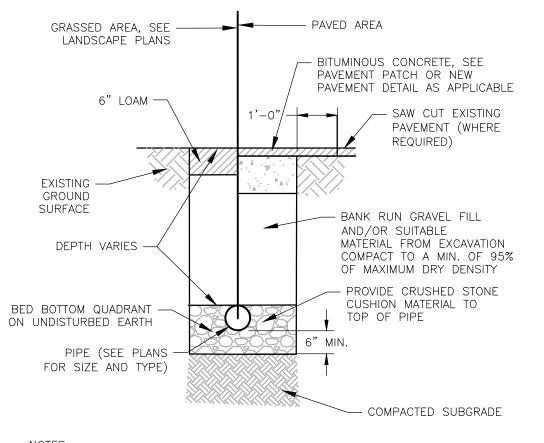


CURB

2' TRANSITION -

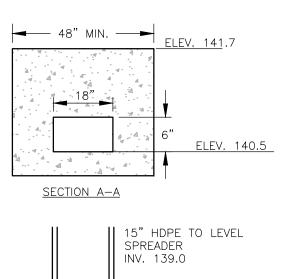
ADA RAMP TYPE F CA-RD-12F

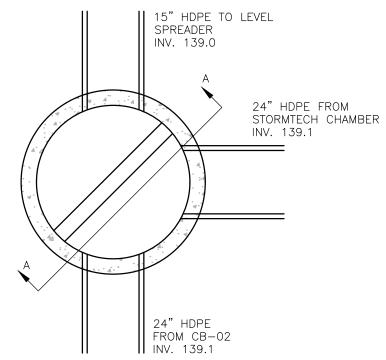
CONCRETE SIDEWALK



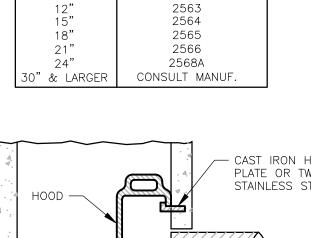
- 1. WIDTH (W) OF TRENCH IS EQUAL TO THE INSIDE DIAMETER OF THE PIPE
- PLUS 12". 2. SOIL UNDER CRUSHED STONE FOUNDATION SHALL BE UNDISTURBED AND COMPACTED WITH SEVERAL PASSES OF A VIBRATORY PLATE COMPACTOR.
- 3. CRUSHED STONE FOUNDATION 34" MAXIMUM SIZE, SHALL BE PLACED 6" UNDER THE PIPE AND UP TO THE PIPE GRADE, THE PIPE LAID THEREON, CRUSHED STONE PULLED AGAINST THE PIPE SIDES TO FIRMLY HOLD THE
- PIPE IN PLACE. 4. CRUSHED STONE HAUNCHING 3/4" MAXIMUM SIZE SHALL BE BROUGHT LEVEL TO THE TOP OF THE PIPE AND OUT TO THE TRENCH WALL AT THIS ELEVATION FOR ALL PIPES.

UTILITY TRENCH CA-U-004

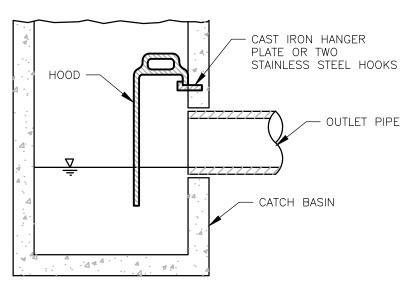




DMH-02 WEIR MANHOLE CA-D-030



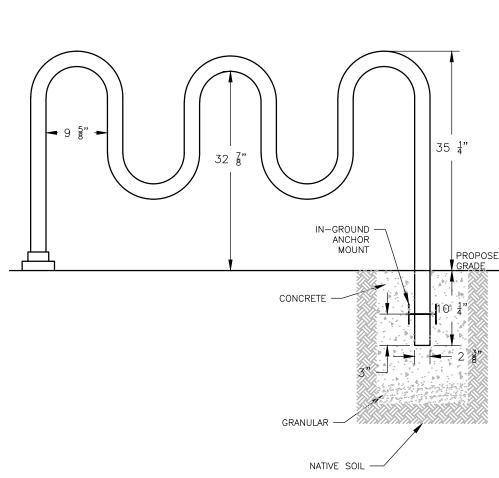
PIPE SIZE PATTERN NUMBER *



USE CAST IRON HOOD FOR PIPE SIZES UP TO 24". USE GALVANIZED FABRICATED STEEL HOOD FOR PIPE SIZES 24" AND LARGER. * CAMPBELL FOUNDRY CO. PATTERN NUMBERS.

CATCH BASIN HOOD

CA-D-001D



NOTE:

1. ALL STANDARD UNITS MADE FROM ASTM A53/A500 SCH 40 STEEL PIPE, HYDAULICALLY BENT WITH MODRIL, HOT-DIPPED GALVANIZED POST FABRICATION.

2. RIBBON AVAILABLE IN ASTM A312 SCHEDULE 40 TP 304 STAINLESS STEEL.

CAP UNIT ADHERE -TO TOP UNIT W/ VERSA-LOK (OR

CONCRETE ADHESIVÉ

MODULAR CONCRETÉ

VERSA-LOK (OR

EQUIVALENT)

FACING UNITS

GRANULAR LEVELING -

BY OTHERS

CLEANOUT

RISER

SECTION(S)

AS REQ'D.

MONOLITHIC

BASE SECTION

CLEAN-OUT PLUG -

CONCRETE PAD -

2 FT x 2 FT

BY GENERAL

CONTRACTOR

8" CRUSHED -

% BEND −

STONE BASE

CONCENTRIC CONE SECTION

SEE ALTERNATE TOP SLAB

(ABOVE) OR ECCENTRIC CONE

SECTION ON DMH DETAIL

8" 24" 8" ACCESS 8"

48" DIA.

NOTES:

1. ALL SECTIONS SHALL BE DESIGNED FOR HS—20 LOADING.

SINGLE/DOUBLE CATCH BASIN

PIPE. MORTAR ALL PIPE CONNECTIONS.

(MIN.)

4' (MIN)

2. PROVIDE OPENINGS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF

3. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL

PAD MIN. 6" THICK

EQUIVALENT)

RB-11 BICYCLE RACK

DRAINAGE

AGGREGATE

12" THICK

MINIMUM

PIPE OUTLET

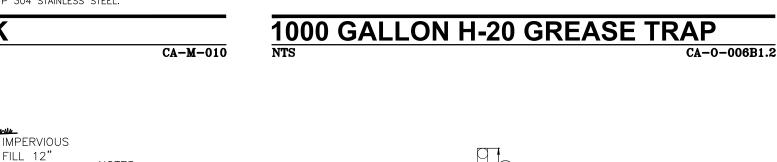
WALL OR @

40' CENTERS

@ END OF

MAXIMUM

RETAINING WALL - UNREINFORCED



CONTRACTOR TO

PROVIDE A

STRUCTURAL

DESIGN TO THE

CLIENT AND REVIEWING

ENGINEER FOR

CONSTRUCTION.

LANDSCAPE AREA

- COMPACTED SUBGRADE

- COVER TO GRADE

24" SQUARE OPENING FOR SINGLE GRATE CATCH BASIN. 24" X 48" OPENING FOR

DOUBLE GRATE CATCH BASIN.

ALTERNATE TOP SLAB

OR EQUIVALENT, 225 SQ.IN.

FINISH GRADE

WITH MORTAR

CONNECTION

SEE NOTE 2

— COMPACTED GRAVEL

COMPACTED

SUBGRADE

- SEE NOTE 4

— SEE NOTE 3

- RIDOT 6.3.0 FRAME AND GRATE

MIN. OPEN AREA PER GRATE

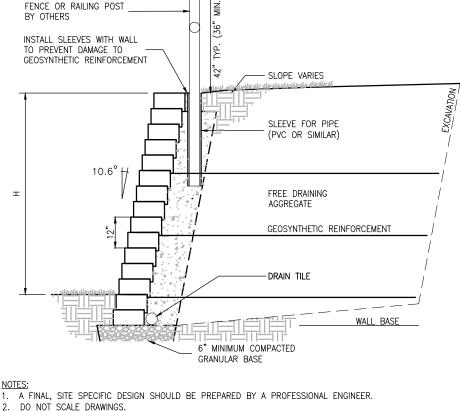
APPROVAL PRIOR

CA-M-012B

CA-D-008

STAMPED.

5'-2.75"



PLAN VIEW

CROSS SECTION VIEW

. CHAMBER IS DESIGNED FOR H-20 LOADING WITH 18" OF SOIL COVER.

2. ALL INLETS AND OUTLETS SHALL HAVE WATER TIGHT STATE APPROVED SEALS.

ALL JOINTS SEALED WITH BUTYL RUBBER SEALANT.

4. APPROXIMATE TANK WEIGHT: 14,300 IBS

5. UNITED CONCRETE OR APPROVED EQUAL

OPENING

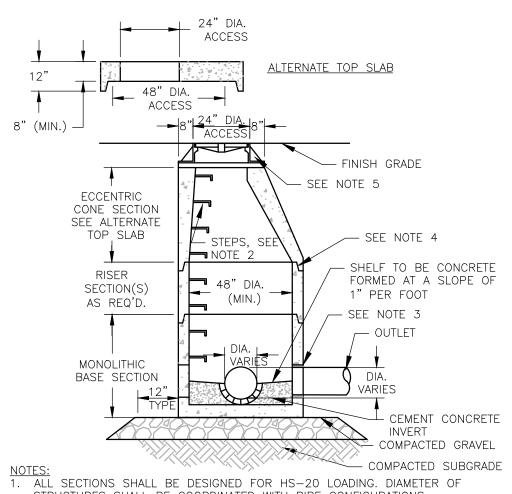
3'-10.5"

- NOTES:

 1. A FINAL, SITE SPECIFIC DESIGN SHOULD BE PREPARED BY A PROFESSIONAL ENGINEER. . DO NOT SCALE DRAWINGS. 3. EXCAVATE AREA TO LINE AND GRADES AS SHOWN ON CONSTRUCTION DRAWINGS.
 4. SUBGRADE TO BE FIRM, UNDISTURBED AND COMPACTED TO 95 % S.P.D.
 5. BASE MATERIAL SHALL BE GRANULAR A COMPACTED TO 98% S.P.D. AND GRADED TO PROVIDE LEVEL GRANULAR
- SURFACE ON WHICH TO PLACE THE FIRST COURSE OF UNITS. MINIMUM THICKNESS 6" (150 MM.) 6. PLACE FIRST COURSE MINIMUM OF 8" (200 MM) BELOW FINISHED GRADE, WITH THE FRONT EDGES TIGHT TOGETHER. 7. FILL CAVITIES WITH WITH SAND OR CLEAR CRUSHED STONE AND COMPACT. SWEEP CLEAN AND CHECK THAT THE UNITS ARE LEVEL AND ALIGNED.

 8. BACKFILL FRONT AND BACK OF ENTIRE BASE ROW TO FIRMLY LOCK IN PLACE.
- 9. INSTALL SUBSEQUENT COURSES WITH 1FT./300MM MIN. BACKFILL BEHIND TO ENSURE STABILITY 10. ALL NOTES AND INSTALLATION TO FOLLOW ALL APPLICABLE BUILDING CODES. CONTRACTORS NOTE: FOR PRODUCT AND COMPANY INFORMATION VISIT www.CADdetails.com/info REFERENCE NUMBER 000-027.

RETAINING WALL WITH FENCING CA-W-004

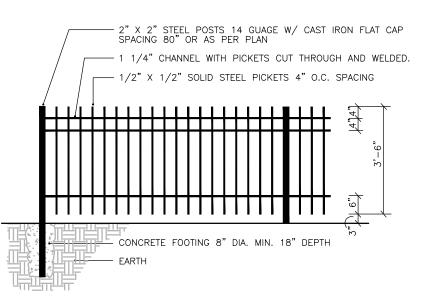


- STRUCTURES SHALL BE COORDINATED WITH PIPE CONFIGURATIONS. 2. COPOLYMER MANHOLE STEPS SHALL BE INSTALLED AT 12" O.C. FOR THE
- FULL DEPTH OF THE STRUCTURE. 3. PROVIDE OPENINGS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF
- PIPE. MORTAR ALL PIPE CONNECTIONS. 4. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL
- 4. CATCH BASIN FRAME AND GRATE SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSES 5. DRAIN MANHOLE FRAME AND COVER SHALL BE SET IN FULL MORTAR BED. TYPICALLY, 5 BRICK COURSES MAXIMUM) ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSES TYPICALLY, 5 BRICK COURSES MAXIMUM).

PRECAST DRAIN MANHOLE CA-001A

CA-D-002

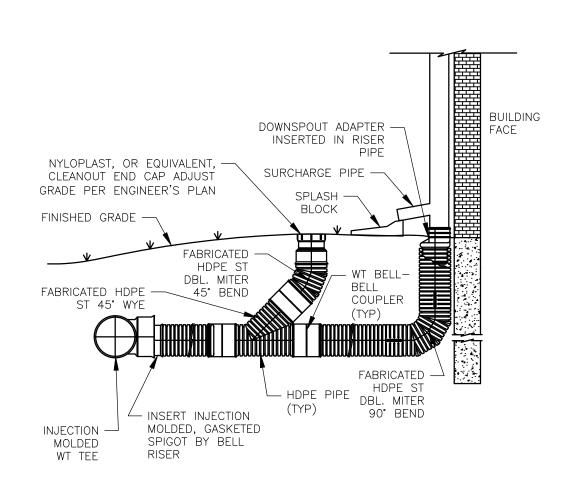
• ALL METAL TO BE DEGREASED, PHOSPHATIZED WITH RUST RETARDANT UNDERCOAT AND DIP COATED WITH TWO COATS OF INDUSTRIAL GRADE FLAT BLACK ENAMEL.



1. THIS DRAWING IS THE PROPERTY OF CADDETAILS.COM, LTD. AND HAS BEEN MADE AVAILABLE TO DESIGN PROFESSIONALS FOR INFORMATION PURPOSES ONLY.
2. DUPLICATION AND DISTRIBUTION OF THIS DRAWING IS STRICTLY PROHIBITED.
3. DO NOT SCALE DRAWINGS.
4. DO NOT USE FOR CONSTRUCTION. . FOR UPDATES AND ADDITIONAL INFORMATION VISIT www.CADdetails.com

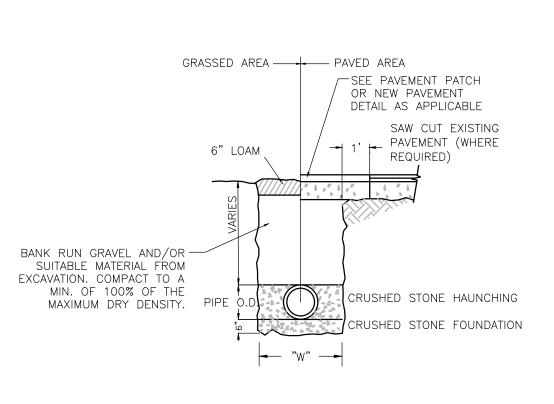
WROUGHT IRON FENCE

CA-M-013



NOTES:
1. FABRICATED FITTINGS ARE AVAILABLE IN TEES, WYES, REDUCERS, 45° 2. FITTINGS SHOWN ARE EITHER WATERTIGHT (WT) OR SOIL-TIGHT (ST).

TYPICAL ROOF DRAIN CONNECTION



1. WIDTH (W) OF TRENCH IS EQUAL TO THE INSIDE DIAMETER OF THE PIPE

- PLUS 12". SOIL UNDER CRUSHED STONE FOUNDATION SHALL BE UNDISTURBED AND COMPACTED WITH SEVERAL PASSES OF A VIBRATORY PLATE COMPACTOR.
- 3. CRUSHED STONE FOUNDATION 3/4" MAXIMUM SIZE, SHALL BE PLACED 6" UNDER THE PIPE AND UP TO THE PIPE GRADE, THE PIPE LAID THEREON, CRUSHED STONE PULLED AGAINST THE PIPE SIDES TO FIRMLY HOLD THE 4. CRUSHED STONE HAUNCHING 3/4" MAXIMUM SIZE SHALL BE BROUGHT LEVEL TO THE TOP OF THE PIPE AND OUT TO THE TRENCH WALL AT THIS

STORM DRAIN TRENCH

ELEVATION FOR ALL PIPE.

CA-U-013

Pawcatuck, CT 06379

Tel: 860.629.6500

Civil Engineers

Land Use Planners

Environmental Engineers

Land Surveyors Fax: 860.599.6090

Westerly, RI 02891

www.cherenzia.com

Tel: 401.596.7747

		PLAN RE	VISIONS		
REV. NO.	DATE	DESCRIPTION	V	DWN BY	CF B
1	1/25/24	TOWN COMMENTS		SETB	SI
2	3/19/24	TOWN COMN	IENTS	SETB	SI
3	5/3/24	TOWN COMMENTS		SETB	SI
SCA	LE: N.T	.s.	DRAWN B	Y: SETB	

CA JOB # 223022

DECEMBER 22, 2023

Site Details 2

ISSUED FOR REVIEW

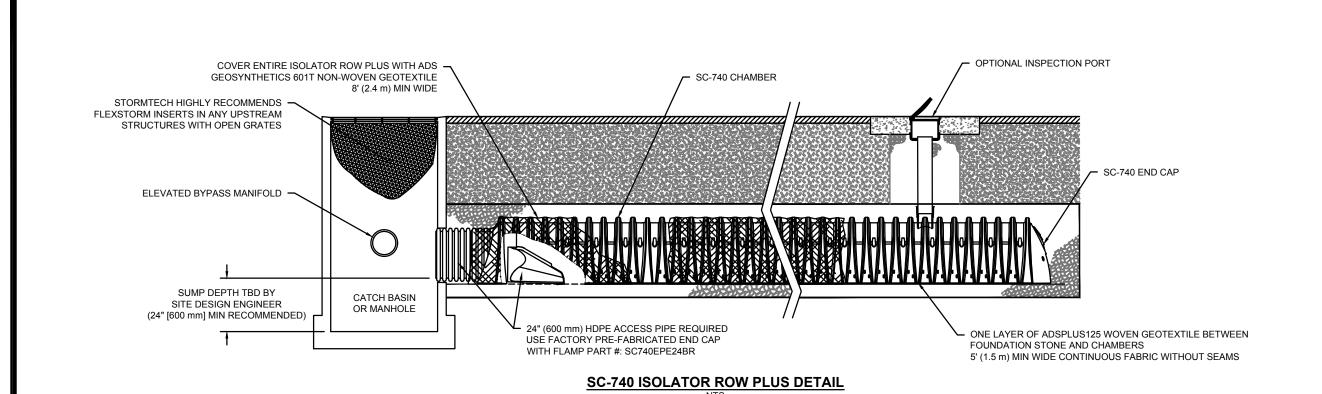
CHECK BY: SFC

FUEL DISPENSING STATION & CONVENIENCE STORE 388 & 390 LONG HILL ROAD 17 BROOKSHAVEN ROAD ASSESSOR'S ID 476, 1389 & 1591 GROTON, CONNECTICUT

> PREPARED FOR AR ENERGY LLC



Sheet C-8 of C-11



INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT

- A INSPECTION PORTS (IF PRESENT) REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
- REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
- A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3. B. ALL ISOLATOR PLUS ROWS
- REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
- i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED

12.5 12.5

12.5'

14.5'

INLET PIPE FROM

- APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN VACUUM STRUCTURE SUMP AS REQUIRED
- STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

SIZE

SC-740

MC-4500

. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.

ADS 315ST (OR EQUAL) WOVEN GEOTEXTILE

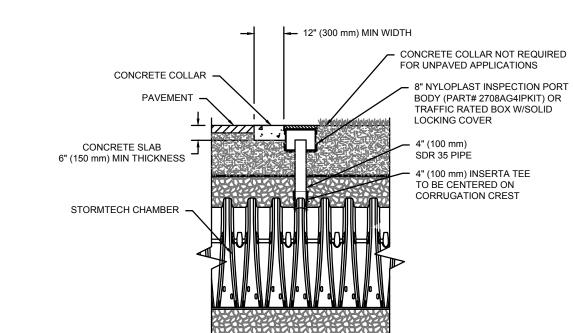
SCOUR PROTECTION SHALL BE INSTALLED AT ALL INLETS TO THE STORMWATER INFILTRATION SYSTEM (AS SHOWN ON THE PLAN) WITH THE EXCEPTION OF THE ISOLATOR ROWS WHICH HAVE THEIR OWN GEOTEXITLE REQUIREMENTS.

STORMTECH INLET SCOUR PROTECTION

CHAMBER, FABRIC SHALL EXTEND THE ENTIRE

WIDTH OF THE CHAMBERS PLUS A MIN. OF 10"

2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY



INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION CREST.

4" PVC INSPECTION PORT DETAIL

SC-740 STORMTECH CHAMBER SPECIFICATIONS

- CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE
- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD
- IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION. THE STRUCTURAL DESIGN OF THE CHAMBERS. THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHAL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
- CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION HAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO
- REQUIREMENTS FOR HANDLING AND INSTALLATION: TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
- TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2". TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 550 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL
- BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
- THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.

 THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
- THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.

. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

- IMPORTANT NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-740 SYSTEM STORMTECH SC-740 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A
- PRE-CONSTRUCTION MEETING WITH THE INSTALLERS. STORMTECH SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780
- CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS STORMTECH RECOMMENDS 3 BACKFILL METHODS: STONESHOOTER LOCATED OFF THE CHAMBER BED
- BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE. BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
 THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS
- JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE. MAINTAIN MINIMUM - 6" (150 mm) SPACING BETWEEN THE CHAMBER ROWS.
- EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4-2" (20-50 mm). THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE
- ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

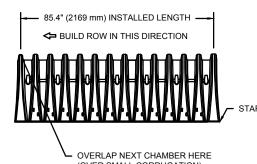
- STORMTECH SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
- THE USE OF CONSTRUCTION EQUIPMENT OVER SC-740 CHAMBERS IS LIMITED: NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS
- NO RUBBER TIRED LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE". WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION
- 3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

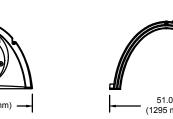
USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS

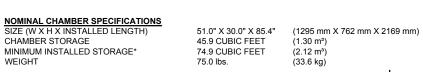
NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR

SC-740 NOTES

90.7" (2304 mm) ACTUAL LENGTH ———







PRE-FAB STUB AT BOTTOM OF END CAP WITH FLAMP END WITH "BR" PRE-FAB STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"

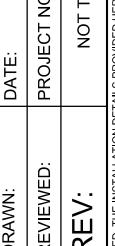
*ASSUMES 6" (152 mm) STONE ABOVE, BELOW, AND BETWEEN CHAMBERS

PART#	STUB	A	В	С
C740EPE06T / SC740EPE06TPC	6" (1E0 mm)	10.0" (277 mm)	18.5" (470 mm)	
C740EPE06B / SC740EPE06BPC	6" (150 mm)	10.9" (277 mm)		0.5" (13 mm)
SC740EPE08T /SC740EPE08TPC	9" (200 mm)	12.2" (310 mm)	16.5" (419 mm)	
C740EPE08B / SC740EPE08BPC	8" (200 mm)			0.6" (15 mm)
SC740EPE10T / SC740EPE10TPC	40" (050)	13.4" (340 mm)	14.5" (368 mm)	
SC740EPE10B / SC740EPE10BPC	10" (250 mm)			0.7" (18 mm)
SC740EPE12T / SC740EPE12TPC	12" (300 mm)	44.7" (272)	12.5" (318 mm)	
C740EPE12B / SC740EPE12BPC	12 (300 11111)	14.7" (373 mm)		1.2" (30 mm)
SC740EPE15T / SC740EPE15TPC	15" (375 mm)	18.4" (467 mm)	9.0" (229 mm)	
SC740EPE15B / SC740EPE15BPC	15 (3/5 11111)	10.4 (407 111111)		1.3" (33 mm)
C740EPE18T / SC740EPE18TPC	18" (450 mm)	19.7" (500 mm)	5.0" (127 mm)	
C740EPE18B / SC740EPE18BPC	16 (450 11111)	19.7 (500 11111)		1.6" (41 mm)
CC740EDE24D*	24" (600 mm)	18.5" (470 mm)		0.1" (3 mm)

ALL STUBS, EXCEPT FOR THE SC740EPE24B/SC740EPE24BR ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

* FOR THE SC740EPE24B/SC740EPE24BR THE 24" (600 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 1.75" (44 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

SC-740 TECHNICAL SPECIFICATIONS



45 E ----SC-ARI

PLAN REVISIONS

DESCRIPTION

TOWN COMMENTS

TOWN COMMENTS

TOWN COMMENTS

BY B

SETB SI

SETB SE

SETB SF

DATE

1/25/24

3/19/24

5/3/24

SHEET

DRAWN BY: SETB SCALE: N.T.S. CHECK BY: SFC CA JOB # 223022 **DECEMBER 22, 2023** ISSUED FOR REVIEW

Site Details 3

Pawcatuck, CT 06379

Tel: 401.596.7747

www.cherenzia.com

Tel: 860.629.6500

Fax: 860.599.6090

Civil Engineers

Land Surveyors

Land Use Planners

nvironmental Engineers

FUEL DISPENSING STATION & CONVENIENCE STORE 388 & 390 LONG HILL ROAD 17 BROOKSHAVEN ROAD ASSESSOR'S ID 476, 1389 & 1591

> PREPARED FOR AR ENERGY LLC

GROTON, CONNECTICUT



Sheet C-9 of C-11

ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
С	INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145 ¹ A-1, A-2-4, A-3 OR AASHTO M43 ¹ 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
В	EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43¹ 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43 ¹ 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. ^{2,3}

THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".

STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGNS, CONTACT STORMTECH FOR WHERE INFILTRATION SURFACES MAY BE COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR . ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION

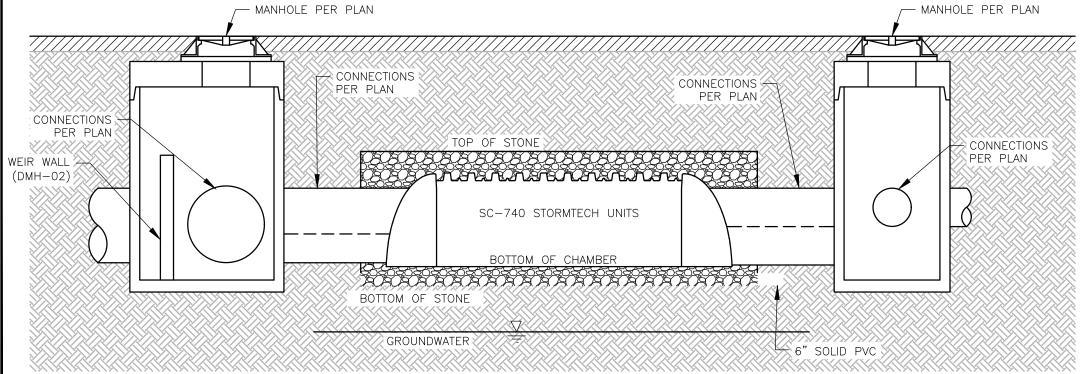
ADS GEOSYNTHETICS 601T NON-WOVEN GEOTEXTILE ALL AROUND CLEAN, CRUSHED, ANGULAR STONE IN A & B LAYERS PAVEMENT LAYER (DESIGNED) BY SITE DESIGN ENGINEER) EXCAVATION WALL (CAN BE SLOPED OR VERTICAL **THIS CROSS SECTION DETAIL REPRESENTS PLEASE SEE THE LAYOUT SHEET(S) FOR PROJECT SPECIFIC REQUIREMENTS. DEPTH OF STONE TO BE DETERMINED

SHEET OF

- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" SC-740 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS"
- THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
- PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS REQUIREMENTS FOR HANDLING AND INSTALLATION:
- TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS
- TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2". TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 550
- LBS/FT/%. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW



- MANHOLE PER PLAN



/K/	OT OT WITH THE ETC.	,,
	CHAMBER SIZE	SC-740
	BOTTOM OF STONE ELEVATION	138.6
	BOTTOM OF CHAMBER ELEVATION	139.1
	TOP OF STONE ELEVATION	142.1
	FINISH GRADE	144.7 - 143.6
	WEIR ELEVATION	141.7
	ORIFICE ELEVATION	140.5
	HIGHEST SEASONAL HIGH GROUND WATER TABLE ELEVATION (BASED ON INTERPRETING BETWEEN TEST HOLES)	135.6
	SEPARATION DISTANCE TO BOTTOM OF BASIN	3.0
	STORM EVENT ELEVATIONS 2-YEAR	140.6
	10-YEAR	141.0
	25-YEAR	141.5
-039	100-YEAR	142.0

STORMWATER TREATMENT DATA

STORMWATER TREATMENT TRAIN SECTION

TOWN OF GROTON

GENERAL CONDITIONS

1. WATER SERVICE AND HOUSE SEWER PIPES SHALL BE LAID IN SEPARATE TRENCHES AT LEAST TEN FEET APART. WHEN APPROVED TO BE LAID IN THE SAME TRENCH DUE TO WARRANTED CONDITIONS, THE WATER PIPE SHALL BE LAID ON A BENCH AT LEAST 18" ABOVE THE TOP OF THE SEWER PIPE AND 18" FROM THE SIDE OF THE SEWER PIPE.

- MINIMUM COVER ON WATER MAINS AND SERVICES SHALL BE 4'-6". 3. IN GENERAL, SEPARATE UNITS (EACH SEPARATE RESIDENTIAL UNIT IN A CONDOMINIUM) SHALL BE SEPARATELY
- METERED AND HAVE SEPARATE WATER SERVICES. WATER MAINS SHOULD BE AT LEAST 10' FROM ANY BUILDING.
- CURB BOXES SHOULD BE AT LEAST 6' FROM ANY BUILDING. MINIMUM SIZE OF ANY MAIN LINE WATER MAIN TO SUPPLY A HYDRANT - 8".
- HYDRANT BRANCH LINE SIZE 6" MINIMUM.
- 9. <u>METERS:</u>
 BUILDINGS WITHOUT BASEMENTS MUST HAVE METERS LOCATED OUTSIDE OF THE BUILDINGS IN A METER PIT. EXTERIOR METERS LOCATED IN METER PITS SHALL BE SO LOCATED AS TO BE ACCESSIBLE TO THE MAIN DISTRIBUTION INE FOR PROPER SERVICE CONNECTION. THE METER PIT SHALL BE INSTALLED AS TO BE UNAFFECTED BY CLIMATIC CONDITIONS, REASONABLY SECURE FROM DAMAGE AND IN AREAS NOT SUBJECT TO VEHICLE TRAFFIC IF POSSIBLE. INTERIOR METERS INSTALLED INSIDE BUILDINGS SHALL BE LOCATED AS NEAR AS POSSIBLE TO THE POINT WHERE THE SERVICE PIPE ENTERS THE BUILDING AND SO AS TO BE REASONABLY SECURE FROM DAMAGE AND READILY ACCESSIBLE

MINIMUM SIZE OF ANY WATER SERVICE INSTALLED FROM THE MAIN TO PROPERTY LINE SHALL BE 1".

- 10. <u>Water mains:</u>
 In so far as practicable shall be designed to avoid dead ends. Where dead ends are necessary, hydrants or blow—offs for the purpose of flushing the mains must be installed. REMOTE WATER METER READING DEVICES ARE REQUIRED ON ALL UNITS. . BACKFLOW PREVENTION DEVICES ARE REQUIRED ON ALL COMMERCIAL SERVICES FOR OTHER POTENTIALLY
- 13. NO BACKFILLING OF PIPE SHALL BE DONE UNTIL A DESIGNATED REPRESENTATIVE OF THE CITY OF GROTON, DEPARTMENT OF UTILITIES, HAS MADE AN INSPECTION AND INSTALLATION HAS BEEN APPROVED. EARTH EXCAVATION, BACKFILL, AND FILL
- 1. WORK INCLUDED
 THE EXCAVATION SHALL INCLUDE THE REMOVAL, HANDLING, FILLING, AND DISPOSAL OF ANY AND ALL MATERIALS ENCOUNTERED WITHIN THE LIMITS OF THE WORK, AND SHALL INCLUDE ALL PUMPING, BAILING, DRAINING, SHEETING, SHORING, COFFERDAMMING, BACKFILL, REFILL AND PROTECTION THEREOF.
- 2. <u>Separation of Surface Materials</u> The contractor shall remove only as much of any existing pavement as is necessary for the prosecution OF THE WORK.
- 3. <u>WIDTH OF TRENCH</u>
 PIPE TRENCHES SHALL BE MADE AS NARROW AS PRACTICABLE AND SHALL NOT BE WIDENED BY SCRAPING OR LOOSENING MATERIALS FROM THE SIDES. EVERY EFFORT SHALL BE MADE TO KEEP THE SIDES OF THE TRENCHES FIRM AND UNDISTURBED UNTIL BACKFILLING HAS BEEN COMPLETED AND CONSOLIDATED TRENCHES SHALL BE EXCAVATED WITH APPROXIMATELY VERTICAL SIDES BETWEEN THE ELEVATION OF THE CENTER OF THE PIPE AND AN ELEVATION ONE (1) FOOT ABOVE THE TOP OF THE PIPE.
- 4. TRENCH EXCAVATION
 WHERE PIPE IS TO BE LAID IN GRAVEL BEDDING, THE TRENCH MAY BE EXCAVATED BY MACHINERY TO, OR TO JUST BELOW, THE DESIGNATED SUBGRADE, PROVIDED THAT THE MATERIAL REMAINING AT THE BOTTOM OF THE TRENCH IS NO MORE THAN SLIGHTLY DISTURBED. 5. <u>Unauthorized excavation</u>
 If the Bottom of any excavation is taken out beyond the limits indicated or prescribed, the resulting void
- SHALL BE BACKFILLED AT THE CONTRACTOR'S EXPENSE WITH THOROUGHLY COMPACTED, SCREENED GRAVEL, IF THE EXCAVATION WAS FOR A PIPELINE, OR WITH CONCRETE, IF THE EXCAVATION WAS FOR A MASONRY STRUCTURE. 6. <u>EXCAVATION NEAR EXISTING STRUCTURES</u>
 ATTENTION IS DIRECTED TO THE FACT THAT THERE ARE PIPES, DRAINS, AND OTHER UTILITIES IN CERTAIN LOCATIONS. AS THE EXCAVATION APPROACHES PIPES, CONDUITS, OR OTHER UNDERGROUND STRUCTURES, DIGGING BY MACHINERY

SHALL BE DISCONTINUED AND THE EXCAVATION SHALL BE DONE BY MEANS OF HAND TOOLS. SUCH MANUAL EXCAVATION,

- WHEN INCIDENTAL TO NORMAL EXCAVATION, SHALL BE INCLUDED IN THE WORK TO BE DONE UNDER ITEMS INVOLVING WHERE DETERMINATION OF THE EXACT LOCATION OF PIPE OR OTHER UNDERGROUND STRUCTURE IS NECESSARY FOR DOING THE WORK PROPERLY, THE CONTRACTOR MAY BE REQUIRED TO EXCAVATE TEST PITS TO DETERMINE SUCH
- 7. <u>Elimination of unsuitable material</u>
 If material unsuitable for foundation is found at or below the grade to which excavation would normally
 BE CARRIED, THE CONTRACTOR SHALL REMOVE SUCH MATERIAL TO THE REQUIRED WIDTH AND DEPTH AND REPLACE IT WITH THOROUGHLY COMPACTED, SCREENED GRAVEL OR CONCRETE AS DIRECTED.
- 8. <u>Sheeting and Shoring</u> The Contractor shall be responsible for supporting and maintaining excavations required hereunder, even TO THE EXTENT OF SHEETING OR SHORING THE SIDES AND ENDS OF EXCAVATIONS WITH THE TIMBER OR STEEL SHEET PILING. THE REQUIREMENTS OF SHEETING OR SHORING OR THE ADDITION OF SUPPORTS SHALL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY FOR THEIR SUFFICIENCY. ALL TIMBERING SHALL BE REMOVED EXCEPT THAT FOR THE PURPOSE OF PREVENTING INJURY TO THE PIPING OR OTHER STRUCTURES, TO OTHER PROPERTY OR TO PERSONS. THE CONTRACTOR MAY LEAVE IN PLACE TO BE EMBEDDED IN THE BACKFILL OF THE EXCAVATION ANY SHEETING OR BRACING WHICH THE ENGINEER CONSIDERS NECESSARY FOR THAT PURPOSE. IN ANY CASE WHERE SHEETING IS REMOVED, THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR INJURY TO THE PIPE OR OTHER STRUCTURE OR TO OTHER PROPERTY OR PERSONS ARISING FROM FAILURE TO LEAVE IN
- PLACE A SUFFICIENT QUANTITY OF SHEETING AND BRACING. 9. REMOVAL OF WATER
 UNTIL FINAL ACCEPTANCE OF THE WORK, THE CONTRACTOR SHALL PUMP OUT OR OTHERWISE REMOVE AND DISPOSE OF AS FAST AS IT MAY COLLECT, ANY WATER, SEWAGE OR ANY OTHER LIQUIDS WHICH MAY BE FOUND OR MAY ACCUMULATE IN THE EXCAVATIONS, REGARDLESS OF WHETHER IT BE WATER OR LIQUID WASTES FROM HIS OWN CONTRACT OR FROM THERE SHALL BE UPON THE WORK AT ALL TIMES DURING THE CONSTRUCTION PROPER AND APPROVED MACHINERY OF SUFFICIENT CAPACITY (INCLUDING SPARE UNITS KEPT READY FOR IMMEDIATE USE IN CASE OF BREAKDOWNS) TO MEET
- THE MAXIMUM REQUIREMENTS FOR THE REMOVAL OF THE WATER OR OTHER LIQUIDS AND THEIR DISPOSAL IN SUCH A MANNER AS NOT TO WITHDRAW SAND OR CEMENT FROM THE CONCRETE AND SO AS NOT TO INTERFERE WITH THE PROPER LAYING OF PIPE AND/OR MASONRY OR THE PROSECUTION OF WORK UNDER THIS OR OTHER CONTRACT NOR ENDANGER EXISTING STRUCTURES. 10. PROTECTION TO EXISTING STRUCTURES, VEGETATION
 ALL EXISTING WALKS, PIPES, CONDUITS, POLES, WIRES, FENCES, STAIRWAYS, CURBINGS, PROPERTY LINE MAKERS, WALLS,
 BUILDINGS AND OTHER STRUCTURES WHICH DO NOT REQUIRE TO BE CHANGED IN LOCATION, SHALL BE CAREFULLY
 SUPPORTED AND PROTECTED FROM INJURY BY THE CONTRACTOR WITHOUT ADDITIONAL COMPENSATION, AND IN CASE OF
- INJURY, THEY SHALL BE RESTORED BY HIM WITHOUT COMPENSATION THEREOF, TO AS GOOD CONDITION AS THAT IN TREE ROOTS SHALL NOT BE MUTILATED NOR SHALL THEY BE CUT EXCEPT BY PERMISSION OF THE ENGINEER. WHEN PERMITTED TO CUT TREE ROOTS, THE ENDS SHALL BE CUT OFF SMOOTH, WITHOUT ANY SPLITTING OR SHATTERING. THE TRUNKS OF THE TREES SHALL BE CAREFULLY PROTECTED FROM DAMAGE, AND IF UNAVOIDABLE DAMAGE OCCURS, THE INJURED PORTIONS SHALL BE NEATLY TRIMMED AND COVERED WITH AN APPLICATION OF GRAFTING WAX OR OTHER APPROVED PREPARATION. POWER-DRIVEN EXCAVATING MACHINERY SHALL BE HANDLED WITH CARE TO PREVENT DAMAGE
- O SHADE TREES, PARTICULARLY TO OVERHANGING BRANCHES, AND BRANCHES SHALL NOT BE CUT OFF EXCEPT BY SPECIAL PERMISSION OF THE ENGINEER. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, DIG UP, HANDLE, PROTECT AND PROPERLY RESET HEDGES, SMALL TREES. SHRUBBERY, SIGNS, POSTS, GUARD RAILS, CURBING OTHER THAN BITUMINOUS AND THE LIKE ALONG THE LINE OF OR ADJACENT TO THE WORK, AND SHALL TAKE ALL REASONABLE CARE IN THIS WORK NOT TO DISTURB ANY OBJECT THAT CAN BE SAVED IN ITS EXISTING CONDITION. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, PROVIDE SUITABLE AND SAFE BRIDGES AND OTHER CROSSINGS WHERE
- REQUIRED FOR THE ACCOMMODATION OF TRAVEL AND TO PROVIDE ACCESS TO PRIVATE PROPERTY DURING CONSTRUCTION, AND SHALL REMOVE SAID STRUCTURES THEREAFTER. 11. <u>BACKFILLING PIPE TRENCHES</u> AS SOON AS PRACTICABLE AFTER THE PIPES HAVE BEEN LAID OR THE STRUCTURES HAVE BEEN BUILT AND ARE
- STRUCTURALLY ADEQUATE TO SUPPORT THE LOADS, INCLUDING CONSTRUCTION LOADS TO WHICH THEY WILL BE SUBJECTED, THE BACKFILLING SHALL BE STARTED AND THEREAFTER IT SHALL PROCEED UNTIL COMPLETION. a. <u>Zone around Pipe.</u> The space between the pipe and bottom side of the trench shall be packed full by hand shovel with sand. In placing the material, care shall be taken that stones do not strike the PIPE. THE BACKFILL UNDER THE PIPE SHALL BE THOROUGHLY COMPACTED USING CURVED TAMPING BARS. SAND BACKFILL AT THE SIDES AND UP TO THE TOP OF THE PIPE SHALL BE COMPACTED USING APPROVED HAND TAMPERS
- SAND BACKFILL UP TO A LEVEL OF ONE (1) FOOT ABOVE THE TOP OF THE PIPE SHALL BE PLACED IN 6— INCH LAYERS, LEVELED ALONG THE LENGTH AND WIDTH OF THE TRENCH, AND THOROUGHLY COMPACTED USING APPROVED TAMPERS. NO SAND SHALL BE PLACED ABOVE THE TOP OF THE PIPE UNTIL SAND UNDER AND AT THE SIDES OF THE PIPE HAS BEEN COMPACTED. CARE SHALL BE TAKEN IN THE USE OF MECHANICAL OR OTHER TAMPERS NOT TO INJURE OR MOVE THE PIPE OR TO CAUSE THE PIPE TO BE SUPPORTED UNEVENLY.
- MATERIALS. THE NATURE OF THE MATERIALS WILL GOVERN BOTH THEIR ACCEPTABILITY FOR BACKFILL AND THE METHODS BEST SUITED FOR THEIR PLACEMENT AND COMPACTION IN THE BACKFILL. IN GENERAL, MATERIAL USED FOR BACKFILLING TRENCHES AND EXCAVATIONS AROUND STRUCTURES SHALL BE SUITABLE MATERIAL THAT WAS REMOVED IN THE COURSE OF MAKING THE CONSTRUCTION EXCAVATIONS. NO STONE OR ROCK FRAGMENT LARGER THAN 12 INCHES IN GREATEST DIMENSION SHALL BE PLACED IN THE BACKFILL NOR SHALL LARGE MASSES OF BACKFILL MATERIAL BE DROPPED INTO THE TRENCH IN SUCH A MANNER AS T
- ENDANGER THE PIPELINE. IF NECESSARY, A TIMBER GRILLAGE SHALL BE USED TO BREAK THE FALL OF MATERIAL DROPPED FROM A HEIGHT OF MORE THAN FIVE (5) FEET. PIECES OF BITUMINOUS PAVEMENT SHALL BE EXCLUDED FROM THE BACKFILL UNLESS THEIR USE IS EXPRESSLY PERMITTED, IN WHICH CASE THEY SHALL BE BROKEN UP AS DIRECTED.

 C. REMAINDER OF TRENCH. THE REMAINDER OF THE TRENCH ABOVE THE ZONE AROUND THE PIPE SHALL BE COMPACTED BY WATERJETTING, PUDDLING, OR TAMPING, AS DIRECTED OR APPROVED IN ACCORDANCE WITH THE NATURE OF THE MATERIAL. WATERJETTING OR PUDDLING SHALL BE USED WHEREVER THE MATERIAL DOES NOT CONTAIN SO MUCH CLAY OR LOAM AS TO DELAY OR PREVENT SATISFACTORY DE
- <u>WATERJETTING</u>. IF THE BACKFILL IS TO BE COMPACTED BY WATERJETTING, THE MATERIAL SHALL BE PLACED IN UNIFORM LAYERS NOT EXCEEDING FOUR (4) FEET DEEP. BEFORE THE SUCCEEDING LAYER IS PLACED, EACH LAYER SHALL BE THOROUGHLY SATURATED THROUGHOUT ITS FULL DEPTH AND AT FREQUENT INTERVALS ACROSS AND ALONG THE TRENCH UNTIL ALL SLUMPING CEASES. TO ACCOMPLISH THIS, THE CONTRACTOR SHALL FURNISH ONE OR MORE JET PIPES, EACH OF SUFFICIENT LENGTH TO REACH TO THE SPECIFIED DEPTH AND OF SUFFICIENT DIAMETER (NOT LESS THAN 1¼ INCHES) TO SUPPLY AN ADEQUATE FLOW OF WATER TO COMPACT THE MATERIAL. THE JET PIPE SHALL BE EQUIPPED WITH A QUICK-ACTING VALVE AND BE SUPPLIED THROUGH A FIRE HOSE FROM A HYDRANT OR A PUMP HAVING ADEQUATE PRESSURE AND CAPACITY
- e. <u>Puddling</u>. If the Backfill is to be compacted by puddling, the material shall be deposited in water of sufficient depth so that the material will be submerged when in place. Dams or dikes constructed in THE TRENCH TO HOLD THE WATER USED FOR PUDDLING SHALL BE COMPACTED BY TAMPING AS SPECIFIED BELOW. f. <u>Tamping</u>. If the material is suitable for jetting or puddling, compaction shall be accomplished by TAMPING OR, UNDER APPROPRIATE CIRCUMSTANCES, ROLLING. THE MATERIAL SHALL BE DEPOSITED AND SPREAD IN UNIFORM, PARALLEL LAYERS NOT EXCEEDING EIGHT (8) INCHES THICK BEFORE COMPACTION. BEFORE THE NEXT LAYER IS PLACED, EACH LAYER SHALL BE TAMPED AS REQUIRED SO AS TO OBTAIN A THOROUGHLY COMPACTED MASS. IF NECESSARY, THE CONTRACTOR SHALL FURNISH AND USE AN ADEQUATE NUMBER OF POWER-DRIVEN TAMPERS WEIGHING AT LEAST 20 POUNDS, FOR THIS PURPOSE. CARE SHALL BE TAKEN THAT THE MATERIAL CLOSE TO THE BANK, AS WELL AS IN ALL OTHER PORTIONS OF THE TRENCH, IS THOROUGHLY COMPACTED. WHEN THE TRENCH WIDTH AND THE DEPTH TO WHICH BACKFILL HAS BEEN PLACED ARE SUFFICIENT TO MAKE IT FEASIBLE, AND IT CAN BE DONE EFFECTIVELY AND WITHOUT DAMAGE TO THE PIPE, BACKFILL MAY, ON APPROVAL, BE COMPACTED BY THE USE OF SUITABLE ROLLERS, TRACTORS, OR SIMILAR POWERED EQUIPMENT INSTEAD OF BY TAMPING. FOR COMPACTION BY TAMPING (OR ROLLING), THE RATE AT WHICH BACKFILLING MATERIAL IS DEPOSITED IN THE TRENCH SHALL NOT EXCEED THAT PERMITTED BY THE FACILITIES FOR ITS SPREADING, LEVELING, AND COMPACTING AS FURNISHED BY THE CONTRACTOR. IF NECESSARY, TO ENSURE PROPER COMPACTION BY TAMPING (OR ROLLING), THE MATERIAL SHALL FIRST BE WET BY SPRINKLING. HOWEVER, NO COMPACTION BY TAMPING (OR ROLLING) SHALL BE DONE WHEN THE MATERIAL IS TOO WET
- PROPER COMPACTING, OR SUCH OTHER PRECAUTIONS SHALL BE TAKEN AS MAY BE NECESSARY TO OBTAIN PROPER . <u>Miscellaneous requirements</u>. Whatever method of compacting backfill is used, care shall be taken hat stones and lumps shall not become nested and that all voids between stones shall be completely FILLED WITH FINE MATERIAL. ONLY APPROVED QUANTITIES OF STONES AND ROCK FRAGMENTS SHALL BE USED IN THE BACKFILL. THE CONTRACTOR SHALL, AS PART OF THE WORK DONE UNDER THE ITEMS INVOLVING EARTH EXCAVATION AND ROCK EXCAVATION AS APPROPRIATE, FURNISH AND PLACE ALL OTHER NECESSARY BACKFILL MATERIAL.

EITHER FROM RAIN OR TOO GREAT AN APPLICATION OF WATER TO BE COMPACTED PROPERLY; AT SUCH TIMES THE WORK

SHALL BE SUSPENDED UNTIL THE PREVIOUSLY PLACED AND NEW MATERIALS HAVE DRIED OUT SUFFICIENTLY TO PERMIT

- . <u>FILL AND BACKFILL UNDER STRUCTURES AND STATE HIGHWAYS</u>
 L FILL AND BACKFILL UNDER STRUCTURES AND PAVEMENTS ADJACENT TO STRUCTURES SHALL BE COMPACTED BANK-RUN GRAVEL CONTAINING NOT MORE THAN FIVE (5) PERCENT MATERIAL PASSING A 200 SIEVE. THE ENTIRE BACKFILL SHALL BE COMPACTED TO 95 PERCENT OF MAXIMUM DENSITY AT OPTIMUM MOISTURE AS DETERMINED BY METHOD D OF A.S.T.M. D1557-78 STANDARD TEST METHODS FOR MOISTURE-DENSITY RELATIONS OF SOILS AND
- SOIL-AGGREGATE MIXTURES USING 10-LB. (4.54-KG) RAMMER AND 18-INCH (457MM) DROP. 13. <u>DISPOSAL OF MATERIALS</u>
 ANY EXCAVATED MATERIALS NOT REQUIRED OR NOT SUITABLE FOR BACKFILLING SHALL BE REMOVED FROM THE SITE OF THE WORK AND DISPOSED OF BY THE CONTRACTOR AT HIS OWN EXPENSE. THE CONTRACTOR WILL NOT BE ALLOWED TO STORE EXCESS EXCAVATED MATERIAL ON THE PUBLIC HIGHWAY. ALL
- EXCAVATED MATERIAL THAT IS NOT TO BE USED IMMEDIATELY FOR BACKFILLING SHALL BE CARTED AWAY AND STORED UNTIL SUCH TIME AS THE MATERIAL IS TO BE USED FOR BACKFILLING.
- 1. <u>WORK INCLUDED</u>
 THE CONTRACTOR SHALL EXCAVATE WITHIN THE LINES AND GRADES AS SHOWN OR REQUIRED AND SHALL SATISFACTORILY DISPOSE OF ANY ROCK, BOULDERS, OR EXISTING CONCRETE, STONE OR MASONRY WHICH MAY BE ENCOUNTERED IN THE

THE WORD "ROCK" SHALL MEAN BOULDERS AND PIECES OF MASONRY OR CONCRETE EXCEEDING ONE CUBIC YARD IN

VOLUME, OR SOLID LEDGE ROCK WHICH, IN THE OPINION OF THE ENGINEER, REQUIRES FOR ITS REMOVAL, DRILLING AND BLASTING OR WEDGING, OR SLEDGING, OR BARRING, OR BREAKING UP WITH A POWER-OPERATED TOOL. NO SOFT OR DISINTEGRATED ROCK WHICH CAN BE REMOVED WITH A HAND PICK OR POWER-OPERATED EXCAVATOR OR SHOVEL; NO LOOSE. SHAKEN OR PREVIOUSLY BLASTED ROCK OR BROKEN STONE IN ROCK FILLINGS OR ELSEWHERE: AND NO ROCK. EXTERIOR TO THE MINIMUM LIMITS ALLOWED, WHICH MAY FALL INTO THE EXCAVATION, WILL BE MEASURED OR ALLOWED. 2. <u>Blasting and explosives</u> where blasting is necessary, it shall be done in accordance with all ordinances and other pertinent REGULATIONS RELATIVE TO THE STORING AND HANDLING OF EXPLOSIVES AND THE FIRING OF BLASTS. SUCH ORDINANCES, REGULATIONS AND ORDERS SHALL NOT, HOWEVER, RELIEVE THE CONTRACTOR OF ANY RESPONSIBILITY FOR DAMAGES CAUSED BY HIM OR HIS EMPLOYEES PRIOR TO THE FIRING OF BLASTS, ALL PERSONS IN THE VICINITY SHALL BE GIVEN AMPLE WARNING, AND ONLY LICENSED PERSONS SHALL DO BLASTING. ALL BLASTS SHALL BE WELL COVERED AND PROVISIONS SHALL BE MADE TO PROTEC ALL PIPES AND STRUCTURES AND ALL PERSONS OR PROPERTY ALONG AND ADJACENT TO THE SITE OF THE WORK. ALL BLASTING SHALL BE COMPLETED WITHIN A DISTANCE OF 25 FEET BEFORE ANY PORTION OF A MASONRY STRUCTURE IS PLACED OR ANY PIPE IS LAID. IN CASE ANY INJURY OCCURS TO ANY PORTION OF THE WORK OR TO THE MATERIALS SURROUNDING OR SUPPORTING THE SAME THROUGH BLASTING, THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL REBUILD OR REPAIR THE WORK AND REPLACE THE MATERIAL SURROUNDING OR SUPPORTING THE SAME. THE USE OF EXPLOSIVES ON RAILROAD PROPERTY WILL NOT BE PERMITTED.

SAND SHALL BE THE FINE, GRANULAR MATERIAL NATURALLY PRODUCED BY THE DISINTEGRATION OF ROCK AND SHALL BE SUFFICIENTLY FREE OF ORGANIC MATERIAL, MICA, LOAM, CLAY AND OTHER DELETERIOUS SUBSTANCES. IN NO CASE SHALL SAND CONTAINING LUMPS OF FROZEN MATERIALS BE USED. GRADATION OF SAND. IN CASE VISUAL INSPECTION OF THE SAND INDICATES THAT IT IS TOO COARSE, THE FOLLOWING GRADATION SHALL DETERMINE ITS ACCEPTABILITY:

PERCENTAGE PASSING SIEVES

3/8 INCH 95 - 10065-90 45-75 30-50 10-22 2-8

SIEVE SIZE

BANK-RUN GRAVEL

GENERAL. THE CONTRACTOR SHALL FURNISH, PLACE, AND COMPACT BANK-RUN GRAVEL AS INDICATED ON THE . <u>General</u>. The contractor shall furnish, frawings or directed and as herein specified. b. GRAVEL. BANK-RUN GRAVEL SHALL BE GRANULAR MATERIAL WELL GRADED FROM FINE TO COARSE WITH A MAXIMUM SIZE OF THREE (3) INCHES OBTAINED FROM APPROVED NATURAL DEPOSITS AND UNPROCESSED EXCEPT FOR THE REMOVAL OF UNACCEPTABLE MATERIAL AND STONES LARGER THAN THE MAXIMUM SIZE PERMITTED. IT SHALL NOT CONTAIN VEGETATION, MASSES OF ROOTS, OR INDIVIDUAL ROOTS MORE THAN 18 INCHES LONG OR MORE THAN 1/2 INCH IN DIAMETER. IT SHALL BE SUBSTANTIALLY FREE FROM LOAM AND OTHER ORGANIC MATTER, CLAY, AND OTHER FÎNE OR

c. PLACING AND COMPACTING. THE BANK-RUN GRAVEL SHALL BE SPREAD IN LAYERS OF UNIFORM THICKNESS NOT EXCEEDING EIGHT (8) INCHES BEFORE COMPACTION AND MOISTENED OR ALLOWED TO DRY AS DIRECTED. THEN IT SHALL BE THOROUGHLY COMPACTED BY MEANS OF SUITABLE POWER-DRIVEN TAMPERS OR OTHER POWER-DRIVEN EQUIPMENT.

1. <u>WORK INCLUDED</u>
THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, TOOLS AND EQUIPMENT NECESSARY TO CONSTRUCT THE CONCRETE WORK. THIS WILL INCLUDE THRUST BLOCKS AT PIPE BENDS AND TEES IN TRENCHES, AND FOR ALL MISCELLANEOUS CONCRETE WORK ORDERED IN THE FIELD BY THE ENGINEER TO MEET FIELD CONDITIONS.

- a. ALL MATERIALS ARE TO BE CAREFULLY SELECTED SO AS TO BE FREE OF DELETERIOUS AMOUNTS OF ACID, ALKALI AND ORGANIC MATERIAL. IF THESE MATERIALS ARE STORED AT THE JOB, THEY SHALL BE PLACE WHERE NO FOREIGN MATERIALS WILL BE INTRODUCED AND NO DETERIORATION OF THE CEMENT WILL TAKE PLACE. LATEST REVISIONS OF A.S.T.M. SPECIFICATIONS ARE TO BE FOLLOWED PORTLAND CEMENT SHALL CONFORM TO A.S.T.M. C150-85A. AGGREGATE SHALL CONFORM TO A.S.T.M. C33-86.
- REINFORCING BARS SHALL CONFORM TO A.S.T.M. A615-85 OR A.S.T.M. A617-84, GRADE 40. 3. <u>CONCRETE QUALITY</u> CONCRETE SHALL HAVE A MINIMUM ULTIMATE 28 DAYS COMPRESSIVE STRENGTH OF 3000 LBS. PER SQUARE INCH USING A MAXIMUM WATER CONTENT OF SIX (6) GALLONS PER BAG OF CEMENT. THE AGGREGATE SHALL BE PROPORTIONED TO GIVE A DENSE CONCRETE OF THIS REQUIRED STRENGTH USING A MAXIMUM AGGREGATE SIZE OF 3/4 INCHES. CONCRETE FOR PAVEMENT REPLACEMENT SHALL CONFORM TO THE REQUIREMENTS OF THE STATE OF CONNECTICUT, DEPARTMENT OF TRANSPORTATION.
- 4. MIXING AND PLACING
 a. CONCRETE SHALL BE MIXED UNTIL THERE IS A UNIFORM DISTRIBUTION OF THE MATERIALS AND SHALL BE DISCHARGED COMPLETELY BEFORE THE MIXER IS RECHARGED.
 b. FOR JOB-MIXED CONCRETE, THE MIXER SHALL BE ROTATED AT A SPEED RECOMMENDED BY THE MANUFACTURER, AND MIXING SHALL BE CONTINUED FOR AT LEAST ONE MINUTE AFTER ALL MATERIALS ARE IN THE MIXER. c. READY-MIXED CONCRETE SHALL BE MIXED AND DELIVERED IN ACCORDANCE WITH THE REQUIREMENTS SET FORTH IN THE STANDARD SPECIFICATIONS FOR READY-MIXED CONCRETE A.S.T.M. C94-86A. d. PROVISIONS SHALL BE MADE FOR MAINTAINING CONCRETE IN A MOIST CONDITION FOR AT LEAST FIVE (5) DAYS
- AFTER PLACEMENT. CONCRETE SHALL BE PROTECTED AGAINST WASH BY GROUND WATER IN DITCHES.

 e. ADEQUATE EQUIPMENT SHALL BE PROVIDED FOR PROTECTING THE CONCRETE FROM FREEZING. NO FROZEN MATERIAL OR MATERIALS CONTAINING ICE SHALL BE USED. NO DEPENDANCE SHALL BE PLACED ON SALT OR OTHER CHEMICALS FOR THE PREVENTION OF FREEZING. f. ADMIXTURES SHALL BE IN CONFORMANCE WITH THE RECOMMENDATIONS AND REQUIREMENTS OF FORM 814 AND SHALL BE APPROVED BY THE ENGINEER PRIOR TO USE. DUCTILE IRON PIPE AND FITTINGS
- THE CONTRACTOR SHALL FURNISH, LAY, JOINT AND TEST ALL DUCTILE IRON PRESSURE PIPE, FITTINGS (INCLUDING SPECIAL CASTINGS), AND APPURTENANT MATERIALS AND EQUIPMENT, AS INDICATED ON DRAWINGS AND AS HEREIN
- STANDARD SPECIFICATIONS

 LL PIPE, FITTINGS, AND ACCESSORIES SHALL CONFORM TO THE REQUIREMENTS OF THE FOLLOWING STANDARD SPECIFICATIONS AS APPLICABLE:
- AMERICAN NATIONAL STANDARDS INSTITUTE AND AMERICAN WATER WORKS ASSOCIATION ANSI/AWWA A21.4-90 CEMENT-MORTAR LINING FOR DUCTILE-IRON

AND PIPE AND FITTINGS FOR WATER. LINING SHALL HAVE THE FOLLOWING MINIMUM THICKNESS: PIPE - 1/16" PIPE -3/32" PIPE - 1/8"

ANSI/AWWA A21.5-93 POLYETHYLENE ENCASEMENT FOR DUCTILE-IRON PIPE SYSTEMS ANSI/AWWA A21.10-93 DUCTILE-IRON AND GRAY-IRON FITTINGS,

ANSI/AWWA C900-89

3 IN. THROUGH 48 IN., FOR (75MM THROUGH 1200MM), FOR C110 WATER AND OTHER LIQUIDS. RUBBER-GASKET JOINTS FOR DUCTILE-IRON PRESSURE PIPE AND ANSI/AWWA A21.11-90 ANSI/AWWA A21.15-94 FLANGED DUCTILE-IRON PIPE WITH DUCTILE-IRON OR GRAY-IRON THREADED FLANGES.

ANSI/AWWA A21.50-91 THICKNESS DESIGN OF DUCTILE-IRON PIPE. THICKNESS CLASS 52. ANSI/AWWA A21.51-91 DUCTILE-IRON PIPE, CENTRIFUGALLY CAST, FOR WATER OR OTHER

3. <u>Ductile Iron Pipe</u> all ductile Iron Pipes shall be designed in accordance with the above—mentioned ansi—a21.50 and shall be MANUFACTURED IN ACCORDANCE WITH ANSI-A21.4 OR ANSI-A21.51. UNLESS OTHERWISE INDICATED OR SPECIFIED, ALL DUCTILE IRON PIPE SHALL BE CLASS 52. 4. <u>PIPE FOR USE WITH COUPLINGS</u>
PIPE FOR USE WITH SLEEVE—TYPE COUPLINGS SHALL BE AS SPECIFIED ABOVE EXCEPT THAT THE ENDS SHALL BE PLAIN (WITHOUT BELLS OR BEADS). THE ENDS SHALL BE CAST OR MACHINED AT RIGHT ANGLES TO THE AXIS. FITTINGS SHALL CONFORM TO THE REQUIREMENTS OF THE AFOREMENTIONED ANSI-A21-10 AND SHALL BE OF A PRESSURE CLASSIFICATION AT LEAST EQUAL TO THAT OF THE PIPE WITH WHICH THEY ARE USED. UNLESS OTHERWISE INDICATED OR SPECIFIED, FITTINGS SHALL BE ALL-BELL FITTINGS WITH MECHANICAL JOINTS. FITTINGS SHALL BE

POLYVINYL CHLORIDE (PVC) PRESSURE PIPE,

4 IN. THROUGH 12 IN., FOR WATER DISTRIBUTION

PROVIDED WITH STANDARD BASES WHERE SO INDICATED. RETAINING GLANDS WILL BE USED FOR THE INSTALLATIONS OF ALL FITTINGS. RESTRAINT SHALL BE BY LOCKING-TYPE JOINTS (MEG-A-LUG) AS APPROVED BY ENGINEER. WHERE IT IS NECESSARY TO JOINT PIPE OF DIFFERENT TYPE, THE CONTRACTOR SHALL FURNISH AND INSTALL THE NECESSARY ADAPTERS UNLESS SOLID SLEEVES ARE INDICATED ON THE DRAWINGS OR APPROVED. ADAPTERS SHALL HAVE ENDS, CONFORMING TO THE ABOVE SPECIFICATIONS FOR THE APPROPRIATE TYPE OF JOINT, TO RECEIVE THE ADJOINING PIPE. ADAPTERS JOINING TWO CLASSES OF PIPE MAY BE OF THE LIGHTER CLASS PROVIDED THAT THE ANNULAR SPACE IN BELL-AND-SPIGOT TYPE JOINTS WILL BE SUFFICIENT FOR PROPER JOINTING.

7. TYPES OF JOINTS

JOINTS FOR DUCTILE IRON PIPE SHALL BE AS HEREINAFTER SPECIFIED. WHERE SO INDICATED, PIPE AND FITTINGS SHALL BE FURNISHED WITH APPROVED LUGS OR HOOKS CAST INTEGRALLY FOR USE WITH BOLTS OR BRIDLE RODS AND SOCKET CLAMPS TO KEEP THE PIPING FROM PULLING APART UNDER PRESSURE. BEADS OF SPIGOT ENDS OF PIPE OR FITTINGS SHALL BE CUT (PIPES ONLY) OR GROUND OFF, IF NECESSARY, TO ENSURE THAT THE SPIGOT ENTERS THE BELL CORRECTLY. JOINTS FOR PUSH-ON PIPE SHALL CONFORM TO ANSI/AWWA.

THE PLAIN END OF PUSH—ON PIPE SHALL BE FACTORY MACHINED TO A TRUE CIRCLE AND CHAMFERED TO FACILITATE PUSH-ON PIPE AND FITTINGS SHALL BE PROVIDED WITH SUFFICIENT QUANTITIES OF ACCESSORIES CONFORMING TO ANSI-A21.11 GASKETS SHALL BE OF A COMPOSITION SUITABLE FOR EXPOSURE TO THE LIQUID WITHIN THE PIPE. SERRATED BRONZE PIPE WEDGES SHALL BE INSTALLED IN THE JOINTS FOR PUSH-ON PIPE TO PROVIDE ELECTRICAL CONTINUITY THROUGH THE JOINT. EACH PIPE WEDGE SHALL BE DRIVEN INTO THE OPENING BETWEEN THE PLAIN END PIPE WEDGE REQUIREMENTS: 2" THROUGH 12" DIAMETER PIPE - TWO PER JOINT

LARGER THAN 12" DIAMETER PIPE - FOUR PER JOINT WHEN FOUR PIPE WEDGES ARE USED, THEY SHALL BE INSERTED SIDE BY SIDE, IN PAIRS. 8. <u>Flexible connections</u>
Where flexible connections in the piping are specified or indicated on the drawings, they shall be OBTAINED BY THE USE OF SLEEVE-TYPE COUPLINGS AND/OR FITTINGS AS HEREIN SPECIFIED. 9. <u>Sleeve type couplings</u> To ensure correct fitting of pipe and couplings, all sleeve—type couplings and accessories shall be FURNISHED BY THE SUPPLIER OF THE PIPE AND SHALL BE OF A PRESSURE RATING AT LEAST EQUAL TO THAT OF THE PIPELINE IN WHICH THEY ARE TO BE INSTALLED. SLEEVE-TYPE COUPLINGS SHALL BE MADE BY DRESSER MFG. DIV., BRADFORD, PA; SMITH-BLAIR, INC., SAN FRANCISCO, CA; R. H. BAKER & CO., INC., HUNTINGTON PARK, CA; OR BE APPROVED FOUAL PRODUCTS

COUPLINGS FOR BURIED PIPE SHALL BE OF CAST IRON AND SHALL BE DRESSER STYLE 53, SMITH-BLAIR STYLE 431, BAKER ALLCAST, OR APPROVED EQUAL PRODUCTS. THE COUPLINGS SHALL BE PROVIDED WITH BLACK, STEEL, TRACKHEAD BOLTS WITH NUTS WHICH SHALL BE THOROUGHLY COATED WITH AN APPROVED BITUMINOUS PAINT WHEN BURIED IN THE ALL COUPLINGS SHALL BE FURNISHED WITH THE PIPE STOP REMOVED. COUPLINGS SHALL BE PROVIDED WITH PLAIN, GRADE 27. RUBBER GASKETS.

THE GASKETS SHALL HAVE METALLIC TIPS TO PROVIDE ELECTRICAL CONTINUITY THROUGH THE JOINT. 10. TAPPED CONNECTIONS
TAPPED CONNECTIONS IN PIPE AND FITTINGS SHALL BE MADE IN SUCH MANNER AS TO PROVIDE A WATERTIGHT JOINT AND ADEQUATE STRENGTH AGAINST PULLOUT. THE MAXIMUM SIZE OF TAPS IN PIPE OF FITTINGS WITHOUT BOSSES SHALL NOT EXCEED THAT LISTED IN THE APPROPRIATE TABLE OF THE APPENDIX TO THE ABOVE-MENTIONED ANSI A21.51 BASED

ON THREE (3) FULL THREADS FOR CAST IRON AND TWO (2) FULL THREADS FOR DUCTILE IRON. WHERE THE SIZE OF THE CONNECTION EXCEEDS THAT GIVEN ABOVE FOR THE PIPE IN QUESTION, A BOSS SHALL BE PROVIDED ON THE PIPE BARREL, THE TAP SHALL BE MADE IN THE FLAT PART OF THE INTERSECTION OF THE RUN AND BRANCH OF A TEE OR CROSS, OR THE CONNECTION SHALL BE MADE BY MEANS OF A TAPPED TEE, BRANCH FITTINGS AND TAPPED PLUG OR REDUCING FLANGE, OR TAPPING TEE AND TAPPING VALVE, ALL AS INDICATED OR APPROVED.
ALL DRILLING AND TAPPING OF DUCTILE IRON PIPE SHALL BE DONE NORMAL TO THE LONGITUDINAL AXIS OF THE PIPE; FITTINGS SHALL BE DRILLED AND TAPPED SIMILARLY, AS APPROPRIATE. DRILLING AND TAPPING SHALL BE DONE ONLY BY

SKILLED MECHANICS. TOOLS SHALL BE ADAPTED TO THE WORK AND IN GOOD CONDITION SO AS TO PRODUCE GOOD, CLEAN-CUT THREADS OF THE CORRECT SIZE, PITCH, AND TAPER. 11. <u>Lining and coating</u>
All pipe and fittings shall be lined and coated as specified below.

THE INSIDE OF PIPE AND FITTINGS SHALL BE COATED WITH THE STANDARD BITUMINOUS SEAL COAT IN ACCORDANCE WITH THE OUTSIDE OF PIPE AND FITTINGS SHALL BE COATED WITH THE STANDARD BITUMINOUS COATING SPECIFIED UNDER THE APPROPRIATE STANDARD SPECIFICATION FOR THE PIPE AND FITTINGS MACHINED SURFACES SHALL BE CLEANED AND COATED WITH A SUITABLE RUST-PREVENTATIVE COATING AT THE SHOP IMMEDIATELY AFTER BEING MACHINED.

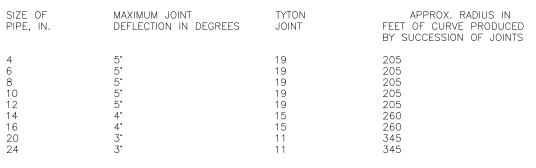
12. <u>Inspection and testing</u> all pipe and fittings shall be inspected and tested at the foundry as required by the standard SPECIFICATIONS TO WHICH THE MATERIAL IS MANUFACTURED. PIPES AND FITTINGS SHALL BE SUBJECTED TO A CAREFUL INSPECTION AND A HAMMER TEST JUST BEFORE BEING LAID OR INSTALLED. HANDLING AND CUTTING PIPE

THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE FACT THAT DUCTILE IRON USED FOR PIPE AND FITTINGS AND THE CEMENT LININGS ARE COMPARATIVELY BRITTLE. EVERY CARE SHALL BE TAKEN IN HANDLING AND LAYING PIPE AND FITTINGS TO AVOID DAMAGING THE PIPE AND LININGS, SCRATCHING OR MARRING MACHINED SURFACES, AND ABRASION OF THE PIPE COATING OR LINING ANY FITTING SHOWING A CRACK AND ANY FITTING OR PIPE WHICH HAS RECEIVED A SEVERE BLOW THAT MAY HAVE CAUSED AN INCIPIENT FRACTURE, EVEN THOUGH NO SUCH FRACTURE CAN BE SEEN, SHALL BE MARKED AS REJECTED AND REMOVED AT ONCE FROM THE WORK. IN ANY PIPE SHOWING A DISTINCT CRACK AND IN WHICH IT IS BELIEVED THERE IS NO INCIPIENT FRACTURE BEYOND THE

LIMITS OF THE VISIBLE CRACK, THE CRACKED PORTIONS, IF SO APPROVED, MAY BE CUT OFF BY AND AT THE EXPENSE OF THE CONTRACTOR BEFORE THE PIPE IS LAID SO THAT THE PIPE USED MAY BE PERFECTLY SOUND. THE CUT SHALL BE MADE IN THE SOUND BARREL AT A POINT AT LEAST 12 INCHES FROM THE VISIBLE LIMITS OF THE CRACK. EXCEPT AS OTHERWISE APPROVED, ALL CUTTING SHALL BE DONE WITH A MACHINE HAVING ROLLING WHEEL CUTTERS OR KNIVES ADAPTED TO THE PURPOSE. HAMMER AND CHISEL SHALL NOT BE USED TO CUT PIPE. ALL CUT ENDS SHALL BE EXAMINED FOR POSSIBLE CRACKS CAUSED BY CUTTING CUT ENDS TO BE USED WITH PUSH-ON JOINTS SHALL BE CAREFULLY CHAMFERED TO PREVENT CUTTING THE GASKET WHEN THE PIPE IS LAID OR INSTALLED. LINED AND COATED PIPE AND FITTINGS SHALL BE INSTALLED AS, AND ASSEMBLED WITH, APPROVED PACKING OR GASKETS OF THE TYPE RECOMMENDED BY THE PIPE MANUFACTURER FOR THE PARTICULAR LINING USED. 14. <u>Installing Pipe and Fittings</u>
No defective Pipe or Fittings shall be laid or placed in the Piping, and any Piece discovered to be

DEFECTIVE AFTER HAVING BEEN LAID OR PLACED SHALL BE REMOVED AND REPLACED BY A SOUND AND SATISFACTORY EACH PIPE AND FITTING SHALL BE CLEARED OF ALL DEBRIS, DIRT, ETC., BEFORE BEING LAID AND SHALL BE KEPT CLEAN UNTIL ACCEPTED IN THE COMPLETED WORK. PIPE AND FITTINGS SHALL BE LAID ACCURATELY TO THE LINES AND GRADES INDICATED ON THE DRAWINGS OR REQUIRED. CARE SHALL BE TAKEN TO ENSURE A GOOD ALIGNMENT BOTH HORIZONTALLY AND VERTICALLY. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT FLOATATION OF THE PIPELINE IN THE TRENCH. IN BURIED PIPELINES, EACH PIPE SHALL HAVE A FIRM BEARING ALONG ITS ENTIRE LENGTH. THE DEFLECTION OF ALIGNMENT AT A JOINT SHALL NOT EXCEED THE VALUES SHOWN BELOW:

PIPE DEFLECTION ALLOWANCES (FULL LENGTH PIPE) MAXIMUM PERMISSIBLE DEFLECTION, IN. *



*MAXIMUM PERMISSIBLE DEFLECTION FOR 18-FOOT LENGTH; MAXIMUM PERMISSIBLE DEFLECTIONS FOR OTHER LENGTHS SHALL BE IN PROPORTION OF SUCH LENGTHS TO 18 FEET.

AT ALL TIMES WHEN PIPE LAYING IS NOT ACTUALLY IN PROGRESS, THE OPEN ENDS OF PIPE SHALL BE CLOSED BY TEMPORARY WATERTIGHT PLUGS OR BY OTHER APPROVED MEANS. IF WATER IS IN THE TRENCH WHEN WORK IS RESUMED, THE PLUG SHALL NOT BE REMOVED UNTIL ALL DANGER OF WATER ENTERING THE PIPE HAS PASSED. PIPELINES SHALL NOT BE USED AS CONDUITS FOR TRENCH DRAINAGE DURING CONSTRUCTION. 16. <u>Assembling push—on joints</u> push—on joints shall be made up by first inserting the gasket into the groove of the bell and applying

A THIN FILM OF SPECIAL NON-TOXIC GASKET LUBRICANT UNIFORMLY OVER THE INNER SURFACE OF THE GASKET THAT WILL BE IN CONTACT WITH THE SPIGOT END OF THE PIPE. THE CHAMFERED END OF THE PLAIN PIPE SHALL BE INSERTED INTO THE GASKET AND THEN FORCED PAST IT UNTIL IT SEATS AGAINST THE BOTTOM OF THE SOCKET. 17. ASSEMBLING MECHANICAL JOINTS
SURFACES AGAINST WHICH THE GASKET WILL COME IN CONTACT SHALL BE THOROUGHLY BRUSHED WITH A WIRE BRUSH
PRIOR TO ASSEMBLY OF THE JOINT. THE GASKET SHALL BE CLEANED. THE GASKET, BELL, AND SPIGOT SHALL BE
LUBRICATED BY BEING WASHED WITH SOAPY WATER. THE GLAND AND GASKET, IN THAT ORDER, SHALL BE SLIPPED OVER
THE SPIGOT, AND THE SPIGOT SHALL BE INSERTED INTO THE BELL UNTIL IT IS CORRECTLY SEATED. THE GASKET SHALL
THE SPIGOT AND THE SPIGOT SHALL BE INSERTED INTO THE BELL UNTIL IT IS CORRECTLY SEATED. THE GASKET SHALL THEN BE SEATED EVENLY IN THE BELL AT ALL POINTS, CENTERING THE SPIGOT, AND THE GLAND SHALL BE PRESSED FIRMLY AGAINST THE GASKET. AFTER ALL BOLTS HAVE BEEN INSERTED AND THE NUTS HAVE BEEN MADE UP FINGERTIGHT, DIAMETRICALLY OPPOSITE NUTS SHALL BE PROGRESSIVELY AND UNIFORMLY TIGHTENED ALL AROUND THI JOINT TO THE PROPER TENSION, PREFERABLY BY MEANS OF A TORQUE WRENCH. THE CORRECT RANGE OF TORQUE AS INDICATED BY A TORQUE WRENCH AND THE LENGTH OF WRENCH (IF NOT A TORQUE WRENCH) USED BY AN AVERAGE

PERSON TO PRODUCE SUCH RANGE OF TORQUE, SHALL NOT EXCEED THE VALUES SPECIFIED AS: RANGE OF TORQUE: 60 - 90 FT-LB. LENGTH OF WRENCH: 10 IN. IF EFFECTIVE SEALING OF THE JOINT IS NOT ATTAINED AT THE MAXIMUM TORQUE, INDICATED ABOVE, THE JOINT SHALL BE DISASSEMBLED AND THOROUGHLY CLEANED, THEN REASSEMBLED. BOLTS SHALL NOT BE OVERSTRESSED TO TIGHTEN 18. <u>Assembling Sleeve—Type Couplings</u>
Prior to the installation of Sleeve—Type Couplings, the Pipe ends shall be cleaned thoroughly for a

DISTANCE OF EIGHT (8) INCHES. SOAPY WATER MAY BE USED AS A GASKET LUBRICANT. A FOLLOWER AND GASKET, IN THAT ORDER, SHALL BE SLIPPED OVER EACH PIPE TO A DISTANCE OF ABOUT SIX (6) INCHES FROM THE END. AND THE MIDDLE RING SHALL BE PLACED ON THE ALREADY LAID PIPE END, UNTIL IT IS PROPERLY CENTERED OVER THE JOINT. HE OTHER PIPE END SHALL BE INSERTED INTO THE MIDDLE RING AND BROUGHT TO PROPER POSITION IN RELATION TO IHE PIPE ALREADY LAID. THE GASKETS AND FOLLOWERS SHALL THEN BE PRESSED EVENLY AND FIRMLY INTO THE MIDDLE RING FLARE. AFTER THE BOLTS HAVE BEEN INSERTED AND ALL NUTS HAVE BEEN MADE UP FINGERTIGHT DIAMETRICALLY OPPOSITE NUTS SHALL BE PROGRESSIVELY AND UNIFORMLY TIGHTENED ALL AROUND THE JOINT, PREFERABLY BY USE OF A TORQUE WRENCH OF THE APPROPRIATE SIZE AND TORQUE FOR THE BOLTS THE CORRECT TORQUE AS INDICATED BY A TORQUE WRENCH SHALL NOT EXCEED THE VALUES INDICATED IN THE TABULATION FOLLOWING:

NORMAL PIPE SIZE, IN. BOLT DIA., IN. MAXIMUM TORQUE FT.-LB. 3 - 245/8 3 - 243/4

AFTER ASSEMBLY AND INSPECTION AND BEFORE BEING BACKFILLED, ALL EXTERIOR SURFACES OF BURIED SLEEVE-TYPE COUPLINGS, INCLUDING THE MIDDLE AND FOLLOWER RINGS, BOLTS, AND NUTS, SHALL BE THOROUGHLY COATED WITH AN APPROVED HEAVY—BODIED BITUMINOUS MASTIC. CARE SHOULD BE TAKEN AND APPROPRIATE DEVICES USED TO ENSURE THAT THE UNDERSIDES, AS WELL AS THE MORE READILY ACCESSIBLE PARTS, ARE WELL COATED.

19. <u>Setting appurtenances</u>
All valves, fittings and appurtenances shall be set and jointed as indicated on the drawings. 20. SOCKET PIPE CLAMPS, TIE RODS, AND BRIDLES
WHERE INDICATED OR NECESSARY TO PREVENT BELL-AND-SPIGOT JOINTS OR SLEEVE COUPLINGS FROM PULLING APART
UNDER PRESSURE, SUITABLE SOCKET PIPE CLAMPS, TIE RODS, AND BRIDLES SHALL BE PROVIDED. BRIDLES AND TIE RODS SHALL BE OF WROUGHT IRON AT LEAST 3/4 INCH IN DIAMETER EXCEPT WHERE THEY REPLACE FLANGE BOLTS OF SMALLER SIZE, IN WHICH CASE THEY SHALL BE FITTED WITH A NUT ON EACH SIDE OF THE PAIR OF FLANGES. THE SOCKET CLAMPS AND TIE RODS OR BRIDLES SHALL BE COATED WITH AN APPROVED BITUMINOUS PAINT AFTER ASSEMBLY WHERE REQUIRED, BENDS, TEES, AND OTHER FITTINGS IN CAST-IRON PIPELINES BURIED IN THE GROUND SHALL BE BACKED UP WITH CONCRETE PLACED AGAINST UNDISTURBED EARTH WHERE FIRM SUPPORT CAN BE OBTAINED. IF THE SOIL DOES NOT PROVIDE FIRM SUPPORT, THEN SUITABLE BRIDLE RODS, CLAMPS, AND ACCESSORIES TO BRACE THE FITTINGS PROPERLY SHALL BE PROVIDED. SUCH BRIDLE RODS, ETC., SHALL BE COATED THOROUGHLY AND HEAVILY WITH AN APPROVED BITUMINOUS PAINT AFTER ASSEMBLY OR, IF NECESSARY, BEFORE ASSEMBLY.

21. <u>CLEANING</u>
PRIOR TO THE PRESSURE AND LEAKAGE TESTS, THE PIPING SHALL BE THOROUGHLY CLEANED OF ALL DIRT, DUST, OIL, GREASE AND OTHER FOREIGN MATERIAL. THIS WORK SHALL BE DONE WITH CARE TO AVOID DAMAGE TO LININGS AND

VALVES AND APPURTENANCES

THE CONTRACTOR SHALL FURNISH ALL VALVES AND APPURTENANCES AS INDICATED ON THE DRAWINGS AND AS HEREIN 2. <u>Butterfly valves</u>

Buried Butterfly valves shall be iron—body, ductile iron valve discs with rubber seats offset from the

VALVE SHAFT IN ORDER TO PROVIDE COMPLETE 360' SEATING HAVING MECHANICAL, FLANGED, OR BELL—AND—SPIGOT ENDS NECESSARY TO MATCH CONNECTING PIPE. THE VALVE SHALL BE SUITABLE FOR 150 PSI WORKING PRESSURE FOR 12-INCH TO 24-INCH SIZES AND SHALL CONFORM TO THE AWWA STANDARD FOR RUBBER-SEATED BUTTERFLY VALVES. DESIGNATION C504-94 INSOFAR AS APPLICABLE. VALVES SHALL BE MADE BY THE MUELLER COMPANY, DECATUR, ILLINOIS OR APPROVED FOUAL THEY SHALL, IN ADDITION, MEET THE FOLLOWING REQUIREMENTS: VALVE BODY SEATING SURFACE SHALL BE STAINLESS STEEL, ASTM A276, TYPE 304. THE MATING SEAT SHALL BE

NATURAL RUBBER BONDED TO AN 18-8 STAINLESS STEEL SEAT RETAINING RING AND SHALL BE MOUNTED ON THE DISC. THE RUBBER SEAT MOUNTED ON THE DISC SHALL BE FIELD ADJUSTABLE AND FIELD REPLACEABLE.

VALVE SHAFTS SHALL BE STAINLESS STEEL, ASTM A276, TYPE 304 OF THE STUB SHAFT DESIGN. THE SHAFTS AND DISC SHALL BE CONNECTED BY MEANS OF AN O-RING SEALED TAPER PIN, HELD IN PLACE BY SELF-LOCKING NUTS. DISC SHALL BE HELD IN THE CENTER OF THE VALVE BY FACTORY SET THRUST COLLARS. SHAFT SEALS SHALL BE OF THE O-RING TYPE IN A REMOVABLE BRONZE CARTRIDGE. OPERATORS SHALL BE OF THE TRAVELING-NUT TYPE WITH READILY ADJUSTABLE END STOPS WITHOUT DISASSEMBLY OF OPERATOR OR USE OF MACHINE TOOLS. OPERATORS SHALL BE FIELD REPLACEABLE. ALL VALVES FURNISHED SHALL OPEN COUNTER-CLOCKWISE.

3. GATE VALVES THREE (3) INCHES AND LARGER IN SIZE
BURIED GATE VALVES SHALL BE OF THE RESILIENT SEATED WEDGE TYPE WITH NON-RISING BRONZE STEM AND IRON BODY HAVING MECHANICAL ENDS FOR CONNECTING PIPE. THE VALVES SHALL BE SUITABLE FOR 200 PSI WORKING PRESSURE FOR 3—INCH TO 12—INCH SIZES AND SHALL CONFORM TO THE AWWA C509—94 STANDARD FOR RESILIENT-SEATED GATE VALVES FOR WATER SUPPLY SERVICE. VALVES SHALL BE AS MANUFACTURED BY THE KENNEDY VALVE COMPANY OF ELMIRA. NEW YORK: MUELLER CO. OF DECATUR, ILLINOIS; WATEROUS (DIVISION OF AMHOIST) OF ST. PAUL, MINNESOTA, AMERICAN VALVE COMPANY OF BIRMINGHAM, ALABAMA; OR OF AN APPRÔVED EQUAL. THEY SHALL, IN ADDITION, MEET THE FLOWING REQUIREMENTS:

RESILIENT GATE VALVES SHALL BE OF THE INSIDE-SCREW TYPE WITH AN OPERATING NUT. ALL VALVES FURNISHED SHALL OPEN COUNTER—CLOCKWISE.

MECHANICAL END CONNECTIONS SHALL BE FURNISHED WITH ALL NECESSARY JOINT MATERIALS.

VALVES SHALL HAVE A FULL OPENING FLOW WAY OF A DIAMETER EQUAL TO THE NOMINAL SIZE OF THE CONNECTING RESILIENT SEATED VALVES SHALL HAVE NO RECESSES AT THE BOTTOM OF THE BORE WHERE STONES OR OTHER DEBRIS CAN COLLECT OR PREVENT CLOSURE.

ALL INTERNAL FERROUS METALS SHALL BE COATED WITH AN EPOXY COATING. THE COATING SHALL BE NON—TOXIC, IMPART NO TASTE TO WATER, PROTECT ALL SEATING AND ADJACENT SURFACES FROM CORROSION AND PREVENT BUILD—UP OF SCALE OR TUBERCULATION. IT SHALL MEET ALL REQUIREMENTS OF AWWA C550-90, STANDARD FOR PROTECTIVE I'HE SEALING MECHANISM SHALL PROVIDE ZERO LEAKAGE AT WORKING WATER PRESSURES UP TO 200 PSI WITH FLOW IN VALVES SHALL BE PROVIDED WITH TWO O-RING STEM SEALS, WITH AT LEAST ONE O-RING ABOVE THE STEM THRUST COLLAR AND BEARING SURFACES. AT LEAST ONE ANTI-FRICTION WASHER SHALL BE LOCATED ABOVE THE THRUST COLLAR TO MINIMIZE OPERATING TORQUE. ALL INTERNAL PARTS SHALL BE ACCESSIBLE WITHOUT REMOVING THE MAIN BODY FROM THE PRESSURE LINE.

GATE VALVES SMALLER THAN THREE (3) INCHES IN SIZE SHALL MEET THE STANDARDS NOTED ABOVE FOR GATE VALVES THREE (3) INCHES AND LARGER IN SIZE. 5. <u>Retàining glands</u> Mechanical joint restraint shall be incorporated in the design of the follower gland and shall include a RESTRAINING MECHANISM WHICH, WHEN ACTUATED, IMPARTS MULTIPLE WEDGING ACTION AGAINST THE PIPE, INCREASING ITS RESISTANCE AS THE PRESSURE INCREASES. GLANDS SHALL BE MANUFACTURED OF DUCTILE IRON CONFORMING TO

A.S.T.M. A536-80, GRADE 60-42-10. RESTRAINING DEVICES SHALL BE OF DUCTILE IRON HEAT TREATED TO A MINIMUM

HARDNESS OF 370 BHN. DIMENSIONS OF THE GLAND SHALL BE SUCH THAT IT CAN BE USED WITH THE STANDARDIZED

GATE VALVES SMALLER THAN THREE (3) INCHES IN SIZE

MECHANICAL JOINT BELL AND TEE-HEAD BOLTS CONFORMING TO ANSI/AWWA A21.11 AND ANSI/AWWA C153/A21.53 OF LATEST REVISION. TWIST-OFF NUTS, SIZED SAME AS TEE-HEAD BOLTS, SHALL BE USED TO INSURE PROPER ACTUATING OF RESTRAINING DEVICES. THE MECHANICAL JOINT RESTRAINT DEVICE SHALL HAVE A WORKING PRESSURE OF AT LEAST 250 PSI WITH A MINIMUM SAFETY FACTOR OF 2:1 AND SHALL BE EBAA IRON, INC., MEGALUG OR EQUAL. 6. <u>VALVE BOXES</u> VALVE BOXES SHALL BE THREE—SECTION CAST—IRON. ADJUSTABLE SCREW TYPE. HEAVY PATTERN. THE LOWER SECTION OF

THE BOX SHALL BE DESIGNED TO ENCLOSE THE OPERATING NUT AND STUFFING BOX OF THE VALVE AND REST ON THE BACKFILL. THE LENGTH SHALL BE NECESSARY TO SUIT THE GROUND ELEVATION. THE INSIDE DIAMETER OF THE BOXES SHALL BE AT LEAST 4-1/2 INCHES, INCLUDING COVER. 7. CORPORATION COCKS

CORPORATION COCKS SHALL BE OF BRONZE WITH A LAPPED, GROUND KEY. THE INLET THREAD SHALL BE OF STEEP

TO SHALL BE OF BRONZE WITH A LAPPED, GROUND KEY. THE TYPE OF PIPE OR TURING CONNECTED. THE TAPER TYPE. OUTLET CONNECTIONS SHALL BE AS REQUIRED TO SUIT THE TYPE OF PIPE OR TUBING CONNECTED. THE COCKS SHALL BE THE APPROVED EQUAL TO THOSE MADE BY MUELLER CO., OR RED HEAD MFG. CO.

8. <u>HYDRANTS</u>
HYDRANTS SHALL BE BREAKAWAY TYPE STANDARD AWWA HYDRANTS CONFORMING TO APPLICABLE REQUIREMENTS OF THE AWWA STANDARD SPECIFICATIONS FOR DRY-BARREL FIRE HYDRANTS, DESIGNATION C502-94. HYDRANTS SHALL BE FURNISHED WITH ONE PUMPER AND TWO HOSE CONNECTIONS. THE SIZE OF THE CONNECTIONS AND THREADS SHALL BE AS REQUIRED BY THE CITY OF GROTON. OPERATING NUTS SHALL TURN COUNTERCLOCKWISSE TO OPEN THE HYDRANTS. HYDRANTS SHALL BE A 5¼-INCH VALVE AND 6-INCH MECHANICAL JOINT INLET CONNECTION. HYDRANTS, VALVES, AND CONNECTING PIPING SHALL BE RATED FOR A WORKING WATER PRESSURE OF AT LEAST 150 P.S.I. HYDRANTS SHALL BE ITHER MODEL B-62-B QUIK-FIX HYDRANT MANUFACTURED BY AMERICAN VALVE AND HYDRANT COMPANY OF BIRMINGHAM, ALABAMA OR MODEL A-423 SUPER CENTURION 200 HYDRANT MANUFACTURED BY THE MUELLER COMPANY OF DECATUR, ILLINOIS. THE CONTRACTOR SHALL REMOVE ALL HYDRANT NOZZLE CAP CHAINS AND SHALL PAINT ALL HYDRANTS AFTER BEING PLACED INTO SERVICE WITH TWO (2) COATS OF PAINT. THE PAINT AND COLOR SHALL BE SHERWIN-WILLLIAMS, INDUSTRIAL SAFETY YELLOW, NO. B54Y37. 9. <u>SETTING VALVES AND HYDRANTS</u> VALVES, HYDRANTS, AND VALVE BOXES SHALL BE SET PLUMB AND CENTERED WITH THE VALVE BOX DIRECTLY OVER THE

OPERATING NUT. THE HYDRANT CONNECTING PIPE SHALL HAVE AT LEAST THE SAME DEPTH OF COVER AS THE DISTRIBUTION MAIN. HYDRANTS SHALL BE SET UPON A SLAB OF STONE OR CONCRETE NOT LESS THAN FOUR (4) NCHES THICK AND 15 INCHES SQUARE AND INSTALLED TO THE BURY LINE ON THE HYDRANT AS RECOMMENDED BY THE MANUFACTURER FROM FINAL FINISH GRADE. THE SIDE OF THE HYDRANT OPPOSITE THE PIPE CONNECTION SHALL BE FIRMLY WEDGED AGAINST THE VERTICAL FACE OF THE TRENCH WITH A CONCRETE THRUST BLOCK, AS INDICATED ON THE DRAWINGS. NOT LESS THAN FOUR (4) CUBIC FEET OF SCREENED GRAVEL SHALL BE PLACED AROUND THE BASE OF EACH HYDRANT AT THE LOCATION OF THE DRAIN HOLES. BACKFILL AROUND THE HYDRANTS SHALL BE SPECIFIED UNDER EARTH EXCAVATION, BACKFILL, AND FILL. 10. <u>TAPPING SLEEVES AND VALVES</u>
THE TAPPING SLEEVES AND VALVES SHALL BE INSTALLED BY THE CITY OF GROTON WHEN REQUIRED.

11. <u>INSERTING VALVES</u>
INSERTING VALVES, SLEEVES, AND ANCHOR CLAMPS SHALL BE INSTALLED BY THE CITY OF GROTON. 2. <u>Connections to existing mains</u> The City of Groton shall make all connections to the existing mains as indicated on the drawings and as EXISTING PIPELINE DAMAGED BY THE CONTRACTOR SHALL BE REPLACED OR REPAIRED BY GROTON UTILITIES AT THE CONTRACTOR'S EXPENSE, ON PURCHASE ORDER.

13. <u>TIE RODS AND CLAMPS</u>
THE CONTRACTOR SHALL FURNISH AND INSTALL TIE RODS, CLAMPS, COUPLINGS, AND ACCESSORIES TO PREVENT THE MOVEMENT OF BRANCH VALVES, AS INDICATED ON THE DRAWINGS OR AS DIRECTED. THE CLAMPS, ETC., SHALL BE OF THE SIZES, MATERIALS, AND CONSTRUCTION INDICATED ON THE DRAWINGS. PRESSURE AND LEAKAGE TESTS

THE PIPELINES SHALL BE GIVEN COMBINED PRESSURE AND LEAKAGE TESTS IN SECTIONS OF APPROVED LENGTH IN ACCORDANCE WITH THE AWWA STANDARD SPECIFICATION (C600-87).
THE SCHEDULING OF PRESSURE AND LEAKAGE TESTS SHALL BE AS DIRECTED BY THE ENGINEER.
SUBJECT TO APPROVAL AND PROVIDED THAT THE TESTS ARE MADE WITHIN A REASONABLE TIME, CONSIDERING THE PROGRESS OF THE PROJECT AS A WHOLE AND THE NEED TO PUT THE SECTION INTO SERVICE, THE CONTRACTOR MAY MAKE THE TESTS WHEN HE DESIRES. THE CONTRACTOR SHALL FURNISH AND INSTALL SUITABLE TEMPORARY TESTING PLUGS OR CAPS FOR THE PIPELINE; ALL NECESSARY PUMPS. PIPE CONNECTIONS. AND OTHER SIMILAR EQUIPMENT; AND ALL LABOR REQUIRED, ALL WITHOUT ADDITIONAL COMPENSATION. THE OWNER SHALL FURNISH A WATER METER AND A PRESSURE GAUGE THAT THE CONTRACTOR SHALL INSTALL IN SUCH A MANNER THAT ALL WATER ENTERING THE SECTION UNDER TEST WILL BE MEASURED AND THE PRESSURE IN THE SECTION INDICATED. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE COST OF ALL WATER TO BE USED FOR WATER TESTING AND ROAD UNLESS IT HAS ALREADY BEEN DONE, THE SECTION OF PIPE TO BE TESTED SHALL BE FILLED WITH WATER OF APPROVED QUALITY AND ALL AIR SHALL BE EXPELLED FROM THE PIPE. IF HYDRANTS OR BLOW-OFFS ARE NOT AVAILABLE AT HIGH POINTS FOR RELEASING AIR, THE CONTRACTOR SHALL MAKE THE NECESSARY EXCAVATIONS AND DO THE NECESSARY BACKFILLING AND MAKE THE NECESSARY TAPS AT SUCH POINTS AND SHALL PLUG SAID HOLES AFTER COMPLETION OF THE SECTION UNDER TEST SHALL BE MAINTAINED FULL OF WATER FOR A PERIOD OF 24 HOURS PRIOR TO THE COMBINED PRESSURE AND LEAKAGE TEST BEING APPLIED. THE PRESSURE AND LEAKAGE TEST SHALL CONSIST OF FIRST RAISING THE WATER PRESSURE (BASED ON THE ELEVATION OF THE LOWEST POINT OF THE SECTION UNDER TEST AND CORRECTED TO THE GAUGE LOCATION) TO A PRESSURE IN POUNDS PER SQUARE INCH NUMERICALLY EQUAL TO THE PRESSURE RATING OF THE PIPE. WHILE MAINTAINING THI PRESSURE, THE CONTRACTOR SHALL MAKE A LEAKAGE TEST BY METERING THE FLOW OF WATER INTO THE PIPE. IF THE AVERAGE LEAKAGE DURING A TWO-HOUR PERIOD EXCEEDS A RATE OF 10 GALLONS PER INCH OF DIAMETER PER 24 HOURS PER MILE OF PIPELINE, THE SECTION SHALL BE CONSIDERED AS HAVING FAILED THE TEST. ALL JOINTS WITHIN CHAMBERS AND ALL FLANGED JOINTS SHALL HAVE NO VISIBLE LEAKAGE. NO CAULKING OF COMPOUND JOINTS WITH LEAD OR OTHER FOREIGN MATERIAL WILL BE ALLOWED. COMPOUND JOINTS WHICH DRIP SLIGHTLY WILL, IN GENERAL, BE SATISFACTORY, BUT NO JOINTS FROM WHICH WATER CONTINUES TO RUN OR SQUIRT IN AN ACTIVE MANNER WILL BE IF THE SECTION SHALL FAIL TO PASS THE PRESSURE TEST OR THE LEAKAGE TEST, OR BOTH, THE CONTRACTOR SHALL

DISINFECTING AND FLUSHING

REPAIRS SHALL BE MADE UNTIL THE SECTION PASSES THE SPECIFIED TESTS.

AFTER A SECTION OF THE MAIN HAS BEEN TESTED AND FOUND ACCEPTABLE, IT SHALL BE FLUSHED THOROUGHLY BY THE CONTRACTOR. UPON COMPLETION OF FLUSHING OPERATIONS, THE CONTRACTOR SHALL FURNISH ALL EQUIPMENT AND MATERIALS NECESSARY TO DO THE WORK TO DISINFECT THE MAIN WITH A SOLUTION CONSISTING OF 50 PPM. OF CHLORINE (WHICH SHALL BE RETAINED IN THE MAIN FOR AT LEAST 24 HOURS) IN ACCORDANCE WITH THE AWWA STANDARD SPECIFICATIONS FOR DISINFECTING WATER MAINS (C651-92), SECTIONS 1 TO 9, INCLUSIVE. HE CONTRACTOR SHALL DECHLORINATE THE WATER USED FÒR DISINFÉCTING AND FLUSHING PRIOR TO DISPOSAL AND SHALL DISPOSE OF SUCH WATER IN AN APPROVED MANNER. AFTER FINAL FLUSHING, TWO CONSECUTIVE BACTERIOLOGICAL WATER SAMPLE SETS SHALL BE COLLECTED AT LEAST 24 HOURS APART, FROM THE NEW WATERMAIN AT EACH SELECTED POINT. SPACING OF SAMPLES SHALL NOT EXCEED 1000 FEET. IN ADDITION, ONE SAMPLE SET SHALL BE COLLECTED FROM THE POINT OF WATER ENTRY INTO THE NEW MAIN, AT THE ENDS OF THE NEW MAIN, AND AT THE ENDS OF ALL BRANCHES OFF THE NEW MAIN. HOSES OR HYDRANTS MAY NOT BE USED FOR THE COLLECTION OF SAMPLES. SAMPLE SITES AND PROCEDURES SHALL BE REVIEWED AND

DO EVERYTHING NECESSARY TO LOCATE, UNCOVER, AND REPAIR OR REPLACE THE DEFECTIVE PIPE, FITTING. OR JOINT.

ALL AT HIS OWN EXPENSE AND WITHOUT EXTENSION OF TIME FOR COMPLETION OF THE WORK. ADDITIONAL TESTS AND

APPROVED BY THE ENGINEER PRIOR TO SAMPLING IF DIRT OR DEBRIS HAS ENTERED THE NEW MAIN DURING CONSTRUCTION, BACTERIOLOGICAL SAMPLE SETS SHALL BE COLLECTED AT 200-FOOT INTERVALS AS DIRECTED BY THE ENGINEER. CONSECUTIVE SAMPLING SHALL BE REPEATED FOR ANY FAILURE UNTIL BOTH SAMPLES WITHIN EACH SET MEET THE ACCEPTANCE CRITERIA DESCRIBED BELOW. IHE SAMPLES SHALL BE TAKEN AND ANALYZED BY GROTON UTILITIES. NO SECTION SHALL BE PUT INTO SERVICE UNTIL THE CHIEF OPERATOR OF THE GROTON UTILITIES WATER TREATMENT PLANT HAS GRANTED APPROVAL. TEST RESULTS SHALL DEMONSTRATE THAT ALL WATER SAMPLED FROM THE WATERMAIN HAS A TOTAL-COLIFORM COUNT OF ZERO. THE COST FOR ALL WORK ASSOCIATED WITH FLUSHING AND DISINFECTING SHALL BE PAID FOR BY THE CONTRACTOR.

<u>CAPPING OF EXISTING WATER MAIN</u>

EXISTING WATER MAINS TO BE ABANDONED IN PLACE SHALL BE CUT AND A SUFFICIENT AMOUNT OF PIPING REMOVED TO AVOID CONTACT WITH THE NEW PIPE INSTALLATION OR RECONNECTION. THE MINIMUM DISTANCE OF SEPARATION SHALL BE FIVE (5) FEET OR AS OTHERWEISE DIRECTED BY THE ENGINEER. EACH END OF THE EXISTING PIPE TO BE ABANDONED SHALL THEN BE CAPPED BY PLACEMENT OF A SUFFICIENT AMOUNT OF CONCRETE - APPROXIMATELY ONE (1) CUBIC YARD - TO PERMANENTLY CLOSE OFF THE PIPE ENDS. THE CONTRACTOR SHALL INSTALL A PLUG FAR ENOUGHT INTO THE PIPE TO SERVE AS A FORM AGAINST WHICH TO PLACE CONCRETE AND HE SHALL FORM THE OUTSIDE OF THE PIPE FACE TO HOLD THE CONCRETE IN PLACE UNTIL IT HAS SUFFICIENTLY CURED TO ALLOW FOR THE PLACEMENT OF BACKFILL. THIS CAPPING PROCESS SHALL BE DONE AT THE DIRECTION OF AND UNDER THE SUPERVISION OF THE ENGINEER AND THE CONTRACTOR SHALL GIVE SUFFICIENT NOTICE PRIOR TO SUCH INSTALLATION TO ALLOW FOR THE ENGINEER TO BE PRESENT.

LOAMING AND SEEDING

ANY EXISTING GRASS AREAS WHICH ARE DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE REFINISHED WITH FOUR (4) INCHES OF ORGANICALLY ENRICHED (NOT LESS THAN 25 PERCENT WELL ROTTEN MANURE OR COMPOST AND LIME) TÓPSOIL AND SEEDED WITH AN APPROVED PERENNIAL GRASS SEED. GRASS SEED SHALL BE FURNISHED IN SEALED BÁGS OR CONTAINERS FORM THE SUPPLIER AND CLEARLY LABELED. RESEEDING AND WATERING SHALL BE CONTINUED UNTIL A SATISFACTORY STAND OF GRASS IS OBTAINED.

PAVEMENT REPLACEMENT

1. GENERAL
THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO RESTORE OR REPLACE, AS DIRECTED, ALL PAVED SURFACES AND CURBS REMOVED OR DAMAGED TO A CONDITION AT LEAST EQUAL TO THAT EXISTING IMMEDIATELY PRIOR TO THE BEGINNING OF HIS OPERATIONS AND IN ACCORDANCE WITH HIGHWAY DEPARTMENT



nvironmental Engineers www.cherenzia.com

> PLAN REVISIONS DESCRIPTION TOWN COMMENTS

DATE

1/25/24

DECEMBER 22, 2023

DWN CH

BY B

SETB | SF

3/19/24 TOWN COMMENTS SETB SF 5/3/24 SETB SF TOWN COMMENTS DRAWN BY: SETB CALE: N.T.S. CHECK BY: SFC CA JOB # 223022

ISSUED FOR REVIEW

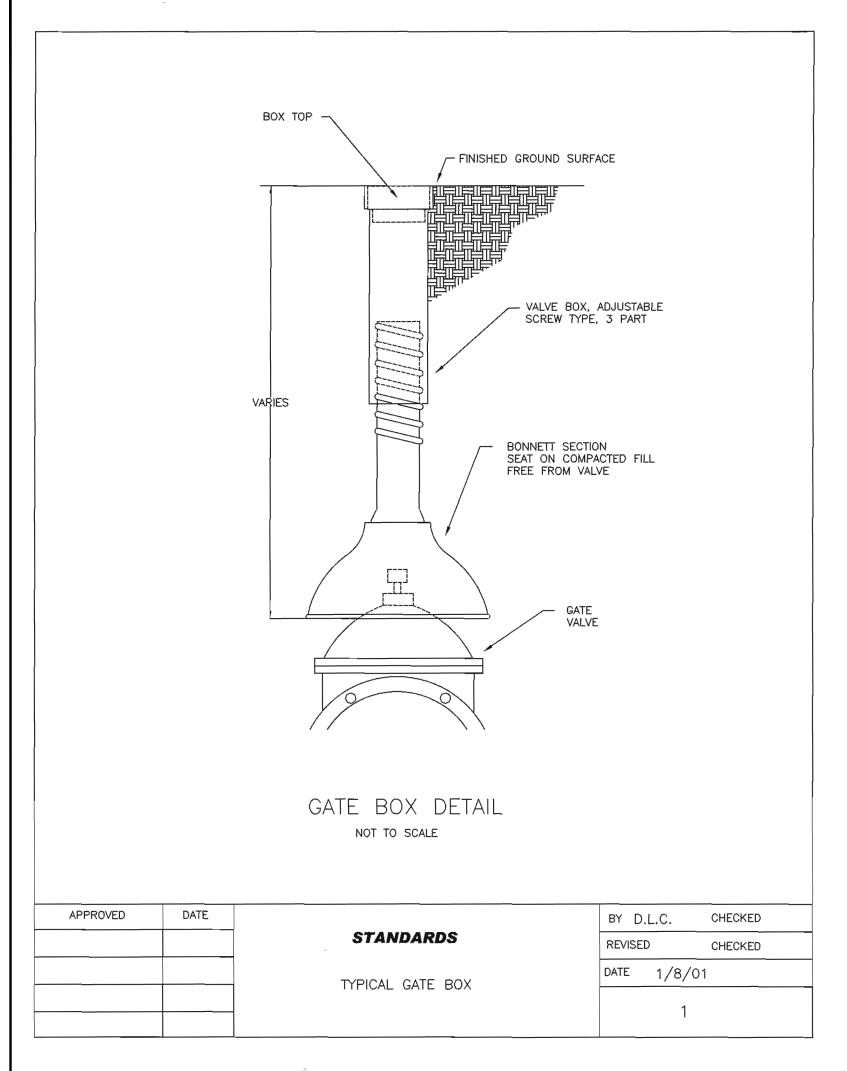
Town of Groton Utilities Technical Standards

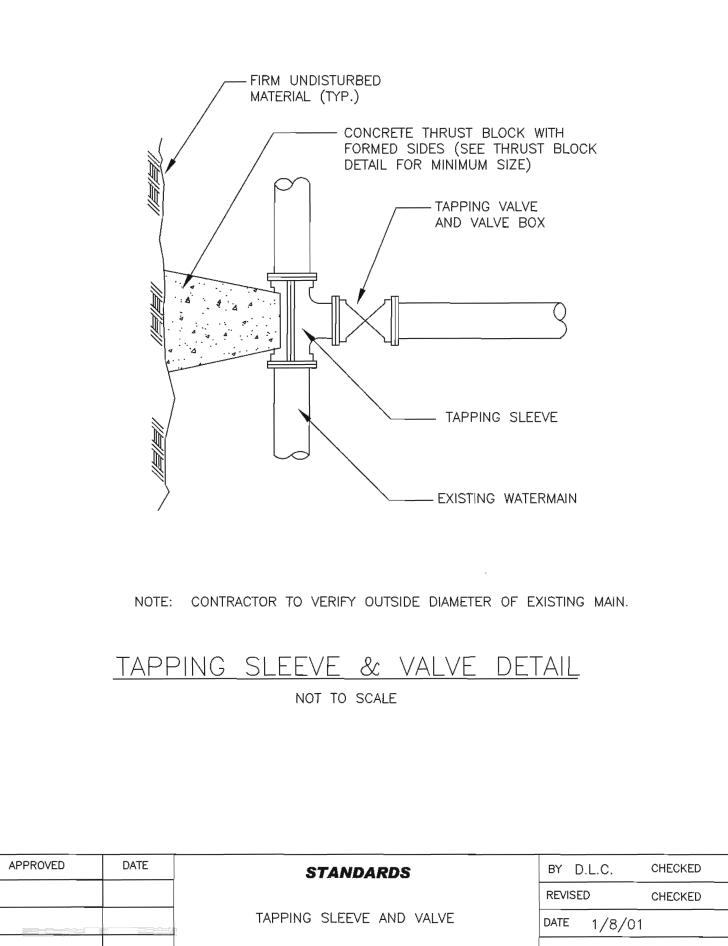
FUEL DISPENSING STATION & CONVENIENCE STORE 388 & 390 LONG HILL ROAD 17 BROOKSHAVEN ROAD ASSESSOR'S ID 476, 1389 & 1591 GROTON, CONNECTICUT

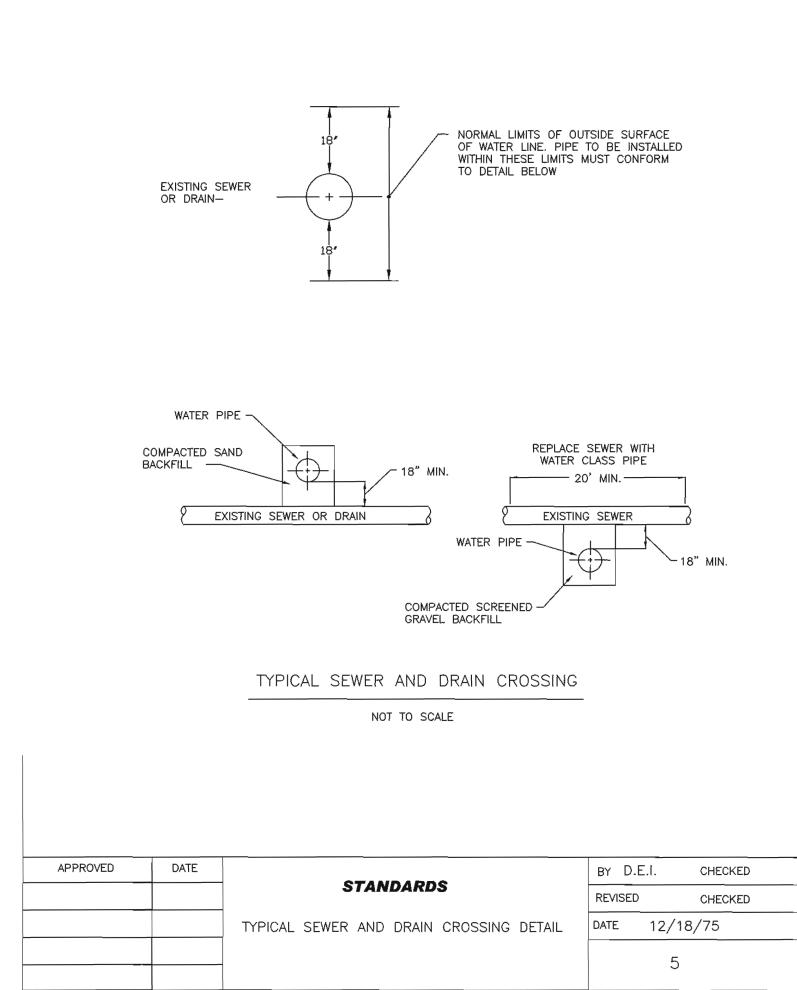
> PREPARED FOR AR ENERGY LLC

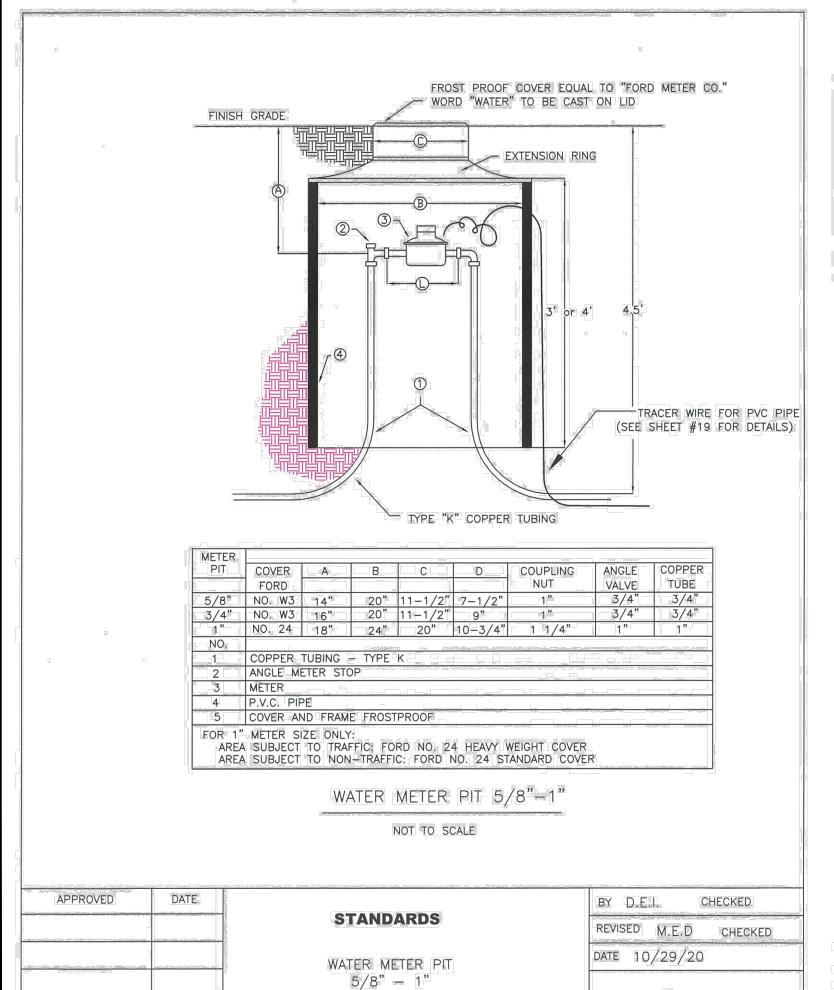


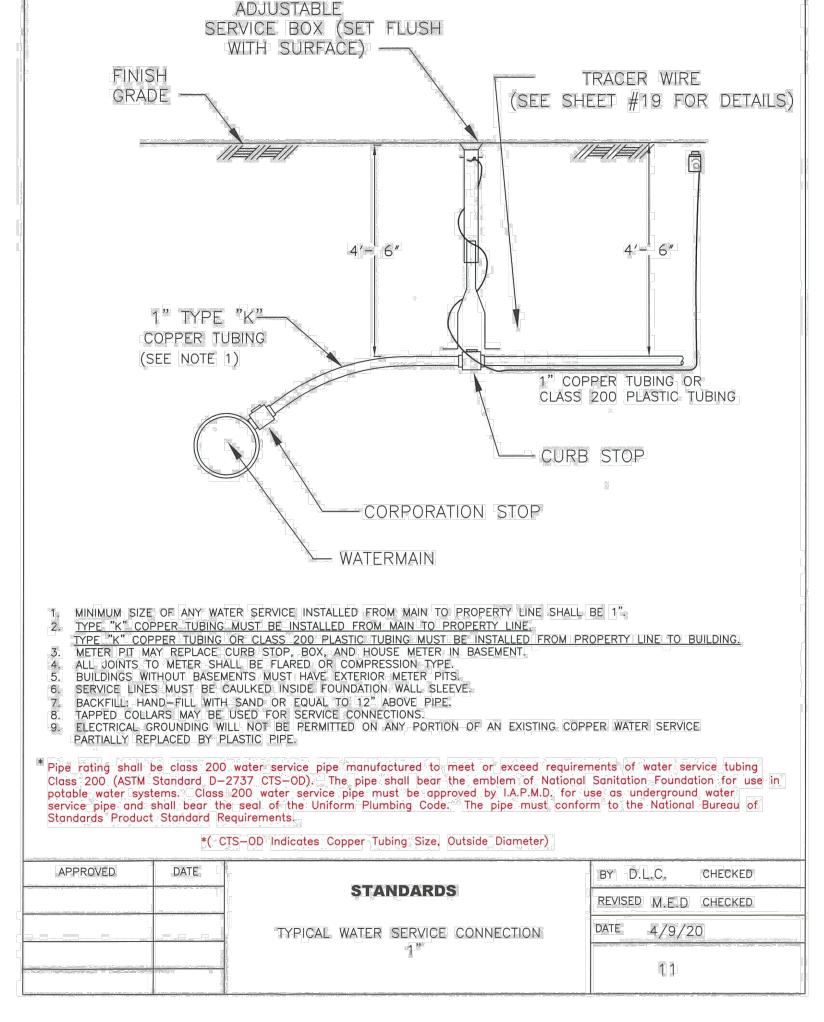
Sheet C-10 of C-11

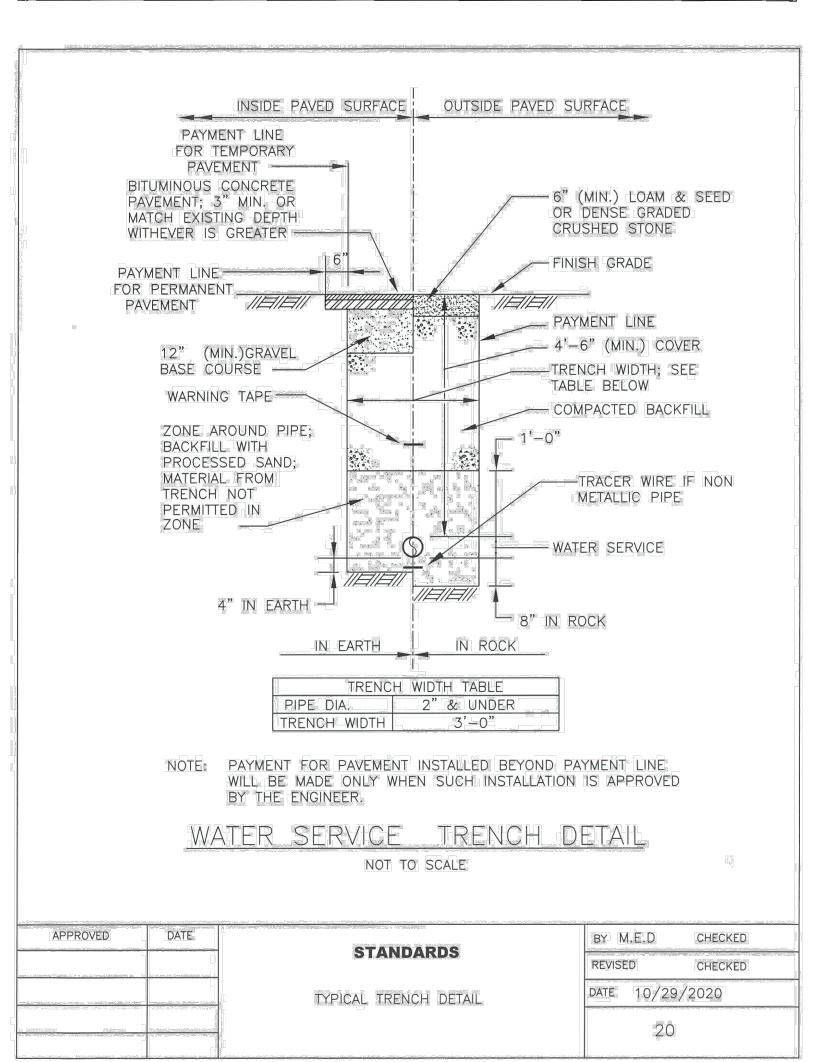














		PLAN RE	EVISIONS		
REV. NO.	DATE	DESCRIPTION		DWN BY	(
1	1/25/24	TOWN COM	SETB		
2	3/19/24	TOWN COM	MENTS	SETB	
3 5/3/24		TOWN COMMENTS		SETB	
SCALE: N.T.S. CA JOB # 223022 DECEMBER 22, 2023			DRAWN BY: SI CHECK BY: SF		

ISSUED FOR REVIEW

Town of Groton Water Details

FUEL DISPENSING STATION & CONVENIENCE STORE

388 & 390 LONG HILL ROAD

17 BROOKSHAVEN ROAD

ASSESSOR'S ID 476, 1389 & 1591

GROTON, CONNECTICUT

PREPARED FOR AR ENERGY LLC



C-11

Sheet C-11 of C-11

