

LOCUS MAP  
(NOT TO SCALE)

# MULTI-FAMILY SITE DEVELOPMENT

## THE RESIDENCES AT THOREAU

### 275 FOREST RIDGE ROAD CONCORD, MA 01742

**OWNER:**  
THOREAU REAL ESTATE LLC  
275 FOREST RIDGE ROAD  
CONCORD, MA 01742

**APPLICANT:**  
THOREAU RESIDENCES, LLC  
275 FOREST RIDGE ROAD  
CONCORD, MA 01742

**BUILDING ARCHITECT:**  
THE ARCHITECTURAL TEAM, INC.  
50 COMMANDANT'S WAY AT ADMIRAL'S HILL  
CHELSEA, MA 02150  
(617) 889-4402

**CIVIL ENGINEER / LAND SURVEYOR:**  
ALLEN & MAJOR ASSOCIATES, INC.  
10 MAIN STREET  
LAKEVILLE, MA 02347  
(508) 923-1010

**LANDSCAPE ARCHITECT**  
HAWK DESIGN, INC.  
39 PLEASANT STREET  
SAGAMORE, MA 02561  
(508) 833-8800



#### LIST OF DRAWINGS

DRAWING TITLE	SHEET NO.	ISSUED	LAST REVISED
COVER	—	12/20/2023	02/28/2025
EXISTING CONDITIONS	V-100 - V-102	12/20/2023	02/28/2025
ABBREVIATIONS & NOTES	C-001 - C-002	12/20/2023	02/28/2025
LOCUS PLAN	C-100A - C-100B	12/20/2023	02/28/2025
EROSION CONTROL PLAN	C-101A - C-101B	12/20/2023	02/28/2025
SITE PREPARATION PLAN	C-102A - C-102B	12/20/2023	02/28/2025
LAYOUT & MATERIALS PLAN	C-103 - C-103C	12/20/2023	02/28/2025
GRADING & DRAINAGE PLAN	C-104 - C-104C	02/28/2025	—
TEST PITS	C-104D	12/20/2023	02/28/2025
UTILITIES PLAN	C-105 - C-105B	12/20/2023	02/28/2025
SNOW STORAGE PLAN	C-106A - C-106B	12/20/2023	02/28/2025
FIRE TRUCK TURNING PLAN	C-107A - C-107B	12/20/2023	02/28/2025
LIGHTING PLAN	C-108A - C-108C	12/20/2023	02/28/2025
SEPTIC SYSTEM DESIGN PLAN	C-109	02/28/2025	—
SEPTIC SYSTEM DETAILS	C-109A - C-109C	02/28/2025	—
DETAILS	C-501 - C-508	12/20/2023	02/28/2025

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PREPARED BY:



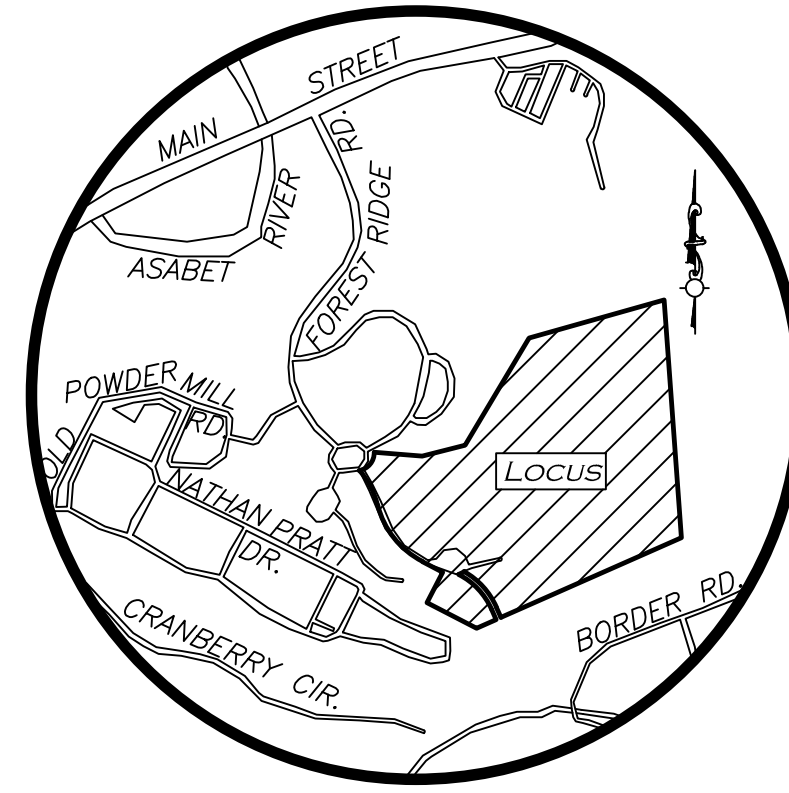
**ALLEN & MAJOR  
ASSOCIATES, INC.**

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DECEMBER 20, 2023  
LAST REVISED FEBRUARY 28, 2025

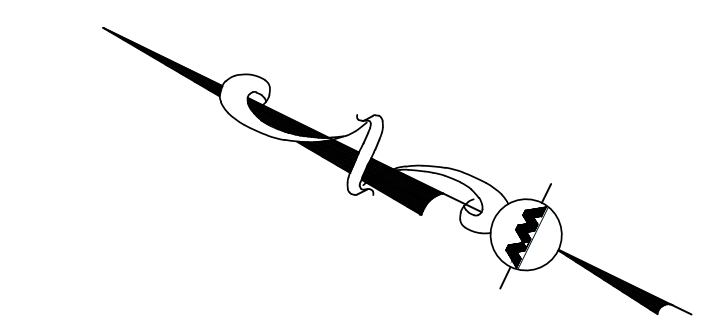


**LOCUS MAP**  
(NOT TO SCALE)

**LEGEND**

STONE BOUND (SB)	FLARED END SECTION	GAS METER	CONCRETE WALL	CONCRETE	CONC.
IRON ROD (IR)	LIGHT	HANDICAPPED PARKING SPACE	TREE LINE	GRANITE	GRAN.
PK NAIL	FLOODLIGHT	IRRIGATION CONTROL VALVE	EDGE OF PAVEMENT	BOTTOM CENTER	(BC)
DRAIN MANHOLE (DMH)	TRAFFIC SIGNAL	PARKING SPACE COUNT	CURB	REINFORCED CONCRETE PIPE	RCP
SEWER MANHOLE (SMH)	TREE	BASKETBALL HOOP	CHAIN LINK FENCE	POLYVINYL CHLORIDE PIPE	PVC
MISC. MANHOLE (MH)	BUSH / SHRUB	CONCRETE	STOCKADE FENCE	CORRUGATED METAL PIPE	CMP
CATCH BASIN (CB)	SIGN	LANDSCAPED AREA (LSA)	VINYL FENCE	HIGH DENSITY POLYETHYLENE PIPE	HDPE
ROUND CATCH BASIN (RCB)	MAILBOX	BRICK	GUARDRAIL	FOUND	FND
UTILITY POLE	TRANSFORMER	BUILDING	WATER LINE	NOW OR FORMERLY	N/F
GUY WIRE	WELL	BUILDING OVERHANG	SEWER LINE	BOOK	BK.
FIRE HYDRANT	MONITOR WELL	EASEMENT LINE	DRAIN LINE	PAGE	PG.
FIRE STANDPIPE	DOWNSPOUT	2' CONTOUR	GAS LINE	PLAN BOOK	PB.
WATER GATE	HAND HOLE	10' CONTOUR	ELECTRIC LINE	PLAN	PL.
GAS GATE	TELEPHONE BOX	PROPERTY LINE	OVERHEAD WIRES	CERTIFICATE OF TITLE	COT
BOLLARD	ELECTRIC BOX	ABUTTERS LINE	FINISHED FLOOR ELEVATION	LAND COURT	L.C.
CLEANOUT			BITUMINOUS	LAND COURT CASE	L.C.C.

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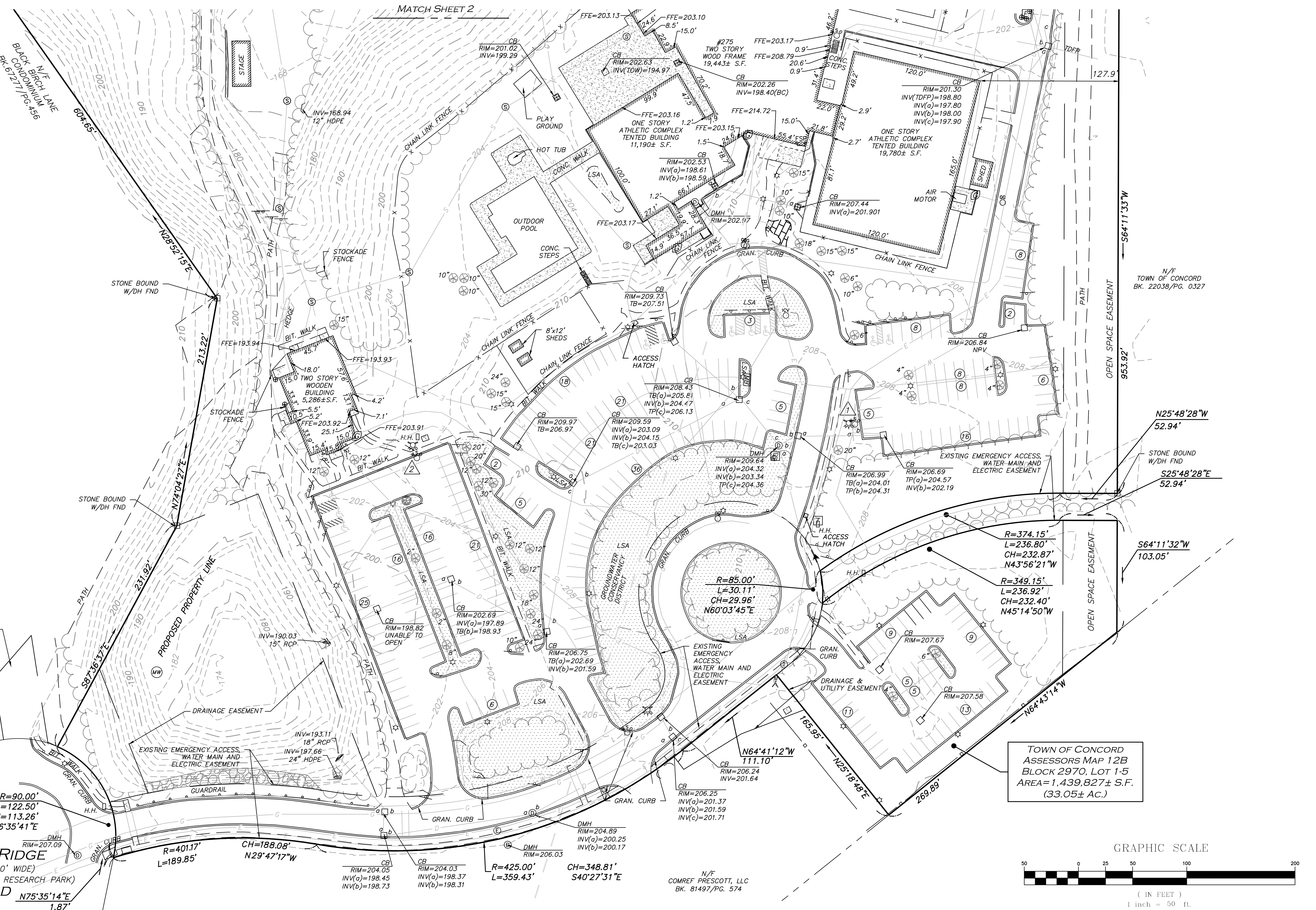
**BENCHMARK SUMMARY**

TBM #	DESCRIPTION	ELEV.
1	X-CUT ON HYDRANT FLANGE BOLT	210.37
2	X-CUT ON HYDRANT FLANGE BOLT	206.63

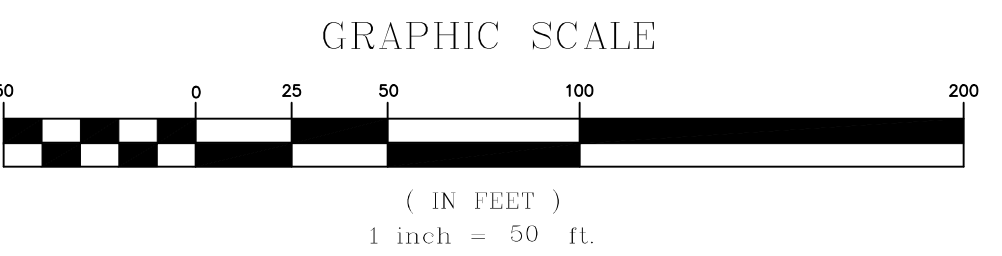
**PARKING SUMMARY**

STANDARD STALLS	298
HANDICAPPED STALLS	10
<b>TOTAL STALLS</b>	<b>308</b>

**NOTE**  
1. SEE SHEET V-102 FOR LOCUS REFERENCES, PLAN REFERENCE, AND ADDITIONAL NOTES.



TOWN OF CONCORD  
ASSESSORS MAP 12B  
BLOCK 2970, LOT 1-5  
AREA=1,439.827± S.F.  
(33.05± AC.)



WE HEREBY CERTIFY THAT:  
THIS PLAN IS THE RESULT OF AN ACTUAL ON THE GROUND SURVEY PERFORMED ON OR BETWEEN SEPTEMBER 20, 2023 AND MAY 28, 2024.  
THE SUBJECT PREMISES IS LOCATED IN ZONE X (UNSHADED) "AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN" AS SHOWN ON FLOOD INSURANCE RATE MAP FOR THE TOWN OF CONCORD MASSACHUSETTS MIDDLESEX COUNTY SOUTH DISTRICT COMMUNITY PANEL NUMBER 25017C0366F HAVING AN EFFECTIVE DATE OF JULY 7, 2014.  
THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE REGISTERERS OF DEEDS DATED JANUARY 1, 1976 AND REVISED JANUARY 12, 1988. ACCORDING TO DEEDS AND PLANS OF RECORD, THE PROPERTY LINES SHOWN ON THIS PLAN ARE THE LINES DIVIDING EXISTING OWNERSHIP, AND THE LINES OF THE STREETS OR WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS AND WAYS ALREADY ESTABLISHED, AND THAT NO NEW LINES FOR THE DIVISION OF EXISTING OWNERSHIP OR FOR NEW WAYS ARE SHOWN.  
THE ABOVE CERTIFICATION IS INTENDED TO MEET REGISTRY OF DEEDS REQUIREMENTS FOR THE RECORDING OF PLANS AND IS NOT A CERTIFICATION TO THE TITLE OR OWNERSHIP OF THE PROPERTY SHOWN. OWNERS OF ADJOINING PROPERTIES ARE SHOWN ACCORDING TO CURRENT TOWN OF CONCORD ASSESSOR'S INFORMATION.  
THE ABOVE IS CERTIFIED TO THE BEST OF MY PROFESSIONAL KNOWLEDGE, INFORMATION AND BELIEF.

ALLEN & MAJOR ASSOCIATES, INC.  
  
Digitally signed by Andrew J. Ruggles  
Date: 2025.03.03 13:44:36 -0500  
PROFESSIONAL LAND SURVEYOR FOR ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
03	02/28/25	PER PEER REVIEW COMMENTS
02	10/18/24	ZBA RESUBMISSION
01	02/23/24	ZBA RESUBMISSION

APPLICANT/OWNER:  
**THOREAU RESIDENCES, LLC**  
275 FOREST RIDGE ROAD  
CONCORD, MA 01742

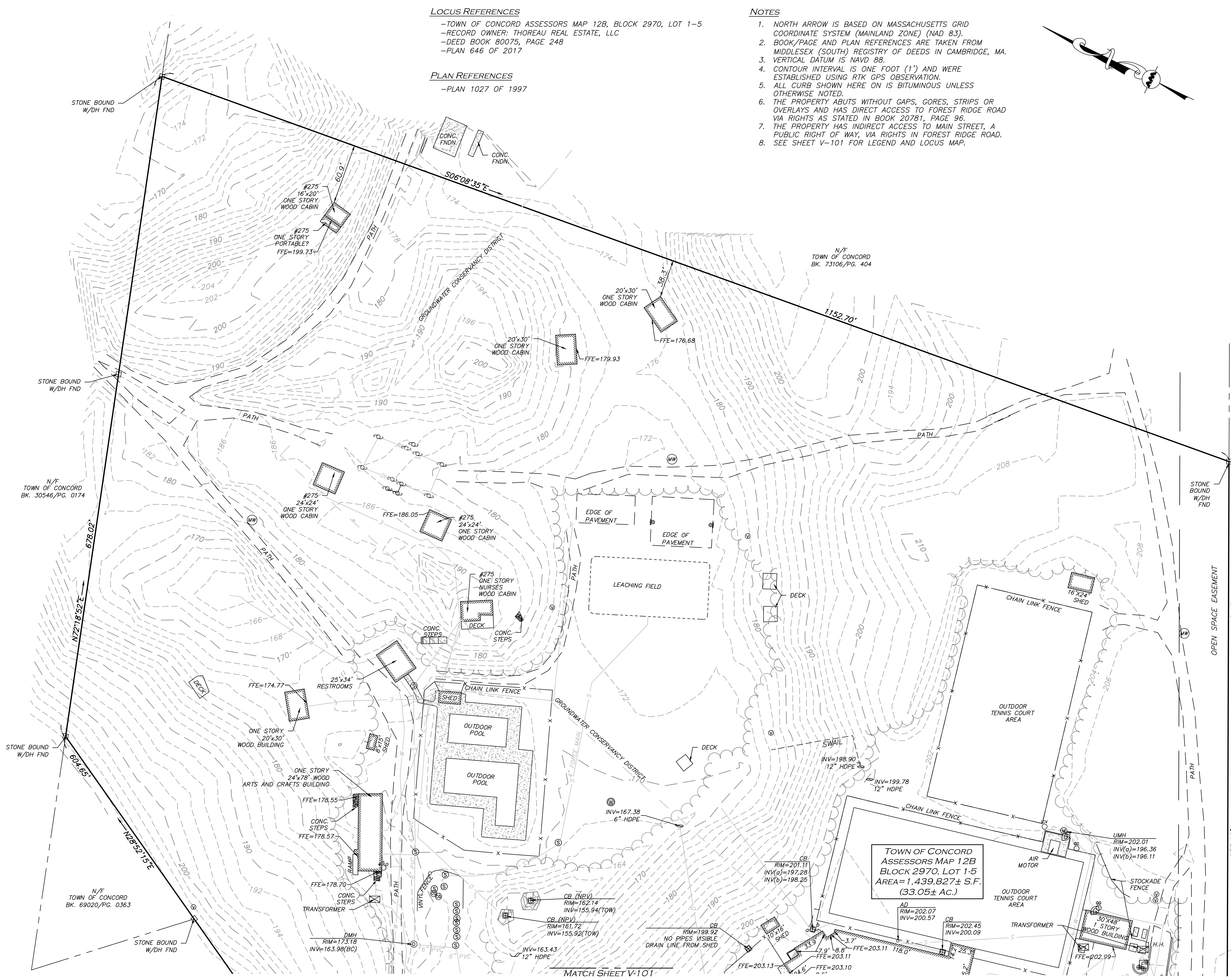
PROJECT:  
**THE RESIDENCES AT THOREAU**  
275 FOREST RIDGE ROAD  
CONCORD, MA 01742

PROJECT NO. 1670-24 DATE: 12/20/23  
SCALE: 1" = 50' DWG. NAMES-1670-24-ALTA  
DRAFTED BY: KMB/CTP/COB CHECKED BY: NIL

PREPARED BY:  
  
**ALLEN & MAJOR ASSOCIATES, INC.**  
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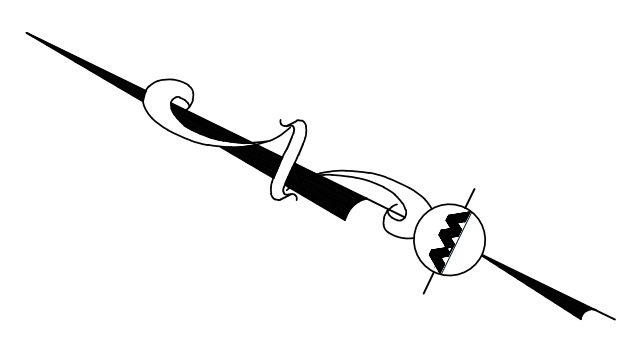
DRAWING TITLE: **EXISTING CONDITIONS** SHEET NO. **V-101**  
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**LOCUS REFERENCES**  
 -TOWN OF CONCORD ASSESSORS MAP 12B, BLOCK 2970, LOT 1-5  
 -RECORD OWNER: THOREAU REAL ESTATE, LLC  
 -DEED BOOK 80075, PAGE 248  
 -PLAN 646 OF 2017

**PLAN REFERENCES**  
 -PLAN 1027 OF 1997

- NOTES**
1. NORTH ARROW IS BASED ON MASSACHUSETTS GRID COORDINATE SYSTEM (MAINLAND ZONE) (NAD 83).
  2. BOOK/PAGE AND PLAN REFERENCES ARE TAKEN FROM MIDDLESEX (SOUTH) REGISTRY OF DEEDS IN CAMBRIDGE, MA.
  3. VERTICAL DATUM IS NAVD 88.
  4. CONTOUR INTERVAL IS ONE FOOT (1') AND WERE ESTABLISHED USING RTK GPS OBSERVATION.
  5. ALL CURB SHOWN HERE ON IS BITUMINOUS UNLESS OTHERWISE NOTED.
  6. THE PROPERTY ABUTS WITHOUT GAPS, GORES, STRIPS OR OVERLAYS AND HAS DIRECT ACCESS TO FOREST RIDGE ROAD VIA RIGHTS AS STATED IN BOOK 20781, PAGE 96.
  7. THE PROPERTY HAS INDIRECT ACCESS TO MAIN STREET, A PUBLIC RIGHT OF WAY, VIA RIGHTS IN FOREST RIDGE ROAD.
  8. SEE SHEET V-101 FOR LEGEND AND LOCUS MAP.



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ALLEN & MAJOR ASSOCIATES, INC.

Digitally signed by Andrew J. Ruggles  
 Date: 2025.03.03 13:43:53 -05'00'

PROFESSIONAL LAND SURVEYOR FOR ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
03	02/28/25	PER PEER REVIEW COMMENTS
02	10/18/24	ZBA RESUBMISSION
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APPLICANT/OWNER:  
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 275 FOREST RIDGE ROAD  
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PROJECT:  
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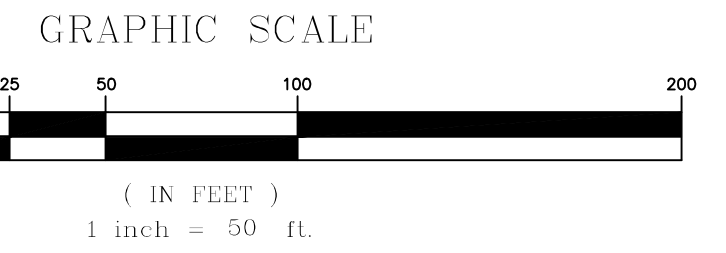
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PREPARED BY:

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DRAWING TITLE: **EXISTING CONDITIONS** SHEET NO. **V-102**



# NOTES

## GENERAL NOTES:

- TOPOGRAPHIC INFORMATION AND EXISTING SITE FEATURES WERE OBTAINED FROM AN ACTUAL FIELD SURVEY PERFORMED BY ALLEN & MAJOR ASSOCIATES, INC. 100 COMMERCE WAY, WOBURN, MASSACHUSETTS.
- ZONING DISTRICT IS LIMITED INDUSTRIAL PARK 2 AND THE GROUNDWATER CONSERVANCY DISTRICT.
- THE PROPERTY LOCATED AT 275 FOREST RIDGE ROAD, CONCORD, MASSACHUSETTS IS SUBJECT TO AN APPROVAL NOT REQUIRED (ANR) SUBDIVISION PROCESS. SITE WORK SHOWN ON THE SUBSEQUENT DRAWINGS ASSOCIATED WITH THE ANR LOT FOR THE MULTI-FAMILY DEVELOPMENT IS PART OF A COMPREHENSIVE PERMIT APPLICATION TO THE ZONING BOARD OF APPEALS. ANY WORK SHOWN ON THE REMAINING LAND IS FOR COORDINATION PURPOSES ONLY AND SHALL BE DESIGNED AND PERMITTED BY OTHERS AS REQUIRED BY THE TOWN OF CONCORD REGULATIONS.
- OVERALL LOT SIZE: 33.05± ACRES. NEW MULTI-FAMILY LOT AREA IS 13.09 ACRES AND THE REMAINING LAND IS 19.96 ACRES.
- DURING CONSTRUCTION, ALL VEHICLES MUST BE PARKED ON SITE.
- DURING CONSTRUCTION, ALL STAGING AND DELIVERIES WILL OCCUR ON SITE.
- THIS PROJECT WILL BE SERVED BY PUBLIC WATER AND PRIVATE ON-SITE SEWER, TELEPHONE, CABLE AND ELECTRIC. ALL UTILITY LINES WILL BE INSTALLED UNDERGROUND UNLESS OTHERWISE NOTED.
- THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AND STRUCTURES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF VARIOUS UTILITY COMPANIES AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THIS INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE LOCATION OF ALL UNDERGROUND UTILITIES AND STRUCTURES SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR MUST CONTACT THE APPROPRIATE UTILITY COMPANY, ANY GOVERNING PERMITTING AUTHORITY AND "DIGSAFE" AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION WORK TO REQUEST EXACT FIELD LOCATION OF UTILITIES AND THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES INTERFERING WITH THE PROPOSED CONSTRUCTION AND APPROPRIATE REMEDIAL ACTION TAKEN BEFORE PROCEEDING WITH THE WORK. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS AT NO ADDITIONAL COST.
- ALL PROPOSED MAIN BUILDING ENTRANCES AND WALKS SHALL BE HANDICAP ACCESSIBLE PER FEDERAL ADA & MA AAB REGULATIONS.
- ALL SITE WORK DONE FOR THIS PROJECT SHALL BE IN STRICT ACCORDANCE WITH THE SITE PLANS AND SITE WORK SPECIFICATIONS FOR CONSTRUCTION.
- ANY DAMAGE TO PRIVATE OR PUBLIC PROPERTIES DUE TO THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AND RESTORED BY THE CONTRACTOR AT THEIR OWN EXPENSE.
- ALL PROPERTY MARKERS AND STREET LINE MONUMENTS SHALL BE PROPERLY PROTECTED DURING CONSTRUCTION. ANY DAMAGE TO THESE ITEMS SHALL BE REPAIRED AND RESTORED BY A SURVEYOR REGISTERED IN THE STATE OF MASSACHUSETTS AT THE CONTRACTOR'S EXPENSE.
- ALL APPLICABLE PERMITS AND AN APPROVED SET OF PLANS SHALL BE AVAILABLE AT THE CONSTRUCTION SITE.
- THE CONTRACTOR IS RESPONSIBLE FOR SCHEDULING A PRE-CONSTRUCTION MEETING WITH THE APPROPRIATE CITY DEPARTMENTS, THE APPROPRIATE UTILITY COMPANIES, THE OWNER AND OWNER'S REPRESENTATIVE. THE MEETING SHALL TAKE PLACE PRIOR TO THE START OF CONSTRUCTION AND THE CONTRACTOR MUST PROVIDE 48 HOURS NOTICE TO ALL ATTENDEES PRIOR TO THE START OF THE MEETING.
- APPROPRIATE WARNING SIGNS, MARKERS, BARRICADES AND/OR FLAG MEN SHALL BE PROVIDED TO REGULATE TRAFFIC. CONSTRUCTION TRAFFIC CONTROLS SHALL BE IMPLEMENTED AND OPERATED ACCORDING TO THE MASS DEPARTMENT OF TRANSPORTATION, THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND THE LOCAL AUTHORITY.
- THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ADDITIONAL BENCHMARK INFORMATION IF REQUIRED. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING BENCHMARKS. IF IT IS NECESSARY TO RELOCATE A BENCHMARK, IT SHALL BE RELOCATED BY A MASSACHUSETTS PROFESSIONAL LAND SURVEYOR AND DONE SO AT THE CONTRACTOR'S EXPENSE.
- ALL BUILDING DIMENSIONS ARE MEASURED TO THE OUTSIDE FACE OF THE BUILDING.
- ALL RADII ARE 3 FEET UNLESS OTHERWISE NOTED.
- ALL PARKING LOT AND AISLE DIMENSIONS ARE TAKEN FROM THE FACE OF CURB AND INDICATE EDGE OF PAVEMENT.
- CONSTRUCTION DURING WET WEATHER OR WINTER CONDITIONS IS TO BE ANTICIPATED AND PROVISIONS TO ADEQUATELY ADDRESS THESE CONDITIONS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AT NO ADDITIONAL COST.
- THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND PAYING FOR ANY PERMITS AND/OR CONNECTION FEES REQUIRED TO CARRY OUT THE WORK INCLUDING BUT NOT LIMITED TO DEMOLITION.
- DISPOSAL OF ALL DEMOLISHED MATERIALS INCLUDING EXISTING MISC. CONSTRUCTION DEBRIS IS THE RESPONSIBILITY OF THE CONTRACTOR AND MUST BE DISPOSED OF OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL MUNICIPAL REQUIREMENTS AT NO ADDITIONAL COST.
- ALL DISTURBED AREAS NOT NOTED TO RECEIVE OTHER TREATMENT ARE TO RECEIVE SIX INCHES (6") MINIMUM OF TOPSOIL & SEED, AND BE MAINTAINED UNTIL ESTABLISHED & ACCEPTED.
- EXISTING STRUCTURES WITHIN CONSTRUCTION LIMITS ARE TO BE PROTECTED, ABANDONED, REMOVED OR RELOCATED AS NECESSARY.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RELOCATIONS, INCLUDING BUT NOT LIMITED TO, ALL UTILITIES, STORM DRAINAGE, SIGNS, & POLES, ETC. AS REQUIRED. ALL WORK SHALL BE IN ACCORDANCE WITH THE LOCAL MUNICIPALITY'S GOVERNING AUTHORITY'S SPECIFICATIONS AND SHALL BE APPROVED BY SAME.
- THE CONTRACTOR SHALL COORDINATE WITH ALL UTILITY COMPANIES TO DETERMINE EXACT POINT OF SERVICE CONNECTION AND DISCONNECTION AT EXISTING UTILITY.

- ALL ELEVATIONS SHOWN ARE IN REFERENCE TO THE BENCHMARKS SHOWN ON THE EXISTING CONDITIONS SITE PLAN AND MUST BE VERIFIED BY THE GENERAL CONTRACTOR AT GROUNDBREAKING.
- CONTRACTOR IS RESPONSIBLE FOR DIGGING TEST HOLES AND VERIFYING ANY EXISTING UTILITY OR STRUCTURE PRIOR TO CONSTRUCTION. CONTRACTOR SHALL VERIFY THAT BASED ON EXACT LOCATION OF EXISTING UTILITIES, THERE ARE NO CONFLICTS BETWEEN THE EXISTING AND THE PROPOSED UTILITIES/DRAINAGE STRUCTURES.
- THE CONTRACTOR SHALL ADHERE TO ALL PERMIT CONDITIONS PROVIDED BY ALL GOVERNING AGENCIES AT NO ADDITIONAL COSTS. THIS INCLUDES BUT IS NOT LIMITED TO BUILDING PERMITS, DEMOLITION PERMITS, PLUMBING, GAS, AND ELECTRICAL PERMITS. PERMITS FROM THE PLANNING BOARD OR CITY COUNCIL.
- DURING EXCAVATION, ANY EXISTING EARTH CUT MATERIALS THAT DO NOT MEET THE "ORDINARY FILL" SPECIFICATIONS OR "LOAM" SPECIFICATIONS AND CANNOT BE REUSED SHALL BE REMOVED OFF-SITE BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNERS. MATERIAL WHICH DOES NOT MEET THE SPECIFICATION INCLUDES ALL BOULDERS, ROCKS, CONSTRUCTION DEBRIS, AND MISC. MATERIAL. PRIOR TO REUSE, CONTRACTOR TO PROVIDE TESTING REPORT OF SIEVE ANALYSIS TO ENGINEER FOR APPROVAL. CONTRACTOR CAN AMEND MATERIALS AND CONTINUE TO RETEST AS NECESSARY AT NO ADDITIONAL COST TO OWNER. AFTER AMENDING, IF MATERIAL STILL DOES NOT MEET THE SPECIFICATIONS, IT IS TO BE REMOVED FROM SITE AT NO ADDITIONAL COST TO THE OWNER AND IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.
- ANY PROPOSED SIGNAGE SHALL BE APPROVED BY SEPARATE APPLICATION TO THE APPROPRIATE MUNICIPAL AUTHORITY INCLUDING BUT NOT LIMITED TO THE ZONING BOARD OF APPEALS AND CITY COUNCIL. ALL PROPOSED SIGNAGE MUST MEET THE REQUIREMENTS OF THE LOCAL ZONING CODE.

## GRADING & DRAINAGE NOTES:

- EXISTING PAVEMENT SHALL BE SAW-CUT AND PAVEMENT JOINT SHALL BE INSTALLED WHERE NECESSARY TO ENSURE A SMOOTH CONTINUOUS GRADE.
- PITCH EVENLY BETWEEN SPOT GRADES. ALL PAVED AREAS MUST PITCH TO DRAIN AT A MINIMUM OF 1/8" PER FOOT UNLESS OTHERWISE SPECIFIED. ANY DISCREPANCIES NOT ALLOWING THIS MINIMUM PITCH SHALL BE REPORTED TO THE ENGINEER PRIOR TO CONTINUING WORK.
- ALL GRADING OPERATIONS SHALL BE COORDINATED WITH THE APPROPRIATE UTILITY COMPANIES.
- IN LANDSCAPED AREAS THE TOP ELEVATION OF MANHOLES SHALL MATCH THE FINISH GRADE OF THE TOPSOIL. IN PAVED AREAS THE TOP ELEVATIONS OF MANHOLES SHALL MATCH FINISH GRADE.
- ALL AREAS DISTURBED DURING CONSTRUCTION SHALL BE STABILIZED AS SOON AS POSSIBLE UPON COMPLETION OF CONSTRUCTION WORK IN THE AREA.
- TEMPORARY TUBULAR BARRIER PROTECTION AND/OR SILT SACKS SHALL BE INSTALLED AND MAINTAINED AT EXISTING DRAINAGE STRUCTURES DURING CONSTRUCTION, TO PREVENT SEDIMENT LADEN RUNOFF FROM ENTERING THE DRAINAGE SYSTEM.
- CONTRACTOR IS RESPONSIBLE FOR DEMOLITION OF EXISTING STRUCTURES INCLUDING REMOVAL OF ANY EXISTING UTILITIES SERVING THE STRUCTURE PER DEMOLITION PLAN.
- ALL CATCH BASINS, MANHOLES, INFILTRATION SYSTEMS, AND WATER QUALITY STRUCTURES ARE TO BE CLEANED TO REMOVE ALL CONSTRUCTION SILT AND DEBRIS PRIOR TO FINAL APPROVAL.
- IF ANY EXISTING UTILITY STRUCTURES TO REMAIN ARE DAMAGED DURING CONSTRUCTION, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR AND/OR REPLACE THE EXISTING STRUCTURE AS NECESSARY TO RETURN IT TO EXISTING CONDITIONS OR BETTER AT NO ADDITIONAL COST.
- ALL STORM PIPES ENTERING STRUCTURES SHALL BE GROUTED TO ENSURE CONNECTION AT STRUCTURE IS WATERTIGHT.
- ALL STORM DRAIN MANHOLES SHALL HAVE TRAFFIC BEARING RING & COVERS & SHALL BE LABELED "DRAIN".
- THE CONTRACTOR SHALL ADHERE TO ALL TERMS & CONDITIONS AS OUTLINED IN THE GENERAL N.P.D.E.S. PERMIT FOR STORM WATER DISCHARGE ASSOCIATED WITH CONSTRUCTION ACTIVITIES.
- CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE AWAY FROM BUILDINGS FOR ALL NATURAL AND PAVED AREAS.
- CONTRACTOR SHALL APPLY STABILIZATION FABRIC TO ALL SLOPES STEEPER THAN 3H:1V.
- ALL DRAINAGE SYSTEM COMPONENTS SHALL CONFORM TO LOCAL REQUIREMENTS.

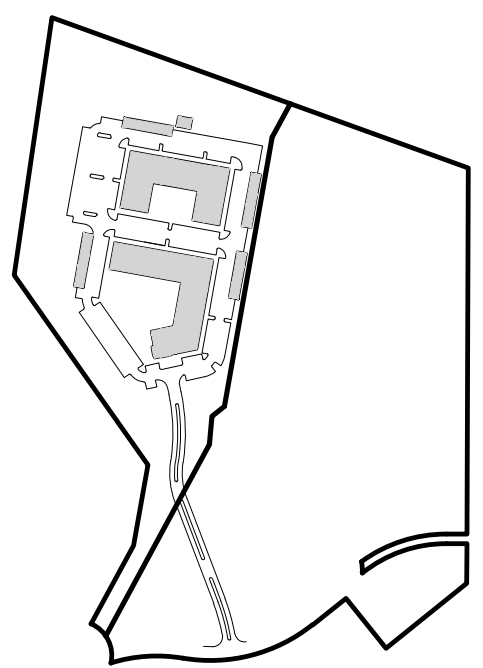
## UTILITY NOTES:

- THE LATEST STANDARDS OF THE LOCAL MUNICIPALITY SHALL BE FOLLOWED WHEN INSTALLING ANY STORM DRAIN WORK. STORM DRAIN WORK WILL BE INSPECTED BY THE LOCAL GOVERNING AUTHORITY PERSONNEL AND ALL COSTS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION.
- ABANDONED EXISTING UTILITIES AND UTILITIES TO BE ABANDONED SHALL EITHER BE ABANDONED IN PLACE AS NOTED OR SHALL BE REMOVED AND DISPOSED OF AS SPECIFIED. ALL UTILITIES SCHEDULED FOR ABANDONMENT OR REMOVAL AND DISPOSAL MUST BE COORDINATED BY THE CONTRACTOR WITH THE RESPECTIVE UTILITY OWNER. WHEN ABANDONED UTILITIES ARE TO BE LEFT IN PLACE, PLUG OR CAP THE ENDS OF THE CONDUITS AND PIPES. REMOVE ABANDONED UTILITY MANHOLES, JUNCTION BOXES AND SIMILAR STRUCTURES TO A MINIMUM DEPTH OF 4 FEET BELOW FINISHED GRADE AND PUNCTURE OR BREAK THE BOTTOM SLABS OF MANHOLES AND SIMILAR STRUCTURE TO ALLOW DRAINAGE. BACKFILL AND COMPACT EXCAVATIONS RESULTING FROM REMOVAL OF UTILITY FACILITIES, AS REQUIRED TO RESTORE THE ORIGINAL GRADE.
- THE CONTRACTOR SHALL MAKE ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENTS OF NATURAL GAS, ELECTRIC, TELEPHONE AND ANY OTHER UTILITY BY THE UTILITY OWNER.
- THE CONTRACTOR SHALL USE THE FOLLOWING PIPE MATERIALS:
  - DRAIN - HDPE (HIGH DENSITY CORRUGATED POLYETHYLENE PIPE WITH SMOOTH INNER WALL), ASTM D2321 (UNLESS OTHERWISE SPECIFIED ON PLAN); ALL JOINTS TO BE WATER TIGHT PER CONCORD PUBLIC WORKS (CPW) STANDARD 2.3.1.2.D.4.
  - WATER - CLDI (CONCRETE LINED DUCTILE IRON PIPE)
  - SEWER - PVC PIPE (POLYVINYL CHLORIDE PLASTIC PIPE)

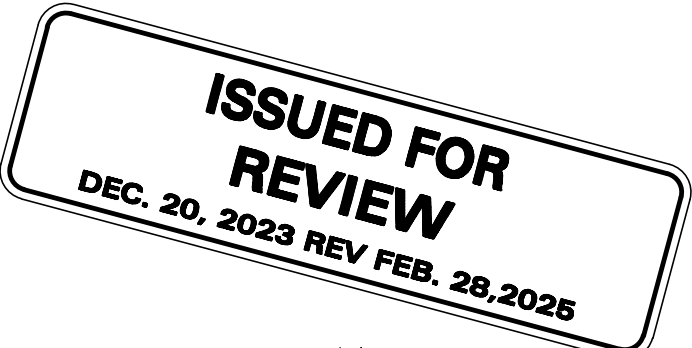
- BEFORE UTILITY WORK BEGINS, THE CONTRACTOR WILL COORDINATE WITH THE LOCAL MUNICIPALITY FOR THE APPROPRIATE PERMIT AND INSPECTION FEES.
- A MINIMUM OF 10 FEET CLEAR HORIZONTALLY SHALL BE MAINTAINED BETWEEN WATER MAINS AND SANITARY SEWER MAINS AND/OR STORM DRAINS. WHENEVER CONDITIONS PREVENT A LATERAL SEPARATION OF 10 FEET TO A WATER MAIN, THE WATER MAIN SHALL BE LAID IN A SEPARATE TRENCH AND THE DIFFERENCE IN ELEVATION BETWEEN THE WATER MAIN AND THE SEWER MAIN SHALL BE AT LEAST 18 INCHES.
- ALL FILL MATERIAL IS TO BE IN PLACE, AND COMPACTED BEFORE INSTALLATION OF PROPOSED UTILITIES.
- CONTRACTOR SHALL NOTIFY THE UTILITY AUTHORITY'S INSPECTORS 72 HOURS BEFORE CONNECTING TO ANY EXISTING LINE.
- MINIMUM TRENCH WIDTH SHALL BE 2 FEET.
- CONTRACTOR SHALL MAINTAIN A MINIMUM OF 5'-0" COVER AND A MAXIMUM OF 8'-0" COVER ON ALL WATERLINES.
- IN THE EVENT OF A VERTICAL CONFLICT BETWEEN WATERLINES, SANITARY LINES, STORM LINES AND GAS LINES (EXISTING AND PROPOSED), THE SANITARY LINE SHALL BE DUCTILE IRON PIPE WITH MECHANICAL JOINTS AT LEAST 10 FEET ON BOTH SIDES OF CROSSING, THE WATERLINE SHALL HAVE MECHANICAL JOINTS WITH APPROPRIATE THRUST BLOCKING AS REQUIRED TO PROVIDE A MINIMUM OF 18" CLEARANCE BETWEEN THE PIPES. WHERE THE WATERLINE IS LESS THAN THE 18" VERTICAL CLEARANCE AND MEETING 10' HORIZONTAL CLEARANCE CANNOT BE MET, THE WATER MUST BE ENCASED IN CONCRETE.
- ALL CONCRETE FOR ENCASEMENTS SHALL HAVE A MINIMUM 28 DAY COMPRESSION STRENGTH OF 3000 P.S.I.
- CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH THE SPECIFICATIONS OF THE LOCAL AUTHORITIES WITH REGARDS TO MATERIALS AND INSTALLATION OF THE WATER, SEWER, GAS AND ELECTRICAL AND TELECOMMUNICATIONS LINES.
- ALL NECESSARY INSPECTIONS AND/OR CERTIFICATIONS REQUIRED BY CODES AND/OR UTILITY SERVICE COMPANIES SHALL BE PERFORMED PRIOR TO ANNOUNCED BUILDING POSSESSION AND THE FINAL CONNECTION OF SERVICE.
- DRAWINGS DO NOT NECESSARILY SHOW ALL EXISTING UTILITIES.

# ABBREVIATIONS

ABAN	ABANDON	L	LENGTH
ADJ	ADJUST	LB	LEACHING BASIN
		LP	LIGHT POLE
B	BORING		
BC	BOTTOM OF CURB	MAT	MATERIAL
BIT	BITUMINOUS	MAX	MAXIMUM
BCB	BITUMINOUS CONCRETE BERM	MH	MANHOLE
BLDG	BUILDING	MIN	MINIMUM
BM	BENCH MARK	MISC	MISCELLANEOUS
BOS	BOTTOM OF SLOPE	MTD	MOUNTED
BOW	BOTTOM OF WALL	MW	MONITORING WELL
BRK	BRICK		
BV&B	BUTTERFLY VALVE & BOX	N	NORTH
BVW	BORDERING VEGETATED WETLAND	NIC	NOT IN CONTRACT
		NO	NUMBER
		NTS	NOT TO SCALE
CATV	CABLE TELEVISION		
CB	CATCH BASIN	OC	ON CENTER
CF	CUBIC FEET	OD	OUTSIDE DIAMETER
CFS	CUBIC FEET PER SECOND	OHW	OVERHEAD WIRE
CI	CAST IRON (PIPE)	OVHD	OVERHEAD
CL	CENTERLINE	OW	OBSERVATION WELL
CLDI	CEMENT LINED DUCTILE IRON (PIPE)		
CM	CONSTRUCTION MANAGER	PC	POINT OF CURVATURE
CMP	CORRUGATED METAL PIPE	PCC	PRECAST CONCRETE CURB
CO	CLEAN OUT	PI	POINT OF INTERSECTION
CONC	CONCRETE	PKG	PARKING
CONST	CONSTRUCTION	PL	PROPERTY LINE
CONT	CONTRACTOR	PLMB	PLUMBING
CRD	COORDINATE	POC	POINT ON CURVATURE
CRP	CORRUGATED POLYETHYLENE PIPE	POT	POINT ON TANGENT
CUL	CULVERT	PRC	POINT OF REVERSE CURVATURE
	CUBIC YARD	PROP, P	PROPOSED
		PT	POINT (OR POINT OF TANGENT)
		PVC	POLYVINYL CHLORIDE (PIPE)
DB	DISTRIBUTION BOX		
DBL	DOUBLE	R&R	REMOVE & RESET/REPLACE
DEM	DEMOLISH	R&S	REMOVE & STACK
DET	DETENTION	RCP	REINFORCED CONCRETE PIPE
DI	DUCTILE IRON (PIPE)	RD	ROAD (OR ROOF DRAIN)
DIA	DIAMETER	RED	REDUCER
DIM	DIMENSION	RELOC	RELOCATE
DMH	DRAIN MANHOLE	REM	REMOVE
DW	DOMESTIC WATER (OR DRY WELL)	RET	RETAIN, RETAINING OR RETENTION
DWG	DRAWING	RTW	RIGHT OF WAY
DYCL	DOUBLE YELLOW CENTERLINE	RR	RAILROAD
		RWL	RAIN WATER LEADER
		RWY	ROADWAY
EHH	ELECTRIC HANDHOLE		
EL	ELEVATION	SD	SUBDRAIN
ELEC	ELECTRIC	SF	SQUARE FEET
EMH	ELECTRIC MANHOLE	SGC	SLOPED GRANITE CURB
EOP	EDGE OF PAVEMENT	SMH	SEWER MANHOLE
EOR	EDGE OF ROAD	SP	STANDPIPE
EOW	EDGE OF WETLANDS	SPEC	SPECIFICATION
ETC	ELECTRIC, TELEPHONE, CABLE	STA	STATION
EXIST	EXISTING	STC	STORMCEPTOR
EXT	EXTERIOR	STD	STANDARD
		STRTL	STRUCTURAL
		SWEL	SOLID WHITE EDGE LINE
FA	FIRE ALARM	SW	SIDEWALK
FCC	FLUSH CONCRETE CURB	SWLL	SOLID WHITE LANE LINE
FES	FLARED END SECTION	SYCL	SOLID YELLOW CENTERLINE
FFE	FINISH FLOOR ELEVATION		
FLNP	FIRE LANE NO PARKING	TB	TEST BORING
FPS	FEET PER SECOND	TC	TOP OF CURB
FS	FIRE SERVICE	TD	TRENCH DRAIN
FT	FOOT/FEET	TEL	TELEPHONE
		TMH	TELEPHONE MANHOLE
GC	GENERAL CONTRACTOR	TOS	TOP OF SLOPE
GEN	GENERAL	TOW	TOP OF WALL
GG	GAS GATE	TP	TEST PIT
GR	GUIDE RAIL	TS&V	TAPPING SLEEVE & VALVE
GRAN	GRANITE	TYP	TYPICAL
GV	GATE VALVE	UD	UNDERDRAIN
GV&B	GATE VALVE & BOX	UL	UNDERWRITERS LABORATORY
GW	GROUND WATER	UP	UTILITY POLE
HCR	HANDICAP RAMP	VCP	VITRIFIED CLAY PIPE
HOR	HORIZONTAL	VERT	VERTICAL
HT	HEIGHT	VGC	VERTICAL GRANITE CURB
HW	HEADWALL		
HWY	HIGHWAY	WD	WOOD
HYD	HYDRANT	WG	WATER GATE
		WM	WATER MAIN
		WMH	WATER MANHOLE
		WSO	WATER SHUTOFF
ID	INSIDE DIAMETER		
IN	INCHES		
INCL	INCLUDE		
INST	INSTALLED		
INV, I.E.	INVERT, INVERT ELEVATION		



KEYSHEET



PROFESSIONAL ENGINEER FOR ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
05	02/28/25	PER PEER REVIEW COMMENTS
04	02/13/25	LAYOUT REVISIONS PER WORKSHOP
03	01/23/25	LAYOUT REVISIONS PER WORKSHOP
02	10/18/24	ZBA RESUBMISSION
01	02/23/24	ZBA RESUBMISSION

APPLICANT/OWNER:  
**THOREAU RESIDENCES, LLC**  
 275 FOREST RIDGE ROAD  
 CONCORD, MA 01742

PROJECT:  
**THE RESIDENCES AT THOREAU**  
 275 FOREST RIDGE ROAD  
 CONCORD, MA 01742

PROJECT NO.	1670-24	DATE:	12/20/2023
SCALE:	NONE	DWG. NAME:	C-1670-24
DESIGNED BY:	BDP	CHECKED BY:	PLC

PREPARED BY:

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ABBREVIATIONS & NOTES	C-001

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# EROSION CONTROL NOTES

## EROSION & SEDIMENTATION CONTROL NOTES:

1. EROSION CONTROL SHALL BE INSTALLED PRIOR TO CONSTRUCTION AND SHALL BE ADEQUATE TO MAINTAIN SEDIMENT ON SITE. ANY MODIFICATIONS TO SILT CONTROLS SHOWN ON THE APPROVED PLANS AS A RESULT OF ACTUAL FIELD CONDITIONS OR CONSTRUCTION PRACTICES SHALL BE INSTALLED IN ACCORDANCE WITH B.M.P. (BEST MANAGEMENT PRACTICES) PER THE E.P.A. 2017 "CONSTRUCTION GENERAL PERMIT" MANUAL, AND MASSACHUSETTS 2003 EROSION & SEDIMENT CONTROL GUIDELINES FOR URBAN AND SUBURBAN AREAS. ANY SUCH MODIFICATIONS FROM THE ABOVE MANUALS SHALL BE INSTALLED AS APPROVED BY THE ENGINEER OR THE LOCAL MUNICIPALITY.
2. AREAS OF EXPOSED SOIL UNDERGOING CONSTRUCTION THAT WILL NOT BE COVERED AND OR FINISHED GRADED SHALL BE STABILIZED AS SOON AS PRACTICABLE BUT IN NO CASE MORE THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY (UNLESS MUNICIPALITY HAS STRICTER REQUIREMENTS WHICH SHALL BE FOLLOWED) IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. TEMPORARY EROSION CONTROL MEASURES SHALL INCLUDE EROSION CONTROL MESH, NETTING OR MULCH AS DIRECTED BY THE OWNER'S REPRESENTATIVE AND SHOWN ON THE DESIGN PLANS. IF MULCH IS USED, STRAW MULCH SHALL BE APPLIED AT THE RATE OF 4 BALES PER 1,000 SQUARE FEET. APPLICATION AREA SHALL BE SUFFICIENTLY COVERED WITH MULCH TO AVOID ANY VISIBLE SOIL EXPOSURE. MULCH SHALL BE KEPT MOIST TO AVOID LOSS DUE TO WIND. MULCH AND NETTING SHALL BE APPLIED IN THE BASE OF ALL GRASSED WATERWAYS, IN VEGETATIVE SLOPES WHICH EXCEED 15% AND DISTURBED AREAS WITHIN 100 FEET OF WETLANDS OR STREAMS.
3. IF DISTURBED AREAS DO NOT RECEIVE FINAL SEEDING BY OCTOBER 1ST OF THE CONSTRUCTION YEAR, THEN ALL DISTURBED AREAS SHALL BE SEED WITH A WINTER COVER CROP AT THE RATE OF 3 LBS PER 1,000 SQUARE FEET. WINTER SEEDING SHALL BE COVERED WITH EROSION CONTROL MESH (MULCH AND NETTING). HEAVY GRADE MATS SHALL BE USED IN THE BASE OF ALL GRASSED WATERWAYS ON VEGETATED SLOPES IN EXCESS OF 15%, AND ANY DISTURBED AREAS WITHIN 100 FEET OF WETLANDS OR STREAMS. MULCH AND NETTING SHALL ALSO BE PROVIDED FOR ADDITIONAL WINTER PROTECTION.
4. ALL TOPSOIL SHALL BE COLLECTED, STOCKPILED, SEED WITH RYE AT 3LBS PER 1,000 SQUARE FOOT AND MULCHED, AND REUSED AS REQUIRED. TUBULAR BARRIERS SHALL BE PLACED DOWN GRADIENT FROM STOCKPILED LOAM. LOAM SHALL BE STOCKPILED AT LOCATIONS DESIGNATED BY THE OWNER AND ENGINEER.
5. ALL TUBULAR BARRIERS, SILT SACKS, AND EROSION CONTROL BERMS SHALL BE INSTALLED ACCORDING TO THE SITE PREPARATION PLAN. THESE SHALL BE MAINTAINED DURING DEVELOPMENT TO REMOVE SEDIMENT FROM RUNOFF WATER. ALL THE FILTER BARRIERS AND EROSION CONTROL BERMS SHALL BE INSPECTED AFTER ANY RAINFALL OR RUNOFF EVENT, MAINTAINED AND CLEANED UNTIL ALL AREAS HAVE AT LEAST 85-90% VIGOROUS PERENNIAL COVER OF GRASSES.
6. ADJACENT ROADS SHALL BE PERIODICALLY SWEEPED OR WASHED TO AVOID TRACKING MUD, DUST OR DEBRIS FROM THE CONSTRUCTION AREA AS OFTEN AS NECESSARY (WHICH COULD BE ON A DAILY BASIS) TO REMOVE ANY SOIL OR SEDIMENTS AT NO ADDITIONAL COST TO THE OWNER. A WATERING TRUCK WILL BE USED TO PERIODICALLY SPRINKLE CONSTRUCTION AREAS IN ORDER TO KEEP THE LEVEL OF DUST TO A MINIMUM DURING THE DRY MONTHS AT NO ADDITIONAL COST TO THE OWNER.
7. THE CONTRACTOR SHALL USE EXTREME CAUTION TO AVOID ALLOWING SEDIMENTS TO ENTER THE STORM DRAIN SYSTEM DURING CONSTRUCTION. BOTH EXISTING AND PROPOSED CATCH BASIN INLETS SHALL BE PROTECTED DURING CONSTRUCTION BY THE USE SILT SACKS AND/OR TUBULAR BARRIERS AROUND EACH INLET AS NOTED ON THE PLANS. INLET PROTECTION MAY BE REMOVED ONLY AFTER FINISHED AREAS ARE PAVED AND THE VEGETATED SLOPES ARE ESTABLISHED WITH AT LEAST 85-90% OF VIGOROUS PERENNIAL GROWTH.
8. AS APPLICABLE, EROSION CONTROL MESH SHALL BE APPLIED IN ACCORDANCE WITH THE PLANS OVER ALL FINISHED SEEDING AREAS AS SPECIFIED ON THE DESIGN PLANS.
9. AT A MINIMUM, ALL TUBULAR BARRIERS AND FILTER FABRIC SHALL REMAIN IN PLACE UNTIL SEEDINGS OR PLANTINGS HAVE BECOME 85-90% ESTABLISHED. THE DESIGN ENGINEER MUST APPROVE THE REMOVAL OR RELOCATION OF ANY OF THE TUBULAR BARRIERS AND FILTER FABRIC. ONCE THE TUBULAR BARRIERS ARE REMOVED THE AREAS ARE TO BE LOAMED AND SEED TO ACHIEVE FULL STABILIZATION.
10. AT THE OWNER'S DISCRETION ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED TO MAINTAIN STABILITY OF EARTHWORKS AND FINISHED GRADED AREAS. THE CONTRACTOR, AT HIS EXPENSE, WILL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ANY ADDITIONAL MEASURES AS SPECIFIED BY THE OWNER. THIS INCLUDES BUT IS NOT LIMITED TO REQUESTS BY MA DEP, THE ENGINEER AND THE LOCAL MUNICIPALITY, AS AUTHORIZED BY THE OWNER. FAILURE TO COMPLY WITH THE OWNER'S DIRECTIONS WILL RESULT IN DISCONTINUATION OF CONSTRUCTION ACTIVITIES.
11. INSPECTIONS AND MONITORING MAINTENANCE MEASURES SHALL BE APPLIED AS NEEDED DURING THE ENTIRE CONSTRUCTION CYCLE. WEEKLY INSPECTIONS SHALL BE HELD THROUGH THE DURATION OF CONSTRUCTION ACTIVITY. WEEKLY INSPECTION REPORTS SHALL BE MAINTAINED BY THE CONTRACTOR AND LOCATED IN THE CONTRACTORS FIELD OFFICE ONSITE. IN ADDITION TO THE NORMAL WEEKLY INSPECTIONS, THE CONTRACTOR SHALL PERFORM AN INSPECTION OF ALL EROSION CONTROL MEASURES AFTER EACH RAINFALL OR RUNOFF EVENT, AND PERFORM THE NECESSARY REPAIRS. THE INSPECTIONS SHALL INCLUDE BUT NOT BE LIMITED TO THE SITE'S DOWN STREAM DISCHARGE POINTS.
12. IF ANY EVIDENCE OF SEDIMENTATION IS OBSERVED AT THE STORMWATER MANAGEMENT AREA INLETS, THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, PROVIDE A PLAN TO THE ENGINEER TO REMOVE ANY ACCUMULATED SEDIMENT IN THESE AREAS. THE CONTRACTOR SHALL ALSO IMMEDIATELY PROVIDE ADDITIONAL ON SITE EROSION AND SEDIMENTATION CONTROL MEASURES TO PREVENT FURTHER DEGRADATION OF THE AREA.
13. FOLLOWING THE TEMPORARY OR FINAL SEEDINGS, THE CONTRACTOR SHALL INSPECT THE WORK AREA SEMI-MONTHLY TO ENSURE THE AREAS HAVE A MINIMUM OF 85-90% VEGETATED VIGOROUS GROWTH. RE-SEEDING SHALL BE CARRIED OUT BY THE CONTRACTOR WITH FOLLOW UP INSPECTIONS IN THE EVENT OF ANY FAILURES UNTIL VEGETATION IS ADEQUATELY ESTABLISHED.
14. CONTRACTOR & ALL SITE SUBCONTRACTORS SHALL BE FAMILIAR WITH & FOLLOW ALL APPROVED PERMITS AND CONDITIONS. CONTRACTOR SHALL MAINTAIN A COPY OF ALL APPROVED PERMITS ONSITE. ALL CONDITIONS & RECOMMENDATIONS WITHIN THE APPROVED PERMITS SHALL BE COMPLETED.

15. ALL EROSION MEASURES SHALL BE INSTALLED PRIOR TO CONSTRUCTION AND SHALL BE ADEQUATE TO MAINTAIN SEDIMENT ON SITE. ANY MODIFICATIONS SHALL BE INSTALLED AS DIRECTED BY THE ENGINEER OR THE LOCAL MUNICIPALITY.
16. EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE MAINTAINED DURING CONSTRUCTION, AND SHALL REMAIN IN PLACE UNTIL ALL SITE WORK IS COMPLETE AND GROUND COVER IS ESTABLISHED.
17. TOP OF STOCKPILES SHALL BE COVERED IN SUCH MANNER THAT STORMWATER DOES NOT INFILTRATE THE MATERIALS AND THEREBY RENDER THE SAME UNSUITABLE FOR FILL USE.
18. ALL DISTURBED OR EXPOSED AREAS SUBJECT TO EROSION SHALL BE STABILIZED WITH MULCH OR SEEDED FOR TEMPORARY VEGETATIVE COVER. NO AREA SUBJECT TO EROSION SHALL BE LEFT DISTURBED AND UNSTABILIZED FOR PERIODS LONGER THAN IS ABSOLUTELY NECESSARY TO CARRY OUT THAT PORTION OF THE CONSTRUCTION WORK OR SIX MONTHS AFTER SOIL HAS BEEN DISTURBED WHICHEVER IS LESS.
19. CULVERT/PIPE INLETS AND OUTFALLS SHALL BE PROTECTED BY TUBULAR BARRIER FILTERS AND STONE CHECK DAMS UNTIL DISTURBED AREAS ARE PERMANENTLY STABILIZED.
20. TUBULAR BARRIER DIKES SHALL BE CONSTRUCTED AT ALL EXISTING & PROPOSED CATCH BASINS, NO SEDIMENTATION SHALL ENTER THE ON-SITE OR OFF-SITE DRAINAGE SYSTEMS AT ANY TIME.
21. ALL EROSION CONTROL MEASURES SHALL BE ROUTINELY INSPECTED, CLEANED AND REPAIRED OR REPLACED AS NECESSARY THROUGHOUT ALL PHASES OF CONSTRUCTION. IN ADDITION, INSPECTIONS SHALL TAKE PLACE WEEKLY AND BEFORE AND AFTER EACH RAINFALL EVENT.
22. ALL PROPOSED SLOPES STEEPER THAN 3:1 SHALL BE STABILIZED WITH JUTE MESH AND PROTECTED FROM EROSION UNTIL WORK IS COMPLETE AND GROUND COVER IS ESTABLISHED.
23. THE CONTRACTOR SHALL KEEP ON SITE AT ALL TIMES ADDITIONAL TUBULAR BARRIERS FOR INSTALLATION AT THE DIRECTION OF THE ENGINEER OR THE TOWN ENGINEER TO MITIGATE ANY EMERGENCY CONDITION.
24. AS CONSTRUCTION DISTURBANCE IS GREATER THAN 1 ACRE, A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) CONSTRUCTION GENERAL PERMIT NOI AND STORM WATER POLLUTION PREVENTION PLAN (SWPPP) WILL NEED TO BE SUBMITTED TO THE EPA. THE NPDES PERMIT FOR STORM WATER DISCHARGE, & CONSTRUCTION GENERAL PERMIT NOI WILL BE REQUIRED TO BE SUBMITTED AT LEAST 14 DAYS PRIOR TO COMMENCING CONSTRUCTION BY THE CONTRACTOR.
25. OWNER AND CONTRACTOR ARE RESPONSIBLE FOR COMPLIANCE WITH THE CONSTRUCTION GENERAL PERMIT NOI. WEEKLY SWPPP INSPECTION REPORTS TO BE PERFORMED BY CONTRACTOR. COPIES OF ALL SWPPP INSPECTION REPORTS SHALL BE PROVIDED TO THE LOCAL MUNICIPALITY, EPA, DEP, OR ANY OTHER AUTHORITY REQUESTING WITHIN 3 DAYS OF EACH INSPECTION.
26. APPLICABLE WORK AND MATERIALS SHALL COMPLY WITH ALL LOCAL, MA DEP, EPA CONSTRUCTION GENERAL PERMIT STANDARDS. ALL CONSTRUCTION SHALL CONFORM TO THE APPLICABLE SITE PLAN REGULATIONS FROM THE LOCAL AND USDA SOIL CONSERVATION SERVICE VEGETATIVE PRACTICES IN SITE DEVELOPMENT.
27. A WATERING TRUCK SHALL BE USED TO PERIODICALLY SPRINKLE CONSTRUCTION AREAS IN ORDER TO KEEP THE LEVEL OF DUST TO A MINIMUM DURING THE DRY MONTHS AND AS REQUIRED.
28. IF DEWATERING IS NECESSARY IT SHALL ONLY BE COMPLETED AS FOLLOWS: THE DISCHARGE SHALL BE STOPPED IMMEDIATELY IF THE RECEIVING AREA SHOWS ANY SIGN OF INSTABILITY OR EROSION. ALL CHANNELS, SWALES, AND DITCHES DUG FOR DISCHARGING WATER FROM THE EXCAVATED AREA SHALL BE STABLE PRIOR TO DIRECTING DISCHARGE TO THEM. IF A CONSTRUCTION EQUIPMENT BUCKET IS USED, IT SHALL BE EMPTY. THE MATERIAL TO A STABLE AREA. NO DEWATERING SHALL OCCUR DURING PERIODS OF INTENSE, HEAVY RAIN. FLOW TO THE SEDIMENT REMOVAL STRUCTURE SHALL NOT EXCEED THE STRUCTURE'S CAPACITY TO SETTLE AND FILTER FLOW OR ITS VOLUME CAPACITY. WHENEVER POSSIBLE, THE DISCHARGE FROM THE SEDIMENT REMOVAL STRUCTURE SHALL DRAIN TO A WELL-VEGETATED BUFFER BY SHEET FLOW WHILE MAXIMIZING THE DISTANCE TO THE NEAREST WATER RESOURCE AND MINIMIZING THE SLOPE OF THE BUFFER AREA. THERE SHALL BE NO DIRECT DISCHARGE TO EXISTING WETLANDS OR STREAMS. ALL DISCHARGE SHALL BE IN COMPLIANCE WITH STATE, LOCAL, AND FEDERAL REQUIREMENTS.
29. INITIATE STABILIZATION OF EXPOSED AREAS IMMEDIATELY IF CONSTRUCTION WORK TEMPORARILY OR PERMANENTLY CEASES.
30. ALL DISCHARGES FROM POLLUTION SOURCES ARE PROHIBITED ONSITE SUCH AS FUELS, WASTEWATER FROM WASH OUT OF CONCRETE, WASTEWATER FROM CLEAN OUT OF PAINTS, FORM RELEASE OILS, SOLVENTS, ADHESIVES, CURING COMPOUNDS, POLLUTANTS USED FOR MAINTENANCE OF VEHICLES AND EQUIPMENT, SOAPS & SOLVENTS, TOXIC OR HAZARDOUS SUBSTANCES, CHEMICALS AND OILS. IF A POLLUTANT IS DISCHARGED IT NEEDS TO BE IMMEDIATELY CLEANED UP BY REMOVING THE CHEMICAL AND AFFECTED SOIL OR AREA OF SPILL FROM THE SITE IN ACCORDANCE WITH BOTH THE MANUFACTURER RECOMMENDATIONS, FEDERAL, STATE, AND LOCAL REQUIREMENTS. DO NOT HOSE DOWN AND SPREAD SPILLED ITEM. ALL CHEMICALS USED ON THE SITE SHALL BE IN LEAK-PROOF CONTAINERS STORED AWAY FROM WETLANDS, SURFACE WATERS, STORMWATER INLETS, AND DRAINAGE MEASURES. SPILL KITS SHALL BE AVAILABLE ONSITE FOR EMERGENCY USE. THERE SHALL BE A SECONDARY CONTAINMENT MEASURE OF ALL CHEMICALS IN ADDITION TO SPILL-PROOF CONTAINERS.
31. PRIOR TO COMMENCEMENT OF CONSTRUCTION, APPLICABLE CONTRACTOR PERSONNEL MUST HAVE AN UNDERSTANDING OF THE EPA CONSTRUCTION GENERAL PERMIT REQUIREMENTS AND THEIR SPECIFIC RESPONSIBILITIES UNDER THE PERMIT. AT A MINIMUM, PERSONNEL MUST BE TRAINED AND UNDERSTAND THE FOLLOWING: LOCATION OF ALL STORMWATER CONTROLS AND HOW TO MAINTAIN THEM. PROCEDURES FOR COMPLYING WITH THE POLLUTION PREVENTION REQUIREMENTS. PROCEDURES FOR CONDUCTING INSPECTIONS, RECORDING FINDINGS, AND TAKING CORRECTIVE ACTION.
32. ALL SEDIMENT TRACKED ONTO ROADWAYS MUST BE REMOVED AT END OF EACH WORK DAY.
33. ALL USE OF CATIONIC TREATMENT CHEMICALS (EXAMPLES INCLUDE POLYMERS, CHITOSAN, CATIONIC PAM, FLOCCULANTS OR OTHER CHEMICAL UTILIZED FOR STABILIZATION) ARE PROHIBITED. IF ALL OTHER AVAILABLE STABILIZATION MEASURES ARE NOT POSSIBLE AND USE OF CATIONIC CHEMICALS IS ABSOLUTELY NECESSARY THE CONTRACTOR WILL NEED TO CONTACT THE EPA NEW ENGLAND OFFICE IN WRITING FOR APPROVAL AND SPECIFIC REQUIREMENTS (MAXIMUM DOSAGE RATE, RESIDUAL TESTING, SPECIFIC LIMITATIONS, ETC) PRIOR TO USE.

34. IF USING NON-VEGETATIVE STABILIZATION MEASURES, IT MUST BE COMPLETED NO LATER THAN 14 DAYS AFTER INITIATING STABILIZATION. ALL AREAS OF EXPOSED SOILS MUST BE COVERED.
35. INSPECTIONS OF EROSION CONTROL MEASURES SHALL BE AT LEAST ONCE EVERY 7 DAYS BY THE CONTRACTOR. AT A MINIMUM INSPECTIONS SHALL INCLUDE ALL DISTURBED AREAS, ALL STORMWATER CONTROLS AND POLLUTION PREVENTION MEASURES. ALL LOCATIONS WHERE STABILIZATION MEASURES HAVE BEEN IMPLEMENTED, EQUIPMENT AND MATERIAL STORAGE AREAS, ALL AREAS WHERE STORMWATER FLOWS AND ALL POINTS OF DISCHARGE. WHEN CORRECTIVE ACTIONS ARE REQUIRED, THE CONTRACTOR MUST IMMEDIATELY TAKE ALL STEPS TO PREVENT POLLUTANT DISCHARGES UNTIL A PERMANENT SOLUTION IS IMPLEMENTED. AS NECESSARY NEW OR MODIFIED CONTROLS MUST BE INSTALLED AND OPERATIONAL, THE REPAIR MUST BE COMPLETED WITHIN 7 DAYS FROM THE TIME OF DISCOVERY. WITHIN 24 HOURS OF A TRIGGERING CONDITION OCCURRING THAT REQUIRES A CORRECTIVE ACTION, A CORRECTIVE ACTION REPORT MUST BE COMPLETED.

## MAINTENANCE:

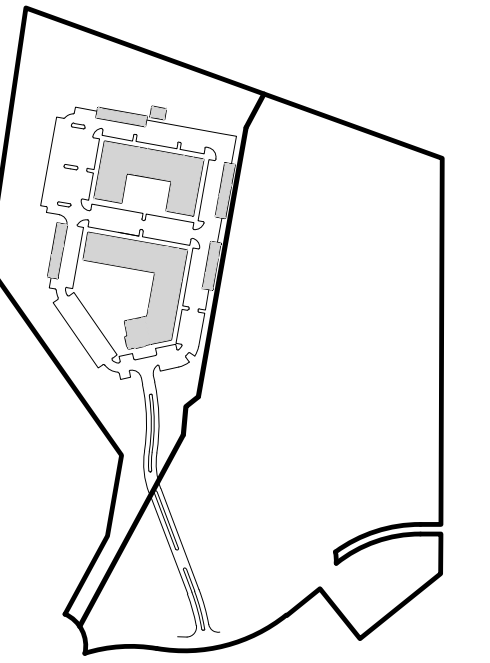
1. ALL MEASURES STATED ON THE STORMWATER POLLUTION PREVENTION PLANS, SHALL BE MAINTAINED IN FULLY FUNCTIONAL CONDITION BY CONTRACTOR UNTIL NO LONGER REQUIRED FOR A COMPLETED PHASE OF WORK OR FINAL STABILIZATION OF THE SITE. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE CHECKED BY A QUALIFIED PERSON IN ACCORDANCE WITH THE CONTRACT DOCUMENTS OR THE APPLICABLE PERMIT, WHICHEVER IS MORE STRINGENT, AND REPAIRED IN ACCORDANCE WITH THE FOLLOWING:
  - INLET PROTECTION DEVICES AND BARRIERS SHALL BE REPAIRED OR REPLACED IF THEY SHOW SIGNS OF UNDERMINING, OR DETERIORATION.
  - ALL SEEDING AREAS SHALL BE CHECKED REGULARLY TO SEE THAT A HEALTHY STAND OF GRASS IS MAINTAINED. AREAS SHOULD BE FERTILIZED, WATERED, AND RESEEDING AS NEEDED.
  - ALL SEDIMENT CONTROLS SHALL BE REPAIRED TO THEIR ORIGINAL CONDITIONS IF DAMAGED. SEDIMENT SHALL BE REMOVED FROM THE TUBULAR SEDIMENT CONTROLS WHEN IT REACHES HALF THE HEIGHT OF THE CONTROL MEASURE OR AS REQUESTED BY THE OWNER OR ENGINEER.
  - THE CONSTRUCTION ENTRANCES SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOW OF MUD ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING OF THE CONSTRUCTION ENTRANCES AS CONDITIONS DEMAND.
  - THE TEMPORARY PARKING AND STORAGE AREA SHALL BE KEPT IN GOOD CONDITION (SUITABLE FOR PARKING AND STORAGE). THIS MAY REQUIRE PERIODIC TOP DRESSING OF THE TEMPORARY PARKING AS CONDITIONS DEMAND.
  - OUTLET STRUCTURES IN THE SEDIMENTATION BASINS SHALL BE MAINTAINED IN OPERATIONAL CONDITIONS AT ALL TIMES. SEDIMENT SHALL BE REMOVED FROM SEDIMENT BASINS OR TRAPS WHEN THE DESIGN CAPACITY HAS BEEN REDUCED BY 50%.

## CONSTRUCTION GENERAL PERMIT NOTES AND NARRATIVE:

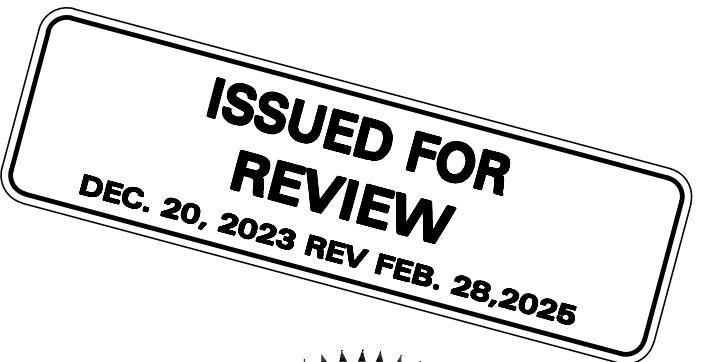
1. NARRATIVE: THE STORMWATER POLLUTION PREVENTION PLANS CONSIST OF THE SITE PREPARATION PLAN TOGETHER WITH AN EXISTING CONDITIONS PLANS, GRADING PLANS, ABBREVIATIONS AND NOTES SHEETS, AND DETAIL SHEETS.

THE EROSION CONTROL PLAN WILL BE IMPLEMENTED TO:

- A. TREAT EROSION AS SOON AS POSSIBLE AFTER DISTURBANCE.
- B. PREVENT SEDIMENT FROM LEAVING THE CONSTRUCTION AREA AND ENTERING THE RECEIVING WATERS.
- C. CONSTRUCTION ACTIVITIES SHALL BE SCHEDULED TO MINIMIZE EROSION. ONLY DISTURB, CLEAR, OR GRADE AREAS NECESSARY FOR CONSTRUCTION.



KEYSHEET



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01	02/23/24	ZBA RESUBMISSION

REV DATE DESCRIPTION

APPLICANT/OWNER:

THOREAU RESIDENCES, LLC  
275 FOREST RIDGE ROAD  
CONCORD, MA 01742

PROJECT:

THE RESIDENCES AT THOREAU  
275 FOREST RIDGE ROAD  
CONCORD, MA 01742

PROJECT NO. 1670-24 DATE: 12/20/2023

SCALE: NONE DWG. NAME: C-1670-24

DESIGNED BY: BDP CHECKED BY: PLC

PREPARED BY:



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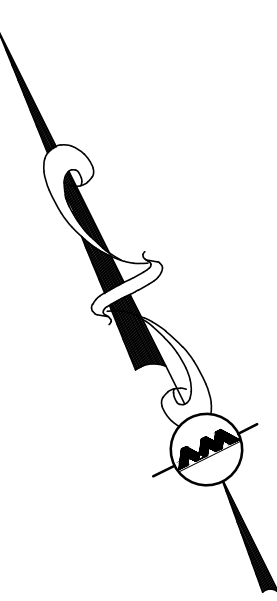
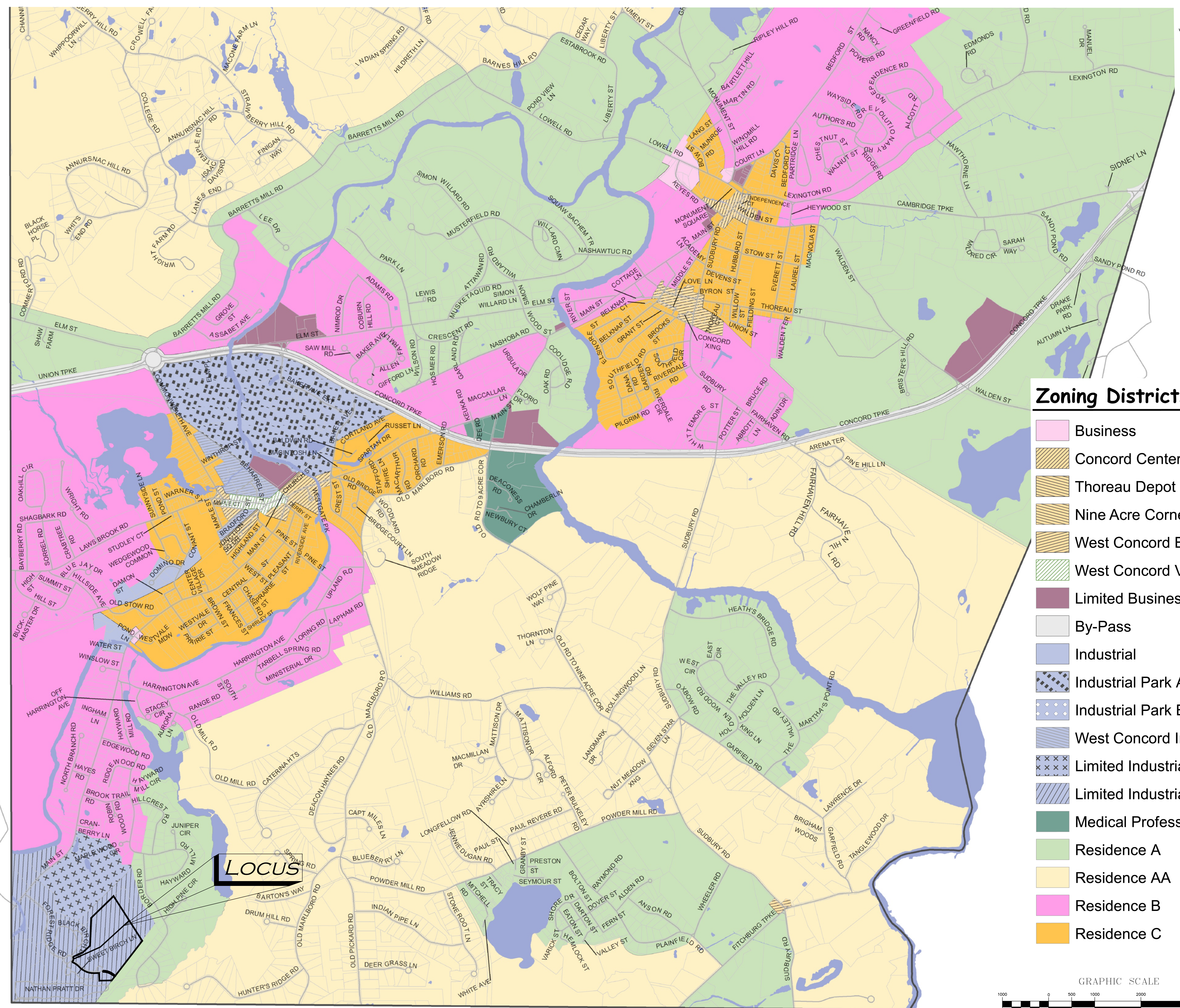
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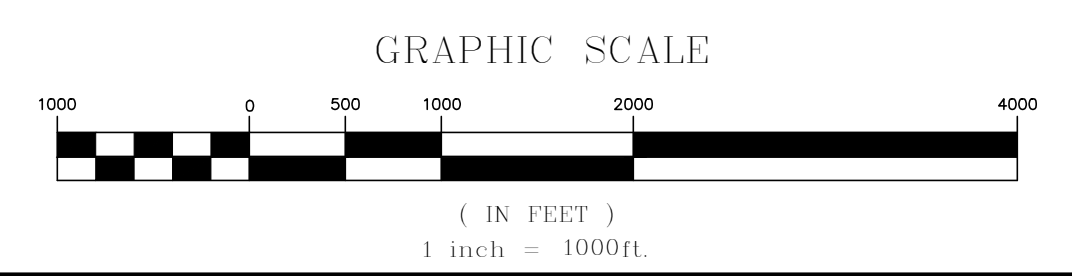
ABBREVIATIONS & NOTES C-002

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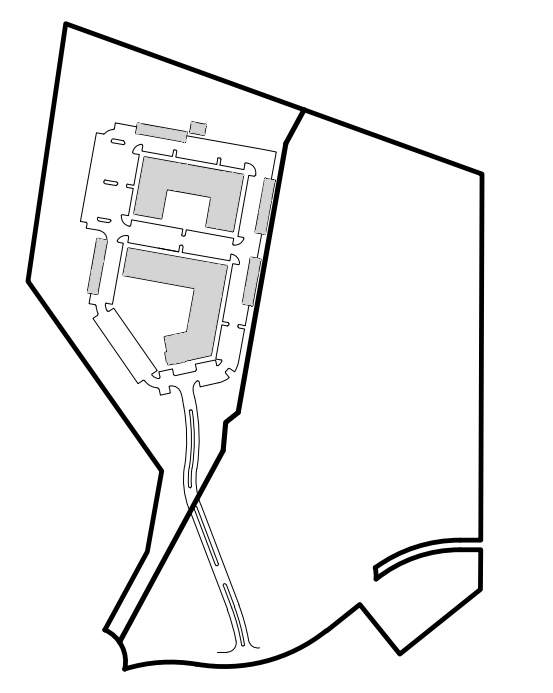


### Zoning Districts

- Business
- Concord Center Business
- Thoreau Depot Business
- Nine Acre Corner Business
- West Concord Business
- West Concord Village
- Limited Business
- By-Pass
- Industrial
- Industrial Park A
- Industrial Park B
- West Concord Industrial
- Limited Industrial Park 1
- Limited Industrial Park 2
- Medical Professional
- Residence A
- Residence AA
- Residence B
- Residence C



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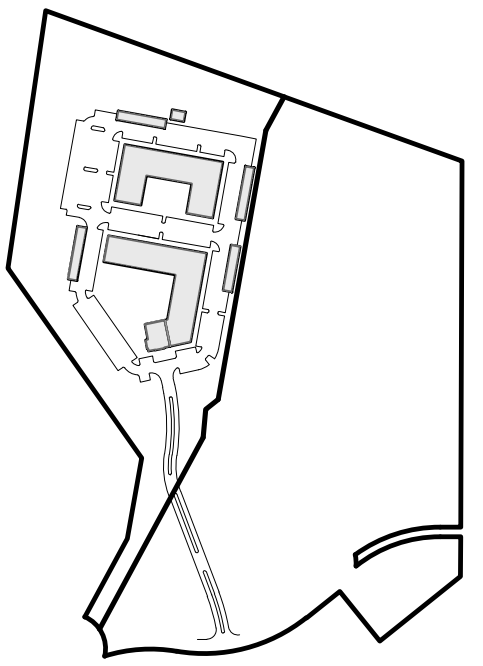
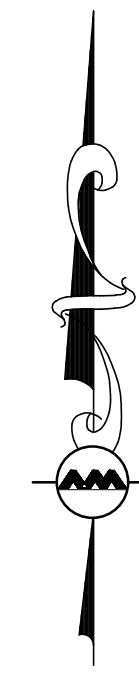
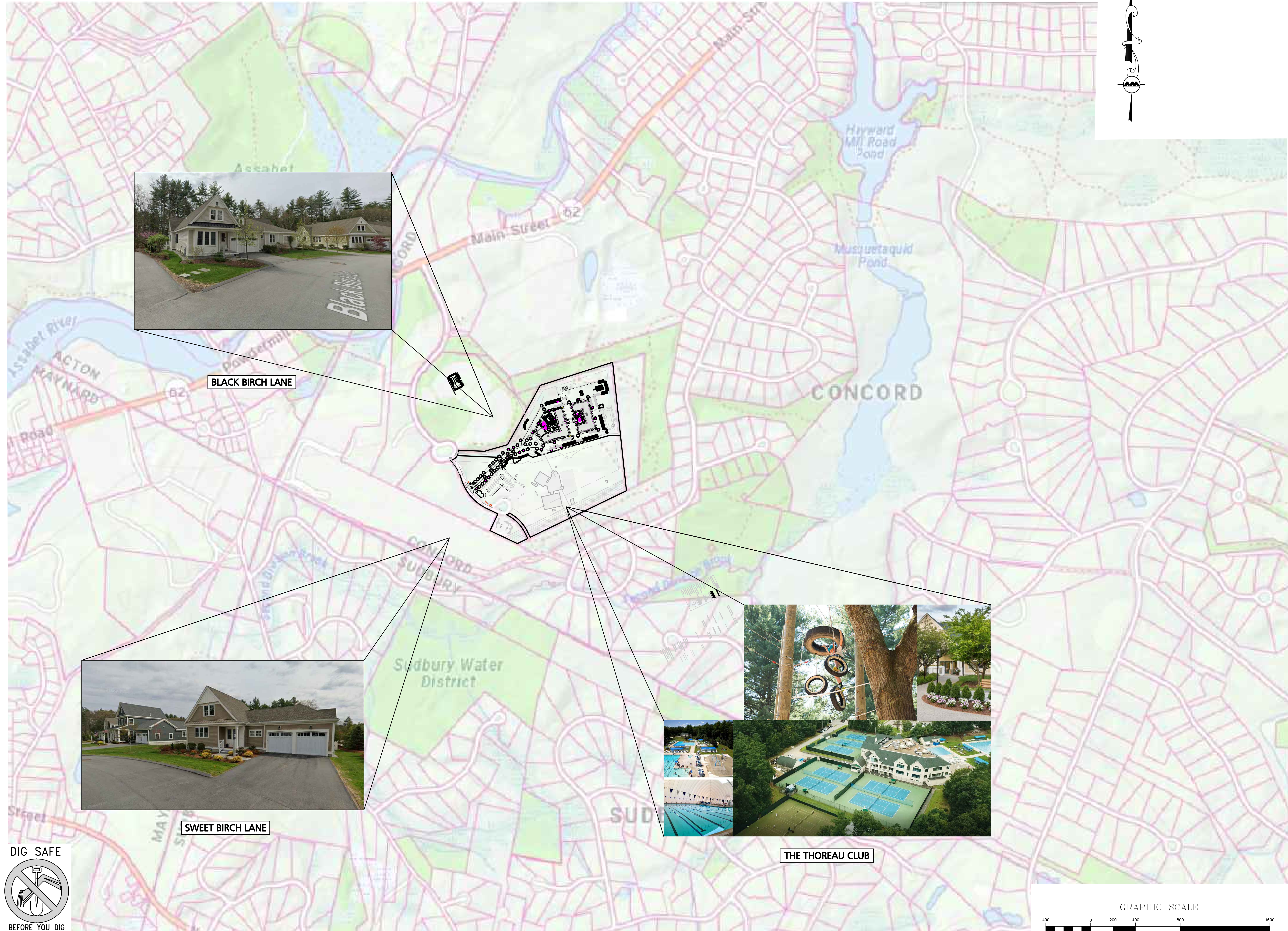
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DRAWING TITLE:	SHEET No.
LOCUS PLAN	C-100A

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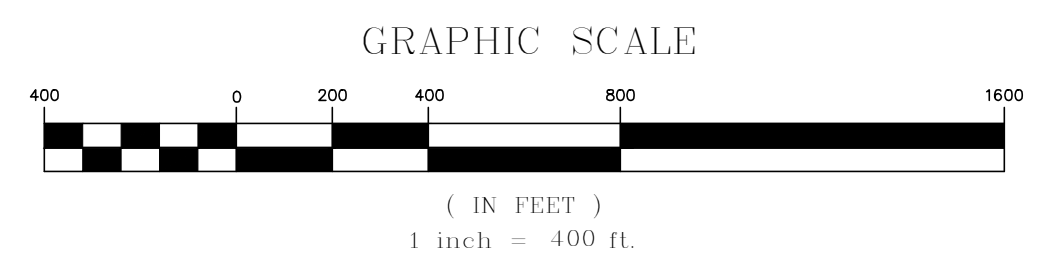
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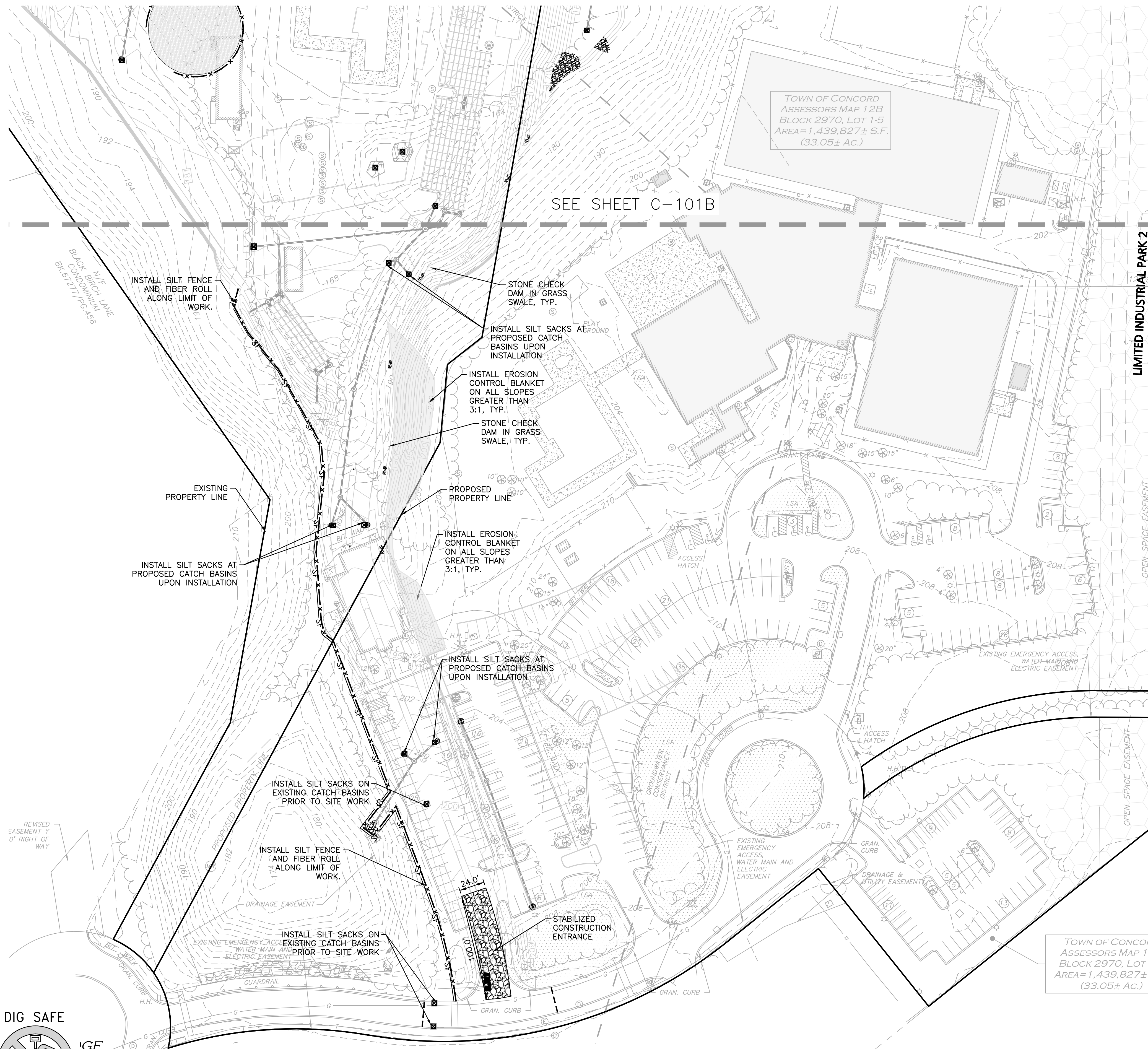
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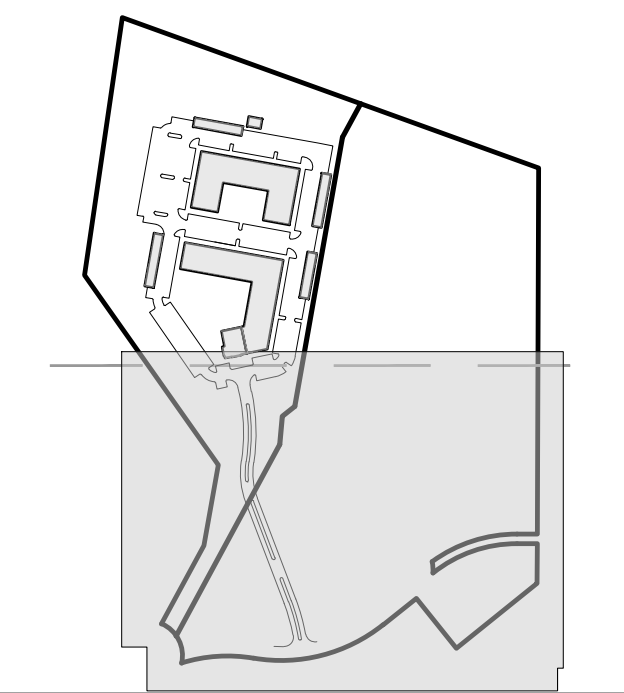
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**LEGEND**

- SILT FENCE — SF —
- FIBER ROLL BARRIER — x x x x —
- EROSION CONTROL FABRIC — [stippled pattern] —
- CATCH BASIN FILTER — [grid pattern] —
- STONE CHECK DAM — [stone symbol] —
- STABILIZED ENTRANCE — [hatched pattern] —
- STOCKPILE/STAGING AREA — [diagonal lines] —



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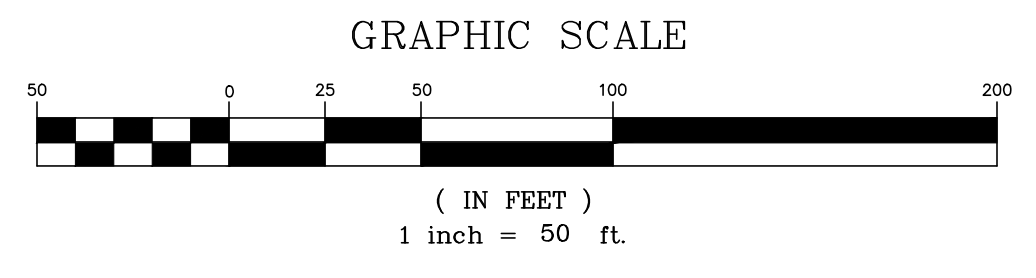
DRAWING TITLE: **EROSION CONTROL PLAN** SHEET No. **C-101A**

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TOWN OF CONCORD  
 ASSESSORS MAP 12B  
 BLOCK 2970, LOT 1-5  
 AREA=1,439,827± S.F.  
 (33.05± AC.)

TOWN OF CONCORD  
 ASSESSORS MAP 12B  
 BLOCK 2970, LOT 1-5  
 AREA=1,439,827± S.F.  
 (33.05± AC.)

SEE SHEET C-101B



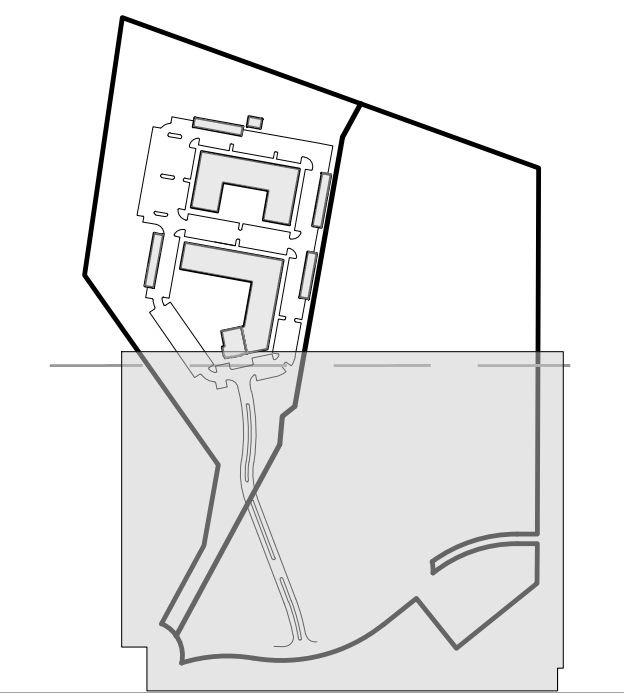
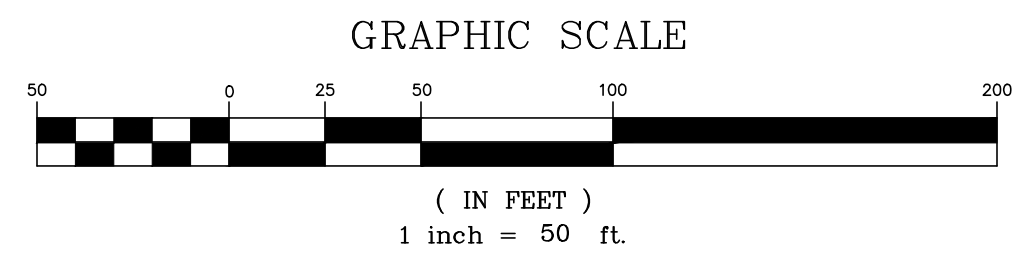


SEE SHEET C-102B

**LEGEND**

- LIMIT OF DISTURBANCE
- BUILDING TO BE REMOVED
- PAVEMENT TO BE REMOVED
- LIMIT OF 'CLEAR AND GRUB'
- UTILITY CUT AND CAP
- TEMPORARY FENCE

- NOTES:**
- ALL EXISTING UTILITY SERVICES SHALL BE SHUTOFF, DISCONNECTED AND REMOVED. WATER UTILITIES SHALL BE CUT AND CAPPED AT THE SERVICE MAIN. ANY ALTERNATE LOCATIONS MUST BE APPROVED BY THE TOWN, OWNER, OR OWNER'S REPRESENTATIVE PRIOR TO DISCONTINUANCE.
  - ALL EXISTING SITE FEATURES WITHIN THE LIMIT OF WORK AREAS ARE TO BE REMOVED AND DISPOSED OF IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS.
  - PRIOR TO DEMOLITION, ALL EROSION CONTROL AND GENERAL CONSTRUCTION SAFETY MEASURES SHALL BE IN PLACE. REFER TO SHEETS C-101A AND C-101B FOR EROSION CONTROL.
  - ALL LOAM ON SITE IS TO BE STRIPPED AND STOCKPILED ON-SITE OR EXPORTED AS NEEDED AND IS THE RESPONSIBILITY OF THE CONTRACTOR.
  - CONSTRUCTION STAGING, TRAILERS, ETC. SHALL BE COORDINATED BY SITE CONTRACTOR PRIOR TO BREAKING GROUND.
  - NOT ALL UTILITIES MAY BE SHOWN AND/OR THEIR EXACT LOCATIONS. ALL SERVICES TO BE COORDINATED WITH SPECIFIC PROVIDER.
  - THE ONSITE EXISTING SEWER AND DRAINAGE LINES ARE TO BE REMOVED AND RELOCATED AS SHOWN ON THE SITE UTILITY PLAN.
  - FOR VOID AREAS OR FILL AREAS, REFER TO GEOTECHNICAL REPORT FOR BACKFILL MATERIAL & COMPACTION SPECIFICATIONS.
  - LIMIT OF GRADING/WORK IS TO BE MARKED IN FIELD PRIOR TO TREE REMOVAL. ONCE MARKED, OWNER SHALL REVIEW TO DETERMINE ANY TREES THAT SHOULD REMAIN AND BE PROTECTED DURING CONSTRUCTION. REFER TO GRADING PLAN FOR LIMIT OF SITE GRADING.
  - ALL UTILITY SERVICE TRENCHES WITHIN STREETS SHALL RECEIVE ASPHALT TRENCH PATCHES AS APPROVED BY THE TOWN OF CONCORD DEPARTMENT OF PUBLIC WORKS.
  - FINAL LOCATION OF GRANITE CURB REMOVAL SHALL BE DONE IN THE FIELD, BASED ON THE LOCATION OF EXISTING JOINTS AND COORDINATED WITH THE OWNER.
  - THE SITE PREPARATION PLAN HEREON DOES NOT DEPICT ANY WORK ASSOCIATED WITH ENVIRONMENTAL CONDITIONS. PLEASE REFER TO SPECIFIC ENVIRONMENTAL REPORT PREPARED BY OTHERS.
  - IF FLOWABLE FILL OR GROUT IS UTILIZED TO PLUG EXISTING UTILITY LINES IT SHOULD BE A MIN. STRENGTH OF 1500 PSI AND WILL NEED TO BE APPROVED BY THE OWNER PRIOR TO INSTALLATION.



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PHILIP L. CORDEIRO  
CIVIL  
NO. 47083  
REGISTERED  
PROFESSIONAL ENGINEER

PROFESSIONAL ENGINEER FOR  
ALLEN & MAJOR ASSOCIATES, INC.

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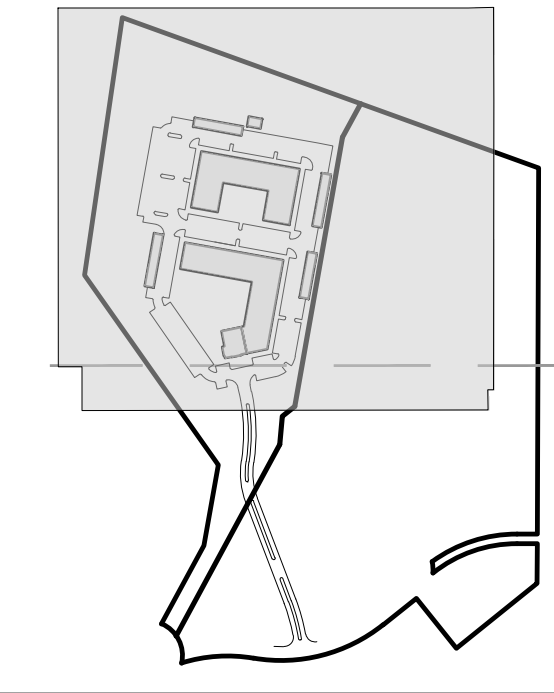
DRAWING TITLE: **SITE PREPARATION PLAN** SHEET No. **C-102A**

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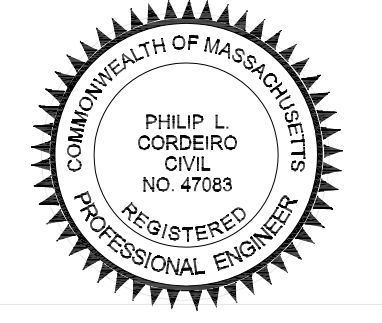
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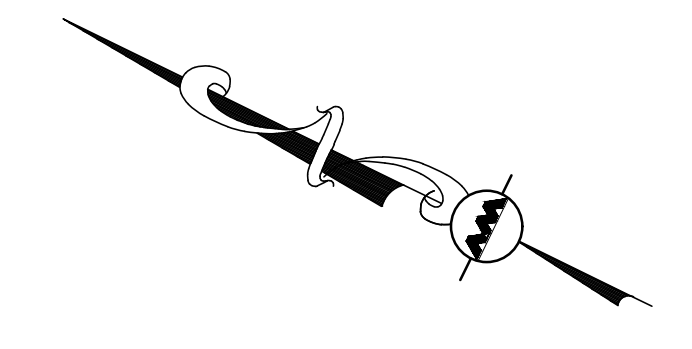
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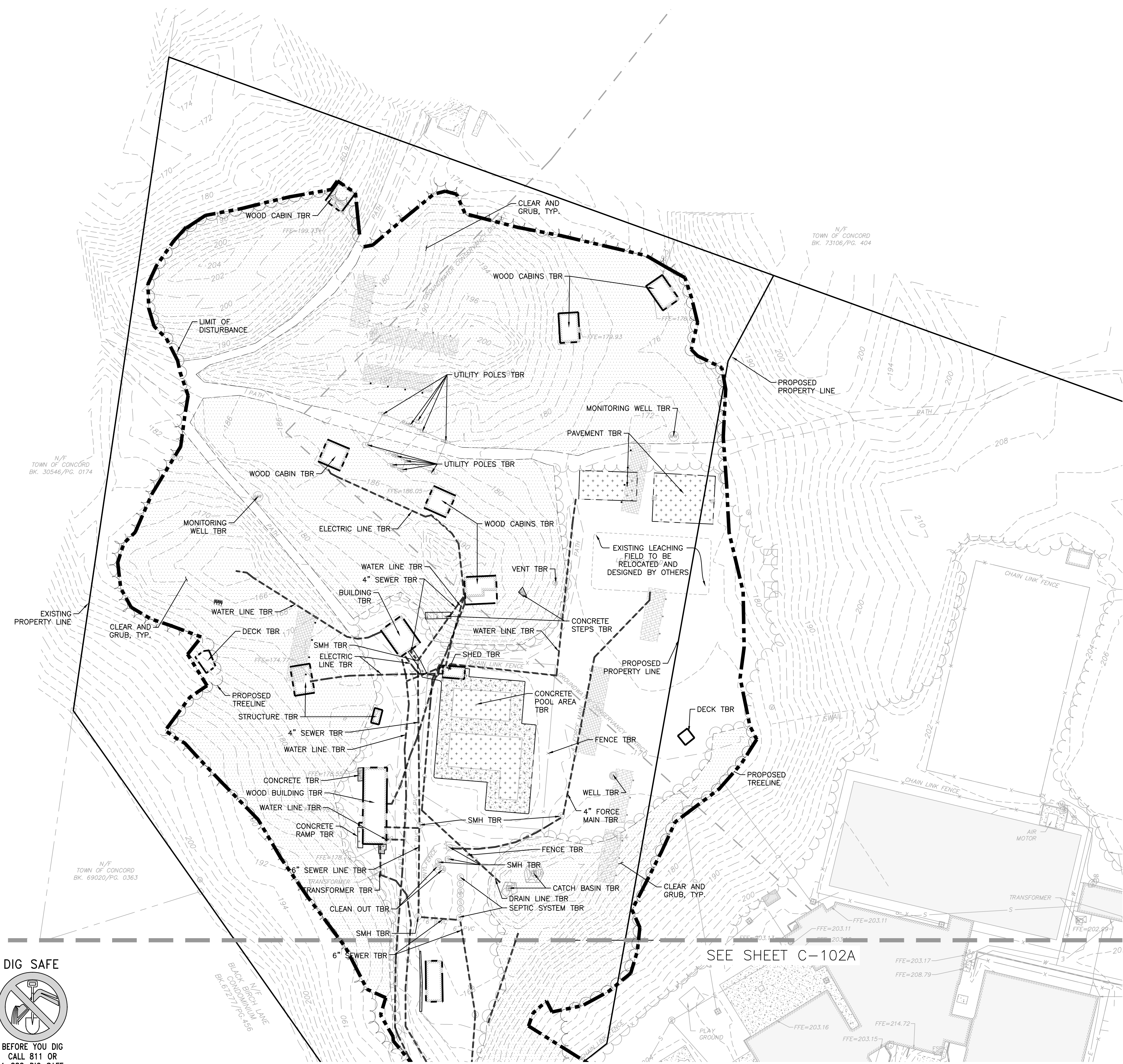
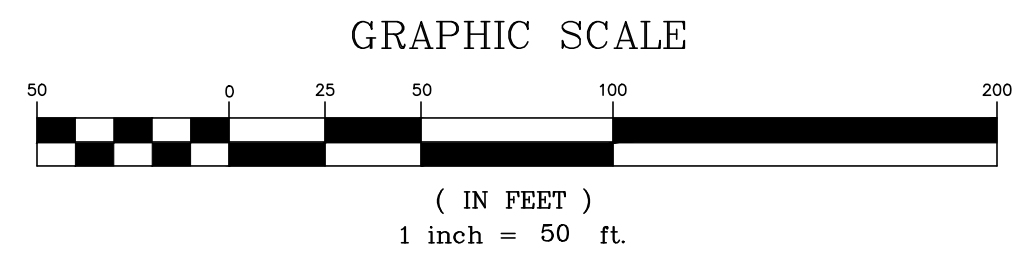
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**LEGEND**

- LIMIT OF DISTURBANCE: [Symbol]
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- PAVEMENT TO BE REMOVED: [Symbol]
- LIMIT OF 'CLEAR AND GRUB': [Symbol]
- UTILITY CUT AND CAP: [Symbol]
- TEMPORARY FENCE: [Symbol]

- NOTES:**
- ALL EXISTING UTILITY SERVICES SHALL BE SHUTOFF, DISCONNECTED AND REMOVED. WATER UTILITIES SHALL BE OUT AND CAPPED AT THE SERVICE MAIN. ANY ALTERNATE LOCATIONS MUST BE APPROVED BY THE TOWN, OWNER, OR OWNER'S REPRESENTATIVE PRIOR TO DISCONTINUANCE.
  - ALL EXISTING SITE FEATURES WITHIN THE LIMIT OF WORK AREAS ARE TO BE REMOVED AND DISPOSED OF IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS.
  - PRIOR TO DEMOLITION, ALL EROSION CONTROL AND GENERAL CONSTRUCTION SAFETY MEASURES SHALL BE IN PLACE. REFER TO SHEETS C-101A AND C-101B FOR EROSION CONTROL.
  - ALL LOAM ON SITE IS TO BE STRIPPED AND STOCKPILED ON-SITE OR EXPORTED AS NEEDED AND IS THE RESPONSIBILITY OF THE CONTRACTOR.
  - CONSTRUCTION STAGING, TRAILERS, ETC. SHALL BE COORDINATED BY SITE CONTRACTOR PRIOR TO BREAKING GROUND.
  - NOT ALL UTILITIES MAY BE SHOWN AND/OR THEIR EXACT LOCATIONS. ALL SERVICES TO BE COORDINATED WITH SPECIFIC PROVIDER.
  - THE ONSITE EXISTING SEWER AND DRAINAGE LINES ARE TO BE REMOVED AND RELOCATED AS SHOWN ON THE SITE UTILITY PLAN.
  - FOR VOID AREAS OR FILL AREAS, REFER TO GEOTECHNICAL REPORT FOR BACKFILL MATERIAL & COMPACTION SPECIFICATIONS.
  - LIMIT OF GRADING/WORK IS TO BE MARKED IN FIELD PRIOR TO TREE REMOVAL. ONCE MARKED, OWNER SHALL REVIEW TO DETERMINE ANY TREES THAT SHOULD REMAIN AND BE PROTECTED DURING CONSTRUCTION. REFER TO GRADING PLAN FOR LIMIT OF SITE GRADING.
  - ALL UTILITY SERVICE TRENCHES WITHIN STREETS SHALL RECEIVE ASPHALT TRENCH PATCHES AS APPROVED BY THE TOWN OF CONCORD DEPARTMENT OF PUBLIC WORKS.
  - FINAL LOCATION OF GRANITE CURB REMOVAL SHALL BE DONE IN THE FIELD, BASED ON THE LOCATION OF EXISTING JOINTS AND COORDINATED WITH THE OWNER.
  - THE SITE PREPARATION PLAN HEREON DOES NOT DEPICT ANY WORK ASSOCIATED WITH ENVIRONMENTAL CONDITIONS. PLEASE REFER TO SPECIFIC ENVIRONMENTAL REPORT PREPARED BY OTHERS.
  - IF FLOWABLE FILL OR GROUT IS UTILIZED TO PLUG EXISTING UTILITY LINES IT SHOULD BE A MIN. STRENGTH OF 1500 PSI AND WILL NEED TO BE APPROVED BY THE OWNER PRIOR TO INSTALLATION.



SEE SHEET C-102A

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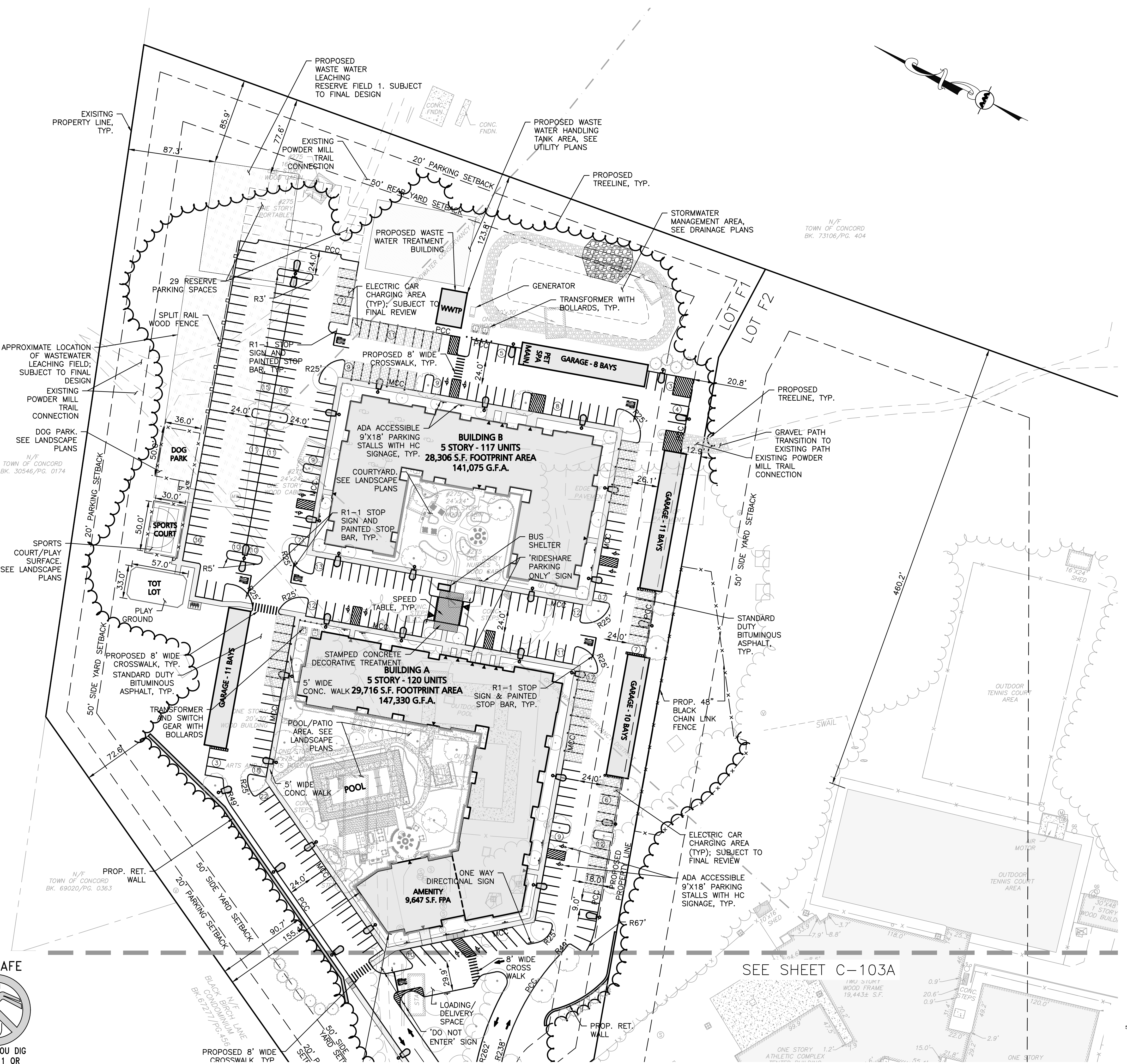
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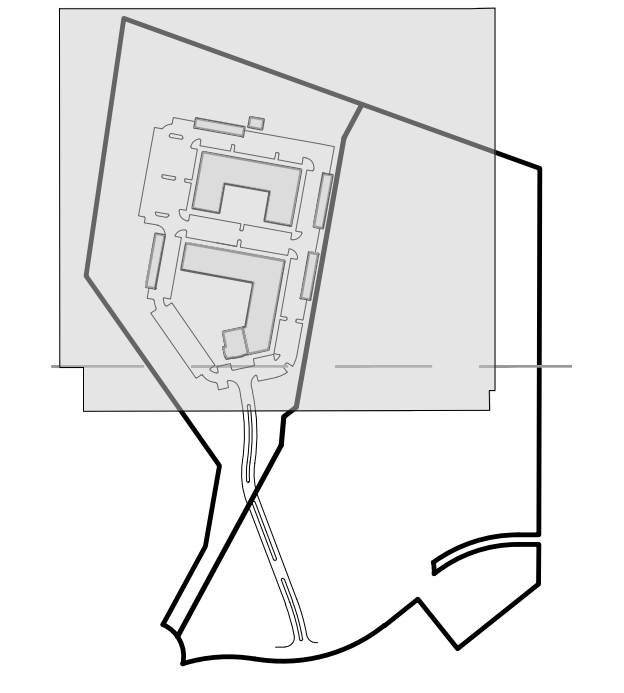
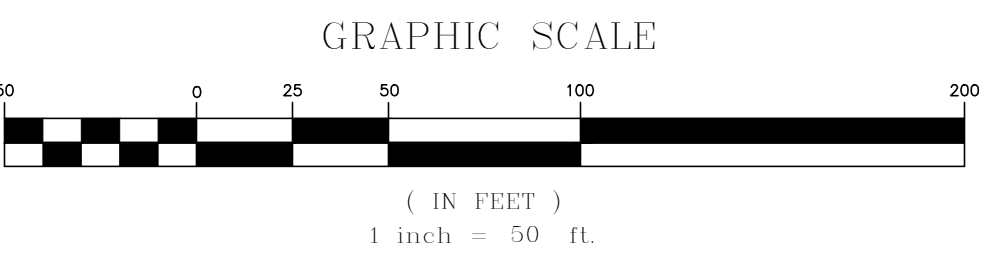
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LEGEND	
PROP. PROPERTY LINE	---
SIGN	+
BOLLARD	•
BUILDING	▭
CURB	▬▬▬
RETAINING WALL	▬▬▬▬▬
PARKING STRIPING	▨▨▨▨▨
TRAFFIC ARROWS	➔➔➔
HEAVY DUTY CONCRETE	▨▨▨▨▨▨▨▨
SIDEWALK	▬▬▬▬▬▬▬▬
ADA ACCESSIBLE RAMP	▭▭▭▭▭
ADA DET. WARNING SURFACE	▨▨▨▨▨▨▨▨
GRAVEL ACCESS	▨▨▨▨▨▨▨▨
SETBACK LINE	---x---
PARKING COUNT	⑩
CHAIN LINK FENCE	—x—x—x—x—
TRANSFORMER	⊞
TREE LINE	⌋⌋⌋⌋⌋⌋⌋⌋
LIGHTING	⊙

- NOTES:
- ALL CURB RADII ARE 3' UNLESS OTHERWISE NOTED.
  - ALL CURBING SHALL BE PRECAST CONCRETE CURBING UNLESS OTHERWISE NOTED.
  - ALL SIDEWALKS SHALL BE 5 FEET MINIMUM WIDTH UNLESS OTHERWISE NOTED.
  - ALL PROPOSED DIRECTIONAL AND TRAFFIC CONTROL SIGNS SHALL BE MUTCD COMPLIANT.

GROUNDWATER CONSERVANCY DISTRICT NOTE:  
NO OUTSIDE STORAGE OF DEICING CHEMICALS ARE ALLOWED WITHIN THE GROUNDWATER CONSERVANCY DISTRICT



**ISSUED FOR REVIEW**  
DEC. 20, 2023 REV FEB. 28, 2025



PROFESSIONAL ENGINEER FOR ALLEN & MAJOR ASSOCIATES, INC.

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01	02/23/24	ZBA RESUBMISSION

APPLICANT/OWNER:  
**THOREAU RESIDENCES, LLC**  
275 FOREST RIDGE ROAD  
CONCORD, MA 01742

PROJECT:  
**THE RESIDENCES AT THOREAU**  
275 FOREST RIDGE ROAD  
CONCORD, MA 01742

PROJECT NO.	1670-24	DATE:	12/20/2023
SCALE:	1" = 50'	DWG. NAME:	C-1670-24
DESIGNED BY:	BDP	CHECKED BY:	PLC

PREPARED BY:

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DRAWING TITLE: **LAYOUT & MATERIALS PLAN** SHEET No. **C-103B**

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DIMENSIONAL REQUIREMENTS: LIMITED INDUSTRIAL PARK2 (LIP2)				
ITEM	REQUIRED/ALLOWED	EXISTING	LOT 5F1	LOT 5F2
LOT AREA MINIMUM	217,800± S.F. 5.0± ACRES	1,439,826± S.F. 33.05± ACRES	570,160± S.F. 13.09± ACRES	869,666± S.F. 19.96± ACRES
FRONTAGE (MIN)	50 FEET	122.5 FEET	50 FEET	74.4 FEET
FRONT YARD (MIN)	50 FEET	352± FEET	706.1 FEET	585.7 FEET
SIDE YARD (MIN)	50 FEET	68.9 FEET	12.9 FEET	83.3 FEET
SIDE YARD (MIN) ABUTTING RESIDENTIAL DISTRICT	200 FEET	96.3* FEET	N/A	96.3* FEET
REAR YARD (MIN)	50 FEET	38.5 FEET	124.4 FEET	460.2 FEET
PARKING SETBACK (MIN)	20 FEET	19.8 FEET*	20.8 FEET	19.8 FEET*
LOT COVERAGE (MAX.)	35%	274,114± S.F. 18.9%	234,142± S.F. 41.1%	285,109± S.F. 32.8%
BUILDING HEIGHT/STORIES (MAX.)	40'/3	26.2'/2	60'/5	26.2'/2
FLOOR AREA RATIO (MAX.)	3,000 SQ.FT. PER ACRE	3,000 SQ.FT + 33.22 AC. = 99,660 (MAX.) 67,847 SQ.FT	3,000 SQ.FT + 13.09 AC. = 39,270 (MAX.) 314,376 SQ.FT (PROP.)	3,000 SQ.FT + 19.96 AC. = 59,880 (MAX.) 42,508 SQ.FT

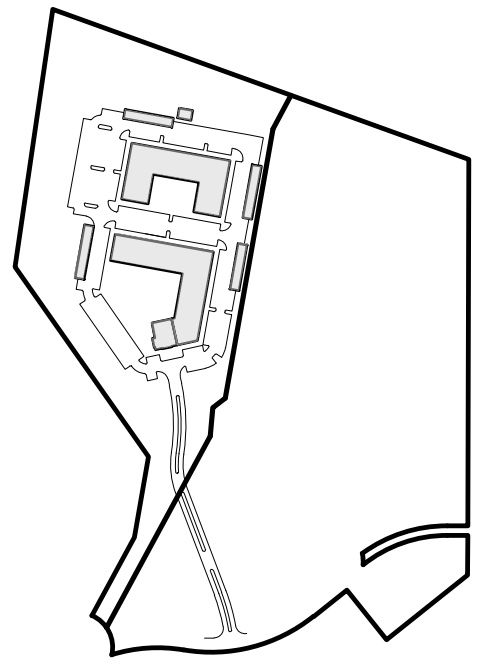
\*EXISTING NON-CONFORMING

OFF-STREET PARKING SUMMARY - LOT 5F1					
USE: MULTI-FAMILY RESIDENTIAL 2 SPACES PER DWELLING UNIT (ONE AND A HALF PER DWELLING UNIT FOR SUBSIDIZED LOW AND MODERATE INCOME HOUSING DEVELOPMENTS)					
237 DWELLING UNITS PROPOSED * 2 SPACES = 474 SPACES					
ADA REQUIRED: 9 TOTAL PARKING STALLS SHALL BE ACCESSIBLE (MINIMUM OF 2 ACCESSIBLE STALLS SHALL BE VAN ACCESSIBLE)					
ADA PROVIDED: 12 TOTAL ACCESSIBLE PARKING STALLS (ALL ARE VAN ACCESSIBLE)					
STANDARD STALLS PROVIDED	ADA ACCESSIBLE STALLS PROVIDED	GARAGE STALLS PROVIDED	RESERVE STALLS	TOTAL STALLS	TOTAL STALLS REQUIRED
328	12	40	29	409	474

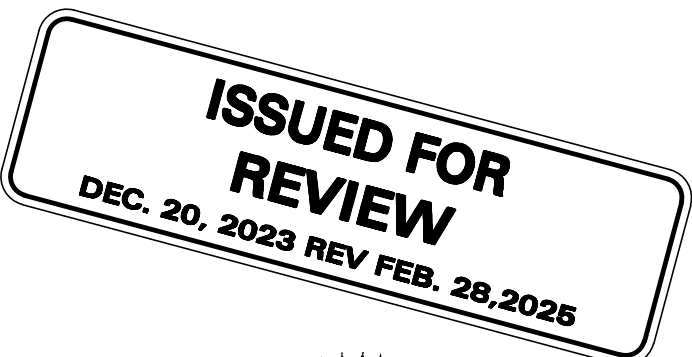
1. PROPOSED PARKING RATIO = 1.73 PER UNIT.
2. 1 LOADING/GENERAL SPACE IS NOT INCLUDED IN ABOVE COUNTS.

OFF-STREET PARKING SUMMARY - LOT 5F2				
USE: TENNIS COURTS 3 SPACES PER COURT PLUS (1) SPACE PER EMPLOYEE ON THE LARGEST SHIFT				
11 TENNIS COURTS * 3 + 12 EMPLOYEES = 45 SPACES				
SWIMMING POOL 1 SPACES PER 75 SQUARE FEET OF GROSS WATER AREA				
9,202 SQ.FT. OF WATER AREA = 123 SPACES				
FITNESS CLUB 1 SPACES PER 250 SQUARE FEET OF GROSS FLOOR AREA				
21,900 SQ.FT. / 250 = 88 SPACES				
OUTDOOR RECREATIONAL FACILITY 1 SPACES PER 4 PERSONS GENERALLY EXPECTED ON THE PREMISES AT ONE TIME				
125 PERSONS = 32 SPACES				
TOTAL REQUIRED = 288				
ADA REQUIRED: 7 TOTAL PARKING STALLS SHALL BE ACCESSIBLE (MINIMUM OF 2 ACCESSIBLE STALLS SHALL BE VAN ACCESSIBLE)				
ADA PROVIDED: 9 TOTAL ACCESSIBLE PARKING STALLS INCLUDING 6 VAN STALLS				
STANDARD STALLS PROVIDED	ACCESSIBLE STALLS PROVIDED	ACCESSIBLE STALLS PROVIDED	TOTAL STALLS PROVIDED	TOTAL STALLS REQUIRED
271	9	27	307	288

PROPOSED PLAN PROVIDES FOR RE-STRIPING SPACES IN KIND OR CONVERSION OF 27 SPACES TO COMPACT SPACES AS ALLOWED UNDER THE BYLAW. NET PARKING REMAINS UNCHANGED. COMPACT PARKING REPRESENTS 8.8% OF TOTAL ONSITE PARKING.



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PROFESSIONAL ENGINEER FOR  
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275 FOREST RIDGE ROAD  
CONCORD, MA 01742

PROJECT:

THE RESIDENCES AT THOREAU  
275 FOREST RIDGE ROAD  
CONCORD, MA 01742

PROJECT NO. 1670-24 DATE: 12/20/2023

SCALE: 1" = 50' DWG. NAME: C-1670-24

DESIGNED BY: BDP CHECKED BY: PLC

PREPARED BY:



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DRAWING TITLE: LAYOUT & MATERIALS PLAN SHEET No. C-103C

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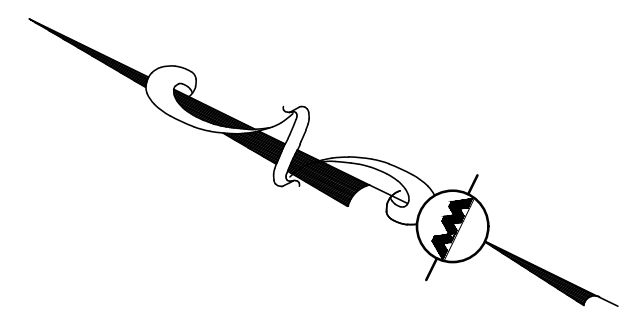
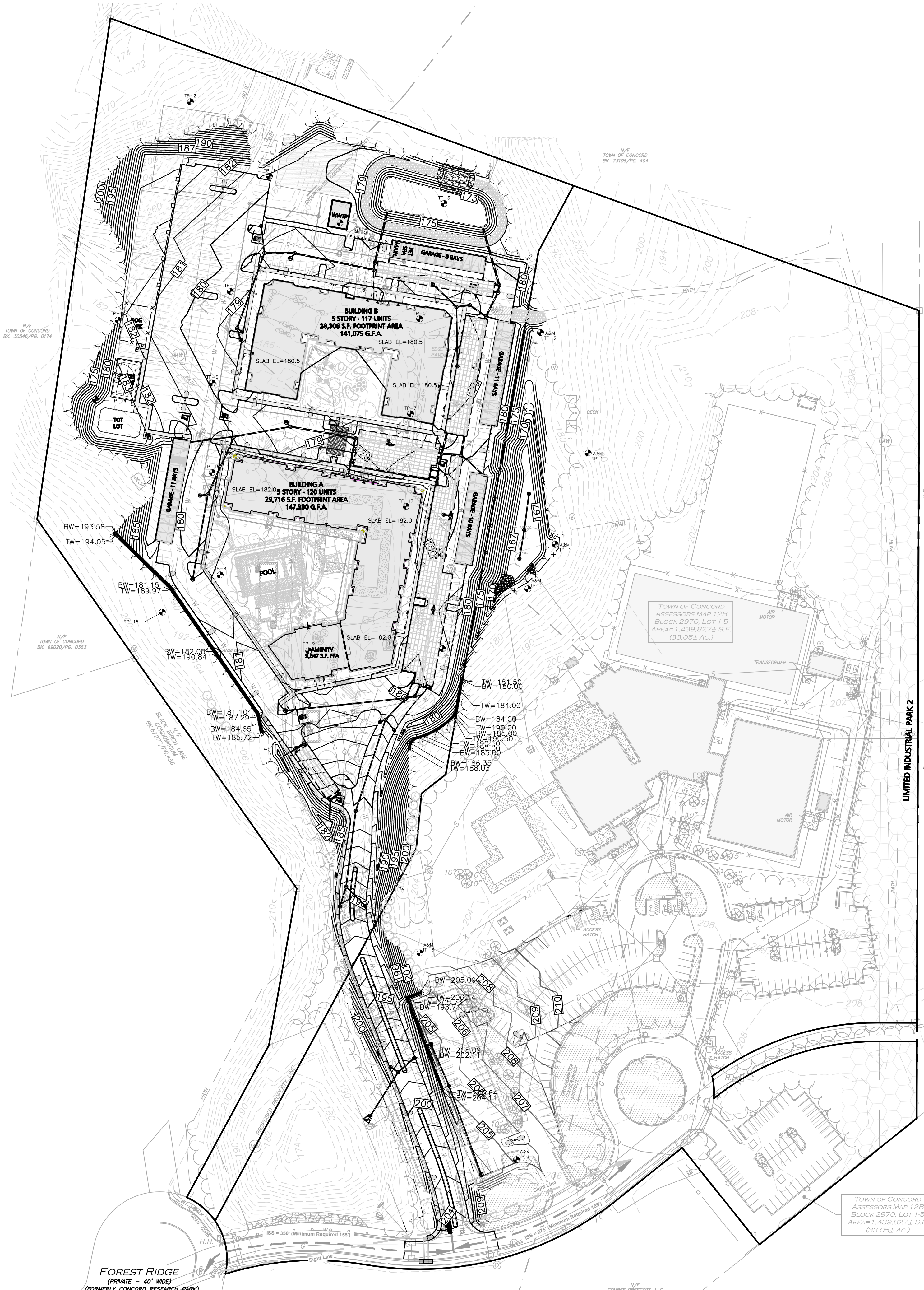
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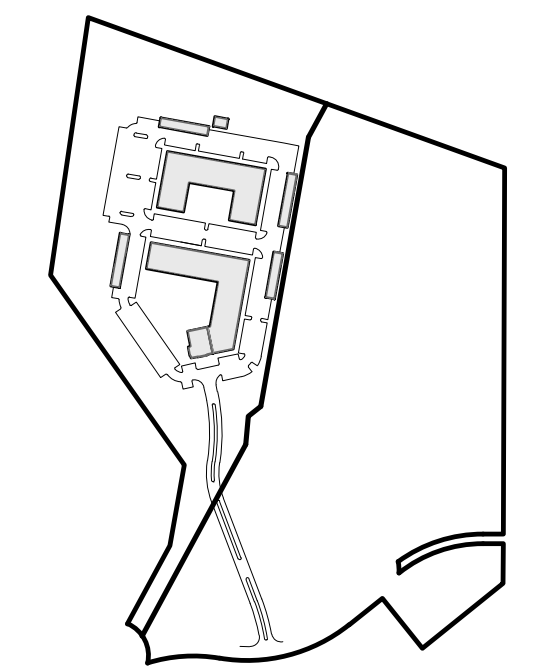


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LEGEND	
DRAIN MANHOLE (DMH)	⊙
CATCH BASIN (CB)	⊙
CATCH BASIN - DOUBLE GRATE	⊙
FLARED END SECTION (FES)	◁
DRAIN LINE	—
RIPRAP OUTFALL	▨
HEADWALL	⌒
5' CONTOUR	—180—
1' CONTOUR	—177—
SPOT GRADE	×180.50
INFILTRATION SYSTEM	▭
INFILTRATION CHAMBERS	▭
ISOLATOR ROW	▭
FLOW DIRECTION	→



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DESIGNED BY:	PGM	CHECKED BY:	PLC

PREPARED BY:

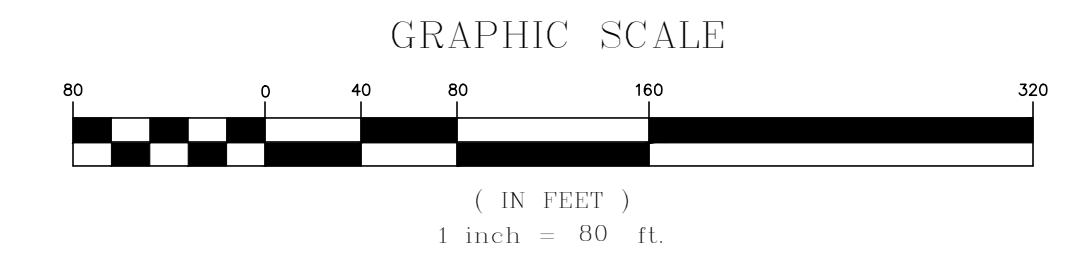
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DRAWING TITLE: **OVERALL GRADING & DRAINAGE PLAN**  
SHEET No. **C-104**  
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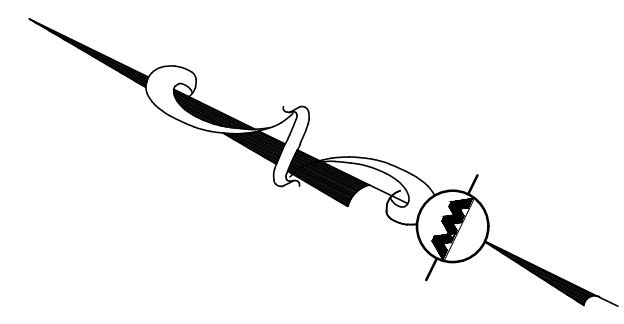
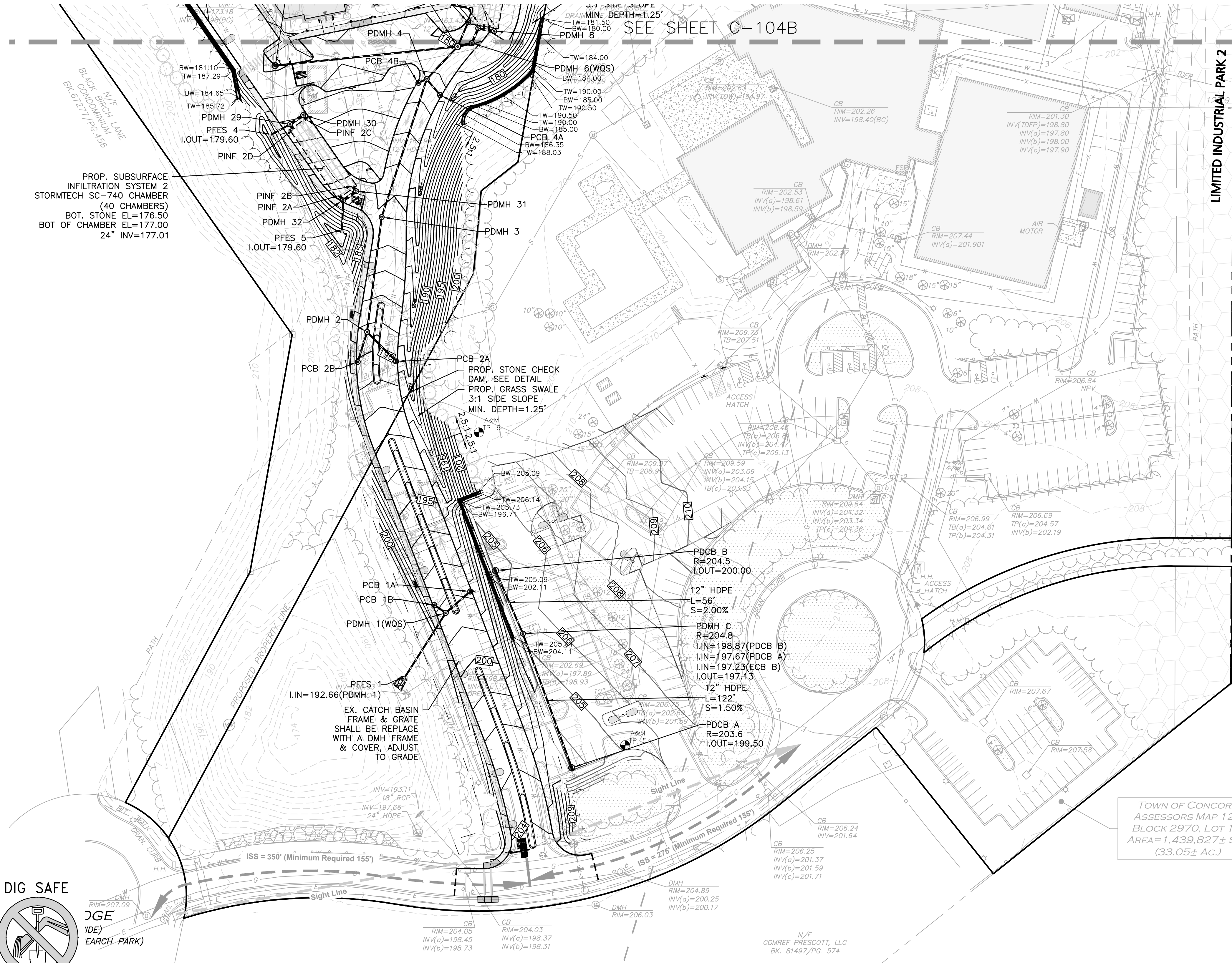


FOREST RIDGE  
(PRIVATE - 40' WIDE)  
(FORMERLY CONCORD RESEARCH PARK)

TOWN OF CONCORD  
ASSESSORS MAP 129  
BLOCK 2970, LOT 1-5  
AREA=1,439,627± S.F.  
(33.05± Ac.)

N.P.  
CONREF PRESCOTT, LLC  
200 WASHINGTON ST., 2ND FL.  
CONCORD, MA 01742

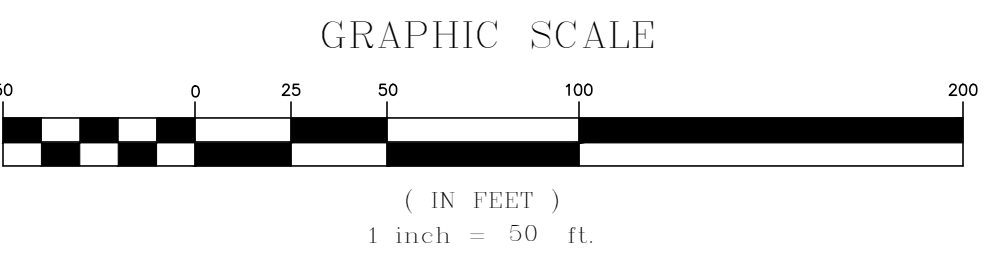
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**LEGEND**

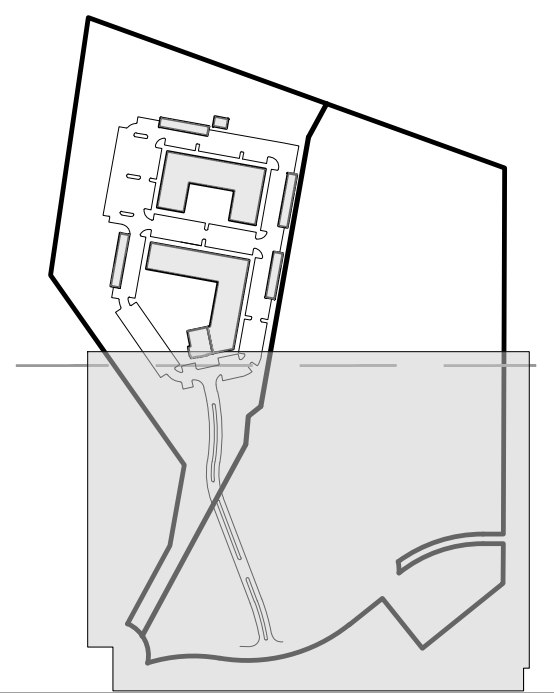
- DRAIN MANHOLE (DMH)
- CATCH BASIN (CB)
- CATCH BASIN - DOUBLE GRATE
- FLARED END SECTION (FES)
- DRAIN LINE
- RIPRAP OUTFALL
- HEADWALL
- 5' CONTOUR
- 1' CONTOUR
- SPOT GRADE
- INFILTRATION SYSTEM
- INFILTRATION CHAMBERS
- ISOLATOR ROW
- FLOW DIRECTION

- NOTES:**
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  - REFER TO SHEET C-104C TO DRAINAGE STRUCTURE AND PIPE TABLES.
  - THE FOLLOWING DRAINAGE STRUCTURES SHALL BE WATER QUALITY STRUCTURES:
    - PDMH 1, PDMH 6, PDMH 11, PDMH 20, PDMH 26
    - PCB 14A, PCB 17A



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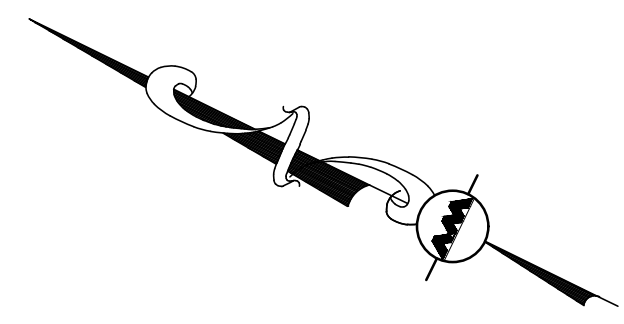
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DRAWING TITLE: **GRADING & DRAINAGE PLAN C-104A**

SHEET No. \_\_\_\_\_

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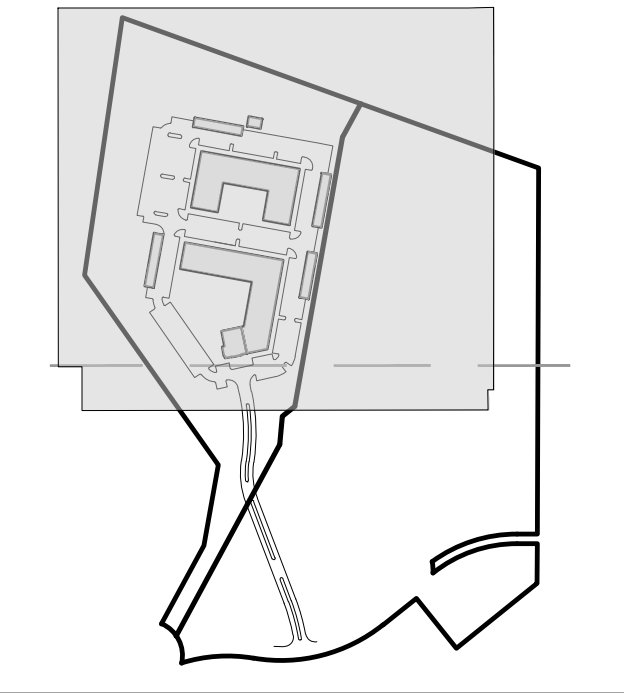
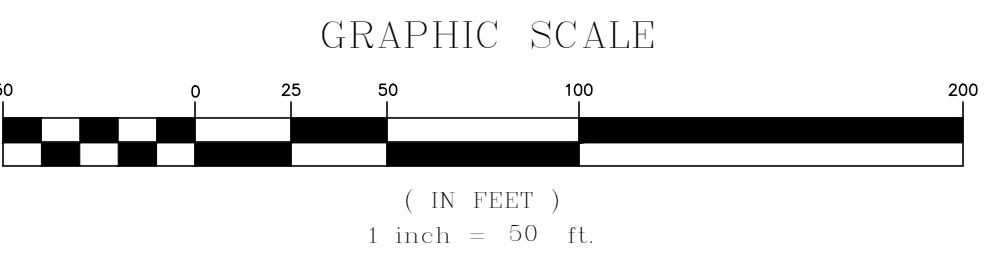
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**LEGEND**

- DRAIN MANHOLE (DMH)
- CATCH BASIN (CB)
- CATCH BASIN - DOUBLE GRATE
- FLARED END SECTION (FES)
- DRAIN LINE
- RIPRAP OUTFALL
- HEADWALL
- 5' CONTOUR
- 1' CONTOUR
- SPOT GRADE
- INFILTRATION SYSTEM
- INFILTRATION CHAMBERS
- ISOLATOR ROW
- FLOW DIRECTION

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    - PDMH 1, PDMH 6, PDMH 11, PDMH 20, PDMH 26
    - PCB 14A, PCB 17A



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DRAWING TITLE: **GRADING & DRAINAGE PLAN** SHEET No. **C-104B**

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STRUCTURE	STRUCTURE DETAILS
ECB A	RIM = 199.59 INV IN = 194.00 (PDMH C) INV OUT = 193.50 (EHW)
PCB 1A	RIM = 197.77 INV OUT = 193.65 (PDMH 1)
PCB 1B	RIM = 197.81 INV OUT = 193.57 (PDMH 1)
PCB 2A	RIM = 190.08 INV OUT = 185.65 (PDMH 2)
PCB 2B	RIM = 190.11 INV OUT = 185.47 (PDMH 2)
PCB 4A	RIM = 181.32 INV OUT = 177.00 (PDMH 4)
PCB 4B	RIM = 181.32 INV OUT = 176.79 (PDMH 4)
PCB 5B	RIM = 179.52 INV OUT = 175.33 (PDMH 5)
PCB 9B	RIM = 179.17 INV OUT = 175.07 (PDMH 9)
PCB 14A	RIM = 178.23 INV OUT = 174.10 (PDMH 14)
PCB 17A	RIM = 179.40 INV OUT = 175.10 (PDMH 17)
PCB 19A	RIM = 178.25 INV OUT = 174.19 (PDMH 19)
PCB 19B	RIM = 178.53 INV OUT = 174.21 (PDMH 19)
PCB 24A	RIM = 178.45 INV OUT = 175.00 (PDMH 24)
PCB 24B	RIM = 178.44 INV OUT = 174.94 (PDMH 24)
PCB 25A	RIM = 179.30 INV OUT = 175.14 (PDMH 25)
PDCB 5A	RIM = 179.85 INV OUT = 175.76 (PDMH 5)
PDCB 9A	RIM = 180.04 INV OUT = 175.83 (PDMH 9)
PDCB 11A	RIM = 178.19 INV OUT = 173.98 (PDMH 11)
PDCB 26A	RIM = 178.39 INV OUT = 174.36 (PDMH 26)

STRUCTURE	STRUCTURE DETAILS
PDMH 1	RIM = 198.29 INV IN = 193.40 (PCB 1A) INV IN = 193.40 (PCB 1B) INV OUT = 193.30 (PFES 1)
PDMH 2	RIM = 189.27 INV IN = 185.00 (PCB 2A) INV IN = 185.00 (PCB 2B) INV OUT = 183.44 (PINF 3)
PDMH 3	RIM = 185.21 INV IN = 180.00 (PDMH 2) INV OUT = 179.82 (PDMH 4)
PDMH 4	RIM = 181.22 INV IN = 176.71 (PDMH 3) INV IN = 176.71 (PCB 4B) INV IN = 176.71 (PCB 4A) INV OUT = 176.61 (PDMH 5)
PDMH 5	RIM = 180.07 INV IN = 174.50 (PDCB 5A) INV IN = 175.90 (PDMH 4) INV IN = 175.14 (PCB 5B) INV OUT = 174.00 (PDMH 6)
PDMH 6	RIM = 179.97 INV IN = 173.94 (PDMH 5) INV OUT = 173.84 (PDMH 7)
PDMH 7	RIM = 179.76 INV IN = 173.77 (PDMH 6) INV OUT = 173.02 (PDMH 8) INV OUT = 172.52 (PINF A)
PDMH 8	RIM = 180.11 INV IN = 173.02 (PDMH 7) INV OUT = 172.52 (PINF B)
PDMH 9	RIM = 179.35 INV IN = 175.00 (PCB 9B) INV IN = 175.00 (PDCB 9A) INV OUT = 174.75 (PDMH 10)
PDMH 10	RIM = 179.95 INV IN = 174.76 (GAR A) INV IN = 174.26 (PDMH 9) INV OUT = 174.16 (PDMH 11)
PDMH 11	RIM = 178.36 INV IN = 173.90 (PDCB 11A) INV IN = 173.65 (PDMH 10) INV OUT = 173.40 (PDMH 12)
PDMH 12	RIM = 178.77 INV IN = 173.03 (PDMH 13) INV IN = 172.90 (PDMH 11) INV OUT = 172.53 (PINF H)

STRUCTURE	STRUCTURE DETAILS
PDMH 13	RIM = 179.37 INV IN = 176.20 (BLDG 1) INV OUT = 172.53 (PINF G) INV OUT = 173.03 (PDMH 12)
PDMH 14	RIM = 178.38 INV IN = 174.04 (PCB 14A) INV OUT = 172.54 (PINF I) INV OUT = 172.54 (PINF J)
PDMH 15	RIM = 179.58 INV IN = 173.03 (PDMH 18) INV OUT = 172.53 (PINF U) INV OUT = 173.03 (PDMH 16)
PDMH 16	RIM = 180.49 INV IN = 173.03 (PDMH 15) INV OUT = 172.53 (PINF E) INV OUT = 172.53 (PINF F)
PDMH 17	RIM = 179.69 INV IN = 175.00 (PCB 17A) INV OUT = 172.54 (PINF C) INV OUT = 172.54 (PINF D)
PDMH 17A	RIM = 179.69 INV OUT = 172.54 (PINF V) INV OUT = 172.54 (PINF W)
PDMH 18	RIM = 179.90 INV IN = 173.03 (PDMH 15) INV IN = 176.12 (GAR B) INV OUT = 172.53 (PINF L) INV OUT = 172.53 (PINF M)
PDMH 19	RIM = 179.74 INV IN = 173.81 (PCB 19A) INV IN = 173.81 (PCB 19B) INV OUT = 173.56 (PDMH 20)
PDMH 20	RIM = 179.72 INV IN = 173.49 (PDMH 19) INV OUT = 173.39 (PDMH 21)
PDMH 21	RIM = 179.32 INV IN = 173.28 (PDMH 20) INV IN = 175.00 (GAR C) INV OUT = 172.53 (PINF N) INV OUT = 173.03 (PDMH 22)
PDMH 22	RIM = 179.48 INV IN = 173.03 (PDMH 21) INV OUT = 173.03 (PDMH 23) INV OUT = -2.25 (PINF O)
PDMH 23	RIM = 179.60 INV IN = 173.03 (PDMH 22) INV OUT = 172.53 (PINF P) INV OUT = 172.50 (PFES 2)

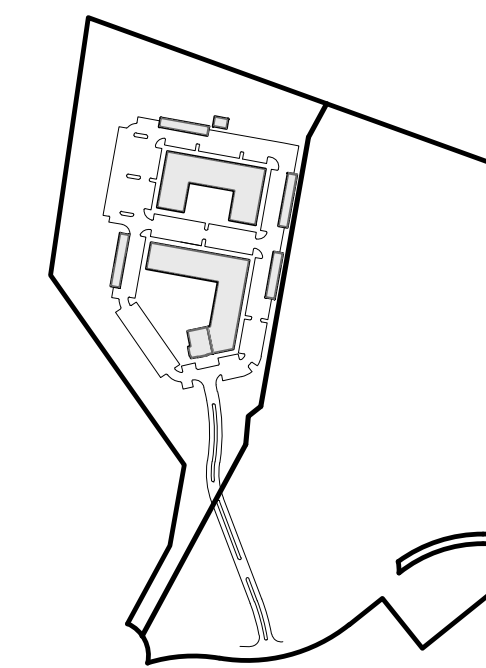
STRUCTURE	STRUCTURE DETAILS
PDMH 24	RIM = 178.59 INV IN = 174.92 (PCB 24A) INV IN = 174.92 (PCB 24B) INV OUT = 174.67 (PDMH 25)
PDMH 25	RIM = 178.90 INV IN = 174.16 (PDMH 24) INV IN = 174.81 (PCB 25A) INV OUT = 174.09 (PDMH 26)
PDMH 26	RIM = 178.56 INV IN = 173.91 (PDMH 25) INV IN = 174.31 (PDCB 26A) INV OUT = 173.81 (PDMH 27)
PDMH 27	RIM = 179.44 INV IN = 173.03 (PDMH 26) INV IN = 174.30 (BLDG 2) INV OUT = 173.03 (PDMH 28) INV OUT = 172.53 (PINF T)
PDMH 28	RIM = 179.63 INV IN = 173.03 (PDMH 27) INV OUT = 172.53 (PINF S) INV OUT = 172.50 (PFES 3)
PDMH 29	RIM = 182.17 INV IN = 178.27 (PFES 4) INV OUT = 177.03 (PINF 2D) INV OUT = 177.03 (PDMH 30)
PDMH 30	RIM = 181.89 INV IN = 177.03 (PDMH 29) INV OUT = 177.03 (PINF 2C)
PDMH 31	RIM = 185.80 INV IN = 177.03 (PDMH 32) INV OUT = 177.03 (PINF 2B)
PDMH 32	RIM = 187.38 INV IN = 178.04 (PFES 5) INV OUT = 177.03 (PINF 2A) INV OUT = 177.03 (PDMH 31)

PIPE SEGMENT	SIZE	LENGTH	SLOPE	MATERIAL
BLDG 1 - PDMH 13	12"	15.74'	4.00%	HDPE
BLDG 2 - PDMH 27	12"	37.78'	1.86%	HDPE
GAR A - PDMH 10	12"	56.96'	1.00%	HDPE
GAR B - PDMH 18	12"	38.21'	1.00%	HDPE
GAR C - PDMH 21	12"	15.42'	2.00%	HDPE
PCB 1A - PDMH 1	12"	24.81'	1.00%	HDPE
PCB 1B - PDMH 1	12"	8.25'	2.00%	HDPE
PCB 2A - PDMH 2	12"	32.55'	2.00%	HDPE
PCB 2B - PDMH 2	12"	23.73'	2.00%	HDPE
PCB 4A - PDMH 4	12"	14.41'	2.00%	HDPE
PCB 4B - PDMH 4	12"	3.91'	2.00%	HDPE
PCB 5B - PDMH 5	12"	18.89'	1.00%	HDPE
PCB 9B - PDMH 9	12"	6.63'	1.00%	HDPE
PCB 14A - PDMH 14	12"	1.52'	4.00%	HDPE
PCB 17A - PDMH 17	12"	4.88'	2.00%	HDPE
PCB 19A - PDMH 19	12"	75.64'	0.50%	HDPE
PCB 19B - PDMH 19	12"	40.26'	1.00%	HDPE
PCB 24A - PDMH 24	12"	12.12'	0.65%	HDPE
PCB 24B - PDMH 24	12"	4.30'	0.50%	HDPE
PCB 25A - PDMH 25	12"	32.43'	1.00%	HDPE

PIPE SEGMENT	SIZE	LENGTH	SLOPE	MATERIAL
PDCB 5A - PDMH 5	12"	157.37'	0.80%	HDPE
PDCB 9A - PDMH 9	12"	110.74'	0.75%	HDPE
PDCB 11A - PDMH 11	12"	4.09'	2.00%	HDPE
PDCB 26A - PDMH 26	12"	4.48'	1.25%	HDPE
PDMH 1 - PFES 1	12"	64.54'	1.00%	HDPE
PDMH 2 - PDMH 3	12"	98.41'	3.50%	HDPE
PDMH 3 - PDMH 4	12"	124.39'	2.50%	HDPE
PDMH 4 - PDMH 5	12"	35.34'	2.00%	HDPE
PDMH 5 - PDMH 6	18"	8.38'	0.70%	HDPE
PDMH 6 - PDMH 7	18"	10.22'	0.70%	HDPE
PDMH 7 - PDMH 8	18"	10.25'	0.00%	HDPE
PDMH 7 - PINF A	24"	2.30'	0.50%	HDPE
PDMH 8 - PINF B	24"	2.30'	0.50%	HDPE
PDMH 9 - PDMH 10	15"	81.27'	0.60%	HDPE
PDMH 10 - PDMH 11	15"	72.70'	0.70%	HDPE
PDMH 11 - PDMH 12	18"	83.92'	0.60%	HDPE
PDMH 12 - PINF H	24"	3.44'	0.50%	HDPE
PDMH 13 - PDMH 12	18"	31.25'	0.00%	HDPE
PDMH 13 - PINF G	24"	5.44'	0.32%	HDPE
PDMH 14 - PINF I	24"	5.40'	0.50%	HDPE

PIPE SEGMENT	SIZE	LENGTH	SLOPE	MATERIAL
PDMH 14 - PINF J	24"	4.84'	0.56%	HDPE
PDMH 15 - PDMH 16	18"	29.25'	0.00%	HDPE
PDMH 15 - PDMH 18	18"	22.19'	0.00%	HDPE
PDMH 15 - PINF K	24"	3.44'	0.50%	HDPE
PDMH 15 - PINF U	24"	28.05'	0.00%	HDPE
PDMH 16 - PINF E	24"	8.95'	0.19%	HDPE
PDMH 16 - PINF F	24"	10.56'	0.16%	HDPE
PDMH 17 - PINF C	24"	5.12'	0.51%	HDPE
PDMH 17 - PINF D	24"	5.12'	0.50%	HDPE
PDMH 17A - PINF V	24"	5.12'	0.51%	HDPE
PDMH 17A - PINF W	24"	5.12'	0.50%	HDPE
PDMH 18 - PINF L	24"	2.67'	0.64%	HDPE
PDMH 18 - PINF M	24"	24.57'	0.07%	HDPE
PDMH 19 - PDMH 20	15"	14.09'	0.50%	HDPE
PDMH 20 - PDMH 21	15"	22.40'	0.50%	HDPE
PDMH 21 - PDMH 22	18"	36.03'	0.00%	HDPE
PDMH 21 - PINF N	24"	3.00'	0.50%	HDPE
PDMH 22 - PDMH 23	18"	9.61'	0.00%	HDPE
PDMH 22 - PINF O	24"	4.90'	0.35%	HDPE
PDMH 23 - PFES 2	24"	78.48'	0.00%	HDPE

PIPE SEGMENT	SIZE	LENGTH	SLOPE	MATERIAL
PDMH 23 - PINF P	24"	5.40'	0.31%	HDPE
PDMH 24 - PDMH 25	15"	103.50'	0.50%	HDPE
PDMH 25 - PDMH 26	18"	36.75'	0.50%	HDPE
PDMH 26 - PDMH 27	18"	103.82'	0.75%	HDPE
PDMH 27 - PDMH 28	18"	7.50'	0.00%	HDPE
PDMH 27 - PINF T	24"	3.44'	0.50%	HDPE
PDMH 28 - PFES 3	24"	69.70'	0.00%	HDPE
PDMH 28 - PINF S	24"	3.44'	0.50%	HDPE
PDMH 29 - PDMH 30	24"	10.25'	0.00%	HDPE
PDMH 29 - PINF 2D	24"	3.50'	0.50%	HDPE
PDMH 30 - PINF 2C	24"	3.50'	0.50%	HDPE
PDMH 31 - PINF 2B	24"	3.50'	0.50%	HDPE
PDMH 32 - PDMH 31	24"	10.25'	0.00%	HDPE
PDMH 32 - PINF 2A	24"	3.50'	0.50%	HDPE
PFES 4 - PDMH 29	12"	16.57'	8.00%	HDPE
PFES 5 - PDMH 32	12"	23.96'	6.50%	HDPE



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REV	DATE	DESCRIPTION
05	02/28/25	PER PEER REVIEW COMMENTS
04	02/13/25	LAYOUT REVISIONS PER WORKSHOP
03	01/23/25	LAYOUT REVISIONS PER WORKSHOP
02	10/18/24	ZBA RESUBMISSION
01	02/23/24	ZBA RESUBMISSION

APPLICANT/OWNER:

THOREAU RESIDENCES, LLC  
275 FOREST RIDGE ROAD  
CONCORD, MA 01742

PROJECT:

THE RESIDENCES AT THOREAU  
275 FOREST RIDGE ROAD  
CONCORD, MA 01742

PROJECT NO. 1670-24 DATE: 12/20/2023

SCALE: 1" = 50' DWG. NAME: C-1670-24

DESIGNED BY: PGM CHECKED BY: PLC

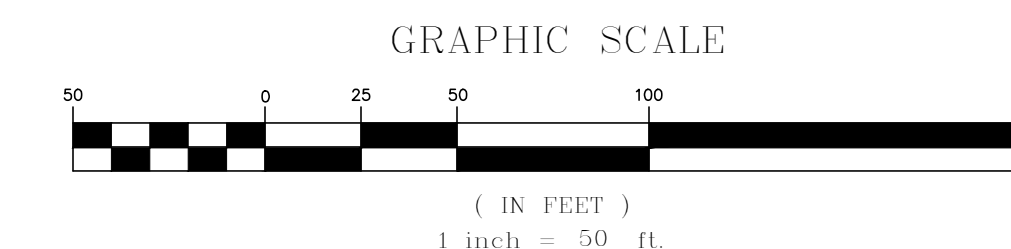
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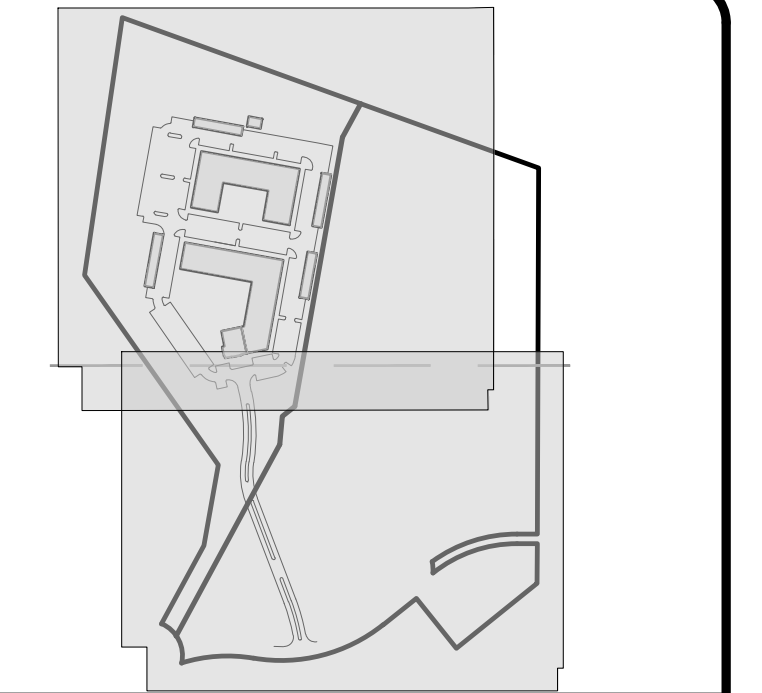
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M:\PROJECTS\1670-24\CIVIL\DRAWINGS\CURRENT\1670-24\_L GRADING & DRAINAGE.DWG

Grid of 24 test pit logs (TP-1 to TP-24) for 'THE RESIDENCES AT THOREAU'. Each log includes project details, test pit data table, and observations. The logs describe soil profiles and groundwater levels for various test pits across the site.



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Revision table with columns: REV, DATE, DESCRIPTION. It lists five revisions: 05 (02/28/25) PER PEER REVIEW COMMENTS, 04 (02/13/25) LAYOUT REVISIONS PER WORKSHOP, 03 (01/23/25) LAYOUT REVISIONS PER WORKSHOP, 02 (10/18/24) ZBA RESUBMISSION, and 01 (02/23/24) ZBA RESUBMISSION.

APPLICANT/OWNER: THOREAU RESIDENCES, LLC 275 FOREST RIDGE ROAD CONCORD, MA 01742

PROJECT: THE RESIDENCES AT THOREAU 275 FOREST RIDGE ROAD CONCORD, MA 01742

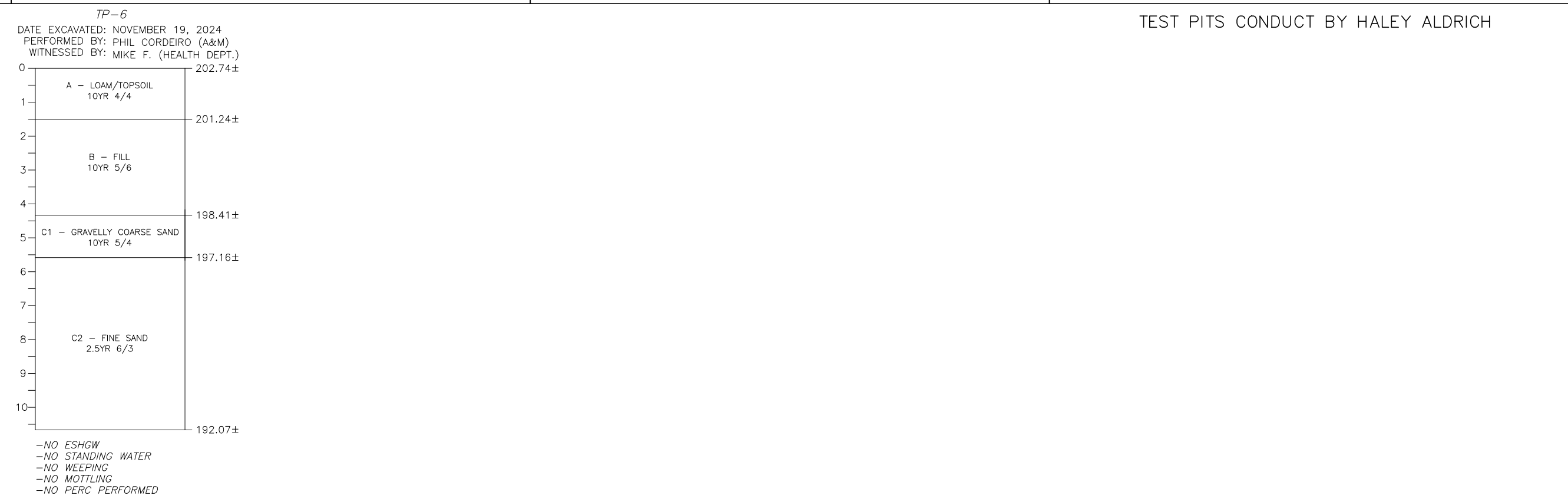
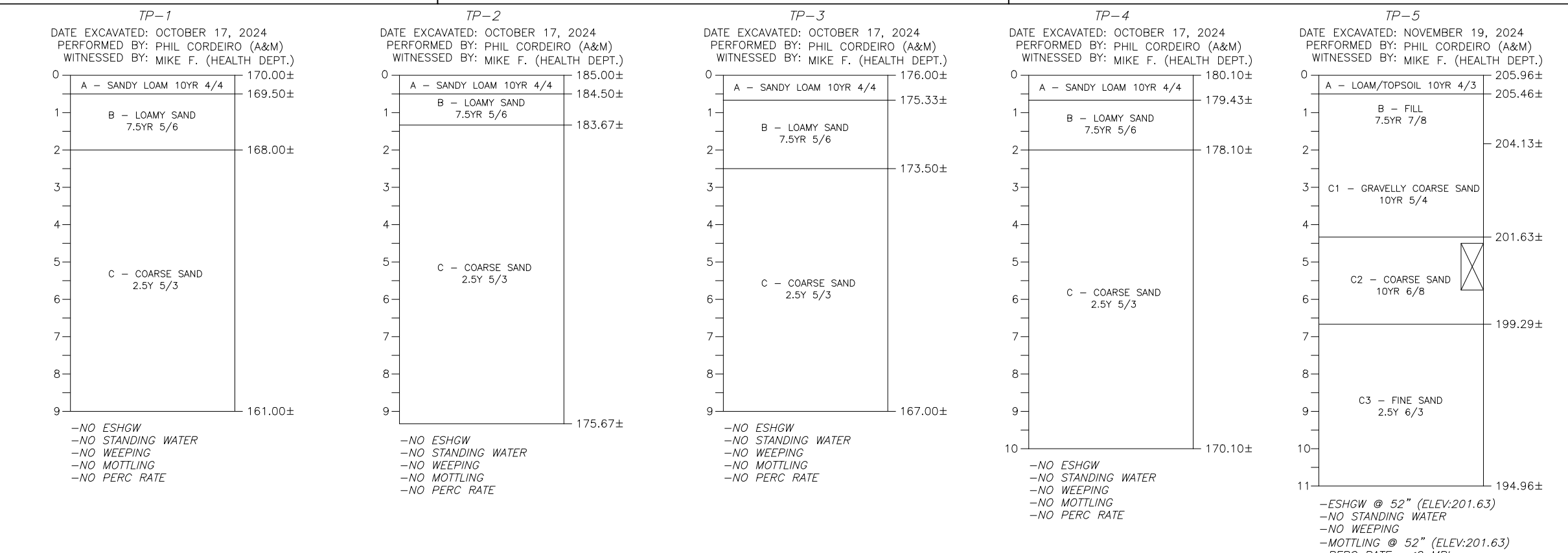
PROJECT NO. 1670-24 DATE: 12/20/2023 SCALE: NOT TO SCALE DWG. NAME: C-1670-24 DESIGNED BY: PLC CHECKED BY: PLC



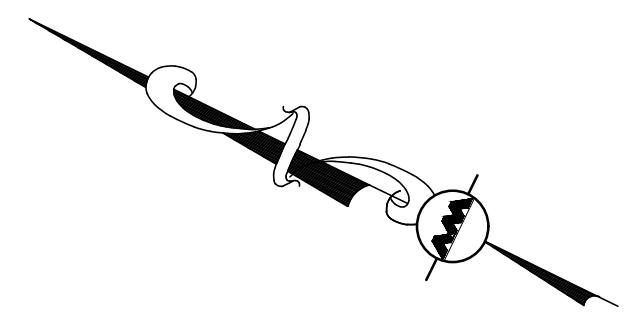
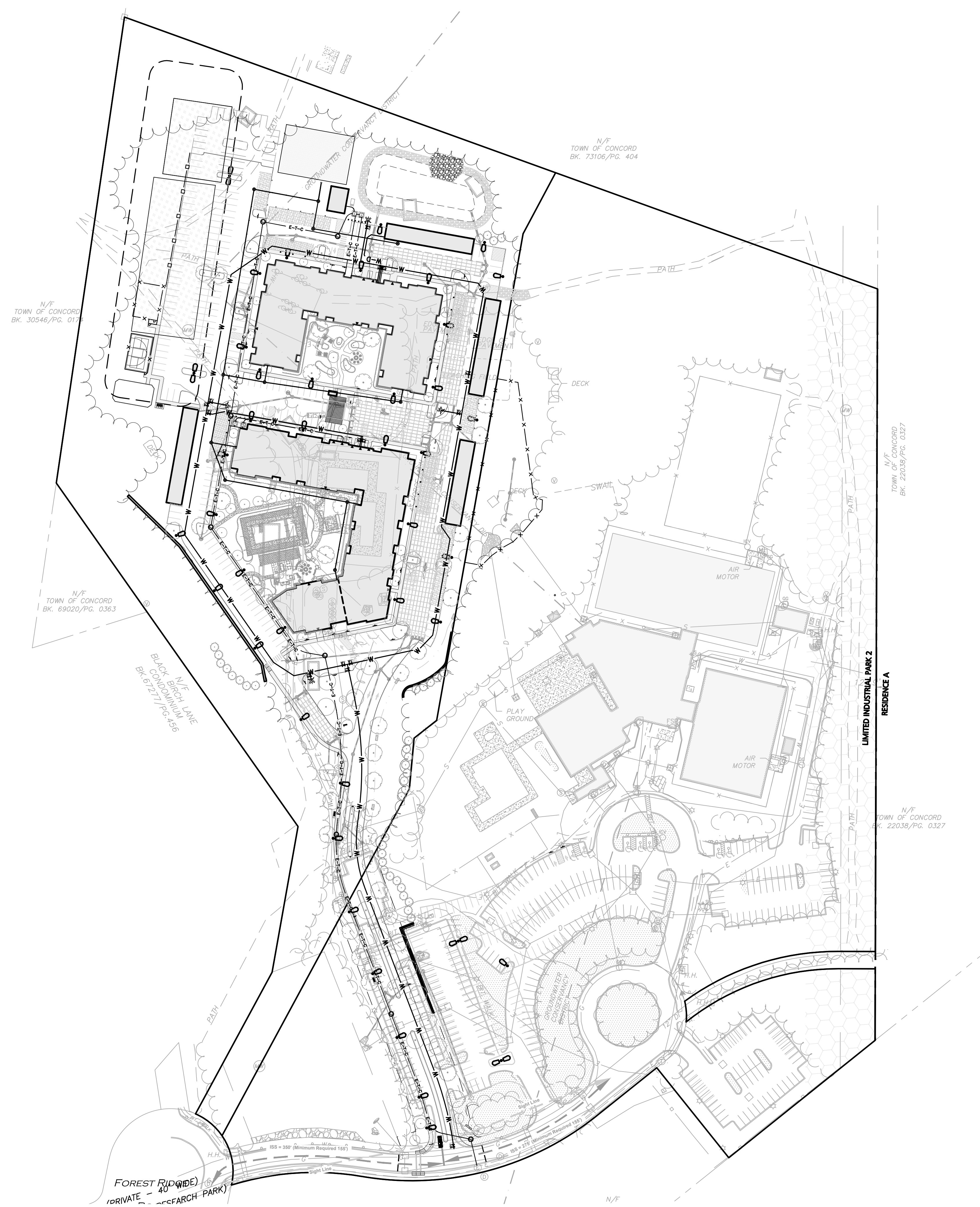
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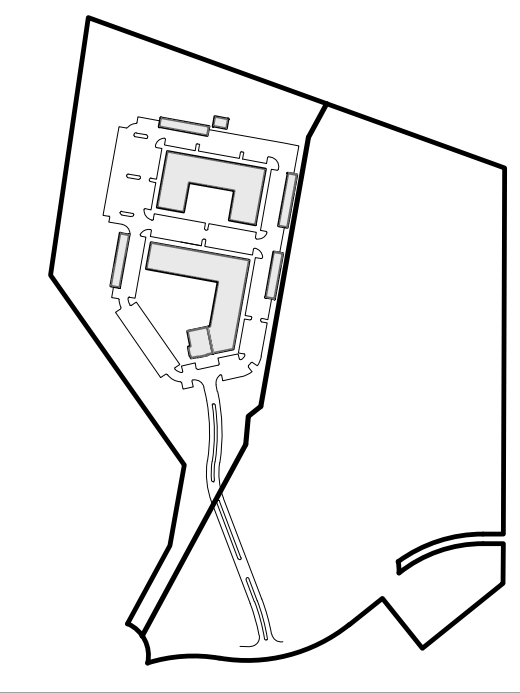
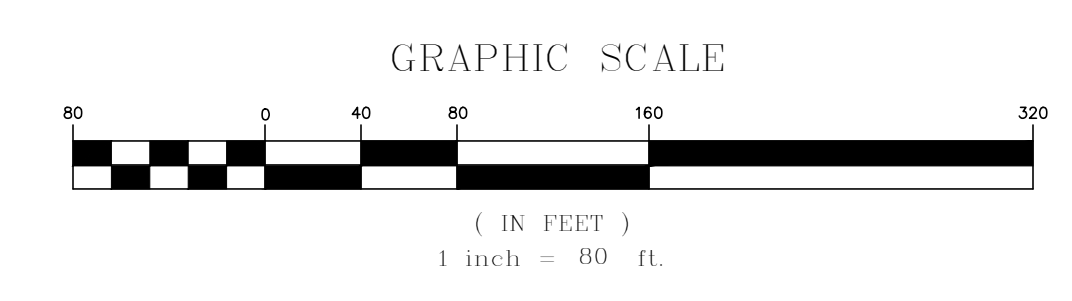
LEGEND	
SEWER MANHOLE	
SEWER LINE	
WATER LINE	
ELEC/TELE/CABLE CONDUIT	
ELECTRIC MANHOLE/SPLICE BOX	
WATER VALVE	
HYDRANT	

3 COUNTS	
SPACES:	328
ICES:	29
PACES:	12
PACES:	1
PACES:	40
ARKING:	307

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CONCORD, MA 01742

PROJECT:  
**THE RESIDENCES AT THOREAU**  
275 FOREST RIDGE ROAD  
CONCORD, MA 01742

PROJECT NO.	1670-24	DATE:	12/20/2023
SCALE:	1" = 80'	DWG. NAME:	C-1670-24
DESIGNED BY:		CHECKED BY:	PLC

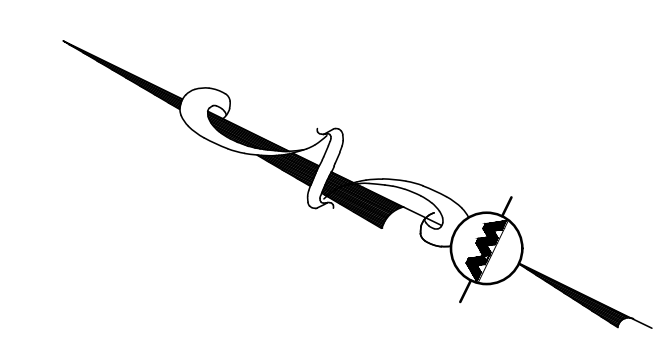
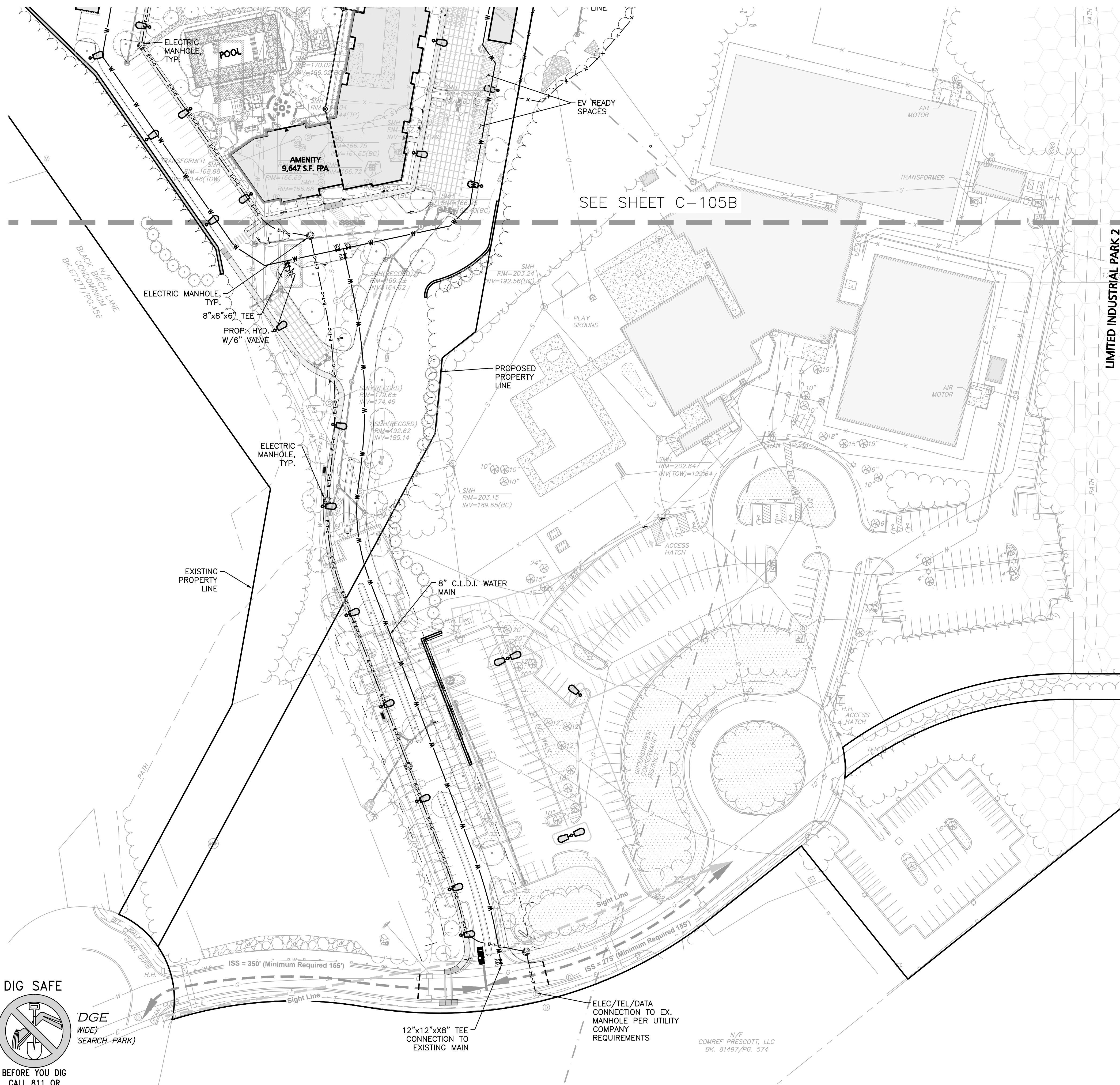
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<b>UTILITIES PLAN</b>	<b>C-105</b>

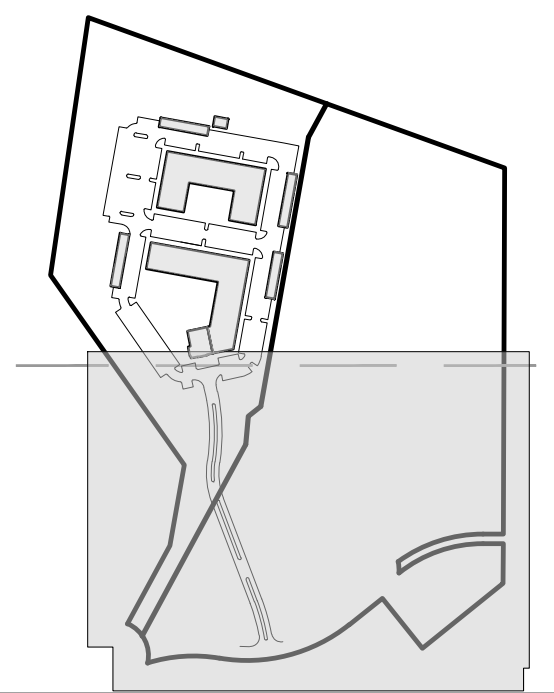
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LEGEND	
SEWER MANHOLE	
SEWER LINE	
WATER LINE	
ELEC/TELE/CABLE CONDUIT	
ELECTRIC MANHOLE/SPLICE BOX	
WATER VALVE	
HYDRANT	

NOTES:  
 1. ELECTRIC VEHICLE CHARGING SPACES ARE SHOWN SCHEMATICALLY AND INDICATE CONFORMANCE TO THE SPECIALIZED ENERGY CODE REQUIREMENTS. FINAL PLACEMENT SHALL BE DETERMINED DURING DESIGN. 20% OF THE PARKING SPACES ARE REQUIRED TO BE WIRED FOR ELECTRIC VEHICLE CHARGING. PHASING OF SPACES (INITIAL VERSUS FUTURE) SHALL BE DETERMINED.

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APPLICANT/OWNER:  
 THOREAU RESIDENCES, LLC  
 275 FOREST RIDGE ROAD  
 CONCORD, MA 01742

PROJECT:  
**THE RESIDENCES AT THOREAU**  
 275 FOREST RIDGE ROAD  
 CONCORD, MA 01742

PROJECT NO.	1670-24	DATE:	12/20/2023
SCALE:	1" = 50'	DWG. NAME:	C-1670-24
DESIGNED BY:	BDP	CHECKED BY:	PLC

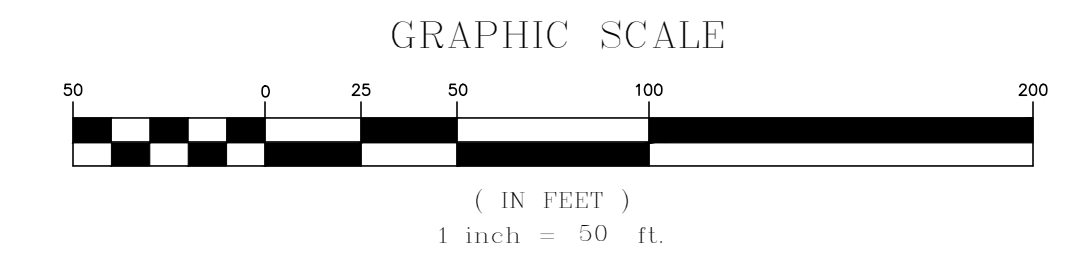
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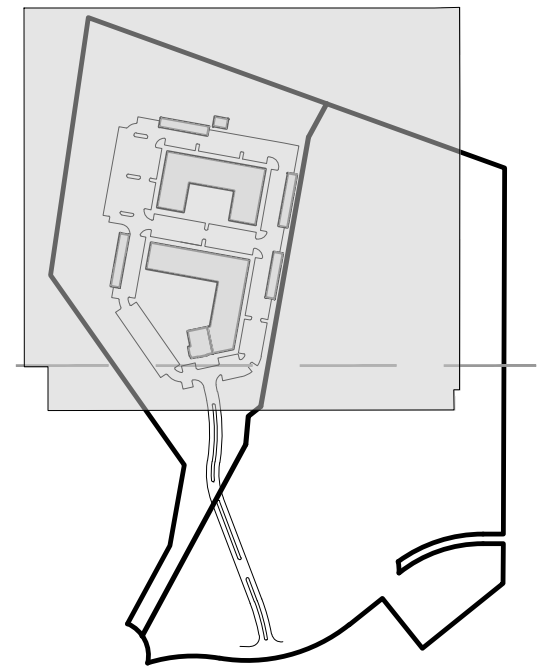
DRAWING TITLE: UTILITIES PLAN SHEET No. C-105A



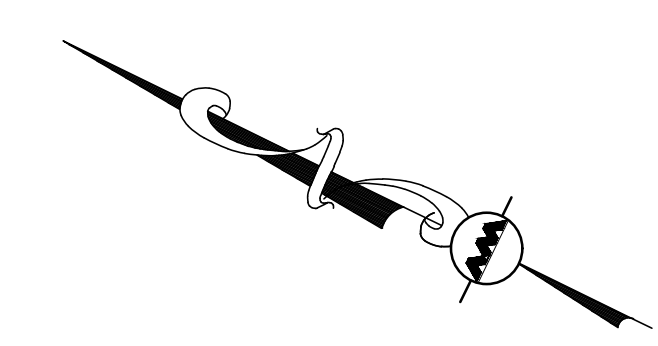
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N/F  
 COMREF PRESCOTT, LLC  
 BK. 81497/PG. 574



KEYSHEET



LEGEND	
SEWER MANHOLE	
SEWER LINE	
WATER LINE	
ELEC/TELE/CABLE CONDUIT	
ELECTRIC MANHOLE/SPLICE BOX	
WATER VALVE	
HYDRANT	

NOTES:  
 1. ELECTRIC VEHICLE CHARGING SPACES ARE SHOWN SCHEMATICALLY AND INDICATE CONFORMANCE TO THE SPECIALIZED ENERGY CODE REQUIREMENTS. FINAL PLACEMENT SHALL BE DETERMINED DURING DESIGN. 20% OF THE PARKING SPACES ARE REQUIRED TO BE WIRED FOR ELECTRIC VEHICLE CHARGING. PHASING OF SPACES (INITIAL VERSUS FUTURE) SHALL BE DETERMINED.

**ISSUED FOR REVIEW**  
 DEC. 20, 2023 REV FEB. 28, 2025



PROFESSIONAL ENGINEER FOR  
 ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
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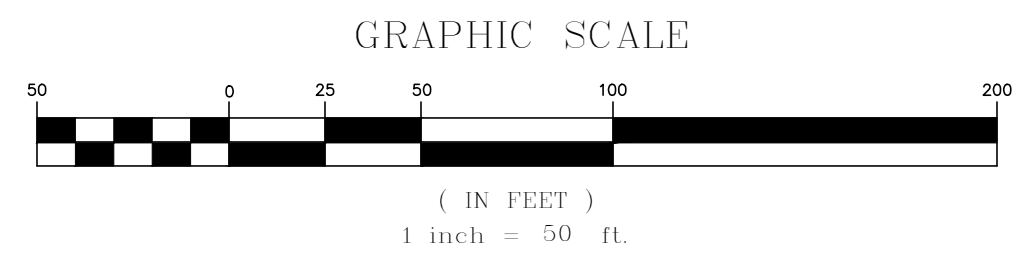
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DRAWING TITLE: UTILITIES PLAN SHEET No. C-105B

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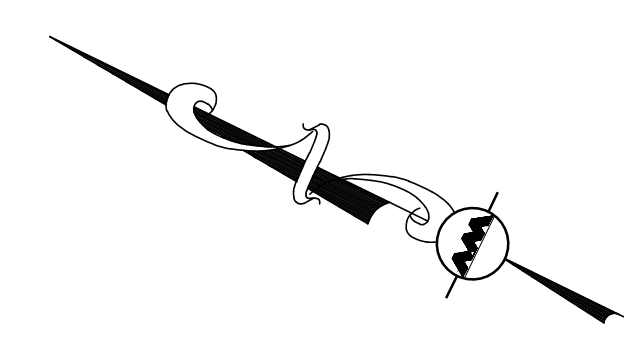


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SEE SHEET C-106B

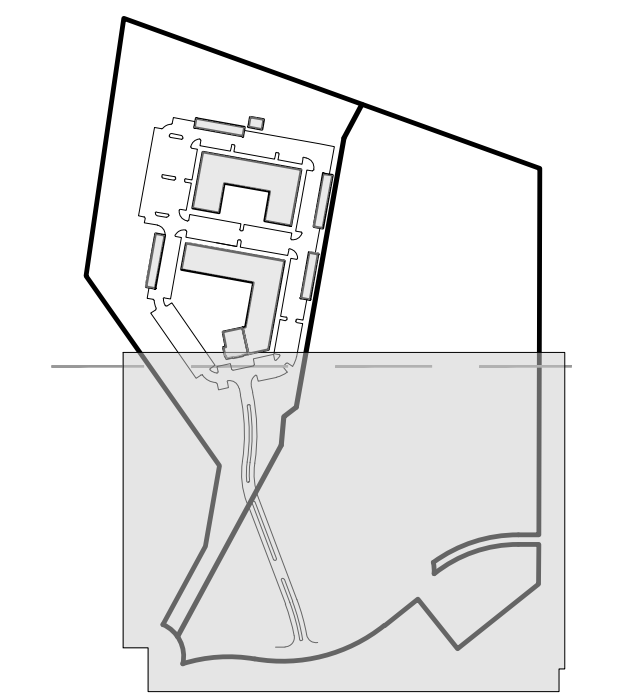
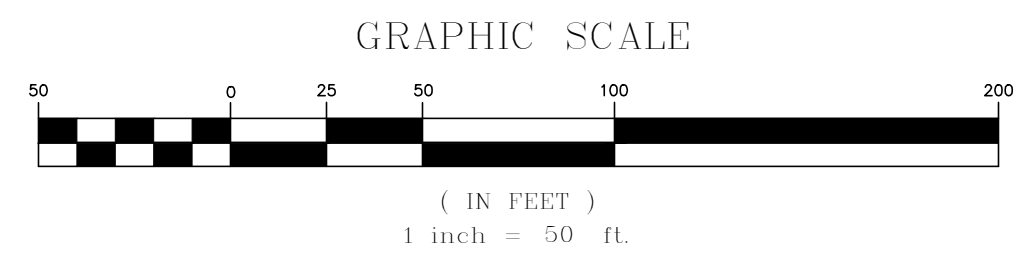


**LEGEND**

SNOW STORAGE AREA

- NOTES:**
- SNOW SHALL NOT BE PLOWED TOWARDS ANY AREA PROTECTED BY THE MASSACHUSETTS WETLANDS PROTECTION ACT. ADDITIONALLY, IT IS PROHIBITED TO DUMP SNOW IN STORMWATER PONDS.
  - SNOW SHALL BE STOCKPILED ON SITE IN LOCATIONS SHOWN UNTIL THE ACCUMULATED SNOW BECOMES A HAZARD TO THE DAILY OPERATIONS OF THE SITE. IT WILL BE THE RESPONSIBILITY OF THE SNOW REMOVAL CONTRACTOR TO PROPERLY DISPOSE OF TRANSPORTED SNOW ACCORDING TO MASSDEP DISPOSAL GUIDELINES.
  - SNOW AREAS DEPICTED AT INTERSECTIONS ARE SUBJECT TO LIMITATIONS FOR SIGHT DISTANCE VISIBILITY AND SHALL NOT IMPEDE SAFE TRAVEL.

GROUNDWATER CONSERVANCY DISTRICT NOTE:  
NO OUTSIDE STORAGE OF DEICING CHEMICALS ARE ALLOWED WITHIN THE GROUNDWATER CONSERVANCY DISTRICT



KEYSHEET

**ISSUED FOR REVIEW**  
DEC. 20, 2023 REV FEB. 28, 2025



PROFESSIONAL ENGINEER FOR ALLEN & MAJOR ASSOCIATES, INC.

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SCALE:	1" = 50'	DWG. NAME:	C-1670-24
DESIGNED BY:	BDP	CHECKED BY:	PLC

PREPARED BY:

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DRAWING TITLE: SNOW STORAGE PLAN SHEET No. C-106A

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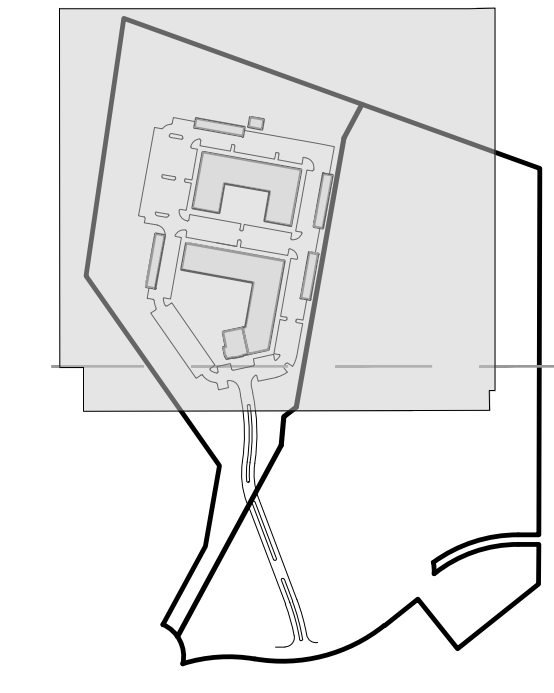
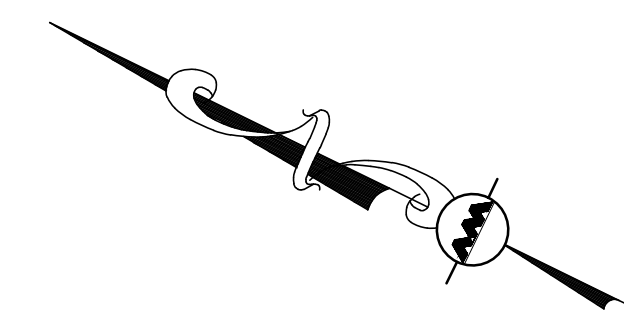
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BK. 81497/PG. 574

N/F  
TOWN OF CONC  
BK. 22038/PG.



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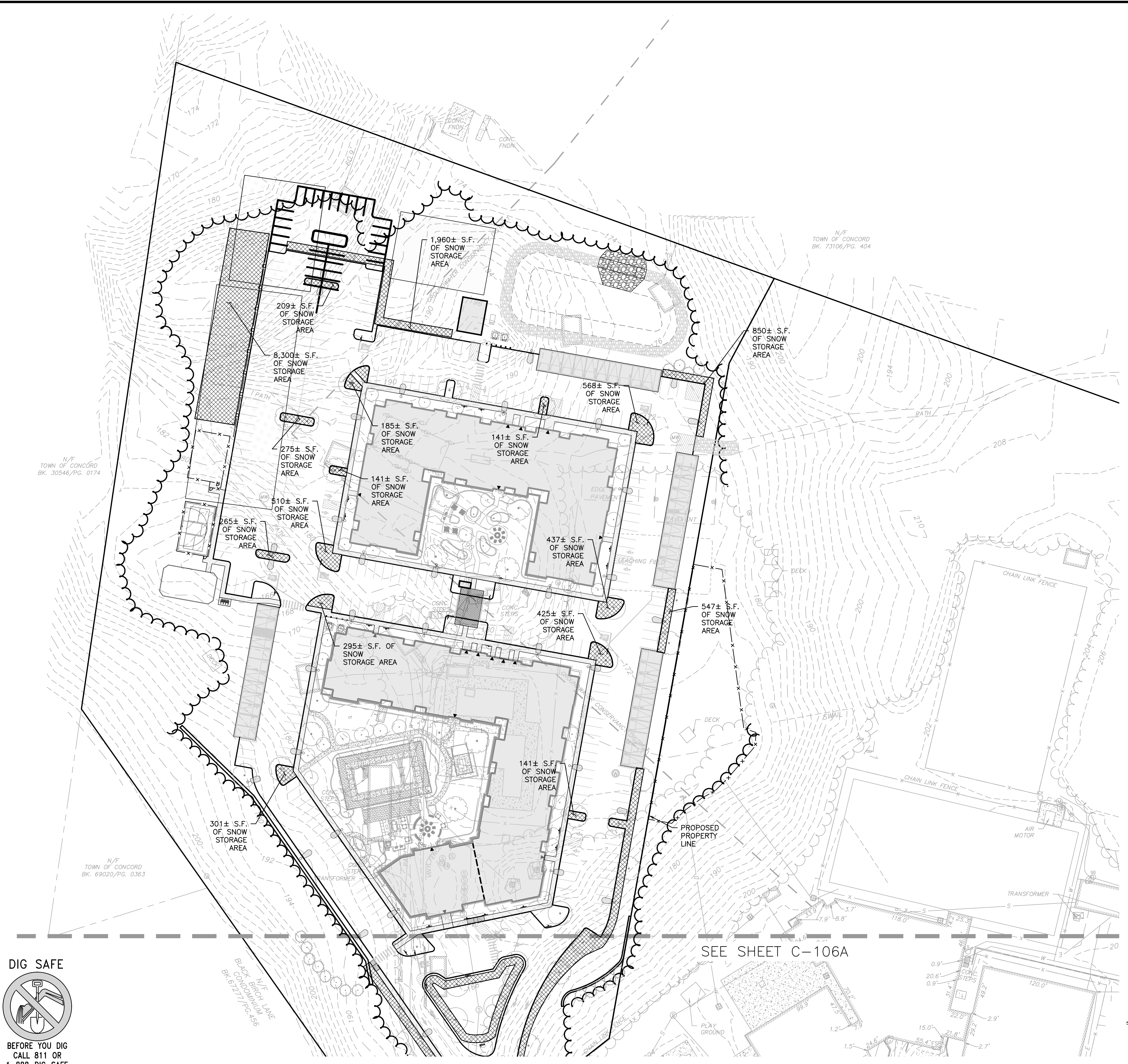
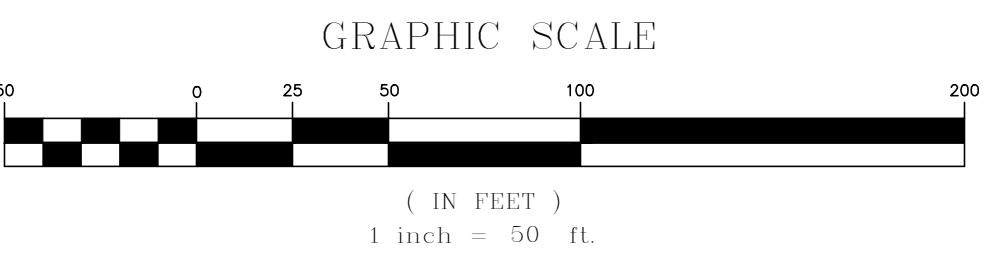
**LEGEND**

SNOW STORAGE AREA

**NOTES:**

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GROUNDWATER CONSERVANCY DISTRICT NOTE:  
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PROFESSIONAL ENGINEER FOR ALLEN & MAJOR ASSOCIATES, INC.

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APPLICANT/OWNER:

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275 FOREST RIDGE ROAD  
CONCORD, MA 01742

PROJECT:

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CONCORD, MA 01742

PROJECT NO.	1670-24	DATE:	12/20/2023
SCALE:	1" = 50'	DWG. NAME:	C-1670-24
DESIGNED BY:	BDP	CHECKED BY:	PLC

PREPARED BY:

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DRAWING TITLE: SNOW STORAGE PLAN SHEET No. C-106B

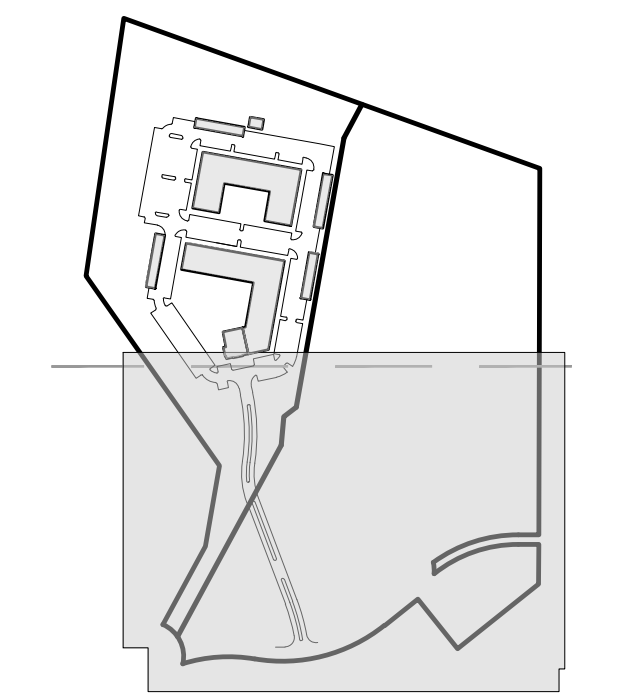
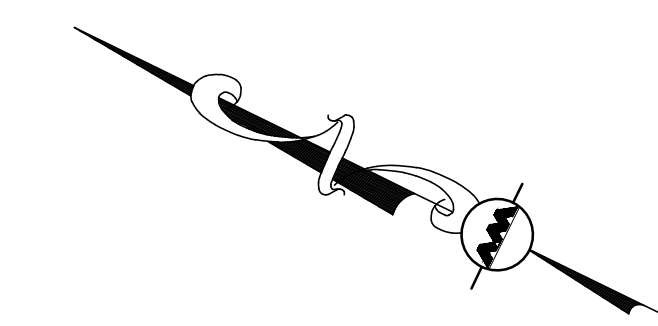
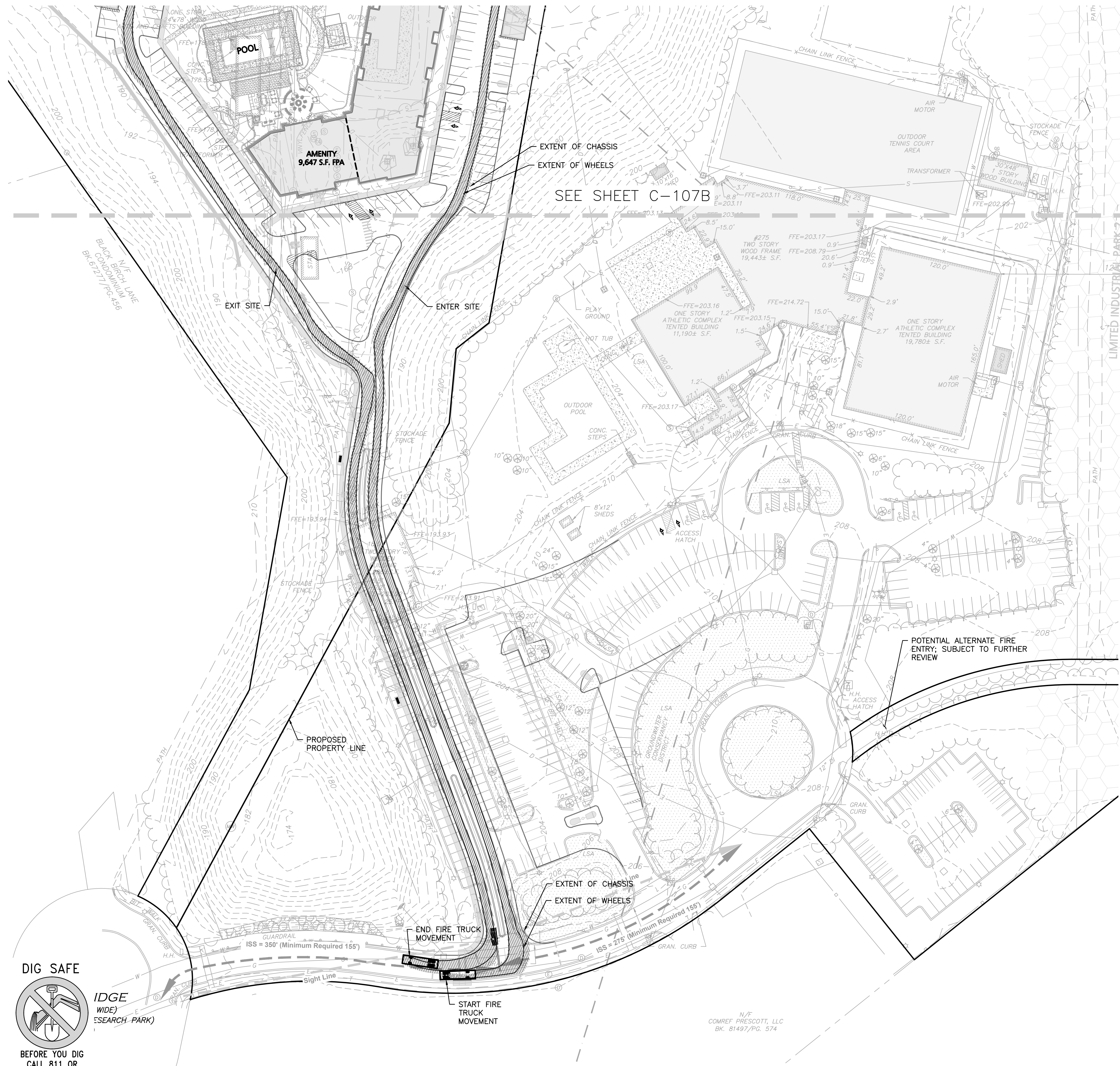
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PROFESSIONAL ENGINEER FOR  
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APPLICANT/OWNER:  
 THOREAU RESIDENCES, LLC  
 275 FOREST RIDGE ROAD  
 CONCORD, MA 01742

PROJECT:  
 THE RESIDENCES AT THOREAU  
 275 FOREST RIDGE ROAD  
 CONCORD, MA 01742

PROJECT NO.	1670-24	DATE:	12/20/2023
SCALE:	1" = 50'	DWG. NAME:	C-1670-24
DESIGNED BY:	BDP	CHECKED BY:	PLC

PREPARED BY:

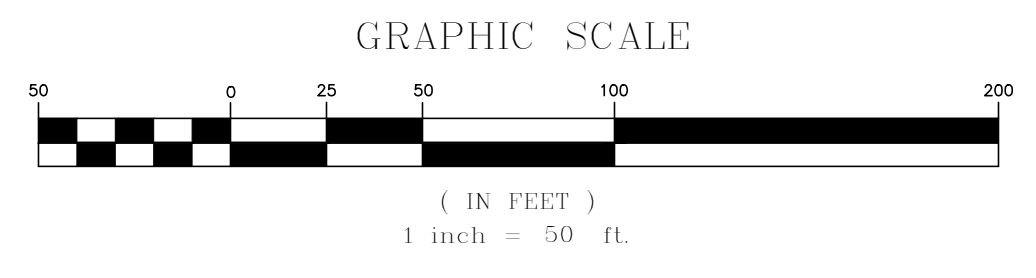
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DRAWING TITLE: **VEHICLE MOVEMENT PLAN** SHEET No. **C-107A**

Concord Fire Truck  
 Overall Length 34.870ft  
 Overall Width 8.330ft  
 Overall Body Height 10.225ft  
 Min Body Ground Clearance 0.656ft  
 Track Width 6.820ft  
 Lock-to-lock time 6.00s  
 Curb to Curb Turning Radius 32.600ft



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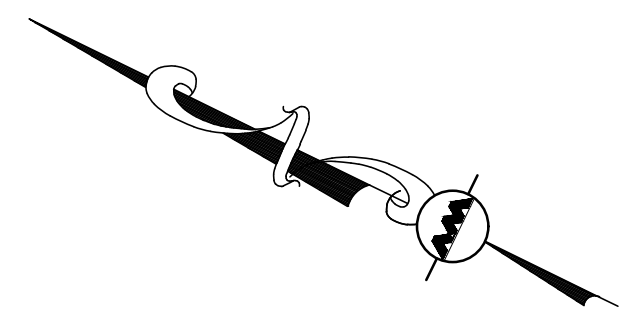
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LEGEND	
DOUBLE POLE LIGHT	
SINGLE POLE LIGHT	
1 FOOTCANDLE CONTOUR	
.5 FOOTCANDLE CONTOUR	
LIGHTING LEVELS GIVEN IN FOOT-CANDLES	0.1 0.2 0.4 0.6

**NOTES:**

- THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR IT'S REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
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- ALL PHOTOMETRIC DATA REFERS TO UNITS IN FOOT CANDLES (FC). THE LIMIT OF 1.0 FC ILLUMINATION IS SHOWN IN A RED SOLID LINE AND THE LIMIT OF THE 0.5 FOOT CANDLE (FC) ILLUMINATION IS SHOWN IN BLUE.
- QUANTITY SHOWN IN LUMINARE SCHEDULE TABLE DENOTES NUMBER OF FIXTURE HEADS. REFER TO PLAN FOR POLES WITH DOUBLE FIXTURES.
- ALL ILLUMINATION ON PARKING LOTS MUST BE SHIELDED SO AS NOT TO SHINE UPON ADJACENT PROPERTIES.
- SEE ARCHITECTURAL DRAWINGS FOR ADDITIONAL LIGHTING INFORMATION.
- ALL PROPOSED LIGHTING FIXTURES SHALL BE DARK SKY COMPLIANT.
- LIGHT POLES ADJACENT TO PARKING SHALL HAVE THE 3'-0" REVEAL FOOTING. LIGHT POLES ADJACENT TO SIDEWALKS SHALL HAVE FOOTING IN A FLUSH CONDITION.

TOWN C BK. 220

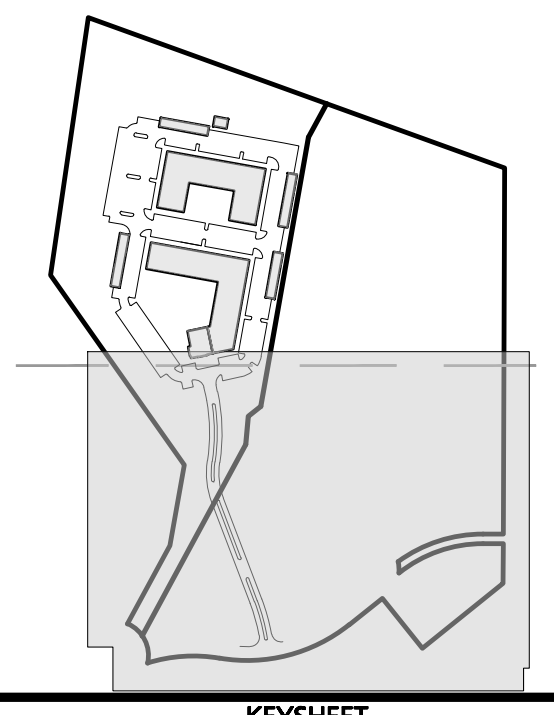
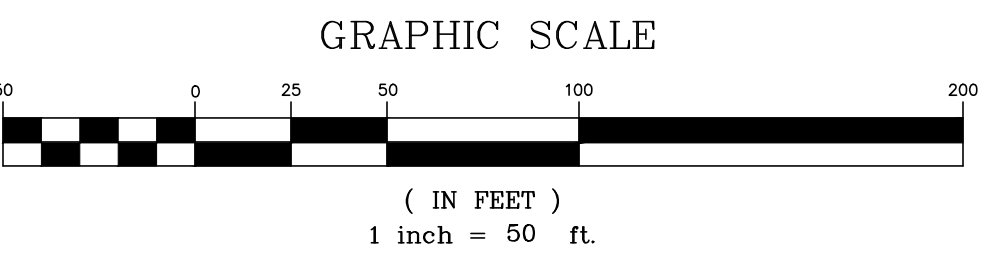
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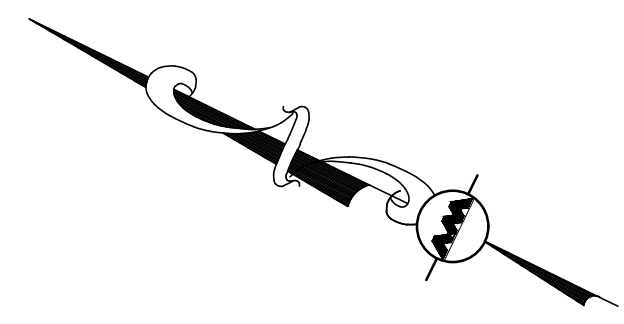
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DRAWING TITLE: **LIGHTING PLAN** SHEET No. **C-108A**

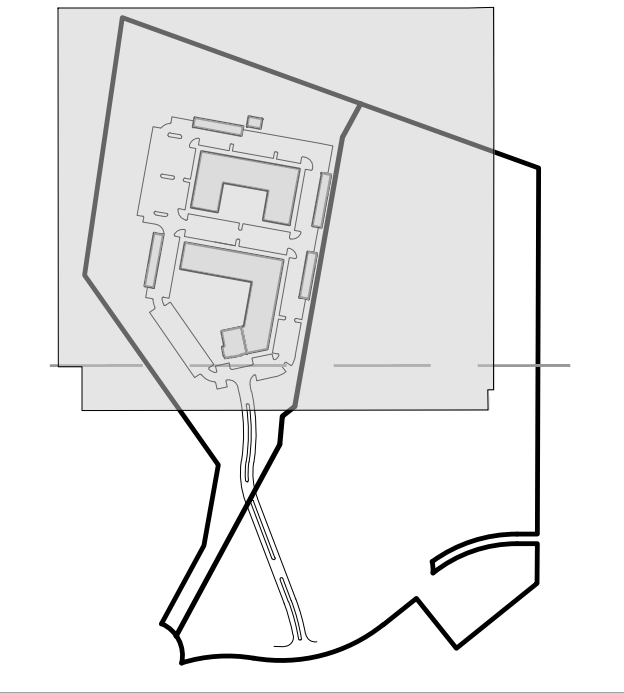
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LEGEND	
DOUBLE POLE LIGHT	
SINGLE POLE LIGHT	
1 FOOTCANDLE CONTOUR	
.5 FOOTCANDLE CONTOUR	
LIGHTING LEVELS GIVEN IN FOOT-CANDLES	1.0 0.1 0.2 0.4 0.6

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- QUANTITY SHOWN IN LUMINARE SCHEDULE TABLE DENOTES NUMBER OF FIXTURE HEADS. REFER TO PLAN FOR POLES WITH DOUBLE FIXTURES.
- ALL ILLUMINATION ON PARKING LOTS MUST BE SHIELDED SO AS NOT TO SHINE UPON ADJACENT PROPERTIES.
- SEE ARCHITECTURAL DRAWINGS FOR ADDITIONAL LIGHTING INFORMATION.
- ALL PROPOSED LIGHTING FIXTURES SHALL BE DARK SKY COMPLIANT.
- LIGHT POLES ADJACENT TO PARKING SHALL HAVE THE 3'-0" REVEAL FOOTING. LIGHT POLES ADJACENT TO SIDEWALKS SHALL HAVE FOOTING IN A FLUSH CONDITION.



KEYSHEET

**ISSUED FOR REVIEW**  
DEC. 20, 2023 REV FEB. 28, 2025



PROFESSIONAL ENGINEER FOR  
ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
05	02/28/25	PER PEER REVIEW COMMENTS
04	02/13/25	LAYOUT REVISIONS PER WORKSHOP
03	01/23/25	LAYOUT REVISIONS PER WORKSHOP
02	10/18/24	ZBA RESUBMISSION
01	02/23/24	ZBA RESUBMISSION

APPLICANT/OWNER:  
**THOREAU RESIDENCES, LLC**  
275 FOREST RIDGE ROAD  
CONCORD, MA 01742

PROJECT:  
**THE RESIDENCES AT THOREAU**  
275 FOREST RIDGE ROAD  
CONCORD, MA 01742

PROJECT NO.	1670-24	DATE:	12/20/2023
SCALE:	1" = 50'	DWG. NAME:	C-1670-24
DESIGNED BY:	JBT	CHECKED BY:	PLC

PREPARED BY:

**ALLEN & MAJOR ASSOCIATES, INC.**  
civil engineering • land surveying  
environmental consulting • landscape architecture  
www.allenmajor.com  
10 MAIN STREET  
LAKEVILLE, MA 02347  
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DRAWING TITLE: **LIGHTING PLAN** SHEET No. **C-108B**

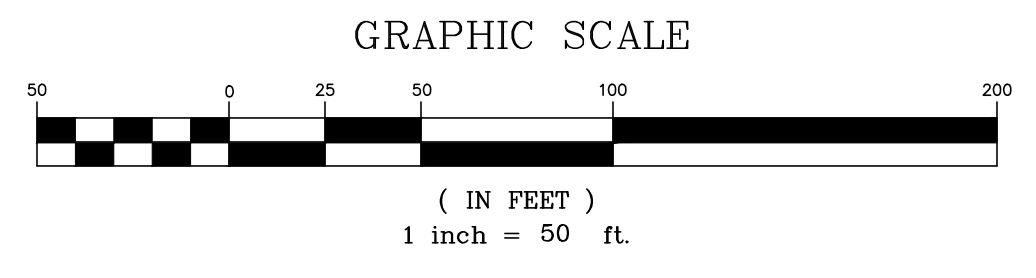
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1-888-344-7233

SEE SHEET C-108A



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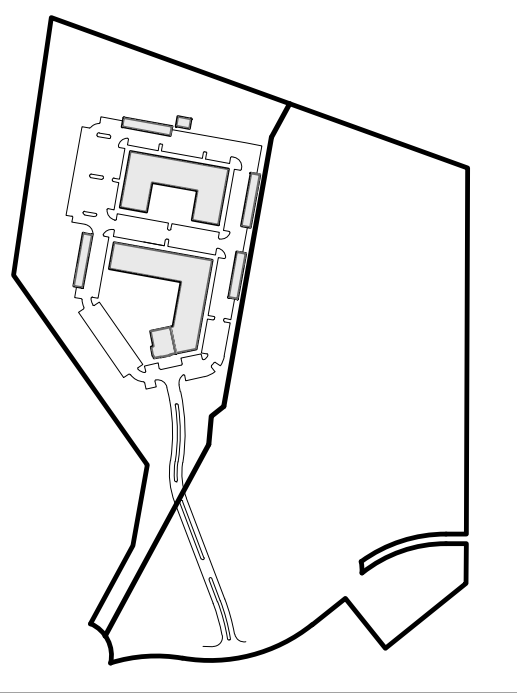
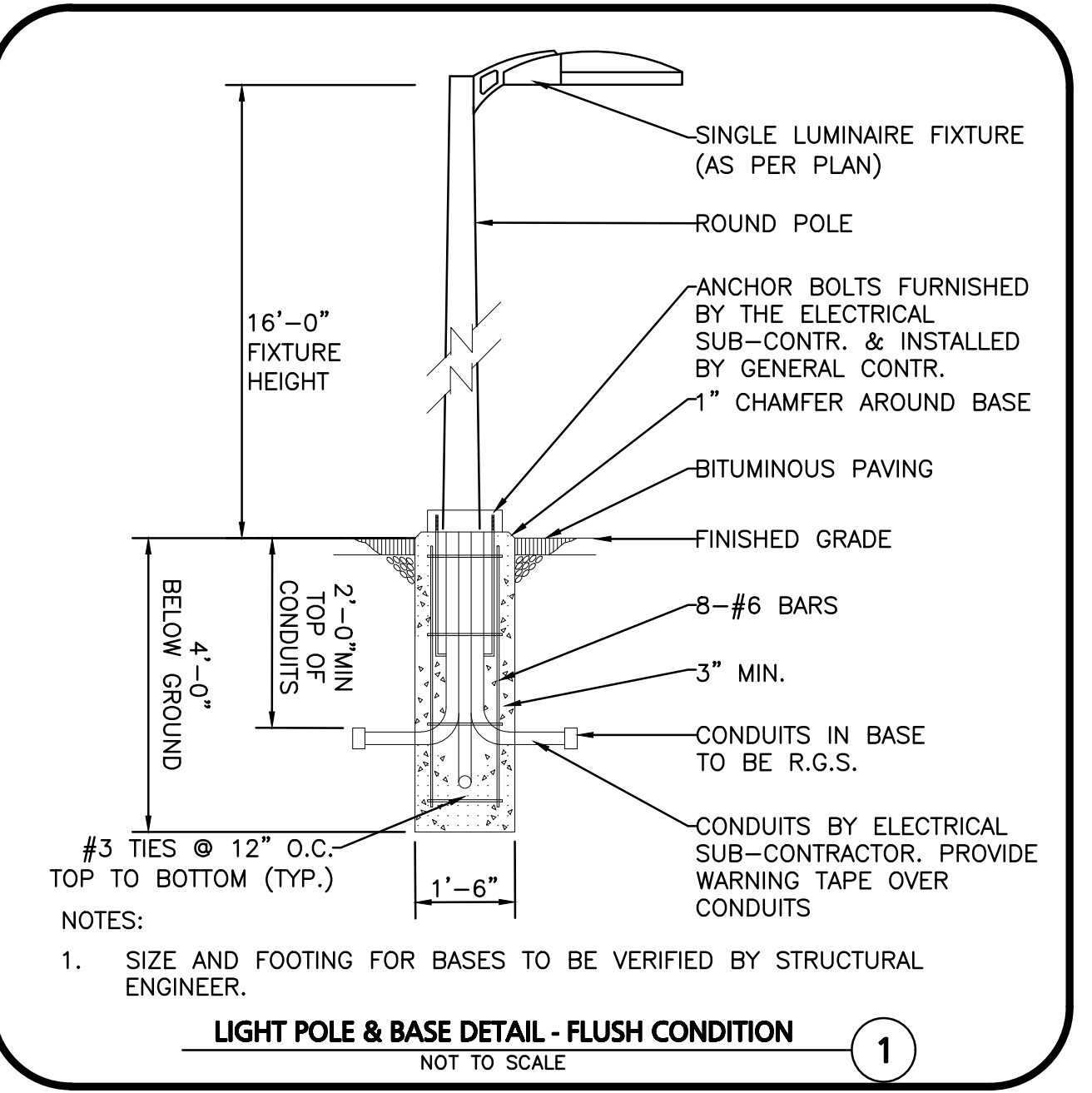
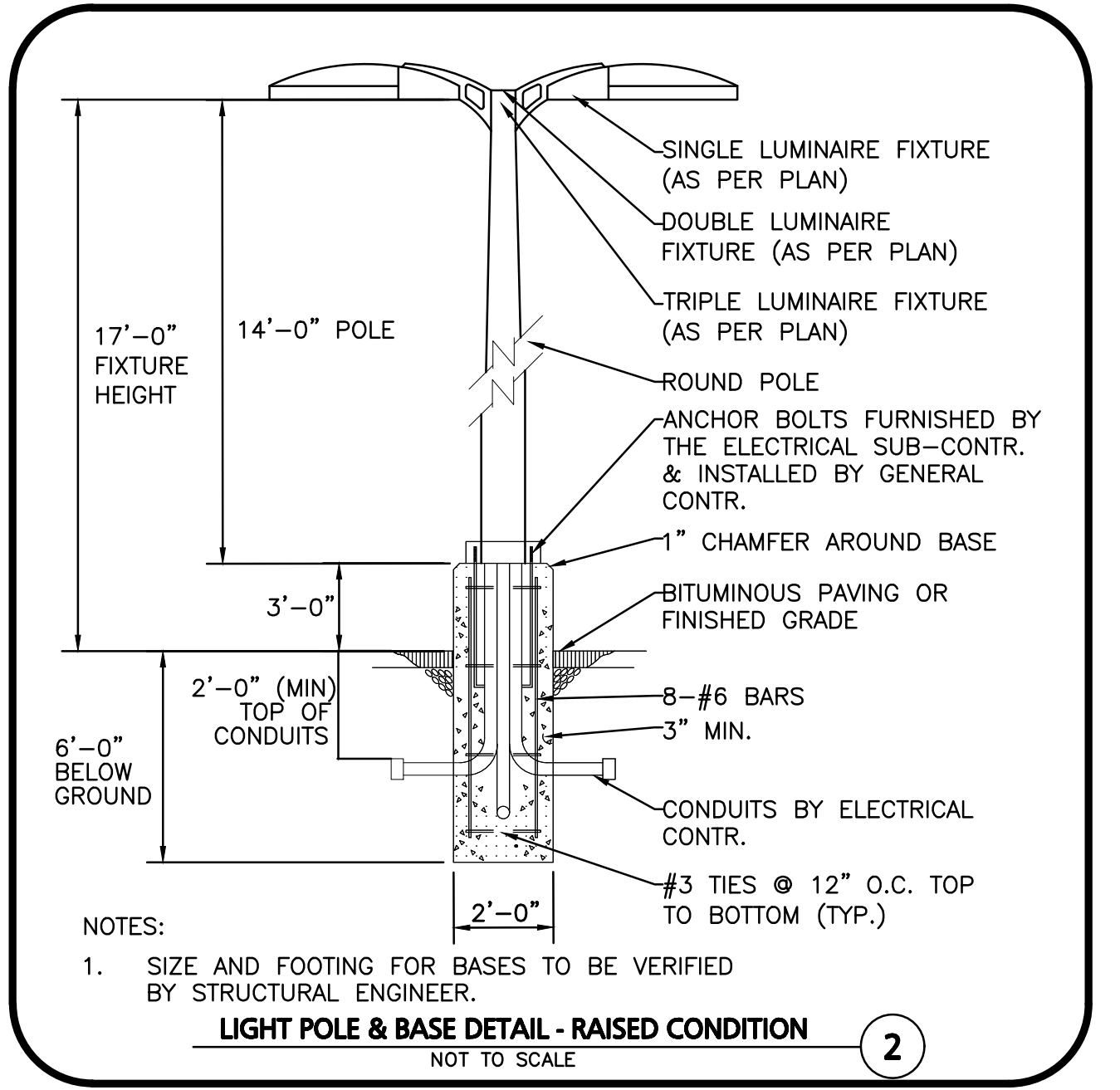
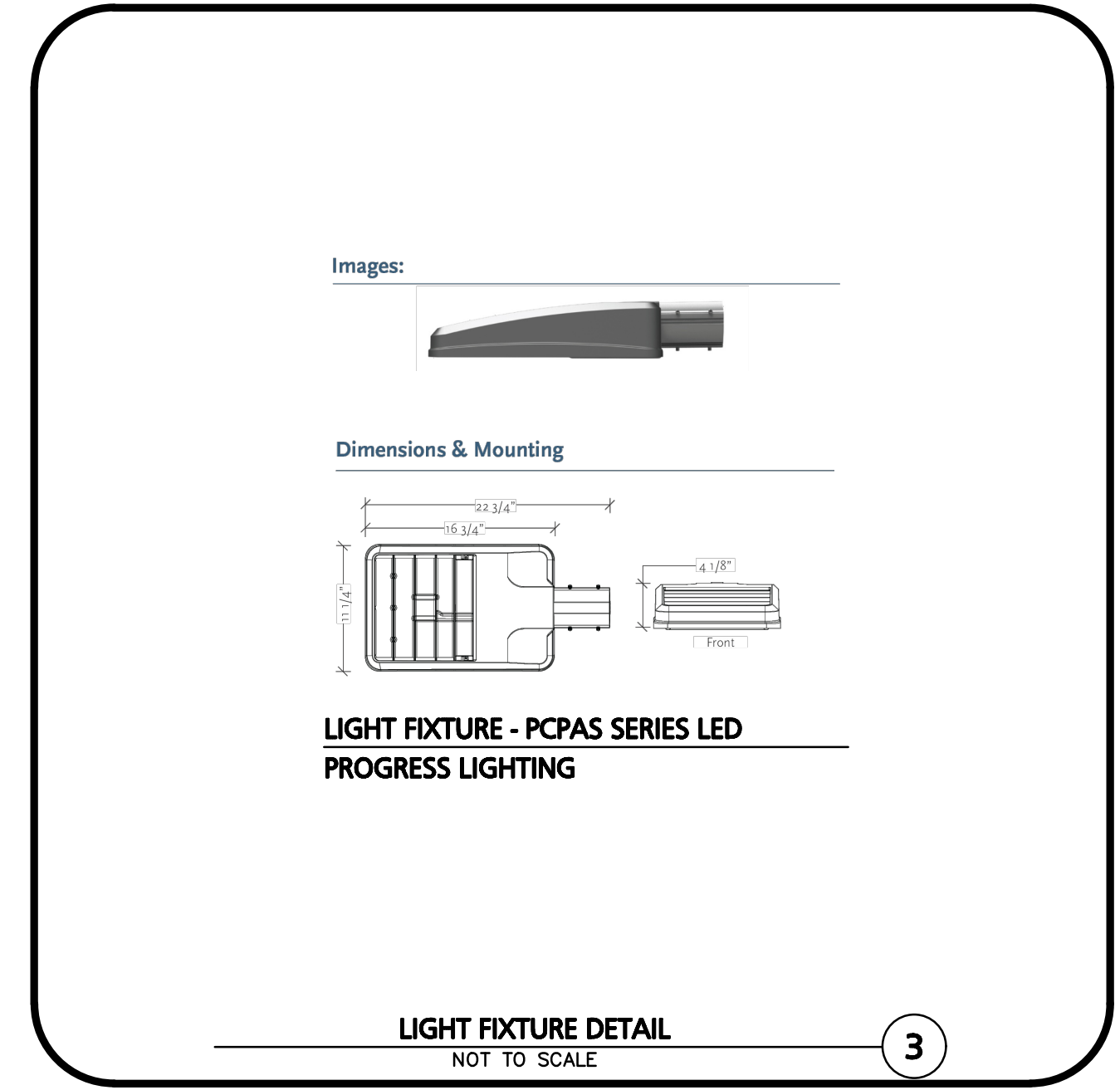


**GENERAL  
PHOTOMETRIC  
SCHEDULE**

AVERAGE FOOT-CANDLES	0.64
MAXIMUM FOOT-CANDLES	6.2
MINIMUM FOOT-CANDLES	0.0

**LUMINAIRE SCHEDULE**

CALLOUT	SYMBOL	QTY	DESCRIPTION	MOUNTING	MOUNTING HT.	TOTAL LUMENS	LAMP DEPRECIATION
A		20	PROGRESS LIGHTING COMMERCIAL, PCPAS-80LED-3K-3	POLE	16'-0"	8238	0.9
B		2	PROGRESS LIGHTING COMMERCIAL, PCPAS-80LED-3K-4W ON 3' BASE	POLE	17'-0"	7908	0.9
C		19	PROGRESS LIGHTING COMMERCIAL, PCPAS-80LED-3K-4W	POLE	16'-0"	7908	0.9



KEYSHEET

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275 FOREST RIDGE ROAD  
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PROJECT:

**THE RESIDENCES AT THOREAU**  
275 FOREST RIDGE ROAD  
CONCORD, MA 01742

PROJECT NO.	1670-24	DATE:	12/20/2023
SCALE:	AS SHOWN	DWG. NAME:	C-1670-24
DESIGNED BY:	JBT	CHECKED BY:	PLC

PREPARED BY:



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DRAWING TITLE:	SHEET No.
<b>LIGHTING PLAN</b>	<b>C-108C</b>

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**NOTES**

- ALL CONSTRUCTION SHALL CONFORM TO THE STATE ENVIRONMENTAL CODE (TITLE 5) 310 CMR 15.00, THE TOWN OF CONCORD BOARD OF HEALTH REGULATIONS, AND THE MASSACHUSETTS ENVIRO-SEPTIC DESIGN AND INSTALLATION MANUAL.
- FILL MATERIAL FOR THE LEACHING AREA SHALL CONFORM WITH SECTION 15.255 OF THE STATE ENVIRONMENTAL CODE. FILL SHALL CONSIST OF SELECT ON-SITE OR IMPORTED SOIL MATERIAL. THE FILL SHALL BE CLEAN, GRANULAR SAND, FREE FROM ORGANIC MATTER AND DELETERIOUS SUBSTANCES. THE PARTICLE SIZE DISTRIBUTION SHALL CONFORM WITH SECTION 15.255 (3) OF THE STATE ENVIRONMENTAL CODE, TITLE 5.
- EXISTING CONDITIONS INFORMATION WAS OBTAINED BY AN ACTUAL ON THE GROUND SURVEY CONDUCTED BY ALLEN & MAJOR ASSOCIATES, INC.
- REMOVE ALL TOPSOIL, SUBSOIL, AND OTHER IMPERVIOUS LAYERS WITHIN FIVE (5) FEET HORIZONTALLY OF THE PROPOSED LEACHING FACILITY AND REPLACE WITH MATERIAL SPECIFIED IN SECTION 15.255 (3) OF THE STATE ENVIRONMENTAL CODE, TITLE 5.
- THE MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION (MADEP) SHALL REQUIRE INSPECTION OF ALL CONSTRUCTION BY THE DESIGN ENGINEER AND/OR BY AN AGENT OF THE DEPARTMENT AND THE DESIGN ENGINEER.
- SHOP DRAWINGS SHALL BE SUBMITTED TO THE APPROVING AUTHORITY.
- THE INSTALLER IS RESPONSIBLE FOR MAKING ARRANGEMENTS FOR INSPECTION OF THE INSTALLATION OF THE SYSTEM WITH MADEP AND THE DESIGN ENGINEER.
- FINISHED GRADING SHALL BE AS INDICATED ON THE SITE PLAN.
- ALL PIPING SHALL CONSIST OF PVC PIPE, SCHEDULE 40, GENERAL PURPOSE SEWER PIPE UNLESS OTHERWISE NOTED. ALL FITTINGS SHALL BE SCHEDULE 40. ALL JOINTING SHALL BE CEMENT. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- ANY ALTERATIONS MUST BE APPROVED IN WRITING PRIOR TO CONSTRUCTION. FOR PROPER PERFORMANCE, THE SEPTIC TANKS SHOULD BE INSPECTED AT LEAST ONCE A YEAR. WHEN THE TOTAL DEPTH OF SCUM AND/OR SOLIDS EXCEEDS 1/3 OF THE LIQUID DEPTH OF THE TANK, THE TANK MUST BE PUMPED.
- ALL EXISTING STRUCTURES IN THE SYSTEM SHALL BE LOCATED BY CONTRACTOR AND THE HORIZONTAL AND VERTICAL LOCATION VERIFIED PRIOR TO CONSTRUCTION. IF THERE ARE CONFLICTS BETWEEN EXISTING AND PROPOSED UTILITIES, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY BEFORE CONSTRUCTION MAY BEGIN.
- THE INSTALLER IS TO BE RESPONSIBLE FOR ALL HORIZONTAL AND VERTICAL CONTROL OF ALL COMPONENTS.
- ALL DISTURBED AREAS SHALL BE RESTORED IN ACCORDANCE WITH THE REQUIREMENTS OF THE SITE PLANS.
- THE CONTRACTOR SHALL CONTACT DIGSAFE IN ORDER TO COMPLY WITH THE REQUIREMENTS OF MASSACHUSETTS GENERAL LAWS CHAPTER 82 AND SECTION 40, AS AMENDED.
- SYSTEM INSTALLER IS TO BE LICENSED BY THE LOCAL BOARD OF HEALTH. INSTALLER MUST PROVIDE WRITTEN CERTIFICATION OF SYSTEM CONSTRUCTION.
- SYSTEM AREA SHALL BE STAKED AND FLAGGED FROM DATE OF INSTALLATION UNTIL CERTIFICATE OF COMPLIANCE IS ISSUED.
- GENERAL CONTRACTOR SHALL COORDINATE THEIR ACTIVITIES WITH THOSE OF ANY OTHER CONTRACTORS ON-SITE SO AS TO INSURE THAT WORK PROCEEDS AS SMOOTHLY AS POSSIBLE AND THAT DELAYS ARE KEPT TO A MINIMUM.
- CONTRACTOR IS RESPONSIBLE FOR ANY DEWATERING OF EXCAVATIONS AS MAY BE REQUIRED. CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO ENSURE THAT NO DAMAGE IS DONE DURING DEWATERING OPERATIONS.
- IN THE EVENT OF A VERTICAL CONFLICT BETWEEN WATERLINES, SANITARY LINES, STORM LINES AND GAS LINES (EXISTING AND PROPOSED), THE SANITARY LINE SHALL BE DUCTILE IRON PIPE WITH MECHANICAL JOINTS AT LEAST 10- FEET ON BOTH SIDES OF CROSSING, THE WATERLINE SHALL HAVE MECHANICAL JOINTS WITH APPROPRIATE THRUST BLOCKING AS REQUIRED TO PROVIDE A MINIMUM OF 18-INCHES CLEARANCE BETWEEN THE PIPES. WHERE THE WATERLINE IS LESS THAN THE 18-INCHES VERTICAL CLEARANCE AND MEETING 10- FEET HORIZONTAL CLEARANCE CANNOT BE MET, THE WATER MUST BE ENCASED IN CONCRETE TO MEET THE REQUIREMENTS OF ANSI A21.10 OR ANSI 21.11 (AWWA C-151) (CLASS 50).
- THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR IT'S REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
- THE INFORMATION SHOWN ON THIS PLAN IS THE SOLE PROPERTY OF ALLEN & MAJOR ASSOCIATES, INC. IT'S INTENDED USE IS TO PROVIDE INFORMATION. ANY ALTERATION, MISUSE, OR RECALCULATION OF INFORMATION OR DATA WITHOUT THE EXPRESSED, WRITTEN CONSENT OF ALLEN & MAJOR ASSOCIATES, INC. IS STRICTLY PROHIBITED.
- ALL STRUCTURES SHALL HAVE RISERS TO GRADE FOR COMPONENT ACCESS.
- THE SOIL ABSORPTION SYSTEM SHALL HAVE A MINIMUM OF ONE INSPECTION PORT IN CONFORMANCE WITH SECTION 15.240(13) OF THE STATE ENVIRONMENTAL CODE, TITLE 5.
- EXISTING WASTEWATER TREATMENT PLANT SHALL BE DECOMMISSIONED IN ACCORDANCE WITH THE RECORDED PERMITS AND MASSDEP (WASTEWATER).
- PROPOSED SEPTIC TANK SHALL HAVE INLET AND OUTLET TEES CONSTRUCTED IN ACCORDANCE WITH 310 CMR 15.277.
- CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLING AND MAINTAINING AN ELEVATION BENCHMARK WITHIN 75 FEET OF THE PROPOSED SOIL ABSORPTION SYSTEM PER 310 CMR 15.220(4)(Q).
- EACH ENVIRO-SEPTIC SYSTEM SHALL HAVE A MINIMUM OF ONE INSPECTION PORT.
- CONSTRUCTION SHOWN HEREON TO BE COMPLETED PRIOR TO DECOMMISSIONING OF THE EXISTING WASTEWATER TREATMENT PLANT.
- CONTRACTOR SHALL PROVIDE BACK UP POWER TO THE PUMP STATION, FINAL LOCATION TO BE COORDINATED WITH OWNER.
- CONTRACTOR TO BE CERTIFIED BY PRESBY ENVIRONMENTAL, INC. PRIOR TO COMMENCEMENT OF WORK.
- REQUIRED SOIL ABSORPTION AREA REDUCED IN ACCORDANCE WITH SECTION D OF THE MASSACHUSETTS ENVIRO-SEPTIC DESIGN AND INSTALLATION MANUAL AND THE MASSDEP GENERAL USE CERTIFICATION.
- SEPTIC TANKS, PUMP CHAMBER, AND DISTRIBUTION BOX TO BE INSTALLED LEVEL AND TRUE TO GRADE ON A LEVEL STABLE BASE IN ACCORDANCE WITH 310 CMR 15.221(2).
- FORCE MAIN SHALL BE INSTALLED IN ACCORDANCE WITH 310 CMR 15.221(6).
- ALL SYSTEM COMPONENTS SHALL BE MARKED WITH MAGNETIC MARKING TAPE OR A COMPARABLE MEANS IN ACCORDANCE WITH 310 CMR 15.221(12).

**SEPTIC SYSTEM DESIGN CRITERIA**

DAILY DESIGN SEWAGE FLOW (OBTAINED FROM WATER USAGE RECORDS):  
 ACCOUNT 3964005  
 AVERAGE DAILY FLOW: 2,252.7 GPD\*  
 = 2,253 GPD\* X 200% = 4,506 GPD  
 ACCOUNT 3964006  
 AVERAGE DAILY FLOW: 1,097.6 GPD\*  
 = 1,098 GPD\* X 200% = 2,196 GPD  
 4,506 GPD + 2,196 GPD = 6,702 GPD (USE 10,000 GPD FOR DESIGN PURPOSES)

SOIL ABSORPTION CAPACITY: CLASS I SOIL (SAND), PERC = <2 MPI  
 CONVENTIONAL REQUIRED:  
 (10,000 GPD)/(63 GPD/SF) = 15,873.02 S.F.  
 (NO GARBAGE GRINDERS PRESENT)  
 (NO WATER SOFTENERS ARE TO BE CONNECTED TO TANK)

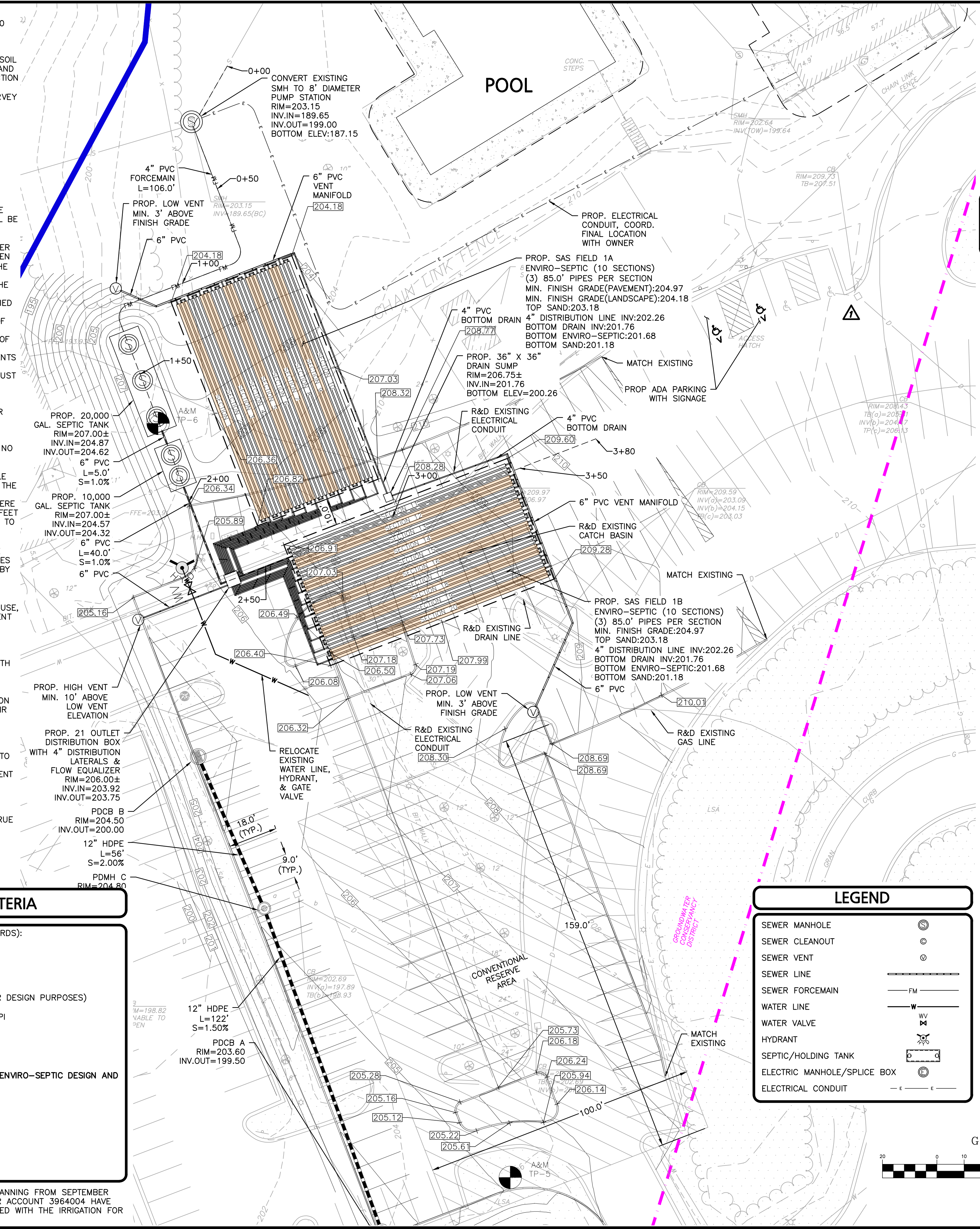
ENVIRO-SEPTIC REQUIRED (OBTAINED FROM MASSACHUSETTS ENVIRO-SEPTIC DESIGN AND INSTALLATION MANUAL):  
 (10,000 GPD)/(100 GPD) = 1,000 GPD  
 1,000 GPD X 81 = 81,000 S.F.  
 (NO GARBAGE GRINDERS PRESENT)  
 (NO WATER SOFTENERS ARE TO BE CONNECTED TO TANK)

PROVIDED:  
 20 ENVIRO-SEPTIC SECTIONS (85'L)  
 TOTAL SAND BED AREA PROVIDED:  
 2(88' X 47.5') = 8,360 S.F.

\* DAILY DESIGN FLOW OBTAINED FROM WATER READING RECORDS SPANNING FROM SEPTEMBER 2020 THROUGH AUGUST 2024. THE WATER READING RECORDS FOR ACCOUNT 3964004 HAVE BEEN OMITTED FROM THE ANALYSIS AS THE ACCOUNT IS ASSOCIATED WITH THE IRRIGATION FOR THE PROPERTY.

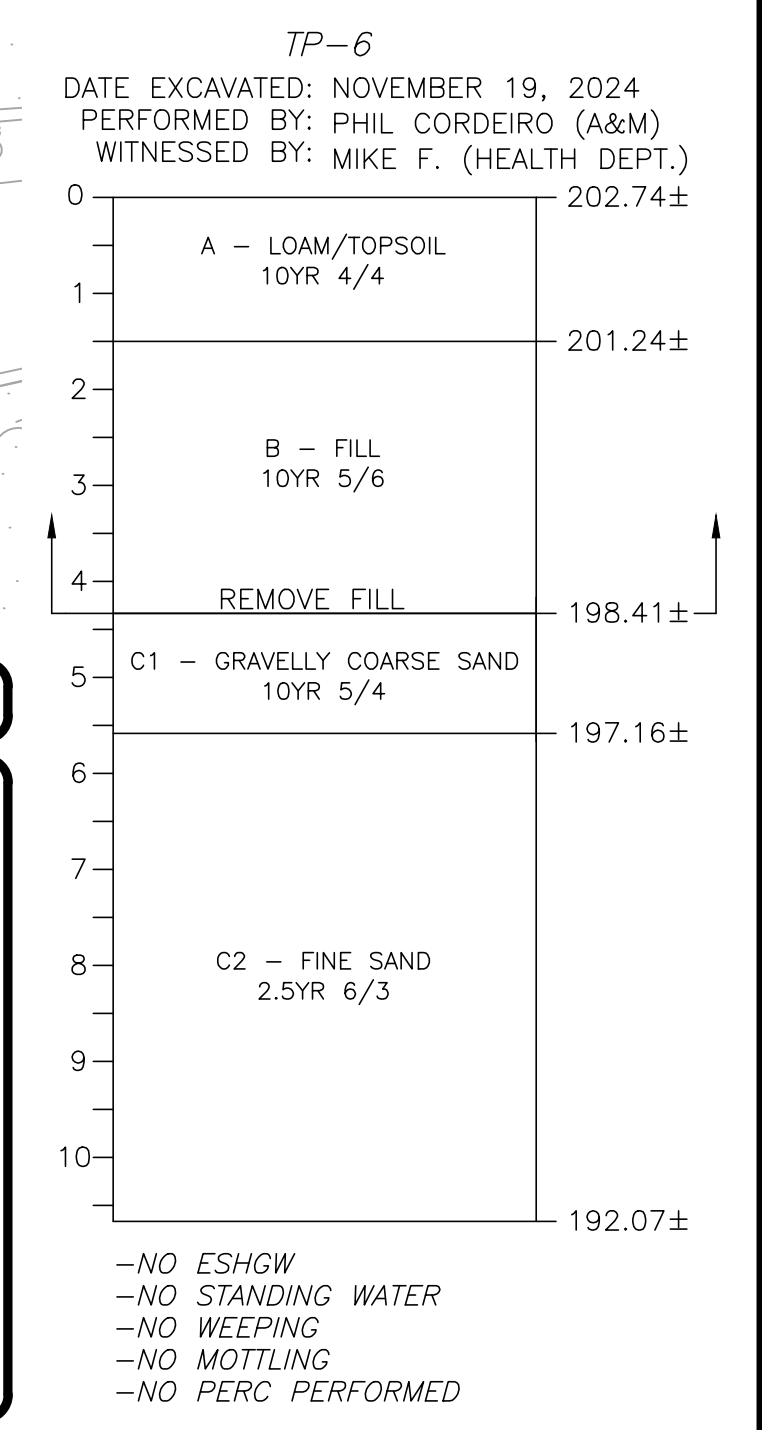
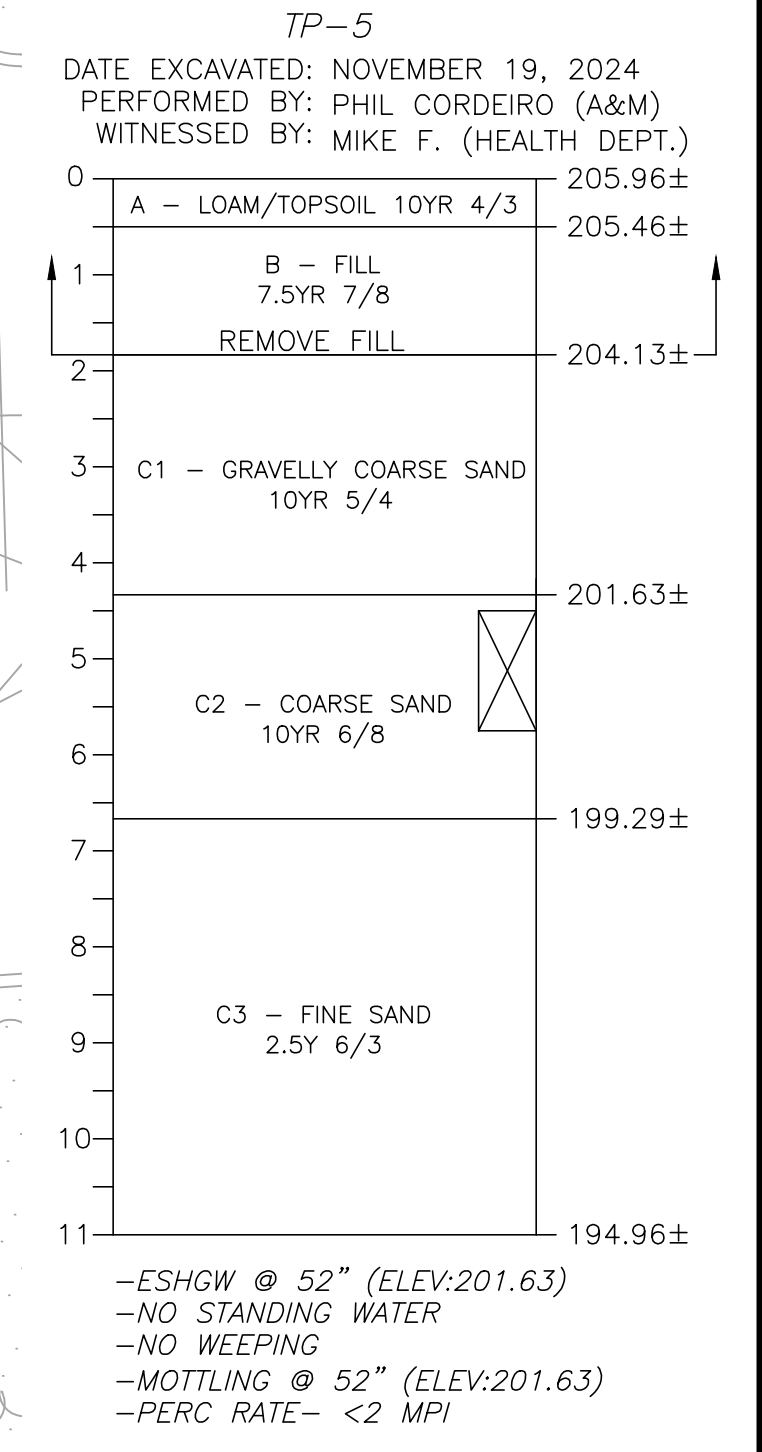


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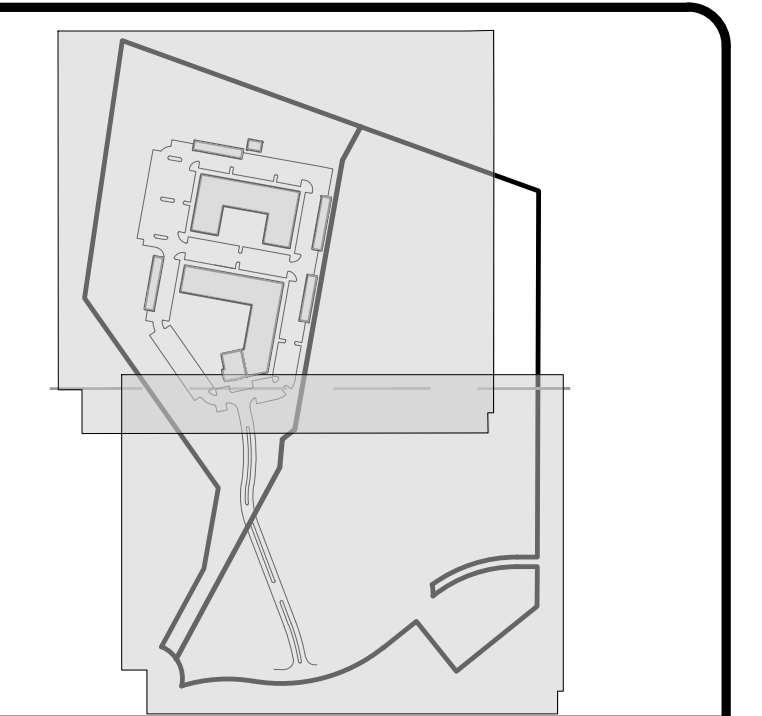
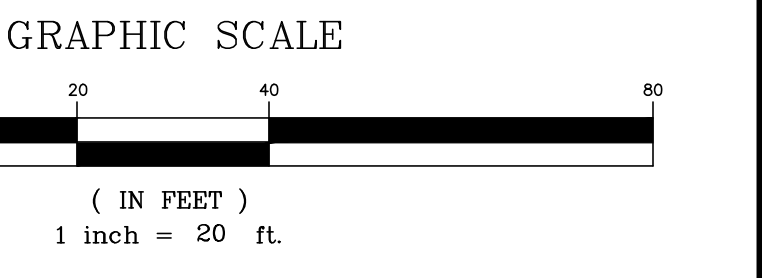
**BENCHMARK SUMMARY**

TBM #	DESCRIPTION	ELEV.
▲	EXISTING SEWER MANHOLE RIM	202.64



**LEGEND**

SEWER MANHOLE	⊙
SEWER CLEANOUT	⊙
SEWER VENT	⊙
SEWER LINE	—
SEWER FORCEMAIN	FM
WATER LINE	W
WATER VALVE	WV
HYDRANT	⊙
SEPTIC/HOLDING TANK	⊙
ELECTRIC MANHOLE/SPUCE BOX	⊙
ELECTRICAL CONDUIT	—



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 275 FOREST RIDGE ROAD  
 CONCORD, MA 01742

**PROJECT:**  
 THE RESIDENCES AT THOREAU  
 275 FOREST RIDGE ROAD  
 CONCORD, MA 01742

**PROJECT NO.:** 1670-24 **DATE:** 12/20/2023  
**SCALE:** 1" = 20' **DWG. NAME:** C-1670-24  
**DESIGNED BY:** **CHECKED BY:** PLC

**PREPARED BY:**

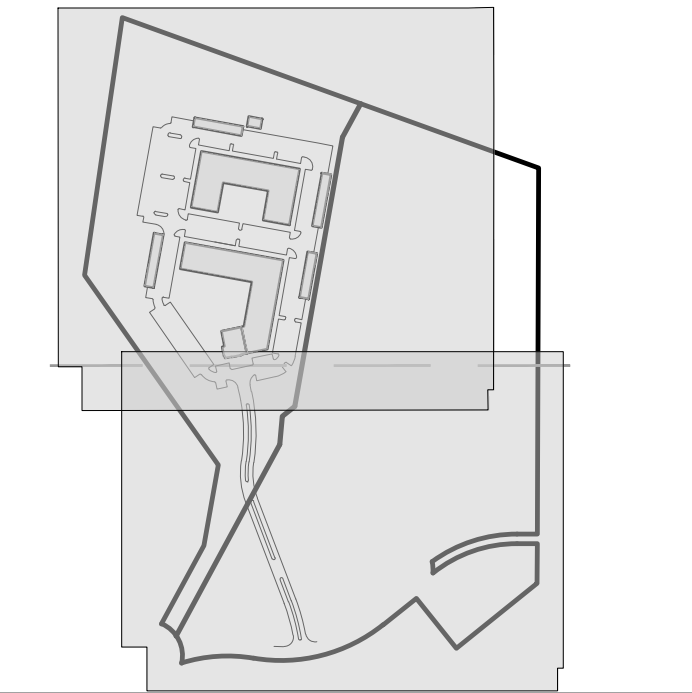
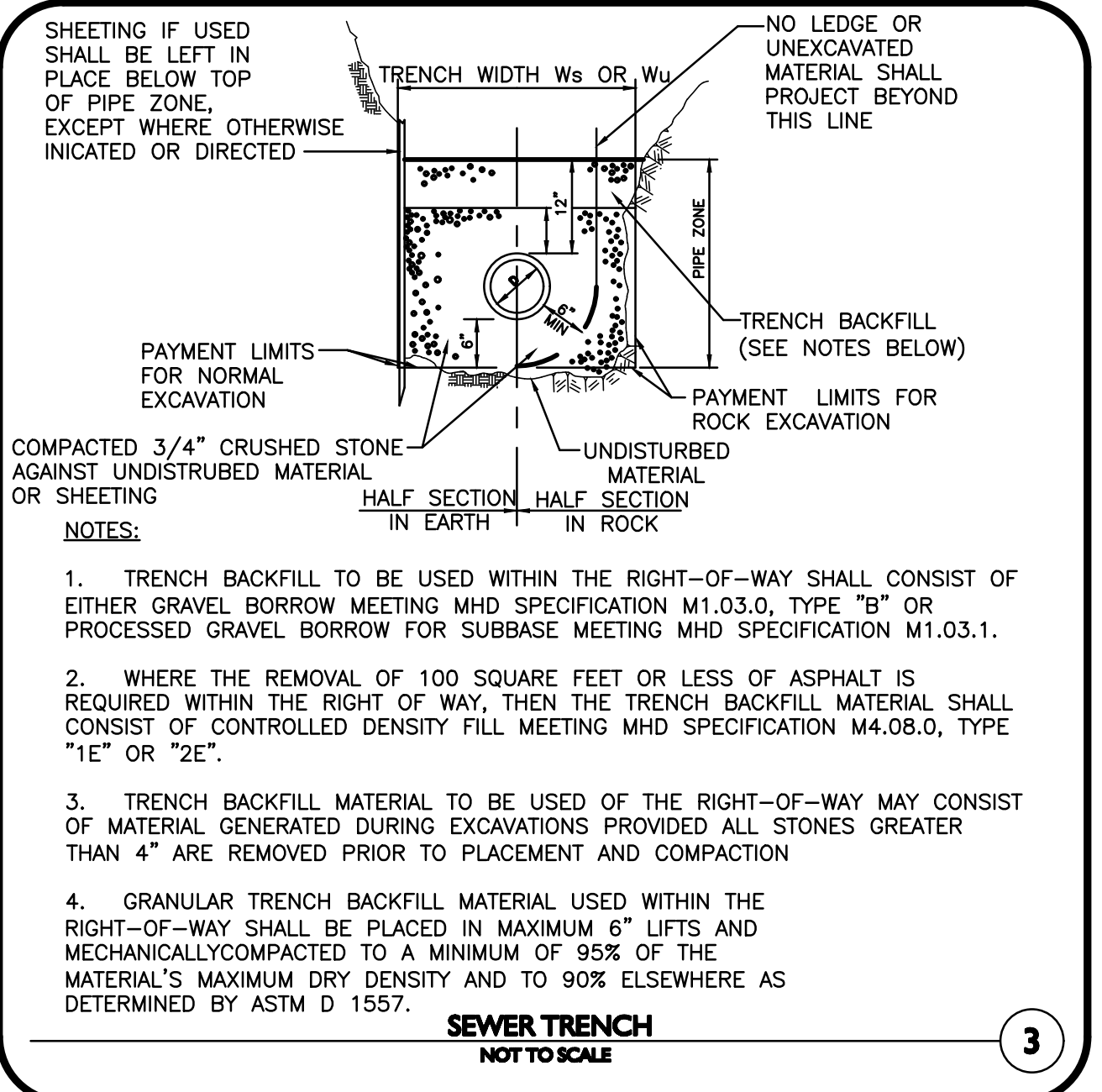
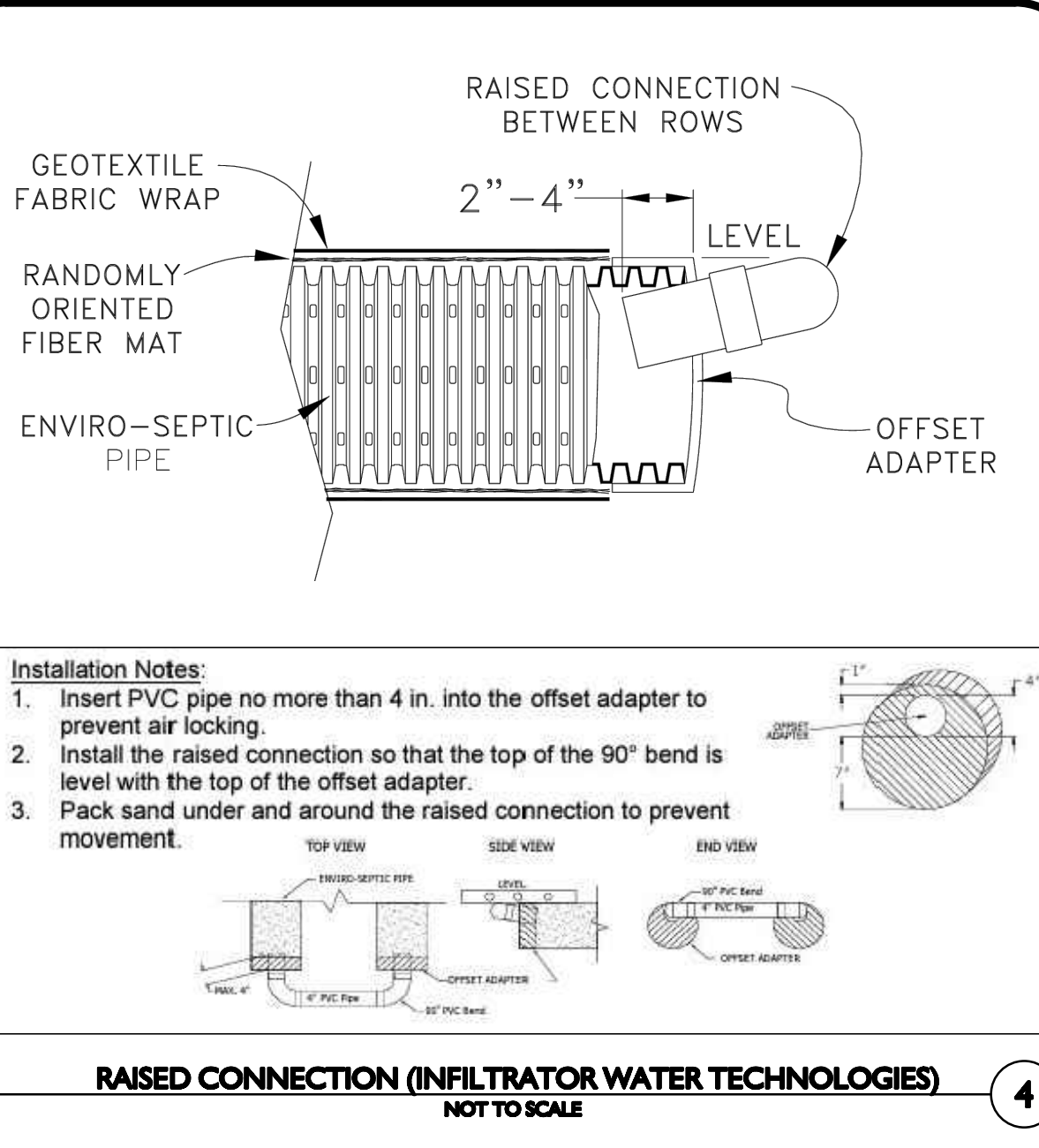
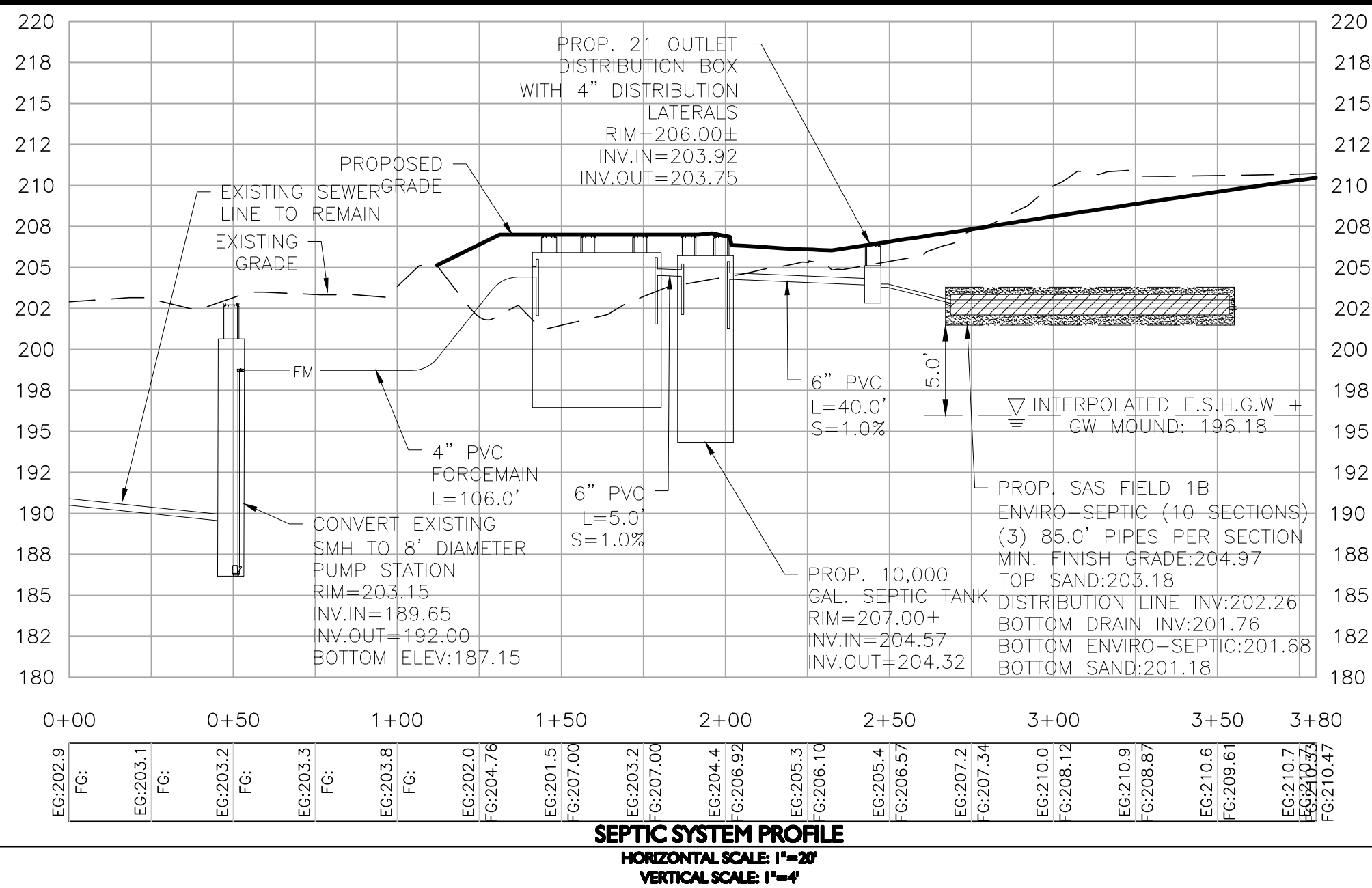
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**DRAWING TITLE:** SEPTIC SYSTEM DESIGN PLAN **SHEET No.:** C-109  
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DEC. 20, 2023 REV FEB. 28, 2025

PHILIP L. CORDERO  
CIVIL ENGINEER  
NO. 47083  
REGISTERED PROFESSIONAL ENGINEER

PROFESSIONAL ENGINEER FOR  
ALLEN & MAJOR ASSOCIATES, INC.

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DESIGNED BY:		CHECKED BY:	PLC

PREPARED BY:

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DRAWING TITLE: SEPTIC SYSTEM DETAILS  
SHEET No. C-109A

**SHEA CONCRETE PRODUCTS** New England's Premier Precastor  
800-696-7432 (SHEA) www.sheaconcrete.com  
BILLING ADDRESS: 87 HAVERHILL RD, AMESBURY MA 01913

**COMMERCIAL LINE TANK**  
4000 TO 12000 GALLON

NOTES:  
1. CONCRETE: 5,000 PSI MINIMUM AFTER 28 DAYS.  
2. DESIGN CONFORMS WITH 310 CMR 15.00, DEP TITLE 5 REGS, FOR SEPTIC TANKS.  
3. ALL REINFORCEMENT PER ASTM C1227.  
4. DESIGNED FOR AASHTO HS-20 LOADING, COVER 1-5 FEET.  
5. TONGUE AND GROOVE JOINT SEALED WITH BUTYL RESIN. INLET HEIGHT MAY INCREASE SLIGHTLY DUE TO THE BUTYL RESIN USED.  
6. TEES AND BAFFLES SOLD SEPARATELY.  
7. SPANNERS USED IN CENTER SECTIONS FOR TANKS GREATER THAN 7000 GALLONS.

GALLONS	A (HEIGHT)	B (INLET)	C (LIQUID)	TOTAL WEIGHT	RISER 1 SIZE	RISER 2 SIZE	RISER 3 SIZE	ITEM NO.
4,000	76"	58"	48"	51,909	48"	30"	0	10X17-40
5,000	88"	70"	60"	55,679	30"	34"	0	10X17-50
6,000	92"	74"	64"	56,936	30"	34"	0	10X17-55
6,500	96"	78"	68"	58,193	34"	34"	0	10X17-60
7,000	100"	82"	72"	59,449	30"	42"	0	10X17-65
7,500	106"	88"	78"	61,334	30"	48"	0	10X17-70
8,000	112"	94"	84"	65,586	42"	42" W/SPAN	0	10X17-75
8,500	118"	100"	90"	67,810	42"	48" W/SPAN	0	10X17-80
9,000	124"	106"	96"	69,695	48"	48" W/SPAN	0	10X17-85
9,500	130"	112"	102"	72,932	30"	30" W/SPAN	42" W/SPAN	10X17-90
10,000	136"	118"	108"	75,156	30"	30" W/SPAN	48" W/SPAN	10X17-95
10,500	140"	122"	112"	76,640	30"	30" W/SPAN	48" W/SPAN	10X17-100
11,000	146"	128"	118"	78,635	34"	42" W/SPAN	42" W/SPAN	10X17-105
11,500	152"	134"	124"	80,859	34"	42" W/SPAN	42" W/SPAN	10X17-110
12,000	158"	140"	130"	83,083	34"	48" W/SPAN	48" W/SPAN	10X17-115
12,000	162"	144"	134"	84,341	38"	48" W/SPAN	48" W/SPAN	10X17-120

ITEM SIZE	WEIGHT
8" TOP	16,312#
21" BOTTOM	20,517#
30" RISER	9,425#
30" RIS + SPAN	11,116#
34" RISER	10,682#
34" RIS + SPAN	12,600#
38" RISER	11,940#
38" RIS + SPAN	14,050#
42" RISER	13,195#
42" RIS + SPAN	15,562#
48" RISER	15,080#
48" RIS + SPAN	17,786#

SHEA PRODUCT ID: SEE TABLE PREPARED FOR: FILE NAME: ctk10x17.dwg  
WEIGHT (LBS): SEE TABLE DRAWN BY: ARO DATE: 03/01/2018 PAGE: 18.1  
773 Salem Street-Wilmington, MA | 153 Cranberry Hwy-Rochester, MA | 87 Haverhill Road-Amesbury, MA | 160 Old Turnpike Rd-Nottingham, NH  
Specifications subject to change without notice

**10,000 GALLON SEPTIC TANK**  
NOT TO SCALE

**SHEA CONCRETE PRODUCTS** New England's Premier Precastor  
800-696-7432 (SHEA) www.sheaconcrete.com  
BILLING ADDRESS: 87 HAVERHILL RD, AMESBURY MA 01913

**TUNNEL TANK**  
13,000 GALLON AND UP

NOTES:  
1. CONCRETE: 5,000 PSI MINIMUM AFTER 28 DAYS.  
2. DESIGN CONFORMS WITH 310 CMR 15.00, DEP TITLE 5 REGS, FOR SEPTIC TANKS.  
3. ALL REINFORCEMENT PER ASTM A-615  
4. DESIGNED FOR AASHTO HS-20 LOADING, 2 TO 5 FEET COVER.  
5. TEES AND BAFFLES SOLD SEPARATELY.  
6. TONGUE AND GROOVE JOINT SEALED WITH BUTYL RESIN AND BOLTED WITH 3/4" DIA BOLTS.

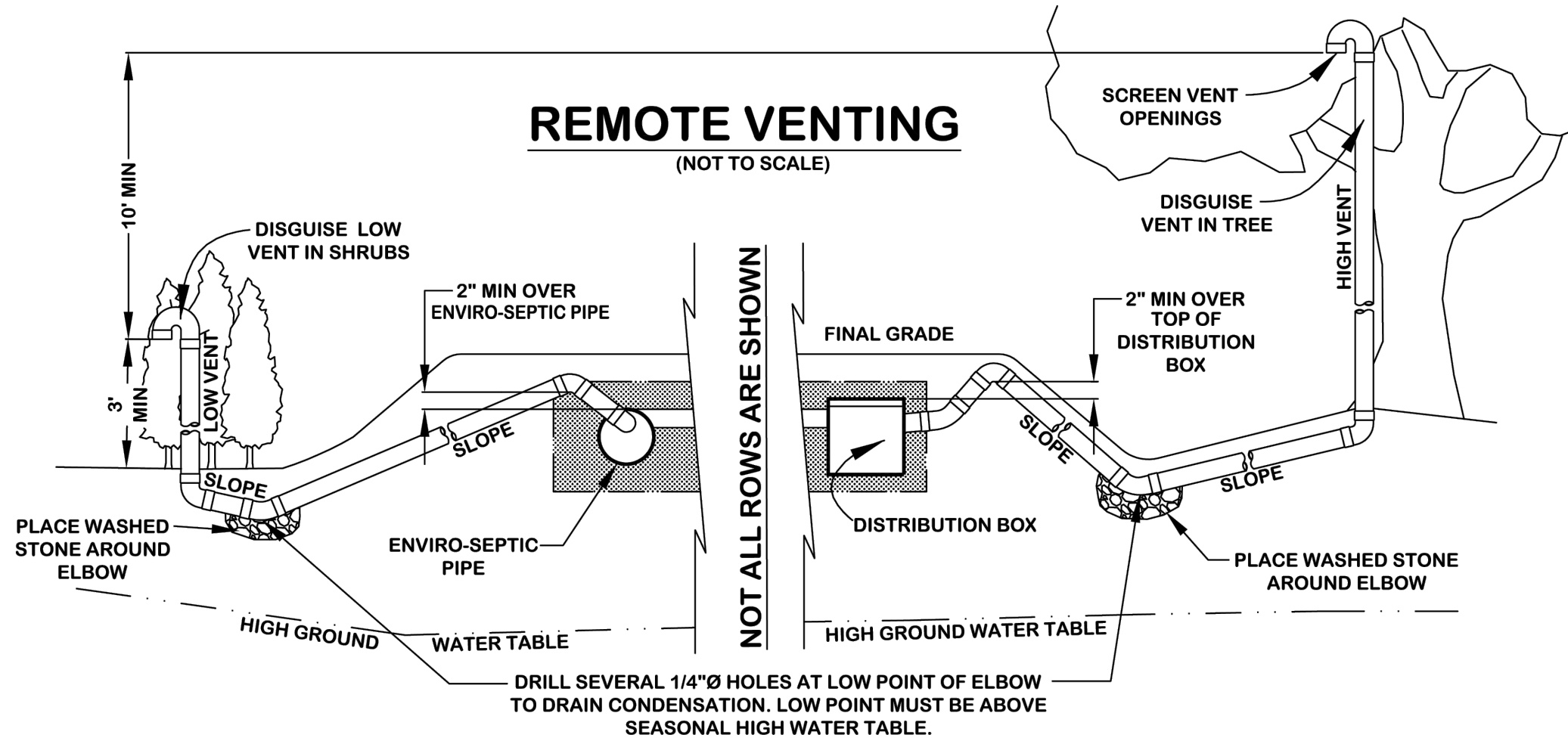
GALLONS	A (LENGTH)	B (LENGTH)	C (BAFFLE)	WEIGHT
13,000	26'-3"	12'-11"	9'-0"	116,598#

OTHER SIZES AVAILABLE:  
545 GALLONS/LF  
3867 LBS/LF  
20,000 GAL. - 13,000 GAL. = 7,000 GAL.  
7,000 GAL. / 545 GAL./LF = 12.84' ≈ 13'  
A(LENGTH) = 26.25' + 13' = 39.25'  
B(LENGTH) = 24.92' + 13' = 37.92'

SHEA PRODUCT ID: VARIES PREPARED FOR: FILE NAME: tunneltank.dwg  
WEIGHT (LBS): VARIES DRAWN BY: ARO DATE: 03/01/2018 PAGE: 19  
773 Salem Street-Wilmington, MA | 153 Cranberry Hwy-Rochester, MA | 87 Haverhill Road-Amesbury, MA | 160 Old Turnpike Rd-Nottingham, NH  
Specifications subject to change without notice

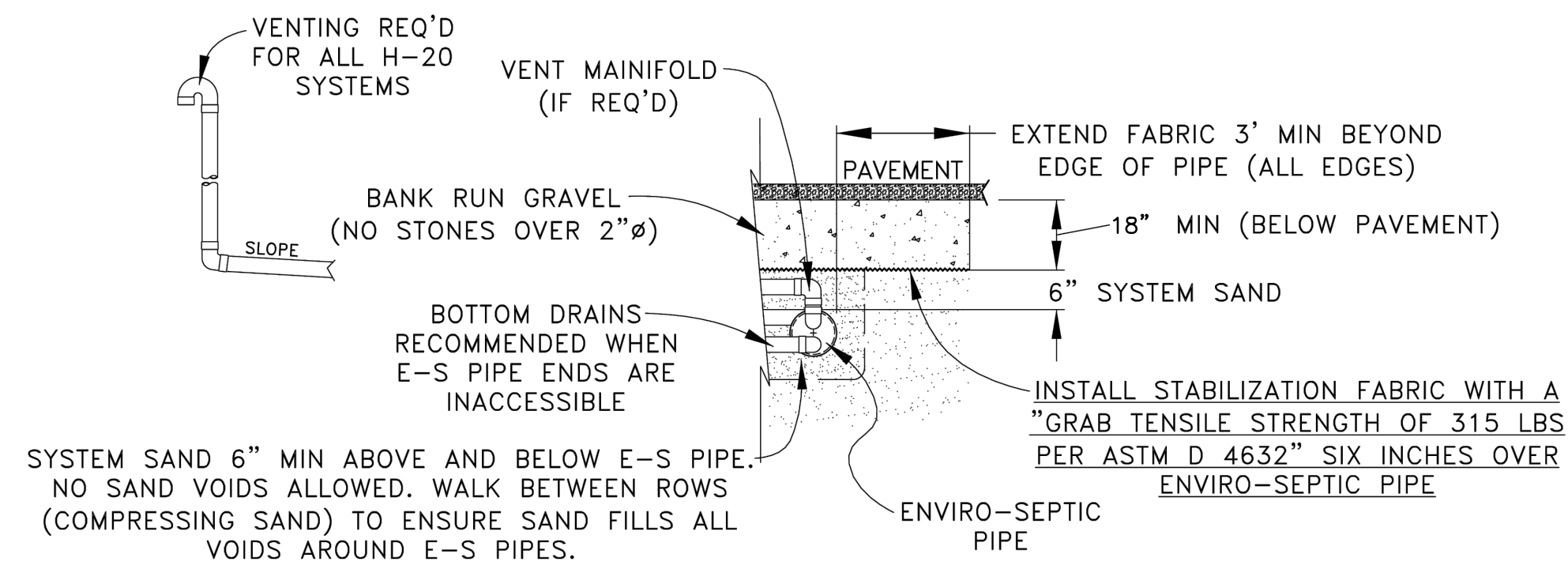
**20,000 GALLON TUNNEL TANK**  
NOT TO SCALE

M:\PROJECTS\1670-24\CIVIL\DRAWINGS\CURRENT\SEPTIC SYSTEM DESIGN\C-1670-24-SEPTIC SYSTEM DESIGN.DWG



REMOTE VENTING DETAIL (INFILTRATOR WATER TECHNOLOGIES)  
NOT TO SCALE

4



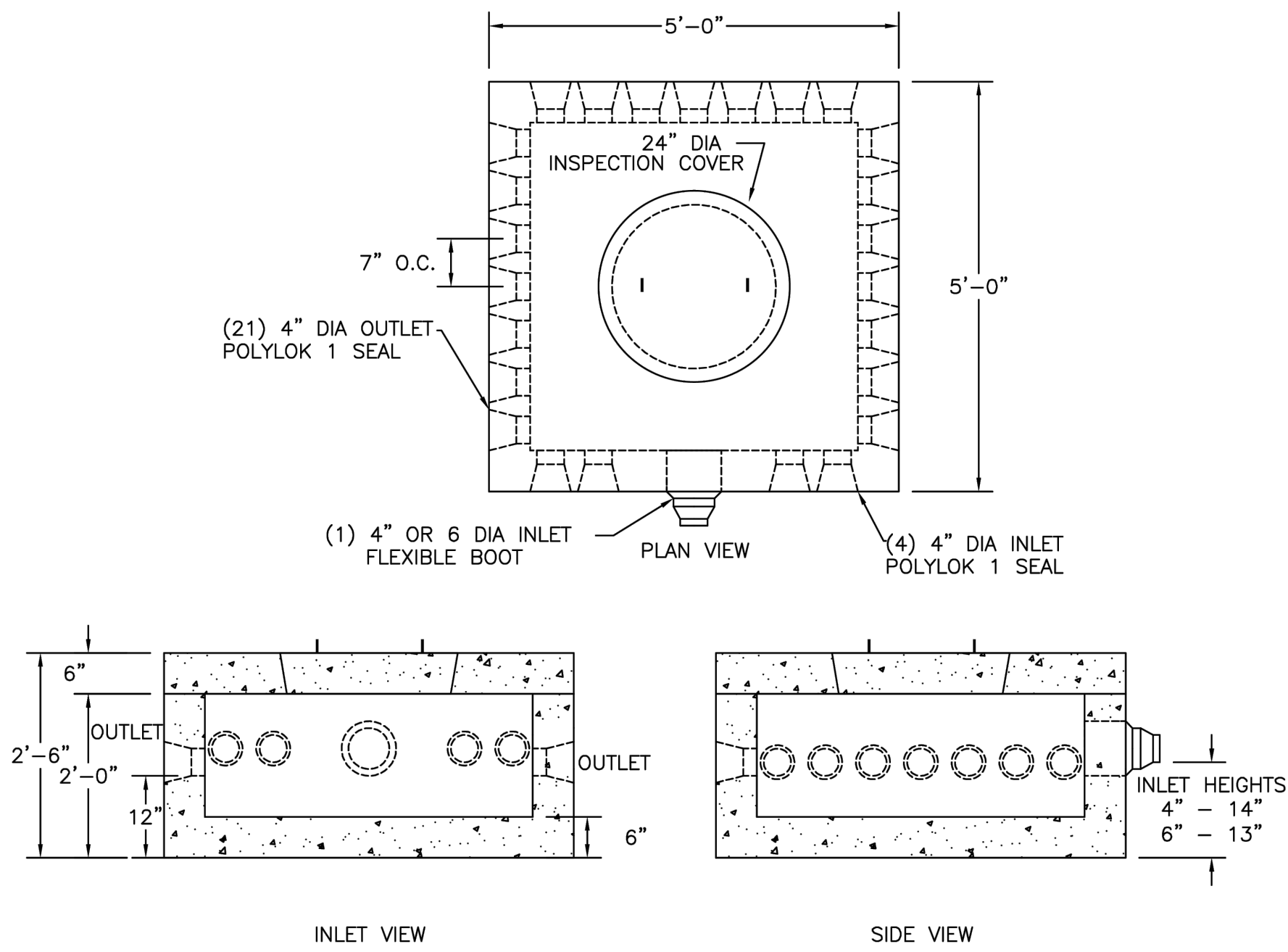
NOTE:  
THE ONLY SOIL COMPACTION THAT SHOULD TAKE PLACE IS AT THE POINT OF PREPARATION FOR PAVEMENT.

H2O LOADING SECTION DETAIL (INFILTRATOR WATER TECHNOLOGIES)  
NOT TO SCALE

3



DISTRIBUTION BOX  
21 OUTLET H2O



NOTES:

1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
2. DESIGN CONFORMS WITH 310 CMR 15.000, DEP TITLE 5 REGS, FOR DISTRIBUTION BOXES.
3. DESIGNED FOR AASHTO HS-20 LOADING, COVER 1 TO 5 FEET.
4. COVER WEIGHT 1,850#

SHEA PRODUCT ID:	21DBH	PREPARED FOR:	FILE NAME:
WEIGHT (LBS):	5,562#	DRAWN BY:	ARO
		DATE:	06/01/18
		PAGE:	D6

773 Salem Street-Wilmington, MA | 153 Cranberry Hwy-Rochester, MA | 87 Haverhill Road-Amesbury, MA | 160 Old Turnpike Rd-Nottingham, NH

21 OUTLET DISTRIBUTION BOX  
NOT TO SCALE

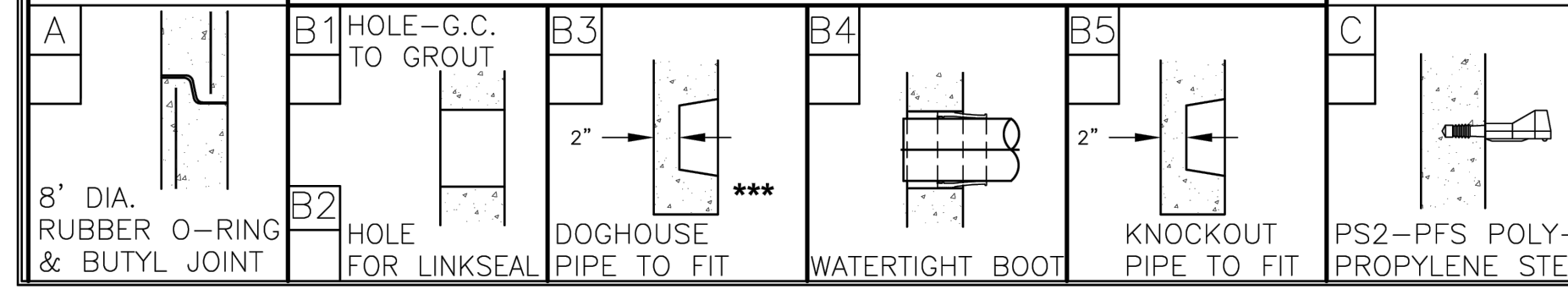
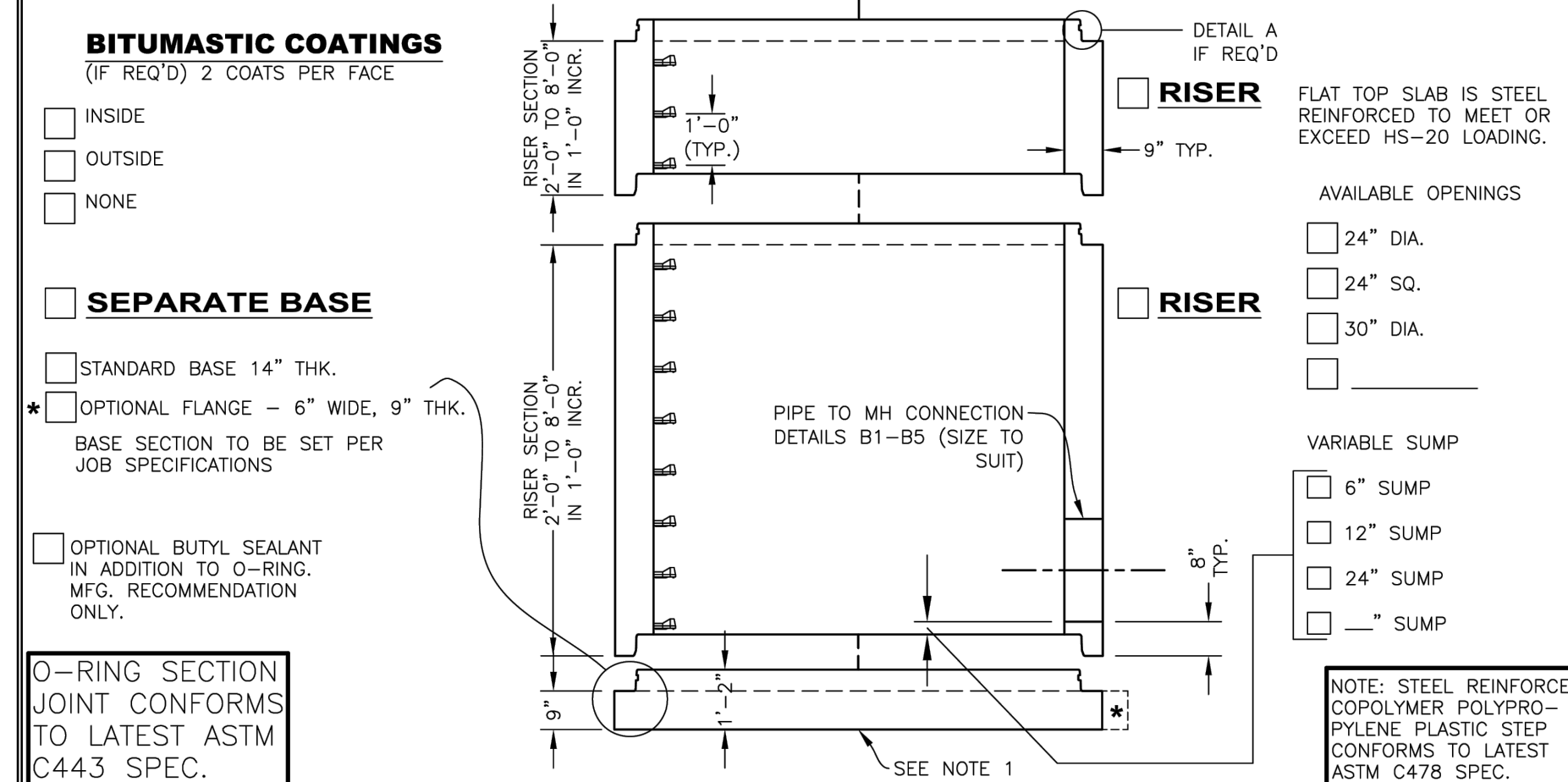
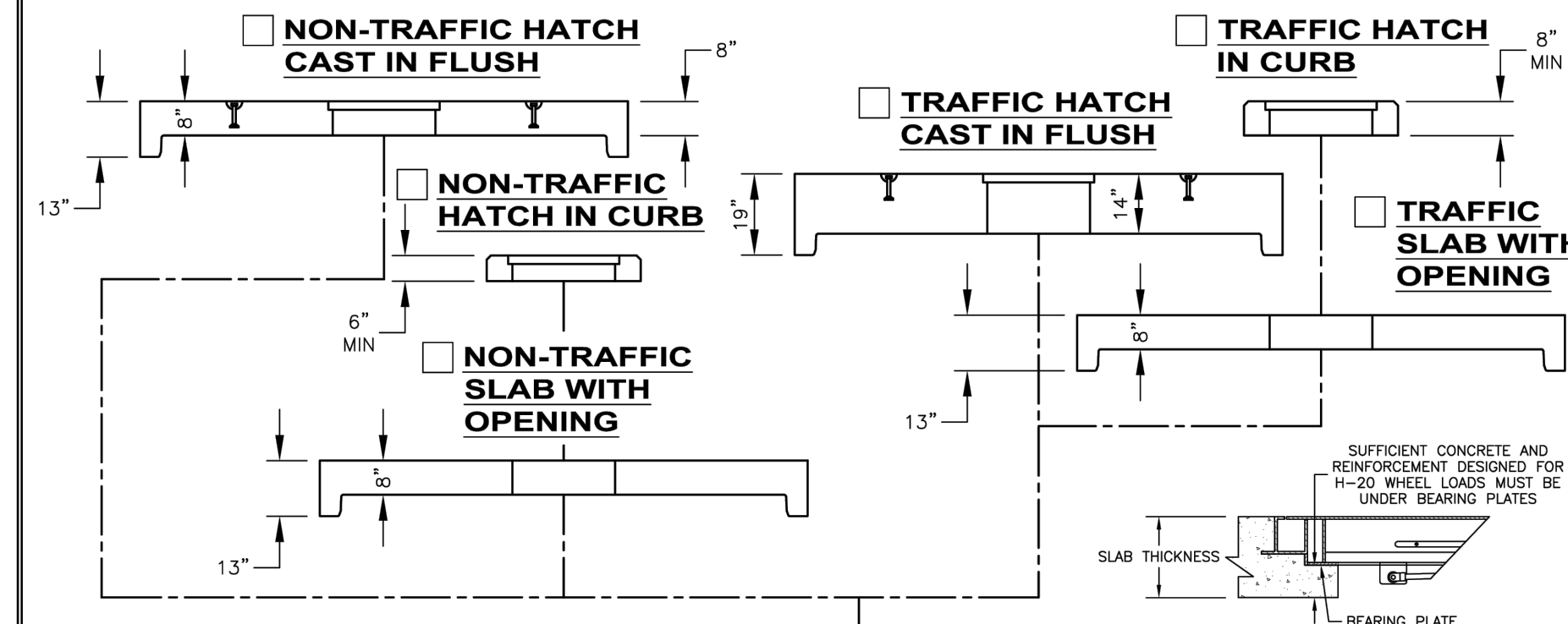
2



PRODUCT DESIGNATION  
MANHOLE 8' DIA. PUMP STATION

DWG. NO.  
MH8PS  
5/23/12

- GENERAL NOTES:
1. REINFORCED STEEL CONFORMS TO ASTM A185 SPEC. 0.24 in<sup>2</sup>/LF AND 0.24 in<sup>2</sup>/LF B/W IN BOT. SLAB.
  2. CONCRETE COMPRESSIVE STRENGTH 4,000 PSI. MINIMUM.
  3. MANHOLE DESIGN SPECIFICATIONS CONFORM TO LATEST ASTM C478 SPEC. FOR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS.
  4. HATCHES DESIGNED FOR H-20 WHEEL LOADS ARE NOT MEANT TO BE SUBJECTED TO HIGH DENSITY TRAFFIC OR TO BE PLACED IN DELIBERATE TRAFFIC AREAS. RECOMMEND GALVANIZED STEEL HATCHES FOR THOSE APPLICATIONS.
  5. LIFTERS ARE RECESSED IN TOP SURFACE OF UNITS WITH HATCHES CAST IN FLUSH.



PUMP ELEVATIONS  
BOTTOM STRUCTURE: 187.15  
PUMP OFF ELEV: 187.65  
PUMP ON ELEV: 188.98  
ALARM ELEV: 190.31

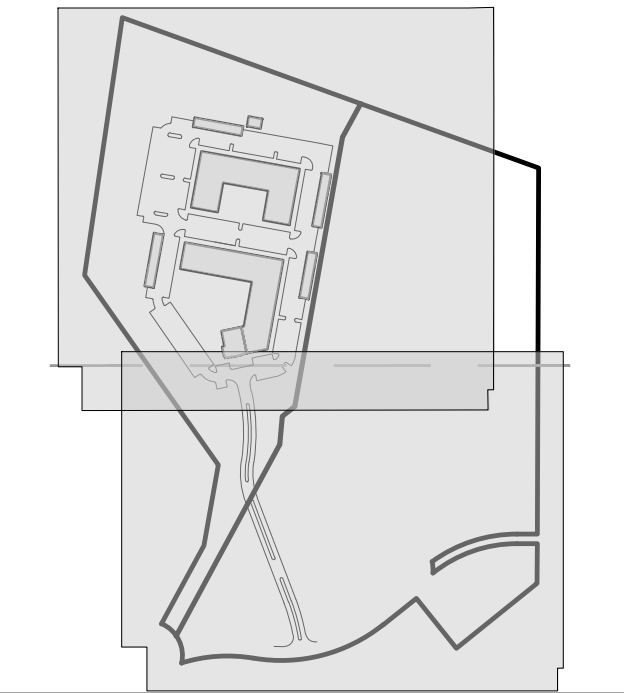
EMERGENCY STORAGE CALCS  
INTERIOR TANK DIMENSIONS: 8.0' Ø  
ALARM ELEV: 190.31  
INVERT OUT: 199.00

DOSING CALCS  
INTERIOR TANK DIMENSIONS: 8.0' Ø  
PUMP OFF ELEV: 187.65  
IPUMP ON ELEV: 188.98

$[(4.0')^2(199.00-187.65)] \approx 66.85 \text{ FT}^3$   
 $66.85 \text{ FT}^3(7.48 \text{ GAL/FT}^3) \approx 500 \text{ GAL.}$

8 FOOT DIAMETER PUMP STATION  
NOT TO SCALE

1



KEYSHEET

ISSUED FOR REVIEW  
DEC. 20, 2023 REV FEB. 28, 2025



PROFESSIONAL ENGINEER FOR  
ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
05	02/28/25	PER PEER REVIEW COMMENTS
04	02/13/25	LAYOUT REVISIONS PER WORKSHOP
03	01/23/25	LAYOUT REVISIONS PER WORKSHOP
02	10/18/24	ZBA RESUBMISSION
01	02/23/24	ZBA RESUBMISSION

APPLICANT/OWNER:  
THOREAU RESIDENCES, LLC  
275 FOREST RIDGE ROAD  
CONCORD, MA 01742

PROJECT:  
THE RESIDENCES AT THOREAU  
275 FOREST RIDGE ROAD  
CONCORD, MA 01742

PROJECT NO.	1670-24	DATE:	12/20/2023
SCALE:	NTS	DWG. NAME:	C-1670-24
DESIGNED BY:		CHECKED BY:	PLC



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DRAWING TITLE:	SHEET NO.
SEPTIC SYSTEM DETAILS	C-109B

M:\PROJECTS\1670-24\CIVIL\DRAWINGS\CURRENT\SEPTIC SYSTEM DESIGN\C-1670-24\_SEPTIC SYSTEM DESIGN.DWG

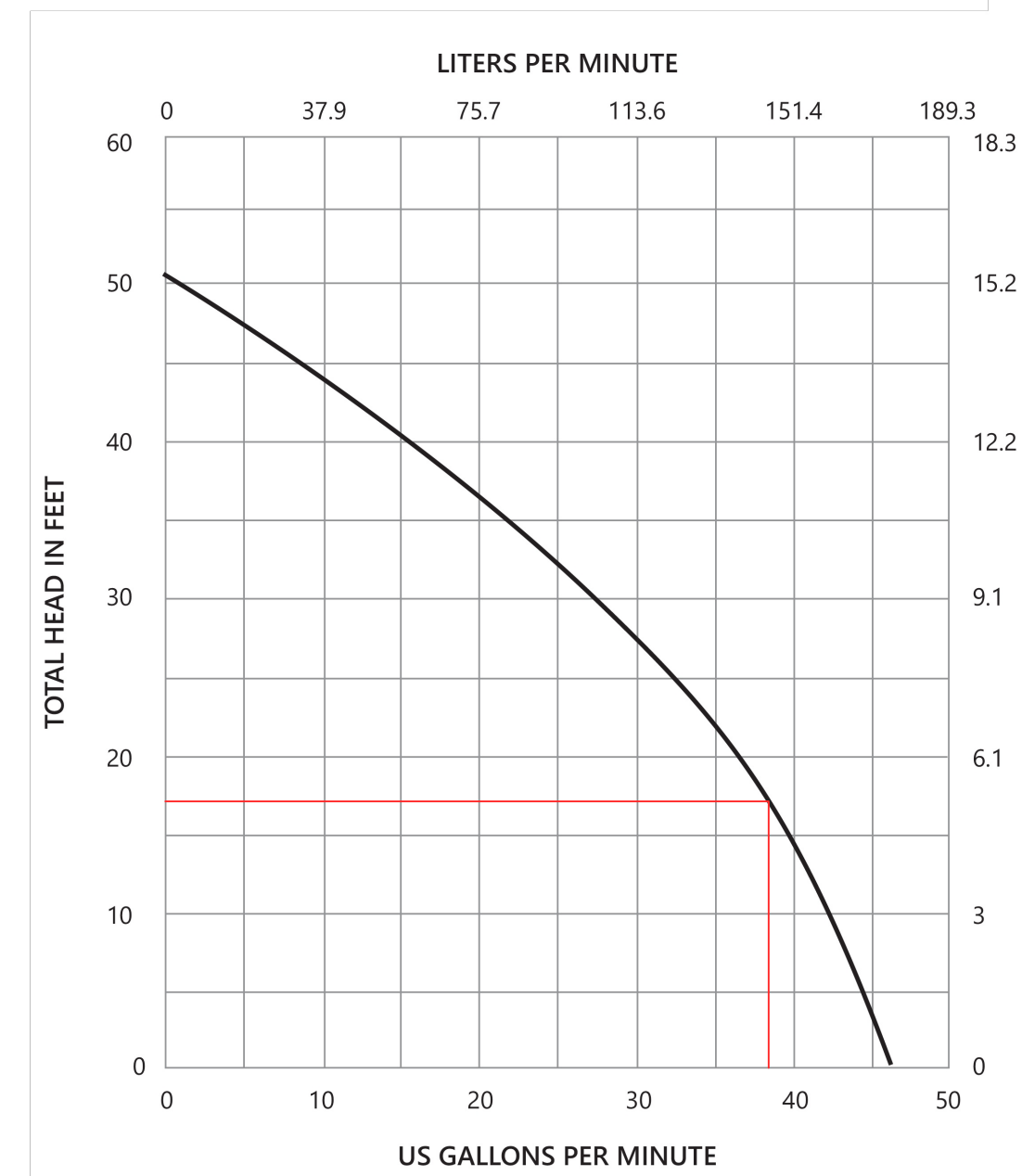
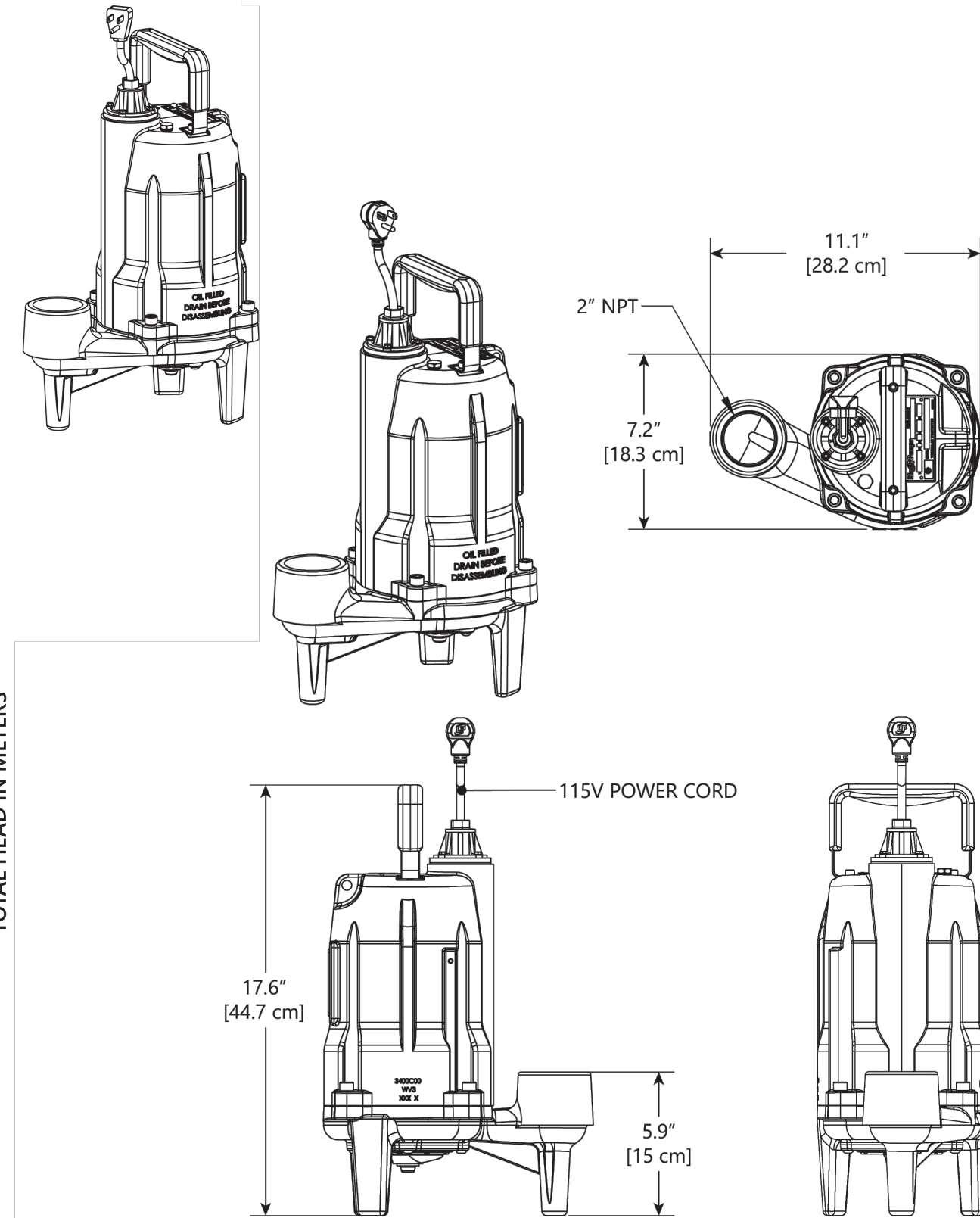


A Family and Employee Owned Company

### Pump Specification

**PRG-Series**  
1 hp Submersible Grinder Pumps

**ProVore**



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7000 Apple Tree Avenue, Bergen NY 14416 • Phone 1-800-543-2550 • Fax 1-585-494-1839 • Email Liberty@LibertyPumps.com • Web www.LibertyPumps.com

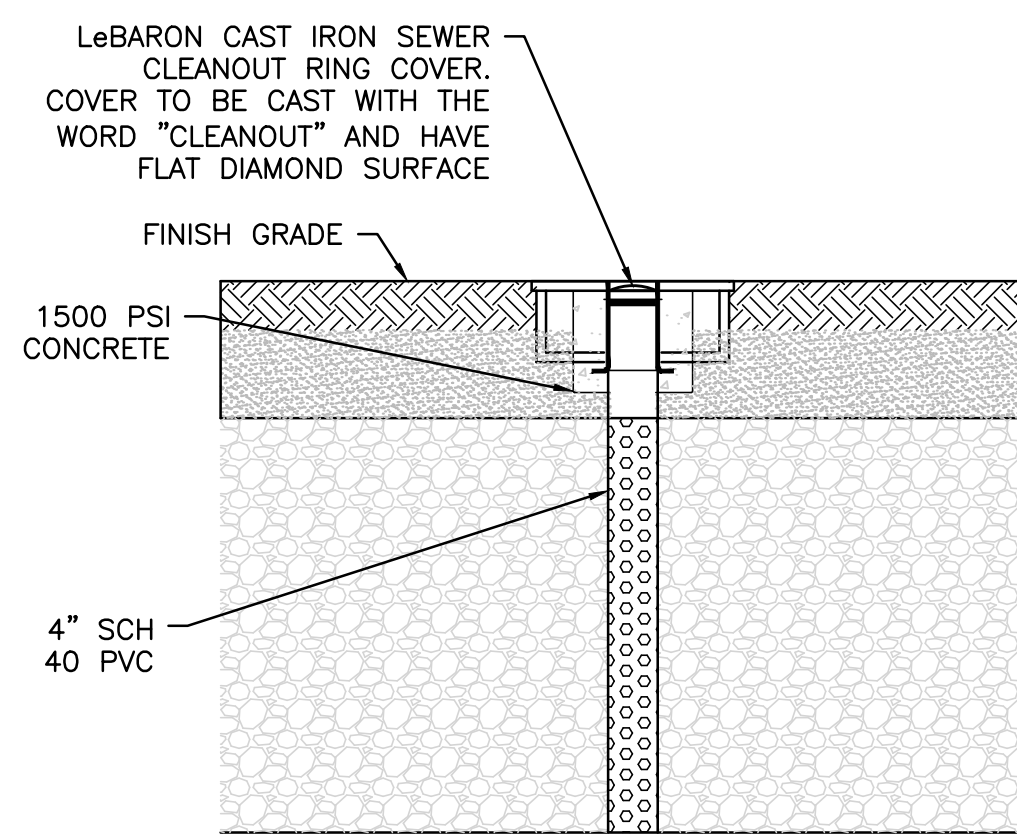
PRG\_P1\_R05/2024

**FORCEMAIN STATIC HEAD**  
204.12 - 187.65 = 16.47'

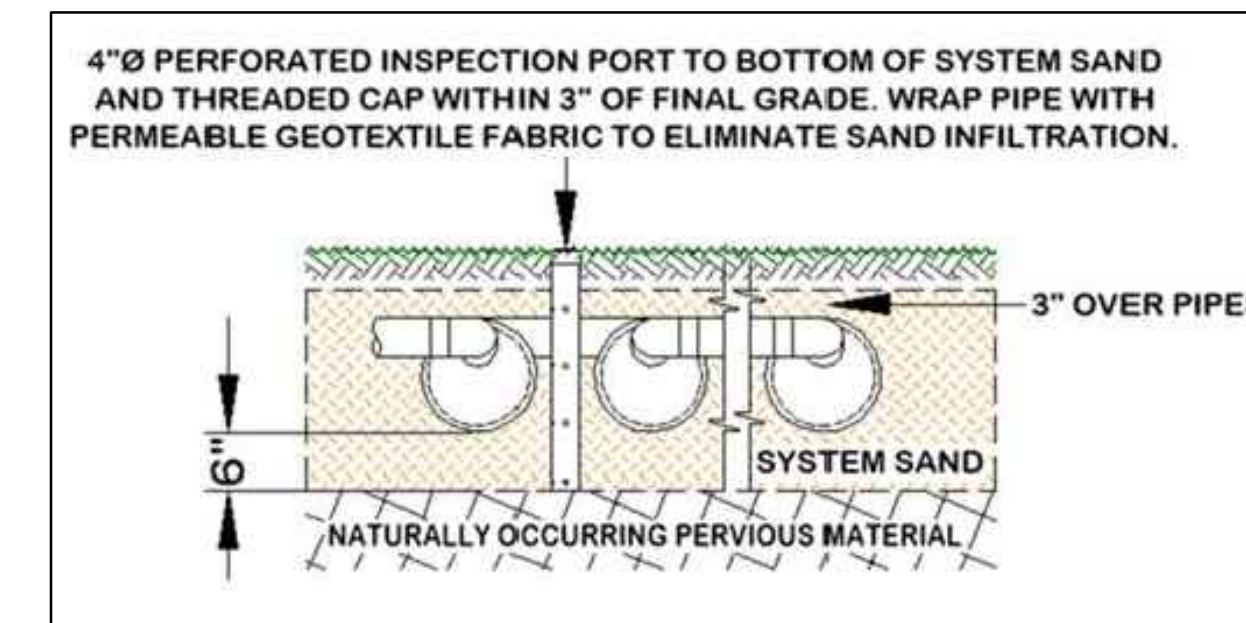
**PUMP ELEVATIONS**  
BOTTOM STRUCTURE: 187.15  
PUMP OFF ELEV: 187.65  
PUMP ON ELEV: 188.98  
ALARM ELEV: 190.31

**LIBERTY PUMPS PRG-SERIES DETAIL**  
NOT TO SCALE

4



**INSPECTION PORT IN PAVEMENT**

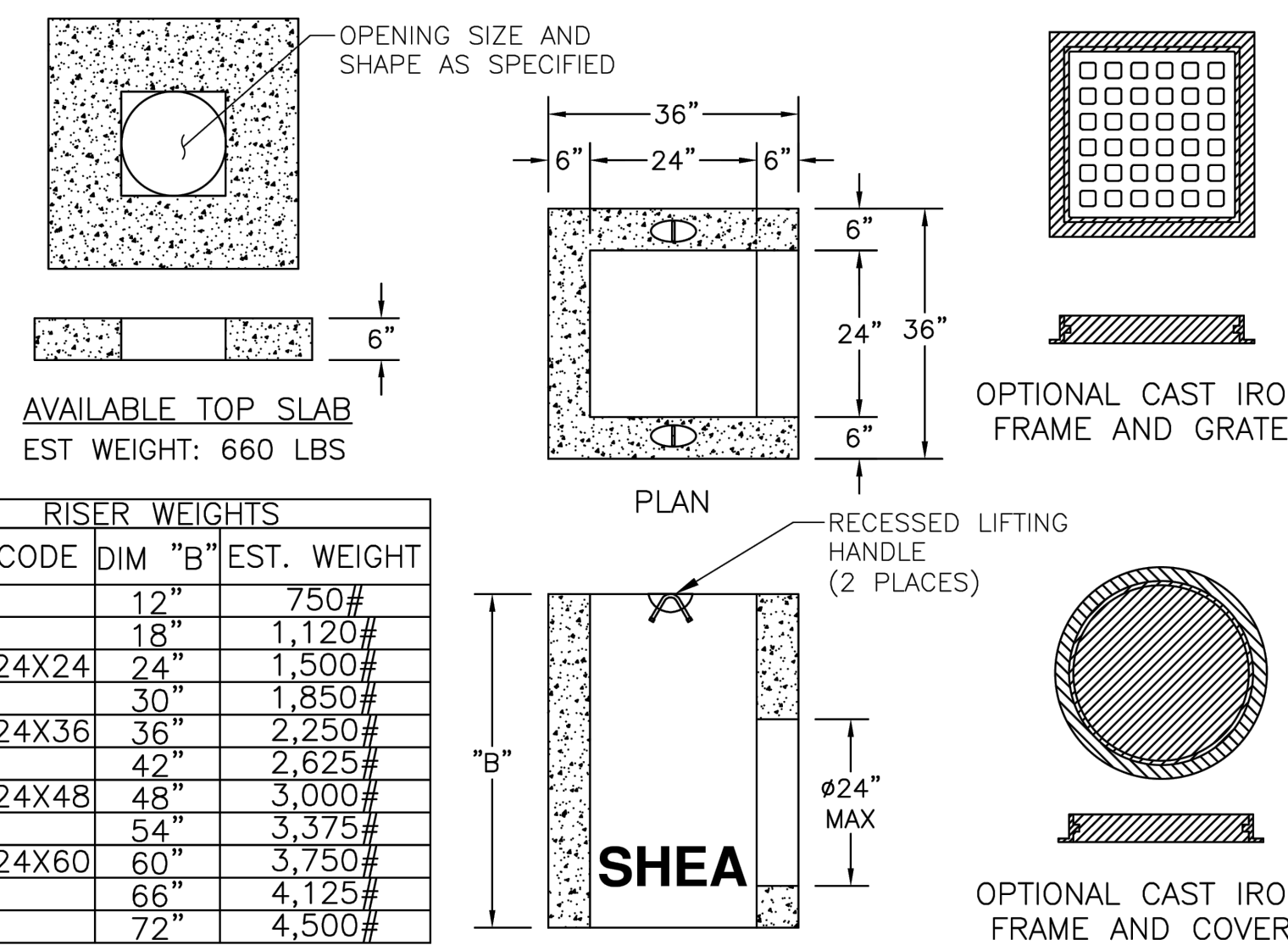


**INSPECTION PORT DETAIL**  
NOT TO SCALE

3



### 2' SQUARE AREA DRAIN



**AVAILABLE TOP SLAB**  
EST WEIGHT: 660 LBS

**OPTIONAL CAST IRON FRAME AND GRATE**

**RECESSED LIFTING HANDLE**  
(2 PLACES)

**OPTIONAL CAST IRON FRAME AND COVER**

ITEM CODE	DIM "B"	EST. WEIGHT
	12"	750#
	18"	1,120#
DIRS-24X24	24"	1,500#
	30"	1,850#
DIRS-24X36	36"	2,250#
	42"	2,625#
DIRS-24X48	48"	3,000#
	54"	3,375#
DIRS-24X60	60"	3,750#
	66"	4,125#
	72"	4,500#

ITEM CODE	DIM "A"	EST. WEIGHT
18SSGI	18"	1,780#
24SSGI	24"	2,150#
30SSGI	30"	2,520#
36SSGI	36"	2,910#
42SSGI	42"	3,260#
48SSGI	48"	3,660#
54SSGI	54"	4,000#
60SSGI	60"	4,410#
66SSGI	66"	4,800#
72SSGI	72"	5,170#

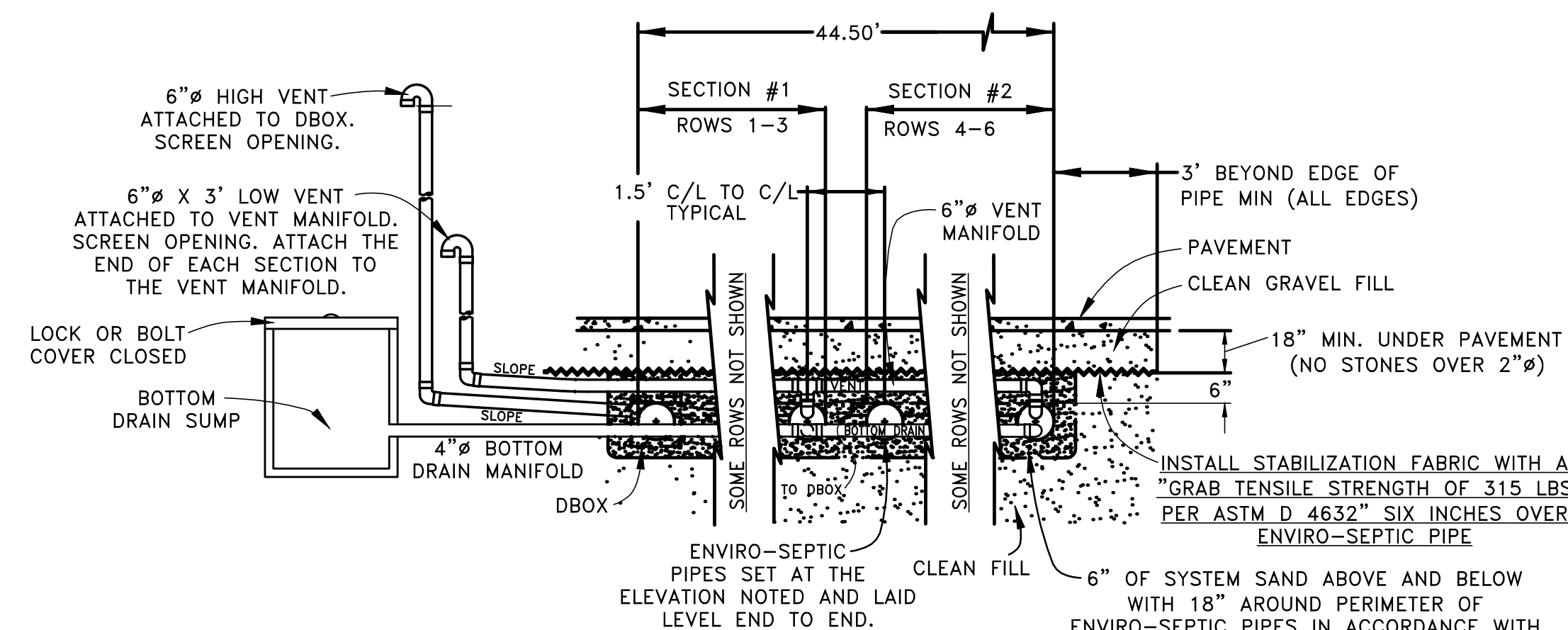
- NOTES:**
1. CONCRETE: 4,000 PSI MIN. AFTER 28 DAYS
  2. DESIGNED FOR AASHTO HS-20 LOADING
  3. SUMP AS REQUIRED

SHEA PRODUCT ID: SEE TABLE	PREPARED FOR: 2SQAD.dwg	FILE NAME: 2SQAD.dwg
WEIGHT (LBS): SEE TABLE	DRAWN BY: AWO	DATE: 06/01/18
		PAGE: G9.3

773 Salem Street-Wilmington, MA | 153 Cranberry Hwy-Rochester, MA | 87 Haverhill Road-Amesbury, MA | 160 Old Turnpike Rd-Nottingham, NH

**DRAIN SUMP WITH 18" SUMP DETAIL**  
NOT TO SCALE

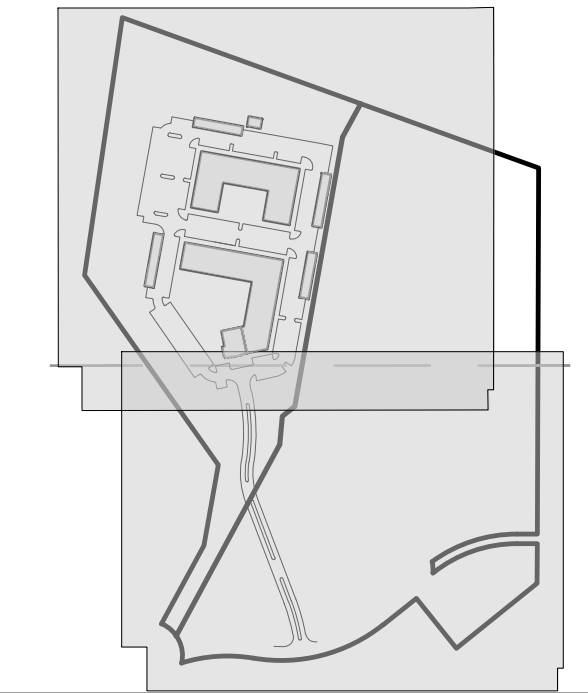
1



BOTTOM DRAIN CONNECTED TO SIX O'CLOCK POSITION OF DOUBLE OFFSET ADAPTER AT THE END OF EACH SERIAL SECTION. THE VENT MANIFOLD IS ATTACHED TO THE TWELVE O'CLOCK POSITION OF THE DOUBLE OFFSET ADAPTER (OVER EACH BOTTOM DRAIN CONNECTION).

**ENVIRO-SEPTIC SYSTEM CROSS SECTION DETAIL**  
NOT TO SCALE

2



KEYSHEET

**ISSUED FOR REVIEW**  
DEC. 20, 2023 REV FEB. 28, 2025



PROFESSIONAL ENGINEER FOR ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
05	02/28/25	PER PEER REVIEW COMMENTS
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03	01/23/25	LAYOUT REVISIONS PER WORKSHOP
02	10/18/24	ZBA RESUBMISSION
01	02/23/24	ZBA RESUBMISSION

**APPLICANT/OWNER:**  
THOREAU RESIDENCES, LLC  
275 FOREST RIDGE ROAD  
CONCORD, MA 01742

**PROJECT:**  
THE RESIDENCES AT THOREAU  
275 FOREST RIDGE ROAD  
CONCORD, MA 01742

PROJECT NO. 1670-24 DATE: 12/20/2023

SCALE: NTS DWG. NAME: C-1670-24

DESIGNED BY: CHECKED BY: PLC

**ALLEN & MAJOR ASSOCIATES, INC.**  
civil engineering • land surveying  
environmental consulting • landscape architecture  
www.allenmajor.com  
10 MAIN STREET  
LAKEVILLE, MA 02347  
TEL: (508) 923-1010  
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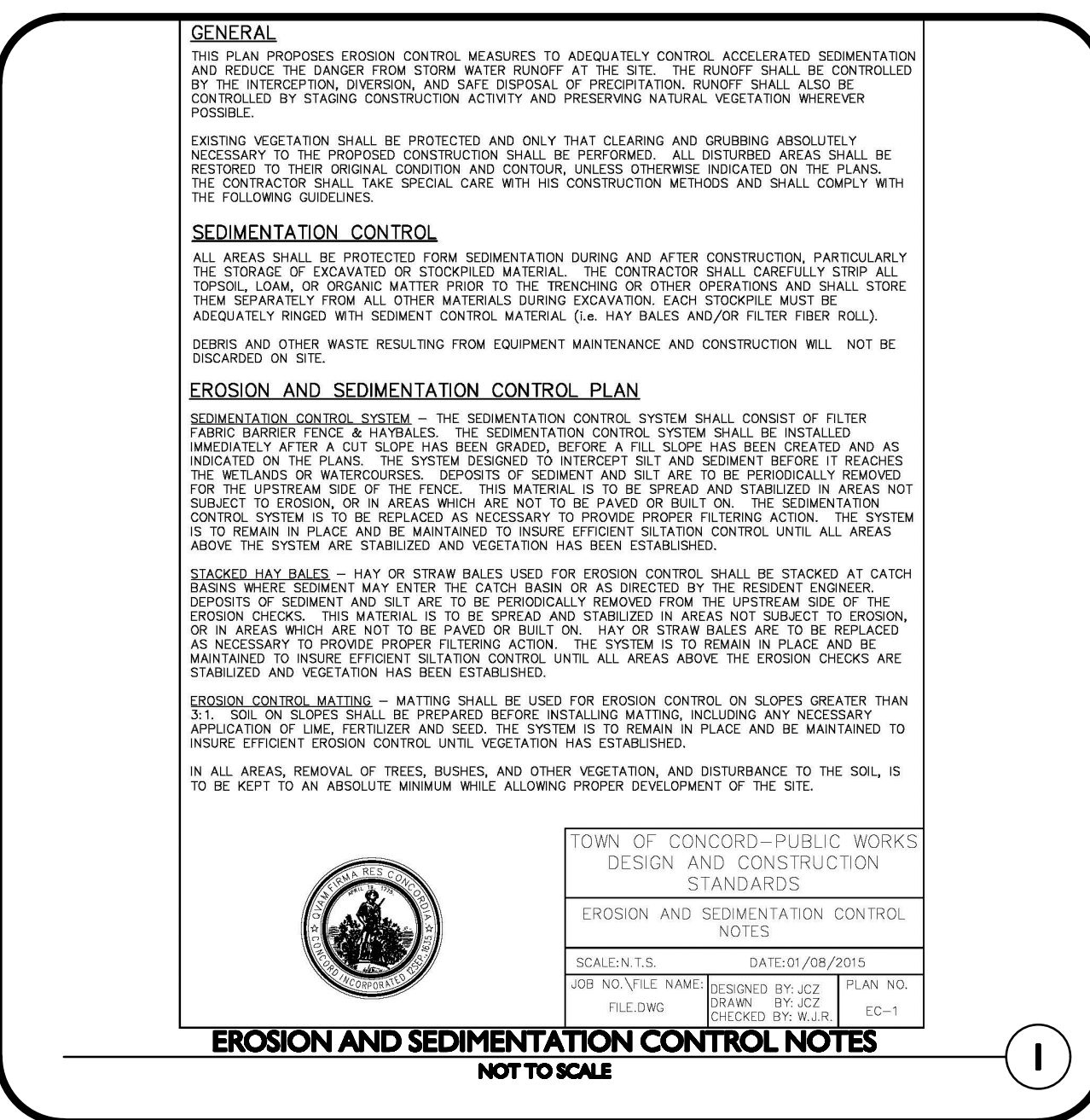
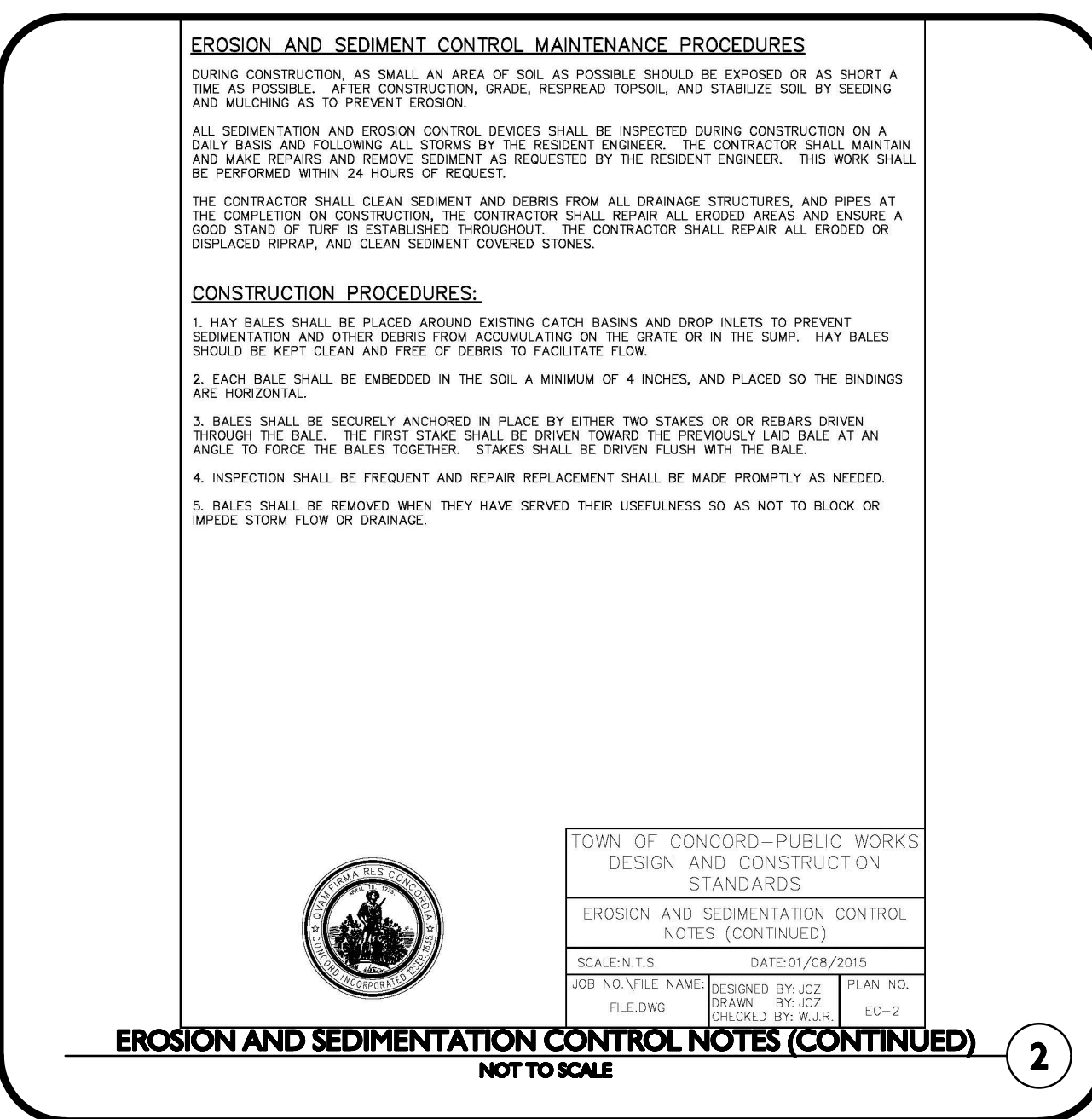
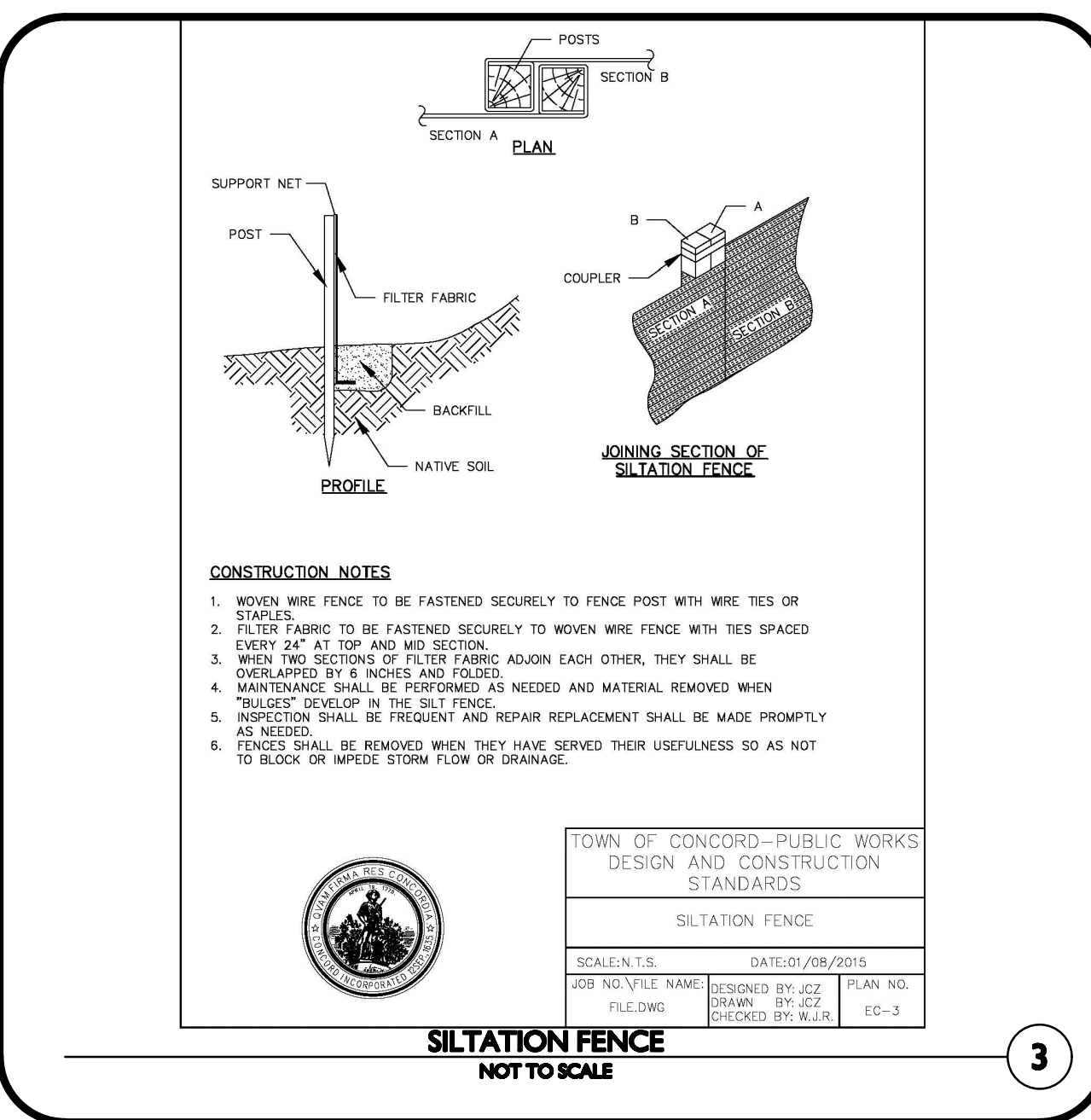
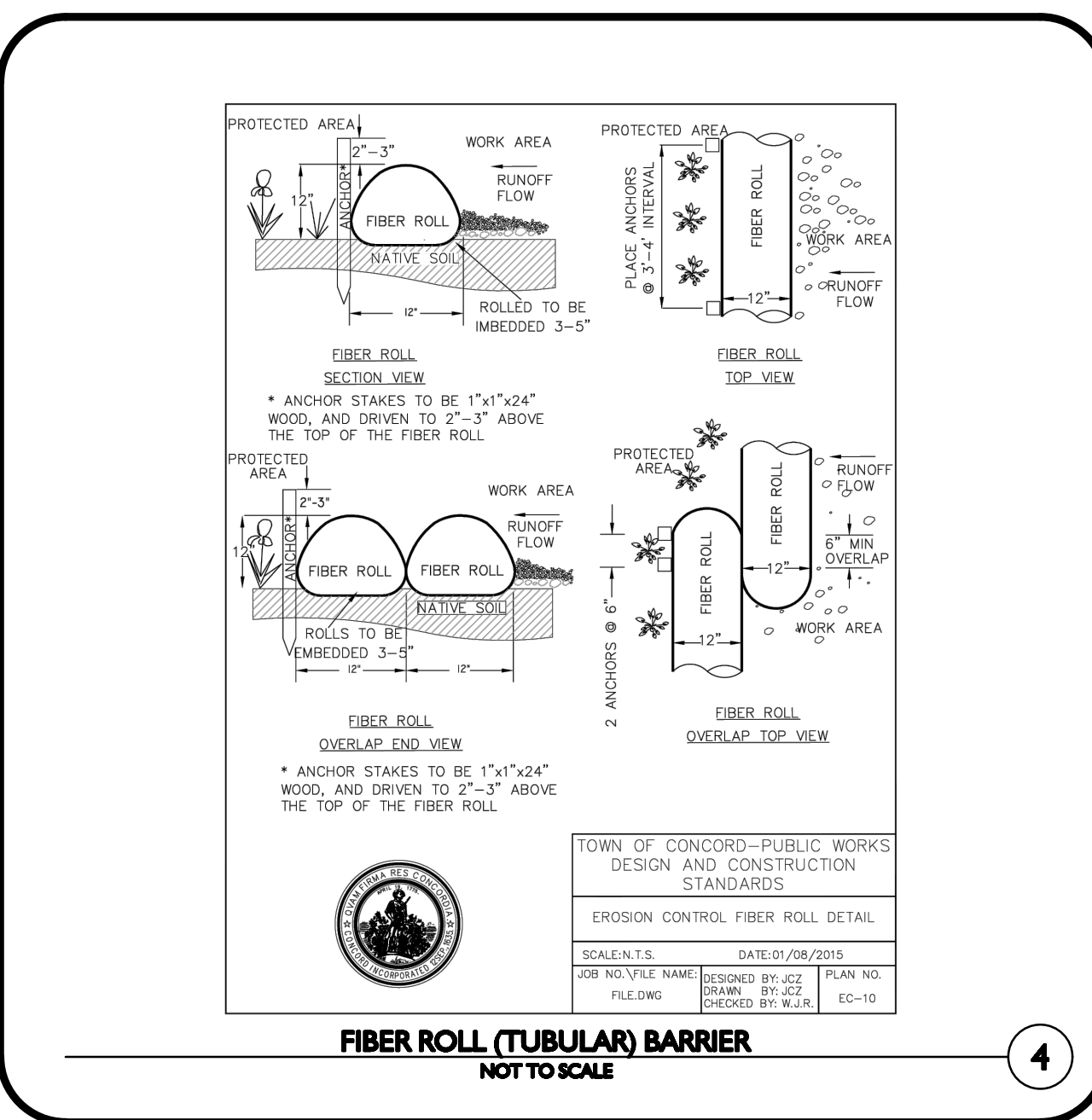
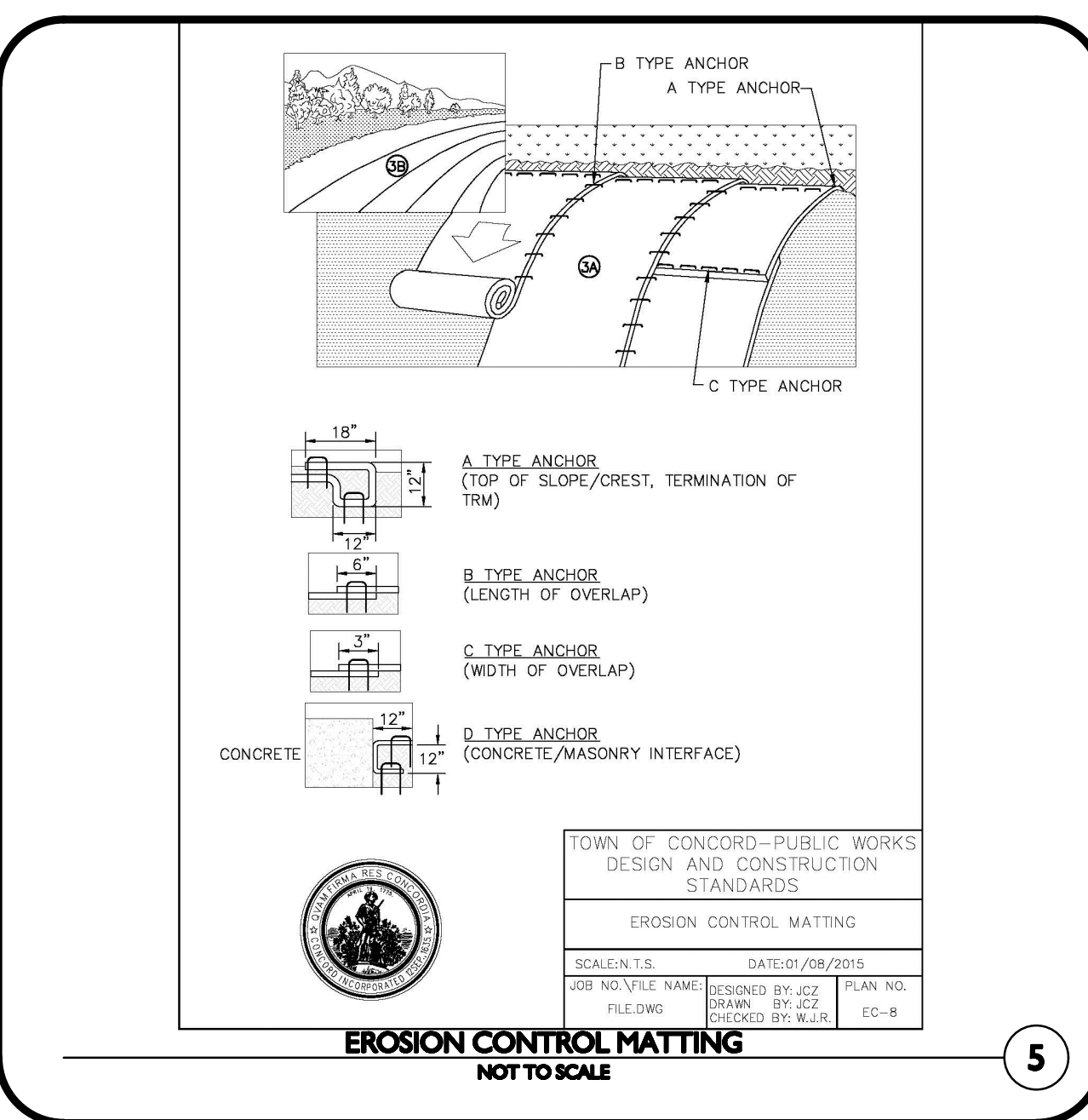
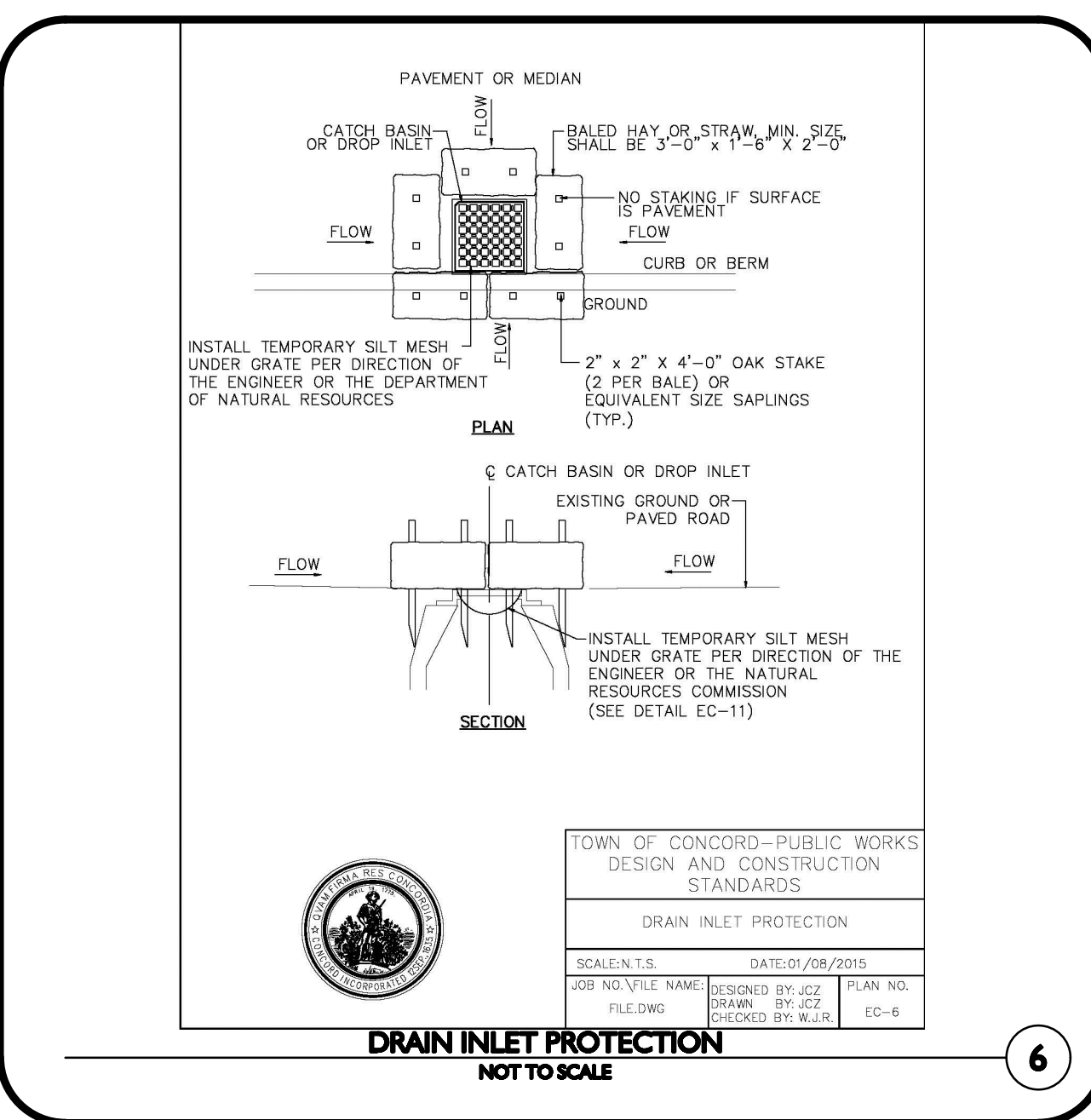
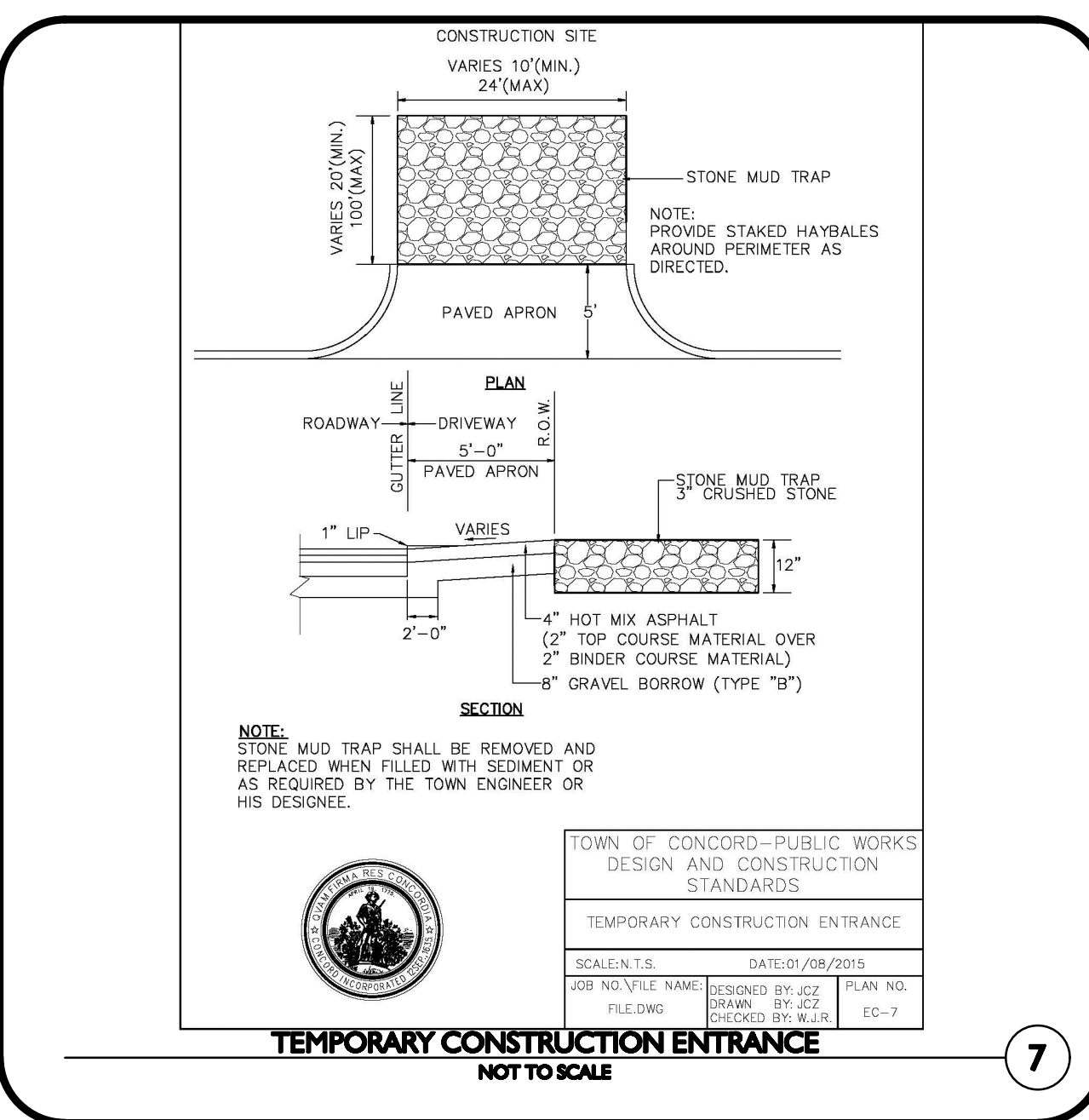
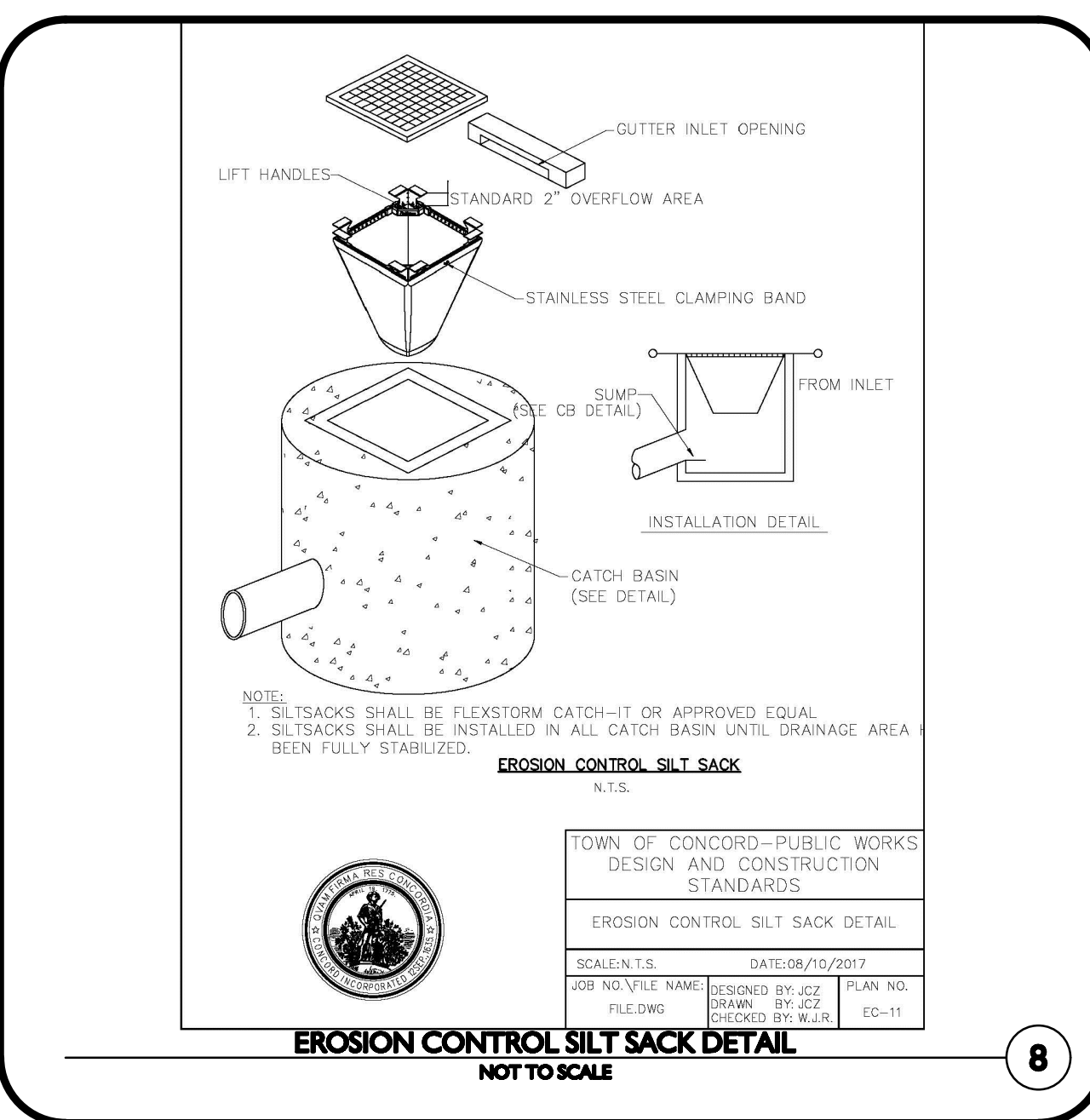
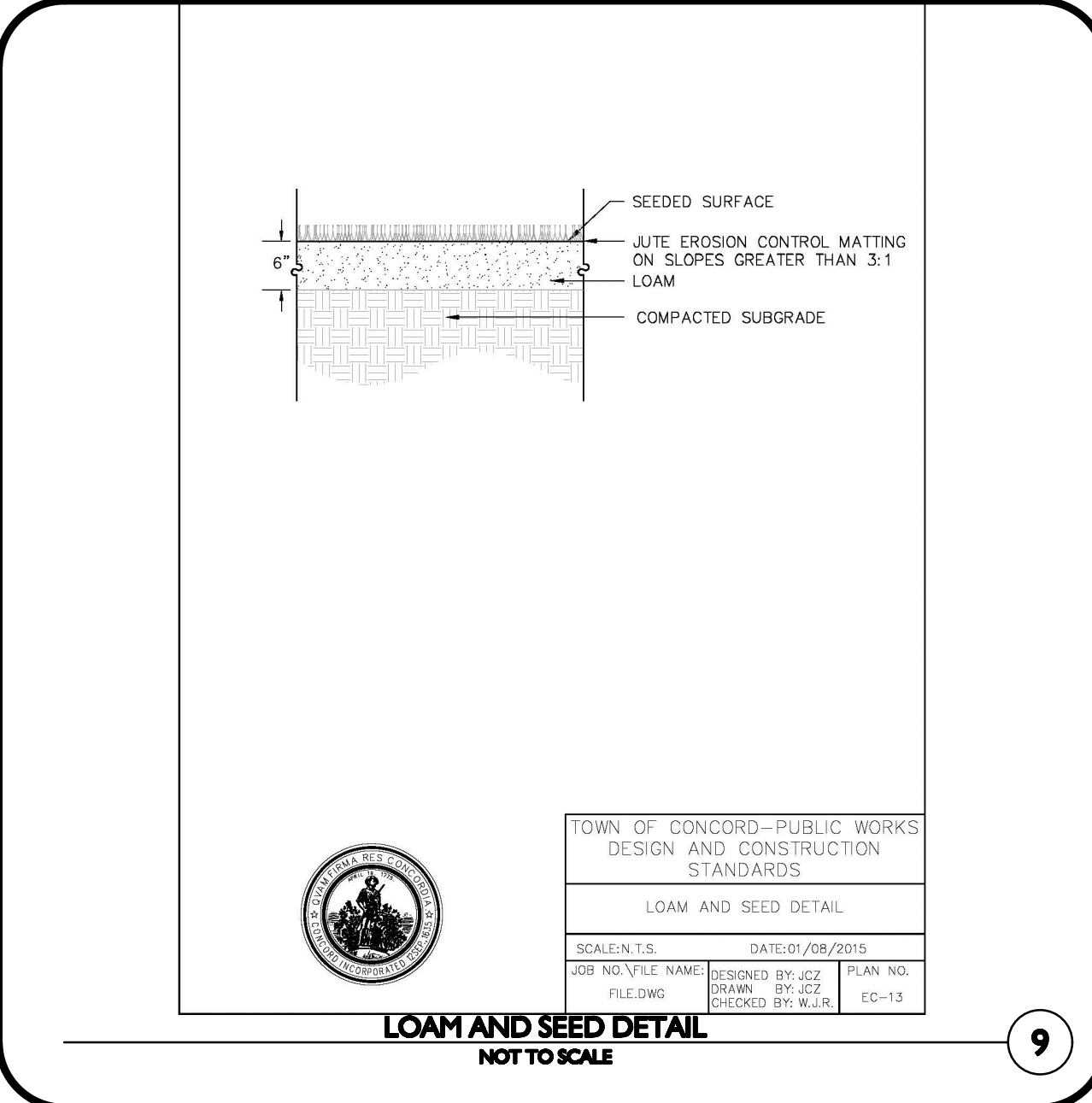
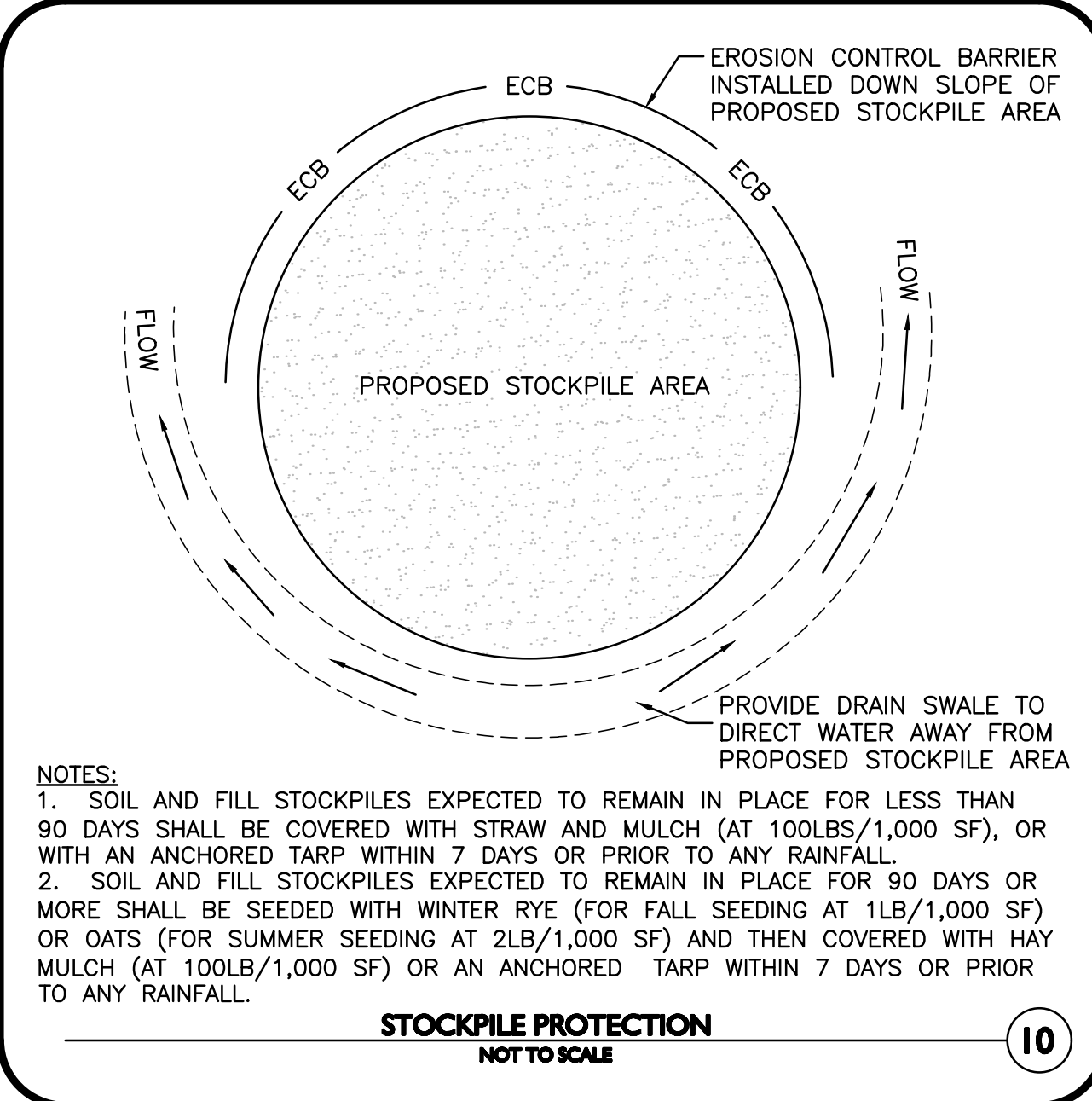
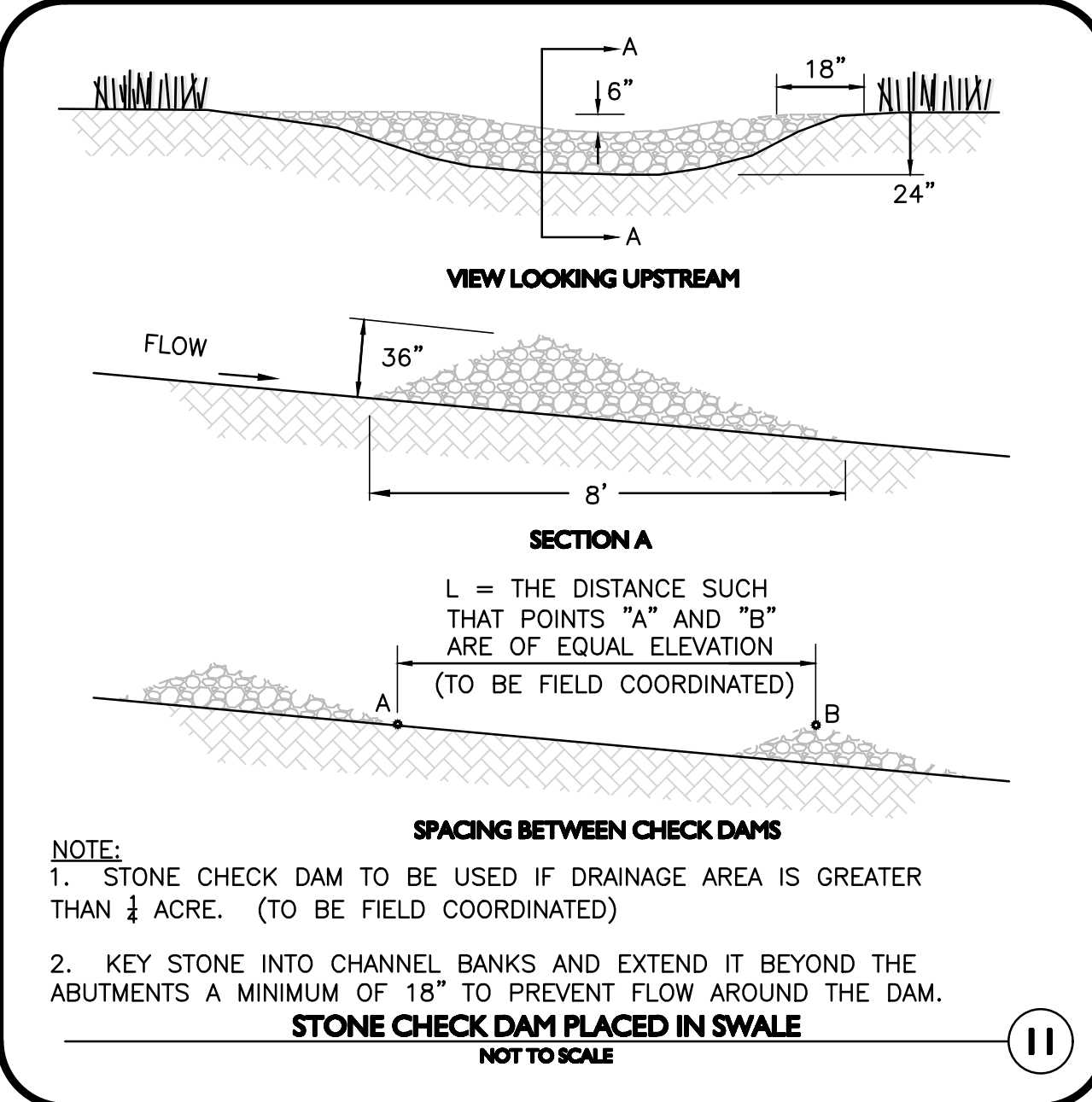
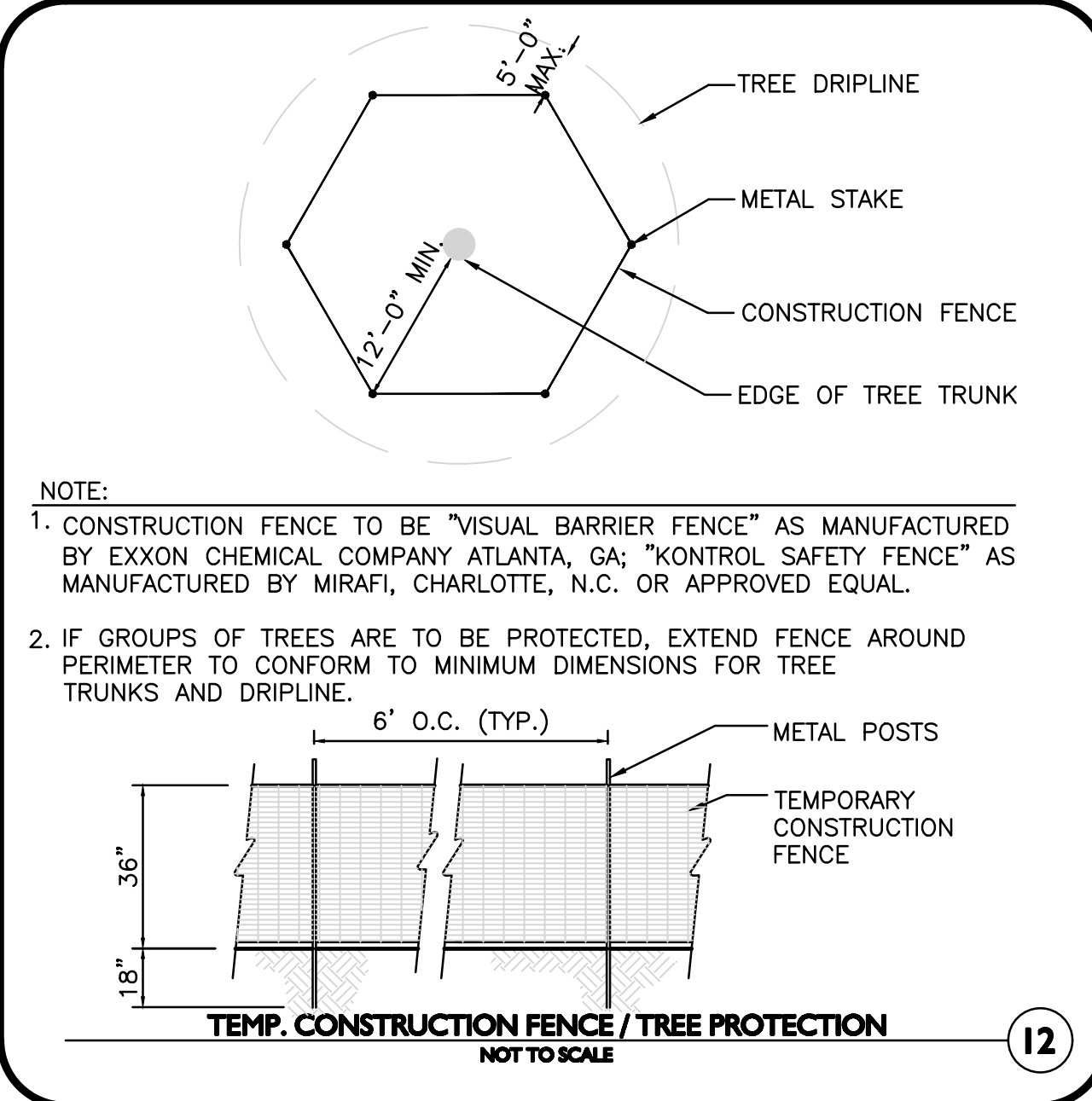
DRAWING TITLE: SHEET No.

SEPTIC SYSTEM DETAILS C-109C

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M:\PROJECTS\1670-24\CIVIL\DRAWINGS\CURRENT\SEPTIC SYSTEM DESIGN\C-1670-24-SEPTIC SYSTEM DESIGN.DWG

M:\PROJECTS\1670-24\CIVIL\DRAWINGS\CURRENT\C-1670-24 - DETAILS.DWG



KEYSHEET

**ISSUED FOR REVIEW**  
 DEC. 20, 2023 REV FEB. 28, 2026

PHILIP L. CORDERO  
 CIVIL ENGINEER  
 NO. 47083  
 REGISTERED PROFESSIONAL ENGINEER

PROFESSIONAL ENGINEER FOR  
 ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
05	02/28/25	PER PEER REVIEW COMMENTS
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APPLICANT/OWNER:  
 THOREAU RESIDENCES, LLC  
 275 FOREST RIDGE ROAD  
 CONCORD, MA 01742

PROJECT:  
 THE RESIDENCES AT THOREAU  
 275 FOREST RIDGE ROAD  
 CONCORD, MA 01742

PROJECT NO. 1670-24 DATE: 12/20/2023  
 SCALE: AS SHOWN DWG. NAME: C-1670-24  
 DESIGNED BY: BDP CHECKED BY: PLC  
 PREPARED BY:

**ALLEN & MAJOR ASSOCIATES, INC.**  
 civil engineering • landscape architecture  
 environmental consulting • interior architecture  
 www.allenmajor.com

10 MAIN STREET  
 LAKEVILLE, MA 02347  
 TEL: (508) 923-1010  
 FAX: (508) 923-6309

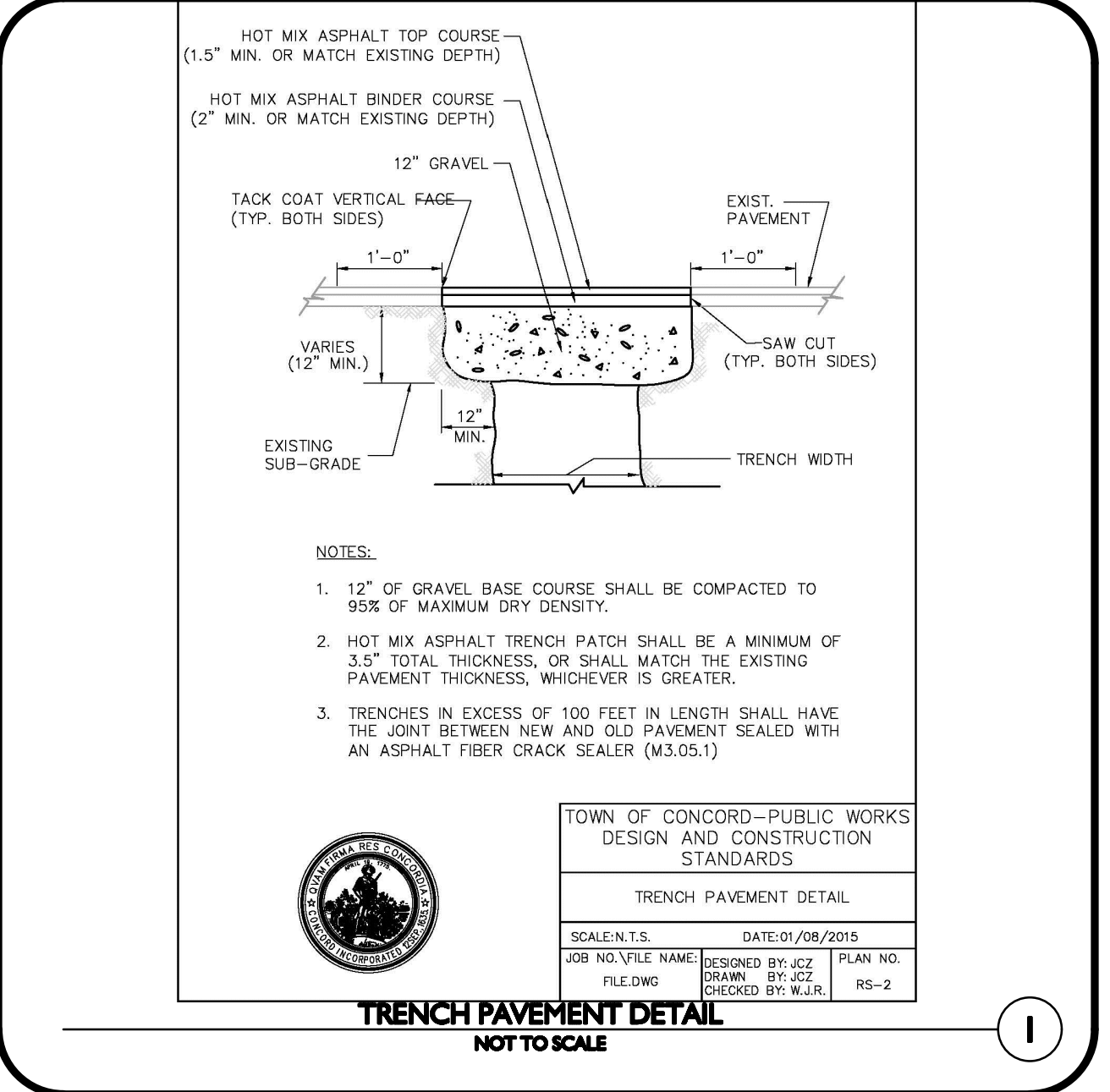
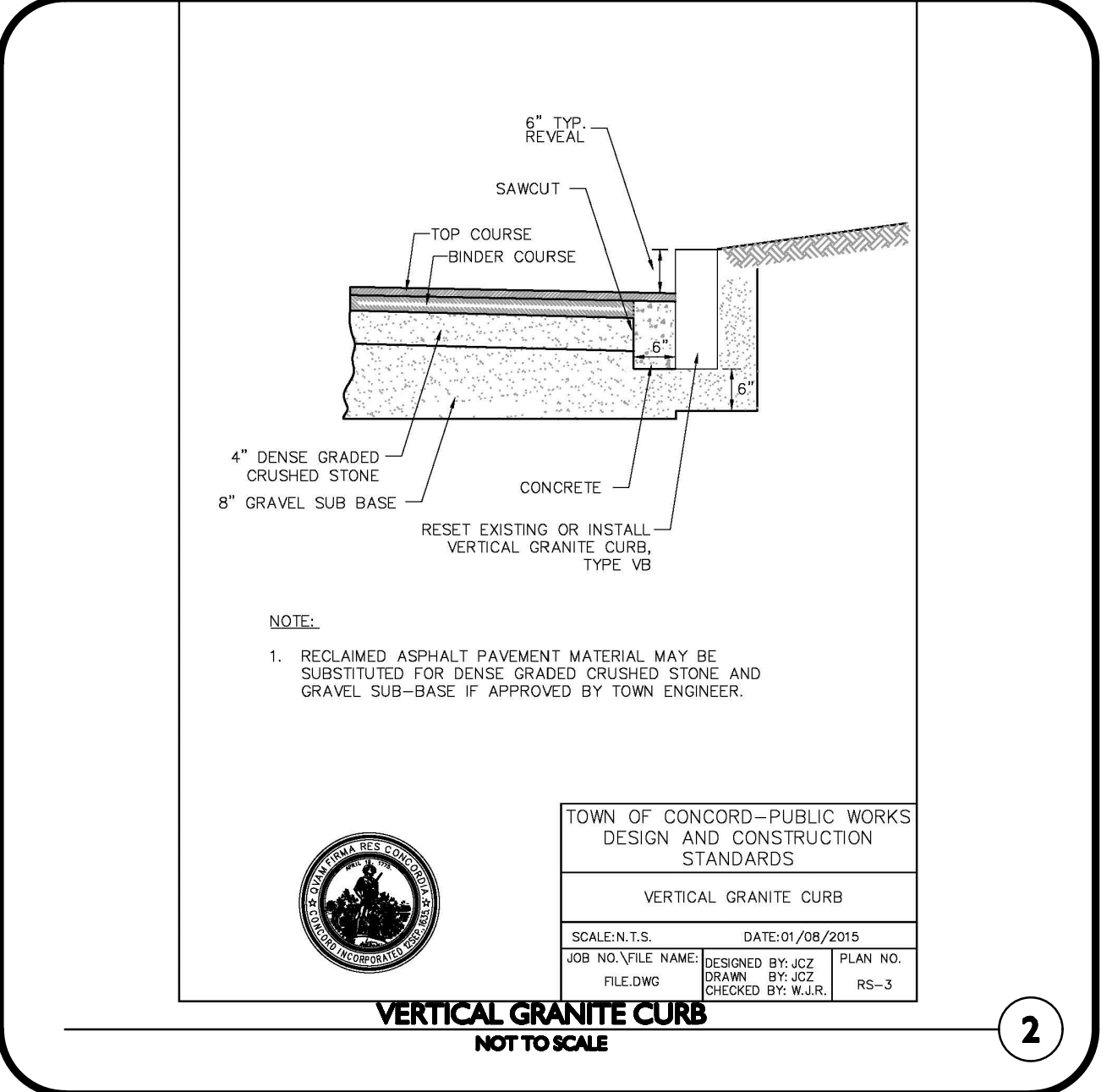
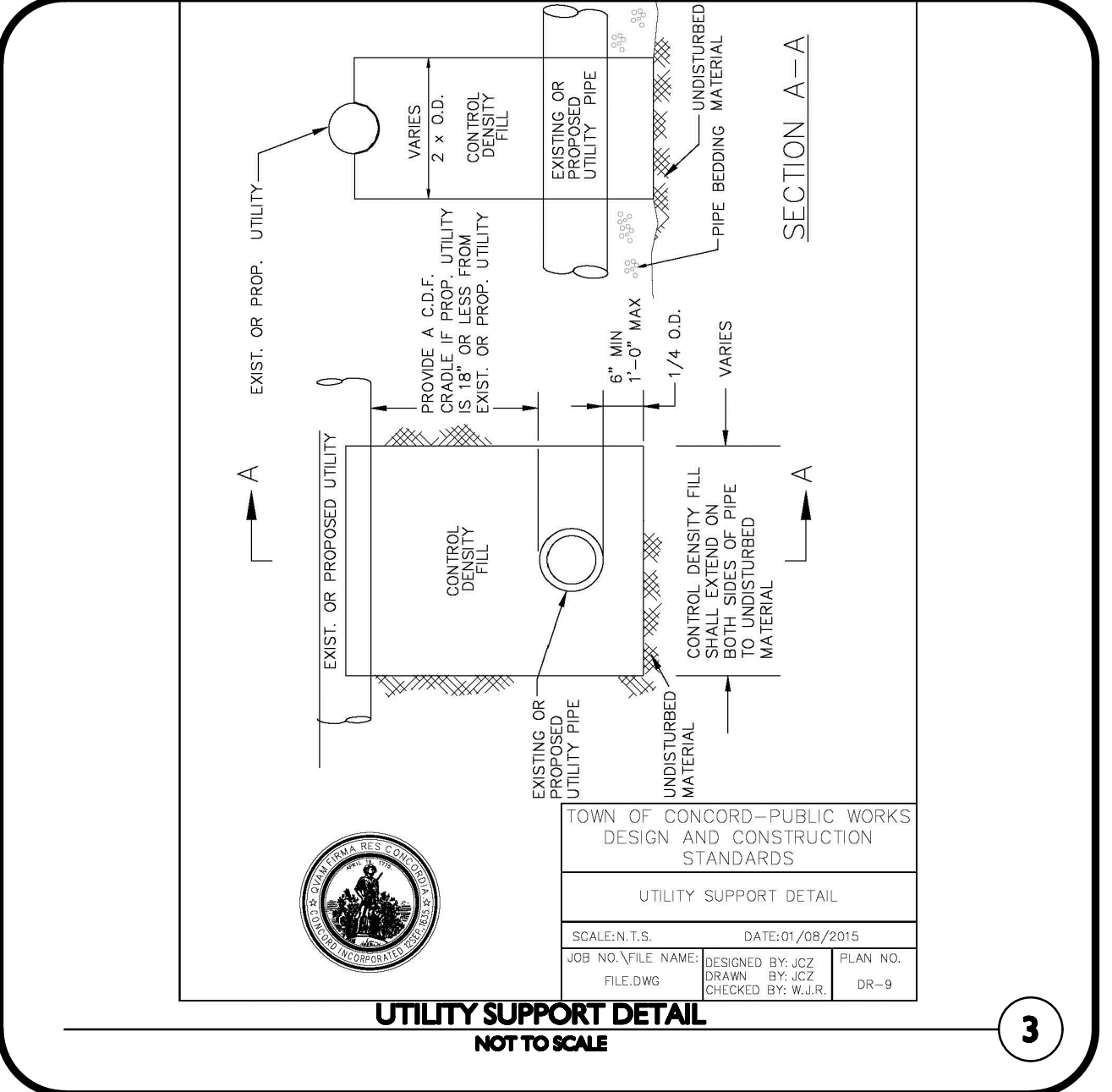
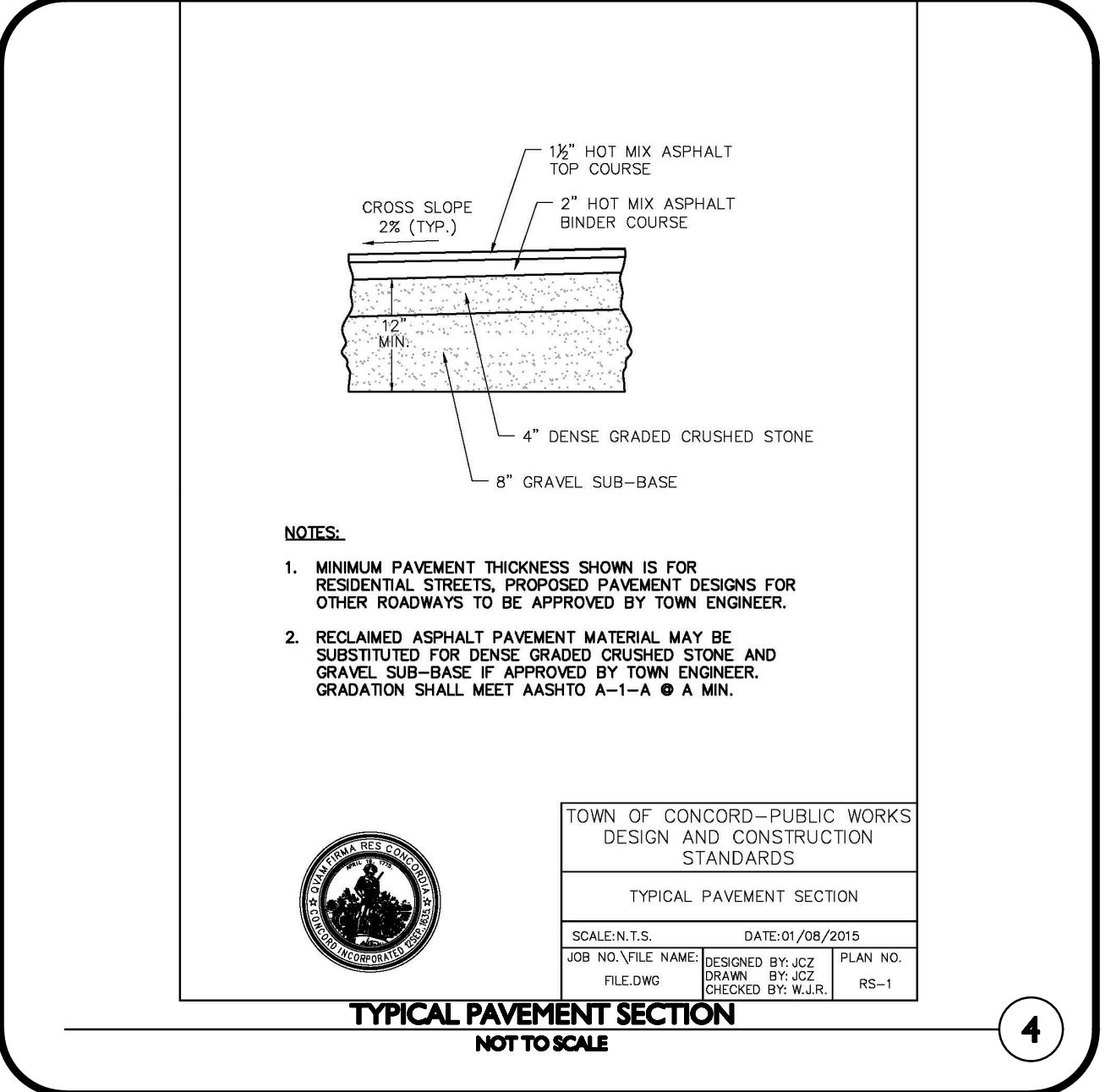
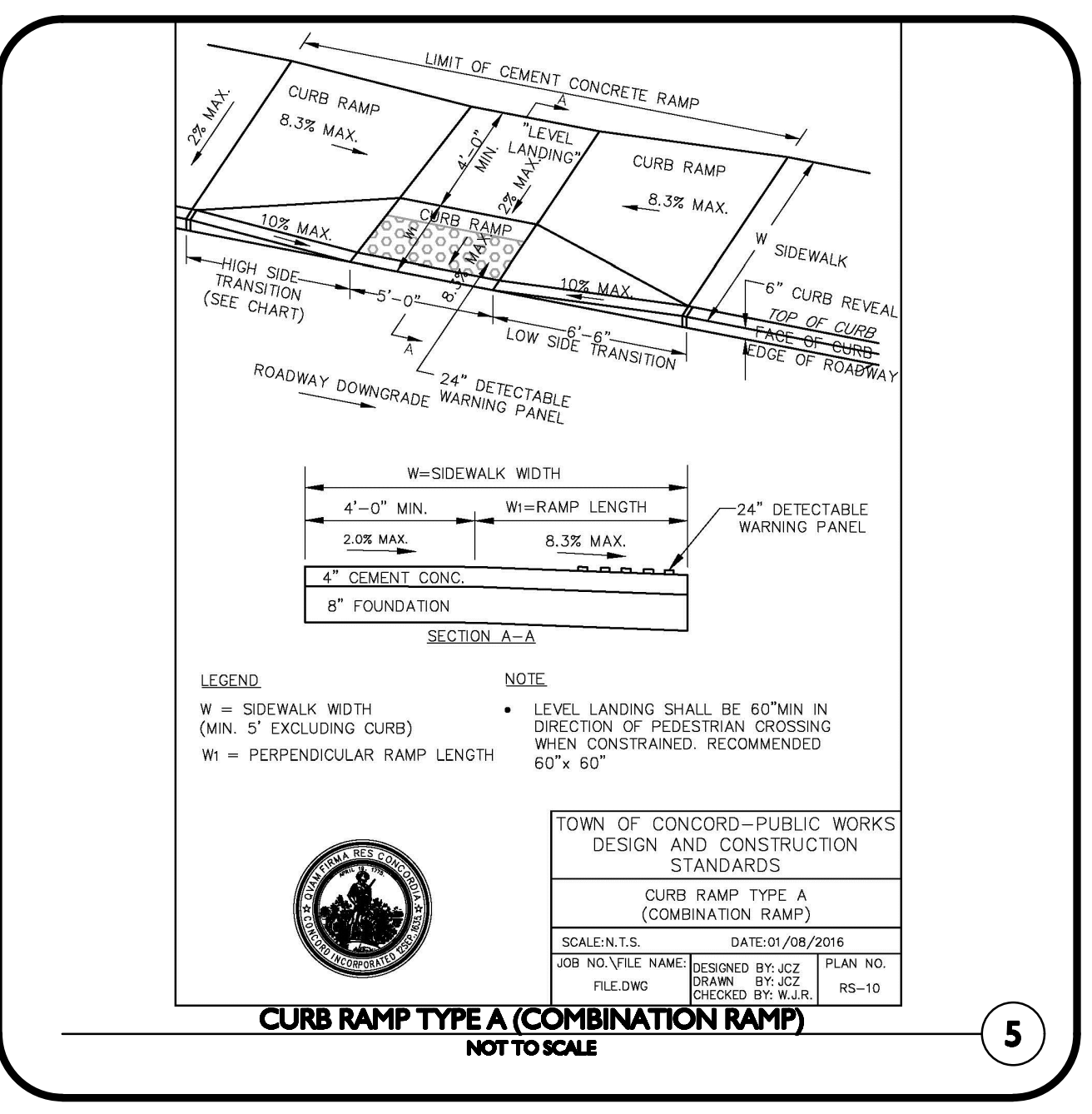
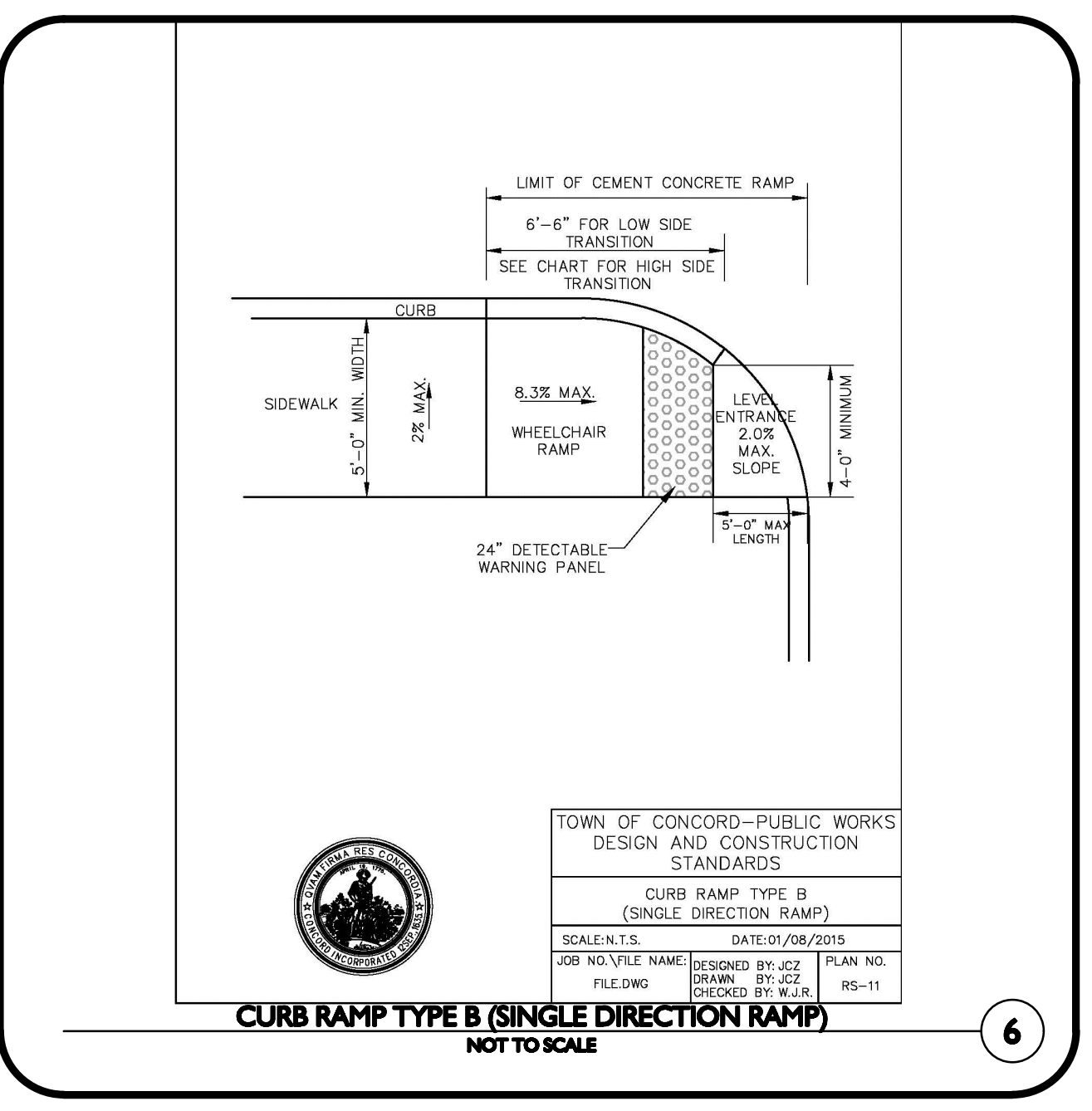
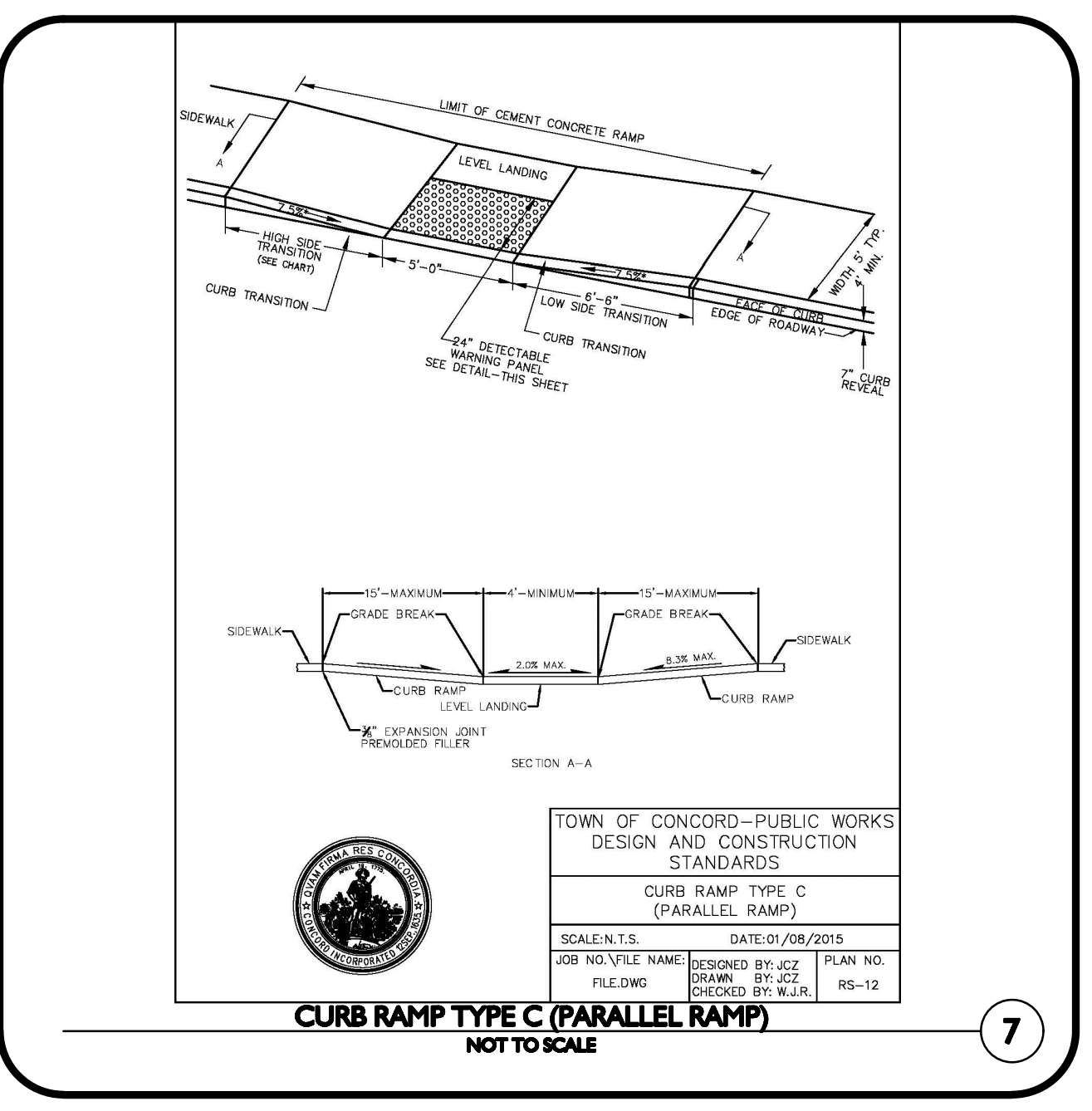
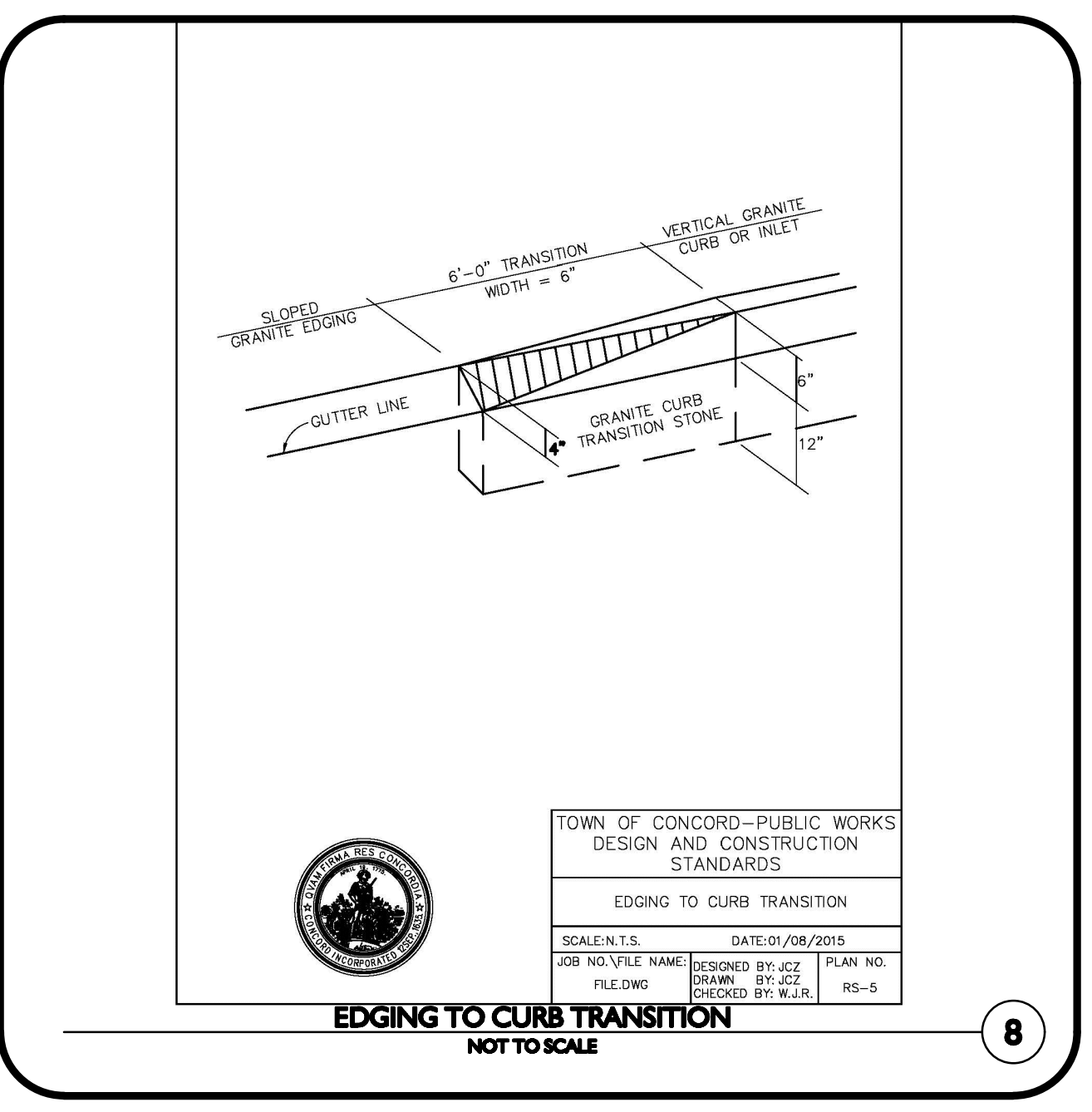
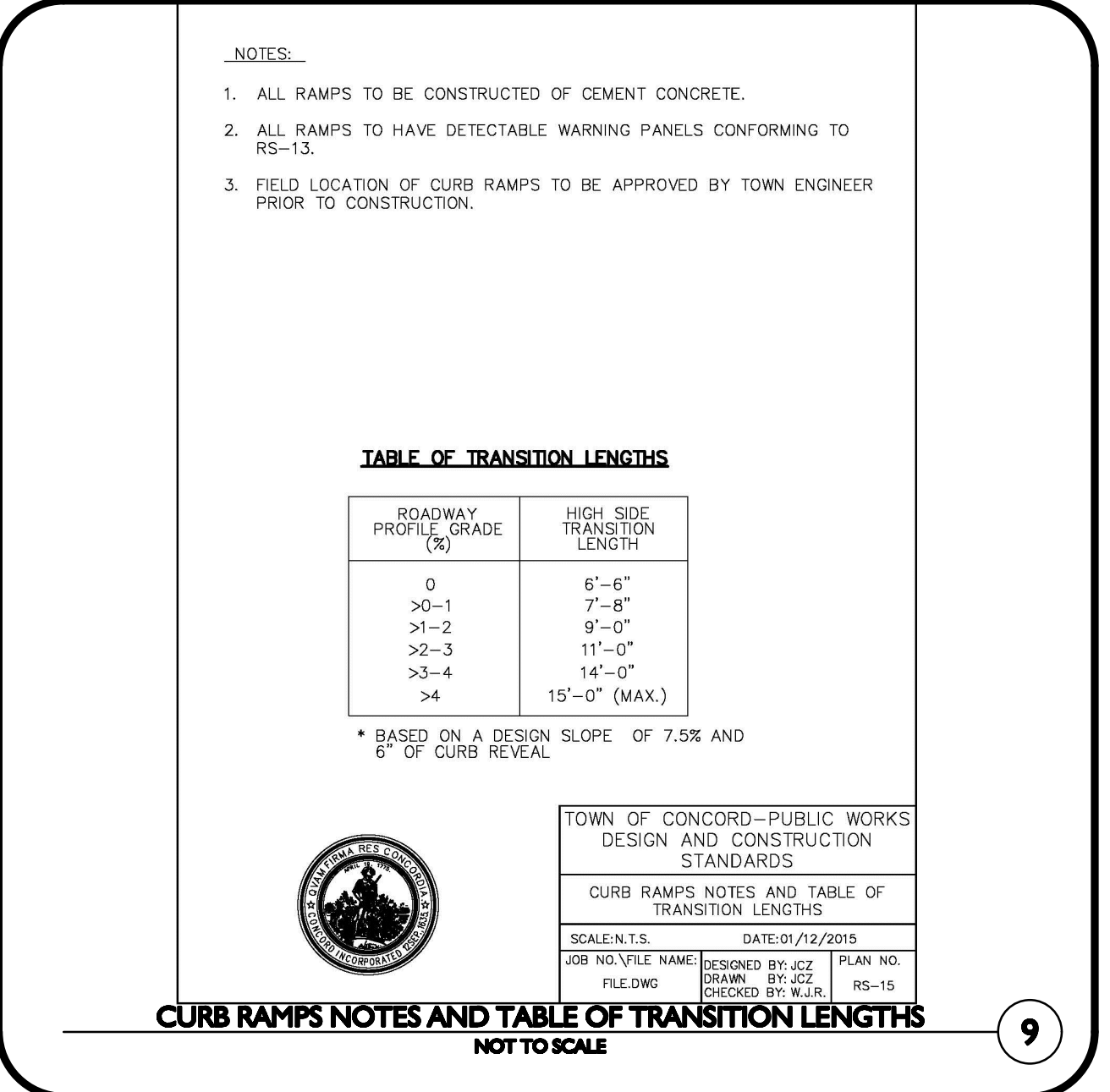
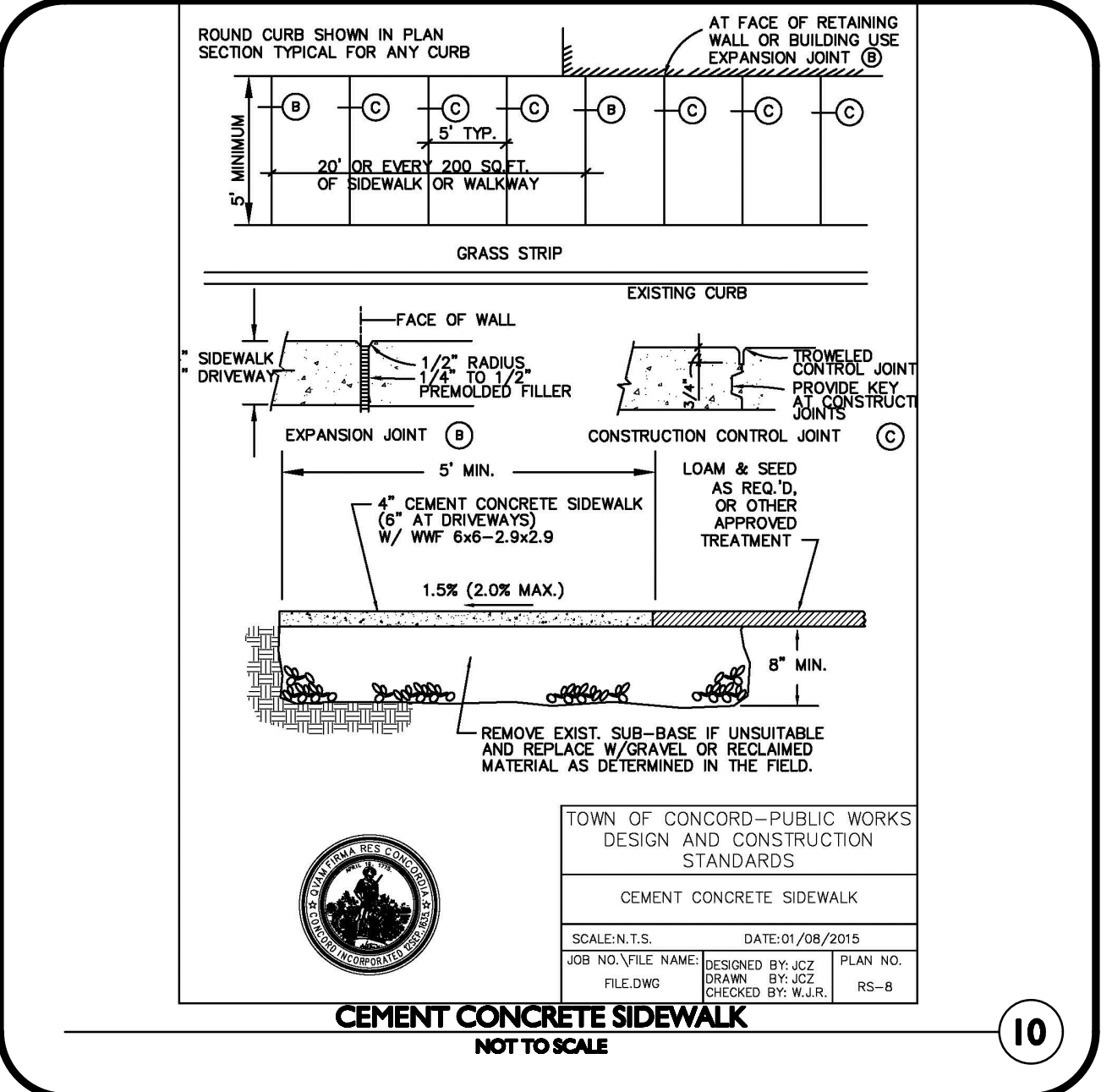
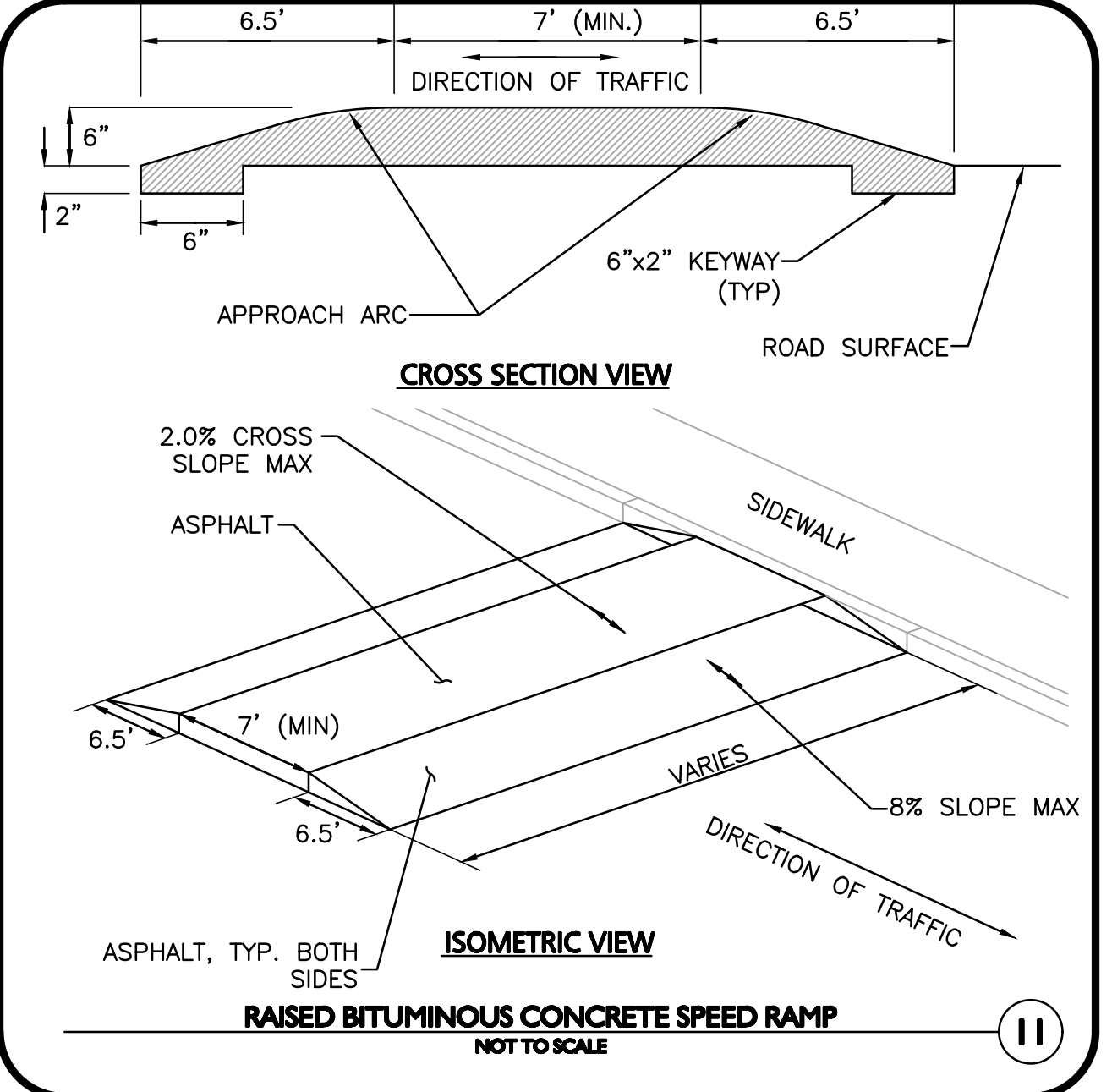
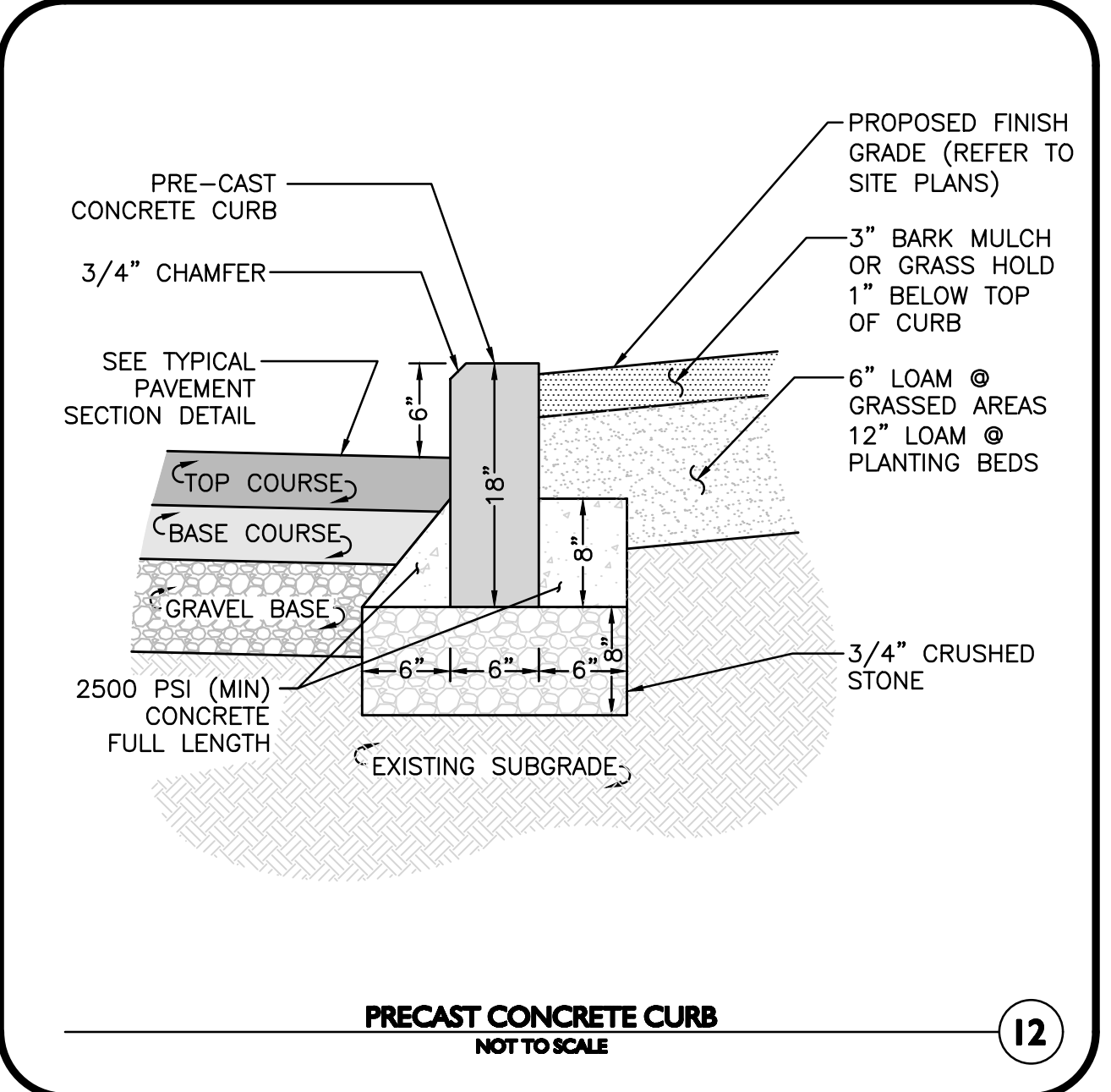
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DRAWING TITLE: DETAILS SHEET NO. C-501

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**KEYSHEET**

**ISSUED FOR REVIEW**  
 DEC. 20, 2023 REV FEB. 28, 2025

PHILIP L. CORDERO  
 CIVIL ENGINEER  
 NO. 47083  
 REGISTERED PROFESSIONAL ENGINEER

PROFESSIONAL ENGINEER FOR  
 ALLEN & MAJOR ASSOCIATES, INC.

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03	01/23/25	LAYOUT REVISIONS PER WORKSHOP
02	10/18/24	ZBA RESUBMISSION
01	02/23/24	ZBA RESUBMISSION

APPLICANT/OWNER:  
**THOREAU RESIDENCES, LLC**  
 275 FOREST RIDGE ROAD  
 CONCORD, MA 01742

PROJECT:  
**THE RESIDENCES AT THOREAU**  
 275 FOREST RIDGE ROAD  
 CONCORD, MA 01742

PROJECT NO. 1670-24 DATE: 12/20/2023  
 SCALE: AS SHOWN DWG. NAME: C-1670-24  
 DESIGNED BY: BDP CHECKED BY: PLC  
 PREPARED BY:

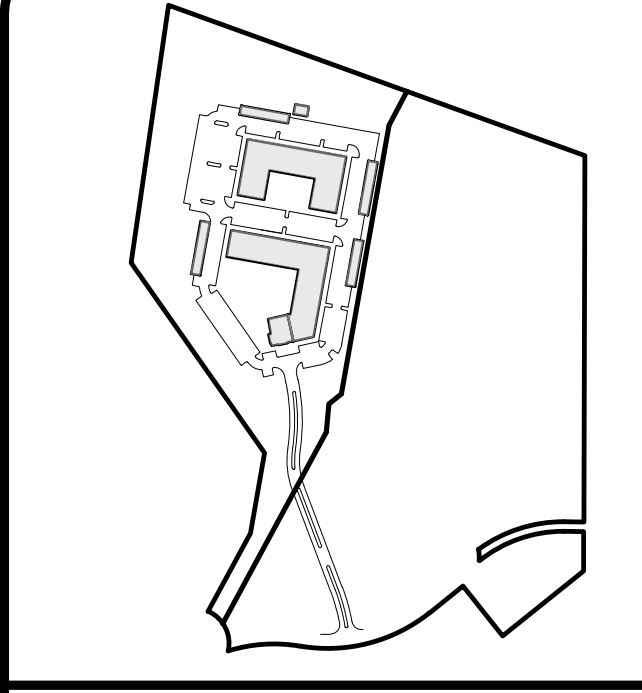
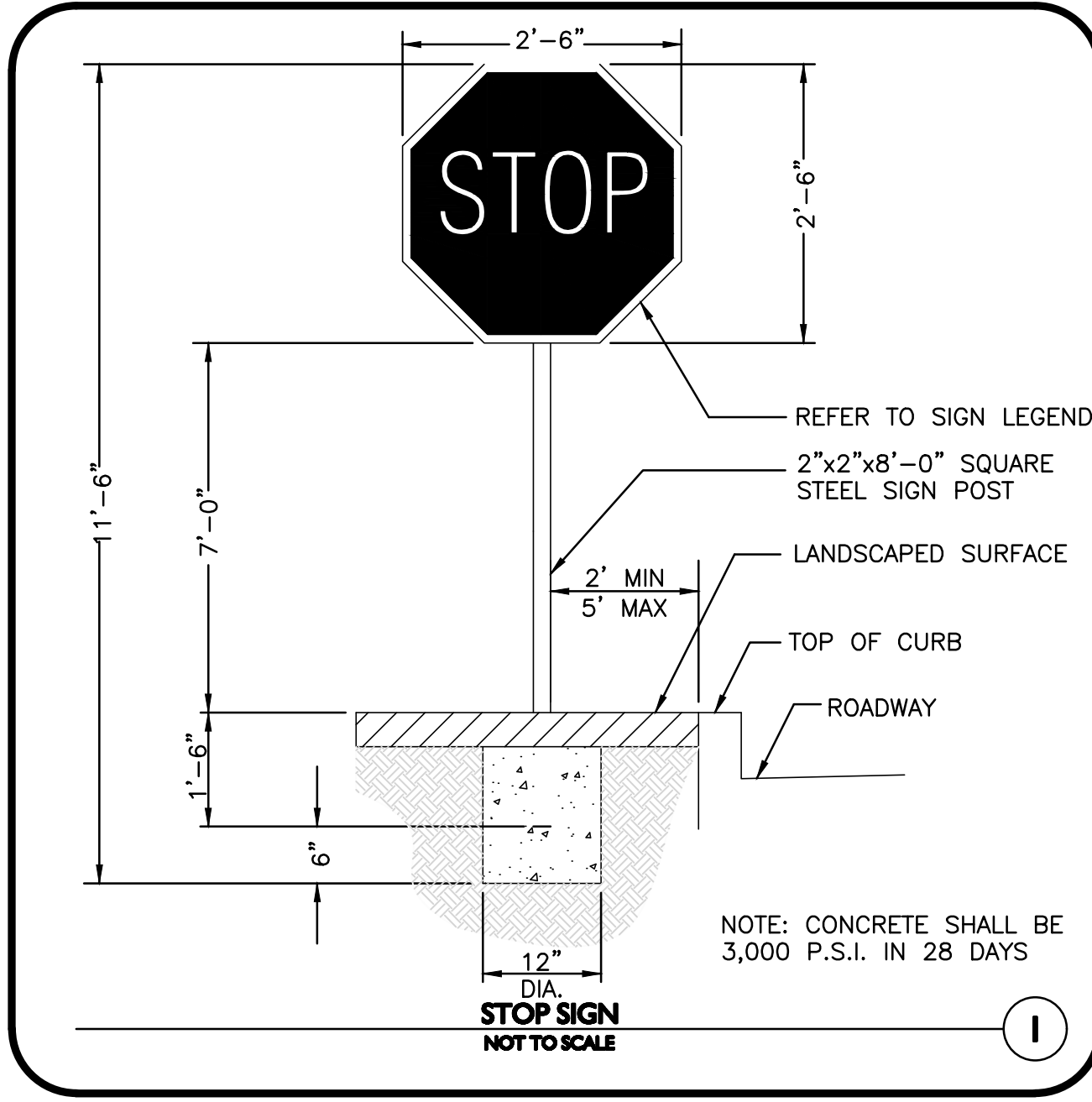
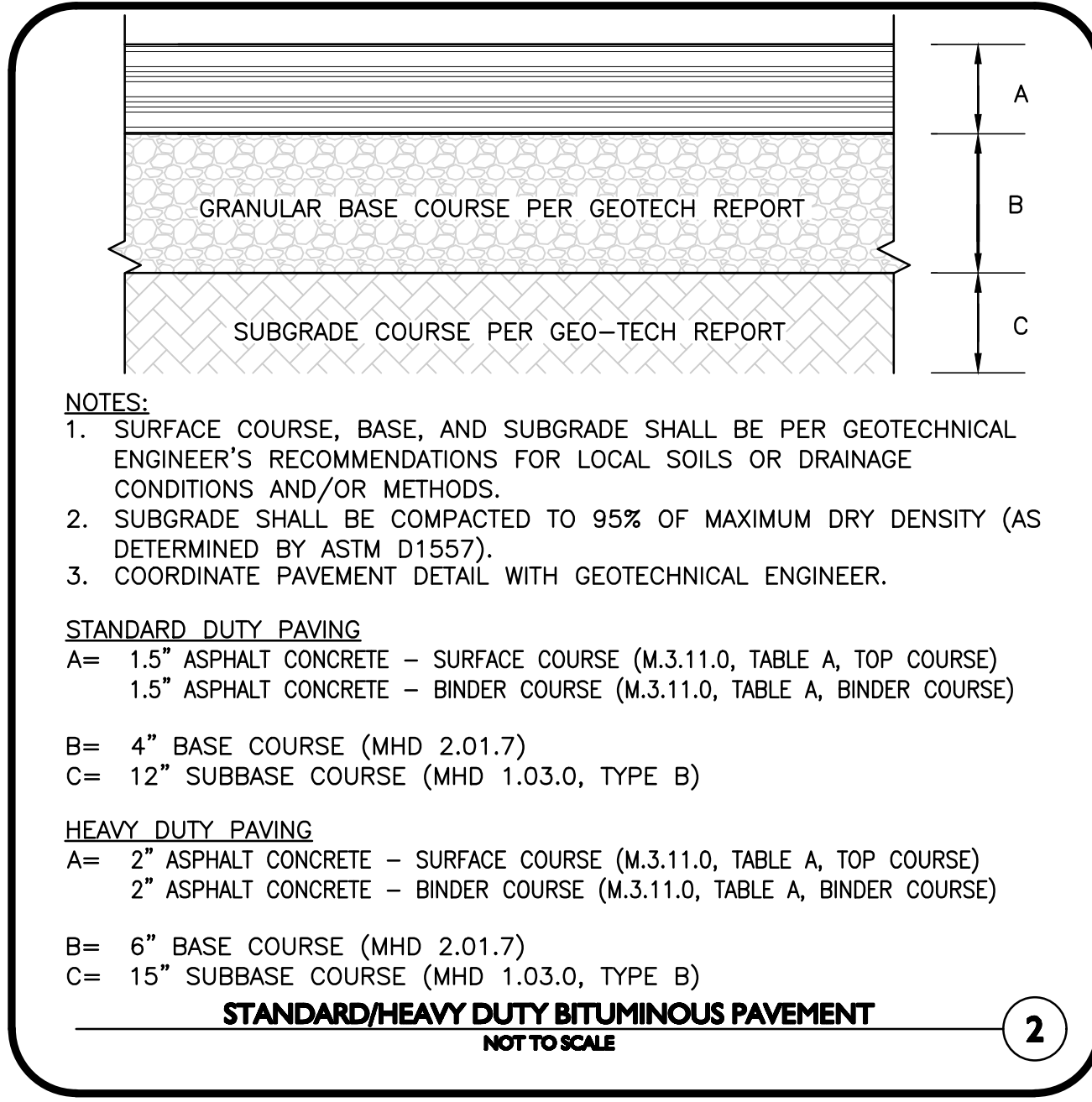
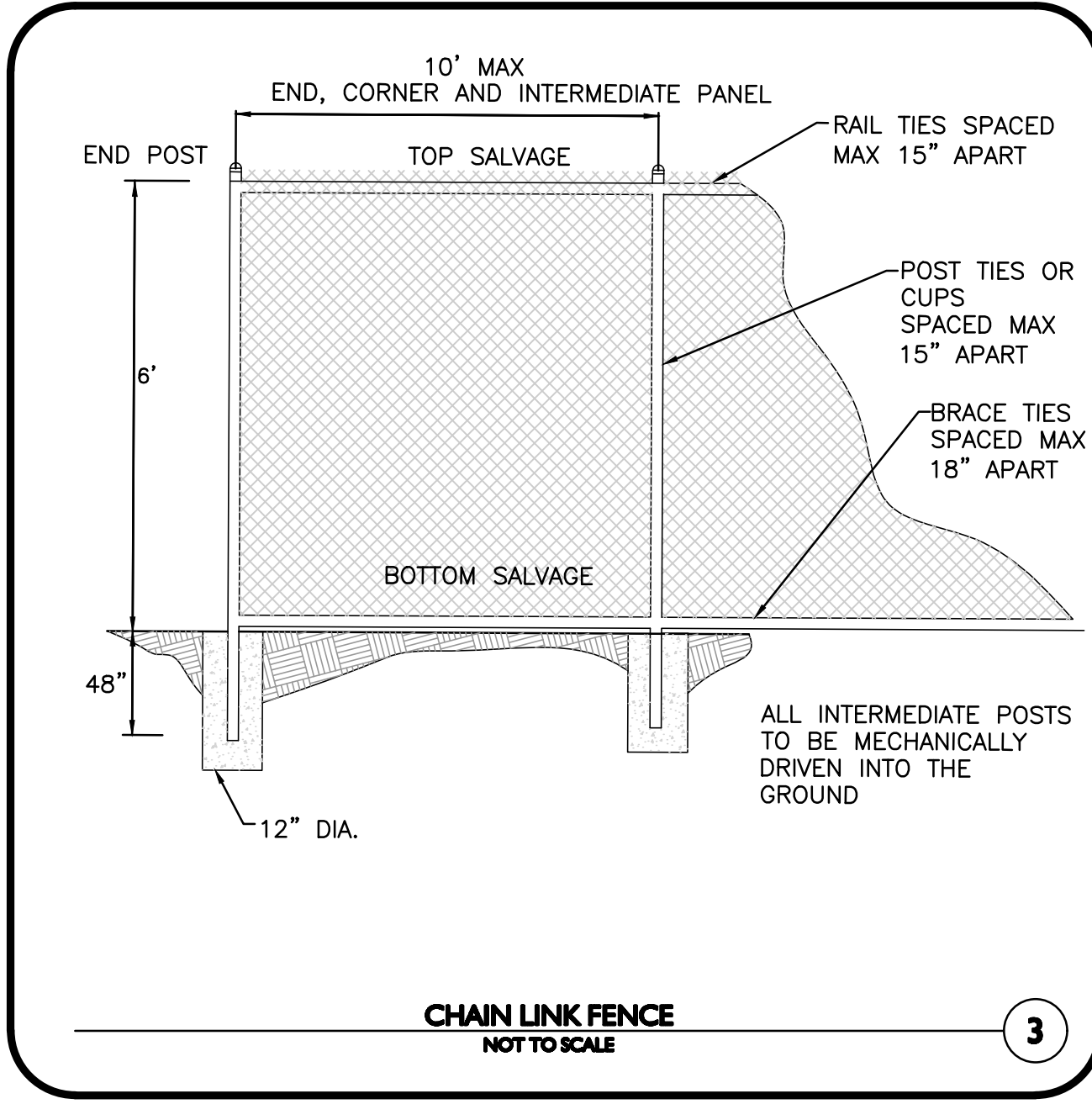
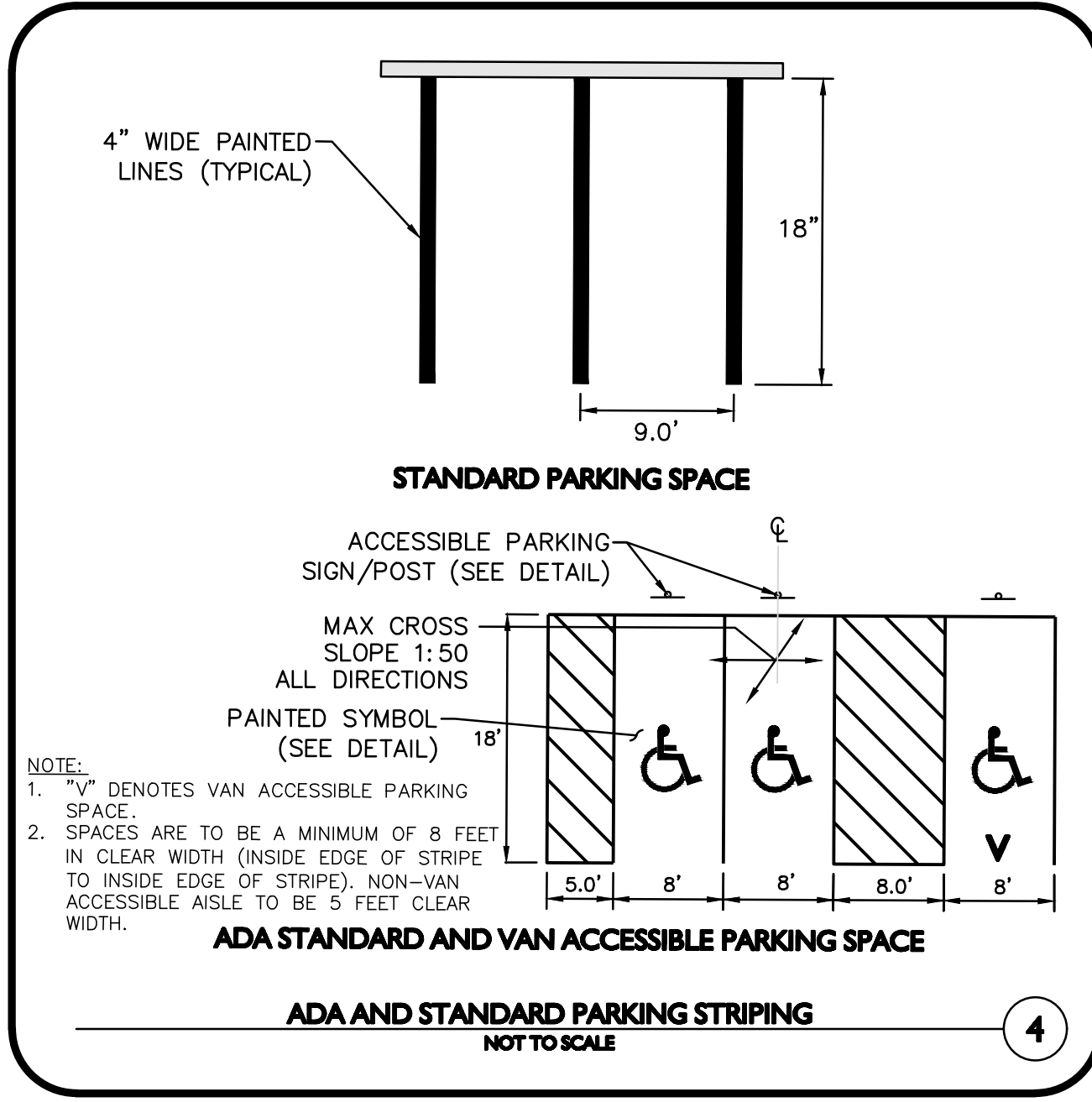
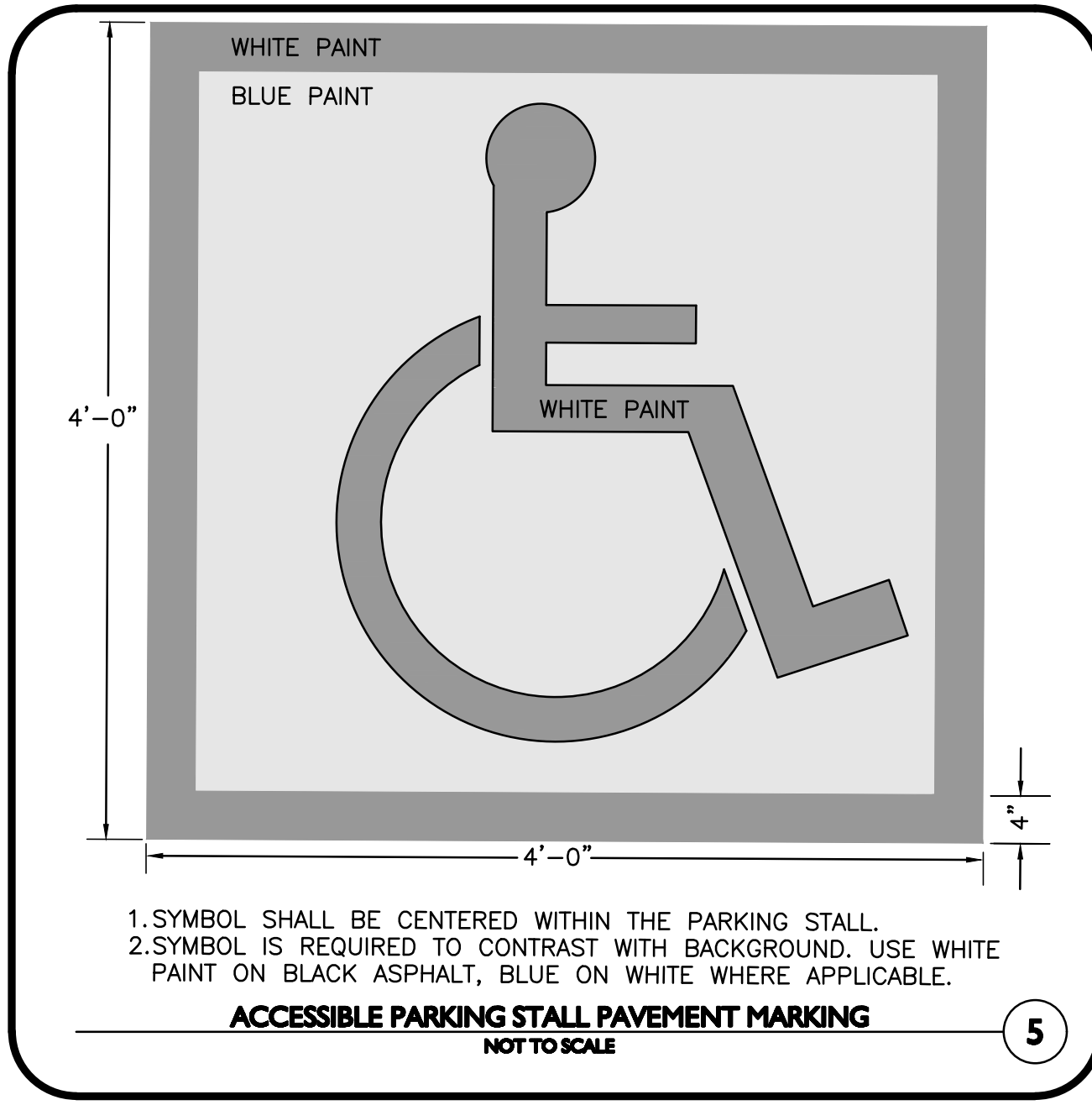
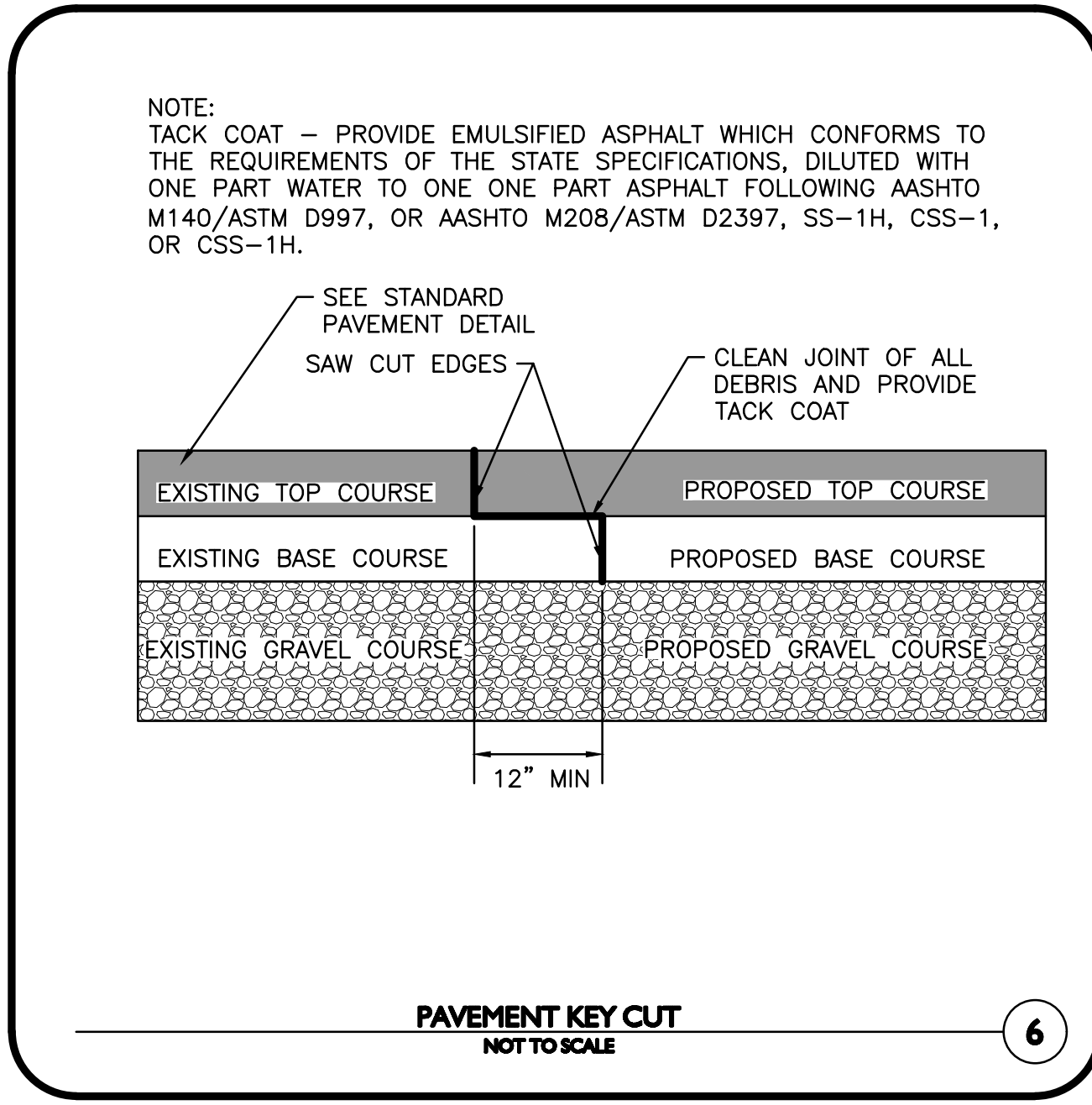
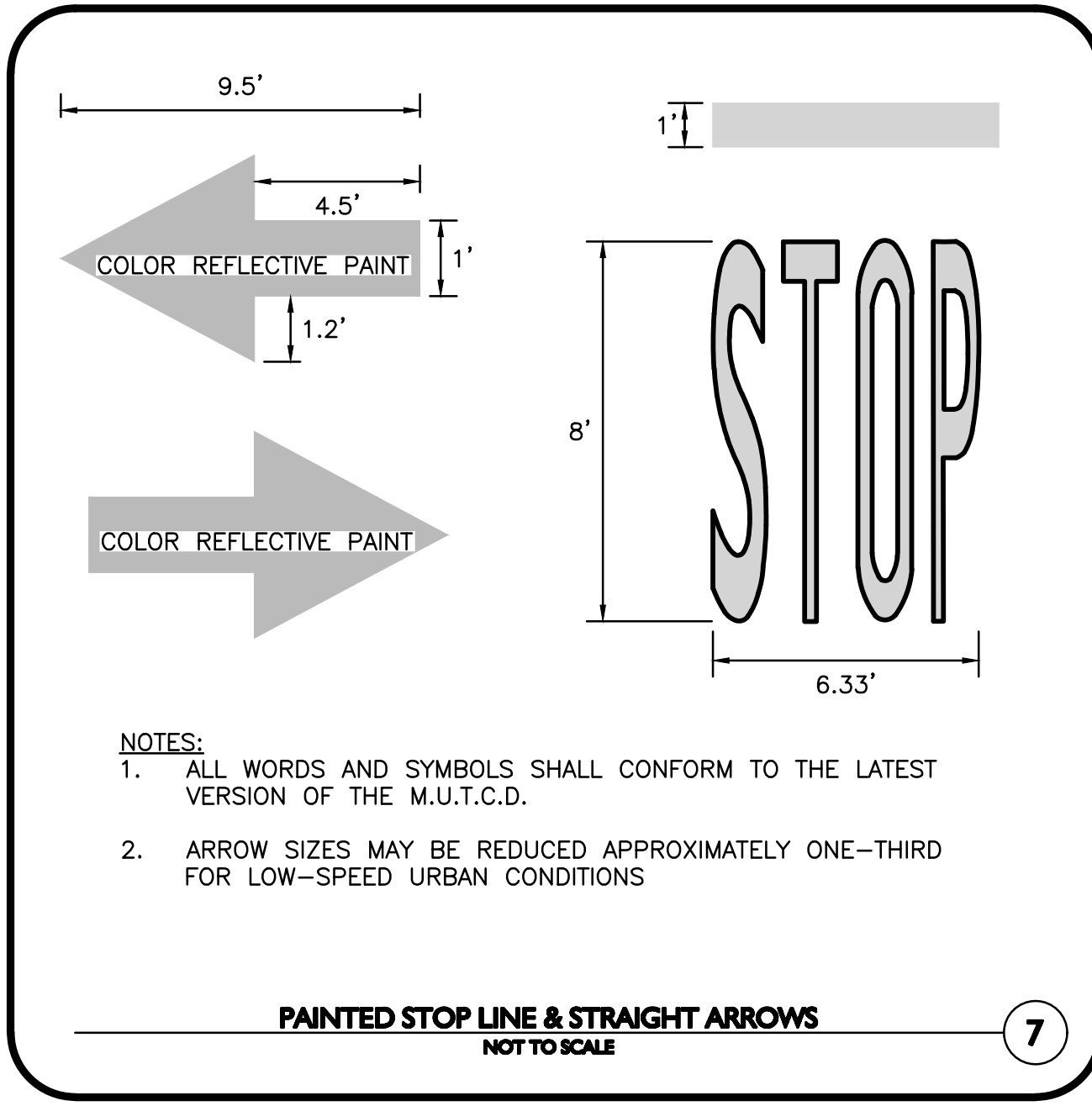
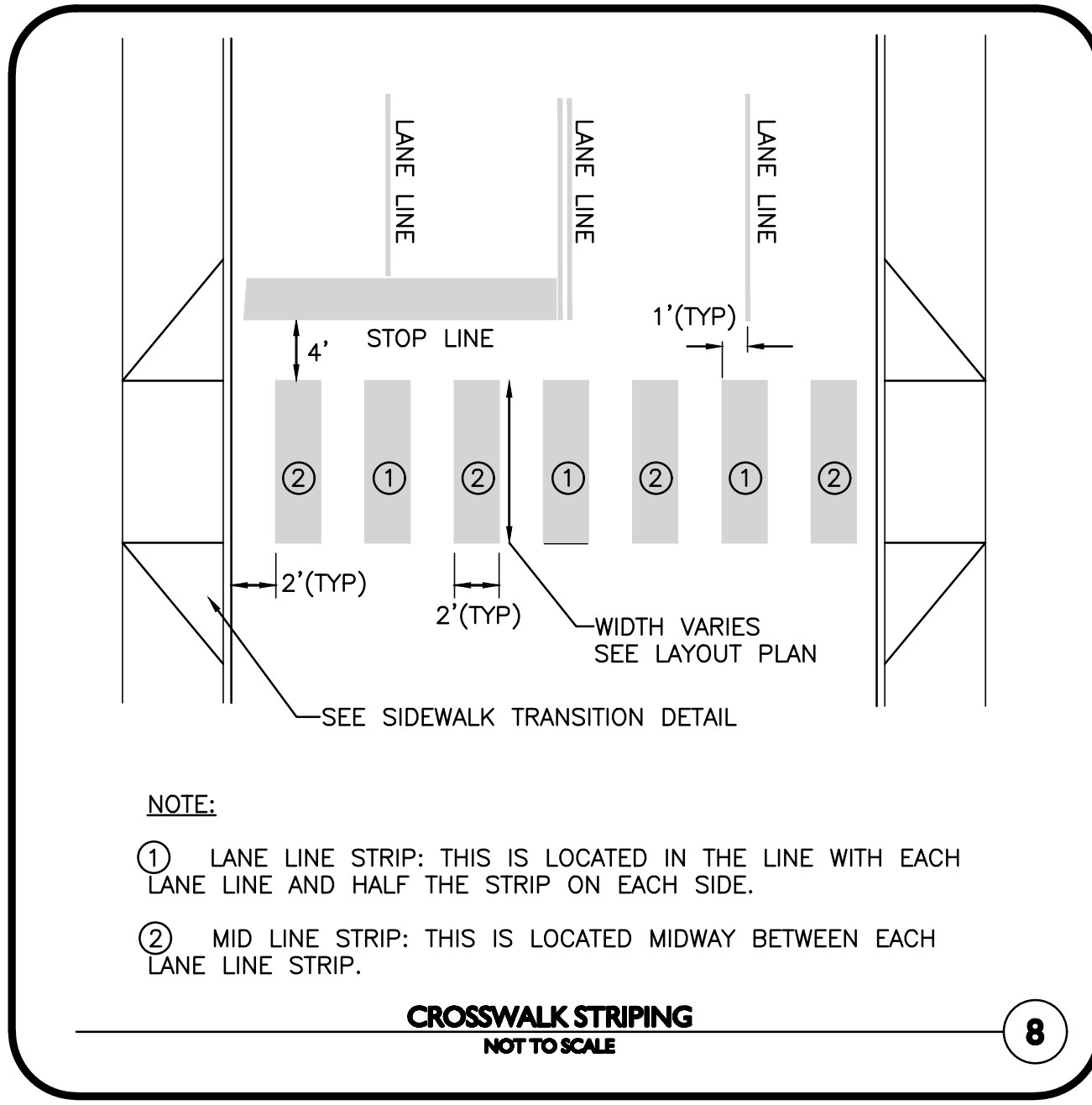
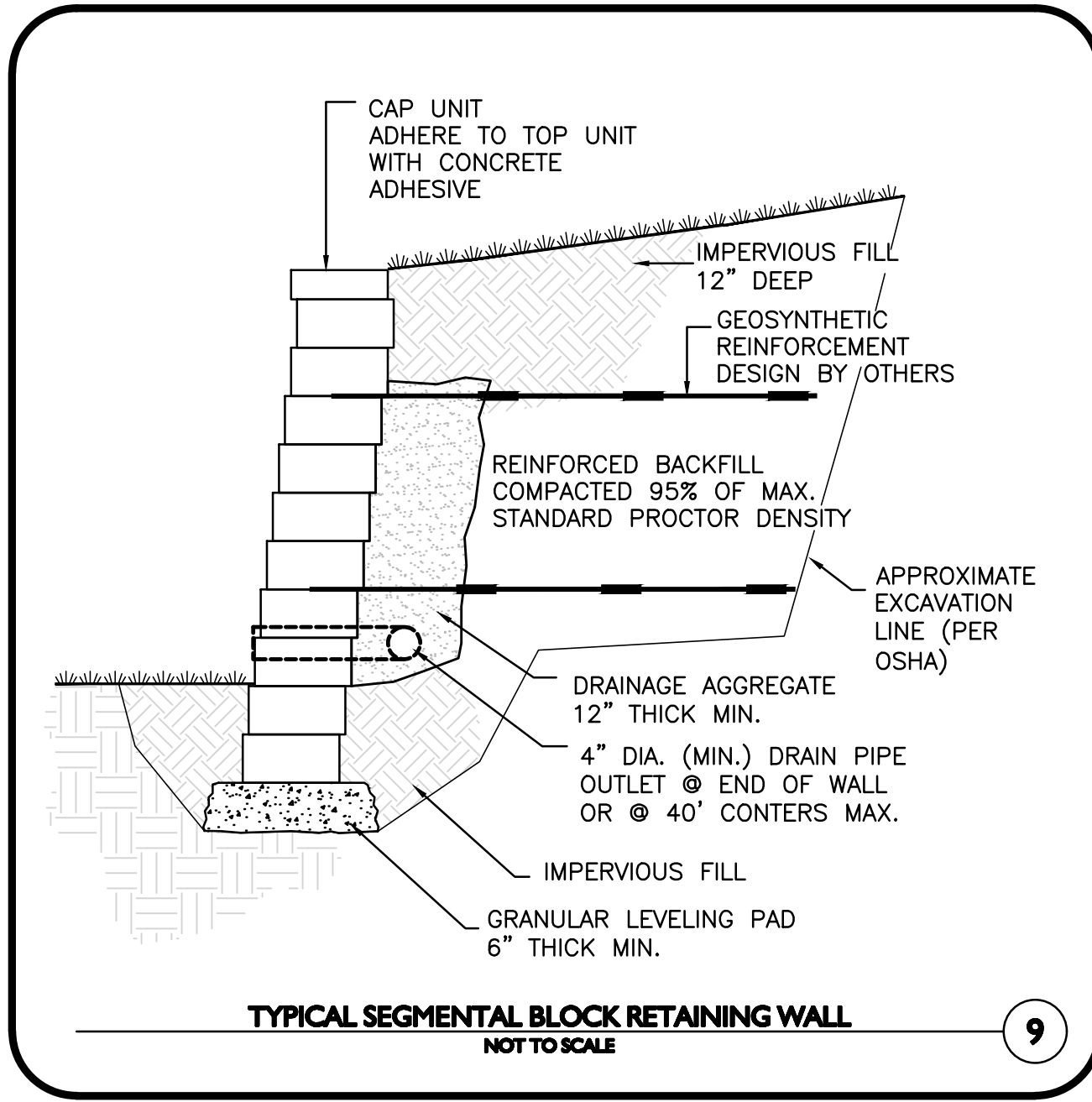
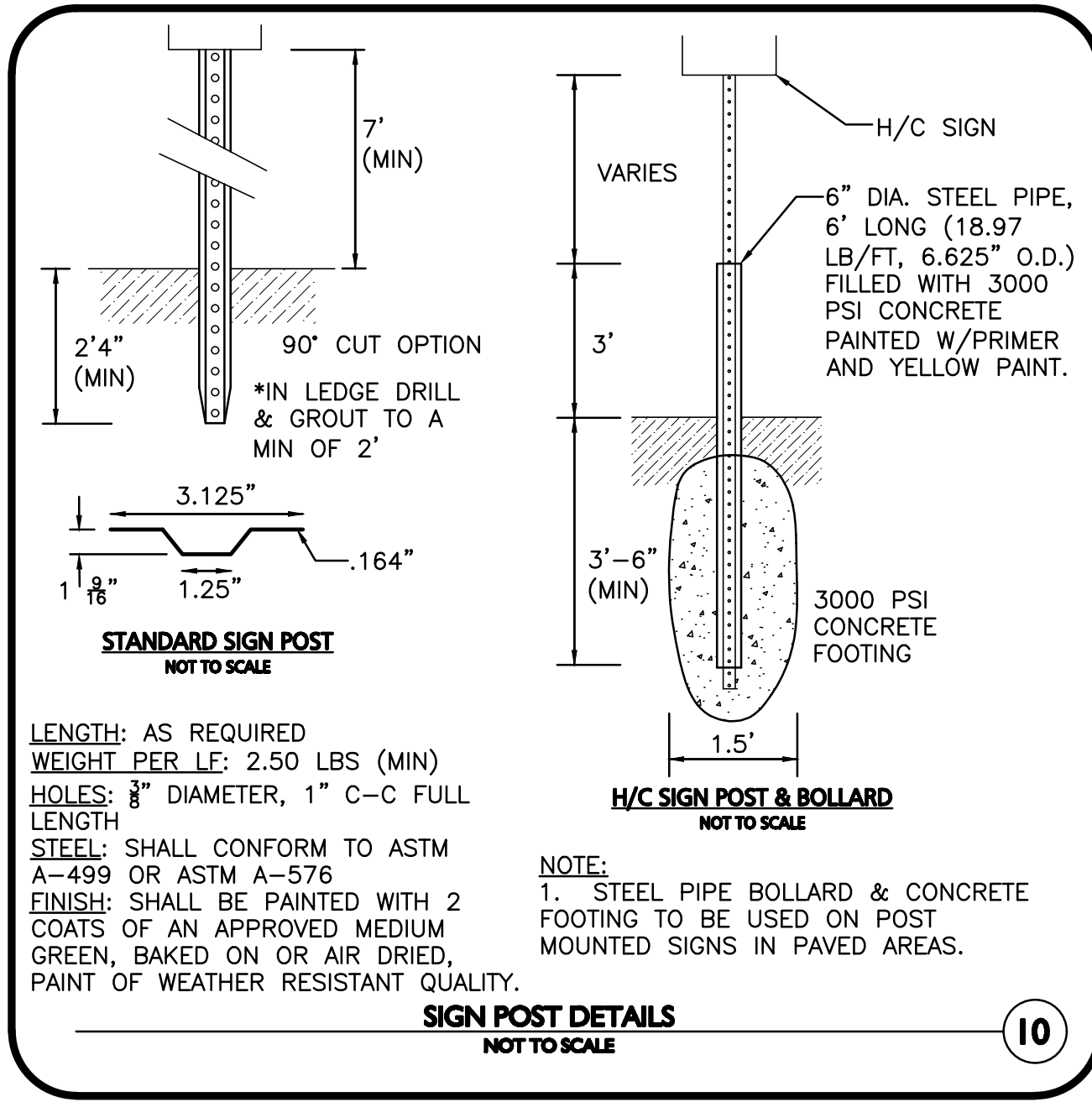
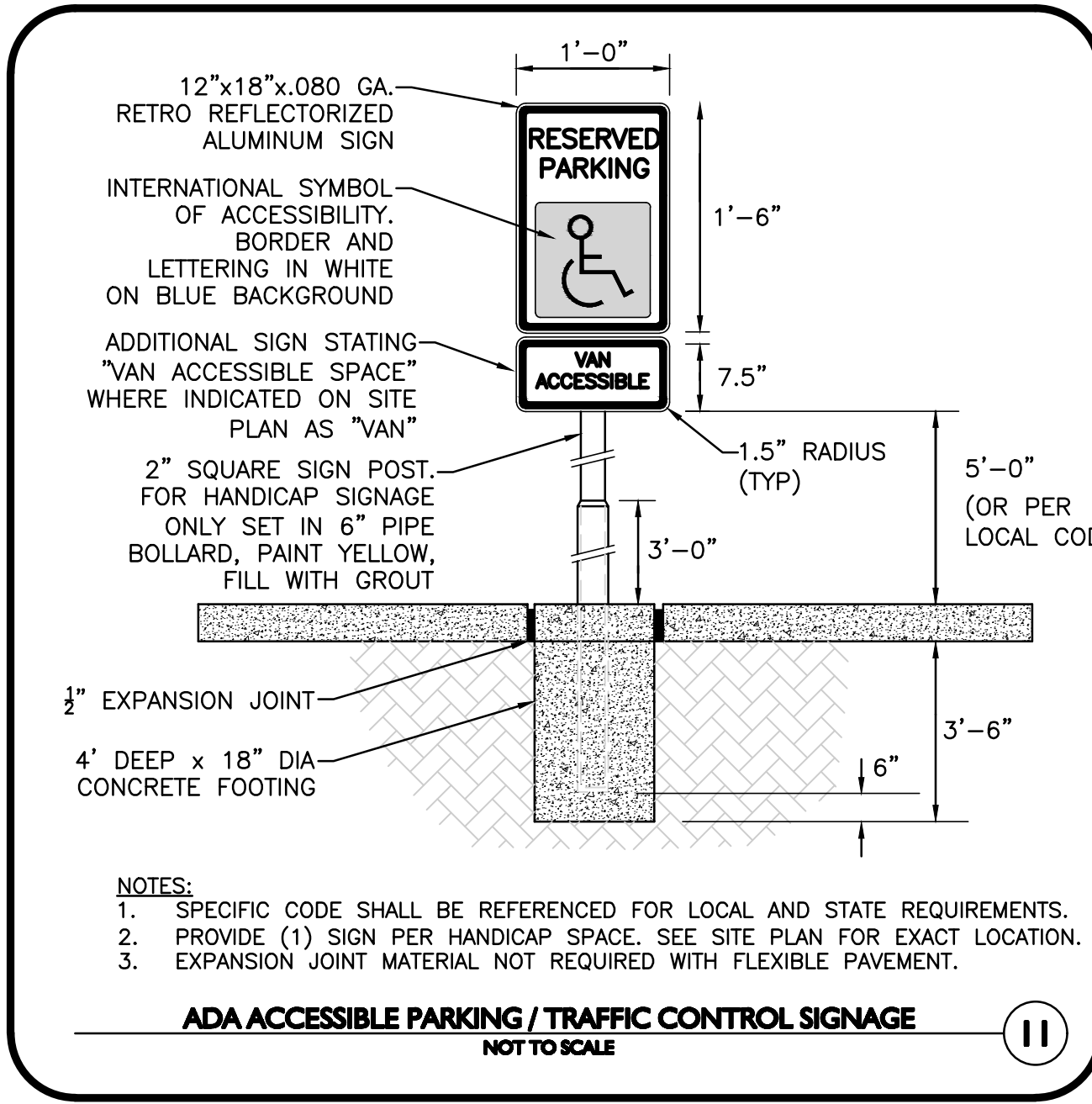
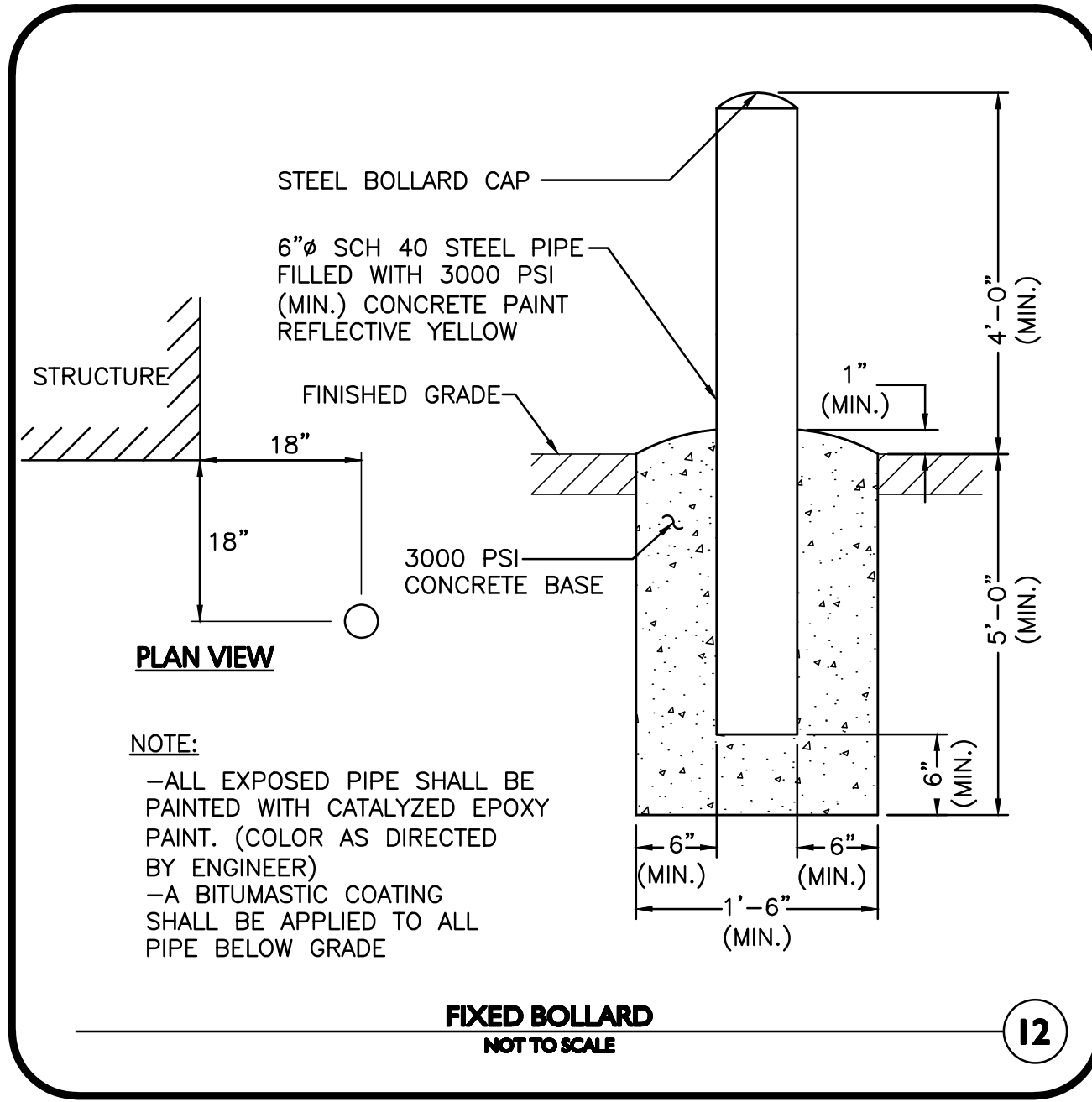
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PROFESSIONAL ENGINEER FOR  
ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
05	02/28/25	PER PEER REVIEW COMMENTS
04	02/13/25	LAYOUT REVISIONS PER WORKSHOP
03	01/23/25	LAYOUT REVISIONS PER WORKSHOP
02	10/18/24	ZBA RESUBMISSION
01	02/23/24	ZBA RESUBMISSION

APPLICANT/OWNER:  
**THOREAU RESIDENCES, LLC**  
275 FOREST RIDGE ROAD  
CONCORD, MA 01742

PROJECT:  
**THE RESIDENCES AT THOREAU**  
275 FOREST RIDGE ROAD  
CONCORD, MA 01742

PROJECT NO. 1670-24 DATE: 12/20/2023  
SCALE: AS SHOWN DWG. NAME: C-1670-24  
DESIGNED BY: BDP CHECKED BY: PLC

PREPARED BY:

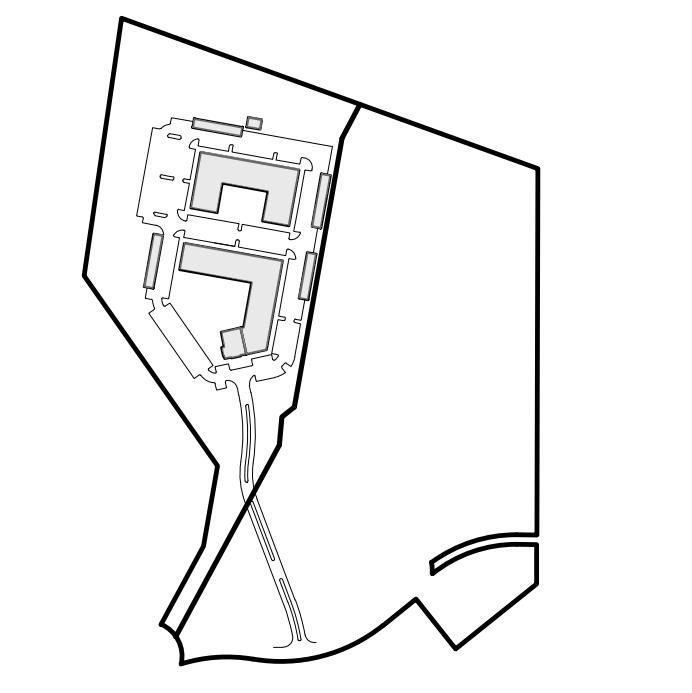
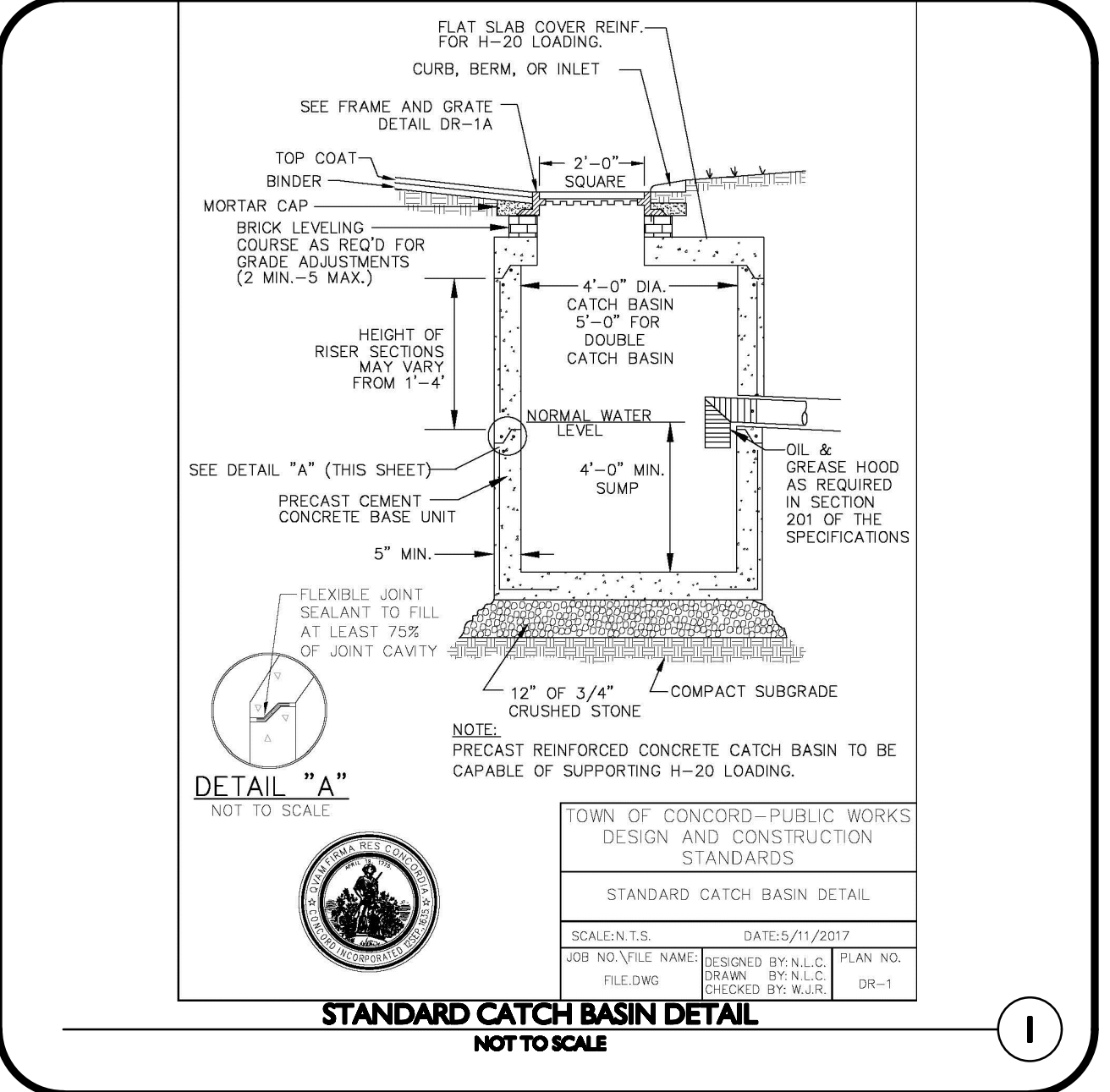
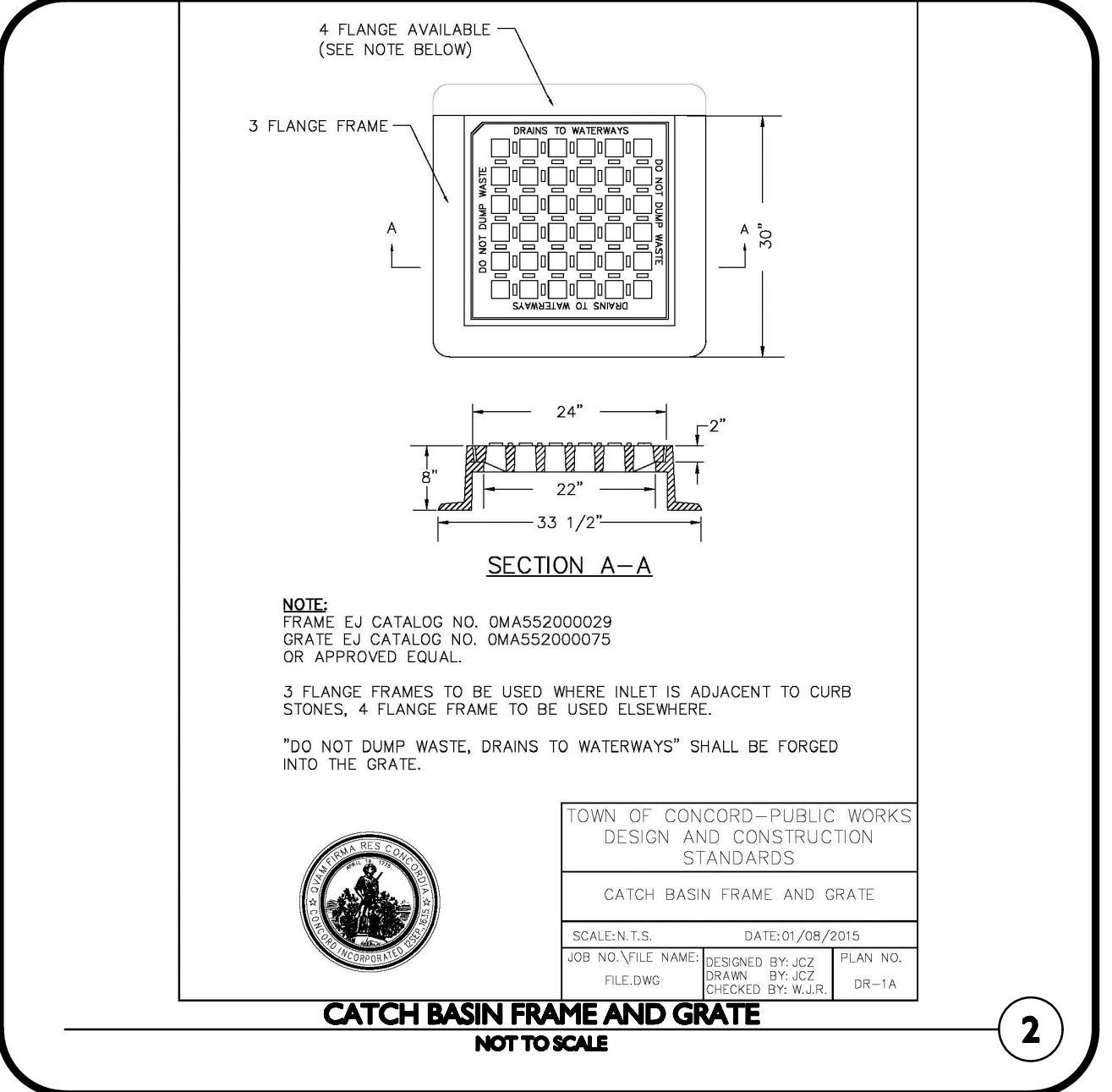
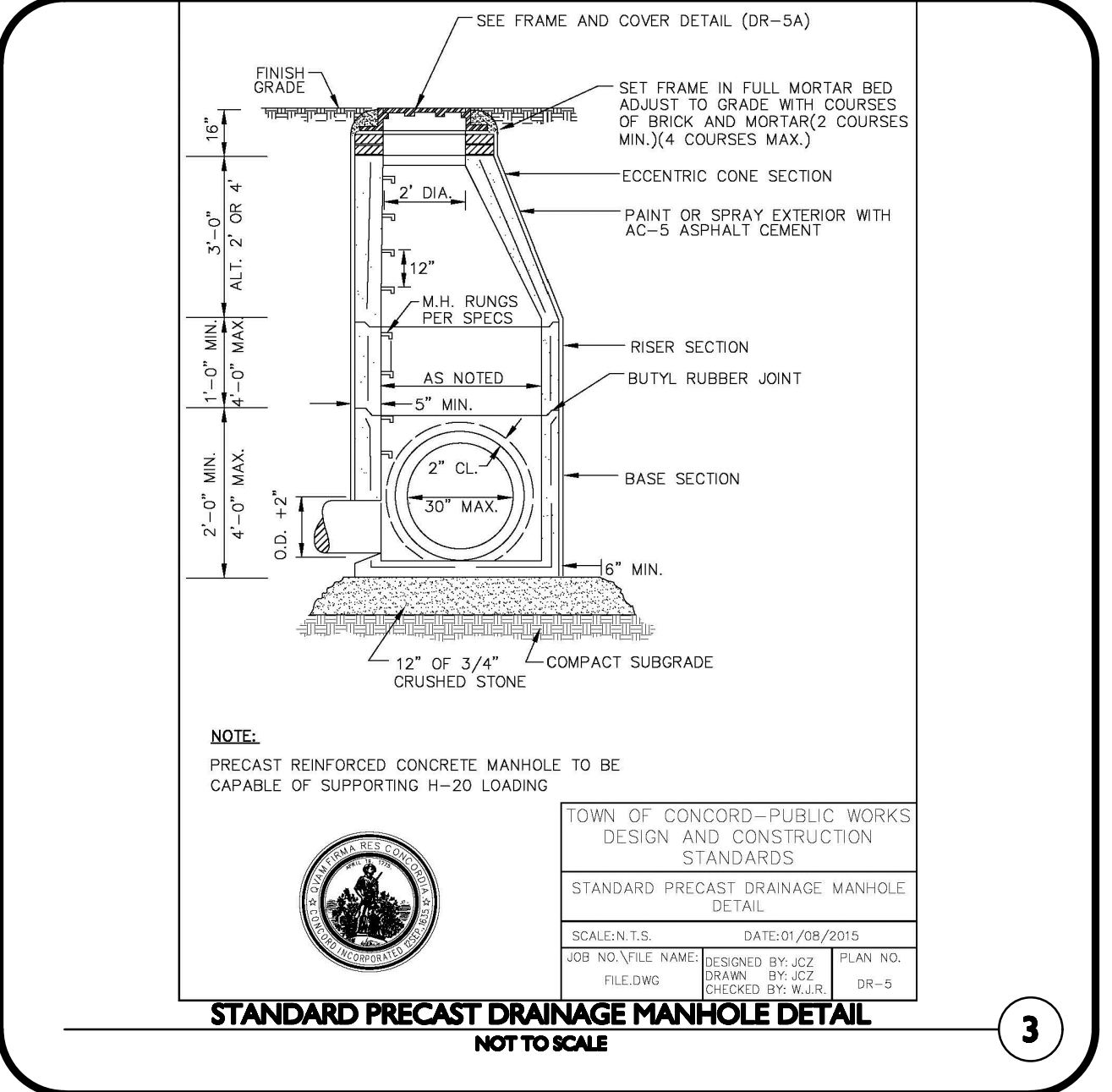
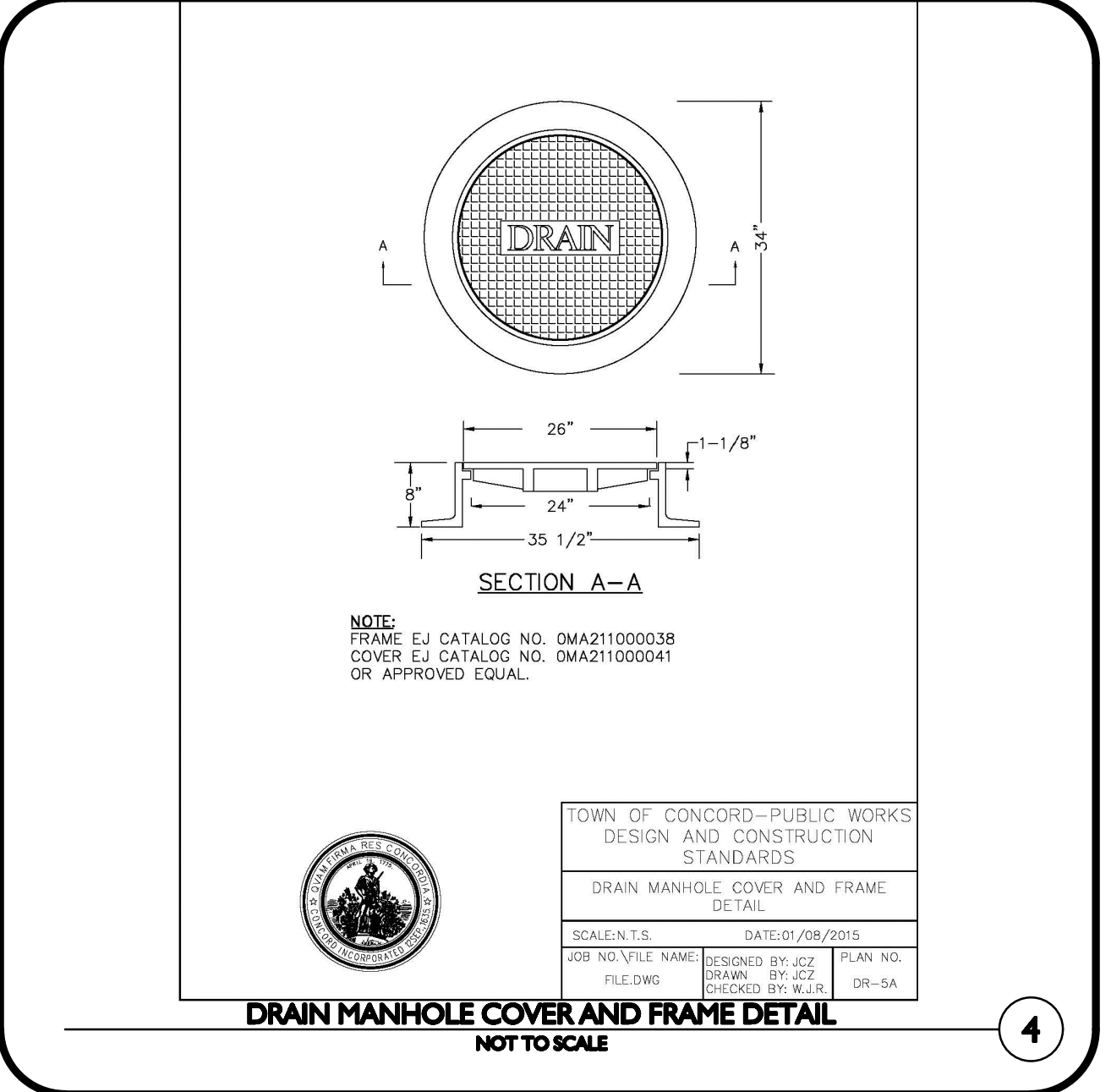
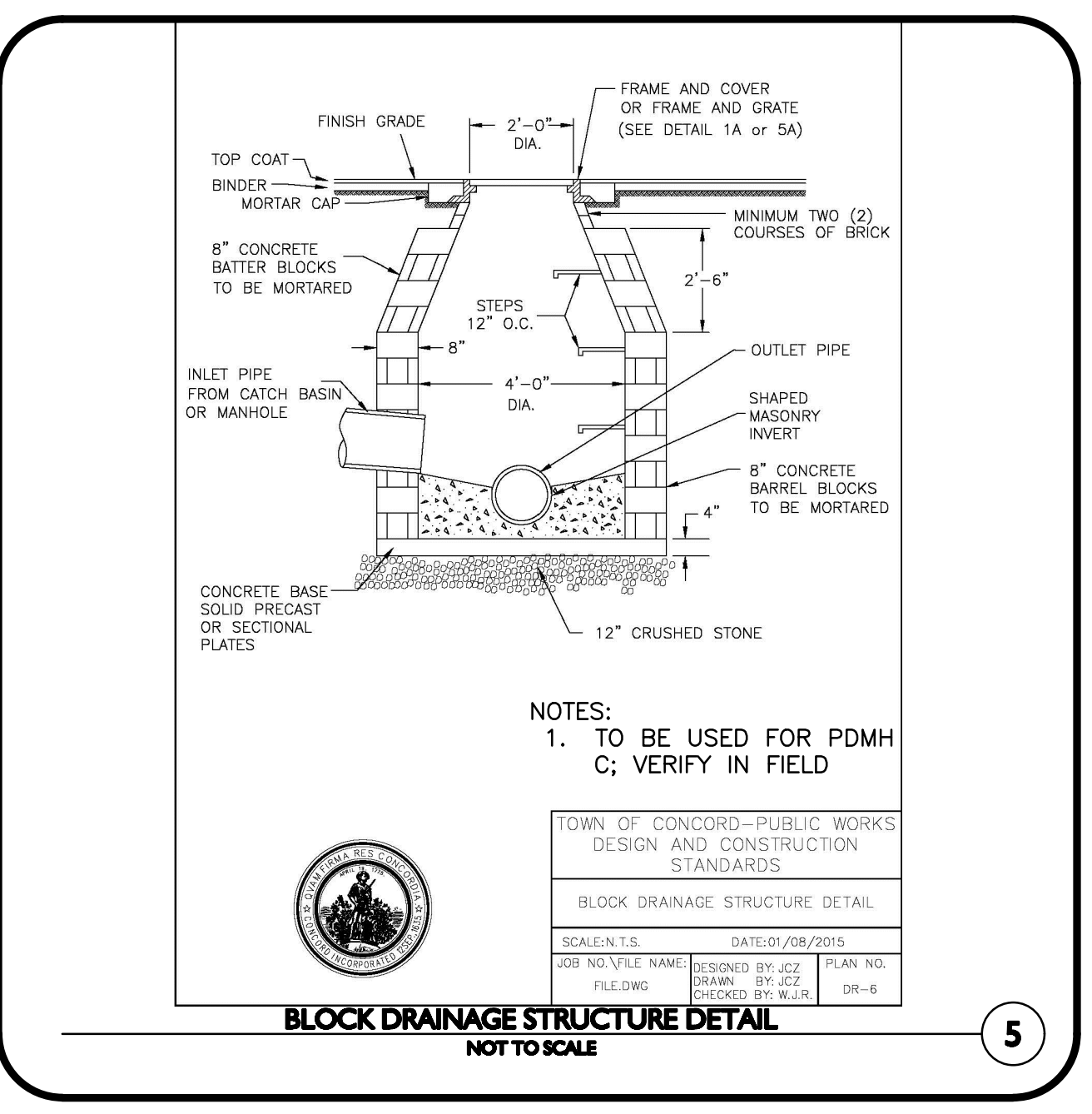
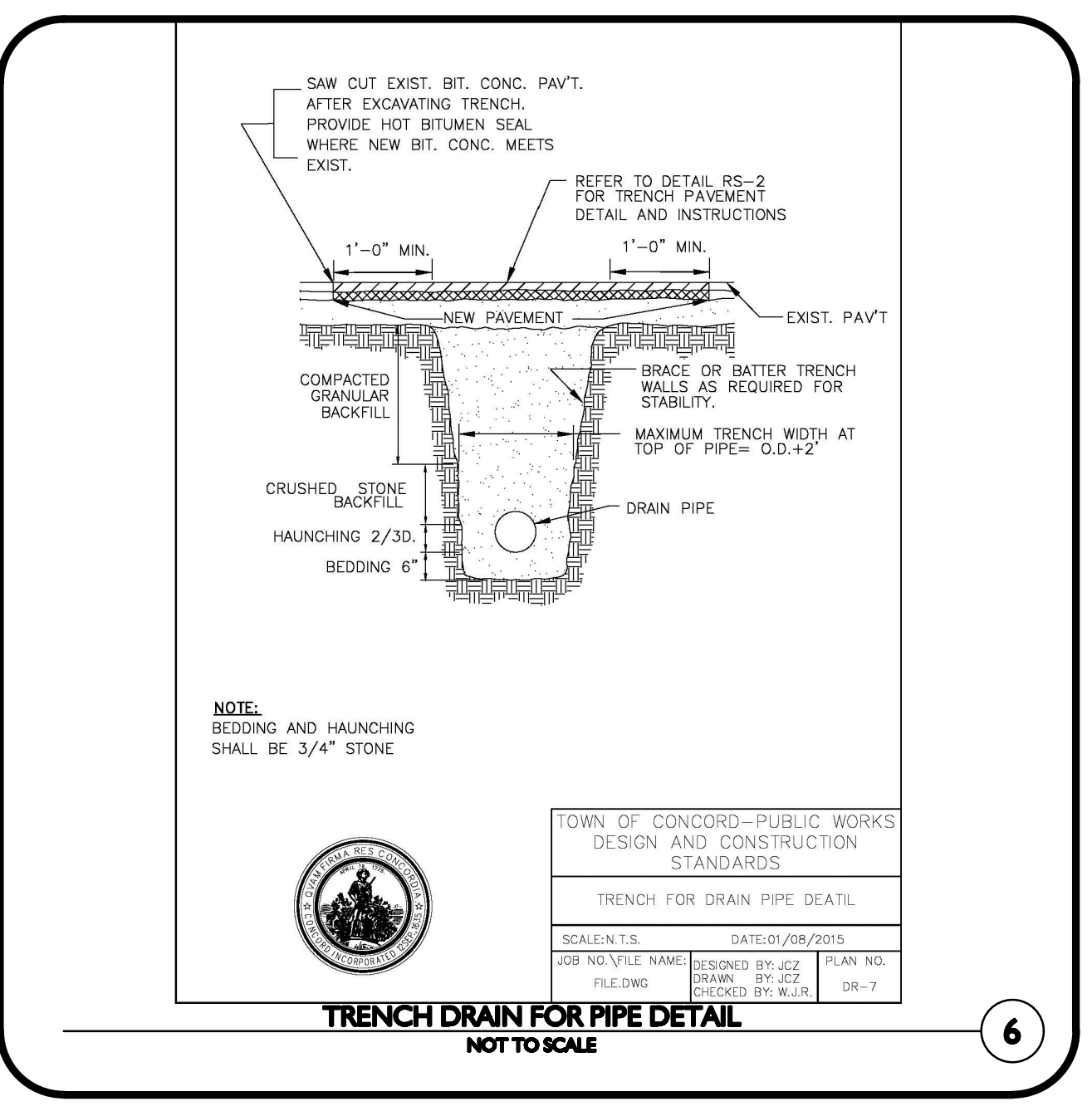
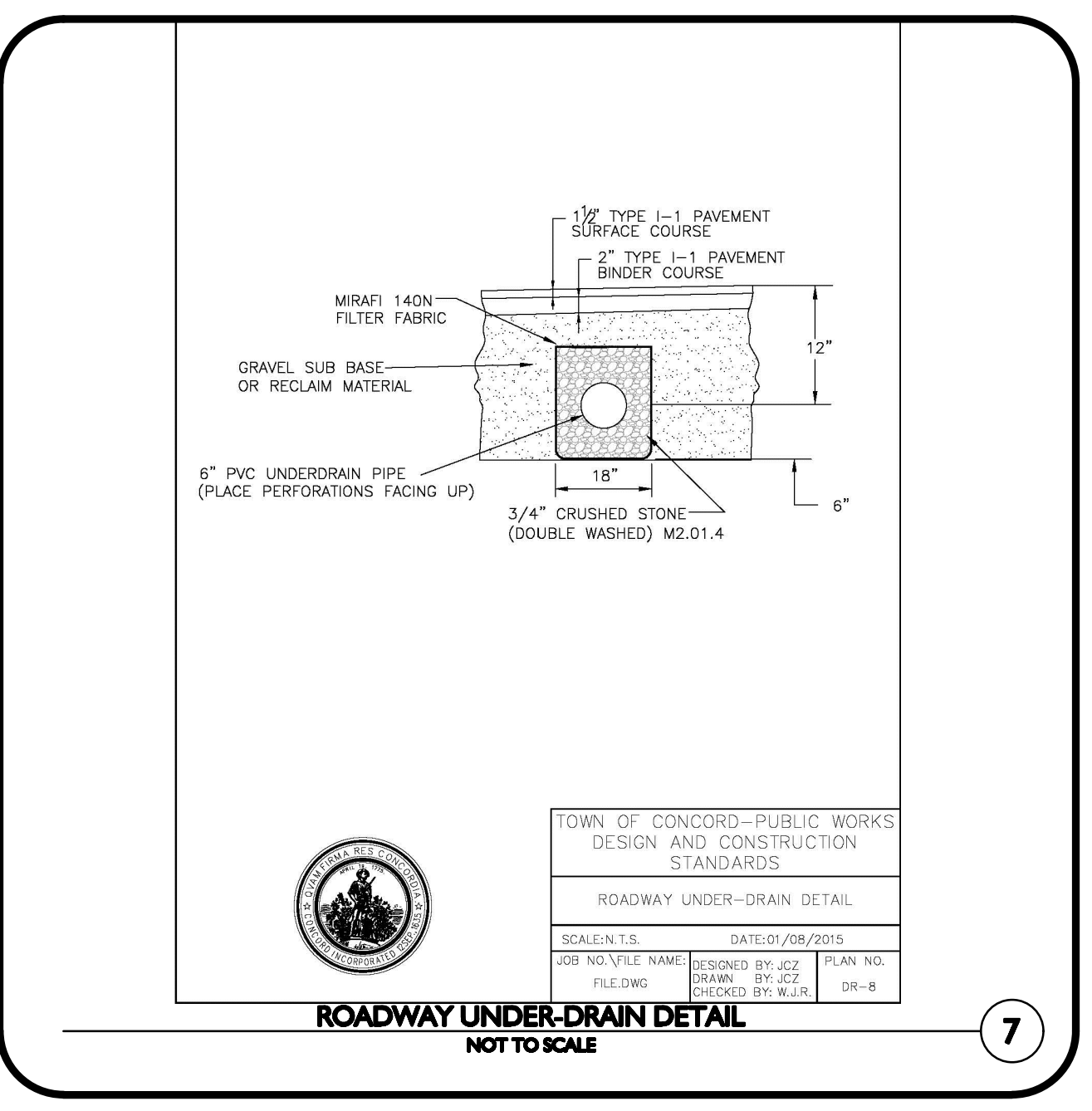
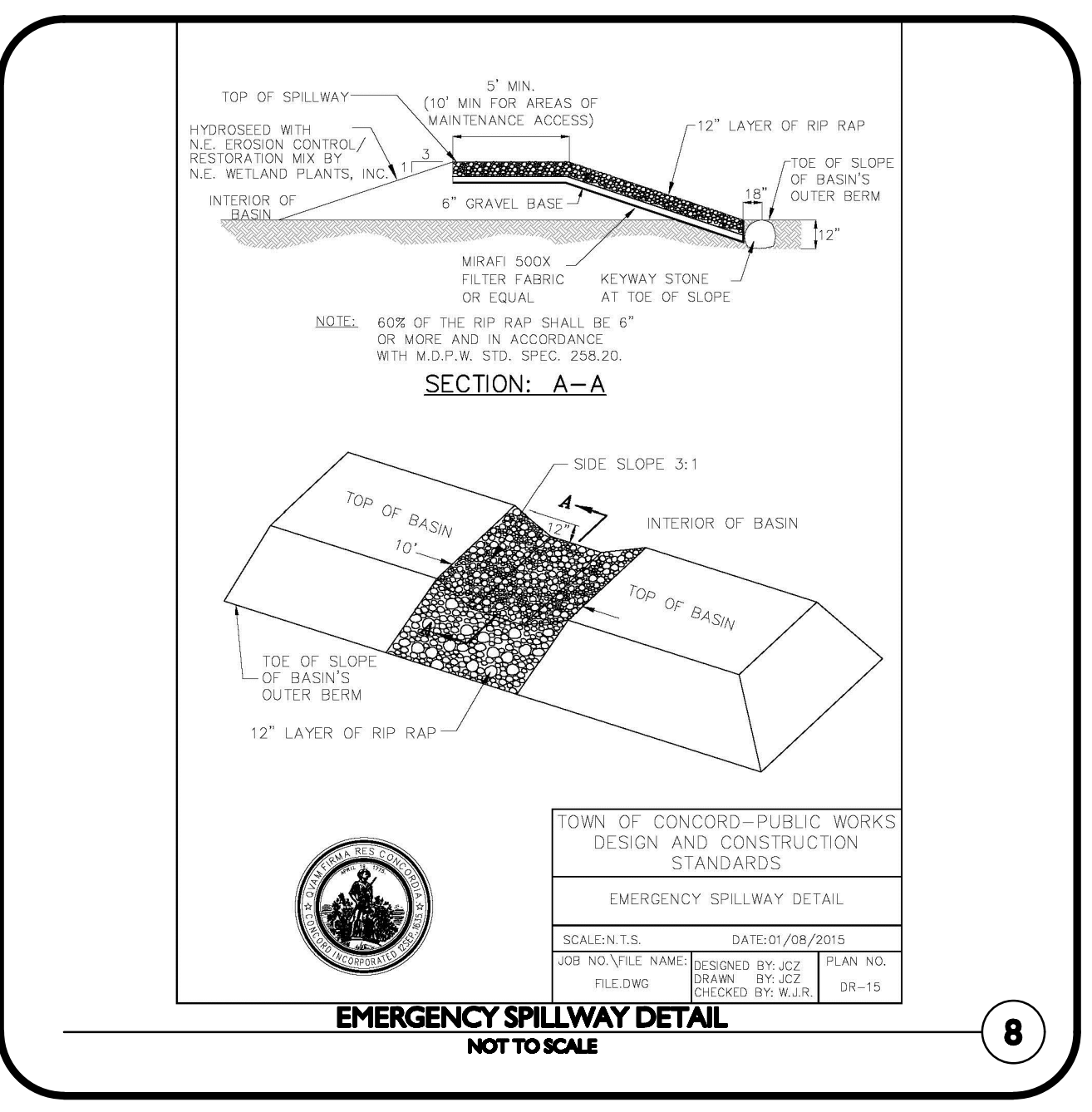
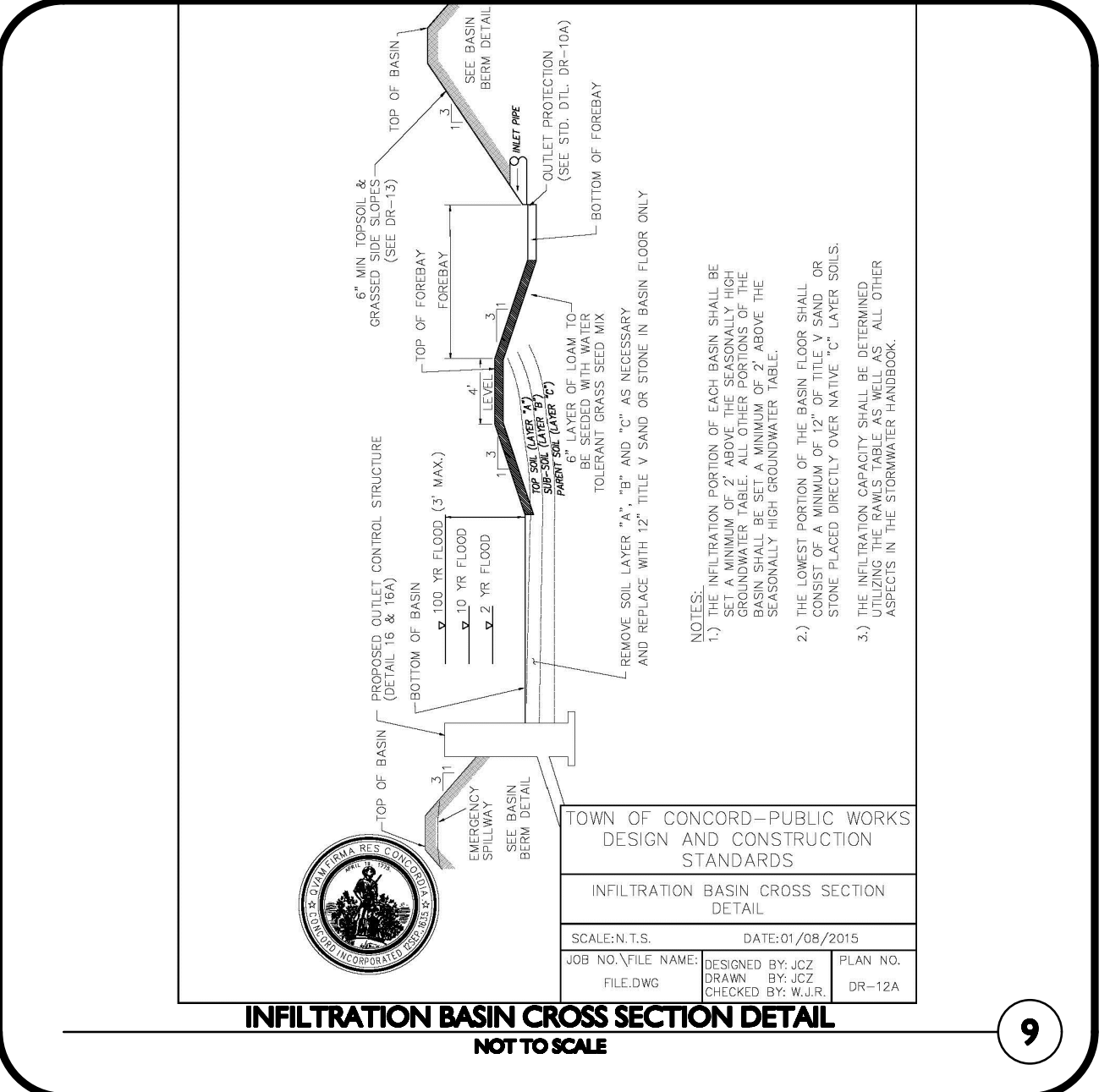
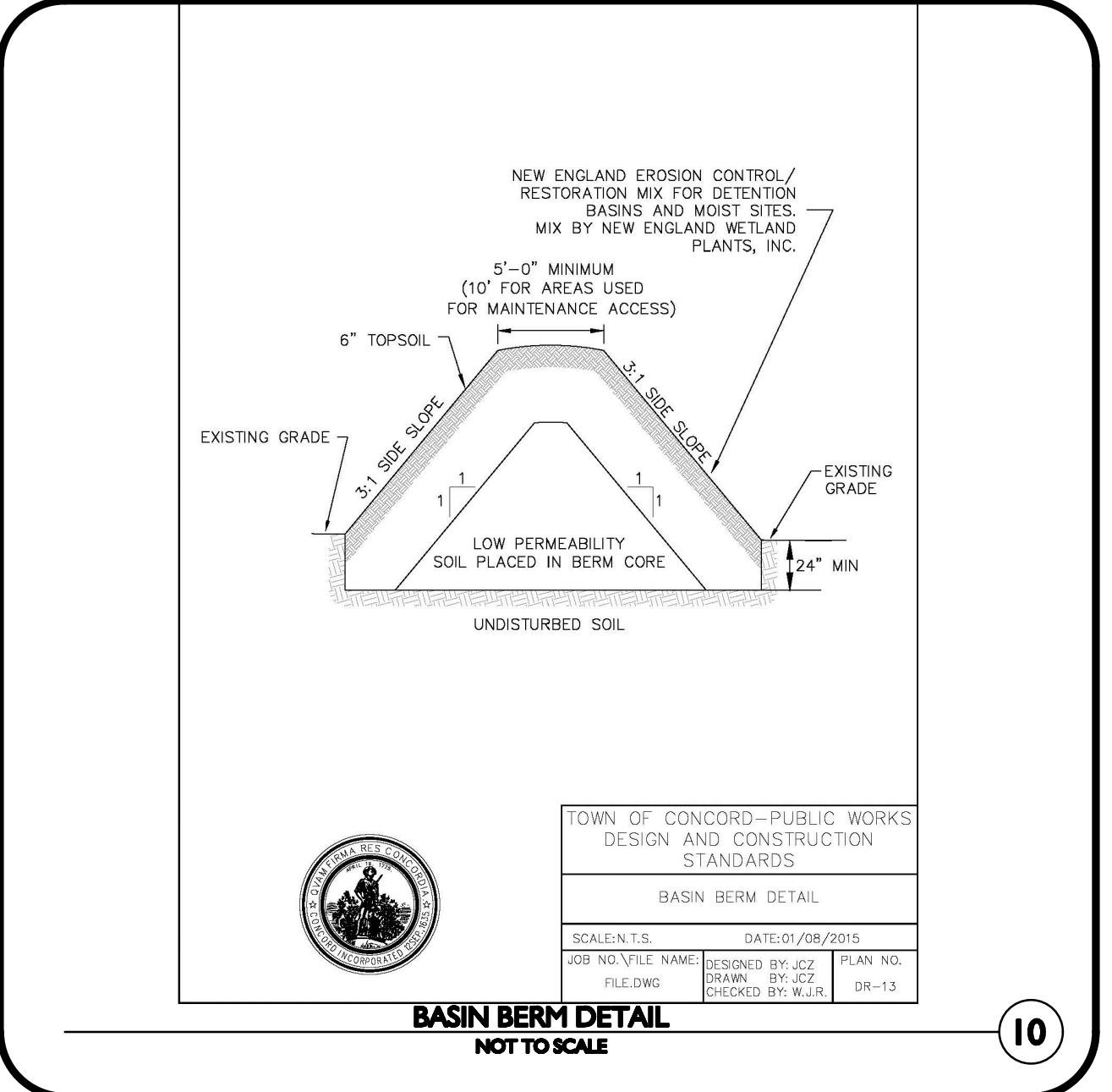
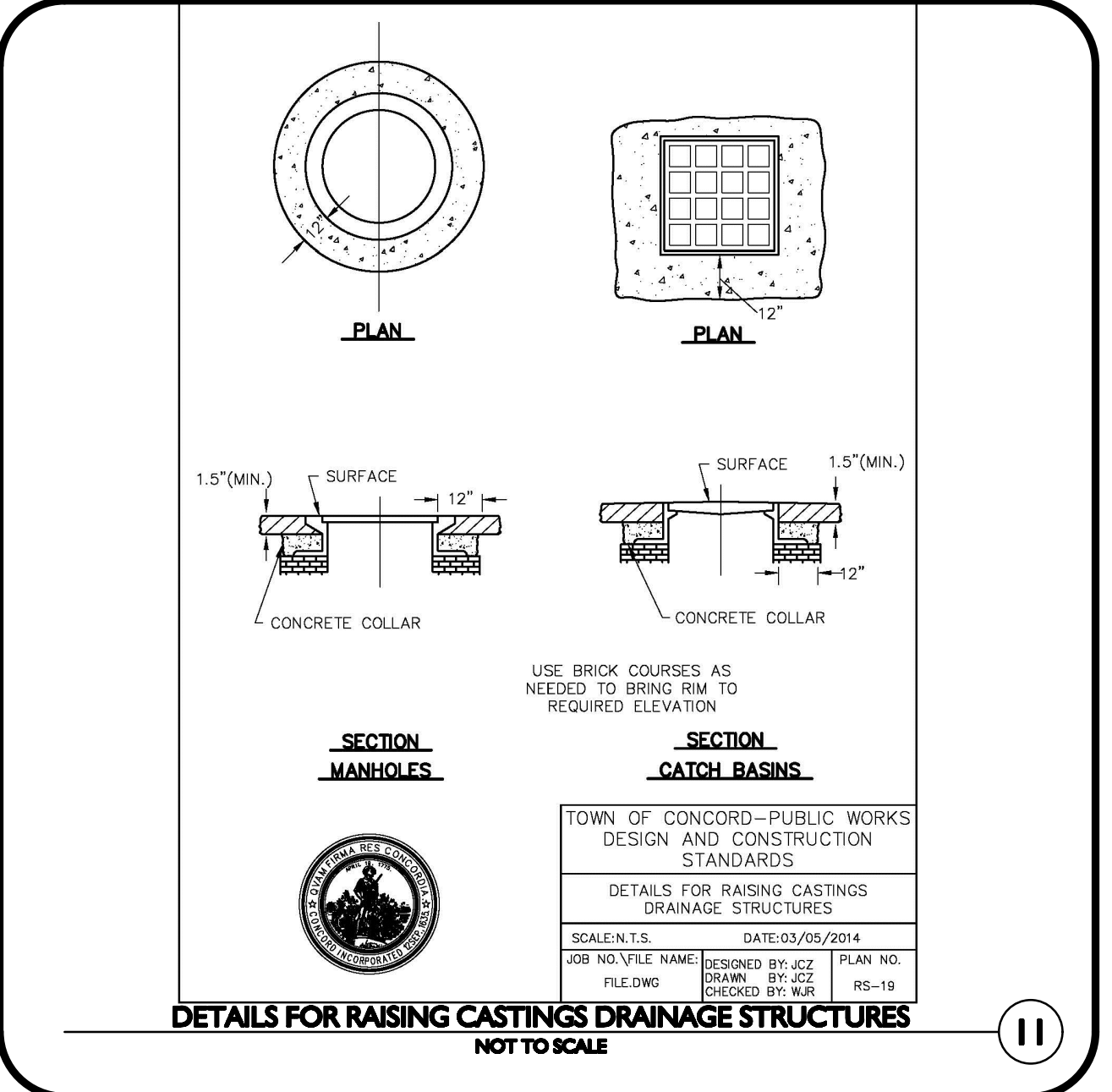
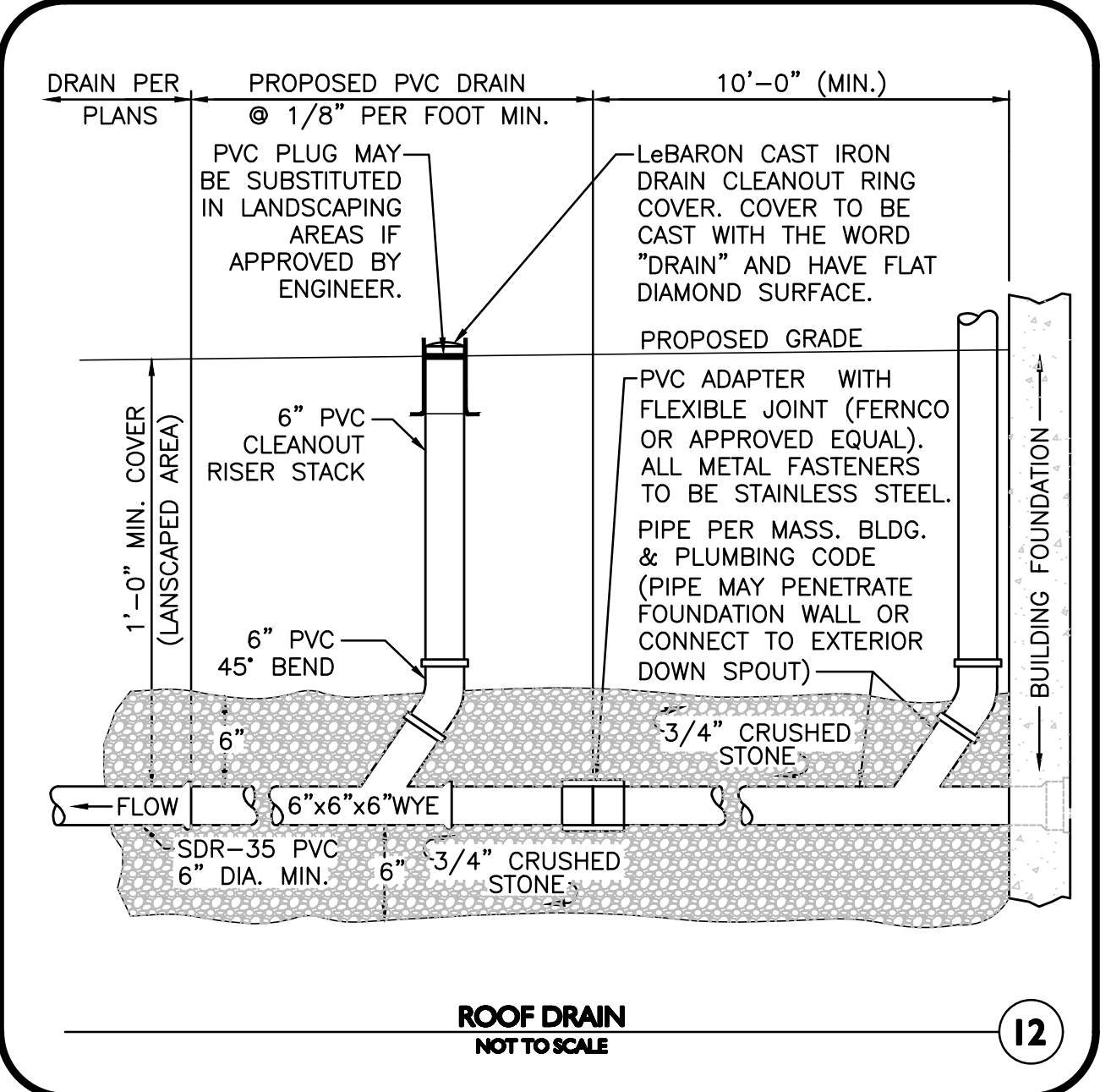
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DRAWING TITLE: **DETAILS** SHEET No. **C-503**

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KEYSHEET

**ISSUED FOR REVIEW**  
DEC. 20, 2023 REV FEB. 28, 2025



PROFESSIONAL ENGINEER FOR  
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APPLICANT/OWNER:

THOREAU RESIDENCES, LLC  
275 FOREST RIDGE ROAD  
CONCORD, MA 01742

PROJECT:

THE RESIDENCES AT THOREAU  
275 FOREST RIDGE ROAD  
CONCORD, MA 01742

PROJECT NO. 1670-24 DATE: 12/20/2023

SCALE: AS SHOWN DWG. NAME: C-1670-24

DESIGNED BY: BDP CHECKED BY: PLC

PREPARED BY:



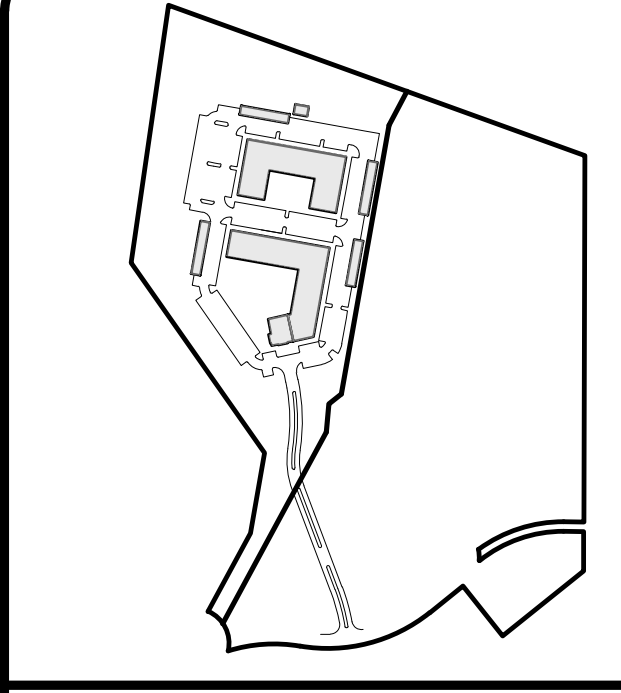
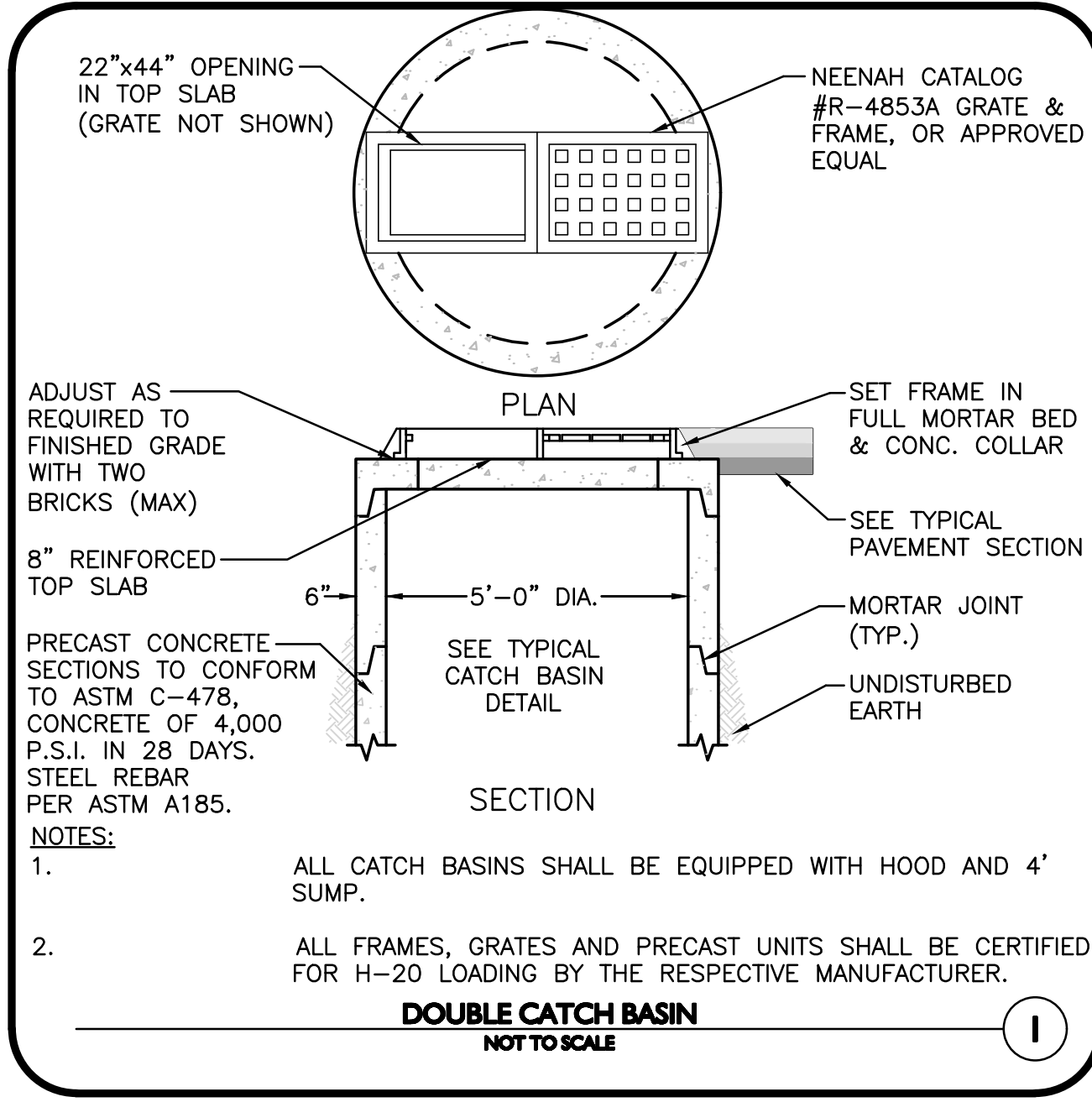
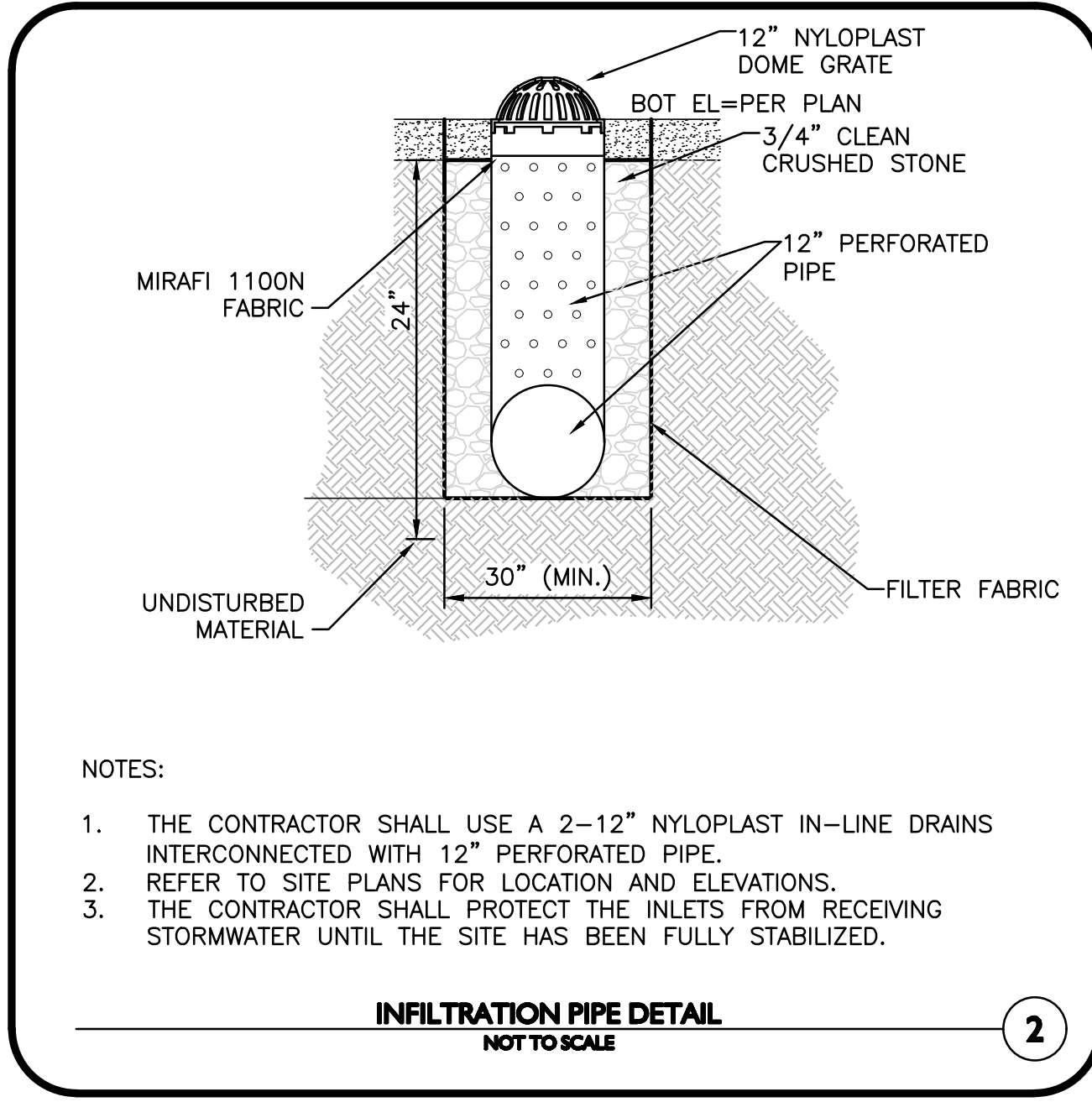
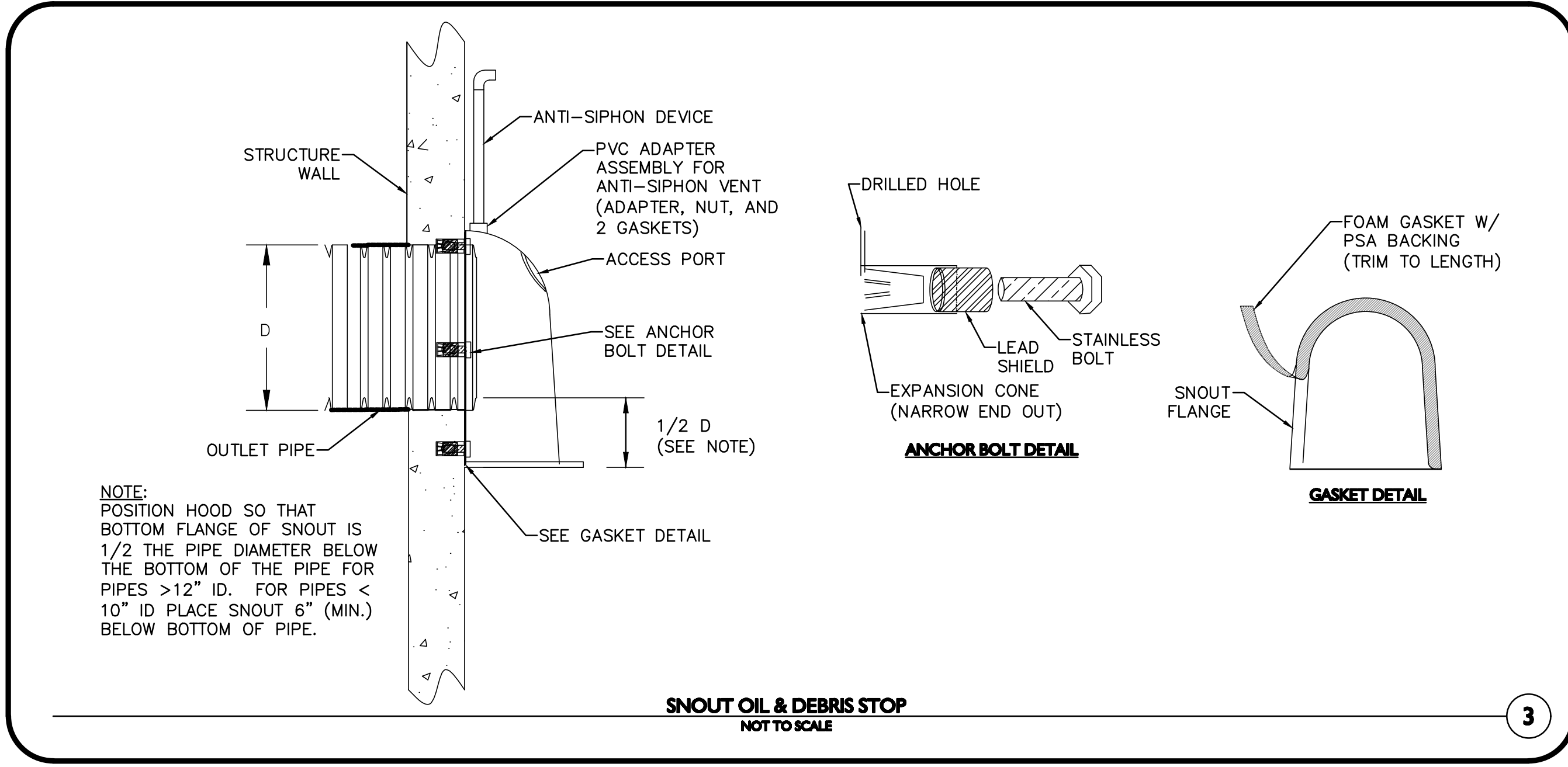
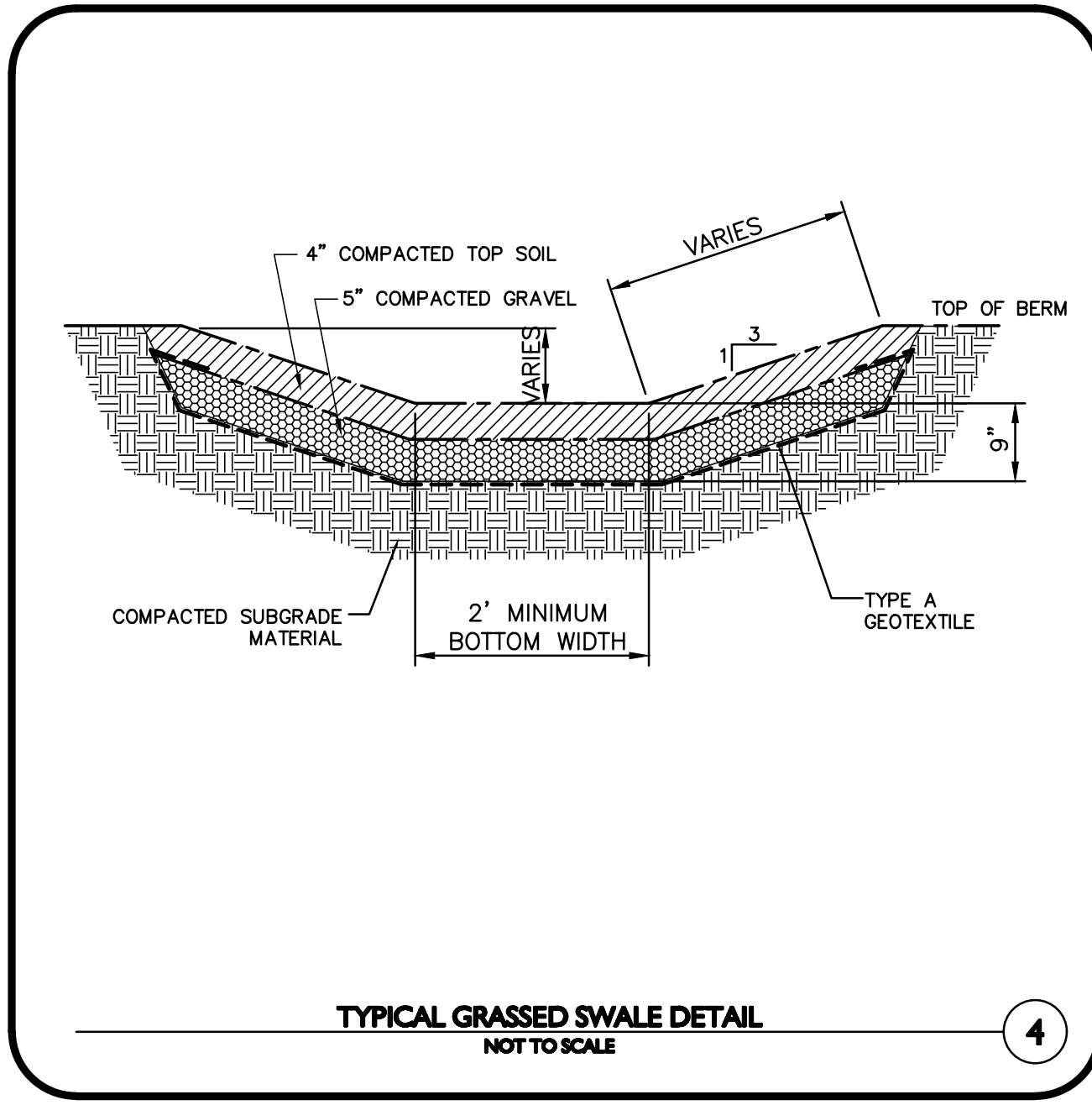
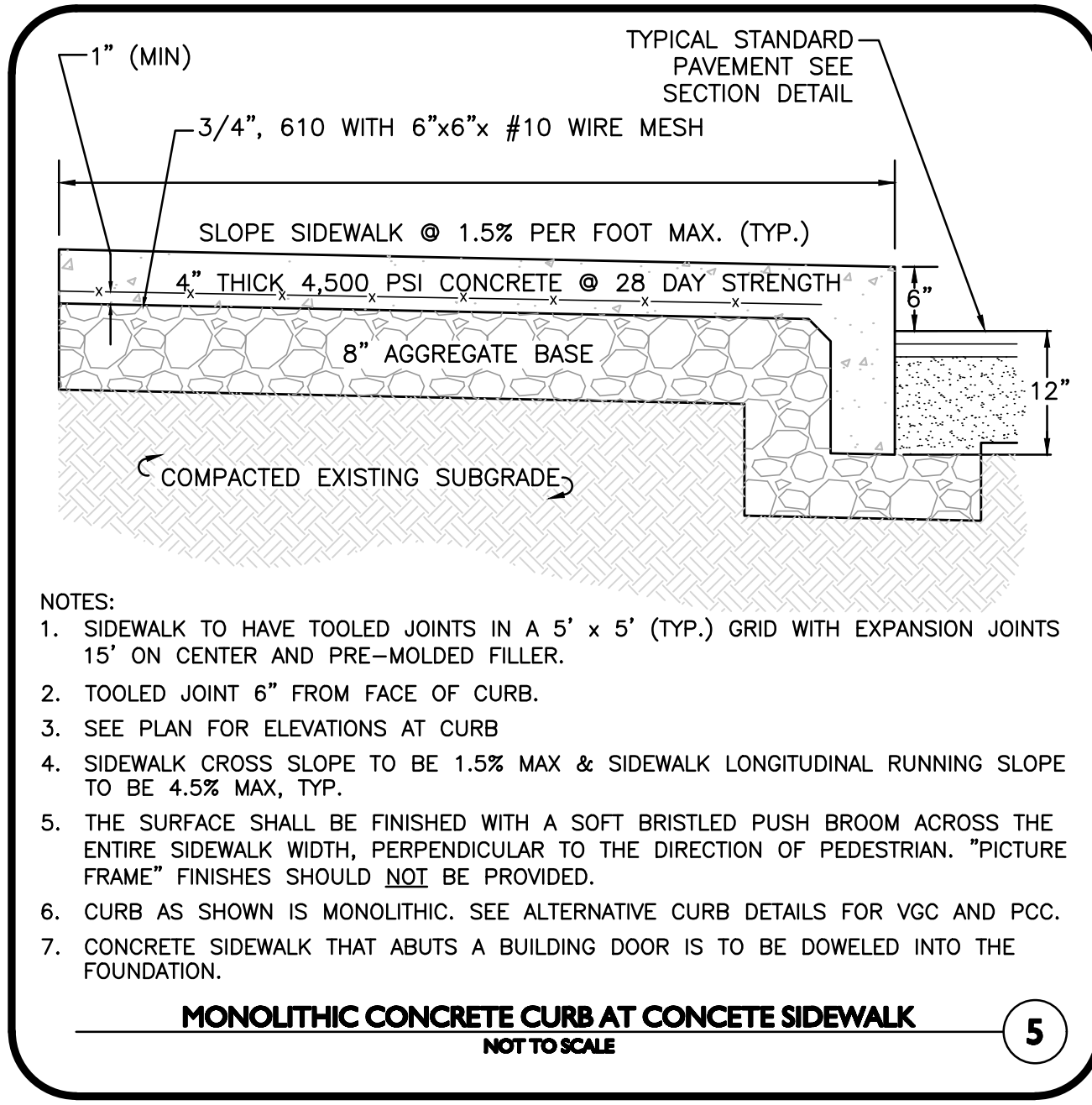
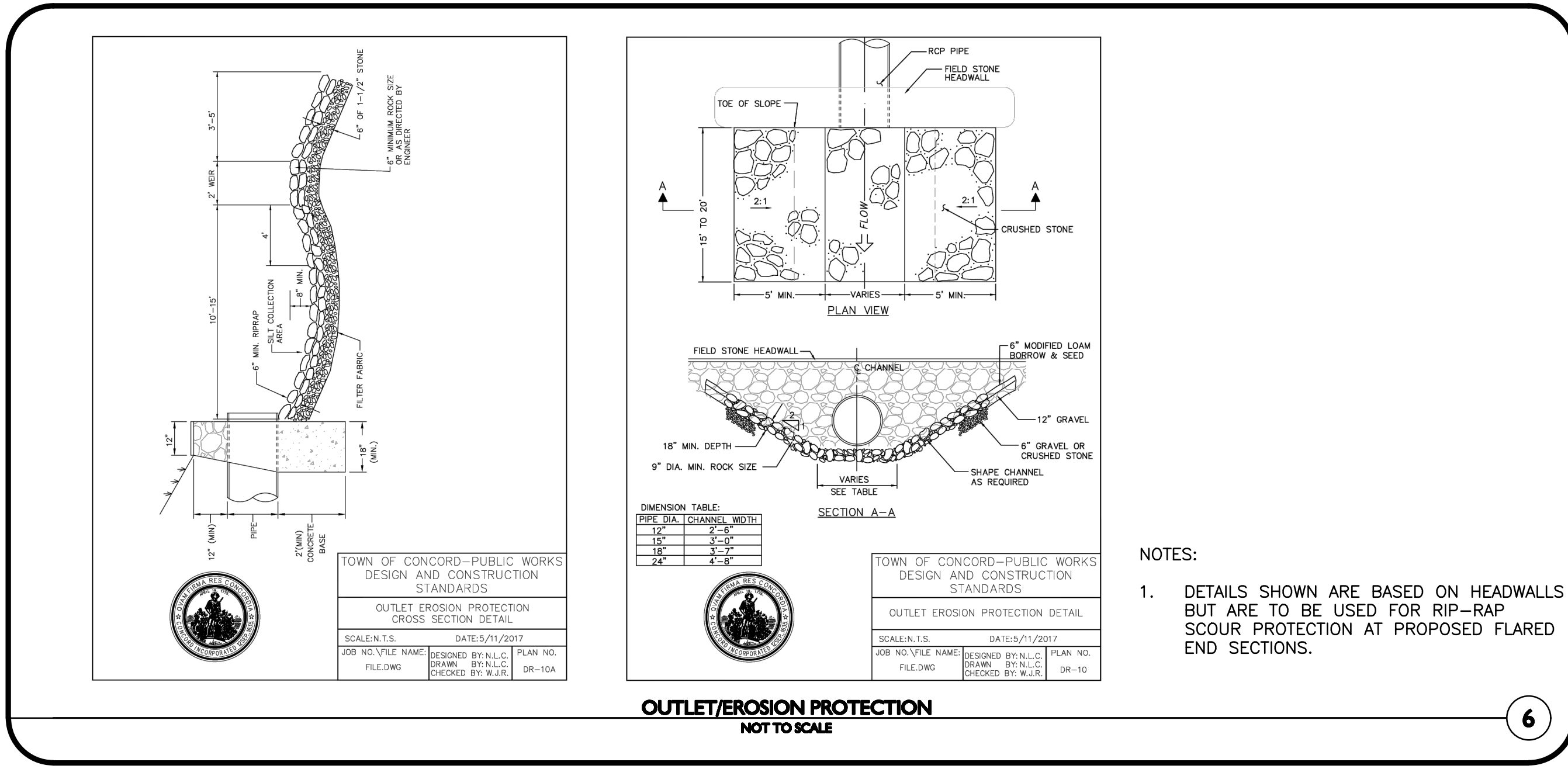
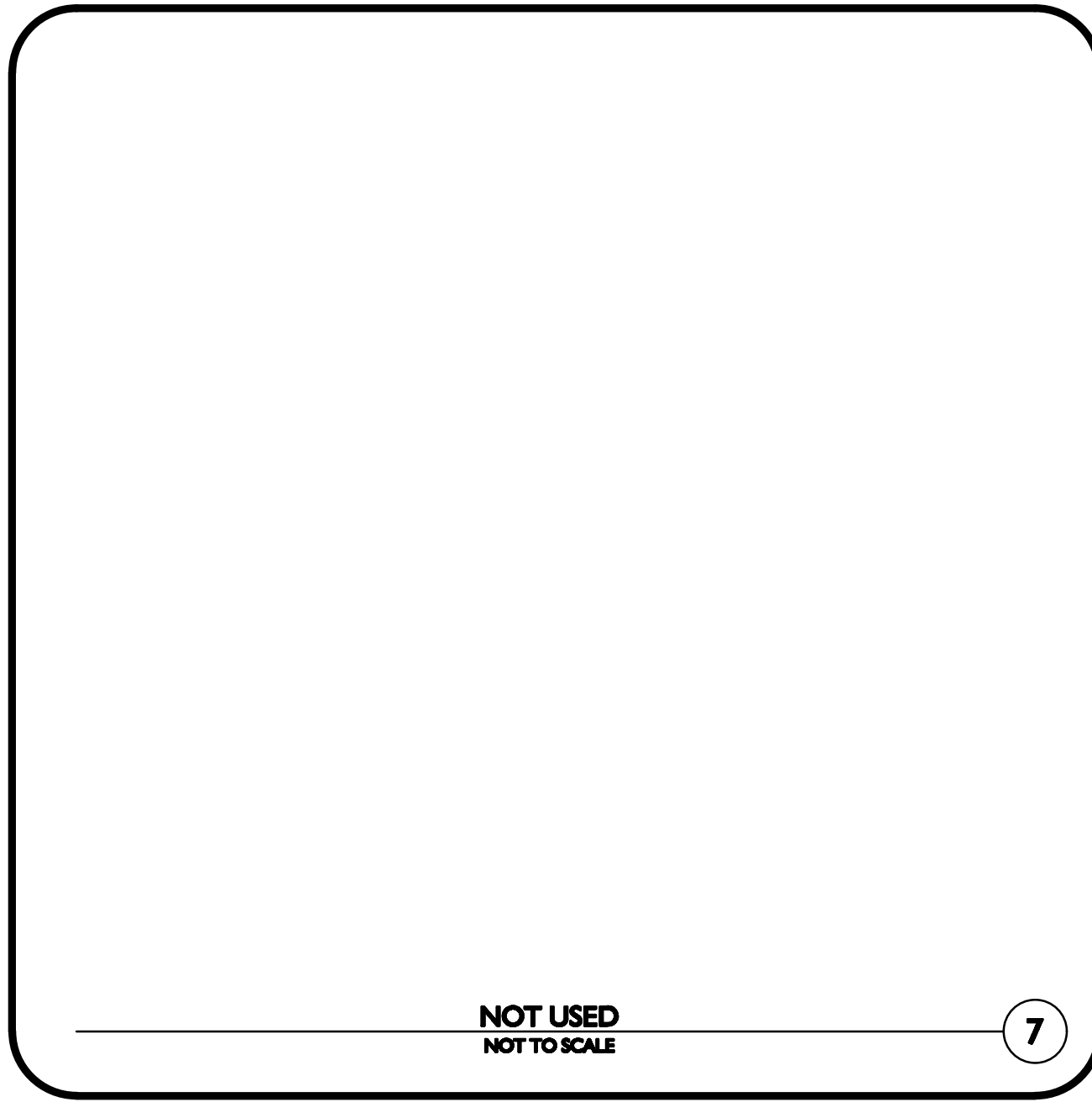
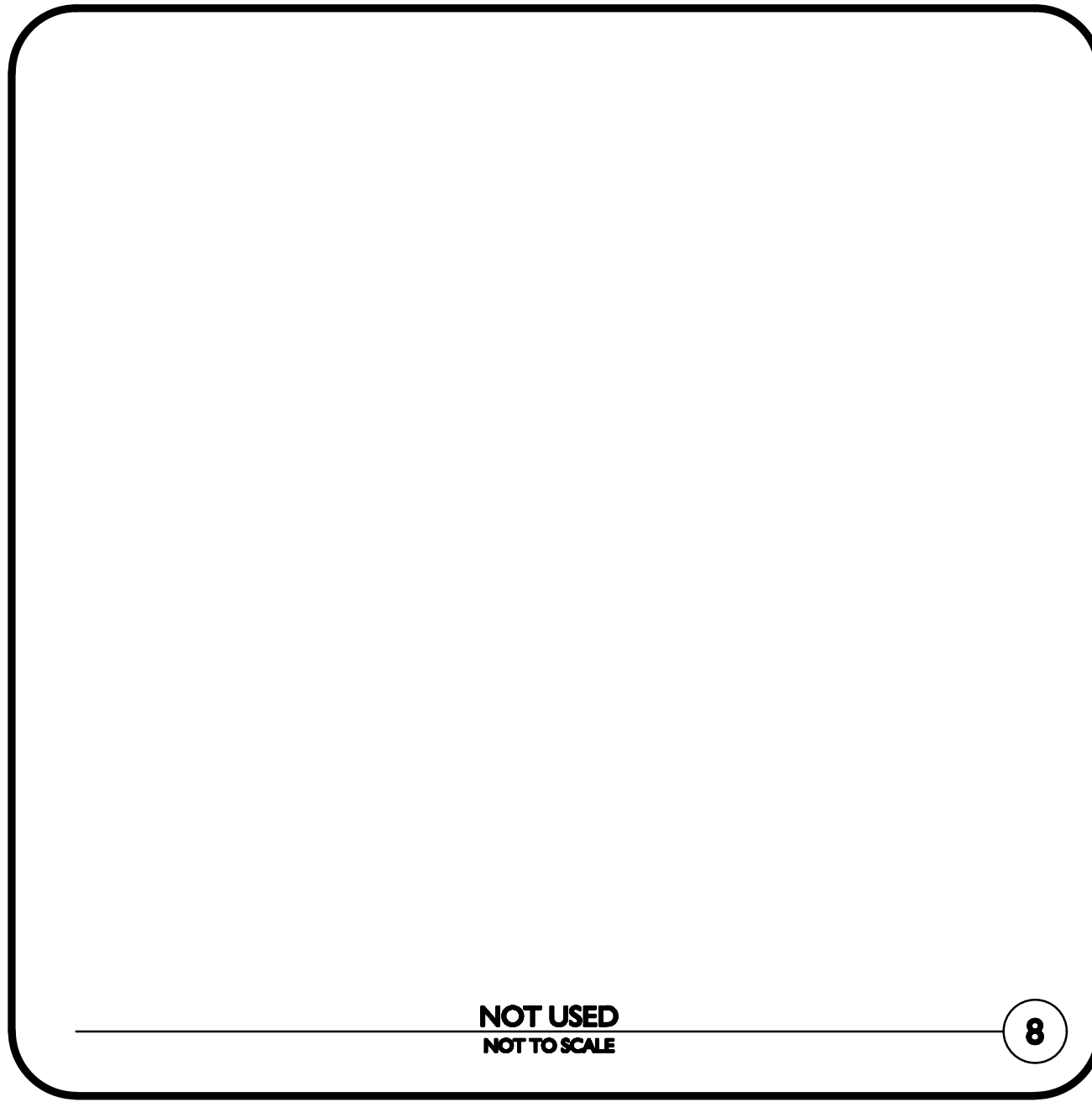
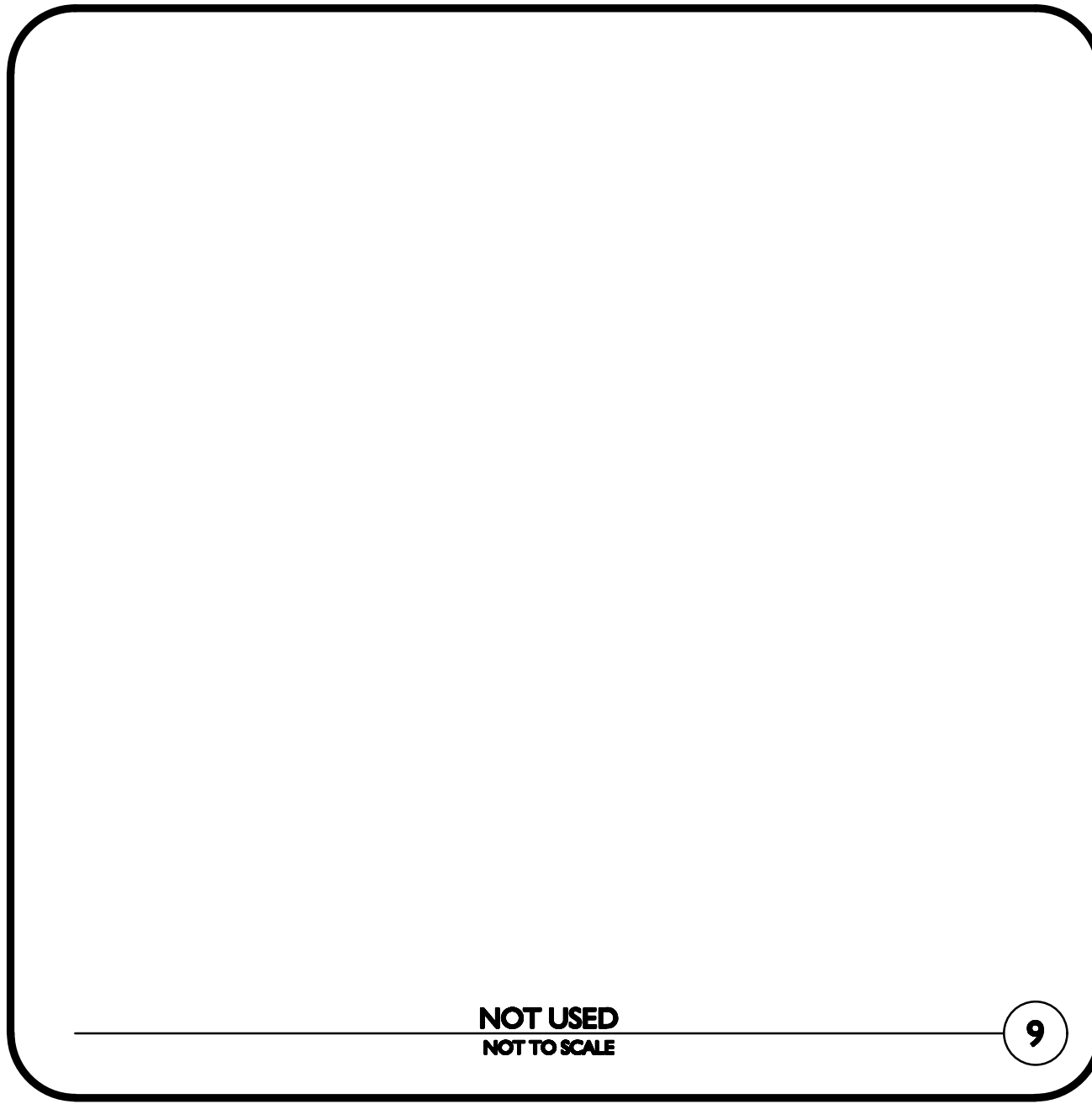
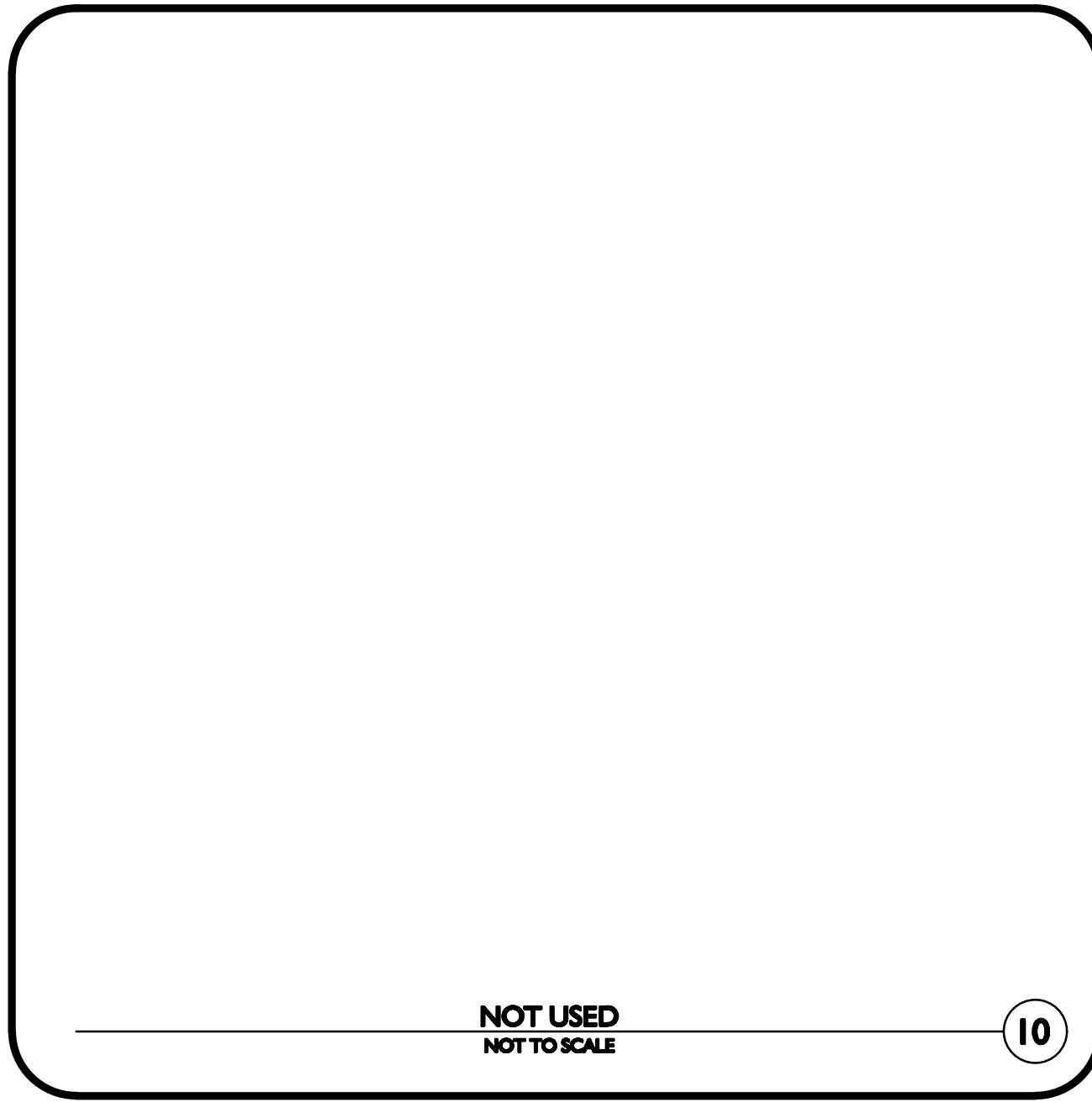
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KEYSHEET

**ISSUED FOR REVIEW**  
DEC. 20, 2023 REV FEB. 28, 2025



PROFESSIONAL ENGINEER FOR  
ALLEN & MAJOR ASSOCIATES, INC.

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APPLICANT/OWNER:  
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275 FOREST RIDGE ROAD  
CONCORD, MA 01742

PROJECT:  
**THE RESIDENCES AT THOREAU**  
275 FOREST RIDGE ROAD  
CONCORD, MA 01742

PROJECT NO.	1670-24	DATE:	12/20/2023
SCALE:	AS SHOWN	DWG. NAME:	C-1670-24
DESIGNED BY:	BDP	CHECKED BY:	PLC

PREPARED BY:

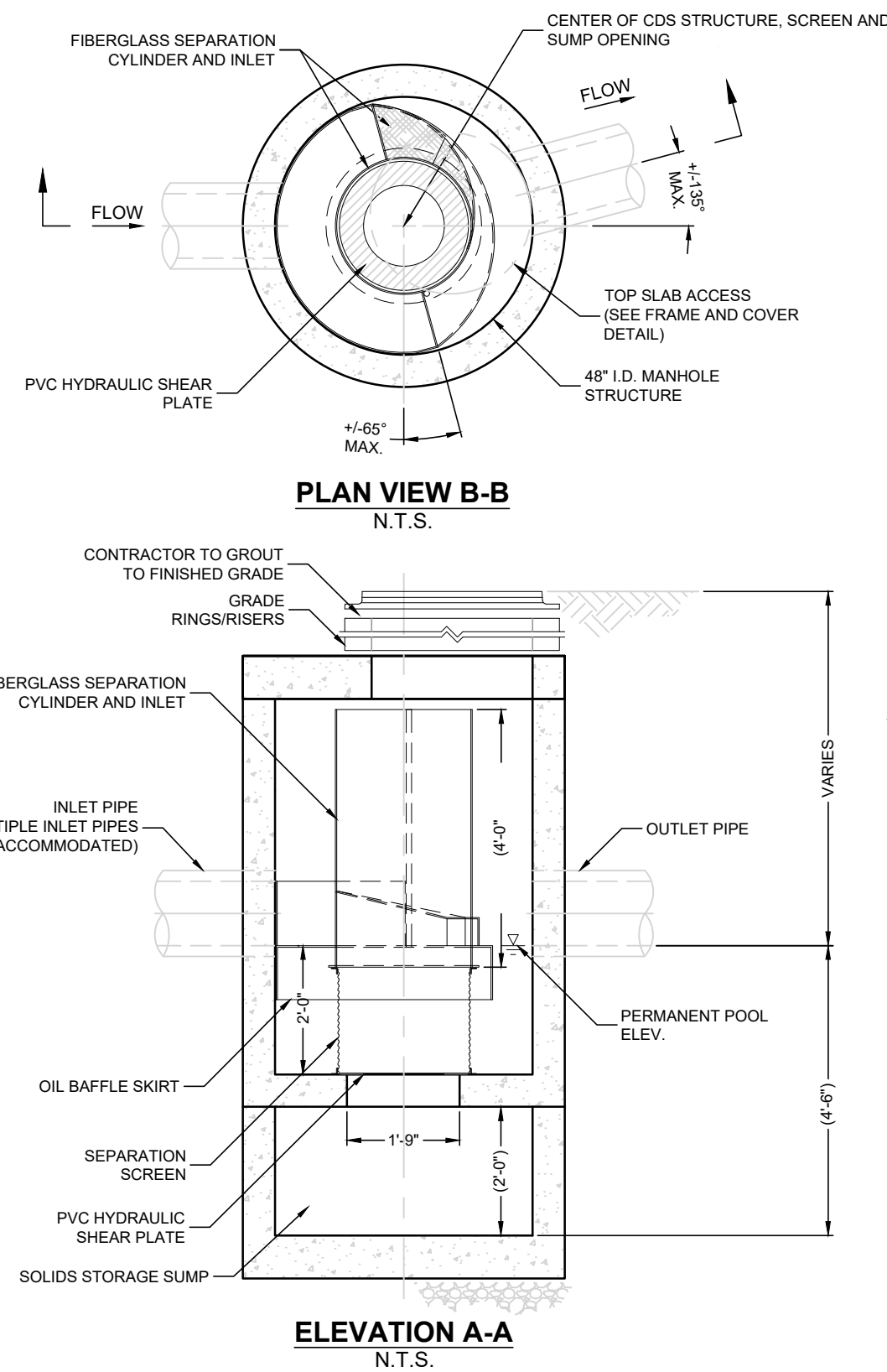
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DRAWING TITLE:	SHEET No.
DETAILS	C-505

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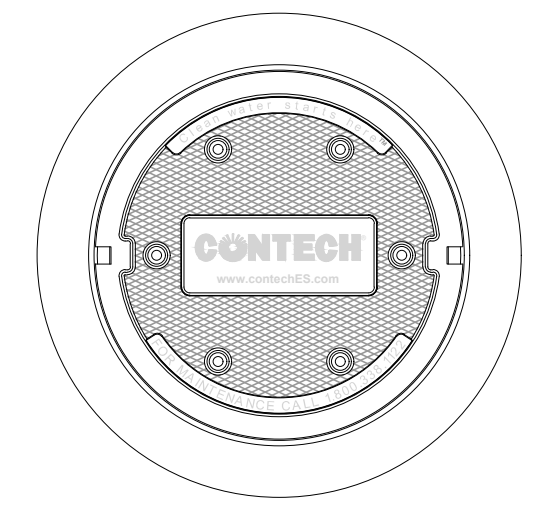


**CDS 2015-4 DESIGN NOTES**

THE STANDARD 2015-4 CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

**CONFIGURATION DESCRIPTION**

GRATED INLET ONLY (NO INLET PIPES)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES
SEPARATE OIL BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION)
SEDIMENT WEIR FOR NJDEP / NJCAT CONFORMING UNITS



**GENERAL NOTES**

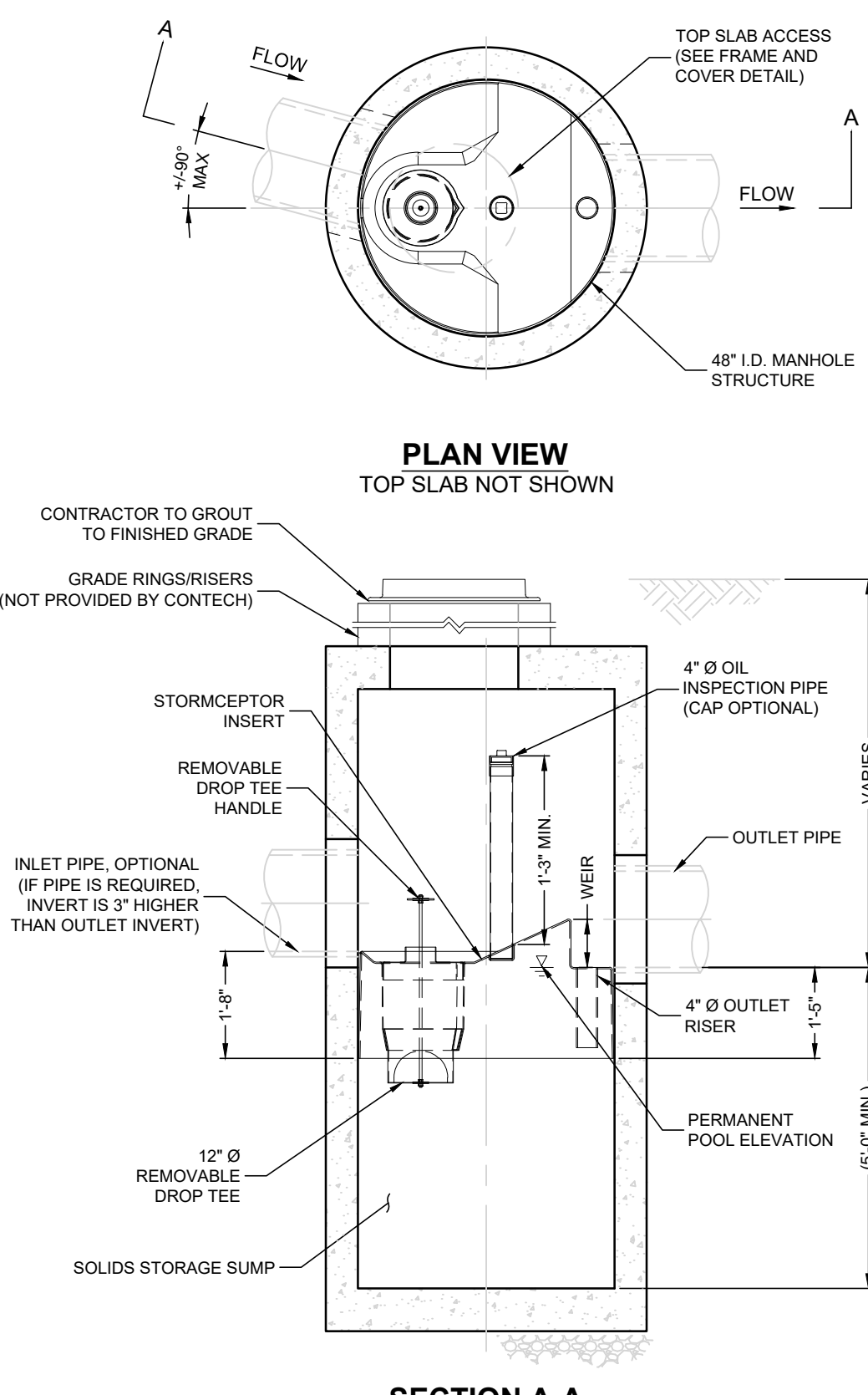
- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
- DIMENSIONS MARKED WITH (I) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
- FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechES.com
- CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
- STRUCTURE SHALL MEET AASHTO H20 AND CASTINGS SHALL MEET H20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
- PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

**INSTALLATION NOTES**

- ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
- CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
- CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
- CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

**CONTECH ENGINEERED SOLUTIONS LLC**  
www.contechES.com  
1000 Central Expressway, Suite 100, Westborough, MA 01581  
508-336-1122 513-445-7000 513-445-7993 FAX

CDS 2015-4  
INLINE CDS  
STANDARD DETAIL



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1000 Central Expressway, Suite 100, Westborough, MA 01581  
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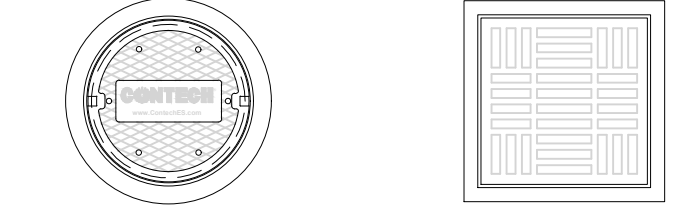
STC 450i  
STORMCEPTOR  
STANDARD DETAIL

**STORMCEPTOR DESIGN NOTES**

THE STANDARD 450i CONFIGURATION WITH ROUND, SOLID FRAME AND COVER, AND INLET PIPE IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

**CONFIGURATION DESCRIPTION**

GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES



**FRAME AND COVER (MAY VARY) NOT TO SCALE**

**FRAME AND GRATE (MAY VARY) NOT TO SCALE**

**GENERAL NOTES**

- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
- FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechES.com
- STORMCEPTOR WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
- STORMCEPTOR STRUCTURE SHALL MEET AASHTO H20 LOAD RATING, ASSUMING EARTH COVER OF 9'-2" (9'10") AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
- STORMCEPTOR STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C478 AND AASHTO LOAD FACTOR DESIGN METHOD.
- ALTERNATE UNITS ARE SHOWN IN MILLIMETERS [mm].

**INSTALLATION NOTES**

- ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMCEPTOR MANHOLE STRUCTURE.
- CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
- CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
- CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

**SITE SPECIFIC DATA REQUIREMENTS**

STRUCTURE ID	PDMH 1 (WQS)		
WATER QUALITY FLOW RATE (cfs)	0.22		
PEAK FLOW RATE (cfs)	1.62		
RETURN PERIOD OF PEAK FLOW (yrs)	100		
RIM ELEVATION	198.27		
PIPE DATA:	INVERT	MATERIAL	DIAMETER
INLET PIPE 1	193.67	HDPE	12"
INLET PIPE 2	193.67	HDPE	12"
OUTLET PIPE	193.67	HDPE	12"

NOTES / SPECIAL REQUIREMENTS: CDS 2015-4

**SITE SPECIFIC DATA REQUIREMENTS**

STRUCTURE ID	PDMH 6 (WQS)		
WATER QUALITY FLOW RATE (cfs)	1.10		
PEAK FLOW RATE (cfs)	8.04		
RETURN PERIOD OF PEAK FLOW (yrs)	100		
RIM ELEVATION	179.68		
PIPE DATA:	INVERT	MATERIAL	DIAMETER
INLET PIPE 1	175.20	HDPE	12"
INLET PIPE 2	174.48	HDPE	15"
OUTLET PIPE	174.23	HDPE	18"

NOTES / SPECIAL REQUIREMENTS: CDS 2015-4

**SITE SPECIFIC DATA REQUIREMENTS**

STRUCTURE ID	PDMH 11 (WQS)		
WATER QUALITY FLOW RATE (cfs)	1.10		
PEAK FLOW RATE (cfs)	8.28		
RETURN PERIOD OF PEAK FLOW (yrs)	100		
RIM ELEVATION	178.36		
PIPE DATA:	INVERT	MATERIAL	DIAMETER
INLET PIPE 1	174.12	HDPE	12"
INLET PIPE 2	173.87	HDPE	15"
OUTLET PIPE	173.62	HDPE	18"

NOTES / SPECIAL REQUIREMENTS: CDS 2015-4

**SITE SPECIFIC DATA REQUIREMENTS**

STRUCTURE ID	PDMH 20 (WQS)		
WATER QUALITY FLOW RATE (cfs)	0.65		
PEAK FLOW RATE (cfs)	4.03		
RETURN PERIOD OF PEAK FLOW (yrs)	100		
RIM ELEVATION	179.77		
PIPE DATA:	INVERT	MATERIAL	DIAMETER
INLET PIPE 1	174.05	HDPE	15"
INLET PIPE 2	-	-	-
OUTLET PIPE	173.95	HDPE	15"

NOTES / SPECIAL REQUIREMENTS: CDS 2015-4

**SITE SPECIFIC DATA REQUIREMENTS**

STRUCTURE ID	PDMH 28 (WQS)		
WATER QUALITY FLOW RATE (cfs)	1.04		
PEAK FLOW RATE (cfs)	7.12		
RETURN PERIOD OF PEAK FLOW (yrs)	100		
RIM ELEVATION	178.68		
PIPE DATA:	INVERT	MATERIAL	DIAMETER
INLET PIPE 1	174.20	HDPE	12"
INLET PIPE 2	173.95	HDPE	15"
OUTLET PIPE	173.70	HDPE	18"

NOTES / SPECIAL REQUIREMENTS: CDS 2015-4

**SITE SPECIFIC DATA REQUIREMENTS**

STRUCTURE ID	PCB 14A (WQS)		
WATER QUALITY FLOW RATE (cfs)	0.34		
PEAK FLOW RATE (cfs)	2.29		
RETURN PERIOD OF PEAK FLOW (yrs)	100		
RIM ELEVATION	178.23		
PIPE DATA:	INVERT	MATERIAL	DIAMETER
INLET PIPE 1	-	-	-
INLET PIPE 2	174.10	HDPE	12"
OUTLET PIPE	-	-	-

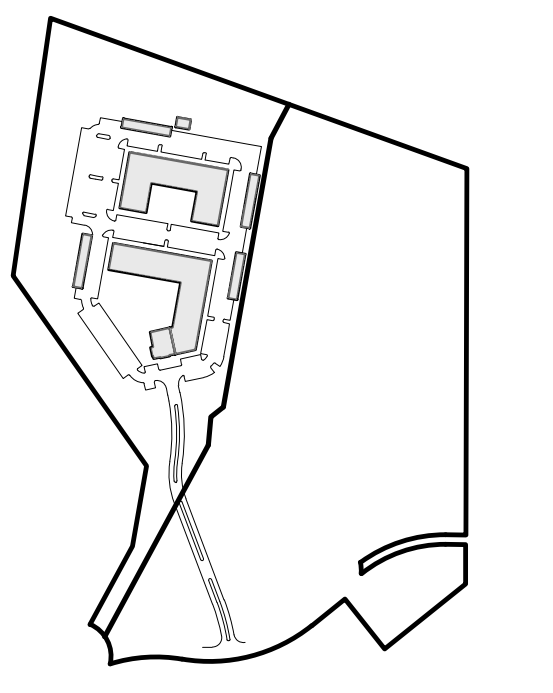
NOTES / SPECIAL REQUIREMENTS: STORMCEPTOR 450i WITH GRATE INLET

**SITE SPECIFIC DATA REQUIREMENTS**

STRUCTURE ID	PCB 17A (WQS)		
WATER QUALITY FLOW RATE (cfs)	0.27		
PEAK FLOW RATE (cfs)	1.65		
RETURN PERIOD OF PEAK FLOW (yrs)	100		
RIM ELEVATION	179.40		
PIPE DATA:	INVERT	MATERIAL	DIAMETER
INLET PIPE 1	-	-	-
INLET PIPE 2	175.10	HDPE	12"
OUTLET PIPE	-	-	-

NOTES / SPECIAL REQUIREMENTS: STORMCEPTOR 450i WITH GRATE INLET

NOTE:  
1. REFER TO SHEET C-104 - C-104C FOR LOCATION, SIZES AND INVERT ELEVATIONS.  
2. DRAWINGS PROVIDED BY CONTECH.



**ISSUED FOR REVIEW**  
DEC. 20, 2023 REV FEB. 28, 2025



PROFESSIONAL ENGINEER FOR ALLEN & MAJOR ASSOCIATES, INC.

05	02/28/25	PER PEER REVIEW COMMENTS
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01	02/23/24	ZBA RESUBMISSION
REV	DATE	DESCRIPTION

APPLICANT/OWNER:  
**THOREAU RESIDENCES, LLC**  
275 FOREST RIDGE ROAD  
CONCORD, MA 01742

PROJECT:  
**THE RESIDENCES AT THOREAU**  
275 FOREST RIDGE ROAD  
CONCORD, MA 01742

PROJECT NO.	1670-24	DATE:	12/20/2023
SCALE:	AS SHOWN	DWG. NAME:	C-1670-24
DESIGNED BY:	BDP	CHECKED BY:	PLC

PREPARED BY:

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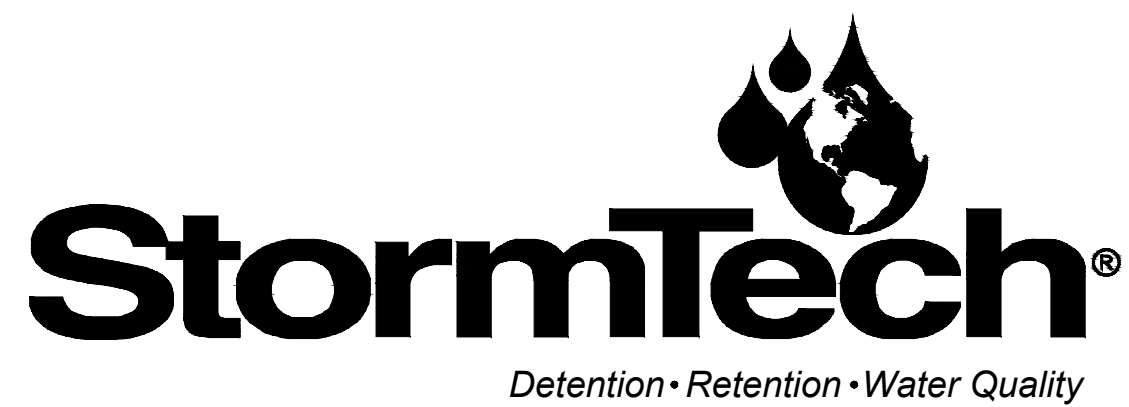
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DRAWING TITLE:	SHEET No.
DETAILS	C-507

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M:\PROJECTS\1670-24\CIVIL\DRAWINGS\CURRENT\C-1670-24 - DETAILS.DWG



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860-529-8188 | 888-892-2694 | WWW.STORMTECH.COM

GENERAL NOTES  
NOT TO SCALE

2

**STORMWATER CHAMBER SPECIFICATIONS**

- CHAMBERS SHALL BE STORMTECH SC-740 OR APPROVED EQUAL. CHAMBERS SHALL BE MANUFACTURED FROM VIRGIN POLYPROPYLENE OR POLYETHYLENE RESINS.
- CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORT PANELS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
- THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL 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 MEET ASTM F2922 (POLYETHYLENE) OR ASTM F2418 (POLYPROPYLENE), "STANDARD SPECIFICATION FOR THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOADS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- ONLY CHAMBERS APPROVED WILL BE ALLOWED. THE CHAMBER MANUFACTURER SHALL SUBMIT THE FOLLOWING UPON REQUEST TO THE SITE DESIGN ENGINEER FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE:
  - A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES 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 AASHTO FOR THERMOPLASTIC PIPE.
  - A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET. THE 50 YEAR CREEP MODULUS DATA SPECIFIED IN ASTM F2418 OR ASTM F2922 MUST BE USED AS PART OF THE AASHTO STRUCTURAL EVALUATION TO VERIFY LONG-TERM PERFORMANCE.
  - STRUCTURAL CROSS SECTION DETAIL ON WHICH THE STRUCTURAL EVALUATION IS BASED.
- CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.
- ISOLATOR ROWS WILL BE DENOTED BY YELLOW ON THE SITE PLANS.

**IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-310/SC-740 SYSTEM**

- STORMTECH SC-310 & SC-740 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
- STORMTECH SC-310 & SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
- 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 SUB-GRADE.
- 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" SPACING BETWEEN THE CHAMBER ROWS. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4-2".
- THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
- 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.

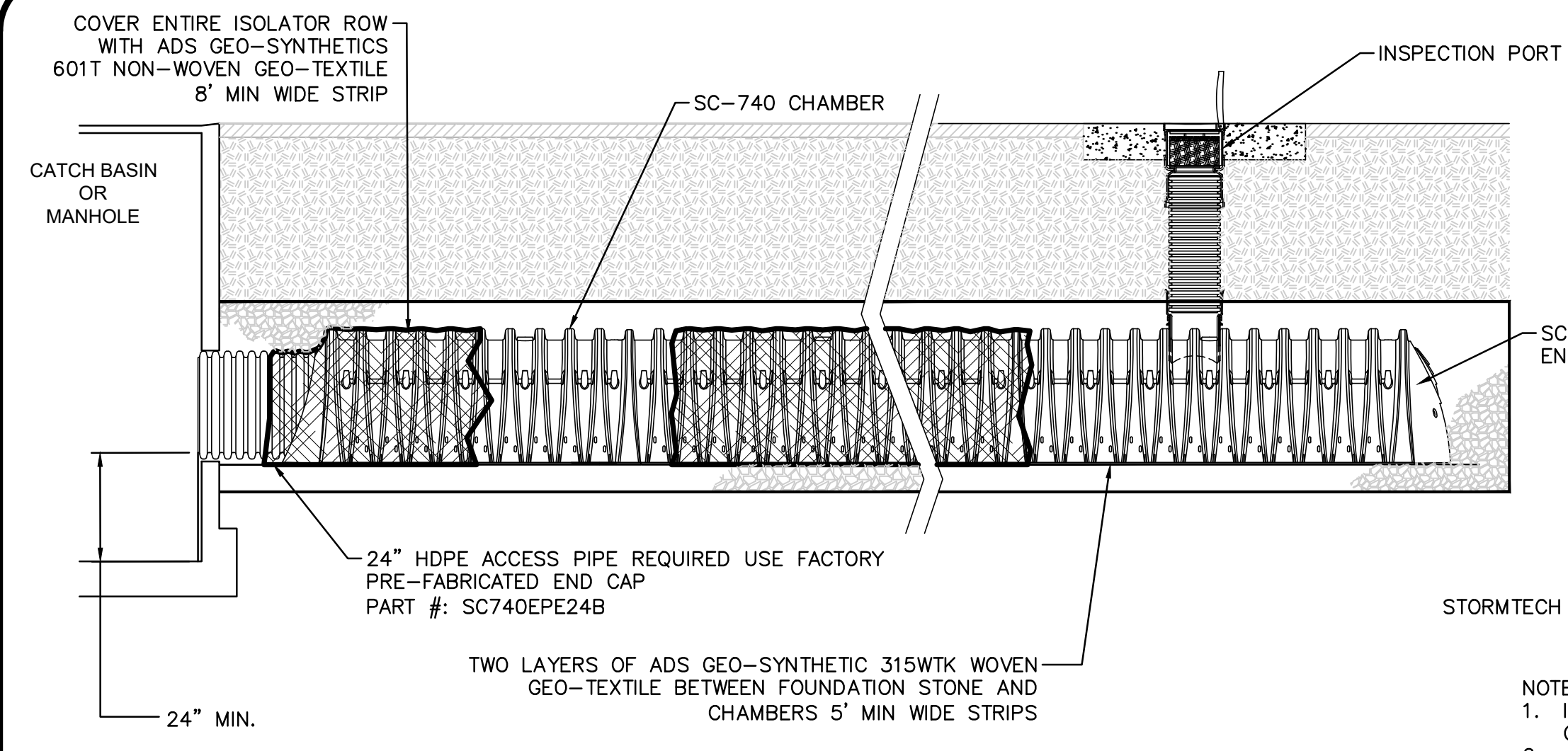
**NOTES FOR CONSTRUCTION EQUIPMENT**

- 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 TIED 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 GUIDE".
- FULL 36" OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

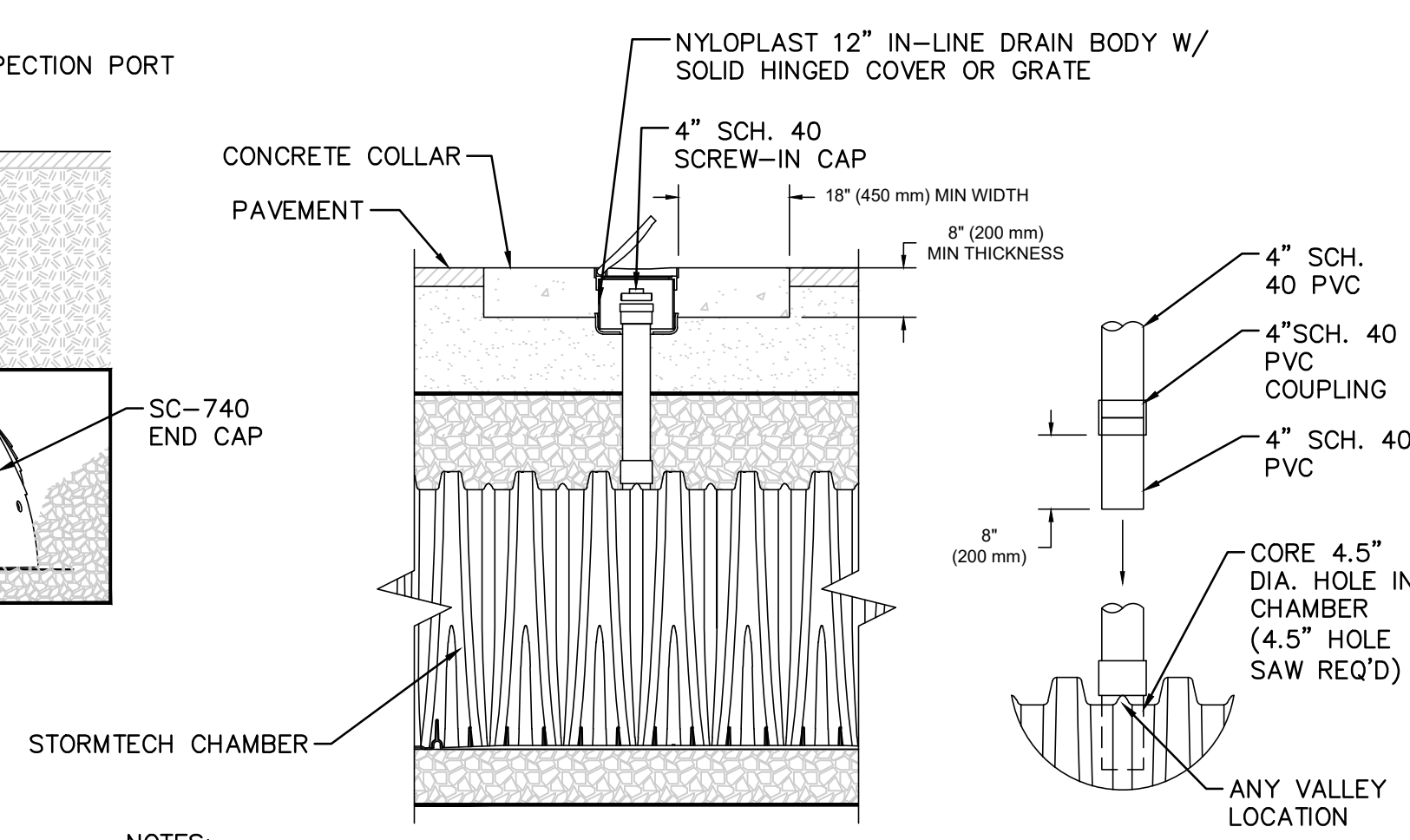
USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

NOT TO SCALE



STORMTECH ISOLATOR ROW\*  
NOT TO SCALE



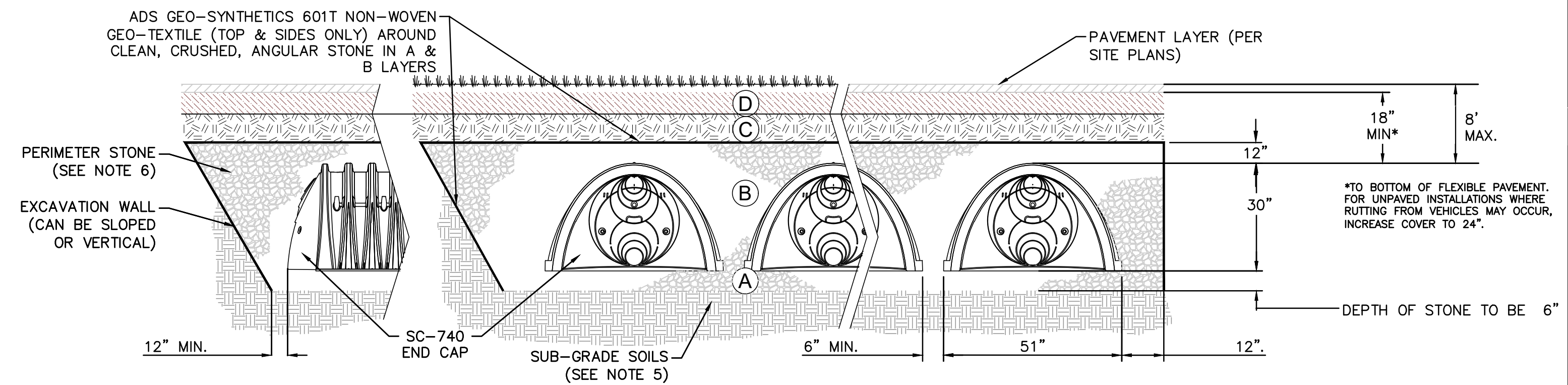
ISOLATOR ROW & INSPECTION PORT  
NOT TO SCALE

- NOTES:  
1. INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION VALLEY.  
2. ALL SCHEDULE 40 FITTINGS TO BE SOLVENT CEMENTED.

INSPECTION PORT DETAIL  
NOT TO SCALE

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 SUB-BASE MAY BE PART OF THE 'D' LAYER.	N/A	PREPARE PER SITE PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE 'C' LAYER TO 18" ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUB-BASE MAY BE A PART OF THE 'C' LAYER.	AASHTO M145 <sup>1</sup> A-1, A-2-4, A-3  OR AASHTO M43 <sup>1</sup> 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" 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).
B	EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	AASHTO M43 <sup>1</sup> 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUB-GRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	AASHTO M43 <sup>1</sup> 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. <sup>2</sup> <sup>3</sup>

- PLEASE NOTE:  
1. 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".  
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.  
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.

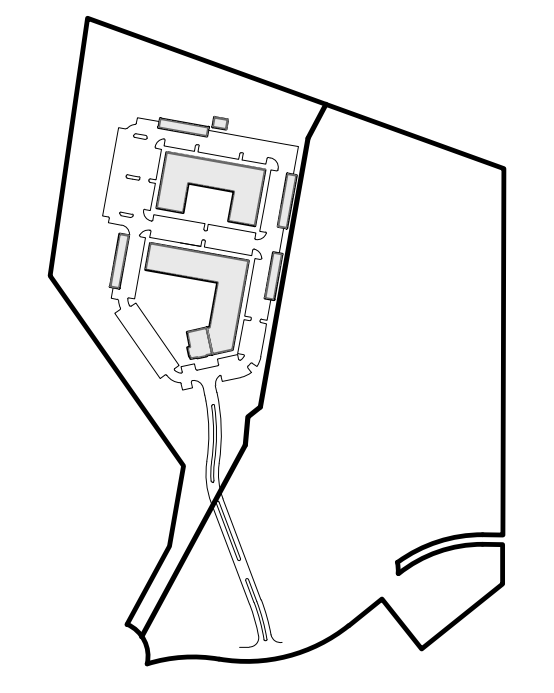


**NOTES:**

- SC-740 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS", OR ASTM F2922 "STANDARD SPECIFICATION FOR POLYETHYLENE (PE) 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".
- "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
- CONTRACTOR IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUB-GRADE 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.
- ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUB-BASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS  
NOT TO SCALE

1



KEYSHEET

**ISSUED FOR REVIEW**  
DEC. 20, 2023 REV FEB. 28, 2026



PROFESSIONAL ENGINEER FOR ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
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CONCORD, MA 01742

**PROJECT:**

THE RESIDENCES AT THOREAU  
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PREPARED BY:

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