

NOTES

GENERAL

- WHERE REFERRED TO THE ENGINEER SHALL BE A REPRESENTATIVE OF SESI CONSULTING ENGINEERS.
- SESI CONSULTING ENGINEERS HAS BEEN RETAINED TO PROVIDE SPECIAL INSPECTION OF THE SOLDIER BEAM AND LAGGING SYSTEM AS SHOWN ON THESE DRAWINGS.
- PROPER NOTICES SHALL BE GIVEN TO THE SPECIAL INSPECTION AGENCY BY THE OWNER'S REPRESENTATIVE FOR THE PERFORMANCE OF THE SPECIAL INSPECTIONS IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 1704.2 OF THE 2020 EDITION OF THE BUILDING CODE OF NEW YORK STATE.
- NOTICE SHALL BE PROVIDED TO ADJOINING PROPERTY OWNERS BY THE OWNER'S REPRESENTATIVE PRIOR TO CONSTRUCTION IN ACCORDANCE WITH LOCAL AND STATE CODES.
- ALL WORK PERFORMED IN CONNECTION WITH SUPPORT OF EXCAVATION SYSTEM SHOWN ON THESE DRAWINGS SHALL ADHERE TO THE APPLICABLE PROVISIONS OF THE LOCAL GOVERNING AGENCY, THE 2020 EDITION OF THE BUILDING CODE OF NEW YORK STATE, REGULATIONS OF THE NEW YORK STATE DEPARTMENT OF LABOR, AND REQUIREMENTS OSHA.
- SESI CONSULTING ENGINEERS HAS BEEN RETAINED TO PERFORM SPECIAL INSPECTIONS FOR THE WORK SHOWN ON THESE DRAWINGS, SPECIFICALLY:
 EXCAVATION SHEETING, SHORING AND BRACING
- PERIMETER FENCING AND OTHER PROTECTION SHALL BE PROVIDED ALONG THE PERIMETER OF THE CONSTRUCTION SITE BOTH DURING AND AFTER WORKING HOURS, PROPERLY MARKED AND LIGHTED. SOE DRAWINGS DO NOT ADDRESS TRAFFIC OR PEDESTRIAN SAFETY. THIS IS TO BE DESIGNED BY OTHERS.
- SESI CONSULTING ENGINEERS SHALL BE ADVISED OF CONFLICTS BETWEEN THIS DRAWING AND ACTUAL FIELD CONDITIONS, PARTICULARLY HORIZONTAL CLEARANCES TO EXISTING CONSTRUCTION. ELEVATIONS OF COMPLETED CONSTRUCTION ARE SHOWN FOR GUIDANCE ONLY. THESE DRAWINGS SHALL BE WORKED IN CONJUNCTION WITH THE CONTRACT DRAWINGS TO ASSURE PROPER COORDINATION.
- PRIOR TO COMMENCEMENT OF INSTALLATION OF SOLDIER BEAM AND LAGGING SYSTEM:
 - THE OWNERS REPRESENTATATIVE IS TO OBTAIN WRITTEN PERMISSION FROM OWNERS OF ALL ADJOINING STRUCTURES OR PROPERTIES FOR ACCESS TO THE PROPERTIES IN ORDER TO PROVIDE PROTECTION, DURING INSTALLATION OF SOLDIER BEAMS AND LAGGING, THE UNDERPINNING OPERATION AND THE MASS EXCAVATION.
 - MAKE VISUAL INSPECTION WITH PHOTO DOCUMENTATION OF ALL ADJOINING STRUCTURES.
 - MONITORING OF EXISTING STRUCTURES TO BE PERFORMED BY THE OWNER.
 - MONITORING OF EXISTING STRUCTURES INCLUDES VERTICAL AND HORIZONTAL MONITORING, CRACK MONITORING, AND VIBRATION MONITORING.
- ANY WATER INFLOW INTO THE EXCAVATION AND GROUNDWATER SHALL BE CONTROLLED IN SUCH A MANNER THAT THE WATER LEVEL SHALL BE MAINTAINED AT LEAST 2-FOOT BELOW THE BOTTOM OF ANY LEVEL OF EXCAVATION ADJACENT TO THE SOLDIER BEAM AND LAGGING.
- A COMPETENT PERSON WHO IS A REPRESENTATIVE OF THE CONTRACTOR SHALL INSPECT THE SUBGRADE OF THE EXCAVATION, ALL BRACING AND BLOCKING AND EXISTING ADJACENT STRUCTURES AS NECESSARY AND AT THE COMMENCMENT OF EACH SHIFT, TO ASSURE INTEGRITY, PRIOR TO PERMITTING WORKMAN TO WORK WITHIN THE AREA PROTECTED BY THE TEMPORARY PERIMETER RETAINING SYSTEMS.
 - * OSHA 29CFR 1926.650 & 1926.651 ET. SEQ

1926.651(K)(1)

"DAILY INSPECTIONS OF EXCAVATIONS, THE ADJACENT AREAS, AND PROTECTIVE SYSTEMS SHALL BE MADE BY A COMPETENT PERSON FOR EVIDENCE OF A SITUATION THAT COULD RESULT IN POSSIBLE CAVE-INS, INDICATION OF FAILURE OF PROTECTIVE SYSTEMS, HAZARDOUS ATMOSPHERES, OR OTHER HAZARDOUS CONDITIONS. AN INSPECTION SHALL BE CONDUCTED BY A COMPETENT PERSON PRIOR TO THE START OF WORK AND AS NEEDED THROUGHOUT THE SHIFT. INSPECTIONS SHALL ALSO BE MADE AFTER EVERY RAINSTORM OR OTHER HAZARD INCREASING OCCURRENCE. THESE INSPECTIONS ARE ONLY REQUIRED WHEN EMPLOYEE EXPOSURE CAN BE REASONABLY ANTICIPATED"

1926.650 (B)

- "'COMPETENT PERSON' MEANS ONE WHO IS CAPABLE OF IDENTIFYING EXISTING AND PREDICTABLE HAZARDS IN THE SURROUNDS, OR WORKING CONDITIONS WHICH ARE UNSANITARY, HAZARDOUS, OR DANGEROUS TO EMPLOYEES, AND WHO HAS AUTHORIZATION TO TAKE PROMPT CORRECTIVE MEASURES TO ELIMINATE THEM."
- STRUCTURAL INFORMATION SHOWN IS FOR REFERENCE ONLY. REFER TO STRUCTURAL DRAWINGS FOR ALL NEW BUILDING INFORMATION.
- SITE LAYOUT INFORMATION INCLUDING EXISTING GRADES OBTAINED FROM TOPOGRAPHIC SURVEY SOIL TEST LOCATION PLAN" PREPARED BY JMC SITE DEVELOPMENT CONSULTANTS, LLC., DATED FEBRUARY 6, 2018, REVISED FEBRUARY 28, 2018.
- THIS ENGINEER HAS MADE NO FIELD VERIFICATION OF EXISTING SITE GRADES OR SITE UTILITIES. THE ENGINEER SHALL BE ADVISED OF CONFLICTS BETWEEN THIS DRAWING AND ACTUAL FIELD CONDITIONS PARTICULARLY HORIZONTAL CLEARANCES TO EXISTING STRUCTURES.

MATERIALS

- MATERIAL FOR SOLDIER BEAMS SHALL MEET THE REQUIREMENTS N80 PIPE. ALL STEEL SECTIONS SHALL BE NEW MATERIAL AND MILL CERTIFICATES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
- ALL PLATES, MISCELLANEOUS BRACKETS, STIFFENERS, WALERS ETC. SHALL MEET THE REQUIREMENTS OF ASTM A572 GRADE 50
- ALL WELDING ELECTRODES SHALL CONFORM TO A.W.S. STANDARDS FOR BOTH FIELD AND SHOP WELDING. THE APPLICABLE ELECTRODE TYPE SHOULD BE UTILIZED FOR THE TYPE OF WELDING TO BE PERFORMED AS DEFINED BY THE 2004 AWS D1.1 CODE. PROPER ELECTRODE DRYING FACILITIES SHALL BE PROVIDED. ONLY NEWLY OPENED, SEALED PACKAGES OF ELECTRODES SHALL BE UTILIZED.
- TIMBER LAGGING SHALL BE ROUGH CUT (FULL SIZE) SOUTHERN YELLOW PINE, WITH A MINIMUM FB = 1200 PSI, AS ACCEPTABLE TO THE ENGINEER. ANY LAGGING THAT WILL REMAIN IN PLACE SHALL BE TREATED TIMBER LAGGING.

• EXPANSION ANCHORS TO BE USED SHALL BE HILTI KWIK BOLT II EXPANSION ANCHORS. EXPANSION ANCHORS TO BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.

SOLDIER BEAM INSTALLATION

- ALL PILES SHALL BE INSTALLED IN LOCATIONS AS SHOWN ON THE CONTRACT DRAWINGS.
- THE PROPOSED WALL ALIGNMENT SHALL BE FILLED AS NECESSARY IN ORDER TO PROVIDE A LEVEL-WORKING PLATFORM FOR THE DRILLING EQUIPMENT.
- INSTALL SOLDIER BEAMS UTILIZING DUPLEX DRILLING METHODS WITH WATER FLUSH. UPON CONFIRMATION OF NO EXISTING UTILITIES WITHIN TWENTY (20) FEET OF THE PROPOSED SOLDIER PILES, CONTRACTOR MAY USE AIR IN LEIU OF WATER FOR PILE INSTALLATION. THE PILE SHALL CONSIST OF A MICROPILE CASING WITH A MINIMUM WALL THICKNESS OF 0.50 INCHES. MICROPILE CASING SHALL BE CONSTRUCTED OF MINIMUM N-80 (80 KSI) STEEL CONFORMING TO API SPECIFICATIONS. THE CASING ARE FLUSHED THREADED IN MINIMUM 5-FOOT LENGTHS WITH A TAPERED MODIFIED THREAD OF 5 THREADS PER INCH. THIS CONFIGURATION HAS A MINIMIUM SHOULDER AND THEREFORE FULL STRESSES ARE TRANSFERRED THROUGH THE THREADS IN BOTH TENSION AND COMPRESSION.
- INSTALL SOLDIER PILES TO THE REQUIRED TIP ELEVATION. IF ROCK OR OBSTRUCTIONS ARE ENCOUNTERED BEFORE ATTAINING THE REQUIRED TIP ELEVATION, THE PILE SHALL BE ADVANCED THROUGH THE OBSTRUCTION OR INTO THE ROCK USING ROTARY PERCUSSION DRILLING METHODS. THE INTERIOR OF THE PILE SHALL BE CLEANED FOR THE FULL LENGTH USING A DOWN-THE-HOLE HAMMER PRIOR TO THE PLACEMENT OF GROUT WITHIN THE PILE.
- GROUT SHALL CONSIST OF 1 SACK OF PORTLAND CEMENT TYPE III AND 6
 GALLONS OF POTABLE WATER (W/C RATION OF 0.53), WHICH WILL YIELD AT
 LEAST 5000 PSI IN 7 DAYS. GROUT SHALL BE MIXED THROUGHLY WITH A
 HIGH-SPEED SHEAR MIXER. GROUT SHALL BE PLACED USING CONVENTIONAL
 TREMIE METHODS.
- IT IS INTENDED THAT EACH SOLDIER BEAM BE GROUTED AS THE DRILLING PROCEEDS TO PREVENT LEAVING OPEN, COMPLETED PILES. THIS PROCEDURE WILL CONTINUE UNTIL ALL SOLDIER BEAMS HAVE BEEN INSTALLED. THE CONTRACTOR MAY AT HIS ON RISK DELAY THE PLACING OF GROUT WITHIN THE PILES UNTIL SEVERAL PILES ARE READY FOR THE GROUT. THE CONTRACTOR IS ADVISED THAT PROPER PROTECTION OF THE PILES WILL BE REQUIRED FOR THOSE LEFT OPEN AND THAT ANY REMEDIAL WORK NECESSARY DUE TO HIS DECISION WILL BE AT HIS EXPENSE.
- THE SOLDIER BEAMS SHOULD BE PLUMB AND ON LINE. IT MAY BE PRUDENT TO UTILIZE SOME FORM OF JIG DURING THE PLACEMENT OF THE SOLDIER BEAMS TO ASSURE THAT THE ALIGNMENT OF THE SOLDIER BEAMS REMAINS ON LINE.
- GROUT SHALL BE CAREFULLY PLACED INSIDE THE PILE TO WITHIN 1 FOOT OF THE TOP OF THE PILE. THE GROUT SHALL BE PLACED BY TREMIE METHODS TO ASSURE THAT THE ENTIRE PILE HAS BEEN FILLED AND NO VOIDS WERE CREATED DURING THE PLACEMENT OPERATION AND NO CONTAMINATION OF THE GROUT DUE TO INTERMIXING WITH DRILLING SPOILS OCCURS.
- UPON COMPLETION OF THE INSTALLATION OF THE SOLDIER BEAMS, THE MASS EXCAVATION MAY COMMENCE IN CONJUNCTION WITH THE INSTALLATION OF THE TIMBER LAGGING. LAGGING SHALL BE CUT TO PROVIDE A MINIMUM OF 3-INCHES OF BEARING ON EACH OF THE L-BRACKET OR FULLY BLOCKED OUT. TIMBER LAGGING SHALL BE CRIMP NAILED TO THE FLANGES OF THE "T" SECTION WITH 12D NAILS. EXCAVATE NO DEEPER THAN 2 FEET BEFORE INSTALLING THE TIMBER LAGGING.
- EACH LAGGING BOARD SHALL BE BLOCKED AT LEAST 1/4-INCH TO PERMIT DRAINAGE. ANY VOIDS BEHIND LAGGING SHALL BE BACKFILLED WITH ON SITE SOIL RAMIMED IN PLACE, FLOWABLE FILL, OR DRYPACK MORTAR.

TIEBACKS AND TESTING

- ALL ANCHORS SHALL BE HOLLOW THREAD BARS AND SHALL BE SINGLE-CORROSION PROTECTED (SCP) ANCHORS. BARS SHALL BE MANUFACTURED BY BELLOLI BARS AND DISTRIBUTED BY SAS STESSSTEEL OR IBO TITAN BARS AND DISTRIBUTED BY CON-TECH SYSTEMS.
- ALL PLATES SHALL CONFORM TO ASTM A-50.
- ANCHOR NUTS AND COUPLERS SHALL BE CAPABLE OF DEVELOPING 100% OF THE ULTIMATE STRENGTH OF THE ANCHOR.
- CARE MUST BE TAKEN NOT TO DAMAGE THE THREAD BARS. KEEP THE THREAD BARS FREE OF DIRT AND OTHER DELETERIOUS SUBSTANCES.
- ALL ANCHORS SHALL BE PROOF-TESTED USING A CALIBRATED CENTER HOLE HYDRAULIC JACK. NO LESS THAN 10% OF THE ANCHORS SHALL BE PERFROMANCE TESTED.

PERFORMANCE TESTING:

- AL, 0.25P
- AL, 0.25P, 0.50P
- AL, 0.25P, 0.50P, 0.75P AL, 0.25P, 0.50P, 0.75P, 1.00P
- AL, 0.25P, 0.50P, 0.75P, 1.00P AL, 0.25P, 0.50P, 0.75P, 1.00P, 1.20P
- AL, 0.25P, 0.50P, 0.75P, 1.00P, 1.20P, 1.33P
 HOLD 1.33P FOR CREEP TEST. RECORD ALL MOVEMENTS USING A DIAL INDICATOR THAT IS CAPABLE OF RECORDING INCREMENTS OF 0.001 INCHES. RECORD THE READINGS AT INTERVALS OF 0, 1, 2, 3, 4, 5, 6, AND 10 MINUTES. RELEASE LOAD BELOW LOCK OFF LOAD AND RELOAD ANCHOR TO LOCK OFF LOAD AND LOCK OFF ANCHOR WITH ANCHOR NUT.

PROOF TEST

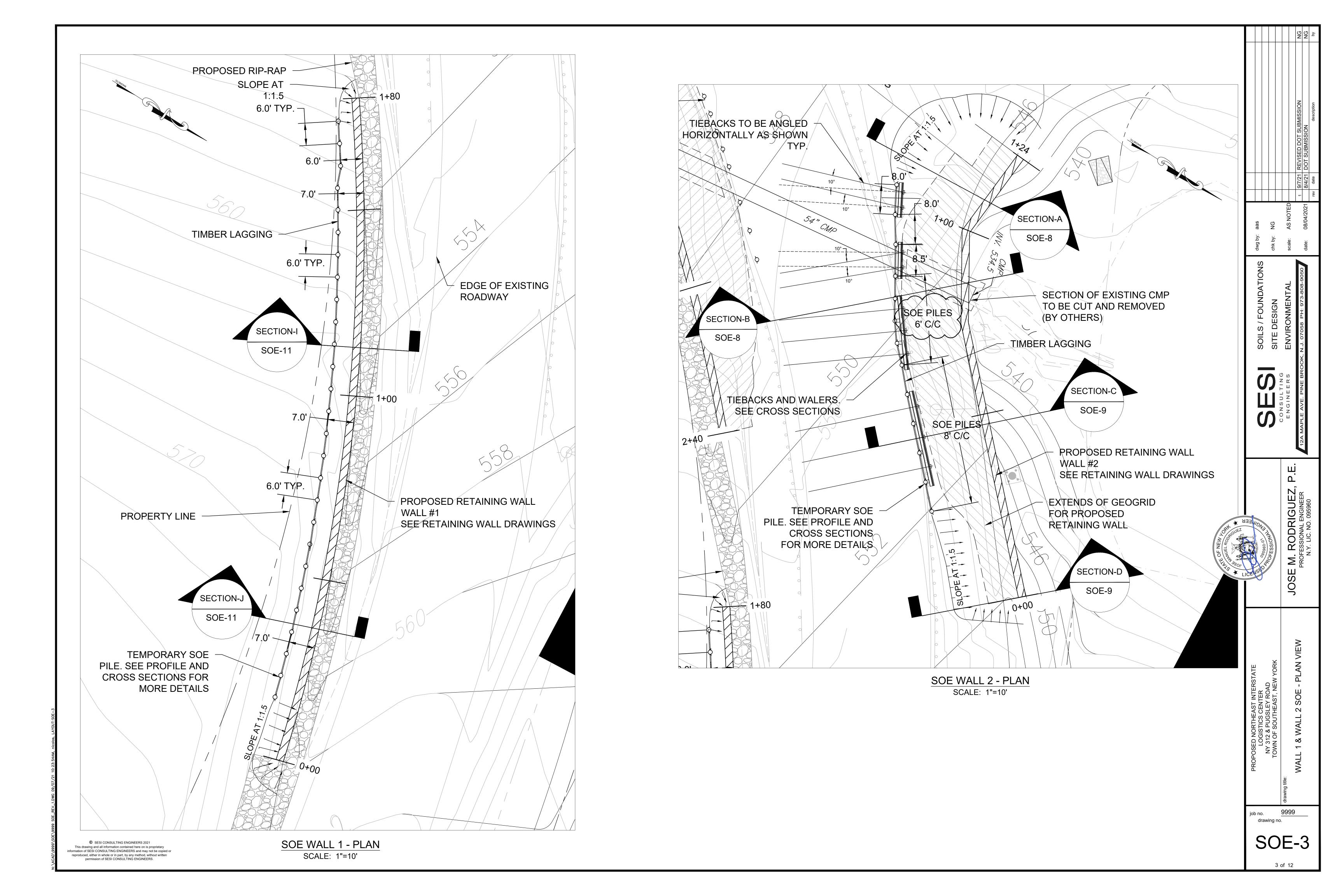
- AL, 0.25P, 0.50P, 0.75P, 1.00P, 1.20P, 1.33P
 HOLD 1.33P FOR CREEP TEST. RECORD ALL MOVEMENTS USING A DIAL INDICATOR THAT IS CAPABLE OF RECORDING INCREMENTS OF 0.001 INCHES. RECORD THE READINGS AT 0, 1, 2, 3, 4, 5, 6, AND 10 MINUTES. RELEASE LOAD BELOW LOCK OFF LOAD AND RELOAD ANCHOR TO LOCK OFF LOAD AND LOCK OFF ANCHOR WITH ANCHOR NUT.
- ALL TIEBACKS SHALL BE LOCKED OFF AT 80% OF THE DESIGN LOAD.
- CONTRACTOR SHALL SUBMIT CERTIFCATION OF JACK CALIBRATIONS FOR APROVAL PRIOR TO COMMENCING TIEBACK INSTALLATION. CALIBRATION REPORT MAY BE NO OLDER THAN 3 MONTHS.

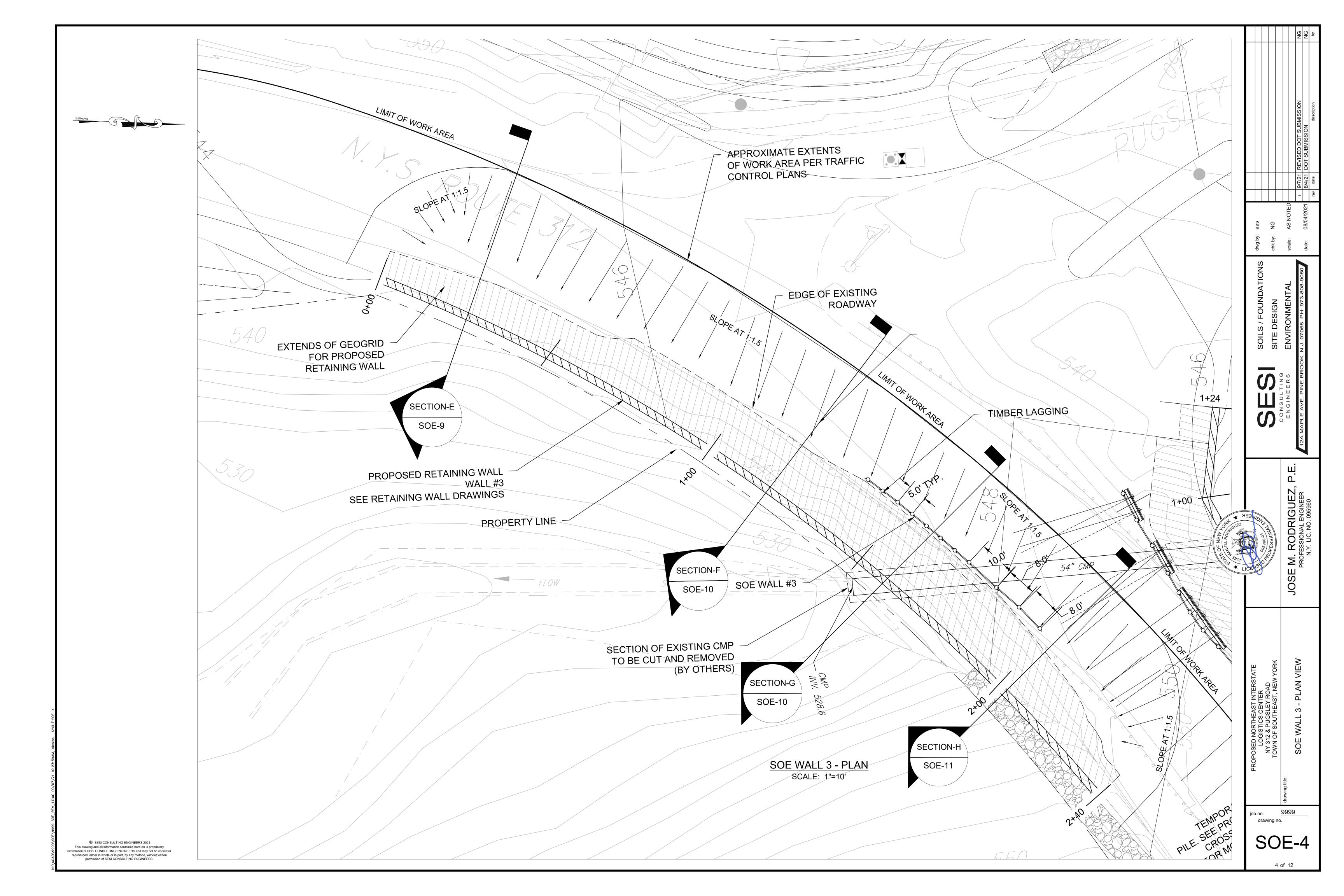
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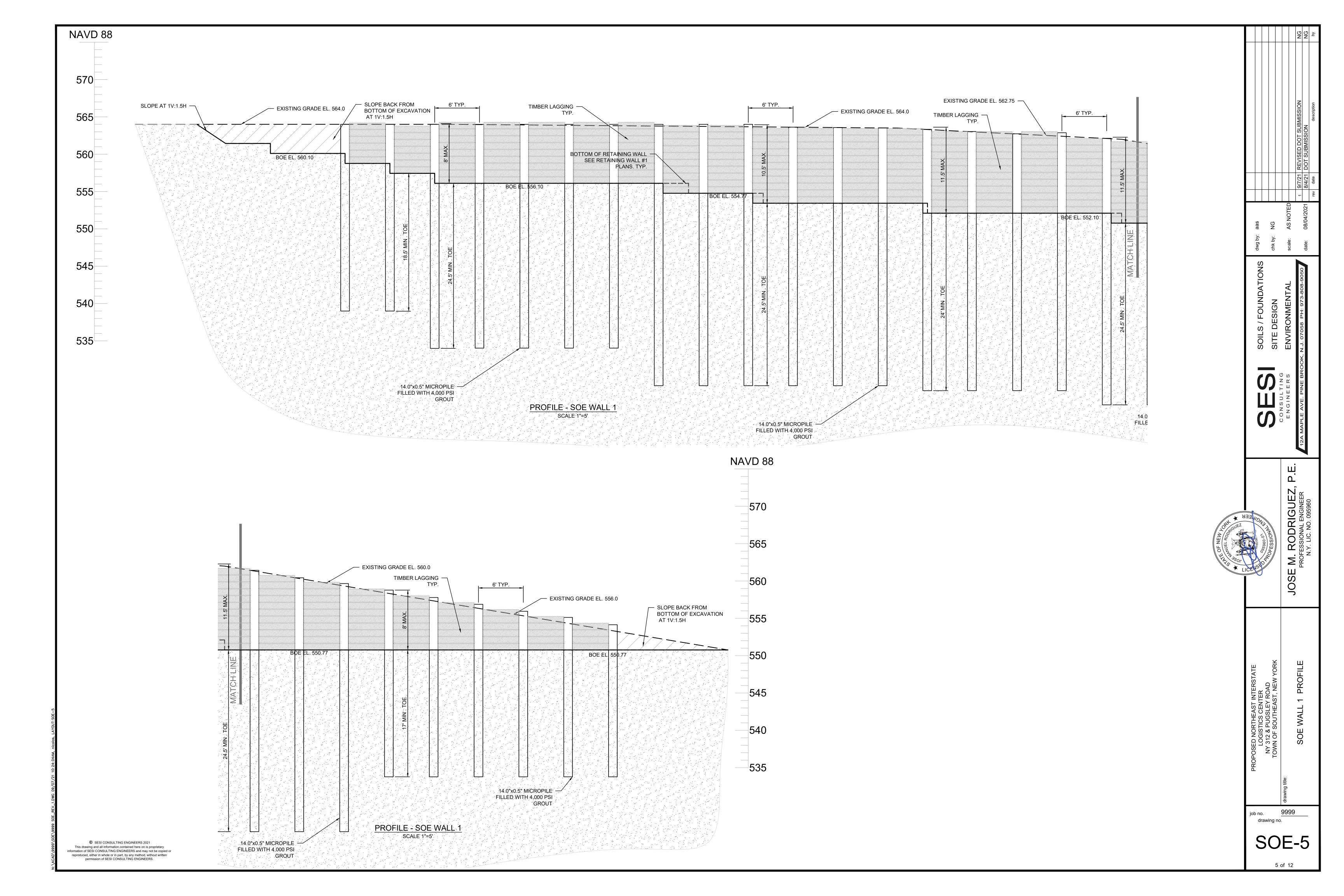
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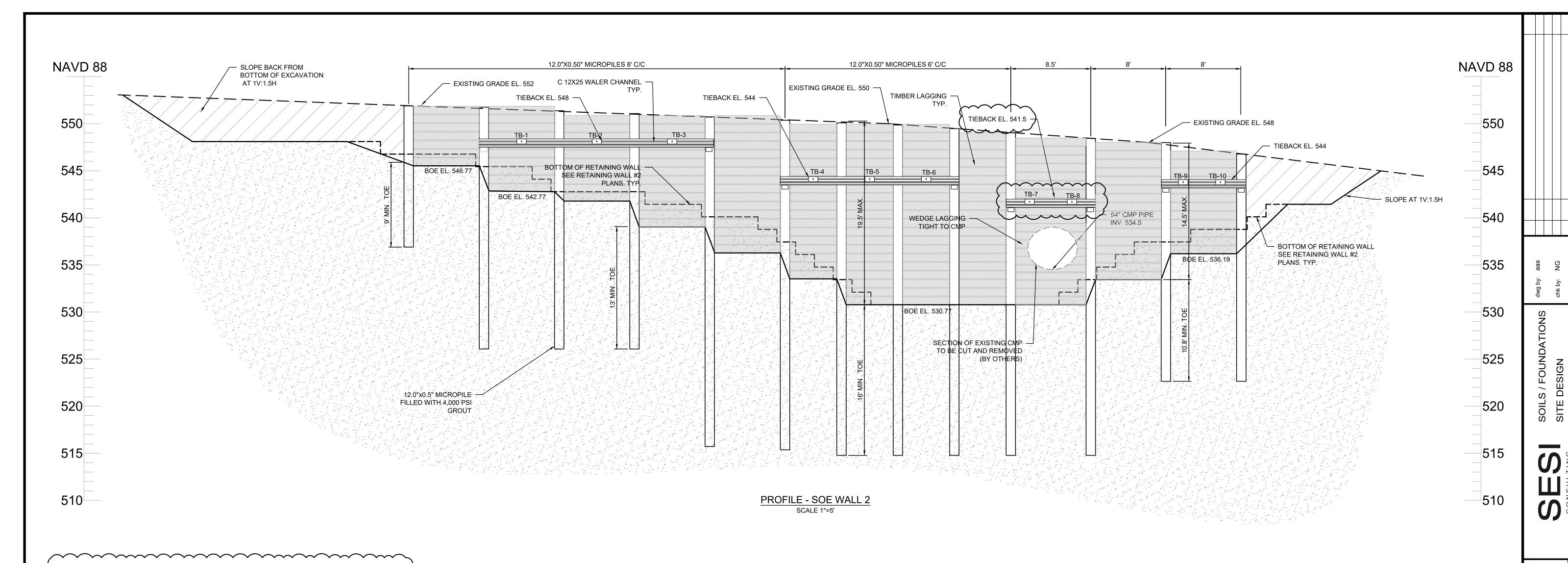
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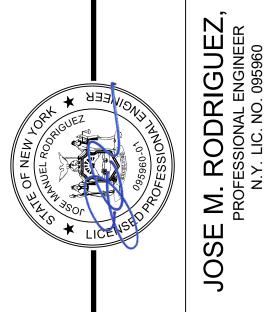








Tieback ID	Angle	Bond	Free	Drill Hole	Bar Size	Design		Lock
	[degree]	Length	Length	Diameter	[O.D. (mm)	Load	Test Load	Load
		[ft]	[ft]	[inch]	/ I.D. (mm)]	[kips]	[kips]	[kips]
TB-1 to TB-3	30	25	15	6	51/28	45	58.5	36
TB-4 to TB-6	30	25	15	6	51/28	37	48.1	29.6
TB-7 & TB-8	15	25	15	6	51/28	52	67.6	41.6
TB-9 & TB-10	30	25	15	6	51/28	32	41.6	25.6



PROPOSED NORTHEAST INTERSTATE
LOGISTICS CENTER
NY 312 & PUGSLEY ROAD
TOWN OF SOUTHEAST, NEW YORK
SOE WALL 2 PROFILE

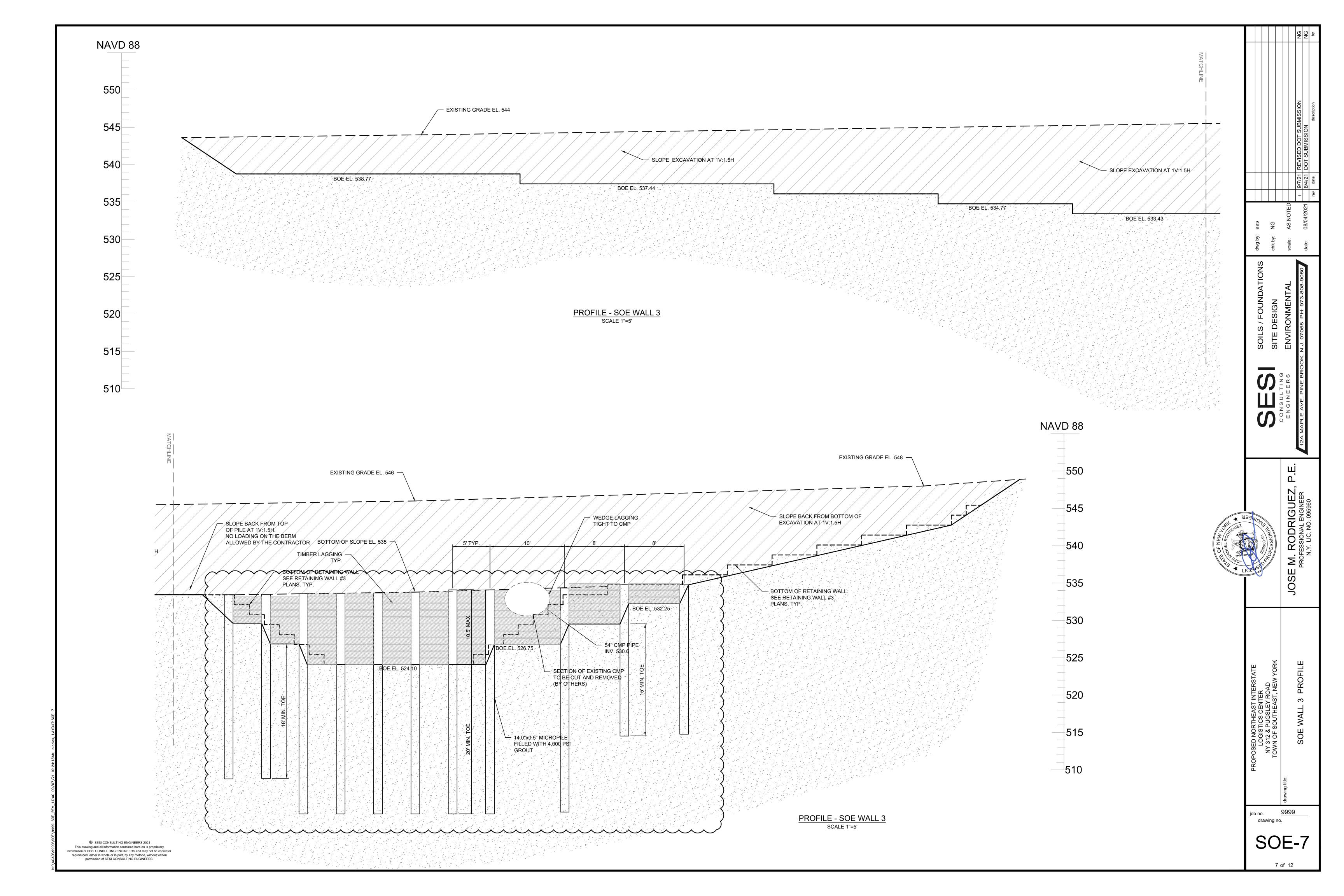
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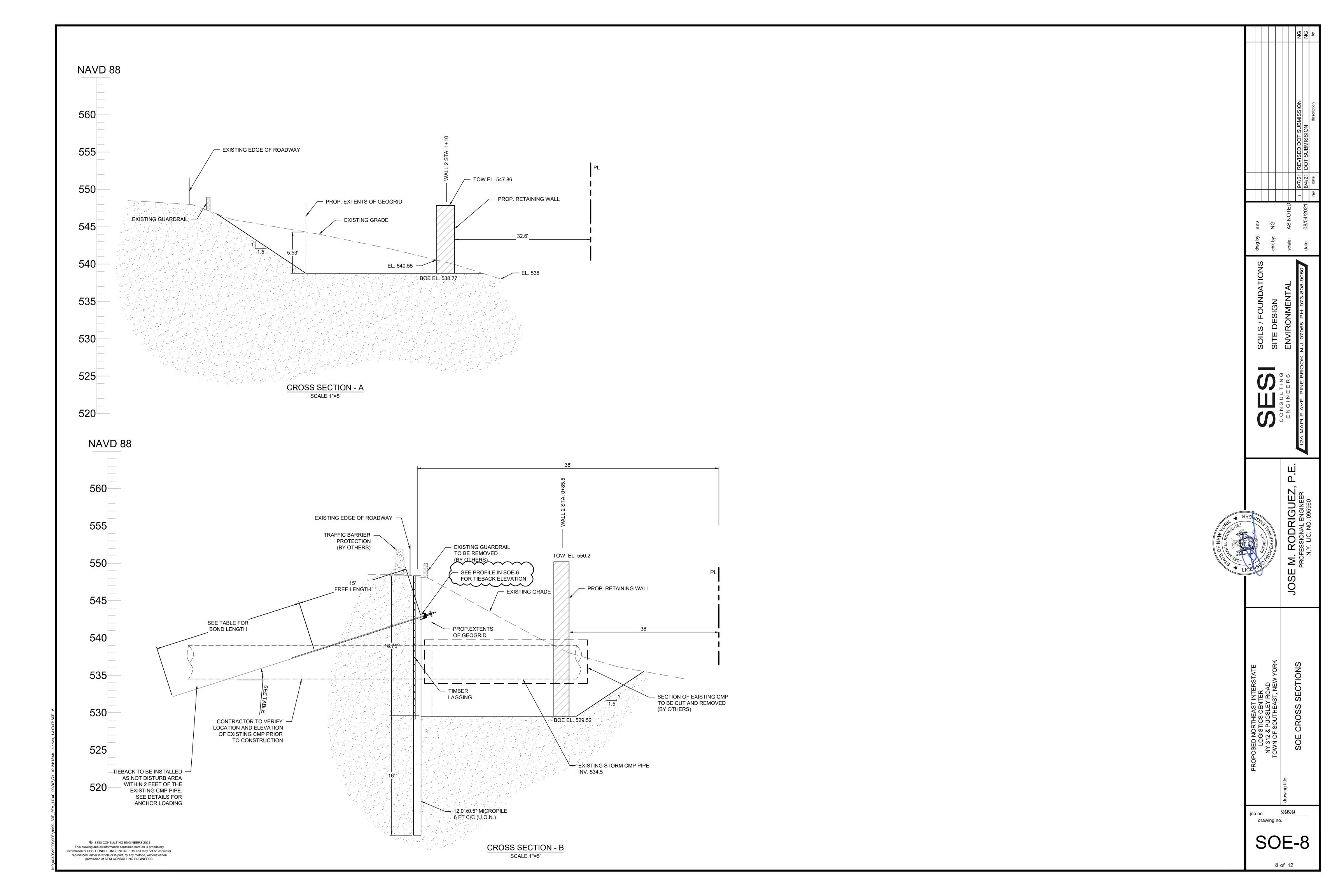
SOE-6

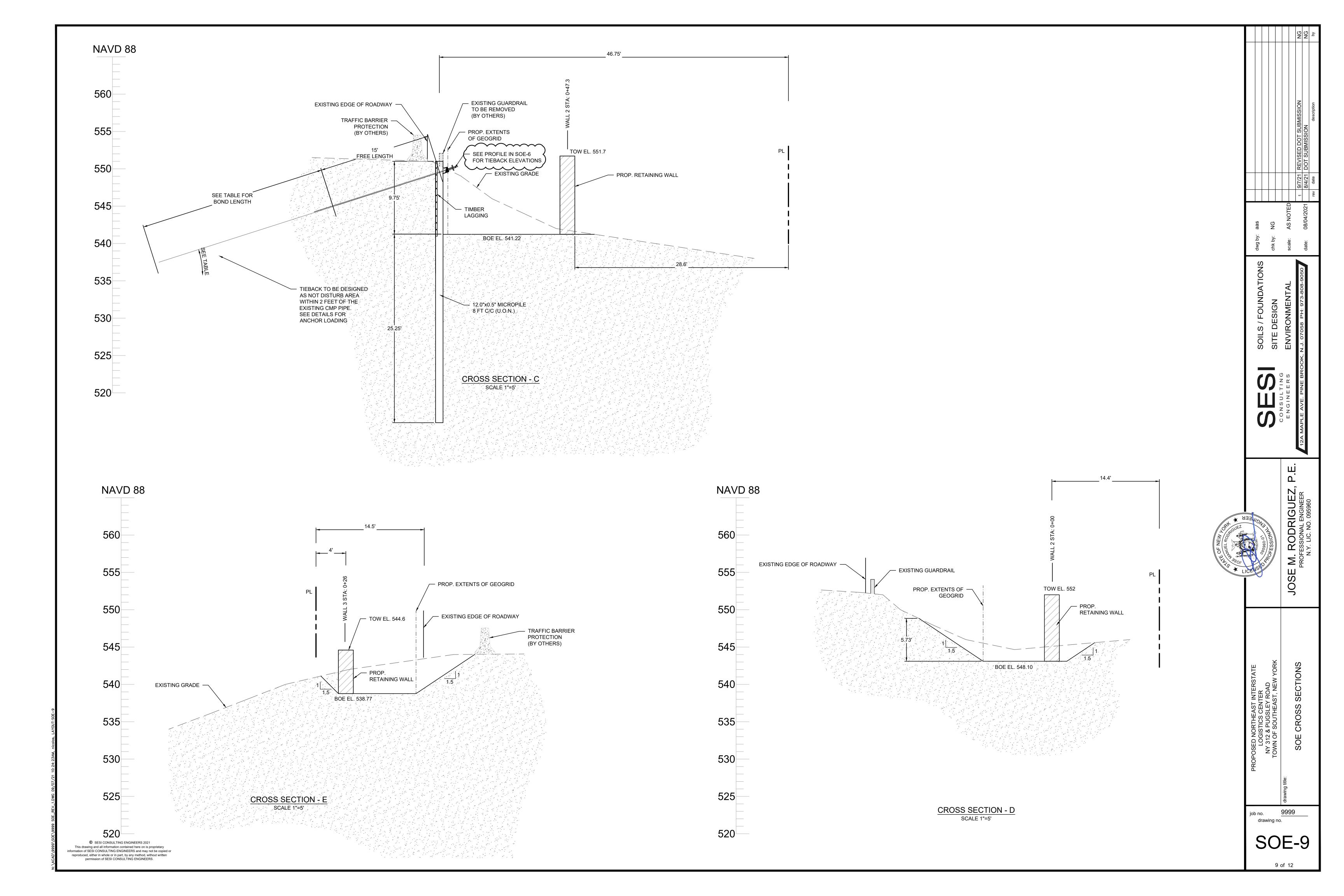
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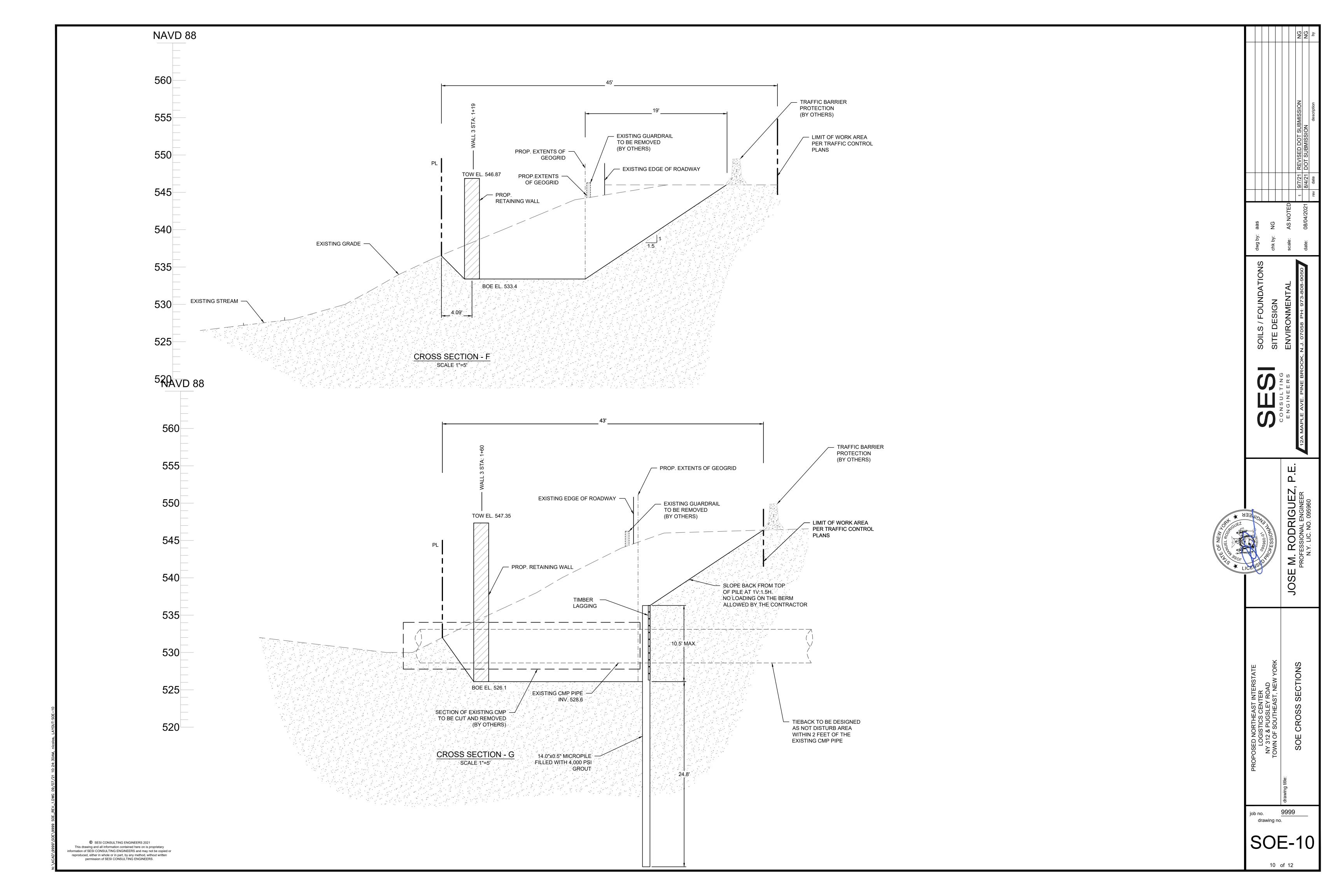
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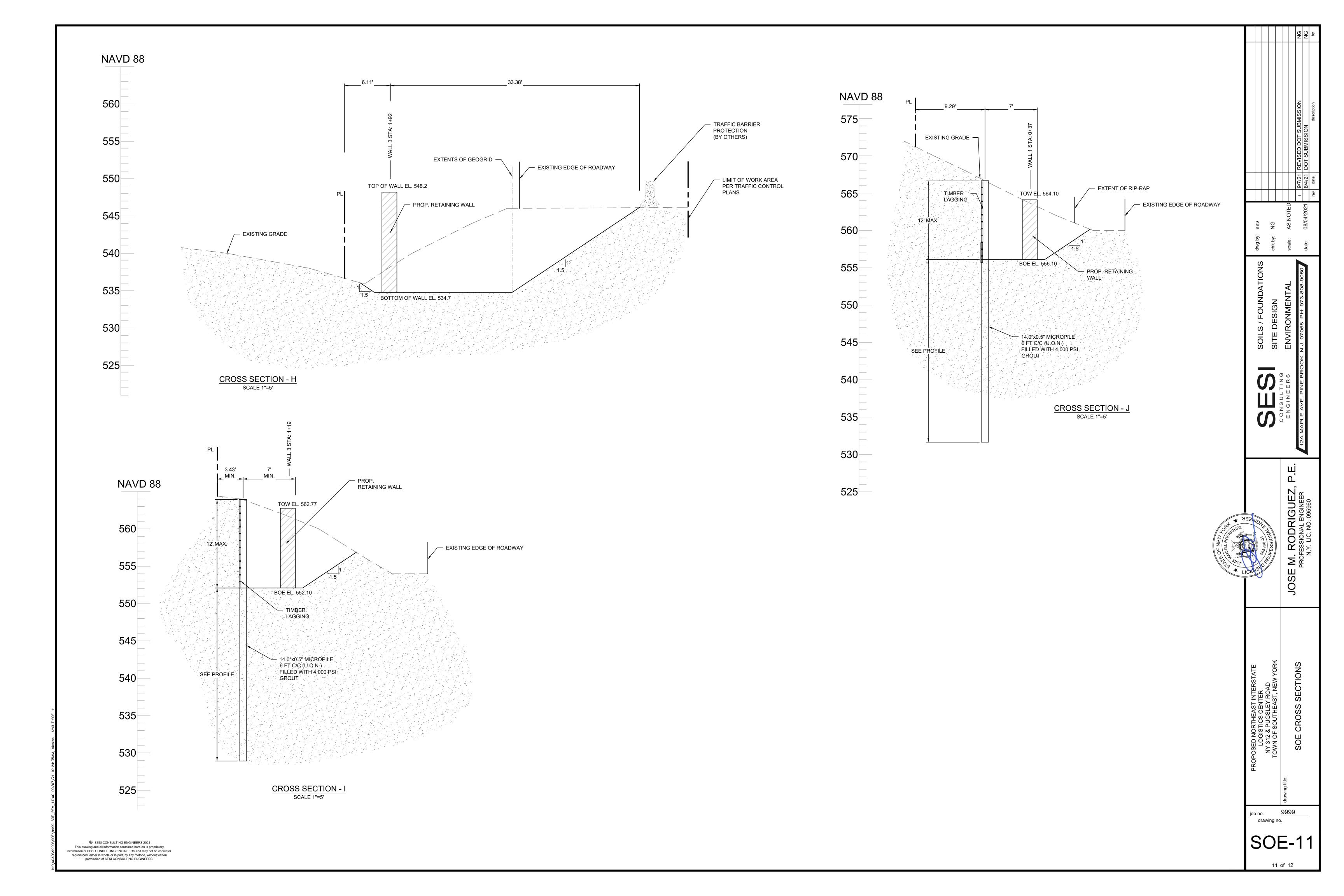
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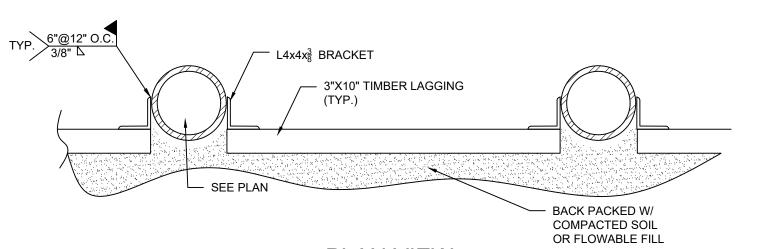




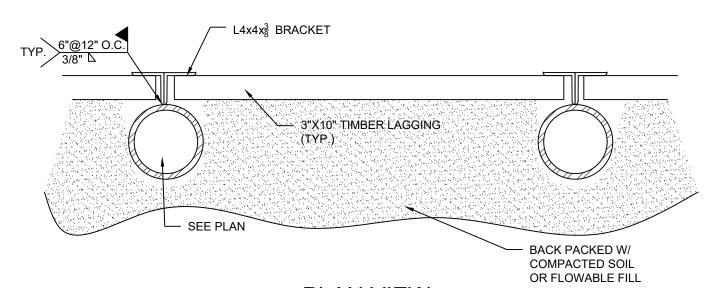




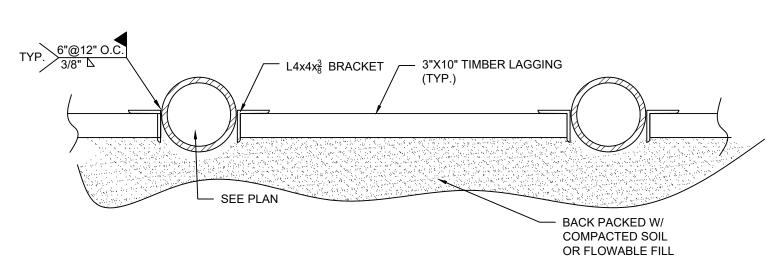




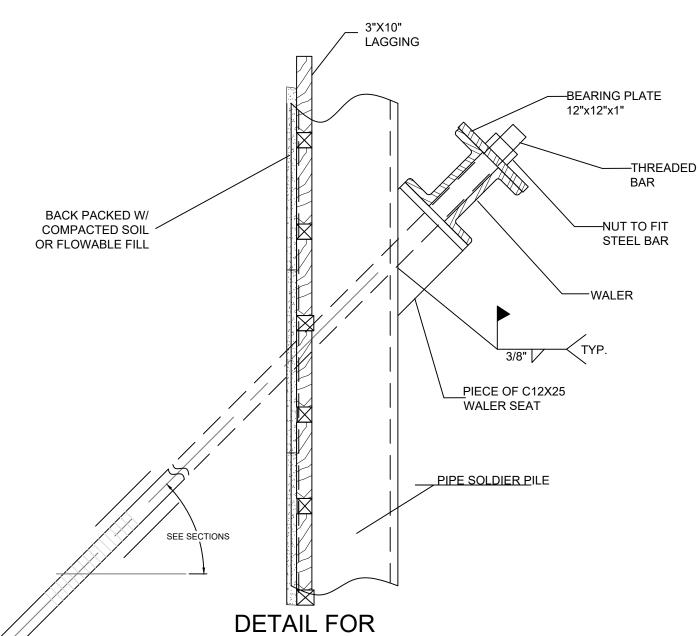
PLAN VIEW TYPICAL LAGGING AND ANGLE DETAIL SCALE: N.T.S.



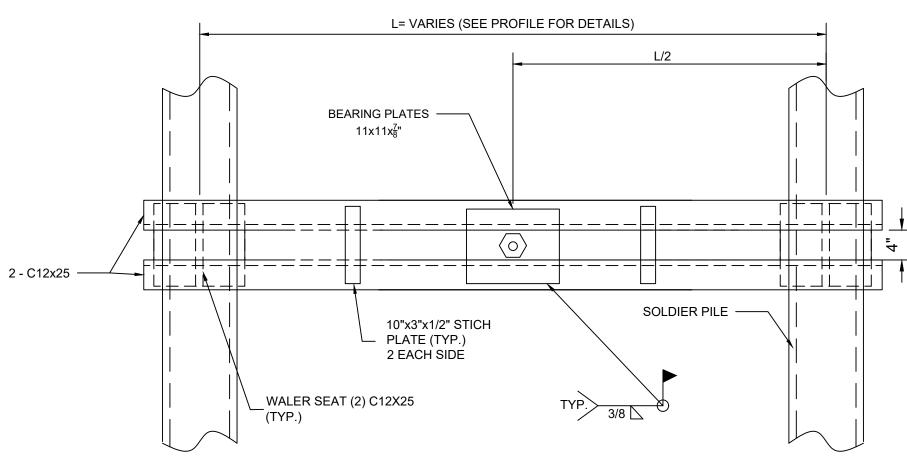
PLAN VIEW TYPICAL LAGGING AND ANGLE DETAIL ALTERNATE I SCALE: N.T.S.



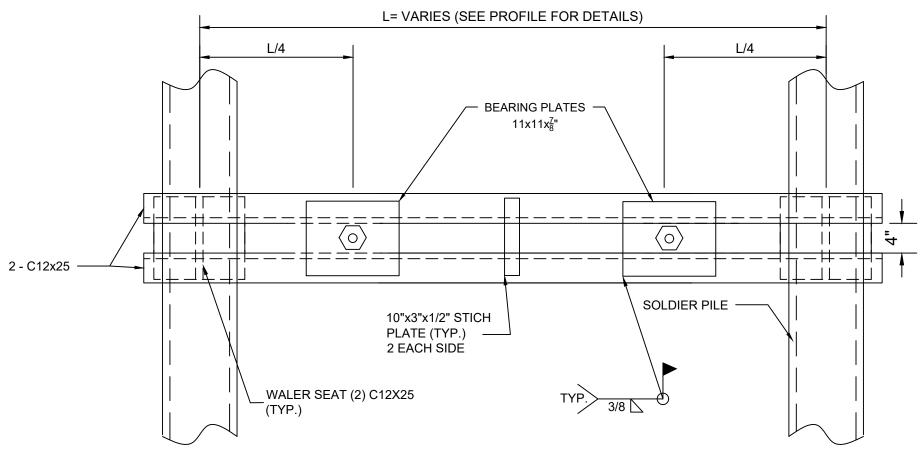
PLAN VIEW TYPICAL LAGGING AND ANGLE DETAIL ALTERNATE II



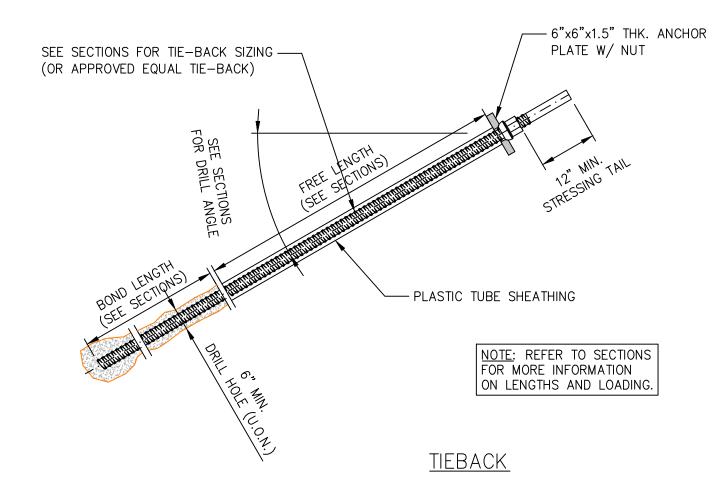
DETAIL FOR

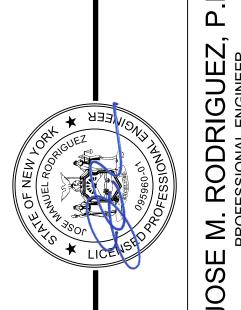


FRONT VIEW OF TIEBACK (SINGLE TIEBACK) SCALE: N.T.S.



FRONT VIEW OF TIEBACK (DOUBLE TIEBACK)
SCALE: N.T.S.





drawing no.

SOE-12

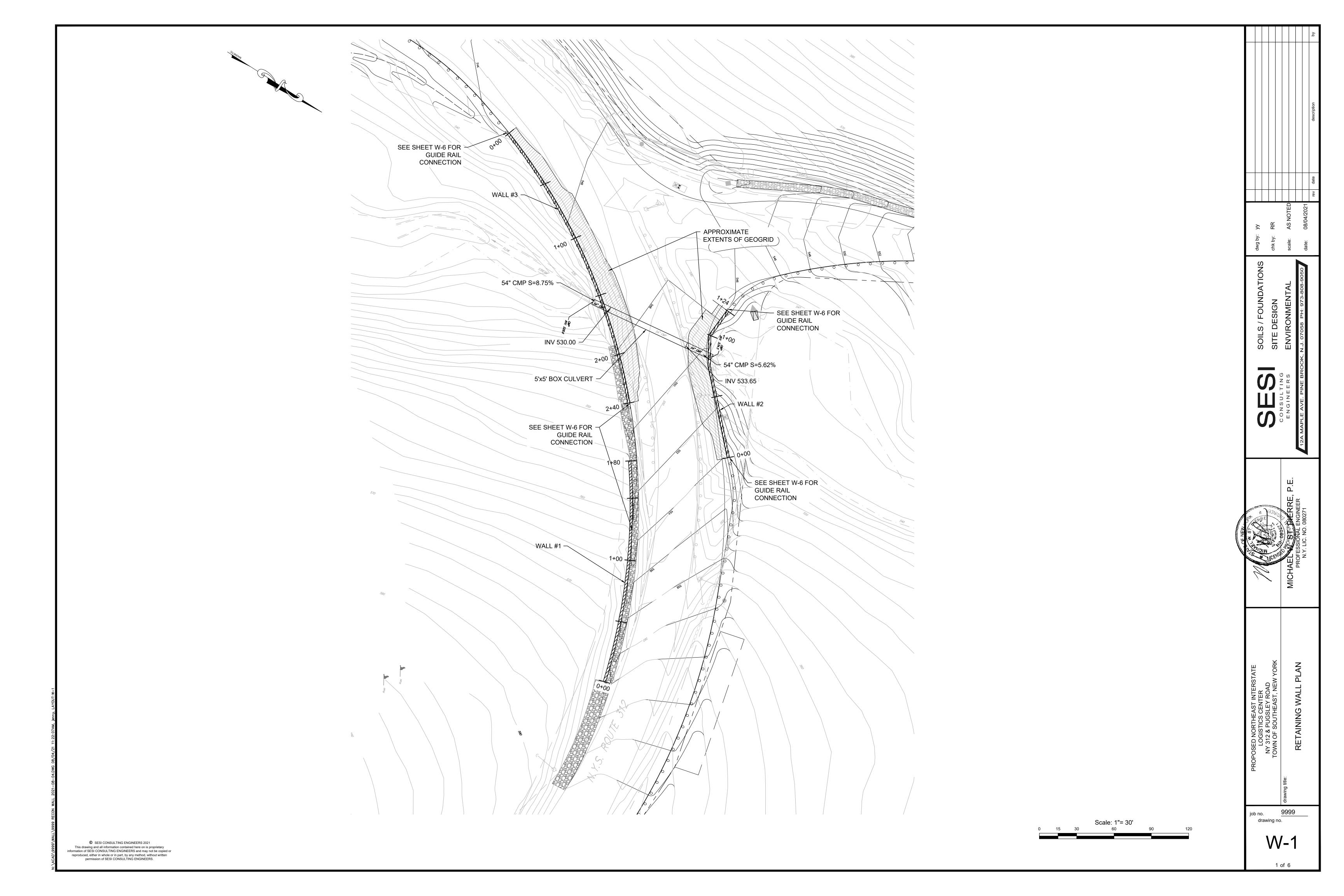
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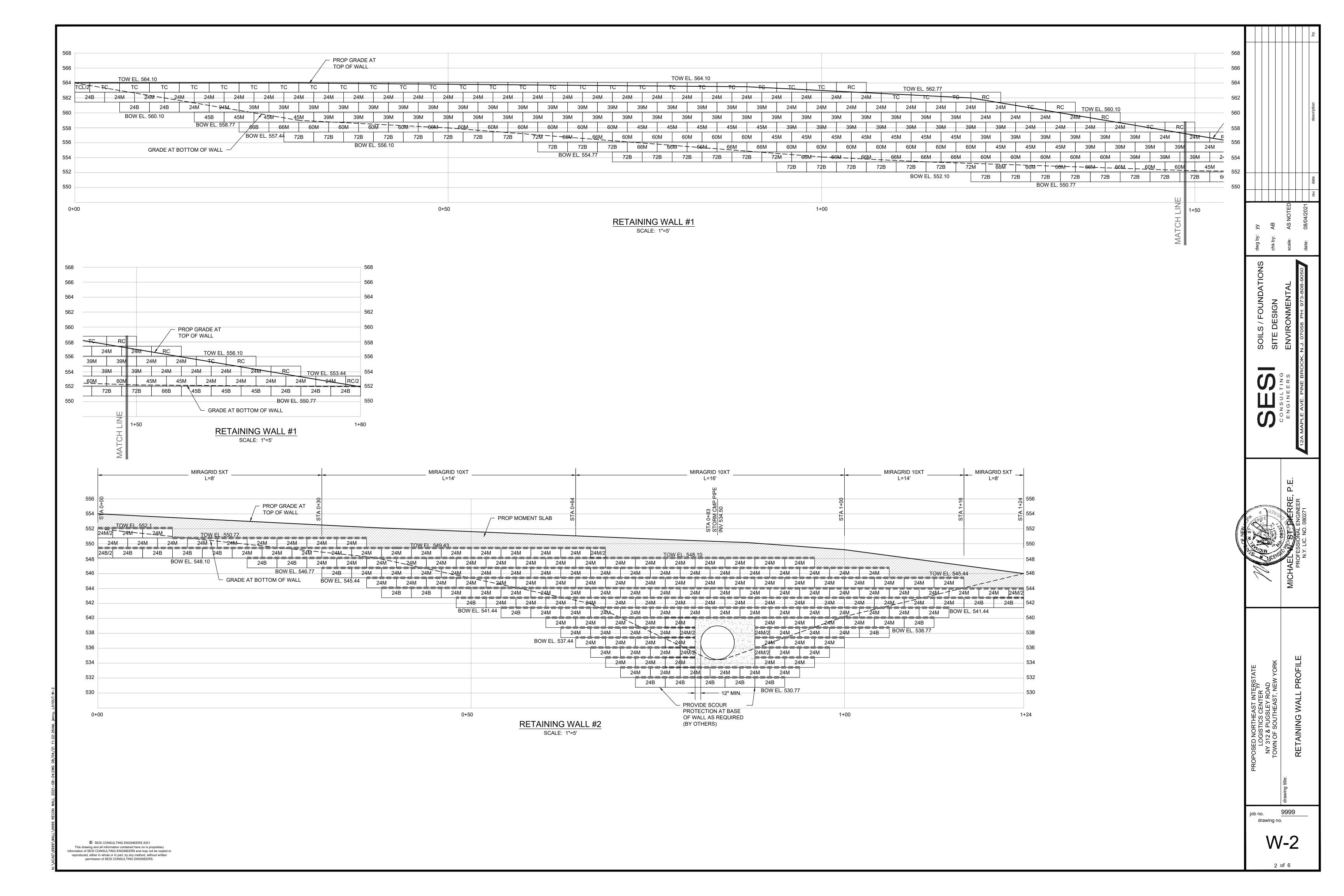
—THREADED

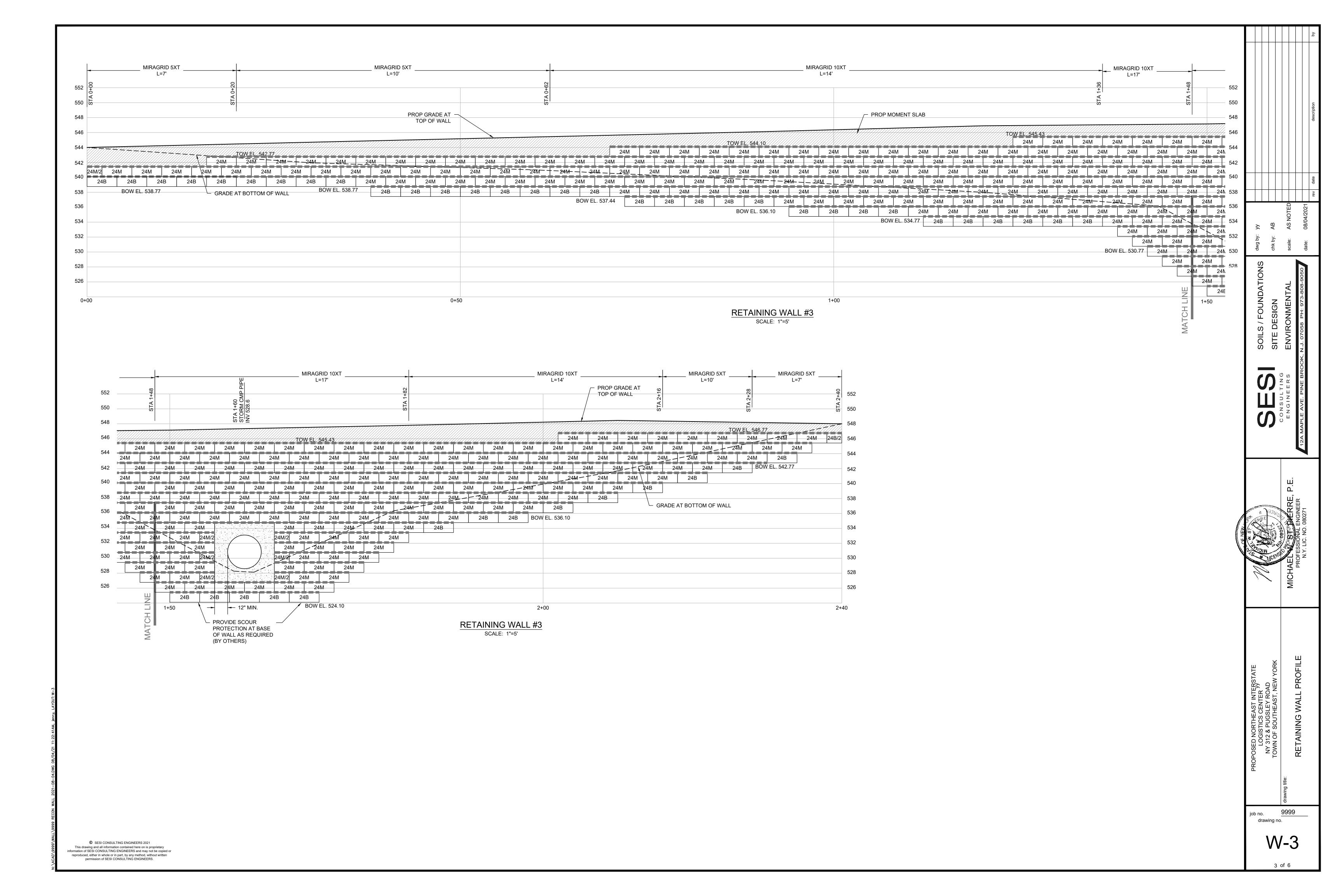
TYPICAL TIE BACK AND LAGGING ATTACHMENT DETAIL SCALE: N.T.S.

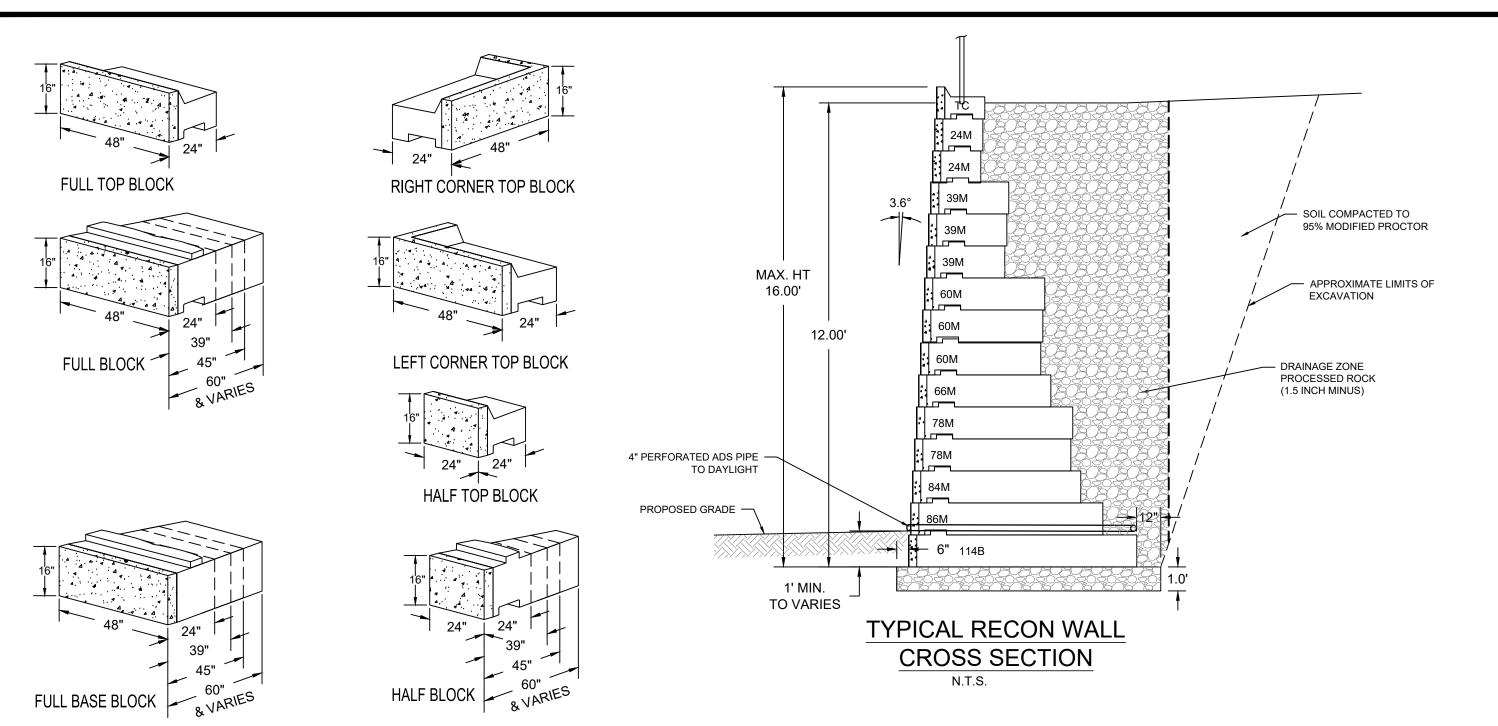
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NOTCH BLOCK AS SHOWN

TO ALLOW FOR DRAINTILE

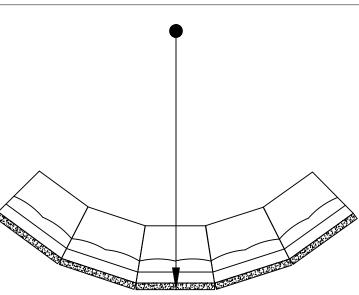
TO DAYLIGHT THROUGH

MAY BE MADE ON TOP OR BOTTOM EDGE OF BLOCK

WITH DIMENSIONS SHOWN

FACE OF WALL NOTCH

Minimum turning radius for a one row high wall is 13'-1". However, see chart for recommended minimum base row radius for varying wall heights



MINIMUM CONVEX / OUTSIDE RADIUS FOR FULL BLOCK

MINIMUM RADIUS TABLE CONVEX / **OUTSIDE CURVE**

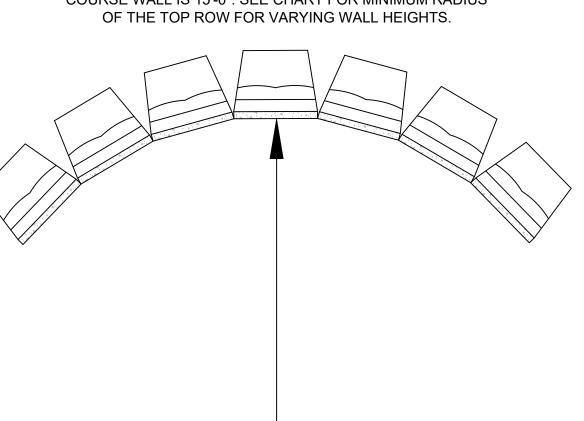
/ALL HEIGHT (FT.)	NUMBER OF ROWS OF BLOCK	MIN. RADIUS OF BASE ROW
2'-8"	2	14'-0"
4'-0"	3	14'-6"
5'-4"	4	15'-0"
6'-8"	5	15'-6"
8'-0"	6	16'-0"
9'-4"	7	16'-6"
10'-8"	8	17'-0"
12'-0"	9	17'-6"

Note: The minimum radius for an

Outside / Convex Curve using the Full Block is 13'-1" for a one row high wall. For curved walls with multiple rows of block, the radius of the base row of block must be increased to accommodate the set back (and resulting tightening of the radius) in each row of block added to the wall. The above Table sets forth the minimum radius of the base row, given varying wall heights. See Block Specification and Installation Instructions for further details.

TYPICAL OUTSIDE RADIUS-FULL BLOCK

THE MINIMUM RADIUS ON THE BASE ROW OF A SINGLE COURSE WALL IS 15'-0". SEE CHART FOR MINIMUM RADIUS



CONCAVE / INSIDE CURVE						
WALL HEIGHT	VALL HEIGHT NUMBER OF ROWS					
2'-8"	2	15'-2"				
4'-0"	3	15'-4"				
5'-4"	4	15'-6"				
6'-8"	5	15'-8"				
8'-0"	6	15'-10"				
9'-4"	7	16'-0"				
10'-8"	8	16'-2"				
12'-0"	9	16'-4"				

MINIMUM RADIUS TABLE

NOTE: THE MINIMUM BASE ROW RADIUS FOR A CONCAVE / INSIDE CURVE USING THE FULL BLOCK SHALL BE NO SMALLER THAN 15'-0" FOR A SINGLE COURSE WALL. THE RADIUS FOR EACH SUCCESSIVE ROW WILL INCREASE BY 2" PER COURSE OF BLOCK ADDED TO ACCOUNT FOR SETBACK SEE BLOCK SPECIFICATION AND INSTALLATION INSTRUCTIONS FOR ADDITIONAL DETAILS.

STANDARD DRAIN DETAILS N.T.S.

- 12" MIN. DRAINAGE STONE

- 4" PERFORATED ADS PIPE

WRAPPED IN FILTER

FABRIC AS REQUIRED

COMPACTED IMPERVIOUS

BLOCK TYPES

4" ADS PIPE

LEVELING PAD

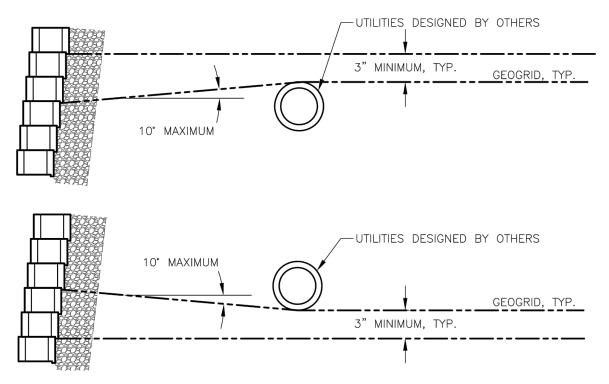
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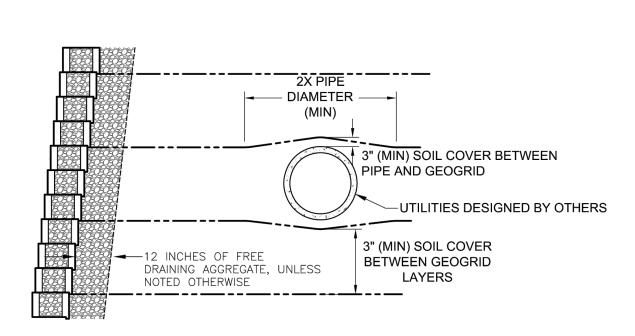
PARTIAL CROSS SECTION

DAYLIGHT THROUGH

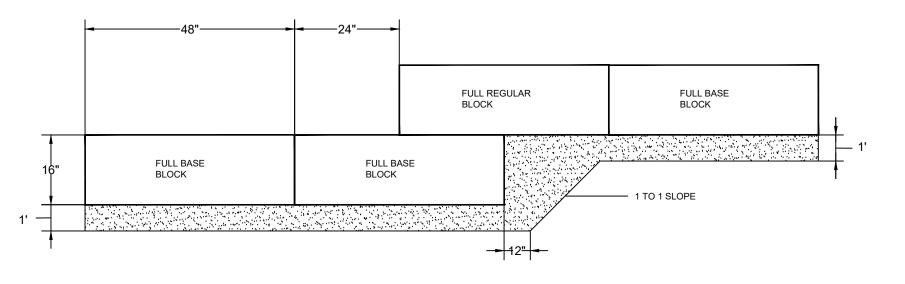
WALL EVERY 30' OR AS

DIRECTED PER ENGINEER

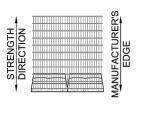




GRID OVER PIPE DETAILS

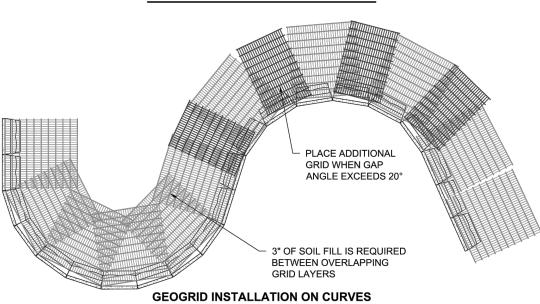


TYPICAL INSIDE RADIUS FULL BLOCK



GEOGRID SHALL BE LAID HORIZONTALLY ON TOP OF BLOCK AND LEVEL COMPACTED BACKFILL. THE GEOGRID MUST BE EXTENDED FORWARD ON THE BLOCK OVER THE TONGUE AND UP TO THE UNEXPOSED FRONT EDGE OF THE BLOCK. THE NEXT COURSE OF BLOCK SHALL BE PLACED SUCH THAT THE GRID IS DEFORMED OVER THE TONGUE AND GROOVE WITH THE BACK EDGE OF THE GROOVE ON THE UPPER BLOCK AGAINST THE BACK OF THE TONGUE ON THE LOWER BLOCK, PULL GRIDS TAUGHT, REMOVING ALL SLACK, ANCHOR/STAKE GRID TO THE COMPACTED FILL PRIOR TO PLACING ANY ADDITIONAL FILL MATERIAL. PROPER GRID ORIENTATION IS CRITICAL. THE STRENGTH DIRECTION OF THE GRID (FACTORY EDGE) MUST EXTEND PERPENDICULAR TO THE FACE OF THE WALL. SEE MANUFACTURER'S INSTRUCTIONS FOR MORE INFORMATION.

GEOGRID PLACEMENT / ORIENTATION



GEOGRID ORIENTATION AND CURVED WALLS

GENERAL NOTES

- 1. DETAILS SHOWN IN ANY SECTIONS APPLY TO ALL SIMILAR SECTIONS UNLESS OTHERWISE NOTED.
- 2. THE CONTRACTOR SHALL ESTABLISH ALL GRADES, LINES LEVELS AND BENCH MARKS AS REQUIRED. SUBGRADE AND FINISHED GRADES SHALL CONFORM TO
- 3. PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITY LOCATIONS
- 4. THE CONTRACTOR SHALL PROVIDE, MAINTAIN, AND OPERATE PUMPS, SUMPS, TRENCHES, AND OTHER APPROVED EQUIPMENT AND METHODS TO KEEP EXCAVATIONS FREE FROM WATER AND TO KEEP WORK FROM BEING DAMAGED BY WATER DURING ALL STAGES OF CONSTRUCTION.
- 5. THE CONTRACTOR SHALL PROVIDE FOR THE TEMPORARY FLOW OF WATER DURING THE STAGES OF CONSTRUCTION, SPECIFICALLY DURING THE CONSTRUCTION AROUND THE CULVERT AND DURING PROTECTION SCOUR INSTALLATION. 6. THE CONTRACTOR AND SUBCONTRACTORS SHALL VISIT AND EXAMINE THE PREMISES SO AS TO FULLY UNDERSTAND ALL OF THE EXISTING CONDITIONS PERTAINING
- 7. ALL DIMENSIONS AND DETAILS SHOWN ON THE CONTRACT DRAWINGS SHALL BE FIELD VERIFIED AND COORDINATED WITH THE G.C. BEFORE PROCEEDING WITH
- 8. THE CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE, AND MUNICIPAL LAWS, ORDINANCES AND CONSTRUCTION CODES. THEY SHALL GIVE NOTICES AND OBTAIN ALL PERMITS NECESSARY FOR THIS WORK. THEY SHALL NOTIFY THE OWNER IF IN THEIR OPINION, ANY WORK IS OMITTED OR IF ANY WORK OR MATERIALS
- SHOWN OR SPECIFIED IS NOT IN ACCORDANCE WITH GOOD PRACTICE OF THESE RULES. 9. WORK TO BE DONE SHALL BE ALL INCLUSIVE AND ANY WORK NOT SPECIFICALLY MENTIONED BUT REASONABLY IMPLIED SHALL BE INCLUDED. THIS INCLUDES ANY
- 10. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN ALL TEMPORARY FENCES. RAILINGS, AND OTHER SAFEGUARDS, AND PROVIDE DANGER SIGNS, LIGHTING, ETC., AS REQUIRED AROUND ALL OPENINGS, EXCAVATIONS, AND ELSEWHERE AS NECESSARY, AND SHALL BE PROVIDED IN ACCORDANCE WITH OSHA AND THE
- 11.THE DRAWINGS SHOW THE INTENT OF THE WORK. THE CONTRACTOR IS RESPONSIBLE FOR MEANS AND METHODS OF CONSTRUCTION. SCHEDULING OF ALL WORK
- INCLUDING DEMOLITION TO BE COORDINATED WITH THE OWNER 12.EXISTING SURVEY MONUMENTS ENCOUNTERED, WHETHER SHOWN ON THE PLAN OR NOT, SHALL BE PROTECTED DURING CONSTRUCTION.
- 13. ALL EXCAVATIONS MUST BE DONE IN ACCORDANCE WITH OSHA STANDARDS AND EVALUATED BY A COMPETENT PERSON.
- 14.PROVIDE REGULAR INSPECTION/MAINTENANCE OF WALL UNDERDRAIN OUTLETS TO PREVENT CLOGGING AND/OR MISPERFORMANCE 15.HYDROSTATIC LOADING (UNBALANCED) IS NOT CONSIDERED IN THE ANALYSIS, IN ACCORDANCE WITH STANDARD PRACTICE. SUFFICIENT DRAINAGE MUST BE PROVIDED AT ALL TIMES SUCH THAT HYDRO STATIC LOADING (PORE PRESSURE) DOES NOT DEVELOP IN THE REINFORCED ZONE.
- 16. SEISMIC PGA USED FOR DESIGN: PGA = 0.18, PER AASHTO GUIDELINES.
- 17.NO HEAVY EQUIPMENT IS ALLOWED TO BE PRESENT WITHIN 5 FEET OF FACE OF THE RETAINING WALL
- 18. ASSUMED IN PLACE DESIGN SOIL PARAMETERS:
- 18.1. RETAINED SOIL: (ONSITE OR IMPORTED) PHI = 34 DEGREES (MINIMUM) GAMMA = 125 PCF (MAXIMUM)
- 18.2. FOUNDATION SOIL: (ONSITE OR IMPORTED) PHI = 34 DEGREES (MINIMUM) GAMMA = 125 PCF (MINIMUM)
- 18.3. FOUNDATION SOIL ALLOWABLE BEARING CAPACITY: 4500 PSF 19. THE OWNER/OWNERS REPRESENTATIVE MUST RETAIN A GEOTECHNICAL ENGINEER/CONSTRUCTION TESTING FIRM TO EVALUATE THE REQUIRED FOUNDATION SOILS
- PARAMETERS PRIOR TO CONSTRUCTION, ANY UNSUITABLE SOILS ENCOUNTERED, AS DETERMINED BY THE OWNER'S GEOTECHNICAL ENGINEER. SHALL BE REMOVED AND REPLACED PROPERLY WITH SUITABLE SOILS AND COMPACTION PROCEDURES AS DIRECTED BY THE OWNER GEOTECHNICAL ENGINEER. UNSUITABLE SOILS ARE DEFINED AS SOILS THAT DO NOT HAVE A SUFFICIENT BEARING CAPACITY OR WILL RESULT IN EXCESSIVE WALL SETTLEMENT
- 20.AFTER THE INSTALLATION OF THE RETAINING WALL, EXCAVATION BELOW GRADE IS NOT ALLOWED UNLESS EXPRESS WRITTEN CONSENT IS GIVEN BY SESI CONSULTING ENGINEERS.
- 21.IN ACCORDANCE WITH THE 3RD EDITION OF THE NCMA DESIGN MANUAL FOR SEGMENTAL RETAINING WALLS, IT IS THE PROJECT GEOTECHNICAL ENGINEER'S RESPONSIBILITY TO REVIEW THE MODULAR RETAINING WALLS FOR GLOBAL STABILITY. 22.ANY EXCAVATION BEING PERFORMED FOR LATERAL OVERSIZING SHALL MAINTAIN A 1:1 SLOPE AWAY FROM THE EDGE OF THE LEVELING PAD, WHERE THE FRONT OF THE WALL EXISTS. AND FROM THE BACK OF THE LOWEST BLOCK OR REINFORCEMENT LAYER.
- 23.DISCREPANCIES BETWEEN ANY INFORMATION ON THESE PLANS AND INFORMATION IN THE PROJECT SPECIFICATIONS ARE ENCOUNTERED, THE MORE RESTRICTIVE
- 24.WALL STATIONING SHOWN ON THE WALL ELEVATION PLAN IS EXCLUSIVELY PERTAINS TO THE STATIONING OF THE PROPOSED RETAINING WALL PLANS AND DOES NOT CORRELATE TO ANY OTHER STATIONING SHOWN ON THE GRADING PLANS. STATION 0+00 IS ON THE LEFT END OF THE WALL AS SEEN FROM THE FRONT OF THE

RETAINING WALL SPECIFICATIONS

PART 1 GENERAL

- DESCRIPTION WORK INCLUDES FURNISHING AND INSTALLING MODULAR BLOCK RETAINING WALL UNITS TO THE LINES AND GRADES DESIGNATED ON THE CONSTRUCTION PRAWINGS AND AS SPECIFIED HEREIN. WORK INCLUDES PREPARING FOUNDATION SOIL, FURNISHING AND INSTALLING LEVELING PAD AND BACKFILL TO THE LINES AND GRADES DESIGNATED ON THE
- FURNISHING AND INSTALLING ALL APPURTENANT MATERIALS REQUIRED FOR CONSTRUCTION OF THE RETAINING WALL AS SHOWN ON THE CONSTRUCTION
- 1.2 REFERENCE STANDARDS ASTM C140-75 SAMPLING AND TESTING CONCRETE MASONRY UNITS.
- ASTM C145-85 SOLID LOAD BEARING CONCRETE MASONRY UNITS. ASTM C1372 SEGMENTAL RETAINING WALL UNITS
- ASTM C92 READY-MIXED CONCRETE 1.3 <u>DELIVERY, STORAGE, AND HANDLING</u>
- CONTRACTOR SHALL CHECK THE MATERIALS UPON DELIVERY TO ASSURE THAT PROPER MATERIAL HAS BEEN RECEIVED.
 CONTRACTOR SHALL PREVENT EXCESSIVE MUD, WET CEMENT, EPOXY, GREASE, AND LIKE MATERIALS WHICH MAY AFFIX THEMSELVES, FROM COMING IN CONTACT
- CONTRACTOR SHALL PROTECT THE MATERIALS FROM DAMAGE: DAMAGED MATERIAL SHALL NOT BE INCORPORATED IN THE RETAINING WALL STRUCTURE.

PART 2 RETAINING WALL 2.1 MATERIALS

- MASONRY WALL UNITS SHALL BE RECON RETAINING WALL UNITS AS MANUFACTURED BY NORTHEAST CONCRETE PRODUCTS OR APPROVED RECON DISTRIBUTOR. CONCRETE WALL UNITS SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4000 PSI IN ACCORDANCE WITH ASTM C-90. THE CONCRETE SHALL HAVE ADEQUATE FREEZE/THAW PROTECTION WITH A MAXIMUM MOISTURE ABSORPTION RATE OF 6%.
- EXTERIOR DIMENSIONS MAY VARY IN ACCORDANCE WITH ASTM C90-85. • UNITS SHALL HAVE ANGLED SIDES CAPABLE OF CONCAVE AND CONVEX ALIGNMENT CURVES WITH A MINIMUM RADIUS OF 13'-1".
- UNITS SHALL BE INTERLOCKED WITH (2) TONGUE AND GROOVE SHAPED PROTRUSIONS ON THE TOP AND BOTTOM OF EACH UNIT.
- MATERIAL SHALL CONSIST OF CRUSHED STONE AS SHOWN ON CONSTRUCTION DRAWING.
- PLACE A MIN. OF 12" OF DRAINAGE FILL BEHIND THE RETAINING WALL UNITS AS SHOWN ON THE CONSTRUCTION DRAWINGS. DRAINGE FILL SHALL CONSIST OF PROCESSED ROCK (1.5 INCH MINUS).
- MATERIAL EXCAVATED DURING CONSTRUCTION OF THE WALL SHALL BE CONSIDERED UNSUITABLE FOR BACKFILL, UNLESS THE ENGINEER APPROVES IT PRIOR TO
- ALL FILL MATERIAL SHALL BE PLACED IN MAXIMUM 12 INCH LIFTS AND COMPACTED TO A MINIMUM OF 95 PERCENT OF MODIFIED PROCTOR DENSITY. (ASTM D1557)

PART 3 EXECUTION 3.1 EXCAVATION

- CONTRACTOR SHALL EXCAVATE TO THE LINES AND GRADES SHOWN ON THE CONSTRUCTION DRAWINGS. CONTRACTOR SHALL BE CAREFUL NOT TO DISTURB EMBANKMENT MATERIALS BEYOND LINES SHOWN 3.2 FOUNDATION SOIL PREPARATION
- FOUNDATION SOIL SHALL BE EXCAVATED AS REQUIRED FOR FOOTING DIMENSIONS SHOWN ON THE CONSTRUCTION DRAWINGS, OR AS DIRECTED BY THE ENGINEER. FOUNDATION SOIL SHALL BE EXAMINED BY A GEOTECHNICAL ENGINEER TO ASSURE THAT THE ACTUAL FOUNDATION SOIL STRENGTH MEETS OR EXCEEDS ASSUMED. DESIGN STRENGTH, SOILS NOT MEETING REQUIRED STRENGTH SHALL BE REMOVED AND REPLACED WITH ACCEPTABLE MATERIAL AS DETERMINED B GEOTECHNICAL ENGINEER
- OVER-EXCAVATED AREAS SHALL BE FILLED WITH APPROVED COMPACTED BACKFILL MATERIAL OR CRUSHED STONE 3.3 BASE LEVELING PAD
- LEVELING PAD SHALL CONSIST OF CRUSHED STONE AS SHOWN ON THE CONSTRUCTION DRAWINGS. PAD DIMENSIONS SHALL EXTEND BEYOND THE BLOCKS IN A DIRECTIONS TO A DISTANCE AT LEAST EQUAL TO THE DEPTH OF THE PAD.

 • LEVELING PAD SHALL BE PREPARED TO INSURE COMPLETE CONTACT OF RETAINING WALL BASE UNIT
- LEVELING PAD MATERIALS SHALL BE TO THE DEPTHS AND WIDTHS SHOWN. 3.4 <u>Unit installation</u> FIRST COURSE OF CONCRETE WALL BASE UNIT SHALL BE PLACED ON THE BASE-LEVELING PAD. THE UNITS SHALL BE PLACED WITH THE AESTHETIC SURFACE FACING OUT AND THE FRONT EDGES TIGHT. ALL UNITS SHALL BE CHECKED FOR LEVEL AND ALIGNMENT AS THEY ARE PLACED. THE FIRST COURSE IS THE MOST
- ${\tt IMPORTANT\ TO\ INSURE\ ACCURATE\ AND\ ACCEPTABLE\ RESULTS}.$ • INSURE THAT UNITS ARE IN FULL CONTACT WITH BASE. • UNITS ARE PLACED SIDE BY SIDE FOR FULL LENGTH OF WALL ALIGNMENT. ALIGNMENT MAY BE DONE BY MEANS OF A STRING LINE OR OFFSET FROM BASE LINE.
- FILL ALL VOIDS BETWEEN UNITS WITH UNIT FILL MATERIAL. TAMP FILL. SWEEP ALL EXCESS MATERIAL FROM TOP OF UNITS. INSURE EACH UNIT IS COMPLETELY BACKFILLED AND COMPACTED PRIOR TO PROCEEDING TO NEXT COURSE
- POSITION NEXT COURSE OF BLOCKS SUCH THAT THE SEAMS OF THE BLOCK ARE OFFSET FROM THE SEAMS IN THE BLOCK FOR THE COURSE BELOW.
 LAY UP EACH COURSE INSURING THAT THE TONGUES PROTRUDE INTO THE GROOVES WITHIN THE ADJOINING COURSE ABOVE. PULL EACH UNIT FORWARD, AWAY FROM THE EMBANKMENT, AGAINST THE PROTRUSIONS IN THE PREVIOUS COURSE AND BACKFILL AS THE COURSE IS COMPLETED, REPEAT PROCEDURE TO THE EXTENT OF WALL HEIGHT.
- SPREAD BACKFILL IN UNIFORM LIFTS NOT EXCEEDING 8 INCHES. EMPLOY METHODS USING LIGHTWEIGHT COMPACTION EQUIPMENT THAT WILL NOT DISTURB THE STABILITY OR BATTER OF THE WALL. HAND-OPERATED PLATE COMPACTION EQUIPMENT SHALL BE USED AROUND THE BLOCK AND WITHIN 3 FEET OF THE WALL.

 • AS APPROPRIATE WHERE THE WALL CHANGES ELEVATION, UNITS CAN BE STEPPED WITH GRADE OR TURNED INTO THE EMBANKMENT WITH A CONVEX RETURN END. PROVIDE APPROPRIATE BURIED UNITS ON COMPACTED LEVELING PAD IN AREA OF CONVEX RETURN END. CUT RECON BLOCKS PER DETAILS TO INSTALL WEEPS.
- PART 4 TOLERANCES
- 4.1 <u>VERTICAL ALIGNMENT</u> • VERTICAL ALIGNMENT SHALL BE PLUS OR MINUS 1-1/4 INCHES OVER A 10 FOOT SPAN, AND A MAXIMUM DIFFERENTIAL OF 3 INCHES OVER THE WALL'S LENGTH. 4.2 HORIZONTAL ALIGNMENT
- HORIZONTAL LOCATION CONTROL GERMANE TO GRADING PLAN. STRAIGHT LINES SHALL BE PLUS OR MINUS 1-1/4 INCHES OVER A 10 FOOT SPAN, AND A MAXIMUM DIFFERENTIAL OF 3 INCHES OVER THE WALL'S LENGTH. CORNERS AND RADII SHALL BE PLUS OR MINUS 12 INCHES
- CURVES AND SERPENTINE RADII SHALL BE PLUS OR MINUS 2 FEET
- POST CONSTRUCTION WALL BATTER SHALL BE WITH 2 DEGREES OF THE DESIGN BATTER AS DEPICTED ON THE PLANS. BULGING SHALL NOT EXCEED PLUS OR MINUS 1-1/4 INCHES OVER A 10 FOOT SPAN.

PART 5 GEOGRID PRODUCTS

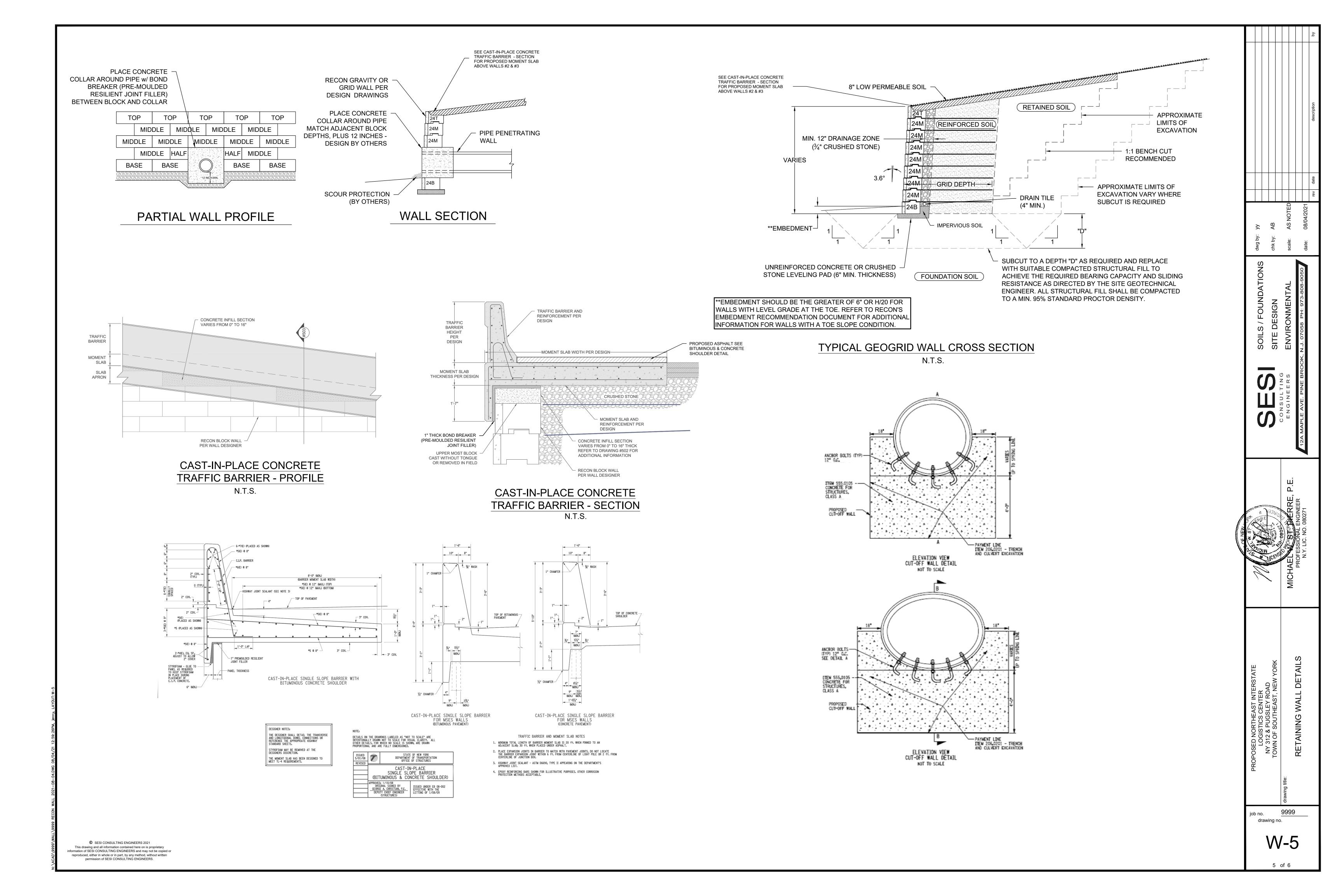
- 5.1 **DEFINITIONS** GEOGRID PRODUCTS SHALL BE UNIAXIAL HIGH STRENGTH POLYESTER WOVEN FIBER MATERIALS, SPECIFICALLY FABRICATED FOR USE AS SOIL REINFORCEMENT WALL FILL IS A FREE DRAINING GRANULAR MATERIAL USED WITHIN & 12" BEHIND THE CONCRETE UNITS.
- BACKFILL IS THE SOIL WHICH IS USED AS FILL FOR THE REINFORCED SOIL MASS. FOUNDATION SOIL IS THE INSITU NATURAL SOIL
- 5.2 **GEOGRID**
- GEOGRID SHALL BE THE TYPE AS SHOWN ON THE DRAWING HAVING THE PROPERTY REQUIREMENTS AS DESCRIBED WITHIN THE MANUFACTURERS SPECIFICATIONS.

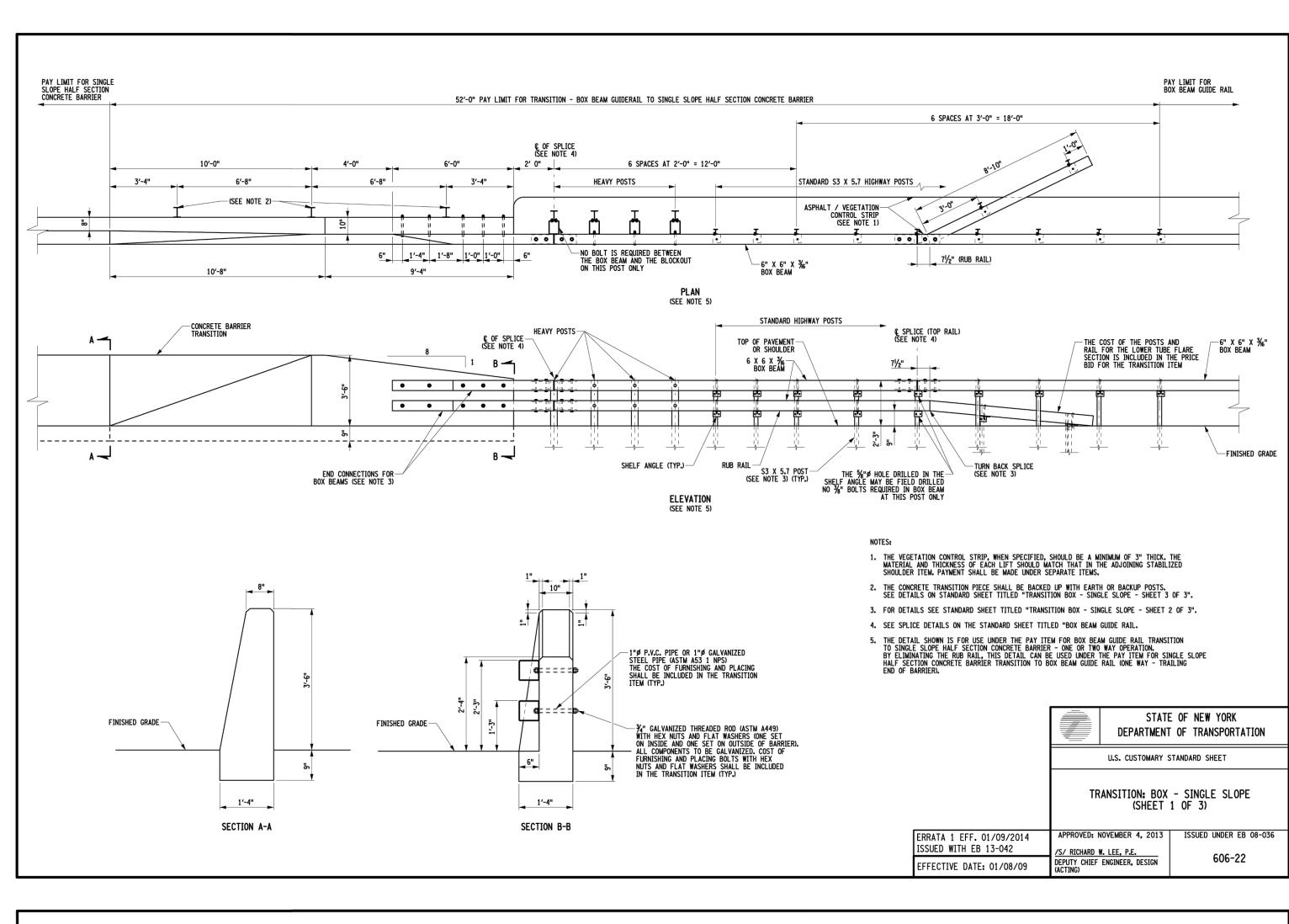
PART 6 GEOGRID INSTALLATION 6.1 GEOGRID INSTALLATION

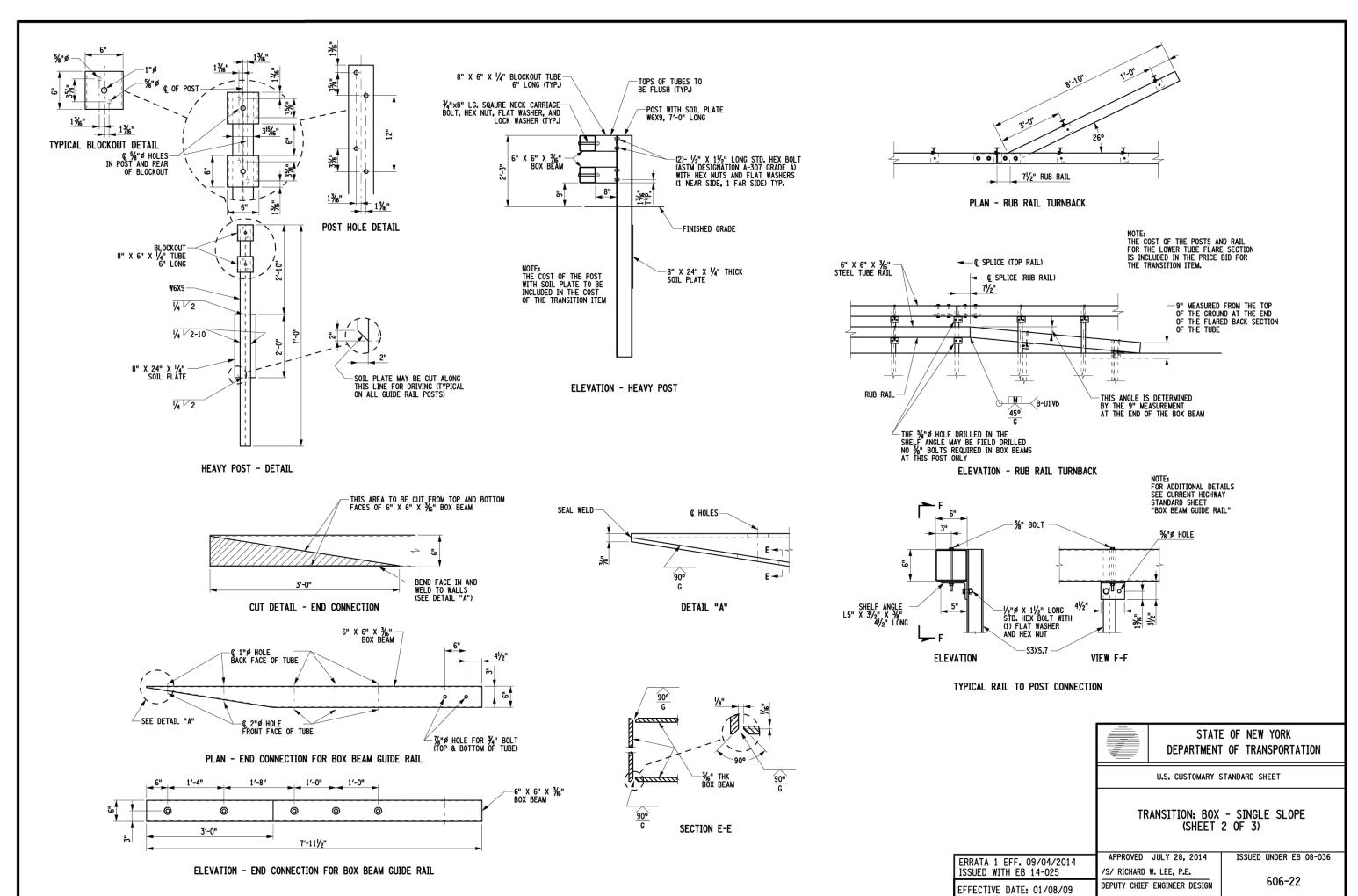
- THE GEOGRID SOIL REINFORCEMENT SHALL BE LAID HORIZONTALLY ON COMPACTED BACKFILL. CUT GEOGRID TO DESIGNED EMBANKMENT LENGTH AND PLACE ON TOP OF RECON BLOCK OVER ALINEMENT LUG AND TO WITHIN 1-INCH OF THE FACE OF THE BLOCK. PULL TAUT, AND ANCHOR BEFORE BACKFILL IS PLACED ON THE SLACK IN THE GEOGRID AT THE WALL UNIT CONNECTIONS SHALL BE REMOVED.
- GEOGRIDS SHALL BE CONTINUOUS. SPLICING PARALLEL TO THE WALL IS NOT PERMITTED. GEOGRID SHALL BE LAID AT THE PROPER ELEVATION AND ORIENTATION AS SHOWN ON THE CONSTRUCTION DRAWINGS OR AS DIRECTED BY THE ON-SITE
- GEOTECHNICAL ENGINEER CORRECT ORIENTATION (ROLL DIRECTION) OF THE GEOGRID SHALL BE VERIFIED BY THE ON-SITE GEOTECHNICAL ENGINEER. TO PRETENSION GEOGRID, PULL PINNED GEOGRID TAUT TO ELIMINATE LOOSE FOLDS. STAKE OR SECURE BACK EDGE OF GEOGRID PRIOR TO AND DURING BACKFILL
- AND COMPACTION. 6.2 FILL PLACEMENT BACKFILL MATERIAL SHALL BE PLACED IN MAXIMUM 8 INCH LIFTS AND COMPACTED TO 95% OF MODIFIED PROCTOR DENSITY, IN-PLACE DENSITY TESTS SHALL BE PERFORMED BY THE ON-SITE GEOTECHNICAL ENGINEER TO VERIFY ADEQUACY OF COMPACTION.
- BACKFILL SHALL BE PLACED, SPREAD, AND COMPACTED IN SUCH A MANNER THAT MINIMIZES THE DEVELOPMENT OF SLACK OR LOSS OF PRETENSION OF THE EOGRID. THIS CAN BE ACCOMPLISHED BY PLACING AND SPREADING THE FILL FROM THE WALL UNIT OUTWARI BACKFILL SHALL BE PLACED FROM THE WALL OUTWARD INTO THE EMBANKMENT TO INSURE THE GEOGRID REMAINS TAUT
- TRACKED CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY ON THE GEOGRID. A MINIMUM BACKFILL THICKNESS OF 8 INCHES IS REQUIRED PRIOR TO OERATION OF TRACKED VEHICLES OVER THE GEOGRID. TURNING OF TRACKED VEHICLES SHOULD BE DEPT TO A MINIMUM TO PREVENT TRACKS FROM DISPLACING THE FILL AND DAMAGING THE GEOGRID. RUBBER-TIRED EQUIPMENT MAY PASS OVER THE GEOGRID REINFORCEMENT AT SLOW SPEEDS, LESS THAN
- 10 MPH, SUDDEN BRAKING AND SHARP TURNING SHALL BE AVOIDED. SOIL TO BE USED WITHIN THE REINFORCED FILL ZONE SHALL BE CAPABLE OF SATISFYING THE FOLLOWING
- DESIGN CRITERIA: PHI ANGLE EQUAL TO OR GREATER THAN 34 DEGREES AND A UNIT WEIGHT OF A MINIMUM OF 125 PCF.

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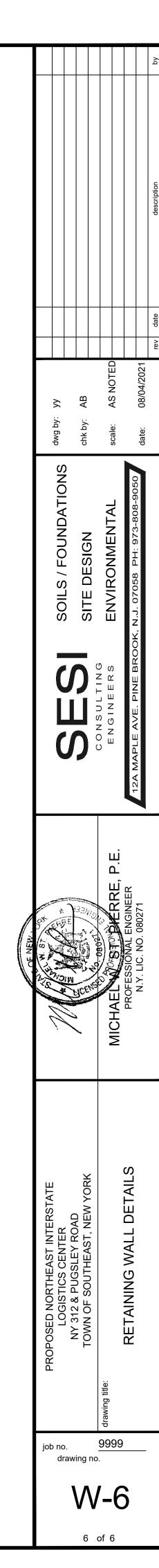


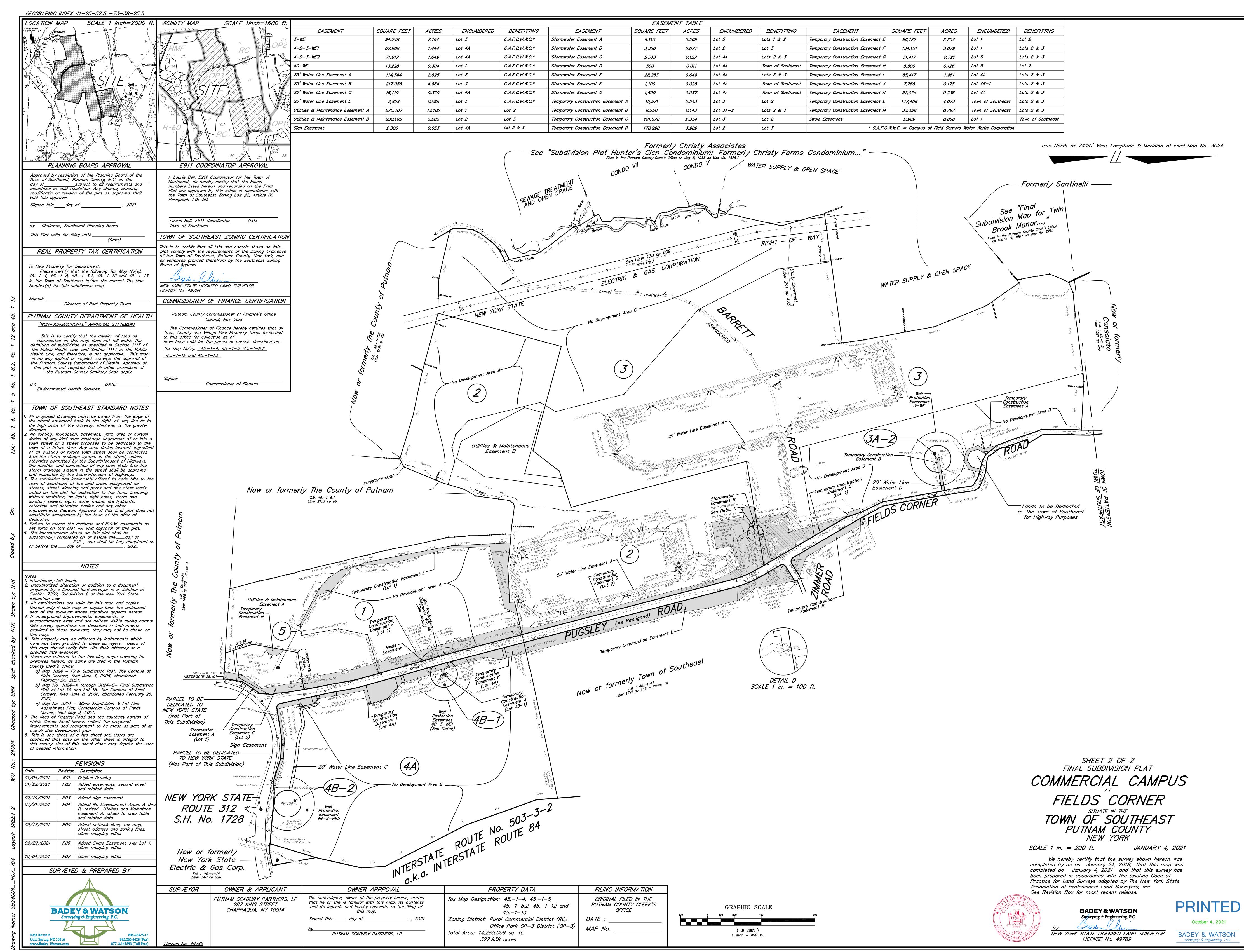


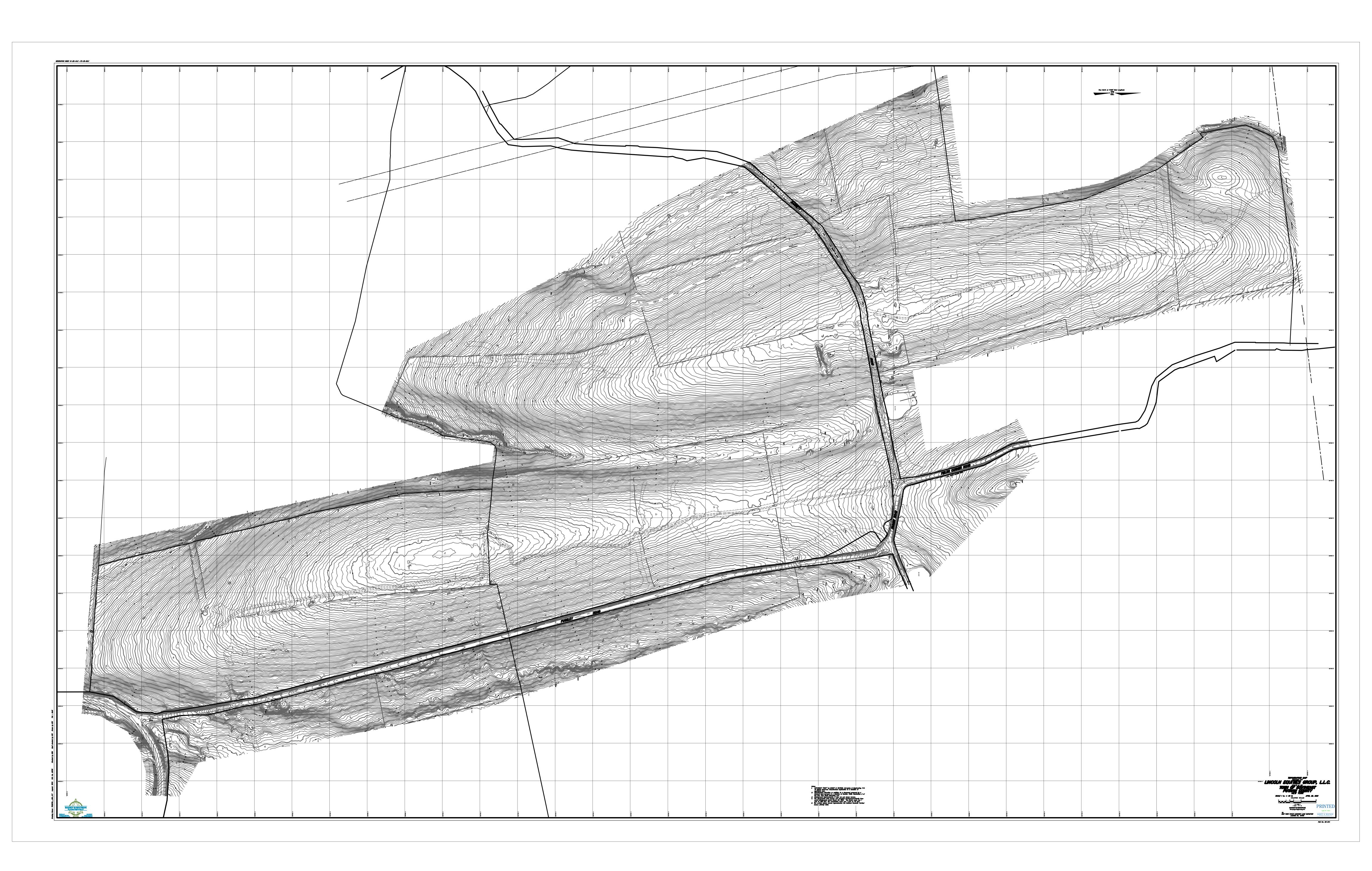


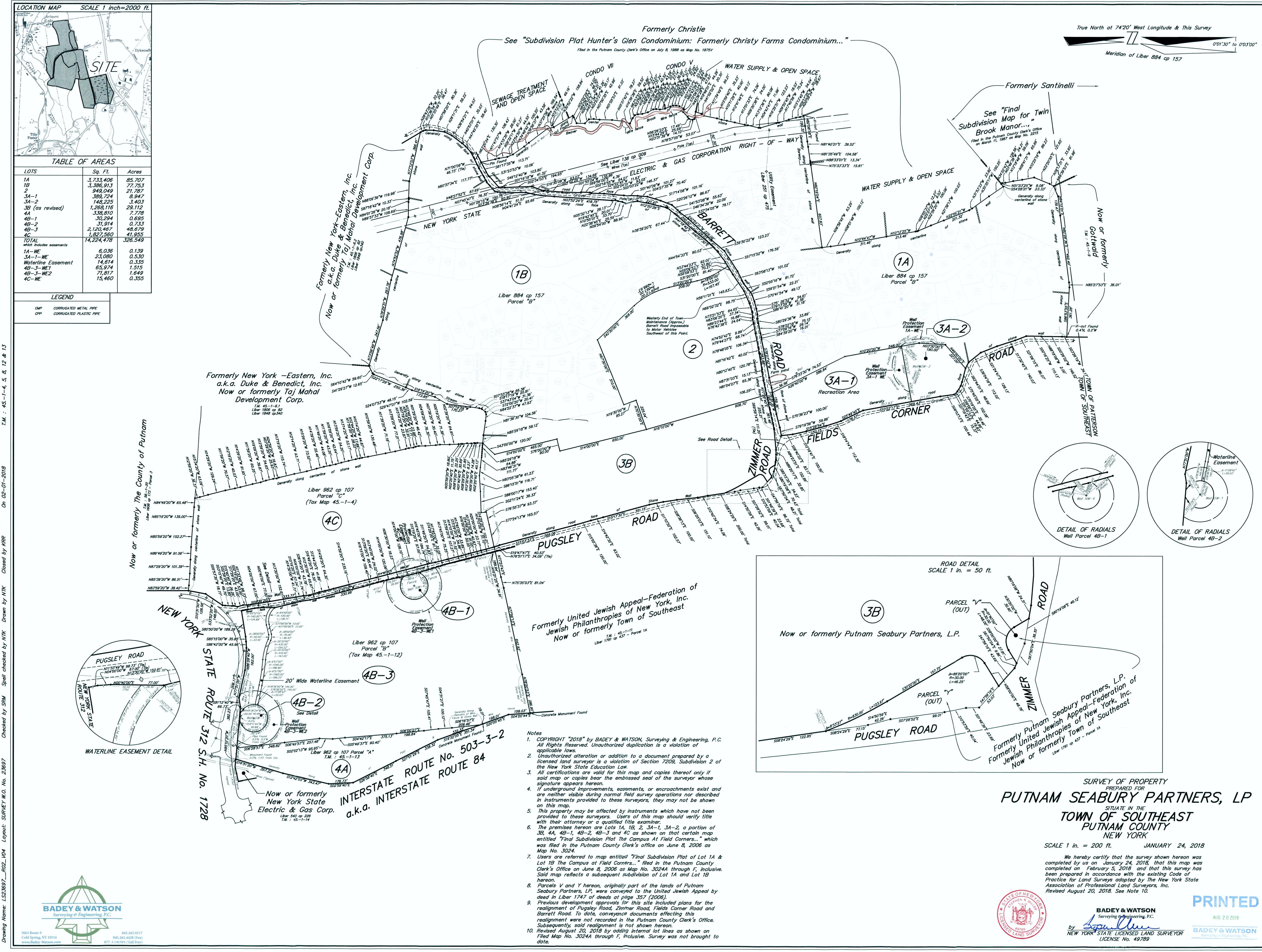
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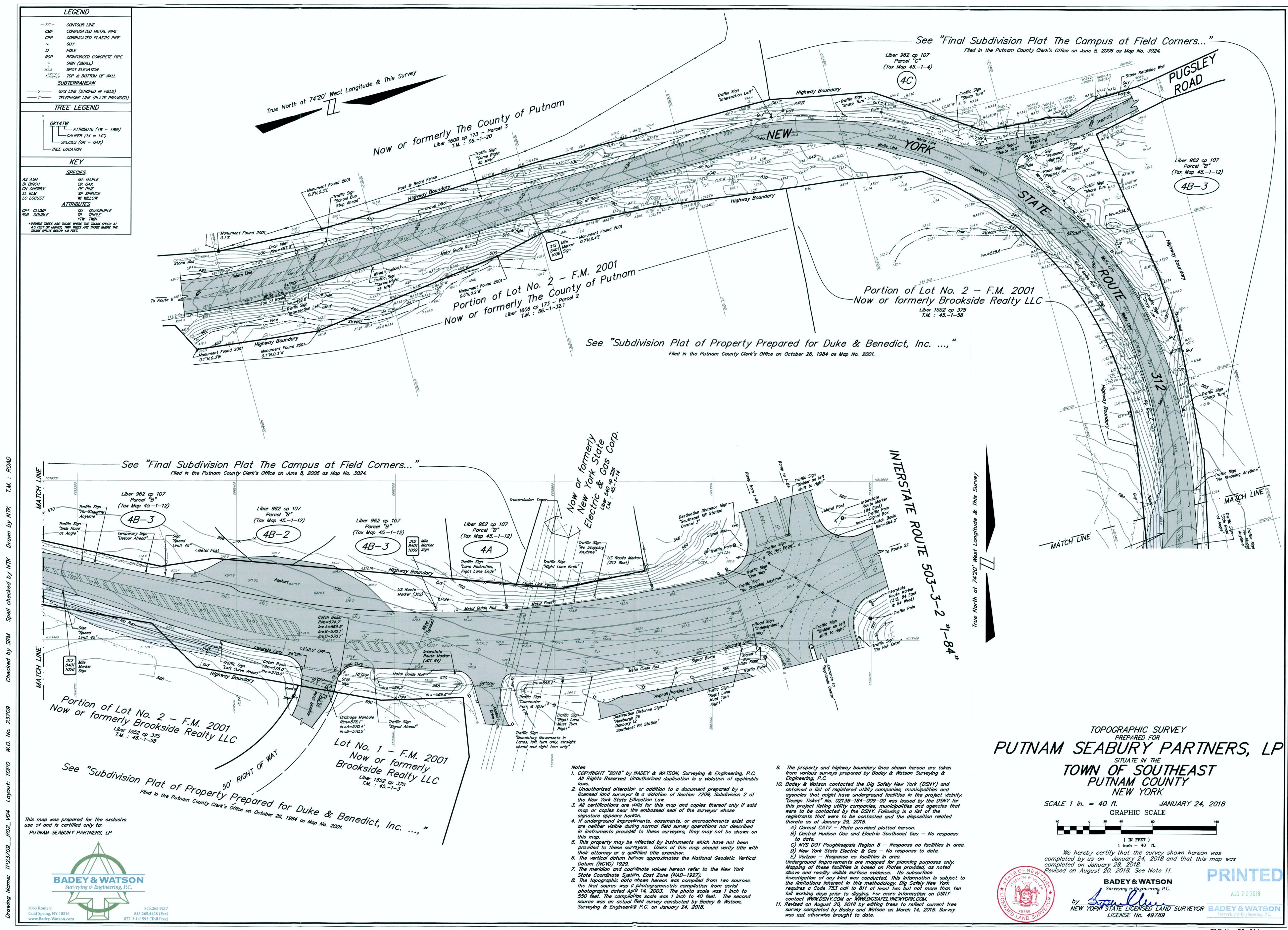
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845.265,9217

845.265,4428 (Fax)

877. 3.141593 (Toll Prec)

3063 Route 9

Cold Spring, NY 10516

FILE No. 50-914DS

BADEY & WATSON

