

RETAINING WALL GENERAL NOTES:

1. DESIGN
- A. DESIGN BASED ON CIVIL DOCUMENTS PREPARED BY LAND SURVEY COMPANY PLOT PLAN DATED 1.4.2022
- B. WALL DESIGN: LOCAL AND INTERNAL STABILITY PER "NCMA DESIGN MANUAL FOR SEGMENTAL RETAINING WALLS" THIRD ADDITION
- C. SOIL DESIGN VALUES
- | SOIL | DESCRIPTION | FRICTION ANGLE
Φ | UNIT WEIGHT
(PCF) |
|---------------------|-----------------------|---------------------|----------------------|
| FOUNDATION SOIL | GRAVEL FILL/LIMESTONE | 34 | 125 |
| REINFORCED BACKFILL | CLEAN GRAVEL | 34 | 110 |
| RETAINED SOIL | CLAY | 26 | 120 |
- ALL DESIGN CALCULATIONS HAVE BEEN PERFORMED BASED ON THESE ASSUMED SOIL PARAMETERS. NOTIFY ENGINEER IF ACTUAL ONSITE SOIL CONDITIONS VARY FROM LISTED VALUES
- D. DESIGN LOADING (TYPICAL UNLESS NOTED OTHERWISE) - WALL DESIGN ASSUMES THAT THE HOUSE IS BEARING ON LIMESTONE BEDROCK AND DOES NOT LOAD THE WALL AS RECCOMENDED IN GEOTECHNICAL REPORT #21-5188 BY CFS ENGINEERS DATED 3.31.2022
- D.1.

VALUE (PSF)	SURCHARGE SET BACK (FT)	SOURCE	MAXIMUM BACKSLOPE	MAXIMUM TOESLOPE
50	NA	INCIDENTAL	0°	18.6°

- D.2. HYDROSTATIC LOADING - NONE
- D.3. GROUND WATER LOCATION - 2/3H BELOW LEVELING PAD (H=HEIGHT OF WALL)
- E. GLOBAL STABILITY: S1 STRUCTURAL HAS NOT PERFORMED A GLOBAL STABILITY ANALYSIS ON THESE WALLS. S1 STRUCTURAL ACCEPTS NO RESPONSIBILITY OR LIABILITY FOR GLOBAL STABILITY AND IT'S EFFECT ON THE SEGMENTAL RETAINING WALL SYSTEM.

2. MATERIALS:

- A. SEGMENTAL RETAINING WALL UNITS: SHALL BE AS LISTED IN THE TABLE BELOW AND MANUFACTURED IN ACCORDANCE WITH ASTM C1372 WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3000 PSI AND A MAXIMUM MOISTURE CONTENT OF 8%. ALL SRW UNITS SHALL BE SOUND AND FREE OF CRACKS OR OTHER DEFECTS THAT WOULD INTERFERE WITH THE PROPER PLACING OF THE UNIT OR IMPAIR THE STRENGTH OR PERFORMANCE OF THE STRUCTURE.

BLOCK PROPERTIES			
MANUFACTURER	UNIT	BATTER	SETBACK (IN)
VENTURE	V-12	3.57°	1/2"

- B. GEOGRID: SHALL BE A HIGH DENSITY POLYETHYLENE EXPANDED SHEET OR POLYESTER WOVEN FIBER MATERIAL SPECIFICALLY FABRICATED FOR FOR USE AS SOIL REINFORCEMENT OF ONE OF THE FOLLOWING PRE APPROVED GEOGRIDS:
- TYPE 1:
- STRATAGRID 200** MANUFACTURED BY STRATA SYSTEMS, INC
- MIRAGRID 3XT** MANUFACTURED BY TENCATE GEOSYNTHETICS
- SYNTEEN 35** MANUFACTURED BY SYNTEEN TECHNICAL FABRICS, INC
- C. DRAINAGE AGGREGATE: SHALL CONSIST OF A CLEAN CRUSHED STONE MEETING ALL REQUIREMENTS OF ASTM C33 #57 OR #67 ROCK INCLUDING THE FOLLOWING GRADATION AS DETERMINED IN ACCORDANCE WITH ASTM D422:
- | SIEVE SIZE | PERCENT PASSING |
|------------|-----------------|
| 1" | 100% |
| 3/4" | 90-100% |
| 1/2" | 25-60% |
| #4 | 0-10% |
| #8 | 0-5% |
- D. REINFORCED GRAVEL FILL: SHALL BE A WELL GRADED CRUSHED STONE MEETING ALL THE REQUIREMENTS OF KDOT AB-3 INCLUDING THE FOLLOWING GRADATION AS DETERMINED IN ACCORDANCE WITH ASTM D422:
- | SIEVE SIZE | PERCENT PASSING |
|------------|-----------------|
| 1" | 100% |
| 3/4" | 70-95% |
| #4 | 40-65% |
| #8 | 30-55% |
| #40 | 16-40% |
| #200 | 8-20% |

OR SHALL MEET ALL REQUIREMENTS OF DRAIN AGGREGATE.

- E. LEVELING PAD: SHALL BE A WELL GRADED CRUSHED STONE MEETING ALL THE REQUIREMENTS OF KDOT AB-3 OR 2000 PSI LEAN CONCRETE
- F. DRAIN PIPE: DRAINAGE PIPE SHALL BE A 4"Ø PERFORATED OR SLOTTED PVC, OR CORRUGATED HDPE PIPE. THE DRAINAGE PIPE MAY BE WRAPPED WITH A GEOTEXTILE TO FUNCTION AS A FILTER. DRAIN PIPE SHALL BE MANUFACTURED WITHIN ACCORDANCE OF ASTM F667, D3034, OR F758.
- G. FILTER FABRIC: SHALL BE A NONWOVEN GEOTEXTILE COMPOSED OF POLYPROPYLENE FIBERS WITH A MINIMUM FLOW RATE OF 110 GPF/SF WHEN TESTED PER ASTM D4491

3. WALL CONSTRUCTION

- A. EXCAVATION: CONTRACTOR SHALL EXCAVATE TO THE LINES AND GRADES SHOWN OF THE PROJECT GRADING PLANS. CONTRACTOR SHALL TAKE PRECAUTIONS TO LIMIT THE AMOUNT OF OVER-EXCAVATION. EXCAVATION STABILITY AND SHORING INCLUDING THE EXCAVATIONS INFLUENCE ON ADJACENT PROPERTY IS THE RESPONSIBILITY OF THE CONTRACTOR.

B. FOUNDATION SOIL:

- B.1. WALL DESIGNED TO BEAR ON LIMESTONE WITH A MINIMUM REQUIRED FOUNDATION SOIL BEARING CAPACITY OF 5000 PSF AS IDENTIFIED IN GEOTECHNICAL REPORT.
- B.2. FOUNDATION SOIL SHALL BE OBSERVED BY THE OWNER'S GEOTECHNICAL ENGINEER TO VERIFY FOUNDATION SOIL STRENGTH MEETS OR EXCEEDS THE MINIMUM REQUIRED BEARING CAPACITY LISTED ON EACH WALL ELEVATION.
- B.3. FOUNDATION SOIL EXTENDS FROM THE TOE OF THE LEVELING PAD TO THE BACK OF THE REINFORCED ZONE.
- B.4. ANY SOIL NOT MEETING THE REQUIRED STRENGTH SHALL BE REMOVED AND REPLACED WITH SOIL MEETING THE MINIMUM DESIGN CRITERIA AS DIRECTED BY THE GEOTECHNICAL ENGINEER.

C. LEVELING PAD:

- C.1. LEVELING PAD SHALL BE PLACED AS SHOWN ON THE DRAWINGS WITH A MINIMUM THICKNESS OF 6".
- C.2. LEVELING PAD SHALL BE CONSTRUCTED TO PROVIDE FULL BEARING OF RETAINING WALL UNITS.
- C.3. KDOT AB-3 LEVELING PADS SHALL BE COMPACTED TO A MINIMUM OF 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D698) AT A MOISTURE CONTENT NECESSARY TO OBTAIN THE MINIMUM COMPACTION.
- C.4. LEAN CONCRETE LEVELING PADS SHALL CURE A MINIMUM OF 12 HOURS PRIOR TO UNIT PLACEMENT.

D. UNIT INSTALLATION:

- D.1. THE FIRST COURSE OF SEGMENTAL CONCRETE WALL UNITS SHALL BE PLACED ON THE BASE LEVELING PAD AND CHECKED FOR LEVEL, ALIGNMENT, AND FULL CONTACT WITH BASE.
- D.2. UNITS SHALL BE PLACED SIDE BY SIDE FOR THE FULL LENGTH OF WALL ALIGNMENT. ALIGNMENT SHALL BE DONE WITH A STRING LINE OR OFFSET MEASUREMENT FROM A BASELINE.
- D.3. PLACE DRAINAGE AGGREGATE A MINIMUM OF 12" DIRECTLY BEHIND AND BETWEEN UNITS (CORE FILL HOLLOW UNITS WITH DRAIN AGG). PLACE REINFORCED BACKFILL DIRECTLY AGAINST DRAIN AGG AND COMPACT. EXCESS MATERIAL SHALL BE REMOVED FROM THE TOP OF THE UNIT PRIOR TO PLACEMENT OF THE NEXT COURSE.
- D.4. LAY UP EACH COURSE ENSURING POSITIVE CONTACT WITH THE COURSE BELOW. INSTALL ALIGNMENT PINS OR ENSURE LIP OF UNIT IS IN FULL CONTACT WITH UNIT BELOW AS REQUIRED.
- D.5. MAXIMUM STACKED VERTICAL HEIGHT OF WALL UNITS PRIOR TO CORE FILL AND REINFORCED FILL PLACEMENT AND COMPACTION SHALL NOT EXCEED 2 COURSES.

E. GEOGRID INSTALLATION:

- E.1. GEOGRID SHALL BE PLACED AT THE PROPER ELEVATION, WITH THE PROPER LENGTHS, AND ALIGNMENT AS SHOWN ON THE PLANS.
- E.2. GEOGRID SHALL BE PLACED HORIZONTALLY ON LEVEL COMPACTED BACKFILL AND EMBEDDED IN THE BLOCK AS SHOWN ON 3/RW1 PLACE GEOGRID ON WALL UNITS. PLACE THE NEXT COURSE OF UNITS. PLACE THE DRAINAGE AGG, PULL GEOGRID TIGHT, AND ANCHOR THE GEOGRID WITH STAPLES STAKES OR HAND TENSIONING PRIOR TO BACKFILL PLACEMENT. ENSURE ALL SLACK IN THE GEOGRID HAS BEEN REMOVED PRIOR TO AND DURING BACKFILL PLACEMENT.
- E.3. CORRECT ORIENTATION (ROLL DIRECTION) OF THE GEOGRID SHALL BE VERIFIED WITH THE DIRECTION OF STRENGTH PERPENDICULAR TO THE WALL FACE.
- E.4. GEOGRID REINFORCEMENTS SHALL BE CONTINUOUS THROUGHOUT THE EMBED LENGTHS AND PLACED SIDE BY SIDE TO PROVIDE 100% COVERAGE AT EACH LAYER OF GEOGRID. SPLICED CONNECTIONS OF GEOGRID IN THE DIRECTION OF STRENGTH ARE NOT ALLOWED.
- E.5. 3" OF REINFORCED BACKFILL SHALL BE PLACED BETWEEN ALL LOCATIONS OF OVERLAPPING GEOGRID.

F. REINFORCED BACKFILL PLACEMENT:

- F.1. REINFORCED BACKFILL SHALL BE PLACED IN A MAXIMUM OF 8" COMPACTED LIFTS. ALL MATERIAL WITHIN 3' OF THE WALL FACE SHALL BE COMPACTED WITH A LIGHTWEIGHT COMPACTOR SUCH AS A VIBRATORY PLATE OR A DRUM VIBRATORY ROLLER.
- F.2. CLEAN GRAVEL BACK FILL (DRAIN AGGREGATE) SHALL BE COMPACTED WITH A MINIMUM OF 3 PASSES OF A VIBRATORY PLATE OR DRUM COMPACTOR.
- F.3. WELL GRADED GRAVEL BACKFILL (KDOT AB-3) SHALL BE COMPACTED TO A MINIMUM OF 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D698) AT A MOISTURE CONTENT NECESSARY TO OBTAIN THE MINIMUM COMPACTION.
- F.4. REINFORCED BACKFILL SHALL BE COMPACTED FROM FROM THE BACK OF THE WALL UNIT REARWARD INTO THE EMBANKMENT TO INSURE THAT THE GEOGRID REMAINS TIGHT.
- F.5. TRACKED CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY ON GEOGRID. A MINIMUM BACKFILL THICKNESS OF 6" SHALL BE MAINTAINED TO OPERATE TRACKED VEHICLES OVER THE GEOGRID. TURNING OF TRACKED CONSTRUCTION EQUIPMENT SHALL BE KEPT TO A MINIMUM TO PREVENT TRACKS FROM DISPLACING THE FILL AND DAMAGING THE GEOGRID.

- G. DRAIN PIPE INSTALLATION: DRAINAGE COLLECTION PIPES SHALL BE INSTALLED TO MAINTAIN GRAVITY FLOW OF WATER AWAY FROM THE REINFORCED ZONE. THE DRAIN PIPE SHOULD CONNECT INTO A STORM SEWER OR DAYLIGHT AS SHOWN IN DETAIL 2/RW-1

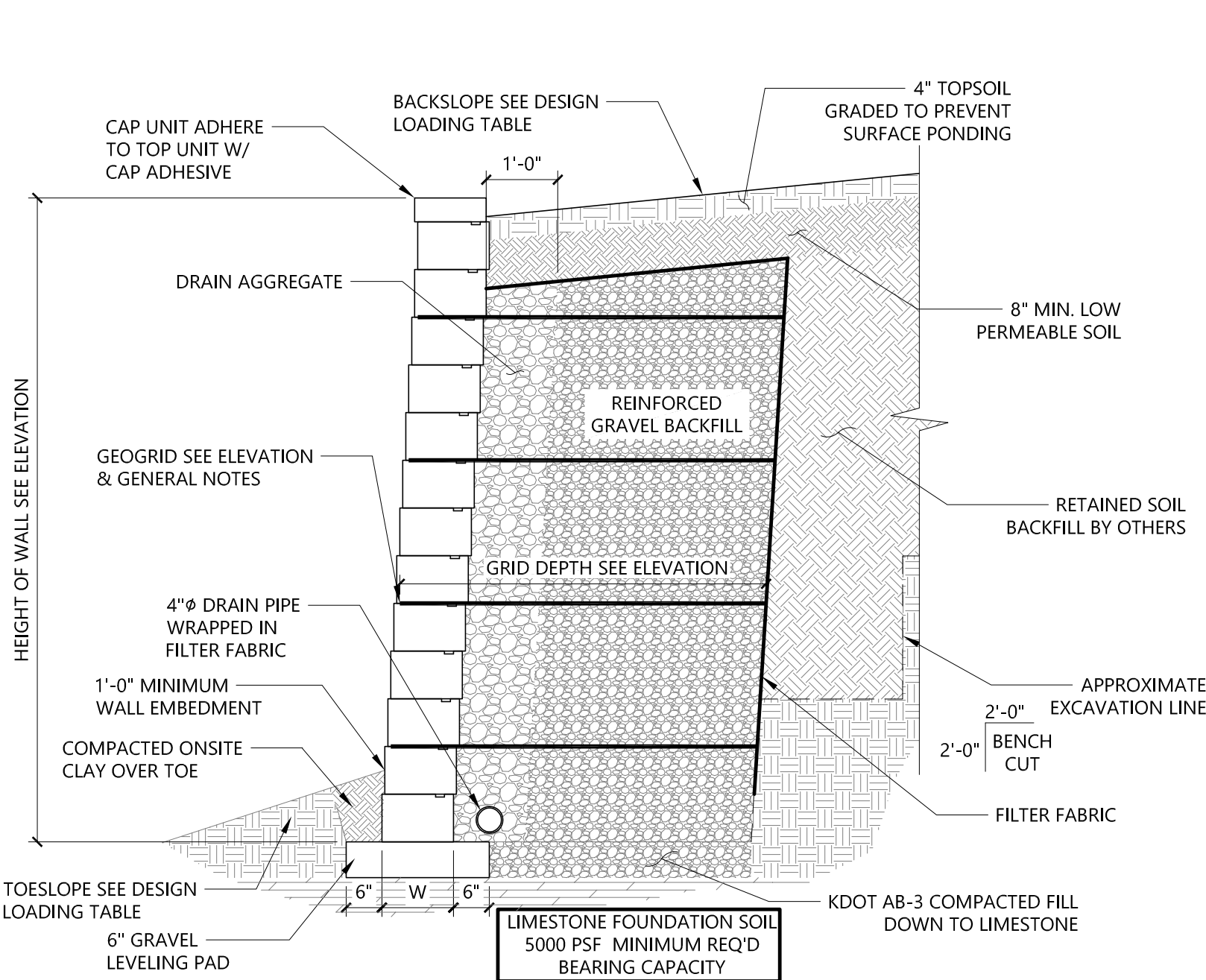
- H. CAP INSTALLATION: CAP UNITS SHALL BE ADHERED TO TO UNDERLYING UNITS WITH AN ALL-WEATHER ADHESIVE RECOMMENDED BY THE MANUFACTURER. PRESS THE CAPS FIRMLY INTO THE ADHESIVE AND ALLOW TO CURE.

I. PROTECTION OF WORK:

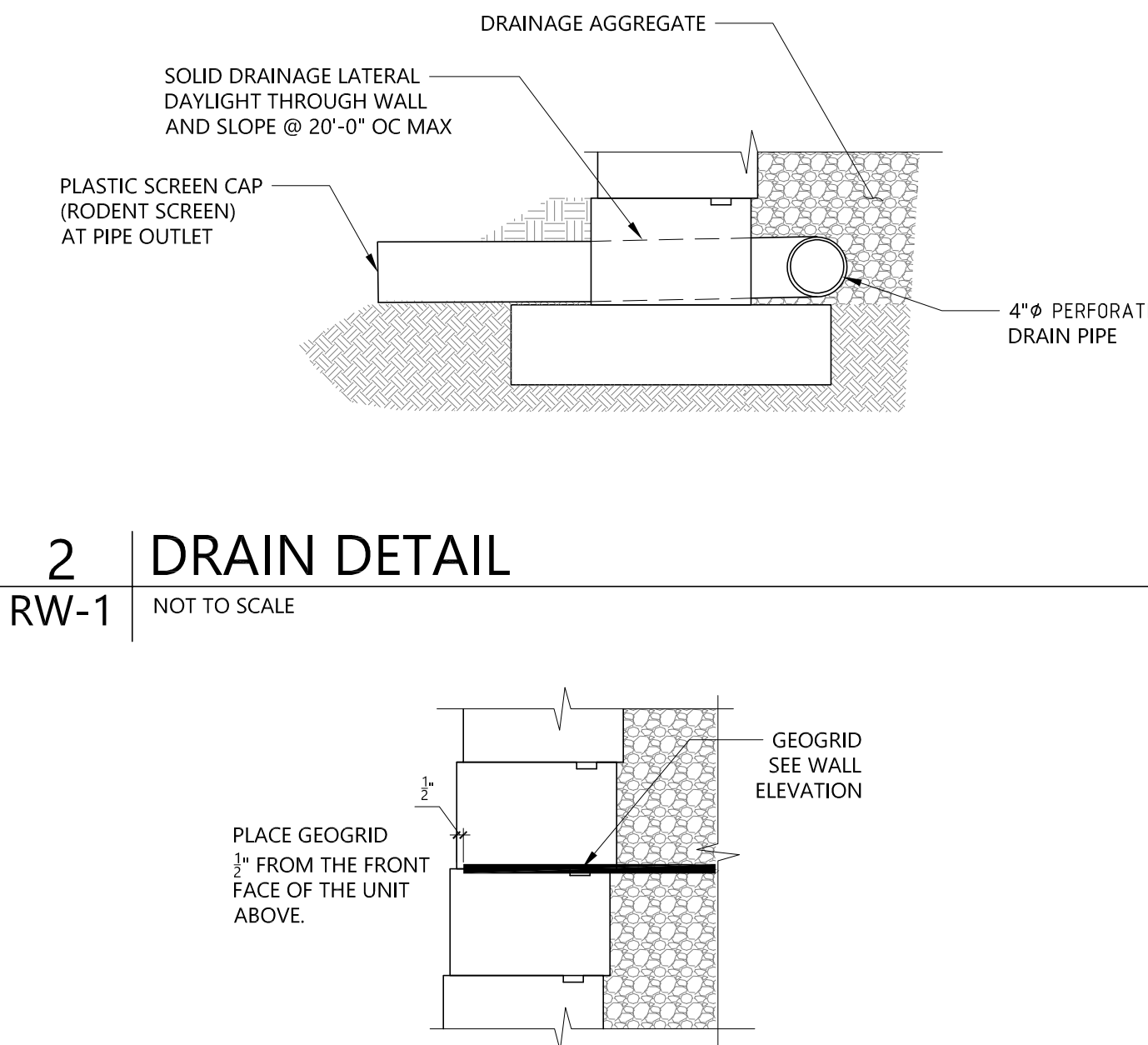
- I.1. AT THE END OF EACH DAYS OPERATION SLOPE BACKFILL AWAY FROM THE FACING TO DIRECT SURFACE RUNOFF AWAY FROM THE WALL FACE.
- I.2. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO ENSURE THAT THE SURFACE WATER RUNOFF FROM ADJACENT CONSTRUCTION AREA IS NOT ALLOWED TO ENTER THE RETAINING WALL AREA.
- I.3. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO PROTECT ALL WORK FROM DAMAGE BY OTHER TRADES ONCE THE WALL INSTALLATION IS COMPLETE.
- I.4. THE REINFORCED ZONE SHALL NOT BE EXCAVATED ONCE THE WALL INSTALLATION IS COMPLETE.

J. SPECIAL INSPECTIONS:

- J.1. THE OWNER OR OWNERS REPRESENTATIVE IS RESPONSIBLE FOR ENGAGING THE SERVICES OF AN INDEPENDENT THIRD PARTY SPECIAL INSPECTOR TO OBSERVE AND VERIFY ALL SOIL PROPERTIES AS WELL AS VERIFY CORRECT INSTALLATION OF ALL SYSTEM COMPONENTS TO MEET THE REQUIREMENTS OF THESE DRAWINGS.
- J.2. FAILURE TO PERFORM THE TESTING AND INSPECTION AS STATED HEREIN WILL RELEASE S1 STRUCTURAL FROM IT'S LIABILITY FOR THIS DESIGN.
- J.3. THE SPECIAL INSPECTOR'S RESPONSIBILITIES INCLUDE, BUT ARE NOT LIMITED TO, VERIFICATION OF THE FOLLOWING ITEMS
- FOUNDATION SOIL PRIOR TO PLACEMENT OF LEVELING PAD AND REINFORCED BACKFILL
 - VERIFY MATERIAL PROPERTIES OF DRAIN AGGS & REINFORCED BACKFILL MEET REQUIREMENTS
 - PROPER TYPE, ALIGNMENT AND INSTALLATION OF GEOGRID.
 - COMPACTION OF DRAIN AGG AND REINFORCED FILL.
- DRAIN AGG - VISUAL OBSERVATION
- KDOT AB-3 - COMPACTION TESTING AT FREQUENCY DETERMINED BY SPECIAL INSPECTOR

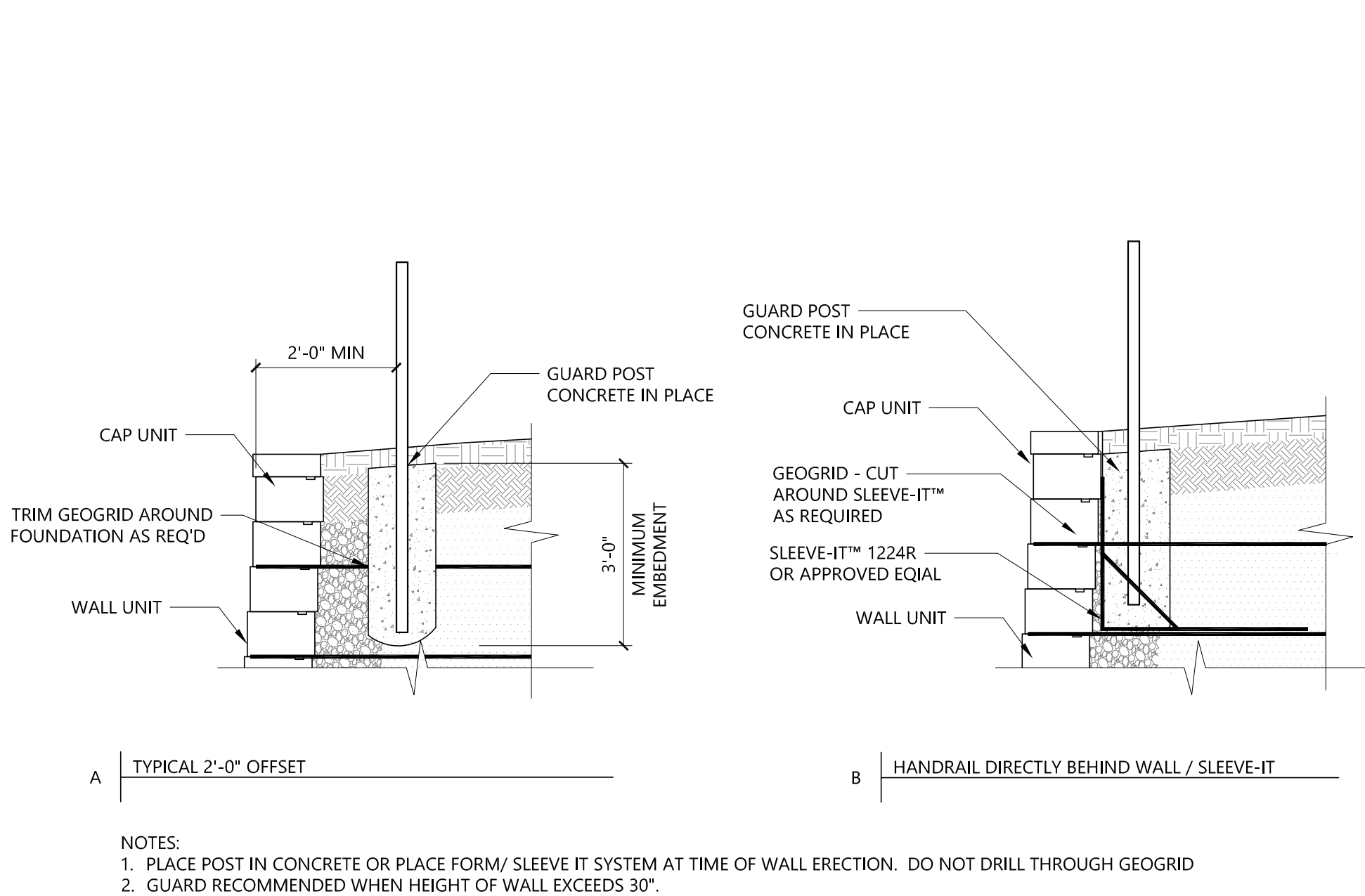


1 | REINFORCED WALL SECTION
RW-1 | NOT TO SCALE

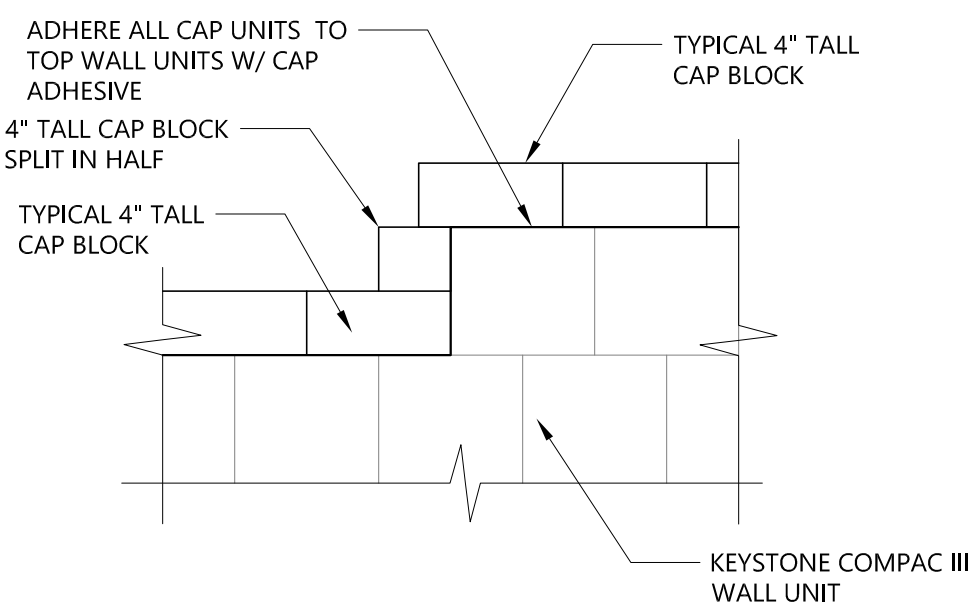


2 | DRAIN DETAIL
RW-1 | NOT TO SCALE

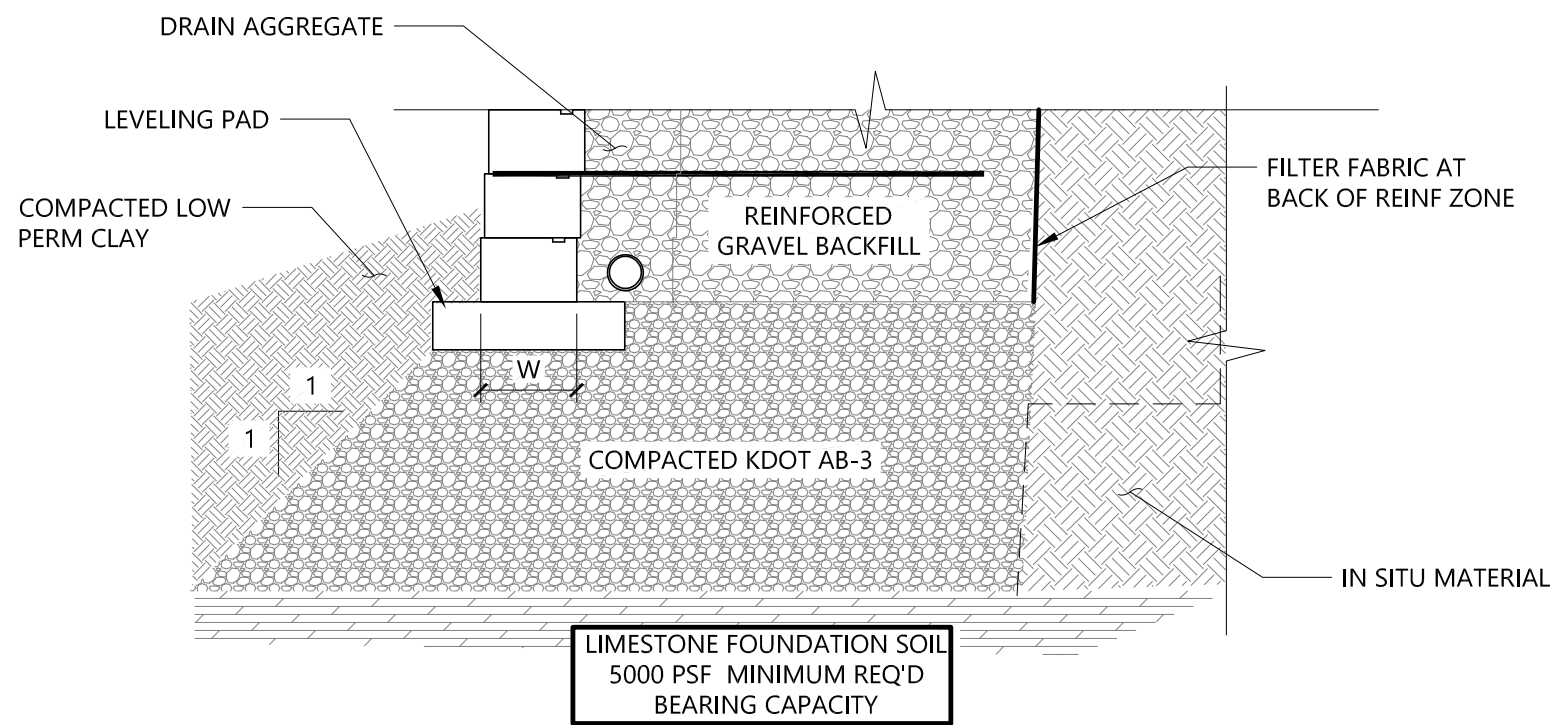
3 | GEOGRID PLACEMENT
RW-1 | NOT TO SCALE



4 | HANDRAIL POST DETAIL
RW-1 | NTS



5 | TOP OF WALL STEP DETAIL
RW-1 | NOT TO SCALE



6 | WALL BEARING - GRAVEL FILL TO LIMESTONE DETAIL
RW-1 | NOT TO SCALE



STRUCTURAL

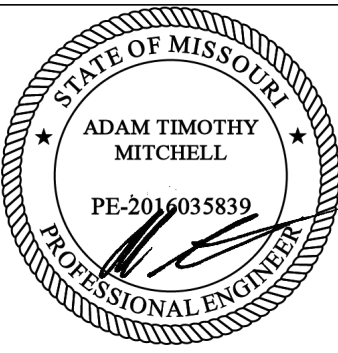
7700 SHAWNEE MISSION PKWY
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OVERLAND PARK, KS 66202
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WWW.S1STRUCTURAL.COM
MO COA LICENSE # E-2017036669

PROJECT #

122-005

STEENSON SEGMENTAL RETAINING WALL

3000 NW AUDOBON LANE
LEE'S SUMMIT, MISSOURI 64081



2.24.22
ADAM MITCHELL - ENGINEER
PE-2016035839

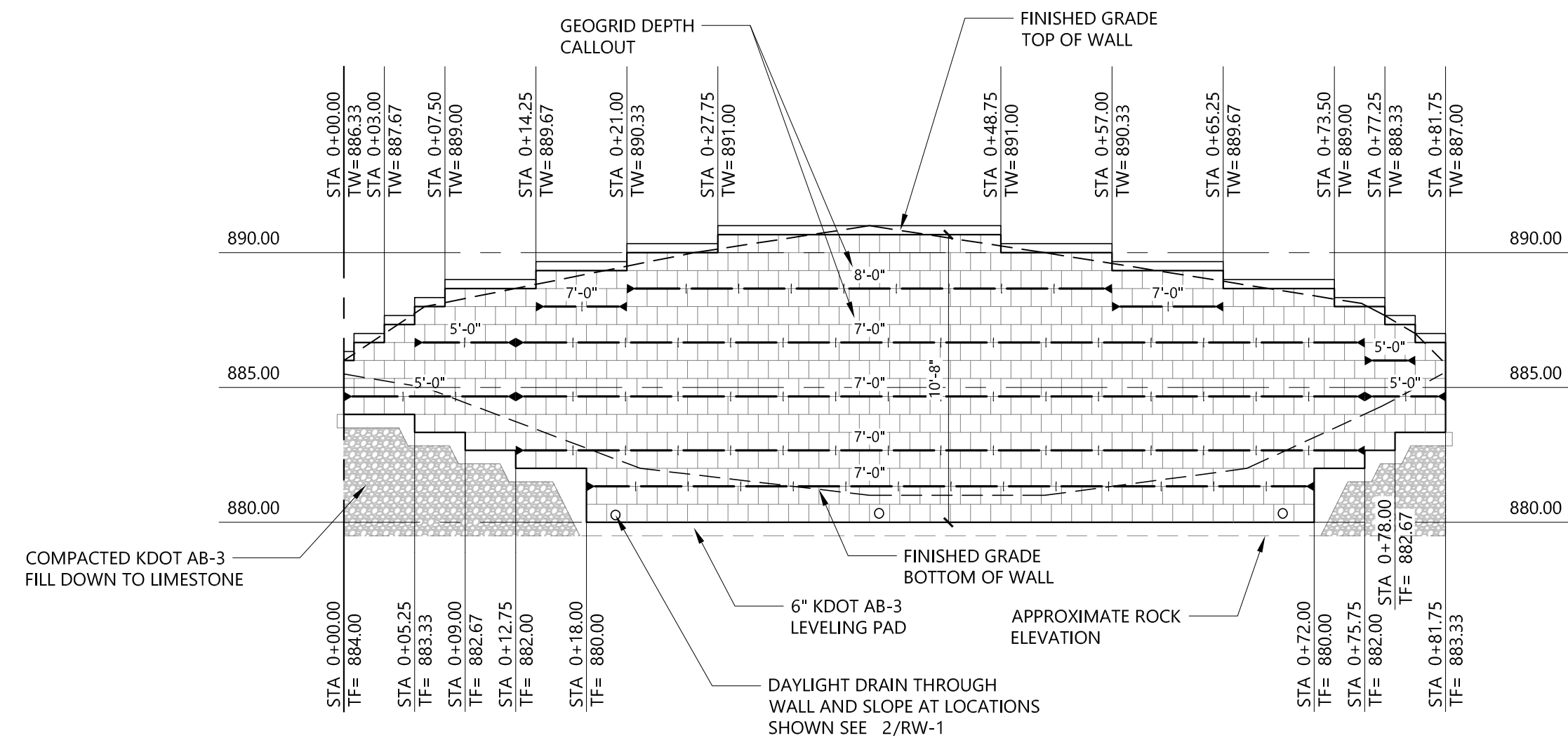
SHEET INFO:

RW-2

WALL ELEVATION

DATE:

02.24.2022



ENTIRE WALL FROM THE TOE OF THE LEVELING PAD TO THE BACK OF THE REINFORCED ZONE BEARS ON LIMESTONE, AS IDENTIFIED IN THE GEOTECHNICAL REPORT, OR KDOT AB-3 COMPACTED FILL DOWN TO LIMESTONE

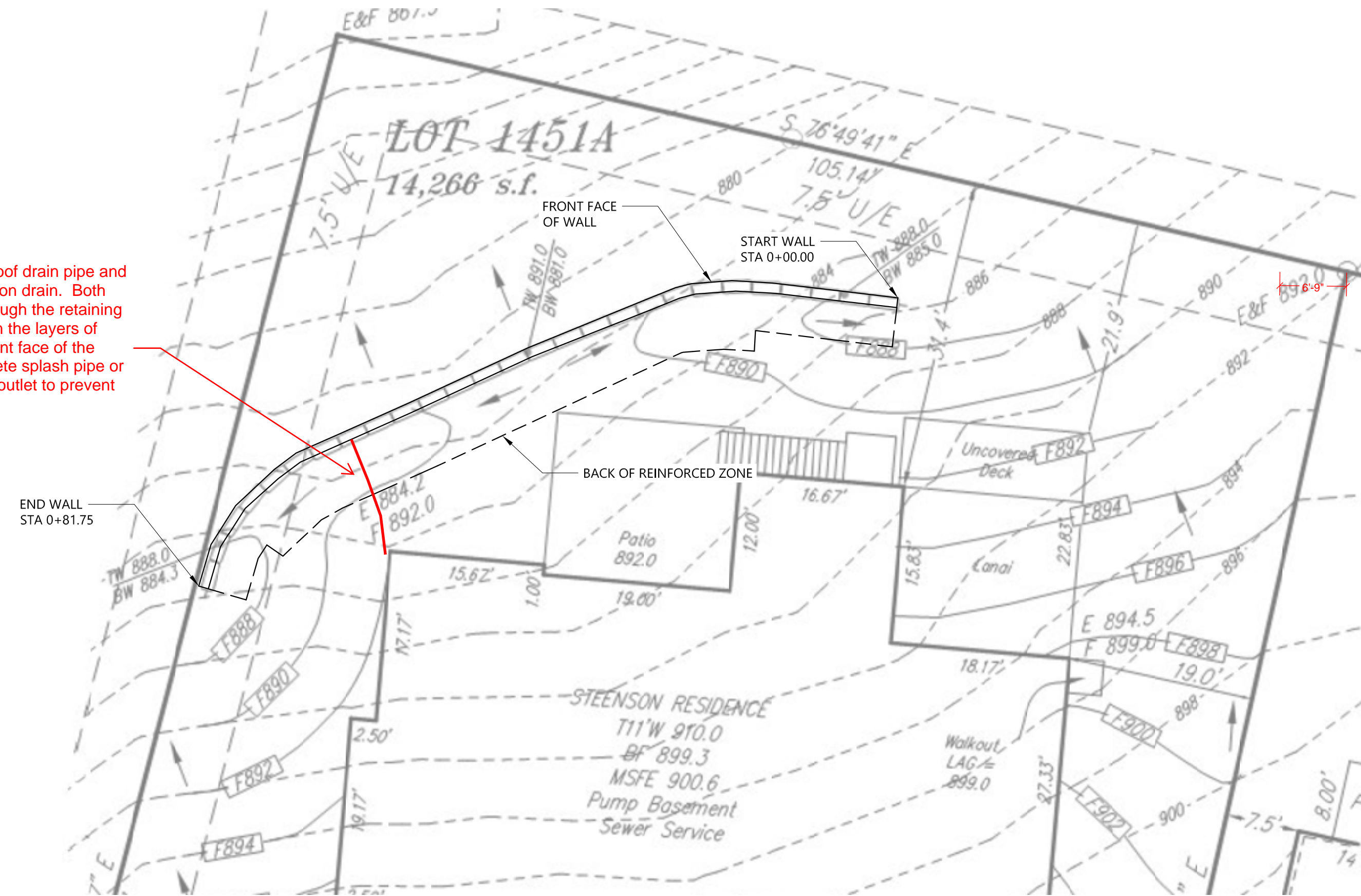
WALL DESIGN ASSUMES THAT THE HOUSE IS BEARING ON LIMESTONE AND DOES NOT LOAD THE WALL AS RECOMMENDED IN CFS ENGINEERS GEOTECHNICAL REPORT #21-5188

ABBREVIATIONS:
STA STATION
TF TOP OF FOOTING ELEVATION
TW TOP OF WALL ELEVATION
U UNITS

1 WALL ELEVATION

RW-2 SCALE: 1"=10'-0" HORIZONTAL
SCALE: 1"=5'-0" VERTICAL

Approximate location of both a roof drain pipe and the pipe from the house foundation drain. Both pipes to be solid drain pipes through the retaining wall reinforced zone, be between the layers of grid, and daylight through the front face of the wall. For the roof drain, a concrete splash pipe or rip rap shall be used at the pipe outlet to prevent erosion.



2 WALL LOCATION PLAN

RW-2 GENERAL LOCATION ONLY SEE CIVIL PLOT PLAN FOR MORE INFORMATION
SCALE: NOT TO SCALE