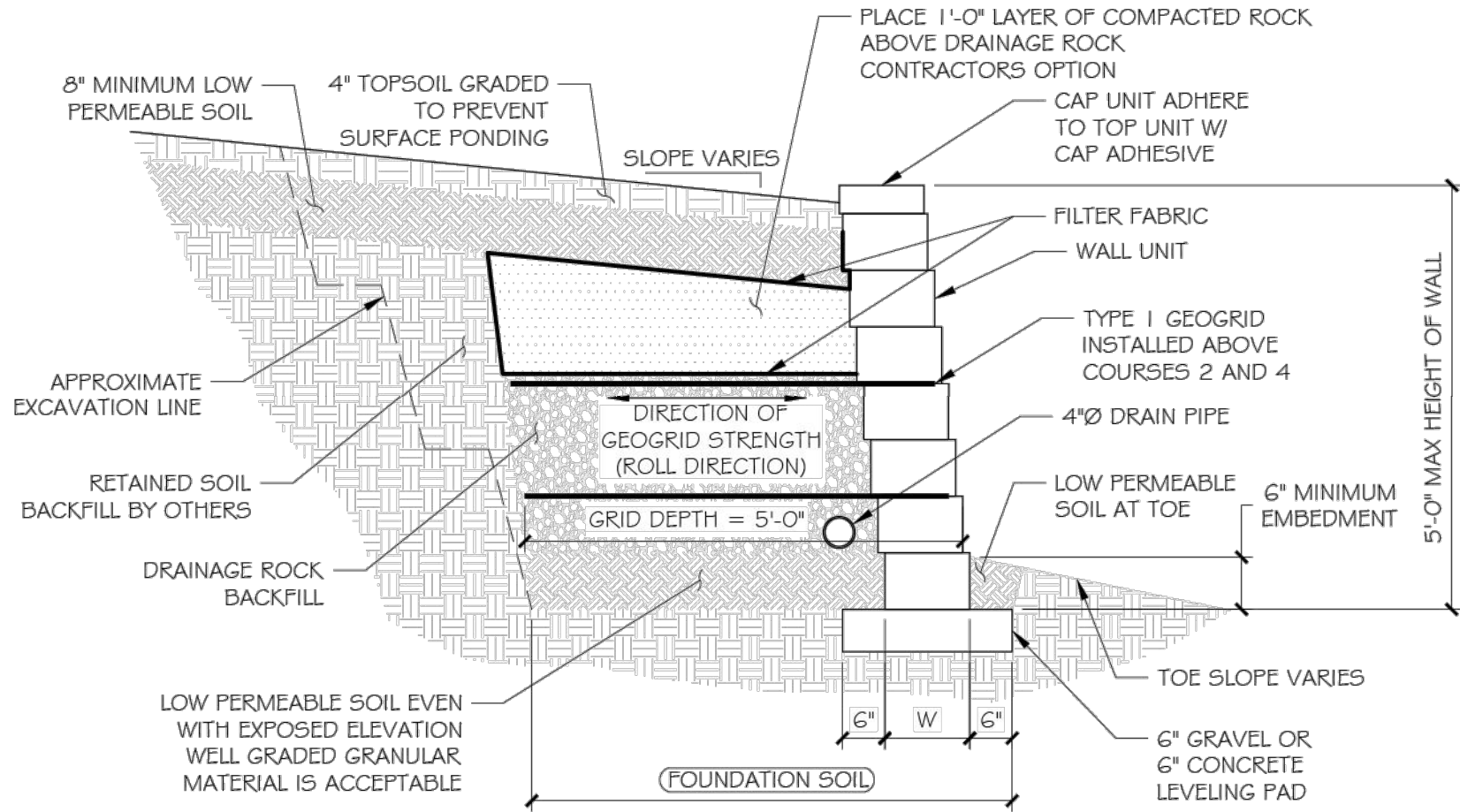


GENERAL NOTES:

1. RETAINING WALL DESIGN:
- 1.1. STRUCTURAL DESIGN HEREIN REPRESENTS A FINISHED STRUCTURE. THE GENERAL CONTRACTOR/OWNER SHALL PROVIDE ALL INTERIM BRACING, SHORING, INTERIM DRAINAGE PROVISIONS, DRAINAGE DIVERSION AND EROSION PROTECTION REQUIRED UNTIL FINAL CAPPING, PAVING, CURBING AND COMPLETION OF FINAL STORM DRAIN SYSTEM.
- 1.1.1. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR/OWNER TO ENSURE THAT THE FINISHED SITE DRAINAGE IS DIRECTED AWAY FROM THE RETAINING WALL SYSTEM.
- 1.1.2. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR/OWNER TO ENSURE THAT THE SURFACE WATER RUNOFF FROM ADJACENT CONSTRUCTION AREAS IS NOT ALLOWED TO ENTER THE RETAINING WALL AREA OF THE CONSTRUCTION SITE.
- 1.2. THE PROJECT GEOTECHNICAL ENGINEER SHALL REVIEW THESE DRAWINGS TO CONFIRM THE ASSUMPTIONS MEET THE INTENT OF THE GEOTECHNICAL REPORT. ADDITIONALLY, THE PROJECT GEOTECHNICAL ENGINEER SHALL REVIEW GLOBAL STABILITY OF THE RETAINING WALLS AND PROVIDE RECOMMENDATIONS AS NEEDED.
- 1.3. THE DESIGN OF THE SEGMENTAL RETAINING WALLS IS IN ACCORDANCE WITH NCMA DESIGN MANUAL FOR SEGMENTAL RETAINING WALLS 3RD EDITION AND NCMA'S SEGMENTAL RETAINING WALLS BEST PRACTICES GUIDE AND INCLUDES EXTERNAL STABILITY; SLIDING AND OVERTURNING OF THE REINFORCED MASS, AND INTERNAL STABILITY; PULLOUT, CONNECTION STRENGTH AND TENSILE STRENGTH OF THE GEOGRID AS WELL AS FACIAL STABILITY OF THE FACE UNITS. THE APPLIED BEARING PRESSURES ARE LISTED ON THE INDIVIDUAL WALL PROFILES.
- 1.4. SCOPE OF DESIGN SERVICES ARE LIMITED TO THOSE DEFINED FOR "SRW (RETAINING WALL) ENGINEER" IN THE NCMA BEST PRACTICES MANUAL (2017) AND NCMA TEK 15-03A. ALL OTHER ENGINEERING SERVICES ARE EXCLUDED.
- 1.5. THE DESIGN OF THE SEGMENTAL RETAINING WALLS IS BASED ON THE FOLLOWING DOCUMENTS:
- DRAWING C2 DATED 8/22/1996 PREPARED BY WEINTRAUB & ASSOCIATES ENGINEERS, INC.
- DRAWING CP3 DATED 10/15/2024 PREPARED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
- 1.6. THE DESIGN OF THE SEGMENTAL RETAINING WALL IS BASED ON THE INDIVIDUAL SOIL PROPERTIES AS LISTED WITHIN THESE PLANS AS WELL AS THE FOLLOWING CRITERIA:
- SEISMIC ACCELERATION = N/A
- GROUND WATER LOCATION = 2H/3 BELOW THE TOP OF LEVEL PAD (WHERE H = HEIGHT OF WALL)
- HYDROSTATIC LOADING = NONE
- SURCHARGE LOADING = SEE WALL ELEVATION(S)
2. SETTLEMENT:
- 2.1. SEGMENTAL RETAINING WALLS ARE FLEXIBLE MASSES THAT CAN TOLERATE MINOR SETTLEMENT. SETTLEMENT SENSITIVE RIGID MASSES FOUNDED ON OR ABOVE THE SEGMENTAL RETAINING WALL SHOULD BE REVIEWED AND, IF REQUIRED, A SETTLEMENT ANALYSIS SHOULD BE PERFORMED BY THE PROJECT GEOTECHNICAL ENGINEER. SETTLEMENT ANALYSIS IS OUTSIDE OF ROSCH ENGINEERING'S SCOPE OF WORK.
3. MATERIAL PROPERTIES:
- 3.1. SEGMENTAL CONCRETE WALL UNITS SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C1372 HAVING A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3,000 PSI AND A MAXIMUM MOISTURE ABSORPTION OF 8%. ALL UNITS SHALL BE SOUND AND FREE OF CRACKS OR OTHER DEFECTS THAT WOULD INTERFERE WITH THE PROPER PLACING OF THE UNIT OR SIGNIFICANTLY IMPAIR THE STRENGTH OR PERFORMANCE OF THE CONSTRUCTION.
- 3.2. DRAINAGE ROCK SHALL BE A CLEAN CRUSHED STONE OR GRANULAR FILL SUCH AS 1" CLEAN MEETING THE FOLLOWING GRADATION AS DETERMINED IN ACCORDANCE WITH ASTM D 422:
- | SIEVE SIZE | PERCENT PASSING |
|------------|-----------------|
| 1" INCH | 100 |
| 3/4" INCH | 75-100 |
| NO. 4 | 0-60 |
| NO. 40 | 0-50 |
| NO. 200 | 0-5 |
- 3.3. COMPACTED ROCK SHALL BE FREE OF ORGANIC MATERIAL. THE ROCK SHALL BE A WELL GRADED GRAVEL OR LIMESTONE MEETING THE FOLLOWING GRADATION AS DETERMINED IN ACCORDANCE WITH ASTM D 422 AND A PI<6:
- | SIEVE SIZE | PERCENT PASSING |
|------------|-----------------|
| 1" INCH | 100 |
| NO. 4 | 20-100 |
| NO. 40 | 0-60 |
| NO. 200 | 0-15 |
- 3.4. LOW PERMEABLE SOIL SHALL CONSIST OF MATERIAL HAVING A MINIMUM PLASTICITY INDEX OF 1.0. NO MORE THAN 10% SHALL BE RETAINED ON A NO. 4 SIEVE AND NO LESS THAN 35% SHALL PASS A NO. 200 SIEVE. MATERIAL WITH A USC DESIGNATION OF ML, CL, OR OL ARE ACCEPTABLE FOR USE AS LOW PERMEABLE SOIL.
- 3.5. THE GEOGRID SHALL BE A HIGH DENSITY POLYETHYLENE EXPANDED SHEET OR POLYESTER WOVEN FIBER MATERIAL, SPECIFICALLY FABRICATED FOR USE AS SOIL REINFORCEMENT. ACCEPTABLE GEOGRID TYPES AND MANUFACTURER AS FOLLOWS:
- TYPE I:
- SF35 BY SYNTEN TECHNICAL FABRICS, INC.
- SGU 60 BY STRATA SYSTEMS, INC.
- MIRAGRID 3XT AS MANUFACTURED BY TENCATE GEOSYNTHETICS.
- HP200 AS MANUFACTURED BY GEOSTAR TECHNOLOGIES, LLC.
- 3.6. GEOTEXTILE FILTER FABRIC SHALL BE A NONWOVEN GEOTEXTILE COMPOSED OF POLYPROPYLENE FIBERS WITH A MINIMUM FLOW RATE OF 140 GPM/FT² WHEN TESTED ACCORDING TO ASTM D 4491.
- 3.7. DRAINAGE PIPE SHALL BE A 4"Ø PERFORATED OR SLOTTED PVC OR CORRUGATED HDPE PIPE.
- 3.8. DRAINAGE PIPE SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM F 405 OR ASTM F 758.
- 3.9. CONSTRUCTION ADHESIVE SHALL BE EXTERIOR GRADE ADHESIVE AS RECOMMENDED BY THE SEGMENTAL CONCRETE WALL UNIT MANUFACTURER.
4. EXCAVATION:
- 4.1. THE CONTRACTOR SHALL EXCAVATE TO THE LINES AND GRADES SHOWN ON THE PLANS, THE GENERAL CONTRACTOR SHALL TAKE PRECAUTIONS TO MINIMIZE OVER-EXCAVATION.
- 4.2. EXCAVATION SUPPORT, INCLUDING THE STABILITY OF THE EXCAVATION AND ITS INFLUENCE ON ADJACENT PROPERTY IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR.
5. FOUNDATION SOIL PREPARATION:
- 5.1. FOLLOWING EXCAVATION FOR THE LEVELING PAD AND THE REINFORCED SOIL ZONE, FOUNDATION SOIL SHALL BE EXAMINED BY THE OWNERS' GEOTECHNICAL ENGINEER TO ASSURE THE ACTUAL FOUNDATION SOIL STRENGTH MEETS OR EXCEEDS THE REQUIRED BEARING STRENGTH. SOIL NOT MEETING THE REQUIRED STRENGTH SHALL BE REMOVED AND REPLACED WITH SOIL MEETING THE DESIGN CRITERIA, AS DIRECTED BY THE OWNERS' GEOTECHNICAL ENGINEER.
- 5.2. IF HIGH PLASTIC SOILS ARE ENCOUNTERED IN THE FOUNDATION ZONE OF ANY RETAINING WALL, IT SHALL BE REMEDIATED SIMILAR TO ANY BUILDING FOUNDATION, AS DIRECTED BY THE PROJECT GEOTECHNICAL ENGINEER.
- 5.3. FOUNDATION SOIL IS DEFINED AS THE SOIL UNDER THE SEGMENTAL RETAINING WALL VOLUME, EXTENDING FROM THE TOE OF THE LEVELING PAD TO THE BACK OF THE REINFORCED MASS.

6. BASE LEVELING PAD INSTALLATION:
- 6.1. LEVELING PAD SHALL BE PLACED AS SHOWN ON THE DRAWINGS AND CONSIST OF EITHER:
- LEAN CONCRETE (2,000 PSI) - 6" MINIMUM THICK
- WELL GRADED 1" GRAVEL OR DRAINAGE ROCK WITH FINES - 6" MINIMUM THICK
- 6.2. SAND OR GRAVEL BASE SHALL BE COMPACTED WITH 3 PASSES OF A VIBRATORY COMPACTOR TO PROVIDE A FIRM, LEVEL BEARING PAD.
- 6.3. LEAN CONCRETE SHALL CURE A MINIMUM OF 12 HOURS PRIOR TO UNIT PLACEMENT.
- 6.4. LEVELING PAD SHALL BE CONSTRUCTED TO INSURE FULL BEARING OF RETAINING WALL UNITS.
7. UNIT INSTALLATION:
- 7.1. THE FIRST COURSE OF SEGMENTAL CONCRETE WALL UNITS SHALL BE PLACED ON THE LEVELING PAD AND CHECKED FOR LEVEL, ALIGNMENT, AND FULL CONTACT WITH BASE.
- 7.2. UNITS SHALL BE PLACED SIDE BY SIDE FOR FULL LENGTH OF WALL. ALIGNMENT SHALL BE DONE BY MEANS OF A STRING LINE OR OFFSET MEASUREMENT FROM BASE LINE.
- 7.3. PLACE DRAINAGE AGGREGATE WITHIN THE BLOCK CORES DIRECTLY BEHIND AND BETWEEN THE UNITS AS SHOWN IN DETAILS. WHERE THE REINFORCED BACKFILL IS COMPACTED ROCK, PLACE REINFORCED BACKFILL DIRECTLY AGAINST DRAINAGE FILL. CONSOLIDATE DRAINAGE AGGREGATE WITH 2 PASSES OF A VIBRATORY COMPACTOR. COMPACTION TESTING OF DRAINAGE AGGREGATE IS NOT REQUIRED. EXCESS MATERIAL SHALL BE REMOVED FROM TOP OF UNITS PRIOR TO INSTALLATION OF NEXT COURSE.
- 7.4. LAY UP EACH COURSE INSURING POSITIVE CONTACT BETWEEN PREVIOUS COURSE IS ACHIEVED.
8. GEOGRID INSTALLATION:
- 8.1. GEOGRID SHALL BE LAID AT THE PROPER ELEVATION AND ORIENTATION AS SHOWN ON THE DRAWINGS.
- 8.2. THE GEOGRID REINFORCEMENT SHALL BE LAID HORIZONTALLY ON LEVEL, COMPACTED BACKFILL, AND EMBEDDED IN THE BLOCK.
- 8.3. PLACE GEOGRID ON CONCRETE WALL UNITS, PLACE THE NEXT COURSE OF UNITS, PLACE THE DRAINAGE FILL, PULL GEOGRID TIGHT PRIOR TO BACKFILLING.
- 8.4. CORRECT ORIENTATION OF THE GEOGRID SHALL BE VERIFIED.
- 8.5. 3" OF REINFORCED BACKFILL SHALL BE PLACED BETWEEN ALL LOCATIONS OF OVERLAPPING GEOGRID.
9. BACKFILL PLACEMENT:
- 9.1. REINFORCED BACKFILL MATERIAL SHALL BE PLACED IN 8" MAXIMUM LIFTS.
- 9.2. COMPACTED ROCK SHALL BE COMPACTED TO A MINIMUM 95% OF STANDARD PROCTOR DENSITY PER ASTM 698 UNLESS NOTED OTHERWISE ON THE INDIVIDUAL WALL PROFILES.
- 9.3. DRAINAGE ROCK SHALL BE COMPACTED WITH A MINIMUM OF 2 PASSES OF A VIBRATORY COMPACTOR. FIELD DENSITY TESTING WILL NOT BE REQUIRED FOR DRAINAGE ROCK.
- 9.4. ONLY LIGHTWEIGHT HAND-OPERATED COMPACTION EQUIPMENT SHALL BE USED WITHIN 3' OF THE BACK FACE OF BLOCK.
- 9.5. REINFORCED BACKFILL SHALL BE PLACED, SPREAD, AND COMPACTED IN SUCH A MANNER THAT ELIMINATES THE DEVELOPMENT OF WRINKLES AND/OR MOVEMENT OF THE GEOGRID.
- 9.6. REINFORCED BACKFILL SHALL BE PLACED AND COMPACTED FROM THE BACK OF THE WALL REARWARD INTO THE EMBANKMENT TO INSURE THAT THE GEOGRID REMAINS TIGHT.
- 9.7. TRACKED CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY ON THE 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.
- 9.8. AT THE END OF EACH DAY'S OPERATION, SLOPE THE LAST LEVEL OF COMPACTED BACKFILL AWAY FROM THE INTERIOR (CONCEALED) FACE OF THE WALL TO DIRECT SURFACE WATER RUNOFF FROM THE WALL FACE.
- 9.8.1. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO ENSURE THE FINISHED SITE DRAINAGE IS DIRECTED AWAY FROM THE RETAINING WALL SYSTEM.
- 9.8.2. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO ENSURE THE SURFACE WATER RUNOFF FROM ADJACENT CONSTRUCTION AREAS IS NOT ALLOWED TO ENTER THE RETAINING WALL AREA OF THE CONSTRUCTION SITE.
10. DRAIN PIPE INSTALLATION:
- 10.1. DRAINAGE COLLECTION PIPES SHALL BE INSTALLED TO MAINTAIN GRAVITY FLOW OF WATER OUTSIDE OF THE REINFORCED SOIL ZONE. THE DRAINAGE COLLECTION PIPE SHOULD CONNECT INTO A STORM SEWER MANHOLE OR DAYLIGHT THROUGH THE FACE OF THE WALL.
11. CAP INSTALLATION:
- 11.1. CAP UNITS SHALL BE ADHERED TO THE TOP UNITS USING MANUFACTURER SUPPLIED ADHESIVE BY PLACING TWO 1/4" BEADS OF ADHESIVE ON EACH UNIT ALONG THE ENTIRE LENGTH OF THE WALL. PRESS THE CAP UNITS FIRMLY INTO THE ADHESIVE AND ALLOW TO CURE.
12. FIELD QUALITY CONTROL:
- 12.1. THE OWNER OR OWNER'S REPRESENTATIVE IS RESPONSIBLE FOR ENGAGING THE SERVICES OF AN INDEPENDENT THIRD PARTY INSPECTOR TO OBSERVE AND VERIFY ALL SOIL PROPERTIES AS WELL AS VERIFY CORRECT INSTALLATION OF ALL SYSTEM COMPONENTS TO MEET THE REQUIREMENTS OF THESE GENERAL NOTES AND DRAWINGS.
- 12.2. TESTING METHODS, FREQUENCY AND VERIFICATION OF MATERIAL SPECIFICATIONS SHALL BE THE RESPONSIBILITY OF THE INDEPENDENT THIRD PARTY INSPECTOR. AT A MINIMUM, COMPACTION TESTING SHALL INCLUDE ONE COMPACTION TEST FOR EACH LIFT BUT NOT LESS THAN ONE TEST FOR EVERY 50 CUBIC YARDS OF COMPACTED FILL AT A SPACING NOT TO EXCEED 100'.
13. ABBREVIATIONS:
- FGE FINISHED GRADE EXTERIOR
- FGI FINISHED GRADE INTERIOR
- FL FLOW LINE
- | | |
| --- | --- |
| MAX | MAXIMUM |
- | | |
| --- | --- |
| MIN | MINIMUM |
- | | |
| --- | --- |
| OC | ON CENTER |
- | | |
| --- | --- |
| PL | PROPERTY LINE |
- | | |
| --- | --- |
| STA | STATION |
- | | |
| --- | --- |
| TP | TOP OF FOOTING ELEVATION |
- | | |
| --- | --- |
| TW | TOP OF WALL ELEVATION |
- | | |
| --- | --- |
| TYP | TYPICAL |
- | | |
| --- | --- |
| UNO | UNLESS NOTED OTHERWISE |

ROSCH ENGINEERING HAS PERFORMED DESIGN CALCULATIONS BASED ON THE DESIGN CRITERIA, ASSUMED SOIL PARAMETERS, AND KNOWN LOADING CONDITIONS AS LISTED IN THESE DRAWINGS. THE OWNERS REPRESENTATIVE, INDEPENDENT THIRD PARTY SPECIAL INSPECTOR AND INSTALLER SHALL NOTIFY ROSCH ENGINEERING OF ANY CHANGES OR DIFFERENCES IN ACTUAL SITE CONDITIONS WHICH VARY FROM THOSE LISTED, PRIOR TO CONSTRUCTING THE WALL.

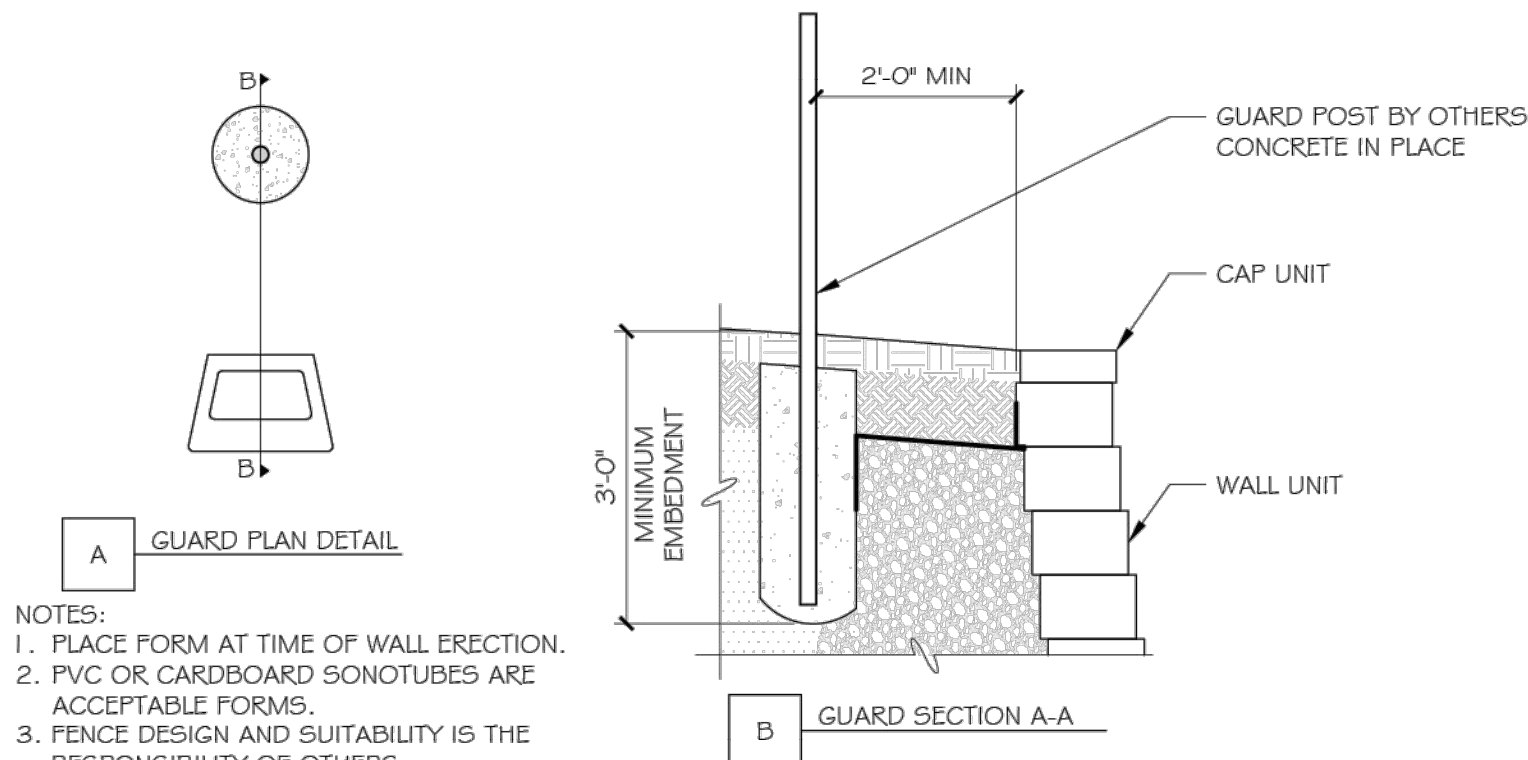


WALL NOTES:

1. GRID DEPTH IS MEASURED FROM THE FACE OF THE BLOCK
2. GRID DEPTH LENGTH IS 5'-0".
3. REINFORCED BACKFILL IS DRAINAGE ROCK.
4. REQ'D BEARING CAPACITY IS 1,000 PSF
5. ANGLE POINTS MAY BE CONSTRUCTED AS RADII.
6. ALIGN BLOCK COURSING WITH EXISTING WALL PORTION

1 TYPICAL SECTION - DRAINAGE ROCK

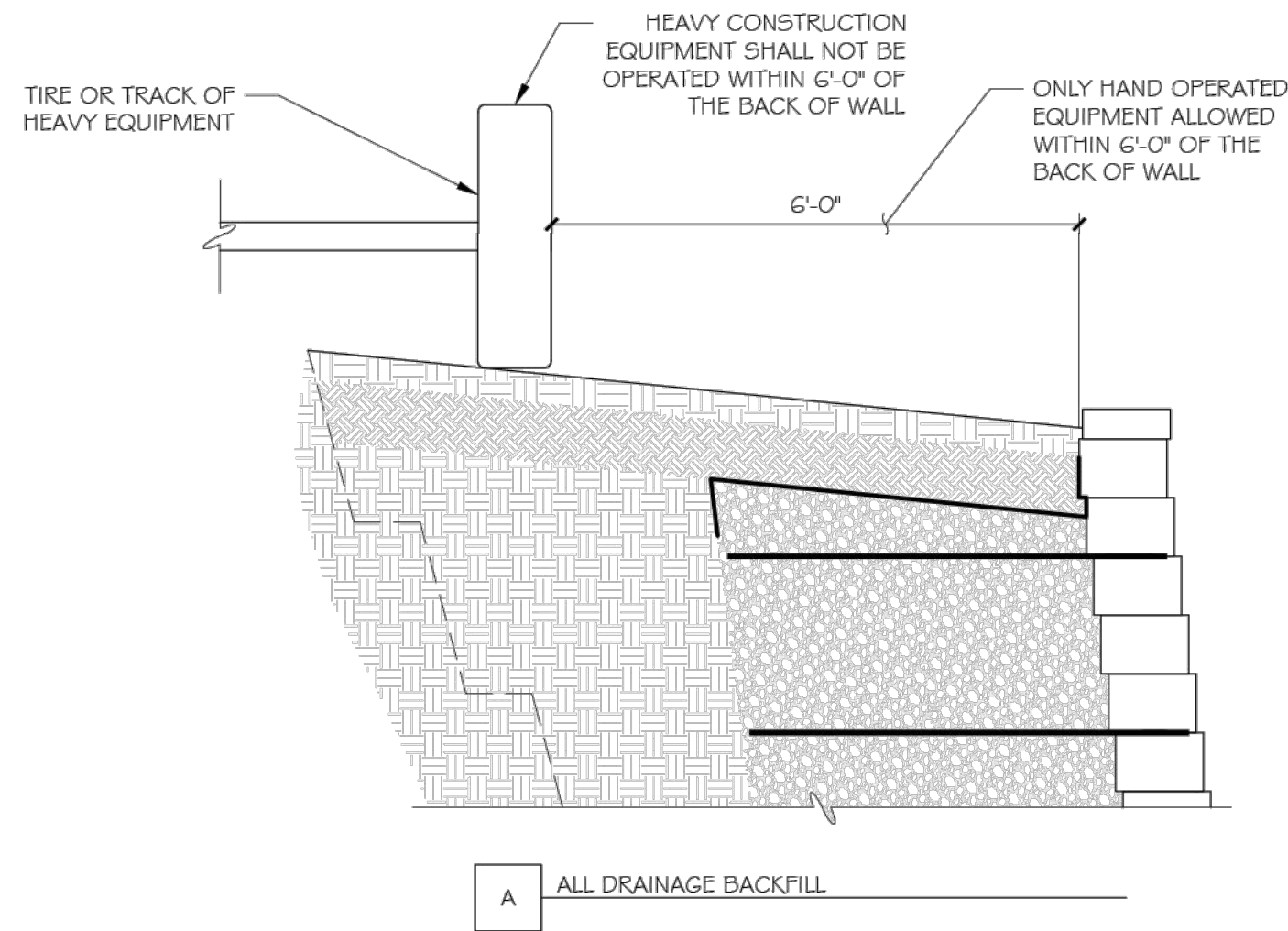
D1 NTS



- NOTES:
1. PLACE FORM AT TIME OF WALL ERECTION.
2. PVC OR CARDBOARD SONOTUBES ARE ACCEPTABLE FORMS.
3. FENCE DESIGN AND SUITABILITY IS THE RESPONSIBILITY OF OTHERS.

3 TYPICAL POST AT UNREINFORCED WALL

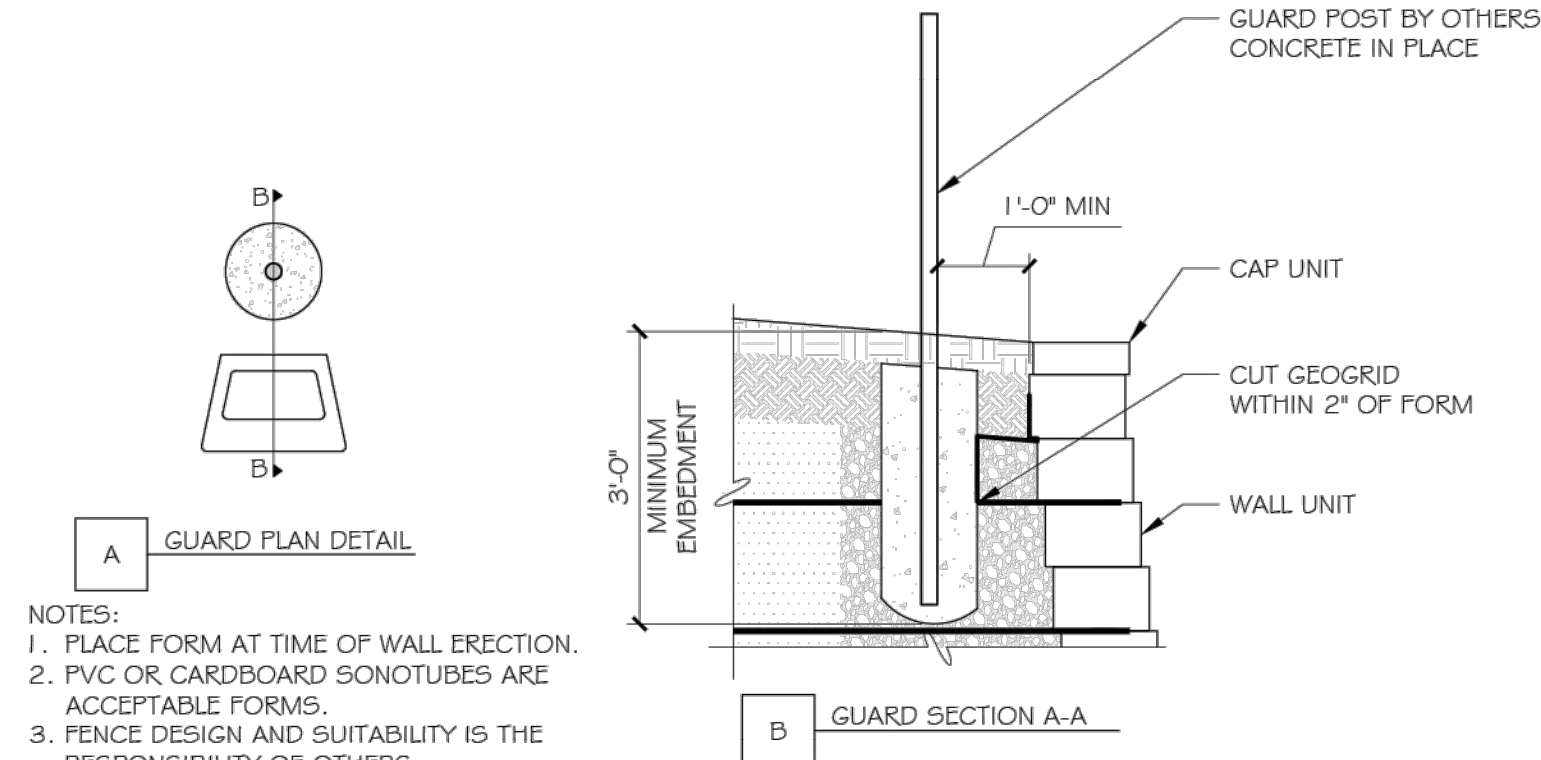
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2 HEAVY EQUIPMENT AT TOP OF WALL

D1 NTS

SEE DETAIL 1/D1 FOR ADDITIONAL INFORMATION NOT SHOWN

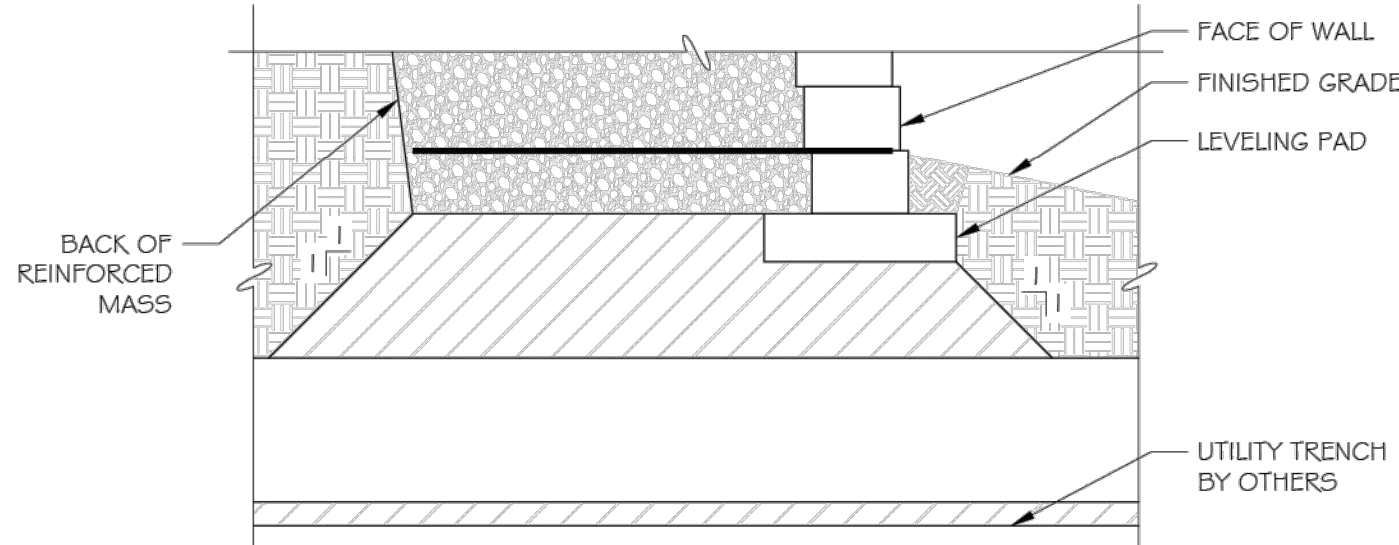


- NOTES:
1. PLACE FORM AT TIME OF WALL ERECTION.
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4 TYPICAL POST AT REINFORCED WALL

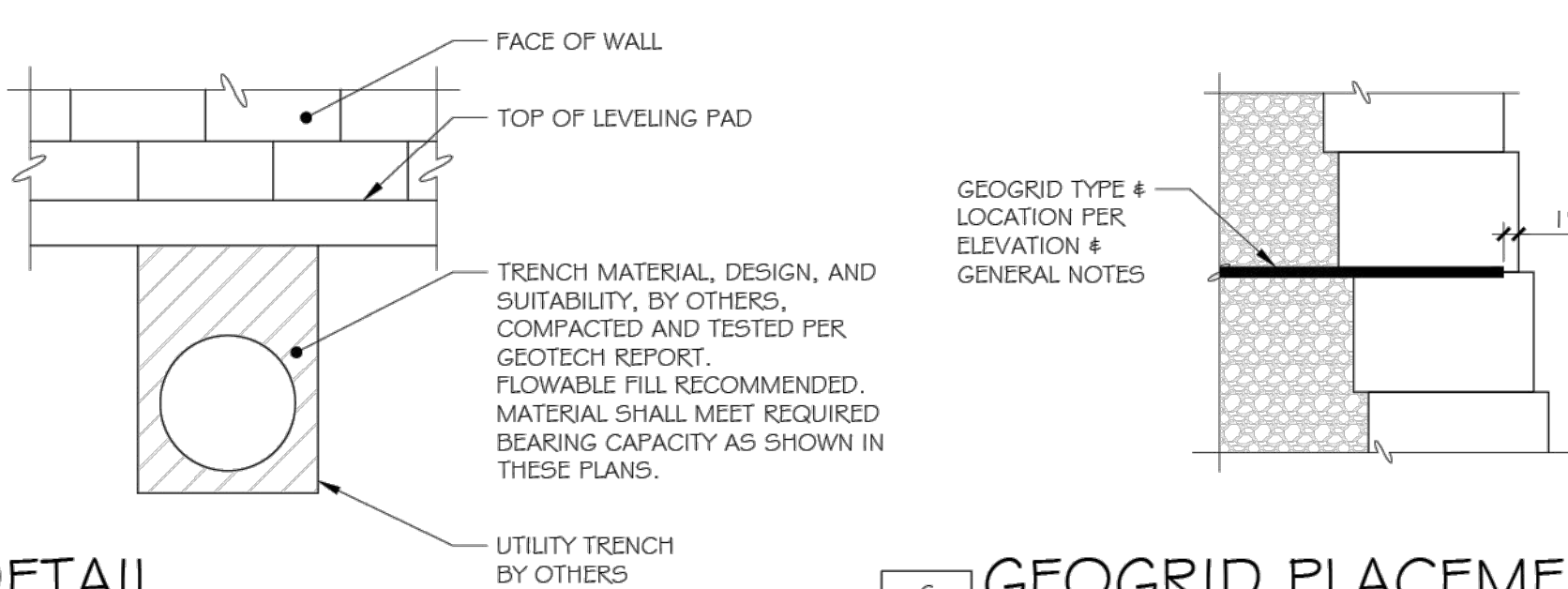
D1 NTS

STRUCTURAL DESIGN HEREIN REPRESENTS A FINISHED STRUCTURE. THE GENERAL CONTRACTOR/OWNER SHALL PROVIDE ALL INTERIM BRACING, SHORING, INTERIM DRAINAGE PROVISIONS, DRAINAGE DIVERSION AND EROSION PROTECTION REQUIRED UNTIL FINAL CAPPING, PAVING, CURBING AND COMPLETION OF FINAL STORM DRAIN SYSTEM IS COMPLETE.



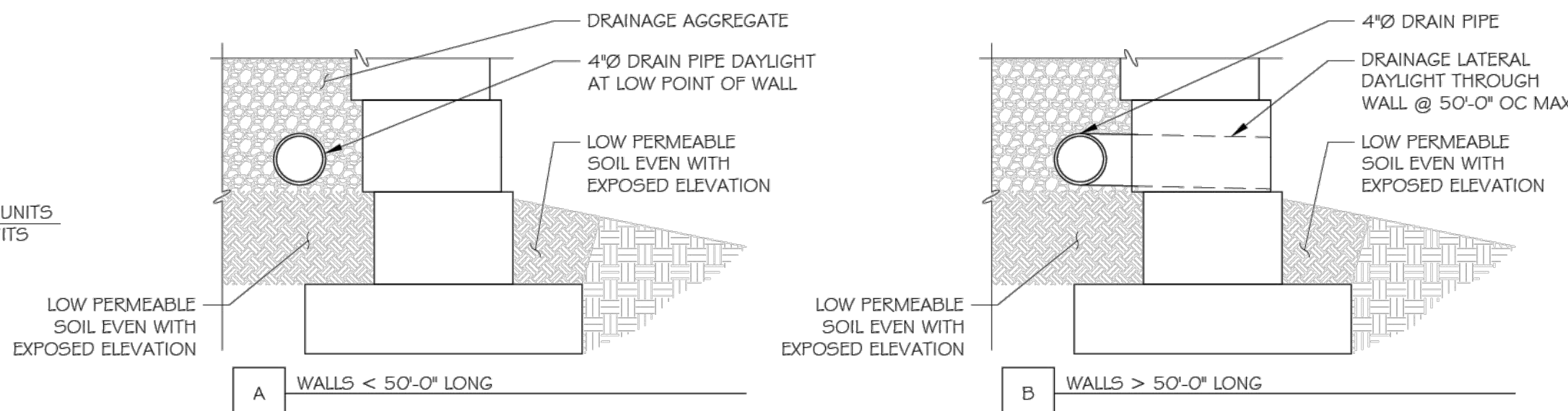
5 UTILITY TRENCH CROSSING DETAIL

D1 NTS



6 GEOGRID PLACEMENT

D1 NOT TO SCALE



7 DRAIN PIPE INSTALLATION

D1 NOT TO SCALE