

RETAINING WALL NOTES

GENERAL:

1)---WALL DESIGN BASED UPON A MINIMUM ALLOWABLE SOIL BEARING CAPACITY OF 2500 PSF.

2)---SOIL PARAMETERS USED IN WALL DESIGN:

REINFORCED FILL: PHI = 27 DEGREES; c = 0; GAMMA = 125 PCF
 RETAINED FILL: PHI = 27 DEGREES; c = 0; GAMMA = 125 PCF
 FOUNDATION FILL: PHI = 30 DEGREES; c = 0; GAMMA = 130 PCF

3)---REINFORCING GRID:

VERSA-GRID VG 3.0 (LTDS = 1,300 LB/FT)

SEGMENTAL RETAINING WALL UNIT CONNECTION PINS:

1)---SRW UNITS SHALL BE INTERLOCKED WITH VERSA-TUFF PINS. THE PINS SHALL CONSIST OF GLASS-REINFORCED NYLON MADE FOR THE EXPRESSED USE WITH THE SRW UNITS SUPPLIED.

GEOSYNTHETIC REINFORCEMENT:

1)---GEOSYNTHETIC REINFORCEMENT SHALL CONSIST OF GEOGRIDS OR GEOTEXTILES MANUFACTURED AS A SOIL REINFORCEMENT ELEMENT. THE MANUFACTURERS/SUPPLIERS OF THE GEOSYNTHETIC REINFORCEMENT SHALL HAVE DEMONSTRATED CONSTRUCTION OF SIMILAR SIZE AND TYPES OF SEGMENTAL RETAINING WALLS ON PREVIOUS PROJECTS.

2)---THE TYPE, STRENGTH, AND PLACEMENT LOCATION OF THE REINFORCING GEOSYNTHETIC SHALL BE AS SHOWN ON THESE PLANS.

LEVELING PAD:

1)---MATERIAL FOR LEVELING PAD SHALL CONSIST OF COMPACTED SAND, GRAVEL, OR COMBINATION THEREOF (USCS SOIL TYPES GP, GW, SP, & SW) AND SHALL BE A MINIMUM OF 6 INCHES IN DEPTH. LEAN CONCRETE WITH A STRENGTH OF 200 TO 300 PSI AND THREE INCHES THICK MAXIMUM MAY ALSO BE USED AS A LEVELING PAD MATERIAL. THE LEVELING PAD SHOULD EXTEND Laterally AT LEAST A DISTANCE OF 6 INCHES FROM THE TOE AND HEEL OF THE LOWERMOST SRW UNIT.

DRAINAGE AGGREGATE:

1)---DRAINAGE AGGREGATE SHALL BE ANGULAR, CLEAN STONE OR GRANULAR FILL MEETING THE FOLLOWING GRADATION AS DETERMINED IN ACCORDANCE WITH ASTM D422.

SIEVE SIZE % PASSING

1-INCH	100
3/4-INCH	75-100
#4	0-60
#40	0-50
#200	0-5

DRAINAGE PIPE:

1)---THE DRAINAGE COLLECTION PIPE SHALL BE A PERFORATED OR SLOTTED PVC, OR CORRUGATED HDPE PIPE. THE DRAINAGE PIPE MAY BE WRAPPED WITH A NON-WOVEN GEOTEXTILE TO FUNCTION AS A FILTER.

2)---DRAINAGE PIPE SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM D3034 AND/OR ASTM D1248.

REINFORCED BACKFILL SOILS:

1)---THE REINFORCED SOIL MATERIAL SHALL BE FREE OF DEBRIS. THE REINFORCED MATERIAL SHALL CONSIST OF THE INORGANIC USCS SOIL TYPES GP, GW, SW, SP, SM MEETING THE FOLLOWING GRADATION, AS DETERMINED IN ACCORDANCE WITH ASTM D422.

SIEVE SIZE % PASSING

4-INCH	100
#4	20-100
#40	0-60
#200	0-35

2)---THE MAXIMUM PARTICLE SIZE OF POORLY-GRADED GRAVELS (GP, NO FINES) SHOULD NOT EXCEED 3/4-INCH.

3)---THE PLASTICITY OF THE FINE FRACTION SHALL BE LESS THAN 20.

FOUNDATION PREPARATION:

1)---FOLLOWING EXCAVATION, THE FOUNDATION SOIL SHALL BE EXAMINED BY THE OWNER'S ENGINEER TO ASSURE ACTUAL FOUNDATION SOIL STRENGTH MEETS OR EXCEEDS THE ASSUMED DESIGN BEARING STRENGTH. SOILS NOT MEETING THE REQUIRED STRENGTH SHALL BE REMOVED AND REPLACED WITH INFILL SOILS, AS DIRECTED BY THE OWNER'S ENGINEER.

LEVELING PAD CONSTRUCTION:

1)---LEVELING PAD SHALL BE PLACED AS SHOWN OF THESE PLANS WITH A MINIMUM THICKNESS OF 6 INCHES. THE LEVELING PAD SHOULD EXTEND Laterally AT LEAST A DISTANCE OF 6 INCHES FROM THE TOE AND HEEL OF THE LOWERMOST SRW UNIT.

2)---GRANULAR LEVELING PAD MATERIAL SHALL BE COMPACTED TO PROVIDE A FIRM, LEVEL BEARING SURFACE ON WHICH TO PLACE THE FIRST COURSE OF UNITS. WELL-GRADED SAND CAN BE USED TO SMOOTH THE TOP 1/4 TO 1/2 INCH OF THE LEVELING PAD. COMPACTION WILL BE WITH MECHANICAL PLATE COMPACTORS TO ACHIEVE 95% OF MAXIMUM STANDARD PROCTOR DENSITY (ASTM D698).

1)---ALL SRW UNITS SHALL BE INSTALLED AT THE PROPER ELEVATION AND ORIENTATION AS SHOWN OF THESE PLANS. THE SRW UNITS SHALL BE INSTALLED IN GENERAL ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION. THE SPECIFICATIONS AND DRAWINGS SHALL GOVERN IN ANY CONFLICT BETWEEN THE TWO REQUIREMENTS.

2)---FIRST COURSE OF SRW UNITS SHALL BE PLACED ON THE LEVELING PAD. THE UNITS SHALL BE LEVELED SIDE-TO-SIDE, FRONT-TO-REAR AND WITH ADJACENT UNITS, AND ALIGNED TO ENSURE INTIMATE CONTACT WITH THE LEVELING PAD. THE FIRST COURSE IS THE MOST IMPORTANT TO ENSURE ACCURATE AND ACCEPTABLE RESULTS. NO GAPS SHALL BE LEFT BETWEEN THE FRONT OF ADJACENT UNITS. ALIGNMENT MAY BE DONE BY MEANS OF A STRING LINE OR OFFSET FROM BASE LINE TO THE BACK OF THE UNITS.

3)---ALL EXCESS DEBRIS SHALL BE CLEANED FROM TOP OF UNITS AND THE NEXT COURSE OF UNITS INSTALLED ON TOP OF THE UNITS BELOW.

4)---TWO VERSA-TUFF PINS SHALL BE INSERTED THROUGH THE PIN HOLES OF EACH UPPER COURSE UNIT INTO RECEIVING SLOTS IN LOWER COURSE UNITS. PINS SHALL BE FULLY SEATED IN THE PIN SLOT BELOW. UNITS SHALL BE PUSHED FORWARD TO REMOVE ANY LOOSENESS IN THE UNIT-TO-UNIT CONNECTION.

5)---PRIOR TO PLACEMENT OF NEXT COURSE, THE LEVEL AND ALIGNMENT OF THE UNITS SHALL BE CHECKED AND CORRECTED, WHERE NEEDED.

6)---LAYOUT OF CURVES AND CORNERS SHALL BE INSTALLED IN ACCORDANCE WITH THE WALL PLAN DETAILS OR IN GENERAL ACCORDANCE WITH SRW MANUFACTURER'S INSTALLATION GUIDELINES. WALLS MEETING AT CORNERS SHALL BE INTERLOCKED BY OVERLAPPING SUCCESSIVE COURSES.

7)---PROCEDURES 3-6 SHALL BE REPEATED UNTIL REACHING TOP OF WALL, JUST BELOW THE HEIGHT OF THE CAP UNITS. GEOSYNTHETIC REINFORCEMENT, DRAINAGE MATERIALS, AND REINFORCED BACKFILL SHALL BE PLACED IN SEQUENCE WITH UNIT INSTALLATION AS DESCRIBED BELOW.

GEOSYNTHETIC REINFORCEMENT PLACEMENT:

1)---ALL GEOSYNTHETIC REINFORCEMENT SHALL BE INSTALLED AT THE PROPER ELEVATION AND ORIENTATION AS SHOWN ON THESE PLANS.

2)---AT THE ELEVATIONS SHOWN, THE GEOSYNTHETIC REINFORCEMENT SHALL BE LAID HORIZONTALLY ON COMPACTED INFILL AND ON TOP OF THE CONCRETE SRW UNITS. IT SHALL BE PLACED TO WITHIN ONE INCH OF THE FRONT FACE OF THE UNIT BELOW. EMBEDMENT OF THE GEOSYNTHETIC IN THE SRW UNITS SHALL BE CONSISTENT WITH SRW MANUFACTURER'S RECOMMENDATIONS. CORRECT ORIENTATION OF THE GEOSYNTHETIC REINFORCEMENT SHALL BE VERIFIED BY THE CONTRACTOR TO BE IN ACCORDANCE WITH THE GEOSYNTHETIC MANUFACTURER'S RECOMMENDATIONS. THE HIGHEST STRENGTH DIRECTION OF THE GEOSYNTHETIC MUST BE PERPENDICULAR TO THE WALL FACE.

3)---GEOSYNTHETIC REINFORCEMENT LAYERS SHALL BE ONE CONTINUOUS PIECE FOR THE ENTIRE EMBEDMENT LENGTH. SPLICING OF THE GEOSYNTHETIC IN THE DESIGN STRENGTH DIRECTION (PERPENDICULAR TO THE WALL FACE) SHALL NOT BE PERMITTED. ALONG THE LENGTH OF THE WALL (PARALLEL TO THE FACE), HORIZONTALLY ADJACENT SECTIONS OF GEOSYNTHETIC REINFORCEMENT SHALL BE BUTTED IN A MANNER TO ASSURE 100% COVERAGE PARALLEL TO THE WALL FACE.

4)---TRACKED CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY ON THE GEOSYNTHETIC REINFORCEMENT. A MINIMUM OF 6 INCHES OF BACKFILL IS REQUIRED PRIOR TO OPERATION OF TRACKED VEHICLES OVER THE GEOSYNTHETIC. TURNING SHOULD BE KEPT TO A MINIMUM. RUBBER Tired EQUIPMENT MAY PASS OVER THE GEOSYNTHETIC REINFORCEMENT AT SLOW SPEEDS (LESS THAN FIVE MILES PER HOUR).

5)---THE GEOSYNTHETIC REINFORCEMENT SHALL BE FREE OF WRINKLES PRIOR TO PLACEMENT OF SOIL FILL. THE NOMINAL TENSION SHALL BE APPLIED TO THE REINFORCEMENT AND SECURED IN PLACE WITH STAPLES, STAKES, OR BY HAND TENSIONING UNTIL REINFORCEMENT IS COVERED BY SIX INCHES OF FILL.

DRAINAGE MATERIALS:

1)---DRAINAGE AGGREGATE SHALL BE INSTALLED TO THE LINE, GRADES, AND SECTION SHOWN ON THESE DRAWINGS. DRAINAGE AGGREGATE SHALL BE PLACED TO THE MINIMUM THICKNESS SHOWN ON THE CONSTRUCTION PLANS BETWEEN AND BEHIND UNITS (A MINIMUM OF ONE CUBIC FOOT FOR EACH EXPOSED SQUARE FOOT OF WALL FACE).

2)---DRAINAGE COLLECTION PIPES SHALL BE INSTALLED TO MAINTAIN GRAVITY FLOW OF WATER TO OUTSIDE THE REINFORCED SOIL ZONE. THE DRAINAGE COLLECTION PIPE SHALL DAYLIGHT INTO A STORM SEWER MANHOLE OR ALONG A SLOPE AT AN ELEVATION LOWER THAN THE LOWEST POINT OF THE PIPE WITHIN THE AGGREGATE DRAIN.

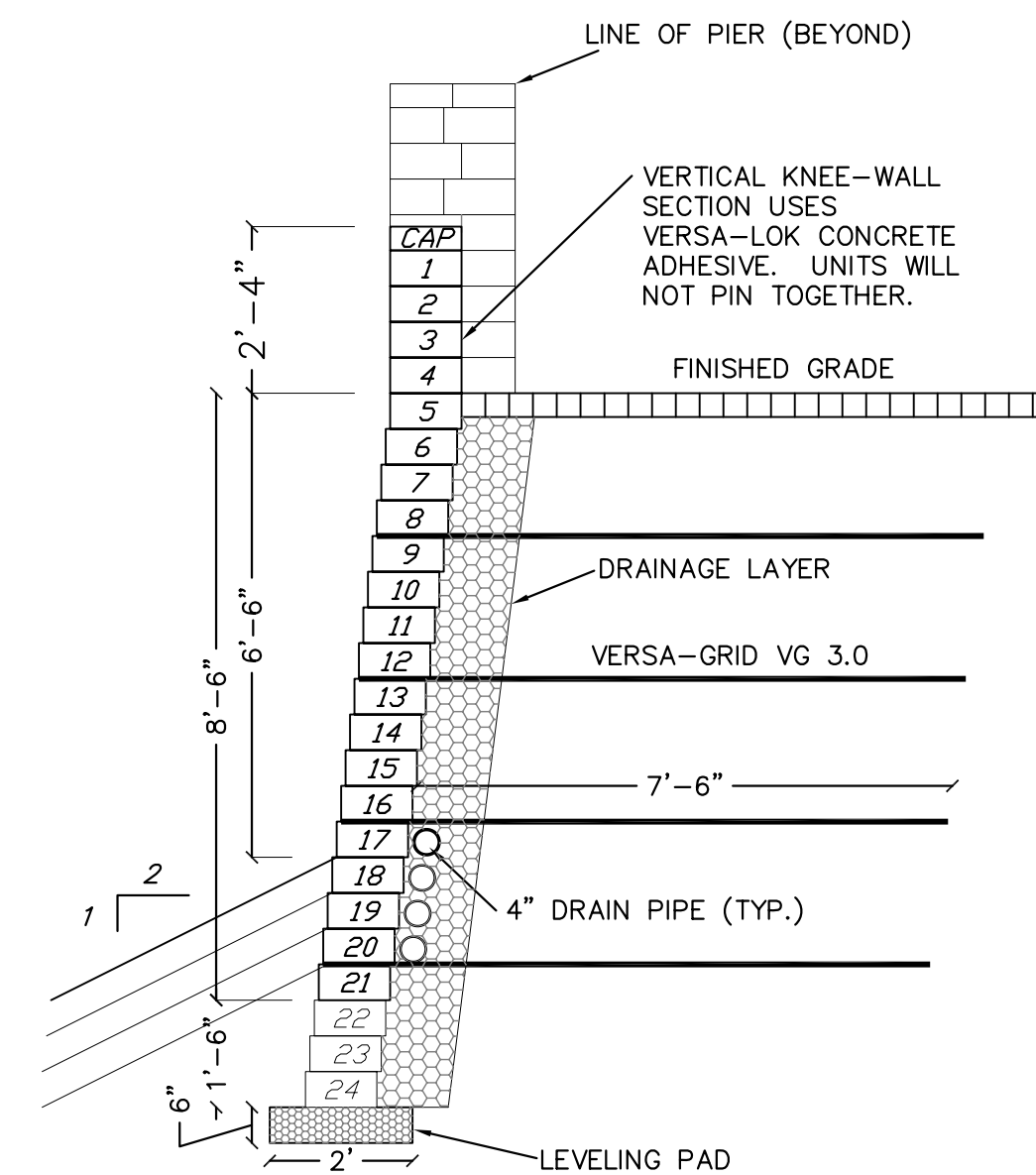
BACKFILL PLACEMENT:

1)---THE REINFORCED BACKFILL SHALL BE PLACED AS SHOWN IN THE FINAL WALL PLANS IN THE MAXIMUM COMPACTED LIFT THICKNESS OF 10 INCHES AND SHALL BE COMPACTED TO A MINIMUM OF 95% OF MODIFIED PROCTOR DENSITY (ASTM D1557) AT A MOISTURE CONTENT WITHIN 2% OF OPTIMUM. THE BACKFILL SHALL BE PLACED AND SPREAD IN SUCH A MANNER AS TO ELIMINATE WRINKLES OR MOVEMENT OF THE GEOSYNTHETIC REINFORCEMENT AND THE SRW UNITS.

2)---ONLY HAND-OPERATED COMPACTION EQUIPMENT SHALL BE ALLOWED WITHIN 3 FEET OF THE BACK OF THE WALL UNIT. COMPACTION WITHIN THE 3 FEET BEHIND THE WALL UNIT SHALL BE ACHIEVED BY AT LEAST 3 PASSES OF A LIGHTWEIGHT MECHANICAL TAMPER, PLATE, OR ROLLER.

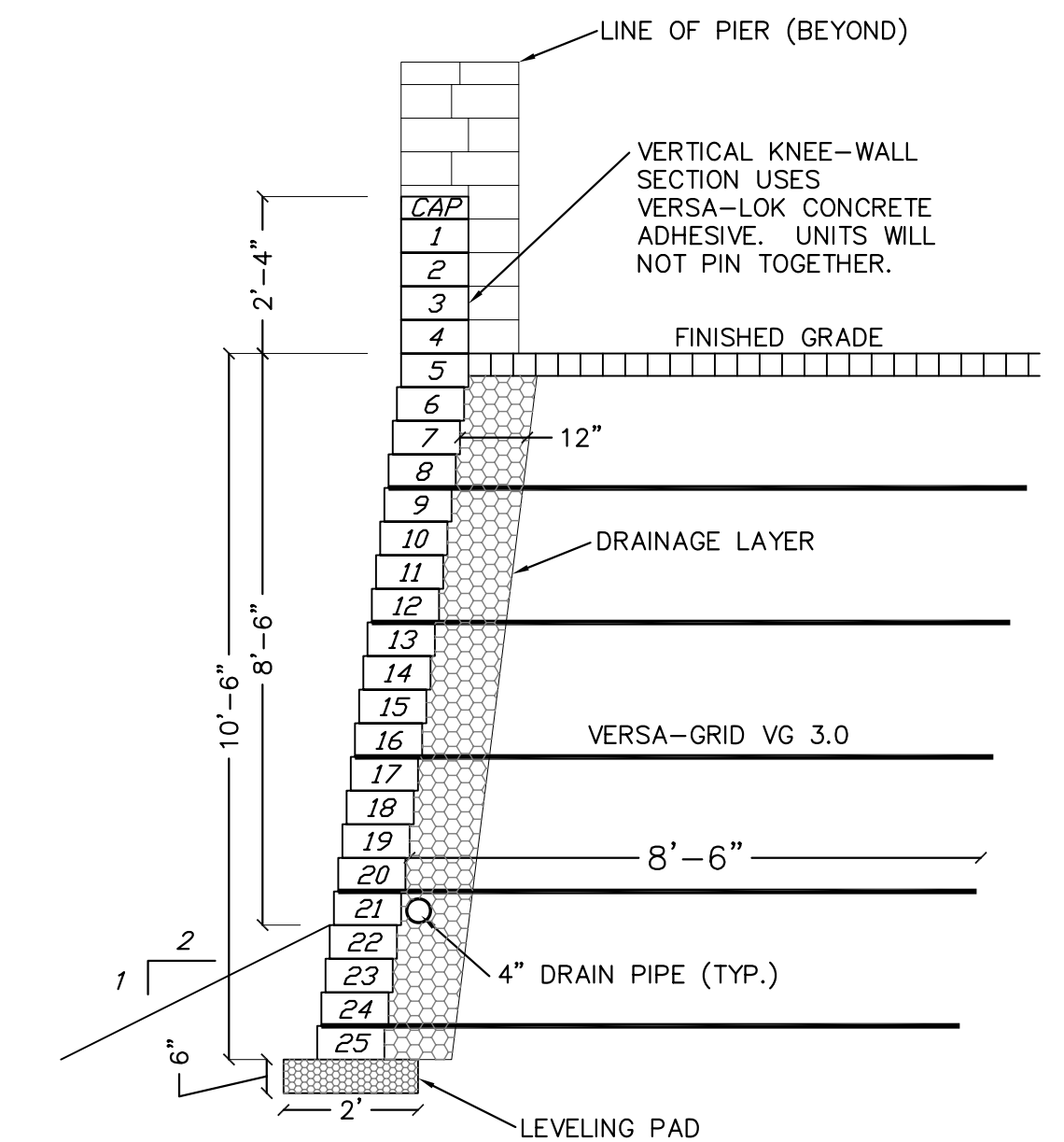
3)---AT THE END OF EACH DAY'S OPERATION, THE CONTRACTOR SHALL SLOPE THE LAST LEVEL OF BACKFILL AWAY FROM THE WALL FACING AND REINFORCED BACKFILL TO DIRECT WATER RUNOFF AWAY FROM THE WALL FACE.

4)---AT COMPLETION OF WALL CONSTRUCTION, BACKFILL WALL BE PLACED LEVEL WITH FINAL TOP OF WALL ELEVATION. IF FINAL GRADING, PAVING, LANDSCAPING, AND/OR STORM DRAINAGE INSTALLATION ADJACENT TO THE WALL IS NOT PLACED IMMEDIATELY AFTER WALL COMPLETION, TEMPORARY GRADING AND DRAINAGE SHALL BE PROVIDED TO ENSURE WATER RUNOFF IS NOT DIRECTED AT THE WALL NOR ALLOWED TO COLLECT OR POND BEHIND THE WALL UNTIL FINAL CONSTRUCTION ADJACENT TO THE WALL IS COMPLETED.



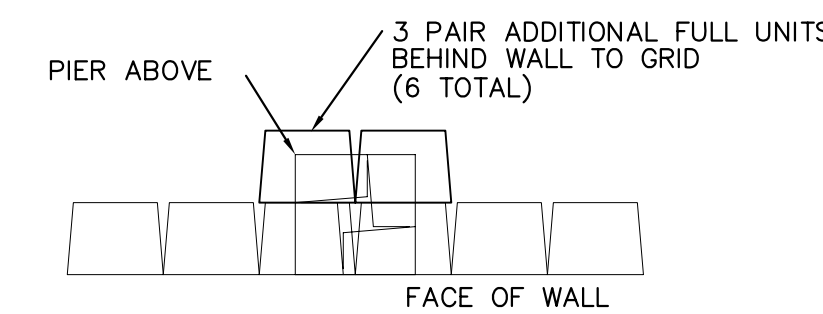
TYPICAL REINFORCED SECTION (21-24 COURSES)

3/4-INCH OFFSET
SCALE: 3/8"=1'



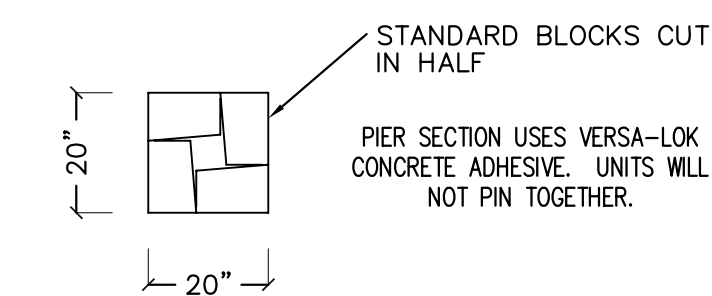
TYPICAL REINFORCED SECTION (25 COURSES)

3/4-INCH OFFSET
SCALE: 3/8"=1'



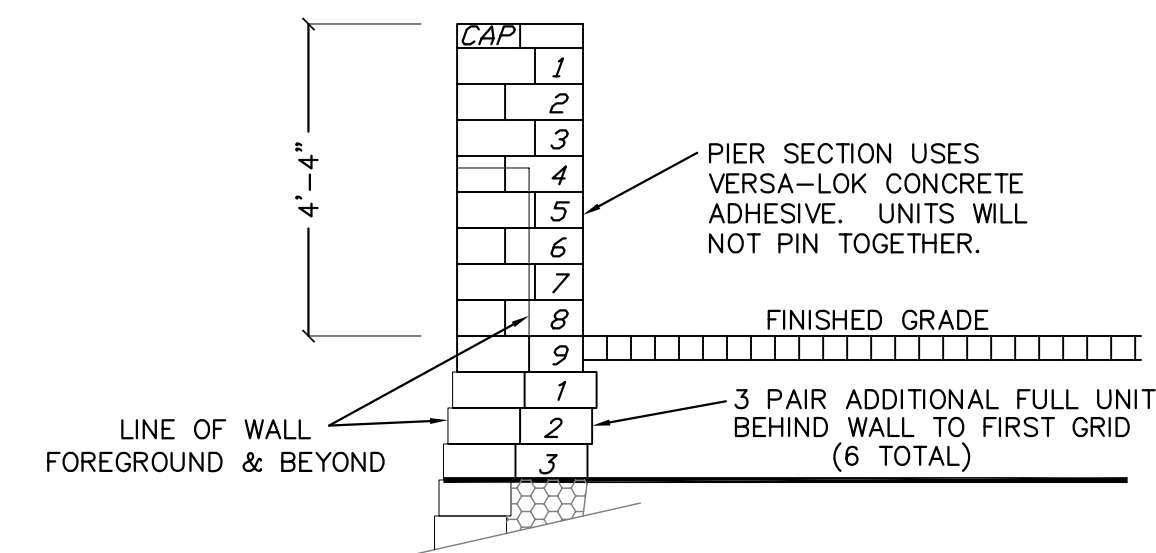
TYPICAL PIER PLAN BELOW WALL

SCALE: 3/8" = 1'



TYPICAL PIER PLAN ABOVE WALL

SCALE: 3/8" = 1'



TYPICAL PIER SECTION

SCALE: 3/8" = 1'

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PROJECT: TAKOMA PARK LINDEN AVE WATER QUALITY RETROFIT & RETAINING WALL REMEDIATION

TITLE: WALL NOTES & DETAILS

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PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM DAILY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE No. _____ EXPIRATION DATE: _____

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