

BNEI Torah Haverstraw, NY

GENERAL NOTES:

DESIGN PROVISIONS:

- THE FOLLOWING EFFECTIVE STRENGTH PARAMETERS WERE ASSUMED IN THE PREPARATION OF THE STRUCTURAL CALCULATIONS FOR THE RETAINING WALL SYSTEM:

SOIL PROPERTIERS				
ZONE	ϕ°	COH (PSF)	γ (PCF)	DESCRIPTION
REINFORCED FILL	28	0	120	SELECT FILL (<20% FINES)
RETAINED FILL	28	0	120	SILTY SAND
FOUNDATION	28	50	120	SILTY SAND

SOIL TYPES AND DESIGN PROPERTIES SHALL BE CONFIRMED BY THE SITE GEOTECHNICAL ENGINEER PRIOR TO WALL CONSTRUCTION OR THESE PLANS SHALL BE VOIDED.

- THE WALL(S) ARE DESIGNED TO SUPPORT THE FOLLOWING MAXIMUM SURCHARGE LOADINGS:

LIVE LOAD: NONE
DEAD LOAD: NONE
BACK SLOPE: NONE
SEISMIC: NONE
HYDROSTATIC: NOT APPLICABLE

- THE FOUNDATION SOILS AT WALL LOCATIONS SHALL BE CAPABLE OF SAFELY SUPPORTING THE MAXIMUM APPLIED BEARING PRESSURE, AS SHOWN ON THE WALL PROFILES, WITHOUT FAILURE OR EXCESSIVE SETTLEMENT. LOCAL BEARING CAPACITY SHALL BE CONFIRMED BY THE SITE GEOTECHNICAL ENGINEER AFTER FOUNDATION EXCAVATION AND PRIOR TO WALL CONSTRUCTION.

- REFERENCES:
 - GEOTECHNICAL REPORT
 - FIELD VERIFY

CornerStone 100 Retaining Wall

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GENERAL NOTES:

SUGGESTED QUALITY ASSURANCE PROVISIONS:

- WALL CONSTRUCTION SHALL BE SUPERVISED BY A QUALIFIED ENGINEER OR TECHNICIAN TO VERIFY FIELD AND SITE SOIL CONDITIONS. IF THIS WORK IS NOT PERFORMED BY THE SITE GEOTECHNICAL ENGINEER, A QUALIFIED GEOTECHNICAL ENGINEER/TECHNICIAN SHALL BE CONSULTED IN THOSE MATTERS PERTAINING TO THE SOIL CONDITIONS AND WALL PERFORMANCE.
- THE FOUNDATION SOILS AT THE BASE OF THE WALL(S) SHALL BE INSPECTED BY THE GEOTECHNICAL ENGINEER. ANY UNSUITABLE SOILS OR IMPROPERLY COMPACTED EMBANKMENT MATERIAL SHALL BE REMOVED AND REPLACED AS DIRECTED BY THE ENGINEER PRIOR TO WALL CONSTRUCTION TO PROVIDE ADEQUATE BEARING CAPACITY AND MINIMIZE SETTLEMENT.
- ALL WALL EXCAVATION AND RETAINED SOILS SHALL BE INSPECTED FOR GROUNDWATER CONDITIONS. ANY ADDITIONAL DRAINAGE PROVISIONS REQUIRED IN THE FIELD SHALL BE INCORPORATED INTO THE WALL CONSTRUCTION AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
- WALL BACKFILL MATERIAL SHALL BE TESTED AND APPROVED BY THE ENGINEER, MEETING THE MINIMUM REQUIREMENTS OF THE APPROVED DESIGN PLANS OR SPECIFICATIONS.
- ALL SOIL BACKFILL SHALL BE TESTED BY THE GEOTECHNICAL ENGINEER FOR MOISTURE, DENSITY, AND COMPACTION PERIODICALLY (EVERY 2' VERTICALLY, 100'-200' C/C) MEETING THE MINIMUM REQUIREMENTS OF THE APPROVED DESIGN PLANS OR SPECIFICATIONS.
- THE CONTRACTOR SHALL ESTABLISH AND MAINTAIN QUALITY CONTROL FOR THE CONSTRUCTION OF THE WALL TO ASSURE COMPLIANCE WITH CONTRACT REQUIREMENTS AND MAINTAIN RECORDS OF ITS QUALITY CONTROL.
- ALL WALL ELEVATIONS, GRADES, AND BACK SLOPE CONDITIONS SHALL BE VERIFIED BY THE ENGINEER IN THE FIELD FOR CONFORMANCE WITH APPROVED DESIGN PLANS. ANY REVISIONS TO THE STRUCTURE GEOMETRY OR DESIGN CRITERIA SHALL REQUIRE DESIGN MODIFICATIONS PRIOR TO PROCEEDING WITH CONSTRUCTION.
- SURFACE WATER SHALL BE DIVERTED AWAY FROM THE RETAINING WALL. WHERE WATER CANNOT BE DIVERTED, NOTIFY THE ENGINEER FOR DESIGN OF A SWALE TO DIVERT THE FLOW OR A DROP BOX TO DRAIN THE WATER THROUGH THE WALL.

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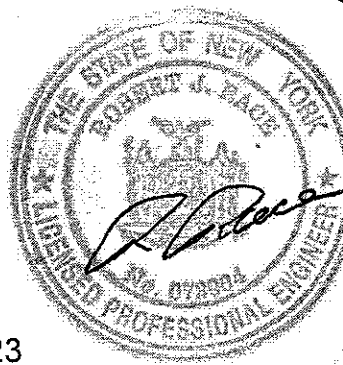
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General Notes

APPROVED

BY 
TOWN OF HAVERSTRAW
BUILDING DEPARTMENT

PROFESSIONAL SIGNATURE



11/24/2023

SHEET TITLE

TITLE PAGE

Project

23-057-01

Date

11/23/2023

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Sheet

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SPECIFICATION:

Part 1:GENERAL

- 1.1 Description
- A The work to be performed includes sourcing, providing, and installing concrete retaining wall blocks to the lines and grades as specified on the project construction drawings and as may be further specified herein.
- B Work includes preparing foundation soil, furnishing, and installing leveling pad, unit fill and backfill to the lines and grades shown on the construction drawings.
- C Work includes furnishing and installing all related materials required for construction of the retaining wall as shown on the construction shop drawings.
- 1.2 Referenced Standards
- A Engineering Design
- 1 NCMA Design Manual for Segmental Retaining Walls 3rd Edition
- 2 ASTM D 6638 - Standard Test Method for Determining the Connection Strength Between Geosynthetics Reinforcement and Segmental Concrete Units
- 3 ASTM D 6916 - Standard Test Method for Determining the Shear Strength Between Segmental Concrete Units
- B Segmental Retaining Wall Units
- 1 ASTM C 140 - Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units
- 2 ASTM C 1262 - Standard Test Method for Evaluating the Freeze-Thaw Durability of Manufactured Concrete Masonry Units and Related Concrete Units
- 3 ASTM C 1372 - Standard Specification for Dry-Cast Segmental Retaining Wall Units
- C Geosynthetic Reinforcement
- 1 ASTM D 4595 - Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method
- 2 ASTM D 5262 - Standard Test Methods for Evaluating the Unconfined Tension Creep and Creep Rupture Behavior of Geosynthetics
- 3 ASTM D 5321 - Standard Test Method for Determining the Coefficient of Soil and Geosynthetic or Geosynthetic Friction by the Direct Shear Method
- 4 ASTM D 5818 - Standard Practice for Exposure and Retrieval of Samples to Evaluate Installation Damage of Geosynthetics
- 5 ASTM D 6637 - Standard Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-Rib Tensile Method
- 6 ASTM D 6706 - Standard Test Method for Measuring Geosynthetic Pullout Resistance in Soil
- 7 ASTM D 6992 - Standard Test Method for Accelerated Tensile Creep and Creep-Rupture of Geosynthetic Materials Based on Time-Temperature Superposition Using Stepped Isothermal Method
- D Soils
- 1 ASTM D 422 - Standard Test Method for Particle-Size Analysis of Soils
- 2 ASTM D 698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³))
- 3 ASTM D 1536 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
- 4 ASTM D1557 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³))
- 5 ASTM D 2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System) [Ref. 89]
- 6 ASTM D 6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
- 7 ASTM D 4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
- 8 ASTM D 6913 - Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis
- 9 ASTM G 51 - Standard Test Method for Measuring pH of Soil for Use in Corrosion Testing
- E Drainage Pipe
- 1 ASTM F 405 - Standard Specification for Corrugated Polyethylene (PE) Pipe and Fittings.
- 2 ASTM F 758 - Standard Specification for Smooth-Wall Poly(Vinyl Chloride) (PVC) Plastic Underdrain Systems for Highway, Airport, and Similar Drainage
- F Where specifications and reference documents conflict, the Owner's Engineer shall make the final determination of applicable document.
- 1.3 Quality Assurance
- A Owner shall be responsible for soil testing and inspection quality control during earthwork operations.
- Part 2:MATERIALS
- 2.1 Definitions
- A Retaining Wall Unit - A segmental concrete facing block that is able to be arranged, stacked, placed, combined, or interchanged easily into an assembled wall system.
- B Leveling Pad - A compacted crushed stone pad which serves as a flat surface for placing the initial course of precast units.
- C Granular Aggregate - Clean 1" minus crushed angular rock located within and immediately behind the retaining wall units to facilitate drainage and avoid compaction in close proximity to the retaining wall units.
- D Joint Geotextile - A filter fabric installed to prevent infill and/or backfill material from migrating through the joints.
- E Foundation Soil - Soil zone immediately beneath the retaining wall facing units, the wall leveling pad and the reinforced soil zone.
- F Reinforced Backfill - Soil immediately behind the retaining wall facing drainage aggregate for reinforced walls.
- G Retained Soil - Soil immediately behind the retaining wall facing drainage aggregate or reinforced backfill if present.
- H Subsurface Drainage System - A system for removing water from behind the wall and channeling it to a point of positive drainage.
- 2.2 CornerStone 100
- A CornerStone 100 wall units shall have a minimum 28-day compressive strength of 3,000 psi.
- B Texture on the face of the block shall be specified. Other surfaces to be smooth form type.
- C Base Leveling Pad Material
- D Material shall consist of compacted crushed stone as shown on the construction drawing.

2.3 Gravel Layer

A Gravel layer shall consist of clean 1" minus crushed stone or crushed gravel meeting the following gradation:

Sieve Size	% Passing
1"	100
3/4"	100-75
No. 4	0-10
No. 50	0-5

2.4 Reinforced Backfill

1 For walls over 15 ft in total height:

(a) The reinforced backfill shall be free of debris and consist of one of the following inorganic USCS soil types: GP, GW, SW, SP, SM, meeting the following gradation as determined in accordance with ASTM D 422.

Sieve Size	Percent Passing
1 in.	100
No. 4	100 - 20
No. 40	0 - 60
No. 200	0 - 15

(a) The maximum size should be limited to 1.0 in. for geosynthetic reinforced soil SRWs unless tests have been performed to evaluate potential strength reduction in the geosynthetic due to installation damage.

(b) The plasticity of the fine fraction of the reinforced soil shall be less than 20.

2 For walls less than 15 ft in total height:

(a) The reinforced backfill shall be free of debris and consist of one of the following inorganic USCS soil types: GP, GW, SW, SP, SM, meeting the following gradation as determined in accordance with ASTM D 422.

Sieve Size	Percent Passing
1 in.	100
No. 4	100 - 20
No. 40	0 - 60
No. 200	0 - 35

(b) The maximum size should be limited to 1.0 in. for geosynthetic reinforced soil SRWs unless tests have been performed to evaluate potential strength reduction in the geosynthetic due to installation damage.

(c) Plasticity Index (PI)<20 and Liquid Limit (LL)<40.

(d) The pH of the backfill material shall be between 3 and 9 when tested in accordance with ASTM G 51.

2.5 Retained Backfill

A Backfill shall be free of debris or organic material.

B Plasticity Index (PI)<20 and Liquid Limits (LL)<40

C Material can be site excavated material when the above requirements are met. Unsuitable soils for backfill (high plastic clays or organic materials) shall not be used in the retained soil mass.

Part 3:EXECUTION

3.1 Excavation

A Contractor shall excavate to the lines and grades shown on the construction drawings. Contractor shall be careful not to disturb embankment and foundation materials beyond lines shown.

3.2 Foundation Soil Preparation

A Foundation soil shall be excavated as required for leveling pad dimensions shown on the construction drawings, or as directed by the Geotechnical Engineer.

B Unsuitable soils shall be removed and replaced with acceptable material.

C Over-excavated areas shall be backfilled with approved compacted backfill material.

3.3 Base Leveling Pad

A Leveling pad materials shall be placed upon approved foundation as shown on the construction drawings to a minimum thickness of 6".

B Aggregate material shall be compacted to provide a dense, level surface on which to place the first course of modular units. Compaction shall be to 95% of Standard Proctor Density as determined in accordance with ASTM D698. For crushed rock, material shall be densely compacted as determined by visual observation.

3.4 Unit Installation

A The first course of concrete modular wall units shall be carefully placed on the base leveling pad. Each unit shall be checked for level and alignment.

B 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 a base line.

C Sweep excess material from top of units and install next course. Ensure that each course is completely unit filled between and 12" behind block. Backfill and compact prior to proceeding to next course.

3.5 Fill Placement

3.6 Fill Placement

A Backfill material shall be placed with a maximum of 8" lifts and compacted to 95% of Standard Proctor Density. As determined in accordance with ASTM D698. The in-place moisture content shall not exceed the optimum moisture content as determined in accordance with ASTM D698 and be no lower than 2% below optimum moisture content.

B Only hand-operated compaction equipment shall be allowed within 3' of the back surfaces of the concrete units.

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General Notes

No. Revision/Issue Date

PROFESSIONAL SIGNATURE

11/24/2023

SHEET TITLE

SPECIFICATION

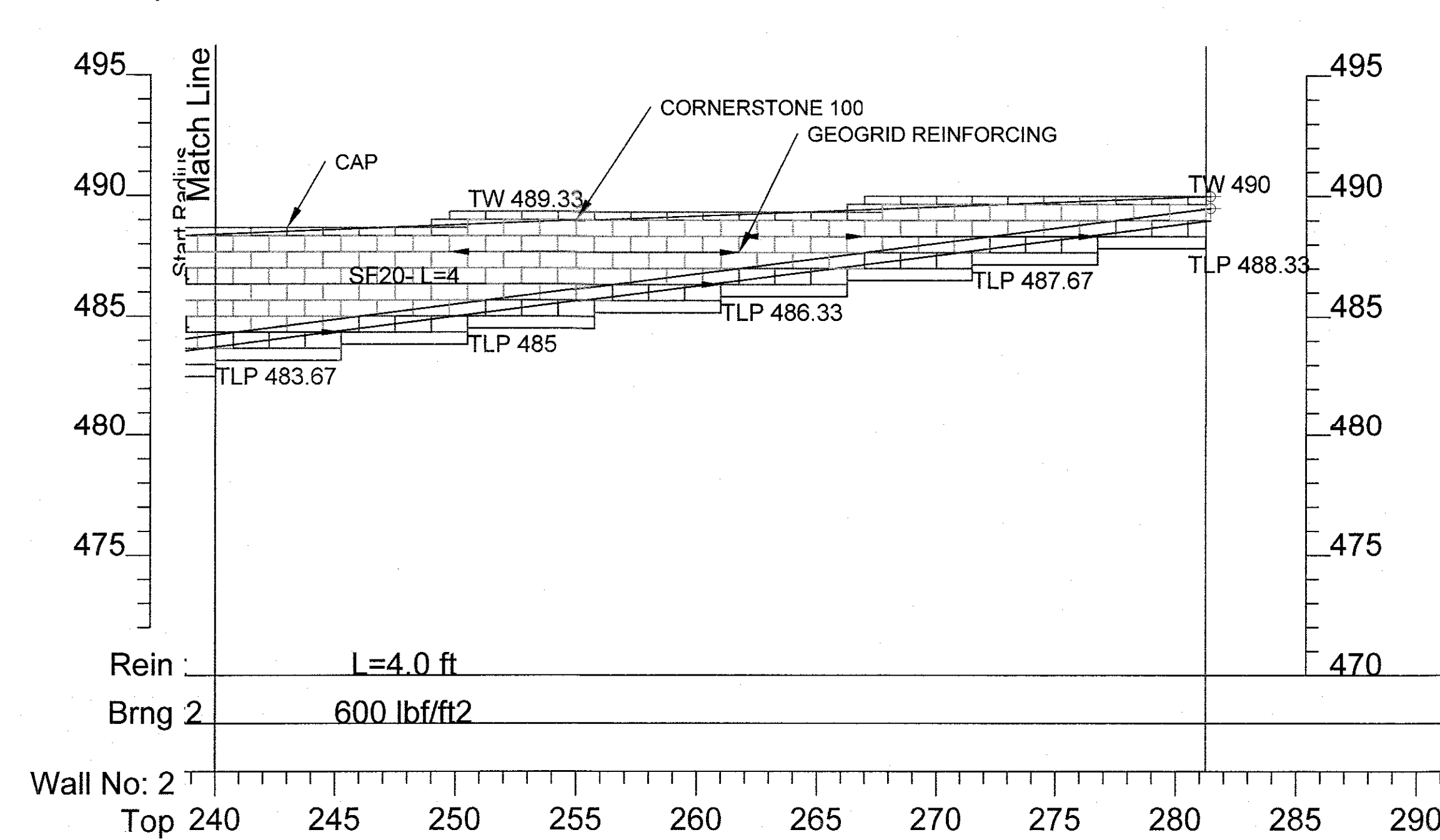
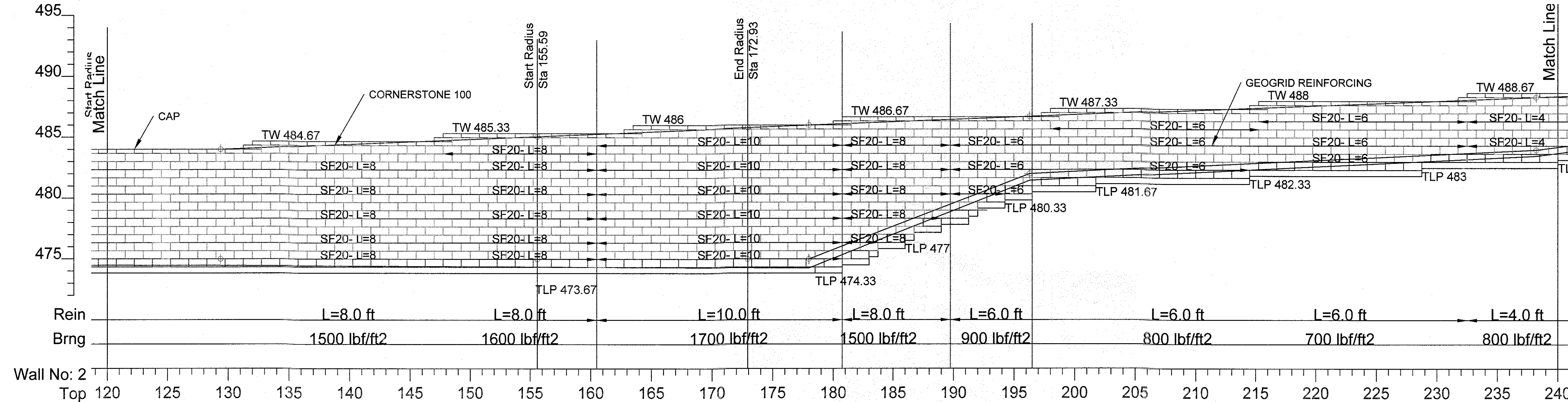
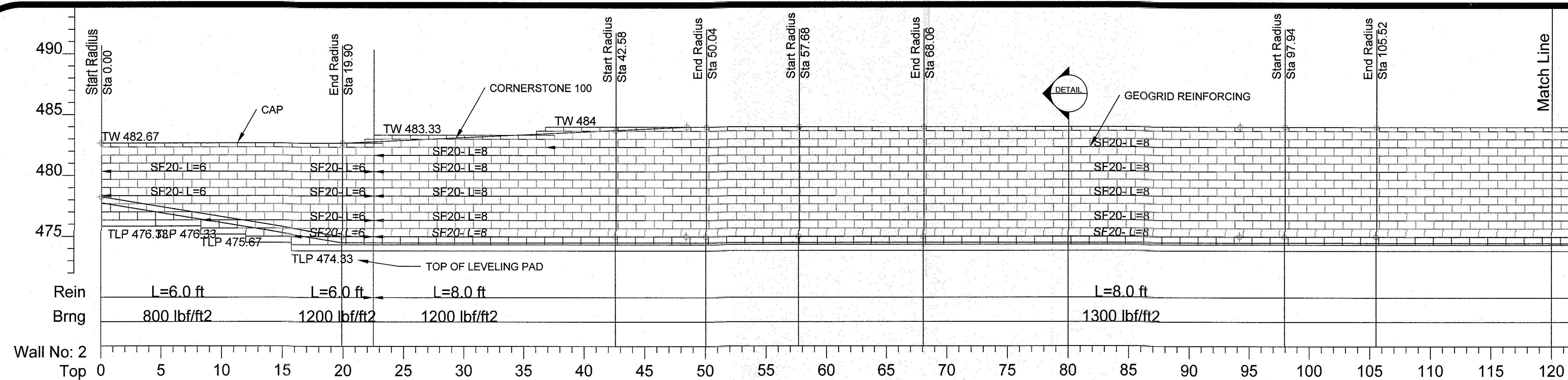
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S-1



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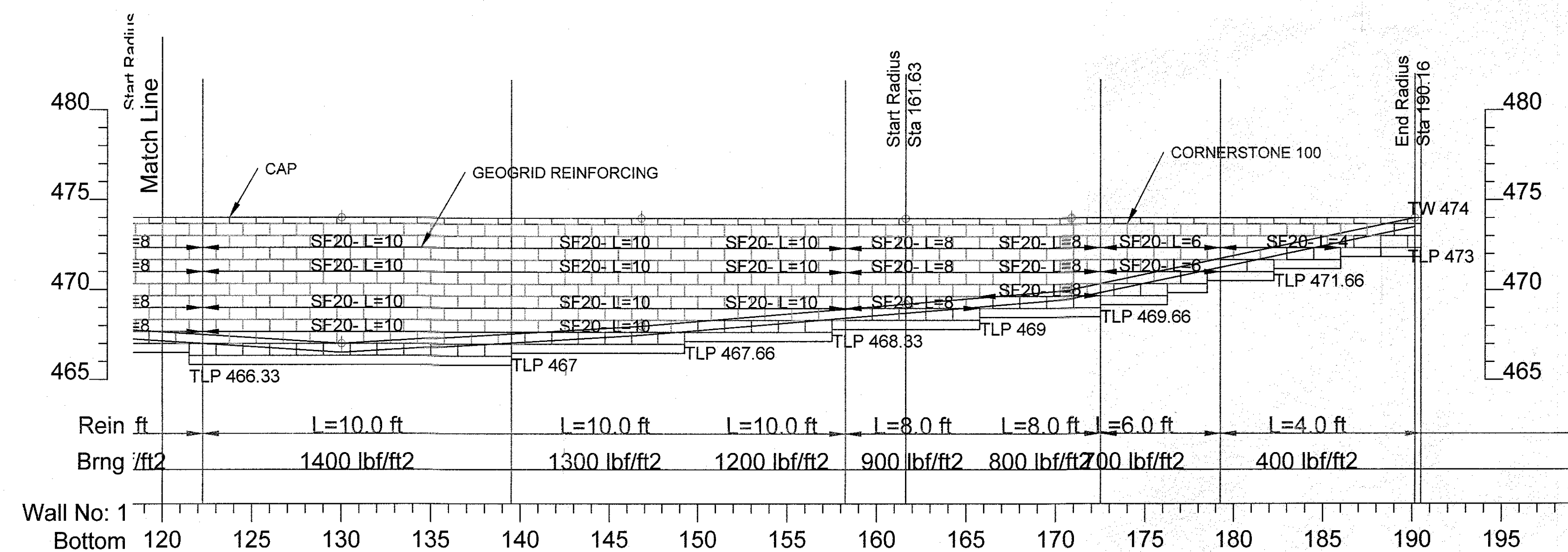
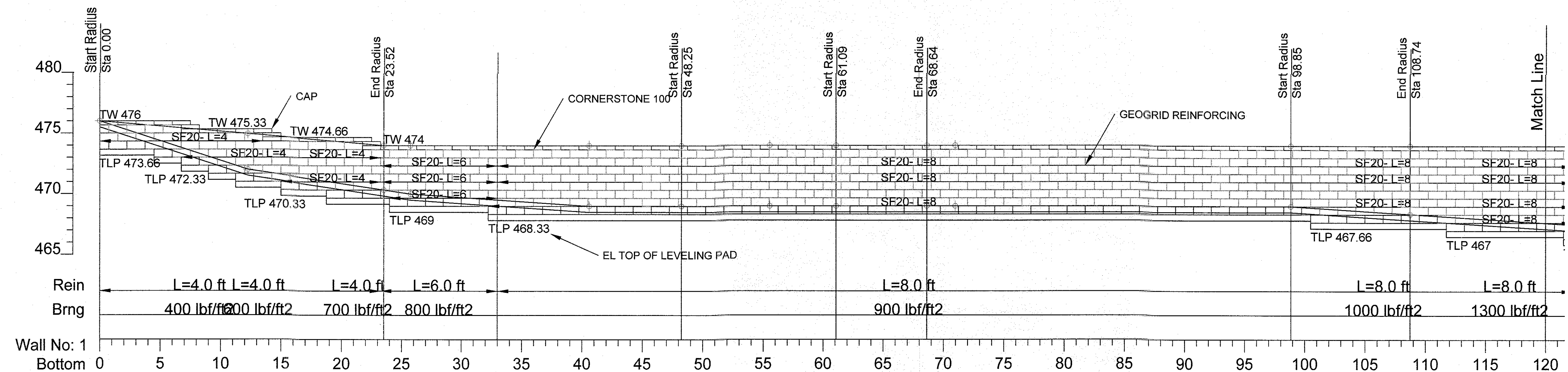
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WALL 1

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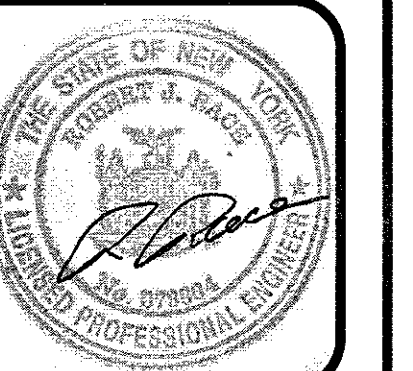
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WALL 2

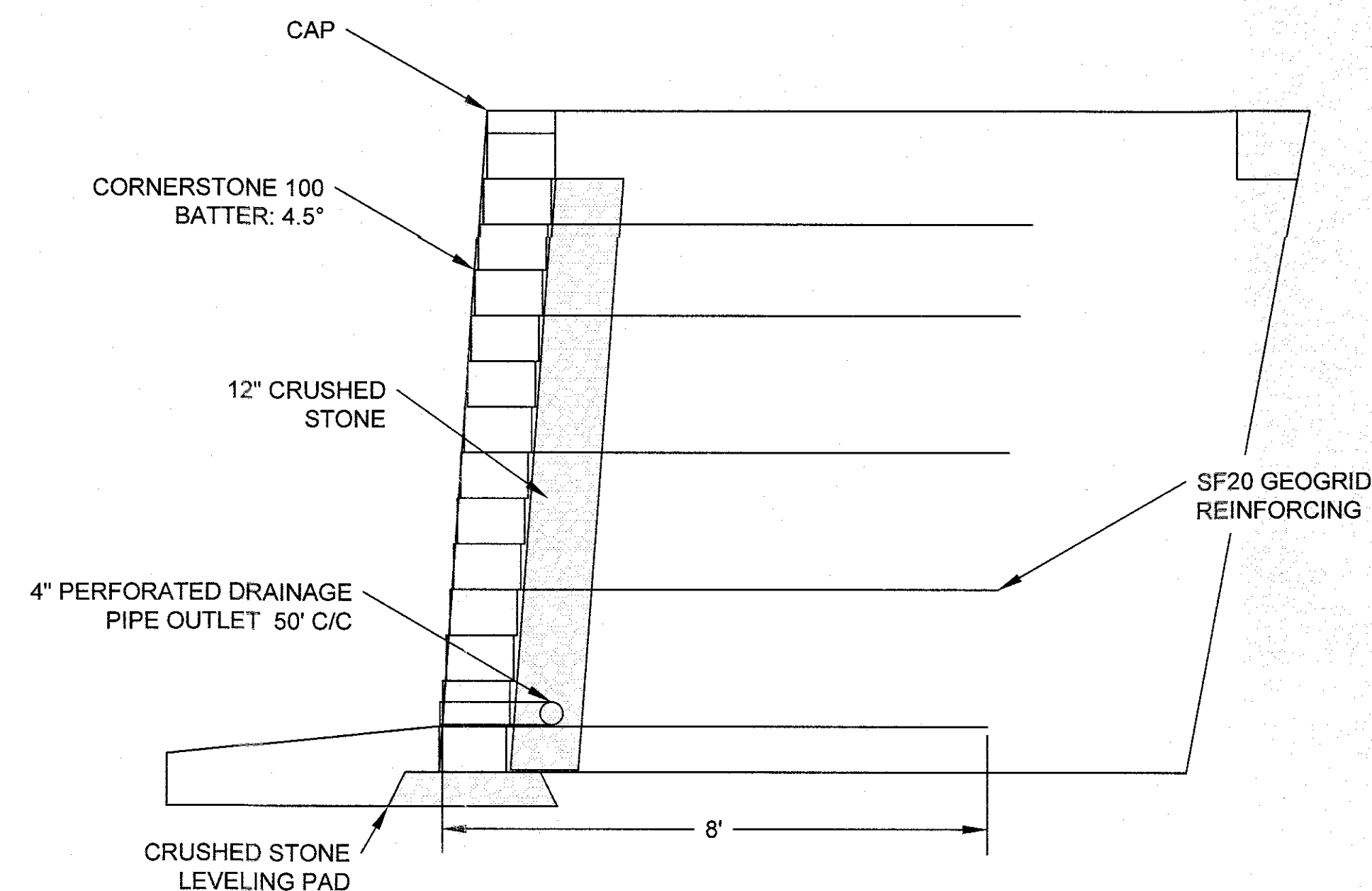
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1. THE SECTION SHOWN IS A REPRESENTATIVE WALL SECTION. THE WALL HEIGHTS, ELEVATIONS, TOE SLOPES, AND BACK SLOPES VARY ACCORDING TO THE ELEVATION PLAN AND SITE PLAN RESPECTIVELY.
2. UPON EXCAVATION, WHERE UNSUITABLE SOILS ARE FOUND, SUBCUT TO DEPTH "D" AS REQUIRED BY THE ONSITE GEOTECHNICAL ENGINEER AND REPLACE WITH SUITABLE COMPACTED STRUCTURAL FILL TO ACHIEVE THE REQUIRED BEARING CAPACITY. THE STRUCTURAL FILL SHALL BE COMPACTED TO A MINIMUM 95% STANDARD PROCTOR DENSITY.
3. APPROXIMATE LIMITS OF EXCAVATION VARIES. ACTUAL LIMITS AND SIDE SLOPES TO BE DETERMINED BY CONTRACTOR, FIELD CONDITIONS AND OSHA REGULATIONS.
4. THE WALLS SHALL BE CONSTRUCTED WITH CORNERSTONE 100 UNITS USING THE 4.5° SETBACK.
5. THE DESIGN REQUIRES STRATA SG200 SOIL REINFORCEMENT AT THE ELEVATIONS SHOWN.
6. DO NOT BRING HEAVY COMPACTION OR PAVING EQUIPMENT WITHIN 3' OF THE BACK OF THE RETAINING WALL.
7. SEE MANUFACTURER INFORMATION FOR ADDITIONAL DETAILS ON THE CORNERSTONE 100 RETAINING WALL SYSTEM.

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CORNERSTONE 100 DETAILS

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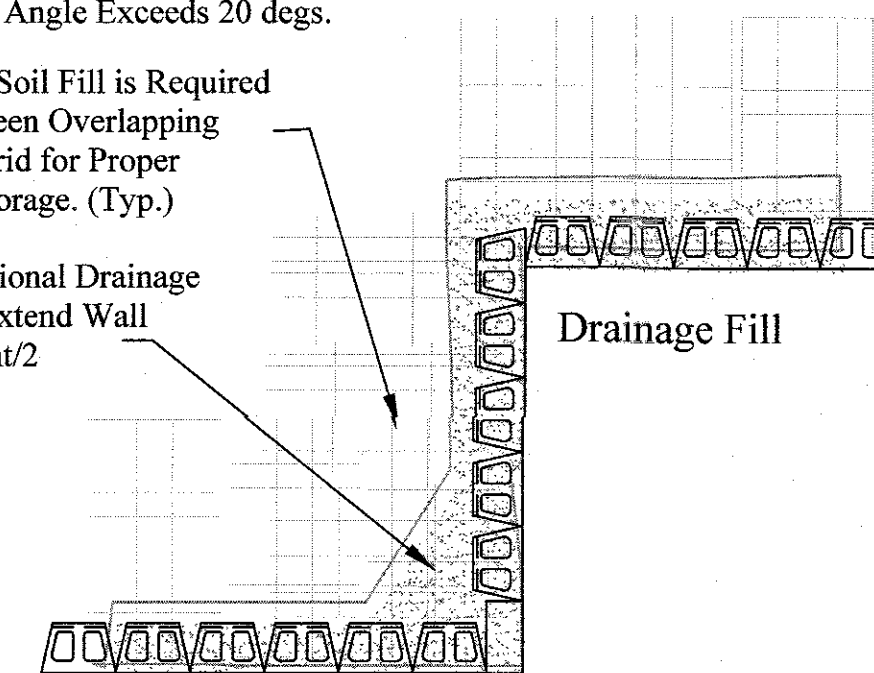
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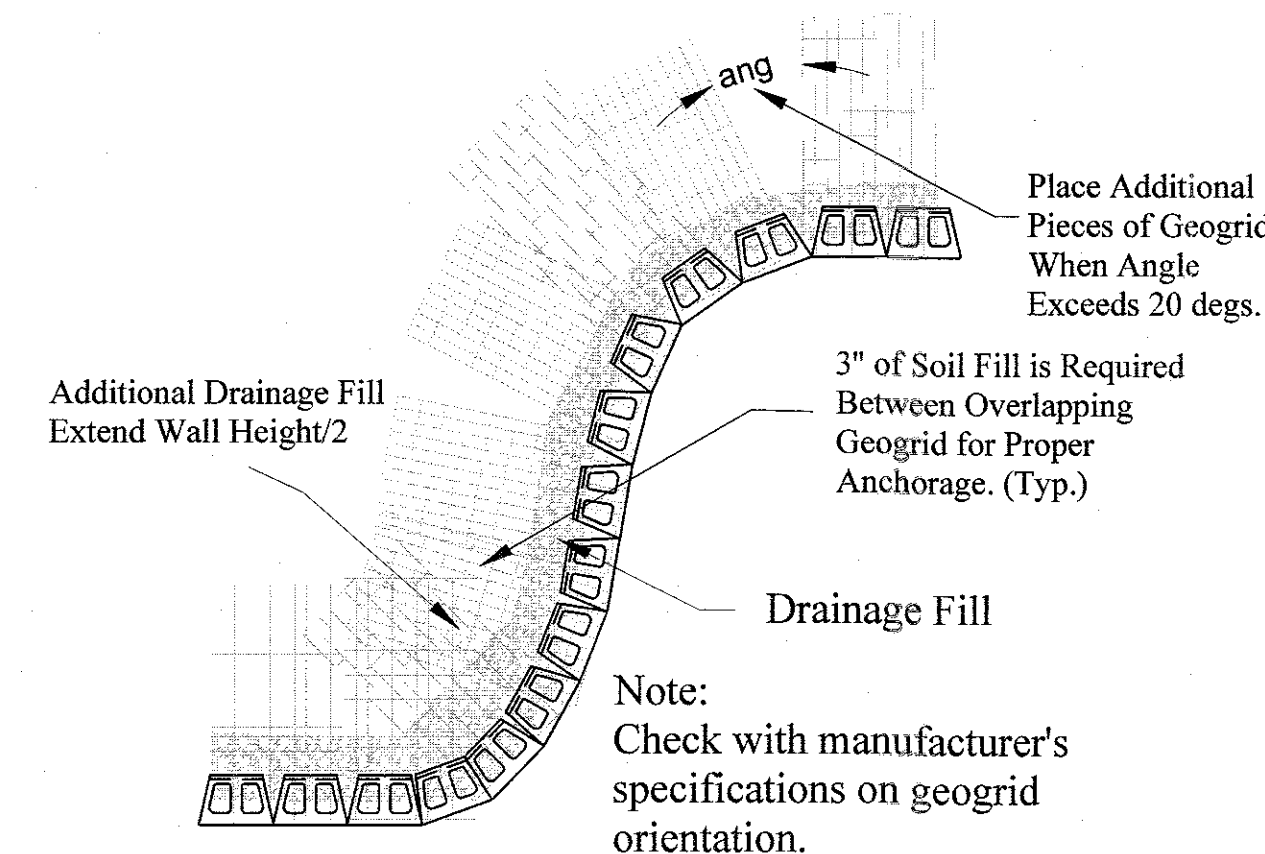
Place Additional Pieces of Geogrid When Angle Exceeds 20 degs.

3" of Soil Fill is Required Between Overlapping Geogrid for Proper Anchorage. (Typ.)

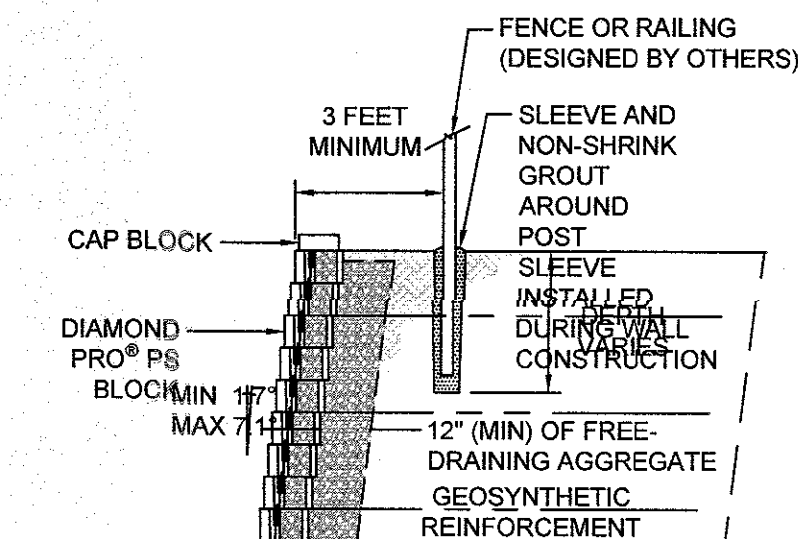
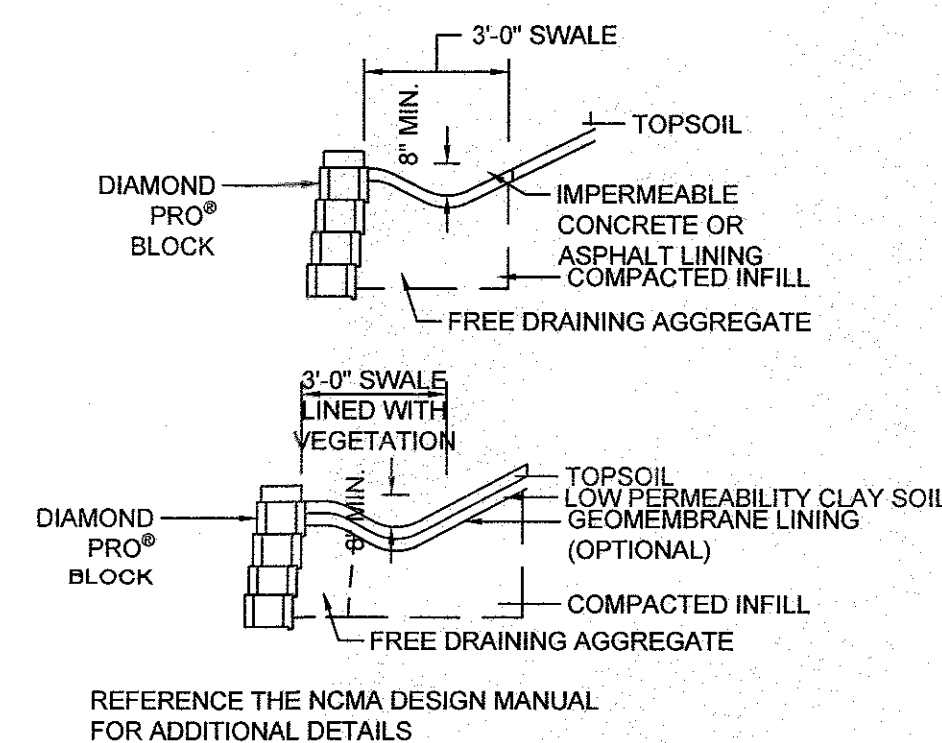
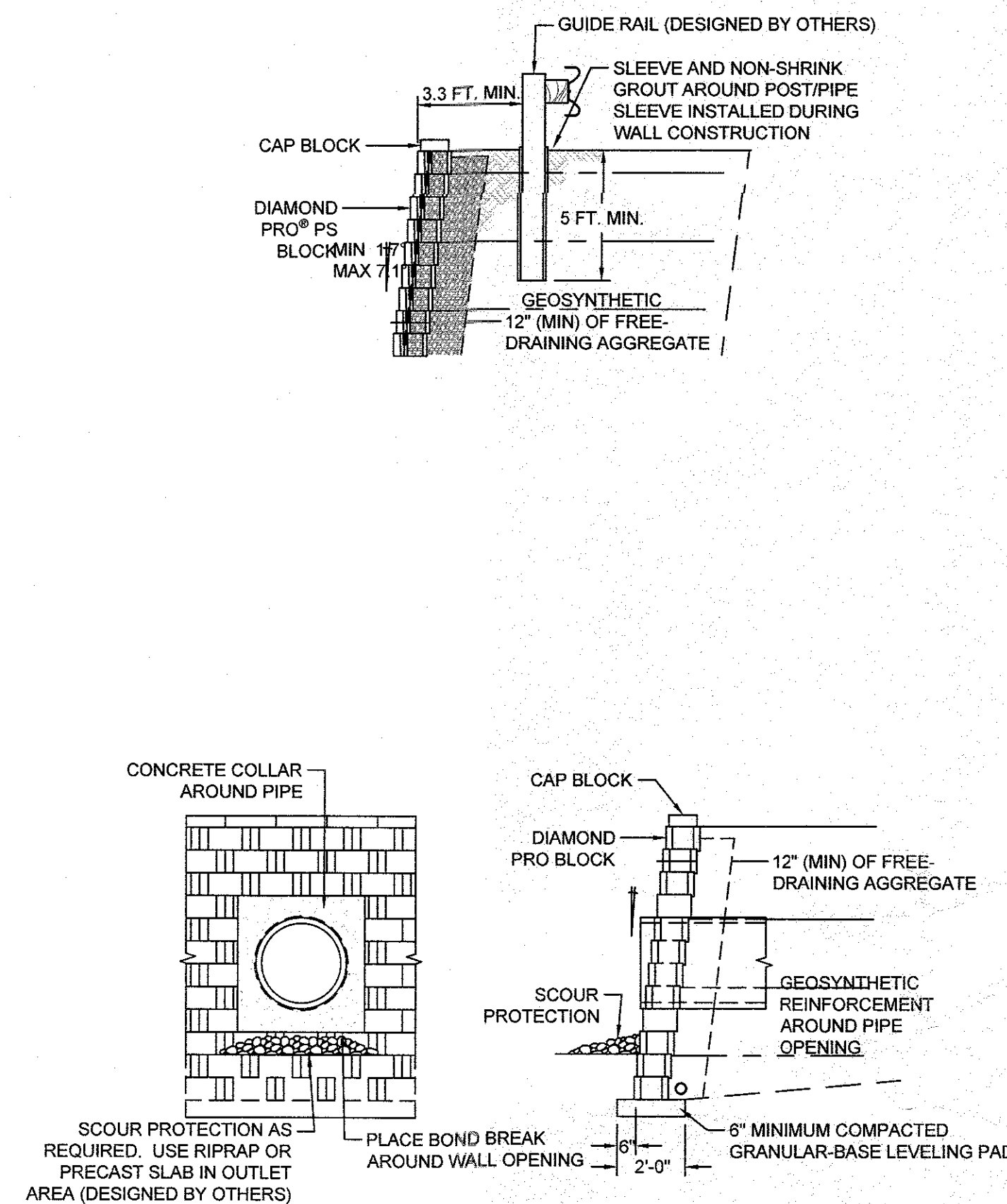
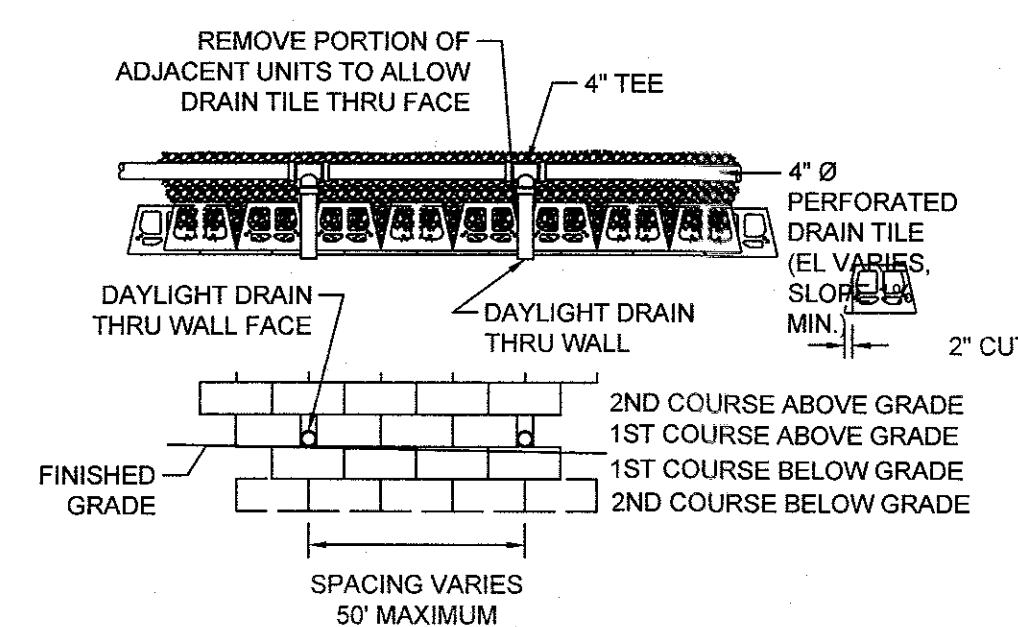
Additional Drainage Fill Extend Wall Height/2



Geogrid Installation at Corners



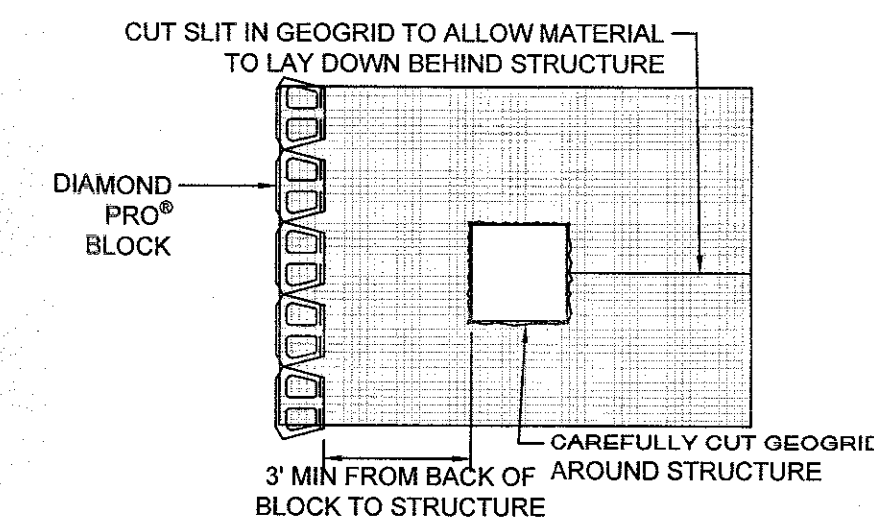
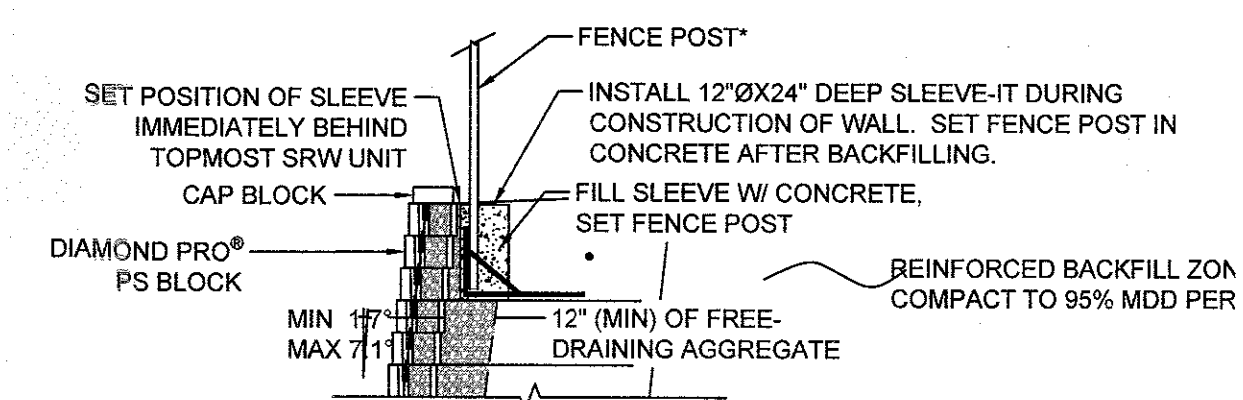
Geogrid Installation on Curves



FOR MORE INFORMATION CONTACT:
STRATA GLOBAL SOLUTIONS
1-800-680-7750

*FENCING SYSTEMS APPROVED FOR USE WITH SLEEVE-IT ARE LIMITED TO THE FOLLOWING HEIGHTS:

- CHAIN LINK UP TO 8 FEET ABOVE FINISHED GRADE WITH POST SPACING OF 8 FEET (MIN)
- ORNAMENTAL (STEEL, ALUMINUM, WROUGHT IRON) POST UP TO 6 FEET ABOVE GRADE WITH POST SPACING OF 10 FEET (MIN)
- OPEN BOARD / GAP BOARD (70% OPEN) POST UP TO 6 FEET ABOVE FINISHED GRADE WITH POST SPACING OF 8 FEET (MIN)



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