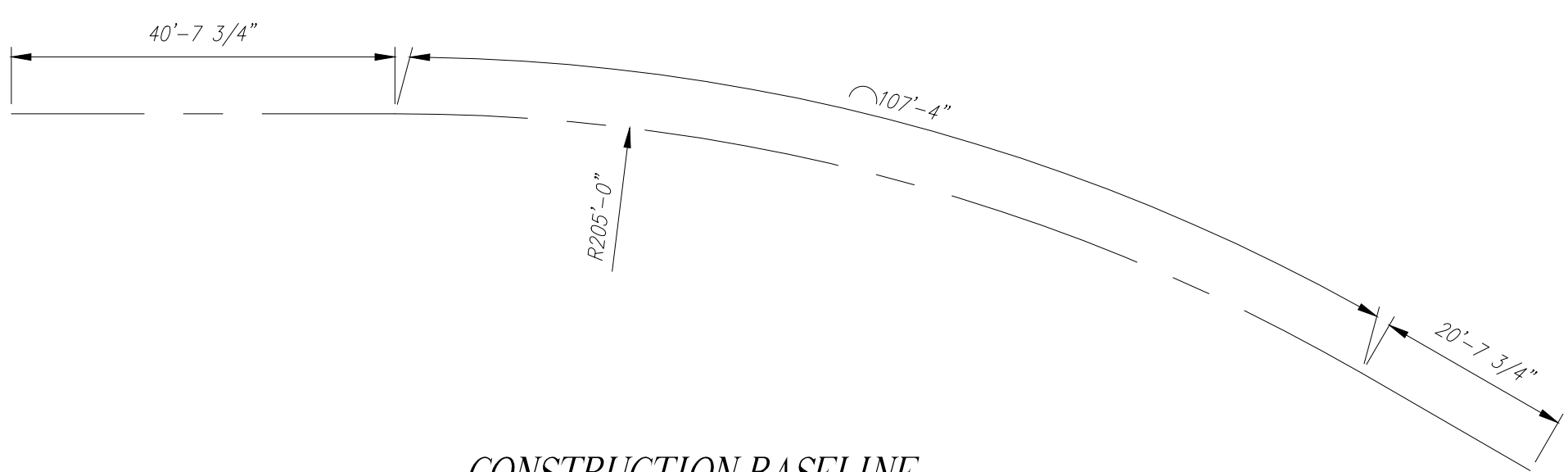
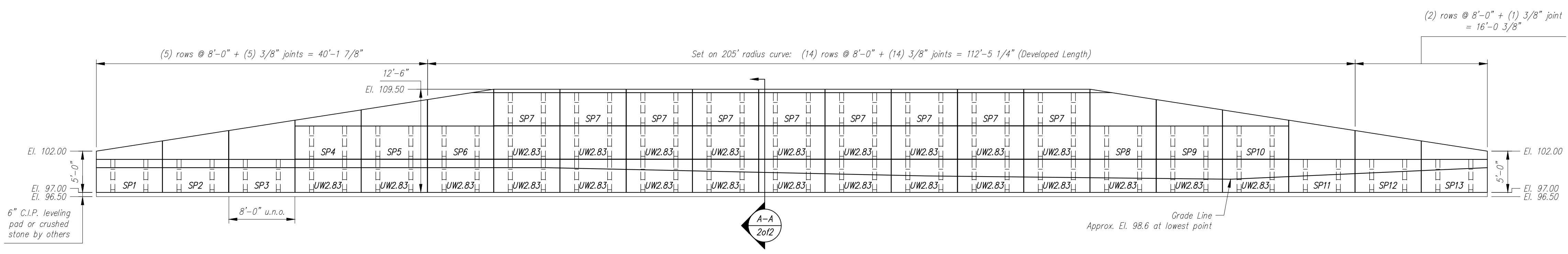


\*U.N.O. = Unless Noted Otherwise

PLAN VIEW



CONSTRUCTION BASELINE



DEVELOPED ELEVATION

▲  
WALL NO. 3 - PIECE SCHEDULE (MX-FA4000SC)

MARK	QTY	WIDTH (FT)	HEIGHT (FT)	YDS	WEIGHT	SQ. FT.
UW2.83	24	8.00	4.00	1.04	2.11 TONS	768
SP1	1	8.00	5.63	1.30	2.64 TONS	45
SP2	1	8.00	6.88	1.50	3.04 TONS	55
SP3	1	8.00	8.13	1.70	3.45 TONS	65
SP4	1	8.00	5.33	1.26	2.54 TONS	43
SP5	1	8.00	6.58	1.46	2.95 TONS	53
SP6	1	8.00	7.60	1.62	3.28 TONS	61
SP7	9	8.00	4.42	1.11	2.25 TONS	318
SP8	1	8.00	7.60	1.62	3.28 TONS	61
SP9	1	8.00	6.58	1.46	2.95 TONS	53
SP10	1	8.00	5.33	1.26	2.54 TONS	43
SP11	1	8.00	8.13	1.70	3.45 TONS	65
SP12	1	8.00	6.88	1.50	3.04 TONS	55
SP13	1	8.00	5.63	1.30	2.64 TONS	45
TOTAL						1728

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Rev.	Date	DESCRIPTION	By
5			
4			
3	07/14/11	Revised piece weights for Wall #3.	AK
2	07/07/11	Design Parameters, Geogrid length = 11ft. Soil compaction Spec. (See sheet 2 of 2)	AK
1	06/09/11	Design parameters	AK

This drawing is based upon information provided from the following documents and/or sources:  
 Engineer: TEC  
 Project No: T0070.09  
 Drawings: Westgate Market Place  
 Specifications: N/A  
 Other Sources:

**CSI**  
 Concrete Systems Inc.  
 9 Commercial St., Hudson, NH, 03051  
 Phone 603-889-4163  
 Fax 603-889-2417

STATE AGENCY	
Drawn By A. KOSTENKO	Date 05/26/2011
Checked By C. VIGOR	Date 05/26/2011
Approved By A. KOSTENKO	Date 07/15/2011

**UNIVERSAL**  
**Uwall**<sup>TM</sup>

PRECAST CONCRETE RETAINING WALL SYSTEM

CONTINENTAL PAVING WESTGATE MARKET PLACE HAVERHILL, MA	
RETAINING WALL NO. 3 LAYOUT AND ELEVATION	REV 3
Drawing No. V20771-LO3-A	SHEET 1 OF 2
Quantity:	Project No: TEC PROJ. NO. T0070.09



**UWALL SYSTEM NOTES:**

- A. GENERAL:**  
 a. The owner or owners representative is responsible for reviewing and verifying that the actual site conditions are as described prior to and during construction.  
 b. All plan dimensions must be verified by the contractor. The project engineer must be notified of any discrepancies before the contractor begins work.  
 c. Structures such as building footings, swimming pools, retaining walls, storage or solid panel fencing must be kept clear such that the load is not placed between a line projected behind the wall from the founding level at 1V : 1H and the wall.  
 d. Precautions must be taken where other building work, service trenches, garden beds, etc. may be excavated in front of the wall.  
 e. If the top of the reinforced fill is to be planted, plants with root systems that may adversely affect the facing units shall not be used.  
 f. Where a safety fence is required by council it shall be set back a minimum of 40" from the top of the wall.  
**B. Reinforced Fill:**  
 a. Fill material in the reinforced soil structure shall be granular and non-expansive and comply with the design parameters specified on the contract drawings and or specifications. The material shall be capable of being compacted in accordance with the specified requirements to form a stable mass of fill.  
 b. Fill material in the facing blocks and in the reinforced soil structure shall be free from organic matter, plastic, metal, rubber or other synthetic material inorganic contaminants, dangerous or toxic material, or material susceptible to combustion. The pH value of the fill shall be between 5 and 10.  
 c. Fill material shall be placed in layers that are no more than one foot, and each layer shall be thoroughly compacted to at least 95% of the maximum dry density for standard compaction in accordance with ASTM D1557. The fill moisture content shall be within  $\pm 2\%$  of the optimum moisture content for compaction.  
 d. The placement and compaction of fill material shall be carried out in a direction parallel to the face of the wall, and shall be completed in stages to follow closely the erection of the Uwall units and placement of Macgrid reinforcing elements.  
 e. Construction vehicles and equipment weighing more than 1,100 lbs. shall be kept more than five feet away from the facing Uwall. Fill material closer than five feet behind the facing wall may be compacted using hand operated mechanical equipment, such as a vibrating plate, trench compactor or similar.  
 f. Where Macgrid layers overlap such as at convex wall curves, provide a minimum of 2" of fill between the Macgrid layers.  
**C. REINFORCING ELEMENTS (WHEN REQUIRED):**  
 a. Macgrid WG reinforcing elements to be stored, transported, handled and placed to the manufacturers specification. They shall not be damaged or displaced during placement and compaction of the fill. Vehicles shall not be operated directly above reinforcing elements that are not covered by at least 4" of fill.  
 b. The Macgrid soil reinforcement shall be laid behind the Uwall units and horizontally on compacted fill. The strong axis of the grid shall be laid perpendicular to the wall face. The next course of units shall be placed. Pull Macgrid taut, and anchor Macgrid to compacted backfill prior to placing backfill. Slack in the Macgrid shall be removed.  
 c. Do not allow fresh concrete, cement powder or lime to come into contact with the reinforcing elements.

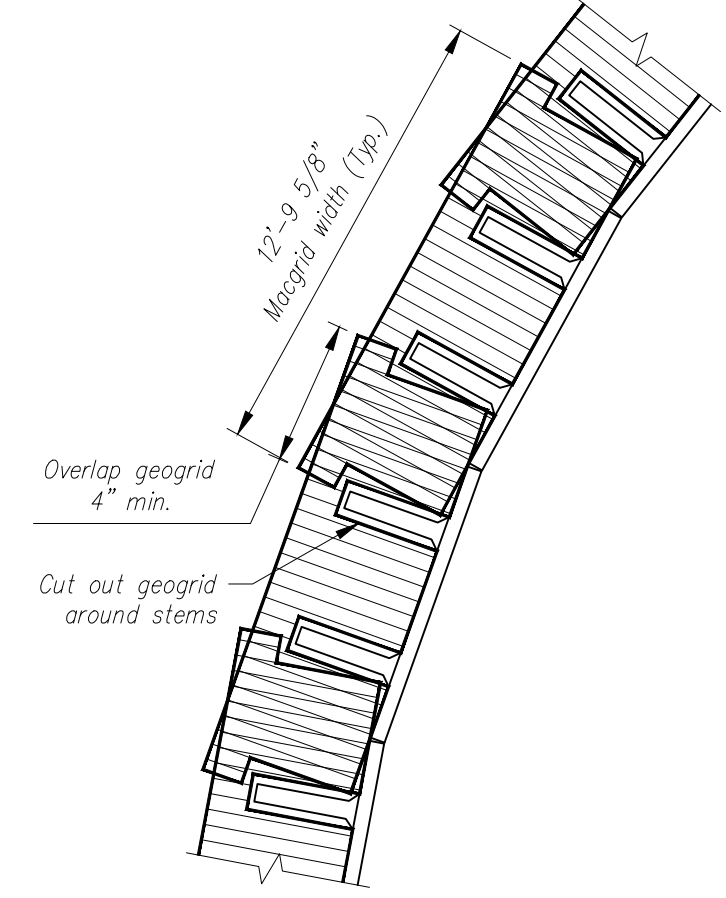
- GENERAL U-WALL NOTES:**  
 1. Concrete Strength  $f'_c = 4000$  psi.  
 2. Reinforcing Steel: ASTM A615 (rebar) grade 60  
 ASTM A1064 (WWF)  $f_y = 60$  ksi  
 3. Designed per NEMA.  
 4. U-Wall units to have form liner finish.

**D. DRAINAGE:**

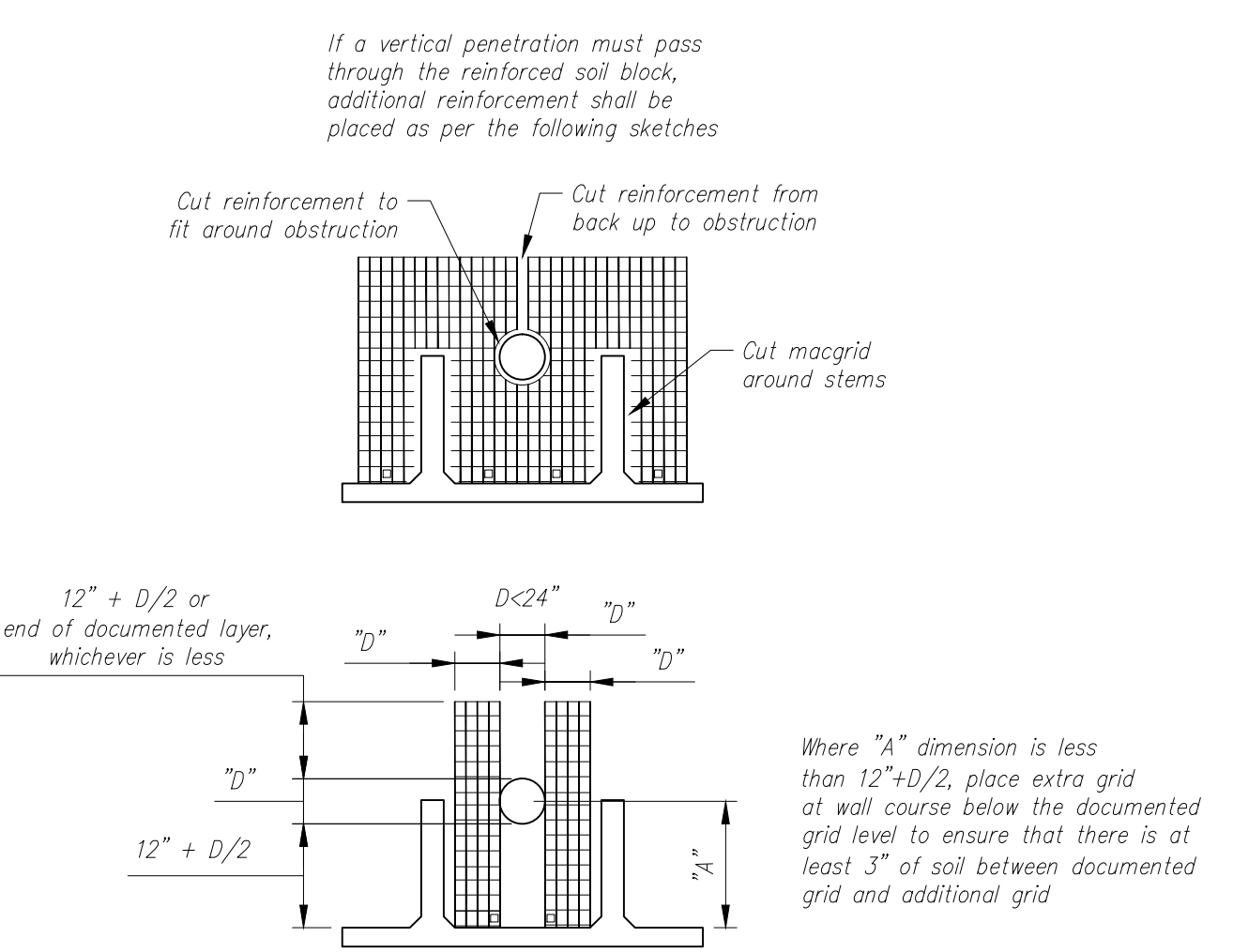
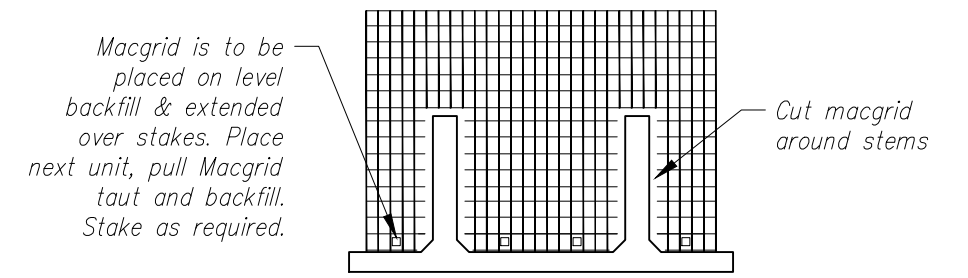
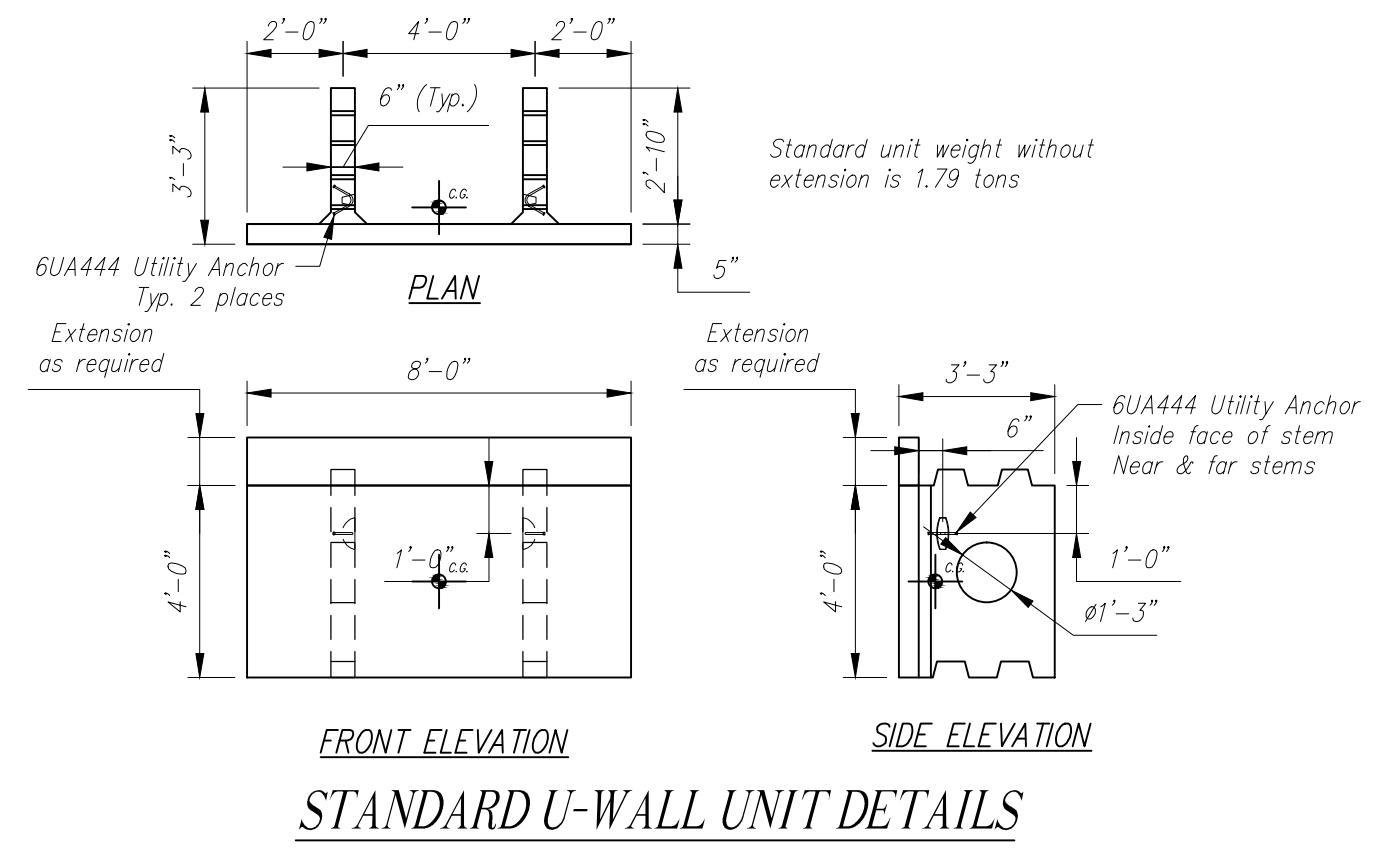
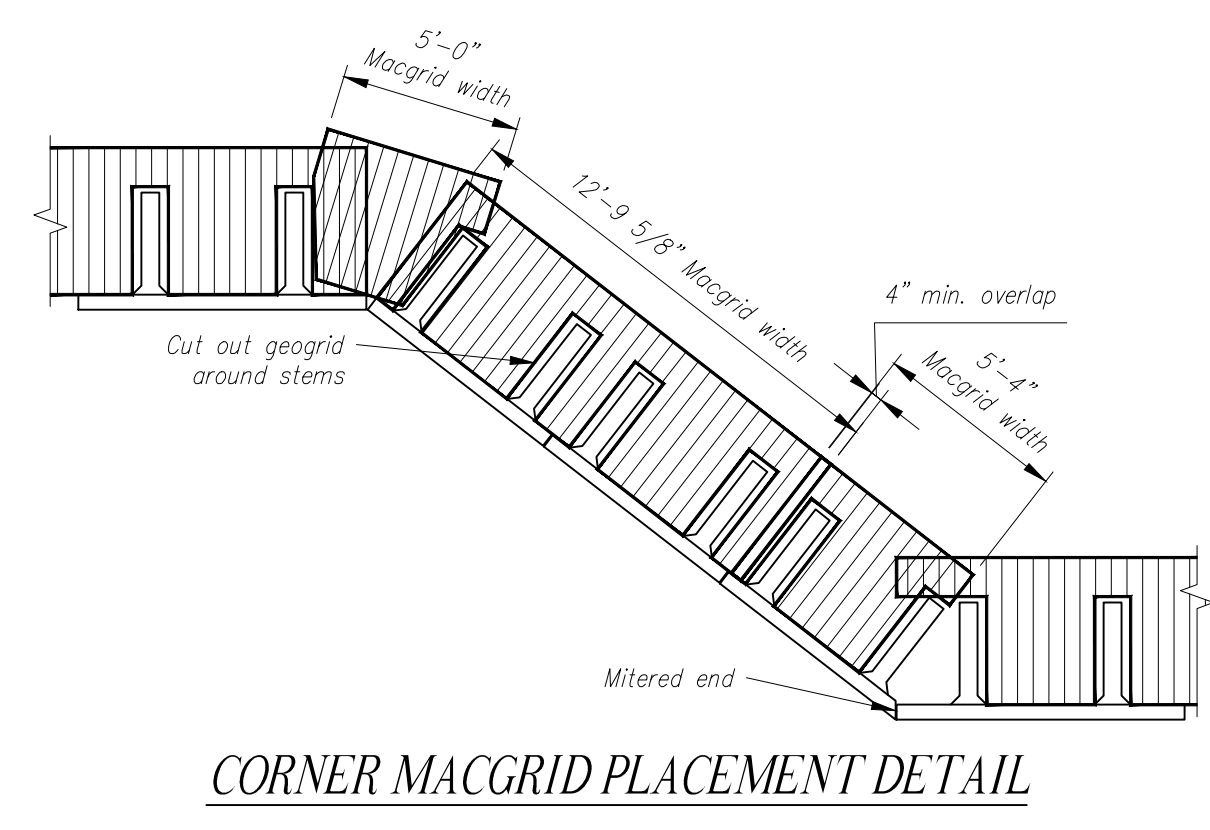
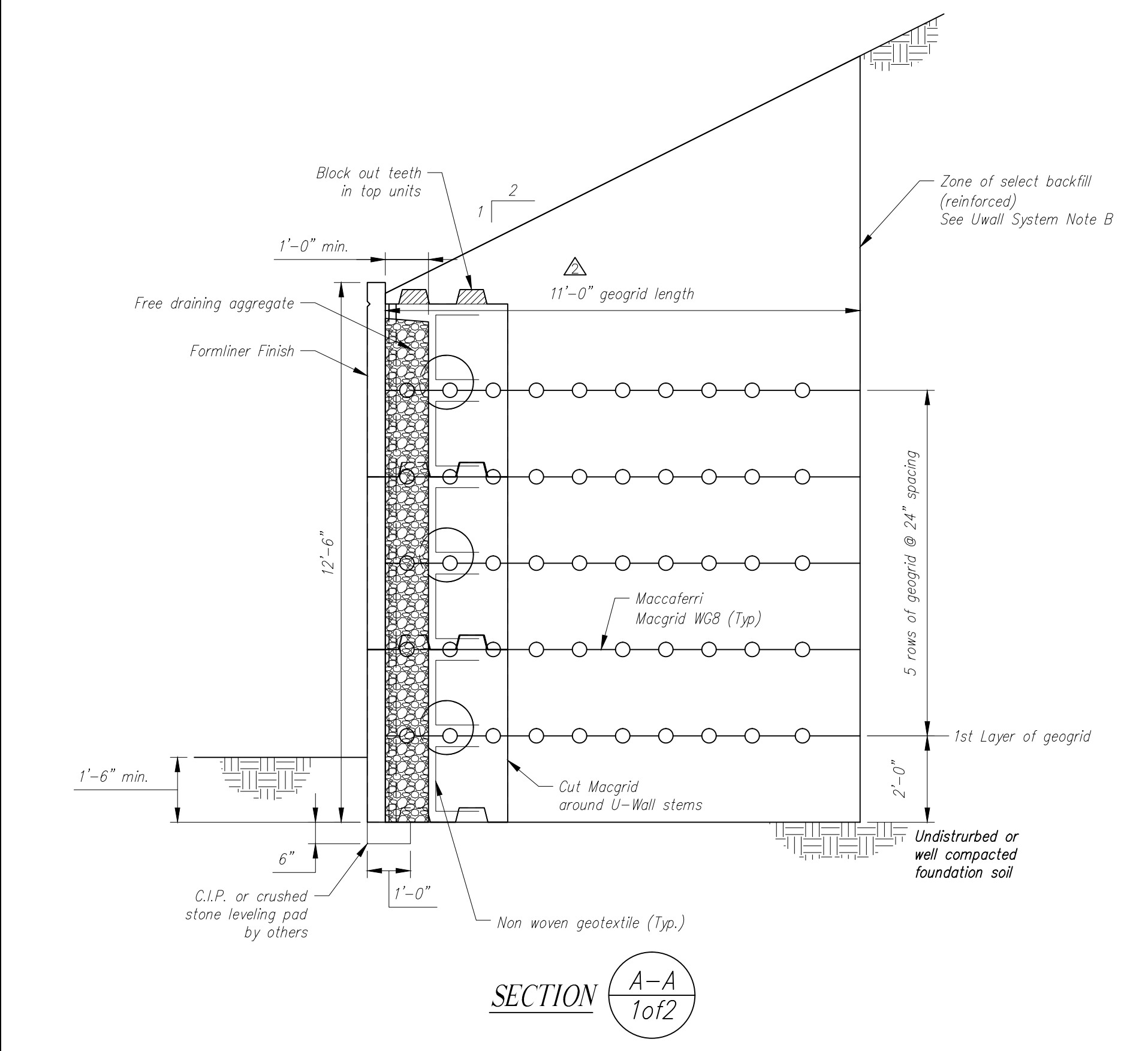
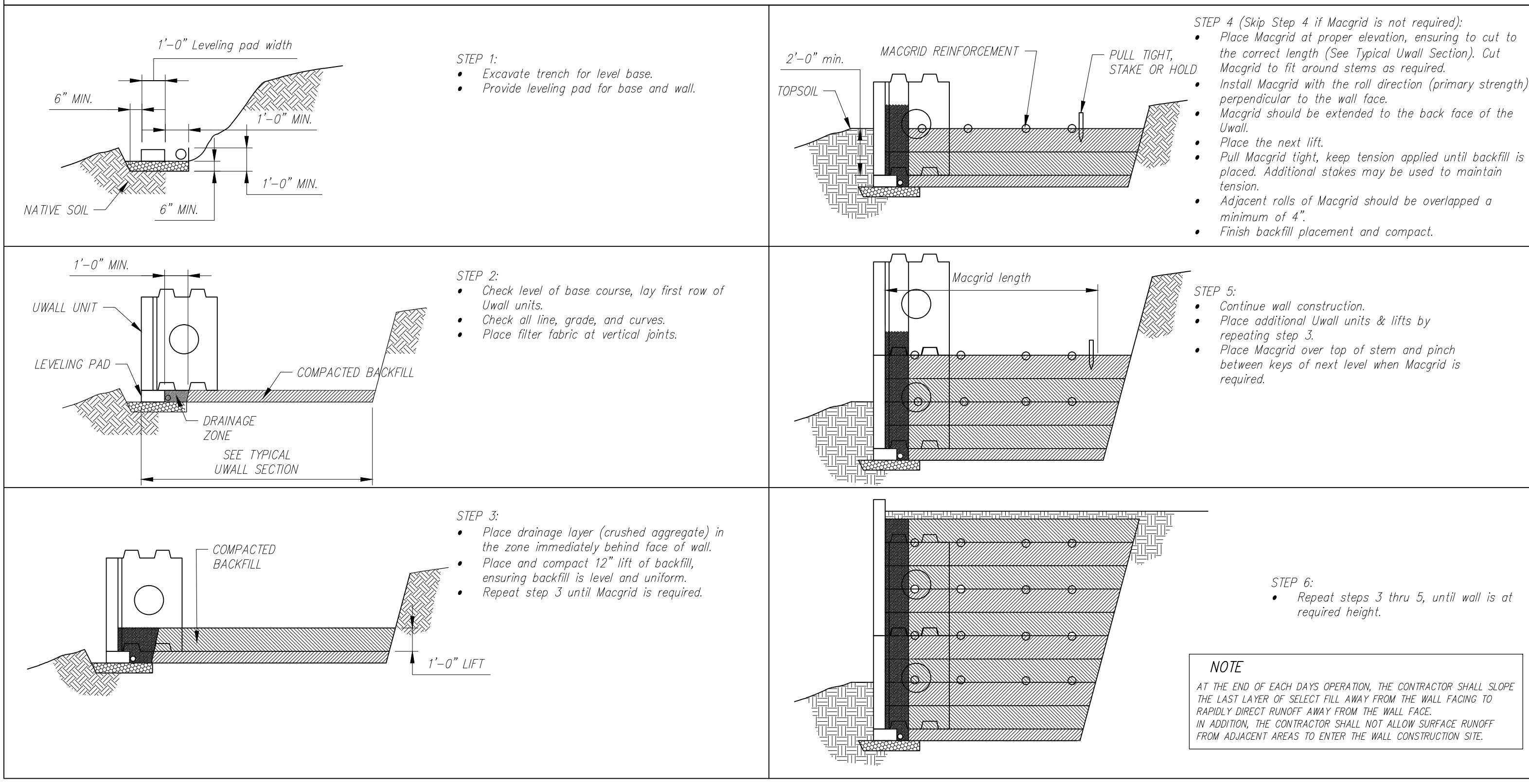
- a. Provide a drainage layer directly behind the face of the unit and between the stems. (12" thick layer of 3/8" crushed aggregate)  
 b. If the backfill is not free-draining, a drainage layer at the back of the reinforcing block shall be provided from the base of the wall to half the wall height with a positive drainage path and a suitable outlet.  
 c. All subsurface drains to have outlets at low point and a positive drainage path. Provide subsurface drainage pipes with flushing points at high points and intermediate points.  
**E. DESIGN ASSUMPTIONS:**  
 a. The design presented herein is based on soil parameters, foundation conditions, groundwater conditions, and loadings stated in the relevant specifications. Should actual conditions vary from those assumed, the project engineer should be notified prior to construction to determine if redesign of the proposed structure is required. CSI Group, Uwall and Maccaferri PTY LTD Group assumes no liability for interpretation of subsurface conditions suitability of soil design parameters, and subsurface groundwater conditions.  
**F. FOUNDATIONS:**  
 a. Bearing capacity is controlled by general shear, maximum permissible eccentricity ratio (soil),  $e/L = 0.25$ . Applied bearing pressure at maximum height: 2,500 psf.  
 b. The foundation soil shall be proof-rolled prior to placement of fill and Macgrid geosynthetic reinforcement.  
 c. The foundation soil shall be examined by the engineer to ensure that the actual foundation soil strength meets or exceeds the assumed design strength. Soil not meeting the required strength shall be excavated or replaced with approved material.  
 d. Wall embedment at toe of wall = 1.5' min.  
**G. DESIGN PARAMETERS:**  
 a. Design of the reinforced soil structures are based upon the following parameters:  
 a.a. Reinforced fill:  
 MHD MZ.01.7  
 Effective internal friction angle =  $36^\circ$   
 Effective Cohesion = 0 psf  
 Moist unit weight = 130 pcf  
 a.b. Retained fill:  
 Effective internal friction angle =  $36^\circ$   
 Effective Cohesion = 0 psf  
 Moist unit weight = 136 pcf  
 a.c. Foundation material:  
 Effective internal friction angle =  $36^\circ$   
 Effective cohesion = 0 psf  
 Moist unit weight = 136 pcf  
 b. Surcharge loads applied to structure:  
 1. Live Load surcharge: N/A  
 2. Live Load construction surcharge = N/A  
 c. The design assumes no water pressure acts on the wall.  
 d. The design has not considered seismic forces.  
 e. Global (slip circle) stability, settlement, bearing capacity of foundation soils, scour, and site drainage to be checked by others.

NOTE: ABOVE DESIGN PARAMETERS ARE ASSUMED. NO GEOTECHNICAL INFORMATION HAS BEEN PROVIDED TO CSI, UWALL OR MACCAFERRI. IT WILL BE THE RESPONSIBILITY OF THE OWNER, OWNER'S ENGINEER OR CONTRACTOR TO VERIFY ALL DESIGN PARAMETERS.

**MACGRID PLACEMENT ON RADIUS DETAIL**



**TYPICAL CONSTRUCTION SEQUENCE**



**MACCAFERRI MACGRID TAKEOFF**

Macgrid Row	Wall Length at Row	Macgrid Grade	Macgrid Length Required (ft)	Macgrid Roll Dimensions (FT) (W x L)	No. Macgrid Rolls Required
1	168	WGB	11	12.8 x 328	0.50
2	120	WGB	11	12.8 x 328	0.40
3	120	WGB	11	12.8 x 328	0.40
4	72	WGB	11	12.8 x 328	0.30
5	72	WGB	11	12.8 x 328	0.30
<b>Total Rolls:</b>					<b>1.90</b>

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STATE AGENCY: CONTINENTAL PAVING  
 WESTGATE MARKET PLACE  
 HAVERHILL, MA  
 Drawing No: RETAINING WALL NO. 3 DETAILS  
 V20771-LO3-B  
 Project No: TEC PROJ. NO. T0070.09  
 SHEET 2 OF 2