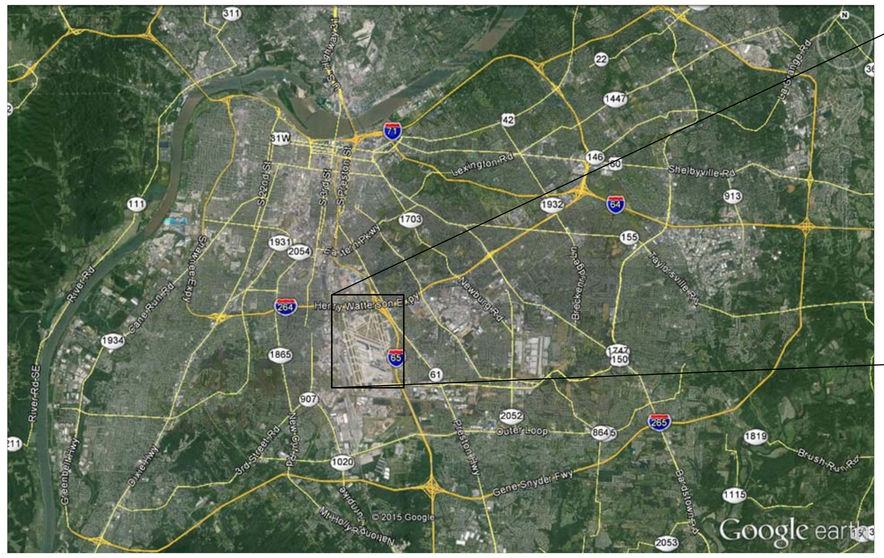
CONSTRUCTION PLANS FOR

LOUISVILLE REGIONAL AIRPORT AUTHORITY
RUNWAY 11-29 (12-30)
SAFETY AREA IMPROVEMENTS
REDI-ROCK RETAINING WALLS

LOUISVILLE, KENTUCKY



PREPARED FOR

REDI-ROCK OF KENTUCKIANA
850 LANDIS LANE
MT. WASHINGTON, KY 40047

PREPARED BY

MATTINGLY ENGINEERS
10622 Worthington Lane
Prospect, KY 40059
502-550-3349 PH

SHEET INDEX

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RUNWAY 11-29 (12-30)
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REDI-ROCK RETAINING WALLS
LOUISVILLE, KENTUCKY

COVER SHEET

STATE OF KENTUCKY
MICHAEL D. MATTINGLY
21104
LICENSED PROFESSIONAL ENGINEER

REVISIONS

NO.	DESCRIPTION	DATE

PROJECT NO: 1508
DATE: 4/17/15
DRAWN BY: MM
CHECKED BY: MM

SHEET: 1 OF 8

1.0 Design

1.1 The wall design was performed according to AASHTO LRFD Bridge Design Specifications, 6th Edition (2012). All load and resistance factors associated with the structural design of the retaining walls are consistent with these specifications.

1.2 The design of the wall system was based on the following soil and rock parameters.

Material	Ø	c	ϒ
Reinforced Backfill – #57 stone	35°	0	115 pcf
Retained Soil – clay/bedrock	28°/45°	0	120 pcf/135 pcf
Foundation – clay/bedrock	28°/45°	0	120 pcf/135 pcf

1.3 Seismic analysis was based on a horizontal acceleration coefficient, Kh=0.144 calculated from a peak ground acceleration, PGA = 0.067g.

1.4 The top and bottom wall elevations and slopes in the vicinity of the wall must be verified before beginning wall construction. Mattingly Engineers, LLC must review any changes to the wall dimensions or slopes around the walls.

1.5 Mattingly Engineers, LLC assumes no liability for information provided by others or not verified.

1.6 Any changes to the wall, including wall heights and grid lengths, must be approved by Mattingly Engineers, LLC.

1.7 This wall design includes a complete analysis of the internal stability of the retaining wall system and an external analysis of the wall system's resistance to sliding and overturning in accordance with the AASHTO guidelines. These retaining wall plans provide the maximum bearing pressure exerted by the wall system.

1.8 A global stability analysis of the entire site, including at the retaining wall location, is beyond the scope of this retaining wall design. The design of the following elements are not included in this retaining wall design and are the responsibility of others: drainage structures near the wall, including pipes and manholes; erosion protection above and below the wall; signs, guard rails, fences, curbs, and pavements. Any of these elements shown on these plans are for information purposes only and intended to alert the wall builder to adjoining site constraints.

2.0 Delivery, Storage & Handling

2.1 The contractor shall check all materials upon delivery to assure that the proper type, grade, color and material certification have been received. Contractor shall protect materials from damage due to jobsite conditions and in accordance with the manufacturer's recommendations. Damaged materials shall not be incorporated into the work.

3.0 Materials

3.1 The wall units shall be Redi-Rock Positive Connection (PC) blocks manufactured by Redi-Rock of Kentuckiana. The units shall be manufactured in accordance with ASTM C94 and have a minimum 28-day compressive strength of 4,000 psi. The color and finish shall be selected by the Owner.

3.2 All backfill within the geogrid-reinforced zone shall be ASTM No. 57 crushed stone or approved equal.

3.3 The geogrid shall be Miragrid 5XT or 8XT as specified and shall be pre-cut in 12 inch roll widths.

3.4 The drainage pipe shall be a minimum 4" diameter, perforated or slotted PVC pipe manufactured in accordance with ASTM D-3034 or corrugated HDPE pipe manufactured in accordance with ASTM D-1248.

4.0 Excavation

4.1 Foundation soil and rock shall be excavated as required for the leveling pad and the reinforced fill zone to the depths and locations shown on the Plans. The exposed foundation shall be observed by a qualified technician, engineer,or owner representative to verify that the exposed material is suitable as a bearing material and is consistent with the design assumptions indicated above. Proof roll foundation area as directed to determine if remedial work is required.

4.2 Any springs, seeps or other water sources noted in the wall excavation must be immediately reported to Mattingly Engineers, LLC for remedial action.

5.0 Leveling Pad

5.1 Soil leveling pad materials shall be placed and compacted according to requirements provided in Wall Backfill section of these specifications.

5.2 Leveling pad shall be prepared to insure full contact to the base surface of the concrete units.

6.0 Wall Construction

6.1 First course of units shall be placed on the leveling pad at the appropriate line and grade. Alignment and level shall be checked in all directions to ensure that all units are in full contact with the base and properly seated.

6.2 Place the front of units side-by-side. No gaps greater than ½ inch shall be permitted between adjacent blocks. Layout of corners and curves shall be in accordance with manufacturer's recommendations.

6.3 Maximum stacked vertical height of wall units, prior to backfill placement and compaction, shall not exceed one course.

6.4 Care must be taken when installing any utilities, structures or landscaping behind the walls in order to avoid damage to the geogrid or wall face. Any damaged geogrid or wall distortion must be replaced.

6.5 The geogrid reinforcement shall be placed at the locations, elevations and lengths indicated on these Plans.

6.6. The wall installer shall take special care to install the correct type and strength of geogrid at the correct location. Higher strength geogrid may be substituted for a lower strength geogrid specified in these Plans. The wall installer is responsible for verifying the strength of any substituted geogrid.

6.7 Only continuous strips of geogrid shall be placed through the vertical core slot of each unit. No splicing, sewn seams or any other splicing is permitted.

6.8 Backfill each unit's vertical core slot level with the top of the block. Remove any backfill material from the top of the unit before placement of subsequent block courses. No additional courses may be stacked until the unit core is filled on the course below.

6.9 Place and compact wall backfill in accordance with Section 7 of these Specifications.

6.10 Subsequent courses of units shall be installed with a running bond (half block horizontal course-to-course offset). The shear channel of the upper block shall be fully engaged with the shear knob of the lower block except at 90° corners, control joints and reinforced wall sections. Gaps less than ½ inch are allowed between the shear channel and shear knob to ensure consistent face batter and wall alignment are maintained.

6.11 Asphalt roofing shingles or rolled roofing may be used as shims between courses to maintain batter and uniform course elevations.

6.12 Blocks for non-reinforced wall sections may be furnished with or without vertical core slots.

7.0 Wall Backfill

7.1 Reinforced backfill shall be placed, spread, and compacted in such a manner that minimizes the development of slack in the geogrid and installation damage.

7.2 Reinforced backfill shall be placed and compacted in lifts not to exceed 6 inches where hand compaction is used, or 8 to 10 inches where heavy compaction equipment is used. Compact with an effort greater than or equal to that produced by a minimum of three passes with an 8 ton steel-wheel vibratory roller. Lift thickness or number of passes may be changed to achieve the required density as required.

7.3 Only lightweight hand-operated equipment shall be allowed within 5 feet from the back face of the wall.

7.4 Minimum cover of 6 inches is required prior to operation of tracked vehicles over the geogrid. Tracked vehicle turning should be kept to a minimum to prevent tracks from displacing the fill and damaging the geogrid.

7.5 Rubber tired equipment may pass over geogrid reinforcement at slow speeds, less than 10 MPH. Sudden braking and sharp turning shall be avoided.

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LOUISVILLE, KENTUCKY

NOTES

STATE OF KENTUCKY
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PROFESSIONAL ENGINEER
LICENSED

REVISIONS					
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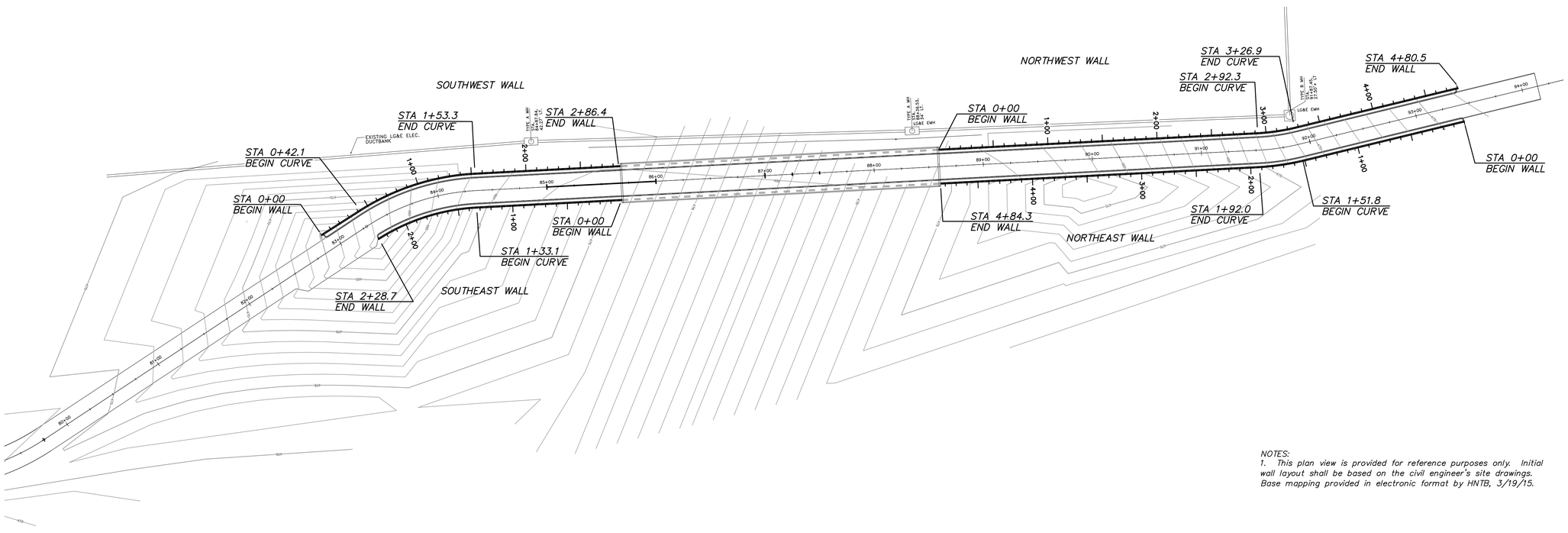
SHEET: 2 OF 8



NOTES:
1. This plan view is provided for reference purposes only. Initial wall layout shall be based on the civil engineer's site drawings. Base mapping provided in electronic format by HNTB, 3/19/15.

PLAN VIEW

0 50 100 150

SCALE: 1" = 50'

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PLAN VIEW

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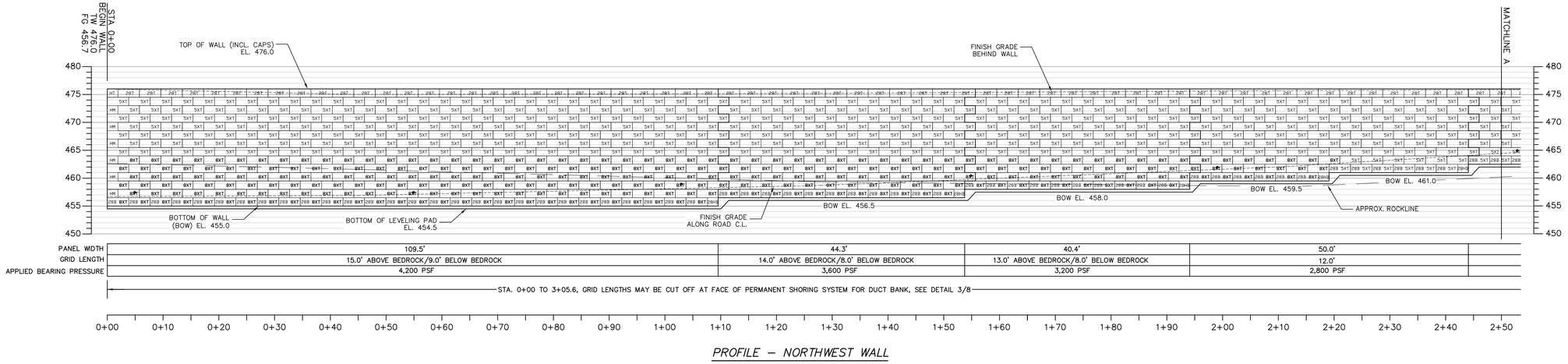
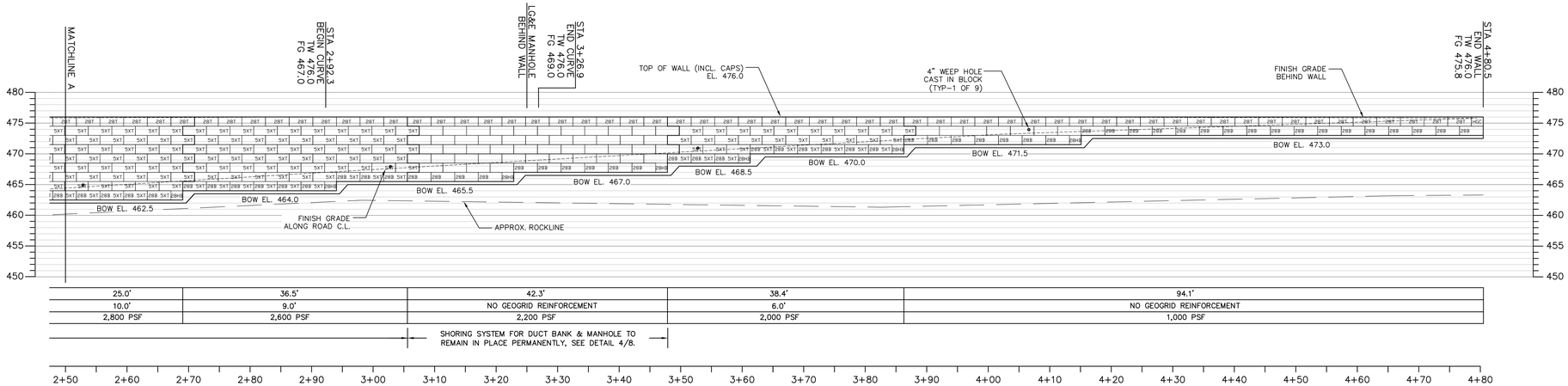


PROFILE – NORTHWEST WALL



PROFILE – NORTHWEST WALL

BLOCK LEGEND:		GEOGRID LEGEND:	
HGC	HALF GARDEN CORNER	5XT	MIRAGRID 5XT
HT	HALF TOP	8XT	MIRAGRID 8XT
GC	GARDEN CORNER		
28T	28" TOP		
HM	28" HALF MIDDLE		
	28" MIDDLE		
28B	28" BOTTOM		
28HB	28" HALF BOTTOM		

0 10 20 30
SCALE: 1" = 10'

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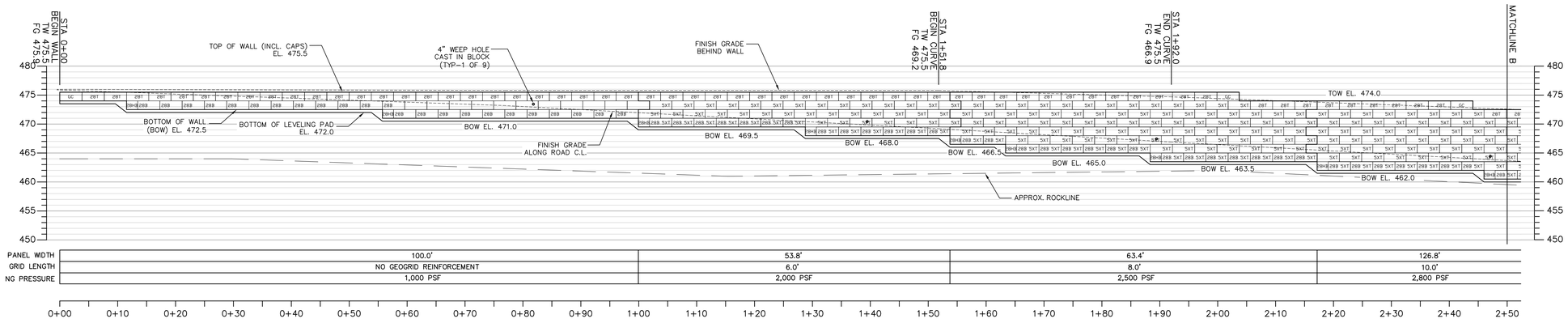
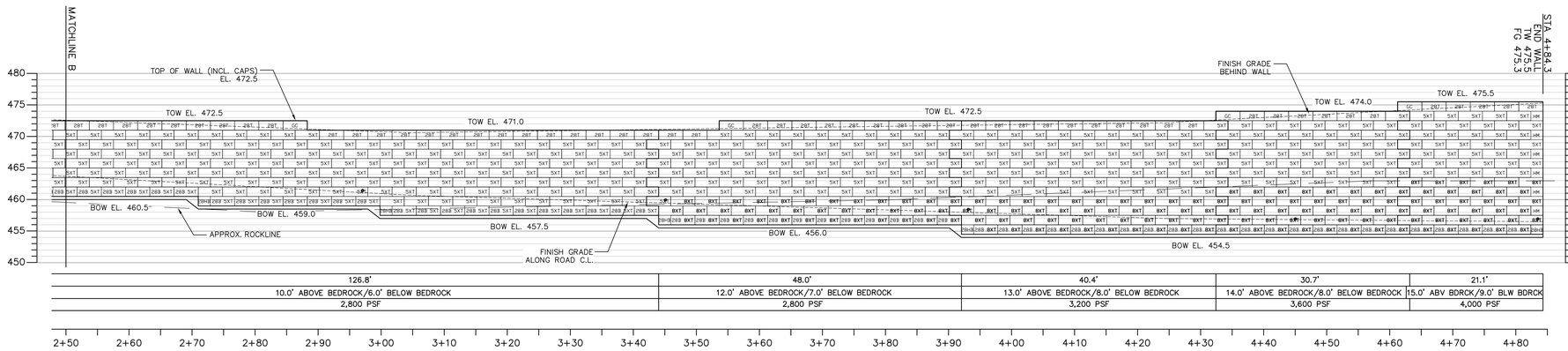


PROFILE – NORTHEAST WALL



PROFILE – NORTHEAST WALL

BLOCK LEGEND:		GEOGRID LEGEND:	
HGC	HALF GARDEN CORNER	5XT	MIRAGRID 5XT
HT	HALF TOP	8XT	MIRAGRID 8XT
GC	GARDEN CORNER		
28T	28" TOP		
HM	28" HALF MIDDLE		
	28" MIDDLE		
28B	28" BOTTOM		
28HB	28" HALF BOTTOM		

0 10 20 30

SCALE: 1" = 10'

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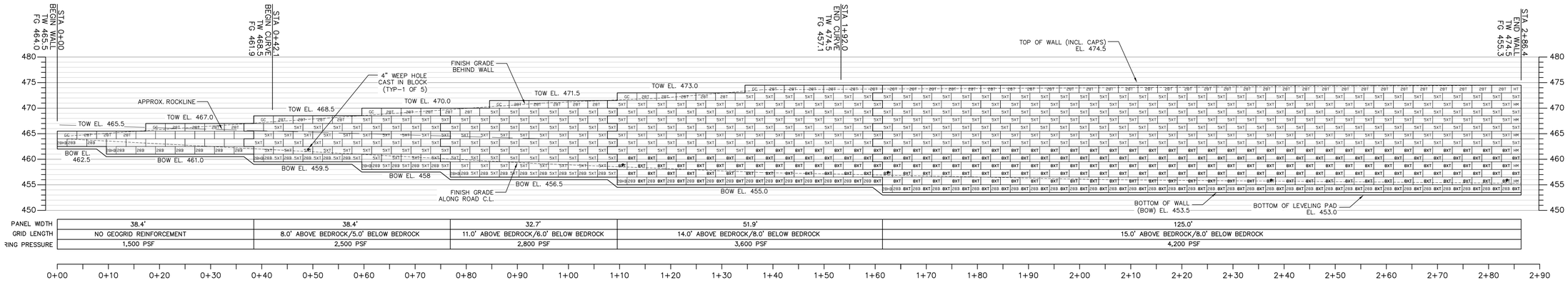

PANEL WIDTH	38.4'	38.4'	32.7'	51.9'	125.0'
GRID LENGTH	NO GEOGRID REINFORCEMENT	8.0' ABOVE BEDROCK/5.0' BELOW BEDROCK	11.0' ABOVE BEDROCK/6.0' BELOW BEDROCK	14.0' ABOVE BEDROCK/8.0' BELOW BEDROCK	15.0' ABOVE BEDROCK/8.0' BELOW BEDROCK
RING PRESSURE	1,500 PSF	2,500 PSF	2,800 PSF	3,600 PSF	4,200 PSF

PROFILE – SOUTHWEST WALL

BLOCK LEGEND:		GEOGRID LEGEND:	
HGC	HALF GARDEN CORNER	5XT	MIRAGRID 5XT
HT	HALF TOP	8XT	MIRAGRID 8XT
GC	GARDEN CORNER		
28T	28" TOP		
HM	28" HALF MIDDLE		
	28" MIDDLE		
28B	28" BOTTOM		
28HB	28" HALF BOTTOM		

0 10 20 30
SCALE: 1" = 10'

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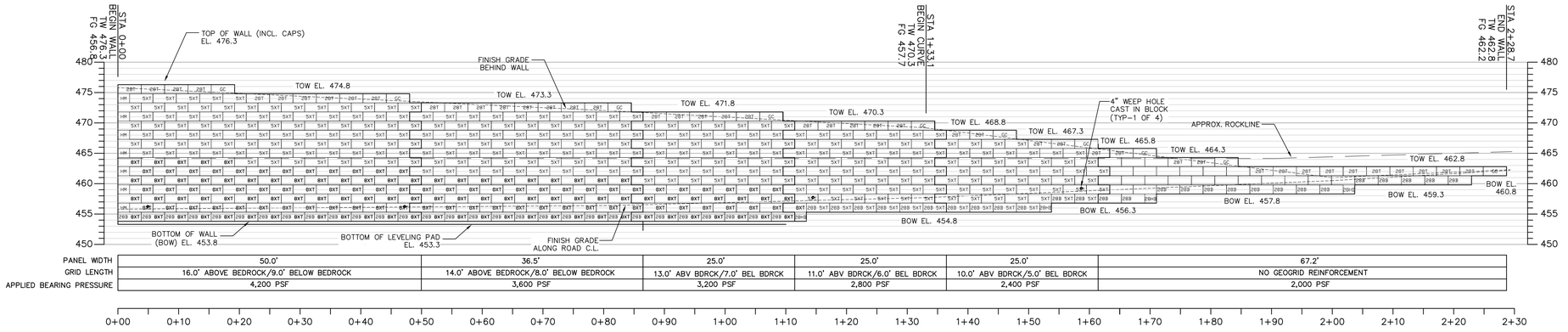

PANEL WIDTH	50.0'	36.5'	25.0'	25.0'	25.0'	67.2'
GRID LENGTH	16.0' ABOVE BEDROCK/9.0' BELOW BEDROCK	14.0' ABOVE BEDROCK/8.0' BELOW BEDROCK	13.0' ABV BDRCK/7.0' BEL BDRCK	11.0' ABV BDRCK/6.0' BEL BDRCK	10.0' ABV BDRCK/5.0' BEL BDRCK	NO GEOGRID REINFORCEMENT
APPLIED BEARING PRESSURE	4,200 PSF	3,600 PSF	3,200 PSF	2,800 PSF	2,400 PSF	2,000 PSF

0+00 0+10 0+20 0+30 0+40 0+50 0+60 0+70 0+80 0+90 1+00 1+10 1+20 1+30 1+40 1+50 1+60 1+70 1+80 1+90 2+00 2+10 2+20 2+30

PROFILE – SOUTHEAST WALL

BLOCK LEGEND:		GEOGRID LEGEND:	
HGC	HALF GARDEN CORNER	SXT	MIRAGRID SXT
HT	HALF TOP	BXT	MIRAGRID BXT
GC	GARDEN CORNER		
28T	28" TOP		
HM	28" HALF MIDDLE		
	28" MIDDLE		
28B	28" BOTTOM		
28HB	28" HALF BOTTOM		

0 10 20 30

SCALE: 1" = 10'

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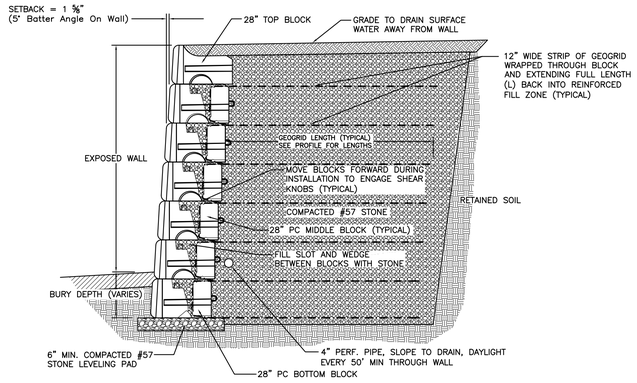

1/8 *TYPICAL SECTION – SOIL RETAINED ZONE*
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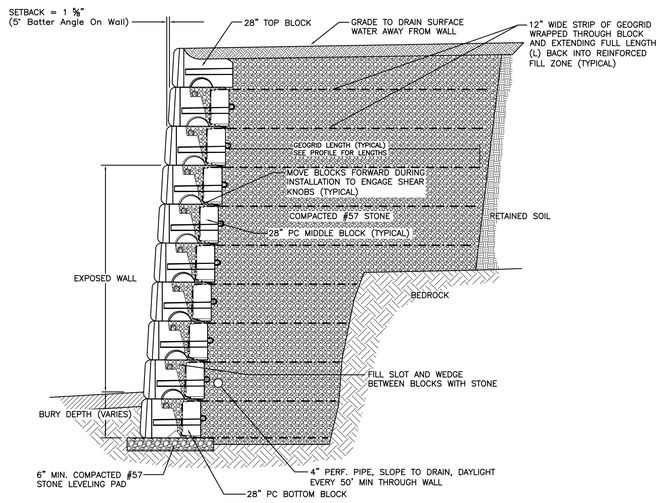

2/8 *TYPICAL SECTION – SOIL & ROCK RETAINED ZONE*
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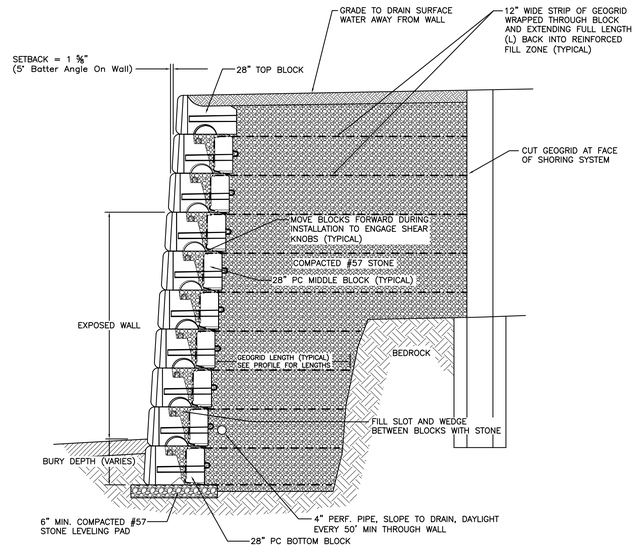

3/8 *TYPICAL SECTION – NORTHWEST WALL STA. 0+00–3+05.6*
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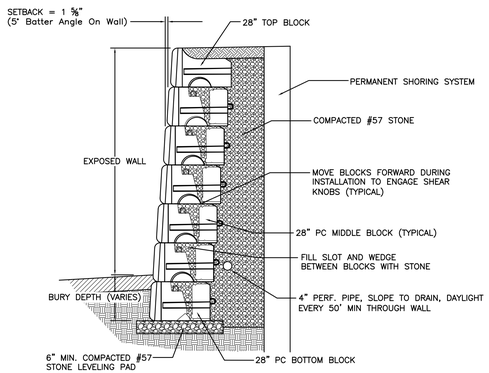

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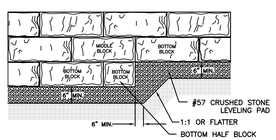

4/8 *LEVELING PAD STEP DETAIL*
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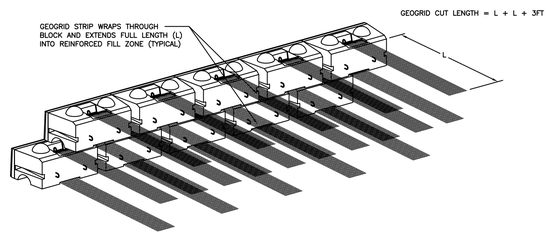
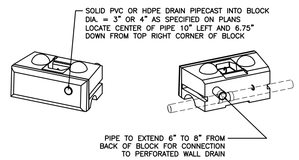


5/8 *ISOMETRIC VIEW–GEOGRID REINFORCEMENT*
NOT TO SCALE



6/8 *WEEP HOLE CAST IN BLOCK*
NOT TO SCALE

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DETAILS

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