



10 Danforth Street  
Portland, ME 04101  
Ph : (207) 773-3625

**Submittal**

**Job:** 1402  
Munjoy Heights  
Sheridan St. Extension  
Portland, ME 04101

**Spec Section No:** 323223  
**Submittal No:** 01  
**Revision No:** 0  
**Sent Date:** 3/6/2014

**Spec Section Title:**

**Submittal Title:** Retaining Wall Product Data and Shop Drawings

**Contractor:**  
Wright-Ryan Construction, Inc.  
Craig Hill

SUBMITTAL REVIEW:  
Reviewed for general conformance with the design concept and contract documents. Markings or comments shall not be construed as relieving the Subcontractor from compliance with the project plans and specifications, nor departure therefrom. The Subcontractor remains responsible for details and accuracy, for conforming and correlating all quantities and dimensions, for selecting fabrication processes, for techniques of assembly and for performing the work in a safe manner.  
WRIGHT-RYAN CONSTRUCTION, INC  
BY: [Signature] DATE: 3/6/14

**Notes:**

- ① GLOBAL STABILITY ANALYSIS TO FOLLOW
  
- ② PICTURES ATTACHED ARE FOR REFERENCE. PROJECT LOCATION CAN BE GIVEN IF NEEDED.

Architect's Stamp

Engineer's Stamp

**Submittal Review**



Munjoy Heights  
 JN 1047  
 79 Walnut Street, Portland, Maine, 04101

Submittal # 7 (Spec. 323223, Sub. 1)  
 Revision #  
 Date Submitted: 3/6/2014  
 Date Returned: 3/13/2014

Client/Owner		Engineers/Architects	
Company	Contact	Company	Contact
Redfern Munjoy LLC	Jonathan Culley	Acorn Engineering, Inc. PO Box 3372 Portland, Maine, 04104	Will Savage, PE Project Manager 207.775.2655 <a href="mailto:wsavage@acorn-engineering.com">wsavage@acorn-engineering.com</a>

Description of Item Submitted: **Retaining Wall Product Data and Design Drawings**  
 Sheet/Specification Page: Summit Geoengineering Services Plans 1, 2, and 3 dated 2/28/14

<input type="checkbox"/> Approved	<input type="checkbox"/> Revise as Noted
<input checked="" type="checkbox"/> Approved as Noted	<input type="checkbox"/> Rejected
<input type="checkbox"/> Revise and Resubmit	

The Consultant's (Acorn Engineering) review was performed only for general conformance with the design concept of the project and general compliance with the information given in the Contract Documents. Modifications or comments made on the submittal/shop drawings during this review do not relieve the contractor from compliance with the requirements of the plans and specifications. This review shall not include review of the accuracy or completeness of details, such as quantities, dimensions, weights or gauges, fabrication processes, construction means or methods, coordination of the work with other trades or construction safety precautions, all of which are the sole responsibility of the Contractor. Review of a specific item shall not indicate that the Consultant has reviewed the entire assembly of which the item is a component. The Consultant shall not be responsible for any deviations from the Contract Documents not brought to the attention of the Consultant in writing by the Contractor. The Consultant shall not be required to review partial submissions or those for which submissions of correlated items have not been received.

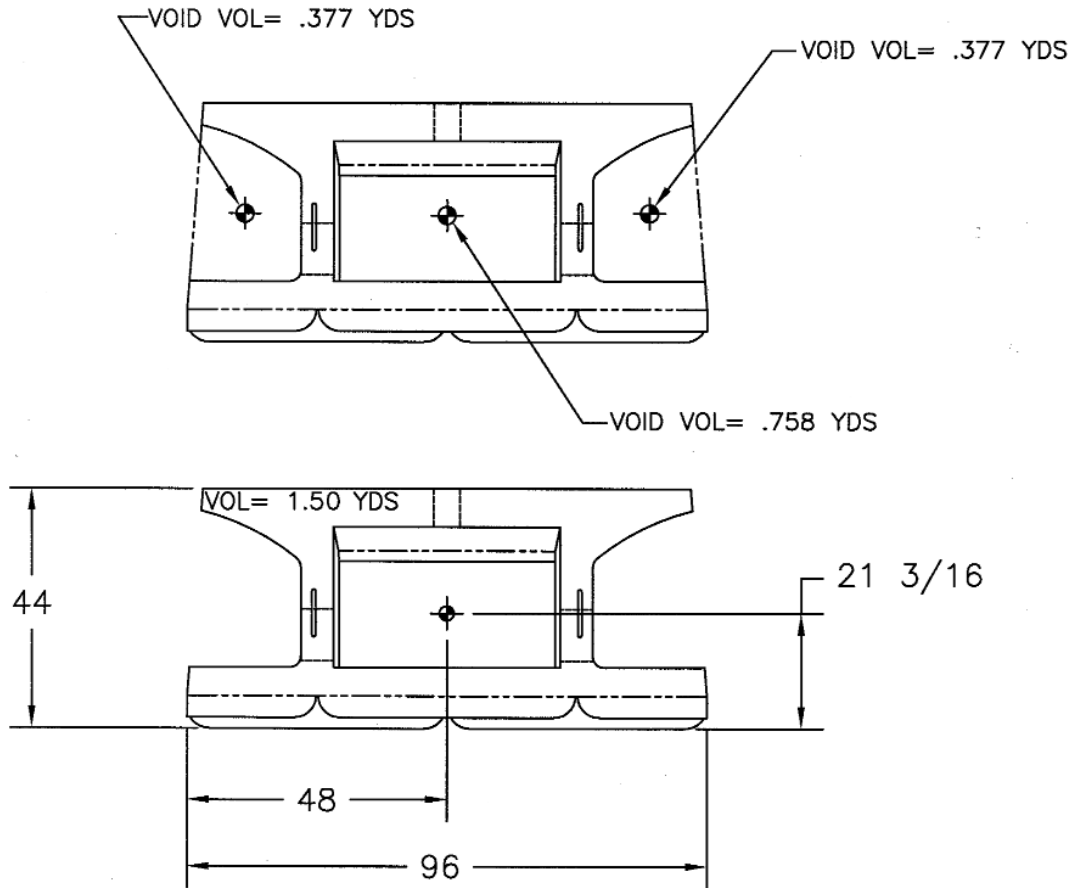
Signature:  Date: 3/13/14

Notes:

- 1) Acorn Engineering's submittal review does not include a review of the design, calculations and construction drawings provided by Summit Geoengineering Services.
- 2) Soren Deniord Design Studio has reviewed the Stone Strong product with the Chiseled Granite finish and finds the wall aesthetics acceptable.
- 3) The Contractor shall coordinate the top of wall fence with Summit Geoengineering Services and Soren Deniord Design Studio.
- 4) Based upon a phone conversation today with Bill Peterlein, Summit Geoengineering Services the geogrid associated with wall 3 does not need to be "pinned" to the foundation wall. This is the design intent of Sheet 3 Note 17.

- 5) The Contractor shall coordinate the location and elevation of the secondary underdrain within the Wall Cross-Section with Acorn Engineering.
- 6) For proposed site grading the Contractor shall refer to Acorn Engineering's Grading, Drainage & Erosion Control Plan, Issued for Construction, dated 2/21/14.
- 7) Wall Cross-Section Detail – Note: Retaining Wall Backfill (See Note 13) would appear to be mis-numbered and apply to Note 24.
- 8) Inspection of the retaining walls during construction is not provided by Acorn Engineering. The Contractor shall coordinate with Summit Geoengineering Services for their inspections services.



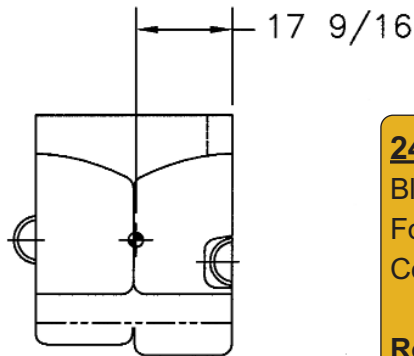


**Metric Dimensions (m)**

2.44x0.92x1.1

**Metric Weight (kg)**

2722



**24SF Block**

Block Wt. = 6,000 lbs

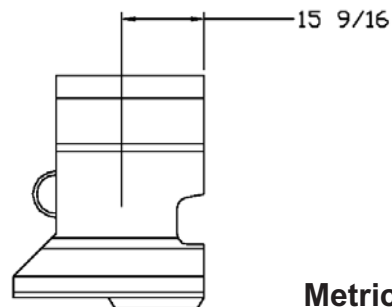
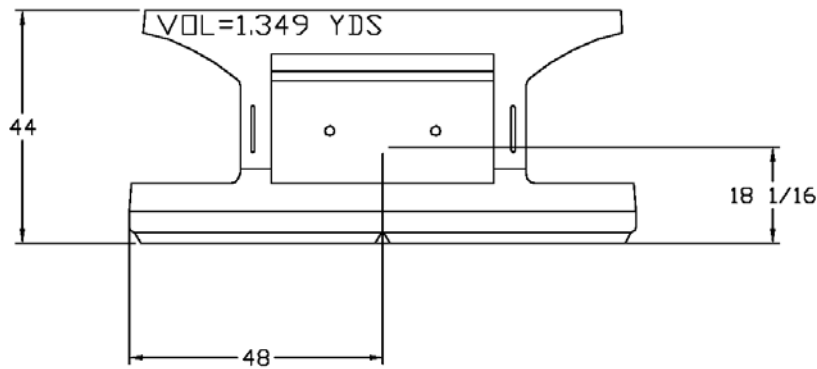
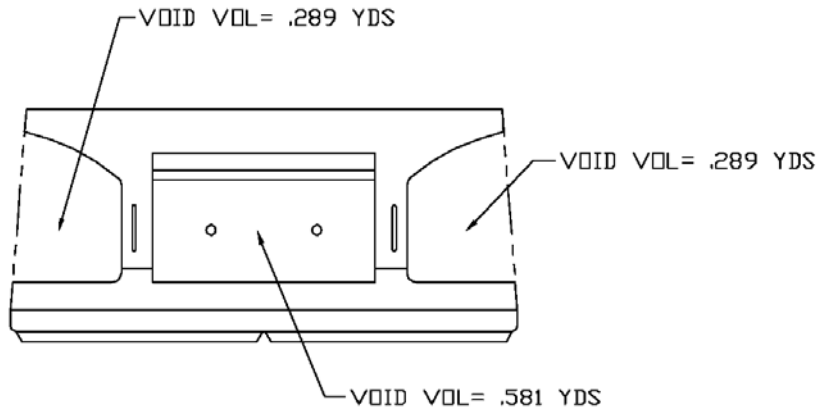
Form Wt. = 4,600 lbs

Concrete Volume = 1.5 cu. yds.

**Rock In-fill** for installation ~ 1.7 cu. yds.  
 equivalent to 2.3 tons







**24SF Top Block**

Block Wt. = 5,400 lbs

Form Wt. = 4,930 lbs

Concrete Volume = 1.349 cu. yds.

Rock In-fill for installation ~ 1.5 cu. yds.

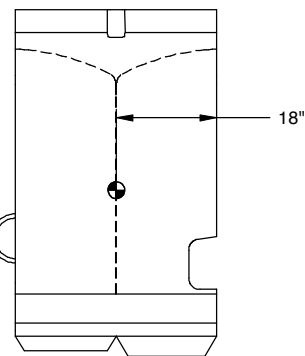
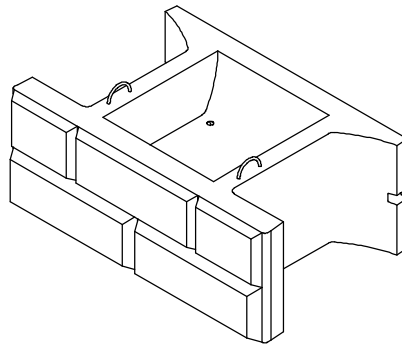
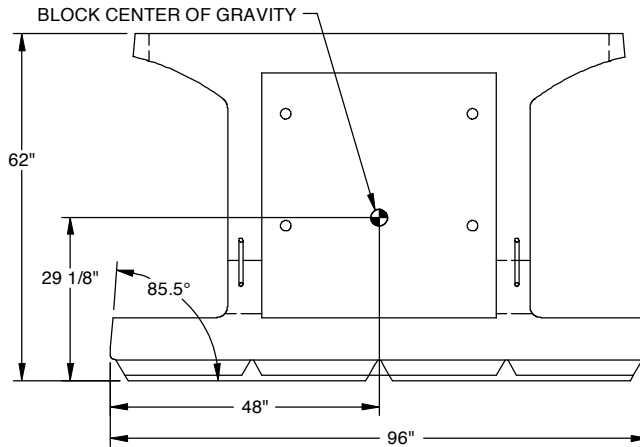
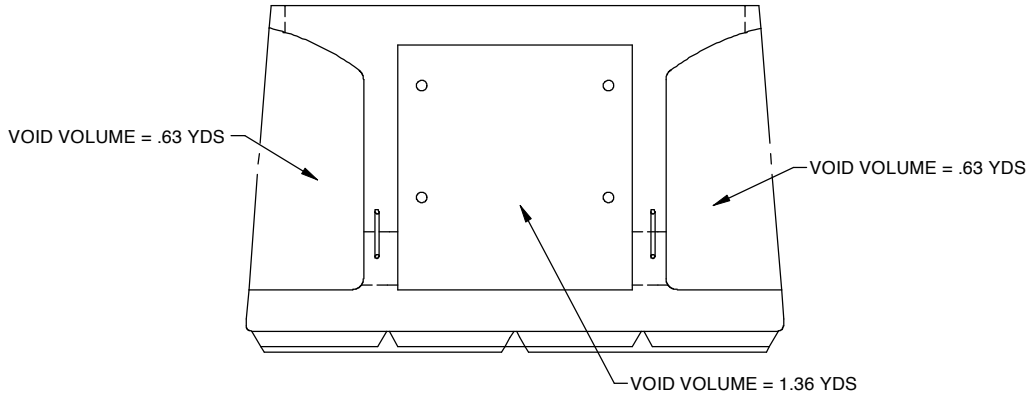
**Metric Dimensions (m)**

2.44x0.92x1.1

**Metric Weight (kg)**

2449





**62HD Block**

Block Wt. = 6,855 lbs

Form Wt. = 6,580 lbs

Concrete Volume = 1.70 cu. yds.

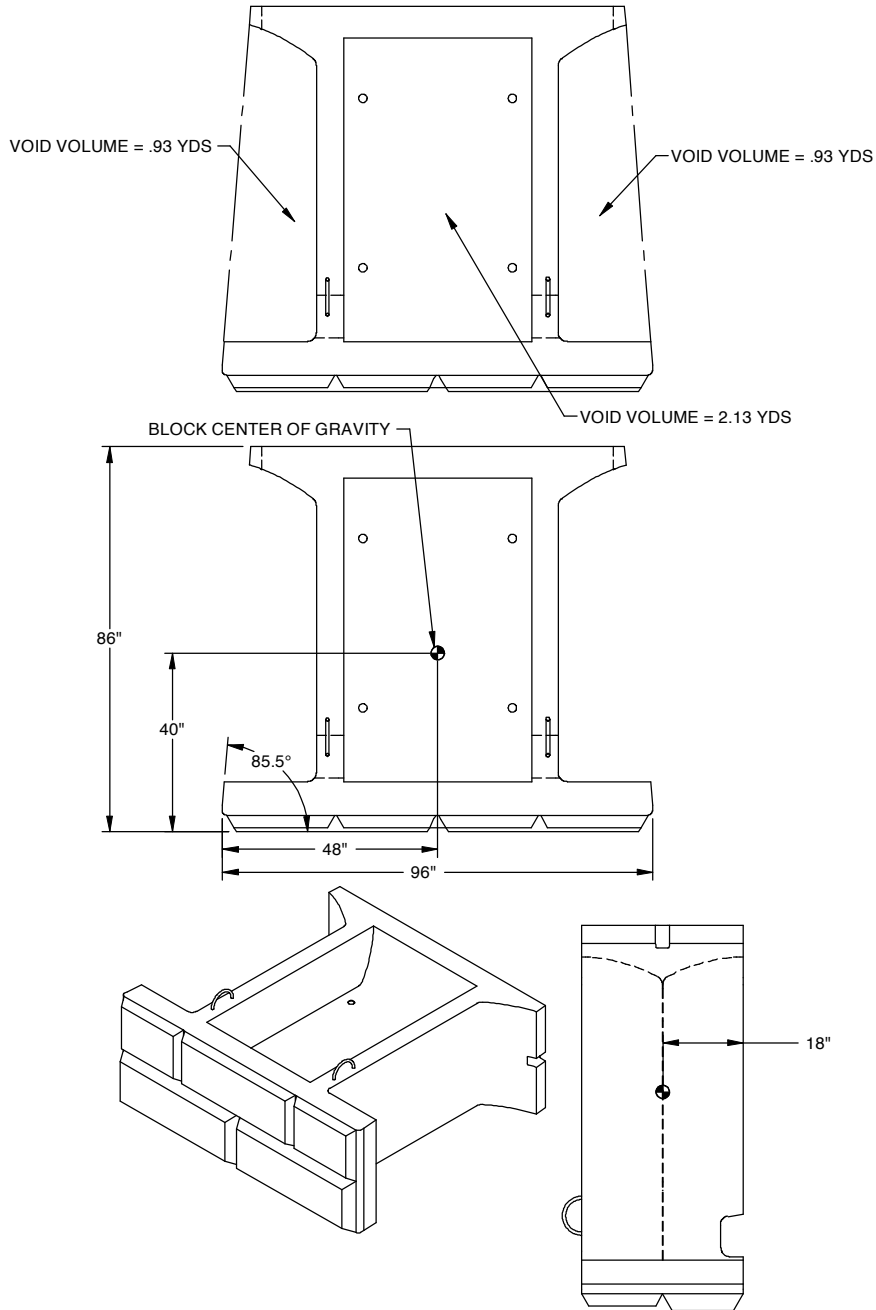
**Metric Dimensions (m)**

2.44x1.57x.91

**Metric Weight (kg)**

3109





**86HD Block**

Block Wt. = 7,693 lbs  
 Form Wt. = 7,531 lbs  
 Concrete Volume = 1.90 cu. yds.

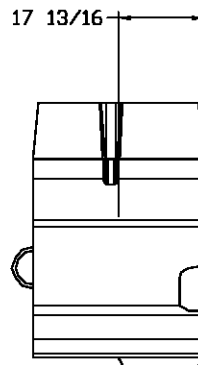
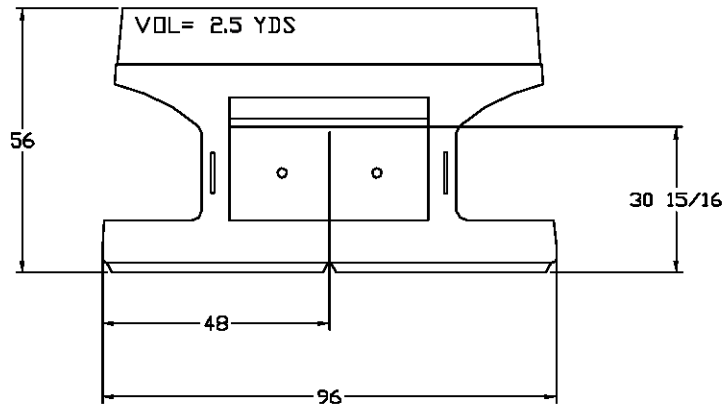
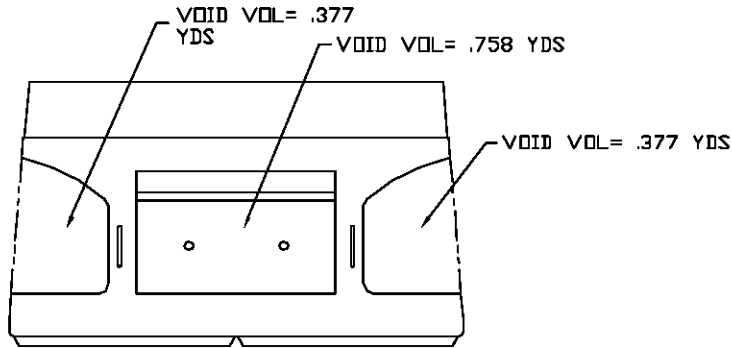
**Metric Dimensions (m)**

2.44x2.18x.91

**Metric Weight (kg)**

3489





**24SF Mass Extender Block**

Block Wt. = 10,000 lbs  
 Form Wt. = 5,119 lbs  
 Concrete Volume = 2.5 cu. yds.

**Rock In-fill** for installation ~ 1.7 cu. yds.  
 equivalent to 2.3 tons

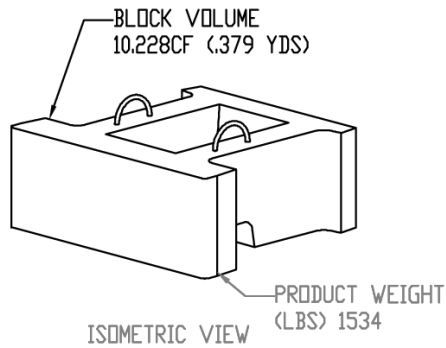
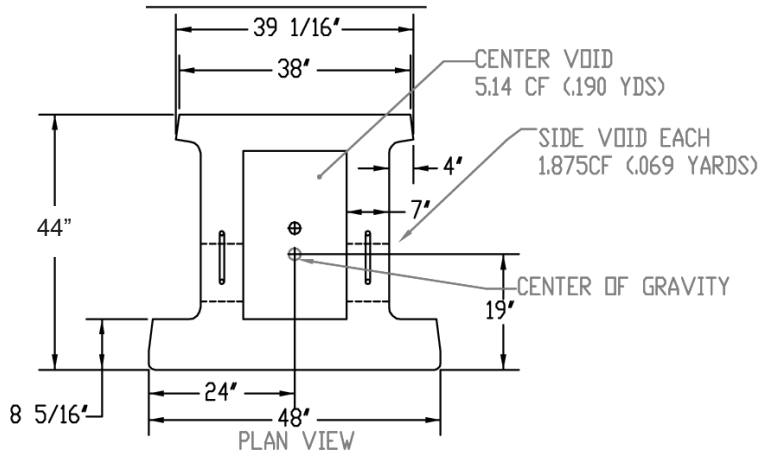
**Metric Dimensions (m)**

2.44x0.92x1.42

**Metric Weight (kg)**

4536





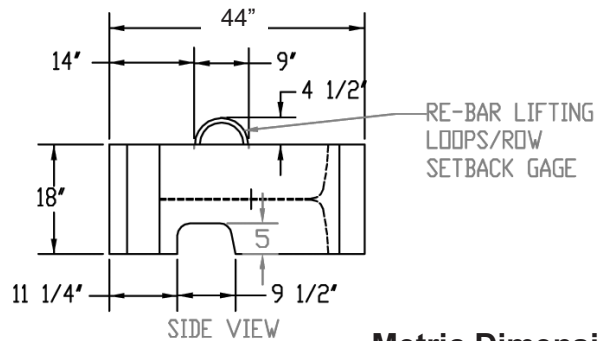
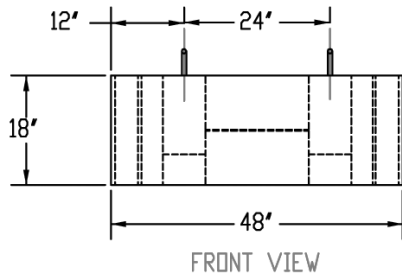
**6SF Block**

Block Wt. = 1,600 lbs

Form Wt. = 1,800 lbs

Concrete Volume = 0.4 cu. yds.

Rock In-fill for installation ~ 0.33 cu. yds.



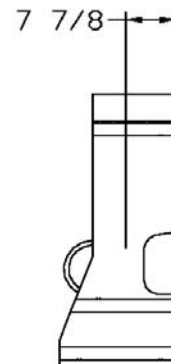
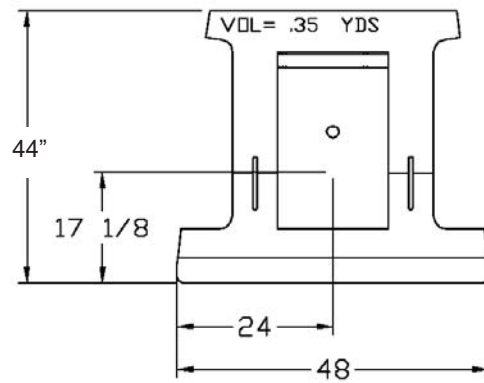
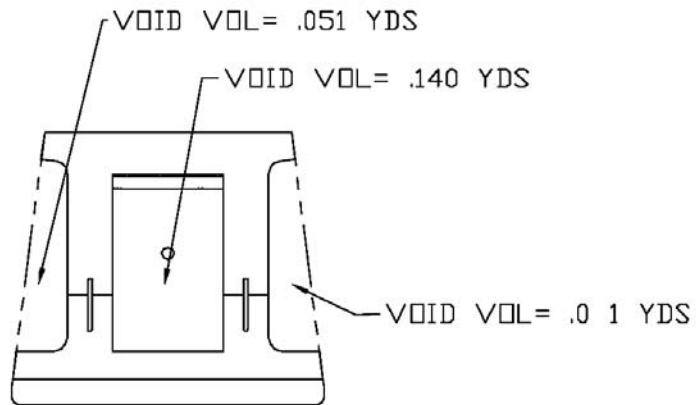
**Metric Dimensions (m)**

1.22x0.46x1.1

**Metric Weight (kg)**

680





**6SF Top Block**

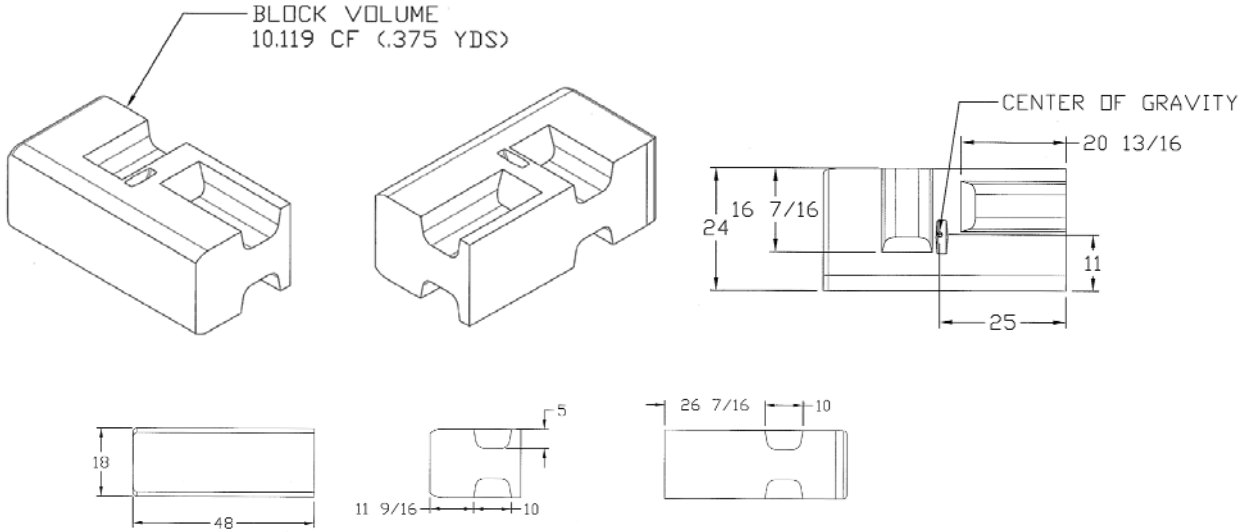
Block Wt. = 1,400 lbs

Form Wt. = 1,955 lbs

Concrete Volume = 0.35 cu. yds.

Rock In-fill for installation ~ 0.31 cu. yds.





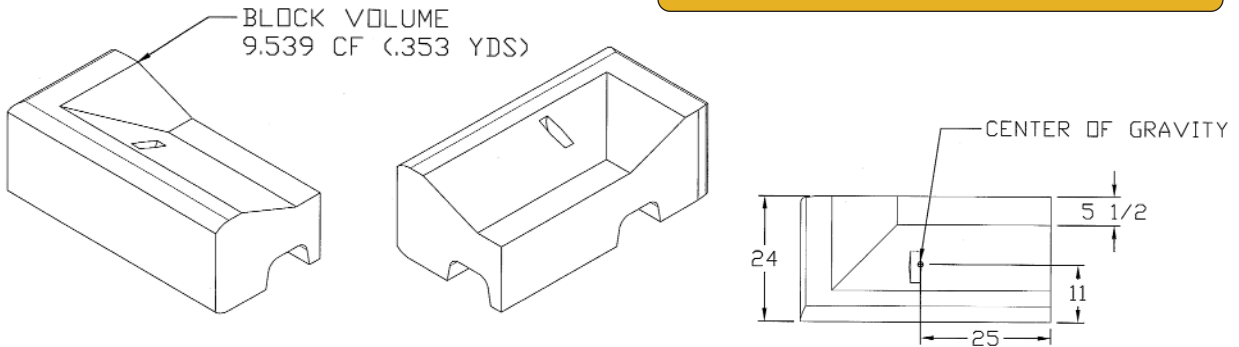
**End Block**

Block Wt. = 1,500 lbs

Form Wt. = 1491lbs

Concrete Volume = 0.375 cu. yds.

Rock In-fill for installation ~ 0 cu. yds.



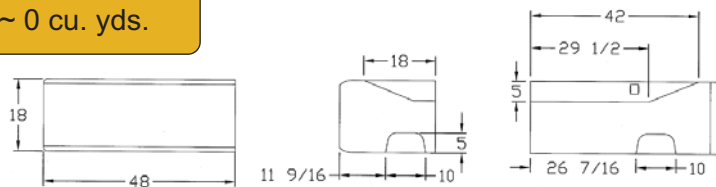
**End Top Block**

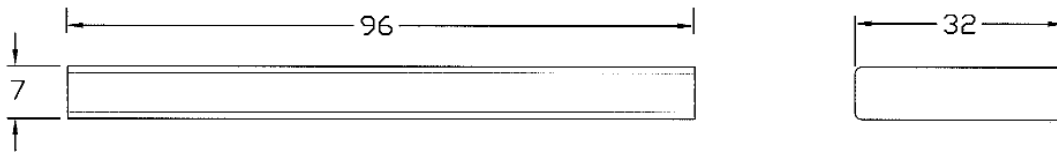
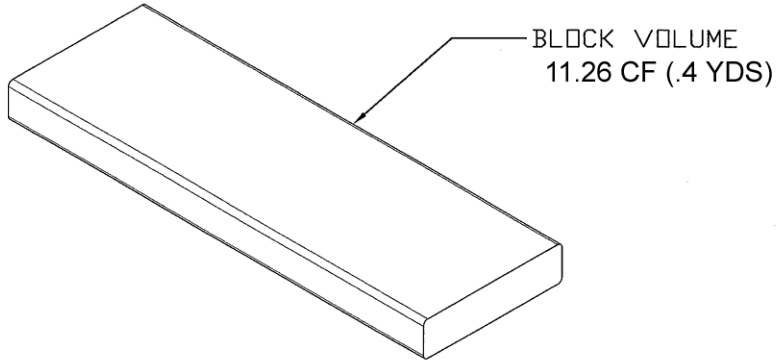
Block Wt. = 1,412 lbs

Concrete Volume = 0.353 cu. yds.

Produced with Insert in End form

Rock In-fill for installation ~ 0 cu. yds.





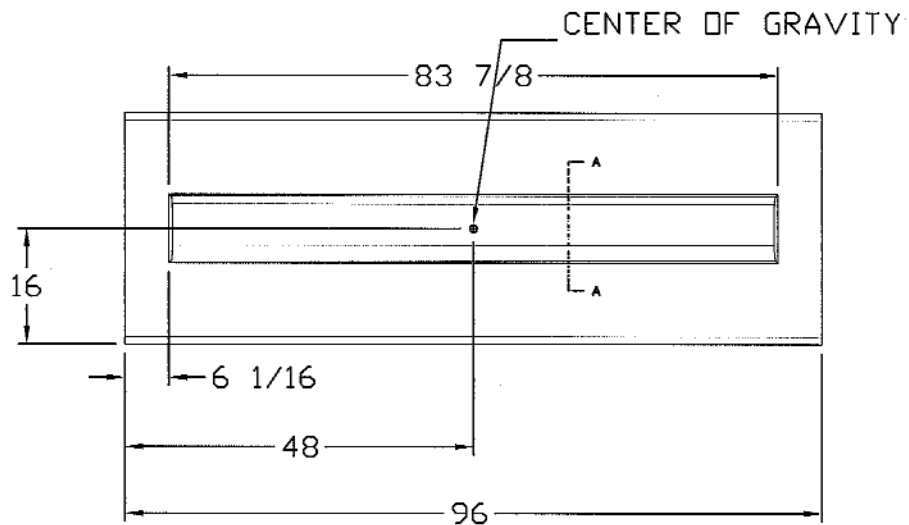
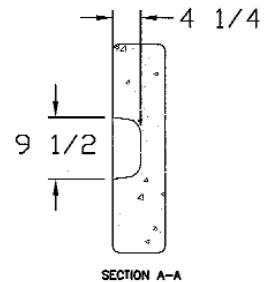
**Cap/Step Block**

Block Wt. = 1,600 lbs

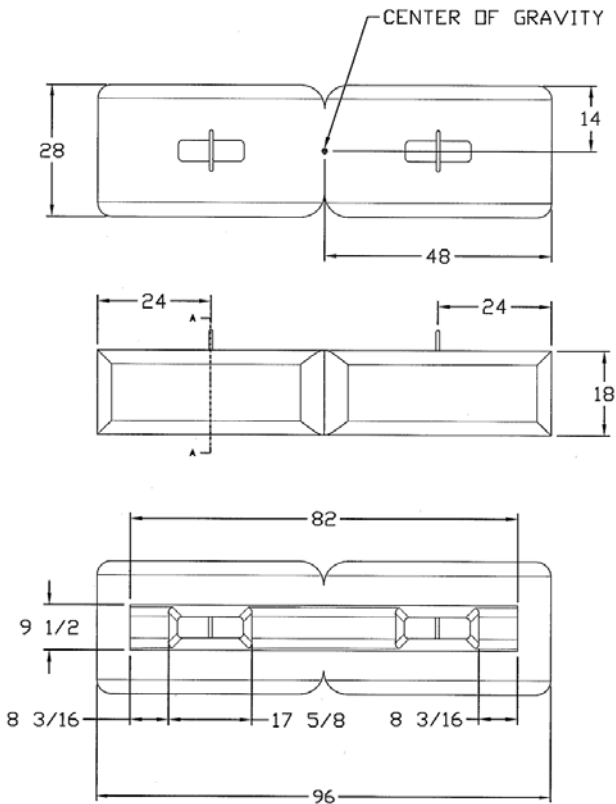
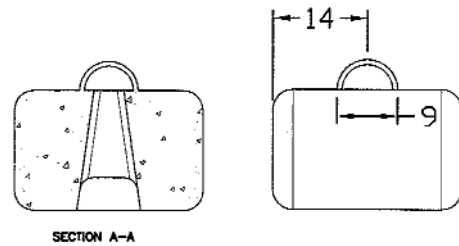
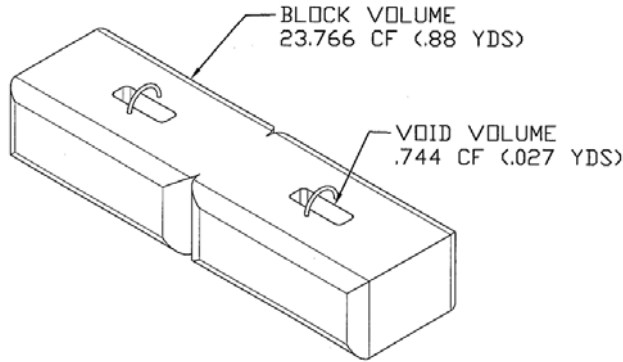
Form Wt. = 1,425 lbs

Concrete Volume = 0.4 cu. yds.

Rock In-fill for installation ~ 0 cu. yds.







### Dual Face Block

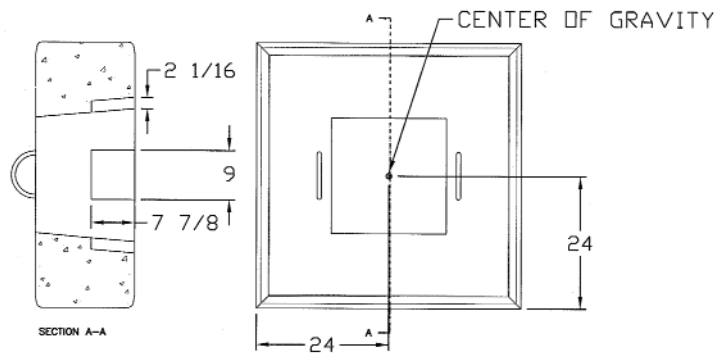
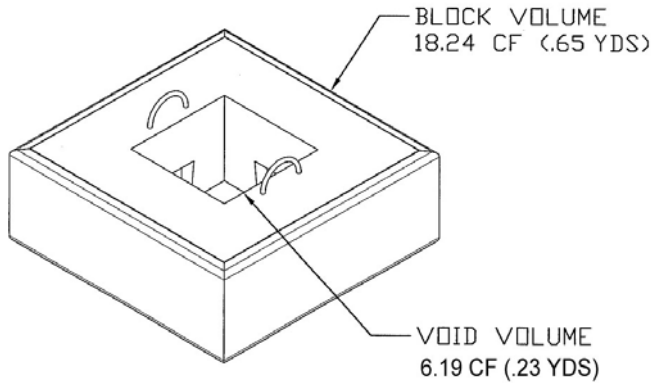
Block Wt. = 3,520 lbs

Form Wt. = 2,431 lbs

Concrete Volume = 0.88 cu. yds.

Rock In-fill for installation ~ 0 cu. yds.





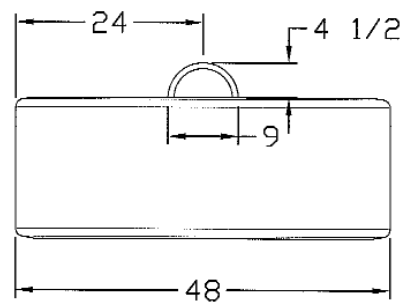
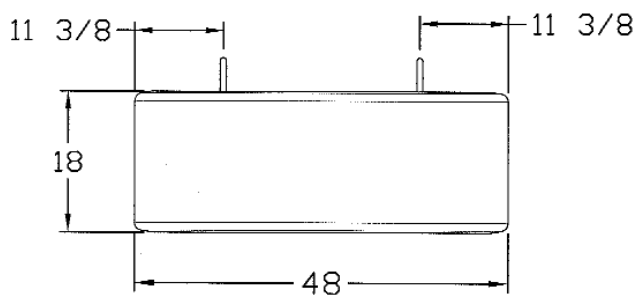
### 90° Block

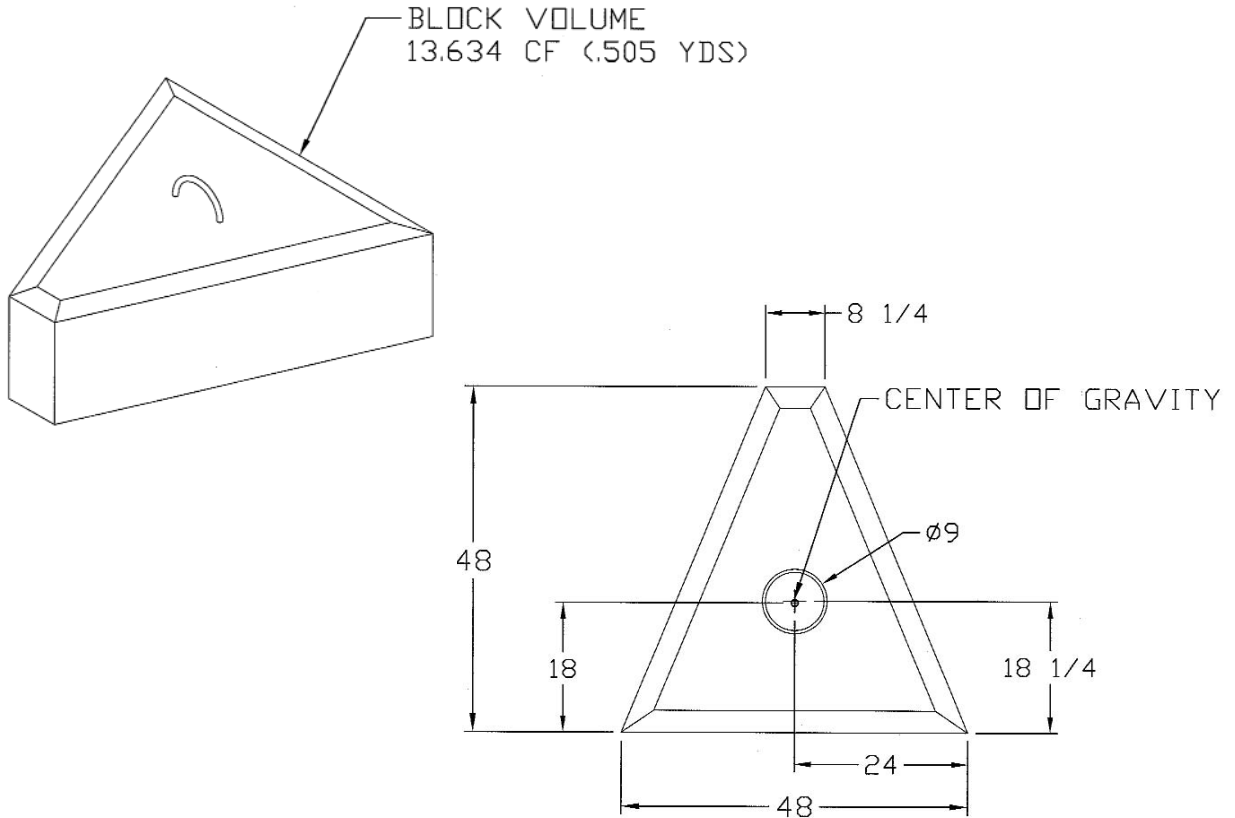
Block Wt. = 2,600 lbs

Form Wt. = 2,456 lbs

Concrete Volume = 0.65 cu. yds.

Rock In-fill for installation ~ 0.2 cu. yds.





**45° Block**

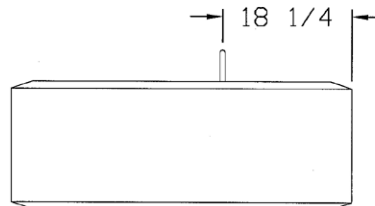
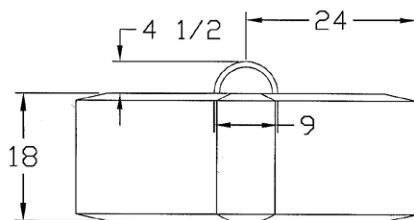
Block Wt. = 2,000 lbs

Concrete Volume = .50 cu. yds.

*Produced with Insert in Column form*

Insert Wt. = 870 lbs

**Rock In-fill** for installation ~ 0 cu. yds.























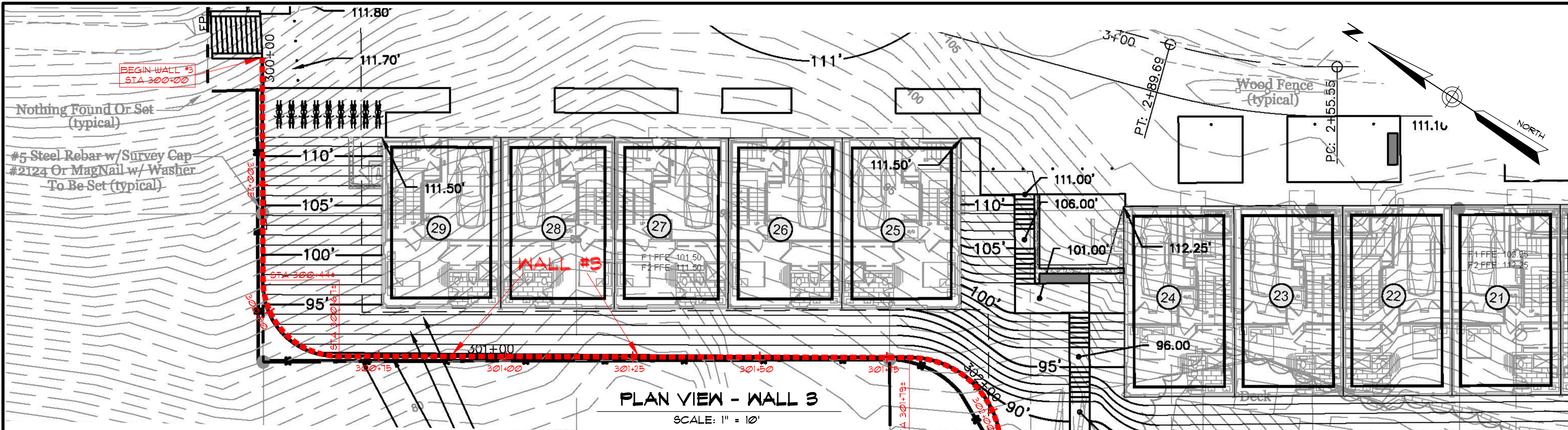






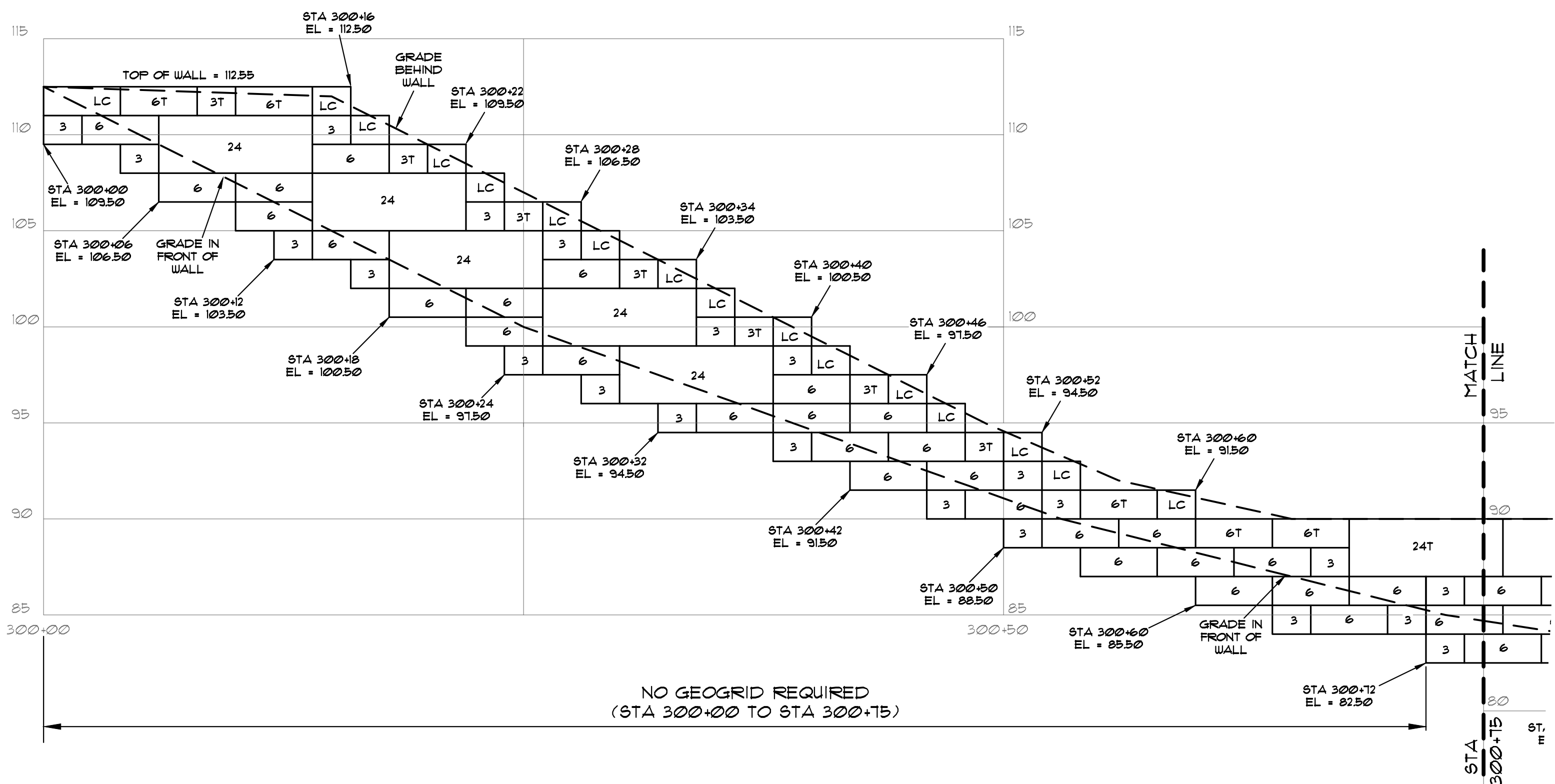






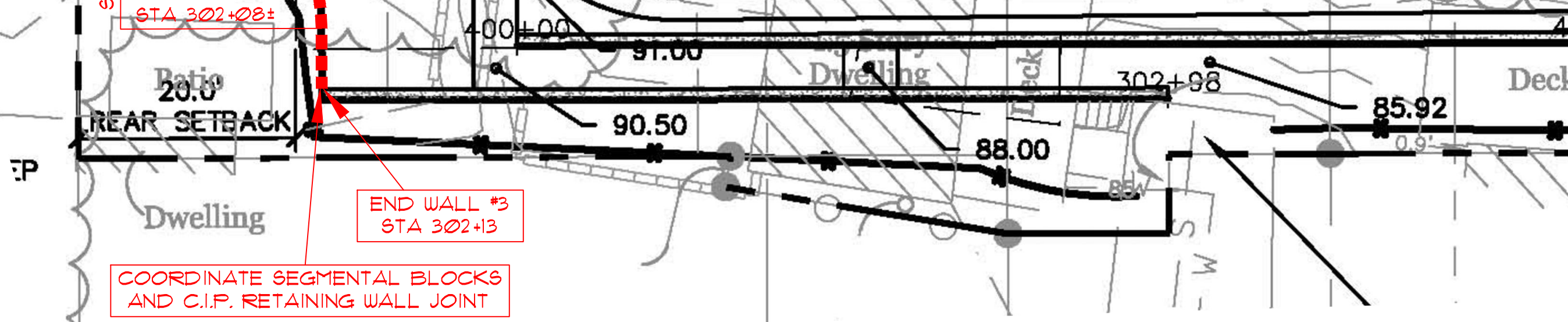
PLAN VIEW - WALL 3

SCALE: 1" = 10'



PROFILE - WALL #3

SCALE: 1" = 5'



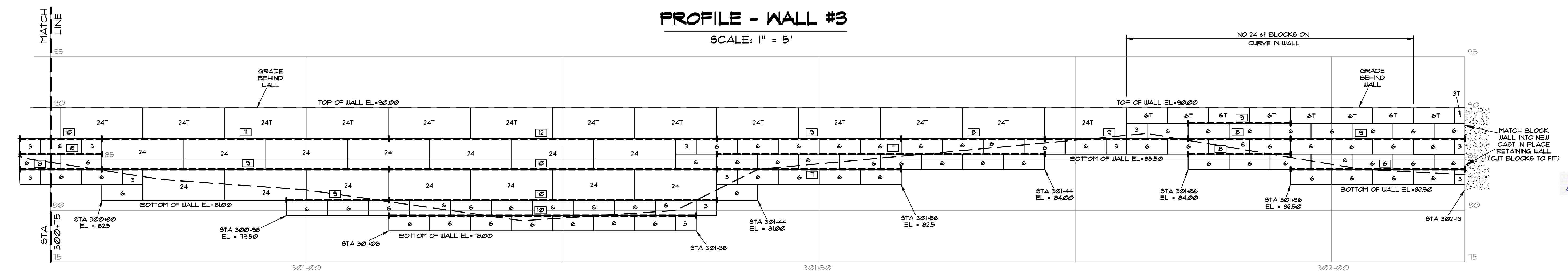
**WALL 3 - BLOCK COUNT**

SYMBOL	BLOCK TYPE	QUANTITY
LC	TOP LEFT COR. (9sf)	16
3T	3sf TOP UNIT	8
6T	6sf TOP UNIT	13
24T	24sf TOP UNIT	14
3	3sf MIDDLE UNIT	32
6	6sf MIDDLE UNIT	103
24	24sf FULL BLOCK	19
TOTAL =		1,752 sq. ft.

**GEOGRID QUANTITIES**

LENGTH (ft.)	WIDTH (ft.)	AREA (ft.²)
6	16	96
7	50	350
8	50	400
9	97	873
10	102	1020
11	28	308
12	32	384
TOTAL =		3,431 sq. ft. / 381 s. y.

ALL GEOGRID IS 9F55 BY SYNTEEN



**STONE STRONG WALL 3**  
**PLAN & PROFILE**

**MUNJOY HEIGHTS**

PROJECT: REDFERN MUNJOY, LLC  
P.O. BOX 8016 - FORTLAND, ME 04104

CLIENT: REDFERN MUNJOY, LLC

SCALE: AS NOTED  
DATE: FEBRUARY 25, 2014

DRAIN BY: KRF  
CHECKED BY: UMP

NO. 1  
REVISION

DATE 2-28-14

145 LISBON ST. - SUITE 601  
LEWISTON, ME 04240  
Tel: (207) 576-3313  
www.summitgeoeng.com

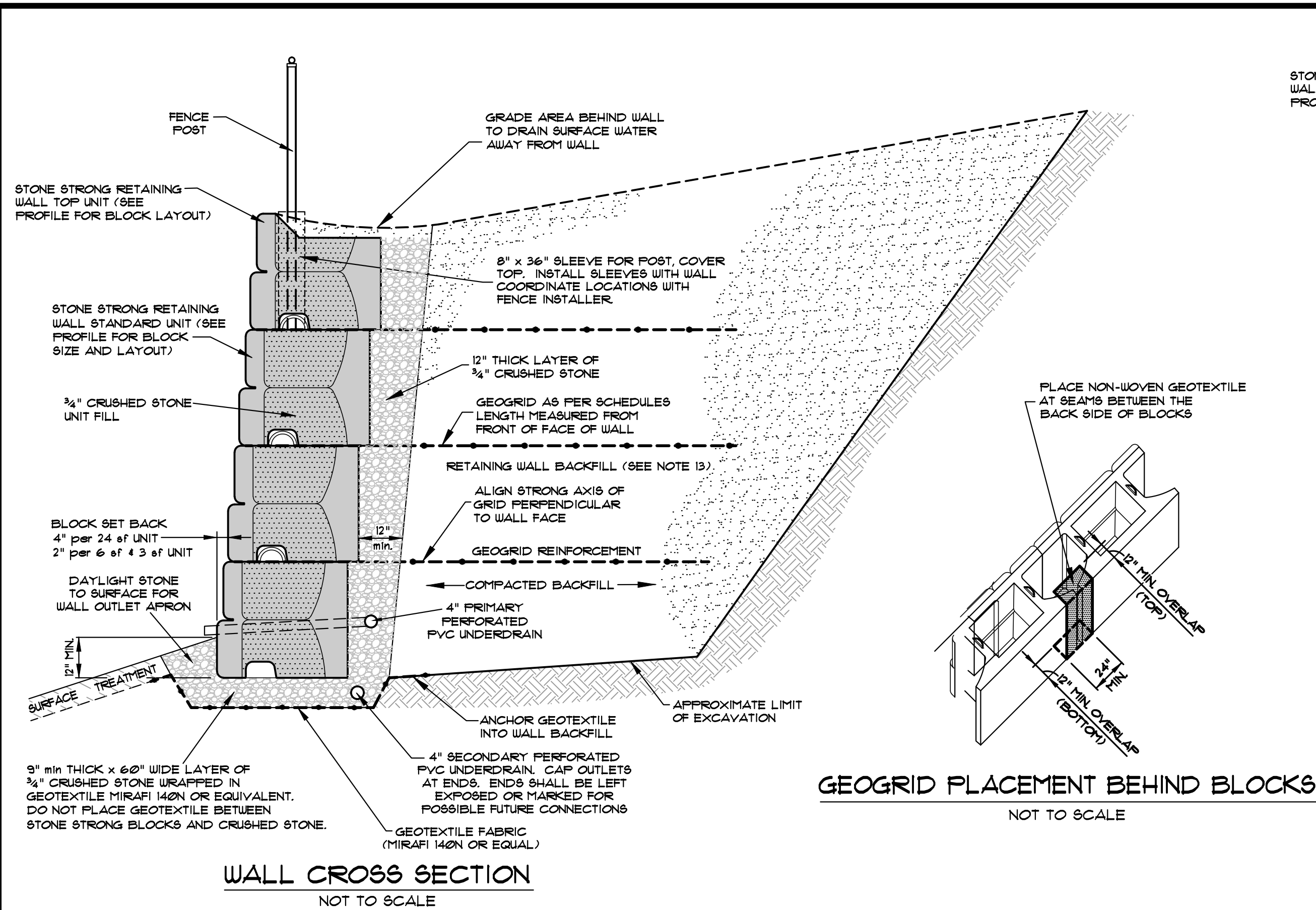
**SUMMIT**  
GEOTECHNICAL SERVICES

STATE OF MAINE  
WILLIAM M. PETERLEIN  
15787  
LICENSED PROFESSIONAL ENGINEER

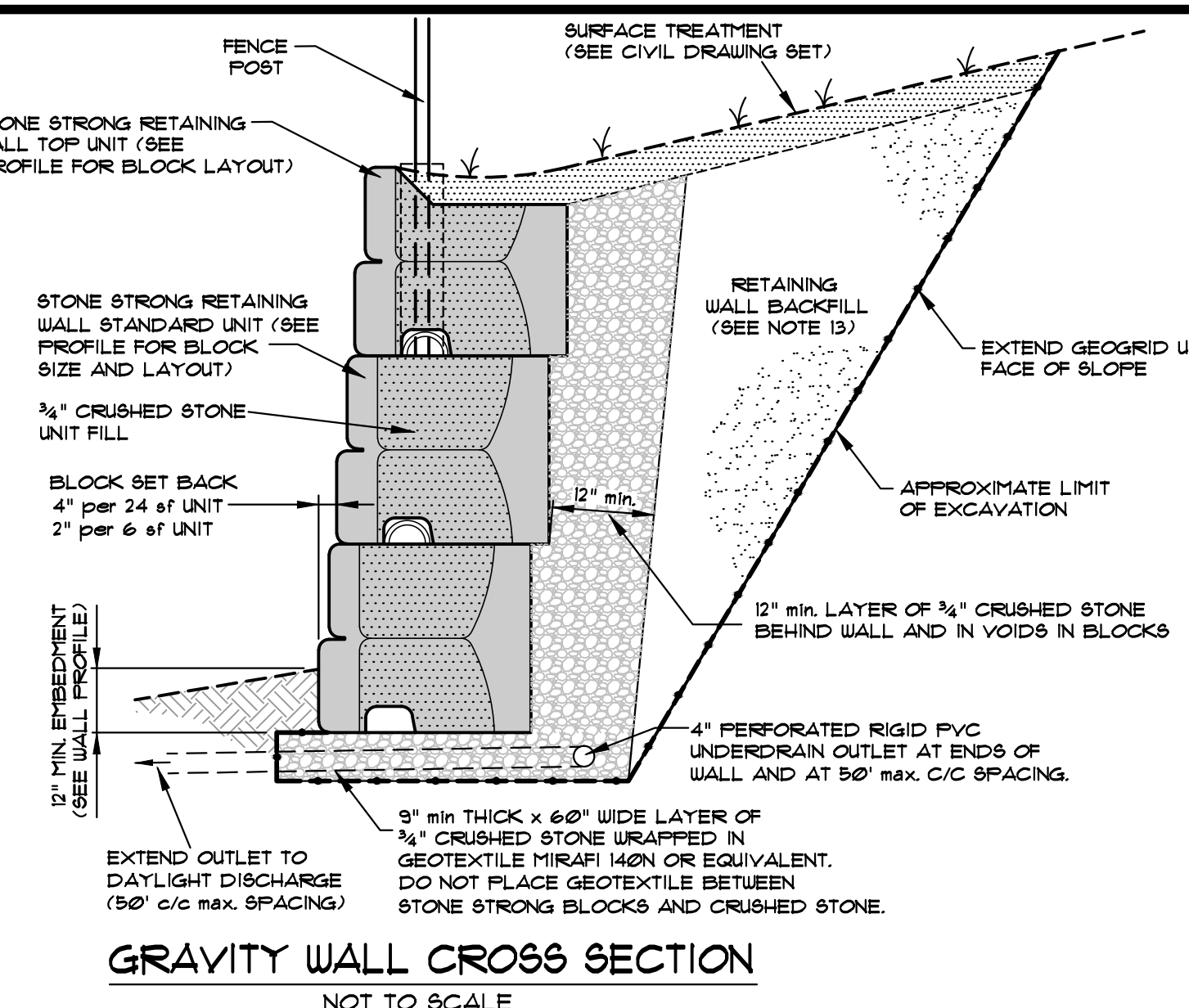
JOB NO. - 13217

SHEET **2**





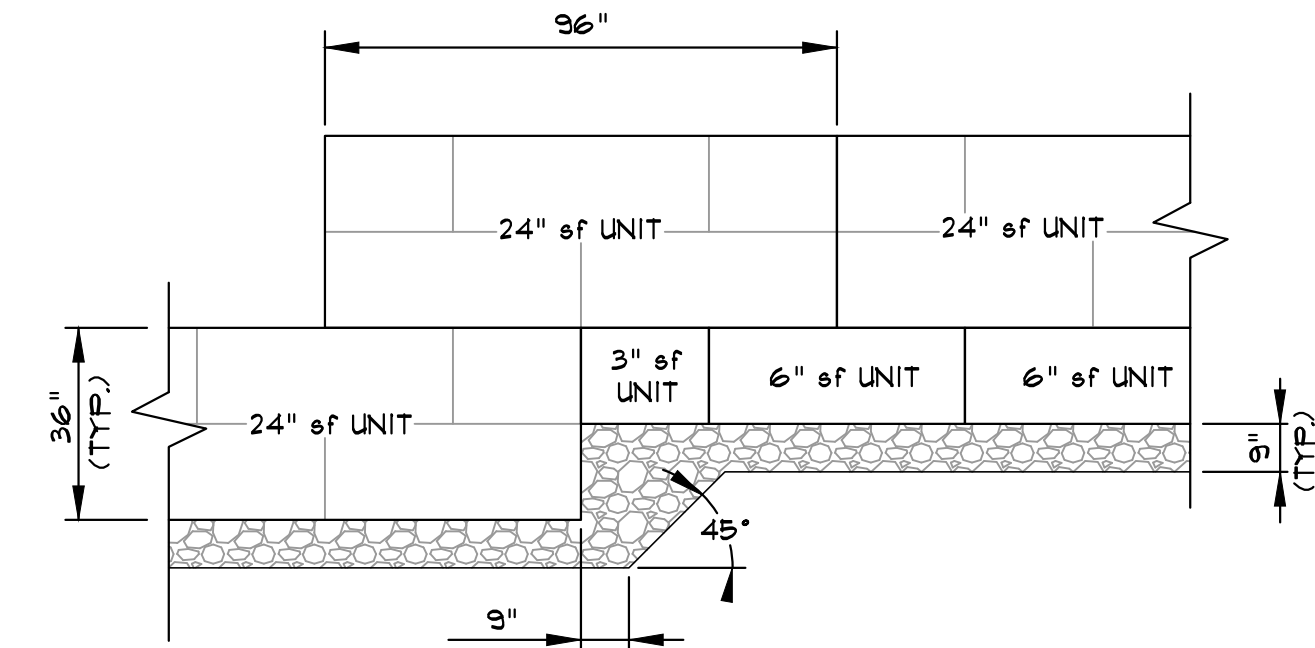
**WALL CROSS SECTION**  
NOT TO SCALE



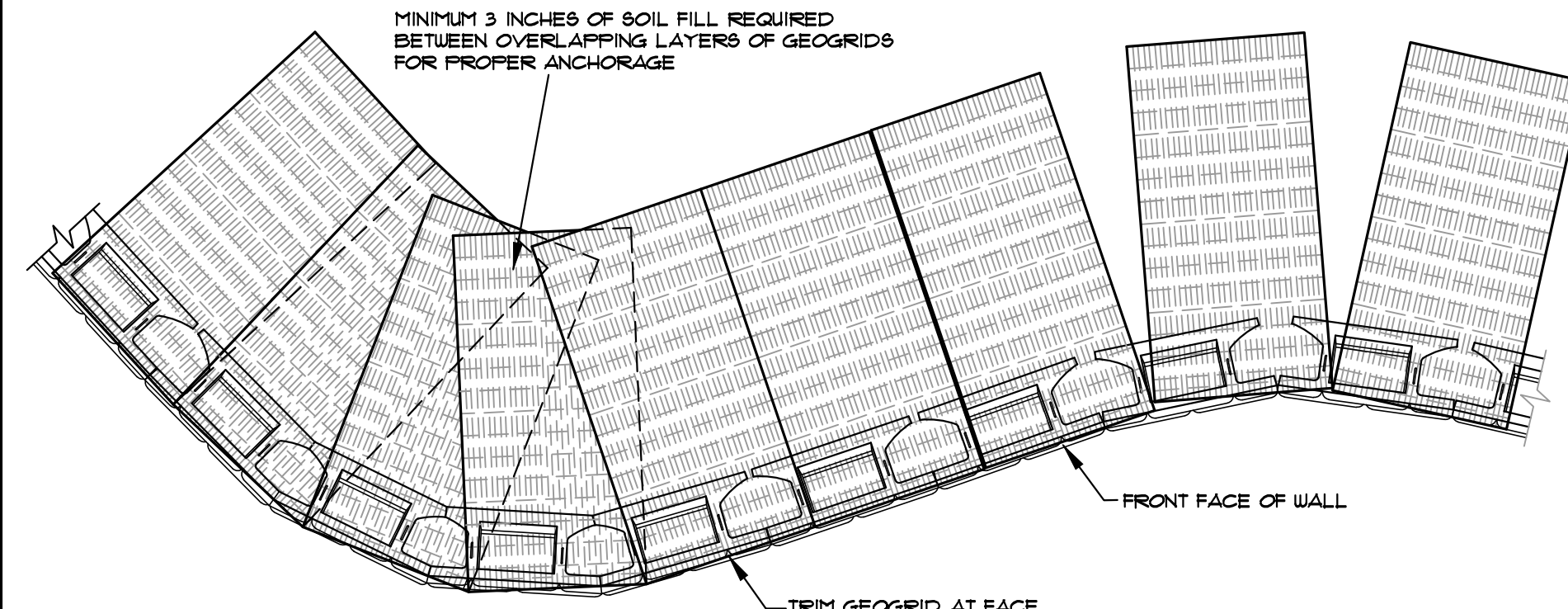
**GRAVITY WALL CROSS SECTION**  
NOT TO SCALE



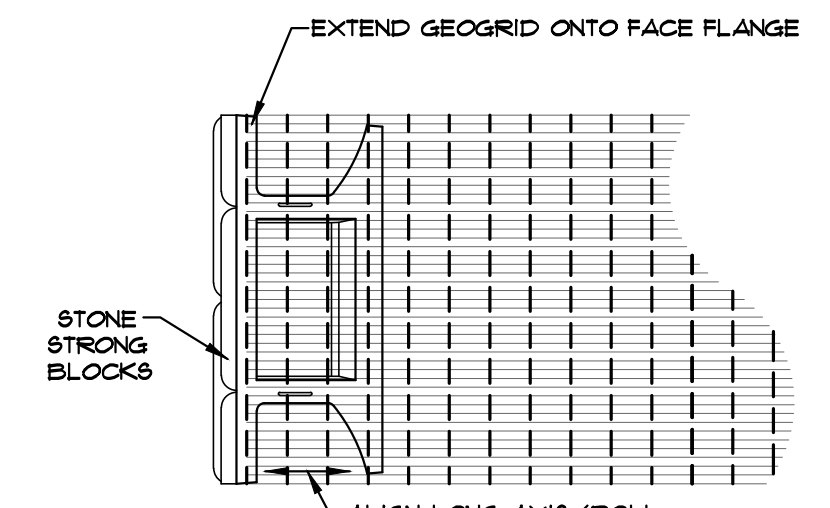
**GEOGRID PLACEMENT BEHIND BLOCKS**  
NOT TO SCALE



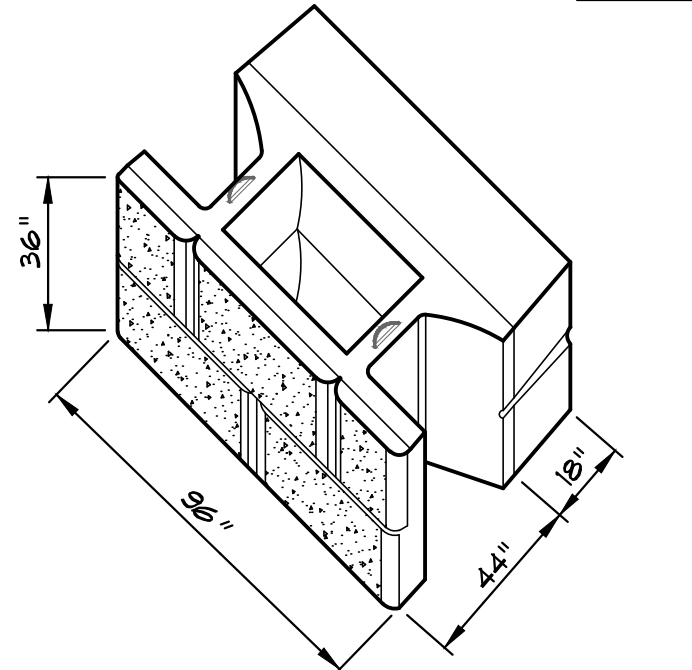
**TYPICAL WALL BASE STEP**  
NOT TO SCALE



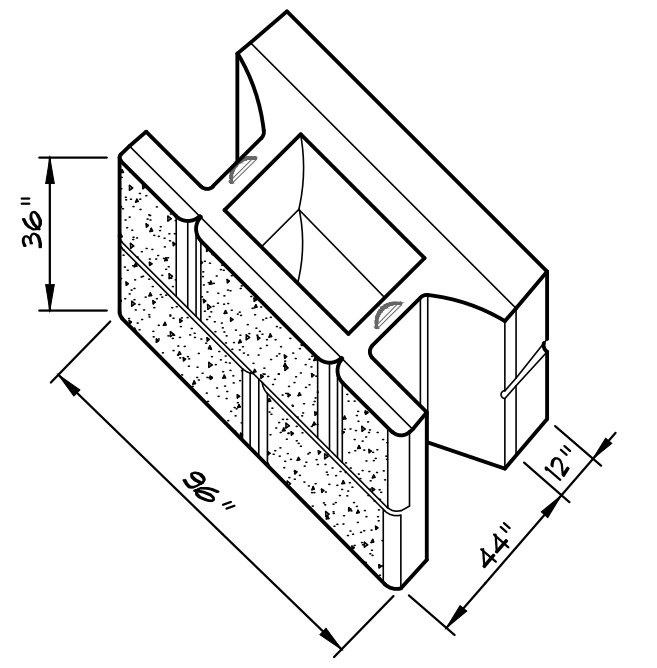
**GEOGRID PLACEMENT ON CURVES**  
NOT TO SCALE



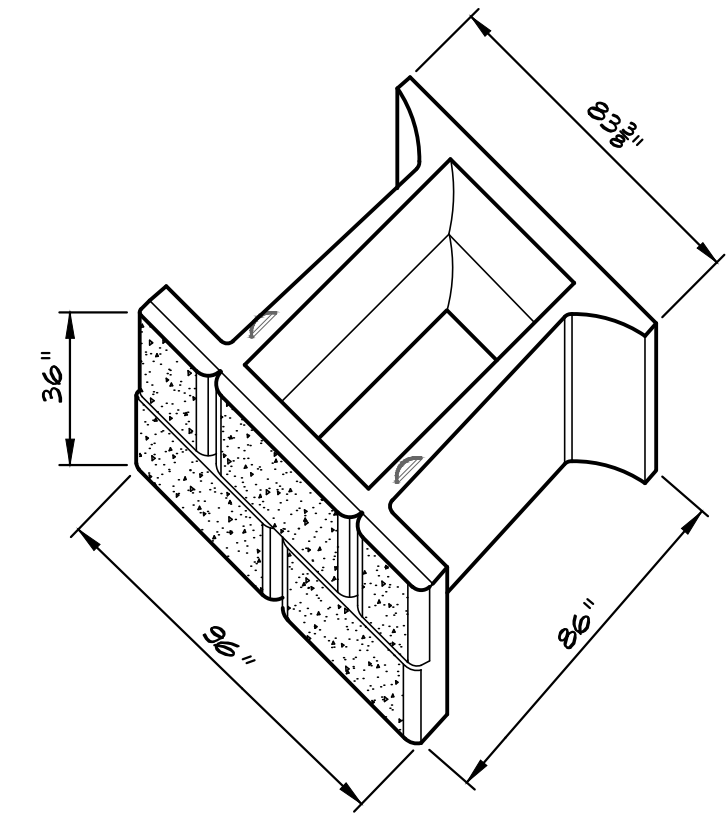
**GEOGRID ORIENTATION**  
NOT TO SCALE



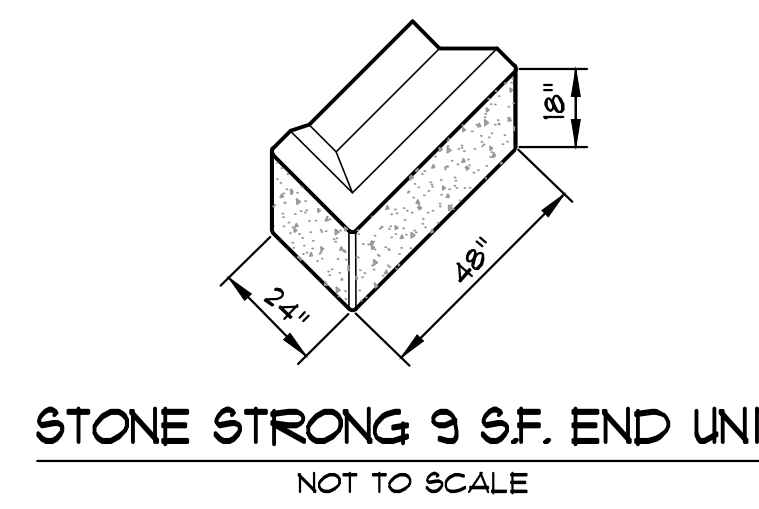
**STONE STRONG 24 SF UNIT WITH 18\"/>**



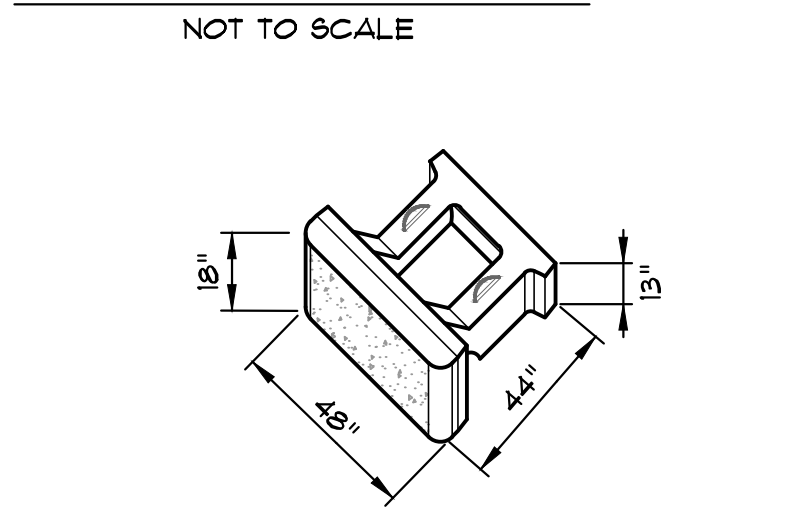
**STONE STRONG 24 SF UNIT WITH 12\"/>**



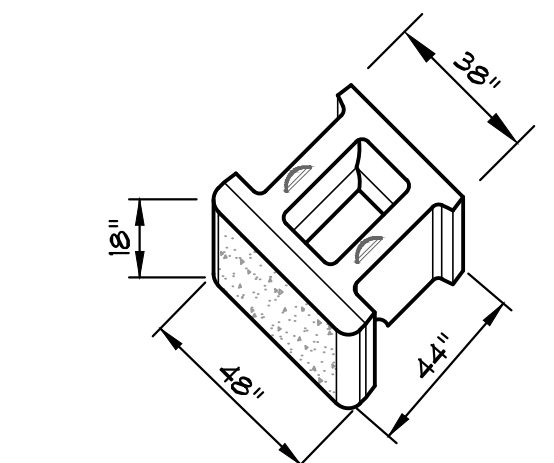
**STONE STRONG 24-86 SF UNIT**  
NOT TO SCALE



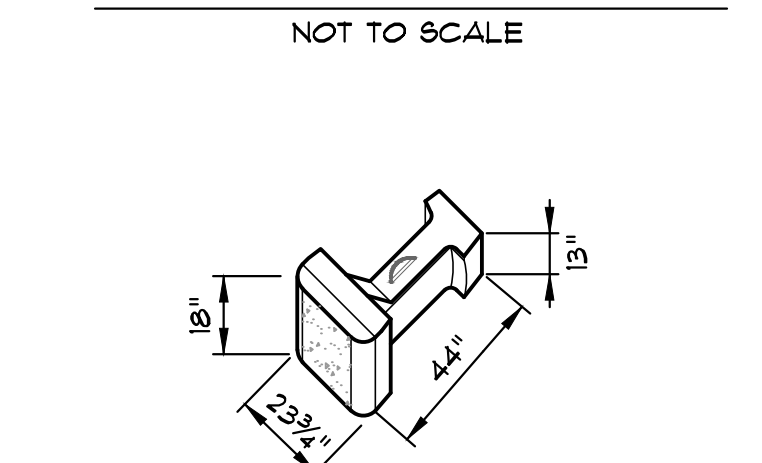
**STONE STRONG 9 SF. END UNIT**  
NOT TO SCALE



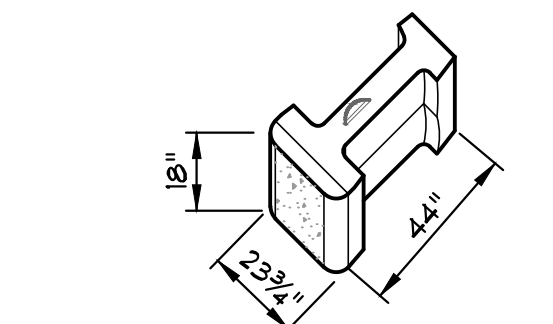
**STONE STRONG 6 SF. TOP UNIT**  
NOT TO SCALE



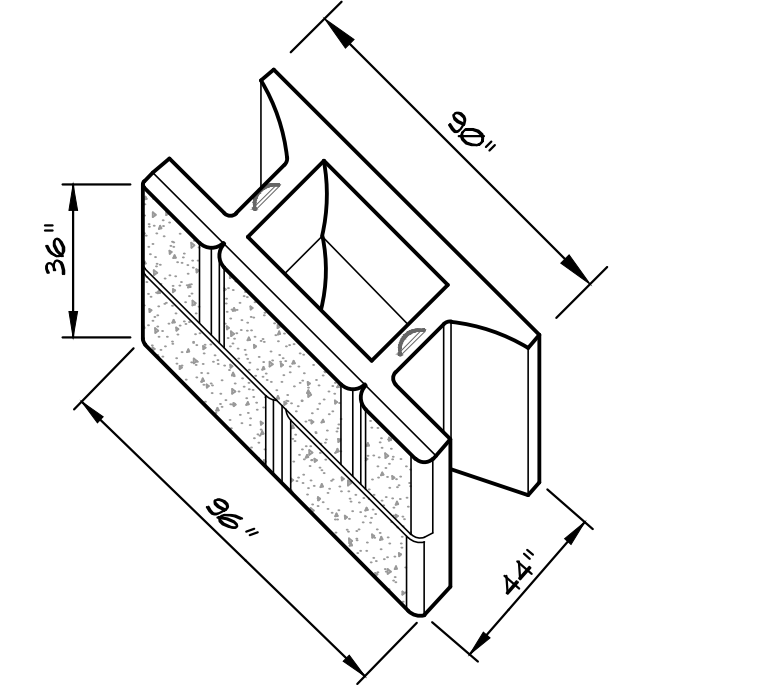
**STONE STRONG 6 SF. UNIT**  
NOT TO SCALE



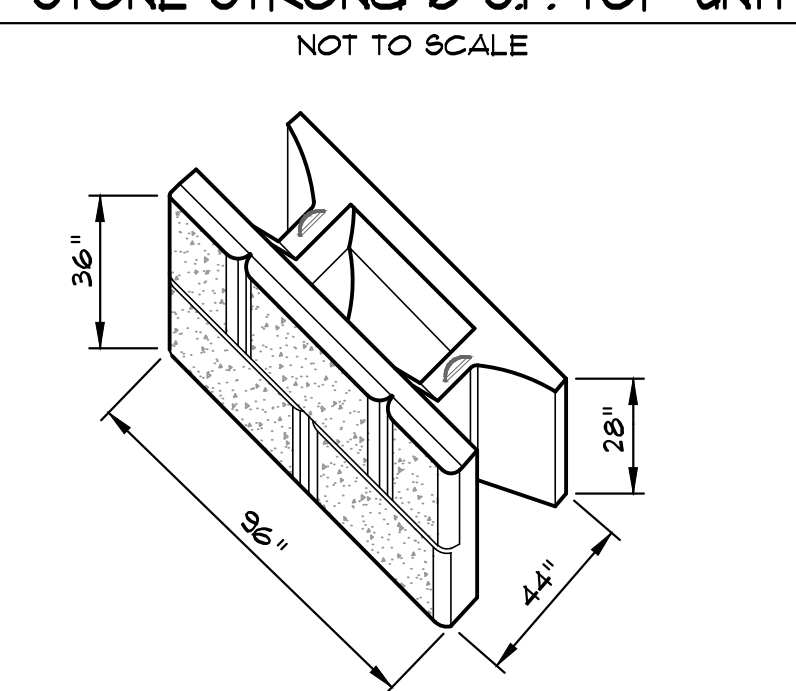
**STONE STRONG 3 SF. TOP UNIT**  
NOT TO SCALE



**STONE STRONG 3 SF. UNIT**  
NOT TO SCALE



**STONE STRONG 24 SF UNIT CHISELLED GRANITE FACE**  
NOT TO SCALE



**STONE STRONG 24 SF TOP UNIT CHISELLED GRANITE FACE**  
NOT TO SCALE

**GENERAL NOTES**

- 1) WALL LAYOUT IS BASED UPON A SET OF PLANS ENTITLED "MUNJOY HEIGHTS", DATED DECEMBER 16, 2013, PREPARED BY ACORN ENGINEERING.
- 2) THE CONTRACTOR IS RESPONSIBLE TO LAYOUT THE LOCATION OF THE FACE OF THE BOTTOM BLOCK COURSE AND THE WALL ALIGNMENT.
- 3) THE DESIGN OF THE WALLS ARE SPECIFIC TO THIS SITE AND SHOULD NOT BE USED ON OTHER SITES. DESIGNS ARE BASED ON INTIMATE KNOWLEDGE OF THE PROJECT BY S.G.S. AS A MEMBER OF THE DESIGN TEAM AND A GEOTECHNICAL INVESTIGATION BY S.G.S.
- 4) SOIL INFORMATION WAS OBTAINED FROM A GEOTECHNICAL INVESTIGATION PERFORMED BY S.G.S.
- 5) THE FOLLOWING ASSUMPTIONS WERE USED IN THE DESIGN -
  - A) SLOPE OF GROUND AT BASE AND TOP OF WALL = 2H : 1V MAXIMUM
  - B) LIVE LOAD SURCHARGE = 100 psf (MSE) & 150 psf (GRAVITY)
  - C) DEAD LOAD SURCHARGE = 500 psf (MSE, TO ACCOUNT FOR FOUNDATIONS)
  - D) SOIL PROPERTIES - GRAVITY WALL
    - FOUNDATION - EXISTING FILL OR GLACIAL TILL,  $u_w = 135$  pcf,  $\phi = 33^\circ$
    - RETAINED - RETAINING WALL BACKFILL (NOTE 22),  $u_w = 125$  pcf,  $\phi = 32^\circ$
  - E) SOIL PROPERTIES - MSE WALL
    - FOUNDATION - GRANULAR FILL OVER GLACIAL TILL,  $u_w = 130$  pcf,  $\phi = 30^\circ$
    - REINFORCED & RETAINED - RETAINING WALL BACKFILL (NOTE 22),  $u_w = 120$  pcf,  $\phi = 32^\circ$
  - F) SEISMIC DESIGN COEFFICIENT = 0.08
  - G) MAXIMUM CONTACT PRESSURE BENEATH WALL IS LESS THAN 4000 psf
  - H) GROUNDWATER BELOW BASE OF WALL
  - I) GEOGRID COVERAGE RATIO = 100%

**FOUNDATION NOTES**

- 6) FOUNDATION EXCAVATION SHALL EXTEND TO UNDISTURBED NATURAL DEPOSITS. ALL EXISTING TOPSOIL, LOOSE MATERIAL, FILL, ORGANIC SOIL AND OTHER SOFT OR UNSTABLE FOUNDATION SOILS SHALL BE REMOVED FROM THE AREA TO BE OCCUPIED BY THE WALL AND REPLACED WITH CRUSHED STONE OR COMPACTED RETAINING WALL BACKFILL. REMOVE UNSUITABLE FOUNDATION SOILS TO THE LATERAL LIMITS EXTENDING BEYOND THE WALL A DISTANCE EQUAL TO THE DEPTH OF FILL REQUIRED BELOW THE WALL PLUS (1) ONE FOOT, SOFT, WET AND OTHERWISE UNSUITABLE SOIL SHOULD BE BROUGHT TO THE ATTENTION OF SUMMIT GEOENGINEERING SERVICES.
- 7) UPON COMPLETION OF THE EXCAVATION, THE NATURAL SUBGRADE SHALL BE COMPACTED BY A MINIMUM OF 4 PASSES USING A VIBRATORY COMPACTOR.
- 8) INSTALL AND COMPACT 3/4\"/>

**WALL INSTALLATION**

- 9) A GLOBAL STABILITY ANALYSIS FOR WALLS 2 & 3 WAS PERFORMED BY S.G.S. THE STABILITY ANALYSIS IS SPECIFIC TO THE STONE STRONG MSE AND GRAVITY WALL SYSTEM. IF AN ALTERNATIVE WALL SYSTEM IS USED, A NEW GLOBAL STABILITY ANALYSIS SHOULD BE PERFORMED USING THE SPECIFIC PROPERTIES OF THE SELECTED WALL SYSTEM.
- 10) A COMPLETE SET OF APPROVED CONSTRUCTION DRAWINGS AND CONTRACT SPECIFICATIONS SHALL BE ON SITE AT ALL TIMES DURING CONSTRUCTION OF THE MSE AND GRAVITY RETAINING WALL SYSTEMS. THE CONTRACTOR IS RESPONSIBLE TO FOLLOW THE SPECIFICATIONS AND THESE DRAWINGS.
- 11) INSTALL BASE COURSE OF BLOCKS ON PREPARED FOUNDATION LEVELING PAD. ENSURE THAT BASE COURSE IS LEVEL SIDE TO SIDE AND PLUMB. ADJUST BLOCKS AS REQUIRED TO PROVIDE A STRAIGHT AND LEVEL BASE COURSE.
- 12) INSTALL 3/4\"/>

**MATERIAL SPECIFICATIONS**

- 23) 3/4\"/>

SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	90 - 100
3/8"	20 - 55
No. 4	0 - 10
No. 8	0 - 5
- 24) RETAINING WALL BACKFILL SHALL BE A FREE DRAINING, WELL GRADED GRANULAR MATERIAL MEETING THE GRADATION REQUIREMENTS OF MIDOT 103.20 GRAVEL BORROW.
 

SIEVE SIZE	PERCENT PASSING
3"	10
1/2"	0 - 10
No. 200	0 - 10
- 25) RETAINING WALL BACKFILL SHALL BE PLACED IN A MAXIMUM OF 18" LIFTS AND COMPACTED TO 95% IN ACCORDANCE WITH ASTM D1557. THE MAXIMUM PARTICLE SIZE SHALL BE LIMITED TO 4".
- 26) BLOCKS SHALL BE STONE STRONG PRECAST CONCRETE BLOCKS, MANUFACTURED BY PRECAST OF MAINE, TOPSHAM, MAINE.
- 27) GEOGRID SHALL BE SF55 MANUFACTURED BY SYNTEN.
- 28) GEOTEXTILE SHALL BE MIRAFI 140N OR EQUIVALENT.

**CONSTRUCTION CONTROL**

- 29) IT IS THE RESPONSIBILITY OF THE CONTRACTOR OR THEIR REPRESENTATIVE TO ENSURE THAT CONSTRUCTION OF THE WALL AND MATERIALS USED IN THE CONSTRUCTION OF THE WALL ARE IN ACCORDANCE WITH THESE SPECIFICATIONS AND/OR THE CONTRACT SPECIFICATIONS WHICH EVER ARE MORE STRINGENT.
- 30) PRECAST OF MAINE AND ITS ENGINEER ACCEPTS NO RESPONSIBILITY NOR LIABILITY IN THE DETERMINATION OF THE ADEQUACY OF SITE MATERIALS AND/OR PROCEDURES.
- 31) PRIOR TO THE START OF CONSTRUCTION THE CONTRACTOR SHALL VERIFY THAT ALL ELEVATIONS AND ASSUMED SITE CONDITIONS SHOWN ON THESE DRAWINGS ARE ACCURATE TO THE GIVEN SITE CONDITIONS. ANY DISCREPANCY SHALL BE BROUGHT TO THE ATTENTION OF S.G.S. PRIOR TO START OF CONSTRUCTION.

DATE: 2-28-14

REVISION: NO.

UPDATE NOTE, REMOVE DETAIL

DRAWN BY: KRF

CHECKED BY: WJMP

SCALE: AS NOTED

DATE: FEBRUARY 25, 2014

SHEET TITLE: **CONSTRUCTION NOTES & DETAILS**

PROJECT: **MUNJOY HEIGHTS**

CLIENT: **REDFERN MUNJOY, LLC**  
P.O. BOX 8816 - PORTLAND, ME 04104

145 LIBBON ST. - SUITE 601  
LEWISTON, ME 04240

Tel: (207) 516-5313  
www.summitgeoceng.com

**SUMMIT**  
GEOENGINEERING SERVICES

STATE OF MAINE  
WILLIAM M. PETERLEIN  
LICENSED PROFESSIONAL ENGINEER  
1578

JOB NO. - 13217

SHEET **3**