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STONE STRONG SYSTEM - GRAVITY RETAINING WALL PREPARED FOR

HOME & LAND DEVELOPMENT

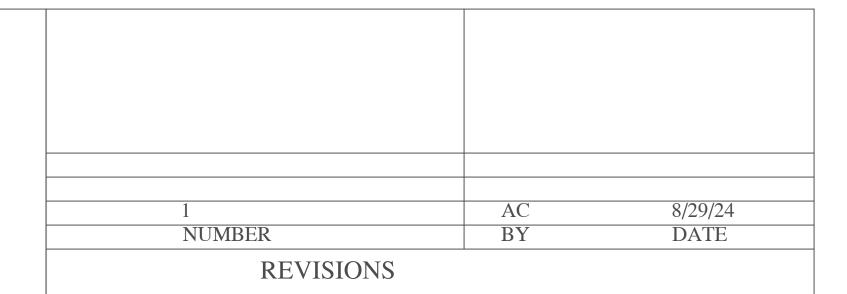
NORTH PEAK STREET PROJECT

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GARDEN STATE PRECAST
P.O. BOX 702
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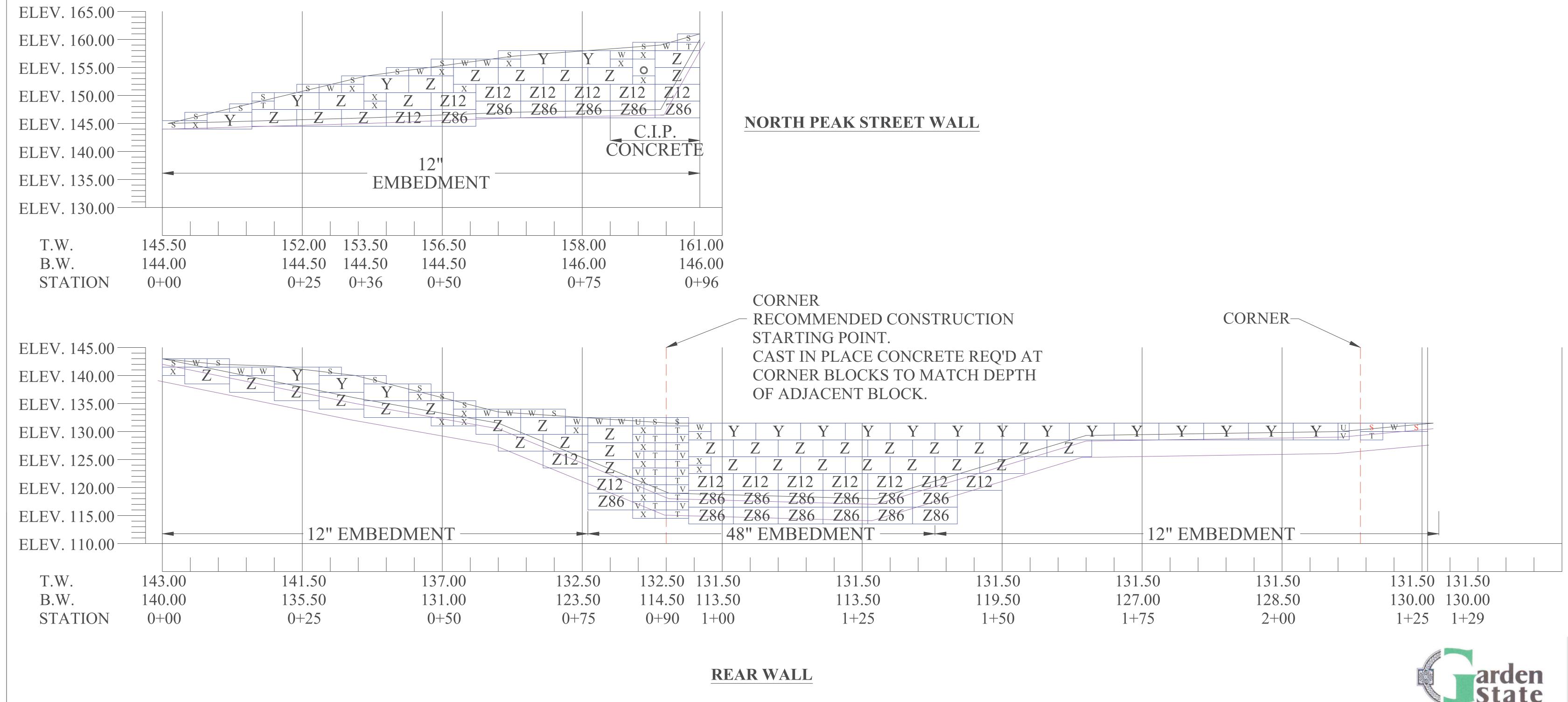






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STONE STRONG WALL ELEVATIONS

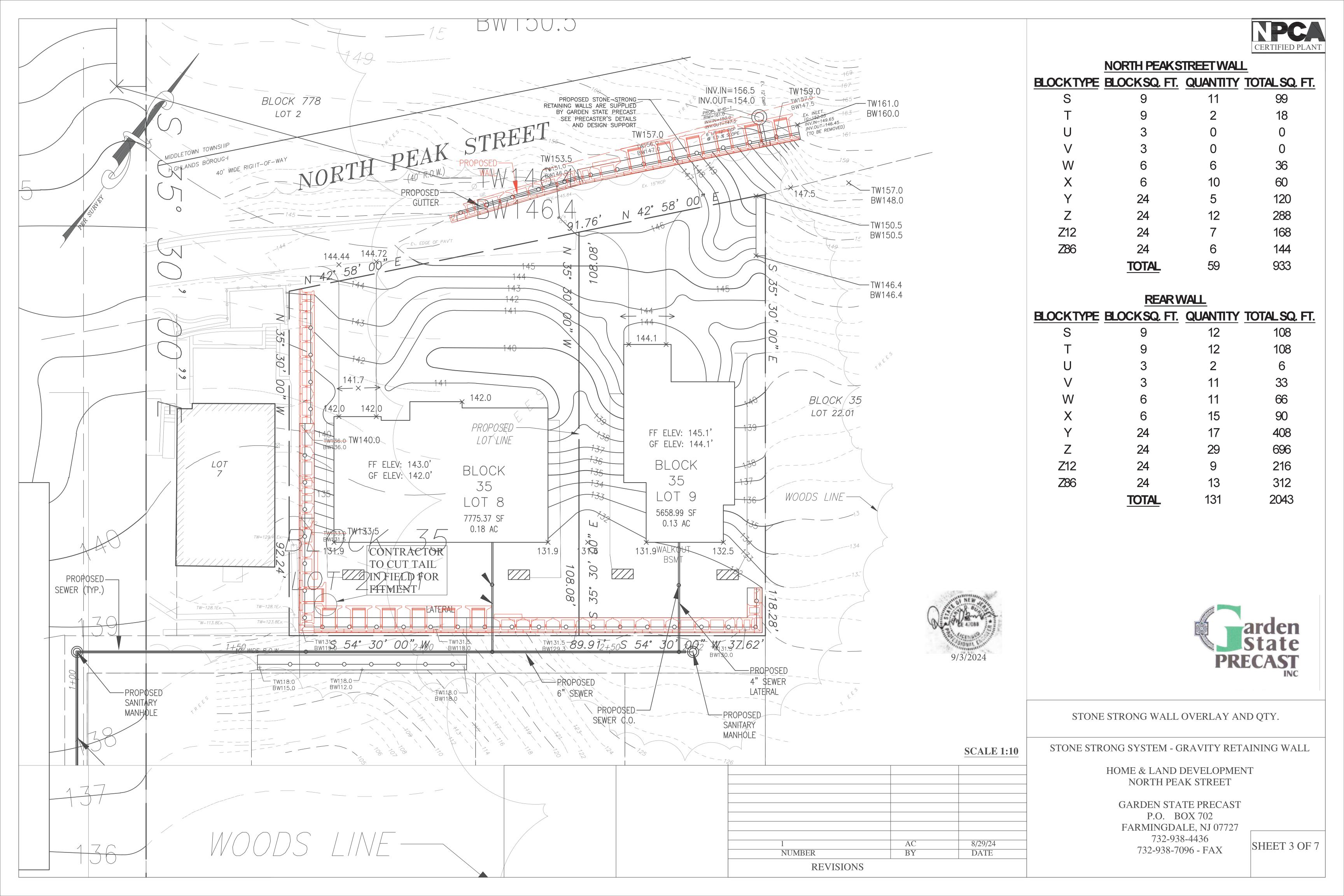
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HOME & LAND DEVELOPMENT NORTH PEAK STREET

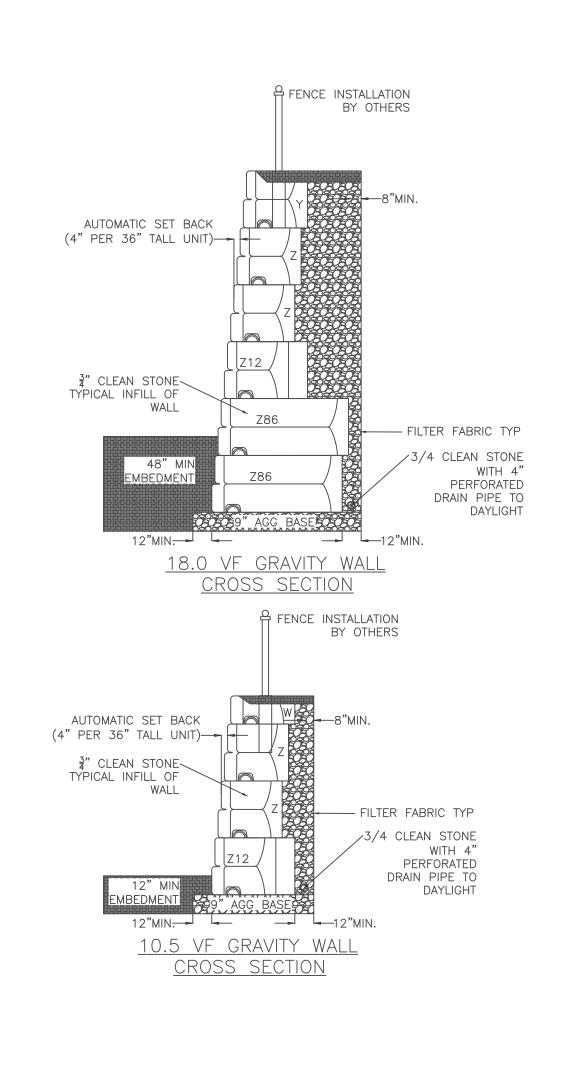
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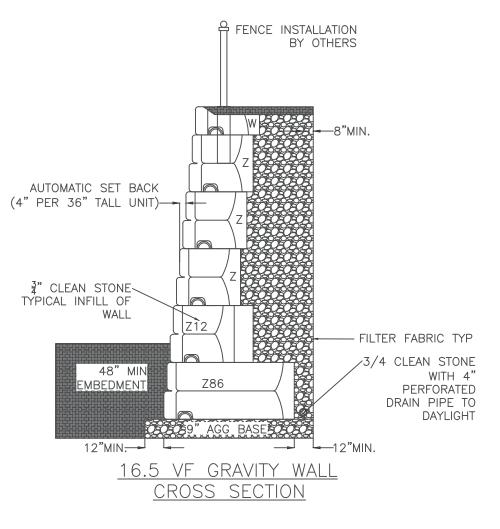
SHEET 2 OF 7

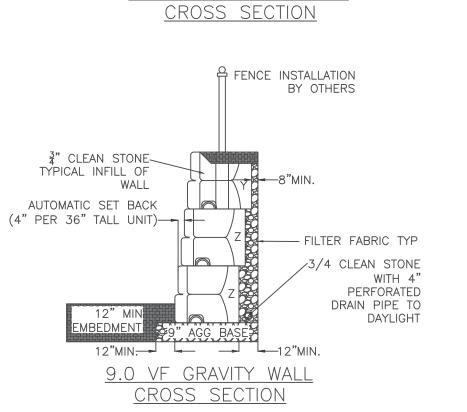
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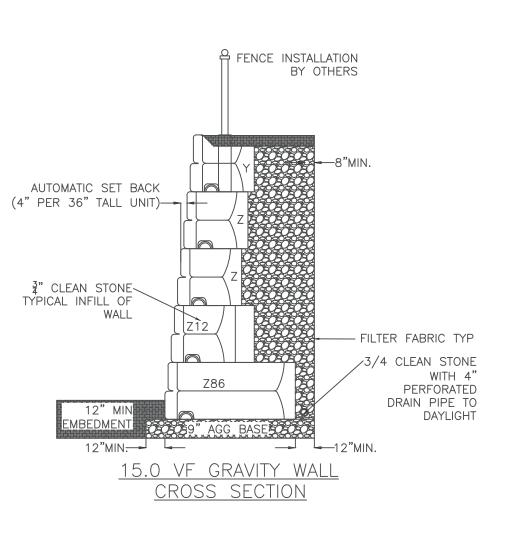


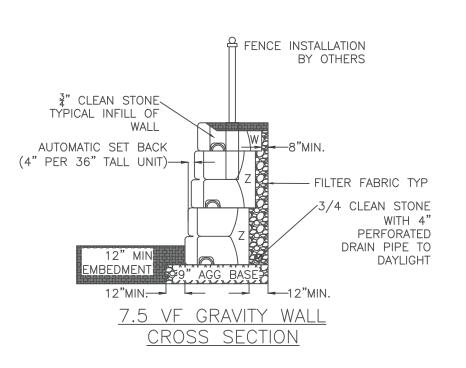


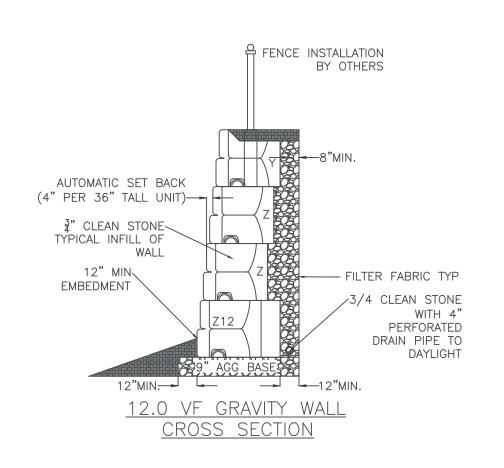


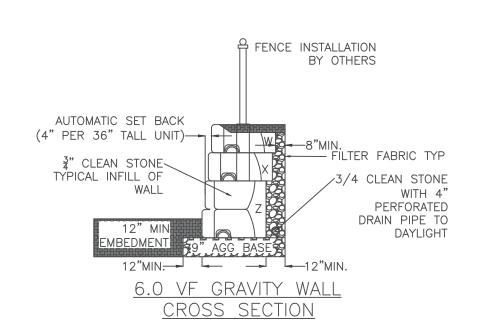


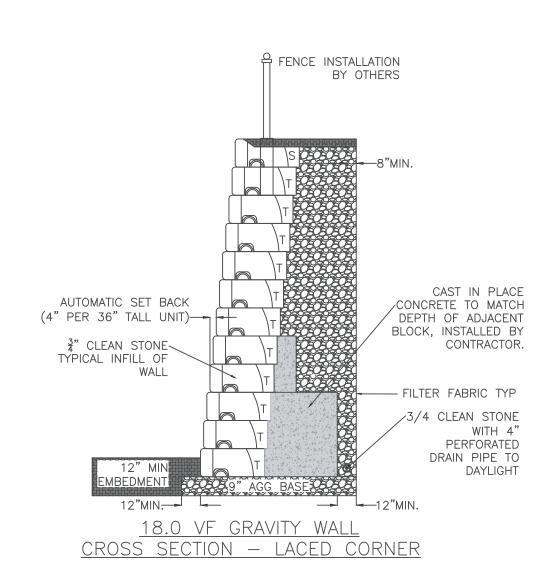




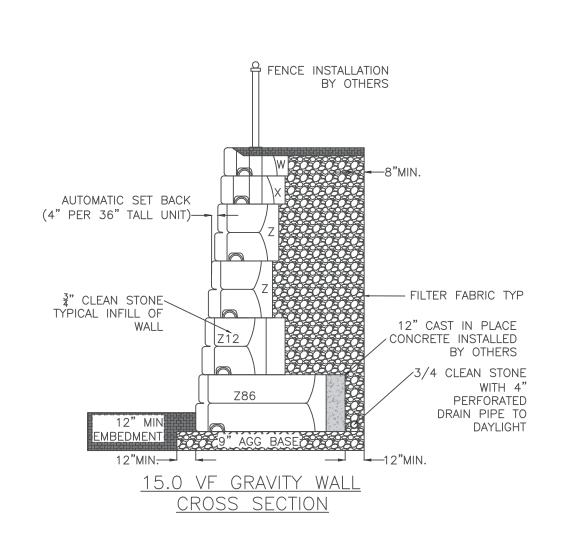


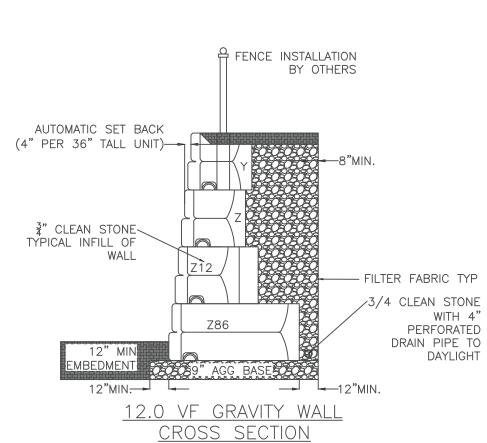


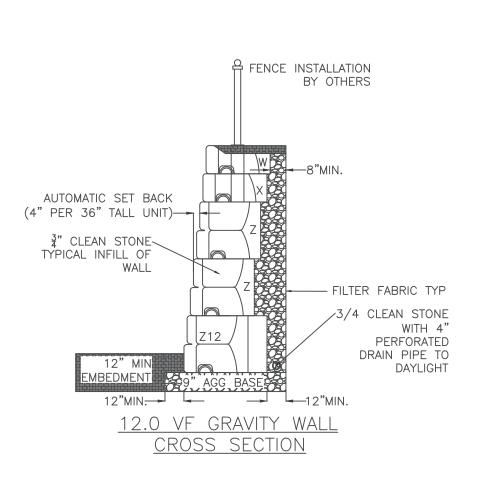


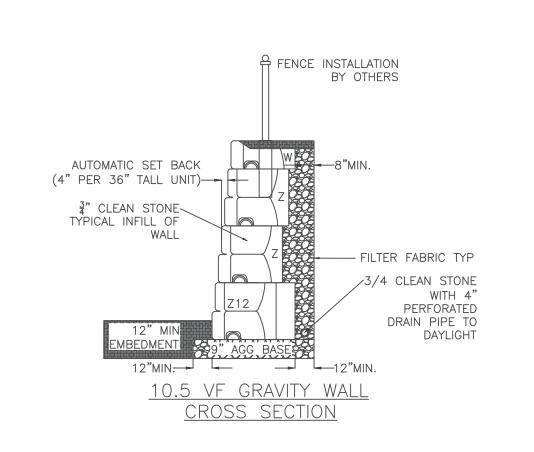


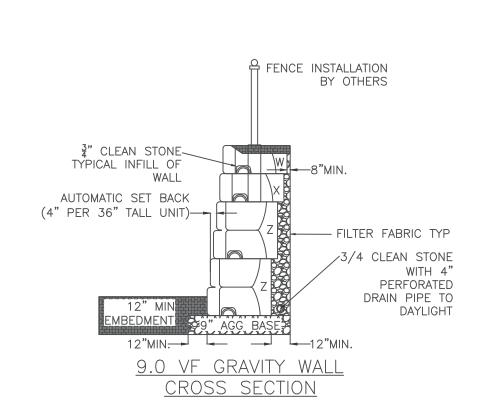
REAR WALL SECTIONS



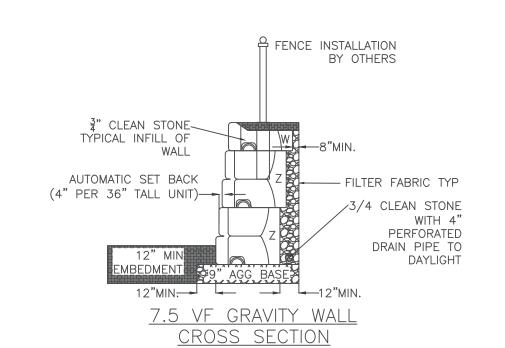


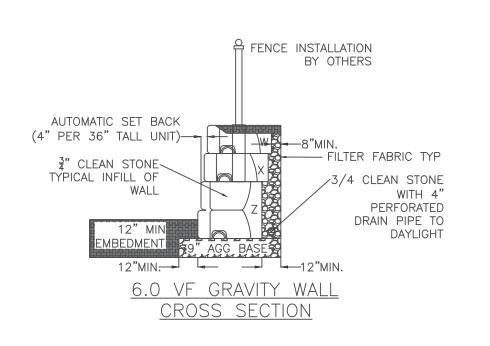














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STONE STRONG WALL SECTIONS

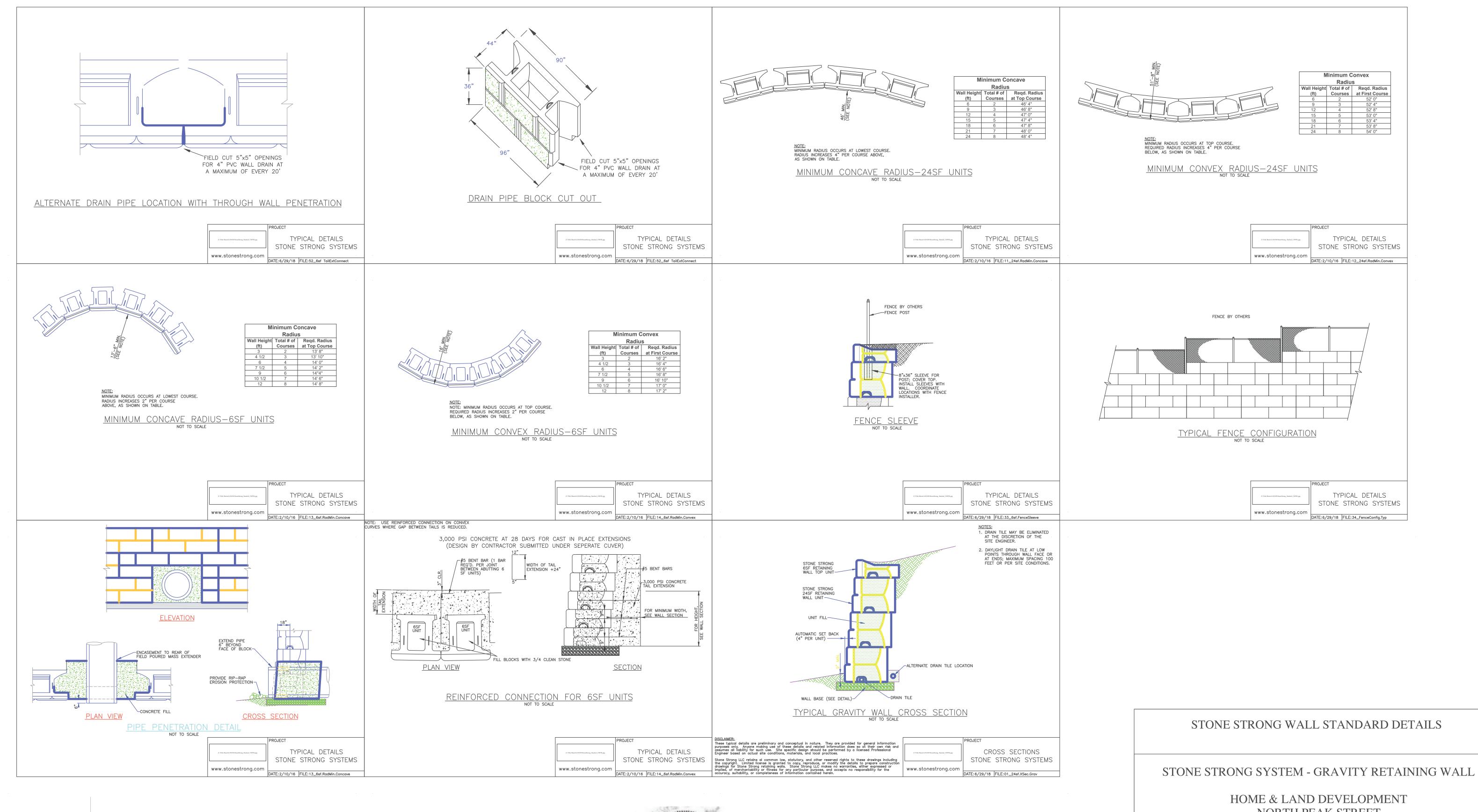
STONE STRONG SYSTEM - GRAVITY RETAINING WALL

HOME & LAND DEVELOPMENT NORTH PEAK STREET

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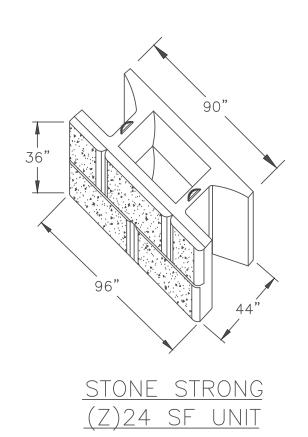
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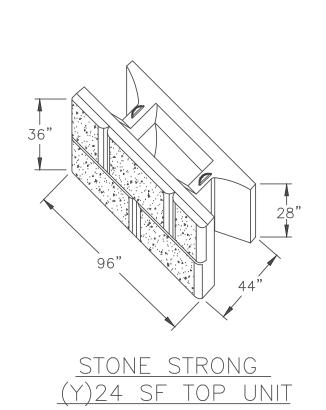
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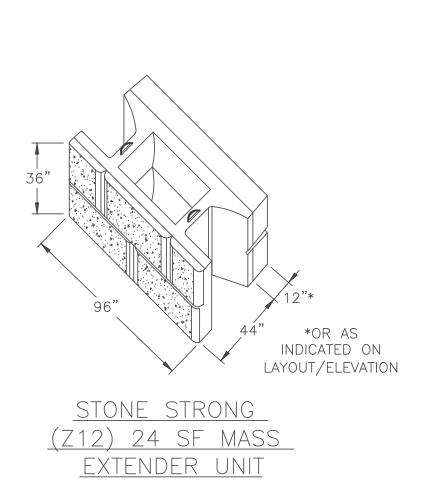
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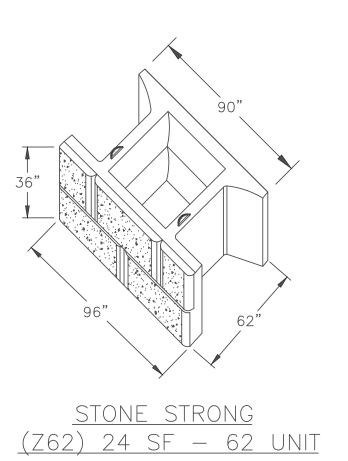
SHEET 5 OF 7

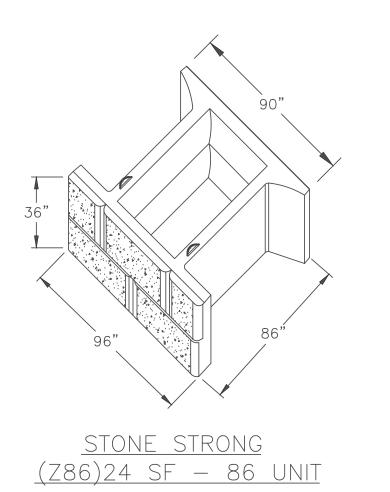


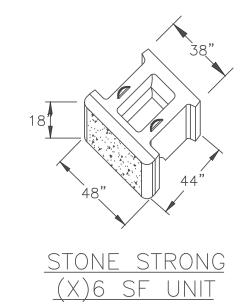


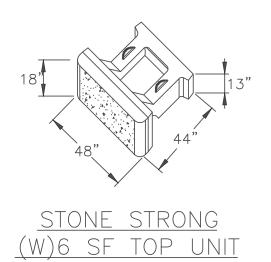


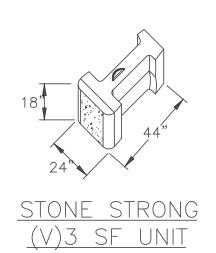


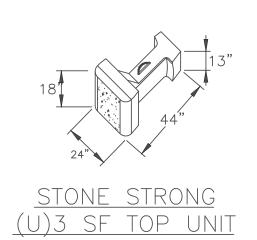


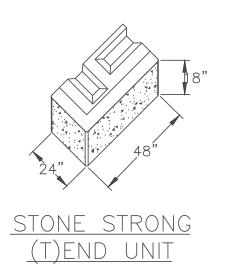


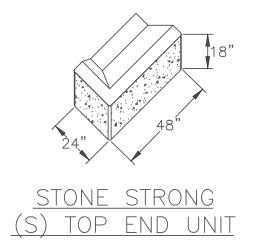


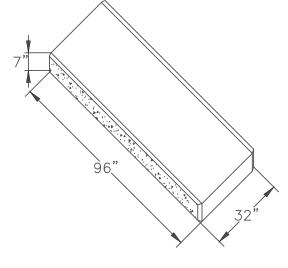




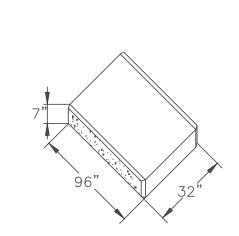




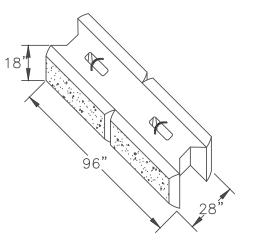




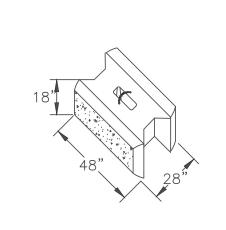




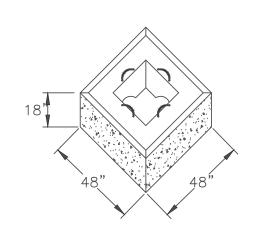
STONE STRONG (P5)CAP STEP HALF BLOCK



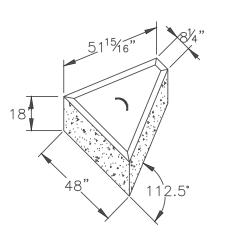
STONE STRONG (Q)DUAL FACE UNIT



STONE STRONG (Q5)DUAL FACE HALF UNIT



<u>STONE STRONG</u> (C)90° CORNER UNIT



<u>stone strong</u> (r)45° corner unit



COMPONENT DATA

| COMPONENT | BLOCK WEIGHT | CONCRETE VOLUME | ROCK IN-FILL |
|-----------------------------|--------------|-----------------|---------------|
| 24 SF(Z) | 6000 LB | 1.50 CU YARDS | 1.70 CU YARDS |
| 24 SF TOP(Y) | 5,400 LB | 1.35 CU YARDS | 1.50 CU YARDS |
| 24 SF MASS EXTENDER(Z12) | 10,000 LB | 2.5 CU YARDS | 1.70 CU YARDS |
| 24 SF -62 UNIT(Z62) | 6,600 LB | 1.65 CU YARDS | 2.81 CU YARDS |
| 24 SF -86 UNIT(Z86) | 7,400 LB | 1.85 CU YARDS | 4.27 CU YARDS |
| 6 SF(X) | 1,600 LB | 0.37 CU YARDS | 0.33 CU YARDS |
| 6 SF TOP (W) | 1,400 LB | 0.35 CU YARDS | 0.31 CU YARDS |
| 3 SF(V) | 800 LB | 0.20 CU YARDS | 0.17 CU YARDS |
| 3 SF TOP(U) | 720 LB | 0.18 CU YARDS | 0.16 CU YARDS |
| END UNIT(T) | 1,500 LB | 0.37 CU YARDS | 0.00 CU YARDS |
| END UNIT TOP(S) | 1,412 LB | 0.35 CU YARDS | 0.00 CU YARDS |
| CAP/STEP UNIT(P) | 1,600 LB | 0.40 CU YARDS | 0.00 CU YARDS |
| CAP/STEP HALF UNIT(P5) | 800 LB | 0.20 CU YARDS | 0.00 CU YARDS |
| DUAL FACE UNIT(Q) | 3,520 LB | 0.88 CU YARDS | 0.00 CU YARDS |
| DUAL FACE HALF UNIT(Q5) | 1,760 LB | 0.44 CU YARDS | 0.00 CU YARDS |
| 90 DEGREE CORNER UNIT(C) | 2,600 LB | 0.65 CU YARDS | 0.10 CU YARDS |
| 45 DEGREE CORNER UNIT(R) | 2,000 LB | 0.50 CU YARDS | 0.00 CU YARDS |
| | | | |

STONE STRONG SYSTEM - GRAVITY RETAINING WALL

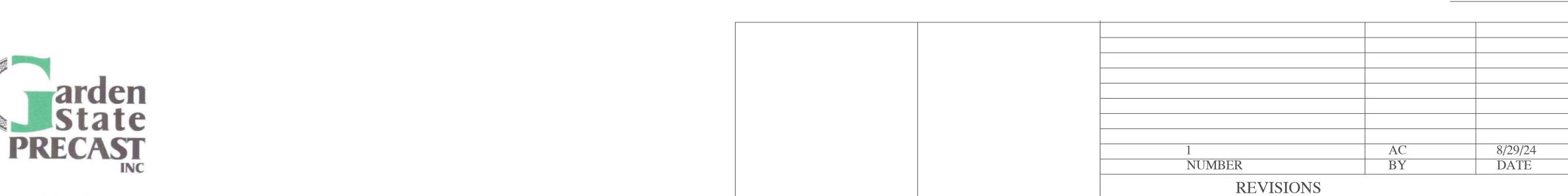
BLOCK REFERENCE

HOME & LAND DEVELOPMENT NORTH PEAK STREET

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STONE STRONG SYSTEMS SPECIFICATIONS FOR PRECAST MODULAR BLOCK RETAINING WALL SYSTEM

1.06 DESIGN SPECIFICATIONS FOR THE STONE STRONG RETAINING WALL SYSTEM

BY NEEDED DETAILS OR CONSTRUCTION SPECIFICATIONS.

> OR EQUAL TO 1.5

45 DEGREES

90 DEGREES

> OR EQUAL TO 1.5

PROVIDE THE FOLLOWING FACTORS OF SAFETY:

BEARING CAPACITY > OR EQUAL TO 2.0

ALLOWABLE DIFFERENTIAL SETTLEMENT

CONCAVE APPLICATIONS 16' RADIUS

CONVEX APPLICATIONS 20' RADIUS

GENERAL

SLIDING

OVERTURNING

45 DEGREE BLOCK

90 DEGREE BLOCK

A. THE STONE STRONG RETAINING WALL SYSTEM DESIGN CONSULTANT TAKES

RESPONSIBILITY FOR THE ENGINEERING THEORY, CALCULATIONS, AND ENSURING

B. THE PROJECT ENGINEER OF RECORD FOR THE PROJECT IS RESPONSIBLE FOR

VERIFYING SOIL ASSUMPTIONS USED IN DESIGN PRIOR TO PRODUCTION.

THE STONE STRONG RETAINING WALL SYSTEM MINIMUM RADIUS AND SPECIAL TURNING

ALL DESIGN ASSUMPTIONS ARE VALIDATED IN THE CONTRACT DOCUMENTS: EITHER

PART 1: GENERAL

1.01 DESCRIPTION

A. WORK INCLUDES FURNISHING AND INSTALLING PRECAST MODULAR BLOCKS (PMB) TO THE LINES AND GRADES SHOWN ON THE PLANS AND AS SPECIFIED HEREIN. ALSO INCLUDED IS FURNISHING AND INSTALLING APPURTENANT MATERIALS REQUIRED FOR CONSTRUCTION OF THE COMPLETE SYSTEM.

B. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR SAFETY. THE

ARCHITECT/ENGINEER AND OWNER SHALL NOT BE RESPONSIBLE FOR MEANS OR METHODS OF CONSTRUCTION OR FOR SAFETY OF WORKERS OR OF THE PUBLIC.

1.02 REFERENCES

A. ASTM C39 - STANDARD TEST METHOD FOR COMPRESSIVE STRENGTH OF

CYLINDRICAL CONCRETE SPECIMENS.

B. ASTM C136 — STANDARD TEST METHOD FOR SIEVE ANALYSIS OF FINE AND

COARSE AGGREGATE. C. ASTM D4318 — STANDARD TEST METHOD FOR LIQUID LIMIT, PLASTIC LIMIT, AND

PLASTICITY INDEX OF SOILS.

D. ASTM D698 - STANDARD TEST METHOD FOR LABORATORY COMPACTION CHARACTERISTICS OF SOIL USING STANDARD EFFORT.

E. ASTM D4595 — STANDARD TEST METHOD FOR TENSILE PROPERTIES OF

GEOTEXTILES BY THE WIDE—WIDTH STRIP METHOD.

F. ASTM D5262 — STANDARD TEST METHOD FOR EVALUATING THE UNCONFINED CREEP BEHAVIOR OF GEOSYNTHETICS.

G. ASTM D4632 — STANDARD TEST METHOD FOR GRAB BREAKING LOAD AND ELONGATION OF GEOTEXTILES.

H. ASTM D6638 — STANDARD TEST METHOD FOR DETERMINING CONNECTION STRENGTH BETWEEN GEOSYNTHETIC REINFORCEMENT AND SEGMENTAL CONCRETE UNITS (MODULAR CONCRETE BLOCKS).

I. ASTM D6916 — STANDARD TEST METHOD FOR DETERMINING THE SHEAR

STRENGTH BETWEEN SEGMENTAL CONCRETE UNITS.

J. AASHTO — STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES.

K. NCMA — "DESIGN MANUAL FOR SEGMENTAL RETAINING WALLS". 1.04 DELIVERY, STORAGE, AND HANDLING

A. CONTRACTOR SHALL CHECK THE MATERIALS UPON DELIVERY TO ASSURE THAT

PROPER MATERIALS HAVE BEEN RECEIVED.

B. CONTRACTOR SHALL PROTECT THE MATERIALS FROM DAMAGE. DAMAGED

MATERIAL SHALL NOT BE INCORPORATED INTO THE WALL OR THE REINFORCED SOIL EMBANKMENTS.

C. CONTRACTOR SHALL PREVENT EXCESSIVE MUD, CONCRETE, ADHESIVES AND

D. EXPOSED FACES OF SEGMENTAL UNITS SHALL BE REASONABLY FREE OF CHIPS,

OTHER SUBSTANCES THAT MAY ADHERE FROM COMING IN CONTACT WITH THE

CRACKS, OR STAINS.
1.05 QUALITY ASSURANCE

A. OWNER SHALL EMPLOY SERVICES OF A MATERIAL ENGINEERING FIRM TO PROVIDE QUALITY CONTROL TESTING DURING EMBANKMENT CONSTRUCTION.

PART 2: MATERIALS 2.01 WALL UNITS

A. A. PRECAST MODULAR BLOCKS SHALL BE STONE STRONG UNITS MANUFACTURED UNDER LICENSE FROM STONE STRONG, LLC.

B. CONCRETE FOR PRECAST MODULAR BLOCKS SHALL HAVE A MINIMUM 28—DAY COMPRESSIVE STRENGTH OF 4,000 PSI. ENTRAINED AIR CONTENT SHALL BE BETWEEN 5 AND 7%.

C. REINFORCING STEEL (IF USED) SHALL BE GRADE 60. MINIMUM CLEAR COVER TO REINFORCEMENT SHALL BE 1½ INCHES.

D. THE FACE PATTERN SHALL BE SELECTED FROM THE MANUFACTURER'S STANDARD MOLDS. THE COLOR OF THE UNITS SHALL BE NATURAL GRAY. A CONCRETE STAIN MAY BE FIELD APPLIED TO COLOR THE UNITS IF SPECIFIED BY THE ARCHITECT/ENGINEER OR OWNER.

2.02 GEOGRID

A. IF GEOGRID REINFORCEMENT IS REQUIRED, IT SHALL BE AS SHOWN IN THE PLANS OR AS DETAILED IN THE SHOP DRAWINGS. SUBSTITUTION OF A DIFFERENT TYPE OF GEOGRID SHALL NOT BE ALLOWED UNLESS APPROVED OF THE ARCHITECT/ENGINEER OR OWNER AFTER SUBMITTAL OF SHOP DRAWINGS

AND TEST DATA. 2.03 WALL BASE

3" CLEAN STONE MATERIAL FOR WALL BASE

4 CLEAN STONE MATERIAL FOR 2.04 UNIT FILL

A. UNIT FILL SHALL BE A CLEAN COARSE AGGREGATE WITH HIGH ANGULARITY. THE UNIT FILL SHALL BE SCREENED 100 PERCENT CRUSHED AGGREGATE MEETING THE FOLLOWING GRADATION:

US STANDARD SIEVE SIZE PERCENT PASSING

1-1/2" 100 3/4" 60-100 #4 0-40 #200 0-5

2.05 BACKFILL

A. PROVIDE BACKFILL PER PHI ANGLE IN DESIGN CALCULATONS

2.06 DRAIN TILE

A. DRAIN TILE SHALL BE USED IF SHOWN ON THE PLANS OR IF INDICATED BY LOCAL PRACTICES AND CONDITIONS. IF USED, THE DRAIN TILE SHOULD BE A PERFORATED OR SLOTTED PVC OR CORRUGATED HDPE PIPE. THE DRAIN TILE SHOULD BE CONNECTED TO STORM DRAINS OR DAYLIGHTED AT LOW POINTS AND/OR PERIODICALLY ALONG THE WALL ALIGNMENT.

2.07 GEOTEXTILE FABRIC

A. IF SHOWN ON THE PLANS OR THE SHOP DRAWINGS, PROVIDE A GEOTEXTILE FILTER FOR SEPARATION FROM BACKFILL AT THE TAILS OF THE BLOCKS. THE GEOTEXTILE SHALL BE A NEEDLE PUNCHED NONWOVEN FABRIC WITH A MINIMUM GRAB TENSILE STRENGTH OF 120 POUNDS ACCORDING TO ASTM D4632. IF USED, THE GEOTEXTILE MAY COVER THE ENTIRE BACK FACE OF THE BLOCKS OR MAY BE CUT IN STRIPS TO COVER THE GAPS BETWEEN TAIL UNITS WITH A MINIMUM OF 6 INCHES OF OVERLAP OVER THE CONCRETE TAIL ON BOTH

PART 3: EXECUTION 3.01 EXCAVATION

A. EXCAVATE AS REQUIRED FOR INSTALLATION OF THE RETAINING WALL SYSTEM.

EXCAVATE TO THE BASE LEVEL FOR A SUFFICIENT DISTANCE BEHIND THE FACE

TO PERMIT INSTALLATION OF THE BASE AND GEOGRID REINFORCEMENT (IF ANY).

B. SLOPE OR SHORE EXCAVATION AS NECESSARY FOR SAFETY AND FOR

CONFORMANCE WITH APPLICABLE OSHA REQUIREMENTS. 3.02 WALL BASE

A. FOUNDATION SOILS SHALL BE EXCAVATED TO THE DIMENSIONS SHOWN ON THE PLANS. FOUNDATION SOIL SHALL BE OBSERVED BY THE GEOTECHNICAL ENGINEER TO CONFIRM THAT THE BEARING SOILS ARE SIMILAR TO THE DESIGN CONDITIONS OR ASSUMPTIONS.

3.03 UNIT INSTALLATION

A. PLACE THE FIRST COURSE OF UNITS DIRECTLY ON THE WALL BASE. CHECK UNITS FOR LEVEL AND ALIGNMENT. ADJACENT UNITS SHOULD BE IN CONTACT. IF POSSIBLE, BEGIN PLACING UNITS AT THE LOWEST SECTION OF THE WALL. B. FILL ALL VOIDS BETWEEN AND WITHIN THE BLOCKS WITH GRANULAR UNIT FILL ADDITIONAL UNIT FILL IS NOT REQUIRED BEHIND THE UNITS, BUT MAY BE

PLACED FOR THE CONVENIENCE OF THE CONTRACTOR.

C. PLACE BACKFILL BEHIND THE UNITS IN MAXIMUM LOOSE LIFTS OF 8 INCHES AND COMPACT. IF SELECT GRANULAR FILL IS REQUIRED, IT SHOULD EXTEND THE FULL LENGTH OF THE GEOGRID REINFORCEMENT. COMPACT ALL BACKFILL TO A MINIMUM OF 95 PERCENT OF THE MAXIMUM DRY DENSITY (ASTM D698, STANDARD PROCTOR). FOR COHESIVE SOILS, THE MOISTURE CONTENT AT THE TIME OF COMPACTION SHOULD BE ADJUSTED TO WITHIN —3 AND +4 PERCENT OF OPTIMUM. PLACE BACKFILL IN SUCCESSIVE LIFTS UNTIL LEVEL WITH THE TOP OF THE FACING UNIT.

D. REMOVE ALL EXCESS AGGREGATE AND OTHER MATERIALS FROM THE TOP OF

THE UNITS BEFORE LAYING UP THE NEXT COURSE.

E. FOR GEOGRID REINFORCED WALLS, PLACE THE CORRECT GEOGRID AT THE LOCATIONS AND ELEVATIONS SHOWN ON THE PLANS OR THE SHOP DRAWINGS. GEOGRID REINFORCEMENT SHALL BE PLACED HORIZONTALLY ON COMPACTED BACKFILL. THE LENGTH OF THE GEOGRID IS MEASURED FROM THE FRONT FACE OF THE WALL. EXTEND THE GRID ONTO THE FRONT FACE FLANGE OF THE FACING UNIT. ORIENT THE GEOGRID WITH THE STRONG AXIS (MACHINE DIRECTION) PLACED PERPENDICULAR TO THE WALL FACE. GEOGRID SHALL NOT

BE SPLICED BY ANY MEANS IN THE ROLL DIRECTION.

F. GEOGRIDS SHALL BE PLACED SIDE BY SIDE TO PROVIDE COMPLETE COVERAGE ALONG THE WALL FACE. NO OVERLAP IS REQUIRED BETWEEN ADJACENT GRIDS ON STRAIGHT SECTIONS OF THE WALL. ON CONVEX CURVES, PLACE A MINIMUM OF 3 INCHES OF BACKFILL MATERIAL BETWEEN OVERLAPPING GEOGRID LAYERS.

G. PLACE THE NEXT COURSE OF SEGMENTAL UNITS IN RUNNING BOND WITH THE PREVIOUS COURSE. PLACE THE WEB NOTCH OVER THE ALIGNMENT HOOP PROTRUDING FROM THE UNIT BELOW, AND PULL THE UNIT FORWARD TO CONTACT THE HOOP.

H. FOR GEOGRID REINFORCED WALLS, PULL GEOGRIDS TAUGHT AND STAKE THE LOOSE END BEFORE PLACING THE NEXT COURSE OF BACKFILL. BACKFILL SHALL BE PLACED, SPREAD, AND COMPACTED IN SUCH A MANNER THAT MINIMIZES THE DEVELOPMENT OF WRINKLES IN THE GEOGRID AND/OR MOVEMENT OF THE GEOGRID. DO NOT OPERATE EQUIPMENT DIRECTLY ON THE GEOGRID. A MINIMUM BACKFILL DEPTH OF 6 INCHES SHOULD BE PLACED BEFORE OPERATING EQUIPMENT OVER THE GRIDS.

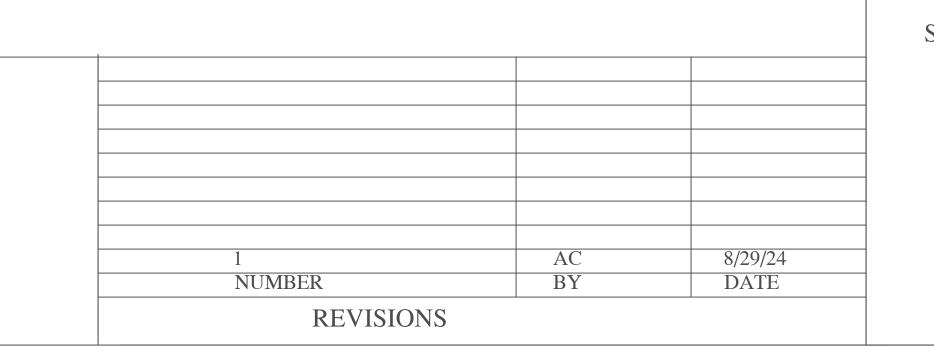
I. CONTINUE PLACING SUCCESSIVE COURSES TO THE ELEVATIONS SHOWN ON THE PLANS. CONSTRUCT WALL IN LEVEL STAGES, PLACING THE UNITS AT EACH COURSE FOR THE ENTIRE LENGTH OF THE WALL, IF POSSIBLE. UNIT FILL AND BACKFILL SHOULD BE PLACED TO THE LEVEL OF THE TOP OF THE FACING UNIT BEFORE PLACING THE NEXT COURSE.

J. PROVIDE TEMPORARY SWALES TO DIVERT RUNOFF AWAY FROM WALL EXCAVATION

AND AWAY FROM FACE.

K. FINAL GRADE ABOVE AND BELOW THE RETAINING WALL SHALL PROVIDE FOR POSITIVE DRAINAGE AND PREVENT PONDING. PROTECT COMPLETED WALL FROM OTHER CONSTRUCTION. DO NOT OPERATE LARGE EQUIPMENT OR STORE MATERIALS ABOVE THE WALL THAT EXCEED THE DESIGN SURCHARGE LOADS.







NOTES

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