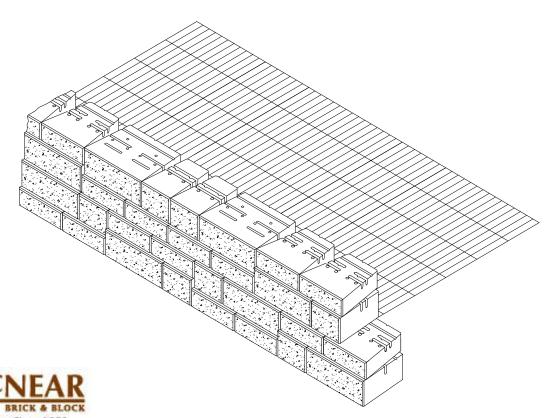


MOSAIC STANDARDIZED MASTERPLAN for walls 2 to 6.0 foot VERSA-LOK Retaining Walls



Manufacturers Since 1868

McNear Brick and Block P.O. Box 151380 San Rafael CA 94915 Ph: 888-442-6811

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VERSA-LOK® MOSAIC STANDARDIZED ENGINEERING PLAN

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Wall designs for this Standardized Engineering Plan have been developed in accordance with current NCMA (National Concrete Masonry Association) segmental retaining wall guidelines from the SRW Design Manual, Ver. 3 - Using NCMA SRWALL4 software and Versa-Lok VDF (Vendor Development Files). Versa-Lok Segmental Retaining Wall Systems (SRW's) are approved by ICC Evaluation Service, LLC - ESR #1784

DISCLAIMER: All Versa-Lok Standardized Plans are based on the following assumptions:

- 1. Wall Installation: All Versa-Lok wall construction is to be performed in accordance with NCMA (National Concrete Masonry Association), Versa-Lok, Manufacturer or Distributor recommendations. Specific design recommendations and standards can be referenced in NCMA (3rd Edition) Design Manual. This Standardized Plan provides a limited overview of the Versa-Lok segmental retaining wall system.
- 2. Site Soils: It is assumed that the project site soils are equivalent or stronger than the soils values for the various conditions presented in this Standardized Engineering Plan.
- 3. Standardized Plan Use or Approval: This Standardized Plan is not a substitute for any agency required: Permitting, specific local codes, required inspections, approvals, additional documentation or site specific engineering and / or working with installation professionals. User should contact the appropriate professional with any questions in regards to this Standardized Versa-Lok Plan.
- 4. Seismic Loads: No seismic loads have been contemplated or added within this Standardized Plan as current building codes do not require it for walls 6' ft. and under in height.
- 5. Sealed Standardized Versa-Lok Plan: Use of this plan may require the seal or review of a duly licensed professional engineer by some jurisdictions or agencies. Any such sealing of this document shall be secured and paid for by the user. McNear Brick & Block, Inc.'s Retaining Wall Division Manager can assist to help the user connect with a qualified engineering design or soils professional.
- 6. Representations / Warranties: McNear Brick & Block, Inc. and/or Versa-Lok® makes no claim, representation or warranty, expressed or implied that any wall construction may or may not require a building permit, the services of a professional engineer, or an installation professional. Versa-Lok® is a registered trademark of Kiltie Corporation.

All information presented herein is presented as general information only. Though every attempt has been made to ensure its accuracy, applicability and suitability for its intended use - this information should not be relied upon for any specific installation without independent professional confirmation and review for accuracy, applicability and suitability for the user's intended project or specific application. Anyone using or relying on this material wholly assumes any and all liability, obligations and / or consequences that may result or arise from such use. Both McNear Brick & Block, Inc., Versa-Lok® (or Kiltie Corporation), their officers, employees, or dealers accepts no liability whatsoever from the user's use of this document or any installation of the Versa-Lok systems depicted herein.

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SPECIFICATIONS FOR VERSA-LOK "MOSAIC" /; 9CGRID RETAINING WALL

Materials

Retaining wall units shall be VERSA-LOK **Mosaic Block Units** as manufactured by McNear Brick & Block, San Rafael, CA. **The Mosaic wall system consists of 3 wall units**, **Standard** (16" wide x 6" tall x 12" deep), **Cobble** (8" wide x 6" tall x 12" deep) and **Accent** (12" wide x 6" tall x 12" deep) with a straight split face finish arrange in a 24" wide x 10" tall panel. Wall units shall meet the requirements of ASTM C 1372. All retaining wall construction shall meet local code and ICC ESR# 1784 requirements. Pins { be VERSA-Tuff Snap-off pins from VERSA-LOK Retaining Wall Systems. Cap adhesive { be VERSA-LOK Adhesive - (or equivalent).

The reinforced wall backfill soil from the site is to meet or exceed pre-determined calculated soils criteria (see page 6). The soil shall be <u>free</u> of debris, clumps, rocks larger than one inch, and organic materials. <u>Do not use</u> high plastic soils that have a PI>20 or LL>40. (Quarry imported road base or 3/4" crushed rock is also acceptable within geogrid zone).

Geogrids shall have a minimum LTDS = 1,670 lb/ft - Such as: Miragrid 3XT, StrataGrid 200SG, or Synteen SF35 (or geogrid of equivalent or greater strength); and are available through many McNear Versa-Lok Dealers. Roll sizes (widths & lengths) vary by geogrid manufacturer. Geogrids are coated polyester with the design strength in a uniaxial direction (roll direction).

The drain aggregate shall be angular, free-draining rock such as $\frac{3}{4}$ inch clean crushed stone with less than 5% passing the #200 sieve.

The drainpipe shall be min. 4" perforated or slotted, PVC SDR35 or corrugated HDPE tubing.

Wall Foundation

Foundation soil shall be excavated as required for the leveling pad (2'w x 6"h min.) and the reinforced fill zone to the depths and locations shown. The exposed foundation soil should be observed prior to construction to verify that the exposed material is suitable for a net design bearing pressure of 2000 psf and that the base of the excavation is free of loose soil, uncompacted fill, or water. Undercut any unsuitable soil. Undercut areas shall be filled with compacted suitable granular soil or crushed stone.

Construct the leveling pad with compacted angular crushed stone, road base* or lean concrete to lines and grades shown on the plans. *(Use of compacted road base material may require leveling of the lower unit with a maximum of 1" of sand.)

Wall Construction

Before proceeding, please obtain a copy of VERSA-LOK Mosaic Design & Installation Guidelines. Thoroughly review all construction fundamentals and begin wall construction according to these guidelines.

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Prior to construction, the project owner (herein the user) is responsible to determine if Versa-Lok Standardized Engineering is acceptable to local governing agency and for verifying that the proposed site conditions, soils and installation meet the requirements within this documentation. The user is responsible to follow all construction guidelines herein and meeting the requirements of this specification, as well as any and all required submittals and documentation to the governing agency.

Install the first course of units on the leveling pad; **use VERSA-LOK Standard units for the base course**. Start the first course of panels (stagger panel joints by minimum of four inches), place two Accent units next to each other on top of the base course units with ¾ inch setback, place Standard and Cobble units on top of Accent units to complete ten inch tall panel. Install two pins per unit through pinhole into receiving slot of lower course units. Pull units forward to engage pins. Alternate units in panel as panels are placed to create a random appearance of wall facing. Place drainage materials, backfill, and compact, continue construction to top-of-wall. Panel layout examples are shown on sheet 11 of 13.

Cap units shall be glued in place to upper course wall units.

Geogrid Reinforcement

Geogrids meeting or exceeding the LTDS 1670 lb/ft shall be cut to design lengths and placed between the blocks at the elevations shown on the plan. The geogrids primary strength direction will be directed perpendicular to the wall face (into the fill) roll direction. The geogrid shall be placed horizontally and lay flat on the reinforced fill soil. The geogrid shall be placed so that a minimum of 10 inches of geogrid is between the block layers. Slack in the geogrid shall be removed prior to placing additional backfill. Backfill shall be placed from the back of the retaining wall facing to the end of the geogrid. Construction equipment shall not be operated directly on the geogrid.

Wall Backfill

Wall backfill material shall be placed in maximum 6" - 8" loose lifts starting directly behind the block units and moving toward the end of the geogrid layer. Each lift should be compacted with a minimum of 3 passes with automated compaction equipment to the requirements of the structural fill. Backfill shall be placed, spread, and compacted in such a manner that minimizes wrinkles and movement of the geogrid. Placing fill in this manner tensions the soil reinforcing and strengthens the SRW - geogrid connection. During backfill placement the three-foot zone directly behind the wall shall be limited to the use of hand operated compaction equipment only.

Drainage aggregate shall be placed directly behind the wall units a minimum of 12" thick Aggregate to consist of either 1/2" to 3/4" clean crushed angular rock or Class II permeable.

Protection of Work

The surface of the wall backfill shall be graded at the end of each day of work to provide positive surface drainage away from the wall. Grading shall include proper contouring of fills in adjacent areas to prevent the flow of surface water into the reinforced earth zone.

The design of the wall is based on conditions and loads imposed on the wall at completion of the project. Prior to project completion, the wall is vulnerable to damages caused by construction activity adjacent to the wall. Of particular concern is construction equipment on the reinforced backfill at the top of the wall. Only equipment with a weight not exceeding one ton can be used in the three foot zone directly behind the back of the wall face. The soil in front of the wall shall be protected from future erosion.

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APPLICATION

The VERSA-LOK / Geogrid wall system is a reinforced soil retaining wall structure combining an architecturally attractive concrete facing block with geogrid reinforcement. The geogrid reinforcement interlocks with the VERSA-LOK **Mosaic Block Units** and fill soil to create a stable gravity retaining wall. Design of these reinforced soil structures uses well-established guidelines that are readily available. If site conditions do not match the Standardized Masterplan conditions contemplated in this plan - site specific engineering will need to be completed.

This Standardized Masterplan can be used when acceptable to local building officials and when site wall height, surcharge loading, and soil types are consistent with this document and may require determination by a qualified Engineer. If wall permitting is necessary, submit the Standardized Masterplan along with any site drawings, surveyplats, literature, etc. that may be required by the building officials. When required, secure a Professional Engineer's stamp on the Standardized Masterplan document, contact McNear's Wall Div. Mgr. to assist in facilitating an engineering contact; (email: dave@mcnear.com for further help or assistance).

STANDARDIZED ENGINEERING PURPOSE & LIMITATIONS

The purpose of Standardized Engineering is to provide pre-calculated wall designs for small VERSA-LOK retaining walls up to 6' feet in height. The ICC (International Code Council - Sec. 105.2.4) recommends a building permit for walls greater than 4' feet in total height. This Standardized Engineering does not alleviate the need for any required building permit; though it does provide the building department and user pre-calculated wall designs in conformance with building codes and industry standards.

When soil conditions do not meet the assumed ICC parameters, the user should have an engineer review the site / soil conditions at the proposed wall location to determine appropriate design parameters. All soil parameters assumed in the design are well-drained, long-term strength conditions, with stable foundation soils. Highly plastic silts and clays should be avoided without specific design recommendations from a local geotechnical engineer.

Standardized Engineering is NOT applicable for: Walls placed on sloping surfaces, wall heights over 6' ft., seismic concerns, more complex walls, walls in contact with water, (i.e. near or at rivers, lakes, and ponds), tiered or multi-tiered wall applications are not considered in these tables, as well as any structurally surcharged wall(s) including, but not limited to; building slabs, foundations, footings, pads, pools or taller / more complex walls require site specific engineering design.

There are manypossibilities for slope and surcharge loadings or combinations of both. Four typical geometric cases were selected for the tables: Case A is a typical retaining wall with a horizontal backfill, Case Bis a 150 pound per square foot surcharge i.e. car, light truck, Case C is a 3:1 horizontal to vertical sloping surcharge, Case D is a 2:1 horizontal to vertical sloping surcharge.

In all geometric cases it is assumed the ground line at the base of the wall is horizontal - perpendicular to the wall face. (If the ground line is sloped downward perpendicular to the wall face greater than 4:1, further wall embedment and a site specific analysis is needed).

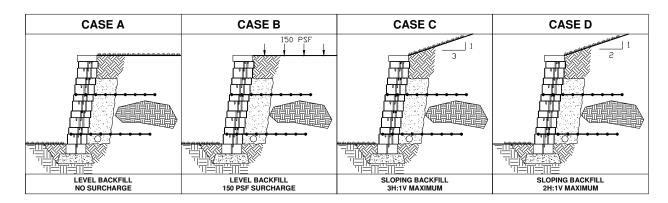
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LOADING CONDITIONS



Standardized Masterplan only allows the use of the soil classifications listed below. If your site soil conditions do not meet the indicated soil types a site specific wall design and / or additional engineering will be needed.

The Masterplan soil classifications are based on the three of the five IBC soil classifications of which Class 3, 4 and 5 are considered in this Masterplan. These class soil types are defined below with their respective Unified Soil Classification designations.

IBC Class 3 Soils - (34° degree Ø phi angle)

IBC Class 3 soil consists of gravel and/or gravel-sand (GW and GP) which are free draining and have predictable design properties.

IBC Class 4 Soils - (30° degree Ø phi angle)

IBC Class 4 soil consists of silty gravel, clayey gravel, sands, silty sands (GM, GC, SW, SP, SM and SC) which are free draining and have predictable design properties.

IBC Class 5 Soils - (28° degree phi angle)

IBC Class 5 soil consists of fine sand, clayey sand, silts, silty clays and lean clay (ML and CL), low to medium plasticity.

NOTE: Documentation of soil types, compaction testing, geogrid materials, special inspection or other engineering services may be required to use Standardized Masterplan when obtaining permits.

WALL BATTER: 8.53 Degrees. All depicted designs meet the minimum factors of safety listed below:

MINIMUM FACTORS OF SAFETY CALCULATED

Reinforcement Pullout = 1.5

Reinforcement Rupture = 1.5 External

Sliding = 1.5 Overturning = 2.0

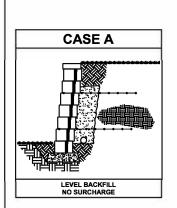
Overall for Unknowns = 1.5 Bearing

Capacity = 2000 psf minimum

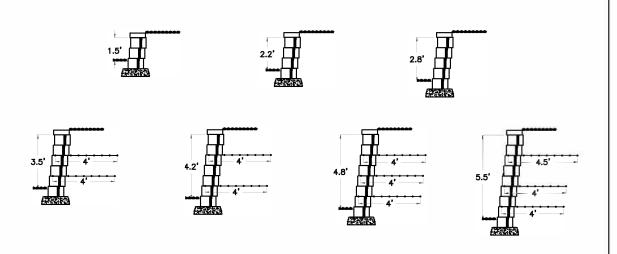
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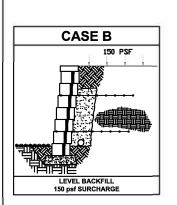


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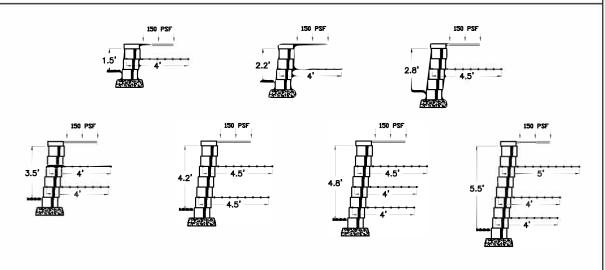


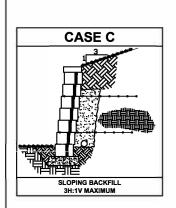
IBC CLASS 3 SOIL



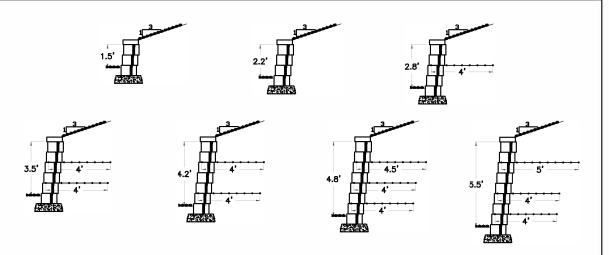


IBC CLASS 3 SOIL





IBC CLASS 3 SOIL

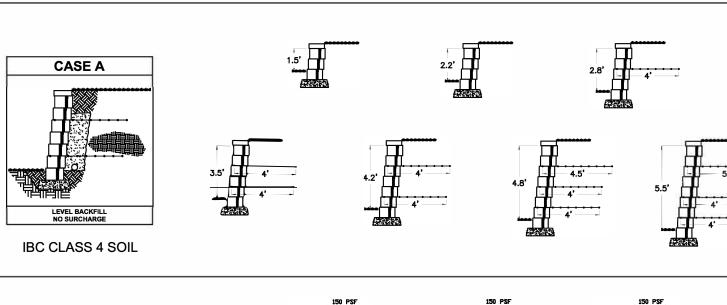


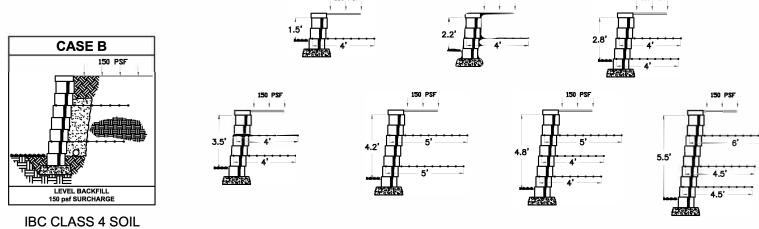


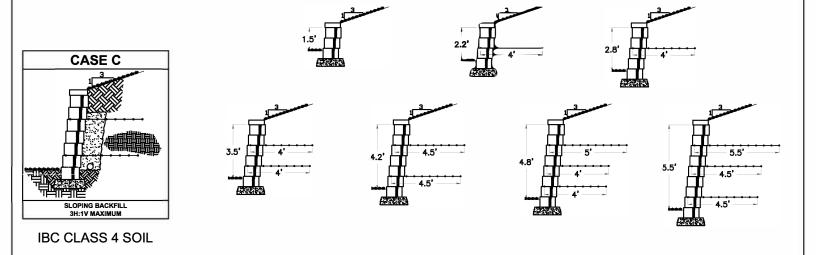
IBC CLASS 3 SOIL REINFORCED WALLS









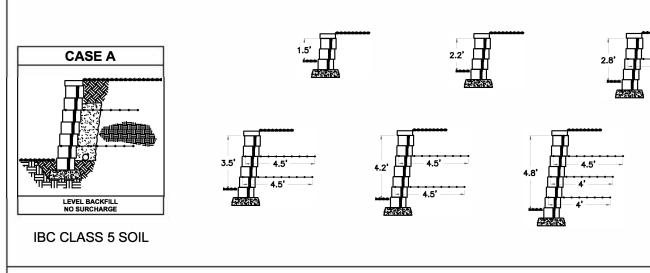


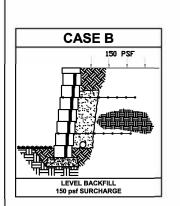
VERSA-LOK SQUARE FOOT UNITS &
MIRAGRID 3XT, STRATAGRID SG200, OR
SYNTEEN SF 35 GEOGRID

IBC CLASS 4 SOIL REINFORCED WALLS

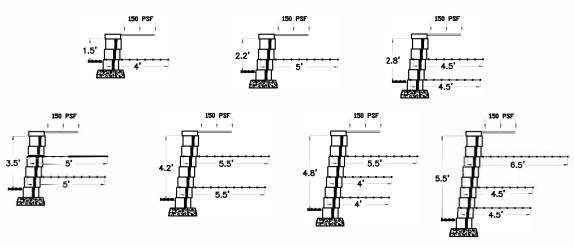


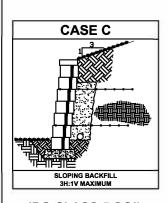




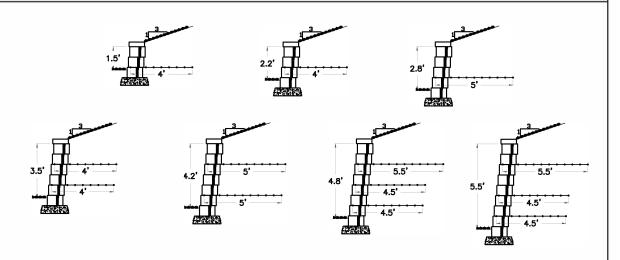


IBC CLASS 5 SOIL





IBC CLASS 5 SOIL

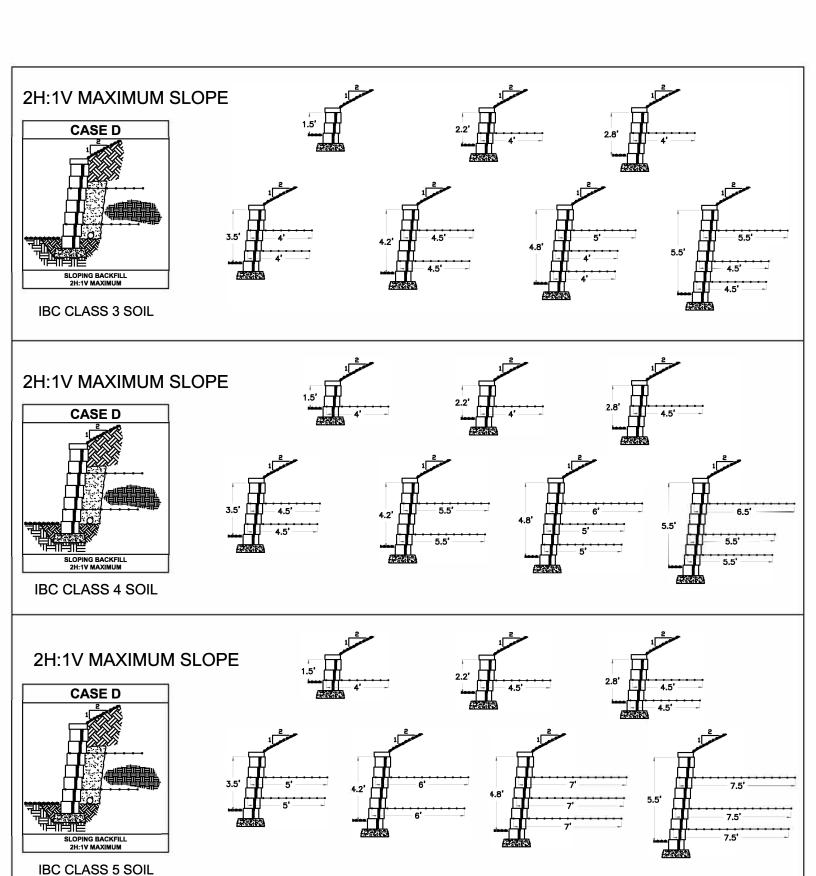


VERSA-LOK SQUARE FOOT UNITS &
MIRAGRID 3XT, STRATAGRID SG200, OR
SYNTEEN SF 35 GEOGRID

IBC CLASS 5 SOIL REINFORCED WALLS





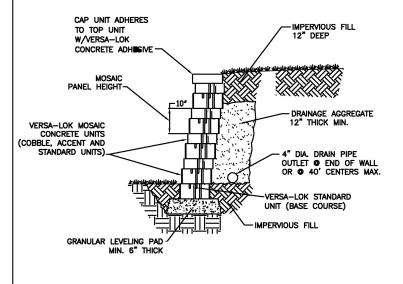




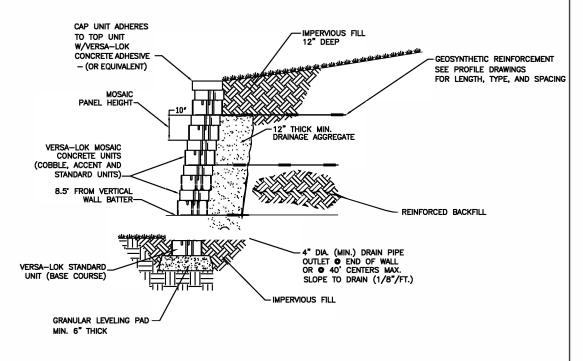
2H:1V MAXIMUM SLOPE REINFORCED WALLS







TYPICAL SECTION-UNREINFORCED RETAINING WALL



TYPICAL SECTION—REINFORCED RETAINING WALL
SCALE: NONE

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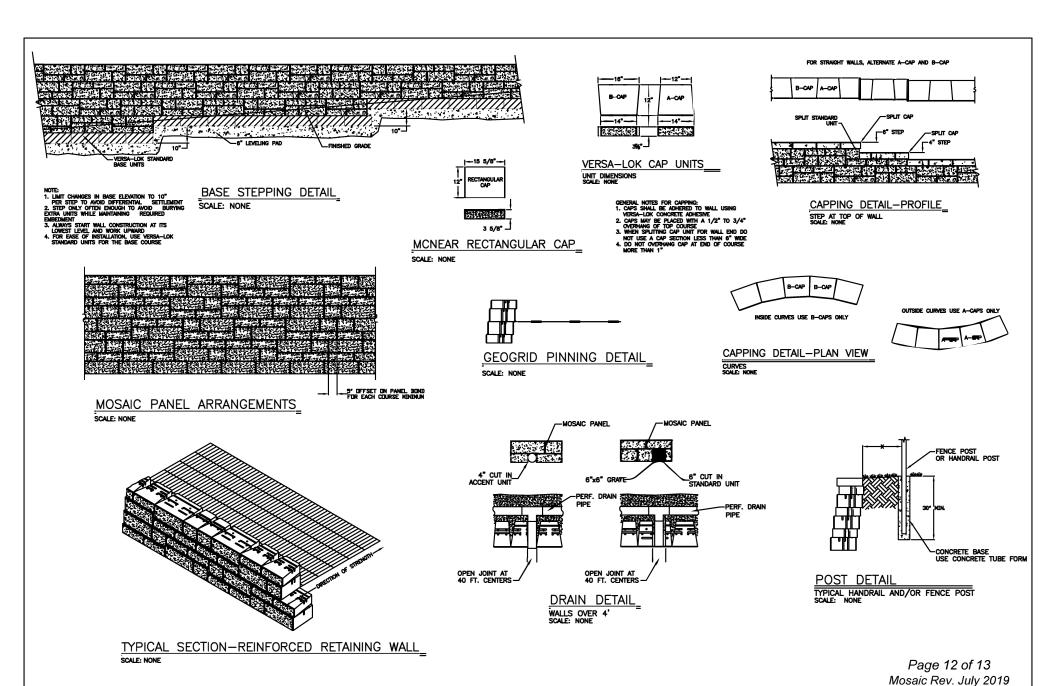
SCALE: NONE

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TYPICAL SECTIONS MOSAIC MASTERPLAN	SCALE: AS NOTED	
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TYPICAL SECTIONS TRANSMENT TO THE PROPERTY OF THE PROPERTY OF

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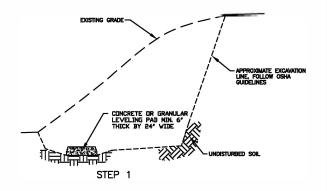
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DATE:
4/04

DIGG. NO. MASTERPLAN MOS. TYP.

CONSTRUCTION SEQUENCE

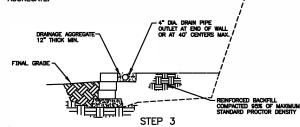
- VERIFY LOCATION OF EXISTING STRUCTURES AND UTILITIES.
 EXCAVATE AREA LARGE ENOUGH TO ACCOMMODATE LEVELING PAD, REQUIRED UNIT EMBEDMENT, AND REQUIRED GEOGRID LENGTHS.
 PROOF ROLL AND COMPACT EXCAVATED FOUNDATION AREA.



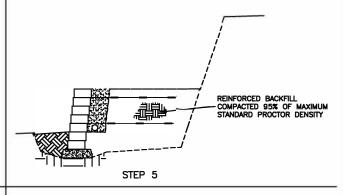
- PLACE MOSAIC PANELS ON LOWER COURSE OF UNITS. INSERT TWO CONNECTION PINS THROUGH TWO OF THE FOUR CENTER HOLES OF THE UPPER COURSE UNITS INTO THE CENTER SLOTS OF THE LOWER
- CHECK LEVEL AND ALIGNMENT OF UNITS.
 CONTINUE PLACING COURSES OF UNITS AND COMPACTING BACKFILL IN FRONT OF AND BEHIND UNITS UNTIL REACHING HEIGHT OF FINAL
- GRADE IN FRONT OF WALL.

 BEGINNING JUST ABOVE THE FINAL GRADE IN FRONT OF WALL, PLACE DRAINING AGREGATE BEHIND THE UNITS TO REQUIRED THICKNESS.

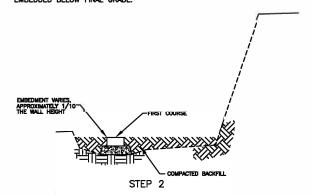
 INSTALL DRAININGE COLLECTION PIPES AT BASE OF DRAININGE
- AGGREGATE, WITH PERFORATION OR SLOTS FACING DOWN.
- SLOPE DRAIN PIPE TO ALLOW GRAVITY FLOW OF WATER TO OUTSIDE THE WALL SYSTEM, OUTLETTING PIPES AS REQUIRED.
- PLACE AND COMPACT REINFORCED BACKFILL BEHIND DRAINAGE AGGREGATE.



- CONTINUE PLACEMENT OF WALL UNITS, GEOSYNTHETIC, DRAINAGE AGGREGATE AND REINFORCED BACKFILL BY REPEATING STEP 4 UNTIL WALL IS WITHIN ONE FOOT OF FINAL HEIGHT.
- STACK NO MORE THAN THREE COURSES BEFORE BACKFILL IS PLACED
- · COMPACT BACKFILL IN NO GREATER THAN 6" THICK LIFTS.



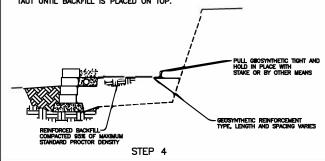
- · PLACE LOWEST COURSE OF STANDARD WALL UNITS ON LEVELING PAD, SETTING UNIT SIDES AGAINST ADJACENT UNITS.
- LEVEL UNITS SIDE-TO-SIDE, FRONT-TO-REAR, AND WITH ADJACENT
- CHECK ALIGNMENT ALONG BACK OF UNITS.
 PLACE AND COMPACT BACKFILL IN FRONT AND BEHIND UNITS TO BE EMBEDDED BELOW FINAL GRADE.



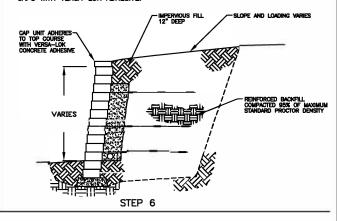
- CONTINUE PLACING UNITS, DRAINAGE AGGREGATE AND REINFORCED BACKFILL. UNTIL REACHING HEIGHT OF GEOSYNTHETIC LAYER.
- •LAY THE REQUIRED LENGTH OF GEOSYNTHETIC HORIZONTALLY ON TOP OF THE UNITS, ENSURING HIGHEST STRENGTH DIRECTION OF GEOSYNTHETIC IS PERPENDICULAR TO WALL FACE.
- PLACE NEXT COURSE OF UNITS ON TOP OF GEOSYNTHETIC AND PIN DOWN THROUGH GEOSYNTHETIC INTO UNITS BELOW.

 PLACE DRAINAGE AGGREGATE BEHIND UNITS TO REQUIRED THICKNESS.
- PULL BACK OF GEOSYNTHETIC TO REMOVE ANY WRINKLES OR
- LOOSENESS. DO NOT OVER TENSION.

 USE STAPLES, STAKES, OR HAND TENSION TO KEEP GEOSYNTHETIC TAUT UNTIL BACKFILL IS PLACED ON TOP.



- PLACE AND COMPACT IMPERVIOUS SOIL BEHIND THE TOP 12 INCHES
- · PLACE AND ALIGN CAP UNITS, WITH A SLIGHT OVERHANG, ON TOP COURSE.
- AFTER ENSURING PROPER ALIGNMENT, REMOVE AND THEN ADHERE CAPS WITH VERSA—LOK ADHESIVE.



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AS NOTED INSTALLATION SEQUENCE 4/04 MOSAIC MASTERPLAN MCN MASTERPLAN MOSAIC