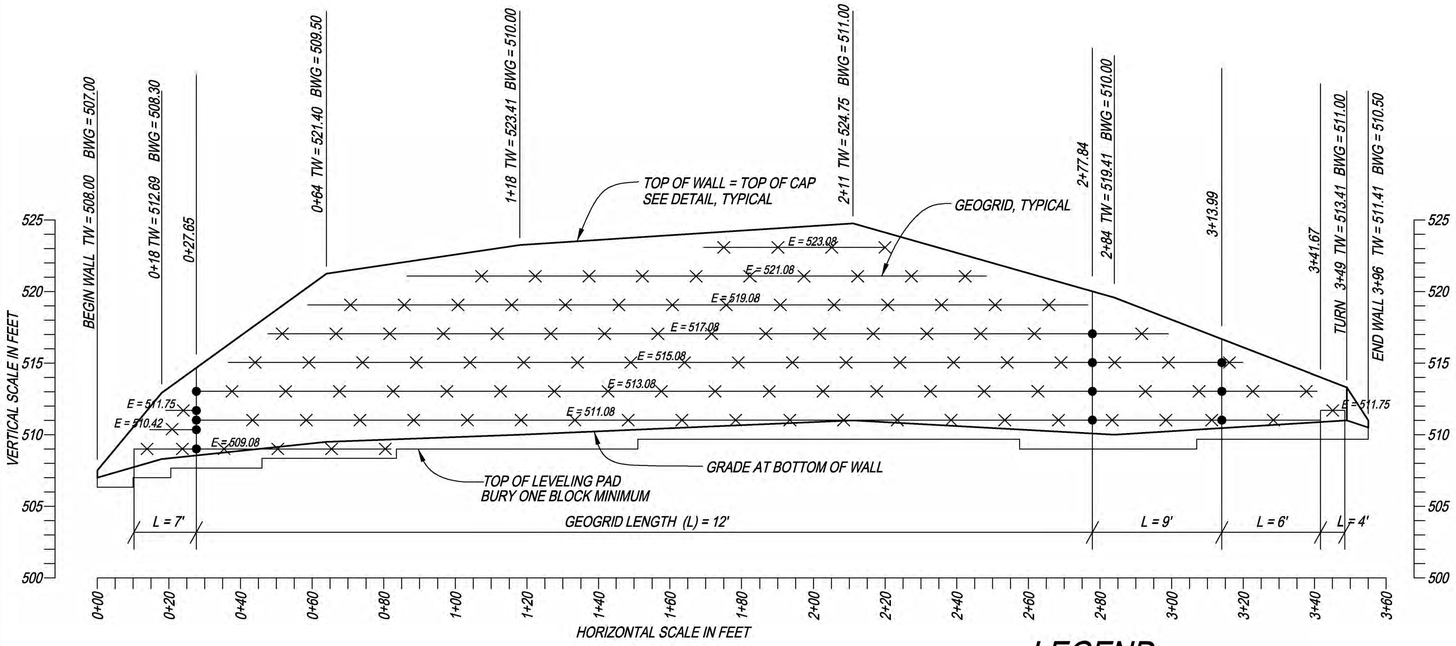
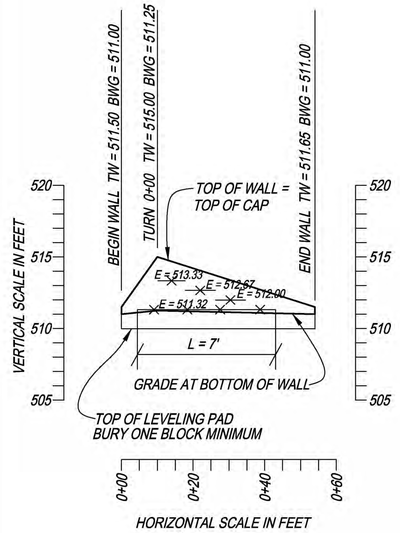


RETAINING WALL 1

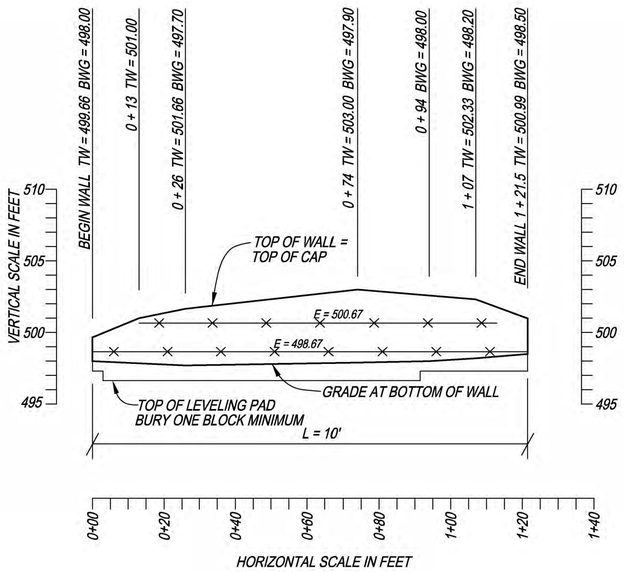
LEGEND

- DENOTES CHANGE IN GEOGRID LENGTH
- MIRAGRID 3XT GEOGRID

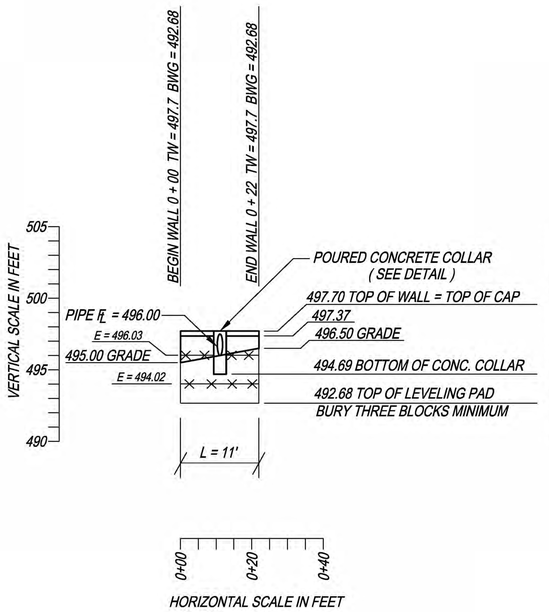
TW = TOP OF WALL
BWG = BOTTOM OF WALL AT GRADE
E = ELEVATION OF GEOGRID
L = LENGTH OF GEOGRID IN FEET MEASURED FROM EXPOSED FACE OF WALL



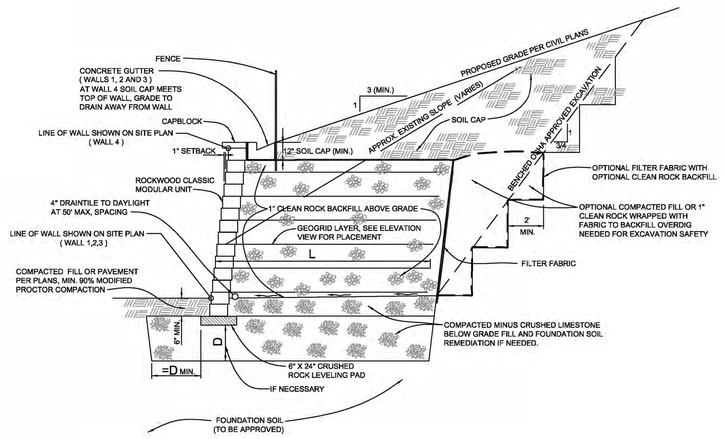
RETAINING WALL 2



RETAINING WALL 3



RETAINING WALL 4



TYPICAL REINFORCED WALL SECTION

(NOT TO SCALE)

GENERAL

See Civil Engineering Retaining Wall Site Plan by others. This design is to specify the structural requirements of the new walls. Existing utilities shall be field located. The contractor shall protect all utilities, and shall be responsible for all job site worker and public safety during the work. Landscaping shall be per owner's direction under separate plan. All installation shall be per the material manufacturer's construction recommendations, and as noted herein.

Uncompacted backfill in any utility trenches in the wall vicinity can affect wall stability and/or settlement performance. The contractor shall locate any utilities at or in the vicinity of the wall to determine if any utility backfill could affect the wall.

Some periodic landscape maintenance may be required at the top of the walls. Maintaining proper storm water drainage above the walls is important to maintaining structural integrity of the walls.

MATERIALS

Leveling pad shall be one-inch minus, crushed limestone, compacted to at least 90 percent of the material's maximum dry density as determined by the Modified Proctor Compaction Test or ASTM D 1557-78.

Retaining wall units shall be Rockwood Classic (8") units. The units must provide an infilled unit weight of at least 118 pounds per cubic foot (pcf). Concrete wall units shall meet the requirements of ASTM C 145-85. Concrete compressive strength shall be 3,000 pounds per square inch (psi) or greater. The maximum water absorption shall be limited to 6.0 percent. The concrete shall have adequate freeze-thaw resistance in accordance with ASTM C 666-90.

Reinforced Wall Backfill shall be one-inch clean crushed limestone tamped to improve the interlock and bond between the particles. The below grade backfill and structural fill shall consist of two-inch minus crushed limestone compacted to at least 90 percent of the material's maximum dry density as determined by the Modified Proctor Compaction Test or ASTM D 1557-78.

Geogrid shall be Miragrid 3XT as indicated on these plans.

Filter fabric shall be 4-oz non-woven.

Block infill shall be one-inch clean, crushed limestone.

Soil Cap shall consist of low plasticity soil compacted at least 88 percent of the soil's maximum dry density per ASTM D 1557-78. The compaction should be tested to confirm adequate densification. The soil shall be placed with moisture slightly above the optimum moisture content to help minimize water infiltration.

WALL FOUNDATION

The walls site shall be excavated to reach the base of the geogrid reinforced fill zone, and trenched to the base of the leveling pad. The excavation must comply with the soil requirements for bearing capacity and global stability considerations and shall comply with the wall design parameters. It must be confirmed the actual soil conditions equal or exceed the design soil parameters. As each excavation section is cut the site shall be inspected by the wall design engineer to evaluate the suitability of the soils. The excavation including the base and retained materials must be free of loose soil, uncompacted fill, water, high plasticity clay with less than 50 percent rock content, or frozen material. Both areas must be approved by the Wall Design Engineer prior to placing rock backfill. Unsuitable soil shall be removed from the excavation as specified by the engineer and replaced with structural fill compacted to at least 90% maximum dry density per ASTM D 1557-78. The structural fill shall extend out in front of the wall from the front of the base block a lateral distance equal to or greater than the depth below the base block as shown on the Typical Wall Sections. At walls 3 and 4 it is noted that the project geotechnical report disclosed old fill. Also we note that the existing sanitary sewer passes beneath this area. A need for the removal and recompaction of old fill including the proposed 3:1 fill slope above Wall 3 is anticipated. It may be feasible to leave the sewer backfill in place subject to to field observations and the owners acceptance of possible settlement. At Wall 4 an old drainage draw with soft soil may be encountered. It may be necessary to undercut and replace soft wet soil as specified by the engineer.

WALL CONSTRUCTION

Provide a six-inch thick, 1-inch minus, crushed limestone leveling pad a minimum of 24 inches wide, compacted to at least 90 percent of the material's maximum dry unit weight per ASTM D 1557 tested for confirmation of compaction. Check that units do not "rock" or "wobble" on the leveling pad and has full bearing. Install the next course in a running bond stack.

The geogrid's maximum strength direction must be directed perpendicular to the length of the wall face (into the fill). The geogrid shall be kept taut. Any slack in the geogrid shall be removed prior to placing backfill. All geogrid installation details shall be in accordance with the geogrid manufacturer's specifications. Place reinforced minus rock backfill (below grade fill) in maximum six-inch loose lifts and compact to at least 90 percent of the maximum dry unit weight per ASTM D 1557, and verify by field density tests. Clean rock backfill shall be tamped to improve the interlock and bond between the particles. Only hand-operated equipment, weighing less than 1,500 pounds shall be used within four feet of the concrete block. Filter fabric shall be placed as shown and including below the soil cap (above the clean rock) and behind the clean rock to prevent migration of soil into the clean rock.

EARTHWORK

Any fill retained by the wall must be compacted to at least 90 percent of the material's maximum dry density per ASTM D 1557, and consist of low plasticity soil, i.e. a soil having a Liquid Limit less than 50, a rocky clay having at least 50 percent rock content distributed through the fill material, or approved granular material. The fill compaction shall be verified through field density testing during placement. Fill placed on slopes with an inclination of 5 (horizontal) to 1 (vertical) shall be placed on level benches cut into approved virgin soil. All organic material shall be stripped from the areas to be filled.

SEWER AND UTILITY BACKFILL

All sewer pipe and structure backfill and other utility trench backfill adjacent to the retaining wall, i.e., within, below, in front of and behind the reinforced fill within a lateral distance of twice a given wall's total cumulative height, must be compacted in accordance with the general structural fill specifications. Where sewers pass beneath the wall, the trench backfill should consist of compactec crushed limestone with fines.

PROTECTION OF WORK

The surface of the wall backfill area shall be graded at the end of each day of work to provide positive surface drainage away from the wall as much as feasible. Grading shall include proper contouring of adjacent ground areas to prevent the flow of surface runoff toward the wall. Until the wall and finish grading is complete, the wall is at greater risk of damage during construction.

The construction methods, and safety are strictly the responsibility of the contractor. The stability of any temporary excavation is strictly the responsibility of the contractor, slope stability engineer and owner in accordance with generally accepted industry practice.

DESIGN PARAMETERS

This design is based upon certain design parameters that should be field verified by the engineers as part of the construction process. This verification is subject to standard limitations but should include both existing soils and new fill material. If any actual conditions are of lesser strength or quality than the design parameters the design may not function as intended. It should be noted that if actual site conditions are of lesser strength or quality than the design parameters, then remediation or redesign and additional expenses could be required to properly complete project.

MISCELLANEOUS

Brucker Engineering Company is available to confirm that the wall construction is done in accordance with these specifications. Brucker Engineering Company will make the necessary field observations for an additional fee provided these services are requested and authorized sufficiently prior to the wall construction. No changes shall be made to these plans without the written approval of Brucker Engineering Company.

THIS SEAL RELATES TO THIS PLAN FOR THE PROPOSED RETAINING WALLS AT THE BIOLIFE PLASMA CENTER IN O'FALLON, MISSOURI AND TO NO OTHER PLAN OR DOCUMENT RELATING TO THIS PROJECT.

PREPARED FOR:
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DATE DRAWN: MARCH 1, 2016

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DRAWN BY: DRC
APPROVED BY: JLT

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PROJECT NAME:
RETAINING WALL PLANS FOR
BIOLIFE PLASMA CENTER
O'FALLON, MISSOURI

SHEET 1

SEE ADDITIONAL DETAILS ATTACHED