

PROPOSED SEGMENTAL RETAINING WALLS WATERBURY TOWN CENTER ST. LOUIS, MISSOURI

JAN 2 2007
OK-98
2/6/07

MATERIAL NOTES

- Concrete Retaining Wall Units: "Anchor Diamond Pro Retaining Wall Units" as manufactured by Building Products Corporation under license from Anchor Wall Systems.
- Geosynthetic Reinforcement: Synteen SF 35, as shown on the Drawings.
- Leveling Pad Base
 - Aggregate Base: Crushed stone or granular fill meeting the following gradation as determined in accordance with ASTM D448:

Sieve Size	Percent Passing
1 inch	100
No. 4	35 to 70
No. 40	10 to 35
No. 200	3 to 10
 - Base Thickness: 6 inches (minimum compacted thickness).
- Drainage Aggregate: Clean crushed stone or granular fill meeting the following gradation as determined in accordance with ASTM D448:

Sieve Size	Percent Passing
1 inch	100
3/4 inch	75 to 100
No. 4	0 to 60
No. 40	0 to 50
No. 200	0 to 5
- Reinforced fill: Soil free of organics and debris and consisting of either GP, GW, SW, SP, SM or CL type, classified in accordance with ASTM D2487 and the USCS classification system.
 - Soils classified as SC are considered suitable soils for segmental retaining walls with a total height of less than 15 feet as long as the Plasticity Index (PI) is less than 20.
 - Maximum particle size for backfill is two (2) inches.
 - Unsuitable soils are organic soils and those soils classified as CH, OH, MH, OL, or PT.
- Impervious Material: Clayey soil or other similar material which will prevent percolation into the drainage zone behind the wall.
- Drainage Pipe: Perforated or slotted PVC or corrugated HDPE pipe manufactured in accordance with D3034 and/or ASTM F405. The pipe may be covered with a geotextile filter fabric to function as a filter.
- Construction Adhesive: Exterior grade adhesive as recommended by the retaining wall unit manufacturer.

FOUNDATION SOIL NOTES

- Excavate foundation soil as required for footing or base dimension shown on the Drawings, or as directed by the Project geotechnical engineer.
- The Project geotechnical engineer will examine foundation soil to ensure that the actual foundation soil strength meets or exceeds that indicated on the Drawings. Remove soil not meeting the required strength. Oversize resulting space sufficiently from the front of the block to the back of the reinforcement, and backfill with suitable compacted backfill soils.
- The Project geotechnical engineer will determine if the foundation soils will require special treatment or correction to control total and differential settlement.
- Fill over-excavated areas with suitable compacted backfill, as recommended by the Project geotechnical engineer.

BASE COURSE NOTES

- Place base materials to the depths and widths shown on the Drawings, upon undisturbed soils, or foundation soils prepared as directed by the project geotechnical engineer.
 - Extend the leveling pad laterally at least 6 inches in front and behind the lowermost concrete retaining wall unit.
 - Provide aggregate base compacted to 6 inches thick (minimum).
- Compact aggregate base material to provide a level, hard surface on which to place the first course of units.
- Prepare base materials to ensure complete contact with retaining wall units. Gaps are not allowed.

ERECTION NOTES

- Excavation support, if required, is the responsibility of the Contractor, including the stability of the excavation and its influence on adjacent properties and structures.
- General: Erect units in accordance with manufacturer's instructions and recommendations, and as specified herein.
- Place first course of concrete wall units on the prepared base material. Check units for level and alignment. Maintain the same elevation at the top of each unit within each section of the base course.
- Ensure that foundation units are in full contact with natural or compacted soil base.
- Place concrete wall units side-by-side for full length of wall alignment. Alignment may be done by using a string line measured from the back of the block. Gaps are not allowed between the foundation concrete wall units.
- Place 12 inches (minimum) of drainage aggregate between, and directly behind the concrete wall units. Fill voids in retaining wall units with drainage aggregate. Provide a drainage zone behind the wall units to within 9 inches of the final grade. Cap the backfill and drainage aggregate zone with 9 inches of impervious material.
- Install drainage pipe at the lowest elevation possible, to maintain gravity flow of water to outside of the reinforced zone. Slope the main collection drainage pipe, located just behind the concrete retaining wall units, 2 percent (minimum) to provide gravity flow to the daylighted areas. Daylight the main collection drainage pipe to an appropriate location away from the wall system at each low point or at 50 foot (maximum) intervals along the wall.
- Remove excess fill from top of units and install next course. Ensure drainage aggregate and backfill are compacted before installation of next course.
- Check each course for level and alignment. Adjust units as necessary with reinforcement shims to maintain level, alignment, and setback prior to proceeding with each additional course.
- Install each succeeding course. Backfill as each course is completed. Pull the units forward until the locating surface of the unit contacts the locating surface of the units in the preceding course. Interlock wall segments that meet at corners by overlapping successive courses. Attach concrete retaining wall units at exterior corners with adhesive specified.
- Install geosynthetic reinforcement in accordance with geosynthetic manufacturer's recommendations and the shop drawings.
 - Orient geosynthetic reinforcement with the highest strength axis perpendicular to the wall face.
 - Prior to geosynthetic reinforcement placement, place the backfill and compact to the elevation of the top of the wall units at the elevation of the geosynthetic reinforcement.
 - Place geosynthetic reinforcement at the elevations and to the lengths shown on the Drawings.
 - Lay geosynthetic reinforcement horizontally on top of the concrete retaining wall units and the compacted backfill soils. Place the geosynthetic reinforcement within one inch of the face of the concrete retaining wall units. Place the next course of concrete retaining wall units on top of the geosynthetic reinforcement.
 - The geosynthetic reinforcement shall be in tension and free from wrinkles prior to placement of the backfill soils. Pull geosynthetic reinforcement hand-taut and secure in place with staples, stakes, or by hand-tensioning until the geosynthetic reinforcement is covered by 6 inches of loose fill.
 - The geosynthetic reinforcements shall be continuous throughout their embedment lengths. Splices in the geosynthetic reinforcement strength direction are not allowed.
 - Do not operate tracked construction equipment directly on the geosynthetic reinforcement. At least 6 inches of compacted backfill soil is required prior to operation of tracked vehicles over the geosynthetic reinforcement. Keep turning of tracked construction equipment to a minimum.
 - Rubber-tired equipment may pass over the geosynthetic reinforcement at speeds of less than 5 miles per hour. Turning of rubber-tired equipment is not allowed on the geosynthetic reinforcement.

BACKFILL PLACEMENT NOTES

- Place reinforced backfill, spread and compact in a manner that will minimize slack in the reinforcement.
- Place fill within the reinforced zone and compact in lifts not exceeding 6 to 8 inches (loose thickness) where hand-operated compaction equipment is used, and not exceeding 12 inches (loose thickness) where heavy, self-propelled compaction equipment is used.
 - Only lightweight hand-operated compaction equipment is allowed within 4 feet of the back of the retaining wall units. If the specified compaction cannot be achieved within 4 feet of the back of the retaining wall units, replace the reinforced soil in this zone with drainage aggregate material.
- Minimum Compaction Requirements for Fill Placed in the Reinforced Zone
 - Compact to 95 percent of the soil's standard Proctor maximum dry density (ASTM D698) for the entire wall height.
 - Increase compaction requirements for retaining wall with slope heights at the back of the reinforced soil zone greater than 5 feet above the top of wall. Verify compaction requirements with the Project geotechnical engineer.
 - Utility Trench Backfill: Compact utility trench backfill in or below the reinforced soil zone to 98 percent of the soil's standard Proctor maximum dry density (ASTM D698), or as recommended by the Project geotechnical engineer.
 - Utilities must be properly designed (by others) to withstand all forces from the retaining wall units, reinforced soil mass, and surcharge loads, if any.
 - Moisture Content: Within 2 percentage points of the optimum moisture content for all wall heights.
- These notes may be changed based on recommendations by the Project geotechnical engineer.
- At the end of each day's operation, slope the last level of compacted backfill away from the interior (concealed) face of the wall to direct surface water runoff away from the wall face.
 - The General Contractor is responsible for ensuring that the finished site drainage is directed away from the retaining wall system.
 - In addition, the General Contractor is responsible for ensuring that surface water runoff from adjacent construction areas is not allowed to enter the retaining wall area of the construction site.

CAP UNIT INSTALLATION NOTES

- Apply adhesive to the top surface of the unit below and place the cap unit into desired position.
- Cut cap units as necessary to obtain the proper fit.
- Backfill and compact to top of cap unit.

WALL CONSTRUCTION TOLERANCE NOTES

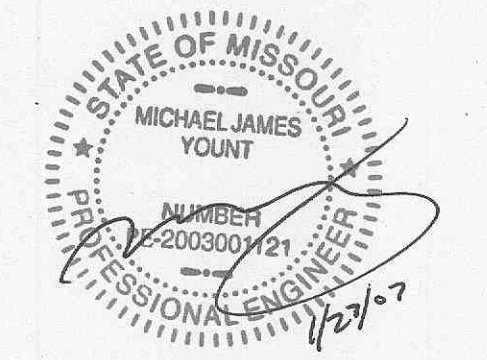
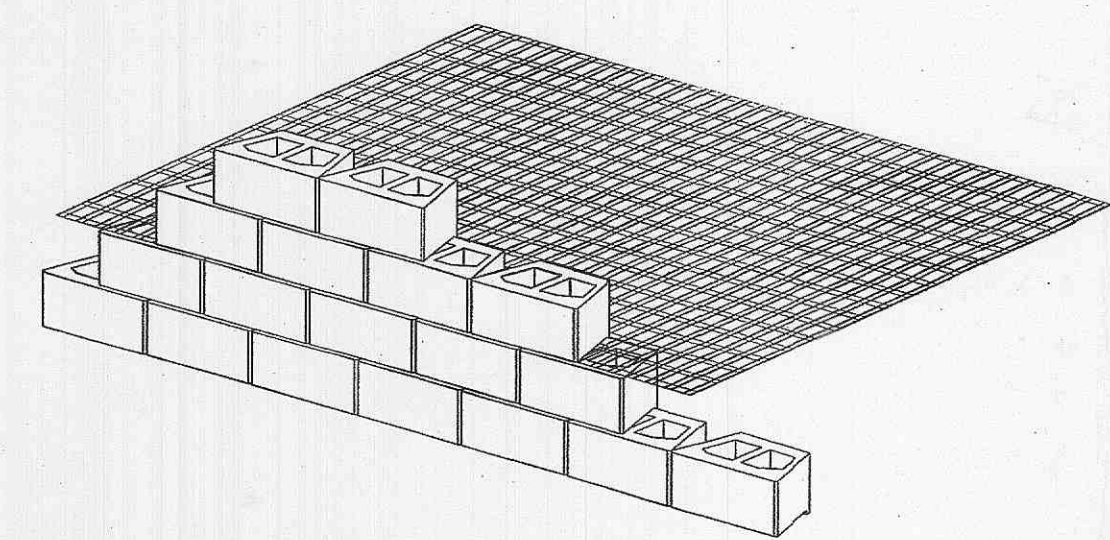
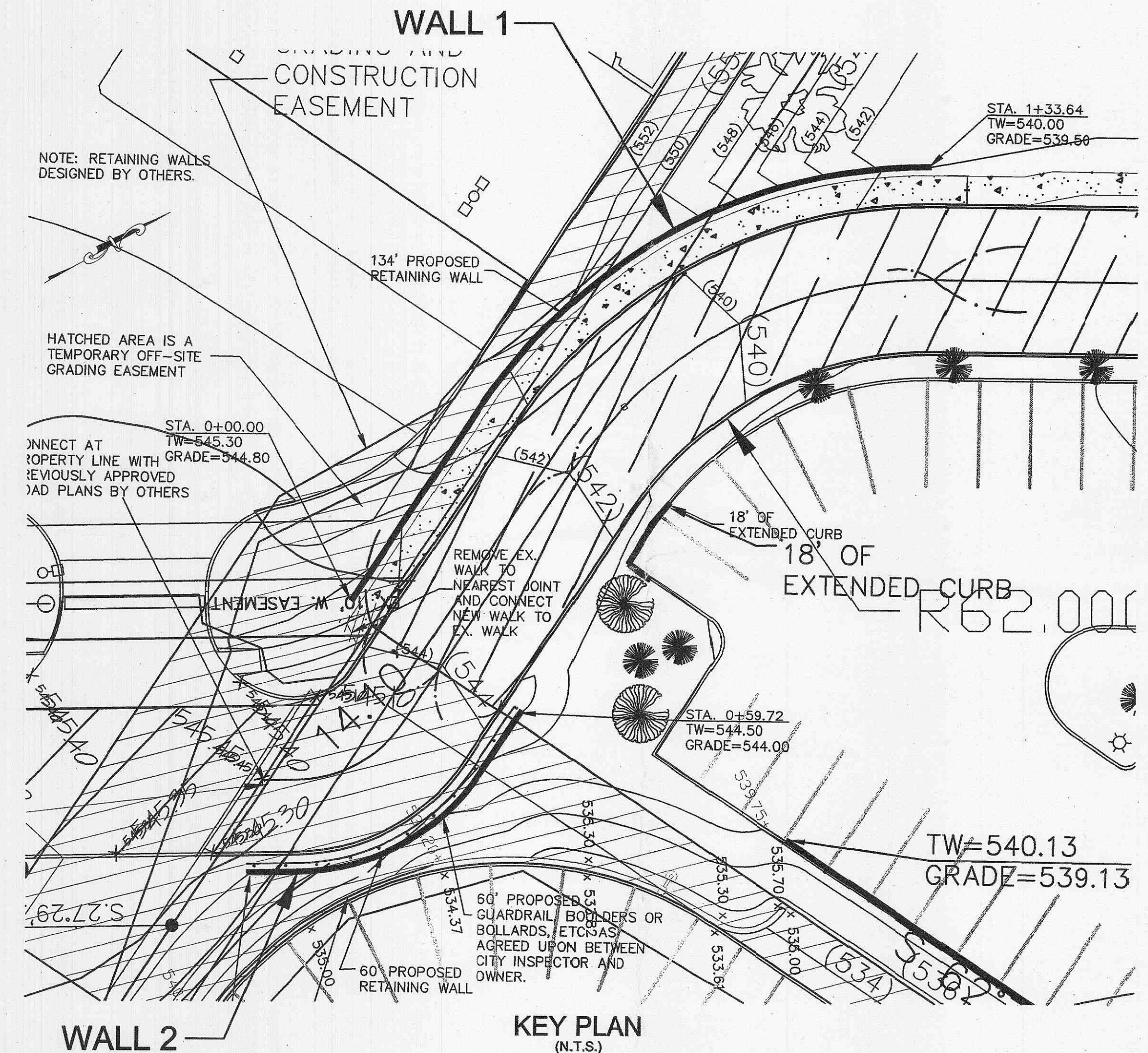
- Wall Construction Tolerances
 - Vertical Alignment: Plus or minus 1-1/4 inches over any 10-foot distance, with a maximum differential of 3 inches over the length of the wall.
 - Horizontal Location Control From Grading Plan
 - Straight Lines: Plus or minus 1-1/4 inches over any 10-foot distance, with a maximum differential of 3 inches over the length of the wall.
 - Corner and Radius Locations: Plus or minus 12 inches.
 - Curves and Serpentine Radii: Plus or minus 2 feet.
 - Immediate Post Construction Wall Batter: Within 2 degrees of the design batter of the concrete retaining wall units.
 - Bulging: Plus or minus 1-1/4 inches over any 10-foot distance.

FIELD QUALITY CONTROL NOTES

- Installer is responsible for quality control of installation of system components. Owner to employ a qualified independent third party to verify the correct installation of system components in accordance with these specifications and the Drawings.
- The Owner, at their expense, will retain a qualified professional to perform quality assurance checks of the installer's work.
- Correct work which does not meet these specifications or the requirements shown on the Drawings at the installer's expense.
- Project Geotechnical Engineer to perform compaction testing of the reinforced backfill placed and compacted in the reinforced backfill zone.
 - Testing Frequency (or as directed by Project Geotechnical Engineer)
 - One test for every 2 feet (vertical) of fill placed and compacted, for every 50 lineal feet of retaining wall.
 - Vary compaction test locations to cover the entire area of the reinforced soil zone, including the area compacted by the hand-operated compaction equipment.

GENERAL NOTES

- The owner or owners representative must retain a geotechnical engineer/construction testing firm to evaluate the foundation soils prior to construction. Unsuitable soils (if any), as determined by the owner's geotechnical engineer, shall be removed and replaced with properly compacted fill soil as directed by the owner's geotechnical engineer. Unsuitable soils are defined as any soil that does not have sufficient bearing capacity or will cause excessive wall settlement.
- The owner or owner's representative has not provided foundation or retained soil strength parameters for design of the segmental retaining walls. In preparation of wall design, soil strength parameters for the foundation and retained soils were assumed by the Engineer of Record. It is the responsibility of the owner or owner's representative to verify the assumed soil strength parameters are representative of the soils available for wall construction. If the soil strength parameters are found to be inconsistent with those assumed by the engineer of record, this design is no longer valid and it is the responsibility of the owner or owner's representative to notify the engineer of record so the retaining wall system can be redesigned. Failure to notify the engineer of record may result in failure of the retaining wall.
- Assumed Design Soil Parameters:
Reinforced soil, imported/on-site clay (CL), phi = 26 degrees, gamma = 125 pcf.
Retained soil, imported/on-site clay (CL), phi = 26 degrees, gamma = 125 pcf.
Foundation soil, imported/on-site clay (CL), phi = 26 degrees, gamma = 125 pcf.
- Any excavation below the wall should have proper 1:1 lateral oversizing. Excavation oversizing should be measured from the front of the gravel leveling pad and the back of the lowest reinforcement layer. Refer to detail 3 on sheet W3.
- Wall stationing shown on sheet W2 is not related to any other stationing shown on the grading plans. Station 0+00 is on the left end of the wall as seen from in front of the wall. The stationing shown for each wall is unique for that wall system.
- This set of segmental retaining wall plans are based on the grading plans prepared by BAX, dated December 20, 2006. If other grading plans are produced that contain different information than that referenced, this plan may need to be revised and/or the walls may need to be redesigned.
- This set of segmental retaining wall plans are based specifically on the walls being constructed with Diamond Pro block and Synteen SF 35 reinforcement products. Absolutely no substitutions allowed.
- Locations of the segmental retaining walls in relation to property lines, utility easements, watershed easements, or any other type of easements are the responsibility of the owner or the site civil engineer. The Engineer of Record assumes no liability for the location of the segmental retaining walls, or if construction of the proposed segmental retaining walls encroaches any property lines or easements.
- It is imperative that the site surveying of all segmental retaining walls be done by the site civil engineer or surveyor and must be based on computer generated site/grading plans and not profile plans done by the Engineer of Record. Surveying of all segmental retaining walls must take into account the design batter indicated on the enclosed plans and details. Failure to take into account wall batter for segmental retaining wall surveying will produce incorrect locations of all top of walls and shall be corrected at no cost to the Engineer of Record or the segmental retaining wall contractor.
- Wall geometry, locations, slopes and surcharge loads for the segmental retaining walls were measured from the site grading plan referenced above, and partially reproduced to the right. If conditions vary in the field from those shown on this plan, the Engineer of Record must be notified prior to construction of the segmental retaining walls to review the design and/or plans. Modifications to the design and/or plans may be required after the review, and may take up to ten business days to complete.
- Complete utility information was not provided to the Engineer of Record for the preparation of these plans. If utilities are located within the proposed reinforced zone, the Engineer of Record must be notified prior to construction of the segmental retaining walls to review the design and/or plans. Modifications to the design and/or plans may take up to ten business days to complete.
- If there are discrepancies between any information on these plans and information in the project specifications, the more restrictive information takes precedence.



SHEET INDEX	
PAGE	DESCRIPTION
W1	TITLE PAGE/KEY PLAN
W2	WALL ELEVATIONS
W3-W4	SECTIONS AND DETAILS

THIS DRAWING IS FURNISHED FOR PRELIMINARY DESIGN PURPOSES ONLY, AND SHOULD NOT BE USED FOR FINAL DRAWINGS WITHOUT THE CERTIFICATION OF A PROFESSIONAL ENGINEER REGISTERED IN THE STATE IN WHICH THE WALL WILL BE CONSTRUCTED.

NO SCALE INTENDED

VERIFY THAT THE BASE ABOVE IS 18" IF NOT, ADJUST THE SCALE ACCORDINGLY.

**PROPOSED SEGMENTAL RETAINING WALLS
WATERBURY TOWN CENTER
ST. LOUIS, MISSOURI**

**BUILDING PRODUCTS CORPORATION
BELLEVILLE, IL**

DRAWN BY: AWS	REV. NO.:	DATE:	DESCRIPTION:
REVIEWED BY: AWS	1	01/22/07	WALL REVISIONS
PROJ. NO.:			
DATE:			

SHEET **W1** OF **4**

TITLE PAGE/
KEY PLAN