

SIDE VIEW

GRS PERFORMANCE TEST

FACE VIEW

CAUTION: THIS TEST APPROACHES THE ULTIMATE SPECIFIED CAPACITY OF THE FABRIC. PERSONNEL CONDUCTING THE TEST AND OBSERVING SHOULD BE WELL CLEAR OF THE SETUP AS IT IS PRESSURIZED. A FAILURE IN THE TEST COULD RESULT IN DAMAGE AND PERSONNEL INJURY.

GRS PERFORMANCE TEST BID ITEM: The item "GRS Performance Test" shall include all necessary items including all labor, equipment and materials to complete the test as described herein. The test shall be satisfactorily completed prior to any construction activity.

CONSTRUCTION OF THE TEST SETUP: The test setup shall be conducted by an independent engineering testing laboratory. The setup shall include as a minimum the cell which is the masonry, soil and fabric model as shown and dimensioned herein. The test cell shall be loaded by a minimum of four sixty (60) ton jacks to an equivalent maximum pressure of 20,000 pounds per square foot on the test soil cell. The vertical deflection during the loading shall be measured such that all variation may be accounted for in the in the vertical movement.

The test loading shall be accomplished in increments of in the unit of two (2) ksf per increment and maintained for a period of ten (10) minutes prior to adding an additional stress. This will be total of ten (10) increments for a total stress of twenty (20) ksf. The test will be terminated at twenty (20) ksf and the load released in units of two (2) ksf at ten minutes per increment. The data will be recorded continuously during the test for a complete report.

TEST SETUP MATERIALS: The materials used in the construction of the test setup shall be identical with that required for the full scale GRS abutment; i.e., Concrete Masonry Units (CMU), geotextile fabric and soil ASTM C33, Coarse Aggregate Size Number 89.

TEST WITNESS: The test shall be witnessed by three Engineering representatives of the City of Wichita. The contractor will be required to provide transportation and per diem to the site of the test should it not be conducted in the City of Wichita. Should the test not be completed in the day of the test the contractor will be required to continue the test at a later date at the expense of the contractor, this will not be reimbursed by the owner for the completion of testing.

TEST COMPLETION: The result of the test shall be summarized in a complete report by the testing laboratory. The report shall include the setup description, materials, operations, personnel and observations.

GEOSYNTHETIC REINFORCED SOIL ABUTMENT

DESIGN DATA:

DESIGN SPECIFICATIONS: AASHTO LRFD Bridge Design Specifications, Fifth Edition, 2010, with the latest interms.

DESIGN LOADING: AASHTO LRFD Bridge Design, HL-93.

GENERAL NOTES:

REMOVAL OF EXISTING STRUCTURES: When the abutment is no longer needed to maintain traffic, the structure shall be removed. The structure shall be removed as part of the bid item "Removal of Existing Structures".

GEOSYNTHETIC REINFORCED SOIL ABUTMENT: The Abutment bid item shall be "Abutment Facing". Included is CMU blocks, special backfill material (C33, #89), geotextile fabric reinforcement. "Abutment Facing" shall include all labor, materials and equipment necessary to complete the soil abutment.

CONCRETE MASONRY BLOCK: This shall consist of the furnishing and placing Hollow Core Concrete Masonry Units (CMU) meeting ASTM C90, Grade N-1, with the modifications that the block shall have a minimum compressive strength of 4000 psi. Place CMU blocks side by side for the full length of each course of the wall. Check wall plumbness a minimum of every 3 layers and correct deviations greater than 1/2 inches.

CONCRETE: This item shall include providing and placing "Commercial Grade" (fc=4,000 psi) in the top three courses of block. All CMU block shall have the fabric cut or removed to allow the voids to be tied together to a depth of three (3) full blocks. A piece of #4 rebar shall be placed in each void. The top of any exposed concrete must be shaped to shed water. All labor, equipment and materials for the concrete voids are subsidiary to the item "Abutment Facing".

SPECIAL - HIGH STRENGTH BIAXIAL WOVEN POLYPROPYLENE FABRIC: The fabric shall have a tensile strength of 4800 pounds per foot in both directions per ASTM D4595. The term "biaxial" refers to equal strength in the orthogonal directions of the fabric. The geosynthetic reinforcement shall be placed as shown on the drawings. The lengths vary as shown on the drawing and geosynthetic reinforcement schedule. Geosynthetic reinforcement shall extend behind the layers of CMU block to provide a frictional connection. The geosynthetic reinforcement shall nearly completely cover the top of the CMU block. Pull the geosynthetic reinforcement taut prior to backfilling to remove wrinkles. To limit construction damage to the geotextile reinforcement, construction equipment shall not drive directly over the geotextile. An aggregate thickness of 6 inches is sufficient to prevent equipment from damaging the geotextile. No lapping of fabric shall be permitted along the face. Where lapped elsewhere a 0.25 inch thickness of stone shall be spread between pieces of fabric. The geotextile is the tension element of the wall design; as such the geotextile fabric shall not be lapped for the full length extending behind the wall where the aggregate is placed.

SPECIAL TESTING - GEOTEXTILE FABRIC: This testing shall be performed by an independent laboratory and provide the following data for the fabric employed in the construction:

- The ultimate geotextile reinforcement strength in the biaxial fabric shall be 4,800 pounds per foot of width.
 - The allowable maximum load at a strain of one percent (1%) shall not be less than six hundred (600) pounds per foot of fabric.
- This item is subsidiary to the bid item "Abutment Facing".

GRANULAR EMBANKMENT #89 STONE: This item shall include furnishing and placing coarse aggregate conforming to ASTM C33, Coarse Aggregate, Size Number 89. This item is not paid but is subsidiary to the item "Abutment Facing". The stone backfill shall be placed behind each layer of CMU block in a lift thickness not to exceed the CMU block height. Placement of the aggregate shall be from the wall face backward to prevent the formation of and to remove any wrinkles in the geotextile. The stone aggregate shall be placed in a manner to avoid wrinkling of the geosynthetic reinforcement. The backfill shall be compacted 95% of maximum per AASHTO T-99. This compaction may generally be achieved by:

- rodding the aggregate fill behind each CMU block approximately every foot while exerting downward pressure on the CMU block to prevent lateral movement.
- Using a vibratory plate compactor (>4 passes) directly behind the CMU block while exerting downward pressure on the CMU block to prevent lateral movement.
- Larger vibratory compactors may be used for the balance of the area more then six (6) feet behind the CMU block.

At the end of a day's operations, slope the last lift of backfill away from the wall face to direct surface runoff away from the wall. Do not allow surface runoff from adjacent areas to enter the wall construction area.

REINFORCED SOIL FOUNDATION: This item shall include the excavation for the RSF, furnishing and placing coarse aggregate conforming to ASTM C33, Coarse Aggregate, Size Number 89 in 6" lifts and compacted 95% of maximum per AASHTO T-99. Upon completion of the excavation the bottom of the RSF excavation shall be proof rolled with a four wheeled 15 ton vehicle to check for soft areas. All labor, materials and equipment necessary to complete the RSF shall be subsidiary to the item "Abutment Facing".

SILL BEAM: The concrete for the sill beam will be paid as "Concrete (Commercial Grade)" (fc=4,000 psi). This shall be full payment for all labor equipment and materials for the Sill Beam. The steel reinforcing for the Sill Beam will be paid as "Reinforcing Steel" which shall be full payment for all labor equipment and materials for the Sill Beam reinforcing steel. This reinforcing steel shall conform to ASTM A615 Grade 60.

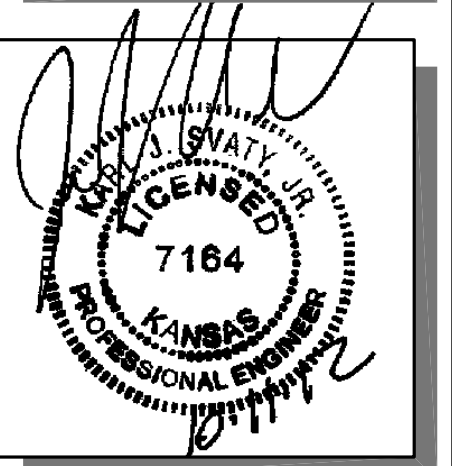
STRUCTURAL STEEL: The structural steel for the span for the GRS abutment to the existing bridge is bid as "Structural Steel (Merchant Quality)". This shall conform to the Kansas Department of Transportation specification for Steel Construction. The steel material shall have a minimum yield strength of 50,000 psi (Fy = 50,000 psi).

SHEET PILE: Sheet Pile SCZ21 or approved equal shall be used. Material ASTM A 572 Grade 50, Fy = 50 k.s.i. Estimated sheet pile driving elevation to 1257.00. Upon removal of the GRS abutment the sheet piling shall be cut off below elevation 1283.0. The remaining pile shall be left in place. The sheet pile shall be paid per square foot of wall face which is full payment for all labor, equipment and materials necessary to complete the sheet pile wall.

SUMMARY OF QUANTITIES		
Item	Unit	Quantity
Abutment Facing	Sq. Ft.	6,108
Concrete (Commercial Grade)	Cu. Yds.	34.3
Reinforcing Steel (Grade 60)	Lbs.	12,810
Structural Steel (Merchant Quality)	Lbs.	125,535
GRS Performance Test	Each	1
Sheet Pile (SCZ 21)	Sq. Ft.	7,283

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0519-01	2012	142	212

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**BROADWAY BRIDGE
AT 34TH STREET SOUTH**

**SHOOFLY
GRS NOTES
AND
QUANTITIES**
SHEET TITLE
472-84830
PROJECT NUMBER

DESIGN BY: KJS
DRAWN BY: DPG
CHECKED BY: KJS

ISSUED
October 9, 2012
REVISED

SHEET NO.
142 of 212