

PROJECT SPECIAL PROVISIONS

ROADWAY

CLEARING AND GRUBBING – METHOD II:

(9-17-02)

SP2 R01

Perform clearing on this project to the limits established by Method “II” shown on Standard No. 200.02 of the *Roadway Standard Drawings*.

PILE/PANEL RETAINING WALL:

The Contractor shall construct a pile and precast concrete panel retaining wall at the locations indicated in the plans and in accordance with the details in plans, the following special provision and as directed by the Engineer.

A pile/panel retaining wall preconstruction conference shall be scheduled with the Contractor including the drilling superintendent, the Resident Engineer including the inspector, the Area Bridge Construction Engineer and the Soils and Foundation Design Engineer to discuss construction and inspection of the pile/panel retaining wall. This conference shall be completed a minimum of 5 days prior to beginning any work.

Steel Piles

HP steel piles shall conform to the applicable parts of the Standard Specifications and these provisions. The HP 12 X 53 steel piles shall be ASTM Grade A36 and the HP 14 X 73 steel piles shall be ASTM Grade 50, both with the addition of 0.2% minimum copper. The size and locations of piles shall be as shown in the plans.

See special provisions contained herein for painting of steel piles.

The piles shall be installed to grade using the lengths and cut off elevations shown in the plans by pre-augering or drilling a 24-inch minimum diameter hole. The hole shall be backfilled with concrete up to the bottom of the cushioning material.

Where the alignment of the wall is curved, the piles shall be laid out on chords and aligned such that their flanges are tangent to the curve at the web.

Piles shall be installed to within 2 inches of their plan location and the center to center distance between piles shall not differ from the plans by more than 3 inches after installation.

The plumbness of the piles shall not vary from the vertical by more than 1/8 inch per foot. In general, installed piles will be acceptable if the precast concrete panels, when installed, have an acceptable appearance without significant gaps between the face of the panels and the pile flanges. The precast concrete panels shall have a minimum 2 inch bearing on the pile flanges.

Splicing of piles is subject to the Engineer's approval and shall be in accordance with the plans. Splices will not be permitted in the portion of the pile that is permanently exposed. Welding shall conform to the requirements of Article 1072-20 of the *Standard Specifications*.

Precast Concrete Panels

Concrete materials for precast panels shall conform to the applicable parts of the Standard Specifications and these special provisions.

Concrete for the precast panels shall have a minimum 28-day compressive strength of 4,000 psi. The panels shall not be removed from the forms until the concrete has attained sufficient strength to prevent damage. Cracked, spalled or discolored panels shall be rejected.

The exposed face of the concrete panels shall have a vertical broomed finish. The side of the panels shall be plumb and have a minimum bearing distance of 2 inches. 1/2" thick expansion joint material shall be placed between the panels and pile flanges for the width of the bearing surface. The panels shall be seated firmly on the cushioning material and shall be held securely against the pile flange until the backfill is placed sufficiently to hold the panels in place.

C.I.P. Coping

The work covered by this provision consists of the construction of portland cement concrete coping in accordance with the details in the plans and the following provisions.

- (1) Concrete shall be Class A conforming to the applicable requirements of Sections 420 and 1000 of the Specifications.
- (2) Reinforcing steel in the coping shall conform to the applicable requirements of Sections 425 and 1070 of the Specifications.

Expansion joints are not permitted, but construction joints may be used where the coping changes slopes and at 90 foot centers.

Shaft Excavation and Concrete

Shaft excavation shall conform to the applicable provisions of Section 410 of the *Standard Specifications*. The shaft concrete shall be Class A meeting the requirements of Section 1000 of the *Standard Specifications*.

The shaft, as shown in the plans, shall be excavated by drilling, augering or coring to a depth sufficient to set the full length of steel pile to grade, and shall be constructed in accordance with Section 825 of the *Standard Specifications*. If rock is encountered during drilling or pre-augering as determined by the Engineer, the pile tip elevation may be raised if a rock socket at least 10' in length is maintained. Shaft concrete shall be cast against undisturbed ground unless otherwise permitted by the Engineer. If over-excavation occurs vertically, the Contractor shall backfill with No. 57 stone before setting the pile. All loose and soft material shall be removed

and the excavation dewatered immediately before and during the concrete casting operation. The top of the concrete shafts shall be generally level.

If necessary, special measures shall be taken to insure the stability of the shaft such as installing temporary casings prior to drilling, installing the pile and placing concrete immediately after a shaft is excavated before caving occurs, installing well points or other measures. If caving occurs, the shaft excavation operation shall be halted until special measures are implemented.

Concrete panels shall not be installed before the shaft concrete has cured for a minimum of 3 days.

Excavation and Backfill

Where necessary for safety, the excavation shall be sloped or shored in accordance with local and state safety standards. It is suggested to use timber lagging in conjunction with the permanent retaining wall piles as excavation shoring. However, the Contractor may elect to use alternate methods of providing a safe excavation provided the methods are submitted to the Engineer for review and acceptance.

The Contractor shall take care to minimize the excavation necessary to place the cushioning material and panels. The excavation for cushioning material and panels shall be backfilled immediately after panels are placed with No. 57 stone. Excavation to install panels and timber lagging shall be limited 6 inches behind the panels. Any overexcavation shall be backfilled with No. 57 stone.

No. 57 stone shall conform to the applicable requirements of Section 1005 of the Standard Specifications and these provisions.

Compaction of the No. 57 stone backfill shall be to the satisfaction of the Engineer. The stone shall be rodded and spread in order to fill all voids and insure maximum density. Larger areas shall be compacted with hand operated equipment. Flushing the stone with water will not be allowed. Heavy compaction equipment will not be allowed behind the wall.

The No. 57 stone cushioning material shall be compacted with at least two (2) passes of lightweight compaction equipment.

Painting of Piles

Steel piles shall be painted in accordance with Section 442 of the *Standard Specifications* and these provisions.

Painting is required only from the top of the pile down to 18 inches below grade. The color of the finish coat shall match the color of the precast concrete panels.

In addition to surface preparation requirements of Section 442, all free edges to be painted shall be planed in accordance with Section 1072-14.

Measurement and Payment

The quantity of pile/panel retaining walls to be paid for will be the actual number of square feet of precast concrete panels which have been incorporated into the completed and accepted retaining wall. Measurement shall be made horizontally and vertically from outside edge to outside edge.

The quantity of pile/panel retaining wall, measured as provided above, will be paid for at the contract unit price per square foot for *Pile/Panel Retaining Wall*.

Such price and payment shall be full compensation for all work covered by this provision including but not limited to shaft excavation, stabilization and dewatering of the shafts, furnishing, installing and painting the piles, furnishing and placing shaft concrete, furnishing and placing precast concrete panels, furnishing and placing No. 57 stone, construction of C.I.P. coping, and all other incidental work and materials necessary to construct the pile/panel retaining walls, with the exception of the items noted below.

Payment for excavation of the material in front of the pile/panel retaining wall, including the removal of the temporary fabric wall, will be included in the contract lump sum price for "Grading".

GABION AND RENO MATTRESS RETAINING WALL:

1-23-07

1.0 GENERAL**A. Description**

The work in this Special Provision governs the construction of the Gabion and Reno Mattress Retaining Wall in accordance with the details and dimensions shown on the plans and this special provision. The term Gabion and Reno Mattress is used generically in this special provision to refer to any proprietary system able to satisfy this special provision and the contract plans.

Gabions are baskets manufactured from 8x10 double twisted hexagonal woven steel wire mesh, as per ASTM A975-97. Gabions are filled with stones at the project site to form gravity retaining walls. The gabion is divided into cells by diaphragms positioned at approximately 3 foot (0.9 m) centers. To reinforce the structure, all mesh panel edges are selvedged with a wire having a greater diameter. The steel wire used in the manufacture of the Gabions is heavily zinc coated soft temper steel. A Polyvinyl Chloride Coating (PVC) coating is then applied to a nominal thickness of 0.02 in. (0.50 mm) to provide additional protection.

The Reno mattress is a structure manufactured from 8x10 double twisted hexagonal woven steel mesh, as per ASTM A975-97. Reno mattresses are filled with stones at the project site to form the base of the retaining wall. The reno mattresses extend in front of the retaining wall providing flexible scour protection for the retaining wall. The

mattresses are divided into cells by means of diaphragms. Typically, cells are 6 feet (1.9 m) wide by 3 feet (0.9 m) long. To reinforce the structure, all mesh panel edges are selvaged with a wire having a greater diameter. The steel wire used in the manufacture of Reno mattresses is heavily zinc coated, soft temper steel. A PVC coating is then applied to a nominal thickness of 0.02 in. (0.50 mm) to provide additional protection.

Gabions and reno mattresses are manufactured and shipped with all components mechanically connected at the production facility.

B. Work Experience

Assign a field supervisor with experience on at least three (3) projects of similar scope to this project, completed over the past five (5) years. The on-site foreman must have completed three (3) projects within the last five (5) years involving Gabion and Reno mattress installations of similar scope and size. The Department may suspend the retaining wall construction work if the Contractor substitutes unqualified personnel and the Contractor shall be liable for additional costs resulting from the suspension.

Prior to the preconstruction meeting, submit the name of the Gabion and Reno Mattress Retaining Wall Contractor and documentation to the Engineer.

C. Preconstruction Meeting

Conduct a retaining wall preconstruction meeting with the field supervisor, the on-site foreman, the Resident Engineer and/or his or her representatives, the Area Roadway Engineer and the Geotechnical Operations Engineer to discuss construction and inspection of the Gabion and Reno Mattress Retaining Wall.

2.0 MATERIALS

All materials are to be as specified or better, and as approved by the Engineer. Submit requests for substitutions to the Engineer 14 days before intended installation. The materials used for the construction of the Gabion and Reno Mattress Retaining Wall must satisfy the following requirements:

A. Wire

Use wire for the manufacture of the gabions, reno mattresses, and lacing wire, that has a maximum tensile strength of 75,000 psi (515 MPa) as per ASTM A641/A641-03. Perform all tests on the wire before manufacturing the mesh. Use wire that complies with ASTM A975-97, style 3 coating, galvanized and PVC coated steel wire.

B. Woven Wire Mesh Type 8x10

Use mesh and wire for the manufacture of the gabions and reno mattresses with characteristics that meet the requirements of ASTM A975-97 Table 1., Mesh type 8x10

and PVC coated. The nominal mesh opening, $D = 3.25$ in. (83 mm.) The minimum mesh properties for strength and flexibility should be in accordance with the following:

- 1) A minimum Mesh Tensile Strength of 2,900 lb/ft (42.3 kN/m) when tested in accordance with ASTM A975-97 section 13.1.1 is required
- 2) A minimum Punch Test resistance of 5,300 lb (23.6 kN) when tested in compliance with ASTM A975-97 section 13.1.4 is required.
- 3) A minimum Connection to Selvedges of 1,200 lb/ft (17.5 kN/m) when tested in accordance with ASTM A975-97 is required.

C. Polyvinyl Chloride Coating (P.V.C.)

The technical characteristics and the resistance of the PVC to aging should meet the relevant standards. The main values for the PVC material are as follows:

- 1) The initial property of the PVC coating shall be in compliance with ASTM A975-97 section 8.2.
- 2) Before UV and abrasion degradation, the PVC polymer coating shall have a projected minimum durability of 60 years when tested in accordance with UL 746B *Polymeric Material – Long Term Property Evaluation* for heat aging test.

D. Fabrication at Manufacturing Facility

1) Gabion

Manufacture and ship gabions with all components mechanically connected at the production facility. The front, base, back, and lid of the gabions shall be woven into a single unit. Factory connect the ends and diaphragm(s) to the base. Selvedge all perimeter edges of the mesh forming the basket and top, or lid, with wire having a greater diameter. The gabion is divided into cells by means of diaphragms positioned at approximately 3 foot (1 m) centers. Secure the diaphragms in position to the base so that no additional lacing is necessary at the jobsite.

2) Reno Mattress

Manufacture and ship reno mattresses with all components mechanically connected at the production facility with the exception of the mattress led, which is produced separately from the base. Form the ends and diaphragm(s) in conjunction with the base. The lid shall be a separate piece made of the same type mesh as the basket. Selvedge all perimeter edges of the mesh forming the basket and top, or lid, with wire having a greater diameter. The Reno mattress is uniformly partitioned into internal cells. Secure the diaphragms in position to the base so that no additional tying is necessary at the jobsite.

3) Lacing Wire

Use lacing wire meeting all of the physical characteristics outlined in Section 2A, 2B, and 2C and having a minimum diameter of 0.127 in. (3.20 mm).

4) Ring Fasteners

Stainless steel ring fastener may be used instead of, or to compliment the lacing wire. Use ring fasteners meeting the requirements of ASTM A975-97 section 6.3. Use ring fasteners with a minimum open dimension of 1.75 in (44 mm), a maximum closed diameter of 0.75 in (19 mm), and a nominal overlap of 1 in. (25 mm) after closure. Do not exceed a spacing of 6 in. (150 mm) for between each ring fastener.

5) Preformed Stiffeners

Preformed stiffeners manufactured for supporting the exposed face of a gabion. The exposed face is any side of a gabion cell that will be exposed or unsupported after the structure is completed.

6) Cross Tie/ Stiffener Wire

Cross tie/stiffener wire may be used instead of, or to compliment the preformed stiffeners. Use cross tie/stiffener wire (lacing wire) meeting all of the physical characteristics outlined in Sections 2A, 2B, and 2C and having a minimum diameter of 0.127 in. (3.20 mm).

7) Stone

The stone for gabions and reno mattresses shall be hard, angular to round, durable and of such quality that they shall not disintegrate on exposure to water or weathering during the life of the structure. Not more than 5 percent by weight of clean spalls resulting from loading and shipment will be allowed in any truckload. The stone may be unwashed quarry material provided it meets all requirements of these special provisions and is placed in conformance with all requirements of the Department's construction permits (including water quality requirements). Before construction, submit testing results and certification that all proposed construction materials meet all requirements of the Standard Specifications to the Resident Engineer. The minimum unit weight of the stone shall be 164 pounds per cubic foot (25.7 kN per cubic meter) (saturated surface dry) and the absorption shall be less than 4 percent. Stone containing organic matter or soft, friable particles in quantities considered objectionable to the Engineer will be

rejected. Only crystalline stone obtained by quarrying with the following size limitations will be allowed:

a. Stone for Gabions

Use stone that ranges in dimension from a minimum of 4 in. (100 mm) to a maximum of 8 in. (200 mm). The range in sizes shall allow for a variation of 5% oversize and/or 5% undersize stone, provided it is not placed on the gabion exposed surface. The size shall be such that a minimum of three layers of stone must be achieved when filling the gabion.

b. Stone for Reno Mattresses

Use stone that ranges in dimension from a minimum of 3 in. (75 mm) to a maximum of 5 in (130 mm). The range in sizes shall allow for a variation of 5% oversize and/or 5% undersize stone, provided it is not placed on the mattress exposed surface. The size shall be such that a minimum of two layers of stone must be achieved when filling the mattress.

3.0 CONSTRUCTION REQUIREMENTS

Use reasonable care in handling, assembling and installing the gabions and reno mattresses to prevent damage including damage to the PVC coating. Gabions or reno mattresses damaged will be repaired in a manner satisfactory to the Engineer or replaced at no cost to the Department.

A. Assembly

Gabions and reno mattress are supplied folded flat and packed in bundles. The units are assembled individually by erecting the sides, ends, and diaphragms, ensuring that all panels are in the correct position, and the tops of all the sides are aligned. First, connect the four corners, followed by the internal diaphragms to the outside walls. Use lacing wire or fasteners, as described in Section 2.0, for all connections.

The procedure for using lacing wire consists of cutting a sufficient length of wire, and first looping and/or twisting to secure the lacing wire to the wire mesh. Proceed to lace with alternating double and single loops through every mesh opening approximately every 6 in (150 mm), pulling each loop tight and finally securing the end of the lacing wire to the wire mesh by looping and/or twisting.

B. Installation

After initial assembly, the gabions and reno mattresses are carried to their final position and are secured joined together along vertical and top edges of their contact surfaces using the same connecting procedure(s) previously described. Whenever a structure requires more than one layer, the upper empty baskets shall also be connected to the top of the lower layer along the front and back edges of the contact surface using the same connecting procedure(s) previously described.

C. Filling Gabions

Fill gabions with stone specified in Section 2.0. During the filling operation some manual stone placement is required to minimize voids. The exposed faces of vertical structures should be carefully hand-placed to give a neat, flat and compact appearance. Care shall be taken when placing fill material to ensure that the sheathing on the PVC coated baskets is not damaged.

Fill the cells in stages so that local deformation is avoided. Do not fill any one cell to a depth exceeding 1 foot (300 mm) higher than an adjoining cell. It is also recommended to slightly overfill the baskets by 1 to 2 in. (25 to 50 mm) to allow for settlement of the stone. Behind gabion walls, compact the backfill material simultaneously to the same level as the filled gabions.

D. Filling Reno Mattresses

Fill reno mattresses with stone specified in Section 2.0. During the filling operation some manual stone placement is required to minimize voids. It is also recommended to slightly overfill the baskets by 1 in. (25 mm) to allow for settlement and so that the stone is tightly confined by the reno mattress lid, thereby minimizing any movement of the rock under hydraulic load. Care shall be taken when placing fill material to ensure that the sheathing on the PVC coated baskets is not damaged.

E. Preformed Stiffeners/Internal Connecting Wires

For gabions, use preformed stiffeners or lacing wire as internal connecting wires when a structure requires more than one layer of gabions to be stacked on top of each other. Connect internal connecting wires to the exposed face of a cell to the adjacent side of the cell. Preformed stiffeners are installed at 45 degree to the face/side of the unit, extending an equal distance along each side to be braced (approximately 1 ft. (300 mm)). Cross tie/stiffener wire (lacing wire) may be used instead of, or to compliment the preformed stiffeners. An exposed face is any side of a gabion cell that will be exposed or unsupported after the structure is completed.

F. 3 Feet (1 m) High Gabions

Fill 3 feet (1 m) gabions in three layers, 1 foot (300 mm) at a time. Install preformed stiffeners/connecting wire after the placement of each layer, that is, at 1 foot (300 mm) high and 2 feet (600 mm) high.

G. 1.5 Feet (0.5 m) High Gabions

1.5 feet (0.5 m) high gabions do not require preformed stiffeners/connecting wire unless the baskets are used to build vertical structures and turned on their side. In some cases, these units shall be filled in two layers, 9 in. (230 mm) at a time. Connecting wires shall be installed after the placement of the first layer, which is 9 in. (230 mm) high.

H. Lid Closing

Once the gabion baskets or reno mattresses are completely full, pull the lids tight until the lid meets the perimeter edges of the basket. A tool such as a lid closer can be used. Tightly lace and/or fasten the lid along all edges, ends, and tops of diaphragm(s) in the same manner previously described.

I. Mesh cutting and folding

Where shown on the plans or other directed by the Engineer, cut the gabion or mattress, fold and fasten together to suit the existing site conditions. Cleanly cut the mesh, fold back the surplus mesh, and neatly wire to an adjacent basket face. Securely fasten the cut edges of the mesh with lacing wire or fasteners in the manner previously described. Assemble, install, fill and close any reshaped gabion or mattress as specified in the previous sections.

4.0 MEASUREMENT AND PAYMENT

Gabion and Reno Mattress retaining walls will be measured and paid for as the actual number of square feet of exposed face area incorporated into the completed and accepted wall. The wall height is measured as the difference between the top and bottom of the wall. The bottom of wall is defined as the point where the finished grade intersects the front of the wall. The top of the wall is defined as the top elevation of the completed wall including any height from the coping, if applicable.

The contract price and payment will be full compensation for furnishing all labor, materials (including excavation and backfill) required to provide the Gabion and Reno Mattress retaining walls including but not limited to those items as shown on the plans and contained in this special provision.

Payment will be made under:

Gabion and Reno Mattress retaining wallsSquare Foot (Square Meter)

SHOULDER AND FILL SLOPE MATERIAL (Lump Sum Grading):

(5-21-02)

SP2 R45

Description

Perform the required shoulder and slope construction for this project in accordance with the applicable requirements of Section 226 of the *Standard Specifications* except as follows:

Construct the top 6 inches of shoulder and fill slopes with soils capable of supporting vegetation.

Provide soil with a P.I. greater than 6 and less than 25 and with a pH ranging from 5.5 to 6.8. Remove stones and other foreign material 2 inches or larger in diameter. All soil is subject to test and acceptance or rejection by the Engineer.

Obtain material from within the project limits or approved borrow source.

Measurement and Payment

No direct payment will be made for this work, as the cost of this work will be considered to be a part of the work being paid for at the contract lump sum price for *Grading*.

PIPE TESTING:

4-17-07

SP3R33

Revise the *2006 Standard Specifications* as follows:

Page 3-3, Article 300-6, add the following:

The Department reserves the right to perform forensic testing on any installed pipe.

AGGREGATE BASE COURSE:

12-19-06

SP5 R03

Revise the *2006 Standard Specifications* as follows:

Page 5-11, Article 520-5 Hauling and Placing Aggregate Base Material, 6th paragraph, replace the first sentence with the following:

Base course that is in place on November 15 shall have been covered with a subsequent layer of pavement structure or with a sand seal. Base course that has been placed between November 16 and March 15 inclusive shall be covered within 7 calendar days with a subsequent layer of pavement structure or with a sand seal.

ASPHALT PAVEMENTS - SUPERPAVE:

(7-18-06) (Rev 9-19-06)

SP6 R01

Revise the *2006 Standard Specifications* as follows:

Page 6-2, Article 600-9 Measurement and Payment

Delete the second paragraph.

Page 6-12, 609-5(C)2(c) add after (AASHTO T 209):

or ASTM D 2041

Page 6-13, last line on page & Page 6-14, Subarticle 609-5(C)(2)(e), delete and substitute the following:

(e) Retained Tensile Strength (TSR) - (AASHTO T 283 Modified), add subarticle (1) Option 1 before the first paragraph.

(1) Option 1

Add subarticle (2) Option 2 and the following sentence as the first sentence of the second paragraph:

(2) Option 2

Mix sampled from truck at plant with one set of specimens prepared by the Contractor and then tested jointly by QA and QC at a mutually agreed upon lab site within the first 7 calendar days after beginning production of each new mix design.

Page 6-28, 610-3(A) Mix Design-General, third sentence of the fourth paragraph:

Substitute 20% for 15%

First, second and third sentences of the fifth paragraph:

Substitute 20% for 15%

Page 6-44, 610-8, third full paragraph, replace the first sentence with the following:

Use the 30 foot minimum length mobile grade reference system or the non-contacting laser or sonar type ski *with at least four referencing stations mounted on the paver at a minimum length of 24 feet* to control the longitudinal profile when placing the initial lanes and all adjacent lanes of all layers, including resurfacing and asphalt in-lays, unless otherwise specified or approved.

Page 6-54, Article 620-4, add the following pay item:

Pay Item	Pay Unit
Asphalt Binder for Plant Mix, Grade PG 70-28	Ton

Page 6-69, Table 660-1 **Material Application Rates and Temperatures**, add the following:

Type of Coat	Grade of Asphalt	Asphalt Rate gal/yd ²	Application Temperature °F	Aggregate Size	Aggregate Rate lb./sq. yd. Total
Sand Seal	CRS-2 or CRS-2P	0.22-0.30	150-175	Blotting Sand	12-15

Page 6-75, 660-9(B), add the following as sub-item (5)

(5) Sand Seal

Place the fully required amount of asphalt material in one application and immediately cover with the seal coat aggregate. Uniformly spread the fully required amount of aggregate in one application and correct all non-uniform areas prior to rolling.

Immediately after the aggregate has been uniformly spread, perform rolling.

When directed, broom excess aggregate material from the surface of the seal coat.

When the sand seal is to be constructed for temporary sealing purposes only and will not be used by traffic, other grades of asphalt material meeting the requirements of Articles 1020-6 and 1020-7 may be used in lieu of the grade of asphalt required by Table 660-1 when approved.

Page 10-41, Table 1012-1, add the following:

Mix Type	Course Aggregate Angularity ^(b) ASTM D5821	Fine Aggregate Angularity % Minimum AASHTO T304 Method A	Sand Equivalent % Minimum AASHTO T176	Flat & Elongated 5:1 Ratio % Maximum ASTM D4791 Section 8.4
S 9.5 D	100/100	45	50	10

Page 10-45, Replace Table 1012-2 with the following:

**TABLE 1012-2
NEW SOURCE RAP GRADATION and BINDER TOLERANCES**
(Apply Tolerances to Mix Design Data)

Mix Type	0-20% RAP			21-25% RAP			26%+ RAP			
	Sieve (mm)	Base	Inter.	Surf.	Base	Inter.	Surf.	Base	Inter.	Surf.
P _b , %			± 0.7%			± 0.4%			± 0.3%	
1 1/2" (37.5)	±10	-	-	±7	-	-	±5	-	-	-
3/4" (19.0)	±10	±10	-	±7	±7	-	±5	±5	-	-
1/2" (12.5)	-	±10	±6	-	±7	±3	-	±5	±2	±2
3/8" (9.5)	-	-	±8	-	-	±5	-	-	-	±4
No. 4 (4.75)	±10	-	±10	±7	-	±7	±5	-	-	±5
No. 8 (2.36)	±8	±8	±8	±5	±5	±5	±4	±4	±4	±4
No.16 (1.18)	±8	±8	±8	±5	±5	±5	±4	±4	±4	±4
No. 30 (0.600)	±8	±8	±8	±5	±5	±5	±4	±4	±4	±4
No. 50 (0.300)	-	-	±8	-	-	±5	-	-	-	±4
No. 200 (0.075)	±4	±4	±4	±2	±2	±2	±1.5	±1.5	±1.5	±1.5

ASPHALT BINDER CONTENT OF ASPHALT PLANT MIXES:
(11-21-00)

SP6 R15

The approximate asphalt binder content of the asphalt concrete plant mixtures used on this project will be as follows:

Asphalt Concrete Base Course	Type B 25.0__	4.3%
Asphalt Concrete Intermediate Course	Type I 19.0__	4.7%
Asphalt Concrete Surface Course	Type S 4.75A	7.0%
Asphalt Concrete Surface Course	Type SF 9.5A	6.5%
Asphalt Concrete Surface Course	Type S 9.5__	6.0%
Asphalt Concrete Surface Course	Type S 12.5__	5.5%

The actual asphalt binder content will be established during construction by the Engineer within the limits established in the *Standard Specifications*.

PRICE ADJUSTMENT - ASPHALT BINDER FOR PLANT MIX:

(11-21-00)

SP6 R25

Price adjustments for asphalt binder for plant mix will be made in accordance with Section 620 of the *Standard Specifications*.

The base price index for asphalt binder for plant mix is **\$311.79** per ton.

This base price index represents an average of F.O.B. selling prices of asphalt binder at supplier's terminals on April 1, 2007.

BOLTDOWN RING AND COVER:

All proposed construction shall meet the applicable requirements of the NC Department of Transportation's *Standard Specifications for Roads and Structures* dated July 2006. Division 15 of the *Standard Specifications* is revised as follows:

Page 15-17, Paragraph 2

Use manhole frames and covers made of cast iron conforming to ASTM A48 Class 35, which are traffic bearing, have machined contact surfaces and are sized as shown. Use covers with two (2) one-inch diameter air vents and cam locks connecting the cover to the frame. The ring shall be rated as "Heavy Duty", with a cover weight of 160# and a total weight of 320#, total height shall not exceed 4". Product submittals shall be approved prior to purchase and delivery to the project. The manhole frame and cover shall be installed on the precast concrete drainage box located at approximate Station 122+25 -L- (identified as structure number 30). The frame and cover shall be measured and paid for per each as "Boltdown Ring and Cover". No additional payment shall be made for any additional material or equipment required to provide a complete installation.

GUARDRAIL ANCHOR UNITS, TYPE 350:

(4-20-04)

SP8 R65

Description

Furnish and install guardrail anchor units in accordance with the details in the plans, the applicable requirements of Section 862 of the *Standard Specifications*, and at locations shown in the plans.

Materials

The Contractor may at his option, furnish any one of the guardrail anchor units.

Guardrail anchor unit (ET-2000) as manufactured by:

Trinity Industries, Inc.
2525 N. Stemmons Freeway
Dallas, Texas 75207
Telephone: 800-644-7976

The guardrail anchor unit (SKT 350) as manufactured by:

Road Systems, Inc.
3616 Old Howard County Airport
Big Spring, Texas 79720
Telephone: 915-263-2435

Prior to installation the Contractor shall submit to the Engineer:

(A) FHWA acceptance letter for each guardrail anchor unit certifying it meets the requirements of NCHRP Report 350, Test Level 3, in accordance with Section 106-2 of the Standard Specifications.

(B) Certified working drawings and assembling instructions from the manufacturer for each guardrail anchor unit in accordance with Section 105-2 of the Specifications.

No modifications shall be made to the guardrail anchor unit without the express written permission from the manufacturer. Perform installation in accordance with the details in the plans, and details and assembling instructions furnished by the manufacturer.

Construction Methods

Guardrail end delineation is required on all approach and trailing end sections for both temporary and permanent installations. Guardrail end delineation consists of yellow reflective sheeting applied to the entire end section of the guardrail in accordance with Section 1088-3 of the *Standard Specifications* and is incidental to the cost of the guardrail anchor unit.

Measurement and Payment

Measurement and payment will be made in accordance with Articles 862-6 of the *Standard Specifications*.

Payment will be made under:

Pay Item	Pay Unit
Guardrail Anchor Units, Type 350	Each

IMPACT ATTENUATOR UNITS, TYPE 350:

(4-20-04) (Rev 7-18-06)

SP8 R75

Description

Furnish and install impact attenuator units and any components necessary to connect the impact attenuator units in accordance with the manufacturer's requirement, the details in the plans and at locations shown in the plans.

Materials

NON-GATING IMPACT ATTENUATOR UNITS:

The impact attenuator unit (QUADGUARD) as manufactured by:

Energy Absorption Systems, Inc.
One East Wacker Drive
Chicago, Illinois 60601-2076
Telephone: 312-467-6750

The impact attenuator unit (TRACC) as manufactured by:

Trinity Industries, Inc.
2525 N. Stemmons Freeway
Dallas, Texas 75207
Telephone: 800-644-7976

GATING IMPACT ATTENUATOR UNITS:

The impact attenuator unit (BRAKEMASTER) as manufactured by:

Energy Absorption Systems, Inc.
One East Wacker Drive
Chicago, Illinois 60601-2076
Telephone: 312-467-6750

The impact attenuator unit (CAT) as manufactured by:

Trinity Industries, Inc.
2525 N. Stemmons Freeway
Dallas, Texas 75207
Telephone: 800-644-7976

Prior to installation the Contractor shall submit to the Engineer:

(A) FHWA acceptance letter for each impact attenuator unit certifying it meets the requirements of NCHRP Report 350, Test Level 3, in accordance with Article 106-2 of the *Standard Specifications*.

(B) Certified working drawings and assembling instructions from the manufacturer for each impact attenuator unit in accordance with Article 105-2 of the *Standard Specifications*.

No modifications shall be made to the impact attenuator unit without the express written permission from the manufacturer. Perform installation in accordance with the details in the plans, and details and assembling instructions furnished by the manufacturer.

Construction Methods

If the median width is 40 feet or less, the Contractor shall supply one of the NON-GATING Impact Attenuator Units listed in the Materials Section herein.

If the median width is greater than 40 feet, the Contractor may use any of the GATING or NON-GATING Impact Attenuator Units listed in the Materials Section herein.

Measurement and Payment

Impact Attenuator Unit, Type 350 will be measured and paid for at the contract unit price per each. Such prices and payment will be full compensation for all work covered by this provision including but not limited to furnishing, installing and all incidentals necessary to complete the work.

Payment will be made under:

Pay Item	Pay Unit
Impact Attenuator Unit, Type 350	Each

AGGREGATE PRODUCTION:

(11-20-01)

SP10 R05

Provide aggregate from a producer who uses the current Aggregate Quality Control/Quality Assurance Program that is in effect at the time of shipment.

No price adjustment is allowed to contractors or producers who use the program. Participation in the program does not relieve the producer of the responsibility of complying with all requirements of the *Standard Specifications*. Copies of this procedure are available upon request from the Materials and Test Unit.

CONCRETE BRICK AND BLOCK PRODUCTION:

(11-20-01)

SP10 R10

Provide concrete brick and block from a producer who uses the current Solid Concrete Masonry Brick/Unit Quality Control/Quality Assurance Program that is in effect on the date that material is received on the project.

No price adjustment is allowed to contractors or producers who use the program. Participation in the program does not relieve the producer of the responsibility of complying with all requirements of the *Standard Specifications*. Copies of this procedure are available upon request from the Materials and Test Unit.

PORTLAND CEMENT CONCRETE (Alkali-Silica Reaction):

2-20-07

SP10 R16

Revise the *2006 Standard Specifications* as follows:

Article 1024-1(A), replace the 2nd paragraph with the following:

Certain combinations of cement and aggregate exhibit an adverse alkali-silica reaction. The alkalinity of any cement, expressed as sodium-oxide equivalent, shall not exceed 1.0 percent. For mix designs that contain non-reactive aggregates and cement with an alkali content less than 0.6%, straight cement or a combination of cement and fly ash, cement and ground granulated blast furnace slag or cement and microsilica may be used. The pozzolan quantity shall not exceed the amount shown in Table 1024-1. For mixes that contain cement with an alkali content between 0.6% and 1.0%, and for mixes that contain a reactive aggregate documented by the Department, regardless of the alkali content of the cement, use a pozzolan in the amount shown in Table 1024-1.

Obtain the list of reactive aggregates documented by the Department at:<http://www.ncdot.org/doh/operations/materials/pdf/quarryasrprob.pdf>

Table 1024-1	
Pozzolans for Use in Portland Cement Concrete	
<i>Pozzolan</i>	<i>Rate</i>
Class F Fly Ash	20% by weight of required cement content, with 1.2 lbs Class F fly ash per lb of cement replaced
Ground Granulated Blast Furnace Slag	35%-50% by weight of required cement content with 1 lb slag per lb of cement replaced
Microsilica	4%-8% by weight of required cement content, with 1 lb microsilica per lb of cement replaced

GLASS BEADS:

(7-18-06)

SP10 R35

Revise the *Standard Specifications* as follows:

Page 10-223, 1087-4(C) Gradation & Roundness

Replace the second sentence of the first paragraph with the following:

All Drop-On and Intermixed Glass Beads shall be tested in accordance with ASTM D1155.

Delete the last paragraph.

ENGINEERING FABRICS TABLE 1056-1:

(7-18-06)

SP10 R40

Revise the *Standard Specifications* as follows:

Page 10-100, Table 1056-1, replace the values for Trapezoidal Tear Strength with the following:

Physical Property	ASTM Test Method	Type 1	Type 2	Type 3		Type 4
				Class A	Class B	
Typical Applications		Shoulder Drain	Under Riprap	Temporary Silt Fence		Soil Stabilization
Trapezoidal Tear Strength	D4533	45 lb	75 lb	--	--	75 lb

CHANGEABLE MESSAGE SIGNS

(11-21-06)

SP11 R11

Revise the *2006 Standard Specifications* as follows:

Page 11-9, Article 1120-3, Replace the 3rd sentence with the following:

Sign operator will adjust flash rate so that no more than two messages will be displayed and be legible to a driver when approaching the sign at the posted speed.

PAVEMENT MARKING LINES MEASUREMENT AND PAYMENT:

(11-21-06)

SP 12 R01

Revise the *2006 Standard Specifications* as follows:

Page 12-14, Subarticle 1205-10, delete the first sentence of the first paragraph and replace with the following:

Pavement Marking Lines will be measured and paid for as the actual number of linear feet of pavement marking lines per application that has been satisfactorily placed and accepted by the Engineer.

DEPARTMENT FURNISHED PORTABLE CONCRETE BARRIER

DESCRIPTION.

Obtain, install, secure, maintain, refurbish, remove, and return Department Furnished Portable Concrete Barrier in accordance with the plans, contract and specifications.

MATERIALS.

The Department will provide Portable Concrete Barrier in accordance with 1170-2 of the current NCDOT Specifications. Obtain the barrier from the stockpile on I-40 at Exit 15.

Provide connecting pins for the Department furnished Portable Concrete Barrier of the size and type required for the Department furnished barrier.

CONSTRUCTION METHODS.

Obtain and return Department Furnished Portable Concrete Barrier in accordance with 1170-3 of the current NCDOT Specifications at the location(s) specified in the plans.

Engineer will inspect Portable Concrete Barrier prior to the Contractor accepting responsibility of the barrier. Contractor is fully responsible for any damage or theft after acceptance.

Transport Portable Concrete Barrier to the project and provide necessary storage area for the barrier at no cost to the Department.

Refurbish and maintain barrier in good operational condition. Return barrier in good operational condition including all manuals, maintenance records, special tools, hardware, etc..

MEASUREMENT AND PAYMENT.

Referred to 1170-4 of the current NCDOT Specifications.

Payment will be made under:

Department Furnished Portable Concrete Barrier Linear Foot