Replacement of SC 41 Bridge over Wando River
Charleston and Berkeley Counties
File 8.158B & 10.032100
Federal Aid Project No. BR88 (079)

NOTICE TO PROPOSERS

November 13, 2013

NOTICE TO PROPOSERS - Enclosed is Addendum #1 to the Request for Proposals (RFP) package for the Replacement of the SC 41 Bridge over the Wando River. The information provided in this notice and the addendum shall be made part of the contract documents.

Addendum #1 is being issued in order to provide clarification and additional information for the project.

This addendum includes the following documents:

- NOTICE TO PROPOSERS
- NOTICE OF RECEIPT
- Pages to be inserted into Request for Proposals

Clarification regarding Access Road and SC 41 Relocated intersection design requirements and typical sections.

Clarification regarding Bridge Operation Classification: It shall be noted that the Bridge Operational Classification identified in F&ME's Site-Specific Seismic Response Analysis Final Report is incorrect. Because the detour length of the bridge is greater than 15 miles, the Bridge Operational Classification is I.

Clarification regarding longitudinal restrainers: If longitudinal joint restrainers are used, they shall be considered secondary and minimum support lengths shall be provided in accordance with the *SCDOT Seismic Design Specifications for Highway Bridges*.

Addition of Seismic Isolation Bearing Assemblies Special Provision.

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NOTICE OF RECEIPT – ADDENDUM #1

The information in this addendum shall be made part of the contract documents. PROPOSERS are instructed to incorporate the information into the previously provided RFP documents.

PROPOSERS are required to sign this document and enclose it with their Technical Proposal and/or Statement of Intent. Signed receipt of this document by The South Carolina Department of Transportation serves as confirmation that the PROPOSER has received and incorporated Addendum #1 into the contract documents.

Confirmation Statement:

I, the PROPOSER confirm that I have received the Addendum #1 package and have incorporated the information provided in the addendum into the contract documents.

_____ _____

PROPOSER's Signature Date

_____

Printed Name

For:_____

Design Build Firm Name

The following pages should be inserted into previously provided copies of the RFP and the old page of the same number removed and disregarded. A summary of the pages included follows:

Replacement of SC 41 Bridge over Wando River
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Exhibit 4a – Roadway Design Criteria

- Complete Section

Exhibit 4b – Structures Design Criteria

- Page 7

Exhibit 4f – Geotechnical Design Criteria

- Pages 3

Exhibit 5– Special Provisions

- Pages 2, 156-161

Section 1

INTENT OF DESIGN CRITERIA

The CONTRACTOR will be expected to design and construct the project according to these design requirements.

Design criteria were established based on design speed, character and composition of traffic and width of right of way. These criteria were derived directly from the South Carolina Department of Transportation (SCDOT) Highway Design Manual and supplemented with AASHTO "A Policy on Geometric Design of Highways and Streets," 2001 Edition.

Section 2

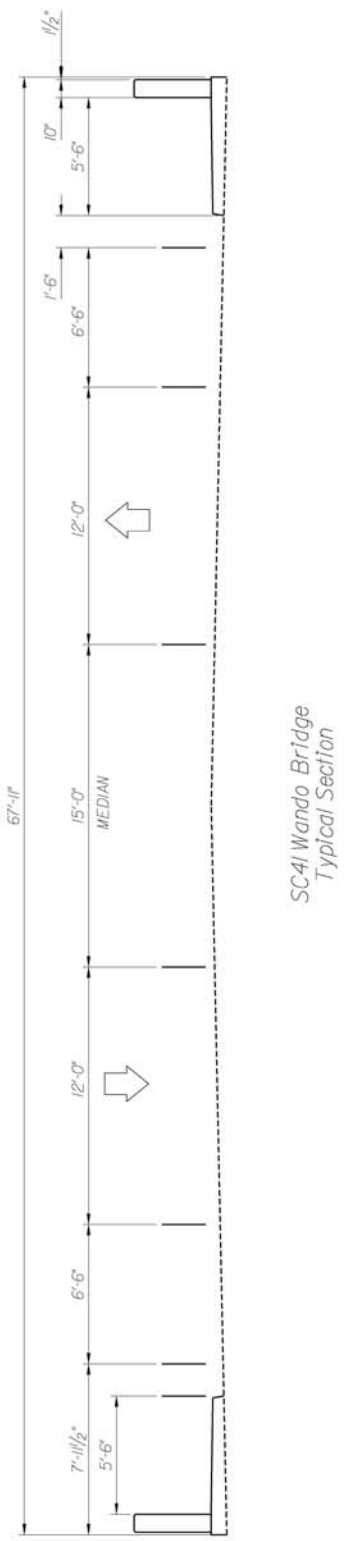
DESIGN CRITERIA

The terrain on all routes within the scope of work shall be classified as level. A WB-62 design vehicle shall be utilized for all geometric design, except where otherwise noted.

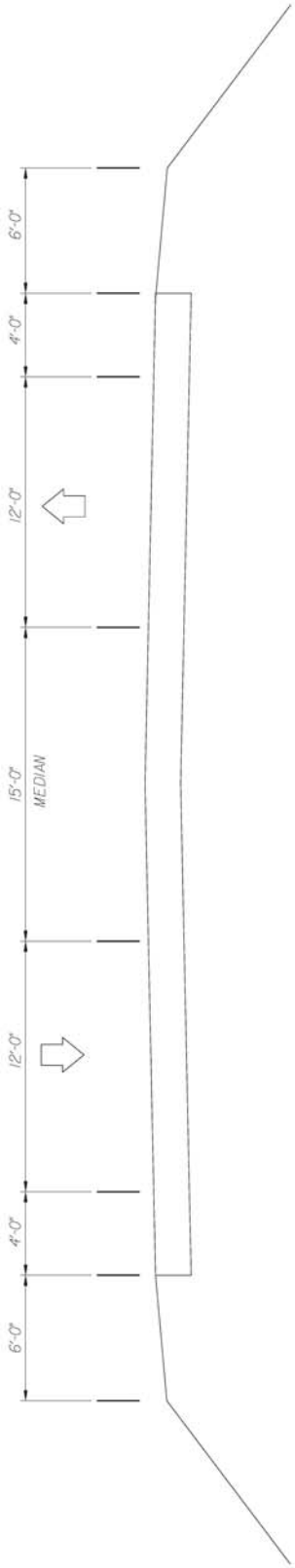
Route	Design Speed	Functional Classification to be used for design
SC 41	45 mph	Urban Arterial
S-33 (Clements Ferry Rd)	45 mph	Collector
*Access Road	NA	Local (Group 2)

*Access Road is shown on the Public Meeting Display

The typical sections shown in Figures 1 and 2 should be used for the project. The full width median on SC 41 shall, at a minimum, begin south of the Access Road intersection in order to develop the left turn lane into the Access Road~~. at the south end bridge approach slab~~ and continue through the relocated intersection of SC 41 and S-33 Clements Ferry Road tapering back down to a 2 lane section on S-33 beyond the auxiliary lanes.



SC41 Wando Bridge
Typical Section



SC41
Typical Section

Figure 1

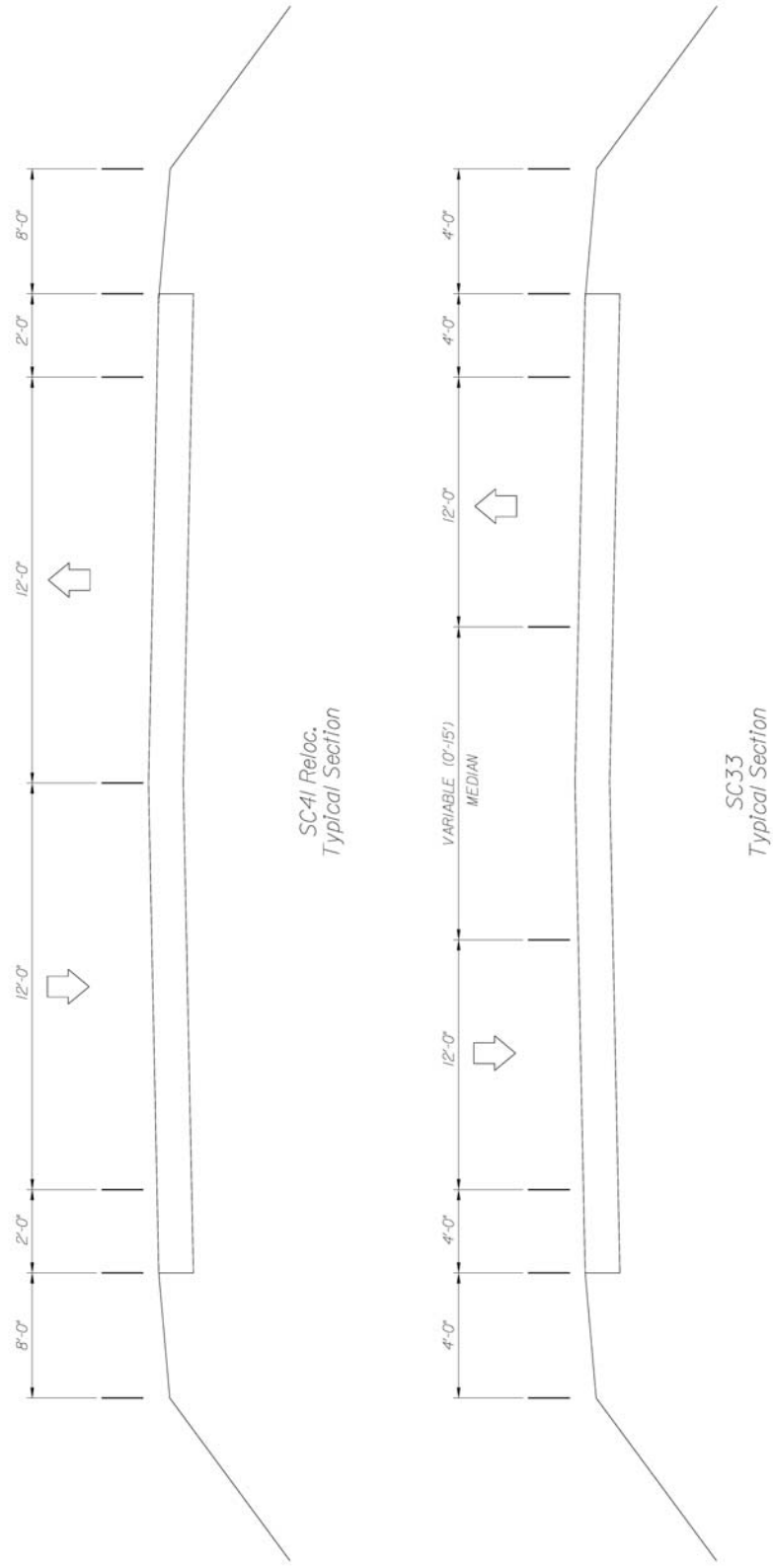

8'-0"
2'-0"
12'-0"
12'-0"
2'-0"
8'-0"
SC41 Reloc.
Typical Section
4'-0"
4'-0"
12'-0"
VARIABLE (0'-15')
MEDIAN
12'-0"
4'-0"
4'-0"
SC33
Typical Section

Figure 2

Section 3

RIGHT-OF-WAY AND CONTROL OF ACCESS

Right-of-way

Right of Way shall be acquired in accordance with Section VIII of the Project Agreement.

Minimum Widths Required

The CONTRACTOR will be expected to design and secure right of way in accordance with these requirements. For existing right of way to be retained, the CONTRACTOR can retain the existing width.

Route	Minimum Right of Way width	See footnotes for additional requirements
SC 41	Retain existing	Arterial
S-33 (Clements Ferry Rd)	Retain Existing	Collector
Access Road	50 feet	Local (Group 2)

Arterial – Cover limits of improvement along route with minimum right of way width specified above. Design build team is allowed to secure necessary permissions for construction beyond minimum width. If permissions are not secured fee simple right of way shall be secured.

Bridge – Secure right of way box to cover bridge area in accordance to chapter 12 section 11-Bridge Location of the Plan Preparation Guide using widths specified above.

Collector – Design build team is allowed to secure necessary permissions for construction outside minimum width specified. If permissions are not secured fee simple right of way may be required.

Local (Group 2) – Design build team shall identify the right of way width necessary to construct and maintain a ~~the~~ new Access Road on the west side of SC 41 ~~following the alignment as shown on the public meeting displays in Attachment B~~.

Right of way lines should maintain uniform alignment for 300’ minimum and not fluctuate in and out.

Section 4

CLEAR ZONE

Clear zone for all areas shall be as defined in the SCDOT Highway Design Manual, Chapter 14 and supplement with 2002 AASHTO Roadside Design Guide with Chapter 6 updates.

Section 5

SIGHT DISTANCE

The SCDOT Highway Design Manual Chapter 10 – Sight Distance will be used.

The upper range value established in the current edition of AASHTO's "A Policy on Geometric Design of Highways and Streets," 2001, for the appropriate design speed will be used.

Section 6

ACCESS ROAD (NEW LOCATION)

Access must be provided to Detyens Shipyard Inc., TMS 269-00-00-034, and Atlantis Marine Inc., TMS 269-00-00-037, by a public roadway, similar to the Access Road shown on the Public Meeting Display. A dedicated 100 foot right turn auxiliary lane shall be provided for southbound traffic and a150 foot left turn auxiliary lane shall be provided for the northbound traffic on the SC 41 mainline to access the new Access Road. The Access Road must be designed to accommodate a future 5-lane widening of SC 41. The below minimum criteria must be met for the Access Road.

- Travel Lane Width – 12’ (1 entry lane, 1 exit lane)
- Shoulder Width – 4’
- Vertical Clearance (Local Road Under) – 16’
- Horizontal Curvature – 115’
- Radius Returns – 40’
- Angle of Intersection - 70°-90°
- Design Vehicle – WB 62

The 25’ minimum tangent distance shown in Figure 15.2C of the HDM between the PC and the intersection is waived for the public access road alignment.

~~A new location Access Road, as shown in the Public Meeting displays, will be required to provide access to the Detyens Shipyard and Atlantis Marine sites. The angle of intersection must be within 20 degrees of the perpendicular. The intersection design shall include dedicated left and right turn lanes on SC 41.~~

Section 7

RELOCATED SC 41

A relocated alignment will be required on SC 41 at the intersection with S-33 to achieve an angle of intersection within 20 degrees of the perpendicular. The intersection design shall include a dedicated right turn lane on SC 41 northbound at SC 41 Relocated, and an auxiliary left turn lane from S-33 to SC 41 Relocated. The Southbound through lane on SC 41 Relocated shall serve as the left turn lane at the intersection with a dedicated right turn developed to the outside. A reduced design speed of 35 mph may be used for the approach on the SC 41 Relocated alignment. All turn lanes serving the SC 41 Relocated intersection shall be designed to provide a minimum of 200’ of storage. ~~See Figure 2.~~

Cross-hole sonic logging (CSL) access tubes shall be installed in all drilled shafts in accordance with the *Standard Specifications for Highway Construction*. CSL testing will be conducted by SCDOT on all of the shafts.

Bridge Railing

The SCDOT 42 inch concrete wall shall be used. See Item #2 in Section 17.6.1.2 of the Bridge Design Manual along with the pedestrian Railing Wall Detail on Bridge Drawings and Details, Drawing No. 700-Misc.

Slope Protection

Provide slope protection for the bridge end fills. The end fills at the northern end of the bridge shall be protected with rip rap in accordance with Standard Drawing 804-105-00. The end fill at the southern end of the bridge shall be protected with concrete slope protection in accordance with the Bridge Drawing Details, Drawing No 804-01.

Longitudinal Restrainers

If longitudinal joint restrainers are used, they shall be considered secondary and minimum support lengths shall be provided in accordance with the *SCDOT Seismic Design Specifications for Highway Bridges*.

2. ROADWAY STRUCTURES

Reinforced Concrete Walls

For walls separating traffic with grade differentials less than 12 feet, Standard Median Barrier Types 11 through 15 may be used as shown in the *SCDOT Standard Drawings*. These standard concrete median barrier walls may be used provided that the foundation soils meet the foundation design requirements indicated on the *SCDOT Standard Drawings*.

Spread footings are permitted for concrete retaining walls that are not directly supporting bridges.

Other Wall Types

Other acceptable wall types include walls, Precast Counterfort walls (which may be used in conjunction with traditional MSE walls in partial rock cuts), Tangent Pile/Secant Pile walls, Anchored walls, and Soil-nailed walls. Use form liners or veneer if brick or masonry appearance is desired.

Wall loadings for anchored wall systems shall be computed in accordance with FHWA Publication No. FHWA-IF-99-015 entitled Geotechnical Engineering

embankments are used as a ground modification, the design method shall be the Collin Method as outlined in the GDM.

- Prefabricated Earthquake Drains with Filter Fabric
- Prefabricated Vertical Drains
- Ground Modification – Vibro-Stone Columns
- Ground Modification – Vibro-densification
- Deep Soil Mixing
- Compaction Grouting
- High-Strength Geotextile for Embankment Reinforcement
- Geotextile for Separation and Stabilization
- Geogrid Soil Reinforcement
- Lightweight Aggregate
- Muck Excavation
- Bridge Lift Materials
- Reinforced Soil Slopes
- Column-Supported Embankments

SEISMIC DESIGN

Final Site-Specific Seismic Response Analysis curves have been supplied in this criterion. The ADRS curves outlined in the Executive Summary of F&ME's Site-Specific Seismic Response Analysis dated January 23, 2012, and attached later herein, shall be used in the design of the embankments and bridge structure and are hereby incorporated into and made part of the contract documents.

A summary table of the applicable seismic coefficients is outlined below.

	FEE	SEE
PGA	0.144	0.422
S_{DS}	0.393	1.102
S_{D1}	0.246	1.102

It shall be noted that the Bridge Operational Classification identified in F&ME's Site-Specific Seismic Response Analysis Final Report is incorrect. Because the detour length of the bridge is greater than 15 miles, the Bridge Operational Classification is I.

(97) DIVISION 700: SEISMIC ISOLATION BEARING ASSEMBLIES

General

1 The work under this item shall consist of designing, furnishing, testing, and installing seismic isolation bearing assemblies (isolators). Isolators shall include the seismic isolation bearings and all other connection assembly components.

2 Isolators should be designed in accordance with SCDOT's Seismic Design Specification for Highway Bridges (2008-Version 2.0) and the 2010 AASHTO Guide Specification for Seismic Isolation Design, 3rd, Edition. If the 2010 AASHTO guide specification references the seismic design criteria from any other AASHTO specification and there is a contradictory or more conservative requirement in the SCODT Seismic Design Specification, then the SCDOT specification shall prevail.

3 The areas around each installed isolator shall be maintained free of debris and construction materials throughout the project.

Bearing Types

1 The following potential isolator systems are acceptable for use on this project. Any provided seismic isolation bearing assemblies shall conform to one or more of the following types:

a. Lead Core Rubber Seismic Isolation Bearings
b. Pendulum Type Seismic Isolation Bearings
c. Sliding Seismic Isolation Bearings

Material Requirements

Lead Core Rubber Seismic Isolation Bearings

1 Lead purity shall be established by chemical analysis from a sample of that used in the isolators. This test shall confirm a minimum of 99% purity of the lead. Lead shall also conform to ASTM B69. A certificate of compliance shall be submitted by the contractor to the RCE.

2 Structural steel components, such as bearing or bevel plates, shall be fabricated from stainless steel meeting the requirements of ASTM A167 for Type 301 or 302 with No. 1 Finish.

3 Steel laminate layers shall conform to ASTM A570. Laminate plates shall have a minimum thickness of 0.12 inches and shall be surrounded by a minimum thickness of 0.5 inches of elastomeric, as defined below. Laminate plates shall be blast cleaned and additionally cleaned of any oil or grease before bonding.

4 The Elastomeric shall be Type NR Grade 3, per ASTM D4014-89, and shall meet or exceed the following:

ELASTOMER PROPERTIES		
TEST	**ASTM TEST**	**REQUIREMENT**
Tensile Strength, psi, minimum	D412	1600
Compression Set, 22 hours @ 158 degrees F., %, maximum	D395 Method B	40
Tear Strength, pounds per inch, minimum	D624 (Die C)	180
Elongation at Break, %, maximum	D412	500
Ozone Resistance 20% strain, 100 hours @104 degrees F. +/- 3.6 degrees	D1149	No visible cracks with a 7X lens
Durometer Hardness, shore point	D2240	60 ± 5
Bond of Elastomeric to Laminate, pound per inch	D429 Method B	40 (100% failure via rubber tear)

Pendulum Type Seismic Isolation Bearings

1 The material of the concave plates shall conform to ASTM A576 Grade 1045 or A536.

2 The material of the main concave spherical surface shall be Grade 304 stainless steel.

3 Slider surface material shall be ASTM A536 or ASTM A576 Grade 1045.

4 Perimeter seals shall be an ethylene propylene material and shall show no cracks under a 7X lens when tested for ozone resistance, 100 hours at 104 degrees +/- 3.6 degrees in accordance with ASTM D1149.

5 All non-stainless steel metal surfaces which are exposed to the atmosphere shall be blasted by the manufacturer and shall be painted by the manufacturer with high solids epoxy paints with a minimum of 5 mils dry film thickness (DFT). The top and bottom surfaces which are to bear against concrete shall be painted with steel primer by the manufacturer using a minimum of 1 mils DFT.

6 The bearing liner shall be bonded to steel surfaces per the manufacturer's standards and specifications.

Sliding Seismic Isolation Bearings

1 The bearing component which slides on the metal surface may be polytetrafluorethylene (PTFE) surfacing or other material specified by the manufacturer. All alternate materials shall be identified as to their generic properties including their physical test properties.

2 The sliding element shall be protected from exposure to conditions which may affect the friction coefficient of the sliding element.

3 The PTFE bearing surface using a fabric shall be filled or unfilled PTFE fabric made from virgin PTFE oriented multifilament and other fibers. The resin in the filaments shall be virgin PTFE material (not reprocessed) meeting the requirements of ASTM D1457. Specific gravity of the resin shall be from 2.13 to 2.19. The melting points shall be 623 degrees F. +/- 2 degrees.

4 Unfilled PTFE sheets shall be recessed into a steel backing plate a minimum of one half of the PTFE thickness. It shall be adhesively bonded in the recess under

controlled factory condition. The adhesive material shall be an epoxy resin conforming to the requirements of Federal Specification MMM-S-134. The contact surfaces of the PTFE and steel plate shall be uniformly roughened to a minimum roughness height of 250 micro-inches.

5 The side of the PTFE sheet to be bonded shall be factory treated by the sodium naphthalene or sodium ammonia process after the contact surface is roughened.

6 The bearing liner shall be self-lubricating, bonded to the articulated slider and steel block and shall use no added lubricants. The bearing liner material shall be a non-metallic, self-sacrificing solid lubricant type and shall have dynamic and wear characteristics required to meet the specified bearing performance as verified by testing. The bearing liner material shall have a compressive strength of at least 40 ksi and a minimum thickness of 0.06 inches.

Fabrication Requirements

1 Regardless of isolator type, both the isolator and its packaging shall bearing marks which clearly identify, at a minimum, its orientation, manufacturer, order number, bearing identification number, and lot number. Bearing markings shall be permanent and placed such that they are visible after installation.

Lead Core Rubber Seismic Isolation Bearings

1 Bearings shall be cast as a single unit in a mold and shall be bonded and vulcanized under heat and pressure. The mold finish shall conform to standard shop practices.

2 The tolerances of the isolator dimensions shall be as follows:

DIMENSION	**TOLERANCE**
Thickness of individual rubber layers (No more than ± 1/8 in.)	± 20% of design
Thickness of top and bottom cover rubber, in.	+0, -1/16
External plan dimensions, in.	± 1/4
Shim plan dimensions, in.	± 1/4
Flatness of top and bottom surfaces of completed bearing, in.	± 1/64 from mean surface
Variation from plane parallel to the theoretical surface.	Top slope relative to bottom of no more than 0.005 radians
Sides, in.	± 1/4
Overall bearing height, in.	± 1/4
Diameter of central core, in.	± 1/32

Pendulum Type Seismic Isolation Bearings

1 A self-lubricating bearing liner material is bonded to the sliding surface of the articulated slider and its housing.

2 The bearing shall include a protective environmental seal.

3 Wind locks or uplift restraints shall be included.

4 The pendulum bearing system shall be manufactured as a complete unit, including all required components.

5 The bearing shall be assembled at the factory and suitable temporary assembly ties shall be provided so that the entire assembly is shipped as a unit and remains intact when uncrated and installed.

6 The external bearing dimensions shall be within 0.3 inches of the values shown on the bearing drawings. The tolerance for each bolt hole location shall be 0.03 inches.

Sliding Seismic Isolation Bearings

1 The finish of the mold used to produce the polyether urethane element for disc bearings shall conform to good machine shop practice.

2 The polyether urethane element shall be confined by a limiting ring which shall be provided by welding a ring or machining a recess into the upper and lower bearing plates.

3 The inside diameter of the ring shall be 4 to 6 percent larger than the diameter of the disc element.

4 The shear restriction mechanism shall be connected to the bearing plate by welding or other acceptable means.

5 All steel surfaces exposed to the atmosphere, except stainless steel surfaces and metal surfaces to be welded shall be painted with a three coat system as per SCDOT *Standard Specifications for Highway Construction* paint system NS1 (Section 710).

6 Metal surfaces to be welded shall be given a coat of clear lacquer, or other protective coating approved by RCE, if the time of exposure before welding is to exceed three (3) months. The coating shall be removed at the time of welding. No painting shall be done to these surfaces prior to welding.

7 Stainless steel sheets shall be attached to its steel substrate with an approved epoxy to ensure complete contact, and then sealed with a continuous seal weld.

8 The tetrafluorethylene (TFE) sheet shall be bonded to its grit blasted steel substrate using an epoxy resin adhesive under controlled factory conditions in accordance with the instructions of the adhesive manufacturer. The TFE sheet shall be recessed into its steel substrate for at least one half of its thickness.

9 All bearing surfaces of steel plates shall be finished to machine flat within 0.010 inches per foot. Out of flatness of greater than 0.010 inches per foot on any plate shall be cause for rejection.

10 The bottom surfaces of lower bearing plates (masonry plates) designed to rest on bearing pads shall not exceed an out-of-flatness value of 0.0625 inches per foot.

11 Oxygen cut surfaces shall not exceed a surface roughness value of 1000 microinches, as designed by ANSI B46.1

12 Gross bearing dimensions shall have a tolerance of -0 in., +1/8 in.

Testing

1 All isolation bearing systems shall have their seismic performance verified by testing. The tests shall, at a minimum, be performed to 125% of the full limits of anticipated seismic displacement as determined by design.

2 Tests shall be conducted at an approved laboratory and under the presence of the SCDOT. Notify the RCE a minimum of four (4) weeks in advance of the scheduled tests.

3 Two (2) record copies and a PDF of the certified test results shall be provided to SCDOT prior to acceptance of the bearing assemblies.

4 All tests shall be performed in the United States of America. All expenses for such testing shall be borne by the contractor and included in his bid.

5 The following tests shall be performed in accordance with Sections 13, 15, 17 and 18 of the AASHTO "Guide Specification for Seismic Isolation Design":

- System Characterization Testing in accordance with HITEC Guidelines for Testing Large Seismic Isolators and Energy Dissipation Devices (2002).
- Prototype Testing
- Quality Control Testing

Installation Requirements

Lead Core Rubber Seismic Isolation Bearings

1 Isolators shall be installed level and normal to the gravity loads.

2 Superstructure gradients or non-level girder flanges are to be accommodated with beveled sole plates.

3 Bearings shall be placed on surfaces that are plane to within 1/16 in. and horizontal to within 0.01 radians.

4 Any lack of parallelism between the top of the bearing and the underside of the girder shall be corrected as directed by the RCE.

5 There shall be no obstructions, including bolt extensions, which prevent the isolators from deforming horizontally in any direction.

6 Any welding performed on steel in contact with or near the isolator shall be performed in such a manner as to not damage the isolator.

Pendulum Type Seismic Isolation Bearings

1 No bearing shall be placed upon a bearing surface which is deformed, irregular or poorly finished. The entire bearing seat area shall be floated and toweled.

2 If the bearing is placed directly on the bridge seat, the concrete shall be finished to a flat surface, free of irregularities.

3 If concrete pedestals are used, the contractor may elect to leave the entire pedestal area 0.25 in. high and bush hammer, or otherwise finish, the entire area to the exact elevations indicated on the plans.

4 Anchor bolts shall be set as shown on the plans unless changes are permitted by the Engineer.

5 If anchor bolts are cast into the substructure concrete, templates or other suitable means shall be used to keep the bolts in the correct vertical and horizontal position during concrete placement.

6 If the anchor bolts are to be drilled into the finished concrete, reinforcing steel shall be placed so that it will not be damaged during drilling.

7 Bearing pads placed between concrete and steel masonry plate shall be located to correct alignment and elevation, and placed at the time of masonry plate installation. Each bearing pad shall be the same size in plan as the masonry plate it supports.

8 The centerline of sole plates or other fixed portions of bearing assemblies attached to the structural steel shall not be offset from the centerline of the bearing stiffeners or diaphragm connection plates by more than one-half the thickness of the flange at the location, or the thickness of the bearing stiffener or connection plate, whichever is the lesser distance.

Sliding Seismic Isolation Bearings

1 Isolators shall be installed in accordance with the alignment plan and installation scheme shown in the shop drawings.

2 Upon final installation of the bearings, RCE, in the presence of the manufacturer's representative, shall inspect the bearing components to assure they are level, normal to gravity loads, and parallel to within $\pm$ 1/32 inches per foot.

3 Any deviations in excess of the allowed tolerances shall be corrected as directed by the RCE.

4 There shall be no obstructions, including bolt extensions, which prevent the isolators from deforming horizontally in any direction.

5 The isolators shall be connected to the superstructure and substructure by bolting or other positive mechanical means acceptable to the RCE.

Required Submittals

1 In addition to the submittals required in other sections of this provision the following shall be provided:

a. Design calculations shall be provided which include clearly stated assumptions regarding long term isolator behavior under slow conditions such as creep, shrinkage, thermal, etc.

b. Testing reports in accordance with requirements above as well as test reports or studies that verify the assumptions listed in the design calculations.

c. Shop plans conforming to the requirements of the SCDOT Standard Construction Specifications.