EXECUTION VERSION

I-395 Project

Exhibit C-3

Technical Requirements

Attachment 3.15c

I-395 Bridge Repair Table and Notes

1. 395 Express Lanes Structures and Bridges

A. 395 Express Lanes Structure and Bridge Repair Quantities

		VDOT Structure No.		100-2805	100-2806	100-2833	000-2016	000-2017	000-2020	000-2027	000-2040	000-1040	000-2030	000-2034	000-2046	000-2051	000-2052	000-2053	000-2056	100-1817	000-2049	100-2807	029-2159	100-2815	100-2814	000-2054			
	Bid Item Description	Specification(s)	Units	I-395 over Sanger Ave	I-395 over West Braddock Rd	I-395 HOV & Bus Ramp over Four Mile Run	I-395 over Glebe Rd	I-395 over Ramp G (Glebe Rd)	I-395 HOV over Country Club Rd	I-395 HOV over Route 27 (Washington Blvd)	I-395 HOV & NBL over Route 27 NBL & Joyce St	Route 27 Reversible Ramp over Joyce St	I-395 HOV NB over Ramps CC & CE	I-395 HOV SB over Ramps CC & CE	I-395 HOV over Fern St	I-395 HOV over Eads St	I-395 HOV NB over Route 110	I-395 HOV SB over Route 110	I-395 HOV over Pentagon Access Rd	Duke St over I-395	I-395 SBL & Rdwy E over Eads St	King St Ramp B over I-395	Ramp B over I-395 SBL	Seminary Rd HOV Bus Ramp	Shirlington HOV Bus Ramp	Ramp G of I-395 NBL over Route 110	Overpass Bridges - Pier Repairs	Roadway Barrier Repairs	Retaining Wall Repairs and Modifications
Superstructure	Replace Existing Bridge Barrier	404, 410, 412, 419, 425	EA	2	2	2	2	2	2	2	2								1										
	Waterproof Existing Bridge Barrier	416	EA									2	2	2	3	3	2	2	2				2	2	2	2			
	Concrete Superstructure Surface Repair	412	SY									2			1			1					1			1			
	Crack Repairs - Existing Bridge Barrier	412	LF									70	133	115	128	137	250	157	107				33	67	56	113			
	Deck Overlay - Shallow	404, 425	LS												1		1						1						
	Deck Overlay - Deep	404, 425	LS	1					1		1	1	1	1	1	1		1	1										
	Type A Patching (HES)	412	SY			1				3														1	16				
	Type B Patching (HES)	412	SY		3	6			3	14		2	2	6	23	2	25	4	4				15	1	3	1			
	Type C Patching (HES)	412	SY	4					2		21	4	2	7	5	3		7	3										
	Crack Repairs - Existing Bridge Deck	412	LF			12				80																27			
	Remove and Replace Raised Median	412, 413	LS												1														
	Expansion Joint Reconstruction - Expansion Dam at Abutments	412, 421	LS	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					1	1	1			
	Expansion Joint Reconstruction - Continuous Link Slab at Piers (Deck Slab Closure)	412	LS		1	1				1	1	1	1	1	1		1	1						1	1	1			
	Clean and Paint Beam Ends	411	LS			1																							
	Replace Bearing	426	EA			24			2																				
	Structural Steel Beam	407	LS						1																				
	Widen Bridge Deck	412	LS						1																				
	Deck Drainage System	See Notes	LS		1	1	1	1											1										
	Widen/Overlay Existing Approach Slab	412, 425	LS	1	1	1	1	1	1	1	1																		
Substructure	Reconstruct Beam Seat	412	EA			7			2								2	3	3										
	Crack Repairs (Substructure)	412	LF			91																							
	Concrete Substructure Surface Repair	251, 412	SY			4																					20		2
	Waterproofing - Epoxy Resin (Type EP-5)	416	SY			75																							
	Waterproofing Coating	See Notes	SY			443																					410		
Miscellaneous	Replace Approach Guardrail Transition	505	LS																							1			
	Repair Existing Roadway Barrier	412	LF																									33	
	Replace Existing Barrier on Retaining Wall	410, 412	LS																										1
	Repair Undermining of Approach Pavement	509	CY													5.0													
	ITS/TTMS Duct Bank Installation	See Notes	LS	1	1	1	1	1	1	1	1		1	1	1		1		1										
	Remove Existing Sign Structure from Bridge	413	LS																	1	1	1							

B. 395 Express Lanes Bridge Repair Notes

1. **General Notes –** The notes provided herein are intended to clarify the requirements for the items listed in the Structure and Bridge Repair Quantities Table. Sections of the VDOT 2016 Road and Bridge Specifications ("the Specifications") are referenced where applicable. Except for the items listed below, the Design-Builder shall be responsible for estimating the quantities required to complete the repairs and modifications as shown on the RFP Conceptual Plans – Structure and Bridge Repair Plans and as described herein.
    - Concrete Superstructure Surface Repair
    - Crack Repairs – Existing Bridge Barrier
    - Type A Patching (HES)
    - Type B Patching (HES)
    - Type C Patching (HES)
    - Crack Repairs – Existing Bridge Deck
    - Replace Bearing
    - Reconstruct Beam Seat
    - Crack Repairs (Substructure)
    - Concrete Substructure Surface Repair
    - Waterproofing – Epoxy Resin (Type EP-5)
    - Waterproofing Coating
    - Repair Existing Roadway Barrier
    - Repair Undermining of Approach Pavement

2. **Superstructure**

    a. **Replace Existing Bridge Barrier –** This work shall include removing the existing concrete bridge barrier and deck overhang and replacing with a cast-in-place concrete barrier or parapet (F-shape) in accordance with Sections 410 and 412 of the Specifications. The barrier and deck shall be designed and detailed in accordance with the requirements of the Manuals of the S&B Division and AASHTO LRFD. To comply with the requirements of Chapter 10 of the Manuals of the S&B Division, for the design of deck overhang, partial depth removal of existing deck (including Type A milling and Type B Hydro-demolition) will be required for installation of additional deck reinforcement and shall be performed in accordance with Section 425 of the Specifications. Deck repairs shall utilize Latex-modified Concrete, Very-Early Strength (LMC-VE) for overlay and deck overhang reconstruction. Bridge deck grooving shall be performed in accordance with Section 404 of the Specifications.

    Any existing conduit(s) in barrier shall be maintained during construction and replaced with new conduit system in accordance with the Technical Requirements and Section 419 of the Specifications.

Existing deck expansion joints disturbed due to milling/hydro-demolition and overlay shall be repaired and/or reconstructed to match existing joint type and spliced with existing joint material in accordance with Section 412 of the Specifications.

b. Waterproof Existing Bridge Barrier – This work shall include applying waterproofing (Epoxy Resin Type EP-5) to existing bridge curbs, barriers, and parapets in accordance with Section 416 of the Specifications.

c. Concrete Superstructure Surface Repair – This work shall include repairing spalls and delaminated areas of existing curbs, barriers, and parapets in accordance with the requirements of Section 412 of the Specifications.

d. Crack Repairs – Existing Bridge Barrier – This work includes repairing cracks in existing curbs, barriers, and parapets using Type A or Type B crack repair methods in accordance with Section 412 of the Specifications.

e. Deck Overlay – Shallow – This work shall be completed in accordance with Section 425 of the Specifications and shall include the following: Type A milling to a maximum depth of ¾" above the top mat of reinforcement, Type A Hydro-demolition to a minimum depth not less than ¾", Type B deck patching repairs (as needed), furnishing and placing Latex-modified Concrete, Very-Early Strength (LMC-VE) and bridge deck grooving. Bridge deck grooving shall be performed in accordance with Section 404 of the Specifications.

Existing top of deck elevations shall be maintained. The work shall be applicable to the limits of bridge deck and exposed concrete area of existing approach slabs as shown in the RFP Conceptual Plans. Unless otherwise approved by the Concessionaire, Type A milling shall not be closer than ¾" to top mat of reinforcing steel and the minimum depth of hydro-demolition shall not be less than ¾".

Once an area of a deck is milled, the Design-Builder shall be responsible for maintaining the surface of the milled deck to be free from any loose aggregate, pot holes, drop-offs between lanes and shall perform cleaning of the milled deck and/or pothole repairs (Type A and B deck patching) as necessary to provide a safe riding surface for all vehicular traffic (including motorcycles) for the entire duration and until the concrete overlay is placed over the entire deck. Deck overlay operations shall not commence until all patching repairs for the entire bridge deck have been completed.

Design-Builder shall be responsible for temporary support of deck during milling, hydro-demolition, and overlay operations.

f. Deck Overlay – Deep – This work shall be completed in accordance with Section 425 of the Specifications and shall include the following: Type A milling to a maximum depth of ¾" above the top mat of reinforcement, Type B Hydro-demolition, Type C deck patching repairs (as needed), furnishing and placing Latex-modified Concrete, Very-Early Strength (LMC-VE) and bridge deck grooving. Bridge deck grooving shall be performed in accordance with Section 404 of the Specifications.

Existing top of deck elevations shall be maintained. The work shall be applicable to the limits of bridge deck and exposed concrete area of existing approach slabs as shown in the RFP Conceptual Plans. Unless otherwise approved by the Concessionaire, Type A milling shall not be closer than ¾" to top mat of reinforcing steel.

Once an area of a deck is milled, the Design-Builder shall be responsible for maintaining the surface of the milled deck to be free from any loose aggregate, pot holes, drop-offs between lanes and shall perform cleaning of the milled deck and/or pothole repairs (Type A and B deck patching) as necessary to provide a safe riding surface for all vehicular traffic (including motorcycles) for the entire duration and until the entire depth of concrete overlay is placed over the entire deck. Deck overlay operations shall not commence until all patching repairs for the entire bridge deck have been completed.

Design-Builder shall be responsible for temporary support of deck during milling, hydro-demolition, and overlay operations.

g. Type A Patching (HES) / Type B Patching (HES) / Type C Patching (HES) – This work shall include patching repairs of delaminated, spalled, and asphalt-patched areas of the existing bridge deck and exposed concrete areas of existing approach slabs using High Early Strength (HES) concrete in accordance with Section 412 of the Specifications.

h. Crack Repairs – Existing Bridge Deck – This work includes repairing cracks in existing bridge deck using Type A, Type B, or Type D crack repair methods in accordance with Section 412 of the Specifications.

i. Remove and Replace Raised Median – This work shall include demolition and removal of existing concrete raised median and placement of concrete and reinforcing steel for new concrete raised median to match existing median geometry. Work shall be performed in accordance with Section 412 and 413 of the Specifications.

j. Expansion Joint Reconstruction – Expansion Dam at Abutments – This work shall include removal and disposal of concrete and any existing joint armor and joint material, reconstruction of joint and replacement with new elastomeric expansion dam using either partial or full-depth reconstruction as

shown in the RFP Conceptual Plans. The work shall be performed in accordance with Section 412 and 421 of the Specifications.

k. Expansion Joint Reconstruction – Continuous Link Slab at Piers (Deck Slab Closure) – This work shall include removal and disposal of concrete and any existing joint armor and joint material and elimination of deck joint at pier locations by placement of continuous link slab using Latex-modified Concrete, Very-Early Strength (LMC-VE). The work shall conform to the requirements of Section 412 of the Specifications. Design-Builder shall analyze existing bearings and substructure elements and submit to Engineer for review and acceptance regarding the feasibility of link slab joint closure. If link slab is determined to not be feasible without bearing and/or substructure modification, the existing joint shall be reconstructed using full-depth joint reconstruction in accordance with "Expansion Joint Reconstruction – Expansion Dam at Abutments".

l. Clean and Paint Beam Ends – This work shall include zone coating of the entire 5 feet of existing beam ends at supports including bearings and end diaphragms, and replacement of existing bearing stiffener plates with new stiffener plates on each side of the web at selected locations specified in the RFP Conceptual Plans. This work shall be completed in accordance with the requirements of Section 411 of the Specifications and shall include environmental protection, health and safety protection, and disposal of material.

m. Replace Bearing – This work shall include jacking and blocking of existing beams, removal and disposal of existing bearings, and installation of new bearings for existing or proposed beams as detailed in the RFP Conceptual Plans. Feasibility of the jacking scheme shall be verified and designed by the Design-Builder. The work shall be completed in accordance with Section 426 of the Specifications.

n. Structural Steel Beam – This work shall include furnishing, fabricating, and erecting new structural steel rolled beam or welded plate girder, lateral bracing and cross-frame members (i.e. diaphragms), connection elements, and bearing assemblies for proposed widening of bridge deck at the I-395 HOV Bridge over Country Club Road (Structure No. 000-2020). The work shall be performed in accordance with Section 407 of the Specifications. Modification of existing abutments for new beam seats shall be performed in accordance with "Reconstruct Beam Seat" and new bearings shall be provided in accordance with "Replace Bearing."

o. Widen Bridge Deck – This work shall include demolition of existing bridge deck to the limits detailed in the RFP Conceptual Plans and reconstruction of widened deck and overhang for proposed widening of bridge deck at the I-395 HOV Bridge over Country Club Road (Structure No. 000-2020). Existing reinforcing steel exposed during demolition shall be cleaned and prepared in

accordance with Section 412 of the Specifications, and new reinforcing steel for proposed widened deck and overhang shall be lapped with existing reinforcing. Deck shall be designed and detailed in accordance with the requirements of the Manuals of the S&B Division and AASHTO LRFD.

p. Deck Drainage System – This work shall include design and installation of bridge deck drainage system which meets project hydraulic design criteria in accordance with the Technical Requirements and VDOT Manuals of the S&B Division, and any applicable bridge repairs and/or modifications required to accommodate the proposed drainage system.

q. Widen/Overlay Existing Approach Slab – This work shall include removal of existing asphalt pavement, excavation, temporary shoring, preparation of subgrade, reconstruction of abutment backwall, and furnishing and placement of Class A4 concrete for widening of existing approach slab to the full width of the roadway. Existing reinforcing steel shall be cleaned and prepared in accordance with Section 412 of the Specifications and incorporated into new concrete. Areas of existing approach slabs with asphalt overlay shall be milled and overlaid with new asphalt concrete in accordance with Section 425 of the Specifications.

3. <u>Substructure</u>

a. Reconstruct Beam Seat – This work shall include jacking and blocking of existing beams, reconstruction of existing beam seats with large spalls and/or loss of bearing, and modification and reconstruction of existing abutments for new beam seats at proposed beams. Feasibility of the jacking scheme shall be verified and designed by the Design-Builder. The work shall be completed in accordance with Section 412 of the Specifications.

b. Crack Repairs (Substructure) – This work includes repairing cracks in existing piers and abutments using Type A or Type B crack repair methods in accordance with Section 412 of the Specifications.

c. Concrete Substructure Surface Repair – This work shall include repairing concrete surfaces of substructures (piers and abutments) and retaining walls in accordance with Section 412 of the Specifications. The work shall include installing embedded galvanic anodes during repair. Galvanic anodes shall conform to Section 251 of the Specifications. Waterproofing shall be applied to substructure after completion of concrete substructure surface repair in accordance with "Waterproofing Coating".

For substructure surface repair of existing piers at bridges crossing over the 395 Express Lanes, only the bottom 5 ft of pier wall or column shall be applicable for repair. Repairs shall be completed in these areas prior to construction of pier protection barriers.

d. Waterproofing – Epoxy Resin (Type EP-5) – This work shall include applying waterproofing (Epoxy Resin Type EP-5) to top of beam seats, pier caps, and abutment caps/stems after completion of substructure repairs and reconstruction of beam seats in accordance with Section 416 of the Specifications.

e. Waterproofing Coating – This work shall consist of cleaning and preparing pier and abutment surfaces; and applying waterproofing coating to all areas of the substructure after completion of concrete substructure repairs. Top of beam seats, pier caps, and abutment caps/stems shall be waterproofed in accordance with "Waterproofing – Epoxy Resin (Type EP-5)".

Waterproofing Coating shall be Tex. Cote 300 by Textured Coatings of America Inc., Thorocoat by BASF Construction Chemicals LLC, Mark - 173.5 by Poly-Carb Cleveland, Ohio or Ultracrete Solvent Borne Textured Coating by Sherwin Williams.

For substructure surface repair of existing piers at bridges crossing over the 395 Express Lanes, only the bottom 5 ft of pier wall or column shall receive the waterproofing coating. Waterproofing coating shall be completed in these areas prior to construction of pier protection barriers.

4. <u>Miscellaneous</u>

a. Replace Approach Guardrail Transition – This work shall include reconstruction and/or replacement of existing approach guardrail transition fixed object attachment to existing bridge barrier at the Ramp G of I-395 NBL Bridge over Route 110 (Structure No. 000-2054) in accordance with Section 505 of the Specifications.

b. Repair Existing Roadway Barrier – This work shall include partial or complete removal and reconstruction of damaged and deteriorated sections of existing roadway barriers. The work shall include repair of cracks, spalls, and other damaged areas at the approximate locations shown in the RFP Conceptual Plans. The work shall be performed in accordance with Section 412 of the Specifications.

c. Replace Existing Barrier on Retaining Wall – This work shall include removal and reconstruction of existing barrier on retaining wall, modification and reconstruction of existing retaining wall, and constructing new cast-in-place concrete F-shape barrier on top of the modified retaining wall. The barrier and retaining wall shall be designed and detailed in accordance with the requirements of the Manuals of the S&B Division and AASHTO LRFD. The work shall include all necessary structure excavation, temporary shoring, preparation of subgrade, and reconstruction of asphalt pavement sections, and shall be performed in accordance with Sections 410 and 412 of the Specifications.

d. Repair Undermining of Approach Pavement – This work shall include repairing undermined areas of existing asphalt pavement with flowable fill material at bridge approaches in accordance with Section 509 of the Specifications. The work shall include any necessary removal of existing pavement, structure excavation, temporary shoring, preparation of subgrade, and reconstruction of asphalt pavement section after placement of the flowable fill material.

e. ITS/TTMS Duct Bank Installation – This work shall include modification of existing abutment backwalls and installation of ITS/TTMS conduits on bridges at the locations shown in the RFP Conceptual Plans. The work shall include any necessary demolition, structure excavation, temporary shoring, structure removal, reconstruction, and design and construction of substructure and superstructure modifications to accommodate the proposed conduits. The feasibility and design of abutment backwalls and superstructure elements for proposed conduits shall be verified and designed by Design-Builder.

f. Remove Existing Sign Structure from Bridge – This work shall include removal and disposal of existing overhead sign structures attached to bridge. This work shall be performed in accordance with Section 413 of the Specifications.

2. Additional Department Improvements

A. 395 General Purpose Lanes Bridge Repair Quantities

	Item Description	Specifications	Units	100-2805 Route 395 (Henry G. Shirley Memorial Hwy) over Sanger Ave.	100-2806 Route 395 (Henry G. Shirley Memorial Hwy) over West Braddock Road	000-2040 Route 395 (NBL & HOV) over Route 27 (NBL)
				Quantity	Quantity	Quantity
Superstructure	Patching (Type B)	See Notes, 412	SY	212	694	400
	Replace Existing Bridge Barrier (Deck)	See Notes	LF	0	300	252
	Modify Approach Barrier / Guardrail	See Notes	LS	0	1	1
	Type A Milling (1")	See Notes, 425	SY	772	0	0
	Type A Milling (3/4")	See Notes, 425	SY	0	2,421	1,368
	Type A Hydro-demolition (3/4")	See Notes, 425	SY	772	2,421	1,368
	Furnish (Very-early-strength latex-modified) concrete (1 1/2 - 2")	See Notes, 425	CY	43	135	76
	Place (Very-early-strength latex-modified) concrete overlay	See Notes, 425	SY	772	2,421	1,368
	Expansion Joint Reconstruction (Very-early strength latex modified concrete)	See Notes, 412	LF	260	315	123
	Deck slab closure (Very-early-strength latex modified concrete)	See Notes, 412	LF	0	158	62
	Bridge-Deck Grooving	404	SY	772	2,421	1,368
	Ultrasonic Impact Treatment	426	EA	42	120	0
	Replace Bearing	See Notes, 426	EA	0	40	30
	Jacking and Blocking Beam	See Notes, 426	EA	0	40	30
	Zone Coating of Existing Structure (Str. No. 2040-HOV)	See Notes, 411	LS	0	0	1
	Prepare and Overcoat Existing Structure (Str. No. 2805-HOV)	See Notes, 411	LS	1	0	0
	Prepare and Overcoat Existing Structure (Str. No. 2040-NB GP)	See Notes, 411	LS	0	0	1
Substructure	Crack Repair Type B (Epoxy injection)	412	LF	80	50	294
	Concrete Substructure Surface Repair	See Notes, 412	SY	27	20	20
	Waterproofing Coating	See Notes	SY	1,090	1,096	1,370
	Waterproofing - Epoxy Resin (Type EP-5)	See Notes, 416	SY	110	204	60

B. 395 General Purpose Lanes Bridge Rehabilitation Notes

1. **General Notes -** Repair quantities listed in the 395 General Purpose Lanes Bridge Repair Quantities table shall be in addition to repairs included in the Section 1 of this Attachment 3.15c.

    - At its discretion, the Concessionaire may elect to decrease or increase a repair quantity for any the items listed for a specific bridge provided that the total quantity for the item (i.e. sum of quantities listed for all bridges)is not exceeded.

    - The cost of deck, superstructure, substructure evaluations and preparing plans for the repairs listed in 395 General Purpose Lanes Bridge Repair Quantities Table, including any necessary engineering calculations required for the preparation of repair details shall not be measured for separate payment. and shall be included in the cost of the repair items.

    - The cost of all maintenance of traffic, including any installation and removal of any work area protection appurtenances (barriers etc.) shall not be measured for separate payment. The cost thereof shall be included in the cost of other repair items.

    - The cost of all new required pavement markings shall not be measured for separate payment. The cost thereof shall be included in the cost of other repair items.

    - The cost of Environmental protection and health and safety, worker protection, Disposal of material shall not be measured for separate payment. The cost thereof shall be included in the cost of other repair items.

2. **Patching (Type B) –** Very-early-strength latex-modified concrete shall be used for all deck patching. Type B patching shall be performed at the following locations:

    - Spalled areas of deck
    - Delaminated areas of deck
    - Previously repaired areas of deck (as deemed necessary by the Department)
    - Areas of deck where the concentration of chloride ions at the depth of top layer of deck reinforcement is equal to or greater than 2.0 pounds per cubic yard.
    - Others areas as directed by the Concessionaire.

3. **Replace Existing Bridge Barrier (Deck)–** This work shall include removing the existing concrete bridge barrier and replacing with a Cast-in-Place Concrete Parapet (F-shape) designed and detailed in accordance with the requirements of the Manuals of the S&B Division and AASHTO LRFD. At a minimum, this work will require the removal and reconstruction of the existing deck overhang. To comply with the requirements of Chapter 10 of the Manuals of the S&B Division, Part 2, for the design of deck overhang, additional partial depth removal of existing deck will be required. Partial deck removal shall be performed in accordance with Section 425 of the Road and Bridge Specifications and shall utilize Very-early-strength latex-modified concrete for overlay material.

   Face-of-curb shall of new barrier shall be located such that width of existing outside shoulder shall be maintained.

4. **Modify Approach Barrier / Guardrail–** This work shall include removing the existing approach barrier / guardrail as necessary to interface with the reconstructed bridge barrier. This work may require partial reconstruction of bridge wing walls and / or approach retaining walls as necessary to permit the construction of new approach barriers.

5. **Type A milling (1" or 3/4"), (Type A) Hydro-demolition (3/4"), Furnish (Very-early-strength latex-modified) concrete (1 1/2"- 2") and Place (Very-early-strength latex-modified) concrete overlay** shall be completed in accordance with the requirements of Section 425 of the Road and Bridge Specifications and the following:

   a. The depths of milling and hydro-demolition noted above were established on the basis of concrete deck cover shown on the as built plans. The Department will review the results of the deck evaluation surveys to confirm established depths of milling and hydro-demolition prior to commencement of milling operations. Unless otherwise approved by the Department, Type A milling shall not be closer than ¾" to top mat of reinforcing steel and the minimum depth of hydro-demolition shall not be less than ¾"

   b. At Bridge over Sanger Ave., entire existing rigid overlay shall be removed.

   c. Existing top of deck elevations shall be maintained.

   d. Once an area of a deck is milled, the Design-Builder shall be responsible for maintaining the surface of the milled deck free from any loose aggregate, pot holes, drop offs between lanes and shall perform cleaning of the milled deck and / or pot hole repairs (deck patching) as necessary to provide a safe riding surface for all vehicular traffic (including motorcycles) for the entire duration and until the concrete overlay is placed over the entire deck.

   e. Concrete Overlay operations shall not commence until all Patching (Type B)

for the entire bridge deck has been completed.

6. **Expansion Joint Reconstruction (Very-early-strength latex-modified concrete)** shall be performed in accordance with Section 412 of the Road and Bridge Specifications and the following:

   a. Expansion Joint Reconstruction shall consist of removing and disposing of existing concrete and any existing joint armor, repairing and replacing reinforcing steel, as may be required by the Concessionaire, preparing the contact surfaces, and furnishing and placing new concrete and reinforcing steel, in accordance with the details shown in Figure 1. Concrete used in Expansion Joint Reconstruction shall be Very-early-strength latex-modified concrete in accordance with Section 425 of the specifications

   b. Expansion joint reconstruction shall be performed after all concrete overlay operations have been completed.

   c. The cost of elastomeric expansion dam shall not be measured for separate payment and shall be included in the cost of Expansion Joint Reconstruction.

7. **Deck Slab Closure** shall be in accordance with Section 412 of the Road and Bridge Specifications and the following:

   a. Deck Slab Closure shall consist of repairing bridge decks for link slabs at piers in accordance with the details shown in the Manual of the Structure and Bridge Division Part 2 File No. 10.02-2 and including parapet concrete as required by the Concessionaire. Details shown in Figure 2 may be used as a reference for an alternative system that may be further evaluated by the Design-Builder for use at Deck Slab Closures.

   b. Unless otherwise approved by the Concessionaire, concrete for the deck slab closure shall be Very-early-strength latex-modified concrete in accordance with Section 425 of the Road and Bridge Specifications.

   c. Deck slab closure shall be completed prior to the placement of the concrete overlay.

   d. The cost of modifying existing expansion or fixed bearings required for the deck slab closure shall not be measured for separate payment. The cost thereof shall be included in the cost of Deck Slab Closure.

8. **Ultrasonic Impact Treatment – Retrofit all members with a fatigue stress category D, E, and E'.** All treated areas shall be spot-painted in accordance with the requirements of Section 411 of the Road and Bridge Specifications.

9. **Replace Bearing** shall consist of removing existing bridge bearings and replace

with new bearings. This work shall be performed in accordance with Sections 408 and 413, and the following:

a. This work shall consist of removing existing welds, removing and disposing of existing bearing components and anchor bolts, furnishing, painting and installing new bearing assemblies (including sole plate, anchor bolts, washers and nuts), placing and inspecting new welds, cleaning and applying paint to new bearings and any disturbed areas, and providing environmental, worker and safety protection, and disposal of material.

b. The existing structures are designated as Type B structures in accordance with Section 411 of the Specifications.

c. A plan for installing new anchor bolts shall be submitted to the Concessionaire for review and approval.

d. Beams shall be jacked a minimum distance as specified on the repair plans prepared by the Design-Builder in order to relieve the load on the bearings. The cost of jacking and supporting beams shall be paid for under the pay item Jacking and Blocking.

e. Remove fillet weld between beam flange and sole plate, and remove the existing bearing assembly.

f. Grind bottom of bottom flange to remove burrs. Clean bottom of flange in accordance with Specifications Section 411.04(a) Method 5.

g. Place the new bearing assembly.

h. Install new anchor bolts, nuts and washers.

i. Fillet weld sole plate to beam flange. New welds shall be inspected by magnetic particle testing to be performed by the Contractor.

j. The bearing assemblies shall be painted in the shop with the system specified on the repair plans prepared by the Design-Builder. The new welds and all disturbed areas shall be cleaned and coated using the coating system specified in the repair plans.

k. Materials and Fabrication shall be in accordance with the applicable requirements of Section 408 of the Specifications. Steel in sole plates and other steel components of the bearings, except as noted on the details, shall be ASTM A709 Grade 36. Grout and adhesive material for anchor bolts shall be from the VDOT approved list.

l. Contractor shall verify heights of existing bearing assemblies prior to preparing

shop drawings.

m. Immediately before casting the new anchor bolts in VDOT approved high-strength grout and mortar, the holes shall be thoroughly cleaned to the satisfaction of the Concessionaire.

10. Jacking and Blocking Beam – This work shall include the replacement of end diaphragms, as necessary, to permit jacking and blocking beam ends.

11. Zone Coating of Existing Structures (Str. No. 2040-HOV) shall include zone coating of the entire 3 feet of beam ends including bearings and diaphragms and entire length of the transverse girders at pier 1 under both the HOV and General Purpose lanes.

12. Prepare and Overcoat Existing Structure (Str. No. 2805-HOV) shall be limited to the steel superstructure under the HOV lanes.

13. Prepare and Overcoat Existing Structure (Str. No. 2040-NB GP) shall be limited to the steel superstructure under the NB General Purpose lanes.

14. Crack Repair (Type B) for pier or abutment shall be completed in accordance with the requirements of Section 412 of the Specifications.

15. Concrete Substructure Surface Repair shall be performed in accordance with the requirements of Section 412 of the Road and Bridge Specifications. The use of shotcrete will not be permitted. Removal of existing concrete shall extend a minimum of 12" beyond the limits of delaminated or otherwise defective surfaces. Minimum concrete cover to reinforcement at repaired areas shall be 1 ½". Jacking and blocking of beams necessary to perform beam seat repairs shall not be measured for separate payment. The cost thereof shall be included in the cost of Concrete substructure surface repair.

16. Waterproofing Coating - This work shall consist of cleaning and preparing pier and abutment surfaces; and applying waterproofing coating to all areas of the substructure after completion of concrete substructure repairs.

Waterproofing Coating shall be Tex. Cote 300 by Textured Coatings of America Inc., Thorocoat by BASF Construction Chemicals LLC, Mark - 173.5 by Poly-Carb Cleveland, Ohio or Ultracrete Solvent Borne Textured Coating by Sherwin Williams. Top of pier caps and abutment caps / stems shall be waterproofed with EP-5.

17. Waterproofing – Epoxy Resin (Type EP-5) - shall be completed in accordance with the requirements of Section 416 of the Specifications.