

I-77 Interchange Exit 26 and Connection Roads
Project ID Number: P042443
Richland County



Proposed Repair Details & Quantities
I-77 Over US-21
Asset ID: 6917 & 6918

Prepared by:



Table of Contents

1. GENERAL BRIDGE REHABILITATION REQUIREMENTS	4
1.1 Surface Preparation and Surface Finish of Exposed Concrete.....	4
2. BRIDGE DECK REPLACEMENT / REPAIR AND OVERLAY	4
2.1 Hydro-demolition and Concrete Overlay.....	4
2.2 Bridge Deck Drainage.....	5
3. JOINT REPLACEMENT	5
3.1 Reseal Expansion Joints with Silicone Sealant (Cold Applied Elastic Filler)	5
4. BEARING REPLACEMENT	6
5. SUPERSTRUCTURE REPAIR	7
5.1 Cleaning and Painting of Structural Steel	7
5.2 Steel Girder Repairs	7
5.3 Barrier Rail Spall Repairs	8
6. SUBSTRUCTURE REPAIR.....	9
6.1 Spall Repairs	9
APPENDIX A: Asset 6917 Structure Inventory and Appraisal Report	23
APPENDIX B: Asset 6918 Structure Inventory and Appraisal Report.....	24
APPENDIX C: Standard Repair Details.....	25
APPENDIX D: Deck Testing Report	26

Table 1: Required Bridge Rehabilitation	11
Table 2: Substructure Repair Quantities	12
Table 3: Superstructure Repair Quantities	13
Table 4: Substructure Repair Quantities - Bent 1	14
Table 5: Substructure Repair Quantities - Bent 2	15
Table 6: Substructure Repair Quantities - Bent 3	16
Table 7: Substructure Repair Quantities - Bent 4	17
Table 8: Substructure Repair Quantities - Bent 5	18
Table 9: Superstructure Repair Quantities - Span 1.....	19
Table 10: Superstructure Repair Quantities - Span 2.....	20
Table 11: Superstructure Repair Quantities - Span 3.....	21
Table 12: Superstructure Repair Quantities - Span 4.....	22

1. GENERAL BRIDGE REHABILITATION REQUIREMENTS

For interstate route bridges that are retained, the “required bridge rehabilitations” provided herein and indicated in Table 1 are the minimum requirements. The Contractor is responsible for an in-depth inspection of each bridge, quantifying all required rehabilitation work, and submitting proposed rehabilitation plans and calculations to SCDOT for review and approval.

An Asbestos Assessment and Lead Based Paint Assessment have been completed by the department and provided for the use of the contractor. All removal, repair, replacement, or disposal performed within this scope of work shall meet all requirements of the Standard Specifications or Special Provisions associated with the presence of asbestos or lead based paint if indicated in the provided assessments.

All bridge rehabilitation shall comply with the requirements of Chapter 23 of the SCDOT Bridge Design Manual. The Contractor is responsible for submitting an updated load rating for all retained bridges per SCDOT’s Load Rating Guidance Document and applicable Load Rating Technical Notes.

In addition to the requirements listed in Table 1, final finish requirements for all retained bridge components shall be in accordance with Section 702.4.11 of the SCDOT Standard Specifications.

1.1 Surface Preparation and Surface Finish of Exposed Concrete

The contractor is responsible for surface preparation and application of a surface finish of all exposed substructure elements, outside edge of bridge deck, and all faces of concrete barriers in accordance with Section 702.4.11 of the SCDOT Standard Specification.

2. BRIDGE DECK REPLACEMENT / REPAIR AND OVERLAY

2.1 Hydro-demolition and Concrete Overlay

SCDOT has performed deck evaluations on Asset ID 6917 and Asset ID 6918 (I-77 over US-21). Quantities associated with the anticipated repairs on these bridges are included in Tables 2 and 3. Evaluation Report is included in Appendix D.

Staging of the deck repairs shall be such that no load (traffic loading, construction loading, barrier wall, etc.) is placed between the beams where the deck is being removed. In other words, no load shall be placed within a beam bay where deck removal is occurring.

Remove the top **3.75”** of the existing deck concrete for all exposed bridge deck in accordance with Special Provisions Section 726. Mechanical scarification of existing decks is limited to the top 1½”, with the remainder requiring hydro-demolition techniques. Place latex modified concrete (LMC) overlay to restore the original deck grade and cross-slope in accordance with Special Provisions Section 726. LMC is the only allowable overlay type except where a full-depth deck replacement is required.

Once the 3.75" deck removal has been performed, evaluate the remaining deck for additional concrete deficiencies and notify the RCE of additional findings. Remove all damaged concrete and perform repairs (overlay, partial depth, or full depth) as directed by the RCE and in conjunction with the special provisions.

For Bridge Deck Rideability Requirements, see Section 702.4.14 of the Standard Specifications.

Apply grooved surface finish in accordance with Section 702.4.16 of the Supplemental Specifications.

2.2 Bridge Deck Drainage

At existing bridge where deck repairs are performed, deck drains are to remain in their existing location. Form sloped recess at deck drain locations as shown in the drain details on existing plans. Repair or replace damaged deck drain components.

3. JOINT REPLACEMENT

3.1 Reseal Expansion Joints with Silicone Sealant (Cold Applied Elastic Filler)

The contractor is responsible for resealing all expansion joints on the bridge in accordance with the SCDOT Standard Specifications and the BDM.

Remove existing failing material and all vegetation/debris as necessary.

Concrete must be in sound condition, remove all loose, spalled, and delaminated concrete. Repair concrete if RCE determines necessary.

Clean the joints by sandblasting with clean dry sand immediately before placing the new joint filler. Sandblast the joint opening to provide a firm, clean joint surface free of curing compound, loose material, and any foreign matter. Sandblast the joint opening without causing pitting or uneven surfaces.

Install joint repair material in accordance with Section 702.2.2.9 of the Standard Specifications and per manufacturers' recommendations.

Work includes the furnishing of materials, labor, tools, and equipment necessary to replace deteriorated joints. This includes removal of existing joint material, repair of existing joint headers, surface preparation and installation of new joint material as indicated on the drawings and specified herein.

4. BEARING REPLACEMENT

Replace existing bearings with elastomeric bearings and bearing plates in accordance with the BDM Section titled "Bearing Assemblies" unless otherwise directed in this section. For a height difference between existing and proposed bearings less than 6 inches, the difference in height can be accommodated with extra thick bearing plate(s) between the bottom flange of the girder and the bearing pad. For height differences greater than or equal to 6 inches, use plates or a steel column comprised of an HP or similar steel section and place reinforced concrete to extend the concrete beam seat up to the bottom of the elastomeric bearing. New anchor bolts shall be installed at all bearing locations. Cut off existing anchor bolts a minimum of 1" below the existing concrete surface and patch the location with an SCDOT approved epoxy mortar/concrete patch in accordance with ASTM C881. Provide new anchor bolts sized in accordance with the BDM and attached to existing concrete in accordance with the requirements for adhesively bonded anchors and dowels in the Supplemental Specifications. When new anchor bolt locations conflict with existing anchor bolts, the existing anchor bolts shall be cored out and removed entirely to facilitate the installation and adhesion of the new anchor bolt system.

Where bridge jacking for bearing replacement is done while under traffic, size the jacks to carry the dead load of the structure plus the anticipated live load during construction. If bridge is to be raised for a duration longer than six hours, use temporary supports instead of jacks. Jack all beams simultaneously in a manner that prevents permanent deformation and/or structural damage to the existing bridge components or any appurtenances attached to the bridge. Utilize temporary asphalt as necessary to limit the vertical elevation difference while bridge is elevated on jacks. The bridge jacking system may be attached to the existing substructure components. Any damage to the existing substructure, including holes for attaching jacking system shall be repaired in accordance with the specifications and to the satisfaction of the RCE.

Submit working drawings and calculations for the bridge jacking procedures (including design of bridge jacking system and evaluation of existing bridge components during the jacking process and in final condition) along with the shop drawings for the bearings and bearing assembly hardware.

Bridge end walls should be chipped as necessary to remove existing bearing assemblies including room to fully remove metal shims and the bearing plates that may be welded to the existing girder and to install new bearings. If portions of the end walls were removed, the exposed concrete shall be patched according to the following procedure. Any damaged or removed reinforcing shall be repaired or replaced to the satisfaction of the RCE.

- A. Remove all grease, dirt, oil, or foreign material from the patch areas by blast cleaning. Immediately before placing patching material, remove all dust, sand, and blasting debris with oil-free compressed air.
- B. Apply an SCDOT approved rust inhibitor to all exposed reinforcing steel. Ensure that the exposed concrete surface is clean and dry. Apply inhibitor in accordance with manufacturer's recommendations.
- C. Apply an SCDOT approved epoxy mortar/concrete patch in accordance with ASTM C881. Fill all voids. The material used shall be rated for vertical and overhead use.

- D. Apply an SCDOT approved epoxy surface sealer to the perimeter of the patch area.

The Contractor shall verify the geometry of the new bearing assemblies, including thermal expansion requirements. If necessary, a reinforced concrete corbel shall be installed to extend the bearing area. The corbel shall be designed in accordance with AASHTO LRFD 5.8.4.2. If necessary, vertical chipping may be required to accommodate the new bearing assembly. If needed, a high strength, fast set, non-shrink, non-metallic grout shall be used. The grout shall be factory-packaged, non-staining, noncorrosive, nongaseous grout complying with ASTM C1107. The grout shall contain a blend of selected Portland cements, plasticizing/water-reducing admixtures and shrinkage compensating agents. The shrinkage agents shall compensate for shrinkage in both the plastic and hardened states. The grout shall meet the following minimum material properties:

- A. Compressive strength at 28 days (ASTM C942): 11,000 psi
- B. Bond strength (ASTM C882): plastic grout to hardened concrete
 - a) At 28 days: 2,500 psi.
 - b) At 1 day: 1,800 psi.
- C. Grout material must be suitable for grouting level pads.
- D. Final set shall occur within 1 hour.

5. SUPERSTRUCTURE REPAIR

5.1 Cleaning and Painting of Structural Steel

Clean and paint all steel girders and diaphragms/cross frames in their entirety in accordance with the Special Provision, "Section 710: Field Painting of Structural Steel (Aluminum Epoxy Mastic Paint System)". Comply with all required regulations and/or guidelines associated with the presence of lead containing paints if present. Painting shall be performed prior to the steel girder repairs as indicated in section 5.2.

5.2 Steel Girder Repairs

Beam end repairs shall be performed in all beams where section loss at the ends of the beams is in excess of 1/8", excessive pitting is occurring on the web or bottom flange or pack rust is occurring with the bottom flange and the existing bearing assembly. Obtain section loss measurements at all beam ends during the required inspection and report latest section loss values in the bridge rehabilitation plans.

Example steel girder end repair details have been provided in Appendix C. Final details shall be prepared and incorporated into the bridge rehabilitation plans. Web and bottom-flange repair plates shall be 1/2" thick. Provide flange repair plates on the top of the existing bottom flange and the plate width shall be sufficient to match the outside edge of the existing bottom flange. Flange and web repair plate length shall be, at a minimum: 2'-0" longer than the area of section loss where section remaining is less than 75% of the original section or 6-feet, whichever is greater. Repair plates shall be at a minimum 8" in height and top row of bolts shall be 2" minimum above the area

of section loss where section remaining is less than 75% of the original section. Bolt repair plates through the web and through the bottom flange using 7/8" diameter bolts. Use a minimum of three (3) horizontal rows of bolts through the web with bolts spaced at 6-inches in each row. Use one (1) row of bolts through the bottom flange on both sides of the web with bolts spaced at 6-inches in each row.

All new steel shall be ASTM A36. All bolts shall be ASTM F3125 grade A325.

All existing steel shall be cleaned and painted in accordance with Section 5.1 prior to the installation of repair plates. All new steel shall be shop painted with the applicable paint system in accordance with Section 5.1 prior to installation. Ensure paint color for new steel matches the field painted existing steel.

All new materials shall conform to the Standard Specifications as identified below:

- Structural Steel - Section 709 conforming to the requirements of Subsection 709.2
- Nuts, Bolts, and Washers - Section 709 conforming to the requirements of Subsection 709.2.4

5.3 Barrier Rail Spall Repairs

Concrete spall repairs have been quantified for both bridges and included in Table 3.

Perform spall repair in accordance with standard specifications and the repair notes below.

Concrete spall repairs in reinforced concrete barrier rail are required if the surface area of the existing spall or delaminated area is over 1 square foot or if the spall is over 1" deep and/or has exposed reinforcement (regardless of spall area). Deficiencies in the reinforced concrete barrier rail shall be assessed and measured by a Professional Engineer with hands-on access to the bridge element and confirmed by the RCE.

Standard Repair Notes:

1. Outline the defective areas and verify depth of concrete cover over reinforcing steel. Saw-cut the outlined areas to a minimum depth of 1/2", if possible, without cutting any reinforcing steel. It appears that the concrete cover on some of the repair locations are inadequate, therefore care shall be taken when prepping the surface or removing the existing concrete.
2. Concrete removal shall be performed using hand tools only to avoid damaging the existing barrier rail or the metal rail attached to the concrete barrier rail. Do not damage the vertical sides of the saw-cut during removal. Be careful not to damage any existing reinforcing. Replace all reinforcing steel damaged during concrete removal as part of the repair. An alternative concrete removal process may be considered if the contractor can demonstrate to the satisfaction of the RCE that it can be accomplished without damaging the existing barrier rail. Any damage to the existing concrete barrier or the attached metal rail shall be repaired to the satisfaction of the RCE.
3. Remove concrete to a depth of no less than 1" behind the existing reinforcing steel.

4. Remove all grease, dirt, oil, or foreign material from the patch areas by blast cleaning. Immediately before placing patching material, remove all dust, sand, and blasting debris with oil-free compressed air.
5. Apply an SCDOT approved rust inhibitor to all exposed reinforcing steel. Ensure that the exposed concrete surface is clean and dry. Apply inhibitor in accordance with manufacturer's recommendations.
6. Apply an SCDOT approved epoxy mortar/concrete patch in accordance with ASTM C881. Fill all voids. The material used shall be rated for vertical and overhead use.
7. Apply an SCDOT approved epoxy surface sealer to the perimeter of the repaired area.

6. SUBSTRUCTURE REPAIR

6.1 Spall Repairs

Areas of concrete crack repairs and spalled concrete repairs have been quantified for both bridges and included in Table 4.

Perform crack and spall repair in accordance with standard specifications and the repair notes below.

Concrete crack repairs in reinforced concrete substructure elements are required if cracks are over 1/4" in width (regardless of crack length) or if cracks are over 0.012" in width and over 6' in length. Concrete spall repairs in substructure elements are required if the surface area of the existing spall or delaminated area is over 5 square feet or if the spall is over 1" deep and/or has exposed reinforcement (regardless of spall area). Deficiencies in the reinforced concrete substructure elements shall be assessed and measured by a Professional Engineer with hands-on access to the bridge element and confirmed by the RCE.

Standard Repair Notes:

1. Outline the defective areas and verify depth of concrete cover over reinforcing steel. Saw-cut the outlined areas to a minimum depth of 1 1/2", if possible, without cutting any reinforcing steel.
2. Remove all defective and/or delaminated concrete in the outlined areas by used of jackhammers. Limit the maximum size of jackhammers to 15 pounds. Do not damage the vertical sides of the saw-cut during removal. Be careful not to damage any existing reinforcing. Replace all reinforcing steel damaged during concrete removal as part of the repair.
3. Remove concrete to a depth of no less than 1" behind the existing reinforcing steel.
4. Remove all grease, dirt, oil, or foreign material from the patch areas by blast cleaning. Immediately before placing patching material, remove all dust, sand, and blasting debris

with oil-free compressed air.

5. Apply an SCDOT approved rust inhibitor to all exposed reinforcing steel. Ensure that the exposed concrete surface is clean and dry. Apply inhibitor in accordance with manufacturer's recommendations.

6. Apply an SCDOT approved epoxy mortar/concrete patch in accordance with ASTM C881. Fill all voids. The material used shall be rated for vertical and overhead use.

7. Apply an SCDOT approved epoxy surface sealer to the perimeter of the repaired area.

Table 2: Substructure Repair Quantities

Bridge Information				Minimum Substructure Repairs			
Asset ID	Facility Carried	Feature Intersected	Year Built	Reinforced Concrete Crack Repair (LF)	Reinforced Concrete Spall Repair ¹ (SF)	Clean and Paint Exposed Concrete (SY)	Bearing Replacement (EA)
6917	I-77	US-21	1976	13	106	484	72
6918	I-77	US-21	1976	25	150	374	56

1. Spall repairs do not include areas adjacent to bearings that may be spalled due to chipping as part of bearing replacement

Table 3: Superstructure Repair Quantities

Bridge Information				Minimum Superstructure Repairs							
Asset ID	Facility Carried	Feature Intersected	Year Built	Superstructure Girder Repair (LB)	Clean and Paint Structural Steel (SY)	Hydro-demolition of Deck (SY)	LMC Overlay (CY)	Rail Spall Repair (SF)	Underside Deck Patching (SF)	Reseal Joint (LF)	Clean and Paint Exposed Concrete (SY)
6917	I-77	US-21	1976	2,063	3,663	1925	605	0	25	435	429
6918	I-77	US-21	1976	16,756	2,863	1529	484	100	38	352	429

Table 4: Substructure Repair Quantities - Bent 1

Bridge Information				Minimum Substructure Repairs			
Asset ID	Facility Carried	Feature Intersected	Year Built	Reinforced Concrete Crack Repair (LF)	Reinforced Concrete Spall Repair ¹ (SF)	Clean and Paint Exposed Concrete (SY)	Bearing Replacement (EA)
6917	I-77	US-21	1976	0	0	0	9
6918	I-77	US-21	1976	0	0	0	7

1. Spall repairs do not include areas adjacent to bearings that may be spalled due to chipping as part of bearing replacement

Table 5: Substructure Repair Quantities - Bent 2

Bridge Information				Minimum Substructure Repairs			
Asset ID	Facility Carried	Feature Intersected	Year Built	Reinforced Concrete Crack Repair (LF)	Reinforced Concrete Spall Repair ¹ (SF)	Clean and Paint Exposed Concrete (SY)	Bearing Replacement (EA)
6917	I-77	US-21	1976	6	38	154	18
6918	I-77	US-21	1976	6	31	121	14

1. Spall repairs do not include areas adjacent to bearings that may be spalled due to chipping as part of bearing replacement

Table 6: Substructure Repair Quantities - Bent 3

Bridge Information				Minimum Substructure Repairs			
Asset ID	Facility Carried	Feature Intersected	Year Built	Reinforced Concrete Crack Repair (LF)	Reinforced Concrete Spall Repair ¹ (SF)	Clean and Paint Exposed Concrete (SY)	Bearing Replacement (EA)
6917	I-77	US-21	1976	6	25	160	18
6918	I-77	US-21	1976	13	100	121	14

1. Spall repairs do not include areas adjacent to bearings that may be spalled due to chipping as part of bearing replacement

Table 7: Substructure Repair Quantities - Bent 4

Bridge Information				Minimum Substructure Repairs			
Asset ID	Facility Carried	Feature Intersected	Year Built	Reinforced Concrete Crack Repair (LF)	Reinforced Concrete Spall Repair ¹ (SF)	Clean and Paint Exposed Concrete (SY)	Bearing Replacement (EA)
6917	I-77	US-21	1976	0	44	171	18
6918	I-77	US-21	1976	6	19	132	14

1. Spall repairs do not include areas adjacent to bearings that may be spalled due to chipping as part of bearing replacement

Table 8: Substructure Repair Quantities - Bent 5

Bridge Information				Minimum Substructure Repairs			
Asset ID	Facility Carried	Feature Intersected	Year Built	Reinforced Concrete Crack Repair (LF)	Reinforced Concrete Spall Repair ¹ (SF)	Clean and Paint Exposed Concrete (SY)	Bearing Replacement (EA)
6917	I-77	US-21	1976	0	0	0	9
6918	I-77	US-21	1976	0	0	0	7

1. Spall repairs do not include areas adjacent to bearings that may be spalled due to chipping as part of bearing replacement

Table 9: Superstructure Repair Quantities - Span 1

Bridge Information				Minimum Superstructure Repairs							
Asset ID	Facility Carried	Feature Intersected	Year Built	Superstructure Girder Repair (LB)	Clean and Paint Structural Steel (SY)	Hydro-demolition of Deck (SY)	LMC Overlay (CY)	Rail Spall Repair (SF)	Underside Deck Patching (SF)	Reseal Joint* (LF)	Clean and Paint Exposed Concrete (SY)
6917	I-77	US-21	1976	675	450	297	94	0	6	171	66
6918	I-77	US-21	1976	5400	314	237	77	25	6	138	66

*Includes joints at the beginning of the bridge and first intermediate bent

Table 10: Superstructure Repair Quantities - Span 2

Bridge Information				Minimum Superstructure Repairs							
Asset ID	Facility Carried	Feature Intersected	Year Built	Superstructure Girder Repair (LB)	Clean and Paint Structural Steel (SY)	Hydro-demolition of Deck (SY)	LMC Overlay (CY)	Rail Spall Repair (SF)	Underside Deck Patching (SF)	Reseal Joint (LF)	Clean and Paint Exposed Concrete (SY)
6917	I-77	US-21	1976	0	1,381	666	209	0	0	88	149
6918	I-77	US-21	1976	7,400	946	528	165	25	19	72	149

Table 11: Superstructure Repair Quantities - Span 3

Bridge Information				Minimum Superstructure Repairs							
Asset ID	Facility Carried	Feature Intersected	Year Built	Superstructure Girder Repair (LB)	Clean and Paint Structural Steel (SY)	Hydro-demolition of Deck (SY)	LMC Overlay (CY)	Rail Spall Repair (SF)	Underside Deck Patching (SF)	Reseal Joint (LF)	Clean and Paint Exposed Concrete (SY)
6917	I-77	US-21	1976	0	1,105	666	209	0	6	88	149
6918	I-77	US-21	1976	750	946	528	165	25	0	72	149

Table 12: Superstructure Repair Quantities - Span 4

Bridge Information				Minimum Superstructure Repairs							
Asset ID	Facility Carried	Feature Intersected	Year Built	Superstructure Girder Repair (LB)	Clean and Paint Structural Steel (SY)	Hydro-demolition of Deck (SY)	LMC Overlay (CY)	Rail Spall Repair (SF)	Underside Deck Patching (SF)	Reseal Joint (LF)	Clean and Paint Exposed Concrete (SY)
6917	I-77	US-21	1976	1,388	450	297	94	0	13	88	66
6918	I-77	US-21	1976	3,206	314	237	77	25	13	72	66

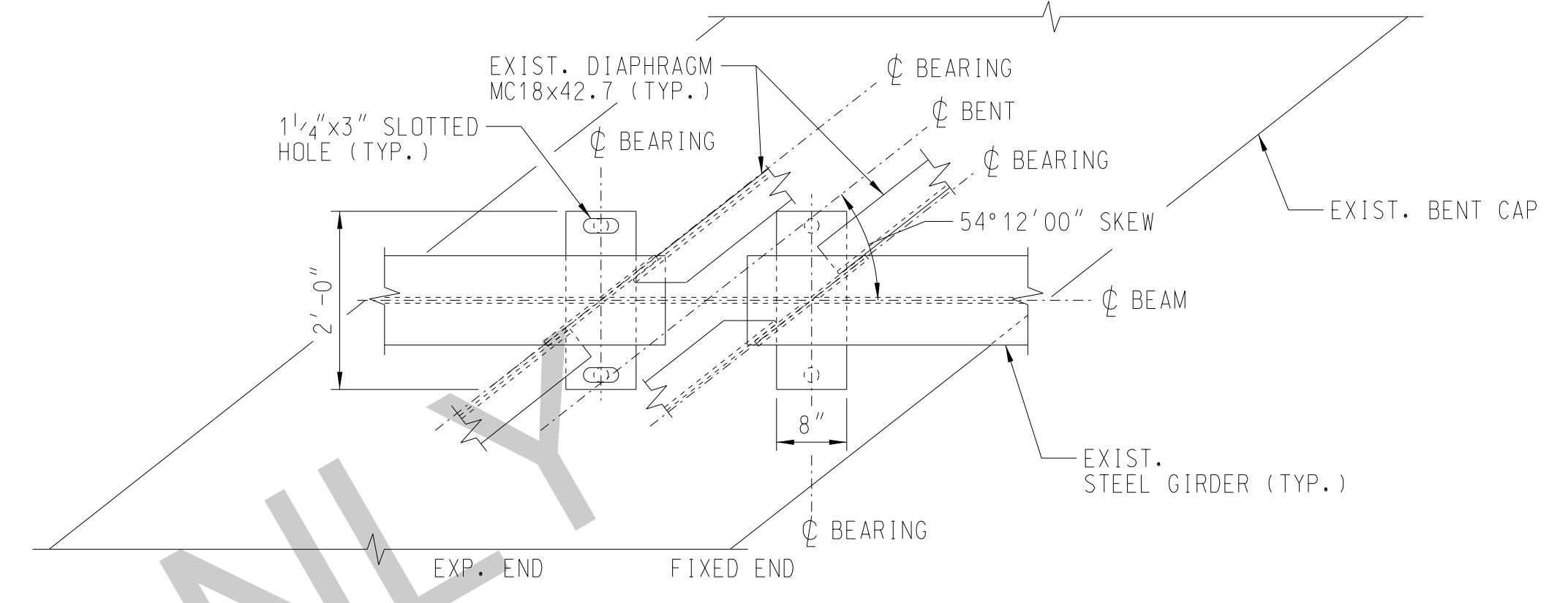
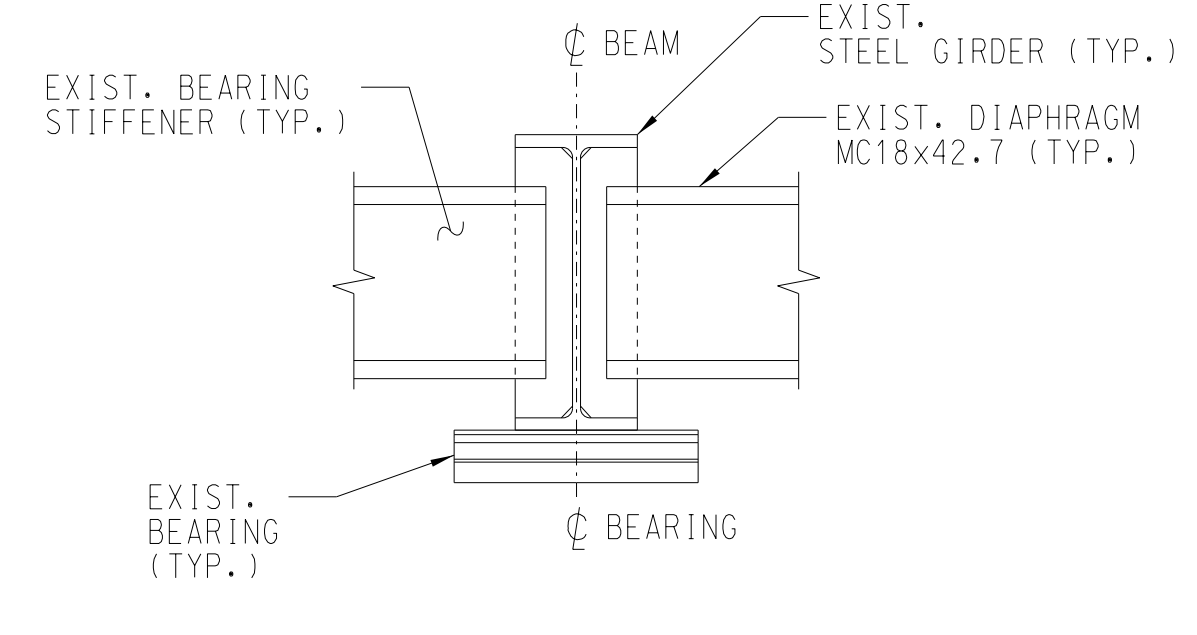
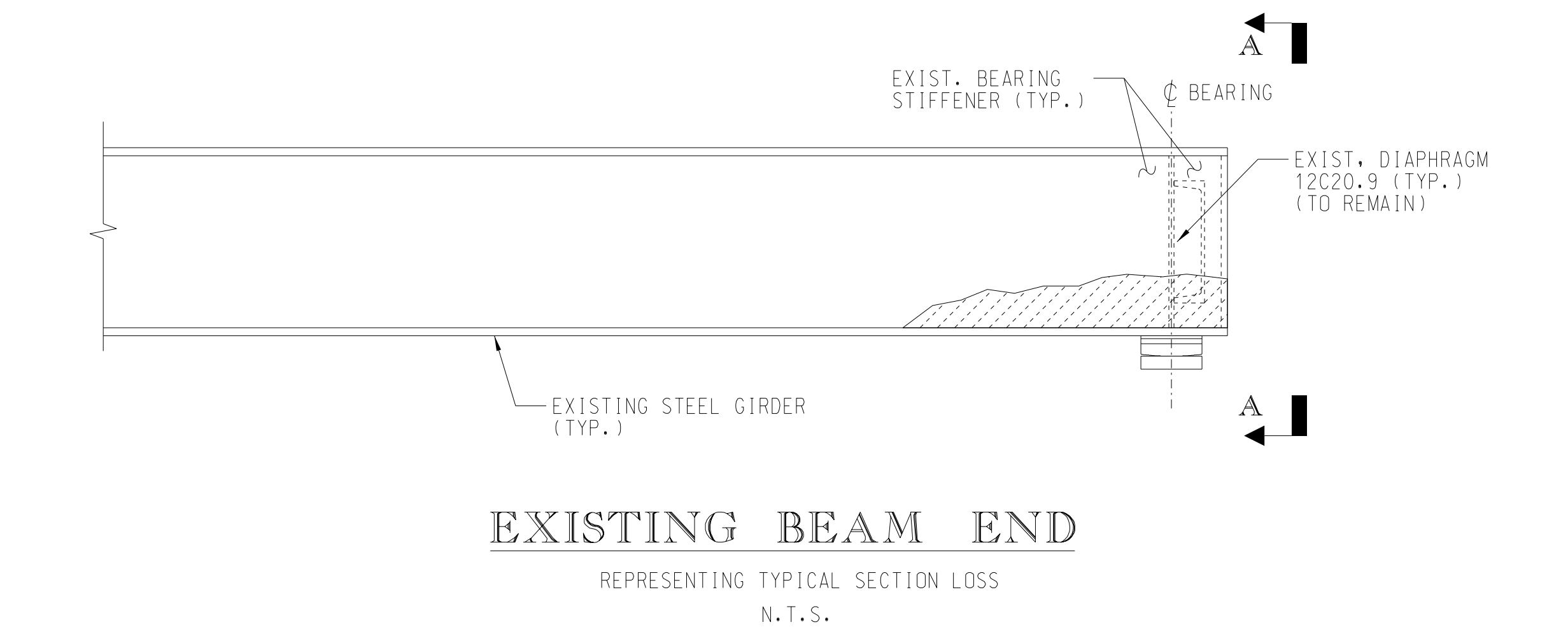
**APPENDIX A: Asset 6917 Structure Inventory and
Appraisal Report**

IDENTIFICATION				CLASSIFICATION			
(1) State Name- SOUTH CAROLINA	Code	454		Sufficiency Rating	=	78.0	
(8) Structure Number # 0004010007712200	Asset ID	6917		Functionally Obsolete	=	NO	
(5) Inventory Route (On/Under)	On -	111000771		Structurally Deficient	=	NO	
(2) State Highway Department District		1					
(3) County Code 79	(4) Place Code						
(6) Features Intersected US 21							
(7) Facility Carried I-77 NB							
(9) Location 10 MI N. COLUMBIA							
(11) Milepoint		24.039					
(12) Base Highway Network - PART OF NET	Code	1		(112) NBIS Bridge Length -		YES	
(13) LRS Inventory Route & Subroute		001-00077000		(104) Highway System - NHS		1	
(16) Latitude 34 Degrees 10 Minutes 17.60 Seconds				(26) Functional System - URBAN-PRIN ART-INT		11	
(17) Longitude 80 Degrees 58 Minutes 17.30 Seconds				(100) Strahnet Highway - STRAH HWY		1	
(98) Border Bridge State Code	% SHARE	%		(101) Parallel Structure - RIGHT STRUCT		R	
(99) Border Bridge Structure No.	#			(102) Direction of Traffic - 2-WAY TRAFFIC		2	
				(103) Temporary Structure -			
				(105) Federal Lands Highways - N/A		0	
				(110) Designated National Network - YES		1	
				(20) Toll - ON FREE ROAD		3	
				(21) Maintain - SCDOT		1	
				(22) Owner - SCDOT		1	
				(37) Historical Significance - NOT ELIGIBLE		5	
STRUCTURE TYPE AND MATERIAL				CONDITION			
(43) Structure Type Main: MATERIAL - STEEL				(58) Deck - SATISFACTORY		6	
Type - STRINGER/MULTI-BEAM OR GIRD	Code	302		(59) Superstructure - FAIR		5	
(44) Structure Type Main: MATERIAL - OTHER OR N/A				(60) Substructure - SATISFACTORY		6	
Type - OTHER OR N/A	Code	000		(61) Channel and Channel Protection - N/A		N	
(45) Number of Spans in Main Unit		4		(62) Culverts - NOT APPLICABLE		N	
(46) Number of Approach Spans		0					
(107) Deck Structure Type - CONCRETE CAST-IN-PLC	Code	1		LOAD RATING AND POSTING			
(108) Wearing Surface / Protective System:				(31) Design Load - HS 20+MOD		6	
A) Type of Wearing Surface - MONO CONCRETE	Code	1		(64) Operating Rating - LRFR		59.29	
B) Type of Membrane - NONE	Code	0		(66) Inventory Rating - LRFR		45.68	
C) Type of Deck Protection - NONE	Code	0		(70) Bridge Posting - EQUAL/ABOVE LEGAL LOADS		5	
				(41) Structure Open, Posted or Closed -		A	
				Description - OPEN, NO RESTRICT			
AGE AND SERVICE				APPRAISAL			
(27) Year Built		1976		(67) Structure Evaluation - BETTER THAN ADEQUACY		5	
(106) Year Reconstructed		0		(68) Deck Geometry		7	
(42) Type of Service On - HIGHWAY				(69) Underclearances, Vertical and Horizontal		4	
Under - HIGHWAY, WITH OR WITHOUT	Code	1		(71) Waterway Adequacy		N	
(28) Lanes: On Structure = 4 Under Structure = 6				(72) Approach Roadway Alignment		8	
(29) Average Daily Traffic		36350		(36) Traffic Safety Features		0111	
(30) Year of ADT 2022	(109) Truck ADT	14 %		(113) Scour Critical Bridges - NOT OVER WATERWAY		N	
(19) Bypass, Detour Length		0 MI					
GEOMETRIC DATA				PROPOSED IMPROVEMENTS			
(48) Length of Maximum Span		93 FT		(75) Type of Work -		Code	
(49) Structure Length		270 FT		(76) Length of Structure Improvement		270.0 FT	
(50) Curb or Sidewalk: Left .0 FT Right .0 FT				(94) Bridge Improvement Cost		\$0.00	
(51) Bridge Roadway Width Curb to Curb		58 FT		(95) Roadway Improvement Costs		\$0.00	
(52) Deck Width Out to Out		61.3 FT		(96) Total Project Cost		\$0.00	
(32) Approach Roadway Width (W/Shoulders)		64 FT		(97) Year of Improvement Cost Estimate		2023	
(33) Bridge Median - NONE	Code	0		(114) Future AADT		45074	
(34) Skew 35 Deg	(35) Structure Flared	NO		(115) Year of Future AADT		2042	
(10) Inventory Route Min Vert Clear	99 FT	99 IN					
(47) Inventory Route Total Horz Clear		58.2 FT		INSPECTIONS			
(53) Min Vert Clear Over Bridge Roadway	99 FT	99 IN		(90) Inspection Date 01/2022	(91) Frequency	24 Mo	
(54) Min Vert Underclear Ref - HWY BENEATH	18 FT	8 IN		(92) Critical Feature Inspection:	(93) CFI Date		
(55) Min Lat Underclear Right Ref - HWY BENEATH	9.7 FT			A) Fracture Crit Detail	NO	Mo	A)
(56) Min Lat Underclear Left	18.8 FT			B) Underwater Insp	NO	Mo	B)
				C) Other Special Insp	NO	Mo	C)
NAVIGATION DATA							
(38) Navigation Control - N/A - NO WATERWAY	Code	N					
(111) Pier Protection -	Code						
(39) Navigation Vertical Clearance		FT					
(116) Vert-Lift Bridge Min Vert Clear		FT					
(40) Navigation Horizontal Clearance		FT					

**APPENDIX B: Asset 6918 Structure Inventory and
Appraisal Report**

IDENTIFICATION				CLASSIFICATION			
(1) State Name- SOUTH CAROLINA	Code	454		Sufficiency Rating	=	60.0	
(8) Structure Number # 0004010007732200	Asset ID	6918		Functionally Obsolete	=	NO	
(5) Inventory Route (On/Under)	On -	111000773		Structurally Deficient	=	YES	
(2) State Highway Department District		1					
(3) County Code 79	(4) Place Code						
(6) Features Intersected US 21							
(7) Facility Carried I-77 SB							
(9) Location 10 MI N. COLUMBIA							
(11) Milepoint		24.039					
(12) Base Highway Network - PART OF NET	Code	1		(112) NBIS Bridge Length -		YES	
(13) LRS Inventory Route & Subroute		001-00077000		(104) Highway System - NHS		1	
(16) Latitude 34 Degrees 10 Minutes 16.14 Seconds				(26) Functional System - URBAN-PRIN ART-INT		11	
(17) Longitude 80 Degrees 58 Minutes 17.79 Seconds				(100) Strahnet Highway - STRAH HWY		1	
(98) Border Bridge State Code	% SHARE	%		(101) Parallel Structure - LEFT STRUCT		L	
(99) Border Bridge Structure No.	#			(102) Direction of Traffic - 1-WAY TRAFFIC		1	
				(103) Temporary Structure -			
				(105) Federal Lands Highways - N/A		0	
				(110) Designated National Network - YES		1	
				(20) Toll - ON FREE ROAD		3	
				(21) Maintain - SCDOT		1	
				(22) Owner - SCDOT		1	
				(37) Historical Significance - NOT ELIGIBLE		5	
STRUCTURE TYPE AND MATERIAL				CONDITION			
(43) Structure Type Main: MATERIAL - STEEL				(58) Deck - SATISFACTORY		6	
Type - STRINGER/MULTI-BEAM OR GIRD	Code	302		(59) Superstructure - POOR		4	
(44) Structure Type Main: MATERIAL - OTHER OR N/A				(60) Substructure - SATISFACTORY		6	
Type - OTHER OR N/A	Code	000		(61) Channel and Channel Protection - N/A		N	
(45) Number of Spans in Main Unit		4		(62) Culverts - NOT APPLICABLE		N	
(46) Number of Approach Spans		0					
(107) Deck Structure Type - CONCRETE CAST-IN-PLC	Code	1					
(108) Wearing Surface / Protective System:							
A) Type of Wearing Surface - MONO CONCRETE	Code	1					
B) Type of Membrane - NONE	Code	0					
C) Type of Deck Protection - NONE	Code	0					
AGE AND SERVICE				LOAD RATING AND POSTING			
(27) Year Built		1976		(31) Design Load - HS 20+MOD		6	
(106) Year Reconstructed		0		(64) Operating Rating - LRFR		55.4	
(42) Type of Service On - HIGHWAY				(66) Inventory Rating - LRFR		42.77	
Under - HIGHWAY, WITH OR WITHOUT	Code	1		(70) Bridge Posting - EQUAL/ABOVE LEGAL LOADS		5	
(28) Lanes: On Structure = 3 Under Structure = 6				(41) Structure Open, Posted or Closed -		A	
(29) Average Daily Traffic		36350		Description - OPEN, NO RESTRICT			
(30) Year of ADT 2022	(109) Truck ADT	14 %					
(19) Bypass, Detour Length		0 MI					
GEOMETRIC DATA				APPRAISAL			
(48) Length of Maximum Span		93 FT		(67) Structure Evaluation - MEETS MIN TOLER LIMITS		4	
(49) Structure Length		270 FT		(68) Deck Geometry		4	
(50) Curb or Sidewalk: Left .0 FT Right .0 FT				(69) Underclearances, Vertical and Horizontal		5	
(51) Bridge Roadway Width Curb to Curb		46 FT		(71) Waterway Adequacy		N	
(52) Deck Width Out to Out		49.3 FT		(72) Approach Roadway Alignment		8	
(32) Approach Roadway Width (W/Shoulders)		58 FT		(36) Traffic Safety Features		011N	
(33) Bridge Median - NONE	Code	0		(113) Scour Critical Bridges - NOT OVER WATERWAY		N	
(34) Skew 35 Deg	(35) Structure Flared	NO					
(10) Inventory Route Min Vert Clear	18 FT	10 IN					
(47) Inventory Route Total Horz Clear		46.1 FT					
(53) Min Vert Clear Over Bridge Roadway	99 FT	99 IN					
(54) Min Vert Underclear Ref - HWY BENEATH	17 FT	4 IN					
(55) Min Lat Underclear Right Ref - HWY BENEATH	19.0 FT						
(56) Min Lat Underclear Left	10.1 FT						
NAVIGATION DATA				PROPOSED IMPROVEMENTS			
(38) Navigation Control - N/A - NO WATERWAY	Code	N		(75) Type of Work - REHAB/DETERIORATION	Code	351	
(111) Pier Protection -	Code			(76) Length of Structure Improvement		304.8 FT	
(39) Navigation Vertical Clearance	FT			(94) Bridge Improvement Cost		\$513,000.00	
(116) Vert-Lift Bridge Min Vert Clear	FT			(95) Roadway Improvement Costs		\$26,000.00	
(40) Navigation Horizontal Clearance	FT			(96) Total Project Cost		\$564,000.00	
				(97) Year of Improvement Cost Estimate		2023	
				(114) Future AADT		45074	
				(115) Year of Future AADT		2042	
INSPECTIONS							
(90) Inspection Date 01/2023	(91) Frequency	12 Mo					
(92) Critical Feature Inspection:	(93) CFI Date						
A) Fracture Crit Detail	NO	Mo	A)				
B) Underwater Insp	NO	Mo	B)				
C) Other Special Insp	NO	Mo	C)				

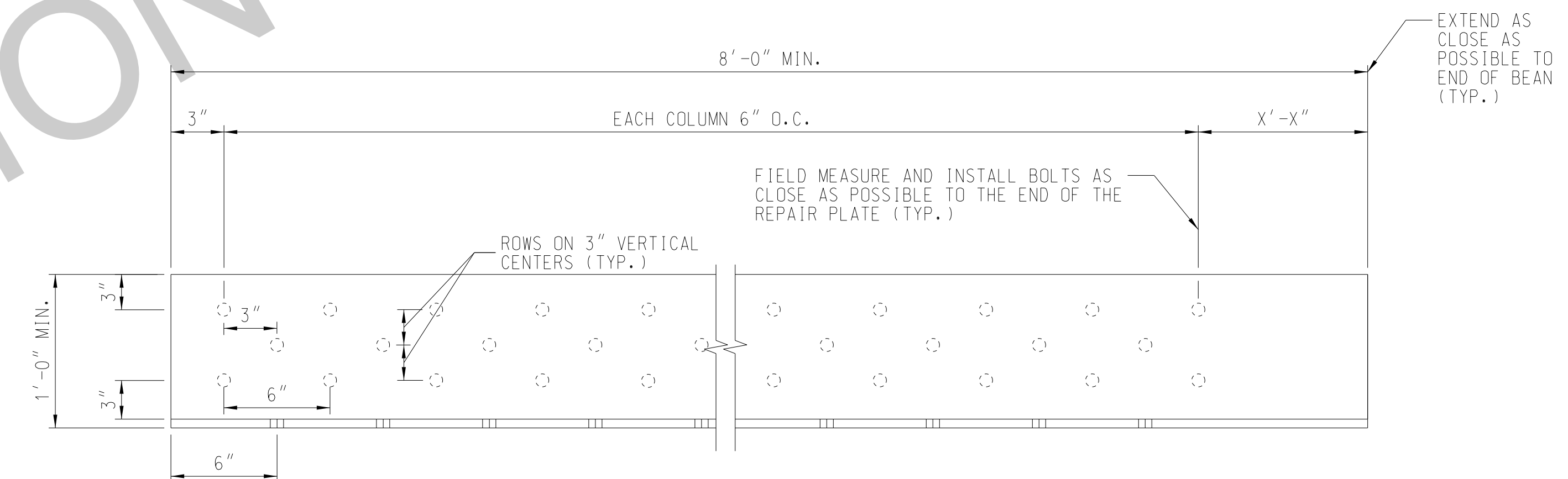
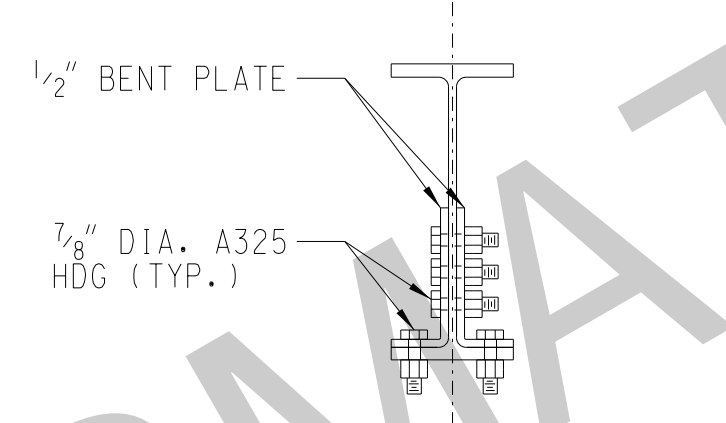
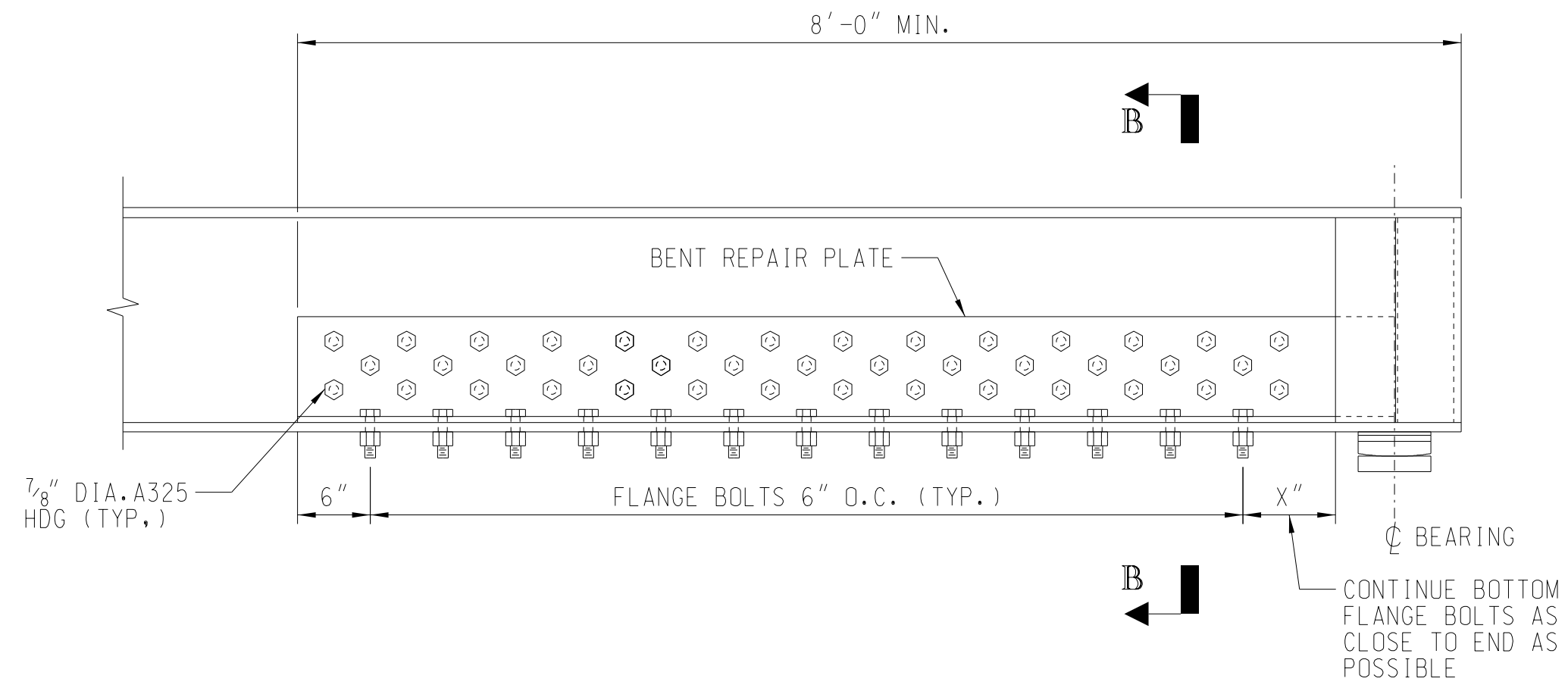
APPENDIX C: Standard Repair Details



EXISTING BEAM END
REPRESENTING TYPICAL SECTION LOSS
N.T.S.

SECTION A-A
N.T.S.

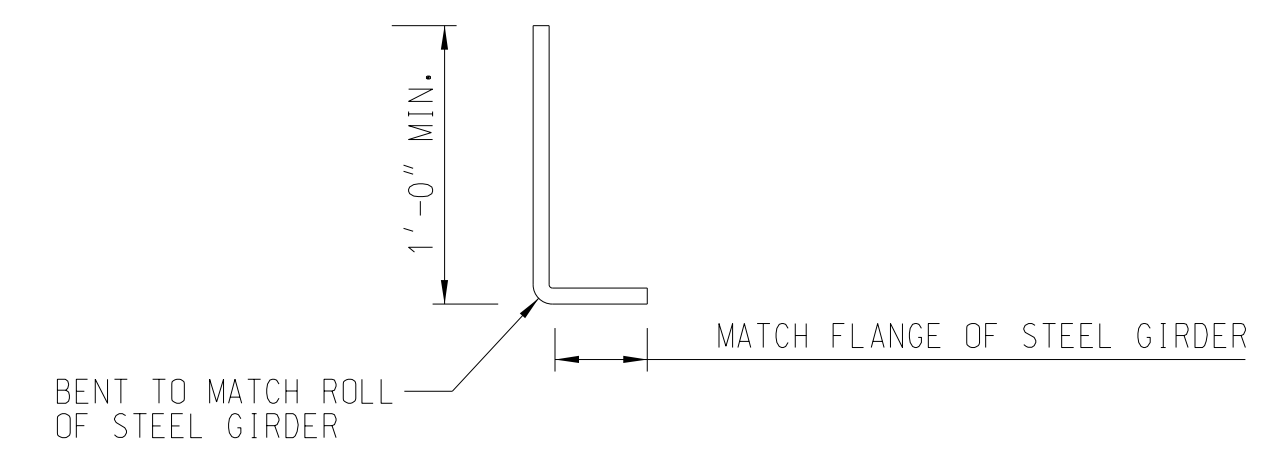
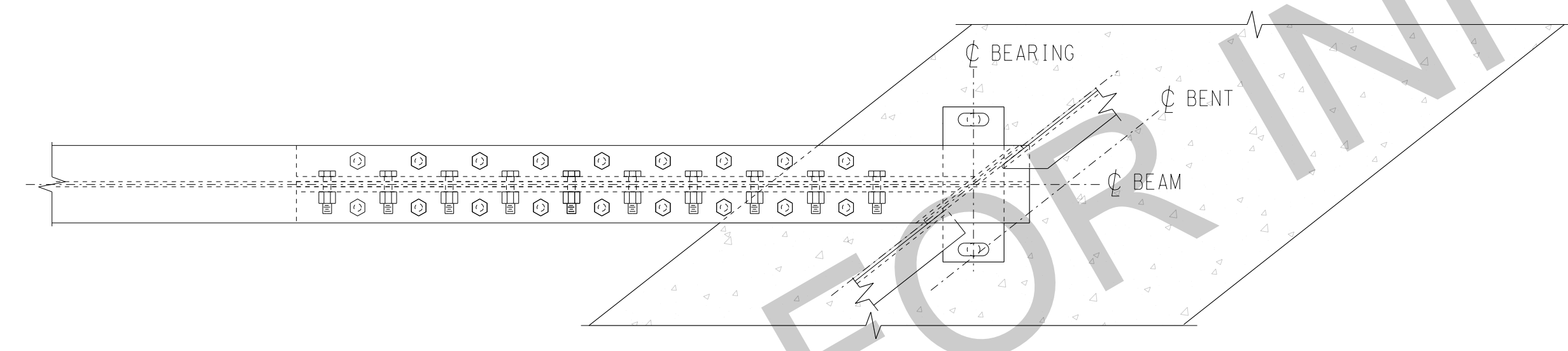
BEARING PLAN
SEE EXIST. PLANS FOR SKEW
N.T.S.



BEAM END REPAIR DETAIL
BENT CAP NOT SHOWN
N.T.S.

SECTION B-B
N.T.S.

BENT PLATE DETAIL
N.T.S.



BEAM END REPAIR PLAN
ADJACENT SPAN NOT SHOWN
SEE EXIST. PLANS FOR SKEW
N.T.S.

SECTION C-C
N.T.S.

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Lee M
1/19/2024

REV.				RS&H	
REV.					
REV.					
REVIEWED					
QUAN.					
DR.					
DES.				STEEL BEAM END REPAIR DETAILS	
BY	CHK.	DATE			
			ASSET ID	ROUTE	COUNTY
			6917/6918	I-77	RICHLAND

APPENDIX D: Deck Testing Report