



FY2022 Annual Inspection and Underwater Inspection, Trestles BSB, DNB, ESB & FSB, NCB-NB, and FIB-SB

FY2022 Facility Annual Inspection Report FINAL

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December 1, 2021

Chesapeake Bay Bridge and Tunnel District

Task Orders 1 & 2

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FY2022 Annual Inspection and Underwater Inspection, Trestles BSB, DNB, ESB & FSB, NCB-NB, and FIB-SB

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Executive Summary

Enclosed is a combination of the GASB 34 with the Maintenance Rating Program (MRP) Condition Scale and ratings for the trestles along with repair recommendations, and recommended insurance coverages for the facilities that make up the Chesapeake Bay Bridge Tunnel District (the District) for Fiscal Year 2022 (FY2021, July 1, 2021 – June 30, 2022). The ratings of the GASB 34 Cluster Item Ratings are summarized below in Table 1, and can be observed in detail in Section 2: Ratings for GASB 34 of the report.

Table 1: GASB 34 Cluster Item Ratings

| Cluster Item | Rating |
|------------------------------|--------|
| A. Approach Roads | 8 |
| B. Fisherman Island Causeway | 8 |
| C. Tunnels | 7 |
| D. Portal Islands | 8 |
| E. Toll Plaza Infrastructure | 8 |
| F. Site-Wide Utilities | 8 |

No critical findings were reported during the inspection. A few specific facility components were rated less than Good Condition (numeric rating of 7 or above) at the time of the inspection, with some of these items being typical components that are regularly monitored and repaired or replaced as needed. The components rated less than 7 make up a minority percentage of the overall cluster items, such that the overall ratings were all 7 or greater as shown in Table 1.

The trestle components were found to be in Good Condition or better (numeric rating of 7 or above). A detailed breakdown of the components can be observed in Section 4: Virginia Department of Transportation (VDOT) Structure Inventory and Appraisal (SI&A) Records (B-6 and B-7 Forms) of the report. Approximately 20% of the piles along Trestle BNB and 6% of the piles along Trestle CNB were coded as Condition State 4 (Severe) due to bay bottom elevations found to be below the Allowable Scour Depth. Otherwise, most of the piles would be coded as Condition State 2 (Fair) based on the physical condition of the pile. It is believed that a conservative approach was taken in the historical structural analysis.

A list of supplemental information used to develop the ratings provided in the report has been submitted to the District electronically. A list of these supplemental items is displayed in Section 11: Electronic Submittals.

Repair recommendations are separated into two categories: Priority Repairs and Routine Repairs and have been provided in Section 3: Repair Recommendations. It is understood by Jacobs that the District is in the process of performing or developing contract documents for the repair or engineering analysis of several of these components such as:

- Repairs to spalled concrete areas on concrete columns, walls, roof beams, and ceiling of the supply fan room of all ventilation buildings.
- Little Creek Pier Fender System will be replaced as part of the lease agreement that the District has with Chesapeake Tunnel Joint Venture (CTJV) prior to the expiration of necessary permits in March 31, 2024.
- Facility wide repairs to concrete pile substructure units to extend service life by approximately 50 years.



1. Inspection Schedule

Portions of the CBBT facility covered during the FY2022, FY2021, FY2020, FY2019, & FY2018 Inspection are noted in Table 2. An underwater inspection was performed on Trestle BSB, NCB-NB, DNB, ESB, FIB-SB, FSB.

Table 2: CBBT Facility Component Inspection Schedule

| Facility Component | | Portion Inspected |
|--------------------|------------------------------|--|
| 1 | Trestle A - Northbound (ANB) | Completed in FY2022: Hands-on: Spans ANB33 to Span ANB81 Visual: Spans A'NB1 to Span ANB33 and ANB82 to Abutment ANB226 |
| | | Completed in FY2021: Hands-on: Abutment A'NB1 to Span ANB32 |
| | | Completed in FY2020: Hands-on: Spans ANB177 to Abutment ANB226 Visual: Spans A'NB1 to ANB176 |
| | | Completed in FY2019: Hands-on: Spans ANB129 to ANB176 Underwater Inspection of Trestle ANB (including ANB') |
| | | Completed in FY2018: Spans A'NB14 to ANB4 from Chic's Beach Hands-on: Spans ANB75 to ANB128 Visual: Spans ANB11 to ANB225 |
| 2 | Trestle A - Southbound (ASB) | Completed in FY2022: Hands-on: Spans ASB167 to ASB186 and ASB194 to Abutment ASB205 |
| | | Completed in FY2021: Hands-on: Spans ASB1 to ASB38 Visual: Spans ASB39 to Abutment ASB205 |
| | | Completed in FY2020: Hands-on: Spans ASB39 to ASB80 Visual: Spans ASB1 to ASB18 from Chic's Beach and ASB204 and Abutment ASB205 |
| | | Completed in FY2019: Hands-on: Spans ASB81 to ASB122 Visual: Spans ASB18 to ASB204 Underwater Inspection of Trestle ASB |
| | | Completed in FY2018: Spans ASB1 to ASB12 from Chic's Beach Hands-on: Spans ASB123 to ASB171 |



| | | |
|---|------------------------------|--|
| 3 | Trestle B - Northbound (BNB) | Completed in FY2022: Hands-on: Spans BNB1 to Abutment BNB44 Visual: Spans BNB45 to BNB264 |
| | | <i>Completed in FY2021: Hands-on: Spans BNB213 to Abutment BNB266 Visual: Spans BNB1 to Abutment BNB212</i> |
| | | <i>Completed in FY2020: Hands-on: Spans BNB159 to BNB212 Visual: Spans BNB1 to 158 and 213 to 265 Underwater Inspection of Trestle BNB</i> |
| | | <i>Completed in FY2019: Hands-on: Spans BNB105 to BNB158</i> |
| | | <i>Completed in FY2018: Spans BNB66 to BNB104 Visual: Spans BNB3 to BNB264</i> |
| 4 | Trestle B - Southbound (BSB) | Completed in FY2022: Hands-on: Spans BSB1 to BSB16, BSB179-BSB202 Underwater Inspection of Trestle BSB |
| | | <i>Completed in FY2021: Hands-on: Spans BSB17 to BSB56 Visual: Spans Abutment BSB1 to Span BSB16 and BSB57 to Abutment BSB203</i> |
| | | <i>Completed in FY2020: Hands-on: Spans BSB57 to BSB100 Visual: Spans BSB1 and BSB202</i> |
| | | <i>Completed in FY2019: Hands-on: Spans BSB101 to BSB142 Visual: Spans BSB1 to BSB202</i> |
| | | <i>Completed in FY2018: Hands-on: Spans BSB143 to BSB178</i> |



| | | |
|----|---|--|
| 5 | Trestle C - Northbound (CNB) | Completed in FY2022: Hands-on: Spans CNB1 to Span CNB45 Visual: Spans CNB46 to CNB322 |
| | | <i>Completed in FY2021: Hands-on: Spans CNB264 to Span CNB322 and Pier NCB-NB1 Visual: Spans CNB1 to 263 and 264 to 322 Underwater Inspection of Trestle CNB</i> |
| | | <i>Completed in FY2020: Hands-on: Spans CNB198 to CNB263 Visual: Spans CNB1 to 197 and 264 to 322</i> |
| | | Completed in FY2019: Hands-on: Spans CNB132 to CNB197 |
| | | <i>Completed in FY2018: Hands-on: Spans CNB78 to CNB131 Visual: Spans CNB3 to CNB322</i> |
| 6 | Trestle C - Southbound (CSB) | Completed in FY2022: Hands-on: Abutment CSB200 to Spans CSB246 |
| | | Completed in FY2021: Hands-on: Abutment CSB1 to Spans CSB52 Visual: Spans CSB53 to CSB246 |
| | | <i>Completed in FY2020: Hands-on: Spans CSB53 to CSB104 Visual: CSB1</i> |
| | | <i>Completed in FY2019: Hands-on: Spans CSB105 to CSB154 Visual: Spans CSB1 to CSB246</i> |
| | | <i>Completed in FY2018: Hands-on: Spans CSB155 to CSB190 Underwater Inspection of Trestle CSB</i> |
| 7 | North Channel Bridge - Northbound (NCB-NB) | Fracture Critical: Spans 1 thru 17 Above Water: Piers 1 thru 18 all completed in FY2022 Underwater Inspection of NCB-NB completed in FY2022 |
| 8 | North Channel Bridge - Southbound (NCB-SB) | <i>Hands-on: Entire component completed in FY2021 Underwater Inspection of NCB-SB completed in FY2020</i> |
| 9 | Trestle D - Northbound (DNB) | Underwater Inspection of DNB completed in FY2022 <i>Hands-on: Entire component completed in FY2021</i> |
| 10 | Trestle D - Southbound (DSB) | <i>Hands-on: Entire component completed in FY2021 Underwater Inspection of DSB completed in FY2020</i> |
| 11 | Trestle E - Northbound, Fisherman Inlet Bridge - Northbound, Trestle F - Northbound (ENB, FIB-NB, FNB) | <i>Hands-on: Entire component completed in FY2021 Underwater Inspection of ENB, FIB-NB, FNB completed in FY2020</i> |



| | | |
|----|---|---|
| 12 | Trestle E - Southbound, Fisherman Inlet Bridge - Southbound, Trestle F - Southbound (ESB, FIB-SB, FSB) | Underwater Inspection of ESB, FIB-SB, FSB completed in FY2022 |
| | | <i>Hands-on: Entire component completed in FY2021</i> |
| 13 | Thimble Shoals Channel Tunnel (TSCT) | Routine inspection of the entire Tunnel, including Open Approaches on Islands 1 and 2 (completed in FY2022) |
| 14 | Chesapeake Channel Tunnel (CCT) | <i>Routine inspection of the entire Tunnel, including Open Approaches on Islands 3 and 4 (completed in FY2021)</i> |
| 15 | Approach Roads | Main components and spot check minor components (support GASB 34) |
| 16 | Fisherman Island Causeway | Main components and spot check minor components (support GASB 34) |
| 17 | Portal Islands No. 1, 2, 3, and 4 | Main components, spot check minor components (support GASB 34). Portal Islands No. 3 & 4 (completed in FY2021) and Portal Islands No. 1 & 2 were inspected this year. |
| 18 | South Toll Plaza | Main components and spot check minor components |
| | | <i>Overhead Sign Structures (S-1, S-2, and S-3) Inspection completed in FY2020</i> |
| 19 | North Toll Plaza | Main components and spot check minor components |
| | | <i>Overhead Sign Structures (N-2 & N-3) and Butterfly Sign Structure (N-1) Inspections completed in FY2020</i> |
| 20 | Toll Plaza Infrastructure | Main components and spot check minor components |
| 21 | Site-Wide Utilities | Main components and spot check minor components |

The projected hands-on inspection schedule for Trestles ANB, ASB, BNB, BSB, CNB, and CSB is noted in Table 3. Southbound portions of the facility are approximated as the crew aims to hit the quota (approximately 1/5 of trestle) while looking to stop at or beyond the quota at light poles that will require the bridge inspection platform to be stowed and redeployed. Visual inspections will be performed on Trestles ANB, BNB, and CNB during even FYs (FY2024, FY2026, etc.) and Trestles ASB, BSB, and CSB during odd FYs (FY2023, 2025, etc.). The rest of the structures on the facility receive hands-on inspections at intervals not to exceed 24-months.



Table 3: CBBT Trestles ANB, ASB, BNB, BSB, CNB, and CSB Projected Hands-on Inspection Schedule

| Facility Component | | Project Spans to be Inspected | | | |
|--------------------|--------------------------------|-------------------------------|-----------|-----------------------|-----------------------|
| | | FY2023 | FY2024 | FY2025 | FY2026 |
| 1 | Trestle ANB (48 spans/year) | 83 – 128 | 129 – 176 | 177 – Abutment 226 | 1' - 32 |
| 2 | Trestle ASB (41 spans/year) | 123 – 164 | 81 - 122 | 39 - 80 | 1 - 38 |
| 3 | Trestle BNB (54 spans/year) | 55 – 104 | 105 - 158 | 159 - 212 | 213 – Abutment 266 |
| 4 | Trestle BSB (41 spans/year) | 143 – 177 | 101 - 142 | 57 - 100 | 17 - 56 |
| 5 | Trestle CNB (65 spans/year) | 67 – 131 | 132 – 196 | 197 - 263 | 264 - 322 |
| 6 | Trestle CSB (41 spans/year) | 155 – 196 | 105 – 154 | 53 - 104 | 1 - 52 |



2. Ratings for GASB 34

The following tables represent condition ratings to support the requirements of Statement No. 34 of the Governmental Accounting Standards Board: Basic Financial Statements - and Management's Discussion and Analysis - for State and Local Governments (GASB 34). The overall Cluster Item Ratings were found to be in Good Condition or better (numeric rating of 7 or above). Table 4 identifies specific components with a condition rating below 7.

Table 4: GASB 34 Components with Condition Rating Below 7

| Item | Component | Rating | Explanation of Rating |
|------|---|--------|---|
| 1 | Tunnel Ventilation Buildings - Structural Framing | 6 | Spalls on columns and roof beams. Some repaired. However, new and existing patches deteriorating. Programmed for repair. |
| 2 | Tunnel Ventilation Building - Elevator | 6 | Elevator will not level out in Ventilation Building Nos. 1 or 2 when the doors open. Programmed for replacement. |
| 3 | Portal Island No. 1 - Splash Walls | 6 | Based on tipping panels at southeast corner, appears to have stabilized in recent years although continue to monitor. To be replaced as part of the Parallel Thimble Shoal Tunnel (PTST) Project. |
| 4 | Portal Islands – Approach Walls | 6 | Several locations of spalled/delaminated concrete, some with exposed reinforcing. |



Table 5: GASB 34 Condition Ratings

| Overall Ratings Summary | FY2022 |
|------------------------------|--------|
| A. Approach Roads | 8 |
| B. Fisherman Island Causeway | 8 |
| C. Tunnels | 7 |
| D. Portal Islands | 8 |
| E. Toll Plaza Infrastructure | 8 |
| F. Site-Wide Utilities | 8 |

| Numeric Code | Narrative Code | Definition |
|--------------|------------------|--|
| 9 | Excellent | Component/Element has been recently put in service or remains in new condition |
| 8 | Very Good | No problems noted, potential exists for minor preventative maintenance |
| 7 | Good | Potential exists for minor maintenance |
| 6 | Satisfactory | Potential exists for major maintenance |
| 5 | Fair | Potential exists for minor repair or rehabilitation |
| 4 | Poor | Potential exists for major repair or rehabilitation |
| 3 | Serious | Major repair or rehabilitation is required |
| 2 | Critical | The need for repair or rehabilitation is urgent, Component/Element should be taken out of service until indicated repair is complete |
| 1 | Imminent Failure | Component/Element is out of service; study feasibility for repair or rehabilitation |
| 0 | Failed | Component/Element is out of service and beyond repair, replacement required |

| Condition Input & Ratings | | | | | FY2022 | | | | | |
|---|------------|-----------|-------------------|-------------------|--------|------------------|------------------|------------------|------------------|-----------------|
| (Do not leave any inputs blank) | | | | | INPUT | Component Rating | Component Rating | Component Rating | Component Rating | Overall Cluster |
| | Importance | Breakdown | Further Breakdown | Further Breakdown | | | | | | |
| A. Approach Roads | | | | | | | | | | 8 |
| 1. Eastern Shore (North) | 70% | | | | | | | | 8 | |
| a. Roadway Surface Including Shoulders - WP to NTP | | 35% | | | 8 | | | 8 | | |
| b. Roadway Surface Including Shoulders - NTP to Rte 600 | | 15% | | | 7 | | | 7 | | |
| c. Overhead Sign Structures | | 15% | | | 7 | | | 7 | | |
| d. Guardrails | | 5% | | | 8 | | | 8 | | |
| e. Drainage/Erosion | | 10% | | | 7 | | | 7 | | |
| f. Protective Rock Dike (West Side) | | 5% | | | 8 | | | 8 | | |
| g. Scenic Overlook | | 5% | | | 7 | | | 7 | | |
| h. Wise Point | | 5% | | | 8 | | | 8 | | |
| i. Fencing | | 5% | | | 8 | | | 8 | | |
| 2. Chesapeake Beach (South) | 30% | | | | | | | | 8 | |
| a. Roadway Surface Including Shoulders | | 65% | | | 8 | | | 8 | | |
| b. Overhead Sign Structures | | 15% | | | 8 | | | 8 | | |
| c. Guardrails | | 5% | | | 7 | | | 7 | | |
| d. Drainage/Erosion | | 10% | | | 7 | | | 7 | | |
| e. Fencing | | 5% | | | 7 | | | 7 | | |



Table 5: GASB 34 Condition Ratings (continued)

| Condition Input & Ratings | | | | | | FY2022 | | | | | |
|---|------------|-----------|-------------------|-------------------|---|--------|------------------|------------------|------------------|------------------|-----------------|
| (Do not leave any inputs blank) | | | | | | INPUT | Component Rating | Component Rating | Component Rating | Component Rating | Overall Cluster |
| | Importance | Breakdown | Further Breakdown | Further Breakdown | | | | | | | |
| B. Fisherman Island Causeway | | | | | | | | | | 8 | |
| 1. Roadway Surface Including Shoulders | 80% | | | | 8 | | | | 8 | | |
| 2. Guardrails | 5% | | | | 7 | | | | 7 | | |
| 3. Drainage/Erosion | 10% | | | | 8 | | | | 8 | | |
| 4. Protective Rock Dike (East Side) | 5% | | | | 7 | | | | 7 | | |
| C. Tunnels | | | | | | | | | | 7 | |
| 1. Ventilation Buildings | 40% | | | | | | | | 7 | | |
| a. Structural Framing | | 25% | | | 6 | | | 6 | | | |
| b. Building Exterior | | 5% | | | 7 | | | 7 | | | |
| c. Garage | | 5% | | | 7 | | | 7 | | | |
| d. Roof | | 5% | | | 8 | | | 8 | | | |
| e. Doors and Windows | | 5% | | | 8 | | | 8 | | | |
| f. Electrical Equipment | | 20% | | | 8 | | | 8 | | | |
| i. 15 kV Distribution Equipment | | | 30% | | | | 8 | | | | |
| 1) Switchgear | | | 50% | | 8 | 8 | | | | | |
| 2) Transformers | | | 50% | | 7 | 7 | | | | | |
| ii. 600v Distribution Equipment | | | 30% | | | | 7 | | | | |
| 1) Switchgear | | | 50% | | 7 | 7 | | | | | |
| 2) Motor Starters | | | 50% | | 7 | 7 | | | | | |
| iii. Standby Power Generation Equipment | | | 30% | | | | 7 | | | | |
| 1) Engine Generator | | | 25% | | 7 | 7 | | | | | |
| 2) Fuel System (Piping and Day Tank) | | | 15% | | 7 | 7 | | | | | |
| 3) Exhaust System (Piping and Muffler) | | | 15% | | 8 | 8 | | | | | |
| 4) Cooling and Combustion Air Dampers and Ducts | | | 15% | | 7 | 7 | | | | | |
| 5) Generator Switchboard | | | 15% | | 8 | 8 | | | | | |
| 6) Transfer Switches | | | 15% | | 8 | 8 | | | | | |
| iv. Building Service and Lighting Systems | | | 10% | | | | 8 | | | | |
| 1) Panelboards | | | 40% | | 7 | 7 | | | | | |
| 2) Low Voltage Transformers | | | 40% | | 8 | 8 | | | | | |
| 3) Lighting Fixtures | | | 20% | | 8 | 8 | | | | | |
| g. Ventilation Equipment | | 25% | | | | | | 7 | | | |
| i. Supply Air Fans (Including Motors) | | | 20% | | 7 | | 7 | | | | |
| ii. Supply Air Fan Housings | | | 20% | | 7 | | 7 | | | | |
| iii. Exhaust Air Fans (Including Motors) | | | 20% | | 7 | | 7 | | | | |
| iv. Exhaust Air Fan Housings and Dampers | | | 20% | | 7 | | 7 | | | | |
| v. Evase Stacks | | | 20% | | 7 | | 7 | | | | |
| h. Elevator/Stairs | | 5% | | | 6 | | | 6 | | | |
| i. Boiler | | 5% | | | 7 | | | 7 | | | |



Table 5: GASB 34 Condition Ratings (continued)

| Condition Input & Ratings | | | | | | FY2022 | | | | | |
|--|-----------|-------------------|-------------------|-------------------|-------------------|--------|------------------|------------------|------------------|------------------|-----------------|
| (Do not leave any inputs blank) | | | | | | INPUT | Component Rating | Component Rating | Component Rating | Component Rating | Overall Cluster |
| Importance | Breakdown | Further Breakdown | Further Breakdown | Further Breakdown | Further Breakdown | | | | | | |
| C. Tunnels (continued) | | | | | | | | | | | |
| 2. Tunnel Structure | 60% | | | | | | | | 7 | | |
| a. Tunnel Roadway Slab | 20% | | | | | 7 | | | 7 | | |
| b. Tunnel Walls | 15% | | | | | 7 | | | 7 | | |
| c. Tunnel Ceiling | 10% | | | | | 7 | | | 7 | | |
| d. Lighting | 10% | | | | | | | | 8 | | |
| i. Fixtures | | 20% | | | | 9 | 9 | | | | |
| ii. Panelboards | | 20% | | | | 8 | 8 | | | | |
| iii. Transformers | | 20% | | | | 8 | 8 | | | | |
| iv. Uninterruptible Power Supply (UPS) | | 20% | | | | 8 | 8 | | | | |
| v. Controls Panel | | 20% | | | | 7 | 7 | | | | |
| e. Supply Air Duct | 10% | | | | | 7 | | | 7 | | |
| f. Exhaust Air Duct | 10% | | | | | 7 | | | 7 | | |
| g. Emergency Crew Walkway (Sidewalk) | 5% | | | | | 7 | | | 7 | | |
| h. Portal Drains and Gutters | 5% | | | | | 7 | | | 7 | | |
| i. Mid-Channel Pump Room Equipment | 5% | | | | | | | | 8 | | |
| i. Lighting Fixtures | | 20% | | | | 7 | 7 | | | | |
| ii. Motor Control Equipment | | 40% | | | | 8 | 8 | | | | |
| iii. Pumps and Valves | | 20% | | | | 8 | 8 | | | | |
| iv. Piping | | 20% | | | | 8 | 8 | | | | |
| j. Fire Emergency Equipment | 5% | | | | | 7 | | | 7 | | |
| k. Portal Pump Rooms | 5% | | | | | 7 | | | 8 | | |
| i. Lighting Fixtures | | 20% | | | | 8 | 8 | | | | |
| ii. Motor Control Equipment | | 40% | | | | 8 | 8 | | | | |
| iii. Pumps and Valves | | 20% | | | | 8 | 8 | | | | |
| iv. Piping | | 20% | | | | 8 | 8 | | | | |



Table 5: GASB 34 Condition Ratings (continued)

| Condition Input & Ratings | | | | | | | | | |
|--|-----------|-------------------|-------------------|-------|------------------|------------------|------------------|------------------|-----------------|
| (Do not leave any inputs blank) | | | | | | | | | |
| FY2022 | | | | | | | | | |
| Importance | Breakdown | Further Breakdown | Further Breakdown | INPUT | Component Rating | Component Rating | Component Rating | Component Rating | Overall Cluster |
| D. Portal Islands | | | | | | | | | |
| 1. Island No. 1 25% | | | | | | | | | |
| a. Splash Walls | 20% | | | 6 | | | 6 | | 7 |
| b. Open Approach Walls | 25% | | | 6 | | | 6 | | |
| c. Open Approach Roadway | 10% | | | 8 | | | 8 | | |
| d. Portal Island Surface | 10% | | | 7 | | | 7 | | |
| e. Guardrails | 5% | | | 7 | | | 7 | | |
| f. Armor Stone | 20% | | | 8 | | | 8 | | |
| g. Perimeter Fencing | 0% | | | 6 | | | 6 | | |
| h. Fishing Pier | 5% | | | | | | 7 | | |
| i. Deck/Railing | | 20% | | 7 | | 7 | | | |
| ii. Superstructure | | 40% | | 7 | | 7 | | | |
| iii. Substructure | | 40% | | 7 | | 7 | | | |
| <div style="border: 1px solid red; padding: 5px; display: inline-block;"> To be Replaced Post PTST Fishing Pier Not Inspected. Ratings carried forward from last inspection until completion of Rehabilitation. </div> | | | | | | | | | |
| 2. Other Islands 75% | | | | | | | | | |
| a. Splash Walls | 25% | | | 7 | | | 7 | | 8 |
| b. Open Approach Walls | 25% | | | 7 | | | 7 | | |
| c. Open Approach Roadway | 15% | | | 8 | | | 8 | | |
| d. Portal Island Surface | 5% | | | 7 | | | 7 | | |
| e. Guardrails | 5% | | | 9 | | | 9 | | |
| f. Armor Stone | 25% | | | 8 | | | 8 | | |



Table 5: GASB 34 Condition Ratings (continued)

| Condition Input & Ratings | | | | | | FY2022 | | | | | |
|--|-----------|-------------------|-------------------|-------------------|-------------------|--------|------------------|------------------|------------------|------------------|-----------------|
| (Do not leave any inputs blank) | | | | | | INPUT | Component Rating | Component Rating | Component Rating | Component Rating | Overall Cluster |
| Importance | Breakdown | Further Breakdown | Further Breakdown | Further Breakdown | Further Breakdown | | | | | | |
| E. Toll Plaza Infrastructure | | | | | | | | | | 8 | |
| 1. South Toll Plaza | 35% | | | | | | | | 7 | | |
| a. Toll Office Building | | 25% | | | | | | | 8 | | |
| i. Building Interior | | | 15% | | | 7 | | 7 | | | |
| ii. Building Exterior | | | 15% | | | 8 | | 8 | | | |
| iii. Roof | | | 25% | | | 9 | | 9 | | | |
| iv. Doors and Windows | | | 5% | | | 8 | | 8 | | | |
| v. Electrical Equipment | | | 20% | | | | | 8 | | | |
| 1) Panelboards | | | | 25% | | 7 | 7 | | | | |
| 2) Transformers | | | | 25% | | 8 | 8 | | | | |
| 3) Engine Generator | | | | 25% | | 7 | 7 | | | | |
| 4) Lighting | | | | 25% | | 8 | 8 | | | | |
| vi. Mechanical Equipment | | | 20% | | | | | 8 | | | |
| 1) Heating & AC Equipment | | | | 25% | | 8 | 8 | | | | |
| 2) Engine Generator Fuel Piping system | | | | 25% | | 8 | 8 | | | | |
| 3) Engine Generator Exhaust Piping system | | | | 25% | | 8 | 8 | | | | |
| 4) Cooling and Combustion Air Duct and Dampers | | | | 25% | | 8 | 8 | | | | |
| b. Toll Booth and Canopy | | 10% | | | | 7 | | | 7 | | |
| c. Pavement/Treadles | | 10% | | | | 7 | | | 7 | | |
| d. Garage Building | | 5% | | | | | | | 8 | | |
| i. Building Interior | | | 20% | | | 7 | | 7 | | | |
| ii. Building Exterior | | | 25% | | | 8 | | 8 | | | |
| iii. Roof | | | 30% | | | 8 | | 8 | | | |
| iv. Doors and Windows | | | 10% | | | 8 | | 8 | | | |
| v. Electrical Equipment | | | 15% | | | 8 | | 8 | | | |
| e. Parking Area | | 5% | | | | 8 | | | 8 | | |
| f. Drainage | | 5% | | | | 7 | | | 7 | | |
| g. Perimeter Fence | | 5% | | | | 7 | | | 7 | | |
| h. Overheight Detectors/Misc. Signage | | 5% | | | | 8 | | | 8 | | |
| i. Electrical Substation | | 30% | | | | | | | 7 | | |
| i. Transformers | | | 35% | | | 7 | | 7 | | | |
| ii. Tap Changers | | | 20% | | | 7 | | 7 | | | |
| iii. Outdoor switchgear | | | 20% | | | 7 | | 7 | | | |
| iv. Switch and dead end structure | | | 20% | | | 7 | | 7 | | | |
| v. Lighting | | | 5% | | | 7 | | 7 | | | |



Table 5: GASB 34 Condition Ratings (continued)

| Condition Input & Ratings | | | | | FY2022 | | | | | |
|--|-----------|-------------------|-------------------|-------------------|--------|------------------|------------------|------------------|------------------|-----------------|
| (Do not leave any inputs blank) | | | | | INPUT | Component Rating | Component Rating | Component Rating | Component Rating | Overall Cluster |
| Importance | Breakdown | Further Breakdown | Further Breakdown | Further Breakdown | | | | | | |
| E. Toll Plaza Infrastructure (continued) | | | | | | | | | | |
| 2. North Toll Plaza | 65% | | | | | | | | 8 | |
| a. Toll Office Building | | 15% | | | | | | 8 | | |
| i. Building Interior | | | 15% | | 8 | | 8 | | | |
| ii. Building Exterior | | | 15% | | 7 | | 7 | | | |
| iii. Roof | | | 20% | | 9 | | 9 | | | |
| iv. Doors and Windows | | | 10% | | 8 | | 8 | | | |
| v. Electrical Equipment | | | 20% | | 8 | | 8 | | | |
| 1) Panelboards | | | | 50% | 8 | 8 | | | | |
| 2) Transformers | | | | 25% | 8 | 8 | | | | |
| 3) Lighting | | | | 25% | 8 | 8 | | | | |
| vi. Mechanical Equipment | | | 20% | | | | 7 | | | |
| 1) Heating and AC Equipment | | | | 100% | 7 | 7 | | | | |
| b. Toll Booth and Canopy | | 10% | | | 8 | | | 8 | | |
| c. Pavement/Treadles | | 10% | | | 7 | | | 7 | | |
| d. Administration Building | | 10% | | | | | | 8 | | |
| i. Building Interior | | | 15% | | 8 | | 8 | | | |
| ii. Building Exterior | | | 20% | | 7 | | 7 | | | |
| iii. Roof | | | 25% | | 7 | | 7 | | | |
| iv. Doors and Windows | | | 5% | | 8 | | 8 | | | |
| v. Electrical Equipment | | | 20% | | 8 | | 8 | | | |
| vi. Mechanical Equipment | | | 15% | | 8 | | 8 | | | |
| e. Maintenance Building | | 10% | | | | | | 8 | | |
| i. Building Interior | | | 15% | | 7 | | 7 | | | |
| ii. Building Exterior | | | 20% | | 8 | | 8 | | | |
| iii. Roof | | | 25% | | 7 | | 7 | | | |
| iv. Doors and Windows | | | 5% | | 8 | | 8 | | | |
| v. Electrical Equipment | | | 20% | | 8 | | 8 | | | |
| vi. Mechanical Equipment | | | 15% | | 8 | | 8 | | | |
| f. Garage and Generator Building | | 10% | | | | | | 7 | | |
| i. Building Interior | | | 10% | | 7 | | 7 | | | |
| ii. Building Exterior | | | 20% | | 7 | | 7 | | | |
| iii. Roof | | | 25% | | 8 | | 8 | | | |
| iv. Doors and Windows | | | 10% | | 7 | | 7 | | | |
| v. Electrical Equipment | | | 35% | | | | 8 | | | |
| 1) 15kV Switchgear | | | | 15% | 7 | 7 | | | | |
| 2) Low voltage switchboards | | | | 10% | 8 | 8 | | | | |
| 3) Panelboards | | | | 10% | 8 | 8 | | | | |
| 4) Engine Generator | | | | 15% | 7 | 7 | | | | |
| 5) Fuel System (Piping & Day Tank) | | | | 10% | 8 | 8 | | | | |
| 6) Exhaust System (Piping and Muffler) | | | | 10% | 7 | 7 | | | | |
| 7) Cooling and Combustion Air Dampers | | | | 10% | 8 | 8 | | | | |
| 8) Transfer Switches | | | | 10% | 8 | 8 | | | | |
| 9) Lighting | | | | 10% | 7 | 7 | | | | |



Table 5: GASB 34 Condition Ratings (continued)

| Condition Input & Ratings | | | | | FY2022 | | | | | |
|---|------------------------------------|-------------------|-------------------|-------------------|--------|------------------|------------------|------------------|------------------|-----------------|
| (Do not leave any inputs blank) | | | | | INPUT | Component Rating | Component Rating | Component Rating | Component Rating | Overall Cluster |
| Importance | Breakdown | Further Breakdown | Further Breakdown | Further Breakdown | | | | | | |
| E. Toll Plaza Infrastructure (continued) | | | | | | | | | | |
| 2. North Toll Plaza (continued) | | | | | | | | | | |
| g. Salt Storage Building 4% | | | | | | | | | | |
| | i. Building Interior | 20% | | | 8 | | 8 | | 8 | |
| | ii. Building Exterior | 25% | | | 7 | | 7 | | | |
| | iii. Roof | 30% | | | 8 | | 8 | | | |
| | iv. Doors | 15% | | | 7 | | 7 | | | |
| | v. Electrical Equipment | 10% | | | 8 | | 8 | | | |
| h. Miscellaneous Small Buildings and Related 4% | | | | | | | | | | |
| I. Fire Pump and Booster Building 40% | | | | | | | | | | |
| | 1) Building | 20% | | | 8 | 8 | | | | |
| | 2) Electrical/Mechanical Equipment | 80% | | | 8 | 8 | | | | |
| ii. Water Tank and Water Valve/Chlorinator Building 30% | | | | | | | | | | |
| | 1) Building | 20% | | | 8 | 8 | | | | |
| | 2) Water Tank | 80% | | | 8 | 8 | | | | |
| iii. Fire Pump Emergency Generator Building 30% | | | | | | | | | | |
| | 1) Building | 20% | | | 8 | 8 | | | | |
| | 2) Electrical/Mechanical Equipment | 80% | | | 7 | 7 | | | | |
| i. Storage Yard and Parking Area 4% | | | | | | | | | | |
| j. Electrical Storage Building 4% | | | | | | | | | | |
| | i. Building Interior | 20% | | | 9 | | 9 | | 9 | |
| | ii. Building Exterior | 25% | | | 9 | | 9 | | | |
| | iii. Roof | 30% | | | 9 | | 9 | | | |
| | iv. Doors | 15% | | | 9 | | 9 | | | |
| | v. Electrical Equipment | 10% | | | 9 | | 9 | | | |
| k. Rest Area Building and Parking Area 4% | | | | | | | | | | |
| | i. Building Interior | 15% | | | 8 | | 8 | | | |
| | ii. Building Exterior | 20% | | | 8 | | 8 | | | |
| | iii. Roof | 20% | | | 8 | | 8 | | | |
| | iv. Doors and Windows | 5% | | | 8 | | 8 | | | |
| | v. Electrical Equipment | 10% | | | 8 | | 8 | | | |
| | vi. Mechanical Equipment | 15% | | | 8 | | 8 | | | |
| | vii. Parking Area | 5% | | | 9 | | 9 | | | |
| | viii. Area Lighting System | 5% | | | 8 | | 8 | | | |
| | ix. Drainage | 5% | | | 8 | | 8 | | | |
| l. Equipment Storage Building 3% | | | | | | | | | | |
| | i. Building Interior | 20% | | | 9 | | 9 | | 9 | |
| | ii. Building Exterior | 25% | | | 9 | | 9 | | | |
| | iii. Roof | 30% | | | 9 | | 9 | | | |
| | iv. Doors | 15% | | | 9 | | 9 | | | |
| | v. Electrical Equipment | 10% | | | 9 | | 9 | | | |
| m. Drainage 4% | | | | | | | | | | |
| n. Perimeter Fence 4% | | | | | | | | | | |
| o. Overheight Detectors/Misc. Signage 4% | | | | | | | | | | |



Table 5: GASB 34 Condition Ratings (continued)

| Condition Input & Ratings | | | | | | FY2022 | | | | | |
|---------------------------------|--|-------------------|-------------------|--|---|--------|------------------|------------------|------------------|------------------|-----------------|
| (Do not leave any inputs blank) | | | | | | INPUT | Component Rating | Component Rating | Component Rating | Component Rating | Overall Cluster |
| Importance | Breakdown | Further Breakdown | Further Breakdown | | | | | | | | |
| F. Site-Wide Utilities | | | | | | | | | | | |
| 1. | Water supply from South Shore to Island #1 | 5% | | | 7 | | | | 7 | 8 | |
| 2. | Sewer From South Shore to Island #1 | 5% | | | 7 | | | | 7 | | |
| 3. | Roadway Lighting System | 15% | | | | | | 9 | | | |
| | a. Fixtures | | 20% | | 9 | | 9 | | | | |
| | b. Poles | | 20% | | 8 | | 8 | | | | |
| | c. Substations | | 20% | | 9 | | 9 | | | | |
| | d. Panelboards | | 20% | | 9 | | 9 | | | | |
| | e. Cable and Cable Tray System | | 20% | | 8 | | 8 | | | | |
| 4. | Emergency Telephone system | 15% | | | | | | 9 | | | |
| | a. Telephones | | 50% | | 9 | | 9 | | | | |
| | b. Cabling/wiring | | 50% | | 9 | | 9 | | | | |
| 5. | SCADA System | 20% | | | | | | 9 | | | |
| | a. CNC Cabinets and Equipment | | 25% | | 9 | | 9 | | | | |
| | b. Standby Engine-Generators | | 25% | | 8 | | 8 | | | | |
| | c. Panelboards | | 25% | | 9 | | 9 | | | | |
| | d. Traffic Control signals | | 25% | | 9 | | 9 | | | | |
| 6. | 15K Distribution System | 30% | | | | | | 8 | | | |
| | a. 15Kv Cable | | 70% | | 8 | | 8 | | | | |
| | b. Cable Tray System | | 30% | | 7 | | 7 | | | | |
| 7. | Toll Collection Systems | 10% | | | 8 | | | | 8 | | |



3. Repair Recommendations

Repair recommendations are separated into two categories, Priority Repairs and Routine Repairs, and are subject to change at each annual report based on progression of degradation observed during each inspection cycle. For this facility, Priority Repairs are for defects that likely will become problematic or repair costs could escalate significantly if not addressed within the next 24 months. Routine Repairs are for defects that will likely not become problematic or see a significant increase in repair costs if not addressed within 60 months and should be completed as the opportunities present themselves during other maintenance and capital improvement operations. All Critical Findings require “immediate” action and each Critical Finding is listed with the date it was reported to the District, and the recommended action or follow-up.



3.1 Trestles, North Channel Bridges, and Fisherman Inlet Bridges

3.1.1 Trestle A – Northbound (ANB)

Table 6: ANB Critical Findings

| Element | Item Description | Date Reported | Recommended Action/Follow-Up |
|---------|------------------|---------------|------------------------------|
| None | N/A | N/A | N/A |

Table 7: ANB Priority Repairs

| Element | Item Description | Quantity | Unit |
|-----------------------------|--|----------|------|
| Prestressed Concrete Girder | Repair delamination/spalling with exposed prestressing strands at 16 locations | 29 | LF |
| Prestressed Concrete Girder | Repair failed repairs of delamination with rust staining or spalling with exposed prestressing strands at 13 locations | 27 | LF |
| Prestressed Concrete Piles | Determine effectiveness of Lifejacket system at ANB57 Pile A where anode does not have a cable connecting it to the junction box at the top of the pile and repair accordingly | 1 | EA |
| Prestressed Concrete Piles | Perform structural review (if historical data is not available) to determine the effect on strength or serviceability of the piles considered to be Scour Condition State 4 at Bent-Pile: ANB211-C, 213-A, B, and C, and 214-A, B, and C. Results of structural review should be used to develop a strategy to mitigate the hazard of scour at these locations and to revise the Scour Condition State Criteria if necessary | 7 | EA |

Table 8: ANB Routine Repairs

| Element | Item Description | Quantity | Unit |
|--------------------------------------|--|----------|------|
| Metal Bridge Railing | Repair spalled concrete curb with exposed reinforcement at ANB'9, ANB11, 23, 34, 35, 47, 48, 50, & 155 | 14 | LF |
| Metal Bridge Railing | Repair delaminated failed concrete curb repair at ANB131, 165 and 198 (all left lane) | 3 | LF |
| Metal Bridge Railing | Repair bent or damaged railing on Spans ANB10, 12, 23, 27, 31, & 217 | 10 | LF |
| Reinforced Concrete Slab (Underside) | Repair area of delaminated concrete on Span ANB226 | 6 | SF |
| Concrete Top Flange (Underside) | Repair spalling with exposed longitudinal and transverse reinforcement or where previous repairs have failed at 57 locations | 125 | SF |
| Prestressed Concrete Girder | Repair areas near bearings with degraded concrete or where previous repairs have failed at 9 locations | 31 | LF |



| | | | |
|-----------------------------|---|-------|----|
| Prestressed Concrete Girder | Repair minor spalling with exposed reinforcement at 45 locations | 60 | LF |
| Prestressed Concrete Piles | Provide a repair to piles and pile caps with failed protective concrete coatings at locations where cracks, delamination, or spalling is present. | 1,859 | SF |
| Prestressed Concrete Piles | Monitor damaged Lifejacket system and repair as needed at Bent-Pile: ANB33-A, 81-C, 89-A, 133-A, 133-B, 135-C, 142-C, 152-C, and 173-A | 9 | EA |
| Prestressed Concrete Piles | Replace anodes on piles with Life Jacket Systems where anode section loss was reported to be greater than 50%: Bent-Pile ANB18-C, 33-B, 39-B, 44-B, 45-B, 57-A, 62-A, 62-B, 62-C, and 210-C | 10 | EA |
| Light Pole | Replace light poles that exhibit cracking at baseplate at: ANB129, 141, 213, 219, and 222 | 5 | EA |



3.1.2 Trestle A – Southbound (ASB)

Table 9: ASB Critical Findings

| Element | Item Description | Date Reported | Recommended Action/Follow-Up |
|---------|------------------|---------------|------------------------------|
| None | N/A | N/A | N/A |

Table 10: ASB Priority Repairs

| Element | Item Description | Quantity | Unit |
|----------------------|---|----------|------|
| Metal Bridge Railing | Repair spalled concrete near railing post on west side of ASB2. | 3 | LF |

Table 11: ASB Routine Repairs

| Element | Item Description | Quantity | Unit |
|-----------------------------|---|----------|------|
| Prestressed Concrete Girder | Repair spalling with exposed reinforcing or exposed strands at girder ends or in the lower portion of the continuity closure pours (77 locations) | 88 | LF |
| Prestressed Concrete Girder | Repair minor spalling with exposed reinforcing at 25 locations | 30 | LF |
| Prestressed Concrete Girder | Repair failed repairs of delamination with rust staining or spalling with exposed prestressing strands at ASB41 G6-Z3; 46 G6-Z3; 49 G6-Z3; 57 G4-Z3; and 61 G6-Z3 | 6 | LF |
| Prestressed Concrete Piles | Repair top portion of pile exhibiting minor spall with exposed reinforcement at Bent-Pile: ASB20-A, 46-A, & 53-C | 3 | EA |
| Prestressed Concrete Piles | Repair failed repairs or areas of delamination with rust staining or spalling with exposed prestressing strands or reinforcement at Bent-Pile: ASB43-B, 60-B, 62-B, & 64-B | 4 | EA |
| Protected Slope Paved | Place fill at locations of erosion on east side of the South Abutment ASB1 around water and sewer lines and under slope protection. | 1 | EA |
| Light Poles | Monitor light poles at ASB42, 45, 57, & 69 that exhibit cracking or delamination/spalling near the baseplate and replace if vertically oriented steel reinforcement becomes exposed and degraded. | 4 | EA |



3.1.3 Trestle B – Northbound (BNB)

Table 12: BNB Critical Findings

| Element | Item Description | Date Reported | Recommended Action/Follow-Up |
|---------|------------------|---------------|------------------------------|
| None | N/A | N/A | N/A |

Table 13: BNB Priority Repairs

| Element | Item Description | Quantity | Unit |
|-----------------------------|--|----------|------|
| Prestressed Concrete Girder | Repair delamination/spalling with exposed prestressing strands at 9 locations. | 17 | LF |
| Prestressed Concrete Girder | Repair failed repairs of spalling with exposed prestressing strands at 5 locations | 20 | LF |
| Prestressed Concrete Piles | Perform an engineering analysis on all piles with a Condition State Rating Below 4 due to Scour. | 1 | EA |

Table 14: BNB Routine Repairs

| Element | Item Description | Quantity | Unit |
|--------------------------------------|---|----------|------|
| Metal Bridge Railing | Repair/replace dented railing on Span BNB219, 234, 238, 249, and 261. | 5 | EA |
| Metal Bridge Railing | Replace corroded anchor bolt connections with section loss at 51 Locations | 51 | EA |
| Reinforced Concrete Slab (Underside) | Repair area of delaminated and spalled concrete on Span BNB265 at 3 locations. | 15 | SF |
| Concrete Top Flange (Underside) | Repair spalling with exposed longitudinal and transverse reinforcement or where previous repairs have failed at 7 locations | 18 | SF |
| Prestressed Concrete Girder | Repair areas near bearings with degraded concrete or where previous repairs have failed at 81 locations | 171 | LF |
| Prestressed Concrete Girder | Repair spall with exposed reinforcement at 10 locations | 12 | LF |
| Prestressed Concrete Piles | Repair piles with wide cracks, exposed prestressing strand on top portion, or exhibit rust staining at 100 locations | 100 | EA |
| Prestressed Concrete Piles | Repair top portion of piles exhibiting minor spalls with exposed reinforcement at 34 locations | 34 | EA |
| Prestressed Concrete Piles | Perform a repair to the steel built-up pile at BNB78 Pile B to prevent additional degradation or corrosion. | 1 | EA |
| Light Pole | Replace light poles that exhibit cracking at baseplate at: BNB18, 108, 111, 120, 129, 132, 141, 144, 156, 180, and 189 | 11 | EA |



3.1.4 Trestle B – Southbound (BSB)

Table 15: BSB Critical Findings

| Element | Item Description | Date Reported | Recommended Action/Follow-Up |
|---------|------------------|---------------|------------------------------|
| None | N/A | N/A | N/A |

Table 16: BSB Priority Repairs

| Element | Item Description | Quantity | Unit |
|----------------------|--|----------|------|
| Metal Bridge Railing | Repair spalled concrete near railing post on west side of BSB32. | 3 | LF |
| Bridge Abutment | Replace material that has eroded away under the bridge abutment at Portal Island No. 2 (BSB1). | 1 | EA |

Table 17: BSB Routine Repairs

| Element | Item Description | Quantity | Unit |
|-----------------------------|--|----------|------|
| Metal Bridge Railing | Repair/replace dented railing on Span BSB20, 21, and 67 near mid-span on West Side | 5 | LF |
| Steel Girders | Repair paint system at scattered locations where overcoat is peeling. | 1 | LS |
| Prestressed Concrete Girder | Repair spalling with exposed reinforcing or exposed strands at girder ends or in the lower portion of the continuity closure pours (99 locations) | 118 | LF |
| Prestressed Concrete Girder | Repair minor spalling with exposed reinforcing at 55 locations | 59 | LF |
| Prestressed Concrete Girder | Repair minor spalling with exposed strands at BSB98 G8-Z1 | 1 | LF |
| Prestressed Concrete Piles | Repair portion of piles exhibiting minor spalls with exposed reinforcement at BSB3-A, 5-B, 8-A, 46-A&B, 98-B, 103-A, 103-C, and 111-B | 8 | EA |
| Light Poles | Monitor light poles at BSB59, 61, 63, 67, 73, 91, and 93 that exhibit cracking or delamination/spalling near the baseplate and replace if vertically oriented steel reinforcement becomes exposed. | 7 | EA |



3.1.5 Trestle C – Northbound (CNB)

Table 18: CNB Critical Findings

| Element | Item Description | Date Reported | Recommended Action/Follow-Up |
|---------|------------------|---------------|------------------------------|
| None | N/A | N/A | N/A |

Table 19: CNB Priority Repairs

| Element | Item Description | Quantity | Unit |
|-----------------------------|--|----------|------|
| Prestressed Concrete Girder | Repair spalling with exposed prestressing strands at 43 locations | 138 | LF |
| Prestressed Concrete Girder | Repair failed prestressing strand repairs or areas with delaminated concrete at prestressing strands at 57 locations | 178 | LF |
| Prestressed Concrete Piles | Fill void in spalled pile joint on CNB267 Pile C with Epoxy | 1 | EA |

Table 20: CNB Routine Repairs

| Element | Item Description | Quantity | Unit |
|---------------------------------|--|----------|------|
| Metal Bridge Railing | Repair/replace dented railing on Span CNB210, 283, and 298. | 3 | EA |
| Metal Bridge Railing | Repair spalled concrete curb with exposed reinforcement at CNB149, 232, and 241 on underside of curb | 6 | LF |
| Metal Bridge Railing | Repair failed concrete curb repair at CNB158, 177, 187, 188, 216, and 220 | 10 | LF |
| Concrete Top Flange (Underside) | Repair spalling with exposed longitudinal and transverse reinforcement at Span CNB2, 150, 186, 253 (2 locations), and 303. | 11 | SF |
| Prestressed Concrete Girder | Repair areas near bearings with degraded concrete or where previous repairs have failed at 213 locations | 434 | LF |
| Prestressed Concrete Girder | Repair spall with exposed reinforcement at 22 locations | 32 | LF |
| Prestressed Concrete Piles | Repair top portion of piles exhibiting minor spalls with exposed reinforcement at 26 locations | 26 | EA |
| Prestressed Concrete Piles | Replace junction box cover on Lifejacket System at Bent-Pile: 183-B and 191-C | 2 | EA |
| Light Pole | Replace light pole at CNB153, 159, 162, 165, 186, 192, 195, 198, 222, 246, and 258 | 11 | EA |



3.1.6 Trestle C – Southbound (CSB)

Table 21: CSB Critical Findings

| Element | Item Description | Date Reported | Recommended Action/Follow-Up |
|---------|------------------|---------------|------------------------------|
| None | N/A | N/A | N/A |

Table 22: CSB Priority Repairs

| Element | Item Description | Quantity | Unit |
|----------------------|--|----------|------|
| Metal Bridge Railing | Repair delaminated concrete at railing post on west side of CSB48 (no apparent damage to railing at the time of inspection). | 1 | EA |

Table 23: CSB Routine Repairs

| Element | Item Description | Quantity | Unit |
|---------------------------------|---|----------|------|
| Metal Bridge Railing | Repair bent or damaged railing on Spans CSB26, 75, and 82. | 3 | EA |
| Metal Bridge Railing (Curb) | Repair spalling with exposed reinforcement or failed repairs at 35 locations | 75 | SF |
| Concrete Top Flange (Underside) | Repair spalling with exposed longitudinal and transverse reinforcement at CSB187 Bay 2 | 1 | SF |
| Concrete Top Flange (Underside) | Repair failed repairs of delamination with rust staining or spalling with exposed reinforcement at: CSB23, 29, 32, 42, 52, 54, & 82 (7 locations) | 7 | SF |
| Steel Diaphragms and Bracing | Replace top protective coating on steel girders at locations where coating has bubbled and exhibits freckled rust along CSB1. | 1 | LS |
| Prestressed Concrete Girder | Repair large spalling or locations with exposed reinforcing or exposed strands at girder ends or in the lower portion of the continuity closure pours (126 locations) | 126 | SF |
| Prestressed Concrete Girder | Repair minor spalling with exposed reinforcing or prestressing at 52 locations | 66 | LF |
| Concrete Pier Caps | Repair detached conduit at CSB25 north face and replace broken conduit near light pole at CSB57 | 2 | EA |
| Light Poles | Monitor light poles at CSB55, 67, 73, 85, 91, 93, 99, 101, & 103 that exhibit cracking or delamination/spalling near the baseplate and replace if vertically oriented steel reinforcement becomes exposed and degraded. | 9 | EA |



3.1.7 North Channel Bridge – Northbound (NCB-NB)

Table 24: NCB-NB Critical Findings

| Element | Item Description | Date Reported | Recommended Action/Follow-Up |
|---------|------------------|---------------|------------------------------|
| None | N/A | N/A | N/A |

Table 25: NCB-NB Priority Repairs

| Element | Item Description | Quantity | Unit |
|---------|------------------|----------|------|
| None | N/A | N/A | N/A |

Table 26: NCB-NB Routine Repairs

| Element | Item Description | Quantity | Unit |
|-----------------------------|---|----------|------|
| Steel Floorbeams | Repair/retrofit floorbeam webs with isolated moderate to severe section loss below stringer connections at the following locations: Span-Floorbeam-Stringer: Truss-3'-1 and 5, and 17-6-4 | 3 | EA |
| Steel Floorbeams | Repair/retrofit areas of bottom flanges with isolated areas of minor section loss along 13-2 and 16-6 (south face) | 4 | LF |
| Steel Floorbeams | Repair/retrofit floorbeam stiffeners over the longitudinal girders with minor to moderate section loss at the following locations, Span-Floorbeam-Quadrant: 1-4-SW, 2-8-SW, 2-9-SW, 2-10-SW, 3-3-SW, 3-9-SW, 5-8-NW, 8-1-SW, 8-6-NW, 11-7-NW, 11-7-SW, 11-8-SE and SW, 12-2-SE, 12-10-NE, 13-1-SW, 13-2-NW and SW, 14-4-NE and SE, 14-5-SW, 14-6-SW, 14-8-SW, 15-1-NW, 15-2-SW, 15-3-NW and SW, 15-4-NW, 15-8-NW, 15-9-NW and SW, 15-10-SW, 16-2-NW and SW, 16-4-SW, 16-5-SW, 16-6-SW, 16-7-SW, 16-8-SW, 16-9-NW, 16-9-SW, 16-10-SW, 17-1-NW, 17-1-SW, 17-2-NW and SW, 17-3-SW, 17-4-NW and SW, 17-5-NE and SW, 17-6-NW, 17-7-NW, and 17-8-SW | 54 | EA |
| Steel Floorbeams | Repair cracked welds between the floorbeam stiffeners and the floorbeams at the following locations, Span-Floorbeam-Quadrant: 1-3-NE and SE, 4-2-NE and SE, 4-3-NE, 4-7-SE, 8-7-NE, 10-2-NE and SE, 11-2-NE and SE | 11 | EA |
| Steel Superstructure | Retrofit or replace areas with greater than 25% section loss throughout the facility | 1 | LS |
| Steel Superstructure | Clean and repaint areas exhibiting coating system failure | 1 | LS |
| Reinforced Concrete Columns | Seal cracks in splash zone at Piers 1, 2, 3, 7, 8, 11, 12, 13, and 14 and cover with Fiber Reinforced Polymer (FRP) wraps | 9 | EA |
| Steel Truss | Repair/retrofit truss members with moderate section loss throughout the structure | 1 | LS |
| Light Pole | Repair cracks in light poles in the following spans: NCB-4, NCB-6, NCB-9, NCB-15 | 4 | EA |



3.1.8 North Channel Bridge – Southbound (NCB-SB)

This component was last inspected in FY2021 and will be inspected again in FY2023.

Table 27: NCB-SB Critical Findings

| Element | Item Description | Date Reported | Recommended Action/Follow-Up |
|---------|------------------|---------------|------------------------------|
| None | N/A | N/A | N/A |

Table 28: NCB-SB Priority Repairs

| Element | Item Description | Quantity | Unit |
|---------|------------------|----------|------|
| None | N/A | N/A | N/A |

Table 29: NCB-SB Routine Repairs

| Element | Item Description | Quantity | Unit |
|---------|------------------|----------|------|
| None | N/A | N/A | N/A |



3.1.9 Trestle D – Northbound (DNB)

This component last received a hands-on inspection in FY2021 and will be inspected again in FY2023. An underwater inspection was performed in FY2022.

Table 30: Trestle DNB Critical Findings

| Element | Item Description | Date Reported | Recommended Action/Follow-Up |
|---------|------------------|---------------|------------------------------|
| None | N/A | N/A | N/A |

Table 31: Trestle DNB Priority Repairs

| Element | Item Description | Quantity | Unit |
|----------------------------|--|----------|------|
| Prestressed Concrete Piles | Repair piles exhibiting wide cracks or rust staining at Bent-Pile 3-A, 3-B, 6-B, 9-B, and 10-A | 5 | EA |

Table 32: Trestle DNB Routine Repairs

| Element | Item Description | Quantity | Unit |
|----------------------------|---|----------|------|
| Prestressed Concrete Piles | Repair piles exhibiting minor spalls with exposed reinforcement at Bent-Pile: 1-C, 2-C, 3-A, 4-C, 7-A, 8-B, 8-C, and 13-B | 8 | EA |



3.1.10 Trestle D – Southbound (DSB)

This component was last inspected in FY2021 and will be inspected again in FY2023.

Table 33: Trestle DSB Critical Findings

| Element | Item Description | Date Reported | Recommended Action/Follow-Up |
|---------|------------------|---------------|------------------------------|
| None | N/A | N/A | N/A |

Table 34: Trestle DSB Priority Repairs

| Element | Item Description | Quantity | Unit |
|---------|------------------|----------|------|
| None | N/A | N/A | N/A |

Table 35: Trestle DSB Routine Repairs

| Element | Item Description | Quantity | Unit |
|---------|------------------|----------|------|
| None | N/A | N/A | N/A |

**3.1.11 Trestle E, Fisherman Inlet Bridge, Trestle F – Northbound (ENB, FIB-NB, and FNB)**

This component was last inspected in FY2021 and will be inspected again in FY2023.

Table 36: ENB, FIB-NB, and FNB Critical Findings

| Element | Item Description | Date Reported | Recommended Action/Follow-Up |
|---------|------------------|---------------|------------------------------|
| None | N/A | N/A | N/A |

Table 37: ENB, FIB-NB, and FNB Priority Repairs

| Element | Item Description | Quantity | Unit |
|---------|------------------|----------|------|
| N/A | N/A | N/A | N/A |

Table 38: ENB, FIB-NB, and FNB Routine Repairs

| Element | Item Description | Quantity | Unit |
|---------|------------------|----------|------|
| N/A | N/A | N/A | N/A |

**3.1.12 Trestle E, Fisherman Inlet Bridge, Trestle F – Southbound (ESB, FIB-SB, and FSB)**

This component last received a hands-on inspection in FY2021 and will be inspected again in FY2023. An underwater inspection was performed in FY2022.

Table 39: ESB, FIB-SB, and FSB Critical Findings

| Element | Item Description | Date Reported | Recommended Action/Follow-Up |
|---------|------------------|---------------|------------------------------|
| None | N/A | N/A | N/A |

Table 40: ESB, FIB-SB, and FSB Priority Repairs

| Element | Item Description | Quantity | Unit |
|---------|------------------|----------|------|
| None | N/A | N/A | N/A |

Table 41: ESB, FIB-SB, and FSB Routine Repairs

| Element | Item Description | Quantity | Unit |
|----------------------------|---|----------|------|
| Prestressed Concrete Piles | Repair piles exhibiting minor spalls with exposed reinforcement at Span-Bent-Pile: FSB-3-C, FSB-5-A | 2 | EA |
| Prestressed Concrete Piles | Monitor damaged Lifejacket system and repair as needed at Span-Bent-Pile: FIB-SB-2-C, FIB-SB-3B, and FIB-SB-3-C | 3 | EA |



3.2 Tunnels

3.2.1 Thimble Shoal Channel Tunnel (TSCT)

Table 42: TSCT Critical Findings

| Element | Item Description | Date Reported | Recommended Action/Follow-Up |
|---------|------------------|---------------|------------------------------|
| None | N/A | N/A | N/A |

Table 43: TSCT Priority Repairs

| Element | Item Description | Quantity | Unit |
|---------|------------------|----------|------|
| None | N/A | N/A | N/A |

Table 44: TSCT Routine Repairs

| Element | Item Description | Quantity | Unit |
|--------------------------|--|----------|------|
| Concrete Invert Slab | Repair spalled concrete along roadway edge of Sidewalk Side at several locations | 50 | SF |
| Steel Pedestrian Railing | Clean and repaints steel railing along the Roadway. | 15,840 | SF |
| Concrete Tunnel Liner | Repair spalls with exposed reinforcement and conduits in exhaust duct at several locations | 741 | SF |
| Concrete Tunnel Liner | Repair spalls with exposed reinforcement in supply duct at several locations | 40 | SF |
| Invert Slab | Repair spalls with exposed reinforcement in supply duct at several locations | 275 | SF |
| Tunnel Lighting | Replace non-functioning tunnel lights | 2 | EA |



3.2.2 Chesapeake Channel Tunnel (CCT)

This component was last inspected in FY2021 and will be inspected again in FY2023.

Table 45: CCT Critical Findings

| Element | Item Description | Date Reported | Recommended Action/Follow-Up |
|---------|------------------|---------------|------------------------------|
| None | N/A | N/A | N/A |

Table 46: CCT Priority Repairs

| Element | Item Description | Quantity | Unit |
|---------|------------------|----------|------|
| None | N/A | N/A | N/A |

Table 47: CCT Routine Repairs

| Element | Item Description | Quantity | Unit |
|---------|------------------|----------|------|
| None | N/A | N/A | N/A |



3.3 General Facility

Table 48: General Facility Critical Findings

| Element | Item Description | Date Reported | Recommended Action/Follow-Up |
|---------|------------------|---------------|------------------------------|
| None | N/A | N/A | N/A |

Table 49: General Facility Priority Repairs

| Element | Item Description | Quantity | Unit |
|---------|------------------|----------|------|
| None | N/A | N/A | N/A |

Table 50: General Facility Routine Repairs

| Element | Item Description | Quantity | Unit |
|--|--|----------|------|
| Portal Island #3 & #4 – Approach Walls | Repair spalled and delaminated concrete along top of wall. | 60 | LF |
| Portal Island #3 & #4 – Light Pole | Repair/replace light poles exhibiting cracking at base and significant concrete spalling and delamination (3 at each island) | 6 | EA |
| Portal Island #3 & #4 – Grading | Continue to monitor and fill washouts and sinkholes near splash walls as required to prevent erosion. | 1 | LS |
| Portal Island #3 & #4 – Splash Wall | Repair spalled and delaminated concrete along the splash walls. | 1 | LS |



4. VDOT Structure Inventory and Appraisal (SI&A) Records (B-6 and B-7 Forms)



4.1 Trestle ANB SI&A Forms

| B-6 ANB | VDOT – BRIDGE INSPECTION REPORT | Page: 1 of 2 |
|-----------------|---------------------------------|---------------------------------------|
| Structure-ID: | 1002 | Type: Regular Inspection |
| County/City: | Northampton | Date of Inspection: 9/15 & 10/4/21 |
| Structure: | _____ (Co./Str.No) | Feature/Intersection: Chesapeake Bay |
| Main Route: | 13 | Facility/Carried: |
| Milepost: | 46.62 | Location: Over Chesapeake Bay |
| Lead Inspector: | Chris Williams | Additional Inspector(s): Todd Eckhart |

WORK DONE: Routine Maintenance

CONDITION OF STRUCTURE: Fair to Generally Good

1. Loose bridge railing on span 154, and bent or damaged railing on spans 10, 12, 23, 27, 31, 135, 161, 171, 174, and 217.
2. Some spalls on bottom flanges of some prestressed girders. Locations with exposed rebar at bearings.
3. Some existing spall repairs on concrete girders are failing or have failed, with some exposing two strands near mid-span or exposing rebar at bearings. Hairline diagonal web cracks on approx. Approximately 66% of concrete girder ends inspected.
4. Minor to moderate defects on approximately 7% of elastomeric bearings.
5. One location requiring repair of expansion joint strap in the cable tray at ANB117.
6. Scattered minor damage to fiberglass jackets on some piles. Nine piles exhibit damage of fiberglass jacket exposing sacrificial zinc mesh (33-A, 81-C, 89-A, 133-A, 133-B, 135-C, 142-C, 152-C, 173-A). Anode is disconnected at bent 57 pile A.
7. Minor reflective cracking through coating at some piles and bent caps, with isolated rust staining and efflorescence at a few locations. Other areas of spalling coating noted. Piles exhibiting rust staining were sounded and concrete was intact.
8. Minor to moderate cracking and map cracking on many of the bent caps inspected, primarily at the ends of the bent caps.
9. Existing repairs to piles with impact damage are typically sound.
10. Bay bottom is typically at or above the Allowable Scour Depth (ASD), with some previous scour remediation in place. Bent ANB214 has bay bottom slightly below ASD, but has scour remediation in place, and bay bottom appears to have stabilized with slight migration towards the north.
11. Spalls recommended for repair noted in the underside of the deck at 57 locations.

REVISED STRESS ANALYSIS:

1. Load rating completed in 12/2018 in accordance with VDOT Instructional and Informational Memorandum 86.2: Load Rating and Posting of Structures (Bridges and Culverts) dated 11/16/2018.
2. Structure load rating controlled by modular superstructure units with reduced capacity from having two-prestressing strands removed due to corrosion (worst-case observed during past inspections).
3. No posting of the structure is required.

RECOMMENDATIONS:

1. Continue periodic hydrographic surveys in interim between underwater inspections scheduled every 5 years
2. Perform structural review (if historical data is not available) to determine the effect on strength or serviceability of the piles considered to be Scour Condition State 4 at Bent-Pile: 211-C, 213-A, B, and C, and 214-A, B, and C. Results of structural review should be used to develop a strategy to mitigate the hazard of scour at these locations and to revise the Scour Condition State Criteria if necessary
3. Continue to patch spalls on prestressed concrete girders, giving priority to girders exhibiting two or more exposed strands per location



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4. Reconnect loose bridge railing on span 154, and repair bent or damaged railing on spans 10, 12, 23, 27, 31, 135, 161, 171, 174, and 217.
5. Continue to patch any new spalls and failed repairs on prestressed concrete girders.
6. Retrofit any deteriorated cable tray expansion joint straps as required.
7. Repair spalls in underside of deck with priority to those exposing multiple layers of steel.
8. Determine effectiveness of damaged pile jackets with cathodic protection.
9. Repair spalls in curbs with exposed reinforcement.

SIGNATURE OF INSPECTOR



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VDOT – BRIDGE INSPECTION REPORT

| | | | |
|------------------------|-------------------|---------------------------------|---------------------|
| Structure-ID: | 1002 | Type: | Regular Inspection |
| County/City: | Northampton | Date of Inspection: | 9/15 & 10/4/21 |
| Structure: | _____(Co./Str.No) | Feature/Intersection: | Chesapeake Bay |
| Main Route: | 13 | Facility/Carried: | |
| Milepost: | 46.62 | Location: | Over Chesapeake Bay |
| Lead Inspector: | Chris Williams | Additional Inspector(s): | Todd Eckhart |

SPECIAL CONDITIONS OR REQUIREMENTS

| | | | |
|----------------------|----------|------------------|---|
| 1. Fracture Critical | - | 5. Segmental | - |
| 2. Underwater | <u>X</u> | 6. Pin & Hanger | - |
| 3. Scour Critical | <u>X</u> | 7. Fatigue Prone | - |
| 4. Moveable | - | | |

36 TRAFFIC SAFETY FEATURES

| | | | |
|-------------------|----------|-----------------------|----------|
| 1. Bridge Railing | <u>1</u> | 3. Approach | <u>1</u> |
| 2. Transition | <u>1</u> | 4. Approach Guardrail | <u>1</u> |

REMARKS:

58 DECK

GENERAL CONDITION RATING [7]

| | | | |
|----------------------|----------|------------------------------------|----------|
| 1. Wearing Surface | <u>G</u> | 6. Railing | <u>G</u> |
| 2. Deck – Structural | <u>G</u> | 7. Drains | <u>N</u> |
| 3. Curbs | <u>G</u> | 8. Lighting | <u>G</u> |
| 4. Median | <u>N</u> | 9. Utilities | <u>G</u> |
| 5. Sidewalks | <u>N</u> | 10. Expansion Joints or Devices | <u>G</u> |

REMARKS:

- a. Replacement of Asphalt Wearing Surface and Open Expansion Joint Header Material was completed in Spring 2020.
- b. Scattered minor cracking with some locations having efflorescence, and spalling on underside of deck
- c. Loose bridge railing on span 154, and bent or damaged railing on spans 10, 12, 23, 27, 31, 135, 161, 171, 174, and 217.
- d. Remove anchor covers on light poles at ANB114 and ANB126 verify condition of anchors, including proper torque
- e. Replace light poles that exhibit cracking at baseplate



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59 SUPERSTRUCTURE

GENERAL CONDITION RATING

[7]

| | | | |
|----------------------------------|----------|------------------------------|----------|
| 1. Bearing Devices | <u>F</u> | 4. Trusses | |
| 2. Stringers | <u>N</u> | A. General | <u>N</u> |
| 3. Girders, Beams, or Slab Spans | | B. Portals | <u>N</u> |
| A. General | <u>F</u> | C. Bracing | <u>N</u> |
| B. Diaphragms or Cross Frames | <u>G</u> | 5. Paint | <u>N</u> |
| C. Bracing | <u>N</u> | Year Painted | <u>N</u> |
| | | 6. Machinery (Moveable Span) | <u>N</u> |

REMARKS:

- a. Minor to moderate splitting of isolated bearings pads
- b. Hairline diagonal web cracks on approx. 66% of concrete girders inspected
- c. Isolated spalls on bottom face of random prestressed girder flanges, and some existing spall repairs on girders are failing or have failed. The District is continuously performing girder repairs as weather conditions allow. Worse conditions observed do not exhibit more than one prestressing strand being exposed and degraded.

60 SUBSTRUCTURE

GENERAL CONDITION RATING

[7]

| | | | |
|------------------|----------|-----------------------|----------|
| 1. Abutments | | 2. Pier/Bent | |
| A. Wings | <u>G</u> | A. Caps | - |
| B. Backwall | <u>G</u> | B. Piles | - |
| C. Bearing Seats | <u>G</u> | C. Column, Stem, Wall | - |
| D. Breastwall | <u>N</u> | D. Piles | - |
| E. Weepholes | <u>N</u> | E. Bracing | - |
| F. Footing | <u>G</u> | F. Erosion/Scour | - |
| G. Piles | * | G. Settlement | - |
| H. Erosion/Scour | <u>G</u> | 3. Pile Bent | |
| I. Settlement | <u>G</u> | A. Caps | <u>F</u> |
| *Not Visible | | B. Bearing Seats | <u>G</u> |
| | | C. Piles | <u>G</u> |
| | | D. Bracing | <u>N</u> |

REMARKS:

- a. Underwater Inspection performed 5/2018 – 10/2018. See FY2019 Underwater Inspection Forms for location of underwater defects and Element Level Inspection Forms for condition ratings of substructure units.
- b. Minor to moderate map cracking at ends of some of the bent caps inspected
- c. Most all repairs completed as part of Substructure Repair Project generally appear in good condition. Minor spalls of fiberglass jackets of the cathodic protection jackets noted. Nine piles have a large spall of fiberglass jacket exposing sacrificial zinc mesh (33-A, 81-C, 89-A, 133-A, 133-B, 135-C, 142-C, 152-C, 173-A). Anode is disconnected at bent 57 pile A.
- d. Minor cracking visible through coating on scattered bent cap faces and at some piles with scattered delamination of pile coatings noted, as well as isolated rust staining and efflorescence at a few pile locations. Piles exhibiting rust staining were sounded and concrete was intact.
- e. Most of the underwater portions of the piles are rated CS1 or CS2 (86%) with a majority of the CS2 ratings attributed to good repairs.



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61 CHANNEL: CHANNEL/SLOPE PROTECTION

GENERAL CONDITION RATING

[8]

| | | | |
|------------------|----------|-----------------------|----------|
| 1. Channel Scour | <u>G</u> | 5. Fender System | - |
| 2. Embankment | - | 6. Spur Dikes/Jetties | - |
| Erosion | - | 7. Rip Rap/Slope | <u>G</u> |
| 3. Drift | - | Protection | |
| 4. Vegetation | - | 8. Adequacy of | <u>E</u> |
| | | Opening | |

REMARKS:

- a. Bay bottom is typically at or above ASD, with some previous scour remediation in place. Bent ANB214 has bay bottom slightly below ASD, but has scour remediation in place, and bay bottom appears to have stabilized with slight migration towards the north.
- b. Scour ratings govern over the condition ratings at only a small percentage of the bents (piles considered to be Scour Condition State 4 at Bent-Pile: ANB211-C, 213-A, B, and C, and 214-A, B, and C).

66 POSTED LOADING

| | | | |
|---------------------|----------|---------------|----------|
| 1. Posted Loading - | | 2. Legibility | <u>N</u> |
| (R12 - 1) | <u>N</u> | 3. Visibility | <u>N</u> |
| (R12 - 5) – Single | <u>N</u> | | |
| (R12 - 5) – Semi | <u>N</u> | | |

REMARKS:

- a. Load rating completed in 12/2018 in accordance with VDOT Instructional and Informational Memorandum 86.2: Load Rating and Posting of Structures (Bridges and Culverts) dated 11/16/2018.
- b. Structure load rating controlled by modular superstructure units with reduced capacity from having two-prestressing strands removed due to corrosion (worst-case observed during past inspections, not present this year).
- c. No posting of the structure is required.



4.2 Trestle ASB SI&A Forms

| | | | |
|------------------------|--|---------------------------------|---------------------|
| B-6 ASB | VDOT – BRIDGE INSPECTION REPORT | | Page: 1 of 2 |
| Structure-ID: | 1010 | Type: | Regular Inspection |
| County/City: | Northampton | Date of Inspection: | 9/14/21 |
| Structure: | _____(Co./Str.No) | Feature/Intersection: | Chesapeake Bay |
| Main Route: | 13 | Facility/Carried: | |
| Milepost: | 46.72 | Location: | Over Chesapeake Bay |
| Lead Inspector: | Chris Williams | Additional Inspector(s): | Todd Eckhart |

WORK DONE: Routine Maintenance.

CONDITION OF STRUCTURE: Good

1. Light poles at ASB42, 45, 57, 69, 81, 86, 99, 105, 107, 109, 115, 119, 121, 129, 131, and 133 exhibited cracking at the baseplate.
2. Minor hairline cracking and minor spalls on some of the piles above waterline.
3. Bent bridge railing on Spans ASB125 and 126 and loose shim plate or anchor plate at Span ASB151 and 167. Misaligned anchor plates along ASB56 (5 total). Two posts with impact damage, ASB3 and ASB56.
4. Deck spall with exposed reinforcement at Span ASB109 and 164, and minor cracking and efflorescence at scattered locations in underside of deck. Spalls in concrete wearing surface of span ASB2 with no exposed reinforcement.
5. Spalled and cracked concrete at lower post tension duct at ASB82 and 93.
6. Girder spall with exposed prestressing strand at Span 54 Girder 3 and Span 56 Girder 2, and reinforcement at bearing on Span ASB132.
7. Scattered minor spalls along bottom flanges and webs where insufficient cover is provided to shear reinforcement or prestressing strands.
8. Large spalling or locations with exposed reinforcing or exposed strands at girder ends or in the lower portion of the continuity closure pours at 75 locations.
9. Roadway striping replaced in 2018 remains in good condition.
10. Bay bottom is typically at or above the Allowable Scour Depth (ASD), accretion occurring where scour remediation was placed near Bents ASB202 and 203 with some previous scour remediation in place. Bent ASB193 has bay bottom slightly below ASD, but has scour remediation in place, and bay bottom appears to have stabilized at adjacent bents with slight migration towards the south.
11. Most of the underwater portions of the piles are in very good condition. Minor spalling, a few hairline cracks and one narrow crack at a few bents at or below the waterline.
12. Erosion on east side of the South Abutment ASB1 around water and sewer lines and under slope protection and on the west side of the abutment.
13. Degradation at joint header and asphalt wearing surface interface at ASB21, 40, 44, 48, 56 60, & 76 creating a path for water to reach the concrete deck.

REVISED STRESS ANALYSIS:

- a. Load rating completed in 12/2018 in accordance with VDOT Instructional and Informational Memorandum 86.2: Load Rating and Posting of Structures (Bridges and Culverts) dated 11/16/2018.
- b. Structure load rating controlled by the simple span steel structure at Span ASB204.
- c. No posting of the structure is required.



B-6 ASB

VDOT – BRIDGE INSPECTION REPORT

Page: 2 of 2

RECOMMENDATIONS:

1. Monitor light poles that exhibit cracking or delamination/spalling near the baseplate and replace if vertically oriented steel reinforcement becomes exposed and degraded.
2. Continue periodic hydrographic surveys in interim between underwater inspections scheduled every 5 years.
3. Perform structural review (if historical data is not available) to determine the effect on strength or serviceability of the piles considered to be Scour Condition State 4 at Bent-Pile: 193-A, C, D, E, and F, and 203-B, C, and D. Results of structural review should be used to develop a strategy to mitigate the hazard of scour at these locations and to revise the Scour Condition State Criteria if necessary
4. Clean exposed reinforcing and repair spalling in girder bottom flanges noted this year and in previous reports.
5. Clean exposed reinforcing and patch spalls/voids previously noted in piles above water.
6. Place fill at locations of erosion on east side of the South Abutment ASB1 around water and sewer lines and under slope protection.
7. Retrofit any deteriorated cable tray expansion joint straps as required.
8. Clean and fill voids at joint header and asphalt wearing surface interface with joint sealant material.

SIGNATURE OF INSPECTOR



B-7 ASB

VDOT – BRIDGE INSPECTION REPORT

| | | | |
|------------------------|-------------------|---------------------------------|---------------------|
| Structure-ID: | 1010 | Type: | Regular Inspection |
| County/City: | Northampton | Date of Inspection: | 9/14/21 |
| Structure: | _____(Co./Str.No) | Feature/Intersection: | Chesapeake Bay |
| Main Route: | 13 | Facility/Carried: | |
| Milepost: | 46.72 | Location: | Over Chesapeake Bay |
| Lead Inspector: | Chris Williams | Additional Inspector(s): | Todd Eckhart |

SPECIAL CONDITIONS OR REQUIREMENTS

| | | | |
|----------------------|---|------------------|---|
| 1. Fracture Critical | - | 5. Segmental | - |
| 2. Underwater | X | 6. Pin & Hanger | - |
| 3. Scour Critical | X | 7. Fatigue Prone | - |
| 4. Moveable | - | | |

36 TRAFFIC SAFETY FEATURES

| | | | |
|-------------------|----------|-----------------------|----------|
| 1. Bridge Railing | <u>1</u> | 3. Approach | <u>1</u> |
| 2. Transition | <u>1</u> | 4. Approach Guardrail | <u>1</u> |

REMARKS:

58 DECK

GENERAL CONDITION RATING [8]

| | | | |
|----------------------|----------|------------------------------------|----------|
| 1. Wearing Surface | <u>G</u> | 6. Railing | <u>G</u> |
| 2. Deck – Structural | <u>G</u> | 7. Drains | <u>N</u> |
| 3. Curbs | <u>G</u> | 8. Lighting | <u>G</u> |
| 4. Median | <u>N</u> | 9. Utilities | <u>G</u> |
| 5. Sidewalks | <u>N</u> | 10. Expansion Joints or Devices | <u>G</u> |

REMARKS:

- a. Light poles at ASB42, 45, 57, 69, 81, 86, 99, 105, 107, 109, 115, 119, 121, 129, 131, and 133 exhibited cracking at the baseplate.
- b. Deck spall with exposed reinforcement at Span ASB109 and 164, and minor cracking and efflorescence at scattered locations in underside of deck
- c. Bent bridge railing on Spans ASB125 and 126 and loose shim plate or anchor plate at Span ASB151 and 167. Misaligned anchor plates along ASB56 (5 total). Two posts with impact damage, ASB2 and ASB56.
- d. Deck spall with exposed reinforcement at Span ASB109 and 164, and minor cracking and efflorescence at scattered locations in underside of deck. Spalls in concrete wearing surface of span ASB3 with no exposed reinforcement.
- e. Roadway striping replaced in 2018 remains in good condition



B-7 ASB

VDOT – BRIDGE INSPECTION REPORT

Page: 2 of 3

59 SUPERSTRUCTURE

GENERAL CONDITION RATING

[8]

| | | | |
|----------------------------------|----------|------------------------------|-------------|
| 1. Bearing Devices | <u>G</u> | 4. Trusses | |
| 2. Stringers | <u>N</u> | A. General | <u>N</u> |
| 3. Girders, Beams, or Slab Spans | | B. Portals | <u>N</u> |
| A. General | <u>G</u> | C. Bracing | <u>N</u> |
| B. Diaphragms or Cross Frames | <u>G</u> | 5. Paint | <u>G</u> |
| C. Bracing | <u>N</u> | Year Painted | <u>2013</u> |
| | | 6. Machinery (Moveable Span) | <u>N</u> |

REMARKS:

- a. Large spalling or locations with exposed reinforcing or exposed strands at girder ends or in the lower portion of the continuity closure pours at 75 locations.
- b. Scattered minor spalls along bottom flanges and webs where insufficient cover is provided to shear reinforcement or prestressing strands.
- c. Girder spall with exposed prestressing strand at Span 54 Girder 3 and Span 56 Girder 2, and reinforcement at bearing on Span ASB132
- d. Damaged expansion joint plates in the cable trays at Bents ASB 125 and 128, and disconnected ground wires at ASB 123, 127, and 151.

60 SUBSTRUCTURE

GENERAL CONDITION RATING

[8]

| | | | |
|---------------------|----------|-----------------------|----------|
| 1. Abutments | | 2. Pier/Bent | |
| A. Wings | <u>N</u> | A. Caps | - |
| B. Backwall | <u>N</u> | B. Piles | - |
| C. Bearing Seats | <u>N</u> | C. Column, Stem, Wall | - |
| D. Breastwall | <u>N</u> | D. Piles | - |
| E. Weepholes | <u>N</u> | E. Bracing | - |
| F. Footing | <u>N</u> | F. Erosion/Scour | - |
| G. Piles | <u>N</u> | G. Settlement | - |
| H. Erosion/Scour | <u>N</u> | 3. Pile Bent | |
| I. Settlement | <u>N</u> | A. Caps | <u>G</u> |
| *Not Visible | | B. Bearing Seats | <u>G</u> |
| | | C. Piles | <u>G</u> |
| | | D. Bracing | <u>N</u> |

REMARKS:

- a. Underwater Inspection performed 5/2018 – 10/2018. See FY2019 Underwater Inspection Forms for location of underwater defects and Element Level Inspection Forms for condition ratings of substructure units
- b. Minor spalling, a few hairline cracks and one narrow crack at a few bents at or below the waterline
- c. Minor hairline cracking and minor spalling on some of the piles
- d. Minor hairline cracking or map cracking on scattered bent caps
- e. Erosion on east side of the South Abutment ASB1 around water and sewer lines and under slope protection



B-7 ASB

VDOT – BRIDGE INSPECTION REPORT

Page: 3 of 3

61 CHANNEL: CHANNEL/SLOPE PROTECTION

GENERAL CONDITION RATING

[8]

| | | | |
|------------------|----------|-----------------------|----------|
| 1. Channel Scour | <u>G</u> | 5. Fender System | - |
| 2. Embankment | - | 6. Spur Dikes/Jetties | - |
| Erosion | - | 7. Rip Rap/Slope | <u>G</u> |
| 3. Drift | - | Protection | |
| 4. Vegetation | - | 8. Adequacy of | <u>E</u> |
| | | Opening | |

REMARKS:

- a. Bay bottom is typically at or above the Allowable Scour Depth (ASD), accretion occurring where scour remediation was placed near Bents ASB202 and 203 with some previous scour remediation in place. Bent ASB193 has bay bottom slightly below ASD, but has scour remediation in place, and bay bottom appears to have stabilized at adjacent bents with slight migration towards the south.

66 POSTED LOADING

| | | | |
|---------------------|----------|---------------|----------|
| 1. Posted Loading - | | 2. Legibility | <u>N</u> |
| (R12 -1) | <u>N</u> | 3. Visibility | <u>N</u> |
| (R12 - 5) – Single | <u>N</u> | | |
| (R12 - 5) – Semi | <u>N</u> | | |

REMARKS:

- a. Load rating completed in 12/2018 in accordance with VDOT Instructional and Informational Memorandum 86.2: Load Rating and Posting of Structures (Bridges and Culverts) dated 11/16/2018.
- b. Structure load rating controlled by the simple span steel structure at Span ASB204. No posting of the structure is required.



4.3 Trestle BNB SI&A Forms

| | | | |
|------------------------|--|---------------------------------|---------------------|
| B-6 BNB | VDOT – BRIDGE INSPECTION REPORT | | Page: 1 of 2 |
| Structure-ID: | 1004 | Type: | Regular Inspection |
| County/City: | Northampton | Date of Inspection: | 9/14/21 |
| Structure: | _____ (Co./Str.No) | Feature/Intersection: | Chesapeake Bay |
| Main Route: | 13 | Facility/Carried: | |
| Milepost: | 41.31 | Location: | Over Chesapeake Bay |
| Lead Inspector: | Chris Williams | Additional Inspector(s): | Todd Eckhart |

WORK DONE: Routine Maintenance. The wearing surface was replaced in Fall 2020.

CONDITION OF STRUCTURE: Generally Fair to Good

1. Light poles at BNB108, 111, 120, 129, 132, 141, 144, 156, 180, and 189 exhibited cracking at the baseplate.
2. Exposed sacrificial mesh or wide cracking in grouted annulus of LifeJacket System on Bent BNB23 Pile B, 74-C, 102-A, 117-A, 127-A, 161-A, and 214-A.
3. New spall repairs on bottom flange of girders in good condition with minor shrinkage cracks noted.
4. Scattered cracks and spalls on bottom flanges of prestressed girders. A few failed patches at older repair locations, including exposed strands near mid-span and exposed rebar at some bearings.
5. Minor cracking on many of the piles and some spalling also noted on a few piles and a few longitudinal wide cracks noted with exposed prestressing strands in the top portion of the pile.
6. Hairline diagonal web cracking on approximately 50% of concrete girder ends inspected.
7. Minor to moderate splitting on approximately 9% of elastomeric bearings.
8. Minor map cracking on a few of the bent cap ends inspected.
9. Several locations where main cable tray grounding straps are disconnected.
10. Material has eroded away under the bridge abutment at Portal Island No. 2 (BNB1) to a maximum horizontal penetration of 6' with vertical gaps typically at 4" high and up to 6" high at one isolated location. Abutment is pile supported and stable.
11. Approximately 20% of the piles along Trestle BNB were coded as Condition State 4 (Severe) due to bay bottom elevations found to be below the Allowable Scour Depth. Otherwise, most of the piles would be coded as Condition State 2 (Fair) based on the physical condition of the pile.
12. For complete details on condition of the underwater portion of piles, see the FY2020 Underwater Inspection Forms. A Level II and III Inspection of the Pile Repair at BNB78 Pile B was performed and the steel built-up pile used for the repair appears to exhibit moderate corrosion (approximately 25% section loss).

REVISED STRESS ANALYSIS:

- a. Load rating completed in 12/2018 in accordance with VDOT Instructional and Informational Memorandum 86.2: Load Rating and Posting of Structures (Bridges and Culverts) dated 11/16/2018.
- b. Structure load rating controlled by modular superstructure units with reduced capacity from having two-prestressing strands removed due to corrosion (worst-case observed during past inspections).
- c. No posting of the structure is required.



B-6 BNB

VDOT – BRIDGE INSPECTION REPORT

Page: 2 of 2

RECOMMENDATIONS:

1. Repair all cracks narrow or greater and repair spalls with exposed reinforcing in the piles.
2. Determine effectiveness of damaged LifeJacket System on Bent BNB23 Pile B, 74-C, 102-A, 117-A, 127-A, 161-A, and 214-A; repair accordingly.
3. Continue periodic hydrographic surveys in interim between underwater inspections scheduled every 5 years.
4. Continue to monitor paint condition of steel beam span (BNB1/BNB2).
5. Repair bent cable tray retainer plate at BNB71.
6. Perform a repair to the steel built-up pile at BNB78 Pile B to prevent additional degradation or corrosion.

SIGNATURE OF INSPECTOR



B-7 BNB

VDOT – BRIDGE INSPECTION REPORT

Page: 1 of 3

| | | | |
|------------------------|-------------------|---------------------------------|---------------------|
| Structure-ID: | 1004 | Type: | Regular Inspection |
| County/City: | Northampton | Date of Inspection: | 9/14/21 |
| Structure: | _____(Co./Str.No) | Feature/Intersection: | Chesapeake Bay |
| Main Route: | 13 | Facility/Carried: | |
| Milepost: | 41.31 | Location: | Over Chesapeake Bay |
| Lead Inspector: | Chris Williams | Additional Inspector(s): | Todd Eckhart |

SPECIAL CONDITIONS OR REQUIREMENTS

| | | | |
|----------------------|----------|------------------|---|
| 1. Fracture Critical | - | 5. Segmental | - |
| 2. Underwater | <u>X</u> | 6. Pin & Hanger | - |
| 3. Scour Critical | <u>X</u> | 7. Fatigue Prone | - |
| 4. Moveable | - | | |

36 TRAFFIC SAFETY FEATURES

| | | | |
|-------------------|----------|-----------------------|----------|
| 1. Bridge Railing | <u>1</u> | 3. Approach | <u>1</u> |
| 2. Transition | <u>1</u> | 4. Approach Guardrail | <u>1</u> |

REMARKS:

58 DECK

GENERAL CONDITION RATING [7]

| | | | |
|----------------------|----------|------------------------------------|----------|
| 1. Wearing Surface | <u>G</u> | 6. Railing | <u>G</u> |
| 2. Deck – Structural | <u>G</u> | 7. Drains | <u>N</u> |
| 3. Curbs | <u>G</u> | 8. Lighting | <u>G</u> |
| 4. Median | <u>N</u> | 9. Utilities | <u>G</u> |
| 5. Sidewalks | <u>N</u> | 10. Expansion Joints or Devices | <u>G</u> |

REMARKS:

- a. Replacement of the asphalt wearing surface and open expansion joint header material is underway as part of the Mill and Repave Trestles, Replace End Dams Project (RMF 2053.2025) that began on September 8, 2020 (immediately following the inspection of this structure). Work on this structure was completed by the end of Fall 2020.
- b. Scattered minor cracking and spalling on underside of deck.
- c. Scattered minor transverse cracking in curbs



B-7 BNB

VDOT – BRIDGE INSPECTION REPORT

Page: 2 of 3

59 SUPERSTRUCTURE

GENERAL CONDITION RATING [7]

| | | | |
|----------------------------------|----------|------------------------------|-------------|
| 1. Bearing Devices | <u>F</u> | 4. Trusses | |
| 2. Stringers | <u>N</u> | A. General | <u>N</u> |
| 3. Girders, Beams, or Slab Spans | | B. Portals | <u>N</u> |
| A. General | <u>F</u> | C. Bracing | <u>N</u> |
| B. Diaphragms or Cross Frames | <u>G</u> | 5. Paint | <u>F</u> |
| C. Bracing | <u>N</u> | Year Painted | <u>2013</u> |
| | | 6. Machinery (Moveable Span) | <u>N</u> |

REMARKS:

- a. Minor splitting of 9% of the bearing pads inspected.
- b. Some spalls on bottom flanges of some prestressed girders, and some existing spall repairs on girders are failing or have failed. The District is continuously performing girder repairs as weather conditions allow. Worse conditions observed do not exhibit more than one prestressing strand being exposed and degraded.
- c. Hairline diagonal web cracking on 50% of girders inspected

60 SUBSTRUCTURE

GENERAL CONDITION RATING [4]

| | | | |
|---------------------|----------|-----------------------|----------|
| 1. Abutments | | 2. Pier/Bent | |
| A. Wings | <u>G</u> | A. Caps | - |
| B. Backwall | <u>G</u> | B. Piles | - |
| C. Bearing Seats | <u>G</u> | C. Column, Stem, Wall | - |
| D. Breastwall | <u>N</u> | D. Piles | - |
| E. Weepholes | <u>N</u> | E. Bracing | - |
| F. Footing | <u>G</u> | F. Erosion/Scour | <u>P</u> |
| G. Piles | * | G. Settlement | - |
| H. Erosion/Scour | <u>G</u> | 3. Pile Bent | |
| I. Settlement | <u>G</u> | A. Caps | <u>F</u> |
| *Not Visible | | B. Bearing Seats | <u>G</u> |
| | | C. Piles | <u>F</u> |
| | | D. Bracing | <u>N</u> |

REMARKS:

- a. Condition rating controlled by scour, see 61 Channel: Channel Slope/Protection.
- b. Spalls with exposed reinforcement on pile cap at BNB100 and abutment at BNB266, and delamination on BNB85, 243, & 265,
- c. Minor cracking on many of the piles. A few longitudinal wide cracks noted with exposed prestressing strands in the top portion of the pile or rust staining. Some spalling with exposed reinforcing steel noted near top.
- d. Spall of LifeJacket fiberglass jacket with exposed sacrificial mesh on Bent BNB23 Pile B, 74-C, 102-A, 117-A, 127-A, 161-A, and 214-A are recommended for evaluation to determine effectiveness of the cathodic protection system and to be repaired accordingly.
- e. Material has eroded away under the bridge abutment at Portal Island No. 2 (BNB1) to a maximum horizontal penetration of 6' with vertical gaps typically at 4" high and up to 6" high at one isolated location.
- f. Defects noted during 2019 Underwater Inspection include wide, narrow and hairline cracks, large spalls and moderate scaling. See Underwater Inspection Forms for additional details. A Level II and III Inspection of the Pile Repair at BNB78 Pile B was performed and the steel built-up pile used for the repair appears to exhibit moderate corrosion (approximately 25% section loss).



B-7 BNB

VDOT – BRIDGE INSPECTION REPORT

Page: 3 of 3

61 CHANNEL: CHANNEL/SLOPE PROTECTION

GENERAL CONDITION RATING

[4]

| | | | |
|------------------|----------|-----------------------|----------|
| 1. Channel Scour | <u>P</u> | 5. Fender System | - |
| 2. Embankment | - | 6. Spur Dikes/Jetties | - |
| Erosion | - | 7. Rip Rap/Slope | <u>G</u> |
| 3. Drift | - | Protection | |
| 4. Vegetation | - | 8. Adequacy of | <u>E</u> |
| | | Opening | |

REMARKS:

- a. Approximately 20% of the piles along Trestle BNB were coded as Condition State 4 (Severe) from the UWI due to bay bottom elevations found to be below the Allowable Scour Depth. It is believed that a conservative approach was taken in the historical structural analysis. Pile B of Bent BNB78 originally damaged and repaired during construction exhibited moderate corrosion where exposed and appeared to be less robust of a structural element as historical records have shown and will also be reviewed in the engineering analysis.
- b. Scour remediation present at some locations and recommended at other locations (2019 UWI Report)
- c. Material has eroded away under the bridge abutment at Portal Island No. 2 (BNB1) to a maximum horizontal penetration of 6' with vertical gaps typically at 4" high and up to 6" high at one isolated location. Abutment is pile supported and stable.

66 POSTED LOADING

| | | | |
|---------------------|----------|---------------|----------|
| 1. Posted Loading - | | 2. Legibility | <u>N</u> |
| (R12 -1) | <u>N</u> | 3. Visibility | <u>N</u> |
| (R12 - 5) – Single | <u>N</u> | | |
| (R12 - 5) – Semi | <u>N</u> | | |

REMARKS:

- a. Load rating completed in 12/2018 in accordance with VDOT Instructional and Informational Memorandum 86.2: Load Rating and Posting of Structures (Bridges and Culverts) dated 11/16/2018.
- b. Structure load rating controlled by modular superstructure units with reduced capacity from having two-prestressing strands removed due to corrosion (worst-case observed during past inspections, not present this year).
- c. No posting of the structure is required.



4.4 Trestle BSB SI&A Forms

| | | | |
|------------------------|--|---------------------------------|---------------------|
| B-6 BSB | VDOT – BRIDGE INSPECTION REPORT | | Page: 1 of 2 |
| Structure-ID: | 1012 | Type: | Regular Inspection |
| County/City: | Northampton | Date of Inspection: | 9/17/21 |
| Structure: | _____(Co./Str.No) | Feature/Intersection: | Chesapeake Bay |
| Main Route: | 13 | Facility/Carried: | |
| Milepost: | 41.38 | Location: | Over Chesapeake Bay |
| Lead Inspector: | Chris Williams | Additional Inspector(s): | Todd Eckhart |

WORK DONE: Routine Maintenance. Underwater Inspection performed 6/27 - 9/28/21.

CONDITION OF STRUCTURE: Good

- a. Light poles at BSB59, 61, 67, 73, 91, 93, 103, 115, 113, 127, 129, and 133 exhibit cracking or delamination/spalling at the base plate, light pole at BSB175 has a spall at the base plate with exposed reinforcement, and light poles at BSB151 and 161 exhibit minor spalling.
- b. Dented railing on Span BSB20, 21, and 67.
- c. Asphalt wearing surface exhibits cracks, splits, surface spalls, and scaling at isolated locations throughout.
- d. Minor hairline cracking and minor spalling on some piles and bent caps.
- e. Minor cracking and spalling with exposed reinforcing near the bearings in a few concrete girders.
- f. Minor hairline cracking scattered on the underside of the deck.
- g. Steel beam span BSB1 and 202 repainted in 2013, structurally in good condition with scattered minor rusting of girders, diaphragms, and bearing connections in areas over armor stones.
- h. Large spalling or locations with exposed reinforcing or exposed strands at girder ends or in the lower portion of the continuity closure pours at 99 locations.
- i. Minor horizontal cracking, some with efflorescence, in intermediate concrete girder diaphragms.
- j. Active scour, with bay bottom at or above Acceptable Scour Depth, was noted at many bents in 2021 UWI Report. 8% of bents were rated 6 or lower for scour.
- k. The underwater portion of the piles are in generally good condition as noted during the 2021 Underwater Inspection. Large repairs previously completed at Bent BSB90 Pile C and at Bent BSB199 Pile C remain in good condition. Minor cracks and spalls were noted on some underwater portions of piles, with 21% of bents rated 6 or lower.
- l. Roadway striping replaced in 2018 remains in good condition.

REVISED STRESS ANALYSIS:

- 1. Load rating completed in 12/2018 in accordance with VDOT Instructional and Informational Memorandum 86.2: Load Rating and Posting of Structures (Bridges and Culverts) dated 11/16/2018.
- 2. Structure load rating controlled by the simple span steel structures at Span BSB1 and BSB202.
- 3. No posting of the structure is required.



B-6 BSB

VDOT – BRIDGE INSPECTION REPORT

Page: 2 of 2

RECOMMENDATIONS:

1. Monitor light poles that exhibit cracking or delamination/spalling near the baseplate and replace if vertically oriented steel reinforcement becomes exposed and degraded.
2. Repair/replace dented railing on Span BSB20, 21, and 67.
3. Repair paint system at scattered locations where overcoat is peeling.
4. Continue periodic hydrographic surveys in interim between underwater inspections.
5. Repair spalls noted this year along with those previously noted on girder bottom flanges.

SIGNATURE OF INSPECTOR



B-7 BSB

VDOT – BRIDGE INSPECTION REPORT

| | | | |
|------------------------|-------------------|---------------------------------|---------------------|
| Structure-ID: | 1012 | Type: | Regular Inspection |
| County/City: | Northampton | Date of Inspection: | 9/17/21 |
| Structure: | _____(Co./Str.No) | Feature/Intersection: | Chesapeake Bay |
| Main Route: | 13 | Facility/Carried: | |
| Milepost: | 41.38 | Location: | Over Chesapeake Bay |
| Lead Inspector: | Chris Williams | Additional Inspector(s): | Todd Eckhart |

SPECIAL CONDITIONS OR REQUIREMENTS

| | | | |
|----------------------|---|------------------|---|
| 1. Fracture Critical | - | 5. Segmental | - |
| 2. Underwater | X | 6. Pin & Hanger | - |
| 3. Scour Critical | X | 7. Fatigue Prone | - |
| 4. Moveable | - | | |

36 TRAFFIC SAFETY FEATURES

| | | | |
|-------------------|----------|-----------------------|----------|
| 1. Bridge Railing | <u>1</u> | 3. Approach | <u>1</u> |
| 2. Transition | <u>1</u> | 4. Approach Guardrail | <u>1</u> |

REMARKS:

58 DECK

GENERAL CONDITION RATING [7]

| | | | |
|----------------------|----------|------------------------------------|----------|
| 1. Wearing Surface | <u>G</u> | 6. Railing | <u>G</u> |
| 2. Deck – Structural | <u>G</u> | 7. Drains | <u>N</u> |
| 3. Curbs | <u>G</u> | 8. Lighting | <u>G</u> |
| 4. Median | <u>N</u> | 9. Utilities | <u>G</u> |
| 5. Sidewalks | <u>N</u> | 10. Expansion Joints or Devices | <u>G</u> |

REMARKS:

- a. Light poles at BSB59, 61, 67, 73, 91, 93, 103, 115, 113, 127, 129, and 133 exhibit cracking or delamination/spalling at the base plate, light pole at BSB175 has a spall at the base plate with exposed reinforcement, and light poles at BSB151 and 161 exhibit minor spalling.
- b. Asphalt wearing surface exhibits cracks, splits, surface spalls, and scaling at isolated locations throughout.
- c. Minor hairline and map cracking scattered on the underside of the deck
- d. Isolated minor shallow spalls on underside of deck at one location
- e. Longitudinal reflective cracks in the overlay sealed, but a few scattered unsealed cracks were noted
- f. Transverse cracks in bare concrete deck need sealing
- g. Roadway striping replaced in 2018 remains in good condition



59 SUPERSTRUCTURE

GENERAL CONDITION RATING

[8]

| | | | |
|----------------------------------|----------|------------------------------|-------------|
| 1. Bearing Devices | <u>G</u> | 4. Trusses | |
| 2. Stringers | <u>N</u> | A. General | <u>N</u> |
| 3. Girders, Beams, or Slab Spans | | B. Portals | <u>N</u> |
| A. General | <u>G</u> | C. Bracing | <u>N</u> |
| B. Diaphragms or Cross Frames | <u>G</u> | 5. Paint | <u>F</u> |
| C. Bracing | <u>N</u> | Year Painted | <u>2013</u> |
| | | 6. Machinery (Moveable Span) | <u>N</u> |

REMARKS:

- a. Spans BSB1 and BSB202 are painted steel girder spans and exhibit scattered minor widespread rust with little to no section loss on portions over armor stones with remaining paint system in Good Condition and are structurally sound
- b. Large spalling or locations with exposed reinforcing or exposed strands at girder ends or in the lower portion of the continuity closure pours at 99 locations.
- c. Minor cracking and spalls with exposed reinforcing at isolated locations on a few girders

60 SUBSTRUCTURE

GENERAL CONDITION RATING

[8]

| | | | |
|---------------------|----------|-----------------------|----------|
| 1. Abutments | | 2. Pier/Bent | |
| A. Wings | <u>G</u> | A. Caps | – |
| B. Backwall | <u>G</u> | B. Piles | – |
| C. Bearing Seats | <u>G</u> | C. Column, Stem, Wall | – |
| D. Breastwall | <u>N</u> | D. Piles | – |
| E. Weepholes | <u>N</u> | E. Bracing | – |
| F. Footing | <u>G</u> | F. Erosion/Scour | – |
| G. Piles | * | G. Settlement | – |
| H. Erosion/Scour | <u>G</u> | 3. Pile Bent | |
| I. Settlement | <u>G</u> | A. Caps | <u>G</u> |
| *Not Visible | | B. Bearing Seats | <u>G</u> |
| | | C. Piles | <u>G</u> |
| | | D. Bracing | <u>N</u> |

REMARKS:

- a. Repairs to large spalls with exposed spiral reinforcing on underwater portions of BSB90 Pile C and BSB199 Pile C remain in good condition (2021 UWI Report)
- b. Minor cracks and spalls underwater at 21% of Bents (2021 UWI Report)
- c. Minor vertical hairline cracks, map cracks and spalls in scattered bent caps
- d. Minor hairline cracking and minor spalling on some of the above water portions of the piles



B-7 BSB

VDOT – BRIDGE INSPECTION REPORT

61 CHANNEL: CHANNEL/SLOPE PROTECTION

GENERAL CONDITION RATING

[8]

| | | | |
|------------------|----------|-----------------------|----------|
| 1. Channel Scour | <u>G</u> | 5. Fender System | - |
| 2. Embankment | - | 6. Spur Dikes/Jetties | - |
| Erosion | - | 7. Rip Rap/Slope | <u>G</u> |
| 3. Drift | - | Protection | |
| 4. Vegetation | - | 8. Adequacy of | <u>E</u> |
| | | Opening | |

REMARKS:

- a. Active scour, with bay bottom at or above Acceptable Scour Depth, was noted at many bents in 2021 UWI Report. 8% of bents were rated 6 or lower for scour as noted in the 2021 UWI Report.

66 POSTED LOADING

| | | | |
|---------------------|----------|---------------|----------|
| 1. Posted Loading - | | 2. Legibility | <u>N</u> |
| (R12 -1) | <u>N</u> | 3. Visibility | <u>N</u> |
| (R12 - 5) – Single | <u>N</u> | | |
| (R12 - 5) – Semi | <u>N</u> | | |

REMARKS:

- a. Load rating completed in 12/2018 in accordance with VDOT Instructional and Informational Memorandum 86.2: Load Rating and Posting of Structures (Bridges and Culverts) dated 11/16/2018.
- b. Structure load rating controlled by the simple span steel structures at Span BSB1 and BSB202.
- c. No posting of the structure is required.



4.5 Trestle CNB SI&A Forms

| B-6 CNB | VDOT – BRIDGE INSPECTION REPORT | | Page: 1 of 2 |
|-----------------|---------------------------------|--------------------------|---------------------|
| Structure-ID: | 1009 | Type: | Regular Inspection |
| County/City: | Northampton | Date of Inspection: | 9/13/21 |
| Structure: | _____ (Co./Str.No) | Feature/Intersection: | Chesapeake Bay |
| Main Route: | 13 | Facility/Carried: | |
| Milepost: | 35.23 | Location: | Over Chesapeake Bay |
| Lead Inspector: | Chris Williams | Additional Inspector(s): | Todd Eckhart |

WORK DONE: Routine Maintenance. Replacement of Asphalt Wearing Surface and Open Expansion Joint Header Material was completed in Spring 2020. Open Expansion Joint Steel Angle Headers were repaired or replaced as required as part of this effort.

CONDITION OF STRUCTURE: Generally Fair to Good

- Loose bridge railing on spans 193 and 194, and bent or damaged railing on spans 149, 181, 185, 193, 210, 242, 267, 271, 283, 289, 297, 298, 301, 312, 318, 320, and 321.
- Light poles at CNB108, 111, 120, 129, 153, 159, 162, 165, 186, 192, 195, 198, 222, 246, and 258 exhibited cracking or spalling at the baseplate, and the light pole at CNB131 has a loose anchor nut.
- Damaged expansion joint plates in cable tray and misaligned cable tray plate at Bent CNB124.
- New spall repairs on bottom flange of girders in good condition with minor shrinkage cracks noted.
- A few failed patches at older repair locations, including exposed strands near mid-span and exposed rebar at some bearings.
- Minor to moderate splitting on appr. 13% of the elastomeric bearings.
- Hairline diagonal web cracking on approximately 26% of concrete girder ends inspected.
- Map cracking at the ends of many of the bent caps.
- Scattered minor to moderate cracking and spalling on a few of the piles, some of which are recommended for repair. Spall in grout at pile joint with rust staining and minor cracking with rust staining on CNB267 Pile C.
- Scour ratings govern over the condition ratings at approximately 37% of the bents (2020 UWI).
- Bay bottom elevation below Allowable Scour Depth (ASD) at 55 locations, and all have scour protection.
- Underwater pile repairs previously completed at large spalls exposing spirals and post tensioning strands were at Pile C of Bent CNB59 and Pile A of Bent CNB154 remain in good condition.
- Approximately 6% of the piles along Trestle CNB were coded as Condition State 4 (Severe) due to bay bottom elevations found to be below the Allowable Scour Depth. Otherwise, most of the piles would be coded as Condition State 2 (Fair) based on the physical condition of the pile.
- For complete details on condition of the underwater portion of piles, see the Underwater Inspection Forms included as an electronic submittal this year.

REVISED STRESS ANALYSIS:

- Load rating completed in 12/2018 in accordance with VDOT Instructional and Informational Memorandum 86.2: Load Rating and Posting of Structures (Bridges and Culverts) dated 11/16/2018.
- Structure load rating controlled by modular superstructure units with reduced capacity from having two-prestressing strands removed due to corrosion (worst-case observed during past inspections).
- No posting of the structure is required.

RECOMMENDATIONS:

- Continue to patch spalls on prestressed concrete girders.
- Patch spalled grout at pile joint on CNB267 Pile C with epoxy.
- Reconnect loose bridge railing on spans 193 and 194, and repair bent or damaged railing on spans 149, 181, 185, and 193, 210, 242, 283 and 298.



B-6 CNB

VDOT – BRIDGE INSPECTION REPORT

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4. Replace light poles at CNB108, 111, 120, 129, 153, 159, 162, 165, 186, 192, 195, and 198.
5. Replace damaged expansion joint plates in the cable tray at Bent CNB124 and realign cable tray plate.
6. Repair piles that exhibit significant cracking or spalling.
7. Continue periodic hydrographic surveys in interim between underwater inspections.
8. Monitor conditions of bay bottom where elevations are below ASD.

SIGNATURE OF INSPECTOR



B-7 CNB

VDOT – BRIDGE INSPECTION REPORT

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| | | | |
|------------------------|-------------------|---------------------------------|---------------------|
| Structure-ID: | 1009 | Type: | Regular Inspection |
| County/City: | Northampton | Date of Inspection: | 9/13/21 |
| Structure: | _____(Co./Str.No) | Feature/Intersection: | Chesapeake Bay |
| Main Route: | 13 | Facility/Carried: | |
| Milepost: | 35.23 | Location: | Over Chesapeake Bay |
| Lead Inspector: | Chris Williams | Additional Inspector(s): | Todd Eckhart |

SPECIAL CONDITIONS OR REQUIREMENTS

| | | | |
|----------------------|----------|------------------|---|
| 1. Fracture Critical | - | 5. Segmental | - |
| 2. Underwater | <u>X</u> | 6. Pin & Hanger | - |
| 3. Scour Critical | <u>X</u> | 7. Fatigue Prone | - |
| 4. Moveable | - | | |

36 TRAFFIC SAFETY FEATURES

| | | | |
|-------------------|----------|-----------------------|----------|
| 1. Bridge Railing | <u>1</u> | 3. Approach | <u>1</u> |
| 2. Transition | <u>1</u> | 4. Approach Guardrail | <u>1</u> |

REMARKS:

58 DECK

GENERAL CONDITION RATING [7]

| | | | |
|----------------------|----------|------------------------------------|----------|
| 1. Wearing Surface | <u>G</u> | 6. Railing | <u>G</u> |
| 2. Deck – Structural | <u>G</u> | 7. Drains | <u>N</u> |
| 3. Curbs | <u>G</u> | 8. Lighting | <u>G</u> |
| 4. Median | <u>N</u> | 9. Utilities | <u>G</u> |
| 5. Sidewalks | <u>N</u> | 10. Expansion Joints or Devices | <u>G</u> |

REMARKS:

- a. Replacement of Asphalt Wearing Surface and Open Expansion Joint Header Material was completed in Spring 2020.
- b. Light poles at CNB108, 111, 120, 129, 153, 159, 162, 165, 186, 192, 195, 198, 222, 246, and 258 exhibited cracking or spalling at the baseplate, and the light pole at CNB131 has a loose anchor nut
- c. Damaged expansion joint plates in cable tray and misaligned cable tray plate at Bent CNB124
- d. Scattered minor transverse cracking and spalling in curbs, with exposed reinforcement at spans CNB82, 98, and 118
- e. Minor cracking, some exhibiting efflorescence on the underside of the deck in scattered spans



B-7 CNB

VDOT – BRIDGE INSPECTION REPORT

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59 SUPERSTRUCTURE

GENERAL CONDITION RATING [7]

| | | | |
|----------------------------------|----------|------------------------------|----------|
| 1. Bearing Devices | <u>F</u> | 4. Trusses | |
| 2. Stringers | <u>N</u> | A. General | <u>N</u> |
| 3. Girders, Beams, or Slab Spans | | B. Portals | <u>N</u> |
| A. General | <u>F</u> | C. Bracing | <u>N</u> |
| B. Diaphragms or Cross Frames | <u>G</u> | 5. Paint | <u>F</u> |
| C. Bracing | <u>N</u> | Year Painted | <u>N</u> |
| | | 6. Machinery (Moveable Span) | <u>N</u> |

REMARKS:

- a. Minor to moderate splitting of 13% of bearings pads inspected
- b. Some cracks and spalls on bottom flanges of some prestressed girders
- c. Deterioration or failure of some existing patches on concrete girders
- d. Some spalls on bottom flanges of some prestressed girders, and some existing spall repairs on girders are failing or have failed. The District is continuously performing girder repairs as weather conditions allow. Worse conditions observed do not exhibit more than one prestressing strand being exposed and degraded.
- e. Hairline diagonal web cracking on 26% of concrete girders inspected

60 SUBSTRUCTURE

GENERAL CONDITION RATING [7]

| | | | |
|---------------------|----------|-----------------------|----------|
| 1. Abutments | | 2. Pier/Bent | |
| A. Wings | <u>N</u> | A. Caps | - |
| B. Backwall | <u>G</u> | B. Piles | - |
| C. Bearing Seats | <u>G</u> | C. Column, Stem, Wall | - |
| D. Breastwall | <u>N</u> | D. Piles | - |
| E. Weepholes | <u>N</u> | E. Bracing | - |
| F. Footing | <u>G</u> | F. Erosion/Scour | - |
| G. Piles | * | G. Settlement | - |
| H. Erosion/Scour | <u>G</u> | 3. Pile Bent | |
| I. Settlement | <u>G</u> | A. Caps | <u>F</u> |
| *Not Visible | | B. Bearing Seats | <u>G</u> |
| | | C. Piles | <u>F</u> |
| | | D. Bracing | <u>N</u> |

REMARKS:

- a. Condition rating controlled by scour, see 61 Channel: Channel Slope/Protection.
- b. Some minor cracking and spalling on many of the piles above water
- c. Minor to moderate map cracking at ends of some bent cap beams
- d. Spall in grout at pile joint with rust staining and minor cracking with rust staining on CNB267 Pile C
- e. Large underwater spalls exposing spirals and post tensioning strands at Pile C of Bent CNB59 and Pile A of Bent CNB154, repaired in 2012 remain in Good condition
- f. Bent CNB20 Pile B and Bent CNB46 Pile C retrofitted with Cathodic Protection jackets and remain in good condition
- g. Defects noted during the Underwater Inspection include wide, narrow and hairline cracks, large spalls and moderate scaling. See Underwater Inspection Forms for additional details.



B-7 CNB

VDOT – BRIDGE INSPECTION REPORT

Page: 3 of 3

61 CHANNEL: CHANNEL/SLOPE PROTECTION

GENERAL CONDITION RATING

[7]

| | | | |
|------------------|----------|-----------------------|----------|
| 1. Channel Scour | <u>E</u> | 5. Fender System | - |
| 2. Embankment | - | 6. Spur Dikes/Jetties | - |
| Erosion | - | 7. Rip Rap/Slope | <u>G</u> |
| 3. Drift | - | Protection | |
| 4. Vegetation | - | 8. Adequacy of | <u>E</u> |
| | | Opening | |

REMARKS:

- a. Scour ratings govern over the condition ratings at approximately 37% of the bents
- b. Bay bottom elevation below Allowable Scour Depth (ASD) at 55 locations, and all have scour protection.
- c. Scour remediation present at approximately 50% of the pile bents.

66 POSTED LOADING

| | | | |
|---------------------|----------|---------------|----------|
| 1. Posted Loading - | | 2. Legibility | <u>N</u> |
| (R12 -1) | <u>N</u> | 3. Visibility | <u>N</u> |
| (R12 - 5) – Single | <u>N</u> | | |
| (R12 - 5) – Semi | <u>N</u> | | |

REMARKS:

- a. Load rating completed in 12/2018 in accordance with VDOT Instructional and Informational Memorandum 86.2: Load Rating and Posting of Structures (Bridges and Culverts) dated 11/16/2018.
- b. Structure load rating controlled by modular superstructure units with reduced capacity from having two-prestressing strands removed due to corrosion (worst-case observed during past inspections, not present this year).
- c. No posting of the structure is required.



4.6 Trestle CSB SI&A Forms

| | | |
|------------------------|--|--|
| B-6 CSB | VDOT – BRIDGE INSPECTION REPORT | Page: 1 of 1 |
| Structure-ID: | 1014 | Type: Regular Inspection |
| County/City: | Northampton | Date of Inspection: 9/16/21 |
| Structure: | _____(Co./Str.No) | Feature/Intersection: Chesapeake Bay |
| Main Route: | 13 | Facility/Carried: |
| Milepost: | 35.28 | Location: Over Chesapeake Bay |
| Lead Inspector: | Chris Williams | Additional Inspector(s): Todd Eckhart |

WORK DONE: Routine Maintenance.

REVISED DIMENSIONS: None

MISCELLANEOUS: No Encroachment Violations

CONDITION OF STRUCTURE: Good

1. Light poles at CSB55, 67, 73, 85, 99, & 101 exhibited cracking or spalling at the baseplate. Light poles at CSB85, 91, 93, & 103 have one anchor bolt that does not extend past the nut when the nut is fully engaged. The light pole at CSB93 has one bolt (same anchor bolt that does not extend past the nut) that is near the outer edge of the baseplate.
2. Portions of guardrail on Spans 26, 75, and 82 has minor impact damage on one section of railing.
3. Minor hairline cracking and minor map cracking on some of the above-water portions of piles and bent caps. Some minor spalls on a few piles.
4. Minor spalling with no exposed reinforcement (except at span 187), and minor cracking and efflorescence at scattered locations in underside of deck.
5. Large spalling or locations with exposed reinforcing or exposed strands at girder ends or in the lower portion of the continuity closure pours at 126 locations.
6. Minor horizontal cracking, some with efflorescence, in intermediate concrete girder diaphragms.
7. Scour generally stable indicated by bay bottom elevations, but several bents noted at or below acceptable scour depth (FY2018 Underwater Inspection Forms and 2019 Hydrographic Survey).

REVISED STRESS ANALYSIS:

- a. Load rating completed in 12/2018 in accordance with VDOT Instructional and Informational Memorandum 86.2: Load Rating and Posting of Structures (Bridges and Culverts) dated 11/16/2018.
- b. Structure load rating controlled by the simple span steel structures at Span CSB1.
- c. No posting of the structure is required.

RECOMMENDATIONS:

1. Continue periodic hydrographic surveys in interim between underwater inspections.
2. Replace top protective coating on steel girders at locations where coating has bubbled and exhibits freckled rust.
3. Monitor light poles exhibit cracking or delamination/spalling near the baseplate and replace if vertically oriented steel reinforcement becomes exposed and degraded.
4. Replace corroded and missing conduit brackets on bent cap faces with stainless steel.

SIGNATURE OF INSPECTOR



B-7 CSB

VDOT – BRIDGE INSPECTION REPORT

Page: 1 of 3

| | | | |
|------------------------|-------------------|---------------------------------|---------------------|
| Structure-ID: | 1014 | Type: | Regular Inspection |
| County/City: | Northampton | Date of Inspection: | 9/16/21 |
| Structure: | _____(Co./Str.No) | Feature/Intersection: | Chesapeake Bay |
| Main Route: | 13 | Facility/Carried: | |
| Milepost: | 35.28 | Location: | Over Chesapeake Bay |
| Lead Inspector: | Chris Williams | Additional Inspector(s): | Todd Eckhart |

SPECIAL CONDITIONS OR REQUIREMENTS

| | | | |
|----------------------|----------|------------------|---|
| 1. Fracture Critical | - | 5. Segmental | - |
| 2. Underwater | <u>X</u> | 6. Pin & Hanger | - |
| 3. Scour Critical | <u>X</u> | 7. Fatigue Prone | - |
| 4. Moveable | - | | |

36 TRAFFIC SAFETY FEATURES

| | | | |
|-------------------|----------|-----------------------|----------|
| 1. Bridge Railing | <u>1</u> | 3. Approach | <u>1</u> |
| 2. Transition | <u>1</u> | 4. Approach Guardrail | <u>1</u> |

REMARKS:

58 DECK

GENERAL CONDITION RATING

[8]

| | | | |
|----------------------|----------|------------------------------------|----------|
| 1. Wearing Surface | <u>G</u> | 6. Railing | <u>G</u> |
| 2. Deck – Structural | <u>G</u> | 7. Drains | <u>N</u> |
| 3. Curbs | <u>G</u> | 8. Lighting | <u>G</u> |
| 4. Median | <u>N</u> | 9. Utilities | <u>G</u> |
| 5. Sidewalks | <u>N</u> | 10. Expansion Joints or Devices | <u>F</u> |

REMARKS:

- a. Replacement of Asphalt Wearing Surface, Open Expansion Joint Header Material was completed in Fall 2019
- b. Minor spalling with no exposed reinforcement (except at span 187), and minor cracking and efflorescence at scattered locations in underside of deck
- c. Scattered minor transverse cracking and spalling or failed repairs in curbs, with exposed reinforcement at spans 54, 88, 100, 105, 108, 116, 119, 121, 122, 130, 131, 134, 135, 138, 140, 141, 142, 145, 146(2), 150, 151, 156, 169, and 170.
- d. Adjust bridge railing baseplate on underside of deck on Spans CSB 98 near midspan on the East side and 170 near midspan on the West side such that both bolts are connected instead of only one as is the current condition.



B-7 CSB

VDOT – BRIDGE INSPECTION REPORT

Page: 2 of 3

59 SUPERSTRUCTURE

GENERAL CONDITION RATING

[7]

| | | | |
|----------------------------------|----------|------------------------------|----------|
| 1. Bearing Devices | <u>G</u> | 4. Trusses | |
| 2. Stringers | <u>N</u> | A. General | <u>N</u> |
| 3. Girders, Beams, or Slab Spans | | B. Portals | <u>N</u> |
| A. General | <u>G</u> | C. Bracing | <u>N</u> |
| B. Diaphragms or Cross Frames | <u>G</u> | 5. Paint | <u>N</u> |
| C. Bracing | <u>N</u> | Year Painted | <u>N</u> |
| | | 6. Machinery (Moveable Span) | <u>N</u> |

REMARKS:

- a. Minor girder spalling with exposed reinforcement at 81 locations, 75 locations are at girder ends or in the lower portion of the continuity closure pours.
- b. Minor spalling with no exposed reinforcement (except at span 187), and minor cracking and efflorescence at scattered locations in underside of deck.
- c. Minor cracking and spalling in concrete girder diaphragms.
- d. Freckled rust and coating failure typical at the flanges and connections from near mid-span to Portal Island #4 due to being in the splash zone of breaking waves.

60 SUBSTRUCTURE

GENERAL CONDITION RATING

[7]

| | | | |
|---------------------|----------|-----------------------|----------|
| 1. Abutments | | 2. Pier/Bent | |
| A. Wings | <u>G</u> | A. Caps | – |
| B. Backwall | <u>G</u> | B. Piles | – |
| C. Bearing Seats | <u>G</u> | C. Column, Stem, Wall | – |
| D. Breastwall | <u>N</u> | D. Piles | – |
| E. Weepholes | <u>N</u> | E. Bracing | – |
| F. Footing | <u>G</u> | F. Erosion/Scour | – |
| G. Piles | * | G. Settlement | – |
| H. Erosion/Scour | <u>G</u> | 3. Pile Bent | |
| I. Settlement | <u>G</u> | A. Caps | <u>G</u> |
| *Not Visible | | B. Bearing Seats | <u>G</u> |
| | | C. Piles | <u>G</u> |
| | | D. Bracing | <u>N</u> |

REMARKS:

- a. Underwater Inspection performed 6/2017 – 10/2017. See FY2018 Underwater Inspection Forms for location of underwater defects and Element Level Inspection Forms for condition ratings of substructure units
- b. Minor hairline cracking and minor map cracking on some of the above-water portions of piles and bent caps, a few piles with minor efflorescence
- c. Minor shallow spalls noted on a few piles, some with exposed reinforcing



B-7 CSB

VDOT – BRIDGE INSPECTION REPORT

Page: 3 of 3

61 CHANNEL: CHANNEL/SLOPE PROTECTION

GENERAL CONDITION RATING

[8]

| | | | |
|------------------|----------|-----------------------|----------|
| 1. Channel Scour | <u>E</u> | 5. Fender System | – |
| 2. Embankment | – | 6. Spur Dikes/Jetties | – |
| Erosion | – | 7. Rip Rap/Slope | <u>G</u> |
| 3. Drift | – | Protection | |
| 4. Vegetation | – | 8. Adequacy of | <u>E</u> |
| | | Opening | |

REMARKS:

- a. Some bents have scour below the acceptable scour depth but are relatively stable and only require monitoring. See FY2018 Bay Bottom Profiles and 2019 Hydrographic Survey for further information

66 POSTED LOADING

| | | | |
|---------------------|----------|---------------|----------|
| 1. Posted Loading - | | 2. Legibility | <u>N</u> |
| (R12 -1) | <u>N</u> | 3. Visibility | <u>N</u> |
| (R12 - 5) – Single | <u>N</u> | | |
| (R12 - 5) – Semi | <u>N</u> | | |

REMARKS

- a. Load rating completed in 12/2018 in accordance with VDOT Instructional and Informational Memorandum 86.2: Load Rating and Posting of Structures (Bridges and Culverts) dated 11/16/2018.
- b. Structure load rating controlled by the simple span steel structures at Span CSB1.
- c. No posting of the structure is required.



4.7 NCB-NB SI&A Forms

| | | | |
|------------------------|--|---------------------------------|--|
| B-6 NCB-NB | VDOT – BRIDGE INSPECTION REPORT | | Page: 1 of 2 |
| Structure-ID: | 1006 | Type: | Regular & Fracture Critical Inspection |
| County/City: | Northampton | Date of Inspection: | 9/18/21, 9/20-9/24/21 |
| Structure: | _____ (Co./Str.No) | Feature/Intersection: | Chesapeake Bay |
| Main Route: | 13 | Facility/Carried: | |
| Milepost: | 34.51 | Location: | Over Chesapeake Bay |
| Lead Inspector: | Chris Williams | Additional Inspector(s): | Todd Eckhart |

WORK DONE: Routine Maintenance. Underwater Inspection performed 6/21 – 9/27/21.

CONDITION OF STRUCTURE: Generally Good

1. Steel bridge components received overcoat painting in 2012/2013.
2. Concrete deck has scattered transverse hairline cracks.
3. Isolated scattered areas of peeling overcoat paint system.
4. Existing cracks in steel floorbeam webs at stiffener locations over the girders.
5. Section loss at random floorbeam web stiffeners over the longitudinal girders.
6. Scattered areas of minor rust.
7. Deteriorated bolts and rivets replaced.
8. Pack rust and crevice corrosion mostly sealed between multiple cover plates at isolated areas along top and bottom girder flanges and at corners of lower chord in Span 9.
9. Minor isolated rust in scattered upper and lower truss joints.
10. Miscellaneous minor spalls and cracks in the piers.
11. Minor cracking and light to moderate scaling in splash zone on some piers.
12. For the underwater portion of the piers, see the 2021 UWI Report.
13. Scouring of the bay bottom appears stable based on the latest hydrographic survey information provided by the District (August 2018, more recent surveys from 2019 are currently being processed) and 2021 UWI Report.
14. Bay bottom at each pier is typically protected by a riprap blanket.
15. Fender system at Piers 9 and 10 replaced in 2013 and noted in good condition.

REVISED STRESS ANALYSIS:

1. Load rating completed in 12/2018 in accordance with VDOT Instructional and Informational Memorandum 86.2: Load Rating and Posting of Structures (Bridges and Culverts) dated 11/16/2018.
2. Structure load rating controlled by Unit NCBA1 – 4-Span Steel Approach Girders, NCBA2 – Steel Floorbeams (on Approach), and NCBT4 – Truss Gusset Plates.
3. No posting of the structure is required.

RECOMMENDATIONS:

1. Annually clean debris from interior of lower chords at panel points.
2. Seal transverse cracks in the concrete deck.
3. Monitor coating placed on interior of lower chords at Panel Points LO and LO'.
4. Monitor rusting welds at some hanger connections for lateral bracing.
5. Monitor floorbeam web cracks.
6. Repair floorbeam web stiffeners with section loss.
7. Monitor scattered minor to moderate corrosion of bolted girder splice connections.
8. Monitor section loss on stringer and floorbeam details at L3 and L3' in Span 9.
9. Monitor any pack rust and crevice corrosion between top and bottom flange cover plates and at corners of lower chord truss members.



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VDOT – BRIDGE INSPECTION REPORT

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10. Monitor minor rust inside scattered upper and lower chord truss joints.
11. Seal minor cracks in all pier tops extending from bearing grout pads.
12. Monitor stringer-to-floorbeam connection for pack rust development and corrosion of connection hardware.
13. Seal cracks in splash zone at Piers 1, 2, 3, 7, 8, 11, 12, 13 and 14 and cover with Fiber Reinforced Polymer (FRP) wrap.
14. Repair paint system at scattered location where overcoat is peeling.
15. Repair areas of section loss on truss diagonals and verticals.

SIGNATURE OF INSPECTOR



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VDOT – BRIDGE INSPECTION REPORT

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| | | | |
|------------------------|-------------------|---------------------------------|-------------------------|
| Structure-ID: | 1006 | Type: | Regular Inspection |
| County/City: | Northampton | Date of Inspection: | 9/18/21, 9/20 – 9/24/21 |
| Structure: | _____(Co./Str.No) | Feature/Intersection: | Chesapeake Bay |
| Main Route: | 13 | Facility/Carried: | |
| Milepost: | 34.51 | Location: | Over Chesapeake Bay |
| Lead Inspector: | Chris Williams | Additional Inspector(s): | Todd Eckhart |

SPECIAL CONDITIONS OR REQUIREMENTS

| | | | |
|----------------------|----------|------------------|---|
| 1. Fracture Critical | <u>X</u> | 5. Segmental | - |
| 2. Underwater | - | 6. Pin & Hanger | - |
| 3. Scour Critical | <u>X</u> | 7. Fatigue Prone | - |
| 4. Moveable | - | | |

36 TRAFFIC SAFETY FEATURES

| | | | |
|-------------------|----------|-----------------------|----------|
| 1. Bridge Railing | <u>1</u> | 3. Approach | <u>1</u> |
| 2. Transition | <u>N</u> | 4. Approach Guardrail | <u>N</u> |

REMARKS:

58 DECK

GENERAL CONDITION RATING

[8]

| | | | |
|----------------------|----------|------------------------------------|----------|
| 1. Wearing Surface | <u>N</u> | 6. Railing | <u>G</u> |
| 2. Deck – Structural | <u>G</u> | 7. Drains | <u>N</u> |
| 3. Curbs | <u>G</u> | 8. Lighting | <u>G</u> |
| 4. Median | <u>N</u> | 9. Utilities | <u>G</u> |
| 5. Sidewalks | <u>N</u> | 10. Expansion Joints or Devices | <u>G</u> |

REMARKS:

- a. Deck replaced in 1998 as part of the Parallel Crossing Project
- b. Scattered transverse hairline cracks, which require sealing
- c. 2005 repair adjacent to joint at Panel Point 3 in Span 9 remains sound
- d. Replace loose guardrail nut at Span 3 Floorbeam 10 east side



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VDOT – BRIDGE INSPECTION REPORT

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59 SUPERSTRUCTURE

GENERAL CONDITION RATING

[7]

| | | | |
|----------------------------------|----------|------------------------------|-------------|
| 1. Bearing Devices | <u>G</u> | 4. Trusses | |
| 2. Stringers | <u>G</u> | A. General | <u>F</u> |
| 3. Girders, Beams, or Slab Spans | | B. Portals | <u>G</u> |
| A. General | <u>F</u> | C. Bracing | <u>G</u> |
| B. Diaphragms or Cross Frames | <u>G</u> | 5. Paint | <u>G</u> |
| C. Bracing | <u>F</u> | Year Painted | <u>2013</u> |
| | | 6. Machinery (Moveable Span) | <u>N</u> |

REMARKS:

- a. Steel bridge components received overcoat painting in 2012/2013
- b. Newer repaired lateral bracing hanger connections in good condition, a few others with scattered rust
- c. Pack rust and crevice corrosion mostly sealed between multiple cover plates at isolated areas along top and bottom girder flanges and at corners of lower chord in Span 9, but some bleed-thru emerging
- d. Deteriorated bolts and rivets replaced, some scattered rust on those not replaced
- e. Existing web cracks in floorbeams over girders
- f. Minor isolated rust in scattered upper and lower truss joints
- g. Isolated areas of scattered minor rust on various members
- h. Section loss at some floorbeam stiffeners over the longitudinal girders
- i. Scattered section loss on floorbeam, stringer seats and associated details at L3 and L3' in truss span. Previous repairs in good condition
- j. Isolated section loss on truss diagonals and verticals

60 SUBSTRUCTURE

GENERAL CONDITION RATING

[7]

| | | | |
|---------------------|----------|-----------------------|----------|
| 1. Abutments | | 2. Pier/Bent | |
| A. Wings | <u>N</u> | A. Caps | <u>G</u> |
| B. Backwall | <u>N</u> | B. Piles | - |
| C. Bearing Seats | <u>N</u> | C. Column, Stem, Wall | <u>G</u> |
| D. Breastwall | <u>N</u> | D. Piles | * |
| E. Weepholes | <u>N</u> | E. Bracing | <u>G</u> |
| F. Footing | <u>N</u> | F. Erosion/Scour | <u>F</u> |
| G. Piles | <u>N</u> | G. Settlement | <u>G</u> |
| H. Erosion/Scour | <u>N</u> | 3. Pile Bent | |
| I. Settlement | <u>N</u> | A. Caps | <u>N</u> |
| *Not Visible | | B. Bearing Seats | <u>N</u> |
| | | C. Piles | <u>N</u> |
| | | D. Bracing | <u>N</u> |

REMARKS:

- a. Miscellaneous minor spalls and cracks in the piers
- b. Seal cracks in splash zones at Piers 1, 2, 3, 7, 8, 11, 12, 13 and 14. with carbon fiber sheets
- c. Repair cracks in tops of pier columns
- d. For the underwater portions of the piers, see the 2021 Underwater Inspection Report



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VDOT – BRIDGE INSPECTION REPORT

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61 CHANNEL: CHANNEL/SLOPE PROTECTION

GENERAL CONDITION RATING

[8]

| | | | |
|-----------------------|----------|-----------------------------|----------|
| 1. Channel Scour | <u>G</u> | 5. Fender System | <u>F</u> |
| 2. Embankment Erosion | - | 6. Spur Dikes/Jetties | - |
| 3. Drift | - | 7. Rip Rap/Slope Protection | <u>G</u> |
| 4. Vegetation | - | 8. Adequacy of Opening | <u>F</u> |

REMARKS:

- a. Scouring of the bay bottom appears stable based on the latest hydrographic survey information provided by the District (Aug.2018, and recent surveys from 2019 are currently being processed) and 2021 Underwater Inspection
- b. Bay bottom at each pier is typically protected by a riprap blanket
- c. Fender systems at Piers 9 and 10 replaced in 2013 and in good condition

66 POSTED LOADING

| | | | |
|------------------------------|----------|---------------|----------|
| 1. Posted Loading - (R12 -1) | <u>N</u> | 2. Legibility | <u>N</u> |
| (R12 - 5) – Single | <u>N</u> | 3. Visibility | <u>N</u> |
| (R12 - 5) – Semi | <u>N</u> | | |

REMARKS

- a. Load rating completed in 12/2018 in accordance with VDOT Instructional and Informational Memorandum 86.2: Load Rating and Posting of Structures (Bridges and Culverts) dated 11/16/2018.
- b. Structure load rating controlled by Unit NCBA1 – 4-Span Steel Approach Girders, NCBA2 – Steel Floorbeams (on Approach), and NCBT4 – Truss Gusset Plates.
- c. No posting of the structure is required.



4.8 NCB-SB SI&A Forms

| | | | |
|------------------------|--|---------------------------------|---------------------|
| B-6 NCB-SB | VDOT – BRIDGE INSPECTION REPORT | | Page: 1 of 1 |
| Structure-ID: | 1015 | Type: | Regular Inspection |
| County/City: | Northampton | Date of Inspection: | 9/14/20 |
| Structure: | _____ (Co./Str.No) | Feature/Intersection: | Chesapeake Bay |
| Main Route: | 13 | Facility/Carried: | |
| Milepost: | 34.69 | Location: | Over Chesapeake Bay |
| Lead Inspector: | John Gaul | Additional Inspector(s): | Jake Landis |

WORK DONE: Routine Maintenance. Replacement of Steel Sliding Plate Expansion Joints with Steel Tooth Expansion Joints completed in Fall 2020. Damaged Pier 9 Fender System repairs completed in July 2021.

REVISED DIMENSIONS: None

MISCELLANEOUS: No Encroachment Violations

CONDITION OF STRUCTURE: Generally Good

1. Steel Tooth Expansion Joint at Pier 1 opening was off by about 1/4" from the east side (2 1/2") to the west side (2 1/4"). The weather was cloudy at the time of measurement (9/14/2020 at 5:07pm) with an ambient air temperature around 76°F with the steel girders and concrete girders measuring at 77°F and 78°F, respectively. The opening dimension for these conditions should have been 2 1/16" according to construction documents.
2. Steel Tooth Expansion Joint at Pier 15 opening was off by about 1/4" from the east side (2 13/16") to the west side (1 7/8"). The weather was cloudy at the time of measurement (9/14/2020 at 1:12pm) with an ambient air temperature around 77°F with the steel girders and concrete girders measuring at 79°F and 80°F, respectively. The opening dimension for these conditions should have been 2 1/16" according to construction documents.
3. Rust around perimeter of some bearing base plates.
4. Isolated minor rust spots on crossframes, diaphragms, and lower lateral bracing members.
5. Minor rust on scattered nuts and bolts of longitudinal girder splices and of crossframe, diaphragm and lower lateral bracing connections.
6. Scattered minor rust on ladder systems at Piers NCB-SB9 and NCB-SB10. Minor rusting of bolts anchoring ladder systems to piers.
7. Minor cracking on some of the pier caps. Repairs to pile cap (footing) completed in fall of 2015 to NCB-SB9 appear satisfactory with minor cracking of the repair material.
8. Minor transverse cracks scattered in concrete deck, mostly hairline, but some noted as narrow.
9. Failing patch in bridge deck surface in Span NCB-SB8.
10. 2019 Hydrographic Survey and the 2019 Underwater Inspection indicates bay bottom was below ASD at Pier NCB-SB13. Bay bottom is stable due to scour blanket in place as indicated in the 2009, 2014, and 2019 Underwater Inspections.
11. No significant defects noted on the underwater portions of the piles in the FY2020 Underwater Inspection Forms.

REVISED STRESS ANALYSIS:

1. Load rating completed in 12/2018 in accordance with VDOT Instructional and Informational Memorandum 86.2: Load Rating and Posting of Structures (Bridges and Culverts) dated 11/16/2018.
2. No posting of the structure is required.



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VDOT – BRIDGE INSPECTION REPORT

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RECOMMENDATIONS:

1. Monitor Steel Tooth Expansion Joints on extremely cold days when temperatures are expected to remain near or below 25°F for several hours to observe if decreased tooth (finger) overlap has created an unsafe condition for the travelling public or snowplow equipment. At 25°F the tooth overlap is anticipated to be below the 1.5" requirement specified in the AASHTO LRFD Bridge Design Specifications.
2. Continue periodic hydrographic surveys in interim between underwater inspections scheduled every 5 years. Perform an engineering analysis on all piles with a Condition State Rating Below 4 due to Scour.
3. Replace top protective coating on steel girders at locations where zinc primer is exposed or coating has bubbled and exhibits freckled rust.

SIGNATURE OF INSPECTOR



B-7 NCB-SB

VDOT – BRIDGE INSPECTION REPORT

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| | | | |
|------------------------|--------------------|---------------------------------|---------------------|
| Structure-ID: | 1015 | Type: | Regular Inspection |
| County/City: | Northampton | Date of Inspection: | 9/14/20 |
| Structure: | _____ (Co./Str.No) | Feature/Intersection: | Chesapeake Bay |
| Main Route: | 13 | Facility/Carried: | |
| Milepost: | 34.69 | Location: | Over Chesapeake Bay |
| Lead Inspector: | John Gaul | Additional Inspector(s): | Jake Landis |

SPECIAL CONDITIONS OR REQUIREMENTS

| | | | |
|----------------------|----------|------------------|---|
| 1. Fracture Critical | - | 5. Segmental | - |
| 2. Underwater | <u>X</u> | 6. Pin & Hanger | - |
| 3. Scour Critical | <u>X</u> | 7. Fatigue Prone | - |
| 4. Moveable | - | | |

36 TRAFFIC SAFETY FEATURES

| | | | |
|-------------------|----------|-----------------------|----------|
| 1. Bridge Railing | <u>1</u> | 3. Approach | <u>1</u> |
| 2. Transition | <u>N</u> | 4. Approach Guardrail | <u>N</u> |

REMARKS:

58 DECK GENERAL CONDITION RATING [8]

| | | | |
|----------------------|----------|------------------------------------|----------|
| 1. Wearing Surface | <u>N</u> | 6. Railing | <u>G</u> |
| 2. Deck – Structural | <u>G</u> | 7. Drains | <u>N</u> |
| 3. Curbs | <u>G</u> | 8. Lighting | <u>G</u> |
| 4. Median | <u>N</u> | 9. Utilities | <u>G</u> |
| 5. Sidewalks | <u>N</u> | 10. Expansion Joints or Devices | <u>G</u> |

REMARKS:

- a. Monitor Steel Tooth Expansion Joints on extremely cold days (temperatures approaching 25°F) to observe if decreased tooth (finger) overlap has created an unsafe condition for the travelling public or snowplow equipment. At 25°F the tooth overlap is anticipated to be below the 1.5" requirement specified in the AASHTO LRFD Bridge Design Specifications.
- b. Minor transverse hairline cracks in deck surface, with a few cracks up to 1/8"
- c. Curb and railing are generally in good condition
- d. Minor failing patch in deck surface of NCB-SB8



B-7 NCB-SB

VDOT – BRIDGE INSPECTION REPORT

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59 SUPERSTRUCTURE

GENERAL CONDITION RATING [7]

| | | | |
|----------------------------------|----------|------------------------------|-------------|
| 1. Bearing Devices | <u>G</u> | 4. Trusses | |
| 2. Stringers | - | A. General | - |
| 3. Girders, Beams, or Slab Spans | | B. Portals | - |
| A. General | <u>G</u> | C. Bracing | - |
| B. Diaphragms or Cross Frames | <u>G</u> | 5. Paint | <u>G</u> |
| C. Bracing | <u>G</u> | Year Painted | 2014 |
| | | 6. Machinery (Moveable Span) | - |

REMARKS:

- a. No significant structural defects noted and minor section loss at areas exhibiting corrosion
- b. Minor rust on scattered nuts and bolts of longitudinal girder splices and also of crossframe, diaphragm and lower lateral bracing connections
- c. Minor rusting areas at bottom of bearings base plates and surface rust on bearing web plates
- d. Lubricate bearings as required
- e. Replace top protective coating on steel girders at locations where zinc primer is exposed or coating has bubbled and exhibits freckled rust
- f. Span 4 Bay 2 Cross Frame 4 Intermediate Crossframe Lower Member Distorted with surface rust, no action required

60 SUBSTRUCTURE

GENERAL CONDITION RATING [7]

| | | | |
|---------------------|----------|-----------------------|----------|
| 1. Abutments | | 2. Pier/Bent | |
| A. Wings | <u>N</u> | A. Caps | <u>G</u> |
| B. Backwall | <u>N</u> | B. Piles | - |
| C. Bearing Seats | <u>N</u> | C. Column, Stem, Wall | <u>G</u> |
| D. Breastwall | <u>N</u> | D. Piles | - |
| E. Weepholes | <u>N</u> | E. Bracing | - |
| F. Footing | <u>N</u> | F. Erosion/Scour | <u>F</u> |
| G. Piles | <u>N</u> | G. Settlement | - |
| H. Erosion/Scour | <u>N</u> | 3. Pile Bent | |
| I. Settlement | <u>N</u> | A. Caps | - |
| *Not Visible | | B. Bearing Seats | - |
| | | C. Piles | - |
| | | D. Bracing | - |

REMARKS:

- a. Minor cracks in some columns and pier caps
- b. Minor cracks in the backwall of pier caps at NCB-SB8 and NCB-SB11
- c. The 2019 Underwater Inspection revealed minor structural defects.
- d. Scattered minor rust on ladder systems at Piers NCB-SB9 and NCB-SB10. Minor rusting of bolts anchoring ladder systems to piers.



B-7 NCB-SB

VDOT – BRIDGE INSPECTION REPORT

Page: 3 of 3

61 CHANNEL: CHANNEL/SLOPE PROTECTION

GENERAL CONDITION RATING

[7]

| | | | |
|-----------------------|----------|-----------------------------|----------|
| 1. Channel Scour | <u>E</u> | 5. Fender System | <u>G</u> |
| 2. Embankment Erosion | - | 6. Spur Dikes/Jetties | - |
| 3. Drift | - | 7. Rip Rap/Slope Protection | - |
| 4. Vegetation | - | 8. Adequacy of Opening | <u>E</u> |

REMARKS:

- a. Northwest portion of Pier 9 Fender System was impacted by a barge on 9/3/20. Damage Inspection identified extents of damage limited to the fender system and repairs are anticipated in the near future. Findings of the Damage Inspection were submitted to the District on 9/10/20.
- b. 2019 Hydrographic Survey and the 2019 Underwater Inspection indicates bay bottom was below ASD at Pier NCB-SB13. Bay bottom is stable due to scour blanket in place as indicated in the 2009, 2014, and 2019 Underwater Inspections.
- c. Repairs to fender system completed in fall 2015 at NCB-SB9 resulting from boat impact noted in good condition
- d. Repairs to pile cap (footing) completed in fall of 2015 to NCB-SB9 appear satisfactory with minor cracking of the repair material

66 POSTED LOADING

| | | | |
|---------------------|----------|---------------|----------|
| 1. Posted Loading - | | 2. Legibility | <u>N</u> |
| (R12 -1) | <u>N</u> | 3. Visibility | <u>N</u> |
| (R12 - 5) – Single | <u>N</u> | | |
| (R12 - 5) – Semi | <u>N</u> | | |

REMARKS

- a. Load rating completed in 12/2018 in accordance with VDOT Instructional and Informational Memorandum 86.2: Load Rating and Posting of Structures (Bridges and Culverts) dated 11/16/2018.
- b. No posting of the structure is required.



4.9 Trestle DNB SI&A Forms

| | | | |
|------------------------|--|---------------------------------|---------------------|
| B-6 DNB | VDOT – BRIDGE INSPECTION REPORT | | Page: 1 of 1 |
| Structure-ID: | 1008 | Type: | Regular Inspection |
| County/City: | Northampton | Date of Inspection: | 9/10/20 |
| Structure: | _____ (Co./Str.No) | Feature/Intersection: | Chesapeake Bay |
| Main Route: | 13 | Facility/Carried: | |
| Milepost: | 34.25 | Location: | Over Chesapeake Bay |
| Lead Inspector: | John Gaul | Additional Inspector(s): | Jake Landis |

WORK DONE: Routine Maintenance. Underwater Inspection performed 8/3/21.

REVISED DIMENSIONS: None

MISCELLANEOUS: No Encroachment Violations

CONDITION OF STRUCTURE: Generally Good

1. The 2021 Underwater Inspection Report revealed only light to moderate scaling and no other apparent defects.
2. Minor cracking on many of the piles and a few of the bent caps.
3. Spalls with exposed reinforcing noted near the tops of a few piles.
4. Some spalls on bottom flanges of some prestressed girders and some deteriorating patches.
5. Girder spall repairs with new method are in good condition.
6. Hairline diagonal web cracking on the concrete girders noted at scattered locations.
7. Minor to moderate defects on several of the elastomeric bearings.
8. Roadway striping replaced in 2018.
9. Bay bottom depths noted in the 2021 Underwater Inspection Report are well above the acceptable scour depth.

REVISED STRESS ANALYSIS:

1. Load rating completed in 12/2018 in accordance with VDOT Instructional and Informational Memorandum 86.2: Load Rating and Posting of Structures (Bridges and Culverts) dated 11/16/2018.
2. Structure load rating controlled by modular superstructure units with reduced capacity from having two-prestressing strands removed due to corrosion (worst-case observed during inspection).
3. No posting of the structure is required.

RECOMMENDATIONS:

1. Patch any spalls that occur on prestressed concrete girders.
2. Patch spalls on cylinder piles.
3. Future inspections and hydrographic surveys should monitor for active scouring.

SIGNATURE OF INSPECTOR



B-7 DNB

VDOT – BRIDGE INSPECTION REPORT

Page: 1 of 3

| | | | |
|------------------------|-------------------|---------------------------------|---------------------|
| Structure-ID: | 1008 | Type: | Regular Inspection |
| County/City: | Northampton | Date of Inspection: | 9/10/20 |
| Structure: | _____(Co./Str.No) | Feature/Intersection: | Chesapeake Bay |
| Main Route: | 13 | Facility/Carried: | |
| Milepost: | 34.25 | Location: | Over Chesapeake Bay |
| Lead Inspector: | John Gaul | Additional Inspector(s): | Jake Landis |

SPECIAL CONDITIONS OR REQUIREMENTS

| | | | |
|----------------------|----------|------------------|---|
| 1. Fracture Critical | - | 5. Segmental | - |
| 2. Underwater | <u>X</u> | 6. Pin & Hanger | - |
| 3. Scour Critical | <u>X</u> | 7. Fatigue Prone | - |
| 4. Moveable | - | | |

36 TRAFFIC SAFETY FEATURES

| | | | |
|-------------------|----------|-----------------------|----------|
| 1. Bridge Railing | <u>1</u> | 3. Approach | <u>1</u> |
| 2. Transition | <u>1</u> | 4. Approach Guardrail | <u>1</u> |

REMARKS:

58 DECK

GENERAL CONDITION RATING [7]

| | | | |
|----------------------|----------|------------------------------------|----------|
| 1. Wearing Surface | <u>G</u> | 6. Railing | <u>G</u> |
| 2. Deck – Structural | <u>G</u> | 7. Drains | <u>N</u> |
| 3. Curbs | <u>G</u> | 8. Lighting | <u>G</u> |
| 4. Median | <u>N</u> | 9. Utilities | <u>G</u> |
| 5. Sidewalks | <u>N</u> | 10. Expansion Joints or Devices | <u>G</u> |

REMARKS:

- a. Top of roadway deck and components in good condition with limited minor impact damage to railings noted
- b. No significant defects noted in underside of deck in spans 1 thru 18



B-7 DNB

VDOT – BRIDGE INSPECTION REPORT

Page: 2 of 3

59 SUPERSTRUCTURE

GENERAL CONDITION RATING [7]

| | | | |
|----------------------------------|----------|------------------------------|----------|
| 1. Bearing Devices | <u>F</u> | 4. Trusses | |
| 2. Stringers | <u>N</u> | A. General | <u>N</u> |
| 3. Girders, Beams, or Slab Spans | | B. Portals | <u>N</u> |
| A. General | <u>F</u> | C. Bracing | <u>N</u> |
| B. Diaphragms or Cross Frames | <u>G</u> | 5. Paint | <u>N</u> |
| C. Bracing | <u>N</u> | Year Painted | <u>N</u> |
| | | 6. Machinery (Moveable Span) | <u>N</u> |

REMARKS:

- a. Minor splitting of isolated bearing pads, and bulging of bearing pad at DNB1 G1 greater than 15% of the bearing thickness
- b. Some cracks and spalls on bottom flanges of some prestressed girders and some deteriorating patches
- c. Hairline diagonal web cracking on the concrete girders noted at scattered locations

60 SUBSTRUCTURE

GENERAL CONDITION RATING [7]

| | | | |
|------------------|----------|-----------------------|----------|
| 1. Abutments | | 2. Pier/Bent | |
| A. Wings | <u>G</u> | A. Caps | - |
| B. Backwall | <u>G</u> | B. Piles | - |
| C. Bearing Seats | <u>G</u> | C. Column, Stem, Wall | - |
| D. Breastwall | <u>N</u> | D. Piles | - |
| E. Weepholes | <u>N</u> | E. Bracing | - |
| F. Footing | <u>G</u> | F. Erosion/Scour | - |
| G. Piles | * | G. Settlement | - |
| H. Erosion/Scour | <u>G</u> | 3. Pile Bent | |
| I. Settlement | <u>G</u> | A. Caps | <u>G</u> |
| *Not Visible | | B. Bearing Seats | <u>G</u> |
| | | C. Piles | <u>F</u> |
| | | D. Bracing | <u>N</u> |

REMARKS:

- a. The 2021 Underwater Inspection revealed only some light to moderate scaling and a shallow failed repair and spall
- b. Minor cracking on many of the piles and a few bent caps above water
- c. Spalls with exposed reinforcing noted near the tops of a few piles



B-7 DNB

VDOT – BRIDGE INSPECTION REPORT

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61 CHANNEL: CHANNEL/SLOPE PROTECTION

GENERAL CONDITION RATING

[8]

| | | | |
|------------------|----------|-----------------------|----------|
| 1. Channel Scour | <u>G</u> | 5. Fender System | - |
| 2. Embankment | - | 6. Spur Dikes/Jetties | - |
| Erosion | - | 7. Rip Rap/Slope | <u>G</u> |
| 3. Drift | - | Protection | |
| 4. Vegetation | - | 8. Adequacy of | <u>E</u> |
| | | Opening | |

REMARKS:

- a. Bay bottom depths noted in the 2021 Underwater Inspection Report are well above the acceptable scour depth

66 POSTED LOADING

| | | | |
|---------------------|----------|---------------|----------|
| 1. Posted Loading - | | 2. Legibility | <u>N</u> |
| (R12 -1) | <u>N</u> | 3. Visibility | <u>N</u> |
| (R12 - 5) – Single | <u>N</u> | | |
| (R12 - 5) – Semi | <u>N</u> | | |

REMARKS

- a. Load rating completed in 12/2018 in accordance with VDOT Instructional and Informational Memorandum 86.2: Load Rating and Posting of Structures (Bridges and Culverts) dated 11/16/2018.
- b. Structure load rating controlled by modular superstructure units with reduced capacity from having two-prestressing strands removed due to corrosion (worst-case observed during past inspections, not present this year).
- c. No posting of the structure is required.



4.10 Trestle DSB SI&A Forms

| | | | |
|------------------------|--|---------------------------------|---------------------|
| B-6 DSB | VDOT – BRIDGE INSPECTION REPORT | | Page: 1 of 1 |
| Structure-ID: | 1016 | Type: | Regular Inspection |
| County/City: | Northampton | Date of Inspection: | 9/11 & 9/14/20 |
| Structure: | _____ (Co./Str.No) | Feature/Intersection: | Chesapeake Bay |
| Main Route: | 13 | Facility/Carried: | |
| Milepost: | 34.29 | Location: | Over Chesapeake Bay |
| Lead Inspector: | John Gaul | Additional Inspector(s): | Jake Landis |

WORK DONE: Routine Maintenance and Roadway Striping Replaced in Spring 2020.

REVISED DIMENSIONS: None

MISCELLANEOUS: No Encroachment Violations

CONDITION OF STRUCTURE: Generally Good

1. Scour remediation was performed at Bent DSB1 in 2002.
2. Minor hairline cracks in many piles above water/land and some bent caps.
3. Widespread map cracking (hairline to narrow) of concrete deck surface in Spans DSB13, DSB14, DSB17 and DSB18.
4. The 2019 Underwater Inspection revealed only a few hairline cracks and a few minor shallow spalls on some of the piles.

REVISED STRESS ANALYSIS:

1. Load rating completed in 12/2018 in accordance with VDOT Instructional and Informational Memorandum 86.2: Load Rating and Posting of Structures (Bridges and Culverts) dated 11/16/2018.
2. No posting of the structure is required.

RECOMMENDATIONS:

1. Continue periodic hydrographic surveys in interim between underwater inspections scheduled every 5 years.
2. Seal piles exhibiting degradation with carbon fiber sheets.

SIGNATURE OF INSPECTOR



B-7 DSB

VDOT – BRIDGE INSPECTION REPORT

Page: 1 of 3

| | | | |
|------------------------|--------------------|---------------------------------|---------------------|
| Structure-ID: | 1016 | Type: | Regular Inspection |
| County/City: | Northampton | Date of Inspection: | 9/11 & 9/14/20 |
| Structure: | _____ (Co./Str.No) | Feature/Intersection: | Chesapeake Bay |
| Main Route: | 13 | Facility/Carried: | |
| Milepost: | 34.29 | Location: | Over Chesapeake Bay |
| Lead Inspector: | John Gaul | Additional Inspector(s): | Jake Landis |

SPECIAL CONDITIONS OR REQUIREMENTS

| | | | |
|----------------------|----------|------------------|---|
| 1. Fracture Critical | - | 5. Segmental | - |
| 2. Underwater | <u>X</u> | 6. Pin & Hanger | - |
| 3. Scour Critical | <u>X</u> | 7. Fatigue Prone | - |
| 4. Moveable | - | | |

36 TRAFFIC SAFETY FEATURES

| | | | |
|-------------------|----------|-----------------------|----------|
| 1. Bridge Railing | <u>1</u> | 3. Approach | <u>1</u> |
| 2. Transition | <u>1</u> | 4. Approach Guardrail | <u>1</u> |

REMARKS:

58 DECK

GENERAL CONDITION RATING [7]

| | | | |
|----------------------|----------|------------------------------------|----------|
| 1. Wearing Surface | - | 6. Railing | <u>G</u> |
| 2. Deck – Structural | <u>G</u> | 7. Drains | <u>N</u> |
| 3. Curbs | <u>G</u> | 8. Lighting | - |
| 4. Median | <u>N</u> | 9. Utilities | <u>G</u> |
| 5. Sidewalks | <u>N</u> | 10. Expansion Joints or Devices | <u>G</u> |

REMARKS:

- a. Hairline cracks with efflorescence in the deck overhangs of several spans inspected
- b. No other significant defects noted in underside of deck
- c. Widespread map cracking (hairline to narrow) of concrete deck surface in Spans DSB2, DSB3, DSB5, DSB13, DSB14, DSB17, and DSB18.



B-7 DSB

VDOT – BRIDGE INSPECTION REPORT

Page: 2 of 3

59 SUPERSTRUCTURE

GENERAL CONDITION RATING [8]

| | | | |
|----------------------------------|----------|------------------------------|----------|
| 1. Bearing Devices | <u>G</u> | 4. Trusses | |
| 2. Stringers | <u>N</u> | A. General | <u>N</u> |
| 3. Girders, Beams, or Slab Spans | | B. Portals | <u>N</u> |
| A. General | <u>G</u> | C. Bracing | <u>N</u> |
| B. Diaphragms or Cross Frames | <u>G</u> | 5. Paint | <u>N</u> |
| C. Bracing | <u>N</u> | Year Painted | – |
| | | 6. Machinery (Moveable Span) | <u>N</u> |

REMARKS:

- a. Minor cracking and spalling at scattered closure pour diaphragms with exposed reinforcement/prestressing with little to no relevant section loss.
- b. Spans 1 thru 19 inspected from Snooper vehicle

60 SUBSTRUCTURE

GENERAL CONDITION RATING [7]

| | | | |
|---------------------|----------|-----------------------|----------|
| 1. Abutments | | 2. Pier/Bent | |
| A. Wings | – | A. Caps | – |
| B. Backwall | – | B. Piles | – |
| C. Bearing Seats | – | C. Column, Stem, Wall | – |
| D. Breastwall | <u>N</u> | D. Piles | – |
| E. Weepholes | <u>N</u> | E. Bracing | – |
| F. Footing | – | F. Erosion/Scour | <u>F</u> |
| G. Piles | * | G. Settlement | – |
| H. Erosion/Scour | – | 3. Pile Bent | |
| I. Settlement | – | A. Caps | <u>G</u> |
| *Not Visible | | B. Bearing Seats | <u>G</u> |
| | | C. Piles | <u>G</u> |
| | | D. Bracing | <u>N</u> |

REMARKS:

- a. The 2019 Underwater Inspection revealed only a few hairline cracks and a few minor shallow spalls on some of the piles
- b. Minor hairline cracks in most piles above water or above ground line adjacent to pile section joints. Crack with rust staining observed above water on Bent 7 Pile B.
- c. Minor hairline cracks on a few bent caps.



B-7 DSB

VDOT – BRIDGE INSPECTION REPORT

Page: 3 of 3

61 CHANNEL: CHANNEL/SLOPE PROTECTION

GENERAL CONDITION RATING

[7]

| | | | |
|------------------|----------|-----------------------|----------|
| 1. Channel Scour | <u>E</u> | 5. Fender System | - |
| 2. Embankment | - | 6. Spur Dikes/Jetties | - |
| Erosion | - | 7. Rip Rap/Slope | <u>G</u> |
| 3. Drift | - | Protection | |
| 4. Vegetation | - | 8. Adequacy of | <u>E</u> |
| | | Opening | |

REMARKS:

- a. Scour remediation was performed at Bent DSB1 in 2002
- b. Bay bottom is relatively stable as indicated in the 2004, 2009, 2014, the 2019 Underwater Inspections.
- c. Scour ratings govern over condition ratings at a majority of the bents in the water

66 POSTED LOADING

| | | | |
|---------------------|----------|---------------|----------|
| 1. Posted Loading - | | 2. Legibility | <u>N</u> |
| (R12 -1) | <u>N</u> | 3. Visibility | <u>N</u> |
| (R12 - 5) – Single | <u>N</u> | | |
| (R12 - 5) – Semi | <u>N</u> | | |

REMARKS

- a. Load rating completed in 12/2018 in accordance with VDOT Instructional and Informational Memorandum 86.2: Load Rating and Posting of Structures (Bridges and Culverts) dated 11/16/2018.
- b. No posting of the structure is required.



4.11 Trestle ENB, FIB-NB, & FNB SI&A Forms

| | | |
|-------------------------------------|---|---------------------|
| B-6 ENB, FIB-NB, & FNB | VDOT – BRIDGE INSPECTION REPORT | Page: 1 of 2 |
| Structure-ID: 1017 | Type: Regular Inspection | |
| County/City: Northampton | Date of Inspection: 9/10 & 9/14/20 | |
| Structure: _____(Co./Str.No) | Feature/Intersection: Chesapeake Bay | |
| Main Route: 13 | Facility/Carried: | |
| Milepost: 32.32 | Location: Over Chesapeake Bay | |
| Lead Inspector: John Gaul | Additional Inspector(s): Jake Landis | |

WORK DONE: Routine Maintenance and Replacement of Asphalt Wearing Surface and Open Expansion Joint Header Material was completed in Spring 2020. Replacement of Steel Sliding Plate Expansion Joints with Steel Tooth Expansion Joints completed in Winter 2020.

REVISED DIMENSIONS: None

MISCELLANEOUS: No Encroachment Violations

CONDITION OF STRUCTURE: Good

1. Minor hairline cracking on many of the piles above water or land.
2. Steel Tooth Expansion Joint at FIB-NB Pier 4 opening was off by about 1/2" from the east side (1 3/4") to the west side (1 1/4"). The weather was cloudy at the time of measurement (9/10/2020 at 2:11pm) with an ambient air temperature around 80°F with both the steel girders and concrete girders measuring at 80°F. The opening dimension for these conditions should have been 1 15/16" according to construction documents.
3. No apparent change in spiral cracking on piles at Bents ENB7 and ENB9 (caused during construction).
4. Rip rap encompassing Bent FNB4 remains well placed and stable.
5. Minor spalls noted in the girders and at the diaphragm closure pours at scattered locations in the trestle spans.
6. Isolated surface spalls in Span ENB1.
7. Scattered minor transverse cracks in concrete portions of FIB bridge deck.
8. Isolated minor rust spots and peeled off topcoat with exposed zinc primer on FIB girders, cross frames and bracing.
9. Minor rust continues to develop on nuts and bolts of FIB girder splices and at cross frames and lower lateral bracing connections.
10. Moderate rust around perimeter of FIB rocker bearing base plates and isolated rust spots on some pins and anchor bolts.
11. The 2019 Underwater Inspection revealed only a few hairline cracks and a few minor shallow spalls on some of the piles.
12. North Fender system was repaired in Fall 2018 after damage that was caused around May 27, 2018.

REVISED STRESS ANALYSIS:

1. Load rating completed in 12/2018 in accordance with VDOT Instructional and Informational Memorandum 86.2: Load Rating and Posting of Structures (Bridges and Culverts) dated 11/16/2018.
2. Structure load rating controlled by the interior girders of FIB-NB.
3. No posting of the structure is required.

RECOMMENDATIONS:

1. Monitor the Steel Tooth Expansion Joint opening on extremely hot days (temperatures approaching 120°F) to observe if opening closes and if any distress occurs on the superstructure.



B-6 ENB, FIB-NB, & FNB

VDOT – BRIDGE INSPECTION REPORT

Page: 2 of 2

2. Clean exposed reinforcing and patch girder spalls on trestle spans.
3. Replace top protective coating on steel girders at locations where zinc primer is exposed or coating has bubbled and exhibits freckled rust (girder splices, cross frames, and rocker bearings).
4. Seal piles exhibiting degradation with carbon fiber sheets.

SIGNATURE OF INSPECTOR



B-7 ENB, FIB-NB, & FNB

VDOT – BRIDGE INSPECTION REPORT

| | | | |
|------------------------|-------------------|----------------------------------|---------------------|
| Structure-ID: | 1017 | Type: | Regular Inspection |
| County/City: | Northampton | Date of Inspection: | 9/10 & 9/14/20 |
| Structure: | _____(Co./Str.No) | Feature/Intersection: | Chesapeake Bay |
| Main Route: | 13 | Facility/Carried: | |
| Milepost: | 32.32 | Location: | Over Chesapeake Bay |
| Lead Inspector: | John Gaul | Additional Inspector(s) : | Jake Landis |

SPECIAL CONDITIONS OR REQUIREMENTS

| | | | |
|----------------------|----------|------------------|---|
| 1. Fracture Critical | - | 5. Segmental | - |
| 2. Underwater | <u>X</u> | 6. Pin & Hanger | - |
| 3. Scour Critical | <u>X</u> | 7. Fatigue Prone | - |
| 4. Moveable | - | | |

36 TRAFFIC SAFETY FEATURES

| | | | |
|-------------------|----------|-----------------------|----------|
| 1. Bridge Railing | <u>1</u> | 3. Approach | <u>1</u> |
| 2. Transition | <u>1</u> | 4. Approach Guardrail | <u>1</u> |

REMARKS:

58 DECK

GENERAL CONDITION RATING [8]

| | | | |
|----------------------|----------|------------------------------------|----------|
| 1. Wearing Surface | <u>G</u> | 6. Railing | <u>G</u> |
| 2. Deck – Structural | <u>G</u> | 7. Drains | <u>N</u> |
| 3. Curbs | <u>G</u> | 8. Lighting | <u>G</u> |
| 4. Median | <u>N</u> | 9. Utilities | <u>G</u> |
| 5. Sidewalks | <u>N</u> | 10. Expansion Joints or Devices | <u>G</u> |

REMARKS:

- a. Minor transverse hairline cracks scattered in concrete FIB-NB deck surface.
- b. Steel Tooth Expansion Joint at FIB-NB Pier 4 opening was off by about 1/2" from the east side (1 3/4") to the west side (1 1/4"). The weather was cloudy at the time of measurement (9/10/2020 at 2:11pm) with an ambient air temperature around 80°F with both the steel girders and concrete girders measuring at 80°F. The opening dimension for these conditions should have been 1 15/16" according to construction documents.
- c. Isolated surface spalls on ENB1 east side.



59 SUPERSTRUCTURE

GENERAL CONDITION RATING

[8]

| | | | |
|----------------------------------|----------|------------------------------|-------------|
| 1. Bearing Devices | <u>G</u> | 4. Trusses | |
| 2. Stringers | <u>N</u> | A. General | <u>N</u> |
| 3. Girders, Beams, or Slab Spans | | B. Portals | <u>N</u> |
| A. General | <u>G</u> | C. Bracing | <u>N</u> |
| B. Diaphragms or Cross Frames | <u>G</u> | 5. Paint | <u>G</u> |
| C. Bracing | <u>N</u> | Year Painted | <u>2013</u> |
| | | 6. Machinery (Moveable Span) | <u>N</u> |

REMARKS:

- a. Minor spalls noted in the girders and at the diaphragm closure pours at scattered locations in the trestle spans
- b. Isolated minor rust spots and peeled off topcoat with exposed zinc primer on FIB girders, cross frames and bracing
- c. Minor rust continues to develop on nuts and bolts of FIB girder splices and at cross frame and lower lateral bracing connections
- d. Rust around perimeter of FIB rocker bearing base plates and isolated rust spots on some pins and anchor bolts

60 SUBSTRUCTURE

GENERAL CONDITION RATING

[8]

| | | | |
|------------------|----------|-----------------------|----------|
| 1. Abutments | | 2. Pier/Bent | |
| A. Wings | <u>G</u> | A. Caps | - |
| B. Backwall | <u>G</u> | B. Piles | - |
| C. Bearing Seats | <u>G</u> | C. Column, Stem, Wall | - |
| D. Breastwall | <u>N</u> | D. Piles | - |
| E. Weepholes | <u>N</u> | E. Bracing | - |
| F. Footing | <u>G</u> | F. Erosion/Scour | - |
| G. Piles | * | G. Settlement | - |
| H. Erosion/Scour | <u>G</u> | 3. Pile Bent | |
| I. Settlement | <u>G</u> | A. Caps | <u>G</u> |
| *Not Visible | | B. Bearing Seats | <u>G</u> |
| | | C. Piles | <u>G</u> |
| | | D. Bracing | <u>N</u> |

REMARKS:

- a. Minor hairline cracking on many of the piles above water or land
- b. Some spalls with exposed reinforcing noted at pile joints of a few piles
- c. No apparent change in spiral cracking on piles at Bents ENB7 and ENB9 (caused during construction)
- d. The 2019 Underwater Inspection revealed only a few hairline cracks and a few minor shallow spalls on some of the piles.



B-7 ENB, FIB-NB, & FNB

VDOT – BRIDGE INSPECTION REPORT

61 CHANNEL: CHANNEL/SLOPE PROTECTION

GENERAL CONDITION RATING

[7]

| | | | |
|------------------|----------|-----------------------|----------|
| 1. Channel Scour | <u>G</u> | 5. Fender System | <u>F</u> |
| 2. Embankment | - | 6. Spur Dikes/Jetties | - |
| Erosion | - | 7. Rip Rap/Slope | <u>G</u> |
| 3. Drift | - | Protection | |
| 4. Vegetation | - | 8. Adequacy of | <u>F</u> |
| | | Opening | |

REMARKS:

- a. Rip rap encompassing Bent FNB4 remains well placed and stable.

66 POSTED LOADING

| | | | |
|---------------------|----------|---------------|----------|
| 1. Posted Loading - | | 2. Legibility | <u>N</u> |
| (R12 -1) | <u>N</u> | 3. Visibility | <u>N</u> |
| (R12 - 5) – Single | <u>N</u> | | |
| (R12 - 5) – Semi | <u>N</u> | | |

REMARKS

- a. Load rating completed in 12/2018 in accordance with VDOT Instructional and Informational Memorandum 86.2: Load Rating and Posting of Structures (Bridges and Culverts) dated 11/16/2018.
- b. Structure load rating controlled by the interior girders of FIB-NB.
- c. No posting of the structure is required.



4.12 Trestle ESB, FIB-SB, & FSB SI&A Forms

| | | |
|-----------------------------------|--|---|
| B-6 ESB, FIB-SB, & FSB | VDOT – BRIDGE INSPECTION REPORT | Page: 1 of 2 |
| Structure-ID: | 1007 | Type: Regular Inspection |
| County/City: | Northampton | Date of Inspection: 9/10 & 9/11/20 |
| Structure: | _____(Co./Str.No) | Feature/Intersection: Chesapeake Bay |
| Main Route: | 13 | Facility/Carried: |
| Milepost: | 32.32 | Location: Over Chesapeake Bay |
| Lead Inspector: | John Gaul | Additional Inspector(s): Jake Landis |

WORK DONE: Routine Maintenance. Underwater Inspection performed 9/7 – 9/13/21

REVISED DIMENSIONS: None

MISCELLANEOUS: No Encroachment Violations

CONDITION OF STRUCTURE: Generally Fair to Good

1. Random spalls on bottom flanges of prestressed girders, with some previous patches failed or failing.
2. Isolated minor rust spots on FIB girders, crossframes & bracing members.
3. Distortion on one FIB girder bottom flange for approximately 3 feet that does not require mitigation; and buckling of one lower lateral bracing diagonal.
4. Minor rust on isolated nuts and bolts of FIB girder splices and other field connections.
5. Cracks in the asphalt wearing surface sealed, but a few scattered unsealed cracks were noted and recommended for sealing.
6. Minor transverse cracks scattered in the FIB concrete deck surface.
7. Roadway striping replaced in 2020.
8. Hairline cracking on many of the piles above water or land.
9. Isolated spalling on some of the piles.
10. Repairs involving installation of cathodic protection jackets on FIB-SB2 and FIB-SB3 were completed in 2014. Several piles at Pier FIB-SB2 and FIB-SB3 exhibited damage to the fiberglass jackets.
11. Previously noted cracks above the jackets on FIB-SB2 and FIB-SB3 were noted to be routed and packed with minor periphery cracking.
12. Fender System at Bent FIB-SB3 was replaced in 2006. Bottom whaler exhibiting 70% section loss at the waterline, but the rest exhibit minimal deterioration. North Fender system was repaired in Fall 2018 after damage that was caused around May 27, 2018.
13. Three pile cluster dolphins and portions of each whaler replaced at west end of fender system in front of Pier FIB-SB2 in 2016 and in good condition.
14. Isolated minor cracks and spalls on a few piles underwater. For a detailed condition of piles underwater and bay bottom scour conditions, see the 2021 Underwater Inspection Report.

REVISED STRESS ANALYSIS:

1. Load rating completed in 12/2018 in accordance with VDOT Instructional and Informational Memorandum 86.2: Load Rating and Posting of Structures (Bridges and Culverts) dated 11/16/2018.
2. No posting of the structure is required.

RECOMMENDATIONS:

1. Patch spalls on prestressed concrete girders and piles.
2. Perform periodic hydrographic surveys in interim between underwater inspections.
3. Monitor and repair any exposed zinc mesh under the spalled fiberglass jackets on Pier FIB-SB2 and FIB-SB3.
4. Clean out and seal transverse cracks in concrete deck spans of FIB-SB.



B-6 ESB, FIB-SB, & FSB VDOT – BRIDGE INSPECTION REPORT

Page: 2 of 2

5. Clean and lubricate rocker bearings on FIB-SB.
6. Replace buckled lower lateral bracing diagonal.

A handwritten signature in black ink, written over a horizontal line. The signature is stylized and appears to be "John Smith".

SIGNATURE OF INSPECTOR



B-7 ESB, FIB-SB, & FSB

VDOT – BRIDGE INSPECTION REPORT

Page: 1 of 3

| | | | |
|------------------------|-------------------|---------------------------------|---------------------|
| Structure-ID: | 1007 | Type: | Regular Inspection |
| County/City: | Northampton | Date of Inspection: | 9/10 & 9/11/20 |
| Structure: | _____(Co./Str.No) | Feature/Intersection: | Chesapeake Bay |
| Main Route: | 13 | Facility/Carried: | |
| Milepost: | 32.32 | Location: | Over Chesapeake Bay |
| Lead Inspector: | John Gaul | Additional Inspector(s): | Jake Landis |

SPECIAL CONDITIONS OR REQUIREMENTS

| | | | |
|----------------------|----------|------------------|---|
| 1. Fracture Critical | - | 5. Segmental | - |
| 2. Underwater | <u>X</u> | 6. Pin & Hanger | - |
| 3. Scour Critical | <u>X</u> | 7. Fatigue Prone | - |
| 4. Moveable | - | | |

36 TRAFFIC SAFETY FEATURES

| | | | |
|-------------------|----------|-----------------------|----------|
| 1. Bridge Railing | <u>1</u> | 3. Approach | <u>1</u> |
| 2. Transition | <u>1</u> | 4. Approach Guardrail | <u>1</u> |

REMARKS:

58 DECK

GENERAL CONDITION RATING

[8]

| | | | |
|----------------------|----------|------------------------------------|----------|
| 1. Wearing Surface | <u>G</u> | 6. Railing | <u>G</u> |
| 2. Deck – Structural | <u>G</u> | 7. Drains | <u>N</u> |
| 3. Curbs | <u>G</u> | 8. Lighting | <u>G</u> |
| 4. Median | <u>N</u> | 9. Utilities | <u>G</u> |
| 5. Sidewalks | <u>N</u> | 10. Expansion Joints or Devices | <u>G</u> |

REMARKS:

- a. The typical simple span fixed and expansion open deck joints of the trestle spans were paved over during the 1999 overlay
- b. Minor transverse cracks scattered in the FIB concrete deck surface recommended for sealing



59 SUPERSTRUCTURE

GENERAL CONDITION RATING

[7]

| | | | |
|----------------------------------|----------|------------------------------|-------------|
| 1. Bearing Devices | <u>G</u> | 4. Trusses | |
| 2. Stringers | <u>N</u> | A. General | <u>N</u> |
| 3. Girders, Beams, or Slab Spans | | B. Portals | <u>N</u> |
| A. General | <u>F</u> | C. Bracing | <u>N</u> |
| B. Diaphragms or Cross Frames | <u>G</u> | 5. Paint | <u>G</u> |
| C. Bracing | <u>N</u> | Year Painted | <u>2013</u> |
| | | 6. Machinery (Moveable Span) | <u>N</u> |

REMARKS:

- a. Some spalls on bottom flanges of some prestressed girders of trestle spans, with some previous patches failed or failing
- b. Minor rust spots on FIB girders, crossframes & bracing members
- c. Minor rust on some nuts and bolts of FIB girder splices and other field connections
- d. Distortion on one FIB girder bottom flange for approximately 3 feet that does not require mitigation, and buckling of one lower lateral bracing diagonal

60 SUBSTRUCTURE

GENERAL CONDITION RATING

[7]

| | | | |
|------------------|----------|-----------------------|----------|
| 1. Abutments | | 2. Pier/Bent | |
| A. Wings | <u>G</u> | A. Caps | - |
| B. Backwall | <u>G</u> | B. Piles | - |
| C. Bearing Seats | <u>G</u> | C. Column, Stem, Wall | - |
| D. Breastwall | <u>N</u> | D. Piles | - |
| E. Weepholes | <u>N</u> | E. Bracing | - |
| F. Footing | <u>G</u> | F. Erosion/Scour | - |
| G. Piles | * | G. Settlement | - |
| H. Erosion/Scour | <u>G</u> | 3. Pile Bent | |
| I. Settlement | <u>G</u> | A. Caps | <u>G</u> |
| *Not Visible | | B. Bearing Seats | <u>G</u> |
| | | C. Piles | <u>F</u> |
| | | D. Bracing | <u>N</u> |

REMARKS:

- a. Minor cracking and isolated spalls on the piles
- b. Repairs involving installation of cathodic protection jackets on Piers FIB-SB2 and FIB-SB3 were completed in 2014. Several piles noted to have large sections of spalled fiberglass jackets at Pier FIB-SB3
- c. Previously noted cracks above the jackets on FIB-SB2 and FIB-SB3 were noted to be routed and packed with minor periphery cracking
- d. Minor to moderate map cracking at ends of some trestle bent caps
- e. Isolated minor cracks and spalls on a few piles underwater. For a detailed condition of piles underwater and bay bottom scour conditions, see the 2021 Underwater Inspection Report.



61 CHANNEL: CHANNEL/SLOPE PROTECTION

GENERAL CONDITION RATING

[8]

| | | | |
|------------------|----------|-----------------------|----------|
| 1. Channel Scour | <u>G</u> | 5. Fender System | <u>F</u> |
| 2. Embankment | - | 6. Spur Dikes/Jetties | - |
| Erosion | - | 7. Rip Rap/Slope | <u>G</u> |
| 3. Drift | - | Protection | |
| 4. Vegetation | - | 8. Adequacy of | <u>F</u> |
| | | Opening | |

REMARKS:

- a. Fender system at Pier FIB-SB3 was replaced in 2006. Bottom whaler exhibits 70% section loss at the waterline, but the rest exhibit minimal deterioration. North Fender system was repaired in Fall 2018 after damage that was caused around May 27, 2018.
- b. Three pile cluster dolphins and portions of each whaler replaced at west end of fender system in front of Pier FIB-SB2 in 2016 and in good condition
- c. North Fender system was under repair at the time of inspection for damage that was caused around May 27, 2018.

66 POSTED LOADING

| | | | |
|---------------------|----------|---------------|----------|
| 1. Posted Loading - | | 2. Legibility | <u>N</u> |
| (R12 -1) | <u>N</u> | 3. Visibility | <u>N</u> |
| (R12 - 5) – Single | <u>N</u> | | |
| (R12 - 5) – Semi | <u>N</u> | | |

REMARKS

- c. Load rating completed in 12/2018 in accordance with VDOT Instructional and Informational Memorandum 86.2: Load Rating and Posting of Structures (Bridges and Culverts) dated 11/16/2018.
- d. No posting of the structure is required.



5. Bridge Element Level Data

The tables provided in this section display the element level bridge condition data and condition states coded per the AASHTO Manual for Bridge Element Inspection, First Edition and the VDOT Supplement to the AASHTO Manual for Bridge Element Inspection (2016) at the time of this inspection.

For Defect 6000 Scour, the Condition State (CS) for each element was determined utilizing the following system:

| Condition State | Description | |
|-----------------|------------------------------|--|
| 1 Good | No Scour | The bay bottom profile at the substructure unit is greater than 10-feet above the Allowable Scour Depth (ASD) |
| 2 Fair | Within Tolerable Limits | The bay bottom at the substructure unit is greater than 5-feet above the ASD, or scour remediation has been placed at the substructure unit, but not below ASD |
| 3 Poor | Within Critical Limits | The bay bottom at the substructure unit is above the ASD, or scour remediation has been placed at the substructure unit at or above the ASD |
| 4 Severe | Warrants a Structural Review | The bay bottom at the pile is below its ASD and scour remediation has not been placed at the substructure unit |



5.1 Trestle ANB Element Level Data

Trestle ANB consists of Spans A'NB1-10 and Spans ANB 1-226. Spans ANB 33-81 received a hands-on inspection this year (approximately 21% of the entire trestle). Element level data is presented in this section for all portions of the trestle that have a received hands-on inspection since FY2018. An underwater inspection was performed on the entire trestle in FY2019, and element level data has been provided for all piles that were inspected along the trestle.

Table 51: ANB Element Level Data

| ANB (1002) Element Level Data | | | | | | | |
|-------------------------------|--|------|-------------------|-------------------|-------------------|-------------------|---------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| DECKS AND SLABS | | | | | | | |
| 16 | Reinforced Concrete Top Flange | SF | 527,586 | 554 | 122 | 0 | 528,262 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | SF | | 41 | 63 | | 104 |
| 1090 | <i>Exposed Rebar</i> | SF | | 29 | 59 | | 96 |
| 1120 | <i>Efflorescence/Rust Staining</i> | SF | | 341 | | | 341 |
| 1130 | <i>Cracking (RC and Other)</i> | SF | | 143 | | | 143 |
| 38 | Reinforced Concrete Slab | SF | 1,188 | 6 | 0 | 0 | 1,194 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | SF | | 6 | | | 6 |
| RAILINGS | | | | | | | |
| 330 | Metal Bridge Railing | LF | 33,099 | 487 | 14 | 0 | 33,600 |
| 1020 | <i>Connection</i> | LF | | 3 | | | 3 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | 75 | 13 | | 88 |
| 1090 | <i>Exposed Rebar</i> | LF | | 12 | 1 | | 13 |
| 1130 | <i>Cracking (RC and Other)</i> | LF | | 383 | | | 383 |
| 7000 | <i>Damage</i> | LF | | 14 | | | 14 |



| ANB (1002) Element Level Data | | | | | | | |
|-------------------------------|--|------|-------------------|-------------------|-------------------|-------------------|---------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| SUPERSTRUCTURE | | | | | | | |
| 109 | Prestressed Concrete Open Girder/Beam | LF | 141,799 | 4,069 | 243 | 0 | 146,111 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | 523 | 83 | | 606 |
| 1090 | <i>Exposed Rebar</i> | LF | | 67 | 91 | | 158 |
| 1100 | <i>Exposed Prestressing</i> | LF | | 15 | 15 | | 30 |
| 1110 | <i>Cracking (PSC)</i> | LF | | 3,457 | 3 | | 3,460 |
| 1120 | <i>Efflorescence/Rust Staining</i> | LF | | 7 | 51 | | 58 |
| 811 | Beam/Girder End | EA | 2,046 | 1,747 | 115 | 0 | 3,908 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | EA | | 44 | 30 | | 67 |
| 1090 | <i>Exposed Rebar</i> | EA | | 13 | 52 | | 65 |
| 1100 | <i>Exposed Prestressing</i> | EA | | | 8 | | 8 |
| 1110 | <i>Cracking (PSC)</i> | EA | | 1,679 | 1 | | 1,680 |
| 1120 | <i>Efflorescence/Rust Staining</i> | EA | | 11 | 24 | | 35 |
| BEARINGS | | | | | | | |
| 310 | Elastomeric Bearing | EA | 3,836 | 12 | 68 | 0 | 3,916 |
| 1000 | <i>Corrosion</i> | EA | | 8 | | | 8 |
| 2230 | <i>Bulging, Splitting, or Tearing</i> | EA | | 4 | 68 | | 72 |



| ANB (1002) Element Level Data | | | | | | | |
|---|--|------|-------------------|-------------------|-------------------|-------------------|---------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| SUBSTRUCTURE | | | | | | | |
| 215 | Reinforced Concrete Abutment | LF | 66 | 0 | 0 | 0 | 66 |
| 226 | Prestressed Concrete Pile | EA | 115 | 510 | 88 | 7 | 720 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | EA | | 175 | 25 | | 200 |
| 1090 | <i>Exposed Rebar</i> | EA | | 1 | 4 | | 5 |
| 1110 | <i>Cracking (PSC)</i> | EA | | 190 | 6 | | 196 |
| 1120 | <i>Efflorescence/Rust Staining</i> | EA | | 72 | 44 | | 116 |
| 1190 | <i>Abrasion/Wear (PSC/RC)</i> | EA | | 6 | | | 6 |
| 6000 | <i>Scour</i> | EA | | 66 | 9 | 7 | 82 |
| 234 | Reinforced Concrete Pier Cap | LF | 7,548 | 562 | 15 | 0 | 8,125 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | 45 | 14 | | 59 |
| 1120 | <i>Efflorescence/Rust Staining</i> | LF | | 196 | 1 | | 197 |
| 1130 | <i>Cracking (RC and Other)</i> | LF | | 321 | | | 321 |
| 824 | Reinforced Concrete Wingwall | EA | 2 | 0 | 0 | 0 | 2 |
| JOINTS | | | | | | | |
| 304 | Open Expansion Joint | LF | 8,541 | 0 | 0 | 0 | 8,541 |
| 845 | Joint Effectiveness | EA | 246 | 0 | 0 | 0 | 246 |
| WEARING SURFACES, PROTECTIVE COATINGS, AND CONCRETE REINFORCING STEEL PROTECTIVE SYSTEMS | | | | | | | |
| 510 | Wearing Surfaces | SF | 507,251 | 170 | 196 | 0 | 507,617 |
| 3210 | <i>Delamination/Spall/Patched Area/Pothole (Wearing Surface)</i> | SF | | 2 | | | 2 |
| 3220 | <i>Crack</i> | SF | | 168 | 196 | | 364 |



| ANB (1002) Element Level Data | | | | | | | |
|-------------------------------|--|------|-------------------|-------------------|-------------------|-------------------|---------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| 520 | Concrete Reinforcing Steel Protective System | SF | 59,941 | 2,568 | 1,490 | 587 | 64,586 |
| 3600 | <i>Effectiveness - Protective System (e.g. cathodic)</i> | SF | | 2,568 | 1,484 | 407 | 4,423 |
| 7000 | <i>Damage</i> | SF | | | 6 | 180 | 186 |
| 521 | Concrete Protective Coating | SF | 138,800 | 257 | 170 | 2,092 | 141,319 |
| 3540 | <i>Effectiveness (Concrete Protective Coatings)</i> | SF | | 257 | 170 | 2,092 | 2,519 |
| SLOPE AND CHANNEL ELEMENTS | | | | | | | |
| 852 | Protected Slope – Paved | EA | 1 | 0 | 0 | 0 | 1 |
| 6506 | <i>Paved Slope Effectiveness</i> | EA | 1 | | | | 1 |
| 853 | Protected Slope - Riprap | EA | 1 | 0 | 0 | 0 | 1 |
| 6507 | <i>Loss of Riprap</i> | EA | 1 | | | | 1 |
| 854 | Channel | EA | 0 | 1 | 0 | 0 | 1 |
| 6000 | <i>Scour</i> | EA | | 1 | | | 1 |



5.2 Trestle ASB Element Level Data

Trestle ASB consists of Spans ASB 1-205. Spans 167-186 and 194-204 received a hands-on inspection this year (approximately 15% of the entire trestle). Element level data is presented in this section for all portions of the trestle that have a received hands-on inspection since FY2018. An underwater inspection was performed on the entire trestle in FY2019, and element level data has been provided for all piles that were inspected along the trestle.

Table 52: ASB Element Level Data

| ASB (1010) Element Level Data | | | | | | | |
|-------------------------------|--|------|-------------------|-------------------|-------------------|-------------------|---------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| DECKS AND SLABS | | | | | | | |
| 12 | Reinforced Concrete Deck | SF | 35,961 | 666 | 3 | 0 | 35,630 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | SF | | | 3 | | 3 |
| 1120 | <i>Efflorescence/Rust Staining</i> | SF | | 178 | | | 178 |
| 1130 | <i>Cracking (RC and Other)</i> | SF | | 488 | | | 488 |
| 16 | Reinforced Concrete Top Flange | SF | 619,723 | 1,164 | 75 | 0 | 620,962 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | SF | | 22 | 46 | | 68 |
| 1090 | <i>Exposed Rebar</i> | SF | | 2 | 27 | | 29 |
| 1120 | <i>Efflorescence/Rust Staining</i> | SF | | 8 | | | 8 |
| 1130 | <i>Cracking (RC and Other)</i> | SF | | 1,132 | 2 | | 1,134 |
| RAILINGS | | | | | | | |
| 330 | Metal Bridge Railing | LF | 35,016 | 115 | 35 | 0 | 35,166 |
| 1020 | <i>Connection</i> | LF | | 3 | | | 3 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | 28 | 6 | | 34 |
| 1090 | <i>Exposed Rebar</i> | LF | | | 6 | | 6 |
| 1120 | <i>Efflorescence/Rust Staining</i> | LF | | | 21 | | 21 |
| 1130 | <i>Cracking (RC and Other)</i> | LF | | 72 | | | 72 |
| 1900 | <i>Distortion</i> | LF | | 12 | 2 | | 14 |
| SUPERSTRUCTURE | | | | | | | |



| ASB (1010) Element Level Data | | | | | | | |
|-------------------------------|--|------|-------------------|-------------------|-------------------|-------------------|---------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| 107 | Steel Open Girder/Beam | LF | 1,340 | 20 | 0 | 0 | 1,360 |
| 1000 | <i>Corrosion</i> | LF | | 20 | | | 3 |
| 109 | Prestressed Concrete Open Girder/Beam | LF | 104,612 | 212 | 58 | 0 | 104,882 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | 107 | 12 | | 119 |
| 1090 | <i>Exposed Rebar</i> | LF | | 60 | 46 | | 106 |
| 1100 | <i>Exposed Prestressing</i> | LF | | 12 | | | 12 |
| 1110 | <i>Cracking (PSC)</i> | LF | | 27 | | | 27 |
| 1120 | <i>Efflorescence/Rust Staining</i> | LF | | 6 | | | 6 |
| 811 | Beam/Girder End | EA | 3,684 | 141 | 43 | 0 | 2,652 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | EA | | 92 | 7 | | 99 |
| 1090 | <i>Exposed Rebar</i> | EA | | 41 | 35 | | 76 |
| 1100 | <i>Exposed Prestressing</i> | EA | | 3 | | | 3 |
| 1110 | <i>Cracking (PSC)</i> | EA | | 4 | 1 | | 5 |
| 1120 | <i>Efflorescence/Rust Staining</i> | EA | | 1 | | | 1 |
| BEARINGS | | | | | | | |
| 310 | Elastomeric Bearing | EA | 2,448 | 0 | 0 | 0 | 2,448 |
| SUBSTRUCTURE | | | | | | | |
| 215 | Reinforced Concrete Abutment | LF | 89 | 0 | 0 | 0 | 89 |



| ASB (1010) Element Level Data | | | | | | | |
|---|--|------|-------------------|-------------------|-------------------|-------------------|---------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| 226 | Prestressed Concrete Pile | EA | 258 | 326 | 43 | 8 | 635 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | EA | | 76 | 19 | | 95 |
| 1090 | <i>Exposed Rebar</i> | EA | | 7 | 2 | | 9 |
| 1110 | <i>Cracking (PSC)</i> | EA | | 132 | 2 | | 134 |
| 1120 | <i>Efflorescence/Rust Staining</i> | EA | | 6 | 4 | | 10 |
| 1190 | <i>Abrasion/Wear (PSC/RC)</i> | EA | | 44 | 1 | | 45 |
| 6000 | <i>Scour</i> | EA | | 61 | 15 | 8 | 84 |
| 234 | Reinforced Concrete Pier Cap | LF | 7,056 | 466 | 15 | 0 | 7,537 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | 17 | 14 | | 31 |
| 1090 | <i>Exposed Rebar</i> | LF | | | 1 | | 1 |
| 1120 | <i>Efflorescence/Rust Staining</i> | LF | | 1 | | | 1 |
| 1130 | <i>Cracking (RC and Other)</i> | LF | | 448 | | | 448 |
| 824 | Reinforced Concrete Wingwall | EA | 2 | 0 | 0 | 0 | 2 |
| JOINTS | | | | | | | |
| 304 | Open Expansion Joint | LF | 3,888 | 9 | 35 | 0 | 3,932 |
| 2360 | <i>Adjacent Deck or Header</i> | LF | | 9 | 35 | | 44 |
| 845 | Joint Effectiveness | EA | 67 | 0 | 0 | 0 | 67 |
| WEARING SURFACES, PROTECTIVE COATINGS, AND CONCRETE REINFORCING STEEL PROTECTIVE SYSTEMS | | | | | | | |
| 510 | Wearing Surfaces | SF | 569,273 | 4,899 | 1,603 | 0 | 575,775 |
| 3210 | <i>Delamination/Spall/Patched Area/Pothole (Wearing Surface)</i> | SF | | | 1 | | 1 |
| 3220 | <i>Crack (Wearing Surface)</i> | SF | | 1,209 | | | 1,209 |
| 3230 | <i>Effectiveness (Wearing Surface)</i> | SF | | 3,690 | 1,602 | | 5,292 |



| ASB (1010) Element Level Data | | | | | | | |
|-----------------------------------|--------------------------|------|-------------------|-------------------|-------------------|-------------------|-------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| SLOPE AND CHANNEL ELEMENTS | | | | | | | |
| 853 | Protected Slope - Riprap | EA | 1 | 0 | 0 | 0 | 1 |
| 6507 | <i>Loss of Riprap</i> | EA | 1 | | | | 1 |
| 854 | Channel | EA | 0 | 1 | 0 | 0 | 1 |
| 6000 | <i>Scour</i> | EA | | 1 | | | 1 |



5.3 Trestle BNB Element Level Data

Trestle BNB consists of Spans BNB 1/2-265. Spans 1-44 received a hands-on inspection this year (approximately 17% of the entire trestle). Element level data is presented in this section for all portions of the trestle that have a received hands-on inspection since FY2018. An underwater inspection was performed on the entire trestle in FY2020, and element level data has been provided for all piles that were inspected along the trestle.

Table 53: BNB Element Level Data

| BNB (1004) Element Level Data | | | | | | | |
|-------------------------------|--|------|-------------------|-------------------|-------------------|-------------------|---------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| DECKS AND SLABS | | | | | | | |
| 12 | Reinforced Concrete Deck | SF | 3,500 | 0 | 0 | 0 | 3,500 |
| 16 | Reinforced Concrete Top Flange | SF | 596,468 | 1,115 | 17 | 0 | 597,600 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | SF | | 22 | 3 | | 25 |
| 1090 | <i>Exposed Rebar</i> | SF | | 6 | 14 | | 20 |
| 1120 | <i>Efflorescence/Rust Staining</i> | SF | | 489 | | | 489 |
| 1130 | <i>Cracking (RC and Other)</i> | SF | | 598 | | | 598 |
| 38 | Reinforced Concrete Slab | SF | 1,174 | 15 | 5 | 0 | 1,194 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | SF | | 11 | | | 11 |
| 1090 | <i>Exposed Rebar</i> | SF | | | 4 | | 4 |
| 1120 | <i>Efflorescence/Rust Staining</i> | SF | | 4 | 1 | | 5 |
| RAILINGS | | | | | | | |
| 330 | Metal Bridge Railing | LF | 35,891 | 588 | 11 | 0 | 36,490 |
| 1000 | <i>Corrosion</i> | LF | | 60 | | | 60 |
| 1020 | <i>Connection</i> | LF | | 18 | 2 | | 20 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | 4 | 9 | | 13 |
| 1130 | <i>Cracking (RC and Other)</i> | LF | | 473 | | | 473 |
| 7000 | <i>Damage</i> | LF | | 33 | | | 33 |



| BNB (1004) Element Level Data | | | | | | | |
|-------------------------------|--|------|-------------------|-------------------|-------------------|-------------------|---------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| SUPERSTRUCTURE | | | | | | | |
| 109 | Prestressed Concrete Open Girder/Beam | LF | 140,430 | 4,645 | 703 | 22 | 145,800 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | 1,497 | 130 | | 1,627 |
| 1090 | <i>Exposed Rebar</i> | LF | | 25 | 63 | | 88 |
| 1100 | <i>Exposed Prestressing</i> | LF | | 10 | 413 | 22 | 445 |
| 1110 | <i>Cracking (PSC)</i> | LF | | 3,112 | 4 | | 3,116 |
| 1120 | <i>Efflorescence/Rust Staining</i> | LF | | 1 | 93 | | 94 |
| 811 | Beam/Girder End | EA | 2,356 | 1,422 | 110 | 0 | 3,888 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | EA | | 44 | 28 | | 70 |
| 1090 | <i>Exposed Rebar</i> | EA | | 16 | 45 | | 59 |
| 1110 | <i>Cracking (PSC)</i> | EA | | 1,361 | 3 | | 1,364 |
| 1120 | <i>Efflorescence/Rust Staining</i> | EA | | 1 | 34 | | 35 |
| BEARINGS | | | | | | | |
| 310 | Elastomeric Bearing | EA | 3,562 | 38 | 288 | 0 | 3,888 |
| 1000 | <i>Corrosion</i> | EA | | 18 | | | 18 |
| 2230 | <i>Bulging, Splitting, or Tearing</i> | EA | | 20 | 288 | | 308 |
| SUBSTRUCTURE | | | | | | | |
| 215 | Reinforced Concrete Abutment | EA | 62 | 3 | 5 | 0 | 70 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | 2 | | | 2 |
| 1090 | <i>Exposed Rebar</i> | LF | | | 4 | | 4 |
| 1120 | <i>Efflorescence/Rust Staining</i> | LF | | | 1 | | 1 |
| 1130 | <i>Cracking (RC and Other)</i> | LF | | 1 | | | 1 |



| BNB (1004) Element Level Data | | | | | | | |
|---|--|------|-------------------|-------------------|-------------------|-------------------|---------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| 226 | Prestressed Concrete Pile | EA | 10 | 380 | 260 | 164 | 814 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | EA | | 17 | 14 | | 31 |
| 1090 | <i>Exposed Rebar</i> | EA | | 1 | 20 | | 21 |
| 1110 | <i>Cracking (PSC)</i> | EA | | 144 | 15 | | 159 |
| 1120 | <i>Efflorescence/Rust Staining</i> | EA | | 62 | 30 | | 92 |
| 1190 | <i>Abrasion/Wear (PSC/RC)</i> | EA | | 38 | | | 38 |
| 6000 | <i>Scour*</i> | EA | | 118 | 181 | 164 | 463 |
| 234 | Reinforced Concrete Pier Cap | LF | 6,700 | 1,328 | 4 | 0 | 8,032 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | 27 | 1 | | 28 |
| 1090 | <i>Exposed Rebar</i> | LF | | | 1 | | 1 |
| 1120 | <i>Efflorescence/Rust Staining</i> | LF | | 2 | | | 2 |
| 1130 | <i>Cracking (RC and Other)</i> | LF | | 1,299 | 2 | | 1,301 |
| JOINTS | | | | | | | |
| 304 | Open Expansion Joint | LF | 8,572 | 0 | 0 | 0 | 8,572 |
| 845 | Joint Effectiveness | EA | 252 | 0 | 0 | 0 | 252 |
| WEARING SURFACES, PROTECTIVE COATINGS, AND CONCRETE REINFORCING STEEL PROTECTIVE SYSTEMS | | | | | | | |
| 510 | Wearing Surfaces | SF | 514,352 | 0 | 0 | 0 | 514,352 |
| 520 | Concrete Reinforcing Steel Protective System | SF | 2,533 | 745 | 12 | 45 | 3,335 |
| 3600 | <i>Effectiveness - Protective System (e.g. cathodic)</i> | SF | | 745 | 12 | 45 | 802 |



| BNB (1004) Element Level Data | | | | | | | |
|-----------------------------------|--------------------------|------|-------------------|-------------------|-------------------|-------------------|-------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| SLOPE AND CHANNEL ELEMENTS | | | | | | | |
| 853 | Protected Slope - Riprap | EA | 1 | 0 | 0 | 0 | 1 |
| 6507 | <i>Loss of Riprap</i> | EA | 1 | | | | 1 |
| 854 | Channel | EA | 0 | 0 | 0 | 1 | 1 |
| 6000 | <i>Scour*</i> | EA | | | | 1 | 1 |

*The condition state rating of 464 piles (approximately 57%) is governed by Scour, with 164 piles at Condition State 4 in accordance with the guidelines set at the beginning of this section. These guidelines were developed from historical engineering analysis performed for the facility and in accordance with the AASHTO Manual for Bridge Element Inspection, First Edition and the VDOT Supplement to the AASHTO Manual for Bridge Element Inspection (2016). Otherwise, most of the piles would be coded as Condition State 2 (Fair) based on the physical condition of the pile. It is believed that a conservative approach was taken in the historical engineering analysis, and based on the current ratings, the District will undertake an engineering analysis. The District has an on-going monitoring program that includes an annual hydrographic survey of the entire facility to monitor changes in the bay bottom. The District also has an ongoing program for scour remediation that targets locations along the facility in which the bay bottom elevation has dropped below the Allowable Scour Depth (ASD) that has resulted in stabilization of the bay bottom where installed. The District will use the results of the additional engineering analysis to identify where additional scour remediation will have the greatest immediate impact and proceed accordingly.



5.4 Trestle BSB Element Level Data

Trestle BSB consists of Spans BSB 1-203. Spans 1 – 16 and 179 - 202 received a hands-on inspection this year (approximately 20% of the entire trestle). Element level data is presented in this section for all portions of the trestle that have a received hands-on inspection since FY2018. An underwater inspection was performed on the entire trestle in FY2022, and element level data has been provided for all piles that were inspected along the trestle.

Table 54: BSB Element Level Data

| BSB (1012) Element Level Data | | | | | | | |
|-------------------------------|--|------|-------------------|-------------------|-------------------|-------------------|---------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| DECKS AND SLABS | | | | | | | |
| 12 | Reinforced Concrete Deck | SF | 8,907 | 0 | 0 | 0 | 8,907 |
| 16 | Reinforced Concrete Top Flange | SF | 781,944 | 998 | 59 | 0 | 783,001 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | SF | | 44 | 34 | | 78 |
| 1090 | <i>Exposed Rebar</i> | SF | | 5 | 7 | | 12 |
| 1120 | <i>Efflorescence/Rust Staining</i> | SF | | 256 | 18 | | 274 |
| 1130 | <i>Cracking (RC and Other)</i> | SF | | 693 | | | 693 |
| RAILINGS | | | | | | | |
| 330 | Metal Bridge Railing | LF | 39,345 | 74 | 8 | 0 | 39,427 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | 8 | 5 | | 13 |
| 1090 | <i>Exposed Rebar</i> | LF | | | 3 | | 3 |
| 1130 | <i>Cracking (RC and Other)</i> | LF | | 60 | | | 60 |
| 7000 | <i>Damage</i> | LF | | 6 | | | 6 |
| SUPERSTRUCTURE | | | | | | | |
| 107 | Steel Beam/Girder | LF | 1,322 | 460 | | | 1,782 |
| 1000 | <i>Corrosion</i> | LF | | 460 | | | 460 |
| 109 | Prestressed Concrete Open Girder/Beam | LF | 119,826 | 422 | 89 | 0 | 120,337 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | 208 | 23 | | 231 |
| 1090 | <i>Exposed Rebar</i> | LF | | 80 | 65 | | 145 |
| 1100 | <i>Exposed Prestressing</i> | LF | | 27 | | | 27 |



| BSB (1012) Element Level Data | | | | | | | |
|-------------------------------|----------------------------------|------|-------------------|-------------------|-------------------|-------------------|-------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| 1110 | Cracking (PSC) | LF | | 103 | 1 | | 104 |
| 1120 | Efflorescence/Rust Staining | LF | | 4 | | | 4 |
| 811 | Beam/Girder End | EA | 2,176 | 236 | 62 | 0 | 2,474 |
| 1080 | Delamination/Spall/ Patched Area | EA | | 144 | 17 | | 161 |
| 1090 | Exposed Rebar | EA | | 37 | 38 | | 75 |
| 1100 | Exposed Prestressing | EA | | 1 | 6 | | 7 |
| 1110 | Cracking (PSC) | EA | | 53 | 1 | | 54 |
| 1120 | Efflorescence/Rust Staining | EA | | 1 | | | 1 |
| BEARINGS | | | | | | | |
| 310 | Elastomeric Bearing | EA | 2,473 | 0 | 1 | 0 | 2,474 |
| 2230 | Bulging, Splitting, or Tearing | EA | | | 1 | | 1 |
| SUBSTRUCTURE | | | | | | | |
| 226 | Prestressed Concrete Pile | EA | 322 | 287 | 24 | 0 | 633 |
| 1080 | Delamination/Spall/ Patched Area | EA | | 3 | | | 3 |
| 1090 | Exposed Rebar | EA | | 9 | 6 | | 15 |
| 1110 | Cracking (PSC) | EA | | 268 | 6 | | 274 |
| 1120 | Efflorescence/Rust Staining | EA | | 6 | 12 | | 18 |
| 1190 | Abrasion/Wear (PSC/RC) | EA | | 1 | | | 1 |
| 234 | Reinforced Concrete Pier Cap | LF | 7,644 | 492 | 7 | 0 | 8,143 |
| 1080 | Delamination/Spall/ Patched Area | LF | | 13 | 1 | | 14 |
| 1090 | Exposed Rebar | LF | | | 6 | | 6 |
| 1120 | Efflorescence/Rust Staining | LF | | 2 | | | 2 |



| BSB (1012) Element Level Data | | | | | | | |
|---|--|------|-------------------|-------------------|-------------------|-------------------|---------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| 1130 | Cracking (RC and Other) | LF | | 477 | | | 477 |
| JOINTS | | | | | | | |
| 304 | Open Expansion Joint | LF | 2,717 | 3 | 0 | 0 | 2,720 |
| 2360 | Adjacent Deck or Header | LF | | 3 | | | 3 |
| 845 | Joint Effectiveness | EA | 68 | 0 | 0 | 0 | 68 |
| WEARING SURFACES, PROTECTIVE COATINGS, AND CONCRETE REINFORCING STEEL PROTECTIVE SYSTEMS | | | | | | | |
| 510 | Wearing Surfaces | SF | 665,504 | 7,531 | 1,030 | 0 | 674,065 |
| 3220 | Crack (Wearing Surface) | SF | | | 686 | | 686 |
| 3230 | Effectiveness (Wearing Surface) | SF | | 7,531 | 344 | | 7,875 |
| 515 | Steel Protective Coating | SF | 13,870 | 4,624 | 0 | 0 | 18,494 |
| 3440 | Effectiveness (Steel Protective Coating) | SF | | 4,624 | | | 4,624 |
| SLOPE AND CHANNEL ELEMENTS | | | | | | | |
| 854 | Channel | EA | 0 | 1 | 0 | 0 | 1 |
| 6000 | Scour | EA | | 1 | | | 1 |



5.5 Trestle CNB Element Level Data

Trestle CNB consists of Spans CNB 1-322. Spans 1-45 received a hands-on inspection this year (approximately 14% of the entire trestle). Element level data is presented in this section for all portions of the trestle that have received hands-on inspection since FY2018. An underwater inspection was performed on the entire trestle in FY2021, and element level data has been provided for all piles that were inspected along the trestle.

Table 55: CNB Element Level Data

| CNB (1009) Element Level Data | | | | | | | |
|-------------------------------|--|------|-------------------|-------------------|-------------------|-------------------|---------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| DECKS AND SLABS | | | | | | | |
| 16 | Reinforced Concrete Top Flange | SF | 734,666 | 3,182 | 502 | 0 | 738,350 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | SF | | 8 | 75 | | 83 |
| 1090 | <i>Exposed Rebar</i> | SF | | 1 | 3 | | 4 |
| 1120 | <i>Efflorescence/Rust Staining</i> | SF | | 396 | 400 | | 796 |
| 1130 | <i>Cracking (RC and Other)</i> | SF | | 2,777 | 24 | | 2,801 |
| 38 | Reinforced Concrete Slab | SF | 1,194 | 0 | 0 | 0 | 1,194 |
| RAILINGS | | | | | | | |
| 330 | Metal Bridge Railing | LF | 42,961 | 505 | 32 | 0 | 43,498 |
| 1020 | <i>Connection</i> | LF | | 19 | | | 19 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | 31 | 14 | | 45 |
| 1090 | <i>Exposed Rebar</i> | LF | | 5 | 9 | | 14 |
| 1130 | <i>Cracking (RC and Other)</i> | LF | | 415 | | | 415 |
| 7000 | <i>Damage</i> | LF | | 35 | 9 | | 44 |



| CNB (1009) Element Level Data | | | | | | | |
|-------------------------------|--|------|-------------------|-------------------|-------------------|-------------------|---------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| SUPERSTRUCTURE | | | | | | | |
| 109 | Prestressed Concrete Open Girder/Beam | LF | 167,788 | 6,462 | 944 | 0 | 175,194 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | 4,399 | 569 | | 4,968 |
| 1090 | <i>Exposed Rebar</i> | LF | | 25 | 88 | | 113 |
| 1100 | <i>Exposed Prestressing</i> | LF | | 27 | 176 | | 203 |
| 1110 | <i>Cracking (PSC)</i> | LF | | 1,981 | 11 | | 1,992 |
| 1120 | <i>Efflorescence/Rust Staining</i> | LF | | 30 | 100 | | 130 |
| 811 | Beam/Girder End | EA | 3,329 | 1,067 | 260 | 0 | 4,656 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | EA | | 87 | 145 | | 232 |
| 1090 | <i>Exposed Rebar</i> | EA | | 7 | 51 | | 58 |
| 1100 | <i>Exposed Prestressing</i> | EA | | 2 | 3 | | 5 |
| 1110 | <i>Cracking (PSC)</i> | EA | | 950 | 4 | | 954 |
| 1120 | <i>Efflorescence/Rust Staining</i> | EA | | 21 | 57 | | 78 |
| BEARINGS | | | | | | | |
| 310 | Elastomeric Bearing | EA | 4,119 | 32 | 505 | 0 | 4,656 |
| 1000 | <i>Corrosion</i> | EA | | 16 | | | 16 |
| 2220 | <i>Alignment</i> | EA | | 5 | | | 5 |
| 2230 | <i>Bulging, Splitting, or Tearing</i> | EA | | 11 | 505 | | 516 |
| 311 | Movable Bearing | EA | 0 | 8 | 0 | 0 | 8 |
| 1000 | <i>Corrosion</i> | EA | | 8 | | | 8 |



| CNB (1009) Element Level Data | | | | | | | |
|---|--|------|-------------------|-------------------|-------------------|-------------------|---------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| SUBSTRUCTURE | | | | | | | |
| 226 | Prestressed Concrete Pile | EA | 0 | 690 | 239 | 55 | 984 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | EA | | 37 | 73 | | 110 |
| 1090 | <i>Exposed Rebar</i> | EA | | 9 | 12 | | 21 |
| 1100 | <i>Exposed Prestressing</i> | EA | | | 3 | | 3 |
| 1110 | <i>Cracking (PSC)</i> | EA | | 204 | 15 | | 222 |
| 1120 | <i>Efflorescence/Rust Staining</i> | EA | | 94 | 98 | | 192 |
| 1190 | <i>Abrasion/Wear (PSC/RC)</i> | EA | | 78 | | | 78 |
| 6000 | <i>Scour</i> | EA | | 268 | 38 | 55 | 361 |
| 234 | Reinforced Concrete Pier Cap | LF | 8,248 | 2,391 | 22 | 0 | 10,661 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | 1 | 14 | | 15 |
| 1120 | <i>Efflorescence/Rust Staining</i> | LF | | 4 | 3 | | 7 |
| 1130 | <i>Cracking (RC and Other)</i> | LF | | 2,386 | 5 | | 2,391 |
| JOINTS | | | | | | | |
| 304 | Open Expansion Joint | LF | 10,168 | 0 | 0 | 0 | 10,168 |
| 845 | Joint Effectiveness | EA | 302 | 0 | 0 | 0 | 302 |
| WEARING SURFACES, PROTECTIVE COATINGS, AND CONCRETE REINFORCING STEEL PROTECTIVE SYSTEMS | | | | | | | |
| 510 | Wearing Surfaces | SF | 613,988 | 10 | 3 | 0 | 614,001 |
| 3230 | <i>Effectiveness (Wearing Surface)</i> | SF | | 10 | 3 | | 13 |
| 520 | Concrete Reinforcing Steel Protective System | SF | 1,979 | 0 | 0 | 0 | 1,979 |
| SLOPE AND CHANNEL ELEMENTS | | | | | | | |
| 854 | Channel | EA | 0 | 1 | 0 | 0 | 1 |
| 6000 | <i>Scour</i> | EA | | 1 | | | 1 |



5.6 Trestle CSB Element Level Data

Trestle CSB consists of Spans CSB 1-246. Spans 200-246 received a hands-on inspection this year (approximately 19% of the entire facility). Element level data is presented in this section for all portions of the trestle that have received hands-on inspection since FY2018. An underwater inspection was performed on the entire trestle in FY2018, and element level data has been provided for all piles that were inspected along the trestle.

Table 56: CSB Element Level Data

| CSB (1014) Element Level Data | | | | | | | |
|-------------------------------|--|------|-------------------|-------------------|-------------------|-------------------|---------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| DECKS AND SLABS | | | | | | | |
| 12 | Reinforced Concrete Deck | SF | 41,123 | 435 | 0 | 0 | 41,558 |
| 1120 | <i>Efflorescence/Rust Staining</i> | SF | | 435 | | | 435 |
| 16 | Reinforced Concrete Top Flange | SF | 715,409 | 273 | 18 | 0 | 898,906 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | SF | | 45 | 12 | | 35 |
| 1090 | <i>Exposed Rebar</i> | SF | | 3 | | | 3 |
| 1120 | <i>Efflorescence/Rust Staining</i> | SF | | 6 | 6 | | 12 |
| 1130 | <i>Cracking (RC and Other)</i> | SF | | 219 | | | 219 |
| RAILINGS | | | | | | | |
| 330 | Metal Bridge Railing | LF | 46,642 | 181 | 50 | 0 | 46,873 |
| 1020 | <i>Connection</i> | LF | | 62 | 1 | | 63 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | 33 | 19 | | 52 |
| 1090 | <i>Exposed Rebar</i> | LF | | 1 | 30 | | 31 |
| 1130 | <i>Cracking (RC and Other)</i> | LF | | 79 | | | 79 |
| 7000 | <i>Damage</i> | LF | | 6 | | | 6 |
| SUPERSTRUCTURE | | | | | | | |
| 107 | Steel Open Girder/Beam | LF | 493 | 419 | 0 | 0 | 912 |
| 1000 | <i>Corrosion</i> | LF | | 419 | | | 419 |



| CSB (1014) Element Level Data | | | | | | | |
|-------------------------------|--|------|-------------------|-------------------|-------------------|-------------------|---------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| 109 | Prestressed Concrete Open Girder/Beam | LF | 141,636 | 795 | 178 | 0 | 142,609 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | 375 | 71 | | 446 |
| 1090 | <i>Exposed Rebar</i> | LF | | 116 | 91 | | 207 |
| 1100 | <i>Exposed Prestressing</i> | LF | | 44 | 2 | | 46 |
| 1110 | <i>Cracking (PSC)</i> | LF | | 158 | | | 153 |
| 1120 | <i>Efflorescence/Rust Staining</i> | LF | | 102 | 13 | | 115 |
| 811 | Beam/Girder End | EA | 2,462 | 338 | 62 | 0 | 2,862 |
| 1000 | <i>Corrosion</i> | LF | | 16 | | | 16 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | EA | | 253 | 20 | | 273 |
| 1090 | <i>Exposed Rebar</i> | EA | | 55 | 41 | | 96 |
| 1100 | <i>Exposed Prestressing</i> | EA | | 9 | 1 | | 10 |
| 1110 | <i>Cracking (PSC)</i> | EA | | 21 | | | 21 |
| 1120 | <i>Efflorescence/Rust Staining</i> | EA | | 3 | 7 | | 10 |
| BEARINGS | | | | | | | |
| 310 | Elastomeric Bearing | EA | 2,847 | 14 | 1 | 0 | 2,862 |
| 1000 | <i>Corrosion</i> | EA | | 14 | | | 14 |
| 2230 | <i>Bulging, Splitting, or Tearing</i> | EA | | | 1 | | 1 |
| SUBSTRUCTURE | | | | | | | |
| 215 | Reinforced Concrete Abutment | LF | 40 | 0 | 0 | 0 | 40 |
| 226 | Prestressed Concrete Pile | EA | 309 | 321 | 78 | 44 | 752 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | EA | | 41 | 17 | | 56 |
| 1090 | <i>Exposed Rebar</i> | EA | | | 2 | | 2 |
| 1110 | <i>Cracking (PSC)</i> | EA | | 179 | | | 179 |
| 1120 | <i>Efflorescence/Rust Staining</i> | EA | | 4 | 12 | | 16 |
| 1190 | <i>Abrasion/Wear (PSC/RC)</i> | EA | | 26 | | | 26 |
| 6000 | <i>Scour</i> | EA | | 71 | 47 | 44 | 162 |



| CSB (1014) Element Level Data | | | | | | | |
|---|---|------|-------------------|-------------------|-------------------|-------------------|---------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| 234 | Reinforced Concrete Pier Cap | LF | 8,634 | 687 | 7 | 0 | 9,328 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | 12 | 4 | | 16 |
| 1090 | <i>Exposed Rebar</i> | LF | | | 1 | | 1 |
| 1120 | <i>Efflorescence/Rust Staining</i> | LF | | 28 | 2 | | 30 |
| 1130 | <i>Cracking (RC and Other)</i> | LF | | 647 | | | 647 |
| 824 | Reinforced Concrete Wingwall | EA | 2 | 0 | 0 | 0 | 2 |
| JOINTS | | | | | | | |
| 304 | Open Expansion Joint | LF | 2,680 | 0 | 0 | 0 | 2,680 |
| 845 | Joint Effectiveness | EA | 67 | 0 | 0 | 0 | 67 |
| APPROACH SLABS | | | | | | | |
| 321 | Reinforced Concrete Approach Slab | SF | 771 | 0 | 0 | 0 | 771 |
| WEARING SURFACES, PROTECTIVE COATINGS, AND CONCRETE REINFORCING STEEL PROTECTIVE SYSTEMS | | | | | | | |
| 510 | Wearing Surfaces | SF | 643,528 | 0 | 0 | 0 | 643,528 |
| 515 | Steel Protective Coating | SF | 8,994 | 419 | 0 | 10 | 9,413 |
| 3420 | <i>Peeling/Bubbling/ Cracking (Steel Protective Coatings)</i> | SF | | 419 | | | 419 |
| SLOPE AND CHANNEL ELEMENTS | | | | | | | |
| 853 | Protected Slope - Riprap | EA | 1 | 0 | 0 | 0 | 1 |
| 6507 | <i>Loss of Riprap</i> | EA | 1 | | | | 1 |
| 854 | Channel | EA | 0 | 1 | 0 | 0 | 1 |
| 6000 | <i>Scour</i> | EA | | 1 | | | 1 |



5.7 NCB-NB Element Level Data

NCB-NB consists of Spans 1-17. The entire structure received a routine and fracture critical inspection this year. Element level data is presented in this section. An underwater inspection was performed on the entire trestle in FY2022, and element level data has been provided for all piles that were inspected in this section.

Table 57: NCB-NB Element Level Data

| NCB-NB (1006) Element Level Data | | | | | | | |
|----------------------------------|---------------------------------|------|-------------------|-------------------|-------------------|-------------------|---------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| DECKS AND SLABS | | | | | | | |
| 12 | Reinforced Concrete Deck | SF | 109,562 | 6,749 | 16 | 0 | 116,327 |
| 1080 | Delamination/Spall/Patched Area | SF | | | 2 | | 2 |
| 1130 | Cracking (RC and Other) | SF | | 6,747 | 14 | | 6,761 |
| 1190 | Abrasion/Wear (PSC/RC) | SF | | 2 | | | 2 |
| RAILINGS | | | | | | | |
| 330 | Metal Bridge Railing | LF | 7,582 | 1 | 4 | 0 | 7,586 |
| 1080 | Delamination/Spall/Patched Area | LF | | | 1 | | 1 |
| 7000 | Damage | LF | | | 3 | | 3 |
| SUPERSTRUCTURE | | | | | | | |
| 107 | Steel Open Girder/Beam | LF | 1,411 | 5,362 | 158 | 0 | 6,931 |
| 1000 | Corrosion | LF | | 5,360 | 157 | | 5,517 |
| 1020 | Connection | LF | | 2 | 1 | | 3 |
| 113 | Steel Stringer | LF | 13,944 | 4,461 | 494 | 0 | 18,905 |
| 1000 | Corrosion | LF | | 4,467 | 494 | | 4,961 |
| 120 | Steel Truss | LF | 123 | 527 | 5 | 0 | 655 |
| 1000 | Corrosion | LF | | 527 | 5 | | 532 |
| 152 | Steel Floor Beam | LF | 2,655 | 1,626 | 635 | 0 | 4,916 |
| 1000 | Corrosion | LF | | 1,245 | 617 | | 1,862 |
| 1010 | Cracking | LF | | 353 | 12 | | 365 |
| 1020 | Connection | LF | | 28 | 6 | | 34 |
| 162 | Gusset Plate | EA | 30 | 10 | 0 | 0 | 40 |
| 1000 | Corrosion | EA | | 10 | | | 10 |



| NCB-NB (1006) Element Level Data | | | | | | | |
|----------------------------------|--|------|-------------------|-------------------|-------------------|-------------------|-------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| 811 | Beam/Girder End | EA | 7 | 48 | 11 | 0 | 66 |
| 1000 | <i>Corrosion</i> | EA | | 48 | 11 | | 59 |
| BEARINGS | | | | | | | |
| 311 | Movable Bearing | EA | 0 | 34 | 0 | 0 | 34 |
| 1000 | <i>Corrosion</i> | EA | | 34 | | | 34 |
| 313 | Fixed Bearing | EA | 0 | 10 | 0 | 0 | 10 |
| 1000 | <i>Corrosion</i> | EA | | 10 | | | 10 |
| SUBSTRUCTURE | | | | | | | |
| 205 | Reinforced Concrete Column | EA | 16 | 19 | 1 | 0 | 36 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | EA | | | 1 | | 1 |
| 1120 | <i>Efflorescence/Rust Staining</i> | EA | | 6 | | | 6 |
| 1130 | <i>Cracking (RC and Other)</i> | EA | | 13 | | | 13 |
| 226 | Prestressed Concrete Pile | EA | 2 | 4 | 30 | | 36 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | EA | | 3 | 6 | | 9 |
| 1120 | <i>Efflorescence/Rust Staining</i> | EA | | 1 | 7 | | 8 |
| 1130 | <i>Cracking (RC and Other)</i> | EA | | | 17 | | 17 |
| 234 | Reinforced Concrete Pier Cap | LF | 48 | 8 | 0 | 0 | 56 |
| 1130 | <i>Cracking (RC and Other)</i> | LF | | 8 | | | 8 |
| JOINTS | | | | | | | |
| 305 | Assembly Joint without Seal | LF | 144 | 24 | 0 | 0 | 168 |
| 2370 | <i>Metal Deterioration or Damage</i> | LF | | 24 | | | 24 |
| 845 | Joint Effectiveness | EA | 6 | 0 | 0 | 0 | 6 |



| NCB-NB (1006) Element Level Data | | | | | | | |
|--|---|------|-------------------|-------------------|-------------------|-------------------|---------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| WEARING SURFACES, PROTECTIVE COATINGS, AND CONCRETE REINFORCING STEEL | | | | | | | |
| PROTECTIVE SYSTEMS | | | | | | | |
| 515 | Steel Protective Coating | SF | 369,229 | 292 | 0 | 27,813 | 397,335 |
| 3420 | <i>Peeling/Bubbling/ Cracking (Steel Protective Coatings)</i> | SF | | 292 | | | 292 |
| 3440 | <i>Effectiveness (Steel Protective Coatings)</i> | SF | | | | 27,813 | 27,813 |
| 886 | Beam/Girder End Protective Coating - Steel | EA | 7 | 48 | 11 | 0 | 66 |
| 3440 | <i>Effectiveness (Steel Protective Coatings)</i> | EA | | 48 | 11 | | 59 |
| SLOPE AND CHANNEL ELEMENTS | | | | | | | |
| 854 | Channel | EA | 0 | 1 | 0 | 0 | 1 |
| 6000 | Scour | EA | | 1 | | | 1 |



5.8 NCB-SB Element Level Data

A hands-on inspection was performed in FY2021, and element level data is presented in this section. An underwater inspection was performed on the entire trestle in FY2020, and element level data has been provided for all piles that were inspected along the trestle.

Table 58: NCB-SB Element Level Data

| NCB-SB (1015) Element Level Data | | | | | | | |
|----------------------------------|--|------|-------------------|-------------------|-------------------|-------------------|---------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| DECKS AND SLABS | | | | | | | |
| 12 | Reinforced Concrete Deck | SF | 90,867 | 33,133 | 0 | 0 | 124,000 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | SF | | 17 | | | 17 |
| 1130 | <i>Cracking (RC and Other)</i> | SF | | 33,116 | | | 33,116 |
| RAILINGS | | | | | | | |
| 330 | Metal Bridge Railing | LF | 6,176 | 7 | 17 | 0 | 6,200 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | 2 | | | 2 |
| 1130 | <i>Cracking (RC and Other)</i> | LF | | 5 | | | 5 |
| 7000 | <i>Damage</i> | LF | | | 17 | | 17 |
| SUPERSTRUCTURE | | | | | | | |
| 107 | Steel Open Girder/Beam | LF | 11,204 | 1,194 | 2 | 0 | 12,400 |
| 1000 | <i>Corrosion</i> | EA | | 1,194 | 2 | | 1,196 |
| 811 | Steel Open Beam/Girder End | EA | 0 | 32 | 0 | 0 | 32 |
| 1000 | <i>Corrosion</i> | EA | | 32 | | | 32 |
| BEARINGS | | | | | | | |
| 311 | Movable Bearing | EA | 0 | 32 | 0 | 0 | 32 |
| 1000 | <i>Corrosion</i> | EA | | 32 | | | 32 |
| 313 | Fixed Bearing | EA | 10 | 30 | 0 | 0 | 40 |
| 1000 | <i>Corrosion</i> | EA | | 30 | | | 30 |



| NCB-SB (1015) Element Level Data | | | | | | | |
|----------------------------------|--|------|-------------------|-------------------|-------------------|-------------------|-------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| SUBSTRUCTURE | | | | | | | |
| 205 | Reinforced Concrete Column | EA | 8 | 20 | 2 | 0 | 30 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | EA | | 2 | 1 | | 3 |
| 1120 | <i>Efflorescence/Rust Staining</i> | EA | | | 1 | | 1 |
| 1130 | <i>Cracking (RC and Other)</i> | EA | | 18 | | | 18 |
| 220 | Reinforced Concrete Pile Cap/Footing | LF | 435 | 3 | 446 | 0 | 884 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | | 430 | | 430 |
| 1120 | <i>Efflorescence/Rust Staining</i> | LF | | | 16 | | 16 |
| 1130 | <i>Cracking (RC and Other)</i> | LF | | 3 | | | 3 |
| 226 | Prestressed Concrete Pile | EA | 133 | 39 | 32 | 15 | 219 |
| 6000 | <i>Scour</i> | EA | | 39 | 32 | 15 | 86 |
| 234 | Reinforced Concrete Pier Cap | LF | 411 | 129 | 0 | 0 | 540 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | 2 | | | 2 |
| 1120 | <i>Efflorescence/Rust Staining</i> | LF | | 23 | | | 23 |
| 1130 | <i>Cracking (RC and Other)</i> | LF | | 104 | | | 104 |
| JOINTS | | | | | | | |
| 305 | Assembly Joint without Seal | LF | 200 | 0 | 0 | 0 | 200 |
| 845 | Joint Effectiveness | EA | 5 | 0 | 0 | 0 | 5 |



| NCB-SB (1015) Element Level Data | | | | | | | |
|--|---|------|-------------------|-------------------|-------------------|-------------------|---------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| WEARING SURFACES, PROTECTIVE COATINGS, AND CONCRETE REINFORCING STEEL | | | | | | | |
| PROTECTIVE SYSTEMS | | | | | | | |
| 515 | Steel Protective Coating | SF | 295,198 | 4,462 | 0 | 10 | 299,670 |
| 3420 | <i>Peeling/Bubbling/ Cracking (Steel Protective Coatings)</i> | SF | | 4,461 | | | 4,461 |
| 3440 | <i>Effectiveness (Steel Protective Coatings)</i> | SF | | 1 | | 10 | 11 |
| 886 | Beam/Girder End Protective Coating - Steel | EA | 0 | 32 | 0 | 0 | 32 |
| SLOPE AND CHANNEL ELEMENTS | | | | | | | |
| 854 | Channel | EA | 0 | 1 | 0 | 0 | 1 |
| 6000 | <i>Scour</i> | EA | | 1 | | | 1 |



5.9 Trestle DNB Element Level Data

A hands-on inspection was performed in FY2021, and element level data is presented in this section.

Table 59: DNB Element Level Data

| DNB (1008) Element Level Data | | | | | | | |
|-------------------------------|--|------|-------------------|-------------------|-------------------|-------------------|--------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| DECKS AND SLABS | | | | | | | |
| 16 | Reinforced Concrete Top Flange | SF | 41,551 | 116 | 5 | 0 | 41,672 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | SF | | 3 | 2 | | 5 |
| 1090 | <i>Exposed Rebar</i> | SF | | | 1 | | 1 |
| 1120 | <i>Efflorescence/Rust Staining</i> | SF | | 107 | 2 | | 109 |
| 1130 | <i>Cracking (RC and Other)</i> | SF | | 6 | | | 6 |
| RAILINGS | | | | | | | |
| 330 | Metal Bridge Railing | LF | 2,489 | 62 | 0 | 0 | 2,551 |
| 1130 | <i>Cracking (RC and Other)</i> | LF | | 37 | | | 37 |
| 7000 | <i>Damage</i> | LF | | 25 | | | 25 |
| SUPERSTRUCTURE | | | | | | | |
| 109 | Prestressed Concrete Open Girder/Beam | LF | 9,916 | 209 | 79 | 0 | 10,204 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | 25 | 5 | | 30 |
| 1090 | <i>Exposed Rebar</i> | LF | | 4 | 15 | | 19 |
| 1100 | <i>Exposed Prestressing</i> | LF | | 4 | 49 | | 53 |
| 1110 | <i>Cracking (PSC)</i> | LF | | 173 | | | 173 |
| 1120 | <i>Efflorescence/Rust Staining</i> | LF | | 3 | 10 | | 13 |
| 811 | Beam/Girder End | EA | 195 | 87 | 6 | 0 | 288 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | EA | | 2 | | | 2 |
| 1090 | <i>Exposed Rebar</i> | EA | | 2 | 1 | | 3 |
| 1110 | <i>Cracking (PSC)</i> | EA | | 81 | | | 81 |
| 1120 | <i>Efflorescence/Rust Staining</i> | EA | | 2 | 5 | | 7 |



| DNB (1008) Element Level Data | | | | | | | |
|-------------------------------|--|------|-------------------|-------------------|-------------------|-------------------|-------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| BEARINGS | | | | | | | |
| 310 | Elastomeric Bearing | EA | 272 | 3 | 5 | | 280 |
| 2230 | <i>Bulging, Splitting, or Tearing</i> | EA | | 3 | 5 | | 8 |
| 311 | Movable Bearing | EA | | 8 | | | 8 |
| 1000 | <i>Corrosion</i> | EA | | 8 | | | 8 |
| SUBSTRUCTURE | | | | | | | |
| 215 | Reinforced Concrete Abutment | LF | 31 | 2 | 0 | 0 | 33 |
| 1130 | <i>Cracking (RC and Other)</i> | LF | | 2 | | | 2 |
| 226 | Prestressed Concrete Pile | EA | 0 | 37 | 14 | 0 | 51 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | EA | | | 4 | | 4 |
| 1090 | <i>Exposed Rebar</i> | EA | | | 7 | | 7 |
| 1110 | <i>Cracking (PSC)</i> | EA | | 34 | 1 | | 35 |
| 1120 | <i>Efflorescence/Rust Staining</i> | EA | | 2 | 2 | | 4 |
| 1190 | <i>Abrasion/Wear (PSC/RC)</i> | EA | | 1 | | | 1 |
| 234 | Reinforced Concrete Pier Cap | LF | 560 | 37 | 0 | 0 | 597 |
| 1130 | <i>Cracking (RC and Other)</i> | LF | | 37 | | | 37 |
| 824 | Reinforced Concrete Wingwall | EA | 2 | 0 | 0 | 0 | 2 |
| JOINTS | | | | | | | |
| 304 | Open Expansion Joint | LF | 588 | 0 | 0 | 0 | 588 |
| 2360 | <i>Adjacent Deck or Header</i> | LF | 588 | | | | 588 |
| 845 | Joint Effectiveness | EA | 18 | | | | 18 |
| APPROACH SLABS | | | | | | | |
| 321 | Reinforced Concrete Approach Slab | SF | 672 | 0 | 0 | 0 | 672 |



| DNB (1008) Element Level Data | | | | | | | |
|--|------------------------|------|-------------------|-------------------|-------------------|-------------------|--------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| WEARING SURFACES, PROTECTIVE COATINGS, AND CONCRETE REINFORCING STEEL | | | | | | | |
| PROTECTIVE SYSTEMS | | | | | | | |
| 510 | Wearing Surfaces | SF | 35,715 | 0 | 0 | 0 | 35,715 |
| SLOPE AND CHANNEL ELEMENTS | | | | | | | |
| 853 | Protected Slope Riprap | EA | 1 | | | | 1 |
| 6000 | Scour | EA | 1 | | | | 1 |
| 854 | Channel | EA | | 1 | | | 1 |
| 6000 | Scour | EA | | 1 | | | 1 |



5.10 Trestle DSB Element Level Data

A hands-on inspection was performed in FY2021, and element level data is presented in this section. An underwater inspection was performed on the entire trestle in FY2020, and element level data has been provided for all piles that were inspected along the trestle.

Table 60: DSB Element Level Data

| DSB (1016) Element Level Data | | | | | | | |
|-------------------------------|--|------|-------------------|-------------------|-------------------|-------------------|--------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| DECKS AND SLABS | | | | | | | |
| 12 | Reinforced Concrete Deck | SF | 76,275 | 7,256 | 0 | 0 | 83,531 |
| 1120 | <i>Efflorescence/Rust Staining</i> | SF | | 6 | | | 6 |
| 1130 | <i>Cracking (RC and Other)</i> | SF | | 7,250 | | | 7,250 |
| RAILINGS | | | | | | | |
| 330 | Metal Bridge Railing | LF | 4,166 | 6 | 5 | 0 | 4,177 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | 2 | 5 | | 7 |
| 1130 | <i>Cracking (RC and Other)</i> | LF | | 4 | | | 4 |
| SUPERSTRUCTURE | | | | | | | |
| 109 | Prestressed Concrete Open Girder/Beam | LF | 10,345 | 70 | 26 | 0 | 10,441 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | 33 | 26 | | 59 |
| 1090 | <i>Exposed Rebar</i> | LF | | 19 | | | 19 |
| 1110 | <i>Cracking (PSC)</i> | LF | | 18 | | | 18 |
| 811 | Beam/Girder End | EA | 119 | 65 | 26 | 0 | 210 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | EA | | 29 | 26 | | 55 |
| 1090 | <i>Exposed Rebar</i> | EA | | 18 | | | 18 |
| 1110 | <i>Cracking (PSC)</i> | EA | | 18 | | | 18 |
| BEARINGS | | | | | | | |
| 310 | Elastomeric Bearing | EA | 210 | 0 | 0 | 0 | 210 |
| SUBSTRUCTURE | | | | | | | |
| 215 | Reinforced Concrete Abutment | LF | 40 | 0 | 0 | 0 | 40 |



| DSB (1016) Element Level Data | | | | | | | |
|-----------------------------------|--|------|-------------------|-------------------|-------------------|-------------------|-------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| 226 | Prestressed Concrete Pile | EA | 5 | 36 | 15 | 4 | 60 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | EA | | 4 | 3 | | 7 |
| 1090 | <i>Exposed Rebar</i> | EA | | 7 | 1 | | 8 |
| 1110 | <i>Cracking (PSC)</i> | EA | | 23 | | | 23 |
| 1120 | <i>Efflorescence/Rust Staining</i> | EA | | | 1 | | 1 |
| 6000 | <i>Scour</i> | EA | | 2 | 10 | 4 | 16 |
| 234 | Reinforced Concrete Pier Cap | LF | 640 | 135 | 0 | 0 | 775 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | 1 | | | 1 |
| 1120 | <i>Efflorescence/Rust Staining</i> | LF | | 1 | | | 1 |
| 1130 | <i>Cracking (RC and Other)</i> | LF | | 133 | | | 133 |
| 824 | Reinforced Concrete Wingwall | EA | 2 | 0 | 0 | 0 | 2 |
| JOINTS | | | | | | | |
| 304 | Open Expansion Joint | LF | 280 | 0 | 0 | 0 | 280 |
| 845 | Joint Effectiveness | EA | 7 | 0 | 0 | 0 | 7 |
| SLOPE AND CHANNEL ELEMENTS | | | | | | | |
| 854 | Channel | EA | 0 | 1 | 0 | 0 | 1 |
| 6000 | <i>Scour</i> | EA | | 1 | | | 1 |



5.11 Trestle ENB, FIB-NB, & FNB Element Level Data

A hands-on inspection was performed in FY2021, and element level data is presented in this section. An underwater inspection was performed on the entire trestle in FY2020, and element level data has been provided for all piles that were inspected along the trestle.

Table 61: ENB, FIB-NB, & FNB Element Level Data

| ENB, FIB-NB, and FNB (1017) Element Level Data | | | | | | | |
|--|--|------|-------------------|-------------------|-------------------|-------------------|--------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| DECKS AND SLABS | | | | | | | |
| 12 | Reinforced Concrete Deck | SF | 17,540 | 860 | 0 | 0 | 18,400 |
| 1130 | <i>Cracking (RC and Other)</i> | SF | | 860 | | | 860 |
| 16 | Reinforced Concrete Top Flange | SF | 65,644 | 45 | 4 | 0 | 65,693 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | SF | | 12 | 4 | | 16 |
| 1090 | <i>Exposed Rebar</i> | LF | | 2 | | | 2 |
| 1130 | <i>Cracking (RC and Other)</i> | SF | | 31 | | | 31 |
| RAILINGS | | | | | | | |
| 330 | Metal Bridge Railing | LF | 4,185 | 15 | 5 | 0 | 4,205 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | 2 | 1 | | 3 |
| 1090 | <i>Exposed Rebar</i> | LF | | | 4 | | 4 |
| 1130 | <i>Cracking (RC and Other)</i> | LF | | 7 | | | 7 |
| 7000 | <i>Damage</i> | LF | | 6 | | | 6 |
| SUPERSTRUCTURE | | | | | | | |
| 107 | Steel Open Girder/Beam | LF | 1,656 | 180 | 0 | 0 | 1,836 |
| 1000 | <i>Corrosion</i> | LF | | 180 | | | 180 |
| 811 | Steel Open Beam/Girder End | EA | 0 | 8 | 0 | 0 | 8 |
| 1000 | <i>Corrosion</i> | EA | | 8 | | | 8 |



| ENB, FIB-NB, and FNB (1017) Element Level Data | | | | | | | |
|--|--|------|-------------------|-------------------|-------------------|-------------------|-------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| 109 | Prestressed Concrete Open Girder/Beam | LF | 9,787 | 64 | 3 | 0 | 9,854 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | 50 | 2 | | 52 |
| 1090 | <i>Exposed Rebar</i> | LF | | 12 | 1 | | 13 |
| 1100 | <i>Exposed Prestressing</i> | LF | | 1 | | | 1 |
| 1110 | <i>Cracking (PSC)</i> | LF | | 1 | | | 1 |
| 811 | Beam/Girder End | EA | 25 | 45 | 2 | 0 | 72 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | EA | | 39 | 2 | | 41 |
| 1090 | <i>Exposed Rebar</i> | EA | | 5 | | | 5 |
| 1110 | <i>Cracking (PSC)</i> | EA | | 1 | | | 1 |
| BEARINGS | | | | | | | |
| 310 | Elastomeric Bearing | EA | 204 | 0 | 0 | 0 | 204 |
| 311 | Movable Bearing | EA | 0 | 8 | 0 | 0 | 8 |
| 1000 | <i>Corrosion</i> | EA | | 8 | | | 8 |
| 313 | Fixed Bearing | EA | 0 | 8 | 0 | 0 | 8 |
| 1000 | <i>Corrosion</i> | EA | | 8 | | | 8 |
| SUBSTRUCTURE | | | | | | | |
| 215 | Reinforced Concrete Abutment | LF | 80 | 0 | 0 | 0 | 80 |
| 226 | Prestressed Concrete Pile | EA | 2 | 58 | 5 | 0 | 65 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | EA | | 1 | 2 | | 3 |
| 1090 | <i>Exposed Rebar</i> | EA | | 2 | | | 2 |
| 1110 | <i>Cracking (PSC)</i> | EA | | 52 | | | 52 |
| 1120 | <i>Efflorescence</i> | EA | | 2 | 3 | | 5 |
| 1190 | <i>Abrasion/Wear</i> | EA | | 1 | | | 1 |
| 234 | Reinforced Concrete Pier Cap | LF | 686 | 45 | 1 | 0 | 732 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | | 1 | | 1 |
| 1130 | <i>Cracking (RC and Other)</i> | LF | | 45 | | | 45 |



| ENB, FIB-NB, and FNB (1017) Element Level Data | | | | | | | |
|---|--|-----------|-------------------|-------------------|-------------------|-------------------|------------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| 824 | Reinforced Concrete Wingwall | EA | 4 | 0 | 0 | 0 | 4 |
| JOINTS | | | | | | | |
| 304 | Open Expansion Joint | LF | 320 | 0 | 0 | 0 | 320 |
| 305 | Assembly Joint without Seal | LF | 80 | 0 | 0 | 0 | 80 |
| 845 | Joint Effectiveness | EA | 10 | 0 | 0 | 0 | 10 |
| APPROACH SLABS | | | | | | | |
| 321 | Reinforced Concrete Approach Slab | SF | 1,440 | 0 | 0 | 0 | 1,440 |
| WEARING SURFACES, PROTECTIVE COATINGS, AND CONCRETE REINFORCING STEEL PROTECTIVE SYSTEMS | | | | | | | |
| 510 | Wearing Surfaces | SF | 59,124 | 0 | 0 | 0 | 59,124 |
| 515 | Steel Protective Coating | SF | 30,699 | 101 | 0 | 0 | 30,800 |
| 3440 | <i>Effectiveness (Steel Protective Coatings)</i> | <i>SF</i> | | <i>101</i> | | | <i>101</i> |
| 886 | Beam/Girder End Protective Coating - Steel | EA | 0 | 8 | 0 | 0 | 8 |
| 3440 | <i>Effectiveness (Steel Protective Coatings)</i> | <i>EA</i> | | <i>8</i> | | | <i>8</i> |
| SLOPE AND CHANNEL ELEMENTS | | | | | | | |
| 853 | Protected Slope Riprap | EA | 2 | 0 | 0 | 0 | 2 |
| 854 | Channel | EA | 0 | 1 | 0 | 0 | 1 |



5.12 Trestle ESB, FIB-SB, & FSB Element Level Data

A hands-on inspection was performed in FY2021 and an underwater inspection was performed in FY2022, and element level data is presented in this section.

Table 62: ESB, FIB-SB, & FSB Element Level Data

| ESB, FIB-SB, and FSB (1007) Element Level Data | | | | | | | |
|--|---------------------------------|------|-------------------|-------------------|-------------------|-------------------|--------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| DECKS AND SLABS | | | | | | | |
| 12 | Reinforced Concrete Deck | SF | 13,871 | 992 | 0 | 0 | 14,863 |
| 1130 | Cracking (RC and Other) | SF | | 992 | | | 992 |
| 16 | Reinforced Concrete Top Flange | SF | 53,830 | 101 | 17 | 0 | 53,948 |
| 1080 | Delamination/Spall/Patched Area | SF | | 5 | | | 5 |
| 1090 | Exposed Rebar | SF | | | 2 | | 2 |
| 1120 | Efflorescence/Rust Staining | SF | | 82 | 15 | | 97 |
| 1130 | Cracking (RC and Other) | SF | | 14 | | | 14 |
| RAILINGS | | | | | | | |
| 330 | Metal Bridge Railing | LF | 4,139 | 73 | 1 | 0 | 4,213 |
| 1080 | Delamination/Spall/Patched Area | LF | | 8 | 1 | | 9 |
| 1130 | Cracking (RC and Other) | LF | | 62 | | | 62 |
| 7000 | Damage | LF | | 3 | | | 3 |
| SUPERSTRUCTURE | | | | | | | |
| 107 | Steel Open Girder/Beam | LF | 0 | 1,817 | 3 | 0 | 1,820 |
| 1000 | Corrosion | LF | | 1,813 | 3 | | 1,816 |
| 1900 | Distortion | LF | | 4 | | | 4 |
| 811 | Steel Open Beam/Girder End | EA | 0 | 8 | 0 | 0 | 8 |
| 1000 | Corrosion | EA | | 8 | | | 8 |



| ESB, FIB-SB, and FSB (1007) Element Level Data | | | | | | | |
|--|--|------|-------------------|-------------------|-------------------|-------------------|--------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| 109 | Prestressed Concrete Open Girder/Beam | LF | 12,717 | 428 | 67 | 0 | 13,212 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | 151 | 28 | | 179 |
| 1090 | <i>Exposed Rebar</i> | LF | | 2 | 2 | | 4 |
| 1100 | <i>Exposed Prestressing</i> | LF | | 2 | 32 | | 34 |
| 1110 | <i>Cracking (PSC)</i> | LF | | 271 | 4 | | 275 |
| 1120 | <i>Efflorescence/Rust Staining</i> | LF | | 2 | 1 | | 3 |
| 811 | Prestressed Concrete Beam/Girder End | EA | 203 | 145 | 4 | 0 | 352 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | EA | | 2 | | | 2 |
| 1090 | <i>Exposed Rebar</i> | EA | | 1 | 1 | | 2 |
| 1100 | <i>Exposed Prestressing</i> | EA | | | 1 | | 1 |
| 1110 | <i>Cracking (PSC)</i> | EA | | 140 | 2 | | 142 |
| 1120 | <i>Efflorescence/Rust Staining</i> | EA | | 2 | | | 2 |
| BEARINGS | | | | | | | |
| 310 | Elastomeric Bearing | EA | 332 | 20 | 0 | 0 | 352 |
| 2230 | <i>Bulging, Splitting, or Tearing</i> | EA | | 20 | | | 20 |
| 311 | Movable Bearing | EA | 0 | 12 | 0 | 0 | 12 |
| 1000 | <i>Corrosion</i> | EA | | 12 | | | 12 |
| 313 | Fixed Bearing | EA | 0 | 4 | 0 | 0 | 4 |
| 1000 | <i>Corrosion</i> | EA | | 4 | | | 4 |
| SUBSTRUCTURE | | | | | | | |
| 215 | Reinforced Concrete Abutment | LF | 62 | 3 | 0 | 0 | 65 |
| 1130 | <i>Cracking (RC and Other)</i> | LF | | 3 | | | 3 |



| ESB, FIB-SB, and FSB (1007) Element Level Data | | | | | | | |
|---|--|------|-------------------|-------------------|-------------------|-------------------|--------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| 226 | Prestressed Concrete Pile | EA | 3 | 70 | 13 | 0 | 86 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | EA | | 2 | 1 | | 3 |
| 1090 | <i>Exposed Rebar</i> | EA | | 8 | 4 | | 12 |
| 1110 | <i>Cracking (PSC)</i> | EA | | 59 | 2 | | 61 |
| 1120 | <i>Efflorescence/Rust Staining</i> | EA | | 1 | 6 | | 7 |
| 234 | Reinforced Concrete Pier Cap | LF | 556 | 239 | 1 | 0 | 796 |
| 1080 | <i>Delamination/Spall/Patched Area</i> | LF | | 1 | | | 1 |
| 1120 | <i>Efflorescence/Rust Staining</i> | LF | | 7 | 1 | | 8 |
| 1130 | <i>Cracking (RC and Other)</i> | LF | | 231 | | | 231 |
| 824 | Reinforced Concrete Wingwall | EA | 4 | 0 | 0 | 0 | 4 |
| JOINTS | | | | | | | |
| 304 | Open Expansion Joint | LF | 689 | 10 | 20 | 0 | 719 |
| 2360 | <i>Adjacent Deck or Header</i> | LF | | 10 | 20 | | 30 |
| 305 | Assembly Joint without Seal | LF | 57 | 8 | 0 | 0 | 65 |
| 2370 | <i>Metal Deterioration or Damage</i> | LF | | 8 | | | 8 |
| 845 | Joint Effectiveness | EA | 24 | 0 | 0 | 0 | 24 |
| APPROACH SLABS | | | | | | | |
| 321 | Reinforced Concrete Approach Slab | SF | 1,344 | 0 | 0 | 0 | 1,344 |
| WEARING SURFACES, PROTECTIVE COATINGS, AND CONCRETE REINFORCING STEEL PROTECTIVE SYSTEMS | | | | | | | |
| 510 | Wearing Surfaces | SF | 45,691 | 550 | 0 | 0 | 46,241 |
| 3220 | <i>Crack (Wearing Surface)</i> | SF | | 259 | | | 259 |
| 3230 | <i>Effectiveness (Wearing Surface)</i> | SF | | 291 | | | 291 |



| ESB, FIB-SB, and FSB (1007) Element Level Data | | | | | | | |
|--|---|------|-------------------|-------------------|-------------------|-------------------|--------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| 515 | Steel Protective Coating | SF | 26,344 | 6,193 | 0 | 0 | 32,540 |
| 3440 | <i>Effectiveness (Steel Protective Coatings)</i> | SF | | 6,193 | | | 6,193 |
| 520 | Concrete Reinforcing Steel Protective System | SF | 5,524 | 0 | 0 | 63 | 5,587 |
| 3540 | <i>Effectiveness (Concrete Protective Coatings)</i> | SF | | | | 63 | 63 |
| 521 | Concrete Protective Coating | SF | 112 | 0 | 0 | 63 | 112 |
| 886 | Beam/Girder End Protective Coating - Steel | EA | 0 | 8 | 0 | 0 | 8 |
| 3440 | <i>Effectiveness (Steel Protective Coatings)</i> | EA | | 8 | | | 8 |
| SLOPE AND CHANNEL ELEMENTS | | | | | | | |
| 853 | Protected Slope Riprap | EA | 2 | 0 | 0 | 0 | 2 |
| 854 | Channel | EA | 1 | 0 | 0 | 0 | 1 |



6. Tunnel Inventory Items

The tables provided in this section reflect the current tunnel inventory data coded per the Specifications for the National Tunnel Inventory (SNTI) at the time of this inspection.



6.1 TSCT Inventory Items

Table 63: TSCT Identification Items

| TSCT Identification Items | | | |
|---------------------------|---|----------------------|----------|
| I.1 | Tunnel Number | CBBT0000000001R | AN15 |
| I.2 | Tunnel Name | Thimble Shoal Tunnel | AN100 |
| I.3 | State Code | 51 | N (2,0) |
| I.4 | County Code | 131 | N (3,0) |
| I.5 | Place Code | 12808 | N (5,0) |
| I.6 | Highway Agency District | HR | AN2 |
| I.7 | Route Number | 00013 | AN5 |
| I.8 | Route Direction | 0 | N (1,0) |
| I.9 | Route Type | 2 | N (1,0) |
| I.10 | Facility Carried | US13 | AN100 |
| I.11 | LRS Route ID | 000000001300 | AN120 |
| I.12 | LRS Mile Point | 43.06 | N (8,3) |
| I.13 | Tunnel Portal's Latitude | 0000000036.96620000 | N (11,8) |
| I.14 | Tunnel Portal's Longitude | 00000000076.11260000 | N (11,8) |
| I.15 | Border Tunnel State or Country Code | | AN2 |
| I.16 | Border Tunnel Financial Responsibility | | N (3,0) |
| I.17 | Border Tunnel Number | | AN15 |
| I.18 | Border Tunnel Inspection Responsibility | | N (1,0) |

Table 64: TSCT Age and Service Items

| TSCT Age and Service Items | | | |
|----------------------------|------------------------------------|--------|---------|
| A.1 | Year Built | 1964 | N (4,0) |
| A.2 | Year Rehabilitated | 2014 | N (4,0) |
| A.3 | Total Number of Lanes | 02 | N (2,0) |
| A.4 | Annual Average Daily Traffic | 011650 | N (6,0) |
| A.5 | Annual Average Daily Truck Traffic | 001065 | N (6,0) |
| A.6 | Year of Average Daily Traffic | 2021 | N (4,0) |
| A.7 | Detour Length | 425 | N (3,0) |
| A.8 | Service in Tunnel | 1 | N (1,0) |



Table 65: TSCT Classification Items

| TSCT Classification Items | | | |
|---------------------------|---------------------------|-------|---------|
| C.1 | Owner | 32 | N (2,0) |
| C.2 | Operator | 32 | N (2,0) |
| C.3 | Direction of Traffic | 2 | N (1,0) |
| C.4 | Toll | 2 | N (1,0) |
| C.5 | NHS Designation | 1 | N (1,0) |
| C.6 | STRAHNET Designation | 1 | N (1,0) |
| C.7 | Functional Classification | 2 | N (1,0) |
| C.8 | Urban Code | 90892 | N (5,0) |

Table 66: TSCT Geometric Data Items

| TSCT Geometric Data Items | | | |
|---------------------------|--|---------|---------|
| G.1 | Tunnel Length | 005738 | N (6,0) |
| G.2 | Minimum Vertical Clearance over Tunnel Roadway | 00013.5 | N (5,1) |
| G.3 | Roadway Width, Curb-to-Curb | 0024.0 | N (4,1) |
| G.4 | Left Sidewalk Width | 002.5 | N (3,1) |
| G.5 | Right Sidewalk Width | 000.0 | N (3,1) |

Table 67: TSCT Inspection Items

| TSCT Inspection Items | | | |
|-----------------------|--------------------------------|----------|---------|
| D.1 | Routine Inspection Target Date | 10012021 | D |
| D.2 | Actual Routine Inspection Date | 09162021 | D |
| D.3 | Routine Inspection Interval | 24 | N (2,0) |
| D.4 | In-Depth Inspection | 0 | N (1,0) |
| D.5 | Damage Inspection | 0 | N (1,0) |
| D.6 | Special Inspection | 0 | N (1,0) |



Table 68: TSCT Load Rating and Posting Items

| TSCT Load Rating and Posting Items | | | |
|------------------------------------|--------------------------------|------|---------|
| L.1 | Load Rating Method | 1 | AN1 |
| L.2 | Inventory Load Rating Factor | 0.63 | N (4,2) |
| L.3 | Operating Load Rating Factor | 1.05 | N (4,2) |
| L.4 | Tunnel Load Posting Status | A | AN1 |
| L.5 | Posting Load - Gross | | N (2,0) |
| L.6 | Posting Load - Axle | | N (2,0) |
| L.7 | Posting Load - Type 3 | | N (2,0) |
| L.8 | Posting Load - Type 3S2 | | N (2,0) |
| L.9 | Posting Load - Type 3-3 | | N (2,0) |
| L.10 | Height Restriction | 1 | N (1,0) |
| L.11 | Hazardous Material Restriction | 1 | N (1,0) |
| L.12 | Other Restrictions | 1 | N (1,0) |

Table 69: TSCT Navigation Items

| TSCT Navigation Items | | | |
|-----------------------|--|-------|---------|
| N.1 | Under Navigable Waterway | 1 | N (1,0) |
| N.2 | Navigable Waterway Clearance | 055.0 | N (3,1) |
| N.3 | Tunnel or Portal Island Protection from Navigation | 1 | N (1,0) |

Table 70: TSCT Structure Type and Materials Items

| TSCT Structure Type and Material Items | | | |
|--|-------------------|---|---------|
| S.1 | Number of Bores | 1 | N (1,0) |
| S.2 | Tunnel Shape | 4 | N (1,0) |
| S.3 | Portal Shapes | 3 | N (1,0) |
| S.4 | Ground Conditions | 1 | N (1,0) |
| S.5 | Complex | 1 | N (1,0) |



6.2 CCT Inventory Items

Table 71: CCT Identification Items

| CCT Identification Items | | | |
|--------------------------|---|---------------------------|----------|
| I.1 | Tunnel Number | CBBT000000000002 | AN15 |
| I.2 | Tunnel Name | Chesapeake Channel Tunnel | AN100 |
| I.3 | State Code | 51 | N (2,0) |
| I.4 | County Code | 131 | N (3,0) |
| I.5 | Place Code | 12808 | N (5,0) |
| I.6 | Highway Agency District | HR | AN2 |
| I.7 | Route Number | 00013 | AN5 |
| I.8 | Route Direction | 0 | N (1,0) |
| I.9 | Route Type | 2 | N (1,0) |
| I.10 | Facility Carried | US13 | AN100 |
| I.11 | LRS Route ID | 000000001300 | AN120 |
| I.12 | LRS Mile Point | 37.32 | N (8,3) |
| I.13 | Tunnel Portal's Latitude | 0000000037.03640000 | N (11,8) |
| I.14 | Tunnel Portal's Longitude | 00000000076.07680000 | N (11,8) |
| I.15 | Border Tunnel State or Country Code | | AN2 |
| I.16 | Border Tunnel Financial Responsibility | | N (3,0) |
| I.17 | Border Tunnel Number | | AN15 |
| I.18 | Border Tunnel Inspection Responsibility | | N (1,0) |

Table 72: CCT Age and Service Items

| CCT Age and Service Items | | | |
|---------------------------|------------------------------------|--------|---------|
| A.1 | Year Built | 1964 | N (4,0) |
| A.2 | Year Rehabilitated | 2019 | N (4,0) |
| A.3 | Total Number of Lanes | 02 | N (2,0) |
| A.4 | Annual Average Daily Traffic | 011650 | N (6,0) |
| A.5 | Annual Average Daily Truck Traffic | 001065 | N (6,0) |
| A.6 | Year of Average Daily Traffic | 2021 | N (4,0) |
| A.7 | Detour Length | 425 | N (3,0) |
| A.8 | Service in Tunnel | 1 | N (1,0) |



Table 73: CCT Classification Items

| CCT Classification Items | | | |
|--------------------------|---------------------------|-------|---------|
| C.1 | Owner | 32 | N (2,0) |
| C.2 | Operator | 32 | N (2,0) |
| C.3 | Direction of Traffic | 2 | N (1,0) |
| C.4 | Toll | 2 | N (1,0) |
| C.5 | NHS Designation | 1 | N (1,0) |
| C.6 | STRAHNET Designation | 1 | N (1,0) |
| C.7 | Functional Classification | 2 | N (1,0) |
| C.8 | Urban Code | 90892 | N (5,0) |

Table 74: CCT Geometric Data Items

| CCT Geometric Data Items | | | |
|--------------------------|--|---------|---------|
| G.1 | Tunnel Length | 005424 | N (6,0) |
| G.2 | Minimum Vertical Clearance over Tunnel Roadway | 00013.5 | N (5,1) |
| G.3 | Roadway Width, Curb-to-Curb | 0024.0 | N (4,1) |
| G.4 | Left Sidewalk Width | 002.5 | N (3,1) |
| G.5 | Right Sidewalk Width | 000.0 | N (3,1) |

Table 75: CCT Inspection Items

| CCT Inspection Items | | | |
|----------------------|--------------------------------|----------|---------|
| D.1 | Routine Inspection Target Date | 10012016 | D |
| D.2 | Actual Routine Inspection Date | 09232020 | D |
| D.3 | Routine Inspection Interval | 24 | N (2,0) |
| D.4 | In-Depth Inspection | 0 | N (1,0) |
| D.5 | Damage Inspection | 0 | N (1,0) |
| D.6 | Special Inspection | 0 | N (1,0) |



Table 76: CCT Load Rating and Posting Items

| CCT Load Rating and Posting Items | | | |
|-----------------------------------|--------------------------------|------|---------|
| L.1 | Load Rating Method | 1 | AN1 |
| L.2 | Inventory Load Rating Factor | 0.63 | N (4,2) |
| L.3 | Operating Load Rating Factor | 1.05 | N (4,2) |
| L.4 | Tunnel Load Posting Status | A | AN1 |
| L.5 | Posting Load - Gross | | N (2,0) |
| L.6 | Posting Load - Axle | | N (2,0) |
| L.7 | Posting Load - Type 3 | | N (2,0) |
| L.8 | Posting Load - Type 3S2 | | N (2,0) |
| L.9 | Posting Load - Type 3-3 | | N (2,0) |
| L.10 | Height Restriction | 1 | N (1,0) |
| L.11 | Hazardous Material Restriction | 1 | N (1,0) |
| L.12 | Other Restrictions | 1 | N (1,0) |

Table 77: CCT Navigation Items

| CCT Navigation Items | | | |
|----------------------|--|-------|---------|
| N.1 | Under Navigable Waterway | 1 | N (1,0) |
| N.2 | Navigable Waterway Clearance | 055.0 | N (3,1) |
| N.3 | Tunnel or Portal Island Protection from Navigation | 1 | N (1,0) |

Table 78: CCT Structure Type and Material Items

| CCT Structure Type and Material Items | | | |
|---------------------------------------|-------------------|---|---------|
| S.1 | Number of Bores | 1 | N (1,0) |
| S.2 | Tunnel Shape | 4 | N (1,0) |
| S.3 | Portal Shapes | 3 | N (1,0) |
| S.4 | Ground Conditions | 1 | N (1,0) |
| S.5 | Complex | 1 | N (1,0) |



7. Tunnel Element Level Data

The tables provided in this section display the tunnel elements and condition states coded per the Specifications for the National Tunnel Inventory (SNTI) at the time of this inspection.



7.1 Thimble Shoal Channel Tunnel - Element Level Data

Table 79: TSCT Element Level Data

| TSCT Element Level Data | | | | | | | |
|-----------------------------------|------------------------------------|------|-------------------|-------------------|-------------------|-------------------|---------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| STRUCTURAL SECTION | | | | | | | |
| 10002 | Precast Concrete Tunnel Liner | SF | 610,787 | 1,040 | 1,073 | 0 | 612,900 |
| 10051 | Concrete Portal | SF | 3,256 | 20 | 10 | | 3,286 |
| 10061 | Concrete Ceiling Slab | SF | 149,988 | 178 | 19 | | 149,188 |
| 10080 | Steel Hangers and Anchorages | EA | 469 | | | | 469 |
| 10101 | Concrete Invert Slab | SF | 118,056 | 17,010 | 2,646 | | 137,712 |
| 10132 | Compression Joint Seal | LF | 184 | | | | 184 |
| CIVIL SECTION | | | | | | | |
| 10158 | Asphalt Wearing Surface | SF | 128,627 | | | | 128,627 |
| 10161 | Concrete Traffic Barrier | LF | 11,475 | 1 | | | 11,476 |
| 10170 | Steel Pedestrian Railing | LF | 0 | 5,710 | 28 | | 5,738 |
| 10950 | Steel Corrosion Protective Coating | SF | | 6,422 | | 714 | 7,136 |
| MECHANICAL SYSTEMS SECTION | | | | | | | |
| 10200 | Ventilation System | EA | 0 | 2 | | | 2 |
| 10201 | Fans | EA | 0 | 11 | 1 | | 12 |
| 10300 | Drainage and Pumping System | EA | 3 | | | | 3 |
| 10301 | Pumps | EA | 13 | | | | 13 |
| 10400 | Emergency Generator System | EA | 2 | | | | 2 |



| TSCT Element Level Data | | | | | | | |
|--|---------------------------------------|------|-------------------|-------------------|-------------------|-------------------|-------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| ELECTRICAL AND LIGHTING SYSTEMS SECTION | | | | | | | |
| 10500 | Electrical Distribution System | EA | 0 | 1 | | | 1 |
| 10550 | Emergency Distribution System | EA | 2 | | | | 2 |
| 10600 | Tunnel Lighting Systems | EA | 2 | | | | 2 |
| 10601 | Tunnel Lighting Fixture | EA | 1,452 | 1 | | | 1,453 |
| 10620 | Emergency Lighting System | EA | 2 | | | | 2 |
| FIRE/LIFE SAFETY/SECURITY SYSTEMS SECTION | | | | | | | |
| 10650 | Fire Detection System | EA | 1 | | | | 1 |
| 10700 | Fire Protection System | EA | 1 | | | | 1 |
| 10750 | Emergency Communication System | EA | 1 | | | | 1 |
| 10800 | Tunnel Operations and Security System | EA | 1 | | | | 1 |
| SIGNS SECTION | | | | | | | |
| 10850 | Traffic Sign | EA | 19 | | | | 19 |
| 10910 | Lane Signal | EA | 2 | | | | 2 |



7.2 Chesapeake Channel Tunnel - Element Level Data

Table 80: CCT Element Level Data

| CCT Element Level Data | | | | | | | |
|-----------------------------------|---|-----------|-------------------|-------------------|-------------------|-------------------|--------------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| STRUCTURAL SECTION | | | | | | | |
| 10002 | Precast Concrete Tunnel Liner | SF | 574,447 | 2,621 | 1,545 | 695 | 579,307 |
| 10051 | Concrete Portal | SF | 3,266 | 20 | | | 3,286 |
| 10061 | Concrete Ceiling Slab | SF | 140,544 | 429 | 38 | | 141,011 |
| 10080 | Steel Hangers and Anchorages | EA | 446 | | | | 446 |
| 10101 | Concrete Invert Slab | SF | 95,606 | 33,881 | 631 | 46 | 130,164 |
| 10132 | Compression Joint Seal | LF | 184 | | | | 184 |
| CIVIL SECTION | | | | | | | |
| 10158 | Asphalt Wearing Surface | SF | 121,569 | 8 | | | 121,577 |
| 10161 | Concrete Traffic Barrier | LF | 10,821 | 7 | 19 | | 10,847 |
| 10170 | Steel Pedestrian Railing | LF | 4,881 | 543 | | | 5,424 |
| 10950 | <i>Steel Corrosion Protective Coating</i> | <i>SF</i> | <i>6,070</i> | | | <i>674</i> | <i>6,744</i> |
| MECHANICAL SYSTEMS SECTION | | | | | | | |
| 10200 | Ventilation System | EA | 1 | 1 | | | 2 |
| 10201 | Fans | EA | 3 | 9 | | | 12 |
| 10300 | Drainage and Pumping System | EA | 3 | | | | 3 |
| 10301 | Pumps | EA | 13 | | | | 13 |
| 10400 | Emergency Generator System | EA | 2 | | | | 2 |



| CCT Element Level Data | | | | | | | |
|--|---------------------------------------|------|-------------------|-------------------|-------------------|-------------------|-------|
| Element Number | Element Name | Unit | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 | Total |
| ELECTRICAL AND LIGHTING SYSTEMS SECTION | | | | | | | |
| 10500 | Electrical Distribution System | EA | 1 | | | | 1 |
| 10550 | Emergency Distribution System | EA | 2 | | | | 2 |
| 10600 | Tunnel Lighting Systems | EA | 2 | | | | 2 |
| 10601 | Tunnel Lighting Fixture | EA | 1,382 | | | | 1,382 |
| 10620 | Emergency Lighting System | EA | 2 | | | | 2 |
| FIRE/LIFE SAFETY/SECURITY SYSTEMS SECTION | | | | | | | |
| 10650 | Fire Detection System | EA | 1 | | | | 1 |
| 10700 | Fire Protection System | EA | 1 | 1 | | | 2 |
| 10750 | Emergency Communication System | EA | 1 | | | | 1 |
| 10800 | Tunnel Operations and Security System | EA | 1 | | | | 1 |
| SIGNS SECTION | | | | | | | |
| 10850 | Traffic Sign | EA | 3 | | | | 3 |
| 10870 | Egress Sign | EA | 67 | | | | 67 |

8. Photographs

8.1 Trestle ANB Photographs



Photo 1: ANB36 Asphalt Wearing Surface – Typical Good Condition of Wearing Surface (Looking North)



Photo 2: ANB37 Concrete Curb – Typical Good Condition of Concrete Curbs (Looking Southeast)



Photo 3: ANB37 Prestressed Concrete Girder – Spalling with Exposed Reinforcement in Bottom Flange of Girder 3 Beam End, Defect represents $<0.1\%$ of Total Quantity (Looking Southeast)



Photo 4: ANB37 Prestressed Concrete Girder – Spall with Two Exposed Strands in Bottom Flange of Girder 3, Defect Represents $<0.1\%$ of (Looking Northeast)



Photo 5: ANB77 Prestressed Concrete Girder – Spall with Exposed Strand in Bottom Flange of Girder 8, Defect Represents <0.1% of Total Quantity (Looking Northwest)



Photo 6: ANB37 Pile C – Missing Bottom Section of Protective Jacket (Looking Southeast)

8.2 Trestle ASB Photographs



Photo 7: ASB182 Asphalt Wearing Surface – Typical Good Condition of Wearing Surface (Looking South)



Photo 8: Open Expansion Joint – Typical Good Condition of Open Expansion Joint (Looking East)

8.3 Trestle BNB Photographs



Photo 9: BNB4 Reinforced Concrete Top Flange and Metal Bridge Railing – Typical Good Condition (Looking North)



Photo 10: BNB4 Metal Bridge Railing – Corrosion with Section Loss of Rail Post Connections (Looking Southeast)



Photo 11: BNB Approach – Typical Condition of Approach Barrier Transition (Looking Southeast)



Photo 12: BNB1 Joint – General Good Condition of Expansion Joint (Looking Southeast)



Photo 13: BNB1/3 Steel Superstructure – Typical Condition of Steel Superstructure with Minor Surface Corrosion (Looking South)



Photo 14: BNB1 Reinforced Concrete Abutment – Typical Good Condition of Abutment (Looking Southwest)



Photo 15: BNB3 Prestressed Girder – Delamination in Bottom Flange of Girder 4 (Looking East)



Photo 16: BNB3 Prestressed Girder – Delamination in Bottom Flange of Girder 3 at Bent 3 (Looking South)



Photo 17: BNB29 Prestressed Concrete Girder – Spall with Exposed Prestressing Strand in Girder 2 in Zone 1 (Looking Southeast)



Photo 18: BNB3 Prestressed Concrete Pile – Moderate Cracking and Spalling in Pile C (Looking South)



Photo 19: BNB7 Prestressed Concrete Pile – Spalling with Exposed Reinforcing on West Face of Pile A (Looking North)



Photo 20: BNB7 Reinforced Concrete Pier Cap – Spalling with Exposed Reinforcement on East Face (Looking Northwest)



Photo 21: BNB25 Prestressed Concrete Pile – Spall with Exposed Reinforcement at Top of Pile C (Looking East)



Photo 22: BNB40 Prestressed Concrete Pile – Spall with Exposed Reinforcement at Top of Pile C (Looking West)

8.4 Trestle BSB Photographs



Photo 23: BSB186 Asphalt Wearing Surface – Typical Good Condition (Looking North)



Photo 24: BSB16 Reinforced Concrete Top Flange – Typical Satisfactory Condition with Typical Transverse Cracking (Looking Southwest)



Photo 25: BSB16 Metal Bridge Railing – Typical Good Condition (Looking Southwest)



Photo 26: BSB1 Superstructure – Typical Good Condition with Isolated Areas of Surface Corrosion (Looking Southeast)



Photo 27: BSB1 Abutment – Typical Condition with Isolated Areas of Rust Stains (Looking South)



Photo 28: BSB186 Prestressed Concrete Pile – Hairline Cracking with Minor Efflorescence in Pile C (Looking Northeast)



Photo 29: BSB186 Reinforced Concrete Pier Cap – Typical Minor Cracking with Efflorescence (Looking North)

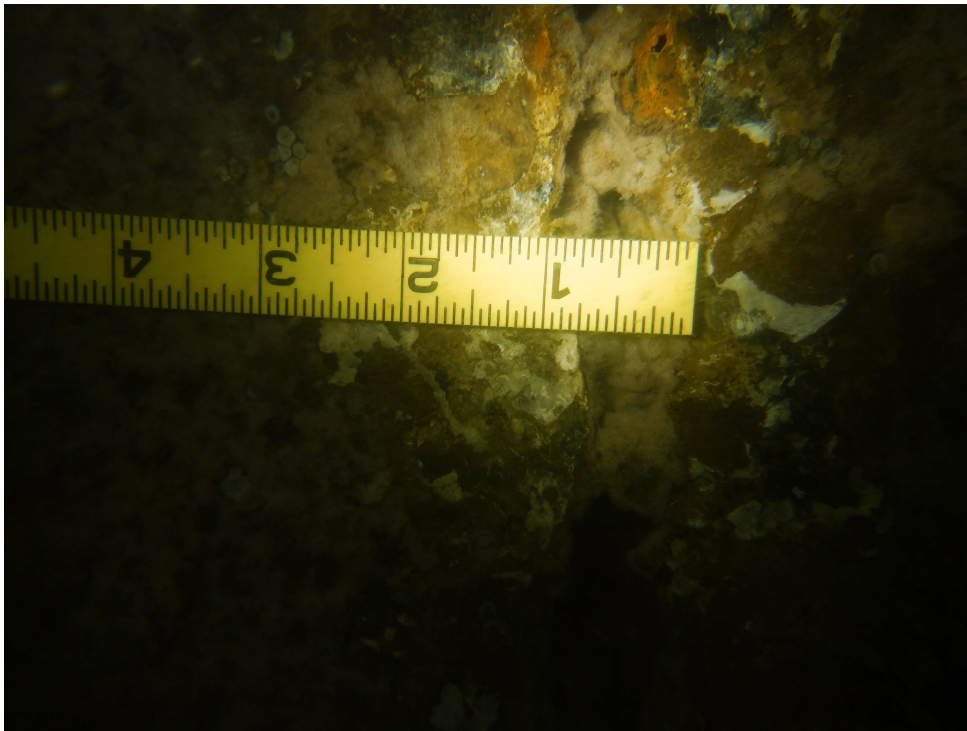


Photo 30: BSB101 Pile C – Minor Cracking in South Face (Looking North)



Photo 31: BSB101 Pile C – Minor Cracking in South Face (Looking North)

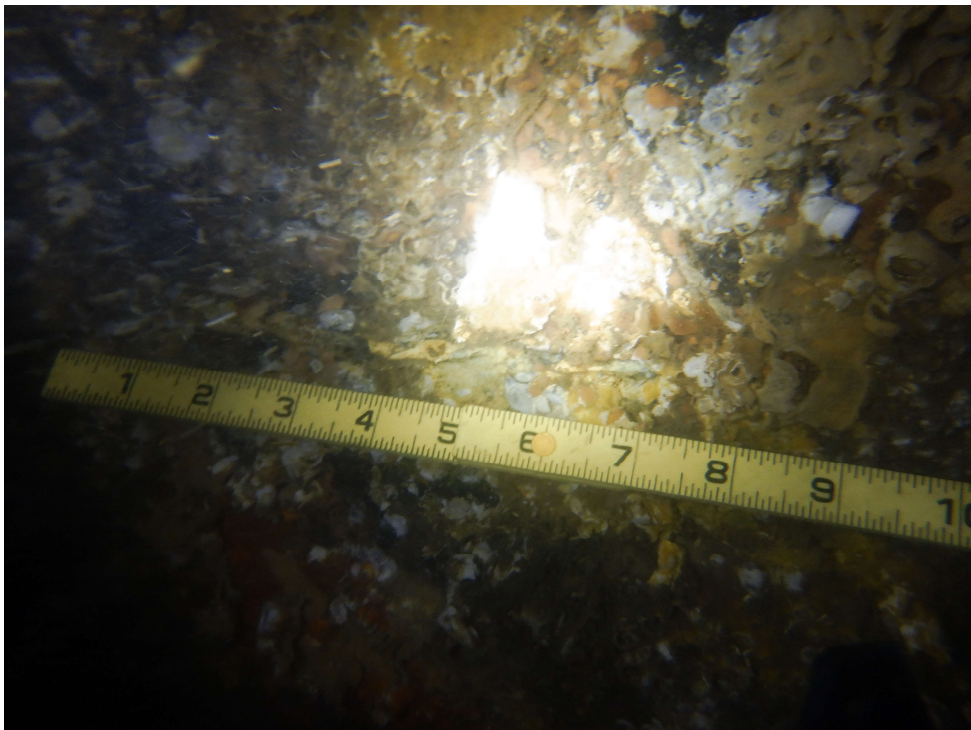


Photo 32: BSB125 Pile A – Spall in North Face, 25' below Water Line, Defect is Worst Case Defect (Looking Southwest)

8.5 Trestle CNB Photographs



Photo 33: CNB1 Abutment – Typical Condition of Abutment and Riprap Protection (Looking Southeast)



Photo 34: CNB1 Abutment – Typical Condition of Abutment and Riprap Protection (Looking Southwest)



Photo 35: CNB40 Prestressed Girder – Spalling with Exposed and Broken Strands at Girder 5 (Worst Case Observed) (Looking Southeast)



Photo 36: CNB13 Prestressed Girder 1 – Typical Sound Patch, Defect Represents 2.5% of Total Quantity (Looking Southeast)



Photo 37: CNB3 Elastomeric Bearing – Deformed Elastomeric Bearing at Bent 4 for Beam 6 (Looking Northwest)



Photo 38: CNB8 Reinforced Concrete Pier Cap – Spalling with Exposed Reinforcement at Base of Cap over Pile A (Looking North)

8.6 Trestle CSB Photographs



Photo 39: CSB232 – Typical Good Condition of Deck and Bridge Railing at EPO (Looking Southwest)



Photo 40: CSB246 – Typical Good Condition of Top of Deck and Bridge Railing (Looking Southwest)



Photo 40: CSB234 – General Good Condition of Superstructure and Substructure (Looking North)



Photo 41: CSB 201 Prestressed Girder 6– Hairline Cracking with Light Efflorescence (Looking North)



Photo 42: CSB227 Prestressed Concrete Girder – Delaminated Concrete at Bottom Flange of Girder 3

8.7 NCB-NB Photographs



Photo 43: NCB-NB1- Typical Condition of Finger Joint

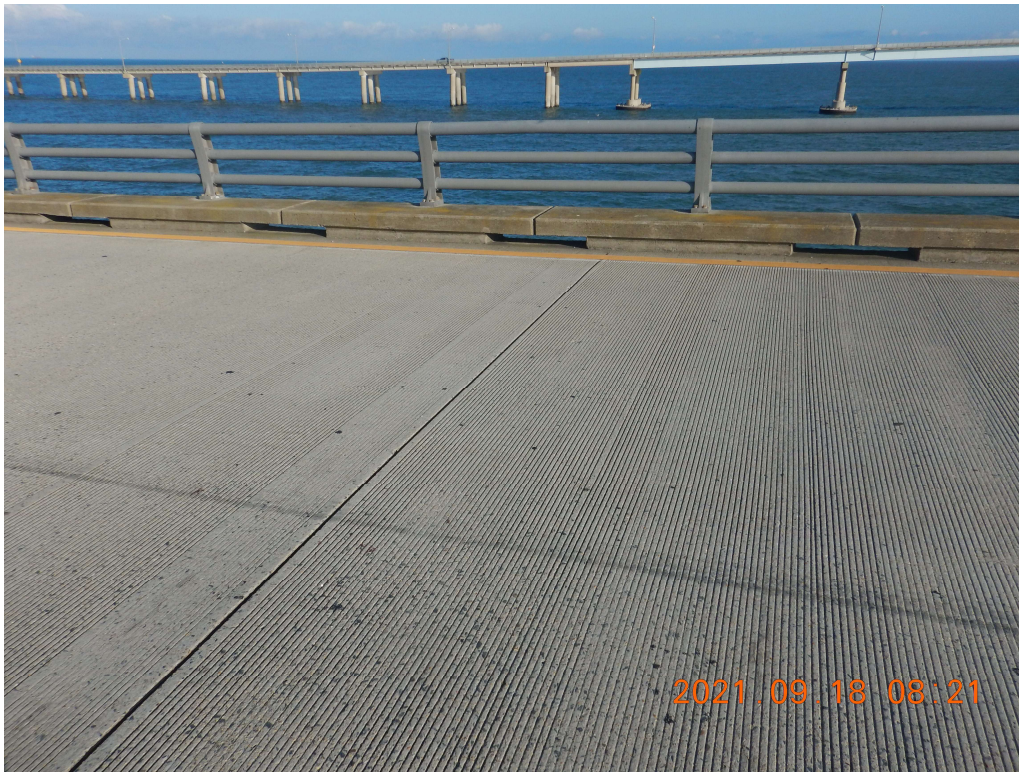


Photo 44: NCB-NB Deck and Railing- Typical Condition of Deck and Railing over Pier 2



Photo 45: NCB-NB9- Deck patch adjacent to joint in satisfactory condition



Photo 46: NCB-NB10- Peeling Paint with Minor to Moderate Corrosion of Access Ladder at Pier 10



Photo 47: NCB-NB FB3'- Corrosion Holes in Web of Floorbeam at Stringer 1



Photo 48: NCB-NB FB3' – Corrosion Holes in Transverse Stiffeners at Stringer 1



8.8 NCB-SB Photographs

Not inspected this year, will be inspected in FY2023.



8.9 Trestle DNB Photographs

Not inspected this year, will be inspected in FY2023.



8.10 Trestle DSB Photographs

Not inspected this year, will be inspected in FY2023.



8.11 Trestle ENB, FIB-NB, & FNB Photographs

Not inspected this year, will be inspected in FY2023.

8.12 Trestle ESB, FIB-SB, & FSB Photographs



Photo 49: FIB-SB Bent 3, Pile C– Missing Fiberglass Jacket and Grout Annulus with Exposed Fiber Mesh

8.13 TSCT Photographs



Photo 50: TSCT North Portal –Typical Good Condition with Isolated Areas of Minor Degradation (Looking Southeast)



Photo 51: TSCT South Portal –Typical Good Condition with Isolated Areas of Minor Degradation (Looking Northwest)



Photo 52: TSCT Island 1 Control Room –Typical Condition of Camera Control Room



Photo 53: TSCT Island 1 Fans –Typical Good Condition



Photo 54: TSCT Island 2 Fans –HMI for New Ventilation Fan MCCs



Photo 55: TSCT Fans –Typical New Ventilation Fan MCC Controls on Front Panel



Photo 56: TSCT Pumps –General View of Mid-channel Pump Room



Photo 57: TSCT Pumps –Typical Good Condition of Mid-channel Pump #2



Photo 58: TSCT Island 1 –ATS Status Indicators during Emergency Testing Phase



Photo 59: TSCT Lighting –Typical Condition of Emergency Lighting at Island 2 Portal (Looking South)



Photo 60: TSCT Island 2 Open Approach –Typical Satisfactory Condition with Minor Cracking with Efflorescence (Looking East)



Photo 61: TSCT Island 1 Open Approach –Typical Satisfactory Condition with Minor Cracking, some Efflorescence and Rust Stains (Looking West)



Photo 62: TSCT Tunnel Liner –STA 191+00 Minor Spalling with Exposed reinforcement (Looking East)



Photo 63: TSCT Tunnel Liner –STA 231+20 in Exhaust Duct Hairline Cracking with Heavy Efflorescence (Looking East)



Photo 64: TSCT Roadway – STA193+50 Random Edge Spalling with Exposed Reinforcement along Roadway Curb, Worst Case Scenario (Looking North)



Photo 65: TSCT Roadway –STA 235+20 Cracked Ceiling Tiles with Minor to Moderate Rust Staining, Worst Case Scenario (Looking East)



Photo 66: TSCT Steel Railing – STA203+50 Missing toe board and post, Worst Case Location (Looking Northeast)



Photo 67: TSCT Supply Duct, Island 1 – Typical Good Condition of Fan Supply Duct Shaft; Note Open Access Door for Ventilation



Photo 69: TSCT Invert Slab – STA197+40 Repaired Spall with Fiber Wrap on Underside of Invert Slab



Photo 70: TSCT Invert Slab – STA197+40 Repaired Spall with Fiber Wrap on Underside of Invert Slab



8.14 CCT Photographs

Not inspected this year, will be inspected in FY2023.

8.15 General Facility



Photo 67: North Toll Plaza (Looking South)



Photo 68: North Toll Plaza Maintenance BUildings (Looking Southeast)



Photo 69: North Toll Plaza Rest Area Building (Looking Northwest)



Photo 70: South Toll Plaza Garage (Looking North)

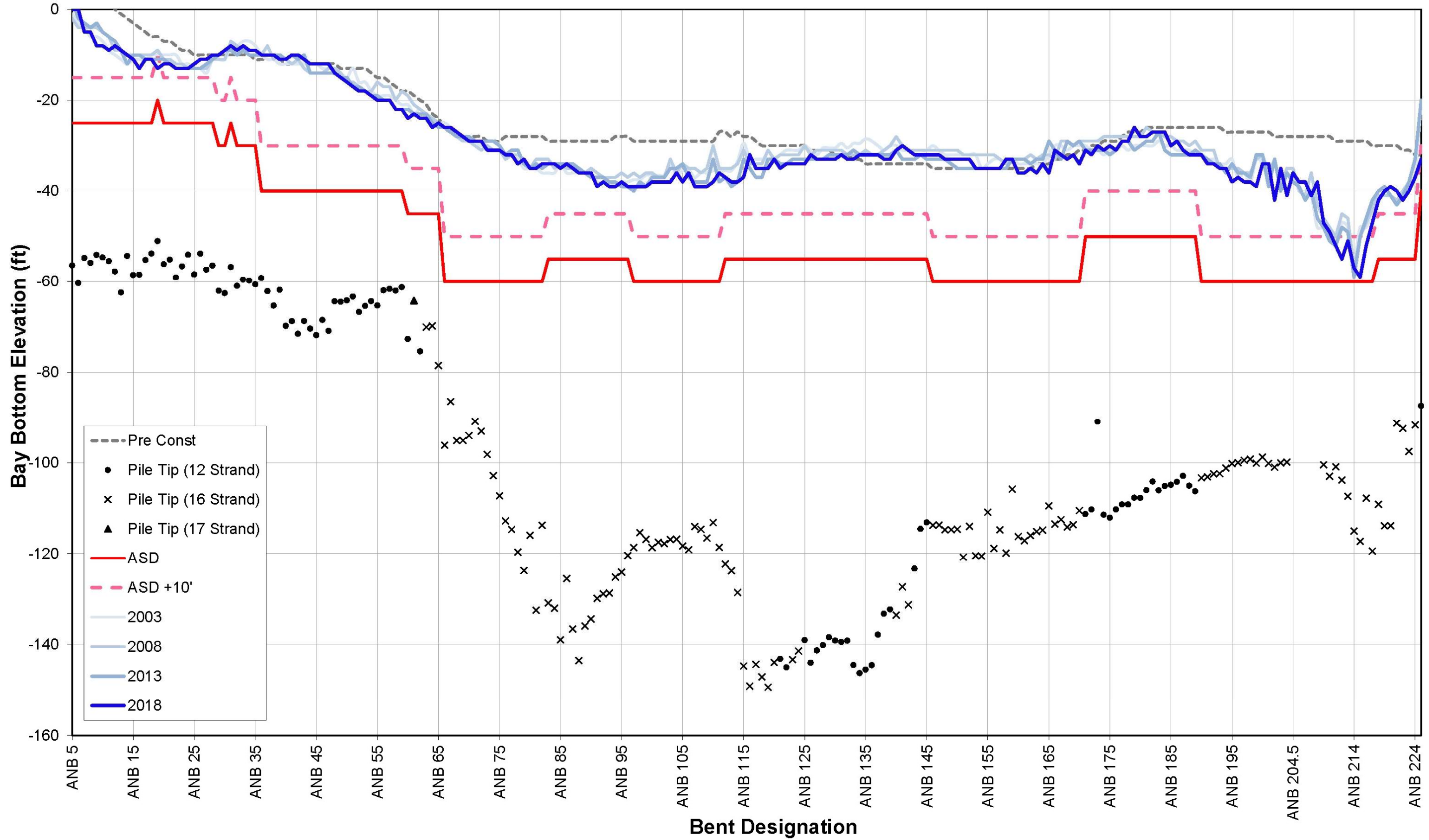


Photo 71: South Toll Plaza (Looking East)

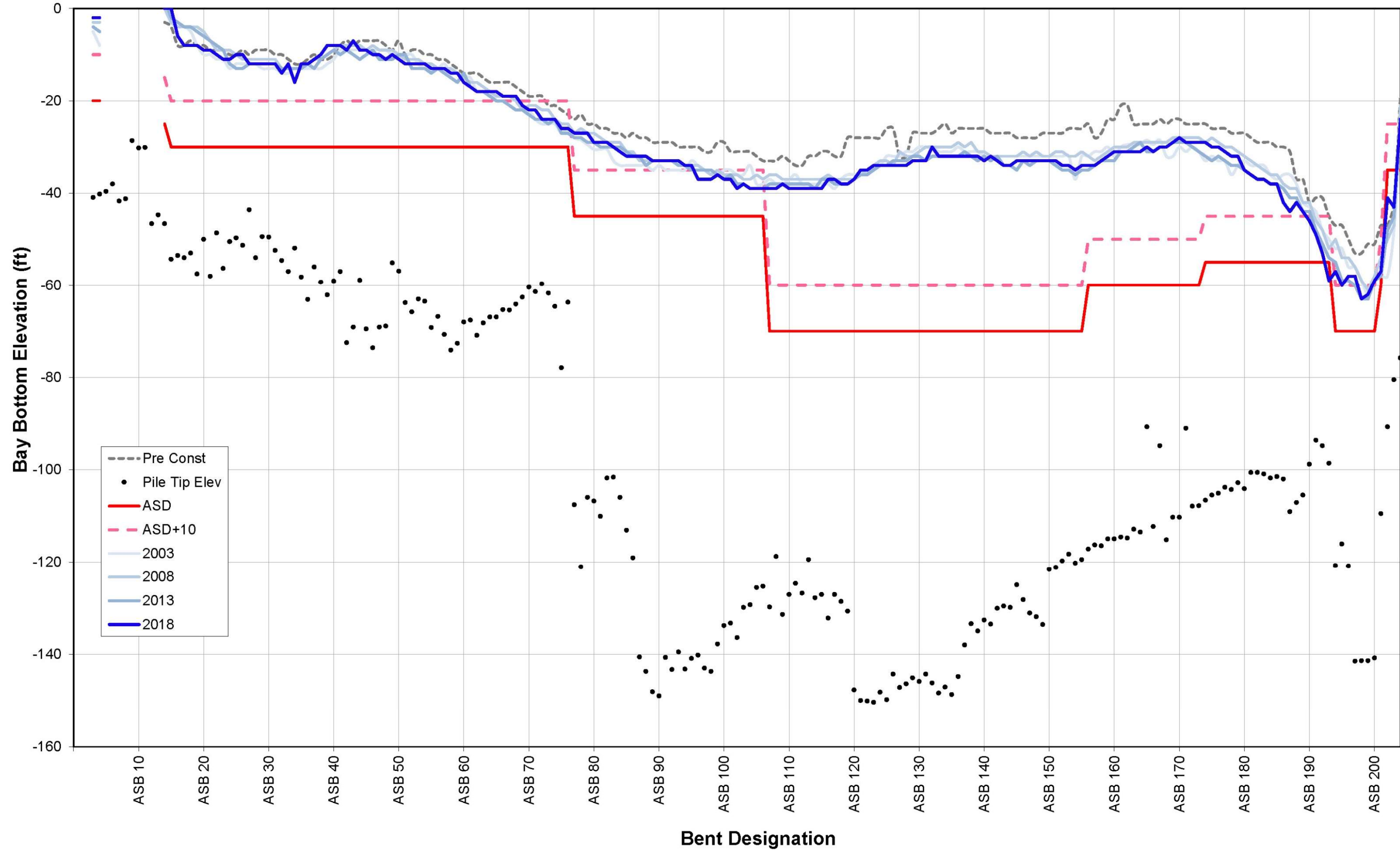


9. Bay Bottom Profiles

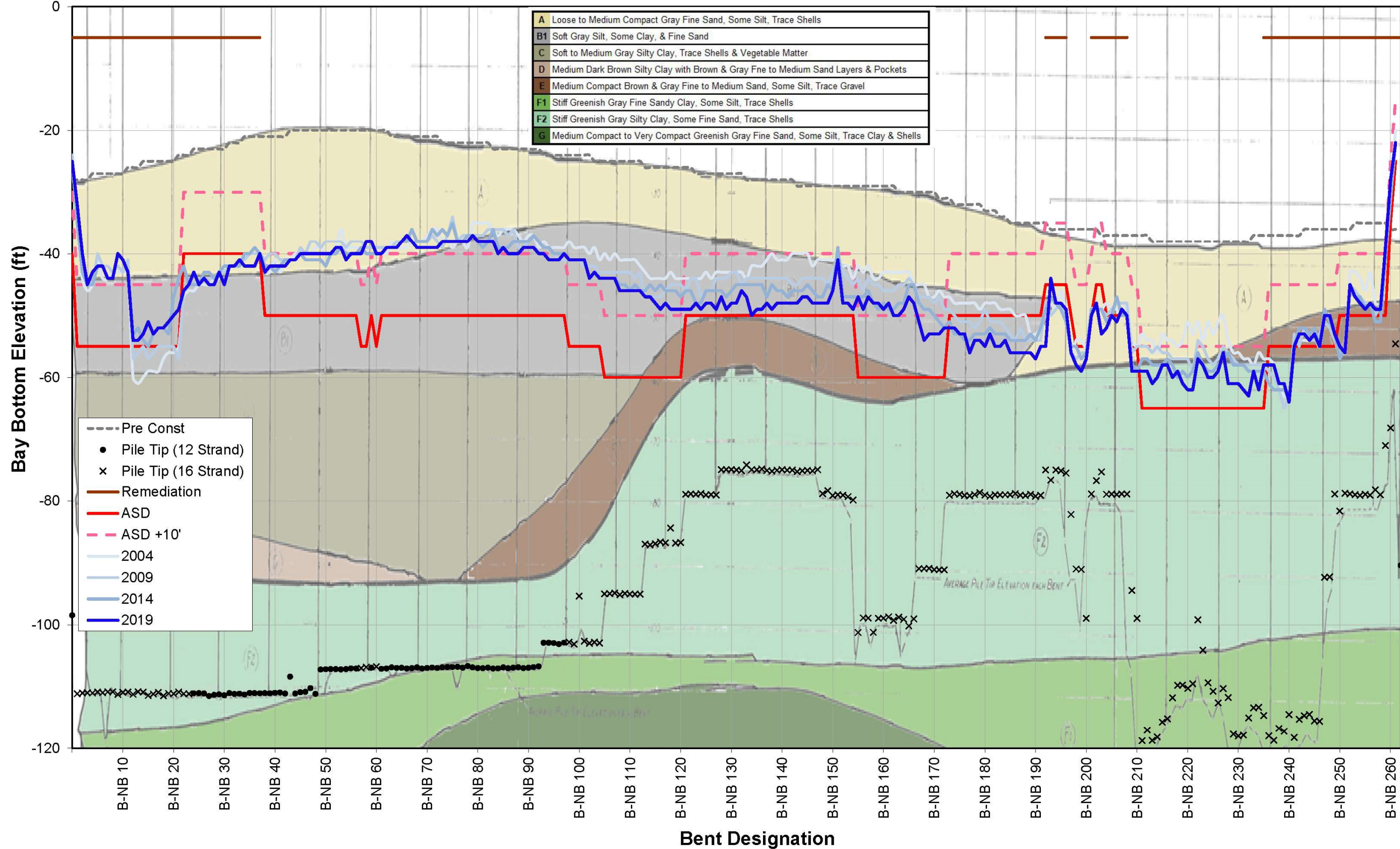
9.1 Trestle ANB Bay Bottom Profile



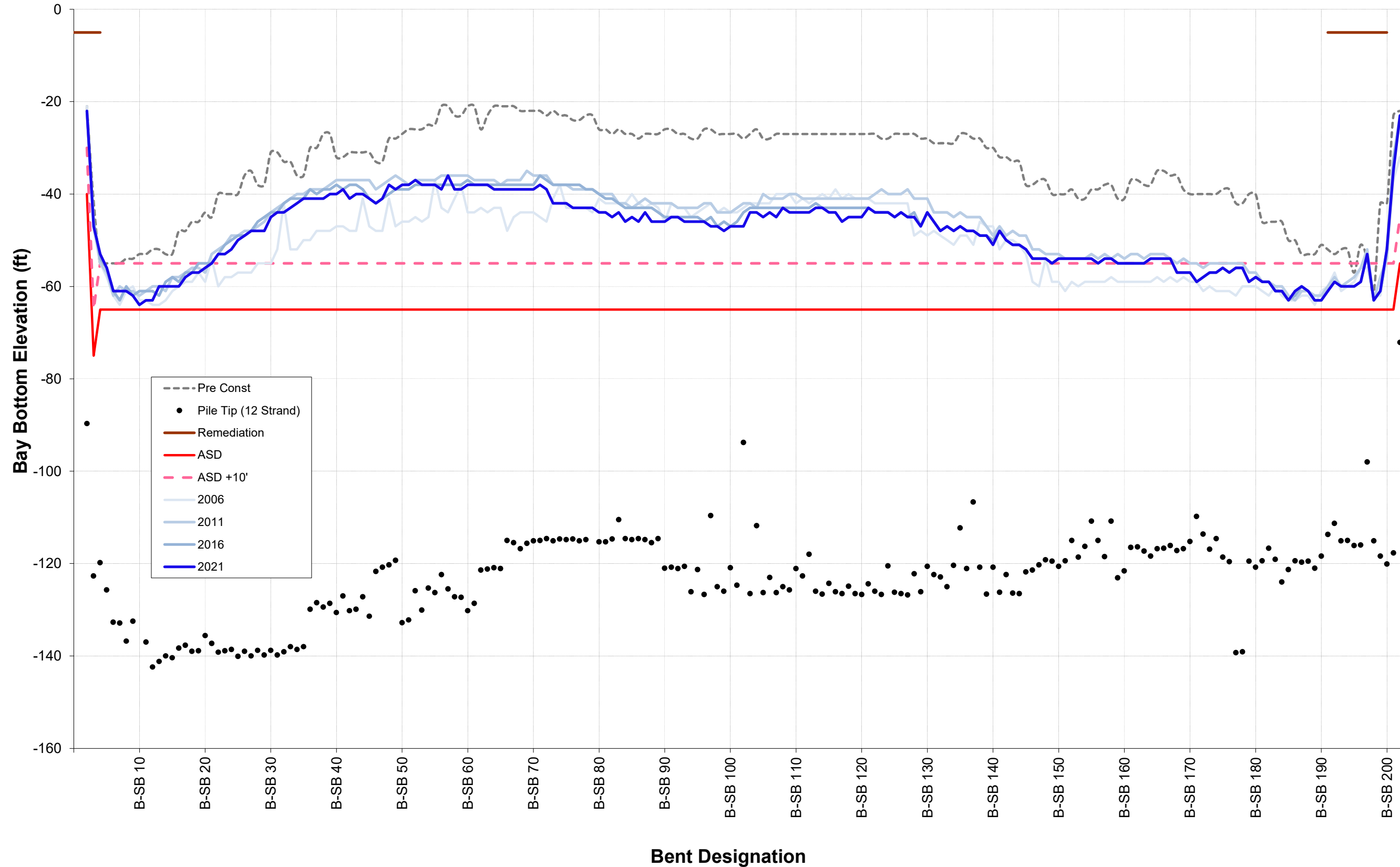
9.2 Trestle ASB Bay Bottom Profile



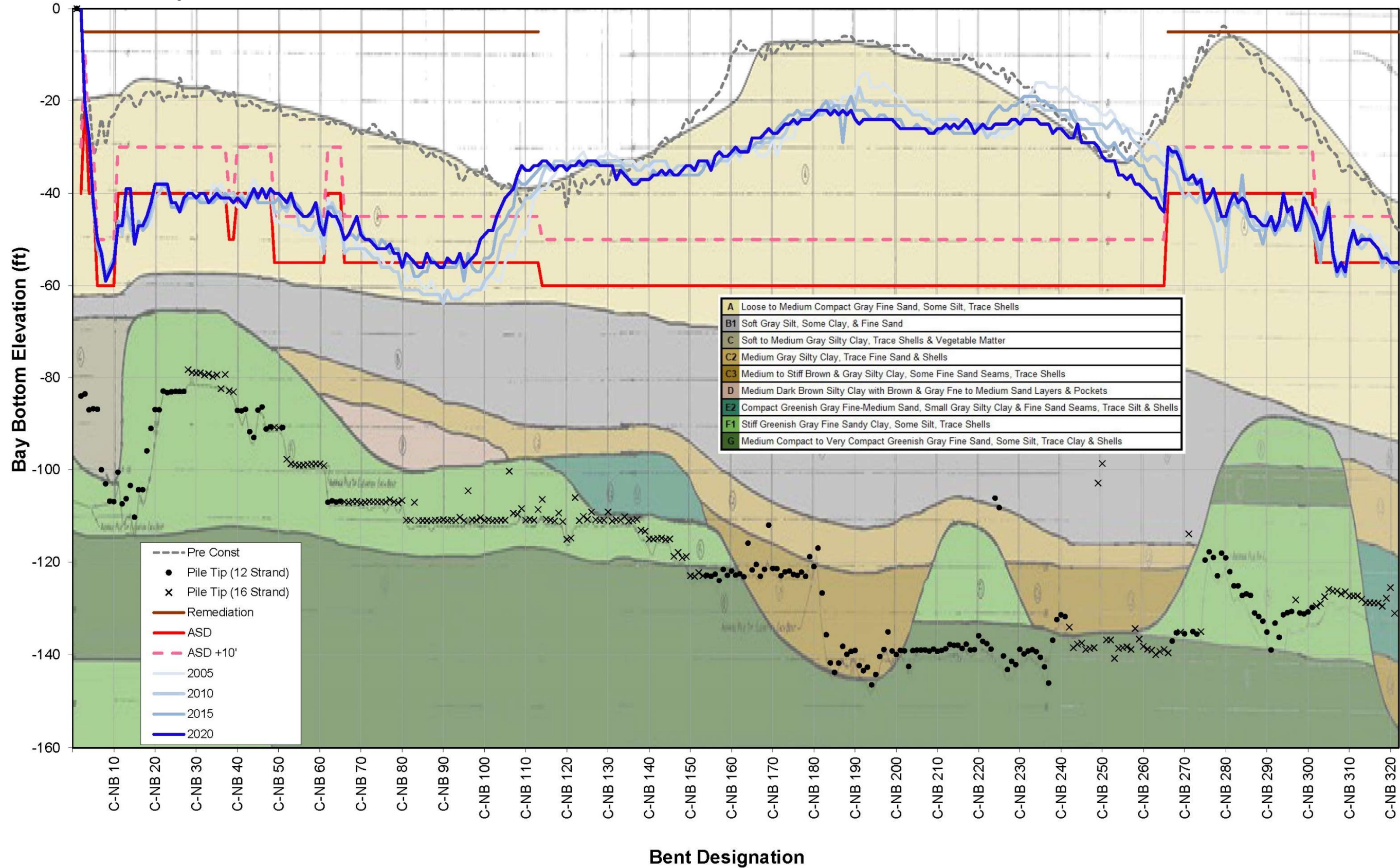
9.3 Trestle BNB Bay Bottom Profile



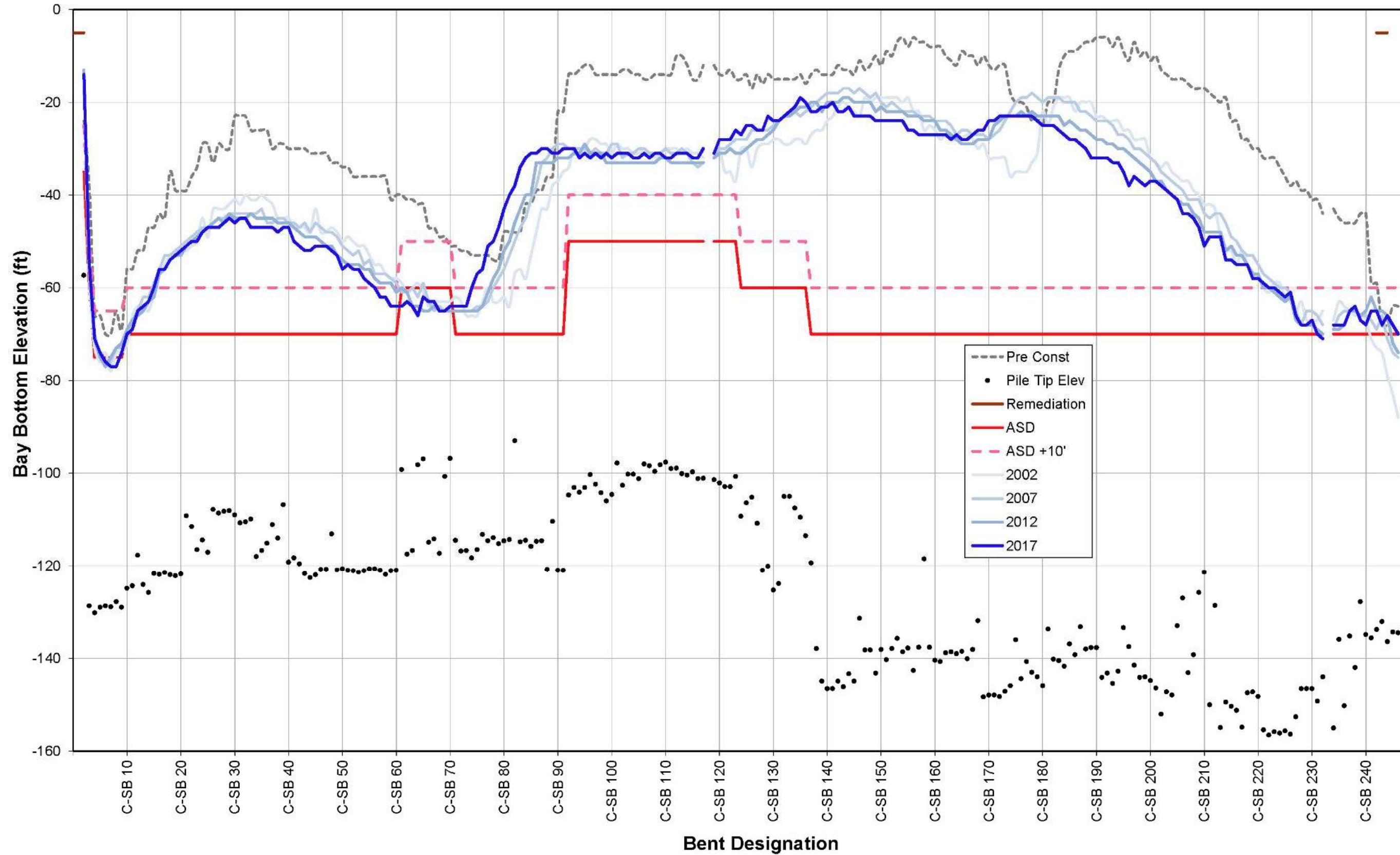
9.4 Trestle BSB Bay Bottom Profile



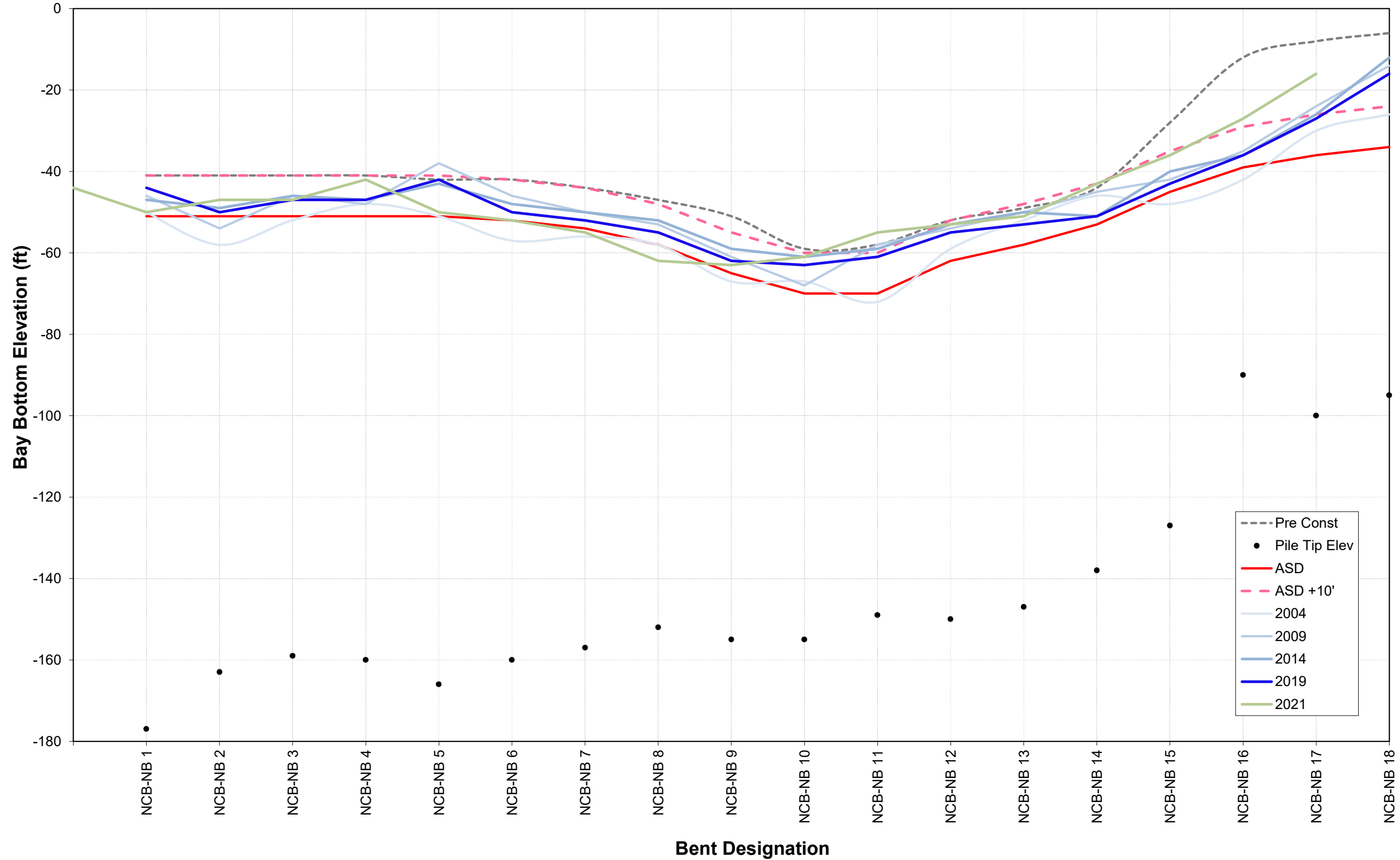
9.5 Trestle CNB Bay Bottom Profile



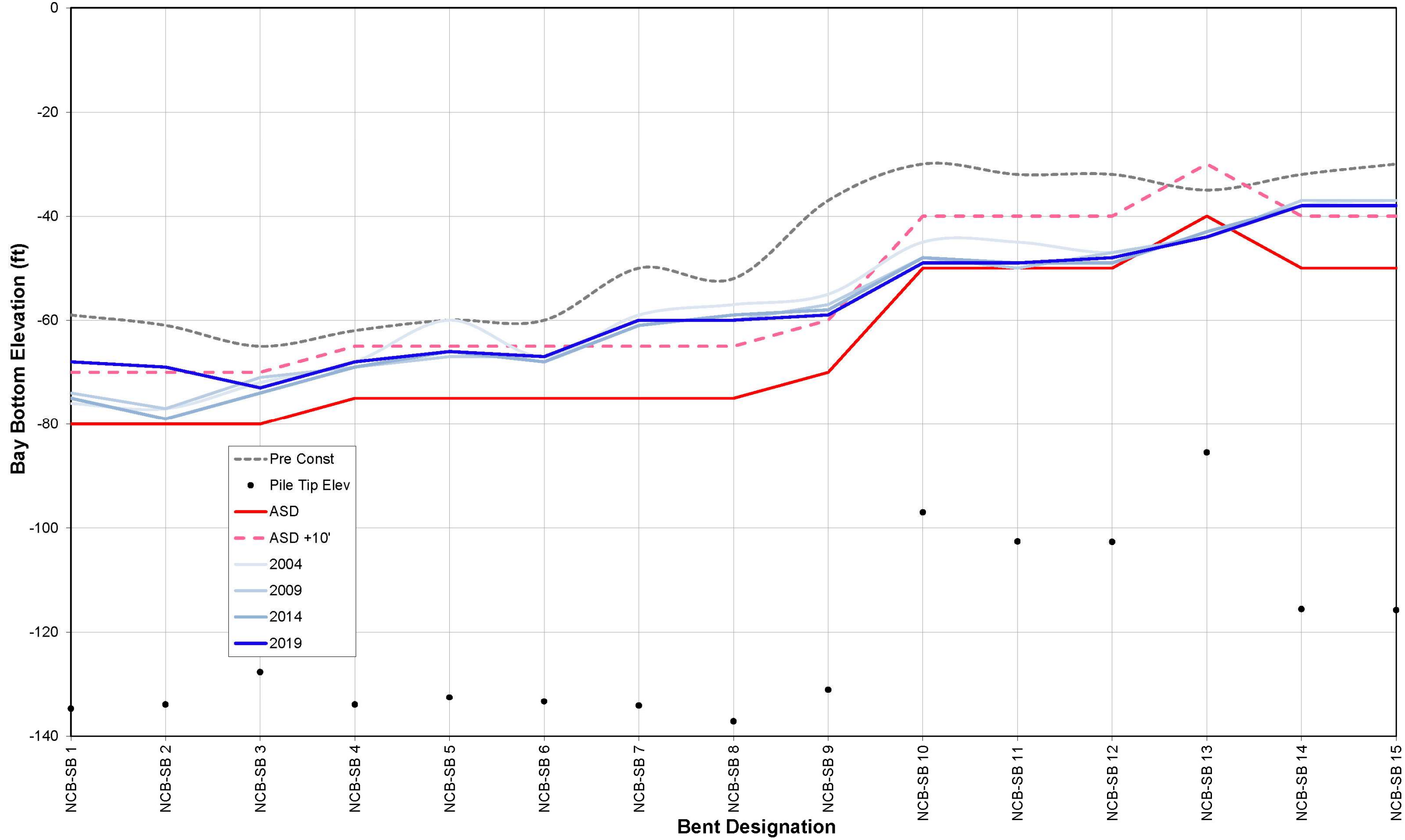
9.6 Trestle CSB Bay Bottom Profile



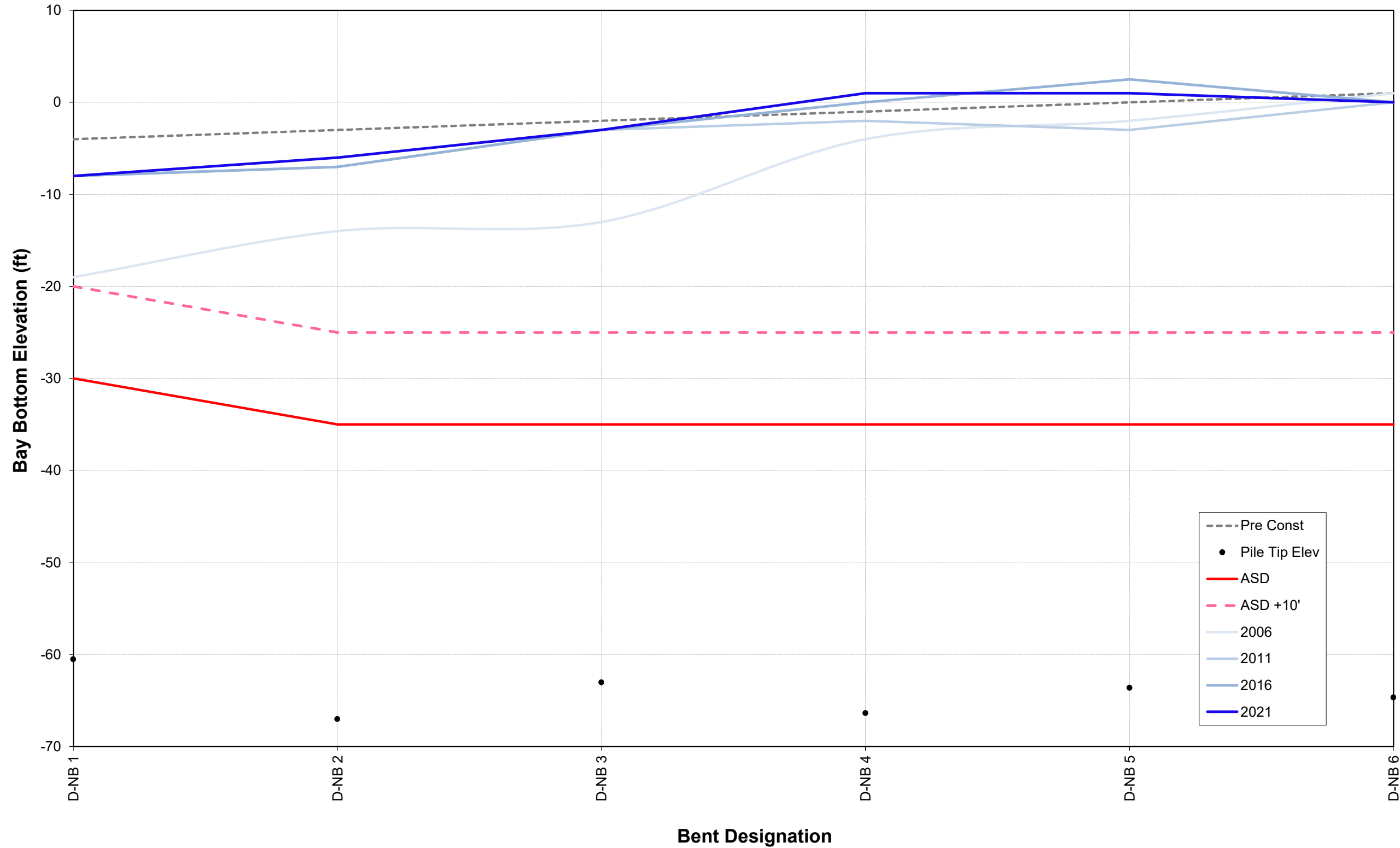
9.7 NCB-NB Bay Bottom Profile



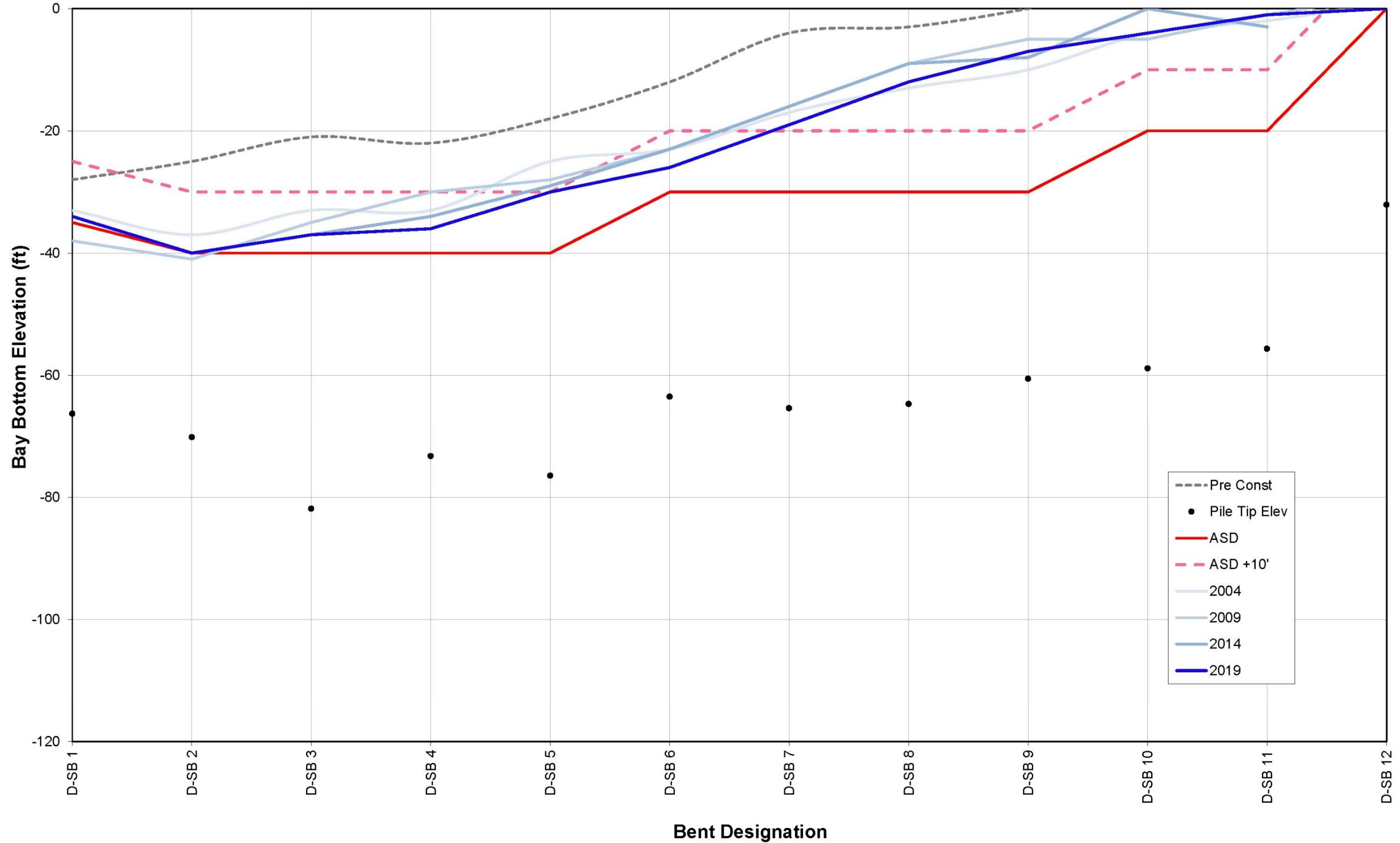
9.8 NCB-SB Bay Bottom Profile



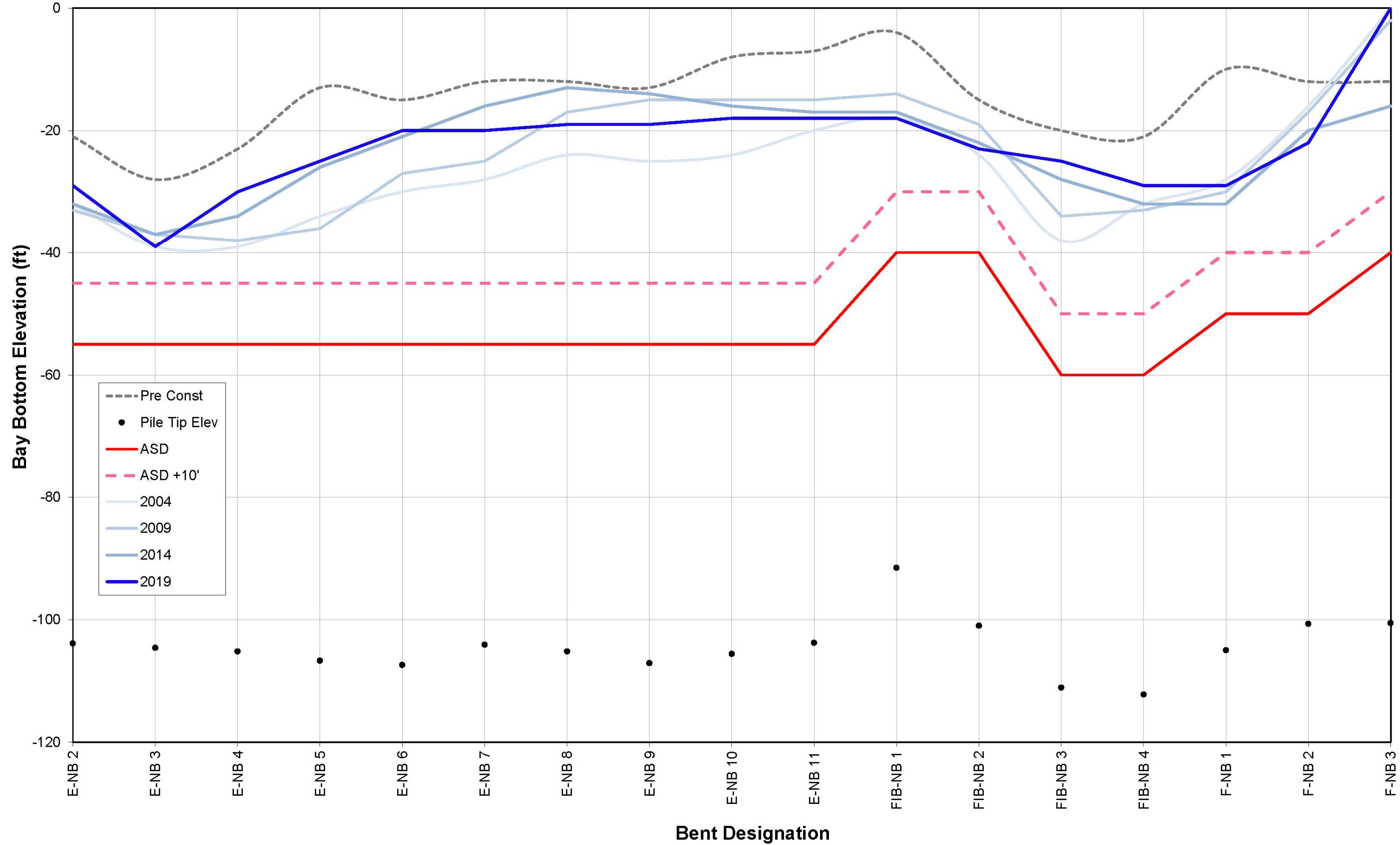
9.9 Trestle DNB Bay Bottom Profile



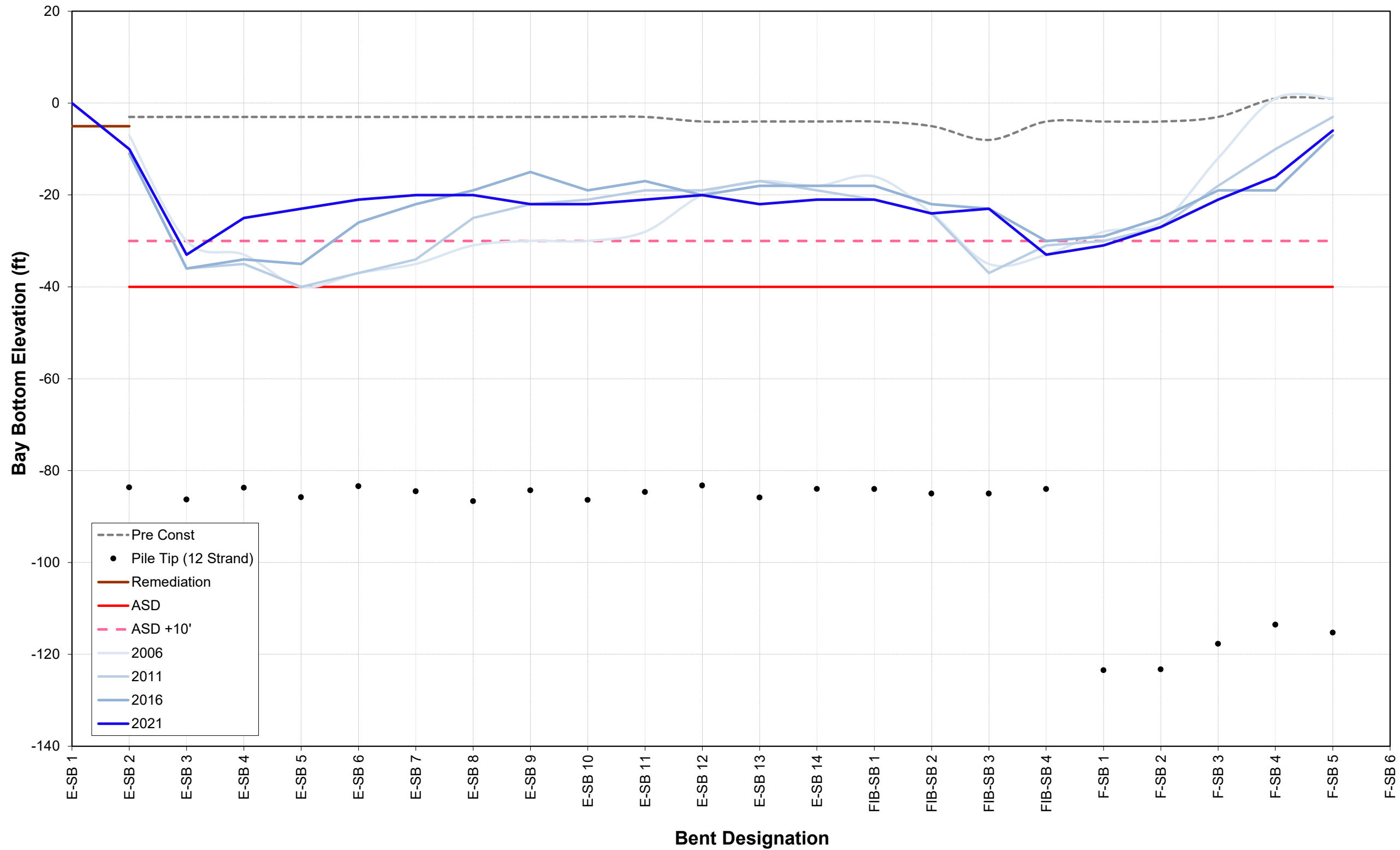
9.10 Trestle DSB Bay Bottom Profile



9.11 Trestle ENB, FIB-NB, & FNB Bay Bottom Profile



9.12 Trestle ESB, FIB-SB, & FSB Bay Bottom Profile





10. Testing Documentation

No testing was performed during this inspection.



11. Electronic Submittals

The following supplemental items will be submitted electronically to the District with the Final Report:

- Inspection Database and Photograph Logs: Includes majority of field notes from the annual inspection and the routine inspections performed on the trestles, and routine inspection of the TSCT
- Bridge Element Level Data for each component that received a hands-on inspection
- Tunnel Element Level Data for TSCT and CCT
- Underwater Inspection Forms (Level I & II) of Trestle NCB-NB, DNB, ESB, FIB-SB, & FSB
- TSCT Mechanical, Electrical and Lighting, Fire/Life Safety/Security Systems field notes