Preliminary Design Report

Lane's Island Bridge #5270
over
Carvers Harbor

Vinalhaven, Maine

STP-2170(700)
WIN 021707.00

Maine Department of Transportation
Bridge Program

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BACKGROUND INFORMATION

TOWN	Vinalhaven	WIN	021707.00	BRIDGE NO.	5270
BRIDGE	Lane's Island Bridge			ROAD	Lane's Island Road

FUNDING: Federal/State

PROGRAM SCOPE: Bridge Improvement

PROGRAM DESCRIPTION: Lane's Island Bridge (#5270) over Carvers Harbor, located 0.08 miles southerly of Round The Mountain Road. This bridge is over 111' in length.

PROJECT BACKGROUND: This Bridge was constructed in 1954. The superstructure is in fair condition and the substructure is in poor condition.

		JURISDICTION	Townway	NHS	No
FUNCTIONAL CLASSIFICATION			Local Road	CORRIDOR PRIORITY	6
		URBAN/RURAL	Rural	FHWA SUFFICIENCY RATING	44.2
		POSTED SPEED	None Posted	LOAD POSTING	None
TRAFFIC:	2018	AADT	320	ACCIDENT DATA, CRF	0
	2038	AADT	380	DHV	49

EXISTING BRIDGE

YEAR BUILT 1954 SPAN LENGTHS 15'-5.83'-15.58'-9.42'-15.83'-7.75'-40'

CURB TO CURB WIDTH 14'

TYPE OF SUPERSTRUCTURE: Seven-span non-continuous structure with painted steel beams with a non-composite concrete deck in Span 7 and a reinforced concrete slab in Spans 1-6, integral concrete wearing surface in all spans. Steel bridge rail in Span 7 and two-cable rail with concrete posts in Spans 1-6.

GENERAL CONDITION: Steel beams are in fair condition with some paint failure and rust on bottom flanges but no major section loss. Concrete deck is in satisfactory condition, mostly sound with one spot that is spalled on surface with one square foot of delamination. Bridge cable rail is in poor condition. Steel bridge rail is in satisfactory condition.

TYPE OF SUBSTRUCTURE: The abutments and the piers are dry stacked granite blocks with cast-in-place concrete caps. The granite blocks bear on marine sediment, glaciomarine silt, clay and sand.

GENERAL CONDITION: The substructure is identified as in poor condition in the inspection report. The dry stacked granite blocks have some voids, identified as missing stones in the inspection report and shifting of stones. The concrete caps are in fair condition. Some stone covered slopes are eroding.

LOAD RATINGS:	OPERATING	INVENTORY
HL-93	43.56 Tons	33.48 Tons
Rating Factor (Steel Span)	1.21	0.93
Rating Factor (Concrete Slab)	1.11	1.06

	LEGAL LOADS
Controlling Configuration: 6	39.96 Tons
Rating Factor	1.11
Controlling Member:	Concrete slab span, positive moment
	See Appendix F for load rating summary

STRUCTURALLY DEFICIENT Yes FUNCTIONALLY OBSOLETE N/A

MAINTENANCE PROBLEMS Substandard deteriorating bridge rail, failing stone covered slopes, leaking joints.

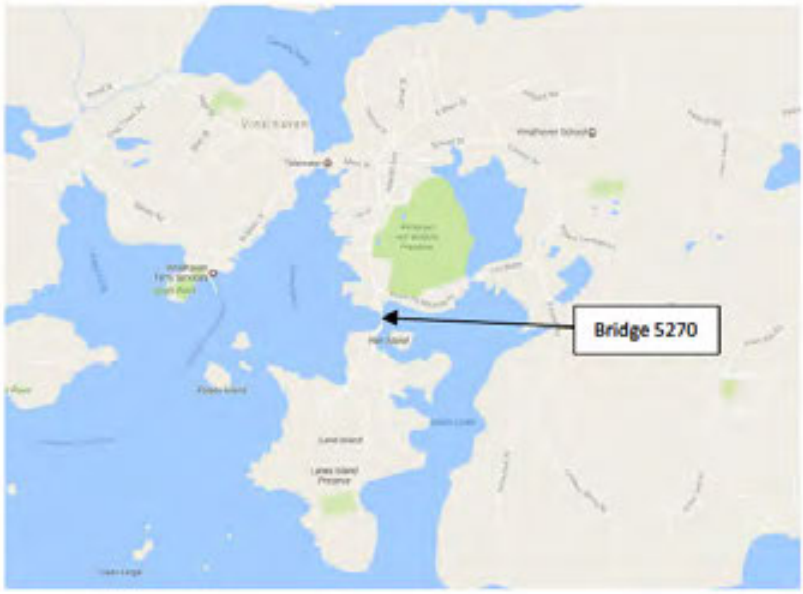
MAINTENANCE WORK: None noted.

PREVIOUS STRUCTURE: Eight small spans with granite slab spans. Main span was a double leaf lift span with wooden towers, eight wood stringers, and 3" transverse plank

OTHER COMMENTS: The bridge is on a horizontal curve with a radius of approximately 182'. The approach to Span 7 is an 80' crest vertical curve with grades of +7% and 0%. Span 7 is on a 0% tangent grade. Spans 1-6 are on a 100' crest vertical curve with grades of 0% and -6%.

LOCATION MAP

Vinalhaven, Lane's Island Bridge #5270, WIN 021707.00
Lane's Island Road over Carvers Harbor



Latitude: 44° 02' 32" N, Longitude: 68° 49' 54" W

BRIDGE RECOMMENDATION FORM

WIN 021707.00 TOWN Vinalhaven
BRIDGE NO. 5270 BRIDGE Lane's Island Bridge

DESIGNED BY CHA Consulting, Inc. DATE 2/23/2018
APPROVED BY GAG DATE 9-11-18
APPROVED BY JSF DATE 9-18-18

PROJECT: Bridge Preservation, Bridge and approach rail upgrading.

ALIGNMENT DESCRIPTION: The existing bridge will be repaired therefore the existing alignment will be unchanged. The bridge is on a horizontal curve with a radius of approximately 182'. The northern approach to Span 7 is on an 80' crest vertical curve with grades of +7% and 0%. Span 7 is on a level tangent. Spans 1-6 are on a 100' crest vertical curve with grades of 0% and -6%.

APPROACH SECTION: Maintain existing approach roadway. Two 7'+/- lanes with variable width shoulders. Replace approach cable rail with steel beam guardrail. Match longitudinal limits of existing rail. Locate new rail up the embankment closer to the road maintaining 2'-0" min. shoulders. Reinforce eroding shoulders with crushed stone slope protection where required.

SPANS	15'-5.83'-15.58'-9.42'-15.83'-7.75'-40'	SKEW	Various
LOADING	HL-93	DESIGN SPEED	25 mph

SUPERSTRUCTURE: The existing superstructure will remain, and no changes are proposed. The joints between spans will be cleaned and sealed with pourable sealant. All exposed concrete will be cleaned and sealed with silane-siloxane. Two-Cable rail with concrete posts on spans 1 thru 6 will be removed and replaced with a modified 2-Bar steel bridge rail. Existing steel bridge rail on span 7 will remain.

ABUTMENTS: The dry stacked granite blocks with cast-in-place concrete caps bearing on marine sediment will be maintained. Larger voids in the granite abutments will be filled with grout. Larger loose stones may be secured by pinning in place.

PIERS: The dry stacked granite blocks with cast-in-place concrete caps bearing on marine sediment will be maintained. Larger voids in the granite piers will be filled with grout. Larger loose stones may be secured by pinning in place.

OPENING AND CLEARANCE	EXISTING	PROPOSED
TOTAL OPENING	1520 SF	1520 SF
TOTAL OPENING AT HIGH TIDE ELEVATION	635 SF	635 SF
FREEBOARD CLEARANCE AT HIGH TIDE ELEVATION	7.2 FT	7.2 FT

AVAILABLE SOILS INFORMATION: Borings were drilled vertically through the existing, dry stacked granite abutments and the north pier. The existing south abutment (B101) bears on approximately 3 feet of marine sediment overlying bedrock. The existing north abutment (B102) bears on approximately 15 feet of marine sediments, and glaciomarine silt, clay, and sand, overlying bedrock. The existing north pier (B201) bears on approximately 7.2 feet of soft/loose marine sediment overlying bedrock. The bedrock is at an elevation of approximately -10.7 at the south abutment and at an elevation of approximately -22.3 at the north abutment.

ADDITIONAL DESIGN FEATURES: Two locations on the eastern bank have riprap that has settled. One location is at the end of the northeast wingwall and one location is in the middle of the southern causeway. The existing stone covered slopes will be supplemented with additional rip rap and crushed stone slope protection.

MAINTENANCE OF TRAFFIC: The bridge currently functions as alternating one-way. This operation will be maintained for the installation of the bridge rail by shifting traffic to one side of the bridge. Short term closures (48 hours max) will be required to repair the deck joints and to seal the deck with a protective waterproof coating. Short term closures and traffic shifts may also be required during installation of the approach railing and slope improvements.

CONSTRUCTION SCHEDULE: One construction season.

ADVERTISING DATE: January 2019

		Amount	Funding	Project Cost	Surplus
Preliminary Engineering		$150,000	$150,000	$25,000	*$125,000*
Right-of-Way		$15,000	$15,000	$0	*$15,000*
Construction [	Structure	$1,185,000	$1,185,000	$165,000	*$980,000*
	Approaches			$40,000	*$0*
Construction Engineering		$150,000	$150,000	$25,000	*$125,000*
Total		$1,500,000	$1,500,000	$255,000	$1,245,000

ADDITIONAL BORINGS REQUIRED? No

ADDITIONAL GEOTECHNICAL EVALUATIONS REQUIRED? No

APPROVED DESIGN EXCEPTIONS: Bridge width is less than State Standards.

COMMENTS BY ENGINEER OF DESIGN:

SUMMARY OF EXPECTED IMPACTS

RIGHT OF WAY Number of: Property Owners 0
Buildings to Be Taken 0

Type of Acquisitions: ☐ Fee Simple ☐ Easement
☐ Temporary Rights ☐ Temporary Road

UTILITIES: Fox Island Electric Co-op, Loren Bunker, L_bunker@foxisland.net
Time Warner Cable, Josh Mooers, Joshua.mooers@charter.com
FairPoint, James Scheid, James.Scheid@consolidated.com

COAST GUARD PERMIT NEEDED? No FAA PERMIT NEEDED? No

ENVIRONMENTAL COORDINATION
Team Member: Kristen Chamberlain

NEPA	Programmatic Categorical Exclusion 771.117 (c) 28
STIP	4/24/18-PE/ROW/ADV
Section 106	SHPO Concurrence- No Effect
Section 4(f)	No Section 4(f) properties
Federal Endangered Species	Atlantic salmon: No Effect Shortnose and Atlantic sturgeon: Not Likely to Adversely Affect, Informal consultation with NMFS required for grout repairs and riprap stabilization
State Endangered Species	Not present
Essential Fish Habitat	Coastal multi-species EFH Consultation with NMFS required.
Fish Passage	No change
In-Stream Window	November 8-March 15
Hazardous Material	No hazardous material encountered
Dredge Material	No dredge anticipated
Stormwater/MS4	N/A
DEP/LUPC	DEP Exempt 480-Q2d
ACOE	Category 2
Mitigation	n/a
Other	

Avoidance & Minimization:

SUMMARY OF PRELIMINARY DESIGN

BACKGROUND

The Lane's Island Bridge #5270 over Carvers Harbor is located 0.08 miles south of Round The Mountain Road in Vinalhaven and is on a corridor priority 6 road. The bridge was built in 1954 and is a one lane, seven span, non-continuous bridge. Span 7 consists of four steel beams spaced at 4'-3" with a non-composite concrete deck and a span of 40'. Spans 1-6 are reinforced concrete slabs with spans of 15.00', 5.83', 15.58', 9.42', 15.83', and 7.75'. The curb-to-curb width for all spans is 14'. The substructure consists of dry stacked granite blocks with concrete caps at the piers and abutments. The substructure is noted in the inspection report as being in poor condition with voids, missing stones, and shifting stones. The superstructure is noted as being in fair condition. The bridge is currently not posted.

PURPOSE

The purpose of this project is to preserve the existing Lane's Island Bridge for 10 to 15 years by addressing deficiencies, safety issues, and ongoing maintenance issues. Specifically, the preferred alternative shall:

1. Provide a bridge that allows the safe movement of land and marine traffic across the bridge and through Carvers Harbor;
2. Provide a solution that extends the life span a minimum of 10 to 15 years;
3. Provide a solution that minimizes future maintenance efforts;
4. Provide a solution that considers visual characteristics of the site;
5. Provide a solution that considers sensible use of Maine public funds.

NEED

The need for the project is based on the following:

1. The existing bridge is identified as structurally deficient;
2. The guard railings are substandard and do not meet current safety standards;
3. The bridge provides the only land access to Lane's Island;
4. The bridge abutments and piers are in poor condition;

MAINTENANCE OF TRAFFIC

The bridge currently functions as alternating one-way. This operation will be maintained for the installation of the bridge rail by shifting traffic to one side of the bridge. Short term closures will be required to repair the deck joints and to seal the deck with a protective waterproof coating. Short term closures and traffic shifts may also be required during installation of the approach railing and slope improvements. A 48-hour closure is

required to clean, apply and cure the deck protective waterproof coating. The joints can be cleaned and prepared using flaggers. A 12-hour closure is required for joint sealant to be installed and cured. Installation of the approach rail will require closures where the road is too narrow for vehicles to maneuver around the post driving truck. These multiple closures are expected to be less than 4 hours in duration.

UTILITIES

There are overhead utilities in the vicinity of the bridge (power, telephone, and cable). There are utility poles on the east side of Atlantic Avenue, one approximately 105' to the south of the bridge and one approximately 30' to the north of the bridge. Due to the curved alignment in the vicinity of the bridge, the overhead utilities cross over the road north and south of the bridge. Since the overhead utilities cross over the work area, they will need to be monitored for potential impact during construction. Utility relocations are not anticipated.

RIGHT OF WAY

The right of way is described as the Limit of Wrought Portion (LOWP). The LOWP is irregular in shape and is just wide enough to encompass the existing bridge and approach slope limits. The LOWP is approximately 25' wide at the bridge, tapers out to approximately 70' wide at the north approach slope limits and tapers back down to 25' wide in Vinalhaven. The LOWP tapers out to approximately 60' wide at the south approach slope limits and tapers down to a variable width of approximately 27' to 38' on Lane's Island. All work will be within the limits of the LOWP. All access to the work is assumed to be from within the roadway. Permanent acquisitions will not be required for construction or access. Laydown and storage areas will be required. The contractor may use a barge for transporting material to the site and storage. The contractor will be responsible for obtaining any rights necessary for his method of material storage.

COMPLETE STREETS

The low volume and travel speed of the roadway allow for a mixed use of pedestrians, bicycles and vehicles. This bridge rehabilitation project does not increase the width of the existing structure and increasing the approach roadway width to provide additional shoulder width would create significant environmental impacts and be cost prohibitive. During construction, all modes of travel will be maintained with the exception of short term roadway and bridge closures as outlined in the Maintenance of Traffic section. A complete bridge replacement may be considered in 10 to 15 years at which time additional bridge and roadway width may be feasible.

SUMMARY OF ALTERNATIVES

The only alternative considered was preservation of the bridge since it meets the purpose of the project with the lowest cost. After reviewing the most recent inspection reports, conducting site visits, and considering all available traffic data, the following key components were considered necessary for improving safety and preserving the bridge.

Bridge Joints:

- Existing Condition: The existing bridge joints were installed during the reconstruction of the bridge in 1954. The existing joints are ½" wide for the full depth of the slabs and are filled with preformed expansion joint material. There are six joints, one between each span. Joint deterioration over time is allowing water and deicing salts to saturate the concrete slab causing efflorescence and concrete deterioration.
- Proposed Repair Alternatives: The existing bridge joint material will be removed to a depth of 3". A backer rod will be installed. A pourable elastomeric sealant will be used within the limits of the roadway. A silicone based joint sealant will be used at the curbs. The pourable elastomeric sealant can be easily installed at minimal cost. The installation of gland seal, compression seal, or any other similar expansion devices are not required for thermal movement and are considered too expensive due to the associated deck end replacement work that would be required for installation.
- Cost: The estimated cost of the new bridge joints is $15,000.
- Conclusion: Replacing the bridge joints will preserve the end of the deck and substructures for the remaining life of the structure. New joints will prevent water seepage and associated efflorescence and concrete deterioration at the end of the deck and on the substructures. The joint replacement will be included in the proposed bridge preservation because it addresses the project purposes of extending the life of the bridge 10-15 years, reducing maintenance, has no impact on aesthetics, and is low cost.

Bridge Railing:

- Existing Condition: Spans 1-6 have a two-cable rail with concrete posts. Span 7 has a 2-bar steel bridge rail with fascia mounted posts. The August 2016 Inspection Report notes the existing bridge railings as nonstandard and unsafe. The cable rail is in poor condition with loose and sagging cables. The 2-bar steel bridge rail is in good condition. The two-cable rail does not provide sufficient resistance to vehicular impact.
- Proposed Repair Alternatives: Cables and concrete posts on spans 1-6 will be removed and replaced with a 2-bar steel railing closely matching the span 7 railing. The steel rail in span 7 will remain in place. The 2-bar rail will be non-standard in geometry, element size and anchorage. The two rails will be steel tubes 5" high and 4" deep. The rails will be aligned vertically with the existing bridge rails. The posts will be W6x25 with base plates. Base plates will be anchored to the top of the existing curb using drilled in anchors. The new posts would be placed in the location of the cut posts to protect the exposed cut rebar from deterioration.
- Cost: The estimated cost of removing and installing new bridge rail is $44,000.
- Conclusion: Replacing the bridge railing for spans 1-6 will improve safety on the bridge. The bridge railing improvement will be included in the proposed bridge preservation because it addresses the project purposes of improving public safety, reducing maintenance, and is a sensible use of public funds. The proposed rail will change the appearance of the bridge but is considered necessary for public safety.

Approach Railing:

- Existing Conditions: The existing approach railing consists of two-cable rail on wood posts. The wood posts are located down the side slopes and do not meet height or strength standards. The cables are attached to the webs of the steel bridge rail posts on span 7 and are continuous across spans 1-6 and the approaches to the south and are continuous on to the approaches to the north. The stone slope around some posts is eroding and the posts are tilted. Some of the posts are rotted or broken. The steel cable is loose, bent, and is in poor condition.
- Proposed Repair Alternatives: The existing approach rail will be removed and replaced with non-standard metal beam railing. The longitudinal limits will match the existing rail termini. The lateral location will be maintained where possible. However, in most locations the railing is too far down the side slope to provide protection and will be moved closer to the road. A minimum width of 18' will be maintained between face of approach rails but will taper at the bridge to meet the existing bridge width of 14'. The railing geometry will be non-standard but considered acceptable for a corridor priority 6 road with low volume and speed. 8-foot-long posts will be utilized to provide additional embedment due to being placed in the side slopes. Design guideline references include

AASHTO's 2001 *"Guideline for Geometric Design of Very-Low-Volume Local Roads (ADT <= 400)"*, *"A New MASH Compliant Guardrail System for Placement on Slope"* by A.Y. Abu-Odeh, R.B. Albin, and D. Olson, Deflection Reduction Factors per the 2010 NYSDOT Highway Design Manual.

- Cost: $32,000
- Conclusion: Replacing the approach railing will improve safety. The approach railing improvement will be included in the proposed bridge preservation because it addresses the project purposes of improving public safety, reducing maintenance, and is a sensible use of public funds. The proposed rail will change the appearance of the bridge but is considered necessary for public safety.

Protective Deck Coating:

- Existing Condition: The August 2016 inspection report indicates the slabs are in satisfactory condition with incidences of minor deterioration. There is one spot that is spalled on surface with one square foot of delamination. There is efflorescent staining on the fascias at all slab joints.
- Proposed Repair Alternatives: A penetrating, silane based protective coating for concrete surfaces will be applied to the existing slab, curbs, and overhangs. The slab is in satisfactory condition, so the proposed work is to maintain the existing condition. The protective coating will prevent water absorption into the concrete and will help reduce concrete deterioration and freeze thaw damage.
- Cost: The estimated cost of the Protective Deck Coating is $3,000.
- Conclusion: Coating the slabs, curbs, and overhang with a penetrating, silane based sealant will preserve the concrete condition for the remaining life of the structure. The deck coating will be included in the proposed bridge preservation because it addresses the proposed project purposes of extending the life of the bridge 10-15 years, reducing maintenance, has no impact on aesthetics, and is a sensible use of public funds.

Structural Steel Painting:

- Existing Condition: The August 2016 inspection report indicates the superstructure is in fair condition. The steel beams have some paint failure and rust with some minor section loss.
- Proposed Repair Alternatives: The steel girders will be cleaned and painted to remove any existing rust and help prevent further deterioration and section loss.
- Cost: The estimated cost of painting the structural steel is $66,000.
- Conclusion: The existing paint is in fair condition with only minor areas of rust. The existing paint will be adequate to preserve the steel for the remaining life of the bridge. Painting the steel span will not be included in the proposed bridge preservation because

it is not required to preserve the bridge for its remaining life, does not improve safety, and its cost will not be sensible use of public funds.

Substructure Grouting:

- Existing Condition: The substructure consists of dry stacked granite stone abutments and piers capped with concrete. The August 2016 inspection report indicates the abutments and piers are in poor condition. There are missing stones, irregularly sized and loosely fitting stones, and large voids. There are cracks in some stones and concrete caps.
- Proposed Repair Alternatives: The existing stone substructures will be repaired by filling larger voids with grout to stabilize the granite stones preventing further shifting and stone loss. Some loose or shifted stones will be stabilized by pinning in place. The following alternatives were considered for grouting the abutments and piers:
    - Underwater Grout Bags: Underwater grout bags can be used below the water line to fill the substructure voids. The grout bags can be manipulated to fit into the irregular shapes of the voids. Work can be completed during low water to limit the amount of underwater work. The grout bags will not completely fill in the void, nor will they bond directly to the existing structure. The bags will prevent cement from entering the water and protect the environment.
    - Underwater Grouting: Underwater grouting can be used below the waterline to completely fill the substructure voids. It would bond the substructure stones and provide solid substructure units. Cofferdams would be required to complete the grouting. Completely filling voids and bonding the stones provides a stronger repair than using grout bags.
    - Above Water Grouting Methods: Above the water line, traditional grouting methods can be used to fill in the voids/joints between existing stone blocks and bond them together. Work can be completed during low water conditions. Grout will be recessed from the face of granite a minimum of 3" to not impair the aesthetics of the dry stacked stone. Large voids will be filled to stabilize stones above, but the aesthetics will not be changed by chinking all the smaller gaps with stones.
- Cost: The estimated cost of the substructure grouting repairs is $50,000.
- Conclusion: The substructures are in poor condition due to the voids in the substructure stones. Grouting the substructure voids will help preserve the bridge and improve safety. A combination of grout bags below the water line to protect the environment and traditional grouting above the water line will be used. Grout bags will be adequate to preserve the structure for its remaining life. Building cofferdams to grout the substructure would be expensive and would not be a sensible use of public funds. The

substructure grouting will be included in the proposed bridge preservation because it addresses the project purposes by improving public safety, extending the life of the bridge 10-15 years, reducing maintenance, and does not have a significant impact on aesthetics. Although the cost is high, it is a sensible use of funds since repairing the substructure will stabilize the bridge and eliminate its primary deficiency.

Slope Stabilization:

- Existing Conditions: The approach causeway consists of dumped granite rubble. There are locations on the eastern bank where the existing stone slopes are eroding and have sloughed down. Portions of the guard rail are 2 to 3 feet below the roadway and the shoulders are rounded down. Erosion around guardrail posts has caused posts to tilt.
- Proposed Repair Alternatives: The eroded and sloughing slopes and posts that have lost support will be spot repaired by filling in with plain rip rap. Severely eroded shoulders will be built up with crushed stone slope protection only to the face of the proposed rail. This will provide a consistent grade between guardrails and help support the new guardrail posts.
- Cost: The estimated cost of slope stabilization is $14,000.
- Conclusion: Slope stabilization will improve safety by providing a consistent roadway cross slope, supporting the guardrail posts and preserving the bridge approaches. The slope stabilization will be included in the proposed bridge preservation because it addresses the project purposes by improving public safety, extending the life of the road 10-15 years, reducing maintenance, has no impact on aesthetics, and is a sensible use of public funds.

PROPOSED ALTERNATIVE

The following activities are recommended for the bridge preservation:

Bridge Joints:

- Clean and install pourable elastomeric sealants; Cost: $15,000.

Bridge Railing:

- Replace bridge rail on spans 1-6 with Modified Steel Bridge Railing, 2-Bar; Cost: $44,000.

Approach Railing:

- Replace approach railing with 31” W-Beam Guardrail; Cost: $32,000

Protective Deck Coating:

- Clean and apply Protective Coating for Concrete Surfaces; Cost: $3,000.

Substructure Grouting:

- Fill large voids and missing stone using grout bags below the waterline and traditional grouting above the waterline; Cost: $50,000.

Slope Stabilization:

- In isolated locations, repair slopes with Plain Rip Rap and rebuild rounded shoulders with Crushed Stone Slope Protection; Cost: $14,000.

The preliminary construction cost of the bridge preservation project is $205,000, which includes percentages for miscellaneous items and mobilization. The total project cost is $255,000. For more information please see Appendix H.

Carvers Harbor is studied by detailed methods in the FEMA Flood Insurance Study (FIS) for Knox County (July 2016) Maine. Based on information included in the FIS, the Lane's Island Bridge is a tidally influenced structure with a minimal contributing riverine watershed. In addition, the bridge provides a hydraulic connection between two tidal waterbodies (Carver's Harbor and Indian Creek), and as such is not expected to experience significant velocities during the tidal cycle (with or without storm surge). The 100-year water surface elevation in the vicinity of the structure is 10 feet (NAVD88), and according to the FEMA mapping, overtops the bridge deck and causeway in the northern roadway approach, as well as several low-lying areas of Lane's Island. While the FIS does not provide water surface elevation data for the 10-, 50-, or 500-year storm events, it does indicate areas of Carvers Harbor that are susceptible to impacts due to wave action. Given that the crossing is protected from the open Atlantic by Lane's Island, the majority of the bridge/causeway is not susceptible to wave impacts, with only the northern roadway approach embankment identified within the limit of moderate wave action (wave heights of 1.5 feet). Finally, based on the flood history of the existing structure (survived the two floods of record, Nor'easters in January and February of 1978), and the shallow bedrock conditions prevalent on the island (current Item 113=8), detailed hydraulic modeling is not required.

SUMMARY

		Existing Structure
		7 Span Steel and concrete
Total Area of Waterway Opening	ft^2	1520
High Tide elevation	ft	5.0
Low Tide elevation	ft	-5.0
Water elevation @ Q_{100}	ft	10
Freeboard @ Q_{100}	ft	2.21
Flood Of Record (Jan & Feb 1978) Elevation Unknown		
Outlet Velocity @ $Q_{1.1}$	ft/s	NA
Outlet Velocity @ Q_{10}	ft/s	NA
Outlet Velocity @ Q_{25}	ft/s	NA
Outlet Velocity @ Q_{50}	ft/s	NA
Outlet Velocity @ Q_{100}	ft/s	NA

Reported by: CHA
Date: February 23, 2018

Note: All elevations based on North American Vertical Datum (NAVD) of 1988.

Appendix A

Preliminary Plans

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

SPECIFICATIONS

Design: Load and Resistance Factor Design per AASHTO LRFD Bridge Design Specifications, Eighth Edition 2017.

TRAFFIC DATA

Current (2018) AADT	320
Future (2028) AADT	350
Future (2038) AADT	380
DHV - % of AADT	13%
Design Hour Volume	49
Heavy Trucks (% of AADT)	5%
Heavy Trucks (% of DHV)	5%
Directional Distribution (% of DHV)	58%
18 kip Equivalent P 2.0	6
18 kip Equivalent P 2.5	6
Design Speed (mph)	25

HYDROLOGIC DATA

Low Tide Elevation	-5.0 ft
High Tide Elevation	5.0 ft
Flood Zone AE Q100 Elevation	10.0 ft

MATERIALS

Reinforcing Steel	ASTM A 615/A 615M, Grade 60
Railing:	
Rail Bars	ASTM A 500, Grade B
Rail posts, shapes & plates	AASHTO M 270M/M270, Grade 50
All other bolts & nuts (unless noted)	ASTM F3125, Grade A325

BASIC DESIGN STRESSES

Non-shrink Grout	f'c = 6,000 psi
Reinforcing Steel	f y = 60,000 psi
Structural Steel	
ASTM 500, Grade B	f y = 46,000 psi
AASHTO M 270, Grade 50	f y = 50,000 psi
ASTM F3125, Grade A325	f u = 120,000 psi

LIST OF DRAWINGS

VINALHAVEN
KNOX COUNTY
LANE'S ISLAND BRIDGE
OVER
CARVERS HARBOR
LANE'S ISLAND ROAD

FEDERAL AID PROJECT NO. STP - 2170(700)
PROJECT LENGTH 0.1 mi.
BRIDGE NO. 5270

UTILITIES

Fox Island Electric Co-op
Time Warner Cable
Fairpoint

MAINTENANCE OF TRAFFIC

One lane of alternating traffic will be maintained during construction for installation of the guardrail. The bridge will be closed to non-emergency traffic during installation of protective coating for concrete surfaces on the deck and for joint repairs.

PROJECT LOCATION:	On Lane's Island Road, 0.08 miles south of the intersection with Round The Mountain Road. Lat. - 44° 02' 32" N Long. - 68° 49' 54" W
PROGRAM AREA:	Bridge
OUTLINE OF WORK:	Repair the expansion joints, repair the bridge and approach railing, apply a protective deck coating, and grout the granite block substructures

STP- 2170(700) WIN 021707.00

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

	DATE
APPROVED	
COMMISSIONER:	
CHIEF ENGINEER:	

PROJECT INFORMATION			
PROGRAM	BRIDGE	SIGNATURE	
PROJECT MANAGER	Joel Kilfredge	P.E. NUMBER	
DESIGNER	Peter Perkins		
CONSULTANT	CHA Consulting Inc.	DATE	
PROJECT RESIDENT			
CONTRACTOR			
PROJECT COMPLETION DATE			

VINALHAVEN
LANE'S ISLAND BRIDGE

TITLE SHEET

1
OF 6

Spot repair the eroding slopes with plain riprap and crushed stone for slope protection (Typ.)

DAVID C. DWYER, TRUSTEE
CONSTANCE D. ANDREWS, TRUSTEE
PHILLIP J. DWYER, TRUSTEE
THE DWYER FAMILY VINALHAVEN TRUST

Install crushed stone for slope protection to repair shoulder & slope around guardrail

R=100'

Terminal end

100+00 To Lane's Island N2°27'36.82"E

101+00

Terminal end

R=100'

Install crushed stone for slope protection to repair shoulder & slope around guardrail

W-beam guardrail, mid-way splice (Typ.)

PC = STA. 100+69.55

PT = STA. 101+38.17

CURVE DATA #2
PI = 101+04.75
D = 45°50'11.8"
Δ = 31°27'04.4" Rt.
R = 125.00'
L = 68.62'
T = 35.20'
E = 4.86'

Connect guardrail directly to bridge rail with terminal connector (Typ. at each bridge corner)

Remove Existing Cable Rail and concrete posts and Replace with Modified Steel Bridge Rail, 2-Bar

PC = STA. 102+16.41

CURVE DATA #3
PI = 102+87.72
D = 31°28'52.3"
Δ = 42°47'22.3" Lt.
R = 182.00'
L = 135.92'
T = 71.31'
E = 13.47'

PCC = STA. 103+52.34

111'-0"

Coat concrete deck with protective waterproof coating

102+00 N33°54'41.22"E Lane's Island Road

103+00

Replace expansion joints over piers (Typ. of 6)

Carvers Harbor

Grout missing granite stones and voids in abutments and piers (Typ.)

CURVE DATA #4
PI = 103+86.67
D = 11°45'15.1"
Δ = 8°03'27.2" Lt.
R = 487.45'
L = 68.55'
T = 34.33'
E = 1.21'

PT = STA. 104+20.89

PC = STA. 104+98.74

CURVE DATA #5
PI = 105+34.01
D = 9°57'52.1"
Δ = 7°01'08.6" Lt.
R = 575.00'
L = 70.44'
T = 35.26'
E = 1.08'

PT = STA. 105+69.18

PC = STA. 105+28.96

104+00 N16°56'08.19"W Lane's Island Road

105+00 N23°57'16.83"W

105+82 To Vinalhaven

Terminal end

R=100'

R=50'

DAVID E. MOYER
VICKI MOYER

TOWN OF VINALHAVEN

VAN A. GUILFORD
EUGENE A. GUILFORD

ARLENE RODENBECK
RICHARD E. MORGAN

STEVEN M. CARPENTER
MARGERY A. CARPENTER

JUDITH KINTNER
PAMELA CONINE
NAOMI EWALD-ORNE
MARY ESTER

PRELIMINARY PLAN

25 0 25 50
Scale of Feet

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

021707.00

WIN 021707.00

BRIDGE NO. 5270

BRIDGE PLANS

	BY	DATE
PROJ. MANAGER	Joel Kittredge	
DESIGN-DETAILED	PJL	MAR 2018
CHECKED-REVIEWED	PMP	MAR 2018
DESIGN2-DETAILED2		
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

SIGNATURE

P.E. NUMBER

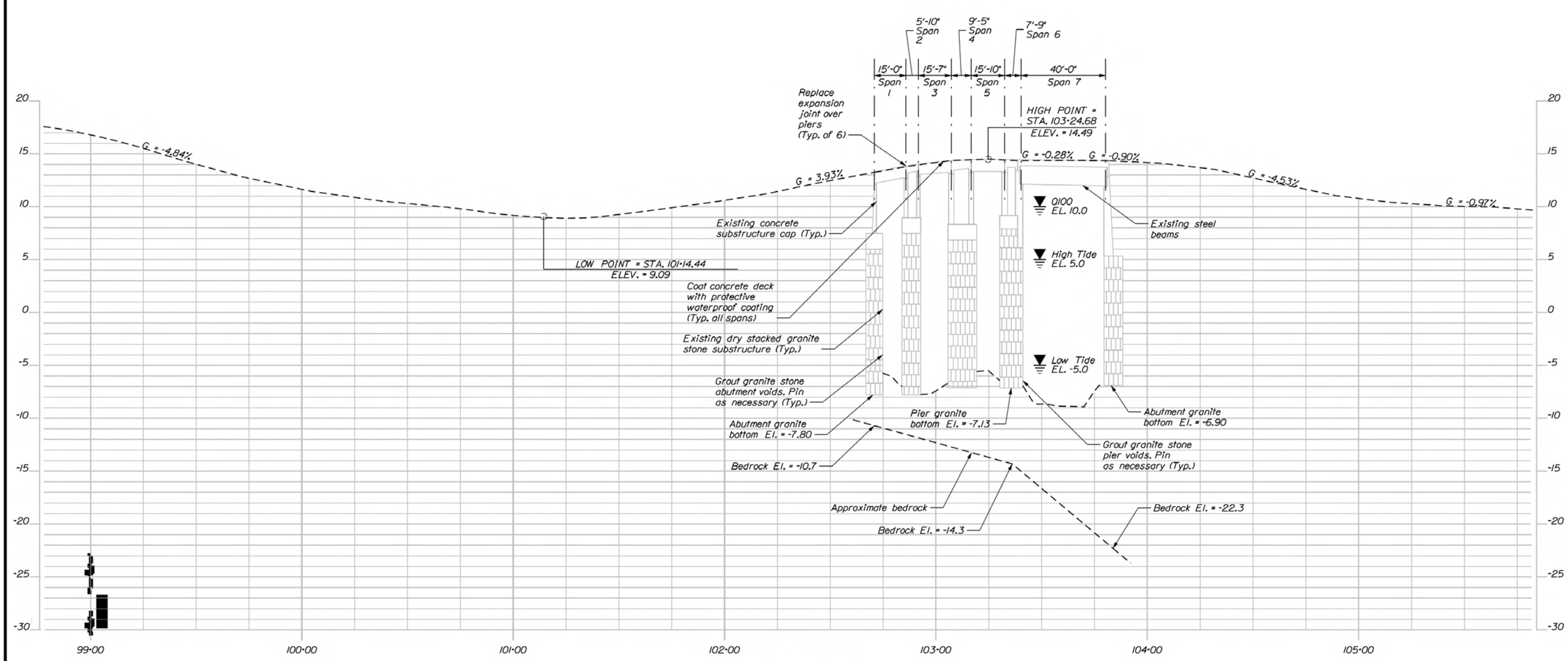
DATE

LANE'S ISLAND BRIDGE
CARVERS HARBOR
VINALHAVEN KNOX COUNTY

PLAN

SHEET NUMBER 2 OF 6

Filename: ...\00\BRIDGE\MSTA\002_Plan.dgn Division: HIGHWAY Username: 3724 Date:Sept 2018



PRELIMINARY PROFILE

Horiz. 25 0 25 50

Vert. 5 0 5 10

Scale of Feet

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

021707.00

WIN 021707.00

BRIDGE NO. 5270

BRIDGE PLANS

	BY	DATE
PROJ. MANAGER Joel Kilbridge		
DESIGN-DETAILED	PAL	MAR 2018
CHECKED-REVIEWED	PWP	MAR 2018
DESIGN2-DETAILED2		
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

SIGNATURE

P.E. NUMBER

DATE

LANE'S ISLAND BRIDGE
CARVERS HARBOR
VINALHAVEN KNOX COUNTY

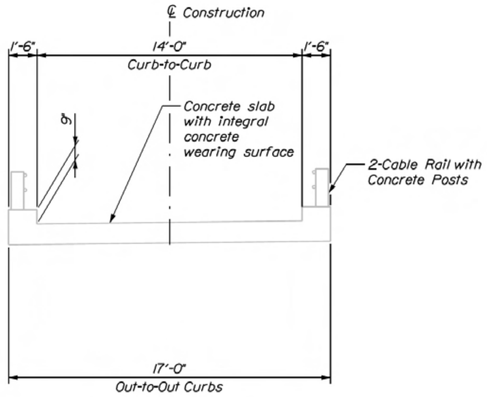
PROFILE

SHEET NUMBER

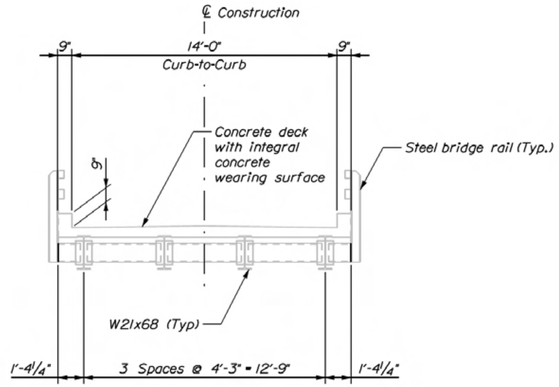
3

OF 6

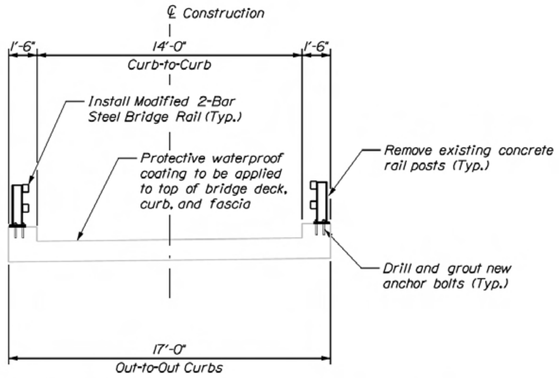
Filename: ...\00\BRIDGE\MSTA\003_Profile.dgn Division: HIGHWAY Username: 3724 Date:Sept 2018



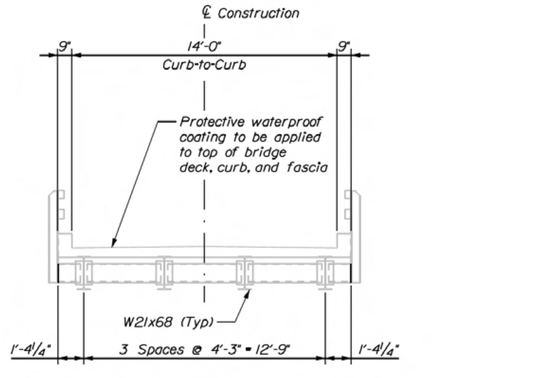
EXISTING BRIDGE SECTION: CONCRETE SLAB



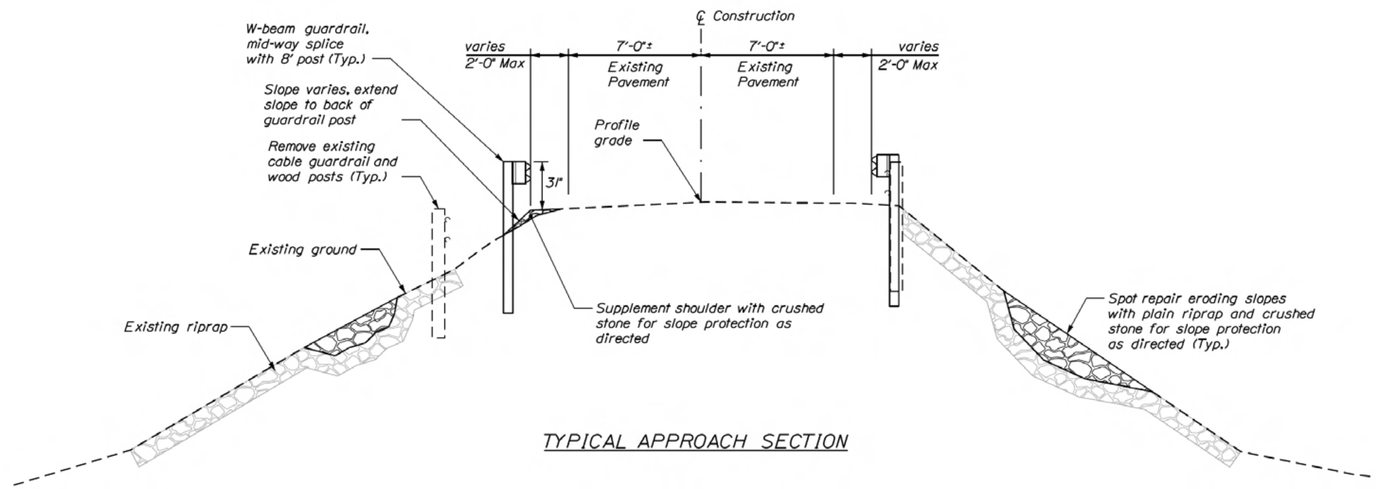
EXISTING BRIDGE SECTION: STEEL BEAMS



PROPOSED BRIDGE SECTION: CONCRETE SLAB



PROPOSED BRIDGE SECTION: STEEL BEAMS



TYPICAL APPROACH SECTION

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

021707.00

WIN 021707.00
BRIDGE NO. 5270

BRIDGE PLANS

	BY	DATE
PROJ. MANAGER Joel Kilbridge		
DESIGN-DETAILED	PAL	MAR 2018
CHECKED-REVIEWED	PWP	MAR 2018
DESIGN2-DETAILED2		
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

SIGNATURE

P.E. NUMBER

DATE

LANE'S ISLAND BRIDGE
CARVERS HARBOR
VINALHAVEN KNOX COUNTY

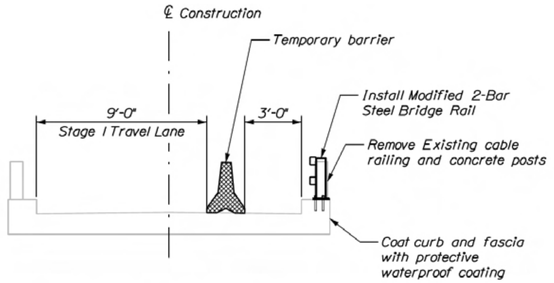
SECTIONS

SHEET NUMBER

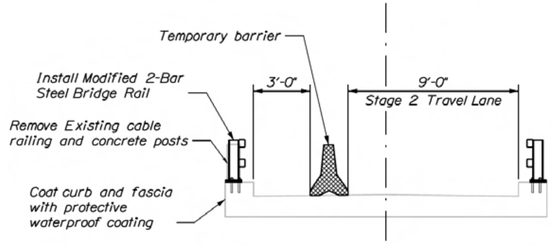
4

OF 6

Filename: ...\00\BRIDGE\MSTA\004_Xsect.dgn Username: 3724 Division: HIGHWAY Date:Sept 2018



STAGE 1 CONSTRUCTION



STAGE 2 CONSTRUCTION

STAGED CONSTRUCTION NOTES

Stage 1 - Construct one 9'-0" travel lane for alternating traffic on the west side. Remove existing cable rail and concrete posts on spans 1-6 and replace with new Modified 2-Bar Steel bridge Rail. Coat curb and fascia with protective waterproof coating.

Stage 2 - Construct one 9'-0" travel lane for alternating traffic on the east side. Remove existing cable rail and concrete posts on spans 1-6 and replace with new Modified 2-Bar Steel bridge Rail. Coat curb and fascia with protective waterproof coating.

Stage 3 - Close bridge to traffic and install the protective waterproof coating on the deck and to install the bridge joints.

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

021707.00

WIN 021707.00

BRIDGE NO. 5270

BRIDGE PLANS

		DATE
PROJ. MANAGER	Jodi Kilbridge	
DESIGN-DETAILED	PAL	MAR 2018
CHECKED-REVIEWED	PMP	MAR 2018
DESIGN2-DETAILED2		
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

BY

SIGNATURE

P.E. NUMBER

DATE

LANE'S ISLAND BRIDGE
CARVERS HARBOR
VINALHAVEN KNOX COUNTY

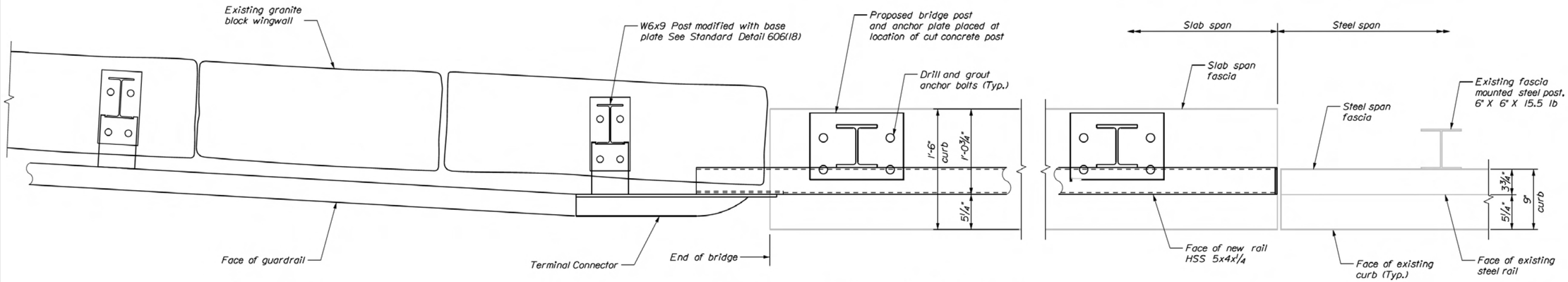
STAGED CONSTRUCTION

SHEET NUMBER

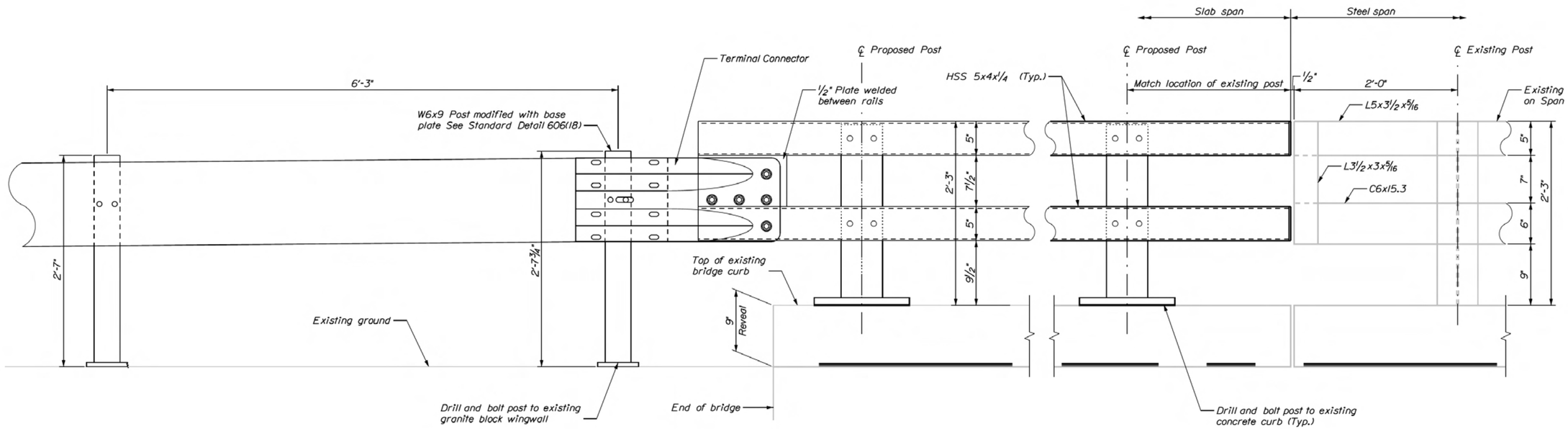
5

OF 6

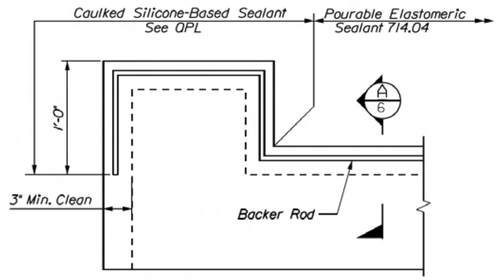
Filename: ...\MSTA\005_StageConstr.dgn Division: HIGHWAY Username: 3724 Date:Sept 2018



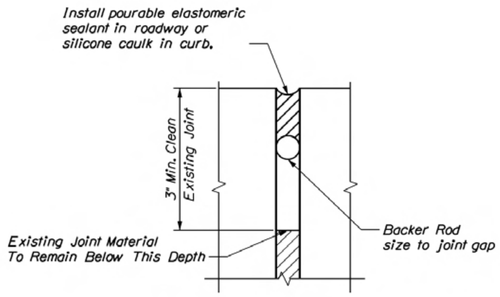
EXISTING TO NEW RAIL TRANSITION PLAN



EXISTING TO NEW RAIL TRANSITION ELEVATION



EXPANSION JOINT REPAIR - DECK SECTION



SECTION A

EXPANSION JOINT INSTALLATION NOTES

1. Remove existing preformed expansion joint material to a 3" depth and blow joint clean

2. Install Backer Rod

3. Install silicone sealant in curbing and pourable elastomeric sealant in roadway.

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

021707.00

WIN 021707.00 BRIDGE PLANS

BRIDGE NO. 5270

	BY	DATE
PROJ. MANAGER	Joel Kittredge	
DESIGN-DETAILED	PAL	MAR 2018
CHECKED-REVIEWED	PMP	MAR 2018
DESIGN2-DETAILED2		
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

SIGNATURE

P.E. NUMBER

DATE

LANE'S ISLAND BRIDGE
CARVERS HARBOR
VINALHAVEN KNOX COUNTY

MISCELLANEOUS DETAILS

SHEET NUMBER

6

OF 6

Filename: ...\00\BRIDGE\MSTA\006_Rail.dgn Division: HIGHWAY Username: 3724 Date:Sept 2018

Appendix B

Photographs

Photo 1: North Approach Looking South

Photo 2: North Approach Looking South

Photo 3: North Approach Looking South

Photo 4: North Approach Looking South

Photo 5: North Approach Looking North

Photo 6: South Approach Looking South

Photo 7: South Approach Looking South

Photo 8: South Approach Looking North

Photo 9: Bridge Looking South

Photo 10: Bridge Steel Span Railing

Photo 11: East Bridge Fascia

Photo 12: East Bridge Fascia

Photo 13: West Bridge Fascia

Photo 14: West Bridge Fascia

Photo 15: West Bridge Fascia

Photo 16: West Bridge Fascia

Photo 17: NE Corner Slope

Photo 18: NE Corner Slope

Photo 19: NW Corner Slope

Photo 20: NW Corner Slope

Photo 21: SW Corner Slope

Appendix C

Inspection Reports

Highway Bridge Inspection Report

LANE ISLAND

LANES ISLAND RD
over
TIDAL FLOW

Asset Code: 5270

Inspection Date: 10/06/2016

Inspected By: Tim Merrithew

Inspection Type(s): Routine

TABLE OF CONTENTS

National Bridge Inventory

Status: 1 - SD Bridge Name: **LANE ISLAND** Sufficiency Rating: 44.2

Inspections

(90) NSPECTION DATE & (91) DESIGNATED INSPECTION FREQUENCY		24	10/06/2016
(92) CRITICAL FEATURE INSPECTION & (93) CFI DATE			
(92A) FRACTURE CRITICAL DETAIL	N		
(92B) UNDERWATER INSPECTION	Y	60	07/10/2014
(92C) OTHER SPECIAL NSPECTION	N		

Identification

(1) STATE CODE	231 - Maine
(8) STRUCTURE NUMBER	5270
(5) INVENTORY ROUTE	
(5A) RECORD TYPE	1: Route carried "on" the structure
(5B) ROUTE SIGNING PREFIX	5 - CITY STREET
(5C) DESIGNATED LEVEL OF SERVICE	0 - None
(5) INVENTORY ROUTE	0
(5) INVENTORY ROUTE	0 - NOT APPLICABLE
(2) HIGHWAY AGENCY DISTRICT	02 - Mid-Coast
(3) COUNTY CODE	013 Knox
(4) PLACE CODE	79130
(6) FEATURES INTERSECTED	TIDAL FLOW
(7) FAC LITY CARRIED	LANES ISLAND RD
(9) LOCATION	SOUTH END OF ISLAND
(11) M LEPOINT	0.420
(12) BASE HIGHWAY NETWORK	Inventory Route is not on the Base Network
(13) LRS INVENTORY ROUTE, SUBROUTE	
(13A) LRS NVENTORY ROUTE	0001305131
(13B) SUBROUTE NUMBER	00
(16) LATITUDE	44 04225
(17) LONGITUDE	-68 83176
(98A) BORDER BR DGE CODE	
(98B) PERCENT RESPONSIBILITY	0
(99) BORDER BRIDGE STRUCT NO.	n/a

Structure Type and Material

(43) STRUCTURE TYPE, MA N	
(43A) KIND OF MATERIAL/DESIGN	3 - Steel
(43B) TYPE OF DESIGN/CONSTR	02 - Stringer/Multi-beam or Girder
(44) STRUCTURE TYPE, APPROACH SPANS	
(44A) KIND OF MATERIAL/DESIGN	1 - Concrete
(44B) TYPE OF DESIGN/CONSTRUCTION	01 - Slab
(45) NUMBER OF SPANS IN MA N UNIT	1
(46) NUMBER OF APPROACH SPANS	6
(107) DECK STRUCTURE TYPE	1 - Concrete Cast-in-Place
(108) WEAR NG SURFACE/PROTECTIVE SYSTEMS	
(108A) WEARING SURFACE	1 - Monolithic Concrete (concurrently placed with structural deck)
(108B) DECK MEMBRANE	0 - None
(108C) DECK PROTECTION	0 - None

Age of Service

(27) YEAR BUILT	1954
(106) YEAR RECONSTRUCTED	0
(42) TYPE OF SERVICE	
(42A) TYPE OF SERVICE ON BRIDGE	1 - Highway
(42B) TYPE OF SERVICE UNDER BR DGE	5 - Waterway
(28) LANES	
(28A) LANES ON THE STRUCTURE	02
(28B) LANES UNDER THE STRUCTURE	00
(29) AVERAGE DAILY TRAFFIC	112
(30) YEAR OF AVERAGE DAILY TRAFFIC	2014
(109) AVERAGE DAILY TRUCK TRAFFIC	5
(19) BYPASS DETOUR LENGTH	100

Geometric Data

(48) LENGTH OF MAXIMUM SPAN (ft.)	40
(49) STRUCTURE LENGTH (ft.)	111.0
(50) CURB/SIDEWALK W DTHS	
(50A) LEFT CURB SIDEWALK (ft.)	0.5
(50B) RIGHT CURB SIDEWALK (ft.)	0.5
(51) BRDG RDWY W DTH CURB-TO-CURB (ft.)	15
(52) DECK WIDTH, OUT-TO-OUT (ft.)	15
(32) APPROACH ROADWAY W DTH (ft.)	18.0
(33) BRIDGE MEDIAN	0 - No median
(34) SKEW (deg.)	0
(35) STRUCTURE FLARED	0 - No flare
(10) NV RTE, M N VERT CLEARANCE (ft.)	328.05
(47) TOTAL HORIZONTAL CLEARANCE (ft.)	14.0
(53) VERTICAL CLEARANCE OVER BRIDGE ROADWAY (ft.)	327.76
(54) M N VERTICAL UNDERCLEARANCE	
(54A) REFERENCE FEATURE	N - Feature not a highway or railroad
(54B) MIN VERTICAL UNDERCLEARENCE (ft.)	0
(55) M N LATERAL UNDER CLEARANCE RIGHT	
(55A) REFERENCE FEATURE	N - Feature not a highway or railroad
(55B) MIN LATERAL UNDER CLEARANCE RIGHT (ft.)	327.76
(56) M N LATERAL UNDER CLEARANCE (ft.)	99.9

Classification

(112) NBIS BRIDGE LENGTH	Yes
(104) HIGHWAY SYSTEM OF THE INVENTORY ROUTE	0 - Structure/Route is NOT on NHS
(26) FUNCTIONAL CLASSIFICATION OF INVENTORY ROUTE	09 - Rural - Local
(100) STRAHNET HIGHWAY DESIGNATION	Not a STRAHNET route
(101) PARALLEL STRUCTURE DESIGNATION	N - No parallel structure
(102) DIRECTION OF TRAFFIC	2-way traffic
(103) TEMP STRUCTURE	
(105) FEDERAL LANDS HIGHWAYS	Not Applicable
(110) DESIGNATED NATIONAL NETWORK	Inventory route not on network
(20) TOLL	3 - On Free Road
(21) MAINTENANCE RESPONSIB LITY	01 - State Highway Agency
(22) OWNER	01 - State Highway Agency
(37) HISTORICAL SIGNIFICANCE	5 - Not eligible

Condition

(58) DECK	6 - Satisfactory Condition (minor deterioration)
(59) SUPERSTRUCTURE	5 - Fair Condition (minor section loss)
(60) SUBSTRUCTURE	4 - Poor Condition (advanced deterioration)
(61) CHANNEL & CHANNEL PROTECTION	6 - Bank slump, widespread minor damage
(62) CULVERT	N - Not Applicable

Load Rating and Posting

(31) DESIGN LOAD	2 - H 15
(63) METHOD USED TO DETERM NE OPERATING RATING	8 - Load and Resistance Factor
(64) OPERATING RATING	1.11
(65) METHOD USED TO DETERM NE NVENTORY RATING	8 - Load and Resistance Factor
(66) NVENTORY RATING	1.06
(70) BRIDGE POSTING	5 - Equal to or above legal
(41) STRUCTURE OPEN/POSTED/CLOSED	A - Open

Appraisal

(67) STRUCTURAL EVALUATION	4
(68) DECK GEOMETRY	2
(69) UNDERCLEARANCES, VERTICAL & HORIZONTAL	N
(71) WATERWAY ADEQUACY	9 - Bridge Above Flood Water Elevations
(72) APPROACH ROADWAY ALIGNMENT	6 - Equal to present minimum criteria
(36) TRAFFIC SAFETY FEATURE	
36A) BRIDGE RAILINGS:	0 - Does not meet acceptable standards/safety feature is required
36B) TRANSITIONS:	0 - Does not meet acceptable standards/safety feature is required
36C) APPROACH GUARDRA L	0 - Does not meet acceptable standards/safety feature is required
36D) APPROACH GUARDRA L ENDS	0 - Does not meet acceptable standards/safety feature is required
(113) SCOUR CRITICAL BR DGES	8 - Stable for scour conditions

Proposed Improvements

(75) TYPE OF WORK	

(75A) TYPE OF WORK PROPOSED	31 - Replacement -
(75B) WORK DONE BY	1 - Work to be done by
(76) LENGTH OF STRUCTURE IMPROVEMENT (ft.)	117.1
(94) BRIDGE IMPROVEMENT COST (SK)	1342000
(95) ROADWAY IMPROVEMENT COST (SK)	134000
(96) TOTAL PROJECT COST	2013000
(97) YEAR OF IMPROVEMENT COST ESTIMATE	2004
(114) FUTURE ADT	168
(115) YEAR OF FUTURE ADT	2034

Navigation Data

(38) NAVIGATION CONTROL	1 - Navigation control on waterway (bridge
(111) PIER OR ABUTMENT PROTECTION	1 - Navigation protection not required
(39) NAV VERT CLEARANCE	4.0
(116) MIN NAVIGATION VERT CLEARANCE, VERT LIFT BRIDGE	0
(40) NAV HORIZONTAL CLEARANCE	36 0

General Bridge Data

Structure Number: 5270 **Structure Name: LANE ISLAND**

Owner:	1 State DOT	Town:	Vinalhaven
Co-Owner:	N Not applicable	Town2:	
Region:	02 Mid Coast	Maintainer:	1 State DOT
Bridge Plans:	☐	Co-Maintainer:	N Not applicable

Structure Type

Main Span		**Approach Span**	
Type:	1 Girder	Type:	3 Slab
Sub Type:	1 Deck	Sub Type:	1 Deck
Construction:	1 Rolled	Construction:	0 Not Applicable
Material:	1 Steel	Material:	2 Concrete
Continuity:	1 Non Continuous	Continuity:	1 Non Continuous
Composite:	1 Non Composite	Composite:	1 Non Composite
Moveable:	0 No	Moveable:	0 No

Deck Area:	1665.024635400000000	(SF)
Curb Reveal Lt:	0.754593200000000	(in)
Curb Reveal Rt:	0.751312360000000	(in)

Repairs Done:

Year	**How**	**Scope**

Substructures

	Shaft	Notes
Abutment 1	**Stub Concrete**	
Pier	**Concrete Column**	**5 columns**
Pier	**Concrete Column**	
Pier	**Stub Concrete**	**abutment 3**
Abutment 2	**Stub Concrete**	

	Foundation	Notes
Abutment 1		
Pier		
Pier		
Pier		
Abutment 2		

Roadway

Road/Route Name	**LANES ISLAND RD**
Abut-Abut Detour	**99.9**
Corridor Priority	**6**

Inspection Notes

Structure Number: 5270 Town: Vinalhaven

Structure Name: LANE ISLAND Inspection Date: 10/06/2016

Structure Notes

1954 Steel girder with concrete deck on concrete capped cut granite masonry abutment and pier for first span. Remaining three spans are monolithic concrete slab on stub concrete pier walls formed on cut granite masonry piers. Structure is in tidal zone.

Wearing Surface

Wearing surface is in fair condition. scattered cracking and patched spalls. See photos.

Deck **NBI Item 58:** 6

Deck is in satisfactory condition with one area of cracking and efflo. See photo.

Superstructure **NBI Item 59:** 5

Girders have some paint failure along flanges but no major section loss.

Substructure **NBI Item 60:** 4

Conc. caps of piers are in fair condition with some minor cracking and efflo. See photos.. Stone abutuments & piers in poor cond. due to several large voids, missing stones and shifting of stones. No cracked conc. caps to suggest recent settling, but appears more voids than previous inspections. see photos.

Culvert **NBI Item 62:** N

Channel **NBI Item 61:** 6

Other

Cable approach rails are failing. See photos Some stone rip rap is falling in to bay

Special Inspection

Monitoring

Pontis Notes

Inspector: Tim Merrithew

Structure Number: 5270

Inspection Date: 10/06/2016

Facility Carried: LANES ISLAND RD

Highway Bridge Inspection Report

National Bridge Inventory

IDENTIFICATION

(1) STATE CODE 231 - Maine
(8) STRUCTURE NUMBER 5270
(5) INV. ROUTE (ON/UNDER) 1 5 0 0 0
(2) HIGHWAY AGENCY 02 (3) COUNTY CODE 013
(4) PLACE CODE 79130
(6) FEATURES INTERSECTED TIDAL FLOW
(7) FACILITY CARRIED LANES ISLAND RD
(9) LOCATION SOUTH END OF ISLAND
(11) MILEPOINT 0.420 (12) BASE HIGHWAY NETWORK 0
(13A) LRS INVENTORY ROUTE 0001305131 (13B) SUBROUTE NUMBER 00
(16) LATITUDE 44.04225 (17) LONGITUDE -68.83176
(98A) BORDER BRIDGE CODE
PERCENT RESPONSIBILITY 0 (99) BORDER BRIDGE STRUCT n/a

STRUCTURE TYPE AND MATERIAL

(43) STRUCTURE TYPE, MAIN
A) KIND OF MATERIAL/DESIGN: 3 - Steel
B) TYPE OF DESIGN/CONSTR: 02 - Stringer/Multi-beam or Girder
(44) STRUCTURE TYPE, APPROACH SPANS
A) KIND OF MATERIAL/DESIGN: 1 - Concrete
B) TYPE OF DESIGN/CONSTR: 01 - Slab
(45) NUMBER OF SPANS IN MAIN 1 (46) NUMBER OF APPROACH 6
(107) DECK STRUCTURE TYPE 1 (108A) WEARING SURFACE 1
(108B) DECK MEMBRANE 0 (108C) DECK PROTECTION 0

AGE OF SERVICE

(27) YEAR BUILT 1954 (106) YEAR RECONSTRUCTED 0
(42) TYPE OF SERVICE ON 1 UNDER 5
(28) LANES ON 02 UNDER 00
(29) AVERAGE DAILY TRAFFIC 112 (19) BYPASS DETOUR LENGTH 100
(30) YEAR OF AVERAGE DAILY TRAFFIC 2014
(109) AVERAGE DAILY TRUCK TRAFFIC 5

GEOMETRIC DATA

(48) LENGTH OF MAX SPAN (ft.) 40 (49) STRUCTURE LENGTH (ft.) 111.0
(50) CURB/SIDEWALK WIDTHS (ft.) LEFT 0.5 RIGHT 0.5
(51) BRDG RDWY WIDTH CURB-TO-CURB (ft.) 15
(52) DECK WIDTH, OUT-TO-OUT (ft.) 15
(32) APPROACH ROADWAY WIDTH (ft.) 18.0
(33) BRIDGE MEDIAN 0 (34) SKEW (DEG.) 0
(35) STRUCTURE FLARED 0 (10) INV RTE, MIN VERT CLEAR (ft.) 328.05
(47) TOTAL HORIZONTAL CLEARANCE (ft.) 14.0
(53) VERTICAL CLEARANCE OVER BRIDGE ROADWAY (ft.) 327.76
(54) VERTICAL UNDER CLEARANCE (ft.) N 0
(55) LATERAL UNDER CLEARANCE RIGHT (ft.) N 327.76
(56) MIN LATERAL UNDER CLEARANCE (ft.) 99.9

PROPOSED IMPROVEMENTS

(75A) TYPE OF WORK PROPOSED 31 (75B) WORK DONE BY 1
(76) LENGTH OF STRUCTURE IMPROVEMENT (ft.) 117.1
(94) BRIDGE IMPROVEMENT COST ($) 1342000
(95) ROADWAY IMPROVEMENT COST ($) 134000
(96) TOTAL PROJECT COST 2013000
(97) YEAR OF IMPROVEMENT COST ESTIMATE 2004
(114) FUTURE ADT 168 (115) YEAR OF FUTURE ADT 2034

INSPECTIONS

(90) INSPECTION DATE 10/06/2016
(91) DESIGNATED INSPECTION FREQUENCY 24
(92) CRITICAL FEATURE INSPECTION (93) CFI DATE
A. FRACTURE CRITICAL DETAIL N
B. UNDERWATER INSPECTION Y 60 07/10/2014
C. OTHER SPECIAL N

CONDITION

(58) DECK 6
(59) SUPERSTRUCTURE 5 (60) SUBSTRUCTURE 4
(61) CHANNEL & CHANNEL PROTECTION 6 (62) CULVERT N

LOAD RATING AND POSTING

(31) DESIGN LOAD 2
(63) METHOD USED TO DETERMINE OPERATING RATING 8
(64) OPERATING RATING 1.11
(65) METHOD USED TO DETERMINE INVENTORY RATING 8
(66) INVENTORY RATING 1.06
(70) BRIDGE POSTING 5
(41) STRUCTURE OPEN/POSTED/CLOSED A

APPRAISAL

(67) STRUCTURAL EVALUATION 4
(68) DECK GEOMETRY 2
(69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
(71) WATERWAY ADEQUACY 9
(72) APPROACH ROADWAY ALIGNMENT 6
(36) TRAFFIC SAFETY FEATURE
36A) BRIDGE RAILINGS: 0
36B) TRANSITIONS: 0
36C) APPROACH GUARDRAIL: 0
36D) APPROACH GUARDRAIL ENDS: 0
(113) SCOUR CRITICAL BRIDGES 8
SUFFICIENCY RATING 1 STATUS 44.2

CLASSIFICATION

(112) NBIS BRIDGE LENGTH Y
(104) HIGHWAY SYSTEM OF THE INVENTORY ROUTE 0
(26) FUNCTIONAL CLASSIFICATION OF INVENTORY ROUTE 09
(100) STRAHNET HIGHWAY DESIGNATION 0
(101) PARALLEL STRUCTURE DESIGNATION N
(102) DIRECTION OF TRAFFIC 2
(103) TEMP STRUCTURE
(105) FEDERAL LANDS HIGHWAYS 0
(110) DESIGNATED NATIONAL NETWORK 0
(20) TOLL 3
(21) MAINTENANCE RESPONSIBILITY 01
(22) OWNER 01
(37) HISTORICAL 5

NAVIGATION DATA

(38) NAVIGATION CONTROL 1
(111) PIER OR ABUTMENT PROTECTION 1
(39) NAV VERT CLEARANCE (ft.) 4.0
(116) MIN NAVIGATION VERT CLEARANCE, VERT LIFT BRIDGE (ft.) 0
(40) NAV HORIZONTAL CLEARANCE (ft.) 36.0

Inspector: Tim Merrithew

Structure Number: 5270

Inspection Date: 10/06/2016

Facility Carried: LANES ISLAND RD

Highway Bridge Inspection Report

Element Inspection

	Environment	Total Quantity	Units	Condition State 1	Condition State 2	Condition State 3	Condition State 4
12 - Reinforced Concrete Deck	3 - Mod.	645	sq. ft.	0	645		
38 - Reinforced Concrete Slab	3 - Mod.	1020	sq. ft.	0	1020		
107 - Steel Open Girder/Beam	3 - Mod.	172	ft.	0	172		
515 - Steel Protective Coating		2918	sq. ft.	2858	60		
213 - Masonry Pier Wall	3 - Mod.	75	ft.	0		75	
217 - Masonry Abutment	3 - Mod.	30	ft.	0	30		
234 - Reinforced Concrete Pier Cap	3 - Mod.	30	ft.	0	30		
311 - Movable Bearing	4 - Sev.	4	each	0	4		
515 - Steel Protective Coating		4	sq. ft.	0	4		
313 - Fixed Bearing	4 - Sev.	4	each	0	4		
515 - Steel Protective Coating		4	sq. ft.	0	4		
330 - Metal Bridge Railing	3 - Mod.	312	ft.	312			
515 - Steel Protective Coating		344	sq. ft.	344			
801 - Beam End	4 - Sev.	8	each	0	8		
822 - Masonry Wall	3 - Mod.	65	ft.	0	65		
841 - Asphalt Wearing Surface with Membrane	3 - Mod.	645	sq. ft.	0	645		
843 - Rigid Wearing Surface	3 - Mod.	1019	sq. ft.	817	202		
861 - Beam End – Protective Coating	4 - Sev.	8	each	0	8		

MaineDOT Load Rating and Posting

Structure Number: 5270 Town 1: Vinalhaven

Bridge Name: LANE ISLAND Town 2:

Owner: 1 State DOT

Design Load

Vehicle:	Operating Rating:	Inventory Rating:
HL-93	1.11	1.06
HL-93 Modified		

Legal Load

Configuration:	Axles:	Weight (Tons):	Rating:	Tons:
1	6	50	1.43	
2	6	47	1.61	
3	5	44	1.61	
4	5	44	1.53	
5	5	44	1.30	
6	4	38	1.11	
7	3	29.5	1.25	
8	2	18.7	1.73	

Routine Permit Loads

Configuration:	Axles:	Weight (Tons):	Rating:	Tons:	Status:
Tractor w/semi trailor	4	60			

Load Rating

TEDOC Reference: 1414771

Controlling Member:

Controlling Stress: positive moment

Posting Committee

Discussion: No signs of shear distress in slabs. OK for legal loads.

TEDOC Reference: 1416184

Load Test

Type:

Load Test Date:

TEDOC Reference:

Load Test Results:

Posting Status

- ☐ Posted
- Weight in tons:
- ☐ Posted for one truck at a time
- ☐ Posted for 4 axle
- ☐ Posted for spacing

Underwater Dive Inspection Report

Structure Number: 5270

Bridge Name: LANE ISLAND

Town 1: 13160 - Vinalhaven

Town 2:

Division: Rockland

DiveID: 5615

☐ Tidal:

Location: SO END ISLAND

Tide Information: Can dive any tide, ocean dive. Dove @ lo tide.

Photos:

None

Dive Entry Location: Take Alcar out.

Scour: 8

Comments/Hazards:

Possible boat traffic

Streambed Description:

Muddy bottom near shore. Typical gravel with marine growth layer.

Channel Description:

Sandy gravel covered with mussells. Some large cut stones near bridge area. Several cut stones placed in channel between piers 1 & 2. Deep channel under steel superstructure span (main channel).

Substructure Description:

4 span concrete and steel superstructure on concrete capped dry laid granite piers and abutments. Piers and abutments stones are irregular in size and loosely fit leaving large voids in between. Some stones may be missing although hard to tell because of uneven placement. SE'ly corner of pier 2 reveals large void area. If from missing stone, it does not appear to be recent. No topside settlement noticed. Steel stringers under long span deck have rusted flanges, but otherwise in good shape. No repairs needed now. Concrete caps in good condition. 2014: Several voids, no settling noticed. Possibly more voids than previous report. Lowered Subst. rating to 5 - Fair. Recommend grout repairs soon.

Inspection Team:	Role:
Edwards	TL,SD
Merrithew	D
Barden	SD
Wathen	D

Dive Conditions:

Time: Entry:	2:15	AM/PM	PM
Time: Exit:	3:00	AM/PM	PM
Water Temp:	60		
Visibility (ft):	6		
Max Depth (ft):	9		
Current:	Tidal		
Weather:	sunny		
Underwater Inspection Date:	07102014		
Channel Condition:	8		
Substr/Culvert Condition:	5		
Inspection Cycle:	Y60		

Ratings Comments:

Inspector: Tim Merrithew

Inspection Date: 10/06/2016

Structure Number: 5270

Facility Carried: LANES ISLAND RD

Highway Bridge Inspection Report

Pictures

PHOTO 1

Description View of bridge from S side

PHOTO 2

Description View of SW Abt

Pictures

PHOTO 3

Description View of piers

PHOTO 4

Description General view of piers showing missing stones and voids

Pictures

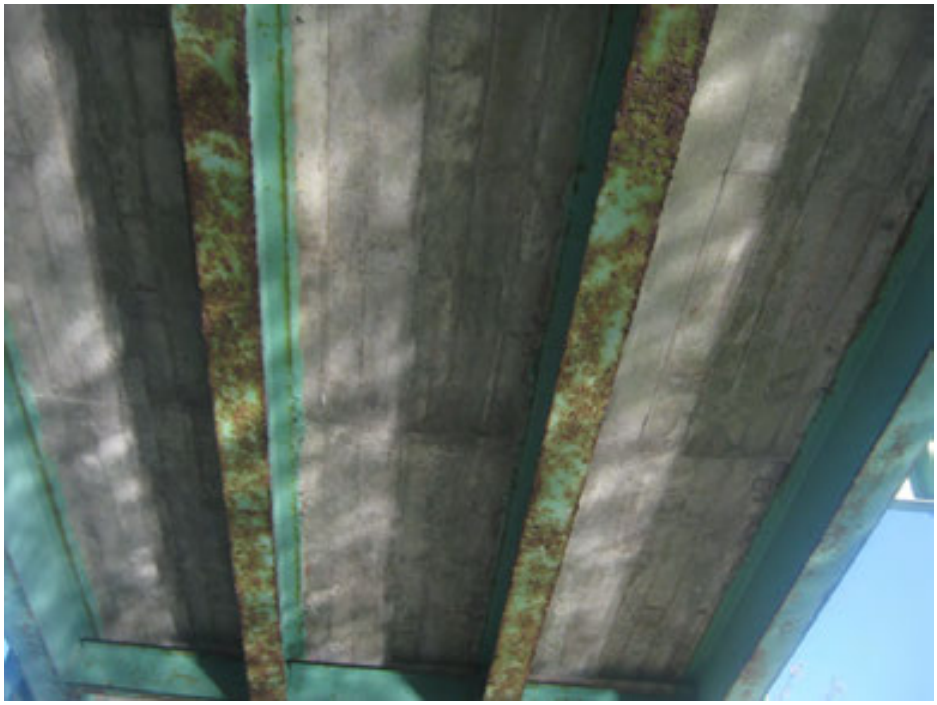


PHOTO 5

Description View of soffit under SW bay

PHOTO 6

Description View of SW pier showing shifting stones and voids

Pictures

PHOTO 7

Description View of N end of SW pier showing voids in stones

PHOTO 8

Description View of N side of bridge and piers

Pictures

PHOTO 9

Description View showing stone shifting out of pier

PHOTO 10

Description View of center pier showing shifting stones and voids

Pictures

PHOTO 11

Description View of center pier showing shifting stones and voids

PHOTO 12

Description View of NE pier showing voids in between stones

Pictures

PHOTO 13

Description View of NE pier showing voids in between stones

PHOTO 14

Description View of pier caps on SW pier showing some cracking and efflo

Pictures

PHOTO 15

Description View of center span soffit showing cracking and efflo

PHOTO 16

Description View of roadway facing vinalhaven

Pictures

PHOTO 17

Description View of cable guard rail failing

PHOTO 18

Description View of wearing surface showing some patching

Pictures

PHOTO 19

Description View showing some spalling at deck joint

PHOTO 20

Description View of failed cable guard rail

Pictures

PHOTO 21

Description View of wearing surface

PHOTO 22

Description View of embankment stones showing some shifting

Pictures

PHOTO 23

Description View showing small spall and crack in curb.

PHOTO 24

Description View showing patch in wearing surface

Pictures

PHOTO 25

Description View showing rotted wooden rail post in concrete

PHOTO 26

Description View showing leaning cable approach rail

Maintenance Work Items

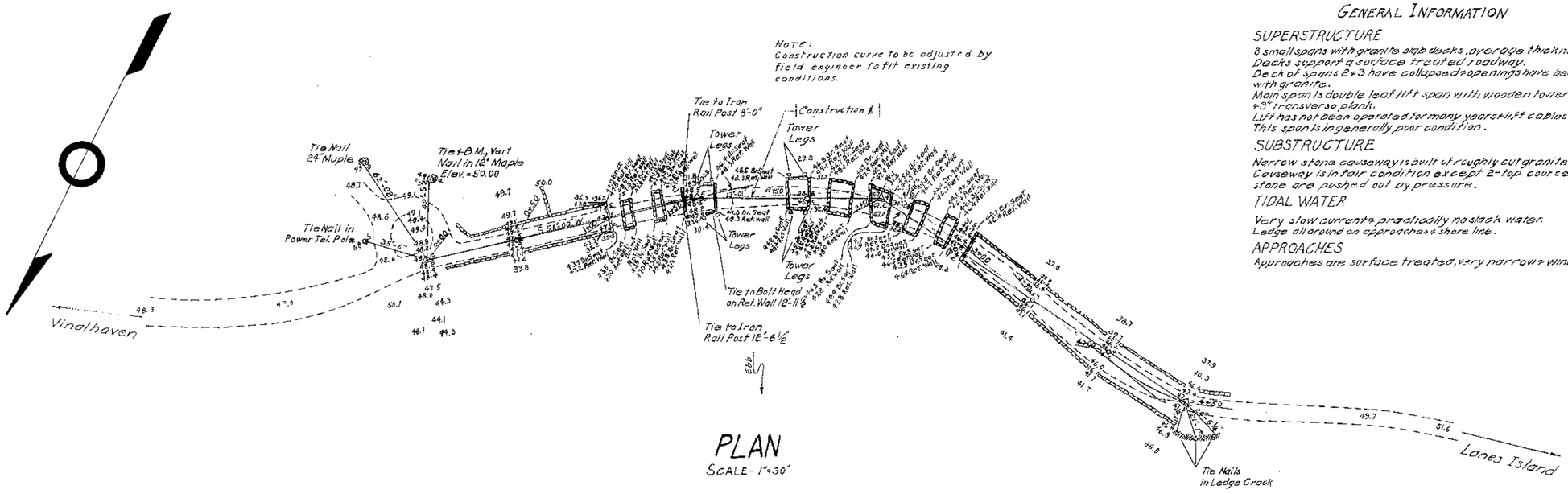
Structure Number: 5270 **Structure Name:** LANE ISLAND

Town: 13160 **Owner:** Merrithew, Tim

Type	Work Item	Priority	Notes
Maintenance	Rehab Substructure	3	Rehab and stabilize pier walls and Abts.
Maintenance	Repair Bridge Rail	3	Replace wire rail
Maintenance	Repair Approach Guardrail	3	Replace approach rails
Maintenance	Replace Wearing Surface	4	
Maintenance	Repair Slope Protection	3	

Appendix D

Existing Bridge Plans



NOTE:
Construction curve to be adjusted by field engineer to fit existing conditions.

PLAN

SCALE - 1"=30'

GENERAL INFORMATION

SUPERSTRUCTURE

8 small spans with granite slab decks, average thickness = 12".
Decks support a surface treated roadway.
Deck of spans 2 & 3 have collapsed & openings have been partially filled with granite.
Main span is double leaf lift span with wooden towers & wood stringers & 3" transverse plank.
Lift has not been operated for many years & lift cables have been removed.
This span is in generally poor condition.

SUBSTRUCTURE

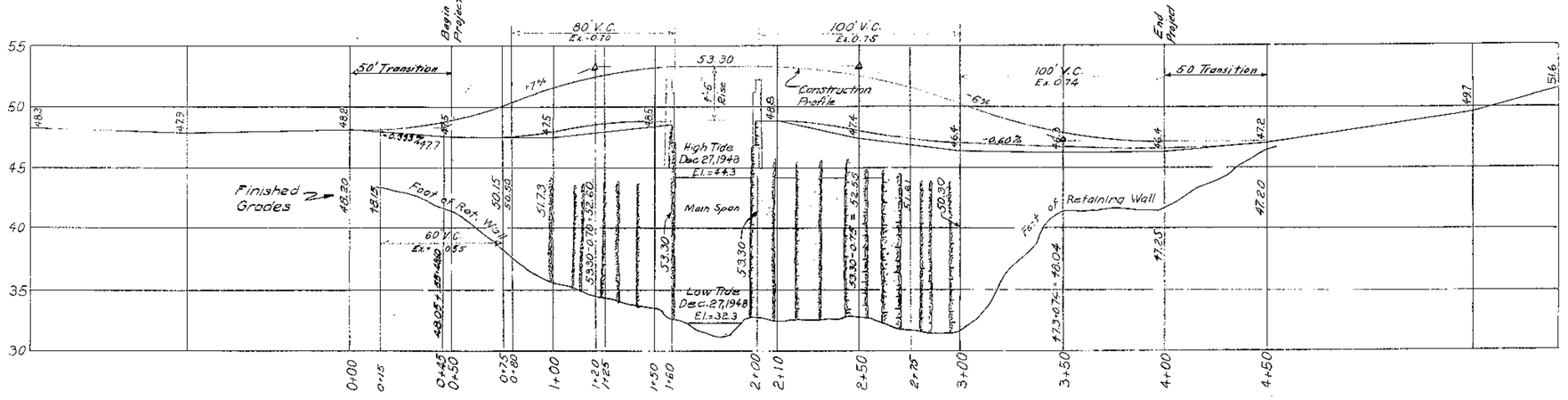
Narrow stone causeway is built of roughly cut granite laid up dry.
Causeway is in fair condition except 2 top courses of retaining wall stone are pushed out by pressure.

TIDAL WATER

Very slow current & practically no slack water.
Ledge all around on approaches & shore line.

APPROACHES

Approaches are surface treated, very narrow & winding



PROFILE

SCALE - Hor. 1"=30', Ver. 1"=5'

Note: The three openings west of the main span are to be preserved. See Sheet No. 4 for layout and details of structure.

Revised 1951

SURVEY - FERGUSON
PLOT & TRACE - BAKER
BRIDGE - 5270

STATE HIGHWAY COMMISSION
BRIDGE DIVISION

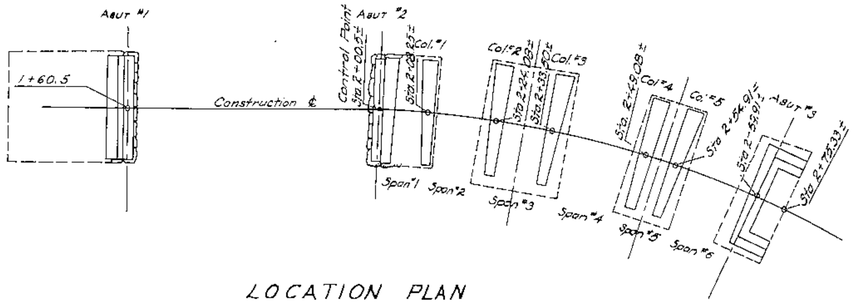
LANES ISLAND BRIDGE
OVER
CARVERS HARBOR
IN THE TOWN OF
VINALHAVEN
KNOX COUNTY

SURVEY

SHEET 1 OF 2 SHEETS AUGUSTA, MAINE JAN. 20, 1950

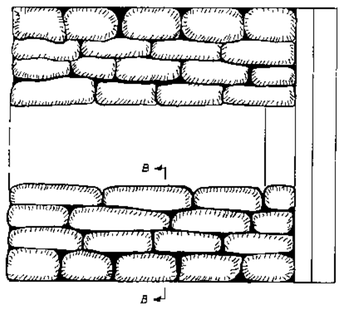
55-143

0 1 2 3 4 5 INCHES

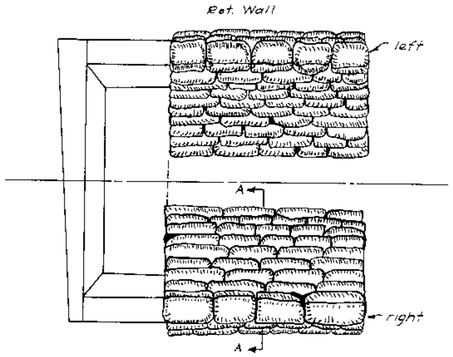


LOCATION PLAN

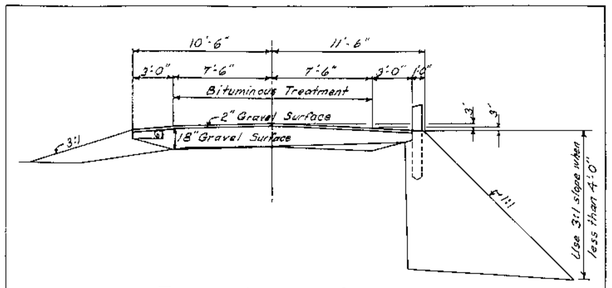
See Sheet #4 for Line Layout



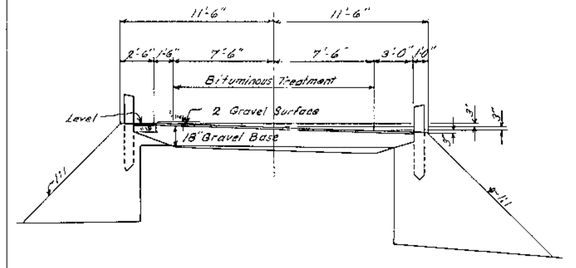
PLAN



PLAN



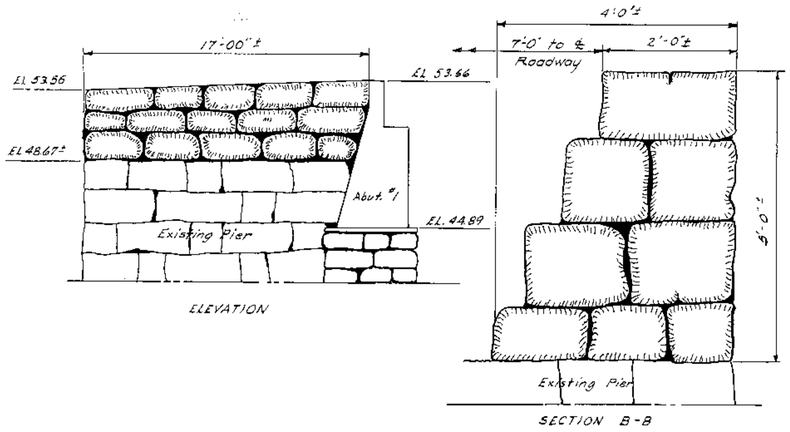
TYPICAL APPROACH SECTION



SUPERELEVATED SECTION

NOTE: All embankments to be stone fill consisting of quarry grout except where 3:1 slopes are used. The embankments having 3:1 slopes shall be gravel

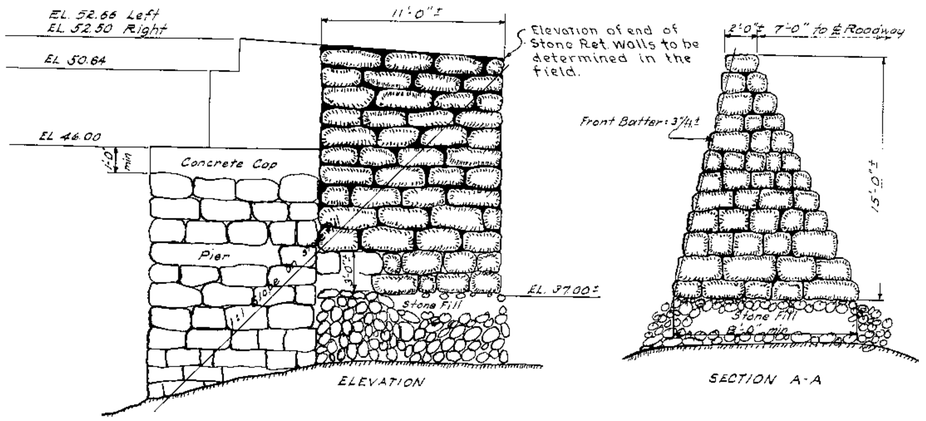
Do not excavate the present roadway for gravel base if existing material is suitable. Excavated material other than stone, shall be used as fill at locations where it cannot be affected by tidal action.



ELEVATION

SECTION B-B

RETAINING WALLS @ABUT. #1



ELEVATION

SECTION A-A

RETAINING WALLS @ ABUT #3

PLAN - VIOLETTE
TRACE - GRAY
CHECK - Reynolds

BRIDGE - 5270

STATE HIGHWAY COMMISSION
BRIDGE DIVISION

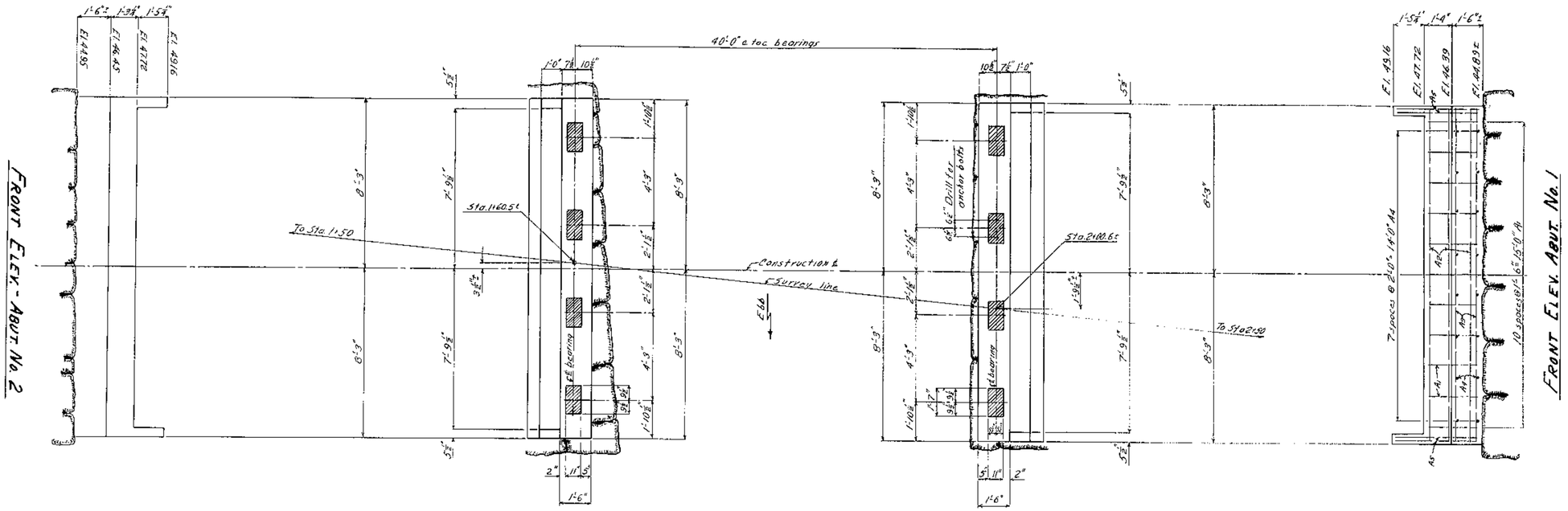
LANES ISLAND BRIDGE
OVER
CARVERS HARBOR
IN THE TOWN OF
VINALHAVEN
KNOX COUNTY

RETAINING WALLS

SHEET 2 OF 9 AUGUSTA, ME. MAY, 1951

55-146

0 1 2 3 4 5 INCHES



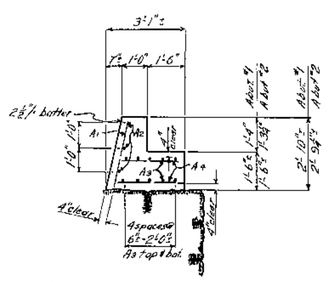
FRONT ELEV. - ABUT. No. 2

FRONT ELEV. ABUT. No. 1

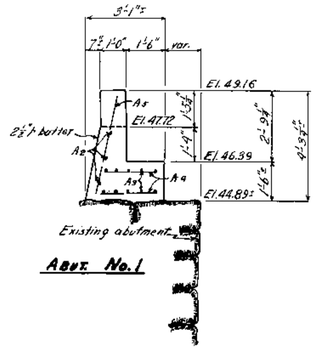
PLAN - ABUT. No. 1
Exp.

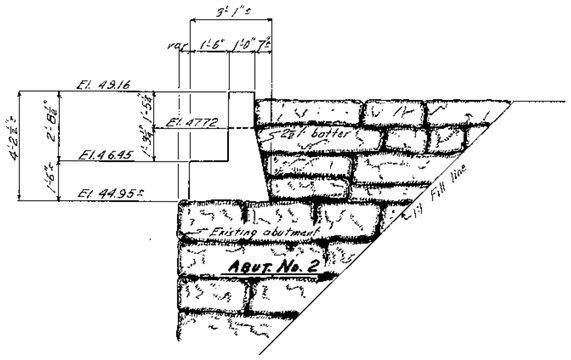
PLAN - ABUT. No. 2
Fix.

NOTE: Dress shaded areas, (one inch larger all around than bearing plates), to exact elevations shown. Reinforcing steel for Abut. No. 2 same as for Abut. No. 1



ABUT. SECTION
Typical details





END ELEV. - ABUTS.

NOTE: See Sheet No. 6 for note about covering of slabs between parapets and superstructure. Backfill for abutments shall be pord for as gravel base.

This substructure built in 1950

DESIGN - RISSEL	BRIDGE - 5270
TRACE - "	
CHECK - HARRIS	

STATE HIGHWAY COMMISSION
BRIDGE DIVISION

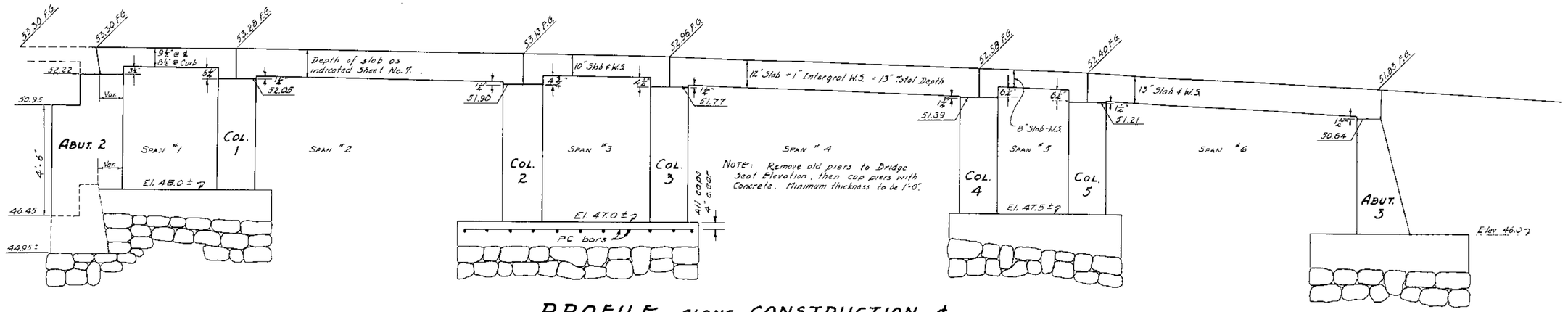
LANES ISLAND BRIDGE
OVER
CARVERS HARBOR
IN THE TOWN OF
VINALHAVEN
KNOX COUNTY

SUBSTRUCTURE 1950

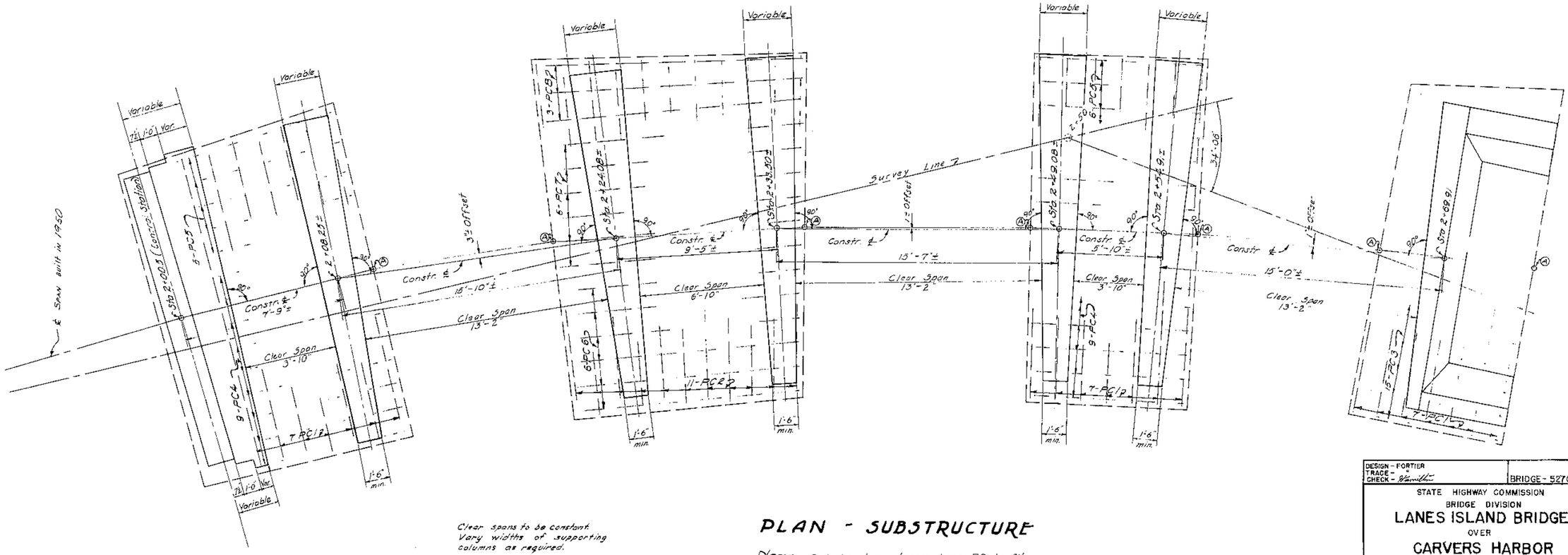
SHEET 3 OF 9 AUGUSTA, MAINE DEC., 1949

55-147

0 1 2 3 4 5 INCHES



PROFILE ALONG CONSTRUCTION ℄



Clear spans to be constant. Vary widths of supporting columns as required.

Points marked Ⓐ are midpoints on faces of existing piers

PLAN - SUBSTRUCTURE

NOTE: Cut, bend or stagger bars PC to fit pier caps as required.

DESIGN - FORTIER
TRACE -
CHECK - Wm. H.

BRIDGE - 5270

STATE HIGHWAY COMMISSION
BRIDGE DIVISION

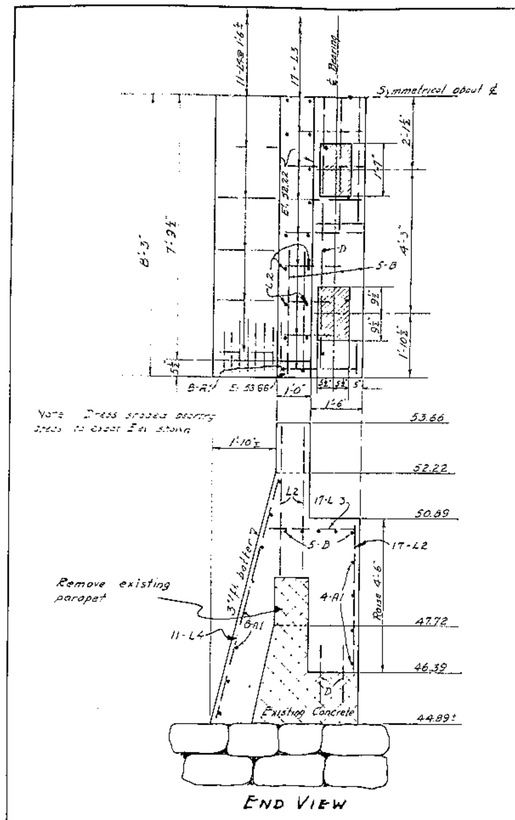
LANES ISLAND BRIDGE
OVER
CARVERS HARBOR
IN THE TOWN OF
VINALHAVEN
KNOX COUNTY

SUBSTRUCTURE 1951

SHEET 4 OF 9 AUGUSTA, ME. MAY, 1951

55-148

0 1 2 3 4 5 INCHES



END VIEW

ABUT. #1

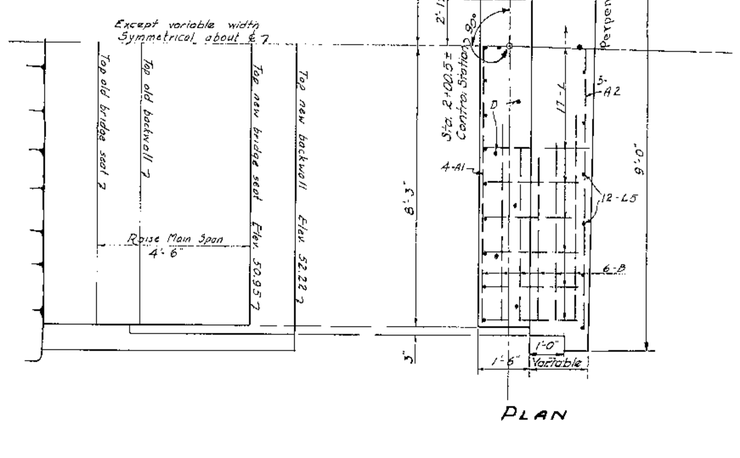
Scale ½" = 1'

NOTE: Final abutment to retain same shape as existing abut. - raise grades 4'-6"

Column No.	Elevation
1	52.05
2	51.90
3	51.77
4	51.39
5	51.2

TYPICAL COLUMN

END VIEW



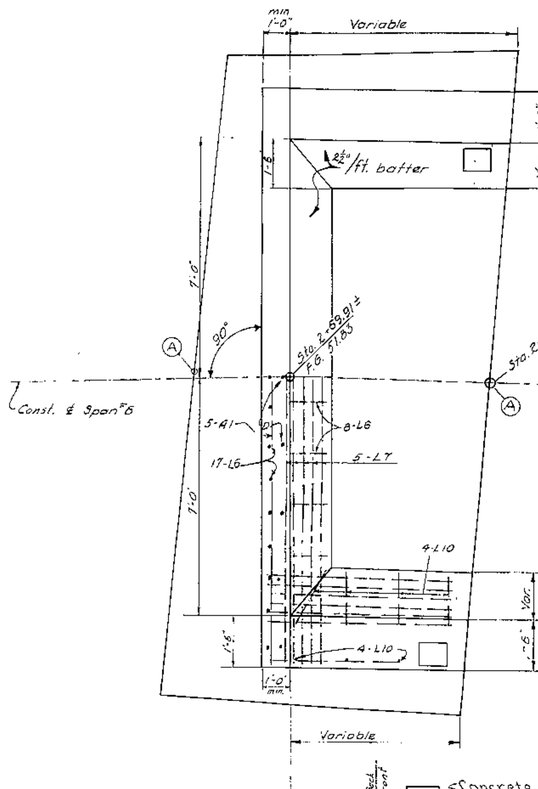
HALF FRONT ELEVATION

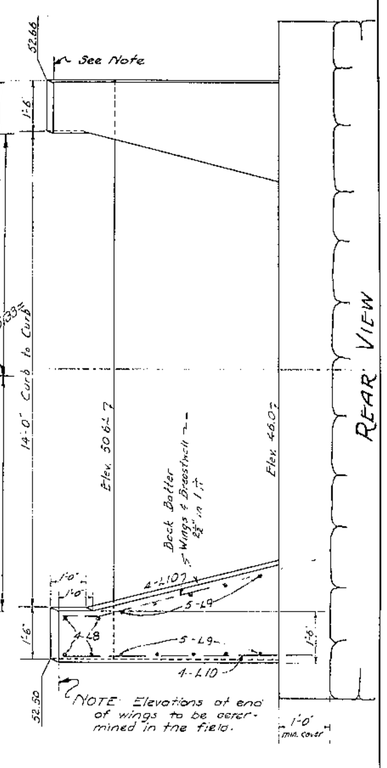
PLAN

ABUT. # 2

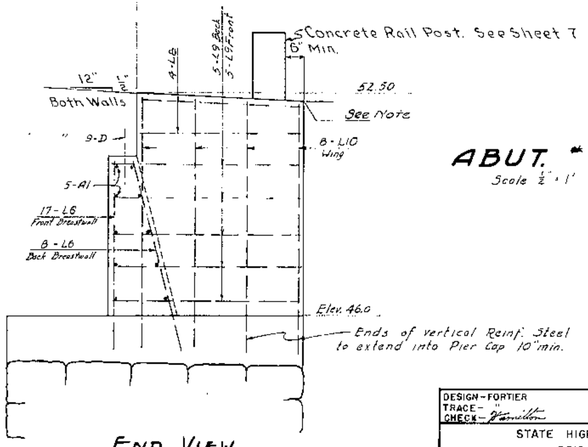
Scale ½" = 1'

NOTE: All steel in substructure to have 3" cover. Cut or bend reinforcing steel to fit where necessary.





REAR VIEW



ABUT. # 3

Scale ½" = 1'

END VIEW

Other end similar

DESIGN - FORTIER
TRACE - "
CHECK - Hamilton

BRIDGE - 5270

STATE HIGHWAY COMMISSION
BRIDGE DIVISION

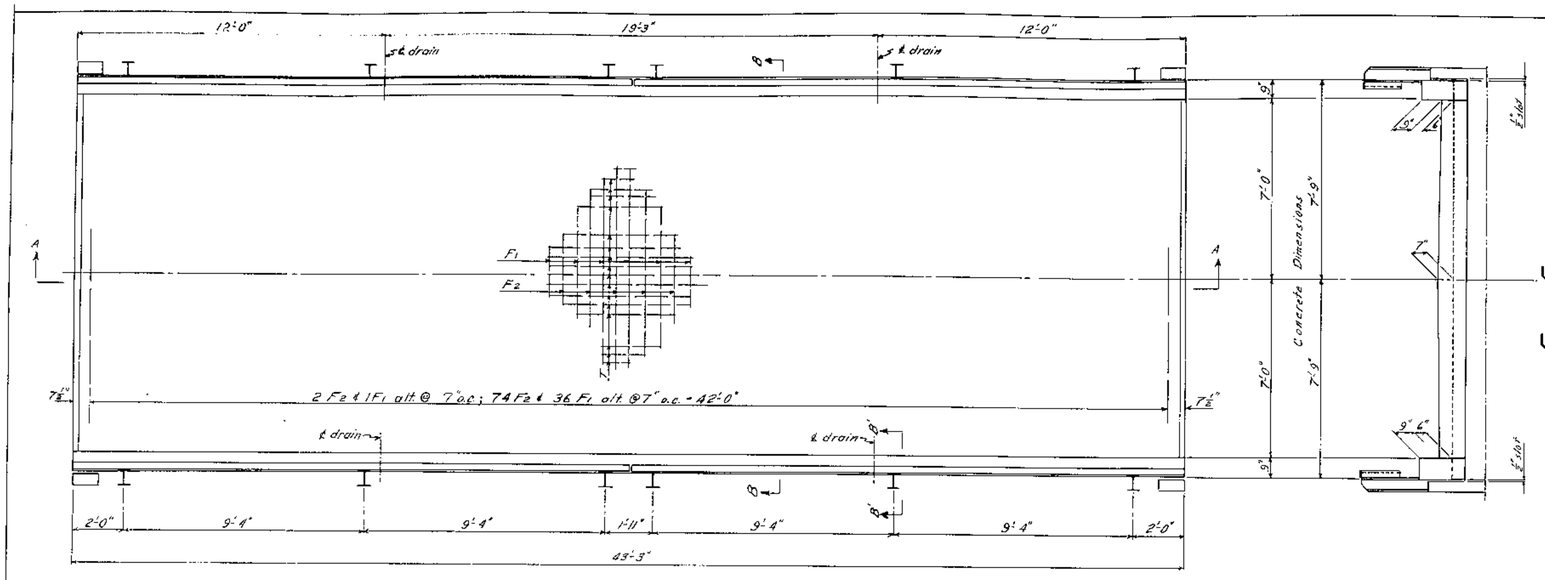
LANES ISLAND BRIDGE
OVER
CARVERS HARBOR
IN THE TOWN OF
VINALHAVEN
KNOX COUNTY

SUBSTRUCTURE 1951

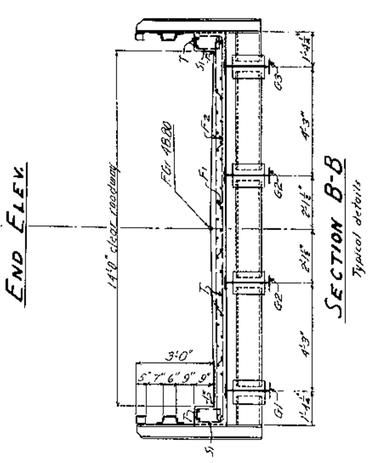
SHEET 5 OF 9 AUGUSTA, ME. MAY, 1951

55-149

0 1 2 3 4 5 INCHES

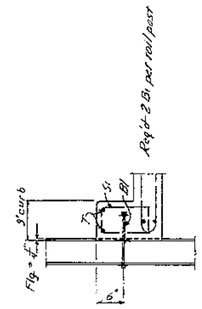


PLAN

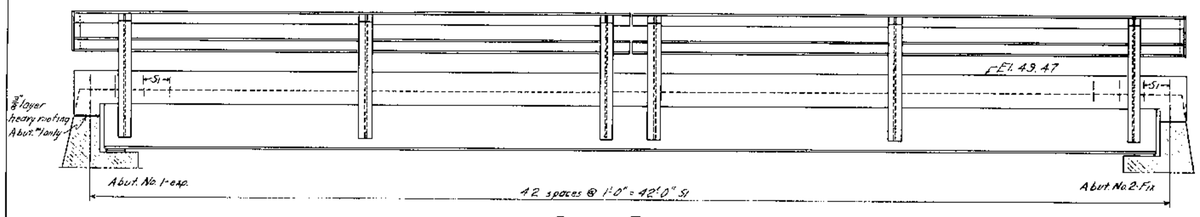


END ELEV.

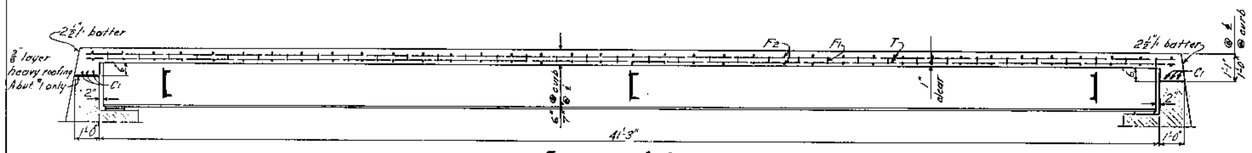
SECTION B-B
Typical details



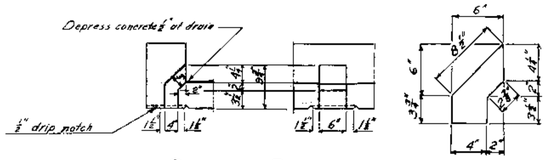
SECTION B'-B'
Typical details



SIDE ELEV.

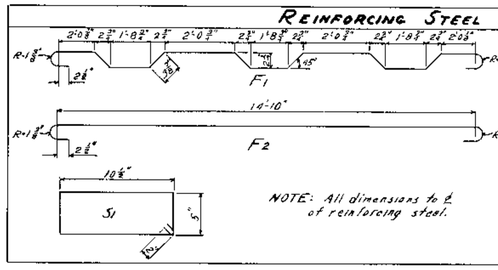


SECTION A-A
Typical details



DRAIN DETAIL
Drains - #24 gage galvanized iron
4 required

REINFORCING STEEL SCHEDULE



Mark	No	Size	Length	Location
Bent Bars				
F1	36	5/8" ϕ	16'-7"	Slab
F2	74	5/8" ϕ	16'-0"	Slab
S1	86	½" ϕ	2'-11"	Curbs
Straight Bars				
A1	22	¾" ϕ	2'-4"	Abutments
A2	6	½" ϕ	15'-10"	do
A3	20	½" ϕ	15'-10"	do
A4	32	½" ϕ	2'-5"	do
A5	8	¾" ϕ	9'-7"	do
T	70	½" ϕ	28'-1"	Slab & curbs, spliced
C1	6	½" ϕ	15'-0"	Ends of slab.

NOTE: Cover the ½" slots between the superstructure and the parapets on the backside with two layers of heavy roofing 10" wide. Coat the surface of the concrete and the backside of each layer as applied with a suitable grade of roofing cement. The area to be covered is to be recessed ¼" by nailing thin strips to the form before concrete is placed.
Curb to be cast with slab.

DESIGN

f_s = 18,000 p.s.i.
f_c = 1,000 p.s.i.
n = 10
Loading = H15-44

This superstructure as built in 1950 to be raised 1'-6".

DESIGN - RISSEL
TRACE - N
CHECK - HARRIS

BRIDGE-5270

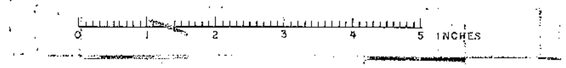
STATE HIGHWAY COMMISSION
BRIDGE DIVISION

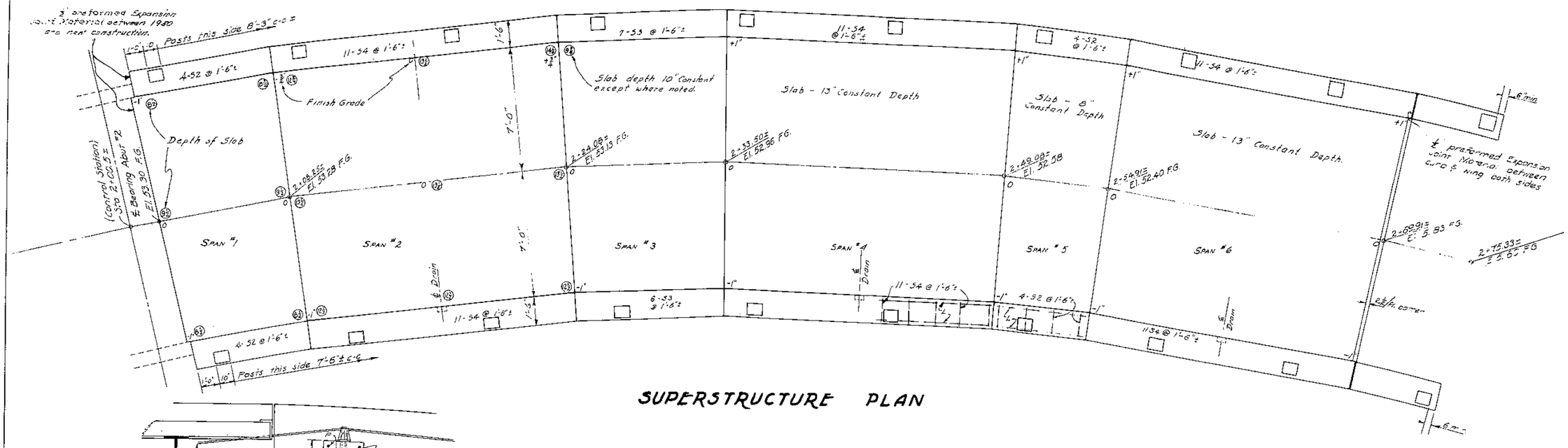
LANES ISLAND BRIDGE
OVER
CARVERS HARBOR
IN THE TOWN OF
VINALHAVEN
KNOX COUNTY

SUPERSTRUCTURE - 1950

SHEET 6 OF 9 AUGUSTA, MAINE DEC., 1949

5F-150

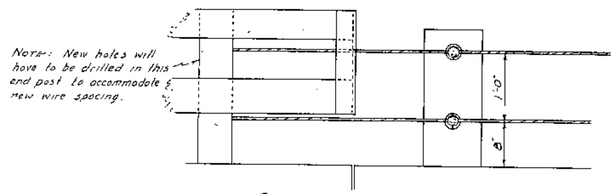




SUPERSTRUCTURE PLAN

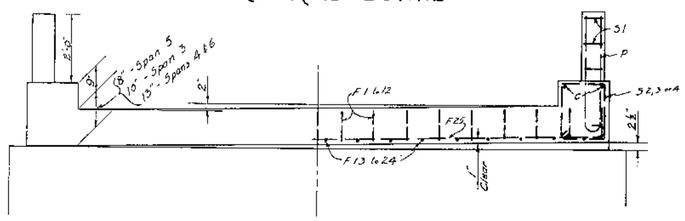
Type A Anchorage at Bridge
4 - Required

Galvanized offset fastenings for 3/4" Wire Cable, ribbed washers and 3/4"ϕ threaded rod.

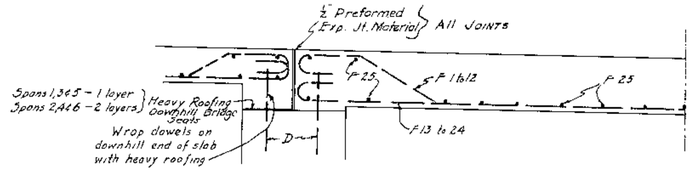


Note: New holes will have to be drilled in this end post to accommodate new wire spacing.

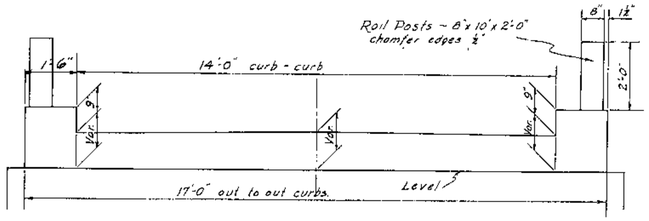
GUARD RAIL DETAIL



TYPICAL SECTION SLAB
AT FULL BANK
(Spans 3, 4, 5 & 6)

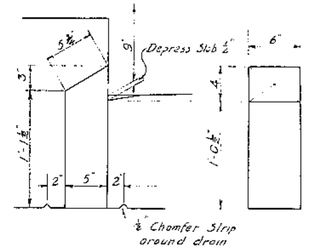


TYPICAL LONGITUDINAL SECTION - SLAB



TYPICAL SECTION SLAB
AT SPANS 1 & 2

Note: Variable slab thickness — this dimension will vary as shown thus (12) on above Plan.



DRAIN DETAIL
No. 24 Gage Galvanized Iron
3 Required

DESIGN
f_s = 18,000 psi.
f_c = 1,000 psi.
n = 10
Loading H 15-44

DESIGN - FORTIER
TRACE - "
CHECK - [illegible]

BRIDGE-5270

STATE HIGHWAY COMMISSION
BRIDGE DIVISION

LANES ISLAND BRIDGE
OVER
CARVERS HARBOR
IN THE TOWN OF
VINALHAVEN
KNOX COUNTY

SUPERSTRUCTURE 1951

SHEET 7 OF 9 AUGUSTA, ME. MAY, 1951

55-151

0 1 2 3 4 5 INCHES

STRAIGHT BARS

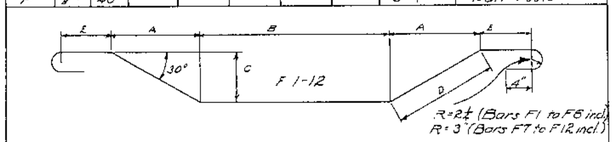
Mark	Size	No.	Length	Location
A 1	½" ⓢ	21	16'-0"	Abuts. #1, 2 & 3
A 2		5	16'-6"	Abut. #2
L 2		68	4'-4"	Abuts. #1 & 2
L 3		34	3'-0"	Abut. #1 & 2
F 25		128	16'-8"	Slab - all spans
L 4	½" ⓢ	11	7'-0"	Abut #1
PC 1	⅜" ⓢ	21	18'-0"	Pier Caps #1, 3 & 4 Longitudinal
2		11	19'-0"	" " #2 "
3		15	8'-0"	" " #4 Transverse
4		18	8'-6"	" " #1 & 3 "
5		11	9'-0"	" " #1 & 3 "
6		6	12'-3"	" " #2 "
7		6	13'-3"	" " #2 "
PC 8	⅝" ⓢ	3	14'-3"	" " #2 "
B	½" ⓢ	11	16'-0"	Abuts. #1 & 2
D	1" ⓢ	137	1'-6"	Abuts. & Columns
L 5	½" ⓢ	12	5'-0"	Abut. #2
L 6		25	5'-3"	Abut. #3
L 7		5	16'-6"	Abut. #3
L 8		8	5'-6"	Abut. #3
L 9		20	6'-6"	Abut. #3
L 10		16	7'-0"	Abut #3
P 1		78	4'-6"	Cols. #1-4-5
P 2		52	5'-6"	Cols. #2-3
P 3	½" ⓢ	42	17'-6"	All Columns

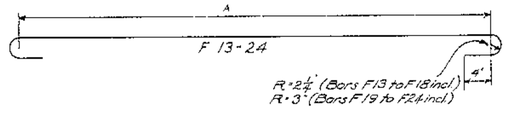
STRAIGHT BARS (Cont.)

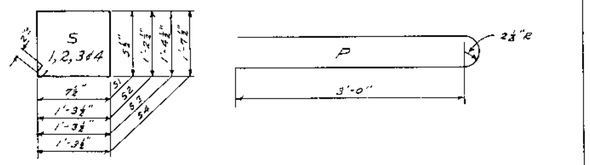
Mark	Size	No.	Length	Location
C 1	½" ⓢ	2	6'-6"	Curb (left) Span #1
C 2		2	16'-6"	" " " #2
C 3		2	9'-6"	" " " #3
C 4		2	15'-6"	" " " #4
C 5		2	5'-6"	" " " #5
C 6		2	14'-8"	" " " #6
C 7		2	5'-0"	" (Right) " #1
C 8		2	14'-6"	" " " #2
C 9		2	9'-4"	" " " #3
C 10		2	14'-8"	" " " #4
C 11		2	5'-2"	" " " #5
C 12	½" ⓢ	2	14'-3"	" " " #6

BENT BARS

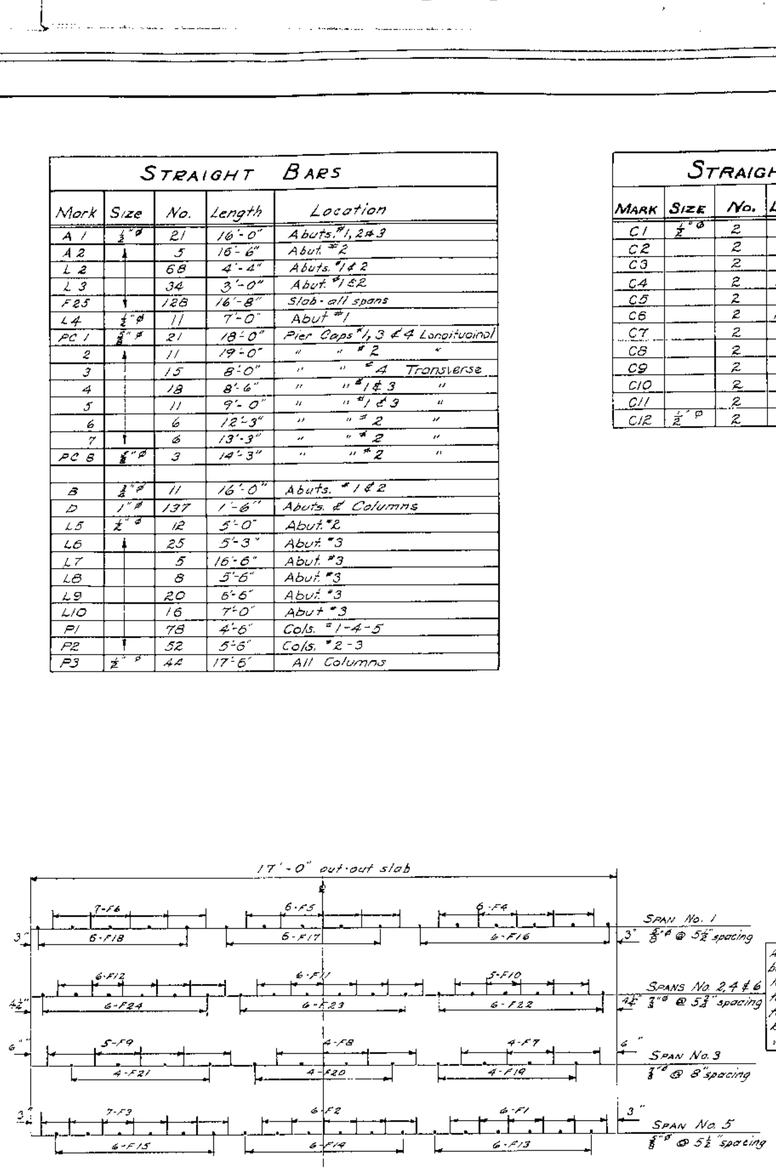
Mark	Size	No.	A	B	C	D	E	Length	Location
F 1	⅝" ⓢ	6	7½"	2'-6½"	4½"	9"	6"	6'-10"	Slab - Span #5 Rt.
2	"	6	"	"	"	"	7"	7'-0"	" Ctr.
3	"	7	"	"	"	"	8"	7'-2"	" Lt.
4	"	6	"	"	"	"	5"	6'-8"	Span #1 Rt.
5	"	6	"	"	"	"	6½"	7'-3"	" Ctr.
6	"	7	"	"	"	"	1'-0½"	7'-11"	" Lt.
7	⅝" ⓢ	4	11½"	4'-11½"	6½"	1'-1"	7"	10'-6"	Span #3 Rt.
8	"	4	"	"	"	"	10½"	11'-1"	" Ctr.
9	"	5	"	"	"	"	1'-2"	11'-8"	" Lt.
10	"	15	1'-4½"	10'-5"	9½"	1'-7"	4½"	16'-7"	Spans #2,4,6 Rt.
11	"	18	"	"	"	"	5½"	16'-9"	" Ctr.
12	"	18	"	"	"	"	7"	17'-0"	" Lt.
13	⅝" ⓢ	6	4'-10"					6'-8"	Span #5 Rt.
14	"	6	5'-0"					6'-10"	" Ctr.
15	"	6	5'-2"					7'-0"	" Lt.
16	"	6	4'-8"					6'-6"	Span #1 Rt.
17	"	6	5'-3"					7'-1"	" Ctr.
18	"	6	5'-11"					7'-9"	" Lt.
19	⅝" ⓢ	4	8'-0"					10'-3"	Span #3 Rt.
20	"	4	8'-7"					10'-10"	" Ctr.
21	"	4	9'-2"					11'-5"	" Lt.
22	"	18	13'-11"					16'-2"	Spans #2,4,6 Rt.
23	"	18	9'-4½"					16'-4"	" Ctr.
24	"	18	9'-7"					16'-6"	" Lt.
S 1	⅜" ⓢ	60						2'-6"	Rail Posts
2	½" ⓢ	16						5'-4"	Curb Spans 1 & 5
3	"	13						5'-8"	Span 3
4	"	66						6'-2"	Spans 2,4,6
P	⅝" ⓢ	40						6'-7"	Rail Posts





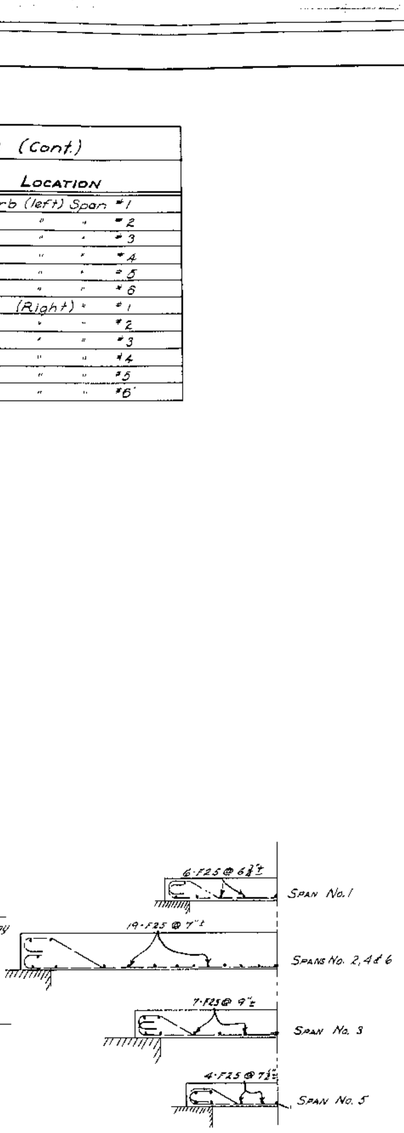


NOTES:
All dimensions are to ℄ of reinforcing bars.
Deformations are to meet A.S.T.M. Specifications A-305.



CROSS SECTION DIAGRAM ~ SLABS
SHOWING SPACING LONG. REINF. STEEL

Alternate bars may be staggered longitudinally to compensate for variable bridge seat widths.



LONG. HALF SECTION ~ SLAB
SHOWING SPACING F-25 BARS

DETAIL - FORTIER
TRACE - GRAY
CHECK - Hamilton

BRIDGE - 5270

STATE HIGHWAY COMMISSION
BRIDGE DIVISION

LANES ISLAND BRIDGE
OVER
CARVERS HARBOR
IN THE TOWN OF
VINALHAVEN
KNOX COUNTY

REINF. STEEL 1951

SHEET 8 OF 9 AUGUSTA, ME. MAY, 1951

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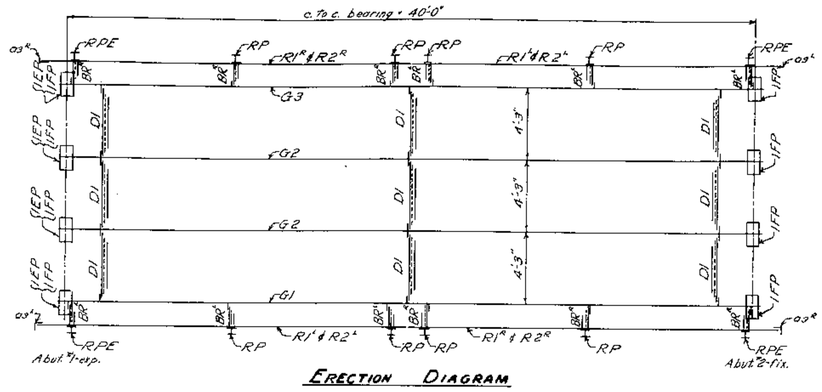
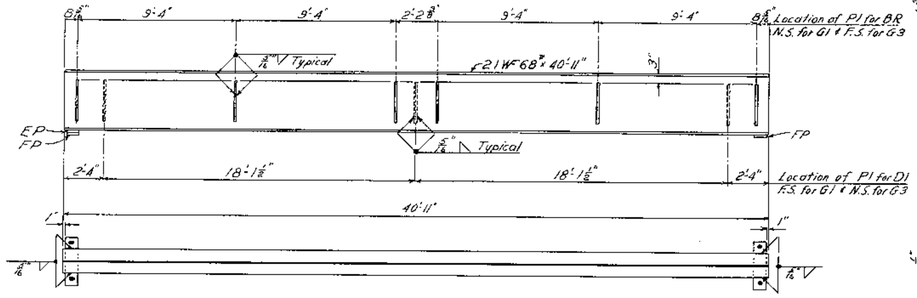
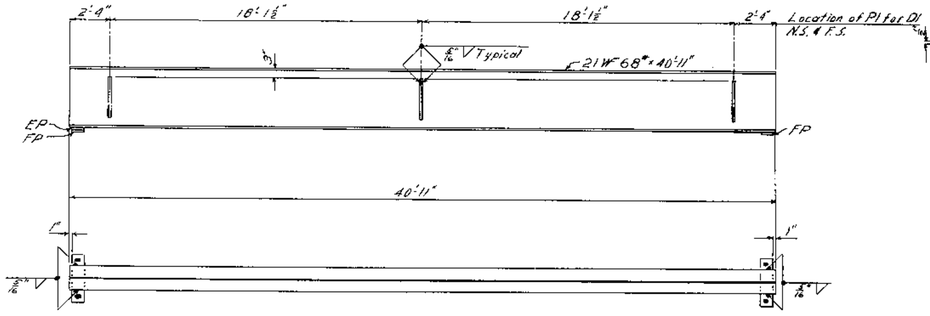


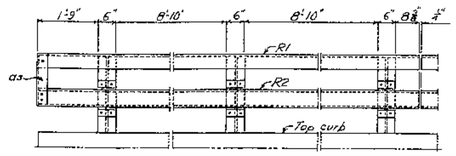
ERECTION DIAGRAM



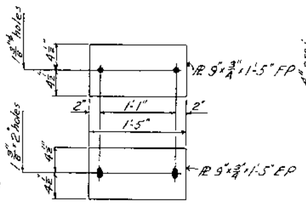
GIRDER - G1 & G3
Roll 1½" camber



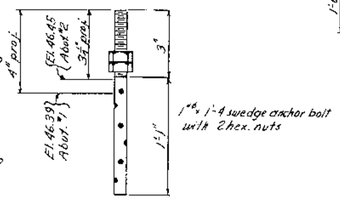
GIRDER - G2
Roll 1½" camber



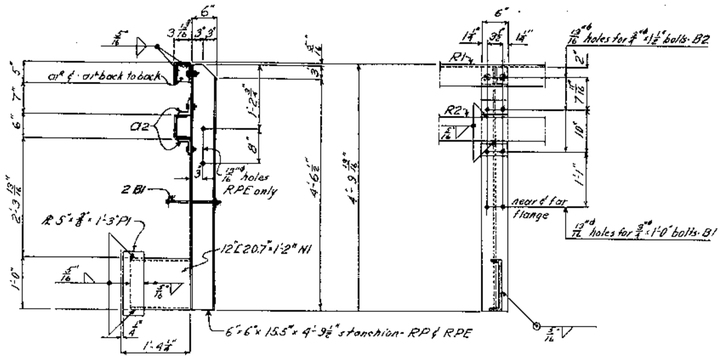
RAIL ASSEMBLY



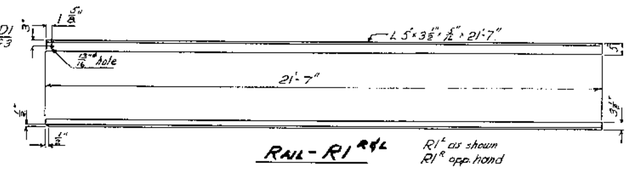
FIXED PLATE - FP &
EXPANSION PLATE - EP



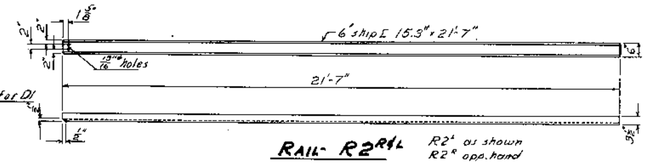
ANCHOR BOLT - AB



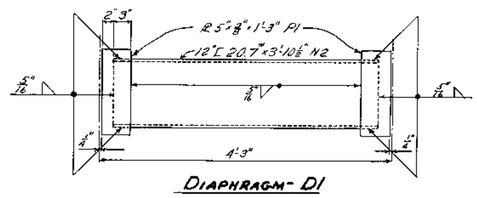
RAIL POST - RP, RPE &
BRACKET - BR R&L
BR^R as shown
BR^L opp hand



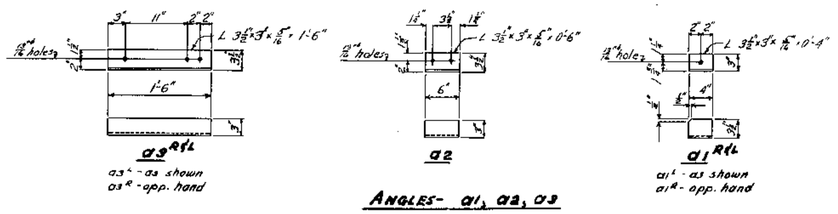
RAIL - R1 R&L
R1^L as shown
R1^R opp. hand



RAIL - R2 R&L
R2^L as shown
R2^R opp. hand



DIAPHRAGM - D1



ANGLES - a1, a2, a3

a3 R&L
a3^L - as shown
a3^R - opp. hand

a2

a1 R&L
a1^L - as shown
a1^R - opp. hand

BILL OF MATERIALS

Mark	Description	No.	Shop work required
G1	21 WF 68# x 40'-11"	1	none
G2	do	2	none
G3	do	1	none
R1^R	L 5"x3½"x⅝" x 21'-7"	2	opp. hand
R1^L	do	2	as shown
R2^R	6" ship L 15.3# x 21'-7"	2	opp. hand
R2^L	do	2	as shown
RP	6"x6"x15.5#x4'-9⅝" stanchion	8	as shown
RPE	do	4	as shown
EP	PL 9"x⅜"x1'-5"	4	as shown
FP	do	8	as shown
AB	1"ø x 1'-4 swedge anchor bolt	16	as shown
a1^R	L 3½"x3"x⅜"x 0'-4"	12	opp. hand
a1^L	L 3½"x3"x⅜"x 0'-4"	12	as shown
a2	L 3½"x3"x⅜"x 0'-6"	24	as shown
a3^R	L 3½"x3"x⅜"x 1'-6"	2	opp. hand
a3^L	do	2	as shown
N1	12"I 20.7#x1'-2"	12	none
N2	12"I 20.7#x3'-10⅝"	9	none
P1	PL 5"x⅜"x1'-3"	30	none
B1	Bolt ¾"ø x 1'-0"; Hex. nut & head & 2 - 2"ø washers	24	none
B2	Bolt ⅞"ø x 1½"; Hex. nut & head & 1 lock washer	84	none

DESIGN - RISSEL
TRACE - "
CHECK - HARRIS

BRIDGE - 5270

STATE HIGHWAY COMMISSION
BRIDGE DIVISION

LANES ISLAND BRIDGE
OVER
CARVERS HARBOR
IN THE TOWN OF
VINALHAVEN
KNOX COUNTY

STEEL DETAILS

SHEET 9 OF 9 AUGUSTA, MAINE DEC., 1949

55-153

0 1 2 3 4 5 INCHES

Appendix E

Hydraulics Data

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

The AE Zone category has been divided by a **Limit of Moderate Wave Action (LIMWA)**. The LIMWA represents the approximate landward limit of the 1.5-foot breaking wave. The effects of wave hazards between the VE Zone and the LIMWA (or between the shoreline and the LIMWA for areas where VE Zones are not identified) will be similar to, but less severe than those in the VE Zone.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 3.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 19. The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NINGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on the Flood Insurance Rate Map (FIRM) was produced by Woolpert, Inc. at a scale of 1:400, from aerial photography dated 2012 or later.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

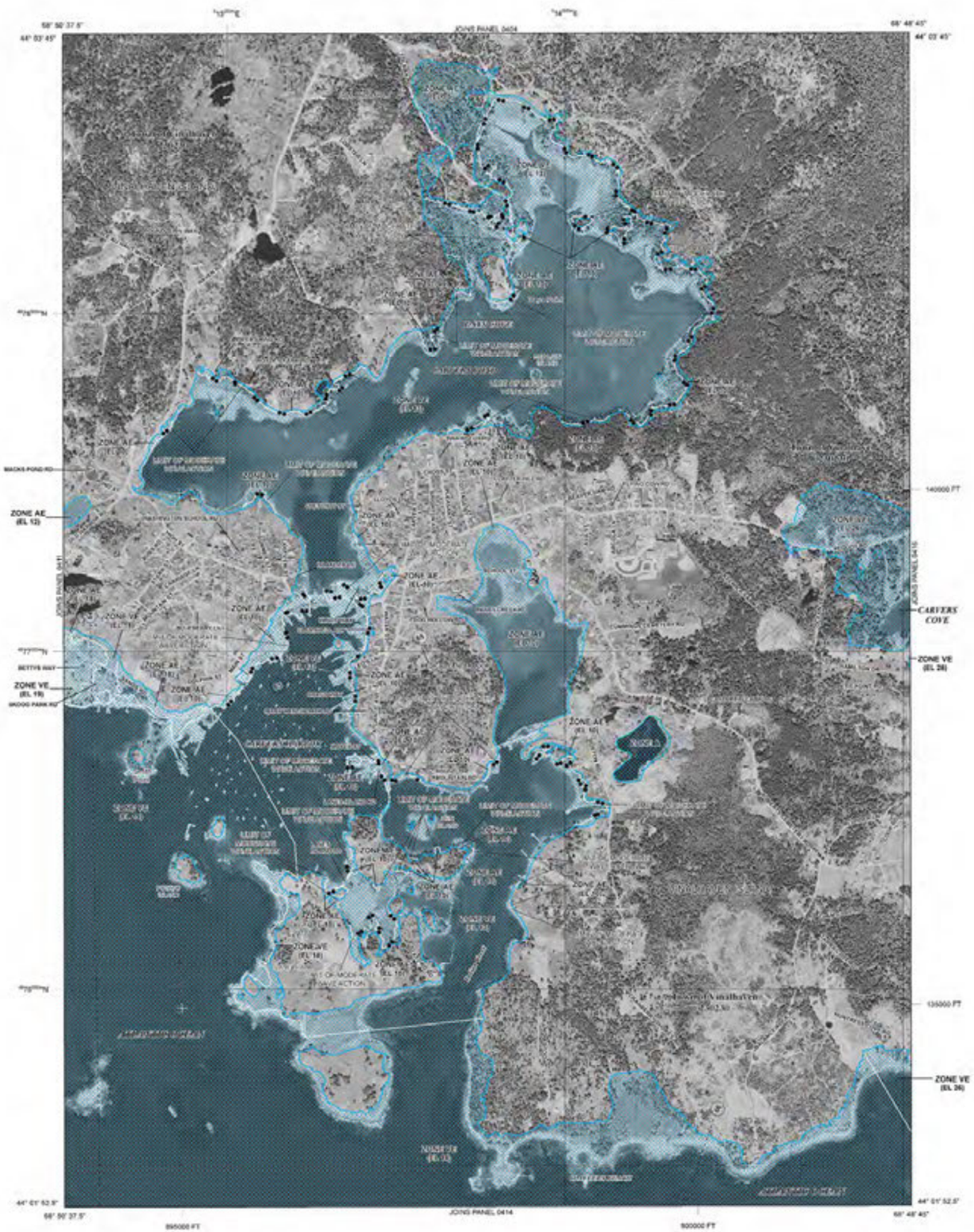
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

State of Maine Floodway Note: Under the Maine Revised Statutes Annotated (M.R.S.A.) Title 38 § 439-A, 7C where the floodway is not designated on the Flood Insurance Rate Map, the floodway is considered to be the channel of a river or other water course and the adjacent land areas to a distance of one-half the width of the floodplain, as measured from the normal high water mark to the upland limit of the floodplain, unless a technical evaluation certified by a registered professional engineer is provided demonstrating the actual floodway based upon approved FEMA modeling methods.

Only coastal structures that are certified to provide protection from the 1-percent-annual-chance flood are shown on this panel. However, all structures taken into consideration for the purpose of coastal flood hazard analysis and mapping are present in the DFIRM database in S_Gen_Struct.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, AR/A, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A — No Base Flood Elevations determined.
ZONE AE — Base Flood Elevations determined.
ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR — Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99 — Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are generally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary
0.2% Annual Chance Floodplain Boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
Limit of Moderate Wave Action
Limit of Moderate Wave Action
513 — Base Flood Elevation line and value; elevation in feet*
(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*
*Referenced to the North American Vertical Datum of 1988
A — A — Cross section line
23 — 23 — Transect line
43° 02' 08", 69° 50' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
4657000 mN — 1000-meter Universal Transverse Mercator grid values, zone 19
DX5510 X — Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
July 6, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'
250 0 500 1000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0412D

FIRM

FLOOD INSURANCE RATE MAP

KNOX COUNTY, MAINE
(ALL JURISDICTIONS)

PANEL 412 OF 925
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
VINALHAVEN, TOWN OF	230078	0412	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
23013C0412D
EFFECTIVE DATE
JULY 6, 2016

Federal Emergency Management Agency

FLOOD INSURANCE STUDY

KNOX COUNTY, MAINE

(ALL JURISDICTIONS)

COMMUNITY NAME	COMMUNITY NUMBER
ANDREWS ISLAND	230967
APPLETON, TOWN OF	230073
BAR ISLAND	230974
BIRCH ISLAND	230966
BRIG LEDGE	230947
CAMDEN, TOWN OF	230074
CAMP COVE LEDGE	230945
CAMP ISLAND	230962
CLAM LEDGES	230970
CRESCENT ISLAND	230955
CRIEHAVEN, TOWNSHIP OF	231034
CROW ISLAND	230978
CUSHING, TOWN OF	230224
DIX ISLAND	230965
EAST GOOSE ROCK	230990
EGG ROCK	230991
FISHERMAN ISLAND	230953
FLAG ISLAND	230972
FRIENDSHIP, TOWN OF	230225
GOOSE ISLAND	230987
GOOSEBERRY KNOB	230959
GRAFFAM ISLAND	230975
GREAT POND ISLAND	230961
GREEN LEDGE	230944
HERRING LEDGE	230937
HEWETT ISLAND	230971
HIGH ISLAND	230964
HIGH LEDGE	230946
HOG ISLAND	230934
HOPE, TOWN OF	230226
ISLE AU HAUT, TOWN OF	230227
LARGE GREEN ISLAND	230936
LASELL ISLAND	230983
LITTLE GREEN ISLAND	230935
LITTLE HURRICANE ISLAND	230973
LITTLE POND ISLAND	230960
LITTLE TWO BUSH ISLAND	230980
*MALCOLM LEDGE	230952
MARBLEHEAD ISLAND	230954
MARK ISLAND	230988
MATINICUS ISLE PLANTATION	230603
METINIC GREEN ISLAND	230932
METINIC ISLAND	230931
MINK ISLAND	230976
MOUSE ISLAND	230986
MUSCLE RIDGE, TOWNSHIP OF	230979
NETTLE ISLAND	230969
NORTH HAVEN, TOWN OF	230228
OAK ISLAND	230957
OTTER ISLAND	230956
OWLS HEAD, TOWN OF	230075
PLEASANT ISLAND	230977
PUDDING ISLAND	230941
RAGGED ISLAND	230940
ROBINSON ROCK	230989
ROCKLAND, CITY OF	230076
ROCKPORT, TOWN OF	230077
SADDLE ISLAND	230982
SAINT GEORGE, TOWN OF	230229
SEAL ISLAND	230948
SHAG LEDGE	230942
SOUTH THOMASTON, TOWN OF	230078
SPECTACLE ISLAND	230963
TENPOUND ISLAND	230633
*THE HOGSHEAD	230943
THE NUBBLE	230933
THOMASTON, TOWN OF	230079
TWO BUSH ISLAND	230477
UNION,TOWN OF	230080
VINALHAVEN, TOWN OF	230230
WARREN, TOWN OF	230081
WASHINGTON, TOWN OF	230082
WHEATON ISLAND	230456
WHEELER BIG ROCK	230939
WOODEN BALL ISLAND	230950
YELLOW LEDGE	230981

*No Special Flood Hazard Areas Identified

Effective: July 6, 2016

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
23013CV000A

Figure 1 is a profile for a hypothetical transect showing the effects of energy dissipation on a wave as it moves inland. This figure shows the wave elevations being decreased by obstructions, such as buildings, vegetation, and rising ground elevations and being increased by open, unobstructed wind fetches. Actual wave conditions may not necessarily include all of the situations shown in Figure 1.

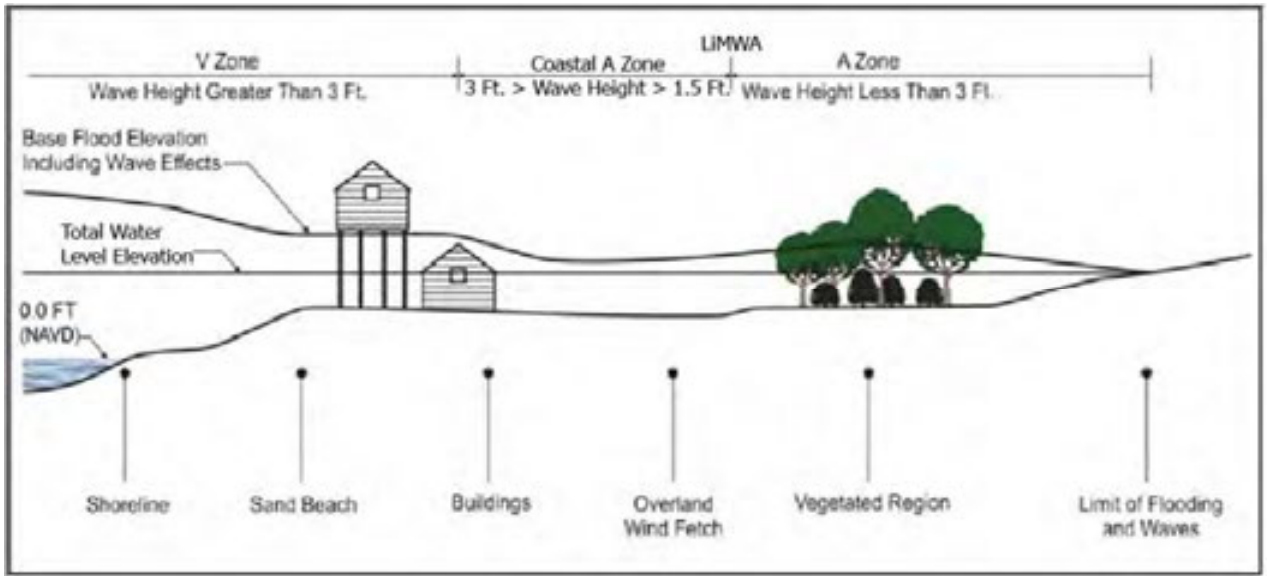


Figure 1 - Transect Schematic

Table 8 – Transect Data Location

	STILLWATER ELEVATION (FEET NAVD88[1])						
TRANSECT	10-PERCENT-ANNUAL-CHANCE	2-PERCENT-ANNUAL-CHANCE	1-PERCENT-ANNUAL-CHANCE	0.2-PERCENT-ANNUAL-CHANCE	TOTAL WATER LEVEL[2] 1-PERCENT-ANNUAL-CHANCE	ZONE	BASE FLOOD ELEVATION (FEET NAVD88[1,3])
1	*	*	9.3	*	11.0	AE	13
2	*	*	9.2	*	10.0	VE	13-14
3	*	*	9.1	*	10.6	VE	13
4	*	*	9.1	*	10.6	VE	13
5	*	*	9.1	*	10.3	VE	13-14
6	*	*	9.1	*	10.1	AE/VE	11/14
7	*	*	9.1	*	9.5	AE	11
8	*	*	9.1	*	11.0	AE	12
9	*	*	9.2	*	9.5	AE	10-11
10	*	*	9.2	*	11.3	VE	14
11	*	*	9.3	*	11.1	VE	13
12	*	*	9.4	*	11.5	AE	13
13	*	*	9.6	*	11.3	AE	13

[1]North American Datum of 1988
[2]Including stillwater elevation and effects of wave setup
[3]Due to map scale limitations, BFEs shown on the FIRM may represent average elevation for the zone depicted
*Data not available

Table 8 – Transect Data Location *(continued)*

TRANSECT	STILLWATER ELEVATION (FEET NAVD88[1]) 10-PERCENT-ANNUAL-CHANCE	2-PERCENT-ANNUAL-CHANCE	1-PERCENT-ANNUAL-CHANCE	0.2-PERCENT-ANNUAL-CHANCE	TOTAL WATER LEVEL[2] 1-PERCENT-ANNUAL-CHANCE	ZONE	BASE FLOOD ELEVATION (FEET NAVD88[2,3])
46	*	*	9.0	*	10.8	VE	19
47	*	*	9.0	*	10.8	VE	14-16
48	*	*	9.0	*	11.1	VE	21
49	*	*	9.0	*	10.5	VE	12-14
50	*	*	9.0	*	11.3	VE	14
51	*	*	9.1	*	11.3	VE	16-17
52	*	*	9.1	*	11.1	VE	19
52A	*	*	9.2	*	11.5	VE	18
52B	*	*	9.2	*	12.1	VE	17
52C	*	*	9.2	*	12.0	VE	16
52D	*	*	9.2	*	10.9	AE	11-12
53	*	*	9.1	*	9.3	AE	10-11
53A	*	*	9.2	*	12.1	VE	16
54	*	*	9.1	*	11.4	VE	19
55	*	*	9.1	*	10.6	VE	17
56	*	*	9.2	*	10.7	VE	15
57	*	*	9.1	*	10.3	AE	12
58	*	*	9.0	*	10.8	AE	12
59	*	*	9.0	*	11.0	VE	14
60	*	*	9.0	*	11.1	AE	12
61	*	*	8.9	*	10.9	VE	13
62	*	*	8.9	*	10.3	AE	12
63	*	*	8.8	*	10.0	AE	12
64	*	*	8.8	*	13.1	AE/VE	18/18-19
65	*	*	8.8	*	10.0	AE/VE	10/13
66	*	*	8.8	*	13.1	VE	19
67	*	*	8.8	*	13.1	VE	26
68	*	*	8.9	*	13.3	VE	22
69	*	*	8.8	*	10.1	AE	12
70	*	*	8.8	*	10.1	AE	11
71	*	*	8.8	*	14.2	VE	18-20
71A	*	*	8.7		11.8	VE	14-18
72	*	*	8.7	*	14.1	VE	17-21
73	*	*	8.7	*	11.7	AE/VE	20/20
74	*	*	8.7	*	12.2	VE	15-18
75	*	*	8.7	*	11.2	AE/VE	12/14-17

[1]North American Datum of 1988
[2]Including stillwater elevation and effects of wave setup
[3]Due to map scale limitations, BFEs shown on the FIRM may represent average elevation for the zone depicted
*Data not available

Table 9 provides a description of the transect locations, the 1-percent-annual-chance coastal stillwater elevations, and the maximum 1-percent-annual-chance wave crest elevations.

Table 9 - Transect Descriptions *(continued)*

Transects	Location	Elevation (FEET NAVD88)[1] Stillwater 1-percent-annual-chance	Elevation (FEET NAVD88)[1] Maximum Wave Crest 1-percent-annual-chance[2]
61	At the shoreline of the Atlantic Ocean, in the Town of Vinalhaven, extending approximately 1,292 feet northwest near Browns Head Light Road, in Red Lion Island	8.9	13
62	At the shoreline of the Atlantic Ocean, in the Town of Vinalhaven, extending approximately 909 feet southwest near Crockers River Road and Long Cove Road, in Red Lion Island	8.9	12
63	At the shoreline of the Atlantic Ocean, in the Town of Vinalhaven, extending approximately 2,680 feet southwest near Old Harbor Road and City Point Road, in Red Lion Island	8.8	12
64	At the shoreline of the Atlantic Ocean, in the Town of Vinalhaven, extending approximately 11,880 feet south near Skoog Park Road and Sands Road, in Red Lion Island	8.8	19
65	At the shoreline of the Atlantic Ocean, in the Town of Vinalhaven, extending approximately 1,352 feet southwest from the Medical Center Loop, in Red Lion Island	8.8	13
66	At the shoreline of the Atlantic Ocean, in the Town of Vinalhaven, extending approximately 10,929 feet southwest from Cranberry Shores Road and Balance Rock Road, in Red Lion Island	8.8	19
67	At the shoreline of the Atlantic Ocean, in the Town of Vinalhaven, extending approximately 6,678 feet from Narrow Island Road, in Red Lion Island	8.8	26

[1]North American Vertical Datum of 1988

[2]Because of map scale limitations, maximum wave elevations may not be shown on the FIRM

Appendix F

Miscellaneous Information

-Existing Load Rating

Bridge Load Rating

Prepared for

Maine Department of Transportation

Bridge No. 5270

VINALHAVEN

LANES ISLAND ROAD

OVER

TIDAL FLOW

Date of Inspection: 1/19/2012

Date of Rating: 7/28/2014

Prepared By: Travis J. Cook, E.I.

Checked By: Carl T. Ayers, P.E.

Q.C. Review By: Christopher D. Baker, P.E.

Christopher D. Baker

VHB - Vanasse Hangen Brustlin, Inc.

Bridge No:	5270	Owner:	MaineDOT
Town/City:	Vinalhaven, ME	Maintainer:	MaineDOT
Route Carried:	Lanes Island Road	Year Built	1954
Crosses:	Tidal Flow	Year(s) Rebuilt/Rehab:	

SUMMARY OF BRIDGE RATING

VEHICLE TYPE		RF	RT (TONS)	POSTING LOAD (TONS)
HL-93	INVENTORY	*0.35*		
	OPERATING	*0.46*		
HL-93 modified	INVENTORY			
	OPERATING			
CONFIGURATION 1		*0.78*	39.2	34.6
CONFIGURATION 2		*0.92*	43.3	41.8
CONFIGURATION 3		*0.94*	41.3	40.1
CONFIGURATION 4		*0.65*	28.5	21.9
CONFIGURATION 5		*0.71*	31.3	25.9
CONFIGURATION 6		*0.73*	27.8	23.4
CONFIGURATION 7		*0.68*	20.1	16.1
CONFIGURATION 8		*0.65*	12.1	9.3

Group 1 Posting Analysis (Configuration 1)

Governing Posting:	34.6
Governing Load Model:	CONFIGURATION 1

Group 2 Posting Analysis (Configurations 2 - 5)

Governing Posting:	21.9
Governing Load Model:	CONFIGURATION 4

Group 3 Posting Analysis (Configurations 6 - 8)

Governing Posting:	9.3
Governing Load Model:	CONFIGURATION 8

LRFR Evaluation Factors:

Live Load Factor:	1.75
Live Load Routine Commercial:	1.30
Live Load Special Hauling:	1.30
Impact Factor:	33%
Governing Condition Factor, ϕ_c:	0.95
System Factor, ϕ_s:	1.00
ADTT (one-way):	3

Please check all the boxes that apply:

- ☐ Bridge load rating is governed by substructure rating
- ☐ Connections control the load rating
- ☐ Exterior girder controls load rating
- ■ As-built load rating
- ☐ As-inspected load rating
- ■ One Lane Loaded
- ■ Advanced Analysis Used
- ☐ Actual Measurements Taken
- ☐ Finite Fatigue Life _____ years

Bridge Load Rating

Prepared for

Maine Department of Transportation

Bridge No. 5270

VINALHAVEN

LANES ISLAND ROAD

OVER

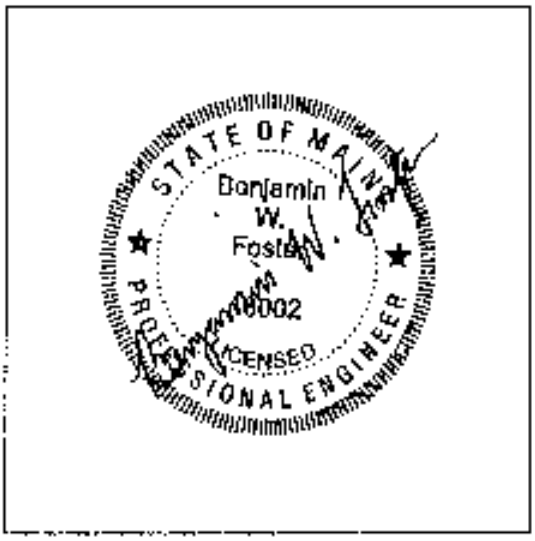
TIDAL FLOW

Date of Inspection: May 30th, 2014

Date of Rating: September 15th, 2014

Prepared By: Joshua Simpson, MaineDOT

Checked By: Ben Foster, MaineDOT



Town/City:	Vinalhaven
Route Carried:	Lanes Island Road
Owner:	State Highway Agency
Maintainer:	State Highway Agency

Bridge No:	5270
Crosses:	Tidal Flow
Year Built:	1954
Year(s) Rebuilt/Rehab:	1998 - Complete Painting

SUMMARY OF BRIDGE RATING

VEHICLE TYPE		RF	RT (TONS)	POSTING LOAD (TONS)
HL-93	INVENTORY	1.06	38.16	
	OPERATING	1.11	39.96	
HL-93 modified	INVENTORY			
	OPERATING			
CONFIGURATION 1		1.43	71.50	OK
CONFIGURATION 2		1.61	75.67	OK
CONFIGURATION 3		1.61	70.84	OK
CONFIGURATION 4		1.53	67.32	OK
CONFIGURATION 5		1.30	57.20	OK
CONFIGURATION 6		1.11	42.12	OK
CONFIGURATION 7		1.25	36.88	OK
CONFIGURATION 8		1.73	32.35	OK

Group 1 Posting Analysis (Configuration 1)

Governing Posting Load:	NO POSTING
Governing Load Model:	N/A

Group 2 Posting Analysis (Configuration 2-5)

Governing Posting Load:	NO POSTING
Governing Load Model:	N/A

Group 3 Posting Analysis (Configuration 6-8)

Governing Posting Load:	NO POSTING
Governing Load Model:	N/A

LRFR Evaluation Factors:

Live Load Distribution Factor:	-
Live Load Routine Commercial Load Factor:	-
Live Load Special Hauling Load Factor:	-
Impact Factor:	33%
Governing Condition Factor, φ_c:	1.00
System Factor, φ_s:	1.00
ADTT (one-way):	3

Please check all the following boxes that apply:

- ☐ Bridge load rating is governed by substructure rating
- ☐ Connections control the load rating
- ☐ Exterior girder controls the load rating
- ☑ As-built load rating
- ☐ As-inspected load rating
- ☑ One Lane Loaded
- ☑ Advanced Analysis Used
- ☐ Actual Measurements Taken
- ☐ Finite Fatigue Life _____ years

Appendix G

Traffic and Accident Data

STATE OF MAINE

FILE: Knox Cty.

INTERDEPARTMENTAL MEMORANDUM

Date of Request: 5/3/2016 Return: 05/13/2016

Latest Date Needed By 5/6/2016

To: **Ed Hanscom** Dept.: MDOT, Bridge Program

From: **Janet Damren 4-3462** Dept.: Bridge Program

Subject: **Request for Traffic Information** Project Manager: **Joel Kittredge**

TOWN(S): Vinalhaven P.I.N. **021707.00** Consultant Proj ☐

COUNTY: Knox ROUTE: 1305131

LOCATION/ DESCRIPTION: Lane Island Bridge #5270 which carries Lanes Island Road (IR 5131) over Tidal Flow, located 0.06 mi S/O Round the Mountain Road (IR 6033).

	Roadway Changes or Relocation (Attach Sketch)	Turning Movement needed (Provide Locations under Comments)	Other Please Describe Under Comments
Please Check Box if Applicable:	☐	☐	☐

Prep By: JG

Description of Sections	Sec. 1 Atlantic Avenue S/O School Street	Sec. 2	Sec. 3	Sec. 4	Sec. 5
1 Latest AADT (Year)	320 (2011)				
2 Current **2018** AADT	320				
3 Future **2028** AADT	350				
4 Future **2038** AADT	380				
5 DHV - % of AADT	13%	%	%	%	%
6 Design Hourly Volume	49				
7 % Heavy Trucks (AADT)	5%	%	%	%	%
8 % Heavy Trucks (DHV)	5%	%	%	%	%
9 Direct.Dist. (DHV)	58%	%	%	%	%
10 18-KIP Equivalent P 2.0	6				
11 18-KIP Equivalent P 2.5	6				

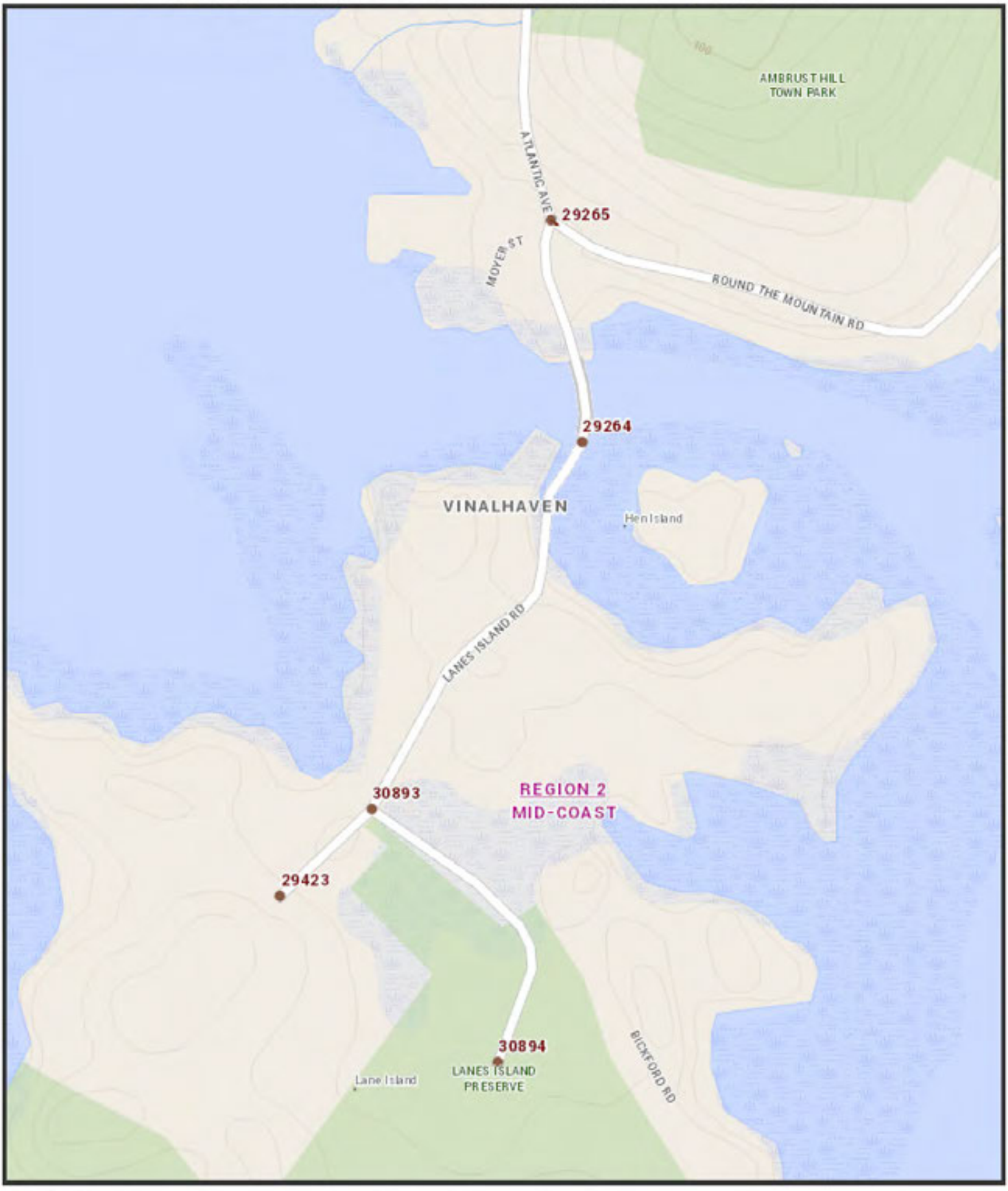
Notes or Remarks: 18-Kip ESALs based on 20 year life

PLEASE PROVIDE: (1) PIN NUMBER, (2) THE CURRENT & FUTURE YEARS FOR WHICH YOU WANT AADT CALCULATED, AND SEND TO MIKE MORGAN. (A LOCATION MAP IS NO LONGER NEEDED.)
TRAFFIC REQUESTS WILL BE FILLED ON A FIRST COME / SERVE BASIS. PLEASE SEND WHEN PROJECT KICKS OFF!!!!

Need Only Data Items Numbered ☐

Comments: No heavy truck data available at the bridge site. Assumed 5% heavy trucks based on 2 nearby classifications on Vinalhaven Island. The Section 1 traffic count is the nearest count available.

DEFAULT TITLE FROM MAP DOCUMENT



0.065 Miles

1 inch = 0.07 miles

Date: 4/4/2018
Time: 7:48:37 AM

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary Report

Report Selections and Input Parameters

REPORT SELECTIONS

☑ Crash Summary I ☐ Section Detail ☑ Crash Summary II ☐ 1320 Public ☐ 1320 Private ☑ 1320 Summary

REPORT DESCRIPTION

WIN 21707 Bridge 5270 in Vinalhaven

REPORT PARAMETERS

Year 2012, Start Month 1 through Year 2016 End Month: 12

Route: 1305131	Start Node: 29265	Start Offset: 0	☐ Exclude First Node
	End Node: 30893	End Offset: 0	☐ Exclude Last Node

Crash Summary I

Nodes

Node	Route - MP	Node Description	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual M Ent-Veh	Crash Rate	Critical Rate	CRF
29265	1305131 - 0.36	Int of ATLANTIC AV LANES ISLAND RD ROUND THE MOUI	1	0	0	0	0	0	0	0.0	0.081	0.00	0.35	0.00
												Statewide Crash Rate:	0.13	
29264	1305131 - 0.45	Non Int LANES ISLAND RD	1	0	0	0	0	0	0	0.0	0.035	0.00	-0.52	0.00
												Statewide Crash Rate:	0.13	
30893	1305131 - 0.64	Int of LANES ISLAND RD LANES PRESERVE	1	0	0	0	0	0	0	0.0	0.025	0.00	-1.24	0.00
												Statewide Crash Rate:	0.13	
Study Years:	5.01	NODE TOTALS:		0	0	0	0	0	0	0.0	0.141	0.00	0.55	0.00

Crash Summary I

Sections

Start Node	End Node	Element	Offset Begin - End	Route - MP	Section Length	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual HMVM	Crash Rate	Critical Rate	CRF
29264	29265	206801	0 - 0.09	1305131 - 0.36	0.09	1	0	0	0	0	0	0	0.0	0.00004	0.00	419.08	0.00
Non Int LANES ISLAND RD				RD INV 13 05131											Statewide Crash Rate: 227.30		
29264	30893	206802	0 - 0.19	1305131 - 0.45	0.19	1	0	0	0	0	0	0	0.0	0.00005	0.00	704.67	0.00
Non Int LANES ISLAND RD				RD INV 13 05131											Statewide Crash Rate: 227.30		
Study Years: 5.01				Section Totals:	0.28		0	0	0	0	0	0	0.0	0.00009	0.00	945.76	0.00
				Grand Totals:	0.28		0	0	0	0	0	0	0.0	0.00009	0.00	1064.96	0.00

Crash Summary

Section Details

Start Node	End Node	Element	Offset Begin - End	Route - MP	Total Crashes	Injury Crashes K	A	B	C	PD	Crash Report	Crash Date	Crash Mile Point	Injury Degree
29264	29265	206801	0 - 0.09	1305131 - 0.36	0	0	0	0	0	0				
29264	30893	206802	0 - 0.19	1305131 - 0.45	0	0	0	0	0	0				
				Totals:	0	0	0	0	0	0				

Crash Summary II - Characteristics

Crashes by Day and Hour

	AM												Hour of Day	PM											
Day Of Week	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	Un	Tot
SUNDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MONDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TUESDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WEDNESDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
THURSDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FRIDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SATURDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Vehicle Counts by Type

Unit Type	Total
1-Passenger Car	0
2-(Sport) Utility Vehicle	0
3-Passenger Van	0
4-Cargo Van (10K lbs or Less)	0
5-Pickup	0
6-Motor Home	0
7-School Bus	0
8-Transit Bus	0
9-Motor Coach	0
10-Other Bus	0
11-Motorcycle	0
12-Moped	0
13-Low Speed Vehicle	0
14-Autocycle	0
15-Experimental	0
16-Other Light Trucks (10,000 lbs or Less)	0
17-Medium/Heavy Trucks (More than 10,000 lbs)	0
18-ATV - (4 wheel)	0
20-ATV - (2 wheel)	0
21-Snowmobile	0
22-Pedestrian	0
23-Bicyclist	0
24-Witness	0
25-Other	0
Total	0

Crash Summary II - Characteristics

Crashes by Driver Action at Time of Crash

Driver Action at Time of Crash	Dr 1	Dr 2	Dr 3	Dr 4	Dr 5	Other	Total
No Contributing Action	0	0	0	0	0	0	0
Ran Off Roadway	0	0	0	0	0	0	0
Failed to Yield Right-of-Way	0	0	0	0	0	0	0
Ran Red Light	0	0	0	0	0	0	0
Ran Stop Sign	0	0	0	0	0	0	0
Disregarded Other Traffic Sign	0	0	0	0	0	0	0
Disregarded Other Road Markings	0	0	0	0	0	0	0
Exceeded Posted Speed Limit	0	0	0	0	0	0	0
Drove Too Fast For Conditions	0	0	0	0	0	0	0
Improper Turn	0	0	0	0	0	0	0
Improper Backing	0	0	0	0	0	0	0
Improper Passing	0	0	0	0	0	0	0
Wrong Way	0	0	0	0	0	0	0
Followed Too Closely	0	0	0	0	0	0	0
Failed to Keep in Proper Lane	0	0	0	0	0	0	0
Operated Motor Vehicle in Erratic, Reckless, Careless, Negligent or Aggressive Manner	0	0	0	0	0	0	0
Swerved or Avoided Due to Wind, Slippery Surface, Motor Vehicle, Object, Non-Motorist in Roadway	0	0	0	0	0	0	0
Over-Correcting/Over-Steering	0	0	0	0	0	0	0
Other Contributing Action	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0

Crashes by Apparent Physical Condition And Driver

Apparent Physical Condition	Dr 1	Dr 2	Dr 3	Dr 4	Dr 5	Other	Total
Apparently Normal	0	0	0	0	0	0	0
Physically Impaired or Handicapped	0	0	0	0	0	0	0
Emotional(Depressed, Angry, Disturbed, etc.)	0	0	0	0	0	0	0
Ill (Sick)	0	0	0	0	0	0	0
Asleep or Fatigued	0	0	0	0	0	0	0
Under the Influence of Medications/Drugs/Alcohol	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0

Driver Age by Unit Type

Age	Driver	Bicycle	SnowMobile	Pedestrian	ATV	Total
09-Under	0	0	0	0	0	0
10-14	0	0	0	0	0	0
15-19	0	0	0	0	0	0
20-24	0	0	0	0	0	0
25-29	0	0	0	0	0	0
30-39	0	0	0	0	0	0
40-49	0	0	0	0	0	0
50-59	0	0	0	0	0	0
60-69	0	0	0	0	0	0
70-79	0	0	0	0	0	0
80-Over	0	0	0	0	0	0
Unknown	0	0	0	0	0	0
Total	0	0	0	0	0	0

Crash Summary II - Characteristics

Most Harmful Event

Most Harmful Event	Total
1-Overturn / Rollover	0
2-Fire / Explosion	0
3-Immersion	0
4-Jackknife	0
5-Cargo / Equipment Loss Or Shift	0
6-Fell / Jumped from Motor Vehicle	0
7-Thrown or Falling Object	0
8-Other Non-Collision	0
9-Pedestrian	0
10-Pedalcycle	0
11-Railway Vehicle - Train, Engine	0
12-Animal	0
13-Motor Vehicle in Transport	0
14-Parked Motor Vehicle	0
15-Struck by Falling, Shifting Cargo or Anything Set in Motion by Motor Vehicle	0
16-Work Zone / Maintenance Equipment	0
17-Other Non-Fixed Object	0
18-Impact Attenuator / Crash Cushion	0
19-Bridge Overhead Structure	0
20-Bridge Pier or Support	0
21-Bridge Rail	0
22-Cable Barrier	0
23-Culvert	0
24-Curb	0
25-Ditch	0
26-Embankment	0
27-Guardrail Face	0
28-Guardrail End	0
29-Concrete Traffic Barrier	0
30-Other Traffic Barrier	0
31-Tree (Standing)	0
32-Utility Pole / Light Support	0
33-Traffic Sign Support	0
34-Traffic Signal Support	0
35-Fence	0
36-Mailbox	0
37-Other Post Pole or Support	0
38-Other Fixed Object (wall, building, tunnel, etc.)	0
39-Unknown	0
40-Gate or Cable	0
41-Pressure Ridge	0
Total	0

Traffic Control Devices

Traffic Control Device	Total
1-Traffic Signals (Stop & Go)	0
2-Traffic Signals (Flashing)	0
3-Advisory/Warning Sign	0
4-Stop Signs - All Approaches	0
5-Stop Signs - Other	0
6-Yield Sign	0
7-Curve Warning Sign	0
8-Officer, Flagman, School Patrol	0
9-School Bus Stop Arm	0
10-School Zone Sign	0
11-R.R. Crossing Device	0
12-No Passing Zone	0
13-None	0
14-Other	0
Total	0

Injury Data

Severity Code	Injury Crashes	Number Of Injuries
K	0	
A	0	
B	0	
C	0	
PD	0	0
Total	0	0

Road Character

Road Grade	Total
1-Level	0
2-On Grade	0
3-Top of Hill	0
4-Bottom of Hill	0
5-Other	0
Total	0

Light

Light Condition	Total
1-Daylight	0
2-Dawn	0
3-Dusk	0
4-Dark - Lighted	0
5-Dark - Not Lighted	0
6-Dark - Unknown Lighting	0
7-Unknown	0
Total	0

Crash Summary II - Characteristics

Crashes by Year and Month

Month	2012	2013	2014	2015	2016	Total
JANUARY	0	0	0	0	0	0
FEBRUARY	0	0	0	0	0	0
MARCH	0	0	0	0	0	0
APRIL	0	0	0	0	0	0
MAY	0	0	0	0	0	0
JUNE	0	0	0	0	0	0
JULY	0	0	0	0	0	0
AUGUST	0	0	0	0	0	0
SEPTEMBER	0	0	0	0	0	0
OCTOBER	0	0	0	0	0	0
NOVEMBER	0	0	0	0	0	0
DECEMBER	0	0	0	0	0	0
Total	0	0	0	0	0	0

Report is limited to the last 10 years of data.

Crash Summary II - Characteristics

Crashes by Crash Type and Type of Location

Crash Type	Straight Road	Curved Road	Three Leg Intersection	Four Leg Intersection	Five or More Leg Intersection	Driveways	Bridges	Interchanges	Other	Parking Lot	Private Way	Cross Over	Railroad Crossing	Traffic Circle-Roundabout	Total
Object in Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rear End - Sideswipe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Head-on - Sideswipe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Intersection Movement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Train	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Went Off Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All Other Animal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jackknife	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rollover	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fire	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Submersion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thrown or Falling Object	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Deer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moose	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Turkey	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Dry	Ice/Frost	Mud, Dirt, Gravel	Oil	Other	Sand	Slush	Snow	Unknown	Water (Standing, Moving)	Wet	Total
Blowing Sand, Soil, Dirt												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Blowing Snow												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Clear												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Cloudy												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Dry	Ice/Frost	Mud, Dirt, Gravel	Oil	Other	Sand	Slush	Snow	Unknown	Water (Standing, Moving)	Wet	Total
Fog, Smog, Smoke												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Other												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Rain												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Severe Crosswinds												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather / Light	Dry	Ice/Frost	Mud, Dirt, Gravel	Oil	Other	Sand	Slush	Snow	Unknown	Water (Standing, Moving)	Wet	Total
Sleet, Hail (Freezing Rain or Drizzle)												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Snow												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0

Appendix H

Preliminary Cost Estimates

Preliminary Cost Estimate
Alternative 1

PROJECT:	Vinalhaven, Lanes Island Bridge #5720	WIN:	021707.00
Alternative 1:	Bridge Preservation Deck Area: 114' x 17' = 1,938 SF	ESTIMATED BY:	CJO

SUPERSTRUCTURE:	1,938	SF	×	$31.90	=	$62,000
ABUTMENTS	2	EA	×	$7,600.00	=	$16,000
PIERS	3	EA	×	$11,050.00	=	$34,000
COFFERDAMS	0	EA	×	$0.00	=	$0
STRUCTURAL EXCAVATION & BORROW	0	CY	×	$0.00	=	$0
PLAIN RIPRAP & CRUSHED STONE SLOPE PROTECTION	140	CY	×	$100.00	=	$14,000
EXISTING BRIDGE REMOVAL	0	LS	×	$0.00	=	$0
DETOUR AND/OR TEMPORARY BRIDGE	0	LS	×	$0.00	=	$0
REHABILITATION CONTINGENCIES				7%	=	$9,000
MISCELLANEOUS (TCP'S, FIELD OFFICE, ETC.)				10%	=	$13,000
MOBILIZATION				10%	=	$13,000
				STRUCTURE SUBTOTAL	=	$165,000
APPROACHES	525	LF	×	$60.50	=	$32,000
MISCELLANEOUS				7%	=	$3,000
MOBILIZATION (Increase for Island Access)				14%	=	$5,000
				APPROACHES SUBTOTAL	=	$40,000
				TOTAL CONSTRUCTION COST	=	$205,000
PRELIMINARY ENGINEERING				12%	=	$25,000
RIGHT OF WAY					=	$0
CONSTRUCTION ENGINEERING				12%	=	$25,000
OTHER:					=	$0
				TOTAL PROJECT COST	=	$255,000