Preliminary Design Report

Beals Island Bridge #5500
Bridge Street
over
Moosabec Reach

Jonesport-Beals, Maine

WIN 22626.00

March 25, 2015
Revised April 10, 2015

Maine Department of Transportation

Bridge Program

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BACKGROUND INFORMATION

TOWN - Jonesport-Beals **WIN -** 22626.00 **BRIDGE NO. -** 5500

FUNDING - Federal/State **STATE ROUTE -** N/A

WORK PLAN:

YEAR	14/16	**ESTIMATE**	$125,000
YEAR	15/17	**ESTIMATE**	$9,000,000
		FUNDS TRANSFERRED IN/OUT	$581,718
		TOTAL	$9,706,718

PROGRAM SCOPE - Bridge Replacement

PROGRAM DESCRIPTION – Beals Island Bridge (# 5500) carries Bridge Street over Moosabec Reach. Located on the Beals - Jonesport town line.

PROJECT BACKGROUND - This bridge was constructed circa 1958 and it is the only crossing that connects the island and town of Beals with the mainland at Jonesport. It is in fair condition but requires rehabilitation or replacement to maintain or improve condition and extend service life.

JURISDICTION - State Highway

FUNCTIONAL CLASSIFICATION - Major Collector

CORRIDOR PRIORITY - 4

NHS - No

URBAN/RURAL - Rural

FHWA SUFFICIENCY RATING - 44

LOAD POSTING - N/A

POSTED SPEED - 25 mph

STRUCTURALLY DEFICIENT - No

FUNCTIONALLY OBSOLETE - Yes

TRAFFIC - **2015** **AADT** 2,060

2035 **AADT** 2,470

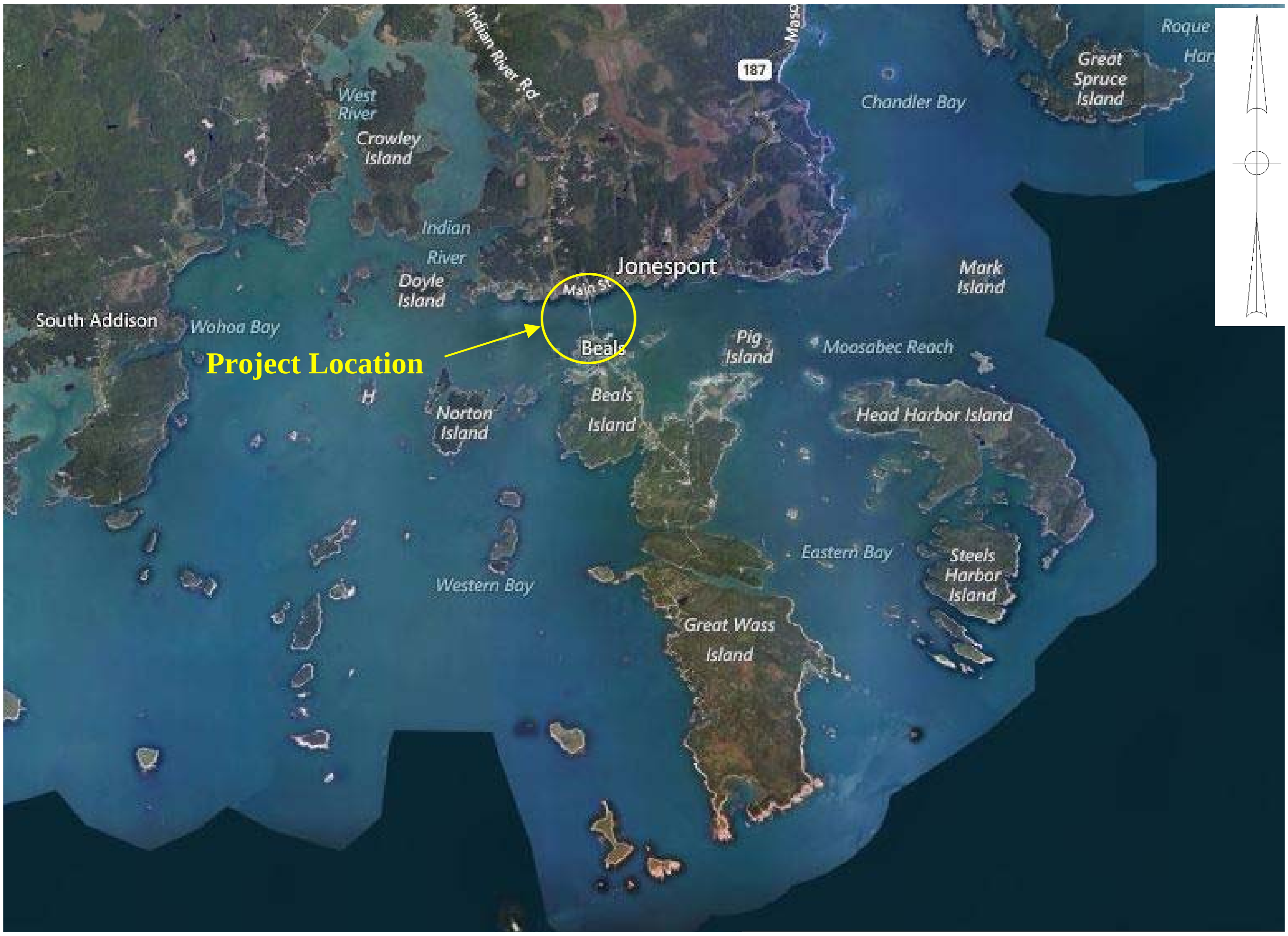
***ACCIDENT DATA, CRF -** 0.0

DHV 296

*(2006 thru 2008 data)

LOCATION MAP

Jonesport-Beals, Beals Island Bridge #5500, WIN 22626.00
Bridge Street over Moosabec Reach



Latitude: 44° 31’ 28.11” N, Longitude: 67° 36’ 52.81” W

BRIDGE RECOMMENDATION FORM

TOWN - Jonesport-Beals **BRIDGE -** Beals Island Bridge **BRIDGE NO. -** 5500

DESIGNED BY - VHB **DATE -** 3/25/15 **WIN -** 22626.00
APPROVED BY - AY **DATE -** 4-10-15
APPROVED BY - JSF **DATE -** 4/14/15

PROJECT - Bridge replacement with 3000' of approaches, including transitions.

ALIGNMENT DESCRIPTION - Tangent on majority of bridge with 4100' horizontal curve located on Jonesport approach and beginning of bridge and 2290' horizontal curve on Beals approach and end of bridge. A 400' crest vertical curve with a finished grade about 5' higher than the existing bridge and 5.5% max grade. New centerline located approximately 38' easterly of existing bridge centerline.

4' LRT 5-22-15

APPROACH SECTION - Two 10' lanes with ~~X~~ shoulders at Jonesport approach. Two 10' lanes with 4' shoulders at Beals approach. 1:1.5 sideslopes with modified steel guardrail and reduced berm widths.

SPANS - 126' – 6 @ 135' – 126' (Total = 1062'-0") **SKEW -** 0°

LOADING - HL-93 modified for Strength 1 **DESIGN SPEED -** 25 mph

SUPERSTRUCTURE - Precast, prestressed concrete New England Bulb Tee 1800 beams with a composite 8" concrete deck and a 3" asphalt wearing surface on ¼" high-performance membrane waterproofing. 28' curb-to-curb with standard 3-bar steel bridge rail and a 2% normal crown. Beams made continuous for live load.

ABUTMENTS – Concrete stub abutments with "u-back" wingwalls supported on spread footings bearing on rock fill.

PIERS – Two column bent pier with a "floating" footing/pile cap or diaphragm wall, supported on drilled shaft foundations in bedrock.

OPENING AND CLEARANCE -

		EXISTING	PROPOSED
TOTAL OPENING -		70,000 SF	~~70,000 SF~~ 71,200 SF
TOTAL OPENING AT ELEVATION	5.9 FT -	39,800 SF	41,100 SF
CLEARANCE AT MHW -		39.0 ~~32.1~~ FT	39.0 ~~33.0~~ FT

LRT 5/28/15

DISPOSITION OF EXISTING BRIDGE – Existing piers, superstructure, and fender system to be completely removed, and to become property of the Contractor. Existing abutments removed to 1'-0" below finished grade.

BRIDGE RECOMMENDATION FORM

AVAILABLE SOILS INFORMATION - Six test borings were obtained in December 2014 and January 2015 to support this study. All six test borings encountered very soft organic deposits at the mudline (1 to 12-ft thick), containing organic silt, clay, sand and shell fragments. Near each abutment, the organic silt was directly underlain by bedrock, or a thin layer of glacial till or marine sand over bedrock. In the borings in the center of the reach, the organic deposit was underlain by very soft marine clay (10 to 13-ft thick) and marine sand (4 to 5.5-ft thick), overlying either glacial till or bedrock. The depth to bedrock ranged from 1 ft to 33 ft, with the thickest soil deposits located near the center of the reach. The bedrock is highly fractured and of poor quality. The geotechnical report is included in Appendix J.

ADDITIONAL DESIGN FEATURES - Begin transition @ STA 200+50, begin project @ STA 213+00, end project @ STA 223+60, end transition @ STA 231+66. A 6' tall retaining wall will be constructed between STA 225+50 and 226+50 on the east side of the Beals approach. A 4.5' tall retaining wall will be constructed between STA 226+00 and 227+00 on the west side of the Beals approach.

MAINTENANCE OF TRAFFIC - Maintain two-way traffic on the existing bridge. Short term lane closures with alternating two-way traffic may be considered.

CONSTRUCTION SCHEDULE - Two construction seasons with landscaping the following spring if required.

ADVERTISING DATE – February 2017

		Program Amount	Available Funding	Estimated Project Cost	Shortfall/ Surplus
	Preliminary Engineering =	$1,110,000	$1,691,718	$1,180,000	$511,718
	Right-of-Way =	$15,000	$15,000	$250,000	-$235,000
Construction [	STRUCTURE =	$8,000,000	$8,000,000	$17,795,000	-$9,795,000
	APPROACHES =			$1,579,000	-$1,579,000
	Construction Engineering =	$0	$0	$1,175,000	-$1,175,000
	Total =	**$9,125,000**	**$9,706,718**	**$21,979,000**	**-$12,272,282**

UTILITIES – Emera Maine, Northern New England Telephone Operations LLC (Fairpoint), Time Warner Cable

EXCEPTIONS TO STANDARDS - The existing horizontal curve of Bay View Road at the Beals approach does not meet the 25mph design speed. The proposed alignment provides a larger radius but still does not meet the 25mph design speed.

BRIDGE RECOMMENDATION FORM

COMMENTS BY ENGINEER OF DESIGN -

SUMMARY OF EXPECTED IMPACTS

RIGHT OF WAY - Number of: Property Owners = 3
Buildings To Be Taken = 0

Type of Acquisitions:
- ☒ Fee Simple
- ☒ Easement
- ☒ Grading
- ☐ Temporary Road

HISTORICAL/ARCHEOLOGICAL – No archaeological resources identified. Bridge is NR-Eligible, as well as the Jonesport Packing Company Smokehouse southeast of 11 Jonesport Avenue and Middle Factory, Jonesport Avenue.

COAST GUARD PERMIT? Yes

FAA PERMIT? No

ENVIRONMENTAL - Instream Work Window? From November 8 To March 15

Coastal Wetlands: +/- 21,000 SF New Footprint
+/- 32,650 SF Fill below HAT line on existing fill slopes

Mitigation Required? Yes
Estimate mitigation cost at $8/sf of coastal wetland impact. Mitigation may not be required for Fill on existing fill slopes.

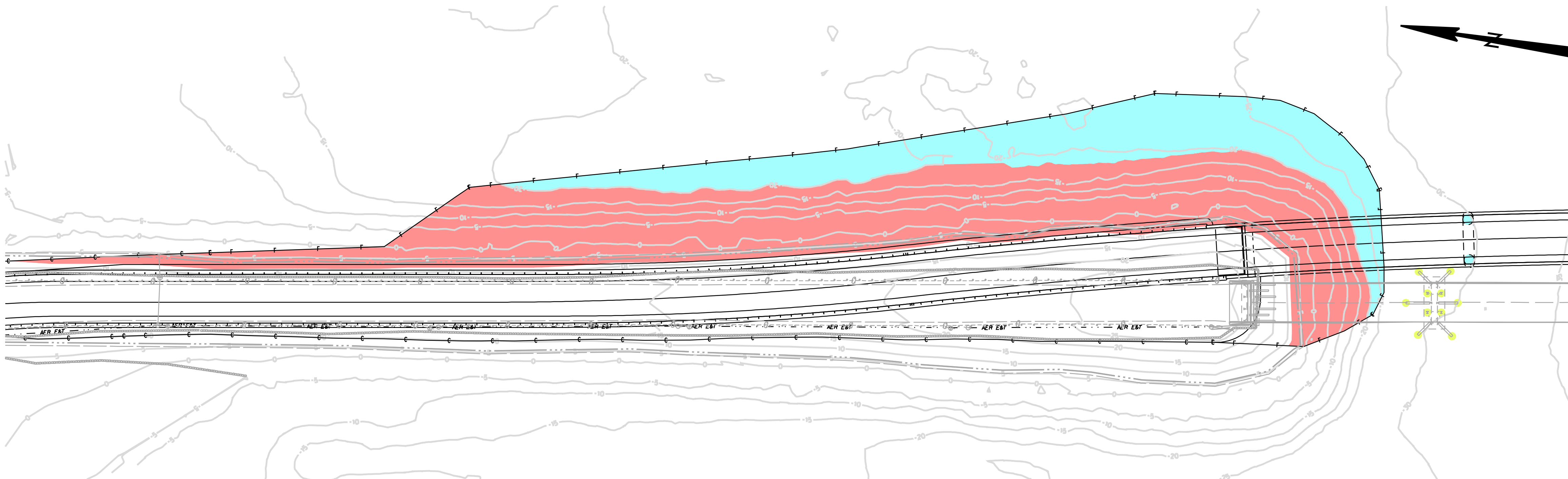
Dredged Spoils Testing Required? TBD based on estimated quantity

Stream Diversion: n/a

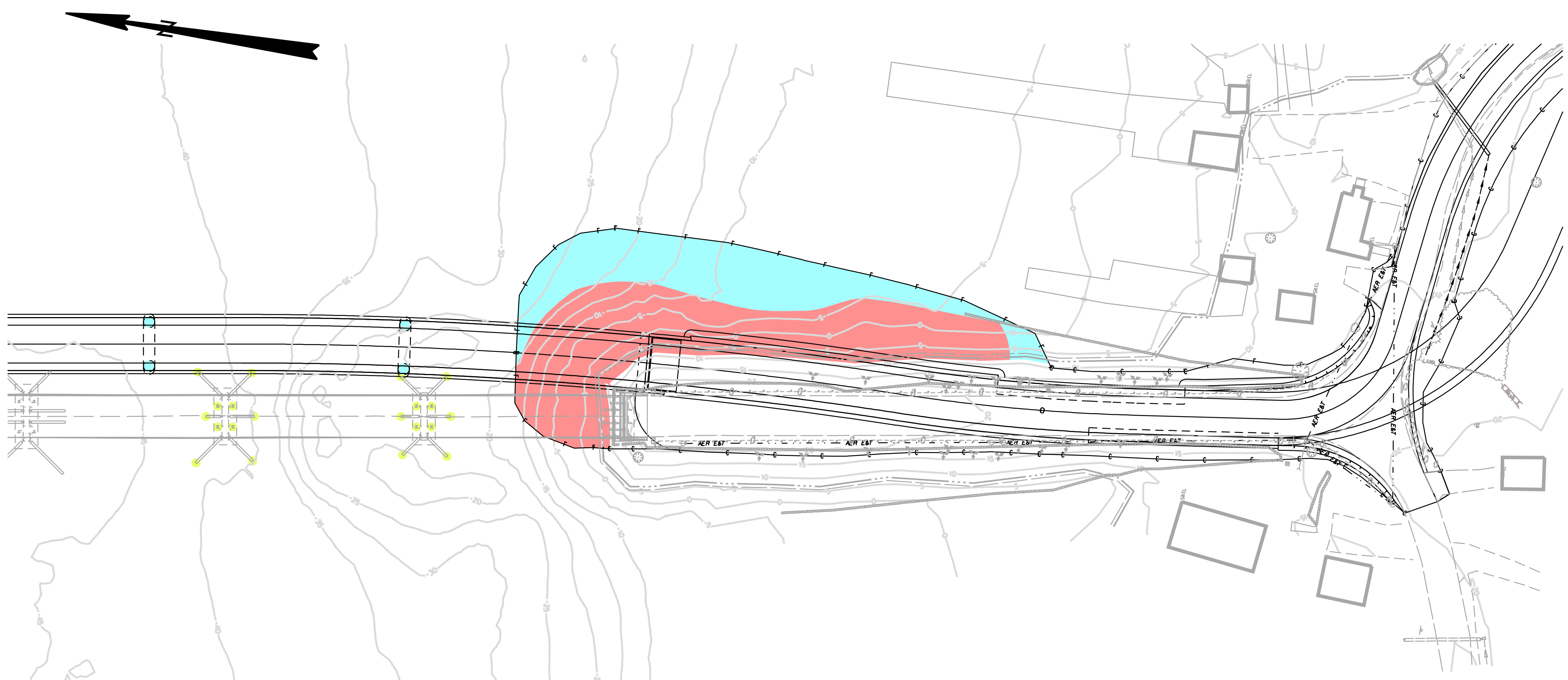
Expected Permit and NEPA Level:
DEP: Individual ACOE: Individual LURC: n/a
NPDES? NEPA: Categorical Exclusion

Summary of Avoidance and Minimization: Retaining walls on the Beals approach are provided to avoid and minimize coastal wetland impacts and property impacts. Reduced berm guardrail offset also provided to minimize coastal wetland impacts.

OTHER:
Section 7 consultation for Atlantic sturgeon, short nose sturgeon, and red knot will be required. Consultation for Northern Long-Eared Bat may be required if tree clearing of trees > 3-inch diameter at breast height (dbh) is required. Marine mammal observation and monitoring, which includes hydroacoustic monitoring, may be required.



NORTH APPROACH



SOUTH APPROACH

PLAN

25 0 25 50

Scale of Feet

KEY

= OCEAN BOTTOM IMPACT 22,000 SF

= IMPACT ON EXISTING SLOPE BELOW HAT (EL. 8.5± TO TOE OF SLOPES) 36,650 SF

SUMMARY OF PRELIMINARY DESIGN

BACKGROUND

Beals Island Bridge #5500 carrying Bridge Street over Moosabec Reach links the town of Beals on Beals Island to the town of Jonesport on the mainland. The bridge carries the only road that connects these two communities.

A PDR for this bridge was completed in April 2001 by CLD Consulting Engineers that evaluated repair and replacement options. The report recommended no significant work to the bridge until a replacement could be completed in approximately fifteen (15) years if and as warranted by the deteriorating concrete deck and other bridge components.

In December 2012, TranSystems produced a Load Rating Report that included analyses of the deck, stringers, and as-inspected H-pile groups at each pier based on reported section losses in the steel piles. The rating report indicates the superstructure rates above 1.0 for legal loads and the as-inspected H-pile foundations rate above 1.0 for axial compression under HL-93 loading.

As part of TranSystems' work, Childs Engineering Corporation, provided a summary study that evaluated various methods of pile inspection and repair. That study concluded that there is insufficient information to determine the most cost-effective repair solution.

Based on information from the 2001 CLD Report and subsequent MaineDOT Structure Inventory and Appraisal Sheets, a condition summary depicting the decline of the major bridge elements with time is provided in the following table.

Bridge Condition Summary Table

Year	Deck	Superstructure	Substructure
2001	Good (7)	Good (7)	Good (7)
2009	Satisfactory (6)	Satisfactory (6)	Fair (5)
2012	Fair (5)	Fair (5)	Fair (5)
2015	Fair (5)	Fair (5)	Poor (4)

In March of 2014, MaineDOT requested VHB provide a PDR that evaluates bridge rehabilitation and replacement options. The Department encouraged creative solutions to address short and long-term rehabilitation strategies and cost-effective replacement concepts.

During preliminary design, VHB met with the Department and project team at two (2) "over-the-shoulder" meetings. At these meetings various concepts were discussed including: access, limitations on loads to existing bridge, rehabilitation options, alignments, new bridge configurations, span arrangements, foundation considerations, impacts, and other design considerations included in this PDR.

SUMMARY OF PRELIMINARY DESIGN

BRIDGE REHABILITATION

Four (4) rehabilitation strategies are evaluated to extend the service of the existing bridge until the bridge is completely replaced. Depending on the strategy, the anticipated service life of the bridge is extended from ten (10) to forty-five (45) years as outlined below. Differences from subsequent strategies are <u>underlined</u>.

10-Year Rehabilitation

This alternative includes the following superstructure work:

- Selective concrete wearing surface repair
- Rehabilitation of expansion joints

This alternative includes the following substructure work:

- Complete cleaning of all exposed steel pier piles
- Structural steel repairs to all piles
- Installation of cathodic protection (sacrificial anodes) on all piles

15-Year Rehabilitation

This alternative includes the following superstructure work:

- Selective concrete wearing surface repair
- Rehabilitation of expansion joints

This alternative includes the following substructure work:

- Complete cleaning of all exposed steel pier piles
- Structural steel repairs to all piles
- <u>Complete encasement and grouting of all piles.</u>

30-Year Rehabilitation

This alternative includes the following superstructure work:

- <u>New, shop-painted steel beam superstructure</u>

This alternative includes the following substructure work:

- Complete cleaning of all exposed steel pier piles
- Structural steel repairs to all piles
- Complete encasement and grouting of all piles.
- <u>Pier repairs and cap widening.</u>
- <u>Abutment widening and new wingwalls</u>

45-Year Rehabilitation

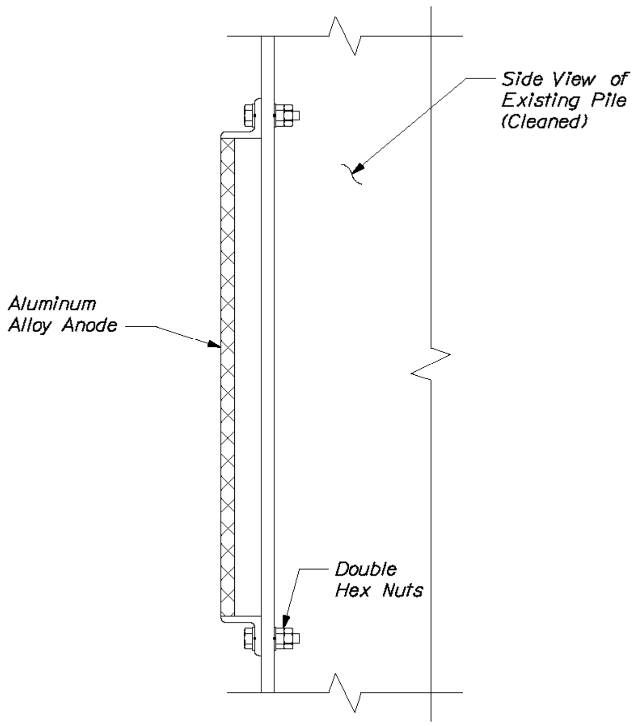
This alternative includes the following superstructure work:

- <u>New, metalized steel beam superstructure</u>

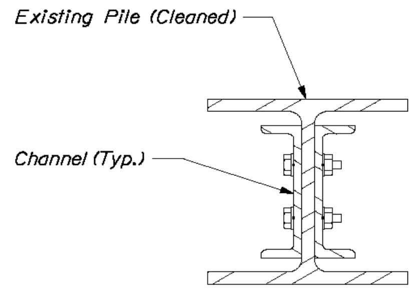
This alternative includes the following substructure work:

- Pier repairs and cap widening.
- <u>Supplemental pipe pile foundation and pile cap extensions.</u>
- Abutment widening and new wingwalls

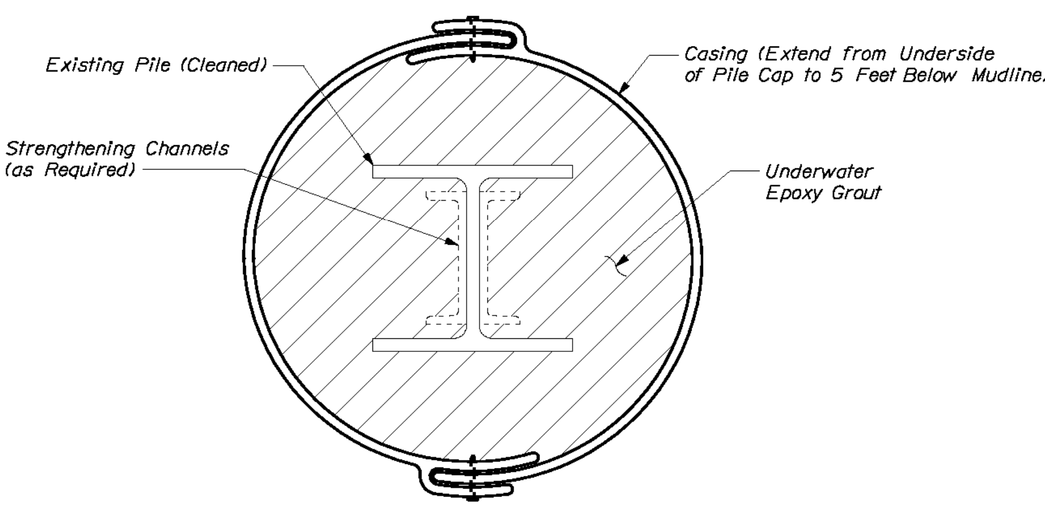
SUMMARY OF PRELIMINARY DESIGN



CATHODIC PROTECTION



STRENGTHENING SECTION



ENCASEMENT

PILE REHABILITATION DETAILS

SUMMARY OF PRELIMINARY DESIGN

MAINTENANCE OF TRAFFIC – REHABILITATION OPTIONS

For short-term rehabilitation options limited to minor concrete wearing surface repairs and expansion joint rehabilitation, traffic would be maintained on the existing bridge with short duration lane closures to complete the work. Two lanes of two-way traffic would be maintained during all substructure work.

Rehabilitation options with a superstructure replacement require phased construction using a temporary traffic signal system to provide one lane of alternating two-way traffic. For these options, a narrow TL-3 railing is recommended to maximize temporary lane widths during phased construction while minimizing the overall width of the bridge. See superstructure replacement phasing figure.

Substructure repairs can be completed independently or in conjunction with superstructure repairs and phasing. For supplemental foundation concepts, see figures showing supplemental foundation at piers 1 thru 8 and pier 9.

Temporary Traffic Signals

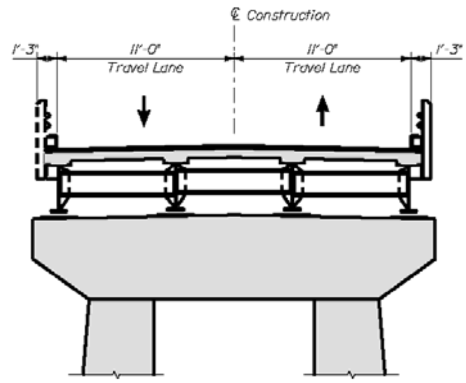
Based on the AADT and DHV information provided by MaineDOT, VHB analyzed a temporary traffic signal for a single reversible lane along the bridge. The following assumptions were made for the traffic evaluation:

- The single lane will be 10 feet wide, channelized with a barrier on one side and the existing or proposed bridge rail on the other side. Pedestrian access prohibited.
- Due to the restricted lane width, the assumed speed limit and travel speed on the restricted section will be 15 MPH.
- The temporary signals will be stationed about 50 feet beyond the bridge joint at each abutment with the stop line at 100 feet beyond the bridge joints. The total closure distance was estimated to be 1,375 feet.
- The calculated clearance time for a vehicle leaving the stop line at one end of the traffic signal and passing the stop line at the other end of the traffic signal was calculated to be 62.5 seconds (at 15 MPH). Therefore, the assumed all red clearance time for the traffic signal operations was assumed to be 64 seconds. The analyzed cycle length was 180 seconds.

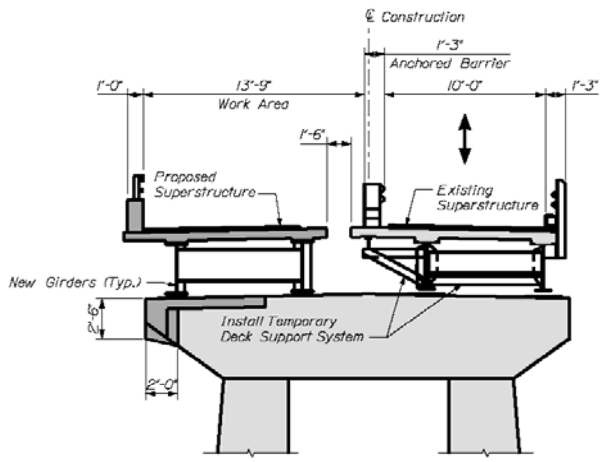
The average vehicle delay is about 93 seconds per vehicle for the peak direction of traffic and about 81 seconds per vehicle in the opposing direction, with a maximum delay for any one vehicle of 160 seconds. For a signalized intersection, these results are equivalent to a level of service (LOS) F. Based on an average of five micro-simulations, the estimated queue length is 325 feet in the peak direction of traffic and 300 feet for the opposing direction.

The profile of the bridge prohibits a driver waiting at one traffic signal to see the drivers at the opposite end of the signal. This lack of sight line along with the estimated average stopped delay in excess of 80 seconds – up to 160 seconds maximum delay - could lead drivers to ignore the traffic signal and proceed into the single travel lane. Therefore, access gates, similar to railroad and drawbridge gating is recommended to reinforce the stop condition until the bridge lane is clear for travel. Additionally, the narrow lane width is challenging for larger vehicles to maneuver and may restrict oversize vehicles altogether.

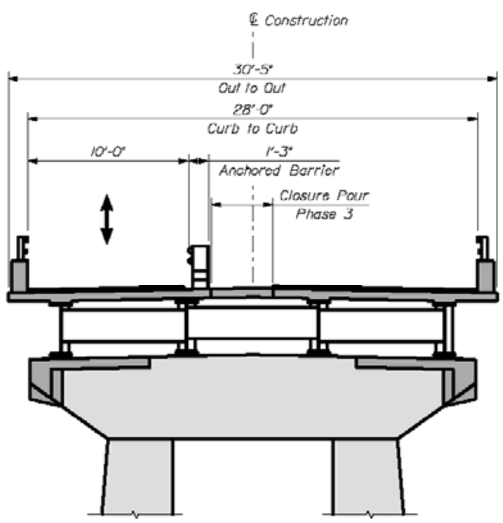
SUMMARY OF PRELIMINARY DESIGN



EXISTING

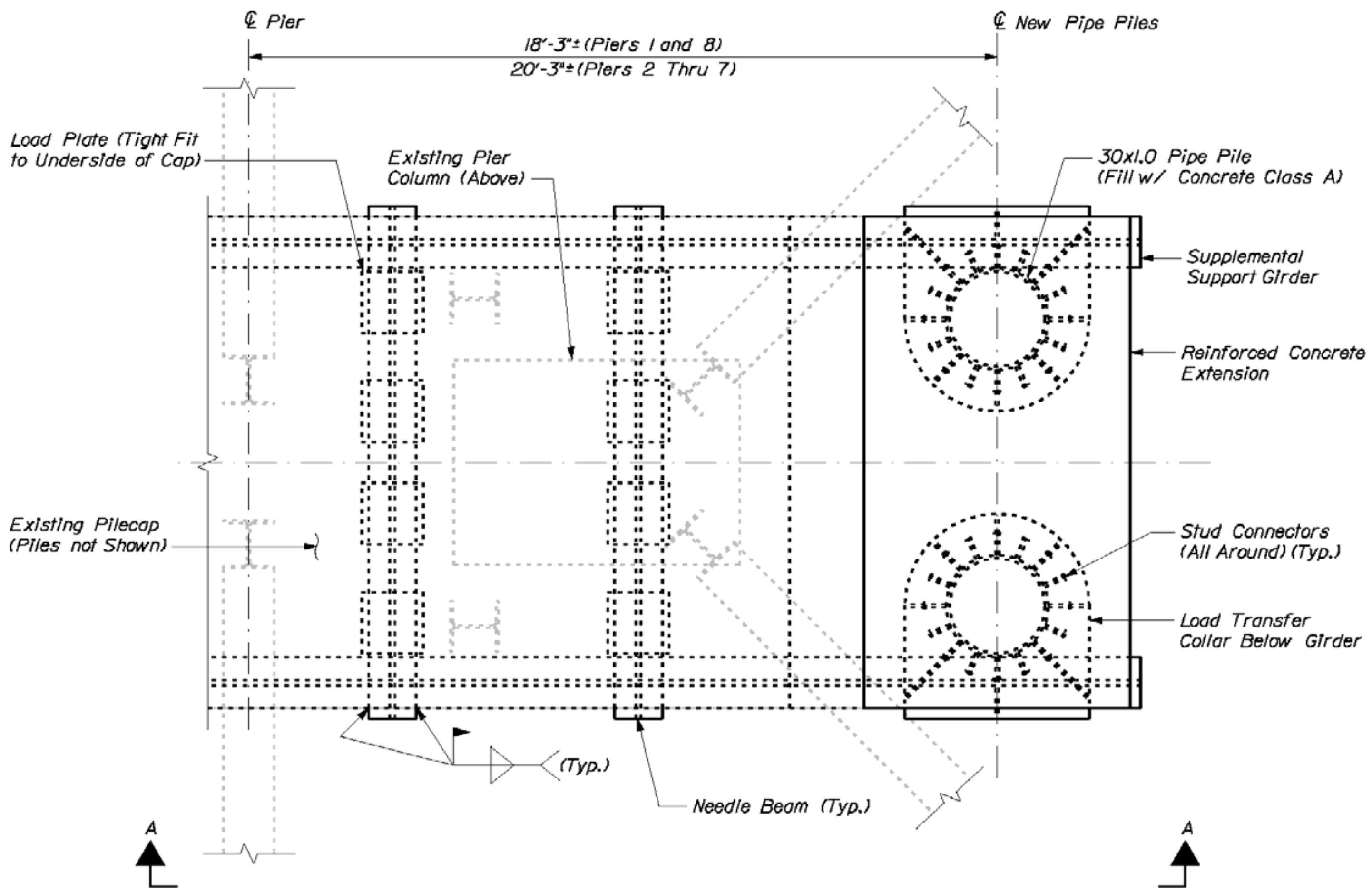


PHASE 1



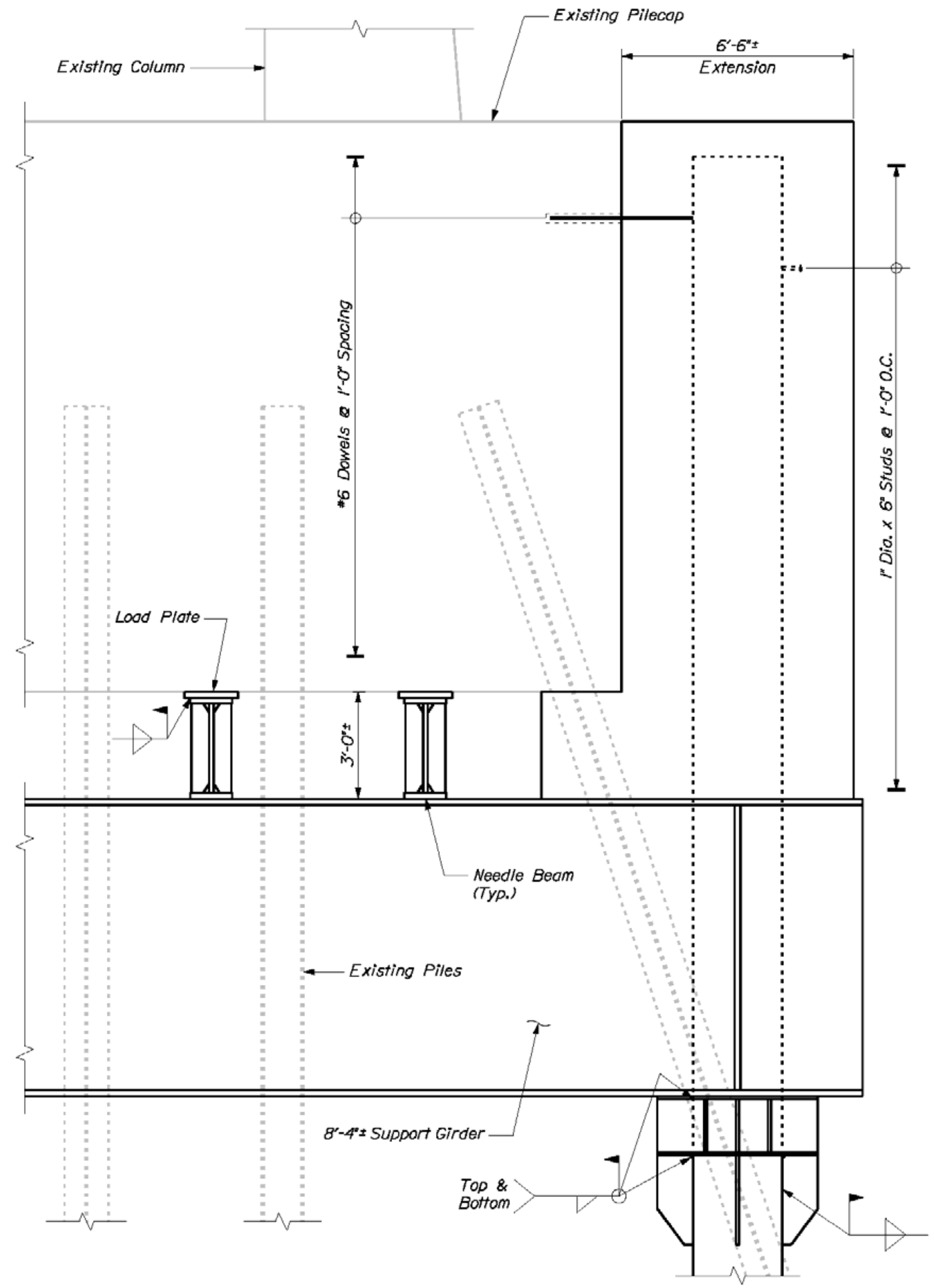
PHASE 2-3

SUPERSTRUCTURE REPLACEMENT PHASING



PLAN

(Pier 1 Shown, Other Piers Similar)

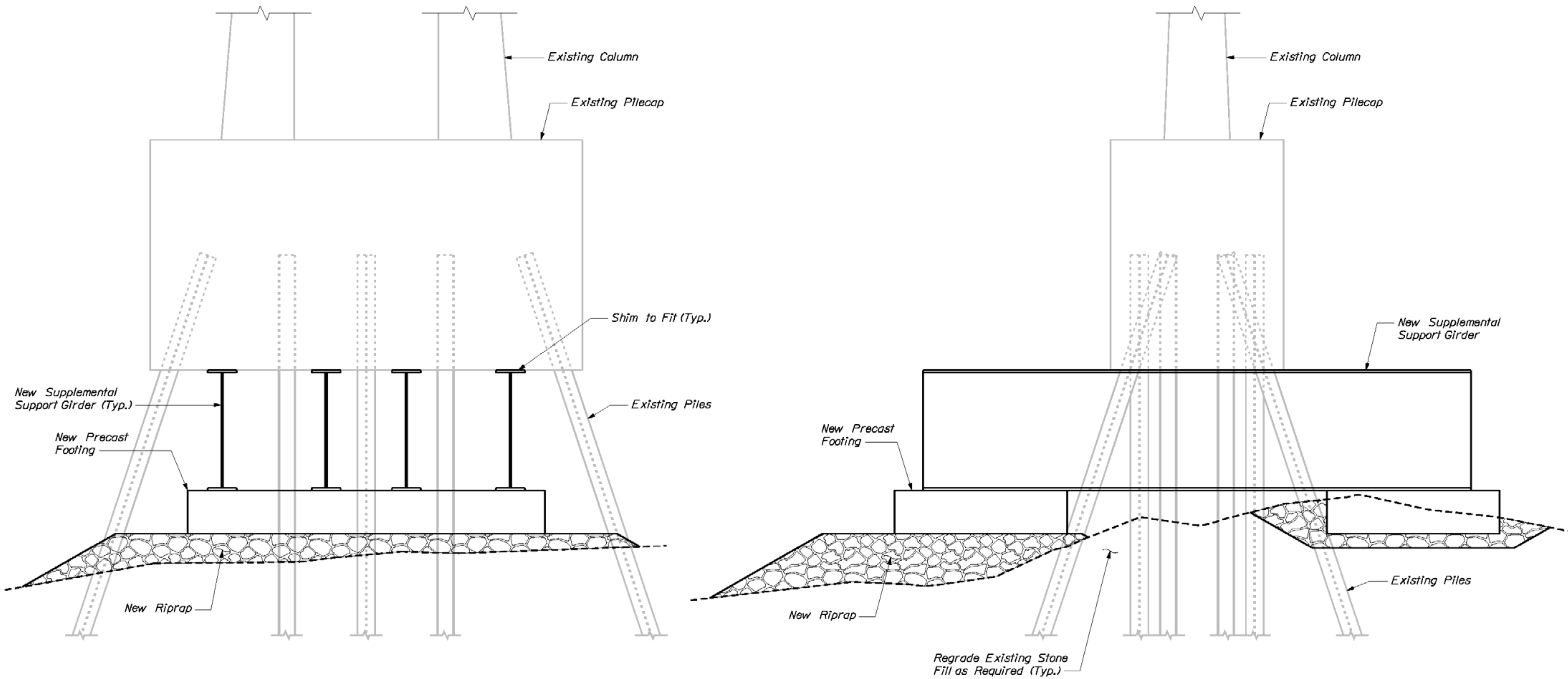


VIEW A-A

SUPPLEMENTAL FOUNDATION

PIERS 1 THRU 8

SUMMARY OF PRELIMINARY DESIGN



SUPPLEMENTAL FOUNDATION
PIER 9

UTILITIES – REHABILITATION OPTIONS

There are aerial utilities on the west side of the bridge on each approach. Depending on voltage, there appears to be sufficient clearance to avoid utility relocations for short-term rehabilitation options limited to minor concrete wearing surface repairs and expansion joint rehabilitation.

Rehabilitation options with a superstructure replacement will require utility relocation to the east during phased construction. New utility poles or concrete encased, buried conduit is anticipated at the approaches. Utilities would be carried across the bridge in conduits on supports between girders.

RIGHT OF WAY – REHABILITATION OPTIONS

ROW impacts are not anticipated for any of the bridge rehabilitation options.

SUMMARY OF PRELIMINARY DESIGN

BRIDGE REPLACEMENT

VHB and Corven Engineering Inc. evaluated several different bridge configurations for a new bridge located on an alignment slightly east of the existing bridge. The following subsections discuss alignment/profile considerations, roadway width and approach details, bridge types and span arrangements, abutment details, pier details, and comparisons of the most cost-effective bridge configurations.

HORIZONTAL ALIGNMENT

A new bridge must be constructed off-line to maintain traffic on the existing bridge during construction. An easterly alignment was selected to avoid impacts to the United States Coast Guard property immediately west of the existing bridge approach in Jonesport.

About 600’ of the proposed bridge follows a tangent alignment, parallel to the existing bridge. Horizontal curves are introduced at either end of the bridge to quickly tie into the existing causeways and minimize impacts to wetlands and properties. The curves and design speed do not require super-elevation which enhances bridge constructability.

The Jonesport approach has a long causeway, so a flattened curve (R = 4100’) allows for a slightly higher design speed. The Beals approach is much shorter and has a sharper curve (R = 2290’) for a 25 mph design speed with a stop condition in the southerly direction. Reverse curves are provided at both of the approaches to match into the existing roadway.

At the south end of the Beals approach, Bridge Street intersects with Bay View Drive. The existing horizontal curve of Bay View Drive at the intersection with Bridge Street does not meet the desired 25 mph design speed. The proposed alignment provides a larger radius but still does not meet the 25 mph design speed. An alternative alignment of Bay View Drive was developed that does provide a 25 mph design speed but it requires right-of-way impacts. Both the proposed and the alternative horizontal alignments are shown on Preliminary Plans sheet 6.

VERTICAL ALIGNMENT

The profile increases the maximum grade from 5% to 5.5% with a 400’ crest vertical curve. This raises the maximum height of the roadway about 6 feet to allow for deeper superstructure types with longer spans and some minor allowance for future sea level rise. Sag curves beyond the bridge match existing grades and minimize impacts to wetlands and properties.

SUMMARY OF PRELIMINARY DESIGN

ROADWAY WIDTH & APPROACH DETAILS

The bridge and approach roadway widths provided are based on: the MaineDOT Complete Streets policy, highway corridor priority (4), traffic volumes, local concerns, accident history, environmental impacts, property impacts, truck traffic, plowing operations, and maintenance of traffic clearances during phased construction.

The proposed bridge width has been increased from 22 to 28 feet (curb-to-curb). This provides a 10-foot lane and 4-foot shoulder in each direction. The Jonesport approach is 24 feet wide to match the existing roadway with a 10-foot lane and 2-foot shoulder in each direction. The Beals approach is 28 feet wide to match the bridge width and the required roadway width for improved turning movements at the intersection of Bay View Drive. Bridge scuppers (if required) and grate frames for drainage structures will have “bike-friendly” grates.

Two hundred feet of precast retaining walls are provided on the Beals approach (100 feet each side) to avoid property impacts and minimize wetland impacts. The walls include a base mounted, steel-tube-backed guardrail that is in line with approach guardrail. Locations and phasing details for these walls are provided in the Preliminary Plans.

Based on record plans, the existing roadway consists of 2” HMA over 6” gravel base over 12” sand base atop stone fill. Roadside barriers consist of variable broken rock/boulders of varying size at six-foot spacing with an embedment depth presumably equal to the roadway box depth of 20”. The proposed approach typical includes a non-standard 20” pavement section and guardrail configuration to minimize impacts and improve constructability.

The proposed pavement depth has been set to 20” minimum to avoid disturbance and removal of the underlying stone fill while maintaining traffic during construction. The prescriptive pavement includes 6” HMA over 14” minimum of dense graded base material and a new separation geotextile as required. If the depth from existing grade to the top of stone fill is greater than 20”, the dense graded base material could be increased accordingly to provide a deeper pavement section.

VHB recommends replacing the existing stone guard posts with a modified guardrail section since the shallow pavement section and underlying stone fill does not allow for driven guardrail posts with 3’-6” embedment. The proposed guardrail section is similar to the standard detail the Department uses when crossing buried culvert structures as shown on page 606(24) of the Standard Details, except that posts are set in blockouts in the concrete grade beam so that they can be more easily replaced if necessary. The posts are shimmed in position and the blockouts are filled with crushed stone. The guardrail beam is doubled in this application for increased stiffness and to allow for a reduced berm width. Accordingly, VHB has reduced the berm from the standard 3’-0” to 2’-6” to minimize impacts to wetlands and properties. Details of the proposed typical section and guardrail treatment are provided in the Preliminary Plans.

If salvaging some of the stone guard posts is required from a cultural resource perspective or to address local concerns, some of the more uniform stones could be reset in the former roadway area located behind the guardrail at the end of the existing bridge and top of causeway.

BRIDGE TYPE & SPAN ARRANGEMENTS

The proposed bridge has an overall length of approximately 1,062 feet. This was set by maintaining the toe of slopes in front of the existing abutments and projecting a finished grade line at a 1.5H:1V slope to about 5 feet above the existing abutment footing elevations. This minimizes the length of the bridge and provides a comparable hydraulic opening to the existing bridge. The new abutments are set slightly behind and adjacent to the existing abutments.

Five different span arrangements were evaluated with five different superstructure types including: prestressed box beams, prestressed New England Bulb Tees (NEBT), post-tensioned NEBT, metalized steel plate girders, and post-tensioned segmental concrete. See the Span Arrangements and Superstructure Options Figure.

All bridge configurations assume expansion joints at the ends of the deck to minimize longitudinal forces at the abutments. The shorter span options include box beams and shallow NEBT girders. The medium and long span options include NEBT girders, metalized steel plate girders, and segmental concrete. The seven span option that consists of a combination of post-tensioned and prestressed NEBT beams assumes up to two more expansion joints may be required between bridge units. At project over-the-shoulder meetings the Department indicated that the metalized steel plate girders are not desired.

VHB’s subconsultant, Corven Engineering, Inc. completed a feasibility study for the segmental alternatives compared to a four-girder NEBT configuration. A copy of this study is provided in Appendix F. Based on the Corven Engineering study and comparison of cost, risk, maintenance and long term durability the four-girder NEBT superstructure is the most cost-effective replacement superstructure type for this project.

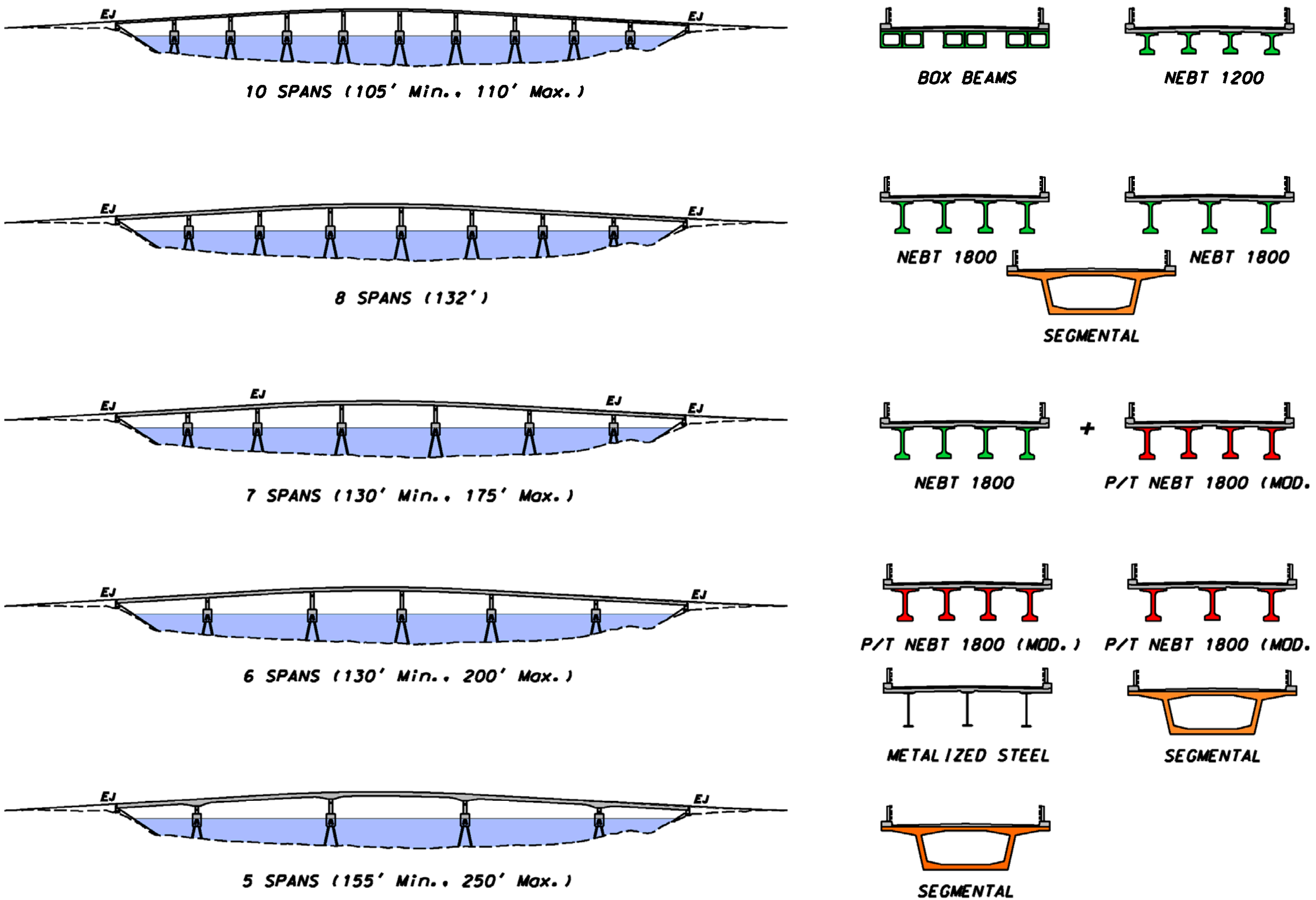
ABUTMENT DETAILS

New abutments are concrete stub-type supported on spread footings atop existing and new stone fill. The bottom of footing elevation is similar to the existing footing elevation. It is anticipated that a choke stone layer will be placed under the new footing to allow for concrete footing placement and even bearing.

The approach slab elevation and seat may need to be raised to accommodate the roadway box and buried utilities to be carried by the bridge and through the abutment backwalls.

The short “u-back” wingwalls minimize longitudinal earth pressure forces on the abutments and maximize construction clearances to maintain two lanes of traffic on the existing bridge during construction.

SUMMARY OF PRELIMINARY DESIGN



SPAN ARRANGEMENTS AND SUPERSTRUCTURE OPTIONS

PIER DETAILS

VHB evaluated three pier and foundation options for the new bridge alternatives. These include:

1. Hammerhead pier on floating pile cap supported by jumbo steel H-piles encased in concrete and FRP shells.
2. Hammerhead pier on floating pile cap supported by reinforced concrete-filled steel pipe piles with a cathodic protection system.
3. Two column bent and floating shaft cap supported on two 6.5ft or three 6.5ft diameter shafts with rock sockets.

Option 1, the H-Pile option, is limited to the shortest span configurations with the smaller load demands. This substructure option is comprised of 10 to 14 end-bearing jumbo HP16 piles with FRP jackets filled with concrete which extend 15 to 20 ft below the marine sediments. The piles have extra thickness for anticipated driving stresses and buckling resistance prior to concrete encasement. The pile installation may require costly noise mitigation if the noise thresholds cannot be met and is restricted to a limited in-water work window from November through mid-March.

Option 2, the pipe pile option, is practical for the longer span configurations because the axial load capacity and stiffness are substantially greater than H-piles with long unbraced lengths. The pipe piles are concrete-filled, coated, and include cathodic protection. The piles have extra thickness for driving stresses and corrosion considerations, and a reinforcing cage within to provide additional redundancy and load support. Similar to the jumbo H-piles, this option may require costly noise mitigation if the noise thresholds cannot be met. The piers closest to the abutments have limited overburden and do not favor driven pipe piles. Rock sockets are needed at these pier foundations requiring special drilling equipment and subcontractors. Therefore drilled shafts are a more practical solution at these piers. Based on discussions with the Department and considerations of future inspections and maintenance, pipe piles or a mix of drilled shafts and pipe piles are not desired.

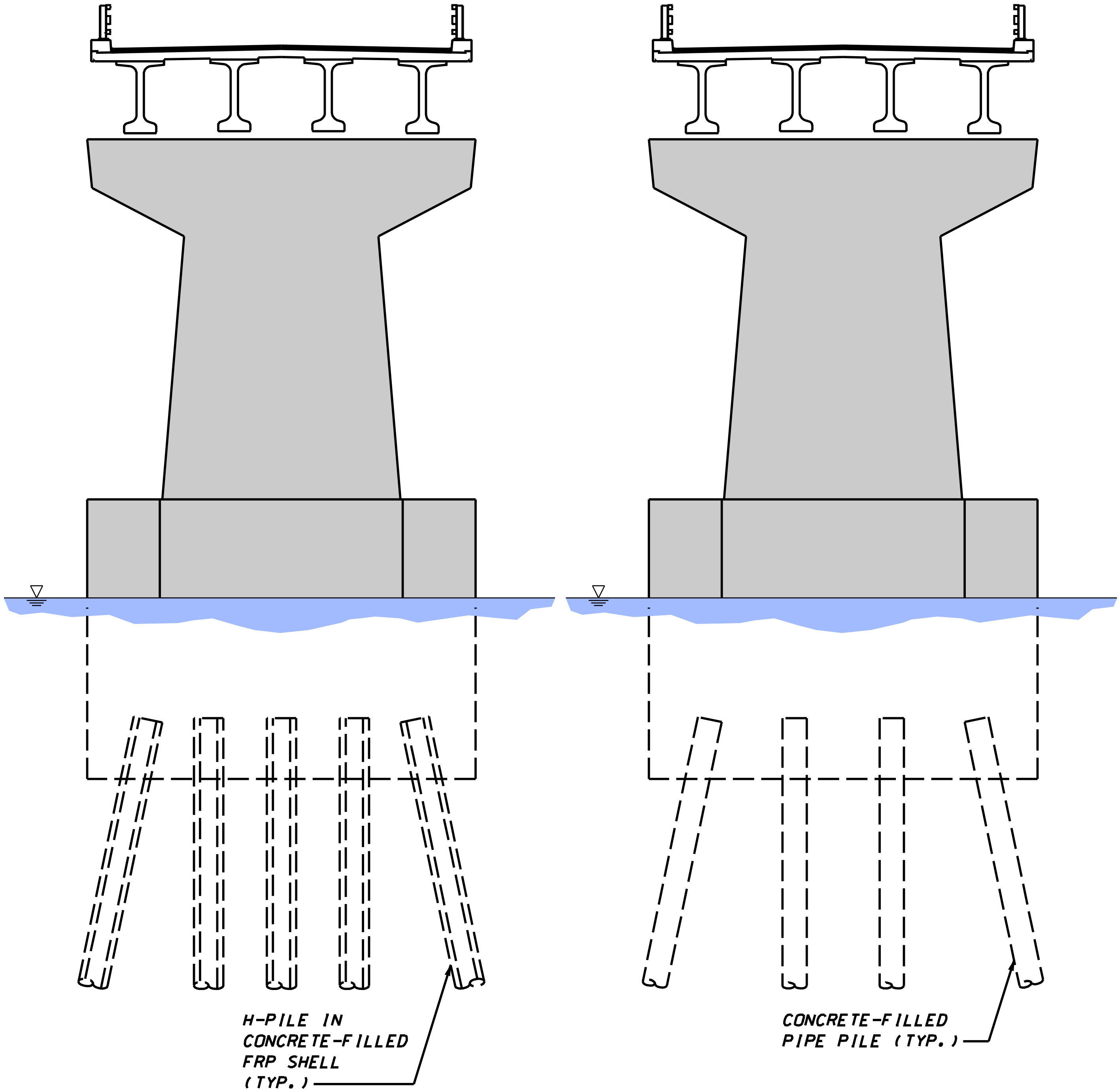
Option 3, the column bent pier option, is supported on drilled shafts. The shortest piers (1, 2, 6 & 7) are supported on two 6.5 ft diameter shafts with 6 ft diameter rock sockets. A reinforced concrete diaphragm wall connects the two shafts above and below the tide range to provide additional stiffness and lateral support under extreme event loads. A floating cap is provided at the tall piers (3, 4 & 5) supported on three shafts with rock sockets similar in dimension to the other piers. The three shafts and cap provide stiffness to accommodate pier fixity and anticipated strength and extreme limit state forces. Casings for drilled shafts will be permanent and are not anticipated to be needed for load resistance of extreme or strength limit states.

Based on the anticipated difficulties in construction and long-term corrosion and maintenance concerns, drilled shafts are recommended for this bridge. The limited overburden, load capacities, and possible noise mitigation requirements favor drilled shafts compared to either driven H-piles or pipe piles. Additional pier protection at the waterline of piers 1, 2, 6 & 7 can be provided by using a floating cap instead of a diaphragm wall if desired.

A fender system at the navigational channel is not necessary based on input received at the public informational meeting in April 2014. Most of the vessels are relatively light fishing boats which currently navigate between all piers. Low-maintenance composite rub rails are recommended at the face of piers along the designated navigational channel.

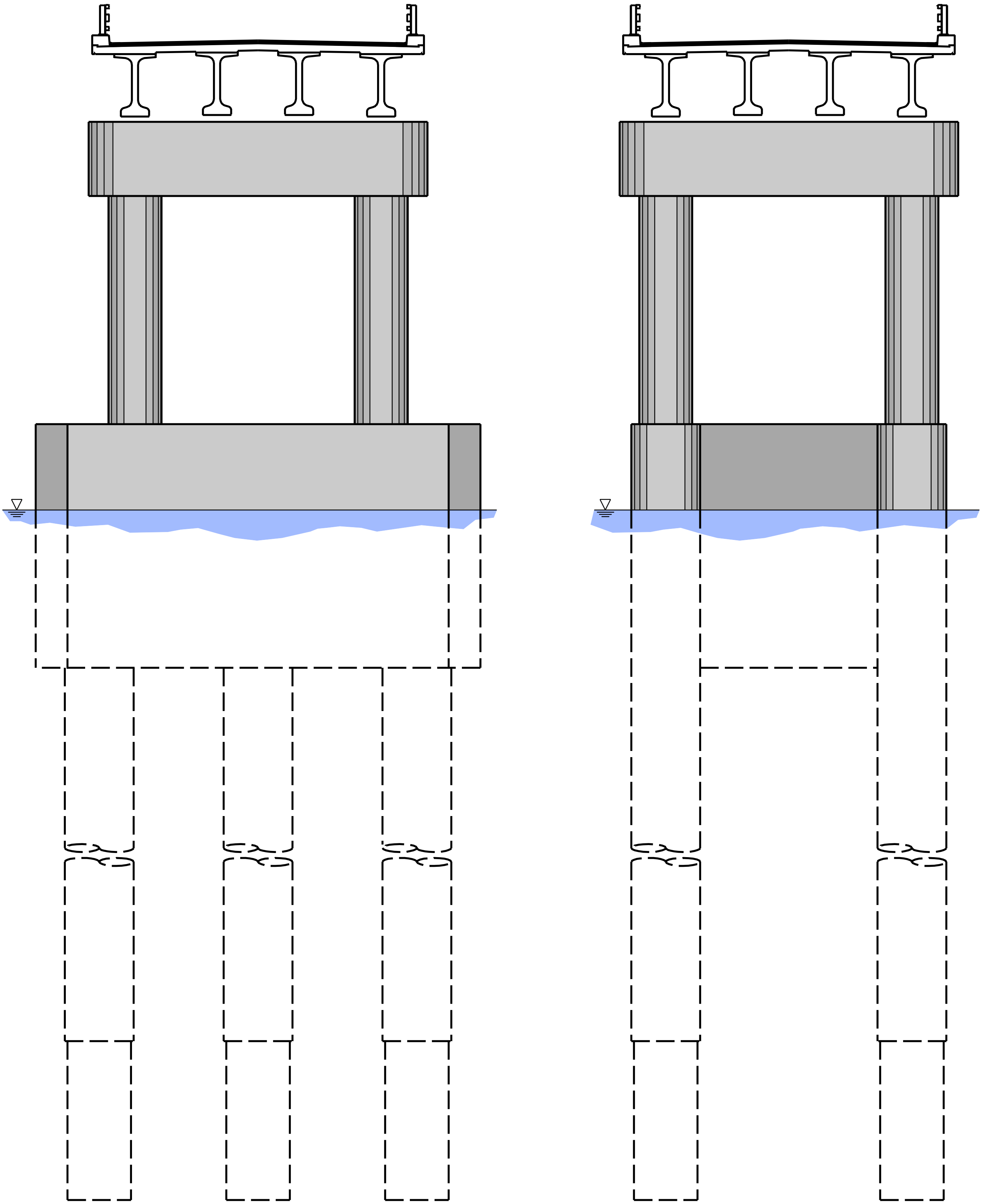
To determine vessel collision design criteria for final design, a study to determine site-specific large vessels, hull configurations/bow heights, and full/empty weights is recommended. The resulting design loads from the site-specific design vessel(s) are anticipated to be significantly less than those from the standard hopper barge in the AASHTO LRFD Bridge Design Specifications. Design of bearings and pier diaphragms will allow transmission of pier impact loads to the deck and load redistribution to adjacent piers.

SUMMARY OF PRELIMINARY DESIGN



PIER TYPES

SUMMARY OF PRELIMINARY DESIGN



PIER TYPES

SUMMARY OF PRELIMINARY DESIGN

SUMMARY AND RECOMMENDATION

In summary, VHB has evaluated four bridge rehabilitation alternatives and three bridge replacement alternatives. These alternatives are summarized in the table on the following page. The rehabilitation alternative that is limited to wearing surface and bridge deck joint replacement, and cleaning and repair of the existing pier piles, has the lowest estimated cost at $5.5 million. However, the anticipated design life of these repairs is only approximately ten years. This rehabilitation alternative and rehabilitation alternatives 2 and 3 have a high risk of significant project overruns if the condition of the existing piles is worse than assumed. Rehabilitation alternatives 3 and 4 include extensive rehabilitation work and have an estimated project cost similar to that of the new bridge alternatives. However, these rehabilitation alternatives do not have the benefit of the longer design life for both superstructure and substructure that would be provided by a new bridge.

The three bridge replacement alternatives include NEBT prestressed concrete girders with various span arrangements from six to ten spans. The bridge width is 28 ft and the design life is 75 years or greater in all three alternatives.

VHB recommends Replacement Alternative 1 consisting of a new 8-span continuous NEBT 1800 girder bridge with an overall length of 1,062 feet. The structure will be supported on drilled shaft foundations. This is the most cost-effective alternative when considering a design or service life greater than 10 years and it provides a durable, low-maintenance superstructure and substructure.

SUMMARY OF PRELIMINARY DESIGN

SUMMARY OF REHABILITATION AND REPLACEMENT ALTERNATIVES CONSIDERED

	SUPERSTRUCTURE	SUBSTRUCTURE	BRIDGE WIDTH	SUPSTR/SUB DESIGN LIFE	IMPACTS BELOW HAT	MAINTENANCE OF TRAFFIC	CHANGE ORDER RISK	PROJECT COST	NOTES
REHAB - 1	WEARING SURFACE AND JOINT REHABILITATION	STRENGTHEN PILES CATHODIC PROTECT	22FT	10 10	0 SF	2LANES/TWO WAY	HIGH	$ 5,500,000	(1)
REHAB-2	WEARING SURFACE AND JOINT REHABILITATION	STRENGTHEN & ENCASE PILES	28 FT	10 25	330 SF	2LANES/TWO WAY	HIGH	$ 11,900,000	(1)
REHAB- 3	REPLACE DECK REPLACE GIRDERS (PAINTED)	STRENGTHEN & ENCASE PILES	28 FT	75 25	330 SF	1 LANE/ ALT. DIR.	HIGH	$ 21,100,000	(1)
REHAB- 4	REPLACE DECK REPLACE GIRDERS (METALIZED)	SUPPLEMENTAL PILE SUPPORT	28FT	75 45	710 SF	1 LANE/ ALT. DIR.	MODERATE	$ 22,100,000	(2)
REPLACE- 1	8 SPANS- NEBT 1800	NEW PIERS AND ABUTMENTS	28 FT	75 75	50206 SF	2LANES/TWO WAY	LOW	$ 21,600,000	(3)
REPLACE- 2	10 SPANS- NEBT 1200	NEW PIERS AND ABUTMENTS	28 FT	75 75	50206 SF	2LANES/TWO WAY	LOW	$ 23,700,000	(3)
REPLACE- 3	6 SPANS- NEBT 1800 (POST-TENSIONED AND PRESTRESSED)	NEW PIERS AND ABUTMENTS	28 FT	75 75	50206 SF	2LANES/TWO WAY	LOW	$ 22,800,000	(3)

Notes:

(1) Rehabilitation alternatives 1, 2 & 3 include costs to clean and strengthen all the existing H-piles.
(2) Approximately half of the estimated cost is for the supplemental pile foundation.
(3) Includes $432,000 for mitigation, $36,000 in special waste disposal, and $200,000 for retaining walls.

EXISTING BRIDGE SYNOPSIS

TOWN - Beals-Jonesport **BRIDGE -** Beals Island Bridge #5500 **YEAR BUILT -** 1958

SPAN LENGTHS - 3 @ 105’, 4 @ 105’, 3 @ 105’ **CURB TO CURB WIDTH -** 22’-0”

TYPE OF SUPERSTRUCTURE – Four lines of painted steel rolled beam stringers with top and bottom cover plates, 7.5” thick composite concrete slab, 2” max concrete wearing surface, fascia-mounted steel bridge rail with steel rub rail and w-beam.

GENERAL CONDITION – The deck and superstructure are in fair condition with few cracks and potholes in the deck and moderate paint failure.

TYPE OF SUBSTRUCTURE – Nine piers with a two-column tapered concrete bent on a partially submerged reinforced pile cap supported with steel H-piles (battered and plumb). Two concrete stub abutments with flying u-back wingwalls supported on steel H-piles (battered and plumb).

GENERAL CONDITION – An underwater inspection in May 2014 found the pier piles to be in poor condition with severe section loss in several locations. The latest inspection from January 2015 indicates the reinforced concrete abutments and piers are in fair condition but the substructure is rated as poor based on the condition of steel piles at the piers.

BRIDGE RATINGS -	**OPERATING**	**INVENTORY**
(HL-93)	1.24 (31 Tons)	0.89 (22 Tons)

(TranSystems report dated 12/31/2012)

FHWA SUFFICIENCY RATING - 44 **POSTED LOAD/DATE -** N/A

MAINTENANCE PROBLEMS – Wearing surface and deck cracking with potholes. Paint system failure on steel beams with areas of moderate corrosion. Rust packing at several cover plates. Minor cracking at abutments. Erosion behind and under southern abutment with minor roadway settling. Section loss, knife edges, and missing flanges reported for underwater piles. Minor cracking of reinforced concrete pile cap. Moderate paint failure on all bearings. Several bearings tipped.

MAINTENANCE WORK – Cathodic protection was unsuccessfully added to the bridge in 1985 and portions of the deck received a latex modified or epoxy coated wearing surface. The timber fender system was replaced in 2001 based on poor performance.

PREVIOUS STRUCTURE – None

OTHER COMMENTS –

HYDRAULIC REPORT

The Moosabec Reach is a portion of the Atlantic Ocean that seperates Jonesport on the mainland from Beals Island. The flow through the area is strictly tidal so a hydrologic study of the drainage area was not performed.

Tidal Elevations were obtained from published information from the National Oceanic and Atmospheric Administration (NOAA). Data from several stations were compared to determine tidal trends and the approximate tidal elevations. In general, the mean range of tide (MN) increases northerly along the coast. Data from the four closest stations both to the north and south of Moosabec Reach were averaged together to determine the tidal elevations. The four stations are located in Bar Harbor, Milbridge, Cutler Naval Base, and Cutler Farris Wharf.

Mean Lower Low Water (MLLW)	-6.6 ft
Mean Low Water (MLW)	-6.3 ft
Mean Tide Level (MTL)	-0.2 ft
Mean High Water (MHW)	5.9 ft
Mean Higher High Water (MHHW)	6.3 ft

Flood elevations were obtained from both Town of Jonesport and Town of Beals Flood Insurance Studies (FIS). The stillwater elevations in the FIS reports were converted from the NGVD29 datum to the project datum of NAVD88. Jonesport stillwater elevations are assumed to be most representative at the bridge and are provided below.

10-YR	11.3 ft
50-YR	11.7 ft
100-YR	11.9 ft
500-YR	12.2 ft
Wave Crest El.	15.3 ft

The proposed bridge will not reduce the current hydraulic opening, therefore only a Level 1 qualitative analysis was performed. Similarly, since the proposed replacement option will be founded on deep foundations and reported maximum currents in the reach are less than 2 knots, a scour analysis was not completed.

APPENDIX A

Preliminary Plans

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

SPECIFICATIONS

Design: Load and Resistance Factor Design per AASHTO LRFD Bridge Design Specifications, 2014.

DESIGN LOADING

Live Load	HL - 93 Modified
Seismic Zone	1

TRAFFIC DATA

Current (2015) AADT	2060
Future (2025) AADT	2270
DHV - % of AADT	12
Design Hour Volume	296
Heavy Trucks (% of AADT)	12
Heavy Trucks (% of DHV)	10
Directional Distribution (% of DHV)	55
18 kip Equivalent P 2.0	114
18 kip Equivalent P 2.5	109
Design Speed - Bridge Street (mph)	30
Design Speed - Bay View Drive (mph)	25

HYDROLOGIC DATA

Storm Surge Elevation (100 - year)	15.3 ft
Mean Lower Low Water (MLLW)	-6.6 ft
Mean Low Water (MLW)	-6.3 ft
Mean Tide Level (MTL)	-0.2 ft
Mean High Water (MHW)	5.9 ft
Mean Higher High Water (MHHW)	6.3 ft

MATERIALS

Concrete:	
Curbs & Transition Barriers	Class "LP"
Seals	Class "S"
Precast	Class "P"
Fill	"Fill"
Drilled Shafts	TBD
All Other	Class "A"
Reinforcing Steel	TBD
Prestressing Strands	AASHTO M203 (ASTM A 416), Grade 270, Low Relaxation
Structural Steel:	
All Material (except as noted)	ASTM A 709, Grade 50 (Galvanized)
High Strength Bolts	ASTM A 325 (Galvanized)
Steel Pipe Piles	ASTM A 252, Grade 3 Modified
Anchor Rods	ASTM F 1554

BASIC DESIGN STRESSES

Concrete Class "LP"	f'c = 5,000 psi
Concrete Class "S" or "Fill"	f'c = 3,000 psi
Concrete Class "A"	f 'c = 4,000 psi
Precast/Prestressed Concrete (varies)	f 'c = 10,000 psi f 'ci = 7,000 psi
Reinforcing Steel	f y = 60,000 psi
Prestressing Strand	F µ = 270,000psi
Structural Steel:	
ASTM A 709, Grade 50	F y = 50,000 psi
ASTM A 709, Grade 36	F y = 36,000 psi
ASTM A 325	F µ = 120,000 psi
ASTM A 252	Fy = 50,000 psi
ASTM F 1554	Fy = 105,000 psi F µ = 120,000 psi

JONESPORT - BEALS
WASHINGTON COUNTY
BEALS ISLAND BRIDGE
OVER
MOOSABEC REACH
BRIDGE STREET
BRIDGE REPLACEMENT
PROJECT LENGTH 0.60 mi.
BRIDGE NO. 5500

PRELIMINARY PLANS
3/27/2015

INDEX OF PRELIMINARY PLANS

UTILITIES

Emera Maine
Northern New England Telephone Operations LLC (Fairpoint Communications)
Time Warner Cable

MAINTENANCE OF TRAFFIC

Two lanes of two-way traffic will be maintained on existing bridge and approaches during construction. Temporary short duration lane closures with alternating one-way traffic will be allowed with flaggers.

PROJECT LOCATION:	Jonesport - Beals Island Bridge (No. 5500) carrying Bridge Street at Jonesport - Beals Town Line. Lattitude: 44°30'27"N Longitude: 67°36'52"W
PROGRAM AREA:	Bridge
OUTLINE OF WORK:	Bridge replacement with approach work.

WIN022626.00

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

APPROVED	DATE
COMMISSIONER:	
CHIEF ENGINEER:	

PROJECT INFORMATION

	SIGNATURE	P.E. NUMBER	DATE
PROGRAM			
PROJECT MANAGER			
DESIGNER			
CONSULTANT			
PROJECT RESIDENT			
CONTRACTOR			
PROJECT COMPLETION DATE			

JONESPORT - BEALS
BEALS ISLAND BRIDGE

TITLE SHEET

SHEET NUMBER
1
OF 17

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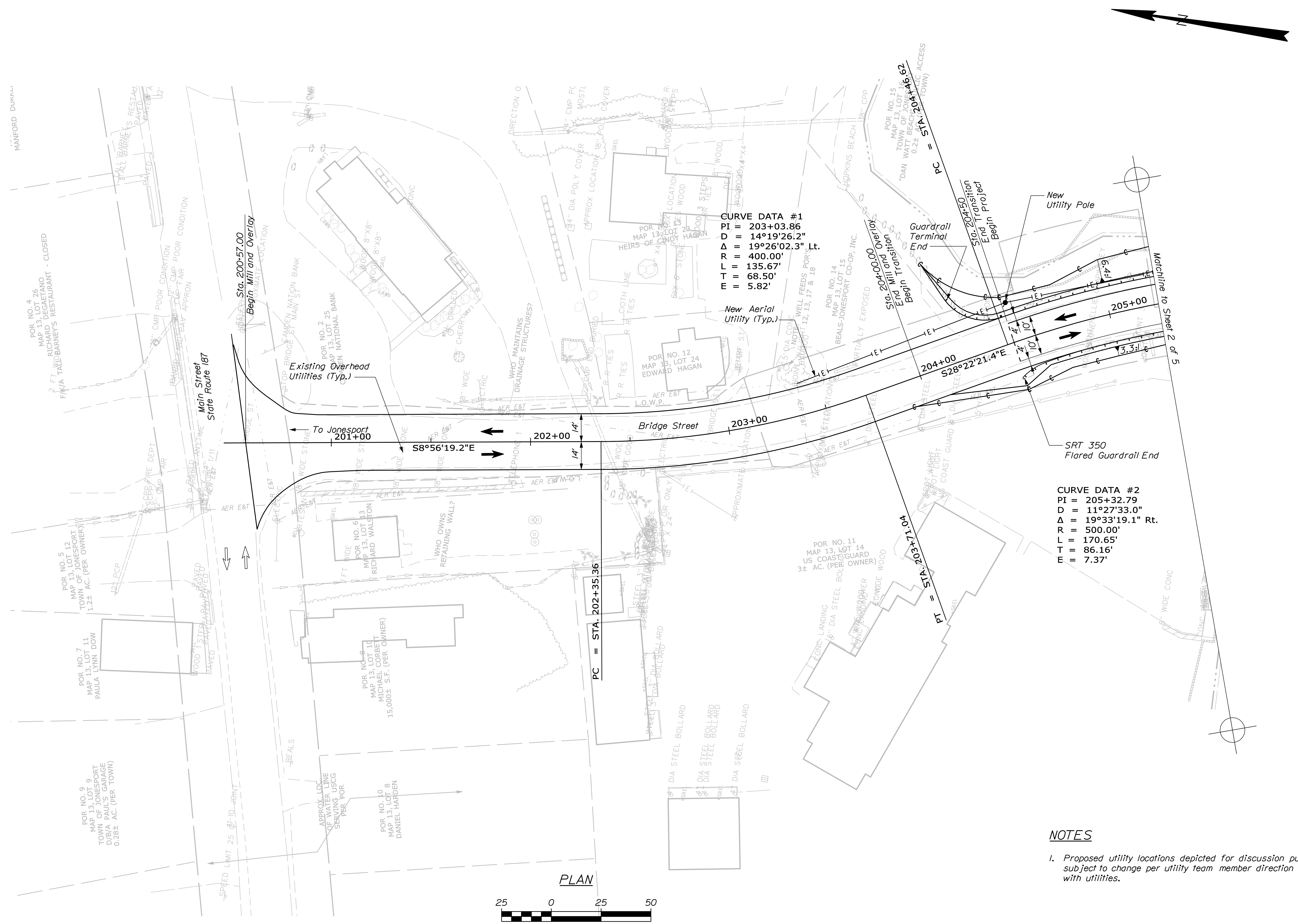


NOTES

1. Proposed utility locations depicted for discussion purposes only and subject to change per utility team member direction and coordination with utilities.

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

BRIDGE NO. 5500

WIN 02262600

BRIDGE PLANS

	BY	DATE
PROJ. MANAGER	...	...
DESIGN-DETAILED	JAW	3/15
CHECKED-REVIEWED	RSB	3/15
DESIGN2-DETAILED2	KDW	3/15
DESIGN3-DETAILED3	SMH	3/15
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

SIGNATURE

P.E. NUMBER

DATE

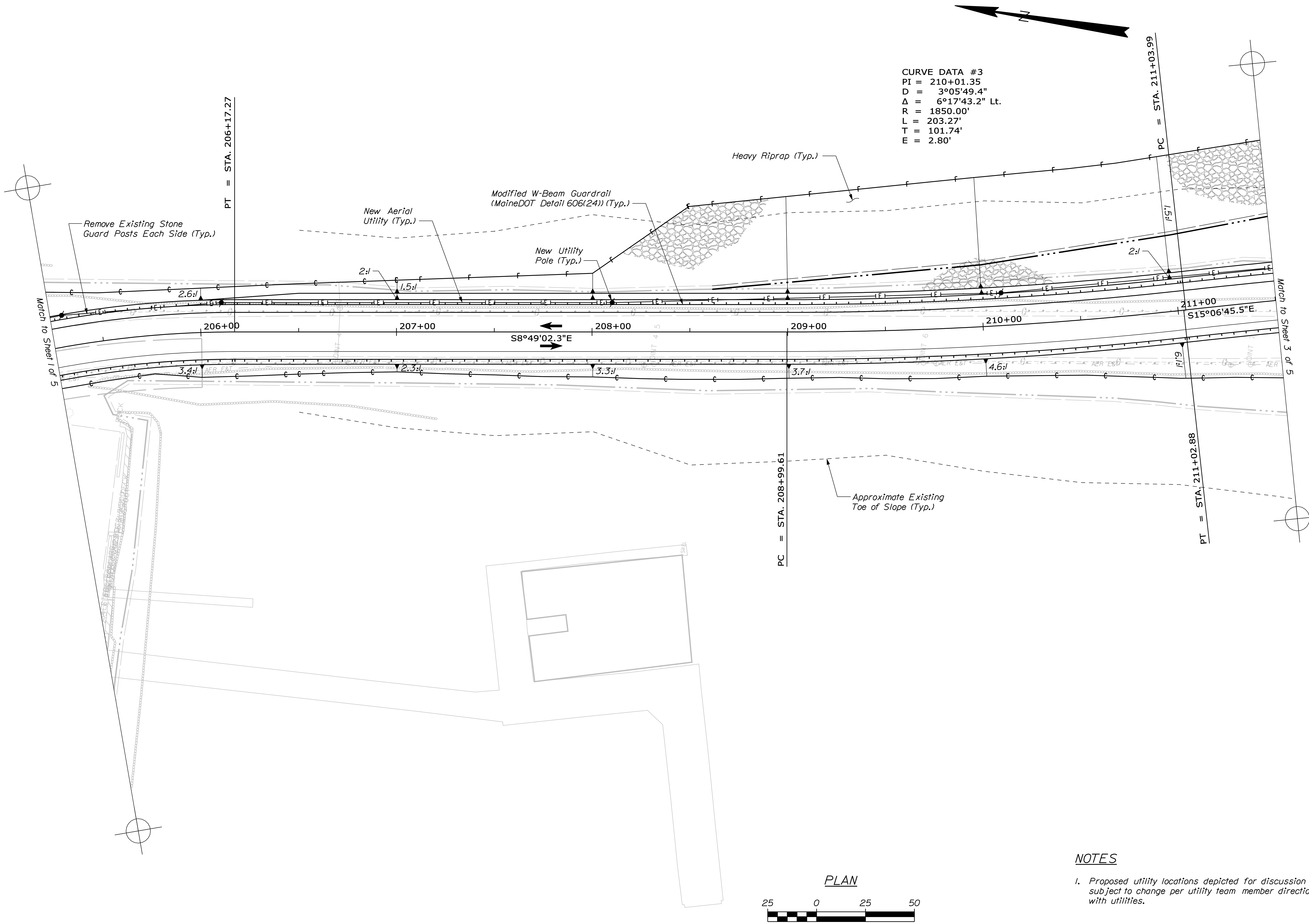
BEALS ISLAND BRIDGE
MOOSABEC REACH
JONESPORT & BEALS WASHINGTON COUNTY

ROADWAY PLAN
(SHEET 1 OF 6)

SHEET NUMBER

2

OF 17



NOTES

1. Proposed utility locations depicted for discussion purposes only and subject to change per utility team member direction and coordination with utilities.

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

BRIDGE NO. 5500

WIN 02262.00

BRIDGE PLANS

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REVISIONS 2	...	...	...
REVISIONS 3	...	...	...
REVISIONS 4	...	...	...
FIELD CHANGES	...	...	...

SIGNATURE

P.E. NUMBER

DATE

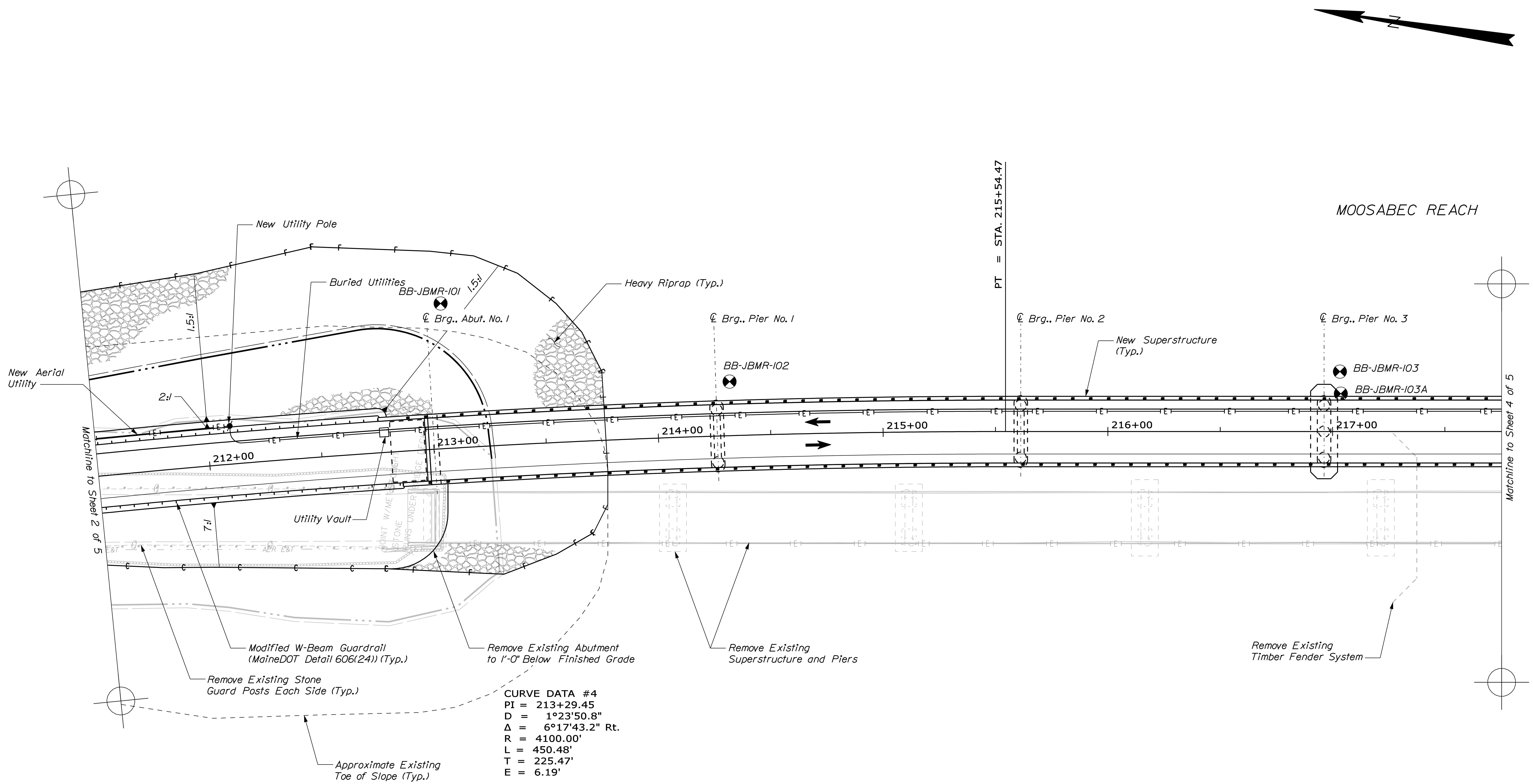
BEALS ISLAND BRIDGE
MOOSABEC REACH
JONESPORT & BEALS WASHINGTON COUNTY

ROADWAY PLAN
(SHEET 2 OF 6)

SHEET NUMBER

3

OF 17



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Δ = 6°17'43.2" Rt.
R = 4100.00'
L = 450.48'
T = 225.47'
E = 6.19'

PLAN

25 0 25 50

NOTES

1. Proposed utility locations depicted for discussion purposes only and subject to change per utility team member direction and coordination with utilities.

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

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WIN 02622.00

BRIDGE NO. 5500

BRIDGE PLANS

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CHECKED-REVIEWED	RSB	3/15
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DESIGN3-DETAILED3	...	...
REVISIONS 1	...	...
REVISIONS 2	...	...
REVISIONS 3	...	...
REVISIONS 4	...	...
FIELD CHANGES	...	...

SIGNATURE

P.E. NUMBER

DATE

BEALS ISLAND BRIDGE
MOOSABEC REACH
JONESPORT & BEALS WASHINGTON COUNTY

ROADWAY PLAN
(SHEET 3 OF 6)

SHEET NUMBER
4
OF 17

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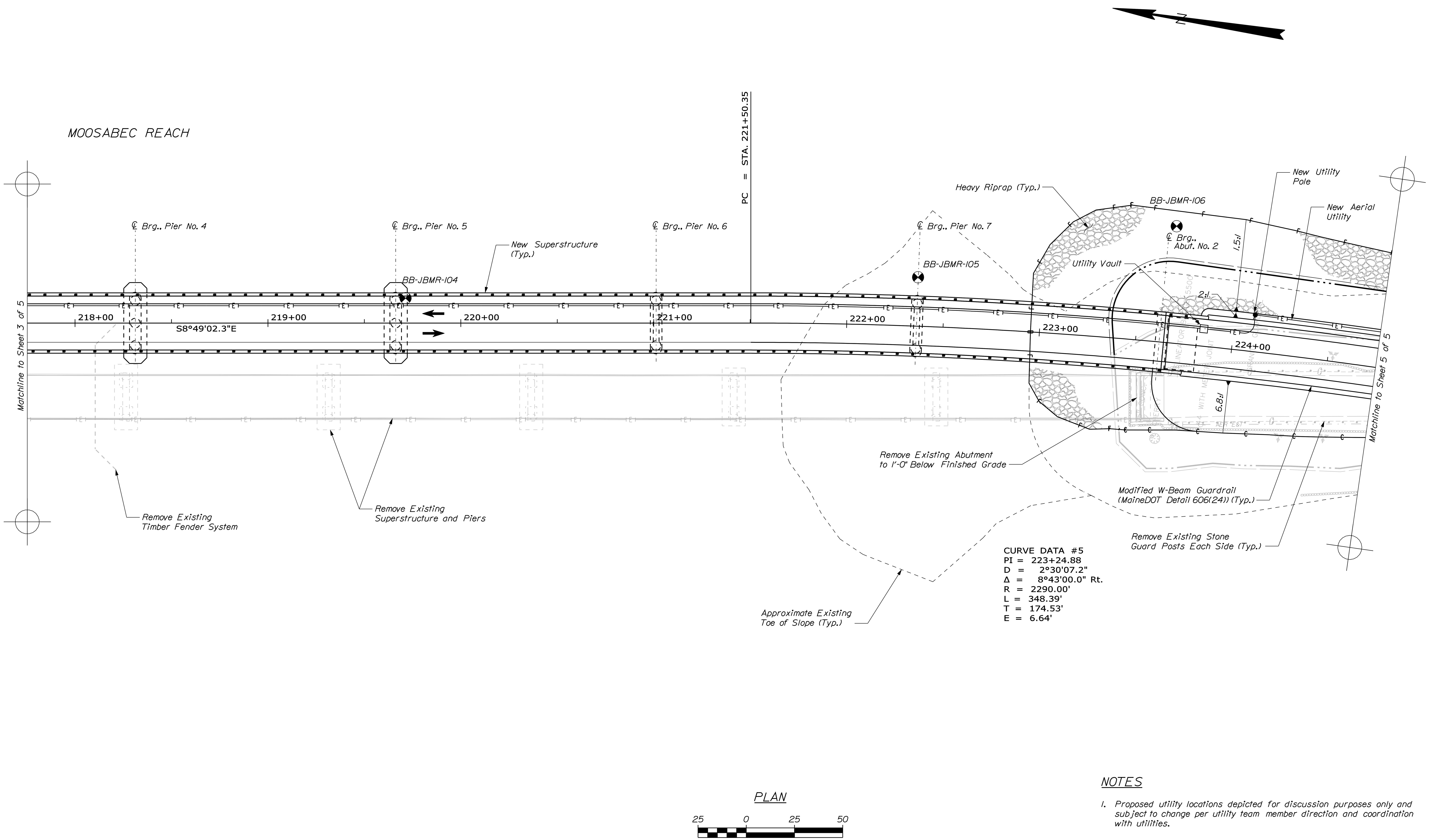

NOTES

1. Proposed utility locations depicted for discussion purposes only and subject to change per utility team member direction and coordination with utilities.

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

BRIDGE NO. 5500 | WIN 02626.00 | BRIDGE PLANS

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CHECKED-REVIEWED	RSB	KDW 3/15
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DESIGN3-DETAILED3	...	...
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

SIGNATURE
P.E. NUMBER
DATE

BEALS ISLAND BRIDGE
MOOSABEC REACH
JONESPORT & BEALS WASHINGTON COUNTY

ROADWAY PLAN (SHEET 4 OF 6)

SHEET NUMBER
5
OF 17

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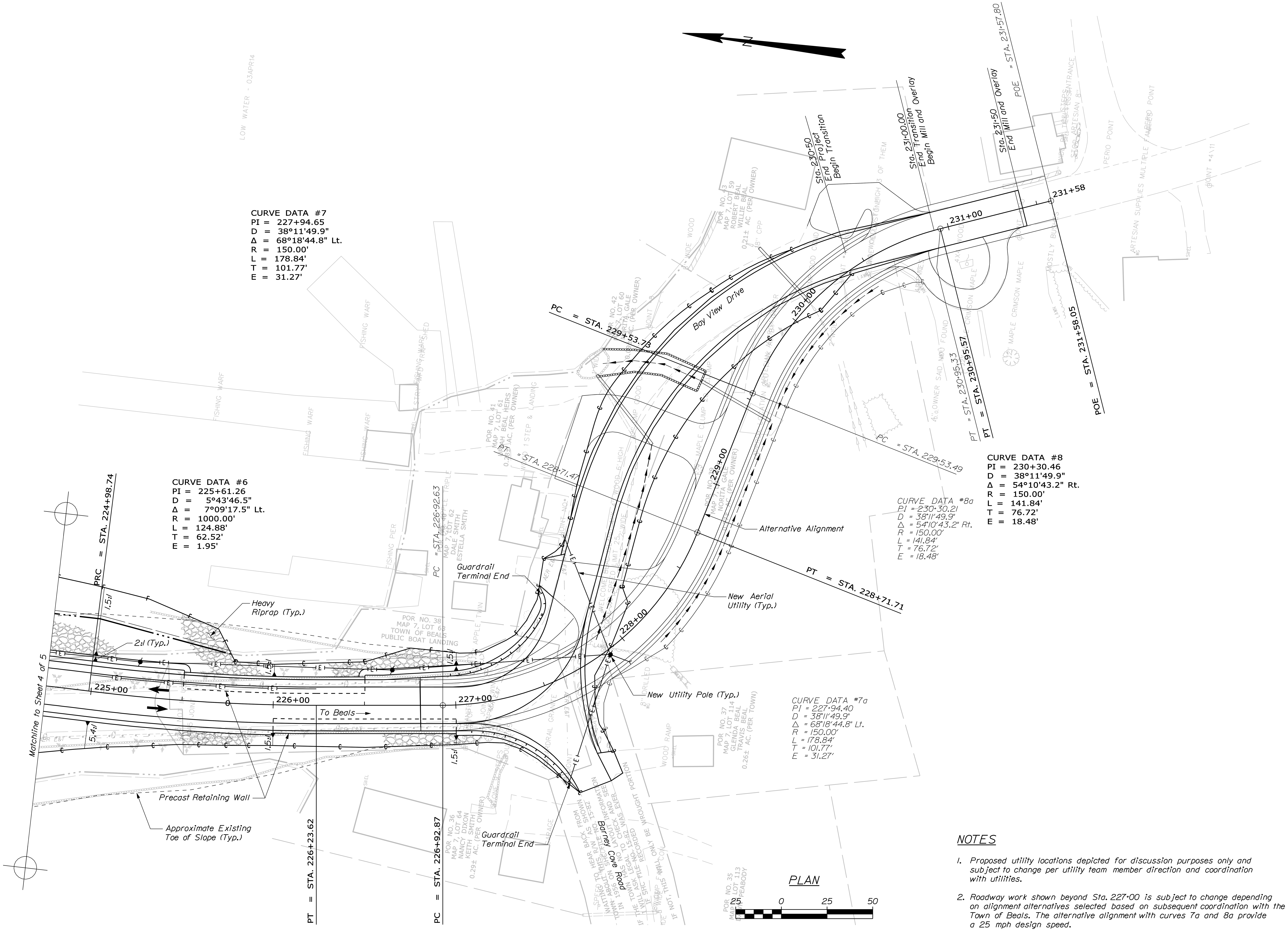

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T = 101.77'
E = 31.27'

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Δ = 7°09'17.5" Lt.
R = 1000.00'
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T = 62.52'
E = 1.95'

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L = 141.84'
T = 76.72'
E = 18.48'

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E = 18.48'

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Δ = 68°18'44.8" Lt.
R = 150.00'
L = 178.84'
T = 101.77'
E = 31.27'

NOTES

1. Proposed utility locations depicted for discussion purposes only and subject to change per utility team member direction and coordination with utilities.
2. Roadway work shown beyond Sta. 227+00 is subject to change depending on alignment alternatives selected based on subsequent coordination with the Town of Beals. The alternative alignment with curves 7a and 8a provide a 25 mph design speed.

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

BRIDGE NO. 5500
WIN 022626.00
BRIDGE PLANS

		BY	DATE
PROJ. MANAGER	...	...	...
DESIGN-DETAILED	JAW	KDW	3/15
CHECKED-REVIEWED	RSB	SMH	3/15
DESIGN2-DETAILED2	...	...	...
DESIGN3-DETAILED3	...	...	...
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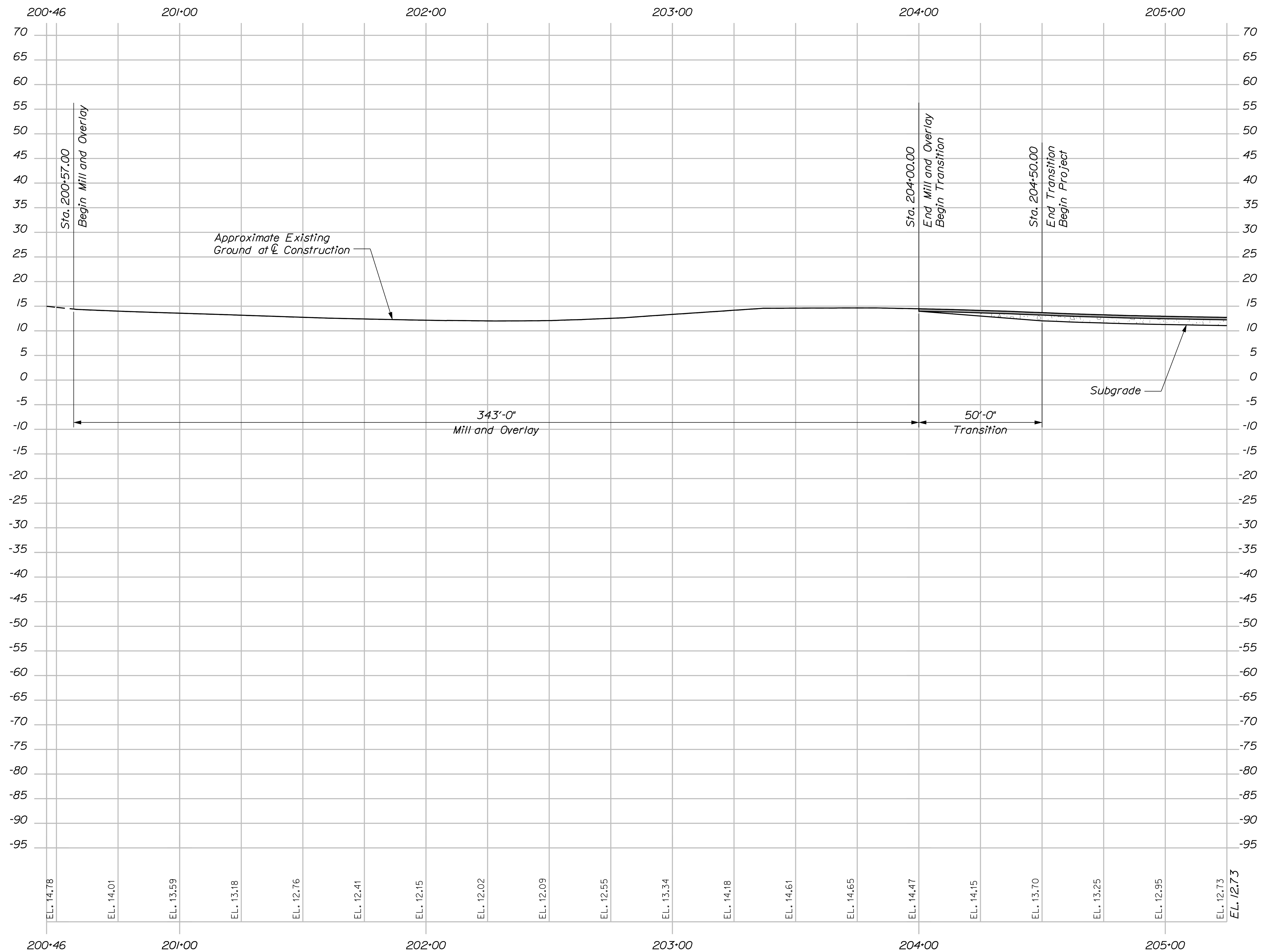
REVISIONS 2	...	...	...
REVISIONS 3	...	...	...
REVISIONS 4	...	...	...
FIELD CHANGES	...	...	...

SIGNATURE
P.E. NUMBER
DATE

BEALS ISLAND BRIDGE
MOOSABEC REACH
JONESPORT & BEALS WASHINGTON COUNTY

ROADWAY PLAN (SHEET 6 OF 6)

SHEET NUMBER
6
OF 17



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STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

BRIDGE NO. 5500 WIN 02626.00 BRIDGE PLANS

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CHECKED-REVIEWED	RSB	SMH	3/15
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DESIGN3-DETAILED3	...	...	...
REVISIONS 1	...	...	...
REVISIONS 2	...	...	...
REVISIONS 3	...	...	...
REVISIONS 4	...	...	...
FIELD CHANGES	...	...	...

SIGNATURE

P.E. NUMBER

DATE

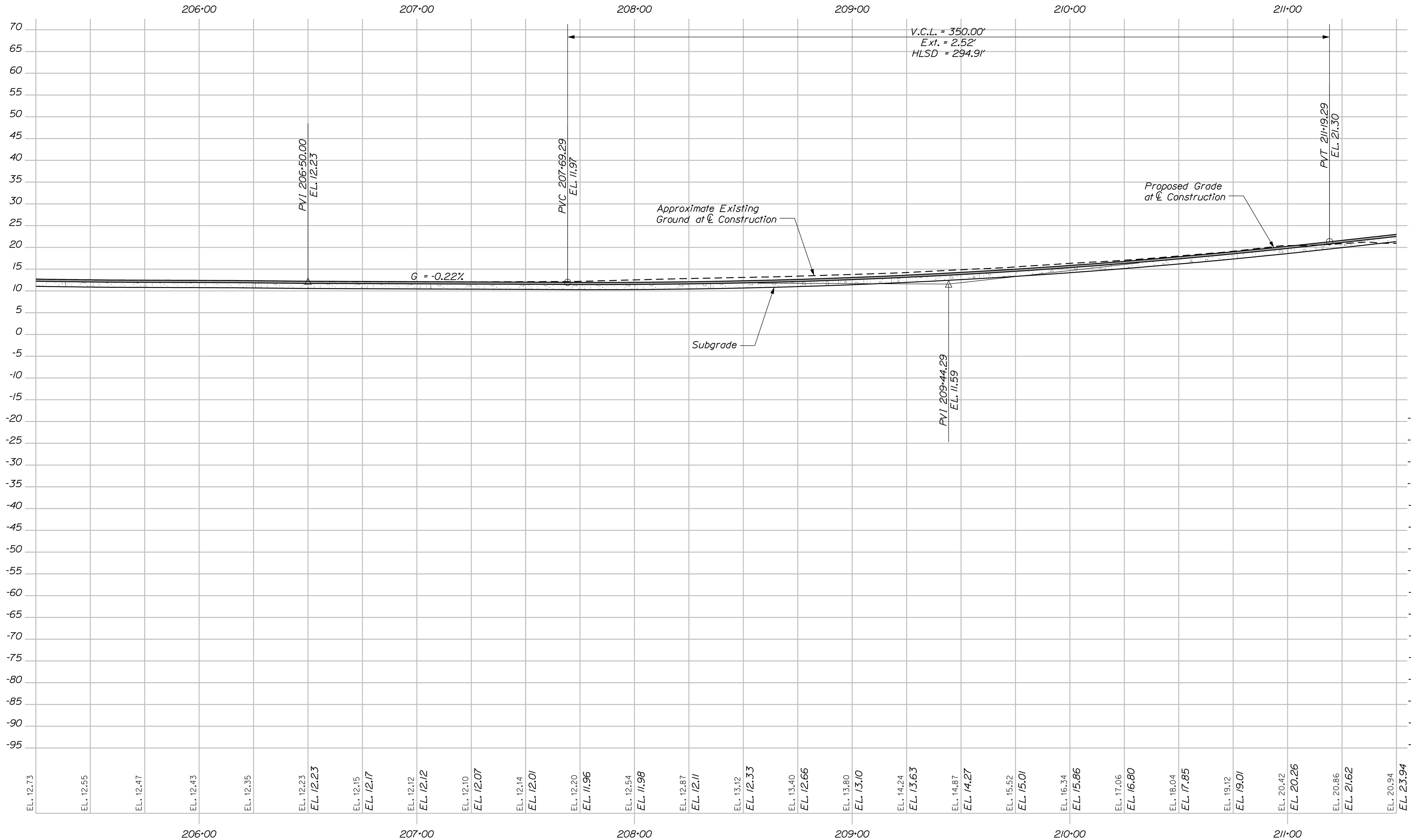
BEALS ISLAND BRIDGE
MOOSABEC REACH
JONESPORT & BEALS WASHINGTON COUNTY

PROFILE (SHEET 1 OF 5)

SHEET NUMBER

7

OF 17



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STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

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WIN 02622.600 BRIDGE PLANS

BRIDGE NO. 5500

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REVISIONS 2	...		...
REVISIONS 3	...		...
REVISIONS 4	...		...
FIELD CHANGES	...		...

SIGNATURE

P.E. NUMBER

DATE

BEALS ISLAND BRIDGE
MOOSABEC REACH
JONESPORT & BEALS WASHINGTON COUNTY

PROFILE (SHEET 2 OF 5)

SHEET NUMBER
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OF 17

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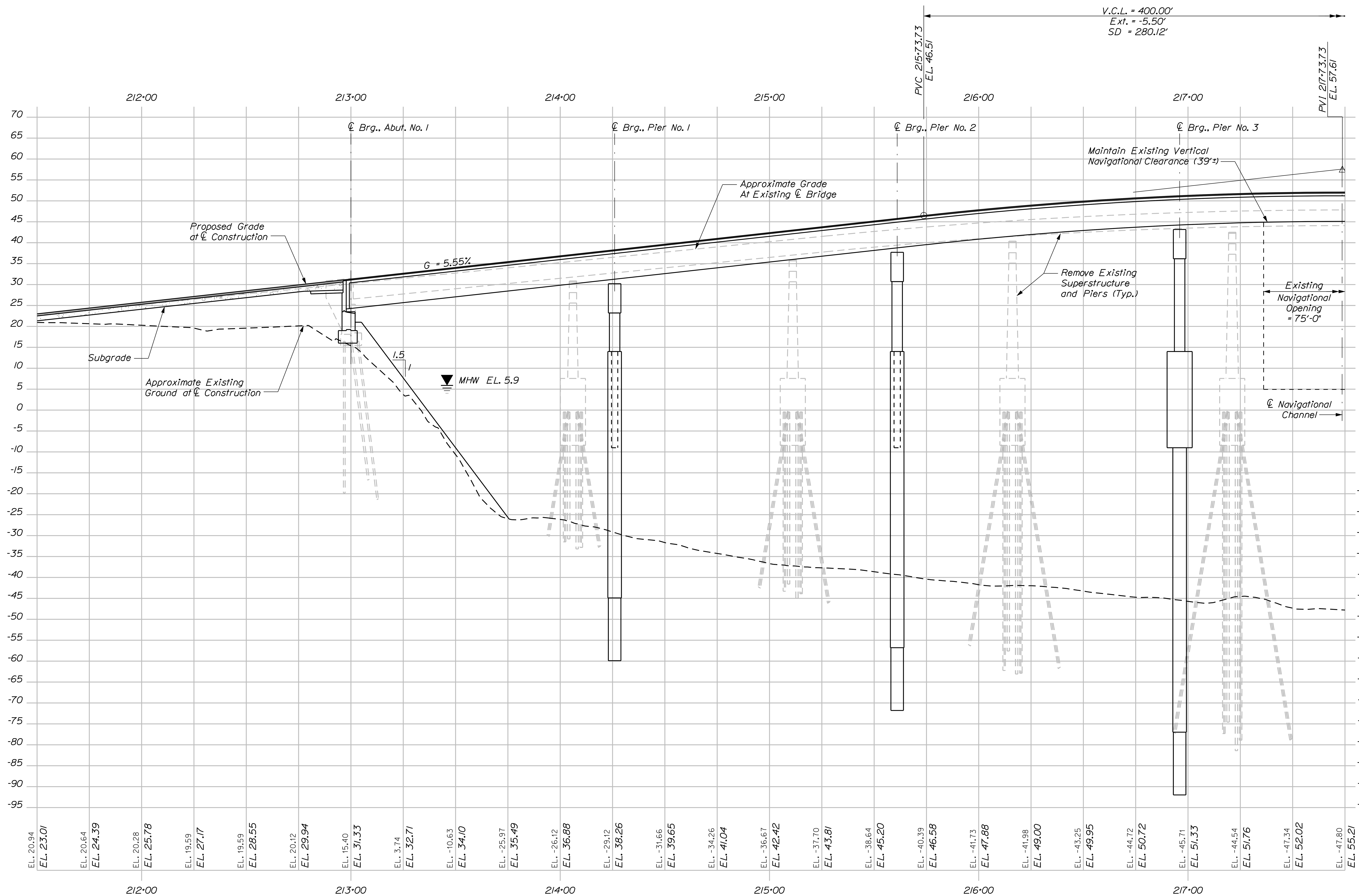

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Scale

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

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WIN
02262600

BRIDGE PLANS

BRIDGE NO. 5500

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CHECKED-REVIEWED	RSB	SMH	3/15
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REVISIONS 1	...	...	...
REVISIONS 2	...	...	...
REVISIONS 3	...	...	...
REVISIONS 4	...	...	...
FIELD CHANGES	...	...	...

SIGNATURE

P.E. NUMBER

DATE

BEALS ISLAND BRIDGE
MOOSABEC REACH
JONESPORT & BEALS WASHINGTON COUNTY

PROFILE (SHEET 3 OF 5)

SHEET NUMBER

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OF 17

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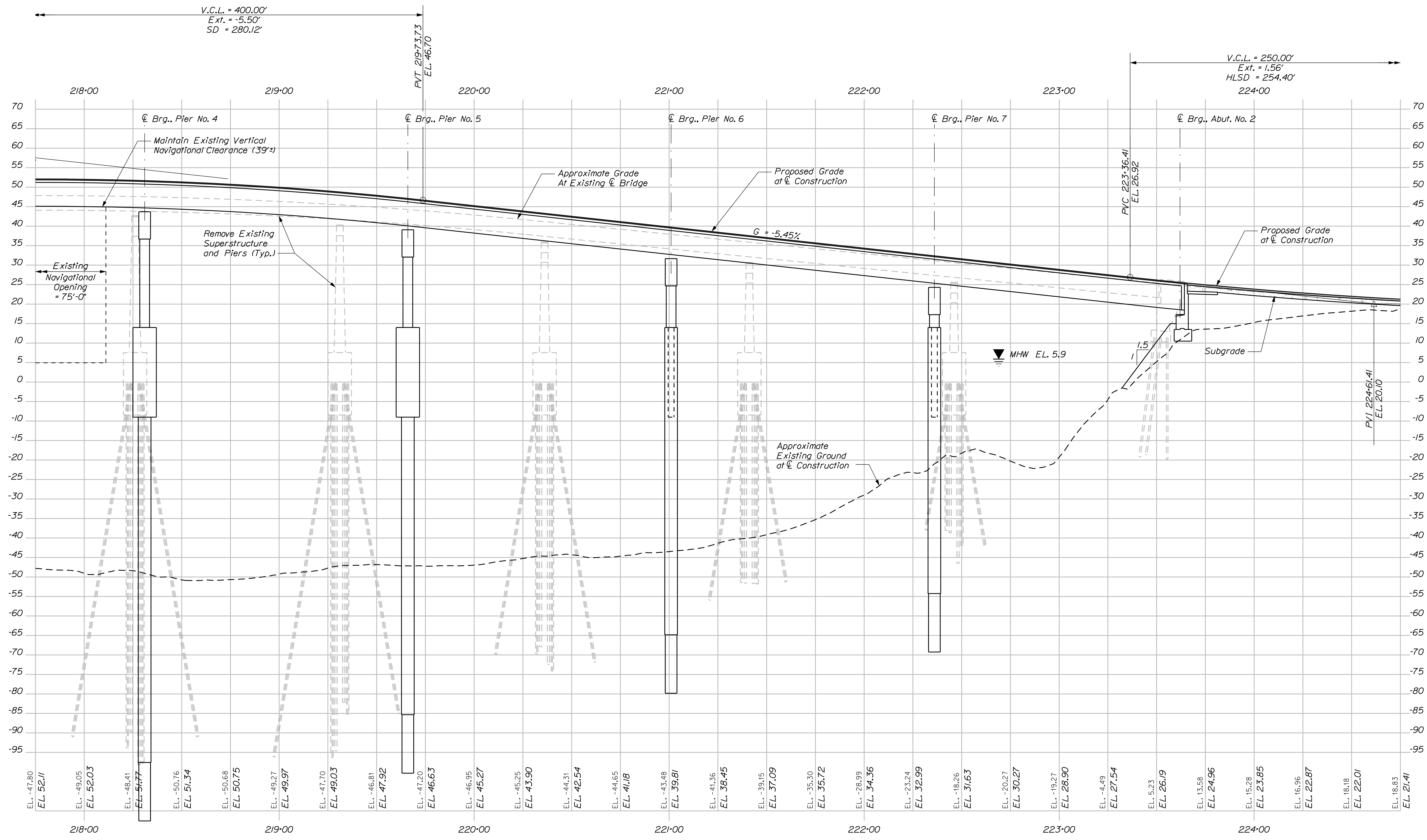

PROFILE

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Vert. 12.5 0 12.5 25
Scale

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

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WIN
022626.00

BRIDGE PLANS

BRIDGE NO. 5500

	BY	DATE
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CHECKED-REVIEWED	RSB	SMH 3/15
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REVISIONS 2	...	...
REVISIONS 3	...	...
REVISIONS 4	...	...
FIELD CHANGES	...	...

SIGNATURE

P.E. NUMBER

DATE

BEALS ISLAND BRIDGE
MOOSABEC REACH
JONESPORT & BEALS WASHINGTON COUNTY

PROFILE (SHEET 4 OF 5)

SHEET NUMBER
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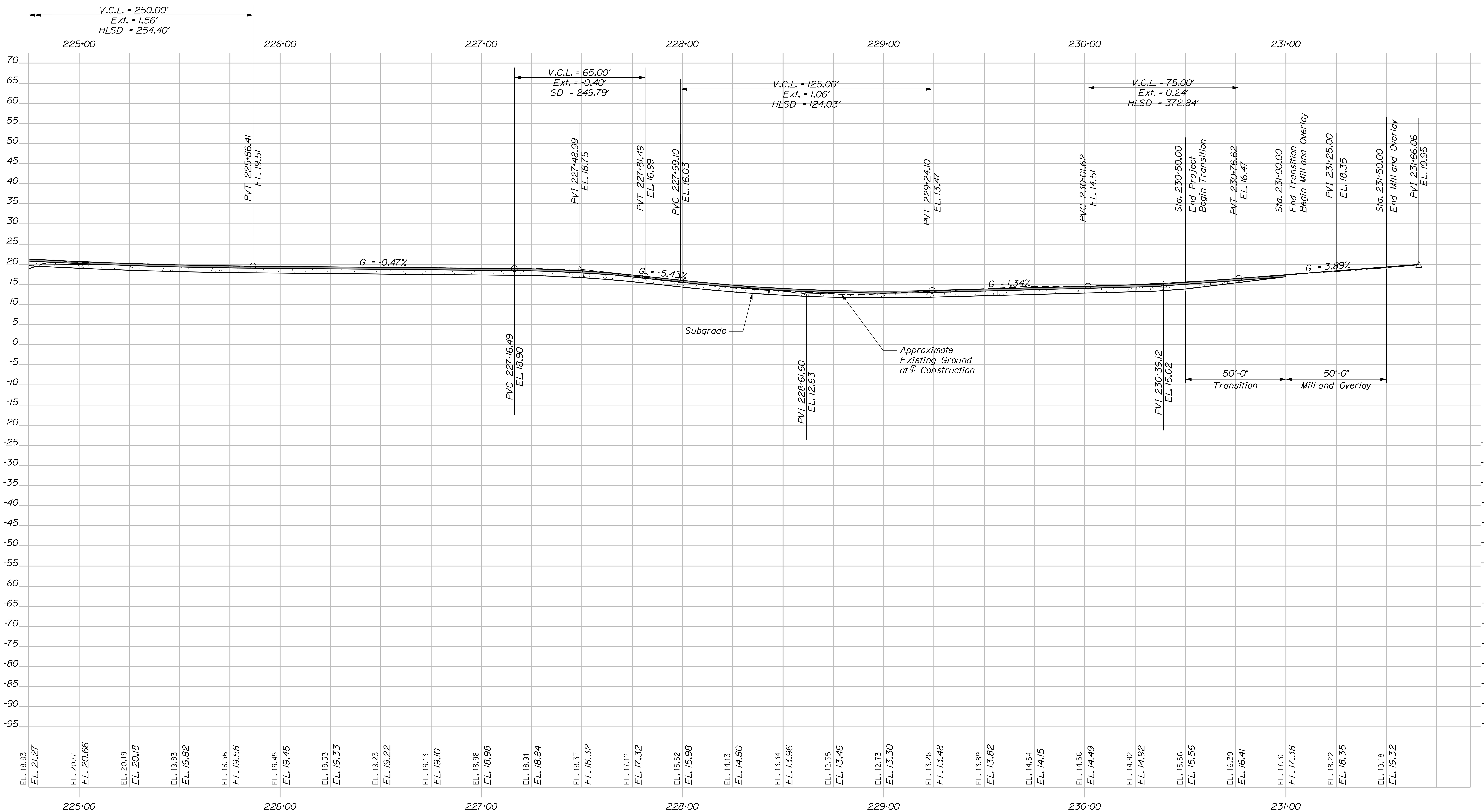
OF 17



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Vert. 12.5 0 12.5 25

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STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

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WIN
02262600

BRIDGE PLANS

BRIDGE NO. 5500

SIGNATURE

P.E. NUMBER

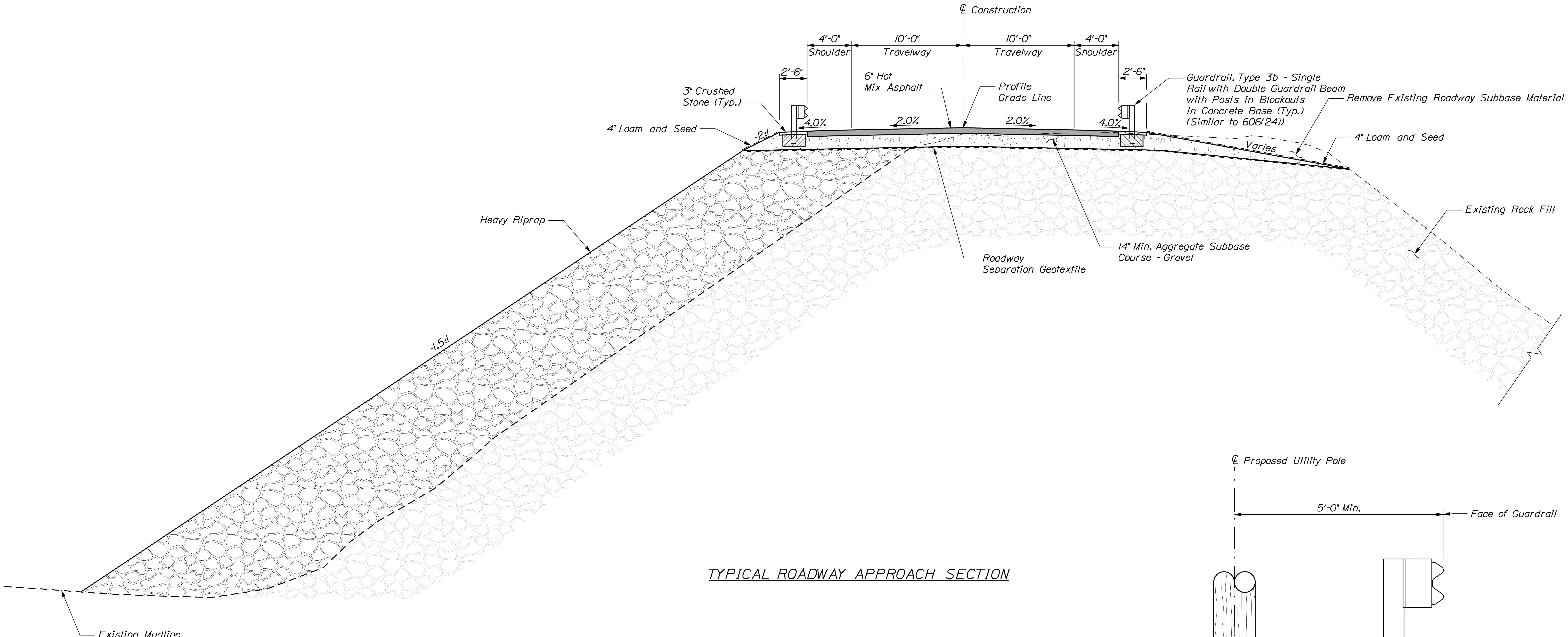
DATE

	BY	DATE
PROJ. MANAGER	...	...
DESIGN-DETAILED	JAW / KDW	3/15
CHECKED-REVIEWED	RSB / SMH	3/15
DESIGN2-DETAILED2	...	...
DESIGN3-DETAILED3	...	...
REVISIONS 1	...	...
REVISIONS 2	...	...
REVISIONS 3	...	...
REVISIONS 4	...	...
FIELD CHANGES	...	...

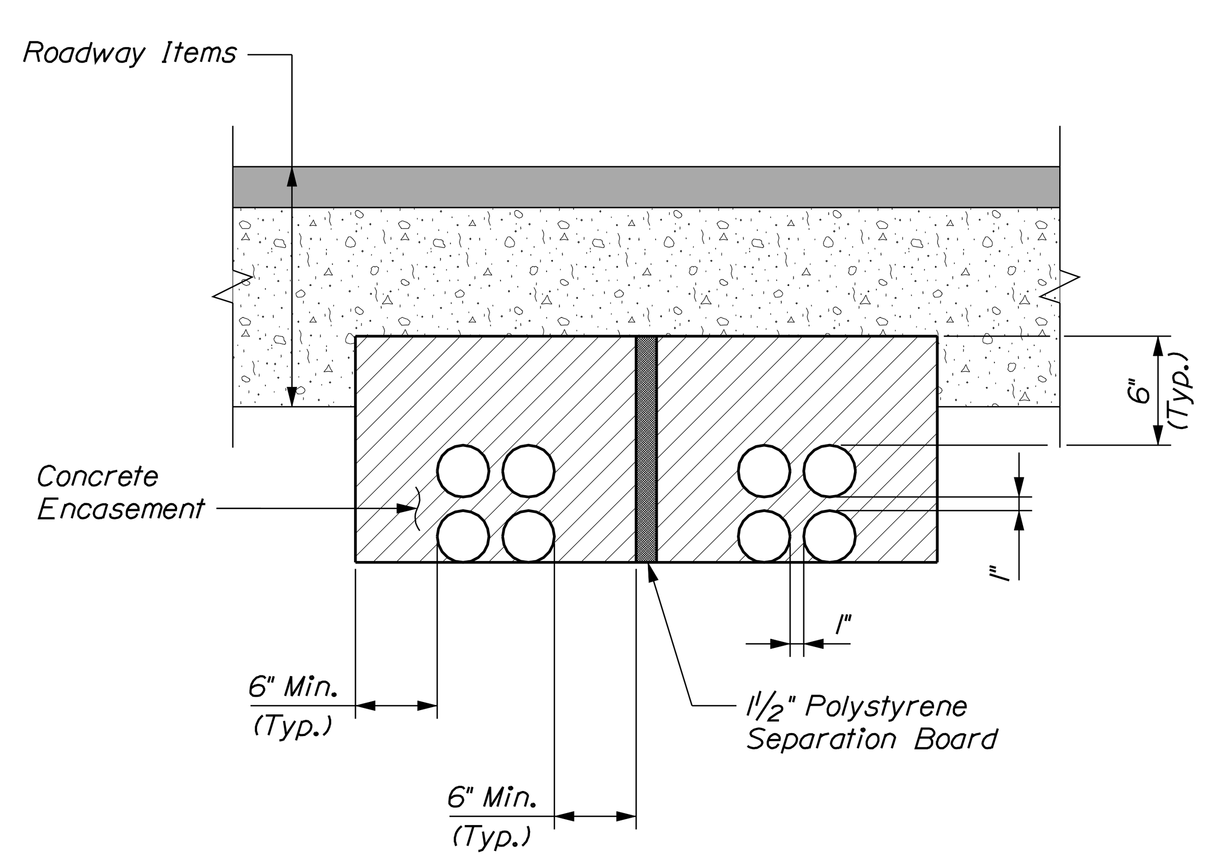
BEALS ISLAND BRIDGE
MOOSABEC REACH
JONESPORT & BEALS WASHINGTON COUNTY

PROFILE (SHEET 5 OF 5)

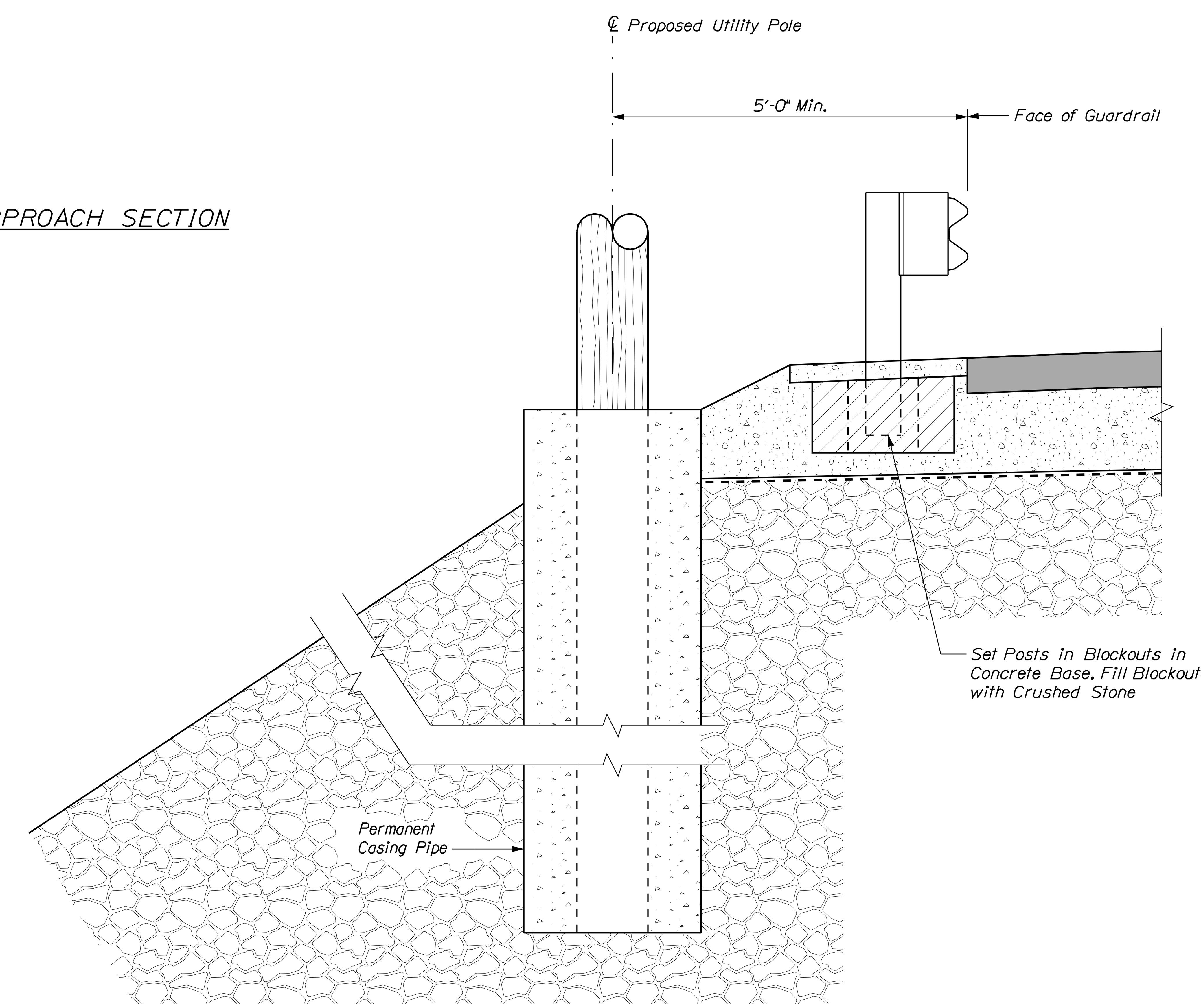
SHEET NUMBER
11
OF 17



TYPICAL ROADWAY APPROACH SECTION



CONCRETE ENCASEMENT DETAIL
FOR SHALLOW COVER



AERIAL UTILITY POLE DETAIL
(Subject to Change)

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

-

WIN
02626.00

BRIDGE PLANS

BRIDGE NO. 5500

		BY	DATE
PROJ. MANAGER	...		
DESIGN-DETAILED	JAW	KDW	3/15
CHECKED-REVIEWED	RSB	SMH	3/15
DESIGN2-DETAILED2	...	...	...
DESIGN3-DETAILED3	...	...	...
REVISIONS 1	...	...	...
REVISIONS 2	...	...	...
REVISIONS 3	...	...	...
REVISIONS 4	...	...	...
FIELD CHANGES	...	...	...

SIGNATURE

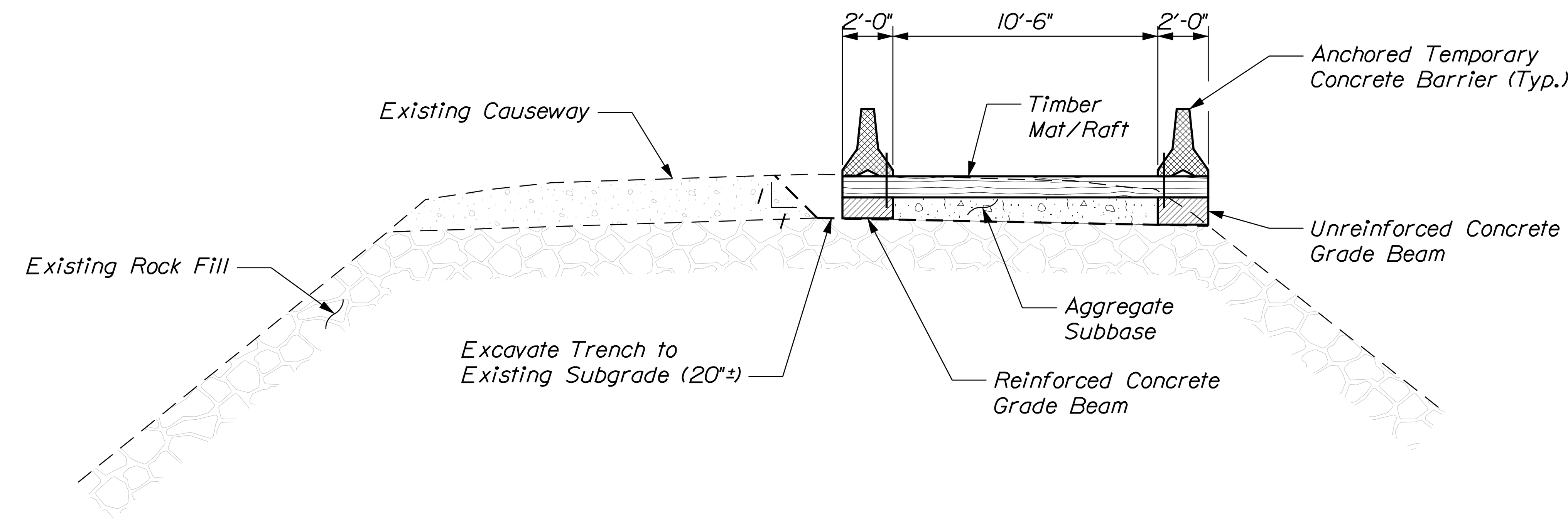
P.E. NUMBER

DATE

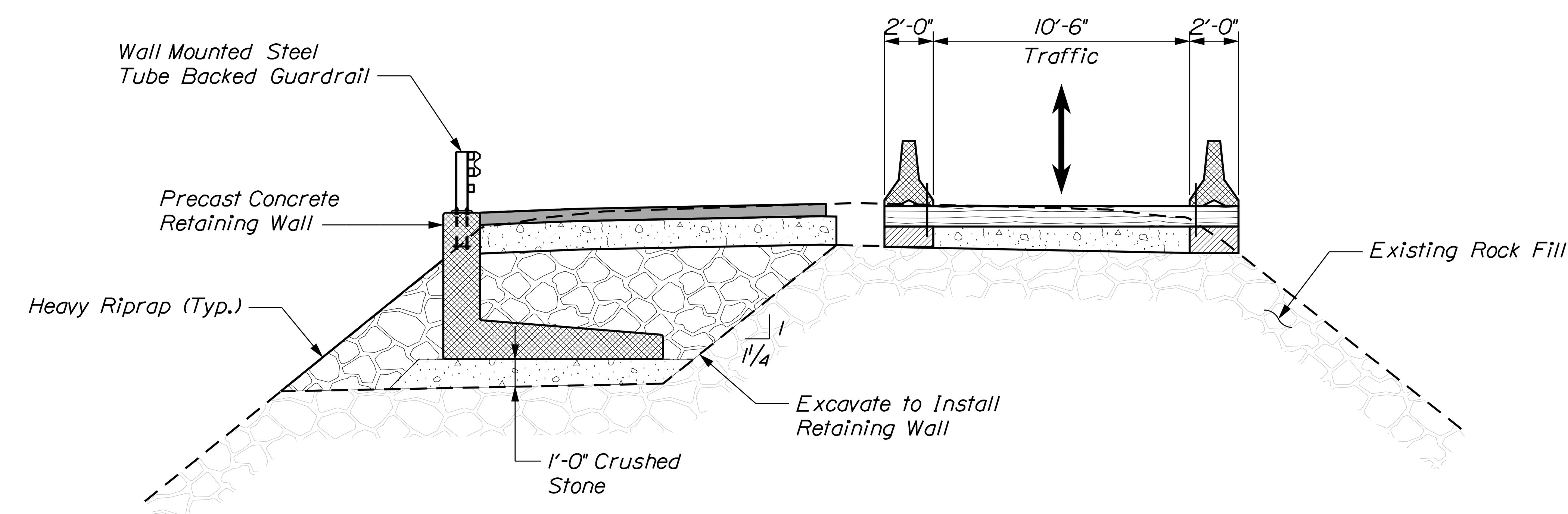
BEALS ISLAND BRIDGE
MOOSABEC REACH
JONESPORT & BEALS WASHINGTON COUNTY

TYPICAL SECTIONS
AND DETAILS

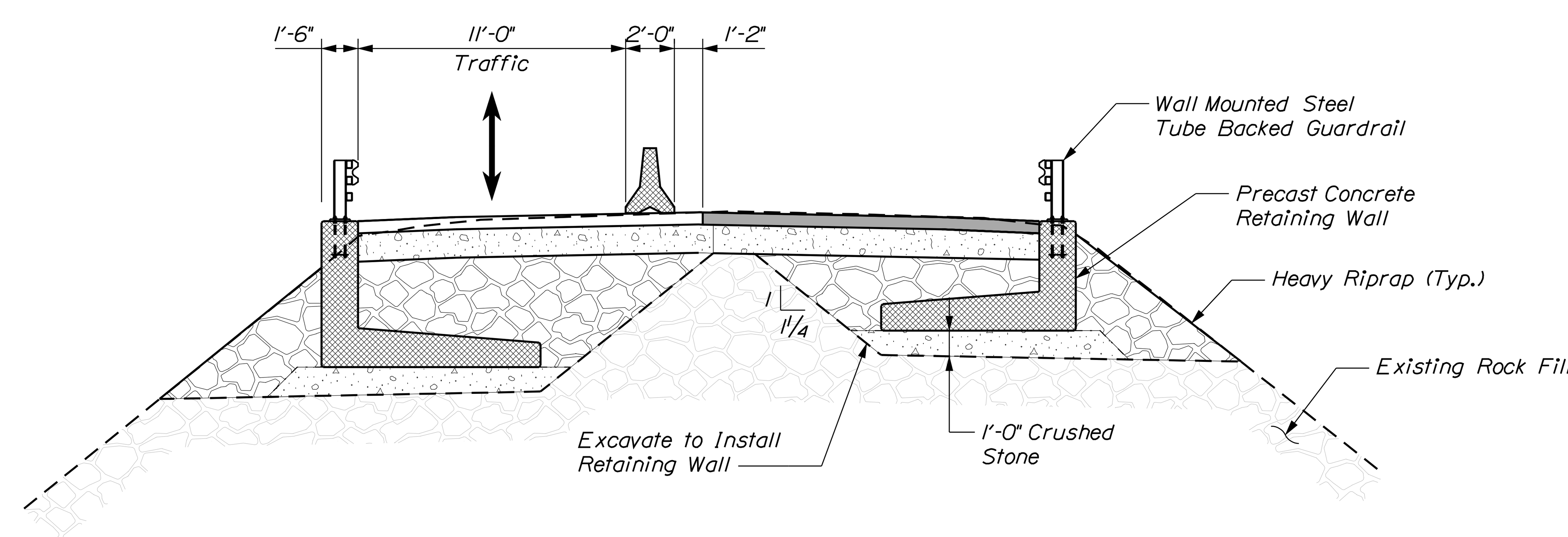
SHEET NUMBER
12
OF 17



PHASE I



PHASE II



PHASE III

Filename: ...\013_Retaining_Wall_Details_01.dgn Division: Structures Username: kwentworth Date:3/25/2015

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

-

WIN
022626.00

BRIDGE PLANS

BRIDGE NO. 5500

		BY	DATE
PROJ. MANAGER	...		
DESIGN-DETAILED	JAW	KDW	3\15
CHECKED-REVIEWED	RSB	SMH	3\15
DESIGN2-DETAILED2	...	...	...
DESIGN3-DETAILED3	...	...	...
REVISIONS 1	...	...	...
REVISIONS 2	...	...	...
REVISIONS 3	...	...	...
REVISIONS 4	...	...	...
FIELD CHANGES	...	...	...

SIGNATURE

P.E. NUMBER

DATE

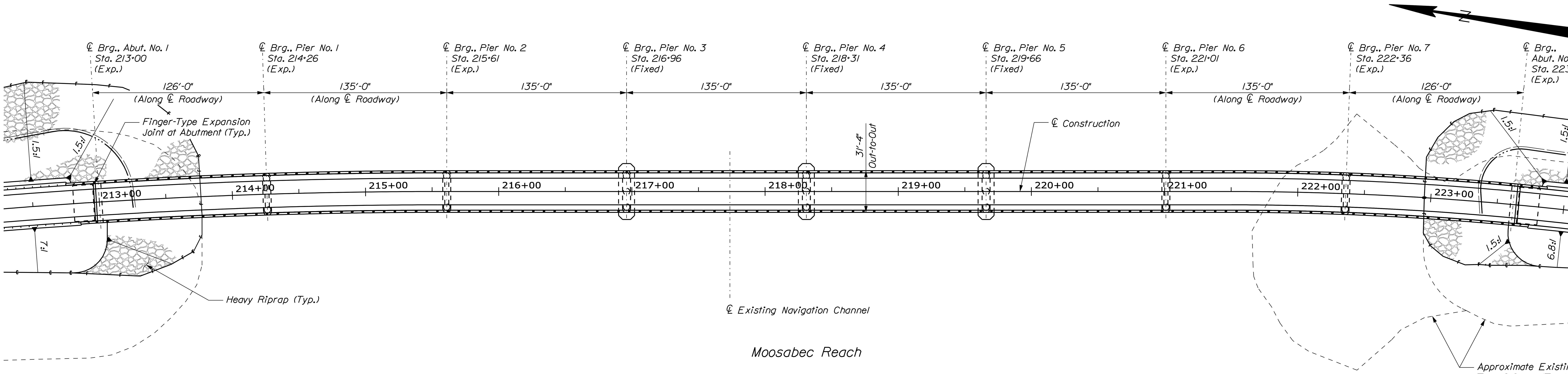
BEALS ISLAND BRIDGE
MOOSABEC REACH
JONESPORT & BEALS WASHINGTON COUNTY

RETAINING WALL DETAILS

SHEET NUMBER

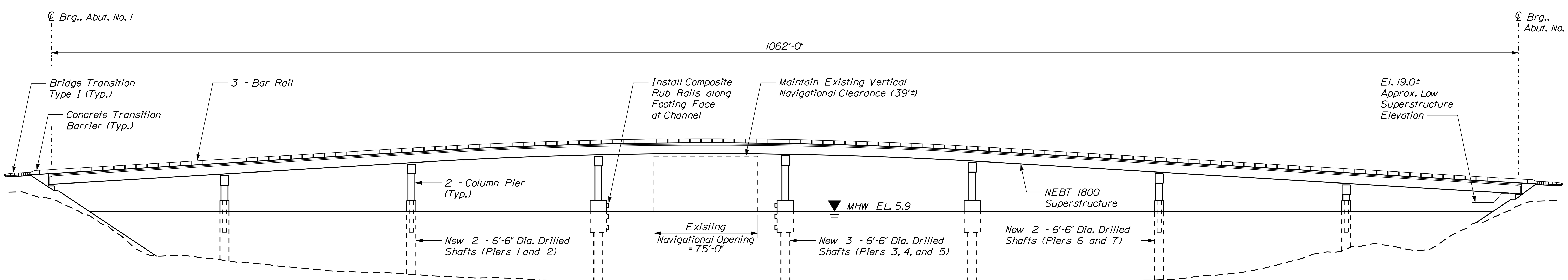
13

OF 17



PLAN

40 0 40 80
Scale of Feet
(Utilities not Shown)



ELEVATION
(Navigation Lights not Shown)

Filename: ...\s\planset\014_plan&elev.dgn
Division: Structures
Username: kwentworth
Date: 5/26/2015

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

WIN 022626.00
BRIDGE PLANS
BRIDGE NO. 5500

		BY	DATE
PROJ. MANAGER	...		
DESIGN-DETAILED	JAW	KDW	3/15
CHECKED-REVIEWED	RSB	SMH	3/15
DESIGN2-DETAILED2	...	...	...
DESIGN3-DETAILED3	...	...	...
REVISIONS 1	...	...	...
REVISIONS 2	...	...	...
REVISIONS 3	...	...	...
REVISIONS 4	...	...	...
FIELD CHANGES	...	...	...

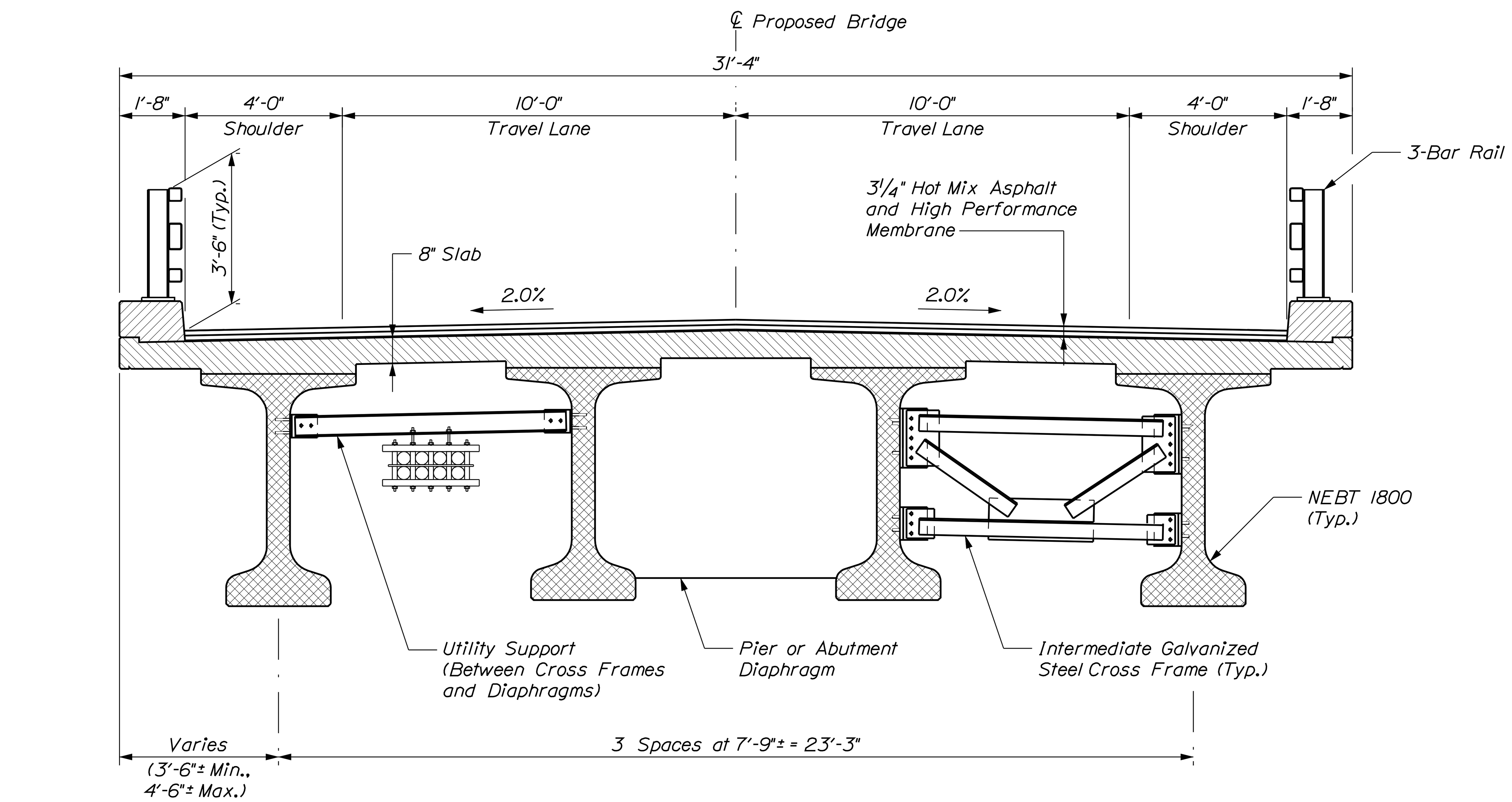
SIGNATURE
P.E. NUMBER
DATE

BEALS ISLAND BRIDGE
MOOSABEC REACH
JONESPORT & BEALS WASHINGTON COUNTY

BRIDGE PLAN AND ELEVATION

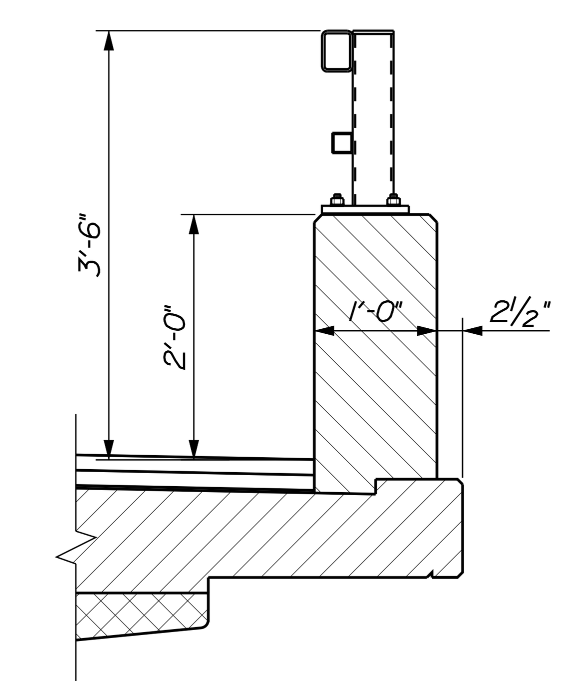
SHEET NUMBER
14
OF 17

Filename: ...\015_Bridge_Sections.dgn Division: Structures Username: kwentworth Date:3/25/2015



SUPERSTRUCTURE SECTION

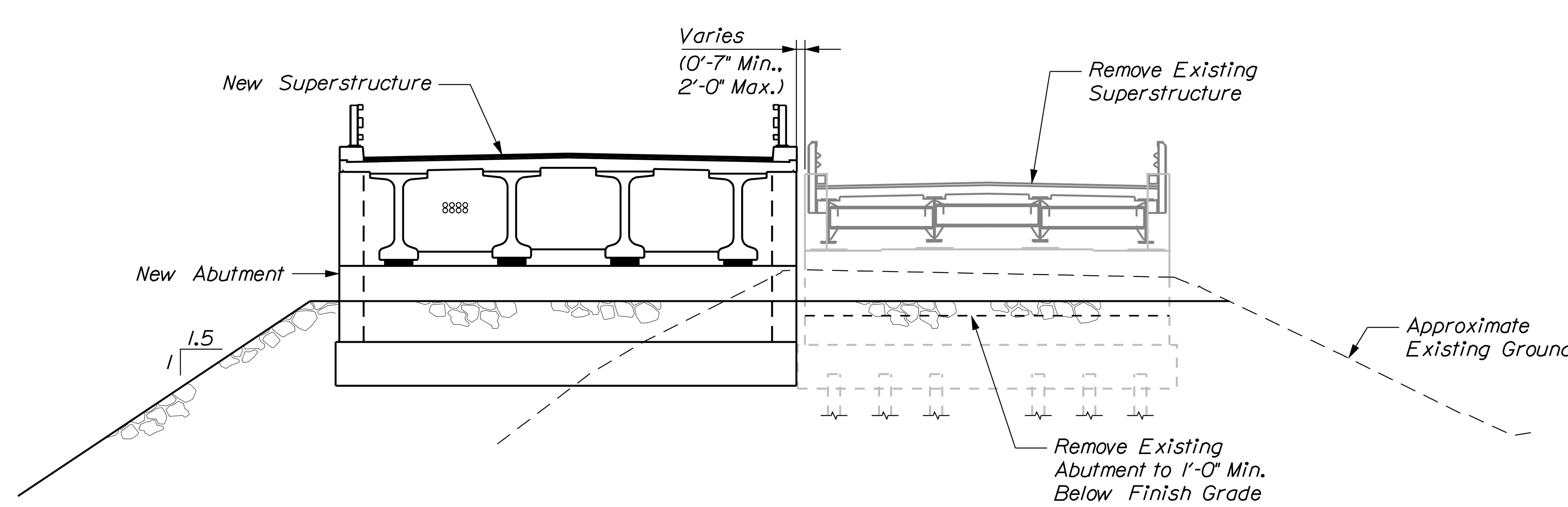
Scale: ⅜" = 1'-0"



MICHIGAN DOT TL-3 PARAPET TUBE RAIL ALTERNATIVE

NOTE

1. Alternative bridge railing shown for consideration of additional roadway width and clearances for bridge drain as required.



ABUTMENT SECTION

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

WIN 022626.00

BRIDGE PLANS

BRIDGE NO. 5500

SIGNATURE

P.E. NUMBER

DATE

		BY	DATE
PROJ. MANAGER	...		
DESIGN-DETAILED	JAW	KDW	3/15
CHECKED-REVIEWED	RSB	SMH	3/15
DESIGN2-DETAILED2	...	...	...
DESIGN3-DETAILED3	...	...	...
REVISIONS 1	...	...	...
REVISIONS 2	...	...	...
REVISIONS 3	...	...	...
REVISIONS 4	...	...	...
FIELD CHANGES	...	...	...

BEALS ISLAND BRIDGE
MOOSABEC REACH
JONESPORT & BEALS WASHINGTON COUNTY

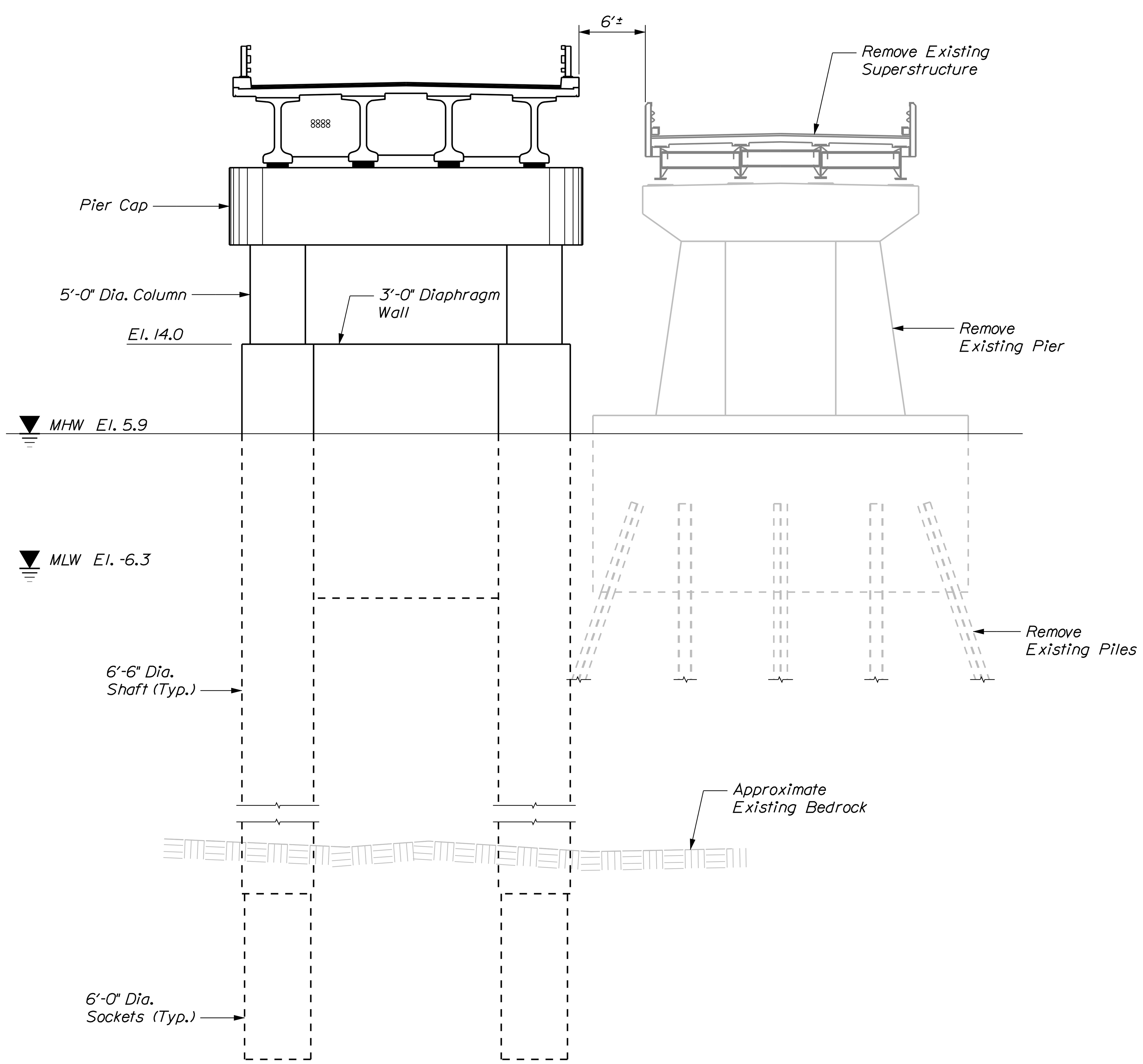
BRIDGE SECTIONS

SHEET NUMBER

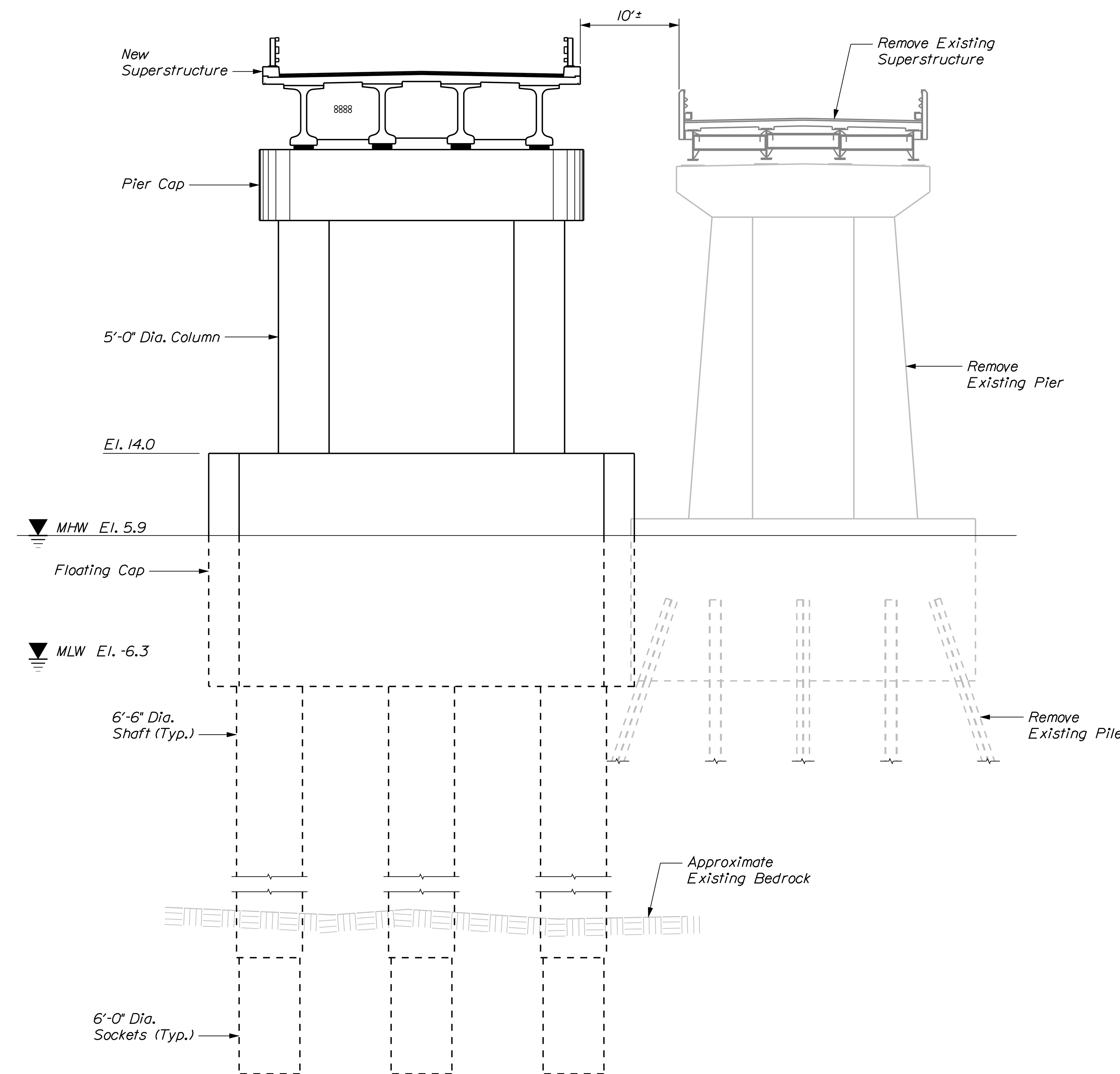
15

OF 17

Filename: ...\planset\016_Pier_Sections.dgn
Division: Structures
Username: kwentworth
Date: 3/25/2015



PIER NO. 1 SECTION
(Piers 1, 2, 6 and 7 are Similar)



PIER NO. 4 SECTION
(Piers 3, 4 and 5 are Similar)

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

BRIDGE NO. 5500
WIN 022626.00
BRIDGE PLANS

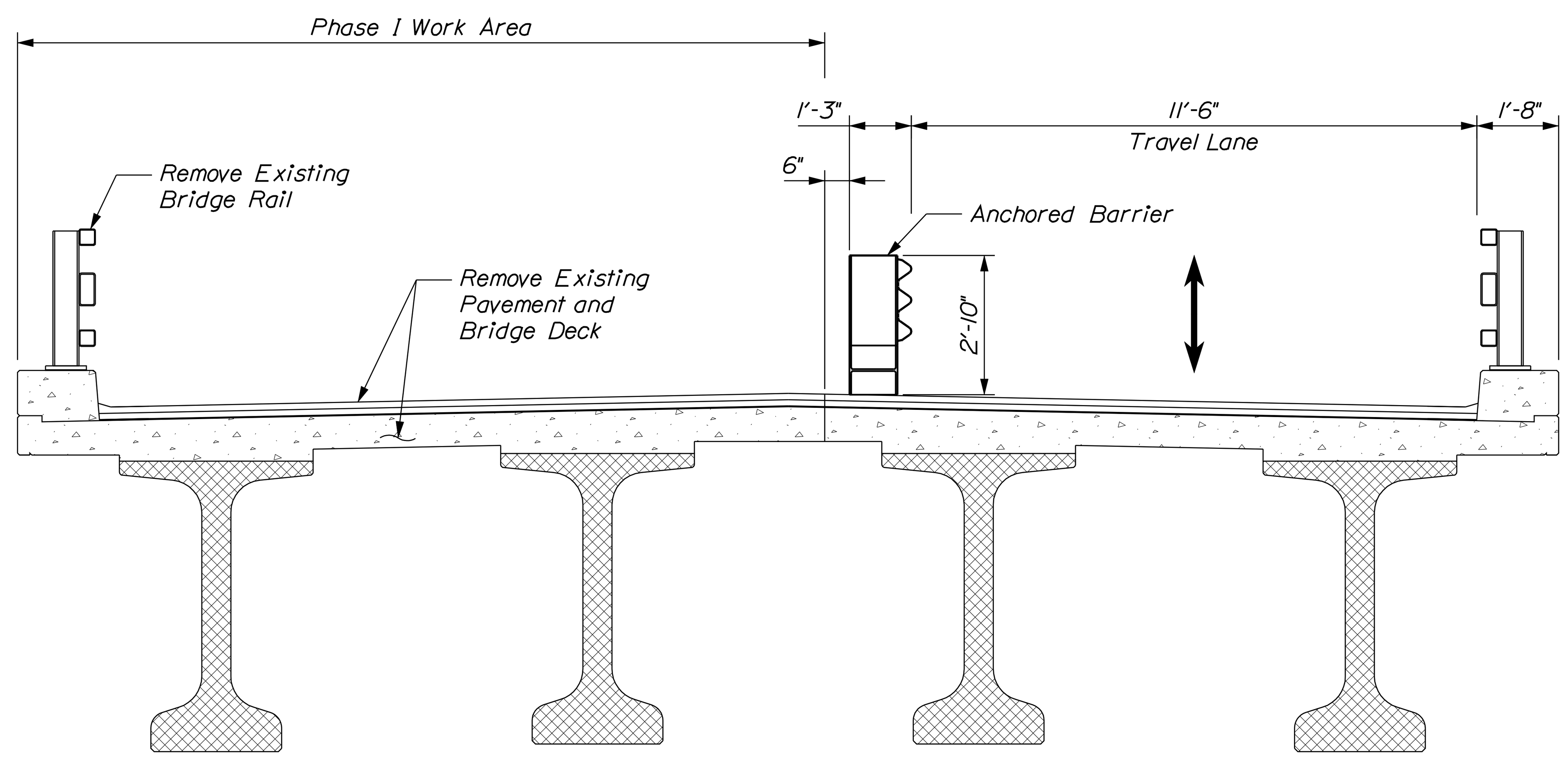
		BY	DATE
PROJ. MANAGER	...		
DESIGN-DETAILED	JAW	KDW	3/15
CHECKED-REVIEWED	RSB	SMH	3/15
DESIGN2-DETAILED2	...	...	...
DESIGN3-DETAILED3	...	...	...
REVISIONS 1	...	...	...
REVISIONS 2	...	...	...
REVISIONS 3	...	...	...
REVISIONS 4	...	...	...
FIELD CHANGES	...	...	...

SIGNATURE
P.E. NUMBER
DATE

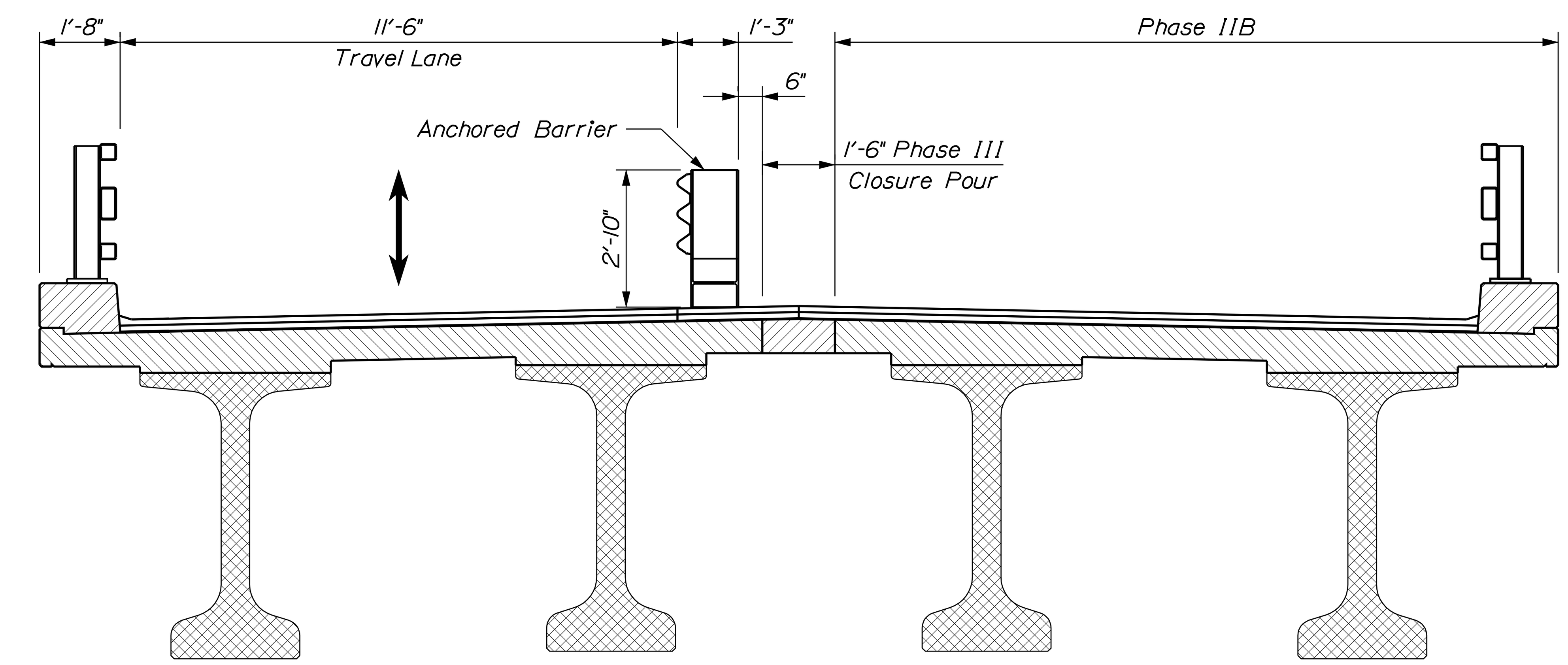
BEALS ISLAND BRIDGE
MOOSABEC REACH
JONESPORT & BEALS WASHINGTON COUNTY

PIER ELEVATIONS

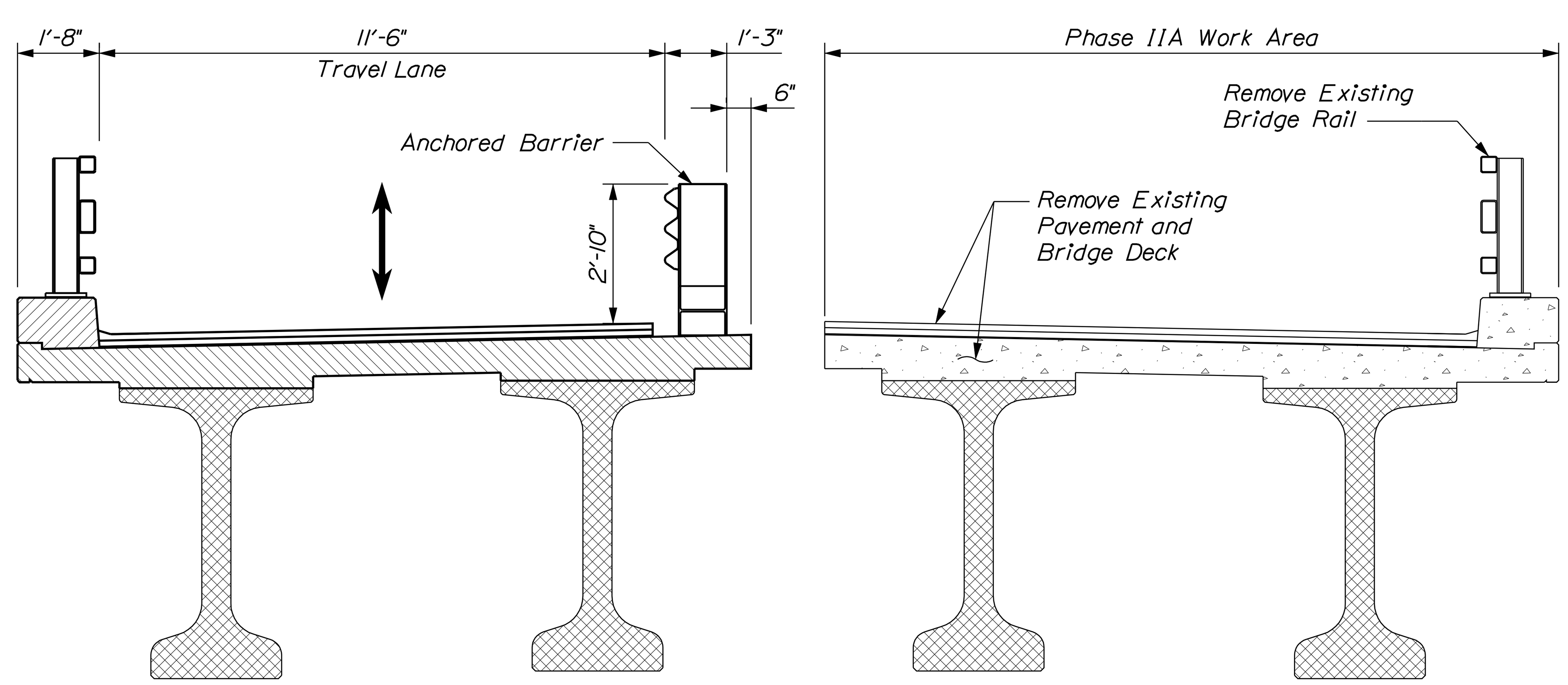
SHEET NUMBER
16
OF 17



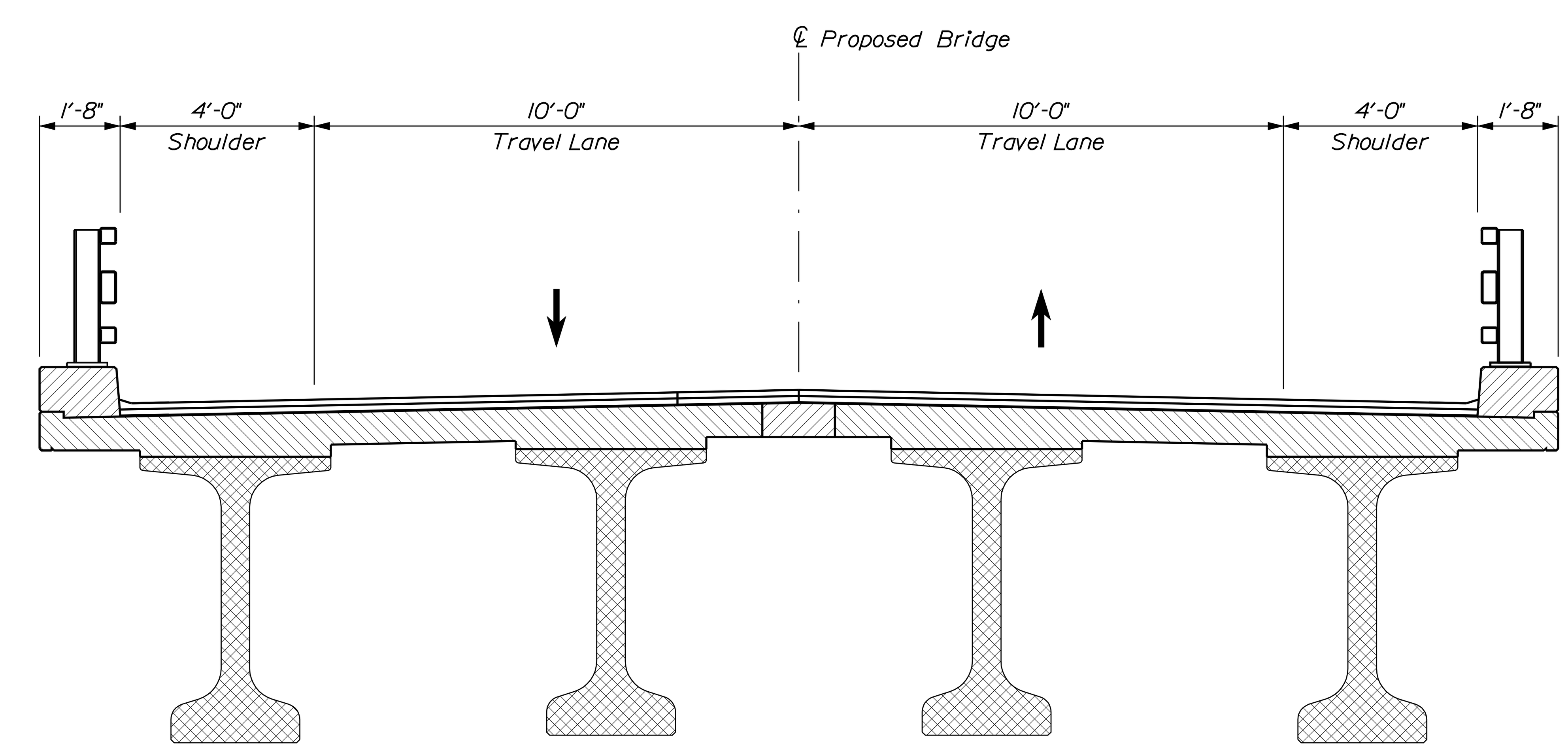
PHASE I
Scale: 3/8" = 1'-0"



PHASE IIB/III
Scale: 3/8" = 1'-0"



PHASE IIA
Scale: 3/8" = 1'-0"



FINAL
Scale: 3/8" = 1'-0"

NOTE

1. Additional travel lane width may be gained with a narrower bridge rail system similar to that shown on Sheet 15.

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

-

BRIDGE NO. 5500

WIN
022626.00

BRIDGE PLANS

		BY	DATE
PROJ. MANAGER	...		
DESIGN-DETAILED	JAW	KDW	3/15
CHECKED-REVIEWED	RSB	SMH	3/15
DESIGN2-DETAILED2	...	...	...
DESIGN3-DETAILED3	...	...	...
REVISIONS 1	...	...	...
REVISIONS 2	...	...	...
REVISIONS 3	...	...	...
REVISIONS 4	...	...	...
FIELD CHANGES	...	...	...

SIGNATURE

P.E. NUMBER

DATE

BEALS ISLAND BRIDGE
MOOSABEC REACH
JONESPORT & BEALS WASHINGTON COUNTY

FUTURE DECK REPLACEMENT CONCEPT

SHEET NUMBER
17
OF 17

Filename: ...\planset\017_Future_Phasing.dgn Division: Structures Username: kwentworth Date:3/25/2015

APPENDIX B

Photographs

Photo #1: View from Beals looking north west

Photo #2: Typical Pier

Photo #3: Jonesport Approach, Looking South

Photo #4: Beals Approach, Looking North

Photo #5: Traffic on Existing Bridge

Photo #6: Jonesport Abutment

Photo #7: Beals Causeway and Abutment

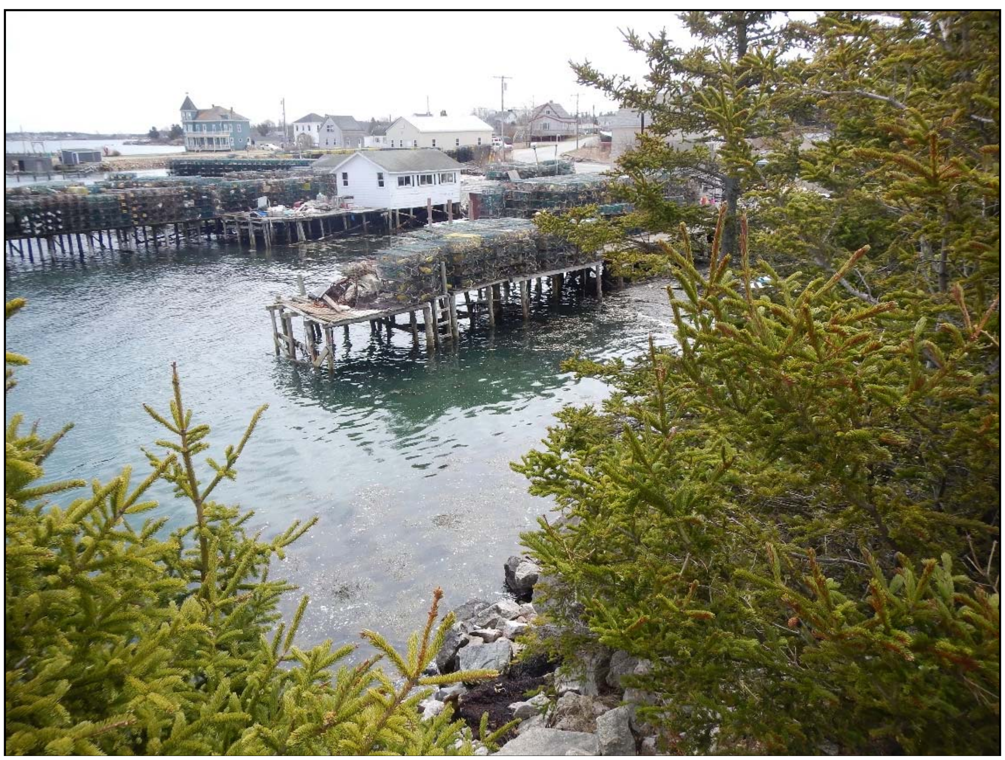


Photo #8: Docks in Beals

Photo #9: US Coast Guard Property in Jonesport

Photo #10: Typical Superstructure

Photo #11: Beals Approach Looking East

Photo #12: View from Beals, Looking north east

Photo #13: Jonesport Approach, Looking South

Photo #14: Beals Approach, Looking South

APPENDIX C

Traffic and Accident Data

STATE OF MAINE

FILE: Wash. Cty

INTERDEPARTMENTAL MEMORANDUM

Date of Request: 2/11/2014 Return: 2/14/2014

Latest Date Needed By 2/18/2014

To: **Ed Hanscom** Dept.: MDOT, Bureau of Planning

From: **Janet Damren** Dept.: Bridge Program

Subject: **Request for Traffic Information** Project Manager: **Leanne Timberlake**

TOWN(S): Beals-Jonesport P.I.N. **22626.00** Consultant Proj ☐

COUNTY: Washington ROUTE: Bridge St.

LOCATION/ DESCRIPTION: Beals Island Bridge #5500 on the Beals-Jonesport town Line, carrying Great Wass Island over Moosebec Reach.

	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: MAM	Sec. 1	Sec. 2	Sec. 3	Sec. 4	Sec. 5
Description of Sections	Jonesport - Bridge St. S/O SR 187 (Main St.)				
1 Latest AADT (Year)	2060(2012)				
2 Current **2015** AADT	2060				
3 Future **2025** AADT	2270				
4 Future **2035** AADT	2470				
5 DHV - % of AADT	12%	%	%	%	%
6 Design Hourly Volume	296				
7 % Heavy Trucks (AADT)	12%	%	%	%	%
8 % Heavy Trucks (DHV)	10%	%	%	%	%
9 Direct.Dist. (DHV)	55%	%	%	%	%
10 18-KIP Equivalent P 2.0	114				
11 18-KIP Equivalent P 2.5	109				

Notes or Remarks: 18-Kip ESALS is 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.)
RAFFIC REQUESTS WILL BE FILLED ON A FIRST COME / SERVE BASIS. PLEASE SEND WHEN PROJECT KICKS OFF!!
Need Only Data Items Numbered

Comments: New project.

Assumed 12% Heavy Trucks as no heavy truck data was available for project.

STATE OF MAINE
INTER-DEPARTMENTAL MEMORANDUM
Maine Department of Transportation
Bureau of Maintenance & Operations

Date: 6/8/09

To: Greg Costello, Accident Records Section
Division: Traffic Engineering
From: Sue Murphy
Department: Bridge
Project Leader: Leanne Timberlake
Subject: Accident Data Requests
Requester's Tel. # 43446

****

Location Data
P.I.N. 01668400
Town Beals-Jonesport
County Washington
Description Beals Island Bridge #5500 carries Great Wass Island
Nodes Rd over Moosebec Reach

Information Required

✓ Accident Summary (I, II)
______ Collision Diagram
✓ M.A.R.S.
(1 page printout with numbers, rates, severity)
______ Other

Study Period

✓ Current 3 years
______ Other

Purpose of Request
Project start up

Accident Section Use Only

Date Received ________
Notes: 0 crashes
Assigned to GWC
Date Returned 6-10-09

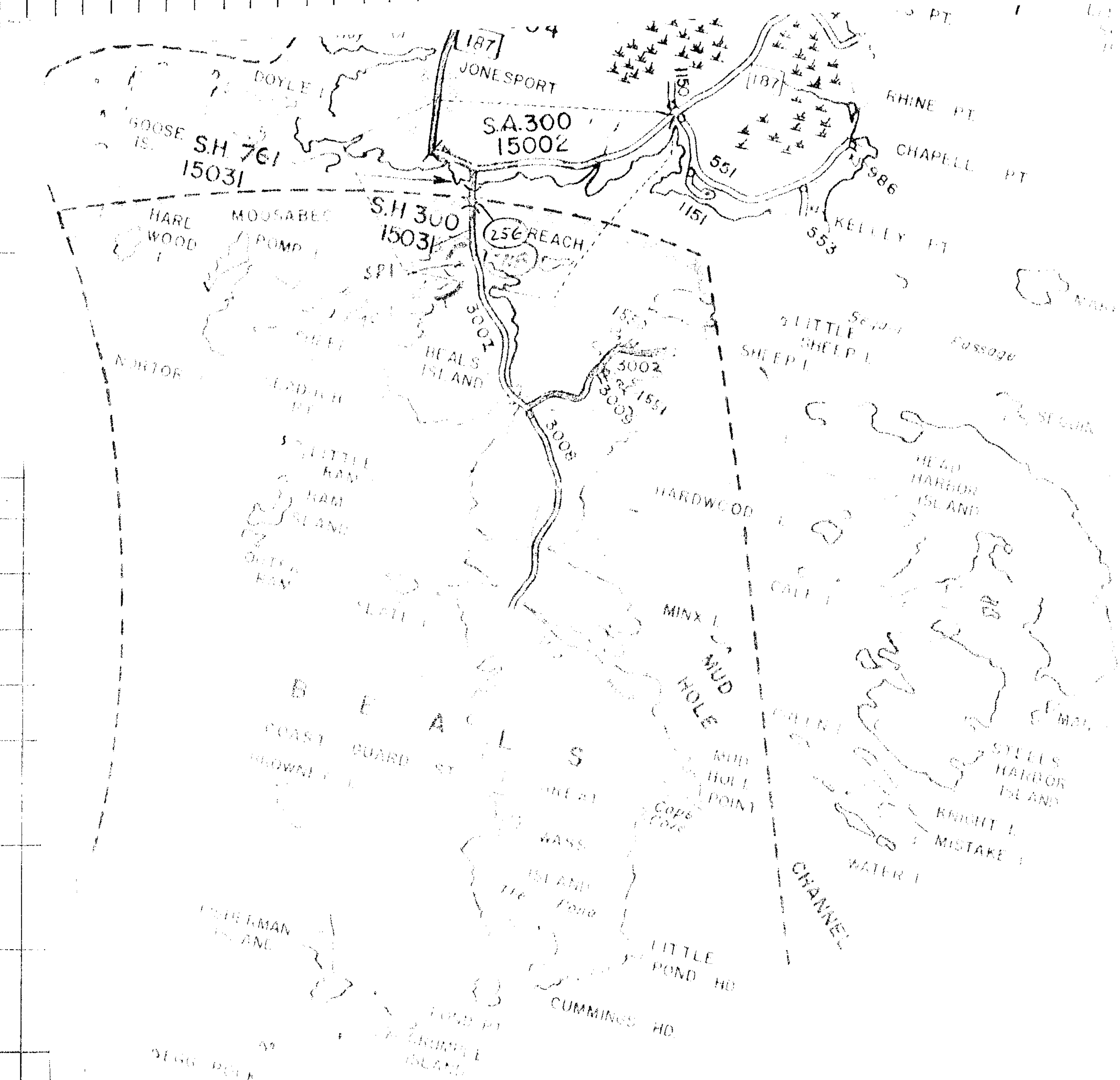
Other copies sent to:

TOWN OF BEALS 15-05 WASHINGTON COUNTY

MAP NUMBER 52

ROUTE NUMBER	HIGHWAY CLASSIFICATION	NAME OF BRIDGE	WATERWAY	NUMBER OF SPANS	LENGTH BETWEEN ABUT'S	ROADWAY WIDTH	SIDEWALK WIDTH	OVERHEAD CLEARANCE	TYPE OF SUBSTRUCTURE	TYPE OF SUPERSTRUCTURE	TYPE OF FLOOR	DATE BUILT	RATING	PLAN NUMBER	CODE NUMBER
		Flying Place	Flying Place Stream	1	25'	18'	—	—	Stone	Wood King Post	wood				3196
718	761	Jonesport-Beals	Moosabec Reach	10	1050'	22'	—	—	conc	conc	conc	1958	HC	68:101-102	
			New Experimental Epoxy waterproof overlay									1986			5500

IDENTIFICATION NUMBER	718
ROUTE NUMBER	
HIGHWAY CLASSIFICATION	761



RATING	
PLAN NUMBER	

TOWN OF

COUNTY

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**

REPORT DESCRIPTION

PIN 16684.00 Bridge 5500 in Beals Jonesport

REPORT PARAMETERS

Year 2006, Start Month 1 through Year 2008 End Month: 12

Route: **2901131**	Start Node: **50208**	Start Offset: **0**	☑ **Exclude First Node**
	End Node: **50210**	End Offset: **0**	☑ **Exclude Last Node**

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary I

Nodes

Node	Route - MP	Node Description	U/R	Total Crashes	K	A	B	C	PD	Percent Injury	Annual M Ent-Veh	Crash Rate	Critical Rate	CRF
50209	2901131 - 0.19	TL - Beals, Jonesport	1	0	0	0	0	0	0	0.0	0.375	0.00	0.52	0.00
											Statewide Crash Rate:	0.12		
Study Years:	3.00	NODE TOTALS:		0	0	0	0	0	0	0.0	0.375	0.00	0.52	0.00

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary I

Sections

Start Node	End Node	Element	Offset Begin - End	Route - MP	Section Length	U/R	Total Crashes	K	Injury Crashes A	B	C	PD	Percent Injury	Annual HMVM	Crash Rate	Critical Rate	CRF
50209	50210	232177	0 - 0.28	2901131 - -0.09 RD INV 29 01131	0.28	1	0	0	0	0	0	0	0.0	0.00210	0.00	483.96	0.00
TL - Beals, Jonesport														Statewide Crash Rate:	156.81		
50208	50209	232176	0 - 0.19	2901131 - 0 RD INV 29 01131	0.19	1	0	0	0	0	0	0	0.0	0.00142	0.00	533.33	0.00
Int of BARNEY COVE RD, BAYVIEW RD, BRIDGE ST														Statewide Crash Rate:	156.81		
Study Years: 3.00				Section Totals:	0.47		0	0	0	0	0	0	0.0	0.00352	0.00	423.31	0.00
				Grand Totals:	0.47		0	0	0	0	0	0	0.0	0.00352	0.00	483.72	0.00

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

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
50208	50209	232176	0 - 0.19	2901131 - 0	0	0	0	0	0	0				
50209	50210	232177	0 - 0.28	2901131 - 0.19	0	0	0	0	0	0				
				Totals:	0	0	0	0	0	0				

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Day and Hour

	AM												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**

Crashes by Year and Month

Month	2006	2007	2008	Total
JANUARY	0	0	0	0
FEBRUARY	0	0	0	0
MARCH	0	0	0	0
APRIL	0	0	0	0
MAY	0	0	0	0
JUNE	0	0	0	0
JULY	0	0	0	0
AUGUST	0	0	0	0
SEPTEMBER	0	0	0	0
OCTOBER	0	0	0	0
NOVEMBER	0	0	0	0
DECEMBER	0	0	0	0
Total	**0**	**0**	**0**	**0**

Vehicle Counts by Type

Unit Type	Total
1-2 Door	0
2-4 Door	0
3-Convertible	0
4-Station Wagon	0
5-Van	0
6-Pickup Truck	0
7-SUV	0
10-Truck Tractor Only (Bobtail)	0
12-School Bus	0
13-Motor Home	0
14-Motorcycle	0
15-Moped	0
16-Motor Bike	0
17-Bicycle	0
18-Snowmobile	0
20-2 Axle Single Unit with Dual Tires	0
21-2 Axle Tractor with Single Axle Semi	0
22-2 Axle Tractor with Tandem Axle Semi	0
25-2 Axle Tractor with Single Axle Semi & 2 Axle Trailer	0
30-3 Axle Single Unit	0
31-3 Axle Tractor with Single Axle Semi	0

Unit Type	Total
32-3 Axle Tractor with Tandem Axle Semi	0
33-3 Axle Tractor with Tridem Axle Semi	0
35-3 Axle Tractor with Single Axle Semi & 2 Axle Trailer	0
36-3 Axle Tractor with Tandem Axle Semi & 2 Axle Trailer	0
37-5 Axle Semi; Split Trailer Tandem	0
38-6 Axle Semi; Split Trailer Tandem with Center Axle	0
39-6 Axle; Standard Trailer Tandem with Center Axle	0
40-4 Axle Single Unit	0
42-4 Axle Tractor with Tandem Axle Semi	0
50-Any Other Axle Configuration	0
60-Other Unit	0
70-ATV	0
81-2 Axle Bus	0
82-3 Axle Bus	0
98-Farm Vehicles / Tractors	0
99-Unknown	0
Total	**0**

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Apparent Contributing Factor And Driver

Apparent Contributing Factor	Dr 1	Dr 2	Dr 3	Dr 4	Dr 5	Other	Total
No Improper Action	0	0	0	0	0	0	0
Failure to Yield Right of Way	0	0	0	0	0	0	0
Illegal Unsafe Speed	0	0	0	0	0	0	0
Following Too Close	0	0	0	0	0	0	0
Disregard Traffic Control Device	0	0	0	0	0	0	0
Driving Left of Center Not Passing	0	0	0	0	0	0	0
Improper Passing, Overtaking	0	0	0	0	0	0	0
Improper Unsafe Lane Change	0	0	0	0	0	0	0
Improper Parking Start, Stop	0	0	0	0	0	0	0
Improper Turn	0	0	0	0	0	0	0
Unsafe Backing	0	0	0	0	0	0	0
No Signal or Improper Signal	0	0	0	0	0	0	0
Impeding Traffic	0	0	0	0	0	0	0
Driver Inattention, Distraction	0	0	0	0	0	0	0
Driver Inexperience	0	0	0	0	0	0	0
Pedestrian Violation Error	0	0	0	0	0	0	0
Physical Impairment	0	0	0	0	0	0	0
Vision Obscured, Windshield Glass	0	0	0	0	0	0	0
Vision Obscured, Sun, Headlights	0	0	0	0	0	0	0
Other Vision Obscurement	0	0	0	0	0	0	0
Other Human Violation Factor	0	0	0	0	0	0	0
Hit and Run	0	0	0	0	0	0	0
Defective Brakes	0	0	0	0	0	0	0
Defective Tire, Tire Failure	0	0	0	0	0	0	0
Defective Lights	0	0	0	0	0	0	0
Defective Suspension	0	0	0	0	0	0	0
Defective Steering	0	0	0	0	0	0	0
Other Vehicle Defect or Factor	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
Normal	0	0	0	0	0	0	0
Under the Influence	0	0	0	0	0	0	0
Had Been Drinking	0	0	0	0	0	0	0
Had Been Using Drugs	0	0	0	0	0	0	0
Asleep	0	0	0	0	0	0	0
Fatigued	0	0	0	0	0	0	0
Ill	0	0	0	0	0	0	0
Handicapped	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**

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Fixed Object Struck

Fixed Object Struck	Total
1-Construction, Barricades Equipment, etc.	0
2-Traffic Signal	0
3-R.R. Crossing Device	0
4-Light Pole	0
5-Utility Pole (Tel. Electrical)	0
6-Sign Structure Post	0
7-Mail Boxes or Posts	0
8-Other Poles, posts or supports	0
9-Fire Hydrant/Parking Meter	0
10-Tree or Shrubbery	0
11-Crash Cushion	0
12-Median Safety Barrier	0
13-Bridge Piers (including protective guard rails)	0
14-Other Guardrails	0
15-Fencing (not median barrier)	0
16-Culvert Headwall	0
17-Embankment, Ditch, Curb	0
18-Building, Wall	0
19-Rock Outcrops or Ledge	0
20-Other	0
21-Gate or Cable	0
22-Pressure Ridge	0
Total	**0**

Traffic Control Devices

Traffic Control Device	Total
1-Traffic Signals (Stop & Go)	0
2-Traffic Flashing	0
3-Overhead Flashers	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**

Road Character

Road Character	Total
1-Level Straight	0
2-Level Curved	0
3-On Grade Straight	0
4-On Grade Curved	0
5-Top of Hill Straight	0
6-Top of Hill Curved	0
7-Bottom of Hill Straight	0
8-Bottom of Hill Curved	0
9-Other	0
Total	**0**

Injury Data

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

Light

Light	Total
1-Dawn (Morning)	0
2-Daylight	0
3-Dusk (Evening)	0
4-Dark (Street Lights On)	0
5-Dark (No Street Lights)	0
6-Dark (Street Lights Off)	0
7-Other	0
Total	**0**

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

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 Leg Intersection	Driveways	Bridges	Interchanges	Other	Total
Object in Road	0	0	0	0	0	0	0	0	0	0
Rear End / Sideswipe	0	0	0	0	0	0	0	0	0	0
Head-on / Sideswipe	0	0	0	0	0	0	0	0	0	0
Intersection Movement	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0
Train	0	0	0	0	0	0	0	0	0	0
Ran Off Road	0	0	0	0	0	0	0	0	0	0
All Other Animal	0	0	0	0	0	0	0	0	0	0
Bike	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Jackknife	0	0	0	0	0	0	0	0	0	0
Rollover	0	0	0	0	0	0	0	0	0	0
Fire	0	0	0	0	0	0	0	0	0	0
Submersion	0	0	0	0	0	0	0	0	0	0
Rock Thrown	0	0	0	0	0	0	0	0	0	0
Bear	0	0	0	0	0	0	0	0	0	0
Deer	0	0	0	0	0	0	0	0	0	0
Moose	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Debris	Dry	Ice, Packed Snow, Not Sanded	Ice, Packed Snow, Sanded	Muddy	Oily	Other	Snow Slush, Not Sanded	Snow, Slush, Sanded	Wet	Total
Blowing Sand or Dust											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Clear											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Cloudy											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Fog, Smog, Smoke											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0

Crash Summary II - Characteristics

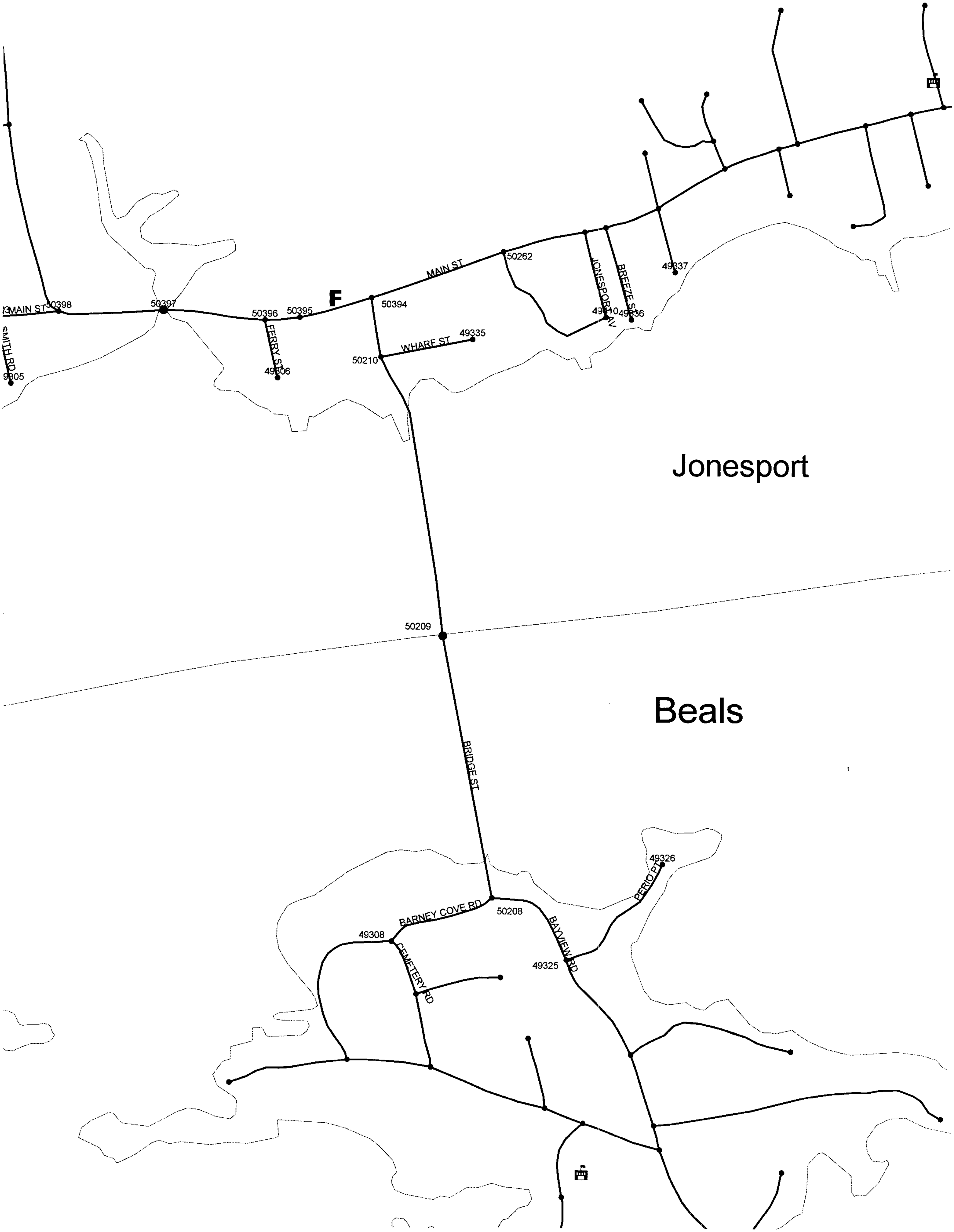
Crashes by Weather, Light Condition and Road Surface

Weather Light	Debris	Dry	Ice, Packed Snow, Not Sanded	Ice, Packed Snow, Sanded	Muddy	Oily	Other	Snow Slush, Not Sanded	Snow, Slush, Sanded	Wet	Total
Other											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Rain											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Severe Cross Winds											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Sleet, Hail, Freezing Rain											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	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	Debris	Dry	Ice, Packed Snow, Not Sanded	Ice, Packed Snow, Sanded	Muddy	Oily	Other	Snow Slush, Not Sanded	Snow, Slush, Sanded	Wet	Total
Snow											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**



MAIN ST
50398
50397
50396
50395
F
50394
MAIN ST
50262
JONESPORT AV
BREEZE ST
49337
SMITH RD
FERRY ST
WHARF ST
49335
50210
Jonesport
50209
Beals
BRIDGE ST
49326
PERIO PT
BARNEY COVE RD
50208
49308
BAYVIEW RD
49325
CEMETERY RD

APPENDIX D

Inspection Reports

Structure Inventory and Appraisal Sheet (English Units)

Bridge Key: 5500 Agency ID: 5500 SR: 44 SD/FO: FO

IDENTIFICATION

State 1: 23 Maine
Struc Num 8: 5500
Facility Carried 7: GREAT WASS ISLAND
Location 9: JONEPT-BEALS ISLE TL
Rte.(On/Under)5A: Route On Structure
Rte. Signing Prefix 5B: 3 State Hwy
Level of Service 5C: 0 None of the below
Rte. Number 5D: 00000
Directional Suffix 5E: 0 N/A (NBI)
% Responsibility : 0
SHD District 2: 04 Eastern
County Code 3: 029 Washington
Place Code 4: 29050 Beals
Mile Post 11: 0.100 mi
Feature Intersected 6: MOOSEBEC REACH
Latitude 16: 44d 30' 27"
Longitude 17: 067d 36' 52"
Border Bridge Code 98: Not Applicable (P)
Border Bridge Number 99: n/a

INSPECTION

Frequency 91: 24 months
Inspection Date 90: 9/9/2013
Next Inspection: 09/09/2015
FC Frequency 92A: NA
FC Inspection Date 93A: NA
Next FC Inspection: NA
UW Frequency 92B: 24 months
UW Inspection Date 93B: 10/5/2012
Next UW Inspection: 10/5/2014
SI Frequency 92C: NA
SI Date 93C: NA
Next SI: NA
Element Frequency: 24 months
Element Inspection Date: 09/09/2013
Next Elem. Insp. Due: 09/09/2015

CLASSIFICATION

Defense Highway 100: 0 Not a STRAHNET hwy
Parallel Structure 101: No || bridge exists
Direction of Traffic 102: 2 2-way traffic
Temporary Structure 103: Not Applicable (P)
Highway System 104: 0 Not on NHS
NBIS Length 112: Long Enough
Toll Facility 20: 3 On free road
Functional Class 26: 07 Rural Mjr Collector
Defense Hwy 110: 0 Not a STRAHNET hwy
Historical Significance 37: 4 Hist sign not determin
Owner 22: 01 State Highway Agency
Custodian 21: 01 State Highway Agency

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: 0
Number of Spans Main Unit 45: 10
Main Span Material/Design 43A/B:
4 Steel Continuous 02 Stringer/Girder
Deck Type 107: 1 Concrete-Cast-in-Place
Wearing Surface 108A: 4 Low Slump Concrete
Membrane 108B: 0 None
Deck Protection 108C: 4 Cathodic Protection

CONDITION

Deck 58: 5 Fair
Super 59: 5 Fair
Sub 60: 5 Fair
Culvert 62: N N/A (NBI)
Channel/Channel Protection 61: 6 Bank Slumping

LOAD RATING AND POSTING

Inventory Rating Method 65: 3 LRFR Load & Res.
Operating Rating Method 63: 3 LRFR Load & Res. Fa
Inventory Rating 66: HS17.8
Operating Rating 64: HS24.8
Design Load 31: 2 M 13.5 (H 15)
Posting 70: 5 At/Above Legal Loads
Posting status 41: A Open, no restriction

AGE AND SERVICE

Year Built 27: 1958
Year Reconstructed 106: 1986
Type of Service on 42A: 1 Highway
Type of Service under 42B: 5 Waterway
Lanes on 28A: 2
Lanes Under 28B: 0
Detour Length 19: 99.9 mi
ADT 29: 1,980
Truck ADT 109: 8 %
Year of ADT 30: 2012

APPRAISAL

Bridge Rail 36A: 0 Substandard
Approach Rail 36C: 0 Substandard
Transition 36B: 0 Substandard
Approach Rail Ends 36D: 0 Substandard
Str. Evaluation 67: 5
Deck Geometry 68: 3 Intolerable - Correct
Underclearance, Vertical and Horizontal 69: N Not applicable (NBI)
Waterway Adequacy 71: 9 Above Desirable
Approach Alignment 72: 6 Equal Min Criteria
Scour Critical 113: 5 Stable w/in footing

GEOMETRIC DATA

Length Max Span 48: 105.0 ft
Structure Length 49: 1,050.0 ft
Curb/Sdwlk Width L 50A: 0.5 ft
Curb/Sidewalk Width R 50B: 0.5 ft
Width Curb to Curb 51: 22.0 ft
Width Out to Out 52: 23.7 ft
Approach Roadway Width 32: (w/ shoulders) 24.0 ft
Median 33: 0 No median
Deck Area: 24,886.2 sq. ft
Skew 34: 0.00 °
Structure Flared 35: 0 No flare
Vertical Clearance 10: 99.99 ft
Horiz. Clearance 47: 22.00 ft
Minimum Vertical Clearance Over Bridge 53: 327.8 ft
Minimum Vertical Underclearance Reference 54A: N Feature not hwy or RR
Minimum Vertical Underclearance 54B: 0.0 ft
Minimum Lateral Underclearance Reference R 55A: N Feature not hwy or RR
Minimum Lateral Underclearance R 55: 327.8 ft
Minimum Lateral Underclearance L 56: 327.8 ft

PROPOSED IMPROVEMENTS

Bridge Cost 94: $ 9,415,000
Type of Work 75: 31 Repl-Load Capacity
Roadway Cost 95: $ 942,000
Length of Improvement 76: 1,068.9 ft
Total Cost 96: $ 14,122,000
Future ADT 114: 2,970
Year of Cost Estimate 97: 2004
Year of Future ADT 115: 2032

NAVIGATION DATA

Navigation Control 38: 1 Permit Required
Vertical Clearance 39: 39.0 ft
Horizontal Clearance 40: 75.0 ft
Pier Protection 111: 3 In-Place, Deteriorated
Lift Bridge Vertical Clearance 116: 0.0 ft

ELEMENT CONDITION STATE DATA

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
1	27/2	Conc Deck/Cathodic	(SF)	24,885	0 %	0	100 %	24,885	0 %	0	0 %	0	0 %	0
1	107/2	Paint Stl Opn Girder	(LF)	4,200	37 %	1,554	15 %	630	31 %	1,302	12 %	504	5 %	210
1	205/2	R/Conc Column	(EA)	18	67 %	12	22 %	4	11 %	2	0 %	0	0 %	0
1	215/2	R/Conc Abutment	(LF)	47	45 %	21	55 %	26	0 %	0	0 %	0	0 %	0
1	218/2	Undefined Wall Elem.	(LF)	45	90 %	40	10 %	5	0 %	0	0 %	0	0 %	0
1	225/2	Unpnt Stl Submd Pile	(EA)	110	80 %	88	10 %	11	10 %	11	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
1	234/2	R/Conc Cap	(LF)	213	87 %	185	11 %	23	2 %	4	0 %	0	0 %	0
1	300/2	Strip Seal Exp Joint	(LF)	24	80 %	19	20 %	5	0 %	0	0 %	0	0 %	0
1	301/2	Pourable Joint Seal	(LF)	24	0 %	0	25 %	6	75 %	18	0 %	0	0 %	0
1	303/2	Assembly Joint/Seal	(LF)	47	80 %	38	20 %	9	0 %	0	0 %	0	0 %	0
1	311/2	Moveable Bearing	(EA)	32	20 %	7	60 %	19	20 %	6	0 %	0	0 %	0
1	313/2	Fixed Bearing	(EA)	20	0 %	0	100 %	20	0 %	0	0 %	0	0 %	0
1	334/2	Metal Rail Coated	(LF)	2,100	59 %	1,239	15 %	315	20 %	420	5 %	105	1 %	21
1	363/2	Section Loss SmFlag	(EA)	1	0 %	0	100 %	1	0 %	0	0 %	0	0 %	0
1	385/2	Wear.Surf. - Rigid	(SF)	24,885	80 %	19,908	0 %	0	20 %	4,977	0 %	0	0 %	0
1	388/2	Paint	(SF)	63,520	0 %	0	0 %	0	80 %	50,816	20 %	12,704	0 %	0

Str Unit	Elm/Env	Description	Element Notes
1	27/2	Concrete Deck - Protected w/ Catho	Approximately 10% cracking with potholes and delaminations at cracks and in wheel tracks. Small areas of patched potholes concrete wearing surface.
1	107/2	Painted Steel Open Girder/Beam	Approximately 40% paint system failure with scattered areas of moderate corrosion at channel webs and bottom flanges. Rust packing at several cover plates. Scattered paint failures and heavy rust scaling at splaice plate harware connections. One loose bolt found. (see photos)
1	205/2	Reinforced Conc Column or Pile Ex	Minor delaminations of pier columns with rust staining.
1	215/2	Reinforced Conc Abutment	Minor cracking only. Erosion under and behind southern abutment very extensive with very minor settling of roadway and loss of material around wingwalls and under riprap on channel slope. Possible grout candidate?
1	218/2	Undefined Wall Elem (Incl. Wing-, H	Minor cracking only. Erosion at southern abutment and wall elements
1	225/2	Unpainted Steel Submerged Pile	Steel H-Piles are below low water mark, see Underwater Inspection for details (7-13-06). Minor to Moderate section loss with Isolated knife edging. (Not visible in 2009, previous comments and ratings left)
1	234/2	Reinforced Conc Cap	Scattered minor to moderate cracking and staining at pier cap edns extending from anchor bolts.
1	300/2	Strip Seal Expansion Joint	Minor leakage only. Scattered areas of pulling out.
1	301/2	Pourable Joint Seal	Beals Island seal partially fallen out
1	303/2	Assembly Joint/Seal (modular)	Joints over piers. Both seals show minor leakage evident and scattered areas of pulling out.
1	311/2	Moveable Bearing (roller, sliding, et	Several bearings tipped.
1	313/2	Fixed Bearing	Moderate paint failure of all bearings.
1	334/2	Metal Bridge Railing - Coated	Missing anchor bolts and one mising bridge rail bolt. (See photos)
1	363/2	Section Loss	Girders have moderate pitting and small amounts of section loss at high exposure areas. Scattered paint failures and heavy rust scaling at splaice plate harware connections. Recommend all connection plate hardware be cleaned and replaced or painted as needed.
1	385/2	Wearing Surface - Rigid (Dummy E	WS has 80% minoir cracking. 20% at south end has moderate cracking delaminating and extensive patches.
1	388/2	Paint (Dummy Element)	80% scattered painy failures and 20% prevalent paint failures.

BRIDGE NOTES

1958 10 span 4 steel open girders with concrete deck, abutments, piers, and wing walls. Concrete wearing surface with steel bolted/guardrail bridge rails. Deck rehab (1986)

Structure Inventory and Appraisal Sheet (English Units)

PAST INSPECTION

Inspection Date: 09/09/2013   Type: 1 Regular NBI

Inspector: DTPDERO   Pontis User Key: DTPDERO - PETE

Scope:

- NBI: [x] Other: [ ] Element: [x]
- Underwater: [ ] Fracture Critical: [ ]

INSPECTION NOTES

Structure is in overall Fair condition.
Section loss of the underwater steel H-piles, see the latest U/W Inspection dated 2011.
An in-depth U/W inspection will be performed to determine the extent of the H-pile deterioration in 2012.

Wearing surface:
Approximately 10% cracking with potholes and delaminations at cracks and in wheel tracks. Numerous areas of patched potholes in the concrete wearing surface, primarily near the end spans.

SUBSTRUCTURE:
Abutments are in generally good condition with minor cracking only.
Piers are in fair condition with scattered locations of cracking, delaminations, corner spalling and some resteel corrosion.
Isolated area, 9th or 2nd pier in from the Jonesport side, on the column with 4" 8" rat holes and exposed re-steel. Pier caps have

PAST INSPECTION

Inspection Date: 10/05/2012   Type: C UW-State force SCUBA

Inspector: DTCEDWA   Pontis User Key: DTCEDWA - CARI

Scope:

- NBI: [ ] Other: [ ] Element: [ ]
- Underwater: [x] Fracture Critical: [ ]

INSPECTION NOTES

Structure is in overall Fair condition.
Section loss of the underwater steel H-piles, see the latest U/W Inspection dated 2011.
An in-depth U/W inspection will be performed to determine the extent of the H-pile deterioration in 2012.

Wearing surface:
Approximately 10% cracking with potholes and delaminations at cracks and in wheel tracks.
Numerous areas of patched potholes in the concrete wearing surface, primarily near the end spans.

SUBSTRUCTURE:
Abutments are in generally good condition with minor cracking only.
Piers are in good condition with scattered locations of cracking, delaminations, corner spalling and some resteel corrosion.
Isolated area, 9th or 2nd pier in from the Jonesport side, on the column with 4" 8" rat holes and exposed re-steel.

Structure Inventory and Appraisal Sheet (English Units)

PAST INSPECTION

Inspection Date: 08/17/2012 Type: 1 Regular NBI

Inspector: DTJHANN Pontis User Key: DTJHANN - JAMIE

Scope:

NBI: ☑ Other: ☐ Element: ☑

Underwater: ☐ Fracture Critical: ☐

INSPECTION NOTES

Structure is in overall Fair condition.
Section loss of the underwater steel H-piles, see the latest U/W Inspection dated 2011.
An in-depth U/W inspection will be performed to determine the extent of the H-pile deterioration in 2012.

Wearing surface:
Approximately 10% cracking with potholes and delaminations at cracks and in wheel tracks.
Numerous areas of patched potholes in the concrete wearing surface, primarily near the end spans.

SUBSTRUCTURE:
Abutments are in generally good condition with minor cracking only.
Piers are in good condition with scattered locations of cracking, delaminations, corner spalling and some resteel corrosion.
Isolated area, 9th or 2nd pier in from the Jonesport side, on the column with 4"-8" rat holes and exposed re-steel

PAST INSPECTION

Inspection Date: 11/21/2011 Type: 1 Regular NBI

Inspector: DTJHARR Pontis User Key: DTJHARR - STEV

Scope:

NBI: ☑ Other: ☐ Element: ☑

Underwater: ☐ Fracture Critical: ☐

INSPECTION NOTES

CHANNEL: Tidal area. SEVERE erosion under and behind southern (Beals Island) abutment extending down into tidal area. Refer to underwater inspection report for bridge items under high tide water mark.
SUBSTRUCTURE:
Abuts: Conc in generally good condition with minor cracking only. Erosion under and behind southern abutment very extensive with very minor settling of roadway and loss of material around wingwalls and under riprap on channel slope.
Piers: Generally good condition with scattered locations of cracking, delaminations, corner spalling and some resteel corrosion. Caps and columns in better shape than footings. Some abrasion damage at bottoms of coulmns possibly due to ice. Footing caps have extensive cracking and scaling with some spalls. Exposed resteel in some locations with up to 8" of concrete loss. Section loss appears to followed "cold joints" in concrete from construction. From high water mark and below heavily encrusted with marine growth and missing some protective timbers. Refer to underwater inspection for more details below waterline.
SUPERSTRUCTURE: Steel beams in fair condition with rust concentrated on beam flanges and splices. Extensive pack rust at ends of beam splices. Scattered rust pockets on webs.

Structure Inventory and Appraisal Sheet (English Units)

PAST INSPECTION

Inspection Date: 10/14/2010 Type: 1 Regular NBI

Inspector: DT2HARR Pontis User Key: DT2HARR - SCOT

Scope:

NBI: ☑ Other: ☐ Element: ☑

Underwater: ☐ Fracture Critical: ☐

INSPECTION NOTES

CHANNEL: Tidal area. SEVERE erosion under and behind southern (Beals Island) abutment extending down into tidal area. Refer to underwater inspection report for bridge items under high tide water mark.
SUBSTRUCTURE:
Abuts: Conc in generally good condition with minor cracking only. Erosion under and behind southern abutment very extensive with very minor settling of roadway and loss of material around wingwalls and under riprap on channel slope.
Piers: Generally good condition with scattered locations of cracking, delaminations, corner spalling and some resteel corrosion. Caps and columns in better shape than footings. Some abrasion damage at bottoms of coulmns possibly due to ice. Footing caps have extensive cracking and scaling with some spalls. Exposed resteel in some locations with up to 8" of concrete loss. Section loss appears to followed "cold joints" in concrete from construction. From high water mark and below heavily encrusted with marine growth and missing some protective timbers. Refer to underwater inspection for more details below waterline.
SUPERSTRUCTURE: Steel beams in fair condition with rust concentrated on beam flanges and splices. Extensive pack rust at ends of beam splices. Scattered rust pockets on webs.

PAST INSPECTION

Inspection Date: 12/01/2009 Type: 1 Regular NBI

Inspector: DTRLANP Pontis User Key: DTRLANP - ROBE

Scope:

NBI: ☑ Other: ☐ Element: ☑

Underwater: ☐ Fracture Critical: ☐

INSPECTION NOTES

CHANNEL: Tidal area. SEVERE erosion under and behind southern (Beals Island) abutment extending down into tidal area. Refer to underwater inspection report for bridge items under high tide water mark.
SUBSTRUCTURE:
Abuts: Conc in generally good condition with minor cracking only. Erosion under and behind southern abutment very extensive with very minor settling of roadway and loss of material around wingwalls and under riprap on channel slope.
Piers: Generally good condition with scattered locations of cracking, delaminations, corner spalling and some resteel corrosion. Caps and columns in better shape than footings. Some abrasion damage at bottoms of coulmns possibly due to ice. Footing caps have extensive cracking and scaling with some spalls. Exposed resteel in some locations with up to 8" of concrete loss. Section loss appears to followed "cold joints" in concrete from construction. From high water mark and below heavily encrusted with marine growth and missing some protective timbers. Refer to underwater inspection for more details below waterline.
SUPERSTRUCTURE: Steel beams in fair condition with rust concentrated on beam flanges and splices. Extensive pack rust at ends of beam splices. Scattered rust pockets on webs.

Structure Inventory and Appraisal Sheet (English Units)

PAST INSPECTION

Inspection Date: 10/14/2009 Type: C UW-State force SCUBA

Inspector: DTCEDWA Pontis User Key: DTCEDWA - CARI

Scope:

NBI: ☐ Other: ☐ Element: ☐

Underwater: ☑ Fracture Critical: ☐

INSPECTION NOTES

CHANNEL: Tidal area. SEVERE erosion under and behind southern (Beals Island) abutment extending down into tidal area.
Refer to underwater inspection report for bridge items under high tide water mark.
SUBSTRUCTURE:
Abuts: Conc in generally good condition with minor cracking only. Erosion under and behind southern abutment very extensive with very minor settling of roadway and loss of material around wingwalls and under riprap on channel slope.
Piers: Generally good condition with scattered locations of cracking, delaminations, corner spalling and some resteel corrosion. Caps and columns in better shape than footings. Some abrasion damage at bottoms of coulmns possibly due to ice. Footing caps have extensive cracking and scaling with some spalls. Exposed resteel in some locations with up to 8" of concrete loss. Section loss appears to followed "cold joints" in concrete from construction. From high water mark and below heavily encrusted with marine growth and missing some protective timbers. Refer to underwater inspection for more details below waterline.
SUPERSTRUCTURE: Steel beams in fair condition with rust concentrated on beam flanges and splices. Extensive pack rust at ends of beam splices. Scattered rust pockets on webs

PAST INSPECTION

Inspection Date: 03/11/2008 Type: 1 Regular NBI

Inspector: DTJHANN Pontis User Key: DTJHANN - JAMIE

Scope:

NBI: ☑ Other: ☐ Element: ☑

Underwater: ☐ Fracture Critical: ☐

INSPECTION NOTES

Structure in Satisfactory and Serviceable condition.
Recommend new protective paint system for steel girders and rail system.
Several bearings need to be re-aligned.
Recommend cathodic protection of steel H-Piles below waterline to slow deterioration rate.
Bottom of deck has transverse cracking with efflo.

See underwater inspection 7-13-06.

Channel:
Alignment - Satisfactory
Gradient - Very strong currents with large tidal fluctuations.
Opening - Satisfactory

Structure Inventory and Appraisal Sheet (English Units)

PAST INSPECTION

Inspection Date: 10/17/2005 Type: 1 Regular NBI

Inspector: DT2HARR Pontis User Key: DT2HARR - SCOT

Scope:

NBI: ☑ Other: ☐ Element: ☑

Underwater: ☐ Fracture Critical: ☐

INSPECTION NOTES

Structure is in overall satisfactory condition with moderate deterioration of elements. Recommend new protective paint system for steel girders and rail system. Several bearings need to be re-aligned.

PAST INSPECTION

Inspection Date: 09/08/2003 Type: 1 Regular NBI

Inspector: -1 Pontis User Key: SBH

Scope:

NBI: ☑ Other: ☐ Element: ☑

Underwater: ☑ Fracture Critical: ☐

INSPECTION NOTES

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INSPECTOR WORK CANDIDATES

Work Candidate ID	Action	Object	Agency Status	Agency Priority	Assigned to a Project	Rec. Date
A-DOT001-0AE76678-00000000	Other	Bridge	Approved	High	No	9/9/2013
A-DOT001-12D4A665-00000000	Scour	Bridge	Approved	High	No	9/9/2013
A-DOT001-0AE63206-00000038	Repl Paint	Paint Stl Opn Girder	Approved	High	No	9/9/2013
A-DOT001-12A7CCE4-00000021	Rehab Elem	R/Conc Column	Approved	Medium	No	9/9/2013
A-DOT001-12A7CCE4-00000023	Rehab Elem	R/Conc Cap	Approved	Medium	No	9/9/2013
A-DOT001-12A7CCE4-0000001F	Rehab/Ovly	Conc Deck/Cathodic	Approved	High	No	9/9/2013
A-DOT001-0AE63206-0000003C	Rehab Elem	Moveable Bearing	Approved	High	No	9/9/2013
A-DOT001-0AE63206-0000003A	Repl Elem	Metal Rail Coated	Approved	High	No	9/9/2013

2014 PROPOSED JONESPORT-BEALS U/W IN-DEPTH INSPECTION

Dates: May 5th-8th

Start: Meet at Sidney Dive Building 5:45am

Slack Tides: Mon. 3 pm hi(4:40pm)
Tues. 9:30am lo(11:11am)/4:00 hi(5:31pm)
Wed. 10:30am lo(12:03pm)/ 4:30pm hi(6:24pm)
Thurs. 11am hi(12:55pm)/ 5:00pm hi(7:16pm) (*if necessary*)

Dive Missions:

- Verify pile layout under cap
- Marine Growth Inventory – how much of each pile is covered, how much has been cleaned.
- D-Meter Measurements – Jamie's Team
- Inspection – All teams inspect each pile and confirm existing conditions

Inspection Team set-up: (3) dive teams, 3 boats

Whaler Team	**Alcar Team**	**Barge Team**
Jamie	***Carl***	***Tim***
Mike F.	Mike B.	Dave S.
Dave C.	Paul	Jim – operator
		John S.

Jamie will use D-meter to check steel thicknesses on (20) random piles, 2 per pier. These piles are to consist of 1 corner and 1 interior pile. Jamie will record measurements at up to 4 spots(1 bottom, 1 top, 2 middle) on longer piles and probably 2 spots on shorter land side piles.

First Dive (Monday afternoon, slack hi) we will work on land- near piers (shallower piers) to check out conditions and start the marine growth inventory task.

Pier layout: piers labeled 1-9, Jonesport to Beals.
piers 1, 2, 8, 9 = (10) piles ea.
piers 3 & 7 = (12) piles ea.
piers 4, 5, 6 = (14) piles ea.

Total = (106) piles

Note: If time permits, we will inspect bridges in between tides in the vicinity of Jonesport. Time will be spent on reviewing inspection data. On the way home the Alcar team will stop and inspect Br. #5191 in Carmel and the Barge team will stop in Brewer and inspect Br. #2755.

2014 JONESPORT-BEALS U/W IN-DEPTH INSPECTION SUMMARY

Dates: May 5th-8th

Actual Dive Times: Mon. 5/5 2:40pm – 3:10pm hi tide
Tues. 5/6 8:45am -9:16am lo tide and 2:45pm-3:10pm hi tide
Wed. 5/7 9:40am – 10:45am lo tide and 2:20pm-2:55pm hi tide
Thurs. 5/8 10:40am-11:30am lo tide

Visibility:

Ranged 5'-10', usually better on the morning low tides.

Dive Missions:

- Verify pile layout under cap
- Marine Growth Inventory – how much of each pile is covered, how much has been cleaned.
- D-Meter Measurements – Jamie's Team
- Inspection – All teams inspect each pile and confirm existing conditions

Inspection Team set-up: (3) dive teams, 3 boats

Whaler Team	**Alcar Team**	**Barge Team**
Jamie	***Carl***	***Tim***
Mike F.	Mike B.	Dave S.
Dave C.	Paul	Jim – operator
		John S.

Jamie used the D-meter to check steel thicknesses on (20) random piles, 2 per pier, although after Day 1, when using calipers to check actual thicknesses, it was determined some readings were off and we decided not use the D-meter any further. We did continue with calipers and take proposed thickness readings as planned. A spreadsheet containing readings from both instruments are included in this inspection.

First Dive (Monday afternoon, slack hi) we worked on Piers #1 & #9 to check out dive conditions and marine growth extent. The areas of previously cleaned spots, usually about 2-3 square feet, are generally documented. However, it is now the consensus that the marine growth is coming back as a thin barnacle layer. There were few areas of bare rusty steel surfaces as found in previous years.

The pile layout is confirmed to be very close to that of the design plans, with pile configuration determining batter. Basically, all corner piles are battered as well as all piles whose web is **parallel** with the pier. All piles turned **perpendicular** to the pier length are vertical, thus giving the appearance on the bottom of interior piles and exterior piles. These interior piles were found to be only 5' apart on the ocean floor. See sketch.

The correct number of piles per pier is also confirmed to match that of the plans, ranging from 10 to 14 piles.
It was decided to number the piles, 1-10,12,14, in a clockwise fashion starting from the NWly corner.

Inspection Highlights:

Pier #1, Pile #1 was found to have considerable flange section loss of both flanges down to the web and for a length of 6’, starting about 5’ above the streambed. Oddly, (3) 2” dia. burn holes, approximately 16” apart, were found in the web just by chance.

Pier #6, pile #7 was found to be severed near the top, just 10” below the concrete cap. It is believed to have a broken weld joint. There was immediate discussion amongst the crew of a possible u/w fix, but further investigation found this pile to have serious flange deterioration for 5’ of length at the bottom. This spot was also previously documented and may have worsened.

Conclusion:

Given the allotted time to basically make only six inspection dives, it was the general consensus to rate the Substructure a **“3”** due to *large loss of section*. We believe there is not only considerable overall section loss of both flange and web thicknesses, but also the serious isolated deterioration completely through flanges & webs as mapped out over the years. Also, the rate of deterioration seen, particularly in just the last few years is cause for concern.

Note: Time did not permit the inspection of any other structures. Interval dive time was spent on reviewing inspection data collected, attending to logistics and making repairs to boat/gear issues.

APPENDIX E

Preliminary Cost Estimates

Preliminary Cost Estimate

	PROJECT: Beals-Jonesport, Beals Island Bridge #5500 - Rehabilitation Alternative 1 10-Yr Rehabilitation. 100% Exposed pile strengthening and galvanic cathodic protection system (anodes)				**WIN:** 22626.00 **ESTIMATED BY:** TJC & KJB **REVIEWED BY:** RSBlunt & SMH		
	SUPERSTRUCTURE:	25,725	**SF**	**x**	$7	**=**	$181,000
	ABUTMENTS:		**SF**	**x**		**=**	$0
	PIERS:	9	**EA**	**x**	$355,000	**=**	$3,195,000
	COFFERDAMS:		**EA**	**x**		**=**	$0
	STRUCTURAL EXCAVATION & BORROW:		**CY**	**x**		**=**	$0
	RIPRAP:		**CY**	**x**		**=**	$0
	EXISTING BRIDGE REMOVAL:		**LS**	**x**		**=**	$0
(1)	**DETOUR AND/OR TEMPORARY BRIDGE:**	1	**LS**	**x**	$20,000	**=**	$20,000
(2)	**REHABILITATION CONTINGENCIES:**				10%	**=**	$340,000
(2)	**MISCELLANEOUS (TCP'S, FIELD OFFICE, ETC.):**				10%	**=**	$340,000
(2)	**MOBILIZATION:**				10%	**=**	$340,000
					STRUCTURE SUBTOTAL	**=**	**$4,425,000**
(3)	**APPROACHES:**	1400	**LF**	**x**	$80	**=**	$112,000
(2)	**MISCELLANEOUS:**				7%	**=**	$8,000
(2)	**MOBILIZATION:**				10%	**=**	$12,000
					APPROACHES SUBTOTAL	**=**	**$135,000**
					TOTAL CONSTRUCTION COST	**=**	**$4,560,000**
(2)	**PRELIMINARY ENGINEERING:**				10%	**=**	$470,000
	RIGHT OF WAY:					**=**	
(2)	**CONSTRUCTION ENGINEERING:**				10%	**=**	$470,000
	OTHER:					**=**	$0
					TOTAL PROJECT COST	**=**	**$5,500,000**

(1) TCP and MOT Cost
(2) Default percentage values
(3) Mill and Overlay

Preliminary Cost Estimate

	PROJECT: Beals-Jonesport, Beals Island Bridge #5500 - Rehabilitation Alternative 2 15-Yr Rehabilitation. 100% Exposed pile strengthening and concrete encasement				WIN: 22626.00 ESTIMATED BY: TJC & KJB REVIEWED BY: RSBlunt & SMH		
	SUPERSTRUCTURE:	25,725	SF	x	$7	=	$181,000
	ABUTMENTS:		SF	x		=	$0
	PIERS:	9	EA	x	$810,000	=	$7,290,000
	COFFERDAMS:		EA	x		=	$0
	STRUCTURAL EXCAVATION & BORROW:		CY	x		=	$0
	RIPRAP:		CY	x		=	$0
	EXISTING BRIDGE REMOVAL:		LS	x		=	$0
(1)	DETOUR AND/OR TEMPORARY BRIDGE:	1	LS	x	$20,000	=	$20,000
(2)	REHABILITATION CONTINGENCIES:				10%	=	$750,000
(2)	MISCELLANEOUS (TCP'S, FIELD OFFICE, ETC.):				10%	=	$750,000
(2)	MOBILIZATION:				10%	=	$750,000
					STRUCTURE SUBTOTAL	=	$9,745,000
(3)	APPROACHES:	1400	LF	x	$80.00	=	$112,000
(2)	MISCELLANEOUS:				7%	=	$8,000
(2)	MOBILIZATION:				10%	=	$12,000
					APPROACHES SUBTOTAL	=	$135,000
					TOTAL CONSTRUCTION COST	=	$9,880,000
(2)	PRELIMINARY ENGINEERING:				10%	=	$1,010,000
	RIGHT OF WAY:					=	
(2)	CONSTRUCTION ENGINEERING:				10%	=	$1,010,000
	OTHER:					=	$0
					TOTAL PROJECT COST	=	$11,900,000

(1) TCP and MOT Cost
(2) Default percentage values
(3) Mill and Overlay

Preliminary Cost Estimate

	PROJECT: Beals-Jonesport, Beals Island Bridge #5500 - Rehabilitation Alternative 3 30-Yr Rehabilitation. 100% Exposed pile strengthening with concrete encasement and new painted steel superstructure. Deck Area: 1050' x 30.5' = 32,025 SF				**WIN:** 22626.00 **ESTIMATED BY:** TJC & KJB **REVIEWED BY:** RSBlunt & SMH		
	SUPERSTRUCTURE:	32,025	**SF**	**x**	$135	**=**	$4,324,000
	ABUTMENTS:	32,025	**SF**	**x**	$7	**=**	$225,000
	PIERS:	9	**EA**	**x**	$845,000	**=**	$7,605,000
	COFFERDAMS:		**EA**	**x**		**=**	$0
	STRUCTURAL EXCAVATION & BORROW:		**CY**	**x**		**=**	$0
	RIPRAP:		**CY**	**x**		**=**	$0
	EXISTING BRIDGE REMOVAL:	1	**LS**	**x**	$625,000	**=**	$625,000
(1)	**DETOUR AND/OR TEMPORARY BRIDGE:**	1	**LS**	**x**	$305,000	**=**	$305,000
(2)	**REHABILITATION CONTINGENCIES:**				10%	**=**	$1,309,000
(2)	**MISCELLANEOUS (TCP'S, FIELD OFFICE, ETC.):**				10%	**=**	$1,309,000
(2)	**MOBILIZATION:**				10%	**=**	$1,309,000
					STRUCTURE SUBTOTAL	**=**	**$17,015,000**
	APPROACHES:	1400	**LF**	**x**	$330	**=**	$462,000
(2)	**MISCELLANEOUS:**				7%	**=**	$33,000
(2)	**MOBILIZATION:**				10%	**=**	$47,000
					APPROACHES SUBTOTAL	**=**	**$545,000**
					TOTAL CONSTRUCTION COST	**=**	**$17,560,000**
(2)	**PRELIMINARY ENGINEERING:**				10%	**=**	$1,770,000
	RIGHT OF WAY:					**=**	
(2)	**CONSTRUCTION ENGINEERING:**				10%	**=**	$1,770,000
	OTHER:					**=**	$0
					TOTAL PROJECT COST	**=**	**$21,100,000**

(1) TCP and MOT Cost
(2) Default percentage values

Preliminary Cost Estimate

PROJECT: Beals-Jonesport, Beals Island Bridge #5500 - Rehabilitation Alternative 4 45-Yr Rehabilitation. New metalized steel beam superstructure with supplemental pipe pile foundation. Deck Area: 1050' x 30.5' = 32,025 SF				**WIN:** 22626.00 **ESTIMATED BY:** TJC & KJB **REVIEWED BY:** RSBlunt & SMH			
SUPERSTRUCTURE:	32,025	**SF**	**x**	$150	**=**	$4,804,000	
ABUTMENTS:	32,025	**SF**	**x**	$7	**=**	$225,000	
PIERS:	9	**EA**	**x**	$780,000	**=**	$7,020,000	
COFFERDAMS:	9	**EA**	**x**	$80,000	**=**	$720,000	
STRUCTURAL EXCAVATION & BORROW:		**CY**	**x**		**=**	$0	
RIPRAP:		**CY**	**x**		**=**	$0	
EXISTING BRIDGE REMOVAL:	1	**LS**	**x**	$625,000	**=**	$625,000	
(1) **DETOUR AND/OR TEMPORARY BRIDGE:**	1	**LS**	**x**	$305,000	**=**	$305,000	
(2) **REHABILITATION CONTINGENCIES:**				10%	**=**	$1,370,000	
(2) **MISCELLANEOUS (TCP'S, FIELD OFFICE, ETC.):**				10%	**=**	$1,370,000	
(2) **MOBILIZATION:**				10%	**=**	$1,370,000	
				STRUCTURE SUBTOTAL	**=**	**$17,810,000**	
APPROACHES:	1400	**LF**	**x**	$340	**=**	$476,000	
(2) **MISCELLANEOUS:**				7%	**=**	$34,000	
(2) **MOBILIZATION:**				10%	**=**	$48,000	
				APPROACHES SUBTOTAL	**=**	**$560,000**	
				TOTAL CONSTRUCTION COST	**=**	**$18,370,000**	
(2) **PRELIMINARY ENGINEERING:**				10%	**=**	$1,860,000	
RIGHT OF WAY:					**=**		
(2) **CONSTRUCTION ENGINEERING:**				10%	**=**	$1,870,000	
OTHER:					**=**	$0	
				TOTAL PROJECT COST	**=**	**$22,100,000**	

(1) TCP and MOT Cost
(2) Default percentage values

Preliminary Cost Estimate

PROJECT: Beals-Jonesport, Beals Island Bridge #5500 Bridge Replacement Option 1 8 spans with 4-1800 NEBT's on stub abutments and two column piers. Deck Area: 1060' x 31.33' = 33,220 SF				**WIN:** 22626.00 **ESTIMATED BY:** JAW & TJC **REVIEWED BY:** RSBlunt & SMH		
SUPERSTRUCTURE:	33,220	**SF**	**x**	$110	**=**	$3,655,000
ABUTMENTS:	2	**EA**	**x**	$90,000	**=**	$180,000
PIERS:	7	**EA**	**x**	$1,030,000	**=**	$7,210,000
COFFERDAMS:	7	**EA**	**x**	$125,000	**=**	$875,000
STRUCTURAL EXCAVATION & BORROW:		**CY**	**x**		**=**	$0
(1) **RIPRAP:**	21,000	**CY**	**x**	$75	**=**	$1,575,000
EXISTING BRIDGE REMOVAL:	1	**LS**	**x**	$1,300,000	**=**	$1,300,000
(2) **DETOUR AND/OR TEMPORARY BRIDGE:**	1	**LS**	**x**	$55,000	**=**	$55,000
REHABILITATION CONTINGENCIES:				N/A	**=**	$0
(4) **MISCELLANEOUS (TCP'S, FIELD OFFICE, ETC.):**				10%	**=**	$1,456,000
(4) **MOBILIZATION:**				10%	**=**	$1,485,000
				STRUCTURE SUBTOTAL	**=**	**$17,795,000**
(3) **APPROACHES:**	3000	**LF**	**x**	$437	**=**	$1,311,000
(4) **MISCELLANEOUS:**				10%	**=**	$136,000
(4) **MOBILIZATION:**				10%	**=**	$132,000
				APPROACHES SUBTOTAL	**=**	**$1,579,000**
				TOTAL CONSTRUCTION COST	**=**	**$19,374,000**
(4) **PRELIMINARY ENGINEERING:**				6%	**=**	$1,180,000
(5) **RIGHT OF WAY:**					**=**	$250,000
(4) **CONSTRUCTION ENGINEERING:**				6%	**=**	$1,175,000
OTHER:					**=**	$0
				TOTAL PROJECT COST	**=**	**$21,979,000**

Revision 5-15-15

(1) Includes stone fill for causeway widening
(2) TCP and MOT Cost
(3) Includes $472,000 for mitigation, $36,000 in special waste disposal, and $200,000 for retaining walls.
(4) Estimated values
(5) Assumed value of $250,000

Preliminary Cost Estimate

	PROJECT: Beals-Jonesport, Beals Island Bridge #5500 Bridge Replacement Option 2 10 spans with 4-1200 NEBT's on stub abutments and two column piers. Deck Area: 1060' x 31.33' = 33,220 SF				WIN: 22626.00 ESTIMATED BY: JAW & TJC REVIEWED BY: RSBlunt & SMH		
	SUPERSTRUCTURE:	33,220	SF	x	$101	=	$3,356,000
	ABUTMENTS:	2	EA	x	$90,000	=	$180,000
	PIERS:	9	EA	x	$980,000	=	$8,820,000
	COFFERDAMS:	9	EA	x	$125,000	=	$1,125,000
	STRUCTURAL EXCAVATION & BORROW:		CY	x		=	$0
(1)	RIPRAP:	19,800	CY	x	$75	=	$1,485,000
	EXISTING BRIDGE REMOVAL:	1	LS	x	$1,340,000	=	$1,340,000
(2)	DETOUR AND/OR TEMPORARY BRIDGE:	1	LS	x	$55,000	=	$55,000
	REHABILITATION CONTINGENCIES:				N/A	=	$0
(4)	MISCELLANEOUS (TCP'S, FIELD OFFICE, ETC.):				10%	=	$1,637,000
(4)	MOBILIZATION:				10%	=	$1,637,000
					STRUCTURE SUBTOTAL	=	$19,635,000
(3)	APPROACHES:	3000	LF	x	$400	=	$1,200,000
(4)	MISCELLANEOUS:				7%	=	$84,000
(4)	MOBILIZATION:				10%	=	$120,000
					APPROACHES SUBTOTAL	=	$1,405,000
					TOTAL CONSTRUCTION COST	=	$21,040,000
(4)	PRELIMINARY ENGINEERING:				10%	=	$1,290,000
(5)	RIGHT OF WAY:					=	$70,000
(4)	CONSTRUCTION ENGINEERING:				10%	=	$1,300,000
	OTHER:					=	$0
					TOTAL PROJECT COST	=	$23,700,000

(1) Includes stone fill for causeway widening
(2) TCP and MOT Cost
(3) Includes $432,000 for mitigation, $36,000 in special waste disposal, and $200,000 for retaining walls.
(4) Estimated values
(5) Assumed value of $70,000

Preliminary Cost Estimate

	PROJECT: Beals-Jonesport, Beals Island Bridge #5500 Bridge Replacement Option 3 6 spans with 4-1800 NEBT's (post-tensioned and prestressed) on stub abutments and two column piers. Deck Area: 1060' x 31.33' = 33,220 SF				**WIN:** 22626.00 **ESTIMATED BY:** JAW & TJC **REVIEWED BY:** RSBlunt & SMH		
	SUPERSTRUCTURE:	33,220	**SF**	**x**	$190	=	$6,312,000
	ABUTMENTS:	2	**EA**	**x**	$90,000	=	$180,000
	PIERS:	5	**EA**	**x**	$1,080,000	=	$5,400,000
	COFFERDAMS:	5	**EA**	**x**	$125,000	=	$625,000
	STRUCTURAL EXCAVATION & BORROW:		**CY**	**x**		=	$0
(1)	**RIPRAP:**	19,800	**CY**	**x**	$75	=	$1,485,000
	EXISTING BRIDGE REMOVAL:	1	**LS**	**x**	$1,340,000	=	$1,340,000
(2)	**DETOUR AND/OR TEMPORARY BRIDGE:**	1	**LS**	**x**	$55,000	=	$55,000
	REHABILITATION CONTINGENCIES:				N/A	=	$0
(4)	**MISCELLANEOUS (TCP'S, FIELD OFFICE, ETC.):**				10%	=	$1,540,000
(4)	**MOBILIZATION:**				10%	=	$1,540,000
					STRUCTURE SUBTOTAL	=	**$18,485,000**
(3)	**APPROACHES:**	3000	**LF**	**x**	$400	=	$1,200,000
(4)	**MISCELLANEOUS:**				7%	=	$84,000
(4)	**MOBILIZATION:**				10%	=	$120,000
					APPROACHES SUBTOTAL	=	**$1,405,000**
					TOTAL CONSTRUCTION COST	**=**	**$19,890,000**
(4)	**PRELIMINARY ENGINEERING:**				10%	=	$1,420,000
(5)	**RIGHT OF WAY:**					=	$70,000
(4)	**CONSTRUCTION ENGINEERING:**				10%	=	$1,420,000
(6)	**OTHER:**					=	$0
					TOTAL PROJECT COST	**=**	**$22,800,000**

(1) Includes stone fill for causeway widening
(2) TCP and MOT Cost
(3) Includes $432,000 for mitigation, $36,000 in special waste disposal, and $200,000 for retaining walls.
(4) Estimated values
(5) Assumed value of $70,000

APPENDIX F

Segmental Alternative Feasibility Study

Beals Island Bridge Replacement
Beals-Jonesport, Maine

Segmental Alternate Feasibility Study
Prepared for VHB

Corven Engineering, Inc.
2882 Remington Green Circle
Tallahassee, FL 32308

August 15, 2014

Segmental Alternate Feasibility Study

Contents

1. Introduction

Great Wass Island and the Town of Beals is connected to State Road 187 at the west end of Jonesport via Bridge Street. The 2250' long connection is comprised of an 850' north approach causeway, the 1050' long Beals Island Bridge over Moosabec Reach, and a 350' south approach causeway. The bridge was constructed in 1958.

The existing 1050' long bridge is made up of 10 spans of 105'. The 24'-6" wide bridge carries a 22' roadway (curb-to-curb) to Great Wass Island. A navigational channel in Span 5 provides for 75' of horizontal clearance between a timber fender system and 39' of vertical clearance above Mean High Water. Mean tidal variations at the Bridge are +/-5.75' and water depths at high tide are approximately 50' at the navigational channel.

The superstructure of the existing bridge consists of four girder lines of 36" WF built-up sections, arranged in three continuous units (3-spans, 4-spans, 3-spans). The steel girders support a 7-½" reinforced concrete slab. The substructure of the bridge is reinforced concrete columns attached to elevated footings which are supported by steel piling driven to refusal in the supporting substrate.

Maintenance concerns of the Beals Island Bridge have led the Maine Department of Transportation to consider replacing the bridge. To that end, Vanasse Hangen and Brustlin, Inc. (VHB) is preparing a Preliminary Design Report (PDR) for the Department. Corven Engineering, Inc. is evaluating concrete segmental bridge alternates for possible inclusion in the PDR. This Report presents findings of an initial review of several segmental bridge alternates.

2. Bridge Layout Constraints

Water Depth – Water depths in Moosabec Reach as it passes below the Beals Island Bridge approach fifty feet. Longer spans minimize the number of piers and the cost of expensive deep water foundations.

Vertical profile – Longer spans generally have deeper superstructure depths. As a result, the vertical profile of the new bridge needs to be elevated to maintain navigational clearances, and provide sufficient freeboard at abutments. VHB has developed the preliminary vertical profile shown in Figure 1 to accommodate increased structure depth and an assumed 1.8' increase in future sea level.

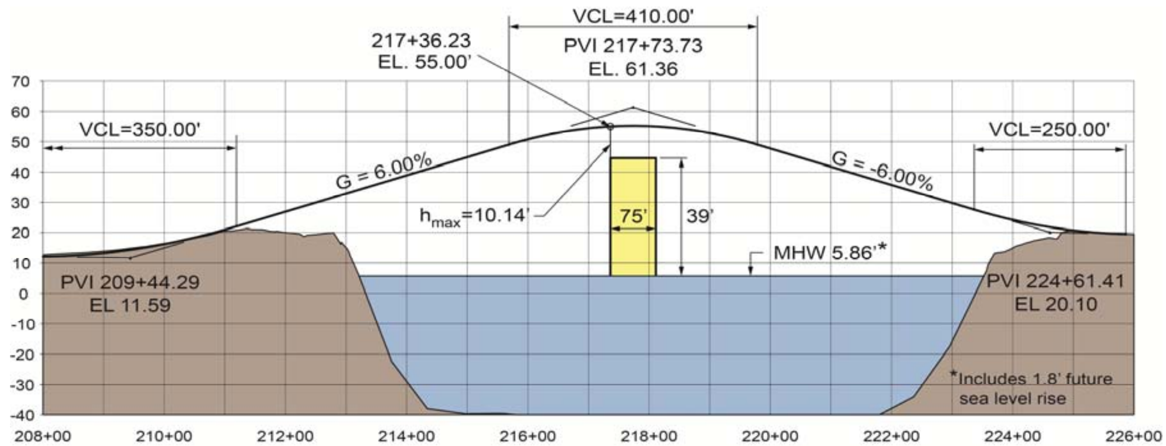


Figure 1 – Proposed Profile of the Beals Island Bridge Replacement

Six percent grades are used to elevate Bridge Street over the navigational channel which passes between existing Pier 4 and Pier 5. The depth of the proposed bridge is governed by this profile as it crosses the down-station limit of the 75' wide navigational channel. The maximum depth of bridge including overlay is 10.14'.

Navigational Channel – Pier locations for the replacement bridge have been developed such that the 75' navigational channel remains in its current location.

3. Bridge Layout Alternatives

Three different span arrangements are considered for an overall bridge length of 1060'. The three alternatives are shown in Figure 2. The approach taken in evaluating the feasibility of these alternatives is to first study the 132'-6" span layout (Alternate 1) and compare it to a similar bridge but where the superstructure of is comprised of four New England Bulb-T's and cast-in-place bridge deck. Only the cost of major items is compared. With this baseline established, the other longer span alternatives are investigated in similar relative fashion.

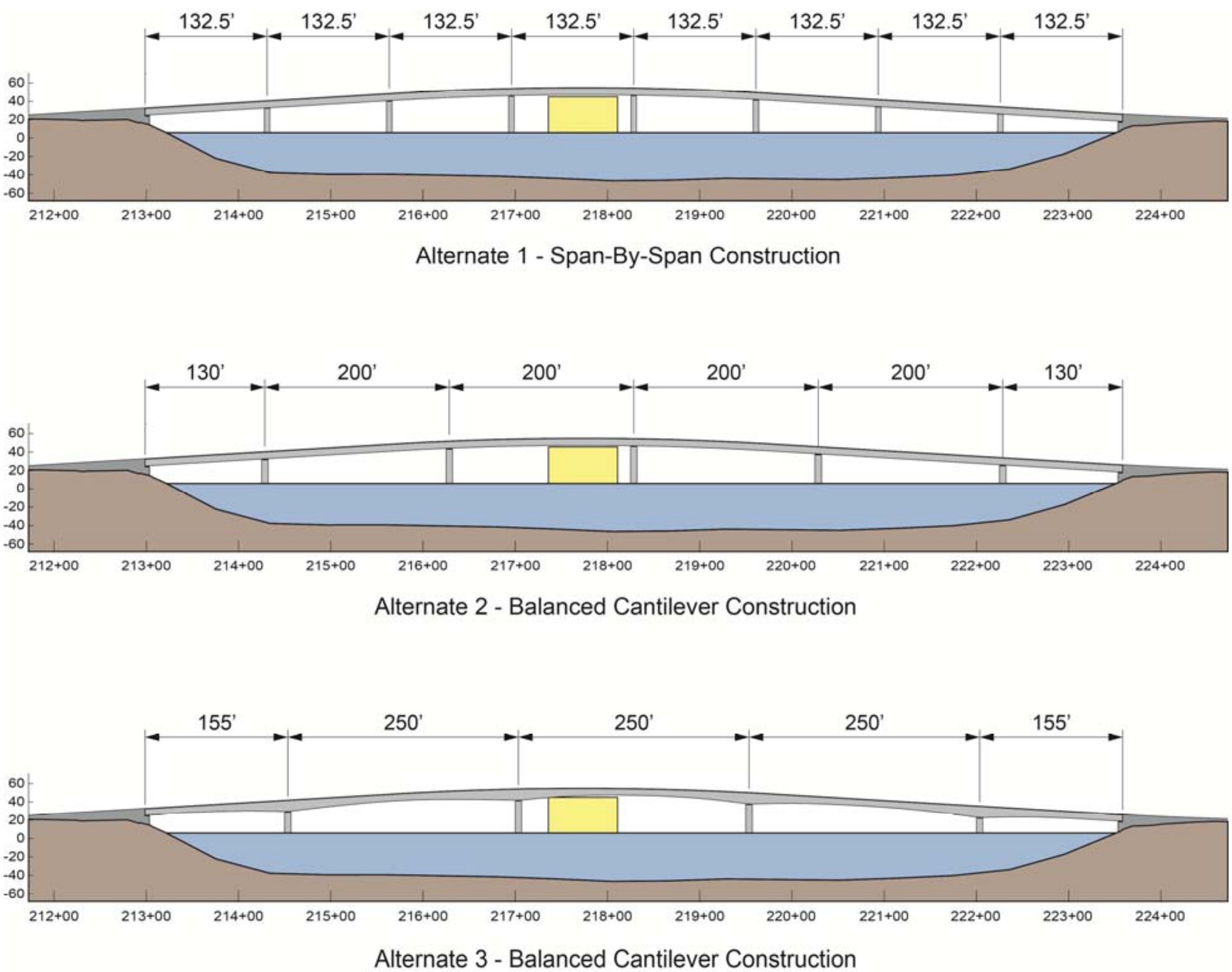


Figure 2 – Segmental Bridge Alternatives

Alternate 1 – 132'-6" Span Bridge (Span-by-Span Construction)

Alternate 1 is comprised of eight equal length spans of 132'-6". Erection of the bridge is by the span-by-span method on temporary erection girders. This span arrangement requires seven deep water foundations. Longer spans, that could save one deep water foundation, are possible using span-by-span construction. Conflicts with the navigational channel, however, lead to a single shorter span and no reduction in the number of deep water foundations.

Segments of this alternate would have a constant depth of 8 feet. To be cost effective, the segments would most likely be precast at an existing precast yard and delivered to the site by truck or barge. Ten foot long segments weighing 35 tons could be delivered by truck and erected over the already erected portion of segmental bridge. A crane located on the completed portion of segmental bridge, adjacent to the span under construction, would pick the segments from the delivery truck and place them on a temporary erection girder. This approach was used to erect the Wiscasset-Edgecomb Bridge. Longer segments, reducing the number of casting and erection activities, could be shipped by barge and erected by a barge mounted crane.

The temporary erection girders would be comprised of single-span, plate girder box beams. The girders would span between temporary supports erected on top of the bridge's newly constructed footings. The girders are advanced by a barge mounted crane lifting their leading ends and pulling them forward to temporary supports at the next pier. The anticipated erection cycle of this particular bridge is anticipated to be one completed span a week.

Alternate 2 – 200' Span Bridge (Balanced Cantilever Bridge Construction)

Alternate 2 features a constant depth box girder and typical span lengths of 200 feet. End span lengths of 130' are appropriate for balanced cantilever construction and will minimize the number of end span segments to be erected on temporary falsework. The span arrangement shown in Figure 2 requires five deep water foundations.

Eight foot constant depth segments are used in this alternative. The bottom slab of the box girder is increased in thickness near the piers to help control compressive stresses. An alternative to this configuration would be to add a 1' haunch in the girder near the pier. The haunch reduces post-tensioning quantities and improves principal tensile stresses in the webs.

Segments for this alternate would be cast-in-place using form travelers. Pier table forms are first erected to cast the superstructure directly over the piers. Form travelers would then be mounted to the pier table and balanced cantilever construction started. A temporary stability tower is required as the bridge is supported on bearings. The erection cycle for one segment on either end of a cantilever is assumed to be one week.

Alternate 3 – 250' Span Bridge (Balanced Cantilever Bridge Construction)

The third alternate evaluated for this study is seen at the bottom of Figure 2. Alternate 3 features 250' typical spans and 155' end spans, resulting in four deep water foundations.

The box girder for this alternate would be a variable depth girder, ranging in depth from 12'-6" at the piers to 7'-6" at mid-span. Segments would be cast-in-place using form travelers similar to Alternate 2.

4. Superstructure Cross Sections

Cross sections for the superstructure of the three segmental bridge alternates have been conceptually sized. These cross sections are shown in Figures 3, 4, and 5. Figure 6 shows the cross section of 132'-6" span bridge using the New England Bulb-T (1800).

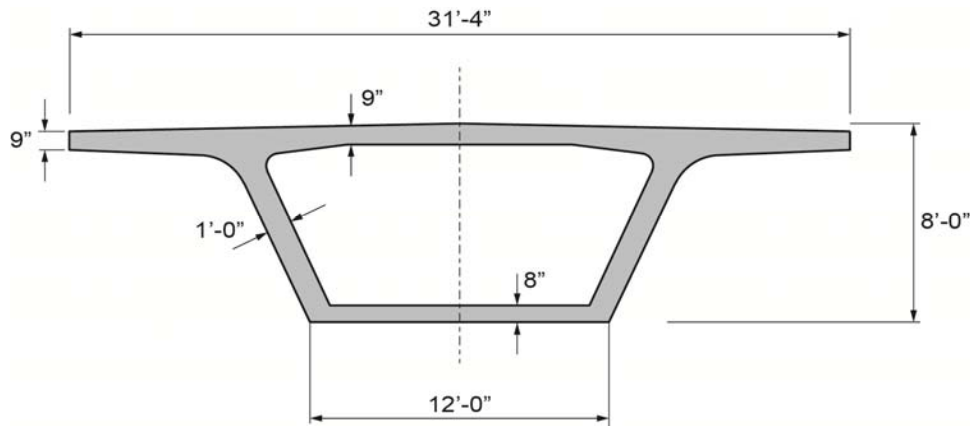


Figure 3 – Cross Section for the 132'-6" Span Bridge shown in Alternate 1

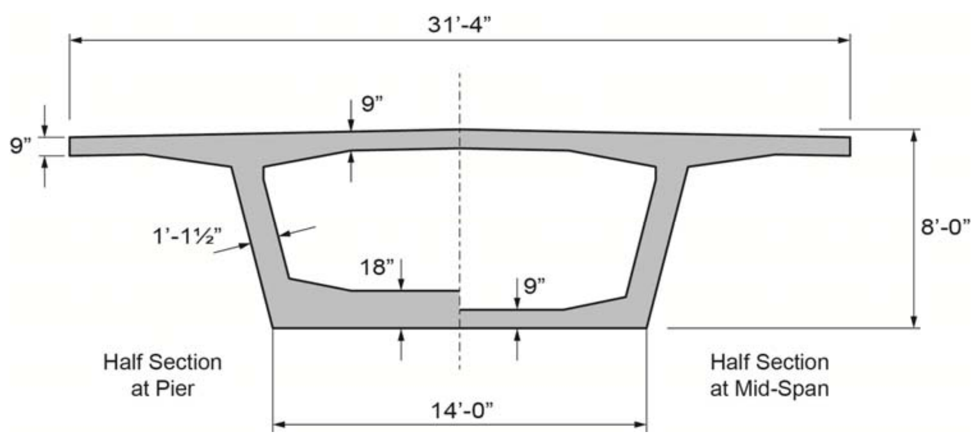


Figure 4 – Cross Section for the 200' Span Bridge shown in Alternate 2

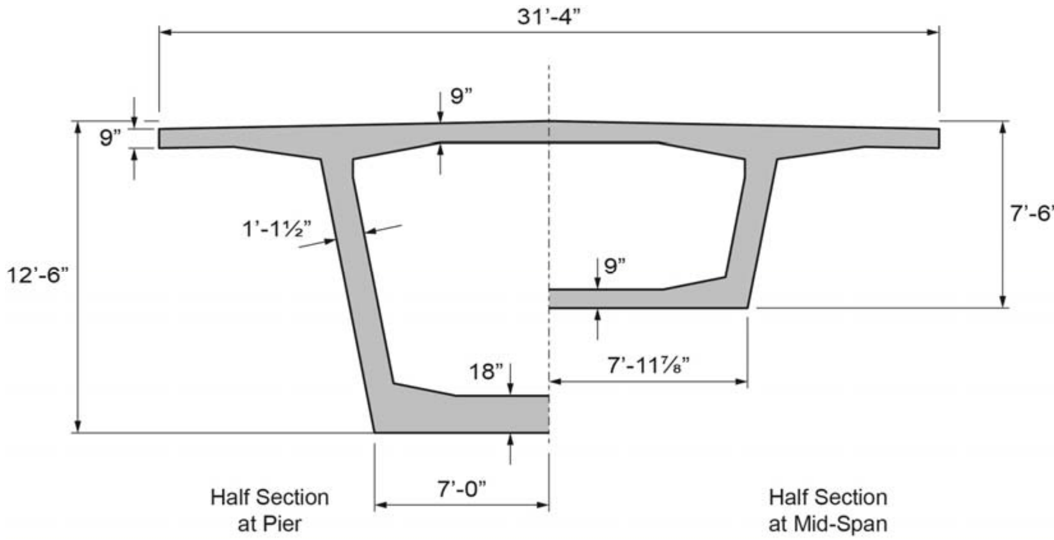


Figure 5 – Cross Section for the 250' Span Bridge shown in Alternate 3

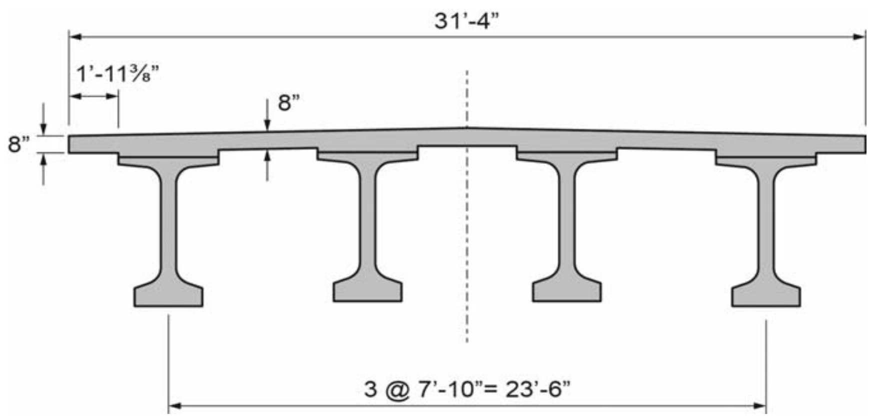


Figure 6 – Cross Section for the 132'-6" Span Bridge using NEBT 1800 - Baseline

5. Conceptual Substructures

Relative comparison of the three segmental alternates and the NEBT1800 alternate requires estimation of costs. Figure 7 shows the conceptual substructure for the span-by-span segmental alternate. The same pier configuration with an added hammerhead could be used for the NEBT1800 alternates. Figures 8 and 9 show the substructures for the balanced cantilever alternates.

For equity in comparison, the substructures shown are based on the same bridge elements and construction methodology. Piling for all alternates is 24" diameter steel pipe piling filled with tremie concrete. Piers and footing are reinforced concrete members.

Construction assumes elevated, reusable steel cofferdams. A barge mounted crane locates the cofferdam. Spud piles help secure the location of the cofferdam and barge. A precast concrete pile driving template is secured at the base of the cofferdam. Steel piling are driven to refusal and then filled with tremie concrete. Seal concrete is poured and the cofferdam dewatered.

The footing and a portion of the pier is constructed in the dewatered cofferdam. When pier construction reaches approximately +15', the cofferdam is disassembled and relocated to the next pier to be constructed.

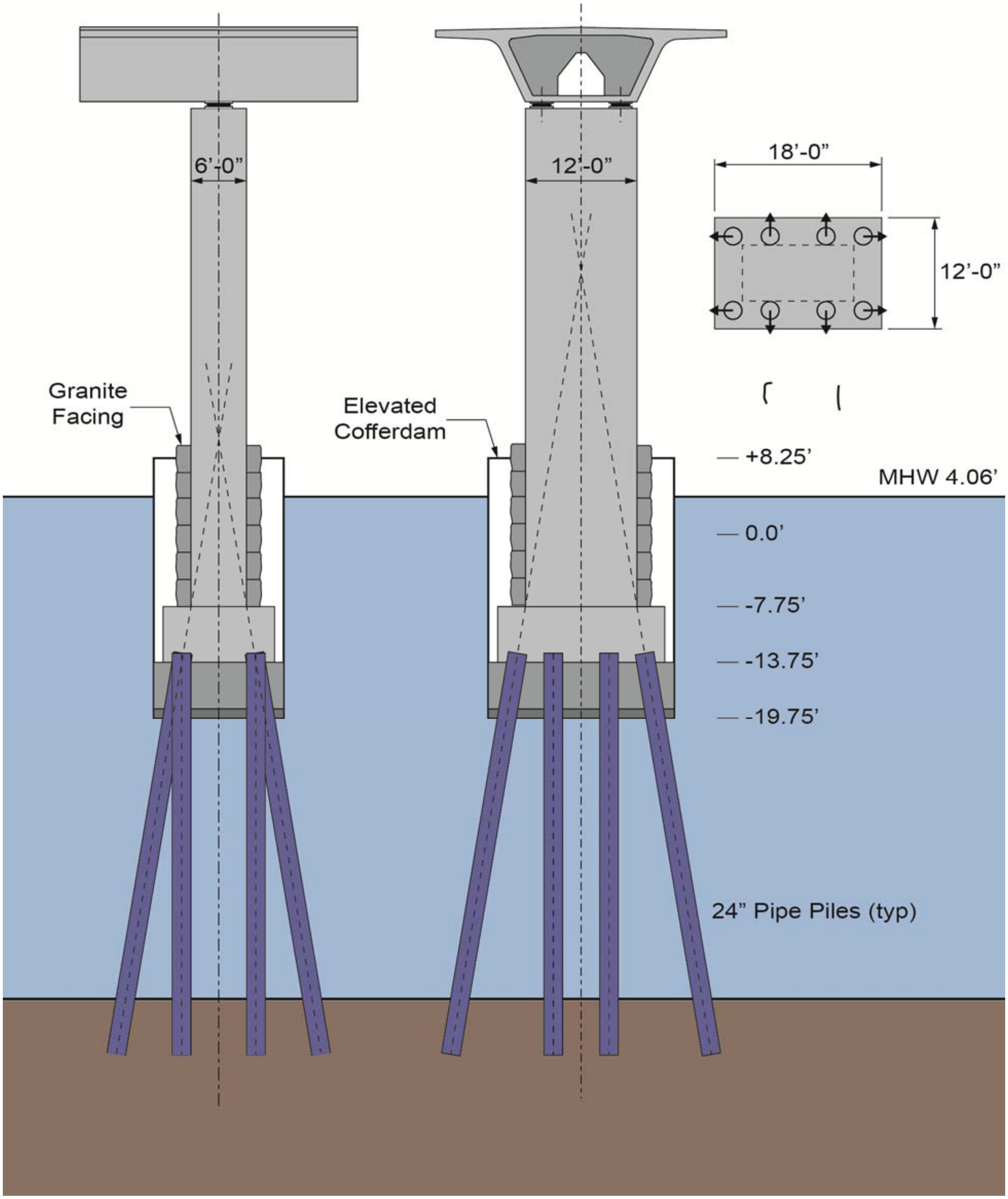


Figure 7 – Substructure for the Span-by-Span Segmental Alternate

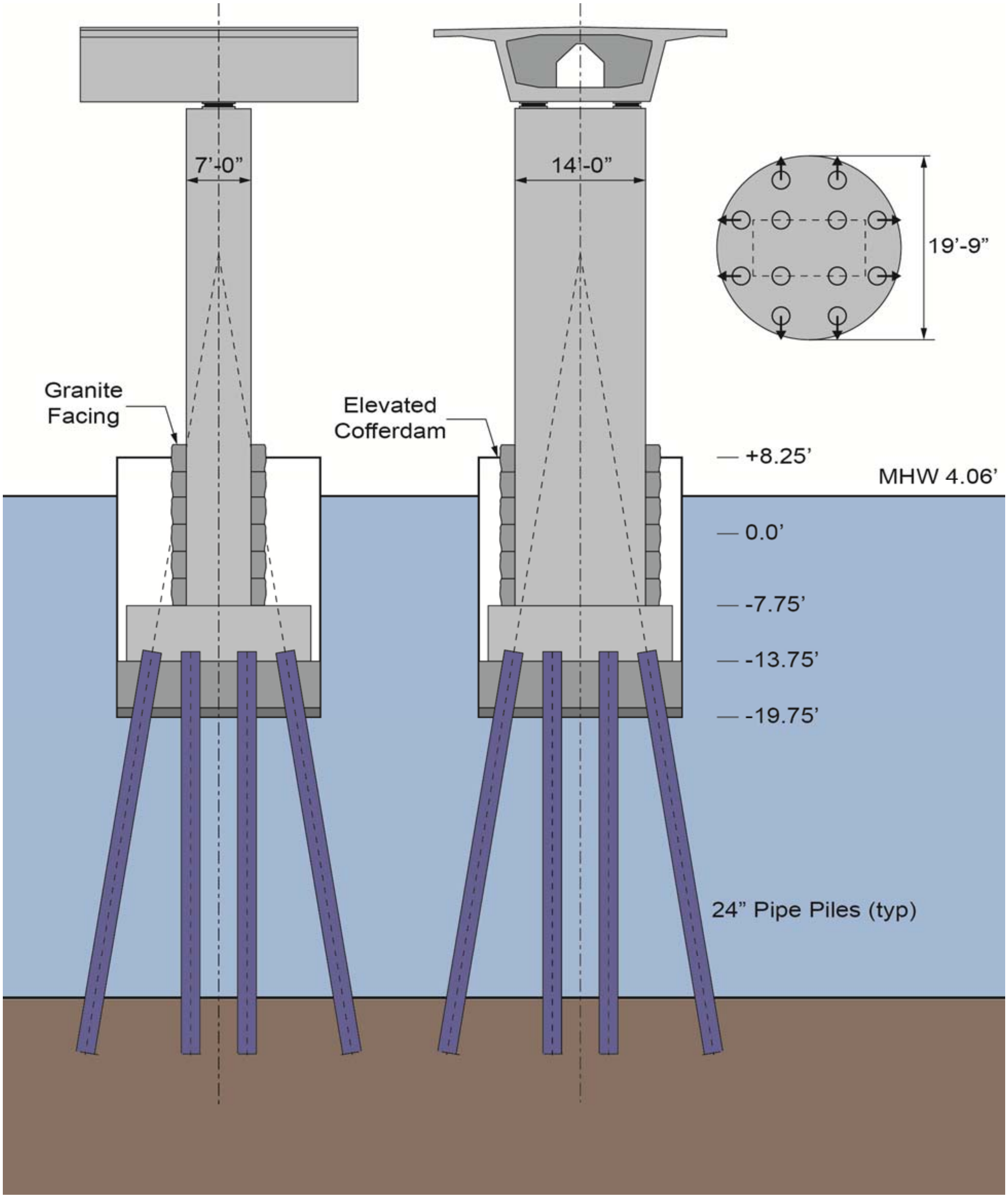


Figure 8 – Substructure for the 200' Balanced Cantilever Segmental Alternate

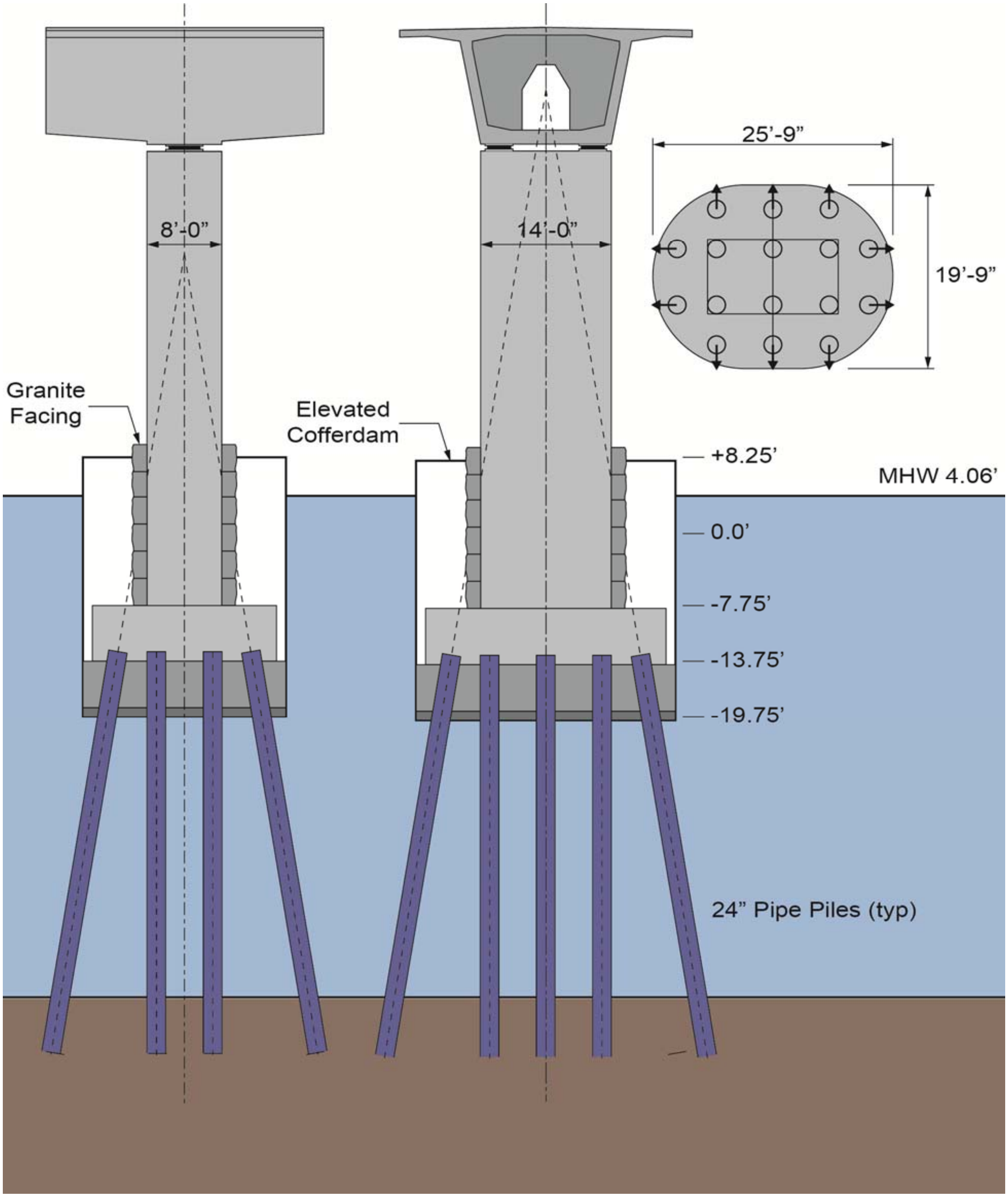


Figure 9 – Substructure for the 250' Balanced Cantilever Segmental Alternate

5. Construction Timeline Diagrams

Unit prices for the concrete in the segmental alternates are presented in Appendix B. The development of these unit prices requires an estimate of bridge superstructure construction duration. A review of construction duration was made for each of the segmental alternates based on experience on similar projects. The results of this review are presented in timeline diagrams presented in Figures 10, 11, and 12. Assumed substructure timelines are also shown in these figures to show their impact on segmental construction. The timeline diagrams are not an estimate of total construction contract duration. Also, the diagrams do not include the impact of seasonal breaks in construction.

Figure 10 shows the construction timeline for the span-by-span segmental alternative. The assumed rate of segment casting is 1 segment per day for typical segments and 2 days for pier and abutment segments. The number of casting days is 145, and the number of erection days is 60 days. A 20 week period was assumed for assembling the casting machine in an existing prestressed concrete plant.

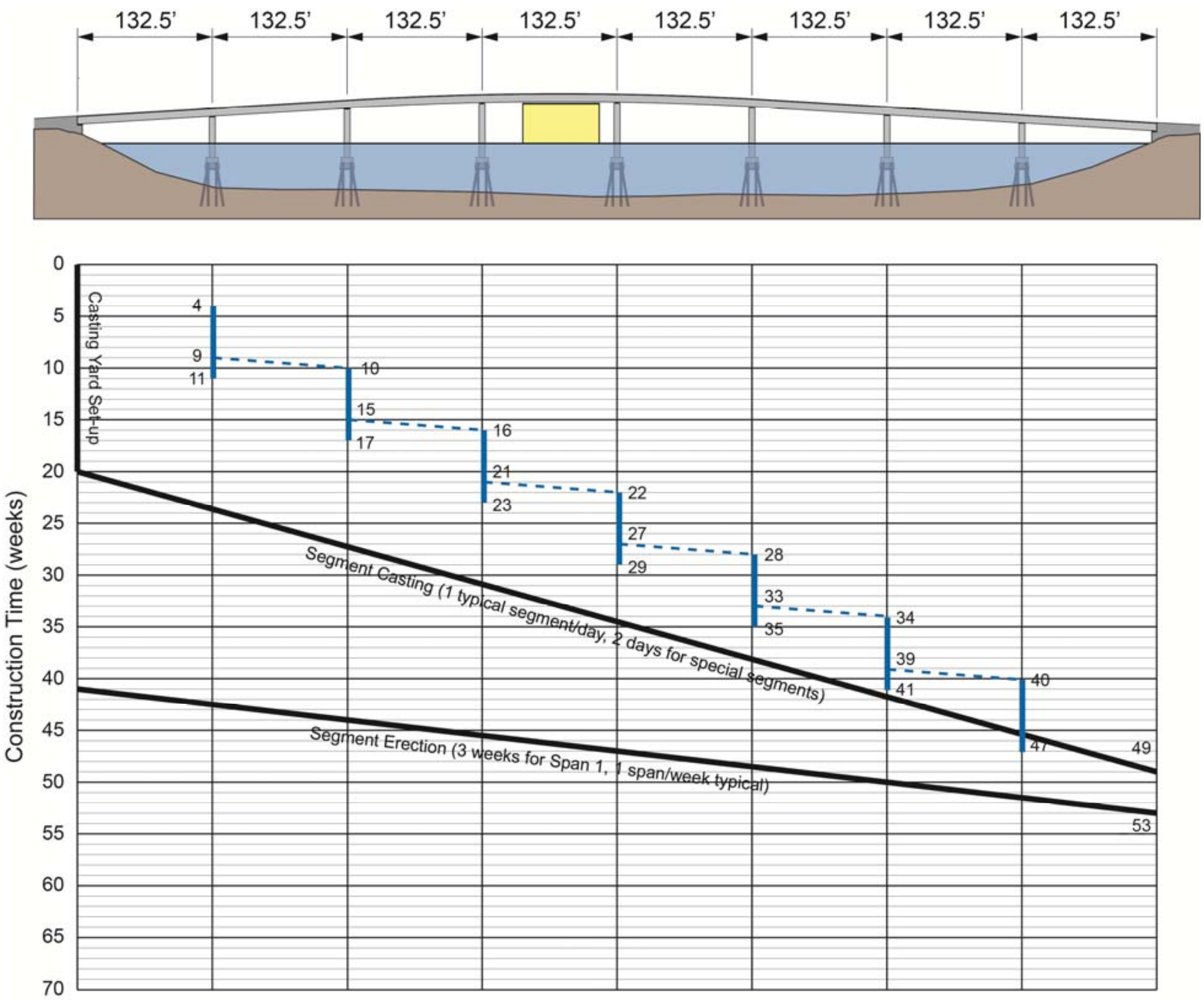


Figure 10 – Construction Timeline for the Span-by-Span Segmental Alternate

Figure 11 shows the construction timeline for the 200' cast-in-place balanced cantilever segmental alternative. Cast-in-place pier tables are formed and poured in five weeks. The assumed rate of segment casting segments in the form travelers is one segment on each end of a cantilever each week.

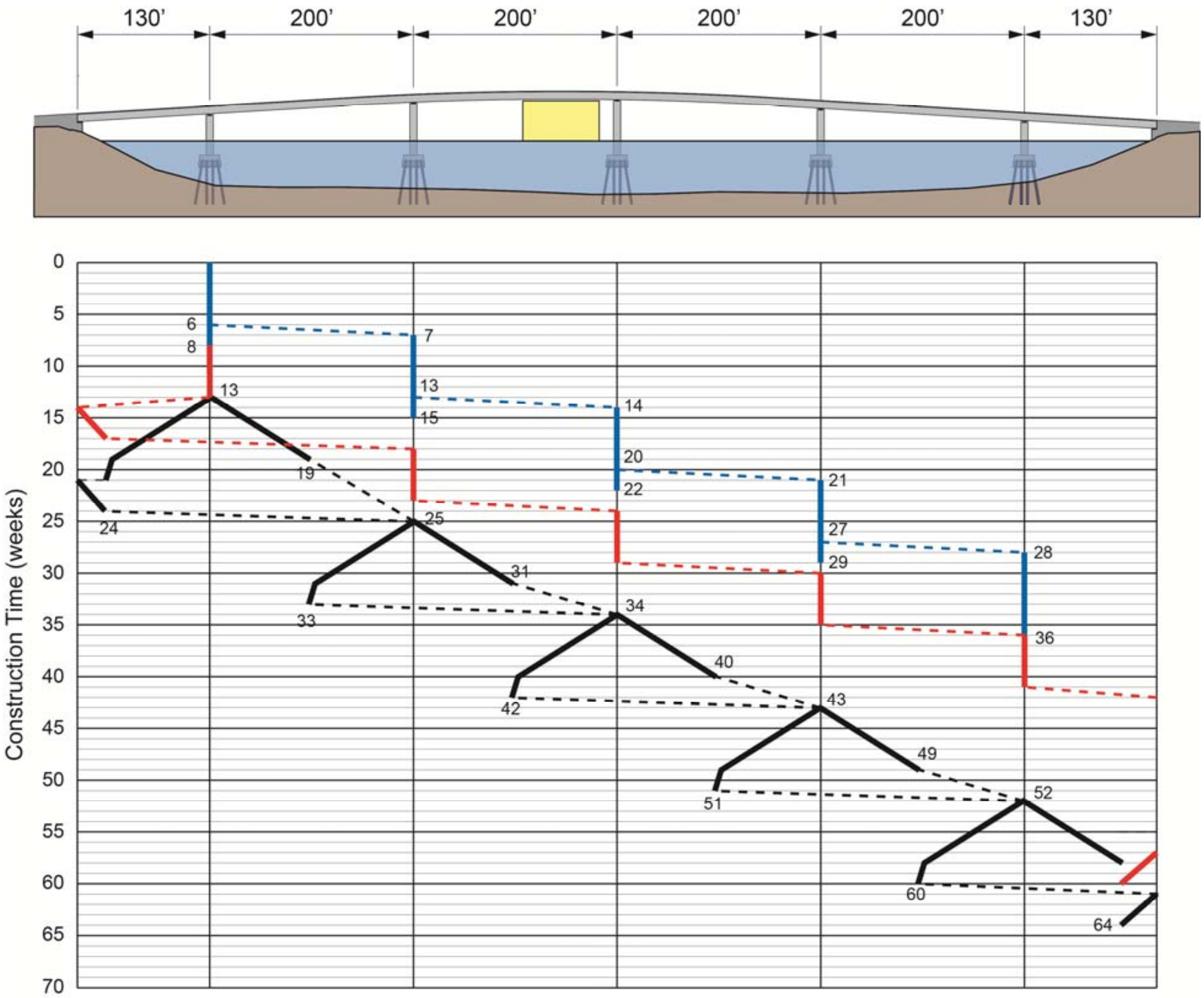


Figure 11 – Construction Timeline for the 200' Balanced Cantilever Segmental Alternate

The construction timeline for the 250' cast-in-place balanced cantilever segmental alternative is shown in Figure 12. Cast-in-place pier tables are formed and poured in six weeks. The assumed rate of segment casting segments in cantilever is one segment on each end of a cantilever each week.

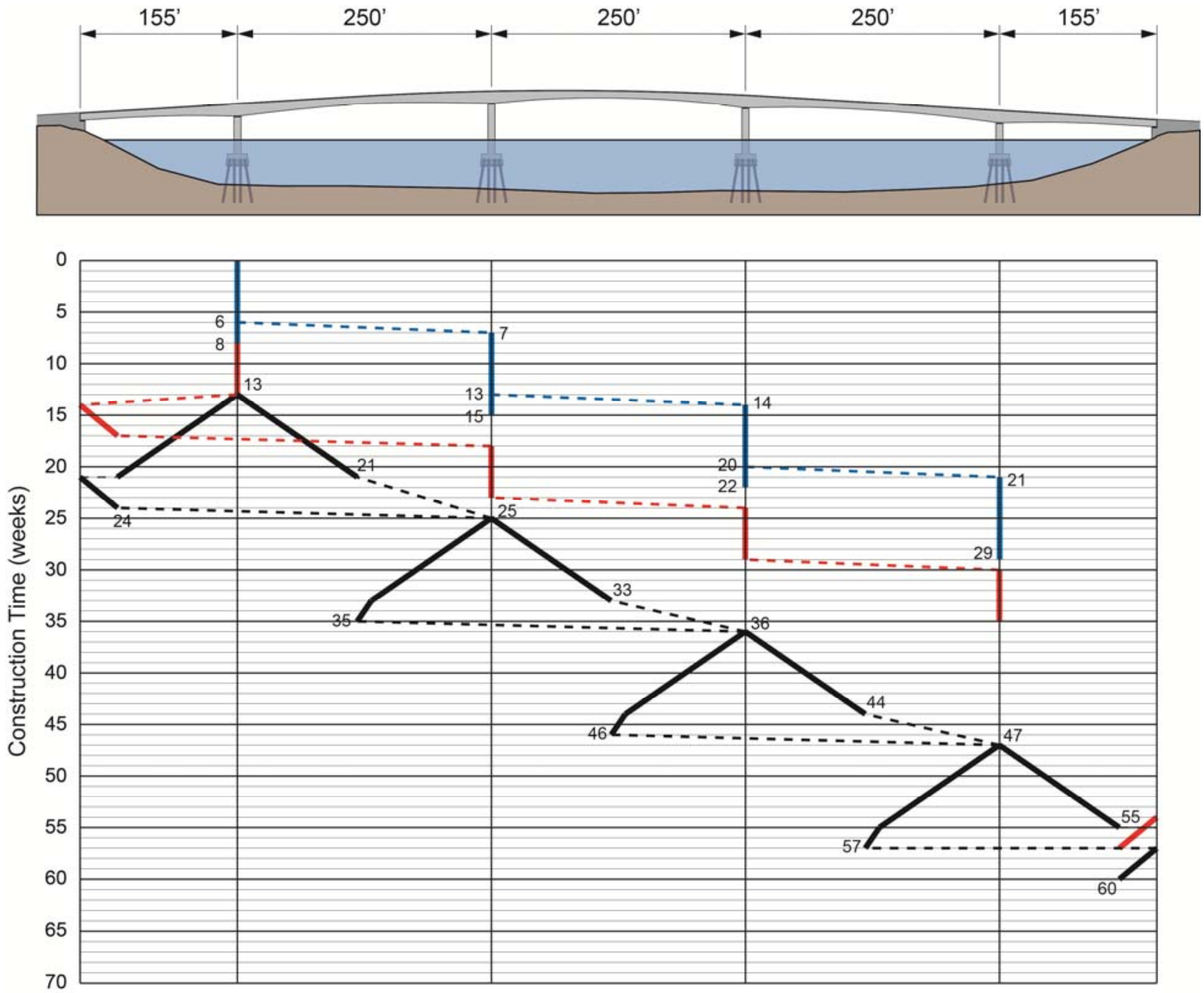


Figure 12 – Construction Timeline for the 250' Balanced Cantilever Segmental Alternate

6. Construction Cost Estimate Summary

Appendix A presents cost estimates for the alternate segmental designs presented in this study and the base design that consists of NEBT 1800 girders. Quantities were developed for a single span of each alternate. Unit costs for segment concrete of the three segmental alternates are developed in Appendix B. These unit costs are based on the construction timelines presented in the previous section. Table 1 shows a summary of the costs of the four alternates.

Alternative	Cost ($)/SF
NEBT 1800 (132.5' spans)	363
Segmental Alternate 1 - P/C SBS (132.5' spans)	418
Segmental Alternate 2 - CIP BC (200' spans)	422
Segmental Alternate 3 - CIP BC (250' spans)	399

Table 1 – Cost Estimate Summary (Major Bridge Items Only – Not Total Cost)

The cost estimates prepared for this report indicate that Segmental Alternate 3, the cast-in-place balanced cantilever bridge with the fewest foundations (250' spans), is the least cost segmental alternate. Also indicated, is that this segmental alternate is approximately 10% greater than the base alternate consisting of NEBT 1800 precast prestressed girders.

Appendix A – Cost Estimates

Beals Island Bridge Replacement
Single Span Order of Magnitude Cost Estimates
August 15, 2014

132.5' Span Bridge Alternate (NEBT 1800)

	Bid Item	Unit	Quantity	Unit Cost	Cost
Substructure					
	Cofferdam	LB	125,000	$ 4.00	$ 500,000
	24" Diameter Piling	LF	344	$ 325.00	$ 111,800
	Template Concrete	CY	10	$ 1,200.00	$ 12,000
	Seal Concrete	CY	52	$ 550.00	$ 28,600
	Footing Concrete	CY	48	$ 600.00	$ 28,800
	Pier Concrete	CY	159	$ 850.00	$ 135,150
	Reinforcing Steel	LB	43,400	$ 1.00	$ 43,400
	Pile Equipment Mobilization	EA	1	$ 100,000.00	$ 100,000
	Pier Protection	SF	612	$ 50.00	$ 30,600
			Substructure Subtotal		$ 990,350
			Contingency (10%)		99,035
			Substructure Cost (Per Pier)		$ 1,089,385
			Unit Cost ($/sf)		$ 262
Superstructure	NEBT 1800	LF	530	$ 435.00	$ 230,550
	Deck Concrete	CY	102	$ 1,200.00	$ 122,400
	Deck Reinforcing	LB		$ 2.25	$ -
	Segment Concrete	CY		$ 1,250.00	$ -
	Segment Reinforcing	LB		$ 2.25	$ -
	Longitudinal PT	LB		$ 2.50	$ -
	Transverse PT	LB		$ 4.00	$ -
	Bearings	EA	16	$ 1,700.00	$ 27,200
			Subtotal		$ 380,150
			Contingency (10%)		38,015
			Superstructure Cost (Per Span)		$ 418,165
			Unit Cost ($/sf)		$ 101
Totals	Span Length	132.5			
	Bridge Width	31.3	Total Cost		$ 1,507,550
	Deck Area	4151.7	Unit Cost ($/sf)		$ 363

(Estimate includes order of magnitude estimate with comparative bridge items only.)
(This is not a total bridge or project cost.)

Beals Island Bridge Replacement
Single Span Order of Magnitude Cost Estimates
August 15, 2014

132.5' Span Bridge (Span-By-Span Segmental)

	Bid Item	Unit	Quantity	Unit Cost	Cost
Substructure					
	Cofferdam	LB	125,000	$ 4.00	$ 500,000
	24" Diameter Piling	LF	344	$ 325.00	$ 111,800
	Template Concrete	CY	10	$ 1,200.00	$ 12,000
	Seal Concrete	CY	52	$ 550.00	$ 28,600
	Footing Concrete	CY	48	$ 600.00	$ 28,800
	Pier Concrete	CY	141	$ 850.00	$ 119,850
	Reinforcing Steel	LB	39,800	$ 1.00	$ 39,800
	Pile Equipment Mobilization	EA	1	$ 100,000.00	$ 100,000
	Pier Protection	SF	612	$ 50.00	$ 30,600
			Substructure Subtotal		$ 971,450
			Contingency (10%)		97,145
			Substructure Cost (Per Pier)		$ 1,068,595
			Unit Cost ($/sf)		$ 257
Superstructure	NEBT 1800	LF			$ -
	Deck Concrete	CY			$ -
	Deck Reinforcing	LB		$ 2.25	$ -
	Segment Concrete	CY	272	$ 1,513.00	$ 411,536
	Segment Reinforcing	LB	61,200	$ 2.25	$ 137,700
	Longitudinal PT	LB	14,531	$ 2.50	$ 36,327
	Transverse PT	LB	2,765	$ 4.00	$ 11,060
	Bearings	EA	2	$ 5,000.00	$ 10,000
			Subtotal		$ 606,623
			Contingency (10%)		60,662
			Superstructure Cost (Per Span)		$ 667,285
			Unit Cost ($/sf)		$ 161
Totals	Span Length	132.5			
	Bridge Width	31.3	Total Cost		$ 1,735,880
	Deck Area	4151.7	Unit Cost ($/sf)		$ 418

(Estimate includes order of magnitude estimate with comparative bridge items only.)
(This is not a total bridge or project cost.)

Beals Island Bridge Replacement
Single Span Order of Magnitude Cost Estimates
August 15, 2014

200' Span Bridge (Balanced Cantilever Segmental)

	Bid Item	Unit	Quantity	Unit Cost	Cost
Substructure					
	Cofferdam	LB	117,000	$ 4.00	$ 468,000
	24" Diameter Piling	LF	516	$ 325.00	$ 167,700
	Template Concrete	CY	14	$ 1,200.00	$ 16,800
	Seal Concrete	CY	69	$ 550.00	$ 37,950
	Footing Concrete	CY	68	$ 600.00	$ 40,800
	Pier Concrete	CY	192	$ 850.00	$ 163,200
	Reinforcing Steel	LB	54,800	$ 1.00	$ 54,800
	Pile Equipment Mobilization	EA	1	$ 100,000.00	$ 100,000
	Pier Protection	SF	714	$ 50.00	$ 35,700
			Substructure Subtotal		$ 1,084,950
			Contingency (10%)		108,495
			Substructure Cost (Per Pier)		$ 1,193,445
			Unit Cost ($/sf)		$ 190
Superstructure	NEBT 1800	LF			$ -
	Deck Concrete	CY			$ -
	Deck Reinforcing	LB		$ 2.25	$ -
	Segment Concrete	CY	447	$ 2,108.00	$ 942,276
	Segment Reinforcing	LB	111,750	$ 2.25	$ 251,438
	Longitudinal PT	LB	34,467	$ 2.50	$ 86,167
	Transverse PT	LB	4,174	$ 4.00	$ 16,694
	Bearings	EA	2	$ 10,000.00	$ 20,000
			Subtotal		$ 1,316,575
			Contingency (10%)		131,657
			Superstructure Cost (Per Span)		$ 1,448,232
			Unit Cost ($/sf)		$ 231
Totals	Span Length	200.0			
	Bridge Width	31.3	Total Cost		$ 2,641,677
	Deck Area	6266.7	Unit Cost ($/sf)		$ 422

(Estimate includes order of magnitude estimate with comparative bridge items only.)

Beals Island Bridge Replacement
Single Span Order of Magnitude Cost Estimates
August 15, 2014

250' Span Bridge (Balanced Cantilever Segmental)

	Bid Item	Unit	Quantity	Unit Cost	Cost
Substructure					
	Cofferdam	LB	138,000	$ 4.00	$ 552,000
	24" Diameter Piling	LF	688	$ 325.00	$ 223,600
	Template Concrete	CY	19	$ 1,200.00	$ 22,800
	Seal Concrete	CY	94	$ 550.00	$ 51,700
	Footing Concrete	CY	94	$ 600.00	$ 56,400
	Pier Concrete	CY	205	$ 850.00	$ 174,250
	Reinforcing Steel	LB	63,600	$ 1.00	$ 63,600
	Pile Equipment Mobilization	EA	1	$ 100,000.00	$ 100,000
	Pier Protection	SF	748	$ 50.00	$ 37,400
			Substructure Subtotal		$ 1,281,750
			Contingency (10%)		128,175
			Substructure Cost (Per Pier)		$ 1,409,925
			Unit Cost ($/sf)		$ 180
Superstructure	NEBT 1800	LF			$ -
	Deck Concrete	CY			$ -
	Deck Reinforcing	LB		$ 2.25	$ -
	Segment Concrete	CY	583	$ 1,828.00	$ 1,065,724
	Segment Reinforcing	LB	145,750	$ 2.25	$ 327,938
	Longitudinal PT	LB	47,000	$ 2.50	$ 117,500
	Transverse PT	LB	5,217	$ 4.00	$ 20,868
	Bearings	EA	2	$ 15,000.00	$ 30,000
			Subtotal		$ 1,562,029
			Contingency (10%)		156,203
			Superstructure Cost (Per Span)		$ 1,718,232
			Unit Cost ($/sf)		$ 219
Totals	Span Length	250.0			
	Bridge Width	31.3	Total Cost (Partial)		$ 3,128,157
	Deck Area	7833.3	Unit Cost (Partial) ($/sf)		$ 399

(Estimate includes order of magnitude estimate with comparative bridge items only.)

Appendix B – Segmental Concrete Unit Costs

Beals Island Bridge Replacement
Order of Magnitude Cost Estimates
August 15, 2014

132.5' SBS - Development of Concrete Unit Price

I. BRIDGE DATA

Length	=	1060.00	ft	
Width	=	31.33	ft	
No. Spans	=	8		
No. Typical Segments	=	0		
Pier Segments	=	14		
Closure Segments	=	16		
No. EJ Segments	=	2		
Total Number of Segments	=	32		
Deck Area	=	33213	sf	
Cross Sectional Area	=	51.13	sf	
Segment Concrete	=	2007.3	cy	
Diaphragm Concrete	=	160	cy	(10cy/pier segment)
Blister Concrete	=	40	cy	(2% of concrete)
Total Concrete	=	2207	cy	
Average Thickness	=	1.795	ft	

II. MATERIALS

Concrete Cost	=	$200.00	/cy		
Corrosion Inhibitor		$50.00	/cy		
Epoxy Cost	=	$11,588	total	4.5	gal/joint
				103	joints
Total Material Cost/CY	**=**	**$255**		25	$/gal

III. FORMS AND CASTING YARD SETUP

Typical Segment Forms	=	1
EJ Segment Modification	=	1

		Unit Cost	Number	Cost
Typical Segment Forms	=	$250,000	1	$200,000
EJ Segment Forms	=	$100,000	1	$100,000
Casting Yard Setup	=	$15,000	1	$15,000

Total Cost	=	$315,000
Total Cost/CY	**=**	**$143**

IV. CASTING LABOR

Concrete Crew	=	3
Rebar Crew	=	3

1 Survey Crew of 2 people	=	1	
1 Foreman	=	1	
Total Crew	=	8	
Casting Days	=	145	
Hours/day	=	8	
Man Hours	=	9280	
Average rate	=	$50.00	
Fringe & Mark-up	=	30.00%	
Labor Cost	=	$603,200	
Total Cost/CY	**=**	**$273**	

V. ERECTION EQUIPMENT

Total Erection Time	=	3	months
Percent Dedication	=	100.00%	
Crane Rental	=	$120,000.00	40000
Barge Rental	=	$45,000.00	15000
Tug Rental	=	$75,000.00	25000
Erection Girders & Brackets	=	$350,000.00	
Equipment Cost	=	$590,000.00	
Tug Operator		1	
Tug Crew		2	
Crane Operator		1	
Crane Crew		2	
Total Crew	=	6	
Site Days	=	60	
Hours/day	=	10	
Man Hours	=	3600	
Average rate	=	$75.00	
Fringe	=	30.00%	
Labor Cost	=	$351,000	
Total Equipment Cost	=	$941,000	
Total Cost/CY (50%)	**=**	**$426**	

VI. ERECTION LABOR

Erection Crew	=	4
PT Crew	=	3
General Labor	=	2
Survey Crew	=	2
Foreman	=	2
Superintendent	=	1
Total Crew	=	14
Erection Days	=	60
Hours/day	=	10
Man Hours	=	8400
Average rate	=	$50.00
Fringe & Mark-up	=	30.00%

Labor Cost	=	$546,000	
Total Cost/CY	=	**$247**	

VII. SEGMENT HANDLING AND TRANSPORTATION

Barge Delivery			
Total Erection Time	=	3	months
Percent Dedication	=	100.00%	
Barge Rental	=	$45,000.00	15000
Tug Rental	=	$75,000.00	25000
Equipment Cost	=	$120,000.00	
Tug Operator		1	
Tug Crew		2	
Total Crew	=	3	
Site Days	=	60	
Hours/day	=	10	
Man Hours	=	1800	
Average rate	=	$75.00	
Fringe	=	30.00%	
Labor Cost	=	$175,500	
Segment Handling in Casting Yard			
Total Casting Time	=	7	months
Percent Dedication	=	25.00%	
Travel List Cost	=	$75,000.00	25000
Equipment Cost	=	$18,750.00	
Operator		2	
Oiler	=	2	
Casting Days	=	145	
Hours/day	=	8	
Man Hours	=	2320	
Average rate	=	$75.00	
Fringe	=	30.00%	
Labor Cost	=	$56,550	
Total Transportation Cost	=	$370,800	
Total Cost/CY	=	**$168**	

VIII. SUMMARY OF COSTS

Materials	=	$255
Forms & Casting Yard	=	$143
Casting Labor	=	$273
Erection Equipment	=	$426
Erection Labor	=	$247
Segment Transportation	=	$168
	=	
Total Unit Cost	=	**$1,513**

Beals Island Bridge Replacement
Order of Magnitude Cost Estimates
August 15, 2014

200' Balanced Cantilever - Development of Concrete Unit Price

I. BRIDGE DATA

Length	=	1060.00	ft		
Width	=	31.33	ft		
No. Spans	=	5			
Pier Tables	=	5			
Cantilevers	=	10			
Closure Segments	=	4			
End Spans on Falsework	=	2			
Total Number of Elements	=	21			
Deck Area	=	33213	sf		
Pier Table Concrete	=	331.5	cy	66.3	cy/ea
Cantilever Concrete	=	1802.0	cy	180.2	cy/ea
Closure Segment Concrete	=	82.0	cy	20.5	cy/ea
End Span Concrete	=	163.2	cy	81.6	cy/ea
Total Concrete		2378.7	cy		
Average Thickness	=	1.934	ft		

II. MATERIALS

Concrete Cost	=	$200.00	/cy
Corrosion Inhibitor		$50.00	/cy
Epoxy Cost	=	$0.00	total
Total Material Cost/CY	**=**	**$250**	

III. FORM TRAVELERS AND FALSEWORK

		Unit Cost	Number	Cost
Form Traveler	=	$150,000	2	$300,000
Pier Table Falsework	=	$25,000	1	$25,000
End Span Falsework	=	$40,000	1	$40,000
Stability Tower	=	$30,000	1	$30,000
Total Cost	=	$395,000		
Total Cost/CY	**=**	**$166**		

IV. CASTING LABOR

Concrete Crew	=	3

Rebar Crew	=	2	
Falsework Crew	=	2	
General Labor	=	3	
Post-Tensioning Crew	=	3	
Foreman	=	2	
Surveyor	=	1	
Total Crew	=	16	
Casting Days	=	280	
Hours/day	=	10	
Man Hours	=	44800	
Average rate	=	$50.00	
Fringe	=	30.00%	
Labor Cost	=	$2,912,000	
Total Cost/CY	**=**	**$1,224**	

V. ERECTION EQUIPMENT

Total Erection Time	=	13	months
Percent Dedication	=	50.00%	
Crane Rental	=	$325,000.00	25000
Barge Rental	=	$65,000.00	5000
Tug Rental	=	$195,000.00	15000
Equipment Cost	=	$585,000.00	
Tug Operator		1	
Tug Crew		2	
Crane Operator		1	
Crane Crew		2	
Total Crew	=	6	
Site Days	=	280	
Hours/day	=	10	
Man Hours	=	16800	
Average rate	=	$75.00	
Fringe	=	30.00%	
Labor Cost	=	$1,638,000	
Total Equipment Cost	=	$2,223,000	
Total Cost/CY (50%)	**=**	**$467**	

VIII. SUMMARY OF COSTS

Materials	=	$250
Forms & Casting Yard	=	$166
Casting Labor	=	$1,224
Erection Equipment	=	$467
	=	
Total Unit Cost	**=**	**$2,108**

Beals Island Bridge Replacement
Order of Magnitude Cost Estimates
August 15, 2014

250' Balanced Cantilever - Development of Concrete Unit Price

I. BRIDGE DATA

Length	=	1060.00	ft		
Width	=	31.33	ft		
No. Spans	=	5			
Pier Tables	=	4			
Cantilevers	=	8			
Closure Segments	=	3			
End Spans on Falsework	=	2			
Total Number of Elements	=	17			
Deck Area	=	33213	sf		
Pier Table Concrete	=	294.4	cy	73.6	cy/ea
Cantilever Concrete	=	1954.4	cy	244.3	cy/ea
Closure Segment Concrete	=	60.9	cy	20.3	cy/ea
End Span Concrete	=	142.2	cy	71.1	cy/ea
Total Concrete		2451.9	cy		
Average Thickness	=	1.993	ft		

II. MATERIALS

Concrete Cost	=	$200.00	/cy
Corrosion Inhibitor		$50.00	/cy
Epoxy Cost	=	$0.00	total
Total Material Cost/CY	**=**	**$250**	

III. FORM TRAVELERS AND FALSEWORK

		Unit Cost	Number	Cost
Form Traveler	=	$150,000	2	$300,000
Pier Table Falsework	=	$25,000	1	$25,000
End Span Falsework	=	$40,000	1	$40,000
Stability Tower	=	$30,000	1	$30,000
Total Cost	=	$395,000		
Total Cost/CY	**=**	**$161**		

IV. CASTING LABOR

Concrete Crew	=	3

Rebar Crew	=	2	
Falsework Crew	=	2	
General Labor	=	3	
Post-Tensioning Crew	=	3	
Foreman	=	2	
Surveyor	=	1	
Total Crew	=	16	
Casting Days	=	235	
Hours/day	=	10	
Man Hours	=	37600	
Average rate	=	$50.00	
Fringe	=	30.00%	
Labor Cost	=	$2,444,000	
Total Cost/CY	**=**	**$997**	

V. ERECTION EQUIPMENT

Total Erection Time	=	12	months
Percent Dedication	=	50.00%	
Crane Rental	=	$300,000.00	25000
Barge Rental	=	$60,000.00	5000
Tug Rental	=	$180,000.00	15000
Equipment Cost	=	$540,000.00	
Tug Operator		1	
Tug Crew		2	
Crane Operator		1	
Crane Crew		2	
Total Crew	=	6	
Site Days	=	260	
Hours/day	=	10	
Man Hours	=	15600	
Average rate	=	$75.00	
Fringe	=	30.00%	
Labor Cost	=	$1,521,000	
Total Equipment Cost	=	$2,061,000	
Total Cost/CY (50%)	**=**	**$420**	

VIII. SUMMARY OF COSTS

Materials	=	$250
Forms & Casting Yard	=	$161
Casting Labor	=	$997
Erection Equipment	=	$420
	=	
Total Unit Cost	**=**	**$1,828**

APPENDIX G

Existing Plans

STATE OF MAINE

STATE HIGHWAY COMMISSION

JONESPORT — BEALS BRIDGE

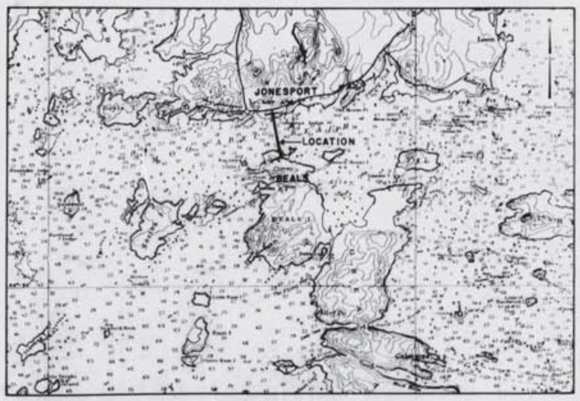
CONVENTIONAL SIGNS

STATE OR NATIONAL LINE	SURVEY LINE
COUNTY LINE	CULVERT
TOWN LINE	DROP INLET
UNFENCED PROPERTY	TROLLEY POLE
FENCE	POWER POLE
RIGHT OF WAY LINE	TEL. POLE
TRAVELED WAY	MARSH
RAILROAD	TREES
RETAINING WALL	STONE WALL

TOTAL LENGTH = 0.47 MILES

SCALES
- PLAN 1 IN. = 100 FT. – 1 IN. = 20 FT.
- PROFILE: HOR. 1 IN. = 100 FT.; VER. 1 IN. = 100 FT.
- CROSS SECTIONS 1 IN. = 10 FT.

INDEX TO DRAWINGS



KEY MAP

0 5000 SCALE IN FEET

As Built Sept. 1958

APPROVED:
MAINE STATE HIGHWAY COMMISSION

CHAIRMAN

CHIEF ENGINEER

STATE HIGHWAY COMMISSION AUGUSTA, MAINE		
JONESPORT - BEALS BRIDGE		
TITLE SHEET AND INDEX TO DRAWINGS		
SHEET 1 OF 21	SCALES: AS NOTED	MAY 1956

FAY, SPOFFORD & THORNDIKE
CONSULTING ENGINEERS

VI-38
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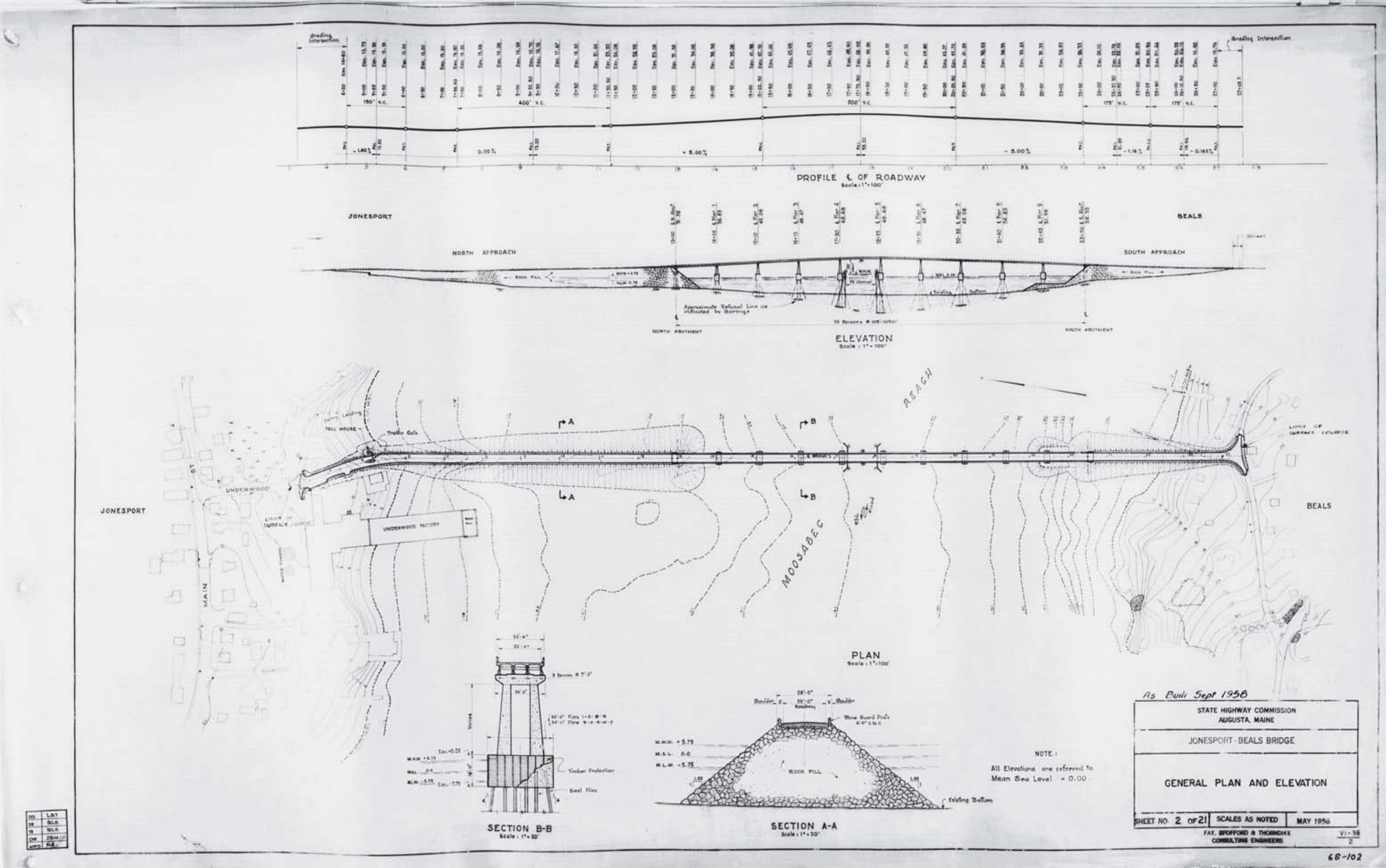
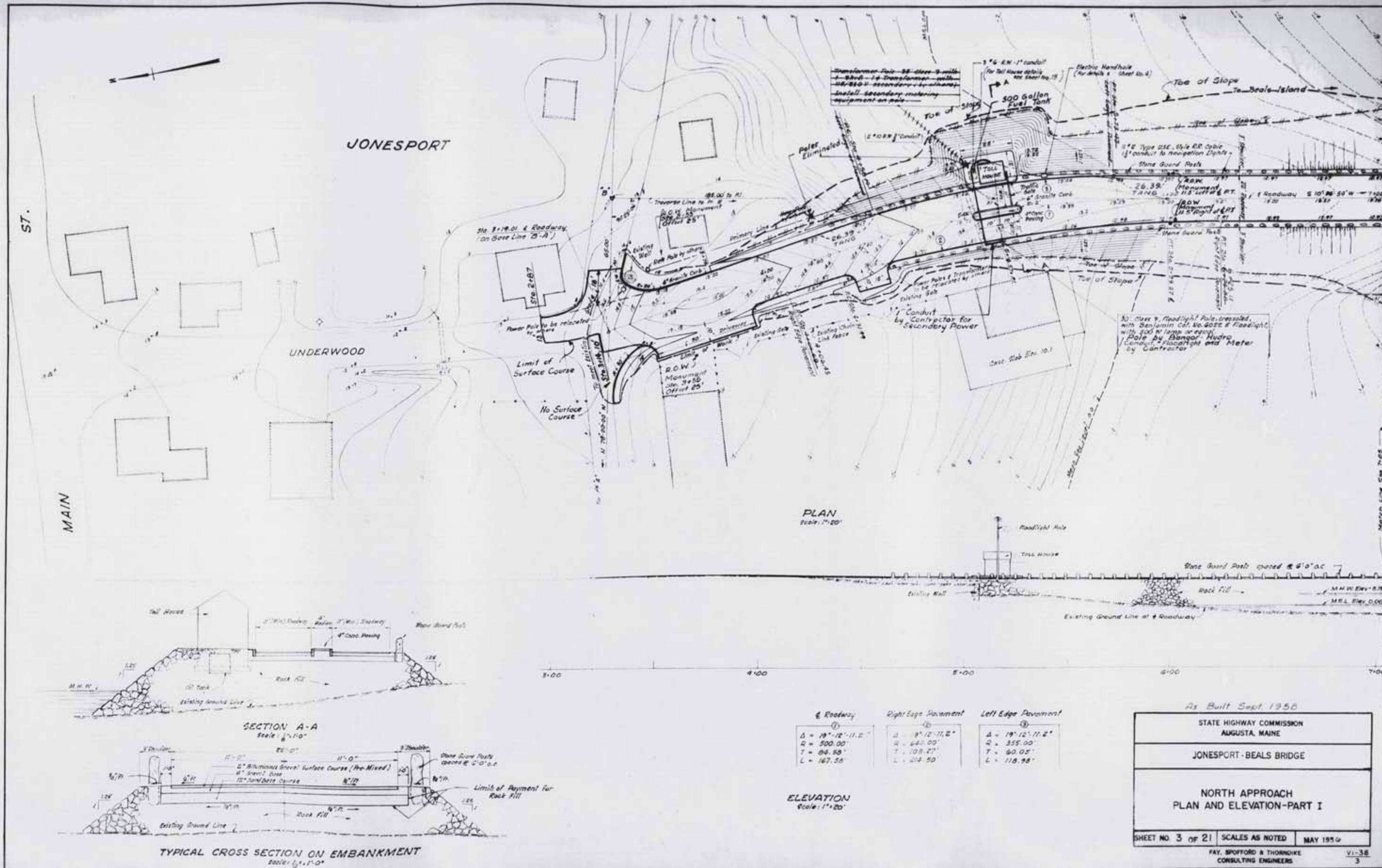
68-101

0 1 2 3 4 5 INCHES



PROFILE ℄ OF ROADWAY
Scale: 1" = 100'
JONESPORT
BEALS
NORTH APPROACH
SOUTH APPROACH
ROCK FILL
NORTH ABUTMENT
SOUTH ABUTMENT
ELEVATION
Scale: 1" = 100'
REACH
TOLL HOUSE
Traffic Gate
UNDERWOOD
UNDERWOOD FACTORY
JONESPORT
MAIN ST
MOOSABEC
BEALS
PLAN
Scale: 1" = 100'
SECTION B-B
Scale: 1" = 20'
Timber Protection
Steel Piles
M.H.W. + 5.75
M.S.L. 0.0
M.L.W. − 5.75
ROCK FILL
Existing Bottom
SECTION A-A
Scale: 1" = 20'
NOTE:
All Elevations are referred to
Mean Sea Level = 0.00
As Built Sept 1958
STATE HIGHWAY COMMISSION
AUGUSTA, MAINE
JONESPORT - BEALS BRIDGE
GENERAL PLAN AND ELEVATION
SHEET NO. 2 OF 21
SCALES AS NOTED
MAY 1956
FAY, SPOFFORD & THORNDIKE
CONSULTING ENGINEERS
VI-38
2
6B-102
INCHES


JONESPORT
MAIN ST.
UNDERWOOD
PLAN
Scale: 1"=20'
Toe of Slope
To Beals Island
500 Gallon Fuel Tank
Poles Eliminated
Toll House
Limit of Surface Course
No Surface Course
Stone Guard Posts
Floodlight Pole
Toll House
Stone Guard Posts spaced @ 6'0" o.c.
Existing Wall
Rock Fill
M.H.W. Elev. 5.75
M.S.L. Elev. 0.00
Existing Ground Line at ¢ Roadway
3+00
4+00
5+00
6+00
7+00
Toll House
Stone Guard Posts
4" Conc. Paving
Rock Fill
Oil Tank
Existing Ground Line
SECTION A-A
Scale: 1/8"=1'0"
Stone Guard Posts spaced @ 6'0" o.c.
Limit of Payment for Rock Fill
Rock Fill
Existing Ground Line
TYPICAL CROSS SECTION ON EMBANKMENT
ELEVATION
Scale: 1"=20'
¢ Roadway
Right Edge Pavement
Left Edge Pavement
Δ = 19°-12'-11.2"
R = 500.00'
T = 84.58'
L = 167.58'
Δ = 19°-12'-11.2"
R = 355.00'
T = 60.05'
L = 118.98'
As Built Sept. 1958
STATE HIGHWAY COMMISSION
AUGUSTA, MAINE
JONESPORT-BEALS BRIDGE
NORTH APPROACH
PLAN AND ELEVATION-PART I
SHEET NO. 3 OF 21
SCALES AS NOTED
MAY 1956
FAY, SPOFFORD & THORNDIKE
CONSULTING ENGINEERS
VI-38
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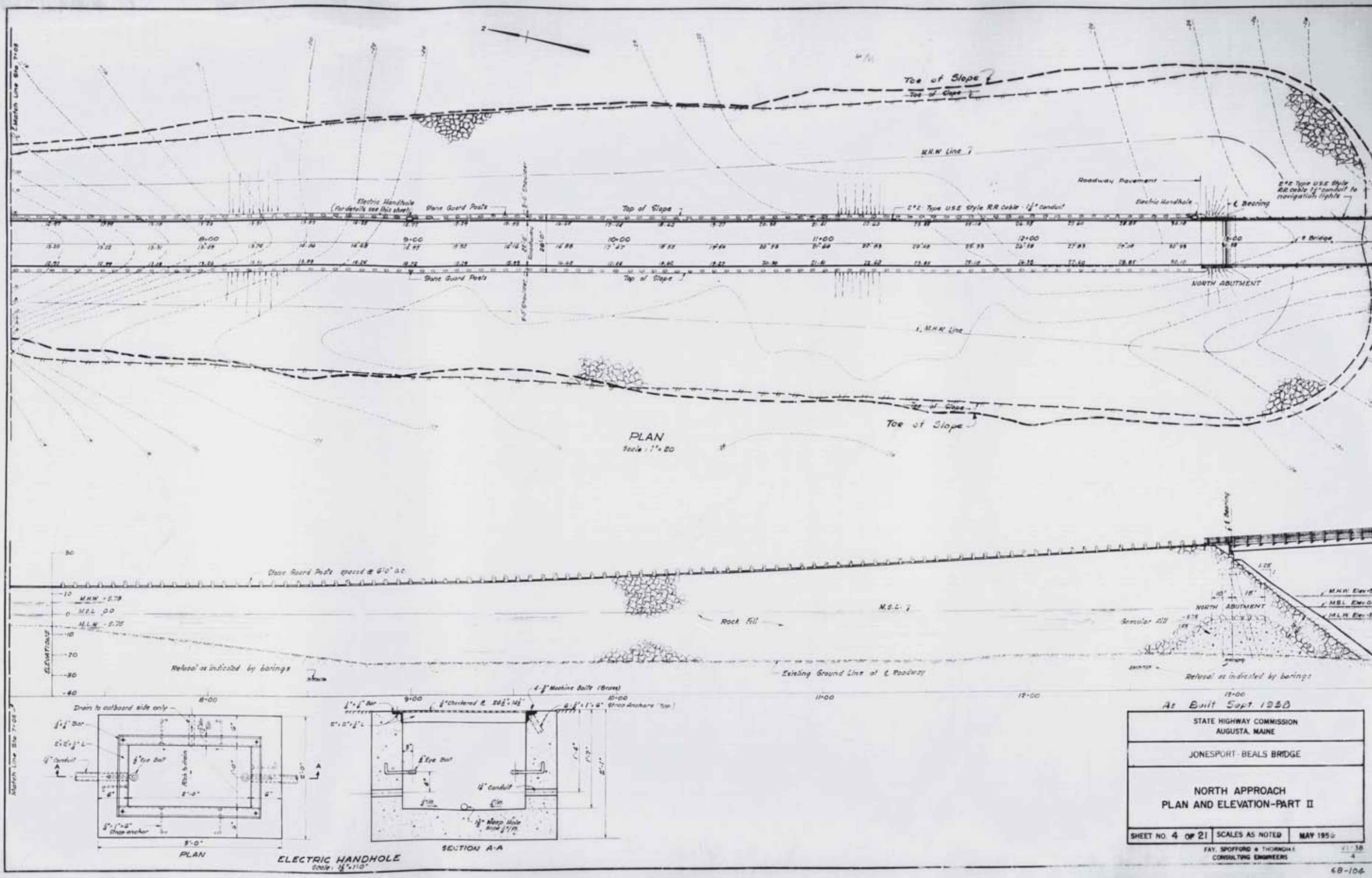
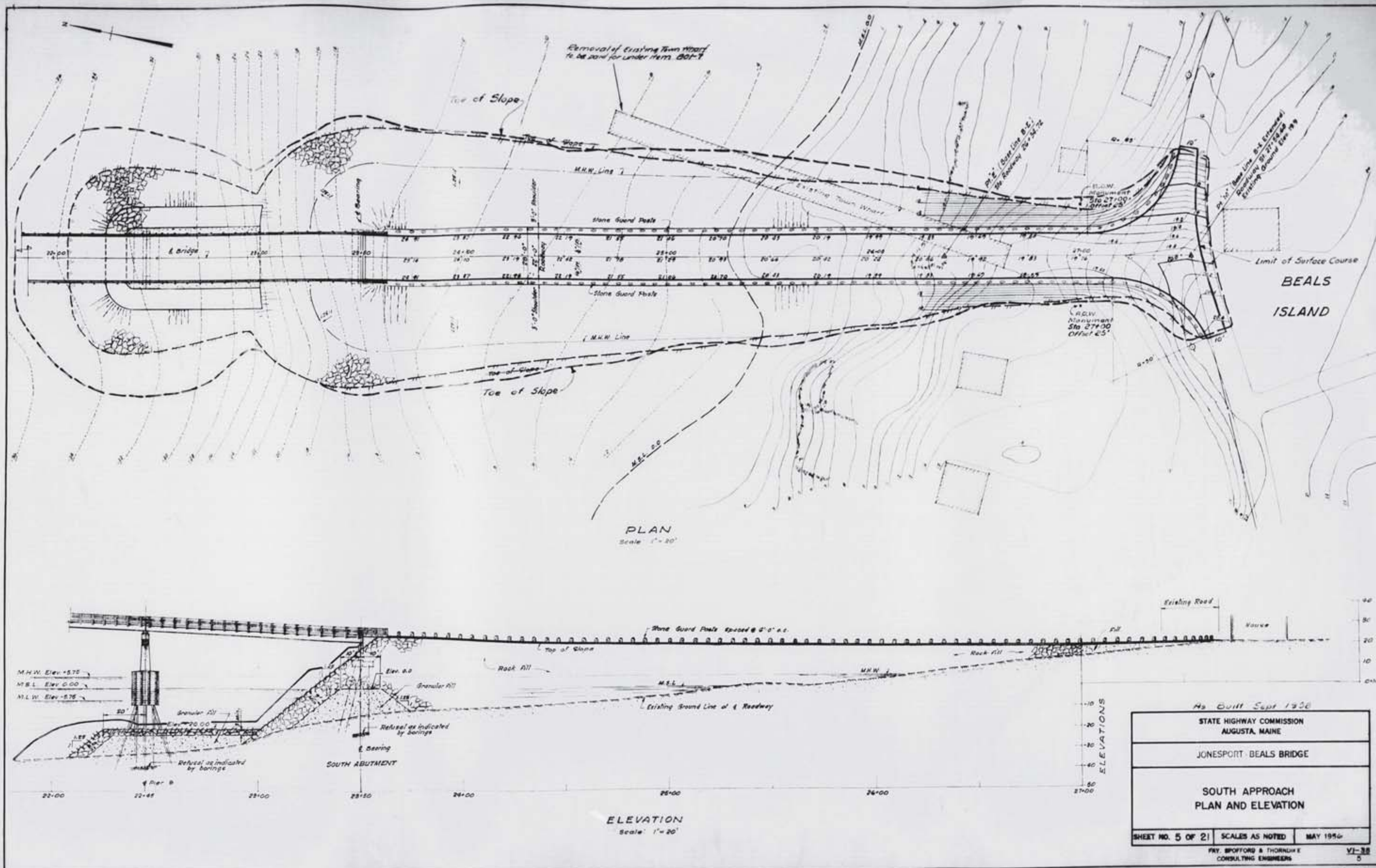
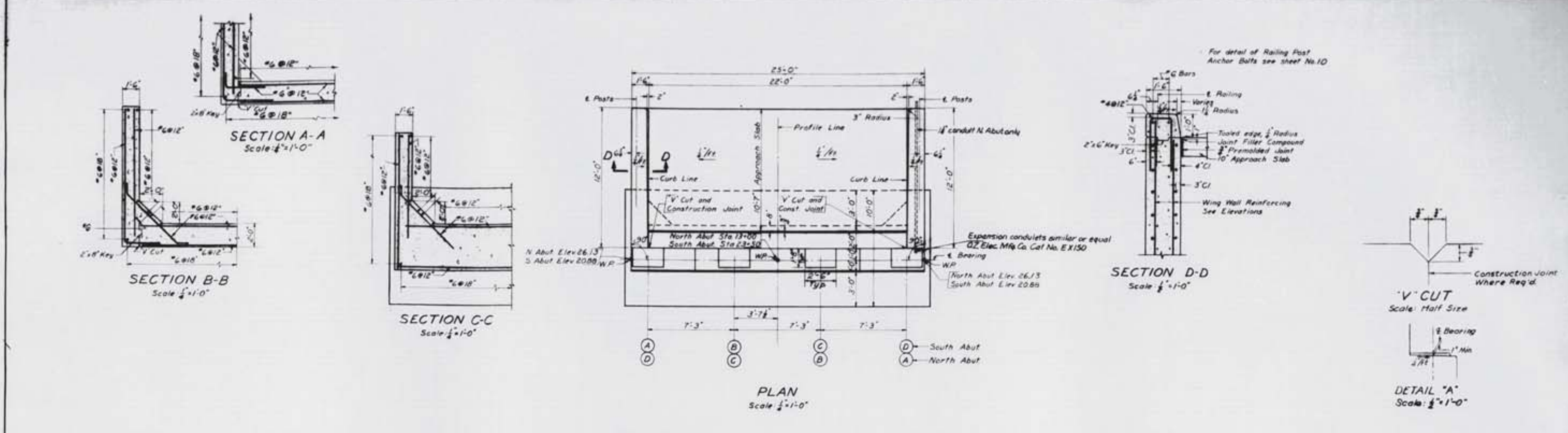
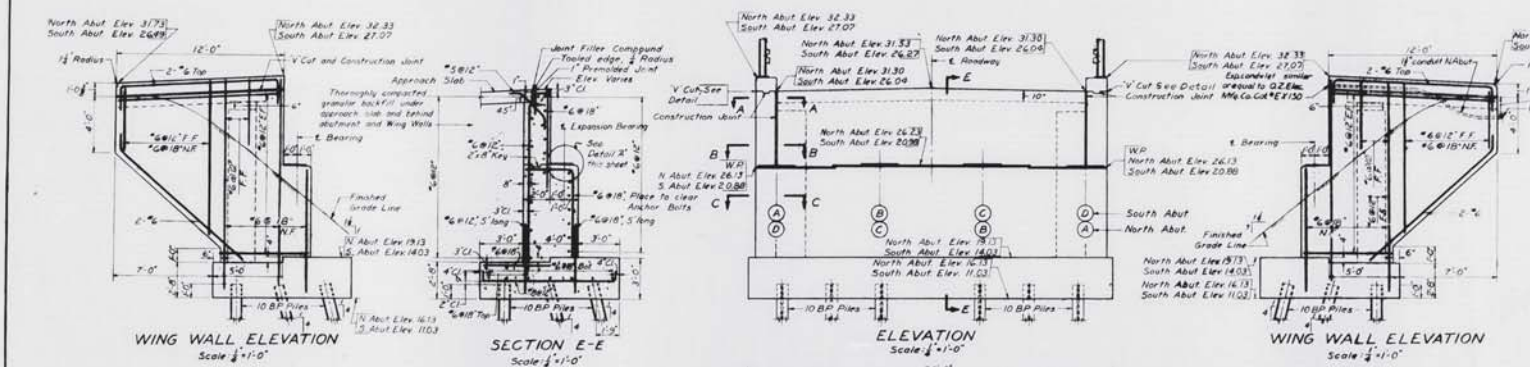
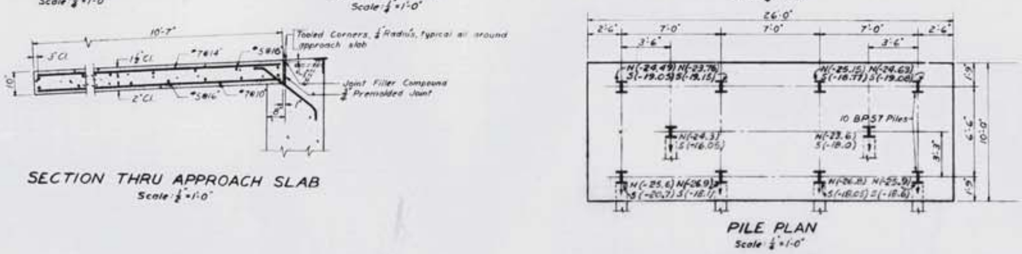
68-103


PLAN
Scale: 1" = 20'
Toe of Slope
M.H.W. Line
Top of Slope
Stone Guard Posts
Electric Handhole
Roadway Pavement
NORTH ABUTMENT
Stone Guard Posts spaced @ 6'-0" c.c.
Rock Fill
Refusal as indicated by borings
Existing Ground Line at ℄ Roadway
Granular Fill
ELECTRIC HANDHOLE
Scale: 1½" = 1'-0"
PLAN
SECTION A-A
As Built Sept. 1958
STATE HIGHWAY COMMISSION
AUGUSTA, MAINE
JONESPORT-BEALS BRIDGE
NORTH APPROACH
PLAN AND ELEVATION-PART II
SHEET NO. 4 OF 21
SCALES AS NOTED
MAY 1956
FAY, SPOFFORD & THORNDIKE
CONSULTING ENGINEERS
68-104


Removal of Existing Town Wharf to be paid for under item 801-7
Toe of Slope
M.H.W. Line
Stone Guard Posts
℄ Bridge
Existing Town Wharf
R.O.W. Monument Sta 27+00 Offset 25'
Limit of Surface Course
BEALS
ISLAND
M.S.L. 0.0
PLAN
Scale 1" = 20'
Existing Road
House
Stone Guard Posts spaced @ 6'-0" c.c.
Top of Slope
Rock Fill
M.H.W. Elev +5.70
M.S.L. Elev 0.00
M.L.W. Elev -5.75
Granular Fill
Refusal as indicated by borings
℄ Bearing
SOUTH ABUTMENT
℄ Pier 6
Existing Ground Line at ℄ Roadway
ELEVATIONS
22+00
23+00
23+50
24+00
25+00
26+00
27+00
ELEVATION
Scale: 1" = 20'
As Built Sept 1958
STATE HIGHWAY COMMISSION
AUGUSTA, MAINE
JONESPORT - BEALS BRIDGE
SOUTH APPROACH
PLAN AND ELEVATION
SHEET NO. 5 OF 21
SCALES AS NOTED
MAY 1956
FAY, SPOFFORD & THORNDIKE
CONSULTING ENGINEERS
VI-38
68-105







NOTES FOR PIERS AND ABUTMENTS

All exposed edges of concrete to have 3/4" chamfer, except as shown otherwise.

Thickness of concrete cover on reinforcement to be 3" except as noted.

All reinforcement to be lapped or anchored 30 diameters except as noted.

For location of Swedge Anchor Bolts see sheet No. 10

Reinforcing steel to be positioned to avoid interference with swedge anchor bolts.

Stringer Bearing Pads to be cast monolithically with cap or abutment and to be of sufficient height to permit bush hammering or grinding to proper elevation.

N(-25.15) indicates elev tip of pile at North abutment.

S(-18.0) indicates elev tip of pile at South abutment.

GENERAL BRIDGE NOTES

1. Design is in accordance with the following specifications:
   A) State of Maine, State Highway Commission Standard Specifications, Highways and Bridges - Revision of 1956
   B) AASHO 1953
2. Live Loading H-15
3. Concrete shall be as follows:
   Concrete poured under water - Class S
   Pier Base poured in dry - Class A
   Concrete Pier Bents and Abutments - Class A
   Concrete Bridge Deck - Class A
4. All reinforcement shall conform to A.S.T.M. Specification A-15 and Deformations to A.S.T.M. Spec. A-305. All Reinforcing Steel shall be intermediate grade new billet steel
5. All stringers & welded cover plates shall conform to A.S.T.M. Spec. A-373. All other steel shall conform to A.S.T.M. Spec. A-7 or A-373
6. Allowable stresses:
   Reinforcing Steel - 20,000 p.s.i.
   Structural Steel - 18,000 p.s.i.
   Piles (Bearing on Rock) 6000 p.s.i.

As Built Sept 1958

STATE HIGHWAY COMMISSION AUGUSTA, MAINE
JONESPORT - BEALS BRIDGE
NORTH ABUTMENT - SOUTH ABUTMENT
SHEET NO 6 OF 21 · SCALES AS NOTED · MAY 1955

FAY, SPOFFORD & THORNDIKE
CONSULTING ENGINEERS

VI-38
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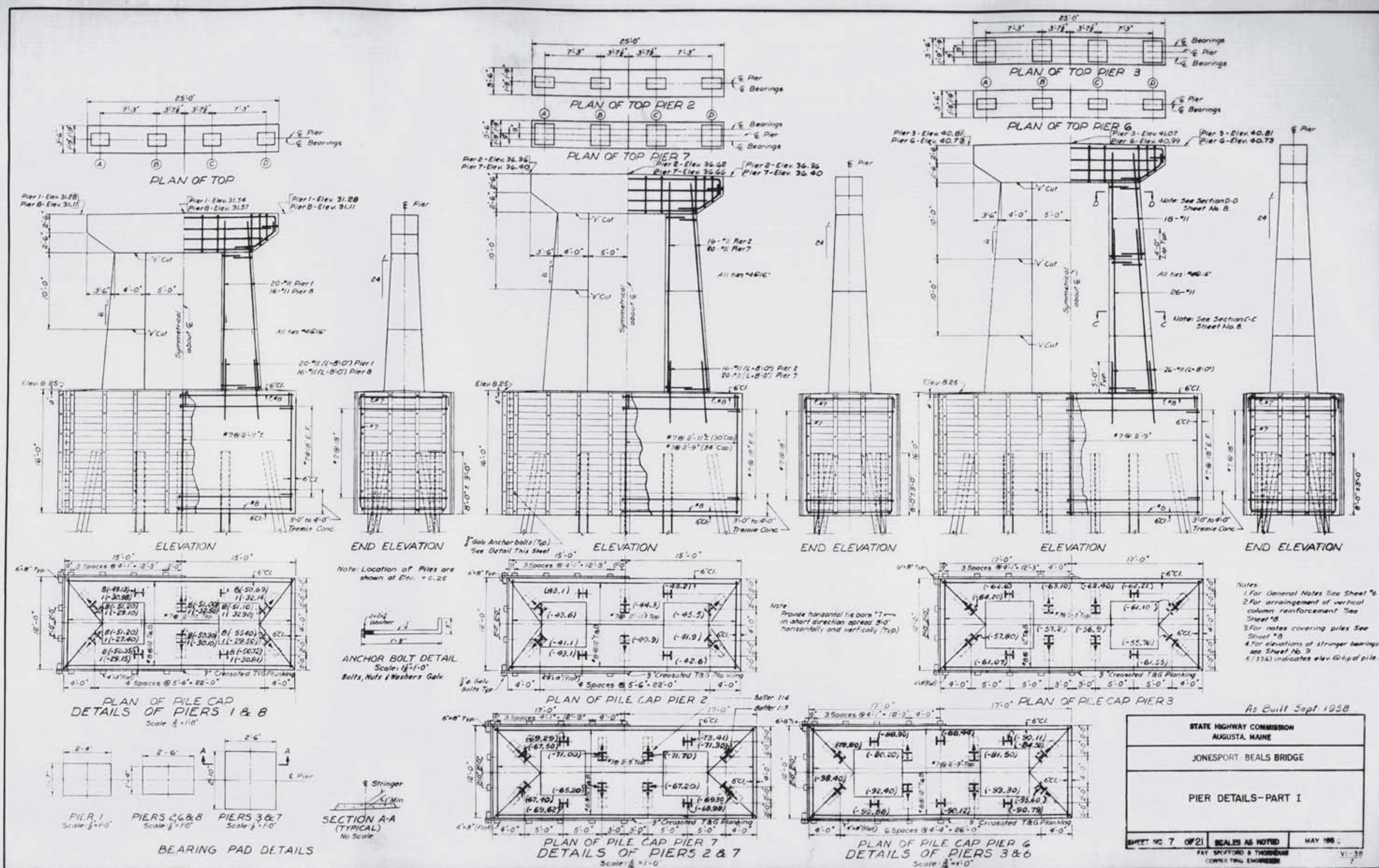
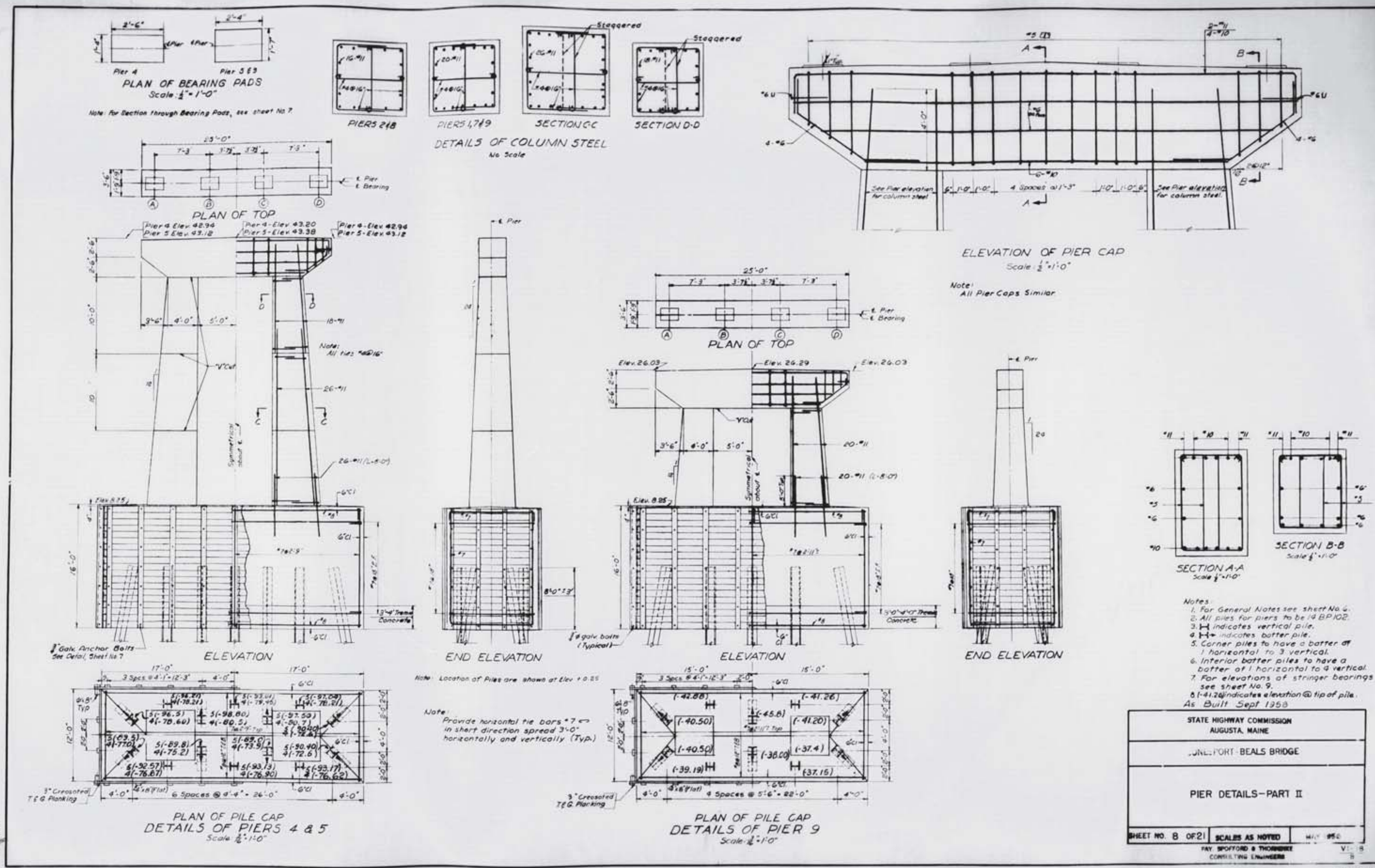
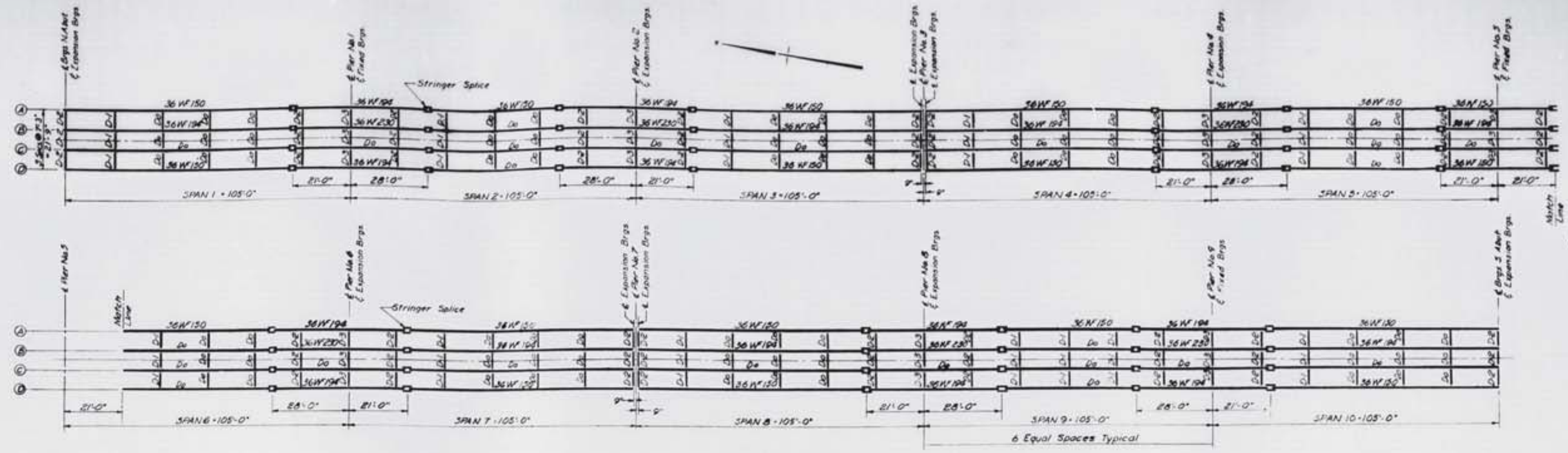

PLAN OF TOP
PLAN OF TOP PIER 2
PLAN OF TOP PIER 7
PLAN OF TOP PIER 3
PLAN OF TOP PIER 6
ELEVATION
END ELEVATION
ELEVATION
END ELEVATION
ELEVATION
END ELEVATION
Note: Location of Piles are shown at Elev. + 6.25
ANCHOR BOLT DETAIL
Scale: 1½"=1'-0"
Bolts, Nuts & Washers Galv.
PLAN OF PILE CAP
DETAILS OF PIERS 1 & 8
PLAN OF PILE CAP PIER 2
PLAN OF PILE CAP PIER 3
PLAN OF PILE CAP PIER 7
DETAILS OF PIERS 2 & 7
PLAN OF PILE CAP PIER 6
DETAILS OF PIERS 3 & 6
PIER 1
PIERS 2, 6 & 8
PIERS 3 & 7
BEARING PAD DETAILS
SECTION A-A
(TYPICAL)
No Scale
Notes
1 For General Notes See Sheet #6
2 For arrangement of vertical column reinforcement See Sheet #8
3 For notes covering piles See Sheet #8
4 For elevations of stringer bearings see Sheet No. 9
As Built Sept. 1958
STATE HIGHWAY COMMISSION
AUGUSTA, MAINE
JONESPORT - BEALS BRIDGE
PIER DETAILS-PART I
SHEET NO. 7 OF 21
SCALES AS NOTED
FAY, SPOFFORD & THORNDIKE
CONSULTING ENGINEERS
8-107



PLAN OF BEARING PADS
Scale: 1/2" = 1'-0"
Pier 4
Pier 5 & 9
Note: For Section through Bearing Pads, see sheet No. 7.
PIERS 2 & 8
PIERS 1, 7 & 9
SECTION C-C
SECTION D-D
Staggered
DETAILS OF COLUMN STEEL
No Scale
PLAN OF TOP
ELEVATION OF PIER CAP
Scale: 1/2" = 1'-0"
Note:
All Pier Caps Similar
See Pier elevation for column steel
Pier 4 - Elev. 42.94
Pier 5 - Elev. 43.12
Pier 4 - Elev. 43.20
Pier 5 - Elev. 43.38
Note:
All ties #4 @ 16"
Symmetrical about ℄
ELEVATION
END ELEVATION
Note: Location of Piles are shown at Elev. + 0.25
Note:
Provide horizontal tie bars #7 in short direction spread 3'-0" horizontally and vertically (Typ.)
3/4" Galv. Anchor Bolts
See Detail, Sheet No. 7
Elev. 26.03
Elev. 26.29
SECTION A-A
Scale 1/2" = 1'-0"
SECTION B-B
Scale 1/2" = 1'-0"
3" Creosoted T & G Planking
PLAN OF PILE CAP
DETAILS OF PIERS 4 & 5
Scale 1/8" = 1'-0"
PLAN OF PILE CAP
DETAILS OF PIER 9
Scale 1/8" = 1'-0"
Notes:
1. For General Notes see sheet No. 6.
2. All piles for piers to be 14 BP 102.
3. ⊢⊣ indicates vertical pile.
4. ⊢⊣→ indicates batter pile.
5. Corner piles to have a batter of 1 horizontal to 3 vertical.
6. Interior batter piles to have a batter of 1 horizontal to 4 vertical.
7. For elevations of stringer bearings see sheet No. 9.
8. (-41.26) indicates elevation @ tip of pile.
As Built Sept 1958
STATE HIGHWAY COMMISSION
AUGUSTA, MAINE
JONESPORT - BEALS BRIDGE
PIER DETAILS—PART II
SHEET NO. 8 OF 21
SCALES AS NOTED
FAY, SPOFFORD & THORNDIKE
CONSULTING ENGINEERS
68-108



FRAMING PLAN

Scale 1" = 20'

Bearings	A&D	B&C
North Abut.	26.17	26.27
Pier 1	31.46	31.66
Pier 2	36.54	36.74
Pier 3 Span 3	41.04	41.14
Pier 3 Span 4	41.04	41.14
Pier 4	43.12	43.33
Pier 5	43.36	43.45
Pier 6	40.91	41.12
Pier 7 Span 7	36.64	36.74
Pier 7 Span 8	36.64	36.74
Pier 8	31.29	31.49
Pier 9	26.21	26.41
South Abut.	20.92	21.02

ELEVATIONS OF BEARINGS (BOTTOM OF MASONRY PLATES)

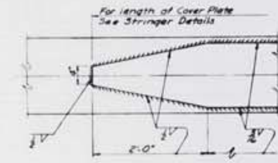
STRINGER DETAILS

No Scale

STRINGER	SPIRAL SHEAR CONNECTORS									
	PANEL A		PANEL B		PANEL C		PANEL D		PANEL E	
	PITCH	LENGTH	PITCH	LENGTH	PITCH	LENGTH	PITCH	LENGTH	PITCH	LENGTH
3-SPAN FASCIA & INTERIOR	7"	14'-0"	14"	44'-4"	7"	22'-2"	7"	14'-7"	14"	16'-4"
4-SPAN FASCIA & INTERIOR	7"	14'-0"	14"	44'-4"	7"	22'-2"	7"	16'-4"	14"	18'-8"

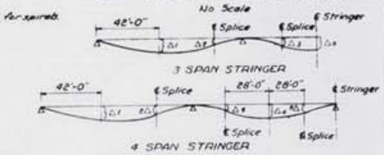
All spirals to have a diameter of 4½" and to be ⅝" ⌀ bars.
Spirals to be welded to beam with 2-$\frac{5}{16}$" welds 2¼" long at each point of contact.
Spiral lengths given are net lengths and do not include any allowance for laps.
Where spiral sections are joined, they shall be lapped for a distance of one half the smaller pitch.
Automatically end welded stud connectors may be used as an alternate for spirals. Details for studs will be submitted to the engineer for his approval.

Dead Load Deflections					
Stringer	Δ_1	Δ_2	Δ_3	Δ_4	Δ_5
3 Span Interior	2⅛"	1⅛"	1⅛"	2"	—
3 Span Fascia	2⅜"	1⅛"	1⅛"	1⅛"	—
4 Span Interior	3"	1⅜"	¾"	¾"	¾"
4 Span Fascia	2⅞"	1⅛"	¾"	¾"	¾"



COVER PLATE WELDING DETAIL

No Scale



DEFLECTION DIAGRAM

No Scale

Notes:
For General Notes See Sheet No. 6
All dimensions shown on Framing Plan are horizontal
For details of stringer splices see Sheet No. 11
For bearing details see Sheet No. 10
Stringers shall be cambered for dead load deflection and vertical curve. Fabricator shall submit proposed camber diagram

As Built Sept 1958

STATE HIGHWAY COMMISSION
AUGUSTA, MAINE

JONESPORT-BEALS BRIDGE

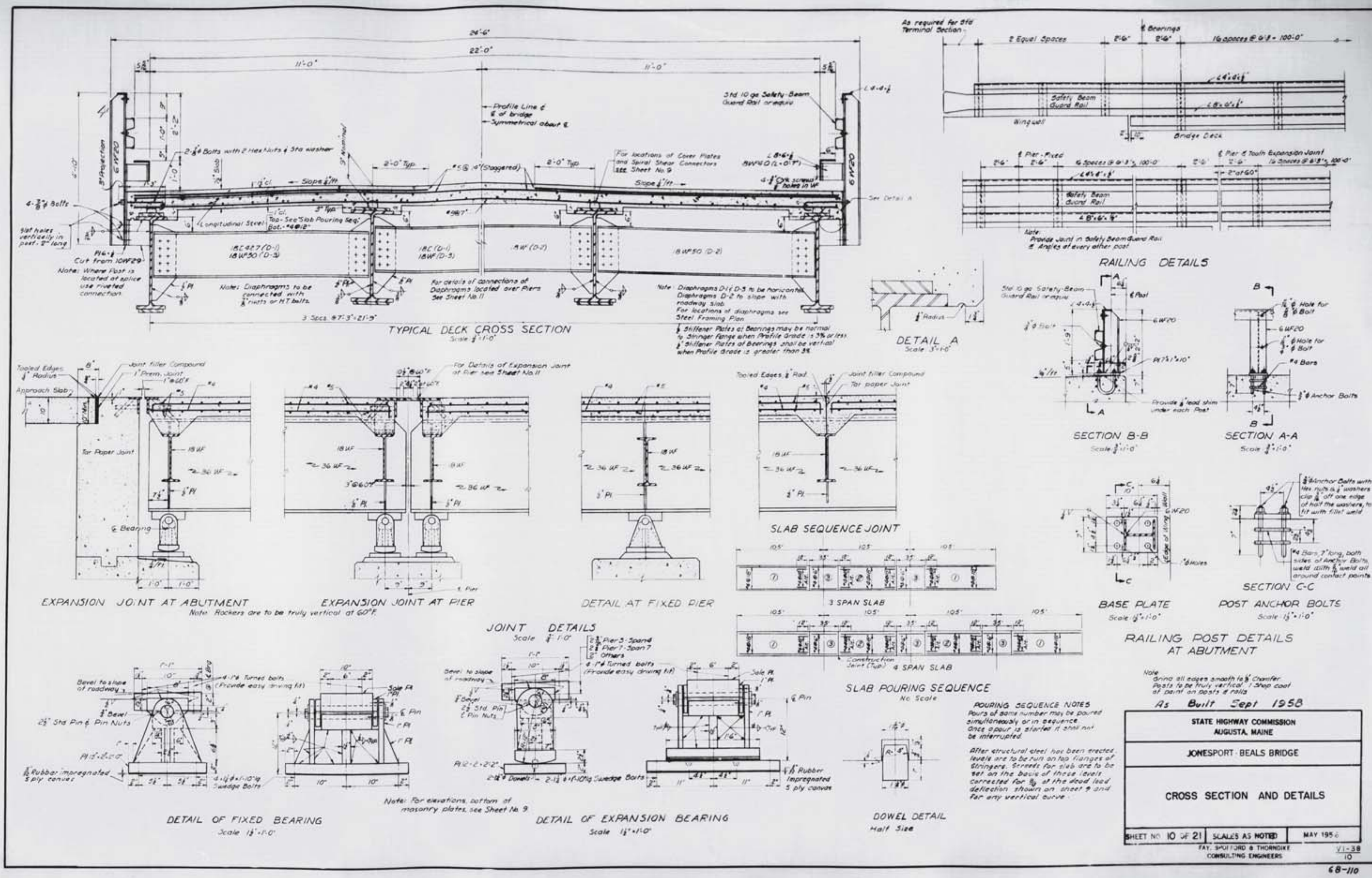
FRAMING PLAN AND DETAILS

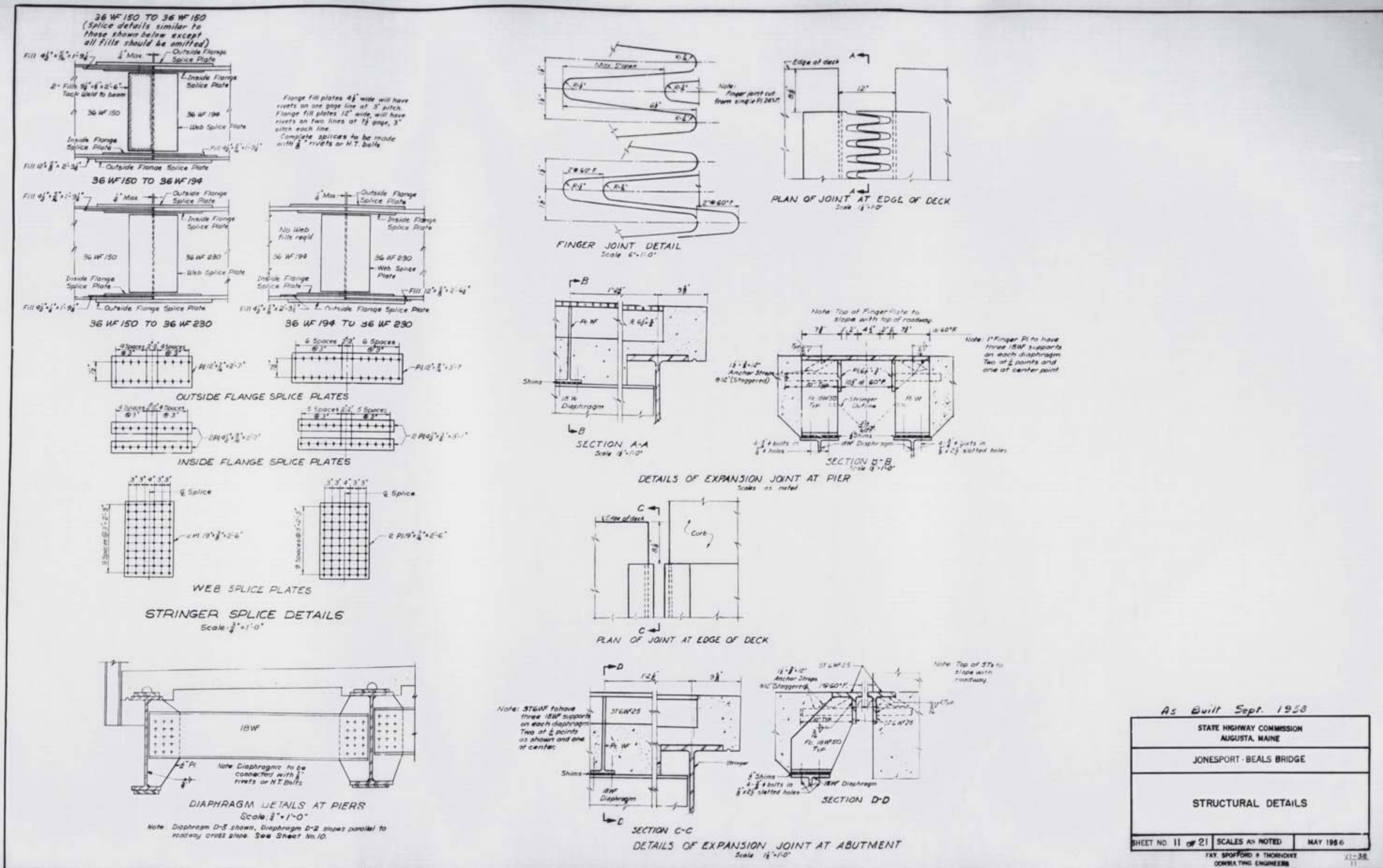
SHEET NO. 9 OF 21	SCALES AS NOTED	MAY 1956

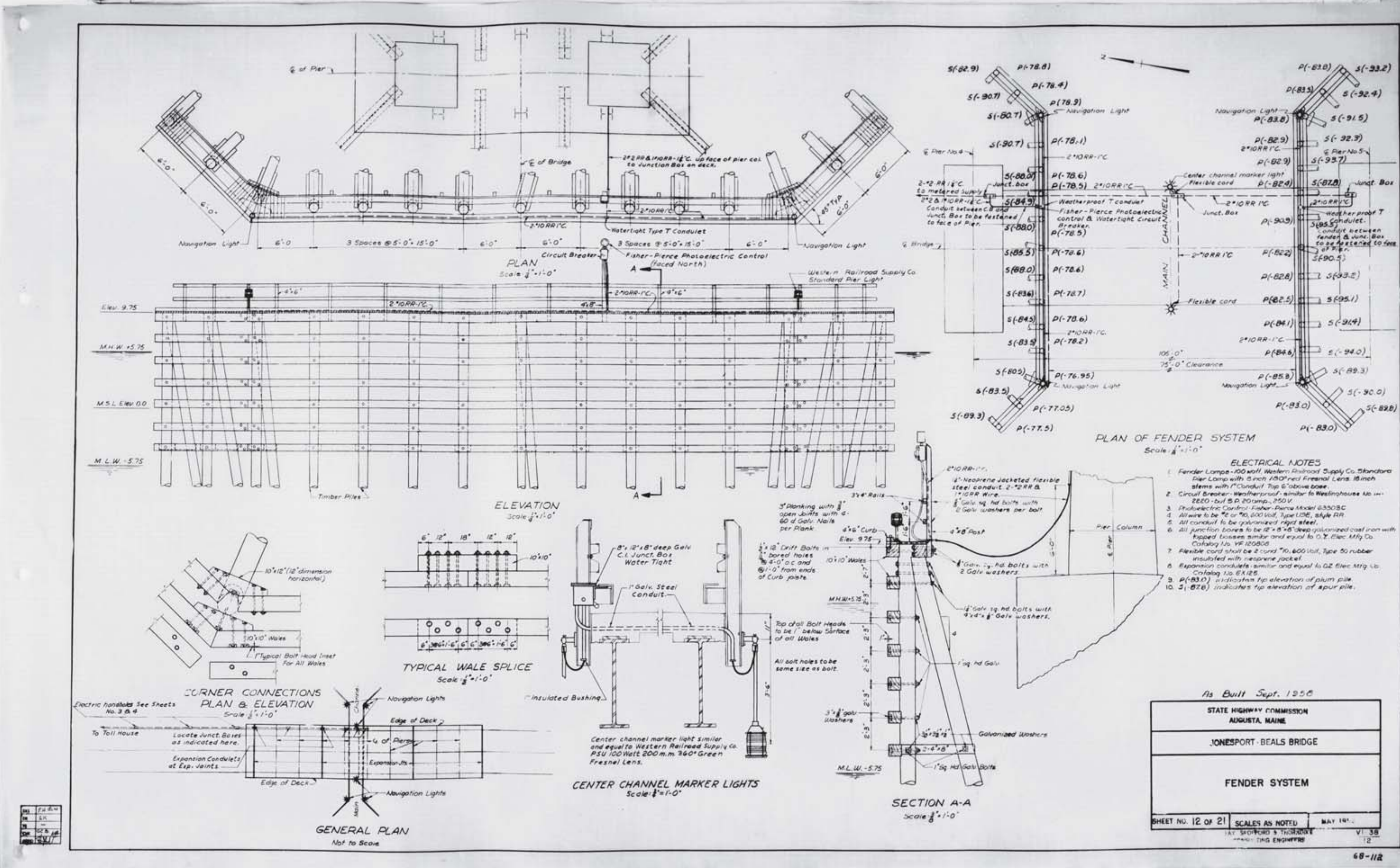
FAY, SPOFFORD & THORNDIKE
CONSULTING ENGINEERS

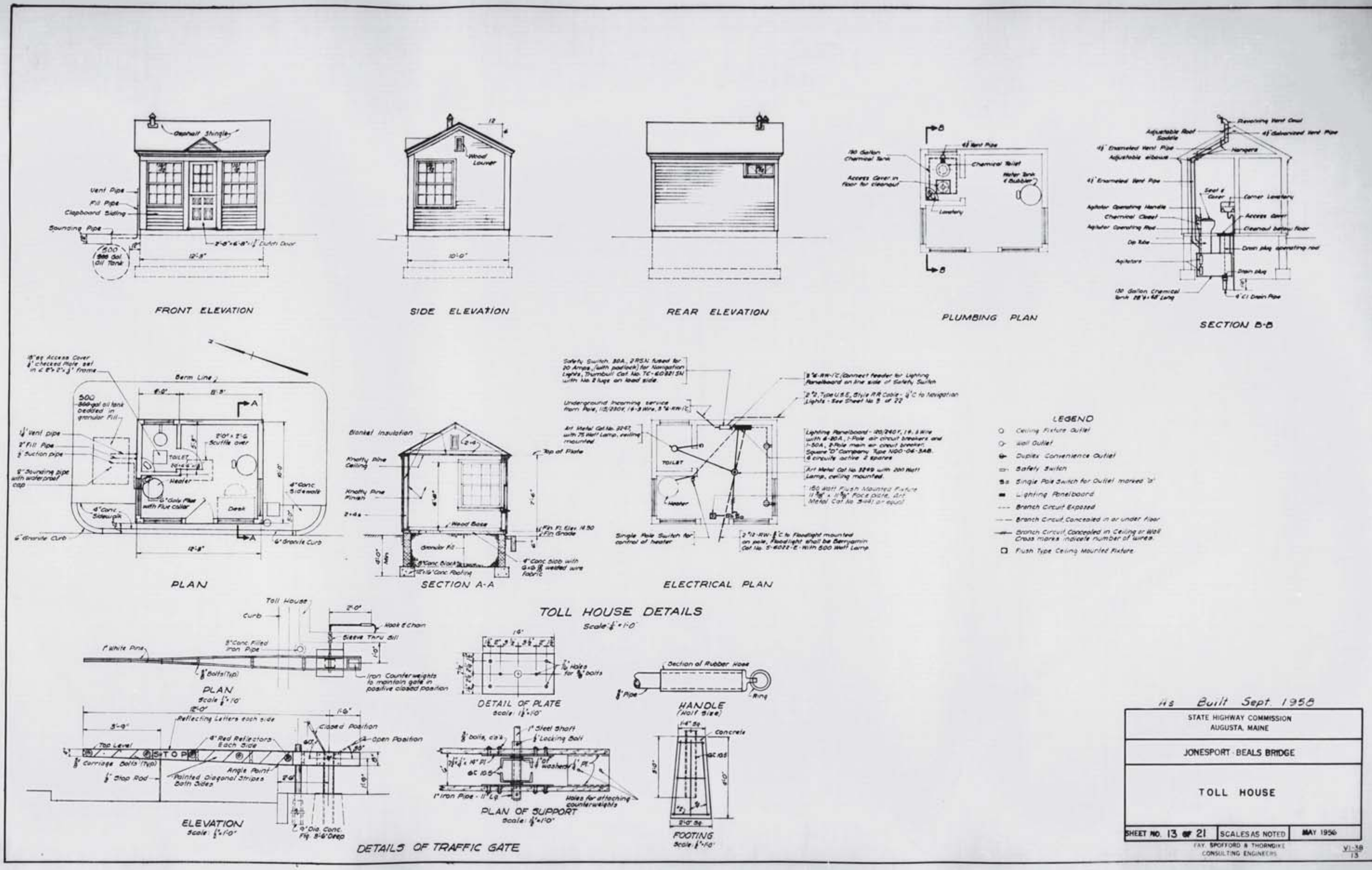
VI-38 / 9

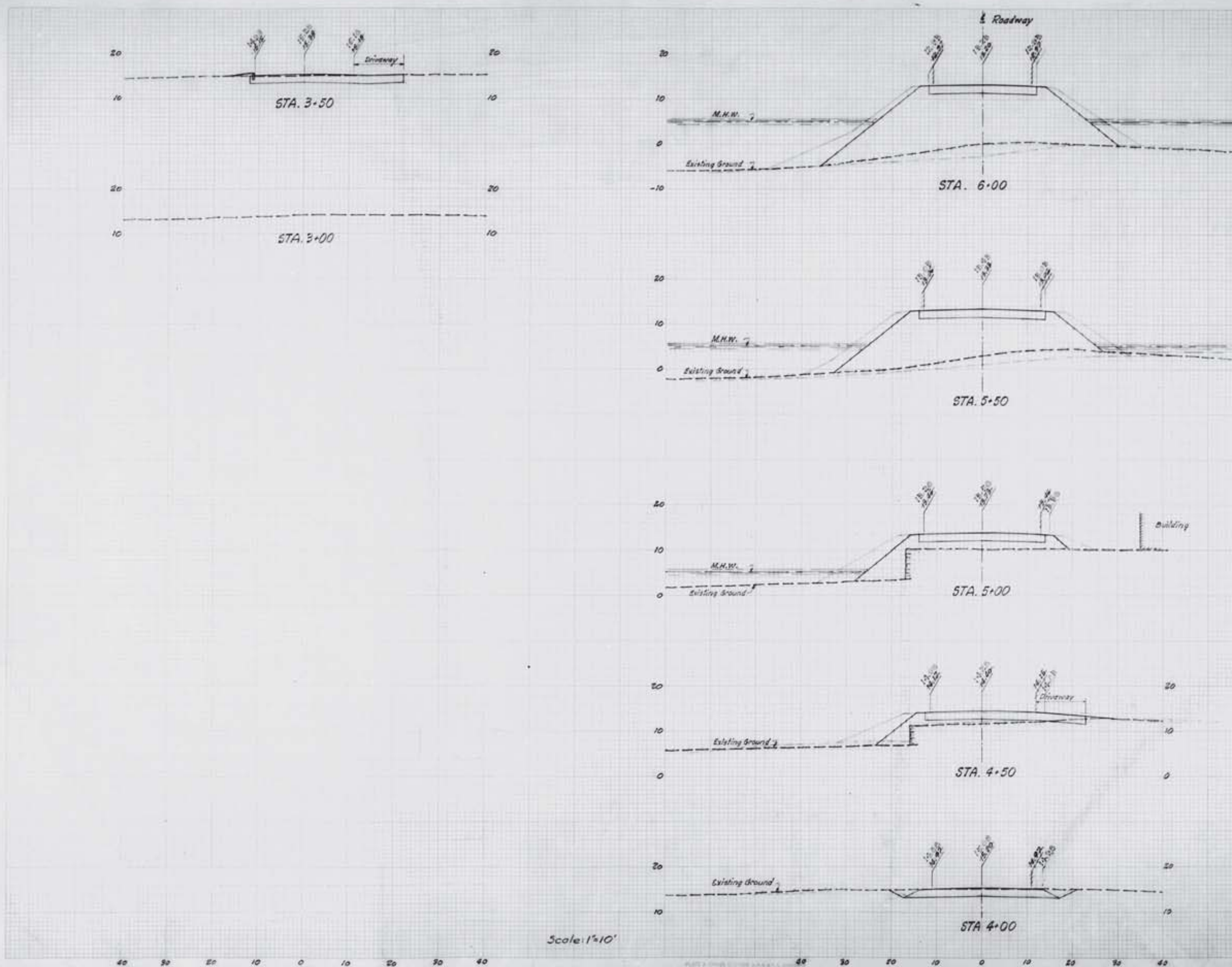
68-109


TYPICAL DECK CROSS SECTION
RAILING DETAILS
DETAIL A
SECTION B-B
SECTION A-A
SLAB SEQUENCE JOINT
3 SPAN SLAB
4 SPAN SLAB
SLAB POURING SEQUENCE
No Scale
EXPANSION JOINT AT ABUTMENT
EXPANSION JOINT AT PIER
Note: Rockers are to be truly vertical at 60°F.
DETAIL AT FIXED PIER
JOINT DETAILS
BASE PLATE
SECTION C-C
POST ANCHOR BOLTS
RAILING POST DETAILS
AT ABUTMENT
POURING SEQUENCE NOTES
Pours of same number may be poured simultaneously or in sequence. Once a pour is started it shall not be interrupted.
Note: For elevations, bottom of masonry plates, see Sheet No. 9.
DETAIL OF FIXED BEARING
DETAIL OF EXPANSION BEARING
DOWEL DETAIL
Half Size
As Built Sept 1958
STATE HIGHWAY COMMISSION
AUGUSTA, MAINE
JONESPORT - BEALS BRIDGE
CROSS SECTION AND DETAILS
SHEET NO. 10 OF 21
SCALES AS NOTED
MAY 1956
FAY, SPOFFORD & THORNDIKE
CONSULTING ENGINEERS
VI-38
10
68-110


36 WF 150 TO 36 WF 150
(Splice details similar to those shown below except all Fills should be omitted)
36 WF 150 TO 36 WF 194
36 WF 150 TO 36 WF 230
36 WF 194 TO 36 WF 230
Outside Flange Splice Plate
Inside Flange Splice Plate
Web Splice Plate
No Web Fills req'd
Flange fill plates 4½" wide will have rivets on one gage line at 3" pitch. Flange fill plates 12" wide, will have rivets on two lines at 7½" gage, 3" pitch each line.
Complete splices to be made with ⅞" rivets or H.T. bolts
OUTSIDE FLANGE SPLICE PLATES
INSIDE FLANGE SPLICE PLATES
WEB SPLICE PLATES
STRINGER SPLICE DETAILS
Scale: ¾" = 1'-0"
DIAPHRAGM DETAILS AT PIERS
Scale: ¾" = 1'-0"
Note: Diaphragms to be connected with ⅞" rivets or H.T. Bolts
Note: Diaphragm D-3 shown, Diaphragm D-2 slopes parallel to roadway cross slope. See Sheet No. 10.
FINGER JOINT DETAIL
Scale 6" = 1'-0"
Note: Finger joint cut from single Pl 24"x1"
PLAN OF JOINT AT EDGE OF DECK
Scale 1½" = 1'-0"
SECTION A-A
Scale 1½" = 1'-0"
SECTION B-B
Scale 1½" = 1'-0"
Note: Top of Finger Plate to slope with top of roadway.
Note: 1" Finger Pl to have three 18WF supports on each diaphragm. Two at ¼ points and one at center point.
DETAILS OF EXPANSION JOINT AT PIER
Scales as noted
PLAN OF JOINT AT EDGE OF DECK
Curb
Note: ST6WF to have three 18WF supports on each diaphragm. Two at ¼ points as shown and one at center.
Note: Top of STs to slope with roadway.
SECTION C-C
SECTION D-D
DETAILS OF EXPANSION JOINT AT ABUTMENT
Scale 1½" = 1'-0"
As Built Sept. 1958
STATE HIGHWAY COMMISSION
AUGUSTA, MAINE
JONESPORT - BEALS BRIDGE
STRUCTURAL DETAILS
SHEET NO. 11 OF 21
SCALES AS NOTED
MAY 1956
FAY, SPOFFORD & THORNDIKE CONSULTING ENGINEERS
68-111


PLAN
Scale 1/8"=1'-0"
ELEVATION
Scale 1/8"=1'-0"
PLAN OF FENDER SYSTEM
Scale 1/16"=1'-0"
ELECTRICAL NOTES
1. Fender Lamps - 100 watt, Western Railroad Supply Co. Standard Pier Lamp with 8 inch 180° red Fresnel Lens. 18 inch stems with 1" Conduit. Top 6" above base.
2. Circuit Breaker - Weatherproof - similar to Westinghouse No. 2220 - but S.P. 20 amp., 250 V.
3. Photoelectric Control - Fisher-Pierce Model 6350BC
4. All wire to be #2 or #10, 600 Volt, Type USE, style RR.
5. All conduit to be galvanized rigid steel.
6. All junction boxes to be 12" × 8" × 8" deep galvanized cast iron with tapped bosses similar and equal to O.Z. Elec. Mfg. Co. Catalog No. YF 120808
7. Flexible cord shall be 2 cond. #10, 600 Volt, Type SO rubber insulated with neoprene jacket.
8. Expansion condulets - similar and equal to OZ Elec. Mfg. Co. Catalog No. EX 125.
9. P(-83.0) indicates tip elevation of plum pile.
10. S(-87.8) indicates tip elevation of spur pile.
CORNER CONNECTIONS
PLAN & ELEVATION
Scale 1/4"=1'-0"
TYPICAL WALE SPLICE
Scale 1/4"=1'-0"
CENTER CHANNEL MARKER LIGHTS
Scale 1"=1'-0"
Center channel marker light similar and equal to Western Railroad Supply Co. PSU 100 Watt 200 m.m. 360° Green Fresnel Lens.
SECTION A-A
Scale 3/8"=1'-0"
GENERAL PLAN
Not to Scale
As Built Sept. 1958
STATE HIGHWAY COMMISSION
AUGUSTA, MAINE
JONESPORT - BEALS BRIDGE
FENDER SYSTEM
SHEET NO. 12 OF 21
SCALES AS NOTED
FAY, SPOFFORD & THORNDIKE
CONSULTING ENGINEERS
VI 38
12
68-112


FRONT ELEVATION
SIDE ELEVATION
REAR ELEVATION
PLUMBING PLAN
SECTION B-B
PLAN
SECTION A-A
ELECTRICAL PLAN
LEGEND
Ceiling Fixture Outlet
Wall Outlet
Duplex Convenience Outlet
Safety Switch
Lighting Panelboard
Branch Circuit Exposed
Flush Type Ceiling Mounted Fixture
TOLL HOUSE DETAILS
Scale 1/4" = 1'-0"
PLAN
DETAIL OF PLATE
HANDLE
ELEVATION
PLAN OF SUPPORT
FOOTING
DETAILS OF TRAFFIC GATE
As Built Sept. 1958
STATE HIGHWAY COMMISSION
AUGUSTA, MAINE
JONESPORT - BEALS BRIDGE
TOLL HOUSE
SHEET NO. 13 OF 21
SCALES AS NOTED
MAY 1956
FAY, SPOFFORD & THORNDIKE
CONSULTING ENGINEERS
VI-38
13



STATE HIGHWAY COMMISSION
AUGUSTA, MAINE

JONESPORT - BEALS BRIDGE

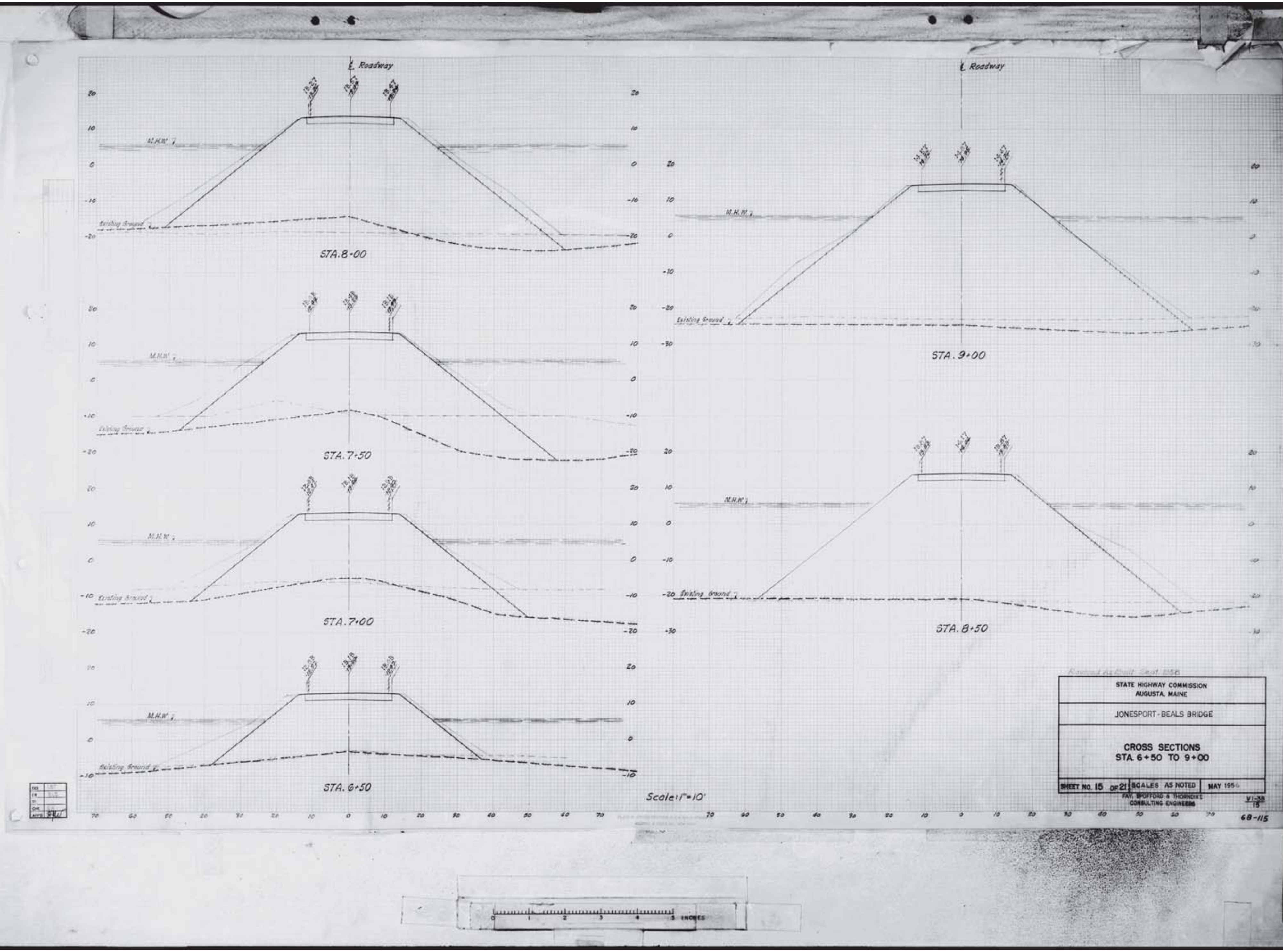
CROSS SECTIONS
STA. 0+50 TO 6+00

SHEET NO. 14 OF 21	SCALES AS NOTED	MAY 1956

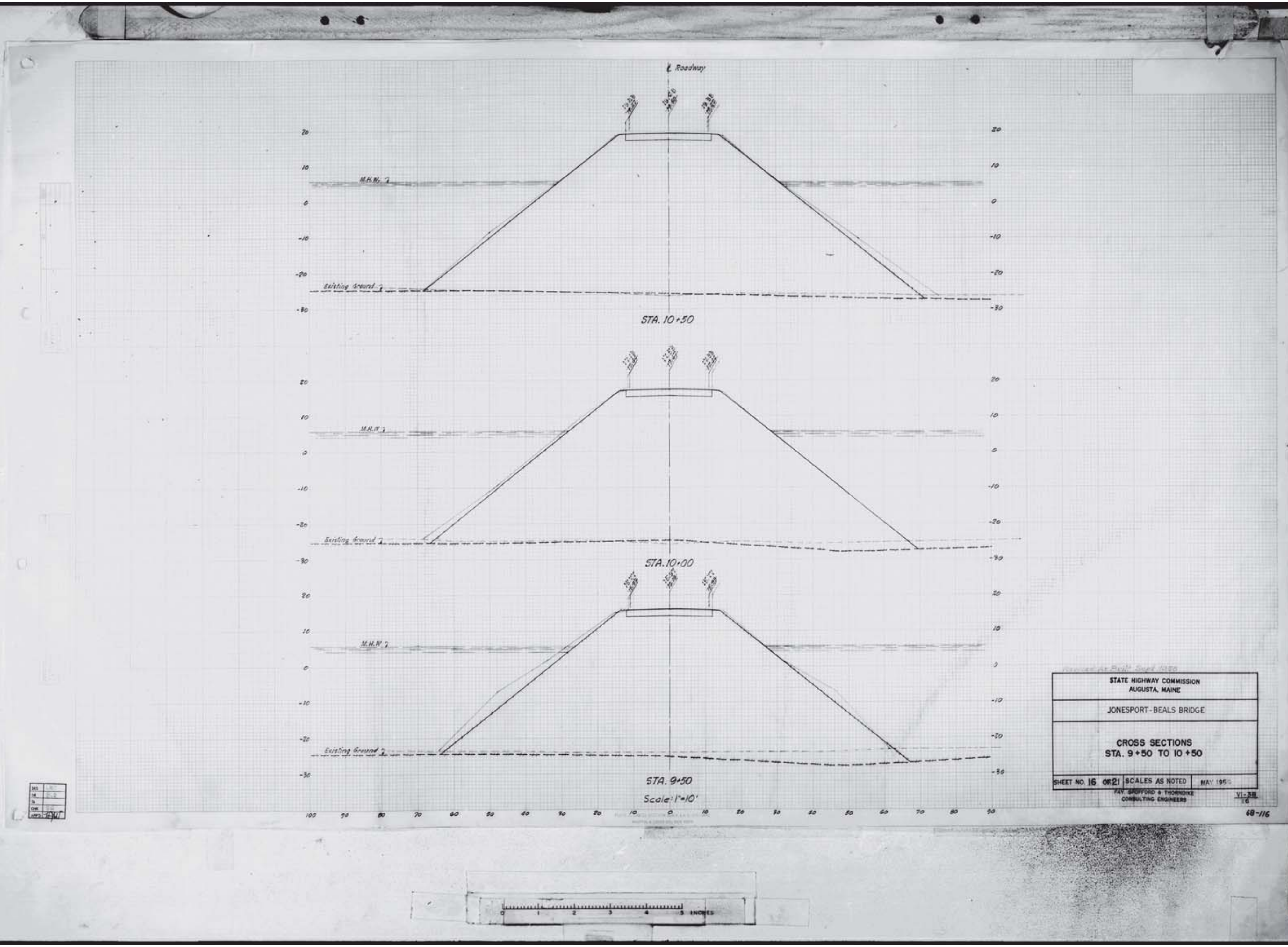
FAY, SPOFFORD & THORNDIKE
CONSULTING ENGINEERS

VI-38 / 14

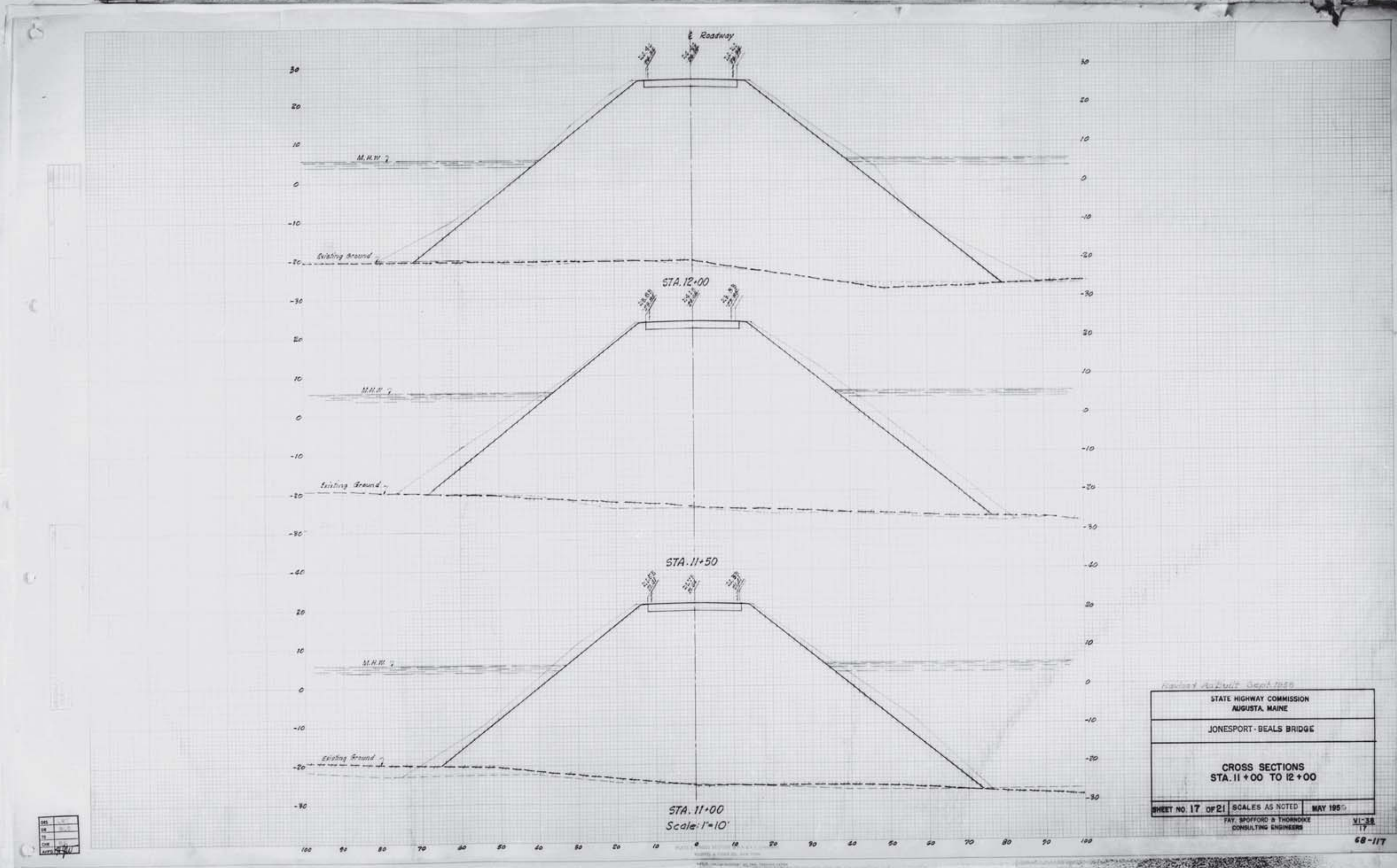
68-114



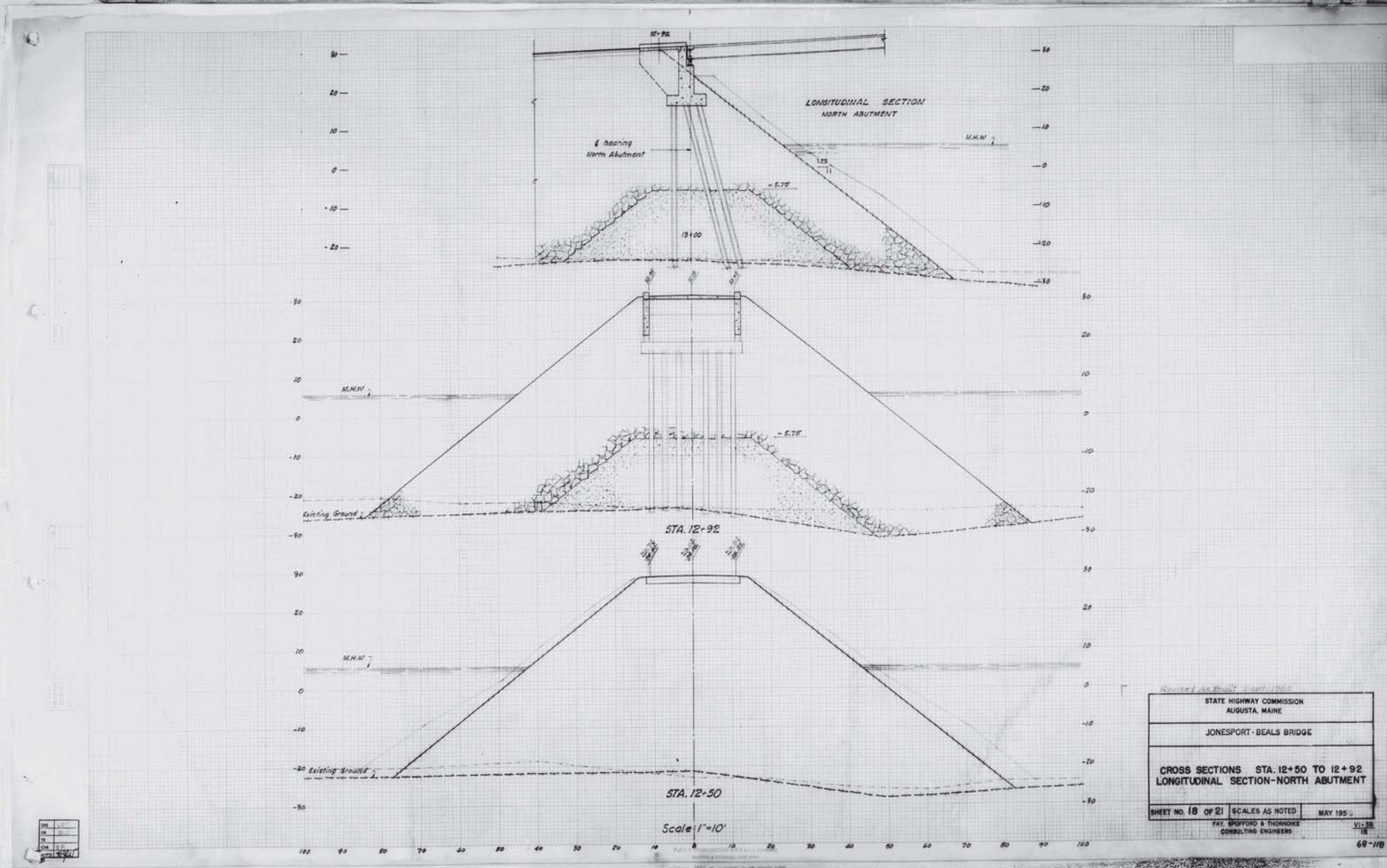
℄ Roadway
℄ Roadway
M.H.W.
Existing Ground
STA. 8+00
STA. 7+50
STA. 7+00
STA. 6+50
STA. 9+00
STA. 8+50
Scale: 1" = 10'
STATE HIGHWAY COMMISSION
AUGUSTA, MAINE
JONESPORT - BEALS BRIDGE
CROSS SECTIONS
STA. 6+50 TO 9+00
SHEET NO. 15 OF 21
SCALES AS NOTED
MAY 1956
FAY, SPOFFORD & THORNDIKE
CONSULTING ENGINEERS
VI-38
15
68-115
INCHES



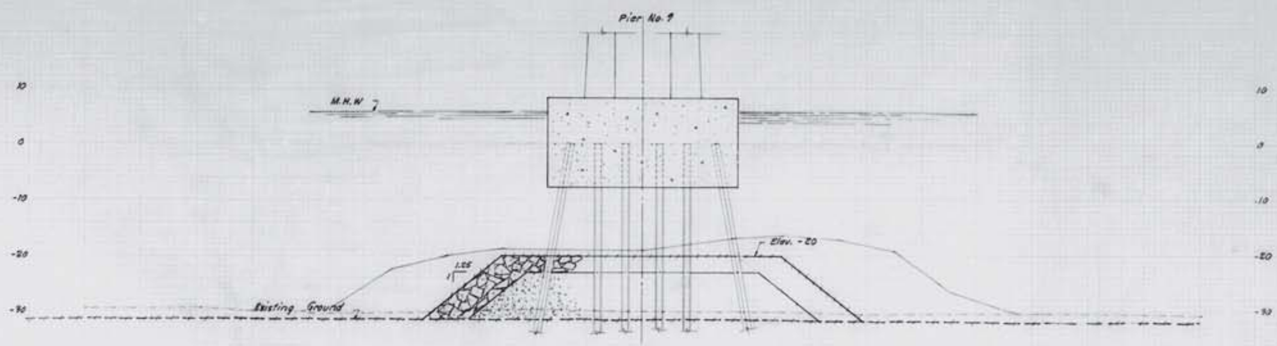
℄ Roadway
M.H.W.
Existing Ground
STA. 10+50
STA. 10+00
STA. 9+50
Scale: 1"=10'
STATE HIGHWAY COMMISSION
AUGUSTA, MAINE
JONESPORT-BEALS BRIDGE
CROSS SECTIONS
STA. 9+50 TO 10+50
SHEET NO. 16 OF 21
SCALES AS NOTED
FAY, SPOFFORD & THORNDIKE
CONSULTING ENGINEERS
VI-38
16
68-116
INCHES

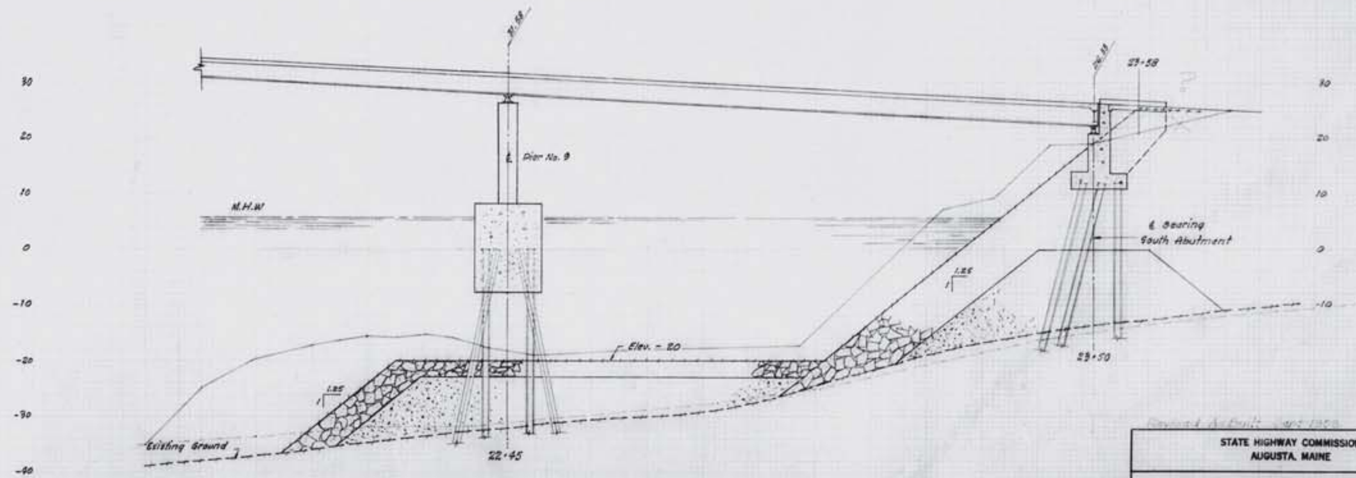


℄ Roadway
M.H.W.
Existing Ground
STA. 12+00
STA. 11+50
STA. 11+00
Scale: 1"=10'
STATE HIGHWAY COMMISSION
AUGUSTA, MAINE
JONESPORT - BEALS BRIDGE
CROSS SECTIONS
STA. 11+00 TO 12+00
SHEET NO. 17 OF 21
SCALES AS NOTED
MAY 195
FAY, SPOFFORD & THORNDIKE
CONSULTING ENGINEERS
VI-38
17
68-117
INCHES



12+92
LONGITUDINAL SECTION
NORTH ABUTMENT
℄ Bearing
North Abutment
M.H.W.
1.25
1
-5.75
13+00
M.H.W.
-5.75
Existing Ground
STA. 12+92
M.H.W.
Existing Ground
STA. 12+50
Scale: 1"=10'
STATE HIGHWAY COMMISSION
AUGUSTA, MAINE
JONESPORT-BEALS BRIDGE
CROSS SECTIONS STA. 12+50 TO 12+92
LONGITUDINAL SECTION-NORTH ABUTMENT
SHEET NO. 18 OF 21
SCALES AS NOTED
MAY 195
FAY, SPOFFORD & THORNDIKE
CONSULTING ENGINEERS
VI-38
18
68-118





LONGITUDINAL SECTION - SOUTH ABUTMENT

Scale: 1" = 10'

STATE HIGHWAY COMMISSION
AUGUSTA, MAINE

JONESPORT - BEALS BRIDGE

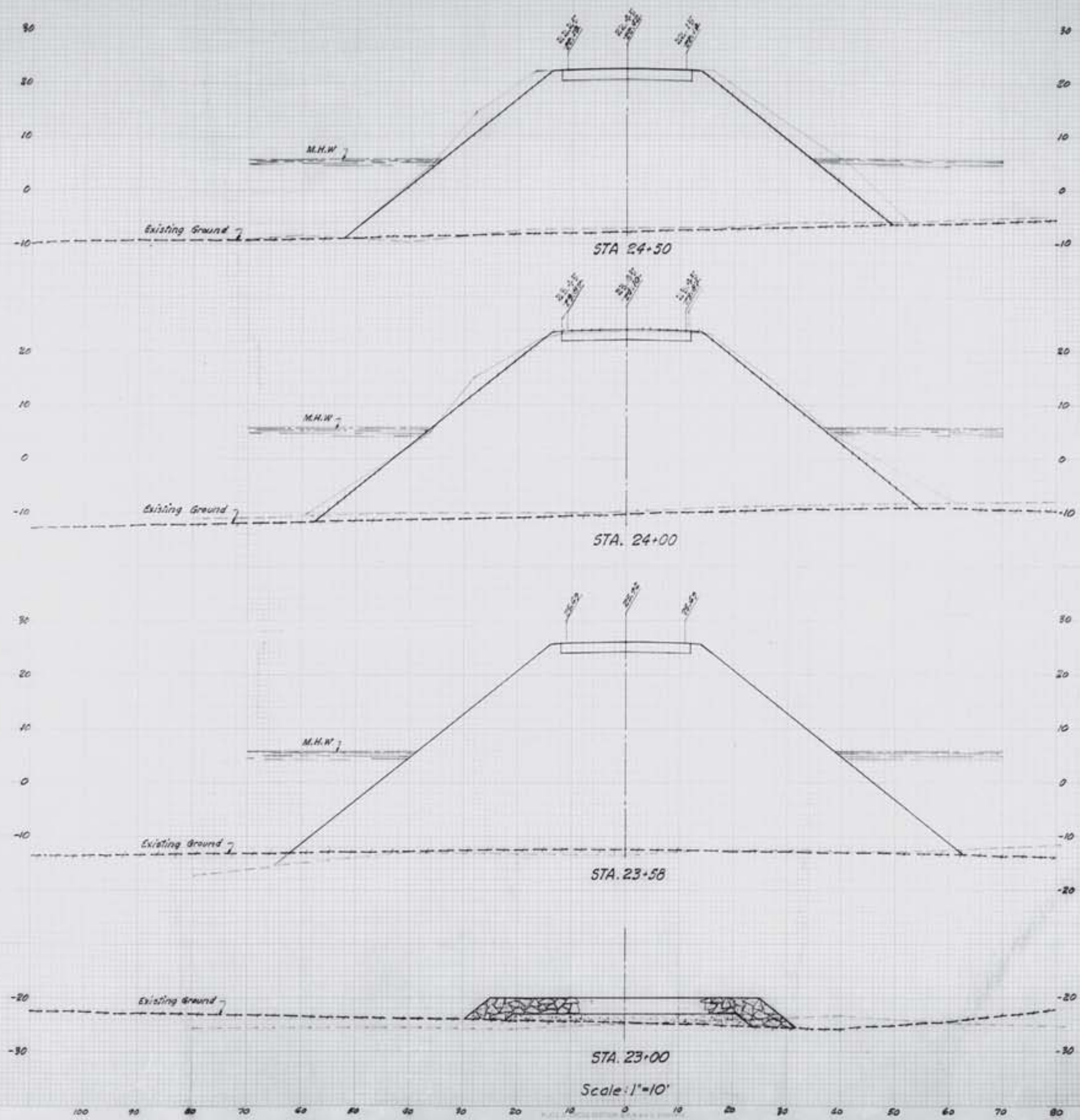
CROSS SECTION STA. 22+50
LONGITUDINAL SECTION-SOUTH ABUTMENT

SHEET NO. 19 OF 21	SCALES AS NOTED	MAY 1956

FAY, SPOFFORD & THORNDIKE
CONSULTING ENGINEERS

VI-38
19

68-119



Revised as Built Sept. 1956

STATE HIGHWAY COMMISSION
AUGUSTA, MAINE

JONESPORT-BEALS BRIDGE

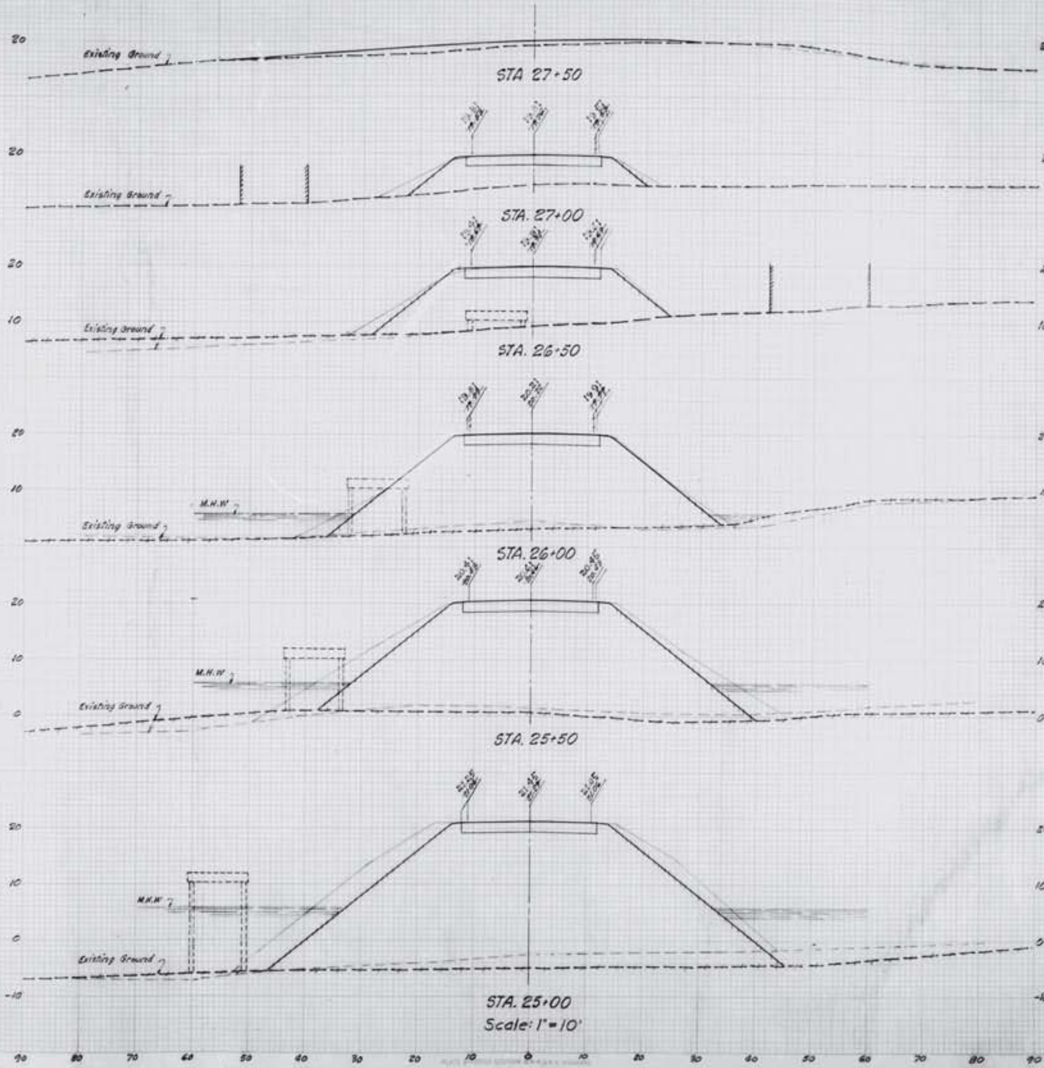
CROSS SECTIONS
STA. 23+00 TO 24+50

SHEET NO. 20 OF 21	SCALES AS NOTED	MAY 1956

FAY, SPOFFORD & THORNDIKE
CONSULTING ENGINEERS

VI-38
20

68-120



Revised As Built Sept 1958

STATE HIGHWAY COMMISSION
AUGUSTA, MAINE

JONESPORT - BEALS BRIDGE

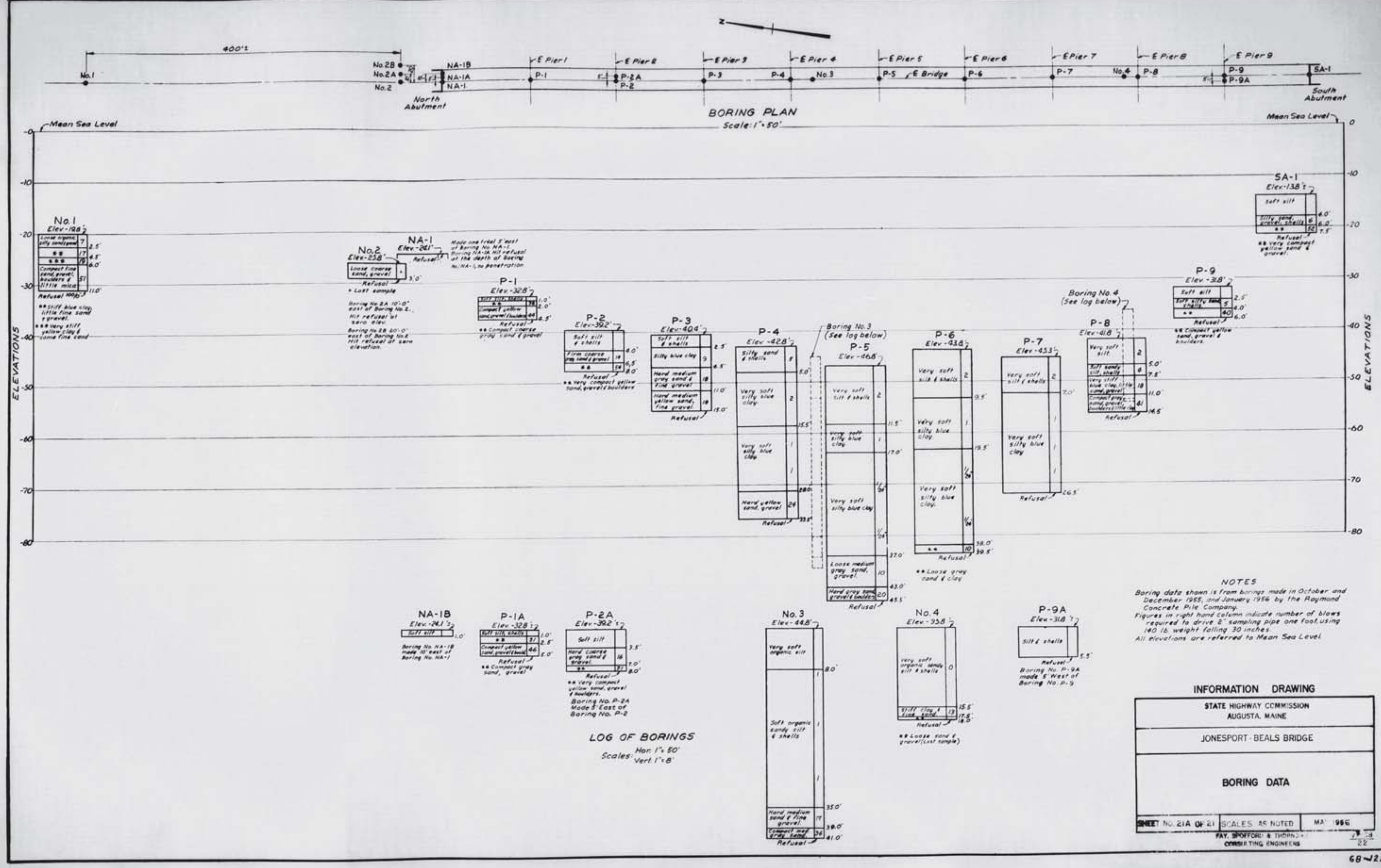
CROSS SECTIONS
STA. 25+00 TO 27+50

SHEET NO. 21 OF 21	SCALES AS NOTED	MAY 1956

FAY, SPOFFORD & THORNDIKE
CONSULTING ENGINEERS

VI-38 / 21

68-121



NOTES

Boring data shown is from borings made in October and December 1955, and January 1956 by the Raymond Concrete Pile Company.

Figures in right hand column indicate number of blows required to drive 2" sampling pipe one foot, using 140 lb. weight falling 30 inches.

All elevations are referred to Mean Sea Level.

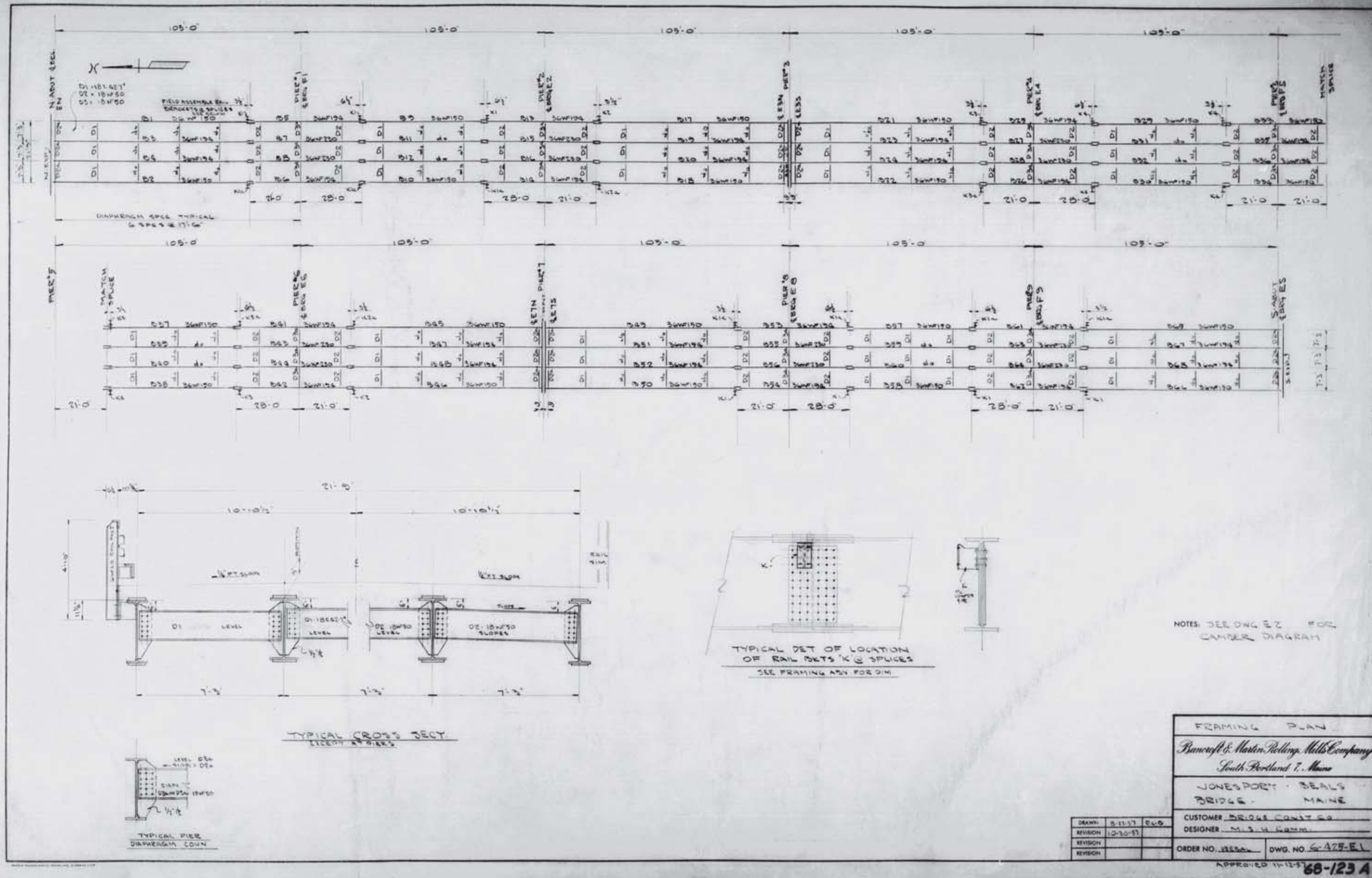
INFORMATION DRAWING

STATE HIGHWAY COMMISSION AUGUSTA, MAINE
JONESPORT - BEALS BRIDGE
BORING DATA

SHEET NO. 21A OF 21	SCALES AS NOTED	MAY 1956

FAY, SPOFFORD & THORNDIKE
CONSULTING ENGINEERS

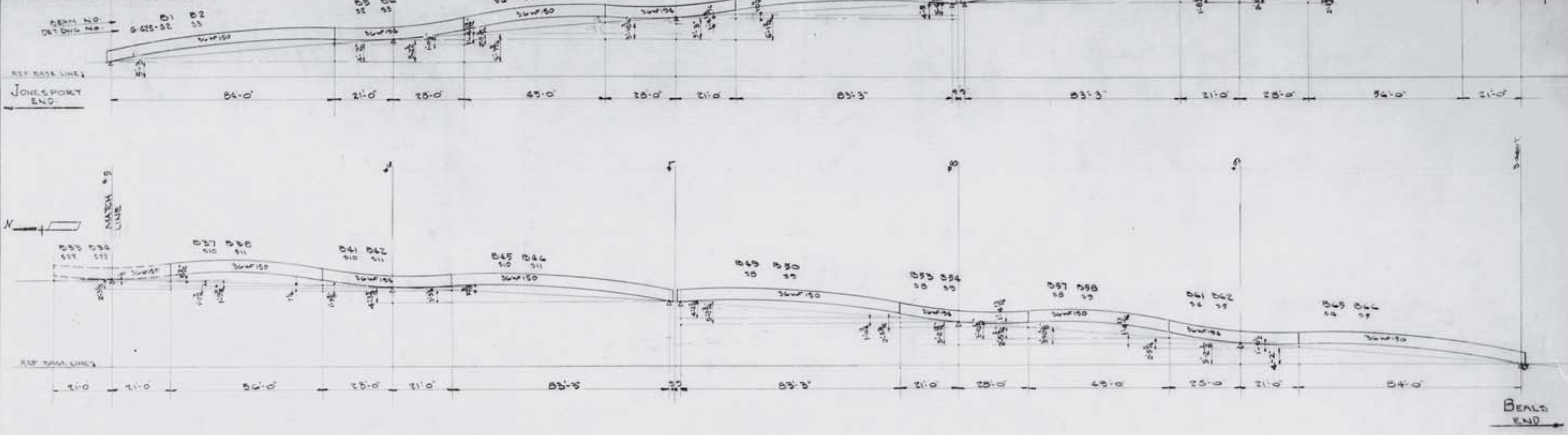
68-J22



TYPICAL CROSS SECT
TYPICAL DET OF LOCATION OF RAIL BKTS 'K' @ SPLICES
SEE FRAMING ASSY FOR DIM
TYPICAL PIER DIAPHRAGM CONN
NOTES: SEE DWG E2 FOR CAMBER DIAGRAM
FRAMING PLAN
Bancroft & Martin Rolling Mills Company
South Portland 7, Maine
JONESPORT - BEALS BRIDGE - MAINE
DRAWN 8-11-57
REVISION 10-30-57
REVISION
REVISION
CUSTOMER BRIDGE CONST CO
DESIGNER M.S.H. Comm.
DWG. NO. G-475-E1
68-123 A

FASCIA BEAMS

NOTE: DIMS GIVEN AT ALL BRG. POINTS ARE TAKEN AT BOTM OF BEAM FLANGE & ALONG STRAIGHT LINE CONNECTING SUCH POINTS. SHOP TO ADJUST FOR CAMBERS.



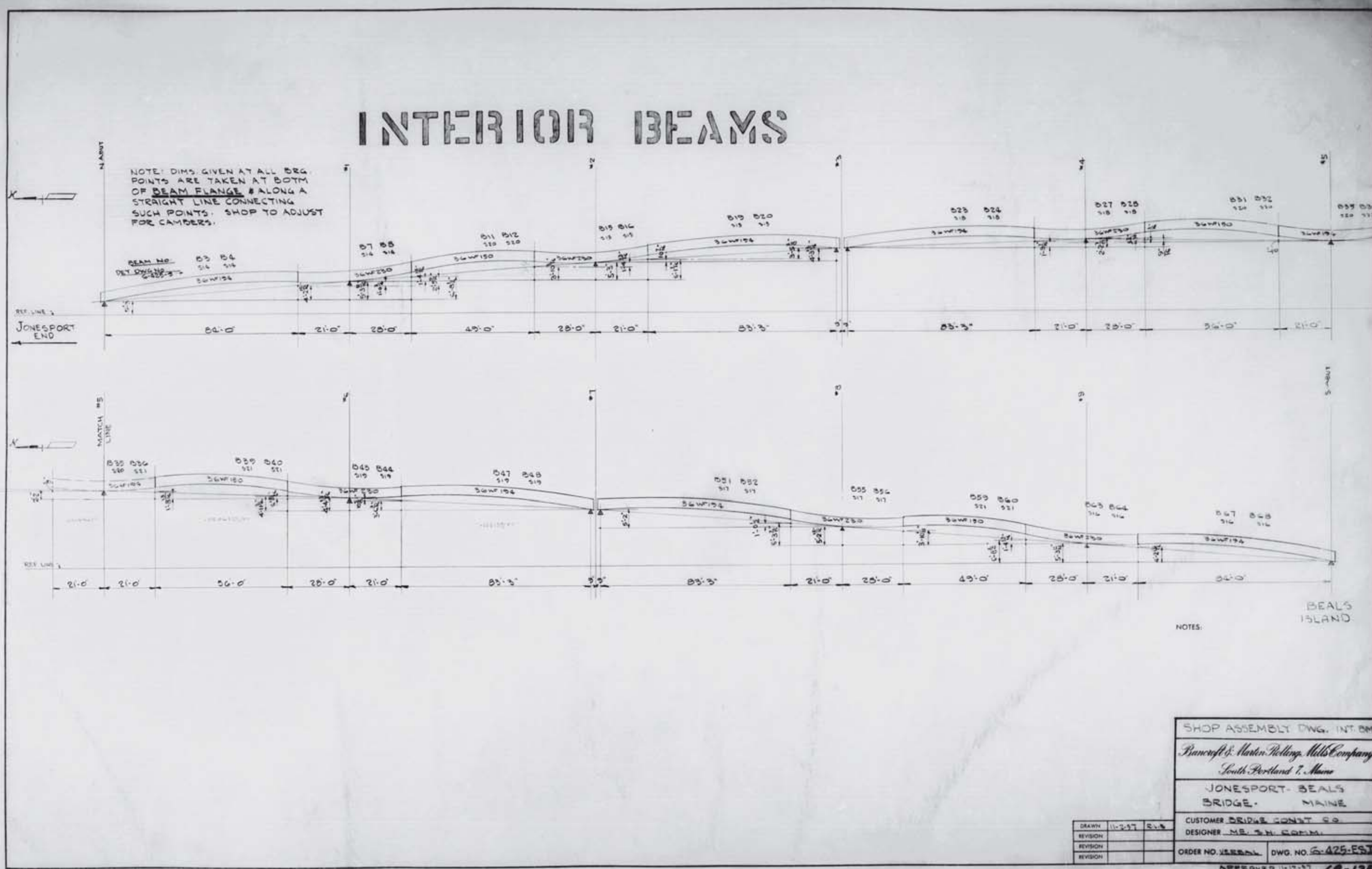
NOTES:

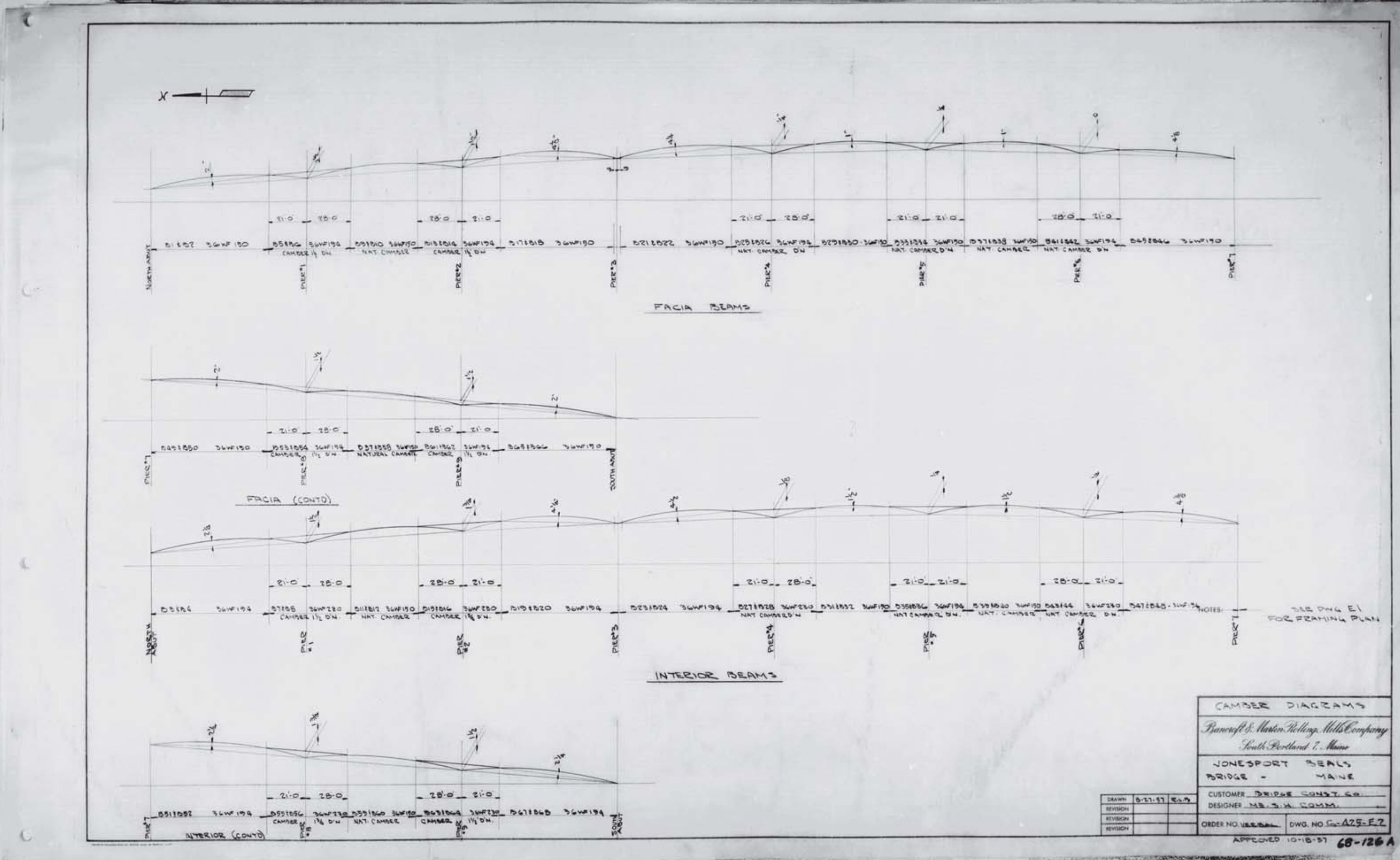
SHOP ASSEMBLY DWG. FAC	
Bancroft & Martin Rolling Mills Company, South Portland 7, Maine	
JONESPORT - BEALS BRIDGE - MAINE	
CUSTOMER: BRIDGE CONST. CO	
DESIGNER: ME. S. H. COMM.	
ORDER NO. VERBAL	DWG. NO. G-425-ESF

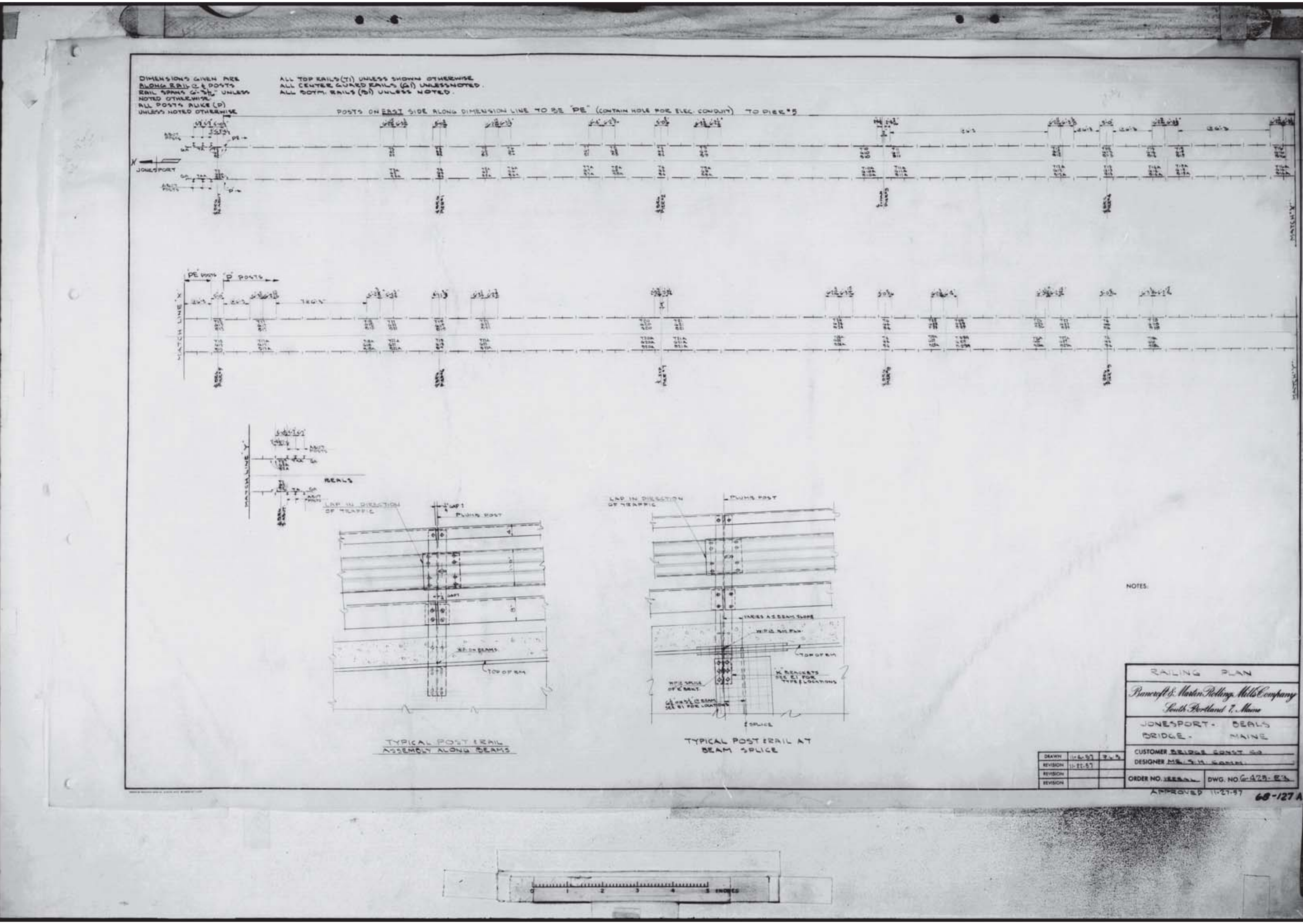
DRAWN	9-24-54	E.L.S.
REVISION	10-30-57	
REVISION		
REVISION		

APPROVED 11-12-57

68-124 A


INTERIOR BEAMS
NOTE: DIMS. GIVEN AT ALL BRG. POINTS ARE TAKEN AT BOTM. OF BEAM FLANGE & ALONG A STRAIGHT LINE CONNECTING SUCH POINTS. SHOP TO ADJUST FOR CAMBERS.
BEAM NO.
DET. DWG. NO.
JONESPORT END
BEALS ISLAND
MATCH LINE
REF. LINE
NOTES:
SHOP ASSEMBLY DWG. INT. BMS
Bancroft & Martin Rolling Mills Company
South Portland 7, Maine
JONESPORT - BEALS BRIDGE - MAINE
CUSTOMER
DESIGNER
DRAWN
REVISION
ORDER NO.
DWG. NO.
APPROVED
68-125


FACIA BEAMS
FACIA (CONT'D)
INTERIOR BEAMS
INTERIOR (CONT'D)
NOTES:
SEE DWG E1 FOR FRAMING PLAN
CAMBER DIAGRAMS
Bancroft & Martin Rolling Mills Company
South Portland 7, Maine
JONESPORT BEALS BRIDGE - MAINE
CUSTOMER BRIDGE CONST. CO.
DESIGNER ME. S.H. COMM.
DRAWN 8-27-57
REVISION
REVISION
REVISION
ORDER NO. VERBAL
DWG. NO. G-A25-E7
APPROVED 10-18-57
68-126 A
INCHES

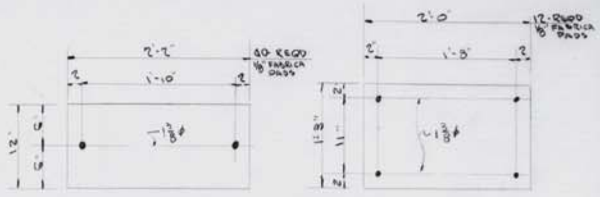


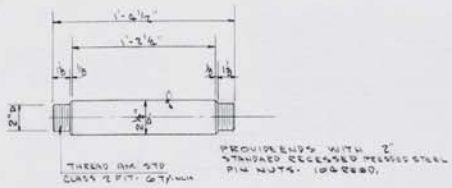
DIMENSIONS GIVEN ARE ALONG RAIL ℄ & POSTS
RAIL SPANS 6'-3 3/16" UNLESS NOTED OTHERWISE
ALL POSTS ALIKE (P) UNLESS NOTED OTHERWISE
ALL TOP RAILS (T1) UNLESS SHOWN OTHERWISE
ALL CENTER GUARD RAILS (G1) UNLESS NOTED.
ALL BOTM. RAILS (B1) UNLESS NOTED.
POSTS ON EAST SIDE ALONG DIMENSION LINE TO BE "PE" (CONTAIN HOLE FOR ELEC. CONDUIT) TO PIER #5
JONESPORT
MATCH LINE "X"
"PE" POSTS
"P" POSTS
MATCH LINE "Y"
BEALS
LAP IN DIRECTION OF TRAFFIC
PLUMB POST
TOP OF BM
TYPICAL POST & RAIL ASSEMBLY ALONG BEAMS
VARIES AS BEAM SLOPE
℄ SPLICE
TYPICAL POST & RAIL AT BEAM SPLICE
NOTES:
RAILING PLAN
Bancroft & Martin Rolling Mills Company
South Portland 7, Maine
JONESPORT - BEALS
BRIDGE - MAINE
CUSTOMER
DESIGNER
DRAWN 11-6-57
REVISION 11-22-57
REVISION
REVISION
ORDER NO.
DWG. NO. G-429-E3
APPROVED 11-27-57
68-127 A
INCHES

BEARING LOCATIONS

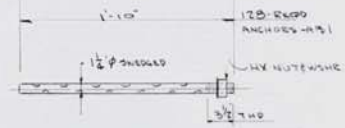
TABLE
4 OF EACH MARK REQUIRED

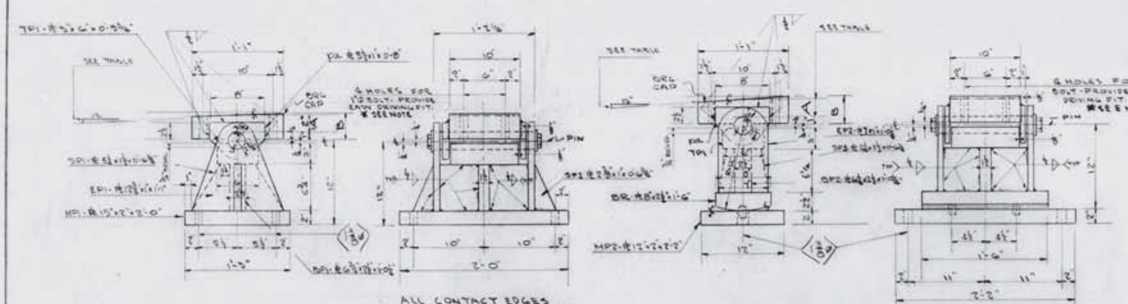
BEARING MARK	PITCH FOR BEARG CAP	CAP PLT ½ DIM. "A"	CAP PLT THKNS DIM "B"
EN	3/8"/FT	2"	3 3/8
E2	do	2"	3 3/8
E7S	do	2"	3 3/8
E8	do	2"	3 3/8
E5	do	2"	3 3/8
F1	do	2"	3 3/8
F9	do	2"	3 3/8
E3N	1/2"/FT	2"	3 1/4
E7N	do	2 1/8"	4 1/8
E3S	1/16"/FT	2 9/16"	3 11/16
E6	3/16"/FT	2"	3 1/4
E4	1/8"/FT	2"	3 1/8
F5	do	2	3 1/8





PIN DETAIL
52 REQD

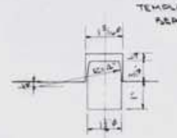




ALL CONTACT EDGES OF PLATES TO BE MILLED

ALL CONTACT EDGES OF PLATES TO BE MILLED

* HOLES FOR 1" ϕ TURNED BOLTS TO BE REAMED TO METAL TEMPLATE - SAME TEMPLATE TO BE USED FOR BEAMS



DOWEL DET.
80 REQD.

NOTE - PAINT RED LEAD & OIL EXCEPT PIN SURFACES & BOTH OF BR & TOP OF MP2 WHICH ARE PAINTED WITH WHITE LEAD & TALLOW IN WAY OF CONTACTS

FIXED BEARINGS -
TOTAL 12 REQD -
4 OF EACH TYPE AS MARKED IN TABLE ABV

EXPANSION BEARINGS
TOTAL 40 REQD -
4 OF EACH TYPE AS MARKED IN TABLE ABOVE

NOTE: SCALE WEIGH ASSEMBLIES

BILL OF MATERIAL — DWG. NO. 6-425-51

SHIP MARK	NO.	MARK	SHAPE	LENGTH (FT)	LENGTH (IN)	WT.	REMARKS
EN	4		℄ 10" × 3 3/8	1	1		MACH. BEVEL.
E2	4		do	1	1		
E7S	4		do	1	1		
E8	4		do	1	1		
E5	4		do	1	1		
F1	4		do	1	1		
F9	4		do	1	1		
E3N	4		℄ 10 × 3 1/4	1	1		
E7N	4		℄ 10 × 4 1/8	1	1		
E3S	4		℄ 10 × 3 11/16	1	1		
E6	4		℄ 10 × 3 1/4	1	1		
E4	4		℄ 10 × 3 1/8	1	1		
F5	4		℄ 10 × 3 1/8	1	1		
	104	pa	℄ 5 1/2 × 1"		8"		
	52	TP1	℄ 3" × 6"		3 3/4		
	12	BP1	℄ 6 5/8 × 2 1/2	1	0 1/4		
	40	BP2	℄ 6 1/4 × 2 1/2	1	0 1/4		
	12	MP1	℄ 15" × 2"	2	0		
	40	MP2	℄ 12 × 2	2	2		
	40	BR	℄ 8 × 2 1/2	1	6		
	24	SP1	℄ 5 1/4 × 1 1/2		6 3/4		
	80	SP3	℄ 2 1/4 × 1 1/2		6 1/4		
	24	SP2	℄ 2 7/8 × 1"		6 3/4		
	24	EP1	℄ 12 3/4 × 1"	1	1		
	80	EP2	℄ 7 × 1"	1	0 1/4		
	80	DOWELS	1 1/2" ϕ TURNED		1 3/4"		
	52	PINS	2 1/2" ϕ TURNED	1	4 1/2		
	104	PIN NUTS	2" STANDARD			208	
AB1	128		1 1/2 ϕ ROD	1	10		
	128	HV NUTS	1 1/2"				
	128	CUT WASHER	1 1/2"				
	56		1" TURNED MACH BOLTS		6 1/2		
	152		[illegible]		7 1/2		
PADS	40		1/8" FABRICA × 12"	2	2		
do	12		1/8" FABRICA × 1'-8"	2	0		

SHOP CONNECTIONS: WELDED
FIELD CONNECTIONS: BOLTED
HOLES: AS NOTED.
PAINT: RED LEAD & LIN OIL — SEE NOTE

DRAWN	4-18-57	R.L.B.
REVISION		
REVISION		
REVISION		

BEARING DETAILS

Bancroft & Martin Rolling Mills Company
South Portland 7, Maine

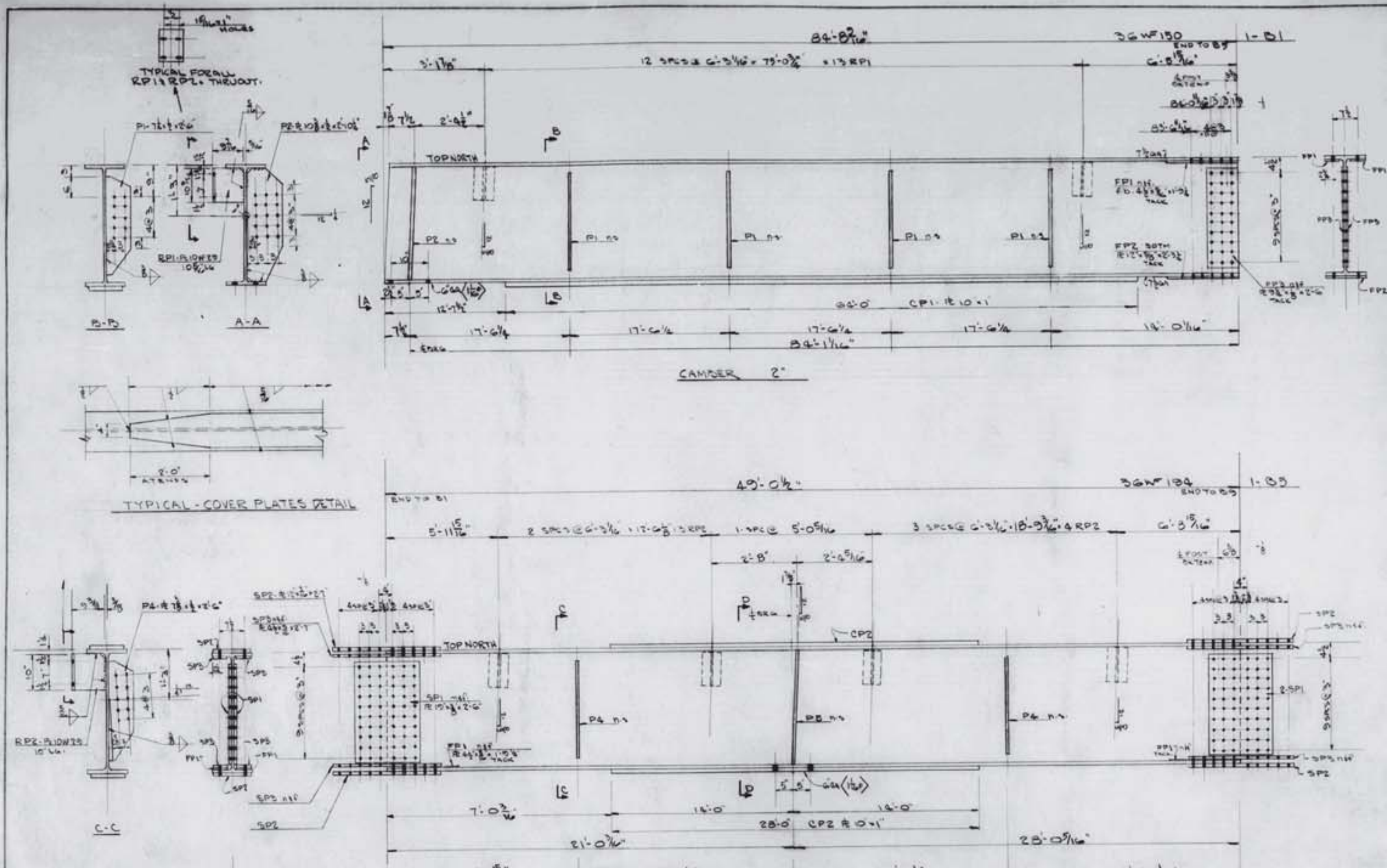
JONESPORT - BEALS BRIDGE
MAINE

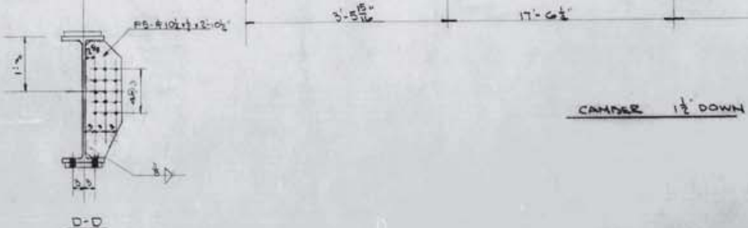
CUSTOMER BRIDGE CONST. CO.
DESIGNER ME. STATE H. COMM.

ORDER NO. 12234L | DWG. NO. 6-425-51

APPROVED 4-26-57

68-128 A





SHIP MARK	NO.	MARK	SHAPE	LENGTH		WT.	DEDUCTS	REMARKS
B1	1		36WF150	84	8 3/16	12707	12"	
B5	1		36WF194	49	0 1/2	9514		
	4	P1	℞ 7 1/2 x 1/2	2	6	127	24	
	2	P4	℞ 7 5/8 x 1/2	2	6	63	12	
	1	P2	℞ 10 3/8 x 1/2	2	10 1/2	50	5	
	1	P5	℞ 10 1/16 x 1/2	2	10 1/2	50	5	
	4	SP1	℞ 19 x 5/8	2	6	242		
	4	SP2	℞ 12 x 7/16	2	7	185		
	8	SP3	℞ 4 1/2 x 9/16	2	7	178		
	6	FP1	F.6 4 1/2 x 5/16	1	9 1/2	51		
	1	FP2	℞ 12 x 5/8	2	3 1/2	58		
	2	FP3	℞ 9 1/2 x 1/8	2	6	20		
	1	CP1	℞ 10" x 1"	64	0	2176	41	
	2	CP2	do	28	0	1904	32	
	13	RP1	℞ 10WF29		10 5/16	324	111	
	7	RP2	do		10	169	57	
						27314	349	
	WELD							
			1/2" FILLET	26		11		
			3/8" "	44		11		
			5/16" "	261		43		
						65		
FIELD BOLTS	936		7/8 Ø HI STRENGTH BOLTS		3"	—		
	2256				3 1/4	—		ACTUAL COUNT
	232				3 1/2	—		FOR ALL
	1184				3 3/4	—		BEAM SPLICES
	48				6	—		
	848				4 1/2	—		
	288				4 3/4	—		
	11584		7/8 Washers			—		HARDENED
11584 - 7/8 RIVET HDS.						2055		ALLOW. WT
			GROSS WT.			29964		
			DEDUCT			349		
			PAY WT.			29615		

SHIPPING KEY

SHOP CONNECTIONS: WELDED
FIELD CONNECTIONS: 7/8" Ø HI TEN BOLTS
HOLES: 15/16 Ø (SEE NOTE)
PAINT: RED LEAD & OIL PER M.S.H. SPECS

GENERAL NOTES:

NO PAINT ON TOP & EDGES OF TOP FLANGES, OR ON SPLICE PLATES OR ON BEAMS IN WAY OF SAME.
MATING BEAMS TO BE SHOP ASSEMBLED
ALL HOLES TO BE SUBPUNCHED OR DRILLED, FOR SPLICE CONNECTIONS, TO 13/16 Ø AND REAMED AT ASSEMBLY TO 15/16 Ø
SLIDE PLATES BACK FOR SHIPMENT
SEE DWG E2 FOR CAMBERING DIAGRAM

PAY WT. APPROVED 1-20-58

WT. 1-14-58

DRAWN		
REVISION	10-30-57	
REVISION	11-22-57	
REVISION		

BEAM DETAILS (FRAN)

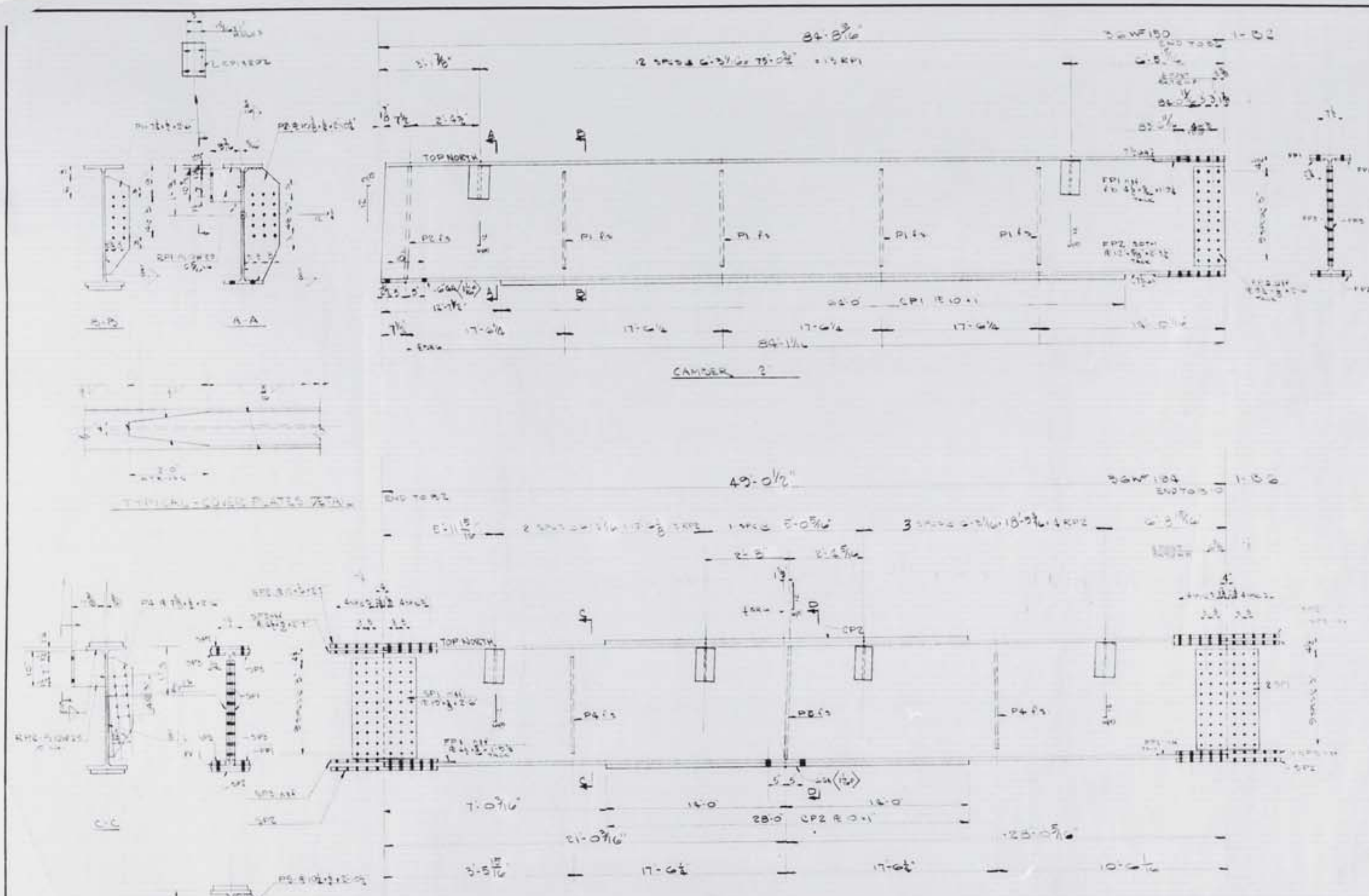
Bancroft & Martin Rolling Mills Company
South Portland 7, Maine

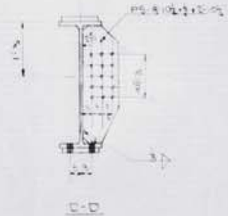
JONESPORT - BEALS BRIDGE - MAINE

CUSTOMER BRIDGE CONST. CO.
DESIGNER M.S.H. COMM.
ORDER NO. [illegible] DWG. NO. 6-425-52

DETAILS APPROVED 11-12-57

68-129 A





SHIP MARK	NO.	MARK	SHAPE	LENGTH		WT.		REMARKS
B2	1		36WF150	84	0 5/16	12707	12	
B6	1		36WF194	49	0 1/2	9514	0	
	4	P1	PL 7 1/2 x 1/2	2	6	123	24	
	2	P4	PL 7 3/8 x 1/2	2	6	63	12	
	1	P2	PL 10 3/4 x 1/2	2	10 1/2	50	5	
	1	P5	PL 12 1/16 x 1/2	2	10 1/2	50	5	
	4	SP1	PL 19 x 7/8	2	6	[illegible]	[illegible]	
	4	SP2	PL 12 x 7/16	2	7	135	[illegible]	
	8	SP3	PL 4 1/2 x 7/16	2	7	176	[illegible]	
	6	FP1	PL 10 4 1/2 x 7/16	1	9 3/4	[illegible]	[illegible]	
	1	FP2	PL 12 x 7/8	2	9 3/4	[illegible]	[illegible]	
	2	FP3	PL 9 1/2 x 1/8	2	6	[illegible]	[illegible]	
	1	CP1	PL 10 x 1	62	0	[illegible]	41	
	2	CP2	do	28	0	[illegible]	62	
	13	RP1	½ 10WF25		10 1/2	[illegible]	[illegible]	
	7	RP2	do		10	[illegible]	77	

SHOP CONNECTIONS: [illegible]
FIELD CONNECTIONS: 7/8 Ø H. TEN. BOLTS
HOLES: 15/16 Ø (SEE NOTE)
PAINT: RED LEAD & OIL PER M.S.H. SPECS

GENERAL NOTES:
NO PAINT ON TOP & EDGES OF TOP FLANGES, OR ON SPLICE PLATES OR ON BEAMS IN WAY OF SAME
MATING BEAMS TO BE SHOP ASSEMBLED
ALL HOLES TO BE SUBPUNCHED OR DRILLED, FOR SPLICE CONNECTIONS, TO 11/16 Ø AND REAMED AT ASSEMBLY TO 15/16 Ø
SLICE PLATES BALL FOR SHIPMENT
SEE DWG E2 FOR CAMBERING DIAGRAM

BEAM DETAILS [illegible]

Bancroft & Martin Rolling Mills Company
South Portland 7, Maine

JONESPORT - BEALS BRIDGE MAINE

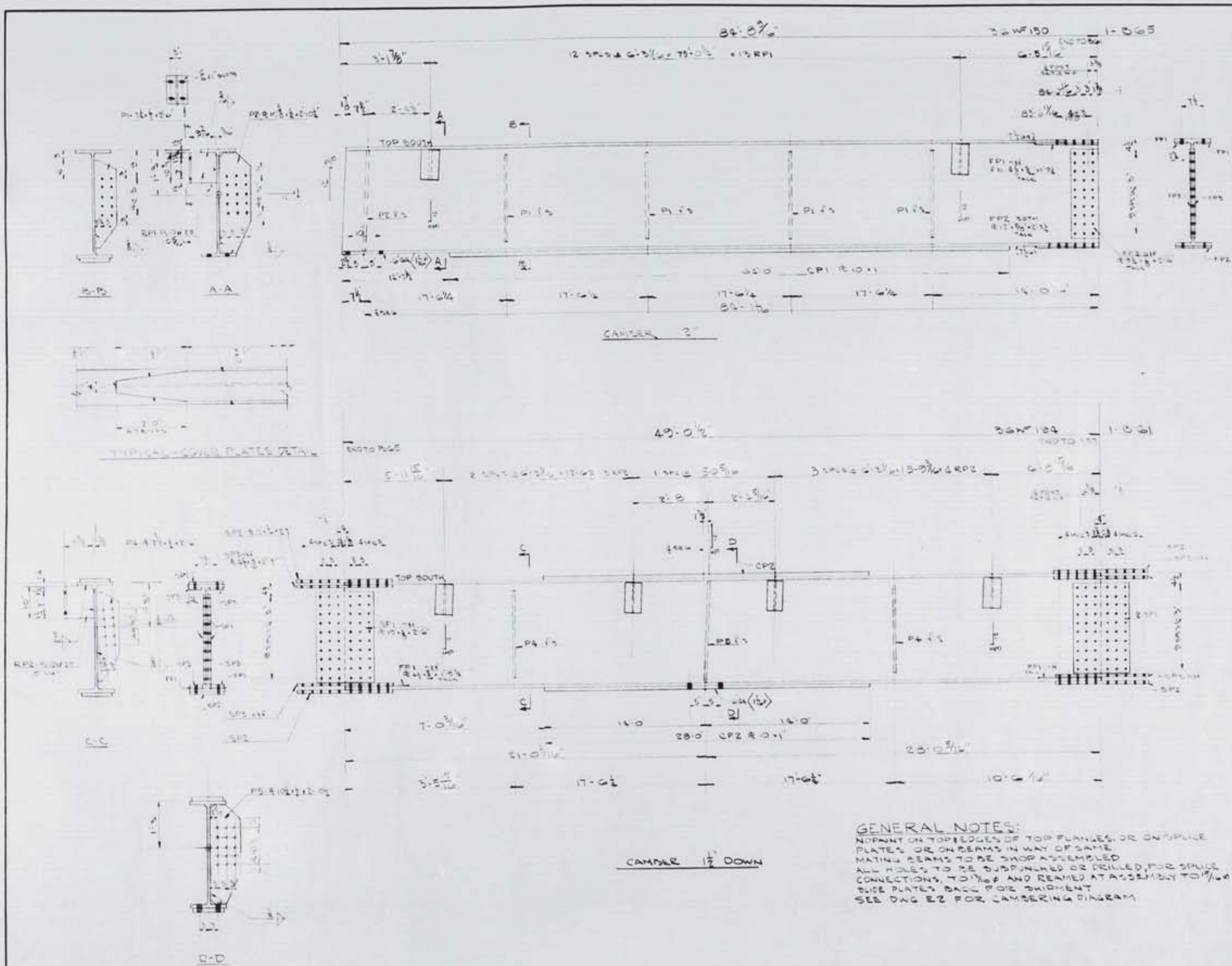
DRAWN		[illegible]
REVISION	[illegible]	
REVISION		
REVISION		

CUSTOMER BRIDGE CONST CO
DESIGNER M.S.H. COMM

ORDER NO. [illegible] DWG. NO. 6-425-53

APPROVED

6B-130 A



GENERAL NOTES:
NO PAINT ON TOP & EDGES OF TOP FLANGES, OR ON SPLICE PLATES OR ON BEAMS IN WAY OF SAME
MATING BEAMS TO BE SHOP ASSEMBLED
ALL HOLES TO BE SUBPUNCHED OR DRILLED, FOR SPLICE CONNECTIONS, TO 11/16 ϕ AND REAMED AT ASSEMBLY TO 15/16 ϕ
SLICE PLATES BACK FOR SHIPMENT
SEE DWG E2 FOR CAMBERING DIAGRAM

SHIP	BILL OF MATERIAL						DWG. NO 6-425-S4
MARK	NO.	MARK	SHAPE	LENGTH		WT.	REMARKS
B65	1		36WF150	84	0 3/4		
B61	1		36WF194	49	0 1/2		
	4	P1	PL 7 1/2 x 1/2	2	6		
	2	P4	PL 7 1/8 x 1/2	2	6		
	1	P2	PL 10 3/8 x 1/2	2	10 3/4		
	1	P5	PL [illegible] x 1/2	2	10 1/4		
	4	SP1	PL 13 x 5/8	2	6		
	4	SP2	PL 12 x 7/16	2	7		
	8	SP3	PL 4 1/2 x 9/16	2	7		
	6	FP1	[illegible]	1	5 3/4		
	1	FP2	PL 12 x 7/8	2	3 1/4		
	2	FP3	PL 9 1/2 x 1/8	2	6		
	1	CP1	PL 10 x 1	54	0		
	2	CP2	"	28	0		
	13	RP1	[illegible]		10 5/8		
	7	RP2	"		10		

SHOP CONNECTIONS: WELDED
FIELD CONNECTIONS: 7/8 ϕ HI TEN BOLTS
HOLES: 15/16 ϕ (SEE NOTE)
PAINT: [illegible]

BEAM DETAILS

Bancroft & Martin Rolling Mills Company
South Portland 7, Maine

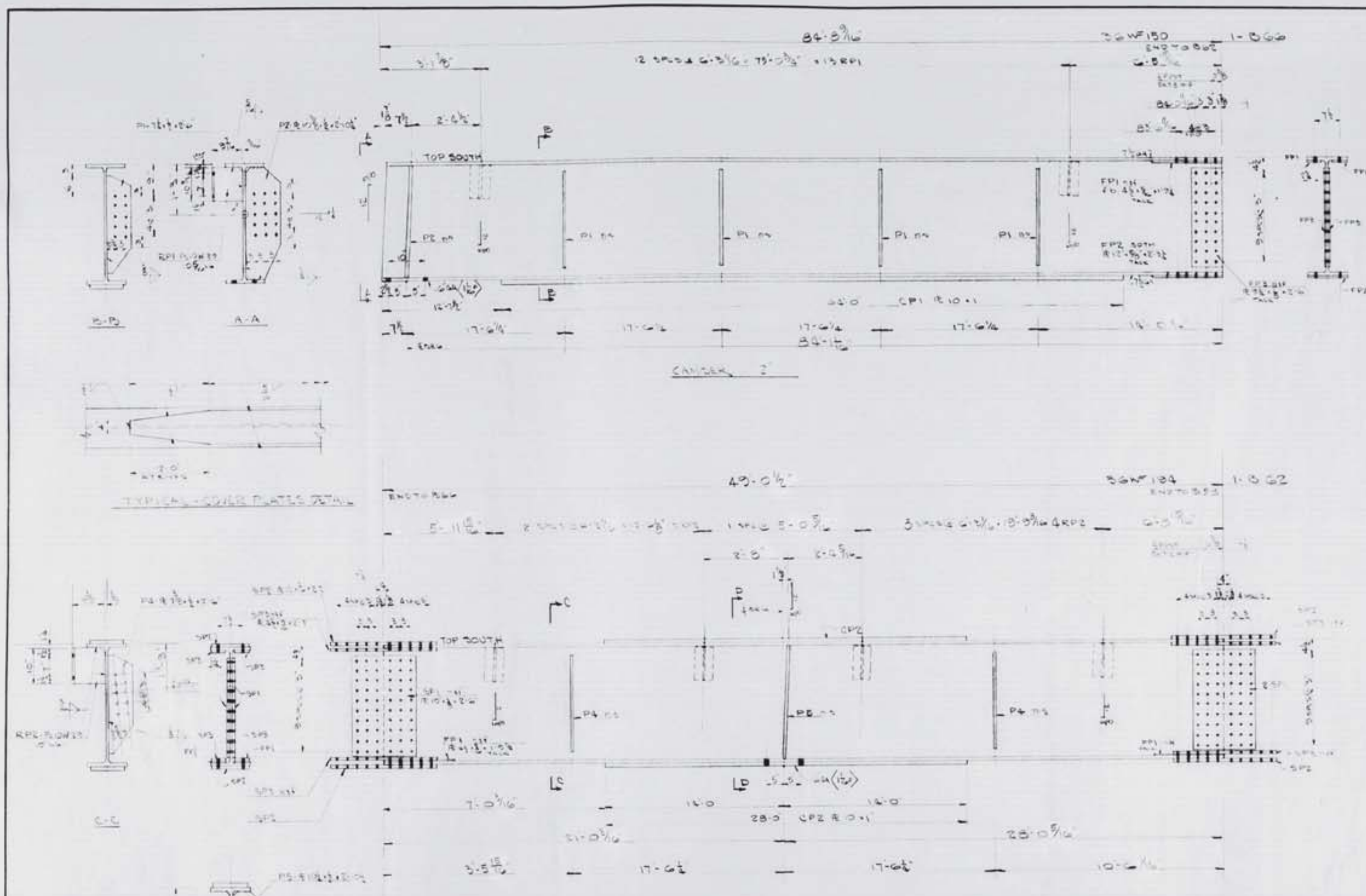
JONESPORT - BEALS BRIDGE MAINE

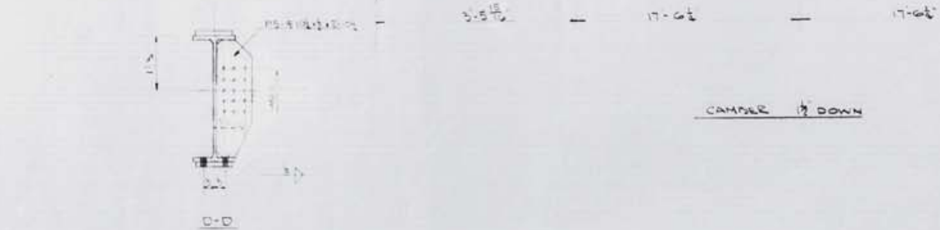
CUSTOMER BRIDGE CONST CO.
DESIGNER M. S. H. COMM.

DRAWN		
REVISION		
REVISION		
REVISION		

ORDER NO. [illegible] DWG. NO 6-425-S4

68-131 A





GENERAL NOTES:
NO PAINT ON TOP & EDGES OF TOP FLANGES, OR ON SPLICE PLATES OR ON BEAMS IN WAY OF SAME.
MATING BEAMS TO BE SHOP ASSEMBLED
ALL HOLES TO BE SUBPUNCHED OR DRILLED, FOR SPLICE CONNECTIONS TO 11/16 Ø AND REAMED AT ASSEMBLY TO 15/16 Ø
SLIDE PLATES BACK FOR SHIPMENT
SEE DWG E2 FOR CAMBERING DIAGRAM

BILL OF MATERIAL DWG. NO 6-425-S5

SHIP MARK	NO.	MARK	SHAPE	LENGTH		WT.	REMARKS
B66	1		36WF150	84	9¾		
B62	1		36WF194	49	0½		
	4	P1	PL 7½ x ½	2	6		
	2	P4	PL 7 15/16 x ½	2	6		
	1	P2	PL 10¾ x ½	2	10¾		
	1	P5	PL 10 5/16 x ½	2	10¾		
	4	SP1	PL 13 x 3/8	2	6		
	4	SP2	PL 12 x 7/16	2	7		
	8	SP3	PL 4½ x 9/16	2	7		
	6	FP1	PL 4½ x 5/16	1	9½		
		FP2	PL 12 x 5/8	2	3¼		
	2	FP3	PL 5½ x 3/8	2	6		
	1	CP1	PL 10 x 1	54	0		
	2	CP2	do	28	0		
	13	RP1	½ 10WF29		10⅝		
	7	RP2	do		10		

SHOP CONNECTIONS: WELDED
FIELD CONNECTIONS: ⅞ Ø H. TEN. BOLTS
HOLES: 15/16 Ø (SEE NOTE)
PAINT: RED LEAD & OIL PER M.S.H. SPECS

BEAM DETAILS

Bancroft & Martin Rolling Mills Company
South Portland 7, Maine

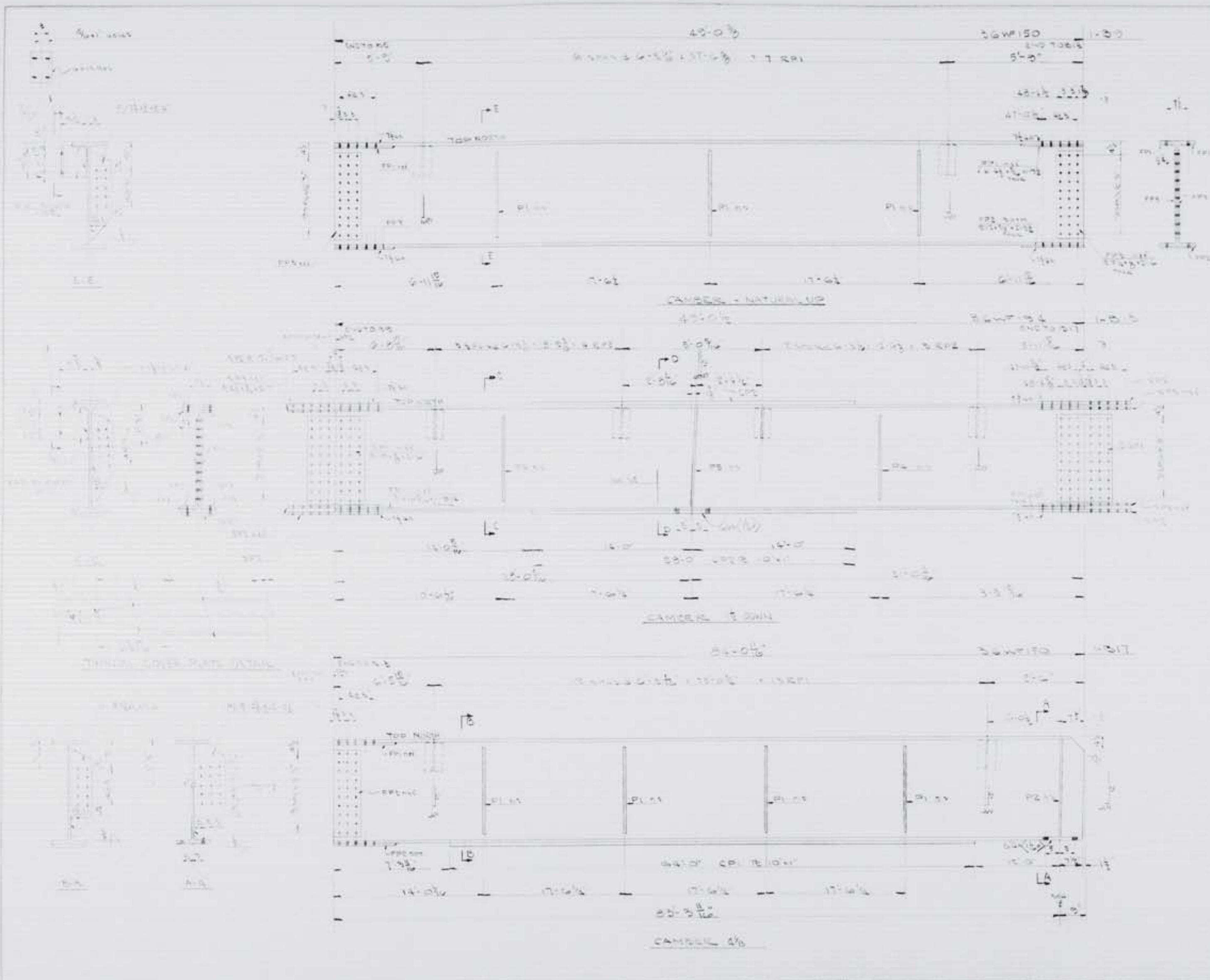
JONESPORT BEALS BRIDGE MAINE

CUSTOMER BRIDGE CONST CO
DESIGNER M.S.H. COMM

DRAWN		
REVISION		
REVISION		
REVISION		

ORDER NO. 18555 DWG. NO. 6-425-S5

68-132 A



SHIP MARK	NO.	MARK	SHAPE	LENGTH		WT.	REMARKS
B9	1		36WF150	49	0 5/8	7355	
B17	1		do	54	0 5/8	[illegible]	
B15	1		36WF194	49	0 1/2	[illegible]	
	7	P1	[illegible]	2	6	[illegible]	
	2	P4	[illegible]	2	[illegible]	[illegible]	
	1	P2	[illegible]	2	10 1/2	56	
	1	P3	[illegible]	2	10 1/2	56	
	4	SP1	[illegible]	2	6	[illegible]	
	4	SP2	[illegible]	2	7	[illegible]	
	3	SP3	[illegible]	2	7	[illegible]	
	10	FP1	[illegible]	1	[illegible]	[illegible]	
	5	FP2	[illegible]	[illegible]	[illegible]	[illegible]	
	4	FP3	[illegible]	2	6	[illegible]	
	1	CP1	[illegible]	[illegible]	0	[illegible]	
	2	CP2	do	28	0	[illegible]	
	20	RP1	[illegible]		[illegible]	[illegible]	
	2	RP2	do		10	[illegible]	

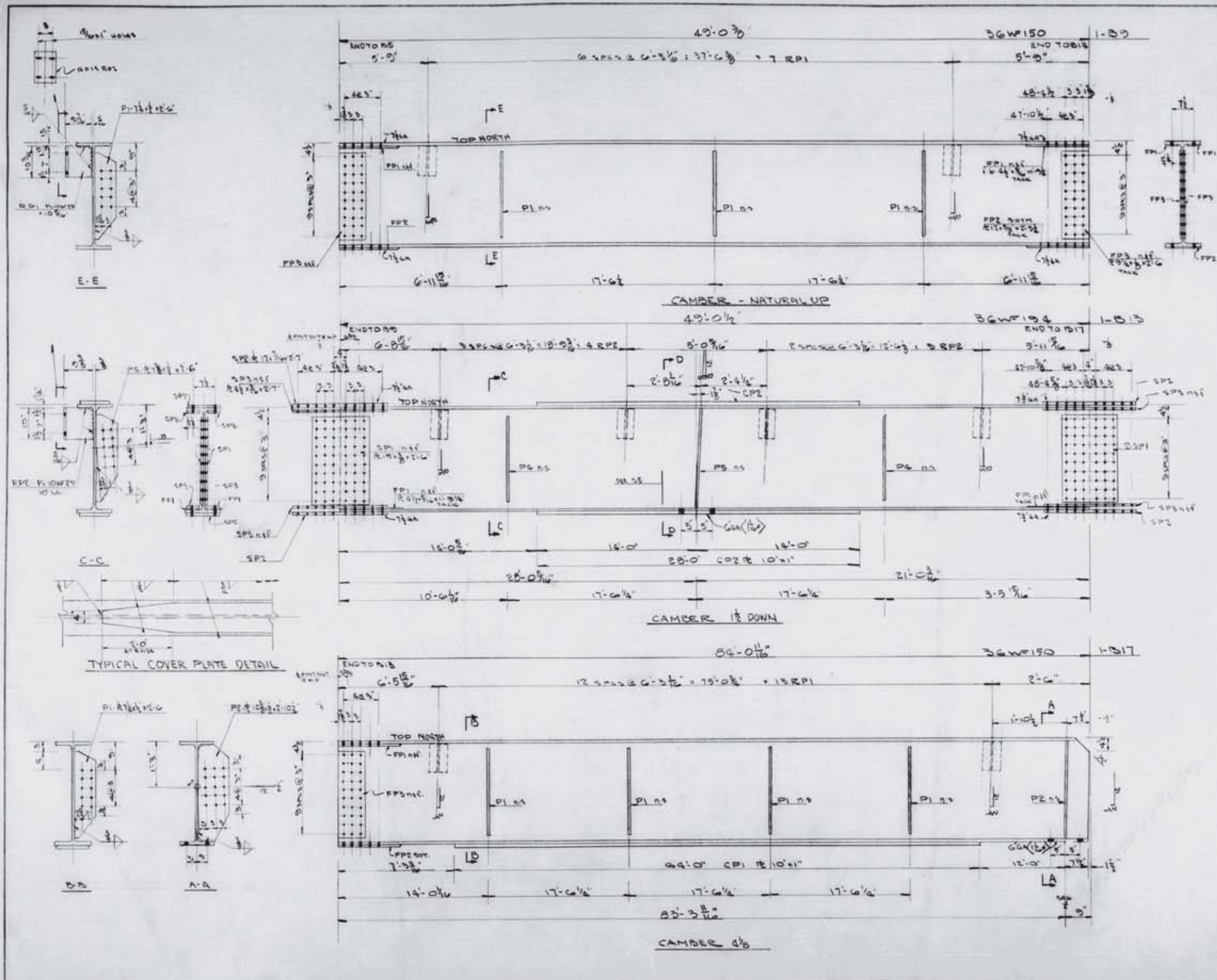
BILL OF MATERIAL — DWG NO 6-425-56

BEAM DETAILS

JONESPORT BEALS BRIDGE, MAINE

DWG NO 6-425-56

68-133 A



SHIP	BILL OF MATERIAL						DWG. NO 6-425-56	
MARK	NO.	MARK	SHAPE	LENGTH		WT.	DEDUCTS	REMARKS
B9	1		36WF150	49	0 3/8	7355		
B17	1		do	84	0 11/16	12689	25	
B13	1		36WF194	49	0½	9514		
	7	P1	PL 7½ x ½	2	6	215	42	
	2	P4	PL 7½ x ½	2	6	63	12	
	1	P2	PL 10½ x ½	2	10¾	50	5	
	1	P5	PL 10½ x ½	2	10¾	50	5	
	4	SP1	PL 15 x 3/8	2	6	242		
	4	SP2	PL 12 x 7/16	2	7	185		
	8	SP3	PL 4½ x 9/16	2	7	178		
	10	FP1	PL 4½ x 5/16	1	9¾	85		
	3	FP2	PL 12 x 5/8	2	3½	174		
	6	FP3	PL 5½ x 1/8	2	6	59		
	1	CP1	PL 10" x 1"	64	0	2176	41	
	2	CP2	do	28	0	1904	82	
	20	RP1	PL 10WF29		10⅜	498	170	
	7	RP2	do		10	169	57	
		WT. STR.				35526	434	
	WELD							
			½ Fillet	26		11		
			3/8 "	59		14		
			5/16 "	277		46		
						71		
		GROSS WT.				35597		
			deduct			439		
		PAY WT.				35158		

SHOP CONNECTIONS: WELDED
FIELD CONNECTIONS: 7/8" Ø HI TEN BOLTS
HOLES: 15/16 Ø UNLESS NOTED - SEE NOTES-52
PAINT: RED LEAD & OIL PER ME S H SPECS
SEE NOTES DWG 52

PAY WT.
APPROVED
1-20-58

WTS - 1-14-58

DRAWN		R.L.
REVISION	10-30-57	
REVISION		
REVISION		

BEAM DETAILS (MAIN)

Bancroft & Martin Rolling Mills Company
South Portland 7, Maine

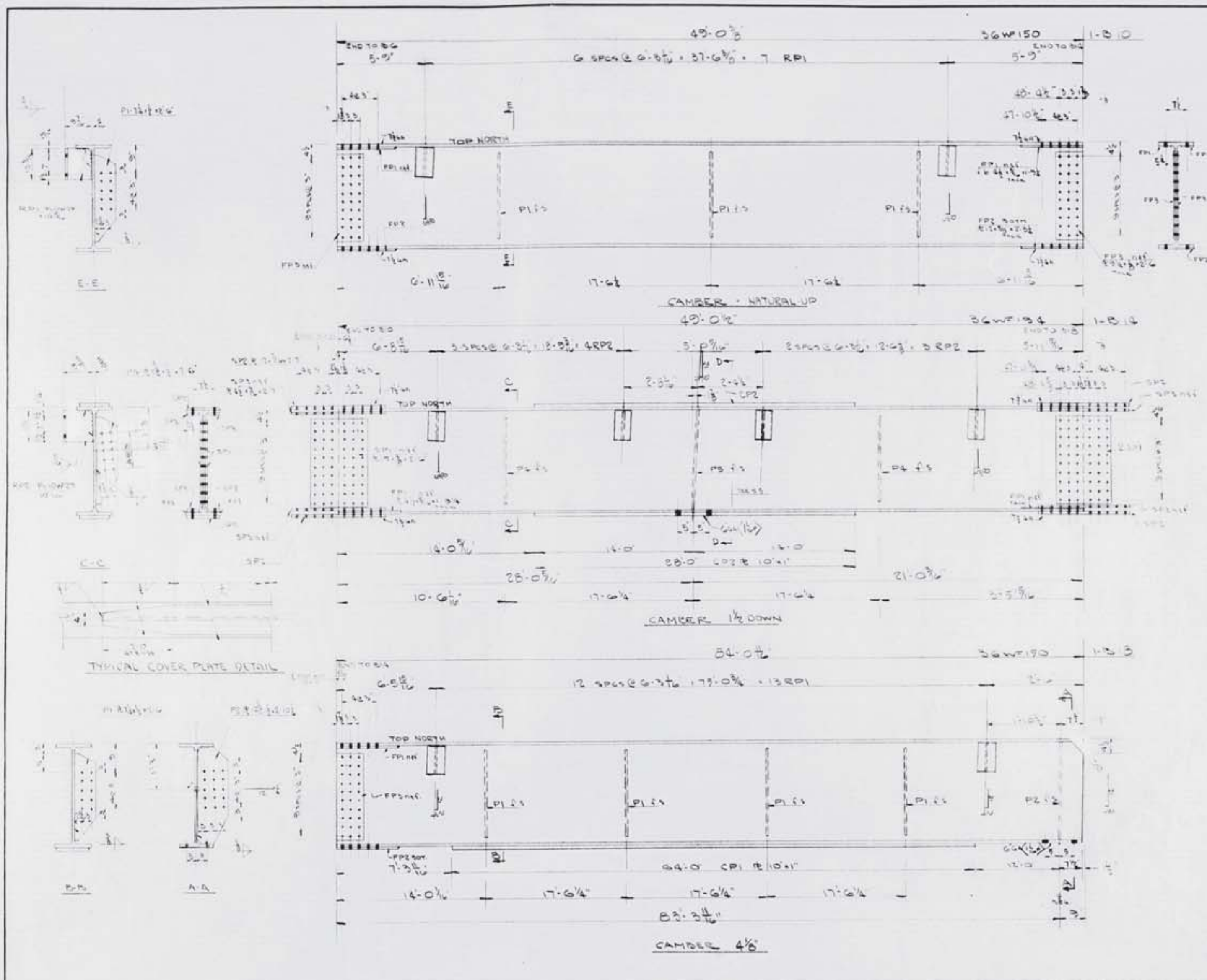
JONESPORT BEALS
BRIDGE - MAINE

CUSTOMER BRIDGE CONST. CO.
DESIGNER ME. S. H. COMM.

ORDER NO. 1238AL | DWG. NO 6-425-56

DETAILS APPROVED 11-12-57

68-133 A



SHIP MARK	NO.	MARK	SHAPE	LENGTH		WT.	REMARKS
B10	1		36WF150	49	0 3/8	7355	
B13	1		do	84	0 1/2	12609	25
B14	1		36WF184	49	0 1/2	9514	
	7	P1	PL 7 1/2 x 1/2	2	6	215	42
	2	P4	[illegible]	2	6	63	12
	1	P2	PL 10 x 1/2	2	10 1/4	50	5
	1	P5	[illegible]	2	10 1/4	50	5
	4	SP1	PL 13 x 3/8	2	6	242	
	4	SP2	PL 12 x 5/16	2	7	155	
	8	SP3	PL 4 1/2 x 9/16	2	7	[illegible]	
	10	FP1	PL 6 1/2 x 9/16	1	9 1/2	55	
	3	FP2	PL 12 x 5/8	2	3 1/2	174	
	6	FP3	PL 5 1/2 x 1/8	2	6	5[illegible]	
	1	CP1	PL 10 x 1"	64	0	[illegible]	
	2	CP2	do	28	0	[illegible]	
	20	RP1	PL 10WF29		10 3/4	[illegible]	
	7	RP2	do		10	[illegible]	

SHOP CONNECTIONS: WELDED

FIELD CONNECTIONS: [illegible]

HOLES: [illegible] SEE NOTES -52

PAINT: [illegible]
SEE NOTES DWG 52

BEAM DETAILS

Bancroft & Martin Rolling Mills Company
South Portland 7, Maine

JONESPORT BEALS BRIDGE - MAINE

CUSTOMER BRIDGE CONST CO

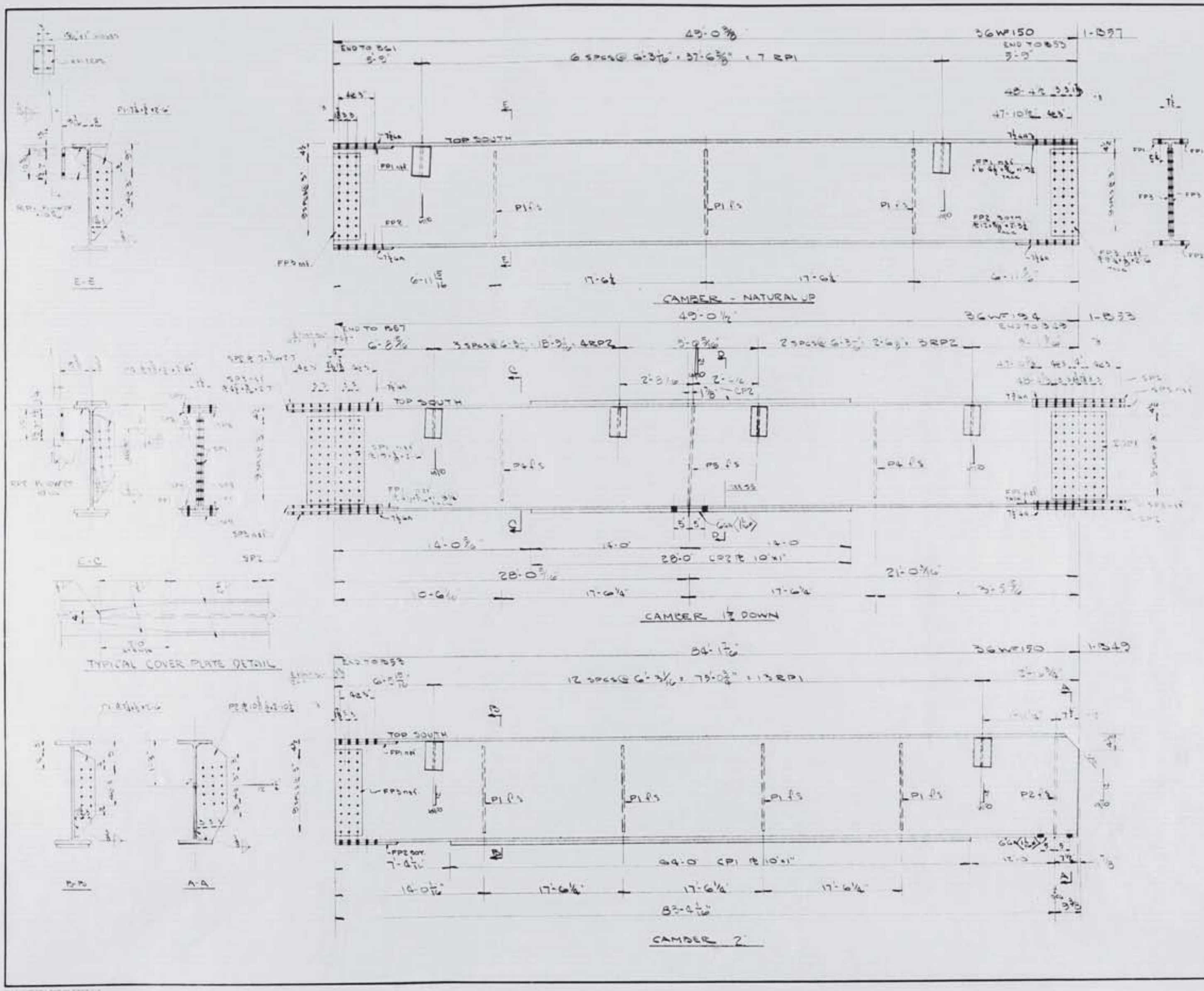
DESIGNER ME S.H. COMM.

DRAWN		
REVISION		
REVISION		
REVISION		

ORDER NO. [illegible]

DWG. NO 6-425-57

68-134 A



SHIP MARK	NO.	MARK	SHAPE	LENGTH		WT.		REMARKS
B57	1		36WF150	49	0⅜			
B49	1		do	84	1			
B53	1		36WF184	49	0½			
	7	P1	PL 7½ x ½	2	6			
	2	P4	PL [illegible]	2	6			
	1	P2	PL 10 [illegible]	2	10½			
	1	P5	PL [illegible]	2	10½			
	4	SP1	PL 13 x ⅜	2	6			
	4	SP2	PL 12 x [illegible]	2	7			
	8	SP3	PL 4½ x [illegible]	2	7			
	10	FP1	PL [illegible]	1	9½			
	3	FP2	PL 12 x ⅝	2	3½			
	6	FP3	PL 5½ x ⅛	2	6			
	1	CP1	PL 10 x 1	64	0			
	2	CP2	do	28	0			
	20	RP1	PL 10WF29		10½			
	7	RP2	do		10			

SHOP CONNECTIONS: WELDED
FIELD CONNECTIONS: ⅞ Ø H.S. [illegible] BOLTS
HOLES: [illegible] UNLESS NOTED - SEE NOTES - 52
PAINT: [illegible]
SEE NOTES [illegible]

BEAM DETAILS

Bancroft & Martin Rolling Mills Company
South Portland 7, Maine

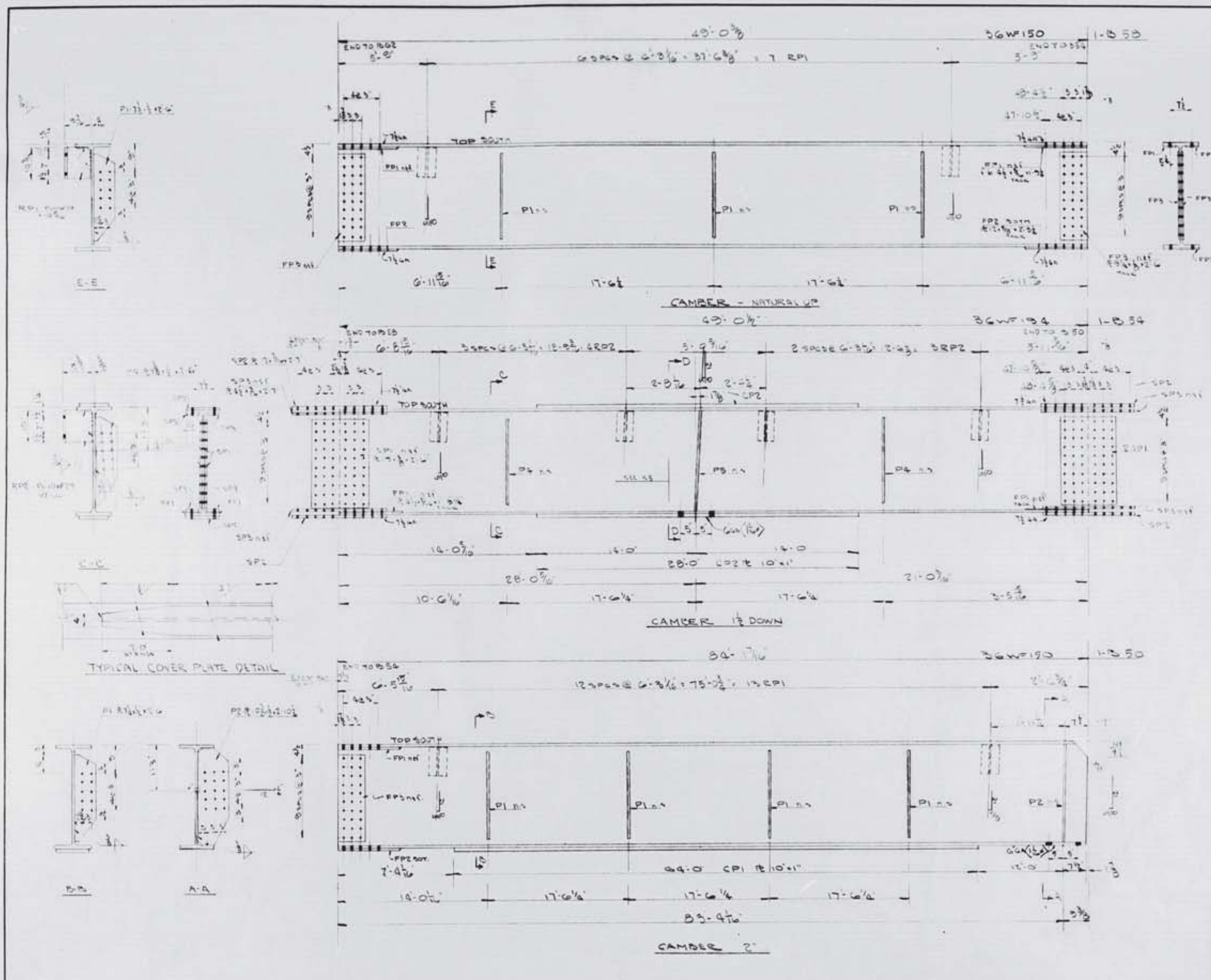
JONESPORT BEALS BRIDGE - MAINE

CUSTOMER [illegible]
DESIGNER [illegible]

DRAWN		RLS
REVISION		
REVISION		
REVISION		

ORDER NO. VERBAL | DWG. NO. 6-425-53

68-135 A



SHIP	BILL OF MATERIAL						DWG. NO 6-425-53
MARK	NO.	MARK	SHAPE	LENGTH		WT.	REMARKS
B58	1		36WF150	49	0⅜		
B50	1		do	84	1⅛		
B54	1		36WF194	49	0½		
	7	P1	PL 7½ x ½	2	6		
	2	P4	PL 7½ x ½	2	6		
	1	P2	PL 10¼ x ½	2	10½		
	1	P5	PL 10¼ x ½	2	10½		
	4	SP1	PL 13 x ⅞	2	6		
	4	SP2	PL 12 x 7/16	2	7		
	8	SP3	PL 4½ x 9/16	2	7		
	10	FP1	PL 6½ x 9/16	1	9½		
	3	FP2	PL 12 x ⅝	2	3½		
	6	FP3	PL 5½ x ⅛	2	6		
	1	CP1	PL 10" x 1	64	0		
	2	CP2	do	28	0		
	20	RP1	PL 10WF29		10⅝		
	7	RP2	do		10		

SHOP CONNECTIONS: WELDED
FIELD CONNECTIONS: ⅞ Ø H.T. BOLTS
HOLES: 15/16 Ø UNLESS NOTED - SEE NOTES -52
PAINT: RED LEAD & OIL PER M.E.S.H. SPECS. SEE NOTES DWG. 52

BEAM DETAILS

Bancroft & Martin Rolling Mills Company
South Portland 7, Maine

JONESPORT BEALS BRIDGE - MAINE

CUSTOMER BRIDGE CONST. CO.
DESIGNER MR. S. H. COMM.

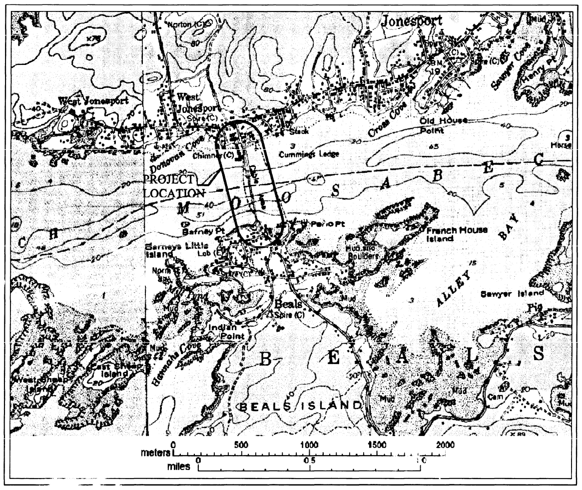
DRAWN		R.L.S.
REVISION		
REVISION		
REVISION		

ORDER NO. VERBAL
DWG. NO 6-425-53

68-136A

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
Jonesport - Beals Bridge No. 5500 Fender Repair

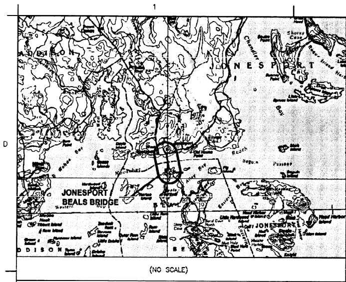
PROJECT NO: 6892-00



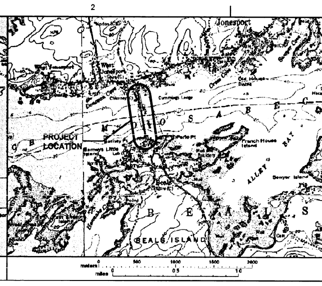
INDEX OF SHEETS

CHILDS ENGINEERING CORPORATION
BOX 333 MEDFIELD, MASSACHUSETTS 02052 U.S.A.
Phone: (508) 359-8945 Fax: (508) 359-2751
E-mail: mail@childseng.com

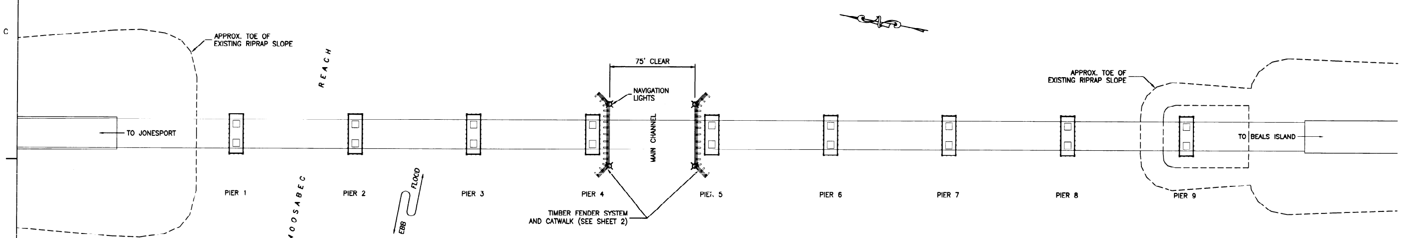
APPROVED:
STATE OF MAINE
MAINE DEPARTMENT OF TRANSPORTATION
11/29/01
COMMISSIONER DATE
John E. Dority 11/29/01
CHIEF ENGINEER DATE



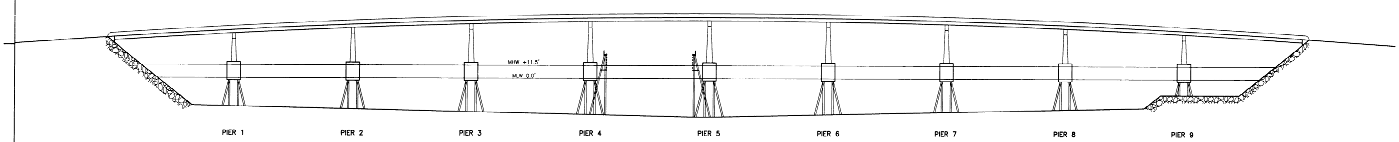
AREA MAP



LOCUS MAP



GENERAL PLAN
SCALE: 1"=40'-0"



ELEVATION
SCALE: 1"=40'-0"

DATUM: MEAN LOW WATER (MLW) = 0.0'

REFERENCED FROM:

DRAWINGS 8 & 12 OF 21 TITLED

"JONESPORT – BEALS BRIDGE
OVER
MOOSABEC REACH
IN THE TOWNS OF
JONESPORT AND BEALS
WASHINGTON COUNTY
PIER DETAILS & FENDER SYSTEM"

DATED 1958

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BOX 333 MEDFIELD, MASSACHUSETTS 02052 U.S.A.
Phone: (508) 359-8945 Fax: (508) 359-2751
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STATE OF MAINE DAVID LIVINGSTON PORTER No. 4786 REGISTERED PROFESSIONAL ENGINEER

Mark	Description	Date	Appr.

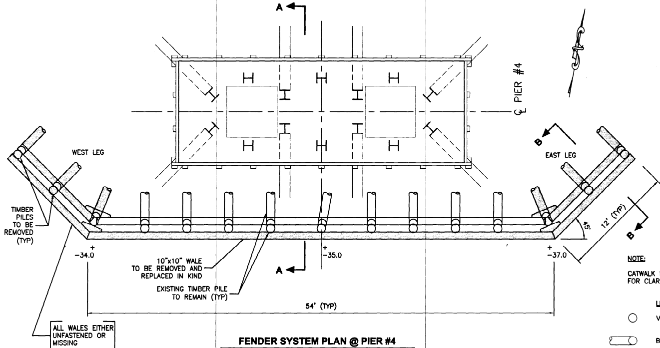
Designed by: FAR	Date: 11/13/01
Drn by: TEQ / Ckd by: FAR	Design file no. 157600_2-1
Reviewed by: FAR	Plot Scale: 1"=0'-1"

OK P Bhile

MAINE D.O.T.
JONESPORT – BEALS BRIDGE
PIER #4 & #5
FENDER SYSTEM REPAIR

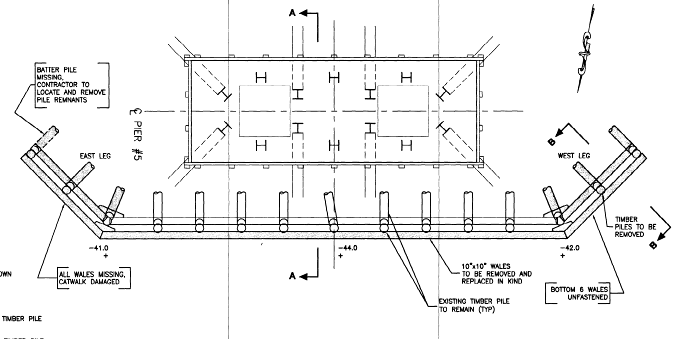
LOCUS MAP AND SITE PLAN

Sheet reference number: M-001
Sheet 1 of 4



FENDER SYSTEM PLAN @ PIER #4

SCALE: 3/16"=1'-0"



FENDER SYSTEM PLAN @ PIER #5

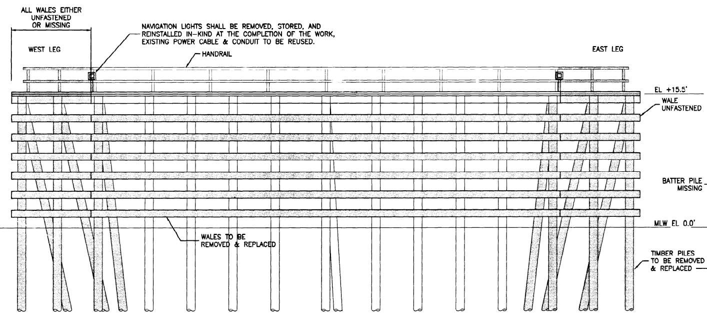
SCALE: 3/16"=1'-0"

NOTE:

CATWALK NOT SHOWN FOR CLARITY.

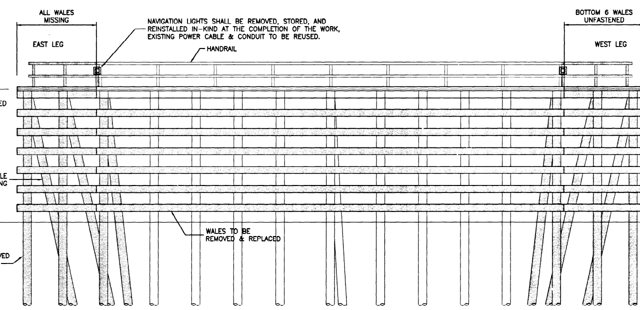
LEGEND:

- VERTICAL TIMBER PILE
- BATTERED TIMBER PILE
- VERTICAL STEEL PILE
- BATTERED STEEL PILE
- -48.0 + SOUNDING IN FEET BELOW MEAN LOW WATER (MLW)
- OBJECT TO BE REMOVED & REPLACED



FENDER SYSTEM ELEVATION @ PIER #4

SCALE: 3/16"=1'-0"



FENDER SYSTEM ELEVATION @ PIER #5

SCALE: 3/16"=1'-0"

REFERENCED FROM:

DRAWINGS 8 & 12 OF 21 TITLED

"JONESPORT – BEALS BRIDGE OVER MOOSABEC REACH IN THE TOWNS OF JONESPORT AND BEALS WASHINGTON COUNTY PIER DETAILS & FENDER SYSTEM"

DATED 1958

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E-mail: mail@childseng.com

STATE OF MAINE, DAVID LIVINGSTON PORTER, No. 4788, REGISTERED PROFESSIONAL ENGINEER

Mark	Description	Date	Appr.

OK P Battle

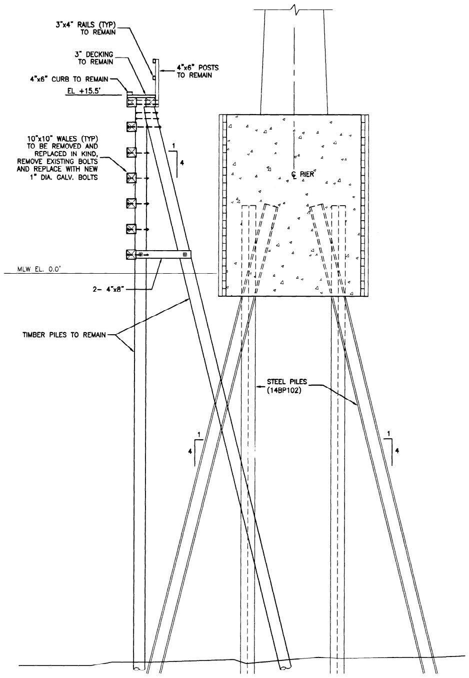
Designed by:	Date:
FAR	11/13/01
Dwn by: TEQ / Ckd by: FAR	Design file no: 157600_2-2
Reviewed by: FAR	Plot Scale: 1"=0'-1"

MAINE D.O.T.
JONESPORT – BEALS BRIDGE
PIER #4 & #5
FENDER SYSTEM REPAIR

EXISTING CONDITIONS/ DEMOLITION PLAN AND ELEVATIONS

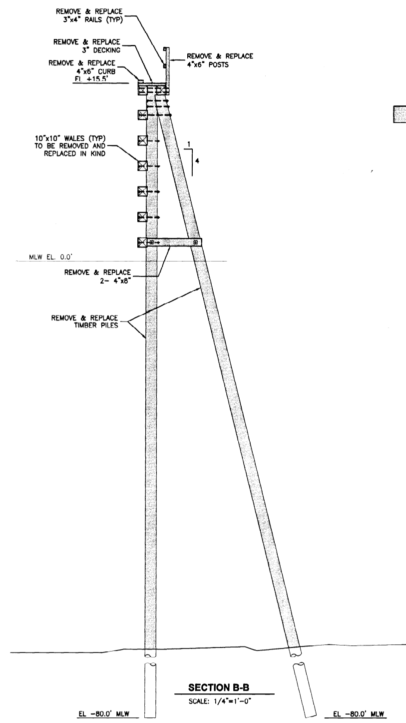
Sheet reference number: M-002

Sheet 2 of 4



SECTION A-A

SCALE: 1/4"=1'-0"



SECTION B-B

SCALE: 1/4"=1'-0"

LEGEND:

OBJECT TO BE REMOVED & REPLACED

REFERENCED FROM:

DRAWINGS 8 & 12 OF 21 TITLED

"JONESPORT – BEALS BRIDGE
OVER
MOOSABEC REACH
IN THE TOWNS OF
JONESPORT AND BEALS
WASHINGTON COUNTY
PIER DETAILS & FENDER SYSTEM"

DATED 1958

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STATE OF MAINE
LIVINGSTON PORTER
No. 4788
REGISTERED PROFESSIONAL ENGINEER

Mark	Description	Date	Appr.

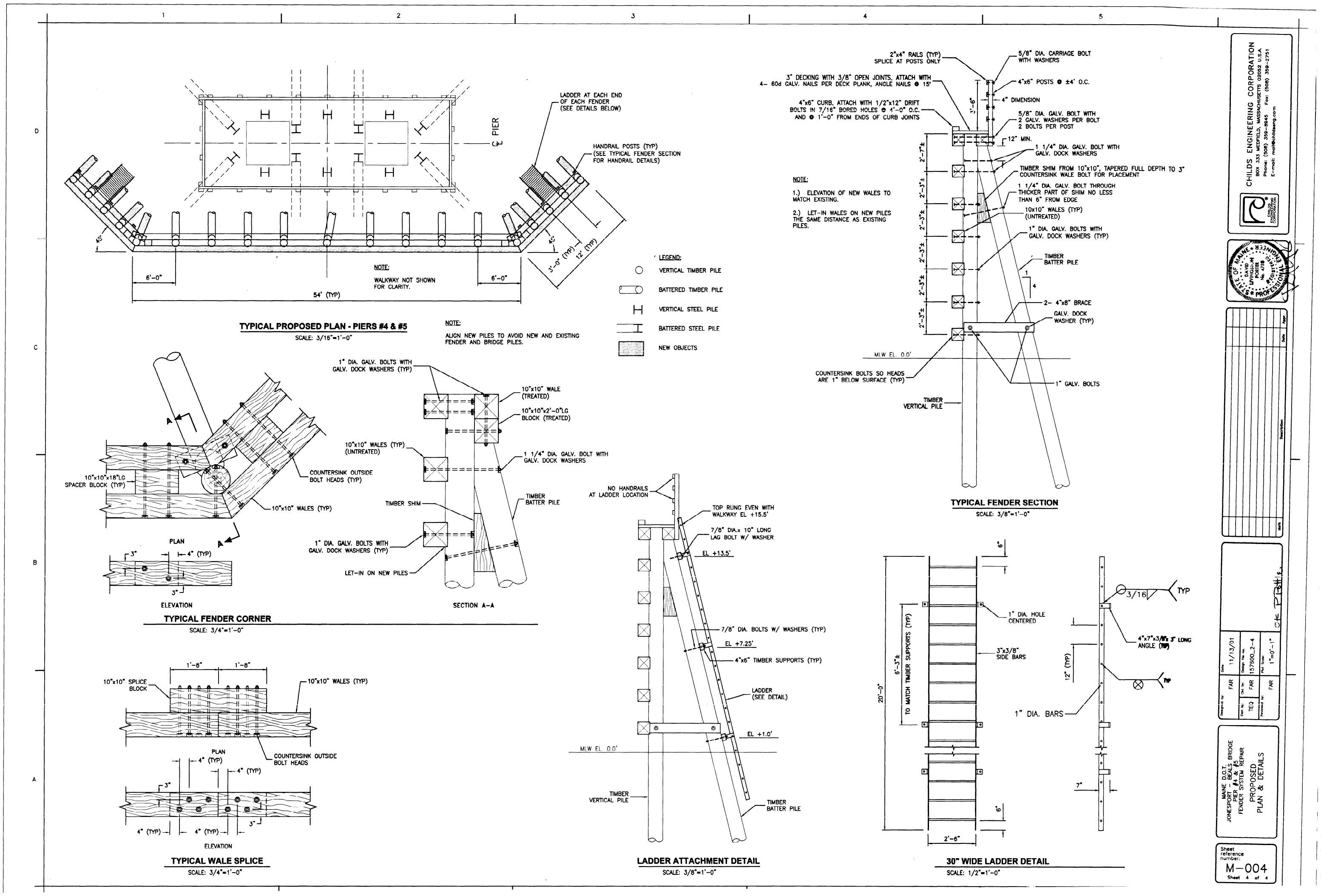
OK P Pottle

Designed by: FAR	Date: 11/13/01
Dwn by: TEQ	Chd by: FAR	Design file no.: 157600_2-3
Reviewed by: FAR	Plot Scale: 1"=0'-1"

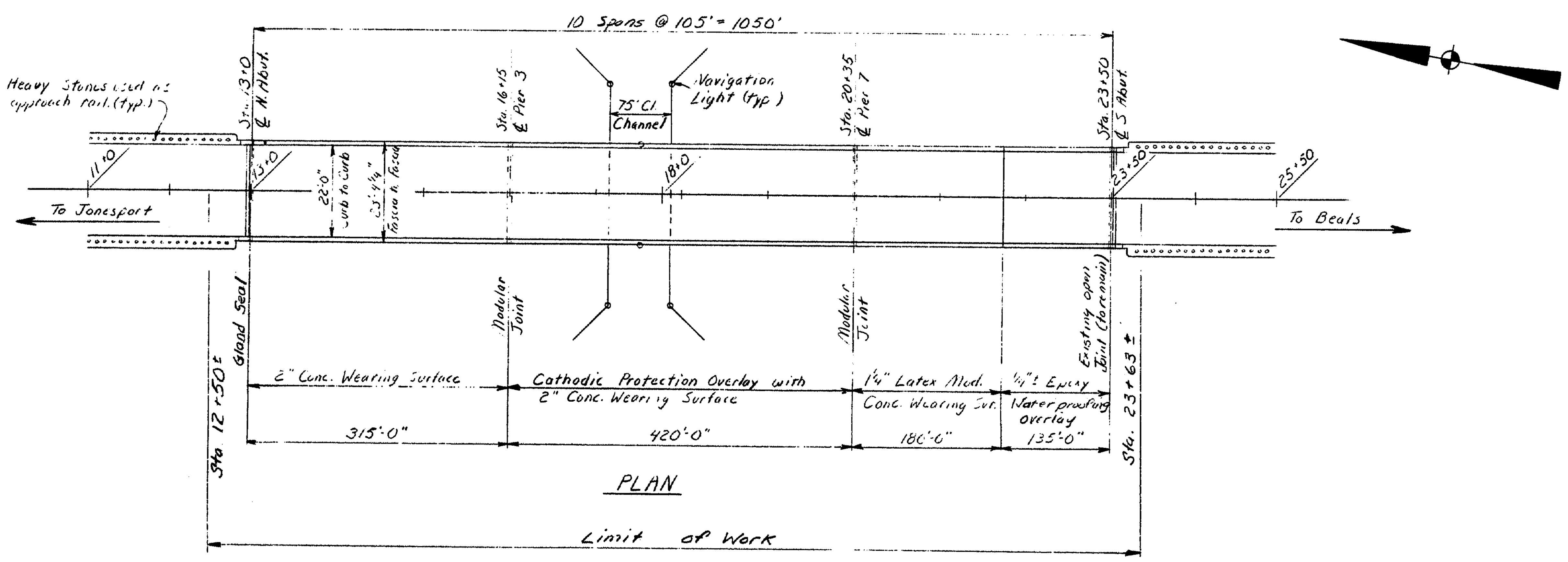
MAINE D.O.T.
JONESPORT – BEALS BRIDGE
PIER #4 & #5
FENDER SYSTEM REPAIR

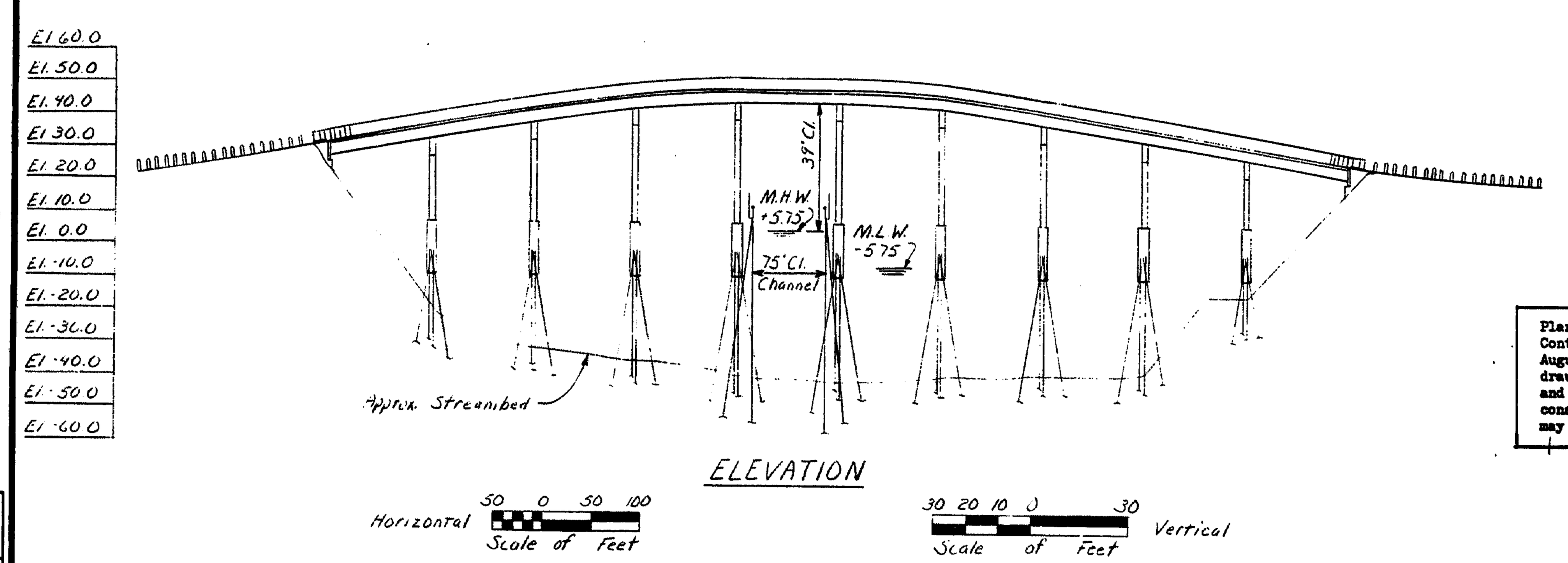
EXISTING CONDITIONS/
DEMOLITION SECTIONS

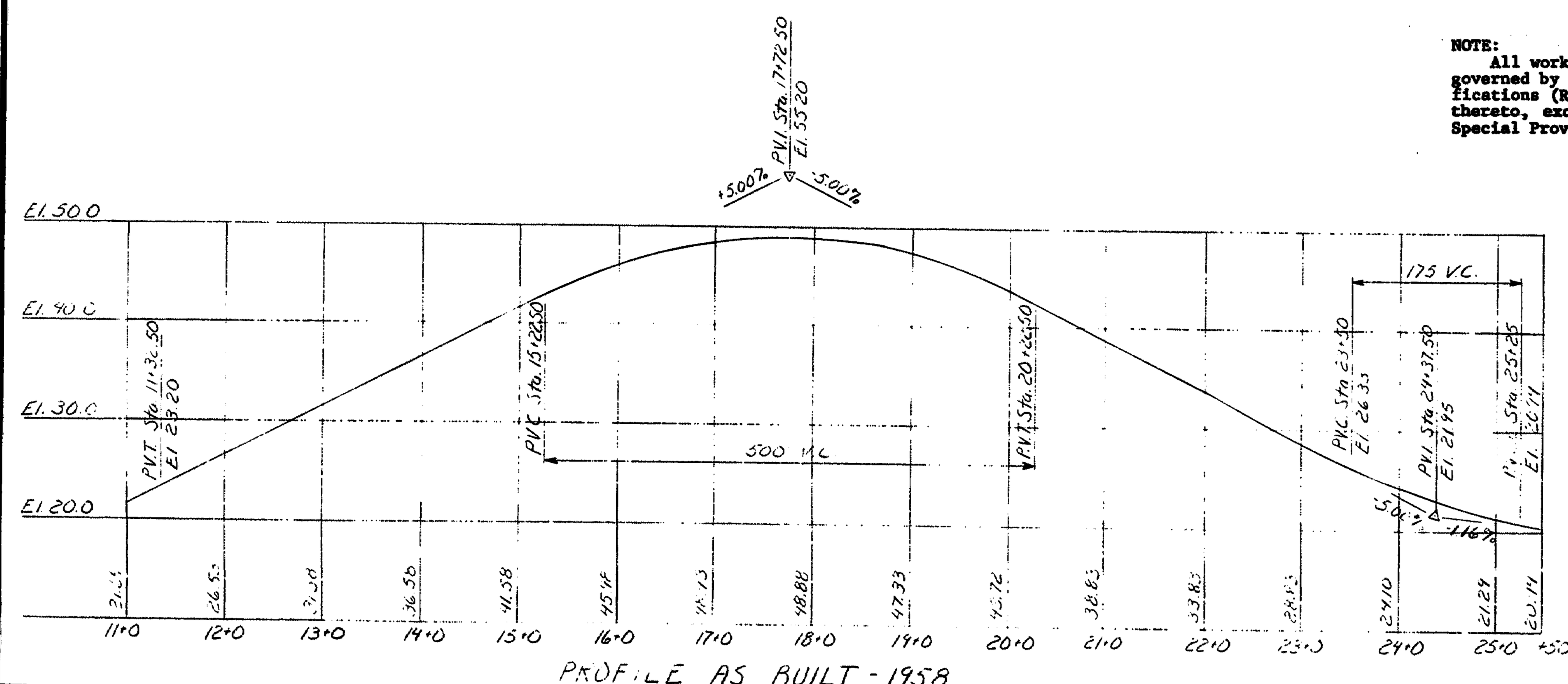
Sheet reference number:
M-003
Sheet 3 of 4



TYPICAL PROPOSED PLAN - PIERS #4 & #5
SCALE: 3/16"=1'-0"
LADDER AT EACH END OF EACH FENDER (SEE DETAILS BELOW)
HANDRAIL POSTS (TYP) (SEE TYPICAL FENDER SECTION FOR HANDRAIL DETAILS)
PIER
NOTE: WALKWAY NOT SHOWN FOR CLARITY.
6'-0"
54' (TYP)
3'-0" (TYP)
12' (TYP)
45°
NOTE: ALIGN NEW PILES TO AVOID NEW AND EXISTING FENDER AND BRIDGE PILES.
LEGEND:
VERTICAL TIMBER PILE
BATTERED TIMBER PILE
VERTICAL STEEL PILE
BATTERED STEEL PILE
NEW OBJECTS
TYPICAL FENDER SECTION
SCALE: 3/8"=1'-0"
2"x4" RAILS (TYP) SPLICE AT POSTS ONLY
5/8" DIA. CARRIAGE BOLT WITH WASHERS
3" DECKING WITH 3/8" OPEN JOINTS. ATTACH WITH 4- 60d GALV. NAILS PER DECK PLANK, ANGLE NAILS @ 15°
4"x6" POSTS @ ±4' O.C.
4" DIMENSION
4"x6" CURB. ATTACH WITH 1/2"x12" DRIFT BOLTS IN 7/16" BORED HOLES @ 4'-0" O.C. AND @ 1'-0" FROM ENDS OF CURB JOINTS
5/8" DIA. GALV. BOLT WITH 2 GALV. WASHERS PER BOLT 2 BOLTS PER POST
12" MIN.
1 1/4" DIA. GALV. BOLT WITH GALV. DOCK WASHERS
TIMBER SHIM FROM 10"x10", TAPERED FULL DEPTH TO 3" COUNTERSINK WALE BOLT FOR PLACEMENT
1 1/4" DIA. GALV. BOLT THROUGH THICKER PART OF SHIM NO LESS THAN 6" FROM EDGE
10x10" WALES (TYP) (UNTREATED)
1" DIA. GALV. BOLTS WITH GALV. DOCK WASHERS (TYP)
TIMBER BATTER PILE
2- 4"x8" BRACE
GALV. DOCK WASHER (TYP)
1" GALV. BOLTS
COUNTERSINK BOLTS SO HEADS ARE 1" BELOW SURFACE (TYP)
TIMBER VERTICAL PILE
MLW EL. 0.0'
NOTE:
1.) ELEVATION OF NEW WALES TO MATCH EXISTING.
2.) LET-IN WALES ON NEW PILES THE SAME DISTANCE AS EXISTING PILES.
TYPICAL FENDER CORNER
SCALE: 3/4"=1'-0"
10"x10"x18"LG SPACER BLOCK (TYP)
COUNTERSINK OUTSIDE BOLT HEADS (TYP)
10"x10" WALES (TYP)
PLAN
ELEVATION
4" (TYP)
3"
SECTION A-A
1" DIA. GALV. BOLTS WITH GALV. DOCK WASHERS (TYP)
10"x10" WALE (TREATED)
10"x10"x2'-0"LG BLOCK (TREATED)
10"x10" WALES (TYP) (UNTREATED)
1 1/4" DIA. GALV. BOLT WITH GALV. DOCK WASHERS
TIMBER SHIM
TIMBER BATTER PILE
LET-IN ON NEW PILES
TYPICAL WALE SPLICE
SCALE: 3/4"=1'-0"
10"x10" SPLICE BLOCK
1'-8"
10"x10" WALES (TYP)
COUNTERSINK OUTSIDE BOLT HEADS
PLAN
ELEVATION
LADDER ATTACHMENT DETAIL
SCALE: 3/8"=1'-0"
NO HANDRAILS AT LADDER LOCATION
TOP RUNG EVEN WITH WALKWAY EL +15.5'
7/8" DIA.x 10" LONG LAG BOLT W/ WASHER
EL +13.5'
7/8" DIA. BOLTS W/ WASHERS (TYP)
EL +7.25'
4"x6" TIMBER SUPPORTS (TYP)
LADDER (SEE DETAIL)
EL +1.0'
MLW EL. 0.0'
TIMBER VERTICAL PILE
TIMBER BATTER PILE
30" WIDE LADDER DETAIL
SCALE: 1/2"=1'-0"
1" DIA. HOLE CENTERED
3"x3/8" SIDE BARS
TO MATCH TIMBER SUPPORTS (TYP)
20'-0"
2'-6"
1" DIA. BARS
3/16
TYP
4"x7"x3/8" 3" LONG ANGLE (TYP)
12" (TYP)
CHILDS ENGINEERING CORPORATION
BOX 333 MEDFIELD, MASSACHUSETTS 02052 U.S.A.
Phone: (508) 359-8945 Fax: (508) 359-2751
E-mail: mail@childseng.com
STATE OF MAINE DAVID LIVINGSTON PORTER No. 4788 REGISTERED PROFESSIONAL ENGINEER
Work
Description
Date
Appr.
OK PRH
Designed by: FAR
Date: 11/13/01
Drn by: TEQ
Ckd by: FAR
Design file no. 157600_2-4
Reviewed by: FAR
Plot Scale: 1"=0'-1"
MAINE D.O.T.
JONESPORT - BEALS BRIDGE
PIER #4 & #5
FENDER SYSTEM REPAIR
PROPOSED PLAN & DETAILS
Sheet reference number:
M-004
Sheet 4 of 4







SPECIFICATIONS

DESIGN: Load Factor Design, per AASHTO Standard Specifications for Highway Bridges 1983 and interim specifications 1984.

CONTRACT: State of Maine, Department of Transportation Standard Specifications, Highway and Bridges Revision of January, 1984.

MATERIALS

CONCRETE: ------ Class AA (Except as noted)

BASIC ALLOWABLE STRESSES

CONCRETE: f'_c = --------- 3000 psi

F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	BH-0005(52)	1	14

INDEX OF SHEETS

STANDARD DETAILS

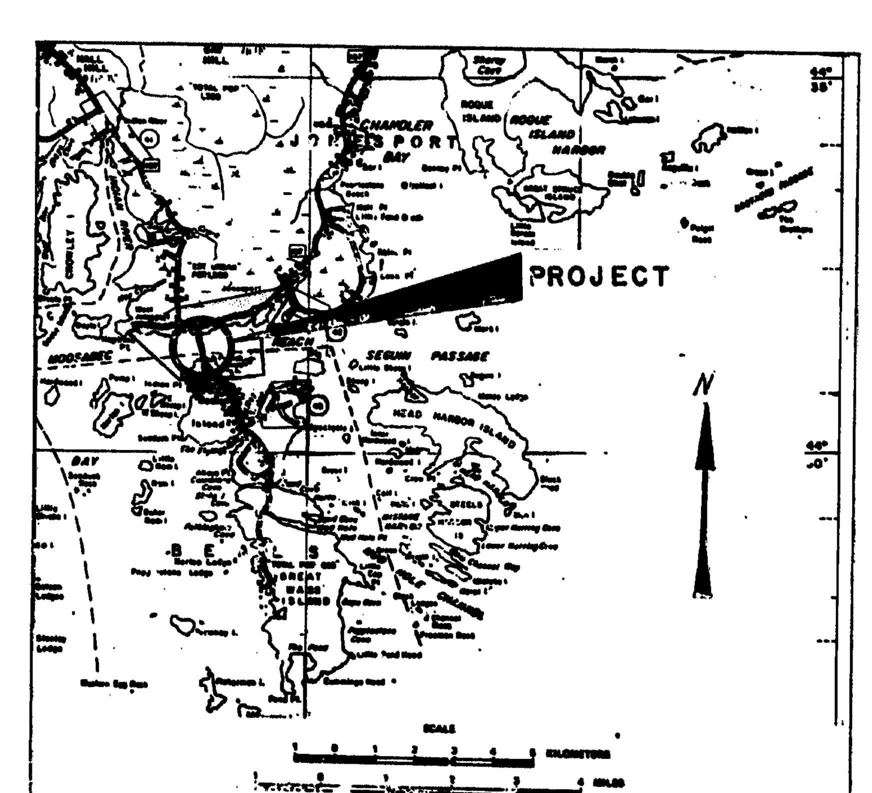
9	BD 127-81
10	BD 128-82
11	6 TYPE 3 Guard Rail
12-14	MAINTENANCE OF TRAFFIC

Plans of the existing bridge are available for the Contractor's reference at the Bridge Design Office in Augusta. The plans are reproductions of original drawings as prepared for the construction of the bridge and it is very unlikely that the plans will show any construction field changes or any alterations which may have been made to the bridge during its life span.

NOTE:
All work contemplated under this contract shall be governed by and in conformity with the Standard Specifications (Revision of January 1984) and supplementals thereto, except as modified on the plans and in the Special Provisions.

TRAFFIC DATA

AADT (1985)	2400
AADT (2005)	4800
DHV	528
T %	3
D	70
18 Kip P 2.0	30
18 Kip P 2.5	33



LOCATION MAP

APPROVED:
STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

	DATE
COMMISSIONER	5/14/86
CHIEF ENGINEER	5/14/86

UNITED STATES
DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
REGION 1
APPROVED: 103-99
DIVISION ENGINEER DATE

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

JONESPORT-BEALS BRIDGE
OVER
MOOSABEC REACH
IN THE TOWNS OF
JONESPORT AND BEALS
WASHINGTON COUNTY
GENERAL PLAN
SHEET 1 OF 14 AUGUSTA, MAINE

PROJECT DESIGN ENGINEER	BY	DATE
PLANS DESIGN - DETAILED	WR SRL	7-85
CHECKED		
REVISIONS		
FIELD CHANGES		

G 39

F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	BH-0005(52)	2	14

ESTIMATED QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
202.123	SCARIFYING CONCRETE DECK - TOP ½ INCH	1	LS
403.10	HOT BIT. PAVEMENT, GRADING "D"	9	TON
410.15	EMULSIFIED ASPHALT APPLIED	13	G
502.290	STRUC CONC WEARING SURFACE ON BRIDGES	1	LS
503.12	REINFORCING STEEL FAB & DELIVERED	920	LB
503.13	REINFORCING STEEL PLACING	920	LB
514.06	CURING BOX FOR CONCRETE CYLINDERS	1	EA
515.21	PROTECTIVE COATING FOR CONCRETE SURFACES	1	L.S.
516.21	LATEX MODIFIED MORTAR or CONCRETE WEARING SURFACE ON BRIDGE	1	LS
518.30	REHABILITATION OF STRUC. CONC. SLAB - TO REINFORCING STEEL	3,400	SF
518.31	REHABILITATION OF STRUC. CONC. SLAB - TO BELOW REINFORCING STEEL	1,650	SF
519.30	EPOXY WATERPROOFING OVERLAY	500	SY.
520.24	EXPANSION DEVICE - GLAND SEAL	1	EA
522.06	MODULAR EXPANSION DEVICE	2	EA
526.301	TEMPORARY CONCRETE BARRIER, TYPE 1	1	LS
606.178	GUARD RAIL BEAM	4,290	LF
627.61	4 INCH SOLID WHITE PAVEMENT MARKING LINE	2,500	LF
627.63	4 INCH SOLID YELLOW PAVEMENT MARKING LINE	2,500	LF
639.19	FIELD OFFICE TYPE B	1	EA
643.72	TEMPORARY TRAFFIC SIGNALS	1	LS
652.31	TYPE I BARRICADES	20	EA.
652.33	DRUM	10	EA.
652.34	CONE	10	EA.
652.35	CONSTRUCTION SIGNS	270	S.F.
652.36	MAINTENANCE OF TRAFFIC CONTROL DEVICES	110	C.D.
652.37	WARNING LIGHTS	2	GP.
652.38	FLAGGER	500	MH
655.40	CATHODIC PROTECTION	1	LS
659.10	MOBILIZATION	1	LS

GENERAL CONSTRUCTION NOTES

1) The utilities involved in this contract are:
   Bangor Hydro Electric Company
   New England Telephone Company
   Pine Tree Cablevision

   All utility facilities shall be adjusted by the respective utilities unless noted.

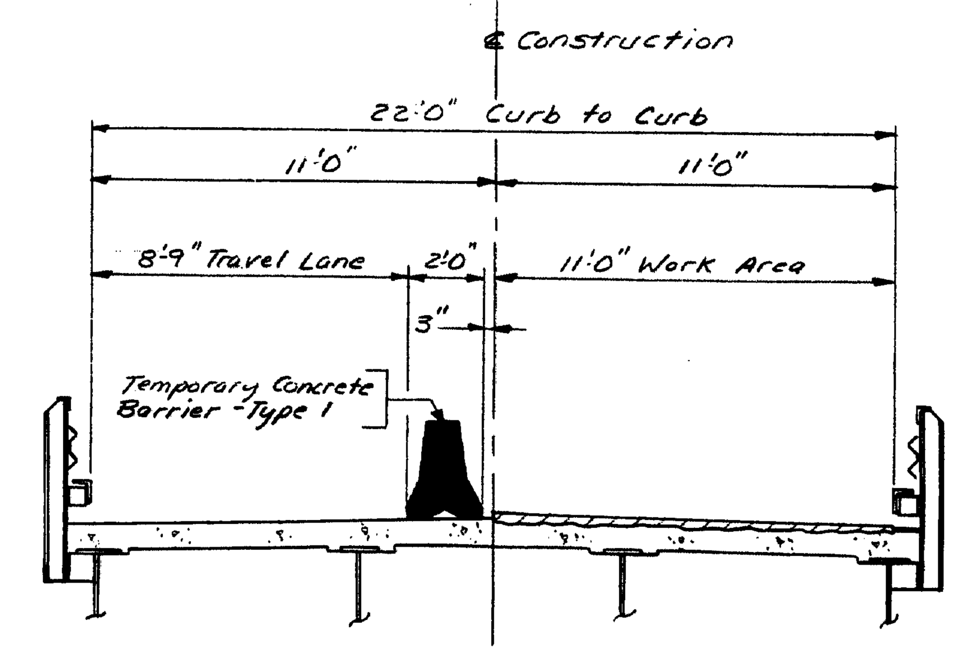
TEMPORARY TRAFFIC SIGNAL SEQUENCE OF OPERATION

Approach \ Interval	1	2	3	4	5	6	7
N. Bound Traffic	G	Y	R	R	R	R	G
S. Bound Traffic	R	R	R	G	Y	R	R
Time (seconds)	12	3	35	12	3	35	

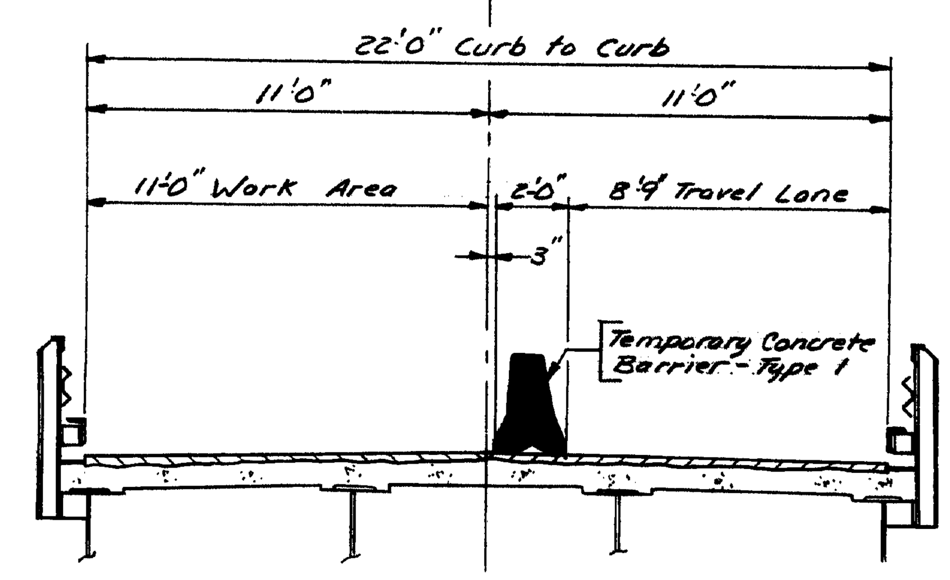
The Temporary Traffic Signal Controller shall be a pretimed, two-phase Controller.

LEGEND

G = 12" Green Light
Y = 12" Yellow Light
R = 12" Red Light



STAGE - 1



STAGE - 2

SEQUENCE OF CONSTRUCTION

STAGE - 1 Install traffic control devices, Maintain 8'9" travel lane, Modify expansion devices, Scarify deck, Place wearing surface.

STAGE - 2 Relocate traffic control devices, Maintain 8'9" travel lane, Modify expansion devices, Scarify deck, Place wearing surface.

103-100

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

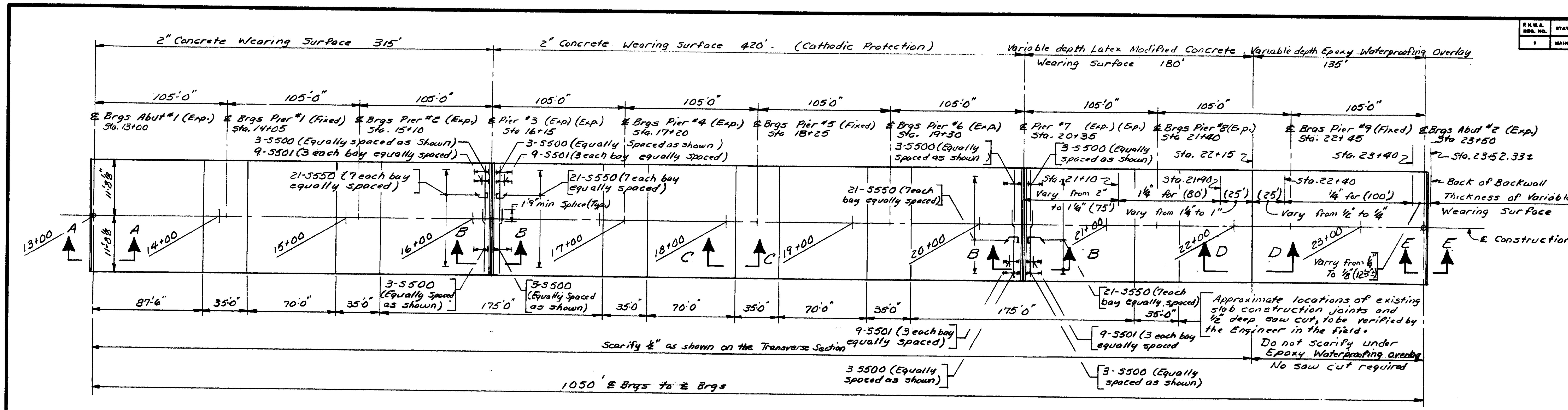
JONESPORT - BEALS BRIDGE
OVER
MOOSABEC REACH
IN THE TOWNS OF
JONESPORT AND BEALS
WASHINGTON COUNTY
SEQUENCE OF CONST. & ESTIMATED QUANT.
SHEET 2 OF 14 AUGUSTA, MAINE

PLANS		BY	DATE
PROJECT DESIGN ENGINEER			
DESIGN - DETAILED			
CHECKED			11-85
REVISIONS			
FIELD CHANGES			

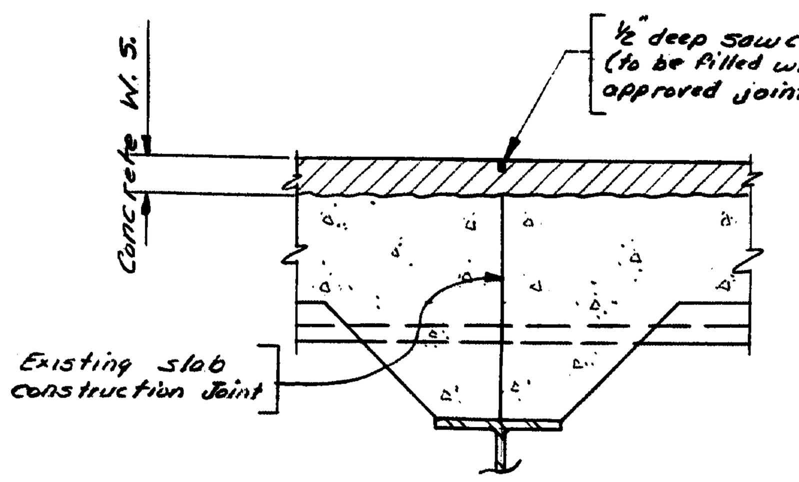
BRUNING 44-132 45710-1

REEL
103
sh. 101 thru 200

F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	BH-0005(52)	3	14

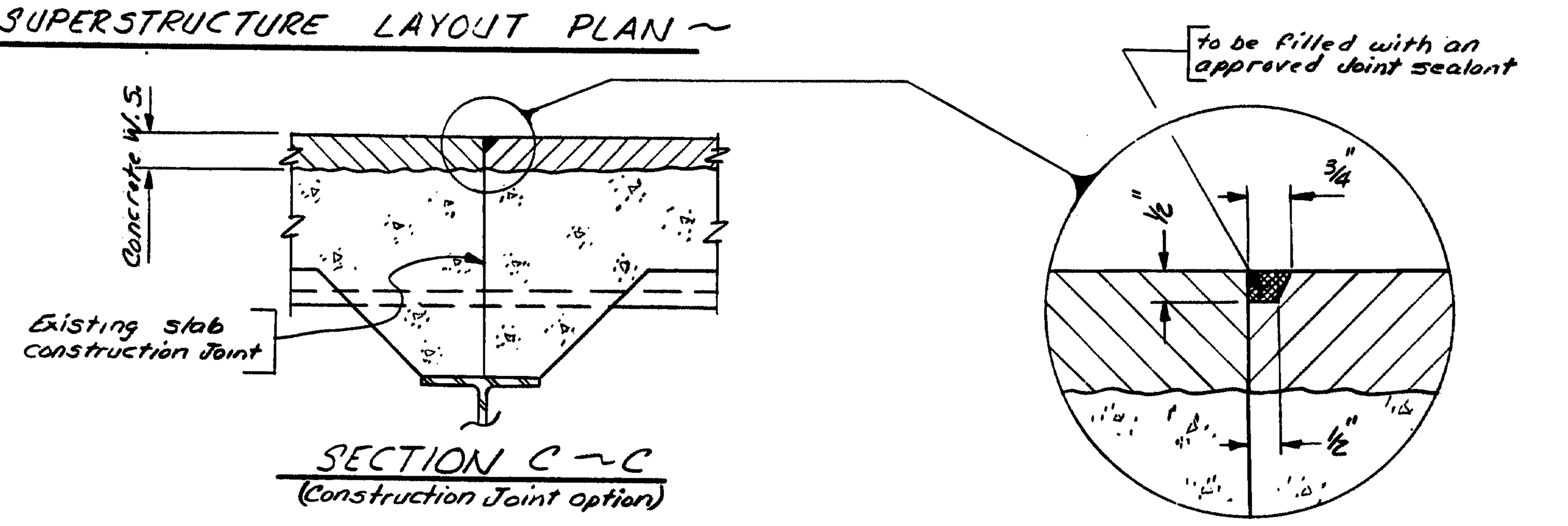


~ SUPERSTRUCTURE LAYOUT PLAN ~

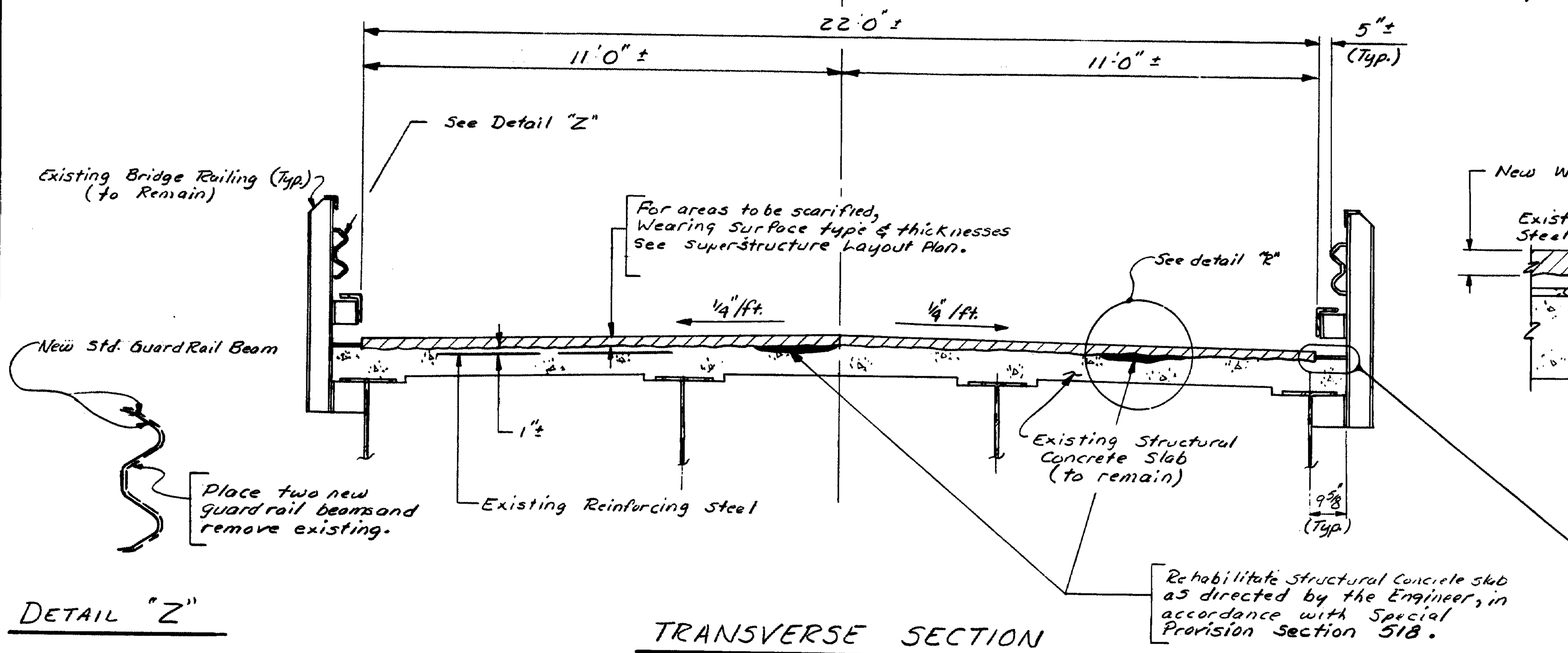


NOTE: At existing slab construction joint locations, the contractor shall place a construction joint or a ½" deep saw cut, at his option, in the new concrete wearing surface. Payment for this work and materials will be incidental to concrete wearing surface pay items.

SECTION C ~ C
(Saw cut option)

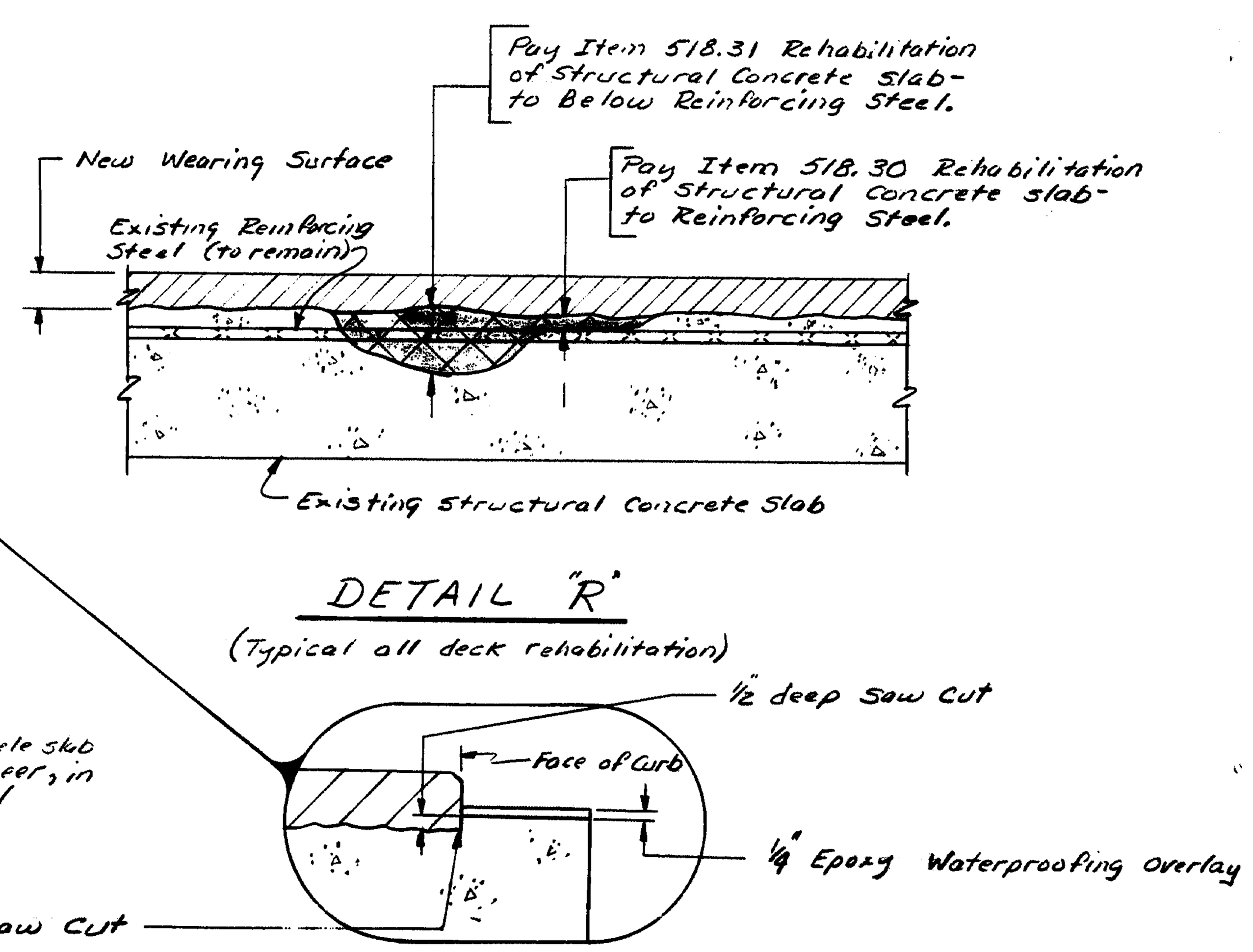


SECTION C ~ C
(Construction Joint option)



DETAIL "Z"

TRANSVERSE SECTION



DETAIL "R"
(Typical all deck rehabilitation)

SUPERSTRUCTURE NOTES

1.----Reinforcing steel shall have two inches minumim cover unless otherwise indicated.

2.----At all concrete wearing surface longitudinal construction joints, brush joint with neat cement paste before making adjacent concrete placement.

3.----Protective coating for concrete surfaces shall be applied to the new concrete wearing surface from sta 13+00± to sta. 20+35± and the Existing fascia to the drip notch for the entire length of the bridge.

4.----The existing guard rail beam shall be removed and replaced with two new guard rail beams placed together as shown in the transverse section. Payment will be made under Item 606.178, Guard Rail Beam.

5.----If the Contractor so chooses, he may remove the steel curb on the side of the bridge under construction. The steel curb shall be reinstalled to its original position before traffic is allowed on the newly constructed lane. Any damage incurred to the curb or rail post during this operation shall be repaired by the Contractor at his expense. There will be no extra payment for removing and reinstalling the existing steel curb. It shall be considered incidental to related contract items.

PLANS		BY	DATE
PROJECT DESIGN ENGINEER			
DESIGN - DETAILED		MAD RVN	10-85
CHECKED		GOT	3-86
REVISIONS			
FIELD CHANGES			

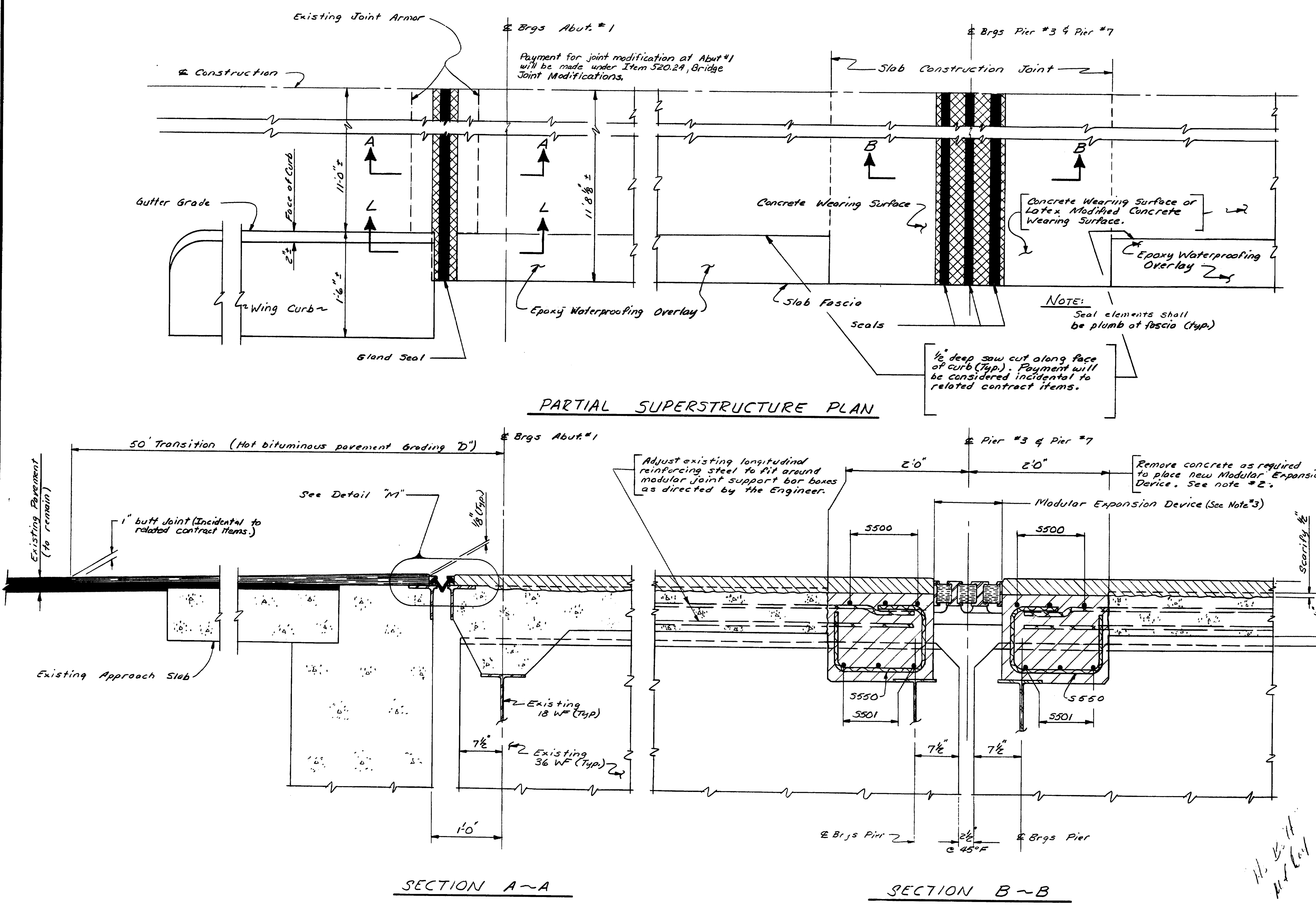
BRUNING 44-132 45710-1

103-101

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

JONESPORT - BEALS BRIDGE
OVER
MOOSABEC REACH
IN THE TOWNS OF
JONESPORT AND BEALS
WASHINGTON COUNTY
SUPERSTRUCTURE LAYOUT
SHEET 3 OF 14 AUGUSTA, MAINE

F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	BH-0005(52)	4	14



NOTES

1. At the Contractor's option, the Modular Expansion Devices to be installed at Pier #3 & #7 shall be one of the following:
   ~ Watson Bowman Acme D900
   ~ D. S. Brown D241

2. The 2'0" dimension shown for the removal of bridge deck at Pier #3 and Pier #7 is approximate and may vary depending on the new Modular Expansion Device selected. The removal of the bridge deck structural concrete shall be done with care so as not to damage the existing reinforcing steel. The exposed reinforcing steel shall be cleaned by sand blasting or other approved method. Class AA concrete shall be used to replace the structural concrete removed.

3. The Modular Expansion Device shall be installed complete as one unit. The Contractor shall maintain traffic over the blocked out portions of the deck with an approved temporary bridging system. Payment will be made under Item 522.06, Modular Expansion Device and will be considered full compensation for all materials, labor, equipment, and incidentals necessary to complete to work, including removing and replacing structural concrete, adjusting and cleaning reinforcing steel, temporarily bridging over the blocked out portion and fabricating and installing the Modular Expansion Device.

PROJECT DESIGN ENGINEER	BY	DATE
PLANS DESIGN-DETAILED	MLB	10-85
CHECKED	RJN	5-86
REVISIONS	GOT	
FIELD CHANGES		

BRUNING 44-132 45710-1

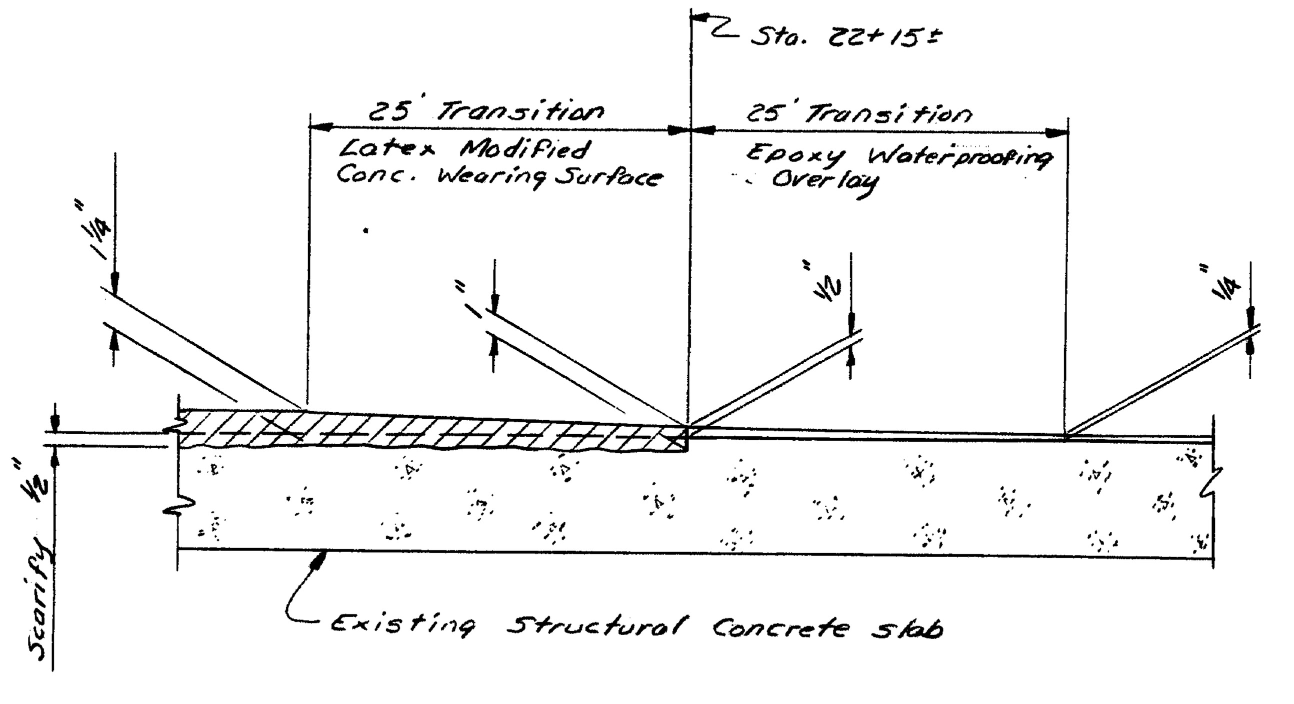
103-102

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

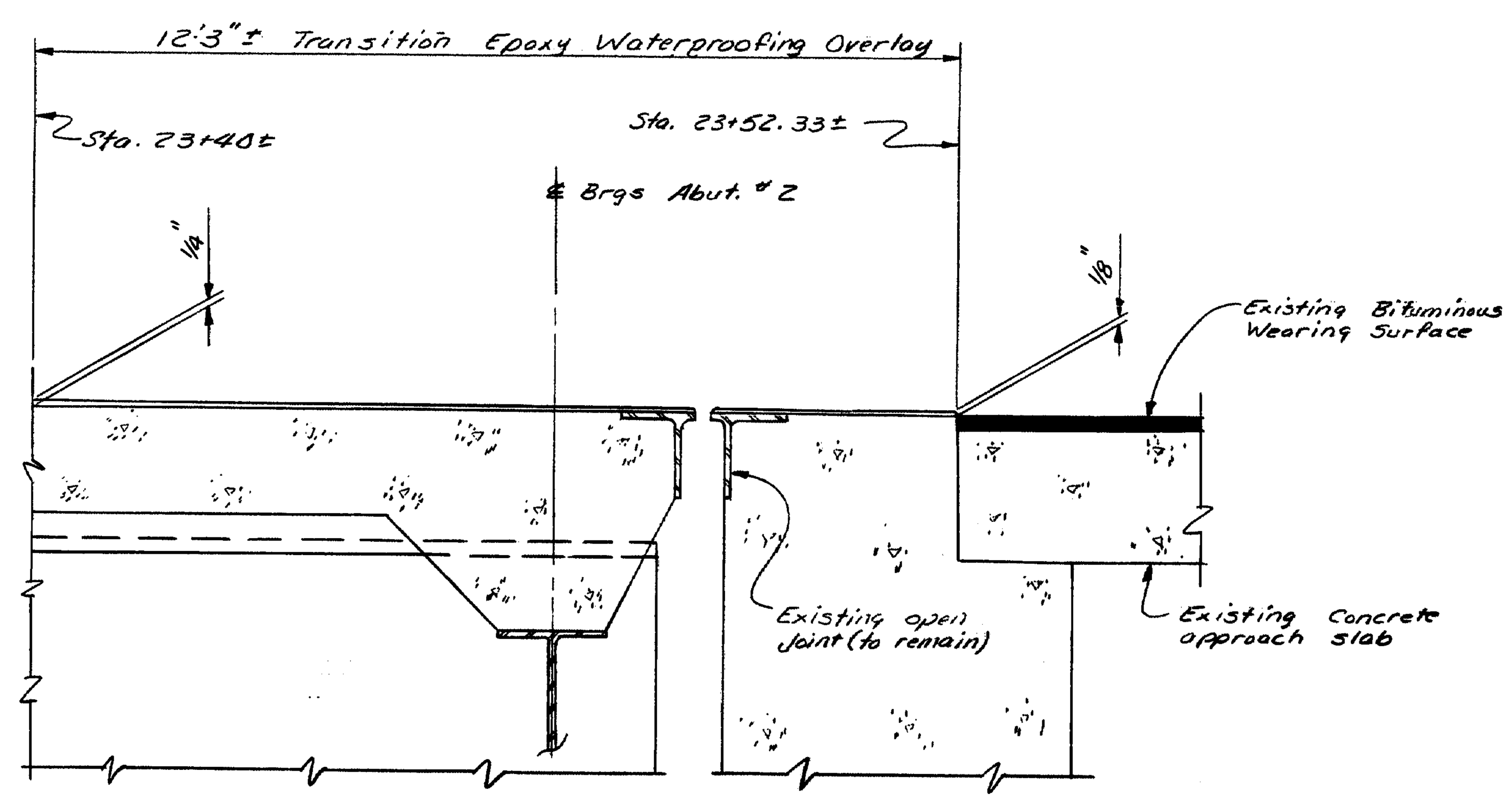
JONESPORT-BEALS BRIDGE
OVER
MOOSABEC REACH
IN THE TOWNS OF
JONESPORT AND BEALS
WASHINGTON COUNTY
SUPERSTRUCTURE DETAILS

SHEET 4 OF 14 AUGUSTA, MAINE

F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	BH-0005(52)	5	14



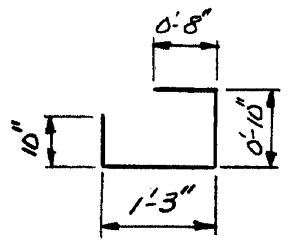
SECTION D~D



SECTION E~E

REINFORCING STEEL SCHEDULE

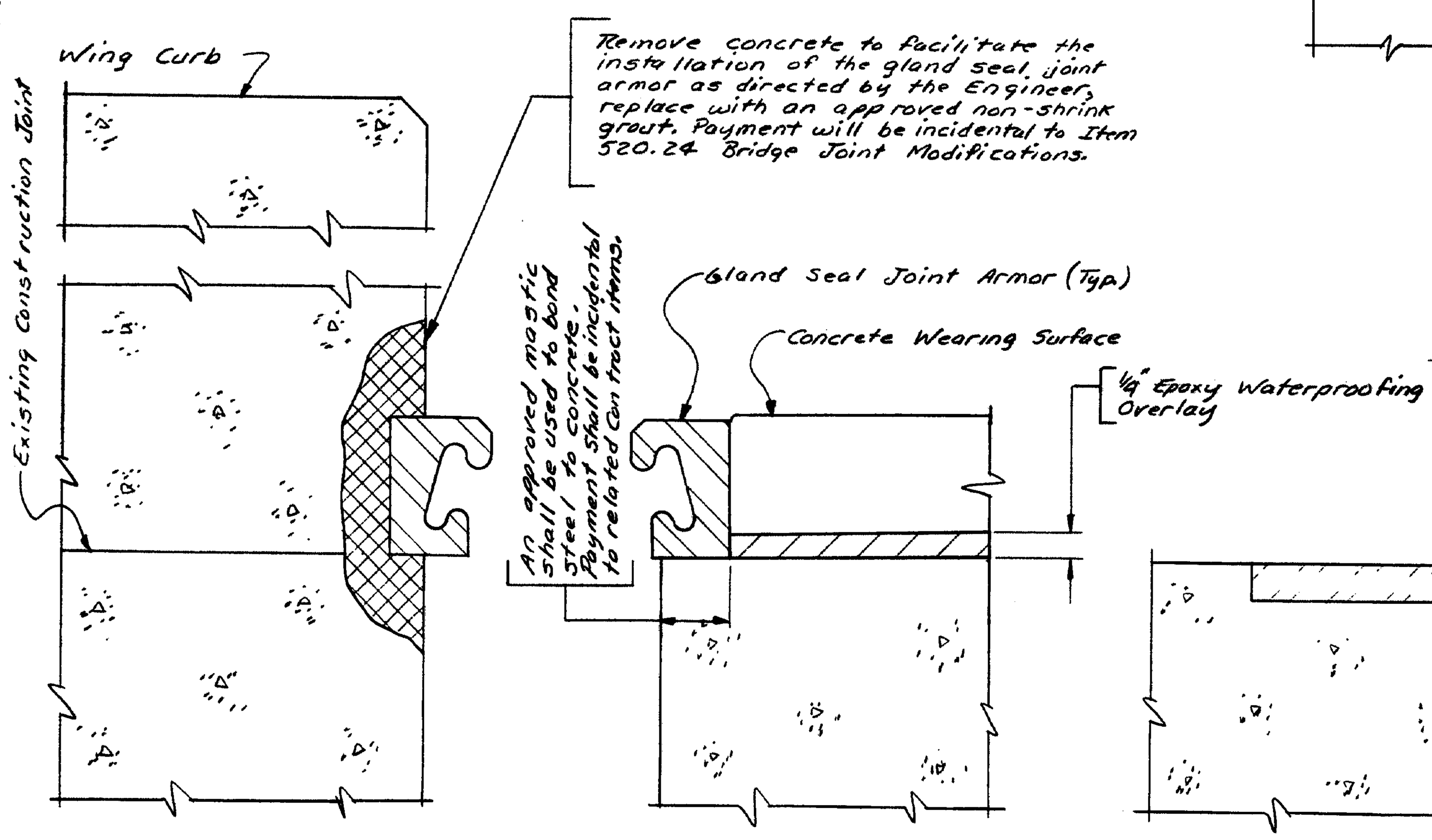
Mark	Qty.	Length	Location
STRAIGHT BARS			
S500	24	14'0"	Transverse
S501	36	6'8"	Transverse
BENT BARS			
S550	84	3'7"	haunch



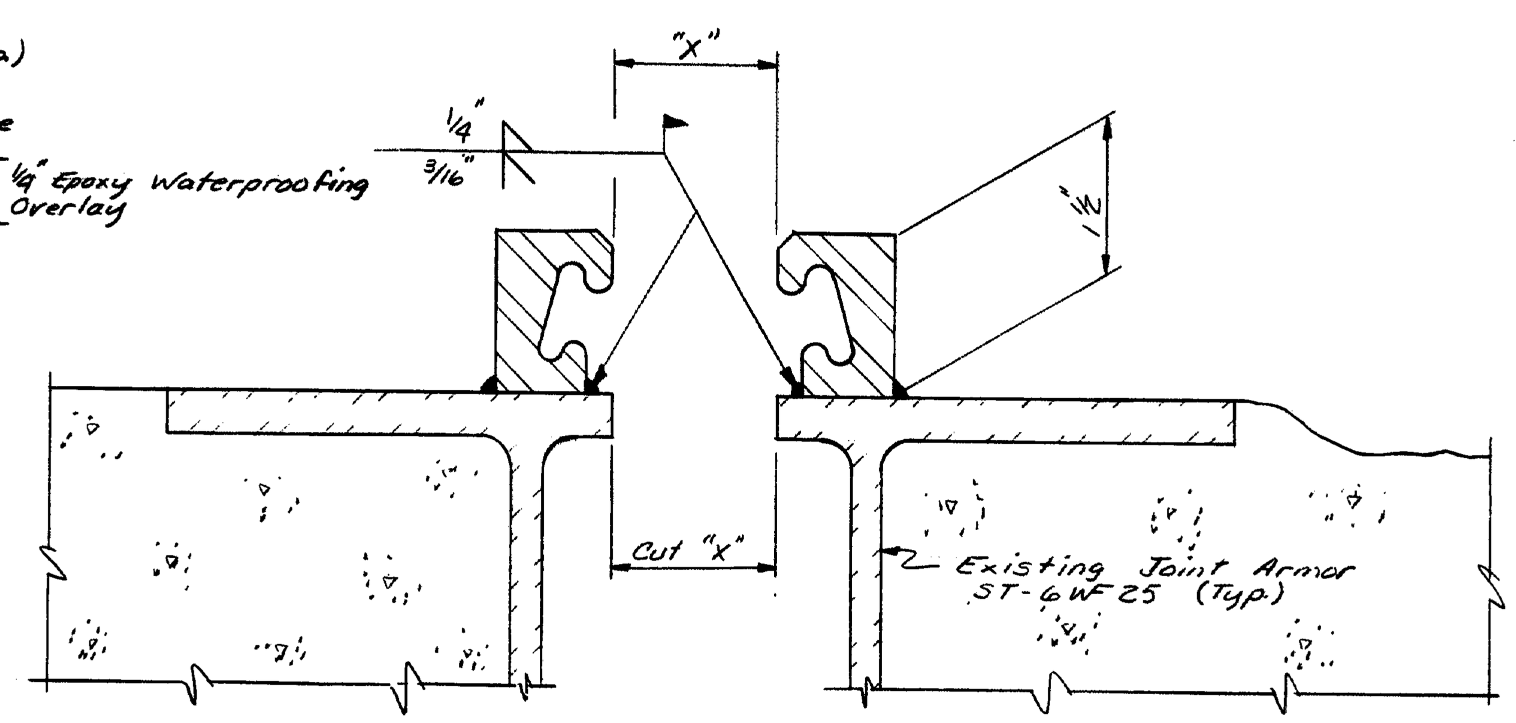
Note: Dimensions are out to out of bars

ASTM A615, Grade 60

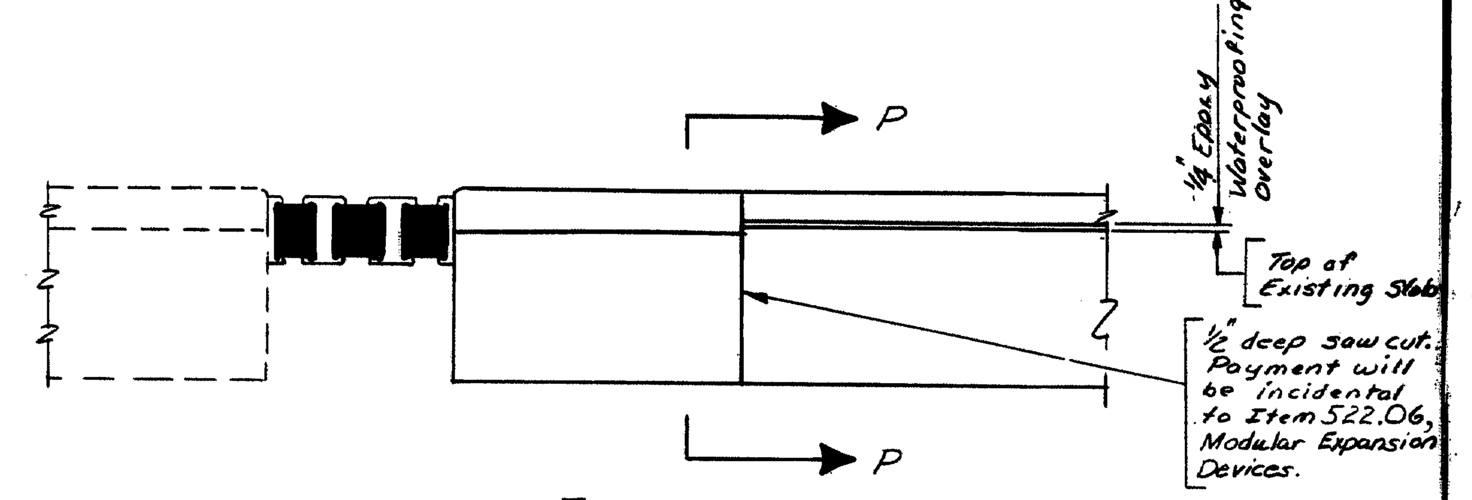
All bars are #5 bars



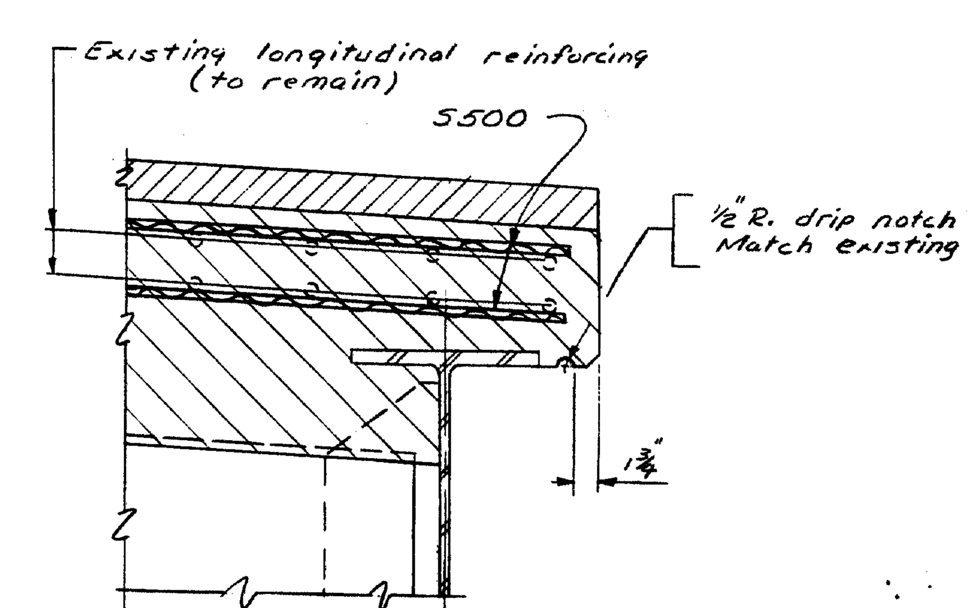
SECTION L~L



DETAIL "M"



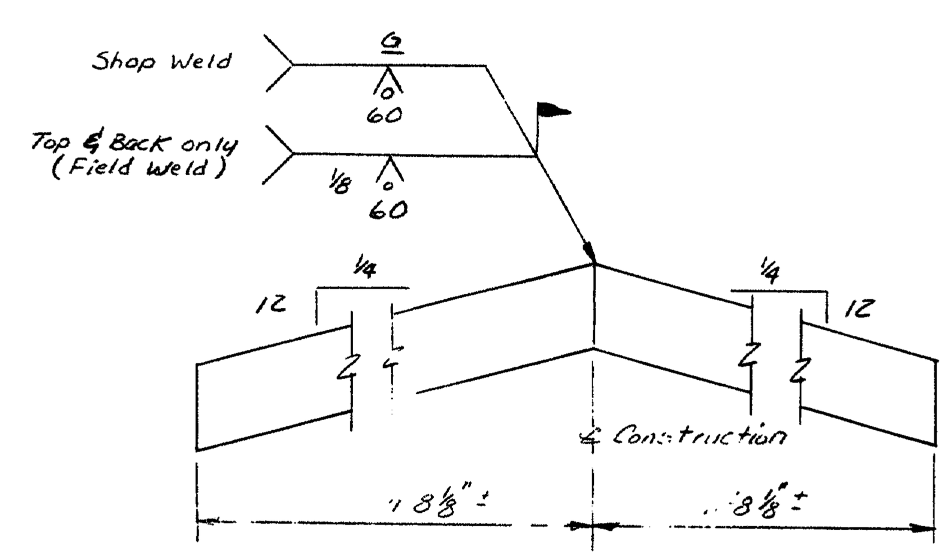
TYPICAL FASCIA DETAIL



SECTION P~P

TOTAL MOVEMENT REQUIRED "X"	Dim "X" Measured Parallel to ℄ of Roadway Temperature (°F)										
	120°	105°	90°	75°	60°	45°	30°	15°	0°	-15°	-30°
1 1/2"	1"	1 1/8"	1 1/4"	1 1/2"	1 5/8"	1 3/4"	1 7/8"	2"	2 1/4"	2 3/8"	2 1/2"

GLAND SEAL SETTING TABLE



PROFILE GLAND SEAL JOINT ARMOR

NOTE

Gland seal joint armor shall be plumb at Fascia (Typ.).

"As Built" M.A. Gray

103-103

PLANS	BY	DATE
PROJECT DESIGN ENGINEER		
DESIGN-DETAILED	[illegible] / RVN	11-85
CHECKED	GDT	5-86
REVISIONS		
FIELD CHANGES		

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

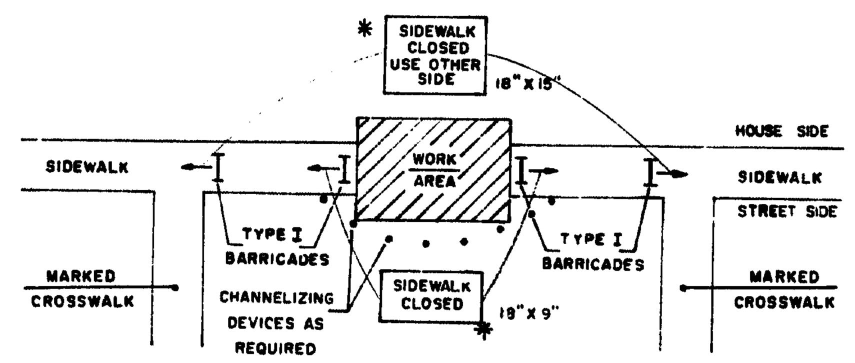
JONESPORT-BEALS BRIDGE
OVER
MOOSABEC REACH
IN THE TOWNS OF
JONESPORT AND BEALS
WASHINGTON COUNTY
SUPERSTRUCTURE DETAILS

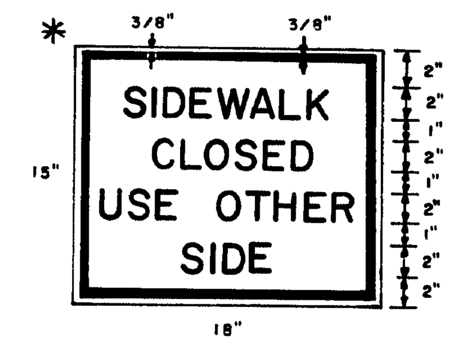
SHEET 5 OF 14 AUGUSTA, MAINE

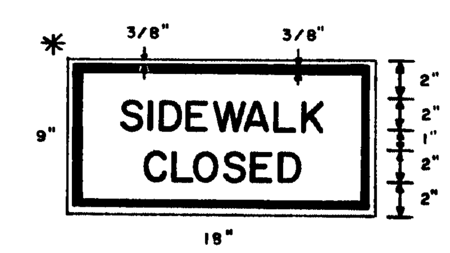
BRUNING 44-132 45710-1

F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO	TOTAL SHEETS
1	MAINE	BH-0005(52)	12	14

* NON-REFLECTORIZED WHITE BACKGROUND, BLACK TEXT AND BORDER-2" SERIES 'C' UPPER CASE LETTERS



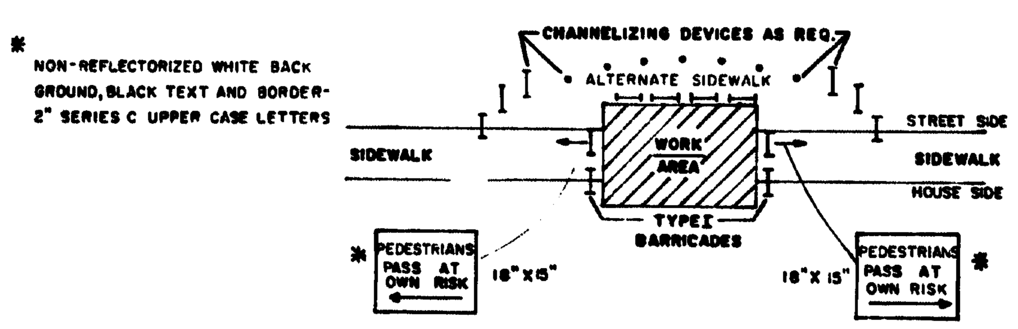


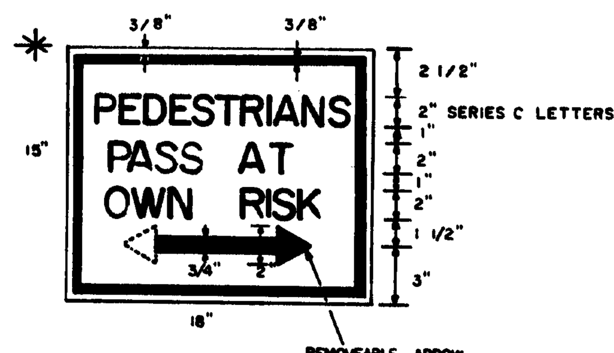


SIDEWALK CLOSURE
WITHOUT ALTERNATE SIDEWALK

A

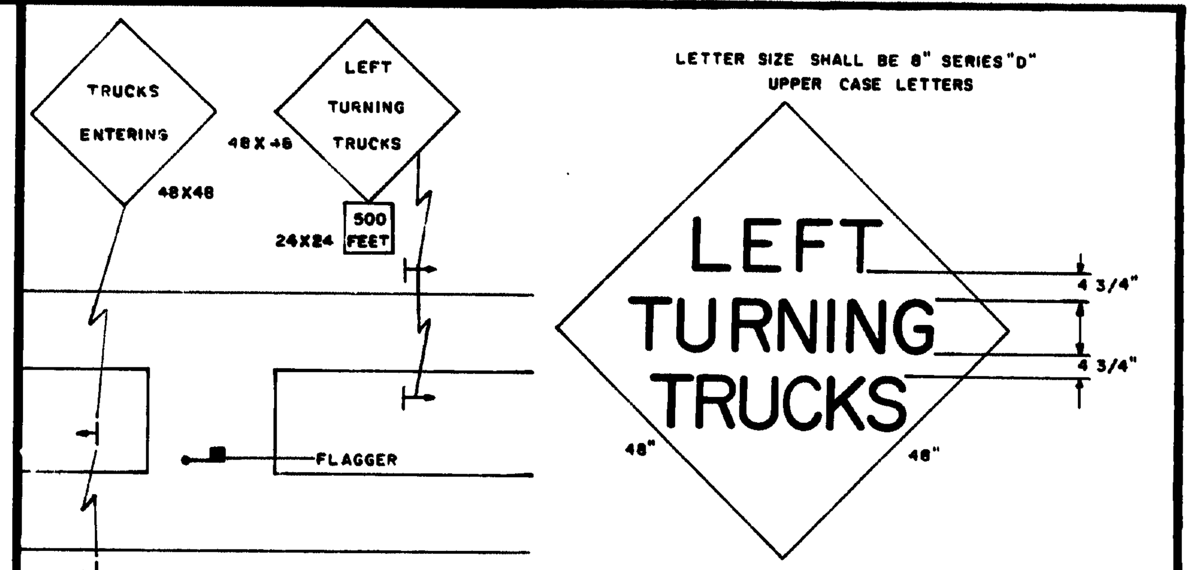
* NON-REFLECTORIZED WHITE BACKGROUND, BLACK TEXT AND BORDER-2" SERIES C UPPER CASE LETTERS





SIDEWALK CLOSURE
WITH ALTERNATE SIDEWALK

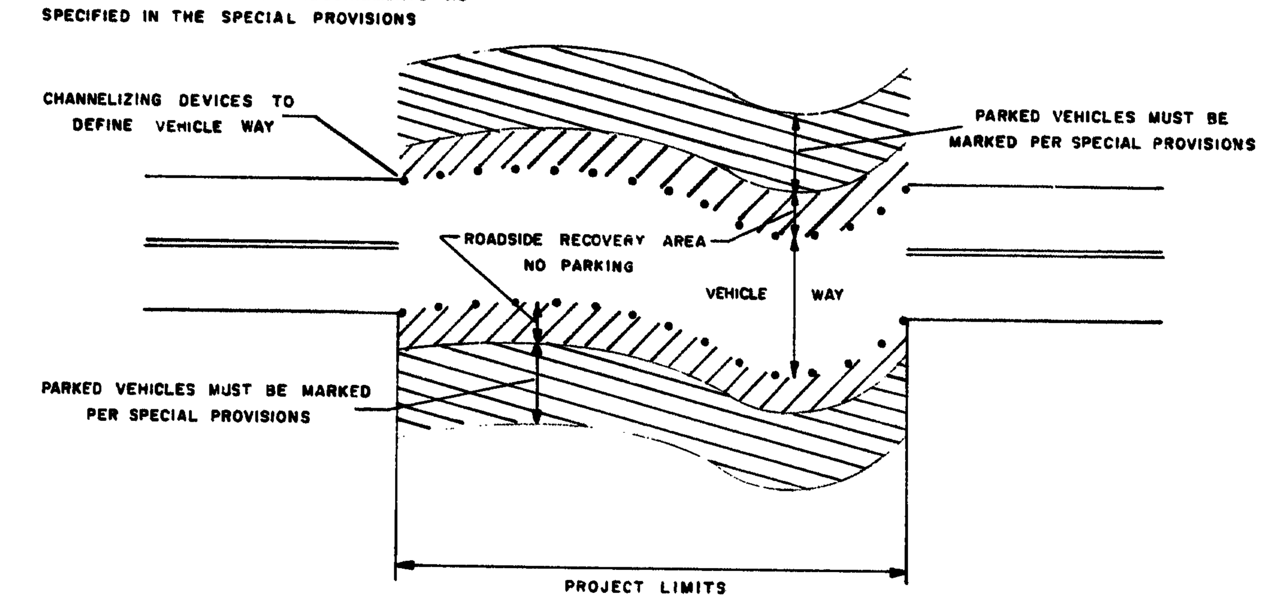
B



MEDIAN CROSSOVER

E

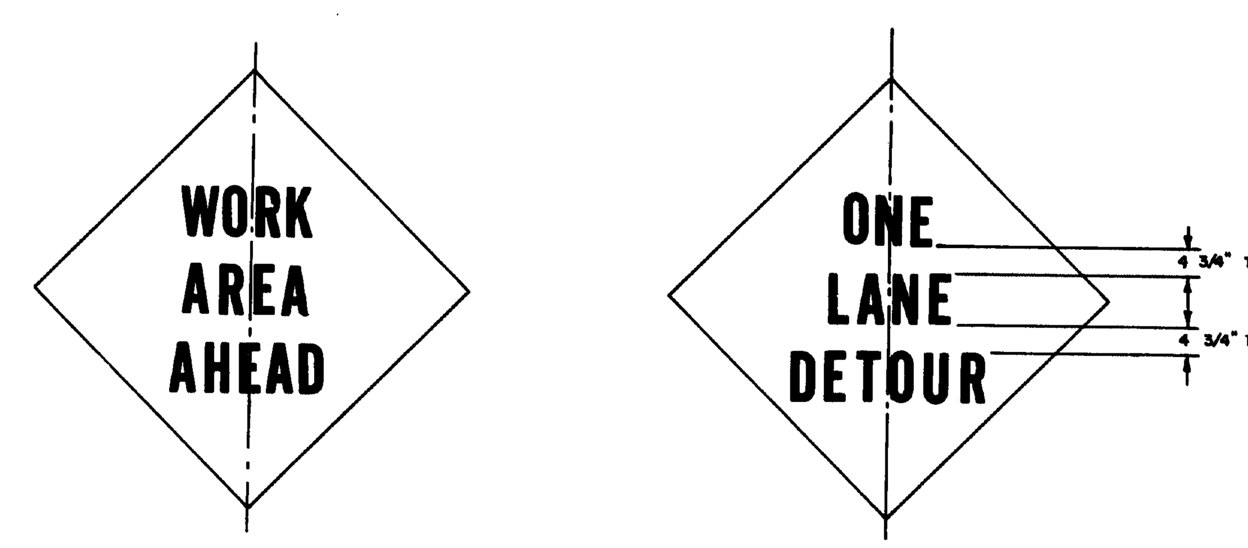
ALL DIMENSIONS AND OTHER REQUIREMENTS AS SPECIFIED IN THE SPECIAL PROVISIONS



ROADSIDE RECOVERY AREA

C

CONSTRUCTION WARNING SIGN DETAIL



1. Letter size shall be 8" Series 'D'.
2. Border dimensions and legend design shall conform to "Standard Highway Signs".

D

GENERAL NOTES

1. Distances shown for sign placement are nominal, exact locations shall be determined by the Engineer.
2. Grades on temporary roadways through the construction zone used by the public shall not exceed 10 percent.
3. Advisory speed consistant with prevailing conditions shall be as determined by the Engineer.
4. Use shaded signs when specified in the Special Provisions.
5. The length of tapers shall be determined from the following formulae:

   If S is equal to or less than 40 MPH
   $L = (W \times S \times S) / 60$

   If S is equal to or greater than 45 MPH
   $L = WS$

   Where:

   L = taper length in feet
   S = operating speed in MPH
   W = width of roadway to be closed in feet

   Taper lengths shall be rounded to the nearest five feet.

   It may be required to extend lane closure tapers to provide a smooth transition where geometric alignment reduces sight distance.

6. The maximum longitudinal spacing of channelizing devices shall conform to the following:
   (a) 50 feet through work areas
   (b) A distance in tapers equal to the numerical value of the operating speed, i.e., 45MPH = 45 feet
   (c) In all areas not covered above maximum spacing shall be as follows:

Radius of curve	Spacing
50' to 300'	25'
301' to 700'	50'
701' to 1000'	75'
over 1000'	5 times the operating speed

   The maximum transverse spacing in tapers shall be determined from the the following formula:

   $D = (W \times S) / L$

   Where:

   D = transverse spacing in feet
   W = width of roadway to be closed in feet
   L = taper length in feet
   S = operating speed in MPH

7. BORDER DIMENSIONS AND LEGEND DESIGN SHALL CONFORM TO THE STANDARD HIGHWAY SIGNS BOOKLET.

103-104

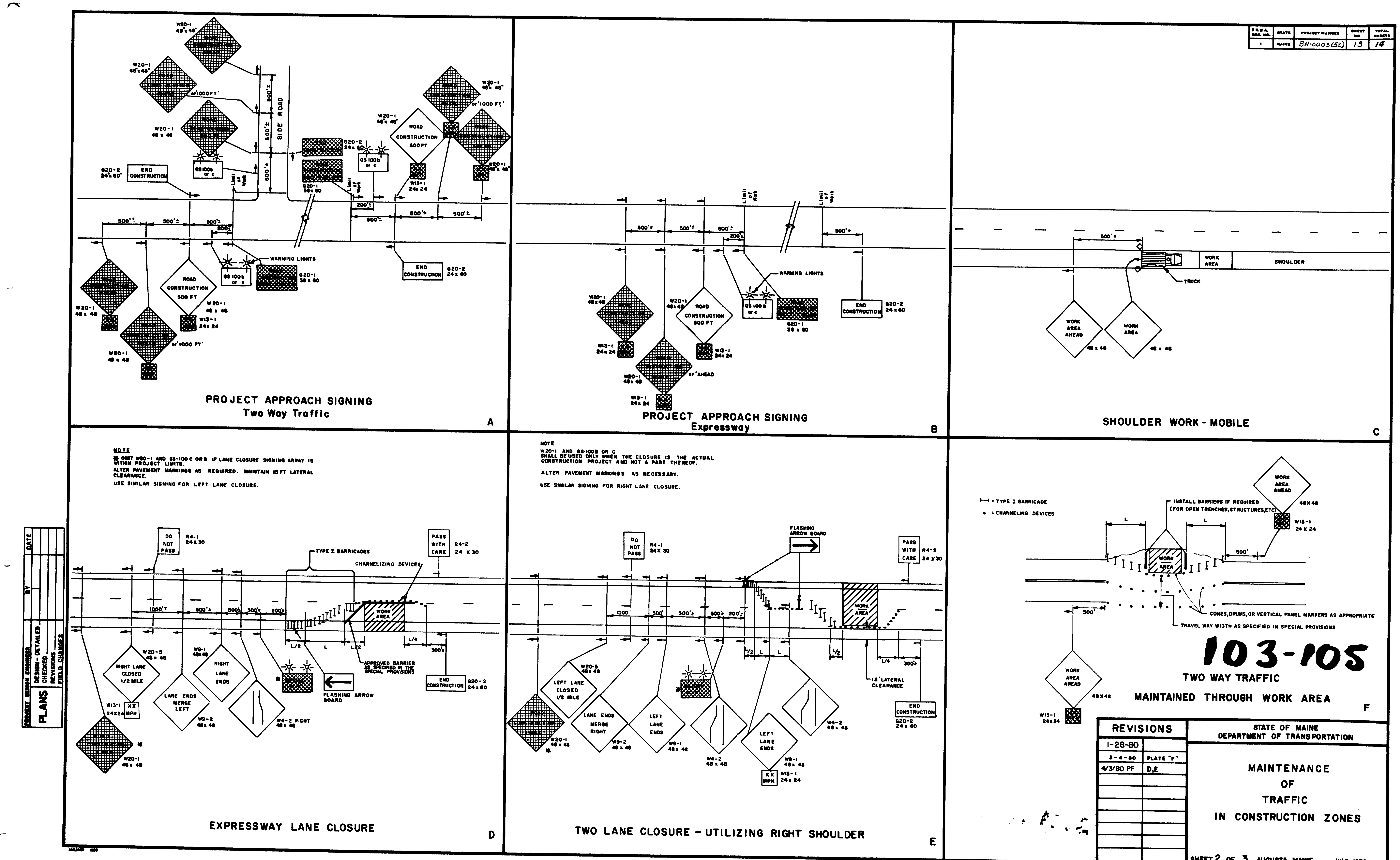
PLANS	BY	DATE
PROJECT DESIGN ENGINEER		
DESIGN - DETAILED		
CHECKED		
REVISIONS		
FIELD CHANGES		

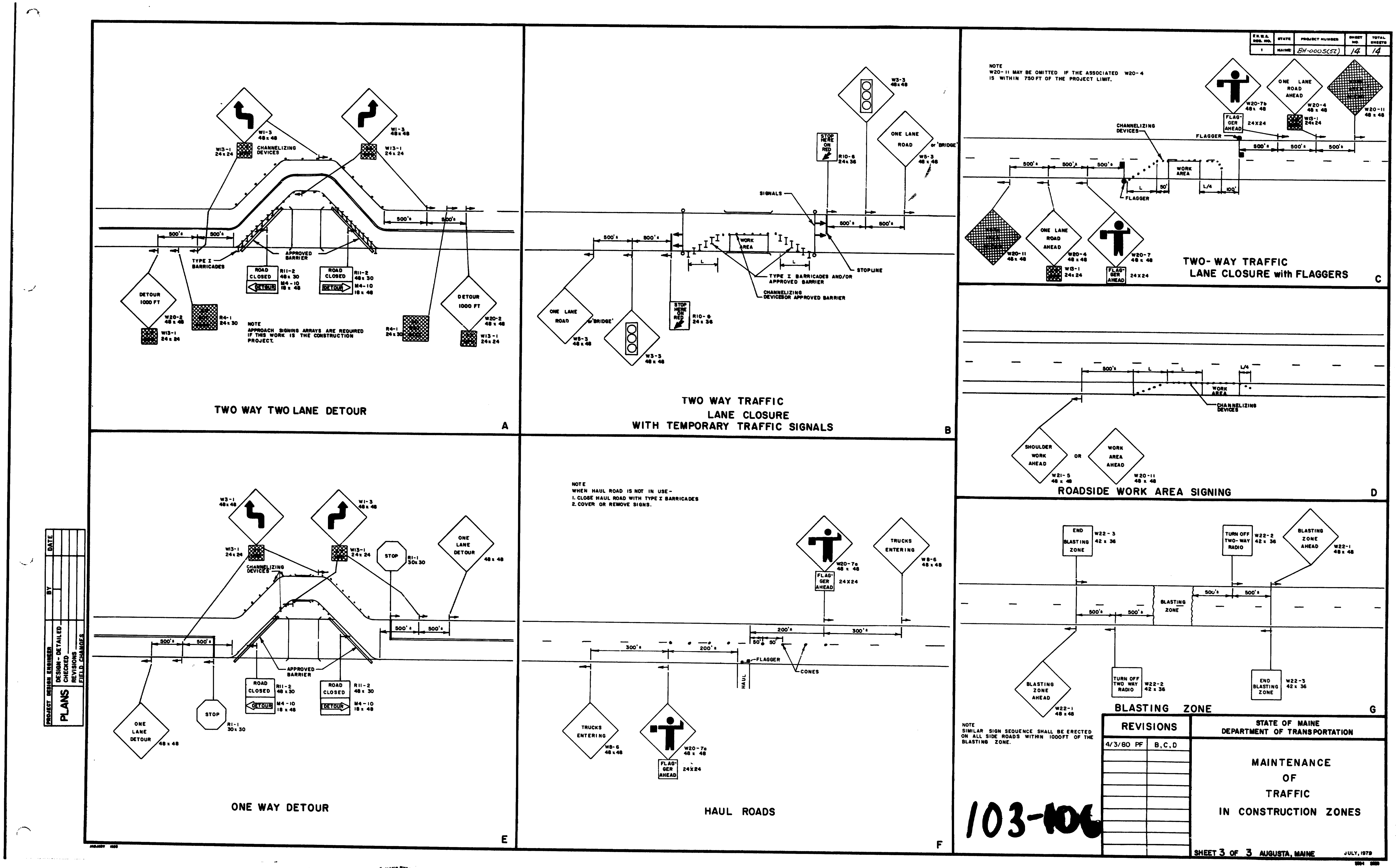
REVISIONS			
3-4-80	GENERAL NOTES		
4/3/80 PF	A,B,C,GN		

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

MAINTENANCE
OF
TRAFFIC
IN CONSTRUCTION ZONES

SHEET 1 OF 3 AUGUSTA, MAINE


F.H.W.A. REG. NO. 1 | STATE MAINE | PROJECT NUMBER BH-0005(52) | SHEET NO. 13 | TOTAL SHEETS 14
PROJECT APPROACH SIGNING
Two Way Traffic
A
PROJECT APPROACH SIGNING
Expressway
B
SHOULDER WORK - MOBILE
C
NOTE
※ OMIT W20-1 AND GS-100 C OR B IF LANE CLOSURE SIGNING ARRAY IS WITHIN PROJECT LIMITS.
ALTER PAVEMENT MARKINGS AS REQUIRED. MAINTAIN 15 FT LATERAL CLEARANCE.
USE SIMILAR SIGNING FOR LEFT LANE CLOSURE.
EXPRESSWAY LANE CLOSURE
D
NOTE
W20-1 AND GS-100B OR C SHALL BE USED ONLY WHEN THE CLOSURE IS THE ACTUAL CONSTRUCTION PROJECT AND NOT A PART THEREOF.
ALTER PAVEMENT MARKINGS AS NECESSARY.
USE SIMILAR SIGNING FOR RIGHT LANE CLOSURE.
TWO LANE CLOSURE - UTILIZING RIGHT SHOULDER
E
TYPE I BARRICADE
CHANNELING DEVICES
INSTALL BARRIERS IF REQUIRED (FOR OPEN TRENCHES, STRUCTURES, ETC)
CONES, DRUMS, OR VERTICAL PANEL MARKERS AS APPROPRIATE
TRAVEL WAY WIDTH AS SPECIFIED IN SPECIAL PROVISIONS
103-105
TWO WAY TRAFFIC
MAINTAINED THROUGH WORK AREA
F
REVISIONS
1-28-80
3-4-80 PLATE "F"
4/3/80 PF D,E
STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
MAINTENANCE
OF
TRAFFIC
IN CONSTRUCTION ZONES
SHEET 2 OF 3 AUGUSTA, MAINE JULY, 1979
PROJECT DESIGN ENGINEER
PLANS
DESIGN - DETAILED
CHECKED
REVISIONS
FIELD CHANGES
BY
DATE


F.H.W.A. REG. NO. | STATE | PROJECT NUMBER | SHEET NO. | TOTAL SHEETS
1 | MAINE | BH-0005(52) | 14 | 14
NOTE
APPROACH SIGNING ARRAYS ARE REQUIRED IF THIS WORK IS THE CONSTRUCTION PROJECT.
TWO WAY TWO LANE DETOUR
A
TWO WAY TRAFFIC
LANE CLOSURE
WITH TEMPORARY TRAFFIC SIGNALS
B
NOTE
W20-11 MAY BE OMITTED IF THE ASSOCIATED W20-4 IS WITHIN 750 FT OF THE PROJECT LIMIT.
TWO-WAY TRAFFIC
LANE CLOSURE with FLAGGERS
C
ROADSIDE WORK AREA SIGNING
D
ONE WAY DETOUR
E
NOTE
WHEN HAUL ROAD IS NOT IN USE-
1. CLOSE HAUL ROAD WITH TYPE III BARRICADES
2. COVER OR REMOVE SIGNS.
HAUL ROADS
F
BLASTING ZONE
G
NOTE
SIMILAR SIGN SEQUENCE SHALL BE ERECTED ON ALL SIDE ROADS WITHIN 1000FT OF THE BLASTING ZONE.
PROJECT DESIGN ENGINEER
DESIGN - DETAILED
CHECKED
REVISIONS
FIELD CHANGES
BY
DATE
PLANS
REVISIONS
4/3/80 PF | B,C,D
STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
MAINTENANCE
OF
TRAFFIC
IN CONSTRUCTION ZONES
SHEET 3 OF 3 AUGUSTA, MAINE
JULY, 1979
103-106

APPENDIX H

Hydraulic Data

VHB *Computations*

Project: Beals-Jonesport
Location: Beals-Jonesport
Calculated by: JMW
Checked by: RSB
Title Hydraulic Opening and Clearance

Project # 55029.00
Sheet 1 of 2
Date: 3/16/2015
Date: 5/28/2015

Opening and Clearance:

	Existing		Proposed	
Total Opening	~~70,110 SF~~	70,000	~~72,282 SF~~	71,200
Total Opening at ~~El. 6.3 Ft~~ MHW=5.9ft	~~40,331 SF~~	39,800	~~41,468 SF~~	41,100

See Profile-hydraulic info.dgn under planmisc for shapes

Low Superstructure El.:

Super depth = 71" beam
8" deck
3/4" pave
2.79" slope [(7.75' + 7.75'/2)(2%)(12) = 2.79"]
2" Haunch

87.04' = 7.25'

vhb

Computations

Project BEALS-JONESPORT Project # 55029.00
Location BEALS BRIDGE Sheet 1 of 2
Calculated by SMH Date 5-26-15
Checked by RSB Date 5-28-15
Title CLEARANCE TO MHW

PGL ≈ 52.0 @ NAV. CHANNEL 51.89

Beams = 71"
Haunch = 2.5"± 2"
Deck = 8"
Pave+Memb = 3.25"
X-Slope = 1.5 × 7.75' × 0.02 × 12 = 2.8"

Total Depth = 88" ≈ 7.3' 7.13

CLR @ MHW = 52.0 (PGL)
− 7.3 (SuperDepth)
− 5.9 (MHW)

38.8 → Need to Keep @ Existing!
38.9
≈ 39 FT* Agreed

*Adjust Profile Slightly in Final Design if Necessary.

VHB Vanasse Hangen Brustlin, Inc.

Estimate

Project:		**Project #:**	55029
Location:	Jonesport/Beals	**Sheet:**	1 of 1
Calculated by:	TJC	**Date:**	6/9/2014
Checked by:	JAW	**Date:**	8/28/2014
Title:	Tidal Elevations		

Tide Information from the nearest stations

Bar Harbor, Maine	(30 miles S.W.W.)
Milbridge, Maine	(15 miles W)
Cutler Naval Base, Maine	(20 miles N.E.E.)
Cutler Ferris Wharf	(22 miles N.E.E.)

Elevations Relative to NAVD88 ✓

	Bar Harbor ✓	Milbridge ✓	Cutler Naval ✓	Cutler Ferris	Average
MHHW	5.40 ✓ ft	5.88 ✓ft	6.82 ✓ft	7.01 ✓ft	**6.28** ft
MHW	4.97 ✓ ft	5.45 ✓ft	6.40 ✓ft	6.57 ✓ft	**5.85** ft
MTL	-0.31 ✓ft	-0.21 ✓ft	0.02 ✓ft	-0.30 ✓ft	**-0.20** ft
MSL	-0.30 ✓ft	-0.16 ✓ft	0.01 ✓ft	-0.36 ✓ft	**-0.20** ft
MLW	-5.59 ✓ft	-5.87 ✓ft	-6.36 ✓ft	-7.16 ✓ft	**-6.25** ft
MLLW	-5.97 ✓ft	-6.24 ✓ft	-6.74 ✓ft	-7.57 ✓ft	**-6.63** ft

Tidal Elevation - Bar Harbor, ME

- NGS Home
- About NGS
- Data & Imagery
- Tools
- Surveys
- Science & Education

Search

Go Back to Main Page

ELEVATION INFORMATION

PID:	PE0281
VM:	163
STATION ID:	8413320
EPOCH:	1983-2001
DATE:	Wednesday, August 27, 2014 1:53:20 PM EST

			Relative to NAVD88
MHHW	=	11.37 feet (3.466 meters)	→ 5.40' ✓
MHW	=	10.94 feet (3.336 meters)	→ 4.97' ✓
NAVD88	=	5.97 feet (1.820 meters)	→ 0.00' ← ✓
MSL	=	5.67 feet (1.728 meters)	→ -0.30' ✓
MTL	=	5.66 feet (1.726 meters)	→ -0.31' ✓
NGVD29	=	5.34 feet (1.628 meters)	→ -0.63'
MLW	=	0.38 feet (0.116 meters)	→ ~~[illegible]~~ -5.59' ✓
MLLW	=	0.00 feet (0.000 meters)	→ -5.97' ✓

The NAVD 88 and the NGVD 29 elevations related to MLLW were computed from Bench Mark, K 22, at the station.

Displayed tidal datums are Mean Higher High Water(MHHW), Mean High Water (MHW), Mean Tide Level(MTL), Mean Sea Level (MSL), Mean Low Water(MLW), and Mean Lower Low Water(MLLW) referenced on 1983-2001 Epoch.

Tidal Elevation - Cutler Naval Base

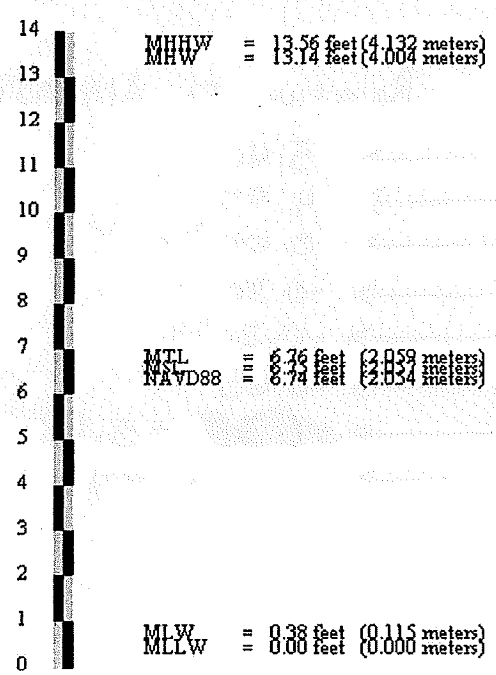
- NGS Home
- About NGS
- Data & Imagery
- Tools
- Surveys
- Science & Education

Search

Go Back to Main Page

ELEVATION INFORMATION

PID:	AJ2727
VM:	13801
STATION ID:	8411250
EPOCH:	1983-2001
DATE:	Wednesday, August 27, 2014 1:49:03 PM EST



MHHW = 13.56' → 6.82'
MHW = 13.14' → 6.40' ✓
MTL = 6.76' → 0.02' ✓
MSL = 6.75' → 0.01' ✓
NAVD88 = 6.74' → 0.00' ✓
MLW = 0.38' → -6.36' ✓
MLLW = 0.00' → -6.74' ✓

The NAVD 88 and the NGVD 29 elevations related to MLLW were computed from Bench Mark, null, at the station.

Displayed tidal datums are Mean Higher High Water(MHHW), Mean High Water (MHW), Mean Tide Level(MTL), Mean Sea Level (MSL), Mean Low Water(MLW), and Mean Lower Low Water(MLLW) referenced on 1983-2001 Epoch.

Tidal Elevation – Milbridge, ME

- NGS Home
- About NGS
- Data & Imagery
- Tools
- Surveys
- Science & Education

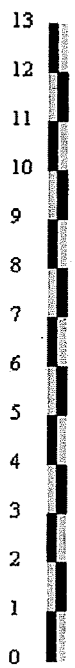
Search

Go Back to Main Page

ELEVATION INFORMATION

PID:	PD0347
VM:	15903
STATION ID:	8412581
EPOCH:	1983-2001
DATE:	Wednesday, August 27, 2014 1:51:30 PM EST

Relative to NAVD88



MHHW = 12.12 feet (3.694 meters) MHHW = 12.12' → 5.88'

MHW = 11.69 feet (3.562 meters) MHW = 11.69' → 5.45'

NAVD88 = 6.24 feet (1.903 meters) NAVD88 = 6.24' → 0.0'

MSL = 6.08 feet (1.853 meters) MSL = 6.08' → -0.16'

MTL = 6.03 feet (1.838 meters) MTD = 6.03' → -0.21

NGVD29 = 5.59 feet (1.703 meters) NGVD29 = 5.59' → -0.65

MLW = 0.37 feet (0.114 meters) MLW = .37' → -5.87'

MLLW = 0.00 feet (0.000 meters) MLLW = 0' → -6.24'

The NAVD 88 and the NGVD 29 elevations related to MLLW were computed from Bench Mark, A 148, at the station.

Displayed tidal datums are Mean Higher High Water(MHHW), Mean High Water (MHW), Mean Tide Level(MTL), Mean Sea Level (MSL), Mean Low Water(MLW), and Mean Lower Low Water(MLLW) referenced on 1983-2001 Epoch.

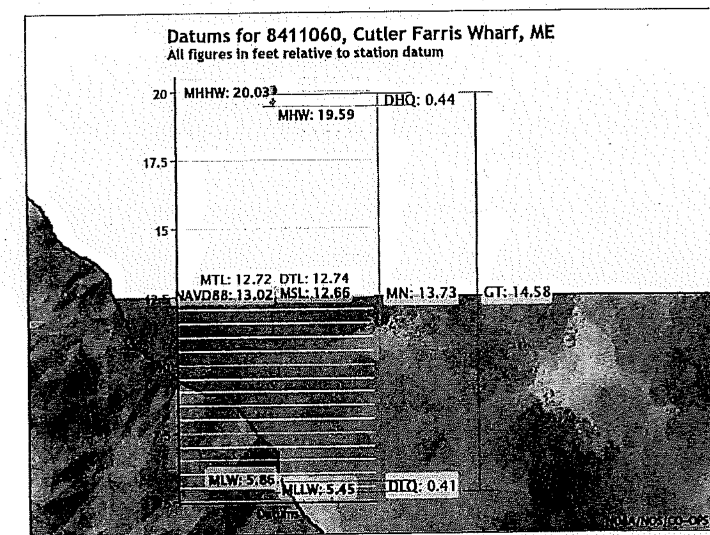
TIDAL INFORMATION FOR BEALS

Datums for 8411060, Cutler Farris Wharf ME

Elevations on Station Datum

Station: 8411060, Cutler Farris Wharf, ME
Status: Accepted (Feb 1 2013)
Units: Feet
T.M.: 75 W
Epoch: (/datum_options.html#NTDE) 1983-2001
Datum: STND

NAVD88	Datum	Value	Description
✓ 7.01'	MHHW (/datum_options.html#MHHW)	20.03	Mean Higher-High Water
✓ 6.57'	MHW (/datum_options.html#MHW)	19.59	Mean High Water
✓ -0.3'	MTL (/datum_options.html#MTL)	12.72	Mean Tide Level
✓ -0.36'	MSL (/datum_options.html#MSL)	12.66	Mean Sea Level
	DTL (/datum_options.html#DTL)	12.74	Mean Diurnal Tide Level
✓ -7.16'	MLW (/datum_options.html#MLW)	5.86	Mean Low Water
✓ -7.57'	MLLW (/datum_options.html#MLLW)	5.45	Mean Lower-Low Water
	NAVD88 (/datum_options.html)	13.02	North American Vertical Datum of 1988
	STND (/datum_options.html#STND)	0.00	Station Datum
	GT (/datum_options.html#GT)	14.58	Great Diurnal Range
	MN (/datum_options.html#MN)	13.73	Mean Range of Tide
	DHQ (/datum_options.html#DHQ)	0.44	Mean Diurnal High Water Inequality
	DLQ (/datum_options.html#DLQ)	0.41	Mean Diurnal Low Water Inequality
	HWI (/datum_options.html#HWI)	3.25	Greenwich High Water Interval (in hours)
	LWI (/datum_options.html#LWI)	9.52	Greenwich Low Water Interval (in hours)
	Maximum	23.67	Highest Observed Water Level
	Max Date & Time	10/28/2011 16:12	Highest Observed Water Level Date and Time
	Minimum	2.79	Lowest Observed Water Level
	Min Date & Time	04/20/2011 10:54	Lowest Observed Water Level Date and Time



Showing datums for

8411060 Cutler Farris Wharf,...

Data Units ◉ Feet ○ Meters

Epoch ◉ Present (1983-2001) ○ Superseded (1960-1978)

Submit

VHB Computations

Project: BEALS-JONESPORT Project # 55029
Location: BEALS ISLAND Sheet of
Calculated by: TJC Date: 8-22-2014
Checked by: JAW Date: 8/26/2014
Title

TIDAL INFORMATION

From CLD Report

MLLW = -1.77 m ✓ → -5.8071 ft ✓

MLW = -1.65 m ✓ → -5.4134 ft ✓

MTL = 0.10 m ✓ → 0.3281 ft ✓

MHW = 1.84 m ✓ → 6.0368 ft ✓

MHHW = 1.95 m ✓ → 6.3976 ft ✓

NGVD29 to NAVD88 correction is -0.692 ft ✓

MLLW = -5.8071 ft - 0.692 ft = -6.4991 → -6.50 ft ✓

MLW = -5.4134 ft - 0.692 ft = -6.1054 → -6.11 ft ✓

MTL = 0.3281 ft - 0.692 ft = -0.3639 → -0.36 ft ✓

MHW = 6.0368 ft - 0.692 ft = 5.3448 → 5.35 ft ✓

MHHW = 6.3976 ft - 0.692 ft = 5.7056 → 5.71 ft ✓

HYDROLOGY REPORT

The Moosabec Reach is an area of the Atlantic Ocean bordered by Jonesport on the mainland and at Beals Island. Since the flow through this area is strictly tidal, no hydrologic study of the drainage area was performed to determine riverine discharges.

Tidal Elevations were obtained from the National Oceanic and Atmospheric Administration (NOAA) and the National Ocean Service (NOS). Recorded tidal elevations from the Jonesport benchmark (operational in 1959) adjacent to the project location were obtained from the Center for Operational Oceanographic Products and Services (CO-OPS) of NOS.

The following information is relevant at the bridge location:

Mean Lower Low Water (MLLW)	=	-1.77 m
Mean Low Water (MLW)	=	-1.65 m
Mean Tide Level (MTL)	=	0.10 m
Mean High Water (MHW)	=	1.84 m
Mean Higher High Water (MHHW)	=	1.95 m
2001 Predicted High Tide	=	2.67 m

Note: The elevations reference NGVD-1929

JoAnn L. Fryer, P.E.

VHB *Computations*

Project: BEALS-JONESPORT
Project # 55029
Location: Great Wass Island
Sheet 1 of 1
Calculated by: TJC
Date: 8/27/2014
Checked by: JAW
Date: 8/27/2014
Title Flood Level Conversions

NGVD29 to NAVD88 Tidal Flood Level Conversions

NGVD29 → NAVD88 : -0.692'

JONESPORT

- from Flood Insurance Study (FIS) May 3, 1990

	Q_{10}	Q_{50}	Q_{100}	Q_{500}	
NGVD29	12.0'	12.4'	12.6'	12.9'	
NAVD88	11.31' ✓	11.71' ✓	11.91' ✓	12.21' ✓	← use

BEALS

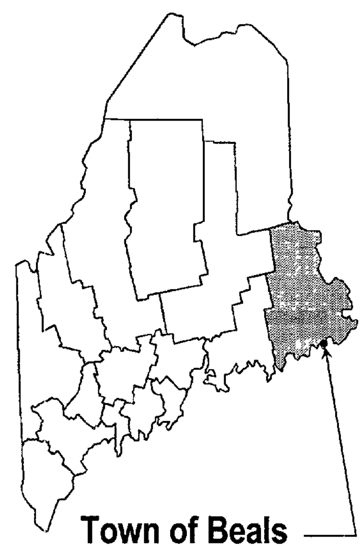
- from Flood Insurance Study (FIS) July 2, 2003
  - Transects #1 is closest to Bridge

	Q_{10}	Q_{50}	Q_{100}	Q_{500}	
NGVD29	10.5'	11.2'	11.7'	12.5'	
NAVD 88	9.81' ✓	10.51' ✓	11.01' ✓	11.81' ✓	← use

FLOOD INSURANCE STUDY

TOWN OF BEALS, MAINE

WASHINGTON COUNTY



REVISED:
JULY 2, 2003

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
230133V000A

Location #1 is closest to the Bridge

TABLE 1 - SUMMARY OF COASTAL STILLWATER ELEVATIONS

FLOODING SOURCE AND LOCATION	ELEVATION (feet NGVD[1]) 10-YEAR	50-YEAR	100-YEAR	500-YEAR	
ATLANTIC OCEAN					
Transects 1 and 11	10.5	11.2	11.7	12.5	← use
~~Transects 2-10 and~~ Transects 12-23	~~10.5~~	~~11.3~~	~~11.8~~[2]	~~12.5~~	

[1]National Geodetic Vertical Datum of 1929
[2]Includes wave setup of 0.1 foot

NGVD to NAVD88 = -.692'
9.81' / 10.51' / 11.01' / 11.81' /

The analyses reported in this study reflect the stillwater elevations due to tidal and wind setup effects. The effects of wave action were also considered in the determination of flood hazard areas. Coastal structures that are located above stillwater flood elevations can still be severely damaged by wave runup, wave-induced erosion, and wave-borne debris. The extent of wave runup above stillwater elevations depends greatly on the wave conditions and local topography.

The extent of wave runup and the height of the storm waves are dependent not only on the specific geometry of the shoreline at a particular site, but also on the potential exposure of the shoreline to storm winds. In Beals, the fetch (distance over which waves can be generated without intersecting a land mass) was accounted for in calculating wave heights and periods. For the 1991 FIS, wind data was transported from the land-based Portland recording station to reflect off-shore conditions. The USACE, in conjunction with beach erosion studies in Rockport and Kennebunk, has developed tables and charts of wind data based on weather records at Portland. The studies present expected wind speeds for a variety of directions, durations, and frequencies of occurrence (USCE, 1986; USACE).

For this revision, hourly wind observations of 1-minute average wind speed and direction were obtained from National Climatic Data Center for the Portland Jetport (PWM), Maine for the period of record 1948-1998. Portland is the closest coastal location to the project area for which complete systematically recorded wind data are available for a long period of record.

The hourly wind data were binned into 16 compass rose directions. For each direction, the annual peaks were selected and converted to a standard 33-foot (10 meter) observation height. A conversion was made to each peak and a stability correction was applied for temperature effects. The resulting wind speeds were converted to 50-minute duration averaged winds speeds and the 10-year return period wind speed was determined using a Pearson Type III frequency analysis (USACE, 1984). The 10-year, 50-minute duration-averaged wind speed was used to calculate the offshore wave conditions. The 10-year wind speed was selected to represent the 1% annual chance (100-year) flood. In Beals where flooding is primarily due to Northeasters, the wind-generated waves accompanying northeaster floods have typically been of a recurrence interval lower then the 100-year. The 10-year wind generated wave heights and the 100-year stillwater elevations combine to form the 100-year flood.

use this location ✓

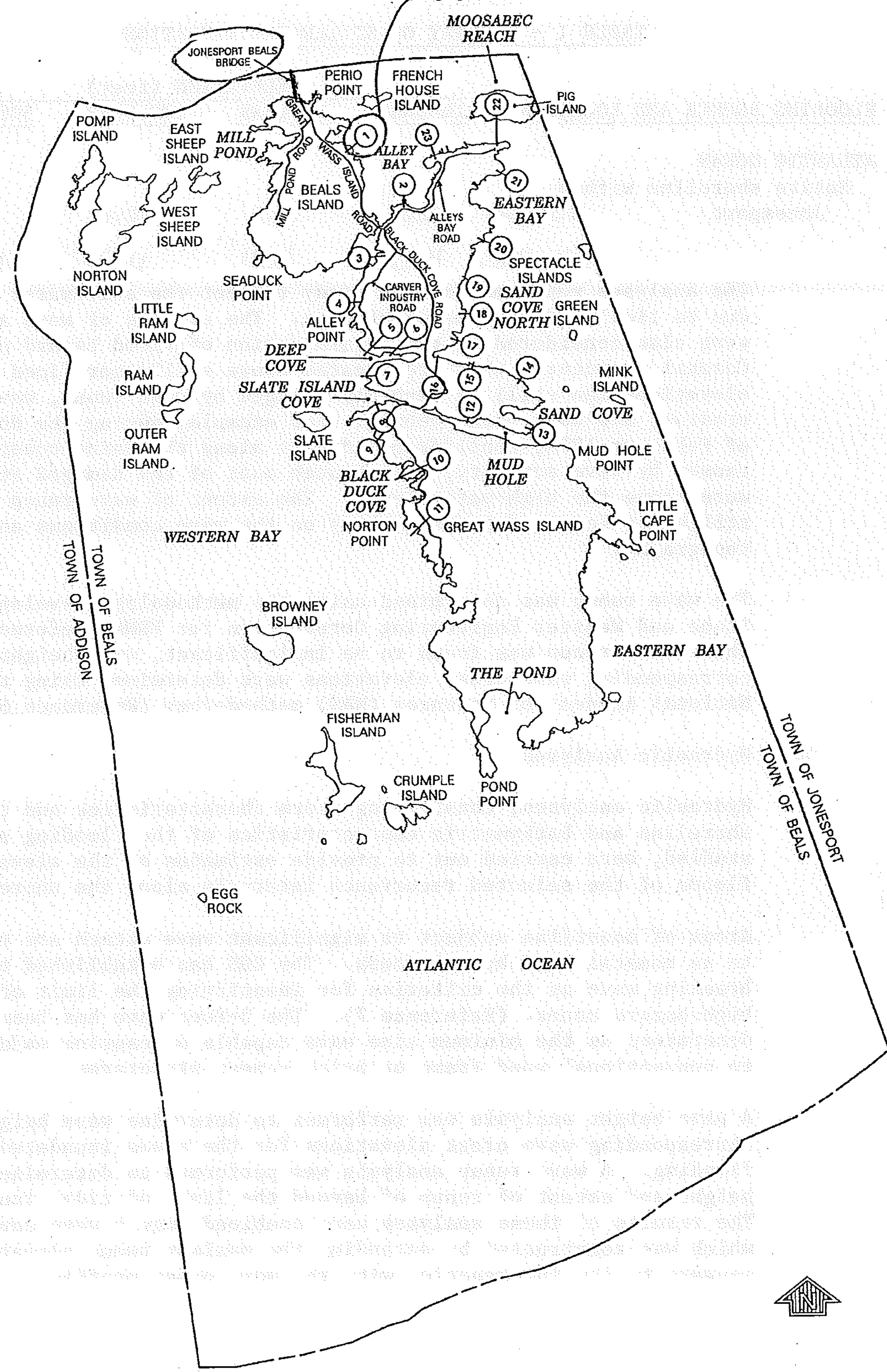


FIGURE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF BEALS, ME

(WASHINGTON COUNTY)

APPROXIMATE SCALE

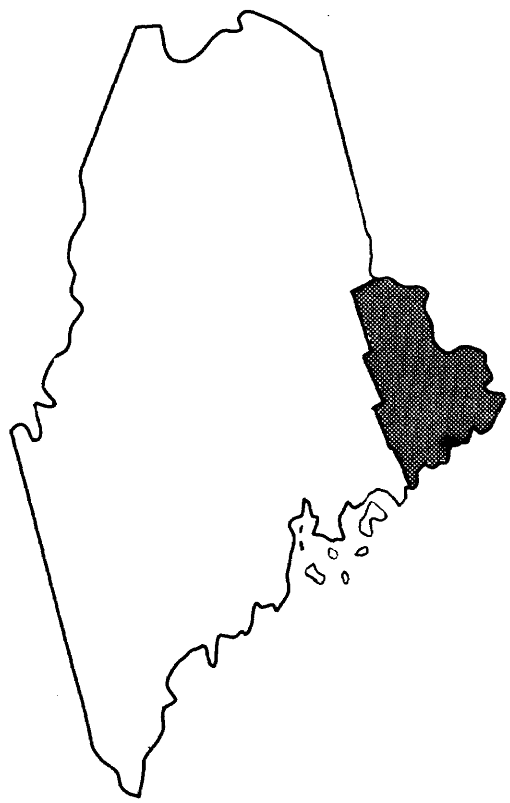
1 0 1 2 MILES

TRANSECT LOCATION MAP

FLOOD INSURANCE STUDY

WAVE HEIGHT ANALYSIS

TOWN OF JONESPORT MAINE
WASHINGTON COUNTY



MAY 3, 1990

Federal Emergency Management Agency

COMMUNITY NUMBER - 230138

NGVD29 to NAVD88 = -0.692'

TABLE 1 - SUMMARY OF STILLWATER ELEVATIONS

FLOODING SOURCE AND LOCATION		ELEVATION (feet) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
ATLANTIC OCEAN					
Entire shoreline within Jonesport	NGVD29:	12.0	12.4	12.6	12.9
	NAVD88:	11.31'	11.71'	11.91'	12.21'

The analyses reported in this study reflect the stillwater effects due to tidal and wind setup effects. The effects of wave action were also considered in the determination of flood hazard areas. Coastal structures that are located above stillwater flood elevations can still be severely damaged by wave runup, wave-induced erosion, and wave-borne debris. For example, during the Northeaster of February 1978, considerable damage along the Maine coast was caused by wave activity, even though most of the damaged structures were above the high-water level. The extent of wave runup past stillwater levels depends greatly on the wave conditions and local topography.

The wave runup was determined using the methodology developed by Stone and Webster Engineering Corporation for FEMA (Reference 5). Where wave runup was found to be insignificant, wave heights and corresponding wave crest elevations were determined using the National Academy of Sciences (NAS) methodology (Reference 6).

3.2 Hydraulic Analyses

Hydraulic analyses, considering storm characteristics and the shoreline and bathymetric characteristics of the flooding source studied, were carried out to provide estimates of the elevations of floods of the selected recurrence intervals along the shoreline.

Areas of coastline subject to significant wave attack are referred to as coastal high hazard zones. The COE has established the 3-foot breaking wave as the criterion for identifying the limit of coastal high-hazard zones. (Reference 7). The 3-foot wave has been determined as the minimum size wave capable of causing major damage to conventional wood frame or brick veneer structures.

A wave height analysis was performed to determine wave heights and corresponding wave crest elevations for the areas inundated by tidal flooding. A wave runup analysis was performed to determine the height and extent of runup of beyond the limit of tidal inundation. The results of these analyses were combined into a wave envelope, which was constructed by extending the maximum runup elevation seaward to its intersection with the wave crest profile.

Max wave crest elevation

TABLE 2 - TRANSECT DESCRIPTIONS

Transect	Location	Elevation (Feet NGVD) 1929 Stillwater 100-year	Maximum Wave Elevation,[1] 100-Year
No. 1	From Spar Island to a point near Great Bar	12.6	17[2]
No. 2	From a point near Great Bar to the north bank of the Sandy River	12.6	17[2]
No. 3	From the north bank of the Sandy River to Bar Island	12.6	17[2]
No. 4	From Bar Island to the south end of Popplestone Beach	12.6	18[2]
No. 5	From the south end of Popplestone Beach to Kelley Point	12.6	24[2]
No. 6	South of Kelley Point	12.6	16[2]
No. 7	From south of Kelley Point to the Henry Point breakwater	12.6	16[2]
No. 8	Sawyer Cove	12.6	13[3]
No. 9	The west end of Old House Point	12.6	21[2]
No. 10	From the west side of Old House Point to a point approximately 2,000 feet west of Cross Cove	12.6	21[2]
No. 11	From a point approximately 2,000 feet west of Cross Cove to Beals Island bridge	12.6	13[3]
No. 12	From Beals Island bridge to a point approximately 1,000 feet west of southbound State Route 187	12.6	16[3] Controls
No. 13	From a point approximately 1,000 feet west of southbound State Route 187 to Hopkins Point	12.6	15[3]
No. 14	From Hopkins Point to the corporate limits with Jonesboro	12.6	13[3]

16' − 0.692 = 15,308

max = 15.3'

[1]Due to map scale limitations, the maximum wave elevation may not be shown on the Flood Insurance Rate Map
[2]Maximum wave runup elevation
[3]Maximum wave height elevation

NGVD#29 to NAVD 88 conversion: − 0.692'

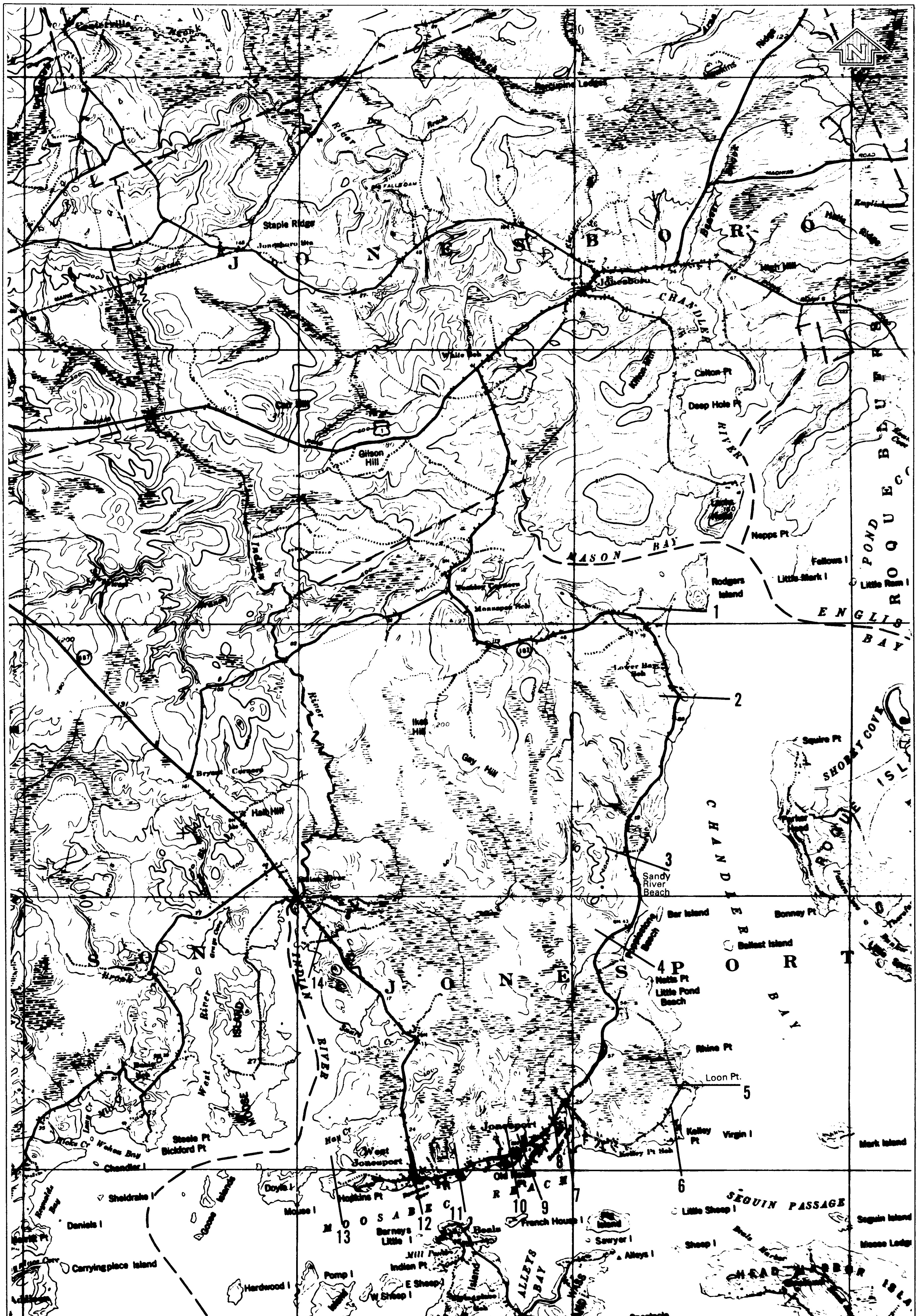


FIGURE 2	FEDERAL EMERGENCY MANAGEMENT AGENCY TOWN OF JONESPORT, ME (WASHINGTON CO.)	APPROXIMATE SCALE 1 0 1 2 3 MILES TRANSECT LOCATION MAP

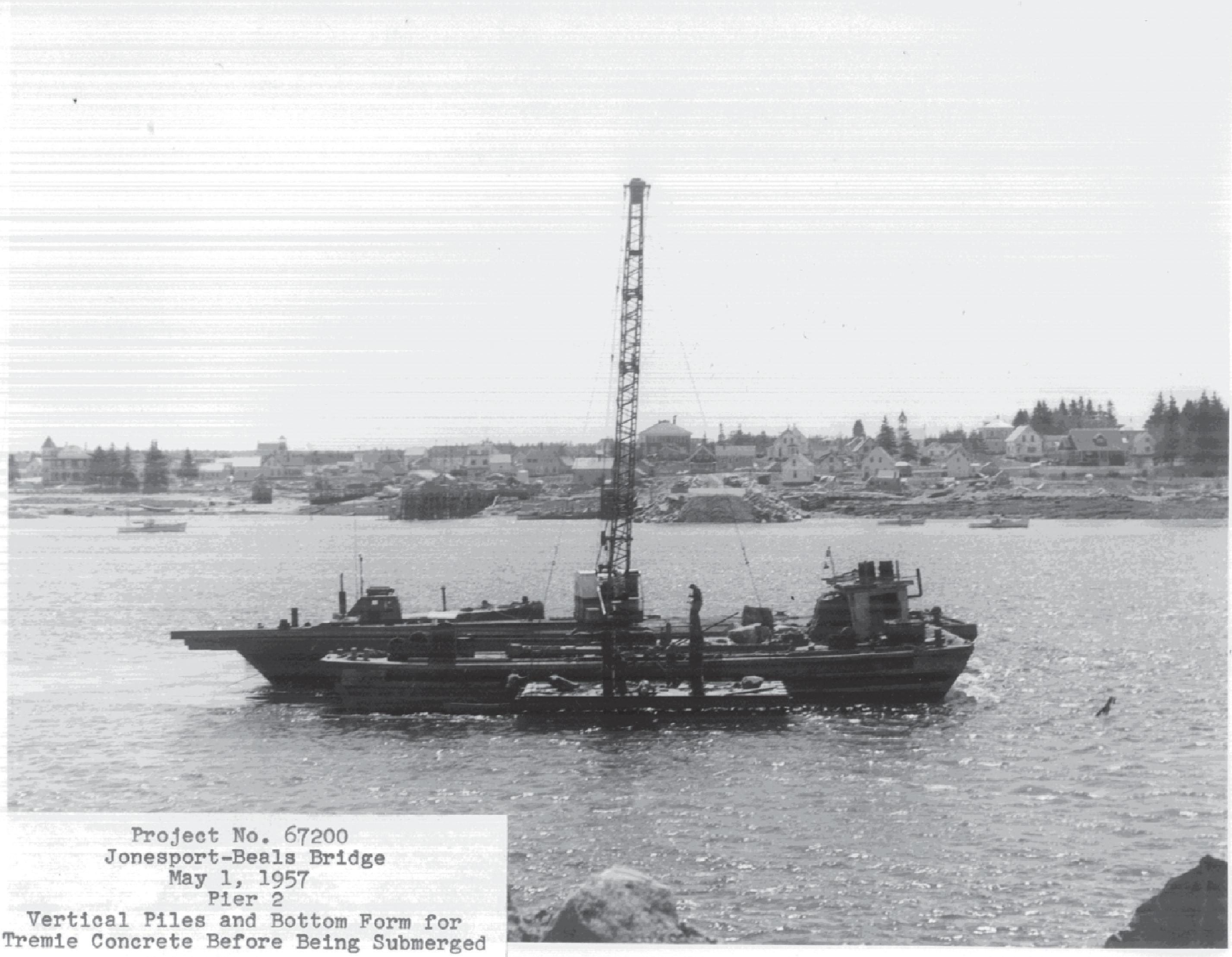
APPENDIX I

Construction Photos

Project No. 67200
Jonesport-Beals Bridge
December 21, 1956
Jonesport Approach
Easterly Side of Embankment

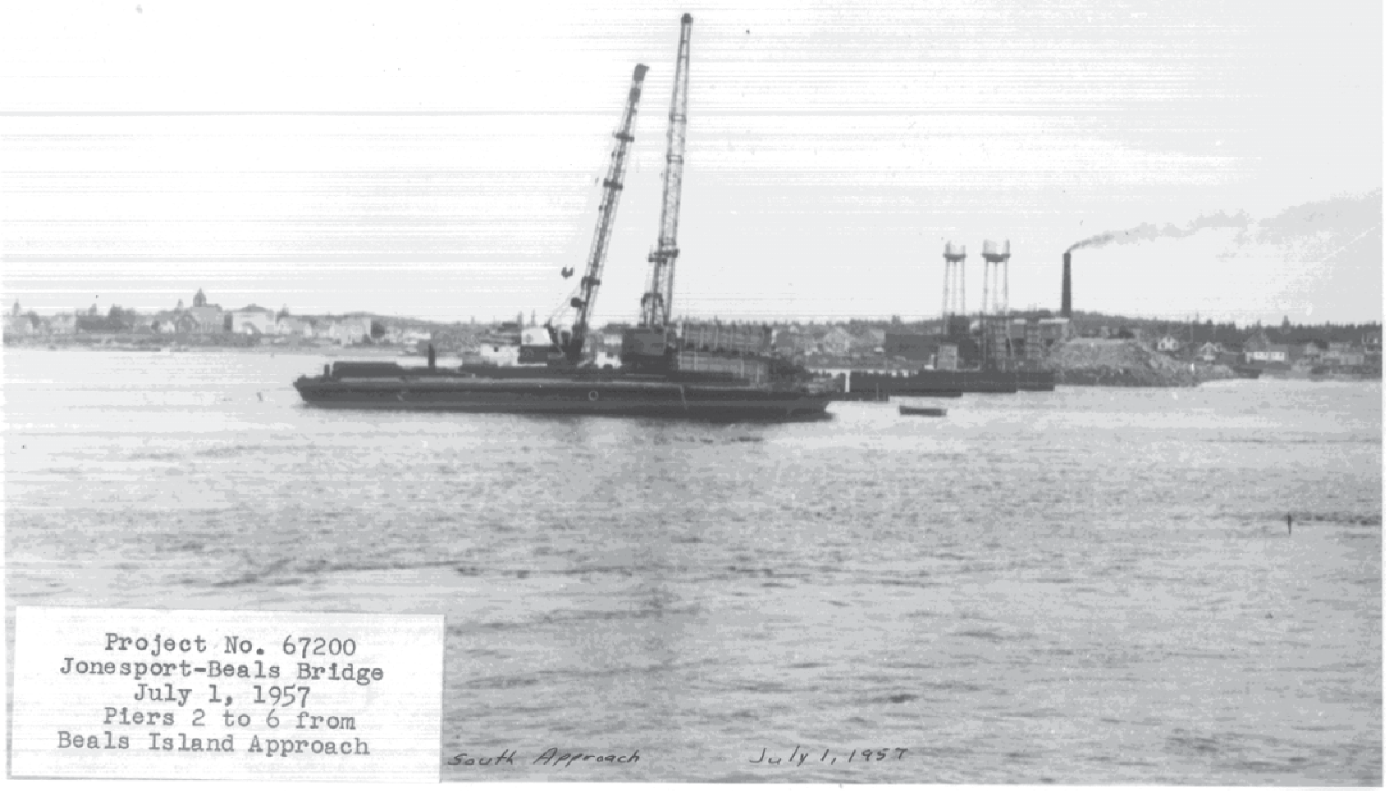
Project No. 67200
Jonesport-Beals Bridge
January 22, 1957
Jonesport Approach
Looking Toward Beals Island

Project No. 67200
Jonesport-Beals Bridge
May 1, 1957
Beals Island Approach
Granular Fill for Abutment Piles

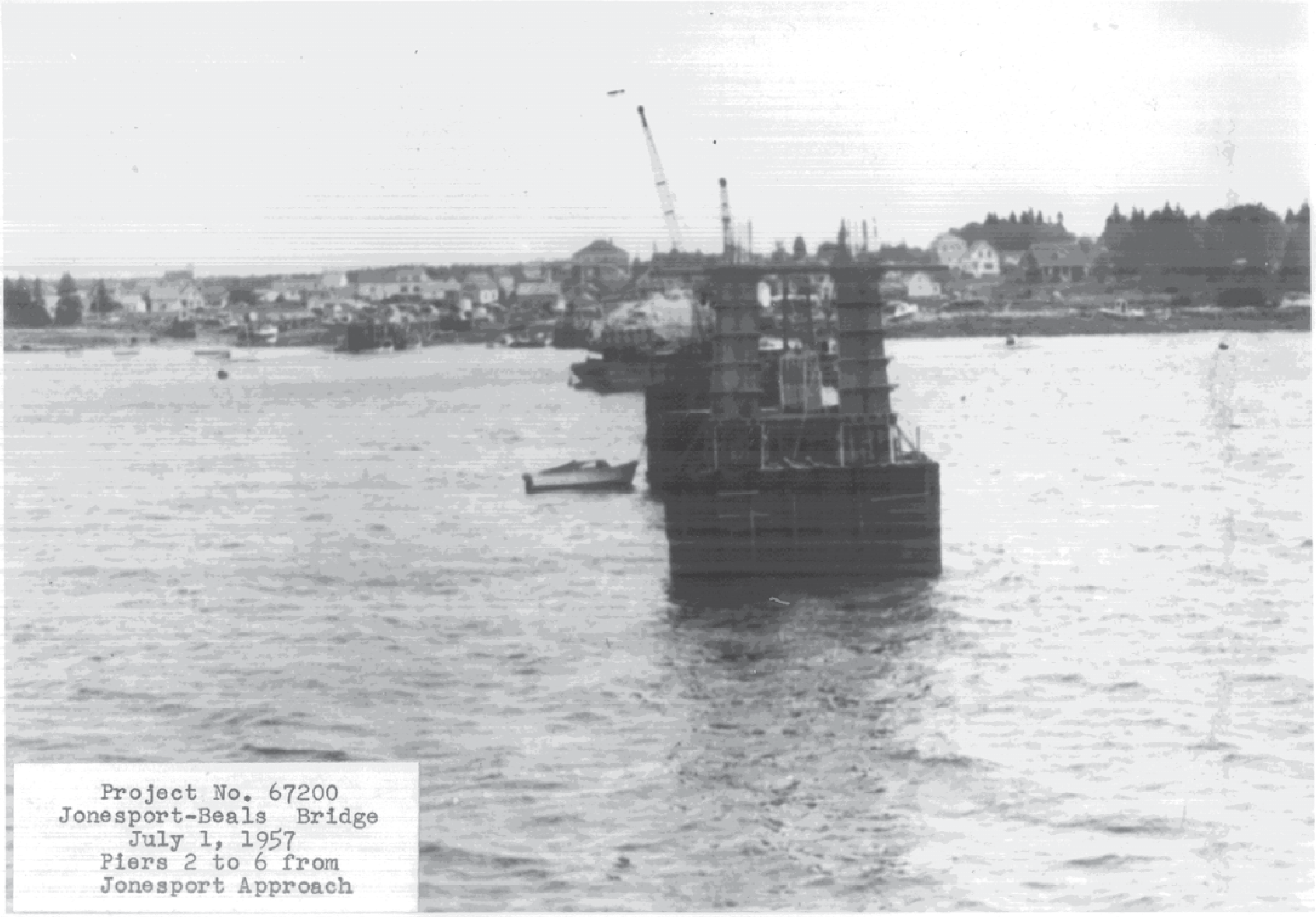


Project No. 67200
Jonesport-Beals Bridge
May 1, 1957
Pier 2
Vertical Piles and Bottom Form for
Tremie Concrete Before Being Submerged

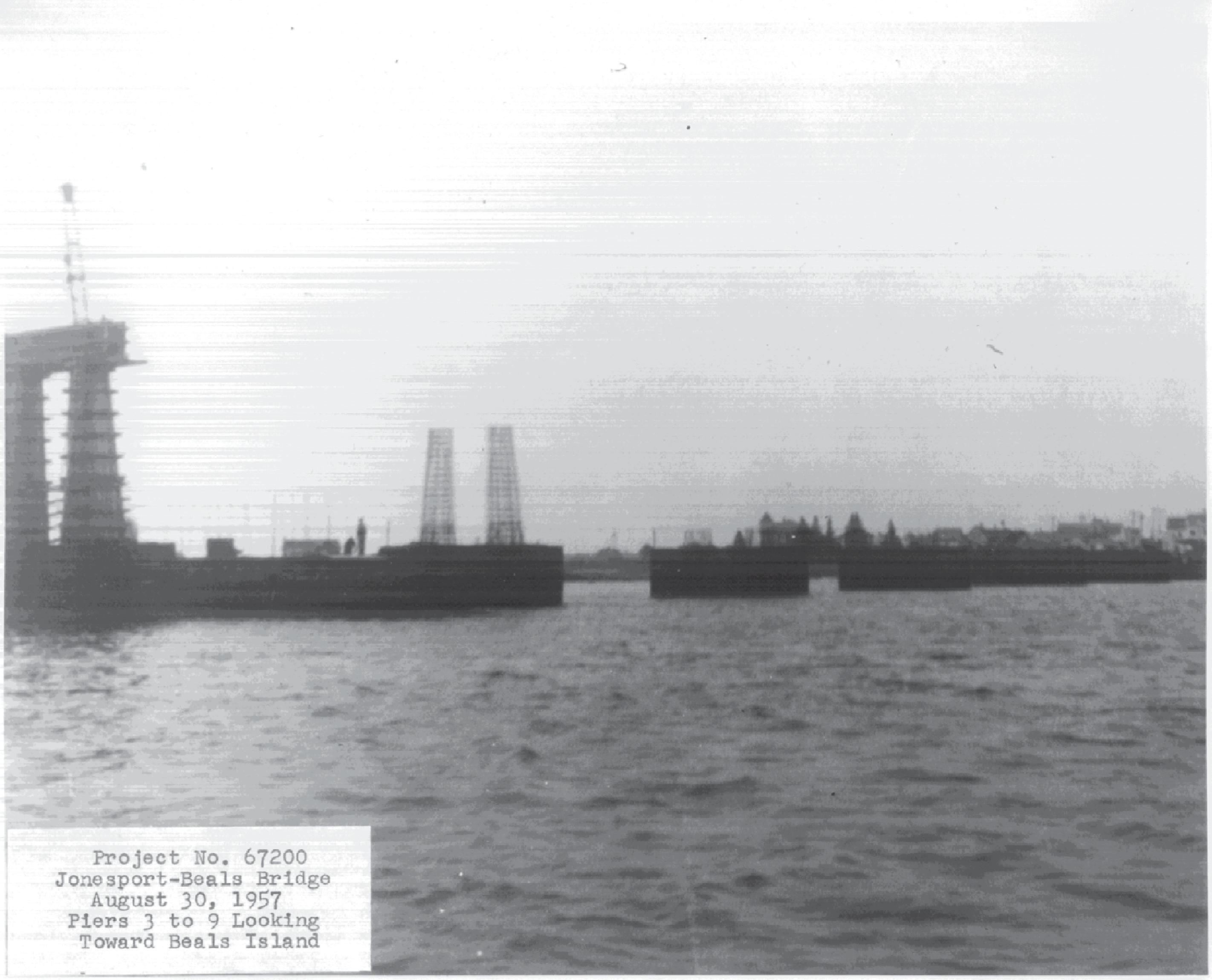
Project No. 67200
Jonesport-Beals Bridge
June 1, 1957
Placing Fill at Pier 9



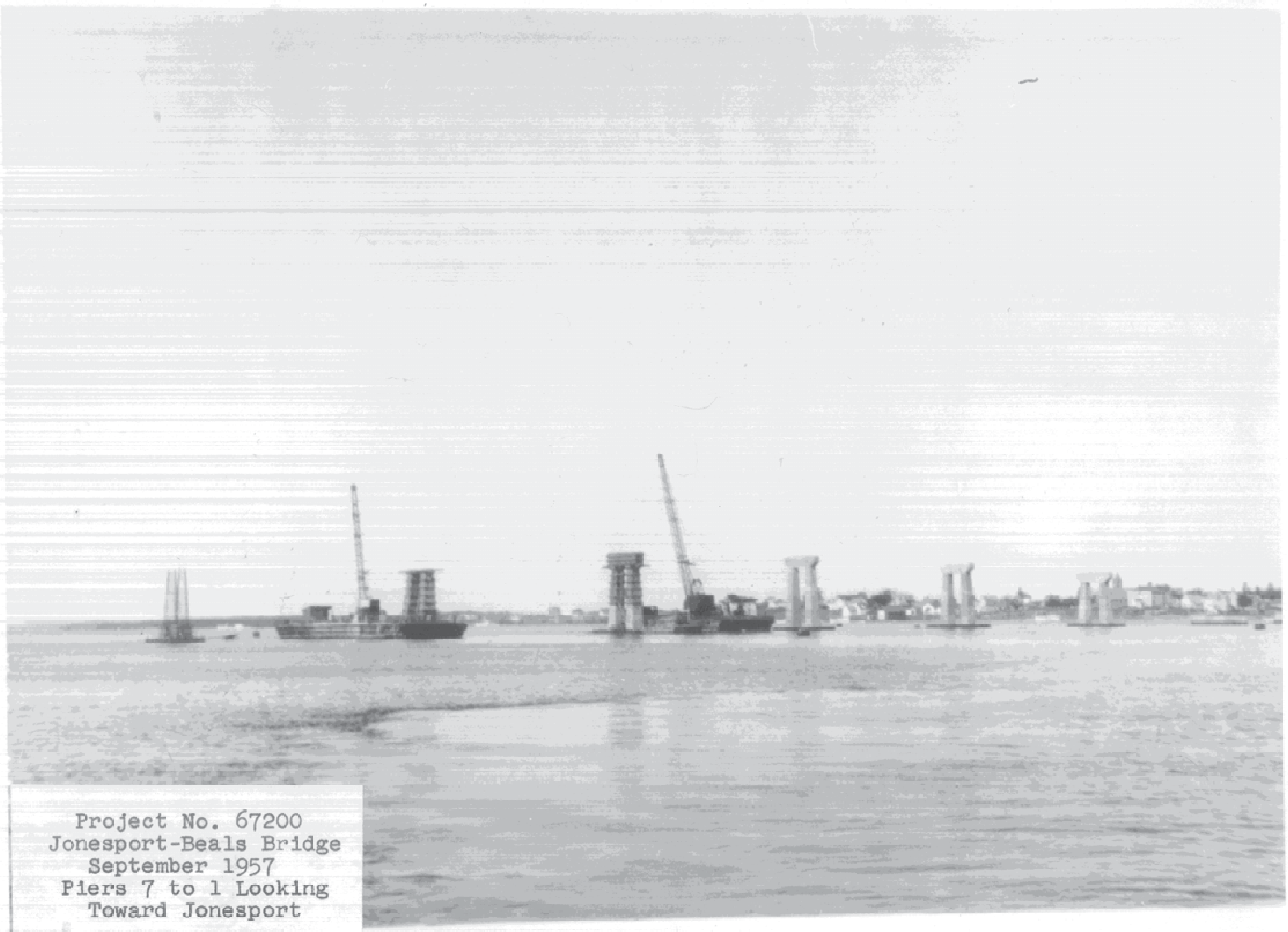
Project No. 67200
Jonesport-Beals Bridge
July 1, 1957
Piers 2 to 6 from
Beals Island Approach



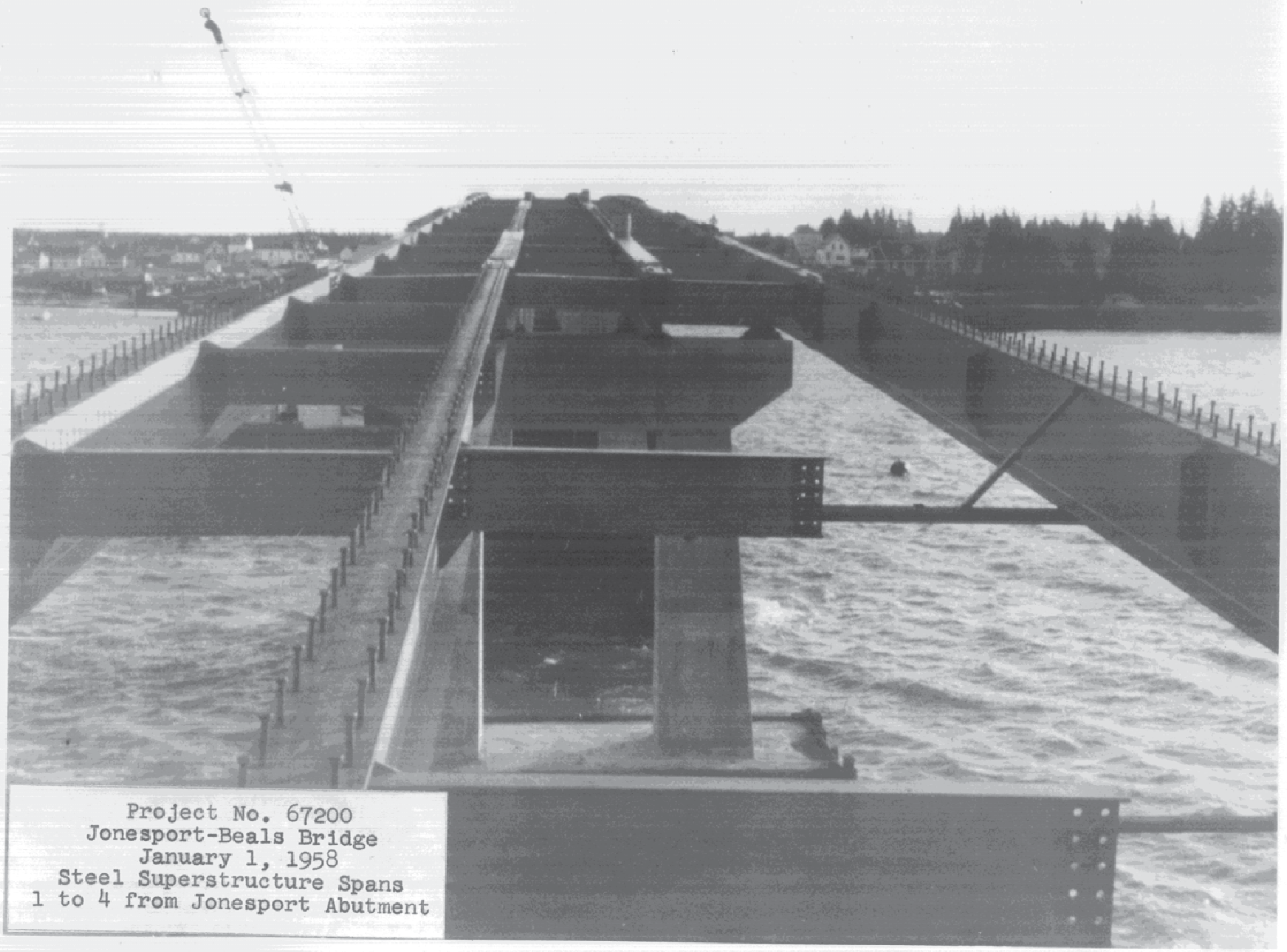
Project No. 67200
Jonesport-Beals Bridge
July 1, 1957
Piers 2 to 6 from
Jonesport Approach



Project No. 67200
Jonesport-Beals Bridge
August 30, 1957
Piers 3 to 9 Looking
Toward Beals Island



Project No. 67200
Jonesport-Beals Bridge
September 1957
Piers 7 to 1 Looking
Toward Jonesport

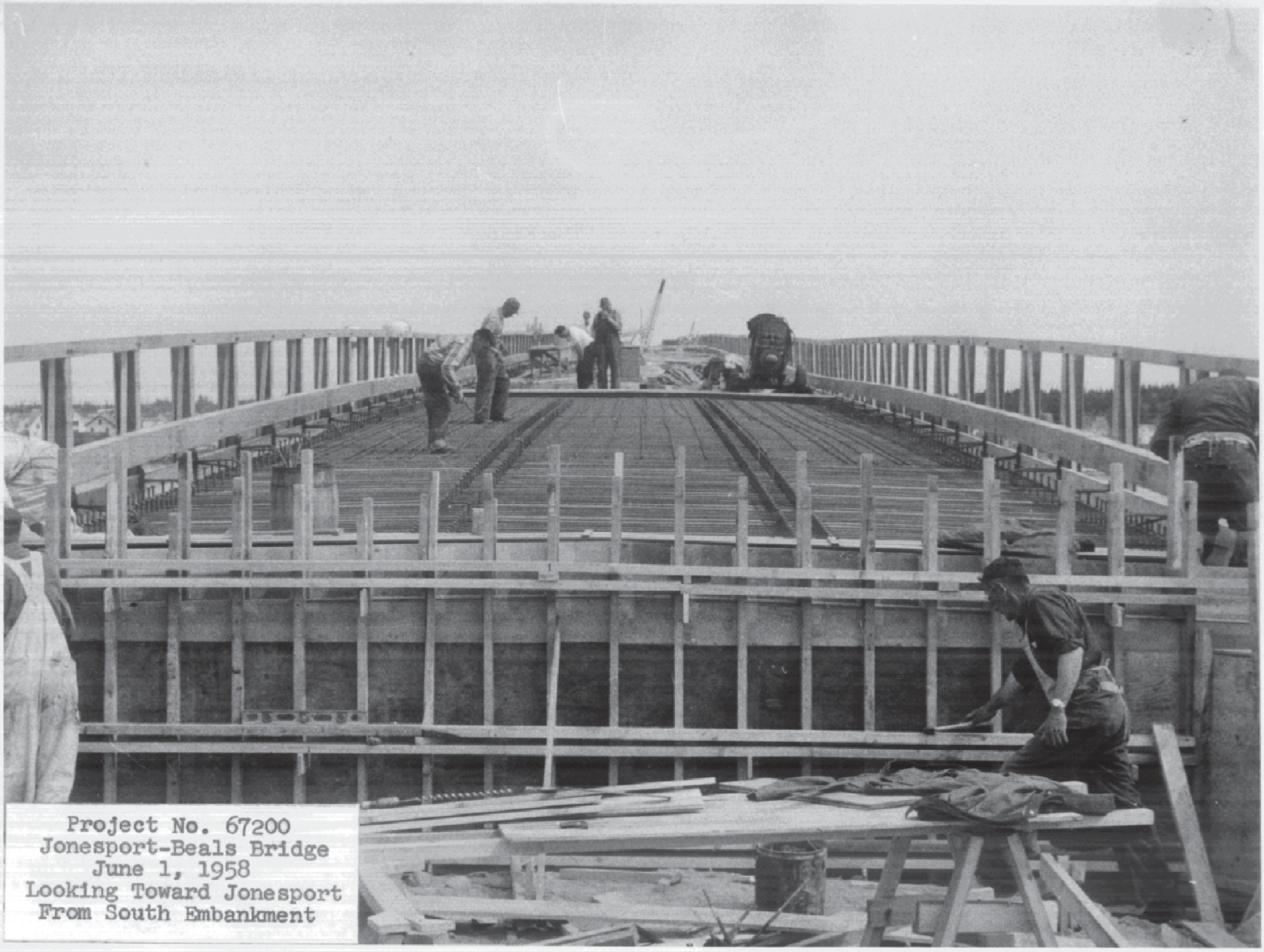


Project No. 67200
Jonesport-Beals Bridge
January 1, 1958
Steel Superstructure Spans
1 to 4 from Jonesport Abutment

Project No. 67200
Jonesport-Beals Bridge
February 1, 1958
Looking Toward Beals Island
From North Abutment

Project No. 67200
Jonesport-Beals Bridge
February 1, 1958
Piers 8 to 4 Looking
Northwest Toward Jonesport

Project No. 67200
Jonesport-Beals Bridge
May 1958
Looking Toward Beals
Island From Pier 5



Project No. 67200
Jonesport-Beals Bridge
June 1, 1958
Looking Toward Jonesport
From South Embankment

APPENDIX J

Geotechnical Report