

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](#)

*ACCIDENT DATA, CRF - [0.0](#)

[2035](#) AADT [2,470](#)

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 - JY DATE - 4-10-15
APPROVED BY - JSE 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.

APPROACH SECTION - Two 10' lanes with ^{4' LRT 5-22-15} 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 1/4" 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 -	<u>70,000 SF</u>	70,000 SF 71,200 SF
TOTAL OPENING AT ELEVATION <u>5.9</u> FT -	<u>39,800 SF</u>	<u>41,100 SF</u>
CLEARANCE AT MHW -	<u>39.032.1 FT</u>	<u>39.033.0 FT</u>

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

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

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

Mitigation Yes
Required? 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

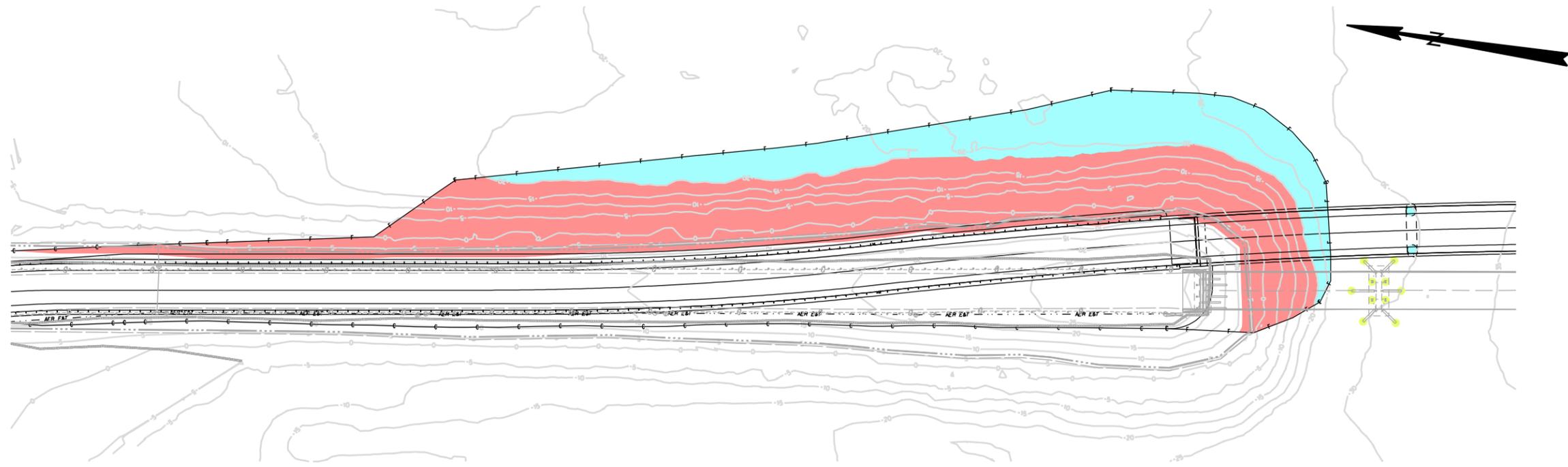
Expected Permit and NEPA Level:

DEP: Individual ACOE: Individual LURC: n/a
NPDES? NEPA: Categorical Exclusion

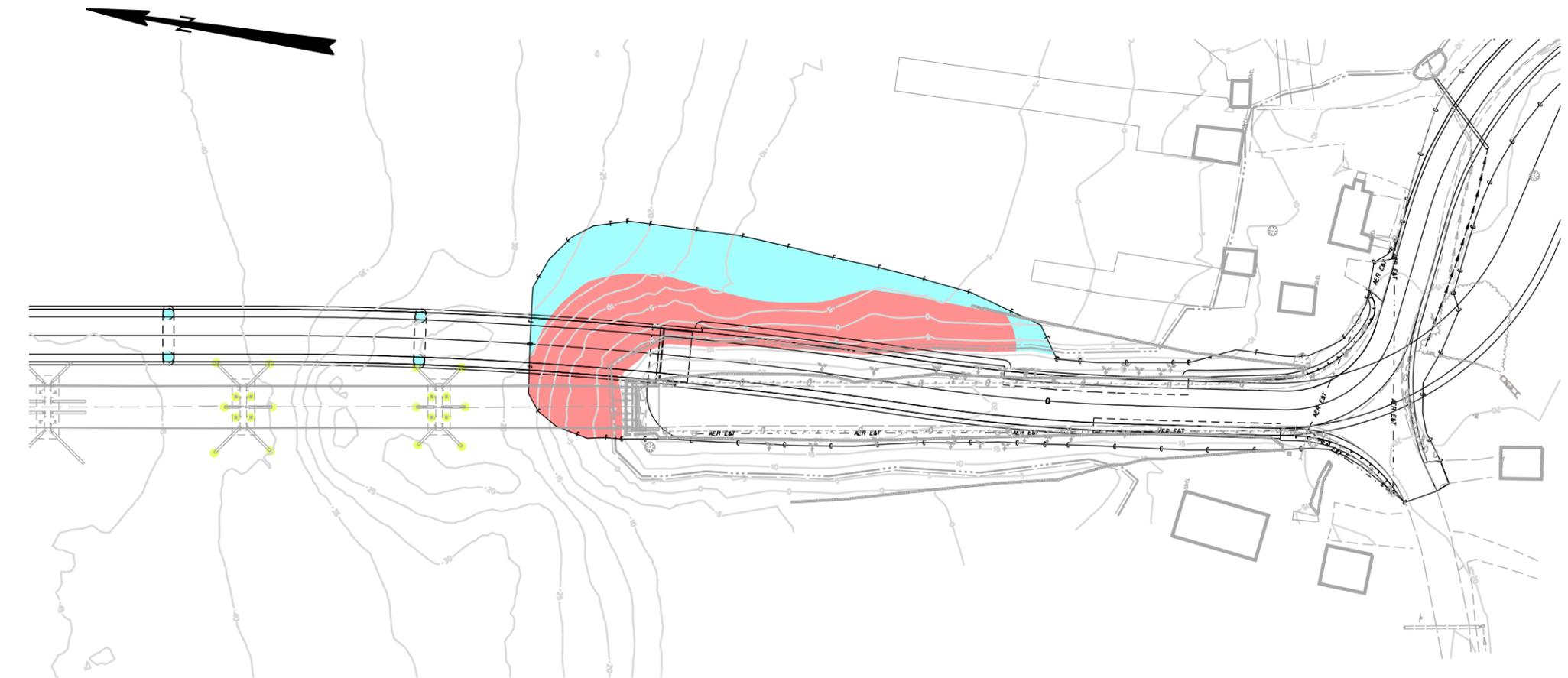
Summary of Avoidance and Minimization: Retaining walls on the Beals approach are provided to avoid and minimize coastal wetland impacts and property impacts. Reduced berm guardrail offset also provided to minimize coastal wetland impacts.

OTHER:

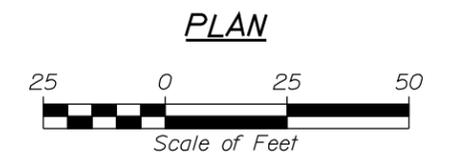
Section 7 consultation for Atlantic sturgeon, short nose sturgeon, and red knot will be required. Consultation for Northern Long-Eared Bat may be required if tree clearing of trees > 3-inch diameter at breast height (dbh) is required. Marine mammal observation and monitoring, which includes hydroacoustic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



NORTH APPROACH



SOUTH APPROACH



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

<u>Year</u>	<u>Deck</u>	<u>Superstructure</u>	<u>Substructure</u>
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 underlined.

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
- Complete encasement and grouting of all piles.

30-Year Rehabilitation

This alternative includes the following superstructure work:

- New, shop-painted steel beam superstructure

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.
- Pier repairs and cap widening.
- Abutment widening and new wingwalls

45-Year Rehabilitation

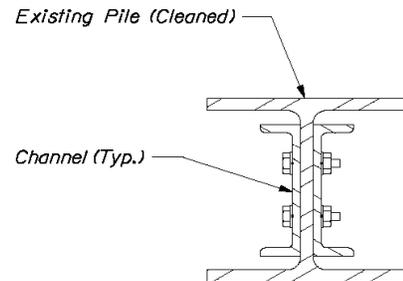
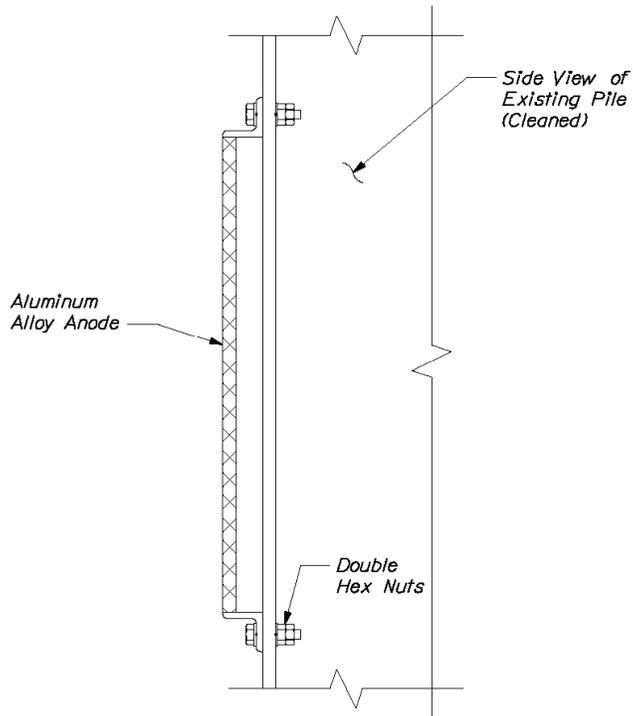
This alternative includes the following superstructure work:

- New, metalized steel beam superstructure

This alternative includes the following substructure work:

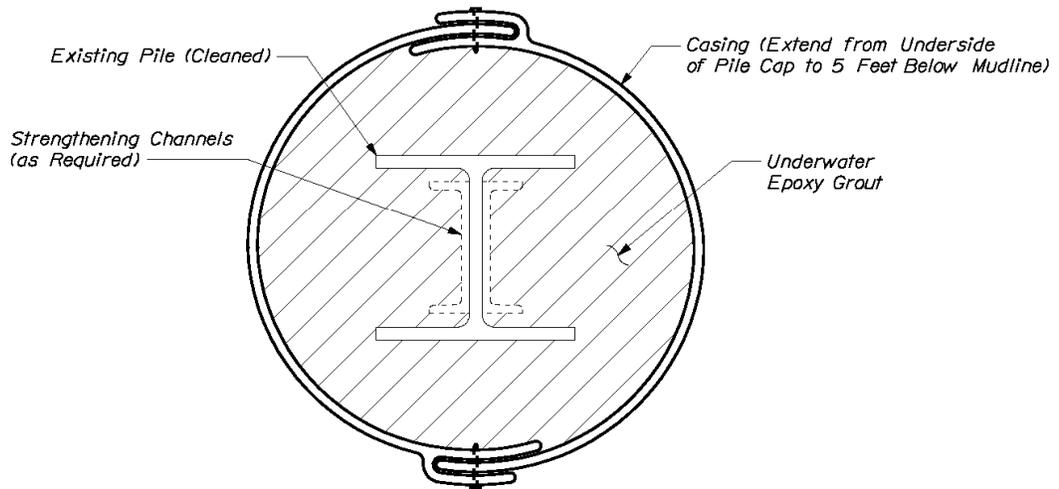
- Pier repairs and cap widening.
- Supplemental pipe pile foundation and pile cap extensions.
- Abutment widening and new wingwalls

SUMMARY OF PRELIMINARY DESIGN



STRENGTHENING SECTION

CATHODIC PROTECTION



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

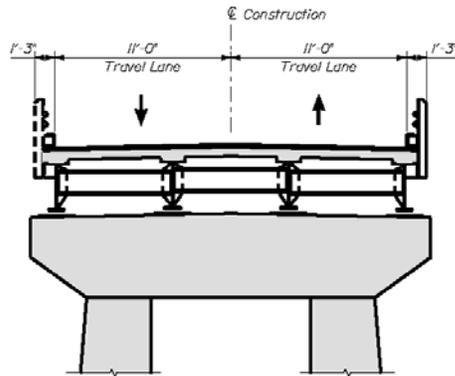
Based on the AADT and DHV information provided by MaineDOT, VHB analyzed a temporary traffic signal for a single reversible lane along the bridge. The following assumptions were made for the traffic evaluation:

- 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.

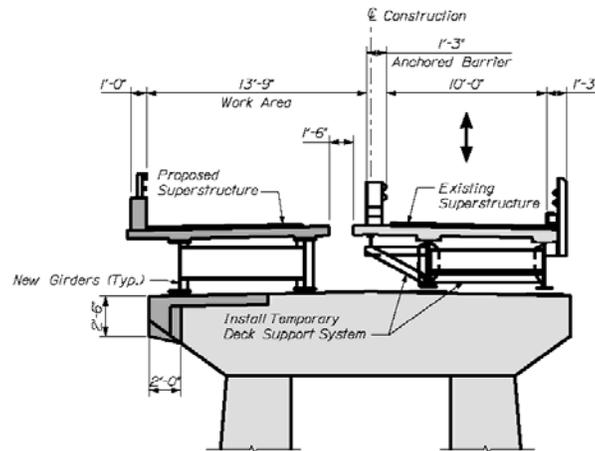
The average vehicle delay is about 93 seconds per vehicle for the peak direction of traffic and about 81 seconds per vehicle in the opposing direction, with a maximum delay for any one vehicle of 160 seconds. For a signalized intersection, these results are equivalent to a level of service (LOS) F. Based 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.

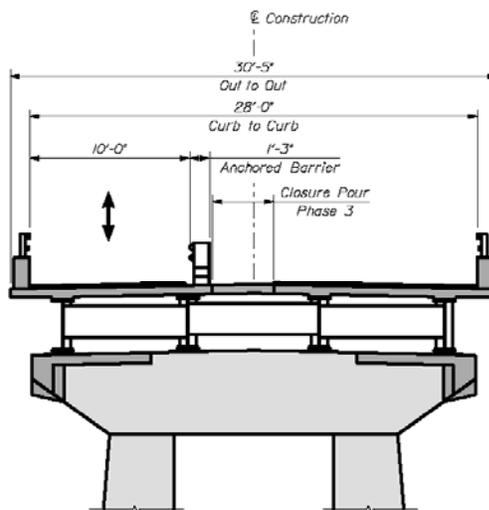
SUMMARY OF PRELIMINARY DESIGN



EXISTING



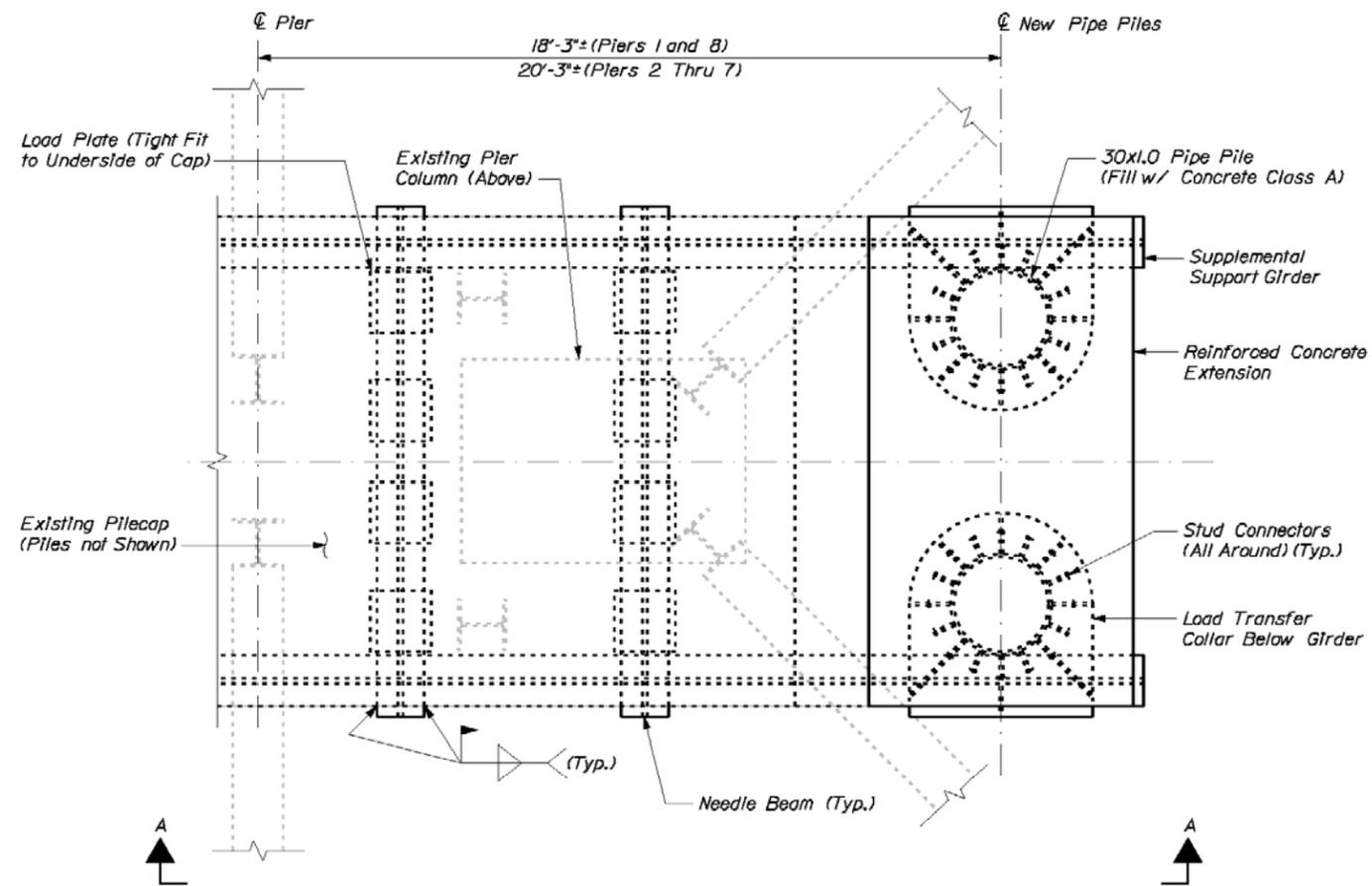
PHASE 1



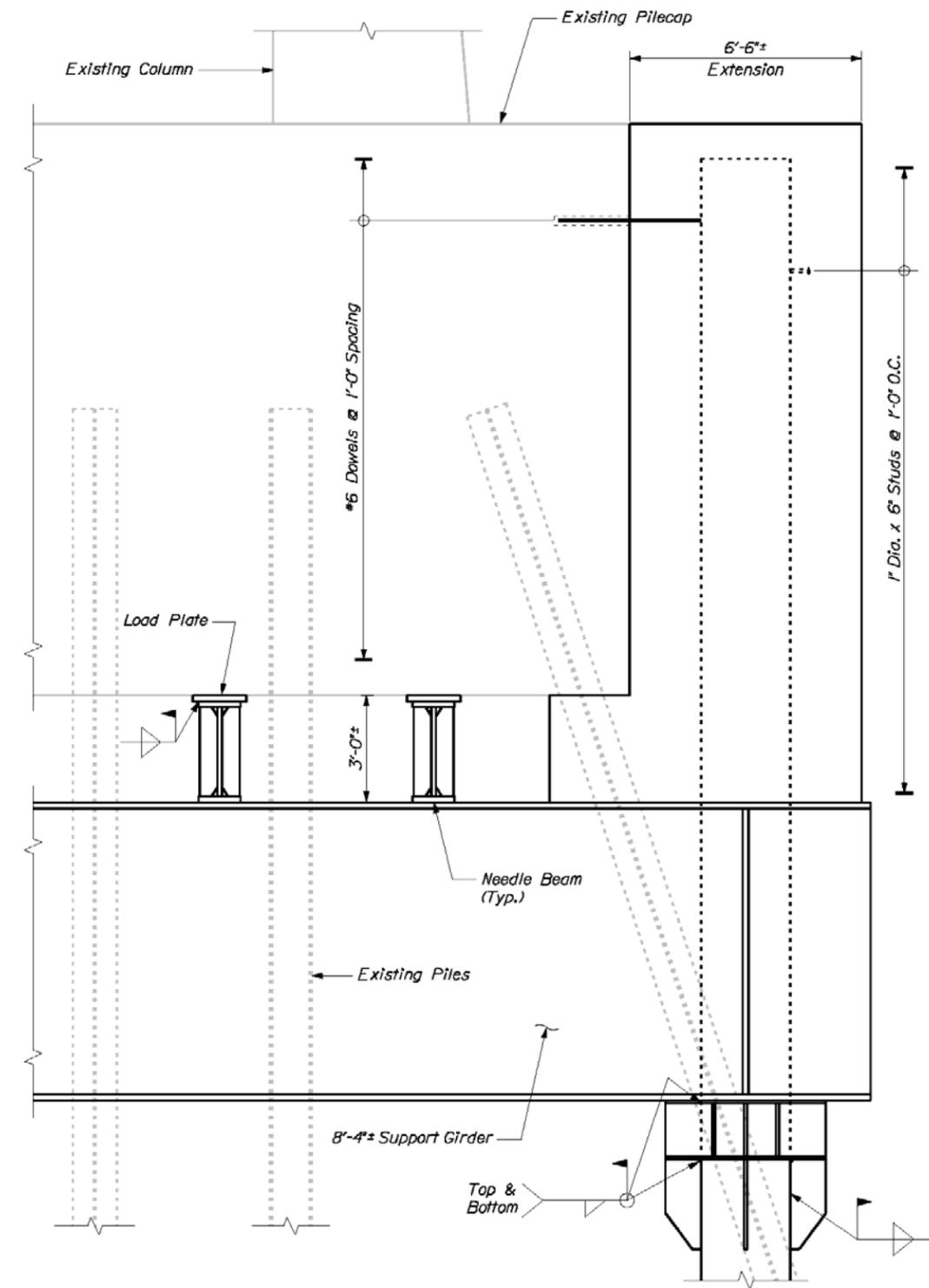
PHASE 2-3

SUPERSTRUCTURE REPLACEMENT PHASING

SUMMARY OF PRELIMINARY DESIGN



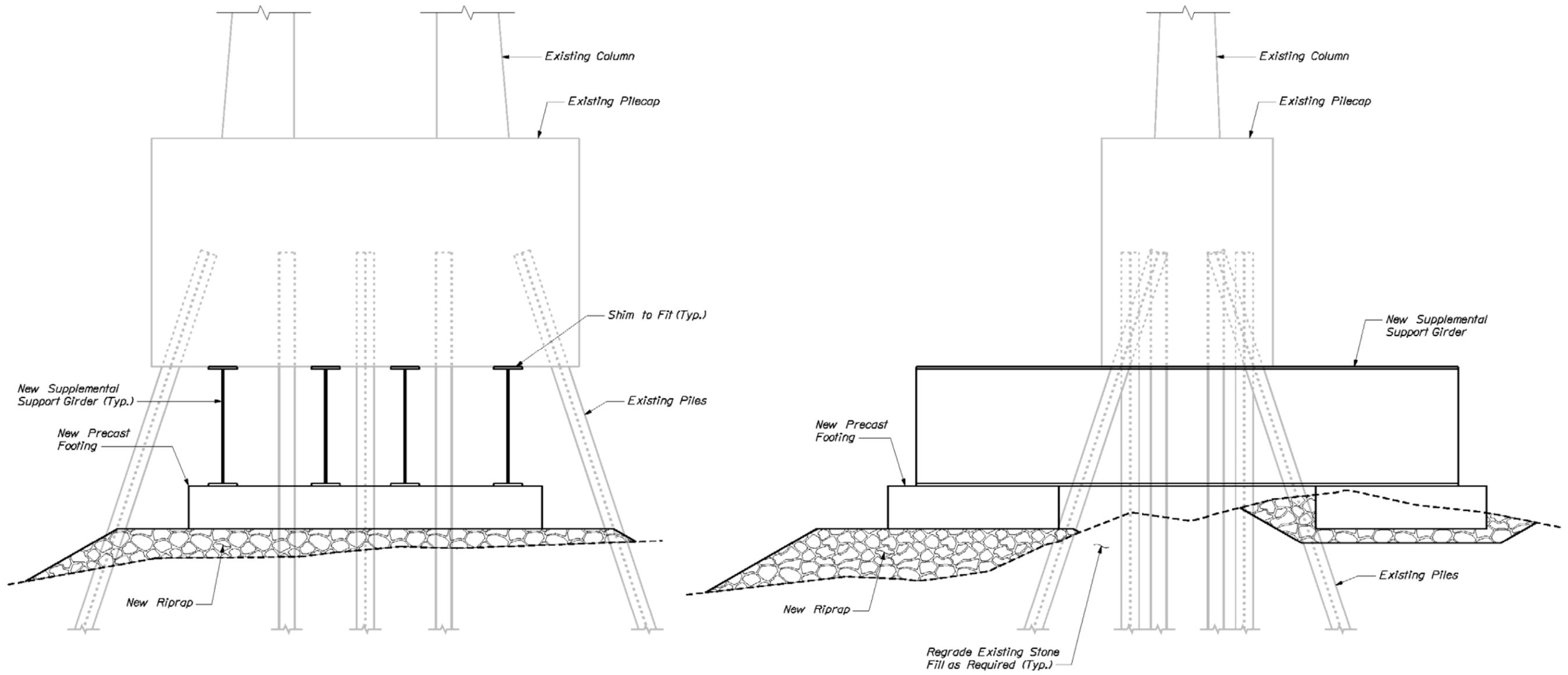
PLAN
(Pier 1 Shown, Other Piers Similar)



VIEW A-A

**SUPPLEMENTAL FOUNDATION
PIERS 1 THRU 8**

SUMMARY OF PRELIMINARY DESIGN



SUPPLEMENTAL FOUNDATION
PIER 9

SUMMARY OF PRELIMINARY DESIGN

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.

SUMMARY OF PRELIMINARY DESIGN

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.

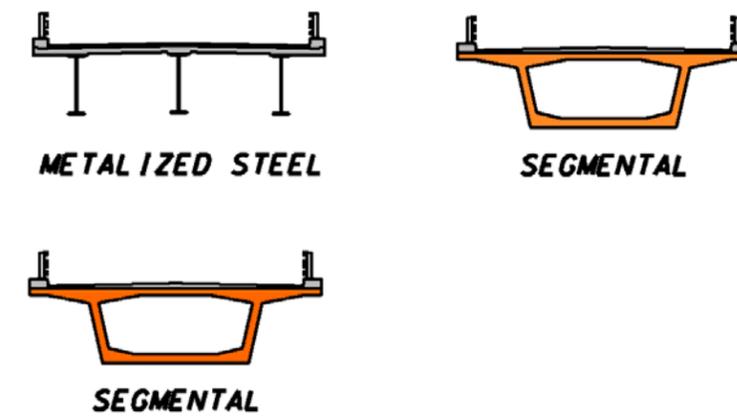
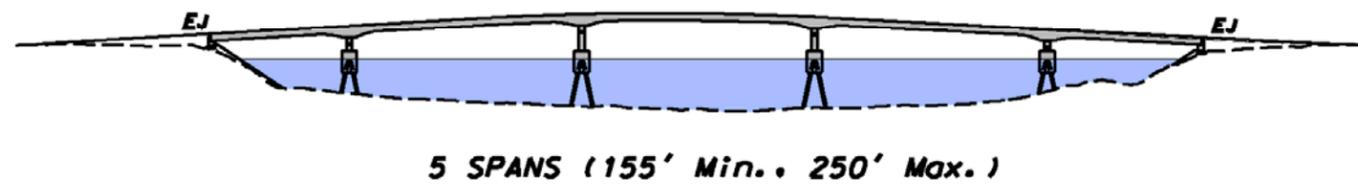
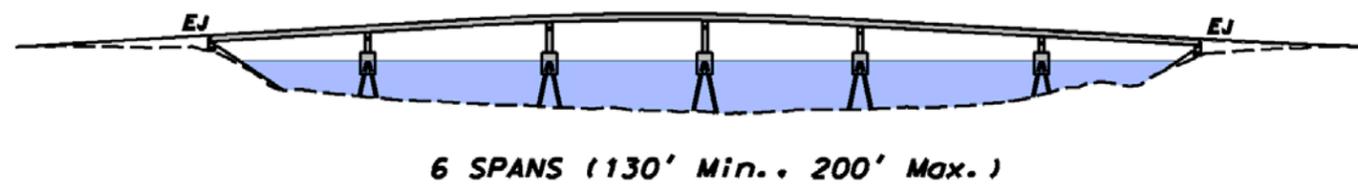
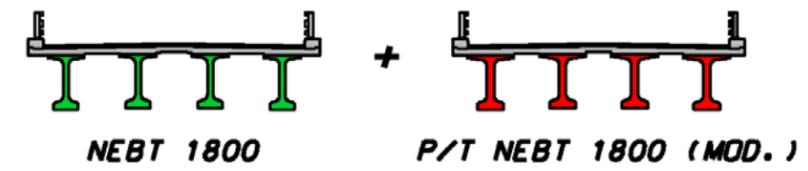
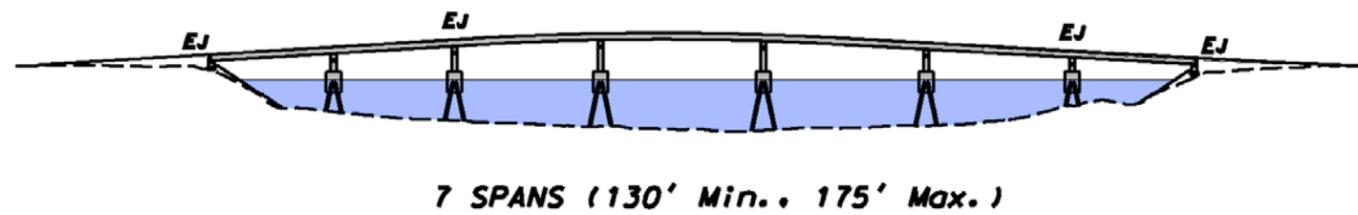
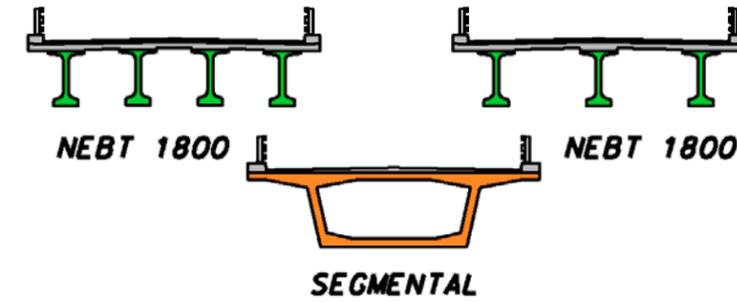
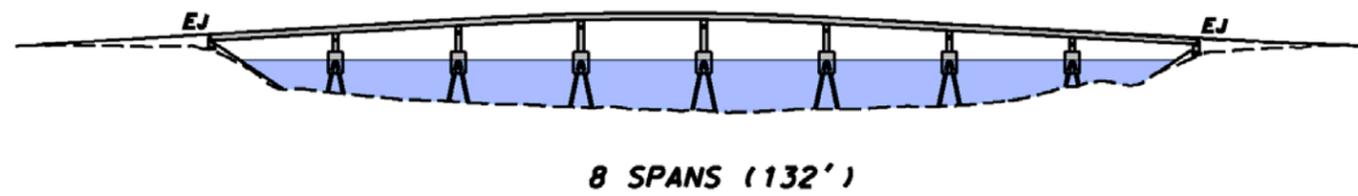
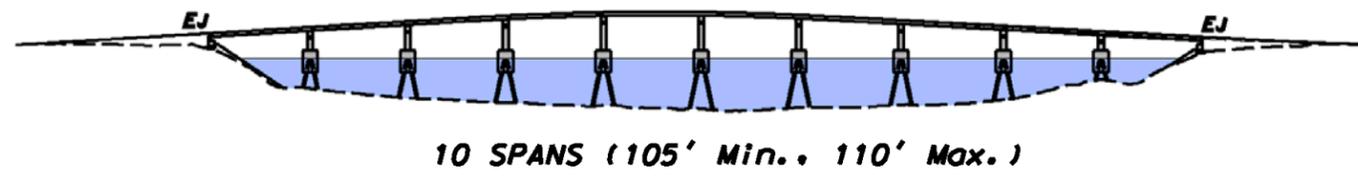
ABUTMENT DETAILS

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

SUMMARY OF PRELIMINARY DESIGN

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

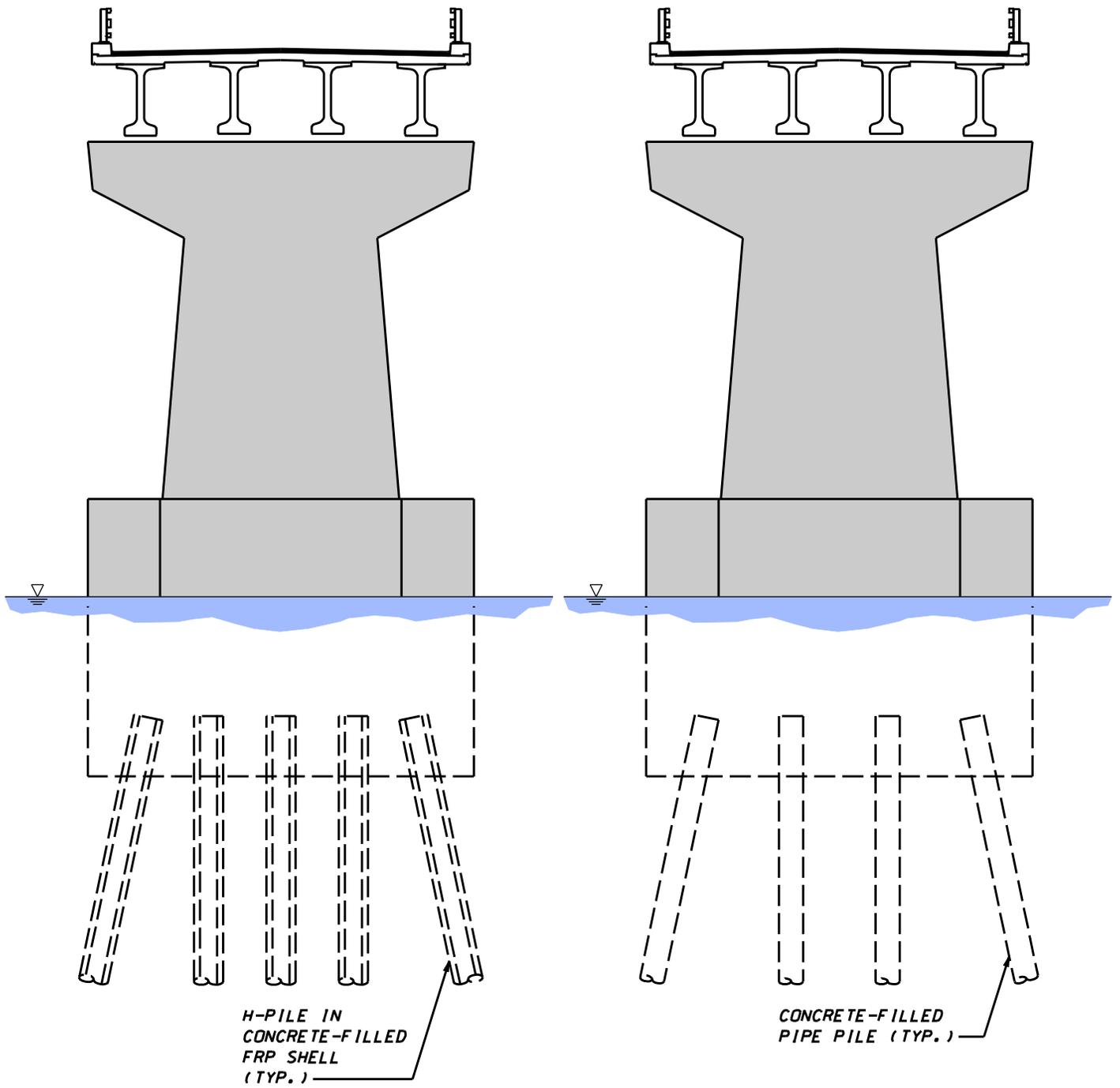
SUMMARY OF PRELIMINARY DESIGN

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 rubber fenders are recommended at the face of piers along the designated navigational channel.

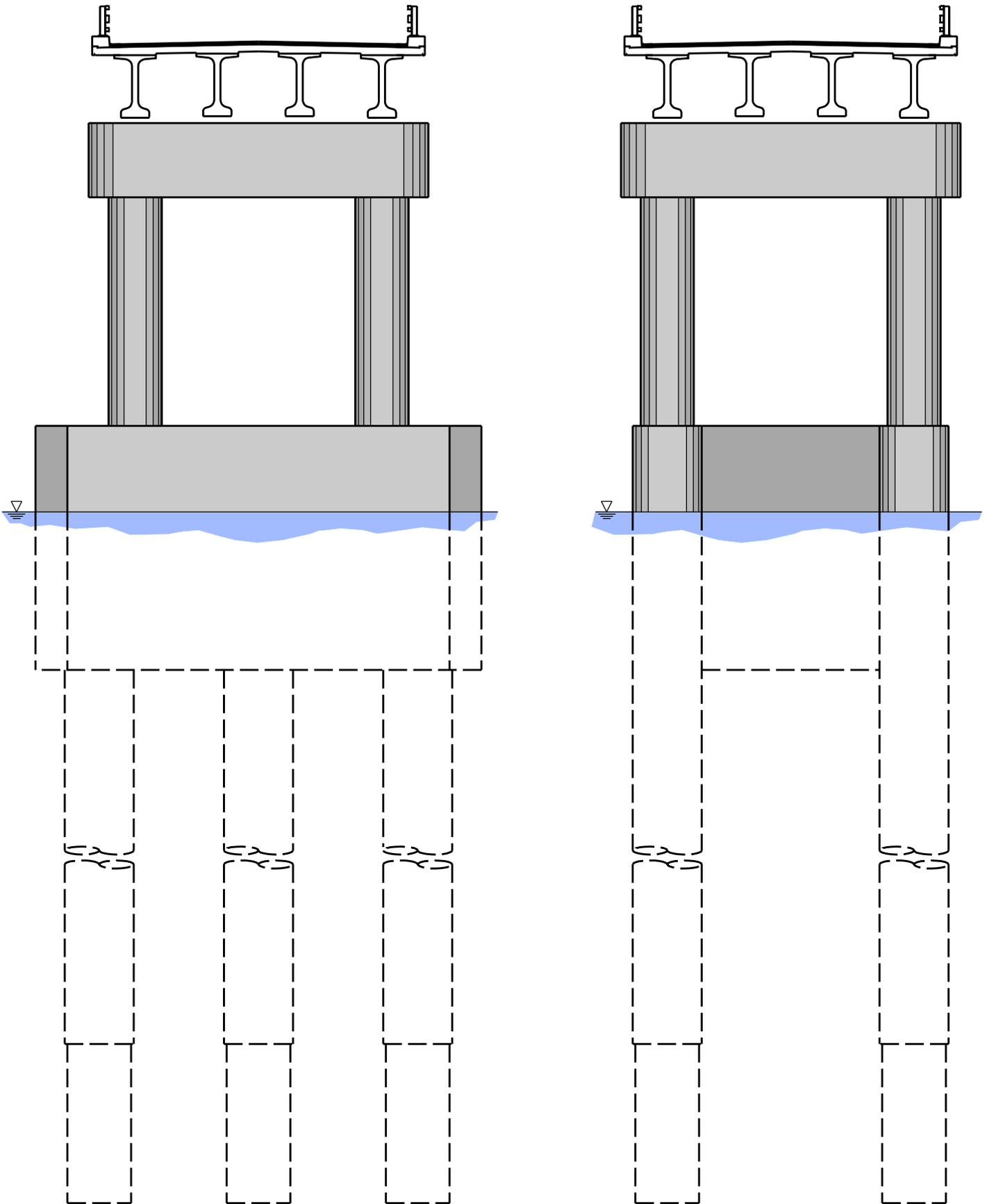
To determine vessel collision design criteria for final design, a study to determine site-specific large vessels, hull configurations/bow heights, and full/empty weights is recommended. The resulting design loads from the site-specific design vessel(s) are anticipated to be significantly less than those 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 - (HL-93)	<u>OPERATING</u> 1.24 (31 Tons)	<u>INVENTORY</u> 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 separates 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 $F_\mu = 270,000$ psi
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 $F_\mu = 120,000$ psi
ASTM A 252 $F_y = 50,000$ psi
ASTM F 1554 $F_y = 105,000$ psi
..... $F_\mu = 120,000$ psi

INDEX OF PRELIMINARY PLANS

Title Sheet	1
Roadway Plan (5 Sheets)	2-6a
Profile (6 Sheets)	7-11
Typical Sections and Details	12
Retaining Wall Details	13
Bridge Plan and Elevation	14
Bridge Sections	15
Pier Elevations	16
Future Deck Replacement Concept	17

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.

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

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

WIN022626.00

JONESPORT - BEALS
BEALS ISLAND BRIDGE
TITLE SHEET

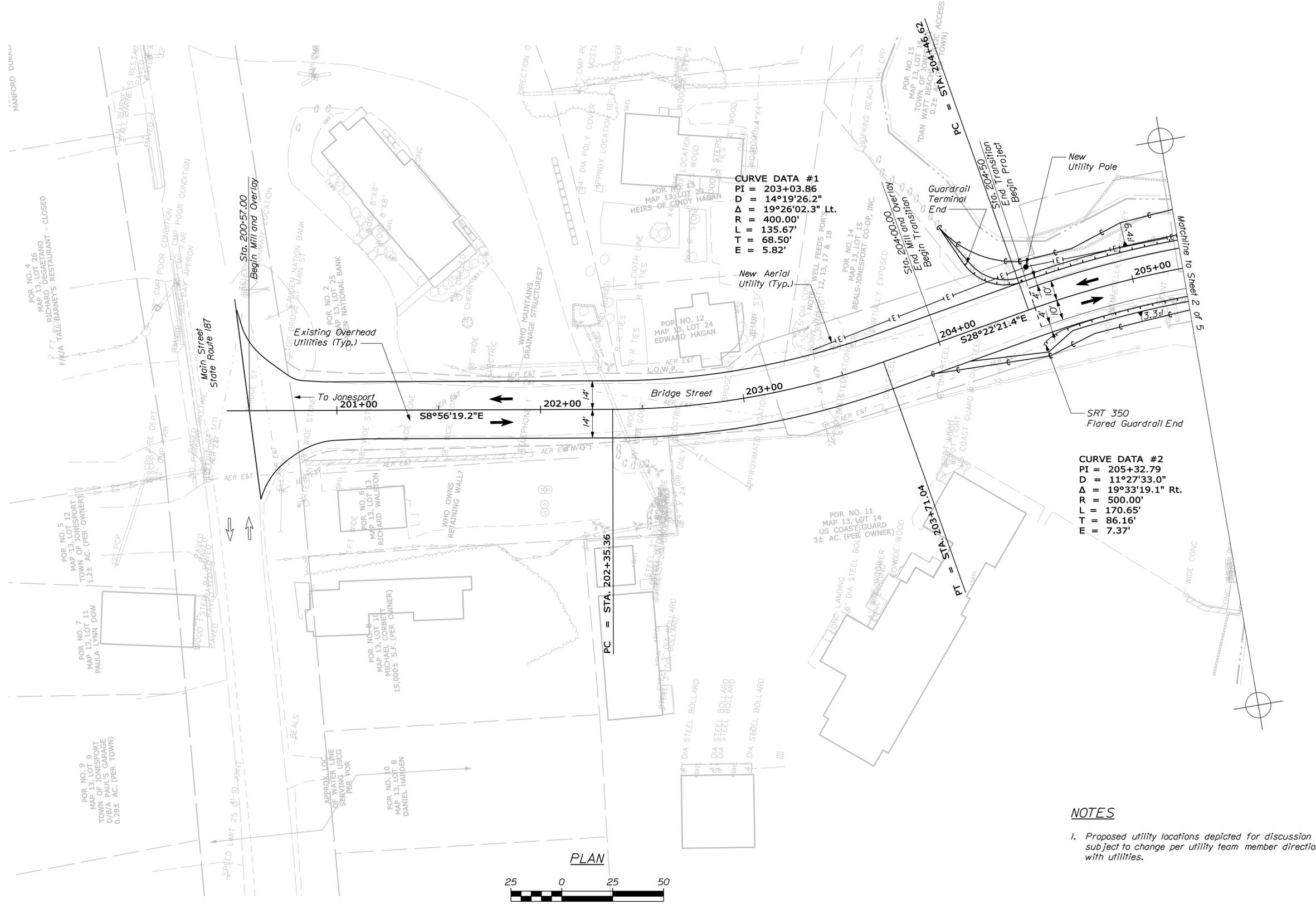
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		COMMISSIONER:	CHIEF ENGINEER:

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



NOTES

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

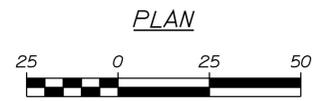
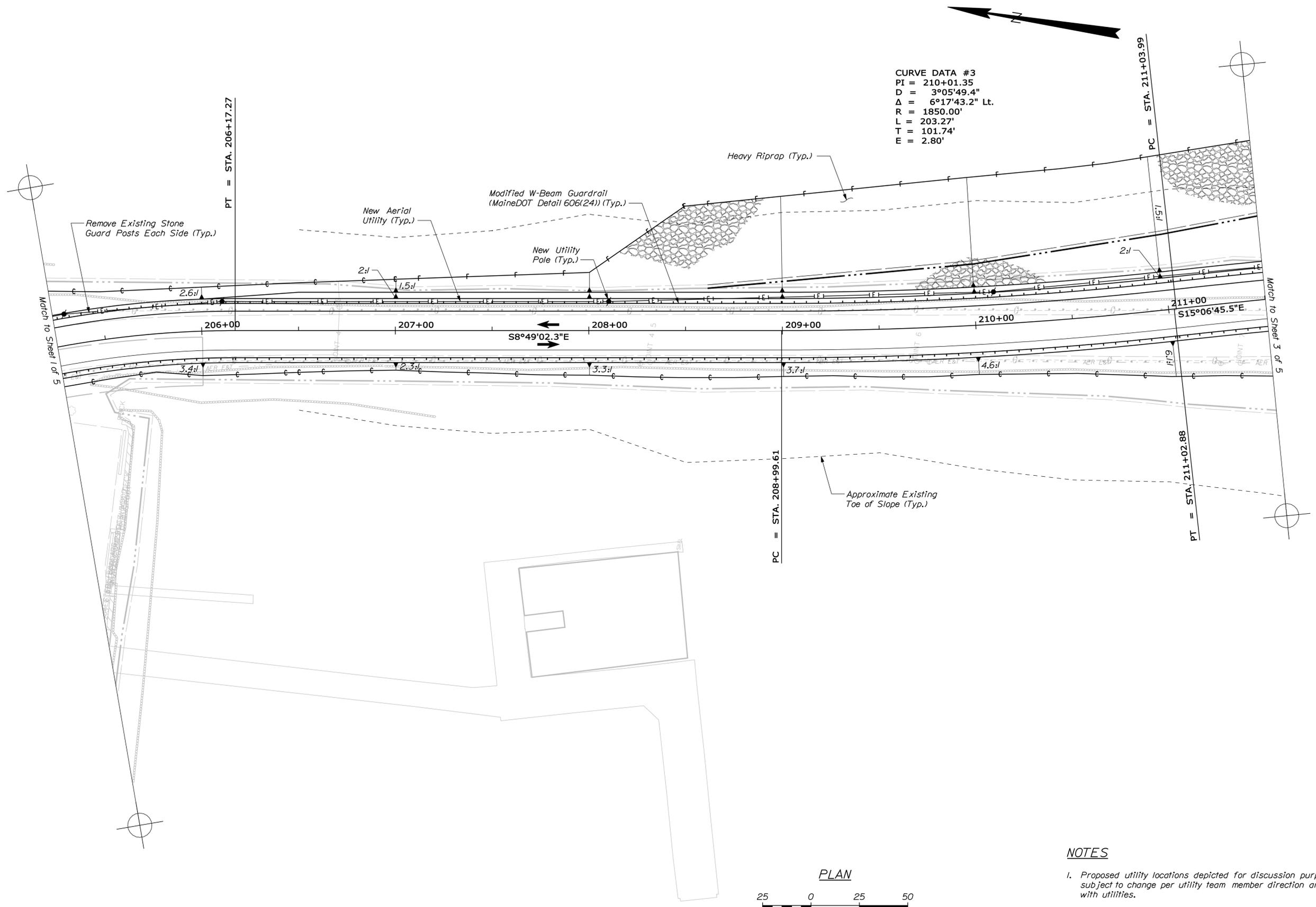
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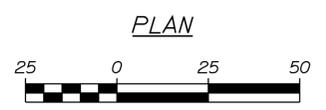
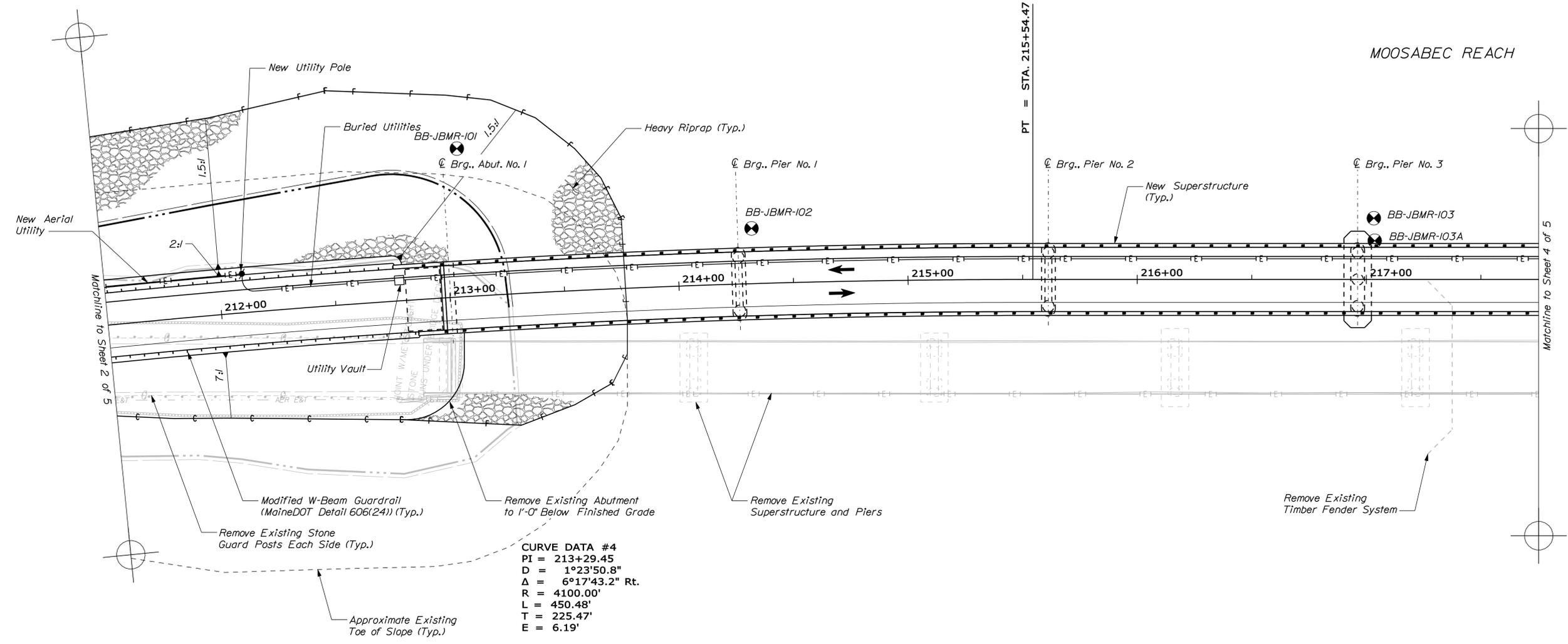
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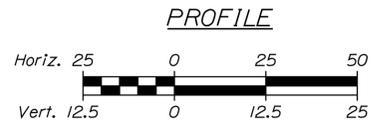
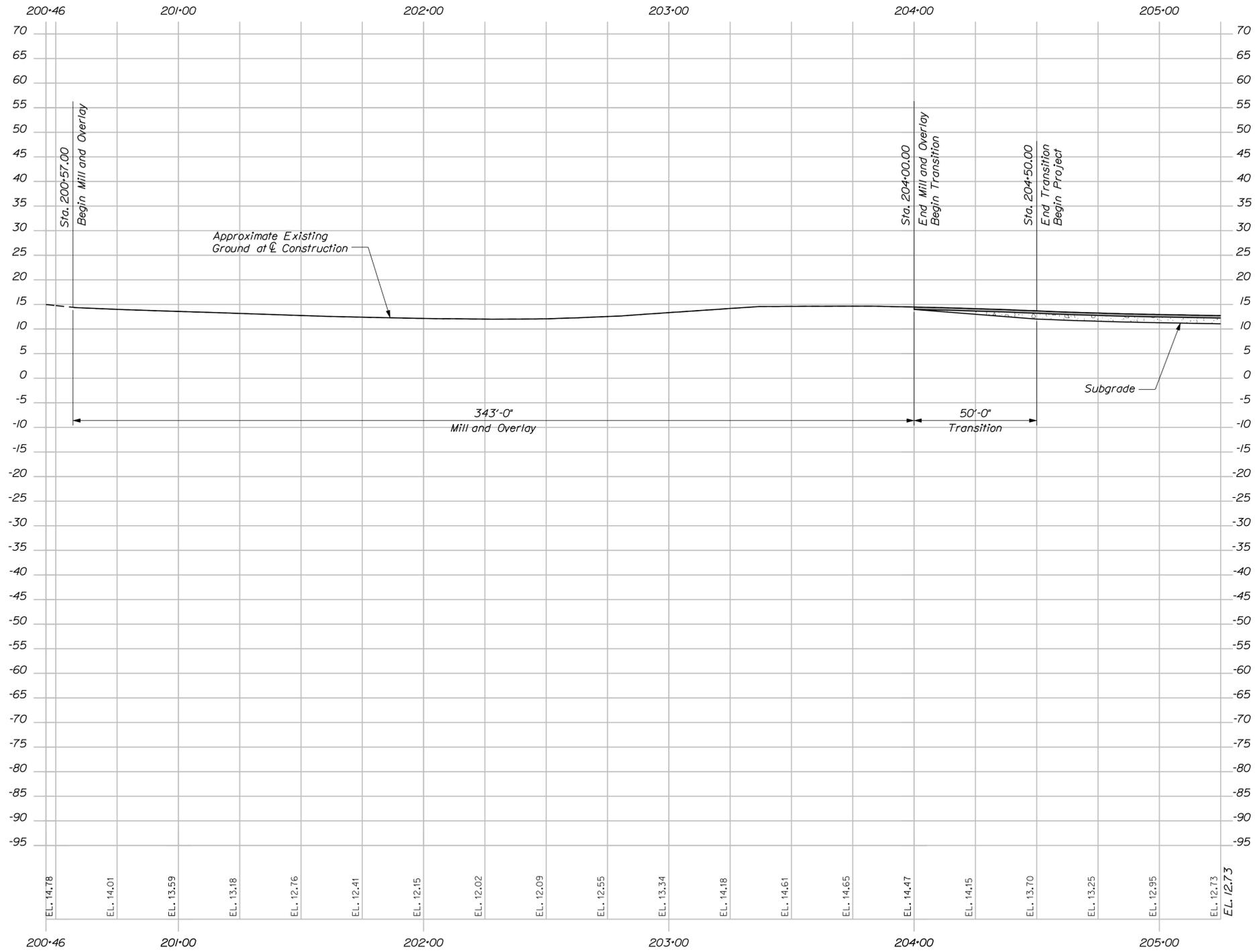
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 JONESPORT & BEALS WASHINGTON COUNTY
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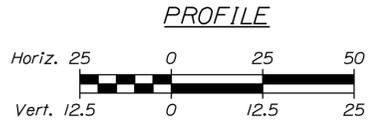
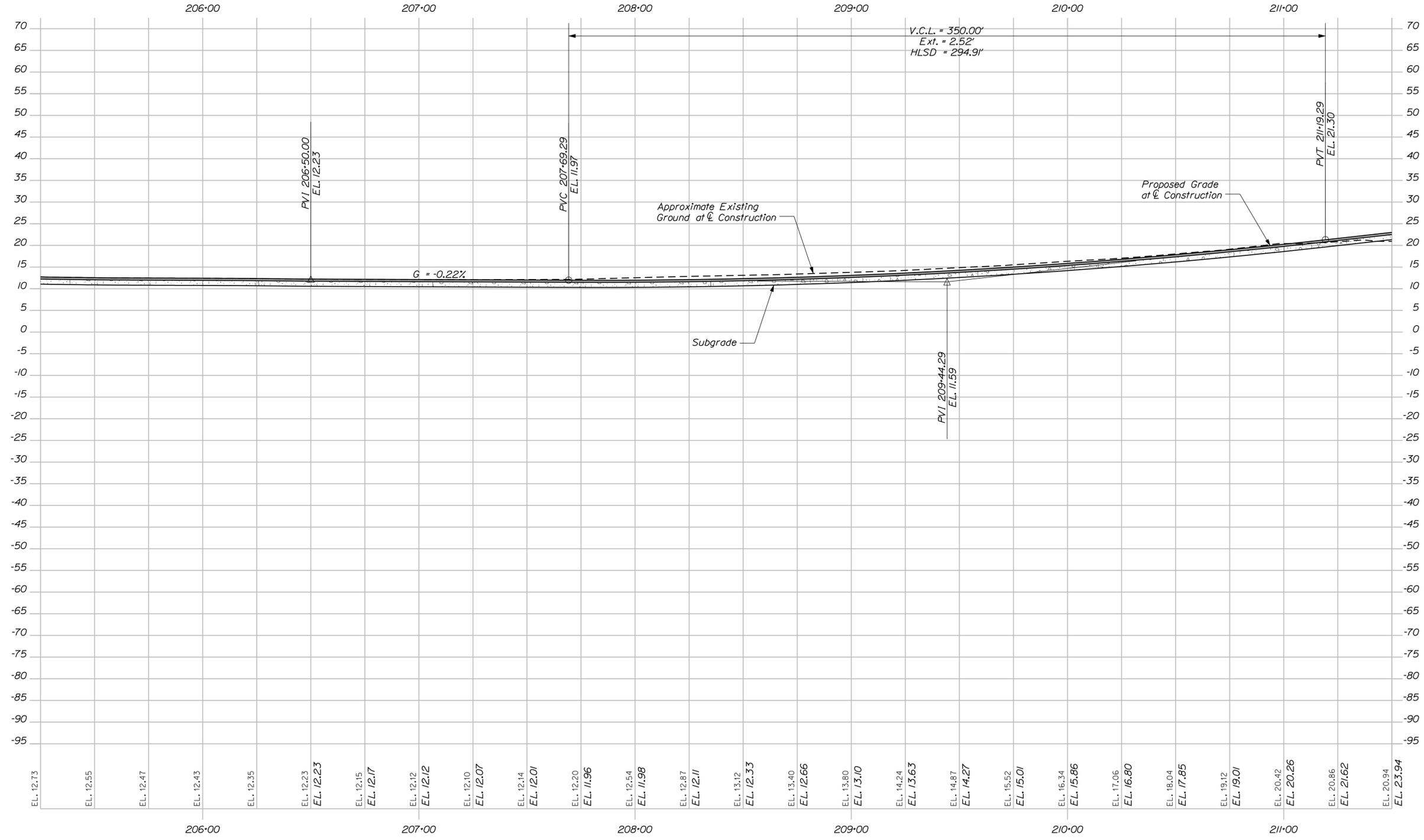
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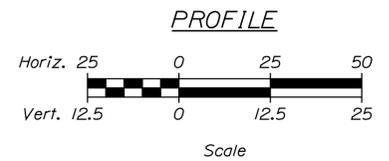
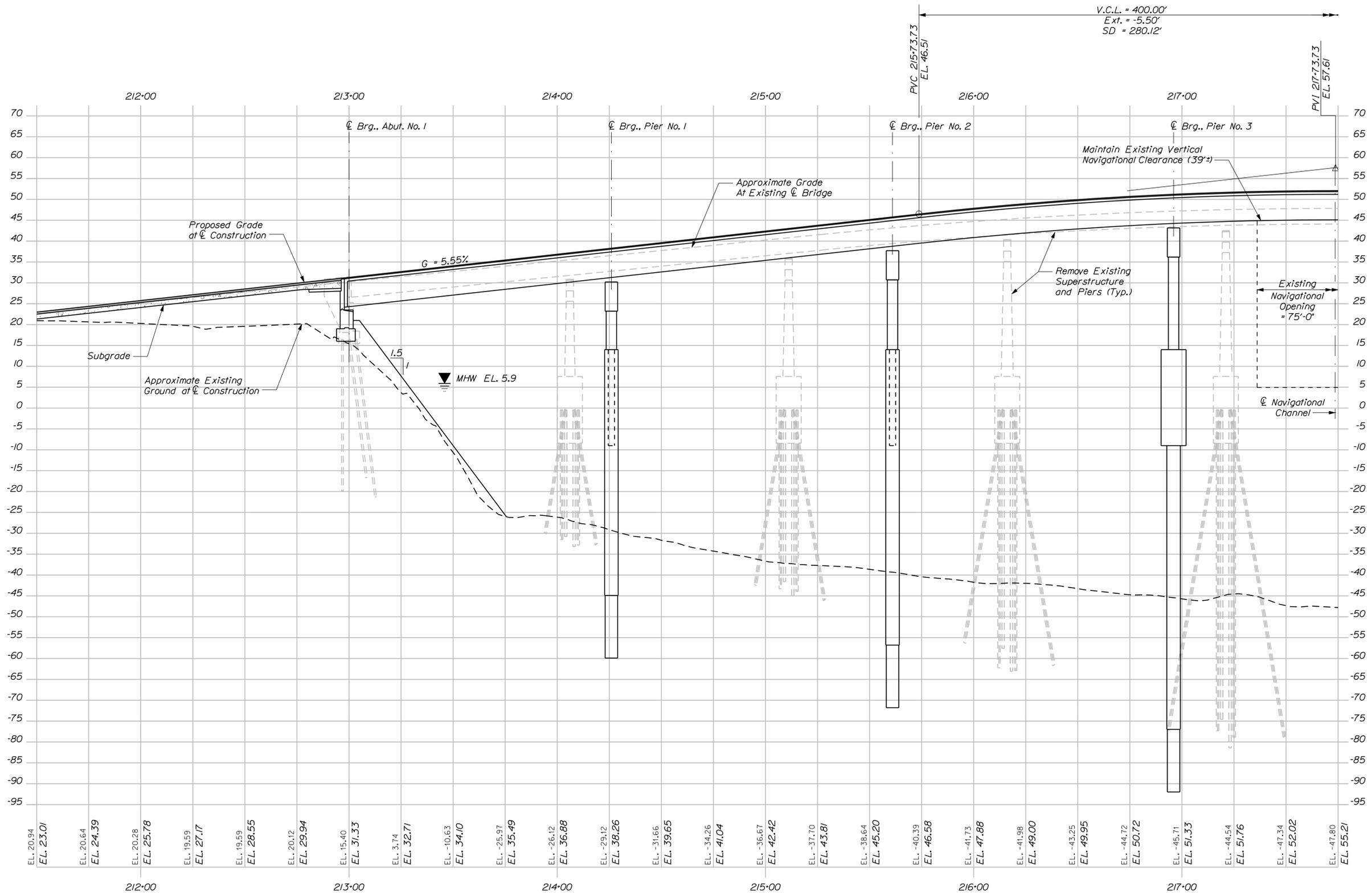
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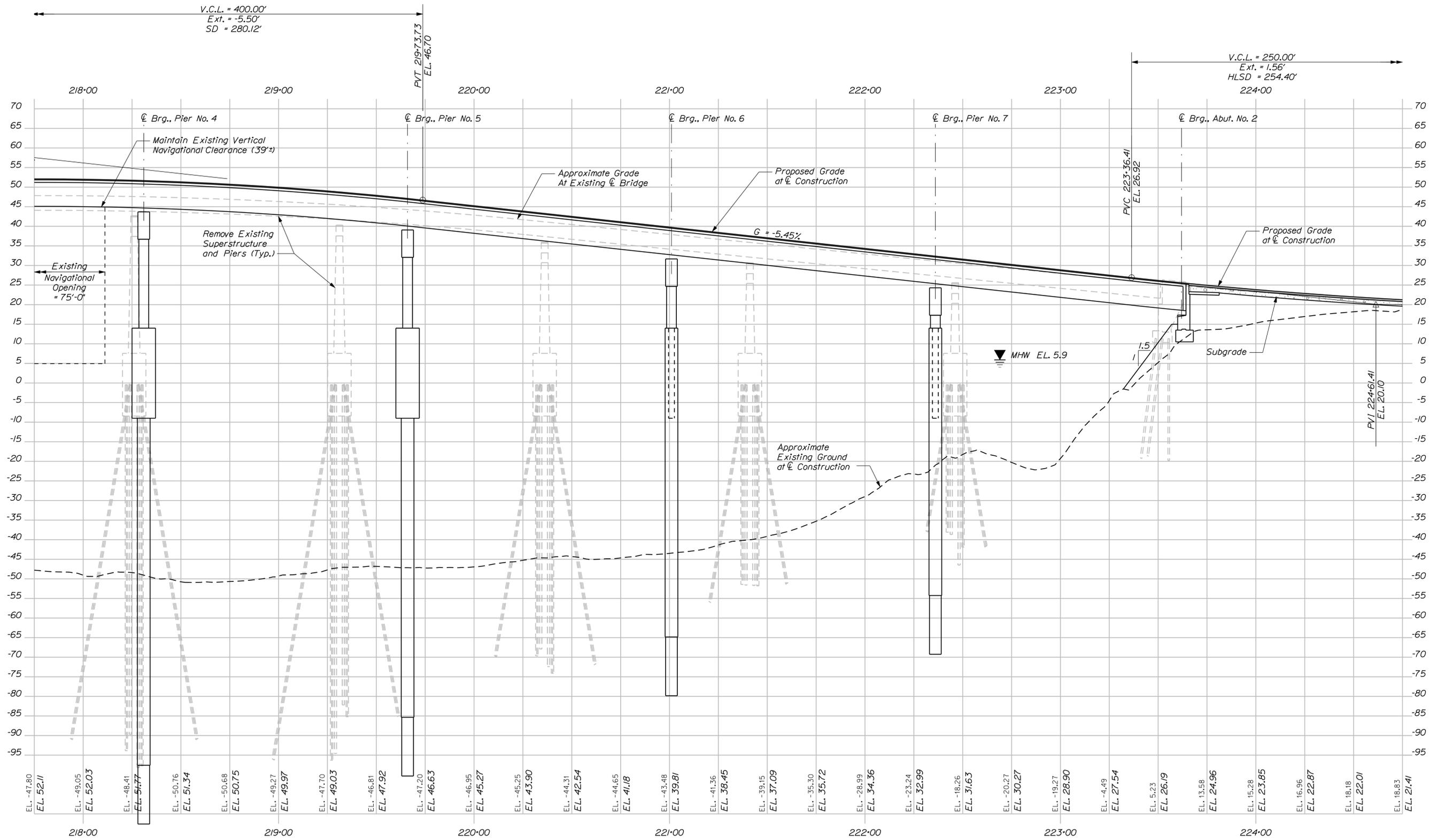




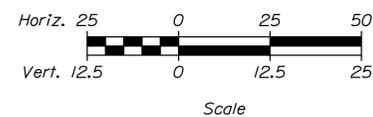
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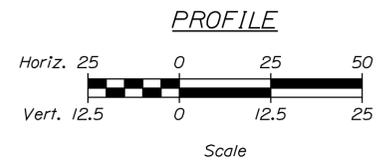
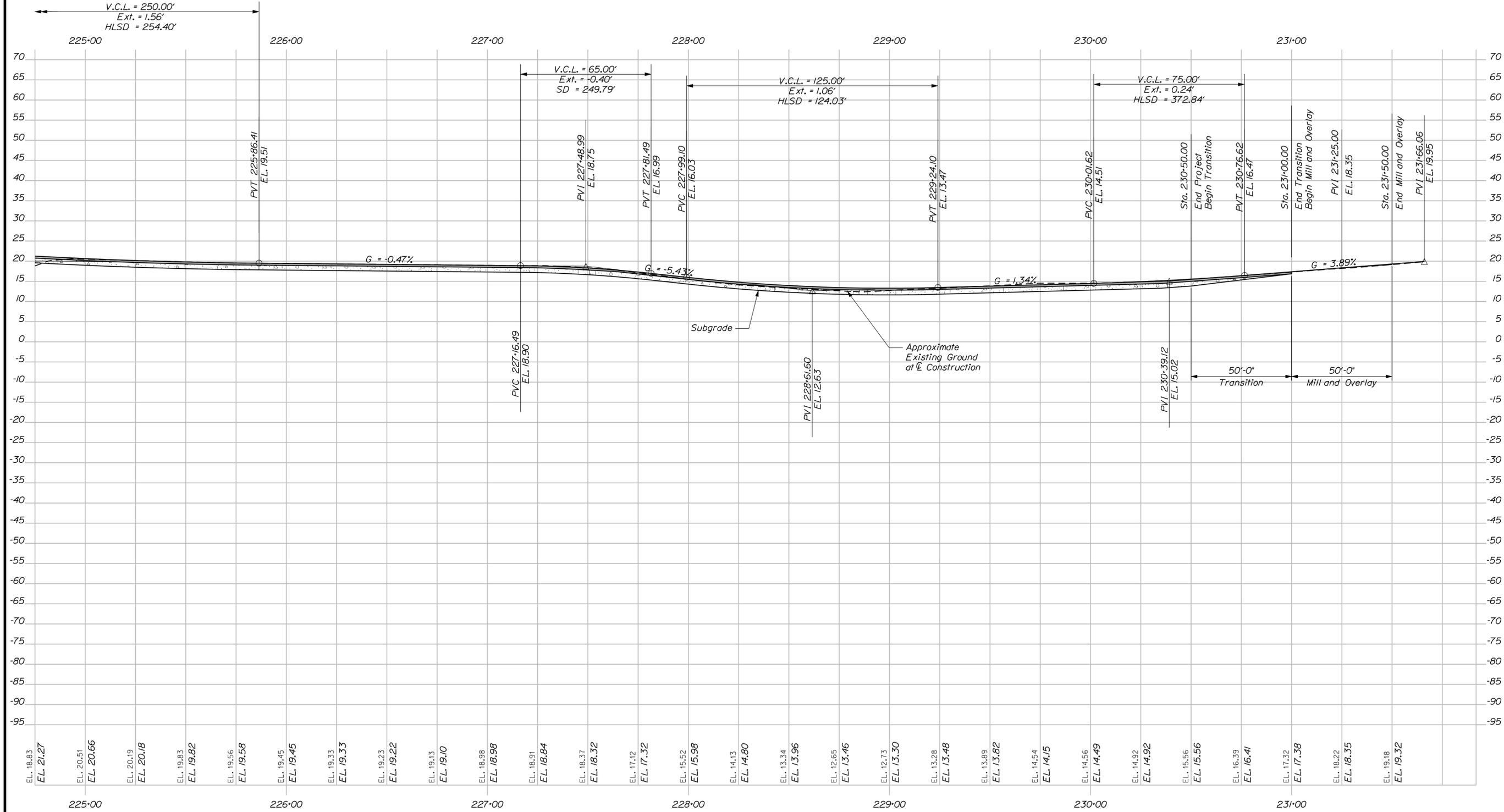
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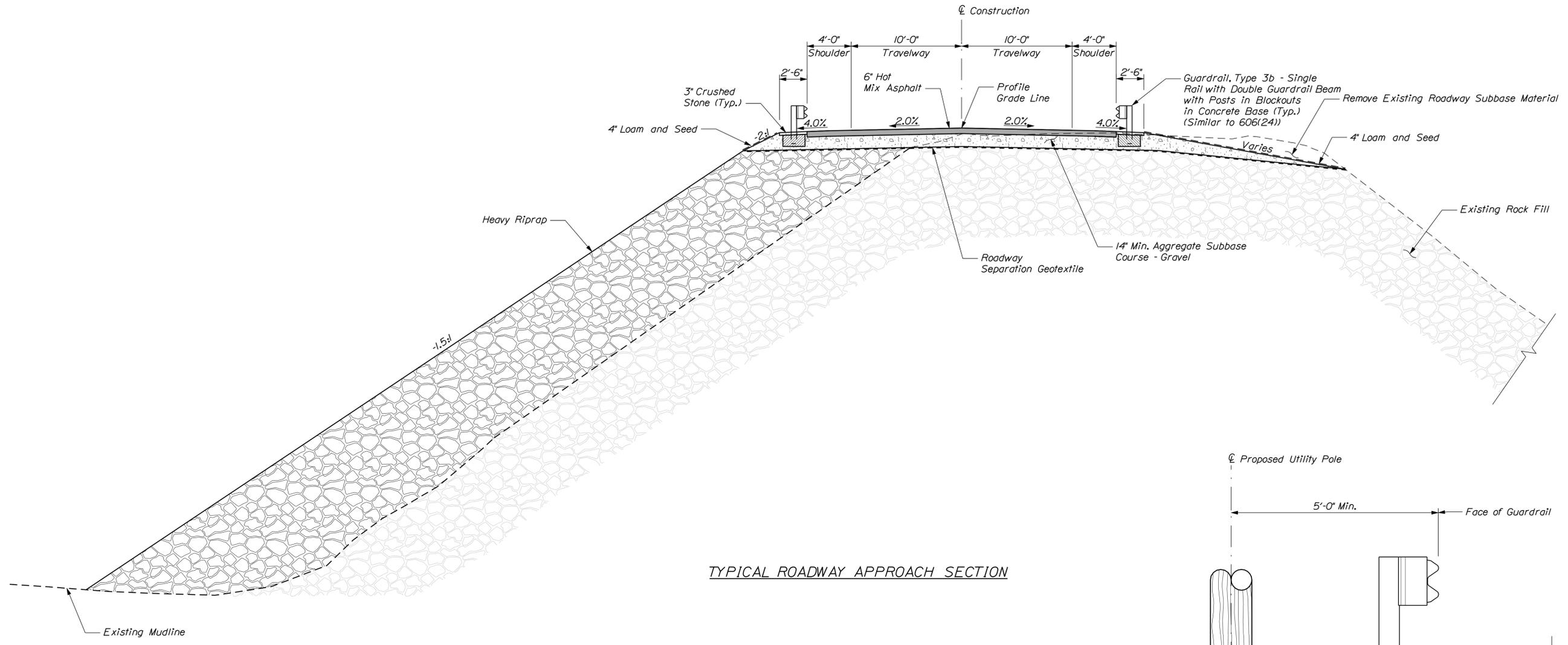
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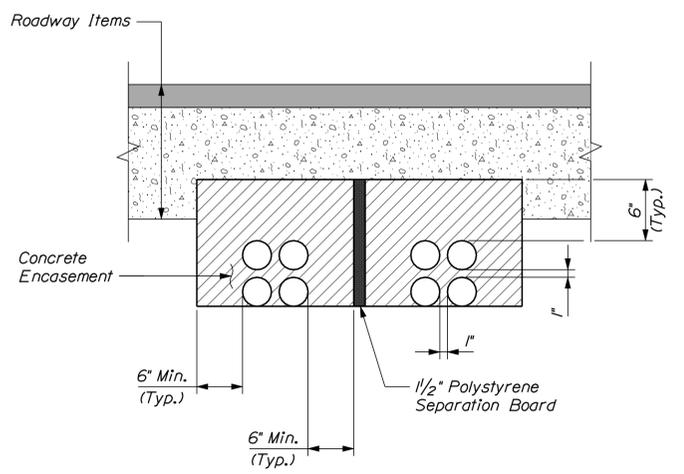
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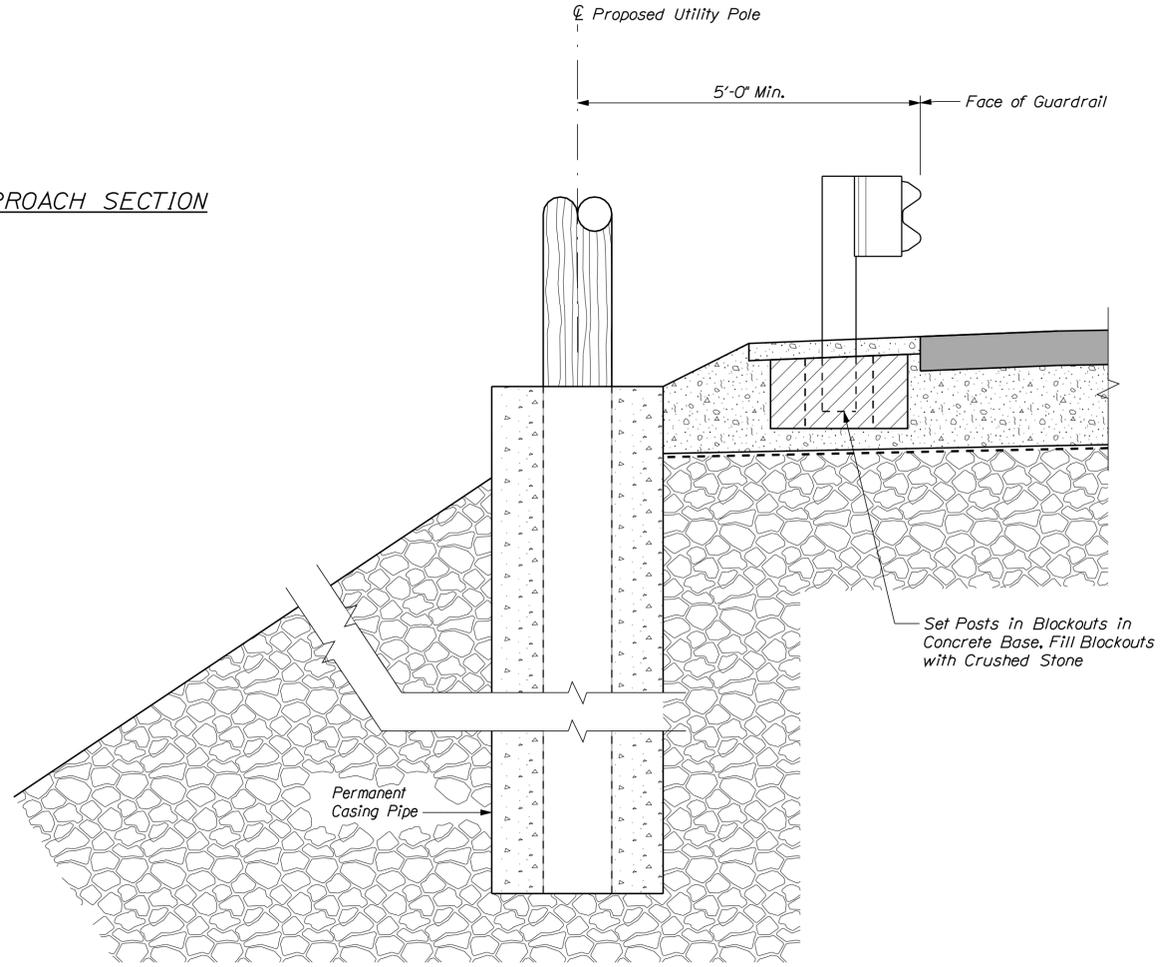
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TYPICAL ROADWAY APPROACH SECTION

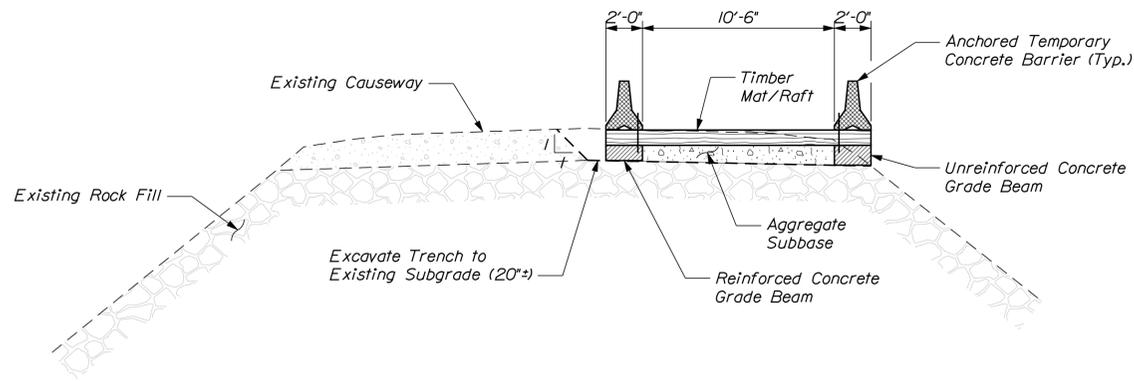


CONCRETE ENCASEMENT DETAIL FOR SHALLOW COVER

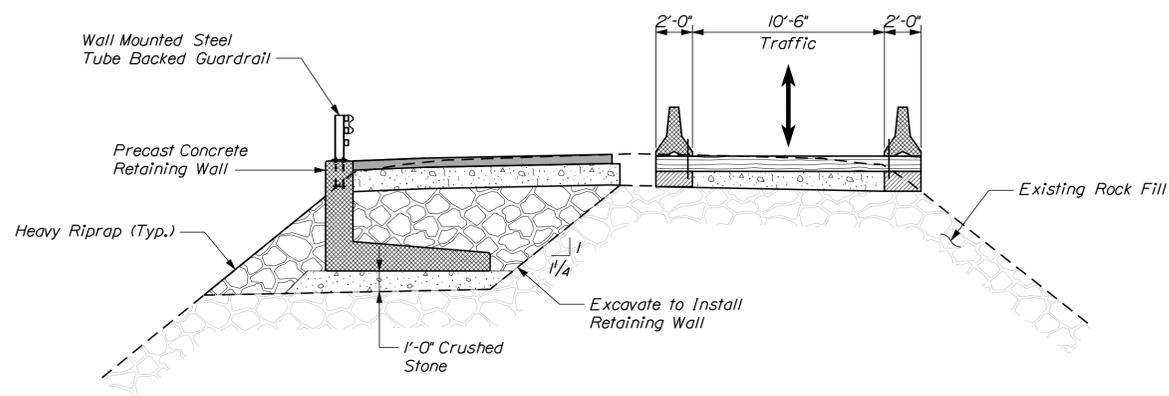


AERIAL UTILITY POLE DETAIL (Subject to Change)

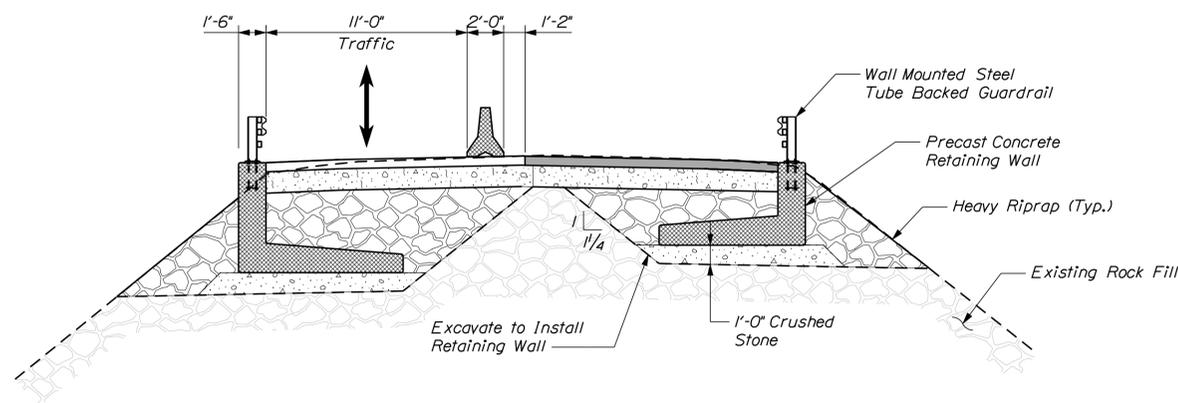
STATE OF MAINE		DEPARTMENT OF TRANSPORTATION	
BEALS ISLAND BRIDGE		MOOSABEC REACH	
JONESPORT & BEALS WASHINGTON COUNTY		TYPICAL SECTIONS AND DETAILS	
PROJ. MANAGER	BY	DATE	
DESIGN DETAILED: JAW	KDW	3/15	
CHECKED/REVIEWED: RSP	SMH	3/15	SIGNATURE
DESIGNS DETAILED:			P.E. NUMBER
REVISIONS 1:			DATE
REVISIONS 2:			
REVISIONS 3:			
REVISIONS 4:			
FIELD CHANGES:			
SHEET NUMBER		BRIDGE NO. 5500	
12		WIN 022626.00	
OF 17		BRIDGE PLANS	



PHASE I



PHASE II



PHASE III

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
BRIDGE NO. 5500
WIN 022626.00
BRIDGE PLANS

PROJ. MANAGER	BY	DATE
DESIGN DETAILED JAW	KDW	3/15
CHECKED/REVIEWED RSP	SMH	3/15
DESIGN DETAILED		
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

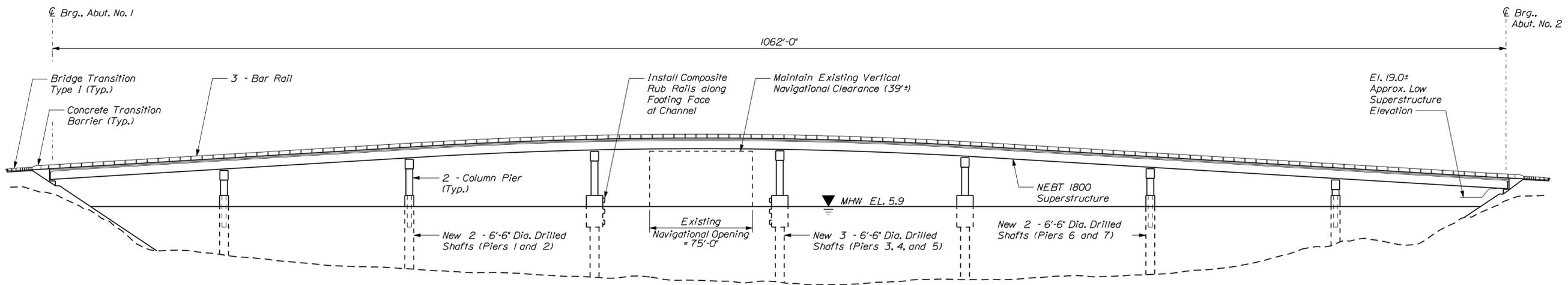
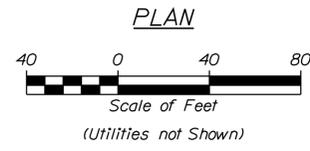
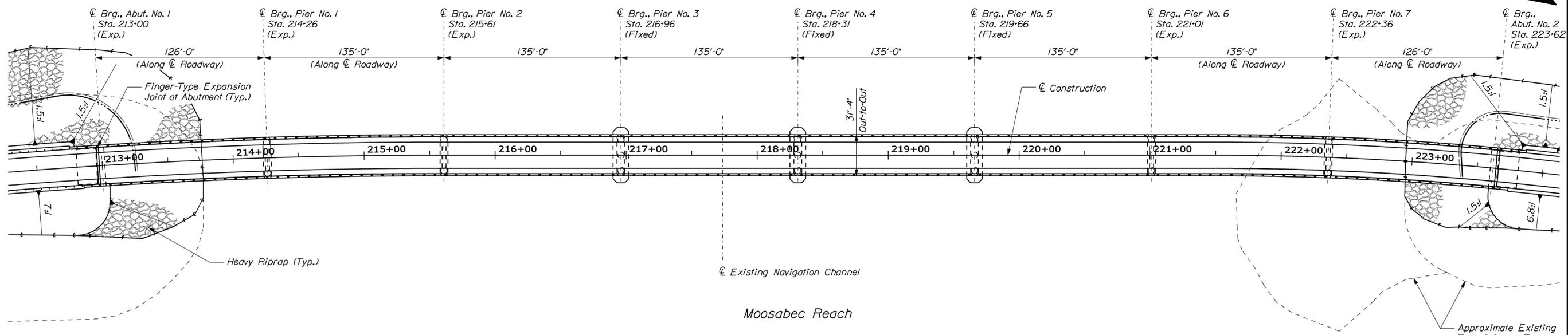
SHEET NUMBER
13
OF 17

Date: 5/26/2015

Username: kwentworth

Division: Structures

Filename: ...st\planset\014_plan&elev.dgn



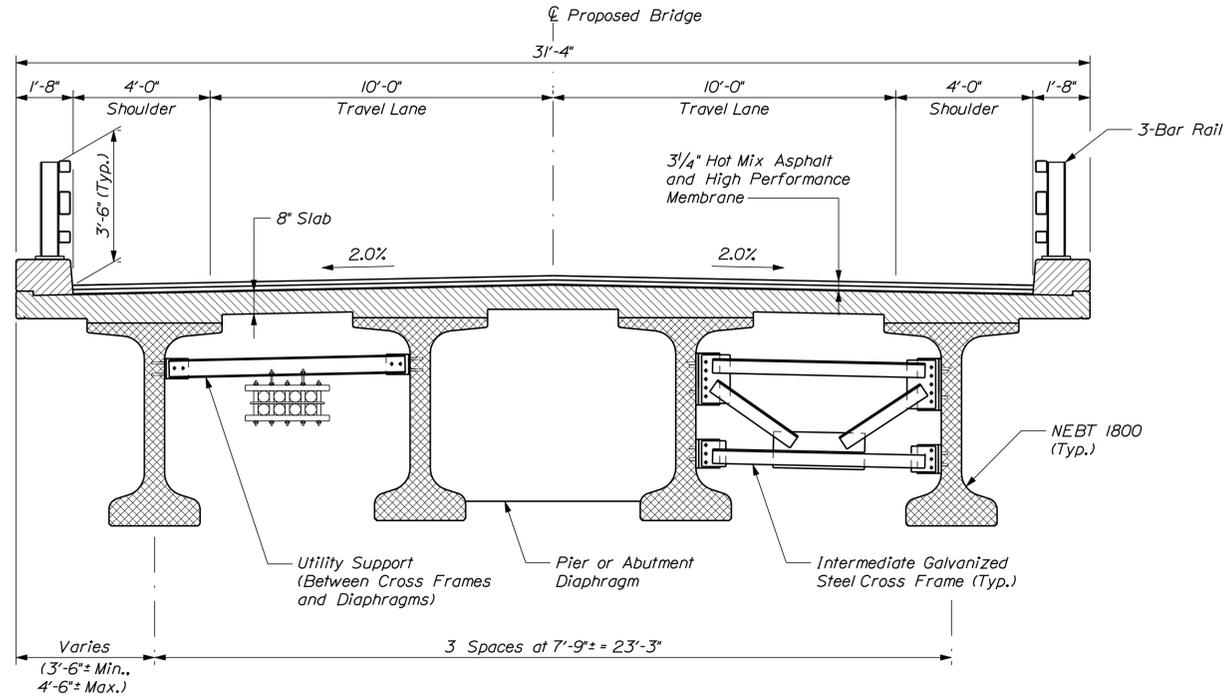
ELEVATION
(Navigation Lights not Shown)

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
BRIDGE NO. 6500
WIN 022626.00
BRIDGE PLANS

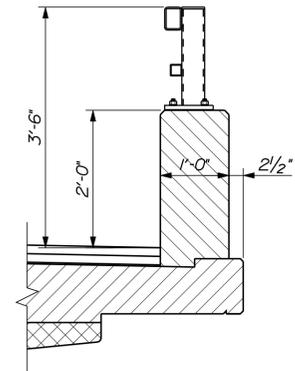
DATE	BY	DESIGN	CHECKED	REVIEWED	JAW	RSB	SMH	DATE	SIGNATURE	P.E. NUMBER	DATE
3/15	KDW							3/15			

BEALS ISLAND BRIDGE
MOOSABEC REACH
JONESPORT & BEALS WASHINGTON COUNTY
BRIDGE PLAN
AND ELEVATION

SHEET NUMBER
14
OF 17



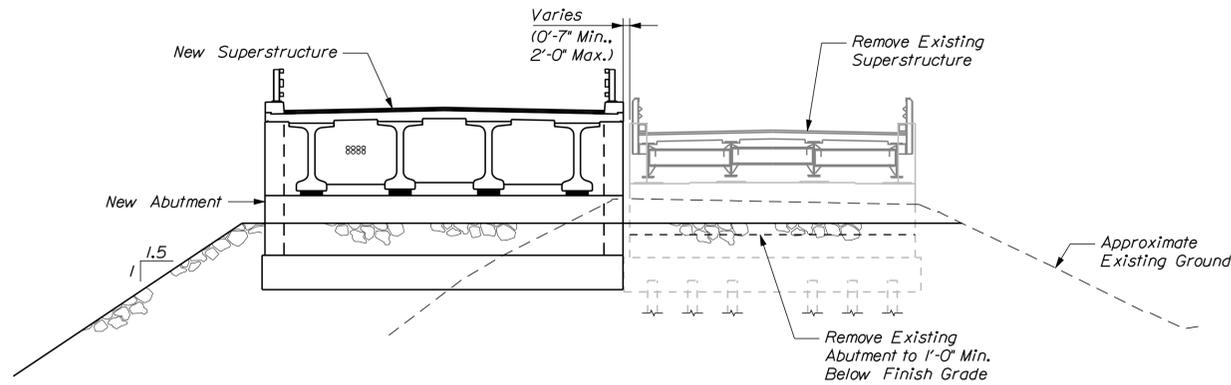
SUPERSTRUCTURE SECTION
Scale: 3/8" = 1'-0"



**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

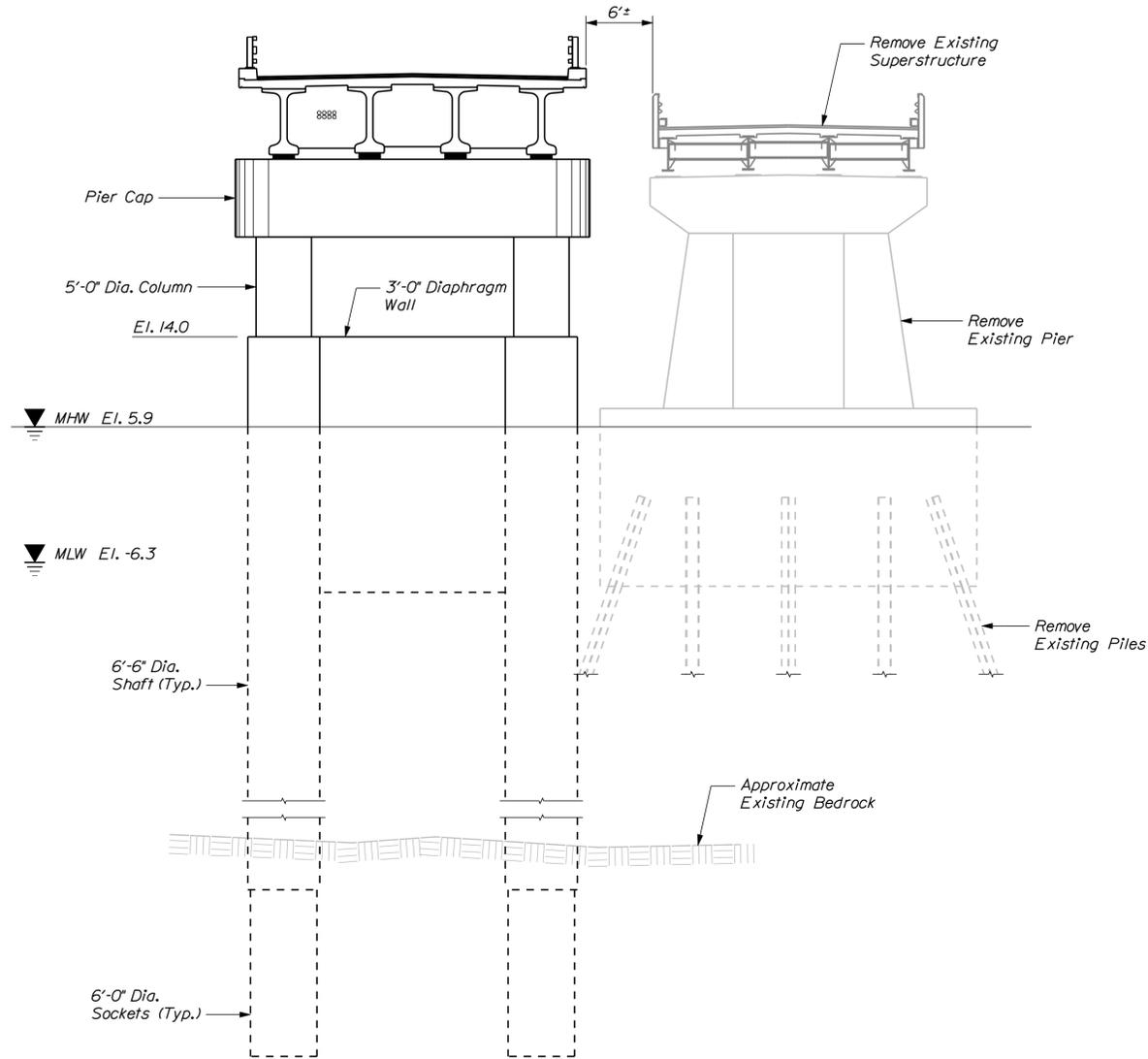
PROJ. MANAGER	DATE	BY	DATE
DESIGN DETAILED	3/15	KDW	3/15
CHECKED-REVIEWED		SMH	
DESIGN DETAILED			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

BEALS ISLAND BRIDGE
MOOSABEC REACH
JONESPORT & BEALS WASHINGTON COUNTY
BRIDGE SECTIONS

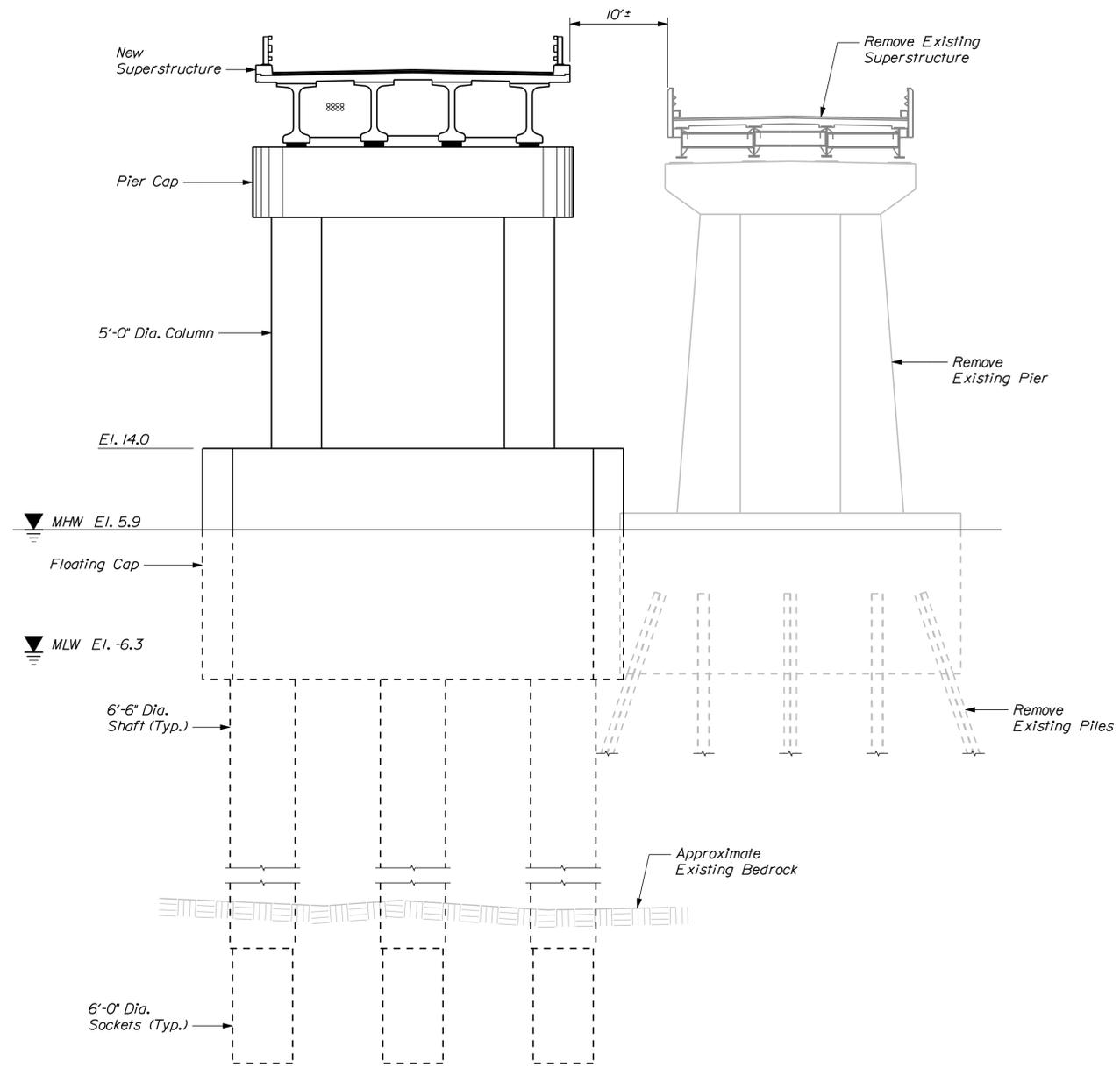
SHEET NUMBER

15

OF 17



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



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

PROJ. MANAGER	DATE	BY	DATE	SIGNATURE	P.E. NUMBER	DATE
DESIGN DETAILED	3/15	KDW	3/15			
CHECKED/REVIEWED		SMH				
DESIGN DETAILED						
REVISIONS 1						
REVISIONS 2						
REVISIONS 3						
REVISIONS 4						
FIELD CHANGES						

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:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Prep By: MAM Sec. 1 Sec. 2 Sec. 3 Sec. 4 Sec. 5

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

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.)
TRAFFIC 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: Joe Murphy Department: Bridge

Project Leader: Leanne Timbertake

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

Notes Rd over Moosebec Reach

Information Required

Study Period

Accident Summary (I, II)

Current 3 years

Collision Diagram

Other

M.A.R.S.

(1 page printout with numbers, rates, severity)

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:

918

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
Tonespart-Beals

Flying Place Stream
Massabac Reach

10
25'
18'

18'
—
—

Stone

Wood
Wood

wood

1959

HIC

68-101-02-100

3196

Now Experimental Epoxy

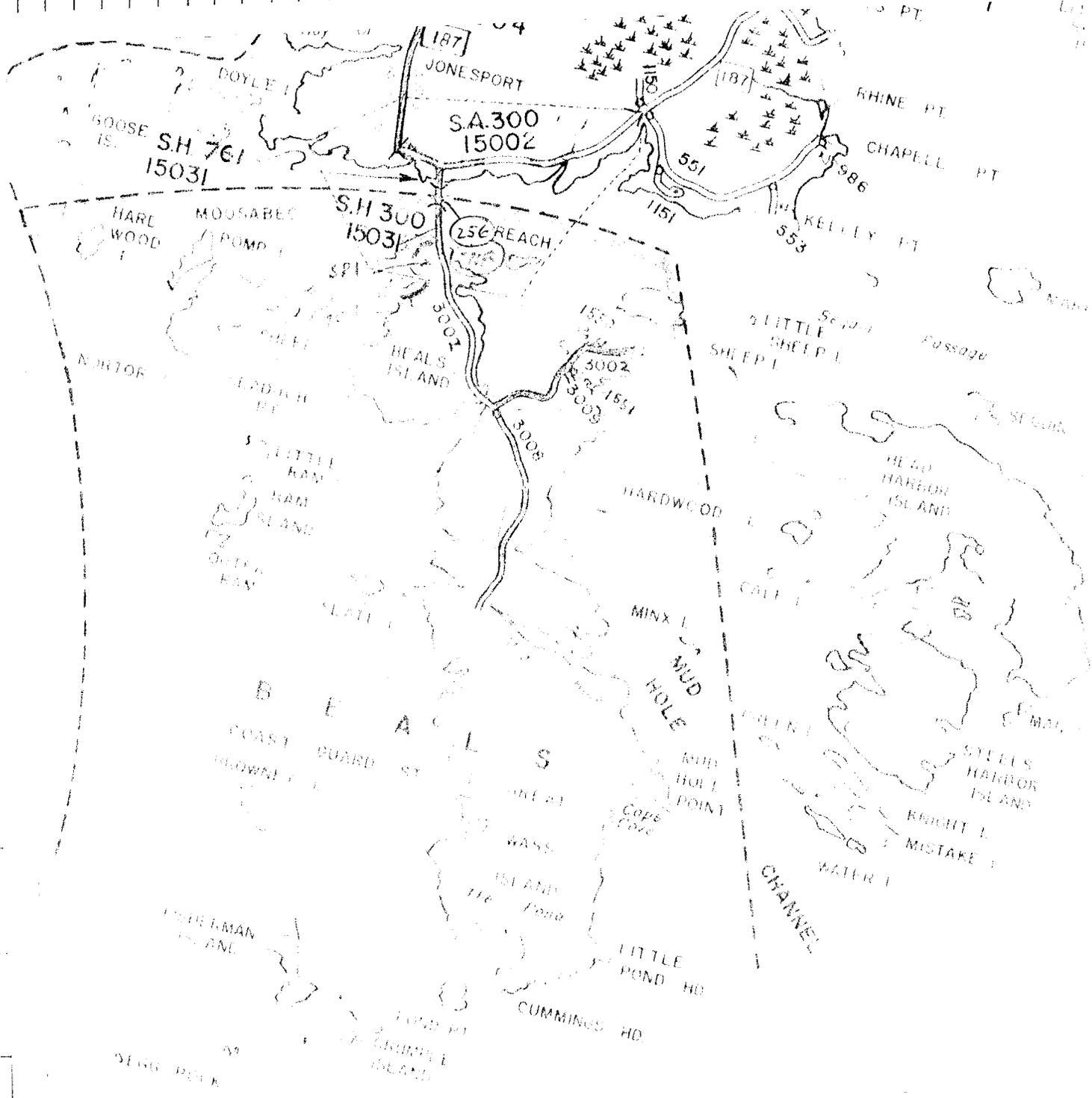
Marked with Epoxy

1986

5500

718
761

IDENTIFICATION NUMBER
ROUTE NUMBER
HIGHWAY CLASSIFICATION



718
761

RATING
PLAN NUMBER

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

End Node: 50210

Start Offset: 0

End Offset: 0

Exclude First Node

Exclude Last Node

Crash Summary I

Nodes															
Node	Route - MP	Node Description	U/R	Total Crashes	K	A	B	C	PD	Injury Crashes	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	0.375	0.00	0.52	0.00
Study Years: 3.00														Statewide Crash Rate: 0.12	
NODE TOTALS:				0	0	0	0	0	0	0	0.0	0.375	0.00	0.52	0.00

Crash Summary I

Sections

Start Node	End Node	Element	Offset Begin - End	Route - MP	Section U/R Length	Total Crashes	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 Statewide Crash Rate: 156.81	0.00210	0.00	483.96	0.00
50208	50209	232176	0 - 0.19	2901131 - 0 RD INV 29 01131	0.19	1	0 0 0	0	0.0 Statewide Crash Rate: 156.81	0.00142	0.00	533.33	0.00
Int of BARNEY COVE RD, BAYVIEW RD, BRIDGE ST													

Study Years: 3.00 **Section Totals:** 0.47 0 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 0.00352 0.00 483.72 0.00

Crash Summary

Section Details														
Start Node	End Node	Element	Offset Begin - End	Route - MP	Total 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 0 0 0 0 0

Crash Summary II - Characteristics

Crashes by Day and Hour

Day Of Week	Hour of Day												Un	Tot												
	AM						PM																			
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11		
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	Unit Type	Total
1-2 Door	0	32-3 Axle Tractor with Tandem Axle Semi	0
2-4 Door	0	33-3 Axle Tractor with Tridem Axle Semi	0
3-Convertible	0	35-3 Axle Tractor with Single Axle Semi & 2 Axle Trailer	0
4-Station Wagon	0	36-3 Axle Tractor with Tandem Axle Semi & 2 Axle Trailer	0
5-Van	0	37-5 Axle Semi; Split Trailer Tandem	0
6-Pickup Truck	0	38-6 Axle Semi; Split Trailer Tandem with Center Axle	0
7-SUV	0	39-6 Axle; Standard Trailer Tandem with Center Axle	0
10-Truck Tractor Only (Bobtail)	0	40-4 Axle Single Unit	0
12-School Bus	0	42-4 Axle Tractor with Tandem Axle Semi	0
13-Motor Home	0	50-Any Other Axle Configuration	0
14-Motorcycle	0	60-Other Unit	0
15-Moped	0	70-ATV	0
16-Motor Bike	0	81-2 Axle Bus	0
17-Bicycle	0	82-3 Axle Bus	0
18-Snowmobile	0	98-Farm Vehicles / Tractors	0
20-2 Axle Single Unit with Dual Tires	0	99-Unknown	0
21-2 Axle Tractor with Single Axle Semi	0	Total	0
22-2 Axle Tractor with Tandem Axle Semi	0	30-3 Axle Single Unit	0
25-2 Axle Tractor with Single Axle Semi & 2 Axle Trailer	0	31-3 Axle Tractor with Single Axle Semi	0

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						

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						

Driver Age by Unit Type

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

Crash Summary II - Characteristics

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		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		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		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

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

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

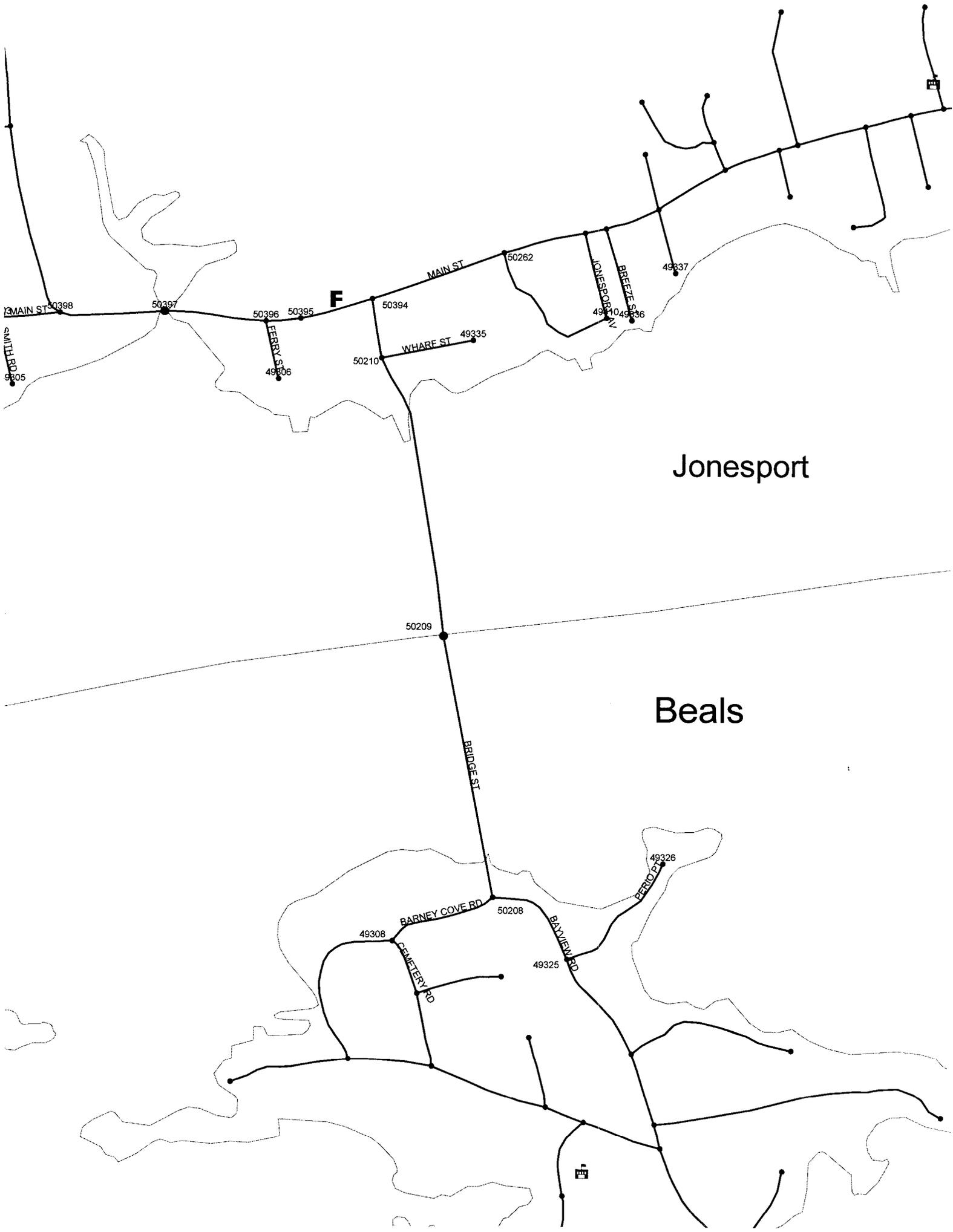
Crashes by Weather, Light Condition and Road Surface

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



Jonesport

Beals

F

50398

50397

50396

50395

50394

50262

49337

SMITH RD.
9305

FERRY ST.
49306

50210

WHARF ST.

49335

49334

49336

50209

BRIDGE ST.

BARNEY COVE RD.

50208

49308

CEMETERY RD.

49325

BARVIEW RD.

FERRY RD.
49326

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. F:
 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/Sdwk 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: 24.0 ft Median 33: 0 No median (w/ shoulders)
 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/ Cath	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-	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, e	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% minor 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: 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 fair condition with scattered locations of cracking, delaminations, corner spalling and some resteel corrosion.
 Isolated area 9th or 2nd pier in from the longest 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: 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 longest 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 0th or 2nd pier in from the longest side on the column with 4" 8" rebar holes and exposed rebar.

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 columns 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 coulms 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 coulms 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 endices. 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

Jamie
Mike F.
Dave C.

Alcar Team

Carl
Mike B.
Paul

Barge Team

Tim
Dave S.
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

Jamie
Mike F.
Dave C.

Alcar Team

Carl
Mike B.
Paul

Barge Team

Tim
Dave S.
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
APPROACHES:						
(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:					=	\$0
(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
(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
APPROACHES:						
(3)	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:					=	\$0
(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					WIN: 22626.00	
30-Yr Rehabilitation. 100% Exposed pile strengthening with concrete encasement and new painted steel superstructure. Deck Area: 1050' x 30.5' = 32,025 SF					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					WIN: 22626.00	
45-Yr Rehabilitation. New metalized steel beam superstructure with supplemental pipe pile foundation. Deck Area: 1050' x 30.5' = 32,025 SF					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

CORVENENG

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

August 15, 2014

Segmental Alternate Feasibility Study

Contents

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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.

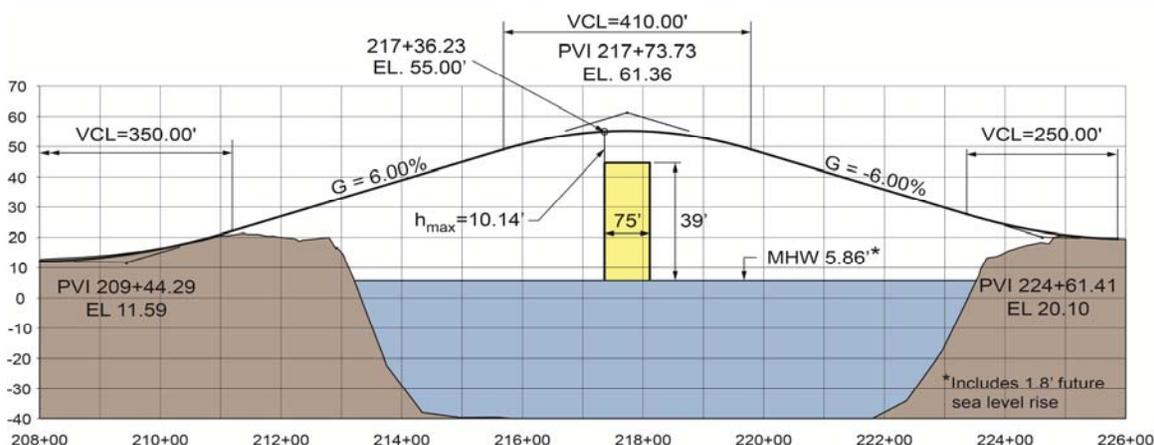


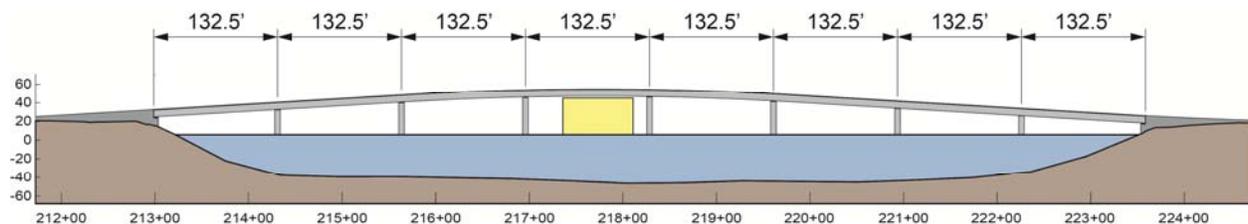
Figure 1 – Proposed Profile of the Beals Island Bridge Replacement

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'.

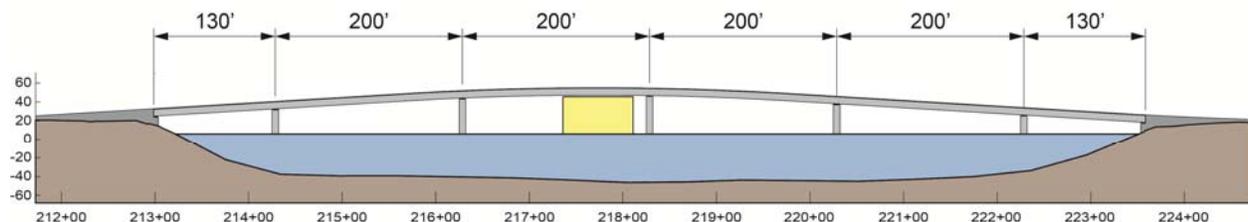
Navigational Channel – Pier locations for the replacement bridge have been developed such that the 75' navigational channel remains in its current location.

3. Bridge Layout Alternatives

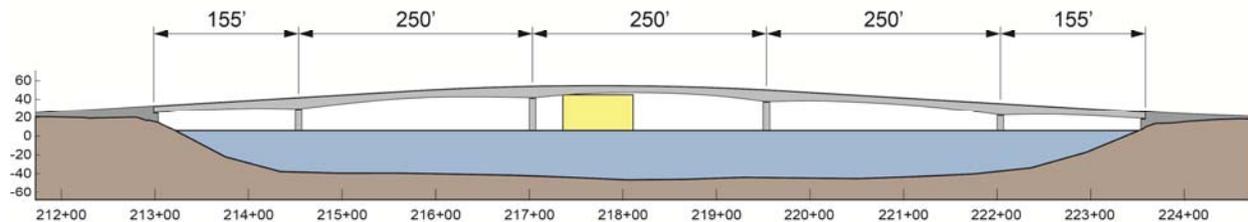
Three different span arrangements are considered for an overall bridge length of 1060'. The three alternatives are shown in Figure 2. The approach taken in evaluating the feasibility of these alternatives is to first study the 132'-6" span layout (Alternate 1) and compare it to a similar bridge but where 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.



Alternate 1 - Span-By-Span Construction



Alternate 2 - Balanced Cantilever Construction



Alternate 3 - Balanced Cantilever Construction

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).

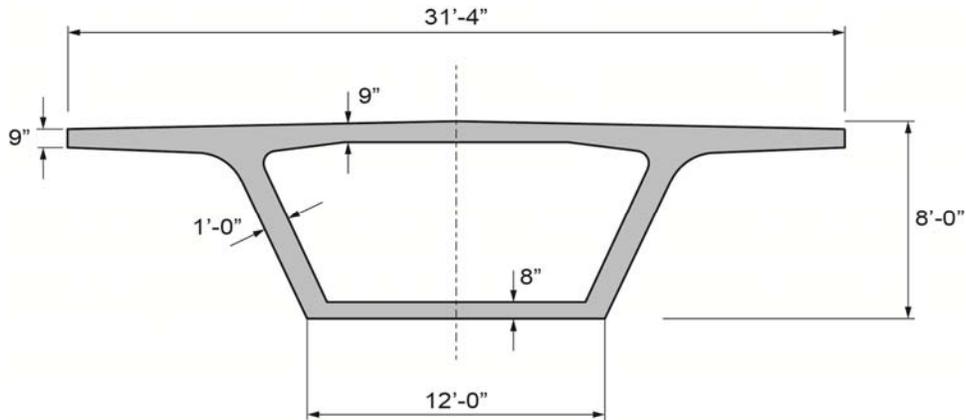


Figure 3 – Cross Section for the 132'-6" Span Bridge shown in Alternate 1

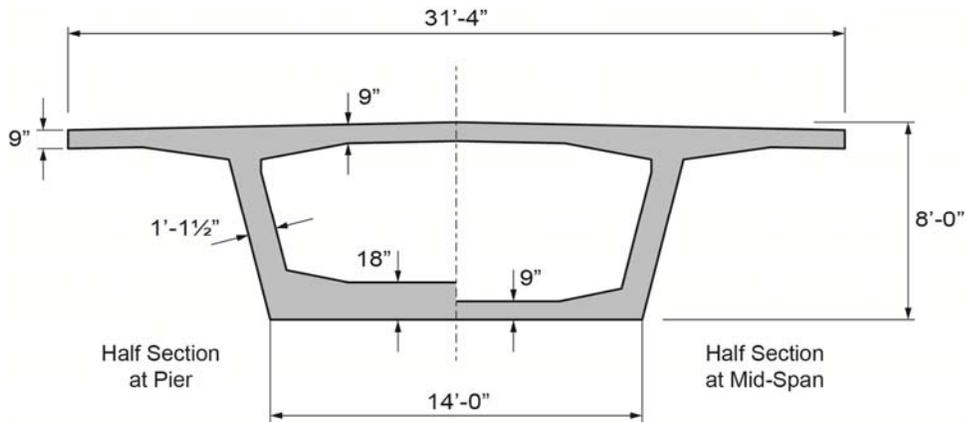


Figure 4 – Cross Section for the 200' Span Bridge shown in Alternate 2

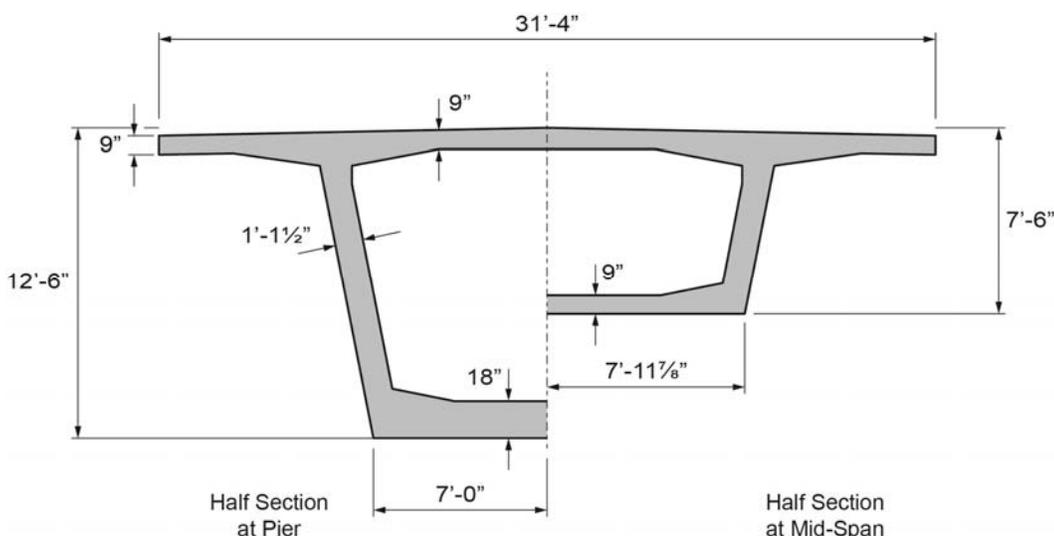


Figure 5 – Cross Section for the 250' Span Bridge shown in Alternate 3

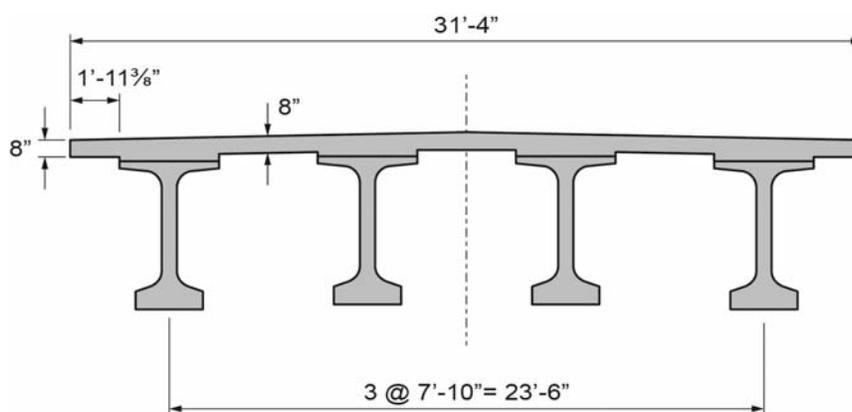


Figure 6 – Cross Section for the 132'-6" Span Bridge using NEBT 1800 - Baseline

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.

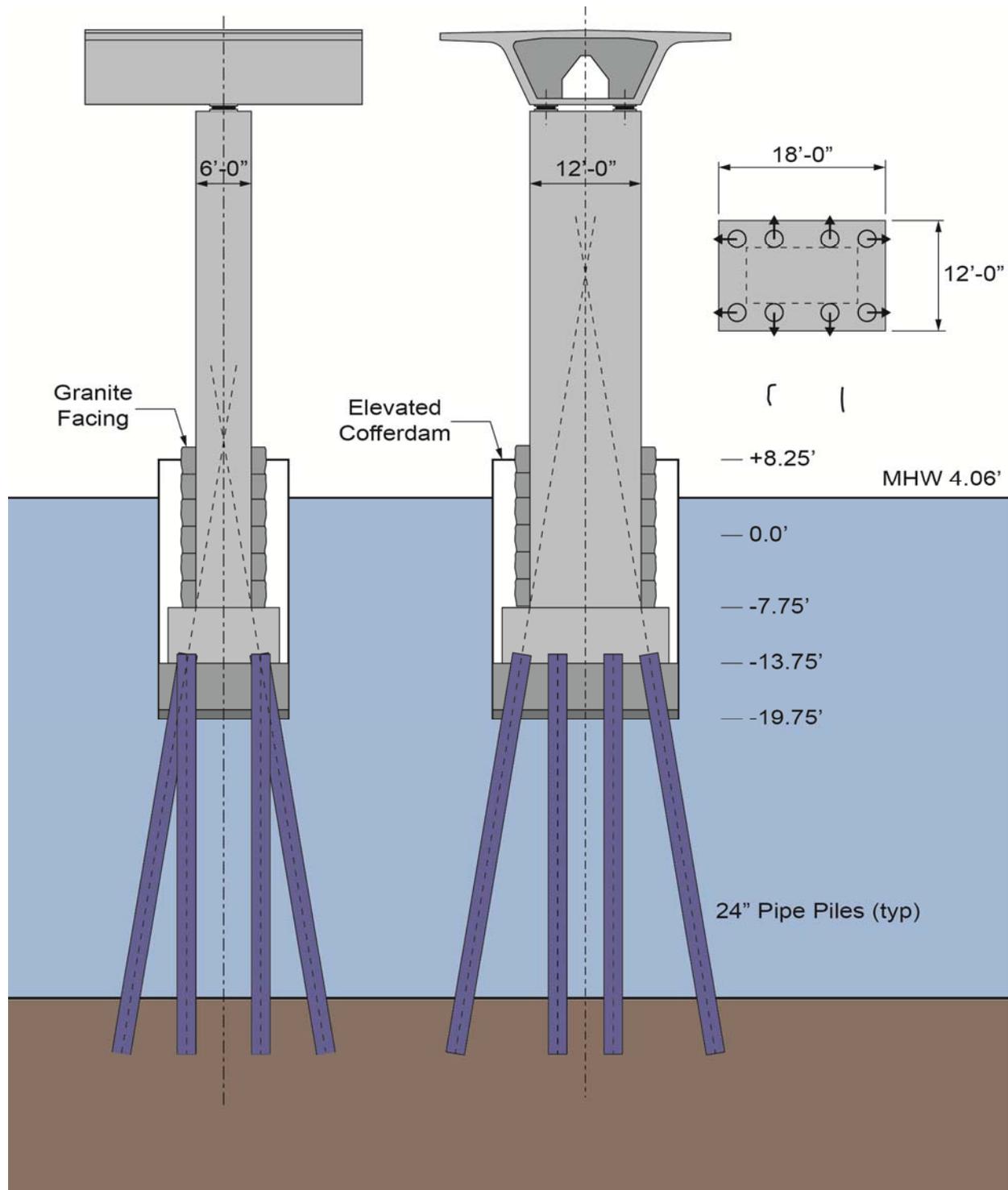


Figure 7 – Substructure for the Span-by-Span Segmental Alternate

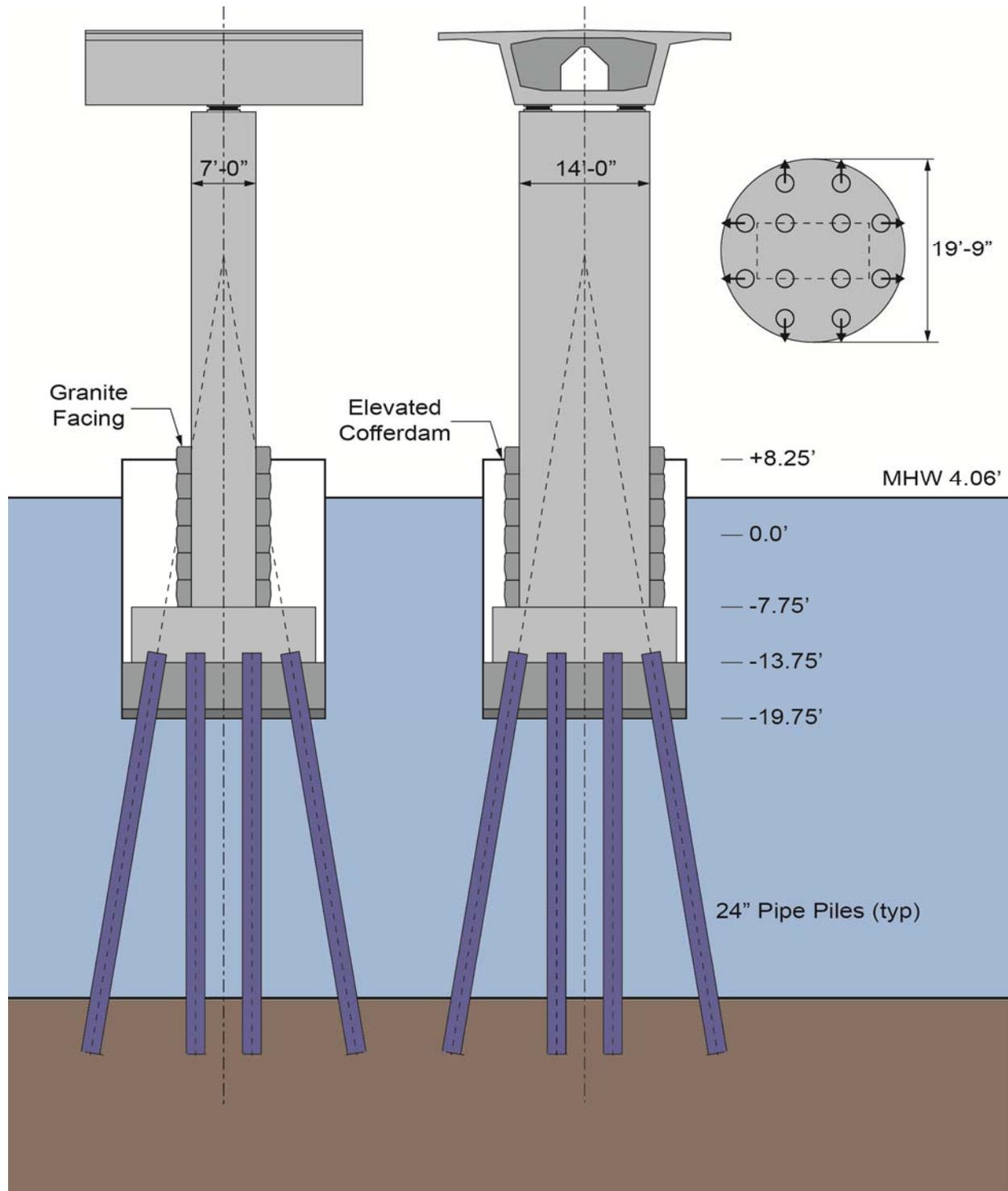


Figure 8 – Substructure for the 200' Balanced Cantilever Segmental Alternate

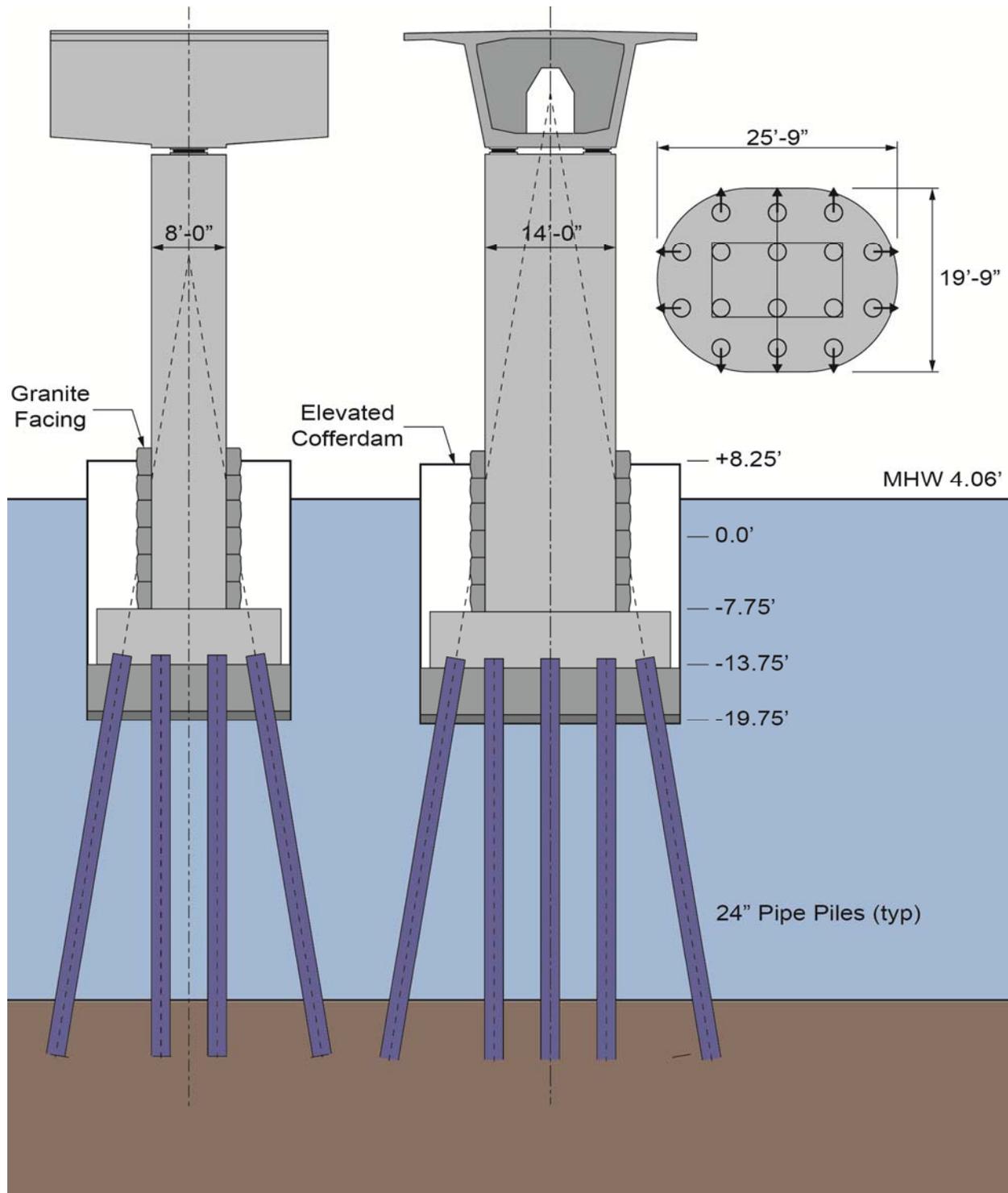


Figure 9 – Substructure for the 250' Balanced Cantilever Segmental Alternate

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.

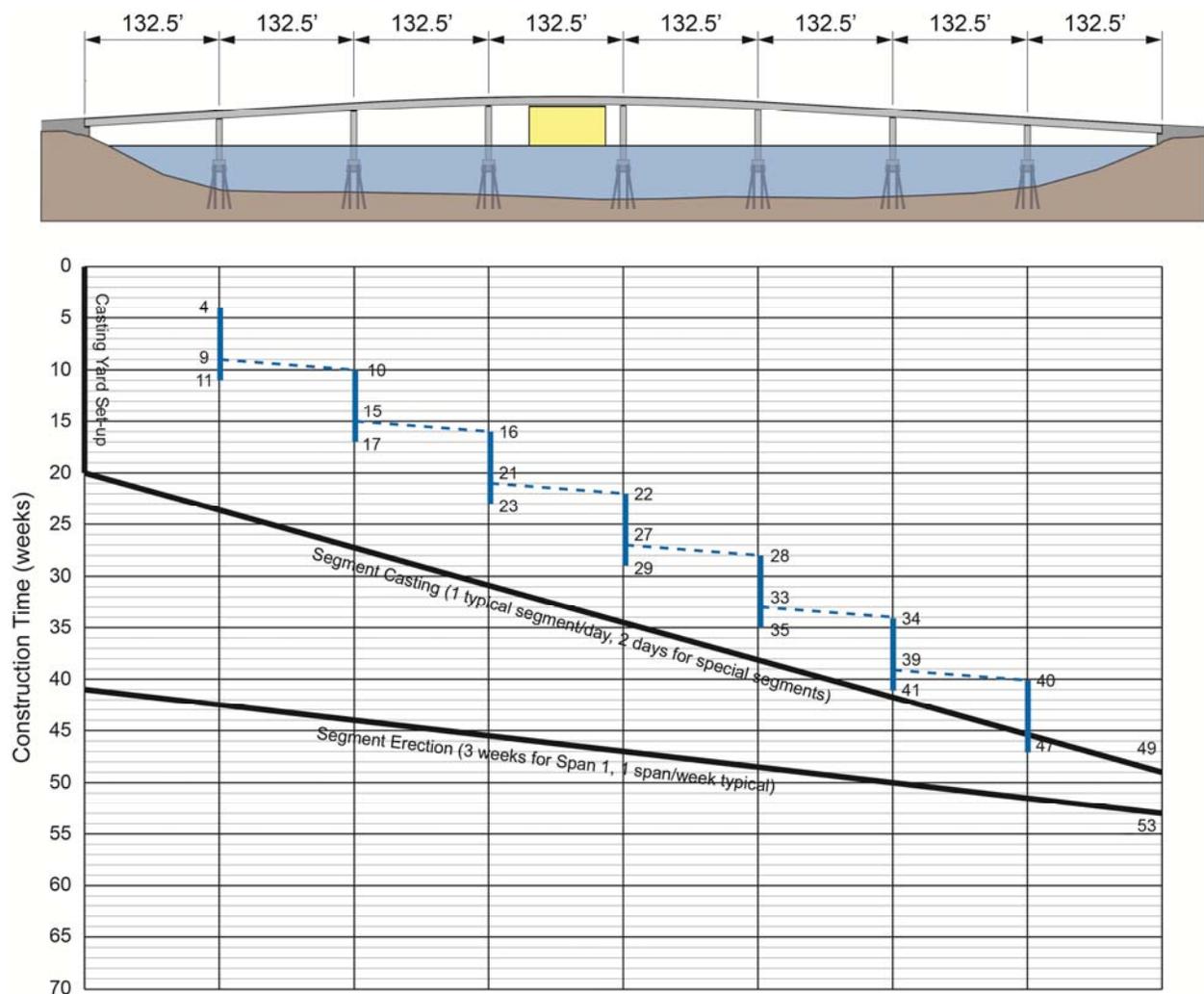


Figure 10 – Construction Timeline for the Span-by-Span Segmental Alternate

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.

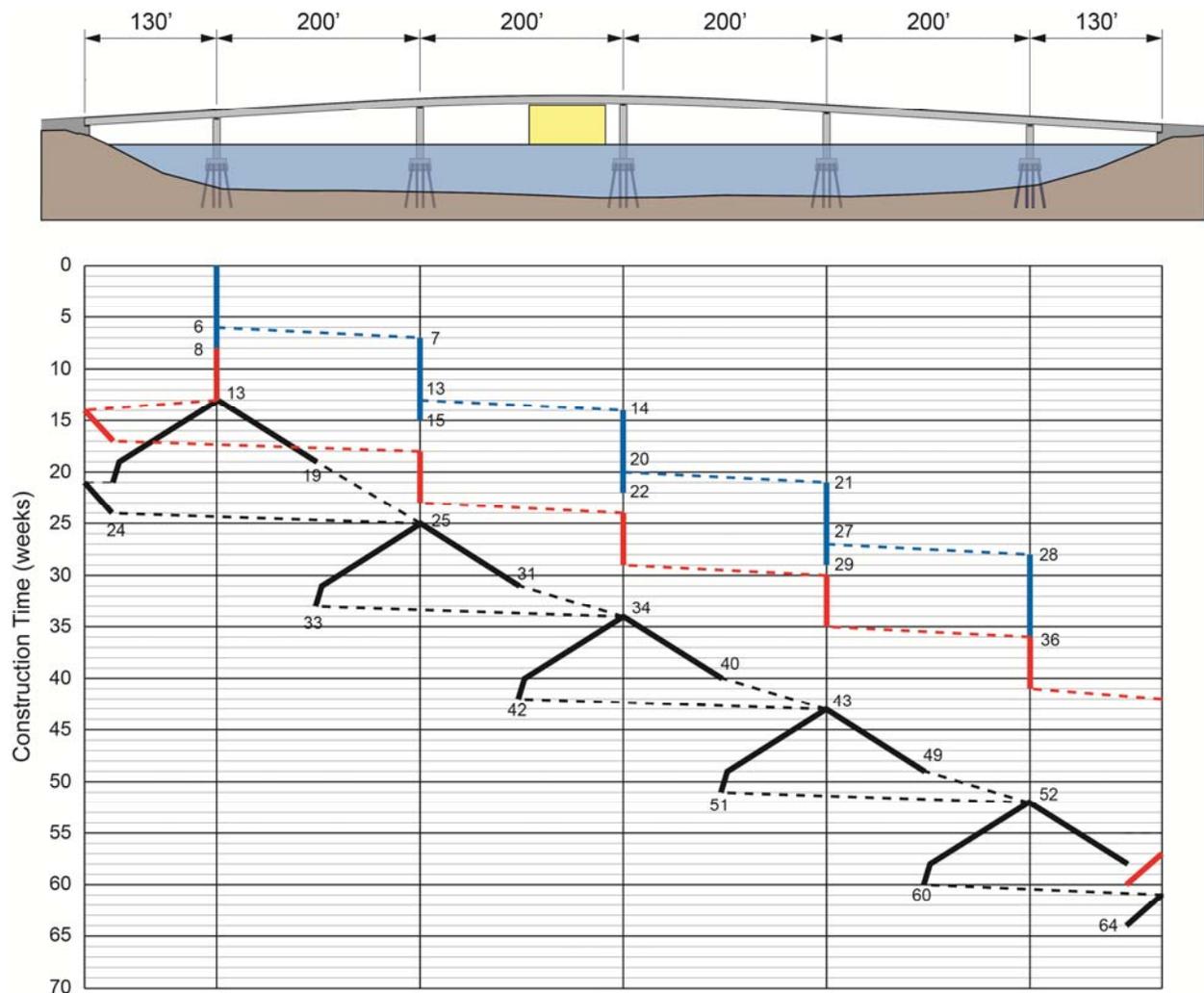


Figure 11 – Construction Timeline for the 200' Balanced Cantilever Segmental Alternate

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.

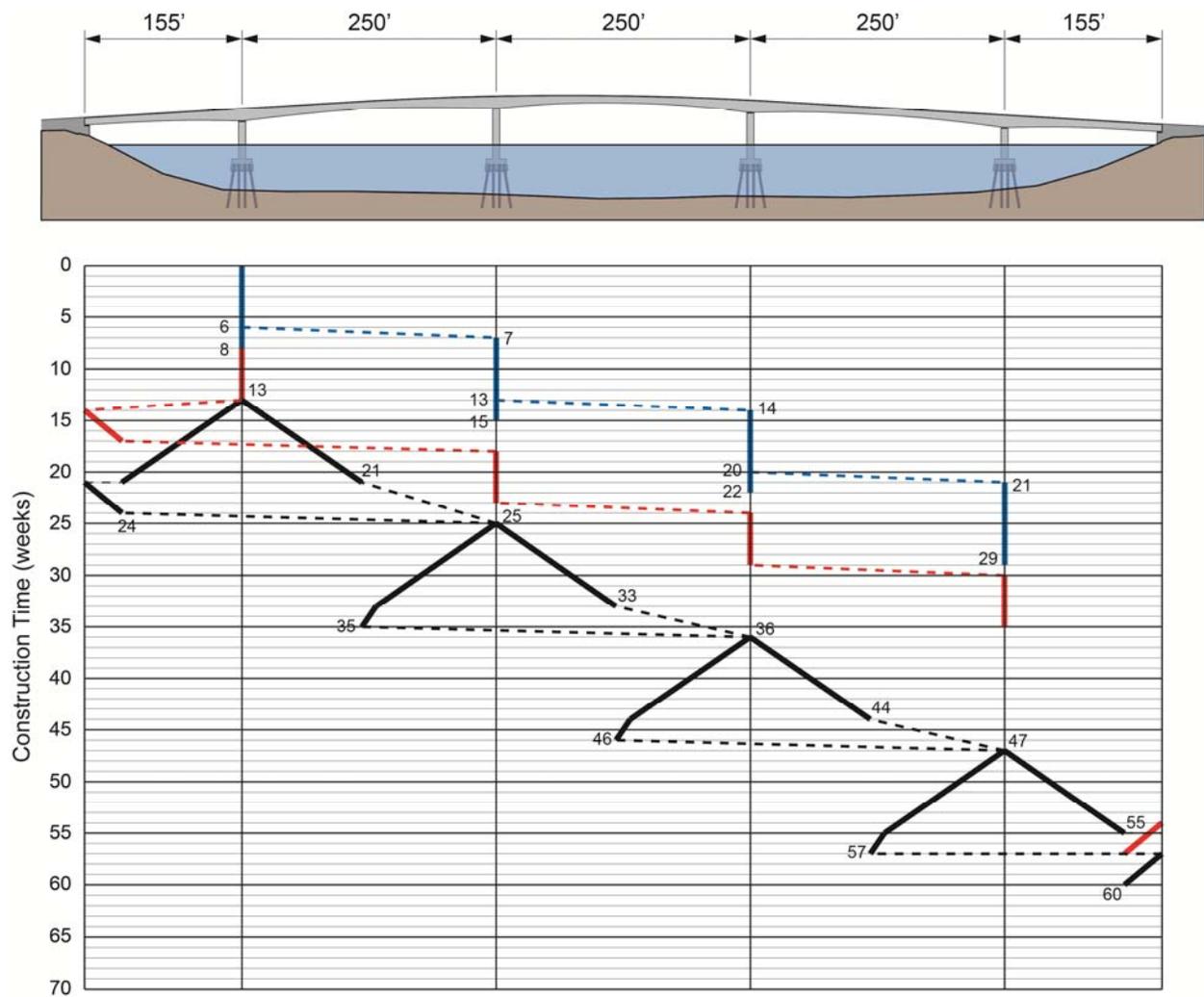


Figure 12 – Construction Timeline for the 250' Balanced Cantilever Segmental Alternate

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	1	\$200,000
EJ Segment Forms	=	\$100,000	1	1	\$100,000
Casting Yard Setup	=	\$15,000	1	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
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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	-----
COUNTY LINE	-----
TOWN LINE	-----
UNFENCED PROPERTY	-----
FENCE	-----
RIGHT OF WAY LINE	-----
TRAVELED WAY	-----
RAILROAD	-----
RETAINING WALL	-----
SURVEY LINE	-----
CULVERT	-----
DROP INLET	-----
TROLLEY POLE	-----
POWER POLE	-----
TEL. POLE	-----
MARSH	-----
TREES	-----
STONE WALL	-----

TOTAL LENGTH - 0.47 MILES
 PLAN 1 IN. = 100 FT. - 1 IN. = 20 FT.
 SCALES PROFILE { HOR. 1 IN. = 100 FT.
 VER. 1 IN. = 100 FT.
 CROSS SECTIONS 1 IN. = 10 FT.



KEY MAP
SCALE IN FEET

INDEX TO DRAWINGS

SHEET NO.	TITLE
1.	TITLE SHEET AND INDEX TO DRAWINGS
2.	GENERAL PLAN AND ELEVATION
3.	NORTH APPROACH - PLAN AND ELEVATION - PART I
4.	NORTH APPROACH - PLAN AND ELEVATION - PART II
5.	SOUTH APPROACH - PLAN AND ELEVATION
6.	NORTH ABUTMENT - SOUTH ABUTMENT
7.	PIER DETAILS - PART I
8.	PIER DETAILS - PART II
9.	FRAMING PLAN AND DETAILS
10.	CROSS SECTION AND DETAILS
11.	STRUCTURAL DETAILS
12.	FENDER SYSTEM
13.	TOLL HOUSE
14.	CROSS SECTIONS - STA. 0+50 TO 6+00
15.	CROSS SECTIONS - STA. 6+50 TO 9+00
16.	CROSS SECTIONS - STA. 9+50 TO 10+50
17.	CROSS SECTIONS - STA. 11+00 TO 12+00
18.	CROSS SECTIONS - STA. 12+50 TO 12+92, LONGITUDINAL SECTION - NORTH ABUTMENT
19.	CROSS SECTION - STA. 22+50, LONGITUDINAL SECTION - SOUTH ABUTMENT
20.	CROSS SECTIONS - STA. 23+00 TO 24+50
21.	CROSS SECTIONS - STA. 25+00 TO 27+50
21A.	BORING DATA

As Built Sept. 1958

APPROVED:
MAINE STATE HIGHWAY COMMISSION

David H. Lewis
CHAIRMAN
Charles S. Cook
Edward G. Conroy
Christopher J. Giff
CHIEF ENGINEER

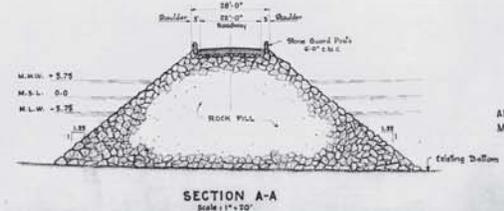
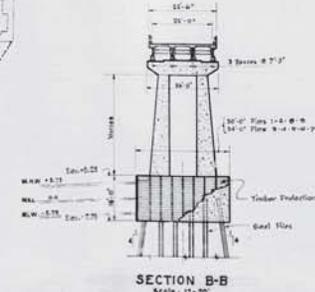
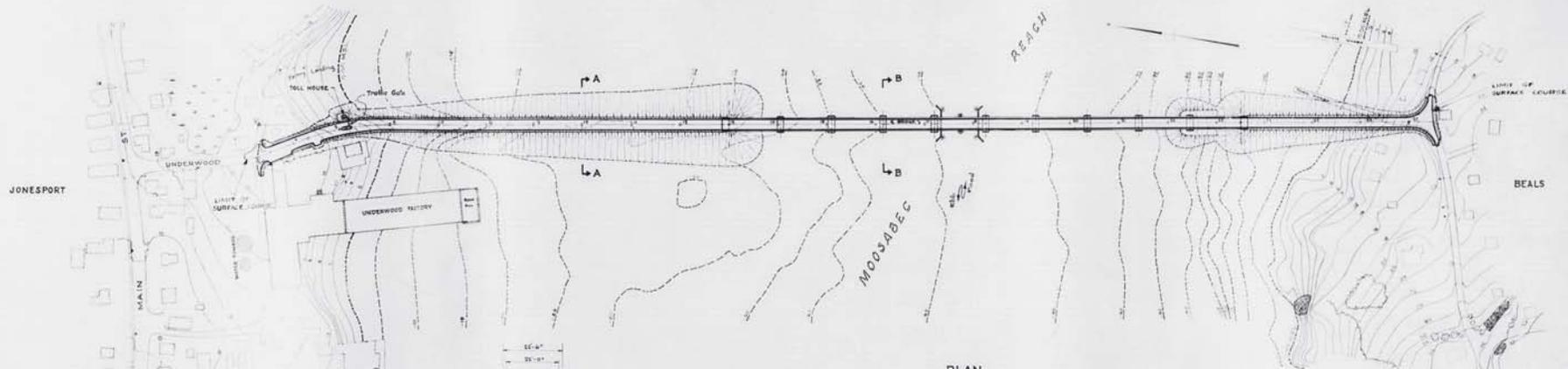
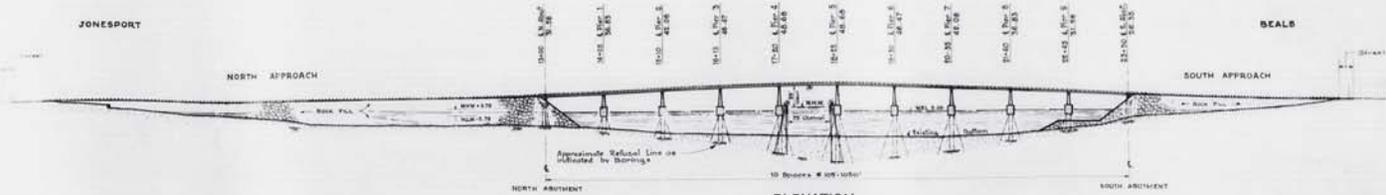
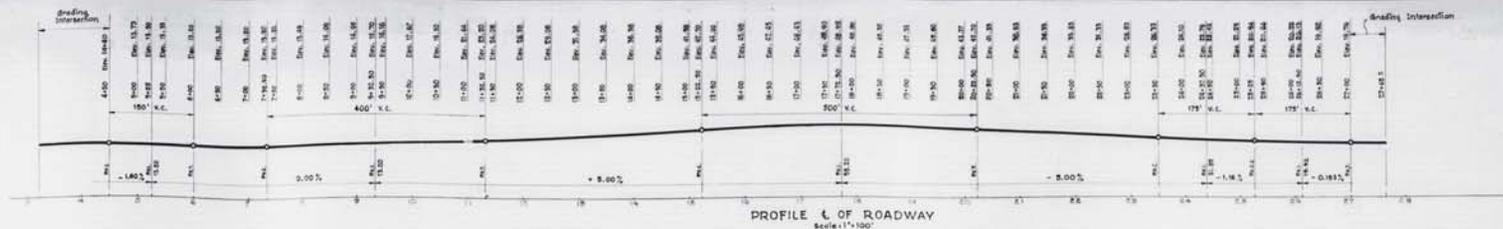
STATE HIGHWAY COMMISSION AUGUSTA, MAINE		
JONESPORT - BEALS BRIDGE		
TITLE SHEET AND INDEX TO DRAWINGS		
SHEET 1 OF 21	SCALES: AS NOTED	MAY 1956

FAY, SPOFFORD & THORNDIKE
CONSULTING ENGINEERS

SL-38



NO. 1-57
IN. 1-51
IN. 1-51
IN. 1-51
IN. 1-51



NOTE:
All Elevations are referred to
Mean Sea Level = 0.00

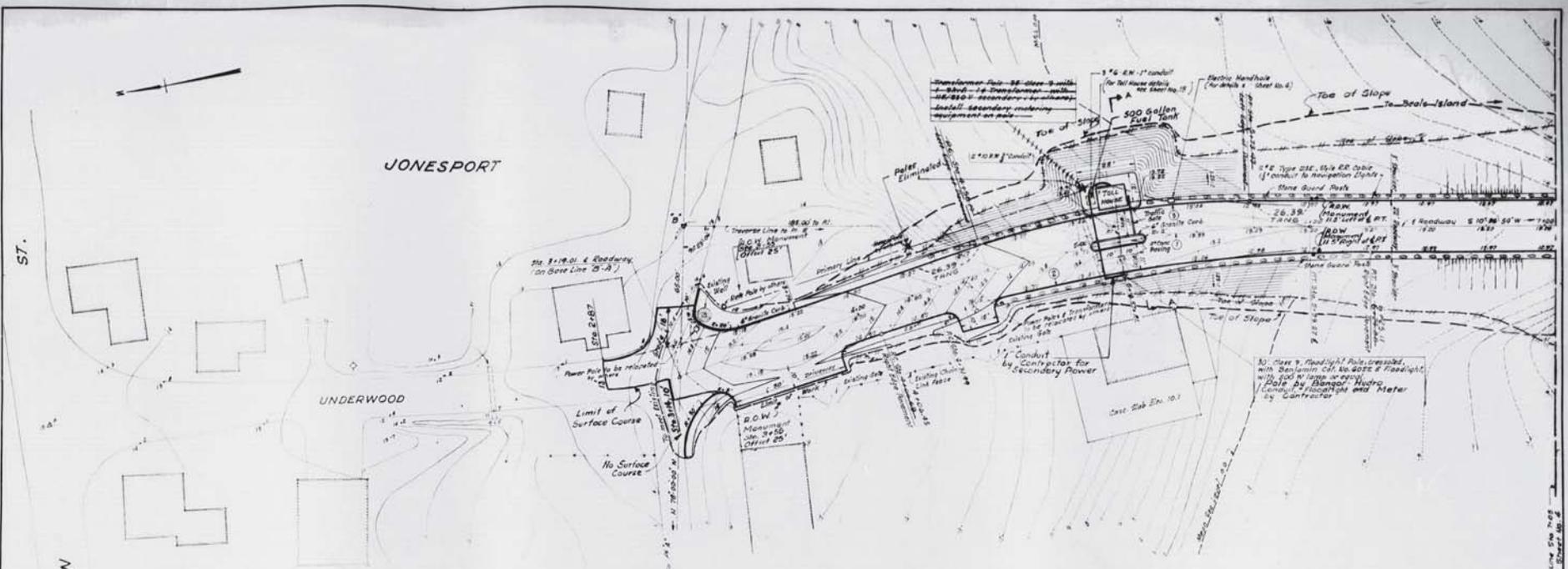
As Built Sept 1956

STATE HIGHWAY COMMISSION AUGUSTA, MAINE
JONESPORT-BEALS BRIDGE
GENERAL PLAN AND ELEVATION

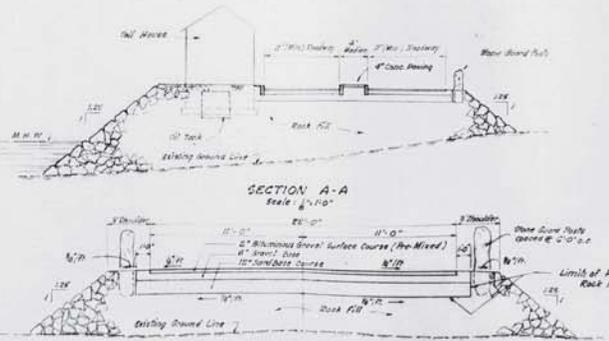
SHEET NO. 2 OF 21 | SCALES AS NOTED | MAY 1956
FAY, SPOFFORD & THORNDIKE
CONSULTING ENGINEERS

DES.	L.W.S.
IN.	W.S.S.
CH.	J.S.M.
APP.	P.S.

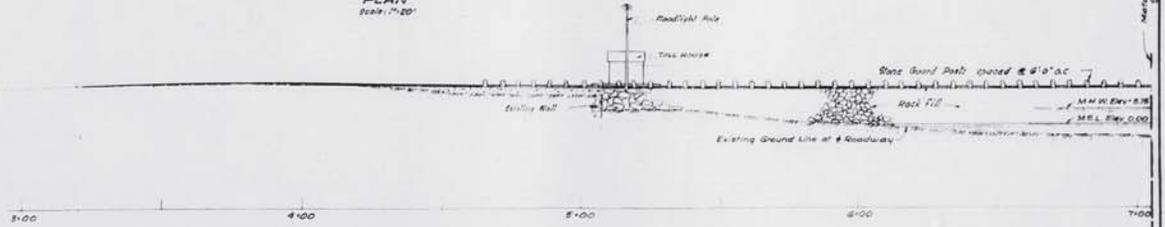




PLAN
Scale 1"=20'



TYPICAL CROSS SECTION ON EMBANKMENT
Scale 1/2"=1'-0"



① Roadway	② Right Edge Pavement	③ Left Edge Pavement
$\Delta = 19^{\circ}12'11.2''$	$\Delta = 19^{\circ}12'11.2''$	$\Delta = 19^{\circ}12'11.2''$
$R = 500.00'$	$R = 440.00'$	$R = 355.00'$
$T = 66.50'$	$T = 108.27'$	$T = 60.05'$
$L = 167.55'$	$L = 214.50'$	$L = 118.98'$

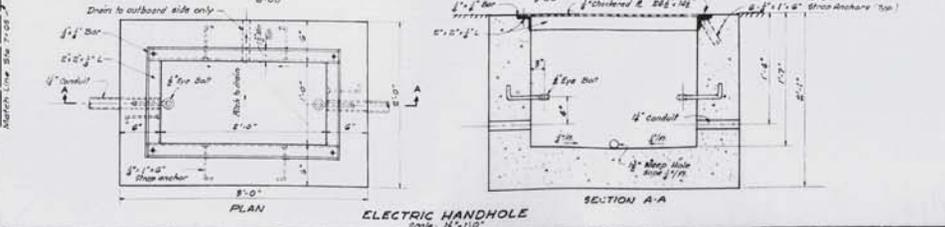
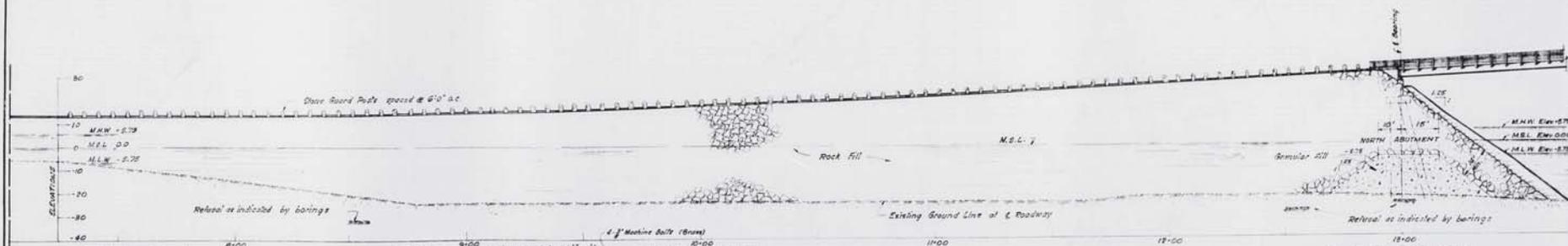
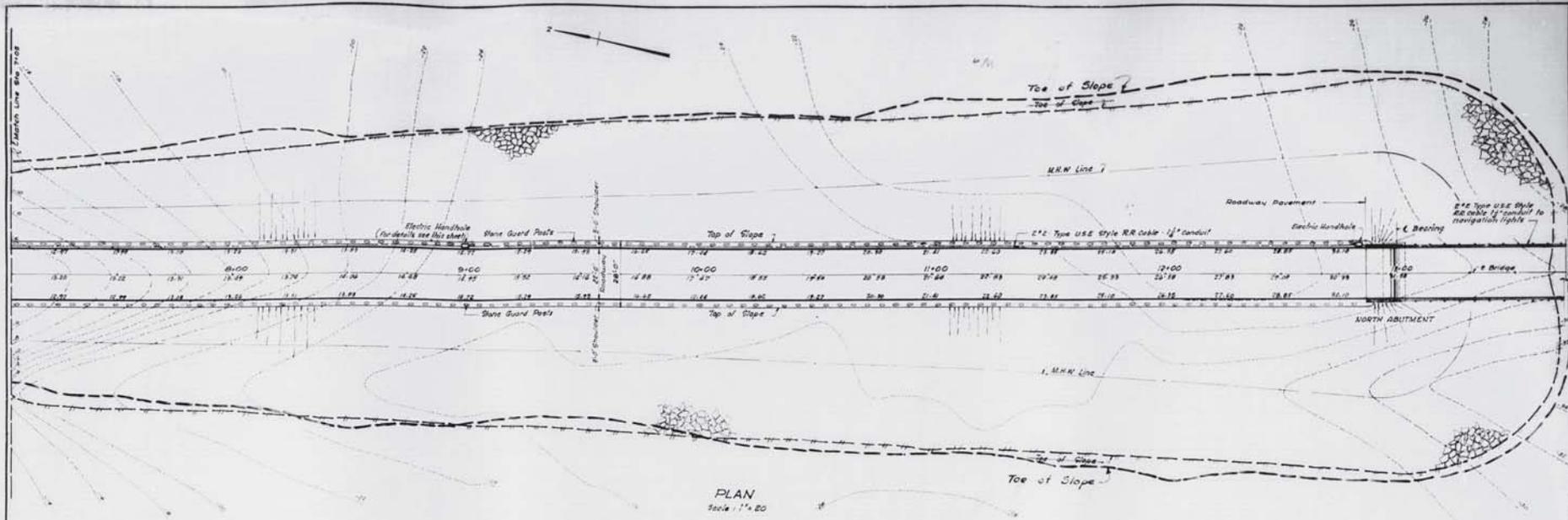
ELEVATION
Scale 1"=20'

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 1958

FAY, SPOFFORD & THORNDIKE
CONSULTING ENGINEERS





At Built Sept. 1933

STATE HIGHWAY COMMISSION
AUGUSTA, MAINE

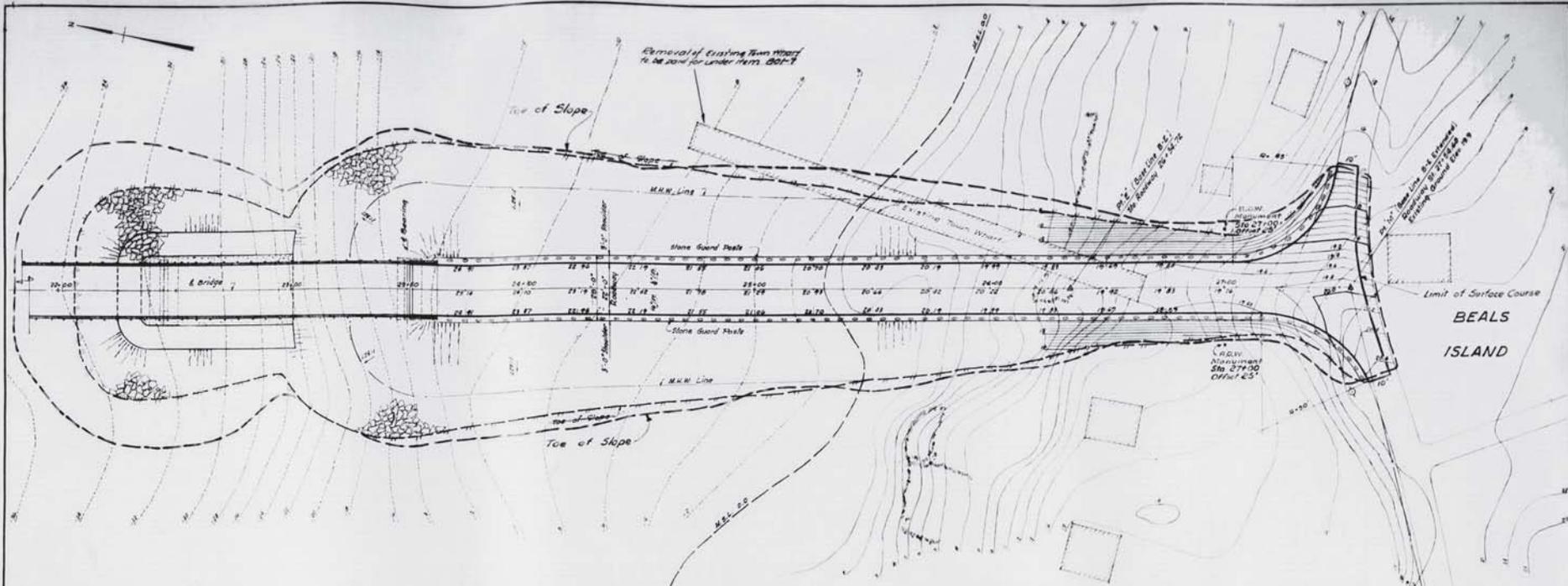
JONESPORT - BEALS BRIDGE

NORTH APPROACH
PLAN AND ELEVATION - PART II

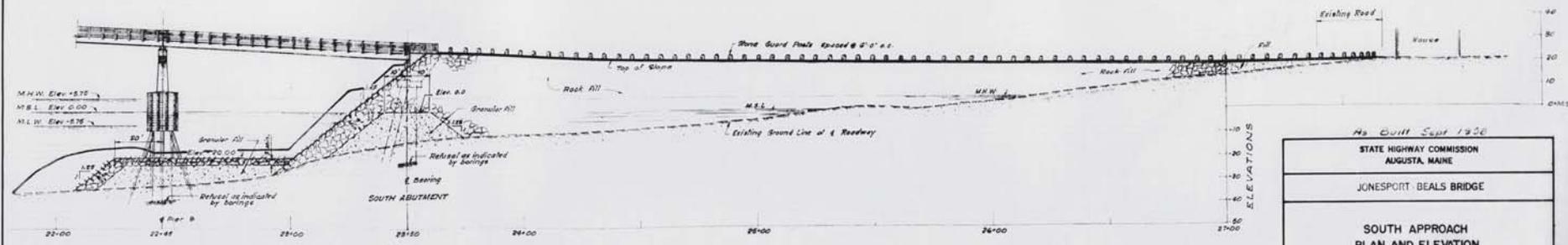
SHEET NO. 4 OF 21 SCALES AS NOTED MAY 1950

FAY, SPORFORD & THORNDIKE
CONSULTING ENGINEERS





PLAN
Scale: 1"=20'



ELEVATION
Scale: 1"=20'

As Built Sept 1938

STATE HIGHWAY COMMISSION AUGUSTA, MAINE
JONESPORT - BEALS BRIDGE
SOUTH APPROACH PLAN AND ELEVATION

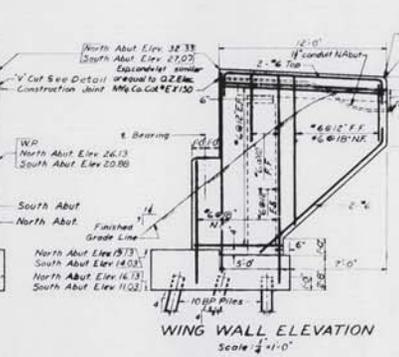
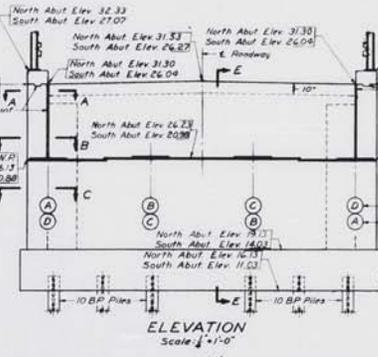
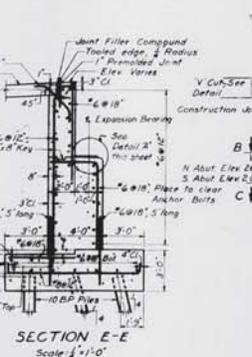
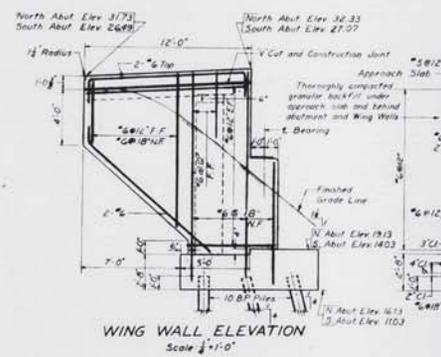
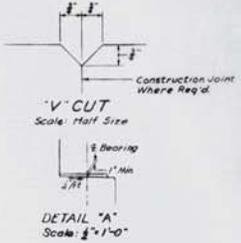
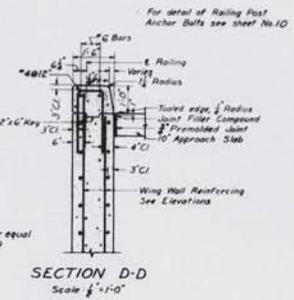
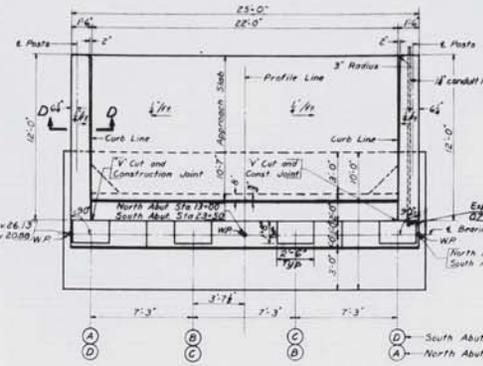
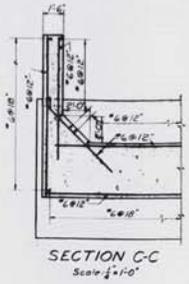
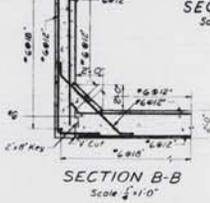
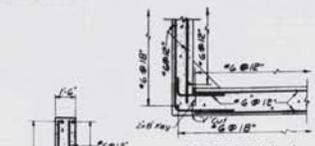
SHEET NO. 5 OF 21 SCALES AS NOTED MAY 1950

FRY, BRIDFORD & THORNDIKE
CONSULTING ENGINEERS

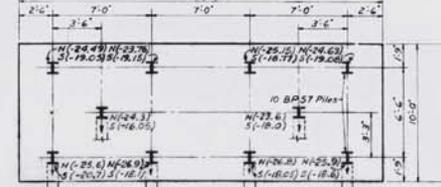
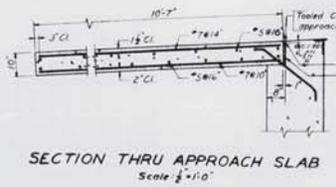
VI-38
5

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20





NOTES FOR PIERS AND ABUTMENTS
 All exposed edges of concrete to have 3/4" chamfer, except as shown otherwise.
 Thickness of concrete cover to reinforcement 4" to 5" except as noted.
 All reinforcement to be lap spliced 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 plates to be cast monolithically with cap or abutment and to be of sufficient depth to permit bush hammering or grinding to proper elevations.
 W.C.S. indicates elev. top of pile at South abutment.
 C.S.B. indicates elev. top of pile at North abutment.



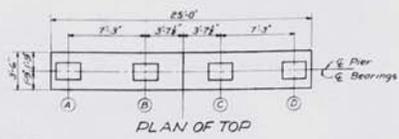
GENERAL BRIDGE NOTES
 1. Design is in accordance with the following specifications:
 AASHTO Manual of Highway Engineering
 Standard Specifications for Highways and Bridges - Division of 1966
 AASHTO 1966
 2. Live Loading - HS
 3. Concrete shall be as follows:
 Concrete poured under water - Class 3
 Pile Bases poured on dry - Class A
 Concrete Pier Bents and Abutments - Class A
 Concrete Bridge Deck - Class A
 4. All reinforcement shall conform to ASTM specification A-617 and deformation to A-371. Splice to be as follows:
 Reinforcing steel shall be interlocked grade new twist steel
 All stringer & wing wall cover plates shall conform to ASTM Spec. A-374. All other steel shall conform to ASTM Spec. A-37 or A-375
 5. Allowable stresses:
 Reinforcing steel - 20,000 p.s.i.
 Structural steel - 18,000 p.s.i.
 Piles (bearing on rock) - Class A-1

As Built Sept 1958

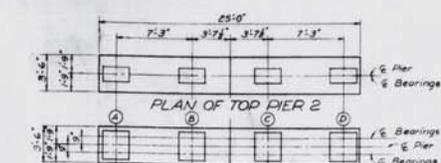
STATE HIGHWAY COMMISSION AUGUSTA, MAINE
JONESPORT - BEALS BRIDGE
NORTH ABUTMENT - SOUTH ABUTMENT

SHEET NO. 6 OF 21
 SCALES AS NOTED
 MAY 1965
 RAY FRANKLIN & THORNTON
 CIVIL ENGINEERS
 68-106

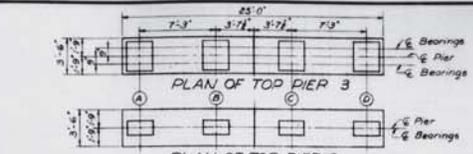




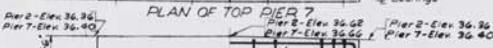
PLAN OF TOP



PLAN OF TOP PIER 2



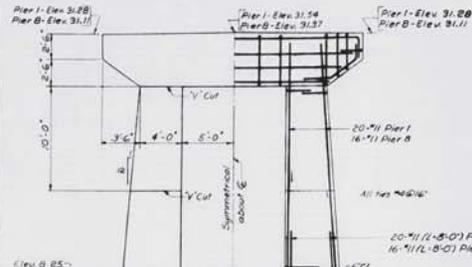
PLAN OF TOP PIER 3



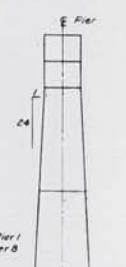
PLAN OF TOP PIER 7



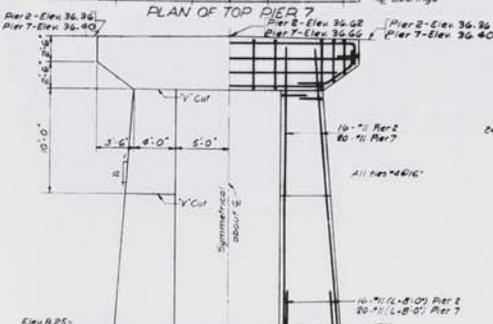
PLAN OF TOP PIER 6



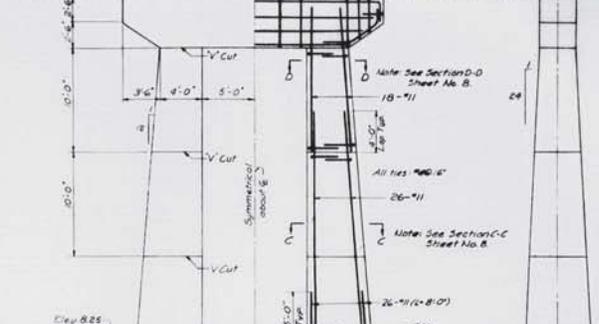
ELEVATION



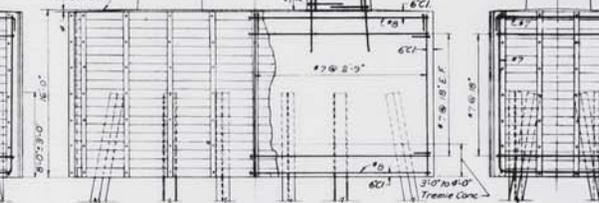
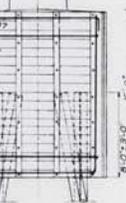
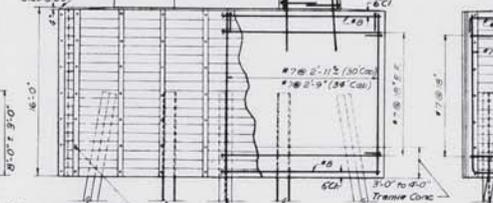
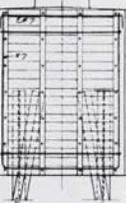
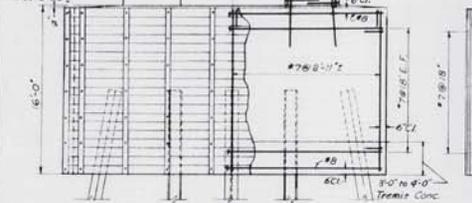
END ELEVATION



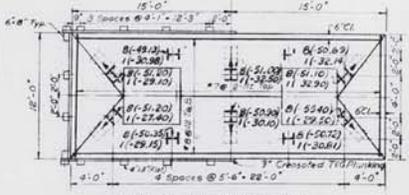
ELEVATION



ELEVATION

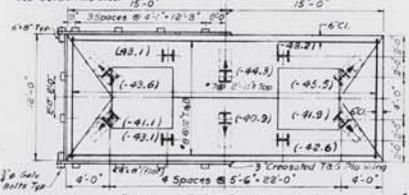


END ELEVATION



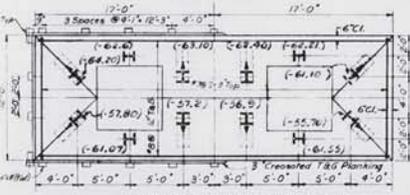
PLAN OF PILE CAP DETAILS OF PIERS 1 & 8

Note: Location of Piles are shown at Elev. + C. 25'



PLAN OF PILE CAP PIER 2

Note: Provide horizontal tie bars 7' in short direction spaced 3'-0" horizontally and vertically (Typ)

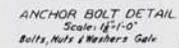


PLAN OF PILE CAP PIER 3

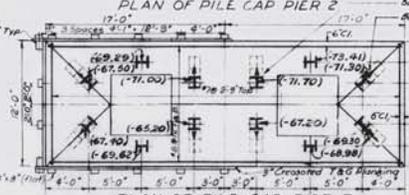
Notes:
1. For General Notes See Sheet #6
2. For arrangement of vertical column reinforcement See Sheet #8
3. For notes covering piles See Sheet #8
4. For elevations of stringer bearings see Sheet #6, 9
5. (316) indicates elev. of top of pile.



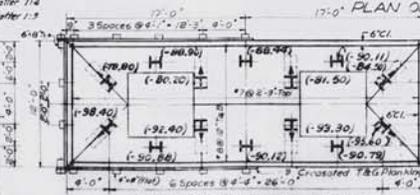
BEARING PAD DETAILS



ANCHOR BOLT DETAIL



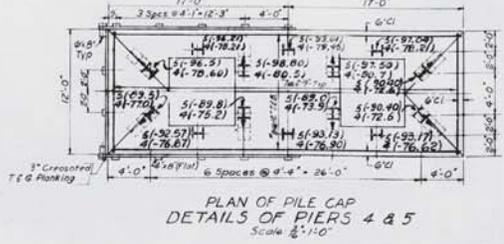
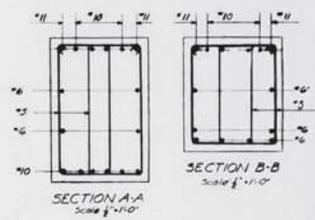
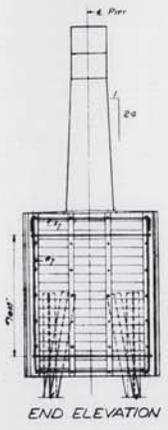
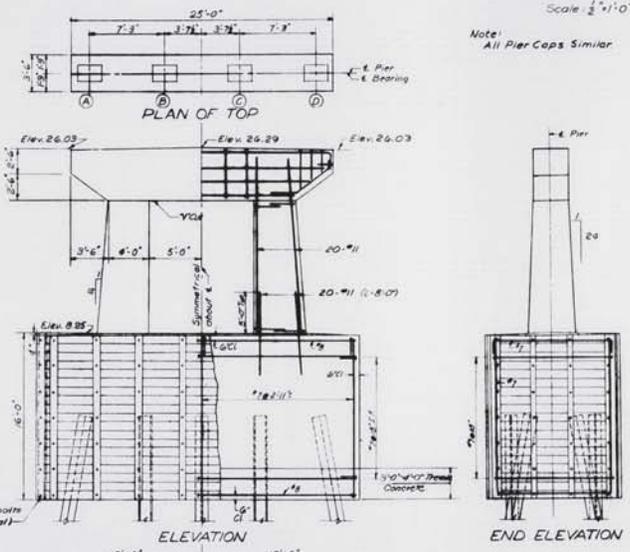
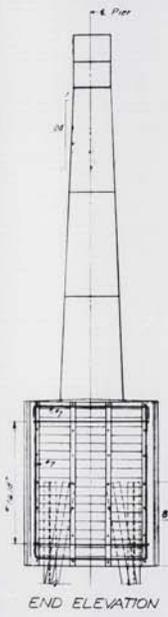
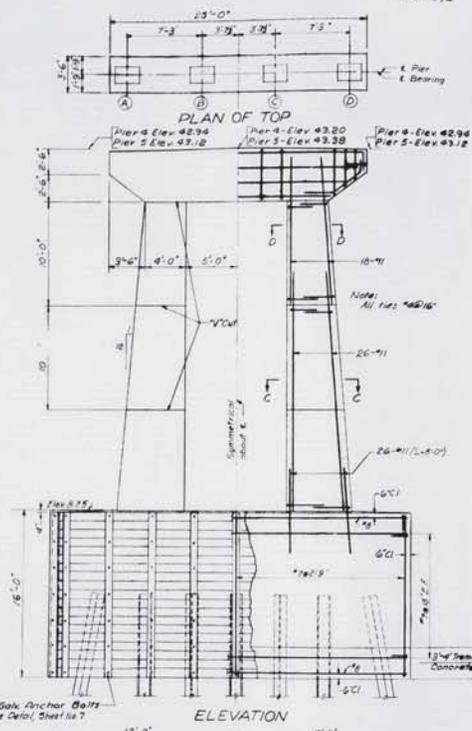
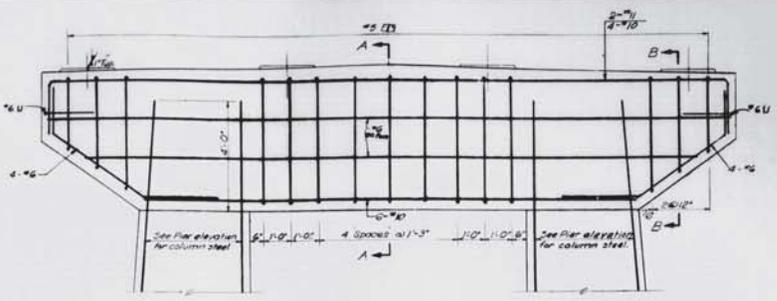
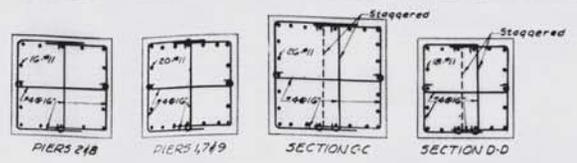
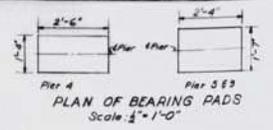
PLAN OF PILE CAP PIER 7



PLAN OF PILE CAP PIER 6

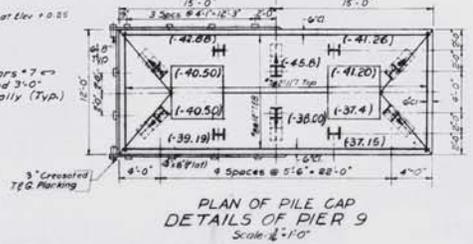
As Built Sept. 1958

STATE HIGHWAY COMMISSION AUGUSTA, MAINE
JONESPORT BEALS BRIDGE
PIER DETAILS-PART I
SHEET NO. 7 OF 21
SCALE AS NOTED
MAY 1961



Note: Location of Piles are shown at Elev. +0.00

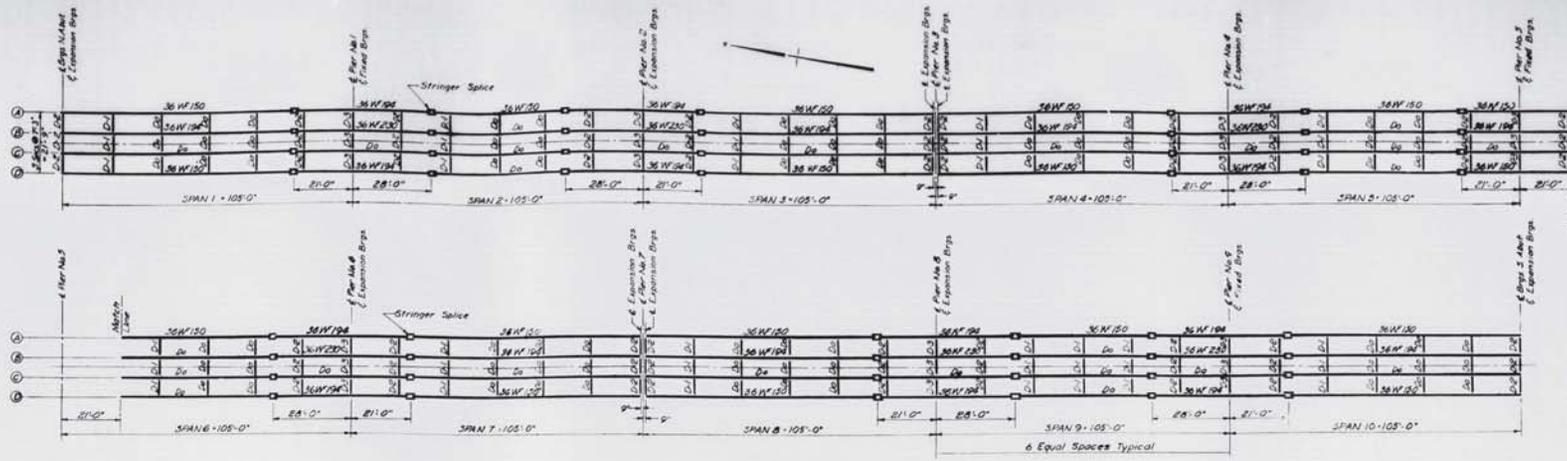
Note: Provide horizontal tie bars #7 @ 3'-0" in short direction spread 3'-0" horizontally and vertically. (Typ.)



- Notes:
1. For General Notes see sheet No. 6.
 2. All piles for piers to be 14 BPIQ2.
 3. 1-4 indicates vertical pile.
 4. 1-4e 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. 1-4.24 indicates elevation @ tip of pile.
 - As Built Sept 1958

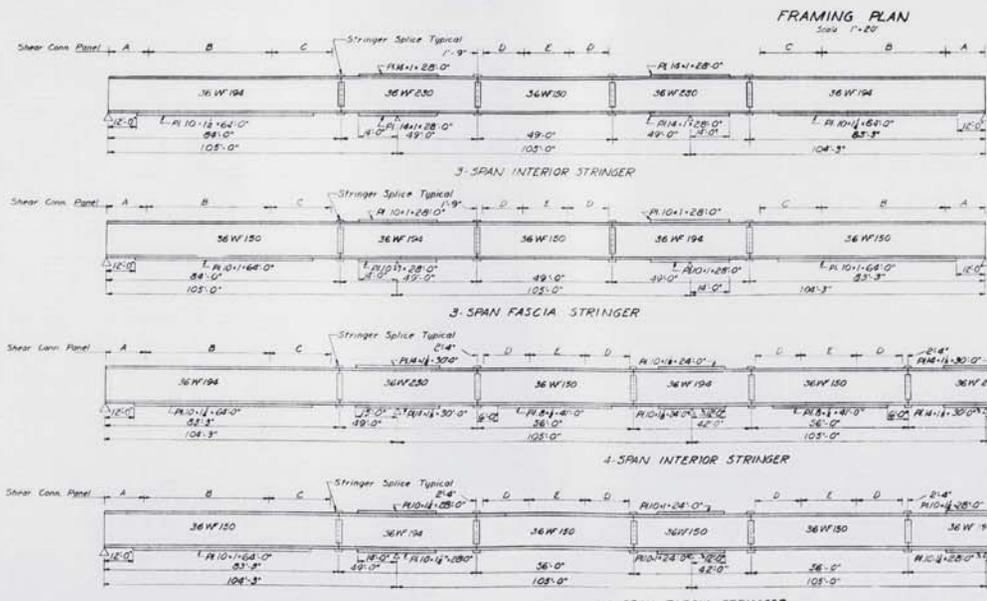
STATE HIGHWAY COMMISSION AUGUSTA, MAINE	
JULIUS-PORT-BEALS BRIDGE	
PIER DETAILS-PART II	
SHEET NO. 8 OF 21	SCALE AS NOTED
FAY SPENCER & THORNDIKE CONS. ENGRS.	1958





Bearings	ADD	B&C
North Abut	26.17	26.27
Pier 1	31.46	31.66
Pier 2	36.28	36.79
Span 3	41.08	41.14
Pier 3	41.08	41.14
Pier 4	43.72	43.33
Pier 5	43.36	43.45
Pier 6	40.91	41.72
Pier 7	36.69	36.70
Span 7	36.69	36.70
Pier 8	31.29	31.89
Pier 9	26.21	26.41
South Abut	20.98	21.08

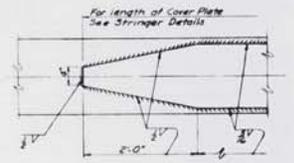
ELEVATIONS OF BEARINGS (BOTTOM OF MASONRY PLATES)



STRINGER	SPIRAL SHEAR CONNECTORS				
	PANEL A	PANEL B	PANEL C	PANEL D	PANEL E
3 SPAN FASCIA INTERIOR	7' 11.0"	14' 44.4"	7' 22.0"	14' 7"	14' 16.4"
4 SPAN FASCIA INTERIOR	7' 11.0"	14' 44.4"	7' 22.0"	7' 16.4"	14' 16.4"

All spirals to have a diameter of $\frac{3}{8}$ " and to be #6 bars. Spirals to be welded to beams with 2- $\frac{1}{2}$ " welds $\frac{1}{2}$ " 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 spiral pitch. Auto-weldable mild steel spiral connectors may be used as an alternate for spaced details for steel to be submitted for the engineer for his approval.

Stringer	Dead Load Deflections			
	Δ_1	Δ_2	Δ_3	Δ_4
3 Span Interior	0.4	1.8	1.8	0
3 Span Fascia	0.8	1.8	1.8	—
4 Span Interior	3	1.8	1.8	1
4 Span Fascia	0.4	1.8	1.8	1



COVER PLATE WELDING DETAIL

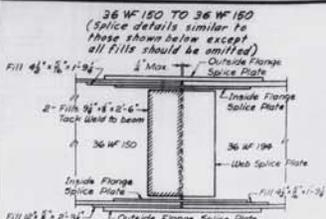


DEFLECTION DIAGRAM

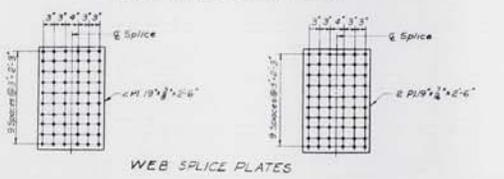
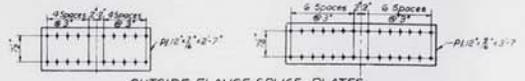
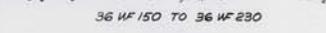
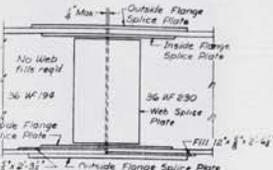
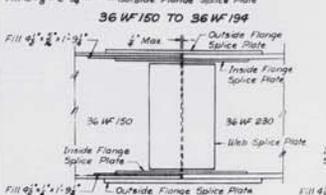
Notes:
 For General Notes See Sheet No. 6.
 All dimensions shown on Framing Plan are horizontal.
 For details of stringer splices see Sheet No. 11.
 For bearing details see Sheet No. 10.
 Stringers shall be cambered for dead load deflection and vertical curve. Fabricator shall submit proposed camber diagram.
 As Built Sept 1953

STATE HIGHWAY COMMISSION AUGUSTA, MAINE
JONESPORT-BEALS BRIDGE
FRAMING PLAN AND DETAILS
SHEET NO 9 OF 21 SCALES AS NOTED MAY 1956

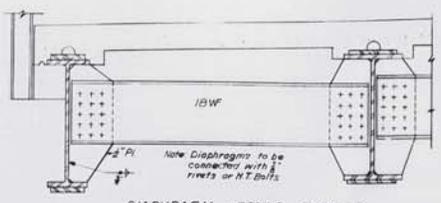
FAY, SPENCER & THORNDIKE CONSULTING ENGINEERS



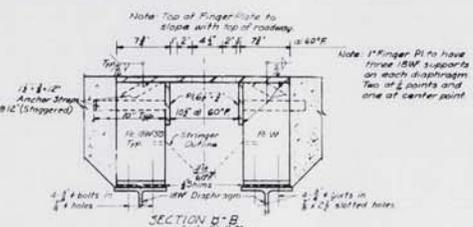
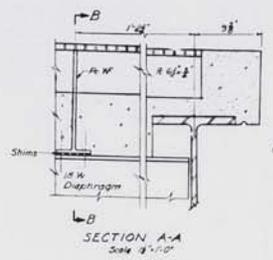
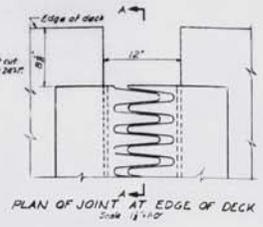
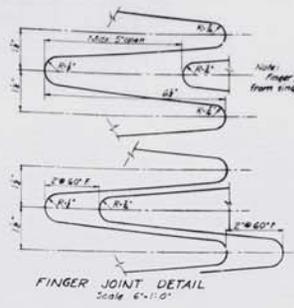
Flange fill plates 4 1/2 inch wide will have rivets on one gage line at 3 inch. Flange fill plates 12 inch wide will have rivets on two lines at 7 1/2 gage, 3 inch each line. Complete splices to be made with 3/4 inch rivets or N.T. Bolts.



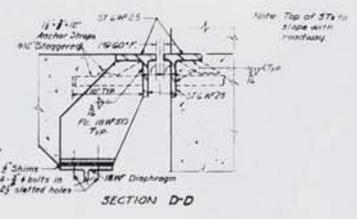
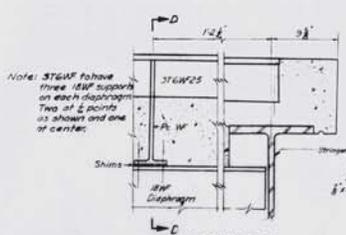
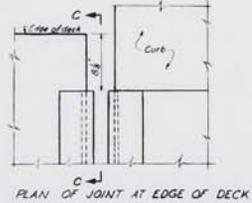
STRINGER SPICE DETAILS
Scale 1/2" = 1'-0"



Note Diaphragm D-3 shown, Diaphragm D-2 slopes parallel to roadway cross slope. See Sheet No. 10.



DETAILS OF EXPANSION JOINT AT PIER
Scales as noted

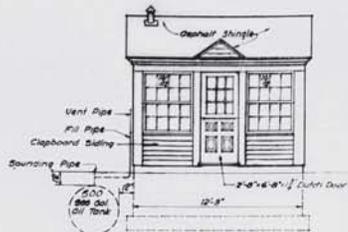


DETAILS OF EXPANSION JOINT AT ABUTMENT
Scale 1/2" = 1'-0"

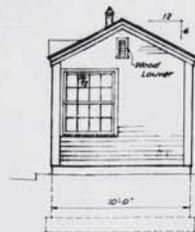
As Built Sept. 1958

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

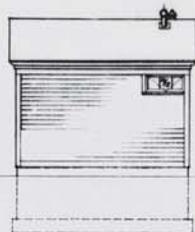




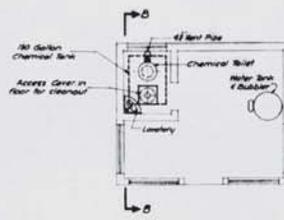
FRONT ELEVATION



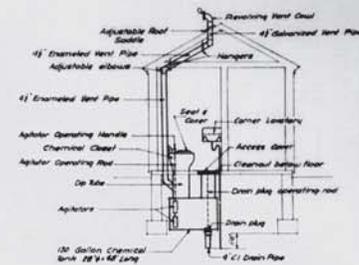
SIDE ELEVATION



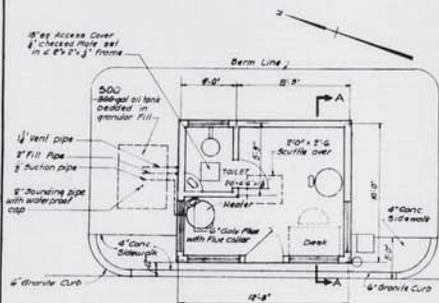
REAR ELEVATION



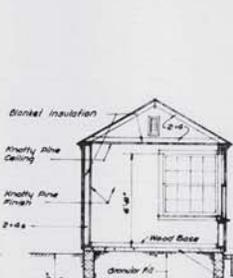
PLUMBING PLAN



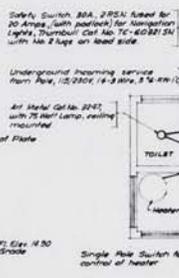
SECTION B-B



PLAN



SECTION A-A



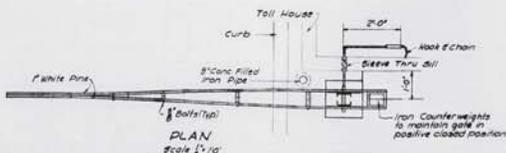
ELECTRICAL PLAN

LEGEND

- Ceiling Picture Outlet
- Wall Outlet
- Duplex Convenience Outlet
- ⊖ Safety Switch
- ⊖ Single Pole Switch for Outlet marked '3'
- Lighting Panelboard
- Branch Circuit Exposed
- Branch Circuit Concealed in or under floor
- Branch Circuit Concealed in Ceiling or Wall
- ⊖ Cross marks indicate number of wires
- Push Type Ceiling Mounted Picture

TOLL HOUSE DETAILS

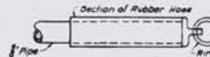
Scale 1/4" = 1'-0"



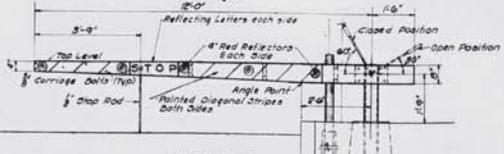
PLAN



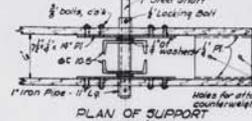
DETAIL OF PLATE



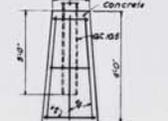
HANDLE



ELEVATION



PLAN OF SUPPORT



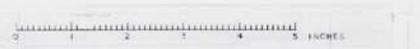
FOOTING

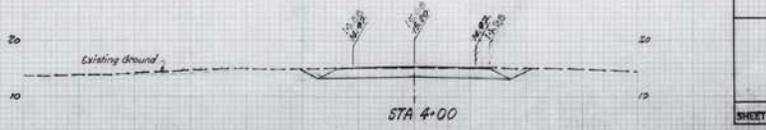
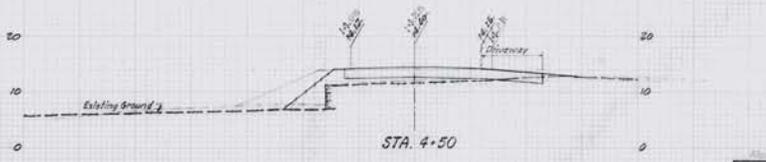
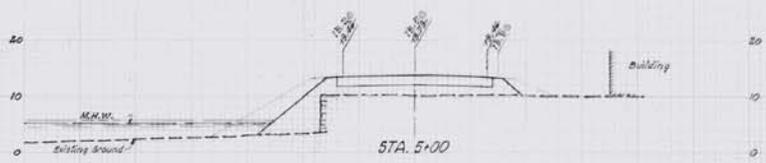
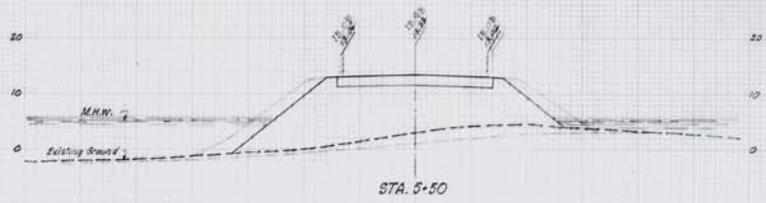
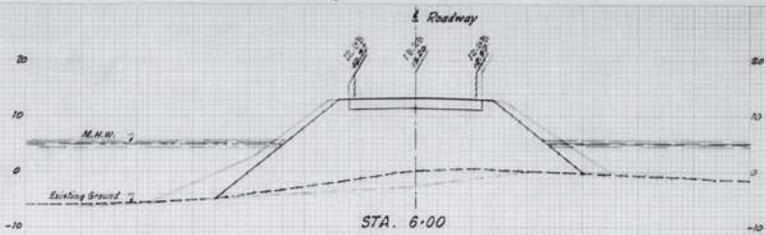
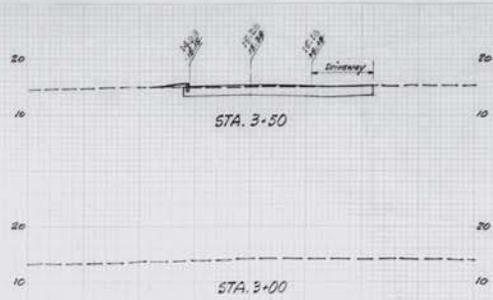
DETAILS OF TRAFFIC GATE

As Built Sept. 1958	
STATE HIGHWAY COMMISSION AUGUSTA, MAINE	
JONESPORT BEALS BRIDGE	
TOLL HOUSE	
SHEET NO. 13 OF 21	SCALE AS NOTED MAY 1956

FAY, SPOFFORD & THORNDIKE
CONSULTING ENGINEERS

XL-18
13

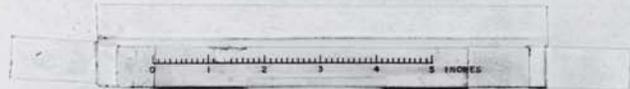


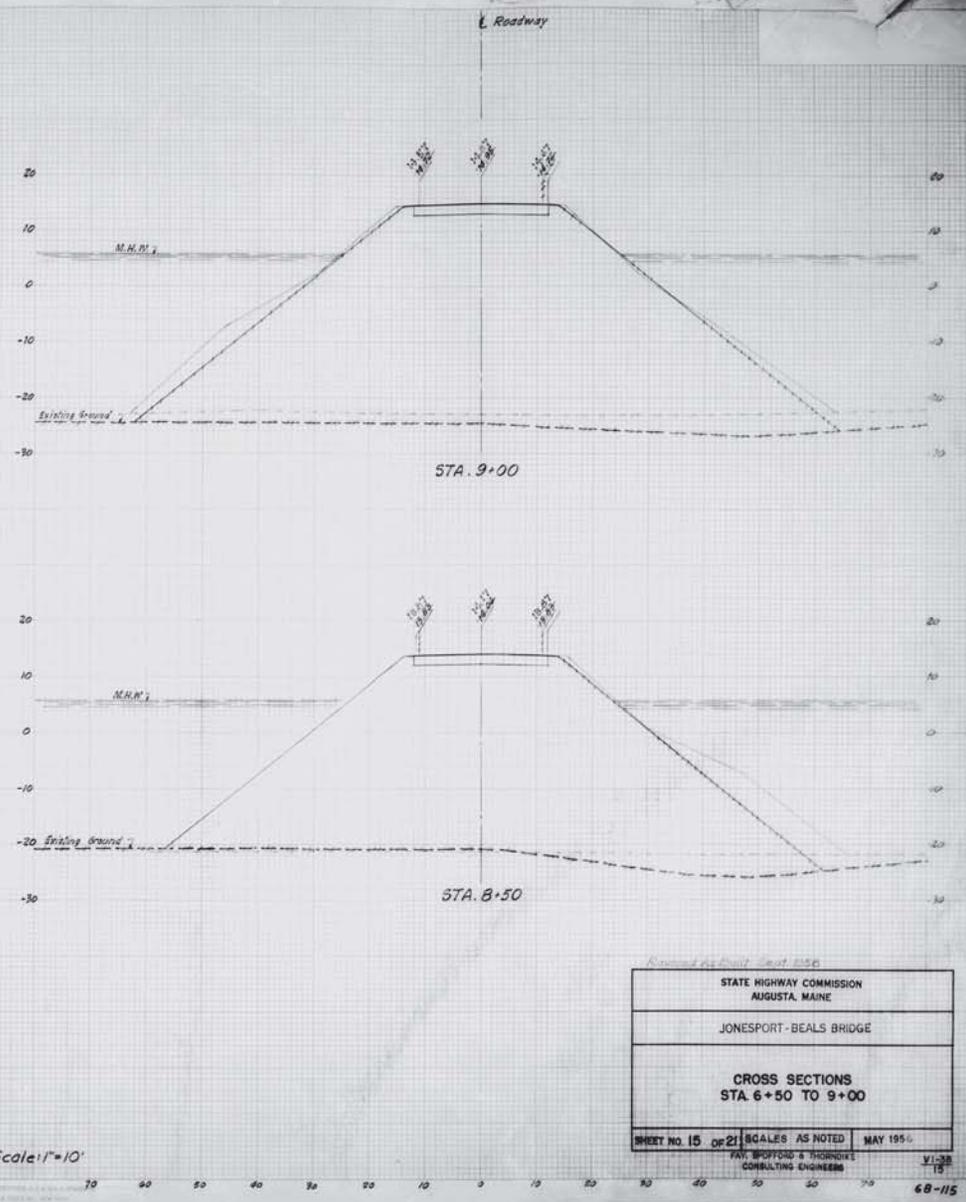
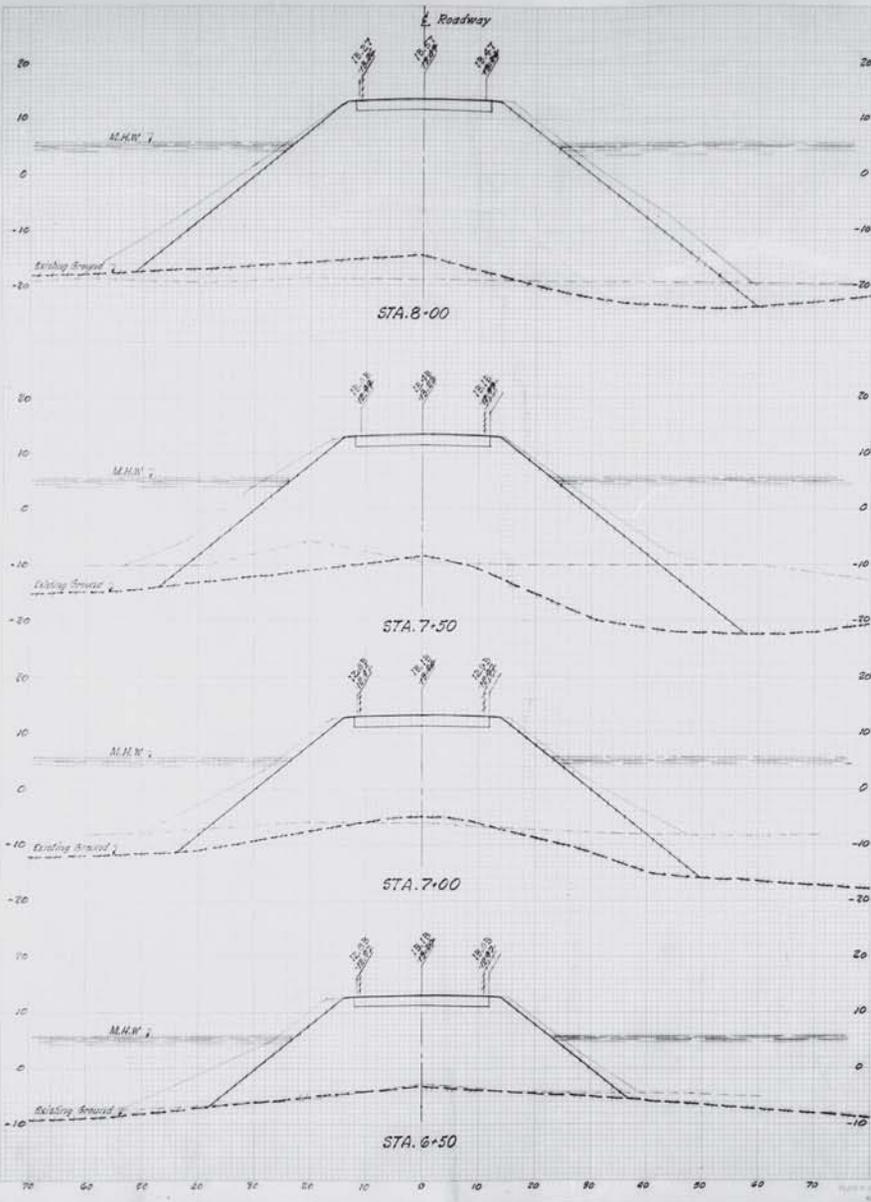


Scale: 1"=10'

STATE HIGHWAY COMMISSION AUGUSTA, MAINE		
JONESPORT - BEALS BRIDGE		
CROSS SECTIONS STA. 0+50 TO 6+00		
SHEET NO. 14	OF 21	MAY 1956
FAY, SPOFFORD & THORNDIKE CONSULTING ENGINEERS		

68-114

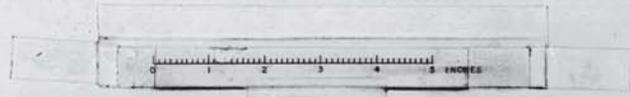


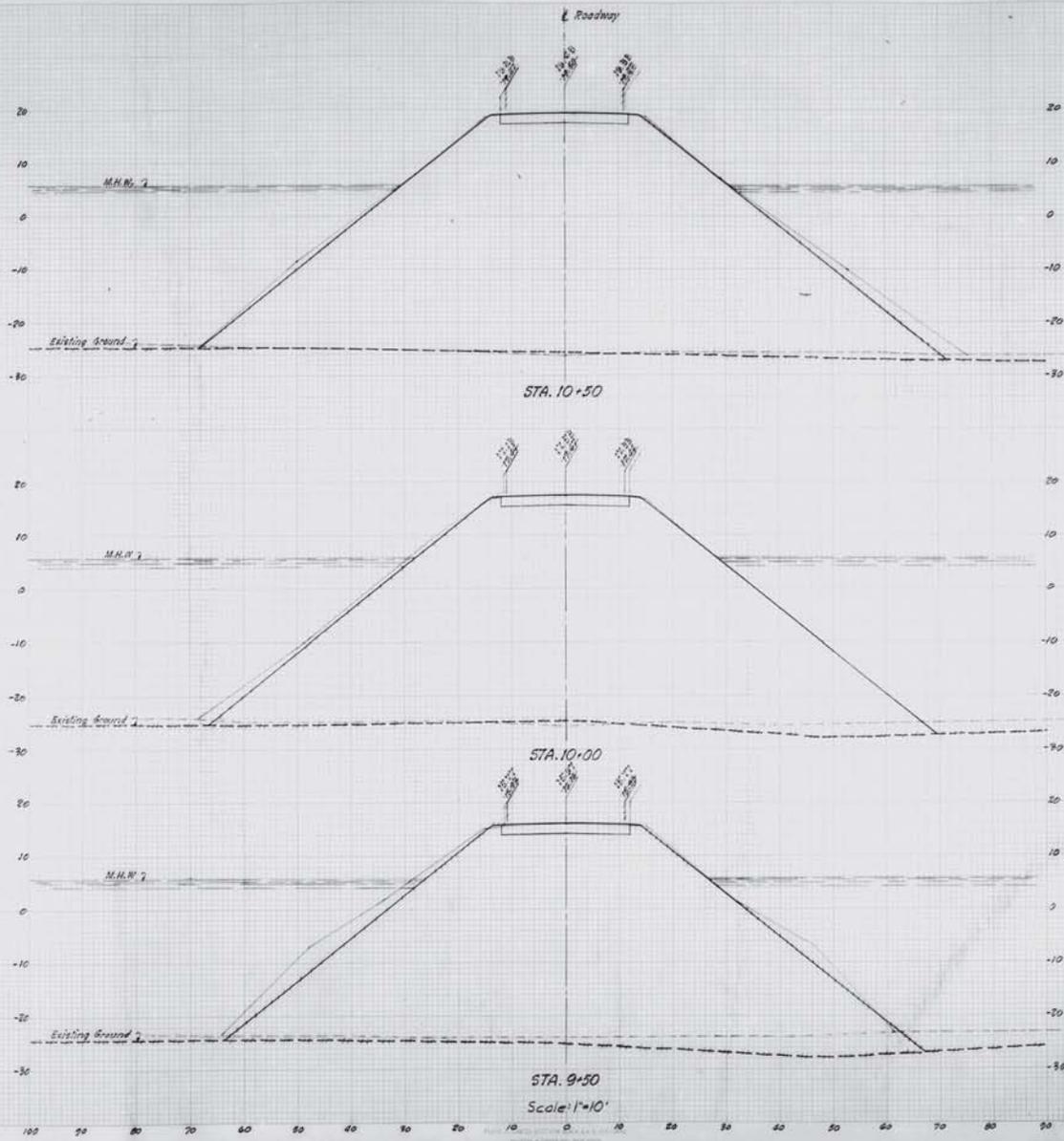


DES.	
EN.	
CHK.	
DATE	5/1/56

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





DES.	...
DR.	...
CHEK.	...
DATE.	...

STATE HIGHWAY COMMISSION
AUGUSTA, MAINE

JONESPORT - BEALS BRIDGE

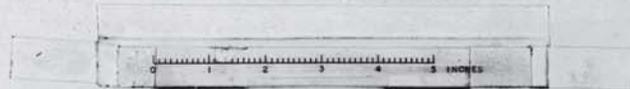
CROSS SECTIONS
STA. 9+50 TO 10+50

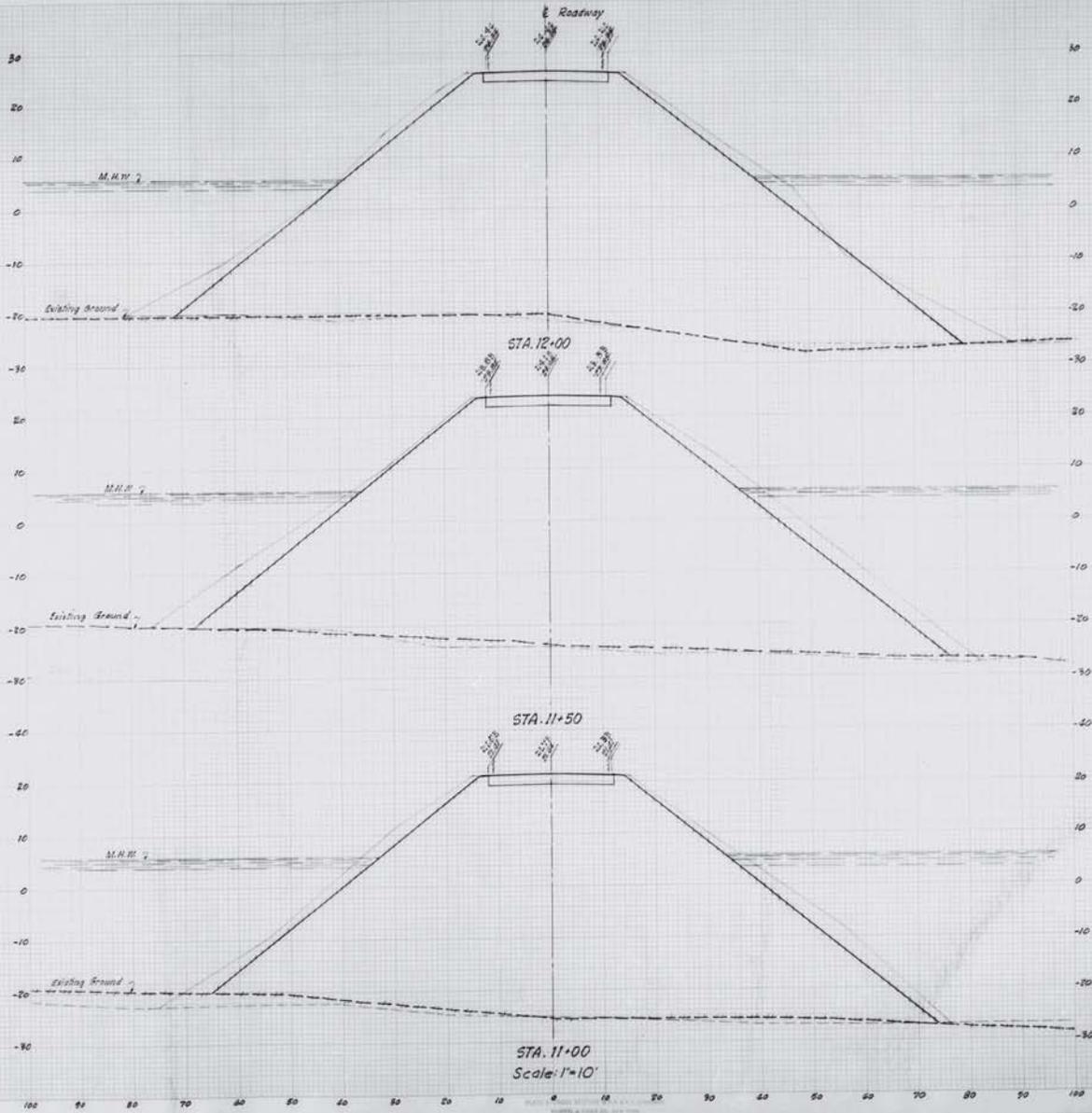
SHEET NO. 15 OF 21 | SCALES AS NOTED | MAY 1956

FAY, BRIDFORD & THORNDIKE
CONSULTING ENGINEERS

VI-38
16

68-116

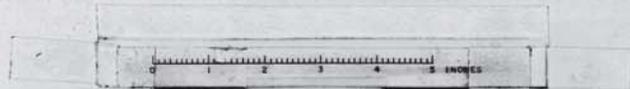


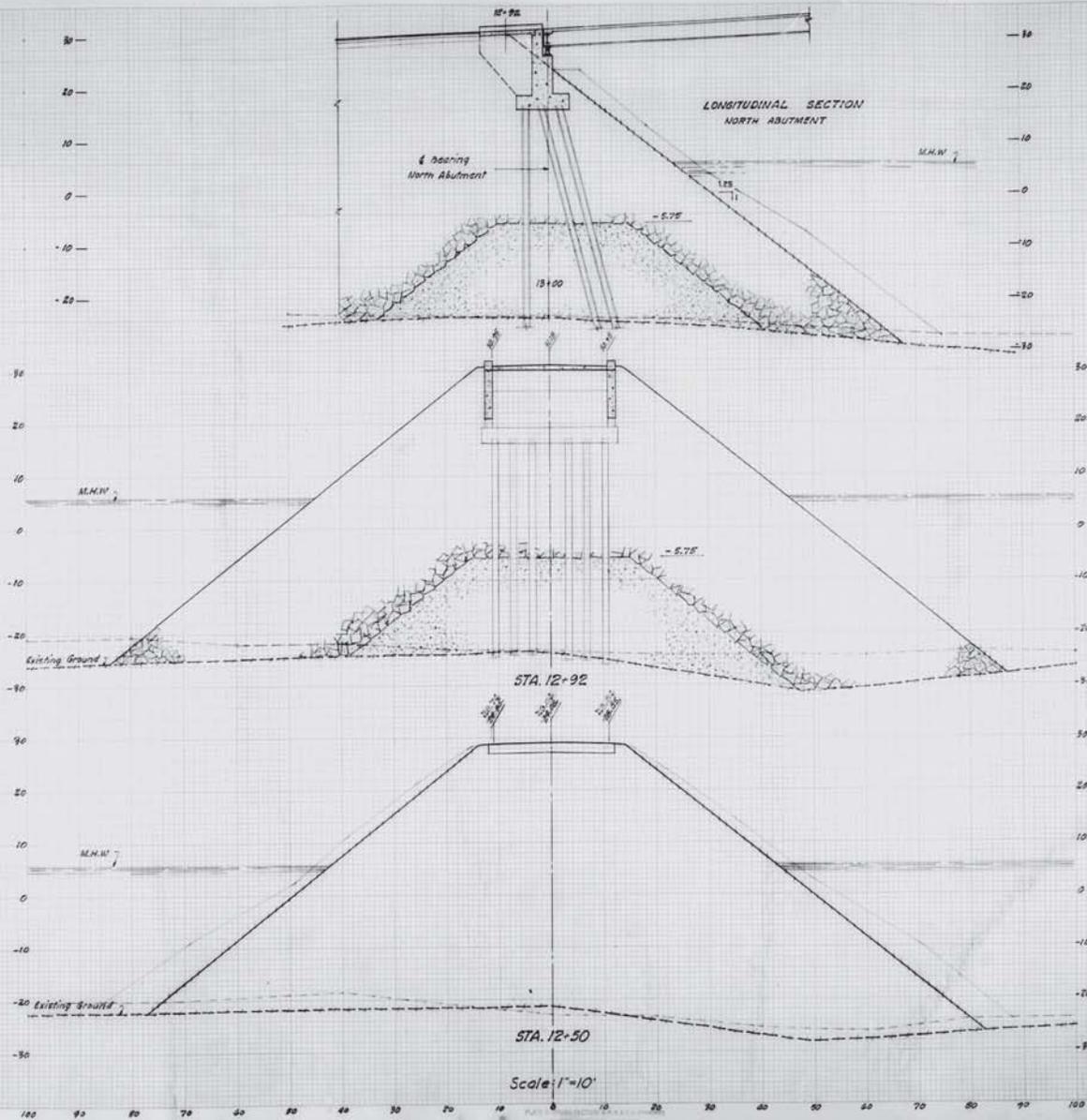


STATE HIGHWAY COMMISSION
 AUGUSTA, MAINE
 JONESPORT - BEALS BRIDGE
 CROSS SECTIONS
 STA. 11+00 TO 12+00
 SHEET NO. 17 OF 21 SCALES AS NOTED MAY 1955

FAY, SPOFFORD & THORNDIKE
 CONSULTING ENGINEERS
 VI-28
 17

68-117





STATE HIGHWAY COMMISSION
AUGUSTA, MAINE

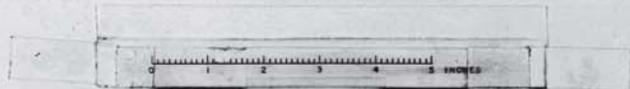
JONESPORT-BEALS BRIDGE

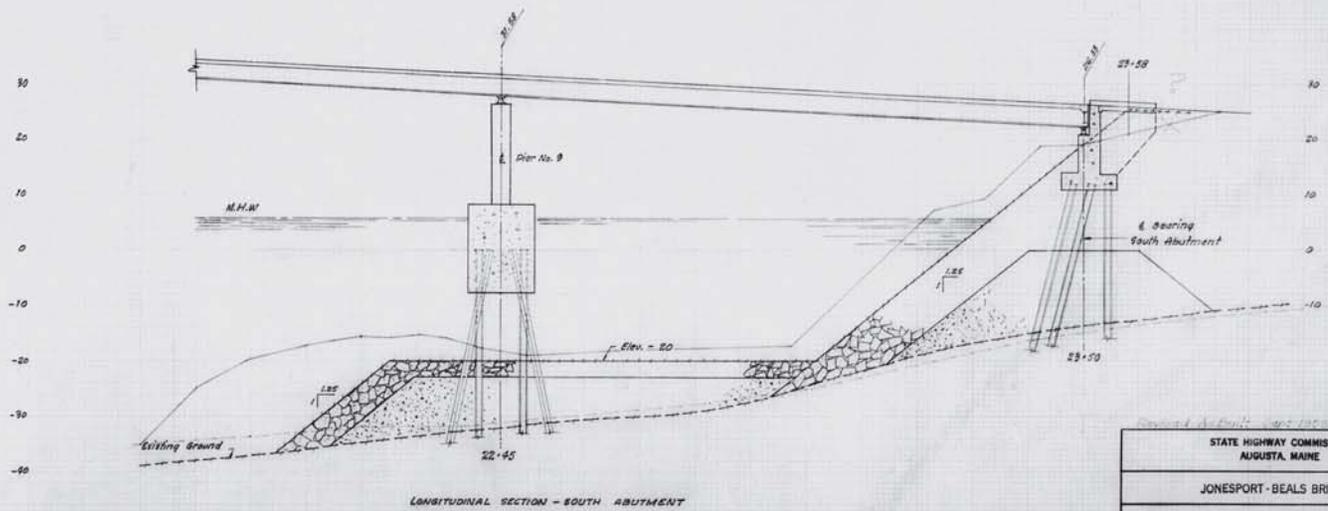
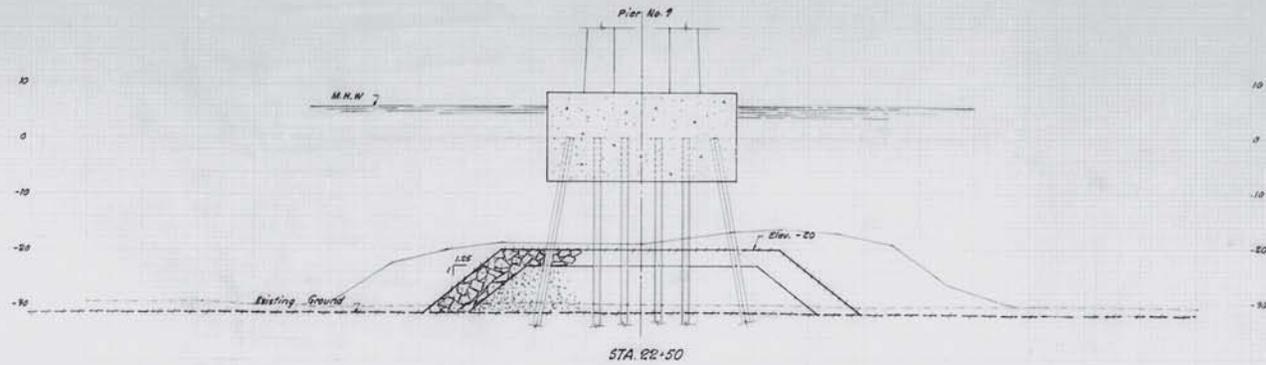
CROSS SECTIONS STA. 12+50 TO 12+92
LONGITUDINAL SECTION-NORTH ABUTMENT

SHEET NO. 18 OF 21 SCALES AS NOTED MAY 1950

FAY, SPOFFORD & THORNDIKE
CONSULTING ENGINEERS

VI-28
18



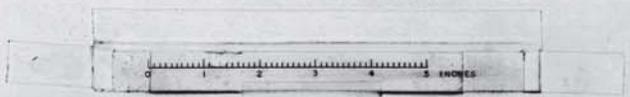


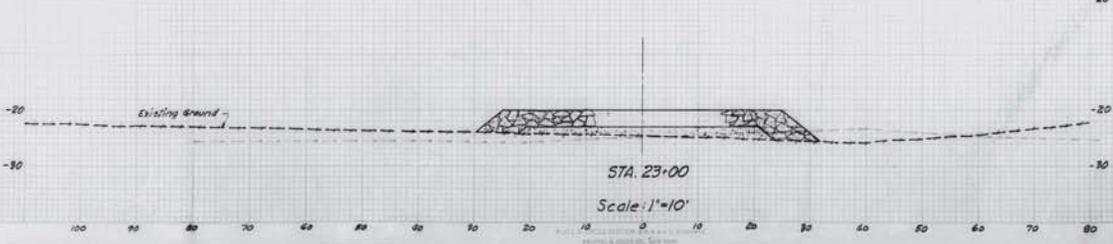
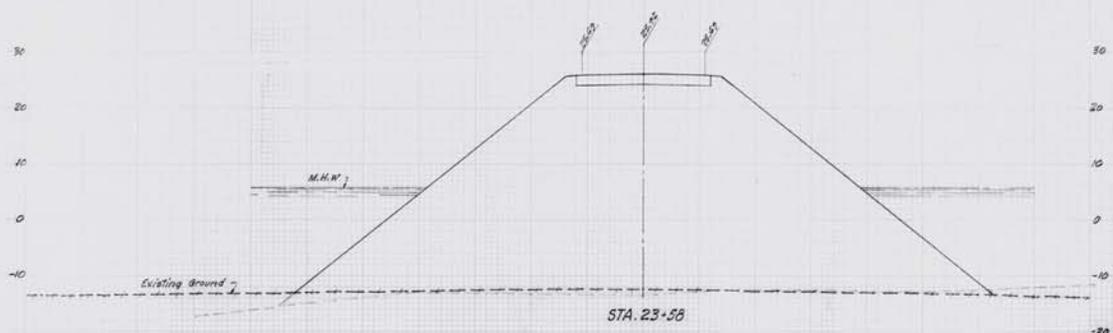
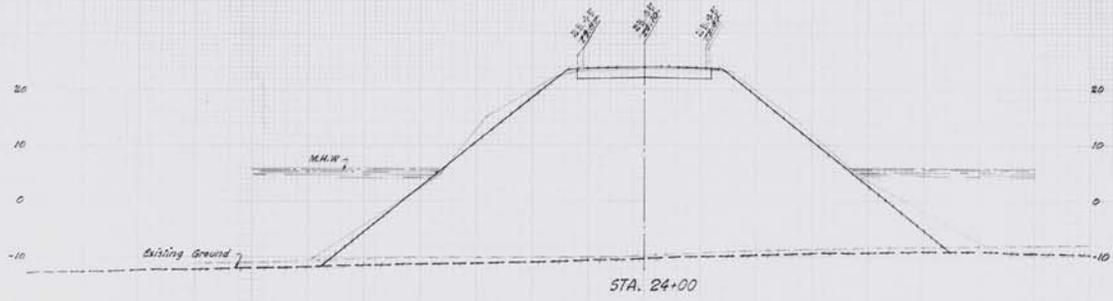
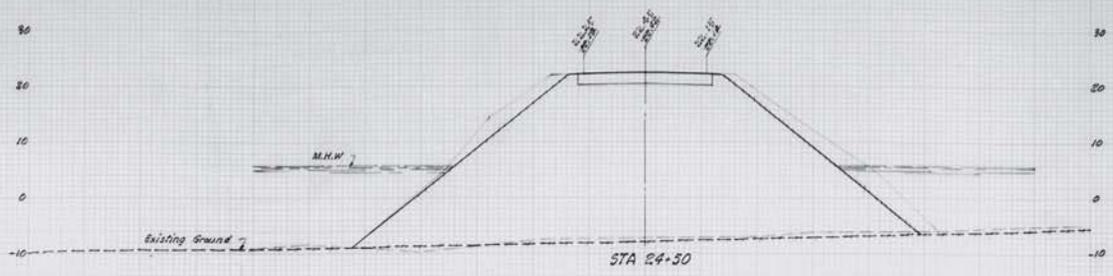
Scale: 1"=10'

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, SPORFORD & THORNDIKE
CONSULTING ENGINEERS
VI-38
19
68-112

IN	1/8"
1/2"	1/4"
3/4"	3/8"
1"	1/2"
1 1/2"	3/4"
2"	1"
3"	1 1/2"
4"	2"
5"	2 1/2"
6"	3"
8"	4"
10"	5"





Scale: 1"=10'

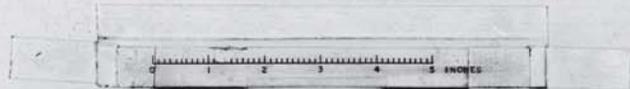
DESIGNED BY BRUCE STAY 1956

STATE HIGHWAY COMMISSION AUGUSTA, MAINE		
JONESPORT - BEALS BRIDGE		
CROSS SECTIONS STA. 23+00 TO 24+50		
SHEET NO. 20	OF 21	MAY 1956

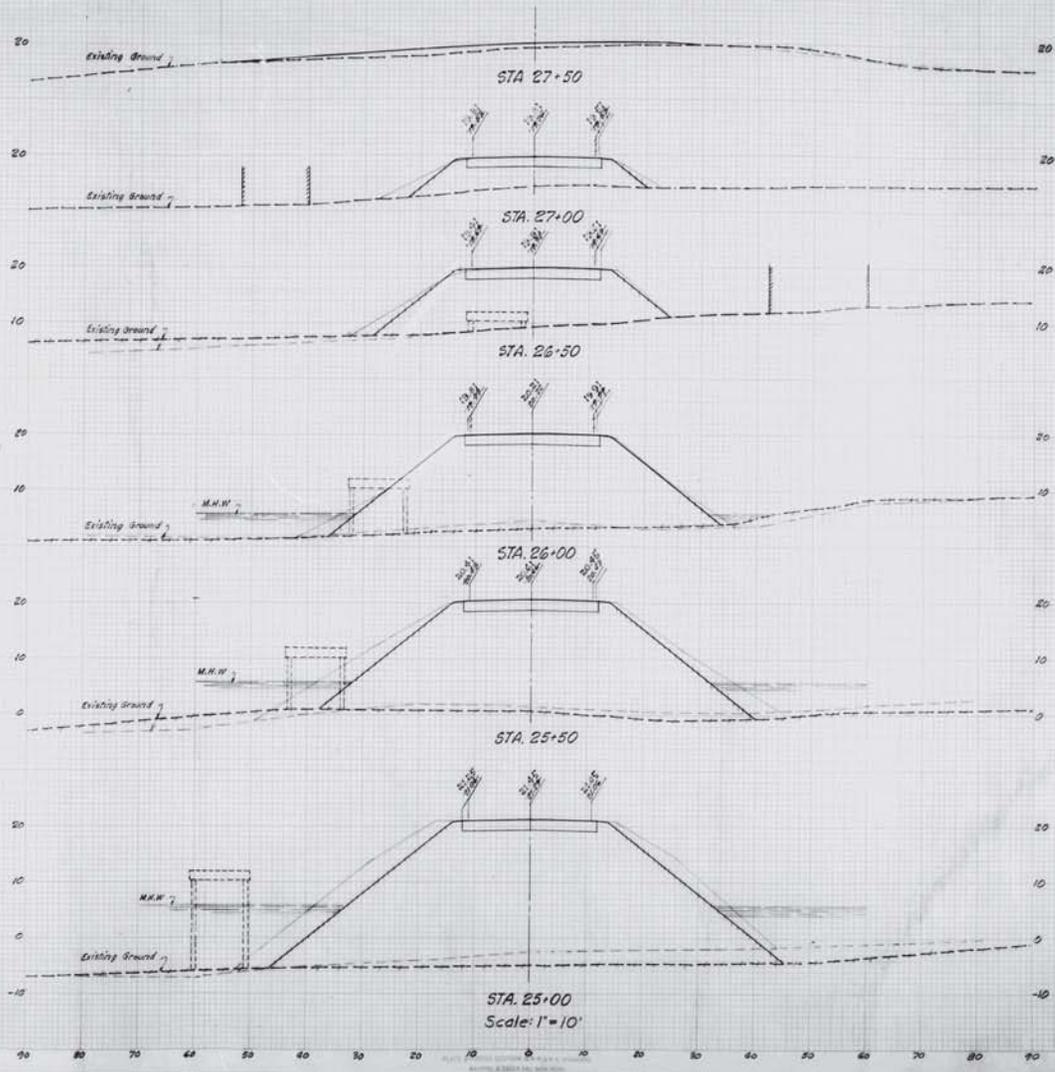
FAY, SPOFFORD & THORNDIKE
CONSULTING ENGINEERS

VI-38
20

68-120



DATE	BY
11	...
12	...
13	...
14	...
15	...
16	...
17	...
18	...
19	...
20	...



Revised As Bldg. Sept 1956

STATE HIGHWAY COMMISSION
 AUGUSTA, MAINE

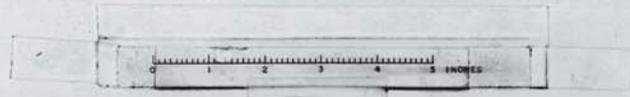
JONESPORT-BEALS BRIDGE

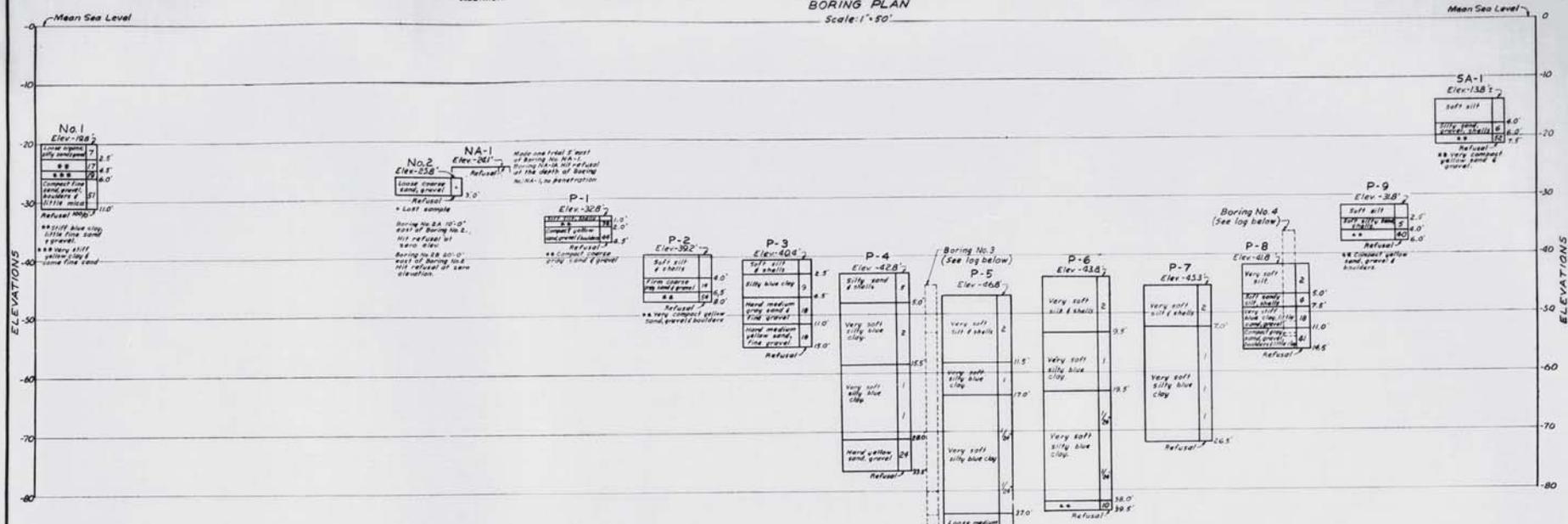
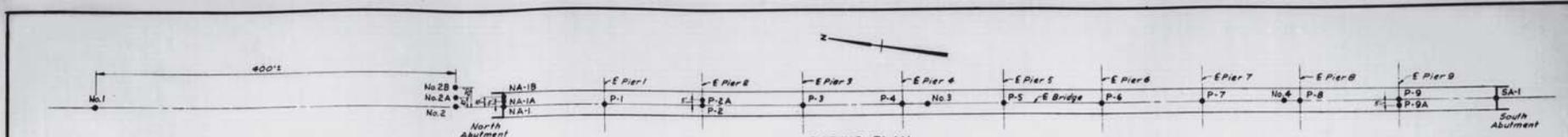
CROSS SECTIONS
 STA. 25+00 TO 27+50

SHEET NO. 21 OF 21 SCALES AS NOTED MAY 1955

FAY, BRIDFORD & THORNDIKE
 CONSULTING ENGINEERS

1"	10'
1/2"	5'
1/4"	2 1/2'
3/16"	1 1/4'
1/8"	1'





NA-1B
Elev. -241' 3/4
Refusal 10'
Boring No. NA-1B made 10' west of Boring No. NA-1

P-1A
Elev. -328' 3/4
Refusal 10'
Boring No. P-1A made 10' east of Boring No. P-1

P-2A
Elev. -322' 1/2
Refusal 10'
Boring No. P-2A made 5' east of Boring No. P-2

LOG OF BORINGS
Hor. 1" = 50'
Vert. 1" = 5'

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

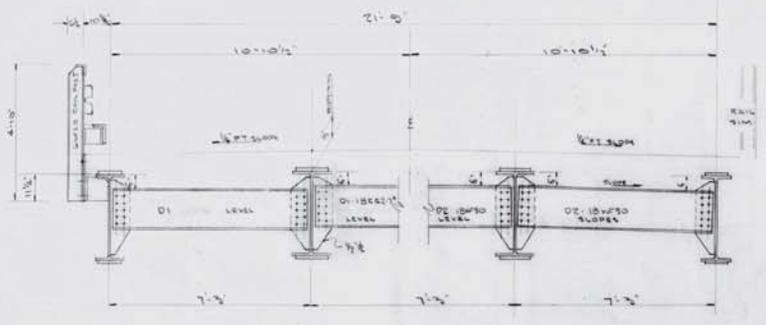
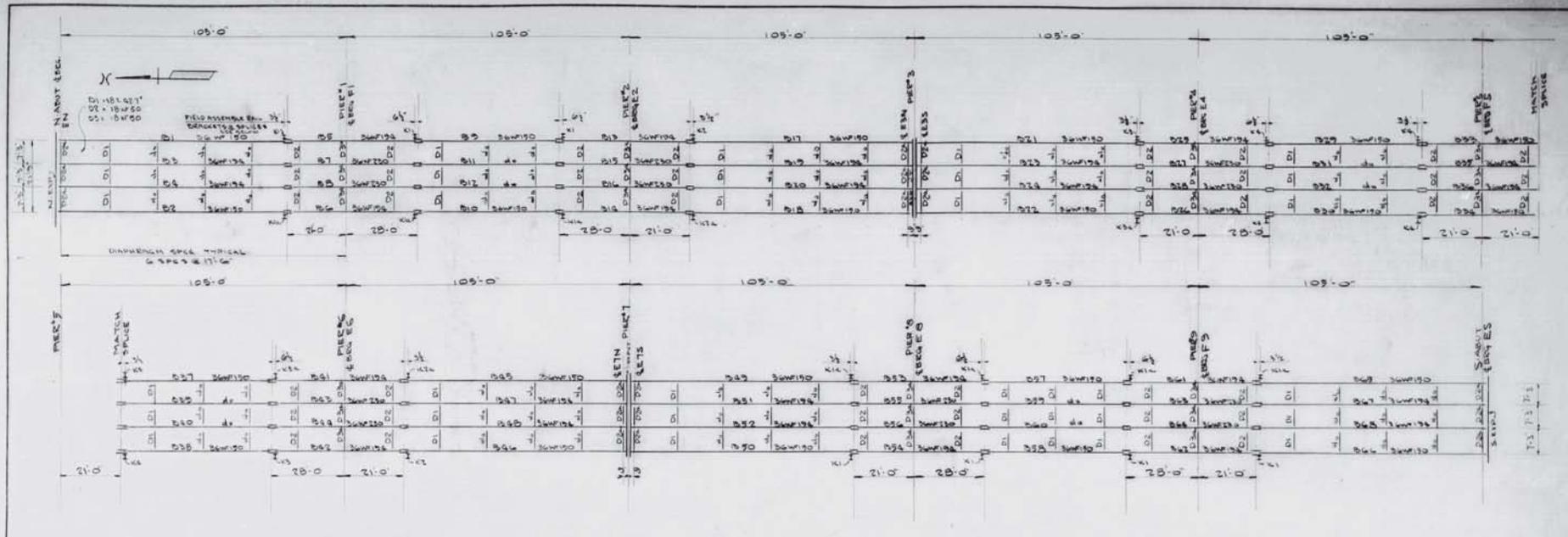
STATE HIGHWAY COMMISSION
AUGUSTA, MAINE

JONESPORT-BEALS BRIDGE

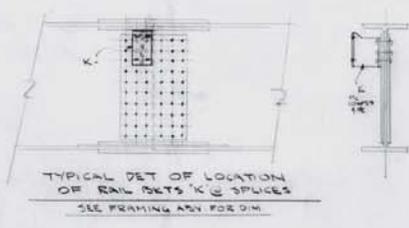
BORING DATA

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

FAY, SPENCER & THORNTON
CONSULTING ENGINEERS

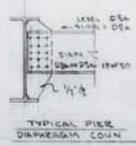


TYPICAL CROSS SECT.
EIGHT AT PIERS



TYPICAL DET OF LOCATION
OF RAIL SILLS 'K' & SPLICES
SEE FRAMING ADV FOR DIM.

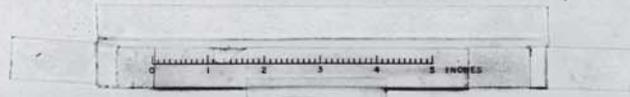
NOTES: SEE DWG E-2 FOR
CAMBER DIAGRAM



TYPICAL PIER
DIAPHRAGM CONN.

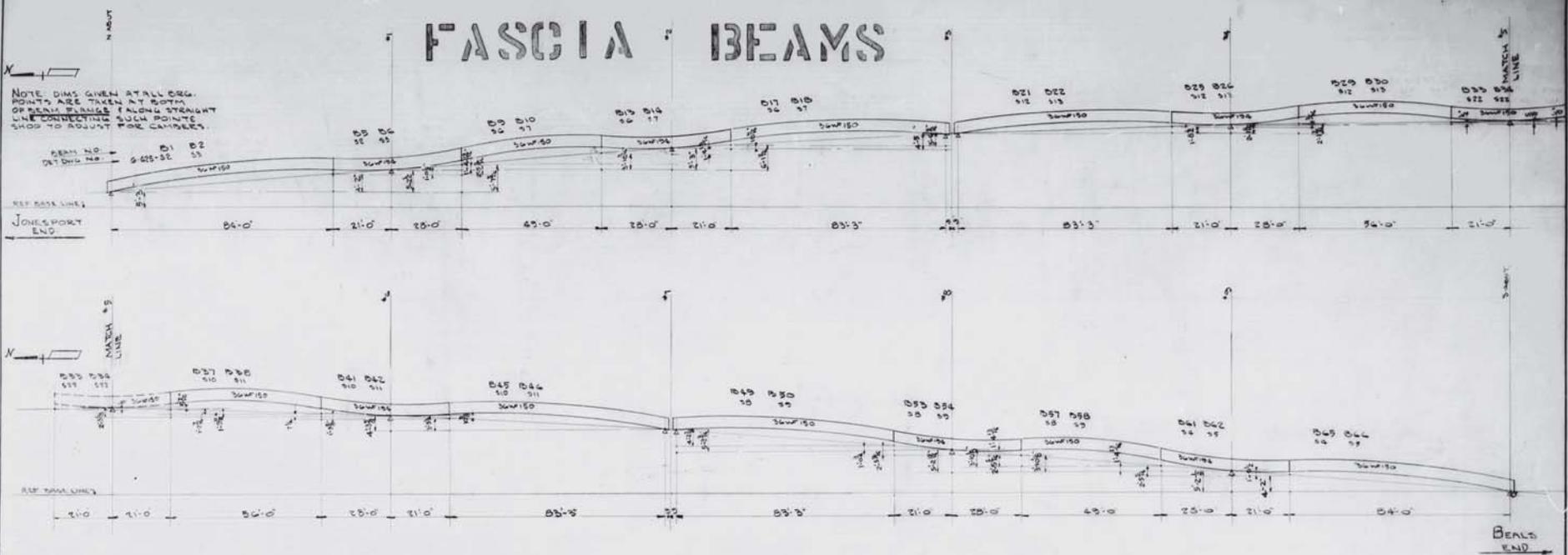
FRAMING PLAN	
Baincraft & Martin, Rolling Mills Company	
South Portland, T. Maine	
JONESPORT - BEALS BRIDGE - MAINE	
DRAWN: S. H. 17 C. L. G.	CUSTOMER: BRIDGE CONTRACTORS
REVISION: 10-20-57	DESIGNER: M. S. H. GARDNER
REVISION:	ORDER NO. 3333
REVISION:	DWG. NO. 68-123-E1

APPROVED 11-13-57 68-123 A



FASCIA BEAMS

NOTE: DIMS GIVEN AT ALL CEG. POINTS ARE TAKEN AT BOTTOM OF BEAM SURFACE. FOLLOW STRAIGHT LINE CONNECTING SUCH POINTS. SHOW NO ADJUST FOR CAMBERS.

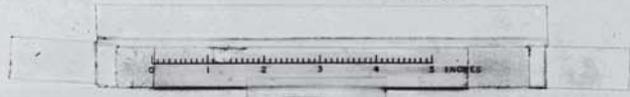


NOTES:

SHOP ASSEMBLY DWG FOR	
Bancroft & Martin Rolling Mills Company	
South Portland, Maine	
JONESPORT - BEALS	
BRIDGE - MAINE	
CUSTOMER: BRIDGE CONST. CO.	
DESIGNER: MR. S. H. GERRARD	
ORDER NO. 425-ESF	DWG. NO. G-425-ESF

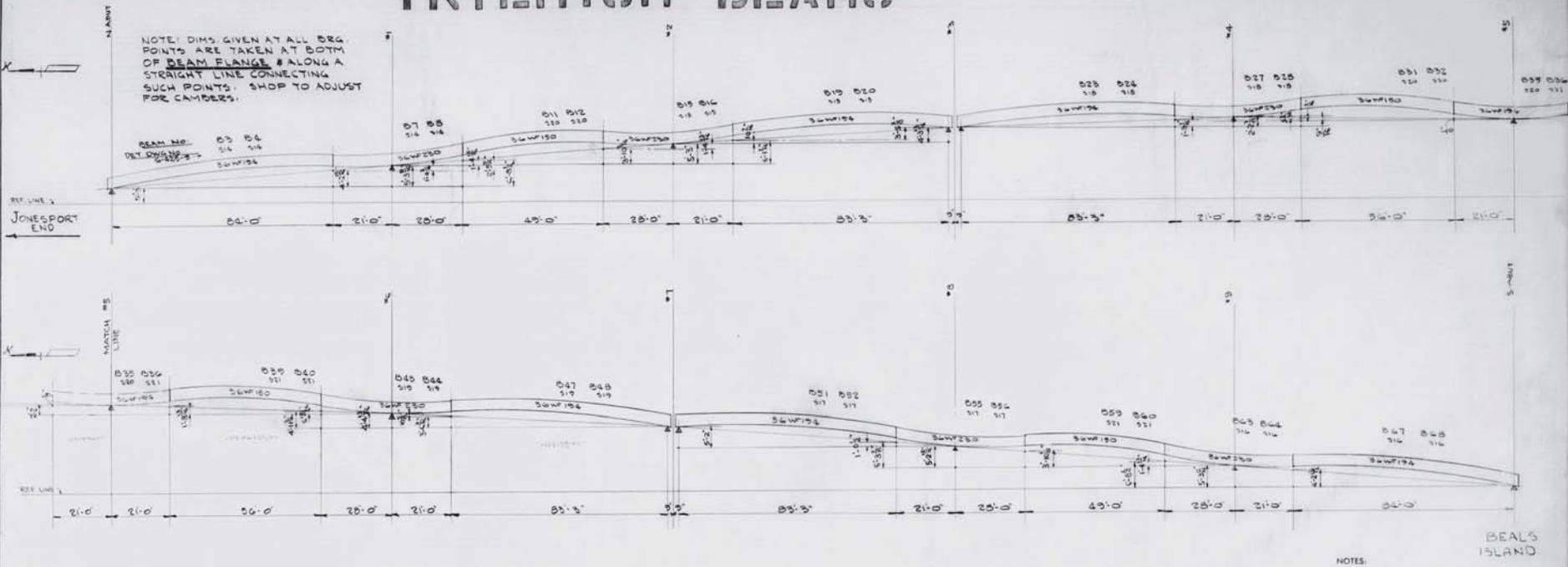
DRAWN	G. H. GERRARD
REVISION	10-10-17
REVISION	
REVISION	

APPROVED 11-12-17 68-124 A



INTERIOR BEAMS

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



NOTES:

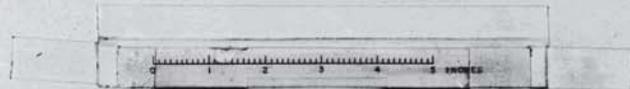
BEALS ISLAND

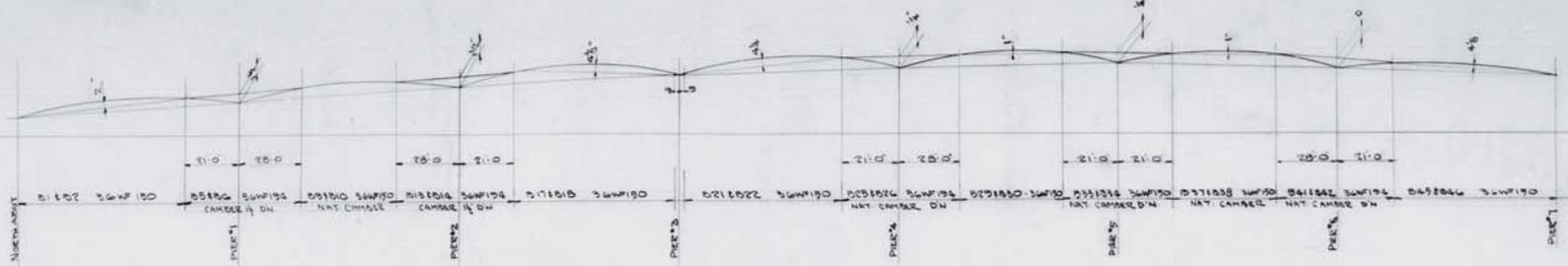
SHOP ASSEMBLY DWG. INT. DIMS
Bancroft & Norton, Portland, Maine Company
 South Portland, Maine
 JONESPORT - BEALS
 BRIDGE - MAINE
 CUSTOMER BRIDGE CONST. CO.
 DESIGNER - MR. J. H. COYNE

DRAWN	11-2-57	R.S.
REVISION		
REVISION		
REVISION		

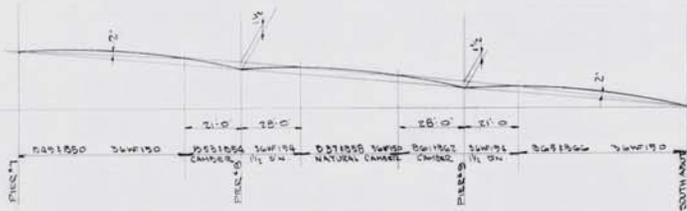
ORDER NO. 13834 DWG. NO. 6-425-EST

APPROVED 11-1-57 68-125

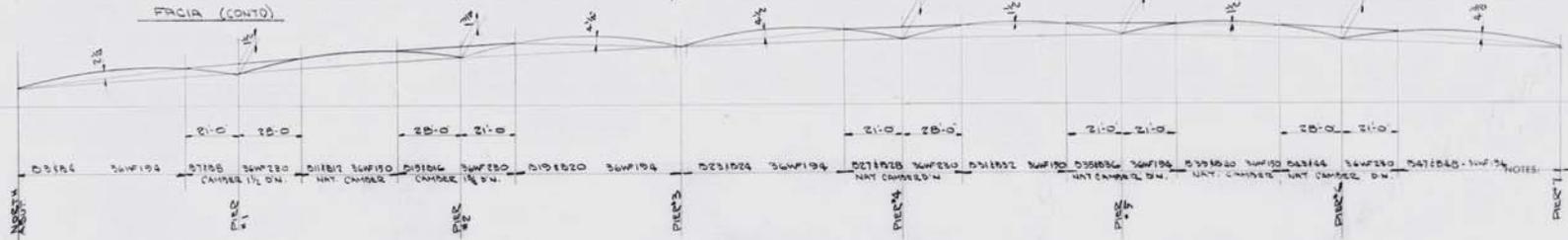




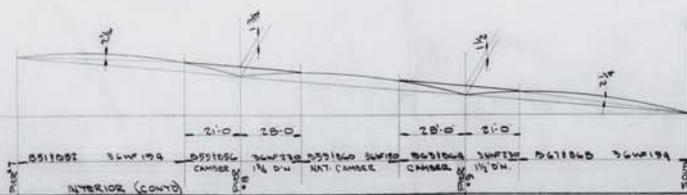
FASCIA BEAMS



FASCIA (CONTD)



INTERIOR BEAMS



INTERIOR (CONTD)

CAMBER DIAGRAMS

Barrett & Martin, Kellogg, Mill Company
South Portland, Me.

JONESPORT BEALS
 BRIDGE - MAINE

CUSTOMER: BRIDGE CONST. CO.
 DESIGNER: M. S. W. COMB.

DRAWN	B. J. ST. 57	E. W.
REVISION		
REVISION		
REVISION		

ORDER NO. 10-18-37 DWG. NO. 60-A25-E7

APPROVED 10-18-37 68-126A

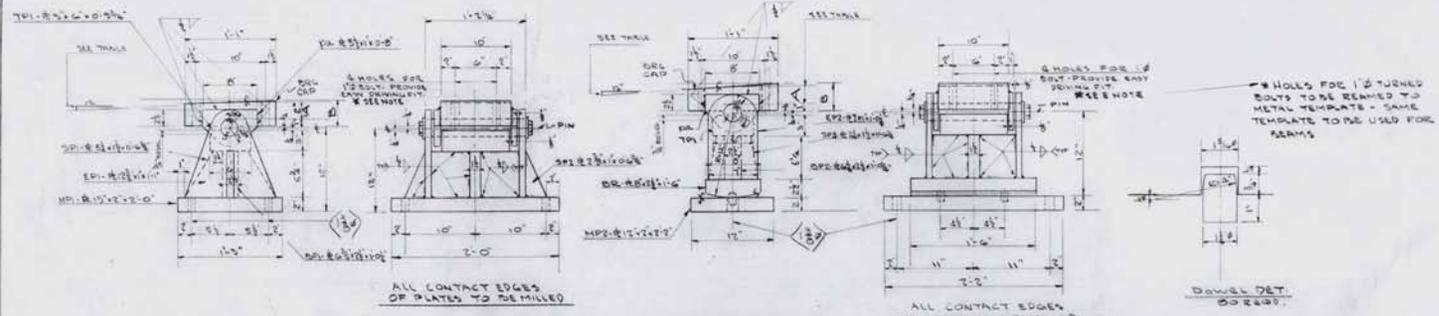
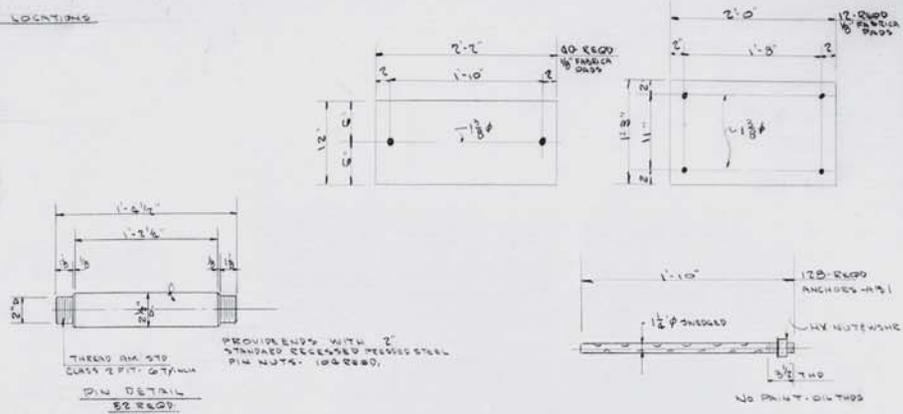


SEE DWG. E1 FOR STRAIGHT PLAN



TABLE
A OF EACH MARK
REQUIRED

BEARING MARK	STD. FOR EACH CAP	CAP DIA. INCH	CAP DIA. INCH
EN	1/2" FT	2"	3 3/8"
E2	do	2"	3 3/8"
E75	do	2"	3 3/8"
EB	do	2"	3 3/8"
ES	do	2"	3 3/8"
FI	do	2"	3 3/8"
FD	do	2"	3 3/8"
EDN	1/2" FT	2"	3 1/4"
ETN	do	2 1/8"	4 1/8"
E55	1/2" FT	2 3/8"	3 1/2"
EG	1/2" FT	2"	3 1/4"
EA	1/2" FT	2"	3 1/8"
FS	do	2"	3 1/8"



FIXED BEARINGS.
TOTAL 12 REGRD.
4 OF EACH TYPE AS MARKED IN TABLE A.

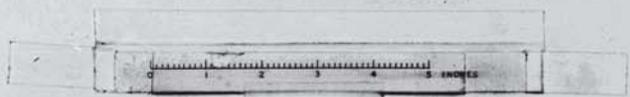
EXPANSION BEARINGS
TOTAL 40 REGRD.
4 OF EACH TYPE AS MARKED IN TABLE ABOVE.

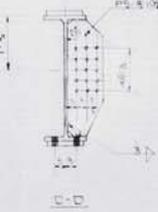
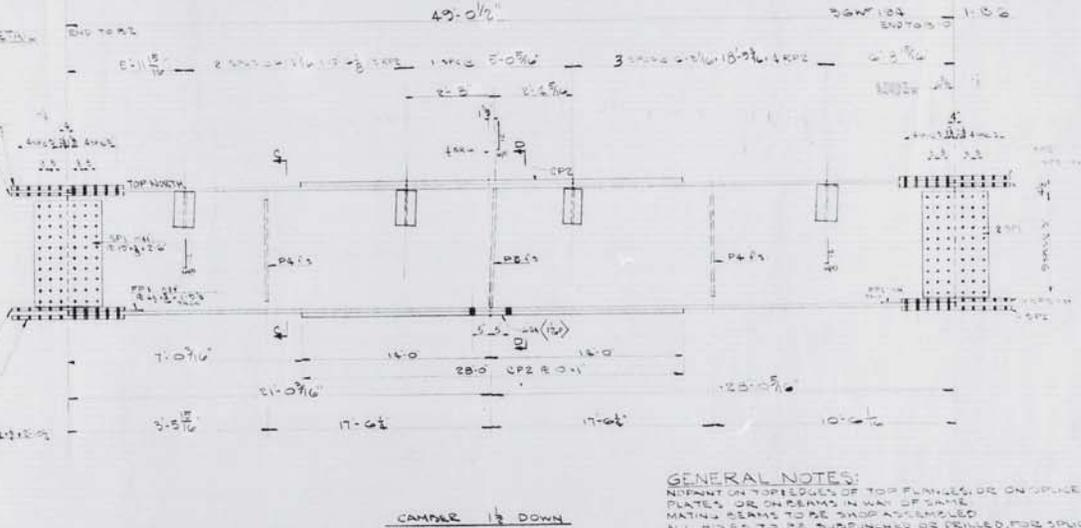
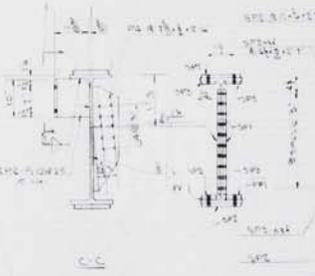
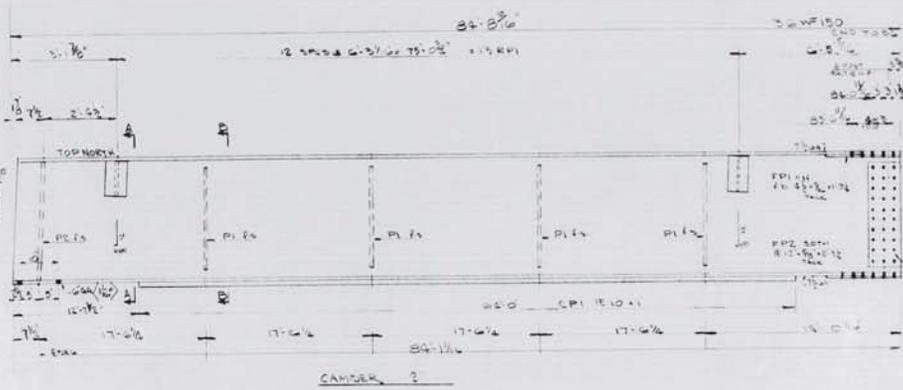
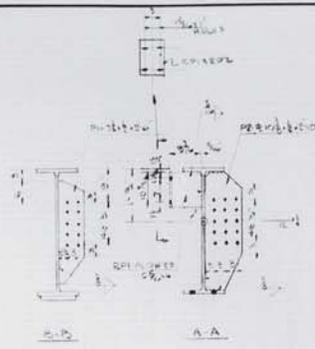
NOTE: SCALE WEIGH ASSEMBLIES

SHIP		BILL OF MATERIAL			DWG. NO. G-423-91	
MARK	NO	MARK	SHAPE	LENGTH	WT	REMARKS
EN	4		R 10 x 3 3/8	1 1/2		MAIN BEVEL
E2	4		do	1 1/2		
E75	4		do	1 1/2		
EB	4		do	1 1/2		
ES	4		do	1 1/2		
FI	4		do	1 1/2		
FD	4		do	1 1/2		
EDN	4		R 10 x 3 1/4	1 1/2		
ETN	4		R 10 x 4 1/8	1 1/2		
E55	4		R 10 x 3 1/2	1 1/2		
EG	4		R 10 x 3 1/4	1 1/2		
EA	4		R 10 x 3 1/8	1 1/2		
FS	4		R 10 x 3 1/8	1 1/2		
104	PI		R 5 1/2 x 1	0		
12	SP1		R 3 x 2 1/2	1 0 1/2		
40	SP2		R 5 x 4 1/2	2		
12	MP1		R 15 x 2	2		
40	MP2		R 12 x 2	2		
40	BR		R 8 x 1 1/2	1		
24	SP1		R 5 1/2 x 1 1/2	6 1/2		
20	SP3		R 2 1/2 x 1 1/2	6 1/2		
24	SP2		R 2 1/2 x 1	6 1/2		
24	EP1		R 1 1/2 x 1	1		
20	EP2		R 1 x 1	1 0 1/2		
20	DOWEL		1/2" TURNED	1 1/2		
22	PIN		1/2" TURNED	1 1/2		
104	PIN NUTS		2 STANDARD		208	
128	WT NUTS		1/2" CUT	1 1/2		
128	WT NUTS		1/2" TURNED	1 1/2		
172	WT NUTS		1/2" TURNED	1 1/2		
PADS	40		PAPER	2	2	
do	12		PAPER	2	0	

SHOP CONNECTIONS: WELDED
FIELD CONNECTIONS: BOLTED
HOLES: AS SHOWN
PAINT: RED LEAD & LIN OIL - SEE NOTE

BEARING DETAILS
Harcroft & Austin Rolling Mills Company
South Portland, Maine
JONESPORT BEARINGS BRIDGE
MAINE
CUSTOMER BRIDGE CONSTR. CO.
DESIGNER: M. S. STATE H. S. M.
ORDER NO. 12345 DWG. NO. G-423-91
APPROVED: 2-10-91





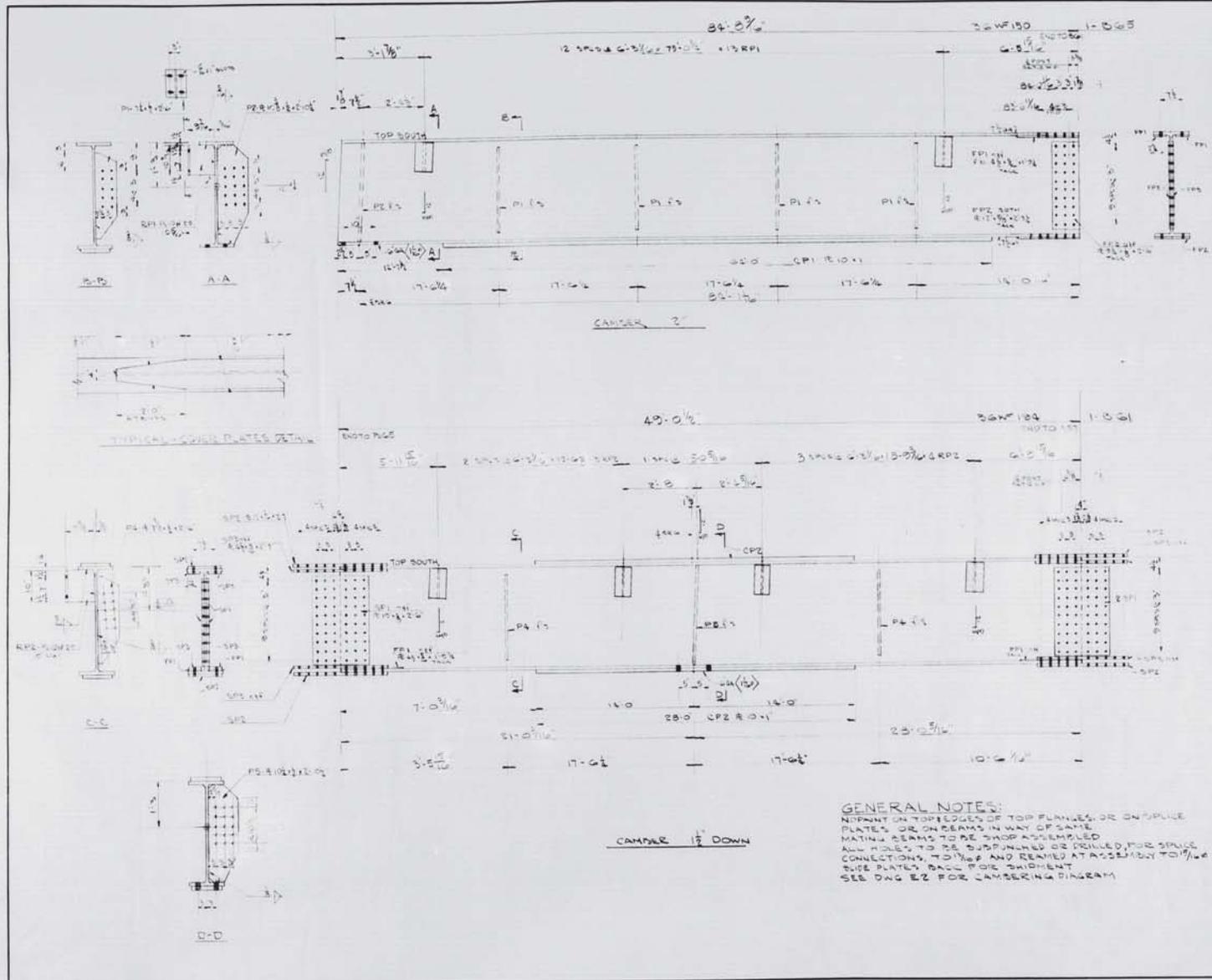
GENERAL NOTES:
 1. WELD ON TOPELLEDGES OF TOP FLANGES OR ON BRACE PLATES OR ON STIFFERS IN WAY OF GAINS.
 2. MAIN BEAMS TO BE SHIP ASSEMBLED.
 3. ALL HOLES TO BE PUNCHING OR DRILLED FOR SPACE CONNECTIONS. TO 1/16" AND REAMED AT ASSEMBLY TO 1/16".
 4. SEE PLATE CALL FOR SHIPMENT.
 5. SEE DWG E2 FOR CAMBERING DIAGRAM.

SHIP		BILL OF MATERIAL				DWG. NO. 423-53
MARK	NO.	MARK	SHAPE	LENGTH	WT.	REMARKS
B	1		36WF150	22	1177	12
B	1		36WF150	49	2514	8
	4	PL	1/2" x 12"	2	123	24
	2	PL	1/2" x 12"	2	63	12
	1	PL	1/2" x 12"	2	50	5
	1	PL	1/2" x 12"	2	50	5
	4	SP1	1/2" x 12"	2	53	8
	4	SP2	1/2" x 12"	2	155	8
	9	SP3	1/2" x 12"	2	178	8
	6	FP1	1/2" x 12"	1	23	8
	1	FP2	1/2" x 12"	2	23	8
	2	FP3	1/2" x 12"	2	23	8
	1	CP1	1/2" x 12"	22	27	11
	2	CP2	1/2" x 12"	22	27	11
	12	RP1	1/2" x 12"	104	127	11
	7	RP2	1/2" x 12"	10	127	11

SHOP CONNECTIONS: ALL WELDS
 FIELD CONNECTIONS: 1/2" x 12" TENSILE
 HOLES: 1/16" (SEE NOTE)
 PAINT: RED OXIDE BROWN FOR MAIN STRUCTURE

BEAM DETAILS FOR
Bunce & Austin Rolling Mill Company
South Portland, Maine
 4045 PORTLAND BRIDGE
 BRIDGE MAINE
 CUSTOMER: BRIDGE COMPANY
 DESIGNER: M. S. H. COOPER
 ORDER NO. 15555 DWG. NO. 423-53

DRAWN	ELN
REVISION	
REVISION	



SHIP		BILL OF MATERIAL				DWG. NO. 6-425-54
MARK	NO.	MARK	SHAPE	LENGTH	WT.	REMARKS
B-05	1	36WF150	24	07		
B-01	1	36WF150	24	07		
	4	P1	47 1/2	2	6	
	2	P4	27 1/2	2	6	
	1	P2	40 1/2	2	10 1/2	
	1	P5	26 1/2	2	10 1/2	
	4	SP1	41 3/4	2	6	
	4	SP2	41 3/4	2	7	
	2	SP3	41 3/4	2	7	
	6	FP1	41 3/4	1	1 1/2	
	2	FP2	41 3/4	2	3 1/2	
	2	FP3	41 3/4	2	3 1/2	
	1	CP1	41 3/4	2	10	
	2	CP2	41 3/4	2	10	
	12	RP1	41 3/4	2	10 1/2	
	7	RP2	41 3/4	2	10	

GENERAL NOTES:
 1. NOT PAINT ON TOP EDGES OF TOP FLANGES OR ON SPLICE PLATES OR ON BEAMS IN WAY OF SAME.
 2. MATING BEAMS TO BE SHOP ASSEMBLED.
 3. ALL HOLES TO BE SPURPOSED OR DRILLED, FOR SPLICE CONNECTIONS, TO 1/8" AND BEAM ASSEMBLY TO 1/16" SIZE PLATE, BOLL FOR SHIPMENT.
 4. SEE DWG E2 FOR CAMBERING DIAGRAM.

SHOP CONNECTIONS: WELDED
 FIELD CONNECTIONS: 7/8" x 1/2" TOP SOUTH
 HOLES: 7/16" (SEE NOTE)
 PAINT: RED LEAD OIL PAINT WITH ZINC

BEAM DETAILS

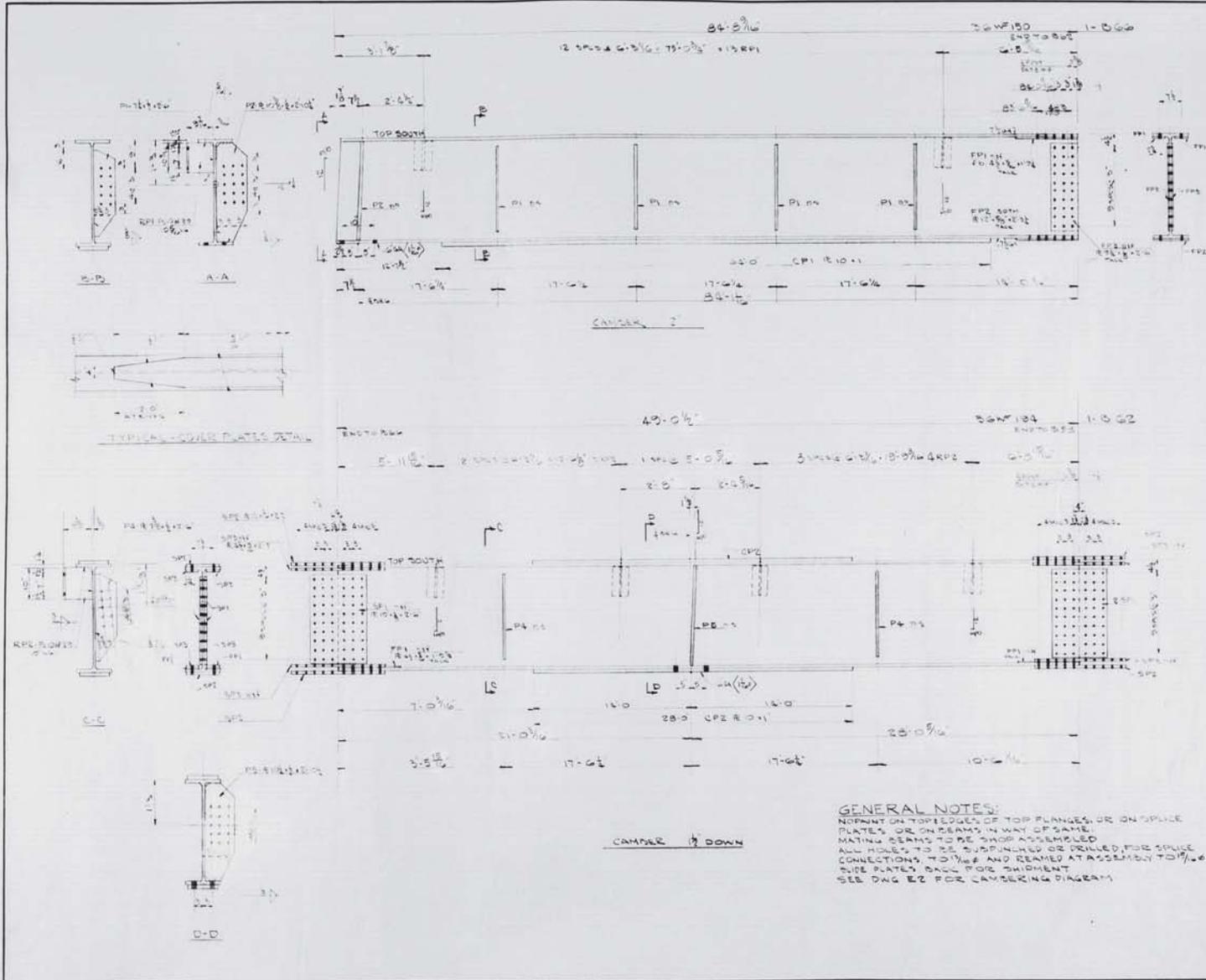
Bancroft & Holden Rolling Mills Company
 South Portland, Maine

NON-SUPPORT BEAMS
 BRIDGE MAIN

CUSTOMER DESIGN POINT 50
 DESIGNER: J.S. J. JONES

ORDER NO. 158224 DWG. NO. 6-425-54

REVISION	DATE	BY



SHIP		BILL OF MATERIAL				DWG. NO. G-425-5-13	
MARK	NO.	MARK	SHAPE	LENGTH	WT.	REMARKS	
B-20	1		36WF150	84'-0 1/2"			
B-20	1		36WF150	49'-0 1/2"			
	4	P1	PL 1/2"	2'-0"			
	2	P4	PL 1/2"	2'-0"			
	1	P2	PL 1/2"	2'-0"			
	1	P5	PL 1/2"	2'-0"			
	4	SP1	SP 1/2"	2'-0"			
	2	SP2	SP 1/2"	2'-0"			
	2	SP3	SP 1/2"	2'-0"			
	2	SP4	SP 1/2"	2'-0"			
	2	SP5	SP 1/2"	2'-0"			
	2	SP6	SP 1/2"	2'-0"			
	2	SP7	SP 1/2"	2'-0"			
	2	SP8	SP 1/2"	2'-0"			
	2	SP9	SP 1/2"	2'-0"			
	2	SP10	SP 1/2"	2'-0"			
	13	R1	R 1/2"	10'-0"			
	7	R2	R 1/2"	10'-0"			

SHOP CONNECTIONS: WELDED
 FIELD CONNECTIONS: 7/8" X 1/2" BOLTS
 HOLES: 7/8" (SEE NOTES)
 PAINT: RED LEAD OIL FREE MS W/SPCC

GENERAL NOTES:
 1. NO POINT ON TOP EDGES OF TOP FLANGES OR ON SPlice PLATES OR ON BEAMS IN WAY OF SAME.
 2. MATING BEAMS TO BE SHOP ASSEMBLED.
 3. ALL HOLES TO BE SUPPLIED OR DRILLED FOR SPlice CONNECTIONS TO 1/8" AND REAMED AT ASSEMBLY TO 1/16" CLEARANCE.
 4. SEE DWG. E2 FOR CAMBERING DIAGRAM.

BEAM DETAILS

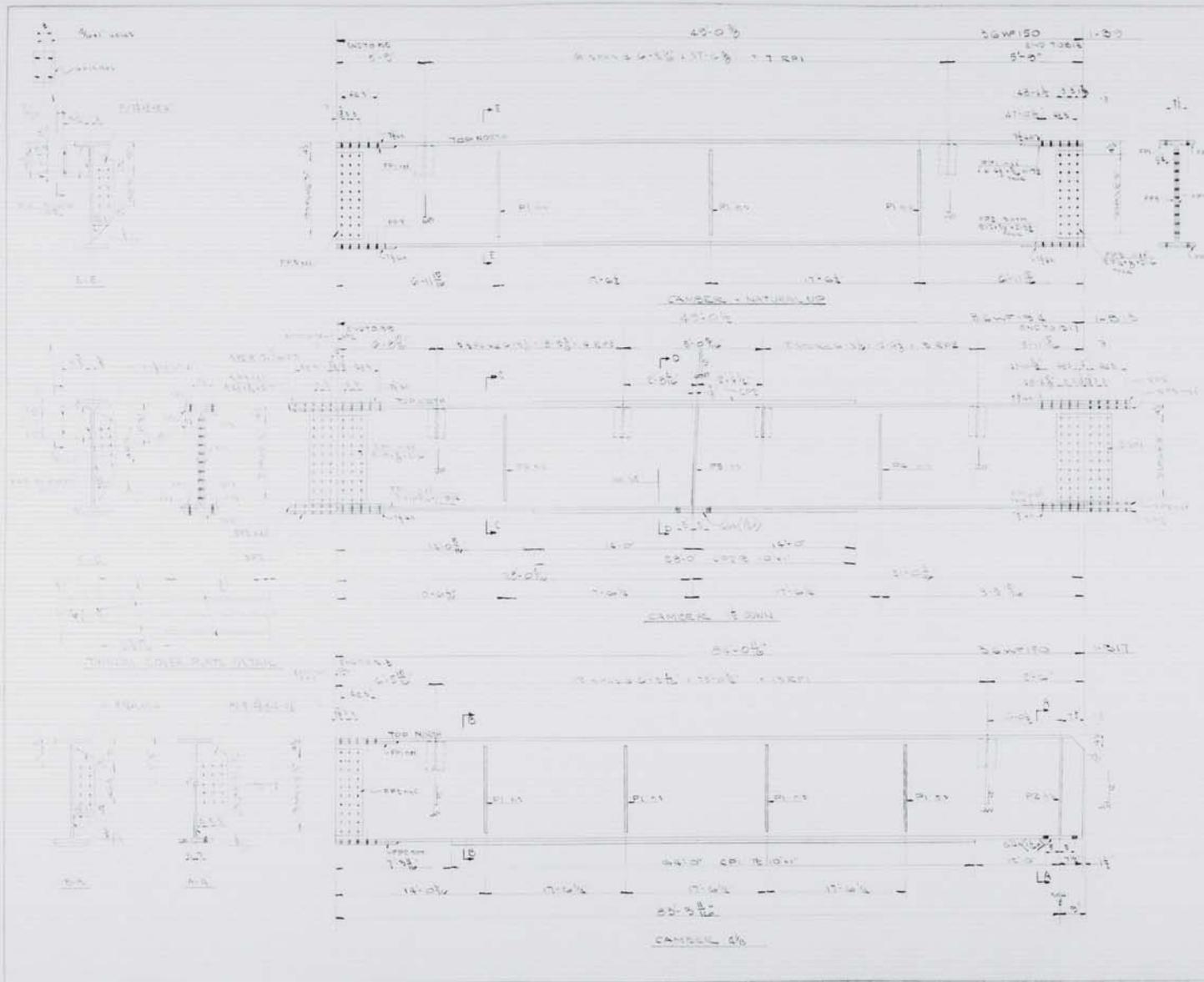
Pennock & Austin Rolling Mill Company
 South Portland, Maine

LONGPORT BEAM
 MODEL MAINE

CUSTOMER SPECIAL CONST. CO.
 DESIGNER: M.S.H. CONST.

DRAWN	...
REVISION	...
REVISION	...
REVISION	...

ORDER NO. 145333 DWG. NO. G-425-5-13
 PRINTED 1-13-53

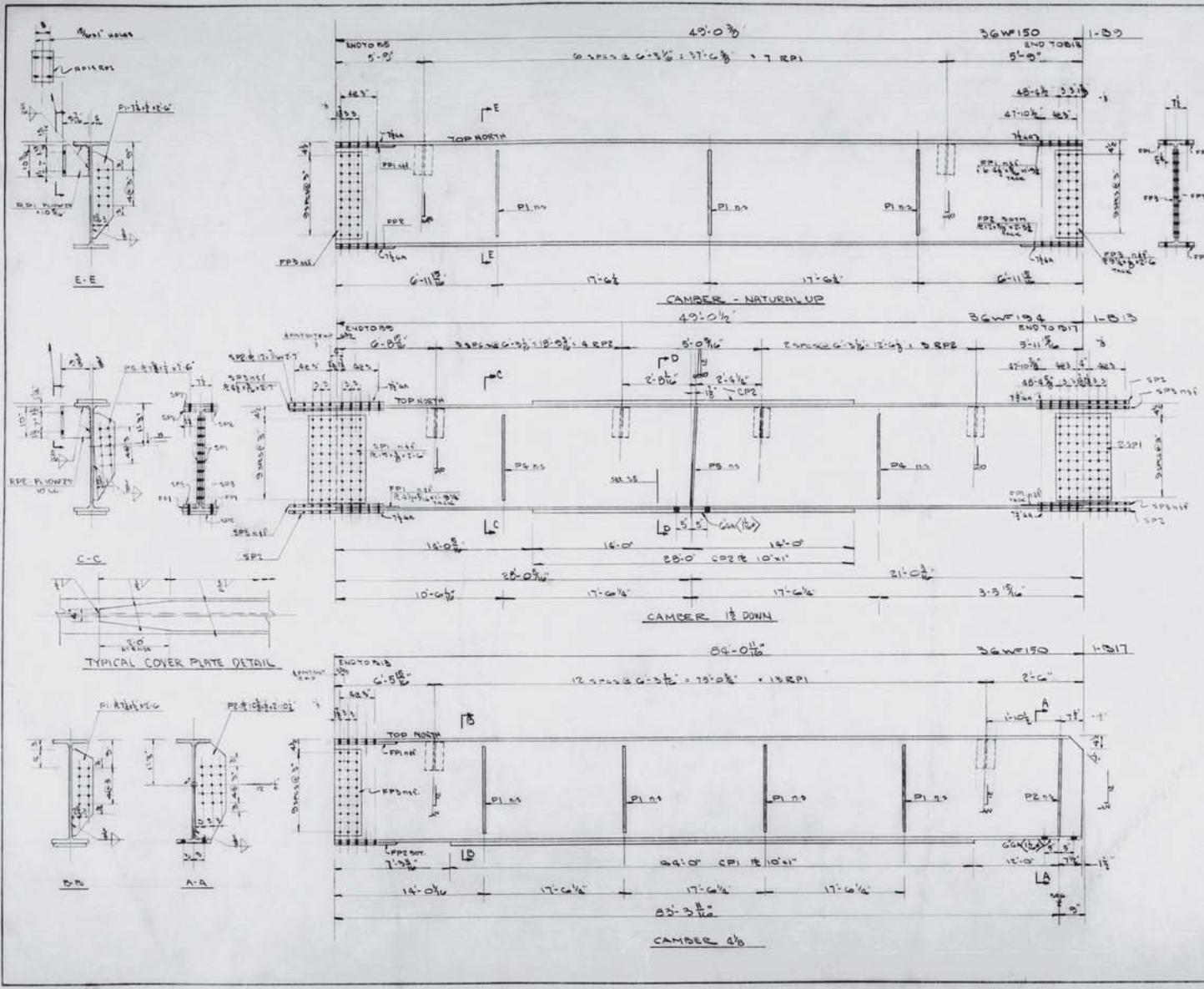


BILL OF MATERIAL		DWD NO. 425-26				
MARK	NO	MARK	SHAPE	AMOUNT	WT.	REMARKS
B-2	1	36WF150	18'0"	1	7155	
B-7	1	4x	14'0"	1	1111	EE
B-13	1	36WF194	42'0"	1	3114	
1	PL	4 1/2x12	2	6	315	MS
2	PL	4 1/2x12	2	6	315	MS
1	PL	4 1/2x12	2	6	315	MS
1	PL	4 1/2x12	2	6	315	MS
4	SP1	4 1/2x12	2	6	315	
4	SP2	4 1/2x12	2	6	315	
2	SP3	4 1/2x12	1	3	157.5	
10	SP4	4 1/2x12	1	3	157.5	
2	SP5	4 1/2x12	1	3	157.5	
4	SP6	4 1/2x12	1	3	157.5	
1	PL	4 1/2x12	2	6	315	MS
2	PL	4 1/2x12	2	6	315	MS
10	SP	4 1/2x12	1	3	157.5	MS
7	SP	4 1/2x12	1	3	157.5	MS

NOT TO SCALE
 ALL DIMENSIONS TO FACE UNLESS NOTED OTHERWISE
 SEE PLAN FOR THE LOCATION OF THE BEAMS

BEAM DETAILS W/
 JOINTS
 JOINTS
 JOINTS





SHIP		BILL OF MATERIAL				DWG NO. 422-56
MARK	NO.	MARK	SHAPE	LENGTH	WT.	REMARKS
B 2	1		36WF150	49' 0 1/2"	1755	
B 17	1		4x	24' 0"	1249	2 E
B 13	1		36WF104	49' 0 1/2"	9514	
	7	P1	2 1/2" x 1/2"	2' 6"	215	4 L
	2	P4	2 1/2" x 1/2"	2' 6"	63	1 L
	1	P2	2 1/2" x 1/2"	2' 10 1/2"	50	5
	1	P5	2 1/2" x 1/2"	2' 10 1/2"	50	5
	4	SP1	2 1/2" x 1/2"	2' 6"	242	
	4	SP2	2 1/2" x 1/2"	2' 7"	185	
	8	SP3	2 1/2" x 1/2"	2' 7"	178	
	10	FP1	2 1/2" x 1/2"	1' 2 1/2"	55	
	3	FP2	2 1/2" x 1/2"	2' 3 1/2"	174	
	6	FP3	2 1/2" x 1/2"	2' 6"	59	
	1	CPI	2 1/2" x 1/2"	24' 0"	2176	4 I
	2	CP2	do	28' 0"	1904	2 L
	20	RPI	1/2" x 10" x 20"	10 1/2"	478	17 O
	7	RPT	do	10'	164	5 T
WT. STEEL					35526	27.3
WELD						
			1/2" x 1/2"	26'	11	
			1/2" x 1/2"	59'	14	
			1/16" x 1/2"	217'	56	
					71	
GROSS WT.					35527	
NET WT.					429	
TOTAL WT.					35198	

SHOP CONNECTIONS: WELDED
 FIELD CONNECTIONS: 3/8" x 1/2" TYP. WELDS
 HOLES: 1/4" UNLESS NOTED - SEE NOTES 1, 2
 PAINT: RED LEAD & OIL DEC. HIGH SOLIDS
 SEE NOTES DWG 42

BEAM DETAILS (PART)

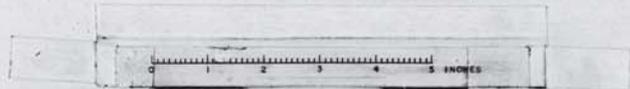
Benwood's Union Bridge & Mill Company
South Portland, Me.

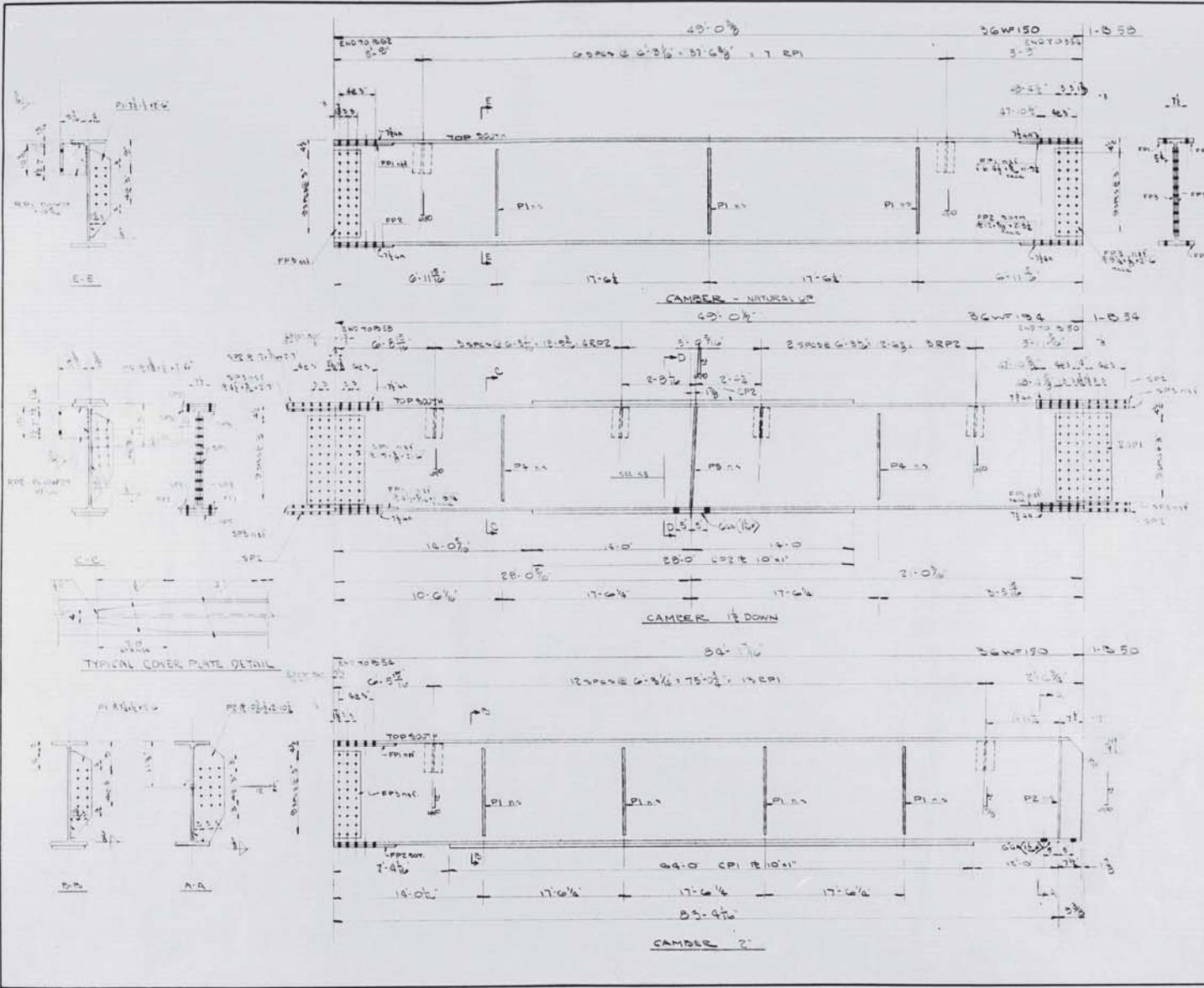
LONGPORT BEAMS
BRIDGE - MAINE

WTS - 1.14.18
 DRAWN: E.S.
 REVISION: 10-20-97
 REVISION:
 REVISION:

CUSTOMER: BRIDGE CONST. CO.
 DESIGNER: M.E.S.H. COOMBS

ORDER NO. 123456 DWG NO. 422-56
 DETAILS APPROVED 11-1-97





SHIP		BILL OF MATERIAL				DWG. NO. G-425-5	
MARK	NO	MARK	SHAPE	LENGTH	WT.	REMARKS	REMARKS
B58	1		36WF150	43'-0"			
B59	1		do	24'-0"			
B54	1		36WF134	43'-0"			
		7	PL 1/2" x 1/2"	2	6		
		2	PL 1/2" x 1/2"	2	6		
		1	PL 1/2" x 1/2"	2	10 1/2		
		1	PL 1/2" x 1/2"	2	10 1/2		
		4	SP1 1/2" x 1/2"	2	6		
		4	SP2 1/2" x 1/2"	2	7		
		8	SP3 1/2" x 1/2"	2	7		
		10	EPI 1/2" x 1/2"	1	2 1/2		
		3	EP2 1/2" x 1/2"	2	3 1/2		
		6	EP3 1/2" x 1/2"	2	6		
		1	CP1 1/2" x 1/2"	24	0		
		2	CP2 1/2" x 1/2"	24	0		
		20	RP1 1/2" x 1/2"	10 1/2			
		7	RP2 1/2" x 1/2"	10			

SHOP CONNECTIONS: WELDED
 FIELD CONNECTIONS: BOLTED
 HOLES: 1/4" UNLESS NOTED OTHERWISE
 PAINT: SEE LATEST SPECIFICATIONS
 SEE NOTES DWG. 52

TEAM DETAILS

Drawn by: Martin Pelting, H&B Company
South Portland, Maine

JONESPORT BEALS BRIDGE - MAINE

CUSTOMER: BEALS BRIDGE CO.
 DESIGNER: H&B COMPANY

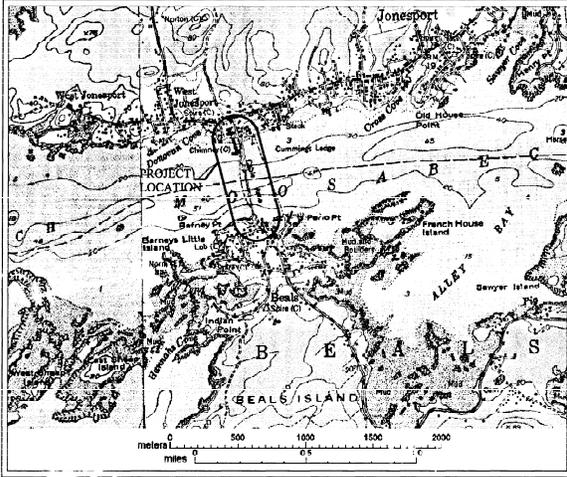
ORDER NO. 123456 DWG. NO. G-425-5

DRAWN		0-1
REVISION		
REVISION		
REVISION		

STATE OF MAINE DEPARTMENT OF TRANSPORTATION

Jonesport - Beals Bridge No. 5500 Fender Repair

PROJECT NO: 6892-00

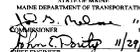


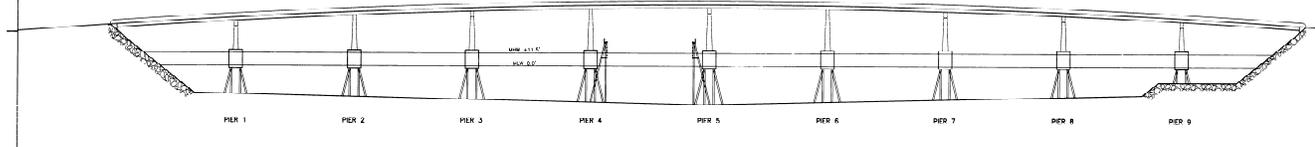
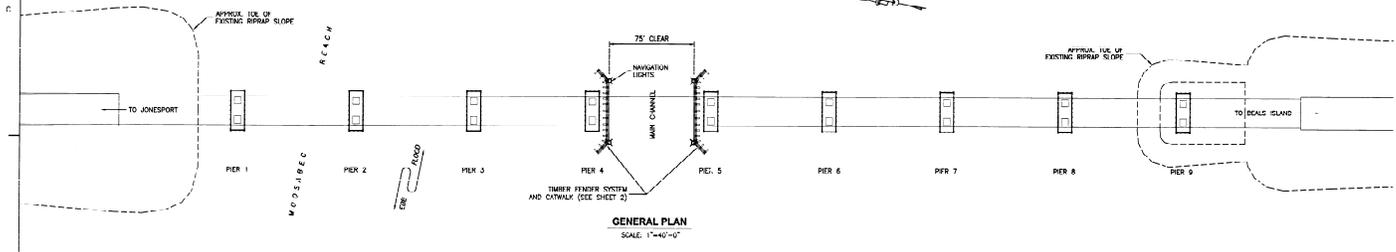
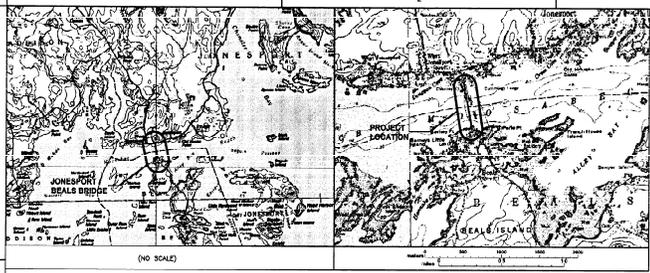
INDEX OF SHEETS

SHEET No.	TITLE
M-001	LOCUS MAP AND SITE PLAN
M-002	EXISTING CONDITIONS / DEMOLITION PLAN AND ELEVATIONS
M-003	EXISTING CONDITIONS / DEMOLITION SECTIONS
M-004	PROPOSED PLAN AND DETAILS


CHILDS ENGINEERING CORPORATION
 BOX 333 WOLFELD, WOLFENBUTTE 03093 U.S.A.
 Phone: (508) 359-8945 Fax: (508) 359-2751
 E-mail: info@childseng.com



APPROVED: STATE OF MAINE
 MAINE DEPARTMENT OF TRANSPORTATION

 J. S. Deity 11/27/01
 CHIEF ENGINEER DATE



DATE: MEAN LOW WATER (MLW) - 0.0'

REFERENCED FROM:
DRAWINGS 6 & 12 OF 21 TITLED:
"JONESPORT - BEALS BRIDGE
OVER
WOODS REACH
IN THE TOWNS OF
JONESPORT AND BEALS
WASHINGTON COUNTY
PIER DESIGN & FENDER SYSTEM"
DATED 1958

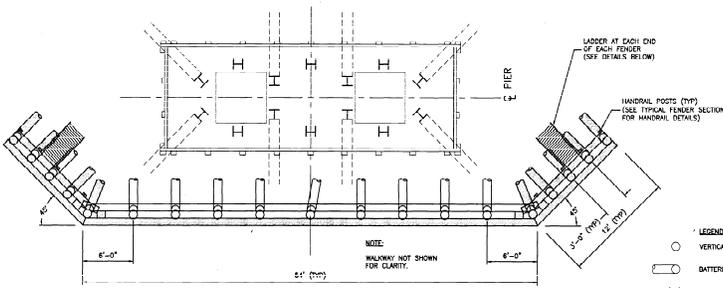
CHILES ENGINEERING CORPORATION
100 S. W. 10TH AVENUE, SUITE 1000, MIAMI, FL 33135
Phone: (305) 371-1111
Fax: (305) 371-1112
www.chileseng.com

PROJECT NO. 11-13-01
SHEET NO. M-001
DATE: 11/13/01

DATE: 11/13/01
SCALE: 1"=40'-0"

PROJECT: JONESPORT - BEALS BRIDGE OVER WOODS REACH IN THE TOWNS OF JONESPORT AND BEALS WASHINGTON COUNTY
PIER DESIGN & FENDER SYSTEM

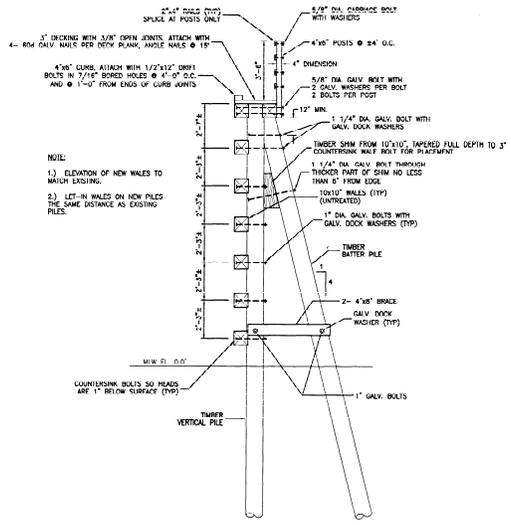
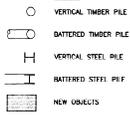
DATE: 11/13/01
SHEET: M-001
OF: 4



TYPICAL PROPOSED PLAN - PIERS #4 & #5

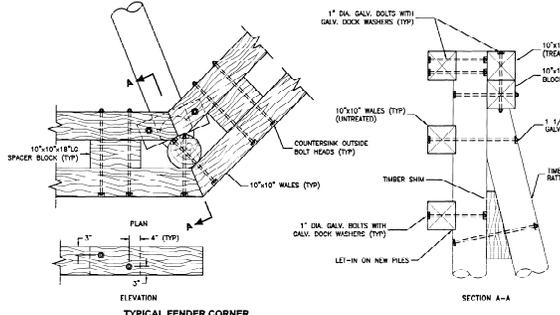
SCALE: 3/16"=1'-0"

NOTE:
ALIGN NEW PILE TO AVOID NEW AND EXISTING FENDER AND BRIDGE PILES.



TYPICAL FENDER SECTION

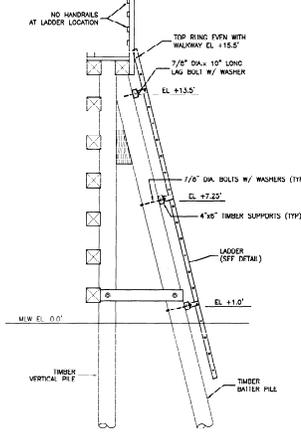
SCALE: 3/16"=1'-0"



TYPICAL FENDER CORNER

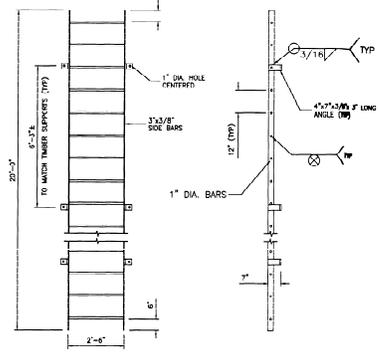
SCALE: 3/4"=1'-0"

SECTION A-A



LADDER ATTACHMENT DETAIL

SCALE: 3/8"=1'-0"



30\"/>

SCALE: 1/2"=1'-0"

CHILDS ENGINEERING CORPORATION
 1100 10th Street, Suite 100
 San Francisco, CA 94103
 Phone: (415) 774-8888 Fax: (415) 774-8889
 E-mail: info@childse.com

PROJECT NO. 17-1700-1-A
 SHEET NO. 17-1700-1-A
 DATE: 11/11/17

DESIGNED BY: J. J. JONES
 CHECKED BY: J. J. JONES
 APPROVED BY: J. J. JONES

DATE: 11/11/17

SCALE: 1/2"=1'-0"

M-004

F.R.E.A. DIST. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	BH-0005(52)	7	14

INDEX OF SHEETS

No	DESCRIPTION
1	GENERAL PLAN
2	SEQUENCE OF CONSTRUCTION AND ESTIMATED QUANTITIES
3	SUPERSTRUCTURE LAYOUT
4-5	SUPERSTRUCTURE DETAILS
6-8	CATHODIC PROTECTION DETAILS

STANDARD DETAILS

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

SPECIFICATIONS

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

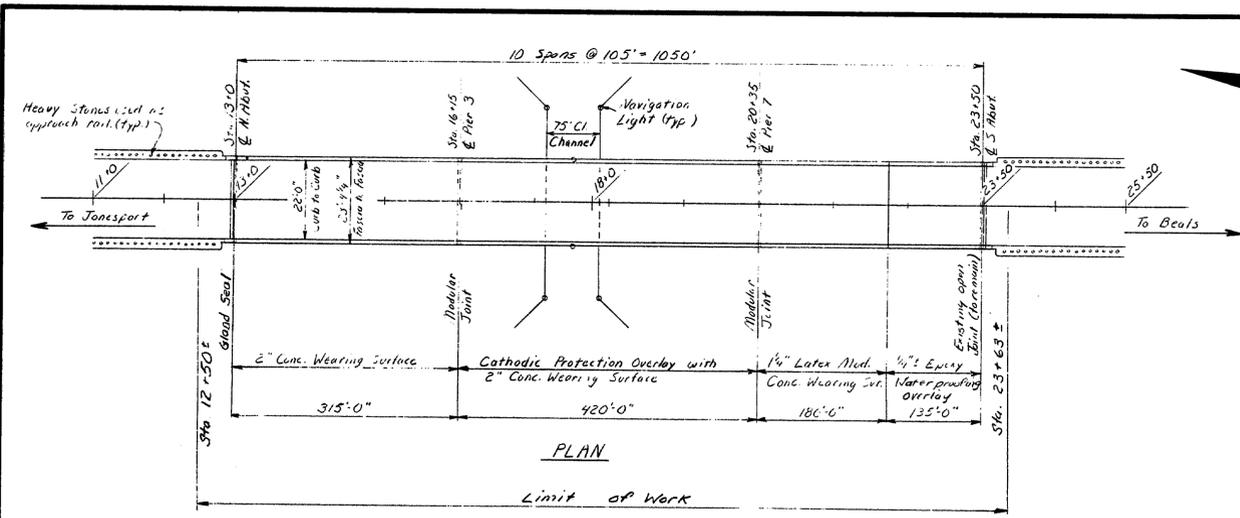
CONTRACT: State of Maine, Department of Transportation Standard Specifications, Highway and Bridges Revision of January, 1984.

MATERIALS

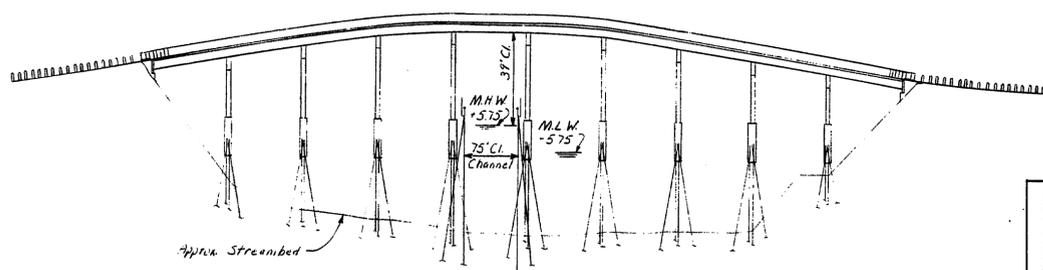
CONCRETE: ----- Class AA (Except as noted)

BASIC ALLOWABLE STRESSES

CONCRETE: f_c = ----- 3000 psi

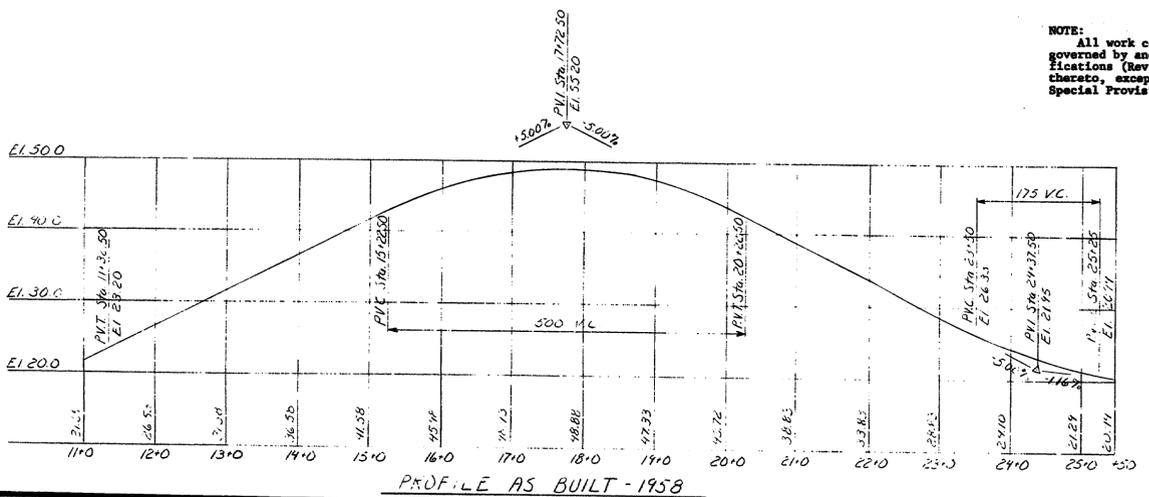


E1.60.0
E1.50.0
E1.40.0
E1.30.0
E1.20.0
E1.10.0
E1.0.0
E1.-10.0
E1.-20.0
E1.-30.0
E1.-40.0
E1.-50.0
E1.-60.0



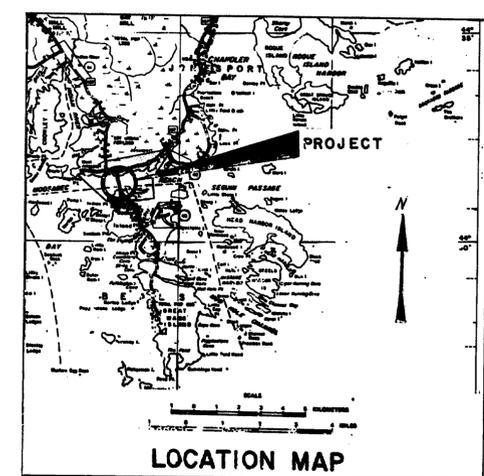
Horizontal Scale of Feet: 0, 50, 100
Vertical Scale of Feet: 0, 10, 20, 30

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 P2.0	30
18 KIP P2.5	33



APPROVED: STATE OF MAINE DEPARTMENT OF TRANSPORTATION
[Signature] 5/14/86
[Signature] 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 7 OF 14 AUGUSTA, MAINE

PROJECT DESIGN ENGINEER	BY	DATE
DESIGN - DETAIL	WLB	5/14/85
CHECKED		7-85
REVISIONS		
FIELD CHANGES		

G 39

BRIDGE 44132 45101

ESTIMATED QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
202.123	SCARIFYING CONCRETE DECK - TOP 1/2 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	LS
516.21	LATEX MODIFIED MORTAR OF CONCRETE WEARING SURFACE ON BRIDGE	1	LS
518.30	REHABILITATION OF STRUC. CONC. SLAB - 70 REINFORCING STEEL	3,400	SF
518.31	REHABILITATION OF STRUC. CONC. SLAB - 70 BELOW REINFORCING STEEL	1,650	SF
519.30	EPoxy WATERPROOFING OVERLAY	500	SF
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

PROJECT ENGINEER	DATE
DESIGN - DETAILED	11-25
CHECKED	11-25
REVISIONS	
FIELD ENGINEER	

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

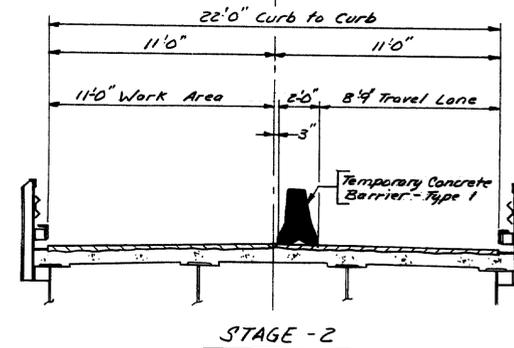
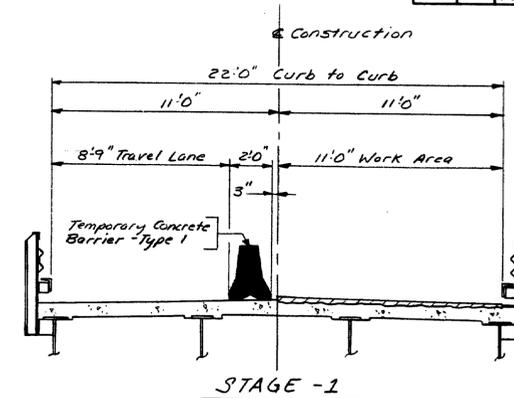
Interval	1	2	3	4	5	6	7
N. Bound Traffic	G	Y	R	R	R	R	G
S. Bound Traffic	R	R	R	G	Y	R	R
Time (seconds)	12	3	35	12	3	35	

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

F.R.L. SHEET NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	BH-0005(52)	2	14



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

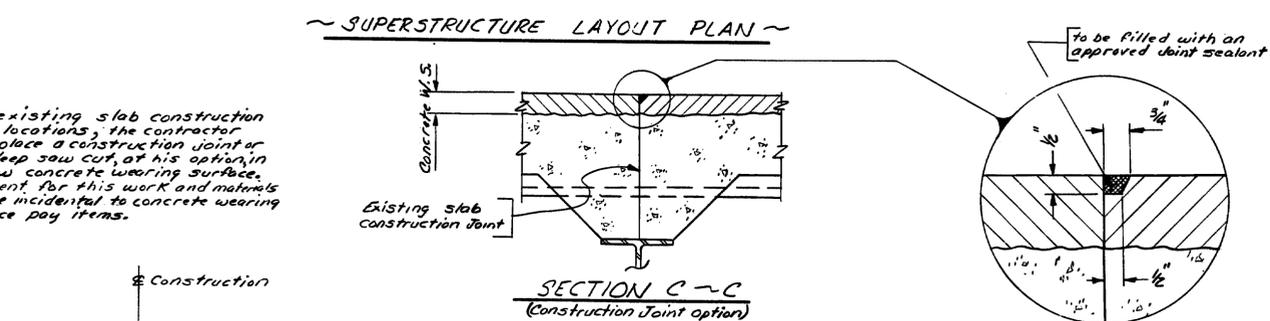
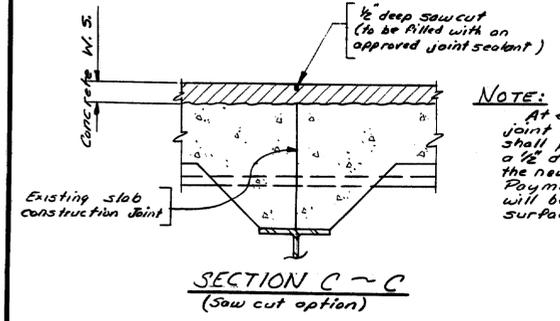
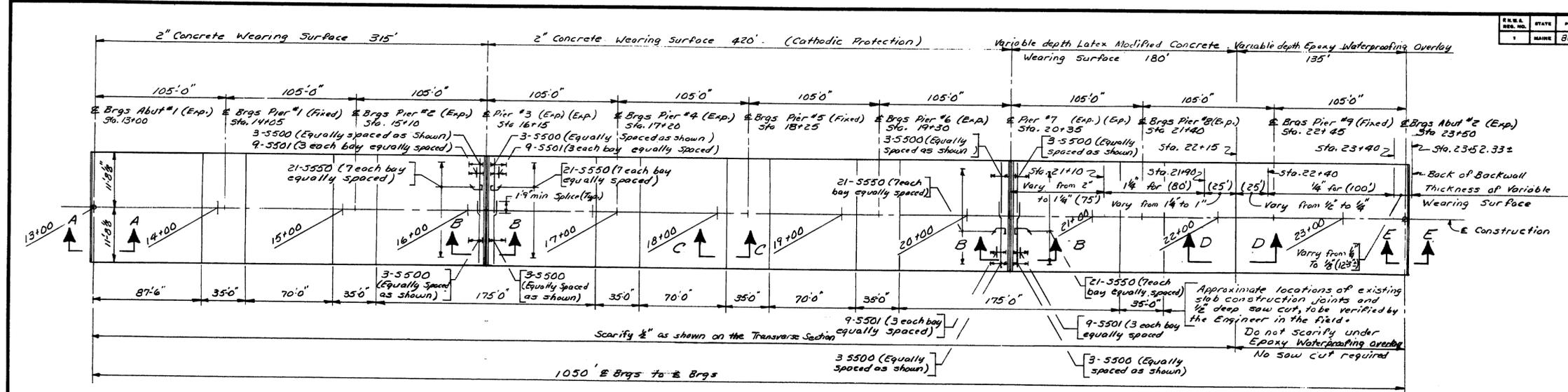
JONESPORT-BEALS BRIDGE
 OVER
 MOOSABEC REACH
 IN THE TOWNS OF
 JONESPORT AND BEALS
 WASHINGTON COUNTY

SEQUENCE OF CONST. & ESTIMATED QUANTITIES
 SHEET 2 OF 14 AUGUSTA, MAINE

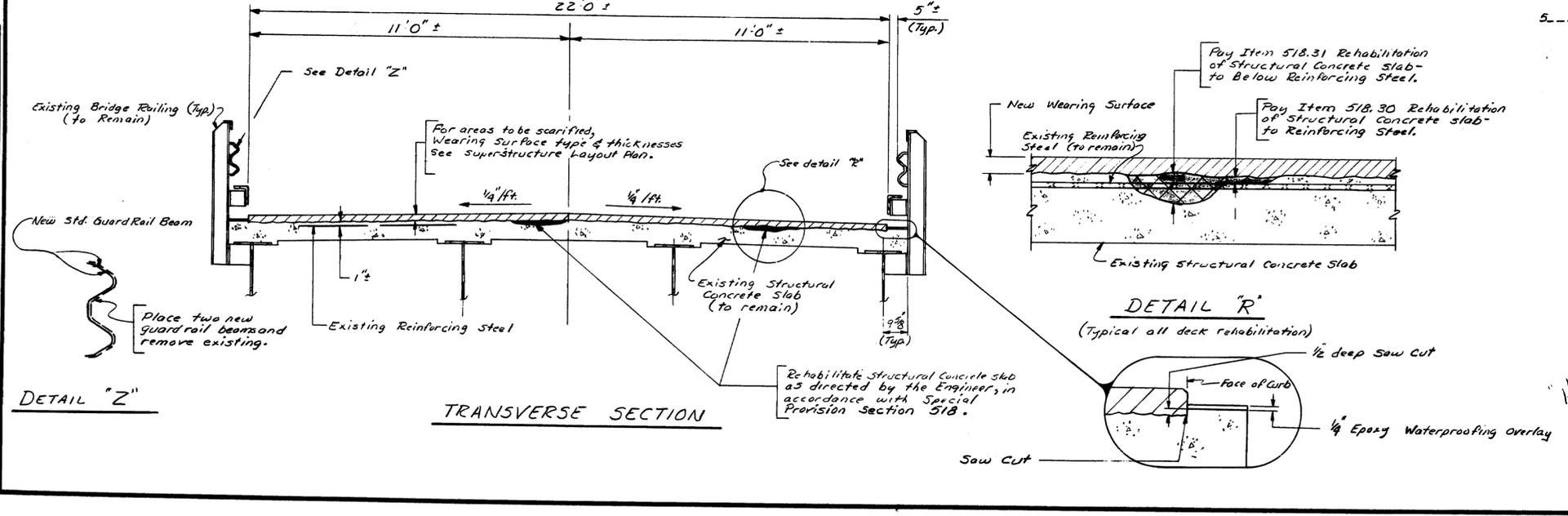
REEL
103

Sh. 101 thru 200

FED. AID DIST. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	BH-005(52)	3	14



- SUPERSTRUCTURE NOTES**
- Reinforcing steel shall have two inches minimum cover unless otherwise indicated.
 - At all concrete wearing surface longitudinal construction joints, brush joint with neat cement paste before making adjacent concrete placement.
 - 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.
 - 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 606.17B, Guard Rail Beam.
 - 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.



103-101

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

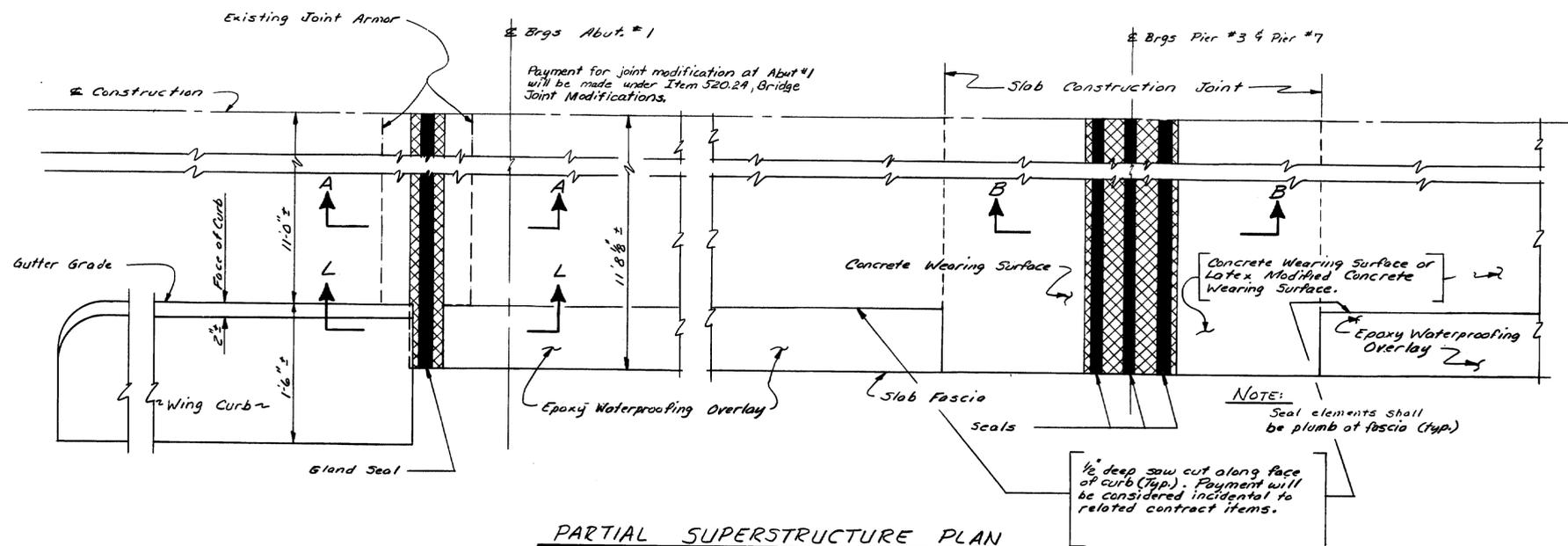
JONESPORT-BEALS BRIDGE
OVER
MOOSABEC REACH
IN THE TOWNS OF
JONESPORT AND BEALS
WASHINGTON COUNTY
SUPERSTRUCTURE LAYOUT
SHEET 3 OF 14 AUGUSTA, MAINE

DATE	BY	REVISIONS
10-15-58	RIN	DESIGN - DETAILED
3-58	GOT	CHECKED
		FIELD CHANGES

PLANS

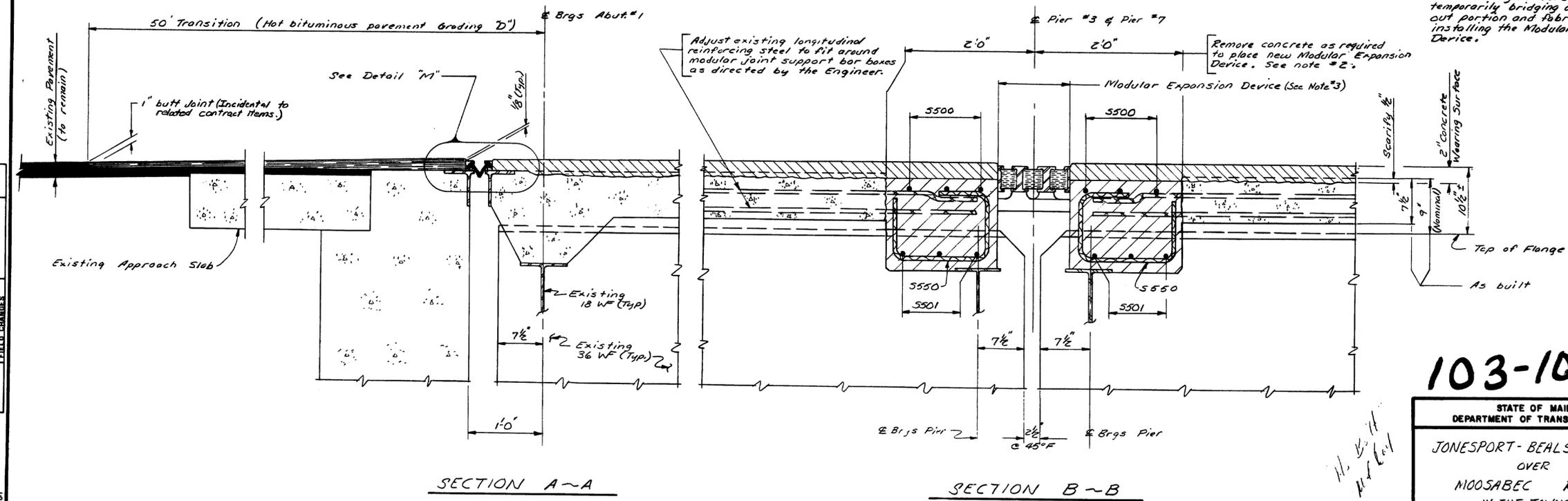
DRAWING NO. 103-101

F.R.D. DIST. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	BH-0005(92)	4	14



PARTIAL SUPERSTRUCTURE PLAN

- NOTES**
- 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
 - 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.
 - 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 532.06, 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.



SECTION A-A

SECTION B-B

PROJECT DESIGN ENGINEER	DATE
DESIGN - DETAILED	10-85
REVISIONS	3-86
FIELD CHANGES	
BY	BY
WJC	R/W
6727	
PLANS	

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

P.R. & S.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	BH-0003(52)	5	14

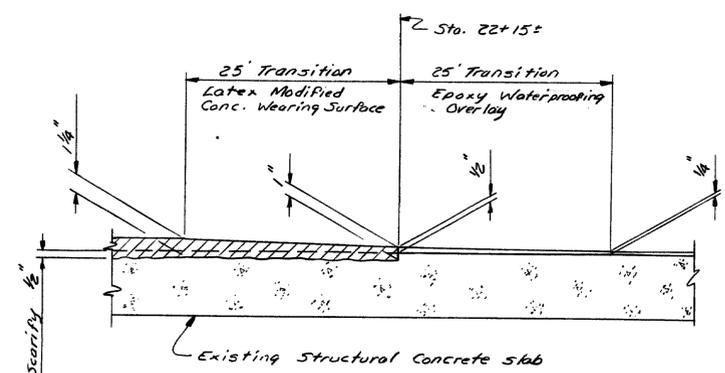
REINFORCING STEEL SCHEDULE			
STRAIGHT BARS			
Mark	Qty.	Length	Location
S500	24	14'-0"	Transverse
S501	36	6'-8"	Transverse
BENT BARS			
S550	84	3'-7" haunch	

S550

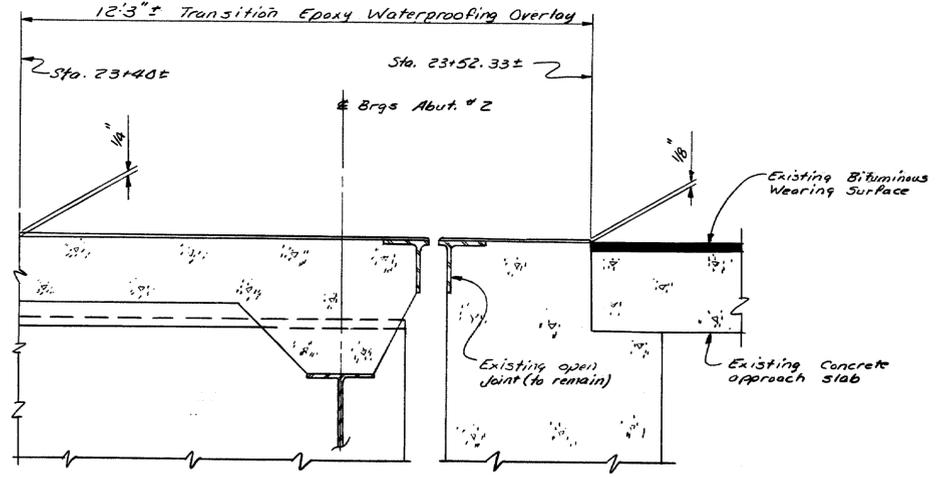
 Note: Dimensions are out to out of bars

 ASTM A615, Grade 60

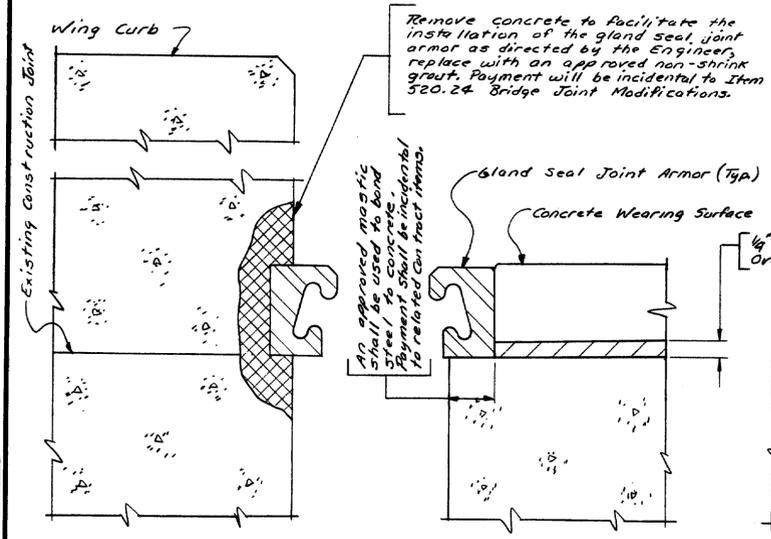
 All bars are #5 bars



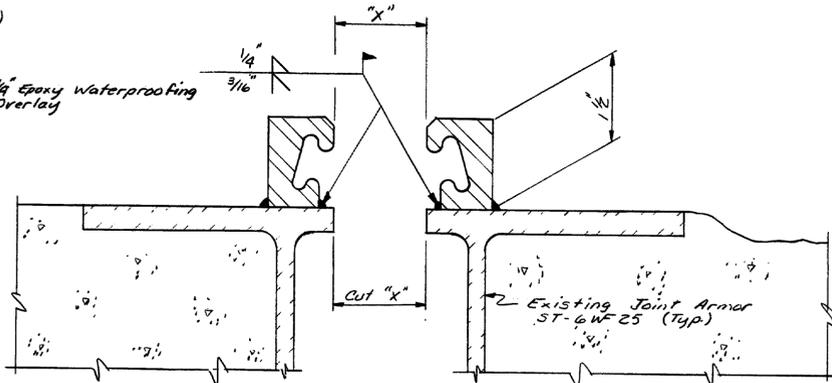
SECTION D~D



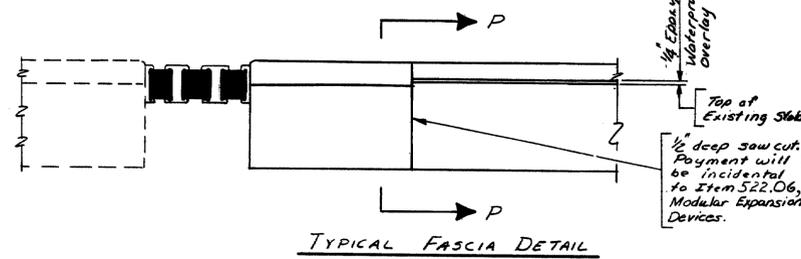
SECTION E~E



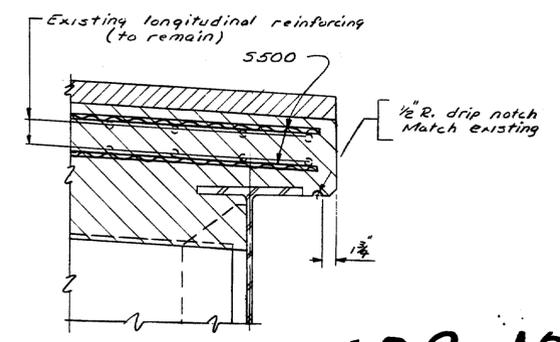
SECTION L~L



DETAIL "M"



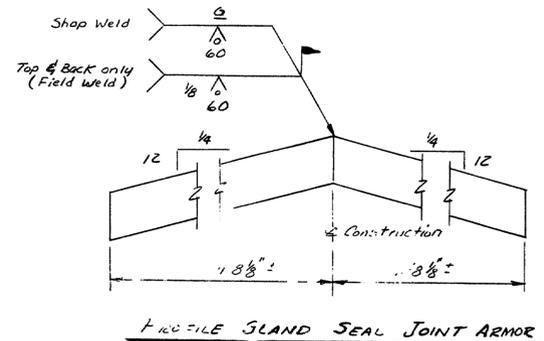
TYPICAL FASCIA DETAIL



SECTION P~P

TOTAL MOVEMENT REQUIRED "X"	Dim "X" Measured Parallel to \pm of Roadway Temperature ($^{\circ}$ 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).

103-103

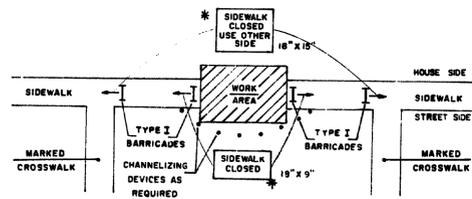
STATE OF MAINE
 DEPARTMENT OF TRANSPORTATION
 JONESPORT-BEALS BRIDGE
 OVER
 MOOSABEC REACH
 IN THE TOWNS OF
 JONESPORT AND BEALS
 WASHINGTON COUNTY
 SUPERSTRUCTURE DETAILS
 SHEET 5 OF 14 AUGUSTA, MAINE

PROJECT DESIGN ENGINEER	DATE
DESIGN - DETAILED	11-85
CHECKED	R/LN
REVISIONS	3-86
FIELD CHANGES	
PLANS	

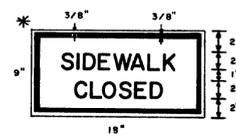
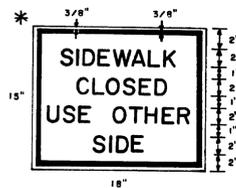
MAINE STATE ROUTE 101

F.R.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	84-0005(52)	12	14

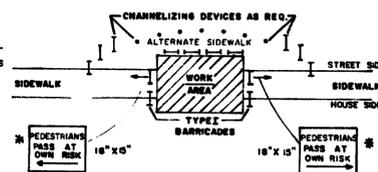
* NON-REFLECTORIZED WHITE BACKGROUND, BLACK TEXT AND BORDER-2" SERIES C UPPER CASE LETTERS



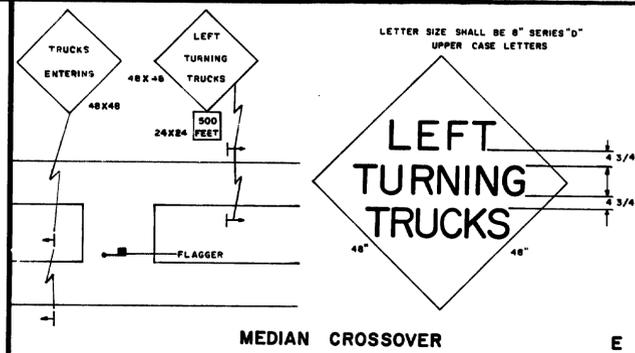
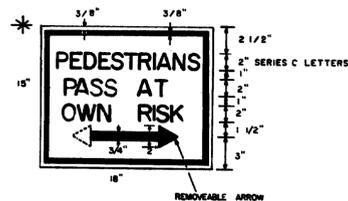
SIDEWALK CLOSURE WITHOUT ALTERNATE SIDEWALK



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

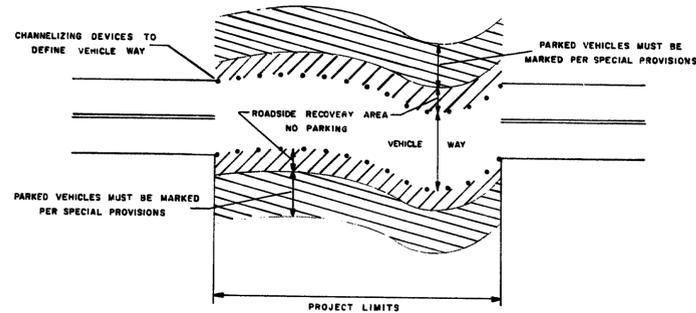


SIDEWALK CLOSURE WITH ALTERNATE SIDEWALK



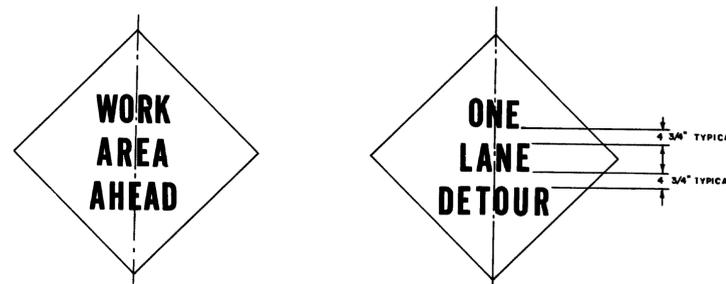
MEDIAN CROSSOVER

ALL DIMENSIONS AND OTHER REQUIREMENTS AS SPECIFIED IN THE SPECIAL PROVISIONS



ROADSIDE RECOVERY AREA

CONSTRUCTION WARNING SIGN DETAIL



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

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 consistent 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., 45 MPH = 45 feet
 - (c) In all areas not covered above maximum spacing shall be as follows:

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

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

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

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.

PROJECT NUMBER	DATE
DESIGNER	
CHECKED	
REVISIONS	
FIELD CHANGER	

PLANS

103-104

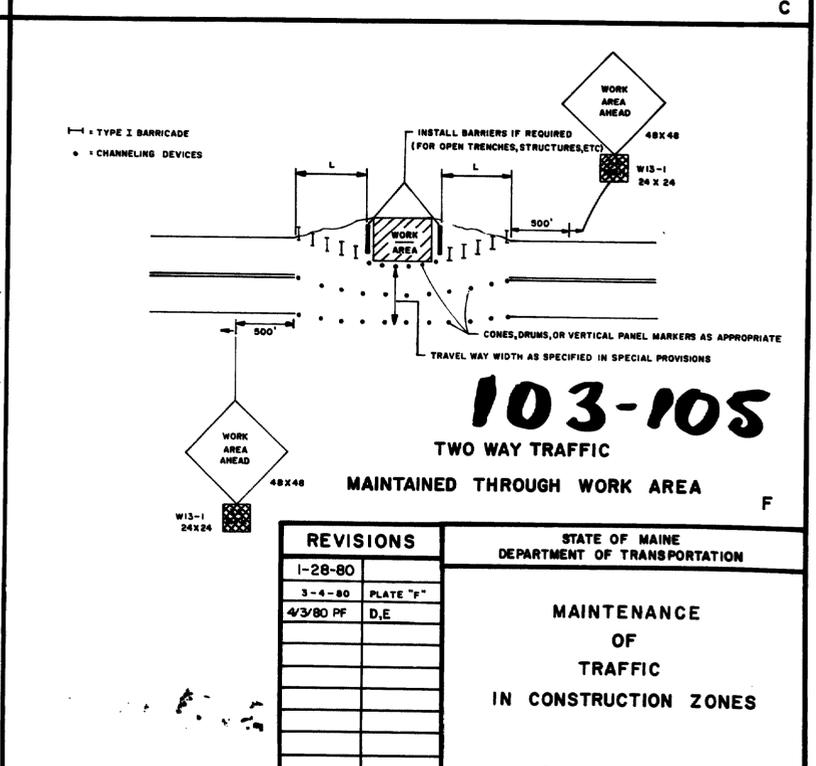
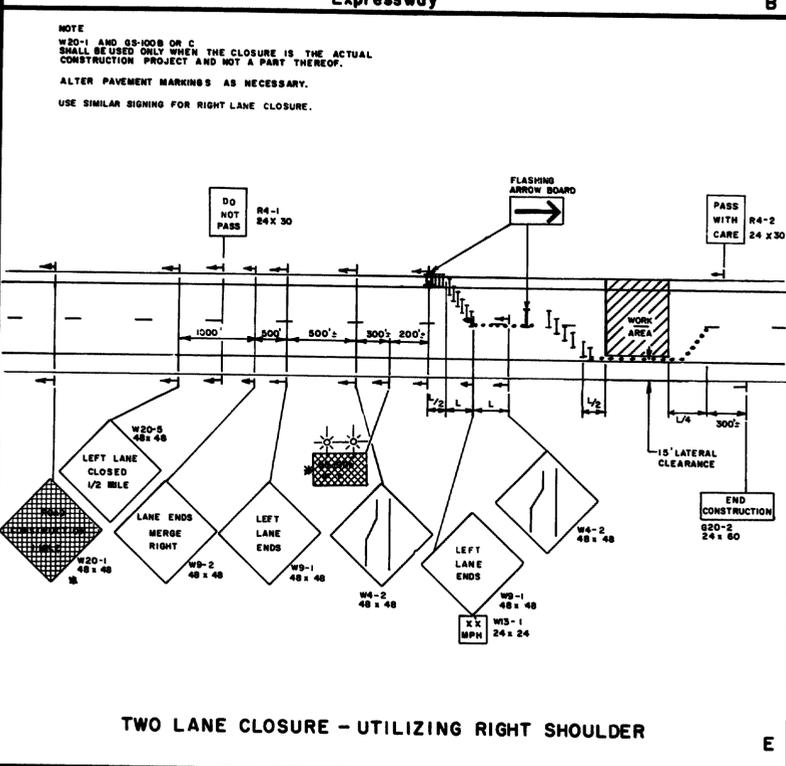
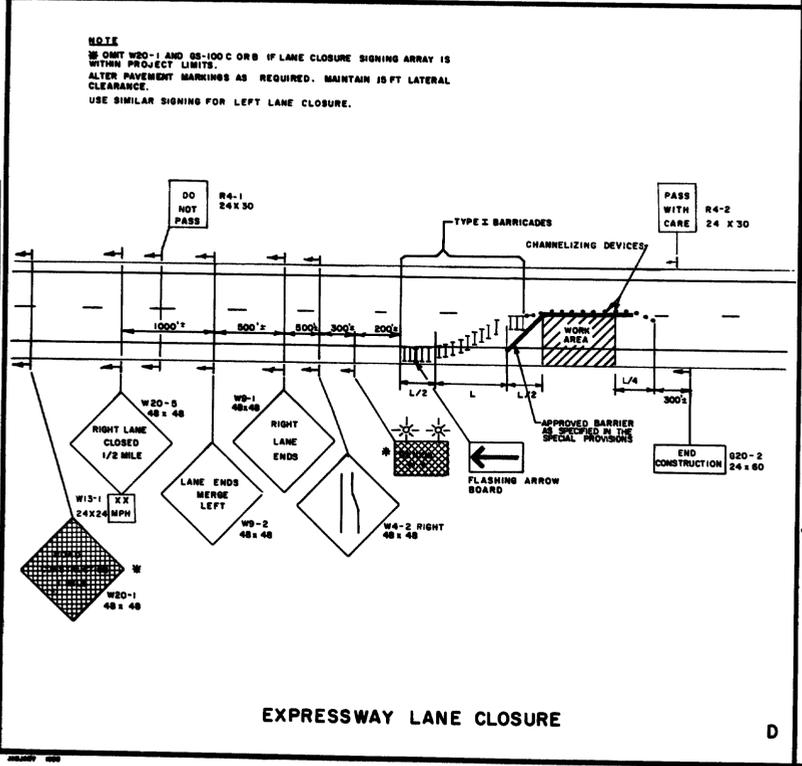
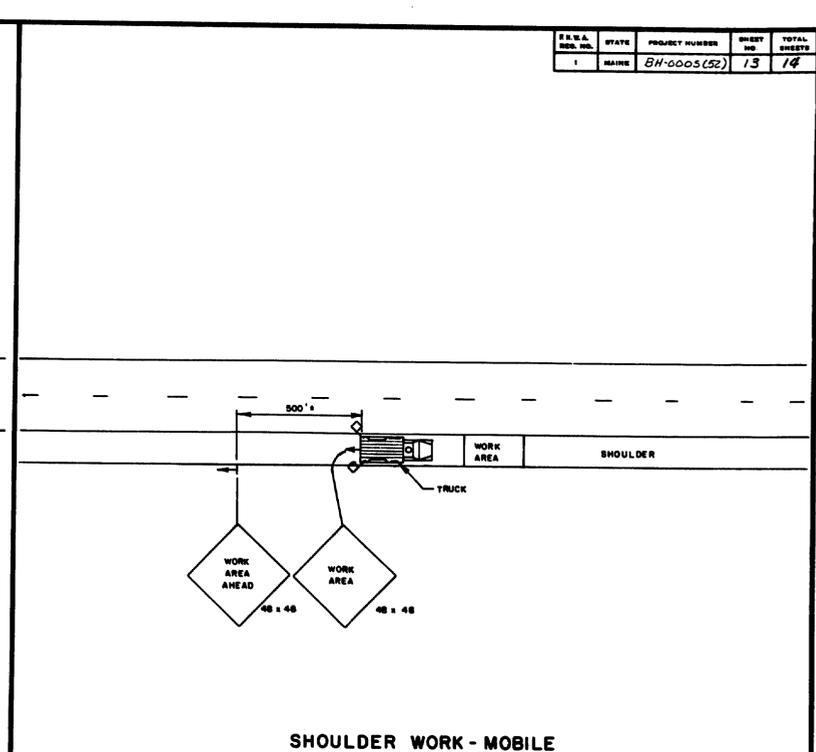
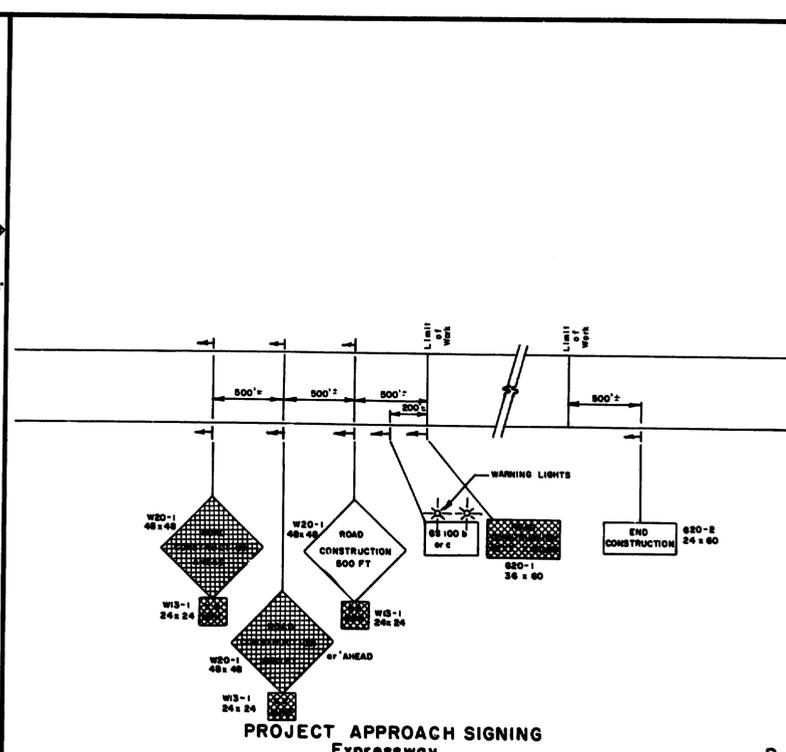
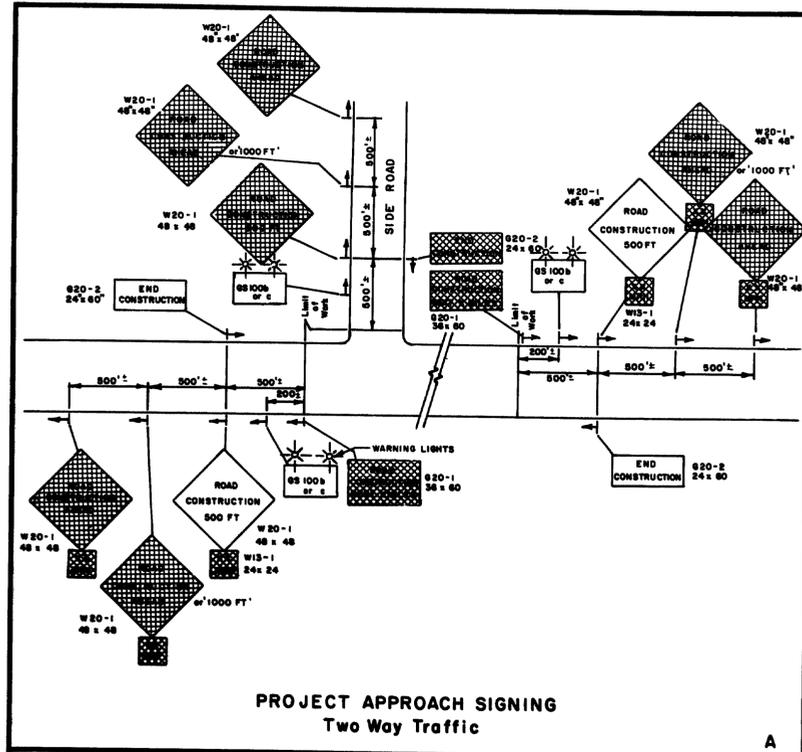
REVISIONS	
3-4-80	GENERAL NOTES
4/3/80 PF	A,B,C,GN

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC IN CONSTRUCTION ZONES

SHEET 1 OF 3 AUGUSTA, MAINE

F.R.S.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	BH-0005(52)	13	14



NOTE
 Omit W20-1 and W20-2 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.

NOTE
 W20-1 and W20-2 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.

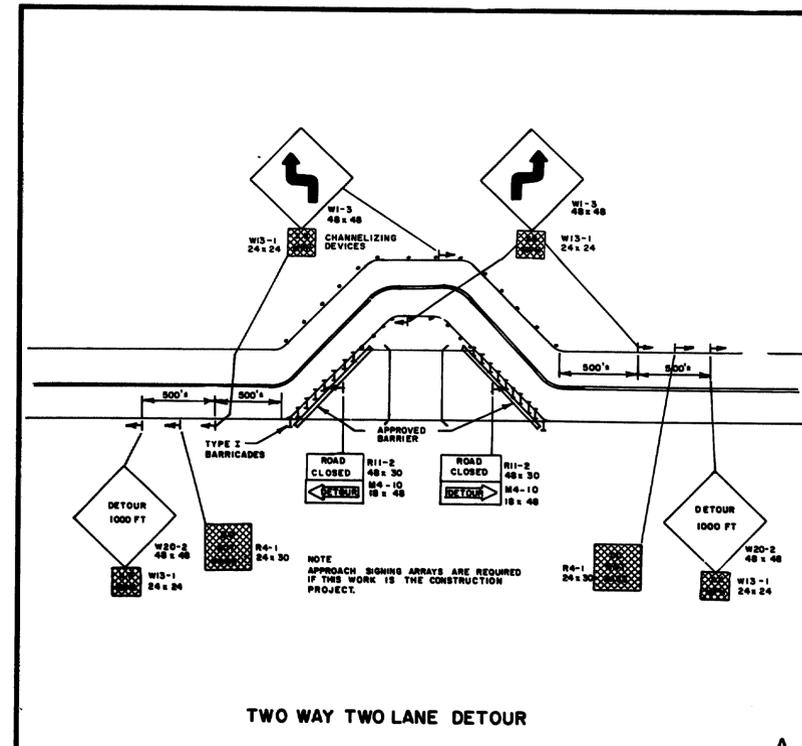
PROJECT NUMBER	DATE
BY	
DESIGN - DETAILED	
REVISIONS	
FIELD CHANGES	
PLANS	

REVISIONS	
1-28-80	
3-4-80	PLATE "F"
4/3/80 PF	D,E

STATE OF MAINE
 DEPARTMENT OF TRANSPORTATION

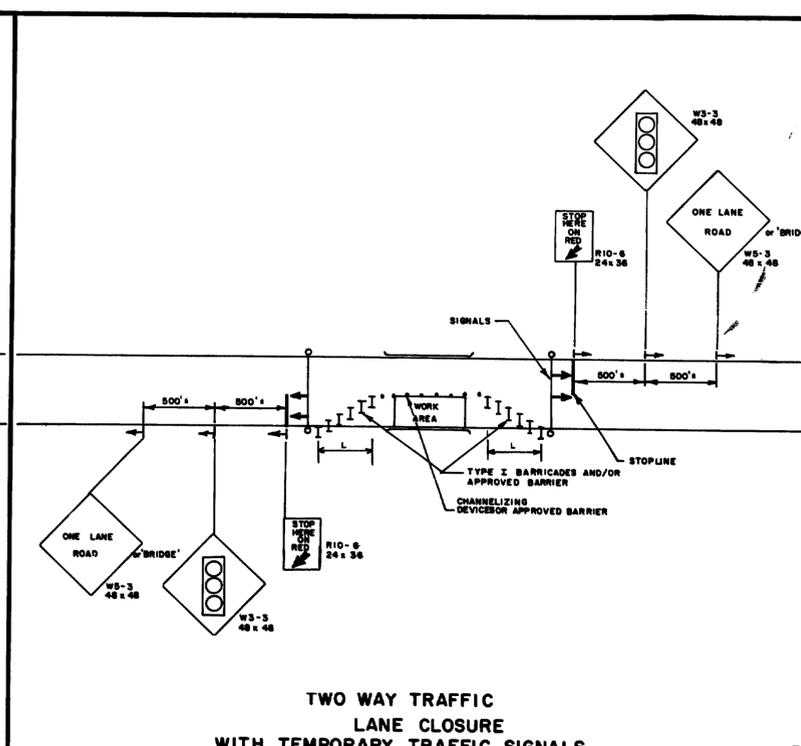
MAINTENANCE OF TRAFFIC IN CONSTRUCTION ZONES

F.R.A. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	BH-000.5(52)	14	14



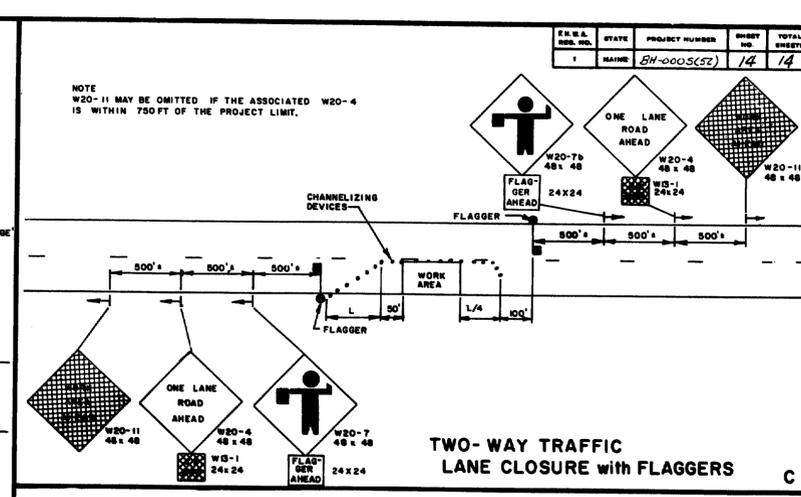
TWO WAY TWO LANE DETOUR

A



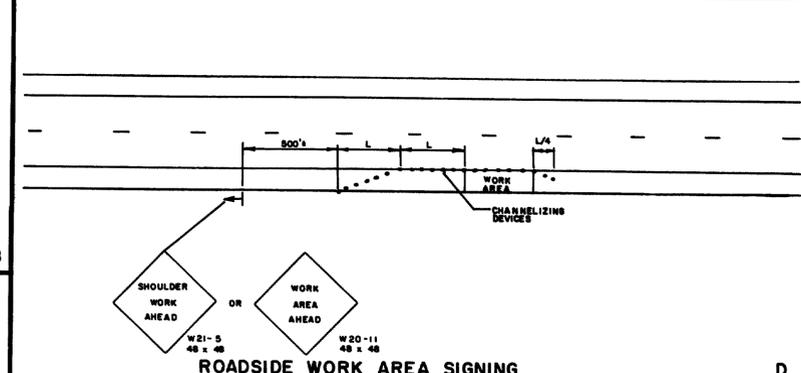
TWO WAY TRAFFIC LANE CLOSURE WITH TEMPORARY TRAFFIC SIGNALS

B



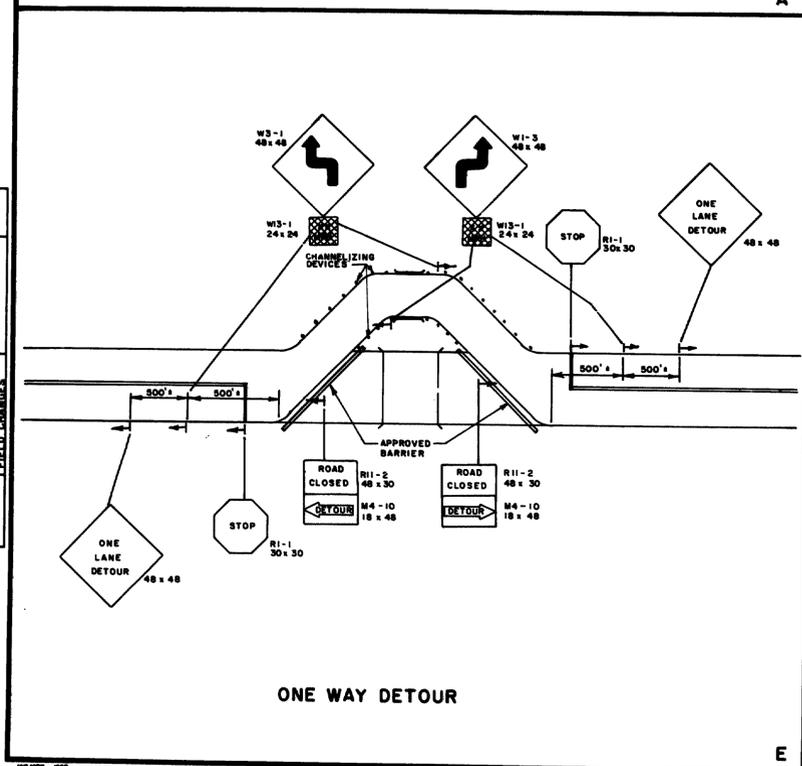
TWO-WAY TRAFFIC LANE CLOSURE with FLAGGERS

C



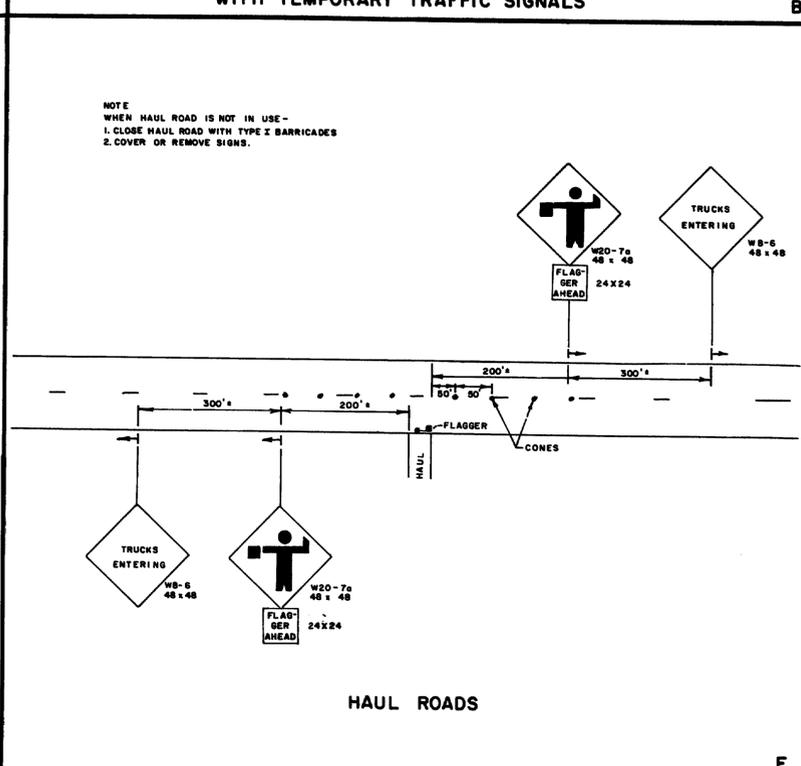
ROADSIDE WORK AREA SIGNING

D



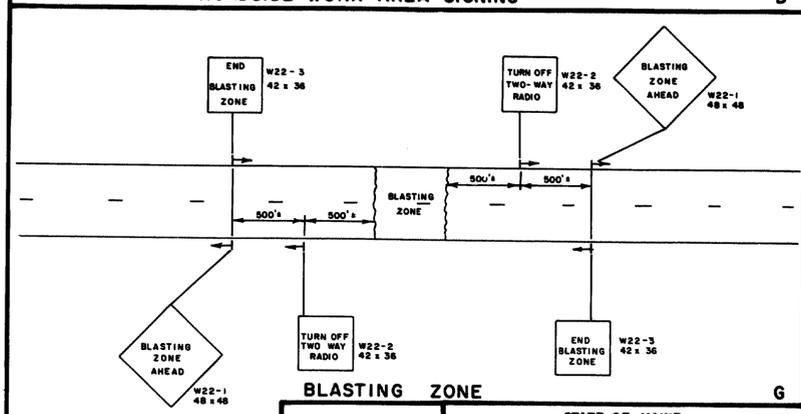
ONE WAY DETOUR

E



HAUL ROADS

F



BLASTING ZONE

G

NOTE: SIMILAR SIGN SEQUENCE SHALL BE ERECTED ON ALL SIDE ROADS WITHIN 1000 FT OF THE BLASTING ZONE.

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

PROJECT ENGINEER	DATE
DRAWN	
CHECKED	
REVISIONS	
FIELD CHANGES	

PLANS

APPENDIX H

Hydraulic Data



Project: Beals - Jonesport

Project # 55029.00

Location: Beals - Jonesport

Sheet 1 of 2

Calculated by: JAW

Date: 3/16/2015

Checked by: RSB

Date: 5/28/2015

Title Hydraulic Opening and Clearance

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	46,331 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 $[(7.75' + 7.75'/2)(2\%)(2) = 2.79']$
 2" haunch

87.04' = 7.25'



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 MMW

PGL $\hat{=}$ 52.0 @ NAV. CHANNEL 51.89

Beams = 71"

Launch = 2.5" \pm 2"

Deck = 8"

Pave + Memb = 3.25"

X-slope = $1.5 \times 7.75' \times 0.02 \times 12 = 2.8"$

Total Depth = 88" = 7.3' 7.13

CLR @ MMW = 52.0 (PGL)
- 7.3 (SuperDepth)
- 5.9 (MMW)

38.8

38.9

\rightarrow Need to keep @ Existing!
 ≈ 39 FT * Agreed

* Adjust Profile Slightly in Final Design if necessary.



Vanasse Hangen Brustlin, Inc.

Estimate

Project: _____ Project #: 55029
 Location: Jonesport/Beals Sheet: 1 of 1
 Calculated by: TJC Date: 6/9/2014
 Checked by: [Signature] Date: 8/22/2014
 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)	→	0.38 -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.

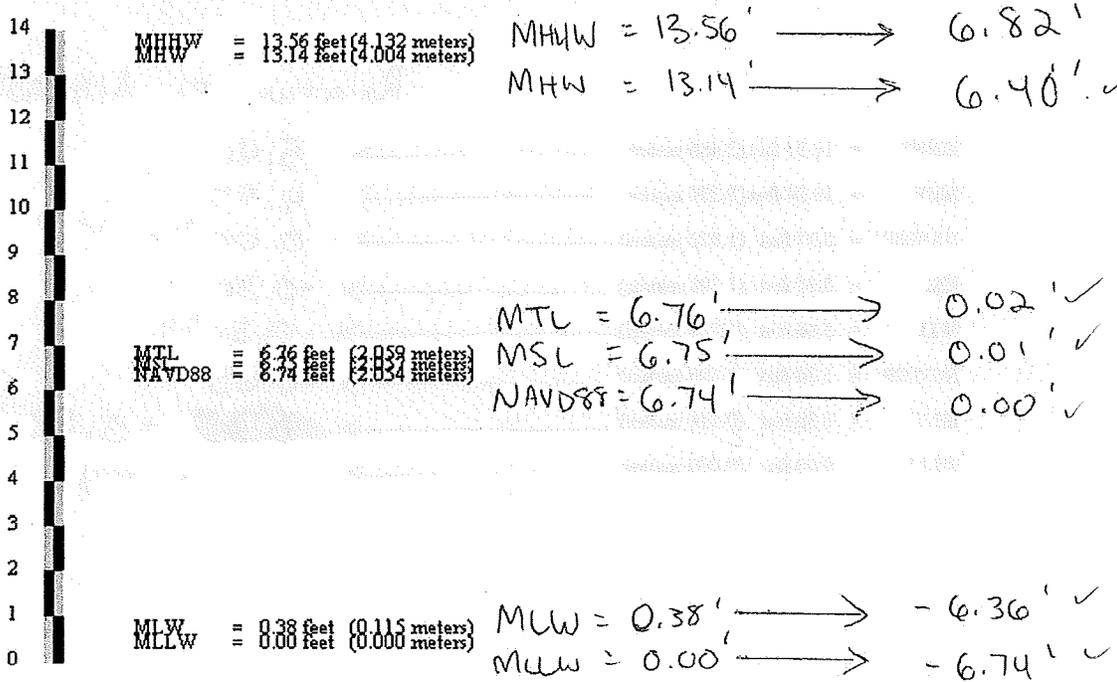
Tidal Elevation - Cutler Naval Base

- [NGS Home](#)
- [About NGS](#)
- [Data & Imagery](#)
- [Tools](#)
- [Surveys](#)
- [Science & Education](#)

[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



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

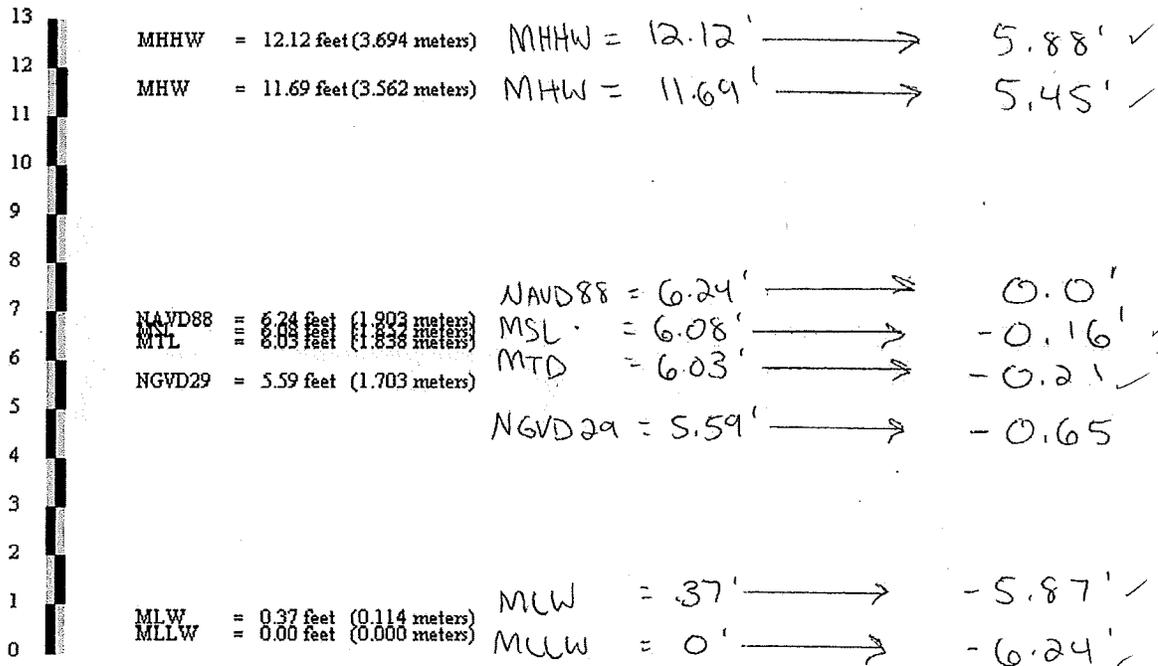
- [NGS Home](#)
- [About NGS](#)
- [Data & Imagery](#)
- [Tools](#)
- [Surveys](#)
- [Science & Education](#)

[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



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

[PRODUCTS](#) (/products.html) Data, Analyses, and Publications
 [PROGRAMS](#) (/programs.html) Serving the Nation
 [EDUCATION](#) (/education.html) Tides, Currents, and Predictions
 [HELP & ABOUT](#) (/about.html) Info and how to reach us

Home (/) / Products (products.html) / Datums (stations.html?type=Datums) / 8411060 Cutler Farris Wharf, ME

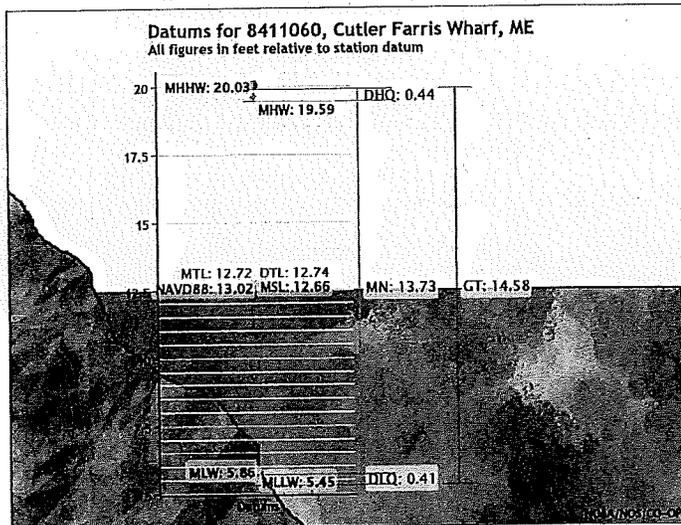
[Station Info](#)
[Tides/Water Levels](#)
[Meteorological Obs. \(/met.html?id=8411060\)](#)
[Phys. Oceanography \(/physocean.html?id=8411060\)](#)

Datums for 8411060, Cutler Farris Wharf ME

Elevations on Station Datum

Station: 8411060, Cutler Farris Wharf, ME	T.M.: 75 W	
Status: Accepted (Feb 1 2013)	Epoch: (/datum_options.html#NTDE) 1983-2001	
Units: Feet	Datum: STND	
Datum	Value	Description
MHHW (/datum_options.html#MHHW)	20.03	Mean Higher-High Water
MHW (/datum_options.html#MHW)	19.59	Mean High Water
MTL (/datum_options.html#MTL)	12.72	Mean Tide Level
MSL (/datum_options.html#MSL)	12.66	Mean Sea Level
DTL (/datum_options.html#DTL)	12.74	Mean Diurnal Tide Level
MLW (/datum_options.html#MLW)	5.86	Mean Low Water
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

NAVD88
 ✓ 7.01'
 ✓ 6.57'
 ✓ -0.3'
 ✓ -0.36'
 ✓ -7.16'
 ✓ -7.57'



Showing datums for 8411060 Cutler Farris Wharf,...

Data Units Feet Meters
 Epoch Present (1983-2001) Superseded (1960-1978)

Submit



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

$$MLLW = -1.77 \text{ m} \checkmark \rightarrow -5.8071 \text{ ft} \checkmark$$

$$MLW = -1.05 \text{ m} \checkmark \rightarrow -5.4134 \text{ ft} \checkmark$$

$$MTL = 0.10 \text{ m} \checkmark \rightarrow 0.3281 \text{ ft} \checkmark$$

$$MHW = 1.84 \text{ m} \checkmark \rightarrow 6.0368 \text{ ft} \checkmark$$

$$MHHW = 1.95 \text{ m} \checkmark \rightarrow 6.3976 \text{ ft} \checkmark$$

NGVD29 to NAVD88 correction is $-0.692 \text{ ft} \checkmark$

$$MLLW = -5.8071 \text{ ft} - 0.692 \text{ ft} = -6.4991 \rightarrow -6.50 \text{ ft} \checkmark$$

$$MLW = -5.4134 \text{ ft} - 0.692 \text{ ft} = -6.1054 \rightarrow -6.11 \text{ ft} \checkmark$$

$$MTL = 0.3281 \text{ ft} - 0.692 \text{ ft} = -0.3639 \rightarrow -0.36 \text{ ft} \checkmark$$

$$MHW = 6.0368 \text{ ft} - 0.692 \text{ ft} = 5.3448 \rightarrow 5.35 \text{ ft} \checkmark$$

$$MHHW = 6.3976 \text{ ft} - 0.692 \text{ ft} = 5.7056 \rightarrow 5.71 \text{ ft} \checkmark$$

HYDROLOGY REPORT

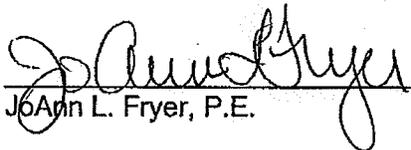
The Moosabec Reach is an area of the Atlantic Ocean bordered by Jonesport on the mainland and at Beals Island. Since the flow through this area is strictly tidal, no hydrologic study of the drainage area was performed to determine riverine discharges.

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.



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

NGVD 29 to NAVD 88 Tidal Flood Level Conversions

NGVD 29 → NAVD 88 : - 0.692'

JONESPORT

• From Flood Insurance Study (FIS) May 3, 1990

	<u>Q₁₀</u>	<u>Q₅₀</u>	<u>Q₁₀₀</u>	<u>Q₅₀₀</u>	
NGVD 29	12.0'	12.4'	12.6'	12.9'	
NAVD 88	11.31' ✓	11.71' ✓	11.91' ✓	12.21' ✓	← use

BEALS

• From Flood Insurance Study (FIS) July 2, 2003

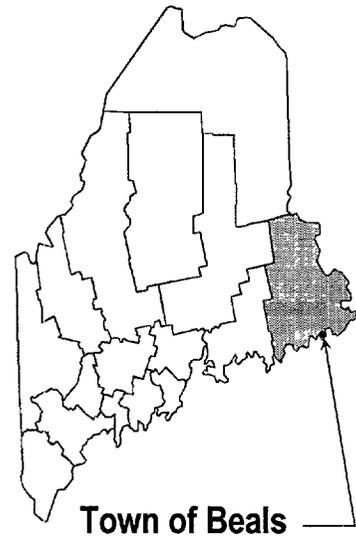
- Transects # 1 is closest to Bridge

	<u>Q₁₀</u>	<u>Q₅₀</u>	<u>Q₁₀₀</u>	<u>Q₅₀₀</u>	
NGVD 29	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

<u>FLOODING SOURCE AND LOCATION</u>	<u>ELEVATION (feet NGVD¹)</u>			
	<u>10-YEAR</u>	<u>50-YEAR</u>	<u>100-YEAR</u>	<u>500-YEAR</u>
<u>ATLANTIC OCEAN</u>				
Transects 1 and 11	10.5	11.2	11.7	12.5 ← use
Transects 2-10 and Transects 12-23	10.5	11.3	11.8²	12.5

¹National Geodetic Vertical Datum of 1929

²Includes 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 than the 100-year. The 10-year wind generated wave heights and the 100-year stillwater elevations combine to form the 100-year flood.

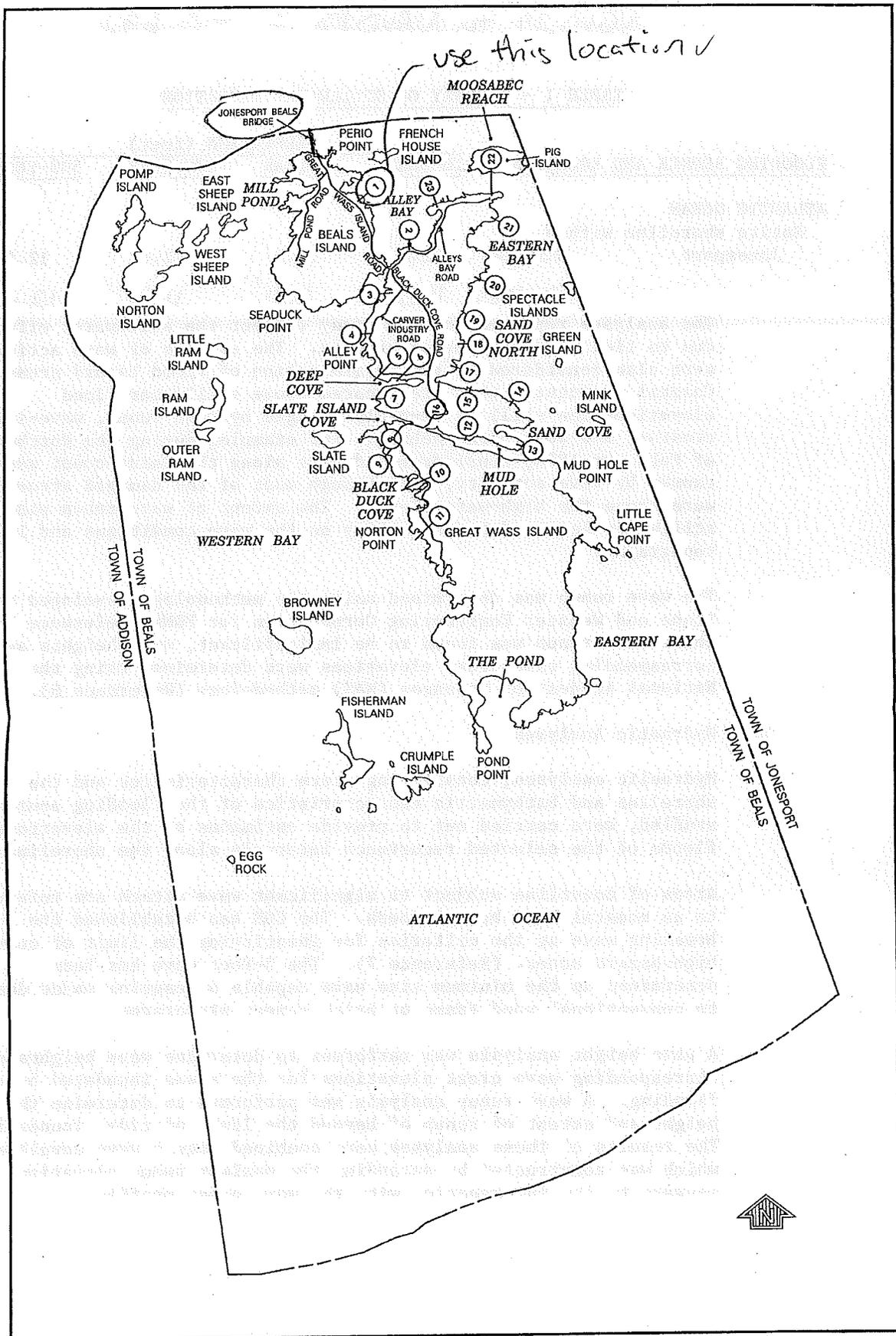


FIGURE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF BEALS, ME
(WASHINGTON COUNTY)

APPROXIMATE SCALE

0 1 2 MILES

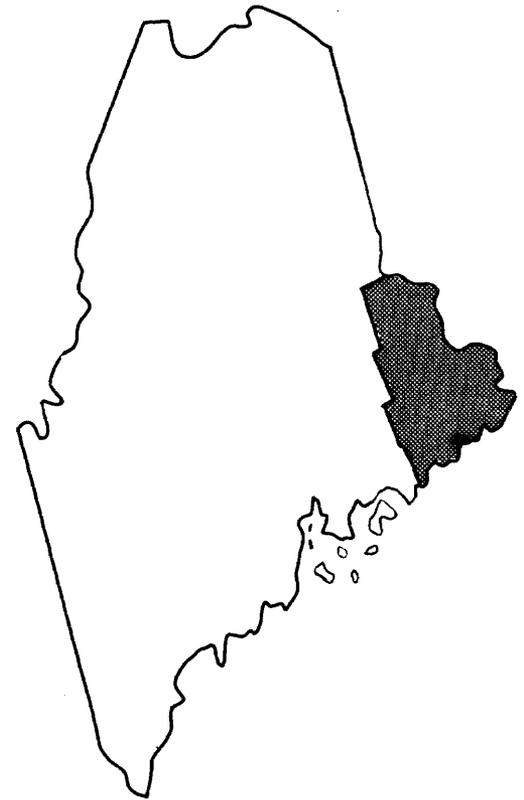
TRANSECT LOCATION MAP

FLOOD INSURANCE STUDY

WAVE
HEIGHT
ANALYSIS



TOWN OF
JONESPORT
MAINE
WASHINGTON COUNTY



MAY 3, 1990



Federal Emergency Management Agency

COMMUNITY NUMBER - 230138

$$\text{NGVD 29 to NAVD88} = -0.692'$$

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 Northeast 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

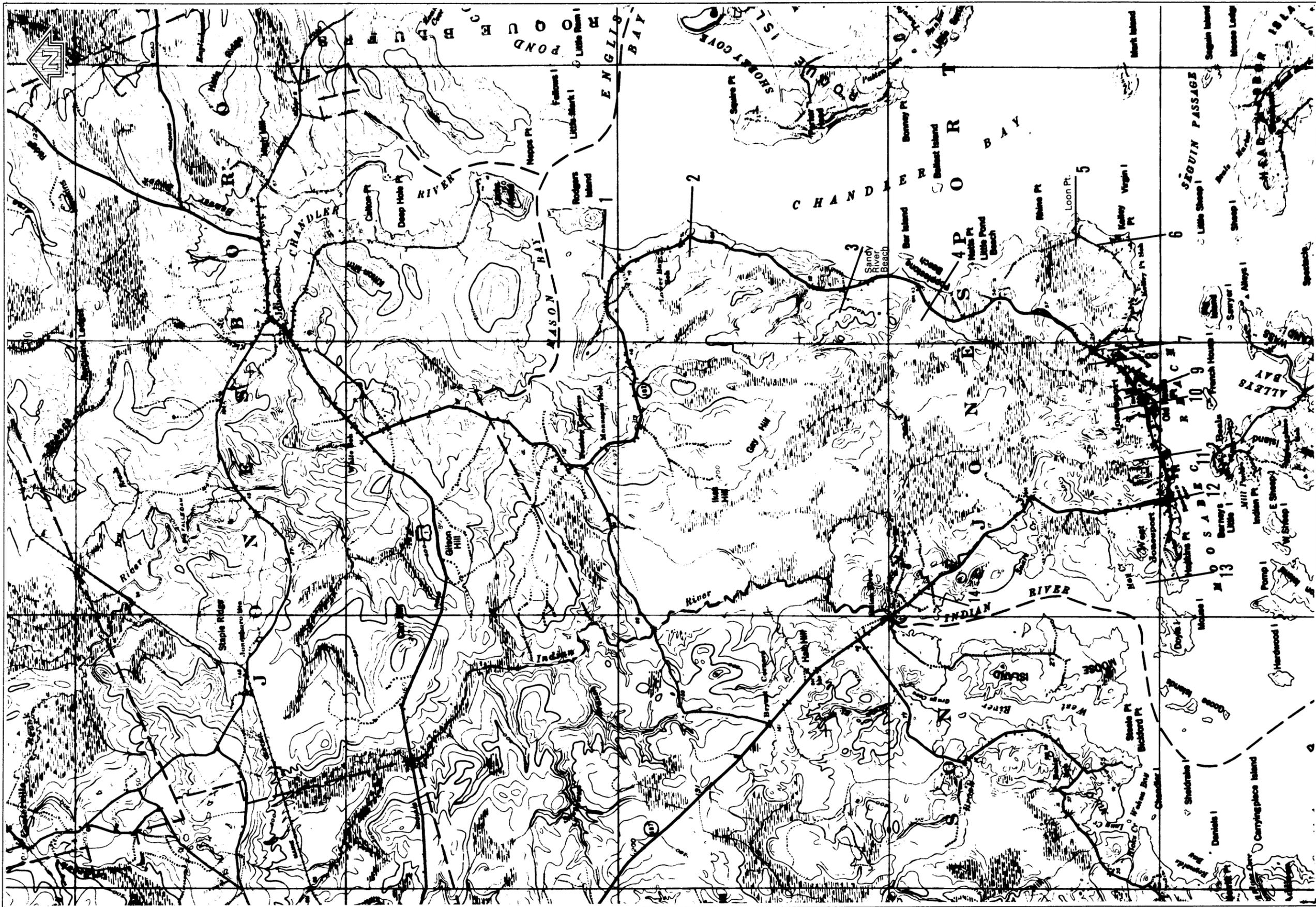
TABLE 2 - TRANSECT DESCRIPTIONS

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 <u>Beals Island</u> bridge	12.6	13 ³
No. 12	From <u>Beals Island</u> bridge to a point approximately 1,000 feet west of southbound State Route 187	12.6	16 ³
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

Controls
 $16' - 0.692 = 15.308$
 $15^3 \text{ max} = 15.3'$

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: $-0.692'$



FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF JONESPORT, ME
(WASHINGTON CO.)

APPROXIMATE SCALE



TRANSECT LOCATION MAP

FIGURE 2

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

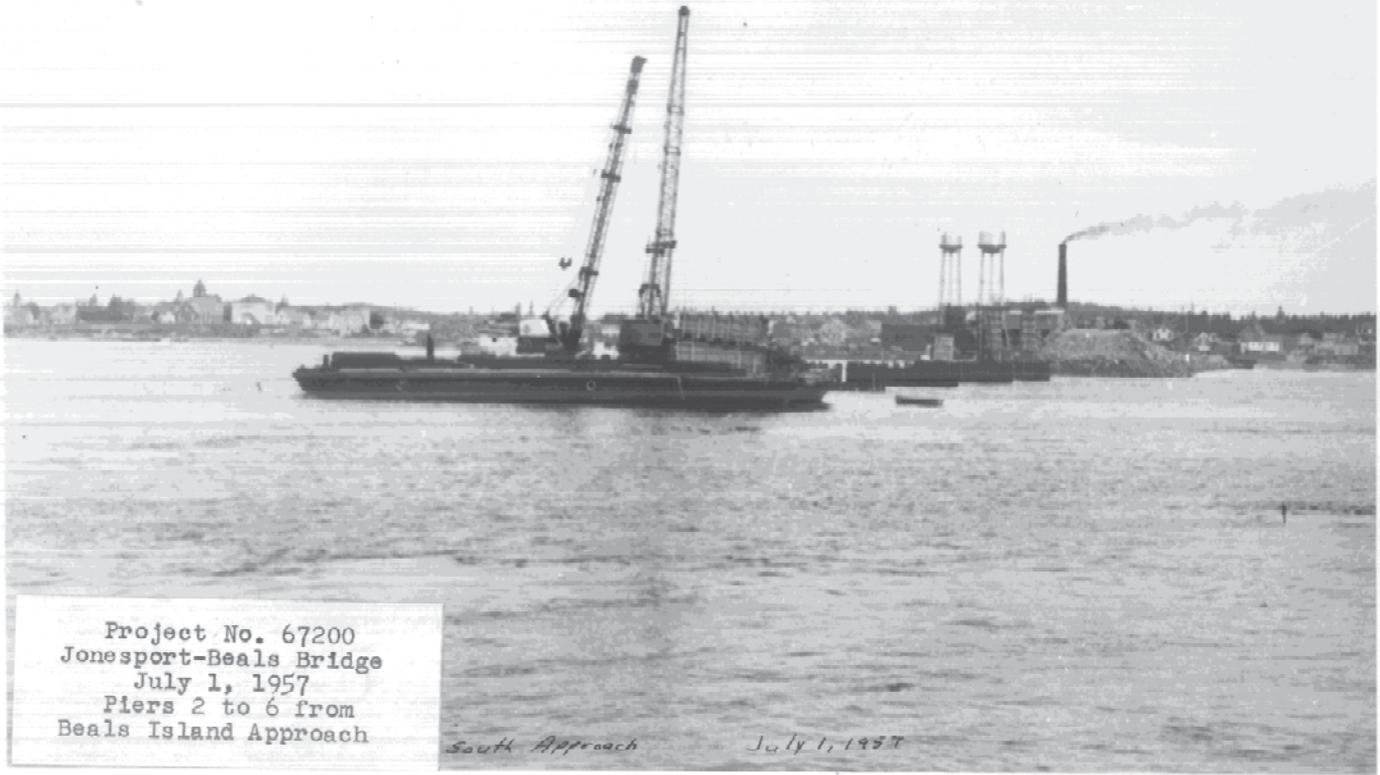


Project No. 67200
Jonesport-Beals Bridge
May 1, 1957
Pier 2
Vertical Piles and Bottom Form for
Tremie Concrete Before Being Submerged



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

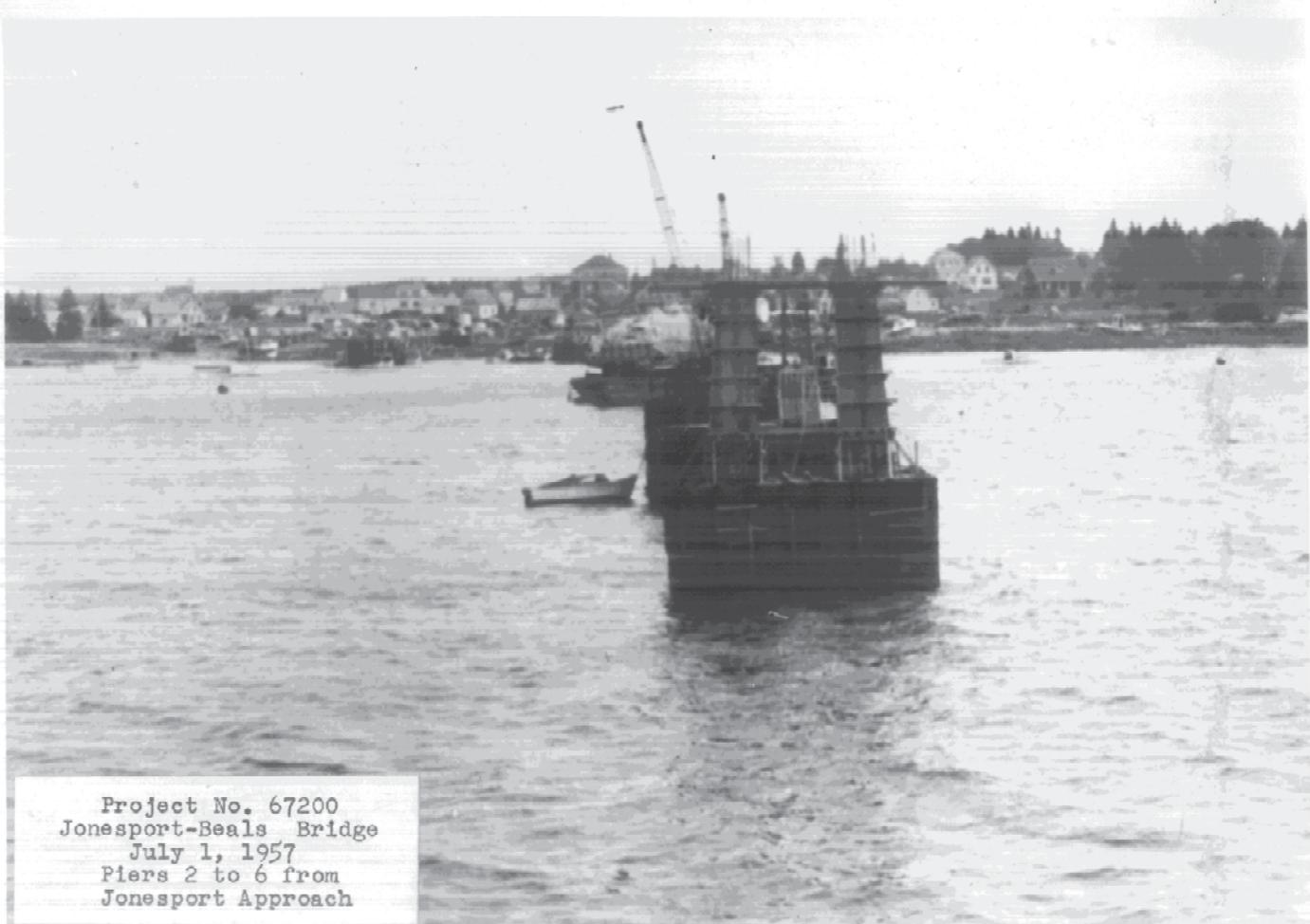
9 6-1-57



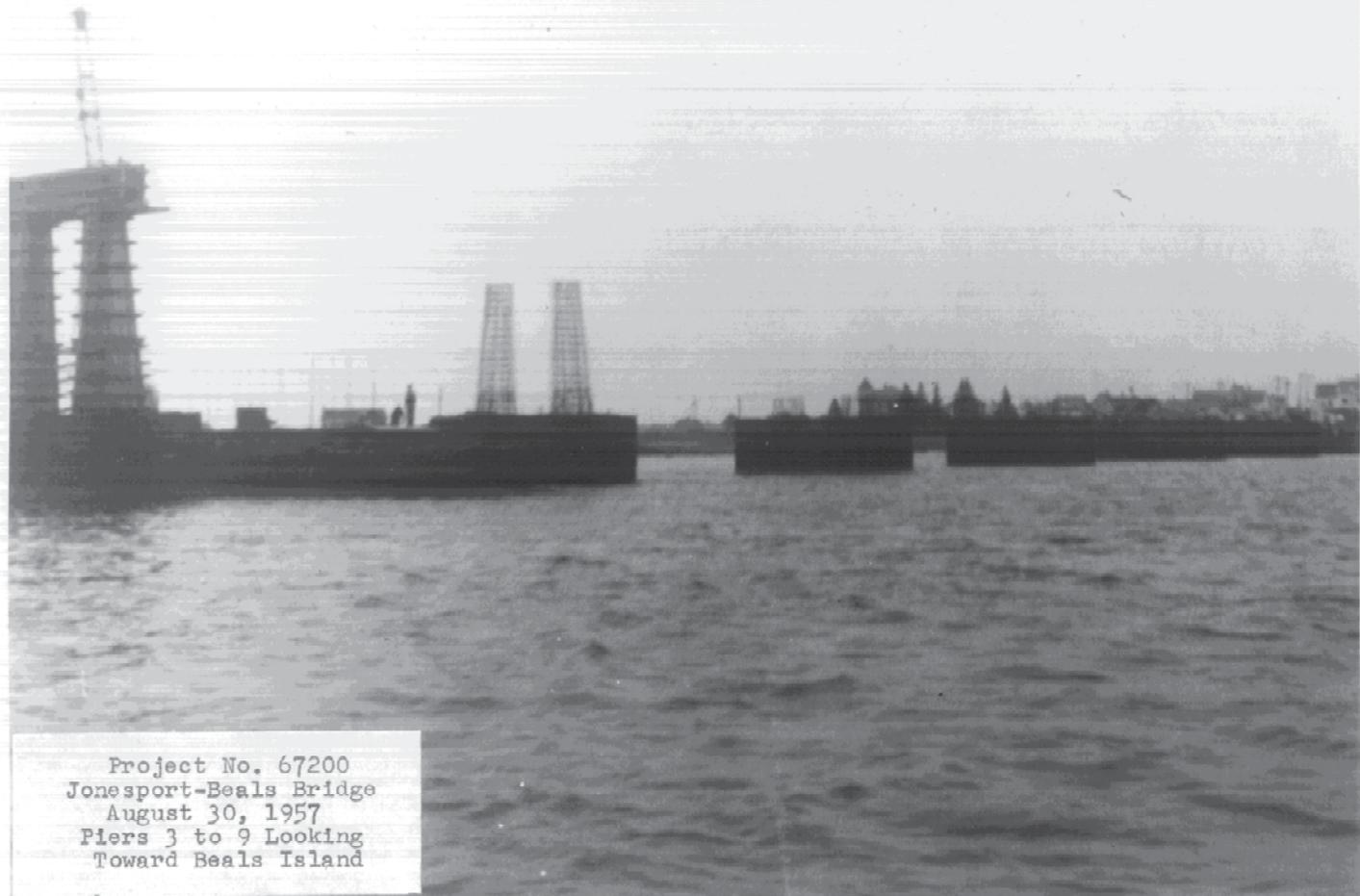
Project No. 67200
Jonesport-Beals Bridge
July 1, 1957
Piers 2 to 6 from
Beals Island Approach

South Approach

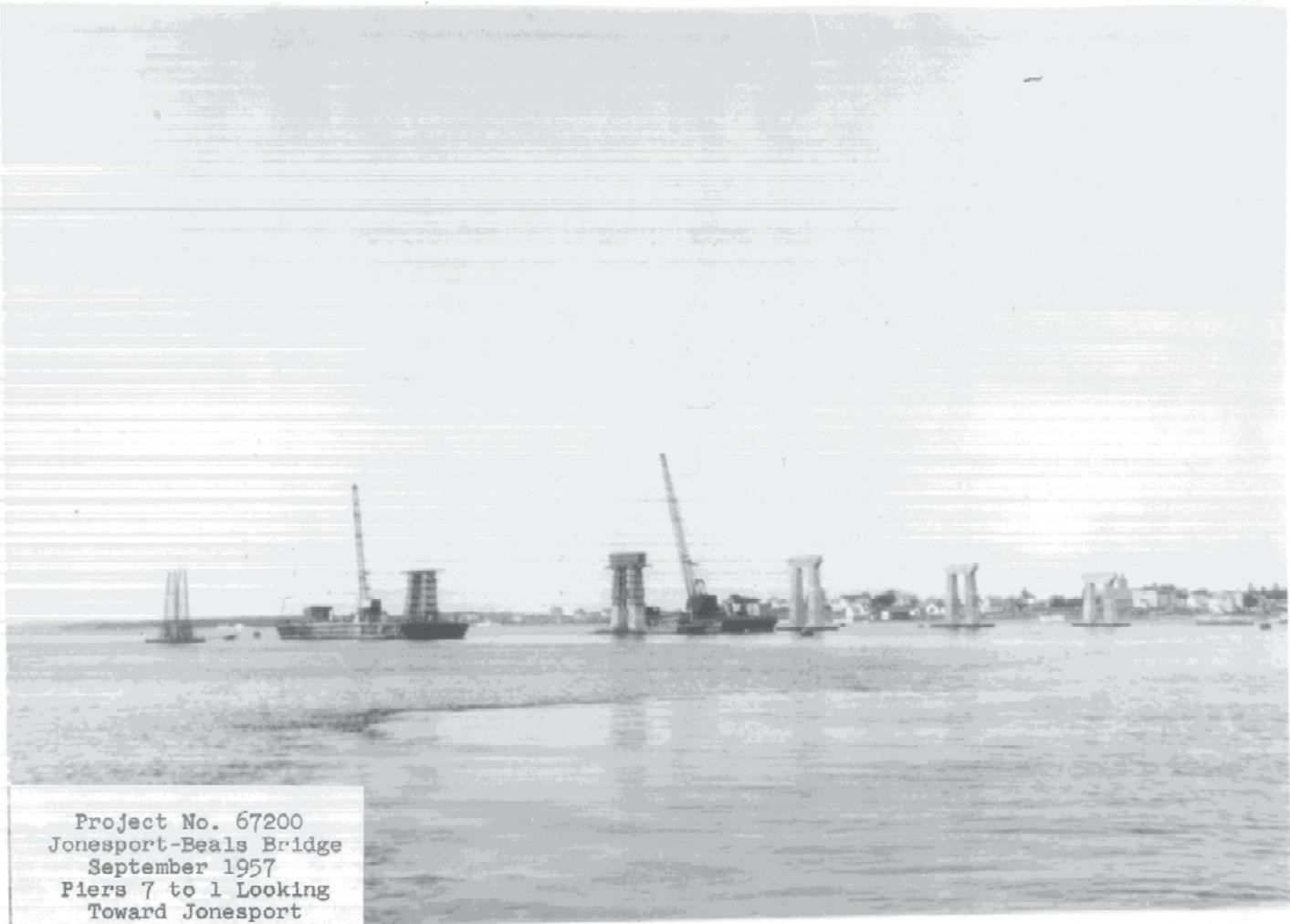
July 1, 1957



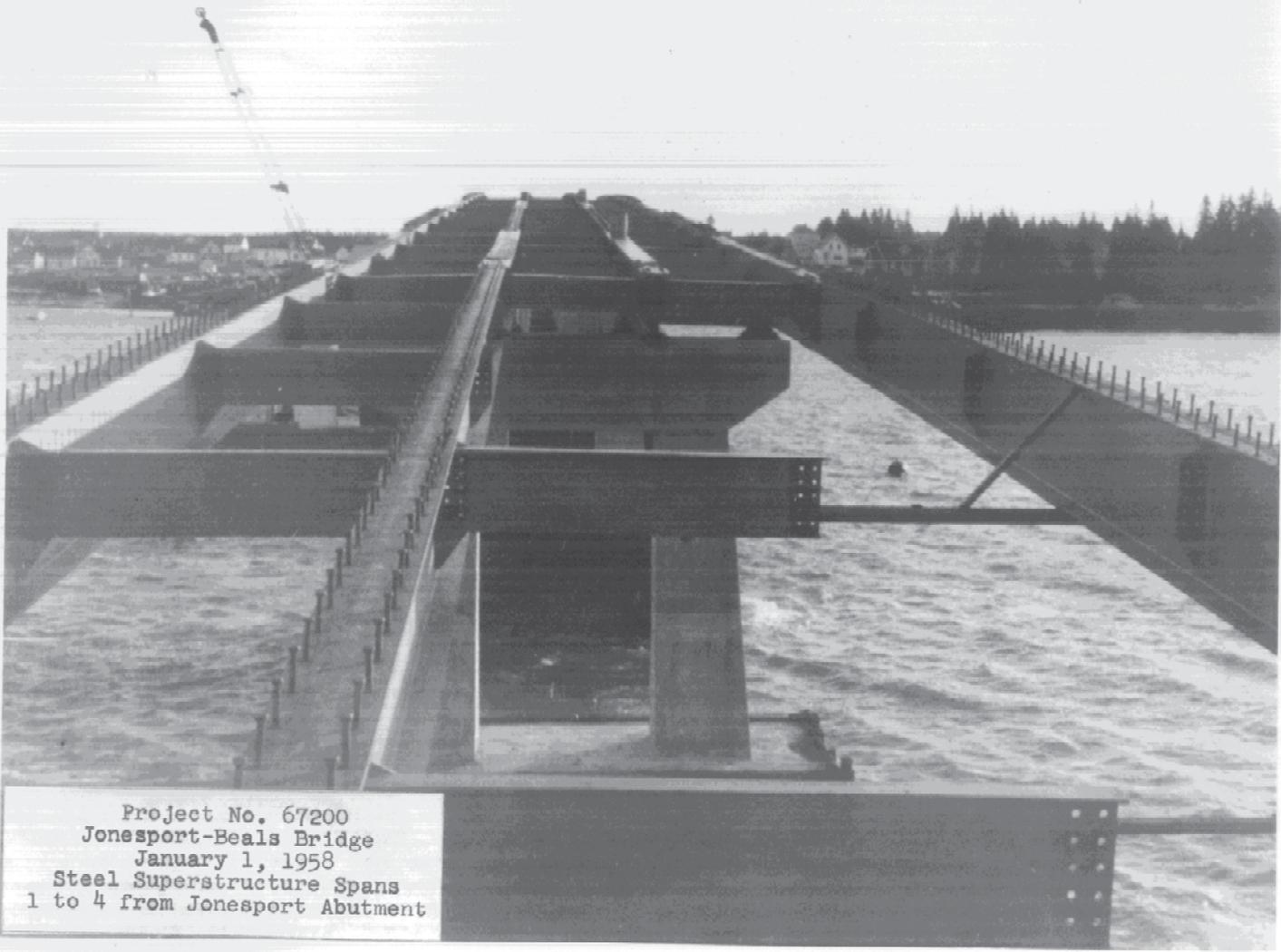
Project No. 67200
Jonesport-Beals Bridge
July 1, 1957
Piers 2 to 6 from
Jonesport Approach



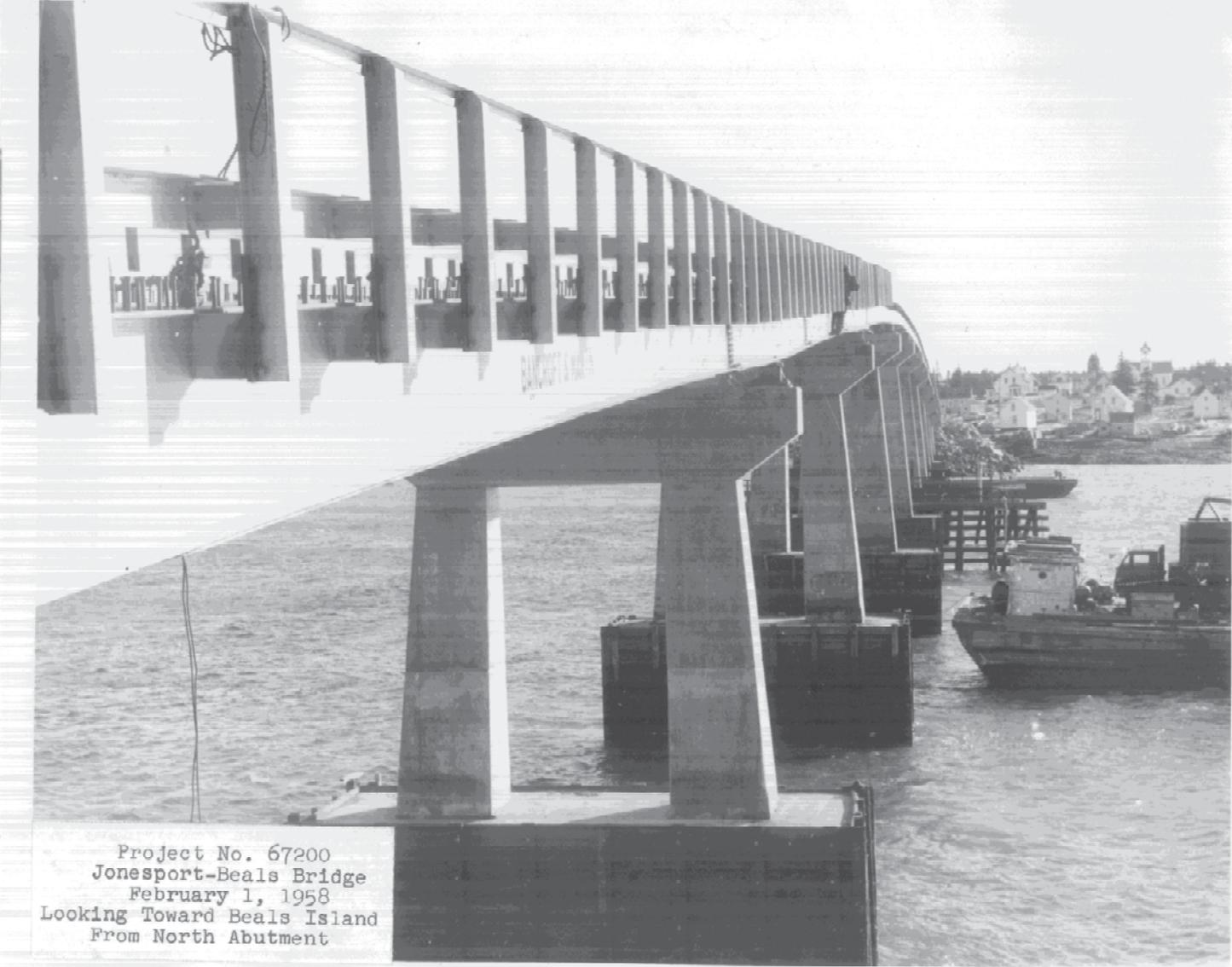
Project No. 67200
Jonesport-Beals Bridge
August 30, 1957
Piers 3 to 9 Looking
Toward Beals Island



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