Supplemental Supporting Information for a Finding of Effect

Project: Woolwich 23929.00 Scope: Bridge Replacement Finding of Effect: **No Adverse Effect**

Purpose and Need

The purpose of the proposed action is to address structural deficiencies, improve safety, and eliminate the fracture critical nature of the Station 46 Bridge #3039 that carries US Route 1 over the Maine Central Railroad and Back River Creek Marsh in Woolwich.

The need for this project is because several components of the bridge exhibit advanced deterioration, including the underside of the concrete deck and the steel tower piers.

Project Background

The Station 46 Bridge #3039 carries U.S. Route 1, a highway corridor priority 1 roadway, over the Maine Central Railroad and the Back River Creek Marsh in the Town of Woolwich. Built in 1933 and widened in 1959 and again in 1979, the bridge has a curb-to-curb width of 49 feet and a total length of 675 feet. The structure consists of nine simple spans supported by eight steel tower piers and two stub abutments. The existing superstructure consists of steel beams, a cast-in-place concrete deck, and a bituminous wearing surface. Each of the fracture critical steel tower piers consist of two bents supporting longitudinal framing founded on either driven piles or spread footings on bedrock.

The bridge carries one lane in each direction with variable shoulders and a variable width stripedivided between the northbound and southbound lanes. The striped divide accommodates the development of a center turn lane at the northerly entrance to the Taste of Maine restaurant beginning approximately 200 feet south of the south abutment. Additionally, there is a roadway intersection at George Wright Road approximately 800 feet north of the north abutment serviced by a dedicated right turn lane. The low point on the existing Route 1 roadway profile is approximately 450 feet north of the bridge. This low point allows for occasional flooding of the Route 1 roadway, primarily during significant storm events. The bridge carries approximately 19,000 vehicles per day with a peak hourly volume of 2,200 vehicles. State accident reports indicate that several fatalities have occurred on the bridge in the past 3 years.

The bridge exhibits areas of moderate to advanced deterioration with a condition rating of "poor" for the bridge substructure. The superstructure steel beams are in fair condition, exhibiting moderate rust staining and section loss throughout. The underside of the concrete deck and the deck overhangs exhibit extensive areas of spalled and delaminated concrete, particularly at the longitudinal joints where the deck was widened, as well as at the transverse deck joints. These transverse deck joints were replaced in 2013 and require periodic maintenance.

The eight towers are comprised of braced steel columns that are in poor condition with moderateto-severe rust staining and section loss per the Inspection Report dated July 31, 2019. These bents have deteriorated due to the saltwater environment and the proximity of the steel columns to wetland areas beneath the bridge. Additionally, portions of the bents are considered fracture critical; failure of these fracture critical members could result in the partial collapse of the bridge. As such, they require more frequent and intensive inspections and costly repairs. Repair or failure of one or more fracture critical components may require a bridge closure with a 58-mile one-way detour on State-aid roads. A detour would significantly impact local and regional travel, emergency service response time, school bussing, rural commutes, and create economic hardship.

Proposed Action

The proposed action is bridge replacement with a 619" five span structure comprised of six metallized steel plate girders supporting an 8" composite concrete deck, a 3" bituminous wearing surface, and standard 3-bar steel traffic/bicycle rail mounted on a concrete curb. The substructure would be comprised of concrete hammerhead piers founded on steel H-piles. Given the shallow depth to bedrock at abutment locations, the abutments are anticipated to be directly seated on bedrock or supported by micropile foundations. The proposed roadway width is 40" curb-to-curb, consisting of two 12" lanes with shoulder widths varying from 6'-3" to 8'-0". The variation of the shoulder widths would be found only on the southern bridge span and would accommodate the portion of the turn lane extending north of Abutment 1. At the southeast approach, a mechanically stabilized earth (MSE) retaining wall is proposed to fill in the first span of the existing structure and prevent the embankments from spilling into the rail line. This MSE wall has a total length of approximately 120" and a maximum height of 26". On the southwest, a cast-in-place wingwall cast parallel with the proposed abutment centerline is proposed to minimize construction costs.

The horizonal alignment would consist of a simple curve across the bridge matching into tangents on both approaches to improve roadway geometrics and sight distance. The curve would have a 3,000' radius which would be flatter than the existing bridge curvature, which is a three centered compound curve. The vertical alignment would consist of a series of crest and sag vertical curves to match the existing roadway profile in the approaches. This profile was developed based on maintaining a minimum vertical clearance of 22'-6" over the railroad and maintaining at least 1" of freeboard above mean high water, plus wave height, assuming 4" of sea level rise. Between these points, most of the bridge would be on a -4.60% tangent grade, ultimately matching into the existing with a sag vertical curve south of the right turn lane on to George Wright Road. The resulting profile would be approximately 1.2 feet higher than existing at the south abutment and 1-foot higher than existing at the north abutment. The flattened horizontal geometrics is anticipated to improve safety by reducing the tendency for vehicles to cross over the roadway centerline. Additionally, the proposed design is developed for a 45-mph design speed based on anticipated changes to the posted speed in the project area.

The proposed action would construct a temporary bridge east of the existing structure to maintain traffic. This option reduces the impact to the travelling public and eliminates several constructability challenges associated with staged construction including the need to partially demolish the existing fracture critical structure.

The highway design for the Station 46 Bridge project is influenced by an adjacent planned project involving potential replacement of several culverts carrying Back River under Route 1 north of the intersection of Route 1 with George Wright Road. The project contemplates replacing the existing culverts with a new bridge. The project will likely include raising the profile of Route 1 to accommodate up to 4" of sea level rise and to provide reasonable freeboard for the new Back River

Bridge. The proposed vertical alignment for the Station 46 Bridge was developed to accommodate a range of potential solutions for the Back River project. The preliminary estimate for the construction cost is \$21,860,000 and total project cost is \$25,800,000.

Federal Action

Federal funding.

Definition of Area of Potential Effect (APE)

The proposed project is located in Woolwich. A map is attached below that shows the APE.

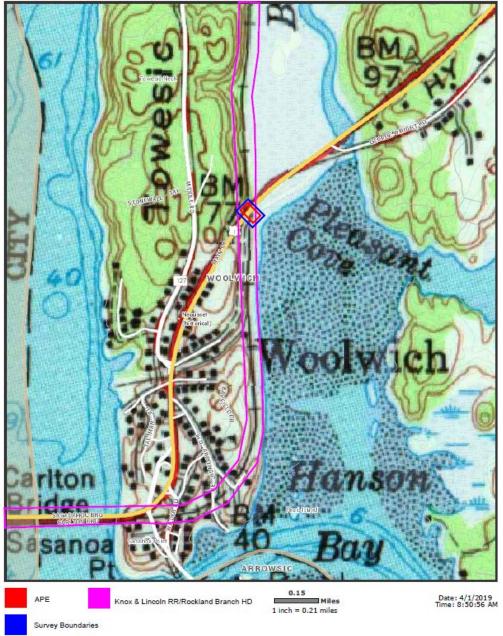
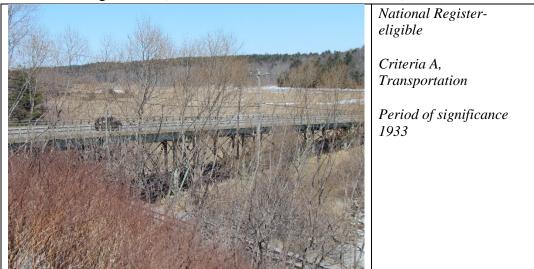


Figure 1. Woolwich 23929.00 Area of Potential Effect

Historic Properties

The proposed project is located in Woolwich. The following descriptions of historic properties found within the project area are based on Maine Historic Preservation Commission (MHPC) survey forms.



Station 46 Bridge #3039 (State of Maine, STA 70+60 - 86+50)

The Station 46 Bridge #3039 is individually eligible for listing in the National Register and is also a contributing resource to the Knox & Lincoln Railroad/Rockland Branch Railroad Historic District. The steel stringer bridge was constructed in 1933 as grade separation of US Route 1 and the Rockland Branch of the Maine Central Railroad. The bridge does not hold significance for its particular type but rather for its role in the transportation system as a grade separation crossing. Beginning in the late 1920s, Federal and State governments looked to identify continuous National or region wide routes via a numbering system. Route 1 was identified from Maine to Florida. During the same time, seasonal automobile tourism in Maine expanded significantly. The increased traffic clogged Maine's smaller towns and roads, many of which were unimproved. Therefore, the highway commission began an effort to increase efficiency of travel on the coastal route while decreasing the burden on local roads. Grade separation of crossings was an integral part of this effort. By elevating the road, traffic could continue at a reasonable pace versus causing backups while waiting for long freight trains to pass a crossing.

The grade separation project at this location occurred six years after the completion of Carlton Bridge over the Kennebec River in Bath. US Route 1 on Towesic Neck experienced a significant realignment/improvement scheme. The first year the realignment appears on topographic maps is 1945; however, based on the planning for the elevated Leeman Highway, Carlton Bridge, and the grade separation at this project's location date closer to circa 1928–1935. Historically the US Route 1 crossed the neck easterly from the ferry terminus then hugged the shore of Pleasant Cove northerly before again turning easterly to cross the cove on a series of causeways, natural land masses and bridges. The realignment effort included the construction of approximately 1 mile of new roadway positioned between Route 127 and the historic US Route 1. The road is arched to the northeast to span the neck. Construction included a new Pleasant Cove crossing, including a grade

separation at the MCRR and to transition down the hill the road is now on. The former roadbed is visible from US Route 1 north at the Pleasant Cove crossing.

 National Registereligible

 Criteria A, C

 Industry,

 Entertainment/Culture,

 Transportation

 Period of significance

 1871 - 1958

Knox & Lincoln Railroad/Rockland Branch Railroad Historic District (State of Maine, STA 80+40 – 81+90)

The Rockland Branch is a 56.6-mile branch of the Maine Central Railroad serving Brunswick to Rockland. The branch consists of two segments. The first, served Bath from Brunswick, where is split from the MCRR main line. The second segment started as the Knox and Lincoln Railroad (KLRR) connecting Bath and Woolwich to Rockland. The KLRR emerged from an 1849 charter to build a railway from the Portland and Kennebec RR to Rockland. The line commenced service in 1871 utilizing a ferry to cross from Bath to Woolwich until the Carrolton Bridge was constructed in 1927. The MCRR leased the KLRR in 1891 and purchased it in 1901. Eleven years later the MCRR purchased the Samoset Resort in Rockland further intertwining profits between transportation and recreation/tourism.

The railroad was used for passengers (including tourists heading towards their summer houses and resorts, particularly the Samoset) and freight. Stops included most every large town and village on the coast between the termini. The route was critical to the success of the lime industry in the Rockland area after the demise of the shipping trade. The branch connected to the Georges River RR at Warren station (north of the bridge, approximately 2 miles SSW of Warren village; the depot remains). The branch also served what is now the Dragon Cement Plant. At one point in the mid-20th century, the plant was MCRR's largest (and potentially only) non-wood product related customer. The branch also connected to at least one other smaller line in Rockland which was specifically for bringing lime from inland quarries to the Rockland wharves and kilns. Rockland had at least 160 waterfront kilns, only one of which remains. Along with the track bed, other known resources of the district include bridges of fifty years or more, the depots at Warren and Newcastle/Damariscotta, the listed turn table and engine house, the listed former station in Rockland, and a brick house formerly of the Knox estate that served as Thomaston's depot until 1957. Rail traffic ceased soon afterward.

Archeological Resources

There are no archaeological resources in the project area.

Impacts to Properties

Station 46 Bridge #3039 (State of Maine, STA 70+60 - 86+50)

National Register-eligible

Criteria A, Transportation

The proposed action would result in **No Adverse Effect** to the Station 46 Bridge #3039. As previously stated, the proposed action would replace the bridge with a 619-foot five span structure comprised of six metallized steel plate girders supporting an 8" composite concrete deck, a 3" bituminous wearing surface, and standard 3-bar steel traffic/bicycle rail mounted on a concrete curb. The substructure would be comprised of concrete hammerhead piers founded on steel H-piles. The horizonal alignment would consist of a simple curve across the bridge with a slight 10' shift that would match into the existing tangents on both approaches to improve roadway geometrics and sight distance. The vertical alignment would consist of a series of crest and sag vertical curves to match the existing roadway profile in the approaches. This profile was developed, in part, based on maintaining a minimum vertical clearance of 22'-6" over the railroad.

As stated previously, the Station 46 Bridge #3039 holds significance under Criteria A for its association with the transportation network. Specifically, the bridge is significant as a grade separation crossing. It has retained its integrity of setting and location, as well as its horizontal and vertical alignment that allows trains to pass under it, thus conveying its historic function. The bridge is not significant for its design type, materials, or workmanship. Although the proposed action would replace the existing bridge, the replacement bridge would maintain the character-defining features of the existing, namely the separated grade, horizontal alignment, and vertical alignment. The replacement bridge would continue to uphold the passage of trains underneath the crossing and the overall historic function of the crossing. Furthermore, the action would not significantly diminish the integrity of setting and location, as the proposed bridge would be built at the same location as the existing.

Knox & Lincoln Railroad/Rockland Branch Railroad Historic District (State of Maine, STA 80+40-81+90)

National Register-eligible

Criteria A, C, Industry, Entertainment/Culture, Transportation

The proposed action would result in **No Adverse Effect** to the Knox & Lincoln Railroad/Rockland Branch Railroad Historic District. The proposed action would not physically impact the railroad track. The existing southeast cast-in-place concrete wingwall would be replaced with a mechanically stabilized earth (MSE) retaining wall orientated parallel to the roadway centerline. The MSE wall would retain fill placed within the first span of the bridge and would keep embankment fill slopes away from the railroad track. Plain riprap would be installed adjacently. Permanent rights would be required for this work. These actions would not significantly diminish the historic district's integrity of setting, feeling, or association.

Archaeological Resources

No archaeological properties would be affected by the proposed undertaking.

Avoidance and Minimization Efforts

MaineDOT sought ways to avoid adverse impacts to the historic properties found within the project area. The proposed action avoids physical impacts to the Knox & Lincoln Railroad/Rockland Branch Railroad Historic District. The proposed actions also avoids adverse impacts to the Station 46 Bridge by replacing on the existing horizontal and vertical alignment.

Dismissed Alternatives

- No BuildThe No Build Alternative takes no action and does not meet the purpose and
need of the project and was therefore removed from further consideration.
- <u>Rehabilitation</u> The Rehabilitation Alternative was considered, but omitted because it yielded an unacceptably short service life, as well as relatively high service life costs given the age and condition of the existing structure. Additionally, the cost to repair and acceptably protect the steel tower bents from future corrosion would be cost prohibitive. The Rehabilitation Alternative would also not eliminate the fracture critical nature of the bridge. For these reasons, the Rehabilitation Alternative was dismissed.
- Alternative 1 Considered a replacement structure consisting of steel plate girders with a composite concrete deck with 8" shoulders tapering to 6" at the south abutment. This option would utilize staged construction with the horizontal alignment shifted 15'-6" east. The proposed curb-to-curb width would vary from 40" to 47'-4" with all girders arranged concentrically to avoid flared girders at south abutment. This girder arrangement would result in excessively large bridge deck overhangs. The alternative was considered impractical, and for this reason, Alternative 1 was dismissed.
- <u>Alternative 2/2A</u> Alternative 2/2A considered a replacement structure consisting of steel plate girders with a composite concrete deck with 6" constant-width shoulders. This option would utilize staged construction with the horizontal alignment shifted 15'-6" east. The proposed curb-to-curb width varies from 36" to 47'- 4" and would require the use of flared girders in the southernmost span of the bridge. Sub-Alternative 2A would have a temporary bridge constructed east of the existing bridge instead of staged construction and would allow for a 32" curb-to-curb width during both phases of construction. This alternative was determined to be impractical due to the use of the flared bridge deck and staged construction would result in higher costs. For these reasons, Alternative 2/2A was dismissed.
- <u>Alternative 3A</u> Alternative 3A considered a replacement structure of steel plate girders with a composite concrete deck with a 40" curb-to-curb width (two 12" lanes, two 8" shoulders) and a 32"roadway width during both phases of construction (two 11" lanes, two 5" shoulders). This alternative would shift the Route 1 alignment further east than the preferred alternative, which would allow traffic to be maintained on the existing bridge while phase 1 of the proposed structure is constructed. The alignment shift would be

approximately 25" to allow for a wider 32" wide roadway during both phases of construction. Instead of flaring the bridge, a constant width of 40" would be maintained for the entire length of the structure and the shoulders width would vary in the first span to accommodate the development of the center turn lane. This alternative was determined to have higher construction costs and impacts due to staged construction and the additional time required for a multi-phase demolition of the existing bridge. For these reasons, Alternative 3A was dismissed.

- <u>Alternative 3B</u> Alternative 3B considered a replacement structure of steel plate girders with a composite concrete deck with a 40" curb-to-curb width (two 12" lanes, two 8" shoulders) and a 32"roadway width during both phases of construction (two 11" lanes, two 5" shoulders). This alternative would replace the bridge on alignment and maintains traffic on a temporary bridge east of the existing structure. The temporary bridge alignment would be straight along the chord of the Route 1 horizontal curve. The proposed temporary bridge would be 32 feet wide to accommodate two 11-foot lanes and two 5-foot shoulders during construction. The impacts to the Taste of Maine restaurant in the final condition would be similar to the other alternatives. However, the temporary bridge would result in additional temporary environmental and property impacts during construction. For these reasons, Alternative 3B was dismissed.
- <u>Alternative 4/4A</u> Alternative 4/4A considered replacing the existing structure with a constant 49" curb-to-curb width bridge using staged construction along an alignment shifted 15'-6" east. The shoulder widths would vary to allow for development of the center turn lane at the Taste of Maine restaurant. Sub-Alternative 4A would have a temporary bridge constructed east of the existing bridge instead of staged construction and would allow for a 32" curb-to-curb width during both phases of construction. This alternative was determined to be impractical due to the use of the flared bridge deck and would result in higher costs. For these reasons, Alternative 4/4A was dismissed.

Public Involvement

MaineDOT contacted the four federally recognized Native American Tribes in Maine. The Penobscot Nation, Passamaquoddy Tribe, and Houlton Band of Maliseets replied with no concern about the undertaking.

The Town of Woolwich was notified of the project initiation and asked to provide comments and information regarding historic resources in the project area. No replies were received.

A preliminary public meeting was held on December 11, 2019. Information regarding the bridge's historic status was shared at that time. The public did not share any comments relating to the historic significance of the bridge at that time. A virtual public meeting was posted on the

MaineDOT website on November 6, 2020. No comments related to the historic resources were received.

The public comment period is ongoing.

Proposed Materials

Metallized steel plate girders, composite concrete deck, steel 3-bar bridge rail, bituminous pavement, plain rip rap, MSE wingwall, steel guardrail.

Attachments

- Final PDR Plans, Woolwich, Sagadahoc County, Station 46 Bridge over MCRR and Back River Creek Marsh, U.S. Route 1, Federal Aid Project No. 2392900, October 15, 2020.
- J. N. Leith Smith, MHPC, to Julie Senk, MaineDOT, April 19, 2019.
- Kirk F. Mohney, MHPC, to Julie Senk, MaineDOT, June 14, 2019.

STATE OF MAINE Memorandum

Date: April 19, 2019

To: Julie Senk, Historic Coordinator, Maine DOT/ENV

From: J. N. Leith Smith, MHPC J. R. Lith Inith

Subject: Initial Archaeology Review

Project: Bridge Replacement, Station 46, Bridge #3039 Carrying Route 1 over Rockland Branch RR and Black River Creek (WIN 23929.00) (MHPC #0472-19), Woolwich, Maine.

Dear Julie,

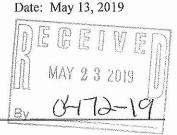
After reviewing our archaeological survey records and maps, including historic maps and surficial geology maps, and comparing this information with a predictive model of archaeological site locations, we find that no archaeological fieldwork is necessary for this project, based on the project location and general project description information received with your memo of April 11, 2019. It is extremely unlikely that an archaeological site would be affected by this project, in our opinion.

In following the procedures specified in the Federal Highway/MHPC/MDOT programmatic agreement, we recommend a finding that there will be no archaeological properties affected by the proposed undertaking.

STATE OF MAINE

Memorandum

To: Kirk F. Mohney, MHPC From: Julie Senk, Maine DOT/ENV Subject: Section 106 request for concurrence Project: Woolwich 23929.00 Scope: bridge replacement



The Maine DOT has reviewed this project pursuant to the Maine Programmatic Agreement (PA) and Section 106 of the National Historic Preservation Act of 1966, as amended.

The MaineDOT is proposing improvements to bridge #3039 on the Rockland Branch of the Maine Central Railroad.

In accordance with 36 CFR Part 800.4, the following identification efforts of historic properties were made:

- 800.4(a) (1) The Area of Potential Effect (APE) includes properties/structures adjacent to the bridge and the project limits. The project limits are defined by the structure and the immediately adjacent area, as well as potential approach roadway and intersection improvements nearby. Properties/structures adjacent to this project limit are considered to be within the APE. The APE is shown as a red polygon on the attached map.
- 800.4(a) (2) Review of existing information consisted of researching the National Register and MHPC survey databases. The Maine Historic Preservation Commission Archaeological staff is currently reviewing this undertaking.
- 800.4(a) (3) The town of Woolwich was contacted via letter and asked to comment on knowledge of, or concerns with, historic properties in the area, and any issues with the undertaking's effect on historic properties. The town was also requested to provide information regarding local historic societies or groups. The town has not replied to date.
- 800.4(a) (4) Letters outlining project location and scope were sent to the 4 federally recognized Tribes in Maine. The Penobscot Nation, Passamaquoddy Tribe, and Houlton Band of Maliseets have replied with no obvious concerns about the project.
- 800.4(c) The Maine DOT conducted historic architectural surveys within the APE to determine if properties met National Register criteria. Maine Historic Preservation Commission Archaeological staff has reviwed this undertaking and recommended a finding of "no archaeological properties affected by the proposed undertaking." The Maine DOT has determined two historic properties within the APE are eligible for listing in the National Register. The properties are Bridge #3039 and the Knox & Lincoln/Rockland Branch MCRR.

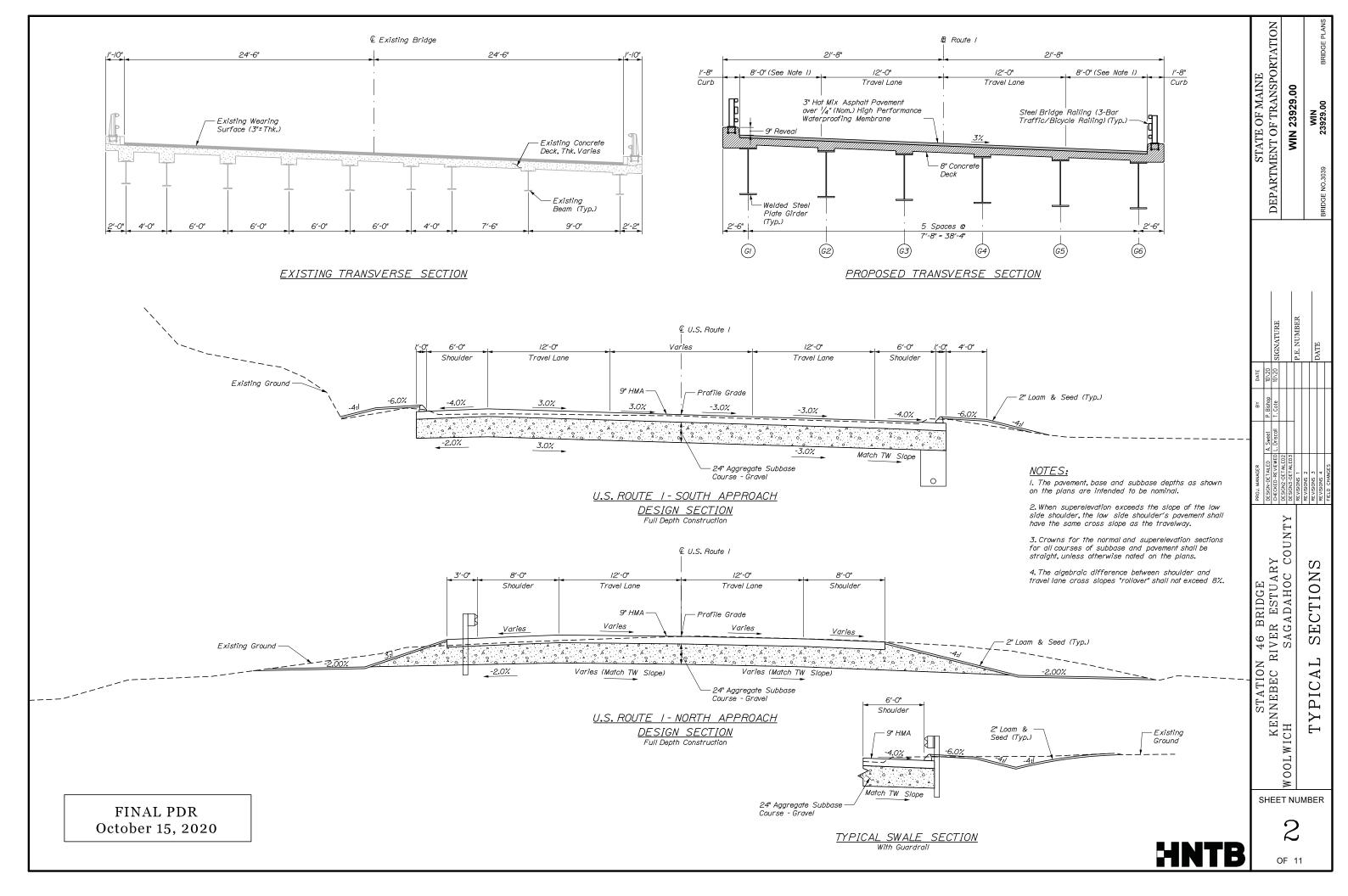
In accordance with the PA and 36 CFR Part 800, please reply with your concurrence or objection to this determination of National Register eligibility within 30 days.

Please contact me at Julie.Senk@maine.gov or 592-3486 if you have any questions. Thank you.

cc: CPD e-file

enc: Architectural survey, Leith Smith, MHPC, to Julie Senk, MaineDOT, April 19, 2019

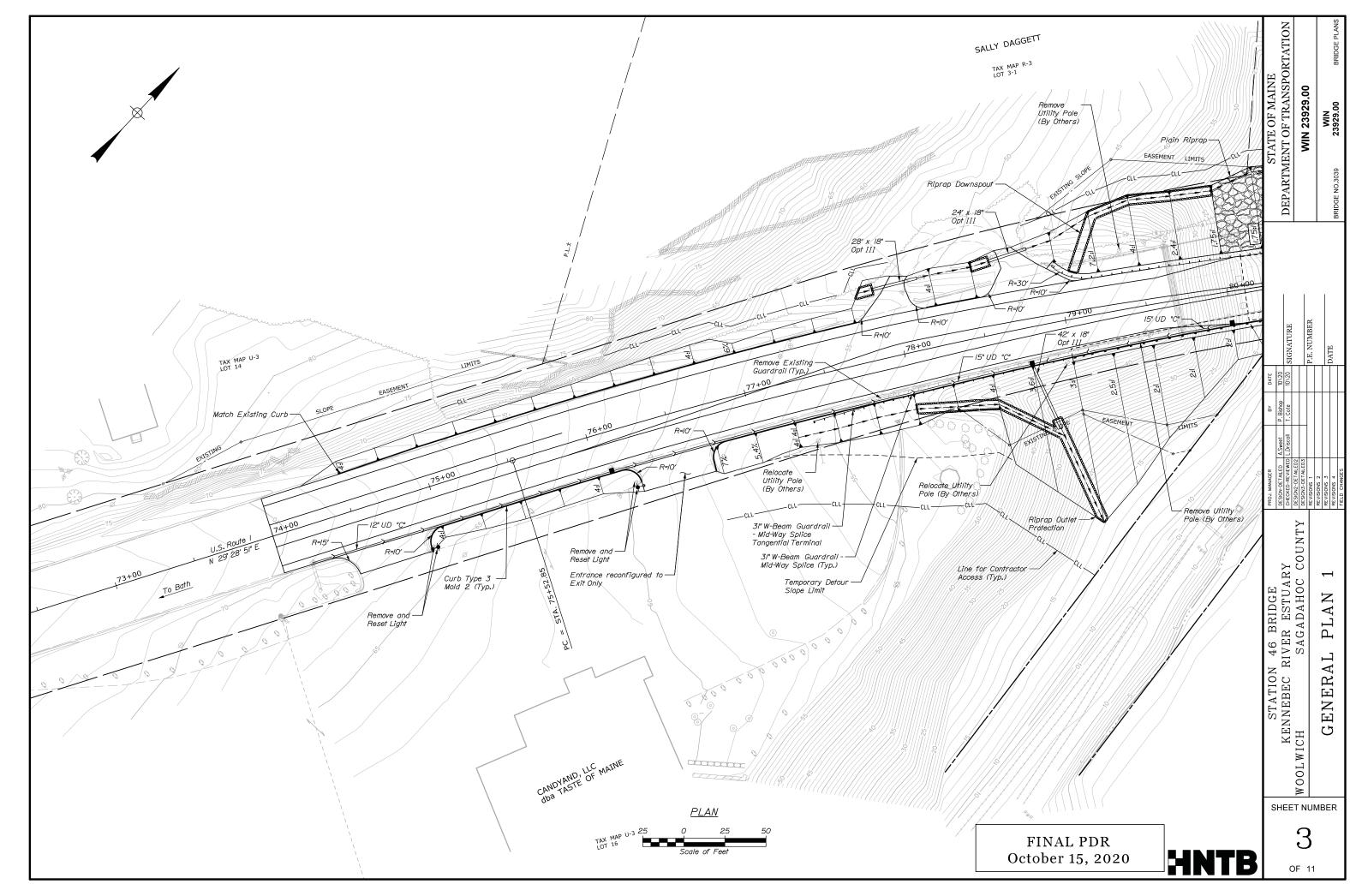
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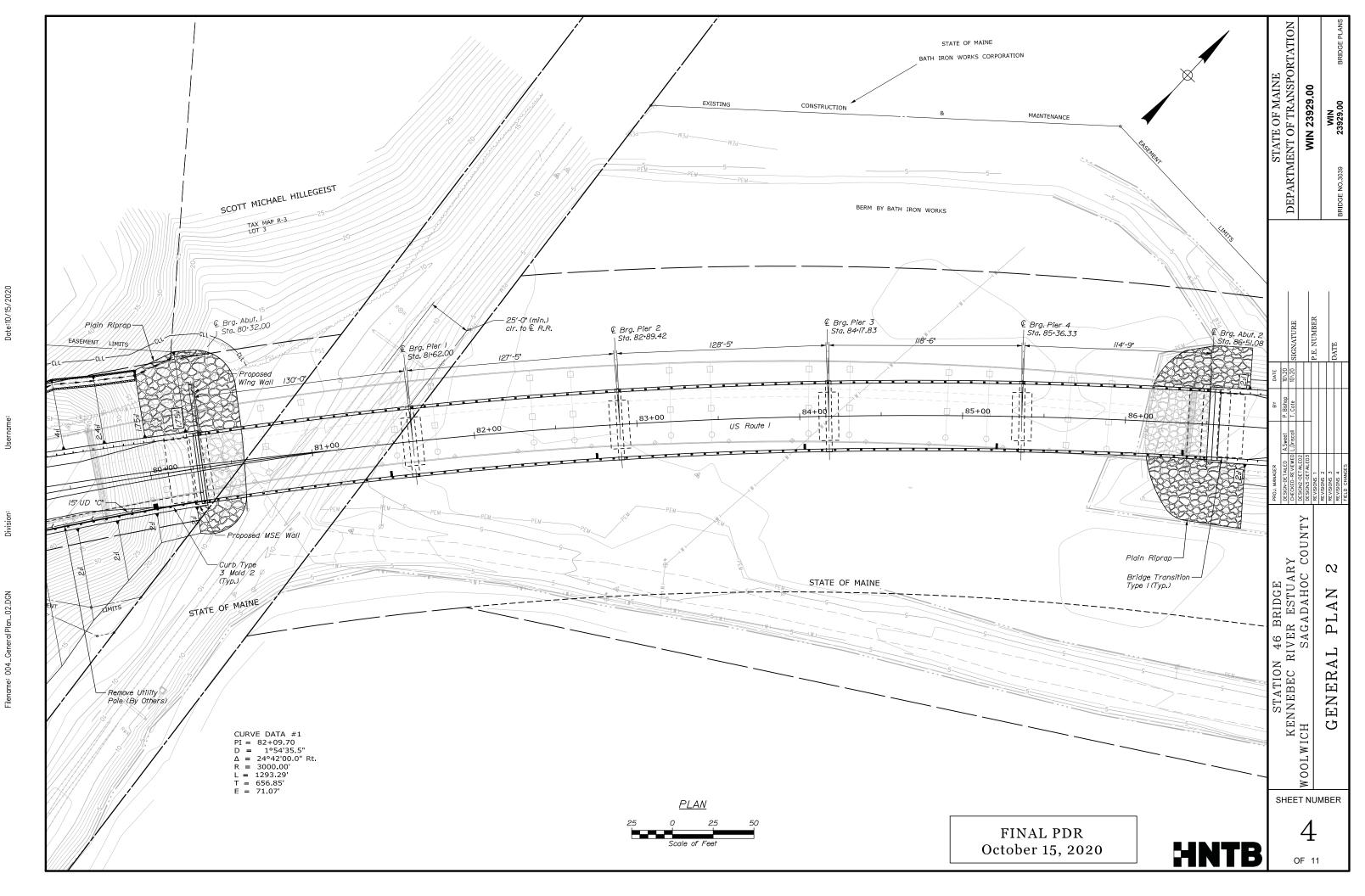


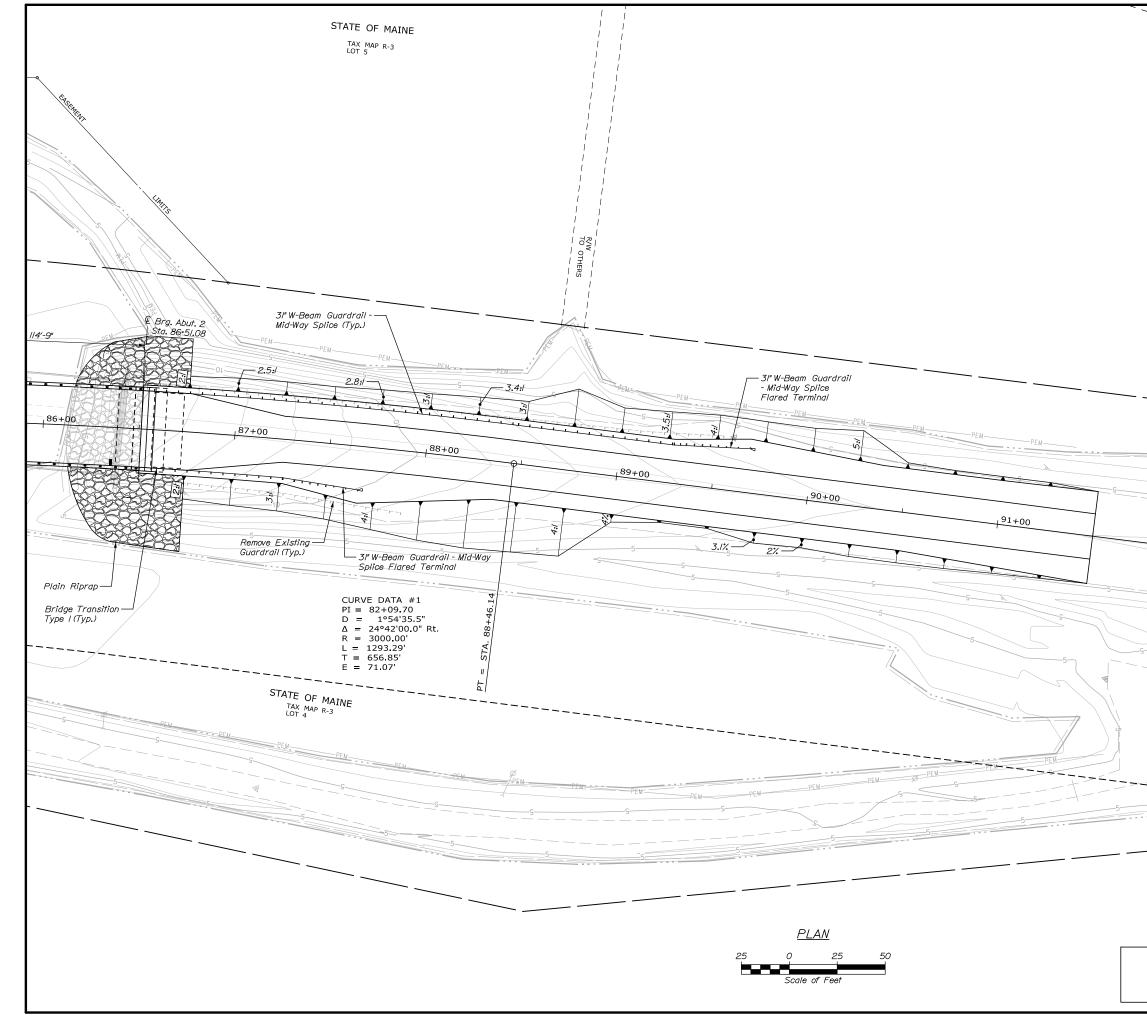
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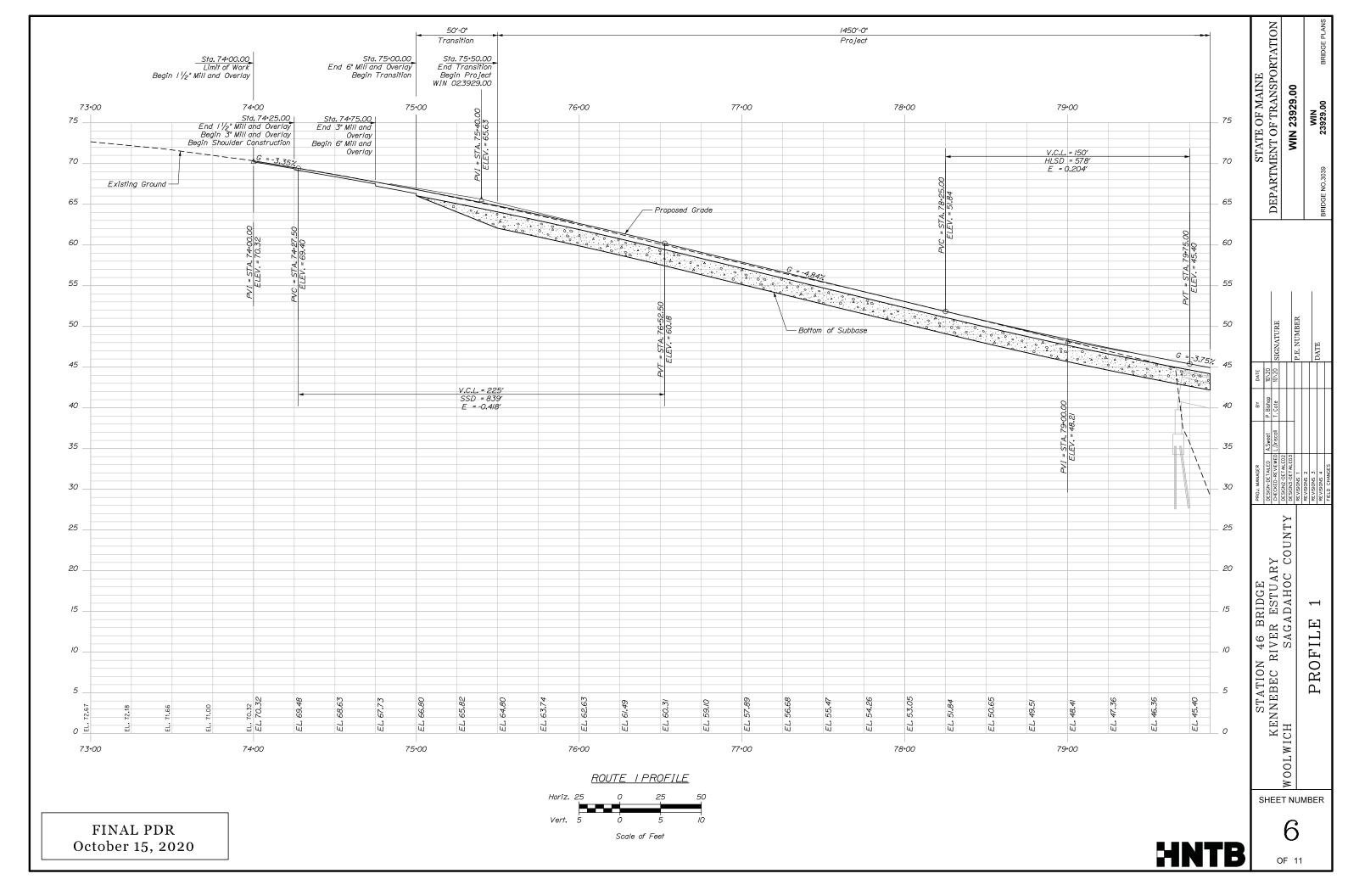
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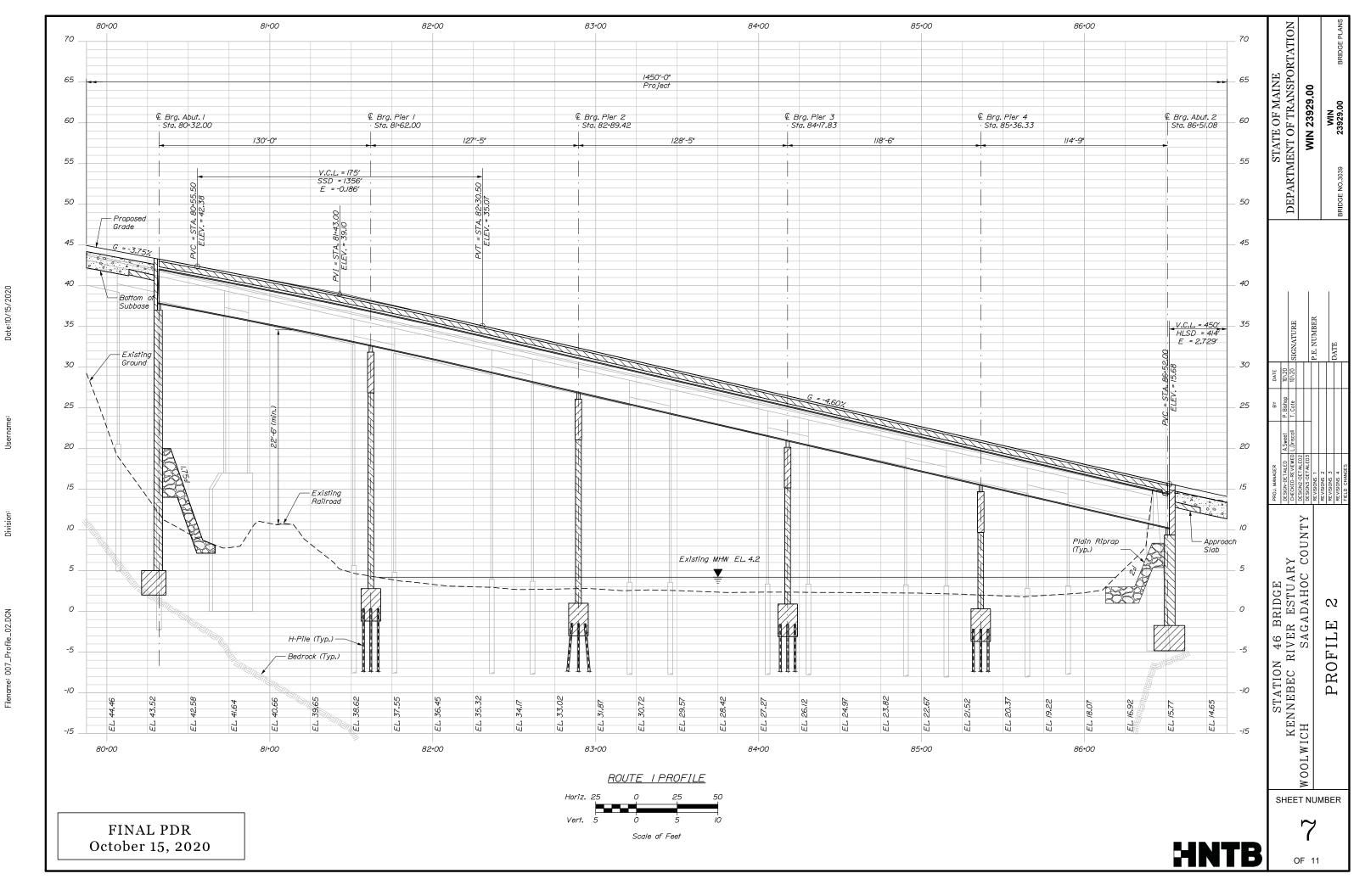


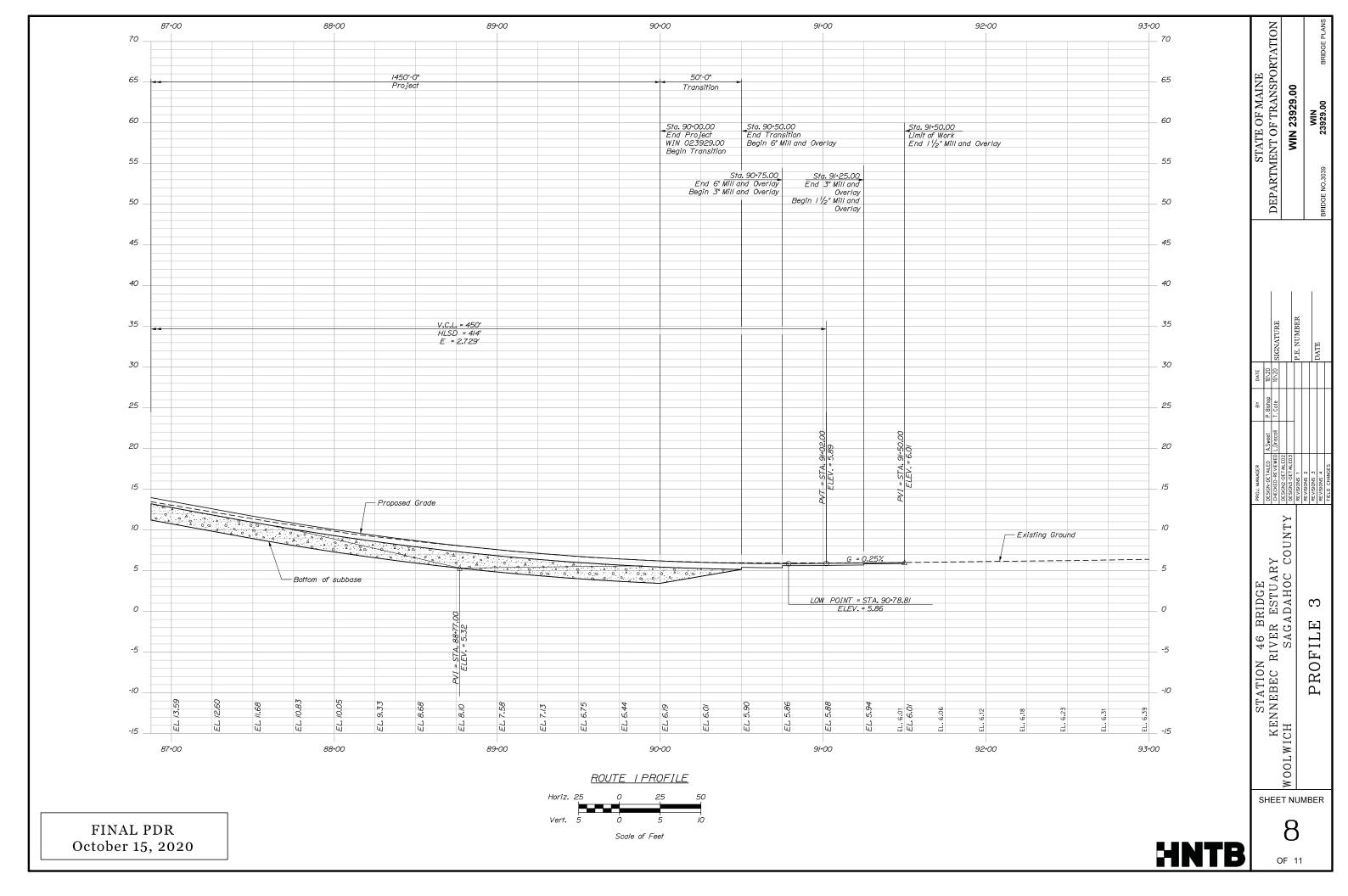
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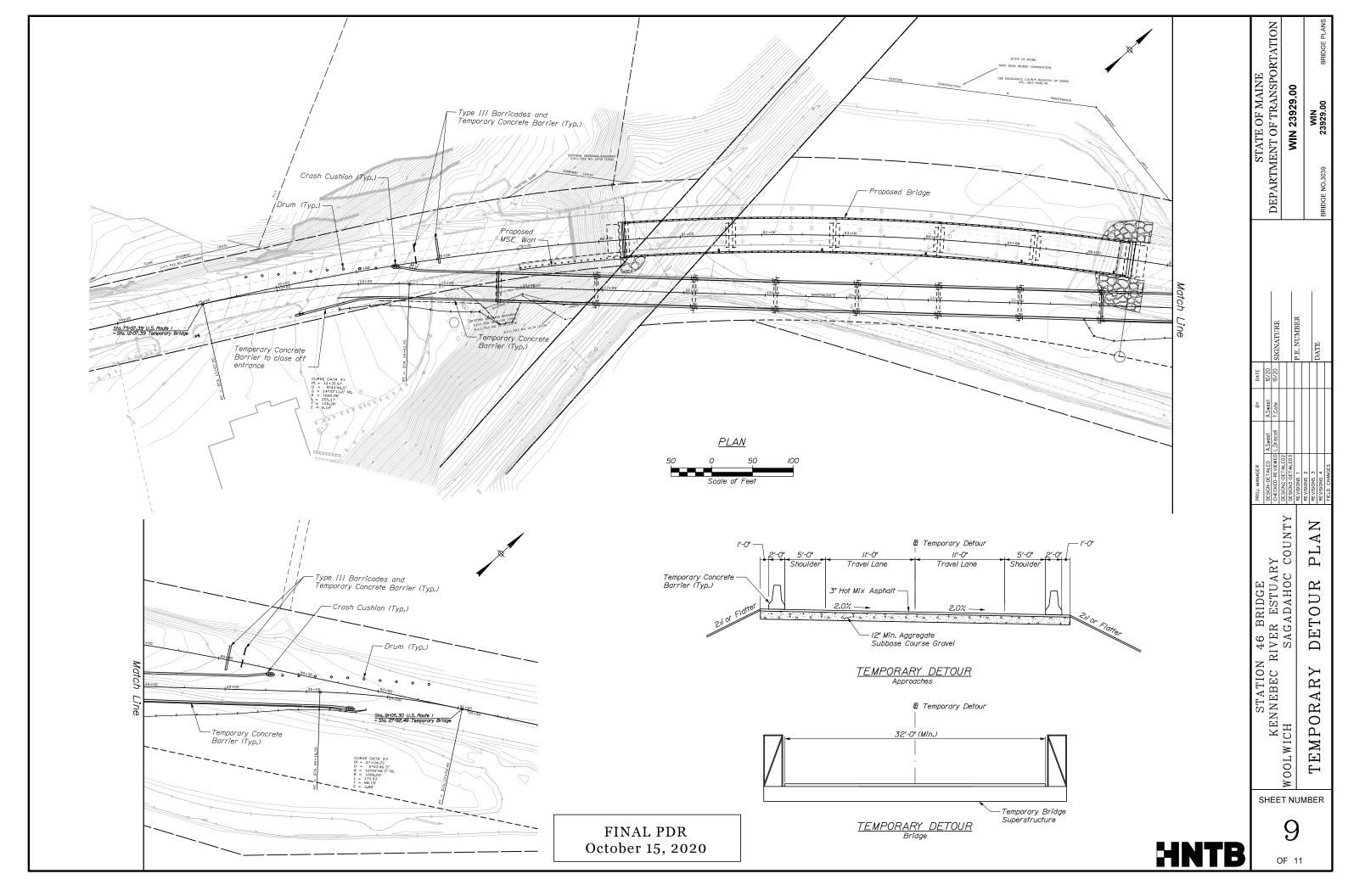




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