Preliminary Design Report

Ticonic Bridge #2854
over
Kennebec River

Waterville-Winslow, Maine

2313800
WIN 023138.00

Maine Department of Transportation
Bridge Program

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EXECUTIVE SUMMARY

The Ticonic Bridge (#2854) carries U.S. Route 201 over Kennebec River connecting the City of Waterville and Town of Winslow. The bridge is comprised of three transversely adjoining structures separated by two longitudinal joints. The downstream structure is a four-span earth filled concrete arch built in 1911 with a total structure length of 517'-0". The central structure, constructed directly upstream of the arch in 1936, is a riveted steel girder bridge with steel needle beams supporting a non-composite cast-in-place concrete deck. The central structure also has four-spans with a total bridge length of 517'-0", shares all the substructure locations of the concrete arch. The bridge was widened in 1970 through the addition of a five-span upstream structure, with a total bridge length of 569'-0", consisting of welded steel plate girders supporting a composite cast-in-place concrete deck. The structure shares two piers and the west abutment with the downstream structures. The remaining two piers and the east abutment are separate from the downstream structures.

The project area is constrained by adjacent intersections on both approaches. Additionally, the Lockwood Dam hydroelectric station is located downstream from the bridge along the west riverbank. The Lockwood Dam extends north beneath the second westerly span of the structure and curves to the northeast where it meets the Winslow riverbank several hundred feet upstream from the bridge. Railroad tracks belonging to Pan-Am Railways cross through the Winslow intersection and cross over the Kennebec River to the north of Ticonic Bridge.

Bridge replacement is recommended to address structural deficiencies. Conventional bridge construction and staged construction is proposed. Traffic will be maintained on site, but throughput of the bridge will be reduced resulting in delays for motorists and first responders. Contractor access at the site is challenging and will require the extensive use of trestles, possibly supplemented with sections of rock roads, on both the upstream and downstream sides of the bridge.

The proposed bridge will be a 566'-0" two-span structure with metallized welded steel plate girders and a concrete deck. The bridge will carry five lanes of traffic with a 65' curb-to-curb width. Sidewalks with crashworthy bridge rail will be located along both fascias. The substructure will consist of concrete stub abutments and full height concrete wall piers supported by bedrock. Several major bridge mounted utilities exist and will be re-installed on the new bridge.

The new bridge will be located generally on-alignment with the bridge centerline shifted 1.5' north to accommodate construction phasing. The Winslow intersection will be modified to include revised lane assignments and signal timing allow for the use of split phasing which will improve traffic operations.

The preliminary estimated program cost for this project is $40,500,000.

BACKGROUND INFORMATION

TOWN	Waterville-Winslow	**WIN**	023138.00	**BRIDGE NO.**	2854
BRIDGE	Ticonic Bridge			**ROAD**	Route 201

FUNDING: Federal/State

PROGRAM SCOPE: Bridge Replacement

PROGRAM DESCRIPTION: Ticonic Bridge (#2854) over Kennebec River. Located on the Waterville-Winslow town line.

PROJECT BACKGROUND: This bridge is a combination of three separate but adjoining structures consisting of two distinct span configurations as a result of widening projects. A five-span welded plate girder superstructure built in 1970 carries westbound traffic and pedestrians. Eastbound traffic is carried by a four-span riveted girder superstructure built in 1936. Pedestrians along the eastbound lanes are carried by a four-span earth-filled concrete arch built in 1911. The bridge wearing surface was replaced and the median was rehabilitated in 1990. The structure is currently in poor condition, particularly due to advanced deterioration of the arch. The existing pier foundations also include concrete jacketed granite block foundations and do not meet modern design standards. The bridge replacement received a Better Utilizing Investments to Leverage Development (BUILD) Grant. The Project is funded for engineering and construction in the 21/22/23 Work Plan.

		JURISDICTION	State Highway	**NHS**	No
		FUNCTIONAL CLASSIFICATION	Minor Arterial	**CORRIDOR PRIORITY**	2
		URBAN/RURAL	Urban	**FHWA SUFFICIENCY RATING**	57.0
		POSTED SPEED	25 mph	**LOAD POSTING**	N/A
TRAFFIC:	2021	**AADT**	17,430	**ACCIDENT DATA, CRF**	1.26
	2041	**AADT**	20,920	**DHV**	2,092

EXISTING BRIDGE

YEAR BUILT 1911,1936,1970 **SPAN LENGTHS** Varies **CURB TO CURB WIDTH** 62’

TYPE OF SUPERSTRUCTURE: The bridge consists of three adjoining structures. The downstream structure is a four-span earth filled concrete arch. The central steel structure, located upstream of the arch, is a four-span continuous structure with riveted steel girders and needle beams with a non-composite concrete deck. The upstream structure is a five-span welded steel girder structure supporting a composite concrete deck. The structures are separated by longitudinal joints within the sidewalk and raised median.

GENERAL CONDITION: Steel girders and needle beams are in fair condition with minor section loss, rusting and isolated locations of moderate corrosion. The concrete deck is in fair condition with areas of spalling and delamination. The wearing surface and bridge rail are in satisfactory condition with minor deterioration. The concrete arch is in overall poor condition and controls the condition of the superstructure. The arch exhibits widespread advanced deterioration including extensive cracking with efflorescence and spalling.

TYPE OF SUBSTRUCTURE: The three superstructures are arranged in two distinct span configurations resulting in three abutment locations and five pier locations. All substructures bear directly on bedrock. The downstream arch and riveted steel structure share substructures including mass concrete gravity abutments. Portions of the abutments incorporate stacked stone abutments from a prior structure. The wall piers consist of a granite block pier from a prior bridge encased in concrete. The lower portion of westernmost pier is encapsulated by the Lockwood Dam spillway that passes under the bridge. The Waterville abutment and the two piers located in the lower basin of the river also support the upstream plate girder structure. Two additional mass concrete wall piers support only the upstream structure. The first is located within the impoundment area west of the dam and the second is located near the east shoreline of the lower basin. The Winslow abutment, which is set approximately 37 feet behind the abutment for the downstream structure is a concrete stub abutment.

GENERAL CONDITION: The abutments are in fair condition with isolated locations of spalling and cracking. The concrete for both abutments is cracked and spalled and in poor overall condition. The pier concrete is in satisfactory condition with some cracking and spalling.

LOAD RATINGS:	**OPERATING**	**INVENTORY**
HL-93	34 Tons	26 Tons
Rating Factor	0.95	0.73
	LEGAL LOADS	
Controlling Configuration: 1	57 Tons	
Rating Factor	1.15	
Controlling Member:	Exterior girder in flexure on central structure	

STRUCTURALLY DEFICIENT Yes **FUNCTIONALLY OBSOLETE** N/A

MAINTENANCE PROBLEMS: Sidewalk settlement and deterioration on the arch structure. Ongoing cracking and deterioration of wearing surface.

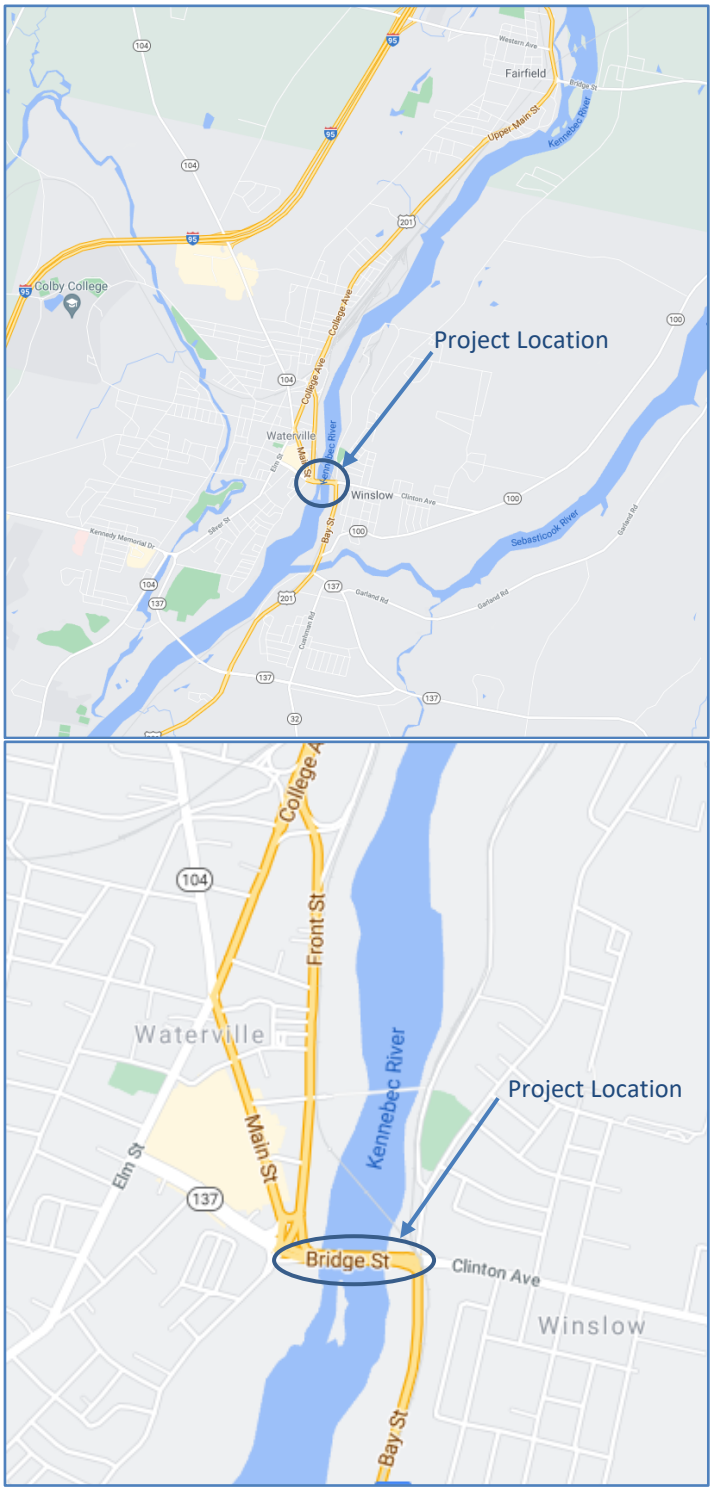
MAINTENANCE WORK: Sidewalk repair to address settlement.

PREVIOUS STRUCTURE: Iron truss supported on stacked stone abutments.

OTHER COMMENTS: This is a non-historic bridge located adjacent to multiple historic districts.

LOCATION MAP

Waterville-Winslow, Ticonic Bridge #2854, WIN 023138.00
Route 201 over Kennebec



Latitude: 44° 32' 50.60" N, Longitude: 69° 37' 37.60" W

BRIDGE RECOMMENDATION FORM

WIN 023138.00 **TOWN** Waterville-Winslow
BRIDGE NO. 2854 **BRIDGE** Ticonic Bridge

PROJECT MANAGER Mark Parlin
DESIGNED BY HNTB **DATE** 8/3/2021
APPROVED BY REM **DATE** 8/5/2021
APPROVED BY J.S. Folsom **DATE** 8/6/2021

PROJECT: Bridge Replacement with 300’ of approaches, including transitions.

ALIGNMENT DESCRIPTION: The proposed bridge will be constructed predominately on the existing horizontal alignment. The new bridge centerline is approximately 1.5’ upstream of existing bridge centerline. The west approach has a 700’ radius horizontal curve that extends approximately 30’ onto the proposed bridge, followed by a 595’ tangent across the bridge, and a 3,000’ radius curve that begins approximately 60’ east of abutment 2. A 120’ sag vertical curve on the west approach transitions to a 0.75% tangent before transitioning to a 200’ crest vertical curve at the center of the bridge. The crest vertical curve transitions to a 0.75% tangent section before ending with a 180’ sag curve.

APPROACH SECTION: Five 11’-0” lanes with 5’-0” shoulders and 6’-0” sidewalks on both sides of the bridge. Sideslopes consist of be 2:1 with MASH compliant steel guardrail and 3:1 sideslopes or flatter without guardrail. Approach sections will match existing intersection geometry.

SPANS	283’-283’	**SKEW**	0° ahead on left
LOADING	HL-93 modified for Strength 1	**DESIGN SPEED**	25 mph

SUPERSTRUCTURE: Nine variable depth welded metallized steel plate girders with an 8” composite cast-in-place concrete deck and a 3” bituminous wearing surface on ¼” high performance waterproofing membrane. Reinforcing bars will be stainless steel. Web depths range from 92” in positive movement regions to 112” in negative moment regions. Curb-to-curb width will be 65’-0” and two 6’-0” sidewalks. Bridge rail will be standard 4-bar steel bridge rail at a minimum, however alternate rail types such as Wyoming Rail or Texas Rail may be used based on further coordination with the communities during final design. The superstructure cross slope will be a 2% normal crown.

ABUTMENTS: Conventional abutments founded supported by bedrock or existing fill concrete. Abutment 1 will include one in-line cast-in-place wingwall and one return wingwall. Abutment 2 will include cast-in-place flared wingwalls. Finger joints will be used at both ends of the bridge to accommodate thermal movements.

PIERS: Mass concrete pier founded on bedrock.

AVAILABLE SOILS INFORMATION: Existing plans show bedrock to be present at about 20' below grade at the existing abutments and bedrock is exposed at riverbed. A boring program will be completed as part of final design.

ADDITIONAL DESIGN FEATURES: Bridge lighting will be provided along the structure to illuminate the proposed sidewalk on both sides of the bridge. Enhancements to bridge lighting may be incorporated based on further municipal coordination during final design.

COMPLETE STREETS: The proposed roadway width of 65' consisting of five 11'-0" lanes, two 5'-0" shoulders and two 6'-0" sidewalks satisfies the Department's Complete Streets Policy by allowing pedestrian and bicycle use. Sidewalks will tie into existing sidewalks on the approaches.

MAINTENANCE OF TRAFFIC: Construction will be completed in two phases to support on-site traffic management to the extent practical. Two options are currently undergoing detailed evaluation. The first maintains one lane of traffic in each direction. The second maintains eastbound traffic only and detours westbound traffic. The ongoing traffic evaluation is further assessing the advantages and disadvantages of each approach. The results will serve as the basis for selecting a preferred traffic management approach.

CONSTRUCTION SCHEDULE: Three years of construction. Schedule assumes Contractor will forego the initial winter in-water work window to allow additional time for project planning and submittals preparation. Mobilization is expected to occur approximately six months after project award. Extending the construction schedule for the Ticonic Bridge is possible in the event that construction of the adjacent fishway project takes longer to complete than planned.

ADVERTISING DATE: June 2022

		Program Amount	Available Funding	Estimated Project Cost	Shortfall/ Surplus
Preliminary Engineering		$485,000	$485,000	$1,200,000	*-$715,000*
Right-of-Way		$15,000	$15,000	$30,000	*-$15,000*
Construction [	**Structure**	$11,500,000	$36,500,000	$35,400,000	*$200,000*
	Approaches			$900,000	*$0*
Construction Engineering		$3,500,000	$3,500,000	$2,970,000	*$530,000*
Total		**$15,500,000**	**$40,500,000**	**$40,500,000**	**$0**

ADDITIONAL BORINGS REQUIRED? Yes

ADDITIONAL GEOTECHNICAL EVALUATIONS REQUIRED? Yes

APPROVED DESIGN EXCEPTIONS: None.

MUNICIPAL/STATE AGREEMENT REQUIRED? Yes, several municipal/state agreements are required as part of the project. First, an agreement is required for the impacts to the war

memorial plaque at the Winslow abutment. Secondly, an agreement is required for the lighting on the bridge. Lighting will be maintained by MaineDOT, but costs associated with operating the lights will be the responsibility of the municipality. Thirdly, an agreement is required for maintenance of the proposed sidewalk throughout the year; this includes clearing the snow during the winter months. Lastly, an agreement will be necessary to outline cost-sharing for any aesthetic enhancements requested by the communities.

COMMENTS BY ENGINEER OF DESIGN:

SUMMARY OF EXPECTED IMPACTS

RIGHT OF WAY Number of: Property Owners 4
Buildings to Be Taken 0

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

UTILITIES: Central Maine Power, Consolidated Communications, Kennebec Water District, Charter Communications, Oxford Networks, Waterville Sewer District, Kennebec Sanitary Treatment District, Summit Natural Gas, Pan-Am Railways, Brookfield

COAST GUARD PERMIT NEEDED? No **FAA PERMIT NEEDED?** No

ENVIRONMENTAL COORDINATION

Team Member: Andrea Brady

Project Scope/Description	Bridge Replacement
NEPA Determination	Programmatic Categorical Exclusion 771.117 (c) 28
STIP Date	5/13/2021 - PE/ROW/ADV & CON
Section 106	Ongoing. Ticonic Bridge #2854 is not National Register (NR) Eligible. 2 NR Eligible Resources have been identified: - Maine Central Railroad Historic District - Waterville Main Street Historic District 2 historic districts have been identified in the project area: - NR-listed Lockwood Mills Historic District - NR-listed Arnold Trail to Quebec Historic District
Section 4(f)	Waterville Head of Falls Waterfront Park is 4f property. All Section 106 properties listed above are considered Section 4f properties.
Section 6(f)	Section 6(f) property on Waterville side – Waterville Head of Falls.
Federal Endangered Species	Project is within Atlantic Salmon Distinct Population Segment (DPS) and Critical Habitat (CH). Formal consultation with U.S. Fish & Wildlife Service (USFWS) required either through the Programmatic Biological Assessment (BA) or a traditional BA (still in discussion).

	Project is within Atlantic/Shortnose Sturgeon DPS/CH – formal consultation with National Marine Fisheries Service (NMFS) required with traditional BA. Potential sturgeon spawning habitat is present beneath and in vicinity of the bridge. Northern Long-Eared Bat – Not likely to Adversely Affect. Streamlined 4(d) Consultation
State Endangered Species	None present.
Essential Fish Habitat	Project is designated EFH for Atlantic Salmon. Adverse Effect – Not substantial. Abbreviated consultation.
Fish Passage Design Review (Post-Construction)	There will be no change to fish passage from proposed structure. Computational Fluid Dynamics (CFD) modeling report pending to determine effects of fishway to flow in bypass channel.
In-Stream Work Window/Other Construction Restrictions	Sept 1 – April 1 (tentative). Earlier start date (i.e., before Sept. 1) will be requested but subject to NMFS approval.
Hazardous Material	Review in progress. Areas of interest noted on Waterville approach (former mills and hydro facility) that are in the MDEP Brownfield & Voluntary Response Action Program (VRAP) programs. Potential former gas station at intersection on Winslow side.
Dredge Material	River is Class B at bridge and Class C upstream. Need information on anticipated amount of dredge and either beneficial reuse or offsite disposal options.
Stormwater/MS4	N/A
DEP/LUPC	DEP Permit Exemption 38 MRSA 480-Q2d
ACOE	PCN (former Category 2)
Mitigation	Not anticipated
Other	

Avoidance & Minimization: Minimize in-water piers and footprint of temporary construction access to the extent practicable.

SUMMARY OF PRELIMINARY DESIGN

BACKGROUND

The Ticonic Bridge (#2854) carries U.S. Route 201 over the Kennebec River connecting the City of Waterville and the Town of Winslow. The bridge is comprised of three transversely adjoining structures separated by two longitudinal joints as shown in Figure 1. The downstream structure is a four-span earth filled concrete arch built in 1911 with a total structure length of 517'-0" and supports a sidewalk and esplanade. The central structure, constructed directly upstream of the arch in 1936, is a riveted steel girder bridge with steel needle beams supporting a non-composite cast-in-place concrete deck. The central structure also has four-spans with a total bridge length of 517'-0", shares all the substructure locations of the concrete arch, and carries three eastbound lanes of traffic. The piers supporting the central structure pre-date the concrete arch and were originally constructed with stacked stone and supported an iron truss bridge. In 1936, the Kennebec River flooded and washed away one of the piers causing a failure of the iron truss. The central riveted steel structure was built as a replacement, reusing the pier locations when possible. The damaged pier was recast as a mass concrete pier while the remaining stacked stone piers and abutments were encased in concrete.

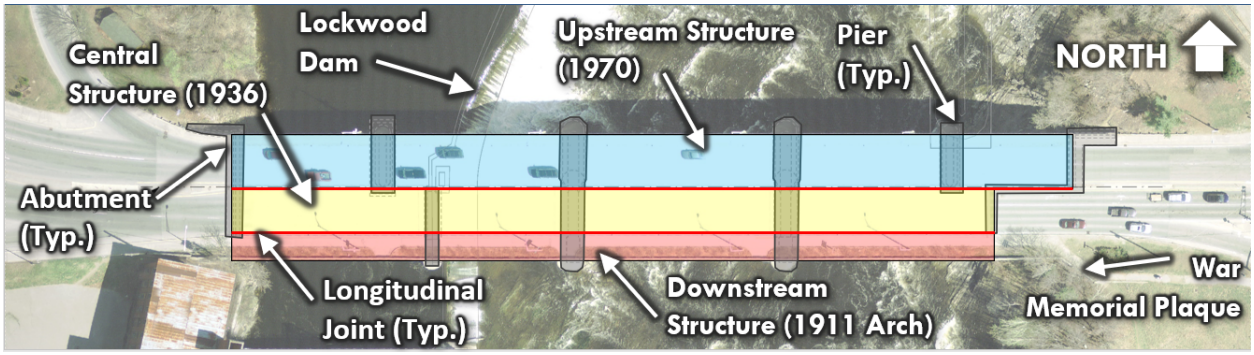
The bridge was widened in 1970 through the addition of a five-span upstream structure consisting of welded steel plate girders supporting a composite cast-in-place concrete deck. The upstream structure carries two lanes of westbound traffic and a sidewalk with a total structure length of 569'-0". The structure shares two piers and the west abutment with the downstream structures. The remaining two piers and the east abutment are separate from, and unrelated to, the downstream structures. Existing plans indicate significant previous urban development along the Waterville approach and embankment. This is supported by historic pictures taken during the 1936 flood and subsequent reconstruction. As a result, remnants of abandoned retaining walls and building foundations are present within the area of the west bridge abutment. These foundations will add to the complexity of design and construction of the west abutment.

The Lockwood Dam hydroelectric station is located downstream from the bridge along the west riverbank. The Lockwood Dam extends north beneath the second westerly span of the structure and curves to the northeast where it meets the Winslow riverbank several hundred feet upstream from the bridge. The resulting impoundment carries water beneath the west span of the bridge to the headgates of the generating station. Downstream from the dam the riverbed consists of exposed bedrock that's frequently exposed during periods of low flow.

The operator of the Lockwood Dam, Brookfield, plans to construct a fishway to the immediate north of the bridge along the east side of the river. Construction of the fishway is anticipated to begin in July of 2022 with construction completion by the end of 2023. The fishway limits end

approximately 30’ north of the Ticonic Bridge. A temporary access road will be constructed between the southern limits of the fishway and the existing bridge.

Figure 1 Ticonic Bridge Existing Conditions



The combined curb-to-curb width of the bridge is 62’-0” including a 3’-0” raised median between the two steel structures with an out-to-out width of 86’-0”. An 8’-0” sidewalk and a 7’-0” esplanade are located on the concrete arch and extend along the eastbound lanes of traffic. On the upstream side of the structure a 6’-0” sidewalk runs along the westbound lanes of traffic. A war memorial plaque is mounted within the railing system mounted atop the southeast wingwall of the existing structure. Bridge mounted utilities include electrical, communication, cable, water, and conduit for bridge mounted light fixtures. Aerial utilities are located in the adjacent intersections but are not present across the bridge. Pan-Am Railways operates two railroad tracks that pass through the adjacent Winslow intersection. South of the bridge the railroad tracks run parallel and to the east of Bay Street. At the intersection east of the bridge the tracks extend northwest through the intersection, crossing the intersection at an angle, and continue across the Kennebec River. The railroad bridge is approximately 200’ north of the Ticonic Bridge at the east riverbank.

Intersections are immediately adjacent to each end of the bridge. The Waterville intersection is currently under construction as part of the Waterville Downtown Revitalization Project (WIN 24371.00). Minor design adjustments to this project are being made during construction to minimize rework as part of the Ticonic Bridge project. The Winslow intersection signals have been redesigned as part of the Statewide Traffic Signal Modernization Project (WIN 24301.00) with construction expected to begin in late 2022 with a completion one year from start of construction. The schedule of the Winslow intersection project allows for the incorporation of any needed design changes prior to construction of that project; the signal system improvements are not expected to be part of the Ticonic Bridge Project.

The historic Hathaway Building is located immediately adjacent to the southwest approach to the bridge. The rehabilitation of this building is in the planning stages and, if the project proceeds to construction, it may result in concurrent construction projects.

The west riverbank is heavily vegetated to the north of the bridge. Concrete retaining walls are present south of the bridge that continue to the Lockwood dam headgates located approximately 60' downstream of the arch. The east riverbank consists of steeply sloping riverbanks with areas of exposed bedrock. The Kennebec River has several dams upstream of this location causing a relatively consistent water level during normal conditions. However, water levels can increase quickly during storm events carrying large debris downstream through the project area and overtopping the dam spillway. Several significant flooding events have occurred over the life of the structure with the flood of record occurring in 1936.

The Ticonic Bridge received a Better Utilizing Investments to Leverage Development (BUILD) Grant. The BUILD grant funding is contingent on advertising the project by September 2022 and construction completion by 2027. The project is scoped for bridge replacement in the 2021/2022/2023 Work Plan with a combined program value of $40,500,000 for PE, ROW, and Con/CE.

PURPOSE AND NEED

The purpose of this project is to provide for long-term safe and efficient travel in support of economic competitiveness for current and projected traffic volumes, including the movement of goods and people, between Waterville and Winslow along U.S. Route 201.

The proposed project is needed to address a structurally deficient bridge that is in overall "poor" to "fair" condition. The 2020 Highway Bridge Inspection Report for this structure reports a FHWA sufficiency rating of 57. The project provides vital a link between Waterville and Winslow and the surrounding communities

TRAFFIC ANALYSIS

The existing bridge carries five lanes of traffic – two westbound lanes and three eastbound lanes. Intersections are immediately adjacent to either end of the structure and include:

- Waterville: Intersection of Spring Street, Water Street, Main Street, and Front Street
- Winslow: Intersection of Bridge Street, Clinton Avenue, Benton Avenue and Bay Street

A series of traffic analyses were completed to determine whether the existing five lane bridge was necessary to support efficient operations of the two adjacent intersections, or if reducing the bridge to four lanes was possible while still maintaining acceptable levels of service. As previously noted, the two adjacent intersections are part of current construction projects and,

therefore, the traffic analysis for the bridge project was completed with consideration given to the proposed improvements. The construction projects include:

- The Waterville Downtown Revitalization Project (WIN 24371.00), includes restoring two-way traffic flow to Front Street and Main Street based on recommendations from the Downtown Waterville Feasibility Study. The project includes a reconfiguration of the intersection west of the bridge to accommodate the new traffic pattern. The intersection improvements include a significant reconfiguration of the intersection together with the installation of new traffic signal equipment. The work is scheduled to be complete before the Ticonic Bridge is advertised for construction. Minor design adjustments to this project are being made during construction to minimize rework as part of the Ticonic Bridge project.
- The Statewide Traffic Signal project (WIN 24301.00) includes updating signal equipment in rural locations throughout the state to provide more modern signal systems and to provide improved accommodations for pedestrians with disabilities. The intersection east of the bridge in Winslow will be upgraded to include new signal equipment, incorporate ADA accommodations, and includes the addition of a new signal mast arm and several pedestal poles. Construction is anticipated to begin in Spring 2022. The schedule of the Winslow intersection project allows for the incorporation of any needed design changes prior to construction of that project; the signal system improvements are not expected to be part of the Ticonic Bridge Project.

Traffic analyses were completed using Synchro/SimTraffic Version 10 software to determine an estimated Level of Service (LOS) for each improved signalized intersection considering either a four-lane or five-lane bridge. To begin, a baseline analysis evaluated AM and PM peak hour conditions for a “future no build” condition consisting of a five-lane bridge with no intersection improvements made beyond those described above. A 20-year design life was used.

At the Winslow intersection the baseline model showed that, even for the existing five lane structure, queues and capacity concerns will be unacceptable and result in failing levels of service. Additionally, the intersection is a high crash location with a CRF of 1.26 and 33 crashes over a three-year period. A third of these crashes occur when vehicles traveling in the same direction and adjacent to one another in a double turn lane fail to negotiate the intersection resulting in sideswipe crashes. The projected LOS, coupled with the crash history at the intersection, led to an evaluation of several alternate Winslow intersection configurations.

A traffic analysis of the Waterville intersection was not necessary since the intersection was thoroughly evaluated as part of the ongoing Waterville Downtown Improvements project. Additionally, the intersection operates as part of a much larger coordinated signal system and,

regardless of whether the bridge is four or five lanes wide, the proposed bridge project will not alter the number of lanes linking the bridge to the intersection.

The alternatives evaluation for the Winslow intersection focused on determining if lane reassignments or other minor geometric changes could be performed to improve the safety and capacity of the intersection. As such, several four and five lane bridge alternatives were evaluated together with corresponding modifications to the Winslow intersection. The four-lane configurations examined two and three lane approaches eastbound coupled with one and two receiving lanes westbound; three lane approaches eastbound coupled with one receiving lane westbound. For the latter scenario, the single receiving lane westbound transitions to two lanes across the bridge. Four- and five-lane alternatives are included in Appendix F.

The main capacity concern for this intersection is driven by the existing intersection geometry. The configuration of the Winslow intersection includes double turn lane movements from Benton Avenue and Bay Street requiring sequential intersection phasing. In sequential phasing, opposing legs of an intersection are not able to operate concurrently and each leg of the intersection receives green time separately from the other legs. In this case, and in many others, sequential timing serves to significant degrade intersection capacity and operations.

The traffic evaluation determined that current-year and future-year traffic volumes support the elimination of the dual turn movements. This change also allows for the use of more efficient split phasing for the signal system. The analysis provided the following additional conclusions:

- The significant sideswipe crash pattern caused by traffic utilizing the dual left from Bay Street onto the bridge could be mitigated;
- Operationally, the westbound receiving lane at the Winslow intersection requires only one lane; and
- Operationally, either the four or five lane structure will operate acceptably. Four-lane structures that operate acceptably require three lane approaches eastbound coupled with one receiving lane westbound. Four-lane options with two lane approaches eastbound and two receiving lanes westbound had failing LOS for based on eastbound approach limitations.
- Operationally, whether a four or five lane structure is selected, traffic operations of the Winslow Intersection will be significantly improved over the baseline condition increasing from a LOS E to LOS B.

Based on the conclusions above, and regardless of whether a four or five lane bridge is selected, modification to the Winslow intersection to remove the duel turn movements, together with changing the existing sequential traffic signal phasing to split phasing, is recommended.

A more detailed summary of the traffic operational analyses is provided in the traffic analysis memorandum included in Appendix F.

MAINTENANCE OF TRAFFIC

Several traffic management options were considered for construction including:

- Option 1: Maintain one lane of traffic in each direction.
- Option 2: Maintain one or two lanes of eastbound traffic, detour westbound traffic.
- Option 3: Bridge closure.
- Option 4a: Option 1 combined with up to 9 months of bridge closure.
- Option 4b: Option 2 combined with up to 9 months of bridge closure.

The use of a temporary bridge was dismissed from consideration. A temporary structure is impractical due to the numerous site constraints, limited access, and significant construction cost.

Emergency services are located on both sides of the bridge and both municipalities provide mutual aid to one another. The Winslow police and fire departments are located on Benton Avenue northeast of the bridge. The Waterville police and fire departments are located on Main Street northwest of the bridge. The two area hospitals are located in Waterville to the northwest (Maine General Health) and southwest (Northern Light Inland Hospital) of the bridge. Preliminary discussions with emergency services from the municipalities revealed a preference for options that maintained traffic on site. They also offered that, while not their first choice, isolated closures were preferred to a complete bridge closure.

A discussion of each maintenance of traffic option is provided below. Additionally, an evaluation matrix comparing and contrasting each option is provided in Appendix F.

Option 1: Maintain one lane of traffic in each direction.

This option maintains one lane of traffic in each direction through the project on the existing and proposed structures. Temporary modifications to signal timing and phasing for both intersections is required, as is the addition of several temporary signal heads to accommodate changes in turn lane locations.

This option accommodates traffic in each direction and, based on conceptual evaluations, results in estimated user cost of $6.94 million – the lowest of all options evaluated. The user costs for this option result from the reduced throughput that occurs at each

intersection because construction activities will not provide the space necessary to maintain all of the turn lanes and storage length needed at each intersection. During periods of high traffic volume some motorists will wait in extended queues while others will voluntarily detour around the project site.

Congestion at each end of the bridge will impact response times for EMS and mutual aid, particularly at peak travel times. The bridge will remain open to traffic in both directions however, because the bridge width during construction will be limited, emergency vehicles will be unable to "split" the traffic lanes to bypass queued traffic. Instead, first responders will need to wait in traffic to cross the bridge or detour around the project.

At each bridge approach the roadway width will flare out at the intersections to accommodate turning lanes, vehicle storage, and turning movements to the extent practical. Therefore, less space will be available to the contractor at each bridge approach. This limits opportunities for laydown and material storage at a project site that is already heavily constrained. Intermittent traffic stoppages will be necessary to support the hauling of materials in and out of the project site. Some construction activities, such as bridge demolition and the delivery of structural steel, can best be accomplished with the bridge reduced to a single lane of traffic. For these activities the traffic in one direction will be detoured off site to provide a closed lane for the contractor to work in. The intermittent traffic stoppages, and periodic off-site detours associated with this option, will require frequent and clear communications with first responders and the community so motorists know what to expect.

Option 2: Maintain eastbound traffic, detouring westbound traffic off site.

This option maintains two lanes of eastbound traffic across the bridge during peak travel times. Westbound traffic will be detoured approximately two miles south to the Carter Memorial Bridge. Detouring westbound traffic is proposed since doing so means the diverted vehicles are making predominantly right hand turns at intersections. Similar to Option 1, temporary modifications to the signal timing and phasing for both intersections is required, as is the addition of several temporary signal heads to accommodate changes in turn lane locations.

For this option, reducing the bridge to a single lane of eastbound traffic during off-peak travel periods can be readily accomplished to allow for improved contractor and first responder access.

This option provides eastbound traffic operations that are similar to current conditions while the travel time and distance for westbound motorists is increased. The estimated user cost for this option is $13.82 million.

The westbound detour includes Route 201 and Route 137 as shown in Appendix F. The additional travel time and distance from abutment to abutment is 9 minutes and 3.7 miles, respectively. At the intersection of Route 201 and 137 a modification will be considered that adds a dedicated right turn lane for vehicles heading south on Route 137. Vehicles frequently use the existing shoulder to make right turns even though it's not striped as a turn lane. This improvement would provide a lasting benefit that would extend beyond the completion of the project.

Limiting traffic to eastbound only has the potential to impact response times for EMS and mutual aid in the event that first responders need to detour south to the Carter Memorial Bridge. However, the impact to response time can be mitigated in two ways. First, limiting traffic to a single lane eastbound during off peak periods would provide an available lane for first responders traveling westbound. Secondly, the use of signal preemption may be possible. One scenario is for the preemption to set all movements at the Waterville intersection to red, and the west leg of the Winslow intersection to green. This would allowing traffic to clear the bridge and provide passage for first responders.

Maintaining only eastbound traffic across the bridge means, compared to Option 1, less space will be required for the roadway at each approach and intersection. More space will be available to the contractor for laydown and material storage, a notable benefit considering the very limited area available on site. Additionally, during off peak travel periods reducing the bridge to a single lane will provide the contractor with significantly improved flexibility with regard to hauling of materials in and out of the project site and for key construction activities such as bridge demolition and the delivery of structural steel. Moreover, unlike Option 1, the implementation of a lane closure will not require the installation of an off-site detour. The result is more consistent and predictable travel patterns for motorists. The potential for miscommunications with first responders is also reduced.

Option 3: Bridge closure

This option closes the bridge to all traffic and detours both eastbound and westbound traffic to Route 137. Both directions of traffic will follow the same detour as noted in Option 2. Spot improvements along the proposed detour route, such as intersection timing modifications and the addition of turn lanes, will be required to accommodate the significant influx of traffic.

This option shortens the construction duration from the 36 months estimated for either Option 1 or Option 2, to 28 months. This option also provides the Contractor with the greatest construction access and laydown space.

However, the extensive detouring of traffic, and the associated delays to first responders, is judged to be unacceptable. The estimated user cost for this option is $22.68 million.

Option 4a and 4b: These alternatives combine Option 1 and Option 2 combined with up to nine months of bridge closure to facilitate safe and efficient construction.

For these options traffic will be maintained as described in either Option 1 or Option 2. One or more closures of the roadway, totaling up to nine months in duration, will be allowed to improve constructability, access and efficiency. The work completed during bridge closures would include critical activities such as bridge demolition, girder erection, and the placement of deck concrete. The bridge closure periods allow the Contractor to use the adjacent structure for access and laydown resulting in improved safety, efficiency and schedule performance. This option allows for an estimated schedule reduction of four months compared to Options 1 and 2.

However, the requirement to detour all traffic for nine months, and the associated delays to first responders, is judged to be unacceptable. The estimated user costs for Option 4a and 4b are $11.72 million and $16.60 million respectively.

Pedestrian accommodations are a significant consideration for this project. Option 3 requires detouring pedestrians away from the project site for the entire duration of construction (28 months). For the remaining options, pedestrian traffic will be detoured during the first phase of construction (16 to 18 months) and then maintained on site for the second phase of construction. The proposed pedestrian detour follows Benton Avenue, the Two Cent Bridge and Front Street. Pedestrians will experience an additional travel time and distance of 9 minutes and 0.5 miles, respectively. Limited improvements will be necessary along the detour route to meet ADA requirements and to provide adequate illumination during the overnight hours. Further coordination regarding these items will occur during final design.

Conclusion: Option 1 and Option 2 are the most viable traffic management solutions for the project. Option 1 provides improved mobility and reduced user costs while Option 2 provides enhanced constructability and contractor access. Given the magnitude of user costs involved, and the difference in constructability and access afforded by these two options, more detailed traffic analyses are currently underway. The ongoing analyses will provide additional metrics including levels of service and queue lengths, travel times associated with each alternative, and potential additional improvements necessary to optimize safety and capacity during construction. The results of this analysis will be summarized in a traffic memorandum, will be used to inform ongoing communications with municipal leaders and first responders, and will ultimately support selection of a preferred traffic management approach.

UTILITIES

A significant number of underground utilities exist within the project limits including water, sewer, electric, communications, cable, and closed drainage. A gas line is not currently on the bridge. However, the project team was asked to add a gas line across the bridge as part of this project.

On the bridge the electric line consists of nine 4" steel conduits mounted to the underside of the deck of the downstream steel structure in the median. The communications line consists of a duct bank with eighteen 4" conduits buried beneath the sidewalk in the concrete arch. Cable resides in the communications duct bank. A 24" waterline is also buried in the concrete arch under the esplanade. All bridge mounted utilities will need to be relocated as part of the project. Temporary relocations are not anticipated. However, the communications line may require a final adjustment considering the 9-18 month relocation time and the anticipated construction staging.

On the west approach, a 48" interceptor sewer line encased in a 72" concrete filled steel liner is located a short distance behind the existing and proposed abutment. Modification to the sewer is not anticipated at this time. However, the local sewer company plans to rehabilitate and strengthen the line prior to construction. Several other electric lines servicing traffic signals and lighting, as well as smaller sewer lines and water lines, are present in both approaches and intersections. Adjustments to these facilities are not anticipated. An existing closed drainage system on both ends of the bridge will be modified to accommodate the proposed configuration. Pan-Am Railways operates two sets of railroad tracks that run through the Winslow intersection. The limits of roadway rehabilitation are not expected to extend through the tracks and, therefore, significant railroad modifications are not anticipated. However, relocation of a railroad signal on the southeast corner of the project is required and minor pavement improvements along the tracks may be completed. As such, railroad agreements and flaggers will be necessary for this work, and to facilitate contractor access from time to time.

GEOTECHNICAL

Geotechnical explorations and evaluations were not available at the time of this report development but are underway and will be completed in support of subsequent project phases. Therefore, existing plans and visual observations of the project site were used to support the preliminary phase of the project. Both confirm shallow bedrock is present at the east abutment, and that the piers are supported directly on bedrock. No appreciable overburden is present at the pier locations. Bedrock is also visible directly beneath the west abutment. However, the original design plans indicate remnants of old building foundations, some of which were filled with concrete when the bridge was built, are present adjacent to the existing and proposed

abutment. Confirmation of subsurface conditions will be completed during subsequent boring programs. In all locations, foundation types are assumed to consist of spread footings founded on sub-footings or concrete seals supported directly by bedrock.

SUMMARY OF ALTERNATIVES

The following rehabilitation and replacement alternatives were considered:

- Rehabilitation: Deck Replacement
- Partial Replacement: Superstructure Replacement
- Bridge Replacement

An evaluation for each alternative was completed and consideration was given to factors such as structural integrity and durability, expected service life, project cost, traffic management, constructability, and hydraulics, among others. Following an initial review of alternatives, the bridge replacement alternative was identified as the preferred alternative. Therefore, the following summaries of rehabilitation and partial replacement below are abbreviated.

The poor condition of the arch, and limited access available for arch rehabilitation caused by the adjacent upstream structure, rehabilitation of the arch structure is considered impractical. Therefore, for all alternatives the concrete arch will be removed and not replaced.

Rehabilitation: Deck Replacement

This alternative includes replacement of the concrete deck, expansion joints and bridge railings, repainting of the structural steel and repair of existing substructure concrete. The existing structural steel would remain in place as part of this alternative. However, strengthening is required in select locations to increase the HL-93 inventory load rating above 1.0. The strengthening work also includes installation of shear connectors along the needle beams to make the 1936 era structure composite with the bridge deck. The typical section on the rehabilitated bridge would provide a four-lane structure including two-11’-0” lanes in each direction with 2’-0” median shoulders, 3’-0” outside shoulders and 6’-0” sidewalks on each fascia. The longitudinal joint would remain in the existing location with a raised curb on each side separating the structures. Partial widening, including a kicker girder and flared overhangs, are required at the Waterville approach to accommodate relocation of the sidewalk that’s currently on the arch onto the central structure. Abutments and piers also required modifications including concrete caps resulting from removing the arch. However, the existing piers and abutments consisting of granite blocks encapsulated in concrete would remain and result in uncertainty regarding the capacity and long-term serviceability of the substructure.

The typical section with two-lanes in each direction will perform with a LOS E as noted in the traffic analysis section. The typical section with two-lanes in each direction does not meet

Complete Streets Policy by providing 3'-0" shoulders instead of 5'-0" shoulders to accommodate bicycle use through the project limits. Additionally, the longitudinal joint and raised median increase the long-term maintenance on the structure and limit the ability to complete future maintenance while effectively maintaining traffic. Based on the scope of required modifications, poor long-term performance of the Winslow intersection, and the limitations this configuration presents for future maintenance operations, this option was eliminated from further consideration. Uncertainty regarding the capacity and long-term serviceability of the existing river piers was also a significant factor in the project team's decision making.

Partial Replacement: Superstructure Replacement

This alternative includes all of the work in the Deck Replacement Alternative plus replacement of the structural steel. For simplicity, a bridge deck longitudinal joint with median curbs was assumed to divide the two superstructures (westbound/eastbound) similar to the existing structure, to minimize concerns from cracking due to differential displacements.

Similar to the Deck Replacement, the typical section on the rehabilitated bridge would provide a four-lane structure including two 11'-0" lanes in each direction with 2'-0" median shoulders, 3'-0" outside shoulders and 6'-0" sidewalks on each fascia. The longitudinal joint separating the two bounds results in the same operational challenges noted in the Deck Replacement option. Abutments and piers also required modifications including concrete caps resulting from removing the arch and modification to the abutment and pier seats by approximately 4' to accommodate a shallower superstructure. This option also reuses the existing piers and abutments consisting of granite blocks encapsulated in concrete. Partial widening, including a kicker girder and flared overhangs, are required at the Waterville approach and abutment to accommodate moving the arch supported sidewalk to the downstream structure. A more significant widening could be completed downstream of the central structure to facilitate five lanes of traffic across the bridge; however, the required substructure widening would add complexity and costs to the project.

This alternative has very similar challenges and limitations as the Deck Replacement option and comes at an increased cost. Therefore, this option was eliminated from further consideration.

Bridge Replacement:

Bridge replacement evaluations considered total bridge length, span configurations, typical section, construction access and phasing, traffic management, co-location with the Lockwood Dam, and long-term maintenance.

Bridge Length and Span Configurations:

The overall bridge length and corresponding span configurations were evaluated prior to evaluation of specific structural elements and construction phasing. Two options for the overall

bridge length were initially considered: an approximately 620’ structure with the abutments located behind both existing abutments and an approximately 550’ structure with the west abutment slightly behind the existing abutment and the east abutment located approximately in line with the abutment for the central and upstream structures.

Potential span configurations were then evaluated considering single, two-, three- and four-span structures. For multi-span options pier locations were selected to avoid known constraints in the waterway including the Lockwood Dam, existing substructure locations, the proposed fishway, and the channel on the eastern half of the waterway.

Single span alternatives were considered briefly using a tied arch or segmental concrete superstructure but were dismissed given the complex nature of these structures, their high construction costs, and concerns regarding increased constructability challenges.

Three- and four-span options were subsequently developed that avoided the constraints noted above. However, they resulted in unbalanced spans, inefficient girder designs and higher project costs. These factors led to the dismissal of these span configurations.

Several two-span bridge layouts for the two span length options were developed and discussed with the project team and representatives from Brookfield. Those conversations concluded the two-span structures were preferred because they minimized in-water work, located piers away from the dam and out of the impoundment, avoided the fishway, and provided the largest hydraulic opening beneath the structure. All of the two span structures necessitate two field splices per span to accommodate allowable shipping lengths. Initial span length and span configurations graphics are provided in Appendix E.

The two-span configuration was evaluated further to refine the bridge length and span proportions considering the site-specific constraints, constructability, and construction cost. The existing west abutment is located directly at the edge of channel/impoundment with return wingwalls. The 48” sewer line encased in a 72” steel pipe liner is located 12’ below grade to the top of liner and approximately 27’ behind the existing abutment at the north end of the existing abutment and approximately 1’ behind the north return wingwall. The sewer line is skewed 21 degrees to the abutment centerline and extends southwest across the bridge approach. Based on these constraints the proposed west abutment will be constructed directly behind the existing abutment with the toe of footing adjacent to the back of the gravity abutment to maximize the offset to the sewer line. Additional subsurface evaluation will be completed during final design to evaluate the condition of the existing seal concrete for reuse. The existing abutment can remain in place during construction to act as a partial cofferdam. The proposed footing will be designed with a shortened heel to provide additional offset to the sewer line. The proposed configuration shifts the west abutment centerline of bearing 11.5’ west and provides a minimum

of approximately 9’ of clear distance between the back of abutment footing and steel liner of sewer line. Consideration was given to moving the proposed abutment behind the sewer toward the Waterville intersection to allow a short stub abutment. However, doing so would increase the bridge length by approximately 65’, directly impact the intersection, and create additional utility and drainage conflicts. Additionally, the abutment locations closer to the intersections constrain maintenance of traffic and contractor operations during construction.

The existing east abutment is split into two sets of bridge seat locations. The upstream structure centerline of bearing is located approximately 37’ east of the central structure centerline of bearing. An abutment location between the two existing locations is considered advantageous to balance bridge length, abutment height, and constructability. An abutment placed in-line with the downstream structure would minimize bridge length but would require a tall cantilever abutment. Additionally, the work would likely be subject to in-water work windows due to the close proximity of the river channel. The bedrock slopes from the central abutment up to the upstream abutment. Therefore, shifting the proposed abutment east reduces the overall abutment height, increases the hydraulic capacity of the bridge, and minimizes in-water work. Additionally, the central return wingwall can be used as an earth retaining structure during stage 1 construction to minimize temporary works. As a result, construction of the east abutment is proposed between the abutments for the central and upstream structures.

The proposed abutment locations result in a total bridge length of 566’. Locating the pier at the center of the bridge optimizes girder efficiency, results in at least an 18’ offset between the proposed and existing piers, and provides a 70’ offset between the pier and the dam spillway. Therefore, this span configuration was selected for final design. The proposed abutment locations allow for stub abutments founded on bedrock and a more cost-effective structure. Abutment backwalls and seats will be reinforced with stainless steel with the remainder reinforced with plain black reinforcing steel.

Full height mass concrete wall piers and partial height wall piers with multi-column bents above floodwater elevation founded on bedrock were considered due to the exposed bedrock in the river. Full height single or multi-column bents were dismissed due to the structure width, construction staging, and history of debris in the river. Wall piers were selected over partial height wall piers with columns due to the limited column height above the Q100 floodwater elevation, simplified construction forming, and because mass wall piers provide a more robust structure. The pier will be reinforced with plain black reinforcing steel. The final details of the pier nosing – whether round or pointed, and whether vertical or inclined, will be determined during final design.

Typical Section:

Two typical sections were evaluated for replacement alternatives.

The first typical section provides a four-lane bridge with 11'-0" travel lanes and 6'-0" shoulders resulting in a 56'-0" curb-to-curb width. Additionally, 6'-0" raised sidewalks will be along both bridge fascias to accommodate pedestrian traffic. This typical section was suggested in the BUILD grant application resulting in 68'-0" wide bridge, face of rail to face of rail. The four-lane typical section consists of two lanes in each direction at the Waterville intersection and transitions to a single lane westbound and three lanes eastbound at the Winslow intersection.

The bridge width will increase near the Waterville intersection where a 6'-6" flare is required to accommodate intersection geometry. To accommodate the required geometry the three downstream girders will be kinked and flared beginning at the field splice located 75' west of the pier. The girder spacing will increase from 9'-4" at the field splice to 11'-0" at the abutment. The flared girder layout required for this option increases the design and construction complexity of the project.

The second typical section provides a five-lane bridge with 11'-0" travel lanes with 5'-0" shoulders resulting in a 65'-0" curb-to-curb width. Additionally, 6'-0" raised sidewalks will be along both bridge fascias to accommodate pedestrian traffic. This typical section results in 77'-0" wide bridge face of rail to face of rail. This section closely matches the existing condition. The typical section requires a minor flare at the Waterville approach that can be accommodated with a variable overhang.

The use of a five-lane typical section rather than a four-lane typical section is estimated to add $1.8 million to the construction cost (roughly 5% of the total construction cost).

A review and discussion of both typical sections by the project team concluded the five-lane typical section was preferrable. Although both options allow for acceptable traffic operations at the adjacent intersections the use of a five lane typical section maximizes traffic mobility, offers increased opportunity to maintain traffic on this critical structure during future bridge repairs, and can best accommodate traffic increases stemming from future economic growth in the region.

Typical sections considering seven, eight and nine girders were evaluated for the five-lane bridge option considering construction staging. A seven-girder sections yields a 12'-2" girder spacing. However, the resulting stage 1 overhang is approximately 6'-10" and was deemed impractical because it would be challenging to design and construct. An eight-girder section yields a 10'-2" girder spacing, with a girder falling at the construction joint between stage 1 and stage 2 construction. However, placing a girder at the construction joint location provide insufficient clearance to the existing structure for construction. Additionally, it makes relocation of the

communication line more difficult and costly compared to the seven and nine girder cross sections. The nine-girder section yields a 9'-2" girder spacing. The nine-girder section results in a 3'-8" overhang during stage 1 construction. Based on the girder spacing and resulting overhangs lengths during construction staging, the nine-girder section is the recommended section for the five-lane bridge.

Based on the required span length of 268' metallized welded steel plate girders were selected for the project; the required span length makes concrete or composite beams impractical. Steel plate girder sizes were evaluated for using both constant and variable web depth. Additionally, high strength steel was investigated for flange material over the pier to reduce structure depth and flange plate sizes. A hybrid girder design consisting of a variable depth web with grade 70 steel flanges over the piers was determined to be the most cost-effective option. The welded plate girders support an 8" composite concrete deck, a 3" bituminous wearing surface over a high-performance waterproofing membrane, and bridge rail mounted to 6'-0" raised sidewalks. Stainless steel reinforcement is proposed for the superstructure. The bridge rail type will be determined during final design as part of ongoing public engagement. Bridge rail options presented as part of the preliminary public process included MaineDOT's standard 4-bar steel pedestrian rail, Massachusetts 3-bar steel rail, Texas classic rail, Texas C2P Rail, and Wyoming rail. Bridge lighting will be provided and, similar to the bridge rail, the final lighting style will be selected during final design as part of ongoing public engagement. The Town of Winslow has expressed the desire for the lighting to match the Waterville Downtown Improvement Project.

Construction Staging and access:
Staged construction required to construct this project given the goal of maintaining traffic on site during construction.

Several bridge-mounted utility adjustments will begin prior to commencing bridge construction. This work will include de-energizing the electrical lines on the bridge (an outage of approximately a year is acceptable) and beginning the 18-month-long process of relocating the communications line from the arch to the new structure. Initially, the communication lines will be relocated onto the central structure in the girder bay beneath the existing bridge median. This will allow the splicing of fiber optic lines to occur as Stage 1 bridge construction is completed, removing the work from the critical path of the project schedule. Following completion of Stage 1 construction the communication lines will be slid laterally approximately 5' into their final location on the new structure.

Stage 1 will include demolition of the upstream structure and construction of the first half of the proposed bridge. All existing bridge-mounted utilities will be relocated, and the electrical lines re-energized, by the completion of Stage 1. The proposed alignment and staging provides 1.5' of

separation between the new and existing bridge using single-face anchored temporary barrier along the construction joint.

Stage 2 includes the demolition of the concrete arch and central structure. Based on the advanced deterioration of the arch controlled demolition of the structure is expected to be difficult and will necessitate extensive planning and temporary supports. Therefore, demolition of the arch will include knocking the structure down directly onto the streambed, or onto work platforms beneath the structure. Further coordination with Brookfield renewables is required regarding operational requirements and necessary protections for the Lockwood Dam during demolition of the arch and the westerly pier that's encapsulated by the dam. Demolition of the central structure will be completed using typical bridge demolition methodologies. Following Stage 2 demolition the remainder of the proposed structure will be constructed and the proposed gas line will be added to the structure.

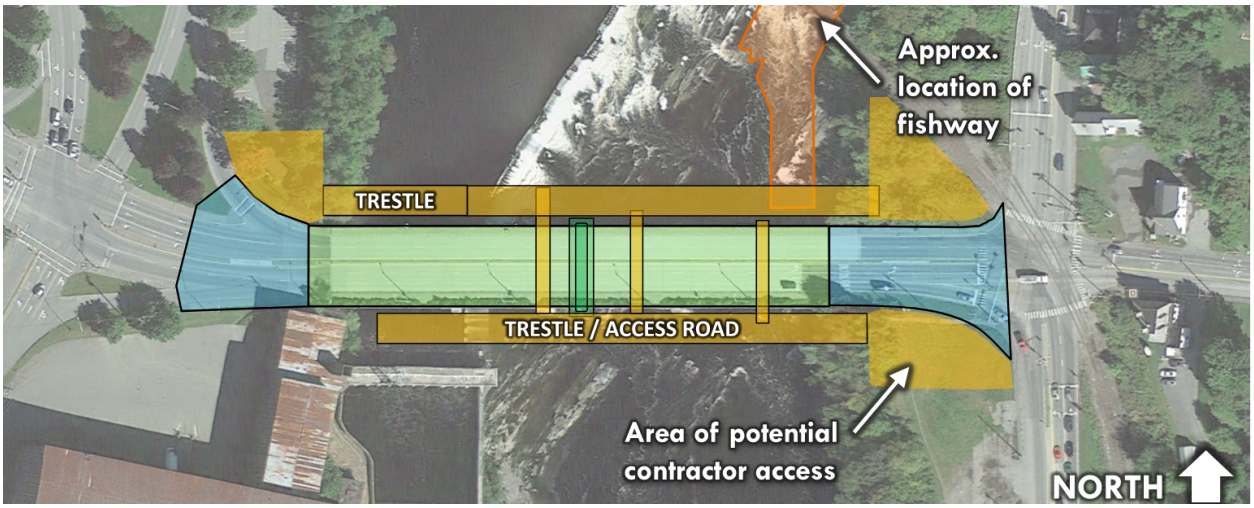
Construction phasing graphics are included in Appendix A, Preliminary Plans.

The project area has several challenges regarding construction access. The project has significant grade differential between the top of deck to bottom of channel with a maximum differential of approximately 52' at the east abutment and approximately 36' at the west abutment. Access will be further challenged by the location of the dam beneath the bridge as well as the future fishway. The Contractor will be provided the option to access the site from three of the four corners of the bridge with the goal of providing the Contractor with the maximum flexibility possible to complete the work. Access from the southwest corner of the bridge is impractical due to the proximity of the historic Hathaway Building as well as the dam headgates located directly downstream. Access will be limited at the northeast corner of the project due to the planned Lockwood Fishway as well as the existing railroad tracks located in that area.

The contractor will be provided a path of access north of the bridge extending from riverbank to riverbank. The use of trestles, possibly supplemented with rock roads in the lower basin, is being coordinated with environmental agencies. A Trestle or small barge will be required in the impoundment. South of the bridge the contractor's access will extend from the southeast corner of the bridge, across the lower basin, and over the impoundment. Similar to the north side of the bridge, access methods including trestles and rock roads are being discussed with environmental agencies and a trestle or small barge will be required in the impoundment. Significant seasonal river flows, combined with frequent and abrupt changes in flow depth and velocity, may make the use of rock roads alone impractical.

Further consideration will be given to protecting the existing Lockwood Dam and related infrastructure, sharing access space with the fishway Contractor, and the effect of temporary works on river flows will be completed during final design.

Figure 2 Anticipated Construction Access



The existing profile over the existing bridge is flat. The proposed vertical alignment matches existing grade at the abutments to minimize impacts to the adjacent intersections. A 200' crest curve with 0.75% tangents on either side of the crest curve is located over the river to provide positive drainage. The tangent sections lead into a 120' sag curve west of the bridge and a 180' sag curve to the east to match into existing grade.

A closed drainage system is present in both approaches and will be modified to accommodate the removal of the existing raised median and adjustment of the bridge and approach curb lines.

RIGHT OF WAY

Temporary property impacts are anticipated at four parcels abutting this project. Temporary construction easements are anticipated at these locations to provide reasonable construction access. Additionally, the project is located within a FERC boundary related to the Lockwood Dam and, as such, the proposed bridge configuration, construction activities and access methods are subject to FERC review and approval.

ENVIRONMENTAL

The project area is designated as critical habitat for the Atlantic Salmon and is a known spawning area for the sturgeon. Coordination with environmental agencies is ongoing regarding allowing in-water work windows and permissible activities regarding the installation of temporary works and the permanent structure. Project approval by FERC and the regulatory agencies is also required to affirm the proposed project will not adversely affect the operation of the proposed fishway.

The proposed bridge is not eligible for listing in the National Register of Historic Places. However, two historic districts are within the project area: the Lockwood Mills Historic District and the Arnold Trail to Quebec Historic District. Two other adjacent districts are eligible for listing in the National Register of Historic Places: the Maine Central Railroad District and the Waterville Main Street Historic District. Archeological evaluations are ongoing, however are not anticipated to impact the project.

A World War II memorial plaque is located on the southeast wingwall in Winslow. Based on initial coordination with the Town the monument will likely be relocated off-site to a more prominent location in Winslow.

CONSTRUCTION SCHEDULE

A preliminary construction schedule was completed for the project that includes major construction activities with anticipated durations and linkages. The preliminary project construction schedule, provided in Appendix E, demonstrates that the project can be reasonably constructed over the course of a 3-year construction period beginning in the summer of 2023 and concluding the fall of 2026. The construction schedule is heavily constrained by required phasing and in-water work window restrictions. In-water is anticipated to be permitted between September 1st and March 31st.

Given the size of the project, the project schedule allows six months for contractor planning and preparation between project award and mobilization. The following key milestone dates are anticipated:

- Project Advertisement: June 2022
- Construction Start: April 2023
- Stage 1 Construction: July 2023 through November 2024
- Stage 2 Construction: August 2024 through July 2026
- Project Completion: September 2026

At the onset of construction, the initial focus would be on the temporary relocation of utilities, particularly the fiber optic communications line. This work is estimated to take up to 18 months with the majority of the time associated with splicing new lines. Following the installation of the infrastructure required to accommodate the relocated fiber optic lines, and once splicing has begun, demolition and construction of the upstream (phase 1) portion of the project would commence. These construction activities may need to occur in concert with the construction of Brookfield's fishway project which may be under construction at the same time as the bridge.

Following the completion of Phase 1, traffic would be routed onto the newly completed upstream structure and the remainder of the original bridge would be demolished and replaced.

Representatives from Brookfield have stated that river flow conditions may delay the completion of the fishway project. In the event that the fishway project is delayed the Department has the option of extending the construction schedule for the Ticonic Bridge by up to one year while still meeting the required completion date prescribed in the BUILD grant. The purpose for the delay in the start of the Ticonic Bridge would be to offset the construction schedules for the two projects, thereby minimizing conflicts during construction.

COORDINATION WITH ADJACENT PROJECTS

Consideration and coordination have been given to adjacent projects, particularly those directly adjacent to the project. In addition to the previously discussed intersection improvements on both ends of the project, Brookfield is anticipated to construct a fishway immediately north of the bridge on the Winslow side of the Kennebec River. The fishway will extend downstream from the dam to within approximately 30' of the north fascia of the proposed bridge. Construction of the fishway is expected to be begin in 2022 with completion planned by the end of 2023. The active construction of the fishway concurrent with the bridge will present a constraint for the contractor as it relates to access on the upstream side of the bridge. The project team is actively coordinating with Brookfield renewables to coordinate the project and minimize conflicts.

PROPOSED ALTERNATIVE

The proposed alternative is a 566' two-span structure (283', 283'), comprised of nine welded metallized steel plate girders supporting an 8" composite concrete deck and 3" bituminous wearing surface over high performance waterproofing membrane with bridge rail mounted to raised sidewalks. The concrete deck will be reinforced with stainless steel. A 65'-0" curb-to-curb width will be provided to accommodate five lanes of vehicular traffic and bicycle traffic and meet MaineDOT's complete street policy. Aesthetic enhancements including bridge rail and bridge lighting will be coordinated as part of final design and will be subject to cost share with the municipalities. The bridge is supported by stub abutments and a full height mass concrete wall pier founded on bedrock. The backwall and abutment seats will be reinforced with stainless steel, while the remainder of the abutment and pier is reinforced with plain reinforcing.

The roadway and bridge typical section will consist of five 11'-0" lanes with 5'-0" shoulders and a 6'-0" raised sidewalk on both sides of the bridge transitioning to match existing conditions at the ends of the project. Approach sideslopes will be 2:1 behind guardrail and 3:1 or flatter when guardrail is not present.

The proposed highway alignment locates the bridge centerline 1.5' upstream of the existing bridge centerline. Horizontal curves at each end of the structure allow the alignment to match into the adjacent intersections where the project limits terminate. The vertical alignment was developed to match the approach roadways and provides a crest curve over the bridge to provide

positive drainage. A normal crown is provided throughout the project limits. The Winslow intersection will be reconfigured to remove dual turn movements and the sequential signal sequencing will be replaced with split phasing to optimize intersection operations.

Construction is anticipated to begin in July of 2023 and be completed in September of 2026. Construction will start with the demolition and reconstruction of the upstream structure, followed by the demolition of the concrete arch, and finishing with the demolition and construction of the downstream side of the structure.

Traffic will be maintained using either Traffic Management Option 1 (maintain one lane eastbound and one lane westbound on the bridge) or Option 2 (maintain only eastbound traffic on the bridge and detour westbound traffic). Option 1 provides improved mobility and reduced user costs while Option 2 provides enhanced constructability and contractor access. Given the magnitude of user costs involved, and the difference in constructability and access afforded by these two options, more detailed traffic analyses are currently underway. The ongoing analyses will provide additional metrics including levels of service and queue lengths, travel times associated with each alternative, and potential additional improvements necessary to optimize safety and capacity during construction. The results of the analysis will be summarized in a traffic memorandum, will be used to inform ongoing communications with municipal leaders and first responders, and will ultimately support selection of a preferred traffic management approach. Pedestrians will be detoured north to the Two Cent Bridge during the first phase of construction and will be maintained on-site during the second phase of construction. Limited ADA and lighting improvements will be needed along the pedestrian detour.

The preliminary construction cost estimate of this replacement is $36,300,000. Additional details regarding the project estimate are provided in Appendix G.

HYDRAULIC AND HYDROLOGY REPORT

Hydraulic modeling and summary report are currently in progress using Alden Labs to support environmental permitting. Summary report will be included in the final Preliminary Design Report once complete.

Appendix A

Preliminary Plans

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

SPECIFICATIONS

Design: Load and Resistance Factor Design per AASHTO LRFD Bridge Design Specifications, Ninth Edition 2020.

DESIGN LOADING

Live Load ..... HL - 93 Modified for Strength I

TRAFFIC DATA

Current (2021) AADT	17,430
Future (2041) AADT	20,920
DHV - % of AADT	10%
Design Hour Volume	2092
Heavy Trucks (% of AADT)	3%
Heavy Trucks (% of DHV)	1%
Directional Distribution (% of DHV)	57%
18 kip Equivalent P 2.0	224
18 kip Equivalent P 2.5	214
Design Speed (mph)	25

HYDROLOGIC DATA

River Flow (Design Low)	2,690 cfs
River Flow (Design High)	21,100 cfs
Head Pond	
Headwater Elevation (Design Low)	50.9 ft
Headwater Elevation (Normal)	52.2 ft
Headwater Elevation (Design High)	55.5 ft
Headwater Elevation (Q50)	65.9 ft
Headwater Elevation (Q100)	67.6 ft
Lower Basin	
Headwater Elevation (Design Low)	30.5 ft
Headwater Elevation (Normal)	32.0 ft
Headwater Elevation (Design High)	36.5 ft
Headwater Elevation (Q50)	60.9 ft
Headwater Elevation (Q100)	64.9 ft

MATERIALS

Concrete:	
Curbs and Sidewalks	Class "LP"
Seals	Class "A"
All Other	Class "A"
Reinforcing Steel	
Plain Reinforcing Steel	ASTM A 615/A 615M, Grade 60
Stainless Reinforcing Steel	ASTM A 955, Grade 75
Structural Steel:	
Flanges over Pier	ASTM A 709, Grade 70 (metallized)
All Material (except as noted)	ASTM A 709, Grade 50 (metallized)
High Strength Bolts	ASTM F 3125, Grade A 325, Type 1

BASIC DESIGN STRESSES

Concrete, Class "A"	f 'c = 4000 psi
Concrete, Class "LP"	f 'c = 5000 psi
Plain Reinforcing Steel	f y = 60,000 psi
Stainless Reinforcing Steel	f y = 75,000 psi
Structural Steel:	
ASTM A 709, Grade 70	F y = 70,000 psi
ASTM A 709, Grade 50	F y = 50,000 psi
ASTM F 3125, Grade A 325, Type 1	F μ = 120,000 psi

WATERVILLE-WINSLOW
KENNEBEC COUNTY
TICONIC BRIDGE
OVER
KENNEBEC RIVER
U.S. ROUTE 201
FEDERAL AID PROJECT NO. 2313800
PROJECT LENGTH 0.156 mi.
BRIDGE NO. 2854

PDR
July 16, 2021

LIST OF DRAWINGS

UTILITIES

Central Maine Power
Consolidated Communications
Charter Communications
Kennebec Water District
Waterville Sewer District
Kennebec Sanitary Treatment District
Oxford Networks
Summit Natural Gas
PanAm Railways
Brookfield

MAINTENANCE OF TRAFFIC

Maintain two lanes of eastbound one-way traffic and pedestrians on the bridge. Westbound traffic will be detoured off site.

PROJECT LOCATION	Ticonic Bridge #2854 in Waterville-Winslow carrying U.S. Route 201 over the Kennebec River Reservoir. Lat./Long. 44°32'50" N 69°37'38" W
PROGRAM AREA	Bridge
OUTLINE OF WORK	Replacement of Ticonic Bridge #2854 in Waterville-Winslow with associated approach work.

WIN 023138.00

2313800

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
APPROVED — DATE
COMMISSIONER:
CHIEF ENGINEER:

PROJECT INFORMATION

PROGRAM	BRIDGE		
PROJECT MANAGER	Mark Parlin	SIGNATURE	
DESIGNER	Tim Cole, PE	P.E. NUMBER	
CONSULTANT	HNTB		
PROJECT RESIDENT		DATE	
CONTRACTOR			
PROJECT COMPLETION DATE			

WATERVILLE-WINSLOW
TICONIC BRIDGE

TITLE SHEET

SHEET NUMBER
1
OF 9

Filename: 01_Title Sheet.dgn Division: Username: Date:7/16/2021

CURVE DATA #1
PI = 11+56.90
D = 3°00'56.0"
Δ = 8°41'23.4" Lt.
R = 1900.00'
L = 288.17'
T = 144.36'
E = 5.48'

CURVE DATA #2
PI = 14+34.08
D = 8°11'06.4"
Δ = 21°34'30.9" Lt.
R = 700.00'
L = 263.59'
T = 133.38'
E = 12.59'

CONTROL INFORMATION

HORIZONTAL DATUM - U.S. STATE PLANE NAD83(2011)
ZONE - MAINE 2000 WEST ZONE
VERTICAL DATUM - NAVD88
COMBINED FACTOR - 1.00002215

PC = STA. 10+12.54
PT = STA. 15+64.29
PCC = STA. 13+00.70
℄ Brg., Abut. No. 1 Sta. 15+34.99
283'-0"
S88°34'14.41"E
℄ Route 201

Spring Street Route 137
Main Street Route 100/201
Front Street Route 100/201
MAIN STREET ROUTE 201 STATE HIGHWAY "33"
FRONT STREET STATE HIGHWAY "33"
SPRING STREET ROUTE 137 STATE HIGHWAY "33"
To Waterville
Water Street
Bridge Street Route 100/137/201
Lockwood Dam
MERIMIL LIMITED PARTNERSHIP

Remove and Reset Signs
Remove Existing Guardrail
Anchored End
Limit of Contractor Access (Typ.)
Convert Catch Basin To Manhole
Adjust Electrical Manhole to Grade (By Others)
Flush Concrete Island
Adjust Drainage Manhole to Grade
Adjust Catch Basin To Grade
Remove
Convert Catch Basin to Manhole
30" X 18" Option III
Adjust Electrical Manhole to Grade (By Others)
Limits of Gas Main to be Determined By Others in Final Design
31" W-Beam Guardrail - Mid-Way Splice Tangent Terminal (TL-2)
Adjust Sewer Manhole to Grade (By Others)
31" W-Beam Guardrail - Mid-Way Splice (Typ.)
Adjust Water Gate to Grade (By Others)
Remove and Reset Sign
11' x 18" Opt. III
Remove Riser Poles (By Others)
Remove and Reset Light Pole
Adjust Manhole to Grade
Bridge Transition Type I (Typ.)

ALTA/ACSM LAND TITLE SURVEY
PROPERTY OF CATHERINE M. MARDEN
FOR LOCKWOOD MILLS III, LLC
BY PLISGA AND DAY
DATED MAY 11, 2007

PDR
July 16, 2021

PLAN
25 0 25 50
Scale of Feet

HNTB

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

2313800

WIN 023138.00

Bridge No. 2854

BRIDGE PLANS

	BY	DATE
PROJ. MANAGER	M. Parlin	
DESIGN-DETAILED	C. Hėmick	05\21
CHECKED-REVIEWED	L. Driscoll	05\21
DESIGN2-DETAILED2	C. Hėmick	
DESIGN3-DETAILED3	R. Honf	
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

SIGNATURE

P.E. NUMBER

DATE

TICONIC BRIDGE
KENNEBEC RIVER RESERVOIR KENNEBEC
WATERVILLE-WINSLOW

GENERAL PLAN 1

SHEET NUMBER
2
OF 9

E NAD83(2011)

MERIMIL LIMITED PARTNERSHIP

MAINE CENTRAL RAILROAD COMPANY

EXISTING CONSTRUCTION+MAINTENANCE EASEMENT

BENTON AVENUE
STATE AID HIGHWAY "6"

Benton Avenue

ARLENE M. LESSARD

ROBERT SIVISKI
SANDRA SIVISKI

ADA Improvements To Be Completed By WIN 024301.00

Approximate Limit of Fishway (By Others)

℄ Brg., Pier No. 1
Sta. 18+18.00

283'-0"

283'-0"

℄ Brg., Abut. No. 2
Sta. 21+01.00

Limit of Contractor Access (Typ.)

STATE OF MAINE

Flow

Riprap Downspout

Bridge Transition Type I (Typ.)

32' x 18" Option III

31' W-Beam Guardrail - Mid-Way Splice (Typ.)

31' W-Beam Guardrail - Mid-Way Splice Tangent Terminal (TL-2)

Remove Existing Guardrail

Convert Catch Basin to Manhole

6' x 18" Opt. III

21' x 18" Opt. III

Flush Concrete Island

21' x 18" Opt. III

11' x 18" Opt. III

60' x 18" Option III

11' x 18" Opt. III

Remove and Stack Sign

Remove Curb and Island

Sawcut

Remove

12" UD Type C

Remove and Replace RR Signal

Remove

Remove and Reset Sign

S.H.C. FILE NO. 6-163
EXISITING CONSTRUCTION
+MAINTENANCE EASEMENT

Ad just Water Gate to Grade (By Others)

Mast Arm Location per WIN 024301.00

Remove and Stack War Memorial Plaque as directed by the Resident

MAINVEST INC.

HUMBERTO N. REGO

Anchored End

Remove and Reset Sign

Limits of Gas Main to be Determined By Others in Final Design

PC = STA. 21+58.85

Limit of Contractor Access (Typ.)

Kennebec River

Approximate Channel Location

CURVE DATA #3
PI = 22+81.85
D = 1°54'35.5"
Δ = 4°41'44.7" Rt.
R = 3000.00'
L = 245.87'
T = 123.00'
E = 2.52'

Bridge Street
Route 100/137/201

18+00

19+00

20+00

21+00

22+00

23+00

24+00

S88°34'14.41"E

S88°34'14.41"E

S83°52'29.72"E

℄ Route 201
BRIDGE STREET
ROUTE 137
STATE HIGHWAY "33"

To Winslow

Clinton Avenue

REAL EZE ESTATES LL

MAINE CENTRAL RAILROAD COMPANY
PT = 44+04.72

BAY STREET
ROUTE 201
STATE HIGHWAY "33"
Bay Street
Route 100/137/201

PDR
July 16, 2021

PLAN

25 0 25 50
Scale of Feet

HNTB

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

2313800

WIN 023138.00

Bridge No. 2854

BRIDGE PLANS

	BY	DATE
PROJ. MANAGER	M. Parlen	
DESIGN-DETAILED	C. Helmick	05\21
CHECKED-REVIEWED	L. Driscoll	05\21
DESIGN2-DETAILED2	C. Helmick	
DESIGN3-DETAILED3	R. Hanf	
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

SIGNATURE

P.E. NUMBER

DATE

TICONIC BRIDGE
KENNEBEC RIVER RESERVOIR KENNEBEC
WATERVILLE-WINSLOW

GENERAL PLAN 2

SHEET NUMBER
3
OF 9

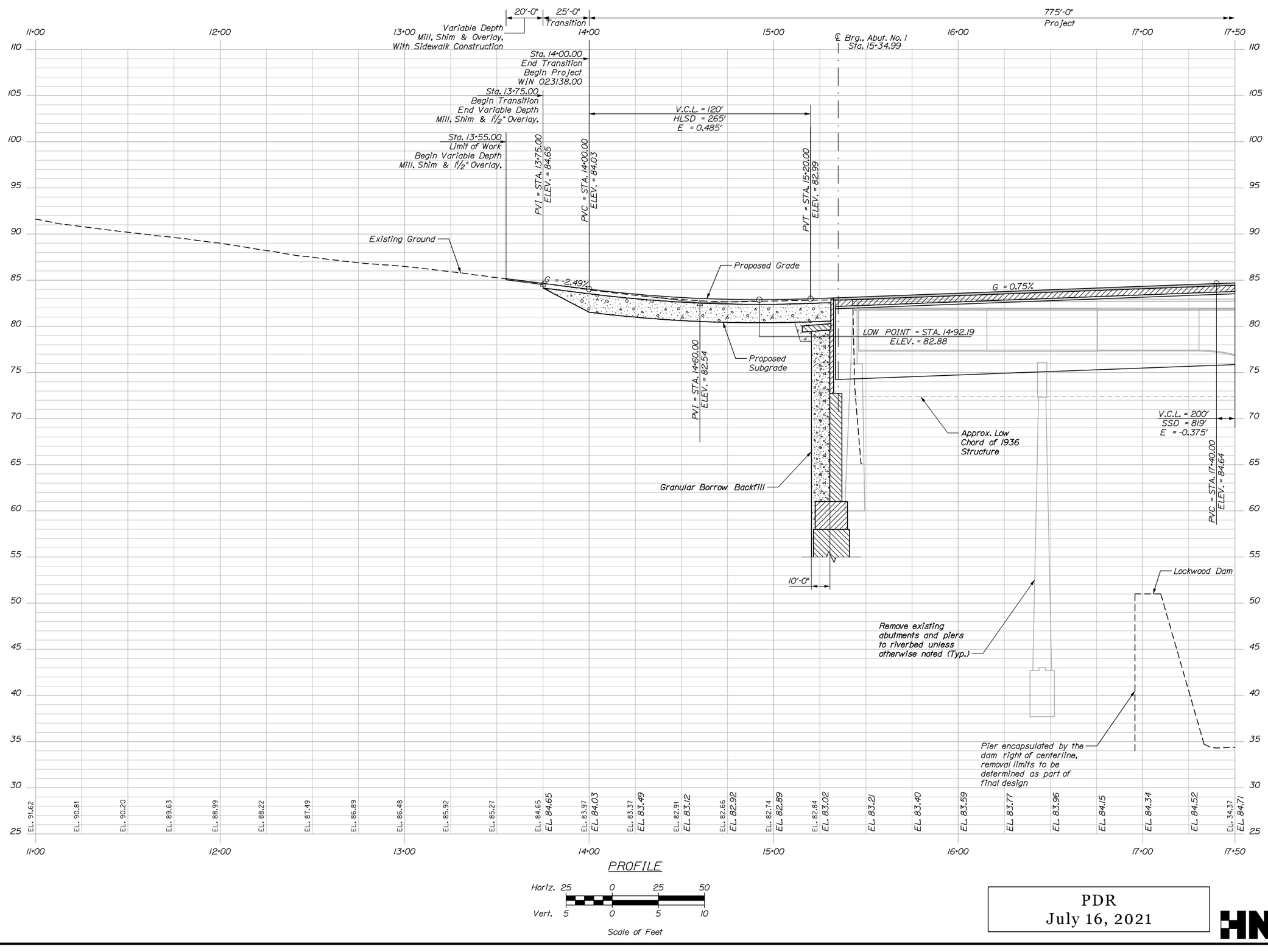
Filename: 003_BDPlan_02.dgn Division: Username: Date:7/16/2021

Username:

Division:

Filename: 004_Profile_01.dgn

Date:7/16/2021



PROFILE

Horiz. 25 0 25 50

Vert. 5 0 5 10

Scale of Feet

PDR
July 16, 2021

HNTB

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

2313800

WIN 023138.00

Bridge No. 2854

BRIDGE PLANS

PROJ. MANAGER	M. Parlin		
DESIGN-DETAILED	C. Helmick	BY	DATE
CHECKED-REVIEWED	L. Driscoll	C. Helmick	05\21
DESIGN2-DETAILED2		R. Hanf	05\21
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

SIGNATURE

P.E. NUMBER

DATE

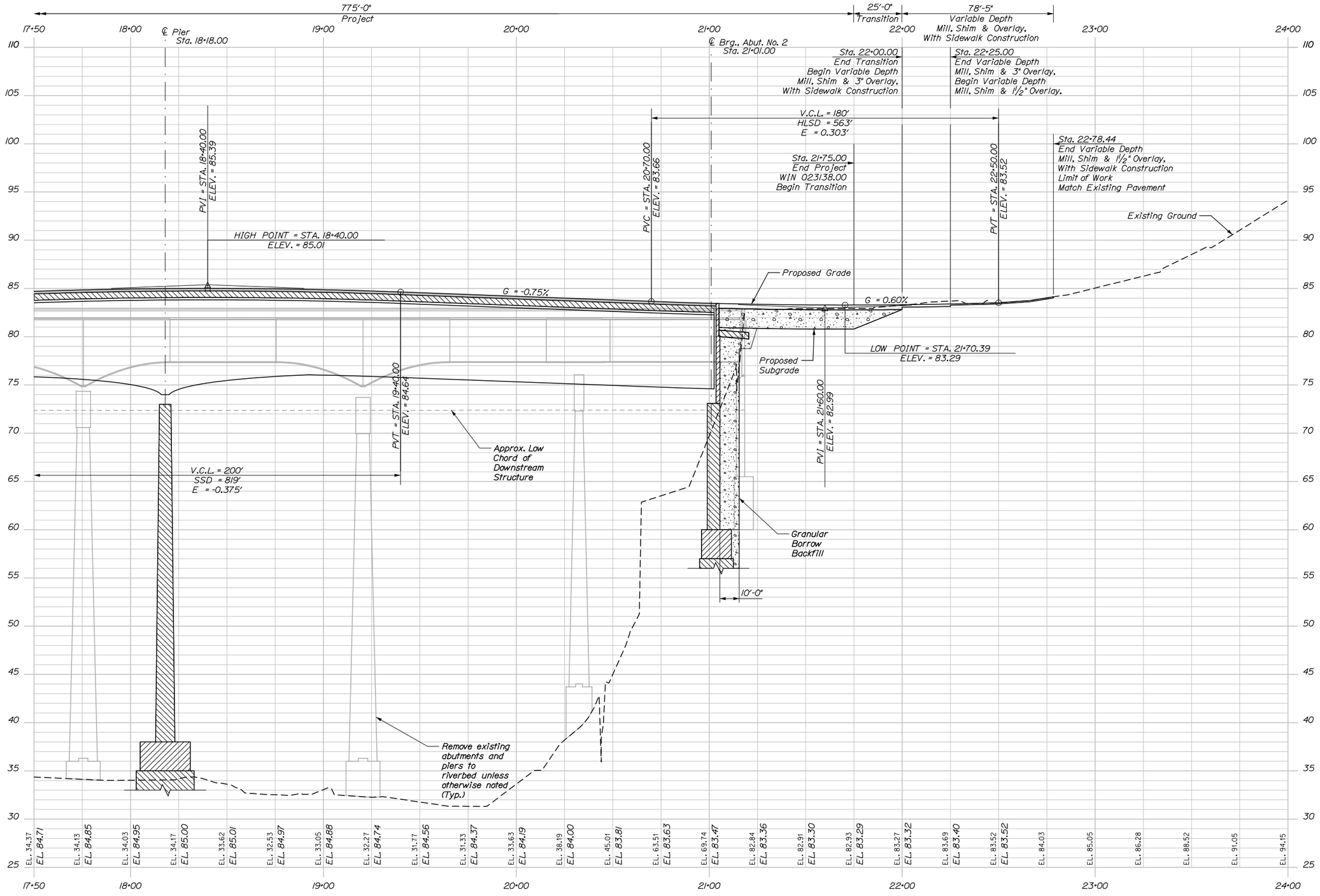
TICONIC BRIDGE
KENNEBEC RIVER RESERVOIR
WATERVILLE-WINSLOW KENNEBEC

PROFILE 1

SHEET NUMBER

4

OF 9



PROFILE

Horiz. 25 0 25 50
Vert. 5 0 5 10
Scale of Feet

PDR
July 16, 2021

HNTB

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

2313800

WIN 023138.00

Bridge No. 2854

BRIDGE PLANS

		DATE
PROJ. MANAGER	M. Parlin	
DESIGN-DETAILED	C. Helmick	05\21
CHECKED-REVIEWED	L. Driscoll	05\21
DESIGN2-DETAILED2		
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

BY

SIGNATURE

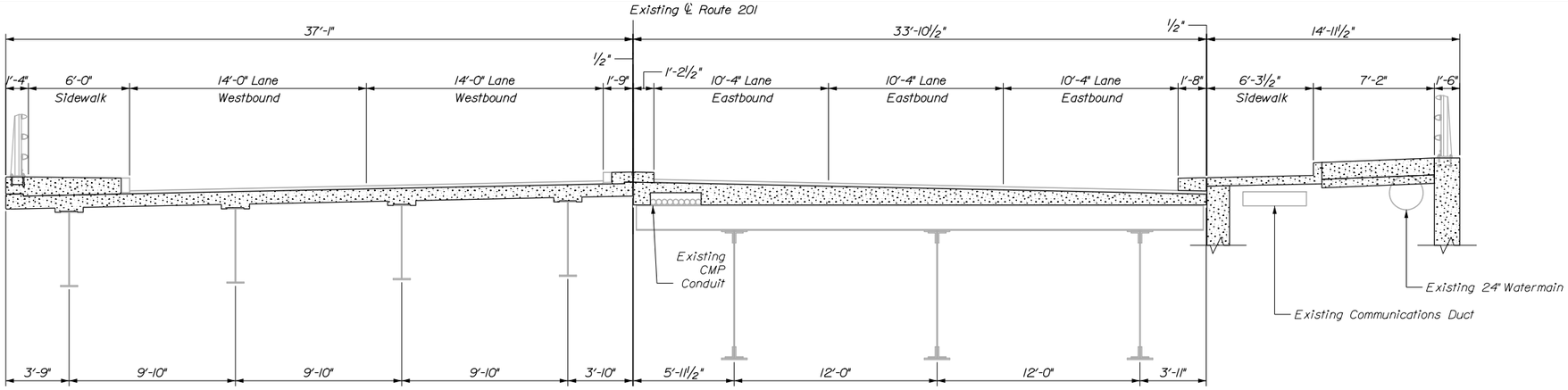
P.E. NUMBER

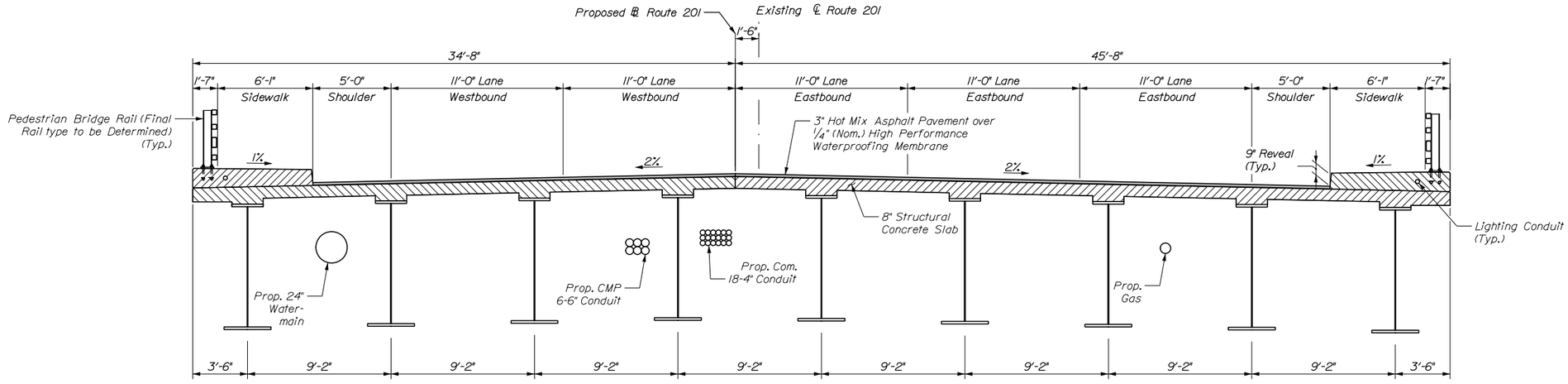
DATE

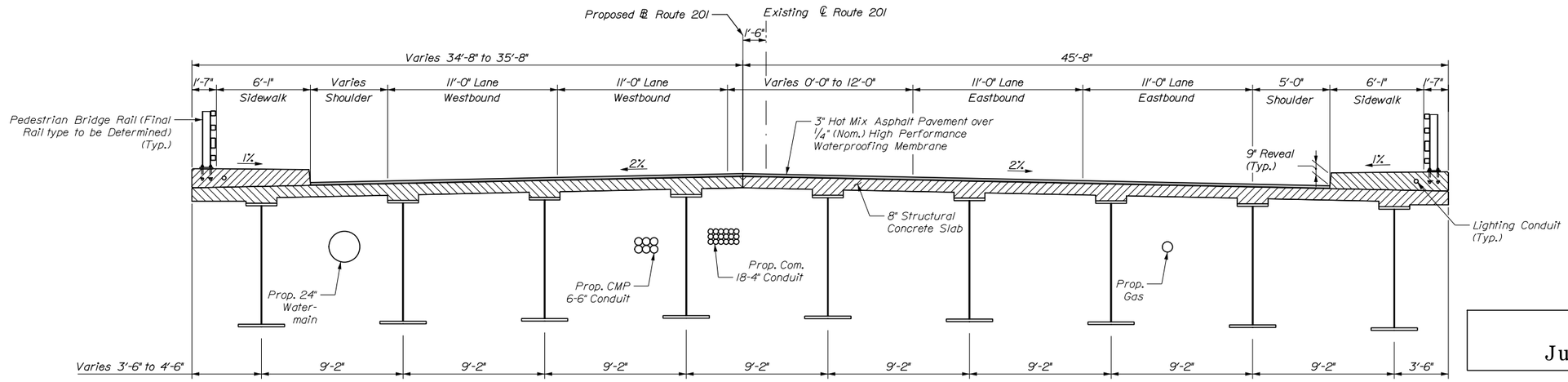
TICONIC BRIDGE
KENNEBEC RIVER RESERVOIR KENNEBEC
WATERVILLE-WINSLOW

PROFILE 2

SHEET NUMBER
5
OF 9







PDR
July 16, 2021

HNTB

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

2313800

WIN 023138.00

Bridge No. 2854

BRIDGE PLANS

		DATE	BY
PROJ. MANAGER	M. Perlin		
DESIGN-DETAILED	A. Stephens	05\21	E. Beausoleil
CHECKED-REVIEWED	L. Driscoll	05\21	T. Cote
DESIGN2-DETAILED2			
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

SIGNATURE

P.E. NUMBER

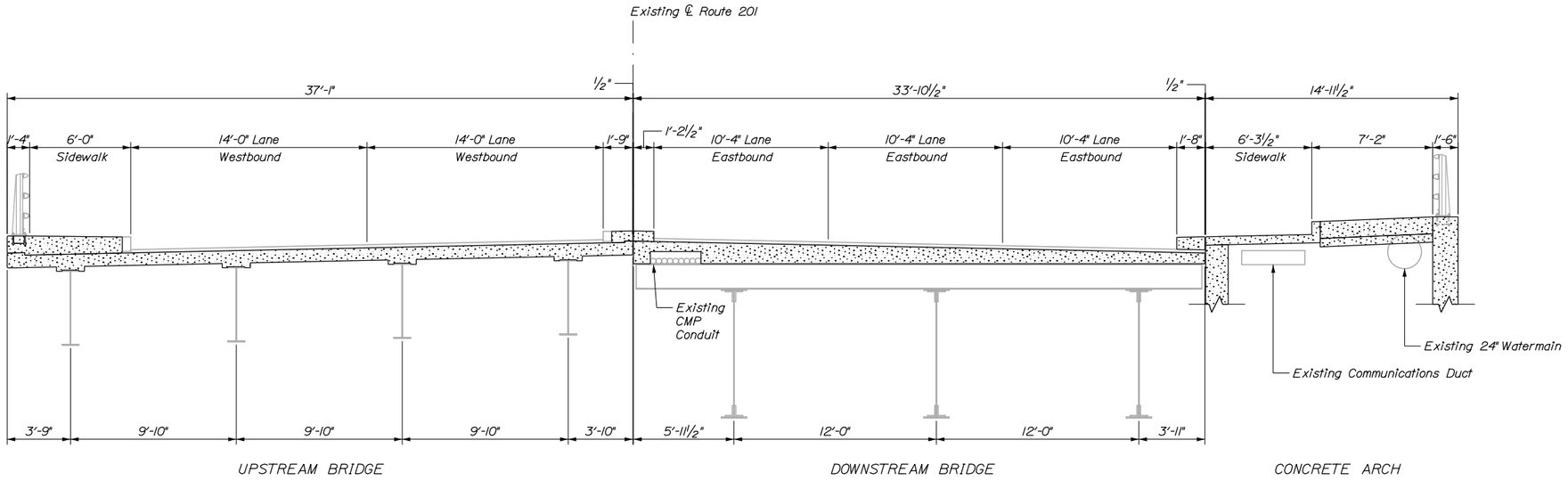
DATE

TICONIC BRIDGE
KENNEBEC RIVER RESERVOIR
WATERVILLE-WINSLOW KENNEBEC

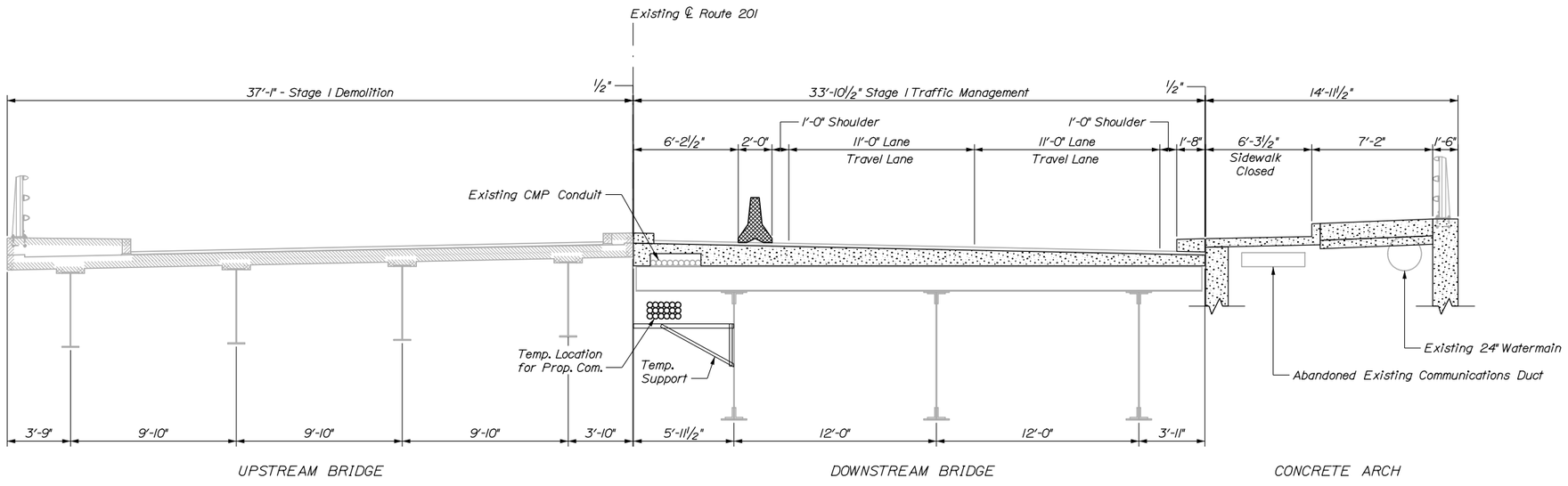
TYPICAL SECTIONS

SHEET NUMBER
6
OF 9

Filename: 006_Typical Sections.dgn Division: Username: Date:7/16/2021



EXISTING SECTION



STAGE I DEMOLITION

HNTB

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

2313800

WIN 023138.00

Bridge No. 2854

BRIDGE PLANS

PROJ. MANAGER	M. Poirier		
DESIGN-DETAILED	A. Stephens	E. Beausoleil	05\21
CHECKED-REVIEWED	L. Driscoll	T. Cote	05\21
DESIGN2-DETAILED2			
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

SIGNATURE

P.E. NUMBER

DATE

TICONIC BRIDGE
KENNEBEC RIVER RESERVOIR
WATERVILLE-WINSLOW
KENNEBEC

CONSTRUCTION
STAGING PLANS 1

SHEET NUMBER

7

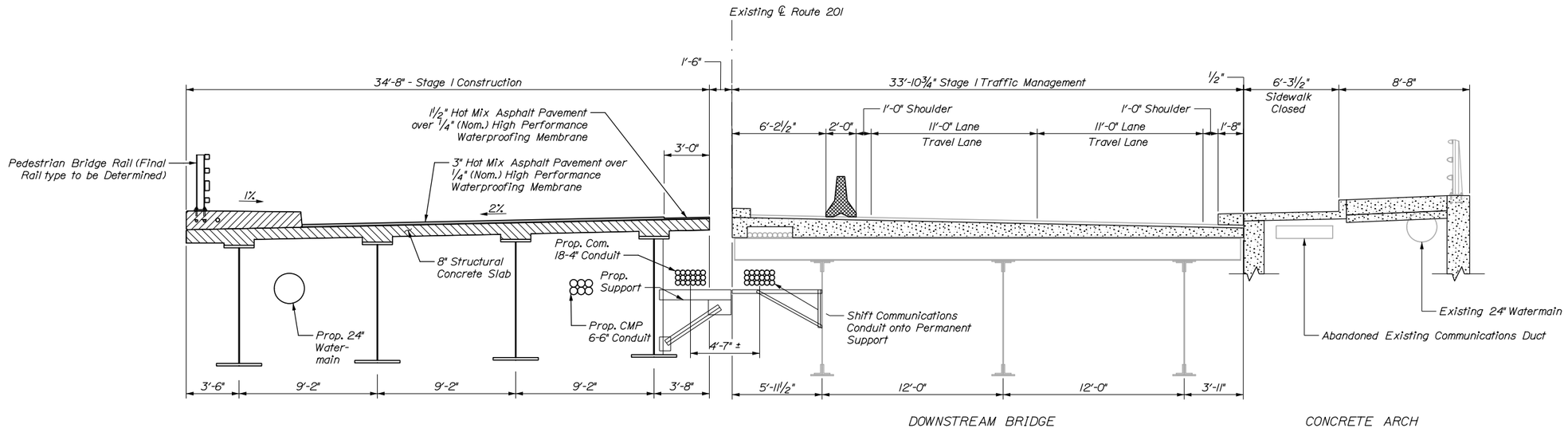
OF 9

Date:7/16/2021

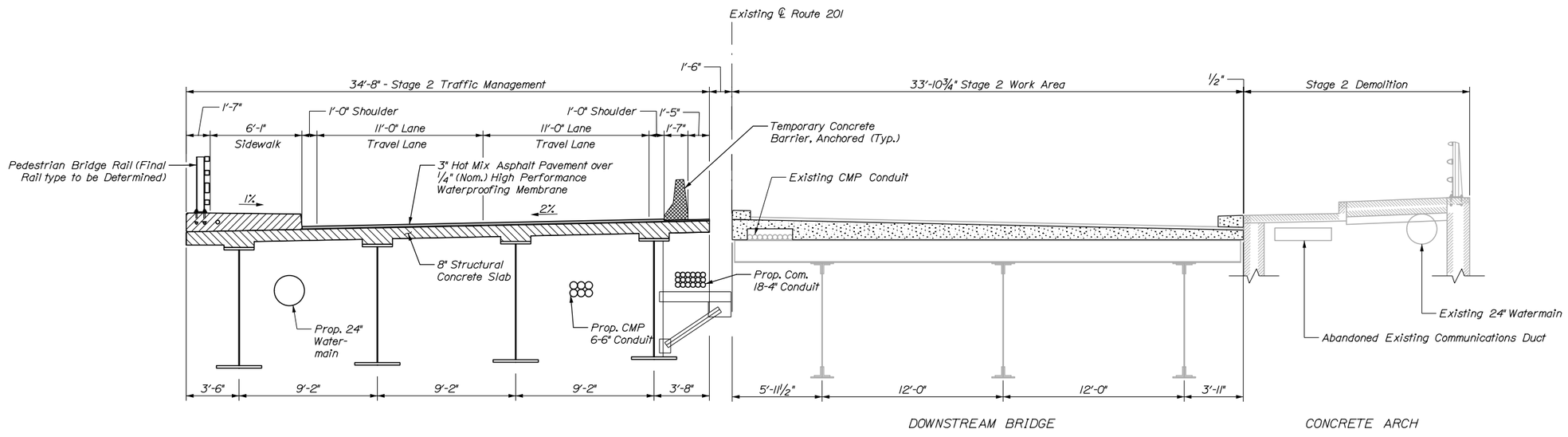
Username:

Division:

Filename: 007_Construction Phasing 1.dgn



STAGE 1 CONSTRUCTION



STAGE 2 DEMOLITION (ARCH)

HNTB

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

2313800

WIN 023138.00

Bridge No. 2854

BRIDGE PLANS

PROJ. MANAGER	M. Poirier		
DESIGN-DETAILED	A. Stephens	E. Beausoleil	05\21
CHECKED-REVIEWED	L. Driscoll	T. Cote	05\21
DESIGN2-DETAILED2			
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

SIGNATURE

P.E. NUMBER

DATE

TICONIC BRIDGE
KENNEBEC RIVER RESERVOIR
WATERVILLE-WINSLOW
KENNEBEC

CONSTRUCTION STAGING PLANS 2

SHEET NUMBER

8

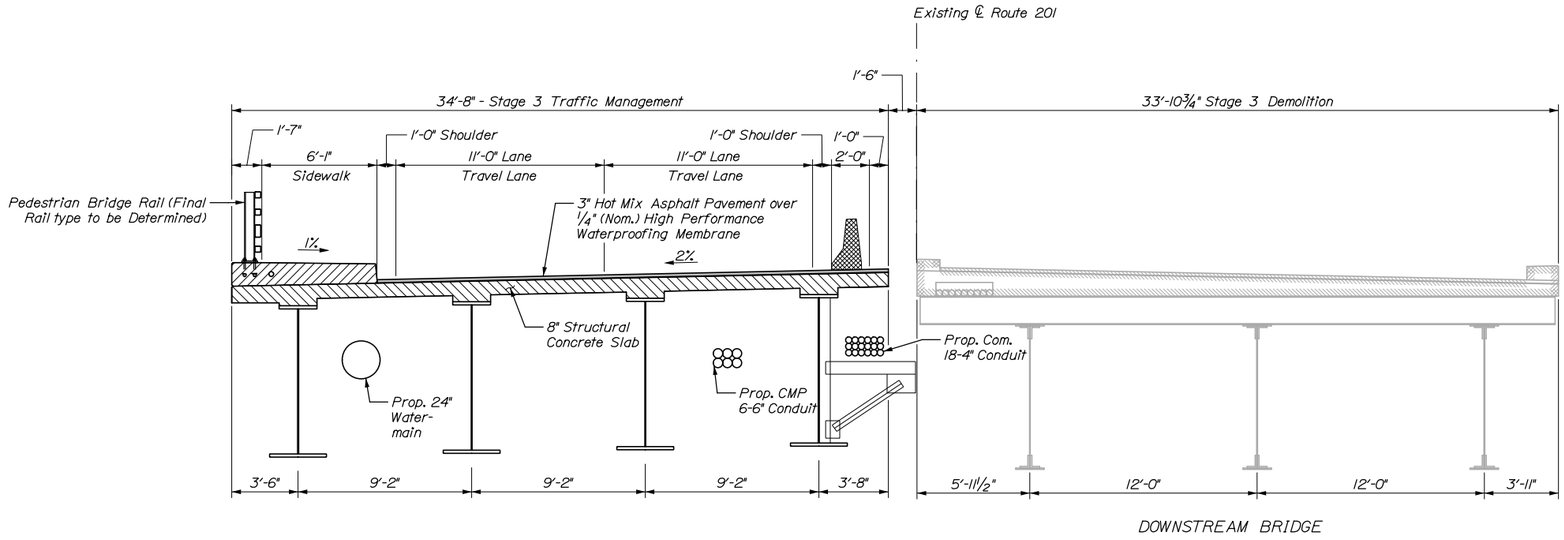
OF 9

Date:7/16/2021

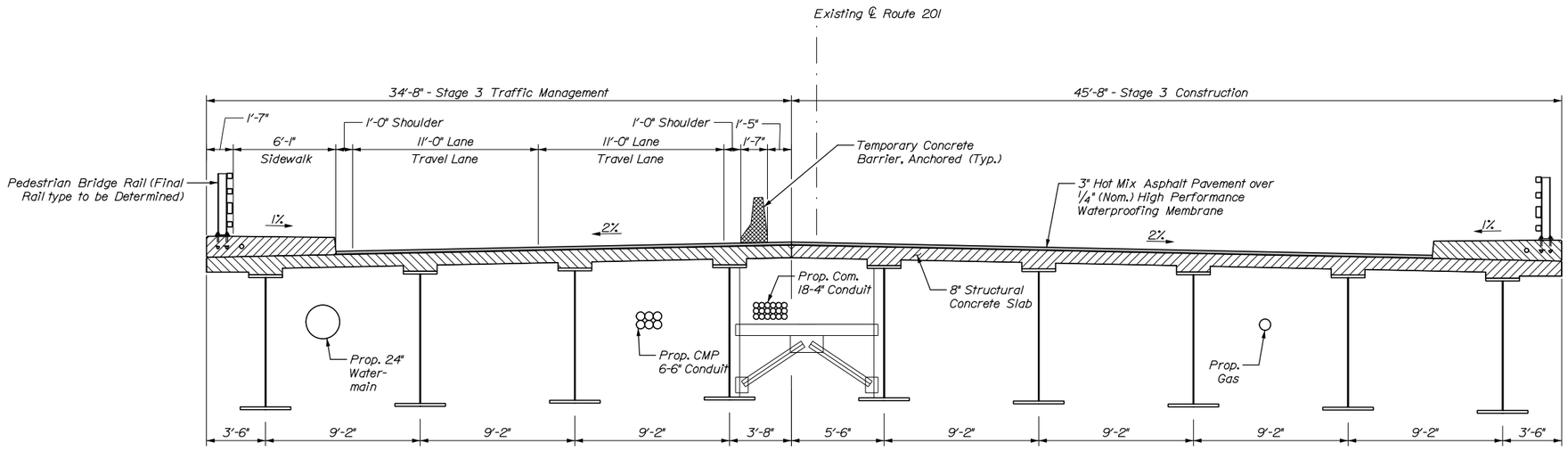
Username:

Division:

Filename: 008_Construction Phasing 2.dgn



STAGE 2 DEMOLITION (GIRDER BRIDGE)



STAGE 2 CONSTRUCTION

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

2313800

WIN 023138.00

Bridge No. 2854

BRIDGE PLANS

PROJ. MANAGER	M. Pearl	BY	DATE
DESIGN-DETAILED	A. Stephens	E. Beausoleil	05\21
CHECKED-REVIEWED	L. Driscoll	T. Cote	05\21
DESIGN2-DETAILED2			
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

SIGNATURE

P.E. NUMBER

DATE

TICONIC BRIDGE
KENNEBEC RIVER RESERVOIR
WATERVILLE-WINSLOW KENNEBEC

CONSTRUCTION STAGING PLANS 3

SHEET NUMBER

9

OF 9

HNTB

Date:7/16/2021

Username:

Division:

Filename: 009_Construction Phasing 3.dgn

Appendix B

Photographs

Figure 1 - Downstream Elevation of Arch

Figure 2 - Arch Looking West

Figure 3 - Bridge Deck Looking East

Figure 4 - Bridge Deck Looking West

Figure 5 - Arch Condition Looking West

Figure 6 - Upstream Bridge Elevation Looking Southwest

Figure 7 - West Abutment Elevation Looking West

Figure 8 - Downstream East Abutment Looking East

Figure 9 - East Abutment Seat

Figure 10 - East Abutment, Bridge Mounted Electric

Figure 11 - East Abutment Looking Southeast

Figure 12 - East Pier Looking East

Figure 13 - Upstream East Pier Looking West

Figure 14 - Downstream East Pier Looking North

Figure 15 - Downstream Dam Spillway

Figure 16 - West Piers, Looking West

Figure 17 - West Piers, Looking East

Figure 18 - Upstream Railroad Bridge Looking Northwest

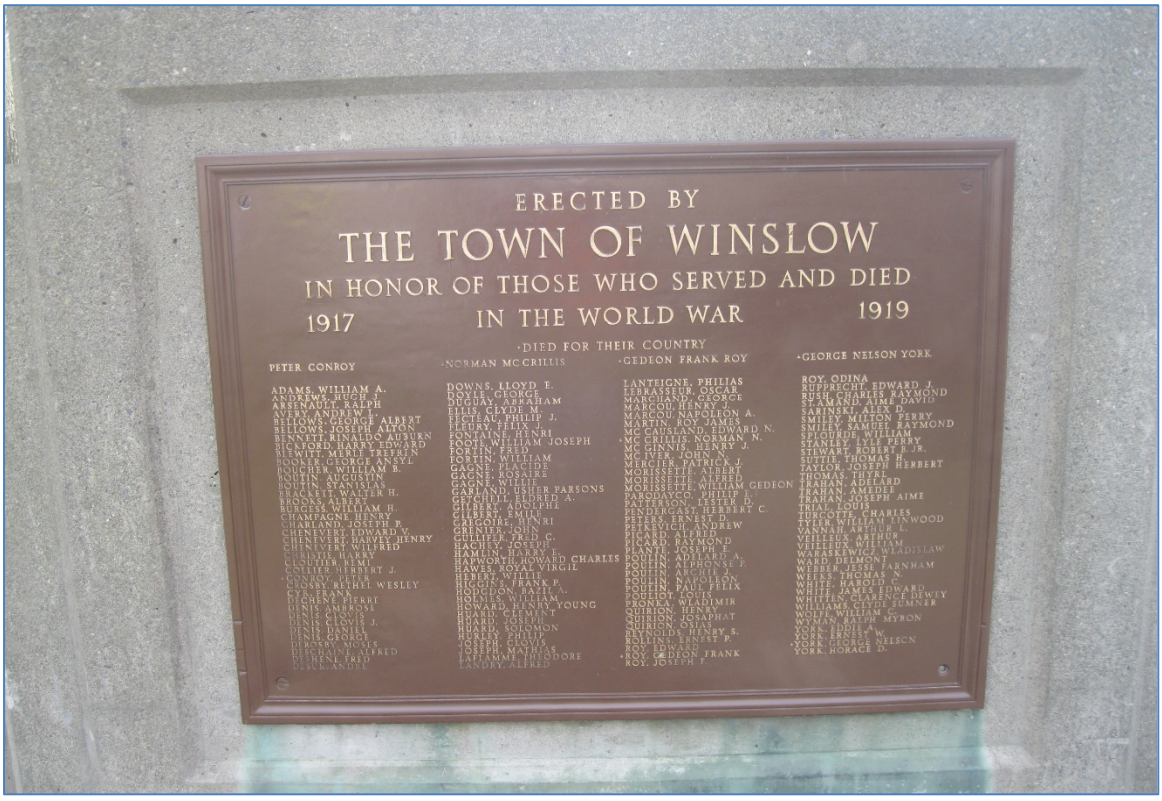


Figure 19 - War Memorial Plaque Looking South

Figure 20 - Winslow Intersection Looking East

Appendix C

Inspection Reports

Routine

Inspection Report

Bridge No. 2854

ROUTE 201 (TICONIC BRIDGE)

OVER

KENNEBEC RIVER

WATERVILLE – WINSLOW

May 7, 2020

WIN #: 23138.00

Prepared For:

MaineDOT

Prepared By:

HNTB Corporation

MAINE DEPARTMENT OF TRANSPORTATION
STRUCTURES INSPECTION FIELD REPORT
ROUTINE INSPECTION

2-DIST	STR. NO.	WIN
02	2854	023138.00

CITY/TOWN	8-STRUCTURE NO.	11-MILE POINT	41-STATUS	90-ROUTINE INSP. DATE
WATERVILLE - WINSLOW	2854	49.98	A:OPEN	MAY 7, 2020

07-FACILITY CARRIED	MEMORIAL NAME/LOCAL NAME	27-YR BUILT	106-YR REBUILT	YR REHAB'D (NON 106)
ROUTE 201	TICONIC BRIDGE	1936	1970	1990

06-FEATURES INTERSECTED	26-FUNCTIONAL CLASS	MaineDOT	R. Taylor, PE
KENNEBEC RIVER	URBAN – MINOR ARTERIAL		

43-STRUCTURE TYPE	22-OWNER	21-MAINTAINER	TEAM LEADER K. Brayley, PE	PM (HNTB) T. Cote, PE
302: STEEL GIRDER	State Highway Agency	State Highway Agency	Kevin Brayley	Timothy R. Cote

107-DECK TYPE	WEATHER	TEMP. (air)	TEAM MEMBERS
1: CONCRETE CAST-IN-PLACE	Varied	60°F	J. MCCAULEY

ITEM 58 — 5

DECK

		DEF
1. Wearing Surface	6	M-P
2. Deck Condition	5	S-P
3. Stay-in-Place Forms	N	-
4. Curbs	7	-
5. Median	7	-
6. Sidewalks	4	S-A
7. Parapets	N	-
8. Railings	6	M-P
9. Anti Missile Fence	N	-
10. Drainage System	6	M-P
11. Lighting Standards	7	-
12. Utilities	6	M-A
13. Deck Joints	6	M-A

CURB REVEAL (In inches)	S	N
	9	9

APPROACHES

		DEF
a. Appr. Pavement Condition	6	M-P
b. Appr. Roadway Settlement	7	-
c. Appr. Sidewalk Condition	5	M-P
d. Appr. Sidewalk Settlement	5	M-P

OVERHEAD SIGNS (Attached to bridge) (Y/N) N

		DEF
a. Condition of Welds	N	-
b. Condition of Bolts	N	-
c. Condition of Signs	N	-

ITEM 59 — 4

SUPERSTRUCTURE

		DEF
1. Stringers	N	-
2. Floorbeams	6	M-P
3. Floor System Bracing	N	-
4. Girders or Beams	5	M-A
5. Trusses – General	N	
a. Upper Chords	N	-
b. Lower Chords	N	-
c. Web Members	N	-
d. Lateral Bracing	N	-
e. Sway Bracing	N	-
f. Portals	N	-
g. End Posts	N	-
6. Gusset Plates	N	-
7. Conn Plates & Angles	6	M-P
8. Cover Plates	5	S-P
9. Bearing Devices	6	M-P
10. Diaphragms/Cross Frames	6	M-P
11. Rivets & Bolts	7	-
12. Welds	7	-
13. Member Alignment	7	-
14. Paint/Coating	6	M-P
15. Concrete Arch	4	S-A

Year Painted	1970

COLLISION DAMAGE: *Please explain*
None (X) Minor ( ) Moderate ( ) Severe ( )

LOAD DEFLECTION: *Please explain*
None ( ) Minor (X) Moderate ( ) Severe ( )

LOAD VIBRATION: *Please explain*
None ( ) Minor (X) Moderate ( ) Severe ( )

Any Fracture Critical Members: (Y/N) N

Any Cracks: (Y/N) N

ITEM 60 — 5

SUBSTRUCTURE

	Dive	Cur		DEF
1. Abutments			5	
a. Pedestals	N	N		-
b. Bridge Seats	N	5		S-P
c. Backwalls	N	6		M-P
d. Breastwalls	N	5		S-P
e. Wingwalls	N	6		M-P
f. Slope Paving/Rip-Rap	N	N		-
g. Pointing	N	N		-
h. Footings	N	H		-
i. Piles	N	N		-
j. Scour	N	N		-
k. Settlement	N	7		-
2. Piers or Bents			6	
a. Pedestals	N	N		-
b. Caps	N	7		-
c. Columns	N	N		-
d. Stems/Webs/Pierwalls	N	6		M-P
e. Pointing	N	N		-
f. Footing	6	7		-
g. Piles	N	N		-
h. Scour	6	H		-
i. Settlement	N	7		-
3. Pile Bents			N	
a. Pile Caps	N	N		-
b. Piles	N	N		-
c. Diagonal Bracing	N	N		-
d. Horizontal Bracing	N	N		-
e. Fasteners	N	N		-

UNDERMINING (Y/N) If YES please explain: N

COLLISION DAMAGE:
None (X) Minor ( ) Moderate ( ) Severe ( )

SCOUR: *Please explain*
None ( ) Minor (X) Moderate ( ) Severe ( )

I-60 (Dive Report) 6 *I-60 (This Report)* 5

93B-U/W (DIVE) Insp 9/29/16

X=UNKNOWN N=NOT APPLICABLE H=HIDDEN/INACCESSIBLE R=REMOVED

CITY/TOWN	WIN	8-STRUCTURE NO.	INSP. DATE
WATERVILLE-WINSLOW	**023138.00**	**2854**	**MAY 7, 2020**

ITEM 61 — 6

CHANNEL & CHANNEL PROTECTION

	Dive	Cur	DEF
1. Channel Scour	N	X	-
2. Embankment Erosion	N	7	-
3. Debris	N	7	-
4. Vegetation	N	7	-
5. Utilities	N	7	-
6. Rip-Rap/Slope Protection	N	N	-
7. Aggradation	N	6	M-P
8. Fender System	N	N	-

STREAM FLOW VELOCITY:
Tidal ( ) High (X) Moderate ( ) Low ( ) None ( )

ITEM 61 (Dive Report): 8 ***ITEM 61 (This Report):*** 6

93b-U/W INSP. DATE: 9/29/16

ITEM 36 — *TRAFFIC SAFETY*

	36	COND	DEF
1. Bridge Railing	0	6	M-P
2. Transitions	0	5	M-P
3. Approach Guardrail	0	7	-
4. Approach Guardrail Ends	0	7	-

WEIGHT POSTING

Not Applicable X

	H	3	3S2	Single
Actual Posting				
Recommended Posting				

Waived Date: 00/00/00 **EJDMT Date:** 00/00/00

Signs In Place (Y=Yes, N=No, NR = Not Required) **Legibility/ Visibility**

	At bridge E	At bridge W	Advance E	Advance W
	NR	NR	NR	NR

CLEARANCE POSTING

Not Applicable X

	N ft	N in	S ft	S in	meter
Actual Field Measurement					
Posted Clearance					

Signs In Place (Y=Yes, N=No, NR = Not Required) **Legibility/ Visibility**

	At bridge N	At bridge S	Advance N	Advance S

ACCESSIBILITY (Y/N/P)

	Needed	Used
Lift Bucket	N	N
Ladder	N	N
Boat	N	N
Waders	N	N
UBIU	Y	Y
Rigging	N	N
Staging	N	N
Traffic Control	Y	Y
RR Flagger	N	N
Police	N	N
Flaggers	N	N
UAV	Y	N

PLANS (Y/N): Y

(V.C.R) (Y/N): N

TAPE#: _____

List of field tests performed:
Visual, Hands-On

RATING

Rating Report (Y/N) Y

Date: 3/18/2016

Inspection data at time of existing rating

I 58: **6** I 59: **5** I 60: **5** Date: **2/23/2015**

(To be filled out by DOT Project Manager)

Request for Rating or Rerating (Y/N) _____

If YES please give priority: High ( ) Medium ( ) Low ( )

REASON: _____

CONDITION RATING GUIDE (For Items 58, 59, 60 and 61)

	CODE	CONDITION	DEFECTS
	N	NOT APPLICABLE	
G	9	EXCELLENT	Excellent condition.
G	8	VERY GOOD	No problems noted.
G	7	GOOD	Some minor problems.
F	6	SATISFACTORY	Structural elements show some minor deterioration.
F	5	FAIR	All primary structural elements are sound, but may have minor section loss, cracking, spalling or scour.
P	4	POOR	Advanced section loss, deterioration, spalling or scour.
P	3	SERIOUS	Loss of section, deterioration, spalling or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.
C	2	CRITICAL	Advanced deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored it may be necessary to close the bridge until corrective action is taken.
C	1	"IMMINENT FAILURE"	Major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Bridge is closed to traffic but corrective action may put it back in light service.
	0	FAILED	Out of service – beyond corrective action.

DEFICIENCY REPORTING GUIDE

DEFICIENCY: A defect in a structure that requires corrective action

CATEGORIES OF DEFICIENCIES:

M = Minor Deficiency- Deficiencies which are minor in nature, generally do not impact the structural integrity of the bridge and could easily be repaired. Examples include but are not limited to: Spalled concrete, Minor pot holes, Minor corrosion to steel, Minor scouring, Clogged drainage, etc.

S = Severe/Major Deficiency- Deficiencies which are more extensive in nature and need more planning and effort to repair. Examples include but are not limited to: Moderate to major deterioration in concrete, Exposed and corroding rebars, Considerable settlement, Considerable scouring or undermining, Moderate to extensive corrosion to structural steel with measurable loss of section, etc.

C-S = Critical Structural Deficiency- A deficiency in a structural element of a bridge that poses an extreme unsafe condition due to the failure or imminent failure of the element which will affect the structural integrity of the bridge.

C-H = Critical Hazard Deficiency- A deficiency in a component or element of a bridge that poses an extreme hazard or unsafe condition to the public, but does not impair the structural integrity of the bridge. Examples included but are not limited to: Loose concrete hanging down over traffic or pedestrians, A hole in a sidewalk that may cause injuries to pedestrians, Missing section of bridge railing, etc.

URGENCY OF REPAIR:

I = Immediate- [Inspector(s) contact Bridge Inspection Engineer to report the Deficiency and to receive further instruction from him/her].

A = ASAP- [Action/Repair should be initiated by Bridge Maintenance Engineer or the Responsible Party (if not a State owned bridge) upon receipt of the Inspection Report].

P = Prioritize- [Shall be prioritized by Bridge Maintenance Engineer or the Responsible Party (if not a State owned bridge) and repairs made when funds and/or manpower is available].

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REMARKS

BRIDGE ORIENTATION

The Ticonic Bridge (Bridge No. 2854) is a four and five span structure carrying Route 201 over the Kennebec River/ Brookfield Dam between Waterville and Winslow **(see sketch 1 and 2 and photos 1 through 15)**.

The bridge is comprised of three types of superstructure configurations **(see sketch 3)**.

1. Concrete Arch Structure (carries south sidewalk): 517 ft-long, 4-Spans (built 1911)
2. Riveted Girder Structure (carries eastbound lanes): 517 ft-long, 4-Spans (built 1936)
3. Plate Girder Structure (carries westbound lanes): 569 ft-long, 5-Spans (built 1970)

The concrete arch structure is a three-sided reinforced concrete system infilled with soil **(see photo 6)**. The riveted girder structure consists of rolled “needle” beams (transverse elements spaced at ~ 8 feet) supported by three built-up riveted girders **(see photo 7)**. The plate girder structure consists of four welded plate girders **(see photo 8)**. All structures support a reinforced concrete sidewalk and/or an 8” structural reinforced concrete slab.

The substructure consists of two reinforced concrete abutments (east and west) with reinforced concrete wingwalls **(see sketch 3 and photos 9 through 11)** and four reinforced concrete pierwalls **(see sketch 3 and photos 12 through 15)**.

This bridge is oriented from east to west and the Kennebec River flows north to south. The spans and piers are numbered from east to west. The needle beams of each span are numbered from east to west. The girders are numbered G1 to G7 from north to south.

GENERAL REMARKS

Inspection Coordination:

Coordination occurred with the following agencies:

- Brookfield Renewable:
  - Notified prior to the inspection, operations did not impact any of the dam infrastructure.
  - Contact: Ernie Deluca
  - Phone: (207) 629-1800
- Town of Waterville:
  - Emailed town manager, police department and fire department of upcoming inspection. Public notices were established, and emergency personnel notified.
- Town of Winslow:
  - Emailed town manager, police department and fire department of upcoming inspection. Public notices were established, and emergency personnel notified.
- MaineDOT Region 2: Notified the Region Manager.
- MaineDOT Traffic Engineer: Developed traffic plan and provided to Dana Hanks for approval.

Inspection Access:

A 75' underbridge inspection unit (UBIU) was utilized to access the underside of deck, girders, and substructure. Due to sidewalk width and concrete arch width deploying from the south fascia was not possible and, therefore, inspection of the concrete arch was limited to visual observations when fully

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REMARKS

GENERAL REMARKS (cont.)

extended from the north fascia (~ 5 feet from arch north face). Past inspections have utilized an unmanned aerial vehicle (UAV) to assess concrete arch condition, that was not part of this cycle's inspection scope.

A single lane traffic closure occurred during the hours of 9:00am to 4:00pm. The approved traffic control plan included turning lane closures at the adjacent east intersection.

ITEM 58 - DECK

Item 58.1 - Wearing Surface
The concrete wearing surface exhibits numerous transverse hairline cracks. The cracks are more prominent over the piers with spacing approximately 2' to 3' apart **(see photo 16)**. Two spalls were observed in the westbound lanes adjacent to the abutment 2 (west) joint up to 2' wide by 6" long by 1/2" deep (**see photo 17**).

Item 58.2 - Deck
The deck in all spans exhibits numerous areas of delamination and spalling with exposed reinforcement along the overhangs and median longitudinal joint, most severe on the north overhang. The spalls are up to 3' long by full width of overhang by 2 1/2" deep with occasional 100% section loss of reinforcement **(see photos 18 through 21)**. The interior girder bays have scattered transverse hairline cracks with efflorescence and areas of spalling with exposed reinforcement up to 3' diameter by 2" deep **(see photo 22)**. Additionally, the deck weep drains exhibit surrounding distressed concrete with hairline cracks with efflorescence and delamination **(see photo 23)**. In scattered locations, most severe at pier locations, the needle beam concrete haunches exhibit spalling with exposed reinforcement up to full interior bay width (**see photo 24**).

Item 58.4 - Curbs
The granite curbs are in good condition with only minor plow scrapes and joint deterioration in isolated locations. Refer to Item 58.6 - Sidewalks for additional remarks.

Item 58.5 - Median
The median and longitudinal joint between the two independent decks are in good condition (**see photo 5**).

Item 58.6 - Sidewalks
The north sidewalk is in generally good condition. There is an 8' long by full width delamination adjacent to Pier 1. The south sidewalk, which is carried by the concrete arch structure, is in poor condition and governs the condition rating of Item 58.6. The following deficiencies were observed throughout the south sidewalk:

- Span 1 of Concrete Arch Structure - Sidewalk concrete panels settled and rotated by up to 6" resulting in a tripping hazard for pedestrians (**see photo 25**).
- Span 3 of Concrete Arch Structure - Sidewalk concrete panels settled and rotated by up to 5" resulting in a tripping hazard for pedestrians (**see photo 26**).
- Span 4 of Concrete Arch Structure - Existing repair patch delaminated and cracked full width of sidewalk (**see photo 27**).
- All Spans - Longitudinal joint has failed in multiple locations with sealant separation/dislodgment (**see photo 28**).

Refer to Item 58.8 - Railings for additional remarks. Settlement of concrete panels appears to correspond directly with noted railing bulging. All of which are likely caused by underlying concrete arch deficiencies.

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REMARKS

ITEM 58 - DECK (cont.)

Item 58.8 - Railings
The north and south railings are 3-bar aluminum railings with pedestrian pickets. There are numerous minor collision scrapes and gouges on the railings throughout the full bridge length. The north rail exhibits two locations where the bottom 6" of a picket is missing in Span 1 **(see photo 29)**. The railing post base plates have scattered locations, up to 10 locations, with missing or loose bolts/nuts **(see photo 30)**.

The south railing exhibits out-of-plane displacement to the south in Spans 1 and 3 of the concrete arch structure. In Span 1 the affected length of railing is approximately 130' and resulted in up to 4" of bulging to the south **(see photo 31)**. In Span 3 the affected length of railing is approximately 110' and resulted in up to 4" of bulging to the south **(see photo 32)**. The corresponding fascia bulge was measured at 2 1/2" which matches measurements taken in 2017 **(see photos 33 and 34).** Refer to Item 59.15 - Concrete Arch for additional remarks.

Item 58.10 - Drainage System
The bridge deck drainage system has steel pipe scuppers along both curbs spaced approximately 25'. All drains were free of debris, however the lower 6" of the downspout pipe exhibits advanced corrosion in most locations with scattered locations of 100% section loss **(see photo 35)**.

Item 58.11 - Lighting Standards
There are four bridge mounted light poles along both the north and south sides of the bridge **(see photo 5)**. The south side poles are mounted within the vegetated sidewalk shoulder. The north side poles are mounted on deck overhang bump-outs. The light poles are in generally good condition based on visual inspection from the bridge sidewalks.

Refer to Item 58.12 for additional remarks.

Item 58.12 - Utilities
The bridge deck underside has nine conduits running longitudinally below the north overhang of the riveted girder structure (median of the bridge) **(see photo 7)**. The conduits exhibit multiple locations of advanced corrosion with scattered locations of 100% section loss **(see photo 36)**. Additionally, there are exposed wires extending from the utility conduit at abutment 2 **(see photo 37)**.

Item 58.13 - Deck Joints
The riveted girder structure has joint seals at each substructure location and the plate girder structure is continuous and only has joint at the abutments **(see photos 17, 38 & 39 through 42)**. The most notable deck joint conditions are:

- Plate Girder Structure, Abutment 1 Joint - East armor is approximately 1/2" higher than the west armor.
- Plate Girder Structure, Abutment 2 Joint - West armor is approximately 1/2" higher than the east armor.

APPROACHES

Approaches a - Appr. Pavement Condition
The approach pavement at both ends of the bridge exhibits moderate transverse and longitudinal cracks. The west approach pavement has multiple depressions and potholes approximately 30' off of the bridge **(see photo 43)**.

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REMARKS

APPROACHES (cont.)

Approaches b - Appr. Roadway Settlement
There is up to 1/2" deep wheel line rutting in the approach pavement at both ends of the bridge.

Approaches c - Appr. Sidewalk Condition
The north sidewalk at both ends generally exhibits minor pavement deterioration with transverse pavement cracking spaced at approximately 5'. The south sidewalk at both ends exhibits advanced deterioration with depressions and failed asphalt patches causing an uneven walking surface **(see photos 44 and 45)**.

Approaches d - Appr. Sidewalk Settlement
The south sidewalk at both ends exhibits up to 5" of settlement mainly caused by heaving and pavement deterioration, resulting in a tripping hazard **(see photo 44)**. This condition is exacerbated by the rotation of the bridge sidewalk panels at the east end.

ITEM 59 - SUPERSTRUCTURE

Item 59.2 - Floorbeams
The floorbeams throughout this report will be considered "needle" beams (transverse elements spaced at ~ 8 feet) to match historical load rating packages and as-built plans. The needle beams support the bridge deck and utility conduits and are supported by the three built-up riveted girders carrying eastbound traffic **(see photos 46 and 47)**. Scattered needle beams have moderate surface rust with the most severe locations occurring within the median deck overhang and over the piers **(see photos 21 and 36)**. The most notable locations are the following:

- Needle Beam at Pier 3 - Heavy corrosion to the bottom flange by full width of the bridge, approximately 1/16" section loss. Additionally, the top flange and cover plates exhibit up to 10% section loss with the bearing stiffener over girder 6 exhibiting 100% section loss for the upper 3" **(see photos 24 and 48)**.
- Needle Beam at Pier 4 - Moderate corrosion to the top flange by full width of the bridge, approximately 5% section loss **(see photo 49)**.
- Needle Beams at Abutment 1 & 2 - Web and bottom flange cut out to accommodate utility conduit pass through **(see photos 37 and 50)**.
- Needle Beams Span 1 and Span 4 - Scattered needle beams were observed to have approximately 2° out-of-plane rotation **(see photo 51)**.

Item 59.4 - Girders
Riveted Girders:
The riveted girders are in fair condition and exhibit minor surface rust throughout the bridge, mainly concentrated on the bottom and top flanges **(see photo 52)**. The riveted coverplates, at both positive and negative moment locations, have scattered locations with up to 1 1/2" impacted rust and corresponding up to 1/8" section loss by the outer 3" of the coverplate **(see photos 53 through 55)**.

Plate Girders:
The plate girders are in good condition, exhibiting minor surface rust throughout the bridge, mainly concentrated on the bottom flanges **(see photo 56)**,

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REMARKS

ITEM 59 - SUPERSTRUCTURE (cont.)

Item 59.7 - Conn Plates & Angles

Riveted Girders Cross Frame Connections:

The riveted girder cross frame connections are generally in good condition with isolated locations of moderate corrosion. The corners of the vertical connection plates exhibit up to 1" of impacted rust at isolated locations **(see photo 57)**.

Riveted Girders Lower Lateral Bracing Connections:

The riveted girder lower lateral bracing connections are generally in good condition with isolated locations of moderate corrosion. The interface between the horizontal connection plates and the girder bottom flanges exhibit impacted rust at isolated locations **(see photo 58)**.

Plate Girders Diaphragm Connections:

The plate girder diaphragms exhibit minor surface rust in isolated locations **(see photo 59)**.

Item 59.8 - Cover Plates

Refer to Items 59.4 for remarks.

Item 59.9 - Bearing Devices

The bridge has steel rocker bearings throughout with a single fixed bearing line at Pier 3. In general, the bearings are in satisfactory condition with minor to moderate corrosion in scattered locations, with the worst conditions existing at the abutments. The most notable deficiencies are noted below:

- Abutment 1 Plate Girder 1 Bearing - Moderate corrosion with loose washers **(see photo 60)**.
- Abutment 1 Plate Girders 2 through 4 Bearings - Anchor bolts missing washers.
- Abutment 1 Riveted Girder 5 Bearing - Moderate corrosion with masonry plate support retrofit **(see photo 61)**.
- Abutment 1 Riveted Girder 6 Bearing - Masonry plate with southwest corner undermined (less than 1") due to abutment seat concrete spall **(see photo 62)**.
- Pier 2 Riveted Girder 7 Bearing - Minor corrosion to bottom of rocker and masonry plate **(see photo 63)**.
- Abutment 2 Riveted Girders 6 & 7 Bearings - Minor corrosion **(see photo 64)**.

Item 59.10 – Diaphragms/Cross Frames

The girder diaphragms and cross frames are in generally satisfactory condition with isolated areas of moderate surface corrosion **(see photos 65 and 66)**. Two diaphragm locations in span 4 of the plate girder structure have missing connection bolts, however the connections are also welded **(see photo 67)**.

Item 59.11 - Rivets & Bolts

The rivets and bolts are in generally good condition throughout the structure with only minor corrosion within areas of structural member corrosion.

Item 59.12 - Welds

The plate girder welds are in good condition.

Item 59.13 - Member Alignment

Refer to Item 59.2 for remarks regarding needle beam alignment.

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REMARKS

ITEM 59 - SUPERSTRUCTURE (cont.)

Item 59.14 - Paint/Coating

Needle Beams:

The needle beams exhibit approximately 5% overall paint system failure, with the most severe locations being over Piers 3 & 4 **(see photos 20, 21, 24, 36, 48, 49 and 51)**.

Riveted Girders:

The riveted girders exhibit a chalky coating color with approximately 20% paint system failure, mainly in locations of noted corrosion throughout this report **(see photos 20, 46, 55, 57 and 65)**.

Plate Girders:

The plate girders exhibit approximately 10% overall paint system failure with chalkiness and freckling, mainly in locations of noted corrosion throughout this report **(see photos 20, 46, 56, and 66)**.

Item 59.15 - Concrete Arch

The concrete arch structure inspection was performed visually for all concrete arch spans due to geometric limitations of the under bridge access equipment (i.e., south sidewalk too wide to deploy). No tactile soundings with hammers were performed.

The concrete arch spans are in poor condition and controls the condition rating for Item 59. The concrete exhibits extensive cracking with efflorescence. The cracking is most severe on the underside of the arch spans with longitudinal cracks observed **(see photos 1, 6, 10, and 68 through 71)**. Arch underside corners exhibit multiple spalls and possible delamination along the full span length, with the most severe cases observed in Span 3 with hanging exposed rebar **(see photos 70 and 72)**. Corresponding bulging of the spandrel walls and railing/sidewalk were observed with the most severe bulge observed adjacent to Pier 2, refer to Items 58.6 & 58.8 for additional remarks. The arch spans do not carry vehicular traffic, only the southerly sidewalk.

ITEM 60 - SUBSTRUCTURE

Item 60.1 - Abutments

Item 60.1.b – Bridge Seats

The abutment 1 bridge seat that supports the riveted girders (i.e., southern portion) is in fair condition and controls the Item 60 condition rating. The abutment 1 southern portion exhibits a 1’-6” wide by 7’ long by 2” deep spall to the north of girder 5 **(see photo 73)**. The abutment 1 southern portion also exhibits a 1’-6” wide by 3’ long by 2” deep spall to the south of girder 6 **(see photo 74)**. Additionally, to the south of girder 6 the abutment seat exhibits a full width by 5’ long by up to 4” deep spall **(see photo 75)**. There is moderate sand and debris accumulation on both abutment bridge seats partially covering the bearings **(see photos 64, 75 and 76)**.

Item 60.1.c - Backwalls

The abutment 1 backwall that supports the riveted girder structure exhibits three up to 1/8” wide cracks that run full height **(see photos 74 and 75)**. Additionally, abutment 1 southern portion exhibits a 3’-6” high by 1’-10” wide delamination directly below the utility blockout **(see photo 50)**. The abutment 1 northern portion and abutment 2 backwalls are in generally good condition.

Item 60.1.d - Breastwalls

All faces of the abutment 1 breastwall exhibit extensive up to 1/32" wide map cracking with moisture throughout and scattered areas of minor efflorescence or moderate rust staining **(see photos 9, 10 and 74)**. Additionally, there is a 3’ wide by 3’-6” high delamination under girder 6 with an adjacent 2’ wide by full height delamination.

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REMARKS

ITEM 60 - SUBSTRUCTURE (cont.)

Item 60.1.e - Wingwalls
The northeast (abutment 1) wingwall exhibits a 4’ long by 2’ high by 4” deep spall with exposed reinforcement adjacent to the deck joint **(see photo 77)**. The north face of the abutment 1 southern portion wingwall exhibits delaminations over approximately 40% of the surface area, more severe closer to the abutment bridge seat and backwall **(see photo 73)**. All wingwalls have isolated up to 1/16" wide vertical cracks extending up to full height.

The southeast wingwall adjacent to the World War I memorial plaque has an erosion hole that is approximately 4’ wide by 10’ deep. The erosion has exposed the edge of the wall footing and undermined drainage pipes causing the ends of the pipes to fail **(see photo 78)**.

Item 60.2 - Piers or Bents
Item 60.2.b - Caps
All pier caps are in generally good condition.

Item 60.2.d - Stems/Webs/Pierwalls
The pierwalls supporting the plate girder structure (westbound traffic) are generally in good condition. Pier 2 west face at approximately mid-height exhibits three pockets of 6” high by 3’ wide delmainations.

The pierwalls supporting the riveted girder structure (eastbound traffic) are generally in fair condition. The interface between the concrete arch structure and the pier wall typically was observed to have hairline map cracking over a 4’ wide by full height zone. Additionally, scattered vertical hairline cracks were observed **(see photos 12 through 15)**.

Item 60.2.f - Footing
Refer to the MaineDOT Underwater Inspection Report dated 9/29/16 for remarks.

Item 60.2.h - Scour
Refer to the MaineDOT Underwater Inspection Report dated 9/29/16 for remarks.

ITEM 61 - CHANNEL AND CHANNEL PROTECTION

Item 61.3 - Debris
The dam spillway naturally keeps the channel free of debris **(see photo 3)**.

Item 61.4 - Vegetation
There is minor to moderate vegetation growth (trees) on both downstream embankments along the river **(see photo 4)**.

Item 61.7 - Aggradation
There is moderate rock aggradation along the southwest embankment **(see photo 4)**.

TRAFFIC SAFETY

Item 36a - Bridge Railing
Refer to Item 58.8 for remarks.

Item 36b - Transitions
The concrete endpost transitions exhibit map cracking with pockets of delamination up to 2’ wide by 2’ high **(see photo 79)**. The southeast railing transition (unconventional transition) includes a World War I memorial plaque **(see photo 80)**.

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REMARKS

TRAFFIC SAFETY (cont.)

Item 36c - Approach Guardrail
There are W-beam guardrails along the north side of the approaches and are in generally good condition.

There is no south side approach guardrail for this bridge due to the sidewalk and termination points away from the roadway clearzone.

Item 36d - Approach Guardrail Ends
The northeast and northwest W-beam approach guardrail ends consist of a terminal end section.

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SKETCHES

Sketch 1: Location Map.

Appendix D

Existing Bridge Plans

Fed Road Dist No	State	Maine Proj No	Fiscal Year	Sheet No	Total Sheets
9	Maine	E.R-1		1	19

STATE OF MAINE

STATE HIGHWAY COMMISSION

PLAN AND PROFILE

STATE HIGHWAY "H"

TICONIC BRIDGE

BETWEEN

WINSLOW - WATERVILLE

OVER THE

KENNEBEC RIVER

KENNEBEC COUNTY

MAINE PROJECT NO. E.R-1

TOTAL LENGTH 0.129 MILES

SCALES { PLAN 1 IN.= 20 FT. ; PROFILE { HOR. 1 IN.= 20 FT. VER. 1 IN.= 5 FT.

CONVENTIONAL SIGNS

State or National Line		Survey Line	
County Line		Culvert	
Town Line		Drop Inlet	
Unfenced Property		Trolley Pole	
Fence		Power Pole	
Right of Way Line		Tel Pole	
Traveled Way		Marsh	
Railroad		Trees	
Retaining Wall		Stone Wall	

INDEX OF SHEETS

GENERAL NOTES

All work contemplated by this Contract shall be governed by and in conformity with the Specifications accompanying these plans.

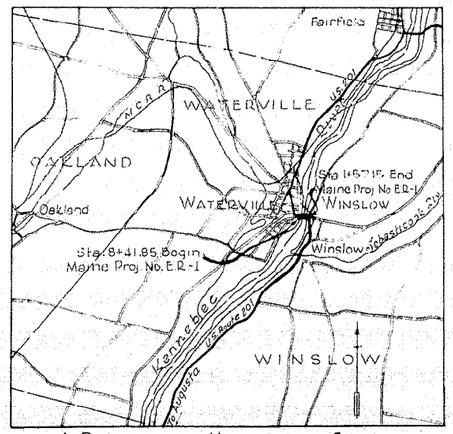
The above Specifications wherein not in conformity with the Federal Government Rules and Regulations for work done under the Federal Aid Act relative to the furnishing of all materials by the Contractor, or otherwise not in conformity therewith, are hereby amended to meet said Rules and Regulations of the Federal Government.

CONCRETE CLASSIFICATIONS

Grade A: Superstructure; Curbs; Approach Roadway & Sidewalk.

Grade B: Abutments; Retaining Walls; Piers

Grade Y: Rail and Wearing Surface



A PORTION OF KENNEBEC CO

Scale 1 inch = 1 mile

Design - E.A. MacLean

Plans checked by Fay, Spofford & Thorndike - Boston, Mass. 1936

APPROVED.
MAINE STATE HIGHWAY COMMISSION

Paul C. Preston
CHAIRMAN

[redacted]

[redacted]

William D. Pennell
CHIEF ENGINEER.

APPROVED:
U. S. BUREAU OF PUBLIC ROADS

[redacted]
DISTRICT ENGINEER

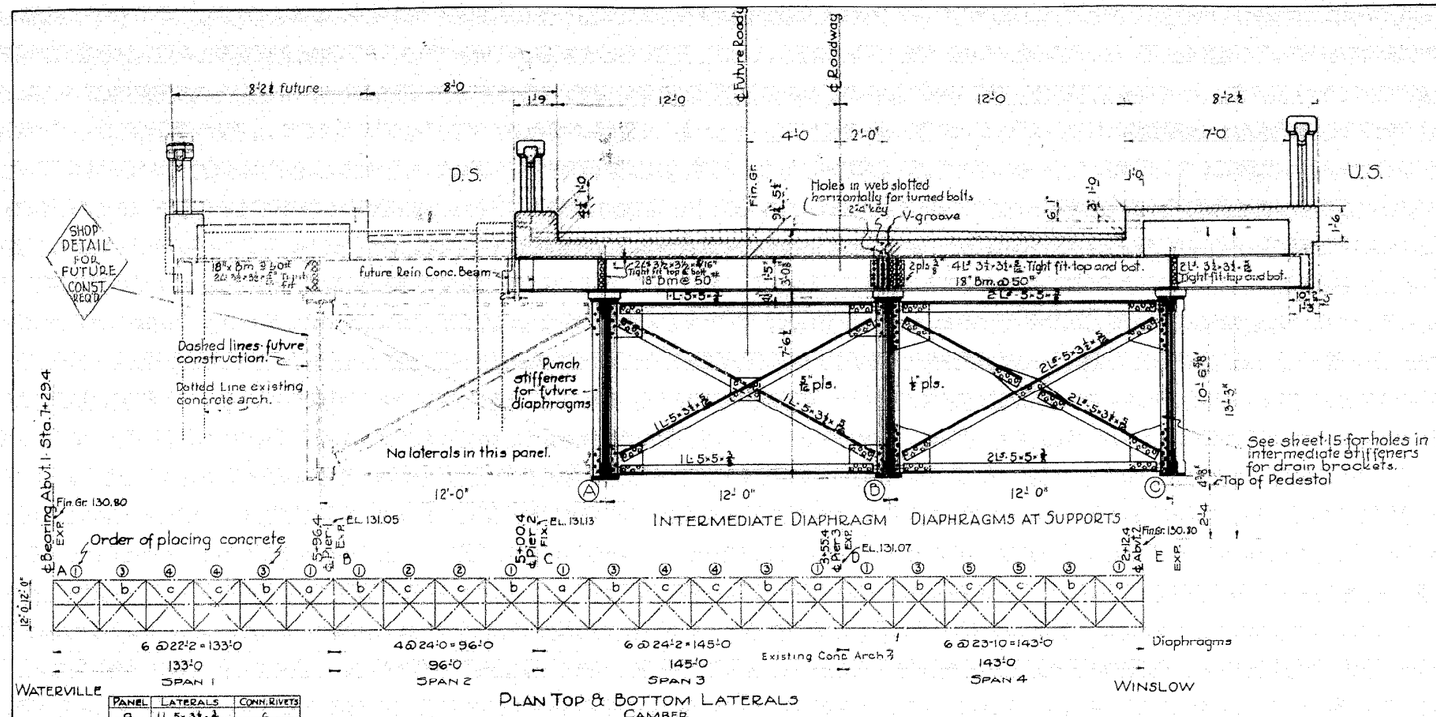
[redacted]
CHIEF ENGINEER

[redacted]
DIRECTOR

27-126

0 1 2 3 4 5 INCHES

FED. ROAD PROJ. NO.	STATE	NOMINAL SCALE	SHEET NO.	TOTAL SHEETS
		1/8 = 1'-0"	6	19



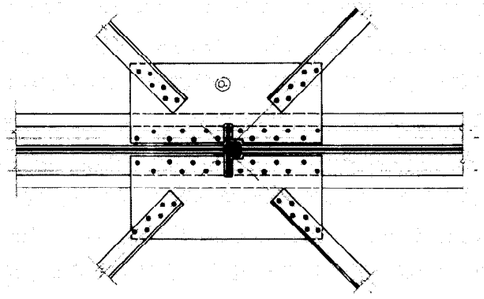
PLAN TOP & BOTTOM LATERALS

PANEL	LATERALS	CONN. RIVETS
a	1 L 5 x 3½ x ⅝	6
b	1 L 3½ x 3½ x ⅝	5
c	1 L 3½ x 3½ x ⅝	4

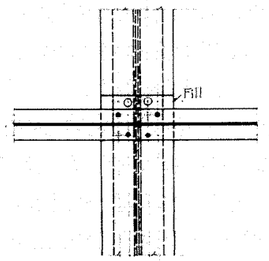
Gusset plates ⅜"

CAMBER

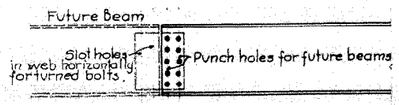
Span	
1	4"
2	1"
3	3½"
4	4"



TYPICAL LATERAL BRACING DETAILS



DETAIL NEEDLE BEAM CONNECTION TO GIRDER



FUTURE NEEDLE BEAM CONNECTION

Design: E.A.M.
Check: Fay, Spofford & Thorndike Boston Mass.

MOMENTS IN KIP FT. INTERIOR GIRDER

	Point A	Max. Pos. M. Span 1	Point B	Max. Pos. M. Span 2	Point C	Max. Pos. M. Span 3	Point D	Max. Pos. M. Span 4	Point E
D.L.	0	+ 4300	-4050	-120	-2700	+2700	-6890	+4050	0
Un.L.L+I	0	+ 2400	-2300	+1200	-2160	+2030	-3300	+2620	0
Con.L.L+I	0	+ 850	- 510	+540	- 480	+ 340	- 450	+ 980	0
TOTAL	0	+ 7550	-6860	+1620 / 1800	-5340	+5620	-10640	+7650	0

SHEAR IN KIPS INTERIOR GIRDER

	A	B L	B R	C L	C R	D L	D R	E
D.L.	157.0	218.0	145.2	124.8	175.0	233.0	250.2	153.8
Un.L.L+I	77.1	93.1	77.4	73.7	98.2	112.6	114.6	81.0
Con.L.L+I	51.3	51.3	51.3	51.3	51.3	51.3	51.3	51.3
TOTAL	285.4	362.4	273.9	251.8	325.5	396.9	416.1	286.1

REACTIONS IN KIPS INTERIOR GIRDER

	A	B	C	D	E
D.L.	157.0	363.2	299.8	483.2	153.8
Un.L.L+I	77.1	170.5	174.9	227.2	81.0
Con.L.L+I	51.3	51.3	51.3	51.3	51.3
TOTAL	285.4	585.0	526.0	761.7	286.1

LOADING

DOWNSTREAM GIRDER (A) Considered as part of future structure

D.L. Floor 2140#
Beams 75
Girder 605
2820# per ft.

Sidewalk L.L+I Uniform $\frac{20}{9}$ 1050 × 1.2 = 1260 / 1280# per sq. ft.

UPSTREAM GIRDER (C)

D.L. Concrete 2370#
Beam 85
Girder 575
3040# per ft.

L.L+I $\frac{640 \times 10' \times 5}{9' \times 12} \times 1.2 = 355$# per ft.

0.2 used for impact for all conditions of loading

S.W.L.L. $60\# \times 7' \times \frac{13.5}{12} = \frac{535}{890}$# per ft.

L.L+I Concentrated Mom 29,500 × 1.2 = 35,400#
Shear 42,700 × 1.2 = 51,300

L.L+I Concentrated Mom $\frac{18,000 \times 10' \times 5'}{9' \times 12} \times 1.2 = 10,000$#
Shear $\frac{26,000 \times 10' \times 5'}{9' \times 12} \times 1.2 = 14,500$#

DESIGN ALL GIRDERS ALIKE GIRDER (A) GOVERNS

NOTES

All details shall be made in accordance with Maine Highway Commission Specifications for Steel Bridge-1936.
Loading H-20
Rivets ⅞" unless noted.
Open holes 15/16" unless noted.
Material in all girders the same.

TOWN 06-29
BRIDGE 2854

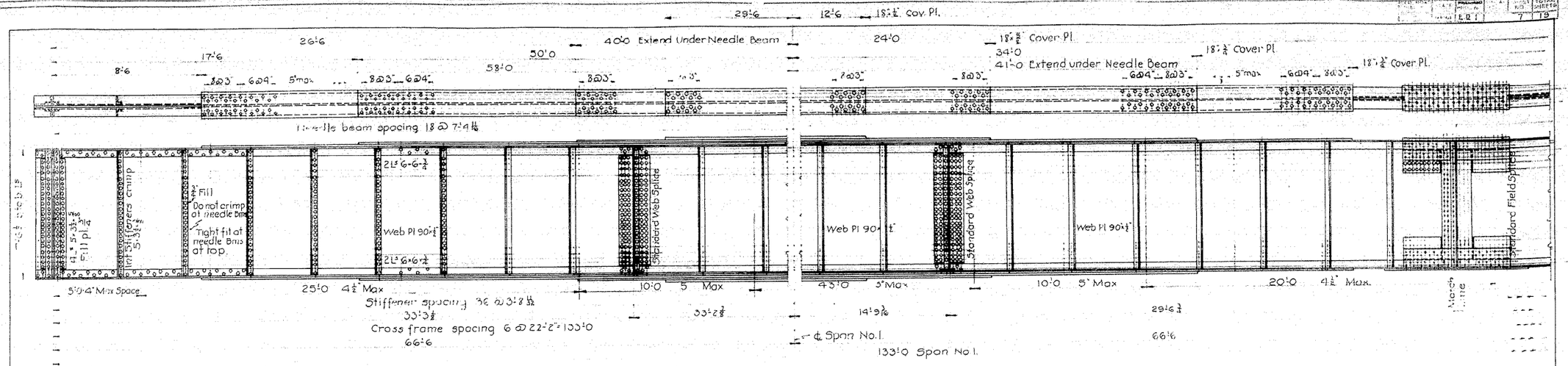
STATE HIGHWAY COMMISSION
BRIDGE DIVISION

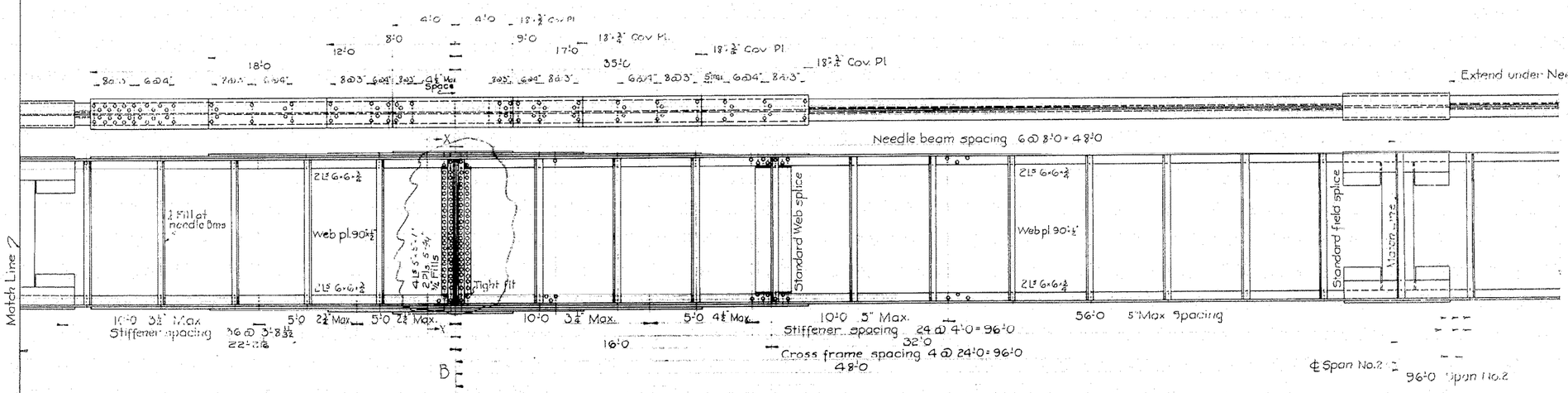
TICONIC BRIDGE
OVER THE
KENNEBEC RIVER
BETWEEN
WATERVILLE AND WINSLOW
CROSS SECTION & STRESS SHEET

SHEET 6 OF 19 SHEETS AUGUSTA ME MAY 1936

Revised 7/13/36
Revised 7/6/36

27-131





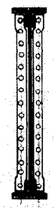
Notes:
All details shall be made in accordance with Maine Highway Commission Specifications for Steel Bridges, 1936.

Loading H-20
Rivets ⅞" unless noted.
Open holes 15/16"

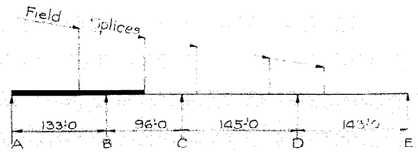
Extend cover plates under Needle Beams as required to get required number of rivets.

Crimp intermediate stiffeners. All stiffeners under needle beams to be tightly fitted at top and not crimped. All stiffeners over piers to be tightly fitted at top and bottom.

Design E.A.M.
Check Fay, Spofford & Thorndike Boston Mass



SECTION X-X



LOCATION DIAGRAM

Revised 11/9/36
Revised 7/13/36

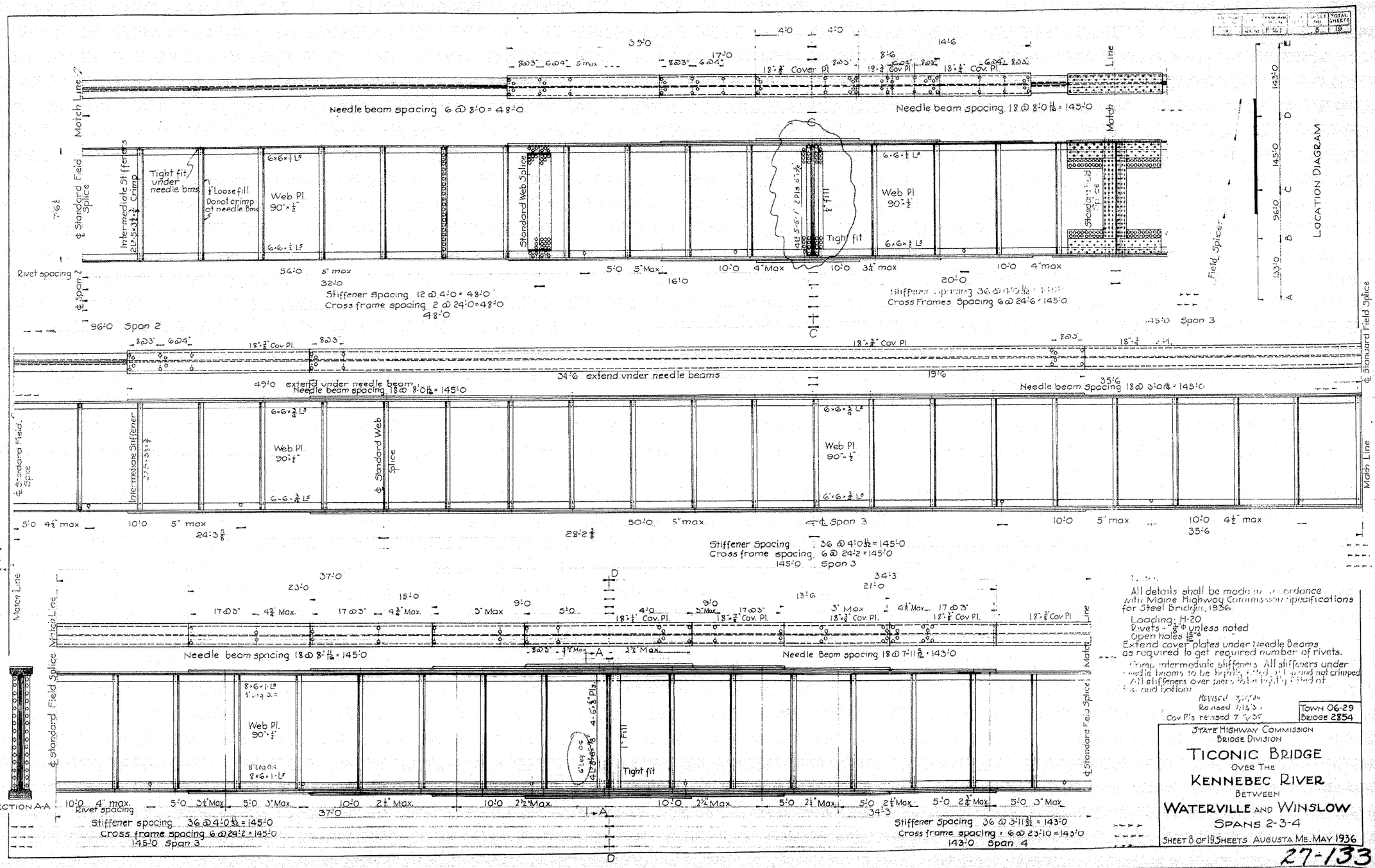
Town 06-29
BRIDGE 2854

STATE HIGHWAY COMMISSION
BRIDGE DIVISION

TICONIC BRIDGE
OVER THE
KENNEBEC RIVER
BETWEEN
WATERVILLE AND WINSLOW
SPANS No.1 & 2

SHEET 7 OF 19 SHEETS AUGUSTA, ME. MAY 1936

27-132



All details shall be made in accordance with Maine Highway Commission specifications for Steel Bridges, 1936.
Loading: H-20
Rivets - 3/4" ϕ unless noted
Open holes 15/16"
Extend cover plates under Needle Beams as required to get required number of rivets.
Crimp intermediate stiffeners. All stiffeners under needle beams to be tight fit and not crimped. All stiffeners over piers to be tightly fitted at top and bottom.

Revised 5/25/36
Revised 7/2/36
Cov Pl's revised 7/29/36

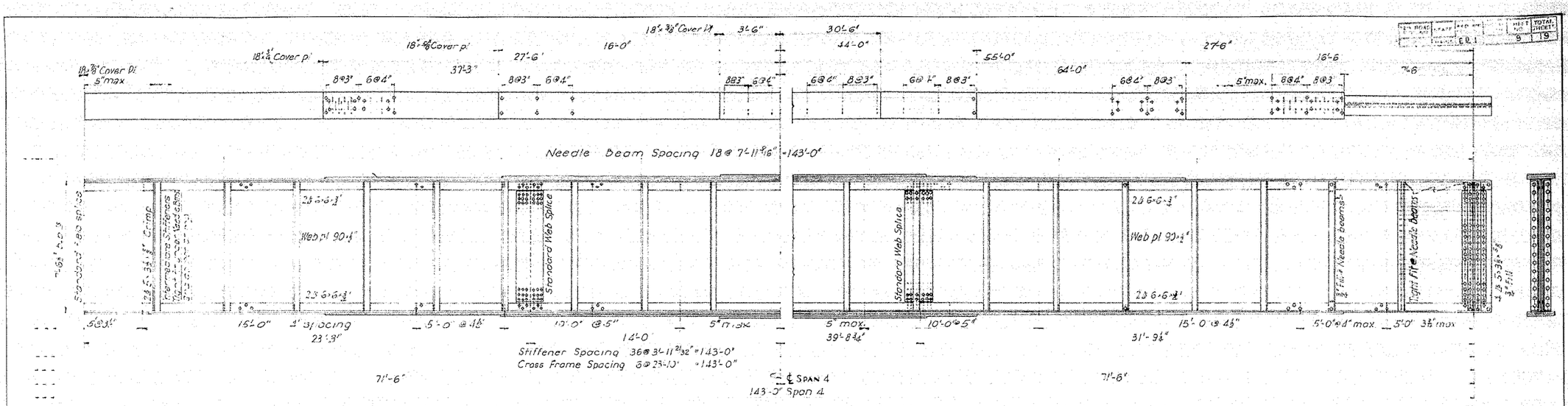
TOWN 06-29
BRIDGE 2854

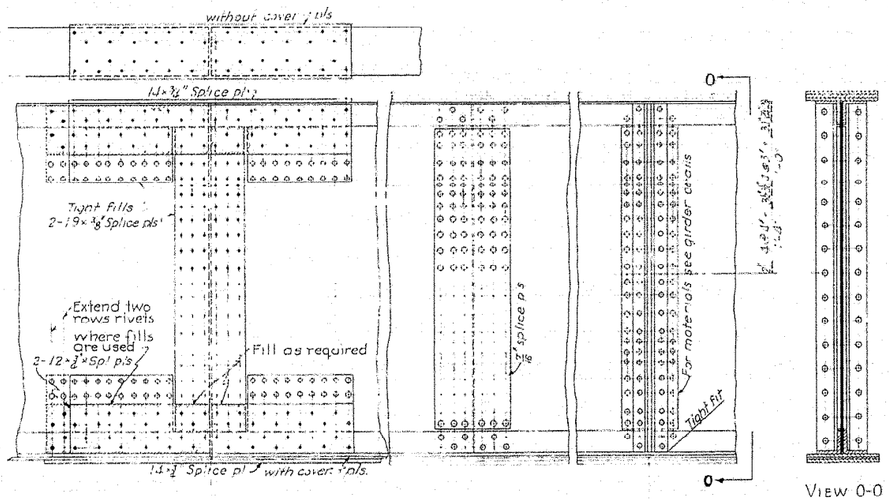
STATE HIGHWAY COMMISSION
BRIDGE DIVISION

TICONIC BRIDGE
OVER THE
KENNEBEC RIVER
BETWEEN
WATERVILLE AND WINSLOW
SPANS 2-3-4

SHEET 8 OF 19 SHEETS AUGUSTA ME. MAY 1936

27-133



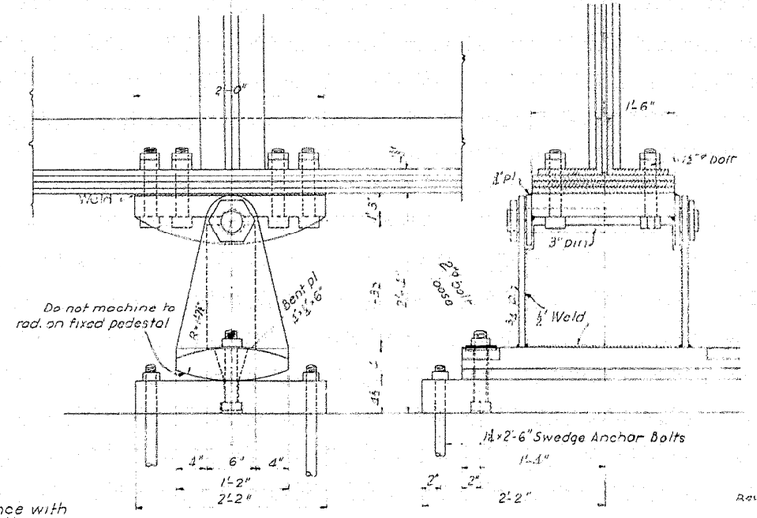


Typical Field Splice
(With and without cover pl.)

Typical Web Splice

Typical Bearing Detail

VIEW 0-0

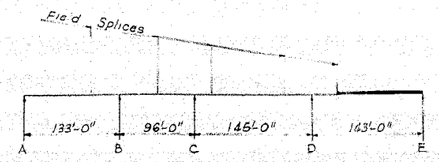


PEDESTAL DETAIL

Revised 7/13/36

Notes.
All detail shall be made in accordance with Maine Highway Commission Specifications for Steel Bridges 1936.
Loading H-20
Rivets - ⅞" unless noted
Open Holes 15/16 "
Extend Cover Plates under Needle Beams as required to get required number of rivets.
Material in all girders is the same.

Crimp intermediate stiffeners, except at needle beams. All stiffeners under needle beams to be tightly fitted at top.
All stiffeners over piers to be tightly fitted at top and bottom.



Location Diagram

Town 06-29
Bridge 2854

MAINE STATE HIGHWAY COMMISSION
BRIDGE DIVISION
TICONIC BRIDGE
OVER THE
KENNEBEC RIVER
BETWEEN
WATERVILLE WINSLOW
SPAN No 4

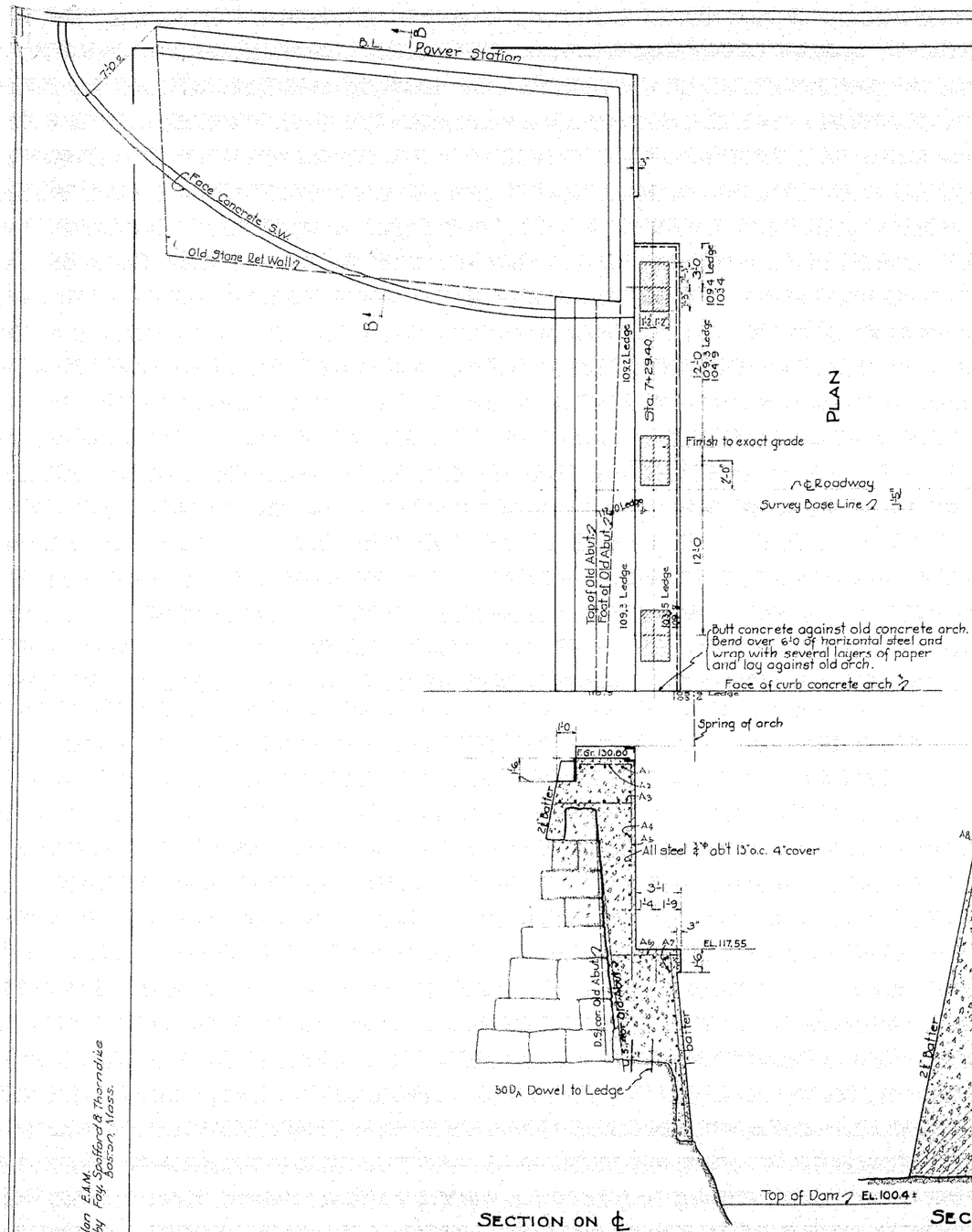
Sheet 9 of 19 Augusta, Me. May 1936

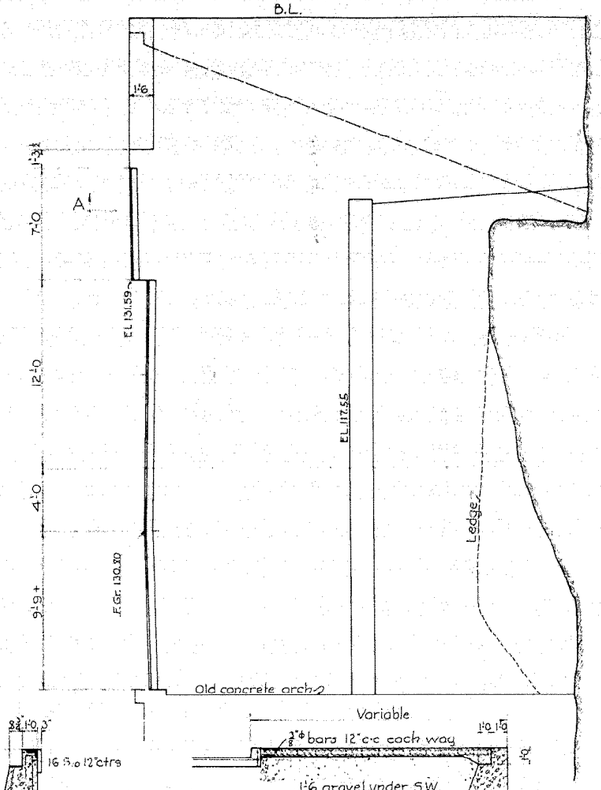
27-134

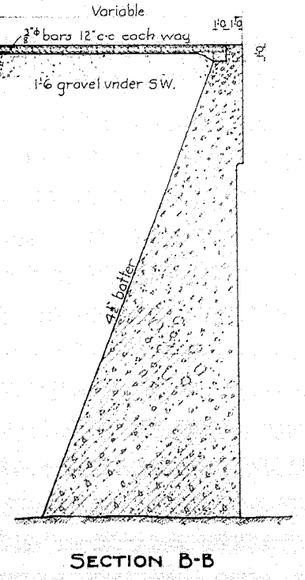
Design E.A.M.
Chkd. Fay, Spofford & Thorndike
Boston, Mass.

1 INCH

STATE	PROJECT NUMBER	FISCAL YEAR	SHEET NO	TOTAL SHEETS
MAINE	20-1		11	19







Plan E.A.N.
v by Fay, Spofford & Thorndike
Boston, Mass.

TOWN 06-29
BRIDGE 2854

STATE HIGHWAY COMMISSION
BRIDGE DIVISION

TICONIC BRIDGE
OVER THE
KENNEBEC RIVER
BETWEEN
WATERVILLE AND WINSLOW

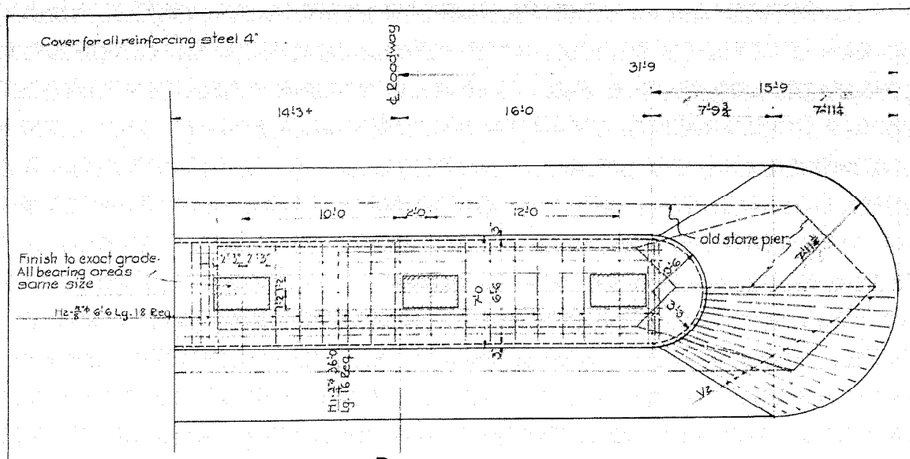
ABUTMENT No. 1.

Revised 7/13/36 SHEET 11 OF 19 SHEETS AUGUSTA ME. MAY 1936.

27-136

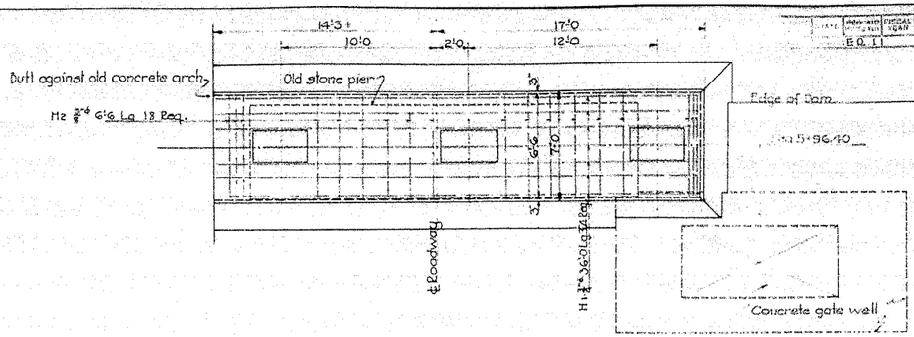
STATE	JOB NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	E.O. 1		12	19

Cover for all reinforcing steel 4"

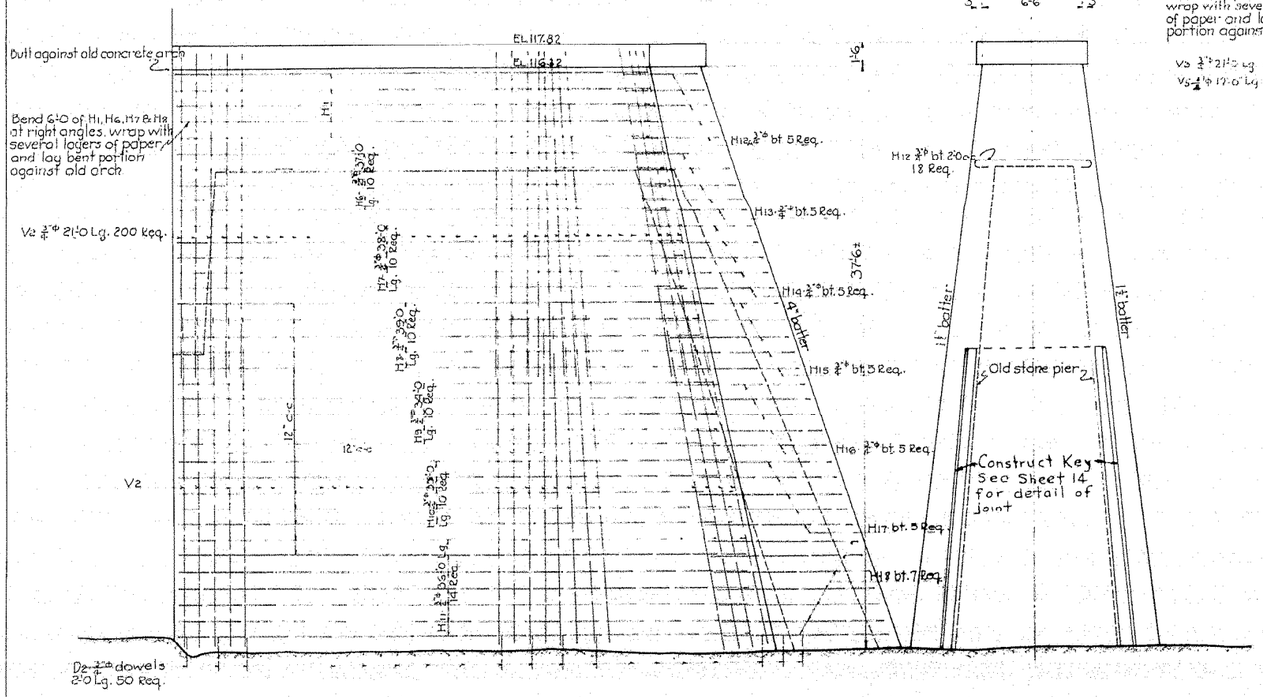


Sta. 3+55.40

PLAN



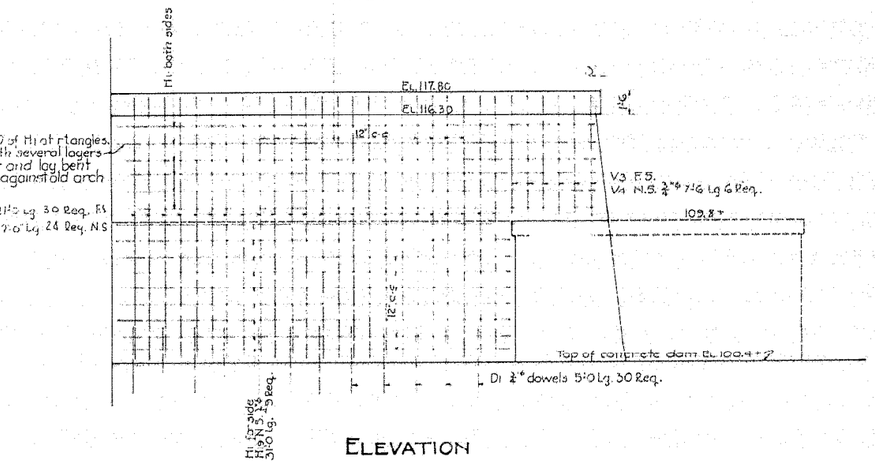
PLAN



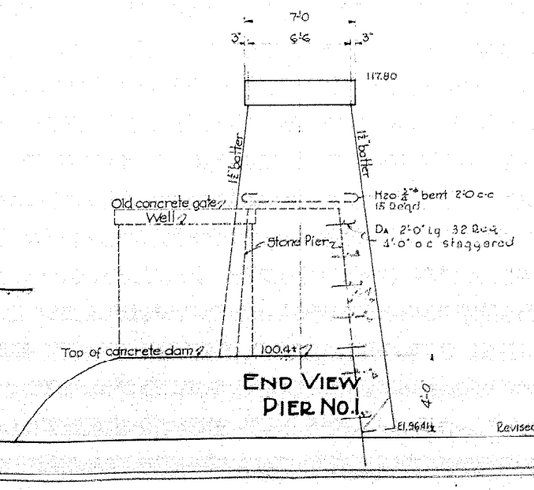
ELEVATION

END VIEW

PIER NO. 3.



ELEVATION



END VIEW
PIER NO. 1.

Plan: E.A.M.
by: Fay, Spofford & Thorndike
Boston, Mass.

TOWN 06-29
BRIDGE 2354

STATE HIGHWAY COMMISSION
BRIDGE DIVISION

TICONIC BRIDGE
OVER THE
KENNEBEC RIVER
BETWEEN
WATERVILLE AND WINSLOW

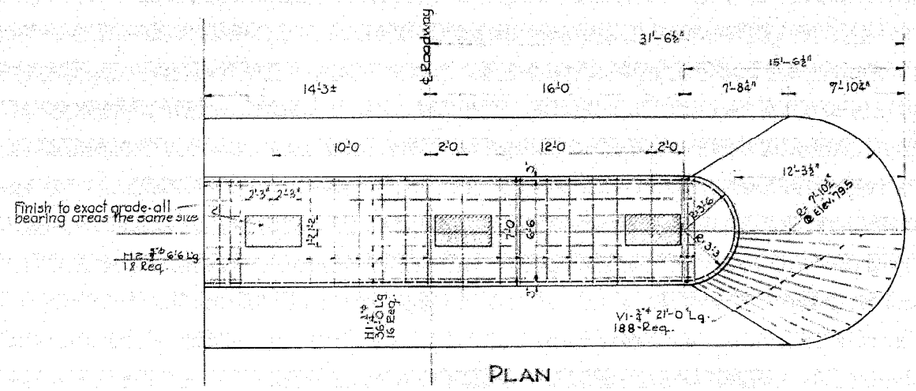
PIERS 1 & 3

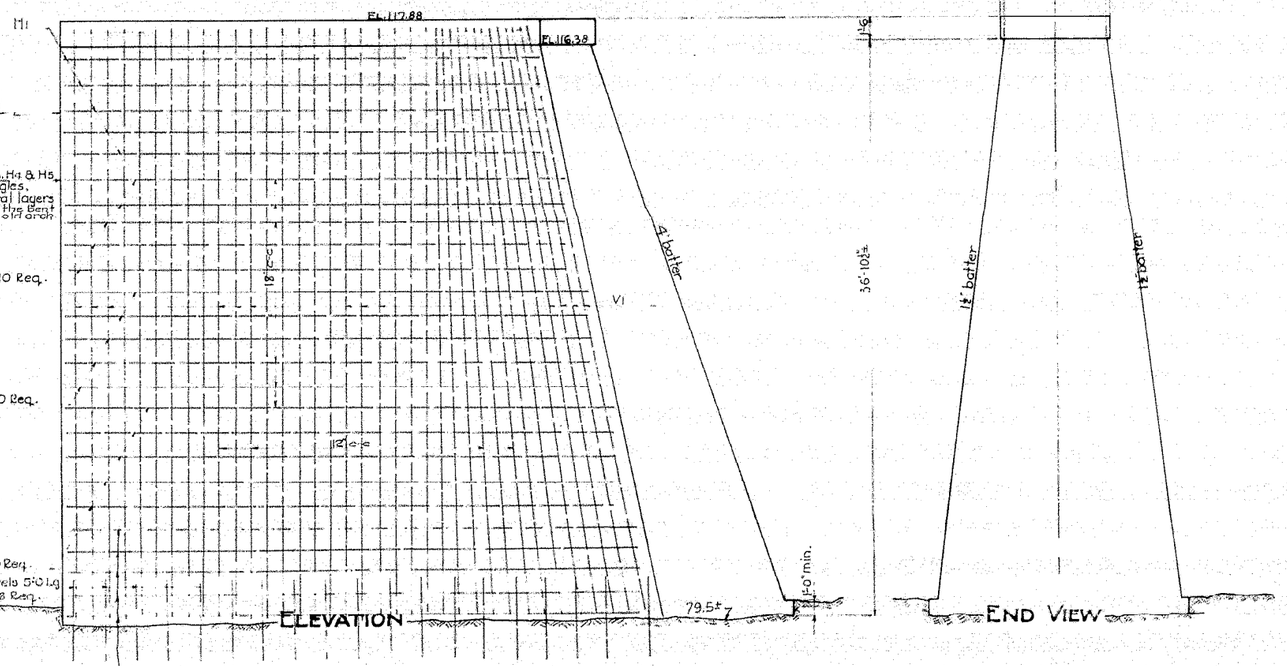
Revised 7/13/36 SHEET 12 OF 19 SHEETS AUGUSTA ME., MAY 1936

27-137

STATE	FED-AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
MAINE	BRIDGE		13	19

Cover for all reinforcing steel 4"





Plan E.A.M.
by Fay, Spofford & Thorndike
Boston, Mass.

Revised 7/6/36
Ledge Elev.

Town 06-29
Bridge 2834

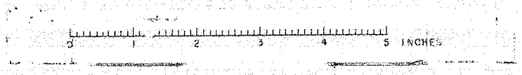
STATE HIGHWAY COMMISSION
BRIDGE DIVISION

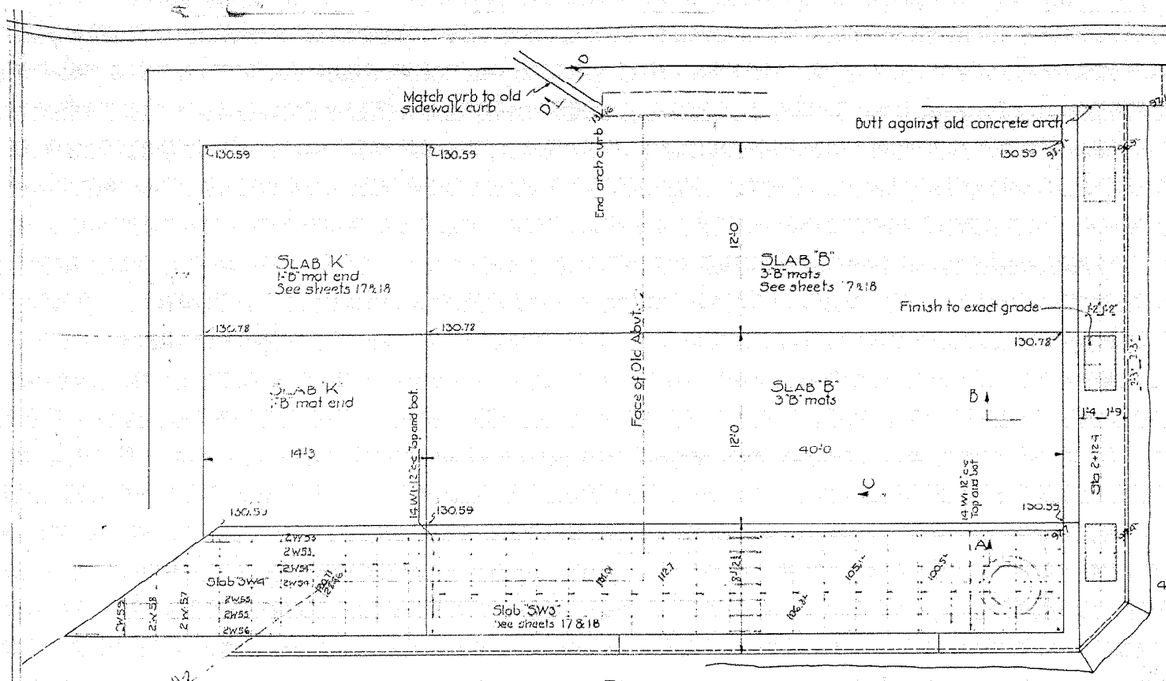
TICONIC BRIDGE
OVER THE
KENNEBEC RIVER
BETWEEN
WATERVILLE WINSLOW

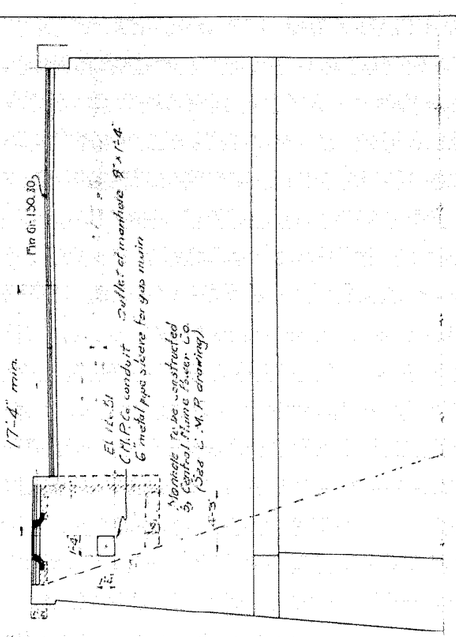
PIER NO. 2.

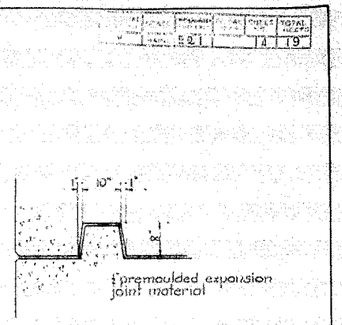
SHEET 13 OF 19 SHEETS AUGUSTA ME MAY 1936

27-138



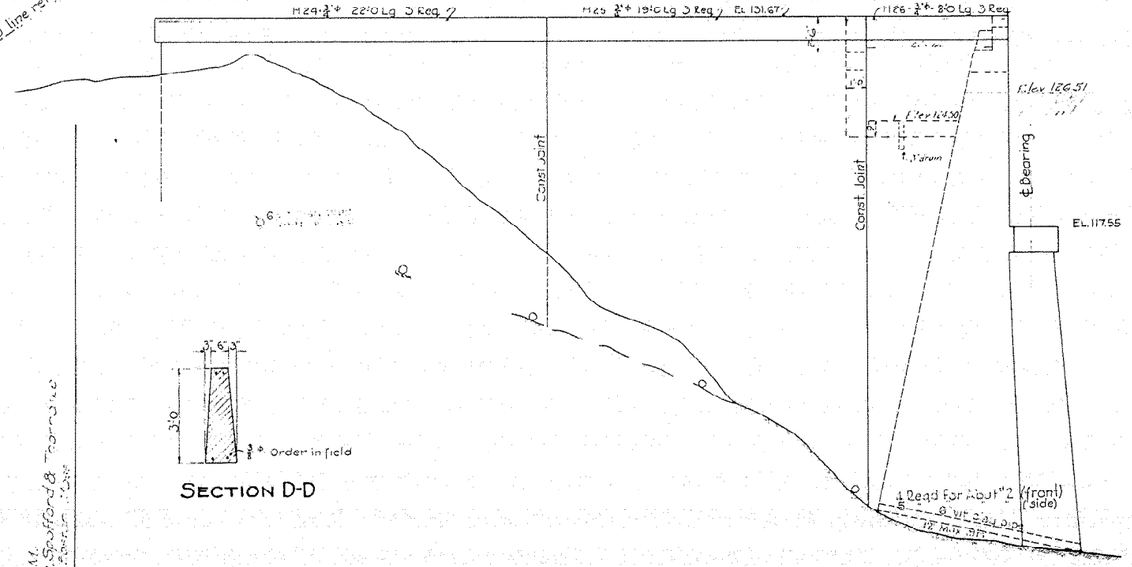




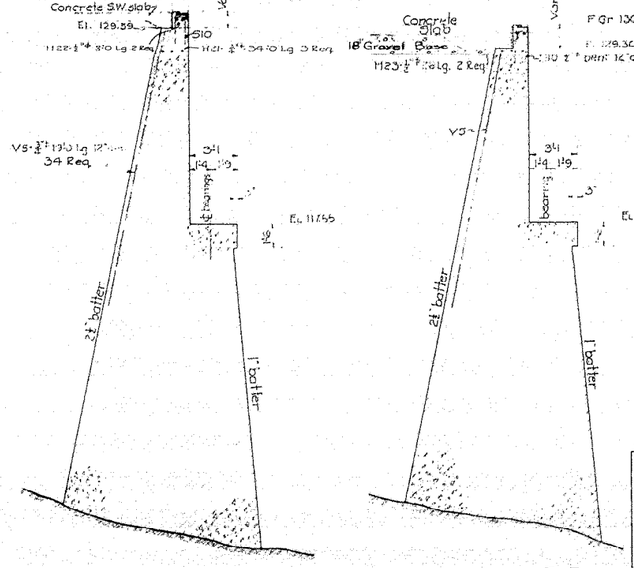


FRONT VIEW

CONSTRUCTION JOINT



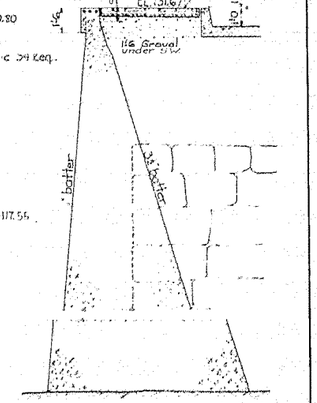
SECTION D-D



SECTION A-A

SECTION B-B

Revised for Conduit 9/29/36
" 9/4/36



SECTION C-C

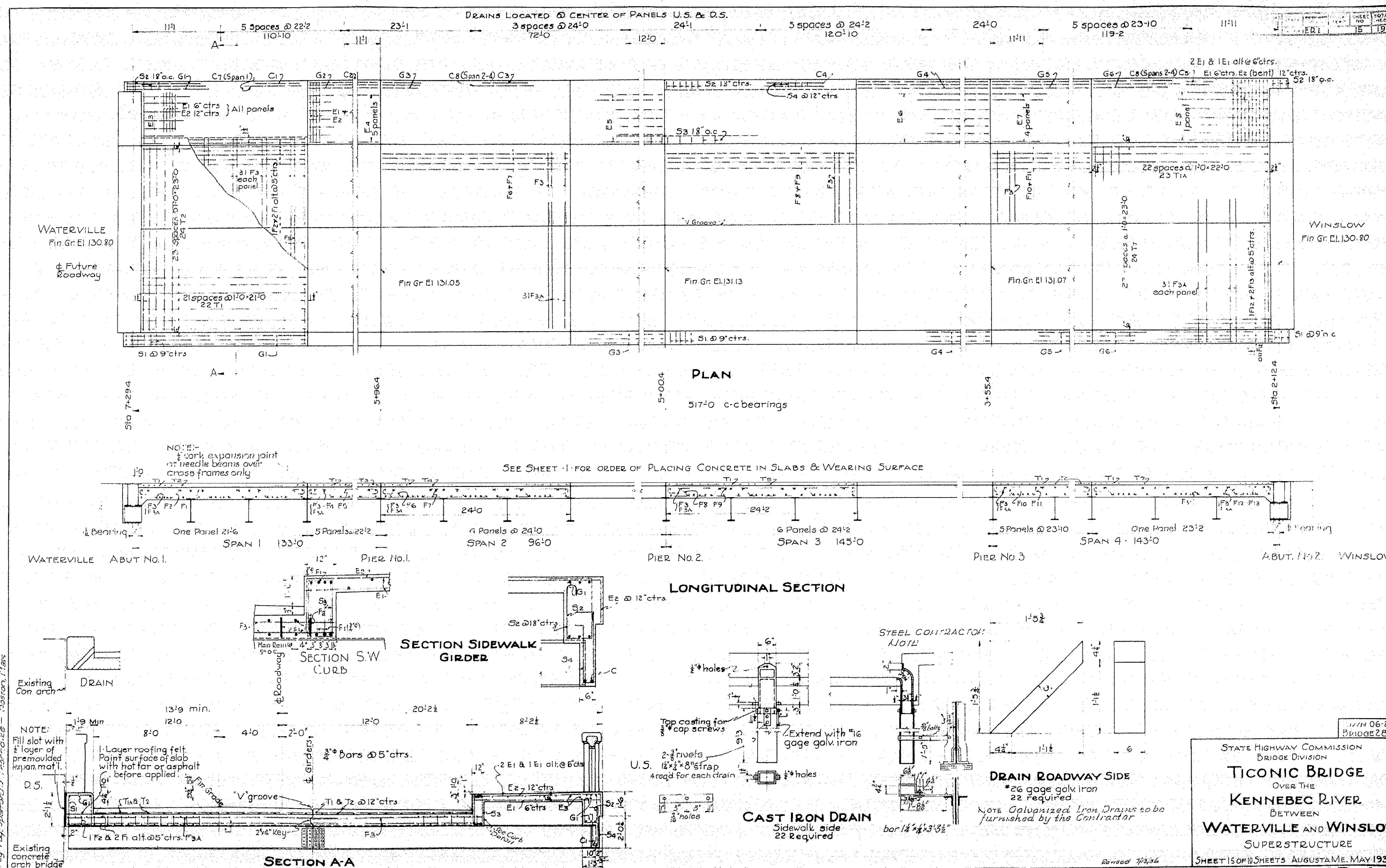
WIN 06-29
BRIDGE 2354

STATE HIGHWAY COMMISSION
BRIDGE DIVISION

TICONIC BRIDGE
OVER THE
KENNEBEC RIVER
BETWEEN
WATERVILLE AND WINSLOW
ABUTMENT No. 2.

SHEET 14 OF 19 SHEETS · AUGUSTA ME., MAY 1936

27-139



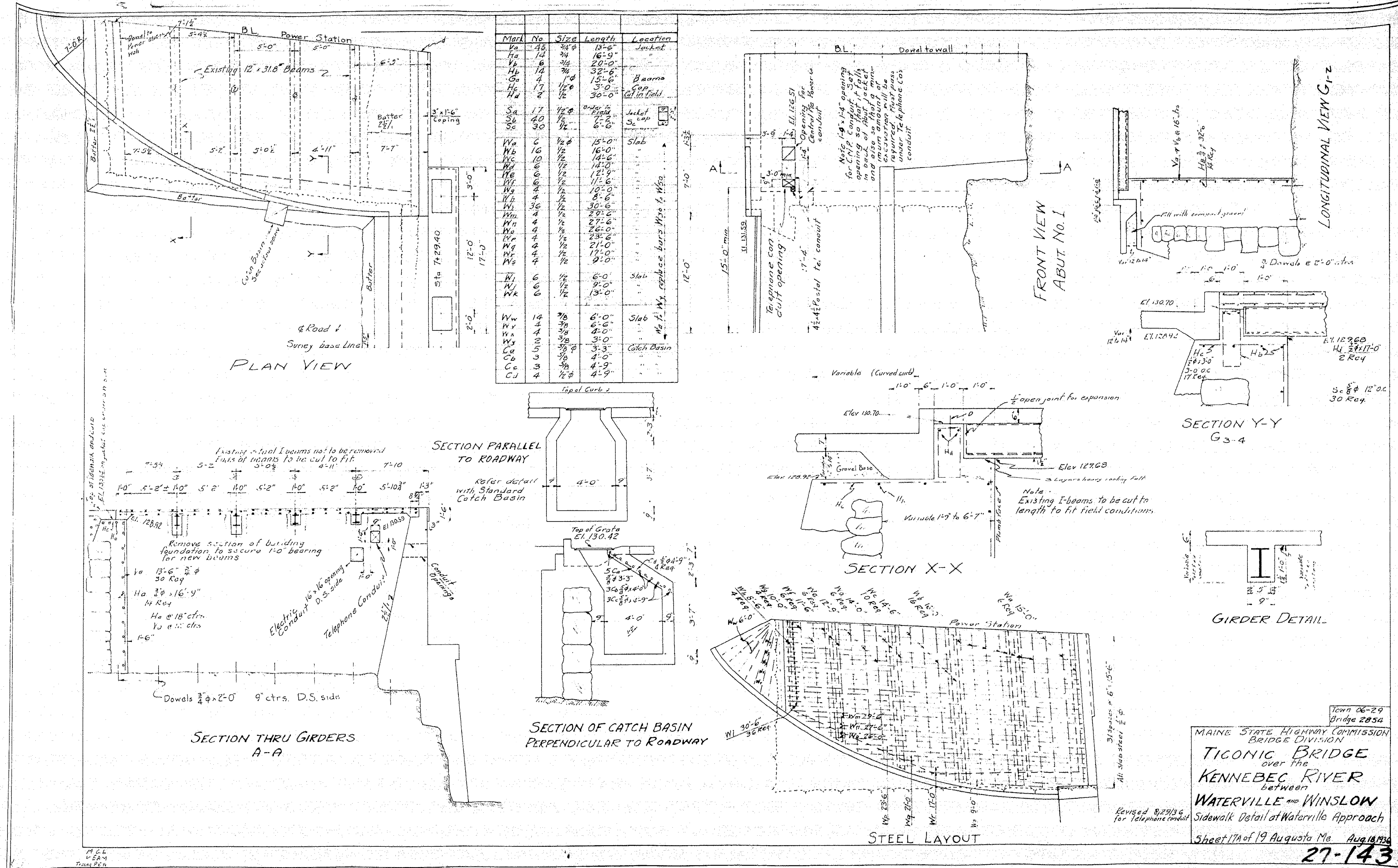
W/N 06-29
Bridge 2854

State Highway Commission
Bridge Division

Ticonic Bridge
over the
Kennebec River
between
Waterville and Winslow
Superstructure

Sheet 15 of 19 Sheets Augusta, Me. May 1936

27-140



Mark	No	Size	Length	Location
Va	45	3/4" ϕ	13'-6"	Jacket
Ha	14	3/4	16'-9"	"
Vb	6	3/4	20'-0"	"
Hb	14	3/4	32'-6"	
Ga	4	1" ϕ	15'-6"	Beams
Hc	17	1/2" ϕ	3'-0"	Cap
Hd	2	1/2	30'-0"	Cut in field
Sa	17	1/2" ϕ	Order in Field	Jacket
Sb	40	1/2	7'-2"	cap
Sc	30	1/2	6'-6"	Sc
Wa	6	1/2" ϕ	15'-0"	Slab
Wb	16	1/2	16'-0"	"
Wc	10	1/2	14'-6"	"
Wd	6	1/2	14'-0"	"
We	6	1/2	12'-9"	"
Wf	6	1/2	11'-6"	"
Wg	4	1/2	10'-0"	"
Wh	4	1/2	8'-6"	"
Wl	36	1/2	30'-6"	"
Wm	4	1/2	29'-6"	"
Wn	4	1/2	27'-6"	"
Wo	4	1/2	26'-0"	"
Wp	4	1/2	23'-6"	"
Wq	4	1/2	21'-0"	"
Wr	4	1/2	17'-0"	"
Ws	4	1/2	9'-0"	"
Wi	6	1/2	6'-0"	Slab
Wj	6	1/2	9'-0"	"
Wk	6	1/2	13'-0"	"
Ww	14	3/8	6'-0"	Slab
Wv	4	3/8	6'-6"	"
Wx	4	3/8	4'-0"	"
Wy	2	3/8	3'-0"	"
Ca	5	5/8" ϕ	3'-3"	Catch Basin
Cb	3	5/8	4'-0"	"
Cc	3	5/8	4'-9"	"
Cd	4	1/2" ϕ	4'-9"	"

Wa to Wy replace bars W30 to W50

Town 06-29
Bridge 2854

MAINE STATE HIGHWAY COMMISSION
BRIDGE DIVISION

TICONIC BRIDGE over the KENNEBEC RIVER between WATERVILLE AND WINSLOW

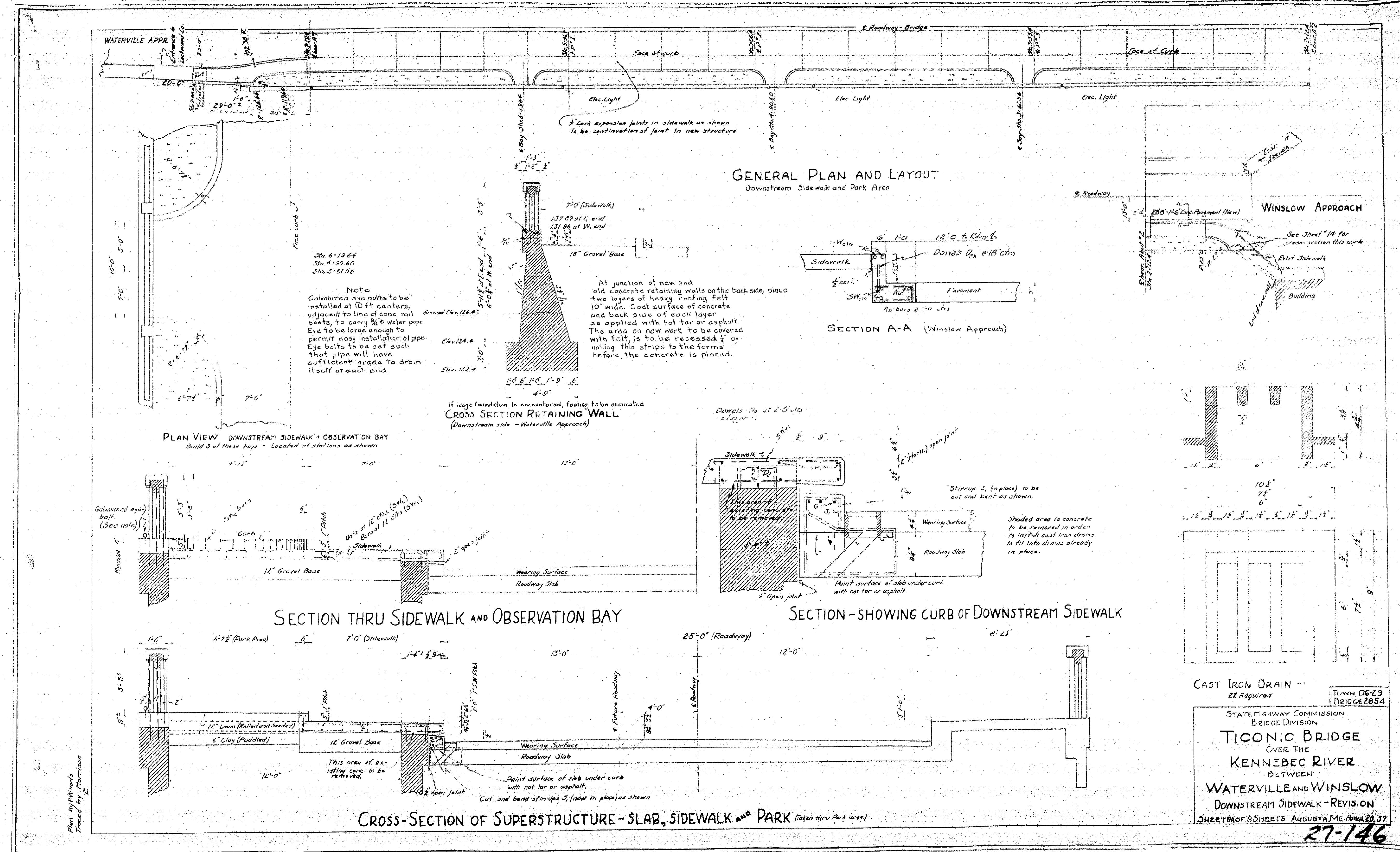
Sidewalk Detail at Waterville Approach

Revised 8/29/36 for telephone conduit

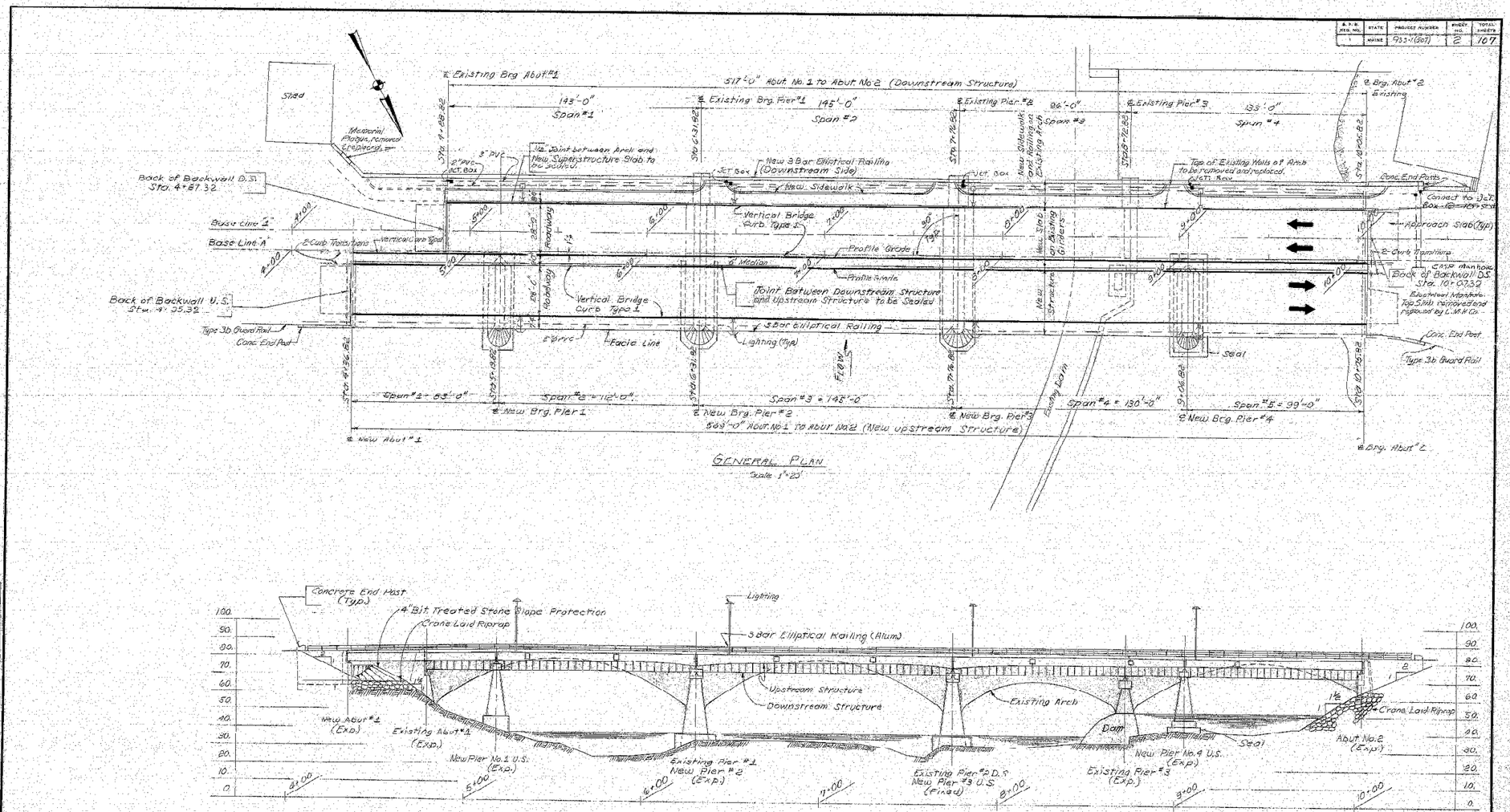
Sheet 17A of 19 Augusta Me Aug. 18, 1936

27-143

M.C.L.
V.E.A.M.
Tracing P.E.W.


GENERAL PLAN AND LAYOUT
Downstream Sidewalk and Park Area
WATERVILLE APPR.
Face of curb
℄ Roadway - Bridge
Elec. Light
℄ Cork expansion joints in sidewalk as shown
To be continuation of joint in new structure
WINSLOW APPROACH
See Sheet #14 for cross section this curb
Exist Sidewalk
Building
PLAN VIEW DOWNSTREAM SIDEWALK + OBSERVATION BAY
Build 3 of these bays - Located at stations as shown
Sta. 6+19.64
Sta. 4+90.60
Sta. 3+61.56
Note
Galvanized eye bolts to be installed at 10 ft centers, adjacent to line of conc rail posts, to carry 3/4 Φ water pipe. Eye to be large enough to permit easy installation of pipe. Eye bolts to be set such that pipe will have sufficient grade to drain itself at each end.
7'-0" (Sidewalk)
18" Gravel Base
If ledge foundation is encountered, footing to be eliminated
CROSS SECTION RETAINING WALL
(Downstream side - Waterville Approach)
At junction of new and old concrete retaining walls on the back side, place two layers of heavy roofing felt 10" wide. Coat surface of concrete and back side of each layer as applied with hot tar or asphalt. The area on new work to be covered with felt, is to be recessed 1/4" by nailing thin strips to the forms before the concrete is placed.
SECTION A-A (Winslow Approach)
Sidewalk
Pavement
SECTION THRU SIDEWALK AND OBSERVATION BAY
Galvanized eye-bolt (See note)
12" Gravel Base
Wearing Surface
Roadway Slab
2" open joint
Stirrup S1 (in place) to be cut and bent as shown.
Shaded area is concrete to be removed in order to install cast iron drains, to fit into drains already in place.
This area of existing concrete to be removed
Paint surface of slab under curb with hot tar or asphalt.
1/2" Open joint
SECTION - SHOWING CURB OF DOWNSTREAM SIDEWALK
CAST IRON DRAIN -
22 Required
6'-7 1/2" (Park Area)
7'-0" (Sidewalk)
25'-0" (Roadway)
12" Loam (Rolled and Seeded)
6" Clay (Puddled)
12" Gravel Base
This area of existing conc. to be removed.
Paint surface of slab under curb with hot tar or asphalt.
Cut and bend stirrups S1 (now in place) as shown
CROSS-SECTION OF SUPERSTRUCTURE - SLAB, SIDEWALK AND PARK (taken thru Park area)
Plan by P. Woods
Traced by Morrison
TOWN 06-29
BRIDGE 2854
STATE HIGHWAY COMMISSION
BRIDGE DIVISION
TICONIC BRIDGE
OVER THE
KENNEBEC RIVER
BETWEEN
WATERVILLE AND WINSLOW
DOWNSTREAM SIDEWALK - REVISION
SHEET 14 OF 19 SHEETS AUGUSTA, ME APRIL 20, 37
27-146

F.A.P. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	933-1(307)	2	107



GENERAL PLAN
Scale 1"=25'

ELEVATION
Scale 1"=25'

SPECIFICATIONS

Design : A.A.S.H.O. Standard Specifications for Highway Bridges 1969 ; Interim Specification 1970.
Contract : State of Maine, State Highway Commission Standard Specifications, Highways & Bridges, Revision of June 1968.
Loading : HS20-44

Design Stresses: Concrete - f'c = 1600 p.s.i.
Reinforcing Steel - fs = 20,000 psi.
Structural Steel - A-36 = 80,000 p.s.i. ; A572 (Grade 50) = 27,000 p.s.i.
Concrete Classifications: See Sheets #8, 10, 14, 30, 32, 26, 32 & 35
Structural Steel Classification : Refer to sheet #16

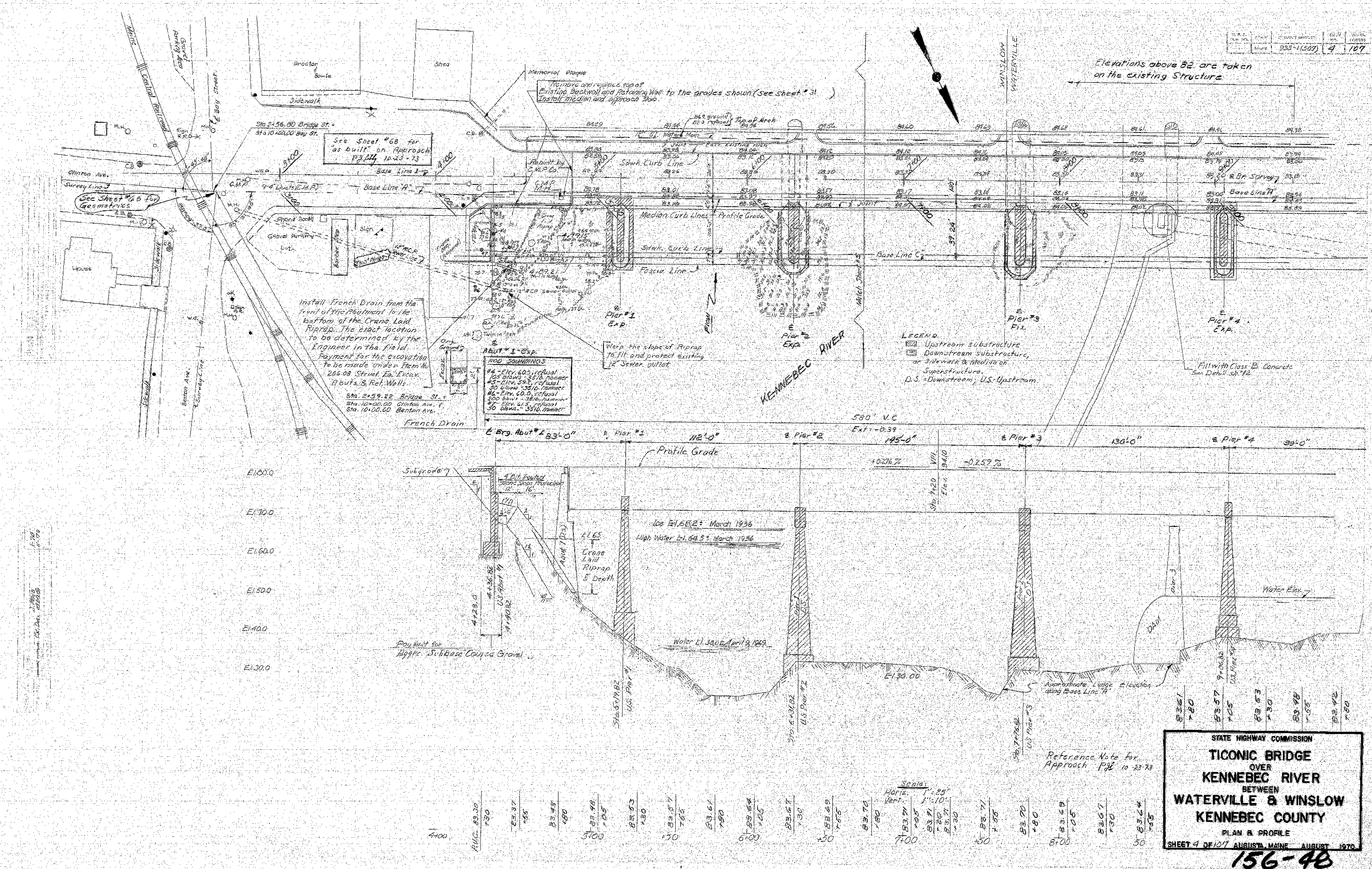
"As Built" rjp-dlg 10-23-73

STATE HIGHWAY COMMISSION
TICONIC BRIDGE
OVER
KENNEBEC RIVER
BETWEEN
WATERVILLE & WINSLOW
KENNEBEC COUNTY
GENERAL PLAN
SHEET 2 OF 107 AUGUSTA, MAINE

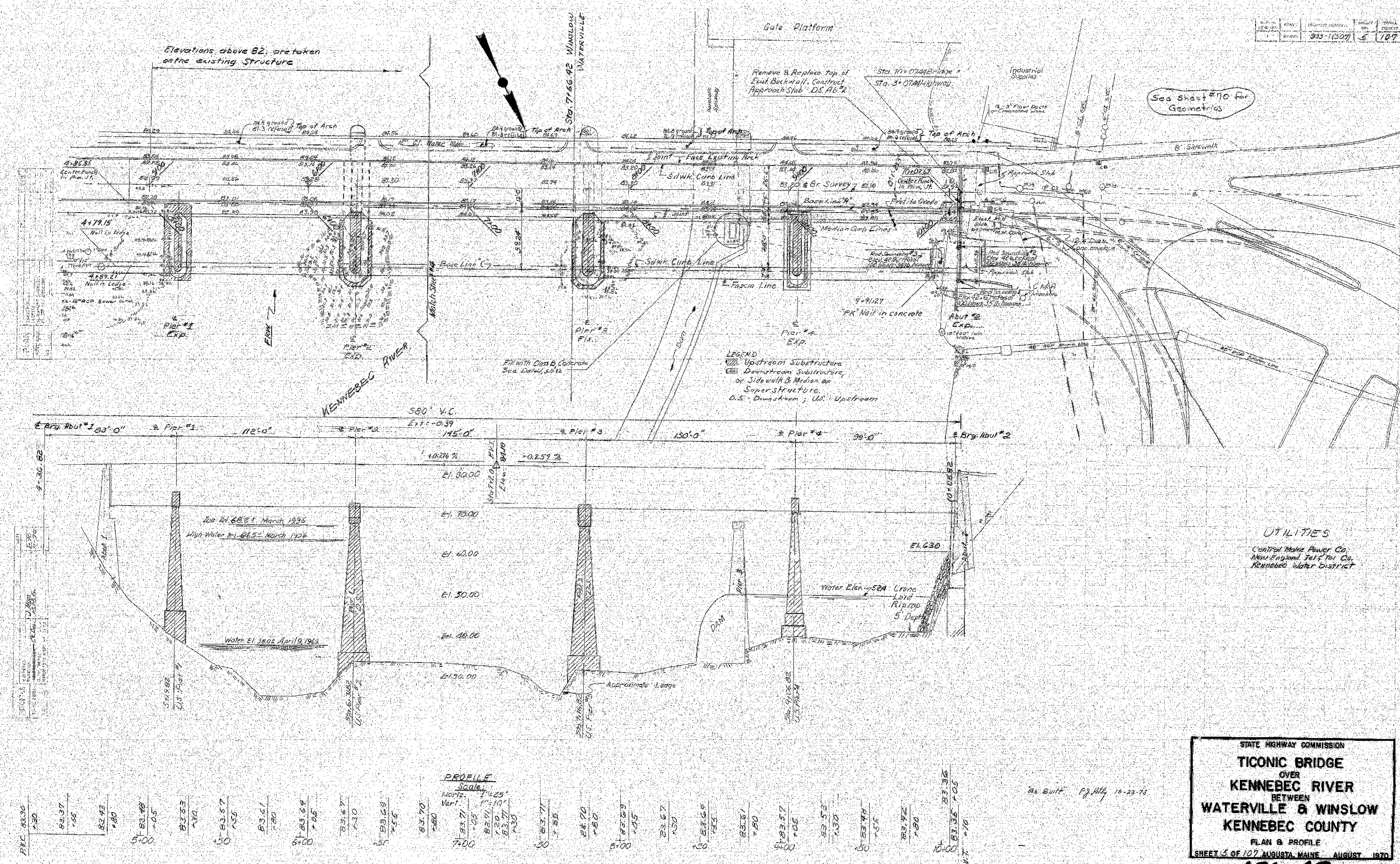
156-47

PLANS	BY	DATE
DESIGN - DE TAIL ED.	A.L.C.	10-28-70
CHECKED	P.J.L.	11-20-70
REVISIONS		
FIELD CHANGES		

JANUARY 1969



Elevations above 82. are taken on the existing Structure
WINSLOW
WATERVILLE
Memorial Plaque
Remove and replace top of Existing Backwall and Retaining Wall to the grades shown (see sheet #31)
Install median and approach Slab
See Sheet #68 for as built on Approach
See Sheet #10 for Geometrics
Clinton Ave.
Survey Line
Base Line "A"
Base Line C
Base Line "B"
Sdwk. Curb Line
Median Curb Lines
Profile Grade
Fascia Line
Gravel Parking Lot
House
Sidewalk
Benton Ave.
Pier #1 Exp.
Pier #2 Exp.
Pier #3 Fix.
Pier #4 Exp.
KENNEBEC RIVER
LEGEND
Upstream substructure
Downstream substructure, or Sidewalk & Median of Superstructure.
D.S. = Downstream, U.S. = Upstream
Fill with Class B Concrete See Detail sh. 12
Install French Drain from the front of the Abutment to the bottom of the Crane Laid Riprap. The exact location to be determined by the Engineer in the field. Payment for the excavation to be made under Item No. 206.08 Street Ex. Excav. Abuts. & Ret. Walls.
Warp the slopes of Riprap to fit and protect existing 12" Sewer outlet
Abut #1 Exp.
ROD SOUNDINGS
French Drain
580' V.C.
Profile Grade
+0.216%
-0.257%
Subgrade
Crane Laid Riprap 5' Depth
Ice El. 68.2± March 1936
High Water El. 68.5± March 1936
Water El. 33.0± April 9, 1969
El. 30.00
Water Elev.
Approximate Ledge Elevation along Base Line "A"
El. 80.0
El. 70.0
El. 60.0
El. 50.0
El. 40.0
El. 30.0
Pay limit for Aggr. Subbase Course Gravel
Reference Note for Approach P.J.K. 10-23-73
Scale: Horiz. 1" = 25' Vert. 1" = 10'
STATE HIGHWAY COMMISSION
TICONIC BRIDGE
OVER
KENNEBEC RIVER
BETWEEN
WATERVILLE & WINSLOW
KENNEBEC COUNTY
PLAN & PROFILE
SHEET 4 OF 107 AUGUSTA, MAINE AUGUST 1970
156-48



STATE HIGHWAY COMMISSION

TICONIC BRIDGE
OVER
KENNEBEC RIVER
BETWEEN
WATERVILLE & WINSLOW
KENNEBEC COUNTY

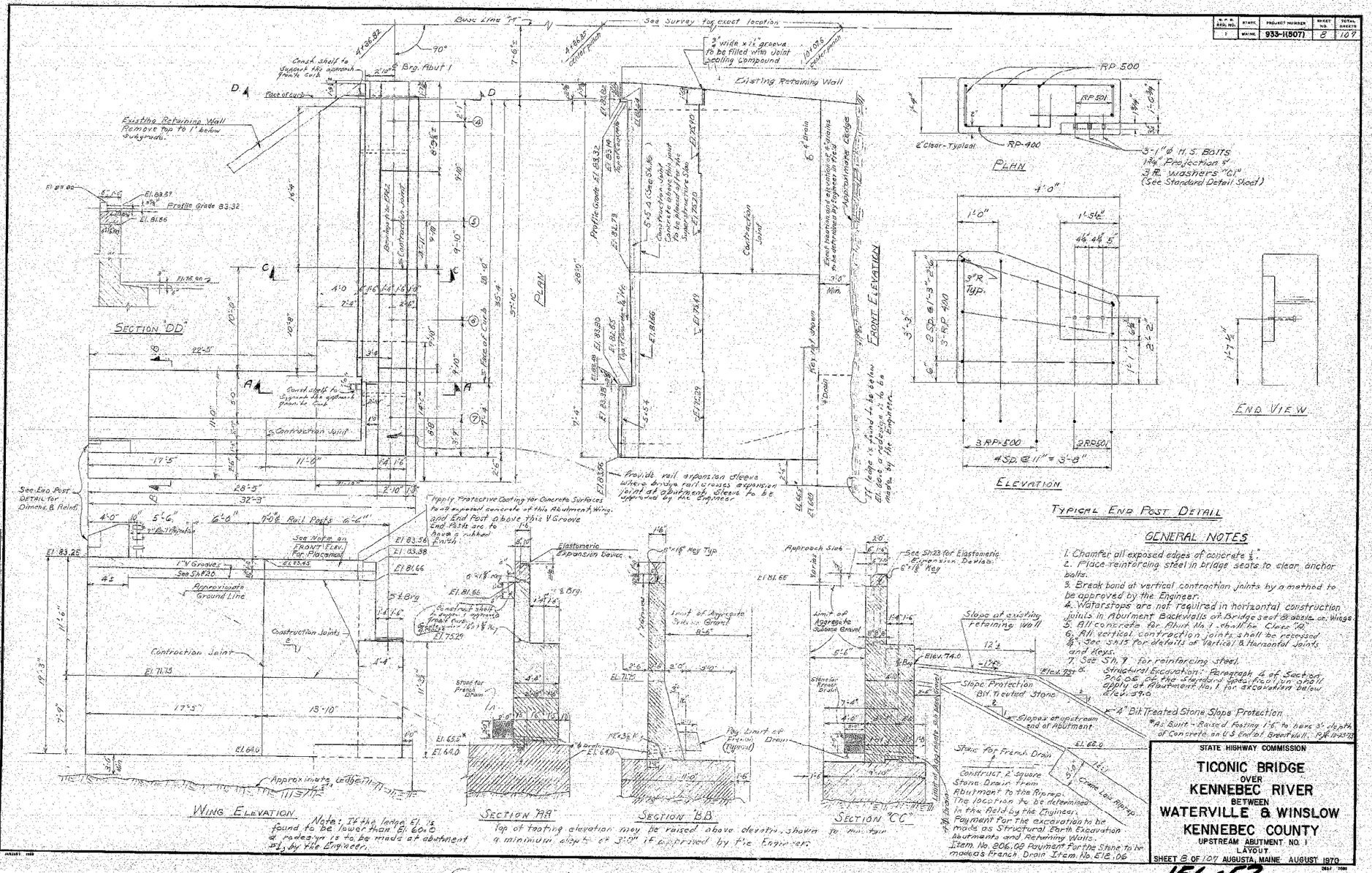
PLAN & PROFILE

SHEET 5 OF 107 AUGUSTA, MAINE AUGUST 1970

156-49

[redacted]

F. P. R. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	933-1(807)	8	107



DATE	BY	DESIGN DETAILED	CHECKED	REVISIONS	FIELD CHANGES
11/70	MMG				

PLANS

GENERAL NOTES

1. Chamfer all exposed edges of concrete ¾".
2. Place reinforcing steel in bridge seats to clear anchor bolts.
3. Break bond at vertical contraction joints by a method to be approved by the Engineer.
4. Waterstops are not required in horizontal construction joints in Abutment Backwalls or Bridge seat Backs on Wings.
5. All concrete for Abut. No. 1 shall be Class "B".
6. All vertical contraction joints shall be recessed ¾". See Sh.13 for details of Vertical & Horizontal Joints and Keys.
7. See Sh. 7 for reinforcing steel.
8. Structural Excavation: Paragraph 4 of Section 206.05 of the Standard Specifications shall apply at Abutment No. 1 for excavation below Elev. 59.0

Note: If the ledge El. is found to be lower than El. 60.0 & redesign is to be made at abutment #1, by the Engineer.

Top of footing elevation may be raised above elevation shown to maintain a minimum slope of 3:10" if approved by the Engineer.

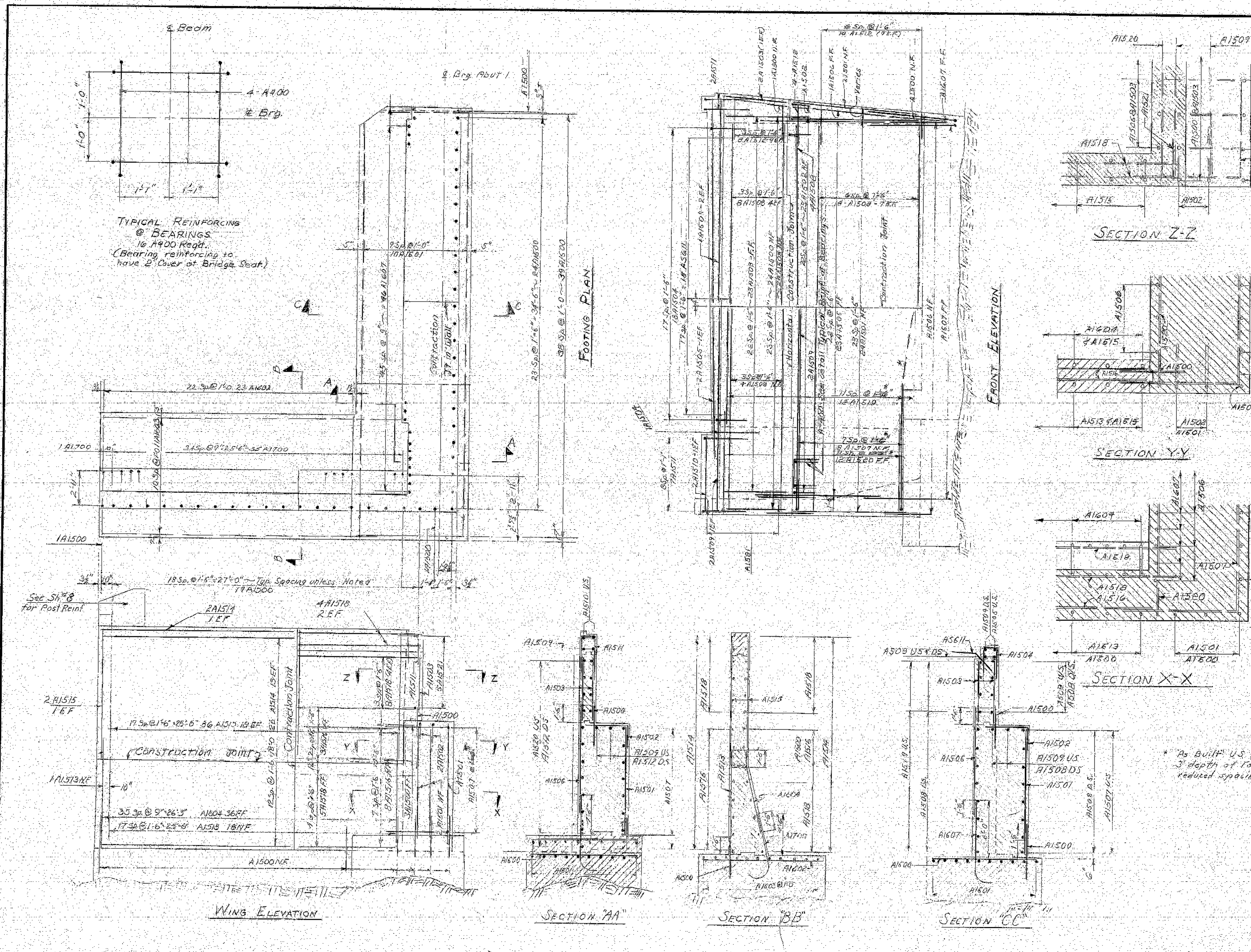
*As Built - Raised Footing 1'-6" to have 3' depth of Concrete on U/S End of Breast Wall. 10/8/70

STATE HIGHWAY COMMISSION

TICONIC BRIDGE
OVER
KENNEBEC RIVER
BETWEEN
WATERVILLE & WINSLOW
KENNEBEC COUNTY
UPSTREAM ABUTMENT NO. 1
LAYOUT
SHEET 8 OF 107 AUGUSTA, MAINE AUGUST 1970

156-52

B. P. R. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	933-1(507)	9	107



Legend:
NF = Near Face
FF = Far Face
EF = Each Face
D.S. = Downstream Section from Breastwall Contraction Joint on structure shown.
U.S. = Upstream Section from Breastwall Contraction Joint on structure shown.

Note:

Reinforcing to have 3" Cover unless otherwise noted.
All Reinforcing Steel Splices and Embedments to be a minimum of 24 Bar Diameters Unless noted.

* As Built: U.S. End of Breastwall Ftg raised to maintain 3' depth of footing. The reinforcing was bent and reduced spacing to accomodate change. PJL 10-23-73

STATE HIGHWAY COMMISSION

TICONIC BRIDGE
OVER
KENNEBEC RIVER
BETWEEN
WATERVILLE & WINSLOW
KENNEBEC COUNTY
UPSTREAM ABUTMENT NO. 1
REINFORCING STEEL LAYOUT
SHEET 9 OF 107 AUGUSTA, MAINE AUGUSTA 1970

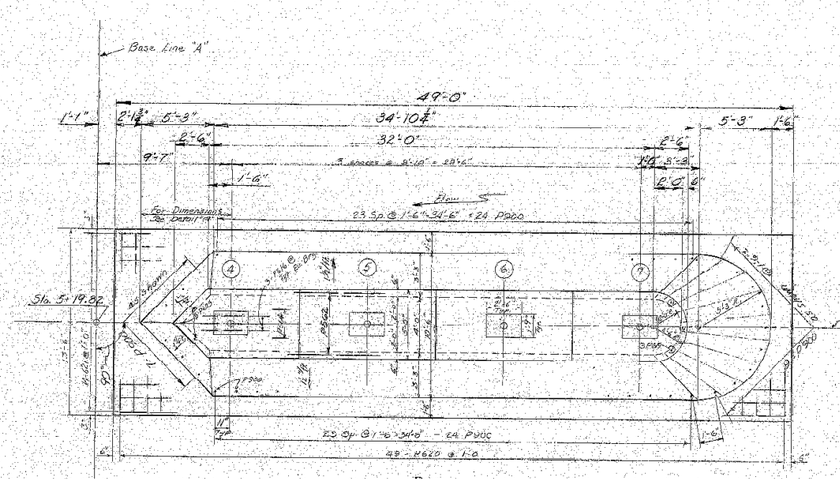
156-53

F.A.P. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	933-1(507)	10	107

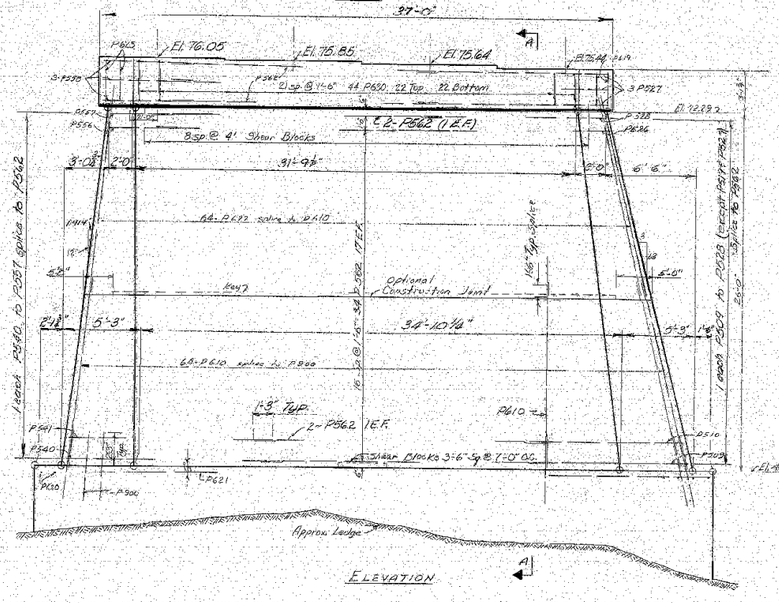
GENERAL PIER NOTES

1. Dress shaded bearing areas to exact elevations shown.
2. Space reinforcing steel in top of caps to clear Anchor Bolts.
3. All reinforcing steel to be 2" clear unless otherwise noted.
4. All ledge surfaces, which have been exposed to wetting and drying, shall be cleaned of bird droppings and other tainted deposits by a method which is to be approved by the Engineer. Payment for such cleaning will not be made directly, but will be considered incidental to Item 502.23 or 502.24.
5. The dimension shown on the plans for seal type footings are predicated on the use of DPC or equivalent steel sheet piling with appropriate standard rolled corners.
6. Drilling and grouting of dowels in the seal concrete shall be incidental to Item 503.19. The mortar tube used for grouting of dowels shall be a Non-shrink mortar approved by the Engineer.
7. All exposed concrete edges shall have a ¾" chamfer.
8. All spirals shall be #4 bar diameters minimum.
9. Concrete for the piers will be of the following classes:
   a. Pier Caps - Class "A"
   b. Pier Shafts - Class "B"
   c. Leveling Slab to be placed in the dry - Class "B"
   d. Seal placed underwater - Class "C"
   e. Seal placed in the dry - Class "B"
10. Structural Excavation: Paragraph 4 of Section 206.05 of the Standard Specifications shall apply for excavation done below the following elevations:

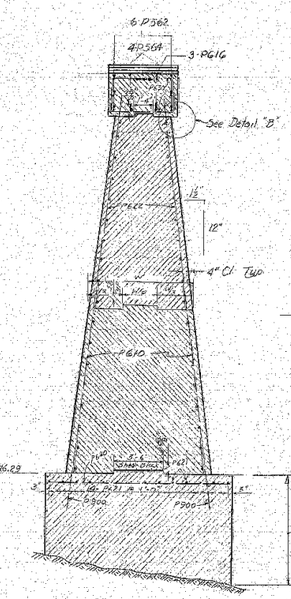
Pier #1	El. 36.0
Pier #2	El. 31.0
Pier #3	El. 24.0
Pier #4	El. 35.0



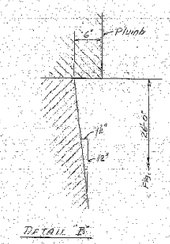
PLAN



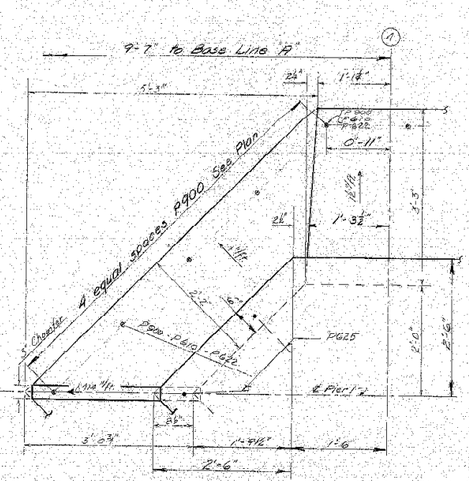
ELEVATION



SECTION A-A



DETAIL "B"



DETAIL "A"

As Built. PJ Riley 10-23-73

PLANS	BY	DATE
DESIGN - DETAILED	K.C.D.	6-20-69
CHECKED	A.M.G.	11-7-70
REVISIONS		
AS-BUILT DRAWINGS		

STATE HIGHWAY COMMISSION

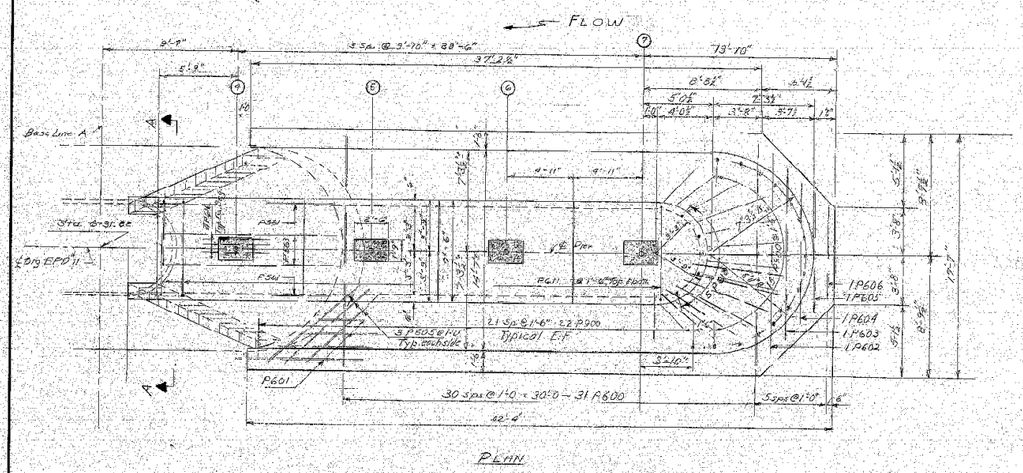
TICONIC BRIDGE
OVER
KENNEBEC RIVER
BETWEEN
WATERVILLE & WINSLOW
KENNEBEC COUNTY

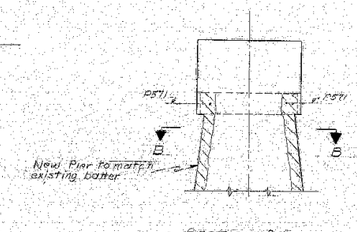
PIER NO. 1

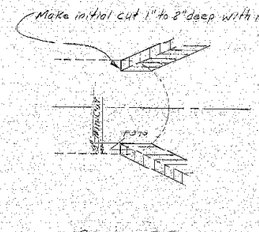
SHEET 10 OF 107 - AUGUSTA, MAINE - AUGUST 1970

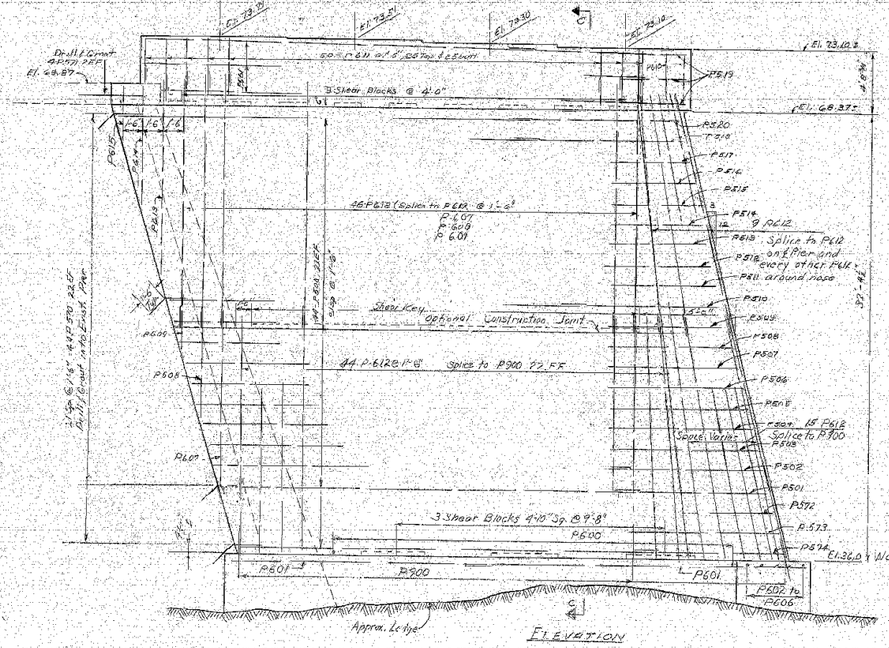
156-54

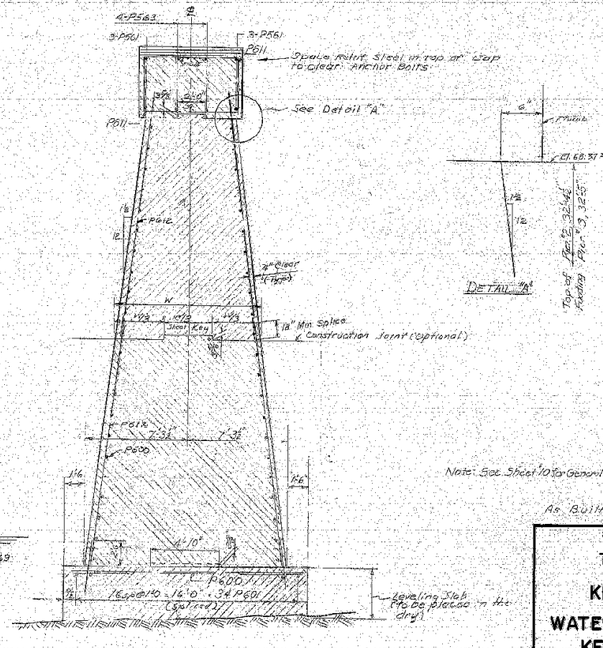
S. P. R. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	933-1(507)	11	107











PLANS
DESIGN - DETAILED
CHECKED
REVISIONS
FIELD CHANGES

As Built P.S.H. 10-23-1973

STATE HIGHWAY COMMISSION

TICONIC BRIDGE
OVER
KENNEBEC RIVER
BETWEEN
WATERVILLE & WINSLOW
KENNEBEC COUNTY

PIER NO. 2

SHEET 11 OF 107 AUGUSTA, MAINE AUGUST 1970

156-55

F.A.P. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	933-1(507)	12	107

PLAN

SECTION B-B

SECTION A-A

SECTION X-X

OLD GATE WELL DETAIL

PLAN

ELEVATION

SECTION C-C

ELEVATION

P_ANS	DESIGN - DETAILED	W.L.B.	DATE 8-70
	CHECKED	R.A.F.	11-70
	REVISIONS	R.M.G.	
	STRUCTURE		

Note:- See Sht 10 for GENERAL PIER NOTES.

As Built PSEA 10-23-73

STATE HIGHWAY COMMISSION

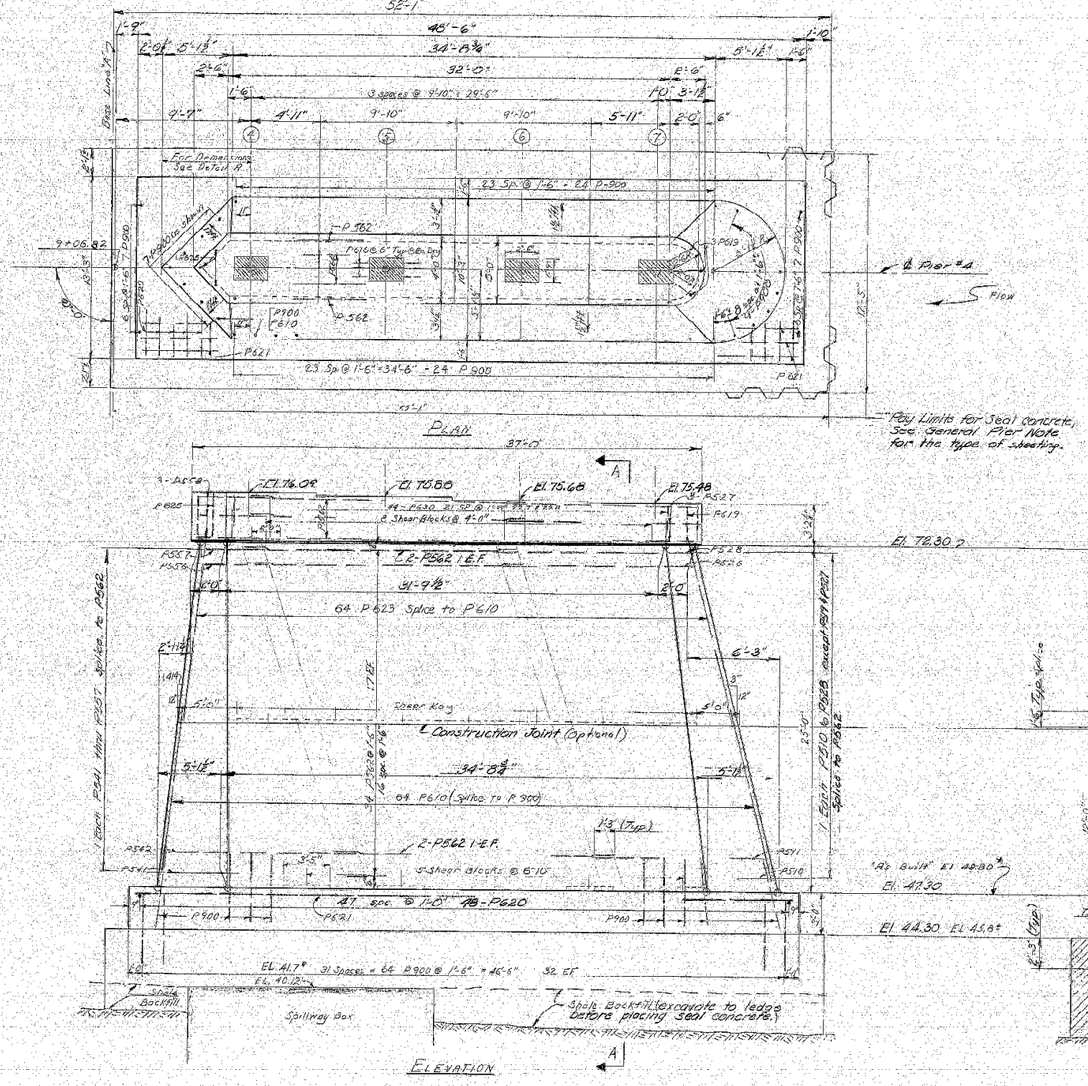
TICONIC BRIDGE
OVER
KENNEBEC RIVER
BETWEEN
WATERVILLE & WINSLOW
KENNEBEC COUNTY

PIER NO. 3

SHEET 12 OF 107 AUGUSTA, MAINE AUGUST 1970

156-56

B.P.R. SEC. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	933-1(607)	13	107



PLANS	DESIGN - DETAILED	BY	DATE
	CHECKED		
	QUANTITIES		
	FIELD CHANGES		

STATE HIGHWAY COMMISSION

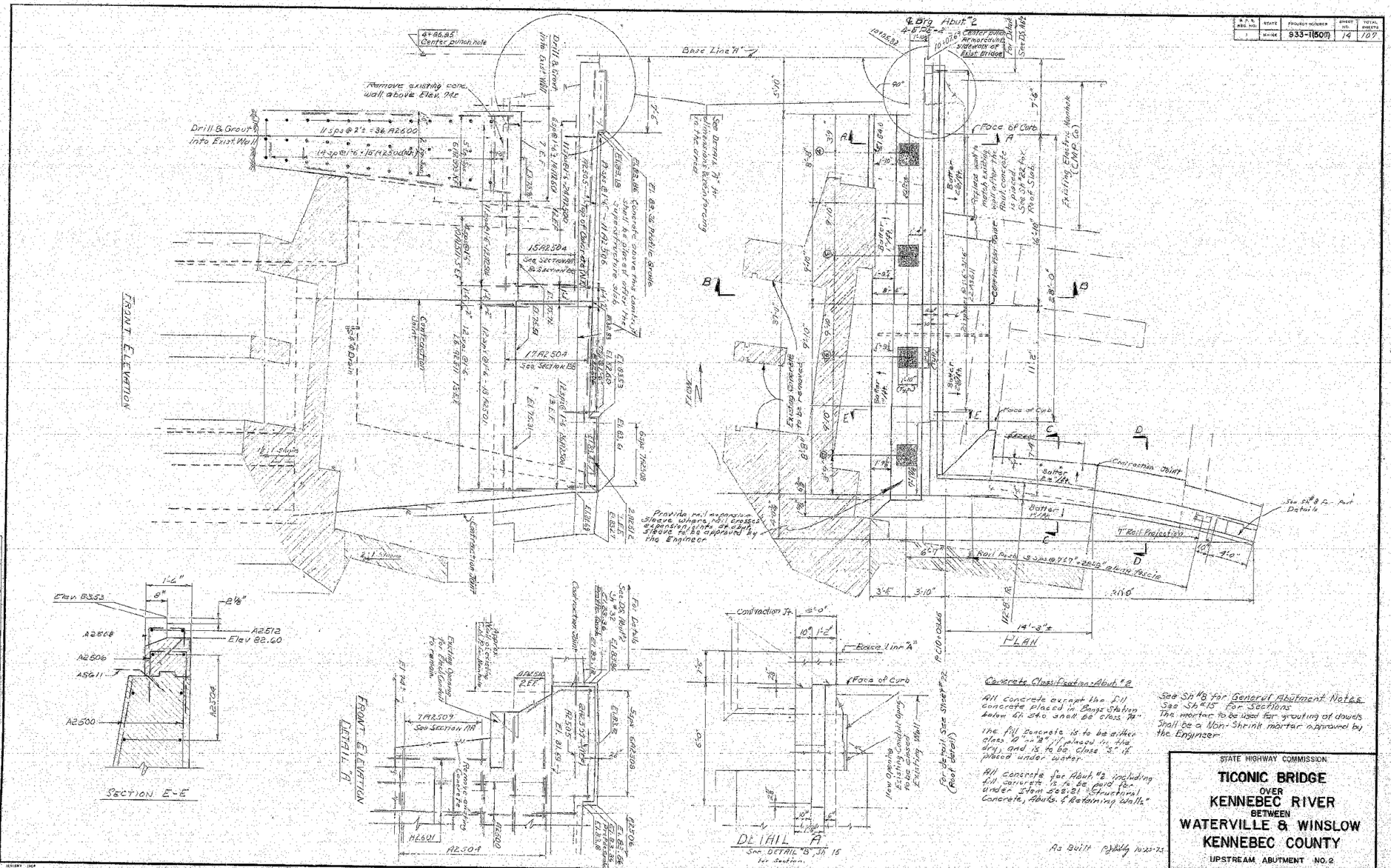
TICONIC BRIDGE
OVER
KENNEBEC RIVER
BETWEEN
WATERVILLE & WINSLOW
KENNEBEC COUNTY

PIER NO. 4

SHEET 13 OF 107 AUGUSTA, MAINE AUGUST 1970

156-57

B.P.R. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
3	MAINE	933-115(7)	14	109



STATE HIGHWAY COMMISSION

TICONIC BRIDGE
OVER
KENNEBEC RIVER
BETWEEN
WATERVILLE & WINSLOW
KENNEBEC COUNTY

UPSTREAM ABUTMENT NO. 2

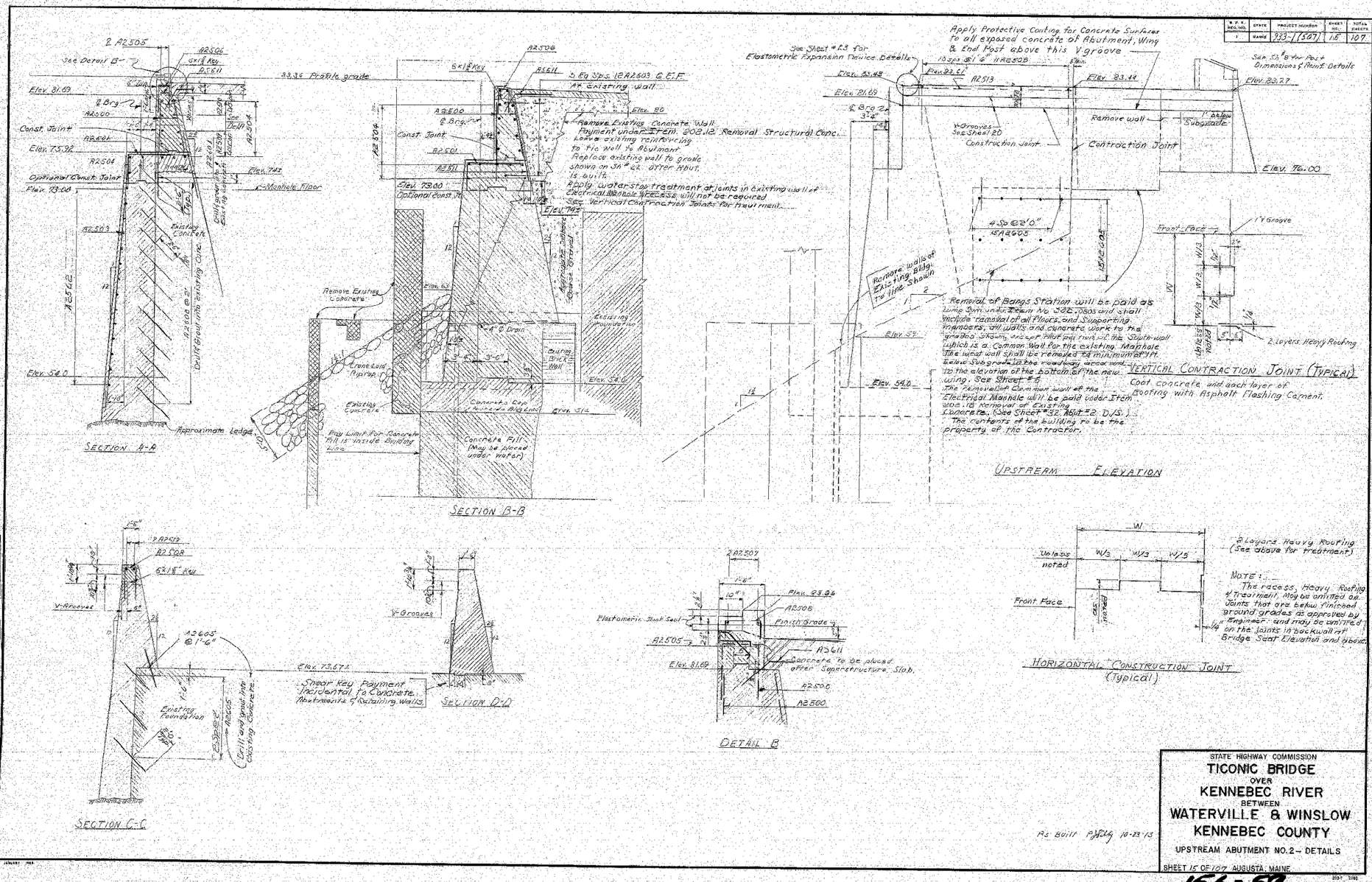
SHEET 14 OF 109 AUGUSTA, MAINE AUGUST 1970

156-58

	BY	DATE
DESIGN - DETAILED	PJC	11/69
CHECKED	MMG	
REVISIONS		
FIELD CHANGES		

P_ANS

F.A.P. REQ. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	733-1(507)	15	107



PLANS

	BY	DATE
DESIGN - DETAILED	J.F.C.	P.F.S.
CHECKED	A.M.J.	11/1972
REVISIONS		
FIELD CHANGES		

As Built Plans 10-23-73

STATE HIGHWAY COMMISSION

TICONIC BRIDGE
OVER
KENNEBEC RIVER
BETWEEN
WATERVILLE & WINSLOW
KENNEBEC COUNTY

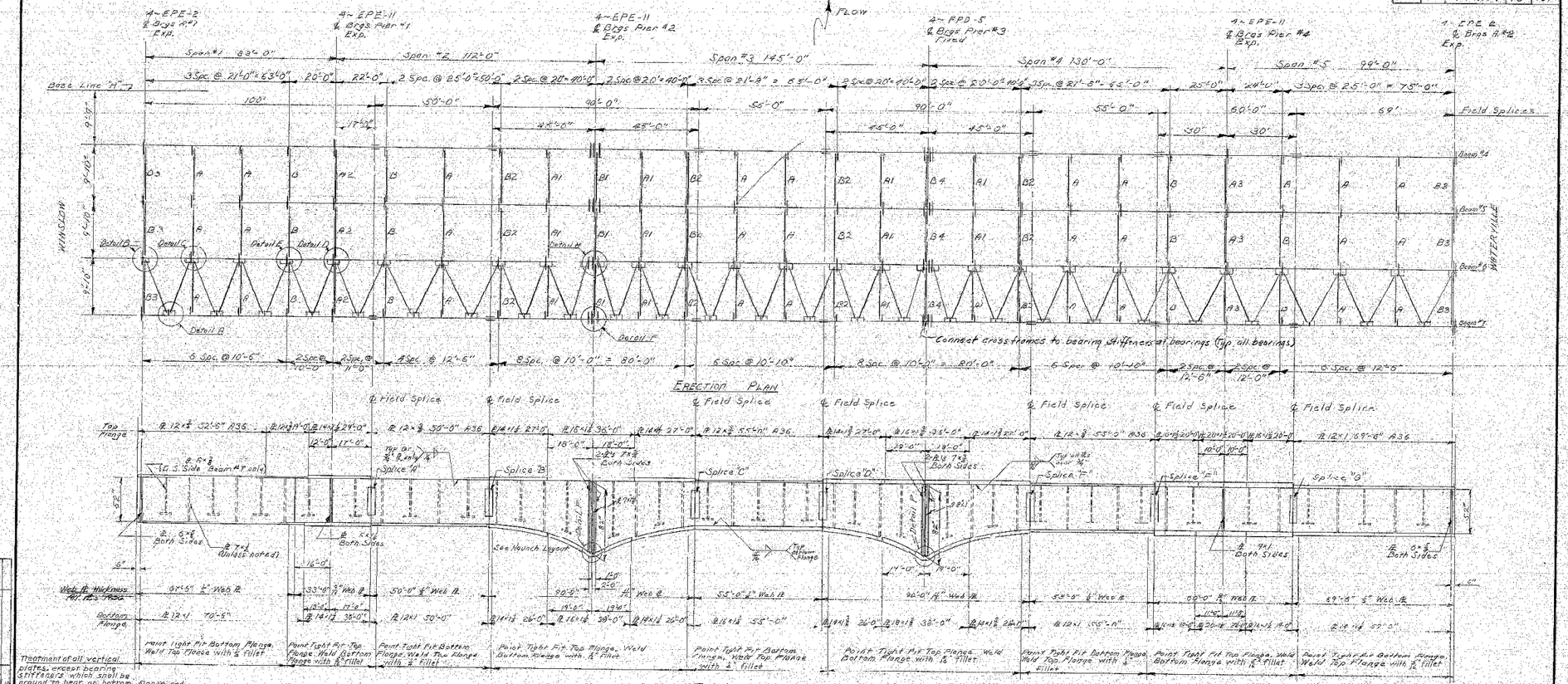
UPSTREAM ABUTMENT NO. 2 – DETAILS

SHEET 15 OF 107 AUGUSTA, MAINE

156-59

JANUARY 1968

F.A.P. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	933-1(50)	16	109



DESIGN DETAILED	BATE
CHECKED	
REVISIONS	
FIELD CHANGES	

P. ANS

STEEL DESIGNATION

Flange plates designated A36 in the Beam Elev. above shall conform to ASTM Designation A36. All other flange plates shall conform to ASTM Designation A572 Grade 55. All Web, Stiffener, bracing connection, and field splice plates shall conform to ASTM Designation A36.

See Sheet #19 for Drain Details

For field splices, shear connector spacing and camber diagram, see sheet #17

For cross frame details A, B, C, D, E & H, see sheet #18.

See Sheet #40 for Downstream Structural Steel.

Dimensions are horizontal.

Beam Fabrication Notes:

- After Flange to Web welds have been completed and before any Stiffeners or Cross Frame Connection Plates are attached to the Web welds shall be inspected and be in accordance with "American Welding Society Specifications for Welded Highway and Railway Bridges" Section 3 Workmanship #3.3.3.5, 3.6.5 & 3.7.7
- The Steel Fabricator at his option may Fabricate the Web Plates with butt welds with the following limitations:
  - A maximum of 2 transverse welds in the positive moment sections per girder per span.
  - A minimum of 1 transverse weld each side of the ℄ of bearing at a minimum distance of 10'-0" from the ℄ of bearings & / or Intermittent weld in the negative moment sections per beam pier haunch. Fractal edges between longitudinal weld & bottom Flange shall be abrasive.
- If butt welds are used to fabricate the web plates, the location and details shall be shown on the shop detail drawings and shall be subject to approval by the Engineer.
- Beams are to be cambered in accordance with the details shown Sheet #17
- Beams are to be fitted with shear connectors in accordance with the details shown, Sheet #17
- Beaming sequence and is to be varied with erection.
- All Intermediate Cross Frame connection holes to be normal to the top flange or may be plumb at the option of Fabricating Shop in either case the shortest taleget shall be used for entire structure.

As Built P.S.M.J. 10-23-70

STATE HIGHWAY COMMISSION

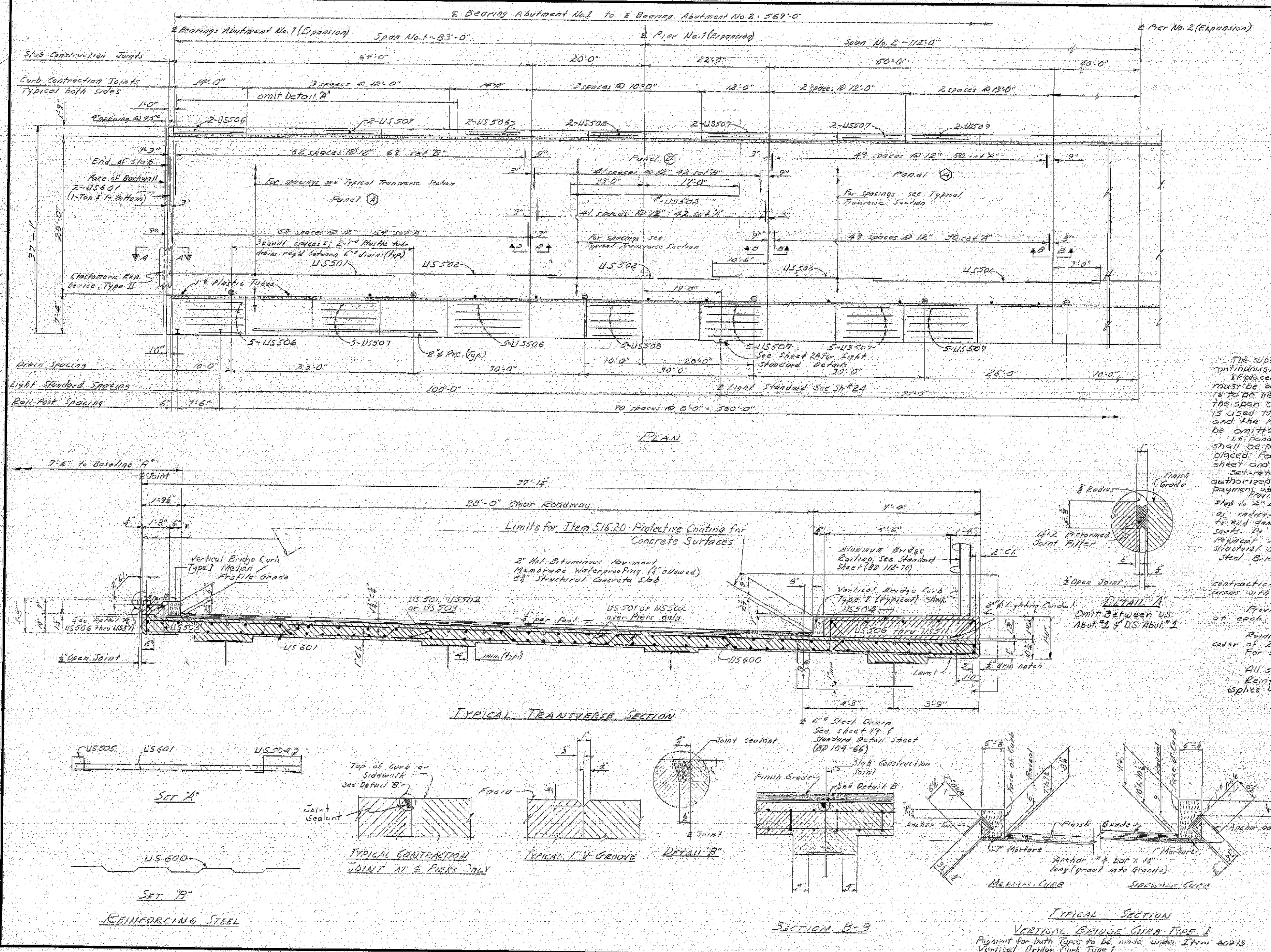
TICONIC BRIDGE
OVER
KENNEBEC RIVER
BETWEEN
WATERVILLE & WINSLOW
KENNEBEC COUNTY

ERECTION PLAN
BEAM ELEVATION

SHEET 16 OF 109 AUGUSTA, MAINE AUGUST 1970

156-60

B.P.R. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	933-1 (507)	20	107



Superstructure Notes

The superstructure slab may be placed either continuously or by panels.

If placed continuously the contractor's methods must be approved by the Engineer. The concrete is to be kept plastic one complete span behind the span being placed. If continuous placement is used the transverse joint, Joint Sealant and the haunch shown in Section B-B may be omitted.

If panel placement is used all panels (A) shall be placed before any panels (B) are placed. For panel designations see this sheet and sheet number 21.

Set-retarding admixtures may be used as authorized by the Engineer and measured for payment as provided in the Standard Specifications.

Provide 2-1" plastic tube drains extending through slab to 2" below bottom of slab, between Roadway Drains as indicated, and at low points of superstructure adjacent to end dams. Place in order for drip to clear bridge seats. Do not cover with membrane waterproofing. Payment to be incidental to Item 502.26 Structural Concrete, Roadway and Sidewalk Slabs on Steel Bridges, Upstream.

At curb contraction joints break bond by coating contact areas with an approved clear form oil.

Provide joints in Vertical Bridge Curb, Type I, at each contraction joint in curb concrete.

Reinforcing Steel to have a minimum concrete cover of 2" except as shown.

For section A-A see sheet 21

All superstructure concrete to be Class "A".

Reinforcing Steel is to have 24 Bar diameter splice unless otherwise noted.

As Built R.J. Kelly 10-23-73

DESIGN- H.L.O. TRACE- DET. - R.T.A. CHECK- GWC	BRIDGE NO. SURVEY- PLOT-

STATE HIGHWAY COMMISSION

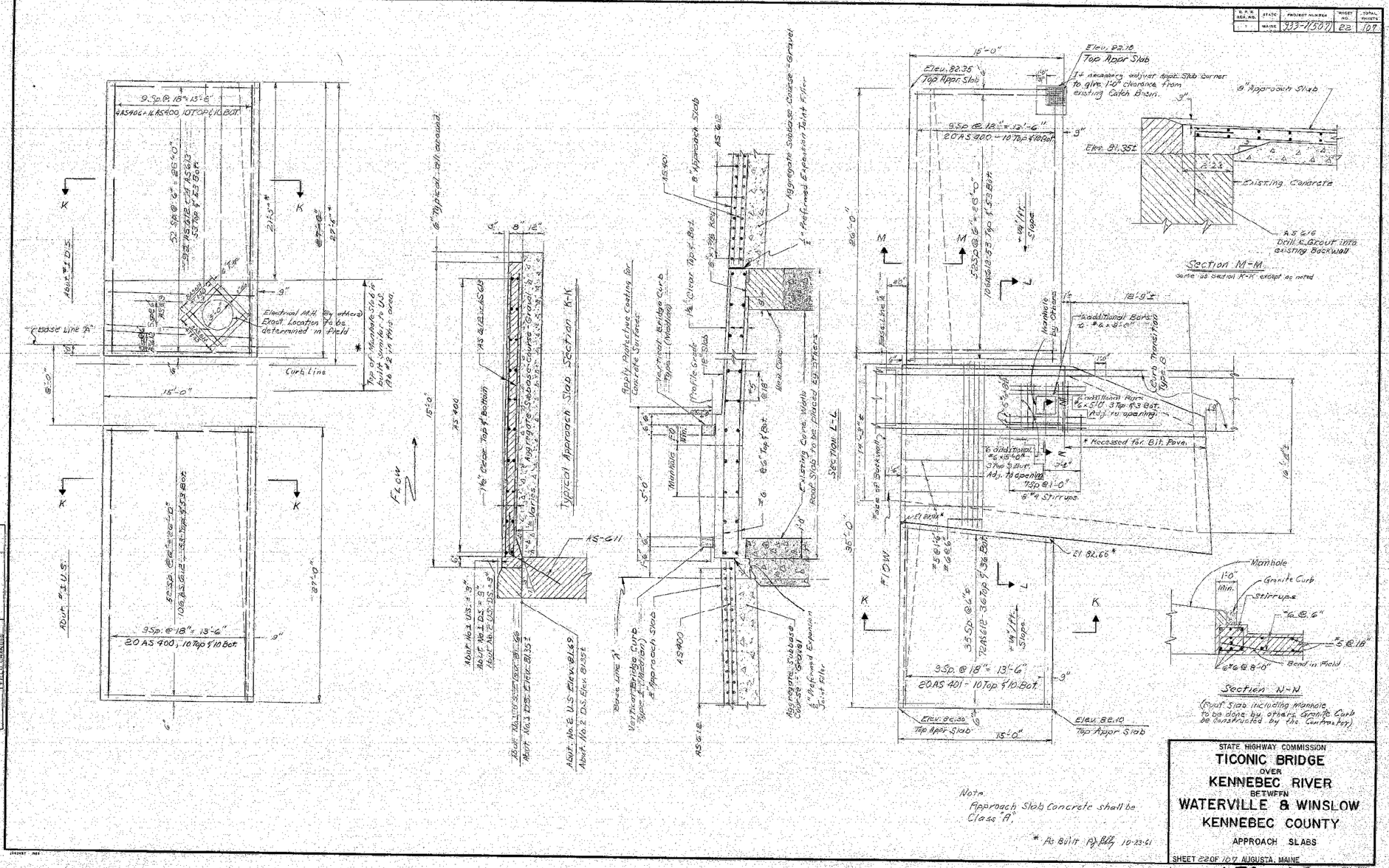
TICONIC BRIDGE
OVER
KENNEBEC RIVER
BETWEEN
WATERVILLE & WINSLOW
KENNEBEC COUNTY

UPSTREAM SUPERSTRUCTURE

SHEET 20 OF 107 AUGUSTA, MAINE AUGUST 1970

156-64

B.P.R. S&S. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
	MAINE	133-1(507)	22	107



PLANS	BY	DATE
DESIGN - DETAILED	J.F.K.	N.M.V.
CHECKED	M.M.C.	
QUANTITIES		
FIELD CHANGES		

STATE HIGHWAY COMMISSION

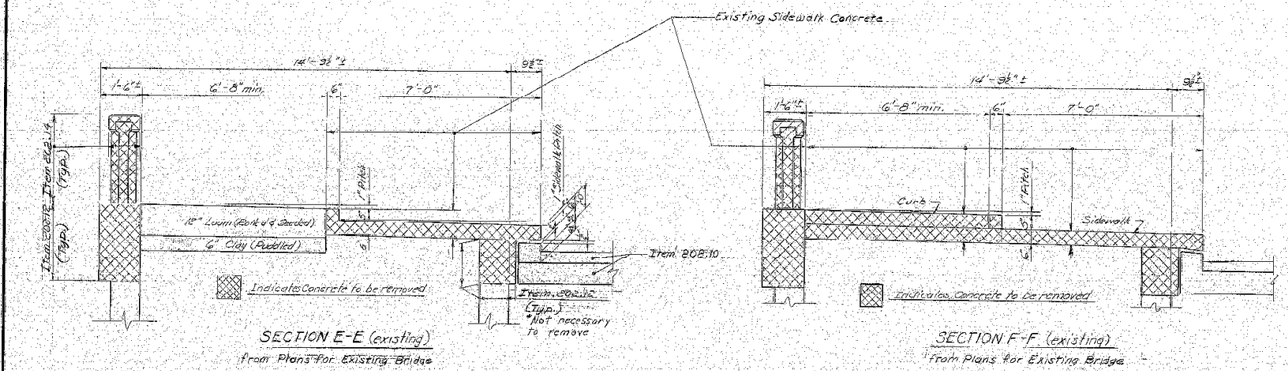
TICONIC BRIDGE
OVER
KENNEBEC RIVER
BETWEEN
WATERVILLE & WINSLOW
KENNEBEC COUNTY

APPROACH SLABS

SHEET 22 OF 107 AUGUSTA, MAINE

156-66

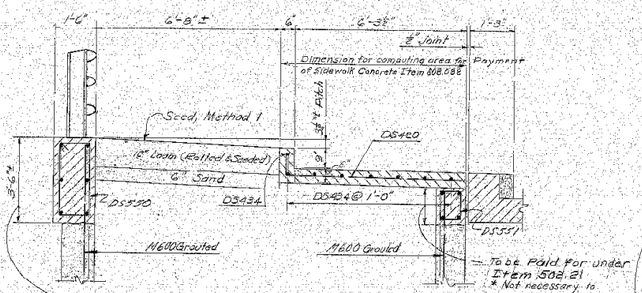
F.A. or S.P.R. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
	MAINE	933-(15)(7)	29	107



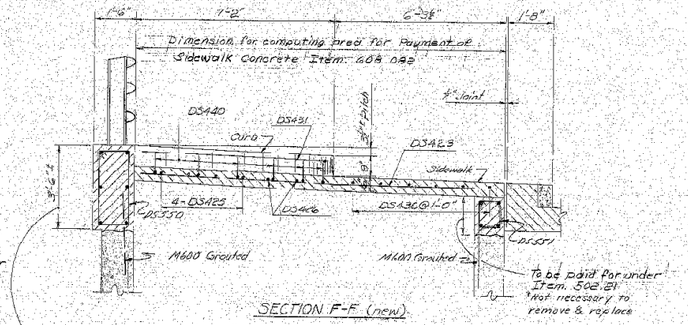
SECTION E-E (existing)
From Plans for Existing Bridge

SECTION F-F (existing)
From Plans for Existing Bridge

Payment for the removal of the existing concrete sidewalk on the arch will be made under Item 202.12. Payment for all earth excavation on the arch will be made under Item 206.08.



SECTION E-E (new)



SECTION F-F (new)

Note:-
See Sheet #30 for location of Sections.
See Sheet #34 for Utility location and additional Details.

* As Built Rdy 10-25-73

PLANS	DESIGN = DETAILED	BY	DATE
	CHECKED	CJC	11-70
	REVISIONS	CJC	
	FIELD SURVEYED		

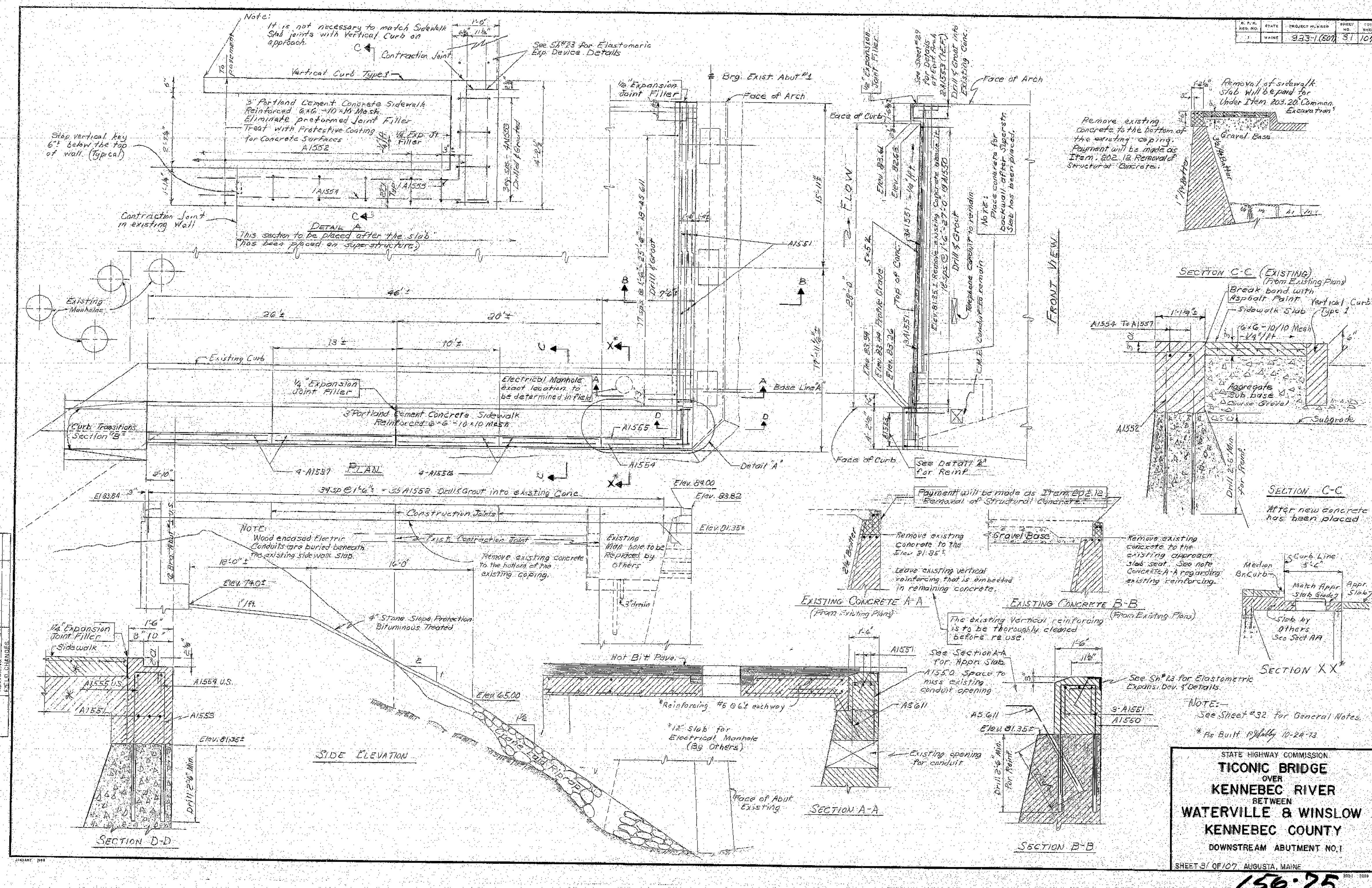
STATE HIGHWAY COMMISSION

TICONIC BRIDGE
OVER
KENNEBEC RIVER
BETWEEN
WATERVILLE & WINSLOW
KENNEBEC COUNTY

ARCH SECTIONS

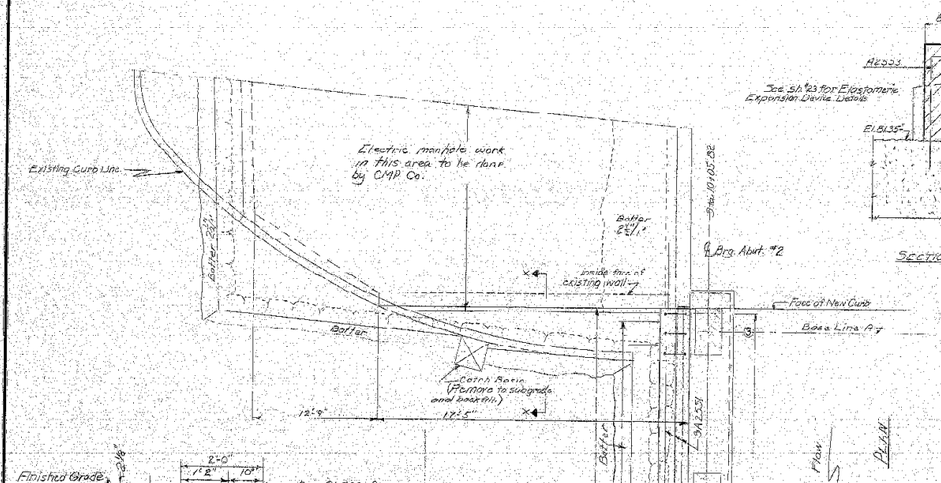
SHEET 29 OF 107 AUGUSTA, MAINE

156-73



PLAN
SIDE ELEVATION
FRONT VIEW
DETAIL A
SECTION C-C (EXISTING) (From Existing Plans)
SECTION C-C
After new concrete has been placed
SECTION XX*
EXISTING CONCRETE A-A (From Existing Plans)
EXISTING CONCRETE B-B (From Existing Plans)
SECTION A-A
SECTION B-B
SECTION D-D
Payment will be made as Item 202.12 Removal of Structural Concrete.
NOTE:— See Sheet #32 for General Notes.
* As Built 10-24-73
STATE HIGHWAY COMMISSION
TICONIC BRIDGE
OVER
KENNEBEC RIVER
BETWEEN
WATERVILLE & WINSLOW
KENNEBEC COUNTY
DOWNSTREAM ABUTMENT NO. 1
SHEET 31 OF 107 AUGUSTA, MAINE
156·75

F.A.P. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	233-1(107)	32	107



PLANS	DESIGN - DETAILED	DESIGNED	CHECKED	FIELD CHANGES	DATE	BY	APPVD

JANUARY 1968

GENERAL NOTES

1. Place backwall concrete after the Superstructure Slab has been placed
2. For reinforcing steel, Schedule, Sheet # 22.
3. For details of electric utility manhole cover roof, see Sheet # 22.
4. All reinforcing steel to have min. splice of 24 bar diameters unless otherwise noted.
5. Drilling and grouting of reinforcing bars into existing concrete shall be incidental to Pay Item 503.13 Placing Reinforcing Steel.
6. The mortar to be used for grouting of dowels shall be a Non-shrink mortar approved by the Engineer.
7. Payment for concrete will be under Item 502.21.
8. Concrete shall be Class "A".
9. Apply Protective Coating for Concrete Surfaces to all exposed Concrete.

As Built P.J.B. 10-24-73

STATE HIGHWAY COMMISSION

TICONIC BRIDGE

OVER

KENNEBEC RIVER

BETWEEN

WATERVILLE & WINSLOW

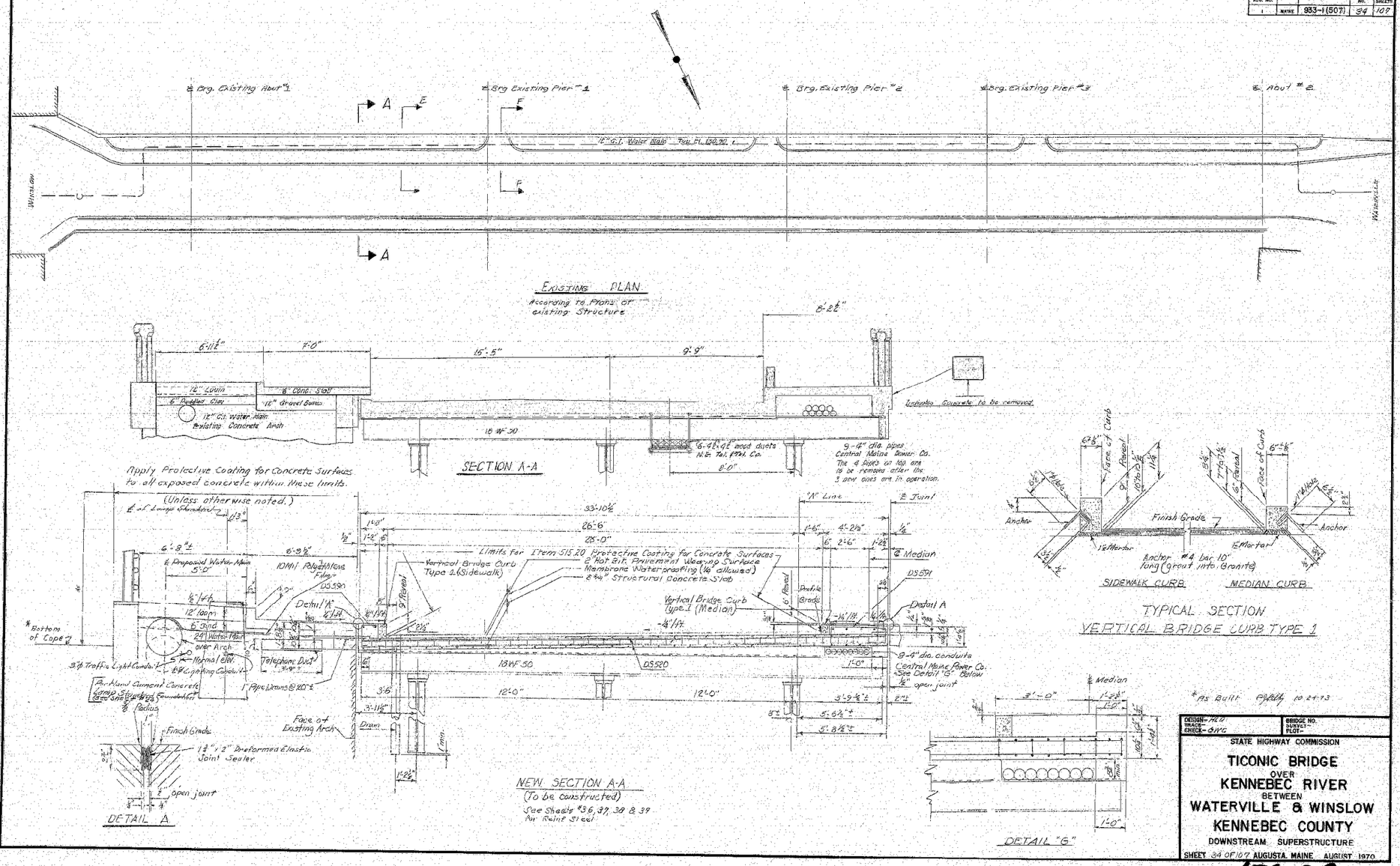
KENNEBEC COUNTY

DOWNSTREAM ABUTMENT NO. 2

SHEET 32 OF 107 AUGUSTA, MAINE

156-76

B. P. R. SEC. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	933-1(507)	34	107



DESIGN-HLD
TRACE-
CHECK-BWC

BRIDGE NO.
SURVEY-
PLOT-

STATE HIGHWAY COMMISSION

TICONIC BRIDGE
OVER
KENNEBEC RIVER
BETWEEN
WATERVILLE & WINSLOW
KENNEBEC COUNTY

DOWNSTREAM SUPERSTRUCTURE

SHEET 34 OF 107 AUGUSTA, MAINE AUGUST 1970

156-28

F.H.W.A. REGION NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE		1	34

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

PLANS

TICONIC BRIDGE
OVER
KENNEBEC RIVER
WATERVILLE - WINSLOW

PROJECT NO. F-029-1(13) — WEARING SURFACE REPLACEMENT AND TRAFFIC SIGNALS — PROJECT LENGTH = 0.167 MILE

PLUS

PROJECT NO. ER-029-1(15) — SLOPE REPAIR

&

WINSLOW BRIDGE
OVER
SEBASTICOOK RIVER
WINSLOW

PROJECT NO. F-029-1(14) — WEARING SURFACE REPLACEMENT

PROJECT LENGTH = 0.08 MILE

PLUS

PROJECT NO. F-029-1(17) — TRAFFIC SIGNALS

KENNEBEC COUNTY

CONVENTIONAL SIGNS

COUNTY LINES	TRAVELLED WAY - PROPOSED
TOWN LINES	UNDERGROUND UTILITIES - EXISTING
PROPERTY LINES	UNDERGROUND UTILITIES - PROPOSED
R/W LINES - EXISTING	RAILROAD - SINGLE TRACK
R/W LINES - NEW - ACCESS CONTROL	RAILROAD - DOUBLE TRACK
R/W LINES - NEW - NO ACCESS CONTROL	UTILITY POLE - EXISTING
CULVERT - EXISTING	UTILITY POLE - JOINT OCCUPANCY
CULVERT - PROPOSED	PROPOSED UTILITY POLE - TEMPORARY
CURBING - EXISTING	PROPOSED UTILITY POLE - PERMANENT
CURBING - PROPOSED	TREES (H hardwood, S softwood)
TRAVELLED WAY - EXISTING	WOODS

SPECIFICATIONS

DESIGN: AASHTO Standard Specifications for Highway Bridges 1983 and Interim Specifications 1984 through 1988.

CONTRACT: State of Maine Department of Transportation, Standard Specifications, Highways and Bridges, Revision of July, 1988.

DESIGN LOADING

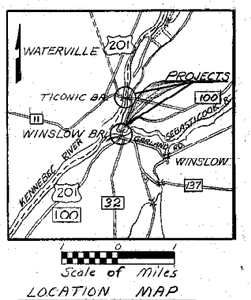
LIVE LOAD (existing) HS20

MATERIALS

STRUCTURAL STEEL: ASTM A36
CONCRETE: Class AA
REINFORCING STEEL: ASTM A615 Grade 60

BASIC DESIGN STRESSES

STRUCTURAL STEEL: Fy = 36000 psi
CONCRETE: f'c = 3000 psi
REINFORCING STEEL: fy = 60000 psi



LOCATION MAP

UTILITIES

Central Maine Power	
New England Telephone	
Bethar Cable Television	
Maine Central Railroad	
Kennebec Water District	
Waterville Fire Department	
Waterville Sewer	
Winslow Fire Department	
Winslow Sewer	

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

TRAFFIC DATA	Ticonic	Winslow
A.D.T. 1990	26780	23270
A.D.T. 2010	37490	37230
D.H.V.	3749	3723
T. (%)	3	4
D. (%)	55	57
V.		30
P.S.D. (%)		
18 KIPS P.S.I	696	361

NOTE

All work contemplated under this contract to be governed by and in conformity with the STANDARD SPECIFICATIONS (revision of July 1988) and supplementals thereto, except as modified on the plans and in the special provisions.

TABLE OF CONTENTS

APPROVED:

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

COMMISSIONER — DATE 12/14/89

CHIEF ENGINEER — 12/14/89

103-341

As Built 4-3-91 GHM

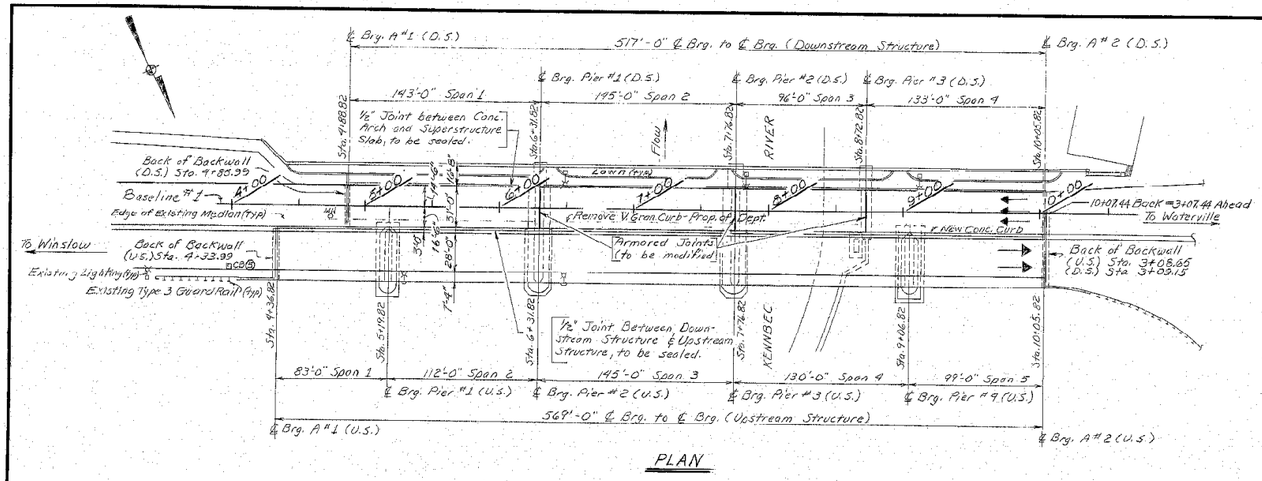
UNITED STATES
DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
REGION 1

APPROVED:

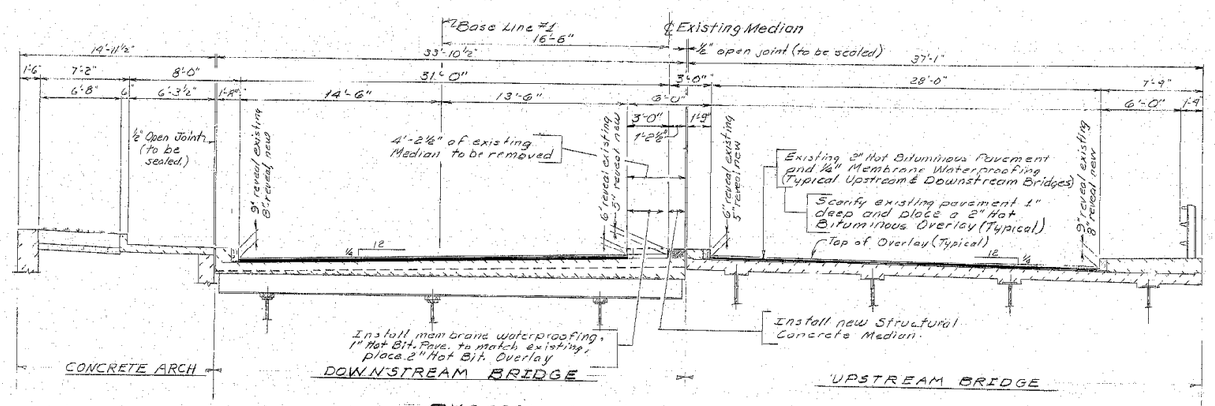
DIVISION ADMINISTRATOR — DATE

F.H.W.A. REV. NO.	STATE	PROJECT NUMBER	SHEET NO	TOTAL SHEETS
1	MAINE	F-029-1(13)	8	34

WATERVILLE & WINSLOW



PLAN



TYPICAL BRIDGE SECTION

GENERAL NOTES

1. ~ Remove existing 4'-2½" median on downstream bridge and install new 1'-2½" structural concrete median. Maintain 2 lanes of traffic 30' width in the east bound lanes (downstream bridge) with temporary Concrete barrier. Modify approach medians from 6' wide to 3' wide.
2. ~ Construct a traffic island in the eastbound Winslow approach between the right turn lane and center lane. Install cantilevered railroad signal.
3. ~ Replace existing transflex joint seals of abutments on the upstream and downstream structures with gland seals.
4. ~ Modify 3 Compression seal joints on the downstream structure to accomodate the Hot Bituminous Overlay.
5. ~ Modify Bridge Drains and adjust Catch Basins to accomodate the Hot Bituminous Overlay.
6. ~ Modification of the bridge joints as described in notes #3 and #4 above shall be accomplished at night. Two-way traffic shall be maintained on opposite roadway while the roadway being modified is closed to traffic. Temporary ramps shall be provided over joints during daylight hours until reconstruction is complete.
7. ~ Scarify the existing bridge pavement leaving one inch of the original pavement.
8. ~ Place 2" Hot Bituminous overlay on bridges and 1" on approaches.
9. ~ Traffic shall be controlled by flaggers during scarifing and paving operations.
10. ~ Clean and paint the bearing pedestals of abutment no. 2.
11. ~ Modifications and reconstruction of approaches shall be performed in conjunction with appropriate bridge work.
12. ~ Modify and seal longitudinal joints between structures.
13. ~ All existing utility installations shall be adjusted by the respective utility.

PROJECT DESIGN ENGINEER		BY	DATE
PLANS	DESIGN - DETAILED	S.R.L.	6-87
	CHECKED	W.B.D.	7-88
	REVISIONS		
	FIELD CHANGES		

BRIDGE 44-132 (07101)

103-348

BRIDGE NO 2854

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

TICONIC BRIDGE
OVER
KENNEBEC RIVER
BETWEEN
WATERVILLE – WINSLOW
KENNEBEC COUNTY
Typical Bridge Section

SHEET 2 OF 12 AUGUSTA, MAINE

F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO	TOTAL SHEETS
1	MAINE	F-029-1(13)	9	34

ER-029-1(15)

DRAINAGE—WINSLOW APPROACH

Item 604.072 Catch Basin Type A5-C
~~③ ~ Sta. 4+50, 14' Left~~ △
① ~ Sta. ~~2+83±~~ 3+33.4± △, 49' Left

Item 604.18 Adjusting Manhole or Catch Basin to Grade
⑤ ~ Sta. 4+00, 47' Right - Cascade Grate & "A" Frame
④ ~ Sta. 4+25, 14' Left - Cascade Grate △

Item 604.16. Altering Catch Basin to Manhole
② ~ Sta. 2+83, 42' Left
~~④ ~ Sta. 4+25, 14' Left~~ △

Item 603.159 12 inch Culvert Pipe Option III
4' ~ Install Between ① and ②
22' ~ Install Betew ③ and ④

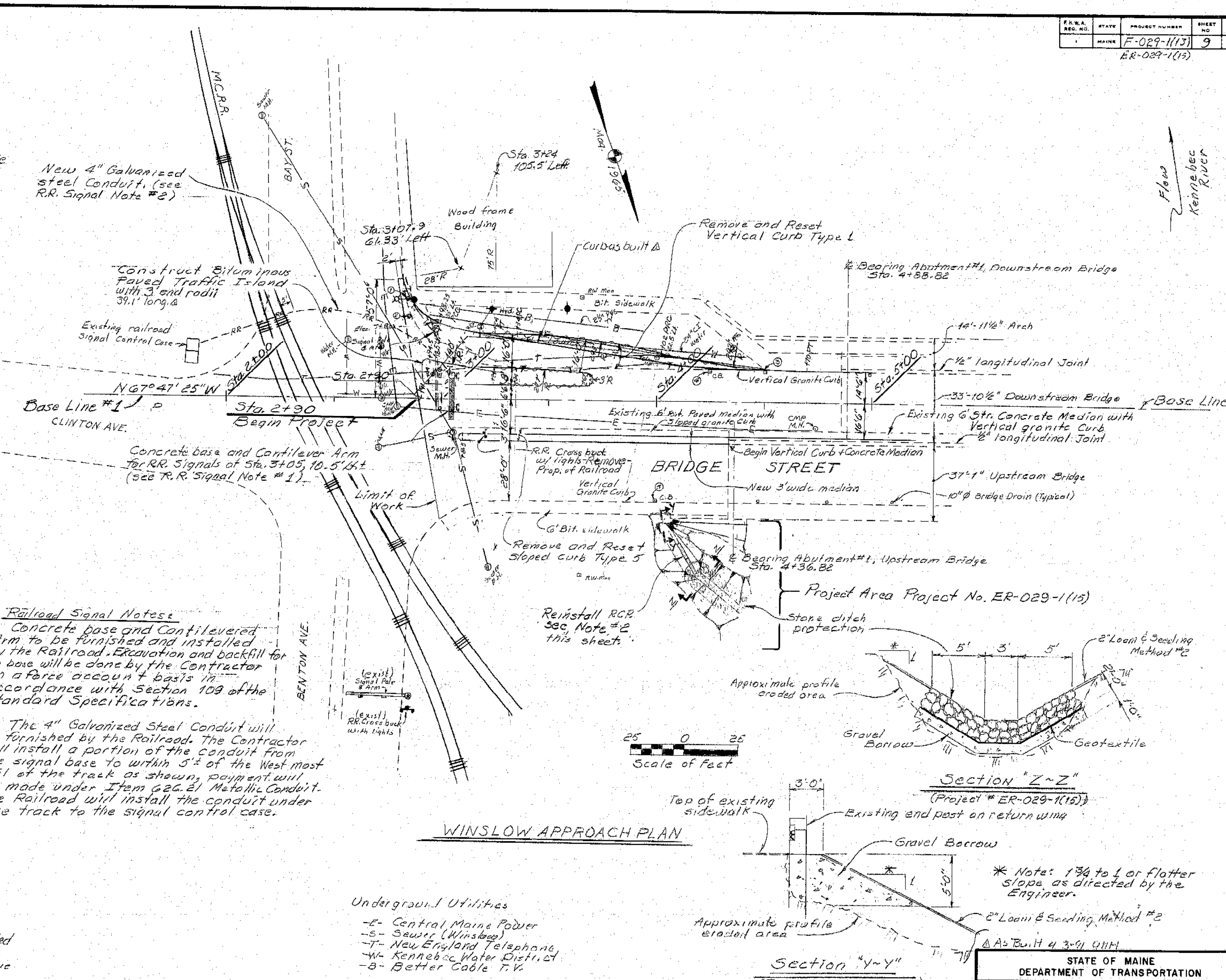
CURBING - WINSLOW APPROACH

Item 609.34 Curb Type 5
~ Sta. 2+91, 9.5' Left to 15.5' Left - 6 Linear ft.
~ Sta. 2+94, 6.5' Left to Sta. 3+67, 6.5' Left - 73 Linear ft.
~ Sta. 2+95±, 18.5' Left to Sta. 3+67, 12.5' Left - 72.5 Linear ft.

Item 609.35 Curb Type 5, Circular
~ Sta. 2+92, 7' Left - 4.71 Linear ft., 3' Radius
~ Sta. 2+92, 16' Left - 5.76 Linear ft., 3' Radius
~ Sta. 3+69, 9.5' Left - 9.42 Linear ft., 3' Radius
~ Sta. 3+07, 16.5' Right - 4.71 Linear ft., 1.5' Radius

Item 609.38 Reset Curb Type 1
~ Sta. 2+81, 53' Left to Sta. 4+70, 14.5' Left - 200 Linear ft.

Item 609.40 Reset Curb Type 5
~ Sta. 3+08.5, 16.5' Right to Sta. 4+35, 16.5' Right - 126.5 Linear ft.
~ Sta. 3+08.5, 19.5' Right to Sta. 4+35, 19.5' Right - 126.5 Linear ft.



Railroad Signal Notes:

1. Concrete base and Cantilevered Arm to be furnished and installed by the Railroad. Excavation and backfill for the base will be done by the Contractor on a force account basis in accordance with Section 109 of the Standard Specifications.

2. The 4" Galvanized Steel Conduit will be furnished by the Railroad. The Contractor will install a portion of the conduit from the signal base to within 5'± of the West most rail of the track as shown, payment will be made under Item 626.21 Metallic Conduit. The Railroad will install the conduit under the track to the signal control case.

Notes: Project No. ER-029-1(15)

1. Any clearing in the ER-029-1(15) Project areas will be considered incidental to the excavation and borrow Items.

2. Two sections of existing 18" Ø reinforced concrete outlet pipes seperated from the existing line during the flood of 1987 shall be reinstalled as directed by the Engineer. Payment will be made under Item 603.74 - Remove and Relay Concrete Pipe: 18 Inch.

Underground Utilities
-E- Central Maine Power
-S- Sewer (Winslow)
-T- New England Telephone
-W- Kennebec Water District
-B- Better Cable T.V.

* Note: 1¾ to 1 or flatter slope as directed by the Engineer.

△ As Built 4-3-91 OHH

103-349

Reference;
Field Book #29/33
Existing 1973 Plans, Proj. # 933-1(507)
1971 Plans, Proj. # U 031-1(9)

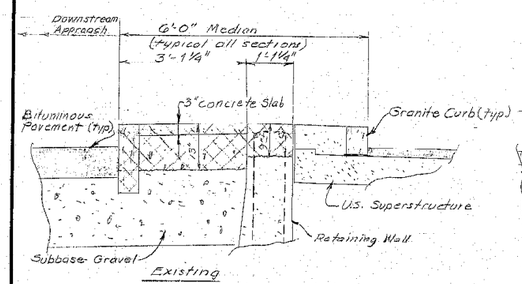
STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

TICONIC BRIDGE
OVER
KENNEBEC RIVER
BETWEEN
WATERVILLE - WINSLOW
KENNEBEC COUNTY
Winslow Approach Plan

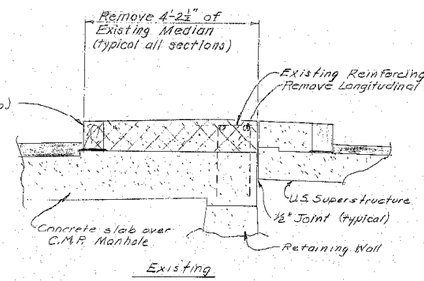
SHEET 3 OF 12 AUGUSTA, MAINE

PROJECT DESIGN ENGINEER — PLANS — DESIGN-DETAILED / CHECKED / REVISIONS / FIELD CHANGES

F.H.W.A. REQ. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	F 029 1(13)	12	34



Existing



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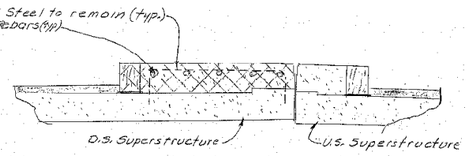

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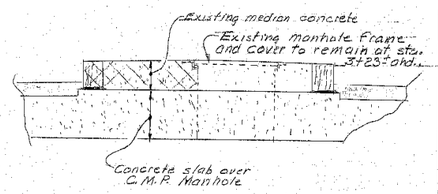
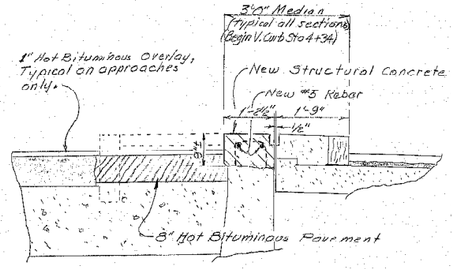


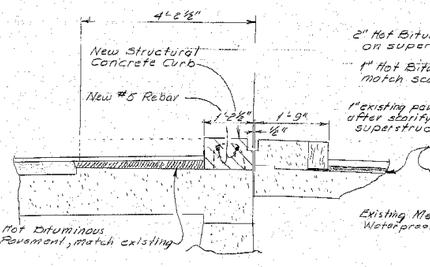
Existing



New Construction

SECTION "M-M"

WINSLOW APPROACH/BRIDGE
(Sta. 4+34 to Sta. 4+71)



New Construction

SECTION "O-O"

WINSLOW APPROACH/BRIDGE
(Sta. 4+71 to Sta. 1+87.50)

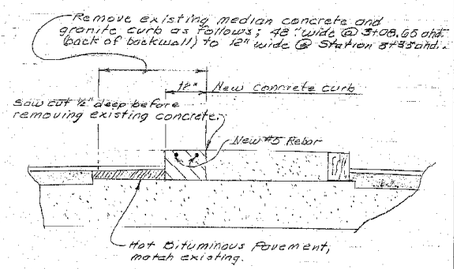
New Construction

SECTION "P-P"

BRIDGE
(Sta. 4+87.50 to Sta. 10+06.15)

MEDIAN SECTIONS

With Vertical Curb
Sta 4+34 Winslow Approach to
Sta 3+47 Waterville Approach



New Construction

SECTION "R-R"

WATERVILLE APPROACH
(Sta. 3+08.65 ahd. to Sta. 3+35)

REINFORCING STEEL

A.S.T.M. A615 Grade 60
44 Each ~ #5 Bar ~ 30' long.
Cut to fit in field.
Minimum splice 1'-3"

NOTE: For location of sections see sheet # 7 of 25.

PROJECT DESIGN ENGINEER		BY	DATE
PLANS	DESIGN - DETAILED	LAW	4/82
	DRAWN	WWD	5/83
	REVISIONS		
	FIELD CHANGES		

BRUNING 44-102-40761

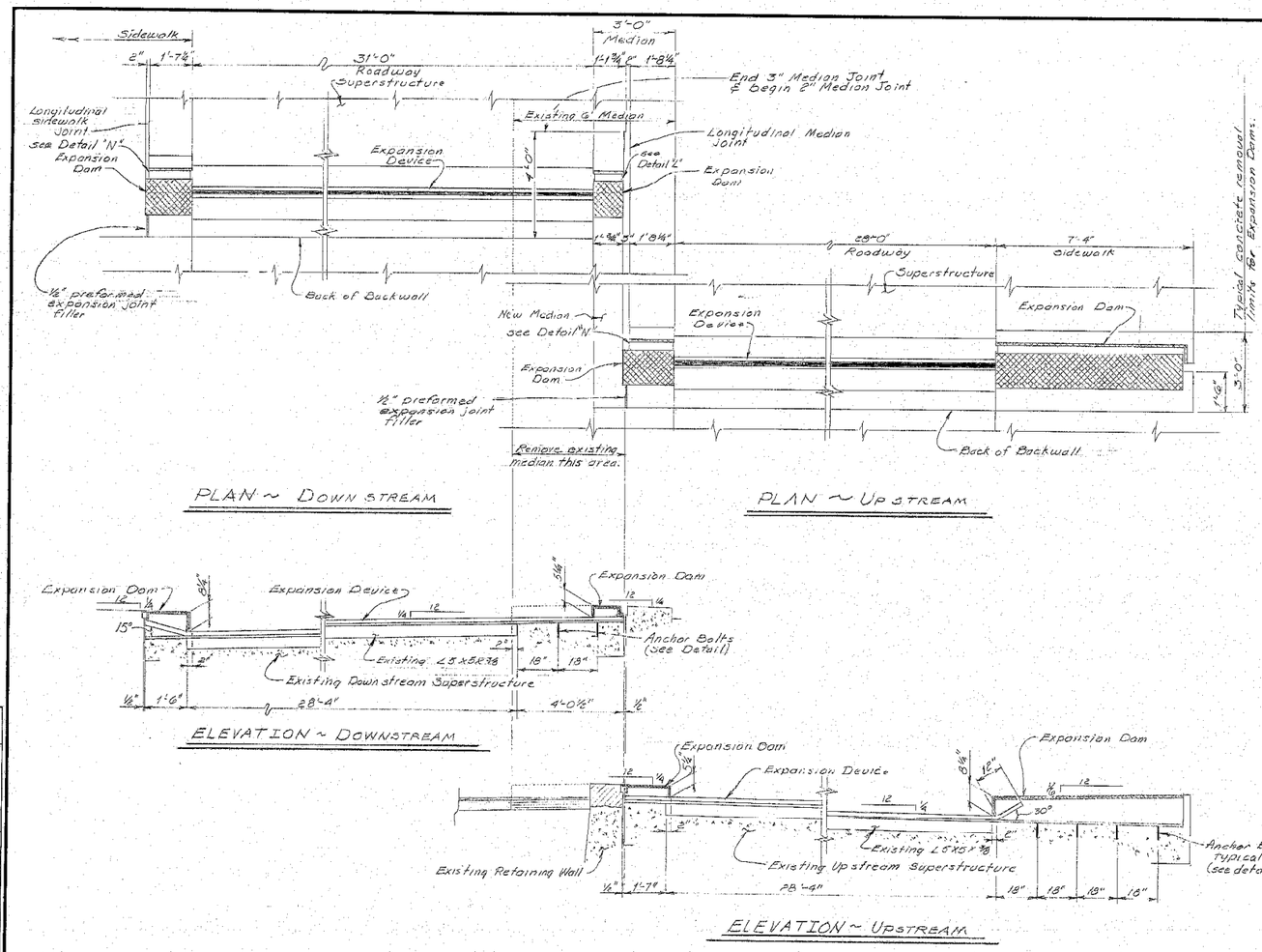
103-352

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

TICONIC BRIDGE
OVER
KENNEBEC RIVER
BETWEEN
WATERVILLE - WINSLOW
KENNEBEC COUNTY
Median Sections

SHEET 6 OF 12 AUGUSTA, MAINE

F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	F-029-1(113)	14	34



PLAN ~ DOWN STREAM

PLAN ~ UP STREAM

ELEVATION ~ DOWNSTREAM

ELEVATION ~ UPSTREAM

ABUTMENT NO. 1 EXPANSION DEVICE

EXPANSION DEVICE NOTES:

1. ~ Remove existing expansion devices and reinstall existing anchor bolts with 1" projection. Remove existing bituminous pavement as necessary and clean the existing concrete and steel surfaces of all foreign material in the area where the new expansion device and concrete is to be installed. The cleaning shall be done to the satisfaction of the Engineer. Payment will be incidental to Item 520.2401 ~~520.2402~~ Bridge Joint Modification, Ticonic Bridge Gland Seal. ⚠2

2. ~ Each expansion device unit consist of one pair of matching steel elements, gland seal, and necessary expansion dams.

3. ~ Anchor studs shall be ¾"ø X 8" long.

4. ~ The existing concrete in the sidewalk and median on which the new expansion device will be installed shall be brush to a smooth even line. An approved non-shrink mortar shall be used to provide full bearing contact of the device with the concrete. Payment will be considered incidental to Item ~~520.2402~~ Bridge Joint Modification, Ticonic Bridge, Gland Seal. 520.2401. ⚠2

Gland Seal Setting Table (Dimension "X")

Temperature °F / Location	105	90	75	60	45	30	15	0	-15
Abut. #1 U.S.	5/16"	3/4"	1⅛"	1 9/16"	2"	2 3/16"	2 7/8"	3¼"	3 1/16"
Abut. #1 D.S.	9/16"	1 5/16"	1¼"	1 7/8"	2"	2 3/8"	2 3/4"	3 1/16"	3 3/16"
Abut. #2 both	7/8"	1⅛"	1 7/16"	1 11/16"	2"	2 5/16"	2 3/16"	2 1/8"	3 1/8"

PROJECT DESIGN ENGINEER		BY	DATE
PLANS	DESIGN DETAILED	MEB	3/89
	CHECKED	WEB	3/89
	REVISIONS		
	FIELD CHANGES		

103-359

⚠2 Revised Jan 8, 1990 MEB

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

TICONIC BRIDGE
OVER
KENNEBEC RIVER
BETWEEN
WATERVILLE – WINSLOW
KENNEBEC COUNTY
Abutment #1 - Expansion Device

SHEET 8 OF 12 AUGUSTA, MAINE

BRIDGE 46-132 4/1/91

Appendix E

Miscellaneous Information

Conceptual Bridge Layouts and Span Configurations

Waterville-Winslow: Ticonic Bridge
Replacement Options

Draft 3/9/2020

Conceptual Fishway Layout

Railroad Bridge

546'-0"

285'-0"

261'-0"

Flow

Proposed ℄

Existing ℄

See Typical Section & Phasing Graphics

Approximate Channel Location

Alternative No. 1

Waterville-Winslow: Ticonic Bridge
Replacement Options

Draft 3/9/2020

Conceptual Fishway Layout

Railroad Bridge

620'-0"

310'-0"

310'-0"

Flow

Proposed ℄

Existing ℄

See Typical Section & Phasing Graphics

Approximate Channel Location

Alternative No. 2

Waterville-Winslow: Ticonic Bridge
Replacement Options

Draft 3/9/2020

Conceptual Fishway Layout

Railroad Bridge

546'-0"

230'-0"

145'-0"

171'-0"

Flow

Proposed ℄

Existing ℄

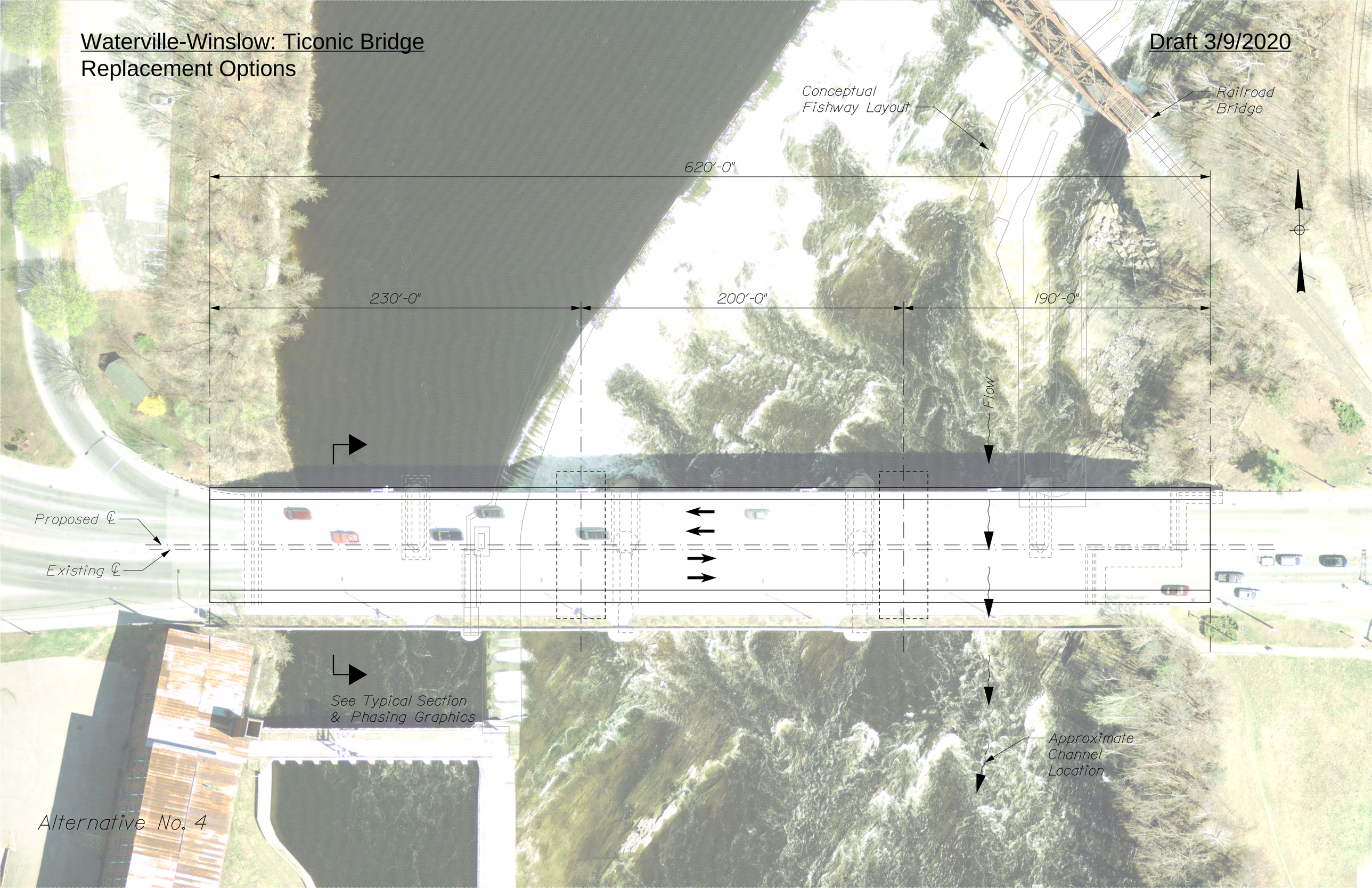
See Typical Section & Phasing Graphics

Approximate Channel Location

Alternative No. 3

Waterville-Winslow: Ticonic Bridge
Replacement Options

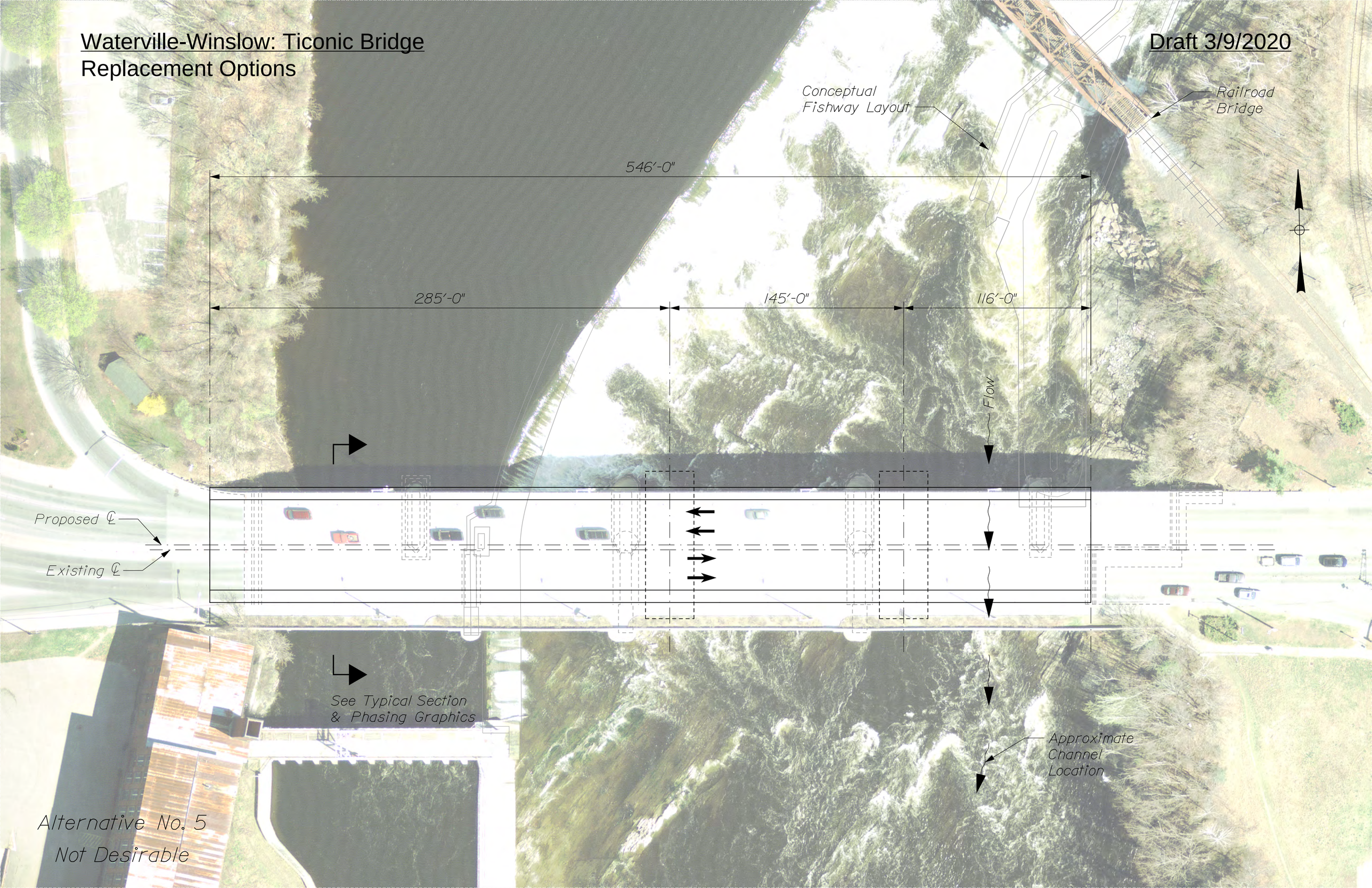
Draft 3/9/2020



Alternative No. 4

Waterville-Winslow: Ticonic Bridge
Replacement Options

Draft 3/9/2020

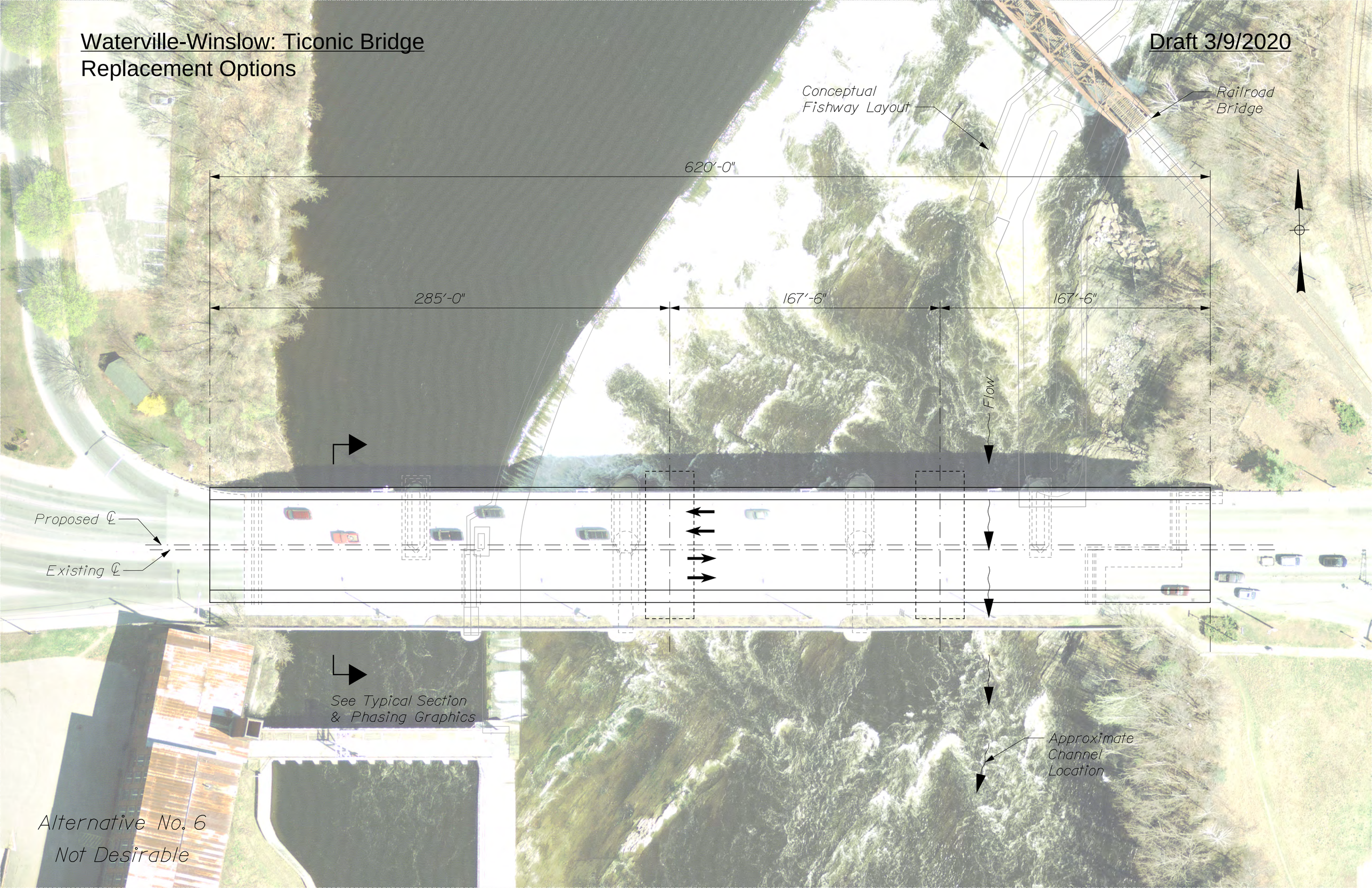


Alternative No. 5

Not Desirable

Waterville-Winslow: Ticonic Bridge
Replacement Options

Draft 3/9/2020



Alternative No. 6

Not Desirable

Waterville-Winslow: Ticonic Bridge
Replacement Options

Draft 3/9/2020

Conceptual Fishway Layout

Railroad Bridge

546'-0"

100'-0"

223'-0"

223'-0"

Flow

Proposed ℄

Existing ℄

See Typical Section & Phasing Graphics

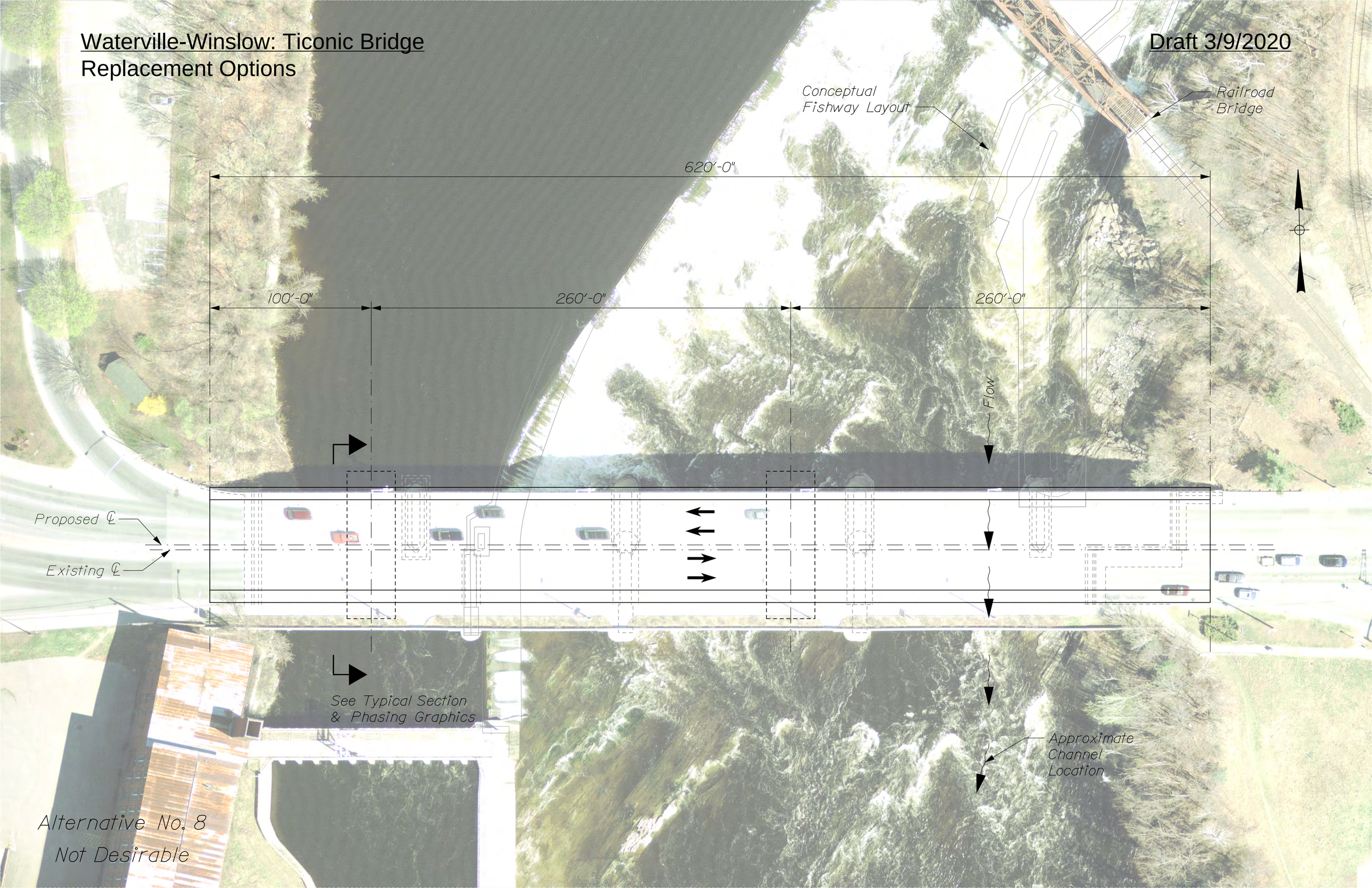
Approximate Channel Location

Alternative No. 7

Not Desirable

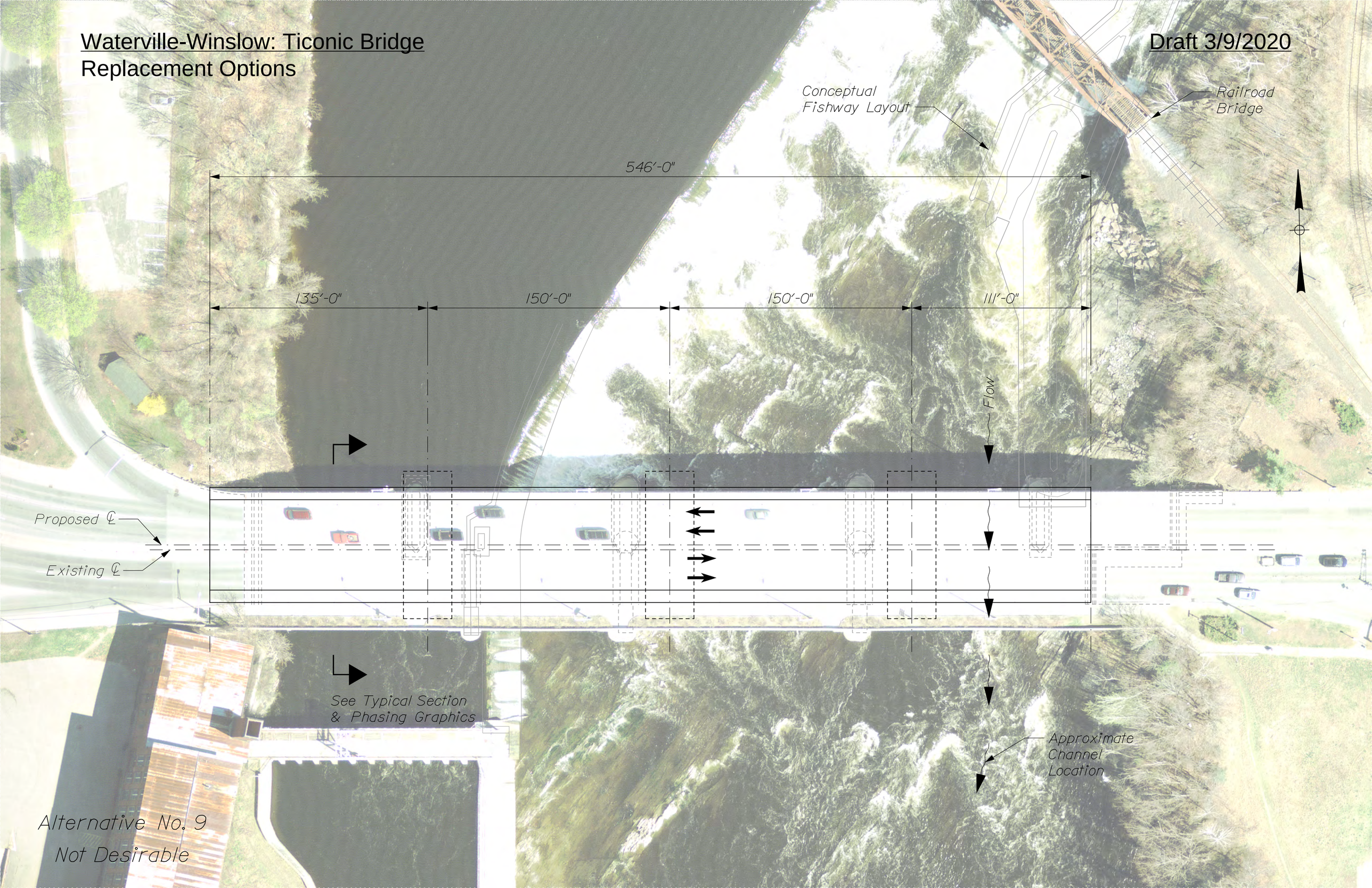
Waterville-Winslow: Ticonic Bridge
Replacement Options

Draft 3/9/2020



Waterville-Winslow: Ticonic Bridge
Replacement Options

Draft 3/9/2020

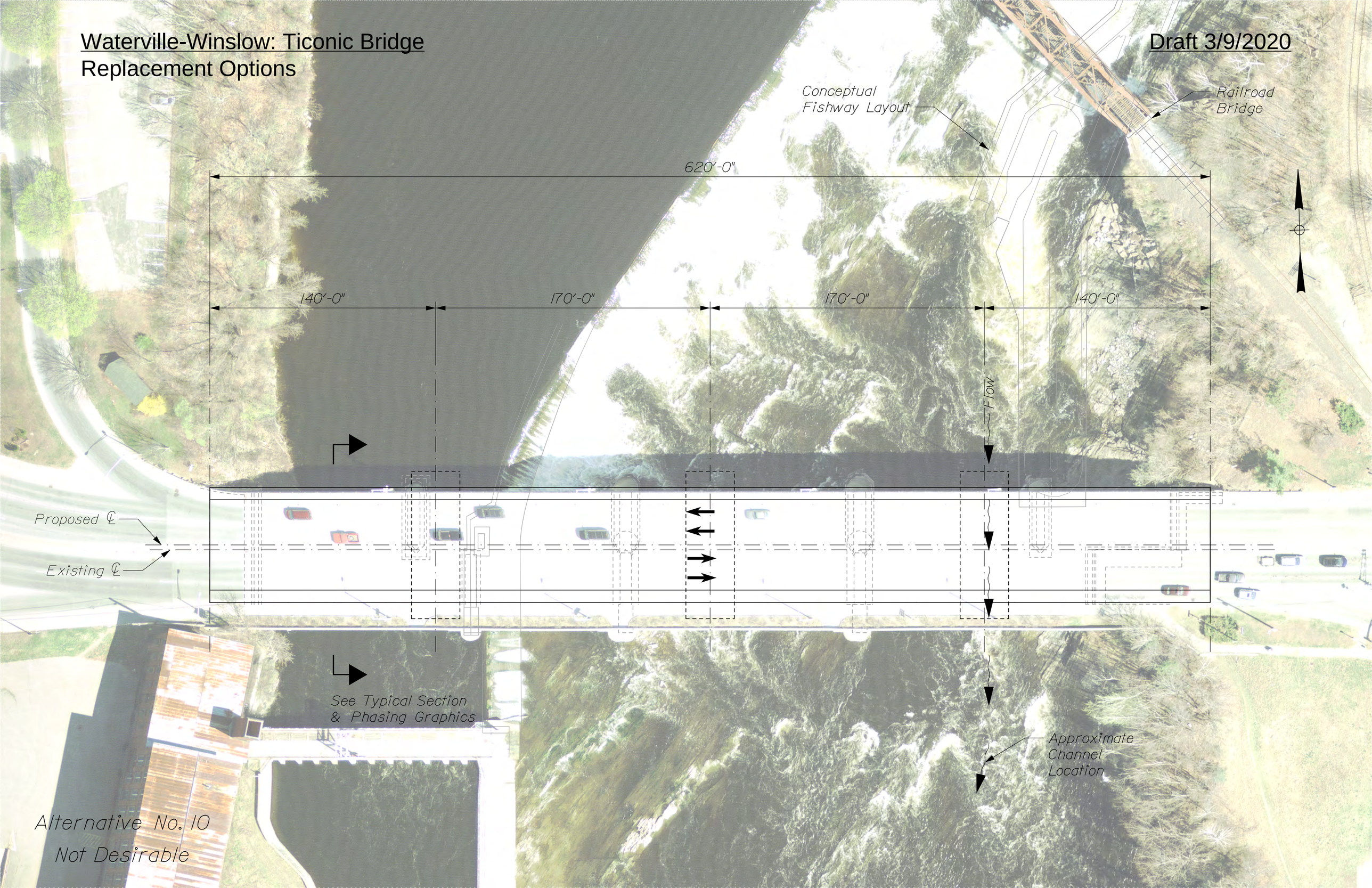


Alternative No. 9

Not Desirable

Waterville-Winslow: Ticonic Bridge
Replacement Options

Draft 3/9/2020

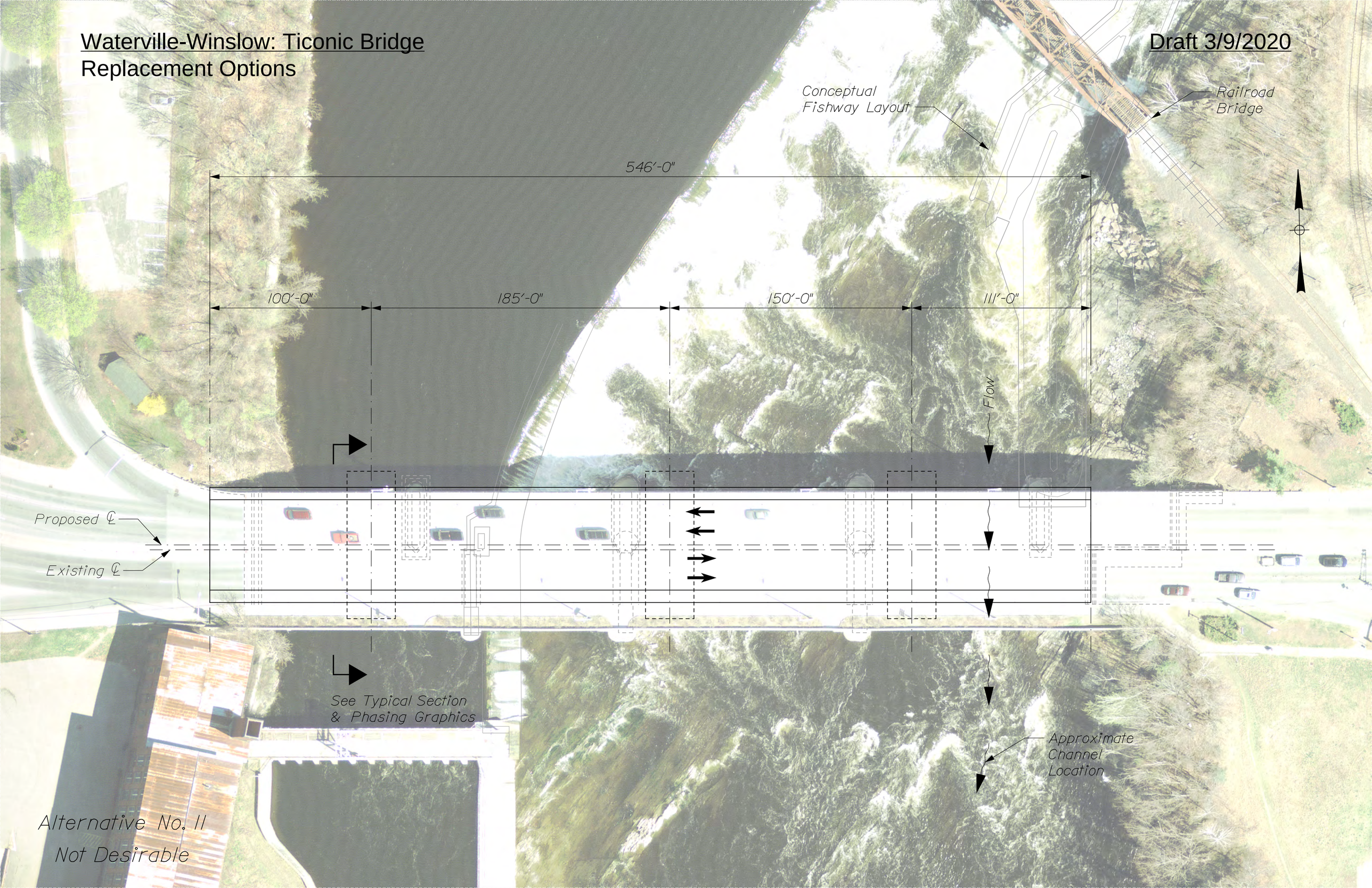


Alternative No. 10

Not Desirable

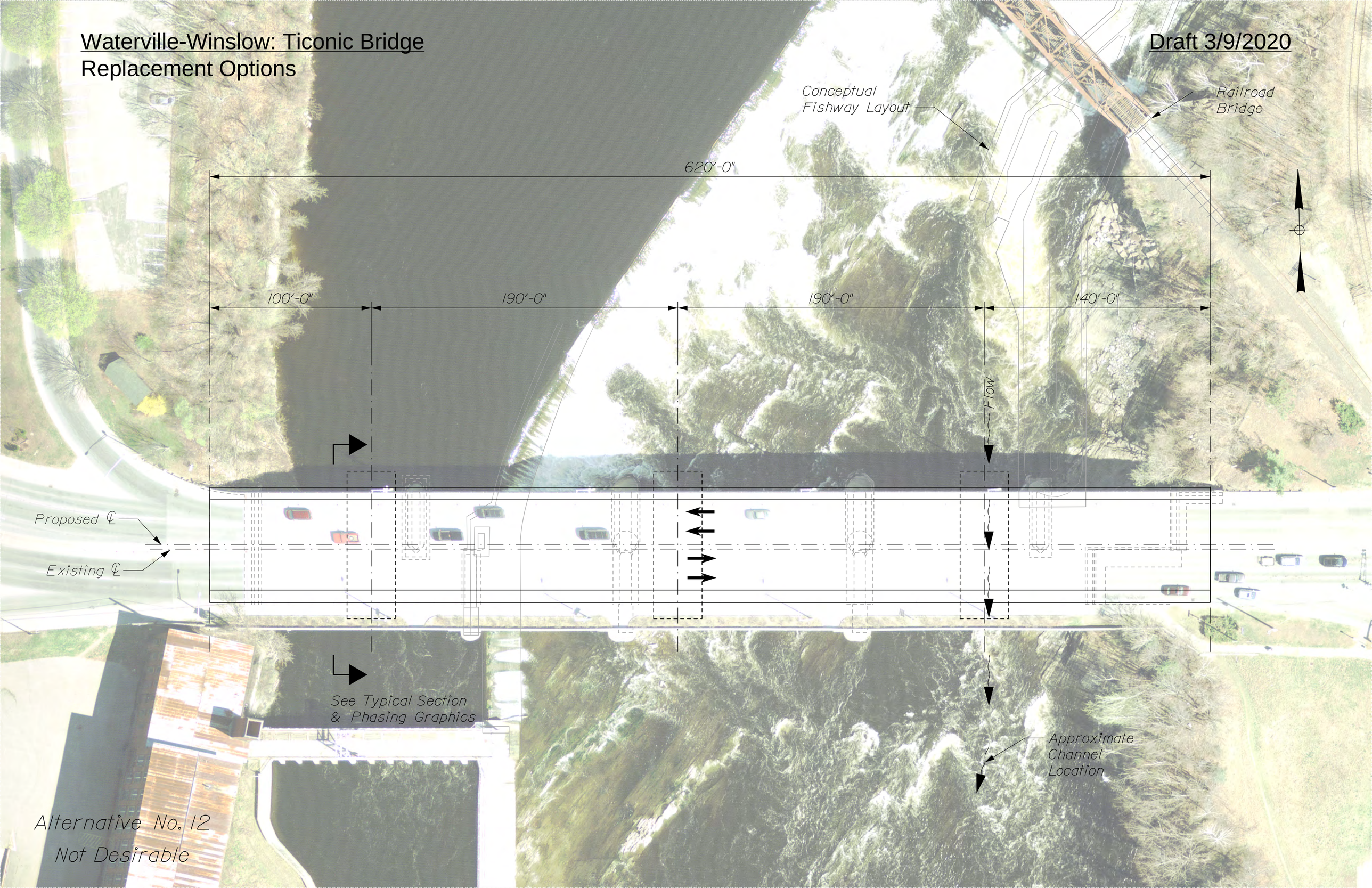
Waterville-Winslow: Ticonic Bridge
Replacement Options

Draft 3/9/2020



Waterville-Winslow: Ticonic Bridge
Replacement Options

Draft 3/9/2020



Alternative No. 12

Not Desirable

Waterville-Winslow: Ticonic Bridge
Replacement Options

Draft 3/9/2020

Conceptual Fishway Layout

Railroad Bridge

546'-0"

168'-0"

210'-0"

168'-0"

Flow

Proposed ℄

Existing ℄

See Typical Section & Phasing Graphics

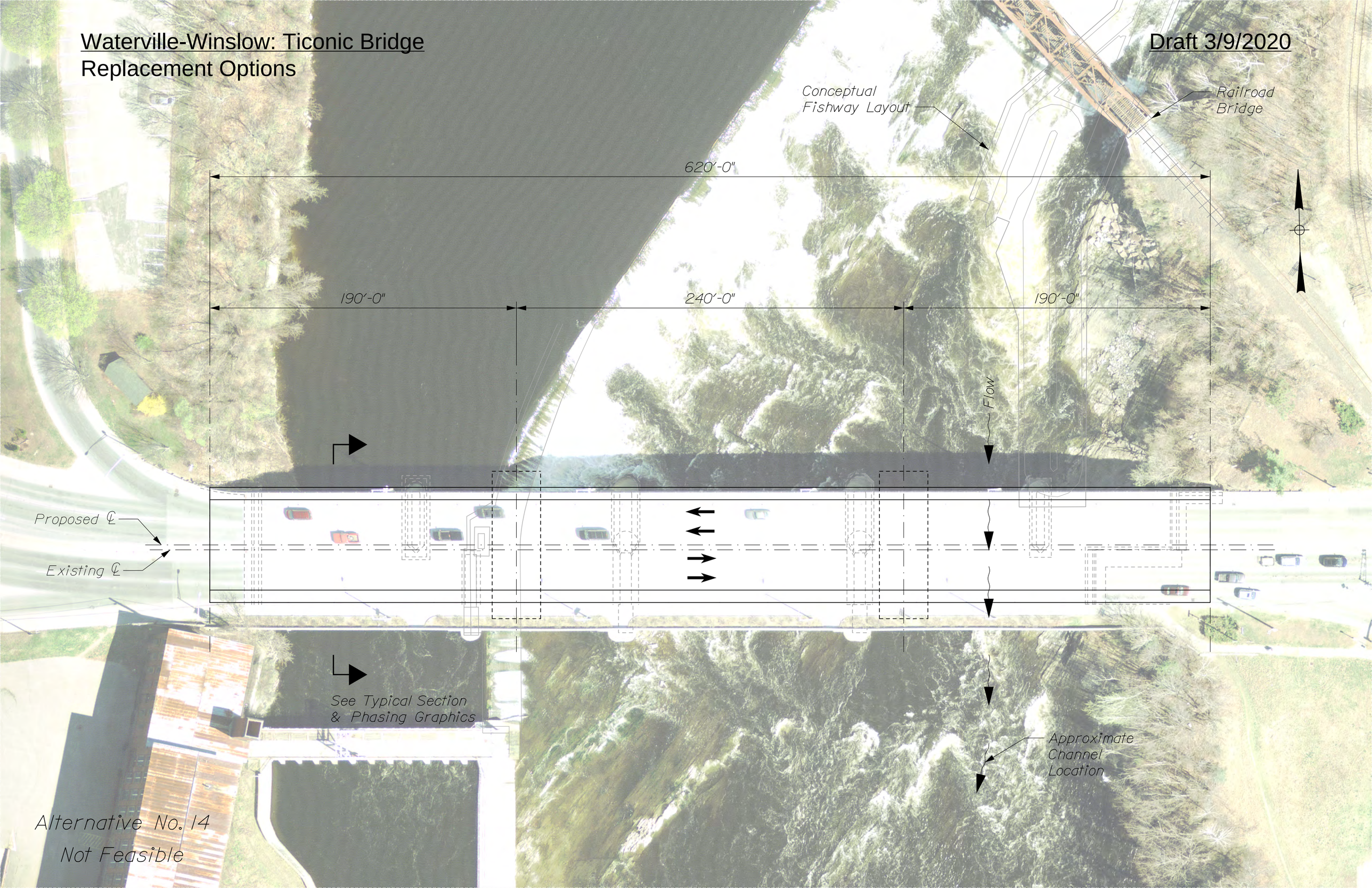
Approximate Channel Location

Alternative No. 13

Not Feasible

Waterville-Winslow: Ticonic Bridge
Replacement Options

Draft 3/9/2020



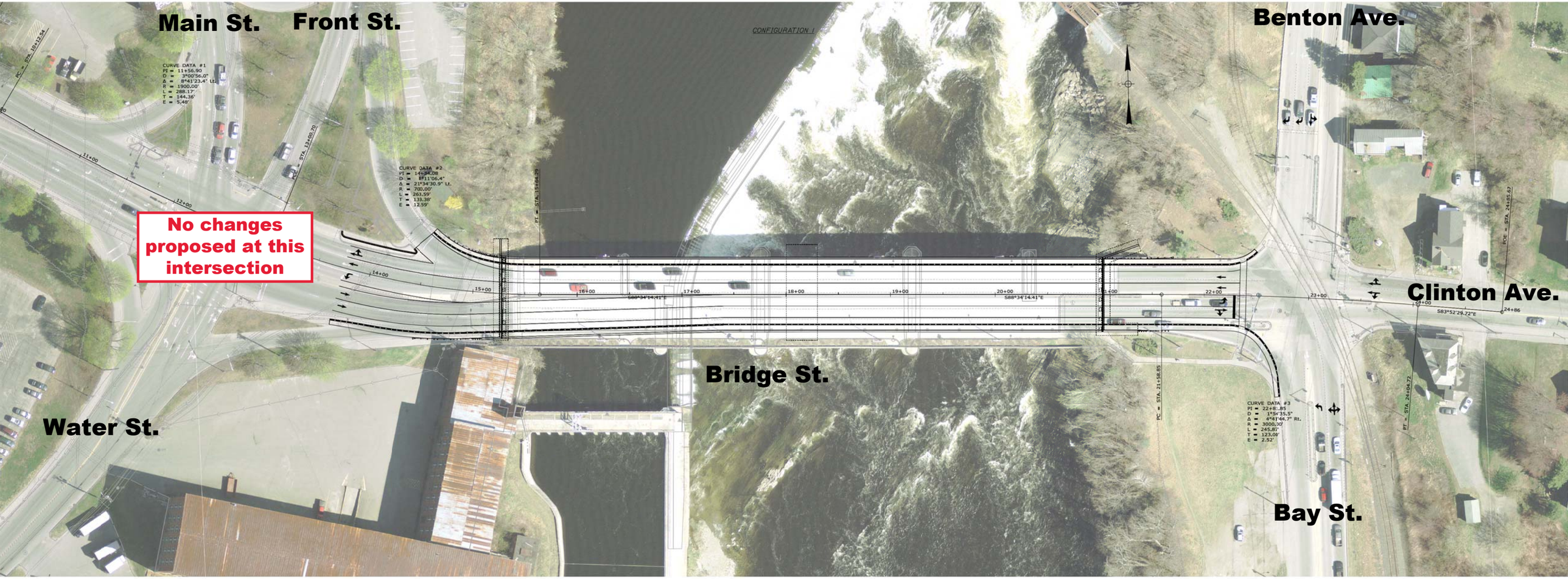
Alternative No. 14

Not Feasible

Bridge Configuration Alternatives

Configuration 1 - Four lane bridge, flared at Waterville approach

- **WB across bridge remains two lanes**
- **EB approach at Winslow intersection reduced to two lanes (dedicated left turn lane with through/right)**
- **Remaining legs of Winslow intersection unchanged**



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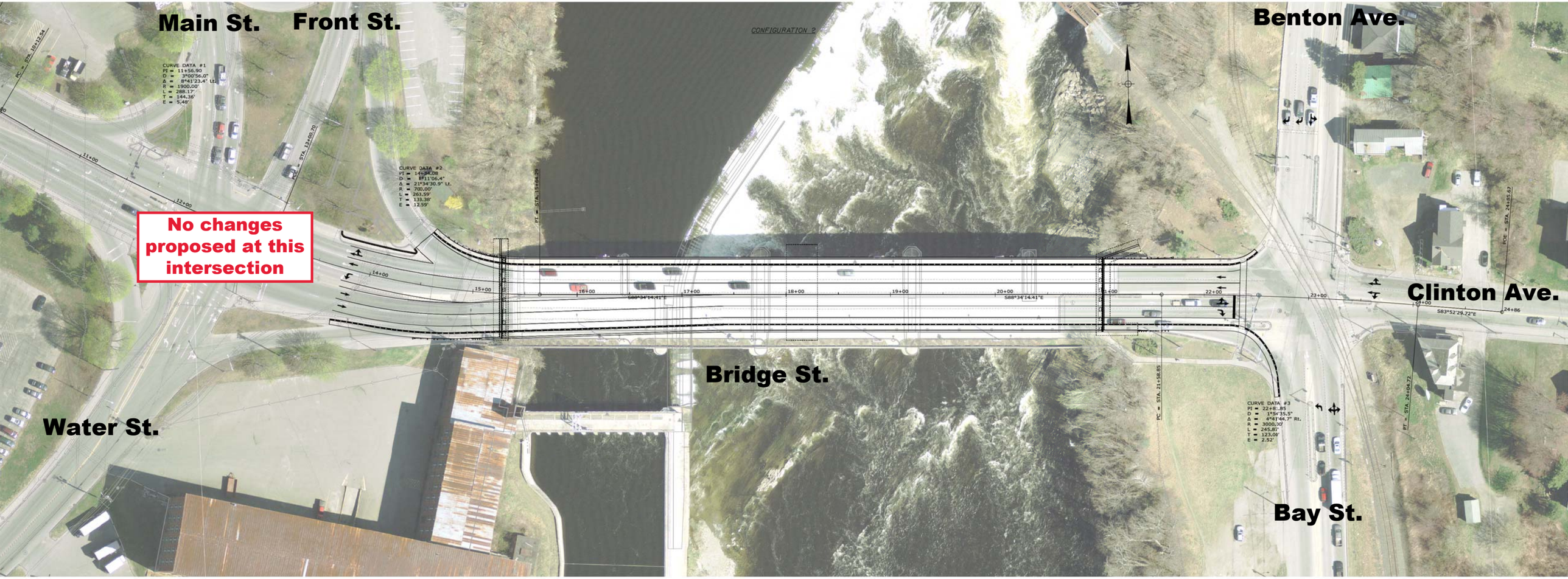
Configuration 2 - Four lane bridge, flared at Waterville approach
- **WB across bridge remains two lanes**
- **EB approach at Winslow intersection reduced to two lanes (through/left lane with dedicated right)**
- **Remaining legs of Winslow intersection unchanged**



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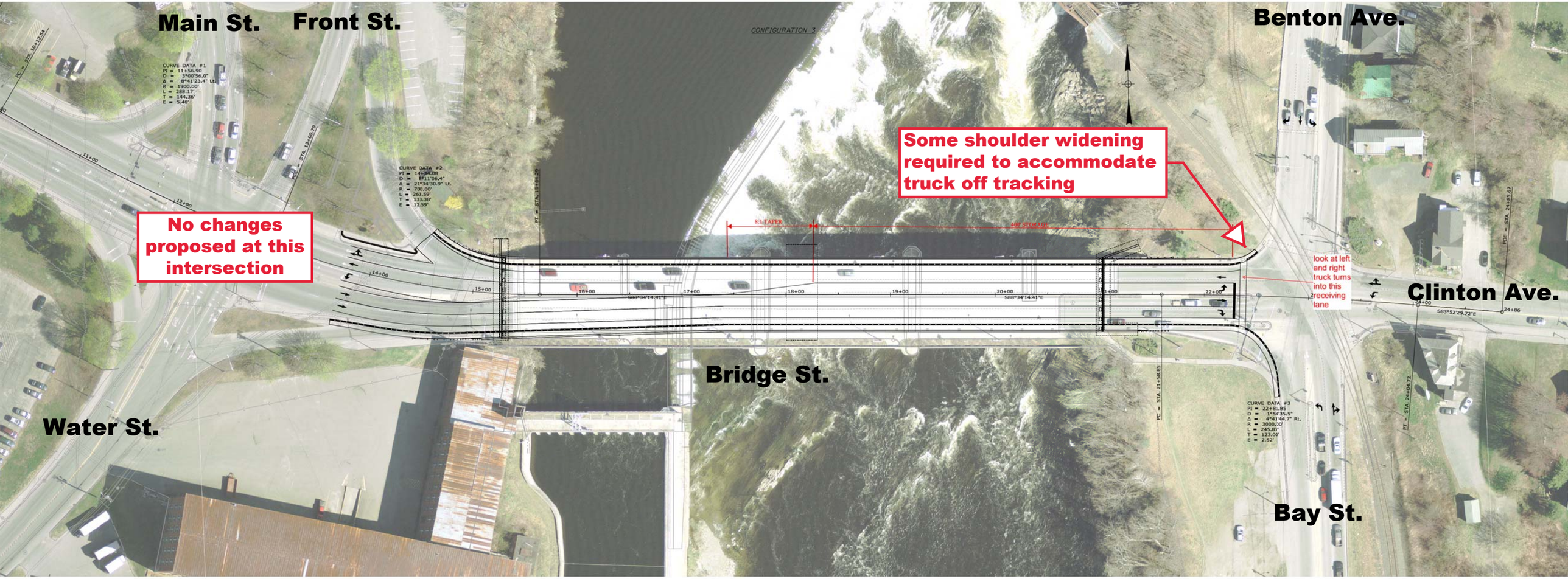
Configuration 3 - Four lane bridge, flared at Waterville approach

- **WB across bridge reduced to a single lane on Winslow side**
- **EB approach at Winslow intersection remains three lanes (separate left, through and right turn lanes)**
- **Remaining legs of Winslow intersection changed to accommodate single WB lane on bridge approach**



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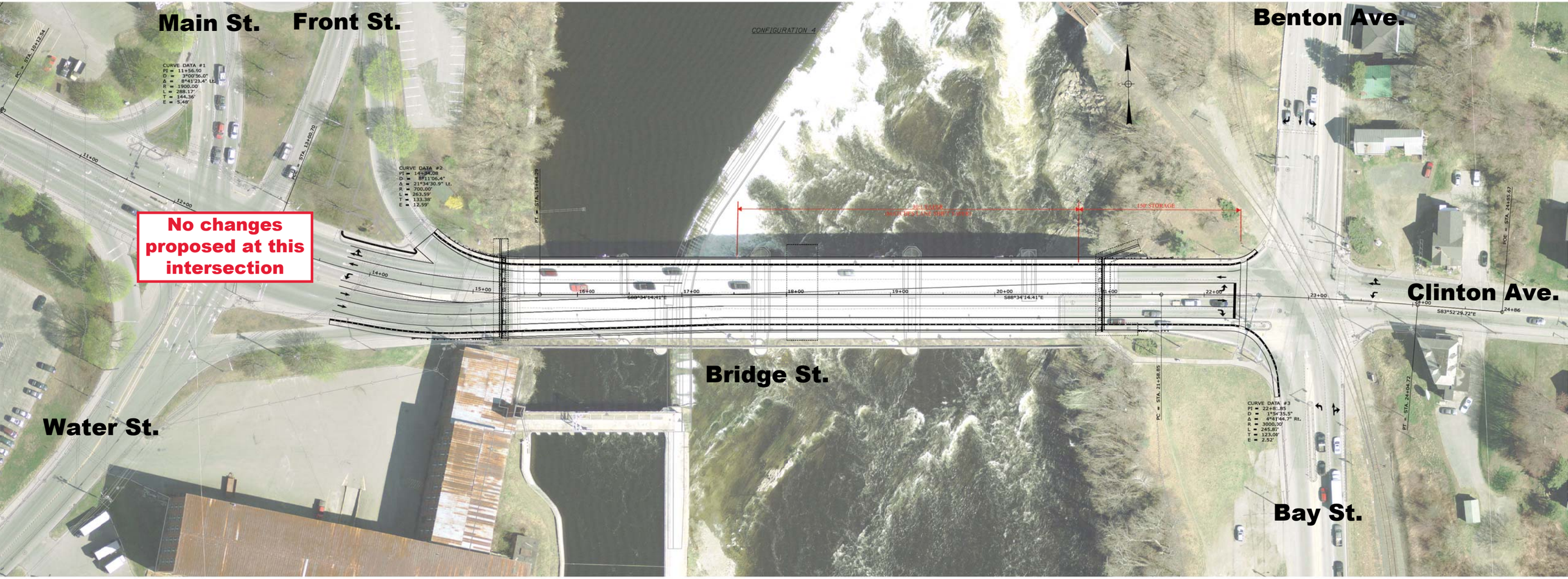
Configuration 4 - Four lane bridge, flared at Waterville approach
- This is a variation of Configuration 3 with a change to how the left turn lane for Bridge St EB develops

This option is not suggested for construction



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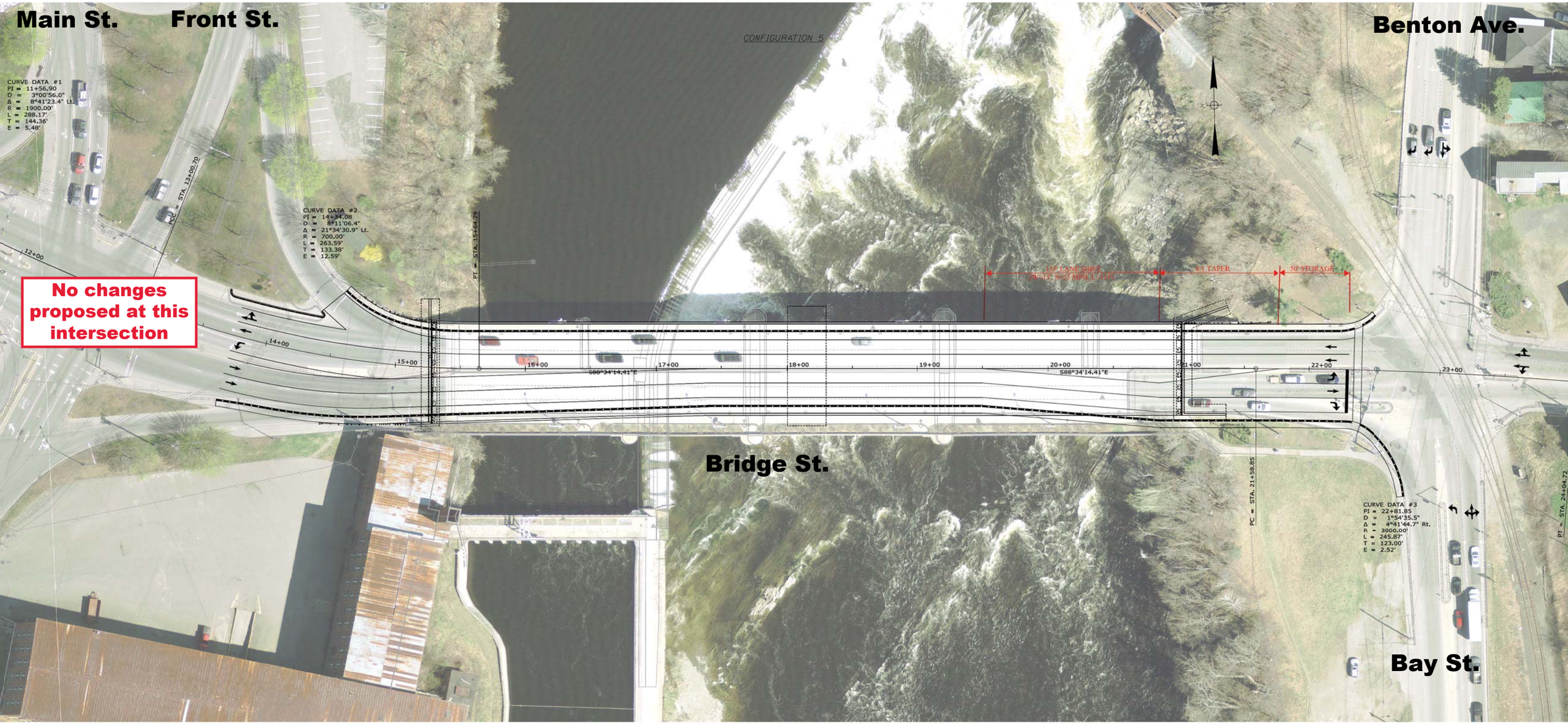
Configuration 5 - Four lane bridge, flared at Waterville and Winslow approach
- This option allows for five lanes at the EB approach to the Winslow intersection with a four lane bridge

This option is not suggested for construction whereas building a five lane bridge would likely be preferable to building a bridge with flares at both ends.



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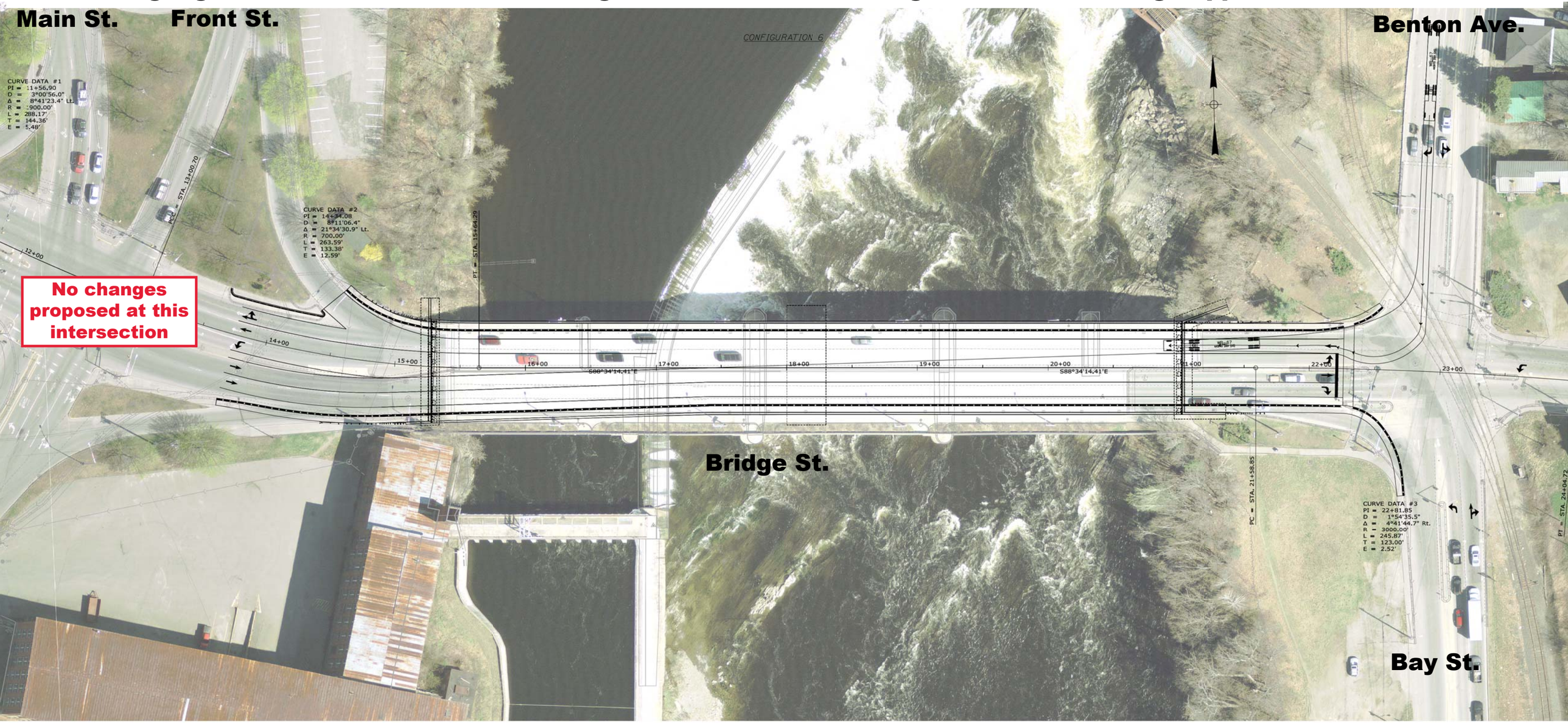
Configuration 6 - Four lane bridge, flared at Waterville approach

- This is a variation of Configuration 3 with a change to the SB leg of the Winslow approach to avoid shoulder widening
- WB across bridge reduced to a single lane on Winslow side
- EB approach at Winslow intersection remains three lanes (separate left, through and right turn lanes)
- Remaining legs of Winslow intersection changed to accommodate single WB lane on bridge approach.



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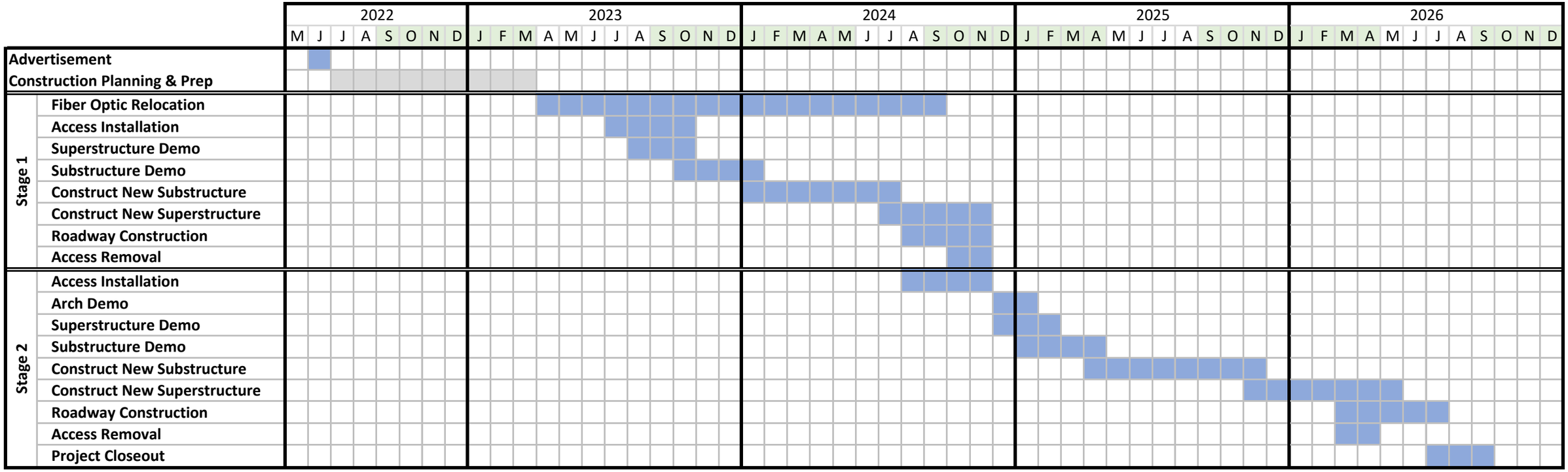
Construction Schedule

Ticonic Bridge Replacement - Preliminary Construction Schedule Summary

Last Revised 06-01-2021

= In water work window



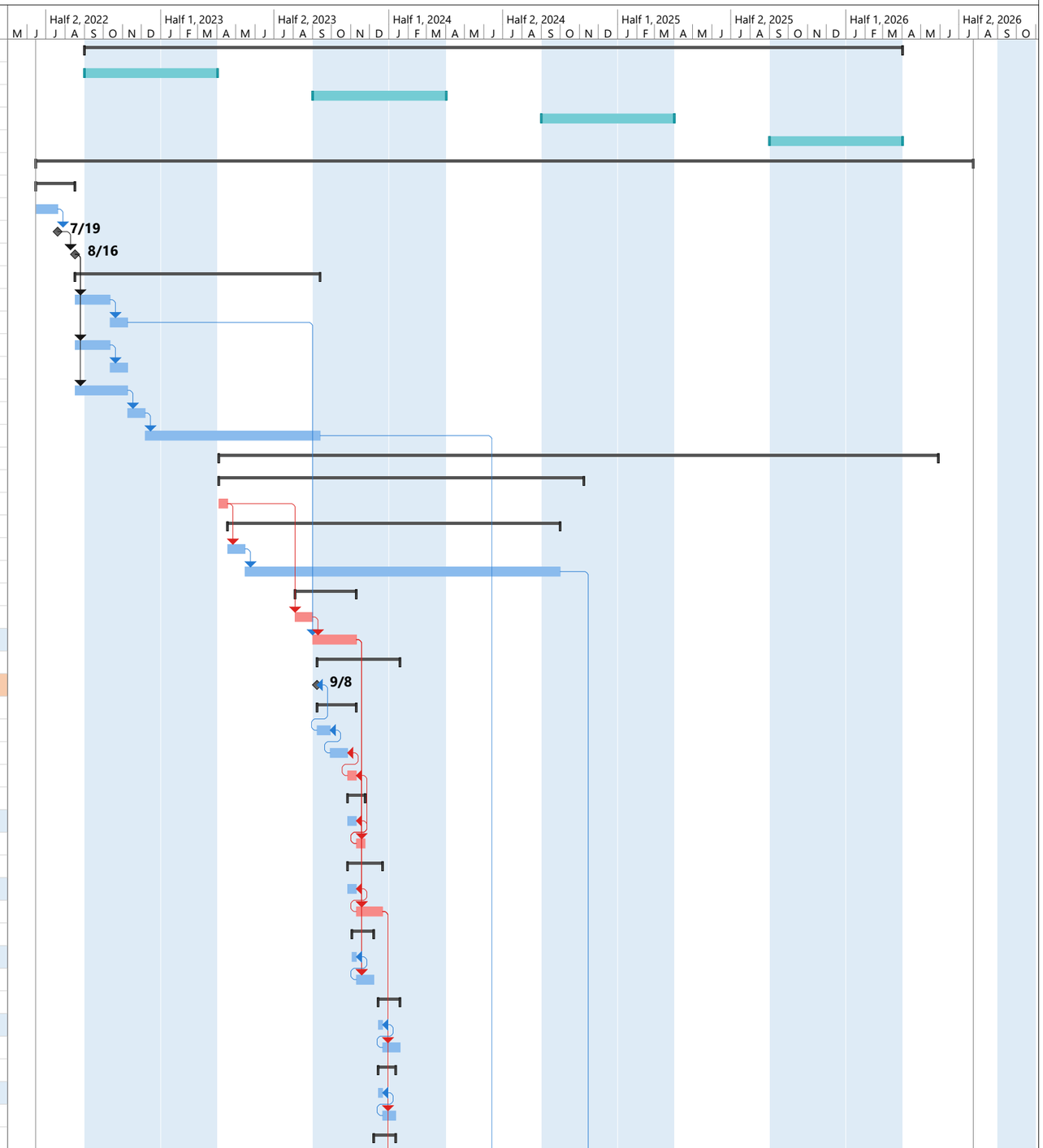
Waterville-Winslow Ticonic Bridge Replacement

WIN 23138.00

Preliminary Construction Schedule

Revised 07-15-2021

ID	Task Name	Duration	Start	Finish	Predecessors	Successors
1	**Assumed In Water Work Windows**	**935 days**	**Thu 9/1/22**	**Wed 4/1/26**		
2	Assumed 2022-2023 In-Water Work Window	153 days	Thu 9/1/22	Sat 4/1/23		
3	Assumed 2023-2024 In-Water Work Window	152 days	Fri 9/1/23	Mon 4/1/24		
4	Assumed 2024-2025 In-Water Work Window	153 days	Sun 9/1/24	Tue 4/1/25		
5	Assumed 2025-2026 In-Water Work Window	153 days	Mon 9/1/25	Wed 4/1/26		
6	**Waterville-Winslow Ticonic Bridge**	**1072 days**	**Wed 6/15/22**	**Thu 7/23/26**		
7	**Advertisement, Award & Submittals**	**45 days**	**Wed 6/15/22**	**Tue 8/16/22**		
8	Advertisement	5 wks	Wed 6/15/22	Tue 7/19/22		9
9	Bid Opening	0 days	Tue 7/19/22	Tue 7/19/22	8	10FS+4 wks
10	Contract Award	0 days	Tue 8/16/22	Tue 8/16/22	9FS+4 wks	12,14,16
11	**Submittal Prep & Long Lead Items**	**280 days**	**Wed 8/17/22**	**Tue 9/12/23**		
12	Prepare & Submit Trestle Submittal	8 wks	Wed 8/17/22	Tue 10/11/22	10	13
13	Review & Approve Trestle Submittal	4 wks	Wed 10/12/22	Tue 11/8/22	12	27
14	Prepare & Submit Demolition Plan	8 wks	Wed 8/17/22	Tue 10/11/22	10	15
15	Review & Approval Demolition Plan	4 wks	Wed 10/12/22	Tue 11/8/22	14	
16	Prepare & Submit Str. Steel & Brgs Submittal	12 wks	Wed 8/17/22	Tue 11/8/22	10	17
17	Review & Approve Str. Steel & Brgs Submittal	4 wks	Wed 11/9/22	Tue 12/6/22	16	18
18	Bearing & Structural Steel Fabrication	10 mons	Wed 12/7/22	Tue 9/12/23	17	73
19	**Construction**	**823 days**	**Tue 4/4/23**	**Thu 5/28/26**		
20	**Phase 1**	**418 days**	**Tue 4/4/23**	**Thu 11/7/24**		
21	Contractor Mobilization and Setup	2 wks	Tue 4/4/23	Mon 4/17/23		23,26FS+78 days
22	**Utility Relocations (Fiber Optic)**	**380 days**	**Tue 4/18/23**	**Mon 9/30/24**		
23	Install conduit up to and across 1936 Bridge	1 mon	Tue 4/18/23	Mon 5/15/23	21	24
24	Pull new fiber lines & splice	18 mons	Tue 5/16/23	Mon 9/30/24	23	88
25	**Construction Access**	**70 days**	**Fri 8/4/23**	**Thu 11/9/23**		
26	Construct Access Roads	4 wks	Fri 8/4/23	Thu 8/31/23	21FS+78 days	27
27	Trestle / Rock Road - River Bank to River Bank	10 wks	Fri 9/1/23	Thu 11/9/23	13,26	36,39,42
28	**Demolition (1970's Era Section)**	**95 days**	**Fri 9/8/23**	**Thu 1/18/24**		
29	Implement Phase 1 Traffic Control	0 days	Fri 9/8/23	Fri 9/8/23	31SF	
30	**Superstructure**	**45 days**	**Fri 9/8/23**	**Fri 11/10/23**		
31	Install Shielding System	3 wks	Fri 9/8/23	Fri 9/29/23	32SF	29SF
32	Sawcut and remove bridge deck	4 wks	Fri 9/29/23	Fri 10/27/23	33SF	31SF
33	Remove girders (night work from adj. str)	2 wks	Fri 10/27/23	Fri 11/10/23	36SF	39,42,32SF
34	**Abutment 1**	**20 days**	**Fri 10/27/23**	**Thu 11/23/23**		
35	Install Abut 1 containment	2 wks	Fri 10/27/23	Fri 11/10/23	36SF	
36	Demolish Portion of Abutment 1	2 wks	Fri 11/10/23	Thu 11/23/23	27	35SF,33SF
37	**Pier 1**	**40 days**	**Fri 10/27/23**	**Thu 12/21/23**		
38	Install Pier 1 containment	2 wks	Fri 10/27/23	Fri 11/10/23	39SF	
39	Demolish Pier 1	6 wks	Fri 11/10/23	Thu 12/21/23	27,33	51,38SF,45,48
40	**Pier 3**	**25 days**	**Fri 11/3/23**	**Thu 12/7/23**		
41	Install Pier 3 Sandbag Cofferdam	1 wk	Fri 11/3/23	Fri 11/10/23	42SF	
42	Demolish Portion of Pier 3	4 wks	Fri 11/10/23	Thu 12/7/23	27,33	41SF
43	**Pier 4**	**25 days**	**Fri 12/15/23**	**Thu 1/18/24**		
44	Install Pier 4 Sandbag Cofferdam	1 wk	Fri 12/15/23	Fri 12/22/23	45SF	
45	Demolish Portion of Pier 4	4 wks	Fri 12/22/23	Thu 1/18/24	39	44SF
46	**Pier 5**	**20 days**	**Fri 12/15/23**	**Thu 1/11/24**		
47	Install Pier 5 Sandbag Cofferdam	1 wk	Fri 12/15/23	Fri 12/22/23	48SF	
48	Demolish Pier 5	3 wks	Fri 12/22/23	Thu 1/11/24	39	47SF
49	**Abutment 2**	**25 days**	**Fri 12/8/23**	**Thu 1/11/24**		



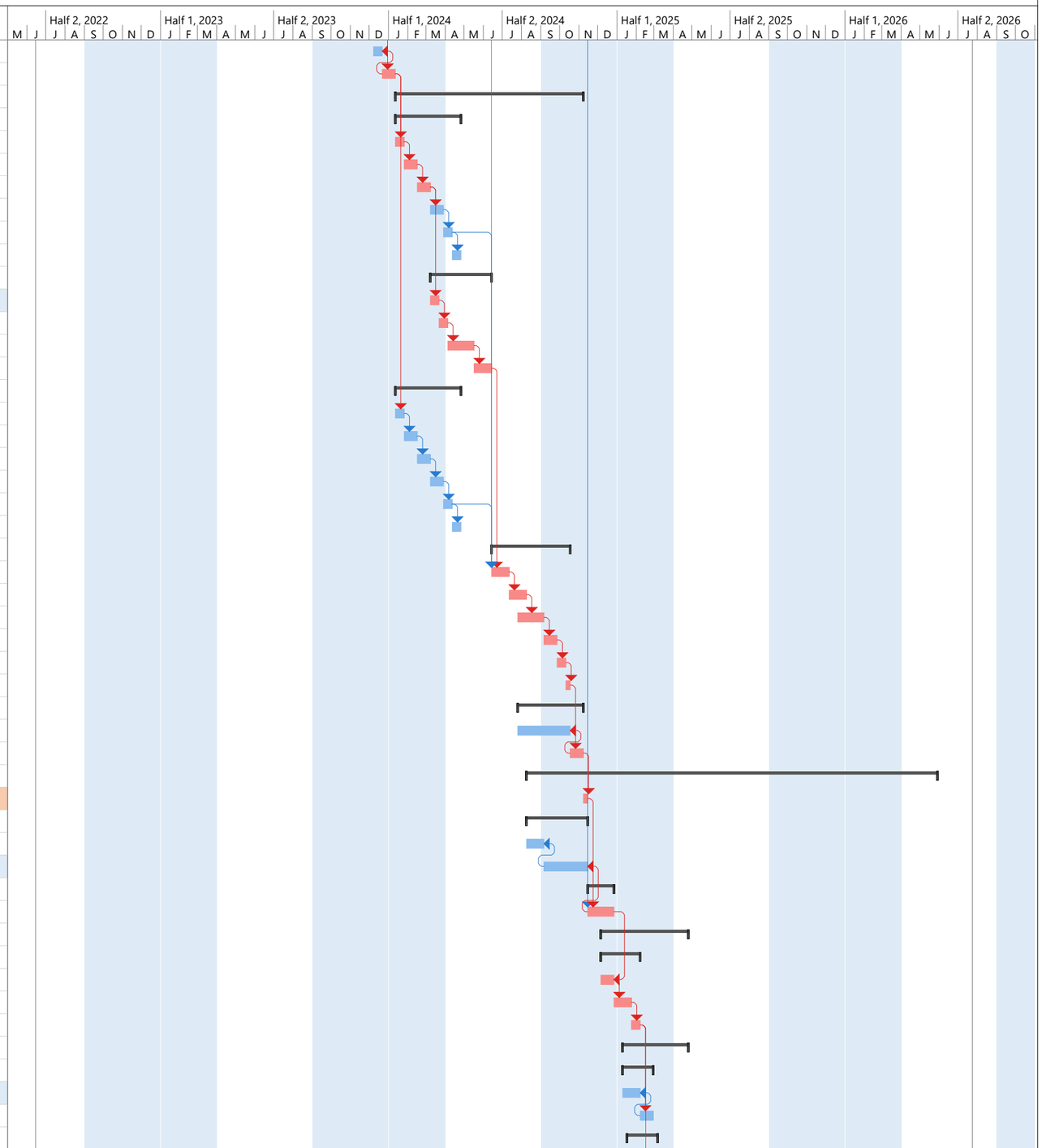
Waterville-Winslow Ticonic Bridge Replacement

WIN 23138.00

Preliminary Construction Schedule

Revised 07-15-2021

ID	Task Name	Duration	Start	Finish	Predecessors	Successors
50	Install Abut. 2 Temp. Earth Support System	2 wks	Fri 12/8/23	Fri 12/22/23	51SF	
51	Demolish Portion of Abutment 2	3 wks	Fri 12/22/23	Thu 1/11/24	39	50SF,66,54
52	**New Construction**	**215 days**	**Fri 1/12/24**	**Thu 11/7/24**		
53	**Abutment 1**	**75 days**	**Fri 1/12/24**	**Thu 4/25/24**		
54	Excavate & Bedrock Prep	2 wks	Fri 1/12/24	Thu 1/25/24	51	55
55	Form, Reinf., Place & Cure Footing	3 wks	Fri 1/26/24	Thu 2/15/24	54	56
56	Form, Reinf., Place & Cure Stem Wall & WW	3 wks	Fri 2/16/24	Thu 3/7/24	55	57,61
57	Form, Reinf., Place & Cure Backwall	3 wks	Fri 3/8/24	Thu 3/28/24	56	58
58	Form, Reinf., Place & Cure Approach Slab	2 wks	Fri 3/29/24	Thu 4/11/24	57	59,73
59	Backfill Abut. & Remove Temp. Earth Supports	2 wks	Fri 4/12/24	Thu 4/25/24	58	
60	**Pier 1**	**70 days**	**Fri 3/8/24**	**Thu 6/13/24**		
61	Install Sandbag Cofferdam & Bedrock Prep	2 wks	Fri 3/8/24	Thu 3/21/24	56	62
62	Form, Reinf., Place & Cure Footing	2 wks	Fri 3/22/24	Thu 4/4/24	61	63
63	Form, Reinf., Place & Cure Pier Stem (2 lifts)	6 wks	Fri 4/5/24	Thu 5/16/24	62	64
64	Form, Reinf., Place & Cure Pier Cap	4 wks	Fri 5/17/24	Thu 6/13/24	63	73
65	**Abutment 2**	**75 days**	**Fri 1/12/24**	**Thu 4/25/24**		
66	Excavate & Bedrock Prep	2 wks	Fri 1/12/24	Thu 1/25/24	51	67
67	Form, Reinforce, Place & Cure Footing	3 wks	Fri 1/26/24	Thu 2/15/24	66	68
68	Form, Reinforce, Place & Cure Stem Wall	3 wks	Fri 2/16/24	Thu 3/7/24	67	69
69	Form, Reinforce, Place & Cure Backwall	3 wks	Fri 3/8/24	Thu 3/28/24	68	70
70	Form, Reinforce, Place & Cure Approach Slab	2 wks	Fri 3/29/24	Thu 4/11/24	69	71,73
71	Backfill Abut. & Remove Temp. Earth Supports	2 wks	Fri 4/12/24	Thu 4/25/24	70	
72	**Superstructure**	**90 days**	**Fri 6/14/24**	**Thu 10/17/24**		
73	Erect Bearings and Structural Steel	4 wks	Fri 6/14/24	Thu 7/11/24	18,58,64,70	74
74	Install Shielding System	4 wks	Fri 7/12/24	Thu 8/8/24	73	75FS-2 wks
75	Form, Reinf., Place & Cure Deck (3 placements)	6 wks	Fri 7/26/24	Thu 9/5/24	74FS-2 wks	76
76	Form, Reinf., Place & Cure Curbs	3 wks	Fri 9/6/24	Thu 9/26/24	75	77
77	Install Bridge Railing	2 wks	Fri 9/27/24	Thu 10/10/24	76	78
78	Install Membrane	1 wk	Fri 10/11/24	Thu 10/17/24	77	81
79	**Roadway**	**75 days**	**Fri 7/26/24**	**Thu 11/7/24**		
80	Approach Roadway Modifications	60 days	Fri 7/26/24	Fri 10/18/24	81SF	
81	Base Pave	3 wks	Fri 10/18/24	Thu 11/7/24	78	80SF,83
82	**Phase 2**	**470 days**	**Fri 8/9/24**	**Thu 5/28/26**		
83	Implement Phase 2 Traffic Control	5 days	Fri 11/8/24	Thu 11/14/24	81	88
84	**Construction Access**	**70 days**	**Fri 8/9/24**	**Fri 11/15/24**		
85	Abut. 2 Access Road Installation	4 wks	Fri 8/9/24	Fri 9/6/24	86SF	
86	Wet Road / Trestle / Dam Protection Installation	10 wks	Fri 9/6/24	Fri 11/15/24	88SF	85SF
87	**Demolition (Arch Structure)**	**30 days**	**Fri 11/15/24**	**Thu 12/26/24**		
88	Remove Earth Fill, Spandrel Walls, Ribs	6 wks	Fri 11/15/24	Thu 12/26/24	83,24	91FF,86SF
89	**Demolition (1930's Structure)**	**100 days**	**Fri 12/6/24**	**Thu 4/24/25**		
90	**Superstructure Removal**	**45 days**	**Fri 12/6/24**	**Thu 2/6/25**		
91	Install Shielding System	3 wks	Fri 12/6/24	Thu 12/26/24	88FF	92
92	Sawcut and remove bridge deck	4 wks	Fri 12/27/24	Thu 1/23/25	91	93
93	Remove girders (night work from adj. str)	2 wks	Fri 1/24/25	Thu 2/6/25	92	97,100,103
94	**Substructure Removal**	**75 days**	**Fri 1/10/25**	**Thu 4/24/25**		
95	**Abutment 1**	**35 days**	**Fri 1/10/25**	**Thu 2/27/25**		
96	Install Cofferdam	4 wks	Fri 1/10/25	Fri 2/7/25	97SF	
97	Demolish Remainder of Abutment 1	3 wks	Fri 2/7/25	Thu 2/27/25	93	96SF
98	**Pier 1**	**35 days**	**Fri 1/17/25**	**Thu 3/6/25**		



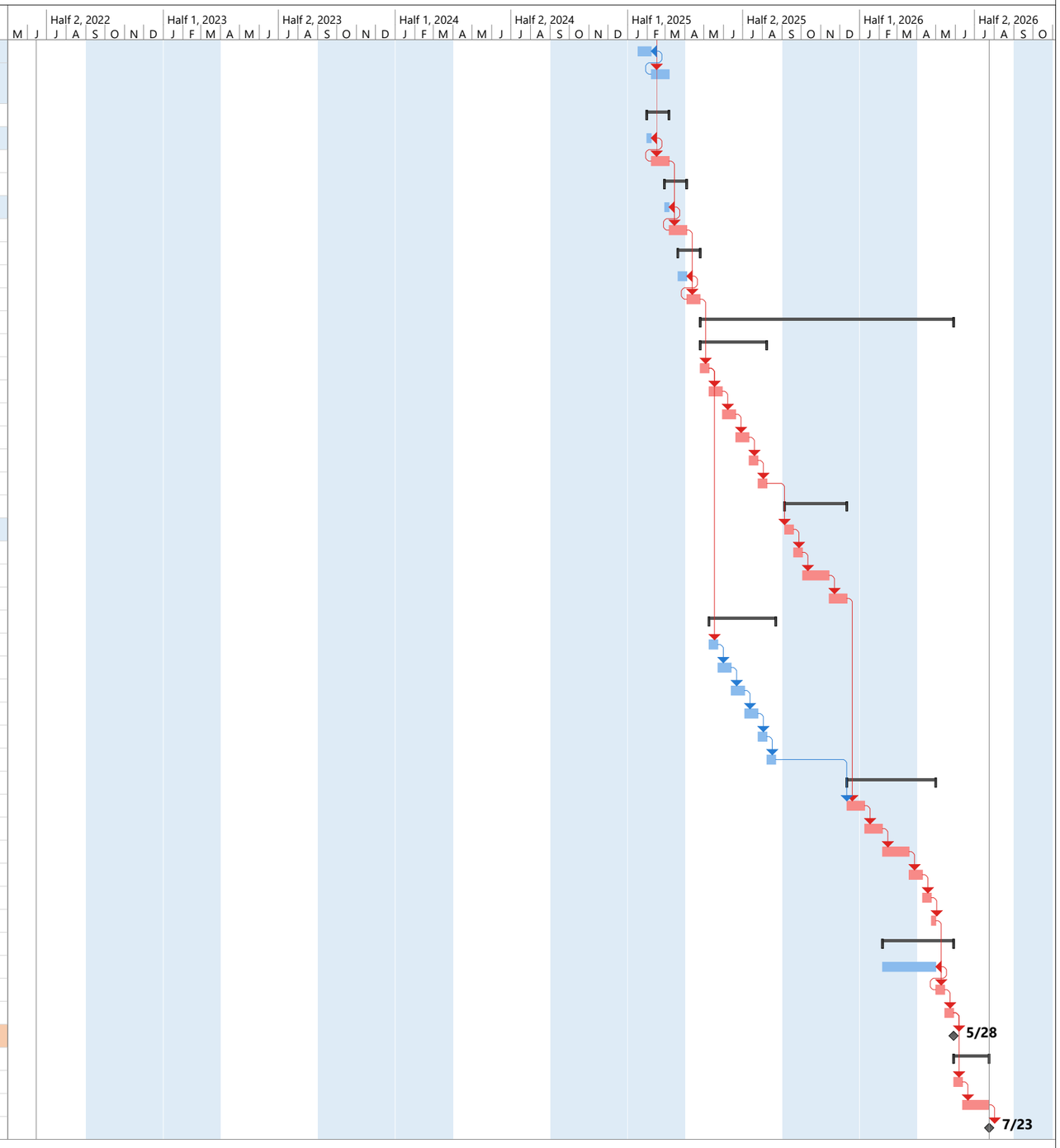
Waterville-Winslow Ticonic Bridge Replacement

WIN 23138.00

Preliminary Construction Schedule

Revised 07-15-2021

ID	Task Name	Duration	Start	Finish	Predecessors	Successors
99	Install Access/Work Platform	3 wks	Fri 1/17/25	Fri 2/7/25	100SF	
100	Demolish Pier 2 Attached to Dam (in water work)	4 wks	Fri 2/7/25	Thu 3/6/25	93	99SF
101	**Pier 3**	**25 days**	**Fri 1/31/25**	**Thu 3/6/25**		
102	Install Pier 3 Sandbag Cofferdam	1 wk	Fri 1/31/25	Fri 2/7/25	103SF	
103	Demolish Remainder of Pier 3	4 wks	Fri 2/7/25	Thu 3/6/25	93	106,102SF
104	**Pier 4**	**25 days**	**Fri 2/28/25**	**Thu 4/3/25**		
105	Install Pier 4 Sandbag Cofferdam	1 wk	Fri 2/28/25	Fri 3/7/25	106SF	
106	Demolish Remainder of Pier 4	4 wks	Fri 3/7/25	Thu 4/3/25	103	105SF,109
107	**Abutment 2**	**25 days**	**Fri 3/21/25**	**Thu 4/24/25**		
108	Install Abut. 2 Temp. Earth Support System	2 wks	Fri 3/21/25	Fri 4/4/25	109SF	
109	Demolish Remainder of Abut. 2	3 wks	Fri 4/4/25	Thu 4/24/25	106	108SF,112
110	**New Construction**	**285 days**	**Fri 4/25/25**	**Thu 5/28/26**		
111	**Abutment 1**	**75 days**	**Fri 4/25/25**	**Thu 8/7/25**		
112	Excavate & Bedrock Prep	2 wks	Fri 4/25/25	Thu 5/8/25	109	113,124
113	Form, Reinf., Place & Cure Footing	3 wks	Fri 5/9/25	Thu 5/29/25	112	114
114	Form, Reinf., Place & Cure Stem Wall & WW	3 wks	Fri 5/30/25	Thu 6/19/25	113	115
115	Form, Reinf., Place & Cure Backwall	3 wks	Fri 6/20/25	Thu 7/10/25	114	116
116	Form, Reinf., Place & Cure Approach Slab	2 wks	Fri 7/11/25	Thu 7/24/25	115	117
117	Backfill Abut. & Remove Temp. Earth Supports	2 wks	Fri 7/25/25	Thu 8/7/25	116	119FS+4 wks
118	**Pier 1**	**70 days**	**Fri 9/5/25**	**Thu 12/11/25**		
119	Install Sandbag Cofferdam & Bedrock Prep	2 wks	Fri 9/5/25	Thu 9/18/25	117FS+4 wks	120
120	Form, Reinf., Place & Cure Footing	2 wks	Fri 9/19/25	Thu 10/2/25	119	121
121	Form, Reinf., Place & Cure Pier Stem (2 lifts)	6 wks	Fri 10/3/25	Thu 11/13/25	120	122
122	Form, Reinf., Place & Cure Pier Cap	4 wks	Fri 11/14/25	Thu 12/11/25	121	131
123	**Abutment 2**	**75 days**	**Fri 5/9/25**	**Thu 8/21/25**		
124	Excavate & Bedrock Prep	2 wks	Fri 5/9/25	Thu 5/22/25	112	125
125	Form, Reinforce, Place & Cure Footing	3 wks	Fri 5/23/25	Thu 6/12/25	124	126
126	Form, Reinforce, Place & Cure Stem Wall	3 wks	Fri 6/13/25	Thu 7/3/25	125	127
127	Form, Reinforce, Place & Cure Backwall	3 wks	Fri 7/4/25	Thu 7/24/25	126	128
128	Form, Reinforce, Place & Cure Approach Slab	2 wks	Fri 7/25/25	Thu 8/7/25	127	129
129	Backfill Abut. & Remove Temp. Earth Supports	2 wks	Fri 8/8/25	Thu 8/21/25	128	131
130	**Superstructure**	**100 days**	**Fri 12/12/25**	**Thu 4/30/26**		
131	Erect Bearings and Structural Steel	4 wks	Fri 12/12/25	Thu 1/8/26	129,122	132
132	Install Shielding System	4 wks	Fri 1/9/26	Thu 2/5/26	131	133
133	Form, Reinf., Place & Cure Deck (3 placements)	6 wks	Fri 2/6/26	Thu 3/19/26	132	134
134	Form, Reinf., Place & Cure Curbs	3 wks	Fri 3/20/26	Thu 4/9/26	133	135
135	Install Bridge Railing	2 wks	Fri 4/10/26	Thu 4/23/26	134	136
136	Install Membrane	1 wk	Fri 4/24/26	Thu 4/30/26	135	139
137	**Roadway**	**80 days**	**Fri 2/6/26**	**Thu 5/28/26**		
138	Approach Roadway Modifications	60 days	Fri 2/6/26	Fri 5/1/26	139SF	
139	Base Pave	2 wks	Fri 5/1/26	Thu 5/14/26	136	140,138SF
140	Final Pave	2 wks	Fri 5/15/26	Thu 5/28/26	139	143,141
141	Reopen bridge to all lanes of traffic	0 days	Thu 5/28/26	Thu 5/28/26	140	
142	**Project Closeout**	**40 days**	**Fri 5/29/26**	**Thu 7/23/26**		
143	Inspection and Produce Punchlist - Proposed Bridge	2 wks	Fri 5/29/26	Thu 6/11/26	140	144
144	Contractor Punchlist and Close-out - Proposed Bridge	6 wks	Fri 6/12/26	Thu 7/23/26	143	145
145	Construction Complete	0 days	Thu 7/23/26	Thu 7/23/26	144	



Appendix F

Traffic, Traffic Management, and Crash Data

STATE OF MAINE

FILE:

INTERDEPARTMENTAL MEMORANDUM

Date of Request: 5/27/2021 Return:

Latest Date Needed By 6/10/2021

To: **Daniel Webster** Dept.: MDOT, Bureau of Planning

From: **Tom Furrow** Dept.: Bridge Program

Subject: **Traffic Report** Project Manager: **Mark Parlin**

TOWN(S): Waterville-Winslow P.I.N. **23138.00**

COUNTY: Kennebec ROUTE: 0201X

LOCATION/ DESCRIPTION: Ticonic Bridge (#2854) over Kennebec River. Located on the Waterville-Winslow town line.

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

Prep By: dw3 ok-ewh

Description of Sections	Sec. 1 SR 100/137B/US 201 E/O WATER ST @ TL - Waterville	Sec. 1 SR 100/137B/US 201 E/O WATER ST @ TL - Waterville			
1 Latest AADT (Year)	16440 (2014)	16440 (2014)			
2 Current **2021** AADT	17430	17430			
3 Future **2033** AADT	19520				
4 Future **2041** AADT		20920			
5 DHV - % of AADT	10%	10%	%	%	%
6 Design Hourly Volume	1952	2092			
7 % Heavy Trucks (AADT)	3%	3%	%	%	%
8 % Heavy Trucks (DHV)	1%	1%	%	%	%
9 Direct.Dist. (DHV)	57%	57%	%	%	%
10 18-KIP Equivalent P 2.0	209	224			
11 18-KIP Equivalent P 2.5	200 (2021-2033)	214 (2021-2041)			

Notes or Remarks:

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: requesting accident data for the subject bridge project between nodes 35161 and 35162 on Route 2 between Rumf Rumford and Mexico.

Crash Data

H. C. L.
CRASH COLLISION DIAGRAM
DATA PACKAGE

COUNTY: **KENNEBEC** TOWN: **WINSLOW**

LOW NODE: **27831** HIGH NODE: **0000** REGION: **2** U/R: **URBAN**

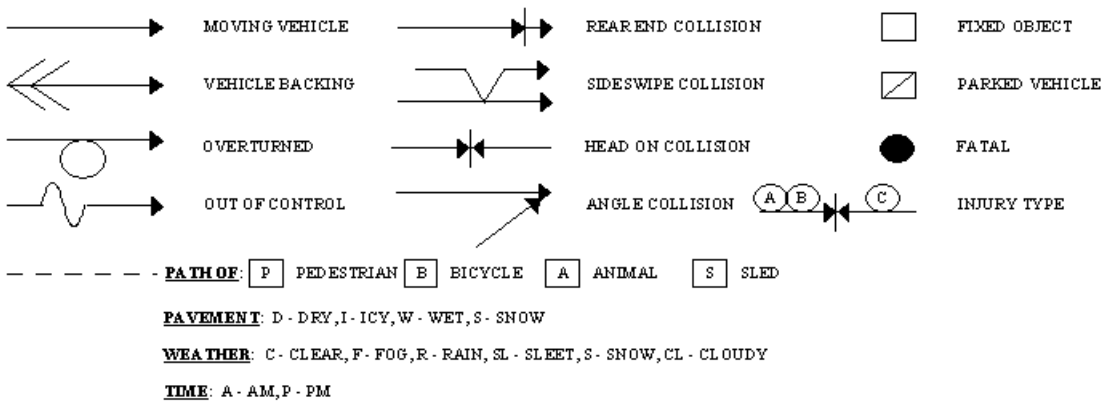
DESCRIPTION: **Jct Bay St/Benton Ave/Bridge St/Clinton Ave**

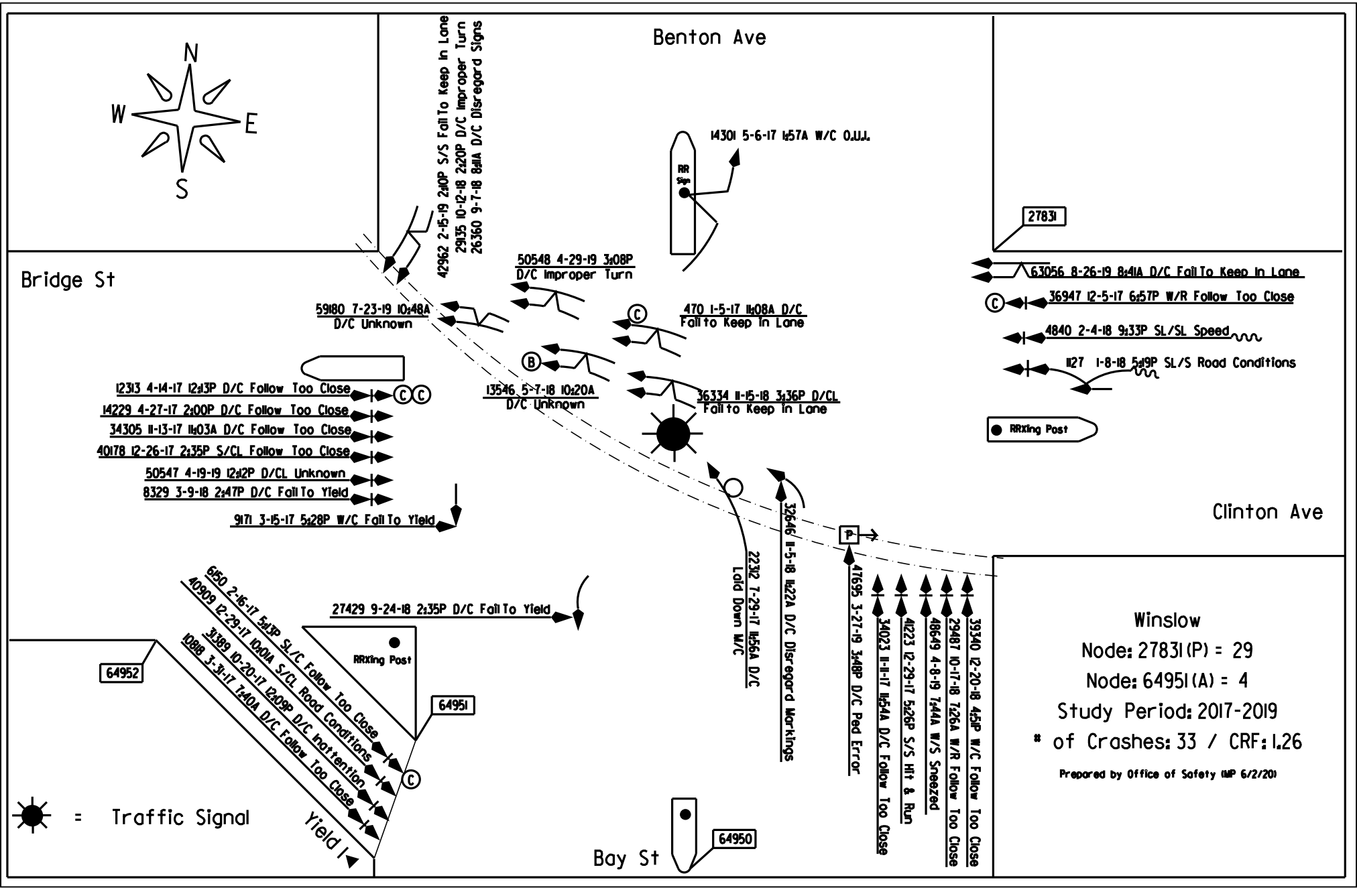
RTE # / RD #: **0100S** DATE DRAWN: **6/2/2020** DRAWN BY: **Michelle**

STUDY FROM: **1/1/2017** STUDY TO: **12/31/2019**

CRASH RATE: **1.52** CRF: **1.26** % INJURY: **18.2** TOTAL CRASHES: **33**

LEGEND




N
W
E
S
Benton Ave
Bridge St
Clinton Ave
Bay St
42962 2-15-19 2:40P S/S Fail To Keep in Lane
29135 10-12-18 2:20P D/C Improper Turn
26360 9-7-18 8:41A D/C Disregard Signs
14301 5-6-17 1:57A W/C O.U.J.
RR Sign
27831
50548 4-29-19 3:08P
D/C Improper Turn
59180 7-23-19 10:48A
D/C Unknown
470 1-5-17 11:08A D/C
Fail to Keep in Lane
13546 5-7-18 10:20A
D/C Unknown
36334 11-15-18 3:36P D/CL
Fail to Keep in Lane
63056 8-26-19 8:41A D/C Fail To Keep in Lane
36947 12-5-17 6:57P W/R Follow Too Close
4840 2-4-18 9:33P SL/SL Speed
1127 1-8-18 5:19P SL/S Road Conditions
RRXing Post
12313 4-14-17 12:13P D/C Follow Too Close
14229 4-27-17 2:00P D/C Follow Too Close
34305 11-13-17 11:03A D/C Follow Too Close
40178 12-26-17 2:35P S/CL Follow Too Close
50547 4-19-19 12:12P D/CL Unknown
8329 3-9-18 2:47P D/C Fail To Yield
9171 3-15-17 5:28P W/C Fail To Yield
22312 7-29-17 11:56A D/C
Laid Down W/C
32646 11-5-18 11:22A D/C Disregard Markings
47695 3-27-19 3:48P D/C Ped Error
34023 11-11-17 11:54A D/C Follow Too Close
41223 12-29-17 5:26P S/S Hit & Run
48649 4-8-19 7:44A W/S Sneezed
29487 10-17-18 7:26A W/R Follow Too Close
39340 12-20-18 4:5?P W/C Follow Too Close
6?50 2-16-17 5:43P SL/C Follow Too Close
40909 12-29-17 10:40A S/CL Road Conditions
31389 10-20-17 12:09P D/C Inattention
10818 3-31-17 7:40A D/C Follow Too Close
27429 9-24-18 2:35P D/C Fail To Yield
RRXing Post
64952
64951
64950
= Traffic Signal
Yield
Winslow
Node: 27831(P) = 29
Node: 64951(A) = 4
Study Period: 2017-2019
# of Crashes: 33 / CRF: 1.26
Prepared by Office of Safety (MP 6/2/20)


Search...
732864
BENTON AVE
WINSLOW
27832
Lower Kennebec River
137B
201
100
BRIDGE ST
64948
64952
27831
73287
CLINTON AVE
64951
67031
BAY ST
64950
Scale: 1:1303
100ft

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary Report

Report Selections and Input Parameters

REPORT SELECTIONS

- [x] Crash Summary I - Single Node
- [ ] Section Detail
- [x] Crash Summary II
- [ ] 1320 Public
- [ ] 1320 Private
- [ ] 1320 Summary

REPORT DESCRIPTION

Winslow
Jct Bay St/Benton Ave/Bridge St/Clinton Ave

REPORT PARAMETERS

Year 2017, Start Month 1 through Year 2019 End Month: 12

Route: 0100S	Start Node: 27831	Start Offset: 0	☐ Exclude First Node
	End Node: 27831	End Offset: 0	☐ Exclude Last Node

Crash Summary I

Nodes

Node	Route - MP	Node Description	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual M Ent-Veh	Crash Rate	Critical Rate	CRF
P27831	0100S - 1.83	Int of BAY ST BENTON AV BRIDGE ST CLINTON AV	9	33	0	0	1	5	27	18.2	7.214	1.52	1.21	1.26
												Statewide Crash Rate:	0.75	
Study Years:	3.00	NODE TOTALS:		33	0	0	1	5	27	18.2	7.214	1.52	1.21	1.26

Crash Summary II - Characteristics

Crashes by Day and Hour

	AM												PM												
	Hour of Day																								
Day Of Week	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	Un	Tot
SUNDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
MONDAY	0	0	0	0	0	0	0	1	1	0	1	2	0	0	1	1	0	1	0	0	0	0	0	0	0	8
TUESDAY	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	3
WEDNESDAY	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	3
THURSDAY	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	1	1	0	0	0	0	0	0	0	5
FRIDAY	0	0	0	0	0	0	0	1	1	0	1	0	3	0	3	0	0	1	0	0	0	0	0	0	0	10
SATURDAY	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Totals	0	1	0	0	0	0	0	3	2	0	3	5	3	0	6	3	1	4	1	0	0	1	0	0	0	33

Vehicle Counts by Type

Unit Type	Total	Unit Type	Total
1-Passenger Car	33	23-Bicyclist	0
2-(Sport) Utility Vehicle	19	24-Witness	2
3-Passenger Van	2	25-Other	0
4-Cargo Van (10K lbs or Less)	0	26-Construction	0
5-Pickup	7	27-Farm Vehicle	0
6-Motor Home	0	Total	66
7-School Bus	0		
8-Transit Bus	0		
9-Motor Coach	0		
10-Other Bus	0		
11-Motorcycle	1		
12-Moped	0		
13-Low Speed Vehicle	0		
14-Autocycle	0		
15-Experimental	0		
16-Other Light Trucks (10,000 lbs or Less)	0		
17-Medium/Heavy Trucks (More than 10,000 lbs)	2		
18-ATV - (4 wheel)	0		
20-ATV - (2 wheel)	0		
21-Snowmobile	0		
22-Pedestrian	0		

Crash Summary II - Characteristics

Crashes by Driver Action at Time of Crash

Driver Action at Time of Crash	Dr 1	Dr 2	Dr 3	Dr 4	Dr 5	Other	Total
No Contributing Action	14	23	1	0	0	0	38
Ran Off Roadway	0	0	0	0	0	0	0
Failed to Yield Right-of-Way	3	0	0	0	0	0	3
Ran Red Light	0	0	0	0	0	0	0
Ran Stop Sign	0	0	0	0	0	0	0
Disregarded Other Traffic Sign	0	2	0	0	0	0	2
Disregarded Other Road Markings	1	0	0	0	0	0	1
Exceeded Posted Speed Limit	0	0	0	0	0	0	0
Drove Too Fast For Conditions	0	1	0	0	0	0	1
Improper Turn	2	0	0	0	0	0	2
Improper Backing	0	0	0	0	0	0	0
Improper Passing	0	0	0	0	0	0	0
Wrong Way	0	0	0	0	0	0	0
Followed Too Closely	4	0	0	0	0	0	4
Failed to Keep in Proper Lane	2	2	0	0	0	0	4
Operated Motor Vehicle in Erratic, Reckless, Careless, Negligent or Aggressive Manner	1	0	0	0	0	0	1
Swerved or Avoided Due to Wind, Slippery Surface, Motor Vehicle, Object, Non-Motorist in Roadway	1	0	0	0	0	0	1
Over-Correcting/Over-Steering	0	0	0	0	0	0	0
Other Contributing Action	4	0	0	0	0	0	4
Unknown	1	1	0	0	0	0	2
Total	33	29	1	0	0	0	63

Crashes by Apparent Physical Condition And Driver

Apparent Physical Condition	Dr 1	Dr 2	Dr 3	Dr 4	Dr 5	Other	Total
Apparently Normal	31	29	1	0	0	0	61
Physically Impaired or Handicapped	0	0	0	0	0	0	0
Emotional(Depressed, Angry, Disturbed, etc.)	1	0	0	0	0	0	1
Ill (Sick)	0	0	0	0	0	0	0
Asleep or Fatigued	0	0	0	0	0	0	0
Under the Influence of Medications/Drugs/Alcohol	1	0	0	0	0	0	1
Other	0	0	0	0	0	0	0
Total	33	29	1	0	0	0	63

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	5	0	0	0	0	5
20-24	4	0	0	0	0	4
25-29	4	0	0	0	0	4
30-39	15	0	0	0	0	15
40-49	11	0	0	0	0	11
50-59	9	0	0	0	0	9
60-69	7	0	0	0	0	7
70-79	6	0	0	0	0	6
80-Over	2	0	0	0	0	2
Unknown	1	0	0	0	0	1
Total	64	0	0	0	0	64

Crash Summary II - Characteristics

Most Harmful Event

Most Harmful Event	Total	Most Harmful Event	Total
1-Overturn / Rollover	0	38-Other Fixed Object (wall, building, tunnel, etc.)	1
2-Fire / Explosion	0	39-Unknown	3
3-Immersion	0	40-Gate or Cable	0
4-Jackknife	0	41-Pressure Ridge	0
5-Cargo / Equipment Loss Or Shift	0	Total	63
6-Fell / Jumped from Motor Vehicle	0		
7-Thrown or Falling Object	0		
8-Other Non-Collision	0		
9-Pedestrian	0		
10-Pedalcycle	0		
11-Railway Vehicle - Train, Engine	0		
12-Animal	0		
13-Motor Vehicle in Transport	57		
14-Parked Motor Vehicle	1		
15-Struck by Falling, Shifting Cargo or Anything Set in Motion by Motor Vehicle	0		
16-Work Zone / Maintenance Equipment	0		
17-Other Non-Fixed Object	0		
18-Impact Attenuator / Crash Cushion	0		
19-Bridge Overhead Structure	0		
20-Bridge Pier or Support	0		
21-Bridge Rail	0		
22-Cable Barrier	0		
23-Culvert	0		
24-Curb	0		
25-Ditch	0		
26-Embankment	0		
27-Guardrail Face	0		
28-Guardrail End	0		
29-Concrete Traffic Barrier	0		
30-Other Traffic Barrier	0		
31-Tree (Standing)	0		
32-Utility Pole / Light Support	0		
33-Traffic Sign Support	0		
34-Traffic Signal Support	0		
35-Fence	0		
36-Mailbox	0		
37-Other Post Pole or Support	1		

Injury Data

Severity Code	Injury Crashes	Number Of Injuries
K	0	0
A	0	0
B	1	1
C	5	7
PD	27	0
Total	33	8

Road Character

Road Grade	Total
1-Level	26
2-On Grade	1
3-Top of Hill	1
4-Bottom of Hill	4
5-Other	1
Total	33

Traffic Control Devices

Traffic Control Device	Total
1-Traffic Signals (Stop & Go)	30
2-Traffic Signals (Flashing)	0
3-Advisory/Warning Sign	0
4-Stop Signs - All Approaches	0
5-Stop Signs - Other	0
6-Yield Sign	1
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	2
14-Other	0
Total	33

Light

Light Condition	Total
1-Daylight	26
2-Dawn	0
3-Dusk	0
4-Dark - Lighted	6
5-Dark - Not Lighted	1
6-Dark - Unknown Lighting	0
7-Unknown	0
Total	33

Crash Summary II - Characteristics

Crashes by Year and Month

Month	2017	2018	2019	Total
JANUARY	1	1	0	2
FEBRUARY	1	1	1	3
MARCH	2	1	1	4
APRIL	2	0	3	5
MAY	1	1	0	2
JUNE	0	0	0	0
JULY	1	0	1	2
AUGUST	0	0	1	1
SEPTEMBER	0	2	0	2
OCTOBER	1	2	0	3
NOVEMBER	2	2	0	4
DECEMBER	4	1	0	5
Total	15	11	7	33

Report is limited to the last 10 years of data.

Crash Summary II - Characteristics

Crashes by Crash Type and Type of Location

Crash Type	Straight Road	Curved Road	Three Leg Intersection	Four Leg Intersection	Five or More Leg Intersection	Driveways	Bridges	Interchanges	Other	Parking Lot	Private Way	Cross Over	Railroad Crossing	Traffic Circle-Roundabout	Total
Object in Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rear End - Sideswipe	0	0	4	24	0	0	0	0	0	0	0	0	0	0	28
Head-on - Sideswipe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Intersection Movement	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
Pedestrians	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Train	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Went Off Road	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
All Other Animal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Jackknife	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rollover	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fire	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Submersion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thrown or Falling Object	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Deer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moose	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Turkey	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	4	28	0	0	0	0	0	0	0	0	1	0	33

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Dry	Ice/Frost	Mud, Dirt, Gravel	Oil	Other	Sand	Slush	Snow	Unknown	Water (Standing, Moving)	Wet	Total
Blowing Sand, Soil, Dirt												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Blowing Snow												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Clear												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	2	2
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	17	0	0	0	0	0	1	0	0	0	1	19
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Cloudy												
Dark - Lighted	1	0	0	0	0	0	0	0	0	0	0	1
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	2	0	0	0	0	0	0	2	0	0	0	4
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Dry	Ice/Frost	Mud, Dirt, Gravel	Oil	Other	Sand	Slush	Snow	Unknown	Water (Standing, Moving)	Wet	Total
Fog, Smog, Smoke												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Other												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Rain												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	1	1
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	1	1
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Severe Crosswinds												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather / Light	Dry	Ice/Frost	Mud, Dirt, Gravel	Oil	Other	Sand	Slush	Snow	Unknown	Water (Standing, Moving)	Wet	Total
Sleet, Hail (Freezing Rain or Drizzle)												
Dark - Lighted	0	0	0	0	0	0	1	0	0	0	0	1
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Snow												
Dark - Lighted	0	0	0	0	0	0	0	1	0	0	0	1
Dark - Not Lighted	0	0	0	0	0	0	1	0	0	0	0	1
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	1	0	0	1	2
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	20	0	0	0	0	0	3	4	0	0	6	33

Traffic Memorandum

Date	To
February 27, 2021	Mark Parlin & Ed Hanscom - MaineDOT
Interoffice Correspondence	**From** Ariel Greenlaw - MaineDOT
	Subject Ticonic Bridge – Traffic Modeling Memo

HNTB

Introduction:

This memorandum summarizes traffic assumptions and analysis results related to the replacement of the Ticonic Bridge (#2854) spanning the Kennebec River and providing access between Waterville and Winslow. There are two intersections immediately adjacent to the structure:

- **Waterville**: Intersection of Spring Street, Water Street, Main Street, Front Street, and Bridge Street
- **Winslow**: Intersection of Bridge Street, Clinton Avenue, Benton Avenue and Bay Street

Analysis results will provide information for future bridge capacity needs and describe operational levels of service for potential maintenance of traffic alternatives. Due to the close proximity of adjacent intersections, bridge needs will be dictated by the capacity constraints of these intersections.

The results indicate a four-lane bridge configuration should be considered and that further analysis is required to confirm design and potential signal timings. The analysis also concluded the Winslow intersection will reach failing levels of service in the future year regardless of how many lanes are on the bridge; changes to the intersection lane configurations and signal phasing are necessary to achieve acceptable levels of service in the long term.

The results further indicate that the best operating traffic management scheme evaluated, as it relates to the operation of the two intersections during construction, involves two lanes eastbound across the bridge with a westbound detour. A further evaluation of user costs and detour routes, EMS and public relations considerations is ongoing and will be used to support a comprehensive assessment of traffic management strategies.

Existing Study Area Projects:

There are several existing projects within this corridor that will have a large impact on this project including:

- **The Waterville Downtown Revitalization** funded by a BUILD Grant with improvements based on recommendations from the Downtown Waterville Feasibility Study. For the purposes of this project, it will reconfigure the westerly Waterville intersection, providing a two-way configuration on Front Street. Intersection improvements are anticipated to be in place for this project.

- **The Statewide Traffic Signal BUILD Grant** aimed to update signal equipment in rural locations through the state. Both intersections adjacent to the bridge have signal upgrades and ADA improvements included in this project. These upgrades are scheduled for Spring 2022.

Changes resulting from the above changes have been considered in the completion of this evaluation.

Data Sources:

Existing volumes, models, and signal timing and phasing used for analysis were obtained from the following sources:

- Downtown Waterville Feasibility Study (Gorrill-Palmer)
- Waterville Downtown Areas: WIN: 024371.00, Federal Aid Project 2437100 (Sebago Technics)
- Statewide Traffic Signal Modernization: Win: 024301.00, Federal Project 2430100 (Sebago Technics)
- Site visit February 12, 2021 (HNTB)
- Streetlight analysis accessed February 2021
- Maine Department of Transportation 2009 Turning Movement Count for the Winslow Intersection
- Maine Department of Transportation Permanent Count Station at Silver Street

Streetlight Analysis was used to validate AM and PM Peak time periods and to provide generalized insight into potentially changing traffic trends due to COVID. The AM Peak hour is strong at 7am, representing approximately 5-6% of daily volumes pre- and post- COVID. The PM Peak hour varies from 4-6pm, trending earlier post- COVID and represents approximately 9-10% of the daily volume. In this area average monthly volumes dipped by as much as 50% during April but have remained within 10% of 2019 volumes since August. These follow general trends observed by the permanent count station at Silver Street.

Due to the varied nature of the sources, all volumes used are for conceptual-level analysis and estimation purposes only.

Site Visit

A site visit was conducted Friday, February 12, 2020 between 4:30pm and 5:30pm at the Winslow intersection to confirm site conditions and traffic patterns. Even during the winter, and with COVID effects, traffic operations suffer from the split phasing required by the existing intersection geometry. Large queues were observed in the north and southbound directions. A high-level Streetlight analysis indicated that observed volumes were likely approximately 30% below typical summer peak volumes at the intersection. Based on observations and modeling, we judge this intersection will reach failing levels of service in the future year regardless of how many lanes are on the bridge; changes to the intersection lane configurations and signal phasing are necessary to achieve acceptable levels of service in the long term.

Based on field observations, a confirmation of existing and future year design volumes for any future signal timing and potential intersection modification design is requested.

Existing study area safety

Table 1 identifies characteristics for the high crash intersection[1] of Bay Street, Benton Avenue, Bridge Street, and Clinton Avenue. A review of the collision diagram indicates rear-end crash patterns typical with signalized intersections as well as a pattern of sideswipe collisions related to the double left turn northbound from Bay Street onto the Ticonic Bridge. If intersection geometry is modified as part of this project, an examination of improvements at this intersection will be conducted.

[1] A high crash location (HCL) is defined by MaineDOT as a roadway segment or intersection that has both a critical rate factor (CRF) greater than 1.0 and eight or more crashes over a three-year period. The CRF compares the actual crash rate to similar locations (using Hundred Million Vehicle Miles (HMVM) in the state – if the CRF is greater than 1.0, the intersection is worse than comparable locations.

Table 1[2] – High Crash Locations

Location Type	Node	Location	Crashes	CRF
Intersection	27831	Bay Street/Benton Avenue/Bridge Street/Clinton Avenue	33	1.52

Ticonic Bridge

While not a high crash segment, there were 11 reported crashes on the Ticonic Bridge. With the exception of 1 crash (with a bicycle), all crashes were vehicular rear-end/collision in type.

Intersection of Spring Street, Main Street, Bridge Street, Water Street and Front Street

Also not a high crash location, there were 11 reported crashes at Waterville Intersection. Crash patterns were not examined in detail as the configuration of this intersection will change as part of the Waterville Downtown Revitalization Project.

Analysis Assumptions:

Analysis was conducted using Synchro/SimTraffic version 10 software. This software allowed for a high-level look at operations between the two intersections across the bridge. The following analysis assumptions were made to prepare this evaluation:

- Annual growth rates were assumed to be approximately 0.85% - 0.9%[3]
- Existing Conditions were modeled in the year 2020
- Future Design Conditions were modeled in the year 2040

Methodology

The following results provide estimated operations at the adjacent bridge intersections using Level of Service (LOS)[4]. The LOS criteria for evaluating the intersections is shown in Table 2. Both intersections involved in the model are signalized and follow the "Signalized Intersection" criteria.

Table 2 - LOS for At-Grade Intersections

LOS	Signalized Intersection	Unsignalized Intersection
A	≤10 sec	≤10 sec
B	10-20 sec	10-15 sec
C	20-35 sec	15-25 sec
D	35-55 sec	25-35 sec
E	55-80 sec	35-50 sec
F	>80 sec	>50 sec

[2] Statistics provided are from the most recent available three-year period (2017-2019).

[3] This is based on the Title Sheet growth rates from the Waterville Downtown Area Project.

[4] Level of Service is a method of using stopped delay per vehicle to estimate intersection operations with an A-F scale. Intersections are estimated to "fail" when they reach an LOS of E or F. Acceptable delays for signalized and unsignalized intersections vary.

Future Conditions Scenarios Modeled

Proposed bridge configurations and maintenance traffic scenarios were modeled. Preliminary sketches are included that provide further layout information. In general, the proposed bridge configurations were investigated to answer the following questions:

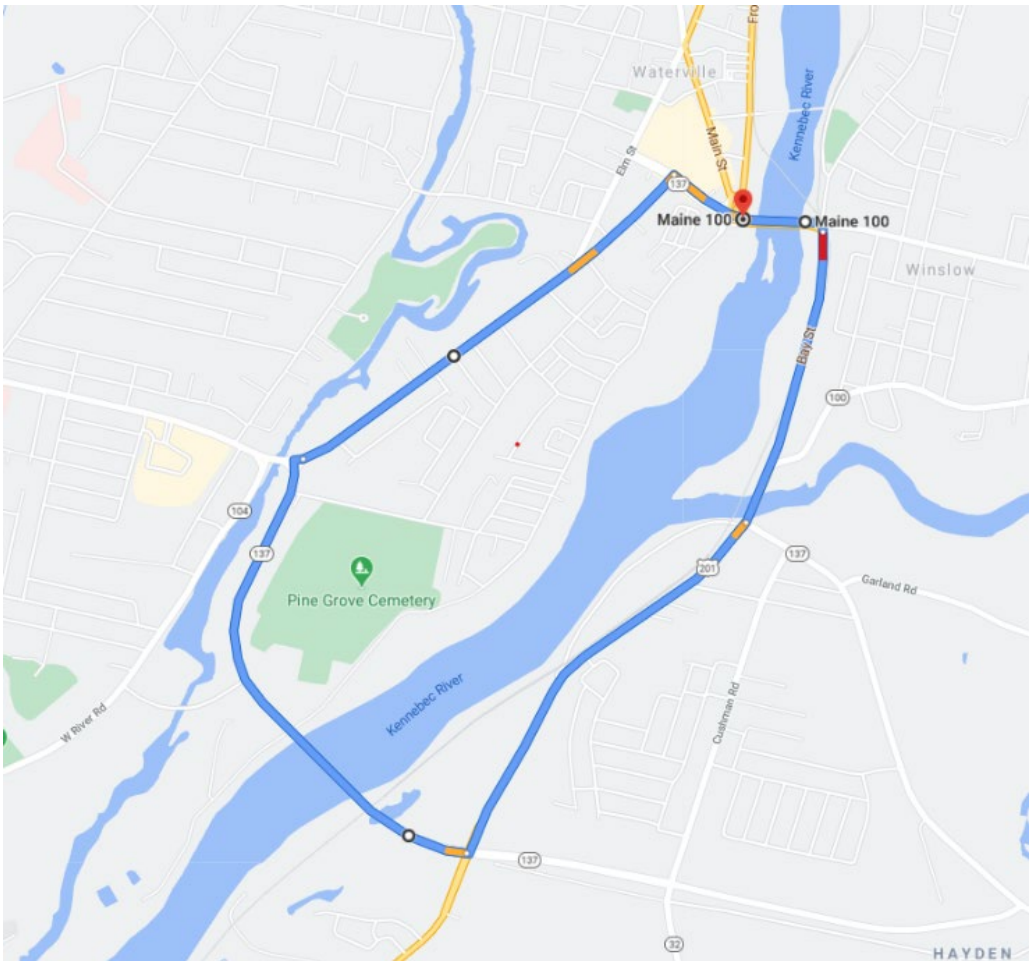
- Can the bridge operate acceptably with 4 lanes?
- Are three approach lanes required for the eastbound Winslow Intersection approach? If three legs are required, what happens to level of service when a short left turn bay is used?
- Is sequential phasing at the intersection necessary or can the intersection approach layout be modified so that opposing movements occur concurrently (and improve intersection efficiency).

Maintenance of Traffic Scenarios Modeled

For the maintenance of traffic condition, 2 scenarios were evaluated:

- 2 lane bridge with 1 lane in each direction and intersection modification to removal dual approaches (included for reference).
- 2 lane bridge with 2 lanes eastbound and intersection modifications to the Winslow intersection to prevent vehicles from entering the bridge. A preliminary detour for westbound traffic is shown below. The detour route has not been operationally evaluated.

Figure 1 – Potential Detour for Bridge Closure



Results

The results for each future scenario are summarized in Table 3.

Table 3: Future Condition Analysis Results

	Intersection	Winslow	
Year	Peak	AM Peak	PM Peak
2020	No Build	C	E*
2040	No Build	D	E*
	Config 1	E*	F*
	Config 2	E*	E*
	Config 3	B	B
	Config 4**	B	B
	Config 5**	E*	E*
	Config 6	B	B

* Indicates movements/approaches with failing levels of service.

** Configurations 4 and 5 are not recommended based on bridge and highway engineering considerations

The Waterville intersection geometry does not change between alternatives investigated and, thus, the LOS for the intersection is judged to operate acceptably in any of the future conditions.

The analysis of the Winslow intersection geometry results in the following conclusions:

- PM Peak dictates;
- The existing condition will fail in the future design year;
- A two-lane approach eastbound does not work – either with a combined left-thru and right or left and combined thru-left approach (Configuration 1 and 2);
- The intersection can operate at an overall acceptable level of service with four lanes on the bridge and dual lane approaches can be removed; and
- If necessary, a reduced length left turn bay can be utilized.

The results for each maintenance of traffic option are presented in Table 4.

Table 4: Maintenance of Traffic Analysis Results

			Intersection	Waterville		Winslow	
			Peak	AM Peak	PM Peak	AM Peak	PM Peak
2020	Two-Lane	Two-Way	Phase 1	C	C	E	C
			Phase 2	B	C	C	F**
		One-Way	--	A	B	B	C

** Indicates delays of several minutes

Under the proposed two-way two-lane phasing option, both intersections will experience failing levels of service during peak hours. This is not atypical for construction conditions and much of this congestion clears up after the first few weeks as users find alternative routes. However, from a purely operational perspective, the scenario in which there are two lanes on the bridge that travel eastbound and westbound traffic detours is the better option. An evaluation of the detour route is planned to allow for a holistic approach to evaluating these traffic management options. For either alternative, updated counts for modified signal timing and phasing is suggested.

Conclusions

Based on the results presented in the previous section, a four-lane configuration on the bridge is feasible. Adjustments to the lane assignments and signal phasing at the Winslow Intersection will be required. If completed, these changes are expected to improve signal operations both in the opening year, and in the future year, compared to the existing condition (existing condition includes improvements scheduled as part of the BUILD Grant signal project). Future analysis using updated traffic counts is suggested to allow for finalization of any planned improvements.

For traffic management during construction the best operating maintenance of traffic approach involves a one-way bridge with two lanes eastbound. Westbound traffic would be detoured off-site. Detour routes and user costs are being evaluated separately. These factors, as well as EMS, Public Relations and other factors will need to be considered prior to finalizing a decision on traffic management for construction.

Maintenance of Traffic Alternatives Matrix

Waterville-Winslow: Ticonic Bridge Replacement Project

MaineDOT WIN # 23138.00

DRAFT

Traffic Management Alternatives Evaluation Matrix

Last Updated: July 16, 2021

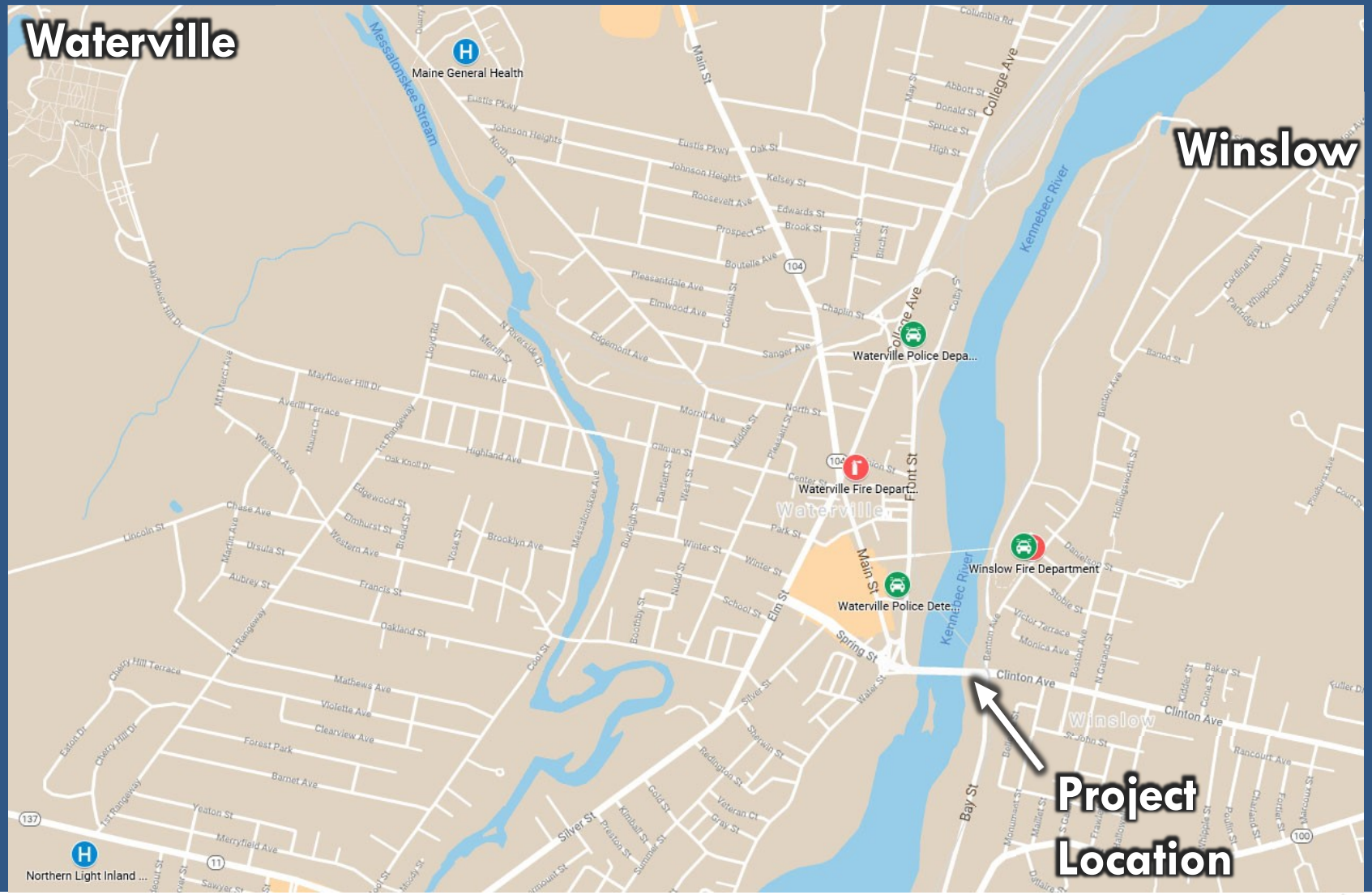
	Evaluation Criteria		Option 1 Maintain one lane in each direction on the birdge	Option 2 Maintain EB traffic on the bridge, detour WB traffic off site	Option 3 Full bridge closure, detour all traffic off site	Option 4a Option 1 w/ extended periods of bridge closure	Option 4b Option 2 w/ extended periods of bridge closure
Description	**Detour Description**		One lane of traffic in each direction maintained on bridge, excess traffic diverted off site	Maintain two lanes of traffic EB on bridge at peak travel times, reduction to one lane EB allowed during off peak hours. WB traffic detoured off site	Close bridge for duration of construction. All traffic detoured off site	Option 1 with up to 9 months of bridge closure to accommodate key construction activities. Actual closure periods and durations remain TBD.	Option 2 with up to 9 months of bridge closure to accommodate key construction activities. Actual closure periods and durations remain TBD.
	Anticipated Construction Duration		36 months	36 months	28 months	32 months	32 months
	Consistency of Traffic Patterns		Better	Best	Best	Lowest	Lowest
	No. of Intersection Modifications		*TBD - Pending refined traffic analysis*	*TBD - Pending refined traffic analysis*	*TBD - Pending refined traffic analysis*	*TBD - Pending refined traffic analysis*	*TBD - Pending refined traffic analysis*
	No. of Temporary Traffic Signals		*TBD - Pending refined traffic analysis*	*TBD - Pending refined traffic analysis*	*TBD - Pending refined traffic analysis*	*TBD - Pending refined traffic analysis*	*TBD - Pending refined traffic analysis*
User & Community Impacts	**Estimated User Costs**		$6.94 Million	$13.82 Million	$22.68 Million	$11.72 Million	$16.60 Million
	Estimated Average % of AADT Detoured		6% (Pending refined traffic analysis)	50% (Pending refined traffic analysis)	100%	32% (Pending refined traffic analysis)	64% (Pending refined traffic analysis)
	Added Travel Time & Distance	**Average of all vehicles**	*Least* *(Pending refined traffic analysis)*	*Less* *(Pending refined traffic analysis)*	*Greatest* *(Pending refined traffic analysis)*	Hybrid of Option 1 and 3	Hybrid of Option 2 and 3
		Eastbound traffic	*Greater* *(Pending refined traffic analysis)*	*Least* *(Pending refined traffic analysis)*	*Greatest* *(Pending refined traffic analysis)*	Hybrid of Option 1 and 3	Hybrid of Option 2 and 3
		Westbound traffic	*Less* *(Pending refined traffic analysis)*	*Greater* *(Pending refined traffic analysis)*	*Greatest* *(Pending refined traffic analysis)*	Hybrid of Option 1 and 3	Hybrid of Option 2 and 3
		Affect on surrounding traffic flow	*Least* *(Pending refined traffic analysis)*	*Greater* *(Pending refined traffic analysis)*	*Greatest* *(Pending refined traffic analysis)*	*Less* *(Pending refined traffic analysis)*	*Less* *(Pending refined traffic analysis)*
	Safety / EMS & Mutual Aid Impacts		Congestion at ends of bridge may slow response times	No impact for EB response time. WB response time increased by detour (+/- 9 minutes & 3.7 miles each way) Use of pre-emption would facilitate WB movement.	EMS and mutual aid diverted south to Carter Memorial Drive (+/- 9 minutes & 3.7 miles each way)	Hybrid of Option 1 and 3	Hybrid of Option 2 and 3
	Pedestrian Impacts		Phase 1 - Diverted to Two Cent Bridge Phase 2 - Pedestrians maintained on site	Phase 1 - Diverted to Two Cent Bridge Phase 2 - Pedestrians maintained on site	Phase 1 & 2 - Diverted to Two Cent Bridge	Hybrid of Option 1 and 4	Hybrid of Option 2 and 4
Constructability & Access	**Constructability & Work Zone Flexibility**		Worst	Better	Best	Moderate	Better
	Access & Lay Down Area		Worst	Better	Best	Worst	Better
	Night Work		Most	Less	Least	Less	Less
	Worker Safety		Worst	Better	Best	Better	Better

Color Code Legend: **More Desirable** → **Less Desirable**

TRAFFIC MANAGEMENT – Project Location

MaineDOT HNTB

TRAFFIC MANAGEMENT – Emergency Services



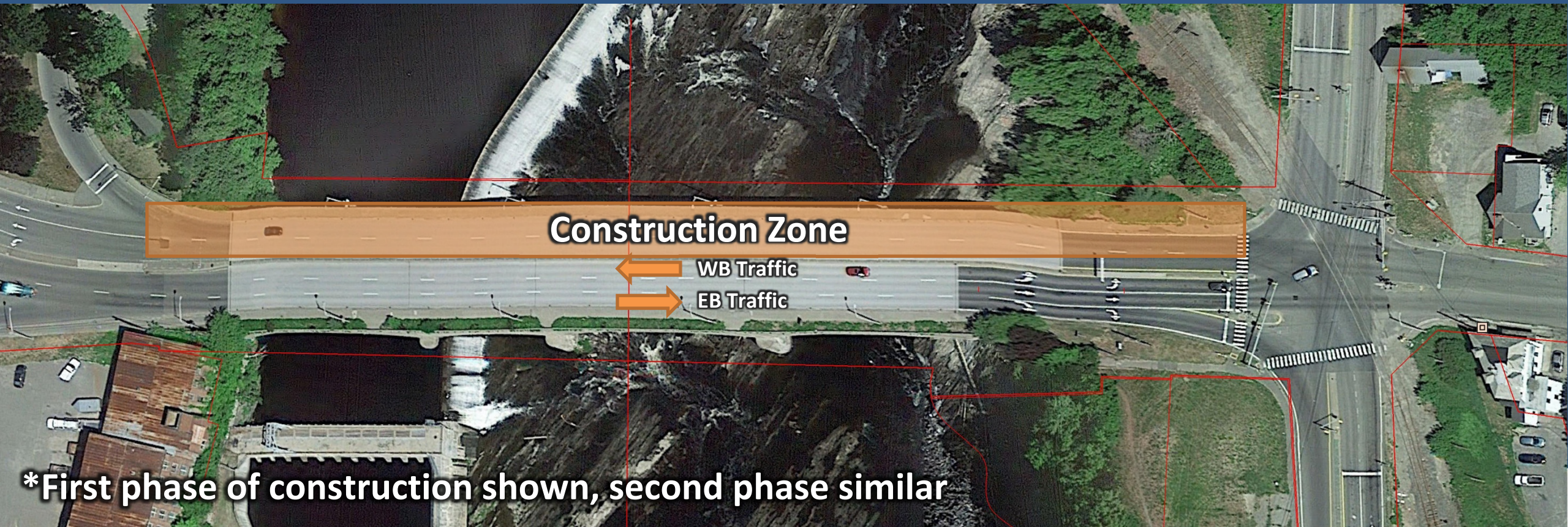
TRAFFIC MANAGEMENT OPTIONS

- Existing AADT's

MaineDOT HNTB

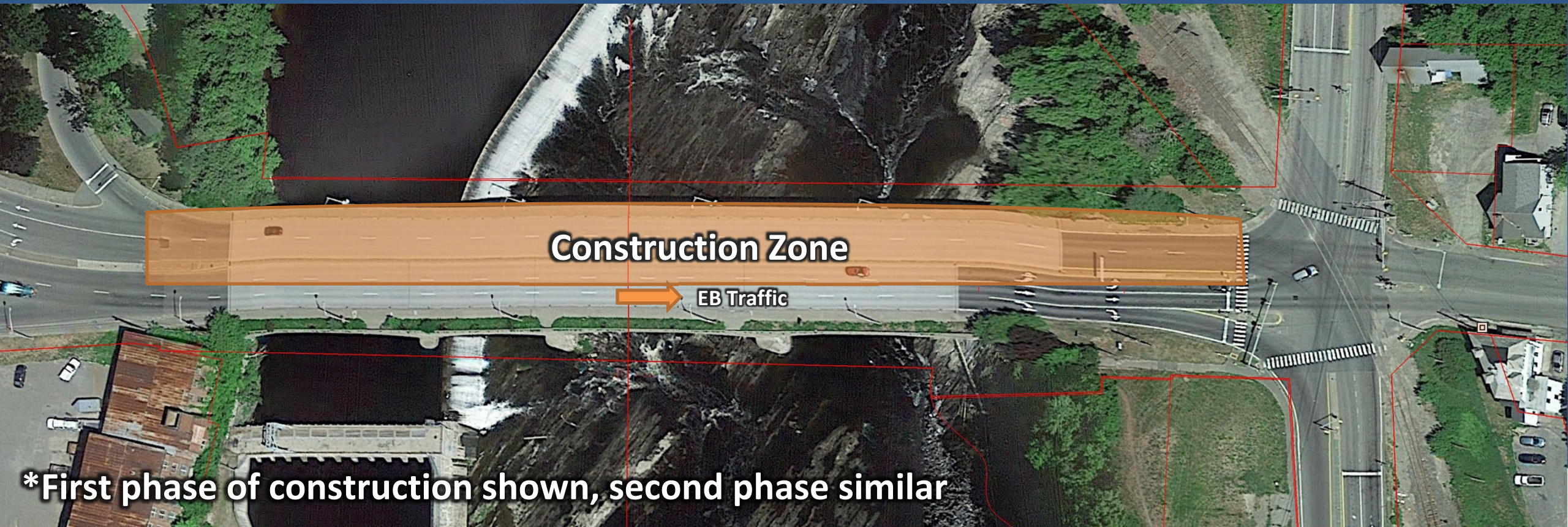
TRAFFIC MANAGEMENT OPTIONS

- Option 1:
  - Traffic limited to one lane of traffic in each direction
  - Occasional short-term bridge closures for key activities (e.g. demolition, girder erection)
  - Two construction phases, longest overall duration



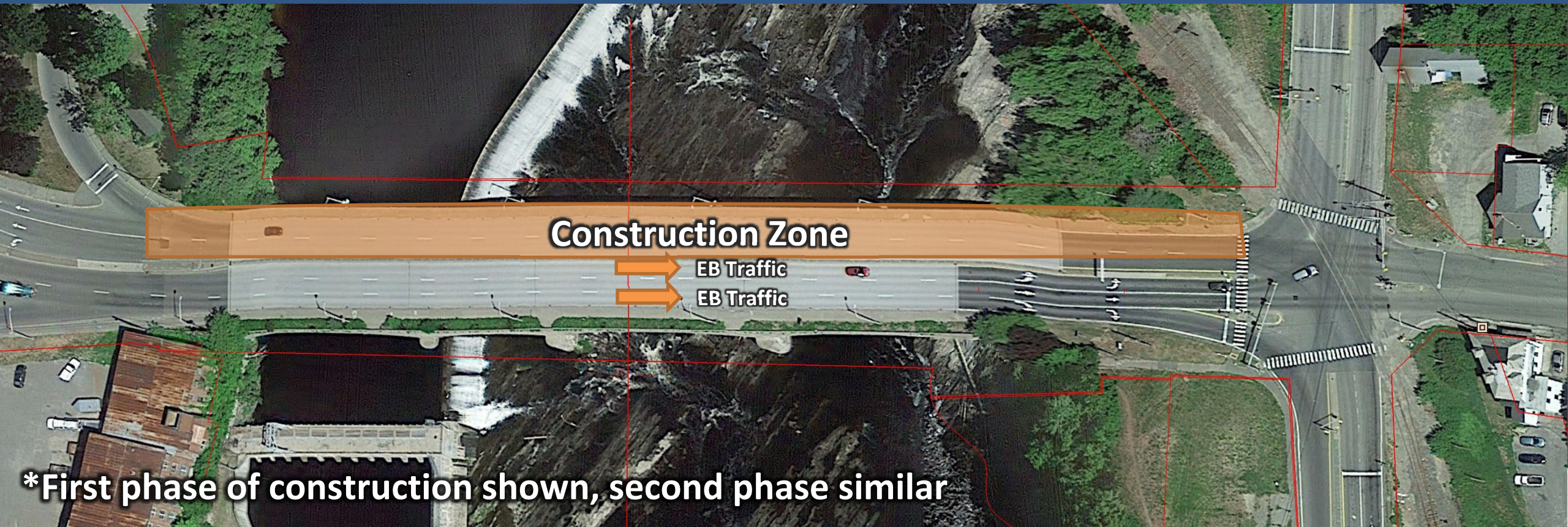
TRAFFIC MANAGEMENT OPTIONS

- Option 2a:
  - Traffic limited to one lane in eastbound direction only. Westbound traffic detoured.
  - Improved worker safety, more efficient construction operations
  - Two construction phases, duration slightly shorter than Option 1.



TRAFFIC MANAGEMENT OPTIONS

- Option 2b:
  - Traffic limited to one lane in eastbound direction only. Westbound traffic detoured.
  - Improved worker safety, more efficient construction operations
  - Two construction phases, duration slightly shorter than Option 1.



TRAFFIC MANAGEMENT OPTIONS

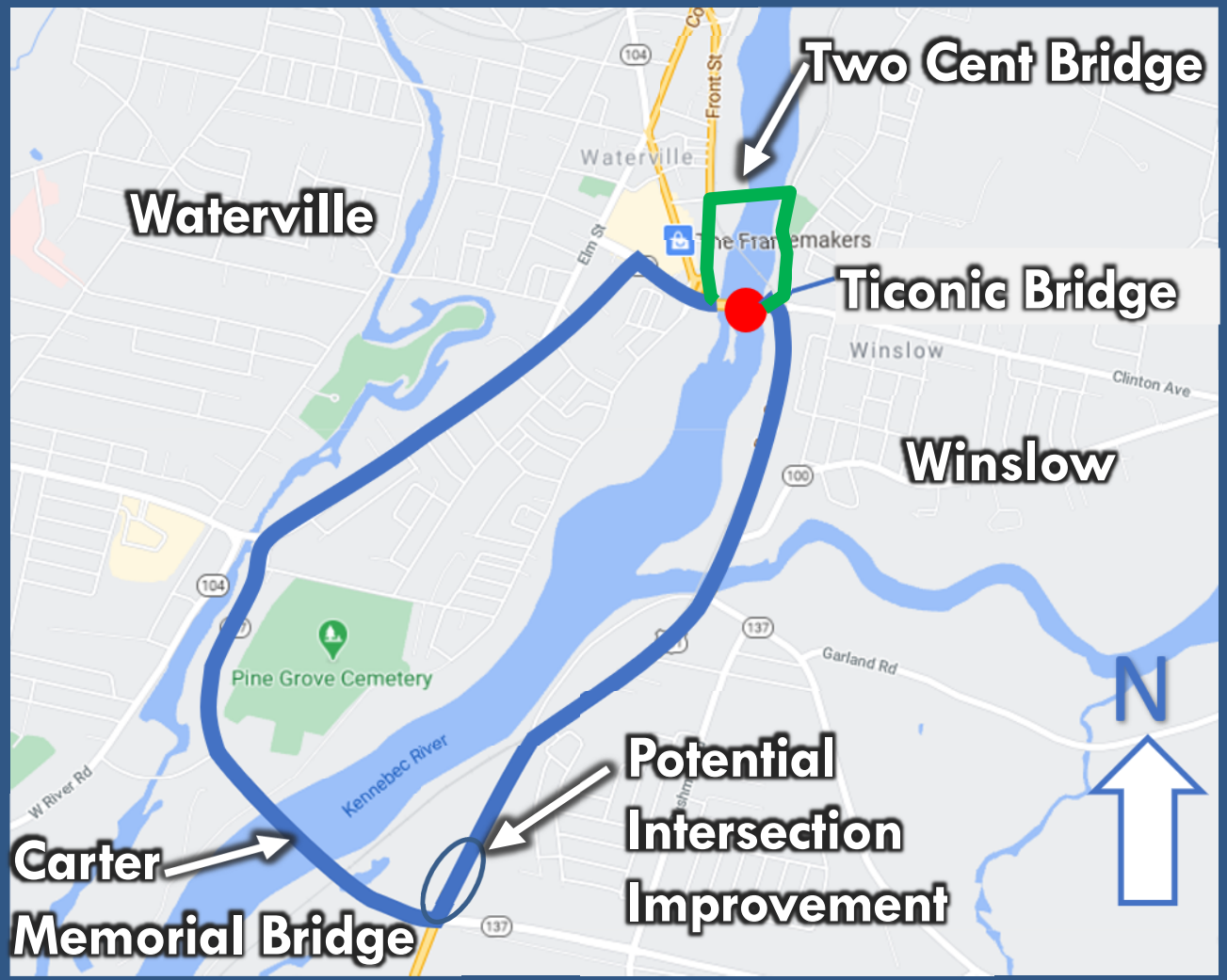
- Option 3:
  - Bridge closed to traffic, motorists and pedestrians detoured.
  - More efficient construction operations, fewer temporary works, improved safety.
  - Shortest overall duration (saves an estimated 6-12 months compared to Options 1 & 2)

TRAFFIC MANAGEMENT OPTIONS

- Option 4a:
  - Option 1 with a period of complete bridge closure to facilitate faster construction.
  - Improved worker safety, more efficient construction operations.

- Option 4b:
  - Option 2 with a period of complete bridge closure to facilitate faster construction.
  - Improved worker safety, more efficient construction operations.

TRAFFIC MANAGEMENT OPTIONS



Potential Vehicle Detour Route via. Carter Memorial Drive (BLUE)

Change in travel time and distance (abut. to abut.)

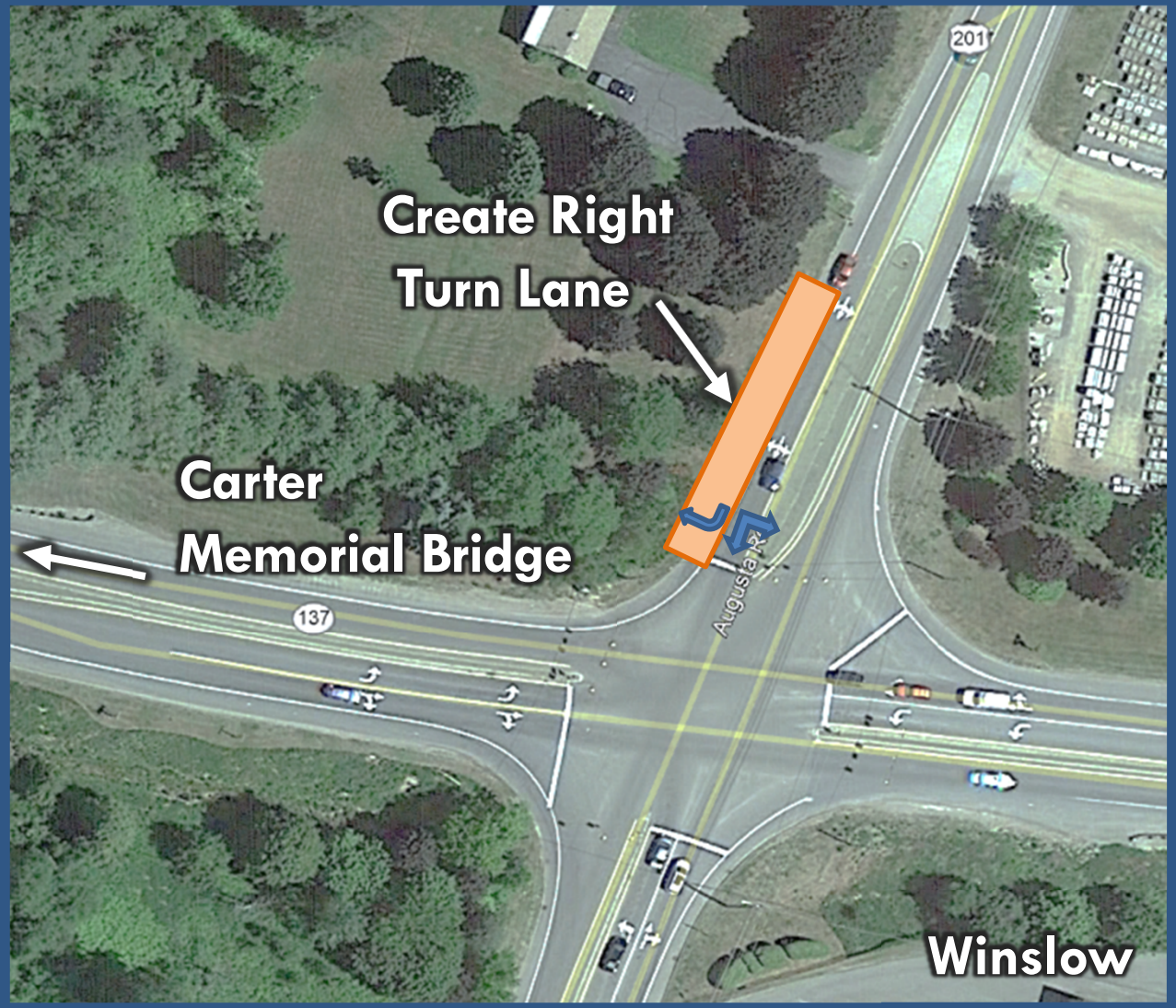
- Travel Time: 11 minutes
- Change in Travel Time: +10 minutes
- Travel Distance: 4.2 miles
- Change in Travel Distance: +4.0 miles

Potential Pedestrian Detour Route via. Two Cent Bridge (GREEN)

Change in travel time and distance (abut. To abut.)

- Travel Time: 15 minutes
- Change in Travel Time: +10 minutes
- Travel Distance: 0.7 miles
- Change in Travel Distance: +0.5 miles

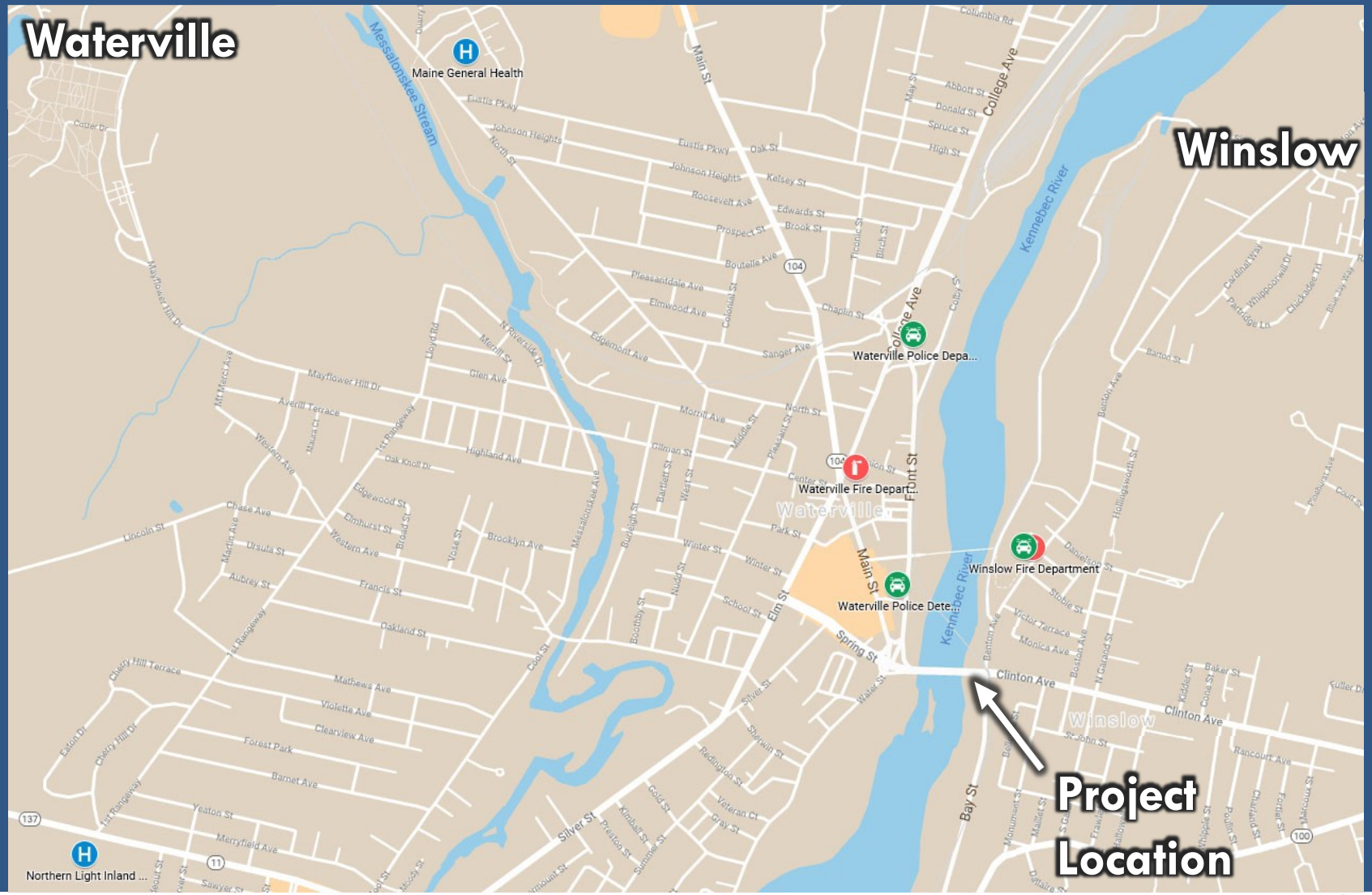
TRAFFIC MANAGEMENT OPTIONS



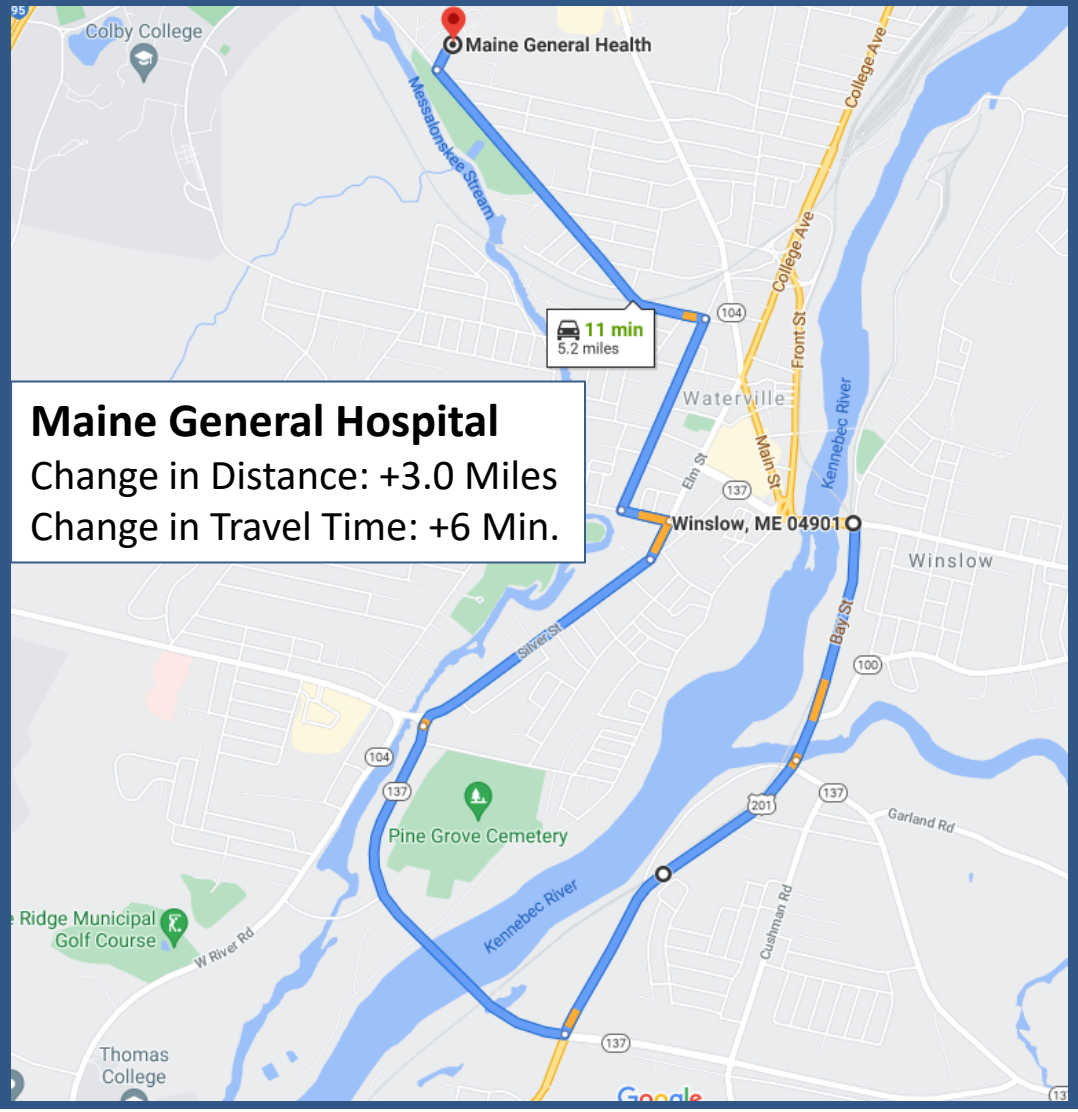
Potential Intersection Improvement

- Create right turn lane along detour/alternate route.
- Shoulder used as a turn lane in existing traffic condition.

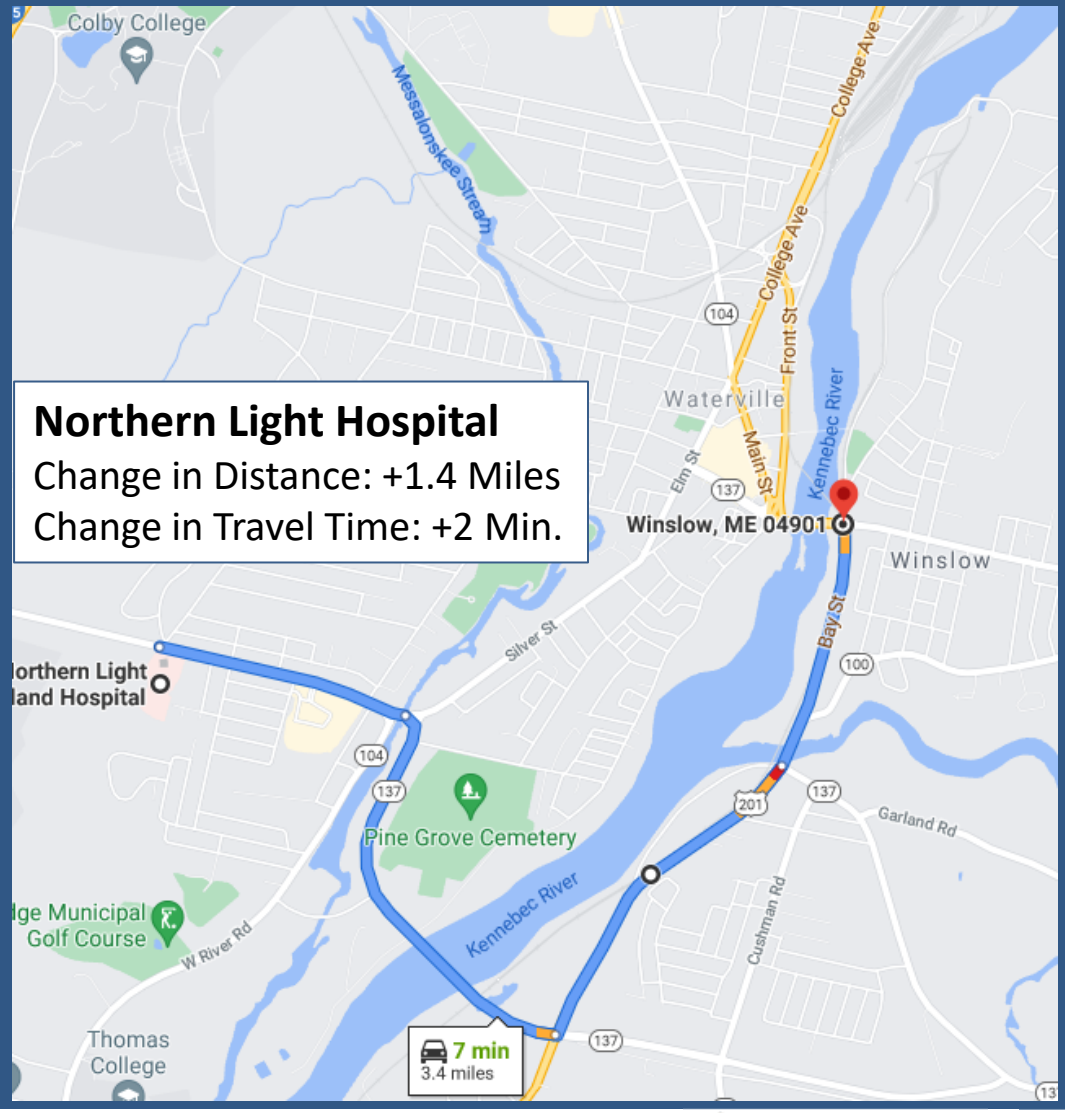
TRAFFIC MANAGEMENT – Emergency Services



TRAFFIC MANAGEMENT – Emergency Services



Maine General Hospital
Change in Distance: +3.0 Miles
Change in Travel Time: +6 Min.

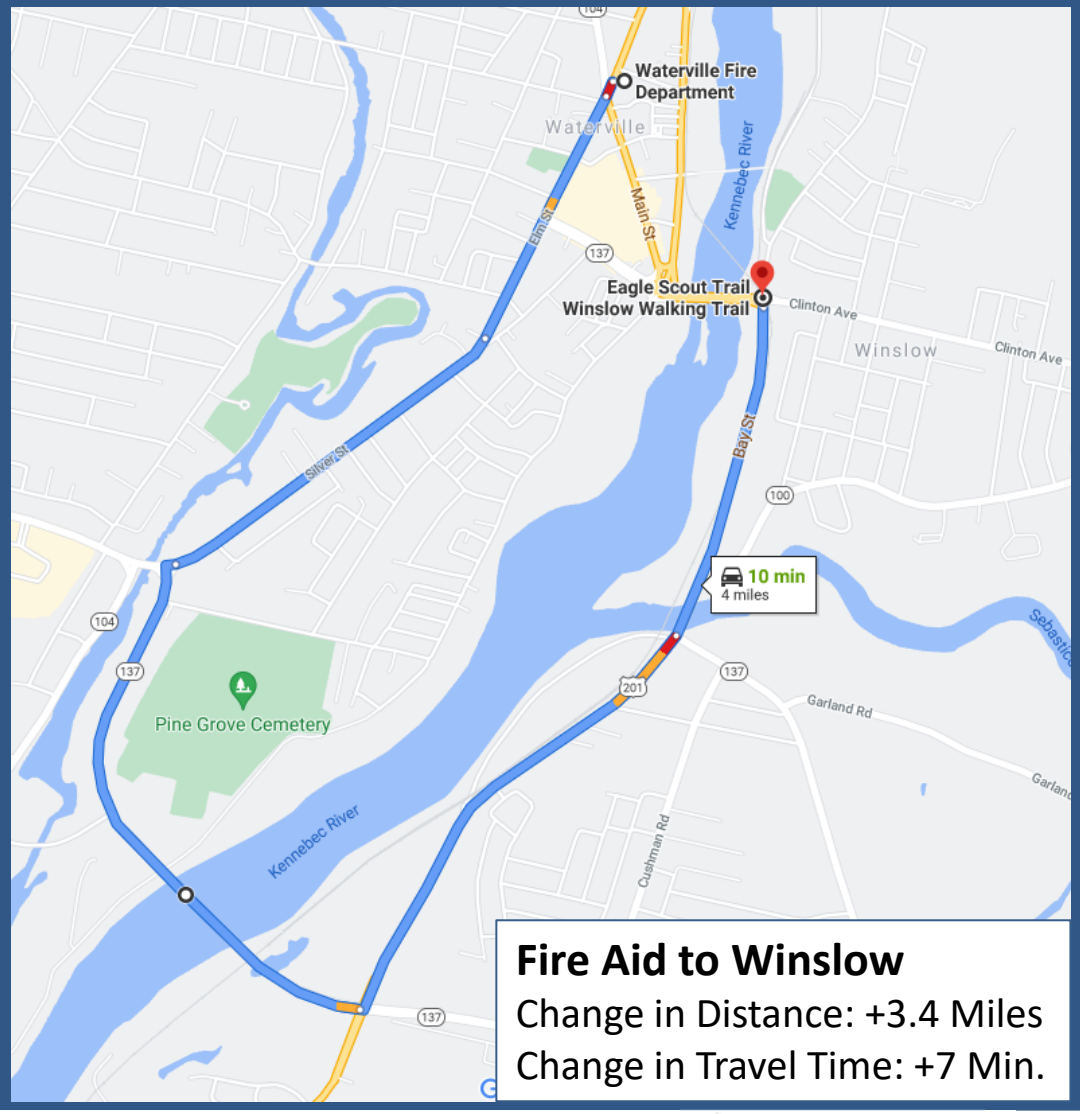


Northern Light Hospital
Change in Distance: +1.4 Miles
Change in Travel Time: +2 Min.

MaineDOT HNTB

TRAFFIC MANAGEMENT – Emergency Services

Fire Aid to Waterville
Change in Distance: +3.5 Miles
Change in Travel Time: +7 Min.



Fire Aid to Winslow
Change in Distance: +3.4 Miles
Change in Travel Time: +7 Min.

MaineDOT HNTB

Maintenance of Traffic Summary and TAMEing Materials

Appendix G

Preliminary Cost Estimates

Preliminary Cost Estimate

Alternative 1

PROJECT:	Waterville - Winslow, Ticonic Bridge #2854	**WIN:**	23138.00
Alternative 1:	Bridge Replacement: Two span bridge on-alignment Variable Depth Steel Girders with Concrete Deck Deck Area: 566’ x 80.33' = 45,470 SF	**ESTIMATED BY:**	HNTB

SUPERSTRUCTURE:	45,470	**SF**	×	$415.00	=	$18,871,000
ABUTMENTS	2	**EA**	×	$750,000.00	=	$1,500,000
PIER	1	**EA**		$1,600,000.00		$1,600,000
COFFERDAMS	3	**EA**	×	$500,000.00	=	$1,500,000
TEMP. STRUCTURAL SUPPORTS	2	**EA**		$150,000.00		$300,000
STRUCTURAL EXCAVATION & BORROW	5,530	**CY**	×	$40.00	=	$222,000
HEAVY RIPRAP	1,200	**CY**	×	$95.00	=	$114,000
BRIDGE DEMOLITION	1	**EA**		$6,000,000.00		$6,000,000
DETOUR UPGRADES	1	**LS**	×	$200,000.00	=	$200,000
REHABILITATION CONTINGENCIES				N/A	=	$0
MISCELLANEOUS (TCP'S, FIELD OFFICE, ETC.)				7%	=	$2,061,000
MOBILIZATION				10%	=	$3,031,000
				STRUCTURE SUBTOTAL	=	**$35,400,000**
APPROACHES	300	**LF**	×	$2,500.00	=	$750,000
MISCELLANEOUS				10%	=	$75,000
MOBILIZATION				10%	=	$75,000
				APPROACHES SUBTOTAL	=	**$900,000**
				TOTAL CONSTRUCTION COST	=	**$36,300,000**
PRELIMINARY ENGINEERING				3%	=	$1,200,000
RIGHT OF WAY					=	$30,000
CONSTRUCTION ENGINEERING				8%	=	$2,970,000
OTHER:					=	$0
				TOTAL PROJECT COST	=	**$40,500,000**

Waterville-Winslow

WIN 023138.00 TICONIC BRIDGE

BRIDGE NO. 2854

Preliminary Design Estimate

Updated: August 3, 2021

ITEM NO.	ITEM DESCRIPTION	UNIT	BRIDGE QUANTITY	CIVIL QUANTITY	TOTAL QUANTITY	UNIT PRICE	CONTRACT TOTAL
201.11	Clearing	AC		0.2	0.2	$12,000.00	$2,400.00
202.13	Removing Existing Railings Retained By Department	LF	1086		1086	$15.00	$16,290.00
202.15	Removing Existing Manhole or Catch Basin	EA		6	6	$1,000.00	$6,000.00
202.19	Removing Existing Bridge (46,400SF)	LS	1		1	$6,032,000.00	$6,032,000.00
202.202	Removing Pavement Surface	SY		700	700	$40.00	$28,000.00
203.20	Common Excavation	CY		1,900	1900	$25.00	$47,500.00
203.25	Granular Borrow	CY	2200		2200	$35.00	$77,000.00
206.082	Structural Earth Excavation - Major Structures, Plan Quantity	CY	3100		3100	$40.00	$124,000.00
206.092	Structural Rock Excavation - Major Structures	CY	230		230	$100.00	$23,000.00
304.10	Aggregate Subbase Course - Gravel	CY		1,550	1550	$50.00	$77,500.00
403.2081	Hot Mix Asphalt, 12.5 mm Nominal Maximum Size (Polymer Modified)	Ton	350	240	590	$300.00	$177,000.00
403.209	Hot Mix Asphalt, 9.5 mm Nominal Maximum Size (Sidewalks, Drives, Islands & Incidentals)	Ton		46	46	$400.00	$18,400.00
403.211	Hot Mix Asphalt, 9.5 mm Nominal Maximum Size (Shimming)	Ton		20	20	$350.00	$7,000.00
403.2131	Hot Mix Asphalt, 12.5 mm Nominal Maximum Size (Base and Intermediate Base Course, Polymer Modfied)	Ton	350	530	880	$300.00	$264,000.00
409.15	Bituminous Tack Coat, Applied	Gal	250	190	440	$30.00	$13,200.00
502.219	Structural Concrete, Abutments and Retaining Walls (990 CY)	LS	1		1	$1,089,000.00	$1,089,000.00
502.22	Structural Concrete, Abutments and Retaining Walls (Placed Under Water)	CY	400		400	$350.00	$140,000.00
502.239	Structural Concrete Piers (1100 CY)	LS	1		1	$1,210,000.00	$1,210,000.00
502.24	Structural Concrete Piers (Placed Under Water)	CY	340		340	$300.00	$102,000.00
502.26	Structural Concrete Roadway and Sidewalk Slab on Steel Bridges (1380 CY)	LS	1		1	$1,932,000.00	$1,932,000.00
502.31	Structural Concrete Approach Slab (49 CY)	LS	1		1	$29,400.00	$29,400.00
502.341	Structural Concrete, Roadway Median	CY		5	5	$500.00	$2,500.00
502.49	Structural Concrete Curbs and Sidewalks (370 CY)	LS	1		1	$444,000.00	$444,000.00
502.77	Fiber Reinforced Polymer Bridge Drain - Type: G	EA	8		8	$6,000.00	$48,000.00
503.12	Reinforcing Steel, Fabricated and Delivered	LB	258500		258500	$0.85	$219,725.00
503.13	Reinforcing Steel, Placing	LB	258500		258500	$0.85	$219,725.00
503.26	Stainless Steel Reinforcement, Fabricated and Delivered	LB	482600		482600	$3.00	$1,447,800.00
503.27	Stainless Steel Reinforcement, Placing	LB	482600		482600	$0.85	$410,210.00
504.702	Structural steel fabricated and delivered, welded (4,170,000 LB)	LS	1		1	$7,297,500.00	$7,297,500.00
504.71	Structural steel erection (4,170,000 LB)	LS	1		1	$1,459,500.00	$1,459,500.00
505.08	Shear Connectors (12,500 EA)	LS	1		1	$75,000.00	$75,000.00
506.9104	Thermal Spray Coating (4,170,000 LB)	LS	1		1	$3,127,500.00	$3,127,500.00
507.0831	Steel Bridge Railing, 4 Bar (1148 LF)	LS	1		1	$241,500.00	$241,500.00
508.14	High Performance Waterproofing Membrane (4,100 SY)	LS	1		1	$123,000.00	$123,000.00
511.07	Cofferdam: Pier	LS	1		1	$500,000.00	$500,000.00
511.07	Cofferdam: Abutment 1	LS	1		1	$400,000.00	$400,000.00
511.07	Cofferdam: Abutment 2	LS	1		1	$400,000.00	$400,000.00
512.081	French Drains (270 LF)	LS	1		1	$13,500.00	$13,500.00
515.21	Protective Coating for Concrete Surfaces (1420 SY)	LS	1		1	$14,200.00	$14,200.00
520.23	Expansion Device - Finger Joint (80.33 LF)	EA	2		2	$150,000.00	$300,000.00
523.52	Bearing Installation	EA	27		27	$2,500.00	$67,500.00
523.5551	Pot or Disc Bearings, Fixed	EA	9		9	$7,000.00	$63,000.00
523.5552	Pot or Disc Bearings, Expansion	EA	18		18	$8,000.00	$144,000.00
524.301	Temporary Structural Support (Abut 1)	LS	1		1	$150,000.00	$150,000.00
524.301	Temporary Structural Support (Abut 2)	LS	1		1	$150,000.00	$150,000.00
603.179	18" Culvert Pipe Option III	LF		150	150	$125.00	$18,750.00
604.072	Catch Basin Type A1-C	EA		6	6	$4,200.00	$25,200.00
604.092	Catch Basin Type B1-C	EA		1	1	$4,400.00	$4,400.00
604.16	Altering Catch Basin to Manhole	EA		1	1	$1,800.00	$1,800.00
604.18	Adjusting Manhole or Catch Basin to Grade	EA		4	4	$1,000.00	$4,000.00
605.11	12" Underdrain Type C	LF		120	120	$70.00	$8,400.00
606.1301	31" W-Beam Guardrail - Mid-Way Splice (Steel Post, 8"Offset Blocks, Single Faced)	LF		65	65	$25.00	$1,625.00
606.1304	31" W-Beam Guardrail - Mid-Way Splice (Steel Post, 8" Offset Blocks, Over 15' Radius)	LF		25	25	$35.00	$875.00
606.1306	31" W-Beam Guardrail - Mid-Way Splice Tangent Terminal	EA		2	2	$3,000.00	$6,000.00
606.1721	Bridge Transition - Type 1	EA		4	4	$3,300.00	$13,200.00
606.259	Anchorage Assembly	EA		2	2	$500.00	$1,000.00
606.265	Terminal End - Single Rail - Galvanized Steel	EA		2	2	$150.00	$300.00
608.26	Curb Ramp Detectable Warning Field	SF		40	40	$125.00	$5,000.00
609.11	Vertical Curb Type 1	LF		500	500	$70.00	$35,000.00
609.12	Vertical Curb Type 1 - Circular	LF		36	36	$90.00	$3,240.00
609.221	Terminal Curb Type 1	LF		60	60	$80.00	$4,800.00
609.34	Curb Type 5	LF		80	80	$50.00	$4,000.00
609.35	Curb Type 5 - Circular	LF		14	14	$90.00	$1,260.00
610.16	Heavy Riprap	CY	1200		1200	$95.00	$114,000.00
615.07	Loam	CY		50	50	$85.00	$4,250.00
620.58	Erosion Control Geotextile	SY	800		800	$4.00	$3,200.00
634.160	Highway Lighting	LS		1	1	$37,500.00	$37,500.00
634.210	Conventional Light Standard	EA		8	8	$3,000.00	$24,000.00
639.18	Field Office, Type A	EA		1	1	$30,000.00	$30,000.00
643.117	Traffic Signal Modifications - Temporary	LS		1	1	$12,000.00	$12,000.00
643.72	Temporary Traffic Signal	LS		1	1	$40,000.00	$40,000.00
659.10	Mobilization	LS	1		1	$3,205,000.00	$3,205,000.00
652.XXX	Maintenance of Traffic Control Devices	LS		1	1	$450,000.00	$450,000.00
652.XXX	Off Site Detour Improvement - Augusta Road Right Turn	LS		1	1	$150,000.00	$150,000.00
652.XXX	Pedestrian Detour Upgrades	LS		1	1	$50,000.00	$50,000.00
						Subtotal =	$32,992,650.00
						Contingency (10%) =	$3,299,265.00
						Total =	$ 36,300,000.00