Maine Department of Transportation
Off-System Bridge Replacements

2023-2026
Bridge Investment Program
Planning and Bridge Project Grants

MaineDOT

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I. BASIC PROJECT INFORMATION – DESCRIPTION, LOCATION, AND PARTIES

1. Project Description

The State of Maine Department of Transportation (MaineDOT) is requesting $30,495,000 in Bridge Investment Program (BIP) grant funding for the Off-System Bridge Investment Bundle Project ("Project.")

The Project consists of the replacement of nine (9) bridges across rural areas of central Maine (Figure 1). These rural bridges are crucial for connecting otherwise geographically isolated communities. According to the National Bridge Inventory (NBI), all nine (9) bridges are in poor condition (Attachment A). Additionally, five (5) of the bridges are considered scour critical, meaning their foundations are either unstable under potential scour conditions or field reviews have identified existing scour instabilities. Another three (3) bridges are currently stable under existing scour conditions but require action to protect their foundations. Furthermore, all these bridges are geometrically undersized in both width and length according to today's design standards.

Figure 1. MaineDOT Off-System Bridge Improvement Bundle Locations.

Due to their isolation and rural nature, these bridges experience low traffic volumes, which makes it challenging to prioritize them for funding within the broader scope of MaineDOT's infrastructure needs. Consequently, they often fall to the bottom of the priority list and continue to deteriorate. These bridges are essential for regional and state roadway networks, connecting people with everyday necessities and essential services such as places of employment, schools, grocery stores, and medical care. Notably, three (3) of these bridges serve dead-end roads, making them even more critical for the residents who rely on them. Without replacement or rehabilitation these bridges are at risk of further deterioration to the point of closure, resulting in severe adverse connectivity, environmental, economic, and social impacts to the surrounding communities.

The closure of any of these bridges will result in a delay of the delivery of emergency services and will increase

vehicle miles traveled (VMT) and localized greenhouse gas emissions (GHG) through use of detour routes. By improving safety, efficiency, and reliability of the movement of people and freight over these bridges, reducing the number of bridges in poor condition, and leveraging MaineDOT's non-Federal financial contributions, the Project will advance all three (3) goals of the BIP as established in the December 20, 2023, Notice of Funding Opportunity – 693JJ324NF00006.

2. Project Location

The Project spans the central part of the state, including structures in six (6) of Maine's counties - Franklin, Hancock, Penobscot, Piscataquis, Sagadahoc, and Somerset Counties. Attachment B labels the location of each structure, including NBI identification numbers, Historically Disadvantaged Communities and Areas of Persistent Poverty.

The status of each bridge location relative to Census Urban Areas (CUA), Areas of Persistent Poverty (APP), and/or Historically Disadvantaged Communities (HDC) is summarized in Table 1. The proposed construction in these high-poverty areas will also help bolster local job rates. By allowing local contractors to staff their projects with community members, as indicated by conversations with contractors in the state, the project will provide much-needed employment opportunities.

Table 1. Bridge Status Relative to CUA, APP, and HDC.[1]

NBI Number	Census Tract	Census Urban Area	Area of Persistent Poverty	Historically Disadvantage Community	Total Population	Per Capita Income	Persons Below Poverty Level
0382	23-007-9701.1	No	No	No	1,983	$49,934	7.5%
0561	23-07-9711.00	No	No	No	2,783	$31,903	11.0%
2090	23-025-9663.00	No	No	No	1,816	$28,808	11.5%
2159	23-001-0302.00	No	No	No	4,529	$33,966	9.0%
2672	**23-025.9653.02**	**No**	**Yes**	**Yes**	**1,706**	**$32,294**	**17.2%**
3921							
5494	**23-009-9653.00**	**No**	**No**	**Yes**	**4,974**	**$31,101**	**11.4%**
5505	23-019-0110.00	No	No	No	2,900	$39,450	10.1%
5559	**23-021-9606.00**	**No**	**Yes**	**Yes**	**2,187**	**$26,007**	**23.5%**

[1]*Sources: DOT Grant Project Location Verification and American Community Survey (ACS) 2022 5-Year*
Bold text indicates bridges within Historically Disadvantaged Communities.

Overall, the state's population is projected to grow by 2.6% from 2020 to 2030, with Hancock (2.2%), Penobscot (0.9%), and Franklin and Sagadahoc (0.6%) counties all anticipated to experience growth due to factors such as lower property and housing costs, increased remote work opportunities, rural employment (e.g., forestry, paper mill, tourism), and desire for a rural lifestyle. The projected decrease in population for Piscataquis (-5.0%) and Somerset (-1.2%) counties risks being exacerbated due to a lack of adequate infrastructure such as safe, efficient, and reliable bridges.[1] Recent state legislation, *An Act to Implement the Recommendations of the Commission To Increase Housing Opportunities in Maine by Studying Zoning and Land Use Restrictions*

[1] https://www.maine.gov/dafs/economist/sites/maine.gov.dafs.economist/files/inline-files/Maine%20Population%20Outlook%20to%202030_5.pdf, p. 3

(commonly referred to as LD 2003), allows for an increase in residential density and the elimination of single-family only residential zoning throughout the state, thus expanding housing potential in rural areas.[2] Finally, the Maine Department of Economic and Community Development's 2023 report, *State of Maine Housing Production Needs Study*, anticipates the need for between 6,620 – 9,610 new housing units in the Project counties by 2030.[3] Increased residential density in rural areas will increase the need for improved infrastructure as well as the consequences of a transportation network disruption.

3. Lead Applicant

As the sole applicant, MaineDOT manages and funds all state-owned transportation assets. With approximately 1,900 employees, the Department disburses more than $600 million annually, including Federal-aid highway program funds under Title 23 U.S.C. as well as state and local funds. MaineDOT performs extensive analysis of infrastructure conditions to prioritize projects for funding that have the most immediate impact and align with USDOT and state transportation goals. The Department has a proven track record as a reliable recipient of previous TIGER, FASTLANE, BUILD, RAISE, INFRA, Culvert AOP, Rural, and CRISI grant funding. USDOT can rely on the Department to meet obligation and construction deadlines without risk.

4. Other Public and Private Parties

There are no other public or private parties or funders involved in delivering the Project.

5. Additional Eligibility Requirements

The bridges included in this Project serve as linkages on rural, local roads. These roads, and so the bridges, can be used by pedestrians and bicyclists. Designs of replacement structures will consider enhanced facilities for these users, as practicable.

II. NATIONAL BRIDGE INVENTORY DATA

All nine (9) of the bridges are listed in the NBI. Detailed data for each bridge are included in Sheet 8 of the Bridge Project Application Template.

III. PROJECT COSTS – GRANT FUNDS, SOURCES, AND USES OF ALL PROJECT FUNDING

MaineDOT requests $30,495,000 in BIP Project Grant funding. The Department will provide a 20% match towards the total project cost using Maine State Highway funding. All mandated budget forms have been uploaded to Grants.gov. The Project budget conforms with the December 20, 2023, BIP NOFO, and upon award, given the Department's technical capacity and Federal grant experience, MaineDOT expects to satisfy applicable administrative and obligation

[2] https://www.mainelegislature.org/legis/bills/getPDF.asp?paper=HP1489&item=9&snum=130
[3] https://mainehousing.org/docs/default-source/default-document-library/state-of-maine-housing-production-needs-study_full_final-v2.pdf, p. 56

requirements. See Attachment C for a full budget breakdown, all dollar amounts are provided as 2024 dollars. Important elements of Project funding include:

1. Non-Federal Match funding includes 20% state funding committed by MaineDOT from its State Highway Fund. A funding commitment letter accompanies the application. Project match funding will be sourced from State Funds.
2. There have been no previously incurred expenses to date.
3. According to the BCA the project has a projected benefit of $923,503,096 over the 30-year analysis period (Attachment D).
4. The Project has a benefit-cost ratio of at least 32:1 based on a Net Present Value (NPV) at a 10% discount rate over 30 years (Attachment D).
5. Savings are realized primarily through coordination of construction and bridge closures requiring detours on surrounding roads. This limits greenhouse gas emissions and minimizes travel time interruptions. Reduced maintenance costs also contribute to cost savings.
6. No funding is contingent upon satisfying a condition, nor is it available only during a set period.
7. No funds other than the requested Grant funding are subject to Federal Limits.

1. Contingency

As with all previous Federal grants MaineDOT has applied for/received, sufficient contingency has been included in the budget to cover unexpected costs, cost increases, and/or inflation. MaineDOT closely monitors inflation in the construction sector and stays up to date on labor and material cost increases, leading to a 3% annual inflation rate applied to future Project costs.

2. Previously Incurred Costs

There have been no previously incurred costs to date.

3. Maintenance Commitment

Maine's Governor's budget includes $207.2 million in State Highway Funds for Fiscal Years 2025 and 2026 for operating and maintaining the state's transportation system. This funding formula is consistent with past and current efforts and is anticipated to continue.

4. Discretionary Funding Need

MaineDOT is unlikely to be able to fully self-fund the Project. The Department intends to bend the curve on their off-system bridge inventory; however, because the entire work plan budget is allocated, there is a great need for discretionary funding, which is described in MaineDOT's long range plan, *Working to Move Maine*. According to the American Road and Transportation Builder's Association (ARTBA), which analyzed and ranked 2024 Federal Highway Administration (FHWA) NBI data, Maine ranks fourth (4th) in the country for the percentage of structurally deficient bridges. The ARTBA data concluded that of the state's 2,518 bridges, 388 (15.4%) are now structurally deficient. This continues an alarming trend in which the state's ranking for

structurally deficient bridges as a percentage of bridge inventory has moved up from seventh (7th) with 12.6% of bridges classified as structurally deficient in 2021.[4]

The population of Mainers aged 65 and older is expected to increase 37% between 2020 and 2030.[5] As older individuals begin to drive less or reach an age where driving is no longer practical, the opportunity to grow gas tax receipts will continue to challenge State lawmakers. More fuel-efficient vehicles and electric vehicles (EVs) supported by the impressive expansion of electric vehicle infrastructure also reduce tax receipts available to fund road and bridge improvements. Under the Infrastructure Investment and Jobs Act (IIJA) formula funding, Maine can expect to receive $1.1 billion for Federal-aid highway apportioned programs, including $135 million for bridge replacement and repairs over five (5) years.[6] The increase in formula funding, although significant (28%), will by and large be offset by construction cost inflation fueled by tight labor and material markets. The amount is also insufficient to cover the state's growing off-system bridge needs.[7] Through MaineDOT's off-system bridge bundling program, the department's will apply its general approach, born of fiscal necessity, of doing the best with what is available. BIP discretionary funding will help MaineDOT insulate the state from the effects of rising costs and improve bridge conditions throughout the state.

IV. MERIT CRITERIA

The following sections describe how the anticipated improvements as part of the proposed nine (9) bridge replacements will meet USDOT BIP selection criteria.

1. State of Good Repair

MaineDOT aims to rebuild deficient off-system bridges, bringing the state's bridge system further toward a state of good repair; however, due to challenges related to a backlog of aging bridges and the rural nature of the bridges included in this Project, BIP funding is critical to keep pace with the deteriorating infrastructure as the bridges approach their end of life simultaneously. As shown in Table 2, all nine bridges are in poor condition and are over 50 years old, exceeding their original designed service life. The proposed replacement bridges will be designed with a 75-year service life. Additionally, Bridge #5505 in the Town of Carmel is already posted for load limiting its usage for heavier commercial vehicles and utility delivery vehicles. Many of the bridges due to condition and low HL-93 Inventory load ratings risk future load postings as conditions worsen.

[4] https://artbabridgereport.org/state/ranking
[5] https://www.maine.gov/dafs/economist/sites/maine.gov.dafs.economist/files/inline-files/Maine%20Population%20Outlook%20to%202030_0.pdf, p. 2
[6] https://www.whitehouse.gov/wp-content/uploads/2023/10/Maine-Fact-Sheet.pdf, p. 1

Table 2. Summary of Project Bridge Conditions.

NBI Number	County Name	Town Name	Year Built[1]	Deck Rating	Superstructure Rating	Substructure Rating	Channel Rating	Culvert Rating	Bridge Condition	AADT	Bypass Detour Length	Scour Rating
0382	Franklin	Salem Twp	1974	N	N	N	5	4	3 –Poor	101	100	4
0561	Franklin	Chesterville	1950	4	4	4	6	N	3 – Poor	127	6	3
2090	Sommerset	Embden	1634	5	5	4	6	N	3 – Poor	599	0	3
2159	Sagadahoc	Bowdoin	1936	4	6	4	7	N	3 – Poor	412	100	5
2672	Sommerset	Caratunk	1922	4	4	5	5	N	3 – Poor	196	0	4
3921	Sommerset	Caratunk	1945	4	4	5	5	N	3 – Poor	180	100	3
5494	Hancock	Orland	1951	5	5	4	6	N	3 – Poor	291	7	2
5505	Penobscot	Carmel	1963	5	4	6	5	N	3 – Poor	600	3	4
5559	Piscataquis	Sangerville	1954	4	4	5	5	N	3 – Poor	103	3	3

[1]*Red cells indicate poor condition ratings.*

There were 1,131 off-system bridges in Maine in 2023, 382 of which will require reconstruction in the near future. Of those, 199 were reported as being in poor condition in 2023, or 18%. Figure 2 shows the resulting undesirable upturn in poor condition off-system bridges. MaineDOT aims to reduce the percentage of off-system bridges in poor condition to below 15% and reverse the current trend. To achieve this, MaineDOT is taking a targeted approach and has carefully selected the Project bridges following a detailed review of the state's Fair and Poor bridges.

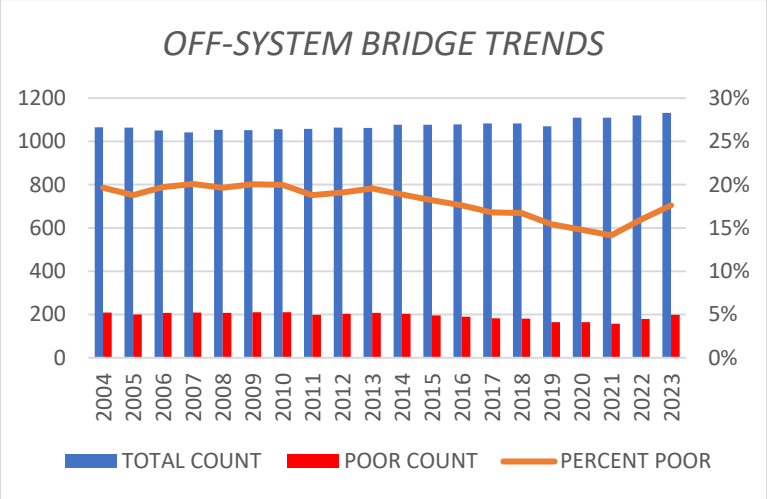

Figure 2. MaineDOT Off-System Poor Condition Bridges Trend.

MaineDOT has had a pavement and bridge management system since the mid-1990s. Per the MaineDOT Transportation Asset Management Plan (TAMP), these management systems comply with the requirements of 23 CFR 515.17 and the Department inspects NHS bridges on a 24-month

cycle in accordance with the bridge inspection standards of 23 CFR 650 (c).[7] MaineDOT is committed to maintaining the new bridges, utilizing the same team of maintenance crews that cover other area bridges. Maintenance funding will be sourced from State funds. MaineDOT will ensure the new bridges are maintained to all Federal and State standards. The Department will perform all required bridge inspections and immediately correct any issues discovered.

2. Safety and Mobility

Safety is MaineDOT's primary consideration in addressing infrastructure challenges posed by outdated and inefficient bridges. Safety and design standards have evolved since the bridges were constructed or reconstructed (1922-1974); all replacement structures will meet current structural design standards. Six of the nine existing bridges do not meet current design standards for width, resulting in narrow bridges that restrict adequate two-way traffic. Additionally, the structural capacity and heights of the bridge railings on all nine bridges are substandard according to today's design standards. Refer to Table 3 for the existing and proposed bridge widths. Figure 3 illustrates the typical section assumed for most bridge replacement locations, which accommodates two 12-foot lanes. In areas with low traffic volumes, slightly narrower sections are assumed to minimize construction impacts. All structures will use MASH-compliant steel bar 3-bar traffic/bicycle railings. The replacement structures will significantly enhance safety for vehicular, bicycle, and pedestrian traffic.

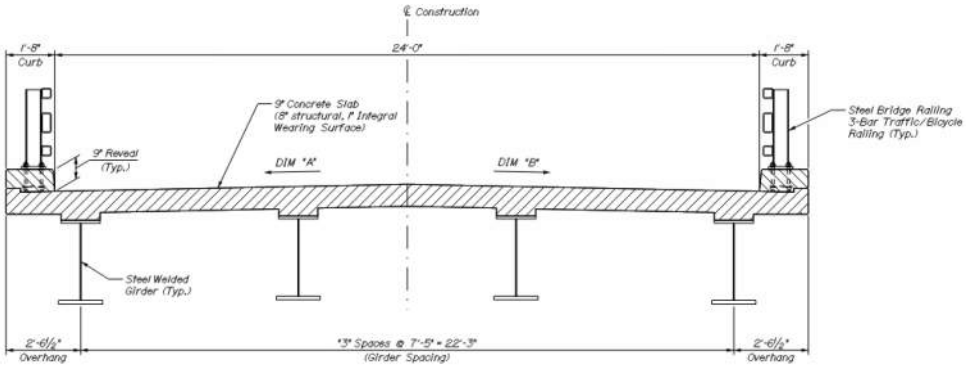

Figure 3. Example of Bridge Cross Section.

Table 3. Bridge Roadway Width.

NBI Number	Town Name	Average Daily Traffic	Existing Curb to Curb Width (ft)[1]	Proposed Curb to Curb Width (ft)[2]
0382	Salem Twp	101	21	22
0561	Chesterville	127	17.3	22
2090	Embden	599	23.9	24
2159	Bowdoin	412	19.3	24
2672	Caratunk	196	20	22
3921	Caratunk	180	24	24
5494	Orland	291	18.2	24
5505	Carmel	600	19.1	24
5559	Sangerville	103	24	24

[1] *Red cells indicate substandard roadway widths.*
[2] *Proposed curb to curb widths are conceptual and could change based on Maine state standards for bicycle and pedestrian safety.*

[7] https://www.maine.gov/mdot/publications/docs/plansreports/MaineDOT-Transportation-Asset-Management-Plan-final.pdf, pp. 8-9

Safety during construction is paramount. Specific considerations for each bridge location have been made to determine the appropriate maintenance of traffic (MOT) scheme. Due to the rural and less-traveled locations of these bridges, different MOT options were assumed based on site characteristics. Each location used either a temporary bridge or a bridge closure with an offsite detour to minimize environmental and vehicular impacts. Three bridges are on dead-end roads or have long detours, justifying the use of temporary bridges or off-alignment construction. MaineDOT will install construction safety signage, barriers, and reduced speed limits in construction zones to protect workers, consistent with the Manual on Uniform Traffic Control Devices (MUTCD).

In terms of mobility, closure of these bridges would significantly disrupt local and regional traffic flow given their isolated rural locations. Increased travel distances and reduced system capacity would lead to higher VMT and travel times, thereby increasing the risk of crashes.

In Maine, most crash injuries and fatalities occur on rural roads.[8] Crash data associated directly with the bridges included in the Project show no reported crashes in the last ten (10) years (Attachment D). However, crash data for potential detours in the event of bridge closure show that travelers would experience a higher risk of crash events if redirected for extended periods (Table 4).

Table 4. Detour Route Crash Data.[1]

	Vehicle Crashes								
Bridge #	**0382**	**0561**	**2090**	**2159**	**2672**	**3921**	**5494**	**5505**	**5559**
Crash Severity Code	-	0	0	-	0	-	0	0	0
Fatal (K)	-	0	0	-	0	-	0	0	0
Serious Injury (A)	-	0	0	-	0	-	0	0	0
Minor Injury (B)	-	0	0	-	0	-	0	0	0
Possible Injury (C)	-	1	0	-	0	-	4	7	2
Property Damage Only (PD)	-	2	9	-	0	-	3	7	5
Total		3	9		0		7	14	7

[1] *Source: Maine Public Crash Query Tool*

3. Economic Competitiveness and Opportunity

The off-system bridges in this Project are vital to Maine's economy, serving as a conduit for commerce between generation facilities/locations, population centers, and intrastate distribution facilities in other parts of the state. According to the *2024 State of Domestic Trade Annual Report* by Maine's Department of Economic and Community Development, the state's agriculture, forestry, and fishing and hunting commercial sector has the greatest competitive advantage nationally due to the state's unique characteristics. Over 76% of these products are exported, necessitating a safe and reliable bridge and roadway system statewide throughout the Project area.[9]

[8] https://uploads.mainedotpima.com/300823a7-ddcf-4ccc-9ca9-53d6425d1c4c.pdf, p. 64
[9] https://www.maine.gov/decd/sites/maine.gov.decd/files/inline-files/Final%20Report%20-%202024%20Annual%20Macro%20Update%20-%20Maine%20DECD.pdf, p. 7

Given the rural nature of these bridges, limited low-mileage detour options, and the low populations of the local towns, impacts from bridge closures or load postings may be more deleterious than in urban areas. In the case of bridge closure, individuals may not be able to access their place of employment, necessary services, etc., or may have to detour which could delay them. In this case that could mean that local business may have to shut or reduce hours if employees are not able to access such locations.

4. Climate Change, Sustainability, Resiliency, and the Environment

a. Reduction of Air Pollution or Greenhouse Gases

MaineDOT is an active member in the Maine Climate Council and the State's Lead by Example Leadership Committee.[10] The Department is dedicated to supporting state and local goals to reduce carbon emissions by 45% by 2030 and achieve carbon neutrality by 2045. Since the publishing of the state's climate action plan, *Maine Won't Wait*, the Department has been actively working to reduce emissions and increase infrastructure resiliency. For this Project, the reduction of air pollution and greenhouses gases will to all intents and purposes be realized through the prevention of an increase in VMT should any of the bridges be closed. During bridge closures, detours ranging from 0 miles to 7 miles would be necessary (Attachment E). In several cases, there is no detour possible, for which the BCA defaults to a 100-mile detour length. Detour routes were determined based on MaineDOT criteria that require adequate facilities to carry detoured vehicles, avoiding gravel, dirt, or local roads to the extent feasible. The identified detours also involve multiple intersections, which require accelerating and decelerating that is not involved when the bridges are operational, leading to further vehicle emissions. As detailed in the BCA, the Project will maintain existing VMT, limiting harmful emissions resulting from a potential bridge closure and long-term detour.

Lower carbon construction materials such as precast concrete may be used in the bridge design, and streamlining the construction schedule could reduce vehicle emissions associated with construction vehicles. Generally, the Project provides needed investment in long-term solutions by improving the resilience of transportation infrastructure vulnerable to increasing sea level rise and extreme weather events. The Project prioritizes public safety in terms of traveler safety and mobility for citizens vulnerable to the multifaceted effects of climate change.

b. Improved Resiliency of At-Risk Infrastructure

Increased extreme weather events and rising water levels will cause more wear to bridges, leading to increased maintenance requirements. This is evidenced by a significant rise in bridge overtopping and approach roadway washouts. This trend underscores the urgency of upgrading the state's infrastructure to be more resilient to such events in the future.

Six of the nine bridges are natural constriction points, as their existing structure lengths are less than 1.2 times the bank-full width (BFW) of the channel, which is the typical design length for new bridge infrastructure in the state (Table 5). All bridge replacements for this project will be single span structures with the substructure elements located behind the existing abutments. Span

[10] https://www.maine.gov/future/sites/maine.gov.future/files/inline-files/Lead%20By%20Example_2021.pdf

lengths are sized to accommodate 1.2 times BFW, matching the existing hydraulic needs of the location and mitigating the risk of future flood inundation, thereby improving overall resiliency.

Table 5. Existing Hydraulic Conditions by Bridge.

NBI Number	Existing Bridge Length (ft)	1.2*BFW (ft)	FEMA Flood Insurance Study Zones	NBI Item 71 (Waterway Adequacy)	Waterway Adequacy Inspection Report Notes
0382	52.2	46.43	Zone X (500 Year Storm)	5 – Occasional Overtopping of Approaches – Significant Delays	N/A
0561	23	26.89	Zone A (100 Year Storm Without Base Flood Elevations)	5 – Occasional Overtopping of Approaches – Significant Delays	The substructure is completely submerged, and the water level is close to the superstructure.
2090	36	45.01	Zone A (100 Year Storm Without Base Flood Elevations)	8 - Bridge Above Approaches	N/A
2159	60.2	44.05	Zone A (100 Year Storm Without Base Flood Elevations)	9 - Bridge Above Flood Water Elevations	N/A
2672	23.3	43.90	Zone A (100 Year Storm Without Base Flood Elevations)	6 - Occasional Overtopping of Approaches - Insignificant Delays	Erosion on the upstream end has scoured higher up the embankment and removed some larger rocks.
3921	30	43.56	Zone A (100 Year Storm Without Base Flood Elevations)	6 - Occasional Overtopping of Approaches - Insignificant Delays	Adjacent roadway washed out due to flooding and overtopping of the bridge during storms in December 2023.
5494	41	61.08	Zone A (100 Year Storm Without Base Flood Elevations)	7 - Slight Chance of Overtopping Bridge	N/A
5505	29	32.48	Zone A (100 Year Storm Without Base Flood Elevations)	9 - Bridge Above Flood Water Elevations	N/A
5559	26.9	25.75	Zone AE (100 Year Storm With Base Flood Elevations)	9 - Bridge Above Flood Water Elevations	N/A

Cost estimates for the length increases were developed assuming profile increases at all structure locations to improve the hydraulic opening and ensure that the bottom of the structure is above

extreme flood elevations. The exact storm event level will be determined during preliminary and final design efforts. Additionally, each bridge foundation will be designed for scour to ensure stability even if a washout occurs.

Multiple bridge locations have inspection report notes regarding deteriorated channels, additionally NBI Item 71 (Waterway Adequacy) indicates that several structures regularly overtop during flood events. Based on the FEMA Flood Insurance Rate Maps (FIRMs) for the region, bridges 0561, 2090, 2159, 3921, 5494, and 5505 are within Special Flood Hazard Area Zone A, meaning there is a 1% annual chance of flooding (100-year storm). Bridge 0382 is in Zone X (500-year storm), and bridge 5559 is in Zone AE (100 Year Storm With Base Flood Elevations). Designing the bridges to withstand the impacts from floodwater forces and debris increases the likelihood of their survival during such events.

c. Improved Wildlife Connectivity, Especially for Aquatic Species

A review of the Maine Department of Inland Fisheries & Wildlife's Beginning with Habitat Map Viewer indicates that there are no endangered or threatened species' habitats associated with Project locations; however, several bridges are located within the Federally-listed Gulf of Maine Distinct Population Segment (DPS) of Atlantic Salmon (ATS) and within designated ATS Critical Habitat. MaineDOT will consider engineering design and construction techniques that mitigate the impacts experienced by wildlife and aquatic species, especially the ATS in the Project area. If necessary, during the environmental phase of the Project, strategies will be identified, potentially including in-water work restrictions, noise monitoring, and/or relocation. The Department has extensive experience designing and constructing similar projects that promote wildlife connectivity and sustainability while allowing for the necessary level of transportation mobility.

d. Addressing Disproportionate Negative Environmental Impacts on Disadvantaged Communities

In considering standardized design for Off-System bridges, minimizing environmental and economic impacts was prioritized. As a result, no disproportionate negative environmental impacts will occur to disadvantaged communities. However, in Maine, rural residents are often geographically distant from locations offering expanded food options, health care, and other commercial activities. As a result of this Project, rural residents and emergency response services will be able to more dependably rely on infrastructure to connect them to commercial or recreational hubs in the region and around the state.

As referenced in Section I.2, four (4) of the Project bridges are in Areas of Persistent Poverty (APP) and Historically Disadvantaged Communities (HDC). Bridges 2672 and 3921 are both in a Census Tract that ranks in the 97th percentile for heart disease. Bridge 5559 is in a Census Tract that ranks in the 90th percentile for asthma and the 95th percentile for heart disease. Avoiding long detours, and thus avoiding locally increased emissions avoids further negative environmental impacts on these disadvantaged communities.

5. Equity and Quality of Life

a. Equity and Engagement

In alignment with Executive Order 13985, *Advancing Racial Equity and Support for Underserved Communities Through the Federal Government*, MaineDOT has issued its own Statement on Equity:

> *The essence of equity in transportation is to ensure that all Maine people have access to safe and reliable transportation options that support economic opportunity and quality of life regardless of a person's economic, social, ethnic, racial, age, sexual orientation, physical, mental, or geographic circumstances.*[11]

In addition, the Department's overall mission is "to support economic opportunity and quality of life by responsibly providing our customers the safest and most reliable transportation system possible, given available resources." MaineDOT values communication with all members of the communities that are impacted by projects.

The Department will use its virtual Public Involvement Management Application (PIMA) for virtual and/or hybrid public engagement during program development and implementation. The number of people accessing the project-specific websites and the number of comments received are significantly higher using PIMA because internet service is commonly available, allowing people to access the virtual platform regardless of their geographic location. Additionally, this engagement has a high level of customer satisfaction. To engage with Project area residents, MaineDOT will utilize PIMA together with direct conversations with local populations to provide the opportunity to proactively minimize impacts to potentially affected community-based organizations, businesses, and residents during project planning. PIMA is particularly effective in engagement of rural populations, for which travel to traditional in-person meetings can pose a barrier. PIMA is used not only to collect comments on projects, but also to reflect how such input is taken into consideration in decision-making and keep the public informed during construction.

MaineDOT's multifaceted approach to community engagement reflects the Department's commitment to reaching out to communities and people who have historically lacked access to the decision-making process or been underserved by our transportation system.

b. Incorporation of Nonvehicular and/or Public Transportation into the Project

The bridges are located primarily along rural and residential roads. These roadways are used for active transportation as well as vehicular travel. This, together with the quality of life sought by rural residents, lends importance to avoiding disruption of active transportation modes through failure of any of the bridges included in this Project.

[11] https://www.maine.gov/mdot/publications/docs/2022/MaineDOTEquityStatement6-5-22.pdf

6. Innovation

a. Innovative Project Design or Construction Techniques

The Project will employ bridge bundling in accordance with FHWA's *Bridge Bundling Guidebook*. The EDC-5 Final Report states that bundling the bridges in the Project will result in up to 50% improvements in efficiency in preliminary design efforts.[12] Bundling will advance the Project efficiently by saving time and reducing design and construction costs, while also creating opportunities for small and disadvantaged businesses.[13] This will allow construction to commence without delay and with minimal risk.

Utility coordination will be streamlined by consolidating all necessary agreements into a single comprehensive agreement under the unified bridge bundle construction contract. This simplifies the coordination process, reduces administrative burdens, and ensures efficient management of all utility-related aspects within the overall project scope.

Each bridge will follow a standardized design detailing. Bridges were selected based on their geographic location and similar span ranges to fully standardize structural elements. Preliminary calculations were developed to understand the required bridge width and length and determine the geometric specifications of each bridge by the type of substructure and superstructure. All bridges will be single-span structures to minimize impacts within the waterway and reduce construction costs associated with in-water pier elements.

The following elements are anticipated to be standardized across all Project bridges:

- Abutment details
- Bearings
- Superstructure girders/beams
- Bridge deck
- Additional components such as diaphragms, railing detail and layout, asphaltic plug joints, scuppers, and approach railing transitions

Attachment F presents conceptual standardized plans with feasible substructure and superstructure configurations. For substructures, the Project will use integral abutments on steel H-piles wherever feasible, providing consistency and ease of construction. In cases where shallow bedrock is present, conventional abutments on spread footings will be utilized. Both types will incorporate consistent details to streamline design and constructability. For superstructures, the Project will use either precast concrete NEXT beams for 70-foot-long bridges or steel plate girders for 90-foot long bridges. Table 6 summarizes each bridge location and the proposed replacement bridge geometrics, superstructure, and substructure types.

[12] https://www.fhwa.dot.gov/innovation/everydaycounts/reports/edc5_finalreport.pdf
[13] https://www.fhwa.dot.gov/ipd/pdfs/alternative_project_delivery/bridge_bundling_guidebook_070219.pdf, p.10

Table 6. Proposed Replacement Geometrics, Superstructure, and Substructure Types.

NBI Number	BFW	Proposed Span Length (ft)	Proposed Bridge Width (ft)	Proposed Superstructure Depth (ft)	Proposed Super Structure Type	Proposed Profile Change (ft)	Abutment Type Integral vs. Conventional	MOT Scheme
0382	46.43	90	25.33	3.75	Steel Beam	1	Integral	Temporary bridge
0561	26.89	70	25.33	3.75	NEXT 36F	3	Integral	Bridge closure with offsite detour
2090	45.01	70	27.33	3.75	NEXT 36F	1	Conventional	Temporary bridge
2159	44.05	90	27.33	3.75	Steel Beam	1	Integral	Temporary bridge
2672	43.90	70	25.33	3.75	NEXT 36F	1	Integral	Bridge closure with offsite detour
3921	43.56	70	27.33	3.75	NEXT 36F	3	Conventional	Temporary bridge
5494	61.08	90	27.33	3.75	Steel Beam	2	Integral	Temporary bridge
5505	32.48	70	27.33	3.75	NEXT 36F	1	Integral	Bridge closure with offsite detour
5559	25.75	70	27.33	3.75	NEXT 36F	1	Integral	Bridge closure with offsite detour

Standardized designs will facilitate time savings across multiple phases, including preliminary and final design, and construction. Maintaining standardized details and structure geometrics will also enhance construction quality by allowing the Contractor(s) to become familiar with the construction approach and improve and iterate for subsequent bridges on the schedule.

Bridges are bundled based on their geographic location to streamline construction activities and optimize resource mobilization. This approach reduces labor costs and logistical challenges, as work crews can efficiently transition between nearby sites. The proximity of multiple projects allows for shared resources, such as equipment and materials, and minimizes travel time for crews, thereby enhancing overall project efficiency.

MaineDOT will likely utilize an innovative design-build Project delivery plan, allowing the Department to contract with a single point of responsibility. The designer and contractor will work together as a team, providing unified Project recommendations that fit the schedule and budget. Any concerns or changes will be addressed by the entire team with a focus on collaborative problem-solving.

b. Innovative Technology

This Project provides the opportunity for innovative technologies to be implemented as part of the design. Standardized structure designs will be used as feasible to capture cost, design, and construction efficiencies. In bridge construction, steel offers opportunities for innovation. Steel beams can be galvanized or metalized to protect them, leading to a longer project lifespan. The Project will utilize metalized steel girders for the 90-foot-long bridges and precast concrete Northeast Extreme Tee (NEXT) beams for the 70-foot-long bridges. The NEXT beam allows for an accelerated construction schedule resulting in cost savings and reduced future maintenance needs. Corrosion resistant rebar can also be used to protect against deterioration within the concrete slabs, leading to more durable bridges. The use of prefabricated materials, where applicable, contributes to reduced construction time and enhanced structure resilience.

Many technological innovations incorporate elements of environmental and community innovation as well, such as helping reduce carbon emissions from construction or streamlining project operations to minimize disruptions. This Project will also rely on interagency cooperation to ensure environmental protection and conservation. MaineDOT has a long history of working effectively with other State and private agencies. As referenced in Section IV.5.a, MaineDOT will use its virtual Public Involvement Management Application (PIMA) for public engagement during program development and implementation.

c. Innovative Financing

The EDC-F Final Report states that bundling can be expected to result in approximately 10% savings in construction cost. MaineDOT estimates bridge bundling and employing an owner-engineer to assist in generating an RFP, and the selection of a design-build team, will save $3,210,000.

d. Innovative Planning and Environmental Review Process Improvements

Environmental permits and approvals necessary for the Project include National Environmental Policy Act (NEPA), Section 106 of the National Historic Preservation Act, the Federal Endangered Specia Act, Section 404 Clean Water Act Permit (U.S. Army Corp of Engineers), and Maine Natural Resources Protection Act (NRPA). MaineDOT is deploying innovation to administer the NEPA process and permitting for the Project through Programmatic Agreements already in place as well as pending NEPA assignment, which will ensure timely and consistent reviews and accelerate Project delivery. MaineDOT, the Federal government, and other State agencies have agreements to thoroughly and expeditiously review a Project's environmental impacts. Specifically, MaineDOT and FHWA Maine Division have a Programmatic Agreement for processing actions classified as Categorical Exclusions (CEs). The agreement authorized MaineDOT to determine on behalf of FHWA whether a project qualifies for a CE specifically listed in 23 CFR 771.117. In addition, it authorizes MaineDOT to approve a CE on behalf of FHWA as a "Programmatic CE" pursuant to the Agreement. No separate review or approval of the CE by FHWA is required. Project documentation is available to FHWA upon request. Based on baseline

data collection and preliminary plans, the Project is expected to have minimal to no impacts on natural or cultural resources or the environment.

Other similar agreements to streamline the environmental and review process include:

1. Programmatic Agreement among Federal Highway Administration, Federal Railroad Administration, the Advisory Council on Historic Preservation, the Maine State Historic Preservation Officer, and Maine Department of Transportation Regarding Implementation of the Federal Aid Highway and Federal Transit Programs in Maine.

2. Cooperative Agreement between U.S. Department of the Interior Fish and Wildlife Service (USFWS), FHWA and the MaineDOT State Transportation Reviews by the USFWS in Maine.

3. Maine Atlantic Salmon Programmatic Consultation finalized January 23, 2017.

4. Programmatic Agreement for the State of Maine concerning identification of listed and proposed species and designation of non-Federal representative under the Federal Endangered Species Act between FHWA, Maine Division USACE, MaineDOT, USFWS, NOAA's National Marine Fisheries Service.

5. Programmatic Agreement for the State of Maine between MaineDOT, FHWA Maine Division, USFWS Regarding Endangered Species Act Section 7 Consultation for Canada Lynx.

6. Memorandum of Agreement for Stormwater Management between the MaineDOT.

7. MTA and Maine Department of Environmental Protection; and

8. Memorandum of Agreement between United States Army Corps of Engineers (USACE), New England District and MaineDOT for Expediting Permit Application Evaluations under Section 214 of the Water Resources Development Act of 2000, as amended, and Section 139(j) of Title 23, United States Code, Assistance to Affected State and Federal Agencies, July 2022.

V. BENEFIT-COST ANALYSIS

A Benefit-Cost Analysis (BCA) was conducted utilizing the BIP BCA workbook provided by USDOT, in accordance with 2024 USDOT BCA Guidance (Attachment D). When the individual bridges are combined, the Project achieves a Benefit-Cost Ratio (BCR) of 32.12, indicating substantial net positive outcomes for the region and the environment, along with significant cost savings. In summary, all bridges have a BCR above 2.0, except for Bridge #2672 in Caratunk. This bridge was included in the project due to its proximity to Bridge #3921, also in Caratunk. Therefore, Bridge #2672 was justified for inclusion based on the geographic benefits of bridge bundling. Aside from the BCR, this bridge exhibits all the same characteristics presented throughout this application. The BCA workbook as provided by USDOT accounts for bridges with

no detour by using a detour value of 100 miles. This value is auto populated by the NBI data, this was used uniformly for the three bridges that have no detour as they are on dead end roads.

VI. PROJECT READINESS AND ENVIRONMENTAL RISK

1. Technical Feasibility and Technical Competency

MaineDOT possesses the technical experience to complete the Project, having successfully designed, built, and maintained similar bridge projects statewide. The Department is a seasoned, meticulous, and dependable recipient of previous TIGER, FASTLANE, INFRA, CHBP, BUILD, Culvert AOP, Rural, and RAISE grant funding. USDOT can trust MaineDOT to fully fund and begin construction on or before the obligation of funds date, ensuring the Project's completion without risk. MaineDOT expends or disburses more than $675 million per year, including Federal, State, and local funds. MaineDOT will comply with all Federal regulations with regards to all aspects of the Project, including Equal Employment Opportunity (EEO) Policy and Affirmative Action, all NEPA requirements, all Civil Rights policies, the Americans with Disabilities Act (ADA), and any other applicable regulations.

2. Project Schedule

MaineDOT is an experienced partner able to deliver the Project with minimal risk as the Department is a responsible recipient of previous grant funding. The Project's non-Federal funding sources are fully committed with funding also available to cover contingency and cost increases. Each bridge is scheduled for two years of construction, the first bridge beginning in 2028 and the final bridge construction ending in 2036. Design, ROW, and NEPA will be completed prior to construction for each bridge. The construction years are staggered by 1 year except for the two located in the town of Caratunk (2672 and 3921) which will be constructed simultaneously. Table 7 provides estimated dates for project milestones. These schedule dates may change due to finalization of the grant agreement.

Table 7. Project Schedule.[1]

Design and Project Status	Planned Start Date	Planned End Date
Preliminary Design	1/01/2026	1/01/2027
NEPA	1/01/2026	1/01/2028
Final Design/RFP Development	1/01/2027	1/01/2028
ROW Acquisition	6/01/2026	1/01/2028
Construction	4/01/2028	11/01/2036

[1] *Design, ROW, and NEPA efforts will be phased according to individual bridge construction years.*

3. Required Approvals

a. Environmental Permits and Reviews

Information about the NEPA status of the Project is included in Section VI.6.d. Bridges included in the Project have been determined to be eligible as CE-level projects under an agreement with FHWA. Specific documentation will be completed between grant application submission and

advertising. Relevant permits required for the Project and their status are available on MaineDOT's grant materials website.
(https://www.maine.gov/mdot/grants/bip/)

b. State and Local Approvals

Necessary environmental permits or reviews are described in Section VI.6.d. Public roads and bridges under the control of MaineDOT are not subject to local zoning controls pursuant to 30-A M.R.S.A. Section 4352.

c. Federal Transportation Requirements Affecting State and Local Planning

Necessary environmental permits or reviews are described in Section VI.6.d. Public roads and bridges under the control of MaineDOT are not subject to local zoning controls pursuant to 30-A M.R.S.A. Section 4352.

d. Assessment of Project Risks and Mitigation Strategies

Potential project risks and related mitigation strategies are discussed in Table 8.

Table 8. Project Risk and Mitigation Strategies

Project Risks	Mitigation
Presence of Atlantic Salmon in all river and stream crossings.	• Minimize permanent and temporary in-water structures. • Plan construction sequence to avoid sensitive times for ATS life stages. • Incorporate measures to avoid and minimize effects early in design and scheduling. • Utilize avoidance and minimization measures during project construction to reduce potential effects from in-water work. • Early coordination with U.S. Fish and Wildlife and Maine Department of Marine Resources to obtain best available information on species.
Flood damage due to 100-year storm for bridges 0561, 2159, and 5494.	• Incorporate climate change resiliency into bridge design.
ROW acquisition and utilities coordination	• MaineDOT will apply their extensive experience with ROW acquisition and utility coordination well before construction commences.
Inflation	• MaineDOT will evaluate the workplan priorities to ensure their commitment to construction of these bridges.

VII. ADMINISTRATIVE PRIORITIES AND DEPARTMENT STRATEGIC PLAN GOALS

1. Safety

As bridge deterioration continues, the predominant risks to public safety are bridge failure and extended use of detours, which will be well-marked with appropriate signage. During construction, MaineDOT will ensure workers are protected and work zones remain safe, a critically important aspect of any MaineDOT project. MaineDOT's Strategic Highway Safety Plan (SHSP) includes elements of the National Roadway Safety Strategy (NRSS) Safe Systems Approach to highway safety. For each strategy or activity within the SHSP, two (2) or more of the five (5) Safe System Elements (safer road users, safer vehicles, safer speeds, safer roads, and post-crash care) were identified.[14]

2. Climate Change and Sustainability

In January 2020, Governor Janet Mills signed an Executive Order committing Maine to carbon neutrality by 2045, five (5) years prior to the target date of 2050 established in Presidential Executive Order 14008, *Tackling the Climate Crisis at Home and Abroad*. *Maine Won't Wait*, the State's comprehensive climate action plan provides State agencies, including MaineDOT, with proven guidelines to consider when incorporating climate change and environmental justice measures into any project. MaineDOT has extensive experience considering a project's potential impacts on the natural, economic, and social environments, as outlined in the *Bridge Bundling Guidebook*, including:

- Threatened and/or endangered species (and their habitats)
- Migratory birds
- USACE Section 408 authorizations
- Cultural resources (archeological or historic)
- Public parklands
- Floodplains and wetlands
- Noise levels, water quality, and air quality
- Human health and safety
- Social and economic impacts on communities

Reconstructing the bridges will eliminate the threat of additional vehicle miles traveled and associated, local harmful emissions that would result should a long-term bridge outage occur. Total Project emission savings, both CO2 and non-CO_2 combined, will result from eliminating long detours should the bridges eventually fail and close permanently. Bridges will be constructed in the same right-of-way as current bridges with some minor right-of-way property accusation expected at each location due to the increase in proposed bridge size.

[14] https://www.maine.gov/mdot/safety/docs/2023/strategic-hwy-safety-plan_shsp2022.pdf

3. Equity

MaineDOT has longstanding policies in place to support all individuals equally and avoid discrimination. The Department's policy states:

> *In accordance with Title VI of the Civil Rights Act of 1964 and other authorities, MaineDOT is committed to ensuring that the fundamental principles of equal opportunity are upheld in all decisions involving our employees and contractors/consultants, and to ensuring that the public-at-large is afforded access to our programs and services. To that end, no person shall be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any MaineDOT program or activity on the grounds of race, color, or national origin. MaineDOT will work with staff, sub-recipients, contractors, and service beneficiaries to promote awareness for the provisions of Title VI and the responsibilities associated with that Act.*[15]

As referenced in Section IV.5.a, MaineDOT has issued its own Statement on Equity that is in alignment with Executive Order 13985, *Advancing Racial Equity and Support for Underserved Communities Through the Federal Government*.

4. Workforce Development, Job Quality, and Wealth Creation

As detailed in Section IV.3, Economic Competition and Opportunity, of the Merit Criteria, the Project will create good-paying jobs that include strong labor standards guided by MaineDOT's EEO Policy and Affirmative Action Plan. MaineDOT will ensure Project contracts let through the Agency adhere to Federal and State law. Consistent with Executive Order 14025, *Implementation of the IIJA*, the Department maintains a strong focus on workforce development with an On-the-Job Training (OJT) Program providing meaningful training opportunities for Women, Minorities, and Disadvantaged individuals on Federal-aid highway and bridge projects, to develop full journeymen. The Project contractor is responsible for demonstrating to the Department steps taken to ensure training and recruitment includes disadvantaged populations.

Workforce development, job quality, and wealth creation are also state priorities, especially in the Project area Census Tracts identified as Areas of Persistent Poverty (APP) and Historically Disadvantaged Communities (HDC). Bridges 2672 and 3921 are both in a Census Tract that ranks in the 83rd percentile for low income, 94th percentile for lack of indoor plumbing, and 90th percentile for unemployment. Bridge 5559 is in a Census Tract that ranks in the 80th percentile for low income and 12% of people ages 25 or older have less than a high school education. Safe and reliable infrastructure is essential to economic and workforce development that will improve residents' quality of life.[16]

VIII. DOT PRIORITY SELECTION CONSIDERATIONS

The Project recognizes and complies with the following DOT priorities.

[15] https://www.maine.gov/mdot/civilrights/title-vi/
[16] https://maps.dot.gov/BTS/GrantProjectLocationVerification/

1. **Plans to improve the condition of a bridge or bundle of bridges in poor condition or in fair condition and at risk of falling into poor conditions within the next three (3) years.**

The Project consists of replacing a bundle of nine (9) bridges in Poor condition that are likely to rapidly deteriorate to a state of closure in the next three (3) years.

2. **Demonstrate but for a BIP grant the project sponsor(s) will be unable to complete the Bridge Project.**

MaineDOT is unable to complete the Project without BIP funding due to a number of challenging internal and external factors. The bridges selected were constructed between 1922 and 1974. Many of the bridges are now reaching the end of their useful life simultaneously. Externally, the Department has committed its available funding to an existing three-year work plan and has experienced inflationary pressures that increase the cost of each infrastructure project.

3. **The applicants are an FLMA that owns the bridge and a State, and Bridge Project application provides evidence that upon completion of the project, the Bridge will be divested.**

The Project bridges are all owned by the State of Maine; no involvement with an FLMA applies.

4. **The project is or will be ready to proceed to the next stage of project delivery within twelve (12) months of a CE Determination, FONSI, or ROD.**

The Project is expected to receive a CE Determination and will proceed to the next stage of project delivery within 12 months of that determination. A general Project Schedule is available in the Project Readiness and Environmental Risk section of the application.

5. **The project considers Workforce Development, Job Quality and Wealth Creation such as the creation of good-paying jobs directly related to the project, that may result in equitable access to those jobs, with a free and fair choice to join a union, expand training programs, and incorporates strong labor standards and includes strategies such as targeted hiring preferences for bringing in and retention of historically underrepresented workers into the workforce.**

As detailed in Section IV.3, Economic Competition and Opportunity, of the Merit Criteria, the Project will create good-paying jobs that include strong labor standards guided by MaineDOT's EEO Policy and Affirmative Action Plan. MaineDOT will ensure Project contracts let through the Agency adhere to Federal and state law. MaineDOT maintains a strong focus on workforce development. MaineDOT's OJT Program provides meaningful training opportunities for Women, Minorities, and Disadvantaged individuals on Federal-aid highway and bridge projects. MaineDOT's OJT program requires contractors make every effort to enroll minority and women trainees (i.e., by conducting systematic and direct recruitment through public and private sources

likely to yield women, minorities, and disadvantaged trainees) to the extent that such persons are available within a reasonable area of recruitment.

6. **Without a BIP grant, construction of the project is unlikely to commence before September 30 of the fiscal year plus 3 years (September 30, 2028, for FY 2025 funds.)**

Without BIP grant funding, Project construction is unlikely to commence prior to September 30, 2028, because sole state funding is not available and would be unsustainable, given the need. Given high bridge replacement costs, the number of bridges requiring replacement, and inflationary pressures, the Department is unable to replace them without BIP funding.

Attachment A – Off-System Bridge Investment Bundle Project Bridges

Number	Condition	Year Built	Potential Capital Investment
0382	**Poor**	**1974**	**Replacement**

Howard Road over West Branch Carrabassett River – Salem Township – Franklin Co.
44° 54’ 34.09” N, 70° 16’ 5.48” W

Top of roadway surface.

North Culvert at East End – Section loss and surface rust the entire length of the culvert near the water line.

Number	Condition	Year Built	Potential Capital Investment
0561	**Poor**	**1950**	**Replacement**

Mace Road over McGurdy Stream – Town of Chesterville – Franklin Co.
44° 32’ 20.4” N, 70° 3’ 58.93” W

Top of Roadway Surface.

Underside of Deck Slab – Cracks throughout with areas of efflorescence and spalls with exposed reinforcing.

2090	Poor	1934	Replacement

Kennebec River Road over Martin Stream – Town of Embden – Somerset Co.
44° 56’ 34.12” N, 69° 52’ 29.14” W

Southeast Return Wall – Shifted return wall, fascia girder with large spall at beam end, and cracks throughout fascia and concrete bridge seat.

Top of roadway surface. Note crack in wearing surface.

2159	Poor	1936	Replacement

Burrough Road over Little River – Lisbon Falls CDP – Androscoggin Co.
44° 1’ 16.5” N, 70° 1’ 58.12” W

Elevation view of east abutment.

Deck Underside – Map cracking with efflorescence throughout. Note surface rust on top flanges of girders.

2672	Poor	1922	Replacement

Main Street Over Pleasant Pond Stream – Town of Caratunk – Somerset Co.
45° 14’ 6.86” N, 69° 59’ 33.86” W

North Abutment near Mid-Length – Large full height vertical crack with minor out-of-plane movement at the crack.

Elevation view.

3921	Poor	1945	Replacement

Pleasant Pond Road over Pleasant Pond Stream – Town of Caratunk – Somerset Co.
45° 14’ 22.92” N, 69° 59’ 7.01” W

Southern elevation view. Note moderate cracks with efflorescence throughout.

South Approach Roadway – Previous washout of roadway adjacent to bridge in December 2023 due to overtopping and flooding at the bridge.

5494	Poor	1951	Replacement

Bald Mountain Road over Moosehorn Stream – Town of Orland – Hancock Co.
44° 37’ 30.9” N, 68° 41’ 19.75” W

Top of Roadway Surface. Note settlement cracking at the abutment.

West Abutment Elevation – Loosely stacked stone with multiple gaps between stones. Note masonry portion collapsing at end of the abutment.

5505	Poor	1963	Replacement

Fuller Road over Harvey Brook – Town of Carmel – Penobscot Co.
44° 49’ 15.85” N, 69° 2’ 23.06” W

Underside of Superstructure – Evidence of leakage, rust staining, and scattered spalls between beams. Note scour placard on abutment.

Top of Roadway Surface. Note cracks at the abutments.

5559	Poor	1954	Replacement

Silver Mills Road over French Mills Brook – Town of Sangerville – Piscataquis Co.
45° 6’ 41.36” N, 69° 18’ 5.54” W

Top of Roadway Surface. Note transverse cracks.

Underside of Concrete Slab – Numerous longitudinal cracks with moderate efflorescence build up.

Images Source: Stantec Inspection Reports

Attachment B – Bridge Locations

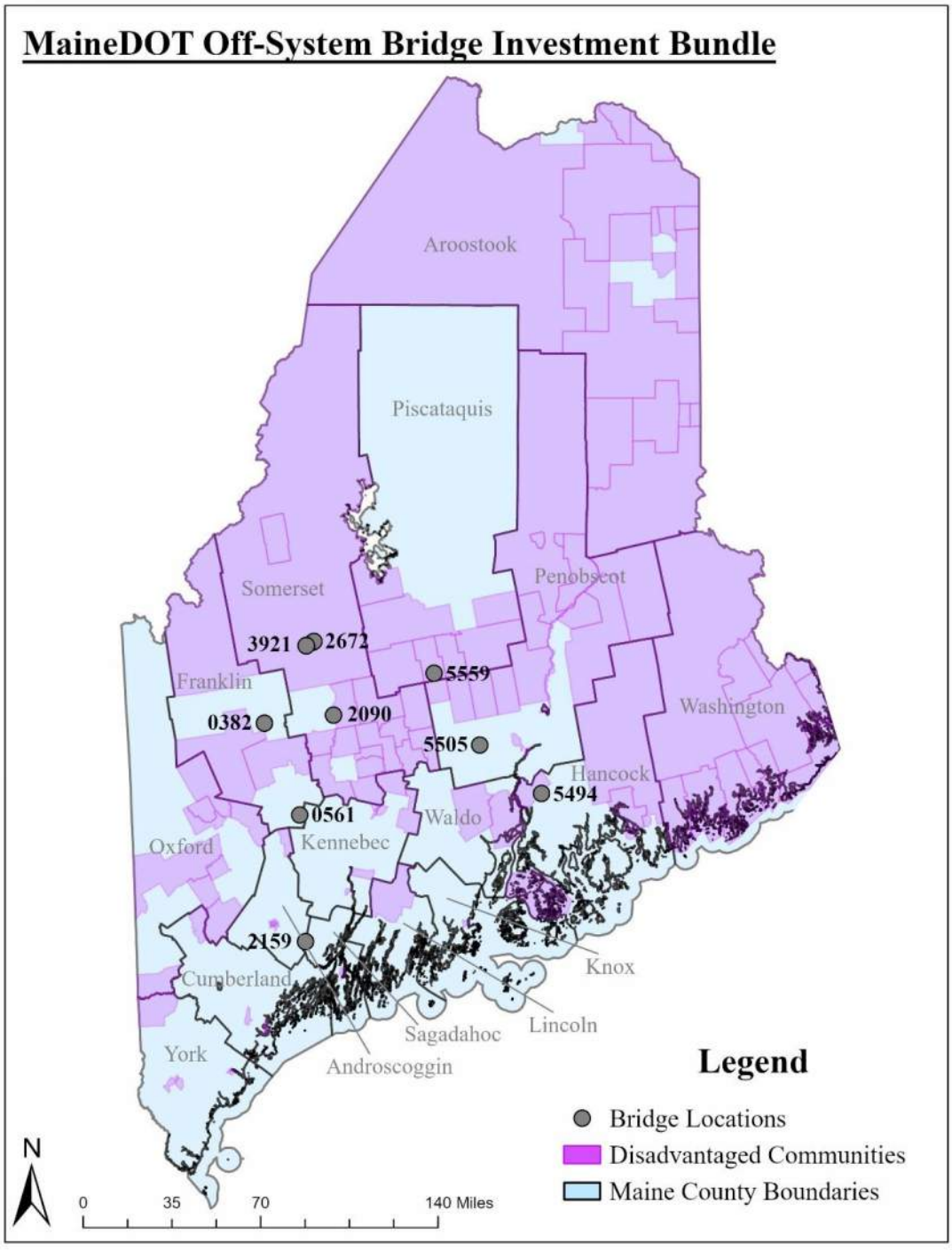

Figure 1. Map of Bridge Locations and Disadvantaged Communities

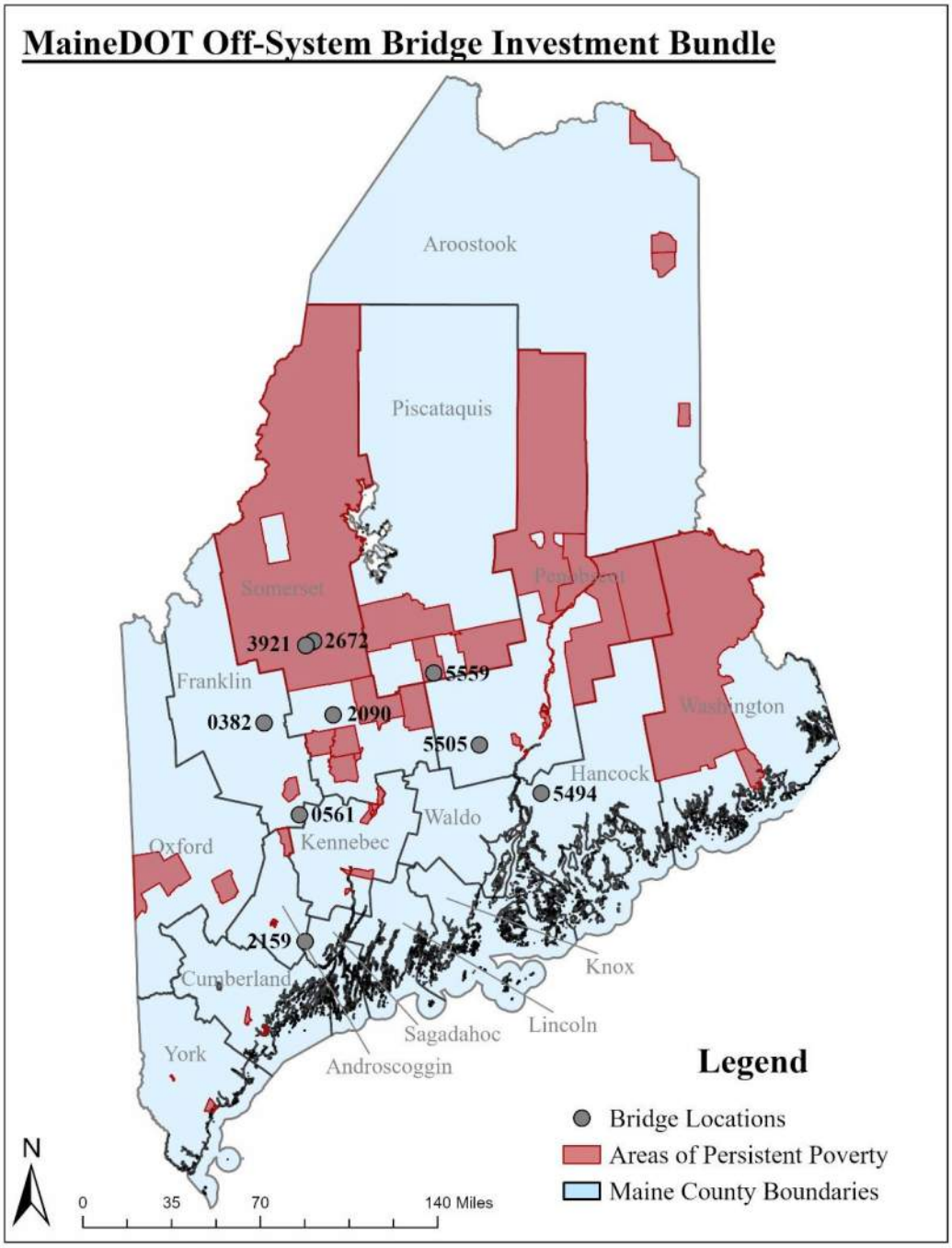

Figure 2. Map of Bridge Locations and Areas of Persistent Poverty

Attachment C – Budget

Bridge #	Town Name	PE/CE/ROW[1]	Total Construction Cost (Includes 15% Contingency)	Total Bundled Project Cost	Total Unbundled Project Cost	Non-Federal Funding	Other Federal Funding	BIP Funding Request Amount	Percent of Total Eligible Cost
0382	Salem Twp	$740,000	$3,700,000	$4,400,000	$4,884,000	$333,000	$592,000	$3,515,000	79%
0561	Chesterville	$680,000	$3,400,000	$4,080,000	$4,488,000	$306,000	$544,000	$3,230,000	79%
2090	Embden	$780,000	$3,900,000	$4,680,000	$5,148,000	$351,000	$624,000	$3,705,000	79%
2159	Bowdoin	$760,000	$3,800,000	$4,560,000	$5,016,000	$342,000	$608,000	$3,610,000	79%
2672	Caratunk	$540,000	$2,700,000	$3,240,000	$3,564,000	$243,000	$432,000	$2,565,000	79%
3921	Caratunk	$920,000	$4,600,000	$5,520,000	$6,072,000	$414,000	$736,000	$4,370,000	79%
5494	Orland	$880,000	$4,400,000	$5,280,000	$5,808,000	$396,000	$704,000	$4,180,000	79%
5505	Carmel	$560,000	$2,800,000	$3,360,000	$3,696,000	$252,000	$448,000	$2,660,000	79%
5559	Sangerville	$560,000	$2,800,000	$3,360,000	$3,696,000	$252,000	$448,000	$2,660,000	79%
Total		**$6,420,000**	**$32,100,000**	**$38,520,000**	**$42,372,000**	**$2,889,000**	**$5,136,000**	**$30,495,000**	**79%**

[1]*All costs are in 2024 dollars*

Attachment D – Benefit Cost Analysis

[See attached excel file]

Attachment E – Detour Maps

Salem Township, Blackwell Bridge #0382 (Howard Road over W Br Carrabasset River)

NBI Detour = 100.0 miles

No available detour for this bridge location, numerous houses on the dead-end road after the bridge.

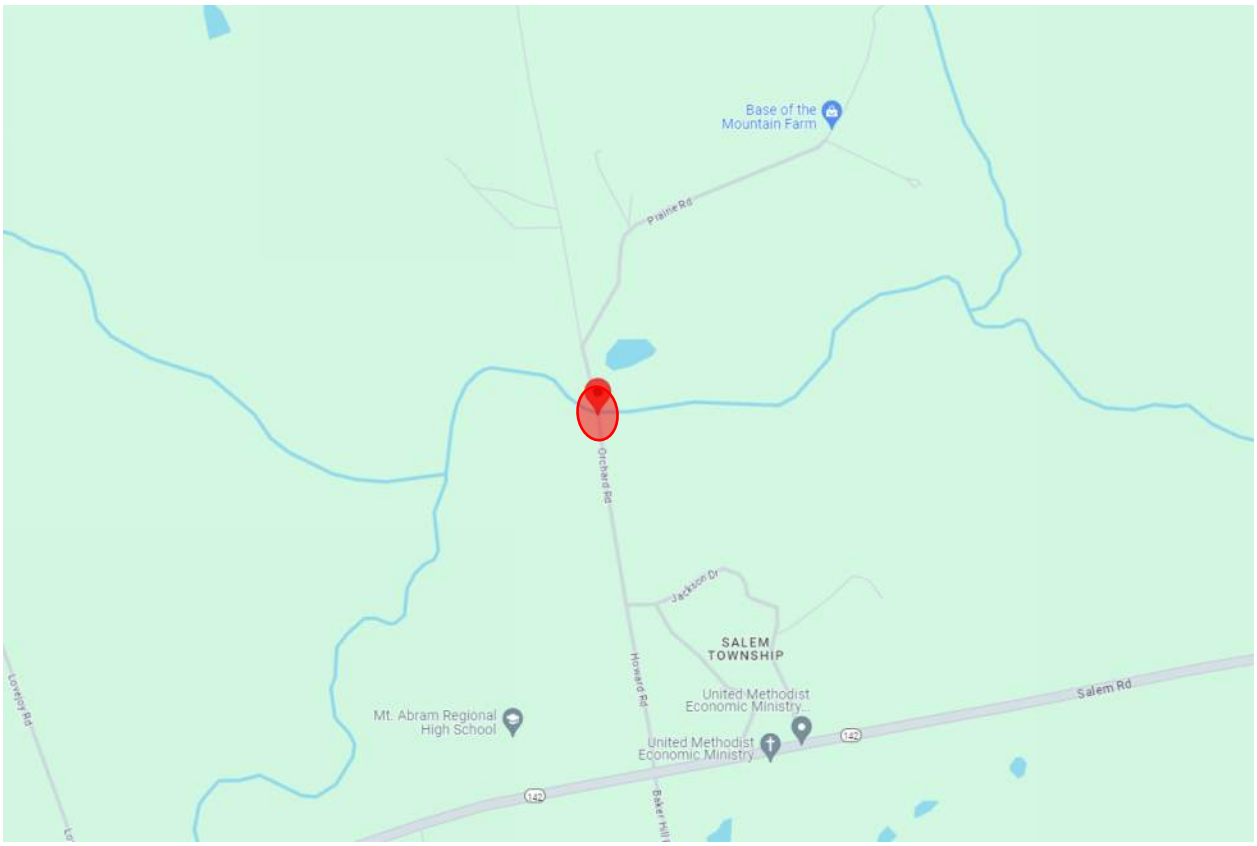

Figure 1 - #0382 Bridge Location (Red circle notes bridge location)

Chesterville, George Washington Bridge #0561 (Mace Road over McGurdy Stream)

NBI Detour = 6.0 miles

Net Detour Calculation: *Figure 3* shows the bypass detour of 9.6 miles (15 min), the original route from point A to B (*Figure 4*) is 3.6 miles (7 min), therefore the net detour is approximately 6.0 miles. Similar to NBI, use NBI value.

Average Detour Travel Speed: 40 mph = (9.6 miles / (15 min / 60))

Note: Abutment to abutment detour (*Figure 2*) is considered due to the remote locations of the bridges and the primarily residential use of these crossings.

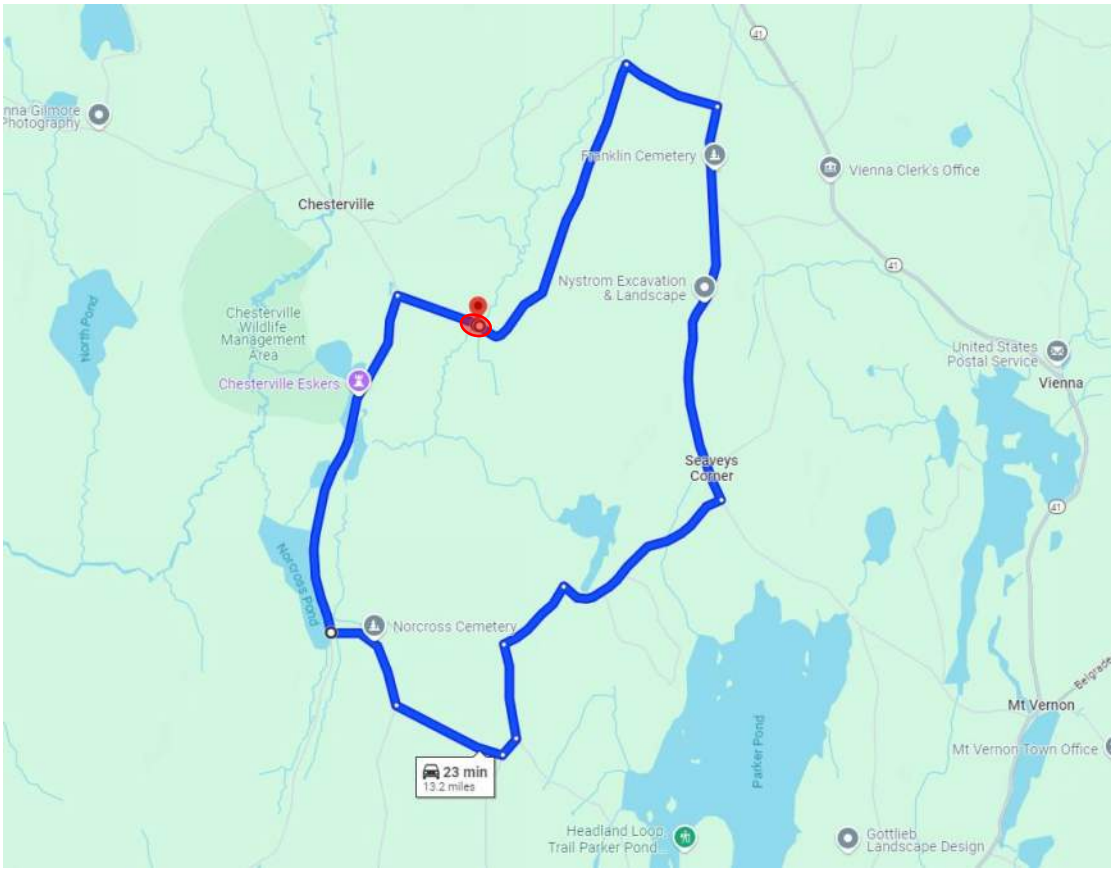

Figure 2 - #0561 Abutment to Abutment Detour Route (Red circle notes bridge location)

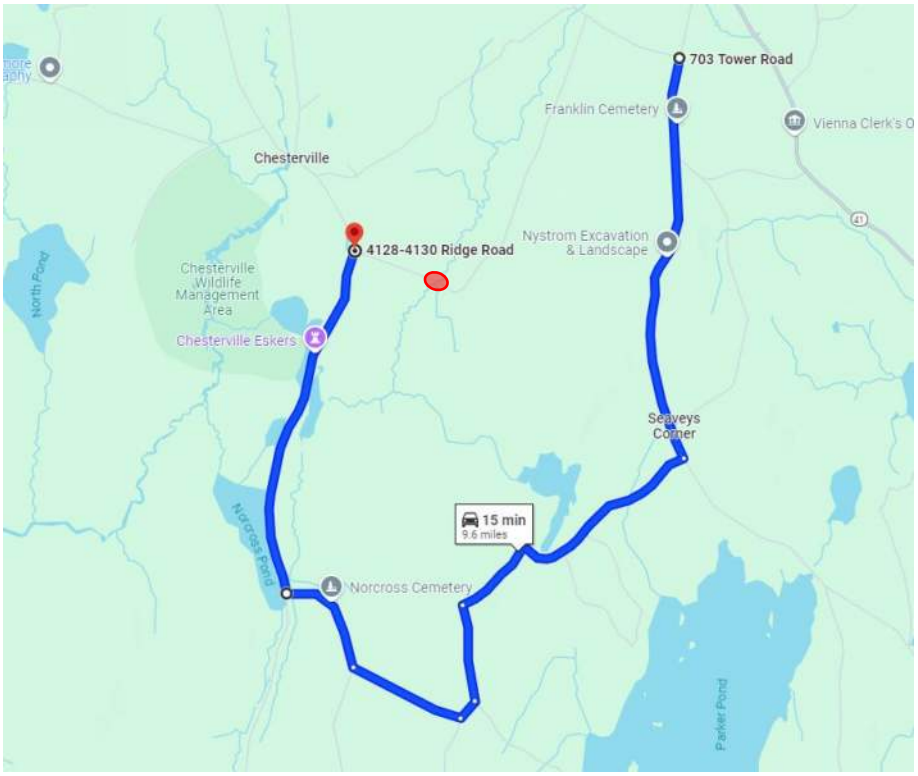

Figure 3 - #0561 Bypass Detour Route (Red circle notes bridge location)

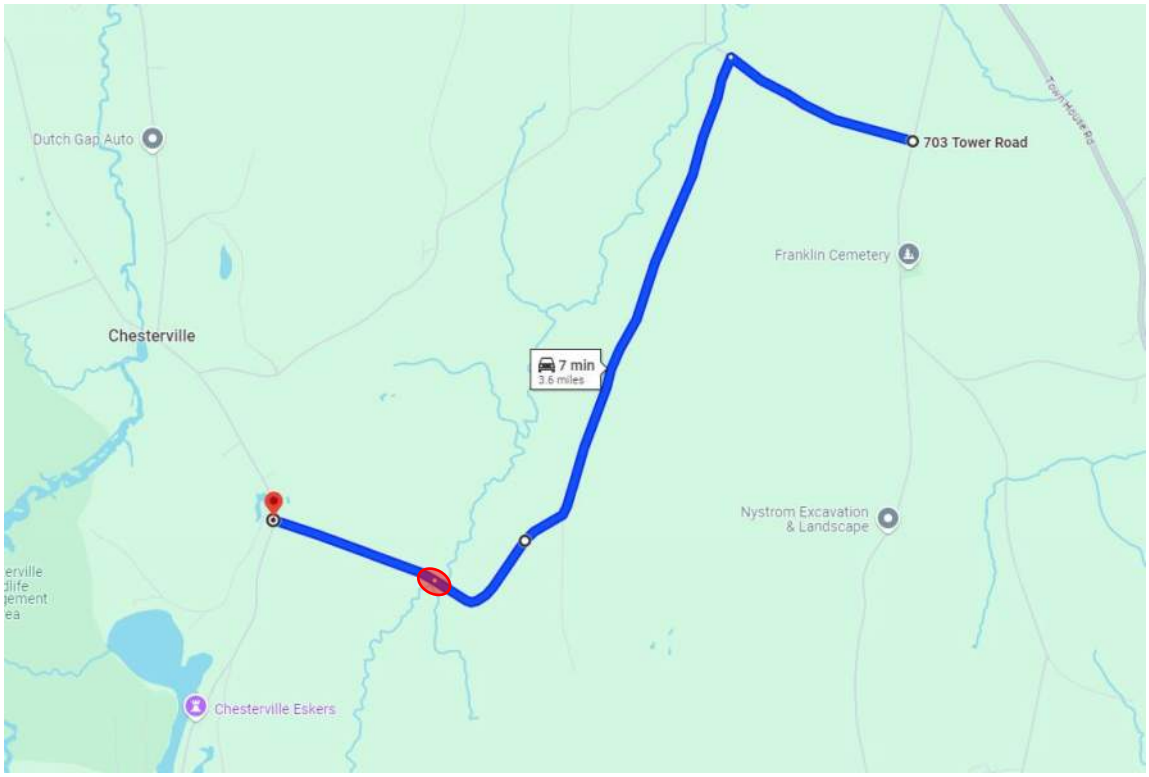

Figure 4 - #0561 Normal Route (Red circle notes bridge location)

Embden, Boyington Bridge #2090 (Kennebec River Road over Martin Stream)

NBI Detour = 0.0 miles

Net Detour Calculation: *Figure 6* shows 8.9 miles (12 min), the original route (*Figure 7*) from point A to B is 9.1 miles (14 min), therefore net detour is approximately -0.2 miles. Similar to NBI, use NBI value.

Average Detour Travel Speed: 45 mph = (8.9 miles / (12 min / 60))

Note: Abutment to abutment detour (*Figure 5*) is considered due to the remote locations of the bridges and the primarily residential use of these crossings.

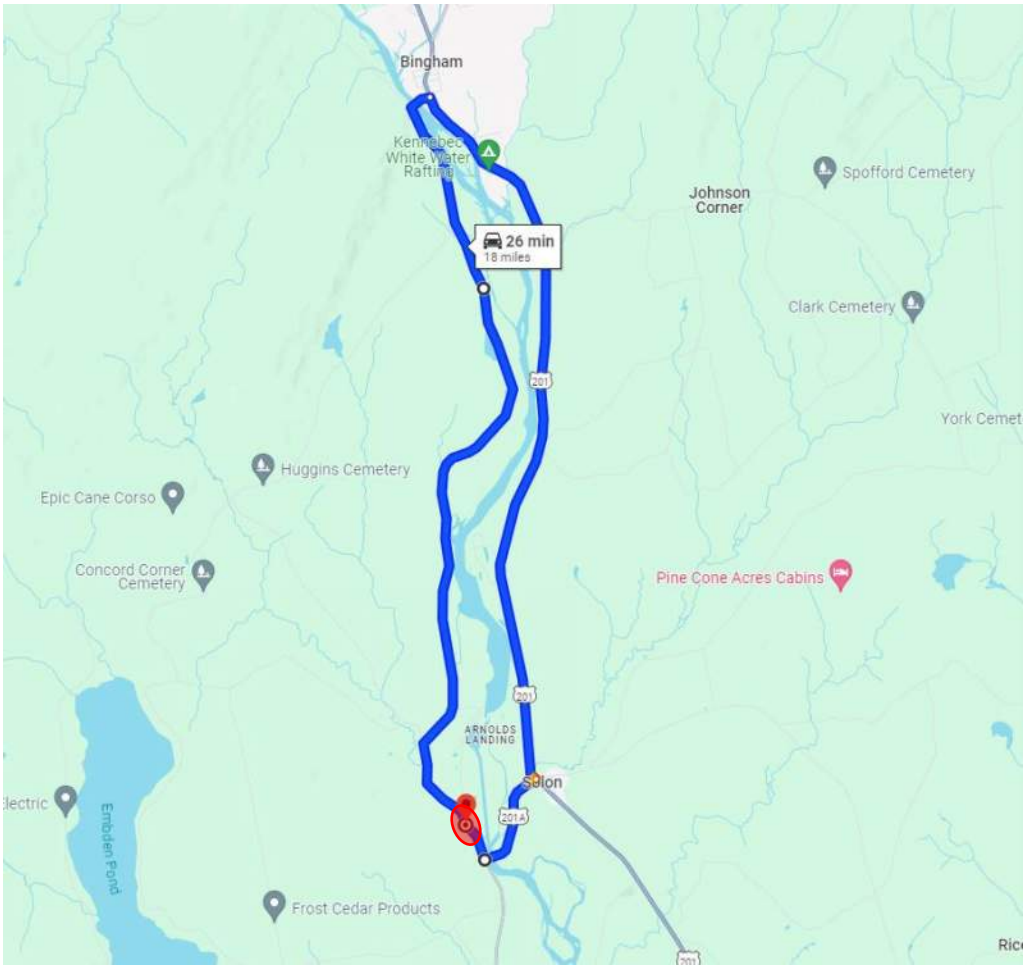

Figure 5 - #2090 Abutment to Abutment Detour Route (Red circle notes bridge location)

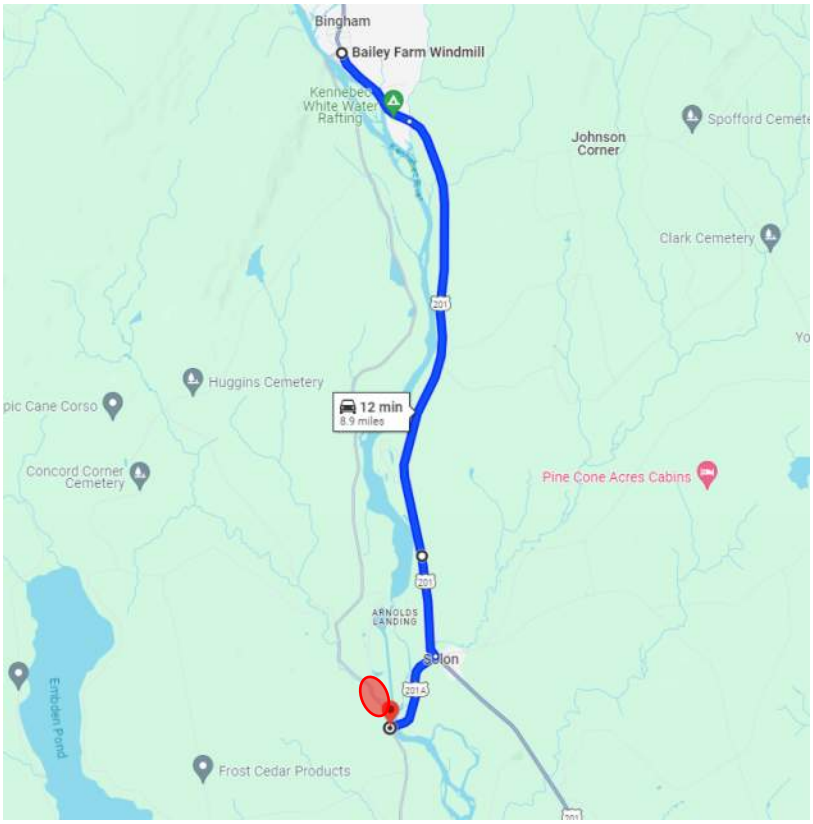

Figure 6 - #2090 Bypass Detour Route (Red circle notes bridge location)

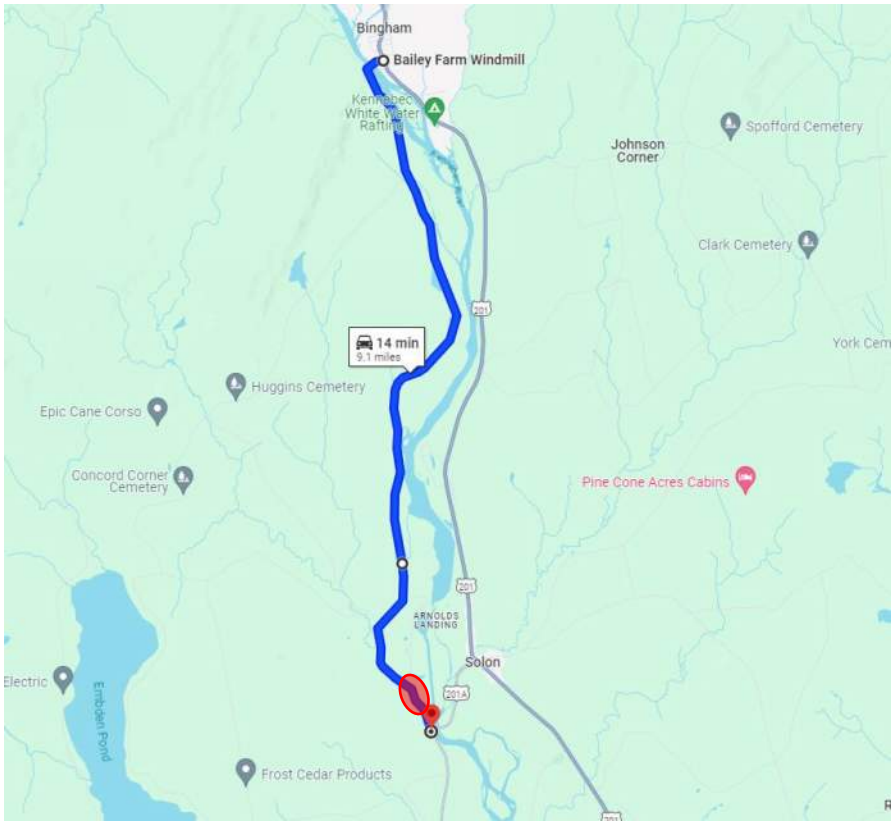

Figure 7 - #2090 Normal Route (Red circle notes bridge location)

Bowdoin, Cobbs Bridge #2159 (Burrough Road over Little River)

NBI Detour = 100.0 miles

No available detour for this bridge location, numerous houses on the dead-end road after the bridge.

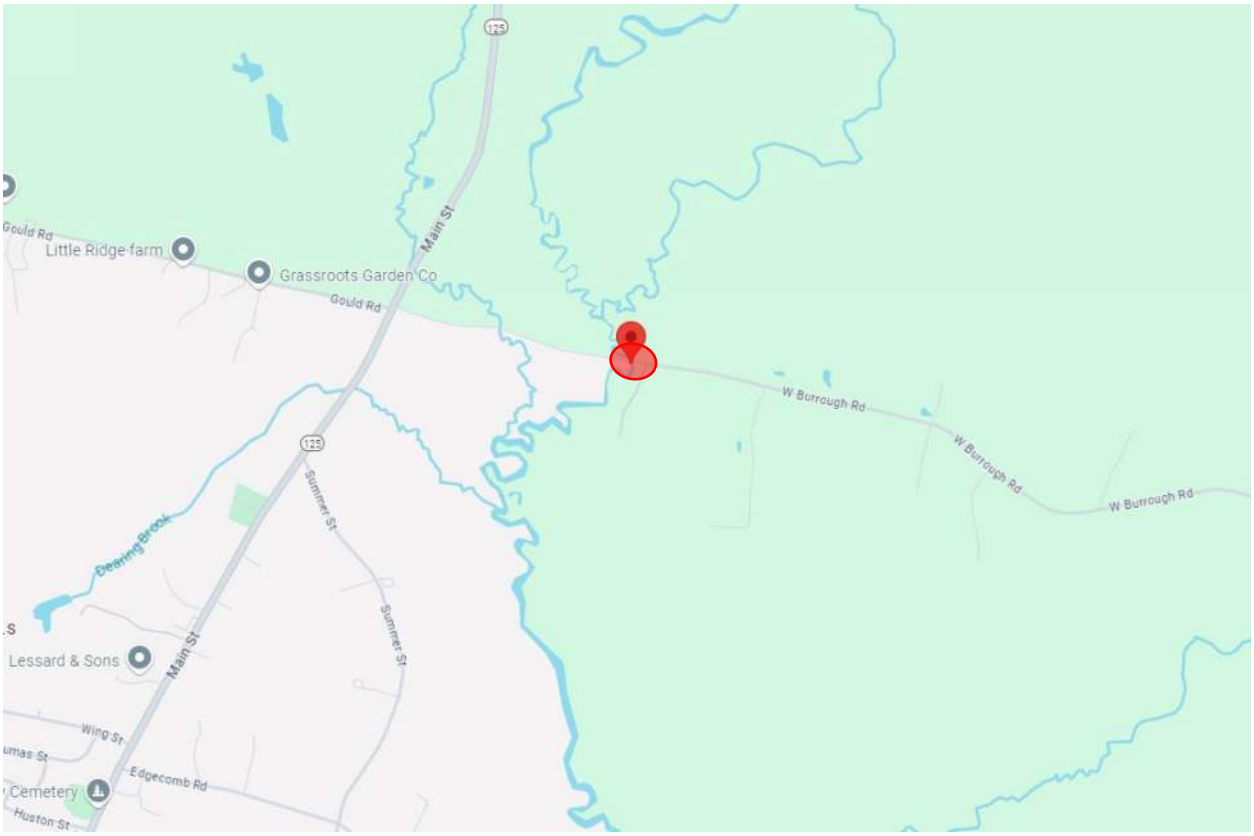

Figure 8 - #2159 Bridge Location (Red circle notes bridge location)

Caratunk, Pleasant Pond Bridge #2672 (Main Street over Pleasant Pond Stream)

NBI Detour = 0.0 miles

Net Detour Calculation: *Figure 10* shows 1.1 miles (1 min), the original route (*Figure 11*) from point A to B is 1.2 miles (3 min), therefore net detour is approximately -0.1 miles. Similar to NBI, use NBI value.

Average Detour Travel Speed: 65 mph = (1.1 miles / (1 min / 60))

Note: Abutment to abutment detour (*Figure 9*) is considered due to the remote locations of the bridges and the primarily residential use of these crossings.

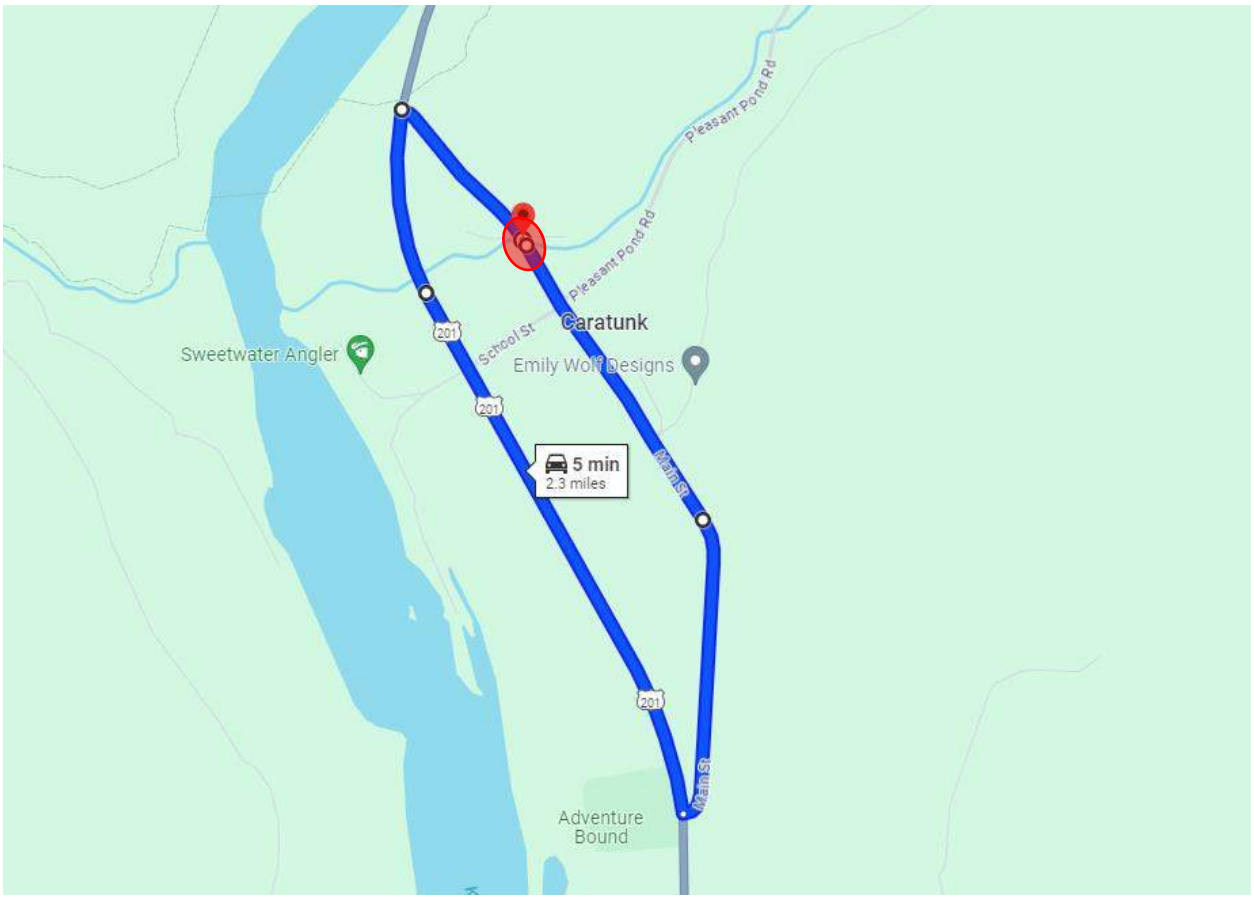

Figure 9 - #2672 Abutment to Abutment Detour Route (Red circle notes bridge location)

Figure 10 - #2672 Bypass Detour Route (Red circle notes bridge location)

Figure 11 - #2672 Normal Route (Red circle notes bridge location)

Caratunk, Pleasant Pond #2 Bridge #3921 (Pleasant Pond Road over Pleasant Pond Stream)

NBI Detour = 100.0 miles

No available detour for this bridge location, numerous houses on the dead-end road after the bridge.

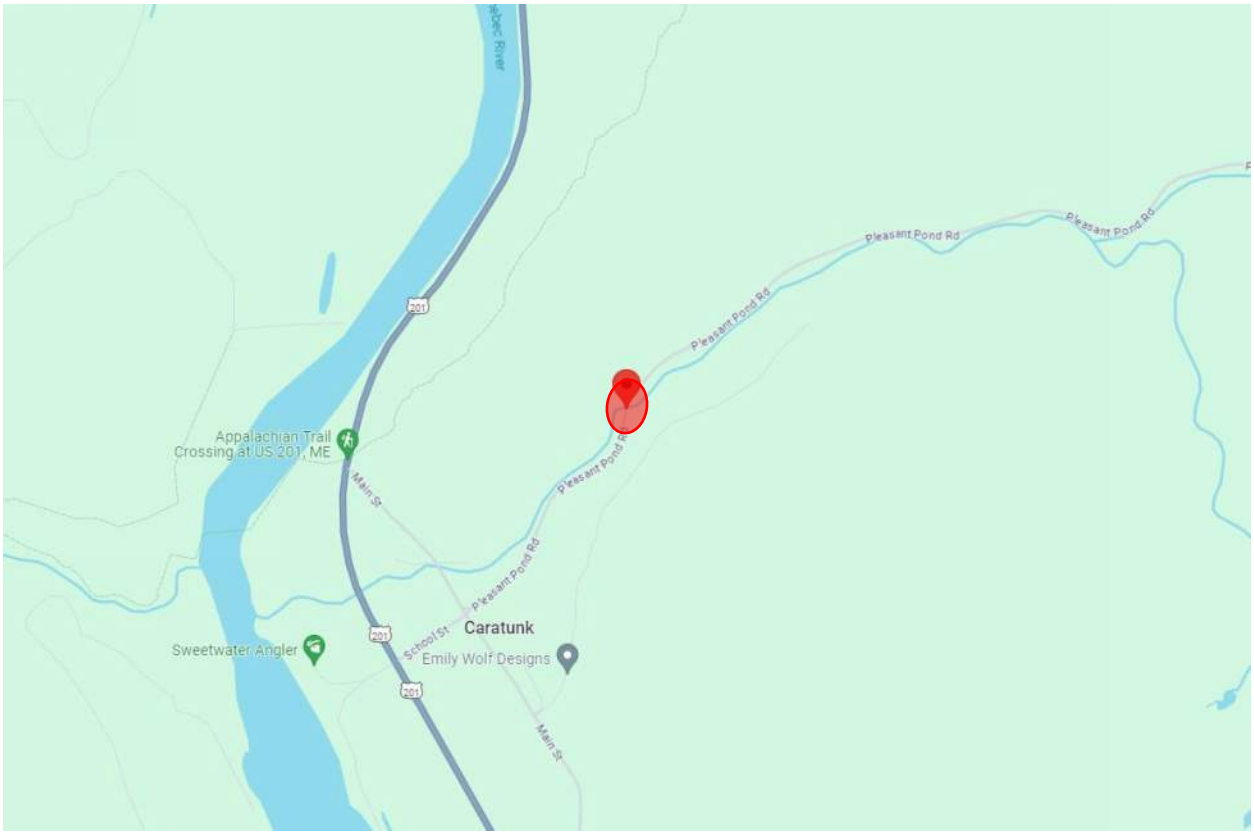

Figure 12 - #3921 Bridge Location (Red circle notes bridge location)

Orland, Moosehorn Creek Bridge #5494 (Bald Mountain Road over Moosehorn Creek)

NBI Detour = 7.0 miles

Net Detour Calculation: *Figure 14* shows 5.5 miles (7 min), the original route (*Figure 15*) from point A to B is 10.2 miles (16 min), therefore net detour is approximately -4.7 miles. Assume appropriate detour length is 0.0 miles.

Average Detour Travel Speed: 48 mph = (5.5 miles / (7 min / 60))

Note: Abutment to abutment detour (*Figure 13*) is considered due to the remote locations of the bridges and the primarily residential use of these crossings.

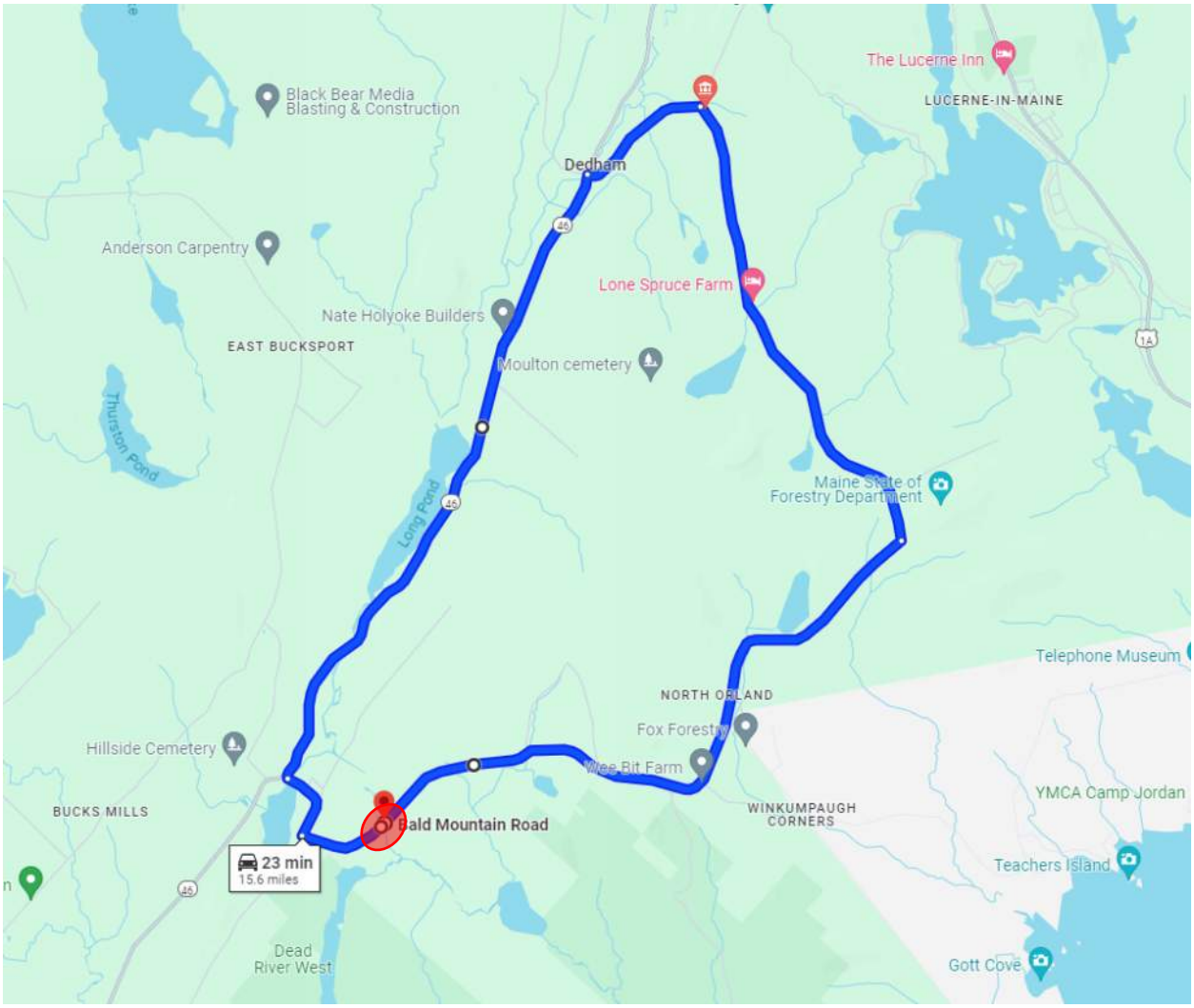

Figure 13 - #5494 Abutment to Abutment Detour Route (Red circle notes bridge location)

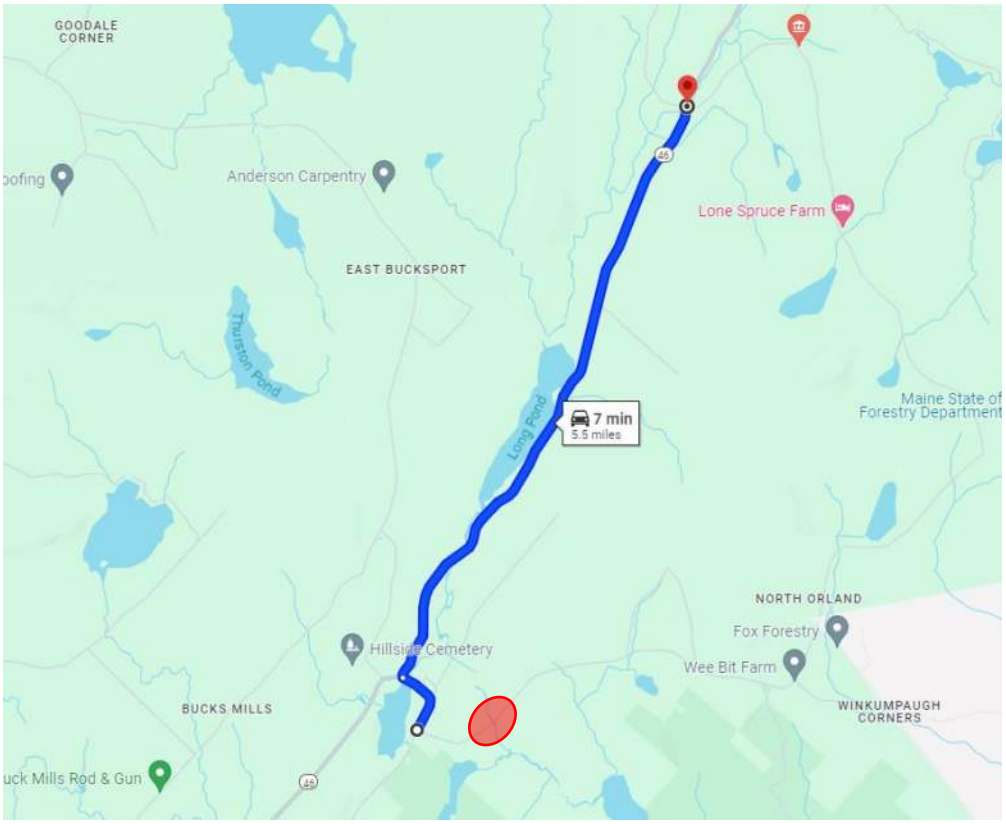

Figure 14 - #5494 Bypass Detour Route (Red circle notes bridge location)

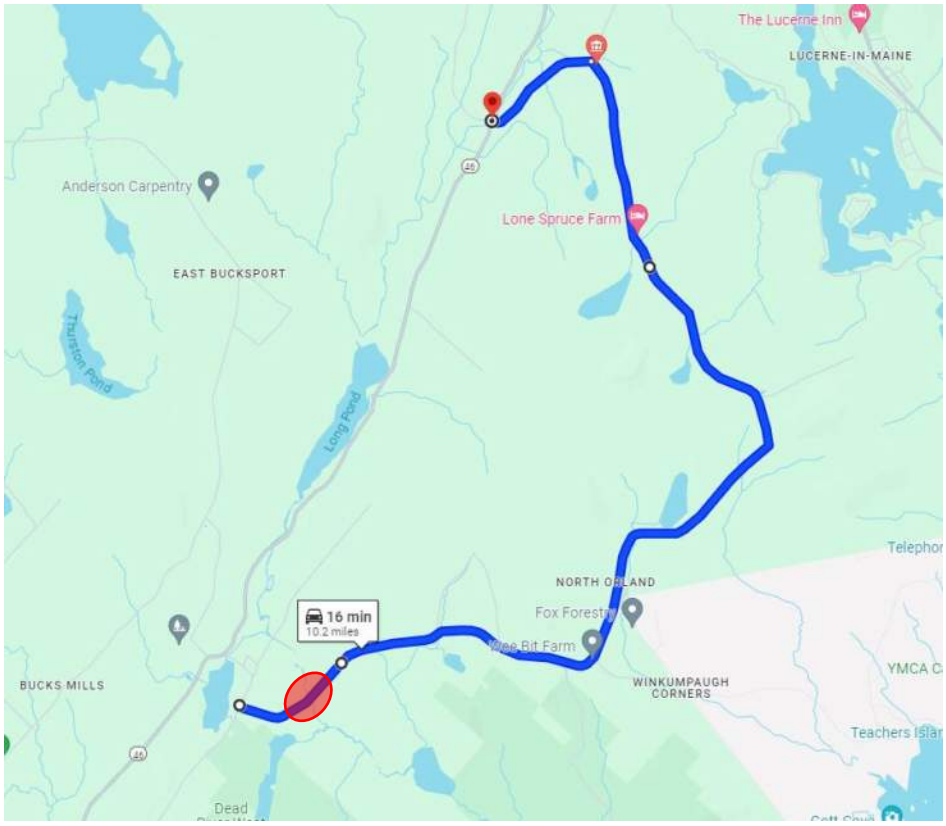

Figure 15 - #5494 Normal Route (Red circle notes bridge location)

Carmel, Philbrook Bridge #5505 (Fuller Road over Harvey Brook)

NBI Detour = 3.0 miles

Net Detour Calculation: *Figure 17* shows 4.9 miles (8 min), the original route (*Figure 18*) from point A to B is 2.1 miles (3 min), therefore net detour is approximately 2.8 miles. Similar to NBI, use NBI value.

Average Detour Travel Speed: 35 mph = (4.9 miles / (8 min / 60))

Note: Abutment to abutment detour (*Figure 16*) is considered due to the remote locations of the bridges and the primarily residential use of these crossings.

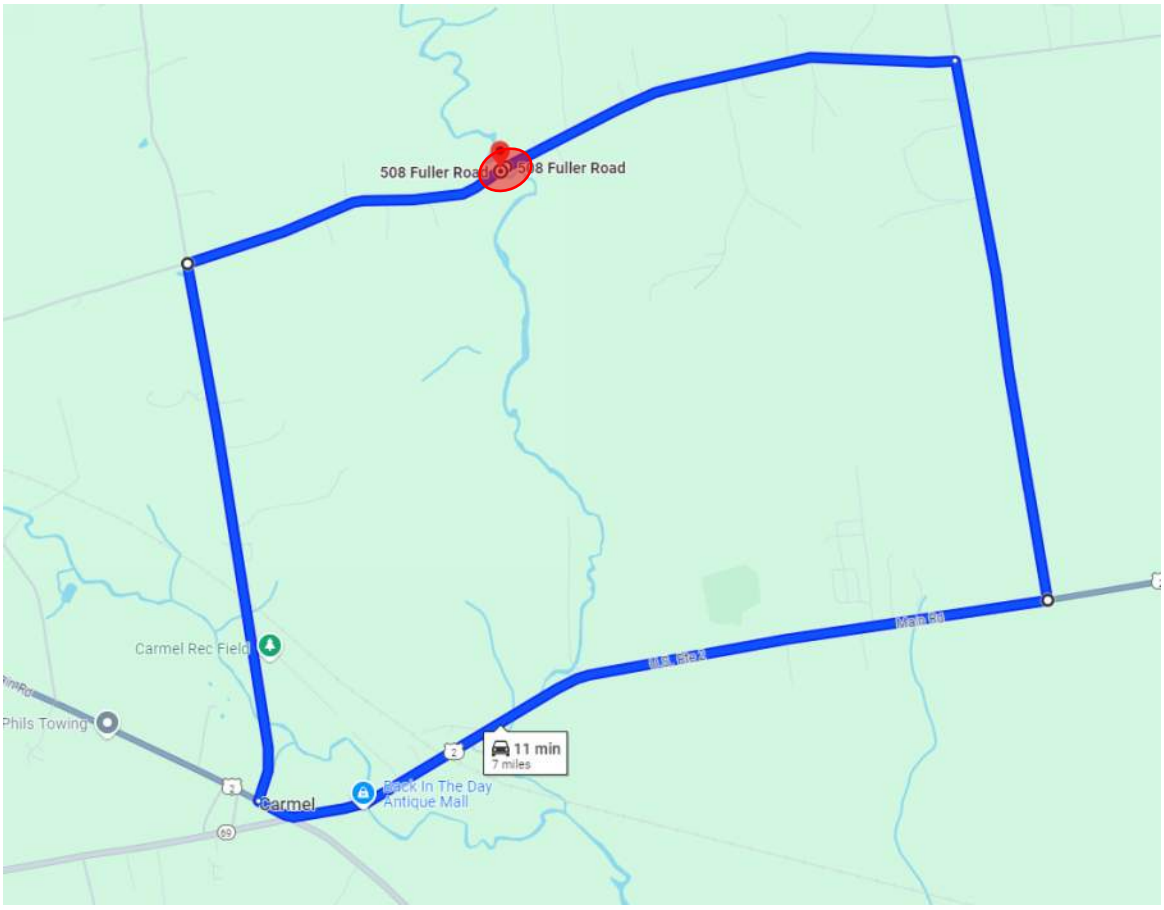

Figure 16 - #5505 Abutment to Abutment Detour Route (Red circle notes bridge location)

Figure 17 - #5505 Bypass Detour Route (Red circle notes bridge location)

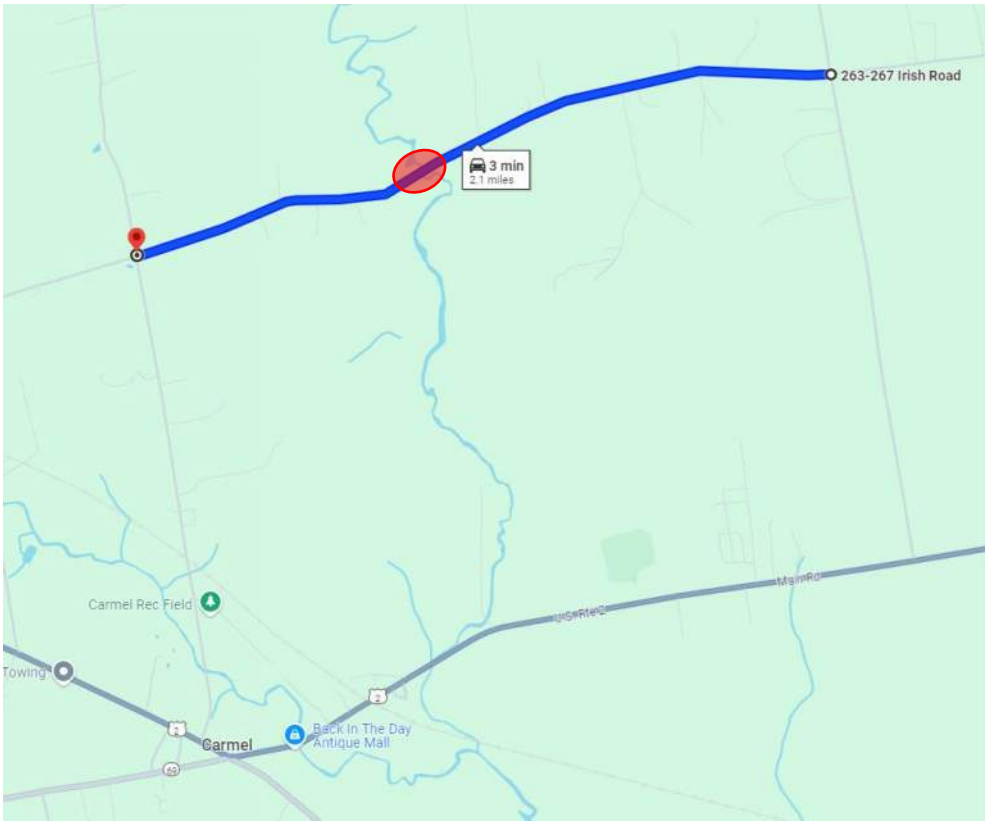

Figure 18 - #5505 Normal Route (Red circle notes bridge location)

Sangerville, Brockways Mill Bridge #5559 (Silvers Mills Road over French Mills Brook)

NBI Detour = 3.0 miles

Net Detour Calculation: *Figure 20* shows 7.0 miles (10 min), the original route (*Figure 21*) from point A to B is 4.5 miles (7 min), therefore net detour is approximately 2.5 miles. Similar to NBI, use NBI value.

Average Detour Travel Speed: 42 mph = (7.0 miles / (10 min / 60))

Note: Abutment to abutment detour (*Figure 19*) is considered due to the remote locations of the bridges and the primarily residential use of these crossings.

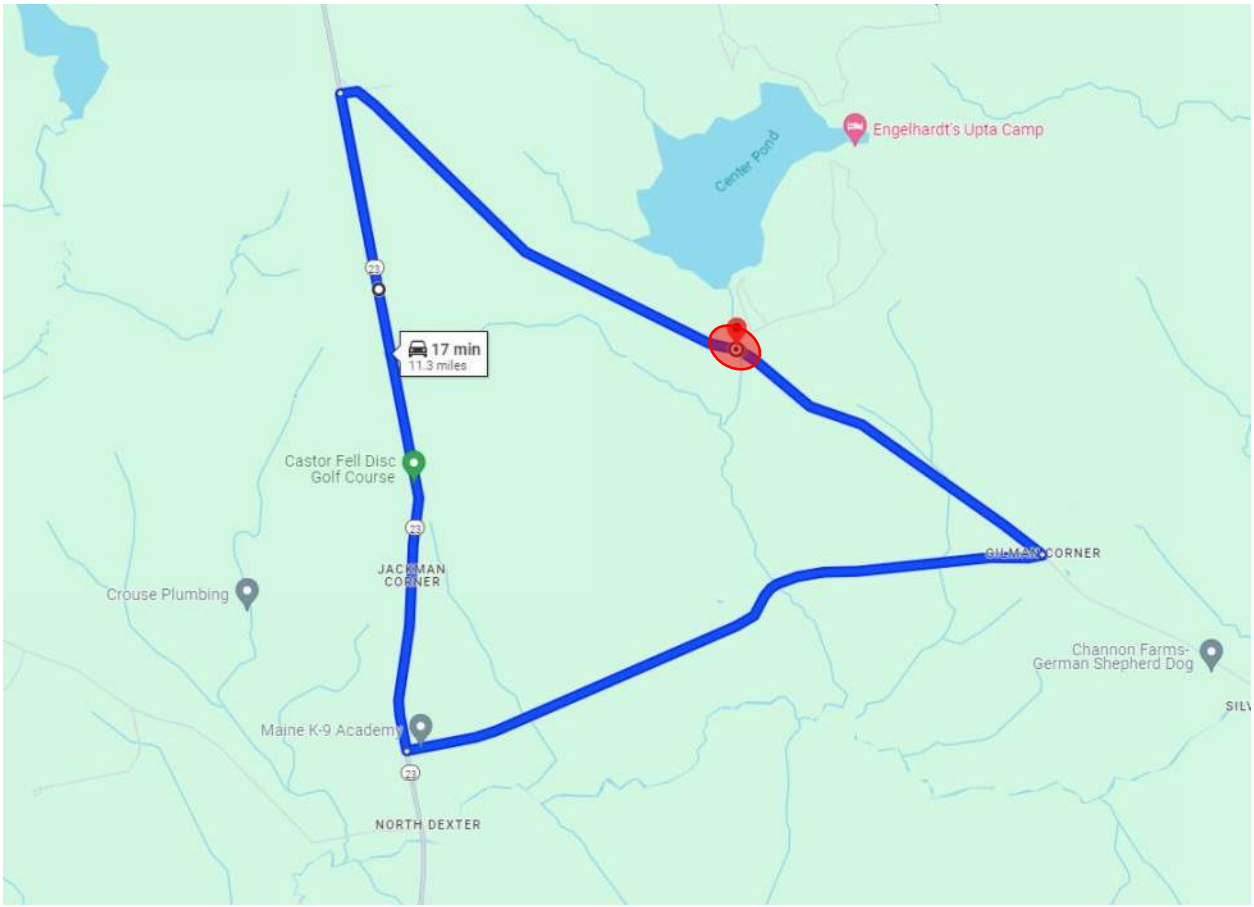

Figure 19 - #5559 Abutment to Abutment Detour Route (Red circle notes bridge location)

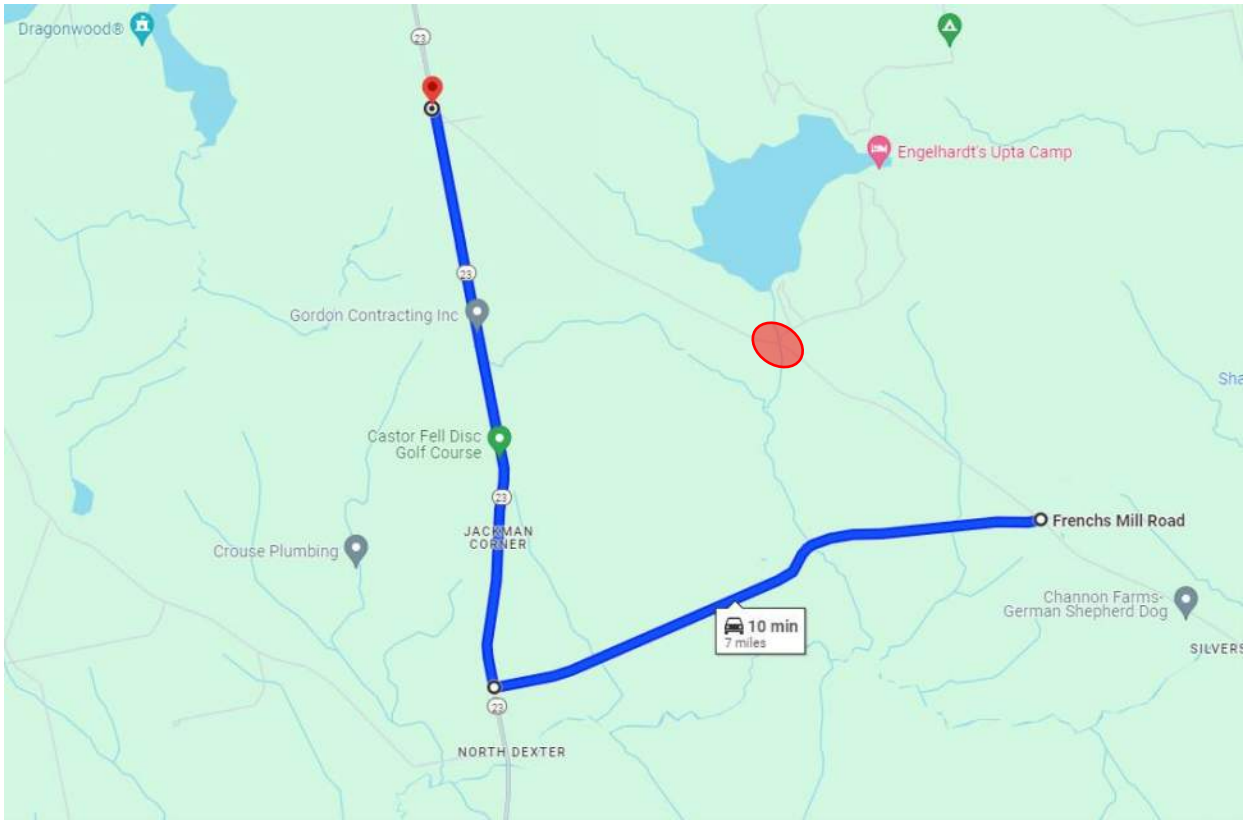

Figure 20 - #5559 Bypass Detour Route (Red circle notes bridge location)

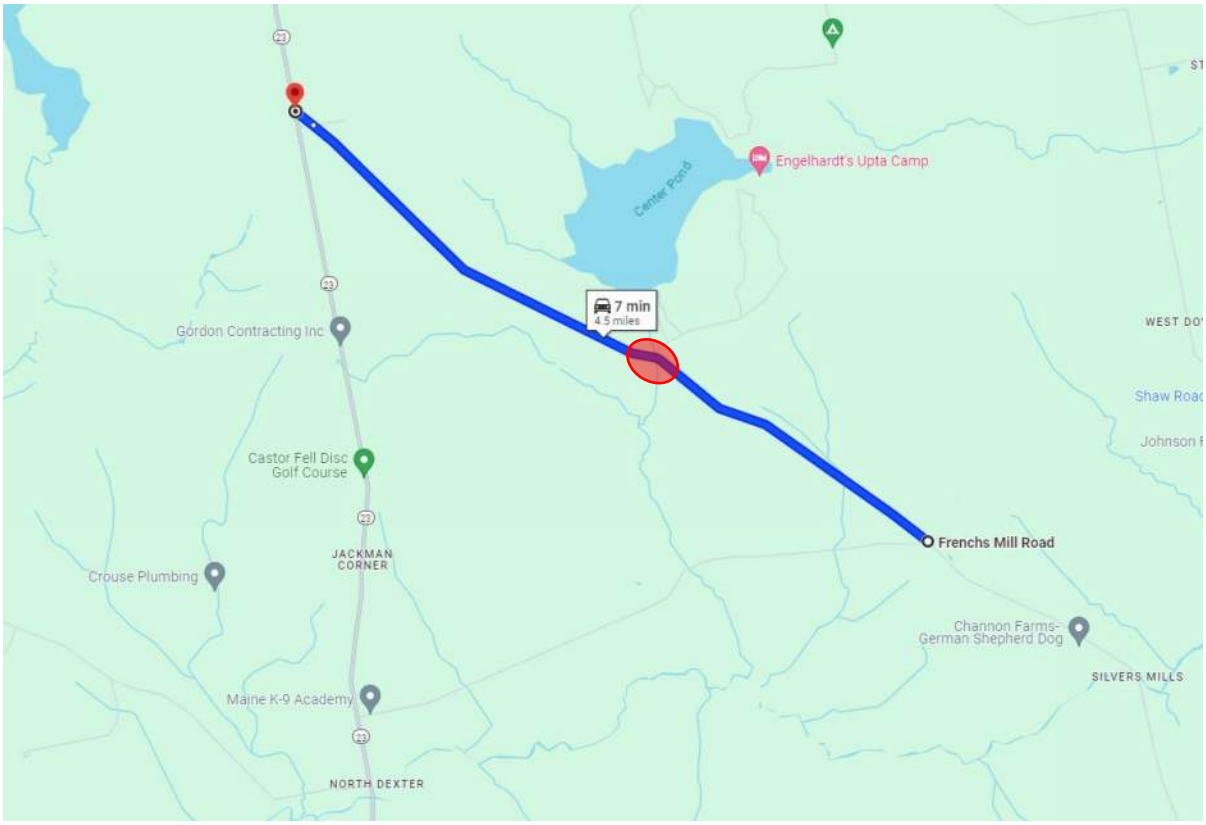

Figure 21 - #5559 Normal Route (Red circle notes bridge location)

Attachment F – Concept 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 1

TRAFFIC DATA

Varies per location, refer to NBI data for traffic volumes. Additional information to be compiled during design phase, not available at this time.

HYDROLOGIC DATA

Data to be compiled and collected during design phase, not available at this time.

MATERIALS

Concrete:
- Curbs & Transition Barriers ..... Class "LP"
- Precast ..... Class "P"
- All Other ..... Class "A"

Reinforcing Steel:
- Plain Reinforcing Steel ..... ASTM A 615, Grade 60
- Low-Carbon Chromium ..... ASTM A 1035, Type CS, Grade 100
- Glass Fiber Reinforced Polymer (GFRP) ..... ASTM D7957
- Prestressing Strands ..... AASHTO M 203 (ASTM A 416), Grade 270, Low Relaxation

BASIC DESIGN STRESSES

Concrete:
- Concrete, Class "A" ..... f 'c = 4,000 psi
- Concrete, Class "P" ..... f 'ci = 6,500 psi, f 'c = 8,000 psi
- Concrete, Class "LP" ..... f 'c = 5,000 psi

Reinforcing:
- Plain Reinforcing Steel ..... f y = 60,000 psi
- Low-Carbon Chromium Reinforcing Steel ..... f y = 100,000 psi
- Prestressing Strands ..... F μ = 270,000 psi
- Glass Fiber Reinforced Polymer:
  - #5 Bar ..... f fu = 100,000 psi
  - #6 Bar ..... f fu = 100,000 psi
  - #7 Bar ..... f fu = 95,000 psi
  - #8 Bar ..... f fu = 90,000 psi
  - Minimum Elastic Modulus ..... E = 6,150,000 psi
  - Minimum Nominal Design Tensile Strain ..... e fu = 1.226%

LIST OF DRAWINGS

OFF-SYSTEM BRIDGE BUNDLE PLANNING STUDY CONCEPT PLANS FOR STANDARDIZED DESIGN

9 BRIDGE LOCATIONS

CONCEPT PLANS TO SUPPORT GRANT APPLICATION NOVEMBER 1, 2024

PROJECT LOCATION:	Varies, see location map
PROGRAM AREA:	Planning
OUTLINE OF WORK:	Conceptual plans for bridge replacement standardized design details to support grant application development.

HNTB

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

APPROVED — DATE

COMMISSIONER:

CHIEF ENGINEER:

PROJECT INFORMATION

PROGRAM	PLANNING
PROJECT MANAGER	ANDREW BICKMORE
DESIGNER	RICH TETREAULT
CONSULTANT	HNTB
PROJECT RESIDENT	
CONTRACTOR	
PROJECT COMPLETION DATE	

SIGNATURE

P.E. NUMBER

DATE

OFF-SYSTEM BRIDGE BUNDLE

TITLE SHEET

SHEET NUMBER

1

OF 17

Date:10/17/2024

Username:

Division:

Filename:001_Title.dgn

CONCEPT PLANS TO
SUPPORT GRANT APPLICATION
NOVEMBER 1, 2024

BRIDGE LOCATIONS

9 Bridges

HNTB

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

CONCEPT PLANS

PLANNING PHASE

		BY	DATE
PROJ. MANAGER	R. Tetreault		
DESIGN-DETAILED	J. McCauley	E. Beausoleil	04\2024
CHECKED-REVIEWED	K. Brayley	J. Olund	04\2024
DESIGN2-DETAILED2			
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

SIGNATURE

P.E. NUMBER

DATE

OFF-SYSTEM
BRIDGE BUNDLE

LOCATION MAP

SHEET NUMBER

2

OF 17

Filename: 002_Location Map.dgn Division: Username: Date:10/17/2024

CONCEPT PLANS TO SUPPORT GRANT APPLICATION NOVEMBER 1, 2024

BRIDGE NOTES:

AADT = 101
Bypass Detour = 100 Miles
MDT = Temporary Bridge

PLAN - HOWARD ROAD OVER WEST BRANCH CARRABASSET RIVER

Bridge #0382

EXISTING BRIDGE ELEVATION

HNTB

PROJ. MANAGER	R. Tetreault	BY	DATE
DESIGN-DETAILED	J. McCauley	E. Beausoleil	04\2024
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DESIGN2-DETAILED2			
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

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DATE

HOWARD ROAD
WEST BRANCH CARRABASSET RIVER
SALEM TOWNSHIP FRANKLIN

PLAN

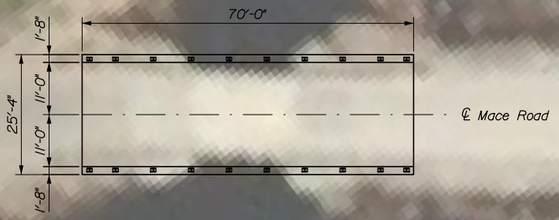
SHEET NUMBER 3 OF 17

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

CONCEPT PLANS

PLANNING PHASE

EXISTING BRIDGE ELEVATION



BRIDGE NOTES:

AADT = 127
Bypass Detour = 6 Miles
MOT = Bridge Closure with Offsite Detour

CONCEPT PLANS TO SUPPORT GRANT APPLICATION NOVEMBER 1, 2024

PLAN - MACE ROAD OVER MCGURDY STREAM
Bridge #0561

HNTB

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

CONCEPT PLANS

PLANNING PHASE

PROJ. MANAGER	R. Tetreault	DATE
DESIGN-DETAILED	J. McCauley	E. Beausoleil 04\2024
CHECKED-REVIEWED	K. Brayley	J. Olund 04\2024
DESIGN2-DETAILED2		
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

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MACE ROAD
MCGURDY STREAM
CHESTERVILLE FRANKLIN

PLAN

SHEET NUMBER

4

OF 17

Scale: 1/16" = 1'-0"

Filename: 004_General Plan - Mace Road.dgn Division: Username: Date:10/17/2024

EXISTING BRIDGE ELEVATION

BRIDGE NOTES:

AADT = 599
Bypass Detour = 0 Miles
MOT = Temporary Bridge

CONCEPT PLANS TO SUPPORT GRANT APPLICATION NOVEMBER 1, 2024

PLAN - KENNEBEC RIVER ROAD OVER MARTIN STREAM
Bridge #2090

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STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

CONCEPT PLANS

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		BY	DATE
PROJ. MANAGER	R. Tetreault		
DESIGN-DETAILED	J. McCauley	E. Beausoleil	04\2024
CHECKED-REVIEWED	K. Brayley	J. Olund	04\2024
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DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
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KENNEBEC RIVER ROAD
MARTIN STREAM
EMBDEN SOMERSET

PLAN

SHEET NUMBER

5

OF 17

Filename: 005_GeneralPlan - Kennebec River Road.dgn Division: Username: Date:10/17/2024

Date:10/17/2024
Username:
Division:
Filename: 006_GeneralPlan - Burrough Road.dgn

EXISTING BRIDGE ELEVATION

PLAN - BURROUGH ROAD OVER LITTLE RIVER
Bridge #2159

BRIDGE NOTES:

AADT = 412
Bypass Detour = 100 Miles
MOT = Temporary Bridge

CONCEPT PLANS TO
SUPPORT GRANT APPLICATION
NOVEMBER 1, 2024

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

CONCEPT PLANS

PLANNING PHASE

		BY	DATE
PROJ. MANAGER	R. Tetreault		
DESIGN-DETAILED	J. McCauley	E. Beausoleil	04\2024
CHECKED-REVIEWED	K. Brayley	J. Olund	04\2024
DESIGN2-DETAILED2			
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

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DATE

BOWDOIN

BURROUGH ROAD
LITTLE RIVER

SAGADAHOC

PLAN

HNTB

SHEET NUMBER
6
OF 17

EXISTING BRIDGE ELEVATION

BRIDGE NOTES:

AADT = 196
Bypass Detour = 0 Miles
MOT = Bridge Closure with Offsite Detour

CONCEPT PLANS TO
SUPPORT GRANT APPLICATION
NOVEMBER 1, 2024

PLAN - MAIN STREET OVER PLEASANT POND STREAM
Bridge #2672

HNTB

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

CONCEPT PLANS

WIN
PLANNING PHASE

PROJ. MANAGER	R. Tetreault	BY	DATE
DESIGN-DETAILED	J. McCauley	E. Beausoleil	04\2024
CHECKED-REVIEWED	K. Brayley	J. Olund	04\2024
DESIGN2-DETAILED2			
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
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DATE

MAIN STREET
PLEASANT POND STREAM
CARATUNK SOMERSET

PLAN

SHEET NUMBER
7
OF 17

EXISTING BRIDGE ELEVATION

PLAN - PLEASANT POND ROAD OVER PLEASANT POND STREAM

Bridge #3921

BRIDGE NOTES:

AADT = 180
Bypass Detour = 100 Miles
MOT = Temporary Bridge

CONCEPT PLANS TO SUPPORT GRANT APPLICATION NOVEMBER 1, 2024

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STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

CONCEPT PLANS

PLANNING PHASE

		BY	DATE
PROJ. MANAGER	R. Tetreault		
DESIGN-DETAILED	J. McCauley	E. Beausoleil	04\2024
CHECKED-REVIEWED	K. Brayley	J. Olund	04\2024
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DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

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PLEASANT POND ROAD
PLEASANT POND STREAM
CARATUNK SOMERSET

PLAN

SHEET NUMBER

8

OF 17

Filename: 008_General Plan - Pleasant Pond.dgn Division: Username: Date:10/17/2024

EXISTING BRIDGE ELEVATION

PLAN - BALD MOUNTAIN ROAD OVER MOOSEHORN CREEK
Bridge #5494

BRIDGE NOTES:
AADT = 291
Bypass Detour = 7 Miles
MOT = Temporary Bridge

CONCEPT PLANS TO SUPPORT GRANT APPLICATION NOVEMBER 1, 2024

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

CONCEPT PLANS

PLANNING PHASE

		BY	DATE
PROJ. MANAGER	R. Tetreault		
DESIGN-DETAILED	J. McCauley	E. Beausoleil	04\2024
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DESIGN2-DETAILED2			
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

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P.E. NUMBER
DATE

BALD MOUNTAIN ROAD
MOOSEHORN CREEK
ORLAND HANCOCK

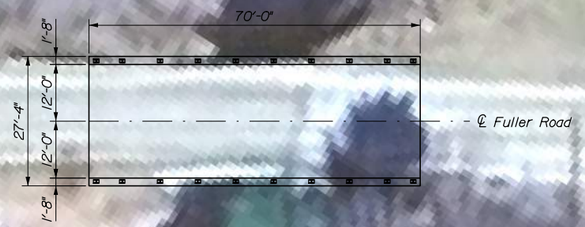
PLAN

SHEET NUMBER
9
OF 17

HNTB

Filename: 009_GeneralPlan - Bald Mountain Road.dgn
Division:
Username:
Date:10/17/2024

EXISTING BRIDGE ELEVATION



PLAN - FULLER ROAD OVER HARVEY BROOK

Bridge #5505

BRIDGE NOTES:

AADT = 600
Bypass Detour = 3 Miles
MOT = Bridge Closure with Offsite Detour

CONCEPT PLANS TO SUPPORT GRANT APPLICATION NOVEMBER 1, 2024

HNTB

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

CONCEPT PLANS

PLANNING PHASE

PROJ. MANAGER	R. Tetreault	BY	
DESIGN-DETAILED	J. McCauley	E. Beausoleil	04\2024
CHECKED-REVIEWED	K. Brayley	J. Olund	04\2024
DESIGN2-DETAILED2			
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

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P.E. NUMBER

DATE

FULLER ROAD
HARVEY BROOK
PENOBSCOT
CARMEL

PLAN

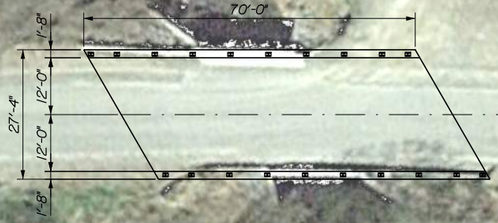
SHEET NUMBER

10

OF 17

Filename: 010_GeneralPlan - Fuller Road.dgn Division: Username: Date:10/17/2024

EXISTING BRIDGE ELEVATION



BRIDGE NOTES:

AADT = 103
Bypass Detour = 3 Miles
MOT = Bridge Closure with Offsite Detour

CONCEPT PLANS TO SUPPORT GRANT APPLICATION NOVEMBER 1, 2024

PLAN - SILVERS MILLS ROAD OVER FRENCH MILLS BROOK
Bridge #5559

NOTES:

1. Curb and railing are in good condition due to recent repair project, however remainder of superstructure and substructure condition are fair to poor condition. Discussion warranted could justify leaving existing bridge due to recent repair investment.

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STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

CONCEPT PLANS

PLANNING PHASE

PROJ. MANAGER	R. Tetreault	BY	DATE
DESIGN-DETAILED	J. McCauley	E. Beausoleil	04\2024
CHECKED-REVIEWED	K. Brayley	J. Olund	04\2024
DESIGN2-DETAILED2			
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

SIGNATURE

P.E. NUMBER

DATE

SILVERS MILLS ROAD
FRENCH MILLS BROOK
SANGERVILLE PISCATAQUIS

PLAN

SHEET NUMBER

11

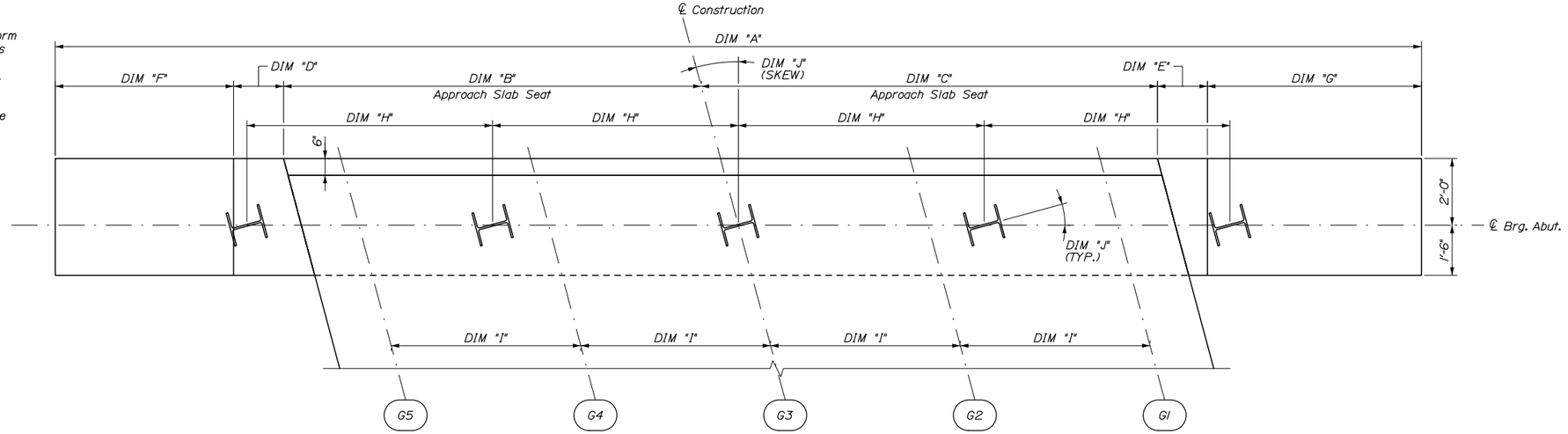
OF 17

Filename: 011_GeneralPlan - Silver Mills Road.dgn Division: Username: Date:10/17/2024

Notes:

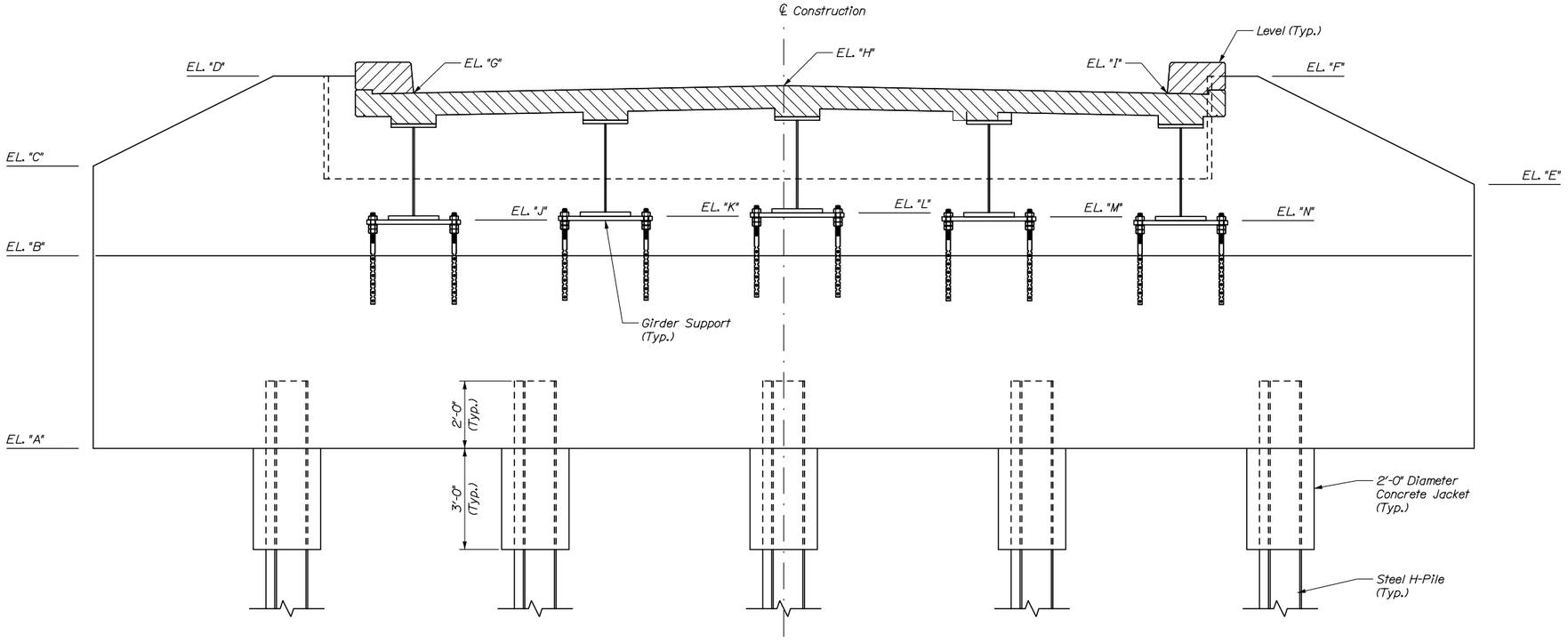
1. Integral abutment bridges shall conform to typical MaineDOT geometrics such as 3' thickness and other typical detailing that will be consistent between bridges.

2. Details show steel girders for the integral abutments. Other superstructure types anticipated to be similar.



ABUTMENT PLAN - INTEGRAL ABUTMENT

ABUTMENT DIMENSIONS												
Bridge	Abutment	DIM "A"	DIM "B"	DIM "C"	DIM "D"	DIM "E"	DIM "F"	DIM "G"	DIM "H"	DIM "I"	DIM "J"
#XXXX	No. 1	Dimensions vary per bridge, to be filled out during preliminary/final design.									
	No. 2										



ABUTMENT ELEVATION - INTEGRAL ABUTMENT

ABUTMENT DIMENSIONS																
Bridge	Abutment	EL. "A"	EL. "B"	EL. "C"	EL. "D"	EL. "E"	EL. "F"	EL. "G"	EL. "H"	EL. "I"	EL. "J"	EL. "K"	EL. "L"	EL. "M"	EL. "N"
#XXXX	No. 1	Dimensions vary per bridge, to be filled out during preliminary/final design.													
	No. 2														

CONCEPT PLANS TO SUPPORT GRANT APPLICATION NOVEMBER 1, 2024

HNTB

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

CONCEPT PLANS

PLANNING PHASE

P.E. NUMBER

SIGNATURE

DATE

	BY	DATE
PROJ. MANAGER	R. Tetreault	
DESIGN-DETAILED	J. McCauley	04\2024
CHECKED-REVIEWED	K. Brayley	04\2024
DESIGN2-DETAILED2		
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

OFF-SYSTEM
BRIDGE BUNDLE

ABUTMENT DETAILS I
INTEGRAL ABUTMENT

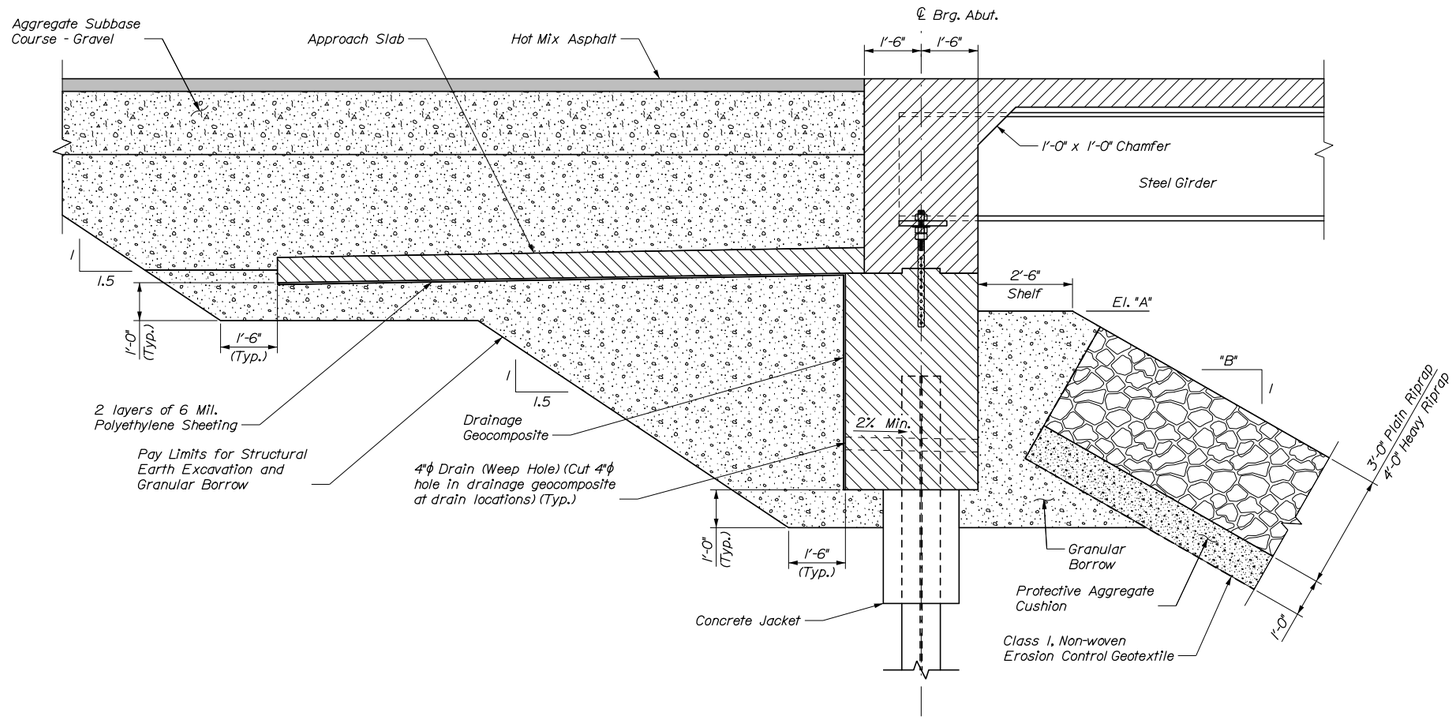
SHEET NUMBER

12

OF 17

Filename: 012_Abutment Details I - IAB.dgn Division: Username: Date:10/17/2024

CONCEPT PLANS TO
SUPPORT GRANT APPLICATION
NOVEMBER 1, 2024



INTEGRAL ABUTMENT BACKFILL DETAIL

ABUTMENT DIMENSIONS

Bridge	Abutment	"A"	"B"
#XXXX	No. 1	Dimensions vary per bridge, to be filled out during preliminary/final design.	
	No. 2		
#XXXX	No. 1		
	No. 2		
#XXXX	No. 1		
	No. 2		
#XXXX	No. 1		
	No. 2		
#XXXX	No. 1		
	No. 2		

HNTB

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

CONCEPT PLANS

PLANNING PHASE

PROJ. MANAGER	R. Tetreault	BY	DATE
DESIGN-DETAILED	J. McCauley	E. Beausoleil	04\2024
CHECKED-REVIEWED	K. Brayley	J. Olund	04\2024
DESIGN2-DETAILED2			
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

SIGNATURE

P.E. NUMBER

DATE

OFF-SYSTEM
BRIDGE BUNDLE

ABUTMENT DETAILS II
INTEGRAL ABUTMENT

SHEET NUMBER

13

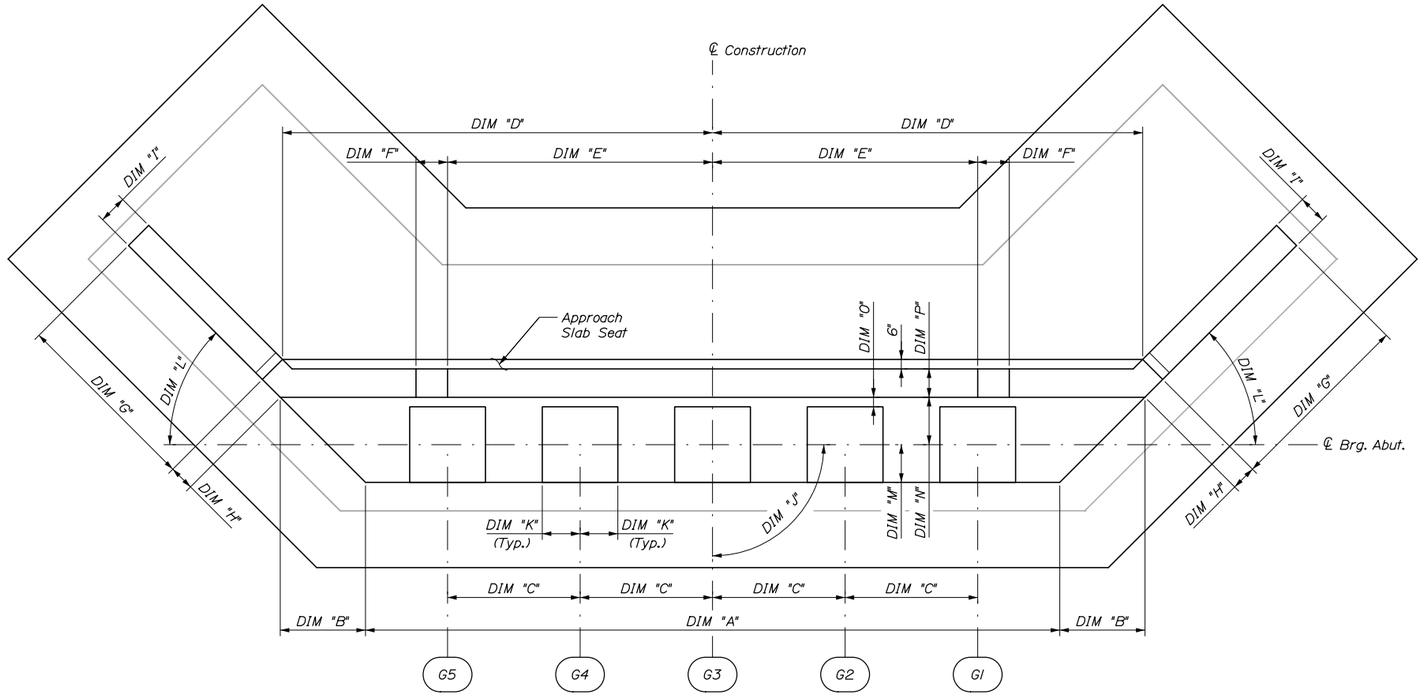
OF 17

Username:

Date:10/17/2024

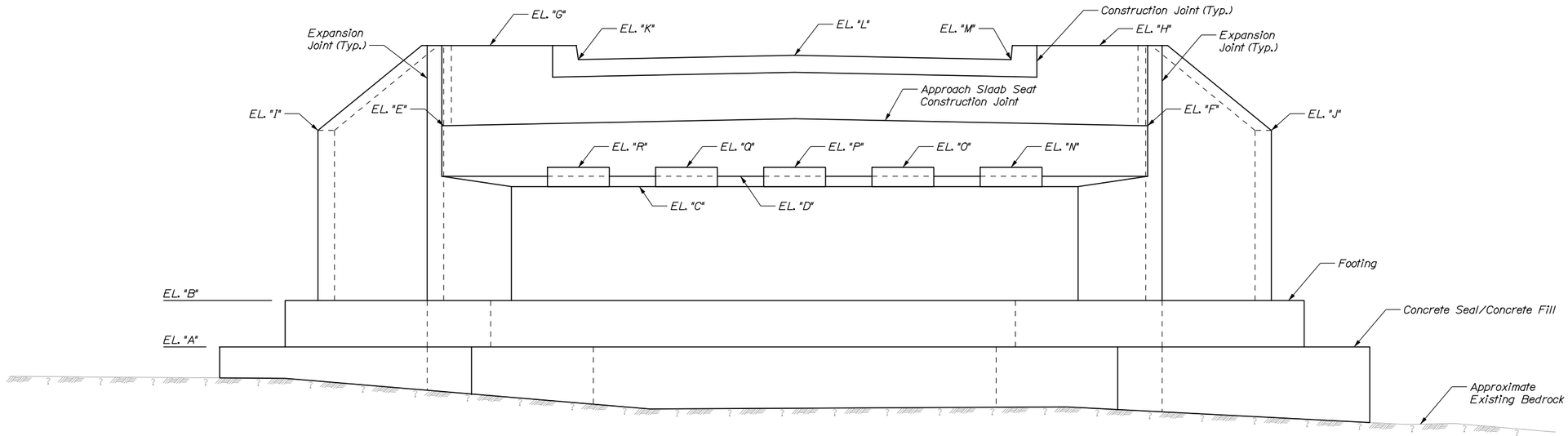
Division:

Filename: 013_Abutment Details II - IAB.dgn



ABUTMENT PLAN - CONVENTIONAL ABUTMENT

ABUTMENT DIMENSIONS																		
Bridge	Abutment	DIM "A"	DIM "B"	DIM "C"	DIM "D"	DIM "E"	DIM "F"	DIM "G"	DIM "H"	DIM "I"	DIM "J"	DIM "K"	DIM "L"	DIM "M"	DIM "N"	DIM "O"	DIM "P"
#XXXX	No. 1	Dimensions vary per bridge, to be filled out during preliminary/final design.															
	No. 2																



ABUTMENT ELEVATION - CONVENTIONAL ABUTMENT

ABUTMENT DIMENSIONS																			
Bridge	Abutment	EL. "A"	EL. "B"	EL. "C"	EL. "D"	EL. "E"	EL. "F"	EL. "G"	EL. "H"	EL. "I"	EL. "J"	EL. "K"	EL. "L"	EL. "M"	EL. "N"	EL. "O"	EL. "P"	EL. "Q"	EL. "R"
#XXXX	No. 1	Dimensions vary per bridge, to be filled out during preliminary/final design.																	
	No. 2																		

CONCEPT PLANS TO SUPPORT GRANT APPLICATION NOVEMBER 1, 2024

HNTB

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

CONCEPT PLANS

PLANNING PHASE

		BY	DATE
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DESIGN-DETAILED	J. McCauley	E. Beausoleil	04\2024
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DESIGN2-DETAILED2			
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

SIGNATURE

P.E. NUMBER

DATE

OFF-SYSTEM
BRIDGE BUNDLE

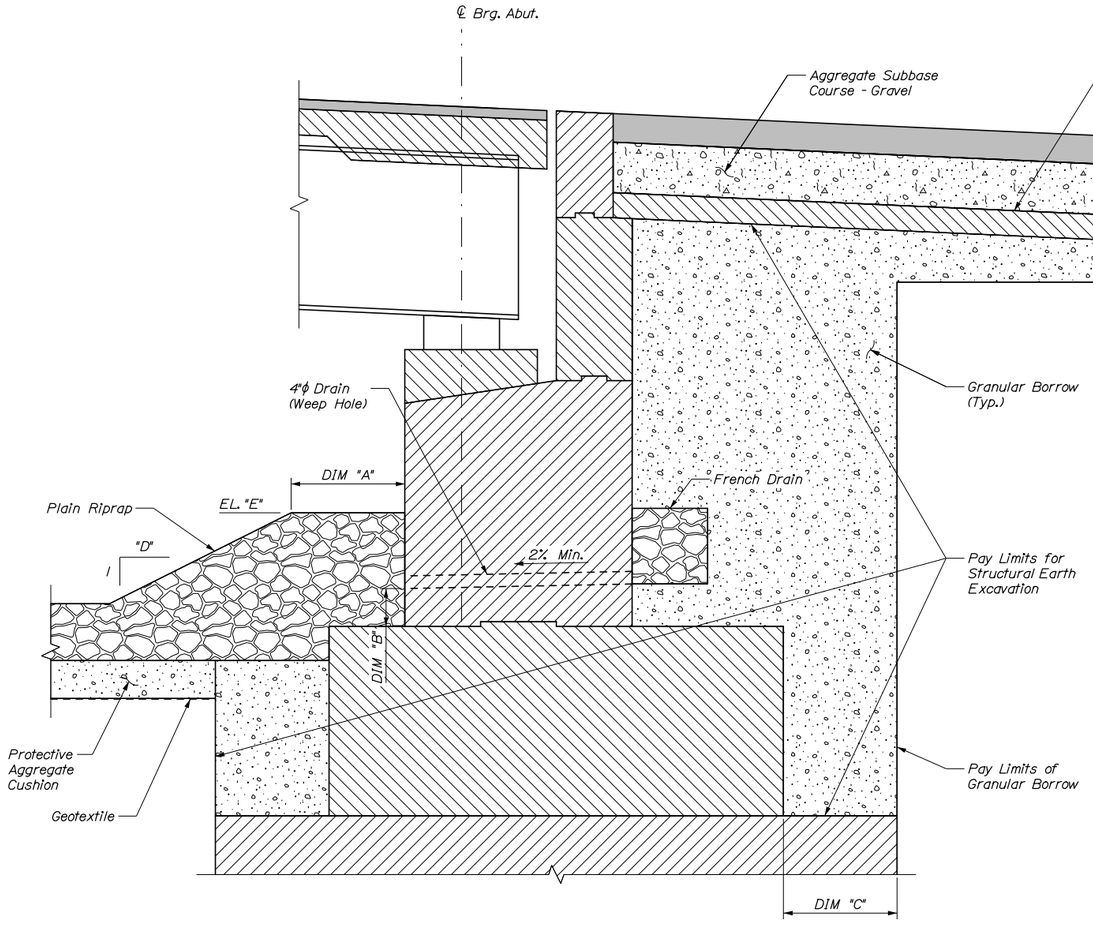
ABUTMENT DETAILS I
CONVENTIONAL ABUTMENT

SHEET NUMBER

14

OF 17

Filename: 014_Abutment Details I - CONV.dgn Username: Division: Date:10/17/2024



CONVENTIONAL ABUTMENT BACKFILL DETAIL

CONCEPT PLANS TO SUPPORT GRANT APPLICATION NOVEMBER 1, 2024

ABUTMENT DIMENSIONS							
Bridge	Abutment	DIM "A"	DIM "B"	DIM "C"	DIM "D"	DIM "E"	
#XXXX	No. 1	Dimensions vary per bridge, to be filled out during preliminary/final design.					
	No. 2						

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STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

CONCEPT PLANS

PLANNING PHASE

P.E. NUMBER

DATE

SIGNATURE

		BY	DATE
PROJ. MANAGER	R. Tetreault		
DESIGN-DETAILED	J. McCauley	E. Beausoleil	04\2024
CHECKED-REVIEWED	K. Brayley	J. Olund	04\2024
DESIGN2-DETAILED2			
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

OFF-SYSTEM
BRIDGE BUNDLE

ABUTMENT DETAILS II
CONVENTIONAL ABUTMENT

SHEET NUMBER

15

OF 17

Filename: 015_Abutment Details II - CONV.dgn Division: Username: Date:10/17/2024

GENERAL NOTES ALL TYPICAL SECTIONS:

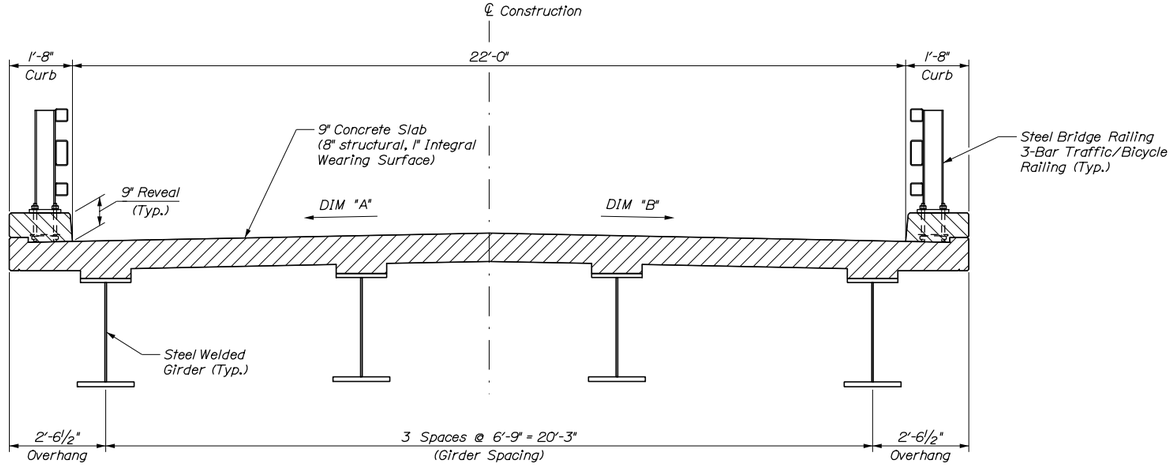
1. The following elements are anticipated to be standardized for all bridges either by the use of MaineDOT Standard Details, or Standard Detail Plan Sheets:
   - Girders/Beams Details for each span length, including deflections
   - Deck reinforcing size and spacing
   - Bearings (elastomeric)
   - Diaphragms
   - Railing & Transitions
   - Joints (APJs)
   - Scuppers (if necessary)

2. The following elements are not anticipated to be standardized and will require unique plan sheets for each bridge:
   - General Plan, Profile & Cross Sections
   - Boring Logs
   - Hydraulics & Traffic Data
   - Framing Plans & Deck Plans
   - Bottom of Slab & Camber

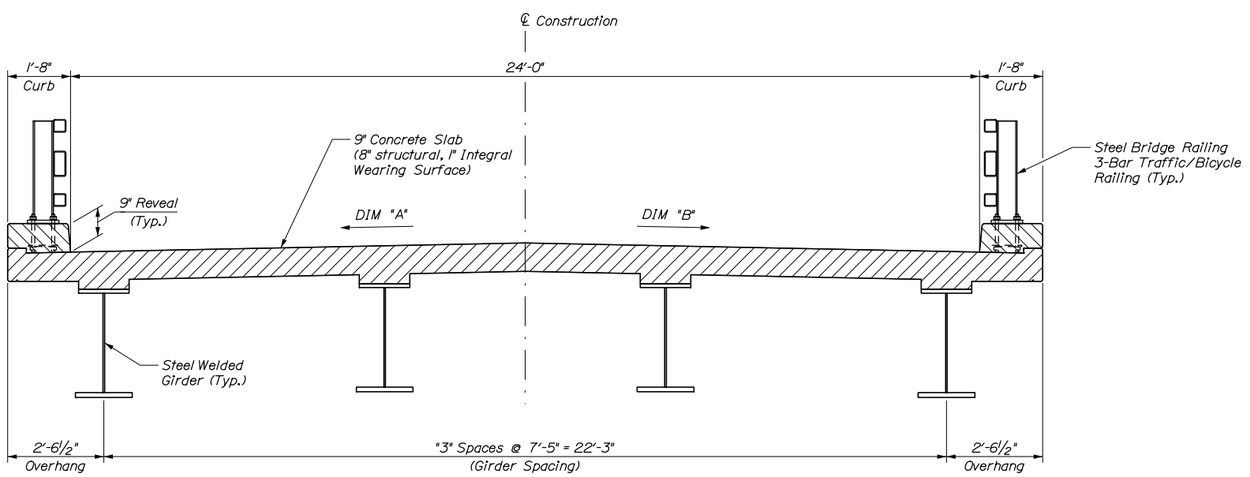
3. Majority of structures will be normal crown with 2% cross-slope. Some locations with require superelevation and geometrics will be tabulated to detail those locations in a later design phase.

STEEL GIRDER NOTES:

1. Two general typical section widths are anticipated, both with standard 1'-8" wide curbs and either a 22' travel width or a 24' travel width. The superstructure types for these two configurations are broken into Types A through B.



TYPICAL SECTION - TYPE A



TYPICAL SECTION - TYPE B

TYPICAL SECTION DIMENSIONS		
Bridge	DIM "A"	DIM "B"
#XXXX	Dimensions vary per bridge, to be filled out during preliminary/final design.	
#XXXX		
#XXXX		
#XXXX		
#XXXX		

CONCEPT PLANS TO SUPPORT GRANT APPLICATION NOVEMBER 1, 2024

HNTB

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

CONCEPT PLANS

PLANNING PHASE

	BY	DATE
PROJ. MANAGER	R. Tetreault	
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CHECKED-REVIEWED	J. McCauley	
DESIGN2-DETAILED2	K. Broyley	
DESIGN3-DETAILED3	J. Olund	04\2024
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

SIGNATURE

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OFF-SYSTEM
BRIDGE BUNDLE

TYPICAL SECTION
STEEL GIRDER

SHEET NUMBER

16

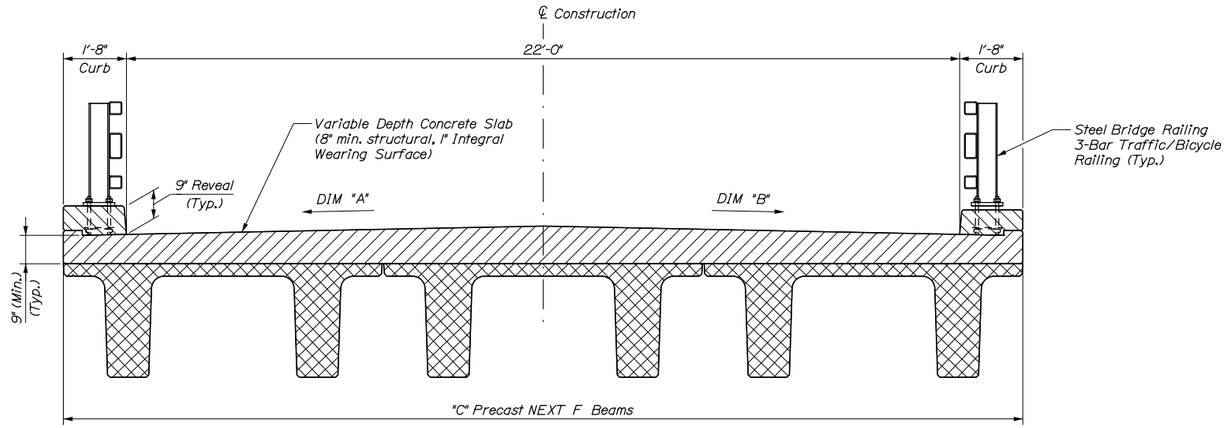
OF 17

Filename: 016_Typical Section - SteelGirder.dgn Division: Username: Date:10/17/2024

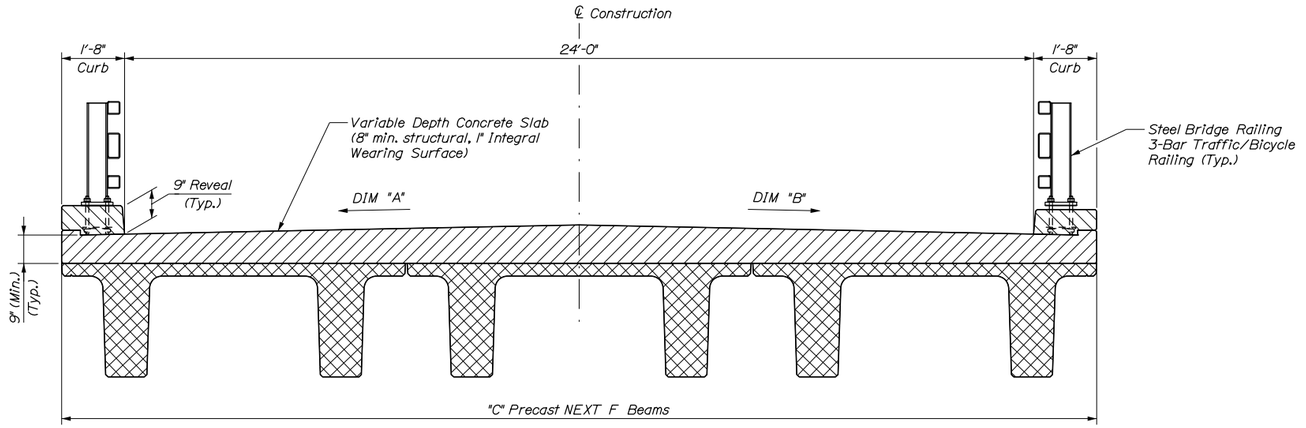
NEXT BEAM NOTES:

1. NEXT Beam 36F is assumed based on span lengths.

2. Two general typical section widths are anticipated, both with standard 1'-8" wide curbs and either a 22' travel width or a 24' travel width. The superstructure types for these two configurations are broken into Types C through D.



TYPICAL SECTION - TYPE C



TYPICAL SECTION - TYPE D

TYPICAL SECTION DIMENSIONS				
Bridge	BEAM SIZE	DIM "A"	DIM "B"	DIM "C"
#XXXX	Dimensions vary per bridge, to be filled out during preliminary/final design.			
#XXXX				
#XXXX				
#XXXX				
#XXXX				

CONCEPT PLANS TO SUPPORT GRANT APPLICATION NOVEMBER 1, 2024

HNTB

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

CONCEPT PLANS

PLANNING PHASE

PROJ. MANAGER	R. Tetreault		
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DESIGN3-DETAILED3			
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REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

SIGNATURE

P.E. NUMBER

DATE

OFF-SYSTEM BRIDGE BUNDLE

TYPICAL SECTION NEXT BEAM

SHEET NUMBER

17

OF 17

Filename: 017_ Typical Section - NEXT Beam.dgn Division: Username: Date:10/17/2024