Bridge Information Form

Project

PIN ______________________ Bridge Number ________

Location ______________________

Bridge Name ______________________

Project Manager ______________________

Lead Designer ______________________

Lead Technician ______________________

Resident ______________________

Design Code

☐ LRFD ☐ LFD ☐ Other (explain)__________________

Bridge Parameters

Number of Spans	____________	
Multiple Span Configuration	____________	
Number of Sidewalks	____________	
Bridge Length (CL Brg Abut to CL Brg Abut)	____________	FT
Buried Structure Total Span Length (use clear spans)	____________	FT
Skew	____________	°
Bridge Width (Fascia-to-Fascia)	____________	FT
Roadway Width (Curb-to-Curb or Rail-to-Rail)	____________	FT
Buried Structure Barrel Length	____________	FT
Beam Spacing	____________	FT
Slab Thickness	____________	IN
Approach Length (inc. buried structure, but exc. bridge)	____________	FT

Scope

☐ BIKEWAY
☐ BRIDGE CONSTRUCTION-NEW
☐ BRIDGE CULVERT REHABILITATION
☐ BRIDGE CULVERT REPLACEMENT
☐ BRIDGE DECK REHABILITATION
☐ BRIDGE DECK REPLACEMENT
☐ BRIDGE IMPROVEMENT
☐ BRIDGE PAINTING
☐ BRIDGE RAIL & CURB IMPROVEMENT
☐ BRIDGE REHABILITATION
☐ BRIDGE REMOVAL
☐ BRIDGE REPLACEMENT
☐ BRIDGE SUBSTRUCTURE REHAB.
☐ BRIDGE SUPERSTRUCTURE REPLACE.
☐ BRIDGE WEARING SURFACE REPLACE.
☐ BRIDGE WIDENING
☐ TEMPORARY BRIDGE
☐ Other (explain)

____

Work Attribute

☐ Consultant LARGE
☐ Consultant MEDIUM
☐ Consultant SMALL
☐ Over Water Replace. X-LARGE
☐ Over Water Replace. LARGE
☐ Over Water Replace. MEDIUM
☐ Over Water Replace. SMALL
☐ Over Water Replace. X-SMALL
☐ Overpass Replace. LARGE
☐ Overpass Replace. MEDIUM
☐ Rehab X-LARGE
☐ Rehab LARGE
☐ Rehab MEDIUM
☐ Rehab SMALL
☐ Paint SIMPLE
☐ Paint COMPLEX
☐ Other (explain)

____

Bridge Information Form

Estimated Quantities

Volume of Abutment Concrete	________	CF
Volume of Pier Concrete	________	CF
Volume of CIP or Precast Rigid Frame Concrete	________	CF
Volume of Structural Slab Concrete	________	CF
Total Length of Concrete Beams/Girders	________	FT
Weight of Structural Steel	________	LB
Weight of Bituminous on Bridge	________	LB
Weight of Substructure Rebar	________	LB
Weight of Superstructure Rebar	________	LB

Buried Structure Type

☐ Structural Steel Pipe or Pipe Arch
☐ Structural Steel Plate Arch or Frame with CIP Footings
☐ Structural Steel Frame with Metal Footings or Bottom Plate
☐ Structural Aluminum Pipe or Pipe Arch
☐ Structural Aluminum Plate Arch or Frame with CIP Footings
☐ Structural Aluminum Frame with Metal Footings or Bottom Plate
☐ Precast Concrete Frame on Concrete Footings
☐ Precast Concrete Box
☐ Cast-in-Place Rigid Frame or Arch
☐ Plastic Pipe
☐ Other (explain)________________________________

Superstructure Type (Primary Load-Carrying Members)

☐ Steel - Rolled Beam
☐ Steel - Welded Constant Depth Girder
☐ Steel - Welded Haunched Girder
☐ Steel - Rolled Beam and Welded Girder
☐ Steel - Welded Box Girder
☐ Precast Prestressed Voided Slab
☐ Precast Prestressed Nonvoided Slab
☐ Precast Prestressed Butted Box Beam
☐ Precast Prestressed Spread Box Beam
☐ Precast Prestressed New England Bulb Tee
☐ Precast Prestressed AASHTO I Girder
☐ CIP Concrete - Slab
☐ CIP Concrete - T-Beam
☐ CIP Concrete - Open Spandrel Arch
☐ Post-Tensioned Concrete - Segmental Box
☐ Inverset
☐ Suspension
☐ Cable-Stayed
☐ Steel - Through Truss
☐ Steel - Pony Truss
☐ Steel - Deck Truss
☐ Timber - Through Truss
☐ Timber - Pony Truss
☐ Timber - Deck Truss
☐ Timber - Covered
☐ Timber - Solid Sawn Beam
☐ Timber - Glulam Beam
☐ Timber - Glulam Direct Span
☐ FRP Reinforced Glulam Beam
☐ Other (explain)
____

Wearing Surface Type

☐ Bituminous with Membrane Waterproofing
☐ Bituminous with HP Membrane Waterproofing
☐ Bituminous over Fill on Buried Structure
☐ Rosphalt
☐ Timber
☐ Concrete - Integral
☐ Concrete - Unreinforced
☐ Concrete - Reinforced
☐ Other (explain)
____

Bridge Information Form

Deck Type

☐ CIP Concrete
☐ CIP Concrete with Precast Deck Panels
☐ Precast Concrete
☐ Open Steel Grid
☐ Concrete-Filled Steel Grid
☐ Orthotropic
☐ Exodermic
☐ Timber
☐ Glulam
☐ Other (explain) ____________________

Composite Deck Design?

☐ Yes ☐ No

Bridge Rail Type

☐ 2-Bar Steel Rail
☐ 3-Bar Steel Rail
☐ 4-Bar Steel Rail
☐ 2-Bar & 4-Bar Steel Rail
☐ Texas Classic Concrete Rail
☐ Maine Concrete Rail
☐ Concrete Barrier
☐ Concrete Barrier with Mounted Steel Rail
☐ Concrete Barrier with Mounted Aluminum Rail
☐ Bridge-Mounted Guardrail
☐ Bridge-Mounted Thrie Beam
☐ 2-Bar Aluminum Rail
☐ 4-Bar Aluminum Rail
☐ Timber and Steel Rail
☐ Timber Rail
☐ Other (explain) ____________________

Abutment Type

☐ Stub Cantilever
☐ Medium Cantilever (5' < Wall < 15')
☐ High Cantilever (Wall >15')
☐ Mass
☐ Integral
☐ Semi-Integral
☐ Other (explain) ____________________

Pier Type

☐ Mass
☐ Pile Bent
☐ Hammerhead
☐ Shaft
☐ Multiple Column
☐ Other (explain) ____________________

Abutment Foundation Type

☐ End-Bearing H-Pile
☐ Friction H-Pile
☐ End-Bearing Pipe Pile
☐ Friction Pipe Pile
☐ Rock-Socketed H-Pile
☐ Rock-Socketed Pipe Pile
☐ Spread Footing on Bedrock
☐ Spread Footing on Soil
☐ Drilled Shaft
☐ MSE Wall
☐ Other (explain) ____________________

Pier Foundation Type

☐ End-Bearing H-Pile
☐ Friction H-Pile
☐ End-Bearing Pipe Pile
☐ Friction Pipe Pile
☐ Rock-Socketed H-Pile
☐ Rock-Socketed Pipe Pile
☐ Spread Footing on Bedrock
☐ Spread Footing on Soil
☐ Drilled Shaft
☐ Other (explain) ____________________

Comments:

3.2.2 Title Page

The Title Page contains the following:

PRELIMINARY DESIGN REPORT
BRIDGE NAME and NUMBER
OVER
RIVER NAME
TOWN, MAINE
FEDERAL PROJECT NUMBER
PIN NUMBER

3.2.3 Table of Contents

This should be a properly identified index of pages.

3.2.4 Background Information

This page provides a quick reference for background information on the project. Much of this information is found either in MaineDOT's ProjEx, the Planning Report, or Bridge Management's SI&A sheet, all of which will be provided by the Project Team. The following sections are completed as shown below:

Program Scope: Copy verbatim the scope from the Biennial Transportation Improvement Program (BTIP).
Program Reads: Copy verbatim the contents of the project description in the BTIP.

Project Background: Provide a brief written description of the project's background, including site review by the 6-Year Plan team, any previous studies and recommendations, requests by Towns, and any other pertinent information.

Structurally Deficient: A structure is structurally deficient if the condition rating for the deck, superstructure, substructure, or the culvert and retaining wall is 4 or less. A structure may also be structurally deficient if the evaluation rating for the overall structural condition or waterway is 2 or less.

Functionally Obsolete: A structure is functionally obsolete if the appraisal rating for the deck geometry, under clearances, or approach roadway alignment is 3 or less. A structure may also be functionally obsolete if the evaluation rating for the overall structural condition or waterway is 3. Any bridge classified as structurally deficient is excluded from the functionally obsolete category.

3.2.5 Location Map

This should be from the Highway Atlas, U.S.G.S., or another map showing the project location. Do not use copyrighted material such as a DeLorme's Maine Atlas and Gazetteer.

3.2.6 Bridge Recommendation Form

All portions of the Recommendation Form should be completed as shown below. A complete description of each component should be included under that component. There are several variations to this form depending on the project scope. If there are parts that are not applicable to the structure type, they need not be included.

Review by - Signature of Engineer of Design is obtained here prior to proceeding with any further work.

Project - State the type of project. Examples:

> "Bridge replacement with 300 ft of approaches, including transitions"
> "Bridge rehabilitation project with no approach work"
> "Bridge replacement as part of Arterial Program project"
> "Bridge replacement with approaches by Arterial Program"

Alignment Description - Give a description of the horizontal and vertical alignments at the structure location and the relationship to the existing alignment. Example:

> "1200' horizontal curve located approximately 30' upstream of existing bridge and a 500' sag (crest) vertical curve with a finish grade 3.5' higher than existing bridge."

Approach Section - Give a description of the typical approach section at the bridge, including the type of guardrail. Example:

> "Two 11' paved lanes with 3' shoulders (30' rail-to-rail) with standard sideslopes. 21" aggregate subbase course gravel with 3" pavement thickness. Type 3 guardrail."

Spans - Give the span lengths along the centerline of construction on straight tangents, and along working lines or chord lines for structures on a curve. If on a curve, indicate span lengths as "along long chord" or other descriptive indication. This section is not required for culvert-type structures.

Skew - Give the skew angle of the substructure units, or the centerline of a culvert-type structure, relative to the longitudinal working line of the structure. The skew angle should always be given as "Ahead on Left" or "Back on Left".

Loading - Indicate the appropriate design vehicle loading.

For a typical superstructure:
"HL – 93 Modified"

For a culvert-type structure:
"HS 25"

Superstructure - Give the design description and governing parameters of the superstructure. For culvert-type structures, this section is simply called Structure. Examples:

For a typical superstructure:
"Five rolled beams of A709, Grade 50W steel with a composite structural concrete slab, elastomeric bearings, one compression seal expansion joint, and a 3" bituminous wearing surface with ¼" (nominal) membrane waterproofing. 36' curb-to-curb with standard 2-bar steel rail. 2% normal crown."

For a culvert-type structure:
"16'-4" span by 8'-2" rise aluminum structural plate pipe arch. Flow line of 1% with Elevation 100.00 at the centerline of construction."

Abutments - State the type of abutment and anticipated support system. Also give any specific features required. This section is not required for culvert-type structures. Example:

"Stub concrete abutments with return wings on steel H-piles, 1.75:1 (plain or heavy) riprap slopes in front" or "Deep concrete abutments with approach slabs on spread footings with sandblasted architectural facing".

Piers - State the type of piers and anticipated support system. This section is not required for culvert-type structures. Example:

"Mass concrete pier with distribution slab and concrete seal supported by steel H-beam piles."

strength required to carry the extra thickness. However, the added support forms cost will be offset by a decrease in labor cost with fewer beams on which blocking must be formed, and also fewer bays in which support forms must be suspended. Therefore, the cost of forming and finishing is assumed to be equal regardless of beam spacing. The price of concrete delivered and placed can be assumed to be equal to about 35% of the unit price of deck concrete. Generally, no cost adjustment is made for reinforcing steel since thicker slabs will have little change in reinforcing steel quantity.

The following example illustrates this method of cost comparison.

Example 2-1 Cost Comparison of Number of Steel Beams

Assume a price comparison of four beams to five beams, with a bid price of $1.00/lb for five welded beams, and assuming equal stiffeners on all beams. Weight of steel for 5 beams is 30,000 lb.

ratio of beams = 4/5 = 0.80
ratio of diaphragms = 3/4 = 0.75
assume a cost ratio on fabricating, delivery, and erecting of 0.79, a number chosen between 0.80 and 0.75, but weighted more toward the beam ratio than the diaphragm ratio

5 beams:	mill	$0.50/lb x 30,000	= $15,000
	fab/del/erect	$0.50/lb x 30,000	= $15,000
			$30,000
4 beams:	mill	$0.50/lb x 30,000	= $15,000
	fab/del/erect	$0.50/lb x 0.79 x 1.1 x 30,000	= $13,000
			$28,000

Assume a bid price of $450/ yd^3 of deck concrete. Assume a five beam bridge will require an 8 inch slab and a four beam bridge will require a 10 inch slab, with quantities of concrete being 150 yd^3 and 200 yd^3 respectively. The slab costs would be:

8 inch deck:	forming & finishing	$290 x 150 yd^3 =	$43,500
	delivery & placing	$160 x 150 yd^3 =	$24,000
			$67,500
10 inch deck:	forming & finishing	$290 x 200 yd^3 =	$58,000
	delivery & placing	$160 x 200 yd^3 =	$32,000
			$90,000

Summary:	5 beams:	$30,000 + $67,500	= $97,500
	4 beams:	$28,000 + 90,000	= $118,000

Table 3-2 Component Loads for Preliminary Design Only

Bridge Component	Design Load
Concrete sidewalk 5' wide (includes concrete under bridge rail)	1110 lb/ft
Concrete sidewalk 6' wide (includes concrete under bridge rail)	1290 lb/ft
Diaphragms for rolled steel beam	15 lb/ft per beam
Diaphragms for welded steel plate girder	20 lb/ft per beam

3.2 MaineDOT Live Load Policy (New and Rehabilitation)

All new and replacement bridge-type structures should be designed by AASHTO LRFD. The live load used is the code-specified live load for all limit states except for Strength I. The Live Load used for the Strength I limit state is the Maine Modified Live Load which consists of the standard HL-93 Live Load with a 25% increase in the Design Truck. All buried structures should be designed by LFD with a HS25 truck in accordance with the AASHTO Standard Specifications.

The magnitude of the design live load to be used in rehabilitating existing structures should be determined in each individual case, taking into account the inherent strength of the existing structure and the cost involved in providing additional load carrying capacity. In general, such structures should be strengthened to at least the code specified HL-93 live load for all limit states. A design capacity less than HL-93 must be approved by the Engineer of Design.

The optional deflection criteria (AASHTO LRFD Section 2.5) should be checked by the Structural Designer using the standard HL-93 Live Load.

Load modifiers specified in AASHTO LRFD Section 1.3 relating to ductility and redundancy should generally be taken as 1.0. The use of non-ductile or non-redundant components is not allowed. The load modifier relating to operational importance should be taken as 1.0, unless otherwise indicated by the Engineer of Design.

Live loads determined by the AASHTO LRFD Specifications that are transferred to the substructure from the superstructure for geotechnical design will be unfactored. This unfactored live load will be used to perform a service load analysis according to the AASHTO Standard Specifications.

3.3 Thermal Effects

The temperature range used to determine thermal forces and movements should be in conformance with the AASHTO LRFD "cold climate" temperature range.

Use the following guidelines for transitions:

- *Steel Bridge Rail:* For transitions on the NHS, use the Concrete Transition Barrier and the Bridge Transition Type 1. The bridge connections and approach guardrail transitions to the standard 2-bar steel bridge rail for bridges not on the NHS may consist of either the Steel Approach Railing or the Concrete Transition Barrier with the Bridge Transition Type 1.

- *Timber Rail:* For approach guardrail transitions and bridge connections to a timber bridge rail, use a shoe attachment with doubled guardrail beam and 3'-1 1/2" post spacing. Either weathering steel or galvanized steel guardrail may be used. If steel backed timber guardrail is used, then the steel should be securely attached to the timber bridge rail.

- *F-Shaped Barrier:* The approach guardrail should be stiffened and rigidly connected to the ends of the standard F-shaped concrete barrier with a Bridge Transition Type 1.

- For one-way bridges on the NHS, the trailing end of the bridge rail need only be connected to the barrier ends with a 6'-3" post spacing and no doubled guardrail beam.

- Regardless of the type of bridge rail selected, if the rail is pedestrian height, then it may be appropriate to have a pedestrian height railing or fence behind all or a portion of the approach railing, depending on site-specific conditions. (i.e., steepness of embankment, height of return wings, etc.)

4.5 Security Fences

The primary purpose of security fencing is to provide for the safety and security of pedestrians, and to prevent objects from being thrown or dropped from bridges to lower roadways, railroads, boat lanes, or occupied property. Certain overpass structures may warrant protective chain link fencing. Refer to the latest version of "A Guide for Protective Screening of Overpass Structures" for more information.

Adding a fence to a bridge structure should not be done routinely. It will increase maintenance responsibilities, and may exacerbate an existing sight distance problem. If a fence is used, it should be no higher than 6 feet to avoid limiting inspections with the under-bridge crane.

B.5 Recommendation Buried Structure

TOWN - Anytown **BRIDGE -** Common Bridge **BRIDGE NO. -** 1234
DESIGNED BY - ABC **DATE -** 3/1/03 **PIN -** 10000.00
APPROVED BY - ______ **DATE -** _______

PROJECT - Bridge replacement with 300' of approaches, including transitions.

ALIGNMENT DESCRIPTION - Horizontal - tangent, same as existing. Vertical - 300' sag curve with finished grade raised 1.5' at bridge.

APPROACH SECTION - Two 11' lanes with 4' shoulders. 1:2 sideslopes with standard steel guardrail and 1:3 sideslopes without guardrail.

SPANS - 25' **SKEW -** 30 ° ahead on left

LOADING - HS25 **DESIGN SPEED -** 45 **mph** |

STRUCTURE - Precast concrete arch on CIP concrete spread footings, with precast concrete headwalls and wings. 30' rail-to-rail width with bridge-mounted guardrail.

TOTAL OPENING - EXISTING - 156 **SF** **PROPOSED -** 286 **SF**

DISPOSITION OF EXISTING BRIDGE - Existing structure to be removed in its entirety, and to become property of the Contractor.

AVAILABLE SOILS INFORMATION - Existing plans and preliminary borings show ledge to be present at about 30'-50' below streambed. For more information, please refer to the Geotechnical Report.

B.6 Recommendation Structural Plate Structure

TOWN - Anytown **BRIDGE -** Common Bridge **BRIDGE NO. -** 1234
DESIGNED BY - ABC **DATE -** 3/1/03 **PIN -** 10000.00
APPROVED BY - ______ **DATE -** _______

PROJECT - Bridge culvert replacement with 300' of approaches, including transitions.

ALIGNMENT DESCRIPTION - Horizontal - tangent, same as existing. Vertical - 300' sag curve with finished grade raised 1.5' at bridge.

APPROACH SECTION - Two 11' lanes with 4' shoulders. 1:2 sideslopes with standard steel guardrail and 1:3 sideslopes without guardrail.

LOADING - HS25 **SKEW -** 30 ° ahead on left |

DESIGN SPEED - 45 **mph**

STRUCTURE - Twin 16'-6" span by 11'-0" rise structural steel plate pipe arches with a 30' rail-to-rail width. Flow line of 1%±. Inlet and outlet invert elevations for easterly pipe arch are 53.2 and 52.5, respectively. Inlet and outlet invert elevations for westerly pipe arch are 53.7 and 53.0, respectively.

TOTAL OPENING - EXISTING - 156 **SF** **PROPOSED -** 286 **SF**

DISPOSITION OF EXISTING BRIDGE - Existing structure to be removed in its entirety, and to become property of the Contractor.

AVAILABLE SOILS INFORMATION - Existing plans and preliminary borings show ledge to be present at about 30'-50' below streambed. For more information, please refer to the Geotechnical Report.

B.7 Summary of Impacts

RIGHT OF WAY - Number of: Property Owners = 4
Buildings To Be Taken = 1

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

HISTORICAL/ARCHEOLOGICAL - Bridge eligible for National Historic Register. Bridge is not historic, but is located in a historic district. Archeological site located on downstream side of bridge is to be avoided.

COAST GUARD PERMIT? Exception Request Required **FAA PERMIT?** No

ENVIRONMENTAL - Instream Work Window? Yes From Jul 15 To Oct 30

Wetlands: Freshwater Area = 1025 SF Coastal Area = 0 SF

Mitigation Required? No Dredged Spoils Testing Required? No

Stream Diversion: Cofferdams required at each abutment and pier.

Expected Permit and NEPA Level:
DEP: DPBR ACOE: Category 1 LURC: N/A
NPDES? No NEPA: CE

Summary of Avoidance and Minimization: 1:2 sideslopes with guardrail and state standards for bridge widths are to be used to minimize wetland impacts, design speed in this area will be lowered from 50 mph to 45 mph so that the increase in finish grade can be dropped by 1.5 feet to minimize wetland impacts. An aluminum arch culvert is recommended over the twin pipe option to reduce stream diversion costs and minimize streambed disturbance.

OTHER - Essential habitats (eagles nest, deer wintering area, rare plant site, etc.), public parks or recreation areas, hazardous materials (if known), special landscape needs.

D.3 Standard Notes Abutments

1. Reinforcing steel shall have 2 inches cover in the walls and 3 inches cover in the footings unless otherwise noted.

2. Cover joints in accordance with Standard Detail 502 (01) where waterstops are not required.

3. Place 4 inch diameter drains in breastwall and wings at XX feet maximum spacing. Exact location to be determined by the Resident in the field.

4. Construct french drains behind the abutments and wings in accordance with Standard Specification Section 512, French Drains.

5. Structural Earth Excavation, Abutments and Retaining Walls, required below Elevation XX will be paid for at one and a half times the contract unit price for Item 206.082, Structural Earth Excavation.

6. Abutments, wings, and their footings shall be backfilled with granular borrow. Pay limits will be the structural excavation limits in cut areas and a vertical plane located 10 feet behind the walls and 1 foot behind the footings in fill areas.

7. Maximum calculated footing pressure is XX tsf.

D.7 Standard Notes Structural Steel

1. Camber ordinates as shown are computed to compensate for all dead load deflections and for the curvature of the finished grade profile.

2. No transverse butt-weld splices will be allowed in the flange plates or web plates within 10 feet or 10% of the span length (whichever is greater) from the points of maximum negative moment or maximum positive moment. Butt-weld splices in flanges shall be not less than 3 feet from transverse butt-welds in the web plates and no transverse web or flange butt-welds shall be located within 3 feet of other transverse welds (e.g. connection plates to web welds) on either flange or web. No transverse butt-weld splices will be allowed in areas of stress reversal.

3. Sections of flange plates or web plates between transverse shop splices or between a transverse shop splice and a field splice shall be not less than XX feet in length unless otherwise shown on the plans.

4. One longitudinal butt weld splice will be allowed in the web of the haunched sections of the girders. Feather edges between the longitudinal welds and the bottom flanges will not be allowed.

5. Bearing stiffeners shall be plumb after erection and dead loading of the structure. Intermediate web stiffeners may be either plumb or normal to the top flange.

6. Cross-frame or diaphragm connection plates may be either plumb or normal to the top flange.

(The following note is used only with designs using A709, Grade 50 or painted Grade 50W.)

7. Filler plates may be steel conforming to the requirements of A709, Grade 36.

8. The dimensions and elevations omitted from the Bottom of Slab Elevations table, the Camber Diagram, and the Stress Diagram will be provided to the Contractor for the structural steel option that has been selected.

9. At locations marked with an asterisk (*), the designated diaphragms shall be changed to a Type A (C) (D) diaphragm as required to accommodate the Contractor's deck placement sequence. No extra compensation will be allowed for any diaphragms so substituted, and any additional costs will be considered incidental to the Contract items.

10. Theoretical blocking is XX inch(es) at the centerline of bearing. Refer to Standard Details 502 (02) for blocking details.

(The following note is used when web depth is 6 feet or greater.)

11. Handhold bars shall be installed in accordance with the Plans and Standard Detail 504 (23-24).

(The following note is used when a single span rolled beam with 3” or more camber is used.)

12. The Contractor may substitute welded plate girders in place of the rolled beams shown on the plans, as approved by the Resident. The fabricator shall determine the plate thicknesses based upon the depth and moment of inertia of the rolled section.