**Updated** 1/19/12

# STATE PROJECT

**Effective January 19, 2012**
**Supersedes December 23, 2011**

## BIDDING INSTRUCTIONS

FOR ALL PROJECTS:

1. Use pen and ink to complete all paper Bids.
2. As a minimum, the following must be received prior to the time of Bid opening:

For a Paper Bid:

a) a copy of the Notice to Contractors, b) the completed Acknowledgement of Bid Amendments form, c) the completed Schedule of Items, d) two copies of the completed and signed Contract Offer, Agreement & Award form, e) a Bid Guaranty, (if required), and f) any other certifications or Bid requirements listed in the Bid Documents as due by Bid opening.

For an Electronic Bid:

a) a completed Bid using Expedite® software and submitted via the Bid Express™ web-based service, b) an electronic Bid Guaranty (if required) or a faxed copy of a Bid Bond (with original to be delivered within 72 hours), and c) any other Certifications or Bid requirements listed in the Bid Documents as due by Bid opening.

3. Include prices for all items in the Schedule of Items (excluding non-selected alternates).
4. Bid Guaranty acceptable forms are:
   a) a properly completed and signed Bid Bond on the Department's prescribed form (or on a form that does not contain any significant variations from the Department's form as determined by the Department) for 5% of the Bid Amount or
   b) an Official Bank Check, Cashier's Check, Certified Check, U.S. Postal Money Order or Negotiable Certificate of Deposit in the amount stated in the Notice to Contractors or
   c) an electronic bid bond submitted with an electronic bid.

5. If a paper Bid is to be sent, "FedEx First Overnight" delivery is suggested as the package is delivered directly to the DOT Headquarters Building located at 16 Child Street in Augusta. Other means, such as U.S. Postal Service's Express Mail has proven not to be reliable.

IN ADDITION, FOR FEDERAL AID PROJECTS:

6. Complete the DBE Proposed Utilization form, and submit with your bid. If you are submitting your bid electronically, you must FAX the form to (207) 624-3431. This is a curable defect.

*If you need further information regarding Bid preparation, call the DOT Contracts Section at (207) 624-3410.*

*For complete bidding requirements, refer to Section 102 of the Maine Department of Transportation, Standard Specifications, Revision of December 2002.*

January 19, 2012
Supersedes September 09, 2011

# NOTICE

**The Maine Department of Transportation is attempting to improve the way Bid Amendments/Addendums are handled, and allow for an electronic downloading of bid packages from our website, while continuing to maintain an optional planholders list.**

**Prospective bidders, subcontractors or suppliers who wish to download a copy of the bid package and receive a courtesy notification of project specific bid amendments, must provide an email address to Diane Barnes or David Venner at the MDOT Contracts mailbox at: MDOT.contracts@maine.gov. Each bid package will require a separate request.**

**Additionally, interested parties will be responsible for reviewing and retrieving the Bid Amendments from our web site, and acknowledging receipt and incorporating those Bid Amendments in their bids using the Acknowledgement of Bid Amendment Form.**

**The downloading of bid packages from the MDOT website is not the same as providing an electronic bid to the Department. Electronic bids must be submitted via http://www.BIDX.com. For information on electronic bidding contact Patrick Corum at patrick.corum@maine.gov , Rebecca Snowden at rebecca.snowden@maine.gov or Diane Barnes at diane.barnes@maine.gov.**

# NOTICE

For security and other reasons, all Bid Packages which are mailed, shall be provided in double (one envelope inside the other) envelopes. The *Inner Envelope* shall have the following information provided on it:

Bid Enclosed - Do Not Open
WIN:
Town:
Date of Bid Opening:
Name of Contractor with mailing address and telephone number:

In Addition to the usual address information, the *Outer Envelope* should have written or typed on it:

Double Envelope: Bid Enclosed
WIN:
Town:
Date of Bid Opening:
Name of Contractor:
*This should not be much of a change for those of you who use Federal Express or similar services.*

Hand-carried Bids may be in one envelope as before, and should be marked with the following infrormation:

Bid Enclosed: Do Not Open
WIN:
Town:
Name of Contractor:

## STATE OF MAINE DEPARTMENT OF TRANSPORTATION

Bid Guaranty-Bid Bond Form

**KNOW ALL MEN BY THESE PRESENTS THAT**_____

_____, of the City/Town of _____and State of_____

as Principal, and _____as Surety, a

Corporation duly organized under the laws of the State of_____and having a usual place of

Business in _____and hereby held and firmly bound unto the Treasurer of

the State of Maine in the sum of_____,for payment which Principal and Surety bind

themselves, their heirs, executers, administrators, successors and assigns, jointly and severally.

The condition of this obligation is that the Principal has submitted to the Maine Department of Transportation, hereafter Department, a certain bid, attached hereto and incorporated as a part herein, to enter into a written contract for the construction of _____

_____

_____and if the Department shall accept said bid and the Principal shall execute and deliver a contract in the form attached hereto (properly completed in accordance with said bid) and shall furnish bonds for this faithful performance of said contract, and for the payment of all persons performing labor or furnishing material in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said bid, then this obligation shall be null and void; otherwise it shall remain in full force, and effect.

Signed and sealed this_____day of _____20_____

WITNESS:

_____

_____

_____

PRINCIPAL:

By_____

By:_____

By:_____

WITNESS

_____

_____

_____

SURETY:

By_____

By:_____

Name of Local Agency: _____

# NOTICE

Bidders:

Please use the attached “Request for Information” form when faxing questions and comments concerning specific Contracts that have been Advertised for Bid. Include additional numbered pages as required. Questions are to be faxed to the number listed in the Notice to Contractors. This is the only allowable mechanism for answering Project specific questions. Maine DOT will not be bound to any answers to Project specific questions received during the Bidding phase through other processes.

State of Maine
Department of Transportation

# REQUEST FOR INFORMATION

Date _____ Time _____

**Information Requested:** **WIN:** _____ **Town(s):** _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

**Request by:** _____ **Phone: (_____)**_____
**Bid Date:** _____ **Fax: (_____)**_____

**Complete top portion of fo rm and transmit to the number listed in the Notice to Contractors**

**RFI No: _____** **RFI received:** _____

**Response:**_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Response By:_____ Date: _____

## Vendor Registration

Prospective Bidders must register as a vendor with the Department of Administrative & Financial Services if the vendor is awarded a contract. Vendors will not be able to receive payment without first being registered. Vendors/Contractors will find information and register through the following link –
http://www.maine.gov/purchases/venbid/index.shtml

# STATE OF MAINE DEPARTMENT OF TRANSPORTATION
# NOTICE TO CONTRACTORS

Sealed Bids addressed to the Maine Department of Transportation, Augusta, Maine 04333 and endorsed on the wrapper "Bids for Exeter Road Bridge replacement in the town of **GARLAND**" will be received from contractors at the Reception Desk, Maine DOT Building, Capitol Street, Augusta, Maine, until 11:00 o'clock A.M. (prevailing time) on June 20, 2012 and at that time and place publicly opened and read. Bids will be accepted from all bidders. The lowest responsive bidder must demonstrate previous successful completion of projects of a similar size and scope to be considered for the award of this contract. **We now accept electronic bids for those bid packages posted on the bidx.com website. Electronic bids do not have to be accompanied by paper bids. Please note: the Department will accept a facsimile of the bid bond; however, the original bid bond must then be received at the MDOT Contract Section within 72 hours of the bid opening. Until further notice, dual bids (one paper, one electronic) will be accepted, with the paper copy taking precedence.**

Description: Project No. 019334.00

Location: In Penobscot County, project is located on Exeter road over Allen stream approximately 0.23 mile northerly of the Garland - Exeter town line.

Scope of Work: Exeter Road Bridge replacement plus other incidental work.

For general information regarding Bidding and Contracting procedures, contact George Macdougall at (207)624-3410. Our webpage at http://www.maine.gov/mdot/contractors/ contains a copy of the schedule of items, Plan Holders List, written portions of bid amendments (not drawings), and bid results. For Project-specific information fax all questions to **Project Manager Shawn Davis** at (207)624-3431. Questions received after 12:00 noon of Monday prior to bid date will not be answered. Bidders shall not contact any other Departmental staff for clarification of Contract provisions, and the Department will not be responsible for any interpretations so obtained. TTY users call Maine Relay 711.

Plans, specifications and bid forms may be seen at the Maine DOT Building in Augusta, Maine and at the Department of Transportation's Regional Office in Bangor. They may be purchased from the Department between the hours of 8:00 a.m. to 4:30 p.m. by cash, credit card (Visa/Mastercard) or check payable to Treasurer, State of Maine sent to Maine Department of Transportation, Attn.: Mailroom, 16 State House Station, Augusta, Maine 04333-0016. They also may be purchased by telephone at (207) 624-3536 between the hours of 8:00 a.m. to 4:30 p.m. Full size plans $11.00 ($14.50 by mail). Half size plans $5.50 ($7.75 by mail), Bid Book $10 ($13 by mail), Single Sheets $2, payment in advance, all non-refundable.

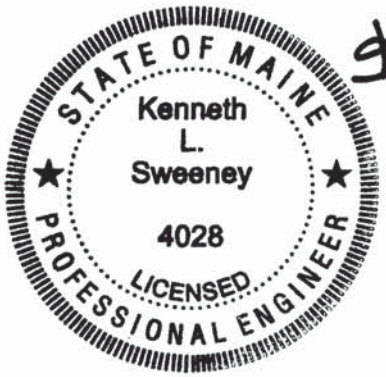
Each Bid must be made upon blank forms provided by the Department and must be accompanied by a bid bond at 5% of the bid amount or an official bank check, cashier's check, certified check, certificate of deposit, or United States postal money order in the amount of $5,000.00 payable to Treasurer, State of Maine as a Bid guarantee. A Contract Performance Surety Bond and a Contract Payment Surety Bond, each in the amount of 100 percent of the Contract price, will be required of the successful Bidder.

This Contract is subject to all applicable State Laws.

All work shall be governed by "State of Maine, Department of Transportation, Standard Specifications, Revision of December 2002", price $10 [$13 by mail], and Standard Details, Revision of December 2002, price $20 [$25 by mail]. Standard Detail updates can be found at http://www.maine.gov/mdot/contractors/publications/ .

The right is hereby reserved to the MDOT to reject any or all bids.

Augusta, Maine
May 30, 2012




KENNETH L. SWEENEY P.E.
CHIEF ENGINEER

**Garland**
**Exeter Bridge**
**WIN 019334.00**
April 14, 2011
Supersedes August 3, 2004

## SPECIAL PROVISION 102.7.3
## ACKNOWLEDGMENT OF BID AMENDMENTS

With this form, the Bidder acknowledges its responsibility to check for all Amendments to the Bid Package. For each Project under Advertisement, Amendments are located at http://www.maine.gov/mdot/contractors/ . It is the responsibility of the Bidder to determine if there are Amendments to the Project, to download them, to incorporate them into their Bid Package, and to reference the Amendment number and the date on the form below. The Maine DOT will not post Bid Amendments any later than noon the day before Bid opening without individually notifying all the planholders.

| Amendment Number | Date |
|---|---|
| | |
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The Contractor, for itself, its successors and assigns, hereby acknowledges that it has received all of the above referenced Amendments to the Bid Package.

CONTRACTOR

Date

Signature of authorized representative

(Name and Title Printed)

March 14, 2007
Supersedes March 3, 1966

Non-federal Projects Only

# NOTICE TO CONTRACTORS - PREFERRED EMPLOYEES

Sec. 1303. Public Works; minimum wage

In the employment of laborers in the construction of public works, including state highways, by the State or by persons contracting for the construction, preference must first be given to citizens of the State who are qualified to perform the work to which the employment relates and, if they can not be obtained in sufficient numbers, then to citizens of the United States. Every contract for public works construction must contain a provision for employing citizens of this State or the United States. The hourly wage and benefit rate paid to laborers employed in the construction of public works, including state highways, may not be less than the fair minimum rate as determined in accordance with section 1308. Any contractor who knowingly and willfully violates this section is subject to a fine of not less than $250 per employee violation. Each day that any contractor employs a laborer at less than the wage and benefit minimum stipulated in this section constitutes a separate violation of this section. [1997, c. 757, §1 (amd).]

CONTRACT ID: 019334.00 PROJECT(S): 019334.00

CONTRACTOR :_____

| LINE NO | ITEM DESCRIPTION | APPROX. QUANTITY AND UNITS | UNIT PRICE DOLLARS | UNIT PRICE CTS | BID AMOUNT DOLLARS | BID AMOUNT CTS |
|---|---|---|---|---|---|---|
| | SECTION 0001 PROJECT ITEMS | | | | | |
| 0010 | 202.202 REMOVING PAVEMENT SURFACE | 1100.000 SY | | | | |
| 0020 | 203.20 COMMON EXCAVATION | 500.000 CY | | | | |
| 0030 | 203.21 ROCK EXCAVATION | 5.000 CY | | | | |
| 0040 | 203.25 GRANULAR BORROW | 200.000 CY | | | | |
| 0050 | 203.35 CRUSHED STONE FILL | 40.000 CY | | | | |
| 0060 | 206.082 STRUCTURAL EARTH EXCAVATION - MAJOR STRUCTURES | 40.000 CY | | | | |
| 0070 | 304.10 AGGREGATE SUBBASE COURSE - GRAVEL | 400.000 CY | | | | |
| 0080 | 403.208 HOT MIX ASPHALT 12.5 MM HMA SURFACE | 130.000 T | | | | |
| 0090 | 403.213 HOT MIX ASPHALT 12.5 MM BASE | 160.000 T | | | | |
| 0100 | 409.15 BITUMINOUS TACK COAT - APPLIED | 70.000 G | | | | |

CONTRACT ID: 019334.00 PROJECT(S): 019334.00

CONTRACTOR :_____

| LINE NO | ITEM DESCRIPTION | APPROX. QUANTITY AND UNITS | UNIT PRICE DOLLARS | UNIT PRICE CTS | BID AMOUNT DOLLARS | BID AMOUNT CTS |
|---|---|---|---|---|---|---|
| 0110 | 508.13 SHEET WATERPROOFING MEMBRANE | LUMP | LUMP | | | |
| 0120 | 511.07 COFFERDAM: DOWNSTREAM | LUMP | LUMP | | | |
| 0130 | 511.07 COFFERDAM: UPSTREAM | LUMP | LUMP | | | |
| 0140 | 526.301 TEMPORARY CONCRETE BARRIER TYPE I | LUMP | LUMP | | | |
| 0150 | 534.7101 PRECAST CONCRETE BOX CULVERT - STATE SUPPLIED | LUMP | LUMP | | | |
| 0160 | 606.23 GUARDRAIL TYPE 3C - SINGLE RAIL | 512.500 LF | | | | |
| 0170 | 606.231 GUARDRAIL TYPE 3C - 15 FOOT RADIUS AND LESS | 25.000 LF | | | | |
| 0180 | 606.265 TERMINAL END - SINGLE RAIL - GALVANIZED STEEL | 1.000 EA | | | | |
| 0190 | 606.353 REFLECTORIZED FLEXIBLE GUARDRAIL MARKER | 8.000 EA | | | | |
| 0200 | 606.79 GUARDRAIL 350 FLARED TERMINAL | 3.000 EA | | | | |
| 0210 | 610.08 PLAIN RIPRAP | 60.000 CY | | | | |

CONTRACT ID: 019334.00 PROJECT(S): 019334.00

CONTRACTOR :_____

| LINE NO | ITEM DESCRIPTION | APPROX. QUANTITY AND UNITS | UNIT PRICE DOLLARS | UNIT PRICE CTS | BID AMOUNT DOLLARS | BID AMOUNT CTS |
|---|---|---|---|---|---|---|
| 0220 | 615.07 LOAM | 50.000 CY | | | | |
| 0230 | 618.1401 SEEDING METHOD NUMBER 2 - PLAN QUANTITY | 10.000 UN | | | | |
| 0240 | 619.1201 MULCH - PLAN QUANTITY | 10.000 UN | | | | |
| 0250 | 620.58 EROSION CONTROL GEOTEXTILE | 40.000 SY | | | | |
| 0260 | 627.76 TEMPORARY PAVEMENT MARKING LINE, WHITE OR YELLOW | LUMP | LUMP | | | |
| 0270 | 629.05 HAND LABOR, STRAIGHT TIME | 10.000 HR | | | | |
| 0280 | 631.12 ALL PURPOSE EXCAVATOR (INCLUDING OPERATOR) | 10.000 HR | | | | |
| 0290 | 631.172 TRUCK - LARGE (INCLUDING OPERATOR) | 10.000 HR | | | | |
| 0300 | 652.312 TYPE III BARRICADE | 12.000 EA | | | | |
| 0310 | 652.33 DRUM | 10.000 EA | | | | |
| 0320 | 652.34 CONE | 20.000 EA | | | | |

CONTRACT ID: 019334.00 PROJECT(S): 019334.00

CONTRACTOR :_____

| LINE NO | ITEM DESCRIPTION | APPROX. QUANTITY AND UNITS | UNIT PRICE DOLLARS | UNIT PRICE CTS | BID AMOUNT DOLLARS | BID AMOUNT CTS |
|---|---|---|---|---|---|---|
| 0330 | 652.35 CONSTRUCTION SIGNS | 560.000 SF | | | | |
| 0340 | 652.36 MAINTENANCE OF TRAFFIC CONTROL DEVICES | 40.000 CD | | | | |
| 0350 | 652.38 FLAGGER | 190.000 HR | | | | |
| 0360 | 656.75 TEMPORARY SOIL EROSION AND WATER POLLUTION CONTROL | LUMP | LUMP | | | |
| 0370 | 659.10 MOBILIZATION | LUMP | LUMP | | | |
| | TOTAL BID | | | | | |

# CONTRACT AGREEMENT, OFFER & AWARD

AGREEMENT made on the date last signed below, by and between the State of Maine, acting through and by its Department of Transportation (Department), an agency of state government with its principal administrative offices located at Child Street, Augusta, Maine, with a mailing address at 16 State House Station, Augusta, Maine 04333-0016, and

_____

a corporation or other legal entity organized under the laws of the State of _____, with its principal place of business located at _____

_____

The Department and the Contractor, in consideration of the mutual promises set forth in this Agreement (the "Contract"), hereby agree as follows:

**A. The Work.**

The Contractor agrees to complete all Work as specified or indicated in the Contract including Extra Work in conformity with the Contract, WIN **019334.00** for the **Exeter Road Bridge Replacement** in the town of **Garland**, County of **Penobscot** Maine. The Work includes construction, maintenance during construction, warranty as provided in the Contract, and other incidental work.

The Contractor shall be responsible for furnishing all supervision, labor, equipment, tools supplies, permanent materials and temporary materials required to perform the Work including construction quality control including inspection, testing and documentation, all required documentation at the conclusion of the project, warranting its work and performing all other work indicated in the Contract.

The Department shall have the right to alter the nature and extent of the Work as provided in the Contract; payment to be made as provided in the same.

**B. Time.**

The Contractor agrees to complete all Work, except warranty work, on or before **September 20, 2012.** Further, the Department may deduct from moneys otherwise due the Contractor, not as a penalty, but as Liquidated Damages in accordance with Sections 107.7 and 107.8 of the State of Maine Department of Transportation Standard Specifications, Revision of December 2002 and related Special Provisions.

**C. Price.**

The quantities given in the Schedule of Items of the Bid Package will be used as the basis for determining the original Contract amount and for determining the amounts of the required Performance Surety Bond and Payment Surety Bond, and that the amount of this offer is _____

_____

**$**_____ Performance Bond and Payment Bond each being 100% of the amount of this Contract.

**D. Contract.**

This Contract, which may be amended, modified, or supplemented in writing only, consists of the Contract documents as defined in the Plans, Standard Specifications, Revision of December 2002, Standard Details Revision of December 2002 as updated through advertisement, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds. It is agreed and understood that this Contract will be governed by the documents listed above.

**E. Certifications.**

By signing below, the Contractor hereby certifies that to the best of the Contractor's knowledge and belief:

1. All of the statements, representations, covenants, and/or certifications required or set forth in the Bid and the Bid Documents, including those in the Contract are still complete and accurate as of the date of this Agreement.

2. The Contractor knows of no legal, contractual, or financial impediment to entering into this Contract.

3. The person signing below is legally authorized by the Contractor to sign this Contract on behalf of the Contractor and to legally bind the Contractor to the terms of the Contract.

**F. Offer.**

The undersigned, having carefully examined the site of work, the Plans, Standard Specifications Revision of December 2002, Standard Details Revision of December 2002 as updated through advertisement, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds contained herein for construction of: **WIN 019334.00 Exeter Road Bridge Replacement**, State of Maine, on which bids will be received until the time specified in the "Notice to Contractors" do(es) hereby bid and offer to enter into this contract to supply all the materials, tools, equipment and labor to construct the whole of the Work in strict accordance with the terms and conditions of this Contract at the unit prices in the attached "Schedule of Items".

The Offeror agrees to perform the work required at the price specified above and in accordance with the bids provided in the attached "Schedule of Items" in strict accordance with the terms of this solicitation, and to provide the appropriate insurance and bonds if this offer is accepted by the Government in writing.

As Offeror also agrees:

First: To do any extra work, not covered by the attached "Schedule of Items", which may be ordered by the Resident, and to accept as full compensation the amount determined upon a "Force Account" basis as provided in the Standard Specifications, Revision of December 2002, and as addressed in the contract documents.

Second: That the bid bond at 5% of the bid amount or the official bank check, cashier's check, certificate of deposit or U. S. Postal Money Order in the amount given in the "Notice to Contractors", payable to the Treasurer of the State of Maine and accompanying this bid, shall be forfeited, as liquidated damages, if in case this bid is accepted, and the undersigned shall fail to abide by the terms and conditions of the offer and fail to furnish satisfactory insurance and Contract bonds under the conditions stipulated in the Specifications within 15 days of notice of intent to award the contract.

Third: To begin the Work as stated in Section 107.2 of the Standard Specifications Revision of December 2002 and complete the Work within the time limits given in the Special Provisions of this Contract.

Fourth: That this offer shall remain open for 30 calendar days after the date of opening of bids.

Fifth: The Bidder hereby certifies, to the best of its knowledge and belief that: the Bidder has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of competitive bidding in connection with its bid, and its subsequent contract with the Department.

IN WITNESS WHEREOF, the Contractor, for itself, its successors and assigns, hereby execute two duplicate originals of this Agreement and thereby binds itself to all covenants, terms, and obligations contained in the Contract Documents.

CONTRACTOR

| | |
|---|---|
| _____ | _____ |
| Date | (Signature of Legally Authorized Representative of the Contractor) |
| _____ | _____ |
| Witness | (Name and Title Printed) |

**G. Award.**

Your offer is hereby accepted. This award consummates the Contract, and the documents referenced herein.

MAINE DEPARTMENT OF TRANSPORTATION

| | |
|---|---|
| _____ | _____ |
| Date | By: David Bernhardt, Commissioner |
| _____ | |
| Witness | |

# CONTRACT AGREEMENT, OFFER & AWARD

AGREEMENT made on the date last signed below, by and between the State of Maine, acting through and by its Department of Transportation (Department), an agency of state government with its principal administrative offices located at Child Street, Augusta, Maine, with a mailing address at 16 State House Station, Augusta, Maine 04333-0016, and

_____

a corporation or other legal entity organized under the laws of the State of _____, with its principal place of business located at _____

_____

The Department and the Contractor, in consideration of the mutual promises set forth in this Agreement (the "Contract"), hereby agree as follows:

**A. The Work.**

The Contractor agrees to complete all Work as specified or indicated in the Contract including Extra Work in conformity with the Contract, WIN **019334.00** for the **Exeter Road Bridge Replacement** in the town of **Garland**, County of **Penobscot** Maine. The Work includes construction, maintenance during construction, warranty as provided in the Contract, and other incidental work.

The Contractor shall be responsible for furnishing all supervision, labor, equipment, tools supplies, permanent materials and temporary materials required to perform the Work including construction quality control including inspection, testing and documentation, all required documentation at the conclusion of the project, warranting its work and performing all other work indicated in the Contract.

The Department shall have the right to alter the nature and extent of the Work as provided in the Contract; payment to be made as provided in the same.

**B. Time.**

The Contractor agrees to complete all Work, except warranty work, on or before **September 20, 2012.** Further, the Department may deduct from moneys otherwise due the Contractor, not as a penalty, but as Liquidated Damages in accordance with Sections 107.7 and 107.8 of the State of Maine Department of Transportation Standard Specifications, Revision of December 2002 and related Special Provisions.

**C. Price.**

The quantities given in the Schedule of Items of the Bid Package will be used as the basis for determining the original Contract amount and for determining the amounts of the required Performance Surety Bond and Payment Surety Bond, and that the amount of this offer is _____

_____

**$**_____ Performance Bond and Payment Bond each being 100% of the amount of this Contract.

**D. Contract.**

This Contract, which may be amended, modified, or supplemented in writing only, consists of the Contract documents as defined in the Plans, Standard Specifications, Revision of December 2002, Standard Details Revision of December 2002 as updated through advertisement, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds. It is agreed and understood that this Contract will be governed by the documents listed above.

**E. Certifications.**

By signing below, the Contractor hereby certifies that to the best of the Contractor's knowledge and belief:

1. All of the statements, representations, covenants, and/or certifications required or set forth in the Bid and the Bid Documents, including those in the Contract are still complete and accurate as of the date of this Agreement.

2. The Contractor knows of no legal, contractual, or financial impediment to entering into this Contract.

3. The person signing below is legally authorized by the Contractor to sign this Contract on behalf of the Contractor and to legally bind the Contractor to the terms of the Contract.

**F. Offer.**

The undersigned, having carefully examined the site of work, the Plans, Standard Specifications Revision of December 2002, Standard Details Revision of December 2002 as updated through advertisement, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds contained herein for construction of: **WIN 019334.00 Exeter Road Bridge Replacement**, State of Maine, on which bids will be received until the time specified in the "Notice to Contractors" do(es) hereby bid and offer to enter into this contract to supply all the materials, tools, equipment and labor to construct the whole of the Work in strict accordance with the terms and conditions of this Contract at the unit prices in the attached "Schedule of Items".

The Offeror agrees to perform the work required at the price specified above and in accordance with the bids provided in the attached "Schedule of Items" in strict accordance with the terms of this solicitation, and to provide the appropriate insurance and bonds if this offer is accepted by the Government in writing.

As Offeror also agrees:

First: To do any extra work, not covered by the attached "Schedule of Items", which may be ordered by the Resident, and to accept as full compensation the amount determined upon a "Force Account" basis as provided in the Standard Specifications, Revision of December 2002, and as addressed in the contract documents.

Second: That the bid bond at 5% of the bid amount or the official bank check, cashier's check, certificate of deposit or U. S. Postal Money Order in the amount given in the "Notice to Contractors", payable to the Treasurer of the State of Maine and accompanying this bid, shall be forfeited, as liquidated damages, if in case this bid is accepted, and the undersigned shall fail to abide by the terms and conditions of the offer and fail to furnish satisfactory insurance and Contract bonds under the conditions stipulated in the Specifications within 15 days of notice of intent to award the contract.

Third: To begin the Work as stated in Section 107.2 of the Standard Specifications Revision of December 2002 and complete the Work within the time limits given in the Special Provisions of this Contract.

Fourth: That this offer shall remain open for 30 calendar days after the date of opening of bids.

Fifth: The Bidder hereby certifies, to the best of its knowledge and belief that: the Bidder has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of competitive bidding in connection with its bid, and its subsequent contract with the Department.

IN WITNESS WHEREOF, the Contractor, for itself, its successors and assigns, hereby execute two duplicate originals of this Agreement and thereby binds itself to all covenants, terms, and obligations contained in the Contract Documents.

CONTRACTOR

| | |
|---|---|
| _____ | _____ |
| Date | (Signature of Legally Authorized Representative of the Contractor) |
| _____ | _____ |
| Witness | (Name and Title Printed) |

**G. Award.**

Your offer is hereby accepted. This award consummates the Contract, and the documents referenced herein.

MAINE DEPARTMENT OF TRANSPORTATION

| | |
|---|---|
| _____ | _____ |
| Date | By: David Bernhardt, Commissioner |
| _____ | |
| Witness | |

# CONTRACT AGREEMENT, OFFER & AWARD

AGREEMENT made on the date last signed below, by and between the State of Maine, acting through and by its Department of Transportation (Department), an agency of state government with its principal administrative offices located at Child Street Augusta, Maine, with a mailing address at 16 State House Station, Augusta, Maine 04333-0016, and **(Name of the firm bidding the job)** a corporation or other legal entity organized under the laws of the State of Maine, with its principal place of business located at **(address of the firm bidding the job)**

The Department and the Contractor, in consideration of the mutual promises set forth in this Agreement (the "Contract"), hereby agree as follows:



**A. The Work.**

The Contractor agrees to complete all Work as specified or indicated in the Contract including Extra Work in conformity with the Contract, PIN No.**1224.00**, for the **Hot Mix Asphalt Overlay** in the town/city of **South Nowhere,** County of **Washington**, Maine. The Work includes construction, maintenance during construction, warranty as provided in the Contract, and other incidental work.

The Contractor shall be responsible for furnishing all supervision, labor, equipment, tools supplies, permanent materials and temporary materials required to perform the Work including construction quality control including inspection, testing and documentation, all required documentation at the conclusion of the project, warranting its work and performing all other work indicated in the Contract.

The Department shall have the right to alter the nature and extent of the Work as provided in the Contract; payment to be made as provided in the same.

**B. Time.**

The Contractor agrees to complete all Work, except warranty work, on or before **November 15, 2006.** Further, the Department may deduct from moneys otherwise due the Contractor, not as a penalty, but as Liquidated Damages in accordance with Sections 107.7 and 107.8 of the State of Maine Department of Transportation Standard Specifications, Revision of December 2002 and related Special Provisions.

**C. Price.**

The quantities given in the Schedule of Items of the Bid Package will be used as the basis for determining the original Contract amount and for determining the amounts of the required Performance Surety Bond and Payment Surety Bond, and that the amount of this offer is **____(Place bid here in alphabetical form such as One Hundred and Two dollars and 10 cents)_____ $_ (repeat bid here in numerical terms, such as $102.10)_____** Performance Bond and Payment Bond each being 100% of the amount of this Contract.

**D. Contract.**

This Contract, which may be amended, modified, or supplemented in writing only, consists of the Contract documents as defined in the Plans, Standard Specifications, Revision of December 2002, Standard Details Revision of December 2002, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds. It is agreed and understood that this Contract will be governed by the documents listed above.



**E. Certifications.**

By signing below, the Contractor hereby certifies that to the best of the Contractor's knowledge and belief:

1. All of the statements, representations, covenants, and/or certifications required or set forth in the Bid and the Bid Documents, including those in Appendix A to Division 100 of the Standard Specifications Revision of December 2002 (Federal Contract Provisions Supplement), and the Contract are still complete and accurate as of the date of this Agreement.

2. The Contractor knows of no legal, contractual, or financial impediment to entering into this Contract.

3. The person signing below is legally authorized by the Contractor to sign this Contract on behalf of the Contractor and to legally bind the Contractor to the terms of the Contract.

**F. Offer.**

The undersigned, having carefully examined the site of work, the Plans, Standard Specifications, Revision of December 2002, Standard Details Revision of December 2002, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds contained herein for construction of:

**PIN 1234.00 South Nowhere, Hot Mix Asphalt Overlay ,**

State of Maine, on which bids will be received until the time specified in the "Notice to Contractors" do(es) hereby bid and offer to enter into this contract to supply all the materials, tools, equipment and labor to construct the whole of the Work in strict accordance with the terms and conditions of this Contract at the unit prices in the attached "Schedule of Items".

The Offeror agrees to perform the work required at the price specified above and in accordance with the bids provided in the attached "Schedule of Items" in strict accordance with the terms of this solicitation, and to provide the appropriate insurance and bonds if this offer is accepted by the Government in writing.



As Offeror also agrees:

First: To do any extra work, not covered by the attached "Schedule of Items", which may be ordered by the Resident, and to accept as full compensation the amount determined upon a "Force Account" basis as provided in the Standard Specifications, Revision of December 2002, and as addressed in the contract documents.

Second: That the bid bond at 5% of the bid amount or the official bank check, cashier's check, certificate of deposit or U. S. Postal Money Order in the amount given in the "Notice to Contractors", payable to the Treasurer of the State of Maine and accompanying this bid, shall be forfeited, as liquidated damages, if in case this bid is accepted, and the undersigned shall fail to abide by the terms and conditions of the offer and fail to furnish satisfactory insurance and Contract bonds under the conditions stipulated in the Specifications within 15 days of notice of intent to award the contract.

Third: To begin the Work as stated in Section 107.2 of the Standard Specifications Revision of 2002 and complete the Work within the time limits given in the Special Provisions of this Contract.

Fourth: The Contractor will be bound to the Disadvantaged Business Enterprise (DBE) Requirements contained in the attached Notice (Additional Instructions to Bidders) and submit a completed Contractor's Disadvantaged Business Enterprise Utilization Plan with their bid.

Fifth: That this offer shall remain open for 30 calendar days after the date of opening of bids.

Sixth: The Bidder hereby certifies, to the best of its knowledge and belief that: the Bidder has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of competitive bidding in connection with its bid, and its subsequent contract with the Department.

IN WITNESS WHEREOF, the Contractor, for itself, its successors and assigns, hereby execute two duplicate originals of this Agreement and thereby binds itself to all covenants, terms, and obligations contained in the Contract Documents.

CONTRACTOR

| | |
|---|---|
| _____ | **(Sign Here)** |
| Date | (Signature of Legally Authorized Representative of the Contractor) |
| ____(**Witness Sign Here)** | **(Print Name Here)** |
| Witness | (Name and Title Printed) |



**G. Award.**

Your offer is hereby accepted. This award consummates the Contract, and the documents referenced herein.

MAINE DEPARTMENT OF TRANSPORTATION

| | |
|---|---|
| Date | By: David A. Cole, Commissioner |
| (Witness) | |

BOND # _____

CONTRACT PERFORMANCE BOND
(Surety Company Form)

KNOW ALL MEN BY THESE PRESENTS: That _____ **_____ in the State of _____**, as principal, and…….....,
a corporation duly organized under the laws of the State of ..... and having a usual place of business ..... .....,
as Surety, are held and firmly bound unto the Treasurer of the State of Maine in the sum of **_____ and 00/100 Dollars ($ )**, to be paid said Treasurer of the State of Maine or his successors in office, for which payment well and truly to be made, Principal and Surety bind themselves, their heirs, executors and administrators, successors and assigns, jointly and severally by these presents.

The condition of this obligation is such that if the Principal designated as Contractor in the Contract to construct Project Number _____ in the Municipality of _____ promptly and faithfully performs the Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

The Surety hereby waives notice of any alteration or extension of time made by the State of Maine.

Signed and sealed this ..... day of ....., 20…. .

| WITNESSES: | SIGNATURES: |
|---|---|
| | CONTRACTOR: |
| Signature..... | .....…..... |
| Print Name Legibly ..... | Print Name Legibly ...…….... |
| | SURETY: |
| Signature ..... | ....…….... |
| Print Name Legibly ..... | Print Name Legibly ..... |
| SURETY ADDRESS: | NAME OF LOCAL AGENCY: |
| ..... | ADDRESS ..... |
| ..... | ...…….... |
| ..... | .....…….... |
| TELEPHONE..... | .....…….... |

BOND # _____

CONTRACT PAYMENT BOND
(Surety Company Form)

KNOW ALL MEN BY THESE PRESENTS: That _____ _____ **in the State of** _____, as principal, and.....…..... a corporation duly organized under the laws of the State of ..... and having a usual place of business in .....……., as Surety, are held and firmly bound unto the Treasurer of the State of Maine for the use and benefit of claimants as herein below defined, in the sum of _____ **and 00/100 Dollars ($ )** for the payment whereof Principal and Surety bind themselves, their heirs, executors and administrators, successors and assigns, jointly and severally by these presents.

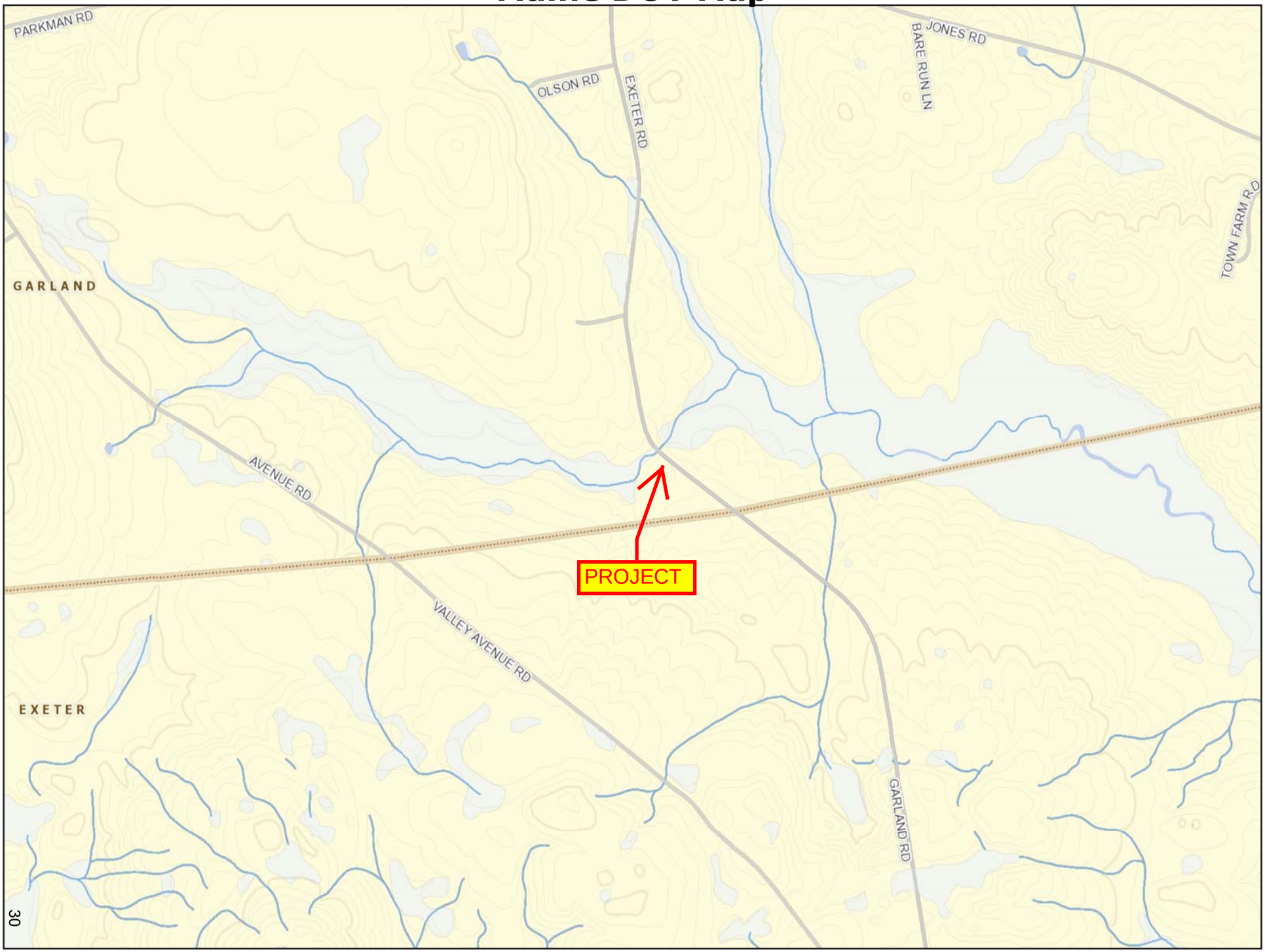
The condition of this obligation is such that if the Principal designated as Contractor in the Contract to construct Project Number _____ in the Municipality of _____ promptly satisfies all claims and demands incurred for all labor and material, used or required by him in connection with the work contemplated by said Contract, and fully reimburses the obligee for all outlay and expense which the obligee may incur in making good any default of said Principal, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

A claimant is defined as one having a direct contract with the Principal or with a Subcontractor of the Principal for labor, material or both, used or reasonably required for use in the performance of the contract.

Signed and sealed this ..... day of ...…….....…., 20 ... .

| | |
|---|---|
| WITNESS: | SIGNATURES: |
| | CONTRACTOR: |
| Signature……..... | .....…..... |
| Print Name Legibly .....…….. | Print Name Legibly ….…..... |
| | SURETY: |
| Signature..... | ...…..... |
| Print Name Legibly ..... | Print Name Legibly ….…..... |
| SURETY ADDRESS: | NAME OF LOCAL AGENCY: |
| ...…..... | ADDRESS ….…..... |
| ..... | ……..... |
| TELEPHONE ..... | ……..... |

# Maine DOT Map



**CONSTRUCTION NOTES**

# 203.35 CRUSHED STONE FILL

This item is to be used as bedding material underneath the new culvert structure.

# 304.10 AGGREGATE SUBBASE COURSE - GRAVEL

This item is to be placed underneath new pavement at 20" depth.

# 403.208 HOT MIX ASPHALT 12.5 MM HMA SURFACE

| Station | Description | Depth |
|---|---|---|
| 11+25 to 13+52 | Mainline | 0.75” |
| 13+52 to 14+69 | Mainline (Strut Area) | 2.00” |
| 14+69 to 17+00 | Mainline | 0.75” |
| 11+25 to 17+00 | Shoulders | 2.00” |

# 403.213 HOT MIX ASPHALT 12.5 MM HMA BASE

| Station | Description | Depth |
|---|---|---|
| 11+25 to 13+52 | Mainline | 1.25” |
| 13+52 to 14+69 | Mainline & Shoulders (Strut Area) | 2.00” |
| 14+69 to 17+00 | Mainline | 1.25” |

# 511.07 COFFERDAM: DOWNSTREAM / UPSTREAM

Cofferdams to be used on both the downstream and upstream ends. These will be Lump Sum quantities.

# 606.23 GUARDRAIL TYPE 3C – SINGLE RAIL

| Station | to | Station | Side |
|---|---|---|---|
| 13+60 | | 14+86 | Lt. |
| 13+35 | | 14+65 | Rt. |

Note: each run of guardrail is to be double-nested to avoid obstruction with the precast structure at station 14+10.41. See standard detail for guardrail treatment over buried structures, 606(24).

**CONSTRUCTION NOTES**

# 606.231 GUARDRAIL TYPE 3C – 15' RADIUS & LESS

| Station | to | Station | Side | Comments |
|---|---|---|---|---|
| 13+44 | | 13+60 | Lt. | Radius into drive at Station 13+34 Lt. |

# 606.353 REFLECTORIZED FLEXIBLE GR MARKER

This item to be placed at leading and trailing ends of FT-350s and radius piece.

# 606.79 GUARDRAIL 350-FT

| Station | to | Station | Side |
|---|---|---|---|
| 14+86 | | 15+23 | Lt. |
| 12+98 | | 13+35 | Rt. |
| 14+65 | | 15+02 | Rt. |

# 610.08 PLAIN RIPRAP

This item is to be used for slope erosion prevention. Material will be placed at a depth of 1.5' at the slopes around the RCPs and as a pad at the inlet and outlet ends of each pipe.

# 620.58 EROSION CONTROL GEOTEXTILE

This item is to be placed underneath Plain Riprap and as directed by the Resident.

## GENERAL NOTES

1) All clearing shall be considered incidental to the contract and no separate payment will be made. The actual lines for clearing shall be established in the field by the contractor as indicated on the plans and approved by the Resident.

2) Where deemed necessary by the Resident, unsuitable excess material shall be removed from the edges of shoulders and placed in designated areas or disposed of. Payment will be made under the appropriate contract items.

3) All inslope and ditches in cut areas shall be graded as shown on the typicals or flatter, or as directed by the Resident.

4) The Contractor shall plan and conduct their work accordingly so that upon final completion of the project there is no drop-off from the edge of shoulder pavement. All remaining or disturbed material on slopes or in ditches on the project shall be capable of attaining a growth of grass that is acceptable according to Standard Specification 618.10. No separate payment will be made for this work.

5) All waste material not used on the project shall be disposed of off the project in waste areas reviewed by the Resident. Grading, seeding, & mulching of all waste areas shall be considered incidental to 656 items.

6) Granular borrow used to backfill muck excavation or in low wet areas to 1' above water level or old ground shall meet requirements for granular borrow underwater backfill.

7) Existing inslopes steeper than 2:1 in proposed fill areas shall be benched as directed by the Resident.

8) Any necessary cleaning of existing pavement prior to paving shall be incidental to the related paving items.

9) Loam has been estimated for disturbed lawn areas. Actual placement of the loam shall be as noted on the plans or designated by the Resident.

10) Unless otherwise noted Seeding Method No. 1 shall be utilized on all lawns and developed areas; Seeding Method No. 2 shall be utilized on all non-guardrail slopes. Seeding Method No. 3 shall be utilized on all guardrail fill slopes. On long non-guardrail backslopes, Seeding Method No. 3 may be used instead of Method No. 2 if noted or directed by the Resident.

**GENERAL NOTES**

11) Loam shall be placed to a nominal depth of 4 inches in lawn areas and 2 inches in all other areas unless otherwise noted or directed.

12) The Contractor will be responsible for maintaining all existing mailboxes to ensure that the mail will be deliverable.

13) Any damage to the slopes caused by the contractor's equipment, personnel, or operation shall be repaired to the satisfaction of the resident. All work, equipment, and materials required to make repairs shall be at the contractor's expense.

14) A copy of the soils report for this project is available at http://www.maine.gov/mdot/comprehensive-list-projects/project-information.php. All computation methods and quantities used for the Engineer's Estimate for **plan quantity items only** are available by contacting Region 4 Project Manager Shawn Davis at 207-592-3134.

15) Areas requiring fill on the project will come from suitable excavation from excavation, ditch & inslope, or equipment rental areas.

16) Additional excavation for the contractor's convenience or to comply with backsloping requirements will not be paid for directly but will be considered incidental to the related drainage items.

17) No separate payment for superintendent or foreman will be made for the supervision of equipment being paid for under the equipment rental items.

18) "Undetermined Locations" shall be determined by the Resident.

19) Stations referenced are approximate.

20) All work shall be done in accordance with the Maine Department of Transportation's Best Management Practices for Erosion & Sedimentation Control, February, 2008.

21) MaineDOT will final stripe the project. The Contractor is responsible for transferring the existing striping pattern to the surface course.

THIS DOCUMENT MUST BE CLEARLY POSTED AT THE PERTAINING STATE FUNDED PREVAILING WAGE CONSTRUCTION SITE

State of Maine
Department of Labor
Bureau of Labor Standards
Technical Services Division
Augusta, Maine 04333-0045
Telephone (207) 623-7906

Wage Determination - In accordance with 26 MRSA §1301 et. seq., this is a determination by the Bureau of Labor Standards, of the fair minimum wage rate to be paid laborers and workers employed on the below titled project.

Title of Project -------Exeter Road Bridge Replacement

Location of Project –Garland, Penobscot

## 2012 Fair Minimum Wage Rates
## Heavy & Bridge Penobscot County

| Occupation Title | Minimum Wage | Minimum Benefit | Total | Occupation Title | Minimum Wage | Minimum Benefit | Total |
|---|---|---|---|---|---|---|---|
| Asbestos/Lead Removal Worker | $16.00 | $1.64 | $17.64 | Insulation Installer | $16.00 | $1.67 | $17.67 |
| Asphalt Raker | $14.60 | $0.52 | $15.12 | Ironworker - Reinforcing | $18.00 | $0.00 | $18.00 |
| Backhoe Loader Operator | $19.04 | $5.95 | $24.99 | Ironworker - Structural | $20.87 | $10.54 | $31.41 |
| Boilermaker | $22.25 | $4.10 | $26.35 | Laborers (Incl.Helpers & Tenders) | $13.00 | $0.76 | $13.76 |
| Boom Truck (Truck Crane) Operator | $32.37 | $17.71 | $50.08 | Laborer - Skilled | $16.62 | $7.50 | $24.12 |
| Bricklayer | $22.85 | $1.23 | $24.08 | Line Erector - Power/Cable Splicer | $23.68 | $9.87 | $33.55 |
| Bulldozer Operator | $15.63 | $0.53 | $16.16 | Loader Operator - Front-End | $15.68 | $2.39 | $18.07 |
| Carpenter | $18.90 | $10.54 | $29.44 | Mechanic,Maintenance | $21.85 | $10.54 | $32.39 |
| Carpenter - Rough | $16.50 | $1.68 | $18.18 | Mechanic, Refrigeration | $21.13 | $3.94 | $25.07 |
| Cement Mason/Finisher | $16.00 | $0.81 | $16.81 | Millwright | $25.37 | $10.54 | $35.91 |
| Communication Equip Installer | $15.00 | $1.86 | $16.86 | Oil/Fuel Burner Servicer & Installer (Licensed) | $20.50 | $3.92 | $24.42 |
| Comm Transmission Erector-Microwave & Cell | $19.38 | $2.98 | $22.36 | Painter | $18.37 | $10.54 | $28.91 |
| Concrete Pump Operator | $20.00 | $3.54 | $23.54 | Paver Operator | $17.00 | $2.44 | $19.44 |
| Crane Operator <15 Tons | $19.00 | $2.41 | $21.41 | Pile Driver Operator | $24.85 | $6.27 | $31.12 |
| Crane Operator =>15 Tons) | $22.31 | $10.54 | $32.85 | Pipe/Steam/Sprinkler Fitter | $24.58 | $10.04 | $34.62 |
| Crusher Plant Operator | $15.50 | $3.52 | $19.02 | Pipelayer | $22.00 | $10.74 | $32.74 |
| Diver | $23.00 | $1.50 | $24.50 | Pump Installer | $17.00 | $2.26 | $19.26 |
| Driller - Rock | $16.00 | $4.13 | $20.13 | Rigger | $17.50 | $4.27 | $21.77 |
| Earth Auger Operator | $19.70 | $7.19 | $26.89 | Roller Operator - Earth | $14.00 | $1.21 | $15.21 |
| Electrician - Licensed | $27.25 | $11.25 | $38.50 | Sheet Metal Worker | $17.00 | $2.71 | $19.71 |
| Electrician Helper/Cable Puller (Licensed) | $17.55 | $10.54 | $28.09 | Stone Mason | $20.00 | $6.20 | $26.20 |
| Excavator Operator | $18.13 | $2.31 | $20.44 | Truck Driver - Light | $15.00 | $1.23 | $16.23 |
| Flagger | $9.00 | $0.00 | $9.00 | Truck Driver - Medium | $17.00 | $10.54 | $27.54 |
| Grader/Scraper Operator | $18.45 | $2.77 | $21.22 | Truck Driver - Heavy | $12.75 | $0.96 | $13.71 |
| Hot Top Plant Operator | $19.38 | $6.09 | $25.47 | Truck Driver - Tractor Trailer | $18.25 | $5.18 | $23.43 |

The Laborer classifications include a wide range of work duties. Therefore, if any specific occupation to be employed on this project is not listed in this determination, call the Bureau of Labor Standards at the above number for further clarification.

Welders are classified in the trade to which the welding is incidental.

Apprentices - The minimum wage rate for registered apprentices are those set forth in the standards and policies of the Maine State Apprenticeship and Training Council for approved apprenticeship programs.

Posting of Schedule - Posting of this schedule is required in accordance with 26 MRSA §1301 et. seq., by any contractor holding a State contract for construction valued at $50,000 or more and any subcontractors to such a contractor.

Appeal - Any person affected by the determination of these rates may appeal to the Commissioner of Labor by filing a written notice with the Commissioner stating the specific grounds of the objection within ten (10) days from the filing of these rates with the Secretary of State.

Determination No: HB-021-2012

Filing Date: May 16, 2012

Expiration Date: 12-31-2012

A true copy

Attest: _____

Richard V Snow
Director
Bureau of Labor Standards

BLS 424HB (R2012) (Heavy & Bridge Penobscot)

# SPECIAL PROVISION
## SECTION 102.3
## EXAMINATION OF DOCUMENTS, SITE, AND OTHER INFORMATION
## (Geotechnical Information)

Add the following to Section 102.3, Examination of Documents, Site and Other Information:

102.3.1 Geotechnical Information In most cases, Geotechnical Information pertaining to the project has been collected and assembled. Bidders and Contractors are obligated to examine and, if necessary, obtain geotechnical information. If one is available, the project geotechnical report may be accessed at the following web address:

http://www.maine.gov/mdot/comprehensive-list-projects/project-information.php.

The Department shall not be responsible for the Bidders' and Contractors' interpretations of or estimates or conclusions drawn from the Geotechnical Information. Data provided may not be representative of the subsurface conditions between the boring locations.

This section does not diminish the duties imposed upon parties in Section 102 or in any other sections.

# SPECIAL PROVISIONS
# SECTION 104
# Utilities

## MEETING

A Pre-Construction Utility Conference, as defined in Subsection 104.4.6 of the Standard Specifications **is** required for Bangor Hydro Electric Company and Northern New England Telephone Operations, LLC (FairPoint).

## GENERAL INFORMATION

These Special Provisions outline the arrangements that have been made by the Department for utility work to be undertaken in conjunction with this project. The following list identifies all known utilities or railroads having facilities presently located within the limits of this project or intending to install facilities during project construction.

**Overview:**

| Utility/Railroad | Aerial | Underground |
|---|---|---|
| **Bangor Hydro Electric Company** | **X** | |
| **Northern New England Telephone Operations, LLC (FairPoint)** | **X** | |

Temporary utility adjustments are anticipated.

All adjustments are to be made by the respective utility unless otherwise specified herein.

All clearing and tree removal in areas where utilities are involved must be completed before the utilities are able to relocate their facilities.

Fire hydrants shall not be disturbed until all necessary work has been accomplished to provide proper fire protection.

## AERIAL

***Summary:***

| Utility | Pole Set | New Wires/ Cables | Trans. Wires/ Cables | Remove Poles | Estimated Working Days |
|---|---|---|---|---|---|
| Bangor Hydro Electric Company | | | X | | 2 |
| Northern New England Telephone Operations, LLC (FairPoint) | X | X | | X | 3 |
| | | | | **Total:** | 5 |

***Utility Specific Issues:***

**Bangor Hydro Electric Company**

Bangor Hydro Electric Company (BHE) has cables to transfer to the new pole locations. After Fairpoint has set the poles BHE will begin their transfers. BHE estimates 2 working days to complete their transfers.

**Northern New England Telephone Operations, LLC (FairPoint)**

Northern New England Telephone Operations, LLC (FairPoint) has approximately 2 poles to set as per the pole list included in this specification and will install new cables on the poles. Fairpoint estimates 3 working days to set the poles and install the new cables. After all transfers are complete, Fairpoint shall remove the abandoned poles.

***Pole List:***

| Existing Pole # | Existing Station | Left/ Right | | Offset From Existing CL | Proposed Station | Left/ Right | | Proposed Offset | Comments |
|---|---|---|---|---|---|---|---|---|---|
| | | LT | RT | | | LT | RT | | |
| No # | 11+36 | X | | 21.8 | | | | | |
| 26 | 13+79 | X | | 23.1 | **13+73** | **X** | | **27** | Replace |
| | | | | | **14+89** | **X** | | **32** | Add new pole |
| 452/25 | 16+60 | X | | 27.7 | | | | | |

**UNDERGROUND**

Underground utility adjustments are not anticipated as part of this project. Utilities have been notified and if utility relocations, though unexpected, become necessary, they will be scheduled in compliance with Section 104 of the Standard Specifications and will be done by the utilities in conjunction with the work by the Contractor.

**THE CONTRACTOR SHALL PLAN AND CONDUCT THEIR WORK ACCORDINGLY.**

The utility contact information is provided as part of contract documents for utility correspondence after contract award. If the Contractor has any questions regarding the utility work or relocations associated with the Project during bidding, the Contractor shall submit questions through the Request for Information process outlined in the contract documents.

| | | |
|---|---|---|
| **Bangor Hydro Electric Company** | **Jerrod Crouse** | **973-2671** |
| **Northern New England Telephone Operations, LLC (Fairpoint)** | **Michael Atwater** | **626-2012** |

Town: Garland
PIN #: 19334.00
Date: 4/19/12

SPECIAL PROVISION
SECTION 105
General Scope of Work
(Environmental Requirements)

In-Water work consists of any activity conducted below the normal high water mark of a river, steam, brook, lake, pond or "Coastal Wetland" areas that are subject to tidal action during the highest tide level for the year which an activity is proposed as identified in the tide tables published by the National Ocean Service. http://www.oceanservice.noaa.gov/ For the full definition of "Coastal Wetlands", please refer to 38 MRSA 480-B(2)

I. In-Water Work shall not be allowed between the dates of 10/1 and 7/14.
**(In-Water work is allowed from 7/15 to 9/30.)**

II. In-Water work window applies to the following water bodies at the following station #'s:
1. Allen Stream

III. Special Conditions:
1. **The contractor shall notify the Resident at least one week prior to dewatering of any cofferdams so that qualified MaineDOT Environmental Staff can be on-site to monitor the drawdown and relocate any Atlantic salmon downstream of the project area. The contractor shall not begin dewatering activities until MaineDOT Environmental Staff are onsite.** The contractor shall contact MaineDOT Environmental Office Field Staff (John Perry, 592-2581) to coordinate fish evacuation and cofferdam installation at least one week prior to anticipated in-water work.
2. A fish evacuation plan must be implemented by appropriate Maine DOT staff during construction and dewatering of all cofferdams to carefully remove fish from the work area. The evacuation plan will include dewatering all areas within cofferdams to ensure evacuation can be completed.
3. Maine DOT shall use a screen on each pump intake sufficiently large enough that the approach velocity does not exceed 0.20 ft/s.2Designing the screen for these approach velocities will minimize screen contact and/or impingement of juvenile fish. Square or round screen face openings not to exceed 2.38 mm (3/32 inch) on a diagonal. Criteria for slotted face openings must not exceed 1.75 mm (approximately 1/16 inch) in the narrow direction. Intake hoses shall be regularly monitored while pumping.
4. A work start notification form and compliance form must be filled out by the MaineDOT resident and sent to ACOE and the MaineDOT ENV office.
5. See ACOE Individual Permit Pages 10-12.
6. See additional pages of this SP 105 for excerpts from MaineDOT's biological assessment for additional conditions.

IV. Approvals:
1. Temporary Soil Erosion and Water Pollution Control Plan

V. All activities are prohibited (including placement and removal of cofferdams unless otherwise permitted by Regulatory Agencies) below the normal high water mark if outside the prescribed in-water work window, except for the following:
1. Work within a cofferdam constructed according to MaineDOT's Standard Specifications and in adherence with the contractors approved "Soil Erosion and Water Pollution Control Plan".

VI. No work is allowed that completely blocks a river, stream, or brook without providing downstream flow.
NOTE: Regulatory Review and Approval is required to modify the existing In-Water work window.

SPECIAL PROVISION
SECTION 105
General Scope of Work
(Environmental Requirements)

***Excerpts from Biological Assessment for MaineDOT Bridge and Culvert Projects***
***February 2011***

**2.1 Coffer Dam Descriptions**

While the projects in this batch consultation vary by scope, the same conceptual construction guidelines for the installation of cofferdams are employed. Project specific details are described in Section 4.0.

The initial step in culvert, box, and strut (minor span) replacement projects is to dewater the work area so that all in-stream work is conducted in the dry. This will be done by 1) Setting up cofferdams both upstream and down to prevent water from leaking into the work area. 2) Dewatering the work area and, 3) Diverting the existing stream flow out of the channel using suction hoses and/or a diversion culvert.

*Cofferdam Placement*

Cofferdams, e.g. sheetpile, sandbag, industrial sandbag, inflatable dam, will be placed to keep water out of the work area by blocking flow both upstream and downstream. This has the added benefit of keeping all sediment released by construction in the dry work area where it can be removed before stream flow is restored.

1. The upstream cofferdam will be installed first. Heavy duty plastic sheeting is laid along the width of the stream when practicable. The sand bags are then placed on the plastic up to a height somewhat higher then the current level of the stream, working from the stream bank to the center.
2. The excess plastic will then be folded over the dam in the upstream direction and another layer of sand bags will be laid on the plastic to help seal the dam from infiltration. The plastic will be extended along the stream bottom as far upstream as practicable.

3. The downstream cofferdam will then be installed. This second dam is a safeguard against a failure of the upstream dam. Most cofferdams leak somewhat, so a pump may be placed within the work area to catch accumulating water, which would then be pumped into the “Dirty water” Treatment System

*Stream Diversion*

Stream flow can be diverted around the work area either by pumping it around through hoses or by diverting flow through a temporary culvert installed next to the stream using sandbags, sheet piles, jersey barriers, etc. The description below outlines the process for using pumps and hoses to divert flow from one side of a project to the other.

1. Prior to in-stream work, a diversion culvert may be placed under the road away from the stream to run a diversion hose. This protects the hose during the construction activities. Another common way of doing this is running the hose over the road and blocking up around it with wood to protect it from traffic.
2. The intake hose will be placed at the upstream end of the culvert, just upstream of the cofferdam. In order to minimize impact on the streambed the hose end will be placed in a bucket and/or the stream bottom will be lined with geotextile. A screen will be placed at the intake hose end to prevent injury to fish and entrapment within the work area. To prevent fish entrainment into the hose, the screen openings shall not exceed 3/32-inches (2.38 mm) in the narrow direction. In order to prevent impingement of Atlantic salmon parr on the screened intake hoses, additional barriers consisting of either placing the intake within a 5-gallon bucket or creating a barrier with a ¼ knotless block seine around the perimeter of the intake will be utilized. Other additional barriers, including barriers made of sandbags, plastic sheeting, or other suitable materials may be utilized depending on site conditions. The approach velocity will be kept below 0.2 ft/second (0.06 m/sec) to avoid impingement of Atlantic salmon juveniles[10].

3. The gasoline diversion pumps will then be setup as far away from the stream as possible. The number and size of pumps used varies depending on the water level present when the work is being conducted.
4. Non-woven geotextile fabric will be laid along the streambed to protect the stream from scour caused by the high water velocity coming from the hose(s) at the downstream end.

*Install "Dirty Water" Treatment System*
After the cofferdams and water diversion pumps have diverted the stream around the work area, it will be necessary to dewater the work area itself. This water will be pumped into a sediment basin for filtration.
1. The system will be installed according to Maine DOT's BMP Manual
2. The basin will either be comprised of hay bales or "dirt bags". Sometimes erosion control fabric is placed under the hay bale filter to catch sediment. These sediments will be disposed of away from the stream in a manner that they cannot erode back into the stream.
3. The sedimentation basin will be located close to the project location with adequate vegetation between it and the stream to act as a filter.

4. Pumping 1. Hoses will be setup between the treatment basin and the downstream scour pool within the work area.
2. The "dirty water" pump(s) will then be started in the downstream scour pool
3. The pool will be slowly dewatered and any stranded aquatic organisms, (including Atlantic salmon) will be caught and transferred to the downstream channel by a MaineDOT biologist (See Appendix A for the Evacuation Plan).

5. The work area will then be pumped dry.
6. If there is leakage around the cofferdam, or upwelling in the work area, pockets will be excavated in the work area to collect the water. This water will be pumped into the "dirty water" system for treatment, prior to its release back into the stream.

**2.2 Culvert Replacement Projects**
Once flow is diverted and the work area is dewatered the culvert replacement can commence. At this point, the crews are working in the dry and there is no sediment release into the stream. All pumps, hoses, dams, and the sediment basin are monitored closely and maintained throughout construction. The old culvert will be removed and the new one replaced in the dry. When the culvert and rip rap installation is complete, all headwalls, disturbed areas, and permanent drainage ditches are stabilized with final treatments, utilizing temporary erosion control BMPs as necessary.
*Closeout Procedures*
1. The upstream "dirty water" pump will then be removed.
2. The diversion pump system will be stopped and the upstream coffer dam will slowly be breached. The first flush of dirty water will be captured by the downstream "dirty water" pump, which will then pump the water into the sediment treatment system.
3. When the water behind the remaining intact cofferdam is clean, that dam will be breached as well.
4. The remainder of the upstream cofferdam and the diversion pump system will then be removed.
5. All disturbed areas will be stabilized, and all permanent erosion control BMPs will be installed.

# SPECIAL PROVISION
# SECTION 105
# LEGAL RELATIONS WITH AND RESPONSIBILITY TO PUBLIC
(NPDES)

105.8.2 Permit Requirements This Section is revised by the addition of the following paragraph:

"The Contractor is advised that the Environmental Protection Agency has issued a final National Pollutant Discharge Elimination System (NPDES) General Permit for storm water discharges from construction sites disturbing more than 2 ha [5 acres]. This permit requires:

- Storm Water Pollution Prevention Plan
- Submission of a Notification of Intent (NOI) at least 48 hours before construction commences
- Submission of a Notification of Termination (NOT) when a site has been finally stabilized and all storm water discharges from construction activities are eliminated.

If the project's land disturbances is 2 ha [5 acres] or more, the Department will prepare the plan and submit the NOI (and NOT). The Contractor shall prepare plans and submit NOI's (and NOT's) for regulated construction activities beyond the project limits (e.g., borrow pits).

The Contractor shall be familiar with and comply with these regulations."

# SPECIAL PROVISION 105
# OVERLIMIT PERMITS

## Title 29-A § 2382 MRSA Overlimit Movement Permits.

**1. Overlimit movement permits issued by State.** The Secretary of State, acting under guidelines and advice of the Commissioner of Transportation, may grant permits to move nondivisible objects having a length, width, height or weight greater than specified in this Title over a way or bridge maintained by the Department of Transportation

**2. Permit fee.** The Secretary of State, with the advice of the Commissioner of Transportation, may set the fee for single trip permits, at not less than $6, nor more than $30, based on weight, height, length and width. The Secretary of State may, by rule, implement fees that have been set by the Commissioner of Transportation for multiple trip, long-term overweight movement permits. Rules established pursuant to this section are routine technical rules pursuant to Title 5, chapter 375, subchapter II-A.

**3. County and municipal permits.** A county commissioner or municipal officer may grant a permit, for a reasonable fee, for travel over a way or bridge maintained by that county or municipality

**4. Permits for weight.** A vehicle granted a permit for excess weight must first be registered for the maximum gross vehicle weight allowed for that vehicle.

**5. Special mobile equipment.** The Secretary of State may grant a permit, for no more than one year, to move pneumatic-tire equipment under its own power, including Class A and Class B special mobile equipment, over ways and bridges maintained by the Department of Transportation. The fee for that permit is $15 for each 30-day period.

**6. Scope of permit.** A permit is limited to the particular vehicle or object to be moved, the trailer or semitrailer hauling the overlimit object and particular ways and bridges.

**7. Construction permits.** A permit for a stated period of time may be issued for loads and equipment employed on public way construction projects, United States Government projects or construction of private ways, when within construction areas established by the Department of Transportation. The permit:

A. Must be procured from the municipal officers for a construction area within that municipality;

B. May require the contractor to be responsible for damage to ways used in the construction areas and may provide for:

(1) Withholding by the agency contracting the work of final payment under contract; or

(2) The furnishing of a bond by the contractor to guarantee suitable repair or payment of damages.

The suitability of repairs or the amount of damage is to be determined by the Department of Transportation on state-maintained ways and bridges, otherwise by the municipal officers;

C. May be granted by the Department of Transportation or by the state engineer in charge of the construction contract; and

D. For construction areas, carries no fee and does not come within the scope of this section.

**8. Gross vehicle weight permits.** The following may grant permits to operate a vehicle having a gross vehicle weight exceeding the prescribed limit:

A. The Secretary of State, with the consent of the Department of Transportation, for state and state aid highways and bridges within city or compact village limits;

B. Municipal officers, for all other ways and bridges within that city and compact village limits; and

C. The county commissioners, for county roads and bridges located in unorganized territory.

**9. Pilot vehicles.** The following restrictions apply to pilot vehicles.

A. Pilot vehicles required by a permit must be equipped with warning lights and signs as required by the Secretary of State with the advice of the Department of Transportation.

B. Warning lights may be operated and lettering on the signs may be visible on a pilot vehicle only while it is escorting a vehicle with a permit on a public way.

With the advice of the Commissioner of Transportation and the Chief of the State Police, the Secretary of State shall establish rules for the operation of pilot vehicles.

**9-A. Police escort.** A person may not operate a single vehicle or a combination of vehicles of 125 feet or more in length or 16 feet or more in width on a public way unless the vehicle or combination of vehicles is accompanied by a police escort. The Secretary of State, with the advice of the Commissioner of Transportation, may require a police escort for vehicles of lesser dimensions.

A. The Bureau of State Police shall establish a fee for state police escorts to defray the costs of providing a police escort. A county sheriff or municipal police department may establish a fee to defray the costs of providing police escorts.

B. The Bureau of State Police shall provide a police escort if a request is made by a permittee. A county sheriff or municipal police department may refuse a permittee's request for a police escort.

C. A vehicle or combination of vehicles for which a police escort is required must be accompanied by a state police escort when operating on the interstate highway system.

**10. Taxes paid.** A permit for a mobile home may not be granted unless the applicant provides reasonable assurance that all property taxes, sewage disposal charges and drain and sewer assessments applicable to the mobile home, including those for the current tax year, have been paid or that the mobile home is exempt from those taxes. A municipality may waive the requirement that those taxes be paid before the issuance of a permit if the mobile home is to be moved from one location in the municipality to another location in the same municipality for purposes not related to the sale of the mobile home.

**11. Violation.** A person who moves an object over the public way in violation of this section commits a traffic infraction.

Section History:
PL 1993, Ch. 683, §A2 (NEW).
PL 1993, Ch. 683, §B5 (AFF).
PL 1997, Ch. 144, §1,2 (AMD).
PL 1999, Ch. 117, §2 (AMD).
PL 1999, Ch. 125, §1 (AMD).
PL 1999, Ch. 580, §13 (AMD).
PL 2001, Ch. 671, §30 (AMD).
PL 2003, Ch. 166, §13 (AMD).
PL 2003, Ch. 452, §Q73,74 (AMD).
PL 2003, Ch. 452, §X2 (AFF).

# SPECIAL PROVISION 105
# CONSTRUCTION AREA

A Construction Area located in the **Town of Garland** has been established by the Maine Department of Transportation (MDOT) in accordance with provisions of 29-A § 2382 Maine Revised Statutes Annotated (MRSA).

(a) The section of highway under construction in the town of Garland, Penobscot County on Exeter road over Allen stream.

(b) (Exeter road) over Allen stream station 11+25.00 to station 17+00.00 of the construction plus approaches.

Per 29-A § 2382 (7) MRSA, the MDOT may "*issue permits for stated periods of time for loads and equipment employed on public way construction projects, United States Government projects or construction of private ways, when within construction areas established by the Department of Transportation. The permit:*

*A. Must be procured from the municipal officers for a construction area within that municipality;*

*B. May require the contractor to be responsible for damage to ways used in the construction areas and may provide for:*

*(1) Withholding by the agency contracting the work of final payment under contract; or*

*(2) The furnishing of a bond by the contractor to guarantee suitable repair or payment of damages.*

*The suitability of repairs or the amount of damage is to be determined by the Department of Transportation on state-maintained ways and bridges, otherwise by the municipal officers;*

*C. May be granted by the Department of Transportation or by the state engineer in charge of the construction contract; and*

*D. For construction areas, carries no fee and does not come within the scope of this section."*

The Municipal Officers for the **Town of Garland** agreed that an Overlimit Permit will be issued to the Contractor for the purpose of using loads and equipment on municipal ways in excess of the limits as specified in 29-A MRSA, on the municipal ways as described in the "Construction Area".

As noted above, a bond may be required by the municipality, the exact amount of said bond to be determined prior to use of any municipal way. The MDOT will assist in determining the bond amount if requested by the municipality.

The maximum speed limits for trucks on any town way will be 25 mph (40 km per hour) unless a higher legal limit is specifically agreed upon in writing by the Municipal Officers concerned.

**SPECIAL PROVISION**
**SECTION 105**
**General Scope of Work**
**(Limitations of Operations)**

1. The Contractor will be allowed to commence work and end work daily according to the Department of Marine Resources Sunrise/Sunset Table at the following Web address (http://www.maine.gov/dmr/sunrise_table.htm). Contractor will be allowed to enter roadway at Sunrise and must be off the roadway before Sunset. Any work outside these times will require an approved nighttime traffic control and lighting plan.

2. A detour will be set up to re-direct traffic away from the area of work. The Contractor shall have this detour in place for no more than 7 continuous calendar days. Please refer to the project's Detour Plan for more information.

3. The Contractor's traffic control plan shall discuss/address ways to minimize impact to the traveling public.

4. All work schedule changes must be submitted for approval to the Department a minimum of 10 calendar days prior to the requested change.

5. No more than one paving operation can be in progress at any one time unless authorized by the Resident.

6. The Contractor shall not work on the following date:

   September 4, 2012 (Labor Day).

**SPECIAL PROVISION**
**SECTION 107**
**PROSECUTION AND PROGRESS**
**(Contract Time)**

1. The Contractor will be allowed to commence work on this project any time on or after the beginning of the In-Stream Work-Window period starting on July 15th, 2012, provided that all applicable plans required under this contract have been submitted and approved by the MaineDOT. The completion date for this contract is September 20th, 2012.

2. For every weekday not worked once operations commence, the Contractor will be charged supplemental liquidated damages per standard specification 107.7.2 (excluding days lost to inclement weather).

3. A 48 hour notice will be required for any changes in the work schedule.

# SPECIAL PROVISION
# SECTION 107
# TIME

107.4.2 Schedule of Work Required. This Section is amended by the following:

In addition to the Contractors initial CPM Schedule, the Department will require the Contractor to update the schedule monthly to show current progress. The submittal date for monthly updates shall be determined by the Resident.

# SPECIAL PROVISION
## SECTION 107
## TIME
(Scheduling of Work – Projected Payment Schedule)

Description The Contractor shall also provide the Department with a Quarterly Projected Payment Schedule that estimates the value of the Work as scheduled, including requests for payment of Delivered Materials. The Projected Payment Schedule must be in accordance with the Contractor's Schedule of Work and prices submitted by the Contractor's Bid. The Contractor shall submit the Projected Payment Schedule as a condition of Award.

**SPECIAL PROVISION**
**SECTION 109.5**
**ADJUSTMENTS FOR DELAY**
**(Delays due to Flooding)**

Subsection 109.5.1, Definitions- Types of Delays, is replaced with the following:

109.5.1 Definitions - Types of Delays Delays are defined as follows and may be divided into more than one type depending upon cause.

A. Excusable Delay Except as expressly provided otherwise by this Contract, an "Excusable Delay" is a Delay to the Critical Path that is directly and solely caused by: (1) an Uncontrollable Event, or (2) a flooding event at the effected location of the Project that results in a Q25 headwater elevation, or greater, but less than a Q50 headwater elevation. Theoretical headwater elevations will be determined by the Department; actual headwater elevations will be determined by the Contractor and verified by the Department.

B. Compensable Delay A "Compensable Delay" is a Delay to the Critical Path that is directly and solely caused by: (1) a weather related Uncontrollable Event of such an unusually severe nature that a Federal Emergency Disaster is declared. The Contractor will only be entitled to an Equitable Adjustment if the Project falls within the geographic boundaries prescribed under the disaster declaration (2) an Uncontrollable Event caused by a Utility Company or other third party (not Subcontractors) Working on Project-related Work within the Project Limits if, and only if, the Utility Company or such other third party offers the Department reimbursement for such Delay~~,~~ (3) acts by the Department that are in violation of applicable laws or the Contract, or (4) a flooding event at the effected location of the Project that results in a Q50 headwater elevation, or greater. Theoretical Q50 headwater elevations will be determined by the Department; actual headwater elevations will be determined by the Contractor and verified by the Department.

C. Inexcusable Delay "Inexcusable Delays" are all Delays that are not Excusable Delays or Compensable Delays.

For a related provision, see Section 101.2 - Definition of Uncontrollable Event.

# SPECIAL PROVISION
# SECTION 203
CRUSHED STONE

Description This work shall consist of placing crushed stone in accordance with these specifications and in reasonably close conformity with the width, grade and thickness shown on the Plans or established by the Resident.

## MATERIALS

Aggregate Crushed stone material shall meet the requirements of ASTM Standard Specification C33, Standard Specification for Concrete Aggregates.

The aggregate shall meet the following gradation requirements:

| Particle size | Percent by Weight Passing |
|---|---|
| 1 inch | 100 |
| ¾ inch | 90 – 100 |
| ½ inch | 20 – 55 |
| ⅜ inch | 0 – 15 |
| No. 4 | 0 - 5 |

Construction Requirements The crushed stone shall be placed and graded as shown on the plans or as directed by the Resident. The crushed stone shall be compacted as required to ensure that all voids in the stone are filled, as approved by the Resident.

Method of Measurement Aggregate for crushed stone will be measured by the cubic yard complete in place, unless noted otherwise in the Plans.

Basis of Payment The accepted quantity of crushed stone will be paid for at the contract unit price per cubic yard of aggregate complete in place, unless noted otherwise in the Plans.

Payment will be under

| Pay Item | | Unit |
|---|---|---|
| 203.35 | Crushed Stone | Cubic Yard |

SPECIAL PROVISION
SECTION 203
EXCAVATION AND EMBANKMENT
(Dredge Materials)

***Description:*** Dredge Material (See MaineDOT Standard Specifications § 101.2) is regulated as a Special Waste.

Work associated with the Allen Stream Strut Replacement initiative will require the excavation of select Dredge Material. It is anticipated that less than 100-cubic yards of Dredge Material will be excavated. There is onsite Beneficial Use for all of the Dredge Materials.

It is acknowledged that the excavation of Dredge for this work may include some boulders. The Maine Department of Environmental Protection has determined that sound boulders (rock 12-inches or more in diameter), that are free of adhering sediment or other contaminants, shall be deemed to be Inert Fill material and shall not be included in the Dredge Material Quantities.

The contractor shall Beneficially Use all Dredge Material excavated at the Allen Stream Strut Replacement project in an area adjacent to and draining into the dredged water body. No more than 100-cubic yards of Dredge Material may be excavated.

CONSTRUCTION REQUIREMENTS

***Management:*** The contractor shall Beneficially Use all Dredge Material excavated at the Allen Stream Strut Replacement in areas adjacent to and draining into the dredged water body. No more than 100-cubic yards of Dredge Material may be excavated at any of the individual culvert sites.

***Method of Measurement:*** Dredge Material will be measured by the cubic yard of material removed.

***Basis of Payment:*** Payment for the Beneficial Use of Dredge Material will be incidental to the Contract Pay Items.

Payment shall be full compensation for excavation, dewatering, managing, transporting, and placement of the Dredge Materials.

# SPECIAL PROVISION
# DIVISION 400
# PAVEMENTS

## SECTION 401 - HOT MIX ASPHALT PAVEMENT

401.01 Description The Contractor shall furnish and place one or more courses of Hot Mix Asphalt Pavement (HMA) on an approved base in accordance with the contract documents and in reasonably close conformity with the lines, grades, thickness, and typical cross sections shown on the plans or established by the Resident. The Department will accept this work under Quality Assurance provisions, in accordance with these specifications and the requirements of Section 106 – Quality, the provisions of AASHTO M 323 except where otherwise noted in sections 401 and 703 of these specifications, and the Maine DOT Policies and Procedures for HMA Sampling and Testing.

401.02 Materials Materials shall meet the requirements specified in Section 700 - Materials:

| | |
|---|---|
| Asphalt Cement | 702.01 |
| Aggregates for HMA Pavement | 703.07 |
| HMA Mixture Composition | 703.09 |

401.021 Recycled Asphalt Materials Recycled Asphalt Pavement (RAP) may be introduced into the mixture at percentages approved by the Department. If approved by the Department, the Contractor shall provide documentation stating the source, test results for average residual asphalt content, and stockpile gradations showing RAP materials have been sized to meet the maximum aggregate size requirements of each mix designation. The Department will obtain samples for verification and approval prior to its use.

For specification purposes, RAP will be categorized as follows:

Classified RAP – RAP consisting of processed millings from federal, state or municipal roadways that is free of materials not generally considered to be asphalt pavement. Millings from other sources that have been fractionated or otherwise processed so as to improve the consistency of the RAP may be considered Classified RAP if approved by the Department.

Unclassified RAP – RAP from unknown sources, from excavated or reclaimed pavements, millings from repaired areas or other sources.

In the event that RAP source or properties change, the Contractor shall notify the Department of the change and submit new documentation stating the new source or properties a minimum of 72 hours prior to the change to allow for obtaining new samples and approval.

401.03 Composition of Mixtures The Contractor shall compose the Hot Mix Asphalt Pavement with aggregate, Performance Graded Asphalt Binder (PGAB), and mineral filler if required. HMA shall be designed and tested according to AASHTO R35 and the volumetric criteria in Table 1. The Contractor shall size, uniformly grade, and combine the aggregate fractions in proportions that provide a mixture meeting the grading requirements of the Job Mix Formula (JMF). The Contractor may use a maximum of 20 percent Classified RAP in any base, binder, surface, or shim course. For Unclassified RAP stockpiles no more than 15 percent shall be used. The Contractor may be allowed to use more than 20 percent Classified RAP, up to a maximum of 25 percent Classified RAP, in a base, binder, or shim course provided that PG 58-34 asphalt binder is used in the mixture. A PG 52-34 may be used when approved by the Department.

The Contractor shall submit for Department approval a JMF to the Central Laboratory in Bangor for each mixture to be supplied. The Department may approve 1 active design per nominal maximum size, per traffic level, per plant, plus a 9.5mm "fine" mix for shimming and where required, a non-RAP design for bridge decks. The Department shall then have 15 calendar days in which to process a new design before approval. The JMF shall establish a single percentage of aggregate passing each sieve size within the limits shown in section 703.09. The mixture shall be designed and produced, including all production tolerances, to comply with the allowable control points for the particular type of mixture as outlined in 703.09. The JMF shall state the original source, gradation, and percentage to be used of each portion of the aggregate including RAP when utilized, and mineral filler if required. It shall also state the proposed PGAB content, the name and location of the refiner, the supplier, the source of PGAB submitted for approval, the type of PGAB modification if applicable, and the location of the terminal if applicable.

In addition, the Contractor shall provide the following information with the proposed JMF:

Properly completed JMF indicating all mix properties (Gmm, VMA, VFB, etc.)
Stockpile Gradation Summary
Design Aggregate Structure Consensus Property Summary
Design Aggregate Structure Trial Blend Gradation Plots (0.45 power chart)
Trial Blend Test Results for at least three different asphalt contents
Design Aggregate Structure for at least three trial blends
Test results for the selected aggregate blend at a minimum of three binder contents
Specific Gravity and temperature/viscosity charts for the PGAB to be used
Recommended mixing and compaction temperatures from the PGAB supplier
Material Safety Data Sheets (MSDS) For PGAB
Asphalt Content vs. Air Voids trial blend curve
Test report for Contractor's Verification sample
Summary of RAP test results (if used), including count, average and standard deviation of binder content and gradation

At the time of JMF submittal, the Contractor shall identify and make available the stockpiles of all proposed aggregates at the plant site. There must be a minimum of 150 Mg [150 ton] for stone stockpiles, 75 Mg [75 ton] for sand stockpiles, and 50 Mg [50 ton] of blend sand before the Department will sample. The Department shall obtain samples for laboratory testing. The Contractor shall also make available to the Department the PGAB proposed for use in the mix in sufficient quantity to test the properties of the asphalt and to produce samples for testing of the mixture. Before the start of paving, the Contractor and the Department shall split a production sample for evaluation. The Contractor shall test its split of the sample and determine if the results meet the requirements of the Department's written policy for mix design verification (See Maine DOT Policies and Procedures for HMA Sampling and Testing available at the Central Laboratory in Bangor). If the results are found to be acceptable, the Contractor will forward their results to the Department's Lab, which will test the Department's split of the sample. The results of the two split samples will be compared and shared between the Department and the Contractor. If the Department finds the mixture acceptable, an approved JMF will be forwarded to the Contractor and paving may commence. The first day's production shall be monitored, and the approval may be withdrawn if the mixture exhibits undesirable characteristics such as checking, shoving or displacement. The Contractor shall be allowed to submit aim changes within 24 hours of receipt of the first Acceptance test result. Adjustments will be allowed of up to 2% on the percent passing the 2.36 mm sieve through the 0.075 mm and 3% on the percent passing the 4.75 mm or larger sieves. Adjustments will be allowed on the %PGAB of up to 0.2%. Adjustments will be allowed on GMM of up to 0.010.

The Contractor shall submit a new JMF for approval each time a change in material source or materials properties is proposed. The same approval process shall be followed. The cold feed percentage of any aggregate may be adjusted up to 10 percentage points from the amount listed on the JMF, however no aggregate listed on the JMF shall be eliminated. The cold feed percentage for RAP may be adjusted up to 5

percentage points from the amount listed on the JMF but shall not exceed the maximum allowable percentage for RAP for the specific application.

TABLE 1: VOLUMETRIC DESIGN CRITERIA

| Design ESAL's (Millions) | Required Density (Percent of $G_{mm}$) | | | Voids in the Mineral Aggregate (VMA)(Minimum Percent) Nominal Maximum Aggregate Size (mm) | | | | | Voids Filled with Binder (VFB) (Minimum %) | Fines/Eff. Binder Ratio |
|---|---|---|---|---|---|---|---|---|---|---|
| | $N_{initial}$ | $N_{design}$ | $N_{max}$ | 25 | 19 | 12.5 | 9.5 | 4.75 | | |
| <0.3 | ≤91.5 | 96.0 | ≤98.0 | 13.0 | 14.0 | 15.0 | 16.0 | 16.0 | 70-80 | 0.6-1.2** |
| 0.3 to <3 | ≤90.5 | | | | | | | | 65-80 | |
| 3 to <10 | ≤89.0 | | | | | | | | 65-80* | |
| 10 to <30 | | | | | | | | | | |
| ≥ 30 | | | | | | | | | | |

*For 9.5 mm nominal maximum aggregate size mixtures, the maximum VFB is 82.
*For 4.75 mm nominal maximum aggregate size mixtures, the maximum VFB is 84.
**For 4.75 mm nominal maximum aggregate size mixtures, the Fines/Effective Binder Ratio is 0.6-1.4.

401.04 Temperature Requirements After the JMF is established, the temperatures of the mixture shall conform to the following tolerances:

In the truck at the mixing plant – allowable range 135° to 163°C [275 to 325°F]
At the Paver – allowable range 135° to 163°C [275 to 325°F]

The JMF and the mix subsequently produced shall meet the requirements of Tables 1 and Section 703.07.

401.05 Performance Graded Asphalt Binder Unless otherwise noted in Special Provision 403 - Hot Mix Asphalt Pavement, the PGAB shall be 64-28, except that for mixtures containing greater than 20 percent but no more than 25 percent RAP the PGAB shall be PG 58-34 (or PG 52-34 when approved by the Department). The PGAB shall meet the applicable requirements of AASHTO M320 - Standard Specification for PGAB. The Contractor shall provide the Department with an approved copy of the Quality Control Plan for PGAB in accordance with AASHTO R 26 Certifying Suppliers of PGAB.
The Contractor shall request approval from the Department for a change in PGAB supplier or source by submitting documentation stating the new supplier or source a minimum of 24 hours prior to the change. In the event that the PGAB supplier or source is changed, the Contractor shall make efforts to minimize the occurrence of PGAB co-mingling.

401.06 Weather and Seasonal Limitations The State is divided into two paving zones as follows:

a. Zone 1 Areas north of US Route 2 from Gilead to Bangor and north of Route 9 from Bangor to Calais.
b. Zone 2 Areas south of Zone 1 including the US Route 2 and Route 9 boundaries.

The Contractor may place Hot Mix Asphalt Pavement for use other than a traveled way wearing course in either Zone between the dates of April 15th and November 15th, provided that the air temperature as determined by an approved thermometer (placed in the shade at the paving location) is 4°C [40°F] or higher and the area to be paved is not frozen. The Contractor may place Hot Mix Asphalt Pavement as traveled way wearing course in Zone 1 between the dates of May 1st and the Saturday following October 1st and in Zone 2 between the dates of April 15th and the Saturday following October 15th, provided the air temperature determined as above is 10°C [50°F] or higher. For the purposes of this Section, the traveled way includes truck lanes, ramps, approach roads and auxiliary lanes. The atmospheric temperature for all courses on bridge decks shall be 10°C [50°F] or higher.

Hot Mix Asphalt Pavement used for curb, driveways, sidewalks, islands, or other incidentals is not subject to seasonal limitations, except that conditions shall be satisfactory for proper handling and finishing of the mixture. All mixtures used for curb, driveways, sidewalks, islands, or other incidentals shall conform to section 401.04 - Temperature Requirements. Unless otherwise specified, the Contractor shall not place Hot Mix Asphalt Pavement on a wet or frozen surface and the air temperature shall be 4°C [40°F] or higher.

On all sections of overlay with wearing courses less than 25 mm [1 in] thick, the wearing course for the travelway and adjacent shoulders shall be placed between the dates of May 15th and the Saturday following September 15th.

On all sections of overlay with wearing courses less than 1 inch thick, the wearing course for the travelway and adjacent shoulders shall be placed between the dates of June 1st and the Saturday following September 1st if the work is to be performed, either by contract requirement, or Contractor option, during conditions defined as "night work".

401.07 Hot Mix Asphalt Plant

401.071 General Requirements HMA plants shall conform to AASHTO M156.

a. Truck Scales When the hot mix asphalt is to be weighed on scales meeting the requirements of Section 108 - Payment, the scales shall be inspected and sealed by the State Sealer as often as the Department deems necessary to verify their accuracy.

Plant scales shall be checked prior to the start of the paving season, and each time a plant is moved to a new location. Subsequent checks will be made as determined by the Resident. The Contractor will have at least ten 20 Kg [50 pound] masses for scale testing.

401.072 Automation of Batching Batch plants shall be automated for weighing, recycling, and monitoring the system. In the case of a malfunction of the printing system, the requirements of Section 401.074 c. of this specification will apply.

The batch plant shall accurately proportion the various materials in the proper order by weight. The entire batching and mixing cycle shall be continuous and shall not require any manual operations. The batch plant shall use auxiliary interlock circuits to trigger an audible alarm whenever an error exceeding the acceptable tolerance occurs. Along with the alarm, the printer shall print an asterisk on the delivery slip in the same row containing the out-of-tolerance weight. The automatic proportioning system shall be capable of consistently delivering material within the full range of batch sizes. When RAP is being used, the plant must be capable of automatically compensating for the moisture content of the RAP.

All plants shall be equipped with an approved digital recording device. The delivery slip load ticket shall contain information required under Section 108.1.3 - Provisions Relating to Certain Measurements, Mass and paragraphs a, b, and c of Section 401.073

401.073 Automatic Ticket Printer System on Automatic HMA Plant An approved automatic ticket printer system shall be used with all approved automatic HMA plants. The requirements for delivery slips for payment of materials measured by weight, as given in the following Sections, shall be waived: 108.1.3 a., 108.1.3 b., 108.1.3 c., and 108.1.3 d. The automatic printed ticket will be considered as the Weight Certificate.

The requirements of Section 108.1.3 f. - Delivery Slips, shall be met by the weigh slip or ticket, printed by the automatic system, which accompanies each truckload, except for the following changes:

a. The quantity information required shall be individual weights of each batch or total net weight of each truckload.
b. Signatures (legible initials acceptable) of Weighmaster (required only in the event of a malfunction as described in 401.074 c.).
c. The MDOT designation for the JMF.

401.074 Weight Checks on Automatic HMA Plant At least twice during each 5 days of production either of the following checks will be performed:

a. A loaded truck may be intercepted and weighed on a platform scale that has been sealed by the State Sealer of Weights and Measures within the past 12 months. Whenever the discrepancy in net weights is greater than 1.0%, but does not exceed 1.5%, the plant inspector will notify the producer to take corrective action; payment will still be governed by the printed ticket.

The producer will be allowed a period of two days to make any needed repairs to the plant and/or platform scales so that the discrepancy in net weights between the two is less than 1.0%. If the discrepancy exceeds 1.5%, the plant will be allowed to operate as long as payment is determined by truck platform scale net weight. Effective corrective action shall be taken within two working days.

b. Where platform scales are not readily available, a check will be made to verify the accuracy and sensitivity of each scale within the normal weighing range and to assure that the interlocking devices and automatic printer system are functioning properly.

c. In the event of a malfunction of the automatic printer system, production may be continued without the use of platform truck scales for a period not to exceed the next two working days, providing total weights of each batch are recorded on weight tickets and certified by a Licensed Public Weighmaster.

401.08 Hauling Equipment Trucks for hauling Hot Mix Asphalt Pavement shall have tight, clean, and smooth metal dump bodies, which have been thinly coated with a small amount of approved release agent to prevent the mixture from adhering to the bodies. Solvent based agents developed to strip asphalts from aggregates will not be allowed as release agents.

All truck dump bodies shall have a cover of canvas or other water repellent material capable of heat retention, which completely covers the mixture. The cover shall be securely fastened on the truck, unless unloading.

All truck bodies shall have an opening on both sides, which will accommodate a thermometer stem. The opening shall be located near the midpoint of the body, at least 300 mm [12 in] above the bed.

401.09 Pavers Pavers shall be self-contained, self-propelled units with an activated screed (heated if necessary) capable of placing courses of Hot Mix Asphalt Pavement in full lane widths specified in the contract on the main line, shoulder, or similar construction.

On projects with no price adjustment for smoothness, pavers shall be of sufficient class and size to place Hot Mix Asphalt Pavement over the full width of the mainline travel way with a 3 m [10 ft] minimum main screed with activated extensions.

The Contractor shall place Hot Mix Asphalt Pavement on the main line with a paver using an automatic grade and slope controlled screed, unless otherwise authorized by the Department. The controls shall automatically adjust the screed and increase or decrease the layer thickness to compensate for irregularities in the preceding course. The controls shall maintain the proper transverse slope and be readily adjustable so that transitions and superelevated curves can be properly paved. The controls shall operate from a fixed or moving reference such as a grade wire or ski type device (floating beam) with a minimum length of 10 m [30 ft], a non-contact grade control with a minimum span of 7.3 m [24 ft], except that a 12 m [40 ft] reference shall be used on Expressway projects.

The Contractor shall operate the paver in such a manner as to produce a visually uniform surface texture and a thickness within the requirements of Section 401.101 - Surface Tolerances. The paver shall have a receiving hopper with sufficient capacity for a uniform spreading operation and a distribution system to place the mixture uniformly, without segregation in front of the screed. The screed assembly shall produce a finished surface of the required evenness and texture without tearing, shoving, or gouging the mixture. Pavers with extendible screeds shall have auger extensions and tunnel extenders as per the manufacturer's recommendations, a copy of which shall be available if requested.

The Contractor shall have the paver at the project site sufficiently before the start of paving operations to be inspected and approved by the Department. The Contractor shall repair or replace any paver found worn or defective, either before or during placement, to the satisfaction of the Department. Pavers that produce an unevenly textured or non-uniform mat will be repaired or replaced before continuing to place HMA on MaineDOT projects.
On a daily basis, the Contractor shall perform nuclear density testing across the mat being placed, prior to being compacted by equipment., at 300 mm [12 in] intervals, If the density values vary by more than 2.0% from the mean, the Contractor shall make adjustments to the screed until the inconsistencies are remedied.

Failure to replace or repair defective placement equipment may result in a letter of suspension of work and notification of a quality control violation resulting in possible monetary penalties as governed by Section 106 - Quality

401.10 Rollers Rollers shall be static steel, pneumatic tire, or approved vibrator type. Rollers shall be in good mechanical condition, capable of starting and stopping smoothly, and be free from backlash when reversing direction. Rollers shall be equipped and operated in such a way as to prevent the picking up of hot mixed material by the roller surface. The use of rollers, which result in crushing of the aggregate or in displacement of the HMA will not be permitted. Any Hot Mix Asphalt Pavement that becomes loose, broken, contaminated, shows an excess or deficiency of Performance Graded Asphalt Binder, or is in any other way defective shall be removed and replaced at no additional cost with fresh Hot Mix Asphalt Pavement, which shall be immediately compacted to conform to the adjacent area.

The Contractor shall repair or replace any roller found to be worn or defective, either before or during placement, to the satisfaction of the Department. Rollers that produce grooved, unevenly textured or non-uniform mat will be repaired or replaced before continuing to place HMA on MaineDOT projects.

The type of rollers to be used and their relative position in the compaction sequence shall generally be the Contractor's option, provided specification densities are attained and with the following requirements:

a. On variable-depth courses, the first lift of pavement over gravel, reclaimed pavement, an irregular surface, or on bridges, at least one roller shall be 14.5 Mg [16 ton] pneumatic-tired. Unless otherwise allowed by the Resident, pneumatic-tired rollers shall be equipped with skirting to minimize the pickup of

HMA materials from the paved surface. When required by the Resident, the roller shall be ballasted to 18.1 Mg [20 ton].

b. Compaction with a vibratory or steel wheel roller shall precede pneumatic-tired rolling, unless otherwise authorized by the Department.

c. Vibratory rollers shall not be operated in the vibratory mode when checking or cracking of the mat occurs, or on bridge decks.

d. Any method, which results in cracking or checking of the mat, will be discontinued and corrective action taken.

The maximum operating speed for a steel wheel or pneumatic roller shall not exceed the manufacturer's recommendations, a copy of which shall be available if requested.

401.101 Surface Tolerances The Department will check surface tolerance utilizing the following methods :

a.) A 5 m [16 ft] straightedge or string line placed directly on the surface, parallel to the centerline of pavement.
b.) A 3 m [10 ft] straightedge or string line placed directly on the surface, transverse to the centerline of pavement.

The Contractor shall correct variations exceeding 6 mm [¼ in] by removing defective work and replacing it with new material as directed by the Department. The Contractor shall furnish a 10 foot straightedge for the Departments use.

401.11 Preparation of Existing Surface The Contractor shall thoroughly clean the surface upon which Hot Mix Asphalt Pavement is to be placed of all objectionable material. When the surface of the existing base or pavement is irregular, the Contractor shall bring it to uniform grade and cross section. All surfaces shall have a tack coat applied prior to placing any new HMA course. Tack coat shall conform to the requirements of Section 409 – Bituminous Tack Coat, Section 702 – Bituminous Material, and all applicable sections of the contract.

401.12 Hot Mix Asphalt Documentation The Contractor and the Department shall agree on the amount of Hot Mix Asphalt Pavement that has been placed each day.

401.13 Preparation of Aggregates The Contractor shall dry and heat the aggregates for the HMA to the required temperature. The Contractor shall properly adjust flames to avoid physical damage to the aggregate and to avoid depositing soot on the aggregate.

401.14 Mixing The Contractor shall combine the dried aggregate in the mixer in the amount of each fraction of aggregate required to meet the JMF. The Contractor shall measure the amount of PGAB and introduce it into the mixer in the amount specified by the JMF.

The Contractor shall produce the HMA at the temperature established by the JMF.

The Contractor shall dry the aggregate sufficiently so that the HMA will not flush, foam excessively, or displace excessively under the action of the rollers. The Contractor shall introduce the aggregate into the mixer at a temperature of not more than 14°C [25°F] above the temperature at which the viscosity of the PGAB being used is 0.150 Pa•s.

The Contractor shall store and introduce into the mixer the Performance Graded Asphalt Binder at a uniformly maintained temperature at which the viscosity of the PGAB is between 0.150 Pa•s and 0.300 Pa•s. The aggregate shall be coated completely and uniformly with a thorough distribution of the PGAB. The Contractor shall determine the wet mixing time for each plant and for each type of aggregate used.

401.15 Spreading and Finishing On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impracticable, the Contractor shall spread, rake, and lute the HMA with hand tools to provide the required compacted thickness. Solvent based agents developed to strip asphalts from aggregates will not be allowed as release agents.

On roadways with adjoining lanes carrying traffic, the Contractor shall place each course over the full width of the traveled way section being paved that day, unless otherwise noted by the Department in Section 403 - Hot Bituminous Pavement.

401.16 Compaction Immediately after the Hot Mix Asphalt Pavement has been spread, struck off, and any surface irregularities adjusted, the Contractor shall thoroughly and uniformly compact the HMA by rolling.

The Contractor shall roll the surface when the mixture is in the proper condition and when the rolling does not cause undue displacement, cracking, or shoving. The Contractor shall prevent adhesion of the HMA to the rollers or vibrating compactors without the use of fuel oil or other petroleum based release agents. Solvents designed to strip asphalt binders from aggregates will not be permitted as release agents on equipment, tools, or pavement surfaces.
The Contractor shall immediately correct any displacement occurring as a result of the reversing of the direction of a roller or from other causes to the satisfaction of the Department. Any operation other than placement of variable depth shim course that results in breakdown of the aggregate shall be discontinued. Any new pavement that shows obvious cracking, checking, or displacement shall be removed and replaced for the full lane width as directed by the Resident at no cost to the Department.

Along forms, curbs, headers, walls, and other places not accessible to the rollers, the Contractor shall thoroughly compact the HMA with mechanical vibrating compactors. The Contractor shall only use hand tamping in areas inaccessible to all other compaction equipment. On depressed areas, the Contractor may use a trench roller or cleated compression strips under a roller to transmit compression to the depressed area.

Any HMA that becomes unacceptable due to cooling, cracking, checking, segregation or deformation as a result of an interruption in mix delivery shall be removed and replaced, with material that meets contract specifications at no cost to the Department.

401.17 Joints The Contractor shall construct wearing course transverse joints in such a manner that minimum tolerances shown in Section 401.101 - Surface Tolerances are met when measured with a straightedge.

The paver shall maintain a uniform head of HMA during transverse and longitudinal joint construction.

The HMA shall be free of segregation and meet temperature requirements outlined in section 401.04. Transverse joints of the wearing course shall be straight and neatly trimmed. The Contractor may form a vertical face exposing the full depth of the course by inserting a header, by breaking the bond with the underlying course, or by cutting back with hand tools. The Department may allow feathered or "lap" joints on lower base courses or when matching existing base type pavements.

Longitudinal joints shall be generally straight to the line of travel, and constructed in a manner that best ensure joint integrity. Methods or activities that prove detrimental to the construction of straight, sound longitudinal joints will be discontinued.

The Contractor shall apply a coating of emulsified asphalt immediately before paving all joints to the vertical face and 75 mm [3 in] of the adjacent portion of any pavement being overlaid except those formed by pavers operating in echelon. The Contractor shall use an approved spray apparatus designed for covering a narrow surface. The Department may approve application by a brush for small surfaces, or in the event of a malfunction of the spray apparatus, but for a period of not more than one working day.

Where pavement under this contract joins an existing pavement, or when the Department directs, the Contractor shall cut the existing pavement along a smooth line, producing a neat, even, vertical joint. The Department will not permit broken or raveled edges. The cost of all work necessary for the preparation of joints is incidental to related contract pay items.

401.18 Quality Control Method A, B & C The Contractor shall operate in accordance with the approved Quality Control Plan (QCP) to assure a product meeting the contract requirements. The QCP shall meet the requirements of Section 106.6 - Acceptance and this Section. The Contractor shall not begin paving operations until the Department approves the QCP in writing.

Prior to placing any mix, the Department and the Contractor shall hold a Pre-paving conference to discuss the paving schedule, source of mix, type and amount of equipment to be used, sequence of paving pattern, rate of mix supply, random sampling, project lots and sublots and traffic control. A copy of the QC random numbers to be used on the project shall be provided to The Resident. The Departments' random numbers for Acceptance testing shall be generated and on file with the Resident and the Project Manager. All field and plant supervisors including the responsible onsite paving supervisor shall attend this meeting.

The QCP shall address any items that affect the quality of the Hot Mix Asphalt Pavement including, but not limited to, the following:

a. JMF(s)
b. Hot mix asphalt plant details
c. Stockpile Management (to include provisions for a minimum 2 day stockpile)
d. Make and type of paver(s)
e. Make and type of rollers including weight, weight per inch of steel wheels, and average contact pressure for pneumatic tired rollers
f. Name of QCP Administrator, and certification number
g. Name of Process Control Technician(s) and certification number(s)
h. Name of Quality Control Technicians(s) and certification number(s)
i. Mixing & transportation including process for ensuring that truck bodies are clean and free of debris or contamination that could adversely affect the finished pavement
j. Testing Plan
k. Laydown operations including longitudinal joint construction, procedures for avoiding paving in inclement weather, type of release agent to be used on trucks tools and rollers, compaction of shoulders, tacking of all joints, methods to ensure that segregation is minimized, procedures to determine the maximum rolling and paving speeds based on best engineering practices as well as past experience in achieving the best possible smoothness of the pavement. Solvent based agents developed to strip asphalts from aggregates will not be allowed as release agents.
l. Examples of Quality Control forms including a daily plant report and a daily paving report

m. Silo management and details (can show storage for use on project of up to 36 hours)
n. Provisions for varying mix temperature due to extraordinary conditions.
o. Name and responsibilities of the Responsible onsite Paving Supervisor.
p. Method for calibration/verification of Density Gauge
q. A note that all testing will be done in accordance with AASHTO and the Maine DOT Policies and Procedures for HMA Sampling and Testing.
r. A detailed description of RAP processing, stockpiling and introduction into the plant as well as a note detailing conditions under which the percent of RAP will vary from that specified on the JMF.
s. A detailed procedure outlining when production will be halted due to QC or Acceptance testing results.
t. A plan to address the change in PGAB source or supplier and the potential co-mingling of differing PGAB's.
u. A procedure to take immediate possession of acceptance samples once released by MaineDOT and deliver said samples to the designated acceptance laboratory.

The QCP shall include the following technicians together with following minimum requirements:

a. QCP Administrator - A qualified individual shall administer the QCP. The QCP Administrator must be a full-time employee of or a consultant engaged by the Contractor or paving subcontractor. The QCP Administrator shall have full authority to institute any and all actions necessary for the successful operation of the QCP. The QCP Administrator (or its designee in the QCP Administrator's absence) shall be available to communicate with the Department at all times. The QCP Administrator shall be certified as a Quality Assurance Technologist certified by the New England Transportation Technician Certification Program (NETTCP).

b. Process Control Technician(s) (PCT) shall utilize test results and other quality control practices to assure the quality of aggregates and other mix components and control proportioning to meet the JMF(s). The PCT shall inspect all equipment used in mixing to assure it is operating properly and that mixing conforms to the mix design(s) and other Contract requirements. The QCP shall detail how these duties and responsibilities are to be accomplished and documented, and whether more than one PCT is required. The Plan shall include the criteria to be utilized by the PCT to correct or reject unsatisfactory materials. The PCT shall be certified as a Plant Technician by the NETTCP.

c. Quality Control Technician(s) (QCT) shall perform and utilize quality control tests at the job site to assure that delivered materials meet the requirements of the JMF(s). The QCT shall inspect all equipment utilized in transporting, laydown, and compacting to assure it is operating properly and that all laydown and compaction conform to the Contract requirements. The QCP shall detail how these duties and responsibilities are to be accomplished and documented, and whether more than one QCT is required. The QCP shall include the criteria utilized by the QCT to correct or reject unsatisfactory materials. The QCT shall be certified as a Paving Inspector by the NETTCP.

The QCP shall detail the coordination of the activities of the Plan Administrator, the PCT and the QCT. The Project Superintendent shall be named in the QCP, and the responsibilities for successful implementation of the QCP shall be outlined.

The Contractor shall sample, test, and evaluate Hot Mix Asphalt Pavement in accordance with the following minimum frequencies:

TABLE 2 : MINIMUM QUALITY CONTROL FREQUENCIES

| Test or Action | Frequency | Test Method |
|---|---|---|
| Temperature of mix | 6 per day at street and plant | - |
| Temperature of mat | 4 per day | - |
| %TMD (Surface) | 1 per 125 Mg [125 ton] (As noted in QC Plan) | ASTM D2950 |
| %TMD (Base) | 1 per 250 Mg [250 ton] (As noted in QC Plan) | AASHTO T269 |
| Fines / Effective Binder | 1 per 500 Mg [500 ton] | AASHTO T 312* |
| Gradation | 1 per 500 Mg [500 ton] | AASHTO T30 |
| PGAB content | 1 per 500 Mg [500 ton] | AASHTO T164 or T308 |
| Voids at $N_{design}$ | 1 per 500 Mg [500 ton] | AASHTO T 312* |
| Voids in Mineral Aggregate at $N_{design}$ | 1 per 500 Mg [500 ton] | AASHTO T 312* |
| Rice Specific Gravity | 1 per 500 Mg [500 ton] | AASHTO T209 |
| Coarse Aggregate Angularity | 1 per 5000 Mg [5000 ton] | ASTM D5821 |
| Flat and Elongated Particles | 1 Per 5000 Mg [5000 ton] | ASTM D4791 |
| Fine Aggregate Angularity | 1 Per 5000 Mg [5000 ton] | AASHTO T304 |

*Method A and B only

The Contractor may utilize innovative equipment or techniques not addressed by the Contract documents to produce or monitor the production of the mix, subject to approval by the Department.

The Contractor shall submit all Hot Mix Asphalt Pavement plant test reports, inspection reports and updated pay factors in writing, signed by the appropriate technician and present them to the Department by 1:00 P.M. on the next working day, except when otherwise noted in the QCP due to local restrictions. The Contractor shall also retain splits of the previous 5 QC tests, with QC results enclosed for random selection and testing by The Department during QA inspections of the HMA production facility. Test results of splits that do not meet the Dispute Resolution Variance Limits in Table 10 shall trigger an investigation by the MDOT Independent Assurance Unit, and may result in that lab losing NETTCP certification and the ability to request a dispute [Section 401.223 - Process for Dispute Resolution (Methods A , B and C only)].

The Contractor shall make density test results, including randomly sampled densities, available to the Department onsite. Summaries of each day's results, including a daily paving report, shall be recorded and signed by the QCT and presented to the Department by 1:00 p.m. the next working day.

The Contractor shall have a testing lab at the plant site, equipped with all testing equipment necessary to complete the tests in Table 2. The Contractor shall locate an approved Gyratory Compactor at the plant testing lab or within 30 minutes of the plant site.

The Contractor shall fill all holes in the pavement resulting from cutting cores by the Contractor or the Department with a properly compacted, acceptable mixture no later than the following working day. Before filling, the Contractor shall carefully clean the holes and apply a coating of emulsified asphalt. On surface courses, cores shall not be cut except for Verification of the Nuclear Density Gauge, at a rate not to exceed 3 per day or 2 per 1000 Mg [1000 ton] placed.
The Contractor shall monitor plant production using running average of three control charts as specified in Section 106 - Quality. Control limits shall be as noted in Table 3 below. The UCL and LCL, shall not exceed the allowable control points for the particular type of mixture as outlined in Table 1 of section 703.09

TABLE 3: Control Limits

| Property | UCL and LCL |
|---|---|
| Passing 4.75 mm and larger sieves | Target +/-4.0 |
| Passing 2.36 mm sieve | Target +/-2.5 |
| Passing .075 mm sieve | Target +/-1.2 |
| PGAB Content* | Target +/-0.3 |
| Voids in the Mineral Aggregate | LCL = LSL + 0.2 |
| % Voids at $N_{design}$ | JMF Target +/-1.3 |

*Based on AASHTO T 308

The Contractor shall cease paving operations whenever one of the following occurs on a lot in progress:

a. Method A: The Pay Factor for VMA, Voids @ $N_d$, Percent PGAB, composite gradation, VFB, fines to effective binder or density using all Acceptance or all Quality Control tests for the current lot is less than 0.85.
b. Method B: The Pay Factor for VMA, Voids @ $N_d$, Percent PGAB, composite gradation, VFB, fines to effective binder or density using all Acceptance or all Quality Control tests for the current lot is less than 0.90.
c. Method C: The Pay Factor for VMA, Voids @ $N_d$, Percent PGAB, percent passing the nominal maximum sieve, percent passing 2.36 mm sieve, percent passing 0.300 mm sieve, percent passing 0.075 mm sieve or density using all Acceptance or all available Quality Control tests for the current lot is less than 0.85.
d. The Coarse Aggregate Angularity or Fine Aggregate Angularity value falls below the requirements of Table 3: Aggregate Consensus Properties Criteria in Section 703.07 for the design traffic level.
e. Each of the first 2 control tests for a Method A or B lot fall outside the upper or lower limits for VMA, Voids @ Nd, or Percent PGAB; or under Method C, each of the first 2 control tests for the lot fall outside the upper or lower limits for the nominal maximum, 2.36 mm, 0.300 mm or 0.075 mm sieves, or percent PGAB.
f. The Flat and Elongated Particles value exceeds 10% by ASTM D4791.
g. There is any visible damage to the aggregate due to over-densification other than on variable depth shim courses.
h. The Contractor fails to follow the approved QCP.

The Contractor shall notify the Resident in writing as to the reason for shutdown, as well as the proposed corrective action, by the end of the work day. Failure to do so will be treated as a second incident under 106.4.6 QCP Non-compliance. The Department will consider corrective action acceptable if the pay factor for the failing property increases, based on samples already in transit, or a verification sample is tested and the property falls within the specification limits.

In cases where the corrective action can be accomplished immediately, such as batch weight or cold feed changes, the Contractor may elect to resume production once the corrective action is completed. Additional QC testing shall be performed to verify the effectiveness of the corrective action. Subsequent occurrences of shutdown for the same property in a Lot in progress will require paving operations to cease. Paving operations shall not resume until the Contactor and the Department determines that material meeting the Contract requirements will be produced. The Department may allow the Contractor to resume production based upon a passing QC sample, with a split of the sample being sent to the Department for verification testing. If the submitted verification sample test results fall outside the specification limits, the Contractor shall cease production until a verification sample is submitted to the Department has been tested by the Department and found to be within specification limits.

If the Contractor's control chart shows the process to be out of control (defined as a single point outside of the control limits on the running average of three chart) on any property listed in Table 3: Control Limits, the Contractor shall notify the Resident in writing of any proposed corrective action by 1:00 PM the next working day.

The Department retains the exclusive right, with the exception of the first day's production of a new JMF, to determine whether the resumption of production involves a significant change to the production process. If the Department so determines, then the current lot will be terminated, a pay factor established, and a new lot will begin.

401.19 Quality Control Method D For Items covered under Method D, the Contractor shall submit a modified QC Plan detailing, how the mix is to be placed, what equipment is to be used, and what HMA plant is to be used. All mix designs (JMF) shall be approved and verified by MDOT prior to use. Certified QC personnel shall not be required. The Contractor shall certify the mix and the test results for each item by a Certificate of Compliance.

401.20 Acceptance Method A, B & C These methods utilizes Quality Level Analysis and pay factor specifications.
For Hot Mix Asphalt Pavement designated for acceptance under Quality Assurance provisions, the Department will sample once per sublot on a statistically random basis, test, and evaluate in accordance with the following Acceptance Criteria:

TABLE 4: ACCEPTANCE CRITERIA

| PROPERTIES | POINT OF SAMPLING | TEST METHOD |
|---|---|---|
| Gradation | Paver Hopper | AASHTO T30 |
| PGAB Content | Paver Hopper | AASHTO T308 |
| %TMD (Surface) | Mat behind all Rollers | AASHTO T269 |
| %TMD (Base or Binder) | Mat behind all Rollers | AASHTO T269 |
| Air Voids at $N_d$ | Paver Hopper | AASHTO T 312 |
| %VMA at $N_d$ | Paver Hopper | AASHTO T 312 |
| Fines to Effective Binder | Paver Hopper | AASHTO T 312 |
| %VFB | Paver Hopper | AASHTO T 312 |

In the event the Department terminates a Lot prematurely but fails to obtain the required number of acceptance samples to calculate the volumetric property pay factor under the test method specified in the contract, the pay factor shall be calculated using the number of samples actually obtained from the contract. Should the number of acceptance samples taken total less than three, the resulting pay factor shall be 1.0 for volumetric properties. A minimum of three cores will be used for a density pay factor, if applicable, for quantities placed to date.

Should the Contractor request a termination of the Lot in progress prior to three acceptance samples being obtained, and the Department agrees to terminate the Lot, then the pay factor for mixture properties shall be 0.80. A minimum of three cores will be used to determine a density pay factor, if applicable, for quantities placed to date.

Lot Size For purposes of evaluating all acceptance test properties, a lot shall consist of the total quantity represented by each item listed under the lot size heading.

Sublot size - Refer to section 401.201, 401.202, and 401.203 for minimum size and number of sublots. The quantity represented by each sample will constitute a sublot.

If there is less than one-half of a sublot remaining at the end, then it shall be combined with the previous sublot. If there is more than one-half sublot remaining at the end, then it shall constitute the last sublot and shall be represented by test results. If it becomes apparent partway through a Lot that, due to an underrun, there will be insufficient mix quantity to obtain the minimum number of sublots needed, the Resident may adjust the size of the remaining sublots and select new sample locations based on the estimated quantity of material remaining in the Lot.

Acceptance Testing The Department will obtain samples of Hot Mix Asphalt Pavement in conformance with AASHTO T168 Sampling Bituminous Paving Mixtures, and the Maine DOT Policies and Procedures for HMA Sampling and Testing, which will then be transported by the Contractor to the designated MDOT Laboratory within 48 hours (except when otherwise noted in the project specific QCP due to local restrictions), as directed by MDOT in approved transport containers to be provided by the Department, unless otherwise directed by the Resident. Failure to deliver an acceptance sample to the designated acceptance laboratory will be considered the second incident under 106.4.6–QCP Non-Compliance.

The Department will take the sample randomly within each sublot. Target values shall be as specified in the JMF. The Department will use Table 5 for calculating pay factors for gradation, PGAB Content, Air Voids at $N_{design}$, VMA, Fines to Effective Binder and VFB. The Department will withhold reporting of the test results for the Acceptance sample until 7:00 AM, on the second working day of receipt of the sample, or after receipt of the Contractors results of the Acceptance sample split. Upon conclusion of each lot, where there is a minimum of four sublots, results shall be examined for statistical outliers, as stated in Section 106.7.2 - Statistical Outliers.

Isolated Areas During the course of inspection, should it appear that there is an isolated area that is not representative of the lot based on a lack of observed compactive effort, excessive segregation or any other questionable practice, that area may be isolated and tested separately. An area so isolated that has a calculated pay factor below 0.80, based on three random tests shall be removed and replaced at the expense of the Contractor for the full lane width and a length not to be less than 50 m [150 ft].

Pavement Density The Department will measure pavement density using core samples tested according to AASHTO T-166. The Department will randomly determine core locations. The Contractor shall cut 6 inch diameter cores at no additional cost to the Department by the end of the working day following the day the pavement is placed, and immediately give them to the Department. Cores for Acceptance testing shall be cut such that the nearest edge is never within 0.225 m (9 inches) of any joint. The cores will be placed in a transport container provided by the Department and transported by the Contractor to the designated MDOT Lab as directed by the Department. Pre-testing of the cores will not be allowed. At the time of sampling, the Contractor and the Department shall mutually determine if a core is damaged. If it is determined that the core(s) is damaged, the Contractor shall cut new core(s) at the same offset and within 1 m [3 ft] of the initial sample. At the time the core is cut, the Contractor and the Department will mutually determine if saw cutting of the core is needed, and will mark the core at the point where sawing is needed. The core may be saw cut by the Contractor in the Department's presence onsite, or in an MDOT Lab by The Department, without disturbing the layer being tested to remove lower layers of Hot Mix Asphalt Pavement, gravel, or RAP. No recuts are allowed at a test location after the core has been tested. Upon conclusion of each lot, density results shall be examined for statistical outliers as stated in Section 106.7.2.

On all sections of overlay with wearing courses designed to be 19 mm [3/4 in] or less in thickness, there shall be no pay adjustment for density otherwise noted in Section 403 - Hot Bituminous Pavement. For overlays designed to be 19 mm [3/4 in] or less in thickness, density shall be obtained by the same rolling train and methods as used on mainline travelway surface courses with a pay adjustments for density, unless otherwise directed by the Department.

There shall be no pay adjustment for density on shoulders unless otherwise noted in Section 403 - Hot Bituminous Pavement. Density for shoulders shall be obtained by the same rolling train and methods as used on mainline travelway, unless otherwise directed by the Department. Efforts to obtain optimum compaction will not be waived by the Department unless it is apparent during construction that local conditions make densification to this point detrimental to the finished pavement surface course.

401.201 Method A Lot Size will be the entire production per JMF for the project, or if so agreed at the Pre-paving Conference, equal lots of up to 4500 Mg [4500 tons], with unanticipated over-runs of up to 1500 Mg [1500 ton] rolled into the last lot. Sublot sizes shall be 750 Mg [750 ton] for mixture properties, 500 Mg [500 ton] for base or binder densities and 250 Mg [250 ton] for surface densities. The minimum number of sublots for mixture properties shall be 4, and the minimum number of sublots for density shall be five.

TABLE 5: METHOD A ACCEPTANCE LIMITS

| Property | USL and LSL |
|---|---|
| Passing 4.75 mm and larger sieves | Target +/-7% |
| Passing 2.36 mm to 1.18 mm sieves | Target +/-4% |
| Passing 0.60 mm | Target +/-3% |
| Passing 0.30 mm to 0.075 mm sieve | Target +/-2% |
| PGAB Content | Target +/-0.4% |
| Air Voids | 4.0% +/-1.5% |
| Fines to Effective Binder | 0.6 to 1.2 |
| Voids in the Mineral Aggregate | LSL Only from Table 1 |
| Voids Filled with Binder | Table 1 values plus a 4% production tolerance for USL only |
| % TMD (In place density) | 95.0% +/- 2.5% |

**For 4.75 mm nominal maximum aggregate size mixtures, the Fines/Effective Binder Ratio is 0.6-1.4.

401.202 Method B Lot Size will be the entire production per JMF for the project and shall be divided into 3 equal sublots for Mixture Properties and 3 equal sublots for density.

TABLE 6: METHOD B ACCEPTANCE LIMITS

| Property | USL and LSL |
|---|---|
| Percent Passing 4.75 mm and larger sieves | Target +/-7 |
| Percent Passing 2.36 mm to 1.18 mm sieves | Target +/-5 |
| Percent Passing 0.60 mm | Target +/-4 |
| Percent Passing 0.30 mm to 0.075 mm sieve | Target +/-3 |
| PGAB Content | Target +/-0.5 |
| Air Voids | 4.0% +/-2.0 |
| Fines to Effective Binder | 0.6 to 1.4 |
| Voids in the Mineral Aggregate | LSL from Table 1 |
| Voids Filled with Binder | Table1 plus a 4% production tolerance for USL. |
| % TMD (In-place Density) | 95.0% +/- 2.5% |

401.203 Testing Method C Lot Size will be the entire production per JMF for the project, or if so agreed at the Pre-paving Conference, equal lots of up to 4500 Mg [4500 tons], with unanticipated over-runs of up to 1500 Mg [1500 ton] rolled into the last lot. Sublot sizes shall be 750 Mg [750 ton] for mixture properties, 500 Mg [500 ton] for base or binder densities and 250 Mg [250 ton] for surface densities. The minimum number of sublots for mixture properties shall be 4, and the minimum number of sublots for density shall be five.

TABLE 7: METHOD C ACCEPTANCE LIMITS

| Property | USL and LSL |
|---|---|
| Passing 4.75 mm and larger sieves | Target +/-7% |
| Passing 2.36 mm to 1.18 mm sieves | Target +/-5% |
| Passing 0.60 mm | Target +/-4% |
| Passing 0.30 mm to 0.075 mm sieve | Target +/-2% |
| PGAB Content | Target +/-0.4% |
| Air Voids | 4.0% +/-1.5% |
| Fines to Effective Binder | 0.6 to 1.2 |
| Voids in the Mineral Aggregate | LSL Only from Table 1 |
| Voids Filled with Binder | Table 1 values plus a 4% production tolerance for USL only |
| % TMD (In place density) | 95.0% +/- 2.5% |

**For 4.75 mm nominal maximum aggregate size mixtures, the Fines/Effective Binder Ratio is 0.6-1.4.

401.204 Testing Method D For hot mix asphalt items designated as Method D in Section 403 - Hot Bituminous Pavement, one sample will be taken from the paver hopper or the truck body per 250 Mg [250 ton] per pay item. The mix will be tested for gradation and PGAB content. Disputes will not be allowed. If the mix is within the tolerances listed in Table 8: Method D Acceptance Limits, the Department will pay the contract unit price. If the test results for each 250 Mg [250 ton] increment are outside these limits, the following deductions (Table 8b) shall apply to the HMA quantity represented by the test.

TABLE 8: METHOD D ACCEPTANCE LIMITS

| Property | USL and LSL |
|---|---|
| Percent Passing 4.75 mm and larger sieves | Target +/-7 |
| Percent Passing 2.36 mm to 1.18 mm sieves | Target +/-5 |
| Percent Passing 0.60 mm | Target +/-4 |
| Percent Passing 0.30 mm to 0.075 mm sieve | Target +/-3 |
| PGAB Content | Target +/-0.5 |
| % TMD (In-place Density) | 95.0% +/- 2.5% |

TABLE 8b Method “D” Price Adjustments

| | |
|---|---|
| PGAB Content | -5% |
| 2.36 mm sieve | -2% |
| 0.30 mm sieve | -1% |
| 0.075 mm sieve | -2% |
| Density | -10%* |

*Only applies when called for in Section 403 - Hot Bituminous Pavement. Contractor shall cut two 150 mm [6 in] cores, which shall be tested for percent TMD per AASHTO T-269. If the average for the two tests falls below 92.5% the disincentive shall apply.

401.21 Method of Measurement The Department will measure Hot Mix Asphalt Pavement by the Mg [ton] in accordance with Section 108.1 - Measurement of Quantities for Payment.

401.22 Basis of Payment The Department will pay for the work, in place and accepted, in accordance with the applicable sections of this Section, for each type of HMA specified.

The Department will pay for the work specified in Section 401.11, for the HMA used, except that cleaning objectionable material from the pavement and furnishing and applying bituminous material to joints and contact surfaces is incidental.

Payment for this work under the appropriate pay items shall be full compensation for all labor, equipment, materials, and incidentals necessary to meet all related contract requirements, including design of the JMF, implementation of the QCP, obtaining core samples, transporting cores and samples, filling core holes, applying emulsified asphalt to joints, and providing testing facilities and equipment.
The Department will make a pay adjustment for quality as specified below.

401.221 Pay Adjustment The Department will sample, test, and evaluate Hot Mix Asphalt Pavement in accordance with Section 106 - Quality and Section 401.20 - Acceptance, of this Specification.

401.222 Pay Factor (PF) The Department will use the following criteria for pay adjustment using the pay adjustment factors under Section 106.7 - Quality Level Analysis:

Density If the pay factor for Density falls below 0.80 for Method A or C or 0.86 for Method B, all of the cores will be randomly re-cut by Sublot. A new pay factor will be calculated that combines all initial and retest results. If the resulting pay factor is below 0.80 for Method A or C or below 0.86 for Method B, the entire Lot shall be removed and replaced with material meeting the specifications at no additional cost to the Department, except that the Department may, when it appears that there is a distinct pattern of defective material, isolate any defective material by investigating each mix sample sublot and require removal of defective mix sample sublots only, leaving any acceptable material in place if it is found to be free of defective material. Pay factors equal to or greater than the reject level will be paid accordingly.

Gradation For HMA evaluated under Acceptance Method A or B, the Department will determine a composite pay factor (CPF) using applicable price adjustment factors “f“ from Table 9: Table of Gradation Composite “f” Factors, and Acceptance limits from Table 5: Method A Acceptance Limits, for Method A or Table 6: Method B Acceptance Limits, for Method B. The Department will not make price adjustments for gradation on Methods A and B, but will monitor them as shutdown criteria.

TABLE 9: TABLE OF GRADATION COMPOSITE " f " FACTORS (Methods A and B)

| Constituent | | "f" Factor | | | |
|---|---|---|---|---|---|
| | | 19 mm | 12.5 mm | 9.5 mm | 4.75 mm |
| Gradation | 25 mm | - | - | - | - |
| | 19 mm | 4 | - | - | - |
| | 12.5 mm | | 4 | 4 | - |
| | 9.50 mm | | | | 4 |
| | 2.36 mm | 6 | 6 | 6 | 8 |
| | 1.18 mm | | | | |
| | 0.60 mm | 2 | 2 | 2 | 2 |
| | 0.30 mm | 2 | 2 | 2 | 2 |
| | 0.075 mm | 6 | 6 | 6 | 8 |

For HMA evaluated under Acceptance Method C, the Department will determine a pay factor using acceptance limits from Table **7**: Method C Acceptance Limits.

VMA, Air Voids, VFB and Fines to Effective Binder The Department will determine a pay factor (PF) using the applicable Acceptance Limits.

The following variables will be used for pay adjustment:

PA = Pay Adjustment
Q = Quantity represented by PF in Mg [ton]
P = Contract price per Mg [ton]
PF = Pay Factor

Pay Adjustment Method A

The Department will use the following criteria for pay adjustment: density, Performance Graded Asphalt Binder content, voids @$N_d$, VMA, VFB, $F/B_{eff}$, and the screen sizes listed in Table 9 for the type of HMA represented in the JMF. If any single pay factor for PGAB Content, VMA, or Air Voids falls below 0.80, then the composite pay factor for PGAB Content, VMA, and Air Voids shall be 0.55.

Density: For mixes having a density requirement, the Department will determine a pay factor using Table 5: Method A Acceptance Limits:

PA = (density PF- 1.0)(Q)(P)x0.50

PGAB Content, VMA and Air Voids: The Department will determine a pay adjustment using Table 5: Method A Acceptance Limits as follows:

PA = (voids @ $N_d$ PF- 1.0)(Q)(P)x0.20 + (VMA @ $N_d$ PF- 1.0)(Q)(P)x0.20 + (PGAB PF- 1.0)(Q)(P)x0.10

VFB and Fines to Effective Binder The Department will determine a pay factor (PF) using Table 5: Method A Acceptance Limits. The Department will not make price adjustments for VFB or Fines to Effective Binder, but will monitor them as shutdown criteria.

Pay Adjustment Method B

The Department will use the following criteria for pay adjustment: density, Performance Graded Asphalt Binder content, voids @$N_d$, VMA, VFB, $F/B_{eff}$, and the screen sizes listed in Table 9 for the type of HMA represented in the JMF. If any single pay factor for PGAB Content, VMA, or Air Voids falls below 0.86, then the composite pay factor for PGAB Content, VMA, and Air Voids shall be 0.70.

Density: For mixes having a density requirement, the Department will determine a pay factor using Table 6: Method B Acceptance Limits:

PA = (density PF- 1.0)(Q)(P)x0.50

PGAB Content, VMA and Air Voids: The Department will determine a pay adjustment using Table 6: Method B Acceptance Limits as follows:

PA = (voids @ $N_d$ PF- 1.0)(Q)(P)x0.20 + (VMA @ $N_d$ PF- 1.0)(Q)(P)x0.20 + (PGAB PF- 1.0)(Q)(P)x0.10

VFB and Fines to Effective Binder The Department will determine a pay factor (PF) using Table 6: Method B Acceptance Limits. The Department will not make price adjustments for VFB or Fines to Effective Binder, but will monitor them as shutdown criteria.

Pay Adjustment Method C

The Department will use density, Performance Graded Asphalt Binder content, and the percent passing the nominal maximum, 2.36 mm, 0.300 mm and 0.075 mm sieves for the type of HMA represented in the JMF. If the PGAB content falls below 0.80, then the PGAB pay factor shall be 0.55.

Density: For mixes having a density requirement, the Department will determine a pay factor using Table 7: Method C Acceptance Limits:

PA = (density PF- 1.0)(Q)(P)x0.50

PGAB Content and Gradation The Department will determine a pay factor using Table **7**: Method C Acceptance Limits. The Department will calculate the price adjustment for Mixture Properties as follows:

PA = (% Passing Nom. Max PF-1.0)(Q)(P)X0.05+(% passing 2.36 mm PF-1.0)(Q)(P)X0.05+(%passing 0.30 mm PF-1.0)(Q)(P)X0.05+(%passing 0.075 mm PF-1.0)(Q)(P)X0.10+(PGAB PF-1.0)(Q)(P)X0.25

VMA, Air Voids, VFB and Fines to Effective Binder The Department will determine a pay factor (PF) using Table 7: Method C Acceptance Limits. The Department will not make price adjustments for VMA, Air Voids, VFB or Fines to Effective Binder, but will monitor them as shutdown criteria.

Pay Adjustment Method D

The Department will use density, Performance Graded Asphalt Binder content, and the screen sizes listed in Table 8b for the type of HMA represented in the JMF. If test results do not meet the Table 8 requirements, deducts as shown in Table 8b shall be applied to the quantity of mix represented by the test.

401.223 Process for Dispute Resolution (Methods A B & C only)

a. Dispute Resolution sampling At the time of Hot-Mix Asphalt sampling, the Department will obtain a split sample of each Acceptance test random sample for possible dispute resolution testing. The Contractor shall also obtain a split sample of the HMA at this same time. If the Contractor wishes to retain the option of requesting dispute testing of the initial Acceptance sample, the Contractor will test their split of the

Acceptance sample and shall report their results to the Resident, with a copy to the QA Engineer at the Central Laboratory in Bangor by 7:00 AM, on the second working day from time of QA sampling, otherwise dispute resolution will not be initiated. The Department's dispute resolution split sample will be properly labeled and stored for a period of not more than two weeks, or until the sample is tested.

b. Disputing Acceptance results The Contractor may dispute the Department's Acceptance results and request (Methods A, B, & C) that the dispute resolution split sample be tested by notifying the Department's Resident and the QA Engineer at the Central Laboratory in Bangor in writing within two working days after receiving the results of the Acceptance test. The following shall be provided in the request:

- Acceptance sample reference number
- The specific test result(s) or property(ies) being disputed, and
- The complete, signed report of the Contractor's testing (In a lab certified by the NETTCP and MDOT) of their split of the Acceptance sample indicating that the variances in Table10: Dispute Resolution Variance Limits, for the specific test result(s) or property(ies) were exceeded.

c. Disputable items The Contractor may dispute any or all of the following Method A or B test results when the difference between the Department's value and the Contractor's value for that test equals or exceeds the corresponding allowable variation in Table 10: Dispute Resolution Variance Limits, PGAB content, $G_{mb}$, and $G_{mm}$. In addition, if the allowable variation for these tests is not met or exceeded, the Contractor may dispute either or both of the following material properties provided the difference between results for them equals or exceeds the corresponding allowable variation in Table 10: Voids at $N_{design}$, and VMA.
For Method C only: The results for PGAB content and the screen sizes used for pay adjustment may be disputed.

d. Outcome The value of any disputed result or property reported for the initial Acceptance sample shall stand if the value reported for the dispute resolution sample is not closer to the value the Contractor reported for their split sample than to the value reported for the initial Acceptance sample. If the value reported for the dispute resolution falls precisely half-way between the other two values the value reported for the dispute resolution will replace the original acceptance value. Otherwise, the value reported for the dispute resolution sample will replace the value reported for the initial Acceptance sample, and will be used to re-calculate any other affected results or properties.

TABLE 10: DISPUTE RESOLUTION VARIANCE LIMITS

| | |
|---|---|
| PGAB Content | +/-0.4% |
| $G_{mb}$ | +/-0.030 |
| $G_{mm}$ | +/-0.020 |
| Voids @ $N_d$ | +/-0.8% |
| VMA | +/-0.8% |
| Passing 4.75 mm and larger sieves | +/- 4.0% |
| Passing 2.36 mm to 0.60 mm sieves | +/- 3.0% |
| Passing 0.30 mm to 0.15 | +/- 2.0 % |
| 0.075 mm sieve | +/- 1.0% |

## SECTION 402 - PAVEMENT SMOOTHNESS

402.00 Smoothness Projects Projects to have their pavement smoothness analyzed in accordance with this Specification will be so noted in Special Provision 403 - Bituminous Box

402.01 Pavement Smoothness The final pavement surface shall be evaluated for smoothness using a Class I or Class II profiler as defined by ASTM E950 (94). Smoothness measurements will be expressed in terms of the International Roughness Index (IRI) as defined by the World Bank, in units of inches/mile.

402.02 Lot Size Lot size for smoothness will be 1000 lane-meters [3000 lane-feet]. A sublot will consist of 20 lane-meters [50 lane-feet]. Partial lots will be included in the previous lot if less than one-half the size of a normal lot. If equal to or greater than one-half the normal lot size, it will be tested as a separate lot.

402.03 Acceptance Testing The Department will conduct Acceptance testing following completion of the surface course. Sections to be excluded from testing include the following:

Bridge decks and joints (no smoothness measurements will be taken within 30 m [100 ft] of bridge joints)
Acceleration and deceleration lanes
Shoulders and ramps
Side streets and roads
Within 30 m [100 ft] of transverse joints at the beginning and end of the project
Within 30 m [100 ft] of railroad crossings
Urban areas with speed limits of 50 kph [30 mph] or lower

Each lot shall have 2 measurements made in each wheel path. The average of the 4 measurements will determine the smoothness for that lot.

The smoothness measurements will be statistically evaluated for pay factors as described in Subsection 106.7 - Quality Level Analysis, using the specification limits shown below.

ACCEPTANCE LIMITS

| Level | USL |
|---|---|
| I | 0.95 m/km [60 in/mile] |
| II | 1.10 m/km [70 in/mile] |
| III | 1.25 m/km [80 in/mile] |

Computation of Smoothness Pay Adjustment:

PA = (PF-1.0)(Q)(P)
where:
Q = Quantity of surface course in the Lot (excluding shoulders, side streets, bridge decks, ramps, acceleration and deceleration lanes)
PF = smoothness pay factor for the Lot
P = Contract unit price for surface pavement
PA = pay adjustment

402.04 Unacceptable Work In the event that any Lot is found to have a pay factor less than 0.80, the Contractor shall take whatever remedial action is required to correct the pavement surface in that Lot at no additional expense to the Department. Such remedial action may include but is not limited to removal and replacement of the unacceptable pavement. In the event remedial action is necessary, the Contractor shall submit a written plan to the Resident outlining the scope of the remedial work. The Resident must approve this plan before the remedial work can begin. Following remedial work, the Lot shall be retested, and will be subject to the specification limits listed above. The resulting pay factor, if within the acceptable range, will be used in the final pay adjustment. The Contractor shall pay the cost of retesting the pavement following corrective action.

Localized surface tolerance defects will be subject to the provisions outlined in Section 401.101 Surface Tolerances.

Payment will be made under:

| Pay Item | Pay Unit |
|---|---|
| 402.10 Incentive/Disincentive - Pavement Smoothness | Lump Sum |

## SECTION 403 - HOT BITUMINOUS PAVEMENT

403.01 Description This work shall consist of constructing one or more courses of bituminous pavement on an approved base in accordance with these specifications, and in reasonably close conformity with the lines, grades, thickness and typical cross sections shown on the plans or established.

The bituminous pavement shall be composed of a mixture of aggregate, filler if required, and bituminous material.

403.02 General The materials and their use shall conform to the requirements of Section 401 - Hot Mix Asphalt Pavement.

403.03 Construction The construction requirements shall be as specified in Section 401 - Hot Mix Asphalt Pavement.
In addition, hot bituminous pavement placed on bridges shall also conform to the following requirements.

a. The mixture shall be composed of aggregate, PGAB and mineral filler but no recycled asphalt pavement and placed in courses as specified in the Special Provisions.

b. The bottom course shall be placed with an approved rubber mounted bituminous paver of such type and operated in such a manner that the membrane waterproofing will not be damaged in any way.

c. The top course shall not be placed until the bottom course has cooled sufficiently to provide stability.

d. The Contractor will not be required to cut sample cores from the compacted pavement on the bridge deck.

e. After the top course has been placed, the shoulder areas shall be sealed 1 meter [3 ft] wide with two applications of an emulsified bituminous sealer meeting the requirements of Section 702.12 - Emulsified Bituminous Sealing Compound. The first application shall be pre-mixed with fine, sharp sand, similar to mortar sand, as needed to fill all voids in the mix in the area being sealed. The second application may be applied without sand. The sealer shall be carried to the curb at the gutter line in sufficient quantity to leave a bead or fillet of material at the face of the curb. The area to be sealed shall be clean, dry and the surface shall be at ambient temperature.

f. The furnishing and applying of the required quantity of sealer for the bridge shoulder areas shall be incidental to placing the hot bituminous pavement.

g. The atmospheric temperature for all courses on bridge decks shall be 10°C [50°F] or higher.

403.04 Method of Measurement Hot bituminous pavement will be measured as specified in Section 401.21- Method of Measurement.

403.05 Basis of Payment The accepted quantities of hot bituminous pavement will be paid for at the contract unit price per Megagram [ton] for the bituminous mixtures, including bituminous material complete in place.

Method A, Method B, Method C and Method D shall be used for acceptance as specified in Section 401 - Hot Mix Asphalt Pavements. (See Complementary Notes, Section 403 - Hot Bituminous Pavement, for Method location).

Payment will be made under:

| Pay Item | | Pay Unit |
|---|---|---|
| 403.102 | Hot Mix Asphalt Pavement for Special Areas | MG [Ton] |
| 403.206 | Hot Mix Asphalt, 25 mm Nominal Maximum Size | MG [Ton] |
| 403.207 | Hot Mix Asphalt, 19.0 mm Nominal Maximum Size | MG [Ton] |
| 403.2071 | Hot Mix Asphalt , 19.0 mm Nominal Maximum Size | MG [Ton] |
| 403.2072 | Asphalt Rich Hot Mix Asphalt,19.0 mm Nominal Maximum Size (Asphalt Rich Base and Intermediate course) | MG [Ton] |
| 403.208 | Hot Mix Asphalt, 12.5 mm Nominal Maximum Size | MG [Ton] |
| 403.2081 | Hot Mix Asphalt - 12.5 mm Nominal Maximum Size (PG 70-28) | MG [Ton] |
| 403.209 | Hot Mix Asphalt, 9.5 mm Nominal Maximum Size (sidewalks, drives, islands & incidentals) | MG [Ton] |
| 403.210 | Hot Mix Asphalt, 9.5 mm Nominal Maximum Size | MG [Ton] |
| 403.2101 | Hot Mix Asphalt - 9.5 mm Nominal Maximum Size (PG 70-28) | MG [Ton] |
| 403.2102 | Asphalt Rich Hot Mix Asphalt, 9.5 mm Nominal Maximum Size (Asphalt Rich Intermediate course) | MG [Ton] |
| 403.211 | Hot Mix Asphalt (shimming) | MG [Ton] |
| 403.212 | Hot Mix Asphalt, 4.75 mm Nominal Maximum Size | MG [Ton] |
| 403.2131 | Hot Mix Asphalt, 12.5 mm Nominal Maximum Size, (PG 70-28) (Base and Intermediate Base course) | MG [Ton] |
| 403.2132 | Asphalt Rich Hot Mix Asphalt, 12.5 mm Nominal Maximum Size (Base and Intermediate Base course) | MG [Ton] |

# SPECIAL PROVISION
# DIVISION 400
# PAVEMENTS

## SECTION 401 - HOT MIX ASPHALT PAVEMENT

The Special Provision 400. Section 401 – Hot Mix Asphalt Pavement, subsection 401.06 – Weather and Seasonal Limitations, has been modified with the following revisions. All sections not revised by this Special Provision shall be as outlined in the Special Provision 400 Pavements, Section 401 – Hot Mix Asphalt Pavement. References to Standard Specifications, Special Provisions, or other documents, shall be determined as the most current version available at the time of bid, or as amended.

401.06 Weather and Seasonal Limitations The following section has been added as follows:

When work is to be performed, either by contract requirement or Contractor option, during conditions defined as "night work", the Contractor may place Hot Mix Asphalt Pavements greater than one inch in depth as traveled way wearing course in Zone 1 between the dates of May 30th and the Saturday following September 1st, and in Zone 2 between the dates of May 15th and the Saturday following September 15 th . The wearing course placement may commence provided that the air temperature as determined by an approved thermometer (placed at the paving location) is 10°C [50.0°F] or higher. Once started, the wearing course placement may continue provided that the air temperature as determined by an approved thermometer (placed at the paving location) is at or above 7°C [45.0°F] minimum temperature.

**SPECIAL PROVISION**
**SECTION 403**
**HOT MIX ASPHALT**

| Desc. Of Course | Grad Design. | Item Number | Bit Cont. % of Mix | Total Thick | No. Of Layers | Comp. Notes |
|---|---|---|---|---|---|---|
| **2" Mill and 2" HMA Overlay Areas** | | | | | | |
| **Mainline Travelway** | | | | | | |
| Wearing | 12.5 mm | 403.208 | N/A | 2" | 1 | 4,10 |
| **4" HMA Overlay Areas** | | | | | | |
| **Mainline Travelway & Shoulders (Up to Face of Guardrail)** | | | | | | |
| Wearing | 12.5 mm | 403.208 | N/A | 2" | 1 | 4,10 |
| Base | 12.5 mm | 403.213 | N/A | 2" | 1 | 4,10 |
| **Shoulders (Guardrail Flareout Sections)** | | | | | | |
| Wearing | 12.5 mm | 403.208 | N/A | 2" | 1 | 2,4,10 |

## COMPLEMENTARY NOTES

2. The incentive/disincentive provisions for density shall not apply. Rollers shall meet the requirements of this special provision. The use of an oscillating steel roller shall be required to compact all mixtures pavements placed on bridge decks.
4. The design traffic level for mix placed shall be 0.3 to <3 million ESALS. The design, verification, Quality Control, and Acceptance tests for this mix will be performed at **50 gyrations**.
10. Section 106.6 Acceptance, (2) Method D.

Tack Coat

A tack coat of emulsified asphalt, RS-1, Item 409.15 shall be applied to any existing pavement at a rate of approximately 0.025 gal/yd², and on milled pavement approximately 0.05 gal/yd² prior to placing a new course. A fog coat of emulsified asphalt shall be applied between shim /base courses and the surface course, at a rate not to exceed 0.025 gal/yd². Tack used between layers of pavement will be paid for at the contract unit price for Item 409.15 Bituminous Tack Coat.

# SPECIAL PROVISION
# SECTION 511
# Coffer Dam

511.01 Description This work shall consist of the complete design, construction, maintenance and removal of cofferdams and other related work, including dewatering and inspection, required to allow for the excavation of foundation units, to permit and protect the construction of bridge or other structural units and to protect adjacent Roadways, embankments or other structural units, in accordance with the Contract.

511.02 Materials As specified in the cofferdam Working Drawings.

511.03 Cofferdam Construction

A. Working Drawings The Contractor shall submit Working Drawings, showing the materials to be used and the proposed method of construction of cofferdams to the Department. Construction shall not start on cofferdams until such Working Drawings have been submitted. Any review of or comment on, or any lack of review of or comment on, these Working Drawings by the Department shall not result in any liability upon the Department and it shall not relieve the Contractor of the responsibility for the satisfactory functioning of the cofferdam.

B. Construction Construct cofferdams in conformance with the submitted Working Drawings. Cofferdams shall, in general, be carried below the elevation of the bottom of footings to adequate depths to ensure stability and adequate heights to seal off water. Cofferdams shall be braced to withstand pressure without buckling, secured in place to prevent tipping or movement and be as watertight as necessary for the safe and proper construction of the substructure Work inside them. With the exception of construction of a concrete foundation seal placed under water, the interior dimensions of cofferdams shall provide sufficient clearance for the construction and inspection of forms and to permit pumping outside of forms. The Contractor shall be responsible for the righting and resetting of cofferdams that have tilted or moved laterally, as required for construction.

During the placing and curing of seal concrete, maintain the water level inside the cofferdam at the same level as the water outside the cofferdam, to prevent flow through the concrete.

No timber or bracing shall be used in cofferdams in such a way as to remain in the substructure Work.

Cofferdams shall be constructed to protect fresh concrete against damage from the sudden rising of the water body, to prevent damage by erosion and to prevent damage to adjacent Roadways, embankments or other structural units.

Unless otherwise noted, cofferdams, including all sheeting and bracing involved, shall be removed after the completion of the substructure Work in a manner that prevents disturbance or injury to the finished Work.

Cofferdams shall be constructed, dewatered and removed in accordance with the requirements of Section 656 - Temporary Soil Erosion and Water Pollution Control and related Special Provisions.

C. Inspection of Seal Cofferdams Seal cofferdam excavations shall initially be inspected and approved by the Contractor.

For each seal cofferdam excavation, the Contractor shall submit a written procedure to the Resident for sediment/overburden removal and excavation inspection. For cofferdams where seal concrete is to be placed on bedrock, the inspection procedure shall describe the Contractor's final cleaning and inspection process for attaining cleanliness of each cofferdam excavation. For cofferdams where seal concrete is not excavated to bedrock, the procedure shall describe the Contractor's final cleaning and inspection process for attaining the bottom of seal elevation shown on the Plans.

The Contractor shall notify the Resident at least 48 hours prior to when each seal cofferdam excavation will be ready for final inspection by the Department. The Contractor shall allow adequate time for each occurrence of cofferdam excavation inspection by the Department. The Contractor shall provide and maintain access and equipment, such as steel probes, for the Resident and/or the Department's Dive Team to independently inspect each cofferdam excavation.

No seal concrete placement shall begin until the Department has approved the cofferdam excavation.

511.04 Pumping Pumping from the interior of any cofferdam shall be done in such a manner as to prevent any current of water that would carry away or segregate the concrete.

Pumping to dewater a sealed cofferdam shall not commence until the seal concrete has set sufficiently to withstand the hydrostatic pressure and meets the following minimum curing time, after the completion of the installation of the seal concrete:

1. When the temperature of the water body outside the cofferdam is greater than 40°F, a minimum of 5 days.
2. When the temperature of the water body outside the cofferdam is less than 40°F, a minimum of 7 days.

Procedures for the removal of all water and materials from cofferdams shall be described in the Soil Erosion and Water Pollution Control Plan as required in Section 656 Temporary Soil Erosion and Water Pollution Control and related Special Provisions.

511.05 Method of Measurement Cofferdams will be measured as one lump sum unit, as indicated on the Plans or called for in the Contract.

511.06 Basis of Payment The accepted quantity of cofferdam will be paid for at the Contract lump sum price for the respective cofferdam items, which price shall be full compensation for design, construction, maintenance, inspection and removal.

When required, the elevation of the bottom of the footing of any substructure unit may be lowered, without change in the price to be paid for cofferdams. However, if the average elevation of more than 25% of the area of the excavation is more than 3 feet below the elevation shown on the Plans, and if requested by the Contractor, then the additional costs incurred that are included in the cofferdam Pay Item will be paid for in accordance with Section 109.7 - Equitable Adjustments to Compensation. The Contractor shall immediately notify the Department when these additional costs commence. Failure of the Contractor to provide this notification will result in undocumented additional work that will be non-reimbursable. The Department will evaluate this additional work to determine an appropriate time extension, if warranted.

All costs for sedimentation control practices, including, but not limited to, constructing, maintaining, and removing sedimentation control structures, and pumping or transporting water and other materials for sedimentation control will not be paid for directly, but will be considered incidental to the cofferdam Pay Item(s).

All costs for related temporary soil erosion and water pollution controls, including inspection and maintenance, will not be paid for directly, but will be considered incidental to the cofferdam Pay Item(s).

All costs associated with preparation of Working Drawings, design calculations, written procedure for sediment/overburden removal and excavation inspection, and the inspection of the seal cofferdam excavation shall be considered incidental to the cofferdam Pay Item(s). There shall be no additional payment for repeated inspection by the Department of the same cofferdam excavation.

All costs for cofferdams and related temporary soil erosion and water pollution controls, including inspection and maintenance, will be considered incidental to related Pay Items, when a specific Pay Item for cofferdams is not included in the Contract.

Seal concrete will be evaluated under Section 502.

Payment will be made under:

| Pay Item | Pay Unit |
|---|---|
| 511.07 Cofferdam | Lump Sum |

May 13, 2008
Supercedes June 24, 2004

# SPECIAL PROVISION
# SECTION 526
# CONCRETE BARRIER
(Temporary Concrete Barrier)

Materials

Temporary concrete barriers must be connected in accordance with Standard Detail 526(02) except as indicated below:

The top of the rod may be hooked over the top connector instead of using the hex nut and washer.

# SPECIAL PROVISION
# SECTION 534
# PRECAST STRUCTURAL CONCRETE
(Precast Structural Concrete Arches, Box Culverts)
(Precast Concrete Box Culvert Installation)

534.10 Description The Contractor shall load, transport, unload, store and install precast structural concrete box culvert(s) and associated headwalls, toewalls and appurtenances, in accordance with the contract documents. The precast concrete box culverts shall be supplied by the Department. The culvert sections are equipped with joint closure mechanisms to draw sections together and close the joints to the required opening. Culvert headwalls and toewalls shall be furnished by the Contractor and can be either precast or cast in place, in accordance with the contract documents.

534.20 Materials Structural precast elements for the arch or box culvert and associated precast elements shall meet the requirements of the following Subsection:

| | |
|---|---|
| Structural Precast Concrete Units | 712.061 |

Grout, concrete patching material, cementitious anchoring material and geotextile shall be one of the products listed on the Department's list of prequalified materials, unless otherwise approved by the Department.

Box culvert joints shall be sealed with an approved flexible joint sealant in accordance with AASHTO M 198 (ASTM C990).

534.40 Construction Requirements The Contractor shall store and transport members in a manner to prevent cracking or damage. The Contractor shall not place precast members in an upright position until a compressive strength of at least 4350 psi is attained.

Delivery of Precast Units The Contractor shall not ship precast members until sufficient strength has been attained to withstand shipping, handling and erection stresses without cracking, deformation, or spalling (but in no case less than 4350 psi).

The Contractor shall set precast members on ½ inch neoprene pads during shipment to prevent damage to the section legs. The Contractor shall repair any damage to precast members resulting from shipping or handling by saw cutting a minimum of ½ inch deep around the perimeter of the damaged area and placing a polymer-modified cementitious patching material.

The Contractor, who is installing the precast units, shall be responsible for unloading the precast units at or near the project site. Any incidental materials needed to temporarily store the precast units at the project site shall be provided by the Contractor.

The Department shall furnish the precast units at the Charleston Maintenance Lot (515 Dover Road; Charleston, ME 04422). The units will be available for pickup on the scheduled

construction start date (August 15, 2012). The Contractor shall schedule transportation to the jobsite on a weekday (Monday to Friday) in coordination with the Department. The jobsite information is listed below:

Garland, ME – Exeter Road Bridge #6455, WIN 019334.00
(Exeter Road Bridge over Allen Stream)
GPS coordinates: 45.009763, -69.159985

Installation of Precast Units When footings are required, the Contractor shall install the precast members on concrete footings that have reached a compressive strength of at least 3000 psi. The Contractor shall construct the completed footing surface to the lines and grades shown on the plans. When checked with a 10 ft. straightedge, the surface shall not vary more than ¼ in. in 10 ft. The footing keyway shall be filled with a non-shrink flowable cementitious grout with a design compressive strength of at least 5000 psi.

Box culvert joints shall be sealed with an approved flexible joint sealant in accordance with AASHTO M 198 (ASTM C 990). Joints shall be closed tight to within 0.625 inches +/-0.125 inch. Culvert sections shall be equipped with joint closure mechanisms to draw sections together and close joints to the required opening.

The Contractor shall fill holes that were cast in the units for handling, with either Portland cement mortar, or with precast plugs secured with Portland cement mortar or other approved adhesive. The Contractor shall completely fill the exterior face of joints between precast members with an approved material and cover with a minimum 12 inches wide joint wrap. The surface shall be free of dirt and deleterious materials before applying the filler material and joint wrap. The Contractor shall install the external wrap in one continuous piece over each member joint, taking care to keep the joint wrap in place during backfilling. The Contractor shall seal the joints between the end unit and attached elements with a non-woven geotextile. The Contractor shall install and tighten the bolts fastening the connection plate(s) between the elements that are designed to be fastened together by the manufacturer.

Final assembly shall be approved by the manufacturer's representative prior to backfilling. The Contractor shall place and compact the bedding material as shown on the plans prior to lifting and setting the box culvert sections. The Contractor shall backfill the structure in accordance with the manufacturer's instructions and the Contract Documents. The Contractor shall uniformly distribute backfill material in layers of not more than 8 inches depth, loose measure, and thoroughly compact each layer using approved compactors before successive layers are placed. The Contractor shall compact the Granular Borrow bedding and backfill in accordance with Section 203.12 - Construction of Earth Embankment with Moisture and Density Control, except that the minimum required compaction shall be 92 percent of maximum density as determined by AASHTO T180, Method C or D. The Contractor shall place and compact backfill without disturbance or displacement of the wall units, keeping the fill at approximately the same elevation on both sides of the structure. Whenever a compaction test fails, the Contractor shall not place additional backfill over the area until the lift is re-compacted and a passing test achieved.

The Contractor shall use hand-operated compactors within 5 ft. of the precast structure as well as over the top until it is covered with at least 12 inches of backfill. Equipment in excess of 12 tons shall not use the structure until a minimum of 24 inches of backfill cover is in place and compacted.

534.50 Method of Measurement The Department will measure Precast Structural Concrete Arch or Box Culvert for payment per Lump Sum each, complete in place and accepted.

534.60 Basis of Payment The Department will pay for the accepted quantity of Precast Structural Concrete Arch or Box Culvert at the Contract Lump Sum price, such payment being full compensation for all transportation, labor, equipment, materials, professional services, and incidentals for furnishing and installing the precast concrete elements and accessories. Falsework, reinforcing steel, jointing tape, grout, cast-in-place concrete fill or grout fill for anchorage of precast or cast in place headwalls and toewalls and/or other appurtenances is incidental to the Lump Sum pay item. Membrane waterproofing will be measured and paid for separately under the provided Contract pay items.

Payment will be made under:

| Pay Item | | Pay Unit |
|---|---|---|
| 534.7101 | Precast Concrete Box Culvert – State Supplied | Lump Sum |

# SPECIAL PROVISION
# SECTION 606
# GUARDRAIL

606.01 Description This work shall consist of furnishing and installing guardrail components in accordance with these specifications and in reasonably close conformity with the lines and grades shown on the plans or as established. The types of guardrail are designated as follows:

Type 3-Galvanized steel "w" beam, wood posts or galvanized steel posts.
Type 3a-Galvanized steel "w" beam, wood posts, wood or composite offset blocks.
Type 3aa-Corrosion resistant steel "w" beam, wood posts, wood or composite offset blocks.
Type 3b-Galvanized steel "w" beam, galvanized steel posts, galvanized steel offset blocks.
Type 3c-Galvanized steel "w" beam, wood posts or galvanized steel posts, wood or composite offset blocks.
Type 3d-Galvanized steel "w" beam, galvanized steel posts, wood or composite offset blocks.
Thrie Beam-Galvanized steel thrie beam, wood posts or galvanized steel posts, wood or composite offset blocks.

Median barriers shall consist of two beams of the above types, mounted on single posts. Except for thrie beam, median barriers may include rub rails when called for.

Bridge mounted guardrail shall consist of furnishing all labor, materials, and equipment necessary to install guardrail as shown on the plans. This work shall also include drilling for and installation of offset blocks if specified, and incidental hardware necessary for satisfactory completion of the work.

Remove and Reset and Remove, Modify, and Reset guardrail shall consist of removing the existing designated guardrail and resetting in a new location as shown on the plans or directed by the Resident. Remove, Modify, and Reset guardrail and Modify guardrail include the following guardrail modifications: Removing plate washers at all posts, except at anchorage assemblies as noted on the Standard Details, Adding offset blocks, and other modifications as listed in the Construction Notes or General Notes. Modifications shall conform to the guardrail Standard Details.

Bridge Connection shall consist of the installation and attachment of beam guardrail to the existing bridge. This work shall consist of constructing a concrete end post or modifying an existing endpost as required, furnishing, and installing a terminal connector, necessary hardware, and incidentals required to complete the work as shown on the plans. Bridge Transition shall consist of a bridge connection and furnishing and installing guardrail components as shown in the Standard Details.

606.02 Materials Materials shall meet the requirements specified in the following Sections of Division 700 - Materials:

| | |
|---|---|
| Timber Preservative | 708.05 |
| Metal Beam Rail | 710.04 |
| Guardrail Posts | 710.07 |
| Guardrail Hardware | 710.08 |

Guardrail components shall meet the applicable standards of "A Guide to Standardized Highway Barrier Hardware" prepared and approved by the AASHTO-AGC-ARTBA Joint Cooperative Committee, Task Force 13 Report.

Posts for underdrain delineators shall be “U” channel steel, 2.44m [8 ft] long, 3.72 kg/m [2 ½ lb/ft] minimum and have 9.5 mm [3/8 in] round holes, 25 mm [1 in] center to center for a minimum distance of 610 mm [2 ft] from the top of the post.

Reflectorized Flexible Guardrail Markers shall be mounted on all guardrails. A marker shall be mounted onto guardrail posts at the flared end treatment’s terminal and its tangent point, both at the leading and trailing ends of each run of guardrail. The marker’s flexible posts shall be grey with either silver-white or yellow reflectors (to match the edge line striping) at the tangents, red at leading ends, and green at trailing ends. Whenever the end treatment is not flared, markers will only be required at the end treatment’s terminal. These shall be red or green as appropriate. Markers shall be installed on the protected side of guardrail posts unless otherwise approved by the Resident. Reflectorized flexible guardrail markers shall be from the Maine DOT’s Approved Product List of Guardrail Material. The marker shall be grey, flexible, durable, and of a non-discoloring material to which 75 mm [3 in] by 225 mm [9 in] reflectors shall be applied, and capable of recovering from repeated impacts. Reflective material shall meet the requirements of Section 719.01 for ASTM D 4956 Type III reflective sheeting. The marker shall be secured to the guardrail post with two fasteners, as shown in the Standard Details.

Reflectorized beam guardrail (“butterfly”-type) delineators shall be mounted on all “w”-beam guardrail. The delineators shall be mounted within the guardrail beam at guardrail posts. Delineators shall be fabricated from high-impact, ultraviolet & weather resistant thermoplastic. Reflectorized beam guardrail delineators shall be placed at approximately 20 m [62.5 ft] intervals or every tenth post on tangents and at approximately 10 m [31.25 ft] intervals or every fifth post on curves. Exact locations of the delineators shall be as directed by the Resident. On divided highways, the left hand delineators shall be yellow and the right hand delineators shall be silver/white. On two directional highways, the right hand side shall be silver/white and no reflectorized delineator used on the left. All reflectors shall have reflective sheeting applied to only one side of the delineator facing the direction of traffic as shown in the Standard Detail 606(07). Reflectorized sheeting for guardrail delineators shall meet the requirements of Section 719.01.

Single wood post shall be of cedar, white oak, or tamarack, well seasoned, straight, and sound and have been cut from live trees. The outer and inner bark shall be removed and all knots trimmed flush with the surface of the post. Posts shall be uniform taper and free of kinks and bends.

Single steel post shall conform to the requirements of Section 710.07 b.

Single steel pipe post shall be galvanized, seamless steel pipe conforming to the requirements of ASTM A120, Schedule No. 40, Standard Weight.

Acceptable multiple mailbox assemblies shall be listed on the Department’s Approved Products List and shall be NCHRP 350 tested and approved.

The Guardrail 350 Flared Terminal shall be a terminal with a 1.2 m [4 ft] offset as shown in the Manufacturer's installation instructions.

Existing materials damaged or lost during adjusting, removing and resetting, or removing, modifying, and resetting, shall be replaced by the Contractor without additional compensation. Existing guardrail posts and guardrail beams found to be unfit for reuse shall be replaced when directed by the Resident.

606.03 Posts Posts for guardrail shall be set plumb in holes or they may be driven if suitable driving equipment is used to prevent battering and distorting the post. When posts are driven through pavement, the damaged area around the post shall be repaired with approved bituminous patching. Damage to lighting and signal conduit and conductors shall be repaired by the Contractor.

When set in holes, posts shall be on a stable foundation and the space around the posts, backfilled in layers with suitable material, thoroughly tamped.

The reflectorized flexible guardrail markers shall be set plumb with the reflective surface facing the oncoming traffic. Markers shall be installed on the protected side of guardrail posts. Markers, which become bent or otherwise damaged, shall be removed and replaced with new markers.

Single wood posts shall be set plumb in holes and backfilled in layers with suitable material, thoroughly tamped. The Resident will designate the elevation and shape of the top. The posts, that are not pressure treated, shall be painted two coats of good quality oil base exterior house paint.

Single steel posts shall be set plumb in holes as specified for single wood posts or they may be driven if suitable driving equipment is used to prevent battering and distorting the post.

Additional bolt holes required in existing posts shall be drilled or punched, but the size of the holes shall not exceed the dimensions given in the Standard Details. Metal around the holes shall be thoroughly cleaned and painted with two coats of approved aluminum rust resistant paint. Holes shall not be burned.

606.04 Rails Brackets and fittings shall be placed and fastened as shown on the plans. Rail beams shall be erected and aligned to provide a smooth, continuous barrier. Beams shall be lapped with the exposed end away from approaching traffic.

End assemblies shall be installed as shown on the plans and shall be securely attached to the rail section and end post.

All bolts shall be of sufficient length to extend beyond the nuts but not more than 13 mm [½ in]. Nuts shall be drawn tight.

Additional bolt holes required in existing beams shall be drilled or punched, but the size of the holes shall not exceed the dimensions given in the Standard Details. Metal around the holes shall be thoroughly cleaned and painted with two coats of approved aluminum rust resistant paint. Holes shall not be burned.

606.045 Offset Blocks The same offset block material is to be provided for the entire project unless otherwise specified.

606.05 Shoulder Widening At designated locations the existing shoulder of the roadway shall be widened as shown on the plans. All grading, paving, seeding, and other necessary work shall be in accordance with the Specifications for the type work being done.

606.06 Mail Box Post Single wood post shall be installed at the designated location for the support of the mailbox. The multiple mailbox assemblies shall be installed at the designated location in accordance with the Standard Details and as recommended by the Manufacturer. Attachment of the mailbox to the post will be the responsibility of the home or business owner.

606.07 Abraded Surfaces All galvanized surfaces of new guardrail and posts, which have been abraded so that the base metal is exposed, and the threaded portions of all fittings and fasteners and cut ends of bolts shall be cleaned and painted with two coats of approved rust resistant paint.

606.08 Method of Measurement Guardrail will be measured by the meter [linear foot] from center to center of end posts along the gradient of the rail except where end connections are made to masonry or steel structures, in which case measurement will be as shown on the plans.

Terminal section, low volume end, NCHRP 350 end treatments, reflectorized flexible guardrail marker, terminal end, bridge transition, bridge connection, multiple mailbox post, and single post will be measured by each unit of the kind specified and installed.

Widened shoulder will be measured as a unit of grading within the limits shown on the plans.

Excavation in solid rock for placement of posts will be measured by the cubic meter [cubic yard] determined from the actual depth of the hole and a hypothetical circle diameter of 600 mm [2 ft].

606.09 Basis of Payment The accepted quantities of guardrail will be paid for at the contract unit price per meter [linear foot] for the type specified, complete in place. Reflectorized beam guardrail (“butterfly”-type) delineators will not be paid for directly, but will be considered incidental to guardrail items. Terminal section, buffer end, NCHRP 350 end treatment, bridge connection, single post and reflectorized flexible guardrail markers will be paid for at the contract unit price each for the kind specified complete in place.

NCHRP 350 end treatments and low volume guardrail ends will be paid for at the contract price each, complete in place which price shall be full payment for furnishing and installing all components including the terminal section, posts, offset blocks, "w" beam, cable foundation posts, plates and for all incidentals necessary to complete the installation within the limits as shown on the Standard Details or the Manufacturer’s installation instructions. Each end treatment will be clearly marked with the manufacturers name and model number to facilitate any future needed repair. Such payment shall also be full compensation for furnishing all material, excavating, backfilling holes, assembling, and all incidentals necessary to complete the work, except that for excavation for posts or anchorages in solid ledge rock, payment will be made under Pay Item 206.07. Type III Retroreflective Adhesive Sheeting

shall be applied to the approach buffer end sections and sized to substantially cover the end section. On all roadways, the ends shall be marked with alternating black and retroreflective yellow stripes. The stripes shall be 75 mm [3 in] wide and sloped down at an angle of 45 degrees toward the side on which traffic is to pass the end section. Guardrail 350 flared terminal shall also include a set of installation drawings supplied to the Resident.

Anchorages to bridge end posts will be part of the bridge work. Connections thereto will be considered included in the unit bid price for guardrail.

Guardrail to be placed on a radius of curvature of 45 m [150 ft] or less will be paid for under the designated radius pay item for the type guardrail being placed.

Widened shoulder will be paid for at the contract unit price each complete in place and will be full compensation for furnishing and placing, grading and compaction of aggregate subbase and any required fill material.

Adjust guardrail will be paid for at the contract unit price per meter and will be full compensation for adjusting to grade. Payment shall also include adjusting terminal end treatments where required.

Modify guardrail will be paid for at the contract unit price per meter and will be full compensation for furnishing and installing offset blocks, additional posts, and other specified modifications; removing, modifying, installing, and adjusting to grade existing posts and beams; removing plate washers and backup plates, and all incidentals necessary to complete the work. Payment shall also include removing and resetting terminal ends where required.

Remove and Reset guardrail will be paid for at the contract unit price per meter and will be full compensation for removing, transporting, storing, reassembling all parts, necessary cutting, furnishing new parts when necessary, reinstalling at the new location, and all other incidentals necessary to complete the work. Payment shall also include removing and resetting terminal ends when required. No payment will be made for guardrail removed, but not reset and all costs for such removal shall be considered incidental to the various contract pay items.

Remove, Modify, and Reset guardrail will be paid for at the contract unit price per meter and will be full compensation for the requirements listed in Modify guardrail and Remove and Reset guardrail.

Bridge Connections will be paid for at the contract unit price each. Payment shall include, attaching the connection to the endpost including furnishing and placing concrete and reinforcing steel necessary to construct new endposts if required, furnishing and installing the terminal connector, and all miscellaneous hardware, labor, equipment, and incidentals necessary to complete the work.

Bridge Transitions will be paid for at the contract unit price each. Payment shall include furnishing and installing the thrie beam or “w”-beam terminal connector, doubled beam section, and transition section, where called for, posts, hardware, precast concrete transition curb, and any other necessary materials and labor, including the bridge connection as stated in the previous paragraph.

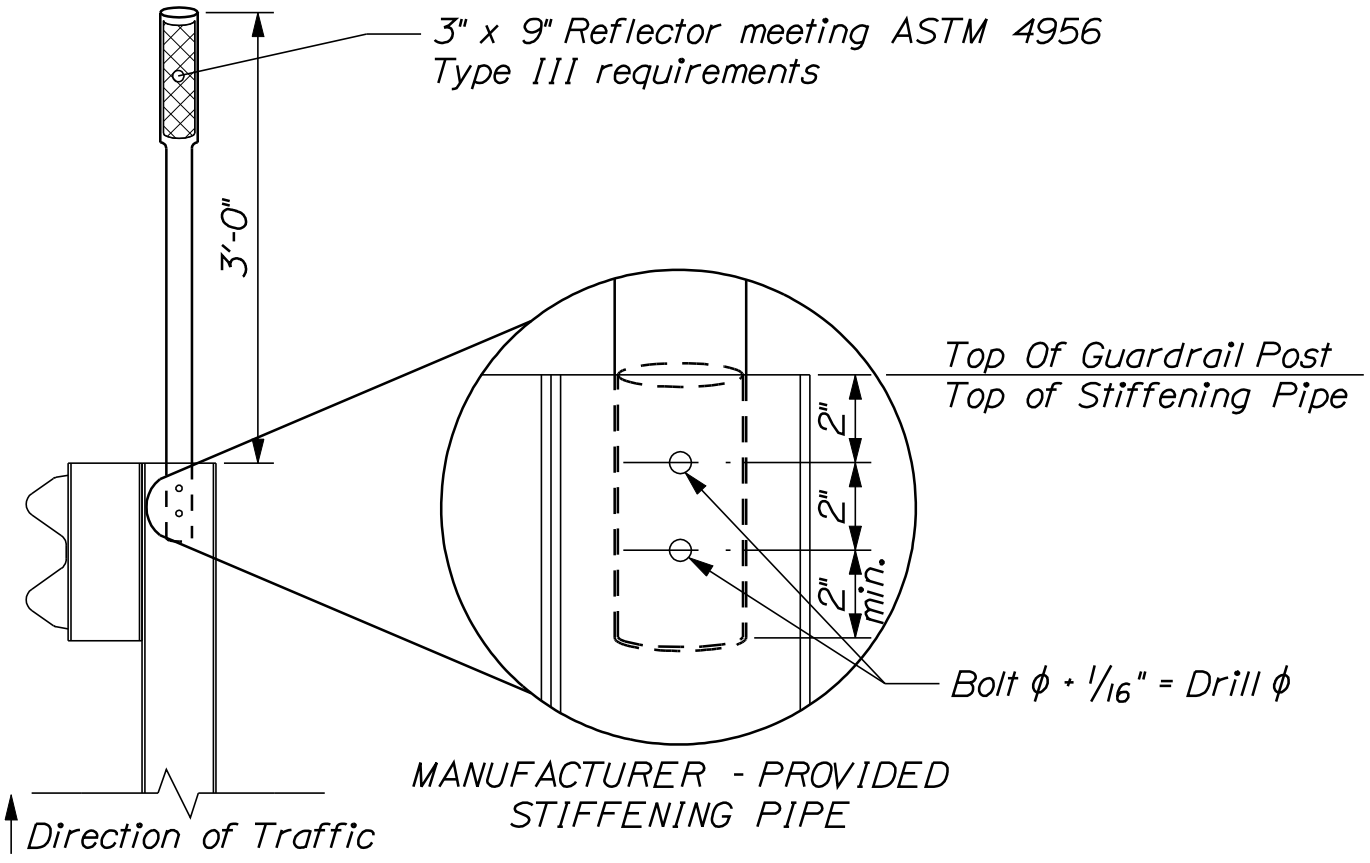
Payment will be made under:

| | Pay Item | Pay Unit |
|---|---|---|
| 606.15 | Guardrail Type 3a-Single Rail | meter [Linear Foot] |
| 606.151 | Guardrail Type 3aa-Single Rail | meter [Linear Foot] |
| 606.17 | Guardrail Type 3b-Single Rail | meter [Linear Foot] |
| 606.1721 | Bridge Transition - Type I | Each |
| 606.1722 | Bridge Transition - Type II | Each |
| 606.1731 | Bridge Connection - Type I | Each |
| 606.1732 | Bridge Connection - Type II | Each |
| 606.178 | Guardrail Beam | meter [Linear foot] |
| 606.18 | Guardrail Type 3b - Double Rail | meter [Linear foot] |
| 606.19 | Guardrail Type 3a - 4.5 m [15 ft] radius and less | meter [Linear Foot] |
| 606.191 | Guardrail Type 3aa - 4.5 m [15 ft] radius and less | meter [Linear Foot] |
| 606.20 | Guardrail Type 3a - over 4.5 m [15 ft] radius | meter [Linear Foot] |
| 606.201 | Guardrail Type 3aa - over 4.5 m [15 ft] radius | meter [Linear Foot] |
| 606.21 | Guardrail Type 3b - 4.5 m [15 ft] radius and less | meter [Linear Foot] |
| 606.22 | Guardrail Type 3b - over 4.5 m [15 ft] radius | meter [Linear Foot] |
| 606.23 | Guardrail Type 3c - Single Rail | meter [Linear Foot] |
| 606.2301 | Guardrail Type 3c - Double Rail | meter [Linear Foot] |
| 606.231 | Guardrail Type 3c - 4.5 m [15 ft] radius and less | meter [Linear Foot] |
| 606.232 | Guardrail Type 3c - over 4.5 m [15 ft] radius | meter [Linear Foot] |
| 606.24 | Guardrail Type 3d - Single Rail | meter [Linear Foot] |
| 606.2401 | Guardrail Type 3d - Double Rail | meter [Linear Foot] |
| 606.241 | Guardrail Type 3d - 4.5 m [15 ft] radius and less | meter [Linear Foot] |
| 606.242 | Guardrail Type 3d - over 4.5 m [15 feet] radius | meter [Linear Foot] |
| 606.25 | Terminal Connector | Each |
| 606.257 | Terminal Connector - Thrie Beam | Each |
| 606.265 | Terminal End-Single Rail - Galvanized Steel | Each |
| 606.266 | Terminal End-Single Rail - Corrosion Resistant Steel | Each |
| 606.275 | Terminal End-Double Rail - Galvanized Steel | Each |
| 606.276 | Terminal End-Double Rail - Corrosion Resistant Steel | Each |
| 606.353 | Reflectorized Flexible Guardrail Marker | Each |
| 606.354 | Remove and Reset Reflectorized Flexible Guardrail Marker | Each |
| 606.356 | Underdrain Delineator Post | Each |
| 606.358 | Guardrail, Modify, Type 3b to 3c | meter [Linear Foot] |
| 606.3581 | Guardrail, Modify Existing to Type 3d | meter [Linear Foot] |
| 606.362 | Guardrail, Adjust | meter [Linear Foot] |
| 606.365 | Guardrail, Remove, Modify, and Reset, Type 3b to 3c | meter [Linear Foot] |
| 606.3651 | Guardrail, Remove, Modify, and Reset Existing to Type 3d | meter [Linear Foot] |
| 606.366 | Guardrail, Removed and Reset, Type 3c | meter [Linear Foot] |
| 606.367 | Replace Unusable Existing Guardrail Posts | Each |
| 606.47 | Single Wood Post | Each |
| 606.48 | Single Galvanized Steel Post | Each |
| 606.50 | Single Steel Pipe Post | Each |

| | | |
|---|---|---|
| 606.51 | Multiple Mailbox Support | Each |
| 606.55 | Guardrail Type 3 - Single Rail | meter [Linear Foot] |
| 606.551 | Guardrail Type 3 - Single Rail with Rub Rail | meter [Linear Foot] |
| 606.56 | Guardrail Type 3 - Double Rail | meter [Linear Foot] |
| 606.561 | Guardrail Type 3 - Double Rail with Rub Rail | meter [Linear Foot] |
| 606.568 | Guardrail, Modify Type 3c -Double Rail | meter [Linear Foot] |
| 606.59 | Guardrail Type 3 - 4.5 m [15 ft] radius and less | meter [Linear Foot] |
| 606.60 | Guardrail Type 3 - over 4.5 m [15 ft] radius | meter [Linear Foot] |
| 606.63 | Thrie Beam Rail Beam | meter [Linear Foot] |
| 606.64 | Guardrail Thrie Beam - Double Rail | meter [Linear Foot] |
| 606.65 | Guardrail Thrie Beam - Single Rail | meter [Linear Foot] |
| 606.66 | Terminal End Thrie Beam | Each |
| 606.70 | Transition Section - Thrie Beam | Each |
| 606.71 | Guardrail Thrie Beam - 4.5 m [15 ft] radius and less | meter [Linear Foot] |
| 606.72 | Guardrail Thrie Beam - over 4.5 m [15 ft] radius | meter [Linear Foot] |
| 606.73 | Guardrail Thrie Beam - Single Rail Bridge Mounted | meter [Linear Foot] |
| 606.74 | Guardrail Type 3 - Single Rail Bridge Mounted | meter [Linear Foot] |
| 606.753 | Widen Shoulder for Low Volume Guardrail End - Type 3 | Each |
| 606.754 | Widen Shoulder for Guardrail 350 Flared Terminal | Each |
| 606.78 | Low Volume Guardrail End - Type 3 | Each |
| 606.79 | Guardrail 350 Flared Terminal | Each |

1. Reflectorized Flexible Guardrail Markers shall be from Maine DOT's Approved Product List of Guardrail Material.

2. Installation:
   a. Each bolt-hole diameter shall be the bolt diameter + 1/16".
   b. Wood post attachment - attach marker with 2, 5/16" diameter zinc-coated lag bolts, having 2" of embedment into wood post.
   c. Steel post attachment - attach marker with 2, 1/4" diameter zinc-coated bolt, washer and nut assemblies, having 1/2" of bolt extension behind steel post.
   d. When provided by the marker manufacturer, a stiffening pipe shall be inserted into the base of the marker prior to drilling bolt holes and shall remain in-place.




# REFLECTORIZED FLEXIBLE GUARDRAIL MARKER DETAILS

606(34)

# SPECIAL PROVISION
# SECTION 652
# MAINTENANCE OF TRAFFIC
(Traffic Control)

Failure by the contractor to follow the Contracts 652 Special Provisions and Standard Specification and/or The Manual on Uniform Traffic Control Devices (MUTCD) and/or The Contractors own Traffic Control Plan will result in a violation letter and result in a reduction in payment as shown in the schedule below. The Departments Resident or any other representative of The Department reserves the right to suspend the work at any time and request a meeting to discuss violations and remedies. The Department shall not be held responsible for any delay in the work due to any suspension under this item. Any reduction in payment under this Special Provision will be in addition to forfeiting payment of maintenance of traffic control devices for that day.

**ORIGINAL CONTRACT AMOUNT**

| from | Up to and | Amount of Penalty |
|---|---|---|
| **More Than** | **Including** | **Damages per Violation** |
| $0 | $100,000 | $250 |
| $100,000 | $300,000 | $500 |
| $300,000 | $500,000 | $750 |
| $500,000 | $1,000,000 | $1,500 |
| $1,000,000 | $2,000,000 | $2,500 |
| $2,000,000 | $4,000,000 | $5,000 |
| $4,000,000 | and more | $10,000 |

April 17, 2007
Supersedes May 10, 2006

# SPECIAL PROVISION
# SECTION 652
## MAINTENANCE OF TRAFFIC
## Construction Sign Sheeting Material

Super high intensity fluorescent retroreflective sheeting, ASTM D 4956 - Type VII, Type VIII, or Type IX (prismatic), is required for all construction signs.

**SPECIAL PROVISION**
**SECTION 656**
Temporary Soil Erosion and Water Pollution Control

The following is added to Section 656 regarding Project Specific Information and Requirements. All references to the Maine Department of Transportation Best Management Practices for Erosion and Sedimentation Control (a.k.a. Best Management Practices manual or BMP Manual) are a reference to the latest revision of said manual. The latest version is dated "February 2008" and is available at:

http://www.maine.gov/mdot/environmental-office-homepage/surface-water-resources.php

**Procedures specified shall be according to the BMP Manual unless stated otherwise.**

## Project Specific Information and Requirements

The following information and requirements apply specifically to this Project. The temporary soil erosion and water pollution control measures associated with this work shall be addressed in the Soil Erosion and Water Pollution Control Plan (SEWPCP.)

### Temporary Stabilization

1. Newly disturbed earth shall be mulched by the end of each workday. Mulch shall be maintained on a daily basis.
2. The SEWPCP shall describe the location and method of temporary erosion and sediment control for existing and proposed catch basins, outlet areas and culvert inlets and outlets.
3. **If water is flowing within the drainage system, the water shall be diverted to a stable area or conduit and work shall be conducted in the dry.** The Contractor's plan shall address when and where the diversions will be necessary.

### Dust Control

4. Dust control items other than those under Standard Specification 637, if applicable, shall be included in the plan.

### Permanent Stabilization

5. Permanent slope stabilization measures shall be applied within one week of the last soil disturbance. Temporary slope stabilization is required on a daily basis.
6. Permanent seeding shall be done in accordance with *Special Provision, Section 618, Seeding* unless the Contract states otherwise.

7. Culvert inlet and outlet protection shall be installed within 48 hours of culvert installation, or prior to a storm event, whichever is sooner.

**SPECIAL PROVISION**
**SECTION 656**
Temporary Soil Erosion and Water Pollution Control

### Winter Stabilization

8. Temporary winter stabilization must be used between November 1st and April 1st or outside of that time period if the ground is frozen or snow covered. Temporary winter stabilization involves, at a minimum, covering all disturbed soils and seeded ground that is not Acceptable Work with an approved method. If temporary winter stabilization practices are used then spring procedures for permanent stabilization shall also be described in the SEWPCP. Use of these methods for over-winter temporary erosion control will be incidental to the contract and be paid for as part of Pay Item 656.75.

### Ditch Treatment

9. All disturbed ditches/slopes shall be stabilized by the end of each workday. Stabilization shall be maintained on a daily basis.
10. Erosion control blanket shall be installed in the bottoms of all ditches except where a stone lining is planned. Seed shall be applied prior to the placement of the blanket.
11. If check dams are used, they shall be constructed of stone in accordance with BMP Manual, Section III.E.1. *Hay Bale Temporary Check Dams* **are not allowed**. Delete all reference to them.

## In Stream

12. The Contractor's SEWPCP shall address in-stream work at this location:
13. Stream flow shall be maintained at all times.
14. The SEWPCP shall describe the containment method for removal of the existing box culvert, including installation of cofferdams and dewatering procedures.
15. A cofferdam sedimentation basin is required if cofferdams are used. The basin shall be located in an upland area where the water can settle and seep into the ground or be released slowly to the resource in a manner that will not cause erosion. The location of such a cofferdam sedimentation basin shall be addressed in the SEWPCP.
16. Discharging impounded water to the stream must take place in a manner that does not disturb the stream bottom or cause erosion.

## STANDARD DETAIL UPDATES

Standard Details and Standard Detail updates are available at:
http://www.maine.gov/mdot/contractor-consultant-information/ss_standard_details_updates.php

| Detail # | Description | Revision Date |
|---|---|---|
| 203(03) | Backslope Rounding | 1/29/08 |
| 502(03) | Concrete Curb - Bituminous Wearing Surface | 8/08/11 |
| 502(03)A | Concrete Curb - Concrete Wearing Surface | 2/2/09 |
| 502(07) | Precast Concrete Deck Panels - Layout Plan | 2/2/09 |
| 502(07)A | Precast Concrete Deck Panels - Layout Plan | 2/2/09 |
| 502(08) | Precast Concrete Deck Panels - Panel Plan | 2/2/09 |
| 502(09) | Precast Concrete Deck Panels - Blocking Detail | 2/2/09 |
| 502(10) | Precast Concrete Deck Panels | 2/2/09 |
| 502(11) | Precast Concrete Deck Panels | 2/2/09 |
| 502(12) | Precast Concrete Deck Panels - Notes | 10/28/09 |
| 502(12)A | Precast Concrete Deck Panels - Notes | 2/2/09 |
| 504(15) | Diaphragms | 5/19/11 |
| 504(22) | Diaphragm & Crossframe Notes | 10/28/09 |
| 504(23) | Hand-Hold Details | 12/08/05 |
| 507(04) | Steel Bridge Railing | 2/05/03 |
| 507(09) | Steel Bridge Railing | 5/19/11 |
| 507(09)A | Steel Bridge Railing | 5/19/11 |
| 526(06) | Permanent Concrete Barrier | 2/2/09 |
| 526(08) | Permanent Concrete Barrier – Type IIIA | 10/07/10 |

| | | |
|---|---|---|
| 526(08)A | Permanent Concrete Barrier – Type IIIA | 12/07/10 |
| 526(13) | Permanent Concrete Barrier – Type IIIB | 2/2/09 |
| 526(14) | Permanent Concrete Barrier – Type IIIB | 2/2/09 |
| 526(21) | Concrete Transition Barrier | 2/2/09 |
| 526(33) | Concrete Transition Barrier | 8/18/03 |
| 526(39) | Texas Classic Rail – Between Window | 2/2/09 |
| 526(40) | Texas Classic Rail – Through Window | 2/2/09 |
| 526(41) | Texas Classic Rail – Through Post | 2/2/09 |
| 526(42) | Texas Classic Rail – Through Nose | 2/2/09 |
| 535(01) | Precast Superstructure - Shear Key | 10/12/06 |
| 535(02) | Precast Superstructure - Curb Key & Drip Notch | 5/20/08 |
| 535(03) | Precast Superstructure - Shear Key | 12/5/07 |
| 535(04) | Precast Superstructure - Shear Key | 12/05/07 |
| 535(05) | Precast Superstructure - Post Tensioning | 5/20/08 |
| 535(06) | Precast Superstructure - Sections | 10/12/06 |
| 535(07) | Precast Superstructure - Precast Slab & Box | 10/12/06 |
| 535(08) | Precast Superstructure - Sections | 10/12/06 |
| 535(09) | Precast Superstructure - Sections | 10/12/06 |
| 535(10) | Precast Superstructure - Sections | 10/12/06 |
| 535(11) | Precast Superstructure - Sections | 10/12/06 |
| 535(12) | Precast Superstructure - Sections | 10/12/06 |
| 535(13) | Precast Superstructure - Sections | 10/12/06 |
| 535(14) | Precast Superstructure - Stirrups | 10/12/06 |

| | | |
|---|---|---|
| 535(15) | Precast Superstructure - Plan | 10/12/06 |
| 535(16) | Precast Superstructure - Reinforcing | 10/12/06 |
| 535(17) | Precast Superstructure - Notes | 12/05/07 |
| 604(01) | Catch Basins | 11/16/05 |
| 604(05) | Type “A” & “B” Catch Basin Tops | 11/16/05 |
| 604(06) | Type “C” Catch Basin Tops | 11/16/05 |
| 604(07) | Manhole Top “D” | 11/16/05 |
| 604(09) | Catch Basin Type “E” | 11/16/05 |
| 606(02) | Multiple Mailbox Support | 11/16/05 |
| 606(03) | Guardrail Standard Detail | 5/10/12 |
| 606(07) | Reflectorized Beam Guardrail Delineator Details | 11/16/05 |
| 606(20) | Guardrail - Type 3 - Single Rail - Bridge Mounted | 2/2/09 |
| 606(21) | Guardrail - Type 3 - Single Rail - Bridge Mounted | 2/2/09 |
| 606(22) | Guardrail - Type 3 - Single Rail - Bridge Mounted | 2/2/09 |
| 606(23) | Guardrail - Type 3 - Single Rail - Bridge Mounted | 2/2/09 |
| 609(03) | Curb Type 3 | 6/27/06 |
| 609(06) | Vertical Bridge Curb | 2/12/09 |
| 609(07) | Curb Type 1 | 6/27/06 |
| 609(08) | Precast Concrete Transition Curb | 2/2/09 |
| 610(02) | Stone Scour Protection | 8/9/11 |
| 610(03) | Stone Scour Protection | 5/19/11 |
| 610(04) | Stone Scour Protection | 5/19/11 |

| | | |
|---|---|---|
| 620(05) | Geotextile Placement for Protection of Slopes Adjactent to Stream & Tidal Areas | 5/19/11 |
| 626(09) | Electrical Junction Box for Traffic Signals and Lighting | 8/27/10 |
| 645(06) | H-Beam Posts – Highway Signing | 7/21/04 |
| 645(09) | Installation of Type II Signs | 7/21/04 |
| 801(01) | Drives on Sidewalk Sections | 12/13/07 |
| 801(02) | Drives on Non-Sidewalk Sections | 12/13/07 |

# SUPPLEMENTAL SPECIFICATION

(Corrections, Additions, & Revisions to Standard Specifications - Revision of December 2002)

## SECTION 101
## CONTRACT INTERPRETATION

101.2 Definitions

Closeout Documentation Replace the sentence "A letter stating the amount….. DBE goals." with "DBE Goal Attainment Verification Form"

Add "Environmental Information Hazardous waste assessments, dredge material test results, boring logs, geophysical studies, and other records and reports of the environmental conditions. For a related provision, see Section 104.3.14 - Interpretation and Interpolation."

Add "Fabrication Engineer The Department's representative responsible for Quality Assurance of pre-fabricated products that are produced off-site."

Geotechnical Information Replace with the following: "Boring logs, soil reports, geotechnical design reports, ground penetrating radar evaluations, seismic refraction studies, and other records of subsurface conditions. For a related provision, see Section 104.3.14 - Interpretation and Interpolation."

## SECTION 102
## DELIVERY OF BIDS

102.7.1 Location and Time Add the following sentence "As a minimum, the Bidder will submit a Bid Package consisting of the Notice to Contractors, the completed Acknowledgement of Bid Amendments form, the completed Schedule of Items, 2 copies of the completed Agreement, Offer, & Award form, a Bid Bond or Bid Guarantee, and any other Certifications or Bid Requirements listed in the Bid Book."

102.11.1 Non-curable Bid Defects Replace E. with "E. The unit price and bid amount is not provided or a lump sum price is not provided or is illegible as determined by the Department."

## SECTION 103
## AWARD AND CONTRACTING

103.3.1 Notice and Information Gathering Change the first paragraph to read as follows: "After Bid Opening and as a condition for Award of a Contract, the Department may require an Apparent Successful Bidder to demonstrate to the Department's satisfaction that the Bidder is responsible and qualified to perform the Work."

## SECTION 104
## GENERAL RIGHTS AND RESPONSIBILITIES

104.3.14 Interpretation and Interpolation In the first sentence, change "…and Geotechnical Information." to "…Environmental Information, and Geotechnical Information."

# SECTION 105
# GENERAL SCOPE OF WORK

Delete the entire Section 105.6 and replace with the following:

105.6.1 Department Provided Services The Department will provide the Contractor with the description and coordinates of vertical and horizontal control points, set by the Department, within the Project Limits, for full construction Projects and other Projects where survey control is necessary. For Projects of 1,500 feet in length, or less: The Department will provide three points. For Projects between 1,500 and 5,000 feet in length: The Department will provide one set of two points at each end of the Project. For Projects in excess of 5,000 feet in length, the Department will provide one set of two points at each end of the Project, plus one additional set of two points for each mile of Project length. For non-full construction Projects and other Projects where survey control is not necessary, the Department will not set any control points and, therefore, will not provide description and coordinates of any control points. Upon request of the Contractor, the Department will provide the Department's survey data management software and Survey Manual to the Contractor, or its survey Subcontractor, for the exclusive use on the Department's Projects.

105.6.2 Contractor Provided Services Utilizing the survey information and points provided by the Department, described in Subsection 105.6.1, Department Provided Services, the Contractor shall provide all additional survey layout necessary to complete the Work. This may include, but not be limited to, reestablishing all points provided by the Department, establishing additional control points, running axis lines, providing layout and maintenance of all other lines, grades, or points, and survey quality control to ensure conformance with the Contract. The Contractor is also responsible for providing construction centerline, or close reference points, for all Utility Facilities relocations and adjustments as necessary to complete the Work. When the Work is to connect with existing Structures, the Contractor shall verify all dimensions before proceeding with the Work. The Contractor shall employ or retain competent engineering and/or surveying personnel to fulfill these responsibilities.

The Contractor must notify the Department of any errors or inconsistencies regarding the data and layout provided by the Department as provided by Section 104.3.3 - Duty to Notify Department If Ambiguities Discovered.

105.6.2.1 Survey Quality Control The Contractor is responsible for all construction survey quality control. Construction survey quality control is generally defined as, first, performing initial field survey layout of the Work and, second, performing an independent check of the initial layout using independent survey data to assure the accuracy of the initial layout; additional iterations of checks may be required if significant discrepancies are discovered in this process. Construction survey layout quality control also requires written documentation of the layout process such that the process can be followed and repeated, if necessary, by an independent survey crew.

105.6.3 Survey Quality Assurance It is the Department's prerogative to perform construction survey quality assurance. Construction survey quality assurance may, or may not, be performed by the Department. Construction survey quality assurance is generally defined as an independent check of the construction survey quality control. The construction survey

quality assurance process may involve physically checking the Contractor's construction survey layout using independent survey data, or may simply involve reviewing the construction survey quality control written documentation. If the Department elects to physically check the Contractor's survey layout, the Contractor's designated surveyor may be required to be present. The Department will provide a minimum notice of 48 hours to the Contractor, whenever possible, if the Contractor's designated surveyor's presence is required. Any errors discovered through the quality assurance process shall be corrected by the Contractor, at no additional cost to the Department.

105.6.4 Boundary Markers The Contractor shall preserve and protect from damage all monuments or other points that mark the boundaries of the Right-of-Way or abutting parcels that are outside the area that must be disturbed to perform the Work. The Contractor indemnifies and holds harmless the Department from all claims to reestablish the former location of all such monuments or points including claims arising from 14 MRSA § 7554-A. For a related provision, see Section 104.3.11 - Responsibility for Property of Others.

## SECTION 106
## QUALITY

106.4.3 Testing Change the first sentence in paragraph three from "…maintain records of all inspections and tests." to "…maintain original documentation of all inspections, tests, and calculations used to generate reports."

106.6 Acceptance Add the following to paragraph 1 of A: "This includes Sections 401 - Hot Mix Asphalt, 402 - Pavement Smoothness, and 502 - Structural Concrete - Method A - Air Content."

Add the following to the beginning of paragraph 3 of A: "For pay factors based on Quality Level Analysis, and"

106.7.1 Standard Deviation Method Add the following to F: "Note: In cases where the mean of the values is equal to either the USL or the LSL, then the PWL will be 50 regardless of the computed value of s."

Add the following to H: "Method C Hot Mix Asphalt: PF = [55 + (Quality Level *0.5)] * 0.01"

## SECTION 107
## TIME

107.3.1 General Add the following: "If a Holiday occurs on a Sunday, the following Monday shall be considered a Holiday. Sunday or Holiday work must be approved by the Department, except that the Contractor may work on Martin Luther King Day, President's Day, Patriot's Day, the Friday after Thanksgiving, and Columbus Day without the Department's approval."

107.7.2 Schedule of Liquidated Damages Replace the table of Liquidated Damages as follows:

| From | Up to and | Amount of Liquidated |
|---|---|---|

| More Than | Including | Damages per Calendar Day |
|---|---|---|
| $0 | $100,000 | $225 |
| $100,000 | $250,000 | $350 |
| $250,000 | $500,000 | $475 |
| $500,000 | $1,000,000 | $675 |
| $1,000,000 | $2,000,000 | $900 |
| $2,000,000 | $4,000,000 | $1,000 |
| $4,000,000 | and more | $2,100 |

## SECTION 108
## PAYMENT

Remove Section 108.4 and replace with the following:

"108.4 Payment for Materials Obtained and Stored Acting upon a request from the Contractor and accompanied by bills or receipted bills, the Department will pay for all or part of the value of acceptable, non-perishable Materials that are to be incorporated in the Work, including Materials that are to be incorporated into the Work, not delivered on the Work site, and stored at places acceptable to the Department. Examples of such Materials include steel piles, stone masonry, curbing, timber and lumber, metal Culverts, stone and sand, gravel, and other Materials. The Department will not make payment on living or perishable Materials until acceptably planted in their final locations.

If payment for Materials is made to the Contractor based on bills, only, then the Contractor must provide receipted bills to the Department for these Materials within 14 days of the date the Contractor receives payment for the Materials. Failure of the Contractor to provide receipted bills for these Materials within 14 days of the dated the Contractor receives payment will result in the paid amount being withheld from the subsequent progress payment, or payments, until such time the receipted bills are received by the Department.

Materials paid for by the Department are the property of the Department, but the risk of loss shall remain with the Contractor. Payment for Materials does not constitute Acceptance of the Material. If Materials for which the Department has paid are later found to be unacceptable, then the Department may withhold amounts reflecting such unacceptable Materials from payments otherwise due the Contractor.

In the event of Default, the Department may use or cause to be used all paid-for Materials in any manner that is in the best interest of the Department."

## SECTION 109
## CHANGES

109.1.1 Changes Permitted Add the following to the end of the paragraph: "There will be no adjustment to Contract Time due to an increase or decrease in quantities, compared to those estimated, except as addressed through Contract Modification(s)."

109.1.2 Substantial Changes to Major Items Add the following to the end of the paragraph: "Contract Time adjustments may be made for substantial changes to Major Items when the change affects the Critical Path, as determined by the Department"

109.4.4 Investigation / Adjustment Third sentence, delete the words "subsections (A) - (E)"

109.5.1 Definitions - Types of Delays

B. Compensable Delay Replace (1) with the following; "a weather related Uncontrollable Event of such an unusually severe nature that a Federal Emergency Disaster is declared. The Contractor will only be entitled to an Equitable Adjustment if the Project falls within the geographic boundaries prescribed under the disaster declaration."

109.7.2 Basis of Payment Replace with the following: "Adjustments will be established by mutual Agreement based upon Unit or Lump Sum Prices. These agreed Unit or Lump Sum prices will be full compensation and no additions or mark-ups are allowed. If Agreement cannot be reached, the Contractor shall accept payment on a Force Account basis as provided in Section 109.7.5 - Force Account Work, as full and complete compensation for all Work relating to the Equitable Adjustment."

109.7.3 Compensable Items Delete this Section entirely.

109.7.4 Non-Compensable Items Replace with the following: "The Contractor is not entitled to compensation or reimbursement for any of the following items:

A. Total profit or home office overhead in excess of 15%,
B. ……."

109.7.5 Force Account Work

C. Equipment
Paragraph 2, delete sentence 1 which starts; "Equipment leased…."

Paragraph 6, change sentence 2 from "The Contractor may furnish…" to read "If requested by the Department, the Contractor will produce cost data to assist the Department in the establishment of such rental rate, including all records that are relevant to the Actual Costs including rental Receipts, acquisition costs, financing documents, lease Agreements, and maintenance and operational cost records."
Add the following paragraph; "Equipment leased by the Contractor for Force Account Work and actually used on the Project will be paid for at the actual invoice amount plus 10% markup for administrative costs."

Add the following section;

"F. Subcontractor Work When accomplishing Force Account Work that utilizes Subcontractors, the Contractor will be allowed a maximum markup of 5% for profit and overhead on the Subcontractor's portion of the Force Account Work. If the Department does not accept the Subcontractor quote, then the Subcontractor work will be subject to the Force Account provisions with a 5% markup for profit & overhead.."

## SECTION 110
## INDEMNIFICATION, BONDING, AND INSURANCE

Delete the entire Section 110.2.3 and replace with the following:
110.2.3 Bonding for Landscape Establishment Period The Contractor shall provide a signed, valid, and enforceable Performance, Warranty, or Maintenance Bond complying with the Contract, to the Department at Final Acceptance.

The bond shall be in the full amount for all Pay Items for work pursuant to Sec 621, Landscape, payable to the "Treasurer - State of Maine," and on the Department's forms, on exact copies thereof, or on forms that do not contain any significant variations from the Department's forms as solely determined by the Department.

The Contractor shall pay all premiums and take all other actions necessary to keep said bond in effect for the duration of the Landscape Establishment Period described in Special Provision 621.0036 - Establishment Period. If the Surety becomes financially insolvent, ceases to be licensed or approved to do business in the State of Maine, or stops operating in the United States, the Contractor shall file new bonds complying with this Section within 10 Days of the date the Contractor is notified or becomes aware of such change.

All Bonds shall be procured from a company organized and operating in the United States, licensed or approved to do business in the State of Maine by the State of Maine Department of Business Regulation, Bureau of Insurance, and listed on the latest Federal Department of the Treasury listing for "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies."

By issuing a bond, the Surety agrees to be bound by all terms of the Contract, including those related to payment, time for performance, quality, warranties, and the Department's self-help remedy provided in Section 112.1 - Default to the same extent as if all terms of the Contract are contained in the bond(s).

Regarding claims related to any obligations covered by the bond, the Surety shall provide, within 60 Days of Receipt of written notice thereof, full payment of the entire claim or written notice of all bases upon which it is denying or contesting payment. Failure of the Surety to provide such notice within the 60-day period constitutes the Surety's waiver of any right to deny or contest payment and the Surety's acknowledgment that the claim is valid and undisputed.

## SECTION 202
## REMOVING STRUCTURES AND OBSTRUCTIONS

202.02 Removing Buildings Make the following change to the last sentence in the final paragraph, change "…Code of Maine Regulations 401." to "…Department of Environmental Protection Maine Solid Waste Management Rules, 06-096 CMR Ch. 401, Landfill Siting, Design and Operation."

# SECTION 203
# EXCAVATION AND EMBANKMENT

203.01 Description Under b. Rock Excavation; add the following sentence: "The use of perchlorate is not allowed in blasting operations."

Delete the entire Section 203.041 and replace with the following:
"203.041 Salvage of Existing Hot Mix Asphalt Pavement All existing hot mix asphalt pavement designated to be removed under this contract must be salvaged for utilization. Existing hot mix asphalt pavement material shall not be deposited in any waste area or be placed below subgrade in any embankment.

Methods of utilization may be any of the following:

1. Used as a replacement for untreated aggregate surface course on entrances provided the material contains no particles greater than 50 mm [2 in] in any dimension. Payment will be made under Pay Item 411.09, Untreated Aggregate Surface Course or 411.10, Untreated Aggregate Surface Course, Truck Measure. Material shall be placed, shaped, compacted and stabilized as directed by the Resident.

2. Used as the top 3" of gravel. Recycled Asphalt Pavement (RAP) shall be process to 1½" minus and blending will not be allowed. When this method is utilized, a surcharge will not be required

3. Stockpiled at commercial or approved sites for commercial or MaineDOT use.

4. Other approved methods proposed by the Contractor, and approved by the Resident which will assure proper use of the existing hot mix asphalt pavement.

The cost of salvaging hot mix asphalt material will be included for payment under the applicable pay item, with no additional allowances made, which will be full compensation for removing, temporarily stockpiling, and rehandling, if necessary, and utilizing the material in entrances or other approved uses, or stockpiling at an approved site as described above. The material will also be measured and paid for under the applicable Pay Item if it is reused for aggregate in entrances, or other approved uses."

# SECTION 502
# STRUCTURAL CONCRETE

502.05 Composition and Proportioning; TABLE #1; NOTE #2; third sentence; Change "…alcohol based saline sealer…" to "alcohol based silane sealer…". Add NOTE #6 to Class S Concrete.

502.0502 Quality Assurance Method A - Rejection by Resident Change the first sentence to read: "For an individual sublot with test results failing to meet the criteria in Table #1, or if the calculated pay factor for Air Content is less than 0.80……"

502.0503 Quality Assurance Method B - Rejection by Resident Change the first sentence to read: "For material represented by a verification test with test results failing to meet the criteria in Table #1, the Department will……"

502.0505 Resolution of Disputed Acceptance Test Results Combine the second and third sentence to read: "Circumstances may arise, however, where the Department may ……"
502.10 Forms and False work

D. Removal of Forms and False work 1., First paragraph; first, second, and third sentence; replace "forms" with "forms and false work"

502.11 Placing Concrete

G. Concrete Wearing Surface and Structural Slabs on Precast Superstructures Last paragraph; third sentence; replace "The temperature of the concrete shall not exceed 24° C [75° F} at the time of placement." with "The temperature of the concrete shall not exceed 24° C [75° F} at the time the concrete is placed in its final position."

502.15 Curing Concrete First paragraph; replace the first sentence with the following; "All concrete surfaces shall be kept wet with clean, fresh water for a curing period of at least 7 days after concrete placing, with the exception of vertical surfaces as provided for in Section 502.10 (D) - Removal of Forms and False work."

Second paragraph; delete the first two sentences.
Third paragraph; delete the entire paragraph which starts "When the ambient temperature…."
Fourth paragraph; delete "approved" to now read "…continuously wet for the entire curing period…"

Fifth paragraph; second sentence; change "…as soon as it is possible to do so without damaging the concrete surface." to "…as soon as possible."

Seventh paragraph; first sentence; change "…until the end of the curing period." to "…until the end of the curing period, except as provided for in Section 502.10(D) - Removal of Forms and False work."

502.19 Basis of Payment First paragraph, second sentence; add "pier nose armor" to the list of items included in the contract price for concrete.

## SECTION 503
## REINFORCING STEEL

503.06 Placing and Fastening Change the second paragraph, first sentence from: "All tack welding shall be done in accordance with Section 504, Structural Steel." to "All tack welding shall be done in accordance with AWS D1.4 Structural Welding Code - Reinforcing Steel."

## SECTION 504
## STRUCTURAL STEEL

504.09 Facilities for Inspection Add the follow as the last paragraph: "Failure to comply with the above requirements will be consider to be a denial to allow access to work by the Contractor. The Department will reject any work done when access for inspection is denied."

504.18 Plates for Fabricated Members Change the second paragraph, first sentence from: "…ASTM A 898/A 898 M…" to "…ASTM A 898/A 898 M or ASTM A 435/A 435 M as applicable and…"

504.31 Shop Assembly Add the following as the last sentence: "The minimum assembly length shall include bearing centerlines of at least two substructure units."

504.64 Non Destructive Testing-Ancillary Bridge Products and Support Structures Change the third paragraph, first sentence from "One hundred percent…" to "Twenty five percent…"

## SECTION 535
## PRECAST, PRESTRESSED CONCRETE SUPERSTRUCTURE

535.02 Materials Change "Steel Strand for Concrete Reinforcement" to "Steel Strand." Add the following to the beginning of the third paragraph; "Concrete shall be Class P conforming to the requirements in this section. 28 day compressive strength shall be as stated on the plans. Coarse aggregate…."

535.05 Inspection Facilities Add the follow as the last paragraph: "If the above requirements are not met, the Contractor shall be considered to be in violation of Standard Specification 104.2.5 – Right to Inspect Work. All work occurring during a violation of this specification will be rejected."

535.26 Lateral Post-Tensioning Replace the first paragraph; "A final tension…" with "Overstressing strands for setting losses cannot be accomplished for chuck to chuck lengths of 7.6 m [25 ft] and less. In such instances, refer to the Plans for all materials and methods. Otherwise, post-tensioning shall be in accordance with PCI standards and shall provide the anchorage force noted in the Plans. The applied jacking force shall be no less than 100% of the design jacking force."

## SECTION 603
## PIPE CULVERTS AND STORM DRAINS

603.0311 Corrugated Polyethylene Pipe for Option III Replace the Minimum Mandrel Diameter Table with the following:

| Nominal Size US Customary (in) | Minimum Mandrel Diameter (in) | Nominal Size Metric (mm) | Minimum Mandrel Diameter (mm) |
|---|---|---|---|
| 12 | 11.23 | 300 | 280.73 |
| 15 | 14.04 | 375 | 350.91 |
| 18 | 16.84 | 450 | 421.09 |
| 24 | 22.46 | 600 | 561.45 |
| 30 | 28.07 | 750 | 701.81 |
| 36 | 33.69 | 900 | 842.18 |
| 42 | 39.30 | 1050 | 982.54 |
| 48 | 44.92 | 1200 | 1122.90 |

## SECTION 604

# MANHOLES, INLETS, AND CATCH BASINS

604.02 Materials Add the following:

| | |
|---|---|
| "Tops and Traps | 712.07 |
| Corrugated Metal Units | 712.08 |
| Catch Basin and Manhole Steps | 712.09" |

## SECTION 605
## UNDERDRAINS

605.05 Underdrain Outlets Make the following change:

In the first paragraph, second sentence, delete the words "metal pipe".

## SECTION 606
## GUARDRAIL

606.02 Materials Delete the entire paragraph which reads "The sole patented supplier of multiple mailbox…." and replace with "Acceptable multiple mailbox assemblies shall be listed on the Department's Approved Products List and shall be NCHRP 350 tested and approved."
Delete the entire paragraph which reads "Retroreflective beam guardrail delineators…." and replace with "Reflectorized sheeting for Guardrail Delineators shall meet the requirements of Section 719.01 - Reflective Sheeting. Delineators shall be fabricated from high-impact, ultraviolet and weather resistant thermoplastic.

606.09 Basis of Payment First paragraph; delete the second and third sentence in their entirety and replace with "Butterfly-type guardrail reflectorized delineators shall be mounted on all W-beam guardrail at an interval of every 10 posts [62.5 ft] on tangents sections and every 5 posts [31.25 ft] on curved sections as directed by the Resident. On divided highways, the delineators shall be yellow on the left hand side and silver/white on the right hand side. On two-way roadways, the delineators shall be silver/white on the right hand side. All delineators shall have retroreflective sheeting applied to only the traffic facing side. Reflectorized guardrail delineators will not be paid for directly, but will be considered incidental to the guardrail items."

## SECTION 609
## CURB

609.04 Bituminous Curb f., Delete the requirement "Color Natural (White)"

## SECTION 610
## STONE FILL, RIPRAP, STONE BLANKET, AND STONE DITCH PROTECTION

Add the following paragraph to Section 610.02:
"Materials shall meet the requirements of the following Sections of Special Provision 703:

| | |
|---|---|
| Stone Fill | 703.25 |
| Plain and Hand Laid Riprap | 703.26 |
| Stone Blanket | 703.27 |
| Heavy Riprap | 703.28 |
| Definitions | 703.32" |

Add the following paragraph to Section 610.032.a.
"Stone fill and stone blanket shall be placed on the slope in a well-knit, compact and uniform layer. The surface stones shall be chinked with smaller stone from the same source."

Add the following paragraph to Section 610.032.b:
"Riprap shall be placed on the slope in a well-knit, compact and uniform layer. The surface stones shall be chinked with smaller stone from the same source."

Add the following to Section 610.032: "Section 610.032.d. The grading of riprap, stone fill, stone blanket and stone ditch protection shall be determined by the Resident by visual inspection of the load before it is dumped into place, or, if ordered by the Resident, by dumping individual loads on a flat surface and sorting and measuring the individual rocks contained in the load. A separate, reference pile of stone with the required gradation will be placed by the Contractor at a convenient location where the Resident can see and judge by eye the suitability of the rock being placed during the duration of the project. The Resident reserves the right to reject stone at the job site or stockpile, and in place. Stone rejected at the job site or in place shall be removed from the site at no additional cost to the Department."

## SECTION 615
## LOAM

615.02 Materials Make the following change:

| Organic Content | Percent by Volume |
|---|---|
| Humus | "5% - 10%", as determined by Ignition Test |

## SECTION 618
## SEEDING

618.01 Description Change the first sentence to read as follows: "This work shall consist of furnishing and applying seed ….." Also remove ",and cellulose fiber mulch" from 618.01(a).
618.03 Rates of Application In 618.03(a), remove the last sentence and replace with the following: "These rates shall apply to Seeding Method 2, 3, and Crown Vetch."

In 618.03(c) "1.8 kg [4 lb]/unit." to "1.95 kg [4 lb]/unit."

618.09 Construction Method In 618.09(a) 1, sentence two, replace "100 mm [4 in]" with "25 mm [1 in] (Method 1 areas) and 50 mm [2 in] (Method 2 areas)"

618.15 Temporary Seeding Change the Pay Unit from Unit to Kg [lb].

## SECTION 620
## GEOTEXTILES

620.03 Placement Section (c)

Title: Replace "Non-woven" in title with "Erosion Control".
First Paragraph: Replace first word "Non-woven" with "Woven monofilament".
Second Paragraph: Replace second word "Non-woven" with "Erosion Control".

620.07 Shipment, Storage, Protection and Repair of Fabric Section (a)

Replace the second sentence with the following: "Damaged geotextiles, as identified by the Resident, shall be repaired immediately."

620.09 Basis of Payment

Pay Item 620.58: Replace "Non-woven" with "Erosion Control"
Pay Item 620.59: Replace "Non-woven" with "Erosion Control"

## SECTION 621
## LANDSCAPING

621.0036 Establishment Period In paragraph 4 and 5, change "time of Final Acceptance" to "end of the period of establishment". In Paragraph 7, change "Final Acceptance date" to ""end of the period of establishment" and change "date of Final Acceptance" to "end of the period of establishment".

## SECTION 626
## HIGHWAY SIGNING

626.034 Concrete Foundations Add to the following to the end of the second paragraph: "Pre-cast and cast-in-place foundations shall be warranteed against leaning and corrosion for two years after the project is completed. If the lean is greater than 2 degrees from normal or the foundation is spalling within the first two years, the Contractor shall replace the foundation at no extra cost."

## SECTION 627
## PAVEMENT MARKINGS

627.10 Basis of Payment Add to the following to the end of the third paragraph: "If allowed by Special Provision, the Contractor may utilize Temporary Bi-Directional Yellow and White(As required) Delineators as temporary pavement marking lines and paid for at the contract lump sum price. Such payment will include as many applications as required and removal."

## SECTION 637
## DUST CONTROL

637.06 Basis of Payment Add the following after the second sentence of the third paragraph: "Failure by the Contractor to follow Standard Specification or Special Provision - Section 637

and/or the Contractor's own Soil Erosion and Pollution Control Plan concerning Dust Control and/or the Contractor's own Traffic Control Plan concerning Dust Control and/or visible evidence of excessive dust problems, as determined by the Resident, will result in a reduction in payment, computed by reducing the Lump Sum Total by 5% per occurrence per day. The Department's Resident or any other representative of the Department reserves the right to suspend the work at any time and request a meeting to discuss violations and remedies. The Department shall not be held responsible for any delay in the work due to any suspension under this item. Additional penalties may also be assessed in accordance with Special Provision 652 - Work Zone Traffic Control and Standard Specification 656 - Temporary Soil Erosion and Water Pollution Control."

## SECTION 639
## ENGINEERING FACILITIES

639.04 Field Offices Change the forth to last paragraph from: "The Contractor shall provide a fully functional desktop copier…" to "….desktop copier/scanner…"

Description Change "Floor Area" to "Floor Area (Outside Dimension)". Change Type B floor area from "15 (160)" to "20 (217)".

639.09 Telephone Paragraph 1 is amended as follows:
"The contractor shall provide **two** telephone lines and two telephones,…."

Add- "In addition the contractor will supply one computer broadband connection, modem lease and router. The router shall have wireless access and be 802.11n or 802.11g capable and wireless. The type of connection supplied will be contingent upon the availability of services (i.e. DSL or Cable Broadband). It shall be the contractor's option to provide dynamic or static IP addresses through the service. **The selected service will have a minimum downstream connection of 1.5 Mbps and 384 Kbps upstream.** The contractor shall be responsible for the installation charges and all reinstallation charges following suspended periods. Monthly service and maintenance charges shall be billed by the Internet Service Provider (ISP) directly to the contractor."

## SECTION 652
## MAINTENANCE OF TRAFFIC

652.2.3 Flashing Arrow Board Delete the existing 5 paragraphs and replace with the following: Flashing Arrow Panels (FAP) must be of a type that has been submitted to AASHTO's National Transportation Product Evaluation Program (NTPEP) for evaluation and placed on the Maine Department of Transportations' Approved Products List of Portable Changeable Message Signs & Flashing Arrow Panels.

FAP units shall meet requirements of the current Manual on Uniform Traffic Control Devices (MUTCD) for Type "C" panels as described in Section 6F.56 - Temporary Traffic Control Devices. An FAP shall have matrix of a minimum of 15 low-glare, sealed beam, Par 46 elements capable of either flashing or sequential displays as well as the various operating modes as described in the MUTCD, Chapter 6-F. If an FAP consisting of a bulb matrix is used, each element should be recess-mounted or equipped with an upper hood of not less than 180

degrees. The color presented by the elements shall be yellow.

FAP elements shall be capable of at least a 50 percent dimming from full brilliance. Full brilliance should be used for daytime operation and the dimmed mode shall be used for nighttime operation. FAP shall be at least 2.4 M x 1.2 M [96" x 48"] and finished in non-reflective black. The FAP shall be interpretable for a distance not less than 1.6 km [1 mile].

Operating modes shall include, flashing arrow, sequential arrow, sequential chevron, flashing double arrow, and flashing caution. In the three arrow signals, the second light from the arrow point shall not operate.

The minimum element on-time shall be 50 percent for the flashing mode, with equal intervals of 25 percent for each sequential phase. The flashing rate shall be not less than 25 nor more than 40 flashes per minute. All on-board circuitry shall be solid state.

Primary power source shall be 12 volt solar with a battery back-up to provide continuous operation when failure of the primary power source occurs, up to 30 days with fully charged batteries. Batteries must be capable of being charged from an onboard 110 volt AC power source and the unit shall be equipped with a cable for this purpose.

Controller and battery compartments shall be enclosed in lockable, weather-tight boxes.
The FAP shall be mounted on a pneumatic-tired trailer or other suitable support for hauling to various locations, as directed. The minimum mounting height of an arrow panel should be 2.1 M [7 feet] from the roadway to the bottom of the panel.

The face of the trailer shall be delineated on a permanent basis by affixing retro-reflective material, known as conspicuity material, in a continuous line as seen by oncoming drivers.

A portable changeable message sign may be used to simulate an arrow panel display."

652.2.4 Other Devices Delete the last paragraph and add the following:
"652.2.5 Portable Changeable Message Sign Trailer mounted Portable Changeable Message Signs (PCMS) must be of a type that has been submitted to AASHTO's National Transportation Product Evaluation Program (NTPEP) for evaluation and placed on the Maine Department of Transportations' Approved Products List of Portable Changeable Message Signs & Flashing Arrow Panels. The PCMS unit shall meet or exceed the current specifications of the Manual on Uniform Traffic Control Devices (MUTCD), 6F.55.

The front face of the sign should be covered with a low-glare protective material. The color of the LED elements shall be amber on a black background. The PCMS should be visible from a distance of 0.8 km [0.5 mile] day and night and have a minimum 15º viewing angle. Characters must be legible from a distance of at least 200 M [650 feet].

The message panel should have adjustable display rates (minimum of 3 seconds per phase), so that the entire message can be read at least twice at the posted speed, the off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed. Each message shall consist of either one or two phases. A phase shall consist of up to eight characters per line. The unit must be capable of displaying at least three lines of text with eight characters per line.

Each character shall be 457 mm [18"] high. Each character module shall use at least a five wide and seven high pixel matrix. The text of the messages shall not scroll or travel horizontally or vertically across the face of the sign.

Units shall automatically adjust their brightness under varying light conditions to maintain legibility.

The control system shall include a display screen upon which messages can be reviewed before being displayed on the message sign. The control system shall be capable of maintaining memory when power is unavailable. Message must be changeable with either a notebook computer or an on-board keypad. The controller shall have the capability to store a minimum of 200 user-defined and 200 pre-programmed messages. Controller and battery compartments shall be enclosed in lockable, weather-tight boxes.

PCMS units shall have the capability of being made programmable by means of wireless communications. PCMS units shall also be fully capable of having an on-board radar system installed if required for a particular application.

PCMS' primary power source shall be solar with a battery back-up to provide continuous operation when failure of the primary power source occurs. Batteries must be capable of being charged from a 110 volt AC power source. The unit must also be capable of being operated solely from a 110 volt AC power source and be equipped with a cable for this purpose.

The PCMS shall be mounted on a trailer in such a way that the bottom of the message sign panel shall be a minimum of 2.1 M [7 ft] above the roadway in urban areas and 1.5 M [5 ft] above the roadway in rural areas when it is in the operating mode. PCMS trailers should be of a heavy duty type with a 51 mm [2"] ball hitch and a minimum of four leveling jacks (at each corner). The sign shall be capable of being rotated 360° relative to the trailer. The face of the trailer shall be delineated on a permanent basis by affixing retro-reflective material, known as conspicuity material, in a continuous line as seen by oncoming drivers."

652.3.3 Submittal of Traffic Control Plan In item e. change "A list of all certified flaggers…" to "A list of all the Contractor's certified flaggers…"

Change a. in the list of requirements to: "a. The name, telephone number, and other contact numbers (cellular phone, pager, if any) of the Contractor's Traffic Control Supervisor (the person with overall responsibility for following the TCP), who has received Work Zone Traffic Control Training commensurate with the level of responsibility shown in the requirements of the Contract, and who is empowered to immediately resolve any work zone traffic control deficiencies or issues. Provide documentation that the Traffic Control Supervisor has completed a Work Zone Traffic Control Training Course (AGC, ATSSA, or other industry-recognized training), and a Supervisory refresher training every 5 years thereafter. Submit the course name, training entity, and date of training.

Traffic Control Training Course curriculum must be based on the standards and guidelines of the MUTCD and must include, at a minimum, the following:

1. Parts of Temporary Traffic Control Zone
2. Appropriate use and spacing of signs
3. Use and spacing of channelizing devices

4. Flagging basics
5. Typical examples and applications

The Traffic Control Supervisor, or designee directly overseeing physical installation, adjustment, and dismantling of work zone traffic control, will ensure all personnel performing those activities are trained to execute the work in a safe and proper manner, in accordance with their level of decision-making and responsibility."

Add the follow to the list of requirements: "k. The plan for unexpected nighttime work along with a list of emergency nighttime equipment available on-site."

In the last paragraph add the following as the second sentence: "The Department will review and provide comments to the Contractor within 14 days of receipt of the TCP." Add the following as the last sentence: "The creation and modification of the TCP will be considered incidental to the related 652 items."

652.3.5 Installation of Traffic Control Devices In the first paragraph, first sentence; change "Signs shall be erected…" to "Portable signs shall be erected.." In the third sentence; change "Signs must be erected so that the sign face…" to "Post-mounted signs must also be erected so that the sign face…"

652.4 Flaggers Replace the first paragraph with the following; "The Contractor shall furnish flaggers as required by the TCP or as otherwise specified by the Resident. All flaggers must have successfully completed a flagger test approved by the Department and administered by a Department-approved Flagger-Certifier who is employing that flagger. All flaggers must carry an official certification card with them while flagging that has been issued by their employer. Flaggers shall wear safety apparel meeting ANSI 107-2004 Class 2 risk exposure that clearly identifies the wearer as a person, and is visible at a minimum distance of 300 m [1000 ft], and shall wear a hardhat with 360° retro-reflectivity. For nighttime conditions, Class 3 apparel, meeting ANSI 107-2004, shall be worn along with a hardhat with 360° retro-reflectivity. Retro-reflective or flashing SLOW/STOP paddles shall be used, and the flagger station shall be illuminated to assure visibility in accordance with 652.6.2."

Second paragraph, first sentence; change "…have sufficient distance to stop before entering the workspace." to "…have sufficient distance to stop at the intended stopping point." Third sentence; change "At a spot obstruction…" to "At a spot obstruction with adequate sight distance,…"

Fourth paragraph, delete and replace with "Flaggers shall be provided as a minimum, a 10 minute break, every 2 hours and a 30 minute or longer lunch period away from the work station. Flaggers may only receive 1 unpaid break per day; all other breaks must be paid. Sufficient certified flaggers shall be available onsite to provide for continuous flagging operations during break periods. If the flaggers are receiving the appropriate breaks, breaker flagger(s) shall be paid starting 2 hours after the work begins and ending 2 hours before the work ends. A maximum of 1 breaker per 6 flaggers will be paid. (1 breaker flagger for 2 to 6 flaggers, 2 breaker flaggers for 7 to 12 flaggers, etc)"

Add the following:

"652.5.1 Rumble Strip Crossing When lane shifts or lane closures require traffic to cross a permanent longitudinal rumble strip for 7 calendar days or less, the Contractor shall install

warning signs that read “RUMBLE STRIP CROSSING” with a supplemental Motorcycle Plaque, (W8-15P).

When lane shifts or lane closures require traffic to cross a permanent longitudinal rumble strip for more than 7 calendar days, the Contractor shall pave in the rumble strips in the area that traffic will cross, unless otherwise directed by the Resident. Rumble strips shall be replaced prior to the end of the project, when it is no longer necessary to cross them.”

652.6 Nightwork Delete this section entirely and replace with the following:
“652.6.1 Daylight Work Times Unless otherwise described in the Contract, the Contractor is allowed to commence work and end work daily according to the Sunrise/Sunset Table at: http://www.sunrisesunset.com/usa/Maine.asp . If the Project town is not listed, the closest town on the list will be used as agreed at the Preconstruction Meeting. Any work conducted before sunrise or after sunset will be considered Night Work.

652.6.2 Night Work When Night Work occurs (either scheduled or unscheduled), the Contractor shall provide and maintain lighting on all equipment and at all work stations.

The lighting facilities shall be capable of providing light of sufficient intensity to permit good workmanship, safety and proper inspection at all times. The lighting shall be cut off and arranged on stanchions at a height that will provide perimeter lighting for each piece of equipment and will not interfere with traffic, including commercial vehicles, approaching the work site from either direction.

The Contractor shall have available portable floodlights for special areas.

The Contractor shall utilize padding, shielding or other insulation of mechanical and electrical equipment, if necessary, to minimize noise, and shall provide sufficient fuel, spare lamps, generators, etc. to maintain lighting of the work site.

The Contractor shall submit, as a subset of the Traffic Control Plan, a lighting plan at the Preconstruction Conference, showing the type and location of lights to be used for night work. The Resident may require modifications be made to the lighting set up in actual field conditions.

Prior to beginning any Night Work, the Contractor shall furnish a light meter for the Residents use that is capable of measuring the range of light levels from 5 to 20 foot-candles.

Horizontal illumination, for activities on the ground, shall be measured with the photometer parallel to the road surface. For purposes of roadway lighting, the photometer is placed on the pavement. Vertical illumination, for overhead activities, shall be measured with the photometer perpendicular to the road surface. Measurements shall be taken at the height and location of the overhead activity.

Night Work lighting requirements:

Mobile Operations: For mobile-type operations, each piece of equipment (paver, roller, milling machine, etc) will carry indirect (i.e. balloon type) lights capable of producing at least 10 foot-candles of lighting around the work area of the equipment.

Fixed Operations: For fixed-type operations (flaggers, curb, bridge, pipes, etc.), direct (i.e. tower) lighting will be utilized capable of illuminating the work area with at least 10 foot-candles of light.

Hybrid Operations: For hybrid-type operations (guardrail, sweeping, Inslope excavation, etc.), either direct or indirect lighting may be utilized. The chosen lights must be capable of producing at least 10 foot-candles of light around the work area of the equipment
Inspection Operations: Areas required to be inspected by the Department will require a minimum of 5 foot-candles of lighting. This may be accomplished through direct or indirect means.

All workers shall wear safety apparel labeled as meeting the ANSI 107-2004 standard performance for Class 3 risk exposure.

The Contractor shall apply 2- inch wide retro-reflective tape, with alternating red and white segments, to outline the front back and sides of construction vehicles and equipment, to define their shape and size to the extent practicable. Pickup trucks and personal vehicles are exempt from this requirement. The Contractor shall furnish approved signs reading "Construction Vehicle - Keep Back" to be used on trucks hauling to the project when such signs are deemed necessary by the Resident. The signs shall be a minimum of 30 inches by 60 inches, Black and Orange, ASTM D 4956 - Type VII, Type VIII, or Type IX (prismatic).

All vehicles used on the project, including pickup trucks and personal vehicles, shall be equipped with amber flashing lights, visible from both front and rear, or by means of single, approved type, revolving, flashing or strobe lights mounted so as to be visible 360º. The vehicle flashing system shall be in continuous operation while the vehicle is on any part of the project.

The Resident or any other representative of the Department reserves the right to suspend the work at any time and request a meeting to discuss violations and remedies. The Department shall not be held responsible for any delay in the work due to any suspension under this item. Failure to follow the approved Lighting Plan will result in a Traffic Control violation.

Payment for lighting, vehicle mounted signs and other costs accrued because of night work will not be made directly but will be considered incidental to the related contract items."

652.8.2 Other Items Replace the first paragraph with the following: "The accepted quantities of flagger hours will be paid for at the contract unit price per hour for each flagging station occupied excluding lunch breaks, and for each approved breaker flagger. Overtime hours, as reported on the certified payrolls, will be paid an additional 30% of the bid price for 652.38. The computation and additional payment for overtime hours will occur during the project close-out process and will be paid as additional hours of 652.38 to the nearest ¼ hour. The

contract unit price shall be full compensation for hiring, transporting, equipping, supervising, and the payment of flaggers and all overhead and incidentals necessary to complete the work." Replace the last paragraph with the following: "There will be no payment made under any 652 pay items after the expiration of the adjusted total contract time."

## SECTION 653
## POLYSTYRENE PLASTIC INSULATION

653.05 Placing Backfill In the second sentence; change "…shall be not less than 150 mm [6 in] loose measure." to "…shall be not less than 250 mm [10 in] loose measure." In the third sentence; change "…crawler type bulldozer of not more than 390 kg/m$^2$ [80 lb/ft$^2$] ground contact pressure…" to "…crawler type bulldozer of not more than 4875 kg/m$^2$ [2000 lb/ft$^2$] ground contact pressure…"

653.06 Compaction In the last sentence; change "…not more than 390 kg/m$^2$ [80 lb/ft$^2$] ground contact…" to "…not more than 4875 kg/m$^2$ [2000 lb/ft$^2$] ground contact…"

## SECTION 656
## TEMPORARY SOIL EROSION AND WATER POLLUTION CONTROL

656.5.1 If Pay Item 656.75 Provided Replace the second paragraph with the following: "Failure by the Contractor to follow Standard Specification or Special Provision - Section 656 and/or the Contractor's own Soil Erosion and Pollution Control Plan will result in a reduction in payment, computed by reducing the Lump Sum Total by 5% per occurrence per day. The Department's Resident or any other representative of the Department reserves the right to suspend the work at any time and request a meeting to discuss violations and remedies. The Department shall not be held responsible for any delay in the work due to any suspension under this item."

## SECTION 701
## STRUCTURAL CONCRETE RELATED MATERIALS

701.10 Fly Ash - Chemical Requirements Change all references from "ASTM C311" to "ASTM C114".

## SECTION 703
## AGGREGATES

703.05 Aggregate for Sand Leveling Change the percent passing the 9.5 mm [3/8 in] sieve from "85 – 10" to "85 – 100"

703.06 Aggregate for Base and Subbase Delete the first paragraph: "The material shall have…" and replace with "The material shall have a minimum degradation value of 15 as determined by Washington State DOT Test Method T113, Method of Test for Determination of Degradation Value (January 2009 version), except that the reported degradation value will be the result of testing a single specimen from that portion of a sample that passes the 12.5 mm [½ in] sieve and is retained on the 2.00 mm [No. 10] sieve, minus any reclaimed asphalt pavement used."

703.07 Aggregates for HMA Pavements Delete the forth paragraph: "The composite blend shall have…" and replace with "The composite blend, minus any reclaimed asphalt pavement used, shall have a Micro-Deval value of 18.0 or less as determined by AASHTO T 327. In the event the material exceeds the Micro Deval limit, a Washington Degradation test shall be performed. The material shall be acceptable if it has a value of 30 or more as determined by Washington State DOT Test Method T 113, Method of Test for Determination of Degradation Value (January 2009 version) except that the reported degradation value will be the result of testing a single composite specimen from that portion of the sample that passes the 12.5mm [1/2 inch] sieve and is retained on the 2.00mm [No 10] sieve, minus any reclaimed asphalt pavement used."

703.09 HMA Mixture Composition The coarse and fine aggregate shall meet the requirements of Section 703.07. The several aggregate fractions for mixtures shall be sized, graded, and combined in such proportions that the resulting composite blends will meet the grading requirements of the following table.

AGGREGATE GRADATION CONTROL POINTS

| SIEVE SIZE | Nominal Maximum Aggregate Size---Control Points (Percent Passing) | | | | |
|---|---|---|---|---|---|
| | TYPE 25 mm | TYPE 19 mm | TYPE 12.5 mm | TYPE 9.5 mm | TYPE 4.75 mm |
| | PERCENT BY WEIGHT PASSING - COMBINED AGGREGATE | | | | |
| 37.5 mm | 100 | | | | |
| 25 mm | 90-100 | 100 | | | |
| 19 mm | -90 | 90-100 | 100 | | |
| 12.5 mm | | -90 | 90-100 | 100 | 100 |
| 9.5 mm | | - | -90 | 90-100 | 95-100 |
| 4.75 mm | | - | - | -90 | 80-100 |
| 2.36 mm | 19-45 | 23-49 | 28-58 | 32-67 | 40 - 80 |
| 1.18 mm | | - | - | - | - |
| 600 µm | | - | - | - | - |
| 300 µm | | - | - | - | - |
| 75 µm | 1-7 | 2-8 | 2-10 | 2-10 | 2-10 |

Gradation Classification---- The combined aggregate gradation shall be classified as coarse-graded when it passes below the Primary Control Sieve (PCS) control point as defined in the following table. All other gradations shall be classified as fine-graded.

**GRADATION CLASSIFICATION**

| PCS Control Point for Mixture Nominal Maximum Aggregate Size (% passing) | | | | |
|---|---|---|---|---|
| Nominal Maximum Aggregate Size | TYPE 25 mm | TYPE 19 mm | TYPE 12.5 mm | TYPE 9.5 mm |
| Primary Control Sieve | 4.75 mm | 4.75 mm | 2.36 mm | 2.36 mm |
| PCS Control Point (% passing) | 40 | 47 | 39 | 47 |

If a Grading "D" mixture is allowed per Special Provision Section 403, it shall meet the following gradation and the aggregate requirements of Section 703.07.

| Sieve Designation | Percentage by Weight Passing Square Mesh Sieves |
|---|---|
| ½ inch | 100 |
| ⅜ inch | 93-100 |
| No. 4 | 60-80 |
| No. 8 | 46-65 |
| No. 16 | 25-55 |
| No. 30 | 16-40 |
| No. 50 | 10-30 |
| No. 100 | 6-22 |
| No. 200 | 3.0-8.0 |

703.18 Common Borrow Replace the first paragraph with the following: "Common borrow shall consist of earth, suitable for embankment construction. It shall be free from frozen material, perishable rubbish, peat, and other unsuitable material including material currently or previously contaminated by chemical, radiological, or biological agents unless the material is from a DOT project and authorized by DEP for use."

703.22 Underdrain Backfill Material Change the first paragraph from "…for Underdrain Type B…" to "…for Underdrain Type B and C…"

Replace subsections 703.25 through 703.28 with the following:
"703.25 Stone Fill Stones for stone fill shall consist of hard, sound, durable rock that will not disintegrate by exposure to water or weather. Stone for stone fill shall be angular and rough. Rounded, subrounded, or long thin stones will not be allowed. Stone for stone fill may be obtained from quarries or by screening oversized rock from earth borrow pits. The maximum allowable length to thickness ratio will be 3:1. The minimum stone size (10 lbs) shall have an average dimension of 5 inches. The maximum stone size (500 lbs) shall have a maximum dimension of approximately 36 inches. Larger stones may be used if approved by the Resident. Fifty percent of the stones by volume shall have an average dimension of 12 inches (200 lbs).

703.26 Plain and Hand Laid Riprap Stone for riprap shall consist of hard, sound durable rock that will not disintegrate by exposure to water or weather. Stone for riprap shall be angular and rough. Rounded, subrounded or long thin stones will not be allowed. The maximum allowable length to width ratio will be 3:1. Stone for riprap may be obtained from quarries or by screening oversized rock from earth borrow pits. The minimum stone size (10 lbs) shall have an average dimension of 5 inches. The maximum stone size (200 lbs) shall have an average dimension of approximately 12 inches. Larger stones may be used if approved by the Resident. Fifty percent of the stones by volume shall have an average dimension greater than 9 inches (50 lbs).

703.27 Stone Blanket Stones for stone blanket shall consist of sound durable rock that will not disintegrate by exposure to water or weather. Stone for stone blanket shall be angular and rough. Rounded or subrounded stones will not be allowed. Stones may be obtained from

quarries or by screening oversized rock from earth borrow pits. The minimum stone size (300 lbs) shall have minimum dimension of 14 inches, and the maximum stone size (3000 lbs) shall have a maximum dimension of approximately 66 inches. Fifty percent of the stones by volume shall have average dimension greater than 24 inches (1000 lbs).

703.28 Heavy Riprap Stone for heavy riprap shall consist of hard, sound, durable rock that will not disintegrate by exposure to water or weather. Stone for heavy riprap shall be angular and rough. Rounded, subrounded, or thin, flat stones will not be allowed. The maximum allowable length to width ratio will be 3:1. Stone for heavy riprap may be obtained from quarries or by screening oversized rock from earth borrow pits. The minimum stone size (500 lbs) shall have minimum dimension of 15 inches, and at least fifty percent of the stones by volume shall have an average dimension greater than 24 inches (1000 lbs)."

Add the following paragraph:
"703.32 Definitions (ASTM D 2488, Table 1).
Angular: Particles have sharp edges and relatively plane sides with unpolished surfaces
Subrounded: Particles have nearly plane sides but have well-rounded corners and edges
Rounded: Particles have smoothly curved sides and no edges"

## SECTION 706
## NON-METALLIC PIPE

706.06 Corrugated Polyethylene Pipe for Underdrain, Option I and Option III Culvert Pipe Change the first sentence from "…300 mm diameters to 900 mm" to "…300 mm diameters to 1200 mm" Delete, in its' entirety, the last sentence which begins "This pipe and resins…" and replace with the following; "Manufacturers of corrugated polyethylene pipe must participate in, and maintain compliance with, AASHTO's National Transportation Product Evaluation Program (www.ntpep.org) which audits producers of plastic pipe. A certificate of compliance must be provided with each shipment."

## SECTION 708
## PAINTS AND PERSERVATIVES

708.03 Pavement Marking Paint Change the first sentence from "…AASHTO M248" to "…the Maine DOT Maintenance Fast-Dry Water-Based Traffic Paint on file at the Traffic Section in Augusta". Delete, in its' entirety, the last sentence.

## SECTION 709
## REINFORCING STEEL AND WELDED STEEL WIRE FABIC

709.03 Steel Strand Change the second paragraph from "…shall be 12mm [½ inch] AASHTO M203M/M203 (ASTM A416/A416M)…" to "…shall be 15.24 mm [0.600 inch] diameter AASHTO M203 (ASTM A416)…"

## SECTION 710
## FENCE AND GUARDRAIL

710.03 Chain Link Fabric Add the following sentence: "Chain Link fabric for PVC coated shall conform to the requirements of AASHTO M181, Type IV-Class B."

710.04 Metal Beam Rail Replace with the following: "Galvanized steel rail elements shall conform to the requirements of AASHTO M 180, Class A, Type II.

When corrosion resistant steel is specified, rail shall conform to AASHTO M 180, Class A, Type IV. Beams of corrosion resistant steel shall not be painted or galvanized. They shall be so handled and stored that the traffic face of these beams, used in a continuous run of guardrail, shall not show a distinctive color differential.

When metal beam rail is to be installed on a curve having a radius of curvature of 150 ft. or less, the beam sections shall be fabricated on an arc to the required radius and permanently stamped or embossed with the designated radius.

The engineer may take one piece of guardrail, a backup plate, and end or buffer section from each 200 pieces in a lot, or from each lot if less than 200 pieces are included therein for determination of compliance with specification requirements. If one piece fails to conform to the requirements of this specification, two other pieces shall be tested. If either of these pieces fails to conform to the requirements of this specification, the lot of material represented by these samples shall be rejected. A lot shall be considered that quantity of material offered for inspection at one time that bears the same heat and coating identification."

710.07 Guardrail Posts Section b. change "…AASHTO M183/M183M…" to "…AASHTO M 270M/M 270 Grade 250 (36)…"

## SECTION 712
## MISCELLANEOUS HIGHWAY MATERIALS

712.04 Stone Curbing and Edging Delete the existing and replace with the following: "Stone for curbing and edging shall be approved granite from acceptable sources. The stone shall be hard and durable, predominantly gray in color, free from seams that would be likely to impair its structural integrity, and of a smooth splitting character. Natural grain size and color variations characteristic of the source deposit will be permitted. Such natural variations may include bands or clusters of mineral crystallization provided they do not impair the structural integrity of the curb stone. The Contractor shall submit for approval the name of the quarry that is the proposed source of the granite for curb materials along with full scale color photos of the granite. Such submission shall be made sufficiently in advance of ordering so that the Resident may have an opportunity to judge the stone, both as to quality and appearance. Samples of curbing shall be submitted for approval only when requested by the Resident. The dimensions, shape, and other details shall be as shown on the plans."

712.06 Precast Concrete Units In the first paragraph, change "…ASTM C478M…" to "…AASHTO M199…" Delete the second paragraph and replace with the following; "Approved structural fibers may be used as a replacement of 6 x 6 #10 gauge welded wire fabric when used at an approved dosage rate for the construction of manhole and catch basin units. The material used shall be one of the products listed on the Maine Department of Transportation's Approved Product List of Structural Fiber Reinforcement." Delete the fifth paragraph and replace with the following; "The concrete mix design shall be approved by the Department. Concrete shall contain 6% air content, plus or minus 1½% tolerance when tested according to AASHTO T152. All concrete shall develop a minimum compressive strength of

28 MPa [4000 psi] in 28 days when tested according to AASHTO T22. The absorption of a specimen, when tested according to AASHTO T280, Test Method "A", shall not exceed nine percent of the dry mass."

Add the following:
"712.07 Tops, and Traps These metal units shall conform to the plan dimensions and to the following specification requirements for the designated materials.

Gray iron or ductile iron castings shall conform to the requirements of AASHTO M306 unless otherwise designated."

712.08 Corrugated Metal Units The units shall conform to plan dimensions and the metal to AASHTO M36/M36M. Bituminous coating, when specified, shall conform to AASHTO M190 Type A.

712.09 Catch Basin and Manhole Steps Steps for catch basins and for manholes shall conform to ASTM C478M [ASTM C478], Section 13 for either of the following material:

(a) Aluminum steps-ASTM B221M, [ASTM B211] Alloy 6061-T6 or 6005-T5.

(b) Reinforced plastic steps Steel reinforcing bar with injection molded plastic coating copolymer polypropylene. Polypropylene shall conform to ASTM D 4101.

712.23 Flashing Lights Flashing Lights shall be power operated or battery operated as specified.

(a) Power operated flashing lights shall consist of housing, adapters, lamps, sockets, reflectors, lens, hoods and other necessary equipment designed to give clearly visible signal indications within an angle of at least 45 degrees and from 3 to 90 m [10 to 300 ft] under all light and atmospheric conditions.

Two circuit flasher controllers with a two-circuit filter capable of providing alternate flashing operations at the rate of not less than 50 nor more than 60 flashes per minute shall be provided.

The lamps shall be 650 lumens, 120 volt traffic signal lamps with sockets constructed to properly focus and hold the lamp firmly in position.
The housing shall have a rotatable sun visor not less than 175 mm [7 in] in length designed to shield the lens.

Reflectors shall be of such design that light from a properly focused lamp will reflect the light rays parallel. Reflectors shall have a maximum diameter at the point of contact with the lens of approximately 200 mm [8 in].

The lens shall consist of a round one-piece convex amber material which, when mounted, shall have a visible diameter of approximately 200 mm [8 in]. They shall distribute light and not diffuse it. The distribution of the light shall be asymmetrical in a downward direction. The light distribution of the lens shall not be uniform, but shall consist of a small high intensity portion with narrow distribution for long distance throw and a larger

low intensity portion with wide distribution for short distance throw. Lenses shall be marked to indicate the top and bottom of the lens.

(b) Battery operated flashing lights shall be self- illuminated by an electric lamp behind the lens. These lights shall also be externally illuminated by reflex-reflective elements built into the lens to enable it to be seen by reflex-reflection of the light from the headlights of oncoming traffic. The batteries must be entirely enclosed in a case. A locking device must secure the case. The light shall have a flash rate of not less than 50 nor more than 60 flashes per minute from minus 30 °C [minus 20 °F] to plus 65 °C [plus 150 °F]. The light shall have an on time of not less than 10 percent of the flash cycle. The light beam projected upon a surface perpendicular to the axis of the light beam shall produce a lighted rectangular projection whose minimum horizontal dimension shall be 5 degrees each side of the horizontal axis. The effective intensity shall not have an initial value greater than 15.0 candelas or drop below 4.0 candelas during the first 336 hours of continuous flashing. The illuminated lens shall appear to be uniformly bright over its entire illuminated surface when viewed from any point within an angle of 9 degrees each side of the vertical axis and 5 degrees each side of the horizontal axis. The lens shall not be less than 175 mm [7 in] in diameter including a reflex-reflector ring of 13 mm [½ in] minimum width around the periphery. The lens shall be yellow in color and have a minimum relative luminous transmittance of 0.440 with a luminance of 2854° Kelvin. The lens shall be one-piece construction. The lens material shall be plastic and meet the luminous transmission requirements of this specification. The case containing the batteries and circuitry shall be constructed of a material capable of withstanding abuse equal to or greater than 1.21 mm thick steel [No. 18 U.S. Standard Gage Steel]. The housing and the lens frame, if of metal shall be properly cleaned, degreased and pretreated to promote adhesion. It shall be given one or more coats of enamel which, when dry shall completely obscure the metal. The enamel coating shall be of such quality that when the coated case is struck a light blow with a sharp tool, the paint will not chip or crack and if scratched with a knife will not powder. The case shall be so constructed and closed as to exclude moisture that would affect the proper operation of light. The case shall have a weep hole to allow the escape of moisture from condensation. Photoelectric controls, if provided, shall keep the light operating whenever the ambient light falls below 215 lx [20 foot candles]. Each light shall be plainly marked as to the manufacturer's name and model number.

If required by the Resident, certification as to conformance to these specifications shall be furnished based on results of tests made by an independent testing laboratory. All lights are subject to random inspection and testing. All necessary random samples shall be provided to the Resident upon request without cost to the Department. All such samples shall be returned to the Contractor upon completion of the tests.

712.32 Copper Tubing Copper tubing and fittings shall conform to the requirements of ASTM B88M Type A [ASTM B88, Type K] or better.

712.33 Non-metallic Pipe, Flexible Non-metallic pipe and pipe fittings shall be acceptable flexible pipe manufactured from virgin polyethylene polymer suitable for transmitting liquids intended for human or animal consumption.

712.34 Non-metallic Pipe, Rigid Non-metallic pipe shall be Schedule 40 polyvinylchloride (PVC) that meets the requirement of ASTM D1785. Fittings shall be of the same material.

712.341 Metallic Pipe Metallic pipe shall be ANSI, Standard B36.10, Schedule 40 steel pipe conforming to the requirements of ASTM A53 Types E or S, Grade B. End plates shall be steel conforming to ASTM A36/A36M.

Both the sleeve and end plates shall be hot dip galvanized. Pipe sleeve splices shall be welded splices with full penetration weld before galvanizing.

712.35 Epoxy Resin Epoxy resin for grouting or sealing shall consist of a mineral filled thixotropic, flexible epoxy resin having a pot life of approximately one hour at 10°C [50°F]. The grout shall be an approved product suitable for cementing steel dowels into the preformed holes of curb inlets and adjacent curbing. The sealant shall be an approved product, light gray in color and suitable for coating the surface.

712.36 Bituminous Curb The asphalt cement for bituminous curb shall be of the grade required for the wearing course, or shall be Viscosity Grade AC-20 meeting the current requirements of Subsection 702.01 Asphalt Cement. The aggregate shall conform to the requirements of Subsection 703.07. The coarse aggregate portion retained on the 2.36 mm [No. 8] sieve may be either crushed rock or crushed gravel.

The mineral constituents of the bituminous mixture shall be sized and graded and combined in a composite blend that will produce a stable durable curbing with an acceptable texture.

Bituminous material for curb shall meet the requirements of Section 403 - Hot Bituminous Pavement.

712.37 Precast Concrete Slab Portland cement concrete for precast slabs shall meet the requirements of Section 502 - Structural Concrete, Class A.

The slabs shall be precast to the dimension shown on the plans and cross section and in accordance with the Standard Detail plans for Concrete Sidewalk Slab. The surface shall be finished with a float finish in accordance with Subsection 502.14(c). Lift devices of sufficient strength to hold the slab while suspended from cables shall be cast into the top or back of the slab.

712.38 Stone Slab Stone slabs shall be of granite from an acceptable source, hard, durable, predominantly gray in color, free from seams which impair the structural integrity and be of smooth splitting character. Natural color variations characteristic of the deposit will be permitted. Exposed surfaces shall be free from drill holes or indications of drill holes. The granite slabs in any one section of backslope must be all the same finish.

The granite slabs shall be scabble dressed or sawed to an approximately true plane having no projections or depressions over 13 mm [½ in] under a 600 mm [2 ft] straightedge or over 25 mm [1 in] under a 1200 mm [4 ft] straightedge. The arris at the intersection of the top surface and exposed front face shall be pitched so that the arris line is uniform throughout the length of the installed slabs. The sides shall be square to the exposed face unless the slabs are to be set

on a radius or other special condition which requires that the joints be cut to fit, but in any case shall be so finished that when the stones are placed side by side no space more than 20 mm [3/4 in] shall show in the joint for the full exposed height.

Liftpin holes in all sides will be allowed except on the exposed face.

## SECTION 717
## ROADSIDE IMPROVEMENT MATERIAL

717.03 C. Method #3 - Roadside Mixture #3 Change the seed proportions to the following:

| | |
|---|---|
| Crown Vetch | 25% |
| Perennial Lupine | 25% |
| Red Clover | 12.5% |
| Annual Rye | 37.5% |

717.05 Mulch Binder Change the third sentence to read as follows:

"Paper fiber mulch may be used as a binder at the rate of 2.3 kg/unit [5 lb/unit]."

## SECTION 720
## STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS

720.08 U-Channel Posts Change the first sentence from "…, U-Channel posts…" to "…, Rib Back U-Channel posts…"

## SECTION 722
## GEOTEXTILES

722.01 Stabilization/Reinforcement Geotextile Add the following to note #3; "The strengths specified in the columns labeled"<50%" and "≥ 50%" refer to the elongation at which the geotextile material was tested. For example; if a fabric is tested at 15% elongation then it must meet or exceed the minimum strength shown in the "<50%" column. Submittals must include the percent elongation at which the material was tested."

722.02 Drainage Geotextile Add the following to note #3; "The strengths specified in the columns labeled"<50%" and "≥ 50%" refer to the elongation at which the geotextile material was tested. For example; if a fabric is tested at 15% elongation then it must meet or exceed the minimum strength shown in the "<50%" column. Submittals must include the percent elongation at which the material was tested."

722.01 Erosion Control Geotextile Add the following note to Elongation in the Mechanical Property Table; "The strengths specified in the columns labeled"<50%" and "≥ 50%" refer to the elongation at which the geotextile material was tested. For example; if a fabric is tested at 15% elongation then it must meet or exceed the minimum strength shown in the "<50%" column. Submittals must include the percent elongation at which the material was tested."

**DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP)**

# PERMIT BY RULE NOTIFICATION FORM

(For use with DEP Regulation, Chapter 305)

■ **MDOT PIN: NA**

**Name of Applicant:** State of Maine Department of Transportation **Name of Contact:** Jared Stanley
**Mailing Address:** 16 Station State House **Town/City:** Augusta **State:** Me. **Zip Code:** 04330-0016
**Daytime Telephone #:** 592-1627 **Name of Wetland, Water Body or Stream:** Unnamed Stream
**Detailed Directions to Site:** 2.0 mi north of intersection of Rt 11/43 and the Garland Rd, project is in Garland on the Garland Rd.

**Town/City:** Garland **Map #:** N/A **Lot #:** N/A **County:** Penobscot

**Description of Project:** Project scope is to **replace existing 96"(w) x 72" (h) x 24' Concrete Box with a 108"(w) x 84" (h) x 56' Concrete Box. Box will be installed to allow fish passage in accordance with DOT Fish Passage Policy and Design Guide, flat grade and has 24" of water in box.** The project will be performed in accordance with erosion control measures conforming with the latest versions of the *State of Maine Department of Transportation Standard Specifications for Highways and Bridges* and the *Department of Transportation's Best Management Practices for Erosion and Sediment Control.*

**Part of a larger project?** ☐**Yes** ☒**No**

(**CHECK ONE**) This project... ☒ does ☐ does not ...involve work below mean low water.

I am filing notice of my intent to carry out work which meets the requirements for Permit By Rule (PBR) under DEP Regulation, Chapter 305. I have a copy of PBR Sections checked below. I have read and will comply with all of the standards.

| | | |
|---|---|---|
| ☐Sec. (2) Soil Disturbance | ☐Sec. (8) Shoreline stabilization | ☐Sec. (14) Piers, Wharves & Pilings |
| ☐Sec. (3) Intake Pipes | ☐Sec. (9) Utility Crossing | ☐Sec. (15) Public Boat Ramps |
| ☐Sec. (4) Replacement of Structures | ☐Sec. (10) Stream Crossing | ☐Sec. (16) Coastal Sand Dune Projects |
| ☐Sec. (5) REPEALED | ☒Sec. (11) State Transport. Facilities | ☐Sec. (17) Transfers/Permit Extension |
| ☐Sec. (6) Movement of Rocks or Vegetation | ☐Sec. (12) Restoration of Natural Areas | ☐Sec. (18) Maintenance Dredging |
| ☐Sec. (7) Outfall Pipes | ☐Sec. (13) F&W Creation/Enhance/Water Quality Improvement | |

I authorize staff of the Departments of Environmental Protection, Inland Fisheries & Wildlife, and Marine Resources to access the project site for the purpose of determining compliance with the rules. I also understand that ***this permit is not valid until approved by the Department or 14 days after receipt by the Department, whichever is less.***

I have attached all of the following required submittals. **NOTIFICATION FORMS CANNOT BE ACCEPTED WITHOUT THE NECESSARY ATTACHMENTS:**

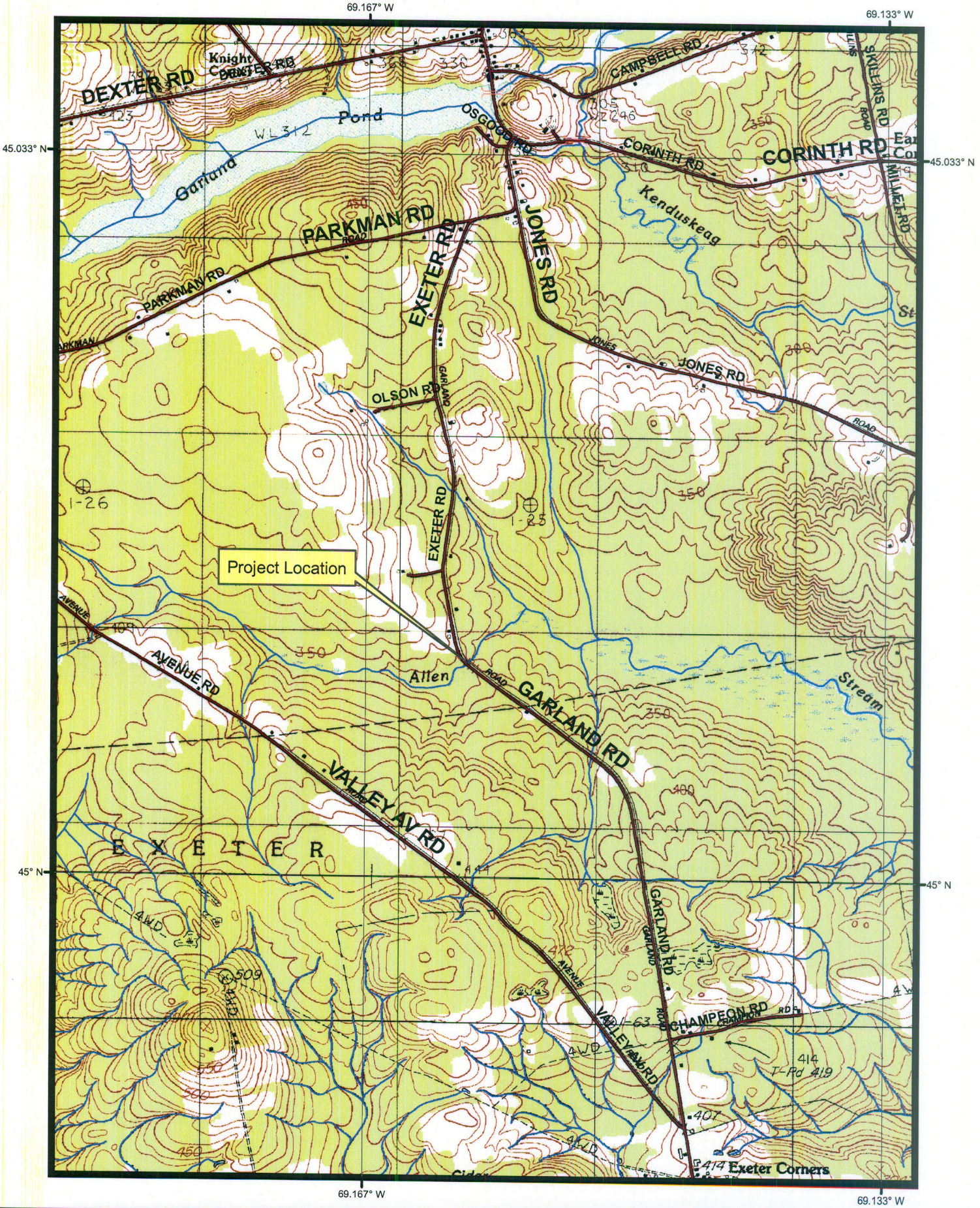
- ■ **A $55 (non-refundable) payment shall be done by internal billing.**
- ■ ***Attach* a U.S.G.S. topo map or Maine Atlas & Gazetteer map with the project site clearly marked.**
- ❑ ***Attach* photographs showing existing site conditions (unless not required under standards).**

**Signature of Applicant:** Judy C. Gates **Date:** 2/16/11
Judy Gates, MaineDOT Env Office Director

*Keep the bottom copy as a record of permit.* Send the form with attachments via certified mail to the Maine Dept. of Environmental Protection **at the appropriate regional office listed below**. The DEP will send a copy to the Town Office as evidence of the DEP's receipt of notification. No further authorization by DEP will be issued after receipt of notice. Permits are valid for two years. **Work carried out in violation of any standard is subject to enforcement action.**

AUGUSTA DEP STATE HOUSE STATION 17 AUGUSTA, ME 04333-0017 (207)287-2111 PORTLAND DEP 312 CANCO ROAD PORTLAND, ME 04103 (207)822-6300 BANGOR DEP 106 HOGAN ROAD BANGOR, ME 04401 (207)941-4570 PRESQUE ISLE DEP 1235 CENTRAL DRIVE PRESQUE ISLE, ME 04769 (207)764-0477

| OFFICE USE ONLY | | Ck.# | Staff | | Staff | |
|---|---|---|---|---|---|---|
| PBR # | FP | Date | Acc. Date | | Def. Date | After Photos |




0 5001,000 2,000 3,000 4,000 Feet

# Garland

On Garland Road 2 miles from intersection of Rt 11/43.

-69.16 45.01

*Coordinates in North American Datum 1983 (Decimal Degrees)*

130

N W E S

## 11. State transportation facilities

### A. Applicability

(1) This section applies to the maintenance, repair, reconstruction, rehabilitation, replacement or minor construction of a State Transportation Facility carried out by, or under the authority of, the Maine Department of Transportation or the Maine Turnpike Authority, including any testing or preconstruction engineering, and associated technical support services.

(2) This section does not apply to an activity within a coastal sand dune system.

NOTE: The construction of a transportation facility other than roads and associated facilities may be subject to the Storm Water Management Law, 38 M.R.S.A. Section 420-D.

### B. Standards

(1) Photographs of the area to be altered by the activity must be taken before work on the site begins. The photographs must be kept on file and be made available at the request of the DEP.

(2) The activity must be reviewed by the Department of Inland Fisheries and Wildlife, the Department of Marine Resources, and the Atlantic Salmon Authority. The activity must be performed according to any recommendations from these authorities.

(3) The activity must be performed in accordance with erosion control measures conforming with the State of Maine Department of Transportation Standard Specifications for Highways and Bridges Revision of April 1995 and with the Department of Transportation's Best Management Practices for Erosion and Sediment Control, September 1997.

NOTE: Guidance on the use of erosion control best management practices can be obtained from the on site Construction Manager.

(4) Alignment changes may not exceed a distance of 200 feet between the old and new center lines in any natural resource.

(5) The activity may not alter more than 300 feet of shoreline (both shores added together) within a mile stretch of any river, stream or brook, including any bridge width or length of culvert.

(6) The activity may not alter more than 150 feet of shoreline (both shores added together) within a mile stretch of any outstanding river segment identified in 38 M.R.S.A. 480-P, including any bridge width or length of culvert.

(7) The activity must minimize wetland intrusion. The activity is exempt from the provisions of Chapter 310, the Wetland Protection Rules, if the activity alters less than 15,000 square feet of natural resources per mile of roadway (centerline measurement) provided that the following impacts are not exceeded within the 15,000 square foot area:

(a) 1,000 square feet of coastal wetland consisting of salt tolerant vegetation or shellfish habitat; or

(b) 5,000 square feet of coastal wetland not containing salt tolerant vegetation or shellfish habitat; or

(c) 1,000 square feet of a great pond.

All other activities must be performed in compliance with all sections of Chapter 310, the Wetland Protection Rules, except 310.2(C), 5(A), 9(1), 9(B) and 9(C).

(8) The activity may not permanently block any fish passage in any watercourse containing fish. The applicant must improve passage beyond what restriction may already exist unless the Department of Inland Fisheries and Wildlife, the Department of Marine Resources, and the Atlantic Salmon Authority concur that the improvement is not necessary.

(9) Rocks may not be removed from below the normal high water line of any coastal wetland, freshwater wetland, great pond, river, stream or brook except to the minimum extent necessary for completion of work within the limits of construction.

(10) If work is performed in a river, stream or brook that is less than three feet deep at the time and location of the activity, with the exception of culvert installation, the applicant must divert flow away from the activity while work is in progress.

(a) Diversion may be accomplished by the use of stable, inert material. No more than two thirds (2/3) of stream width may be diverted at one time.

(b) Any material used to divert water flow must be completely removed upon completion of the activity, and the stream bottom must be restored to its original condition.

(c) A pump may be operated, where necessary, for a temporary diversion. The pump outlet must be located and operated such that erosion or the discharge of sediment to the water is prevented.

NOTE: Guidance on the appropriate location of a diversion and materials which should be used for a stream diversion can be obtained from the on site Construction Manager.

(11) Wheeled or tracked equipment may not operate in the water. Equipment operating on the shore may reach into the water with a bucket or similar extension. Equipment may cross streams on rock, gravel or ledge bottom.

(12) All wheeled or tracked equipment that must travel or work in a vegetated wetland area must travel and work on mats or platforms.

(13) Any debris or excavated material must be stockpiled either outside the wetland or on mats or platforms. Hay bales or silt fence must be used, where necessary, to prevent sedimentation. Any debris generated during the activity must be prevented from washing downstream and must be removed from the wetland or water body. Disposal

of debris must be in conformance with the Maine Hazardous Waste, Septage and Solid Waste Management Act, 38 M.R.S.A. Section 1301 *et seq.*

(14) Work below the normal high water line of a great pond, river, stream or brook must be done at low water except for emergency work or work agreed to by the resource agencies listed in paragraph 2 above. Measures, such as a silt boom or staked fencing, must be employed to reduce and isolate turbidity.

(15) Perimeter controls must be installed before the work starts. Disturbance of natural resources beyond the construction limits shown on the plans is not allowed under this rule.

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NOTE: Guidance on the location of construction limits can be obtained from the on site Construction Manager.

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(16) The use of untreated lumber is preferred. Lumber pressure treated with chromated copper arsenate (CCA) may be used, provided it is cured on dry land in a manner that exposes all surfaces to the air for a period of at least 21 days prior to construction. Wood treated with creosote or pentachlorophenol may not be used where it will contact water.

(17) A temporary road for equipment access must be constructed of crushed stone, blasted ledge, or similar materials that will not cause sedimentation or restrict fish passage. Such roads must be completely removed at the completion of the activity. In addition, any such temporary roads which are in rivers, streams or brooks, must allow for a passage of stormwater flows associated with a 10-year storm.

(18) Soil may not be disturbed during any period when soils are saturated due to rain or snow melt, except as necessary to protect work in progress or as required for bridge maintenance activities. Areas where soils are saturated (i.e. water drips from the soil when squeezed by hand, or the soil is capable of being rolled into a rod 1/8th inch in diameter that does not crumble) must be immediately mulched if they are disturbed.

(19) Disturbed soil must be protected within one week from the time it was last actively worked, and prior to any storm event, using temporary or permanent measures such as the placement of riprap, sod, mulch, erosion control blankets, or other comparable measures.

(20) Hay bale or straw mulch, where used, must be applied at a rate of at least one bale per 500 square feet (1 to 2 tons per acre).

(21) If mulch is likely to be moved because of steep slopes or wind exposure, it must be anchored with netting, peg and twine, binder or other suitable method and must be maintained until a catch of vegetation is established over the entire disturbed area.

(22) In addition to the placement of riprap, sod, erosion control blankets or mulch, additional steps must be taken where necessary to prevent sedimentation of the water Evidence of sedimentation includes visible sheet, rill or gully erosion, discoloration of water by suspended particles and/or slumping of banks. Silt fences, staked hay bales and other sedimentation control measures, where planned for, must be in place

prior to the commencement of an activity, but must also be installed whenever necessary to prevent erosion and sedimentation.

NOTE: Guidance on the location and proper installation of erosion control measures can be obtained from the on site Construction Manager.

(23) Temporary erosion control measures must be maintained and inspected weekly until the site is permanently stabilized with vegetation or other permanent control measures. Erosion control measures must also be inspected immediately prior to and following storms.

(24) Permanent erosion control measures protecting all disturbed areas must be implemented within 30 days from the time the areas were last actively worked, or for fall and winter activities by the following June 15, except where precluded by the type of activity (e.g. riprap, road surfaces, etc.). The permanent erosion control measures must be maintained.

(25) The applicant shall immediately take appropriate measures to prevent erosion or sedimentation from occurring or to correct any existing problems, regardless of the time of year.

(26) Non-native species may not be planted in restored areas.

(27) Disposal of debris must be in conformance with Maine Hazardous Waste, Septage and Solid Waste Management Act, 38 M.R.S.A. Sections 1301 *et seq.*

(28) Disturbance of vegetation must be avoided, if possible. Where vegetation is disturbed outside of the area covered by any road or structure construction, it must be reestablished immediately upon completion of the activity and must be maintained.

(29) A vegetated area at least 25 feet wide must be established and maintained between any new stormwater outfall structure and the high water line of any open water body. A velocity reducing structure must be constructed at the outlet of the stormwater outfall that will create sheet flow of stormwater, and prevent erosion of soil within the vegetated buffer. If the 25 foot vegetated buffer is not practicable, the applicant must explain the reason for a lesser setback in writing. Approval from the DEP must be in writing and any recommendations must be incorporated into the activity.

**C. Definitions.** The following terms, as used in this chapter, have the following meanings, unless the context indicates otherwise:

(1) Diversion. A rerouting of a river, stream or brook to a location outside of its established channel.

(2) Fill. a. (verb) To put into or upon, supply to, or allow to enter a water body or wetland any earth, rock, gravel, sand, silt, clay, peat, or debris; b. (noun) Material, other than structures, placed in or immediately adjacent to a wetland or water body.

(3) Floodplain wetlands. Freshwater wetlands that are inundated with flood water during a 100-year flood event based on flood insurance maps produced by the Federal Emergency Agency or other site specific information.

(4) Riprap. Rocks that are fit into place, usually without mortar, on a slope as defined in the State of Maine, Department of Transportation, Standard Specifications for Highway and Bridges, revision of April 1995.

DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT, CORPS OF ENGINEERS
696 VIRGINIA ROAD
CONCORD, MASSACHUSETTS 01742-2751

REPLY TO
ATTENTION OF

Regulatory Division
CENAE-R-51
Permit Number: NAE-2011-00615

JUN 14 2011

Judy Gates, Director
Office of Environmental Services
Maine Dept. of Transportation
16 State House Station
Augusta, Maine 04333

Dear Ms Gates:

Attached are two copies of a Department of the Army permit authorizing the work described therein. Your signature is necessary to execute this permit. The authorized work cannot start until we receive a complete, signed copy of the permit. If the conditions are acceptable, please sign both copies and return one signed copy of the entire permit to "Regulatory Division" at the address above. No fee is required.

You are required to complete and return the attached forms to this office:

a. Work Start Notification Form at least two weeks before the anticipated work start date.

b. Compliance Certification Form within one month following the completion of the authorized work.

This permit is a limited authorization containing a specific set of conditions. Please read the permit thoroughly to familiarize yourself with those conditions. If a contractor does the work for you, both you and the contractor are responsible for ensuring that the work is done in compliance with the permit's terms and conditions, as any violations could result in civil or criminal penalties.

The Corps of Engineers has consulted with the National Marine Fisheries Service ("NMFS") regarding the effects of your project on Essential Fish Habitat ("EFH") designated under the Magnuson-Stevens Fishery Conservation and Management Act. The NMFS did not provide EFH conservation recommendations and instead deferred to the Endangered Species Act consultation process between the Corps and the U.S. Fish & Wildlife Service. The consultation process resulted in conditions designed to minimize potential impacts to Atlantic salmon, Atlantic salmon critical habitat, and other fisheries. The conditions may be found on Pages 5-8 of the attached permit.

Our verification of this project's wetland delineation under the Corps of Engineers Wetlands Delineation Manual, and its applicable supplement, is valid for a period of five years from the date of this letter unless new information warrants revision of the determination before the expiration date.

A combined Notification of Administrative Appeal Options and Process ("NAP") and Request for Appeal ("RFA") form, and flow chart explaining the appeals process and your options, are attached to this letter. If you desire to appeal this proffered permit, you must submit a completed RFA form along with any supporting or clarifying information to Michael G. Vissichelli, Administrative Appeals Review Officer, North Atlantic Division, Corps of Engineers, North Atlantic Fort Hamilton Military Community, Bldg. 301, General Lee Avenue, Brooklyn, NY 11252-6700. Contact information: (718) 765-7163 or michael.g.vissichelli@usace.army.mil.

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP.

You may not appeal conditions contained in the State water quality certification or the CZM consistency determination under this program as they are automatically included in the federal permit. Also note that the Department of the Army permit process does not supersede any other agency's jurisdiction.

We continually strive to improve our customer service. In order for us to better serve you, we would appreciate your completing our Customer Service Survey located at http://per2.nwp.usace.army.mil/survey.html

If you have any questions regarding this correspondence, please contact Jay Clement at 207-623-8367 at our Manchester, Maine Project Office.

Sincerely,

Jennifer L. McCarthy
Chief, Regulatory Division

Attachments

US Army Corps
of Engineers®
New England District

# INDIVIDUAL PERMIT
# WORK-START NOTIFICATION FORM
(Minimum Notice: Two weeks before work begins)

**********
* MAIL TO: U.S. Army Corps of Engineers, New England District *
* Policy Analysis/Technical Support Branch *
* Regulatory Division *
* 696 Virginia Road *
* Concord, Massachusetts 01742-2751 *
**********

Corps of Engineers Permit No. NAE-2011-00615 was issued to the Maine Dept. of Transportation. This work is located in numerous waterways throughout the State of Maine. The permit authorized the permittee to place permanent and temporary fills in order to repair, rehabilitate, or replace 11 existing deteriorated bridges and culverts.

The people (e.g., contractor) listed below will do the work, and they understand the permit's conditions and limitations.

**PLEASE PRINT OR TYPE**

**Name of Person/Firm:** _____

**Business Address:** _____

_____

_____

_____

**Telephone Numbers:** (___) _____ (___) _____

**Proposed Work Dates:** **Start:** _____ **Finish:** _____

**Permittee/Agent Signature:** _____ **Date:** _____

**Printed Name:** _____ **Title:** _____

Date Permit Issued: _____ Date Permit Expires: _____

**********

**FOR USE BY THE CORPS OF ENGINEERS**

**PM:** Clement **Submittals Required:** _____

**Inspection Recommendation:** Inspections should be tied to annual random inspections of General Permit projects

US Army Corps of Engineers ®
New England District

(Minimum Notice: Permittee must sign and return notification within one month of the completion of work.)

**COMPLIANCE CERTIFICATION FORM**

**USACE Project Number**: NAE-2011-00615

**Name of Permittee**: Maine Dept. of Transportation

**Permit Issuance Date**: _____

Please sign this certification and return it to the following address upon completion of the activity and any mitigation required by the permit. You must submit this after the mitigation is complete, but not the mitigation monitoring, which requires separate submittals.

**********
* MAIL TO: U.S. Army Corps of Engineers, New England District *
*
* Policy Analysis/Technical Support Branch, ATTN: Marie Farese *
*
* Regulatory Division *
* 696 Virginia Road *
* Concord, Massachusetts 01742-2751 *
**********

Please note that your permitted activity is subject to a compliance inspection by an U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification, or revocation.

**I hereby certify that the work authorized by the above referenced permit was completed in accordance with the terms and conditions of the above referenced permit, and any required mitigation was completed in accordance with the permit conditions.**

_____ _____

***Signature of Permittee*** ***Date***

_____ _____

***Printed Name*** ***Date of Work Completion***

(____) _____ (____) _____

***Telephone Number*** ***Telephone Number***

DEPARTMENT OF THE ARMY PERMIT

Permittee Maine Dept. of Transportation, 16 State House Station, Augusta, Maine 04333

Permit No. NAE-2011-00615

Issuing Office New England District

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description:

Place permanent and temporary fill below the ordinary high water line of numerous waterways at eleven locations throughout the State of Maine in order to repair, rehabilitate, or replace numerous existing deteriorated bridges or culverts.

**Project Description Continued on Page 4**

This work is shown on the attached plans entitled, "MAINE DOT, BRIDGE/CULVERT REPAIR, REPLACEMENT, OR REHAB PROJECTS, MULTIPLE STATEWIDE LOCATIONS", on 26 sheets dated "MARCH 2011".

Project Location:

In numerous waterways throughout the State of Maine

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on December 31, 2016. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

1. The permittee shall ensure that a copy of this permit is at the work site whenever work is being performed and that all personnel performing work at the site of the work authorized by this permit are fully aware of the terms and conditions of the permit. This permit, including its drawings and any appendices and other attachments, shall be made a part of any and all contracts and subcontracts for work which affects areas of Corps of Engineers jurisdiction at the site of the work authorized by this permit. This shall be done by including the entire permit in the specifications for work.

**Special Conditions continued on Page 4**

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

( ) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(X) Section 404 of the Clean Water Act (33 U.S.C. 1344).

( ) Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

Judy C. Gates — 6/15/2011

*(PERMITTEE)* — *(DATE)*

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

6-14-2011

*(DISTRICT ENGINEER)* — *(DATE)*

**Philip T. Feir**
**Colonel, Corps of Engineers**

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

*(TRANSFEREE)* — *(DATE)*



☆U.S. GOVERNMENT PRINTING OFFICE: 1986 — 717-425

**Project Description Continued from Page 1**

This work is designed to address critical bridges and other structures that need immediate attention to insure public safety and protect the economic vitality of Maine's transportation network. Refer to attached table(s) for a list of locations, scope of work, and anticipated impacts.

**Special Conditions continued from Page 2**

If the permit is issued after the construction specifications but before receipt of bids or quotes, the entire permit shall be included as an addendum to the specifications. If the permit is issued after receipt of bids or quotes, the entire permit shall be included in the contract or sub-contract as a change order. The term "entire permit" includes permit amendments. Although the permittee may assign various aspects of the work to different contractors or sub-contractors, all contractors and sub-contractors shall be obligated by contract to comply with all environmental protection provisions of the entire permit, and no contract or sub-contract shall require or allow unauthorized work in areas of Corps jurisdiction.

2. The permittee shall complete and return the enclosed Compliance Certification Form within one month following the completion of the authorized work (at each site).

3. Adequate sedimentation and erosion control devices, such as geo-textile silt fences or other devices capable of filtering the fines involved, shall be installed and properly maintained to minimize impacts during construction. These devices must be removed upon completion of work and stabilization of disturbed areas. The sediment collected by these devices must also be removed and placed upland, in a manner that will prevent its later erosion and transport to a waterway or wetland.

4. The permittee shall implement all terms and conditions contained in water quality certifications from the Maine Dept. of Environmental Protection. Copies of all required submittals shall also be provided to the Corps.

5. No temporary fill (e.g., access roads, cofferdams) may be placed in waters or wetlands unless specifically authorized by this permit. If temporary fill is used, it shall be disposed of at an upland site and suitably contained to prevent its subsequent erosion into a water of the U.S., and the area shall be restored to its original contours (but not higher) and character upon completion of the project. During use, such temporary fill must be stabilized to prevent erosion or, in the case fill placed in flowing water (rivers or streams), clean washed stone should be used.

6. Except where stated otherwise, reports, drawings, correspondence and any other submittals required by this permit shall be marked with the words "Permit No. NAE-2011-00615" and shall be addressed to "Inspection Section, CENAE-R, U.S. Army Corps of Engineers, 696 Virginia Road, Concord, MA 01742-2751." Documents which are not marked and addressed in this manner may not reach their intended destination and do not comply with the requirements of this permit.

**Special Conditions Continued on Page 5**

**Special Conditions Continued from Page 4**

7. The permittee shall minimize the adverse effects to Atlantic salmon and its critical habitat and incidental take of Atlantic salmon in the rivers and streams where bridge or culvert projects will occur by employing construction techniques that avoid or minimize adverse effects to water quality, aquatic and riparian habitats, and other aquatic organisms. He shall also minimize adverse effects to Atlantic salmon and its critical habitat and incidental take of Atlantic salmon by ensuring that fish passage and habitat connectivity at culverts and bridges is either maintained in its current condition or is improved by the replacement or rehabilitated structure. In meeting these requirements, the permittee shall comply with the attached conditions entitled "Corps of Engineers Permit No. NAE-2011-00615, Permit Special Conditions Resulting From Formal Endangered Species Act Consultation With U.S. Fish & Wildlife Service".

9. In-water work window extension. A project-specific time-of-year restriction may be extended by as much as 10 days without having to formally request permit modification provided:

a. The project site does not support federally endangered Atlantic salmon or its critical habitat. Any extension requests for these sites will be reviewed on a case-by-case basis and may require re-initiation of consultation.

b. Only the Maine DOT Coordination & Permits Division Manager or the Environmental Office Director may grant such an extension and only after state and/or federal fisheries agencies that initially requested the restriction have been notified and approve the extension request. It is understood that any request to fisheries agencies will include the need and justification for such an extension; that it will be a one-time only request; and that Maine DOT will not submit extension requests for projects delayed due to issues of scheduling or failure to complete work due to conditions within a contractor's control.

For any project that receives an extension to its time of year restriction, Maine DOT shall notify the Corps in writing to include the agency approval so the modification of an approved in-water work window for the project can be documented in the permit record.

**Special Conditions Continued on Page 6**

**Special Conditions Continued from Page 5**

Corps of Engineers Permit No. NAE-2011-00615
Permit Special Conditions Resulting From
Formal Endangered Species Act Consultation
With US Fish & Wildlife Service ("USFWS")
(Reference USFWS Biological Opinion ("BO") dated "May 10, 2011" and
the Corps Biological Assessment ("BA") dated "February 2011")

1. Maine DOT shall hold a pre-construction meeting for each project with the appropriate Maine DOT Environmental Office staff, other Maine DOT staff, and the Maine DOT construction crew or the contractor(s), to review all procedures and requirements for avoiding and minimizing impacts to Atlantic salmon and to emphasize the importance of these measures for protecting salmon and their habitat. Corps of Engineers and USFWS staff shall be notified of and will attend these meetings where practicable.

2. All instream work (which includes the installation and removal of cofferdams, as well as other activities) shall be conducted according to the work windows specified in the BA.

3. All projects authorized by this permit shall be designed in accordance with Maine DOT's 2008 Waterway and Wildlife Crossing Policy and Design Guide.[1]

4. Maine DOT and their contractors shall minimize the potential for impacts to Atlantic salmon and their habitat by conducting all construction activities for each project in accordance with the Maine DOT-approved Soil Erosion and Water Pollution Control Plan. Instream turbidity will be visually monitored. All erosion controls will be inspected daily to ensure that the measures taken are adequate. If monitoring or inspection shows that the erosion controls are ineffective, they shall be immediately repaired, replaced, or reinforced as necessary.

5. All areas of temporary waterway or wetland fill will be restored to their original contour and character upon completion of the projects.

6. Disturbed areas adjacent to the stream will be stabilized and re-vegetated with a seed mix appropriate for riparian areas in Maine.

7. A fish evacuation plan must be implemented by appropriate Maine DOT staff during construction and dewatering of all cofferdams to carefully remove fish from the work area.

8. Maine DOT shall visually assess and report the levels of incidental take in terms of the extent of the stream channel dewatered during construction activities, including: 1) a summary of the length of each stream channel dewatered; and 2) a summary of the length of time each stream channel is dewatered. Maine DOT shall cease operations immediately and shall contact the USFWS if the amount of take is exceeded (USFWS, Maine Field Office, Orono, Maine; 207-866-3344).

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[1] Maine Department of Transportation (MEDOT). 2008b. Waterway and wildlife crossing policy and design guide for aquatic organism, wildlife habitat, and hydrologic connectivity. 3rd edition. Maine Department of Transportation, Augusta, ME.

9. All Atlantic salmon mortalities from electrofishing or other related activities shall be reported to the USFWS within 48 hours of occurrence (Attn: Wende Mahaney at 207-866-3344, Ext. 118; Fax 207-866-3351; or wende_mahaney@fws.gov). Salmon mortalities shall be immediately preserved (refrigerated or frozen) for delivery to the USFWS Maine Field Office. If USFWS is not available, contact the National Marine Fisheries Service ("NMFS") in Orono, Maine to arrange for delivery (Attn: Jeff Murphy; 207-866-7379).

10. To prevent entrainment of Atlantic salmon juveniles, Maine DOT shall use a screen on each pump intake sufficiently large enough that the approach velocity does not exceed 6.10 $m/sec^{-1}$ (0.20 $ft/sec^{-1}$).[2] Square or round screen face openings are not to exceed 2.38 mm (3/32 inch) on a diagonal. Criteria for slotted face openings must not exceed 1.75 mm (approximately 1/16 inch) in the narrow direction. Intake hoses shall be regularly monitored while pumping to minimize potential adverse effects to Atlantic salmon.

11. Any cofferdam constructed as part of the authorized projects shall adhere to the specifications contained in Section 2.1 (Cofferdam Descriptions) of the BA.

12. All culvert installations authorized by this permit must adhere to the specifications contained in Section 2.2 (Culvert Replacement Projects) of the BA.

13. All cofferdams shall be removed from the stream immediately following completion of construction, allowing for minor delays due to high stream flows following heavy precipitation, so that fish and other aquatic life passage is not unnecessarily restricted. If a project is not completed but there will be substantial delays in construction, cofferdams will need to be at least partially removed to allow unobstructed fish passage until construction resumes.

14. Noxious Weeds: All off-road equipment and vehicles (operating off of existing open and maintained roads) must be cleaned prior to entering the easement to remove all soil, seeds, vegetation, or other debris that could contain seeds or reproductive portions of plants. Equipment operators may employ whatever cleaning methods are necessary to ensure that off-road equipment is free for the above material prior to entering the easement portion of any access road. The equipment will be inspected prior to off-loading.

15. Maine DOT or their contractor will follow measures designed to avoid effects to rivers and streams from hazardous materials associated with construction activities, including:

a. All vehicle refueling shall occur more than 100 feet from any water course.

b. All vehicles carrying fuel shall have specific equipment and materials needed to contain or clean up any incidental spills at the project site. Equipment and materials would include spill kits appropriately sized for specific quantities of fuel, shovels, absorbent pads, straw bales, containment structures and liners, and/or booms.

c. During use, all pumps and generators shall have appropriate spill containment structures and/or absorbent pads in place.

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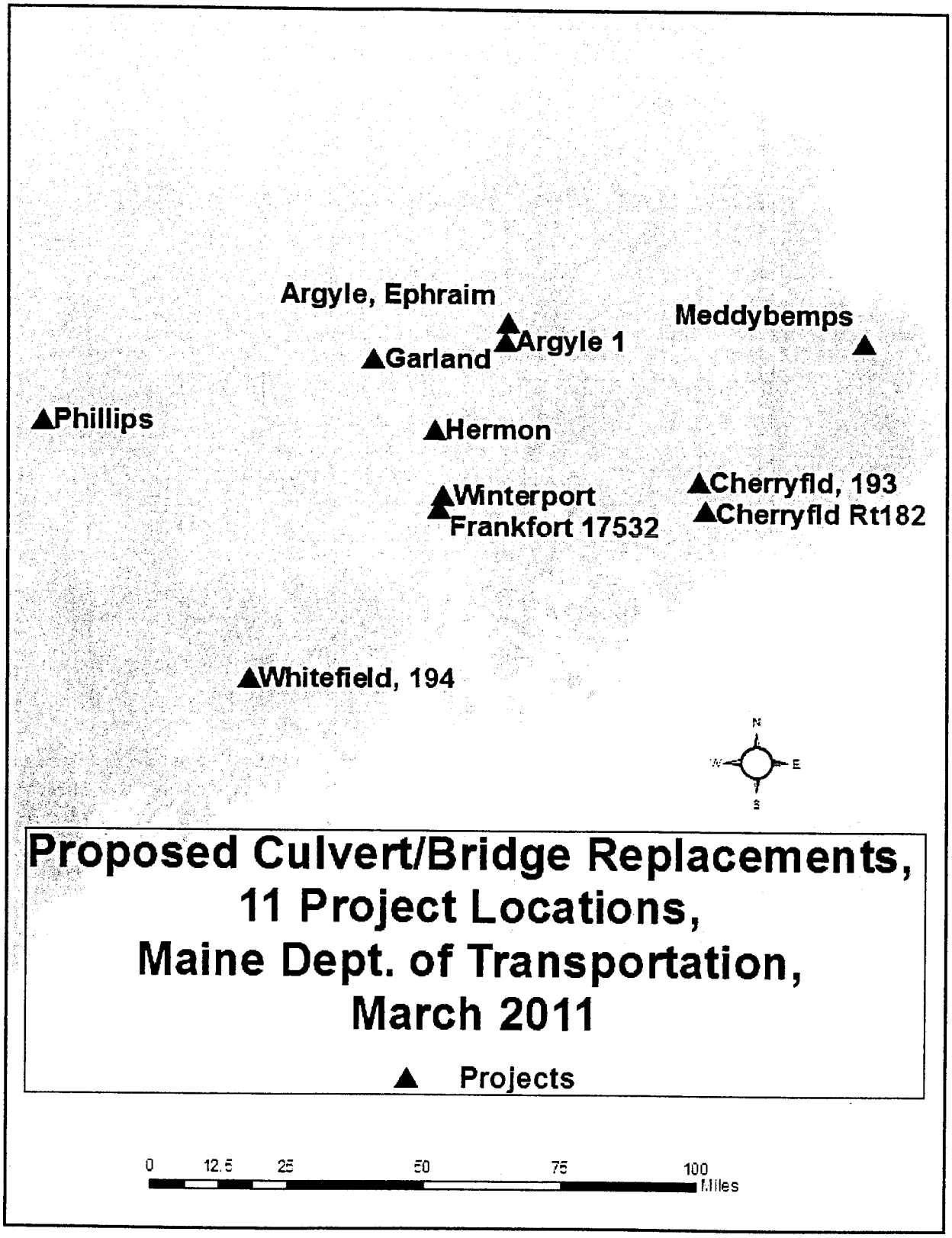
[2] For screen design, the effective screen area is calculated by dividing the maximum screened flow by the allowable approach velocity.

d. All equipment used for instream work shall be cleaned of external oil, grease, dirt, and mud. Any leaks or accumulations of grease would be corrected before entering streams or areas that drain directly to streams or wetlands.

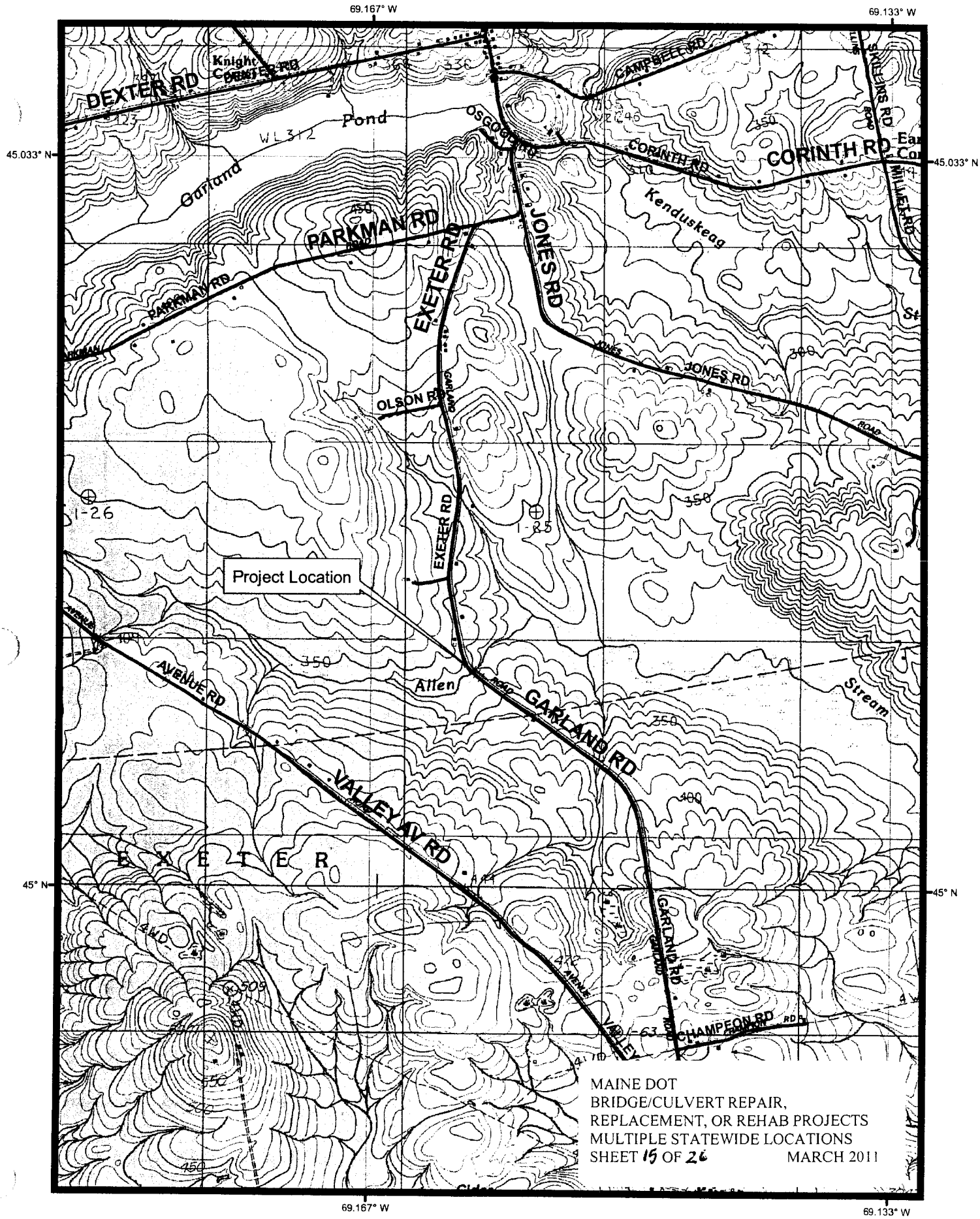
16. A post-project report for each project, confirming completion of construction and the successful application of all Endangered Species Act consultation related terms and conditions listed above, shall be submitted within four weeks of each project completion. Reports shall be submitted to USFWS and the Corps.

17. Annual monitoring reports that describe the procedures and results at each project, as well as numbers of fish captured and accidental fish mortalities, shall be submitted by March 31st of each year to USFWS (Attn: Wende Mahaney, 17 Godfrey Drive, Orono, Maine 04473) and the Corps (Attn: Jay Clement, Maine Project Office, 675 Western Avenue #3, Manchester, Maine 04351) and NMFS (Attn: Jeff Murphy, 17 Godfrey Drive, Orono, Maine 04473).


Argyle, Ephraim
Argyle 1
Garland
Meddybemps
Phillips
Hermon
Winterport
Frankfort 17532
Cherryfld, 193
Cherryfld Rt182
Whitefield, 194
N
W
E
S
Proposed Culvert/Bridge Replacements,
11 Project Locations,
Maine Dept. of Transportation,
March 2011
Projects
0
12.5
25
50
75
100
Miles

| Town | Location | _Code | HGM_Code | Area (SF) | Linear | Waters | Wetland Functions | Latitude(dd.ddd | Longitude dd.d | Local_Waterway | Watershed |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Argyle #1 | Route 116 | R2 | RIVERINE | 250 | 20 | RPW | Fish habitat- Groundwater disc | 45.05928922 | -68.67082385 | unnamed trib | Penobscot |
| Argyle #2 | Route 116 | R2 | RIVERINE | 255 | 20 | RPW | Fish habitat- Groundwater disc | 45.1057959 | -68.66078265 | Ephraim Brook | Penobscot |
| Cherryfield, Rt 182 | Route 182 | R2 | RIVERINE | 66 | | RPW | Fish habitat- Groundwater disc | 44.60112532 | -67.92802975 | unnamed trib to Narrag | Narraguagus |
| Cherryfield, Rt 193 | Route 193 | R2 | RIVERINE | 134 | | RPW | Fish habitat- Groundwater disc | 44.67956923 | -67.94972539 | unnamed trib to Schoo | Narraguagus |
| Frankfort | Loggin Road | R2 | RIVERINE | 77 | | RPW | Fish habitat- Groundwater disc | 44.61210079 | -68.91696339 | Meadow Brook | Marsh River |
| Garland, Garland Road | Garland Road | R2 | RIVERINE | 674 | | RPW | Fish habitat- Groundwater disc | 45.00992587 | -69.16007705 | Allen Stream | Kenduskeag |
| Hermon #1 Annis Road | Annis Road | R2 | RIVERINE | 1106 | | RPW | Fish habitat- Groundwater disc | 44.82108289 | -68.9311577 | unnamed trib to Black S | Soudabscook |
| Meddybemps | Route 191 | R2 | RIVERINE | 45 | | RPW | Fish habitat- Groundwater disc | 45.0465843 | -67.32752431 | unnamed trib to Meddy | Dennys |
| Phillips | Route 4 | R2 | RIVERINE | 50 | | RPW | Fish habitat- Groundwater disc | 44.83194308 | -70.39188558 | Cottle Brook | Sandy River |
| Whitefield, Rt. 194 | Route 194 | R2 | RIVERINE | 709 | 50 | RPW | Fish habitat- Groundwater disc | 44.15527641 | -69.61410532 | unnamed trib to Sheep | Sheepscot River |
| Winterport, Rt 139 | Route 139 | R2 | RIVERINE | 1422 | | RPW | Fish habitat- Groundwater disc | 44.64556401 | -68.90229262 | unnamed trib to Marsh | Marsh River |

| MaineDOT Batch May 2010 | | | | |
|---|---|---|---|---|
| **Project Name** | **Location** | **Scope** | **Name of Resource** | **Impacts** |
| Argyle #1 | Route 116 | The existing structure is a 48-inch x 80-foot corrugated metal pipe which will be replaced by 60-inch x 100-foot reinforced concrete pipe. | Unnamed Trib | Stream:<br>260 SF Direct<br>780 SF temp |
| Argyle #2 | Route 116 | The existing structure is a 36-inch x 80-foot corrugated metal pipe with an overflow pipe which will be replaced by a single 54-inch x 100-foot reinforced concrete pipe. | Ephriam Brook | Stream:<br>255 SF Direct<br>510 SF temp |
| Cherryfield | Route 182 | The project will involve the culvert end replacements of a 36-inch x 100-foot reinforced concrete pipe. | Unnamed Trib | Stream:<br>60 SF Direct<br>360 SF temp |
| Cherryfield | Route 193 | The existing structure is a 30-inch x 40-foot corrugated metal pipe with an overflow which will be replaced by a 60-inch x 50-foot elliptical pipe. | Unnamed Trib | Stream:<br>100 SF Direct<br>300 SF temp |
| Frankfort-17532.00 | Loggins Road | The existing structure are twin 6-foot x 50-foot corrugated metal pipes which will be replaced with a 12-foot span x 8-foot rise x 54-foot long concrete box | Meadow Brook | Stream:<br>270 SF Direct<br>810 SF temp |
| Garland | Garland Road | The existing structure is a 72-inch high x 96-inch wide x 24-foot concrete box which will be replaced with a 72-inch high x 96-inch wide x 60-foot concrete box. | Allen Stream | Stream:<br>728 SF Direct<br>780 SF temp |
| Hermon | Annis Road | The existing structure is a 48-inch x 60-foot corrugated metal pipe which will be replaced with a 72-inch x 60-foot reinforced concrete pipe. | Black Stream | Stream:<br>50 SF Direct<br>600 SF temp |
| Meddybemps | Route 191 | The existing structure is a 36-inch x 67-foot corrugated metal pipe which will be replaced with a 54-inch x 67-foot reinforced concrete pipe. | Lake | Stream:<br>50 SF Direct<br>300 SF temp |
| Phillips | Route 4 | This project will repair a wing wall on the bridge that has been severely undermined. This will be done by the bridge maintenance crew using grout bags | Cottle Brook | Stream:<br>100 SF Direct<br>0 SF temp |
| Winterport | Route 139 | This project will reface the wing walls on the concrete box that are deteriorating | Unnamed Trib | Stream:<br>0 SF Direct<br>1380 SF temp |
| Whitefield | Route 194 | The existing structures are perched twin 48-inch x 112-foot corrugated metal pipes which will be replaced with a 10-foot span x 8-foot rise x 114-foot long concrete box. | Unnamed Trib | Stream:<br>160 SF Direct<br>480 SF temp |




0 5001,000 2,000 3,000 4,000 Feet

# Garland

On Garland Road 2 miles from intersection of Rt 11/43.

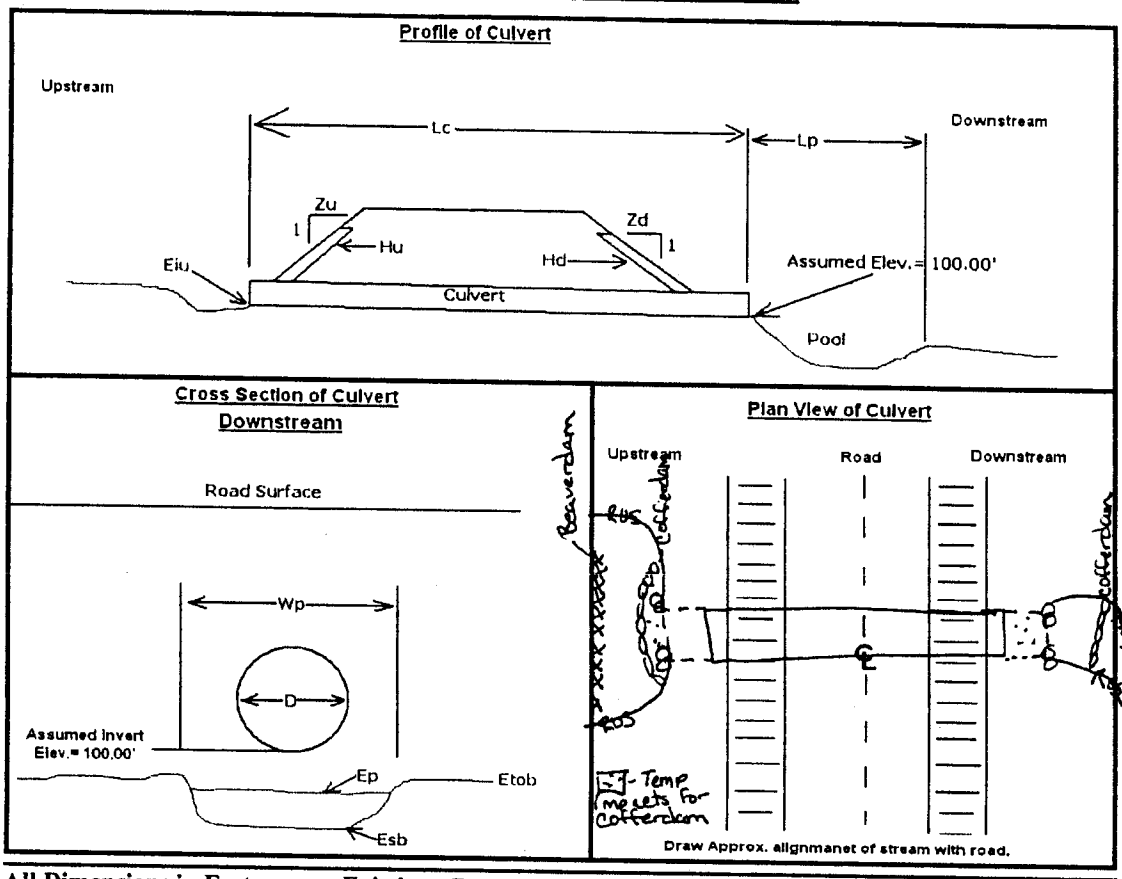
-69.16 45.01

MaineDOT Batch March 2011

151

N

Project Name: Garland Box . Investigator's Name: Jared Stanley. Date: 12/20/10 .
Project PIN: NA . Culvert Location: 2 mi on Garland Exeter Rd from intersection of Rt 11/43 .




--- New Box length

Impacts:
Permanent - 728ft² Rip Rap & Pipe
Temporary - 780ft² Cofferdam

| All Dimensions in Feet | | Existing | Proposed | | | | Existing | Proposed |
|---|---|---|---|---|---|---|---|---|
| Lc | Length of Culvert | 24 | 60 | | Er | Elev. of Road CL | 109 | 109 |
| Lp | Length of Pool | 40 | 24 | | Etob | Elev. Top of Bank (DS) | 103 | 104 |
| Wp | Width of pool | 18 | 18 | | Hu* | Headwall Treatment (US) | CC | RR/V |
| Eiu | Elev. of Invert (US) | 100 | 99 | | Hd* | Headwall Treatment (DS) | CC | RR/V |
| Ep | Elevation of Water (DS Pool) | 101 | 102 | | Zu | Slope Value (US) | Vert | 2:1 |
| Esb | Elev.of Streambed one pipe diameter DS | 98 | 98 | | Zd | Slope Value (DS) | Vert | 2:1 |

Elevation of lowest downstream invert is assumed to be 100.00' and all other elevations are relative to it.
* Types of Headwall Treatments: RR (Rip Rap), CC (Concrete), SB (Stone Block), V (Vegatation)

| All Dimensions in Feet | | (EXISTING) Pipe 1 | Pipe 2 | Pipe 3 | | (PROPOSED) Pipe 1 | Pipe 2 | Pipe 3 |
|---|---|---|---|---|---|---|---|---|
| D | Diameter of Pipe | 6'R x 8'S | | | | 7'Rx9.5'S | | |
| Pt | Type of Pipe* | Concrete | | | | concrete | | |
| Ps | Shape of Pipe** | Box | | | | Box | | |

* Types of Pipes: RCP (Renforced Concrete), CMP (Corrigated Metal), HDPE (High density Polyethylene), PA (Pipe arch), OB (open bottom), SB (Stone box) may enter multiple values

# United States Department of the Interior
FISH AND WILDLIFE SERVICE

Maine Field Office – Ecological Services
17 Godfrey Drive, Suite #2
Orono, ME 04473
(207) 866-3344 Fax: (207) 866-3351

In Reply Refer to:
FWS/Region5/ES/MEFO

Re: Formal Consultation for replacement and/or rehabilitation of culverts and bridges throughout the State of Maine (Log No. 53411-2011-F-0140)

LTC Steven M. Howell, Deputy District Engineer
U.S. Army Corps of Engineers
New England District
696 Virginia Road
Concord, MA 01742-2751

May 10, 2011

Dear Colonel Howell:

The enclosed document contains a biological opinion (Opinion) prepared by the U.S. Fish and Wildlife Service (USFWS) pursuant to section 7(a)(2) of the Endangered Species Act (ESA) on the effects of the U.S. Army Corps of Engineers (ACOE) proposal to issue a permit under section 404 of the Clean Water Act in order to rehabilitate and/or reconstruct multiple culverts and bridges throughout the State of Maine. In this Opinion, USFWS concludes that the action, as proposed, is not likely to jeopardize the continued existence of Atlantic salmon or result in the destruction or adverse modification of designated critical habitat for Atlantic salmon.

As required by section 7 of the ESA, USFWS provided an incidental take statement with the Opinion. The incidental take statement describes reasonable and prudent measures USFWS considers necessary or appropriate to minimize incidental take associated with this action. The take statement sets forth nondiscretionary terms and conditions, including reporting requirements, that the Federal agency, and any person involved with these projects, must comply with to carry out the reasonable and prudent measures. Incidental take from activities that meet these terms and conditions will be exempt from the ESA take prohibition. To ensure that this consultation remains valid, USFWS requests that the action agency or applicant keep us informed of any proposed changes to the projects and gets clearance from us before implementing such changes.

Ms. Wende Mahaney (207) 866-3344 ext. 118 is the USFWS contact for this consultation.

Sincerely,

Laury Zicari, Field Supervisor
Maine Field Office

**ENDANGERED SPECIES ACT SECTION 7 CONSULTATION**

**BATCHED BIOLOGICAL OPINION**

| | |
|---|---|
| Lead Action Agency: | Department of the Army, Corps of Engineers, New England District |
| Activity: | Proposed rehabilitation and/or reconstruction of multiple culverts, struts, and bridges throughout the State of Maine (Corps of Engineers file number: NAE-2011-00615) |
| Consultation Conducted By: | U.S. Fish and Wildlife Service, Maine Field Office [53411-2011-F-0140] |
| Date Issued: | May 10, 2011 |

Approved by: 

Laury Zicari,
Field Supervisor

cc: Jay Clement, ACOE - Manchester, ME
Mark Hasselmann, FHWA – Augusta, ME
Jeff Murphy, NOAA Fisheries – Orono, ME
Norm Dube, MEDMR – Bangor, ME
Steve Timpano, MEIFW- Augusta, ME
John Perry, MEDOT – Augusta, ME

## TABLE OF CONTENTS

## INTRODUCTION

This constitutes the biological opinion (Opinion) of the U.S. Fish and Wildlife Service (USFWS) for eleven proposed road crossing projects proposed by the Maine Department of Transportation (MEDOT) within the Gulf of Maine (GOM) Distinct Population Segment (DPS) for Atlantic salmon (*Salmo salar*). This Opinion and incidental take statement were prepared by the USFWS in accordance with section 7(b) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531, *et seq.*), and implementing regulations at 50 CFR 402. With respect to designated critical habitat, the following analysis relied only on the statutory provisions of the ESA, and not on the regulatory definition of "destruction or adverse modification" at 50 CFR 402.02.

### Background and Consultation History

**October 26, 2010** – Clayton Hawkes (USFWS) of the Maine Field Office (MEFO) visited Argyle #1, Argyle #2, Garland, Hermon, and other stream crossings in the region with MEDOT staff to begin the screen process.

**November 4, 2010** – Clayton Hawkes visited Cherryfield-Rte 182, Cherryfield-Rte 193, Meddybemps, and other stream crossings in the region with MEDOT staff.

**November 16, 2010** – Clayton Hawkes visited Whitefield-Rte194 and other stream crossings in the region with MEDOT staff.

**December 8, 2010** – Clayton Hawkes visited the Frankfort (PIN: 17532) project.

**December 22, 2010** – John Perry (MEDOT) provided hydrology and FishXing 3.0 (USDA-FS 2010) results for most the proposed culvert replacements.

**December 28, 2010** – Clayton Hawkes met with John Perry to go over format for a preliminary draft of MEDOT's biological assessment (BA) and FishXing results for most of the crossings.

**January 4, 2011** – Clayton Hawkes visited Argyle #2 to determine Ephraim Brook's bankfull width.

**January 5, 2011** – MEDOT uploaded a first draft of its BA, with additional projects added to the batch, on to the Federal Highway Administration (FHWA) "online file cabinet" for MEFO to review. MEFO subsequently provided comments on the draft BA.

**January 28, 2011** – Clayton Hawkes met with MEDOT (Charles Hebson, John Perry, Eric Ham), U.S. Geological Survey (Rob Dudley, Glenn Hodgkins), FHWA (Bart Bergendahl), Region 5 Fish Resource/Passage Engineers (Brett Towler, Curt Orvis, Dan Kuzmeskus) and others, to review MEDOT's hydrology calculations, which provide input to FishXing model high/low fish passage design flows and structure design.

**February 7, 2011** – MEDOT and Project SHARE committed to collaborate on the design and installation of the Cherryfield-Rte-193 road crossing project, which is on a tributary to Schoodic Brook in the Narraguagus River watershed. Project SHARE will contribute design assistance and funds necessary to increase the pipe size to a 60-inch elliptical structure.

**February 9, 2011** – MEDOT uploaded a final draft of its BA on to the FHWA file cabinet.

**March 3, 2011** – The ACOE initiated formal consultation with the submission of a Biological Assessment (Appendix A) to the USFWS.

**March 8, 2011** – Letter from USFWS to ACOE acknowledging initiation of formal section 7 consultation. USFWS's biological opinion is due to the ACOE by July 20, 2011.

**April 24, 2011** – USFWS shared the draft BO with MEDOT and the ACOE for review and comment.

The consultation history for this action also includes numerous other telephone conversations and electronic mail exchanges between staff of the USFWS, MEDOT, and ACOE to share additional information or make relatively minor changes to the scopes of individual projects. The ACOE is considering authorization for these projects under section 404 of the Clean Water Act (CWA).

This Opinion presents USFWS' review of the status of Atlantic salmon, the condition of designated critical habitat, the environmental baseline for the action area, all the effects of the action as proposed, and cumulative effects (50 CFR 402.14(g)). For the jeopardy analysis, USFWS analyzes those combined factors to conclude whether the proposed action is likely to appreciably reduce the likelihood of both the survival and recovery of the affected listed species.

This Opinion is based on the following: 1) information provided in the ACOE March 3, 2011, initiation letter and attachments in support of formal consultation under the ESA; 2) the March 23, 2011, MEDOT permit application to the ACOE under section 404 of the CWA; 3) Final Endangered Status for a Distinct Population Segment of Anadromous Atlantic Salmon (*Salmo salar*) in the Gulf of Maine (65 FR 69459; November 17, 2000); 4) Status Review for Anadromous Atlantic Salmon (*Salmo salar*) in the United States (Fay *et al.* 2006); 5) Determination of Endangered Status for the Gulf of Maine Distinct Population Segment of Atlantic salmon; Final Rule (74 FR 29345; June 19, 2009); 6) Designation of Critical Habitat for Atlantic salmon Gulf of Maine Distinct Population Segment (74 FR 29300; June 19, 2009 and 74 FR 39903; August 10, 2009); 7) field investigations; 8) numerous meetings; and 9) other sources of information. A complete administrative record of this consultation will be maintained by the USFWS Maine Field Office in Orono, Maine. The USFWS log number is 53411-2011-F-0140.

# BIOLOGICAL OPINION

## I. DESCRIPTION OF THE PROPOSED ACTION

For purposes of this consultation, the proposed action is the ACOE's issuance of a permit to discharge fill below the below the ordinary high water mark in habitat occupied by ESA-listed fish in order to replace or rehabilitate multiple culverts and make repairs to one bridge, throughout the State of Maine. One of the projects (Frankfort, PIN: 17532) could be partially funded by the FHWA; but since all eleven of the projects require federal permitting the Corps is the lead action agency in this consultation. These projects would all be carried out by the MEDOT, although the actual construction work will often be done by hired contractors under the oversight of MEDOT staff. The eleven proposed projects are listed and briefly described below in Table 1. Appendix A of this Opinion contains a more detailed description for each of the eleven project locations and the anticipated scopes of work, with an emphasis on construction activities that could affect federally-listed species and designated critical habitat.

### 1.1 General Project Scope Descriptions

In order to facilitate the review of the eleven projects in this batch consultation the projects have been grouped into two separate categories based on general scope of work; 1) Culvert Replacement Projects, 2) Culvert Repair and 3) Bridge Repairs. A basic description of each category is given below, with more details to follow in section **1.2 More Detailed Project Scope Descriptions** (beginning on page 5).

#### *1.1.1. Culvert Replacement Projects*

Structures in this group are corrugated metal pipes and concrete box culverts in Cherryfield, Frankfort, Garland, Hermon, Meddybemps, Whitefield, and two in Argyle, Maine that are failing. The existing culverts would be replaced with new longer culverts that are generally needed to accommodate a safer, expanded road shoulder with new guard rails.

#### *1.1.2. Culvert Repair Projects*

Inwater work is proposed in order to rehabilitate and extend the useful lives of two culverts in Cherryfield and Winterport, Maine.

#### *1.1.3. Bridge Pier Repair Project*

Inwater work on a bridge pier is proposed in order to rehabilitate and extend the useful lives of a bridge across Cottle Brook, a tributary to the Sandy River in Phillips, Maine.

**Table 1.** Culvert projects being considered under the 2011 MEDOT batched section 7 consultation.

| Project | PIN | DPS | CH | Stream/River | Watershed |
|---|---|---|---|---|---|
| Culvert Replacement Projects | | | | | |
| Argyle #1 | *M&O | X | X | unnamed tributary | Penobscot River |
| Argyle #2 | M&O | X | X | Ephraim Brook | Penobscot River |
| Cherryfield-Rte 193 | M&O | X | X | unnamed tributary to Schoodic Brook | Narraguagus River |
| Frankfort | 17532 | X | X | Meadow Brook | Marsh Stream |
| Garland | M&O | X | X | Allen Stream | Kenduskeag Stream |
| Hermon | M&O | X | X | unnamed tributary to Black Stream | Soudabscook Stream |
| Meddybemps | M&O | X | X | unnamed tributary to Meddybemps Lake | Dennys River |
| Whitefield | M&O | X | X | unnamed tributary to Sheepscot River | Sheepscot River |
| Culvert Repairs | | | | | |
| Cherryfield-Rte 182, end reset | M&O | X | X | unnamed tributary to Narraguagus River | Narraguagus River |
| Winterport, reface wing-wall | M&O | X | X | unnamed tributary to Marsh Stream | Marsh Stream |
| Bridge Repair | | | | | |
| Phillips, wing-wall footing grout repair | M&O | X | X | Cottle Brook | Sandy River |

* M&O = MEDOT maintenance and operation

## 1.2 More Detailed Project Scope Descriptions

Details for all eleven stream crossing projects included in this consultation are provided in Appendix A. General descriptions of the work scopes that will be used in association with the projects are described below. While individual details may vary, including timing, duration, materials, and extent of stream and riparian impacts, these descriptions generally apply to all MEDOT projects involving instream work. Any modifications will still meet the requirements of the MEDOT Best Management Practices for Erosion and Sediment Control (BMP manual; 2008a) and will minimize impacts to aquatic resources.

### *1.2.1. Cofferdam Descriptions*

The purpose of cofferdams (*e.g.*, sheetpile, sandbag, industrial sandbag, inflatable dam) is to dewater a work area so that all work in the stream channel can be conducted in the dry. The same conceptual construction guidelines for each of the cofferdam types described below are similar. However, the projects in this batch consultation are relatively small; sandbag cofferdams should be sufficient to dewater each of the workspaces. Individual details will vary by project.

Install a block net upstream and downstream of the project site secured to the stream channel, bed, and banks until fish capture and transport activities are complete. Monitor the block net once a day to ensure it is properly functioning and free of organic accumulate. Size and place the block net in the stream in such a way as to exclude ESA-listed juvenile salmonids expected to occur within the project vicinity at the time of work without otherwise impinging these fish on the net. Following installation of the upstream block net, haze fish out of the proposed dewatered sections by walking seines downstream from the upstream block net location to the end of the work site in an attempt to 'herd' fish out of the worksite. A downstream block net would then be installed and efforts to capture remaining fish with dip-nets would follow. Electrofishing gear would be used last in an attempt to clear the work area and only where determined necessary.

After blocknets are installed across the stream, MEDOT or the contractor will: 1) set up cofferdams both upstream and downstream to prevent water from leaking into the work area, 2) dewater the work area, and 3) divert the existing stream flow out of the channel using suction hoses and/or a diversion culvert. Pump intakes will have a fish screen to prevent the impingement or entrainment of small fish. A staged (slow, gradual, controlled) dewatering procedure will be clearly understood and agreed to by the contractor in order to allow additional fish to be removed from the area per the Appendix B Fish Evacuation Plan. Sufficient people including MEDOT biologists, trained to capture and handle fish using methods described in Appendix B, should be in place to conduct capture and removal in order to avoid fish stranding in the dry streambed.

*Cofferdam Placement and diversion:*

*For sandbag cofferdams:*

1. The upstream cofferdam will be installed first. Heavy duty plastic sheeting is laid along the width of the stream when practicable. The sand bags are then placed on the

plastic up to a height somewhat higher than the current level of the stream, working from the stream bank to the center.

2. The excess plastic will then be folded over the dam in the upstream direction and another layer of sand bags will be laid on the plastic to help seal the dam from infiltration. The plastic will be extended along the stream bottom as far upstream as practicable.
3. The downstream cofferdam will then be installed. This second dam is a safeguard against a failure of the upstream dam. Most cofferdams leak somewhat, so a pump may be placed within the work area to catch accumulating water, which would then be pumped into the "Dirty water" Treatment System.

*Stream Diversion after Cofferdam Installation*

The stream will need to be continually diverted around the work area when cofferdams block the entire channel. If there is a large volume of water in the stream, a culvert may be placed adjacent to the existing structure to carry the stream flow during construction. Generally, however, stream flow is diverted around the work area using the following procedure, which applies to all types of cofferdams:

1. Prior to instream work, a diversion culvert may be placed under the road away from the stream to run a diversion hose. This protects the hose during the construction activities. Another approach is to run the hose over the road and block up around it with wood to protect it from vehicle traffic.
2. The intake hose will be placed at the upstream end of the culvert, just upstream of the cofferdam. In order to minimize impact on the streambed, the hose end will be placed in a bucket and/or the stream bottom will be lined with geotextile fabric. A fish screen that meets criteria specified by the National Marine Fisheries Service (2008) will be installed on the intake hose end(s) to prevent injury to fish and other aquatic organisms within the work area. Square screen face openings shall not exceed 2.38 mm (3/32 inch) on a diagonal. The intake screen(s) shall be sufficient in size for the approach velocity at the intakes to be not greater than 6.10 cm $sec^{-1}$ (0.20 ft $sec^{-1}$) in order to minimize juvenile fish/screen contact.[1]
3. The gasoline diversion pump(s) will then be placed as far away from the stream as possible. The number and size of pumps used varies depending on the stream flows present when the work is being conducted.
4. The downstream discharge point within the stream channel will be protected from scour caused by high-velocity water by discharging onto ledge, large boulders, or non-woven geotextile fabric laid along the streambed.

*"Dirty Water" Treatment System*

After the cofferdams and water diversion pumps have diverted the stream around the work area, it will be necessary to dewater the work area itself. This water will be pumped into a sediment basin for filtration.

1. The system will be installed according to MEDOT's BMP manual (2008a).

[1] For screen design, the effective screen area is calculated by dividing the maximum screened flow by the allowable approach velocity.

2. The "dirty water" treatment system will either be comprised of a hay bale basin or a "dirt bag." Erosion control fabric is draped over the hay bales and sometimes placed underneath to assist in trapping sediments. These sediments will be disposed of away from the stream in a manner that they cannot erode back into the stream.
3. The sedimentation basin will be located close to the project location with adequate vegetation between it and the stream to act as a filter.
4. Pumping:
   a. Hoses will be laid between the treatment basin and the downstream scour pool within the work area.
   b. The "dirty water" pump(s) will then be started in the downstream scour pool.
   c. Before dewatering of the area inside the cofferdam is started, MEDOT staff will attempt to remove Atlantic salmon and other fish from the work area. As the pool is dewatered, remaining fish (including Atlantic salmon) will be caught and transferred to the downstream channel by a MEDOT biologist (See Appendix B for the fish evacuation plan).
5. The work area will then be pumped dry, with this water going to the "dirty water" treatment system.
6. If there is leakage around the cofferdam, or upwelling in the work area through the stream substrate, this water will be pumped into the "dirty water" system for treatment prior to its release back into the stream. In some situations, it is necessary to excavate a pocket within the cofferdam to allow such pumping. All pumps, hoses, dams, and the sediment basins are monitored closely and maintained throughout construction.

*Closeout Procedures*

After all construction work within the cofferdams has been completed, the cofferdams can be removed and stream flow restored through or around the crossing structure. The same basic closeout procedure is followed for all cofferdam types, with some slight variations in the removal techniques.

1. The upstream "dirty water" pump will be stopped and removed.
2. The diversion pump system will be stopped and the upstream cofferdam will slowly be breached. The site will be rewatered slowly enough to prevent the loss of surface water downstream as the streambed absorbs water and to minimize or avoid a sudden increase in stream turbidity. The first flush of dirty water from the restored stream flow will be captured by the downstream "dirty water" pump, which will then pump the water into the sediment treatment system.
3. When the water behind the remaining downstream cofferdam is clean, that dam will be breached as well.
4. The remainder of the upstream cofferdam and the diversion pump system will then be removed.
5. All disturbed areas will be stabilized and permanent erosion and/or sediment control BMPs will be installed as appropriate.

Sandbag cofferdams are either removed by hand for small bags or by an excavator or crane working from the stream bank for large, industrial-sized sandbags.

*1.2.2. Culvert Replacement Projects*

1. Once the pumps are running and the work area is dewatered, the culvert replacement can commence. At this point, the crews are working in the dry and there is no sediment release into the stream. All pumps, hoses, dams, and the sediment basin are monitored closely and maintained throughout construction.
2. The old culvert will be removed and the new one replaced in the dry.
3. When the culvert and rip-rap installation is complete, all headwalls, disturbed areas, and permanent drainage ditches are stabilized with final treatments (to include seeding), utilizing temporary erosion control BMPs as necessary (MEDOT 2008a).

*1.2.3. Culvert Rehabilitation Projects*

*Resetting a Culvert End, Re-facing Wing Wall Concrete*

MEDOT proposes to isolate the work area with cofferdams and dewatering at the Cherryfield-Rte 182 and Winterport-Rte 139 projects. These projects will require resetting a culvert end and re-facing the concrete on a wing wall, respectively. Once the work site is dewatered, work may be completed in the dry and there should be no sediment or chemical discharge into the streams. All pumps, hoses, dams, and the sediment basins would be monitored closely and maintained throughout construction.

For the end reset, fill over the culvert end would be excavated so that the existing ends can be temporarily removed to allow final grade work around the pipe to allow the end to be reset back in its original location or to allow placement of a new pipe end or pipe extension. This typically includes adding gravel bedding for the pipe end to sit on. To prevent scour at the outlet, a riprap apron would be placed below the water line under the pipe invert. This apron may extend downstream beyond the end of the pipe. The installation of gravel bedding or rip-rap will not affect fish passage through the culvert. Once final grading is complete, the pipe end will be placed back onto the culvert. The site is then backfilled and slopes rip-rapped. Finally, the cofferdams are removed and normal stream flow is restored.

*1.2.4. Bridge Wing Wall Repair Project*

On the Phillips project, on the Route 4 crossing of Cottle Brook, which is about 4.6 m (15 feet) across and 15-30 cm (6-12 inches) deep in the vicinity of the wing wall repair project, MEDOT proposes to repair an undermined pier behind a cofferdam with approximately 7.6 $m^3$ (10 $yards^3$) of grout bags, as described below.

At bridge abutment and pier repair projects, some of the grout is contained within bags and the rest applied as free flowing grout. The grout will be mixed with an anti-washout admixture to improve visibility for the divers and reduce water quality impacts downstream of the project. The grout slurry is pumped through a 3.81-cm (1.5-inch) hose at a rate of 1.53 $m^3$ (2 $yards^3$) per hour into 1.83-m x 1.83-m (6-foot x 6-foot) or 1.52-m x 2.13-m (5-foot x 7-foot) bags that have been positioned underneath and around the undermined footing. In areas where the footing is exposed, bags are placed and filled to create a terraced foundation wall up to the base of the footing. This terracing increases the footprint of the footing by 1.52 m (5 feet) in the areas where it is necessary. After the bags are filled, free flow grout will be used to fill the seams between the bags and to armor the area between the bags and the substrate. Once a seal has been created around the footing, grout will be pumped through a 2.54 cm (1-inch) PVC pipe into the

undermined area under the pier that is behind the bags. Grout slurry is pumped behind the bags until it starts to seep out underneath the footing. For a complete description of the use of grout in repairing undermined bridge structures refer to section 2.3 of the BA.

### 1.3 Best Management Practices for Erosion and Sedimentation Control

All MEDOT construction project contracts, including those covered by this batch consultation, are required to be in accordance with the most recent version of the MEDOT BMP manual (MEDOT 2008a). These BMPs require that contractors prepare and submit a Soil Erosion and Water Pollution Control Plan (SEWPCP) that is approved by the MEDOT and fully enforced as a contractual agreement. This SEWPCP is prepared and performed in accordance with the BMP manual. Section IID, *Guidance for Sensitive Water Bodies*, of the BMP manual specifies under what conditions a project will be designated as a "sensitive" project. Criteria include state or federal designation of the water bodies, project scope of work, proximity of the project to the water body, etc. All projects considered under this consultation are considered sensitive due the presence of endangered Atlantic salmon or their critical habitat. A representative of the MEDOT Surface Water Quality Unit is assigned to all construction projects and will evaluate each project and provide a contract Special Provision to specify what additional requirements need to be addressed in the SEWPCP to protect the waterbody and its aquatic life.

### 1.4 MEDOT Waterway and Wildlife Crossing Policy and Design Guide

All of the projects in this batch consultation have been reviewed in accordance with and will be constructed following the Waterway and Wildlife Crossing Policy and Design Guide (MEDOT 2008b). This document has been developed by MEDOT in cooperation with several state and federal resource and regulatory agencies. Through implementation of this policy and design guide, MEDOT continues to support the goal of developing effective ways to build, repair and maintain the transportation infrastructure, while protecting important aquatic and surface water resources.

A MEDOT hydrologist and biologist assessed culvert replacements projects in this consultation to determine whether small Atlantic salmon would be capable of moving upstream through the proposed structures. Additionally, the software FishXing was used to calculate the percentage of passable flows, given species specific information as well as stream and culvert characteristics. FishXing models the complexities of culvert hydraulics and fish performance for a variety of species and crossing configurations. Literature swimming capability reported for small Atlantic salmon have not been well documented. Therefore, MEDOT modeled each culvert using 7 cm (2.76 inch) brook trout (*Salvelinus fontinalis)* as a surrogate for juvenile Atlantic salmon.

Monitoring of fish passage at road crossing structures will be done according to the MEDOT crossing policy, ACOE permit conditions, the terms and conditions of the Incidental Take Statement (ITS) in this Opinion, and the Fish Passage Monitoring Plan (Appendix C) attached to this BO.

### 1.5 Proposed Instream Work Windows

MEDOT proposes to complete all inwater work when flows are lowest during the summer due to the possible year-round presence of Atlantic salmon within or near the action areas. All of these projects are in fresh water habitats; the work window will be the standard Atlantic salmon summer-time work window of July 15 to September 30 of any given year.

## 1.6 Fish Passage Testing

In order to ensure compliance with state and federal permits and to minimize adverse effects on Atlantic salmon, MEDOT will monitor and evaluate the success of Argyle #1, Argyle #2, Frankfort (PIN 17532), Garland, Hermon, and Meddybemps projects, during the first, third and fifth year post-construction. Over this monitoring period, measurements shall be taken when flows are low, when depths are more likely to be critical, and during higher flow conditions (e.g., about average annual minimum and average annual), when velocities and/or turbulence are more likely to be critical, in order to sufficiently evaluate fish passage conditions. Monitoring will determine whether methods of design and analysis were appropriate and effective, whether the design criteria were satisfied, and evaluate how the design can be improved for future projects for the passage of juvenile Atlantic salmon.

Effectiveness monitoring shall consist of measuring hydraulic characteristics including water depth, water velocity, and stream discharge with a calibrated gauge. Depth and velocity measurements shall be taken at 5.0-10.0-m intervals, and in sites where substantial variations in velocities are apparent. Velocities shall be taken about 5 cm from the bottom, which would reflect the influence of the bottom materials present, and in the water column at approximately 0.6 of the water depth. Photos will be taken during the inspection to document characteristics of the culvert inlet, outlet, bed details and the stream upstream and downstream from the road surface. MEDOT shall note changes of scour and deposition in the stream. Additionally, characteristics of the substrate deposited in the structure (including type, size, depth, and relative amounts) and use by aquatic organisms will be documented. Velocities and depths will be compared to the results of known swimming capabilities of fish that might inhabit these stream reaches.

Because the FishXing model indicates that each of the proposed structures will pass 7 cm brook trout at 100 percent of the design flow range, or the structures are greater than the measured bankfull width, we believe it will be unnecessary for MEDOT to conduct biological tests of fish passage at any of these projects.

Monitoring reports will be submitted in a timely fashion that will allow for prompt planning and implementation of any necessary instream construction work to correct identified fish passage problems. In order for ACOE, MEDOT, and USFWS to track monitoring of numerous projects, annual monitoring reports shall provide a table with information on each of the projects, including when the project was constructed and inspected and flow volume measured during the inspection. After the fifth year monitoring report is evaluated, the USFWS will determine the need for any further monitoring or corrective measures. For example, additional may monitoring may be warranted if the geomorphologic events, such as head cutting, scour, or bedload deposition, threaten to adversely affect fish passage.

## 1.7 Action Area

'Action area' means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02).

The eleven projects included in this Opinion occur throughout a large portion of the State of Maine spread throughout the 45,980 $km^2$ of the Atlantic salmon GOM DPS, as well as specific areas within the geographic range of the GOM DPS that are designated as critical habitat (Figure

1). These projects occur in all three of the Salmon Habitat Recovery Units (SHRU) in Maine, which represent the geographic framework within which critical habitat has been designated. The projects occur within eight different 10-digit HUC[2] watersheds throughout the three SHRUs (Table 2). These eleven projects are only located within the freshwater portion of the GOM DPS.

The action area includes some or all of the following:

- An area of stream that is temporarily isolated and dewatered within a cofferdam so that construction work can proceed in the dry;
- An area downstream of the cofferdam that would experience a temporary increase in sediment from construction activities, particularly during removal of the cofferdam;
- An area of riparian land along the stream bank where vegetation is removed to facilitate construction, including access of equipment to the stream; and
- An area of stream bank and/or stream bottom that is rip-rapped to stabilize the inlet and outlet of the culvert.
- An area of stream channel upstream and/or downstream existing culverts affected by culverts being lengthened.
- An area upstream of some the culvert sites that may become somewhat more accessible to salmon as a result of improved fish passage conditions.

The action area contains designated critical habitat for Atlantic salmon. There is Atlantic salmon rearing and migratory habitat in the vicinity of all of the projects. Juvenile Atlantic salmon may be present during the work window. It is believed that none of the action area provides spawning habitat for Atlantic salmon.

Based on a construction overview provided by MEDOT for each project, combined with previous experience from similar culvert replacement and culvert or bridge rehabilitation projects, Table 3 provides a reasonable estimate of the likely action area for each project. The manner in which this action area table was developed is supported by several previous biological opinions written by the USFWS for MEDOT bridge and culvert replacement and repair projects (USFWS 2005, 2008, 2009, and 2010). All of the streams where work is proposed in this package have an estimated median flow of less than 0.03 $m^3$ $sec^{-1}$ (1 $ft^3sec^{-1}$) during the summer work window period (July 15 to September 30). Cofferdams are anticipated to be placed within 9.14 m (30 feet) and downstream of the inlet and outlet of the culvert. Therefore, it is anticipated that the action area in streams will extend no more than 30.48 m (100 feet) downstream and 9.14 m upstream of the crossing structures.

MEDOT calculated dewatered areas at culvert by multiplying culvert length, plus 9.14 m (30 feet) at both ends, times the bankfull stream widths.

[2] HUC = hydrologic unit code as defined by the U.S. Geological Survey.

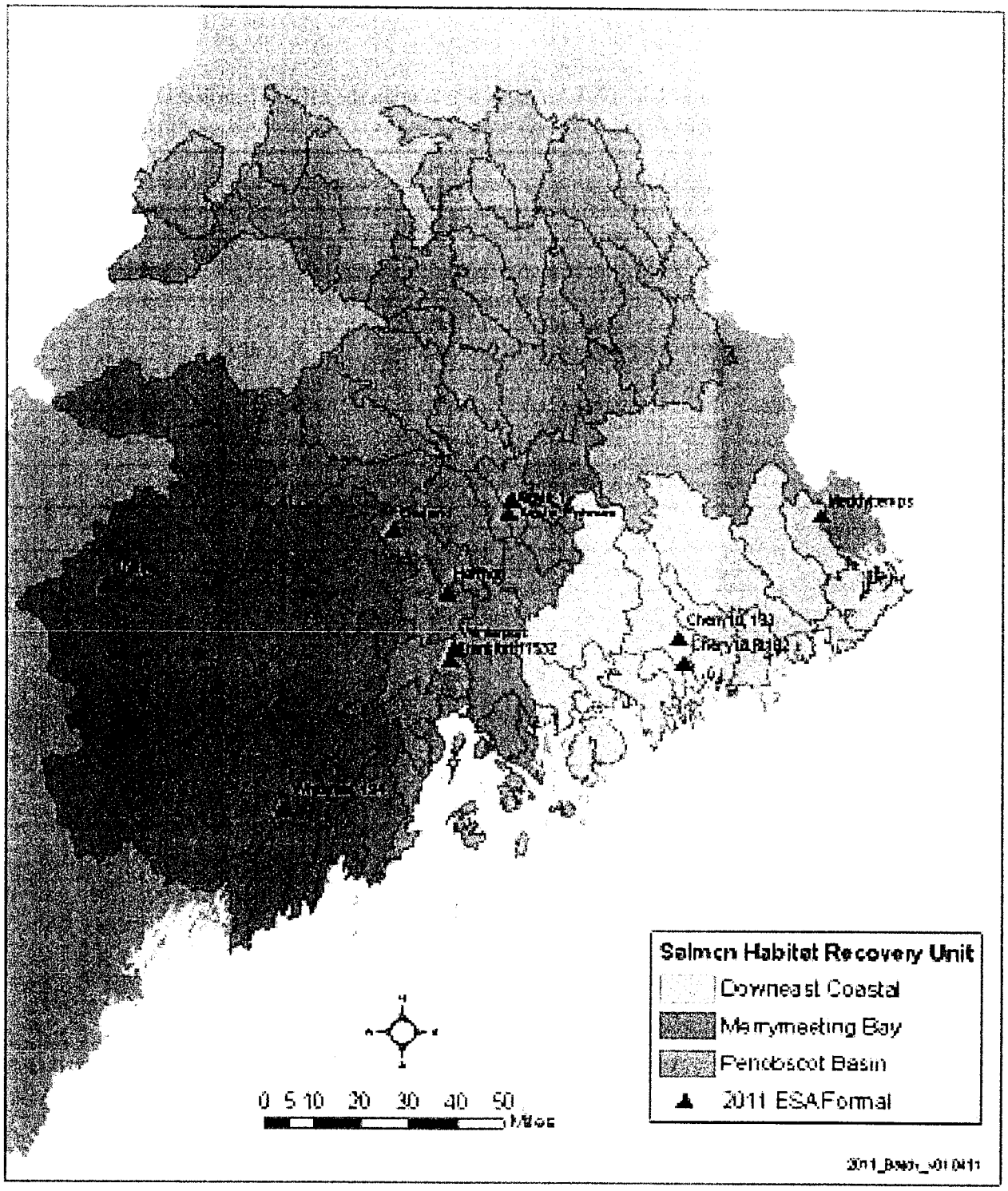



**Figure 1.** Location map of eleven projects considered under this batch consultation.

**Table 2.** List of the SHRU and HUC-10 watersheds that contain the MEDOT projects being considered under this consultation.

| *SHRU* | *HUC-10 Watershed* | *Habitat Units* | *Biological Score* | *# of Projects* |
|---|---|---|---|---|
| **Merrymeeting Bay** | | **372,600** | | **2** |
| | Sandy River | 43,137 | Highly Suitable | 1 |
| | Sheepscot River | 6,574 | Suitable | 1 |
| **Penobscot** | | **323,740** | | **6** |
| | Kenduskeag Stream | 6,869 | Suitable | 1 |
| | Marsh River | 6,018 | Suitable | 2 |
| | Penobscot River (3) at Orson Island | 5,278 | Suitable | 2 |
| | Souadabscook Stream | 5,057 | Marginally Suitable | 1 |
| **Downeast Coastal** | | **61,395** | | **3** |
| | Dennys River | 1,717 | Suitable | 1 |
| | Naraguagus | 6,500 | Suitable | 2 |

**Table 3.** Estimates of Project-Specific Action Areas (square meters).

| Project | Stream | Bankfull (m) | culvert length (m) | Dewatered= cofferdams + culvert length (m) | Cofferdam & Dewatered area (sq m) | Downstream (sq m) | Total Stream Impact (sq m) | Riprap (sq m) | Riparian (sq m) |
|---|---|---|---|---|---|---|---|---|---|
| *Culvert Replacements* | | | | | | | | | |
| Argyle #1 | Ephraim Brook | 3.96 | 30.48 | 48.77 | 193.24 | 120.77 | 314.01 | 0.00 | 9.29 |
| Argyle #2 | unnamed tributary | 2.59 | 30.48 | 48.77 | 126.35 | 78.97 | 205.32 | 7.90 | 18.58 |
| Cherryfield-Rte 193 | unnamed tributary | 1.52 | 15.24 | 33.53 | 51.10 | 46.45 | 97.55 | 4.65 | 9.29 |
| Frankfort | Meadow Brook | 4.11 | 16.46 | 34.75 | 142.98 | 125.42 | 268.40 | 25.08 | 18.58 |
| Garland | Allen Stream | 3.96 | 18.29 | 36.58 | 144.93 | 120.77 | 265.70 | 24.15 | 55.74 |
| Hermon | unnamed tributary | 3.05 | 18.29 | 36.58 | 111.48 | 92.90 | 204.39 | 0.00 | 9.29 |
| Meddybemps | unnamed tributary | 1.52 | 20.42 | 21.95 | 33.45 | 46.45 | 79.90 | 4.65 | 9.29 |
| Whitefield | unnamed tributary | 2.44 | 34.75 | 53.04 | 129.32 | 74.32 | 203.64 | 14.86 | 18.58 |
| *Culvert Repairs* | | | | | | | | | |
| Cherryfield-Rte 182 | unnamed tributary | 1.83 | 30.48 | 30.48 | 55.74 | 55.74 | 111.48 | 5.57 | 9.29 |
| Winterport | unnamed tributary | 7.01 | --structure not dewatered-- | | 128.21 | 55.74 | 341.88 | 0.00 | 0.00 |
| *Bridge Repair* | | | | | | | | | |
| Phillips | Cottle Brook | 4.57 | --structure not dewatered-- | | 75.25 | 139.35 | 214.61 | 9.29 | 0.00 |

## II. STATUS OF THE SPECIES AND CRITICAL HABITAT

The ESA establishes a national program to conserve threatened and endangered species of fish, wildlife, plants, and the habitat on which they depend. Section 7(a)(2) of the ESA requires Federal agencies to consult with the USFWS, National Marine Fisheries Service (NMFS), or both, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their designated critical habitats. Section 7(b)(4) requires the provision of an incidental take statement that specifies the impact of any incidental taking and includes reasonable and prudent measures (RPMs) to minimize such impacts.

This Opinion presents USFWS' review of the status of each listed species considered in this consultation, the condition of designated critical habitat, and the environmental baseline for the action area.

Other federally-listed species under the jurisdiction of USFWS occur in areas of Maine, where the 10 projects are proposed, including the threatened Canada lynx (*Lynx canadensis),* the threatened small whorled pagonia (*Isotrea medeoloides*), and the threatened Eastern prairie fringed orchid (*Plantanthera leucophaea*). Neither of the two listed plant species is known to occur at any of the project location, and therefore, will not be considered further in this consultation. Although the Canada lynx could occur in the general vicinity of one of the proposed projects (Phillips) in Franklin County, the proposed culvert rehabilitation activities in and near Cottle Brook would not be expected to affect lynx or its critical habitat according to the section 7 Programmatic Agreement between MEDOT, USFWS, and FHWA (signed December 16, 2008). Therefore, the Canada lynx and its critical habitat will not be considered further in this consultation.

This section defines the biological requirements of each listed species affected by the proposed action, and the status of each designated critical habitat relative to those requirements. Listed species facing a high risk of extinction and critical habitats with degraded conservation value are more vulnerable to the aggregation of effects considered under the environmental baseline, the effects of the proposed action, and cumulative effects.

### 2.1 Gulf of Maine Distinct Population Segment of Atlantic Salmon

#### *2.1.1. Species Description and Listing History of the GOM DPS*

The Atlantic salmon is an anadromous fish species that spends most of its adult life in the ocean but returns to freshwater to reproduce. The Atlantic salmon is native to the basin of the North Atlantic Ocean, from the Arctic Circle to Portugal in the eastern Atlantic, from Iceland and southern Greenland, and from the Ungava region of northern Quebec south to the Connecticut River (Scott and Crossman 1973). In the United States, Atlantic salmon historically ranged from Maine south to Long Island Sound. However, the Central New England DPS and Long Island Sound DPS have both been extirpated (65 FR 69459; November 17, 2000).

The GOM DPS of anadromous Atlantic salmon was initially listed by the USFWS and NMFS (collectively, the Services) as an endangered species on November 17, 2000 (65 FR 69459). A subsequent re-listing as an endangered species by the Services (74 FR 29344; June 19, 2009), included an expanded range for the GOM DPS of Atlantic salmon. The decision to expand the geographic range of the GOM DPS was largely based on the results of a Status Review (Fay *et*

*al.* 2006) completed by a Biological Review Team consisting of federal and state agencies and Tribal interests. Fay *et al.* (2006) concluded that the DPS delineation in the 2000 listing designation was largely appropriate, except in the case of large rivers that were excluded in the 2000 listing determination. Fay *et al.* (2006) concluded that the salmon currently inhabiting the larger rivers (Androscoggin, Kennebec, and Penobscot) are genetically similar to the rivers included in the GOM DPS as listed in 2000, have similar life history characteristics, and/or occur in the same zoogeographic region. Further, the salmon populations inhabiting the large and small rivers from the Androscoggin River northward to the Dennys River differ genetically and in important life history characteristics from Atlantic salmon in adjacent portions of Canada (Spidle *et al.* 2003; Fay *et al.* 2006). Thus, Fay *et al.* (2006) concluded that this group of populations (a "distinct population segment") met both the discreteness and significance criteria of the Services' DPS Policy (61 FR 4722; February 7, 1996) and, therefore, recommended the geographic range included in the new expanded GOM DPS.

The newly listed GOM DPS includes all anadromous Atlantic salmon whose freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River, and wherever these fish occur in the estuarine and marine environment. The following impassable falls delimit the upstream extent of the freshwater range: Rumford Falls in the town of Rumford on the Androscoggin River; Snow Falls in the town of West Paris on the Little Androscoggin River; Grand Falls in Township 3 Range 4 BKP WKR on the Dead River in the Kennebec Basin; the un-named falls (impounded by Indian Pond Dam) immediately above the Kennebec River Gorge in the town of Indian Stream Township on the Kennebec River; Big Niagara Falls on Nesowadnehunk Stream in Township 3 Range 10 WELS in the Penobscot Basin; Grand Pitch on Webster Brook in Trout Brook Township in the Penobscot Basin; and Grand Falls on the Passadumkeag River in Grand Falls Township in the Penobscot Basin. The marine range of the GOM DPS extends from the Gulf of Maine, throughout the Northwest Atlantic Ocean, to the coast of Greenland.

Included in the GOM DPS are all associated conservation hatchery populations used to supplement these natural populations; currently, such conservation hatchery populations are maintained at Green Lake National Fish Hatchery and Craig Brook National Fish Hatcheries, both operated by the USFWS. Excluded from the GOM DPS are landlocked Atlantic salmon and those salmon raised in commercial hatcheries for the aquaculture industry (74 FR 29344; June 19, 2009).

### *2.1.2. Life History of Atlantic Salmon in the GOM DPS*

Atlantic salmon have a complex life history that includes territorial rearing in rivers to extensive feeding migrations on the high seas. During their life cycle, Atlantic salmon go through several distinct phases that are identified by specific changes in behavior, physiology, morphology, and habitat requirements.

Adult Atlantic salmon return to rivers from the sea and migrate to their natal stream to spawn. Adults ascend the rivers within the GOM DPS beginning in the spring. The ascent of adult salmon continues into the fall. Although spawning does not occur until late fall, the majority of Atlantic salmon in Maine enter freshwater between May and mid-July (Meister 1958; Baum 1997). Early migration is an adaptive trait that ensures adults have sufficient time to effectively reach spawning areas despite the occurrence of temporarily unfavorable conditions that naturally occur within rivers (Bjornn and Reiser 1991). Salmon that return in early spring spend nearly 5

months in the river before spawning, often seeking cool water refuge (*e.g.*, deep pools, springs, and mouths of smaller tributaries) during the summer months.

In the fall, female Atlantic salmon select sites for spawning. Spawning sites are positioned within flowing water, particularly where upwelling of groundwater occurs, allowing for percolation of water through the gravel (Danie *et al.* 1984). These sites are most often positioned at the head of a riffle (Beland *et al.* 1982); the tail of a pool; or the upstream edge of a gravel bar where water depth is decreasing, water velocity is increasing (McLaughlin and Knight 1987; White 1942), and hydraulic head allows for permeation of water through the redd (a gravel depression where eggs are deposited). Female salmon use their caudal fin to scour or dig redds. The digging behavior also serves to clean the substrate of fine sediments that can embed the cobble/gravel substrate needed for spawning and consequently reduce egg survival (Gibson 1993). One or more males fertilize the eggs that the female deposits in the redd (Jordan and Beland 1981). The female then continues digging upstream of the last deposition site, burying the fertilized eggs with clean gravel.

A single female may create several redds before depositing all of her eggs. Female anadromous Atlantic salmon produce a total of 1,500 to 1,800 eggs per kilogram of body weight, yielding an average of 7,500 eggs per 2 sea-winter (SW) female (an adult female that has spent two winters at sea before returning to spawn) (Baum and Meister 1971). After spawning, Atlantic salmon may either return to sea immediately or remain in freshwater until the following spring before returning to the sea (Fay *et al.* 2006). From 1968 to 2009, approximately 2.1 percent of the "naturally-reared" adults (fish originating from natural spawning and hatchery fry) in the Penobscot River were repeat spawners (USASAC 2010).

Embryos develop in redds for a period of 175 to 195 days, hatching in late March or April (Danie *et al.* 1984). Newly hatched salmon, referred to as larval fry, alevin, or sac fry, remain in the redd for approximately 6 weeks after hatching and are nourished by their yolk sac (Gustafson-Greenwood and Moring 1991). Survival from the egg to fry stage in Maine is estimated to range from 15 to 35 percent (Jordan and Beland 1981). Survival rates of eggs and larvae are a function of stream gradient, overwinter temperatures, interstitial flow, predation, disease, and competition (Bley and Moring 1988). Once larval fry emerge from the gravel and begin active feeding they are referred to as fry. The majority of fry (>95 percent) emerge from redds at night (Gustafson-Marjanen and Dowse 1983).

When fry reach approximately 4 cm in length, the young salmon are termed parr (Danie *et al.* 1984). Parr have eight to eleven pigmented vertical bands on their sides that are believed to serve as camouflage (Baum 1997). A territorial behavior, first apparent during the fry stage, grows more pronounced during the parr stage, as the parr actively defend territories (Allen 1940; Kalleberg 1958; Danie *et al.* 1984). Most parr remain in the river for 2 to 3 years before undergoing smoltification, the process in which parr go through physiological changes in order to transition from a freshwater environment to a saltwater marine environment. Some male parr may not go through smoltification and will become sexually mature and participate in spawning with sea-run adult females. These males are referred to as "precocious parr."

First year parr are often characterized as being small parr or 0+ parr (4 to 7 cm long), whereas second and third year parr are characterized as large parr (greater than 7 cm long) (Haines 1992). Parr growth is a function of water temperature (Elliott 1991); parr density (Randall 1982); photoperiod (Lundqvist 1980); interaction with other fish, birds, and mammals (Bjornn and

Reiser 1991); and food supply (Swansburg *et al.* 2002). Parr movement may be quite limited in the winter (Cunjak 1988; Heggenes 1990); however, movement in the winter does occur (Hiscock *et al.* 2002) and is often necessary, as ice formation reduces total habitat availability (Whalen *et al.*1999). Parr have been documented using riverine, lake, and estuarine habitats; incorporating opportunistic and active feeding strategies; defending territories from competitors including other parr; and working together in small schools to actively pursue prey (Gibson 1993; Marschall *et al.*1998; Pepper 1976; Pepper *et al.* 1984; Hutchings 1986; Erkinaro *et al.* 1998; Halvorsen and Svenning 2000; Hutchings 1986; O'Connell and Ash 1993; Erkinaro *et al.* 1995; Dempson *et al.* 1996; Halvorsen and Svenning 2000; Klemetsen *et al.* 2003).

In a parr's second or third spring (age 1 or age 2 respectively), when it has grown to 12.5 to 15 cm in length, a series of physiological, morphological, and behavioral changes occur (Schaffer and Elson 1975). This process, called "smoltification," prepares the parr for migration to the ocean and life in salt water. In Maine, the vast majority of naturally reared parr remain in freshwater for 2 years (90 percent or more) with the balance remaining for either 1 or 3 years (USASAC 2005). In order for parr to undergo smoltification, they must reach a critical size of 10 cm total length at the end of the previous growing season (Hoar 1988). During the smoltification process, parr markings fade and the body becomes streamlined and silvery with a pronounced fork in the tail. Naturally reared smolts in Maine range in size from 13 to 17 cm, and most smolts enter the sea during May to begin their first ocean migration (USASAC 2004). During this migration, smolts must contend with changes in salinity, water temperature, pH, dissolved oxygen, pollution levels, and predator assemblages. The physiological changes that occur during smoltification prepare the fish for the dramatic change in osmoregulatory needs that come with the transition from a fresh to a salt water habitat (Ruggles 1980; Bley 1987; McCormick and Saunders 1987; McCormick *et al.* 1998). The transition of smolts into seawater is usually gradual as they pass through a zone of fresh and saltwater mixing that typically occurs in a river's estuary. Given that smolts undergo smoltification while they are still in the river, they are pre-adapted to make a direct entry into seawater with minimal acclimation (McCormick *et al.* 1998). This pre-adaptation to seawater is necessary under some circumstances where there is very little transition zone between freshwater and the marine environment.

The spring migration of post-smolts out of the coastal environment is generally rapid, within several tidal cycles, and follows a direct route (Hyvarinen *et al.* 2006; Lacroix and McCurdy 1996; Lacroix *et al.* 2004). Post-smolts generally travel out of coastal systems on the ebb tide and may be delayed by flood tides (Hyvarinen *et al.* 2006; Lacroix and McCurdy 1996; Lacroix *et al.* 2004, Lacroix and Knox 2005). Lacroix and McCurdy (1996), however, found that post-smolts exhibit active, directed swimming in areas with strong tidal currents. Studies in the Bay of Fundy and Passamaquoddy Bay suggest that post-smolts aggregate together and move near the coast in "common corridors" and that post-smolt movement is closely related to surface currents in the bay (Hyvarinen *et al.* 2006; Lacroix and McCurdy 1996; Lacroix *et al.* 2004). European post-smolts tend to use the open ocean for a nursery zone, while North American post-smolts appear to have a more near-shore distribution (Friedland *et al.* 2003). Post-smolt distribution may reflect water temperatures (Reddin and Shearer 1987) and/or the major surface-current vectors (Lacroix and Knox 2005). Post-smolts live mainly on the surface of the water column and form shoals, possibly of fish from the same river (Shelton *et al.* 1997).

During the late summer and autumn of the first year, North American post-smolts are concentrated in the Labrador Sea and off of the west coast of Greenland, with the highest

concentrations between 56°N. and 58°N. (Reddin 1985; Reddin and Short 1991; Reddin and Friedland 1993). The salmon located off Greenland are composed of both 1SW fish and fish that have spent multiple years at sea (multi-sea winter fish, or MSW) and includes immature salmon from both North American and European stocks (Reddin 1988; Reddin *et al.* 1988). The first winter at sea regulates annual recruitment, and the distribution of winter habitat in the Labrador Sea and Denmark Strait may be critical for North American populations (Friedland *et al.* 1993). In the spring, North American post-smolts are generally located in the Gulf of St. Lawrence, off the coast of Newfoundland, and on the east coast of the Grand Banks (Reddin 1985; Dutil and Coutu 1988; Ritter 1989; Reddin and Friedland 1993; and Friedland *et al.* 1999).

Some salmon may remain at sea for another year or more before maturing. After their second winter at sea, the salmon over-winter in the area of the Grand Banks before returning to their natal rivers to spawn (Reddin and Shearer 1987). Reddin and Friedland (1993) found immature adults located along the coasts of Newfoundland, Labrador, and Greenland, and in the Labrador and Irminger Sea in the later summer and autumn.

### *2.1.3. Status and Trends of Atlantic Salmon in the GOM DPS*

The abundance of Atlantic salmon within the range of the GOM DPS has been generally declining since the 1800s (Fay *et al.* 2006). Data sets tracking adult abundance are not available throughout this entire time period; however, Fay *et al.* (2006) present a comprehensive time series of adult returns to the GOM DPS dating back to 1967. It is important to note that contemporary abundance levels of Atlantic salmon within the GOM DPS are several orders of magnitude lower than historical abundance estimates. For example, Foster and Atkins (1869) estimated that roughly 100,000 adult salmon returned to the Penobscot River alone before the river was dammed, whereas contemporary estimates of abundance for the entire GOM DPS have rarely exceeded 5,000 individuals in any given year since 1967 (Fay *et al.* 2006; USASAC 2010; MASC 2011).

Contemporary abundance estimates are informative in considering the conservation status of the GOM DPS today. After a period of population growth in the 1970s, adult returns of salmon in the GOM DPS have been steadily declining since the early 1980s and appear to have stabilized at very low levels since 2000. Total adult returns to the GOM DPS improved somewhat in 2008 and 2009 and returned to mid-decade levels in 2010 (Figure 2). The population growth observed in the 1970s is likely attributable to favorable marine survival and increases in hatchery capacity, particularly from Green Lake National Fish Hatchery that was constructed in 1974. Marine survival remained relatively high throughout the 1980s, and salmon populations in the GOM DPS remained relatively stable until the early 1990s. In the early 1990s marine survival rates decreased, leading to the declining trend in adult abundance observed throughout 1990s. Poor marine survival persists in the GOM DPS to date.

Adult returns to the GOM DPS have been very low for many years and remain extremely low in terms of adult abundance in the wild. Further, the majority of all adults in the GOM DPS return to a single river, the Penobscot, which accounted for 93 percent of all adult returns to the GOM DPS in 2010. Of the 1,316 adult returns to the Penobscot the vast majority are the result of smolt stocking and only a small portion naturally-reared. The term naturally-reared includes fish originating from natural spawning and from hatchery fry (USASAC 2010). Hatchery fry are included as naturally-reared because hatchery fry are not marked; therefore, they cannot be

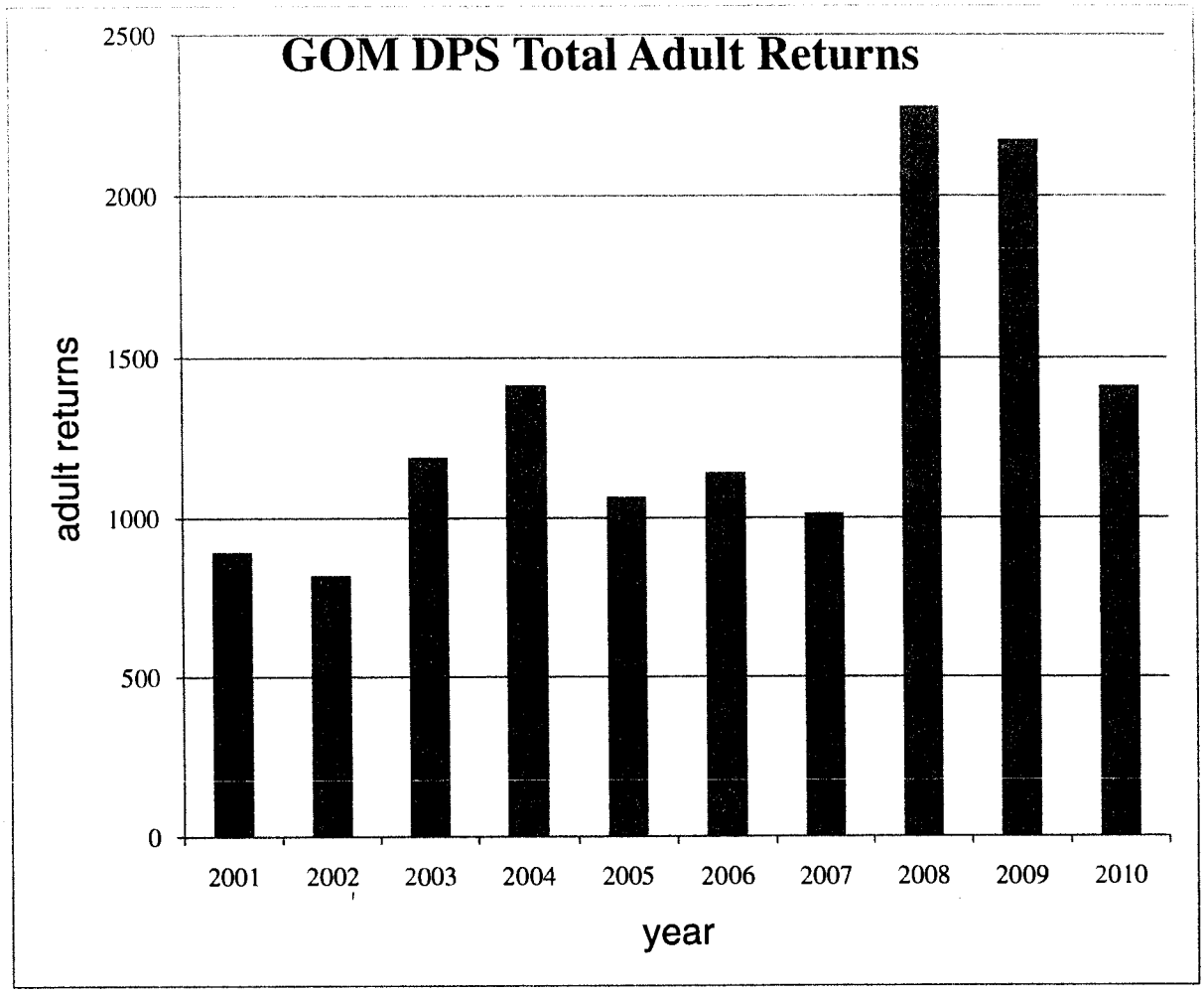



**Figure 2.** Total adult returns for the GOM DPS. Figure reproduced using data from US Atlantic Salmon Assessment Committee reports (USASC 2010) and Maine Atlantic Salmon Commission (2011) trap count statistics for 2010.

distinguished from fish produced through natural spawning. Because of the extensive amount of fry stocking that takes place in an effort to recover the GOM DPS, it is possible that a substantial number of fish counted as naturally-reared were actually hatchery fry. Low abundances of both hatchery-origin and naturally-reared adult salmon returns to Maine demonstrate continued poor marine survival. Declines in hatchery-origin adult returns are less sharp because of the ongoing effects of consistent hatchery supplementation. In GOM DPS, nearly all of the hatchery-reared smolts are released into the Penobscot River -- 560,000 smolts in 2009 (USASAC 2010). In contrast, the number of naturally reared smolts emigrating each year is likely to decline following poor returns of adults (three years prior). Although it is impossible to distinguish truly wild salmon from those stocked as fry, it is likely that some portion of naturally reared adults are in fact wild. Thus, wild smolt production would suffer three years after a year with low adult returns, because the progeny of adult returns typically emigrate three years after their parents return. The relatively constant inputs from smolt stocking, coupled with the declining trend of naturally reared adults, result in the apparent stabilization of hatchery-origin salmon and the

continuing decline of naturally reared components of the GOM DPS observed over the last two decades.

Adult returns for the GOM DPS remain well below conservation spawning escapement (CSE) goals that are widely used (ICES 2005) to describe the status of individual Atlantic salmon populations. When CSE goals are met, Atlantic salmon populations are generally self-sustaining. When CSE goals are not met (*i.e.*, less than 100 percent), populations are not reaching full potential; and this can be indicative of a population decline. For all GOM DPS rivers in Maine, current Atlantic salmon populations (including hatchery contributions) are well below CSE levels required to sustain themselves (Fay *et al.* 2006). Naturally-reared smolts have a better marine survival rate than do hatchery fish but the capacity of rivers to produce adequate numbers of smolts is generally well below replacement rates under current marine survival rates (USASAC 2010).

In conclusion, the abundance of Atlantic salmon in the GOM DPS has been low and either stable or declining over the past several decades. The proportion of fish that are of natural origin is very small (approximately 10%) and is continuing to decline. The conservation hatchery program has assisted in slowing the decline and helping to stabilize populations at low levels, but has not contributed to an increase in the overall abundance of salmon and has not been able to halt the decline of the naturally reared component of the GOM DPS.

## 2.2. Critical Habitat for Atlantic Salmon in the GOM DPS

Coincident with the June 19, 2009 endangered listing, NMFS designated critical habitat for the GOM DPS of Atlantic salmon (74 FR 29300; June 19, 2009)(Figure 3). The final rule was revised on August 10, 2010; designated critical habitat for the expanded GOM DPS of Atlantic salmon was reduced to exclude trust and fee holdings of the Penobscot Indian Nation and a table was corrected (74 FR 39003; August 10, 2009).

### *2.2.1. Primary Constituent Elements of Atlantic Salmon Critical Habitat*

Designation of critical habitat is focused on the known primary constituent elements (PCEs) within the occupied areas of a listed species that are deemed essential to the conservation of the species. Within the GOM DPS, the PCEs for Atlantic salmon are: 1) sites for spawning and rearing, and 2) sites for migration (excluding marine migration[3]). NMFS chose not to separate spawning and rearing habitat into distinct PCEs, although each habitat does have distinct features, because of the GIS-based habitat prediction model approach that was used to designate critical habitat (74 FR 29300; June 19, 2009). This model cannot consistently distinguish between spawning and rearing habitat across the entire range of the GOM DPS.

[3] Although successful marine migration is essential to Atlantic salmon, NMFS was not able to identify the essential features of marine migration and feeding habitat or their specific locations at the time critical habitat was designated.

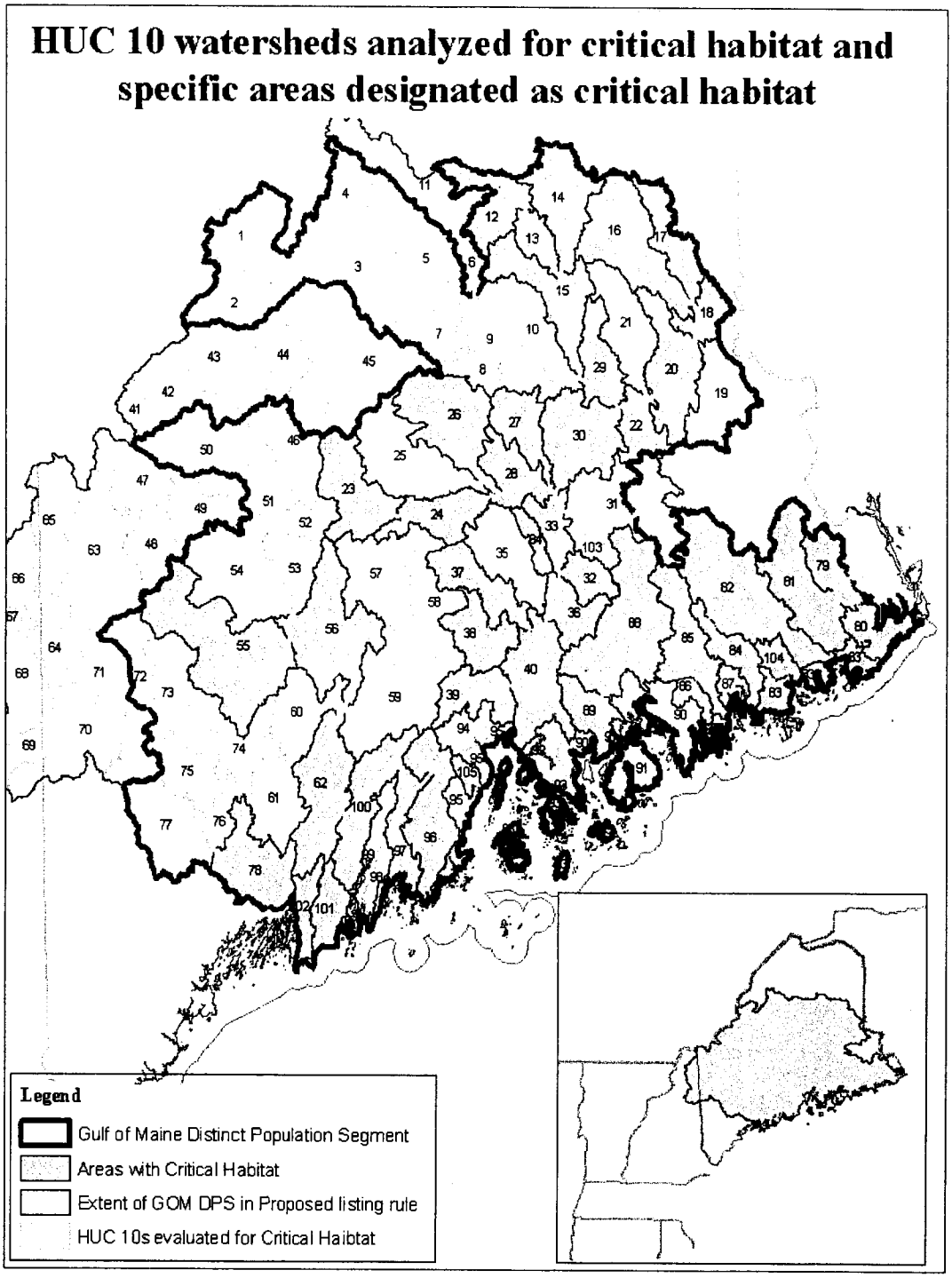



**Figure 3.** HUC-10 watersheds designated as Atlantic salmon critical habitat within the GOM DPS.

The physical and biological features of the two PCEs for Atlantic salmon critical habitat are as follows:

Physical and Biological Features of the Spawning and Rearing PCE[4]

A1. Deep, oxygenated pools and cover (*e.g.*, boulders, woody debris, vegetation, etc.), near freshwater spawning sites, necessary to support adult migrants during the summer while they await spawning in the fall.

A2. Freshwater spawning sites that contain clean, permeable gravel and cobble substrate with oxygenated water and cool water temperatures to support spawning activity, egg incubation, and larval development.

A3. Freshwater spawning and rearing sites with clean, permeable gravel and cobble substrate with oxygenated water and cool water temperatures to support emergence, territorial development and feeding activities of Atlantic salmon fry.

A4. Freshwater rearing sites with space to accommodate growth and survival of Atlantic salmon parr.

A5. Freshwater rearing sites with a combination of river, stream, and lake habitats that accommodate parr's ability to occupy many niches and maximize parr production.

A6. Freshwater rearing sites with cool, oxygenated water to support growth and survival of Atlantic salmon parr.

A7. Freshwater rearing sites with diverse food resources to support growth and survival of Atlantic salmon parr.

Physical and Biological Features of the Migration PCE[5]

B1. Freshwater and estuary migratory sites free from physical and biological barriers that delay or prevent access of adult salmon seeking spawning grounds needed to support recovered populations.

B2. Freshwater and estuary migration sites with pool, lake, and instream habitat that provide cool, oxygenated water and cover items (*e.g.*, boulders, woody debris, and vegetation) to serve as temporary holding and resting areas during upstream migration of adult salmon.

B3. Freshwater and estuary migration sites with abundant, diverse native fish communities to serve as a protective buffer against predation.

B4. Freshwater and estuary migration sites free from physical and biological barriers that delay or prevent emigration of smolts to the marine environment.

B5. Freshwater and estuary migration sites with sufficiently cool water temperatures and water flows that coincide with diurnal cues to stimulate smolt migration.

B6. Freshwater migration sites with water chemistry needed to support sea water adaptation of smolts.

Habitat areas designated as critical habitat must contain one or more PCEs within the acceptable range of values required to support the biological processes for which the species uses that habitat. Critical habitat includes all perennial rivers, streams, and estuaries and lakes connected to the marine environment within the range of the GOM DPS, except for those areas that have

[4] Appendix A designates the seven physical and biological features of the spawning and rearing PCE as A1 – A7. That convention will be used throughout this Opinion.

[5] Appendix A designates the six physical and biological features of the migration PCE as B1-B6. That convention will be used throughout this Opinion.

been specifically excluded as critical habitat. Critical habitat has only been designated in areas considered currently occupied by the species. Critical habitat includes the stream channels within the designated stream reach and includes a lateral extent as defined by the OHWM line or the bankfull elevation in the absence of a defined high-water line. In estuaries, critical habitat is defined by the perimeter of the water body as displayed on standard 1:24,000 scale topographic maps or the elevation of extreme high water, whichever is greater.

For an area containing PCEs to meet the definition of critical habitat, the ESA also requires that the physical and biological features essential to the conservation of Atlantic salmon in that area "may require special management considerations or protections." Activities within the GOM DPS that were identified as potentially affecting the physical and biological features and therefore requiring special management considerations or protections include agriculture, forestry, changing land-use and development, hatcheries and stocking, roads and road crossings, mining, dams, dredging, and aquaculture.

### *2.2.2. Salmon Habitat Recovery Units within Critical Habitat for the GOM DPS*

In describing critical habitat for the Gulf of Maine DPS, NMFS divided the GOM DPS into three Salmon Habitat Recovery Units or SHRUs. The three SHRUs include the Downeast Coastal, Penobscot Bay, and Merrymeeting Bay. The SHRU delineations were designed by NMFS to ensure that a recovered Atlantic salmon population has widespread geographic distribution to help maintain genetic variability and, therefore, a greater probability of population sustainability in the future. Areas designated as critical habitat within each SHRU are described in terms of habitat units. One habitat unit represents 100 $m^2$ of suitable salmon habitat (which could be spawning and rearing habitat or migration habitat). Habitat units within the GOM DPS were estimated through the use of a GIS-based salmon habitat model (Wright *et al.* 2008). Additionally, NMFS discounted the functional capacity of modeled habitat units in areas where habitat degradation has affected the PCEs. For each SHRU, NMFS determined that 30,000 fully functional units of habitat are needed in order to achieve recovery objectives for Atlantic salmon. A brief historical description for this SHRU, as well as contemporary critical habitat designations and special management considerations, are provided below. Brief historical descriptions for each SHRU, as well as contemporary critical habitat designations and special management considerations, are provided below.

*Downeast Coastal SHRU*

The Downeast Coastal SHRU encompasses fourteen HUC-10 watersheds covering approximately 747,737 hectares (1,847,698 acres) within Washington and Hancock Counties. In this SHRU there are approximately 61,400 units of historical spawning and rearing habitat for Atlantic salmon among approximately 6,039 km of rivers, lakes and streams. Of the 61,400 units of historical spawning and rearing habitat, approximately 53,400 units of habitat in eleven HUC-10 watersheds are considered to be currently occupied. Of the 53,400 occupied units within the Downeast Coastal SHRU, NMFS calculated these units to be the equivalent of roughly 29,111 functional units of habitat or approximately 47 percent of the estimated historical functional potential. This estimate is based on the configuration of dams within the SHRU that limit migration and the degradation of physical and biological features from land use activities which reduce the productivity of habitat within each HUC-10. Though the Downeast SHRU does not currently meet the objective of 30,000 fully functional units of habitat available to

Atlantic salmon, there is enough habitat within the occupied range that, in a restored state (*e.g.* improved fish passage or improved habitat quality), the Downeast SHRU could satisfy recovery objectives as described in the final rule for critical habitat (74 FR 29300; June 19, 2009). Certain tribal and military lands within the Downeast Coastal SHRU are excluded from critical habitat designation.

*Penobscot Bay SHRU*

The Penobscot Bay SHRU, which drains approximately 22,234,522 hectares (54,942,705 acres), contains approximately 323,700 units of historically accessible spawning and rearing habitat for Atlantic salmon among approximately 17,440 km of rivers, lakes and streams. Of the 323,700 units of spawning and rearing habitat (within 46 HUC-10 watersheds), approximately 211,000 units of habitat are considered to be currently occupied (within 28 HUC-10 watersheds). Of the 211,000 occupied units within the Penobscot SHRU, NMFS calculated these units to be the equivalent of nearly 66,300 functional units or approximately 20 percent of the historical functional potential. This estimate is based on the configuration of dams within the SHRU that limit migration and the degradation of physical and biological features from land use activities which reduce the productivity of habitat within each HUC-10. The combined qualities and quantities of habitats available to Atlantic salmon within the currently occupied areas in the Penobscot Bay SHRU currently meet the objective of 30,000 fully functional units of habitat available to Atlantic salmon. Three HUC-10 watersheds - Molunkus Stream, Passadumkeag River, and Belfast Bay - are excluded from critical habitat designation due to economic impact. Certain tribal lands within the Penobscot Bay SHRU are also excluded from critical habitat designation, although the Penobscot Nation specifically requested that their lands be included as critical habitat.

*Merrymeeting Bay SHRU*

The Merrymeeting Bay SHRU drains approximately 2,691,814 hectares of land (6,651,620 acres) and contains approximately 372,600 units of historically accessible spawning and rearing habitat for Atlantic salmon located among approximately 5,950 km of historically accessible rivers, lakes and streams. Of the 372,600 units of spawning and rearing habitat, approximately 136,000 units of habitat are considered to be currently occupied. There are forty-five HUC-10 watersheds in this SHRU, but only nine are considered currently occupied. Of the 136,000 occupied units within the Merrymeeting Bay SHRU, NMFS calculated these units to be the equivalent of nearly 40,000 functional units or approximately 11 percent of the historical functional potential. This estimate is based on the configuration of dams within the Merrymeeting Bay SHRU that limit migration and other land use activities that cause degradation of physical and biological features and which reduce the productivity of habitat within each HUC-10. The combined qualities and quantities of habitat available to Atlantic salmon within the currently occupied areas within the Merrymeeting Bay SHRU meet the objective of 30,000 fully functional units of habitat available to Atlantic salmon. Lands controlled by the Department of Defense within the Little Androscoggin HUC-10 and the Sandy River HUC-10 are excluded as critical habitat.

In conclusion, the June 19, 2009 final critical habitat designation for the GOM DPS (as revised on August 10, 2009) includes 45 specific areas occupied by Atlantic salmon that comprise approximately 19,571 km of perennial river, stream, and estuary habitat and 799 $km^2$ of lake

habitat within the range of the GOM DPS and on which are found those physical and biological features essential to the conservation of the species. Within the occupied range of the GOM DPS, approximately 1,256 km of river, stream, and estuary habitat and 100 $km^2$ of lake habitat have been excluded from critical habitat pursuant to section 4(b)(2) of the ESA.

## 2.3 Summary of Factors Affecting Recovery within the GOM DPS

There are a wide variety of factors that have and continue to affect the current status of the GOM DPS and its critical habitat. The potential interactions among these factors are not well understood, nor are the reasons for the seemingly poor response of salmon populations to the many ongoing conservation efforts for this species.

### *2.3.1. Threats to the Species*

The recovery plan for the previously designated GOM DPS (NMFS and USFWS 2005), status review (Fay *et al.* 2006), and the 2009 listing rule, provide a comprehensive assessment of the many factors, including both threats and conservation actions, for currently listed Atlantic salmon. USFWS is currently writing a new draft recovery plan that will include the current DPS, which was expanded in 2009 to include the Androscoggin and large portion of the Kennebec and Penobscot River basins. The draft recovery plan would likely include the following list of high priority threats requiring action to reverse the decline of GOM DPS salmon populations.

- Acidified water and associated aluminum toxicity, which decrease juvenile survival
- Aquaculture practices, which pose ecological and genetic risks
- Avian predation
- Changing land use patterns (*e.g.*, development, agriculture, forestry)
- Climate change
- Depleted diadromous fish communities
- Hydropower system physical and biological impacts, including altered flow regimes, prevention or poor upstream migration, downstream turbine mortality, migration delay, water quality impacts that result from impoundments, etc.
- Incidental capture of adults and parr by recreational anglers
- Introduced fish species that compete or prey on Atlantic salmon
- Low marine survival
- Poaching of adults in DPS rivers
- Recovery hatchery program (potential for artificial selection/domestication)
- Sedimentation of spawning and rearing habitat
- Water extraction

Fay *et al.* (2006) examined each of the five statutory ESA listing factors and determined that each of the five listing factors is at least partly responsible for the present low abundance of the GOM DPS. The information presented in Fay *et al.* (2006) is reflected in and supplemented by the final listing rule for the new GOM DPS (74 FR 29344; June 19, 2009). The following gives a brief overview of the five listing factors as related to the GOM DPS.

1. **Present or threatened destruction, modification, or curtailment of its habitat or range** – Historically and, to a lesser extent currently, dams have adversely impacted Atlantic salmon by obstructing fish passage and degrading riverine habitat. Dams are considered to be one of the primary causes of both historic declines and the contemporary

low abundance of the GOM DPS. Land use practices, including forestry and agriculture, have reduced habitat complexity (*e.g.*, removal of large woody debris from rivers) and habitat connectivity (*e.g.*, poorly designed road crossings) for Atlantic salmon. Water withdrawals, elevated sediment levels, and acid rain also degrade Atlantic salmon habitat.

2. **Overutilization for commercial, recreational, scientific, or educational purposes** – While most directed commercial fisheries for Atlantic salmon have ceased, the impacts from past fisheries are still important in explaining the present low abundance of the GOM DPS. Both poaching and by-catch in recreational and commercial fisheries for other species remain of concern, given critically low numbers of salmon.

3. **Predation and disease** – Natural predator-prey relationships in aquatic ecosystems in the GOM DPS have been substantially altered by introduction of non-native fishes (*e.g.*, chain pickerel, smallmouth bass, and northern pike), declines of other native diadromous fishes, and alteration of habitat by impounding free-flowing rivers and removing instream structure (such as removal of boulders and woody debris during the log-driving era). The threat of predation on the GOM DPS is noteworthy because of the imbalance between the very low numbers of returning adults and the recent increase in populations of some native predators (*e.g.*, double-crested cormorant), as well as non-native predators. Atlantic salmon are susceptible to a number of diseases and parasites, but mortality is primarily documented at conservation hatcheries and aquaculture facilities.

4. **Inadequacy of existing regulatory mechanisms** – The ineffectiveness of current federal and state regulations at requiring fish passage and minimizing or mitigating the aquatic habitat impacts of dams is one of the significant threats to the GOM DPS today. Furthermore, most dams in the GOM DPS do not require state or federal permits. Although the State of Maine has made substantial progress in regulating water withdrawals for agricultural use, threats still remain within the GOM DPS, including those from the effects of irrigation wells on salmon streams.

5. **Other natural or manmade factors** – Poor marine survival rates of Atlantic salmon are a significant threat, although the causes of these decreases are unknown. The role of ecosystem function among the freshwater, estuarine, and marine components of the Atlantic salmon's life history, including the relationship of other diadromous fish species in Maine (e.g., American shad, alewife, sea lamprey), is receiving increased scrutiny in its contribution to the current status of the GOM DPS and its role in recovery of the Atlantic salmon. While current state and federal regulations pertaining to finfish aquaculture have reduced the risks to the GOM DPS (including eliminating the use of non-North American Atlantic salmon and improving containment protocols), risks form the spread of diseases or parasites and from farmed salmon escapees interbreeding with wild salmon still exist.

### *2.3.2. Threats to Critical Habitat within the GOM DPS*

The final rule designating critical habitat for the GOM DPS identifies a number of activities that have and will likely continue to impact the biological and physical features of spawning, rearing, and migration habitat for Atlantic salmon. These include agriculture, forestry, changing land-use and development, hatcheries and stocking, roads and road-crossings and other instream activities

(such as alternative energy development), mining, dams, dredging, and aquaculture. Most of these activities have or still do occur, at least to some extent, in each of the three SHRUs.

*Downeast Coastal SHRU*

The Downeast Coastal SHRU once contained high quality Atlantic salmon habitat in quantities sufficient to support robust Atlantic salmon populations. Impacts to substrate and cover, water quality, water temperature, biological communities, and migratory corridors, among a host of other factors, have impacted the quality and quantity of habitat available to Atlantic salmon populations within the Downeast Coastal SHRU. Two hydropower dams on the Union river, and to a lesser extent the small ice dam on the lower Narraguagus River, limit access to roughly 18,500 units of spawning and rearing habitat within these two watersheds. In the Union River, which contains over 12,000 units of spawning and rearing habitat, physical and biological features have been most notably limited by high water temperatures and abundant smallmouth bass populations associated with impoundments. In the Pleasant River and Tunk Stream, which collectively contain over 4,300 units of spawning and rearing habitat, pH has been identified as possibly being the predominate limiting factor. The Machias, Narraguagus, and East Machias rivers contain the highest quality habitat relative to other HUC-10's in the Downeast Coastal SHRU and collectively account for approximately 40 percent of the spawning and rearing habitat in the Downeast Coastal SHRU.

*Penobscot Bay SHRU*

The Penobscot SHRU once contained high quality Atlantic salmon habitat in quantities sufficient to support robust Atlantic salmon populations. The mainstem Penobscot has the highest biological value to the Penobscot SHRU because it provides a central migratory corridor crucial for the entire Penobscot SHRU. Dams, along with degraded substrate and cover, water quality, water temperature, and biological communities, have reduced the quality and quantity of habitat available to Atlantic salmon populations within the Penobscot SHRU. A combined total of twenty Federal Energy Regulatory Commission-licensed hydropower dams in the Penobscot SHRU significantly impede the migration of Atlantic salmon and other diadromous fish to nearly 300,000 units of historically accessible spawning and rearing habitat. Agriculture and urban development largely affect the lower third of the Penobscot SHRU below the Piscataquis River sub-basin by reducing substrate and cover, reducing water quality, and elevating water temperatures. Introductions of smallmouth bass and other non-indigenous species significantly degrade habitat quality throughout the mainstem Penobscot and portions of the Mattawamkeag, Piscataquis, and lower Penobscot sub-basins by altering predator/prey relationships. Similar to smallmouth bass, recent Northern pike introductions threaten habitat in the lower Penobscot River below the Great Works Dam.

*Merrymeeting Bay SHRU*

Habitat throughout the Merrymeeting Bay SHRU was once of high enough quality to support a robust Atlantic salmon population. The mainstem Kennebec River has the highest biological value to the Merrymeeting Bay SHRU because it provides the central migration conduit crucial for much of the currently occupied habitat found in the Sandy River basin. The Sandy River has the greatest biological value for spawning and rearing habitat within the occupied range of the Merrymeeting Bay SHRU but is currently only accessible to adult salmon through a trap and

truck program around the four lowermost dams. The construction of dams, and to a lesser extent pollution, has degraded habitat quality and accessibility and is likely responsible for the decline of Atlantic salmon populations within the Merrymeeting Bay SHRU. Today, dams are the greatest impediment, outside of marine survival, to the recovery of salmon in the Kennebec and Androscoggin river basins (Fay *et al.* 2006). Hydropower dams in the Merrymeeting Bay SHRU significantly impede the migration of Atlantic salmon and other diadromous fish and either reduce or eliminate access to roughly 352,000 units of historically accessible spawning and rearing habitat. In addition to hydropower dams, agriculture and urban development largely affect the lower third of the Merrymeeting Bay SHRU by reducing substrate and cover, reducing water quality, and elevating water temperatures. Additionally, smallmouth bass and brown trout introductions, along with other non-indigenous species, significantly degrade habitat quality throughout the Merrymeeting Bay SHRU by altering natural predator/prey relationships.

### *2.3.3. Efforts to Protect the GOM DPS and its Critical Habitat*

Efforts aimed at protecting Atlantic salmon and their habitats in Maine have been underway for well over one hundred years. These efforts are supported by a number of federal, state, and local government agencies, as well as many private conservation organizations. The 2005 recovery plan for the originally-listed GOM DPS (NMFS and USFWS 2005) presented a strategy for recovering Atlantic salmon that focused on reducing the severest threats to the species and immediately halting the decline of the species to prevent extinction. The 2005 recovery program included the following elements:

1. Protect and restore freshwater and estuarine habitats;
2. Minimize potential for take in freshwater, estuarine, and marine fisheries;
3. Reduce predation and competition for all life-stages of Atlantic salmon;
4. Reduce risks from commercial aquaculture operations;
5. Supplement wild populations with hatchery-reared DPS salmon;
6. Conserve the genetic integrity of the DPS;
7. Assess stock status of key life stages;
8. Promote salmon recovery through increased public and government awareness; and
9. Assess effectiveness of recovery actions and revise as appropriate.

A wide variety of activities have focused on protecting Atlantic salmon and restoring the GOM DPS, including (but not limited to) hatchery supplementation; removing dams or providing fish passage; improving road crossings that block passage or degrade stream habitat; protecting riparian corridors along rivers; reducing the impact of irrigation water withdrawals; limiting effects of recreational and commercial fishing; reducing the effects of finfish aquaculture; outreach and education activities; and research focused on better understanding the threats to Atlantic salmon and developing effective restoration strategies. In light of the 2009 GOM DPS expanded listing and designation of critical habitat, the Services will produce a new recovery plan for Atlantic salmon. The new plan, which will also cover the Kennebec, Androscoggin and Upper Penobscot watersheds, must address impacts that result from the hydropower systems on these rivers.

## III. ENVIRONMENTAL BASELINE

The Environmental Baseline provides a snapshot of the health or status at a given time of the species and its habitat, within the action area, and is used as a biological basis upon which to analyze the effects of the proposed action. Assessment of the environmental baseline includes an analysis of the past and present impacts of all state, federal, or private actions and other human activities in the action area, the anticipated impacts of all proposed federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions that are contemporaneous with the consultation in process (50 CFR 402.02). An environmental baseline that does not meet the biological requirements of a listed species may increase the likelihood that adverse effects of the proposed action will result in jeopardy to a listed species or in destruction or adverse modification of a designated critical habitat.

The Environmental Baseline is typically a narrowly focused subset of the Status of the Species and Critical Habitat evaluation. For example, an opinion discussing a bridge replacement project on the East Machias River would have an environmental baseline that discusses the status of the salmon population and critical habitat in the East Machias River basin and the project-specific action area on the East Machias River. However, in this Opinion, the action area of the proposed agency action encompasses a considerable portion of the freshwater range of the entire Atlantic salmon GOM DPS and its critical habitat. MEDOT proposes 12 projects in 12 different streams scattered throughout the range of the GOM DPS and all three of the SHRUs with designated critical habitat. Projects occur in eight different HUC-10 watersheds, with seven of these in the Penobscot Bay SHRU, three in the Downeast Coastal SHRU, and two in the Merrymeeting Bay SHRU. As such, the environmental baseline for the species and its critical habitat in the action area is basically the same as the current status of the species and its critical habitat as a whole, as discussed above in Section II. Status of the Species and Critical Habitat (pages 15-29). Based on the best available scientific information, there is nothing noticeably different about the 14 proposed project locations (*i.e.*, streams) when compared to the entire GOM DPS and its critical habitat.

USFWS describes the environmental baseline in terms of the biological requirements for habitat features and processes necessary to support all life stages of the listed species within the action area. The listed species considered in this Opinion resides in or migrates through the action area. Thus, for this action area, the biological requirements for Atlantic salmon are the habitat characteristics that support successful completion of rearing, freshwater migration, and spawning.

# IV. EFFECTS OF THE ACTION

This section of the Opinion analyzes the direct and indirect effects of the proposed action on the GOM DPS of Atlantic salmon and its critical habitat, together with the effects of other activities that are interrelated or interdependent (50 CFR 402.02, June 30, 1986). Effects of the action that reduce the ability of a listed species to meet its biological requirements may increase the likelihood that the proposed action will result in jeopardy to that listed species or in destruction or adverse modification of a designated critical habitat. Indirect effects are those that are caused by the proposed action, are later in time, but are still reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend upon the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration.

Because the projects included in this Opinion will, by and large, have similar effects on the GOM DPS and its critical habitat, this section will generally not include a project-specific analysis of effects. Instead, this section will focus on a general discussion of effects as they apply to most, if not all, of the projects under consideration. For example, many of these projects will involve the temporary isolation of an instream work area by cofferdams and the potential need to capture and relocate Atlantic salmon downstream to a safe location during construction within the cofferdam. A generic discussion of the effects to Atlantic salmon from capture and relocation, following a proposed standard protocol, would then apply to all of the proposed projects.

## 4.1 Effects to Atlantic Salmon from Specific Construction and Monitoring Activities

During construction the proposed action is likely to adversely affect Atlantic salmon through the effects of sediment, riparian vegetation removal, alterations in fish passage conditions, and through disturbing or handling fish during instream work activities.

### *4.1.1. Cofferdams, Dewatering, and Fish Relocation*

At each of the culvert replacement projects and the Cherryfield-Rte 182 culvert repair, the entire stream will be isolated, dammed with sandbags, and diverted around the work site. During this activity, Atlantic salmon may be killed or more likely temporarily disturbed, displaced, or injured by instream work activities. Isolation of a stream work area with a cofferdam is a conservation measure intended to minimize the overall adverse effects of construction activities on Atlantic salmon and their habitat. Dewatering of a stream inside a cofferdam would have a lethal effect on any fish left inside the cofferdam, but most fish in the work area would be successfully transported to a safe location. Fish release upstream of the project site is preferred as sediment impacts would not likely affect individuals upstream of the crossing. Adverse effects could result from the capture, handling, transport and stranding of these fish. We have not factored this unquantifiable amount of harassment and increased stress levels into the Incidental Take Statement. Nevertheless, there is the possibility that some mortality may occur if fish are missed or stranded in substrate interstices during salvage operations.

A block net will be installed upstream and downstream of the project site, secured to the stream channel, bed, and banks, until fish capture and transport activities are complete. Following installation of the upstream block net, fish will be hazed out of the proposed dewatered sections

by walking seines downstream from the upstream block net location to the end of the work site in an attempt to 'herd' fish out of the worksite. A downstream block net would then be installed and efforts to capture remaining fish would follow. Before or while the cofferdam is being dewatered, Atlantic salmon that don't move away and are subsequently captured inside the cofferdam will be relocated outside of the action area to suitable habitat (downstream or upstream), according to the fish evacuation plan (Appendix B). Gear such as dip nets, minnow traps and seines should be used first; electrofishing gear should be used last in an attempt to clear the work area. Electrofishing should be used only where other means of fish capture are not feasible or effective following NOAA Fisheries guidelines found at: http://www.nwr.noaa.gov/ESA-Salmon-Regulations-Permits/4d-Rules/upload/electro2000.pdf (NMFS 2000). To minimize temperature-related handling stress to Atlantic salmon the MEDMR recommends that electroshocking should not be conducted in water temperatures above 23°C (MASC 2005). However, if a project is already underway, areas to be isolated by cofferdams to dewater a work site may be electrofished if temperatures are greater than 23°C, although it must be acknowledged that this could lead to higher mortality than expected (<2%).[6] Reasonable effort should be made to avoid handling fish in warm water temperatures, such as conducting fish evacuation first thing in the morning, when the water temperature would likely be coolest.

Atlantic salmon parr are highly territorial and actively defend their feeding territory to maximize their opportunity to capture prey items. Territory size increases with fish age and size. Atlantic salmon parr temporarily displaced from their territory by construction activities, particularly the de-watering of a section of stream, may be more vulnerable to predators, may be less able to capture prey, and may experience more stress while looking for another suitable, unoccupied area of stream in which to establish a new territory.

To avoid stranding of fish caught inside a cofferdam as a result of dewatering, MEDOT will capture and remove Atlantic salmon and other fish species. Netting and handling of fish is likely to result in harassment and increased stress levels. Hazing and evacuation of fish would only be conducted within culverts if they are tall enough to walk through and the operation is safe for MEDOT to implement. There is also potential that some fish would be missed or stranded in substrate interstices. Capturing and handling salmon also causes physiological stress and can cause physical injury or death, including cardiac or respiratory failure from electrofishing (Snyder 2003). Studies have shown that all aspects of fish handling, such as dipnetting, time out of water, and data collection like measuring the length, are stressful and can lead to immediate or delayed mortality (Murphy and Willis 1996). Direct mortality may occur when fish are handled roughly, not properly restrained, sedated during handling, or kept out of the water for extended periods. It is common for fish to jump out of the worker's hand and fall onto a hard surface, resulting in internal injuries. Fish injured during handling, in association with a disease epizootic, typically die within 24 hours to 14 days. Examples of injuries which can lead to disease problems are loss of mucus, loss of scales, damage to the integument, and internal damage.

To minimize any injury or stress to Atlantic salmon captured during construction and dewatering of the cofferdam, only certain MEDOT Environmental Office staff will be allowed to handle fish and all personnel involved with electrofishing will have appropriate experience with salmonids

[6] We note that electrofishing surveys are terminated in New Brunswick when water temperature reaches 20°C in order to reduce instantaneous and possibly delayed mortality at high water temperatures (Clément and Cunjak 2010).

in Maine (see Appendix B for a list of specific staff names). Handling stress and risk of injury will be minimized by 1) ensuring minimal handling time (no data will be collected from individual Atlantic salmon other than to record the number of salmon captured); 2) ensuring minimal time that fish are held out of water and the stream; and 3) using transfer containers with aerated stream water of ambient temperature. To minimize adverse effects to Atlantic salmon, other MEDOT staff, its consultants, or its contractors may not handle any Atlantic salmon during the course of these construction projects.

Despite precautions, some mortality is inevitable while electrofishing. The MEDMR annually reports to the USFWS juvenile salmon mortality associated with electrofishing activities in GOM DPS waters.[7] While the MEDMR usually handles a few thousand juvenile salmon each year during electrofishing, mortalities are usually less than two percent of total fish captured.

Baum (1997) reported that Maine Atlantic salmon rivers support on average between five and ten parr per 100 $m^2$ of habitat (or one salmon habitat unit), based on data collected by the MEDMR. While electrofishing for juvenile Atlantic salmon population estimates (for both young-of-the-year [YoY] and parr) and collection of parr for use as broodstock at the USFWS's Craig Brook National Fish Hatchery, the MEDMR collected a GOM DPS average of 4.92 salmon/100 $m^2$ in 2006; 10.65 salmon/100 $m^2$ in 2007; 8.03/100 $m^2$ in 2008, and 10.31/100 $m^2$ in 2009, and 20.47/100 $m^2$ in 2010. The five-year GOM DPS average for juvenile Atlantic salmon density is then 10.56 salmon/100 $m^2$. These data are from electrofishing efforts in many streams located in watersheds throughout the new GOM DPS (as defined in June 2009) and represent the best available scientific information to assist in determining the number of juvenile Atlantic salmon that are likely to be displaced or collected and relocated when a portion of a stream is dewatered within a cofferdam.

All projects that will use cofferdams to isolate instream work areas are expected to capture some juvenile Atlantic salmon within the cofferdam areas. The total dewatered area for all projects is 1192.04 $m^2$ or 11.9 units of salmon habitat. While some of the projects included in this total area do not contain juvenile habitat at the project site, there is juvenile rearing habitat upstream and/or downstream of the project; so it is possible that salmon could be moving through the project area during construction. Therefore, it is reasonable that as many as 126 juvenile Atlantic salmon (10.56 parr/100 $m^2$ x 11.9 habitat units = 125.88 salmon) could be displaced from or captured inside cofferdams. However, 10.56 parr/100 $m^2$ is likely high for the project areas covered by this BO. MEDMR's data is mainly based on sites where the numbers are affected by fish stocking. Additionally, some of the habitat within the cofferdams is currently inside of an existing culvert and may not be as suitable as habitat outside of the structure for Atlantic salmon. Therefore, we are reducing the number of salmon expected to be caught by electrofishing by 50%. As a result, it is reasonable that as many as 63 (125.88 x 0.50 = 62.94) juvenile Atlantic salmon could be displaced or captured inside cofferdams and subsequently relocated upstream or downstream of the isolated work area.

Even though very few Atlantic salmon are expected to be injured or killed by capture and relocation activities, fish will be temporarily disrupted from their normal behaviors (*e.g.*, territorial behavior of parr, which includes foraging on aquatic invertebrates). Additionally some

[7] The MEDMR is authorized by the USFWS under section 10(a)(1)(A) of the ESA (Blanket Permit #697823) to conduct various research and recovery activities for GOM DPS Atlantic salmon, some of which may cause take of Atlantic salmon.

mortality may occur if fish be missed or stranded in substrate interstices during salvage operations.[8] Highly territorial salmonids such as Atlantic salmon that hold station and establish territories to maximize profitability under one flow condition may be more vulnerable to stranding effects owing to reluctance to abandon territories (Armstrong *et al.* 1998). During dewatering, stranding is not equal to mortality, as fish are found to survive for several hours in the substrate after dewatering. However, stranding over a longer period and/or removal of substrate for project construction would result in mortality. In a lab experiment conducted with cold water (<4.5°C) Saltveit *et al.* (2001) found that 60% of Atlantic salmon YoY became stranded during dewatering over a period of 42 minutes. Searching the substrate, about 39% of the stranded fish could not even be found. YoY Atlantic salmon were affected more severely than older juveniles. Only about 10% of 1+ Atlantic salmon were stranded during daylight in water greater than 9°C. In general, the incidence of Atlantic salmon stranding is much lower during summer, when water temperature is relatively high than when temperature is cold. This is probably mainly because of lower fish activity during the cold season and a substrate seeking behavior. Stranding is higher during the day, probably because of a predominant night active behavior.

We have not seen literature or data on juvenile Atlantic salmon to quantify this potential form of take during summer daylight conditions, within or near culverts. Given the lack of substrate, shallow depths, and high velocities within most of the culverts being replaced we would not expect many juvenile fish to be present within the culvert pipes or boxes. Thus, we have not calculated an incidental take for stranding. Additionally, USFWS acknowledges that fewer fish are likely to be affected by the salvage operations because the density calculated by MEDMR may be higher than that found in most of the action area for the culvert projects. As described above, MEDMR's fish density estimates included areas known to have been supplemented with hatchery-raised juvenile salmon.

Within the area designated as critical habitat, we believe that no suitable Atlantic salmon spawning occurs in the action area of any of the projects. Additionally, given the current low returns, the USFWS does not believe that take of an adult salmon is reasonably likely to occur. The level of instream activity associated with setting up the cofferdams and other construction-related activities along the stream banks, any adult salmon present in the project areas would very likely be disturbed and move away from the work zone.

In order to keep the stream flows diverted around the cofferdam (in situations where the entire stream channel is blocked off) for the duration of instream work, a pump will be used just upstream of the upper cofferdam. The intake hose has the potential to adversely affect fish, including juvenile Atlantic salmon, through impingement and entrainment. Approach velocities across the screen that are faster than a fish's swimming capability can draw and hold fish against the screen surface (*i.e.*, impingement), resulting in suffocation or physical damage to the fish (NMFS 2008). Impingement and entrainment can be avoided by putting a properly designed fish screen on the end of the intake hose.

To prevent entrainment of Atlantic salmon juveniles, MEDOT proposes to use pump intake screen(s) that are designed and sized to meet NMFS (2008) criteria as described in section *1.2.1 Cofferdam Descriptions*. With the implementation of this protective measure, diversion pumps

[8] For ESA-listed Pacific salmon and steelhead, NMFS calculates an expected stranding rate of 8% (of total exposed population) for both electrofished and non-electrofished sites.

should have minimal, if any, effects on Atlantic salmon. In order for these protective measures to be effective, they must be carefully planned to suit the project site conditions and monitored throughout the period of pumping.

To the best of our knowledge, MEDOT has only killed one out of seven Atlantic salmon juveniles captured by electroshocking to evacuate fish from culvert work sites over the last six years. This "high" mortality rate (14%) is likely a due to the initial small sample size. Given that MEDOT staff biologists, and possibly consultants, who will be electrofishing, are experienced with handling salmonids in Maine, over the long-term we expect a similar level of mortality during electrofishing efforts as that experienced by MEDMR. MEDMR Bureau of Sea Run Fisheries and Habitat staff instituted changes in operating protocols that reduced electrofishing mortality of YoY salmon from 2.72% in 2001 to 1.71 % in 2010 with a mean mortality of 1.45% for both life stages over the last five year period (2006-2010) (Trial 2011). The vast majority of the mortality is to YoY.[9] Consequently, USFWS expects that no more than one (1) juvenile Atlantic salmon will be killed as a result of electrofishing, handling, and dewatering to relocate fish outside of cofferdam work areas (62.94 salmon captured x 1.45% mortality rate = 0.91 salmon mortalities; rounded up to one salmon mortality).

MEDOT anticipates that a small amount of riprap, approximately 96.15 $m^2$ (1,035 $ft^2$), would be placed in at locations vulnerable to erosion at most of the projects, such as the apron area at the inlets and outlets of culverts. Riprap applied behind the cofferdams will be placed in the dry and have no effects on salmon. That placed along the streambanks will be minimal. In order to minimize potential direct effects to salmon juveniles while placing the riprap, MEDOT biologists will isolate the area with siltation fence or block nets and evacuate any salmon that are contained within the enclosed area as described in the evacuation plan (Appendix B).

#### *4.1.2. Culvert Wing Wall and Bridge Wing Wall Footing Repairs*

At the Winterport project, MEDOT proposes to patch the surface of the concrete wing walls that are deteriorating. At the Phillips project, MEDOT proposes to place and fill grout bags below an undermined wing wall footing. Repairs will be made while a portion of the stream is dewatered behind sandbag cofferdams, in isolation from the stream thalwegs. Relatively low numbers of Atlantic salmon in the rivers reduces the likelihood that a salmon would be captured inside a cofferdam; however, as described in the fish evacuation plan (Appendix B), MEDOT intends to remove all fish, including Atlantic salmon captured inside of cofferdams, as the work area is dewatered. Because only portions of the streams will be isolated, fish passage would not be physically affected. Isolated from the stream in a dry work space, no Atlantic salmon could be exposed to high pH water while the concrete is curing. At Phillips project, MEDOT also proposes to add an anti-washout admixture that will increase the cohesiveness of the wet cement and limit the possibility of downstream transport of any released cement. There is a slight potential for the release of sediment when coffer dams are removed. However, we do not foresee any potential for harmful effects to juvenile salmon.

[9] This mortality figure does not include "catch per unit effort" sampling or random "poke" sampling because the size of the stream area sampled is not know in these instances. The data above, however, captures the majority of MEDMR's electrofishing effort for Atlantic salmon and is thought to be representative of overall mortality rates.

*4.1.3. Effects from Fish Passage Testing (Hopefully not needed)*

Following construction of replacement culverts, validation of the design (measuring water depths, velocities, etc.) is necessary at each of the culvert projects. This activity is not expected to have any effect on Atlantic salmon.

*4.1.4. Sedimentation Effects*

Construction activities that involve work in a stream or near the banks of the stream are likely to result in some level of sediment being discharged into the stream as a result of disturbance to either land-based soils or stream substrates. YoY and parr juveniles could be present in each of the streams, but they will relocated away from the work areas, as described in the fish evacuation plan (Appendix B). Fish release upstream of the project site is preferred as sediment impacts would not likely affect individuals upstream of the crossing.

The amount of sediment entering streams in association with these projects is expected to be relatively minor given the measures proposed by MEDOT to minimize erosion and sedimentation and the duration of instream work (1 day) at most projects. All projects covered by this Opinion will have all instream work limited to the period July 15 to September 30. Stream flows usually lowest during the summer in Maine, limiting the potential for rain and subsequent construction-site runoff to cause erosion and carry sediment into a stream. Generally, the longer the construction period, the greater the urgency for adequate erosion control measures.

All projects will be constructed in accordance with the MEDOT BMP manual for sediment and erosion control (MEDOT 2008a). Each project will have an individual Soil Erosion and Water Pollution Control Plan (SEWPCP) that is approved and fully enforced by MEDOT. Because the project is located in habitat for an endangered species, the BMP manual designates the project as "sensitive" and requires that a combination of BMPs will be used to protect the resource, including that one of the BMPs must be an erosion control BMP versus a sedimentation control BMP. A higher level of inspection and compliance assurance is required by MEDOT for all projects where endangered species are present (MEDOT 2008a).

Limiting most instream work to a dewatered section of stream within a cofferdam will minimize the amount of sediment mobilized and distributed downstream. Turbid water from within a cofferdam will be pumped into a "dirty water" treatment system to minimize sedimentation impacts to the stream when the diverted water is returned downstream. However, the installation and removal of these cofferdams and the diversion of streamflow around the construction site can result in some amount of sediment being dispersed in the stream. Construction-related disturbances in riparian areas near the stream have the potential to result in erosion and sediment entering streams, particularly if there are rainstorms during periods when there are disturbed soils on construction sites. Strict adherence to the SEWPCP plan and vigilant monitoring by MEDOT staff should minimize this source of erosion and subsequent sediment reaching streams. MEDOT anticipates that only 157.94 $m^2$ (1,700 $ft^2$) of riparian vegetation would be disturbed in order to complete construction and repairs on the eleven projects.

Atlantic salmon are adapted to natural fluctuations in water turbidity, such as during high water events from spring runoff. However, a variety of anthropogenic activities can result in short-term increases in suspended sediments and unnatural increases in stream turbidity (Robertson *et al.* 2007). Potential adverse effects of these increases in stream turbidity on Atlantic salmon

could include the following (Robertson *et al.* 2006; Newcombe 1994): 1) reduction in feeding rates; 2) increased mortality; 3) physiological stress, including changes in cardiac output, ventilation rate, and blood sugar level; 4) behavioral avoidance of the work area; 5) physical injury (*e.g.*, gill abrasion); 6) reduction in macroinvertebrates as a prey source, and 7) a reduction in territorial behavior.

In a review of the effects of sediment loads and turbidity on fish, Newcombe and Jensen (1996) concluded that more than 6 days exposure to total suspended solids (TSS) greater than 10 mg/l is a moderate stress for juvenile and adult salmonids. A single day exposure to TSS in excess of 50 mg/l is also a moderate stress to salmonids. Robertson *et al.* (2007) found adverse effects to juvenile Atlantic salmon from short-term increases in suspended sediment at sediment levels as low as 15 nephelometric turbidity units (NTU) in a laboratory setting. These effects, however, were observed during the fall and winter seasons, a time period when most of the MEDOT projects will not be engaged in work activities that could release suspended sediment. Effects on fish from short-term turbidity increases (hours or days) are generally temporary and are reversed when turbidity levels return to background levels (Robertson *et al.* 2006).

The USFWS does not have sufficient information to compare the conclusions of Newcombe and Jensen (1996) with TSS levels that might be expected from the projects and various construction activities covered by this Opinion. However, based on our knowledge of instream construction activities in Maine of a similar nature to the projects discussed here, we would not expect construction-related TSS levels to reach those described by Newcombe and Jensen. Most of these projects are located in sections of streams with coarser substrates (boulder, cobble, gravel, sand) where the opportunity for sediment to be mobilized and carried downstream by construction activities will be minimal. The sediment and erosion control measures that will be employed for each project, including construction in the dry, should keep sediment effects on Atlantic salmon to a minimal level on a temporary basis. Based on professional judgment and MEDOT's observations at past projects, suspended sediment plumes should not exceed 30.48 m (100 feet) in the small streams in this consultation. Considering the expected small volume of suspended sediment likely to be introduced into the affected streams, any discharge is likely to dissipate quickly and return to background levels.

The effects of sediment on Atlantic salmon and their habitat will be most pronounced during culvert removal/installation, when the stream is rerouted, bypass culvert installation/removal, backfill of road surfaces, and when the stream flow is returned through the dewatered work site. Suspended sediment pulses are likely to last from a few minutes to several hours. Because of the minor amount of construction-related sediment expected to reach these streams and because of the relatively small number of salmon expected to be in the action areas, turbidity-related effects are expected to be minor and short-term. USFWS expects any exposed fish to volitionally seek adjacent, less turbid habitats, thus avoiding direct sediment exposure. Once suspended sediment levels return to background levels, Atlantic salmon displaced from the action area would be expected to return and normal behaviors resumed (*e.g.*, foraging, defending territory). Such effects would not be expected to "harm" salmon.

Under the ESA, the definition of "take" includes "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (ESA § 3(18)). Harm is defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass in the definition of take in the ESA means an intentional or negligent act or

omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering (50 C.F.R. § 17.3). Any take associated with sediment generated by the project is expected to be sublethal in nature in the form of harassment. Therefore, this activity is not expected to result in a take of any Atlantic salmon that can be quantified.

#### *4.1.5. Effects from Hazardous Materials Associated with Construction*

As a component of the SEWPCP for each project, MEDOT or their contractor will develop and implement a Spill Prevention Control and Countermeasure Plan (SPCCP) designed to avoid any impacts to rivers and streams from hazardous chemicals associated with construction, such as diesel fuel, oil, lubricants, and other hazardous materials. All refueling or other construction equipment maintenance will be done at a location consistent with the SPCCP and in a manner which avoids chemicals or other hazardous materials getting into the stream. Petroleum-based materials, such as diesel fuel and oil, contain polycyclic aromatic hydrocarbons (PAHs). PAHs can be acutely toxic to salmonids and other aquatic organisms at high exposure levels or can cause sublethal effects at lower exposures (Albers 2003). Careful adherence to an approved SPCCP, as part of the overall SEWPCP, should make it highly unlikely that Atlantic salmon would be exposed to harmful chemicals during a construction project.

#### *4.1.6. Effects on the Riparian Zone*

At the project locations some vegetation, including trees, shrubs, or the herbaceous layer, will be removed from the stream banks to allow for construction access, placement of larger crossing structures, or other construction-related activities. Vegetation removal, only 158 $m^2$ (1,700 $ft^2$) of riparian vegetation, will be kept to minimum necessary to complete construction and repairs on the eleven projects. Rip-rap will be used to stabilize stream slopes or protect structures from scour.

Although riprap along stream banks can increase stream water temperatures due to solar radiation, the generally small amounts of riprap proposed (approximately 96.2 $m^2$ at locations vulnerable to erosion, such as the apron area at the inlets and outlets of culverts) should not have a measurable effect on water temperature. Furthermore, minor vegetation removal should not result in any input of sediment into the streams, as long as appropriate erosion control BMPs, such as silt fence, are employed. All disturbed areas will be mulched and stabilized following construction (MEDOT 2008a).

#### *4.1.7. Effects on Stream Connectivity*

Road crossing structures, particularly culverts, can have adverse effects on the passage of aquatic organisms, including Atlantic salmon. As stated in their BA, MEDOT intends to preclude passage of all life stages of Atlantic salmon during construction of culverts, which will last approximately one day per each culvert replacement site, as well as for resetting the end of a culvert at the Cherryfield-Rte 182 project.

Long term, fish passage for adult and juvenile salmon will not be affected by the three repair projects and positively improved at all eight of the culvert replacement projects. Each of the replacement culverts would be wider, except for the Garland culvert. The existing Cherryfield-Rte 193 structure will be replaced with a culvert greater than the measured bankfull width of the

stream. In small watersheds, because of the high likelihood for error calculating stream hydrology in order to determine the FishXing high and low design flows, MEDOT generally follows a 1.2 X bankfull-width guideline. The FishXing model predicts that each of the remaining proposed structures, including Garland, is adequately sized for fish passage through the full range of flows that would juvenile salmon would likely encounter. (The Whitefield structure would also be greater than the measured bankfull width of the stream.)

All of the culvert replacements would be set the correct elevation and embedded, which will better facilitate fish passage and the natural movement of bed load and large wood.

Most of the culverts will be substantially lengthened. Increased length could be a critical factor at culverts where velocity is an issue affecting fish passage. The maximum water velocity that fish are able to swim against as they negotiate the full length of a culvert is dictated by the width, slope, and length of a structure. The longer a culvert, the lower the maximum allowable velocity that fish are capable of sustaining as they swim upstream. Fortunately, added lengths were not a great enough factor to affect the positive outcome of FishXing results at each of the replacements.

Additional discussion of fish passage through culverts is provided below in section *4.2.2.*, which discusses effects of these projects on critical habitat and the migration PCE.

## 4.2 Effects to Atlantic Salmon Critical Habitat

This critical habitat analysis determines whether the proposed action will destroy or adversely modify designated critical habitat for listed species by examining any change in the conservation value of the essential features of that critical habitat. This analysis relies on statutory provisions of the ESA, including those in section 3, which defines "critical habitat" and "conservation," section 4, which describes the designation process, and section 7, which sets forth the substantive protections and procedural aspects of consultation.

The projects covered by this consultation were evaluated by an MEDOT biologist familiar with Atlantic salmon habitat requirements to determine which of the critical habitat PCEs (and their associated physical and biological features) are present within the project action area. All of the projects contain both spawning and rearing and migration PCEs (Table 4). Appendix A provides

**Table 4.** PCEs in vicinity of projects that have critical habitat for GOM Atlantic salmon (A = Spawning and Rearing; B = Migration).

| Project | A1 | A2 | A3 | A4 | A5 | A6 | A7 | B1 | B2 | B3 | B4 | B5 | B6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Argyle #1 | | | | X | X | X | X | | | | X | X | X |
| Argyle #2 | | | | X | X | X | X | | | | X | X | X |
| Cherryfield-Rte 182 | | | | X | X | X | X | | | | X | X | X |
| Cherryfield-Rte 193 | | | | X | X | X | X | | | | X | X | X |
| Garland | | | | X | X | X | X | | | | X | X | X |
| Frankfort | | | | X | X | X | X | | | | X | X | X |
| Hermon | | | | X | X | X | X | | | | X | X | X |
| Meddybemps | | | | X | X | X | X | | | | X | X | X |
| Phillips | | | | X | X | X | X | | | | X | X | X |
| Whitefield | | | | X | X | X | X | | | | X | X | X |
| Winterport | | | | X | X | X | X | | | | X | X | X |

a description of the salmon habitat at each project site and a list of the PCEs and specific habitat features present at each location. The discussion that follows lists each PCE and its associated biological and physical features and then discusses how the proposed bridge and culvert projects may affect the PCE and their associated features.

*4.2.1. Effects to the Spawning and Rearing Primary Constituent Element and its Seven Physical and Biological Features*

*PCE A1) Deep, oxygenated pools and cover (e.g., boulders, woody debris, vegetation, etc.), near freshwater spawning sites, necessary to support adult migrants during the summer while they await spawning in the fall.*

*PCE A2) Freshwater spawning sites that contain clean, permeable gravel and cobble substrate with oxygenated water and cool water temperatures to support spawning activity, egg incubation, and larval development.*

*PCE A3) Freshwater spawning and rearing sites with clean, permeable gravel and cobble substrate with oxygenated water and cool water temperatures to support emergence, territorial development and feeding activities of Atlantic salmon fry.*

None of the eleven projects have been identified as having holding adult or spawning habitat (PCE A1, A2 or A3) in the project vicinity.

*PCE A4-A7 for parr rearing habitat*

The four distinct physical and biological elements of freshwater habitats used by Atlantic salmon parr will be considered together because of the similarity of the habitats that support these various features of critical habitat for parr. MEDOT identified that all four physical and biological features of the spawning and rearing PCE important for parr are present at the eleven project sites. There are no project locations where fewer than four parr PCEs were noted.

*PCE A4. Freshwater rearing sites with space to accommodate growth and survival of Atlantic salmon parr.*

*PCE A5. Freshwater rearing sites with a combination of river, stream, and lake habitats that accommodate parr's ability to occupy many niches and maximize parr production.*

*PCE A6. Freshwater rearing sites with cool, oxygenated water to support growth and survival of Atlantic salmon parr.*

*PCE A7. Freshwater rearing sites with diverse food resources to support growth and survival of Atlantic salmon parr.*

Non-spawning tributaries represent an important part of the habitat complex for Atlantic salmon. Sites occurring furthest upstream, with small cumulative drainage areas, such as the eleven proposed culvert and bridge projects, have high survival of fry and age 1+ parr (juveniles after their first year of life in freshwater) compared to sites lower in a watershed. A likely mechanism for higher survival in stream reaches of small drainage area is that these areas provide more favorable temperatures (Sweka *et al.* 2007). Juveniles salmon tend to seek this habitat. Loughlin (2008) noted upstream migration of fry to 100 meters at all locations and up to 500 meters above the stocking point at one location. Juvenile 1+ and 2+ parr (juveniles after their second year of life in freshwater) enter small tributaries from the main stem of the river and can produce notable numbers of smolt (Erkinaro *et al.* 1998).

For ten of the eleven proposed projects (8 culvert replacements, 3 repairs), sections of streams will be completely dewatered (*i.e.*, the entire channel from one bank to the opposite bank), albeit temporarily, within cofferdams to allow construction work to occur in the dry.

The area of stream channel that is critical habitat for parr that would be temporarily dewatered to complete work in this batch of projects varies from about 33 $m^2$ to about 193 $m^2$. During the period of dewatering, which would typically last about one day for small culverts, parr habitat within the cofferdam area would be unavailable to Atlantic salmon. Once the project is completed, the cofferdams removed, and normal stream flows are restored, the temporarily impacted parr habitat should return to its prior condition. These projects would result in the total, temporary loss of 1192.04 $m^2$ of parr habitat or about 11.9 units of juvenile habitat.

De-watered parr habitat at the realignment and culvert sites would experience a loss of aquatic invertebrates, which provide food for Atlantic salmon juveniles. This loss of food resources would be temporary; however, as aquatic invertebrates should recolonize the stream once flows are re-established. Since the stream habitat would not be permanently altered in any way, its ability to support aquatic invertebrates after construction activities are completed should not change. There will likely be a period of time following restoration of stream flows where the parr habitat will immediately regain the habitat elements of space and cool, oxygenated water but will still lack in food resources until aquatic invertebrates are able to recolonize the stream substrate.

Some projects will require rip-rap to stabilize new or repaired bridge abutments or the inlets and outlets of culverts. Some of this rip-rap will be placed in critical habitat that is used by Atlantic salmon parr. Only some of this rip-rap will result in a permanent loss of habitat because the rock fill will extend above the stream surface (*i.e.*, the rip-rap placed closest to the edge of the stream). As the rip-rap slopes down into the stream from the abutments, some of the placed rock will be under water and would offer rearing habitat for Atlantic salmon parr. Rip-rap impacts are estimated to range from 0.0 $m^2$ to 25.1 $m^2$, which is a relatively minor effect to critical habitat given the amount of salmon habitat available in these streams.

Culverts can result in the loss of natural stream bottom inside the culvert, depending on the type of culvert and the site-specific conditions. Most of the proposed culverts would be longer to accommodate road widening and slope requirements, resulting in an additional 27.43 m (90 ft) of stream with structures and the displacement of 56.30 $m^2$ of parr habitat by the longer structures, based on the new culvert widths. Some habitat can be provided if the culvert is sufficiently embedded with substrate that is similar to the natural streambed. Culverts that have a relatively natural stream bottom, particularly bottomless structures, may offer habitat for salmonids. For example, a large pool under the existing bottomless arch culvert (PIN 16742.00) on Drew Road/Route 171 across Mud Brook in Prentiss Township provided rearing habitat for at least one hundred brook trout and other species, until fish were evacuated on August 3, 2010 to allow replacement with a 4-sided box culvert that destroyed the pool habitat.

None of the existing culverts in this batch of projects have natural stream substrate on the bottom of the culvert. Often old culverts were set too high compared to the stream channel profile and not embedded. As a result hydraulic conditions did not allow the culverts to maintain substrate. Such culverts cause a loss or degradation in habitat conditions from changes in hydrology, sediment transport, and movement of woody debris. To ensure dynamic equilibrium and that replacement culverts are set at the best elevation, a sufficiently long, surveyed profile is essential

for determining both the characteristics of the channel and the appropriate degree of countersink for the new culvert. A vertical profile of the project (approximately 20 channel widths or a minimum of 200 feet upstream and downstream from the culvert) is recommended to determine the true channel slope and the expected extent of scour (Bates *et al.* 2003, Castro 2003, Forest Service Stream-Simulation Working Group 2008, NMFS 2008, Love and Bates 2009, Bates and Kirn 2009, Kilgore *et al.* 2010, MADOT 2010).

All of the proposed culverts in this batch of projects will be placed at a correct elevation and embedded by 0.30 m to 0.61 m (1 to 2 feet) depending on the diameter. Because of the increased width and placement of the new culverts, it is anticipated that some stream substrate will stay in the proposed new culverts, which could offer some habitat value for salmon parr. However, we would not expect the stream substrate habitat in round culverts to match or be as high in quality as a bottomless culvert. Stream substrate under Project SHARE's wide bottomless arch culverts in the Machias River watershed provide a natural stream with habitat for a diverse community of aquatic insects and juvenile salmonids.[10]

MEDOT will monitor each of the culverts to evaluate whether the project provides and maintains hydraulic conditions that are favorable for fish passage and whether or not stream substrate stays in the new culverts. FishXing offers insight into how the hydraulic environment created by a specific stream crossing design compares to the swimming abilities of particular fish. The software can be used to design a new stream crossing through an iterative approach, or to analyze an existing stream crossing to determine if it meets desired fish passage criteria. However, FishXing does not furnish the user with a solution or design. Physical measures, accompanied by measures of water velocity within the culvert and discharge, appear to be the best tools available for evaluating fish passage. FishXing, while a good tool to develop a more fish-friendly road crossing, does not accurately predict water velocity at most locations (Davis and Davis 2002).

#### *4.2.2. Effects to the Migration Primary Constituent Element and its Six Physical and Biological Features*

The migration PCE is present at each of the bridge and culvert projects within designated critical habitat. MEDOT noted that feature B3[11] was absent at all sites due to the overall depleted diadromous fish communities throughout rivers in Maine. However, native diadromous fish are still present in rivers where salmon occur, albeit in reduced numbers, and still provide an alternative prey species for predators of Atlantic salmon, as well as pulses of marine-derived nutrients. Nutrients deposited by fish carcasses that are retained in freshwater and riparian ecosystems are critical for maintaining their stream productivity, and thus, the freshwater phase of salmon populations as well. Each of the sites have an open migration corridor (B4), sufficiently cool water temperatures and a natural flows regime (B5), and water chemistry needed to support sea water adaptation of smolts (B6).

Cherryfield-Rte 182 repairs and the eight culvert replacement projects would result in a complete, temporary blockage of both upstream and downstream fish movements through the

[10] A University of Maine graduate student is documenting use by aquatic insects and juvenile salmon at Project SHARE culverts.

[11] Feature B3 of the migration PCE: Freshwater and estuary migration sites with abundant, diverse native fish communities to serve as a protective buffer against predation.

work site while cofferdams (which span from one stream bank to the other) are in place. This temporary blockage would occur between July 15 and September 30 and could be as brief as one day for smaller projects. Since the summer instream work window occurs after the downstream migration of Atlantic salmon smolts, which is generally during the period from mid-April through mid-June (Baum 1997), these stream blockages will not affect smolt migration. Once the cofferdams are removed, the migration function of the critical habitat would be completely restored.

At Winterport and Phillips repair projects an adequate zone of passage will be maintained at all times in the river channels. Cofferdams would only isolate a portion of the stream channel during construction. Juvenile salmon are expected to be able to move through the work sites to access both upstream and downstream rearing habitat. Once the cofferdams are removed, the migration habitat will be restored to its original condition and there will be no permanent effect to the habitat. These partial stream blockages will generally occur during the July 15 to September 30 work window.

Culverts and bridges can have adverse effects on the passage of fish, including Atlantic salmon (Benton *et al.* 2008; Belford and Gould 1989). Road crossings with culverts, either round pipes or square boxes, can affect fish passage by acting as a physical barrier (*e.g.*, a hanging culvert) or by altering stream flows (*e.g.*, increasing water velocity, decreasing water depth), consequently limiting a fish's ability to navigate a stream crossing.

All of the projects covered by this consultation have been designed in accordance with the MEDOT Wildlife and Water Crossing Policy and Design Guide (MEDOT 2008b), which does not necessarily require the passage of aquatic-dependent organisms, terrestrial wildlife that habitually use riparian areas for movement, as well as native fish species, through a given road crossing structure. While MEDOT recognizes the importance of providing aquatic habitat connectivity, they have to balance the design of transportation projects in light of many considerations including project costs and available funding, regulatory requirements, safety, and right-of-way issues. Consequently, fish passage for all species and all life stages will not be provided at every MEDOT stream crossing at all flows. Nevertheless, in their BA, the ACOE and MEDOT state that all projects covered by this consultation will be suitable for upstream passage of juvenile Atlantic salmon.

The MEDOT design guide utilizes the hydraulic design method, which bases culvert design on the known swimming abilities of the fish species that need to move through a structure and the recognition that crossings should mimic as much as possible the natural hydraulic conditions of the stream. Hydraulic designs optimize the hydraulic effects of culvert size, slope, material, and length to create water depths and velocities suited to the swimming ability of a target fish. The hydraulic design method is a focused approach methodology used to create water depths and velocities in culverts that meet the swimming abilities of target fish populations and life stages during specific periods of fish movement. The method requires the input of a number of uncertain criteria (hydrology and fish swim speeds, behavior and migration timing), but can be appropriate when designing for a small number of target species with similar requirements, if the hydraulic requirements of those species are known. This technique generates a smaller diameter culvert, usually narrower than bankfull width, which keeps cost of materials to a minimum. General considerations include the effect of culvert slope, size, material and length.

Significant errors associated with estimation of hydrology and fish swimming speeds must be resolved by making conservative assumptions in the hydraulic design process. On ungaged streams, hydrology models used for this method may produce design flows with high standard errors. Fish swimming capability is a function of water quality conditions and origin, size and condition of the fish. Swim speeds provided in the literature are typically determined in laboratory settings. Even within a given species, there can exist a large variation between individual capabilities. This can be the result of life stage, condition or individual prowess. It is important to recognize that fish do not always select the distance-maximizing swim speed, and the extent to which the optimum is approached appears to be under the influence of both individual variability and life history or phylogenetic constraints. Also, steady uniform velocity found in a laboratory apparatus is rare in the wild (Castro-Santos 2006).

Turbulence, as well as rapid fluctuations in water velocity and direction in a localized area, that may result from a hydraulic drop, are not considered in hydraulic designs. High levels of turbulence can disorient and exhaust a fish, creating a passage barrier. Also, most streams in Maine provide habitat for a number of different aquatic species. A culvert designed for salmonids would likely not be adequate for most other species. Many weak-swimming or crawling species use the slow water at bank edges and along the stream bottom itself. Little is known about movement timing and capabilities of many species of fish and organisms that migrate through Maine's stream corridors in the Atlantic salmon DPS. As discussed above, fish species other than Atlantic salmon provide an alternative prey species for predators of Atlantic salmon, as well as pulses of marine-derived nutrients when they die after spawning.

Nevertheless, as discussed in section 1.6 and 4.1.7, fish passage will be positively improved at all of the culvert replacement projects, although most of the proposed culverts are longer than the existing structures. FishXing predicts that the structures, with increased width, proper placement, and embedding, should facilitate passage of juvenile salmon through the design flows at each of the proposed projects. However, only the new stream crossing structures at Whitefield and Cherryfield-Rte 193 will be equal or greater than the estimated bankfull width. The other six crossing structures will constrict the streams, increasing velocity past the structure, as well as interfering with normal sediment and wood transport.

MEDOT has not determined the actual passage efficiencies of culverts that have been installed to date in accordance with the crossing policy (MEDOT 2008b). However, MEDOT believes that most of their existing fish passage structures do pass the target fish species, based on indirect evidence (*e.g.*, comparing known swimming speeds versus the water velocity through the structure) or through direct observation of fish using the structure during low flow periods when the structure is accessible. Additional direct evidence of fish passage during various stream flows when salmon would be migrating, such as mark-recapture or PIT (Passive Integrated Transponder) tag data, is needed to demonstrate that these structures can effectively pass both juvenile and adult Atlantic salmon. At this time, USFWS believes that there is insufficient monitoring data from Maine road crossing structures to draw conclusions about overall effectiveness at providing passage for Atlantic salmon.

Hydraulic design culverts and culverts retrofitted with weirs that fail to correct fish passage barriers may result in blockages for the life of structures – several decades. Washington State, which has led the nation in the development of road crossing designs for fish passage, recently conducted a survey that determined that a large percentage of the culverts (30%) permitted during the last decade were in fact fish passage barriers or had failed during floods due to a lack

of evaluation of proposed plans and noncompliance with permit provisions (Price *et al.* 2010). Stream simulation-designed culverts were not included in the Washington Department of Fish and Wildlife survey because by design, these projects should provide no more of an obstacle to fish and other aquatic organisms than the adjacent natural channel (Bates *et al.* 2003, Jackson 2003, Clarkin *et al.* 2005, Forest Service Stream-Simulation Working Group 2008, FHWA 2010).

The USFWS would prefer that MEDOT employ stream or geomorphic simulation designs that allow for a continuous streambed that simulates natural channel width, depth, and slope and connect the reaches upstream and downstream of the crossing. Stream simulation was adopted by the U.S. Department of Agriculture, Forest Service as a pragmatic approach and sustainable long-term solution to maintain passage for all aquatic organisms at all life stages at road-stream crossings while meeting vehicle transportation needs and objectives. Rivers and streams are more than conduits for water and fish. They are linear ecosystems made up of the physical environment, communities of organisms, and a variety of ecological processes that shape and maintain these ecosystems over time.

Stream-simulation designed culverts are also reliable. U.S. Forest Service has determined that its older (greater than approximately 5 years) stream-simulation type culverts, mainly open-bottom arches that have experienced a range of high flows and sufficient channel-forming flow durations have responded adequately to local hydrology (Inter-Fluve Inc. 2009). In Washington, monitoring results show that when road crossings are designed and constructed according to stream simulation design criteria (culvert bed width = 1.2 (channel width) + 2 feet, and slope of culvert < 1.25 (channel slope)), stream simulation culverts are reliable and create similar passage conditions compared to the adjoining channel (Barnard 2003). Stream simulation designed culverts also work well in Maine. During a December 14, 2010, major flood in Downeast Maine, all of the 100+ culvert replacements completed by Project SHARE revealed no failures or damage. During that same flood at least 20 traditional stream-road crossings failed in the Union, Machias, East Machias, and Dennys Rivers (Geiger 2010).

### 4.3 Potential Effects not Considered in this Biological Opinion

Many of the projects in this batch do not yet have final designs. Consequently, there are many unknowns about site-specific conditions, project-specific construction techniques, and final amounts of habitat impacts from new or rehabilitated structures. In general, however, MEDOT and USFWS attempted to analyze projects in light of the greatest likely effects to salmon and their habitat. As project plans develop, it is possible that these plans will reveal an effect to Atlantic salmon or critical habitat that has not been assessed in this Opinion. If this situation develops, it will be necessary for the ACOE to reinitiate section 7 consultation for that particular project (or projects), as discussed below in section IX. The ACOE and MEDOT should allow for adequate time to reinitiate and complete consultation in light of project schedules.

## V. CUMULATIVE EFFECTS

Cumulative effects include the effects of future state, tribal, local or private actions that are reasonably certain to occur in the action area considered in this Opinion. Future federal actions that are unrelated to the proposed action are not considered in this section, because they require separate consultation pursuant to section 7 (a)(2) of the ESA.

Given that the action area encompasses a substantial amount of the freshwater portion of the GOM DPS and an extensive area of land (45,980 $km^2$) associated with many rivers, stream, ponds, and lakes, there is potential for a vast array of future state, tribal, local, and private actions to occur. There is very little federal land within the GOM DPS watersheds. In a broad sense, future activities would include (but not be limited to) agriculture, forestry, residential and commercial/industrial development, and recreational fishing. Within each of these broad categories are a variety of actions that could affect Atlantic salmon and their habitat including water withdrawal to irrigate crops, logging roads and stream crossings, non-point source pollution from residential development, and loss of forest and other natural habitats within a stream or lake ecosystem from residential and commercial development. Irrigation of blueberry and cranberry fields from both surface water withdrawals and wells is an ongoing activity, generally with no federal nexus, that is expected to expand, particularly for blueberries, as crop acreages increase. Reduction in stream flows from irrigation practices during the summer is of concern for Atlantic salmon at a time when stream flows are naturally low in most years. The Services continue to work with state regulatory agencies to address impacts to Atlantic salmon from irrigation.

Because many activities that impact streams, ponds, and wetlands require federal permits from the ACOE under the Clean Water Act and the Rivers and Harbors Act, at least some future actions (whether state, tribal, local, or private in nature) that would affect Atlantic salmon and their critical habitat would be subject to ESA section 7 (a)(2) consultation. Indeed, even some of the activities mentioned above, such as residential development, could be subject to a federal action if impacts to wetlands or streams would occur.

Maine's total population in 2009 was 1,318,301 people, compared to 1,125,043 people in 1980 (17.2% growth over 29 years). The U.S. Census Bureau projected Maine's population growth from 2000 to 2030 and noted an overall aging of Maine's general population. Maine's population is expected to grow by 10.7% through 2030, indicating a reduced growth rate (USCB 2010). Subsequently, patterns and types of land use and development are not expected to dramatically change compared to trends seen over recent decades. Activities that have affected Atlantic salmon and their habitat in recent years are expected to continue relatively unchanged, although efforts at salmon conservation have and will continue to benefit Atlantic salmon (*e.g.*, dam removals and riparian conservation easements).

## VI. CONCLUSION

This Opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statutory provisions of the ESA to complete the following analysis with respect to critical habitat.

After considering the current status of Atlantic salmon and its designated critical habitat, the environmental baseline, the effects of the proposed actions, and the potential for future cumulative effects in the action area, it is the USFWS's biological opinion that the proposed project is not likely to jeopardize the continued existence of the GOM DPS of Atlantic salmon throughout all or a significant portion of its range. Furthermore, the proposed actions are not expected to result in the destruction or adverse modification of critical habitat. In reaching these conclusions, the USFWS considered the best available scientific and commercial information regarding Atlantic salmon and the likely effects of the proposed bridge and culvert projects.

Effects to individual fish may, in turn, affect the attributes associated with a viable population (levels of abundance, productivity, spatial structure, and genetic diversity that support the species' ability to maintain itself naturally at a level to survive environmental stochasticity). USFWS has identified that the most significant direct effects to individuals from this proposed action will be injury and death that result from stream channel dewatering and fish salvage. In-water portions of the replacement and repair projects in this batch of projects would occur between July 15 and September 30, when juvenile Atlantic salmon could be present. Juveniles are likely to be killed as a result of stream dewatering and harmed from fish handling during the salvage operation. Because of the small project area, project timing, reduced stream flows associated with time of year, and the short time work would occur below ordinary high water; only a very small portion of the affected populations would be exposed to the project's adverse effects.

While some limited, short-term adverse effects and limited project-related injury and mortality of juvenile salmon will occur from implementation of these projects, the overall effects will not jeopardize the long-term survival and recovery of the species and or the function of designated critical habitat as needed for the conservation of Atlantic salmon. Degrading effects are expected to be short-term, and should be effectively minimized by the proposed work window, the small footprint of each project, project design criteria, and completing the bulk of the work in the dry. The overall impact of the proposed action on ESA-listed fish and designated critical habitats is expected to be outweighed by the long-term benefit of improving upstream fish passage. By replacing existing stream crossings with larger, embedded structures, there should be an improvement in access to available habitat that is currently under-utilized.

As described in section 4.2.2, we have reservations about culverts designed with the hydraulic design method. Implementation and effectiveness monitoring is needed to determine how well these culverts will function in regards to fish passage effectiveness, habitat connectivity, and the maintenance of ecological processes. However, the long-term effects of the proposed batch of projects on listed fish species and the conservation value of designated critical habitat may be beneficial if it increases the connectivity of watersheds, permitting greater access to areas critical for fulfilling life history requirements. The essential features of water quality, substrate, forage, upstream access (barriers), and floodplain connectivity should all experience some beneficial effects due to implementation. Culvert replacement should remove the risk of sediment inputs associated with road crossing failures.

Our conclusions regarding the GOM DPS of Atlantic salmon and its critical habitat are based on the following considerations.

- Impacts to Atlantic salmon habitat are largely temporary during various instream construction activities. Most habitat will be returned to its previous condition after construction is completed and will continue to function to support Atlantic salmon, either as spawning and rearing habitat or migration habitat.
- Sediment and erosion control practices are enhanced for each project (in addition to standard MEDOT requirements) due to the presence of an endangered species and should result in very minor amounts of sediment being released into rivers and streams. Sedimentation is not expected to affect the long-term function of any spawning and rearing or migration habitat for salmon.
- Take of Atlantic salmon juveniles is expected to be largely non-lethal and is associated mainly with the capture and removal from cofferdams. Capturing and relocating salmon during instream construction activities will avoid the more serious effects to salmon from temporarily dewatering habitat inside a cofferdam or not using a cofferdam at all during construction. Take of adult Atlantic salmon is not authorized and any effects to adults are expected to be relatively minor and short-term. Therefore, the current reproductive potential of the GOM DPS will not be affected.
- Overall, these projects will not adversely affect the ability of Atlantic salmon to access spawning and rearing compared to the existing projects, except on a short-term basis during certain in-water construction activities. MEDOT will evaluate fish passage conditions at culverts to verify that new structures are not fragmenting habitat by blocking fish movements.
- Instream work is scheduled during the standard summer work window when stream flows and precipitation are typically low, minimizing the likelihood of erosion and sedimentation to effect salmon and their habitat. Furthermore, the summer work window avoids particularly sensitive times of the salmon's life cycle, such as spawning, egg incubation, and downstream smolt migration.
- Permanent losses to salmon habitat from rip-rap is relatively minor compared to the total amount of habitat available in each of the three SHRUs. The individual and cumulative losses of habitat will not affect the function of critical habitat as needed to support recovery of the species.

## VII. INCIDENTAL TAKE STATEMENT

Section 9 of the ESA prohibits the take of endangered species without special exemption. The term "take" is defined to include harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Services to include an act that actually kills or injures wildlife. Such acts may include significant habitat modification or degradation that results in death or injury to a listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. The term "harass" is defined by the USFWS as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA, provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement (ITS).

### A. Amount or Extent of Take

The USFWS anticipates that there will be lethal and non-lethal take of juvenile Atlantic salmon as a result of the proposed actions addressed in this Opinion. Incidental take, including injury and death, caused by the adverse effects of the proposed action will include the following: (1) the capture and stranding of juvenile fish during work area isolation and dewatering; and (2) an increase in turbidity and sediment due to construction that will harass juvenile fish.

The latest available five-year GOM DPS average for juvenile Atlantic salmon density is 8.42 salmon/100 $m^2$. These data are from electrofishing efforts in many streams located in watersheds throughout the new GOM DPS (as defined in June 2009) and represent the best available scientific information to assist in determining the number of juvenile Atlantic salmon that are likely to be displaced or collected and relocated when a portion of a stream is dewatered within a cofferdam.

Given the known occurrence of Atlantic salmon somewhere in the affected watersheds, all eleven projects have the potential for salmon to be present in the action area. However, given the current low population size and the lack of hatchery supplementation in the vicinity of most projects, we would expect few project streams in the action area for this BO to contain Atlantic salmon. Therefore, few juvenile Atlantic salmon will be isolated within the cofferdam. Most Atlantic salmon captured during cofferdam installation will be properly handled and moved downstream outside of the work area by qualified MEDOT personnel according to the fish evacuation plan (Appendix B).

As discussed above in more detail in section *4.1.1 Cofferdams, Dewatering and Fish Relocation*, it is reasonable that as many as 63 juvenile Atlantic salmon could be captured within areas segregated from streams by cofferdams and subsequently relocated by MEDOT staff downstream of the action area. USFWS expects that no more than one (1) juvenile Atlantic salmon will be killed as a result of electrofishing activities to relocate fish outside of cofferdam work areas (62.94 salmon captured x 1.45% mortality rate = 0.91 salmon mortalities; rounded up to one salmon mortality).

The loss of this small number of fish is too small to influence the productivity, spatial structure, or genetic diversity of the affected ESA-listed Atlantic salmon population.

This ITS specifically does **not** authorize the take (lethal or non-lethal) of any adult Atlantic salmon associated with any of the eleven projects covered by this Opinion. If take of an adult salmon becomes a concern at any particular project, all activities that might be contributing to this concern should immediately cease and USFWS be contacted to discuss next steps. Reinitiation of section 7 consultation may be necessary depending on the particular circumstances at hand.

### B. Reasonable and Prudent Measures

Conservation measures designed to avoid and minimize effects on listed species and critical habitat are integral components of the proposed action and it is expected that all proposed project activities will be completed consistent with those measures. We have completed our effects analysis accordingly. The measures described below are nondiscretionary and must be implemented by the ACOE (or the MEDOT and their contractors) in order for the exemption in section 7(o)(2) to apply. The ACOE has a continuing duty to regulate the activities covered by this incidental take statement. The protective coverage of section 7(o)(2) will lapse if the ACOE fails to require adherence (or the applicant fails to act in accordance with its permit) to terms and conditions of the incidental take statement, or to exercise that discretion as necessary to retain the oversight to ensure compliance with these terms and conditions. Further consultation may be required to determine what effect any modified action may have on listed species or designated critical habitats.

The USFWS considers full application of conservation measures included as part of the proposed action and the following reasonable and prudent measures to be necessary and appropriate to minimize the likelihood of incidental take of the Atlantic salmon associated with the 12 culvert and bridge projects. Any deviation from the following conservation measures will be beyond the scope of this consultation and will not be exempted from the prohibition against take as described in the attached incidental take statement:

- Minimize the adverse effects to and incidental take of Atlantic salmon in the rivers and streams where bridge or culvert projects will occur by employing construction techniques that avoid or minimize adverse effects to water quality, aquatic and riparian habitats, and other aquatic organisms.
- Minimize adverse effects to and incidental take of Atlantic salmon by ensuring that fish passage and habitat connectivity at culverts and bridges is either maintained in its current condition or is improved by the replacement or rehabilitated structure.
- Ensure completion of a monitoring, evaluation, and reporting program to confirm that the projects are effective in avoiding and minimizing incidental take from permitted activities.

### C. Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the ACOE, MEDOT, and their contractors, must comply with the following terms and conditions, which implement the

reasonable and prudent measure described above, and outline the required reporting/monitoring requirements. These terms and conditions are nondiscretionary.

1. MEDOT shall hold an pre-construction meeting for each project with appropriate MEDOT Environmental Office staff, other MEDOT staff, and the MEDOT construction crew (as practicable) or the contractor(s), to review all procedures and requirements for avoiding and minimizing impacts to Atlantic salmon and to emphasize the importance of these measures for protecting salmon and their habitat. ACOE and USFWS staff will attend these meetings as practicable.
2. All instream work (which includes the installation and removal of cofferdams, as well as other activities) shall be conducted according to the work windows specified in the BA.
3. All projects authorized by this permit shall be designed in accordance with MEDOT's 2008 Waterway and Wildlife Crossing Policy and Design Guide.
4. Maine DOT and their contractors will minimize the potential for impacts to Atlantic salmon and their habitat by conducting all construction activities for each project in accordance with the Maine DOT-approved Soil Erosion and Water Pollution Control Plan. Instream turbidity will be visually monitored. All erosion controls will be inspected daily to ensure that the measures taken are adequate. If monitoring or inspection shows that the erosion controls are ineffective, immediately repair, replace, or reinforce controls as necessary.
5. All areas of temporary waterway or wetland fill will be restored to their original contour and character upon completion of the projects.
6. Disturbed areas adjacent to the stream will be stabilized and re-vegetated with a seed mix appropriate for riparian areas in Maine.
7. The fish evacuation plan (Appendix B) must be implemented by appropriate MEDOT staff during construction and dewatering of all cofferdams to carefully remove fish from the work area. Avoid electroshocking as much as practicable by using netting, trapping and/or seining as the preferred fish exclusion methods.
8. Visually assess and report the levels of incidental take in terms of the extent of the stream channel dewatered during construction activities, including: (1) A summary of the length of each stream channel dewatered; and (2) A summary of the length of time each stream channel is dewatered. Cease operations immediately and contact USFWS (Maine Field Office, Orono, 207-866-3344) if the amount of take is exceeded.
9. All Atlantic salmon mortalities from electrofishing or other related activities will be reported to the USFWS (Wende Mahaney at 866-3344, Ext.118; FAX 866-3351; or wende_mahaney@fws.gov) within 48 hours of occurrence. Salmon mortalities shall be immediately preserved (refrigerate or freeze) for delivery to: the USFWS office in Orono, Maine. If USFWS is not available contact NMFS in Orono (Jeff Murphy; 866-7379) to arrange for delivery.
10. To prevent entrainment of Atlantic salmon juveniles, MEDOT shall use a screen on each pump intake sufficiently large enough that the approach velocity does not exceed 6.10 m

$sec^{-1}$ (0.20 ft $sec^{-1}$).[12] Square or round screen face openings are not to exceed 2.38 mm (3/32 inch) on a diagonal. Criteria for slotted face openings must not exceed 1.75 mm (approximately 1/16 inch) in the narrow direction. Intake hoses shall be regularly monitored while pumping to minimize adverse effects to Atlantic salmon.

11. Any cofferdam constructed as part of the authorized projects shall adhere to the specifications contained in Section 2.1 (Cofferdam Descriptions) of the BA.

12. All culvert installations authorized by this permit must adhere to the specifications contained in Section 2.2 (Culvert Replacement Projects) of the BA.

13. All cofferdams shall be removed from the stream immediately following completion of construction, allowing for minor delays due to high stream flows following heavy precipitation, so that fish and other aquatic life passage is not unnecessarily restricted. If a project is not completed but there will be substantial delays in construction, cofferdams will need to be at least partially removed to allow unobstructed passage of Atlantic salmon until construction resumes.

14. Noxious Weeds: All off-road (operating off of existing open and maintained roads) equipment and vehicles must be cleaned prior to entering the easement to remove all soil, seeds, vegetation, or other debris that could contain seeds or reproductive portions of plants. Equipment operators may employ whatever cleaning methods are necessary to ensure that off-road equipment is free of the above material prior to entering the easement portion of the access road. The equipment will be inspected prior to off-loading.

15. MEDOT or their contractor will follow measures designed to avoid effects to rivers and streams from hazardous materials associated with construction activities, including:

    - All vehicle refueling shall occur more than 100 feet from any water course.
    - All vehicles carrying fuel shall have specific equipment and materials needed to contain or clean up any incidental spills at the project site. Equipment and materials would include spill kits appropriately sized for specific quantities of fuel, shovels, absorbent pads, straw bales, containment structures and liners, and/or booms.
    - During use, all pumps and generators shall have appropriate spill containment structures and/or absorbent pads in place.
    - All equipment used for instream work shall be cleaned of external oil, grease, dirt, and mud. Any leaks or accumulations of grease would be corrected before entering streams or areas that drain directly to streams or wetlands.

16. A post-project report for each project, confirming completion of construction and the successful application of all terms and conditions of this Opinion, shall be submitted within four (4) weeks of project completion. Submit post-project reports to USFWS and the ACOE.

17. To minimize adverse effects to Atlantic salmon and ensure that salmon and other fish species are able to pass through replacement culverts and that stream habitat is not fragmented, MEDOT will monitor and evaluate the design of replacement culverts that were not designed following a stream simulation approach, including Argyle #1, Argyle

[12] For screen design, the effective screen area is calculated by dividing the maximum screened flow by the allowable approach velocity.

#2, Frankfort (PIN 17532), Garland, Hermon, and Meddybemps, as described in part II of Appendix C of the BO. In this batch of projects, Cherryfield-Rte 193 and Whitefield projects are as wide as the bankfull width of the streams.

Following procedures outlined in part II of Appendix C, monitor the effectiveness of the above projects during the first, third, and fifth years after construction. Over this monitoring period, measurements shall be taken when flows are low, when depths are more likely to be critical, and during higher flow conditions (e.g., about average annual minimum and average annual), when velocities and/or turbulence are more likely to be critical, in order to sufficiently evaluate fish passage conditions. Monitoring reports will be submitted in a timely fashion that will allow for the prompt planning and implementation of any necessary instream construction work. Construction to correct adverse fish passage conditions or habitat issues associated with these projects shall be included in the next MEDOT biennial capital work plan. Inwater construction for any corrective actions shall be implemented during a July 15 to September 30 work window, unless another work window is approved by USFWS. After the fifth year monitoring report is evaluated, the USFWS will determine the need for any further monitoring or corrective measures. Such monitoring will be used to test MEDOT's fish passage design assumptions and learn from feedback to guide the design of subsequent stream crossings.

18. Annual monitoring reports that describe the procedures and results at each project, as well as numbers of fish captured and accidental fish mortalities, shall be submitted by March 31st each year to USFWS (Attn: Wende Mahaney, 17 Godfrey Drive, Orono, ME 04473) with a copy to ACOE (Attn: Jay Clement, Maine Project Office, 675 Western Avenue #3, Manchester, ME 04351) and NMFS (Attn: Jeff Murphy, 17 Godfrey Drive, Orono, ME 04473).

19. ACOE staff shall carefully monitor the actions described in this Opinion and document the level of incidental take to ensure that these projects are minimizing the take of Atlantic salmon. ACOE will provide the USFWS Maine Field Office with an annual report summarizing the work done under this Opinion, accounting for all cumulative take of Atlantic salmon, until such time as all projects are completed. When all construction projects are completed, the ACOE shall submit a final report to the USFWS summarizing the total amount of incidental take from all projects within four (4) weeks of completion.

## VIII. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

- ACOE should fund or otherwise support research on the effects of culvert rehabilitation projects, including invert liners and slip liners, on fish passage, stream geomorphology, habitat connectivity, and other aspects of stream ecology.
- ACOE and MEDOT should collaborate to conduct monitoring of stream turbidity levels associated with various construction activities at several different project locations, preferably representing as much variation in site conditions as possible. Collecting this data will be useful for future section 7 consultations regarding MEDOT projects, when assessing the effects of construction projects on Atlantic salmon habitat and their habitat.
- MEDOT, FHWA, COE, NMFS, and USFWS should explore development of standard local operating procedures for ESA-listed fish species in Maine to administer road, culvert, and bridge actions that are authorized by the ACOE in Maine.
- Develop a strategy for conducting fish passage assessments of existing stream crossings across MEDOT administered roads within watersheds occupied by ESA-listed fish species. Work with USFWS and NMFS to establish a prioritization list and schedule for addressing problem stream crossings.

## IX. REINITIATION NOTICE

This concludes formal consultation for the ACOE's proposed permitting of eleven culvert replacement and culvert and bridge repair projects to be carried out by the MEDOT on rivers and streams throughout Maine. As provided in 50 CFR 402.16, reinitiation of formal consultation is required when discretionary federal agency involvement or control over the action has been retained (or is authorized by law), and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion; or (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this Opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease, pending reinitiation.

# Environmental Summary Sheet

**Pin: 19334.00** **Date Submitted: 4/19/12**
**Town: Garland**
**CPD Team Leader: Laurie Rowe**
**NEPA Complete: No FHWA $**

☒ **Section 106**
SHPO Concurrence-No Effect
Special Conditions:

☒ **Section 4(f) and 6(f)**
Section 4(f)
Review Complete- No USDOT $
Section 6(f)
Not Applicable

☒ **Maine Department of Inland Fisheries and Wildlife Essential Habitat**

**Not Applicable** **Timing Window: Not Applicable**

☒ **Section 7**
**Formal Consultation**
**Species of Concern: Atlantic Salmon DPS**
**Atlantic Salmon-Critical Habitat**
**Comments/References: Close attention is needed for all special conditions from Section 7 consultation, please see ACOE permit and the SP 105**

☒ **Maine Department of Conservation/Public Lands, Submerged Land Lease**
**Not Applicable**

☒ **Maine Land Use Regulation Commission**
**Not Applicable**
**Applicable Standards and Permits are included with the contract*

☒ **Maine Department of Environmental Protection**
**Permit by Rule (PBR)**
**Applicable Standards and Permits are included with the contract*

☒ **Army Corps of Engineers, Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act.**
**Category 3**
****Please see ACOE Permit and SP 105 for all special conditions.**
**Applicable Standards and Permits are included with the contract*

☒ **Coast Guard**
**Not Applicable**
**Applicable Standards and Permits are included with the contract*

☒ **Special Provisions Required**

| | | |
|---|---|---|
| **Special Provision 105-Timing of Work Restriction** | N/A☐ | Applicable☒ |
| **Instream work allowed 7/15 to 9/30** | | |
| **Special Provision 656-Erosion Control Plan** | N/A☐ | Applicable☒ |
| **Special Provision 203-Dredge Spec** | N/A☐ | Applicable☒ |
| **General Note for Hazardous Waste** | N/A☒ | Applicable☐ |
| **Special Provision 203-Hazardous Waste** | N/A☒ | Applicable☐ |
| **Special Provision 105.9** | N/A☒ | Applicable☐ |

**All permits and approvals based on plans/scope as of: 6/14/11*