STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
16 STATE HOUSE STATION
AUGUSTA, MAINE
04333-0016

JOHN ELIAS BALDACCI
GOVERNOR

DAVID A. COLE
COMMISSIONER

May 5, 2008
Subject: **Norridgewock**
Project No. BH-6900(01) X
Pin No.006900.01
**Amendment No. 2**

Dear Sir/Ms:

Make the following changes to the Bid Documents:

From the plans, **REMOVE** Sheet 65 of 134 and **REPLACE** with the attached new Sheet 65 of 134.

From the plans, **REMOVE** Sheet 67 of 134 and **REPLACE** with the attached new Sheet 67 of 134.

From the plans, **REMOVE** Sheet 68 of 134 and **REPLACE** with the attached new Sheet 68 of 134.

From the plans, **REMOVE** Sheet 123 of 134 and **REPLACE** with the attached new Sheet 123 of 134.

In the Bid Book, **INSERT** "SPECIAL PROVISION, PROTECTION OF RAILROAD TRAFFIC AND STRUCTURES" (9 pages dated 5/2/08) after SPECIAL PROVISIONS, SECTION 104, Utilities (after page 45 of the Bid Book).

In the Bid Book, **REMOVE** "SPECIAL PROVISION, SECTION 604, MANHOLES AND CATCH BASINS" page 190 (1 page dated March 10, 2008) and **REPLACE** with the attached new "SPECIAL PROVISION, SECTION 604, MANHOLES AND CATCH BASINS", 1 page dated April 30,2008.

In the Bid Book, **REMOVE** "SPECIAL PROVISION, SECTION 635, PREFABRICATED BIN TYPE RETAINING WALL" Pages 206 – 212 in the Bid Book (7 pages dated March 20, 2008) and **REPLACE** with the attached new "SPECIAL PROVISION, SECTION 635, PREFABRICATED BIN TYPE RETAINING WALL" dated April 30, 2008 (7 pages).

In the Bid Book, SPECIAL PROVISION, SECTION 535, HANGER SYSTEM, page 3 of 5 (page 187 of the Bid Book). Change "**523.05 Proofloading**" to read "**535.05 Proofloading**". Make this change in pen and ink.

The following questions have been received:

**Question:** Plan Sheet 106 of 134, note B.2, calls for nuts and washers to meet requirements of ASTM A519. This is a spec for steel tubing, not nuts and washers. Can we quote appropriate specs instead?

**Response:** Nuts should be A563 and washers should be A709 Grade 50.

**Question:** Is there a straightness tolerance for hangar rods?

**Response:** The straightness tolerance for the 5-1/2" diameter hanger rods is L/1000 where L is the rod length.

**Question:** 535.03 Fabrication/ Structural Strand, para. 2, calls for tests required by ASTM A586 to be performed. The question is on breaking strength test of 3" strand. A586 addresses it by not requiring it, but allows for it if the buyer wants it done. This recognizes the expense you can get into with this test, which will total $5000.00 to $10,000 per test by the time all the accounting is done. If "job" sockets are required, the cost could well be more. As this is considerable, you can understand our preference to know exactly what is required.

**Response:** No breaking strength tests are required for the 3" structural strand.

**Question:** Under sockets and testing requirements, acceptance criteria are given for Magnetic Particle Examination, but not for Radiographic Examination. What are the criteria?

**Response:** Criteria for the radiographic examination of the sockets: Use ASTM E336 for material up to 2" thick, ASTM E186 for material up to 4-1/2" thick, and ASTM E280 for material up to 12" thick, with acceptance level 3.

**Question:** 535.04 Structural Steel Assembly, 2$^{nd}$ para., last sentence, states that strand wires adjacent to the socket are to be relubricated after socketing. Why and with what? There is no lubrication specified for the strand.

**Response:** No lubrication of the cables is required.

**Question:** 523.05, Proofloading (probably should be 535.05), how much of the strand/socket assembly is required to be included in the proofloading procedure?

Normally it is the socket and the strand. We had not expected to furnish the cast lower plates.

**Response:** Proof testing is required only for the socket and strand assembly, not for the other hanger components. Please see the above pen and ink change.

**Question:** Will the State be sending a Special Provision for protection of railroad traffic and structures?

**Response:** Please refer to the attached Special Provision – Protection of railroad Traffic and Structures dated 4/29/08.

**Question:** The plan dimensions for the sheet pile pier cofferdam have to be larger than the minimum plan dimensions for the pier seal. Will the contractor be reimbursed tipping fees plus 5% under item 832.071, Contractors Allowance, for all the excavation within the sheet pile cofferdam, removed and disposed of at Norridgewock Crossroad's landfill?

**Response:** The Contractor will be reimbursed tipping fees plus 5% markup under Item 832.071 Contractor Allowance for all material removed from the cofferdams and disposed of at the Norridgewock landfill.

**Question:** Can the contractor use mechanical couplers on bars P1004 between the 10ft. diameter pier shaft and the curtain wall? Will the State pay for the couplers?

**Response:** Mechanical couplers may be used between the pier shaft and the curtain wall; however payment will be incidental to related contract items.

**Question:** Note 5 on plan sheet 82 indicates that the deck rebar, curbs and sidewalks is incidental to the appropriate concrete item. This bar is listed in the reinforcing steel schedule, which normally means it is in the reinforcing steel bid item. Please clarify. Also, if the bar is incidental, what are the limits?
The special provision also indicates that the spirals in the rock socket foundation option are incidental, yet they also appear in the bar schedule. Please clarify?

**Response:** Payment for reinforcing steel fabricated, delivered and placed in the cast in place portion of the bridge deck will be considered incidental to appropriate concrete items. This includes the cast in place portions of the deck slab, sidewalk and transverse diaphragms. This reinforcing steel is listed in the schedule with bar marks starting with the designation S. Reinforcing steel for the concrete barrier rail is paid for under Item 526.324.
Payment for reinforcing steel fabricated, delivered and placed in the rock socketed pipe piles is incidental to Item 501.701 Steel Pipe Piles, In Place. These include bars P650,

P800 and P850 which are shown on the revised reinforcing steel schedule included in this amendment.

**Question:** The expansion and construction joints indicated on sheets 82 & 83 at the ends of spans 1 & 3 appear to contradict with the deck closure section shown on sheet 110. Please clarify?

**Response:** Sheet 82 and 83 show construction joints in the deck and expansion joints in the concrete barrier rail. Construction joints in the deck only are detailed on sheet 110 and the rail expansion joints are detailed on sheet 116.

**Question:** Reference sheet 106, Note D No.3 'the Contractor shall develop a method to precisely align the upper and lower tubes." We can develop a method of alignment at the time of installation, but is the contractor to be responsible for creep, shrinkage, deflection, etc.? Also, on this same sheet – would a pinned connection between the upper anchorage and the hanger cable be acceptable?

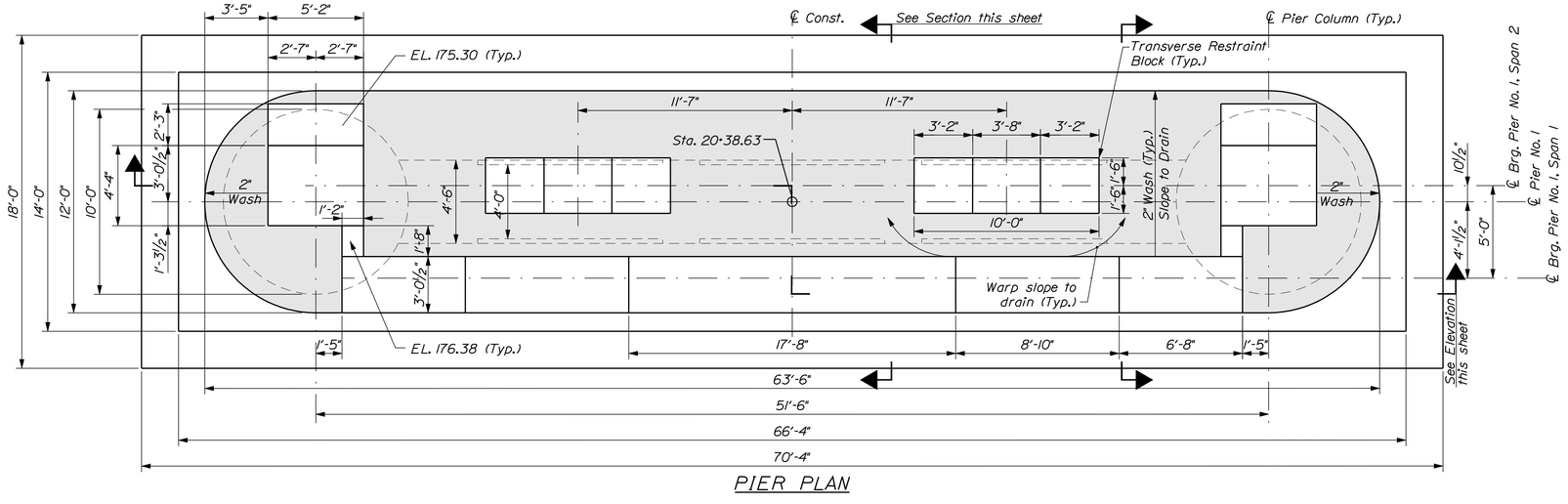
**Response:** The Contractor is responsible for precisely aligning the upper and lower anchorages at the time of installation only; creep, shrinkage, deflection, etc. do not need to be considered. The Department assumed that the upper hangar assemblies, including the 5 ½ "diameter steel rod, 8" OD steel tube, washer, plate, nut and grease cap will be assembled and cast into each arch rib. The hangars are delivered fabricated to the sockets. The large end of the socket is threaded, and will be treaded onto the end of the rod in the field after the concrete is placed.

Consider these changes and information prior to submitting your bid on **May 21, 2008.**

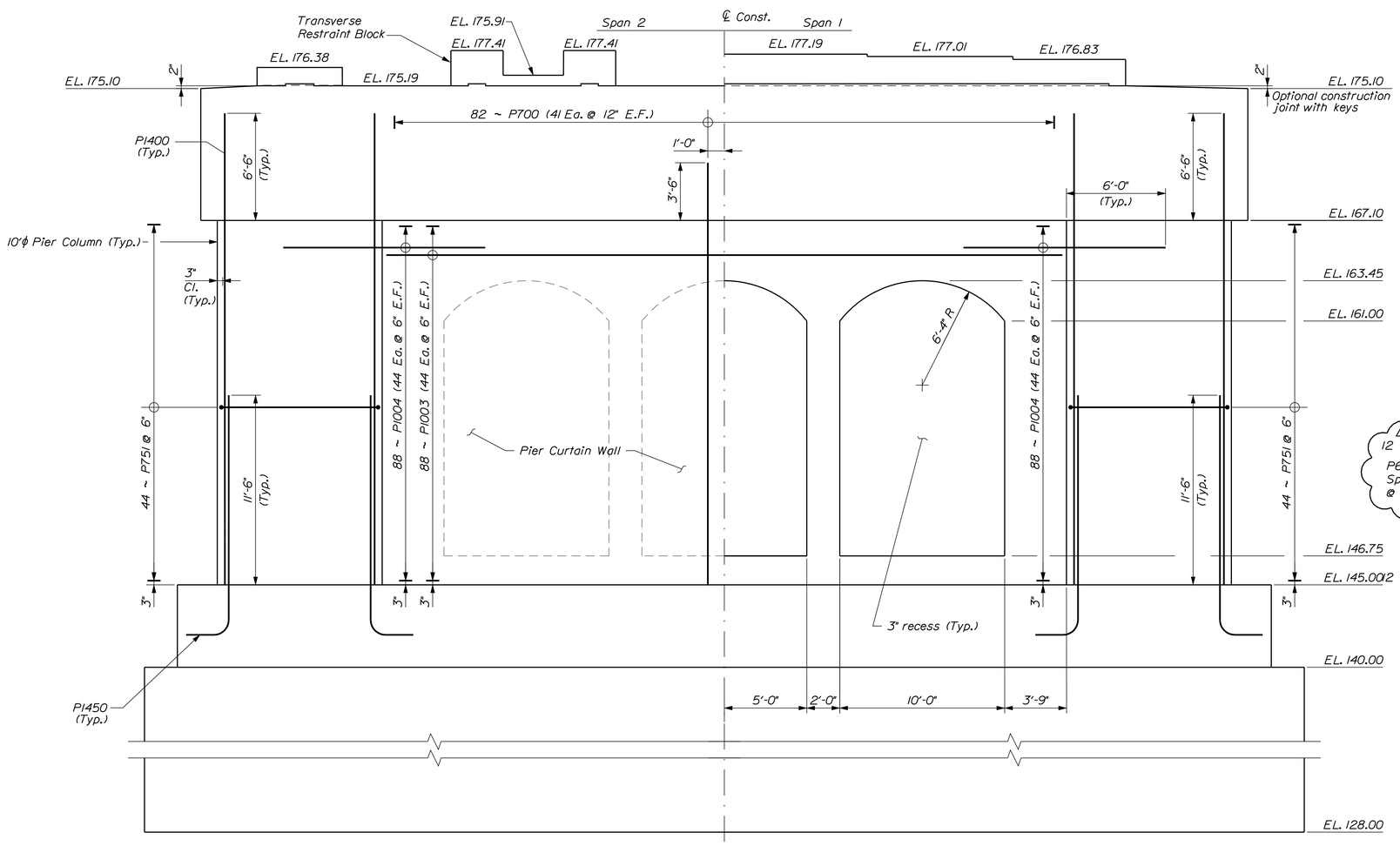
Sincerely,

FOR

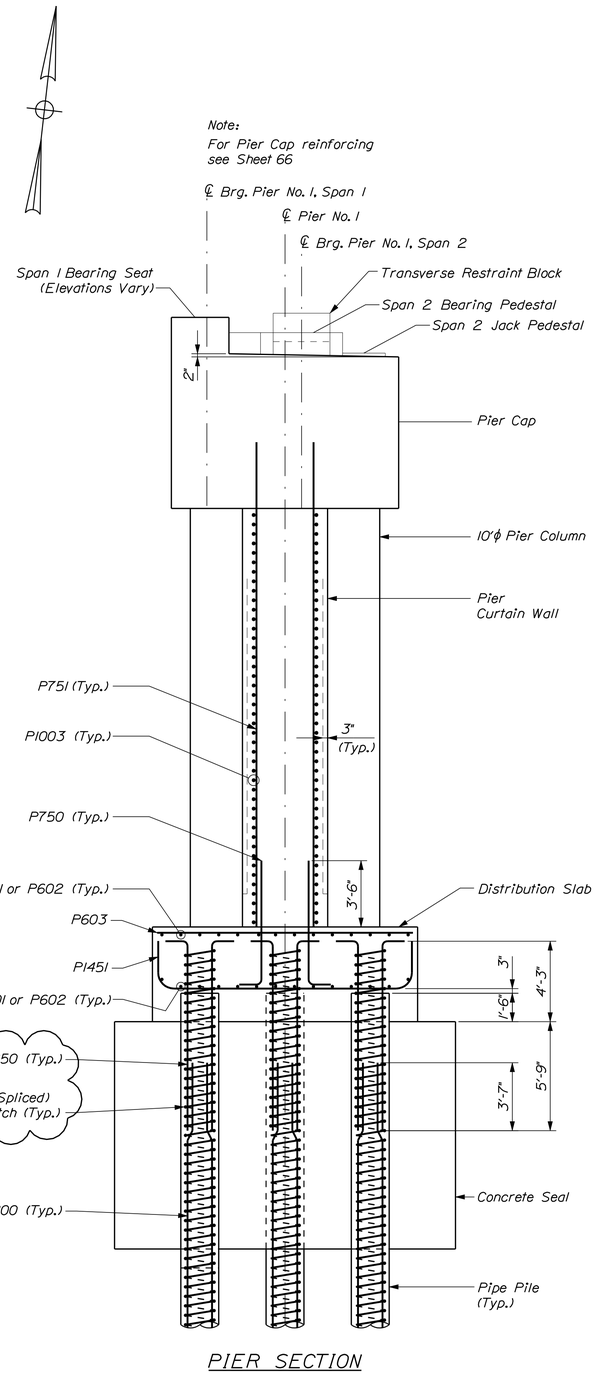
Scott Bickford
Contracts & Specifications Engineer




PIER PLAN




PIER ELEVATION




PIER SECTION

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

BH-6900(01)X

PIN 006900.01

BRIDGE NO. 2187

BRIDGE PLANS

| | BY | DATE |
|---|---|---|
| PROJ. MANAGER | W. FRANKHAUSER | |
| DESIGN-DETAILED | KSW | 03.02.08 |
| CHECKED-REVIEWED | CAW | 03.02.08 |
| DESIGN2-DETAILED2 | PLH | |
| DESIGN3-DETAILED3 | | |
| REVISIONS 1 | MLB | REVISIONS MADE ON 04/25/08 |
| REVISIONS 2 | | |
| REVISIONS 3 | | |
| REVISIONS 4 | | |
| FIELD CHANGES | | |

SIGNATURE

P.E. NUMBER

DATE

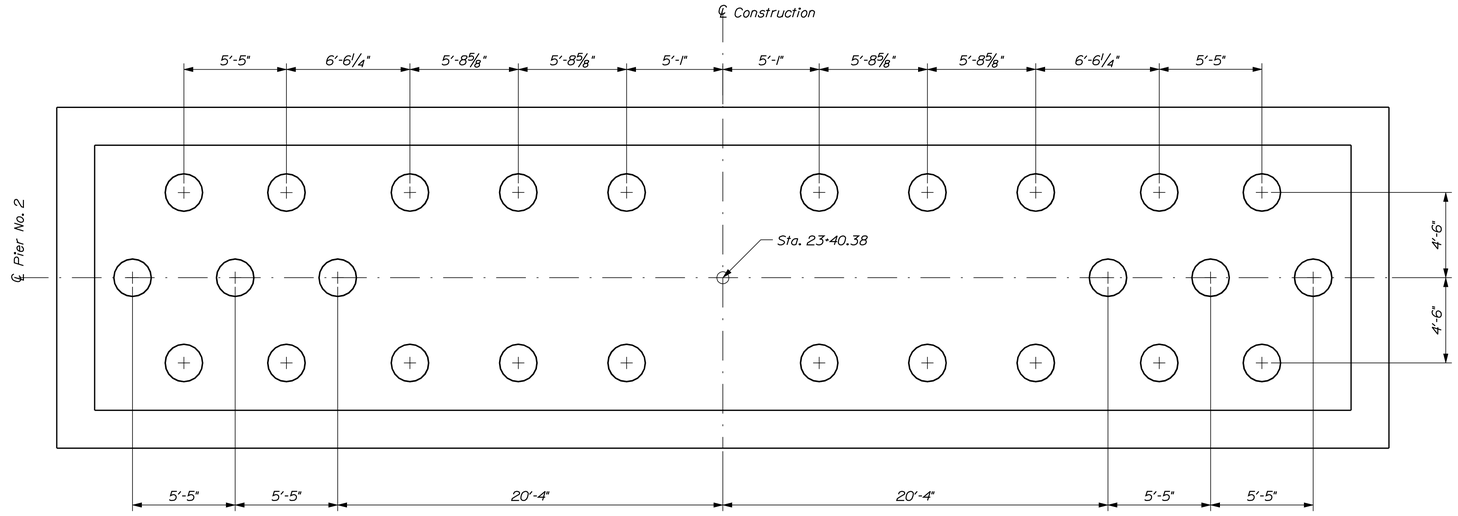
COVERED BRIDGE
KENNEBEC RIVER
NORRIDGEWOCK SOMERSET COUNTY

PIER NO. 1 SHAFT PLAN AND ELEVATION

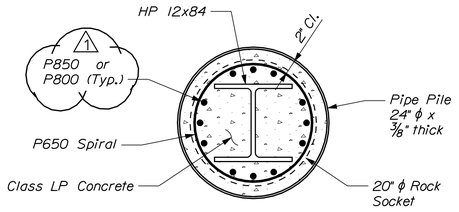
SEA
SEA CONSULTANTS INC.
Scientists/Engineers/Architects

SHEET NUMBER
65
OF 134

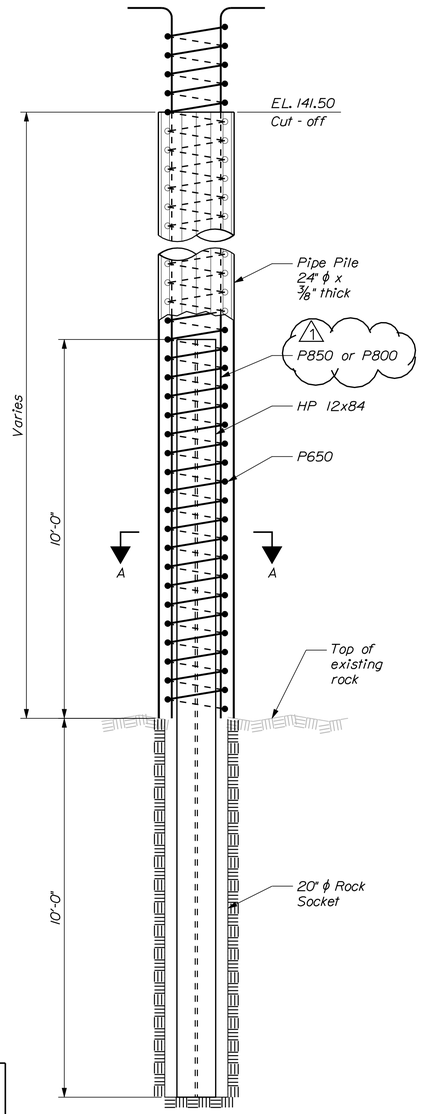
Filename: ...\065_Plan_Pier_1_ Shaft.dgn Division: BRIDGE Username: michelle.boone Date:4/25/2008




PILE PLAN




SECTION A - A

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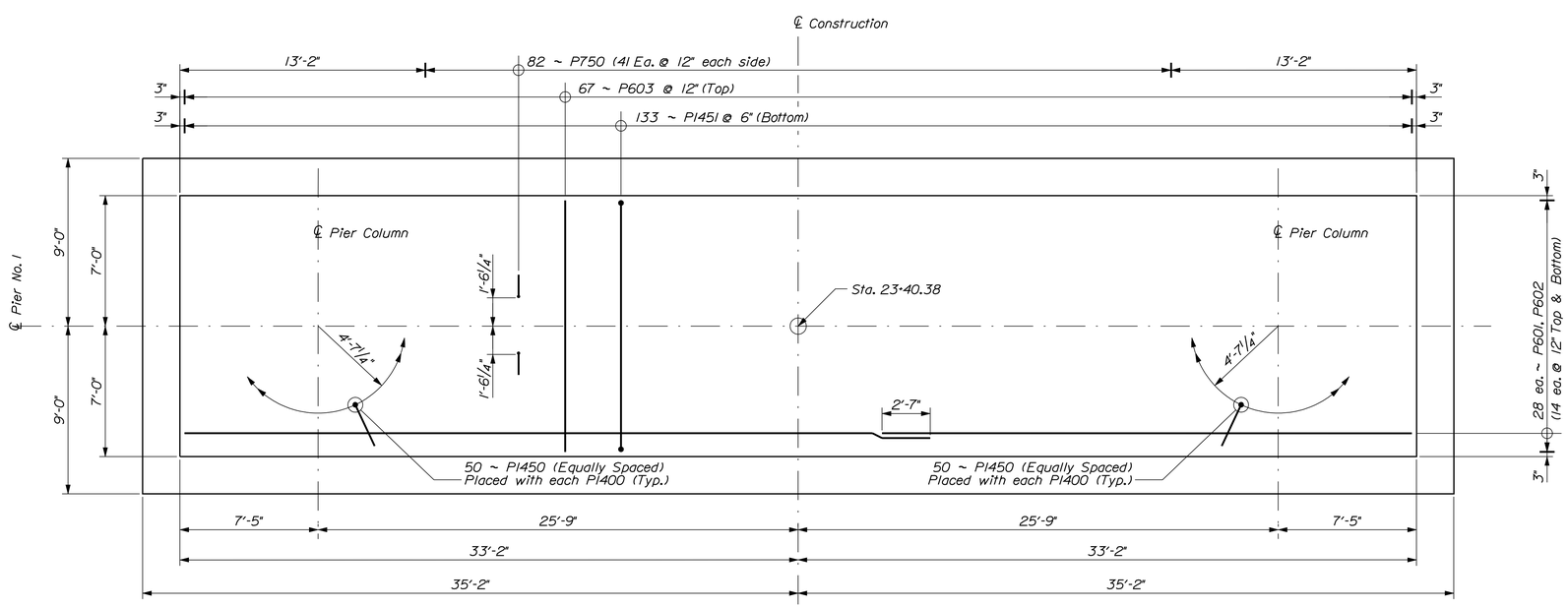



DISTRIBUTION SLAB / SEAL LAYOUT

SEA

SEA CONSULTANTS INC.
Scientists/Engineers/Architects

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

BH-6900(01)X

PIN 006900.01

BRIDGE NO. 2187

BRIDGE PLANS

| | | | |
|---|---|---|---|
| PROJ. MANAGER | W. FRANKHAUSER | BY | DATE |
| DESIGN-DETAILED | KSW | DSS | 03/02/08 |
| CHECKED-REVIEWED | CAW | PLH | 03/02/08 |
| DESIGN2-DETAILED2 | | | |
| DESIGN3-DETAILED3 | | | |
| REVISIONS 1 | MLB REVISIONS MADE ON 04/25/08 | | |
| REVISIONS 2 | | | |
| REVISIONS 3 | | | |
| REVISIONS 4 | | | |
| FIELD CHANGES | | | |

SIGNATURE

P.E. NUMBER

DATE

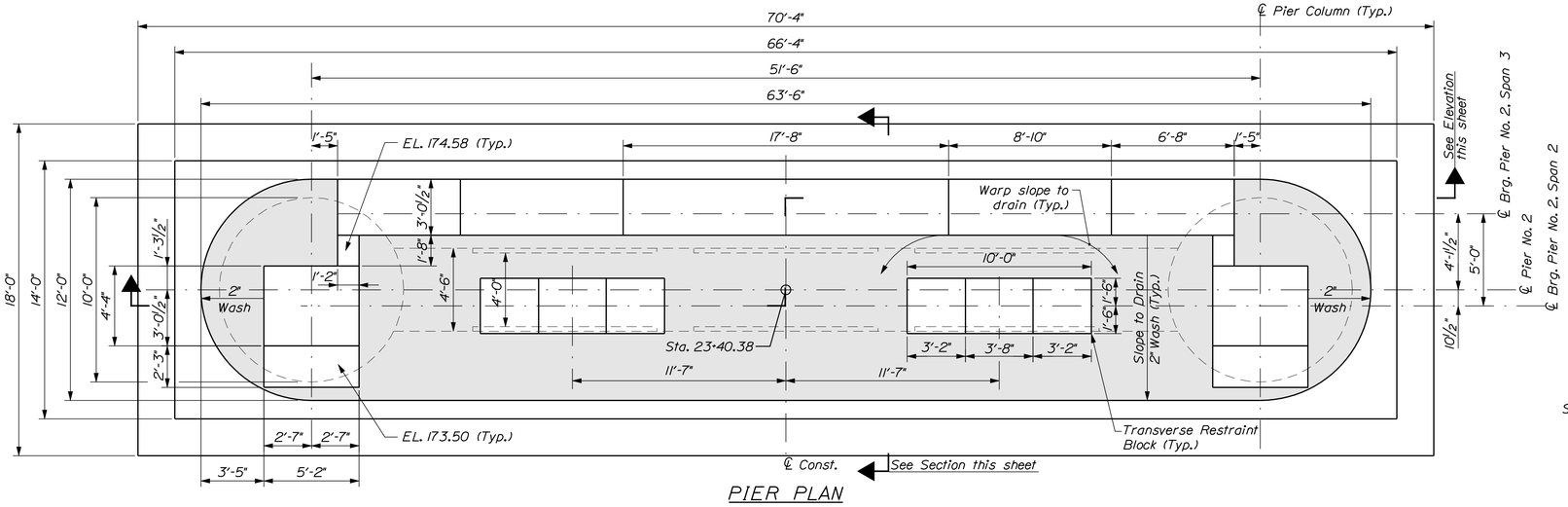
COVERED BRIDGE
KENNEBEC RIVER
NORRIDGEWOCK SOMERSET COUNTY

PIER NO. 2 PILE, DISTRIBUTION
SLAB / SEAL LAYOUT

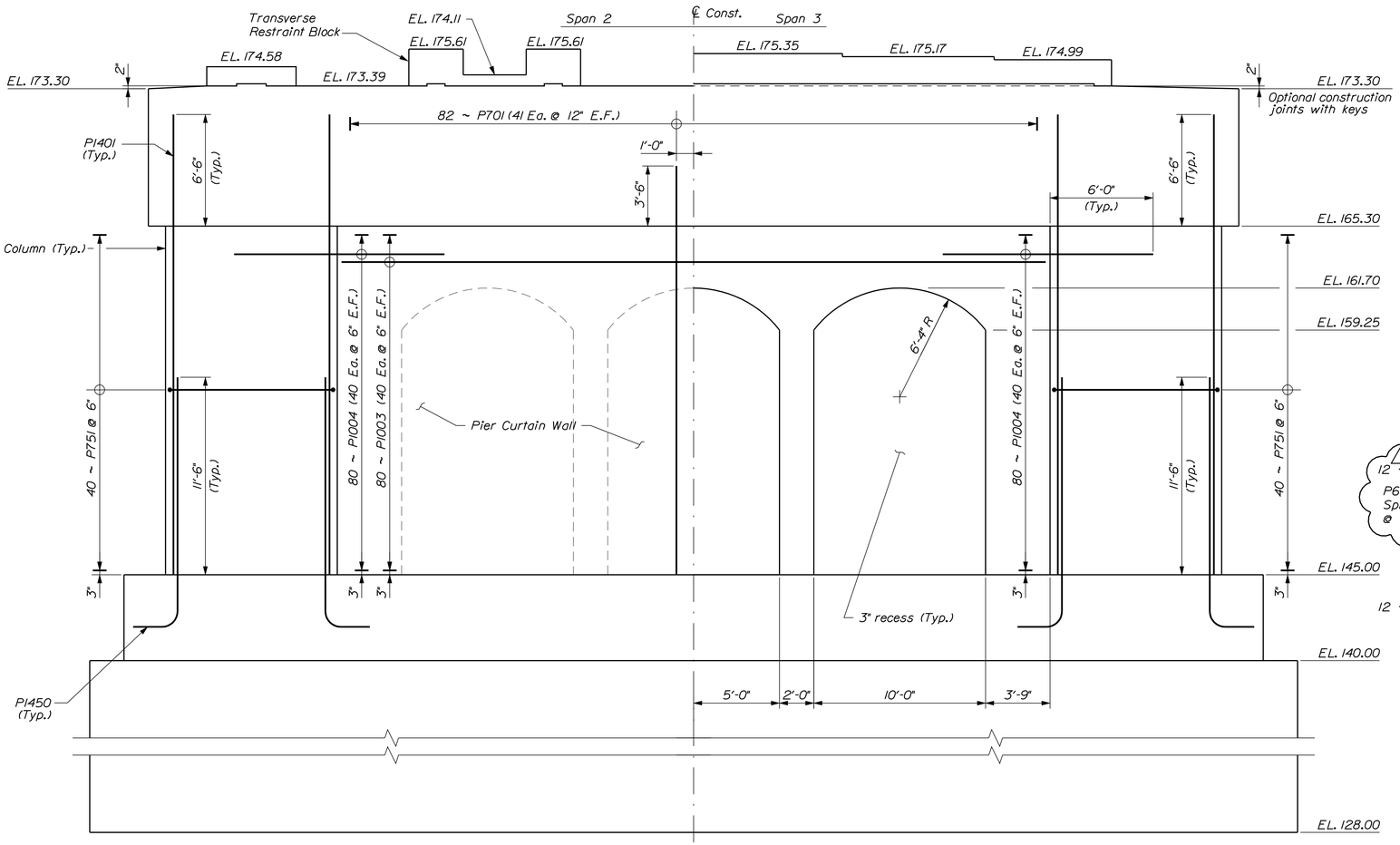
SHEET NUMBER

67

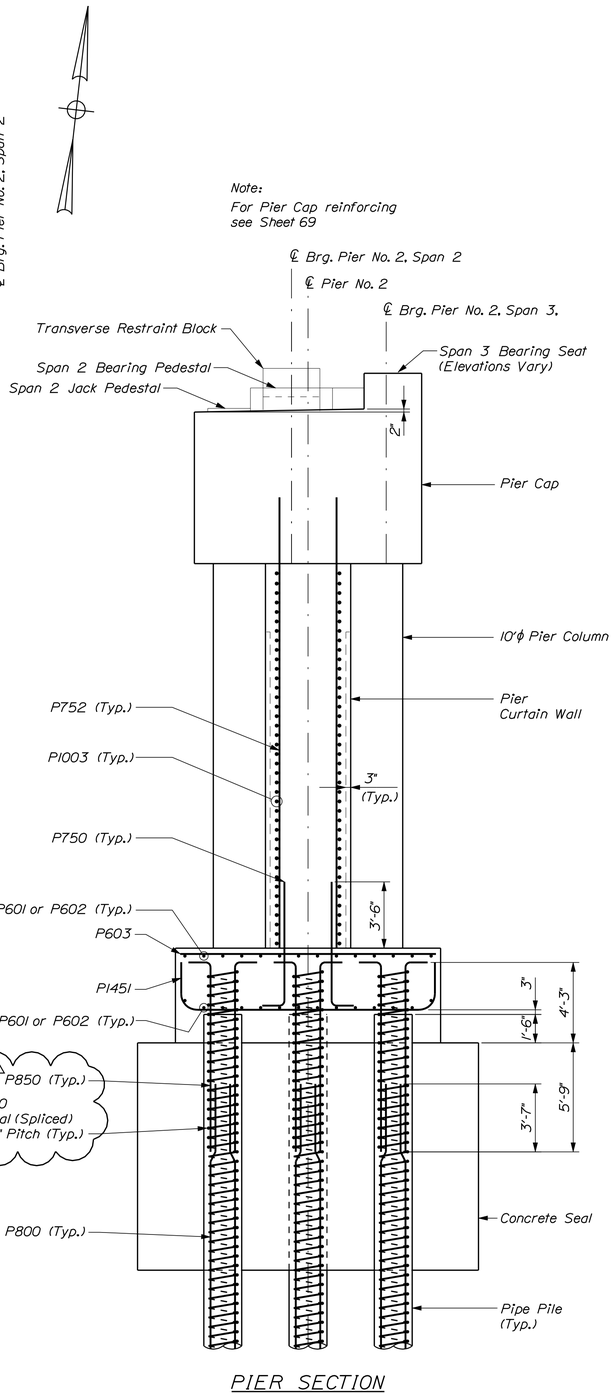
OF 134




PIER PLAN




PIER ELEVATION




PIER SECTION

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

BH-6900(01)X

PIN 006900.01

BRIDGE NO. 2187

BRIDGE PLANS

| | W. FRANKHAUSER | BY | DATE |
|---|---|---|---|
| PROJ. MANAGER | | | |
| DESIGN-DETAILED | KSW | DSS | 03.02.08 |
| CHECKED-REVIEWED | CAW | PLH | 03.02.08 |
| DESIGN2-DETAILED2 | | | |
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| REVISIONS 1 | MLB REVISIONS MADE ON | | 04/25/08 |
| REVISIONS 2 | | | |
| REVISIONS 3 | | | |
| REVISIONS 4 | | | |
| FIELD CHANGES | | | |

SIGNATURE

P.E. NUMBER

DATE

COVERED BRIDGE
KENNEBEC RIVER
NORRIDGEWOCK SOMERSET COUNTY

# PIER NO. 2 SHAFT PLAN AND ELEVATION

SEA
SEA CONSULTANTS INC.
Scientists/Engineers/Architects

SHEET NUMBER
68
OF 134

Filename: ...\068_Plan_Pier_2_ Shaft.dgn Division: BRIDGE Username: michelle.boone Date:4/25/2008

## STRAIGHT BARS

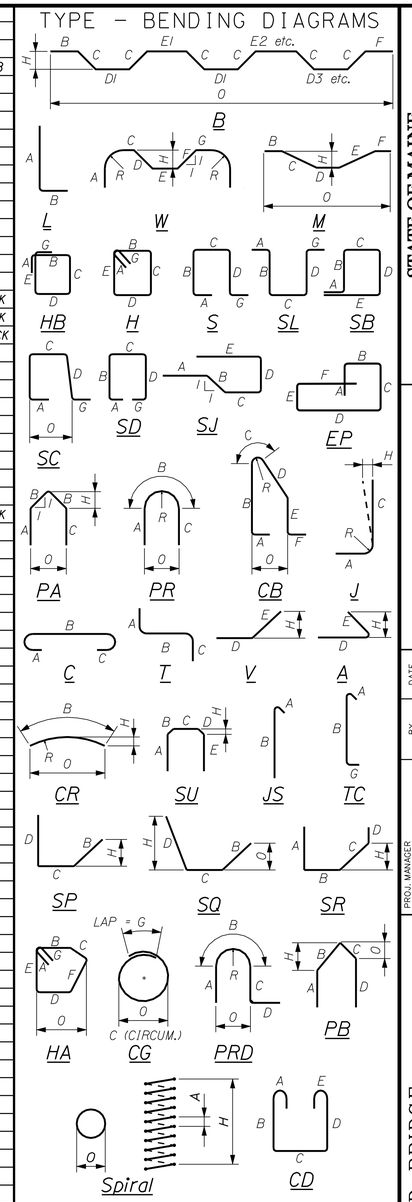
| MARK | QTY. | LENGTH | LOCATION |
|---|---|---|---|
| *SUBSTRUCTURE* | | | |
| P400 | 36 | 4'-8" | HORIZ. PIER CAP |
| P401 | 12 | 17'-2" | HORIZ. PIER CAP |
| P402 | 24 | 8'-6" | HORIZ. PIER CAP |
| P403 | 24 | 6'-4" | HORIZ. PIER CAP |
| P500 | 34 | 7'-6" | VERT. PIER CAP |
| P501 | 24 | 51'-6" | HORIZ. PIER CAP |
| P502 | 4 | 48'-2" | HORIZ. PIER CAP |
| P601 | 56 | 40'-0" | PIER DISTRIBUTION SLAB |
| P602 | 56 | 28'-6" | PIER DISTRIBUTION SLAB |
| P603 | 134 | 13'-6" | PIER DISTRIBUTION SLAB |
| P700 | 82 | 25'-7" | VERT. PIER PIER NO. 1 |
| P701 | 82 | 23'-10" | VERT. PIER PIER NO. 2 |
| ⚠1 P800 | 624 | 40'-0" | PIPE PILES VERTICAL |
| P900 | 32 | 9'-8" | HORIZ. PIER CAP RESTRAINT BLOCK |
| P1000 | 54 | 30'-0" | HORIZ. PIER CAP |
| P1001 | 32 | 20'-0" | HORIZ. PIER CAP |
| P1002 | 44 | 7'-6" | VERT. PIER CAP |
| P1003 | 168 | 41'-0" | HORIZ. PIER CURTAIN WALL |
| P1004 | 336 | 12'-3" | HORIZ. PIER CURTAIN WALL |
| P1400 | 100 | 28'-7" | VERT. PIER NO. 1 COLUMN |
| P1401 | 100 | 26'-10" | VERT. PIER NO. 2 COLUMN |
| *MOMENT SLAB RIGHT* | | | |
| M500 | 90 | 8'-6" | HORIZ. FOOTING |
| M501 | 2 | 16'-1" | HORIZ. FOOTING |
| M502 | 2 | 15'-11" | HORIZ. FOOTING |
| M503 | 2 | 15'-8" | HORIZ. FOOTING |
| M504 | 2 | 15'-5" | HORIZ. FOOTING |
| M505 | 2 | 15'-1" | HORIZ. FOOTING |
| M506 | 2 | 14'-10" | HORIZ. FOOTING |
| M507 | 2 | 14'-7" | HORIZ. FOOTING |
| M508 | 2 | 21'-10" | HORIZ. FOOTING |
| M509 | 2 | 21'-6" | HORIZ. FOOTING |
| M510 | 2 | 20'-11" | HORIZ. FOOTING |
| M511 | 2 | 20'-4" | HORIZ. FOOTING |
| M512 | 2 | 19'-10" | HORIZ. FOOTING |
| M513 | 2 | 19'-3" | HORIZ. FOOTING |
| M514 | 2 | 18'-8" | HORIZ. FOOTING |
| M515 | 2 | 9'-9" | HORIZ. FOOTING |
| M516 | 2 | 9'-7" | HORIZ. FOOTING |
| M517 | 2 | 9'-3" | HORIZ. FOOTING |
| M518 | 2 | 9'-0" | HORIZ. FOOTING |
| M519 | 2 | 8'-9" | HORIZ. FOOTING |
| M520 | 2 | 8'-6" | HORIZ. FOOTING |
| M521 | 2 | 8'-3" | HORIZ. FOOTING |
| M522 | 10 | 41'-3 1/4" | HORIZ. WALL |
| M523 | 43 | 3'-5" | VERT. FOOTING |
| M524 | 3 | 7'-1" | VERT. WALL |
| M525 | 3 | 7'-0" | VERT. WALL |
| M526 | 3 | 6'-11" | VERT. WALL |
| M527 | 3 | 6'-9 1/2" | VERT. WALL |
| M528 | 3 | 6'-8 1/2" | VERT. WALL |
| M529 | 3 | 6'-7 1/2" | VERT. WALL |
| M530 | 3 | 6'-6" | VERT. WALL |
| M531 | 3 | 6'-5" | VERT. WALL |
| M532 | 3 | 6'-4" | VERT. WALL |
| M533 | 3 | 6'-3" | VERT. WALL |
| M534 | 3 | 6'-2" | VERT. WALL |
| M535 | 3 | 6'-1" | VERT. WALL |
| M536 | 4 | 5'-11 1/2" | VERT. WALL |
| M537 | 3 | 5'-10 1/2" | VERT. WALL |
| M600 | 3 | 7'-1" | VERT. WALL |
| M601 | 3 | 7'-0" | VERT. WALL |
| M602 | 3 | 6'-11" | VERT. WALL |
| M603 | 3 | 6'-9 1/2" | VERT. WALL |
| M604 | 3 | 6'-8 1/2" | VERT. WALL |
| M605 | 3 | 6'-7 1/2" | VERT. WALL |
| M606 | 3 | 6'-6" | VERT. WALL |
| M607 | 3 | 6'-5" | VERT. WALL |
| M608 | 3 | 6'-4" | VERT. WALL |
| M609 | 3 | 6'-3" | VERT. WALL |
| M610 | 3 | 6'-2" | VERT. WALL |
| M611 | 3 | 6'-1" | VERT. WALL |
| M612 | 4 | 5'-11 1/2" | VERT. WALL |
| M613 | 3 | 5'-10 1/2" | VERT. WALL |

| MARK | QTY. | LENGTH | LOCATION |
|---|---|---|---|
| *MOMENT SLAB LEFT* | | | |
| N500 | 110 | 8'-6" | HORIZ. FOOTING |
| N501 | 2 | 13'-8" | HORIZ. FOOTING |
| N502 | 2 | 14'-3" | HORIZ. FOOTING |
| N503 | 2 | 14'-9" | HORIZ. FOOTING |
| N504 | 2 | 15'-3" | HORIZ. FOOTING |
| N505 | 2 | 15'-10" | HORIZ. FOOTING |
| N506 | 2 | 16'-5" | HORIZ. FOOTING |
| N507 | 2 | 16'-9" | HORIZ. FOOTING |
| N508 | 2 | 23'-8" | HORIZ. FOOTING |
| N509 | 2 | 24'-10" | HORIZ. FOOTING |
| N510 | 2 | 26'-0" | HORIZ. FOOTING |
| N511 | 2 | 27'-1" | HORIZ. FOOTING |
| N512 | 2 | 28'-3" | HORIZ. FOOTING |
| N513 | 2 | 29'-4" | HORIZ. FOOTING |
| N514 | 2 | 30'-2" | HORIZ. FOOTING |
| N515 | 2 | 17'-5" | HORIZ. FOOTING |
| N516 | 2 | 18'-8" | HORIZ. FOOTING |
| N517 | 2 | 19'-6" | HORIZ. FOOTING |
| N518 | 2 | 20'-1" | HORIZ. FOOTING |
| N519 | 2 | 20'-8" | HORIZ. FOOTING |
| N520 | 2 | 21'-3" | HORIZ. FOOTING |
| N521 | 2 | 21'-7" | HORIZ. FOOTING |
| N522 | 8 | 57'-4" | HORIZ. WALL |
| N523 | 2 | 38'-3" | HORIZ. WALL |
| N524 | 59 | 3'-5" | VERT. RETAINING WALL |
| N525 | 3 | 6'-3 1/2" | VERT. RETAINING WALL |
| N526 | 3 | 6'-3 1/4" | VERT. RETAINING WALL |
| N527 | 2 | 6'-2 1/2" | VERT. RETAINING WALL |
| N528 | 2 | 6'-1 3/4" | VERT. RETAINING WALL |
| N529 | 2 | 6'-0 1/2" | VERT. RETAINING WALL |
| N530 | 2 | 5'-11 1/4" | VERT. RETAINING WALL |
| N531 | 2 | 5'-10 1/4" | VERT. RETAINING WALL |
| N532 | 2 | 5'-9" | VERT. RETAINING WALL |
| N533 | 2 | 5'-8" | VERT. RETAINING WALL |
| N534 | 2 | 5'-7" | VERT. RETAINING WALL |
| N535 | 2 | 5'-5 1/2" | VERT. RETAINING WALL |
| N536 | 2 | 5'-4 1/2" | VERT. RETAINING WALL |
| N537 | 2 | 5'-3 1/2" | VERT. RETAINING WALL |
| N538 | 2 | 5'-2" | VERT. RETAINING WALL |
| N539 | 2 | 5'-1" | VERT. RETAINING WALL |
| N540 | 2 | 5'-0" | VERT. RETAINING WALL |
| N541 | 2 | 4'-11" | VERT. RETAINING WALL |
| N542 | 2 | 4'-9 3/4" | VERT. RETAINING WALL |
| N543 | 2 | 4'-8 1/2" | VERT. RETAINING WALL |
| N544 | 2 | 4'-7 1/2" | VERT. RETAINING WALL |
| N545 | 2 | 4'-6 1/2" | VERT. RETAINING WALL |
| N546 | 2 | 4'-5 1/4" | VERT. RETAINING WALL |
| N547 | 2 | 4'-4" | VERT. RETAINING WALL |
| N548 | 2 | 4'-3" | VERT. RETAINING WALL |
| N549 | 2 | 4'-1 3/4" | VERT. RETAINING WALL |
| N550 | 2 | 4'-0 1/2" | VERT. RETAINING WALL |
| N551 | 2 | 3'-11 1/2" | VERT. RETAINING WALL |
| N552 | 3 | 3'-10 1/4" | VERT. RETAINING WALL |
| | | | |
| N600 | 3 | 6'-3 1/2" | VERT. RETAINING WALL |
| N601 | 3 | 6'-3 1/4" | VERT. RETAINING WALL |
| N602 | 2 | 6'-2 1/2" | VERT. RETAINING WALL |
| N603 | 2 | 6'-1 3/4" | VERT. RETAINING WALL |
| N604 | 2 | 6'-0 1/2" | VERT. RETAINING WALL |
| N605 | 2 | 5'-11 1/4" | VERT. RETAINING WALL |
| N606 | 2 | 5'-10 1/4" | VERT. RETAINING WALL |
| N607 | 2 | 5'-9" | VERT. RETAINING WALL |
| N608 | 2 | 5'-8" | VERT. RETAINING WALL |
| N609 | 2 | 5'-7" | VERT. RETAINING WALL |
| N610 | 2 | 5'-5 1/2" | VERT. RETAINING WALL |
| N611 | 2 | 5'-4 1/2" | VERT. RETAINING WALL |
| N612 | 2 | 5'-3 1/2" | VERT. RETAINING WALL |
| N613 | 2 | 5'-2" | VERT. RETAINING WALL |
| N614 | 2 | 5'-1" | VERT. RETAINING WALL |
| N615 | 2 | 5'-0" | VERT. RETAINING WALL |
| N616 | 2 | 4'-11" | VERT. RETAINING WALL |
| N617 | 2 | 4'-9 3/4" | VERT. RETAINING WALL |
| N618 | 2 | 4'-8 1/2" | VERT. RETAINING WALL |
| N619 | 2 | 4'-7 1/2" | VERT. RETAINING WALL |
| N620 | 2 | 4'-6 1/2" | VERT. RETAINING WALL |
| N621 | 2 | 4'-5 1/4" | VERT. RETAINING WALL |
| N622 | 2 | 4'-4" | VERT. RETAINING WALL |
| N623 | 2 | 4'-3" | VERT. RETAINING WALL |
| N624 | 2 | 4'-1 3/4" | VERT. RETAINING WALL |
| N625 | 2 | 4'-0 1/2" | VERT. RETAINING WALL |
| N626 | 2 | 3'-11 1/2" | VERT. RETAINING WALL |
| N627 | 3 | 3'-10 1/4" | VERT. RETAINING WALL |

## BENT BARS

| MARK | QTY. | LENGTH | TYPE | A | B | C | D | E | F | G | H | O | R | LOCATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BS650 | 2 | 2'-0" | L | 1'-0" | 1'-0" | | | | | | | | | HORIZ. ABUT. 2 APPROACH SLAB |
| *SUBSTRUCTURE* | | | | | | | | | | | | | | |
| P450 | 384 | 20'-10" | S | 0" | 4'-8" | 11'-6" | 4'-8" | | | 0" | | | | VERT. PIER CAP |
| P451 | 8 | 20'-8" | S | 0" | 4'-8" | 11'-4" | 4'-8" | | | 0" | | | | VERT. PIER CAP |
| P452 | 8 | 20'-01" | S | 0" | 4'-8" | 10'-9" | 4'-8" | | | 0" | | | | VERT. PIER CAP |
| P453 | 8 | 19'-2" | S | 0" | 4'-8" | 9'-10" | 4'-8" | | | 0" | | | | VERT. PIER CAP |
| P454 | 8 | 17'-7" | S | 0" | 4'-8" | 8'-3" | 4'-8" | | | 0" | | | | VERT. PIER CAP |
| P455 | 8 | 14'-11" | S | 0" | 4'-8" | 5'-7" | 4'-8" | | | 0" | | | | VERT. PIER CAP |
| P456 | 44 | 8'-4" | S | 0" | 2'-3" | 3'-10" | 2'-3" | | | 0" | | | | HORIZ. PIER CAP |
| P457 | 194 | 9'-6 1/2" | S | 0" | 3'-10" | 2'-6 1/2" | 3'-2" | | | 0" | | | | HORIZ. PIER CAP |
| P458 | 1044 | 8'-3" | TC | 4 1/2" | 7'-6" | | | | | 4 1/2" | | | | VERT. PIER CAP |
| | | | | | | | | | | | | | | |
| P550 | 24 | 27'-6" | PR | 4'-10" | ⚠2 7'-10 3/4" | 4'-10" | | | | | | 11'-4 3/4" | 5'-8 3/8" | HORIZ. PIER CAP |
| P551 | 24 | 7'-0" | S | 0" | 2'-2" | 2'-8" | 2'-2" | | | 0" | | | | VERT. PIER CAP RESTRAINT BLOCK |
| P552 | 48 | 10'-5" | S | 5 1/2" | 3'-8" | 2'-7" | 3'-8" | | | 0" | | | | VERT. PIER CAP RESTRAINT BLOCK |
| P553 | 16 | 11'-11" | H | 5 1/2" | 2'-10" | 2'-8" | 2'-10" | 2'-8" | | 5 1/2" | | | | HORIZ. PIER CAP RESTRAINT BLOCK |
| P650 | 520 | 55'-0" | Spiral | 0'-6" | ⚠3 | | | | | | 4'-6" | 1'-7" | | TOP OF PILES |
| P750 | 164 | 7'-9" | L | 6'-7" | 1'-2" | | | | | | | | | VERT. PIER CURTAIN WALL |
| P751 | 168 | 33'-3" | CG | | | 29'-11" | | | | 3'-5" | | 9'-6" | | VERT. PIER COLUMN |
| P850 | 624 | 11'-4" | L | 10'-0" | 1'-4" | ⚠4 | | | | | | | | TOP OF PILES |
| | | | | | | | | | | | | | | |
| P950 | 32 | 11'-7" | SD | 1'-2" | 3'-3" | 2'-9" | 3'-3" | | | 1'-2" | | | | VERT. PIER CAP RESTRAINT BLOCK |
| | | | | | | | | | | | | | | |
| P1050 | 8 | 27'-6" | PR | 4'-10" | ⚠1 7'-10 3/4" | 4'-10" | | | | | | 11'-4 3/4" | 5'-8 3/8" | HORIZ. PIER CAP |
| P1051 | 8 | 23'-10" | L | 22'-0" | 1'-10" | | | | | | | | | HORIZ. PIER CAP |
| P1052 | 8 | 26'-3" | L | 24'-5" | 1'-10" | | | | | | | | | HORIZ. PIER CAP |
| P1053 | 8 | 27'-2" | L | 25'-4" | 1'-10" | | | | | | | | | HORIZ. PIER CAP |
| P1054 | 8 | 27'-8" | L | 25'-10" | 1'-10" | | | | | | | | | HORIZ. PIER CAP |
| P1055 | 8 | 28'-4" | L | 26'-6" | 1'-10" | | | | | | | | | HORIZ. PIER CAP |
| P1056 | 8 | 28'-8" | L | 26'-10" | 1'-10" | | | | | | | | | HORIZ. PIER CAP |
| P1057 | 8 | 29'-0" | L | 27'-2" | 1'-10" | | | | | | | | | HORIZ. PIER CAP |
| P1058 | 8 | 29'-3" | L | 27'-5" | 1'-10" | | | | | | | | | HORIZ. PIER CAP |
| P1059 | 8 | 29'-5" | L | 27'-7" | 1'-10" | | | | | | | | | HORIZ. PIER CAP |
| P1060 | 8 | 29'-6" | L | 27'-8" | 1'-10" | | | | | | | | | HORIZ. PIER CAP |
| P1061 | 8 | 29'-7" | L | 27'-9" | 1'-10" | | | | | | | | | HORIZ. PIER CAP |
| P1062 | 8 | 17'-7" | L | 15'-9" | 1'-10" | | | | | | | | | HORIZ. PIER CAP |
| P1063 | 8 | 20'-2" | L | 18'-4" | 1'-10" | | | | | | | | | HORIZ. PIER CAP |
| P1064 | 8 | 21'-3" | L | 19'-5" | 1'-10" | | | | | | | | | HORIZ. PIER CAP |
| P1065 | 8 | 21'-11" | L | 20'-1" | 1'-10" | | | | | | | | | HORIZ. PIER CAP |
| P1066 | 8 | 22'-6" | L | 20'-8" | 1'-10" | | | | | | | | | HORIZ. PIER CAP |
| P1067 | 8 | 22'-10" | L | 21'-0" | 1'-10" | | | | | | | | | HORIZ. PIER CAP |
| P1068 | 8 | 23'-1" | L | 21'-3" | 1'-10" | | | | | | | | | HORIZ. PIER CAP |
| P1069 | 8 | 22'-3" | L | 21'-5" | 1'-10" | | | | | | | | | HORIZ. PIER CAP |
| P1070 | 4 | 23'-4" | L | 21'-6" | 1'-10" | | | | | | | | | HORIZ. PIER CAP |
| | | | | | | | | | | | | | | |
| P1450 | 200 | 17'-2" | L | 14'-7" | 2'-7" | | | | | | | | | VERT. PIER COLUMNS |
| P1451 | 266 | 18'-8" | S | 0" | 2'-7" | 13'-6" | 2'-7" | | | 0" | | | | HORIZ. DISTRIBUTION SLAB |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| M450X | 84 | 10'-3" | PR | 4'-9" | 6 5/8" | 4'-9" | | | | | | | 2 1/8" | VERT. WALL |
| | | | | | | | | | | | | | | |
| M580 | 14 | 4'-4" | V | | | | 2'-2" | 2'-2" | | | 9 3/8" | | | HORIZ. FOOTING |
| M581 | 14 | 4'-4" | V | | | | 2'-2" | 2'-2" | | | 9 1/8" | | | HORIZ. FOOTING |
| | | | | | | | | | | | | | | |
| M650 | 43 | 4'-10" | L | 3'-10" | 1'-0" | | | | | | | | | VERT. FOOTING |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| N450X | 116 | 10'-3" | PR | 4'-9" | 6 5/8" | 4'-9" | | | | | | | 2 1/8" | VERT. RETAINING WALL |
| | | | | | | | | | | | | | | |
| N552 | 2 | 8'-8 5/8" | V | | | | 2'-2 1/2" | 6'-6 1/8" | | | 11 1/2" | | | HORIZ. FOOTING |
| N580 | 14 | 4'-4" | V | | | | 2'-2" | 2'-2" | | | 1'-4 7/8" | | | HORIZ. FOOTING |
| N581 | 14 | 4'-4" | V | | | | 2'-2" | 2'-2" | | | 1'-5 1/2" | | | HORIZ. FOOTING |
| | | | | | | | | | | | | | | |
| N655 | 59 | 4'-10" | L | 3'-10" | 1'-0" | | | | | | | | | VERT. FOOTING |

## TYPE - BENDING DIAGRAMS




All dimensions are out-to-out of bar.

Bending details and hooks shall conform to the recommendations of the current revision of ACI Standard 318.

Reinforcing Bar: ASTM A615, Grade 60 except for bars designated with X.

## GENERAL NOTES

1. The first two digits following the letter(s) of the mark indicate the size ofthe bar:

   Mark "A502" = bar size #5
   Mark "P801" = bar size #8
   Mark "S650" = bar size #6

2. For the bend diagram SO see sheet 104.

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

BR-6900(01)X

PIN 6900.01

BRIDGE PLANS

BRIDGE NO. 2187

| | BY | DATE |
|---|---|---|
| PROJ. MANAGER W. FRANKHAUSER, JR., P.E. | | |
| DESIGN-DETAILED | KSW | |
| CHECKED-REVIEWED | CAW | |
| DESIGN2-DETAILED2 | ED2 | |
| DESIGN3-DETAILED3 | ED3 | |
| REVISIONS 1 | MLB REVISIONS MADE ON | 04/25/08 |
| REVISIONS 2 | DSS | 03\02\08 |
| REVISIONS 3 | PLH | |
| REVISIONS 4 | | |
| FIELD CHANGES | | |

SIGNATURE

P.E. NUMBER

DATE

COVERED BRIDGE
KENNEBEC RIVER
NORRIDGEWOCK SOMERSET

# REINFORCING STEEL SCHEDULE

SEA
SEA CONSULTANTS INC.
Scientists/Engineers/Architects

SHEET NUMBER
123
OF 134

Filename: ...\MSTA\123_Rebar3_Schedule.dgn Division: BRIDGE Username: michelle.boone Date:4/25/2008

# SPECIAL PROVISION
# PROTECTION OF RAILROAD TRAFFIC AND STRUCTURES

## 1. GENERAL REQUIREMENTS

Part of the work required by the Contract will be performed within a railroad right of way and/or adjacent to the tracks, telephone, telegraph, signal and electric supply lines of a railroad or railroads. The Contractor agrees to perform all such work in compliance with all of the terms of this Special Provision and all safety rules, regulations, or standards applicable to the Railroad. The Contractor shall be fully responsible for all damages arising from his failure to comply with the requirements of this Special Provision. The Contractor shall be deemed to have included all costs in the unit prices of the Schedule of Prices and the Proposal.

## 2. AMOUNT OF RAILROAD WORK

The estimated amount of work to be done within 15.24 Meters (50 feet) of the track of the **Maine Central Railroad Company** is <1**%** of the contract.

## 3. NUMBER OF TRAINS AND TRAIN SPEED

The Contractor is notified that a maximum speed of (**10** mph) will be considered as prevailing for the operation of trains of the Railroad at this project and that the approximate number of trains per day at this project is **2**.

## 4. PRIORITY OF RAILROAD OPERATIONS

The train movements of the Railroad, and its lessees, and licensees shall have absolute priority over the performance of the Construction Project within the railroad right of way. The Contractor hereby agrees that the hours and times of work within the Railroad right of way must be coordinated through the Railroad and that such hours and times are subject to change without prior notice to the Contractor, unless other prior arrangements have been made through the Railroad.

## 5. AUTHORITY OF RAILROAD TO STOP WORK

If the Contractor fails to comply with the safety terms of this Special Provision, or if the Chief Engineer of the Railroad determines that the Contractor is using unsafe practices that threaten the safety of rail traffic, rail workers, or the general public, the Railroad shall have the right to immediately order the Contractor to cease work and vacate the Railroad's property. The Railroad agrees to confirm any cessation of work in writing by delivering to the Department's Construction Manager a completed Stop Work Order form attached as Exhibit A within 24 hours of giving any such order.

## 6. ENTRY UPON RAILROAD PROPERTY

The Railroad hereby agrees to permit the Contractor, together with their subcontractors, suppliers, consultants and engineers (the "Contractor"), to enter upon the Railroad property for the purpose of performing the Construction Project, PROVIDED THAT the Contractor complies with all of the terms of this Special Provision and all safety requirements and directions of the Chief Engineer of the Railroad, or his authorized representative (the "Railroad's Chief Engineer").

## 7. NOTICE REQUIRED BEFORE ENTRY

The Contractor shall give written notice to the Railroad's Chief Engineer at least **fourteen (14)** calendar day(s) in advance of the time it proposes to do work within the limits of the Railroad right-of-way or perform operations that may create a Hazard as specified by this Special Provision. The Contractor shall give such notice regardless of whether the work may also be within the limits of a public highway.

## 8. HAZARDS

The Contractor shall assess to its own satisfaction hazards which may be caused by its operations. At a minimum, the Contractor agrees that the following shall constitute Hazards.

An operating track shall be considered fouled and subject to hazard when any object is brought nearer than (**15** feet) to the gauge line of the near rail of the track.

A signal line or communication line shall be considered fouled and subject to hazard when any object is brought nearer than (**10** feet) to any wire or cable.

An electric supply line shall be considered fouled and subject to hazard when any object is brought nearer than (**10** feet) to any wire of the line.

Cranes, trucks, power shovels or any other equipment shall be considered as fouling and subjecting to hazard a track, signal line, communication or electric supply line when working in such position that failure of equipment, with or without load, could foul the track, signal line, communication or electric supply line.

Railroad operation will be considered subject to hazard when explosives are used in the vicinity of railroad premises, or during the driving or pulling of sheeting for any footing adjacent to a track, or when erecting structural steel adjacent to a track, or when performing work under, across or adjacent to a track, or when operations involve, swinging booms or chutes that could in any way come nearer then (**15** feet) to the gauge line of the near rail of the track, or when erection or removal of staging, false work or forms fouls a track or wire line.

None of the operations specified as a Hazard above shall be carried on during the approach or passing of a train or without permission from the Railroad's Chief Engineer and the presence of a railroad inspector/flagman, unless other prior arrangements have been made through the Railroad.

## 9. MINIMUM CLEARANCES

During the construction of staging, false work or forms, the Contractor shall at all times maintain a minimum vertical clearance of (**22' 6"** feet) above the top of high rail and a minimum side clearance of (**10** feet) from the gauge line of the near rail where track is tangent. Additional side clearance must be maintained where track is on a curve.

## 10. WORK PLAN SUBMITTAL AND APPROVAL

The Contractor shall submit in writing to the Railroad's Chief Engineer or duly authorized representative, and the Departments Railroad Property Manager or his appointed representative, at least **fourteen (14)** calendar day(s) in advance of the start of the project, an outline of his plan for work within the Railroad right of way including contemplated method(s) of construction. This plan must meet with the approval of the Railroad's Chief Engineer and the Department's Railroad Property Manager in every respect. If the Contractor contemplates the use of "on the track equipment", it should so state and obtain from the Railroad the conditions pertaining to such operations. All Railroad costs included in this operation will be borne by the Contractor. In a like manner, any of the Contractor's equipment or material on cars for this project shall be handled in conformance with existing traffic rules with all costs borne by the Contractor.

Prior to submitting his Proposal, the Contractor shall have ascertained from the Railroad and from the Department's Railroad Property Manager or his appointed representative, all information relating to its requirements and regulations and all costs in connection with compliance thereto.

## 11. EXCAVATIONS

Before excavation for footings adjacent to tracks and/or within the Railroad's right-of-way may commence, whether or not also within the limits of a public highway, plans and calculations for such excavations, prepared by a Professional Engineer authorized to practice in Maine, shall be submitted to the Railroad's Chief Engineer for review and approval. Unless other prior arrangements have been made, the Railroad's Chief Engineer shall have **two (2)** week(s) to perform such review and approval and issue a written permission to proceed with the excavation. No excavation shall proceed without such permission.

At a minimum, excavations must utilize proper bracing, shoring, sheeting or other support as determined by the Railroad's Chief Engineer, to support the tracks with railroad traffic. Open excavation shall be suitably planked over when construction operations are not in progress, the location of any wires, conduits, pipes, cables or other railroad facilities below the surface of the ground. Damage to any such facilities caused by the failure of the Contractor to ascertain the location of such facilities or by failure to use due care to avoid injury to such facilities shall be at the expense of the Contractor.

## 12. EQUIPMENT

Equipment of the Contractor shall be in such condition so as to prevent failure that would cause delay in the operation of trains or damage to railroad facilities. Equipment shall not be placed or put in operation adjacent to a track without first obtaining permission of the Railroad. The Railroad agrees that such permission shall not be unreasonably withheld.

## 13. RAILROAD SERVICES - GENERALLY

When work is to be performed within the Railroad's right-of-way, the Railroad shall provide the services, equipment and materials provided in this Special Provision including, but not limited to, engineering, flagging, inspection, signal protection and/or relocation, and restoration or replacement of the Railroad's track structure of ballast. Further, if the Railroad's Chief Engineer determines that the Contractor's operations do not comply with all of the safety requirements of this Special Provision and all safety requirements and directions of said Chief Engineer, the Railroad will employ the necessary qualified employees to protect its trains and other facilities. The Contractor shall pay to the Railroad the cost for performing all Railroad Services unless said costs are to be paid by the Department as specified in this Special Provision.

## 14. INSPECTION / FLAGGING

The Railroad shall furnish and assign all inspectors / flaggers for general inspection purposes of general protection of railroad property and operations during construction as the Railroad's Chief Engineer determines are necessary to preserve safety.

(a) Responsibility for Cost. The Department will bear the cost of flagging or inspection (including travel time) or any combination thereof up to **60** man days of said flagging or inspection. If, in the opinion of the Railroad's Chief Engineer, further services of a flagger or inspector will be required due to the operations of the Contractor, the services will be furnished and the cost thereof (salary, expenses, insurance, taxes and vacation allowance, etc.) shall be paid to the Railroad by the Department, and will be recovered by the Department from the Contractor.

(b) Terms. The minimum hours per day for the Railroad employees engaged in inspection flagging services shall be eight (8) hours. Time at rates for straight time, overtime or for deadheading starts in accordance with established practices in effect in the territory in which the project is located. Information as to these practices should be obtained from the Railroad's Chief Engineer.

The Contractor shall notify the Railroad's Chief Engineer and the Chief Engineer of the Department in writing **fourteen (14)** calendar day(s) before beginning, resuming or suspending work within (**25** feet) of the track, so that an inspector may be provided or removed in accordance with the requirements of this Special Provision. An inspector may be removed upon **three (3)** calendar day(s) notice, but not before the inspector has worked five (5) consecutive days. Failure to give notice of intent to suspend work shall be cause of charge to the Contractor the cost of inspection during the period when work is suspended.

(c) Estimated Cost. The following is an estimate of the cost per day of inspection/flagging necessary for this project. The rates shown include all overhead charges, travel time, deadheading and personal expenses.

Date of estimate **01/16/08.**

Estimated daily rate for four (4) consecutive hours Monday-Friday (straight time): **$136.00**

Estimated daily rate for four (4) consecutive hours Saturday, Sunday, Holiday (overtime): **$272.00**

Estimated rate for hours worked in excess of eight (8) hours in any one day: **$68.00**
Rates charged will be those in effect at the time of the performing the inspection/ flagging which may be different than the rates used at the date of the Estimate.

(d) Definitions.

Man day (M.D.) - eight (8) consecutive hours or any portion thereof.

Overtime - Each additional hour or fraction thereof consecutive to and beyond the standard man day will count as 3/16 of a man day.

Standard Man day - Eight (8) consecutive hour, Monday - Friday between the hours of **0700** a.m. to **1530** p.m , minus lunch period, unless otherwise noted and agreed to by all parties. *
*Does not include lunch period from 12:00-12:30p.pm.

Travel Time - Time required by flagger and/or inspector to commute between his or her point of headquarters to the project site. This time shall not be charged used in determining available man days.

## 15. OTHER CONTRACTOR RESPONSIBILITIES

The restoring and resurfacing of tracks, if disturbed due to Contractor's operations, shall be at the expense of the Contractor.

Any other changes made or services furnished by the Railroad as a result of the Contractor will be at the Contractor's expense.

## 16. EXTRA-CONTRACT SERVICES

Temporary and permanent changes of tracks and telephone, signal and electric supply lines made necessary by or to clear the permanent work of the Contractor as shown on the construction plans and included in the Railroad force account as recollectable from the State will be made or caused to be made by the Railroad without expense to the Contractor.

## 17. INDEMNIFICATION

Where work is being performed over, under, across or adjacent to Railroad premises, the Contractor shall defend, indemnify and save harmless the Railroad and the Maine Department of Transportation from and against any and all loss, cost, damage, claims, suits, demands, or liability for damages for personal injury including death and for damage to property, which may arise from or out of the operations conducted under his contract, occurring by reason of any act or omission of the Contractor, his agents, servants or employees, or by reason of any act or omission of any subcontractor, his agents, servants or employees.

## 18. INSURANCE

In addition to any other forms of insurance or bonds required under the terms of the Contract, the Contractor will be required to procure and maintain, at its sole cost and expense, the following insurance coverages naming the Railroad as an insured.

(a) Railroad Protective Liability Insurance with limits not less than **$2,000,000.00** per single occurrence and **$6,000,000.00** per aggregate total occurrences.

(b) Comprehensive General Liability Insurance protecting against liability from bodily injury or property damage arising out of the Construction Project with limits of not less than **$2,000,000.00** per single occurrence and **$6,000,000.00** per aggregate total occurrences.

(c) Workers Compensation and Occupational Disease Insurance, as required by law.

(d) Automobile Liability Insurance covering all motor vehicles used about or in connection with the Construction Project.

If any part of the work is sublet, these insurance coverages shall be provided by or on behalf of the subcontractors to cover their operations

Each policy shall carry an endorsement covering the "save harmless" clause in favor of the Railroad and the Maine Department of Transportation, as set forth in the paragraph, "Responsibility for Damage Claims".

If blasting is to be done in the vicinity of the Railroad, the insurance policies shall include such coverage.

The policies shall be in force before any work is done on the project and shall remain in effect until all work required to be performed under the terms of the contract is satisfactorily completed as evidenced by the formal acceptance by the State and the Railroad.

Before any work is done on the project, the Department of Transportation and the Railroad's Chief Engineer shall be furnished certificates of each policy. Further, the original policy of the Comprehensive General Liability Insurance and the Railroad Protective Liability Insurance shall be furnished to the Railroad's Chief Engineer and a duplicate shall be furnished to the Department of Transportation.

The policy or policies of the Railroad's protective public liability and property damage liability shall be written by a Company authorized to do business in the State of Maine, and shall be signed by the President and Secretary of the Insurance Company and shall be countersigned by an authorized representative of the Company.

## 19. **ROADWAY WORKER SAFETY REGULATION**

Notice to all Contractors/Subcontractors and individuals must be aware of the Federal Roadway Worker Safety Regulation, CFR 49, Part 214(c). They may be required to comply with this regulation. Any requirements for them to comply will be discussed at the pre-construction utility meeting.

EXHIBIT A
ORIGINAL TO CONTRACTOR

**MDOT/RAILROAD STOP WORK ORDER**

| | |
|---|---|
| Section A - Contractor | Town |
| | DOT Railroad Project # |
| Railroad Name | Location |
| | Notice # |
| DESCRIPTION OF SAFETY HAZARD/REASON FOR ORDER | |
| Standard Violated | RAC (Risk Assessment Code)<br>**N/R** |
| Railroad Official (Flagger/Inspector) Name<br>Signature | Date |
| | |
| **SECTION B - ACTION TAKEN:** | |

cc: MDOT – R. E. or Inspector
MDOT – Utility Coordinator
MDOT- Project Manager
MDOT- Coy Williams, Bridge Program
Railroad –Chief Engineer

1. Risk Assessment. Each identified/validated hazard shall be assigned a Risk Assessment Code (RAC) by the Safety Office. The RAC represents the degree of risk associated with the deficiency and combines the elements of hazard severity and mishap probability. The RAC is derived as follows:

a. Hazard Severity. The hazard severity is an assessment of the worst potential consequence: Defined by degree of injury, occupational illness, or property damage, which is likely to occur as a result of a deficiency. Hazard severity categories shall be assigned by roman numeral according to the following criteria.

(1) Category I - Catastrophic: The hazard may cause death or loss of a facility.

(2) Category II - Critical: May cause severe injury, severe occupational illness, or major property damage.

(3) Category III - Marginal: May cause minor injury, minor occupational illness, or minor property damage.

(4) Category IV - Negligible: Probably would not affect personnel safety or health, but is nevertheless in violation of a NAVOSH standard.

b. Mishap Probability. The mishap probability is the probability that a hazard will result in a mishap, based on an assessment of such factors as location, exposure in terms of cycles or hours of operation, and affected population. Mishap probability shall be assigned an Arabic letter according to the following criteria:

(1) Sub-category A - Likely to occur immediately or within a short period of time.

(2) Sub-category B - Probably will occur in time.

(3) Sub-category C - May occur in time.

(4) Sub-category D - Unlikely to occur.

c. Risk Assessment Code. The RAC is an expression of risk which combines the elements of hazard severity and mishap probability. Using the matrix shown below, the RAC is expressed as a single Arabic number that can be used to help determine hazard abatement priorities.

| | Mishap Probability | | | | | RAC |
|---|---|---|---|---|---|---|
| | | A | B | C | D | 1 - Critical |
| Hazard Severity | I | 1 | 1 | 2 | 3 | 2 - Serious |
| | II | 1 | 2 | 3 | 4 | 3 - Moderate |
| | III | 2 | 3 | 4 | 5 | 4 - Minor |
| | IV | 3 | 4 | 5 | 5 | 5 - Negligible |

# SPECIAL PROVISION
# SECTION 604

## MANHOLES AND CATCH BASINS
(Dry Well Catch Basin)

This section is amended by addition of the following:

Description Install Dry Well Catch Basin and connect to existing drainage system as shown on the plans in accordance with the requirements of Section 604 of the Standard Specifications and Standard Details as applicable.

Materials Materials shall meet the requirements specified in the following Sections of Division 700 – Materials.

| | |
|---|---|
| Crushed Stone | 703.31 |
| Erosion Control Geotextile | 722.03 |

Construction Requirements The Dry Well Catch Basin shall be in accordance with Subsection 604.03 in addition to the following requirements. The Dry Well Catch Basin shall have an open bottom and 4 square inch perforations for at one foot centers for the bottom 4 feet. The basin shall be set on 2' of crushed stone and surrounded by 1' of crushed stone for the bottom 4'. The base and sides shall have geotextile between the crushed stone and basin. Outlet and pipe elevations may vary from the elevations shown on the plans depending upon field conditions. New invert connections to the proposed manhole or catch basin shall be core cut at the elevation shown on the plans or as determined by the Resident.

Method of Measurement. Measurement shall be in accordance with Subsection 604.05.

Basis of Payment The accepted quantity of Dry Well Catch Basins will be paid for at the contract unit price each complete and in place. Excavation, frames, covers, crushed stone fill, backfill and erosion control geotextile shall be considered part of the structure and no separate payment will be made.

Payment will be made under:

| Pay Item | Pay Unit |
|---|---|
| 604.31 Dry Well Catch Basin | Each |

SPECIAL PROVISION
SECTION 635
PREFABRICATED BIN TYPE RETAINING WALL
(Prefabricated Concrete Modular Gravity Wall)

The following replaces Section 635 in the Standard Specifications:

Description. This work shall consist of the construction of a prefabricated modular reinforced concrete gravity wall in accordance with these specifications and in reasonably close conformance with the lines and grades shown on the plans, or established by the Resident.

Included in the scope of the Prefabricated Concrete Modular Gravity Wall construction are**:** all grading necessary for wall construction, excavation, compaction of the wall foundation, backfill, construction of leveling pads, and segmental unit erection.

The Prefabricated Concrete Modular Gravity Wall design shall follow the general dimensions of the wall envelope shown in the contract plans. The top of the leveling pad shall be located at or below the theoretical leveling pad elevation. The minimum wall embedment shall be at or below the elevation shown on the plans. The top of the face panels shall be at or above the top of the panel elevation shown on the plans.

The Contractor shall require the design-supplier to supply an on-site, qualified experienced technical representative to advise the Contractor concerning proper installation procedures. The technical representative shall be on-site during initial stages of installation and thereafter shall remain available for consultation as necessary for the Contractor or as required by the Resident. The work done by this representative is incidental.

## MATERIALS

Materials. Materials shall meet the requirements of the following subsections of Division 700 - Materials:

| | |
|---|---|
| Gravel Borrow | 703.20 |
| Preformed Expansion Joint Material | 705.01 |
| Reinforcing Steel | 709.01 |
| Structural Pre-cast Concrete Units | 712.061 |
| Drainage Geotextile | 722.02 |

The Contractor is cautioned that all of the materials listed are not required for every Prefabricated Concrete Modular Gravity Wall. The Contractor shall furnish the Resident a Certificate of Compliance certifying that the applicable materials comply with this section of the specifications. Materials shall meet the following additional requirements:

Concrete Units:

Tolerances. In addition to meeting the requirements of 712.061, all prefabricated units shall be manufactured with the following tolerances. All units not meeting the listed tolerances will be rejected.

1. All dimensions shall be within (edge to edge of concrete) 5 mm [±3/16 inch].
2. Squareness. The length differences between the two diagonals shall not exceed 8 mm [5/16 inch].
3. Surface Tolerances. For steel formed surfaces, and other formed surface, any surface defects in excess of 2 mm [.08 inch] in 1.2 m [4 feet] will be rejected. For textured surfaces, any surface defects in excess of 8 mm [5/16 inch] in 1.5 m [5 feet] shall be rejected.

Joint Filler. (Where applicable) Joints shall be filled with material approved by the Resident and supplied by the approved Prefabricated Concrete Modular Gravity Wall supplier. A 100 mm [4 inch] wide, by 13 mm [0.5 inch] preformed expansion joint filler shall be placed in all horizontal joints between facing units. In all vertical joints, a space of 6 mm [0.25 inch] shall be provided. All Preformed Expansion Joint Material shall meet the requirements of subsection 502.03.

Woven Drainage Geotextile. Woven drainage geotextile 300 mm [12 inch] wide shall be bonded with an approved adhesive compound to the back face, covering all joints between units, including joints abutting concrete structures. Geotextile seam laps shall be 150 mm [6 inch] minimum. The fabric shall be secured to the concrete with an adhesive satisfactory to the Resident. Dimensions may be modified per the wall supplier's recommendations, with written approval of the Resident.

Concrete Shear Keys. (Where applicable) Shear keys shall have a thickness at least equal to the pre-cast concrete stem.

Concrete Leveling Pad. Cast-in-place concrete shall be Class A except that permeability requirements will not apply. The horizontal tolerance on the surface of the pad shall be 6 mm [0.25 inch] in 3 m [10 feet]. Dimensions may be modified per the wall supplier's recommendations, with written approval of the Resident.

Backfill and Bedding Material. Bedding and backfill material placed behind and within the reinforced concrete modules shall be gravel borrow conforming to the requirements of Subsection 703.20. The backfill materials shall conform to the following additional requirements: the plasticity index (P.I.) as determined by AASHTO T90 shall not exceed 6. Compliance with the gradation and plasticity requirements shall be the responsibility of the Contractor, who shall furnish a copy of the backfill test results prior to construction.

The backfilling of the interior of the wall units and behind the wall shall progress simultaneously. The material shall be placed in layers not over 200 mm [8

inches] in depth, loose measure, and thoroughly compacted by mechanical or vibratory compactors. Puddling for compaction will not be allowed.

Materials Certificate Letter. The Contractor, or the supplier as his agent, shall furnish the Resident a Materials Certificate Letter for the above materials, including the backfill material, in accordance with Section 700 of the Standard Specifications. A copy of all test results performed by the Contractor or his supplier necessary to assure contract compliance shall also be furnished to the Resident. Acceptance will be based upon the materials Certificate Letter, accompanying test reports, and visual inspection by the Resident.

**DESIGN REQUIREMENTS**

Design Requirements. The Prefabricated Concrete Modular Gravity Wall shall be designed by a Professional Engineer. The design to be performed by the wall system supplier shall be in accordance with AASHTO Standard Specifications for Highway Bridges, current edition, except as required herein. Thirty days prior to beginning construction of the wall, the design computations shall be submitted to the Resident for review by the Department. The design by the wall system supplier shall consider the stability of the wall as outlined below:

(a) Safety Factors. The minimum factors of safety shall be as follows:

| | | |
|---|---|---|
| 1. | Overturning:<br>(No reduction of the overturning safety factor shall be allowed for walls founded on rock.) | 2.0 |
| 2. | Sliding: | 1.5 |
| 3. | Stability of temporary construction slope: | 1.2 |
| 4. | Ultimate bearing capacity: | 2.0 |
| 5. | Pullout Resistance | 1.5 |

(b) Backfill and Wall Unit Soil Parameters. For overturning and sliding stability calculations, earth pressure shall be assumed acting on a vertical plane rising from the back of the lowest wall stem. For overturning, the unit weight of the backfill within the wall units shall be limited to 1602 kg/m$^3$ [100 pcf]. For sliding analyses, the unit weight of the backfill within the wall units can be assumed to be 1922 kg/m$^3$ [120 pcf]. Both analyses may assume a friction angle of 34 degrees for backfill within the wall units.

These unit weights and friction angles are based on a wall unit backfill meeting the requirements for select backfill in this specification. Backfill behind the wall units shall be assumed to have a unit weight of 1922 kg/m$^3$ [120 pcf] and a friction angle of 30 degrees. The friction angle of the foundation soils shall be assumed to be 30 degrees unless otherwise noted on the plans.

(c) Internal Stability. Internal stability of the wall shall be demonstrated using accepted methods, such as Elias' Method, 1991. Shear keys shall not contribute to pullout resistance. Soil-to-soil frictional component along stem shall not contribute to pullout resistance. The failure plane used to determine pullout resistance shall be found by the Rankine theory only for vertical walls with level backfills. When walls are battered or with backslopes > 0 degrees are considered, the angle of the failure plane shall be per Jumikus Method. For computation of pullout force, the width of the backface of each unit shall be no greater than 1.37 m [4.5 feet]. A unit weight of the soil inside the units shall be assumed no greater than 1922 kg/$m^3$ 120 pcf when computing pullout. Coulomb theory may be used.

(d) External loads which affect the internal stability such as those applied through piling, bridge footings, traffic, slope surcharge, hydrostatic and seismic loads shall be accounted for in the design.

(e) The actual applied bearing pressures under the Prefabricated Concrete Modular Gravity block wall shall be clearly indicated on the design drawings.

(f) Stability During Construction. The factors of safety to be used for stability during construction stages shall be the same factors used for the design of the wall.

(g) Hydrostatic forces. Unless specified otherwise, when a design high water surface is shown on the plans at the face of the wall, the design stresses calculated from that elevation to the bottom of wall must include a 0.9 meter [3 foot] minimum differential head of saturated backfill. In addition, the buoyant weight of saturated soil shall be used in the calculation of pullout resistance.

(h) Design Life. Design life shall be in accordance with AASHTO requirements.

(i) Not more than two vertically consecutive units shall have the same stem length, or the same unit depth. Walls with units with extended height curbs shall be designed for the added earth pressure. A separate computation for pullout of each unit with extended height curbs, or extended height coping, shall be prepared and submitted in the design package described above.

Submittals. The Contractor shall supply wall design computations, wall details, dimensions, quantities, and cross sections necessary to construct the wall. Thirty (30) days prior to beginning construction of the wall, the design computations and wall details shall be submitted to the Resident for review. The fully detailed plans shall be prepared in

conformance with Subsection 105.7 of the Standard Specifications and shall include, but not be limited to the following items:

I. A plan and elevation sheet or sheets for each wall, containing the following: elevations at the top of leveling pads, the distance along the face of the wall to all steps in the leveling pads, the designation as to the type of prefabricated module, the distance along the face of the wall to where changes in length of the units occur, the location of the original and final ground line.
II. All details, including reinforcing bar bending details, shall be provided. Bar bending details shall be in accordance with Department standards.
III. All details for foundations and leveling pads, including details for steps in the leveling pads, as well as allowable and actual maximum bearing pressures shall be provided.
IV. All prefabricated modules shall be detailed. The details shall show all dimensions necessary to construct the element, and all reinforcing steel in the element.
V. The wall plans shall be prepared and stamped by a Professional Engineer. Four sets of design drawings and detail design computations shall be submitted to the Resident.
VI. Four weeks prior to the beginning of construction, the contractor shall supply the Resident with two copies of the design-supplier's Installation Manual. In addition, the Contractor shall have two copies of the Installation Manual on the project site.

**CONSTRUCTION REQUIREMENTS**

Excavation. The excavation and use as fill disposal of all excavated material shall meet the requirements of Section 203 -- Excavation and Embankment, except as modified herein.

Foundation. The area upon which the modular gravity wall structure is to rest, and within the limits shown on the submitted plans, shall be graded for a width equal to, or exceeding, the length of the module. Prior to wall and leveling pad construction, this foundation material shall be compacted to at least 95 percent of maximum laboratory dry density. Frozen soils and soils unsuitable or incapable of sustaining the required compaction, shall be removed and replaced.

A concrete leveling pad shall be constructed as indicated on the plans. The leveling pad shall be cast to the design elevations as shown on the plans, or as required by the wall supplier upon written approval of the Resident. Allowable elevation tolerances are +3 mm [+0.01 foot] and -6 mm [-0.02 foot] from the design elevations. Leveling pads which do not meet these requirements shall be repaired or replaced as directed by the Resident at no additional cost to the Department. Placement of wall units may begin after 24 hours curing time of the concrete leveling pad.

Method and Equipment. Prior to erection of the Prefabricated Concrete Modular Gravity Wall, the Contractor shall furnish the Resident with detailed information concerning the proposed construction method and equipment to be used. The erection

procedure shall be in accordance with the manufacturer's instructions. Any pre-cast units that are damaged due to handling will be replaced at the Contractor's expense.

Installation of Wall Units. A field representative from the wall system being used shall be available, as needed, during the erection of the wall. The services of the representative shall be at no additional cost to the Department. Vertical and horizontal joint fillers shall be installed as shown on the plans.

The maximum offset in any unit joint shall be 20 mm [3/4 inch]. The overall vertical tolerance of the wall, plumb from top to bottom, shall not exceed 12 mm per 3 m [1/2 inch per 10 feet] of wall height. The prefabricated wall units shall be installed to a tolerance of plus or minus 20 mm in 3 m [3/4 inch in 10 feet] in vertical alignment and horizontal alignment.

Select Backfill Placement. Backfill placement shall closely follow the erection of each row of prefabricated wall units. The Contractor shall decrease the lift thickness if necessary to obtain the specified density. The maximum lift thickness shall be 200 mm [8 inches] (loose). Gravel borrow backfill shall be compacted in accordance with Subsection 203.12 except that the minimum required compaction shall be 95 percent of maximum density as determined by AASHTO T99 Method C or D. Backfill compaction shall be accomplished without disturbance or displacement of the wall units. Sheepsfoot rollers will not be allowed. Whenever a compaction test fails, no additional backfill shall be placed over the area until the lift is recompacted and a passing test achieved.

The moisture content of the backfill material prior to and during compaction shall be uniform throughout each layer. Backfill material shall have a placement moisture content less than or equal to the optimum moisture content. Backfill material with a placement moisture content in excess of the optimum moisture content shall be removed and reworked until the moisture content is uniform and acceptable throughout the entire lift. The optimum moisture content shall be determined in accordance with AASHTO T99, Method C or D. At the end of the day's operations, the Contractor shall shape the last level of backfill so as to direct runoff of rain water away from the wall face.

Method of Measurement. Prefabricated Concrete Modular Gravity Wall will be measured by the square meter of front surface not to exceed the dimensions shown on the contract plans or authorized by the Resident. Vertical and horizontal dimensions will be from the edges of the facing units. No field measurements for computations will be made unless the Resident specifies, in writing, a change in the limits indicated on the plans.

Basis of Payment. The accepted quantity of Prefabricated Concrete Modular Gravity Retaining Wall will be paid for at the contract unit price per square meter complete in place. Payment shall be full compensation for furnishing all labor, equipment and materials including pre-cast concrete units hardware, joint fillers, woven drainage geotextile, cast-in-place coping or traffic barrier and technical field representative. Cost of cast-in-place concrete for leveling pad will not be paid for separately, but will be considered incidental to the Prefabricated Concrete Modular Gravity Wall.

Excavation, foundation material and backfill material will all be incidental to the Prefabricated Concrete Modular Gravity Wall.

There will be no allowance for excavating and backfilling for the Prefabricated Concrete Modular Gravity Wall beyond the limits shown on the approved submitted plans, except for excavation required to remove unsuitable subsoil in preparation for the foundation, as approved by the Resident. When it is necessary to excavate unsuitable subsoil payment for such excavation shall be made at 1.5 times the contract unit price for Item 206.082 Structural Excavation. Payment for excavating unsuitable subsoil shall be full compensation for all costs of pumping, drainage, sheeting, bracing and incidentals for proper execution of the work.

Payment will be made under:

| Pay Item | Pay Unit |
|---|---|
| 635.14 Prefabricated Concrete Modular Gravity Wall | Square Foot |