



Paul R. LePage  
GOVERNOR

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

David Bernhardt  
COMMISSIONER

March 7, 2014  
Subject: **South Bristol**  
Federal Project No: BH-1675(000)X  
State WIN: 016750.00  
**Amendment No. 2**

Dear Sir/Ms:

Make the following changes to the Bid Documents:

In the Bid Book (pages 17 thru 31) **REMOVE** the "SCHEDULE OF ITEMS" 15 pages dated 140203 and **REPLACE** with the attached new "SCHEDULE OF ITEMS" 14 pages dated 3/5/2014.

In the Bid Book (pages 106 and 107) **REMOVE** "SPECIAL PROVISION, SECTION 203, HOLDING TANK" 2 pages dated January 3, 2014 and **REPLACE** with the attached new "SPECIAL PROVISION, SECTION 203, HOLDING TANK" 2 pages dated February 27, 2014 **AND** 4 attached details labeled "ATTACHMENTS A, B, C and D" for a total of 6 pages..

In the Bid Book (pages 137 and 138) **REMOVE** "SPECIAL PROVISION, SECTION 403, HOT MIX ASPHALT" 2 pages dated January 15, 2014 and **REPLACE** with the attached new "SPECIAL PROVISION, SECTION 403, HOT MIX ASPHALT" 2 pages dated February 27, 2014.

In the Bid Book (pages 202 and 203/) **REMOVE** "SPECIAL PROVISION, SECTION 507-RAILINGS" 2 pages dated January 27, 2014 and **REPLACE** with the attached new "SPECIAL PROVISION, SECTION 507-RAILINGS" 2 pages dated February 28, 2014.

In the Bid Book after page 228 **ADD** the attached "SPECIAL PROVISION, SECTION 525, RE-POINTING GRANITE MASONRY" 2 pages dated February 27, 2014 to the bid book.

In the Bid Book (pages 426 thru 433) **REMOVE** "SPECIAL PROVISION, SECTION 880- BALANCING BRIDGE" 8 pages dated January 27, 2014 and **REPLACE** with the attached new "SPECIAL PROVISION, SECTION - 880 BALANCING BRIDGE" 8 pages dated February 28, 2014



PRINTED ON RECYCLED PAPER

In the Plans;

**REMOVE** the following Plan Sheets and **REPLACE** with the attached new Plan Sheets;

**REMOVE** 18 of 141 and **REPLACE** with 18A of 141

**REMOVE** 19 of 141 and **REPLACE** with 19A of 141

**REMOVE** 20 of 141 and **REPLACE** with 20A of 141

**REMOVE** 22 of 141 and **REPLACE** with 22A of 141

**REMOVE** 37 of 141 and **REPLACE** with 37 of 141

NOTE: Plan Sheets will be FedExed/Mailed to those who purchased plans in the size and quantity ordered.

In the Plans, Plan Sheet 4 of 141, "GENERAL NOTES II" **ADD** the following three notes in pen and ink;

**18. The Contractor shall remove, temporarily store and then put back in place the ornamental stones that surround the driveway located at station 115+81.0 left. This work shall not be paid for directly. This work shall be considered incidental to related contract items.**

**19. The polyurea elastomer coating on the soldier piles shall be colored gray so as to match concrete. Prior to coating, a color chip shall be supplied by the fabricator for final color selection and approval by the Resident. After driving piles, the polyurea coating shall be removed down to 3 inches above the bottom of the cap elevation to ensure an adequate bond between the soldier piles and the concrete, as approved by the Resident.**

**20. The Contractor's operations shall not block boat traffic from accessing land based facilities or docks located immediately north of the bridge. Please be aware that at low tide, the only channel available on the westerly side of Route 129 is located immediately west of the buildings. A ledge outcrop is located approximately 190' west of the centerline of Route 129.**

In the Plans, Sheet 25 of 141 "RETAINING WALL" **DELETE** note "12)" in its entirety. Make this change in pen and ink.

In the Plans, Sheet 96 of 141 "CONTROL HOUSE, PLUMBING SYMBOLS & NOTES", "PLUMBING NOTES" **DELETE** Note "P" in its entirety and **REPLACE** with the following in pen and ink;

**"THE COMPLETE PLUMBING INSTALLATION, METHOD OF HANGING, TESTING, ETC. SHALL COMPLY WITH ALL PROVISIONS OF THE STATE INTERNAL PLUMBING CODE, LATEST REVISION AND THE STATE OF MAINE, SUBSURFACE WASTEWATER DISPOSAL RULES, EFFECTIVE DATE: JANUARY 18, 2011."**

In the Plans, Sheet 99 of 141 “CONTROL HOUSE, ELECTRICAL SYMBOLS & NOTES”, “CONTROL ELECTRICAL NOTES” **DELETE** Note “3” in its entirety. Make this change in pen and ink.

The following questions have been received:

**Question:** Note #2 on page 38 says: “The permanent anchored wall is not designed to support any construction surcharge and/or any loading from the temporary bridge” yet drawing #28 shows the proposed temporary abutments directly on top of the anchored wall installed in stage #1. Please clarify.

**Response:** The temporary abutments and piers shown are for illustrative purposes only. The solid pile and lagging wall (i.e. permanent anchored wall) is not designed to support loading from the temporary bridge. The design of the temporary detour is the responsibility of the Contractor per Special Provision Section 510 dated January 27, 2014.

**Question:** Item #8 on page 30 (Stage #3) says: “Install temporary aerial cable for bridge operations”. Is the intent to open the bridge with temporary controls prior to installing the control house in stage #4?

**Response:** Yes, the intent is to open the bridge to traffic with temporary controls prior to installing the control house shown in stage #4 on sheet 31 of the plans.

**Question:** Ref. page 99: If the control house has to be built during the 213 day closure and per SP 107, the Contractor is allowed to work on Sundays during the closure, why are there restrictions on when electrical work can be done?

**Response:** The control house does not have to be built during the 213 day closure. The control house cannot be built until the temporary detour is removed. Note #3 on sheet 99 shall be removed.

**Question:** Reference page 96: Note “P”, why is New York State plumbing code referenced?

**Response:** Please refer to the updated note in the amendment above.

**Question:** If closure of the navigation channel is such an issue that a \$10,000/CD is warranted, we request that there be a \$10,000/CD incentive for early opening to boat traffic.

**Response:** No incentive will be added to the contract.

**Question:** Ref. Amendment #1: What happens if the permits are obtained post bid and they contain requirements different from what are presently identified? Does the Department intend to “negotiate” changes in the schedule and contract price with the low bidder pre-award? Do the requirements of section 103.4 still apply?

**Response:** The Department expects the permits to directly match the requirements of the contract. In the event that the requirements are different, the Department will evaluate options and decide at that time how to proceed. The Department does not intend to negotiate with the low bidder pre-award. The requirements of section 103.4 will apply.

**Question:** Are the piles 2’ diameter like the ones on Clay Hill Bridges in Kennebunk?

**Response:** No. The piles on the South Bristol, Gut Bridge are different than the ones used on the Clay Hill Bridge project in Kennebunk.

**Question:** Length of piles?

**Response:** The estimated length of the piles to have a polyurea coating are shown on sheet 38 in the table on the upper left hand corner. The estimated pile lengths vary between 28’ and 43’.

**Question:** Length to be sprayed with protective coating?

**Response:** Please see note #4 on amended sheet 37.

**Question:** If not round, what is the shape & material they’re made of?

**Response:** The typical solid pile detail is shown on plan sheet 37, see the detail in the upper right hand corner. Each pile consists of two W 24x103’s connected with a series of lacing bars. A W 24 x 103 has a depth of 24.53 inches and a flange width of 9 inches. The beam has a weight of 103 pounds per linear foot of beam. A W 24 x 103 has a surface area of 6.886 square feet per linear foot of beam. Attached are the complete section properties for a W24 x 103 beam from the AISC manual. Each individual lacing bar is also coated with polyurea.

**Question:** Specs regarding protective coatings?

**Response:** In the contract bid book See Special Provision Section 506 –Shop Applied Protective Coating – Steel dated January 10, 2014 page 197 to page 201 for the specifications regarding the polyurea elastomer coating.

**Question:** Reference page 25, note 12; How can the Contractor determine costs associated with repointing the existing retaining wall when a) No specs are provided as to what is required for repair/repointing and b) half of the retaining wall in question is presently below grade. We request that specs for repair/repointing be provided and that this work be paid by a new bid item.

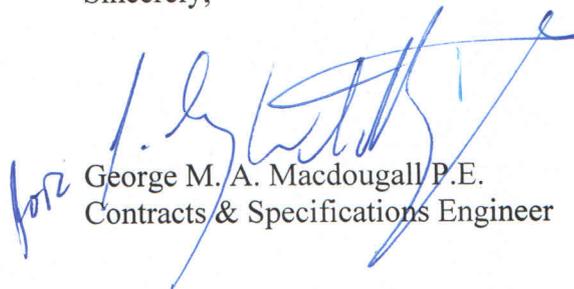
**Response:** Item 525.26 REPOINTING GRANITE MASONRY - 75 SF has been added to the schedule of items. Please see the attached specification Section 525 Repoint Granite Masonry dated February 27, 2014

**Question:** Special Provision 880 Balancing Bridge states that item 880.12 Counterweight-Concrete will be paid by the cubic yard yet the item in the schedule of items has this as a Lump Sum item. Please clarify.

**Response:** The unit of measurement for item 880.112 Counterweight Concrete is lump sum. Please see the attached updated specification.

Consider this changes and information prior to submitting your bid on **April 30, 2014.**

Sincerely,

for  
George M. A. Macdougall P.E.  
Contracts & Specifications Engineer

Maine Department of Transportation

Proposal Schedule of Items

Proposal ID: 016750.00

Project(s): 016750.00

SECTION: 1 PROJECT ITEMS

Alt Set ID:

Alt Mbr ID:

Contractor: \_\_\_\_\_

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price		Bid Amount	
			Dollars	Cents	Dollars	Cents
0010	107.51 PROSECUTION OF WORK - INITIAL SCHEDULE	LUMP SUM			_____	
0020	107.52 PROSECUTION OF WORK - MONTHLY UPDATE	28.000 EA	_____		_____	
0030	202.08 REMOVING BUILDING NO.: CONTROL HOUSE	LUMP SUM			_____	
0040	202.13 REMOVING EXISTING RAILINGS (RETAINED BY DEPARTMENT)	94.000 LF	_____		_____	
0050	202.19 REMOVING EXISTING BRIDGE	LUMP SUM			_____	
0060	202.55 REMOVE AND DISPOSE ADVANCED WARNING SIGN SYSTEM	LUMP SUM			_____	
0070	203.20 COMMON EXCAVATION	791.000 CY	_____		_____	
0080	203.21 ROCK EXCAVATION	20.000 CY	_____		_____	
0090	203.2311 2,000 - GALLON ON-SITE HOLDING TANK	1.000 EA	_____		_____	
0100	203.24 COMMON BORROW	10.000 CY	_____		_____	
0110	203.25 GRANULAR BORROW	760.000 CY	_____		_____	
0120	203.35 CRUSHED STONE FILL	1,540.000 CY	_____		_____	

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			Dollars	Cents	Dollars	Cents
0130	206.082 STRUCTURAL EARTH EXCAVATION - MAJOR STRUCTURES	1,820.000 CY	_____	 _____	_____	 _____
0140	206.10 STRUCTURAL EARTH EXCAVATION - PIERS	690.000 CY	_____	 _____	_____	 _____
0150	304.10 AGGREGATE SUBBASE COURSE - GRAVEL	500.000 CY	_____	 _____	_____	 _____
0160	403.208 HOT MIX ASPHALT 12.5 MM HMA SURFACE	141.000 T	_____	 _____	_____	 _____
0170	403.209 HOT MIX ASPHALT 9.5 MM (SIDEWALKS, DRIVES, INCIDENTALS)	6.000 T	_____	 _____	_____	 _____
0180	403.213 HOT MIX ASPHALT 12.5 MM BASE	160.000 T	_____	 _____	_____	 _____
0190	409.15 BITUMINOUS TACK COAT - APPLIED	31.000 G	_____	 _____	_____	 _____
0200	462.30 ULTRATHIN BONDED WEARING COURSE	125.000 SY	_____	 _____	_____	 _____
0210	501.220 MICRO PILES	26.000 EA	_____	 _____	_____	 _____
0220	501.57 STEEL W24X103 PILES, DELIVERED	1,079.000 LF	_____	 _____	_____	 _____
0230	501.571 STEEL W24X103 PILES, IN PLACE	1,079.000 LF	_____	 _____	_____	 _____
0240	501.802 ROCK SOCKET 36 INCH DIAMETER	382.000 LF	_____	 _____	_____	 _____

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			Dollars	Cents	Dollars	Cents
0250	501.804 DRILLING EQUIPMENT MOBILIZATION	LUMP SUM				
0260	502.21 STRUCTURAL CONCRETE, ABUTMENTS AND RETAINING WALLS	120.000 CY				
0270	502.22 STRUCTURAL CONCRETE, ABUTMENTS AND RETAINING WALLS (PLACED UNDER WATER)	400.000 CY				
0280	502.23 STRUCTURAL CONCRETE PIERS	140.000 CY				
0290	502.24 STRUCTURAL CONCRETE PIERS (PLACED UNDER WATER)	52.000 CY				
0300	502.31 STRUCTURAL CONCRETE APPROACH SLABS	LUMP SUM				
0310	502.56 CONCRETE FILL	4.000 CY				
0320	503.171 MECHANICAL / WELDED SPLICE	LUMP SUM				
0330	503.30 CORROSION RESISTANT REINFORCING SYSTEM, FABRICATED AND DELIVERED	169,200.000 LB				
0340	503.31 CORROSION RESISTANT REINFORCING SYSTEM, PLACING	169,200.000 LB				
0350	504.60 TIMBER FENDER SYSTEM	LUMP SUM				

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			Dollars	Cents	Dollars	Cents
0360	504.692 FURNISH AND INSTALL STAY CABLES	LUMP SUM	LUMP	SUM	_____	_____
0370	504.693 JACKING STAY CABLES	LUMP SUM	LUMP	SUM	_____	_____
0380	504.701 STRUCTURAL STEEL FABRICATED AND DELIVERED, ROLLED	LUMP SUM	LUMP	SUM	_____	_____
0390	504.702 STRUCTURAL STEEL FABRICATED AND DELIVERED, WELDED	LUMP SUM	LUMP	SUM	_____	_____
0400	504.709 BRIDGE HARDWARE	LUMP SUM	LUMP	SUM	_____	_____
0410	504.71 STRUCTURAL STEEL ERECTION	LUMP SUM	LUMP	SUM	_____	_____
0420	504.9068 PERMANENT GROUTED TIEBACKS, FURNISHED, INSTALLED, AND ACCEPTED	LUMP SUM	LUMP	SUM	_____	_____
0430	504.9069 PERFORMANCE TEST, GROUTED TIEBACK	4.000 EA	_____	_____	_____	_____
0440	505.08 SHEAR CONNECTORS	LUMP SUM	LUMP	SUM	_____	_____
0450	506.9102 ZINC RICH COATING SYSTEM (SHOP APPLIED)	LUMP SUM	LUMP	SUM	_____	_____
0460	506.9103 GALVANIZING	LUMP SUM	LUMP	SUM	_____	_____

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			Dollars	Cents	Dollars	Cents
0470	506.9104 THERMAL SPRAY COATING - SHOP APPLIED	LUMP SUM	LUMP	SUM	_____	_____
0480	506.9105 POLYUREA ELASTOMER COATING	LUMP SUM	LUMP	SUM	_____	_____
0490	507.084 STEEL PIPE HAND RAILING	320.000 LF	_____	_____	_____	_____
0500	507.092 ALUMINUM BRIDGE RAILING, 2 BAR	70.000 LF	_____	_____	_____	_____
0510	508.14 HIGH PERFORMANCE WATERPROOFING MEMBRANE	LUMP SUM	LUMP	SUM	_____	_____
0520	509.70 COMPOSITE BEAM	LUMP SUM	LUMP	SUM	_____	_____
0530	510.10 SPECIAL DETOUR _____ ROADWAY WIDTH VEHICULAR & PEDESTRIAN TRAFFIC NOT SEPARATED 18'	LUMP SUM	LUMP	SUM	_____	_____
0540	511.07 COFFERDAM: NO. 3	LUMP SUM	LUMP	SUM	_____	_____
0550	511.07 COFFERDAM: NO. 1	LUMP SUM	LUMP	SUM	_____	_____
0560	511.07 COFFERDAM: NO. 2	LUMP SUM	LUMP	SUM	_____	_____
0570	511.07 COFFERDAM: NO. 5	LUMP SUM	LUMP	SUM	_____	_____
0580	511.07 COFFERDAM: NO.4	LUMP SUM	LUMP	SUM	_____	_____

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			Dollars	Cents	Dollars	Cents
0590	512.081 FRENCH DRAINS	LUMP SUM				
0600	513.22 CRUSHED STONE SLOPE PROTECTION	355.000 SY				
0610	514.06 CURING BOX FOR CONCRETE CYLINDERS	1.000 EA				
0620	515.21 PROTECTIVE COATING FOR CONCRETE SURFACES	LUMP SUM				
0630	520.2024 CLOSED CELL SEAL	70.000 LF				
0640	520.232 EXPANSION DEVICE - ASPHALTIC PLUG JOINT	52.000 LF				
0650	523.52 BEARING INSTALLATION	2.000 EA				
0660	523.5306 BASCULE GIRDER BEARING	2.000 EA				
0670	525.26 REPOINTING GRANITE MASONRY	75.000 SF				
0680	526.301 TEMPORARY CONCRETE BARRIER TYPE I	LUMP SUM				
0690	526.321 PERMANENT CONCRETE BARRIER TYPE III A	LUMP SUM				

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			Dollars	Cents	Dollars	Cents
0700	526.3401 PERMANENT CONCRETE TRANSITION BARRIER - MODIFIED	4.000 EA	_____	 _____	_____	 _____
0710	527.34 WORK ZONE CRASH CUSHIONS	4.000 UN	_____	 _____	_____	 _____
0720	534.7602 PRECAST PIER	LUMP SUM	LUMP SUM		_____	 _____
0730	535.33 PRECAST CONCRETE LAGGING, FABRICATION AND DELIVERY	4,640.000 SF	_____	 _____	_____	 _____
0740	535.34 PRECAST CONCRETE LAGGING, INSTALLATION	4,640.000 SF	_____	 _____	_____	 _____
0750	606.23 GUARDRAIL TYPE 3C - SINGLE RAIL	100.000 LF	_____	 _____	_____	 _____
0760	606.231 GUARDRAIL TYPE 3C - 15 FOOT RADIUS AND LESS	12.500 LF	_____	 _____	_____	 _____
0770	606.265 TERMINAL END - SINGLE RAIL - GALVANIZED STEEL	8.000 EA	_____	 _____	_____	 _____
0780	606.353 REFLECTORIZED FLEXIBLE GUARDRAIL MARKER	7.000 EA	_____	 _____	_____	 _____
0790	607.19 CHAIN LINK FENCE - 8 FOOT	26.000 LF	_____	 _____	_____	 _____
0800	607.2313 CHAIN FENCE GATE 4 FOOT X 8 FOOT OPENING	1.000 EA	_____	 _____	_____	 _____

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			Dollars	Cents	Dollars	Cents
0810	608.26 CURB RAMP DETECTABLE WARNING FIELD	16.000 SF	_____	 _____	_____	 _____
0820	609.11 VERTICAL CURB TYPE 1	35.000 LF	_____	 _____	_____	 _____
0830	609.12 VERTICAL CURB TYPE 1 - CIRCULAR	13.000 LF	_____	 _____	_____	 _____
0840	610.08 PLAIN RIPRAP	270.000 CY	_____	 _____	_____	 _____
0850	610.16 HEAVY RIPRAP	115.000 CY	_____	 _____	_____	 _____
0860	615.07 LOAM	5.000 CY	_____	 _____	_____	 _____
0870	618.1301 SEEDING METHOD NUMBER 1 - PLAN QUANTITY	1.000 UN	_____	 _____	_____	 _____
0880	619.1201 MULCH - PLAN QUANTITY	1.000 UN	_____	 _____	_____	 _____
0890	619.1401 EROSION CONTROL MIX	5.000 CY	_____	 _____	_____	 _____
0900	620.58 EROSION CONTROL GEOTEXTILE	400.000 SY	_____	 _____	_____	 _____
0910	620.60 SEPARATION GEOTEXTILE	570.000 SY	_____	 _____	_____	 _____
0920	626.11 PRECAST CONCRETE JUNCTION BOX	3.000 EA	_____	 _____	_____	 _____

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			Dollars	Cents	Dollars	Cents
0930	626.32 24 INCH FOUNDATION	2.000 EA	_____	 _____	_____	 _____
0940	626.35 CONTROLLER CABINET FOUNDATION	1.000 EA	_____	 _____	_____	 _____
0950	626.37 SPECIAL FOUNDATION	6.000 EA	_____	 _____	_____	 _____
0960	627.733 4" WHITE OR YELLOW PAINTED PAVEMENT MARKING LINE	1,200.000 LF	_____	 _____	_____	 _____
0970	627.75 WHITE OR YELLOW PAVEMENT & CURB MARKING	52.000 SF	_____	 _____	_____	 _____
0980	627.76 TEMPORARY PAVEMENT MARKING LINE, WHITE OR YELLOW	LUMP SUM		 LUMP SUM	_____	 _____
0990	627.77 REMOVING PAVEMENT MARKINGS	302.000 SF	_____	 _____	_____	 _____
1000	629.05 HAND LABOR, STRAIGHT TIME	20.000 HR	_____	 _____	_____	 _____
1010	631.12 ALL PURPOSE EXCAVATOR (INCLUDING OPERATOR)	20.000 HR	_____	 _____	_____	 _____
1020	631.14 GRADER (INCLUDING OPERATOR)	20.000 HR	_____	 _____	_____	 _____
1030	631.15 ROLLER, EARTH AND BASE COURSE (INCLUDING OPERATOR )	20.000 HR	_____	 _____	_____	 _____

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Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price		Bid Amount	
			Dollars	Cents	Dollars	Cents
1040	631.172 TRUCK - LARGE (INCLUDING OPERATOR)	20.000 HR	_____	 _____	_____	 _____
1050	634.160 HIGHWAY LIGHTING	LUMP SUM	LUMP SUM		_____	 _____
1060	634.168 PUMP EQUIPMENT & WIRING	LUMP SUM	LUMP SUM		_____	 _____
1070	634.2042 LED LUMINARIES	2.000 EA	_____	 _____	_____	 _____
1080	635.31 PREFAB CONCRETE BLOCK GRAVITY WALL	355.000 SF	_____	 _____	_____	 _____
1090	635.40 PRECAST AGGREGATE FILLED CONCRETE BLOCK GRAVITY WALL	355.000 SF	_____	 _____	_____	 _____
1100	637.071 DUST CONTROL	LUMP SUM	LUMP SUM		_____	 _____
1110	638.02 NAVIGATION LIGHTS	LUMP SUM	LUMP SUM		_____	 _____
1120	639.18 FIELD OFFICE TYPE A	1.000 EA	_____	 _____	_____	 _____
1130	643.01 TRAFFIC SIGNALS AND GATES	LUMP SUM	LUMP SUM		_____	 _____
1140	643.60 FLASHING BEACON AT: NORTH APPROACH	LUMP SUM	LUMP SUM		_____	 _____
1150	643.60 FLASHING BEACON AT: SOUTH APPROACH	LUMP SUM	LUMP SUM		_____	 _____

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			Dollars	Cents	Dollars	Cents
1160	643.72 TEMPORARY TRAFFIC SIGNAL	LUMP SUM	LUMP	SUM	_____	_____
1170	643.80 TRAFFIC SIGNALS AT NORTH APPROACH	LUMP SUM	LUMP	SUM	_____	_____
1180	643.80 TRAFFIC SIGNALS AT SOUTH APPROACH	LUMP SUM	LUMP	SUM	_____	_____
1190	643.92 PEDESTAL POLE	2.000 EA	_____	_____	_____	_____
1200	643.94 DUAL PURPOSE POLE 10 FT ARM	1.000 EA	_____	_____	_____	_____
1210	643.94 DUAL PURPOSE POLE 22 FT ARM	1.000 EA	_____	_____	_____	_____
1220	643.96 DRAW BRIDGE WARNING SIGN	2.000 EA	_____	_____	_____	_____
1230	645.51 SPECIAL SIGNING	LUMP SUM	LUMP	SUM	_____	_____
1240	652.312 TYPE III BARRICADE	2.000 EA	_____	_____	_____	_____
1250	652.33 DRUM	30.000 EA	_____	_____	_____	_____
1260	652.34 CONE	30.000 EA	_____	_____	_____	_____
1270	652.35 CONSTRUCTION SIGNS	400.000 SF	_____	_____	_____	_____

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			Dollars	Cents	Dollars	Cents
1280	652.361 MAINTENANCE OF TRAFFIC CONTROL DEVICES	LUMP SUM	LUMP	SUM	_____	_____
1290	652.38 FLAGGER	1,000.000 HR	_____	_____	_____	_____
1300	653.23 3 INCH POLYSTYRENE PLASTIC INSULATION	45.000 SY	_____	_____	_____	_____
1310	655.01 ENGINE - GENERATOR SYSTEM STANDBY	LUMP SUM	LUMP	SUM	_____	_____
1320	655.3001 BRIDGE ELECTRICAL AND CONTROL SYSTEM	LUMP SUM	LUMP	SUM	_____	_____
1330	656.75 TEMPORARY SOIL EROSION AND WATER POLLUTION CONTROL	LUMP SUM	LUMP	SUM	_____	_____
1340	659.10 MOBILIZATION	LUMP SUM	LUMP	SUM	_____	_____
1350	660.21 ON-THE-JOB TRAINING (BID)	1,000.000 HR	_____	_____	_____	_____
1360	815.00 BUILDING 1, CONTROL HOUSE	LUMP SUM	LUMP	SUM	_____	_____
1370	841.48 BOLLARDS	3.000 EA	_____	_____	_____	_____
1380	845.20 UTILITY ACCESS DOOR	LUMP SUM	LUMP	SUM	_____	_____
1390	860.11 BRIDGE OPERATING MACHINERY DELIVERED	LUMP SUM	LUMP	SUM	_____	_____

Maine Department of Transportation

Proposal Schedule of Items

Proposal ID: 016750.00

Project(s): 016750.00

SECTION: 1 PROJECT ITEMS

Alt Set ID:

Alt Mbr ID:

Contractor: \_\_\_\_\_

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price		Bid Amount	
			Dollars	Cents	Dollars	Cents
1400	860.12 BRIDGE OPERATING MACHINERY INSTALLATION	LUMP SUM	LUMP	SUM	_____	_____
1410	860.13 BRIDGE TRUNION MACHINERY DELIVERED	LUMP SUM	LUMP	SUM	_____	_____
1420	860.14 BRIDGE TRUNION MACHINERY INSTALLATION	LUMP SUM	LUMP	SUM	_____	_____
1430	860.15 BRIDGE SPAN LOCK MACHINERY DELIVERED	LUMP SUM	LUMP	SUM	_____	_____
1440	860.16 BRIDGE SPAN LOCK MACHINERY INSTALLATION	LUMP SUM	LUMP	SUM	_____	_____
1450	880.02 BRIDGE BALANCING	LUMP SUM	LUMP	SUM	_____	_____
1460	880.031 BALANCE BLOCK	LUMP SUM	LUMP	SUM	_____	_____
1470	880.112 COUNTERWEIGHT CONCRETE	LUMP SUM	LUMP	SUM	_____	_____
1480	910.301 SPECIAL WORK STAFF GAUGES	LUMP SUM	LUMP	SUM	_____	_____
1490	910.301 SPECIAL WORK BRIDGE OPERATION TRAINING	LUMP SUM	LUMP	SUM	_____	_____
1500	910.301 SPECIAL WORK OPERATION AND MAINTENANCE MANUALS	LUMP SUM	LUMP	SUM	_____	_____



**SPECIAL PROVISION**  
**SECTION 203**  
**HOLDING TANK**

Description: This work shall consist of excavation, furnishing materials, installing, backfilling and testing a 2,000 gallon holding tank. The holding tank shall include a 2,000 gallon precast concrete holding tank with an overflow alarm system, anti-flotation cast in place concrete slab including reinforcing steel, cast in place concrete attachment ring, precast riser pieces and 24" diameter cast iron manhole. This work also includes the piping, conduit and wiring required from the operator building to the holding tank.

Materials: The holding tank shall be constructed of reinforced precast concrete with a minimum 28 day compressive strength of 4,000 psi, concrete partitioned chambers, concrete lid with lift rings, vent, inlet inspection hole, and inlet turned down 12 inches below effluent level. The holding tank, risers and covers shall be designed for H2O loading.

All work and materials shall be in general accordance with the following standards:

- a. ASTM C1227 - Standard Specification for Precast Concrete Septic Tanks; 2012
- b. ASTM A74 - Standard Specification for Cast Iron Soil Pipe and Fittings; 2013
- c. ASTM D2729 - Standard Specification for Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2011
- d. ASTM D3034 - Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2008

Any handles for concrete covers shall be made of a non-corroding material.

All joints between the holding tank, precast riser rings and the 24" cast iron cover shall be watertight in accordance with the manufacturer's recommendations. The joint between the inlet pipe and the holding tank shall also be watertight.

The anti-flotation slab and the concrete attachment ring shall use class A concrete with concrete testing method C. The reinforcing steel used for the anti-flotation slab shall be ASTM A615, Grade 60.

Installation: Excavation shall be done in such a manner that the holding tank and piping is placed to the proper elevations and slopes. Bedding under the holding tank shall be placed in one continuous layer not exceeding 6 inches compacted in place. The bedding under the holding tank shall be 4 inch minimum thickness. Tank bedding and backfill shall be granular borrow compacted to 95%. Install the holding tank and related components on bedding in accordance with the manufacturer's recommendations.

All concrete work shall be done in general accordance with section 502 of the Standard Specifications.

Install electrical service within conduit from the building to the appurtenance. Electrical service shall be hardwired to the electrical panel as appropriate. Comply with all applicable electrical codes.

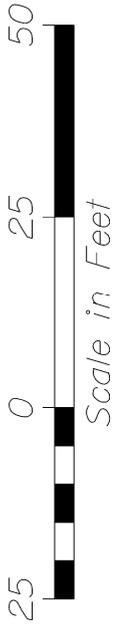
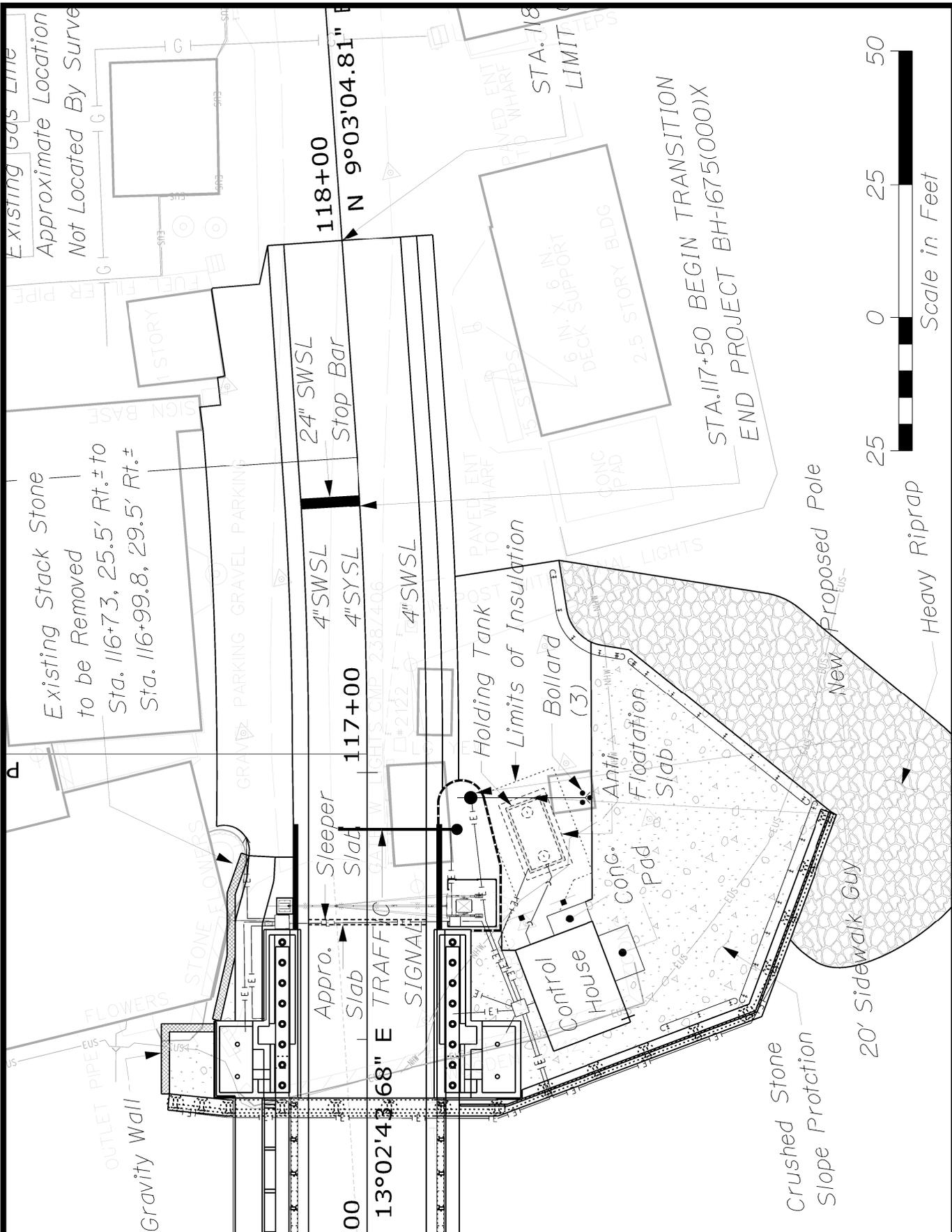
Testing: All tanks with a seam below the outlet invert installed 50 feet or less from the high water mark of a major water body/course or a private potable water supply, or less than 150 feet from a public water supply, must be tested in place, according to the following procedure:

- (a) The tank is to be filled with water to the outlet invert;
- (b) After 24 hours, the water level must be topped off to the outlet invert;
- (c) After 4 hours, the depth from the water surface to the top of the outlet invert is measured. If the value is 1 inch or less, the tank is deemed water-tight.

Method of Measurement: Holding tank shall be measured by the contract unit price each.

Basis of Payment: The accepted quantity for the Holding tank will be paid for at the contract unit price each, complete and in place. The work includes furnishing and installing a holding tank shall with overflow alarm system, anti-flotation cast in place concrete slab including reinforcing steel, cast in place concrete attachment ring, precast riser pieces and 24" diameter cast iron manhole. This work also includes testing the holding tank for watertightness, furnishing and installing the piping, conduit and wiring required from the operator building to the holding tank. Payment will be full compensation for all labor, excavation, backfill, materials, tools and any other incidentals necessary to complete the work.

<u>Pay Item</u>	<u>Pay Unit</u>
203.2311      2,000 Gallon on site Holding tank	Each



STATE OF MAINE  
DEPARTMENT OF TRANSPORTATION

BH-1675(000)X

16750.00 BRIDGE NO. 2339

GUT BRIDGE  
THE GUT

SOUTH BRISTOL LINCOLN COUNTY

**HOLDING TANK PLAN**

ATTACHMENT

**A**

117+00

EDGE OF TRAVEL WAY

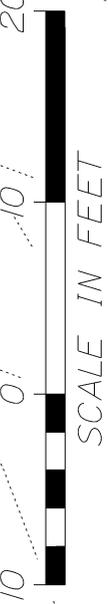
ANTI FLOATION SLAB

37.5'  
TO APPROXIMATE  
FUTURE  
MHW LINE

TIE ANCHOR  
(TYP.)

CONTROL HOUSE  
4" SCH.  
40 PIPE  
37.4'

HOLDING  
TANK



STATE OF MAINE  
DEPARTMENT OF TRANSPORTATION

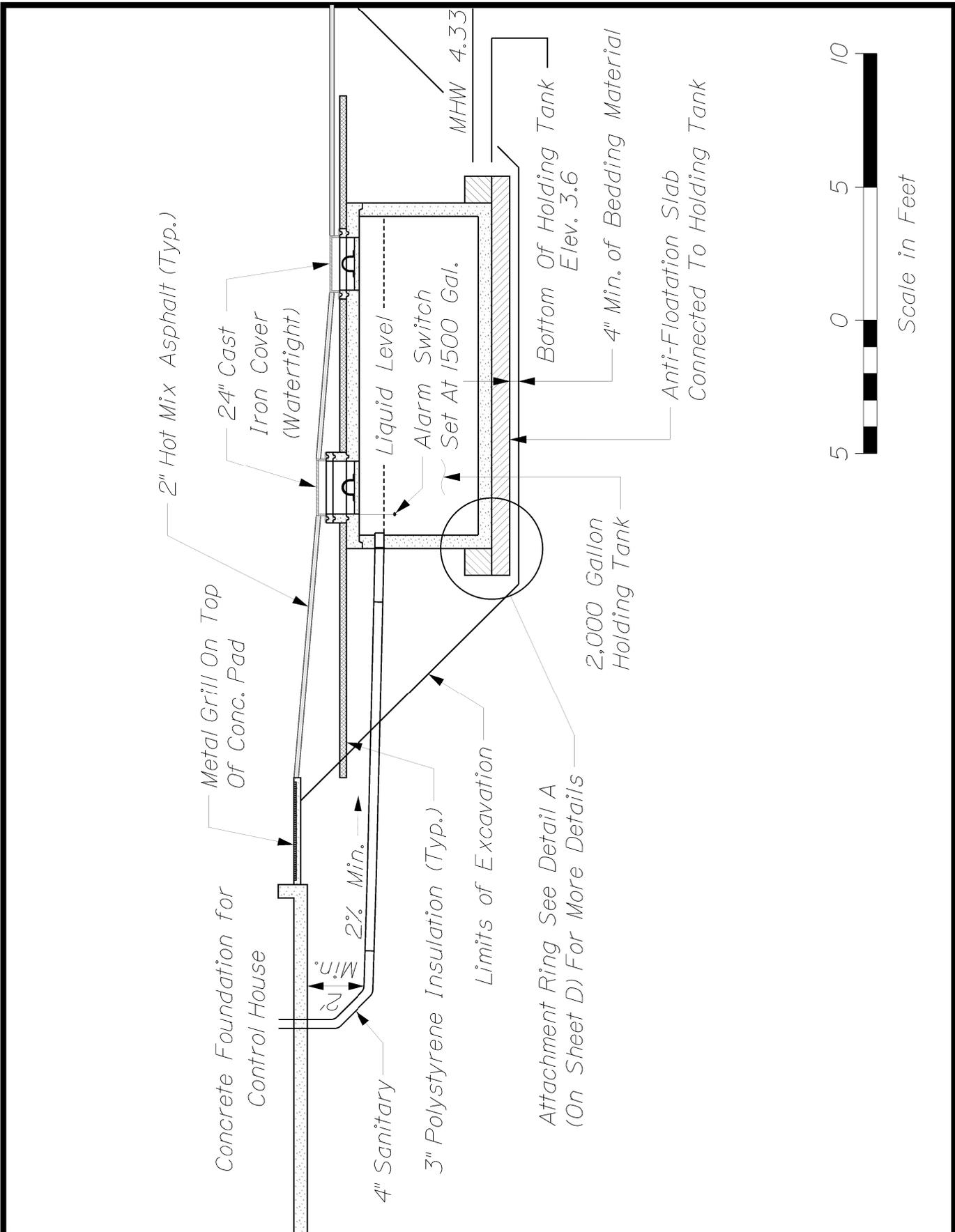
GUT BRIDGE  
THE GUT  
SOUTH BRISTOL LINCOLN COUNTY

ATTACHMENT

PROJECT NO. BH-1675(000)X  
WIN NO. 16750.00 BRIDGE NO. 2339

# HOLDING TANK PLAN

# B



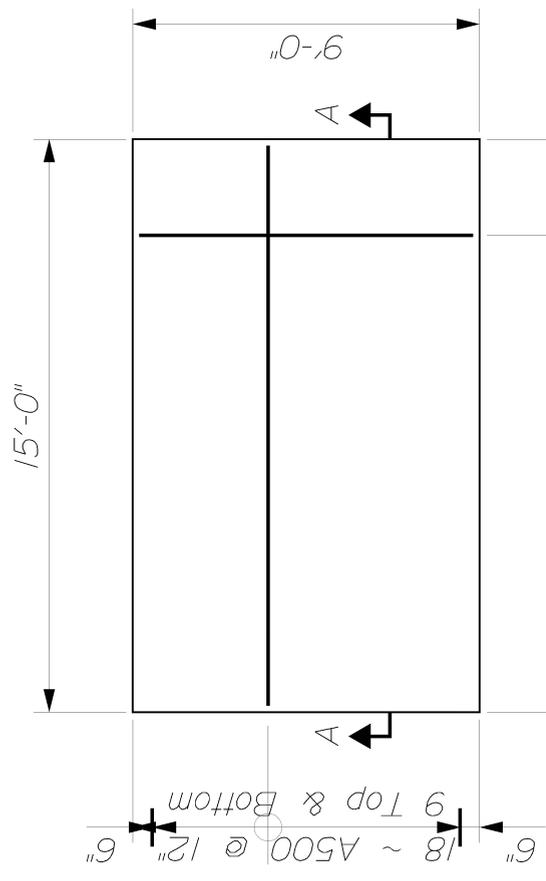
STATE OF MAINE  
DEPARTMENT OF TRANSPORTATION

GUT BRIDGE  
THE GUT  
SOUTH BRISTOL LINCOLN COUNTY

ATTACHMENT  
**C**

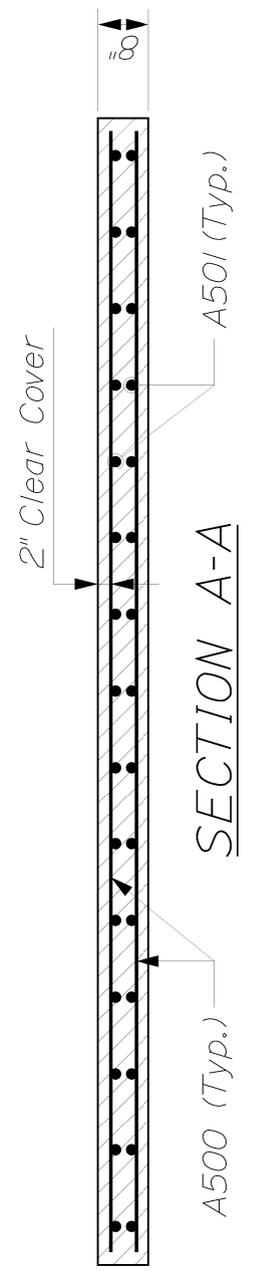
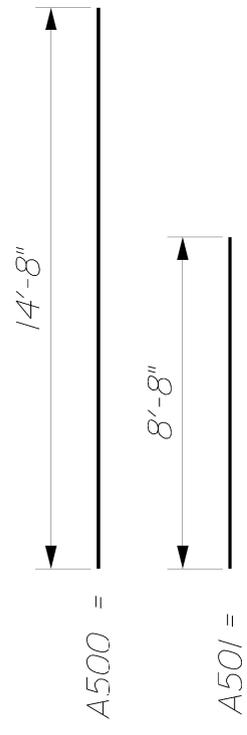
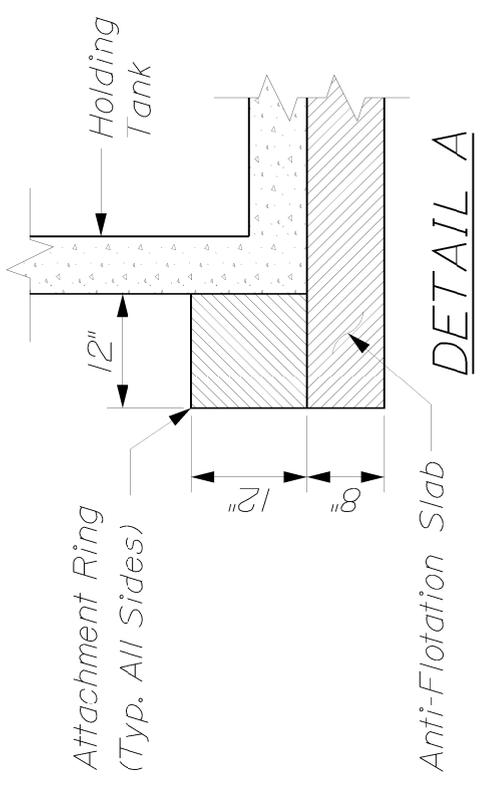
BH-1675(000)X  
16750.00 BRIDGE NO. 2339

**HOLDING TANK SECTION**



**PLAN VIEW**  
(Anti-Floatation Slab)

*Not To Scale*



STATE OF MAINE  
DEPARTMENT OF TRANSPORTATION

GUT BRIDGE  
THE GUT  
SOUTH BRISTOL LINCOLN COUNTY

ATTACHMENT

BH-1675(000)X  
16750.00 BRIDGE NO. 2339

**ANTI-FLOATATION SLAB**

**D**

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

<b>Desc. Of Course</b>	<b>Grad Design.</b>	<b>Item Number</b>	<b>Bit Cont. % of Mix</b>	<b>Total Thick</b>	<b>No. Of Layers</b>	<b>Comp. Notes</b>
<b><u>3/8" – The Gut Bridge Deck</u></b>						
Wearing	Type B	462.30	N/A	5/8"	1	27
<b><u>3" – At Grade Approach Slabs</u></b>						
Wearing	12.5 mm	403.208	N/A	1 1/2"	1	2,4,10,12,17
Base	12.5 mm	403.213	N/A	1 1/2"	1	2,4,10,12,17
<b><u>4" - Route 129 Travel Way &amp; Shoulders</u></b>						
Wearing	12.5 mm	403.208	N/A	1 1/2"	1	2,4,10,12,17
Base	12.5 mm	403.213	N/A	2 1/2"	1	2,4,10,12,17
<b><u>2" – Town Landing, Drive</u></b>						
Wearing	12.5 mm	403.208	N/A	2"	1	2,4,10,12,17
<b><u>2" - Operators House, Drive</u></b>						
Wearing	12.5 mm	403.208	N/A	2"	1	2,4,10,12,17
<b><u>2" – Sidewalks</u></b>						
Wearing	9.5 mm	403.209	N/A	2"	2/more	2,3,10,14

**COMPLEMENTARY NOTES**

2. The incentive/disincentive provisions for density shall not apply. A **Quality Control Technician (QCT) equipped with a density meter** shall be required for all roadway mixtures placed under this contract. Rollers shall meet the requirements of section 401.10 Rollers and this special provision. The use of an oscillating steel roller shall be required to compact all mixtures pavements placed on bridge decks.
3. The design traffic level for mix placed shall be <0.3 million ESALS. The design, verification, Quality Control, and Acceptance tests for this mix will be performed at 50 gyrations.
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.
12. The combined aggregate gradation required for this item shall be classified as a 12.5mm "**fine graded**" mixture, (using the Primary Control Sieve control point) as defined in 703.09.
14. The combined aggregate gradation required for this item shall be classified as a 9.5mm Thin Lift Mixture (TLM) mixture, using the Aggregate Gradation Control Points as defined in 703.09.
17. Compaction of the new Hot Mix Asphalt Pavement will be obtained using a minimal roller train consisting of a **10 ton** vibratory, **12 ton** pneumatic, and a **10 ton** finish roller for roadway work. Density testing of the mixture will be performed by the QCT using a density meter (according to ASTM D 2950). The mixture will be rolled until the density readings show less than 1 pcf change for the final roller passes. This density will be used as the target TMD for the mixture. The remaining mixture shall be compacted to a minimum density of 95% of the target density as determined in the control section. The Contractor shall make

**South Bristol**  
**WIN: 016750.00**  
**Route 129**  
**Bridge Replacement**  
**February 27, 2014**

density test results, including randomly sampled densities, available to the Department's representative onsite. Summaries of each day's results, including a daily paving report, summarizing the mixture type, mixture temperature, equipment used, environmental conditions, and number of roller passes, shall be recorded and signed by the QCT and presented to the Department's representative by the end of the working day. An approved release agent is required to ensure the mixture does not adhere to hand tools, rollers, pavers, and truck bodies. The use of petroleum based fuel oils, or asphalt stripping solvents will not be permitted. The Department may require cores for informational purposes.

27. See Special Provision 462.30 – Ultra Thin Bonded Wearing Course, for project specifics.

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/yd<sup>2</sup>, and on milled pavement approximately 0.05 gal/yd<sup>2</sup>, prior to placing a new course. A fog coat of emulsified asphalt shall be applied between shim / intermediate course and the surface course, at a rate not to exceed 0.025 gal/yd<sup>2</sup>.

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 507 - RAILINGS

**The following shall be added to Section 507.02 Materials:**

507.02 Materials The Materials for the item “Aluminum Bridge Railing, 2 Bar (Foothills TL-2 Rail)” shall be in accordance with the Plans, and comply with the requirements of Sections 713 and 716 of the Specifications.

Aluminum in contact with concrete shall be coated with an approved aluminum-impregnated caulking compound. Aluminum surfaces in contact with metals other than stainless or galvanized steel shall be insulated with approved materials.

The Materials for the item “Steel Pipe Hand Railing” shall be in accordance with the Plans, comply with the requirements of Section 713 of the Specifications, and be approved by the Resident.

The pipe for the posts and top rail and toe rail shall be ASTM A312, Type 316 stainless steel.

All mounting and connection components and hardware shall be stainless steel.

The cable shall be wire rope, 1x19 configuration, conforming to the dimensional properties specified in MIL-DTL-87161 (Military specification for wire strand, stainless steel and zinc coated, non-flexible, for aircraft control.), and shall meet the requirements of ASTM A492, type 316 stainless steel wire, and have a working load limit of 580 lb or greater.

The tensioners shall be 316 grade stainless steel.

**The following shall be added to Section 507.04 General:**

507.04 General All posts shall vertical.

Rails shall follow the profile grade of the bridge in accordance with the heights shown on the Plans. Field bending of the tube sections shall not be allowed. Railings shall be carefully adjusted prior to being fixed in place to ensure proper matching at abutting joints and correct alignment and camber throughout their length.

**The following Section shall be added:**

Section 507.071 Steel Pipe Handrailing The tensioners shall provide the connection of the cables to the end posts, and allow for tightening of the cables by shortening the tensioner. The amount of adjustment provided to shorten the tensioner (and therefore the cable) shall be at least 1.35”. The tensioner shall be connected to the post with 3/16” diameter rivets.

The wire ropes, once installed shall be parallel to each other, free of kinks, sags or other defects, and clean.

The Contractor shall replace defective or damaged wire ropes and hardware as directed by the Resident, at no additional cost to the Department.

The wire ropes and hardware shall be adjusted as required to provide a complete and properly installed decorative metal railing system.

The Contractor shall protect installed products from damage or soiling until completion of project.

The Contractor shall remove and replace railing components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage, including dented and bent components.

**The following shall be added to Section 507.09 Basis of Payment:**

507.09 Basis of Payment The accepted quantity of Steel Pipe Hand Railing and Aluminum Bridge Railing, 2 Bar (Foothills TL-2 Rail) will be paid for at the contract lump sum price, which price shall be full compensation for furnishing and installing rails, rail posts, railing components and connectors, and anchor assemblies.

In addition, the Contractor shall provide 2 additional aluminum rail pieces and two additional traffic rail posts, which will not be measured for payment and will be incidental to the item "Aluminum Bridge Railing, 2 Bar (Foothills TL-2 Rail)". The additional pieces shall be delivered and unloaded at the following location:

MaineDOT Washington Camp  
Route 17  
Washington, Maine  
0.5 mile west of the Union-Washington town line on the east side.

Tom Roberts (592-2470) shall be contacted a minimum of 2 days before delivery.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
507.084 Steel Pipe Hand Railing	Lump Sum
507.092 Aluminum Bridge Railing, 2 Bar (Foothills TL-2 Rail)	Lump Sum

**SPECIAL PROVISION**  
**SECTION 525**  
**RE-POINTING GRANITE MASONRY**

Description Work shall consist of furnishing all labor, material, and equipment necessary to *re-set and re-point* the existing granite masonry as directed by the Resident.

Materials Mortar shall be machine mixed and proportioned as approved by the Resident. Water shall be potable water. Re-tempering of mortar will be permitted when approved by the Resident. Hand mixing of mortar may be permitted only for small quantities as approved by the Resident.

No admixtures except for mortar coloring agents shall be permitted in the mortar without approval of the Resident in writing. Color of mortar shall be as approved by the Resident. Sample mixes of hardened mortar shall be submitted to the Resident for approval if the Resident requests it. The Resident may direct the color of mortar be varied if in his opinion it will improve the appearance of the masonry. However, color of mortar incorporated in work shall be the same and uniform. All mortar coloring agents shall be manufactured from minerals and light-fast, durable and resistant to alkali. Use of calcium chloride is not allowed.

Fast setting mortar shall be used in location where the mortar may be directly exposed to ocean water within 4 hours of placement.

General Construction Re-pointing shall not be done when ambient temperature is 40 degrees F or below, nor when stone contains frost. Joints shall be cleaned with high pressure air or water jet to remove existing loose and deteriorated mortar between the stones. Cleaned areas shall be grouted immediately after the cleaning. Face surfaces of stones shall not be smeared with mortar used in pointing.

Joints shall be thoroughly wet with clean water and filled with mortar.

Mortar shall be well driven into joints and finished with an approved pointing tool. Wall shall be kept wet while pointing is being done, and in hot or dry weather, pointed masonry shall be protected from sun and kept wet for a period of at least three days after completion. After re-pointing is completed and mortar has set, all showing surfaces shall be cleaned of loose mortar and cement stains.

In location where voids between stones extent through the entire wall, a 1" diameter pvc weep holes shall be installed as directed by the Resident. Erosion control geotextile shall be placed over the end of the 1 " pvc pipe that is directly against the soil. The geotextile shall be secured to the end pvc pipe using nylon zip ties or other methods as approved by the Resident. Motar shall be placed around the entire circumference of the 1" pvc pipes.

Method of Measurement The quantity of re-pointing granite masonry to be measured for payment will be the number of square feet measured in place along the exposed face of the newly repointed granite masonry surface. No deduction will be made for joints.

Basis of Payment The accepted quantity of re-pointed granite masonry will be paid for at the contract price per square foot. The work shall include furnishing and installing weep holes as directed by the Resident. The payment will be full compensation for all labor, equipment, materials, scaffolding, and other incidentals necessary to complete the work.

Payment will be made under:

Pay Item

Pay Unit

525.26 Re-pointing Granite Masonry

Square Foot

SPECIAL PROVISION  
SECTION 880 - BALANCING BRIDGE

880.01 Description This work shall include balancing and balance testing the movable span to ensure compliance with the design criteria listed on the Plans and elsewhere herein.

Under the item “Bridge Balancing”, the work includes, but is not limited to:

1. Balance testing performed using the dynamic strain gage procedure described in this provision.
2. Preparation of balance calculations prior to construction based on approved shop drawings and material tests.
3. The development and documentation of the span balance procedure and methods.
4. All other work required to complete the span balance, including placing and adjusting the balance blocks and/or plates and concrete material within the counterweight area or other locations required for balancing the bascule span. This includes fabrication, furnishing, placement, and removal of temporary balance material as required during various phases of construction. This also includes repeated readjustment of balance material as necessary until the span is balanced as specified below. Documentation is required for all balancing work, including temporary balancing during construction.

Under the item “Balance Block - Lead”, the work shall consist of fabricating and furnishing lead blocks and/or plates as shown on the Plans and as required to perform balancing of the bascule span.

Under the Item “Counterweight - Concrete”, the work shall consist of the concrete cast in the counterweight area or other locations required for balancing of the bascule leaf in accordance with the Plans and as required. This shall include furnishing, transporting, mixing, and placing the concrete. This item shall also include furnishing and placing reinforcing in the counterweight as shown on the Plans.

880.02 Materials Materials shall meet the following:

Lead for the Lead blocks and/or plates shall conform to the provisions of ASTM B-29 (density shall be 710 pound per cubic foot).

For” Counterweight - Concrete”, the materials shall comply with the requirements of section 701 of the Specifications and shall meet the requirements of AASHTO LRFD Movable Highway Bridge Design Specifications, 2nd Ed. 2007, 2008 Interim Revision for counterweight concrete. The concrete for the counterweights shall not be air-entrained.

### 880.03 Construction

All lead blocks and/or plates shall be delivered to the site for installation in the counterweights to a location approved by the Resident. Initial installation and adjustment of the lead blocks and/or plates in the counterweights shall be included in the Item "Bridge Balancing".

The quantity of lead blocks and/or plates shall be the amount required to balance the span, as accepted by the Resident.

The Contractor shall determine the density of his proposed mix for the counterweight concrete prior to submitting balance calculations for review as required under the Item "Bridge Balancing". To determine the density of his proposed mix, the Contractor shall cast and cure three test cubes of counterweight concrete and have them accurately weighed. The test blocks shall be the same mix and from the same plant as the proposed counterweight concrete. The volume of each test cube shall not be less than four cubic feet, and the average unit weight shall be measured after curing for 28 days. The actual average unit weight determined from these test cubes shall be used in the Contractor's balance calculations. Two test blocks shall be made during each counterweight pour to serve as a check on the actual concrete placed.

Counterweight concrete shall be placed in lifts not to exceed 4 feet per lift. At least 24 hours shall elapse between pours. If the Contractor requires additional access or vent holes in the counterweight box, he shall submit drawings detailing their location and box reinforcement for approval.

### 880.04 Submittals

- A. Balance calculations shall be submitted to the Resident for approval as specified herein. Balance calculations shall be coordinated with structural steel shop drawings, electrical drawings, mechanical drawings, power and signal drawings, and any other miscellaneous or incidental work to be incorporated on the bascule leaf. All balance calculations required within these specifications shall be submitted to the Resident for approval.
- B. Balance summary tables and back up material for weight adjustments required to achieve proper balance during all phases of construction, prior to the initial imbalance measurement, and prior to any subsequent imbalance measurement shall be submitted to the Resident for approval. Documentation of the exact locations and details of the balance material shall accompany all balance calculation submittals. All summary tables required within these specifications shall be submitted to the Resident for approval.
- C. Qualifications of the strain gage testing company to perform the imbalance measurements shall be submitted to the Resident for approval. Required qualifications are specified below.
- D. Detailed descriptions of procedures and equipment to be used by the strain gage testing company shall be submitted to the Resident for approval, as specified herein.

- E. The Contractor shall submit initial and final balance reports in accordance with these specifications.

#### 880.05 Span Balance Calculations

- A. A Professional Engineer licensed in the State of Maine shall perform the balance calculations. The quantity and location of balance material required within the counterweight area and other span balancing locations - including concrete, balance blocks and/or plates, and other balance material - based on the specified balance requirements and the weight and center of gravity of the bascule leaf shall be computed. These calculations shall be based on weights of final approved shop details and material tests for the actual material on the bascule leaf, including the counterweight areas. The balance calculations shall incorporate the distributions of leaf weight in the vertical and horizontal directions. Balance calculations are required to develop balance summary tables required for all phases of work, as specified herein.
- B. Calculate the imbalance magnitude and position of the center of gravity in terms of alpha angle. The alpha angle is defined as the angle of elevation of the center of gravity of the leaf above (minus being below) the horizontal axis through the centerline rotation of the leaf. Location of the center of gravity within this range will yield a closing imbalance moment for the full rotation of the leaf, with maximum imbalance being near the fully closed position and minimum imbalance at the fully open position of the leaf.
- C. Balance summary tables shall be developed and shown on the shop drawings. The format of these tables shall be in accordance with the balance tables shown in the Drawings. Summary tables shall be developed for all phases of the balance and the proposed imbalances. Temporary balance material, if used, shall be accounted for in the summary tables.
- D. For all balance summary table submittals, a narrative shall be included with the outline of the proposed balance phasing, the duration of the imbalance condition, and all other aspects of the work in accordance with the approved construction schedule. This information shall be coordinated with the Contractor's scheduling requirements. The balance calculations and summary tables shall be updated by the Contractor throughout construction and be submitted to the Resident periodically as required to meet the requirements in these Specifications and in the Plans.

#### 880.06 Bridge Balancing

- A. The Contractor shall place and adjust the balance blocks and/or plates, concrete, and other balance material within the counterweight areas and other locations for balance material

specified on the Plans. This includes repeated readjustment of balance material as necessary until the span is balanced as required.

- B. It shall be the Contractor's responsibility to provide temporary bracing and supports and/or temporary balance material as required to stabilize the movable span during construction. Other than as specified herein, this work shall be included in other pay items.
- C. Resident review of the balance calculations, counterweight details, and quantity and location of balance material does not relieve the Contractor from making such changes in the counterweights and balance material as deemed necessary to balance the leaf without. All changes shall be submitted for approval. Bolting or welding ballast plates to the exterior of the counterweight girder is not acceptable.

#### 880.07 Span Imbalance Measurement

- A. The Contractor shall measure the actual imbalance moment and determine the location of the leaf center of gravity a minimum of twice:
  - 1. Initial - After leaf construction is completed to determine the balance condition and to determine the required adjustments. Prior to performing initial balance testing, the Contractor shall submit balance calculations and summary tables to the Resident for review. If the span drive machinery is used to operate the span prior to final alignment for the balance testing procedures described herein, the maximum calculated span imbalance magnitude shall be 180 kip-feet at an alpha angle not more negative than 20 degrees. A maximum of 15 MPH wind speed is allowed for operation during these conditions.
    - a. Subsequent to initial balance testing, the Contractor shall compute the amount and location of weight adjustments required to achieve the final imbalance specified in the Plans and in these Specifications and submit the computations to the Resident for review. After the Resident's review, the Contractor shall make the approved adjustments.
  - 2. Final - After balance block adjustments, to determine if the revised imbalance is within the limits specified on the Plans and in this Specification. Leaf operation for final balance testing shall be performed with the span drive machinery after final alignment and grouting machinery supports. If the second balance testing indicates that the revised imbalance is not within acceptable limits, further balance block and/or plate adjustments and imbalance measurements are to be performed until the criteria specified on the Drawings and herein are met.

- B. The imbalance of the movable span shall be measured using the dynamic strain gauging technique. The Contractor shall furnish and install all equipment, materials, instruments and labor necessary to determine the imbalance by dynamic strain gauging.
1. The Contractor shall employ the services of an established testing company experienced in dynamic strain gage measurement of movable bridge imbalance, subject to approval of the Resident. Such experience shall be demonstrated by identifying a minimum of six movable bridges including at least three trunnion bascule bridges for which the company has provided complete and satisfactory dynamic strain gage measurements and reporting. The measurements shall be made under the immediate direction of a Professional Engineer registered in the State of Maine who has had hands-on experience measuring movable span imbalance by the dynamic strain gage procedure.
  2. The strain gauge testing company shall furnish and install the required strain gages, all cabling and transmission equipment, data acquisition equipment and strip chart recorders and produce fully documented reports detailing the results of the measurements. Acceptable testing companies include SMI Incorporated, Pittstown, NJ; Teledyne Engineering Services, Waburn, MA; and Stafford Bandlow Engineering, Washington Crossing, PA.
  3. The approved testing company shall submit the following items to the Resident for approval:
    - a. Description of experimental procedure including type and method of installation of strain gage rosettes, method of transmission of low level signals, data acquisition equipment and/or strip chart recorders.
    - b. Layout of span drive machinery showing proposed location of strain gages, amplifiers, cable or radio links, data acquisition equipment and all associated cabling.
    - c. Details of method of transmission of signals from shafting to data acquisition units.
    - d. Elementary wiring diagrams of interconnection of strain gages, amplifiers, data acquisition equipment, and strip chart recorders.
    - e. Sample computations of: shaft torque from measured strains, span imbalance, curve fitting and basis for friction correction.
  4. Strain gauge and equipment installation, strain measurement, torque calculations, and span imbalance presentation shall be in accordance with the following:
    - a. Two foil resistance strain gauge rosettes shall be affixed to each of the main pinion shafts, in accordance with the strain gauge manufacturer's installation instructions. They shall be 2-arm 90 degree rosettes mounted such that the grids are oriented at

45 degrees with the shaft axis and the two rosettes shall be affixed “back-to-back”, spaced 180 degrees apart circumferentially. The gauges shall be connected such that any bending strains in the shafts will be canceled and torsional shearing strains will be measured on each pinion shaft. The areas of the shafts where the gages are to be mounted shall be sufficiently cleaned to remove all contaminants. On each shaft, two rosettes shall be mounted at 180 degrees from each other. The two gauges shall be connected such that any direct shear forces in the shafts are neglected and true torsional shear is measured.

- b. The strain gauge leads on each shaft shall be connected to a four arm amplifier. Transmission of signals from the gauges to the data acquisition equipment shall be either through cable links or amplified and then through wireless transmitters.
  - c. Output leads from each channel of the amplifiers shall be connected to either a computer-based data logger provided with a two-channel strain gauge module streaming the amplified data to disk at a minimum 1-kHz sample rate, or a five channel minimum strip chart recorder with at least ten inch wide chart paper. An inclinometer shall be provided to provide continuous leaf angle to either the data logging equipment or the strip chart recorder. The chart speed shall be step-wise adjustable and shall include a setting of at least 10 inches per minute. The recorder shall be capable of recording data from at least 4 channels if it is equipped with a dedicated event marker or 5 channels if a channel is used to record events.
  - d. The strains in both shafts shall be recorded simultaneously versus span opening angle during opening and closing to a suitable scale. The readings for all shafts shall be recorded at the same strain scale and the chart speed, if a strip chart recorder is used. At least 3 opening/closing runs shall be made, when the wind speed is less than 5 MPH and the bridge deck is visibly dry. Wind-up torque in the operating machinery shall be released prior to each run as verified by space between the faces of the engaged teeth of main pinion and gears.
  - e. The strains induced in the shafts shall be numerically converted to torque by applying fundamental stress-strain relationship calculations for each strain plot for both opening and closing. This data shall be processed to give leaf imbalance (kip-feet) versus opening angle, corrected for friction, at each trunnion. From them, plots of total span imbalance shall be prepared.
5. The Contractor shall submit five copies of a report documenting the results of the initial strain gage measurements. The reports shall contain the following:
- a. Description of experimental procedure and equipment used.
  - b. Span drive diagram showing location at which strain gages were attached and all applicable gear ratios.

- c. Photocopies of a sample original strip chart for one complete run of each of the three sets in the case of strip chart recordings or data and chart files in Excel format if recorded by a data logger. They shall be annotated with strain scales, angle of opening, significant ordinates, etc.
  - d. Description of relationships and sample calculations for obtaining shaft torque from strains, span imbalance from shaft torque, curve fitting and basis for friction correction.
  - e. Plots of the following parameters versus degree of opening during each opening/closing run and fitted balance curves corrected for friction.
    - 1) Total imbalance (kip-feet) for span.
    - 2) Frictional moment (kip-feet) for span.
  - f. Tabulation of imbalance moment at seated position for each leaf/run including the average value for each leaf.
  - g. The location of the leaf center of gravity.
6. The Contractor shall submit five copies of the final balance report, similar in content to the initial report.
  7. The initial and final reports will be bound between heavy plastic covers. The report shall include an introductory section giving the name of the bridge, the date of the measurements, weather conditions during measurements and any other information requested by the Resident.

880.08 Final Balance Requirements The final imbalance measured by the procedures described within this Specification shall be considered acceptable if the imbalance magnitude with the leaf in the seated position is between 200 and 350 kip-feet toe-heavy and the center of gravity alpha angle is between plus 5 degrees and minus 20 degrees. If the alpha angle is more negative than 20 degrees than the imbalance magnitude must be proportionally reduced.

880.09 Method of Measurement The Item "Balance Block - Lead" shall be measured for payment by the lump sum and shall include the lead blocks and/or plates installed in the counterweight and retained for future use in balancing the span.

The Item "Counterweight - Concrete" shall be measured for payment by the number of cubic yards of concrete actually placed in the counterweight area. The volume of embedded material within the

counterweight area, including lead blocks and/or plates and structural steel, shall be deducted when computing the total cubic yards of concrete required to be placed. Test cubes that are cast for density determination shall not be measured for payment.

The item "Bridge Balancing" will be measured for payment by the lump sum.

880.10 Basis of Payment The Item "Balance Block - Lead" shall be paid for at the contract lump sum price. Payment will be full compensation for all materials, equipment, tools, and labor incidental thereto as required for fabrication and delivery.

The item "Counterweight - Concrete" shall be paid for at the contract unit price per cubic yard of concrete and shall include the cost of all materials, equipment, tools, forms and form removal, and labor incidental thereto.

The item "Bridge Balancing" shall be paid for at the contract lump sum price, and will include all material, labor, equipment, tools and incidentals necessary to complete the work. Payment will be full compensation for all preparation, incidentals, adjustments, inspections and testing shall be included in the lump sum price.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
880.02 Bridge Balancing	lump sum
880.031 Balance Block – Lead	lump sum
880.112 Counterweight Concrete	lump sum



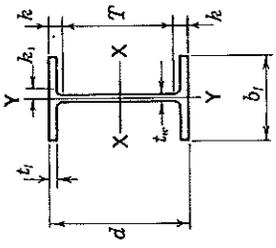






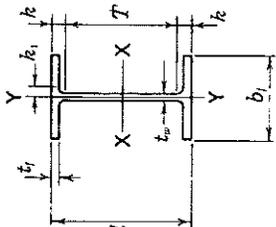


### W SHAPES Properties



Nominal Wt. per Ft. Lb.	Compact Section Criteria		X <sub>1</sub> Ksi	X <sub>2</sub> × 10 <sup>6</sup> (1/Ksi) <sup>2</sup>	Elastic Properties				Plastic Modulus				
	b <sub>1</sub> /2t <sub>1</sub>	f <sub>y</sub> /t <sub>w</sub>			Axis X-X		Axis Y-Y		Z <sub>x</sub> In. <sup>3</sup>	Z <sub>y</sub> In. <sup>3</sup>			
					I In. <sup>4</sup>	S In. <sup>3</sup>	r In.	I In. <sup>4</sup>			S In. <sup>3</sup>	r In.	
117	7.5	39.2	42	2090	8190	3540	291	10.1	297	46.5	2.94	327	71.4
104	8.5	43.1	34	1860	12900	3100	258	10.1	259	40.7	2.91	289	62.4
103	4.6	39.2	42	2400	5280	3000	245	9.96	119	26.5	1.99	280	41.5
94	5.2	41.9	37	2180	7800	2700	222	9.87	109	24.0	1.98	254	37.5
84	5.9	45.9	30	1950	12200	2370	196	9.79	94.4	20.9	1.95	224	32.6
76	6.6	49.0	27	1760	16600	2100	176	9.69	82.5	18.4	1.92	200	28.6
68	7.7	52.0	24	1590	26000	1830	154	9.55	70.4	15.7	1.87	177	24.5
62	6.0	50.1	25	1700	25100	1550	131	9.23	34.5	9.80	1.38	153	15.7
55	6.9	54.6	21	1540	39600	1350	114	9.11	29.1	8.30	1.34	134	13.3
402	2.1	10.8	—	8000	41	12200	937	10.2	1270	189	3.27	1130	296
364	2.3	11.8	—	7340	57	10800	846	10.0	1120	168	3.23	1010	263
333	2.5	12.8	—	6790	78	9610	769	9.91	994	151	3.19	915	237
300	2.7	14.2	—	6200	111	8480	692	9.81	873	134	3.15	816	210
275	2.9	15.4	—	5720	150	7620	632	9.71	785	122	3.12	741	189
248	3.2	17.1	—	5210	215	6760	569	9.63	694	109	3.09	663	169
223	3.5	18.8	—	4700	319	5950	510	9.54	609	96.1	3.05	589	149
201	3.9	20.6	—	4290	453	5310	461	9.47	542	86.1	3.02	530	133
182	4.2	22.6	—	3910	649	4730	417	9.40	483	77.2	3.00	476	119
166	4.6	25.0	—	3590	904	4280	380	9.36	435	70.1	2.98	432	108
147	5.4	26.1	—	3140	1590	3630	329	9.17	376	60.1	2.95	373	92.6
132	6.0	28.9	—	2840	2350	3220	295	9.12	333	53.5	2.93	333	82.3
122	6.5	31.3	—	2630	3160	2960	273	9.09	305	49.2	2.92	307	75.6
111	7.1	34.1	55	2400	4510	2670	249	9.05	274	44.5	2.90	279	68.2
101	7.7	37.5	45	2200	6400	2420	227	9.02	248	40.3	2.89	253	61.7
93	4.5	32.3	61	2680	3460	2070	192	8.70	92.9	22.1	1.84	221	34.7
83	5.0	36.4	48	2400	5250	1830	171	8.67	81.4	19.5	1.83	196	30.5
73	5.6	41.2	38	2140	8380	1600	151	8.64	70.6	17.0	1.81	172	26.6
68	6.0	43.6	34	2000	10900	1480	140	8.60	64.7	15.7	1.80	160	24.4
62	6.7	46.9	29	1820	15900	1330	127	8.54	57.5	13.9	1.77	144	21.7
57	5.0	46.3	30	1960	13100	1170	111	8.36	30.6	9.35	1.35	129	14.8
50	6.1	49.4	26	1730	22600	984	94.5	8.18	24.9	7.64	1.30	110	12.2
44	7.2	53.5	22	1550	36600	843	81.6	8.06	20.7	6.36	1.26	95.4	10.2

### W SHAPES Dimensions



Designation	Area A In. <sup>2</sup>	Depth d In.	Web		Flange		Distance			
			Thickness t <sub>w</sub> In.	t <sub>w</sub> /2 In.	Width b <sub>1</sub> In.	Thickness t <sub>f</sub> In.	T In.	k In.	k <sub>1</sub> In.	
W 24x117 x104	34.4 30.6	24 1/4 24.06	0.550 0.500	1/4 1/4	12.800 12.750	12 3/4 12 3/4	7/8 3/4	21 21	1 1/2 1 1/2	1 1
W 24x103 <sup>a</sup> x 94	30.3 27.7	24 1/2 24.31	0.550 0.515	5/16 1/4	9.000 9.065	9 9 9/16	1 7/8	21 21	1 3/4 1 1/2	1 3/8 1
x 84	24.7	24 1/4	0.470	1/4	9.020	9	3/4	21	1 1/2	1 1/2
x 76	22.4	23 9/16	0.440	3/16	8.990	9	11/16	21	1 1/2	1 1/2
x 68	20.1	23 7/8	0.415	3/16	8.965	9	5/8	21	1 1/2	1 1/2
W 24x 62 x 55	18.2 16.2	23 7/8 23.57	0.430 0.395	3/16 3/16	7.040 7.005	7 7	5/8 1/2	21 21	1 1/2 1 1/2	1 1/2 1 1/2
W 21x40 <sup>a</sup> x36 <sup>a</sup>	118.0 107.0	26.02 25.47	1.730 1.590	1/4 3/16	13.405 13.265	13 1/2 13 1/2	3/8 2/8	18 1/2 18 1/2	3/8 3/8	1 7/8 1 1/2
x33 <sup>a</sup>	97.9	25.00	1.460	1/4	13.130	13 1/2	2/8	18 1/2	3/8	1 1/2
x30 <sup>a</sup>	86.2	24 1/2	1.320	1/4	12.990	12 3/4	2/8	18 1/2	3/8	1 1/4
x27 <sup>a</sup>	80.8	24 1/4	1.220	1/4	12.890	12 3/4	2/8	18 1/2	3/8	1 1/4
x24 <sup>a</sup>	72.8	23 7/8	1.100	1/4	12.775	12 3/4	2/8	18 1/2	3/8	1 1/4
x23	65.4	23.35	1.000	1/2	12.675	12 3/4	2/8	18 1/2	3/8	1 1/4
x201	59.2	23.03	0.910	1/2	12.575	12 3/4	1/8	18 1/2	3/8	1 1/4
x182	53.6	22.72	0.830	3/8	12.500	12 1/2	1/8	18 1/2	3/8	1 1/4
x166	48.8	22.48	0.750	3/8	12.420	12 1/2	1/8	18 1/2	3/8	1 1/4
x147	43.2	22.06	0.720	3/8	12.510	12 1/2	1/8	18 1/2	3/8	1 1/4
x132	38.8	21.83	0.650	3/8	12.440	12 1/2	1/8	18 1/2	3/8	1 1/4
x122	35.9	21.68	0.600	3/8	12.390	12 1/2	1/8	18 1/2	3/8	1 1/4
x111	32.7	21.51	0.550	3/8	12.340	12 1/2	1/8	18 1/2	3/8	1 1/4
x101	29.8	21.36	0.500	1/2	12.290	12 1/2	1/8	18 1/2	3/8	1 1/4
W 21x 93 x 83	27.3 24.3	21.62 21.14	0.580 0.515	3/8 1/4	8.420 8.355	8 3/4 8 3/4	1/8 1/8	18 1/2 18 1/2	1 1/2 1 1/2	1 1/2 1 1/2
x 73	21.5	21.43	0.455	3/8	8.295	8 1/4	1/8	18 1/2	1 1/2	1 1/2
x 68	20.0	21.13	0.430	3/8	8.270	8 1/4	1/8	18 1/2	1 1/2	1 1/2
x 62	18.3	20.99	0.400	3/8	8.240	8 1/4	1/8	18 1/2	1 1/2	1 1/2
W 21x 57 x 50	16.7 14.7	21.06 20.83	0.405 0.380	3/8 3/8	6.555 6.530	6 1/2 6 1/2	1/8 1/8	18 1/2 18 1/2	1 1/2 1 1/2	1 1/2 1 1/2
x 44	13.0	20.66	0.350	3/8	6.500	6 1/2	1/8	18 1/2	1 1/2	1 1/2

<sup>a</sup>For application refer to Notes in Table 2.  
<sup>b</sup>Heavier shapes in this series are available from some producers.