TOWN OF MARSHFIELD, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

CONTRACT NO. 2014-23
DAMONS POINT REVETMENT RESTORATION

BOARD OF PUBLIC WORKS

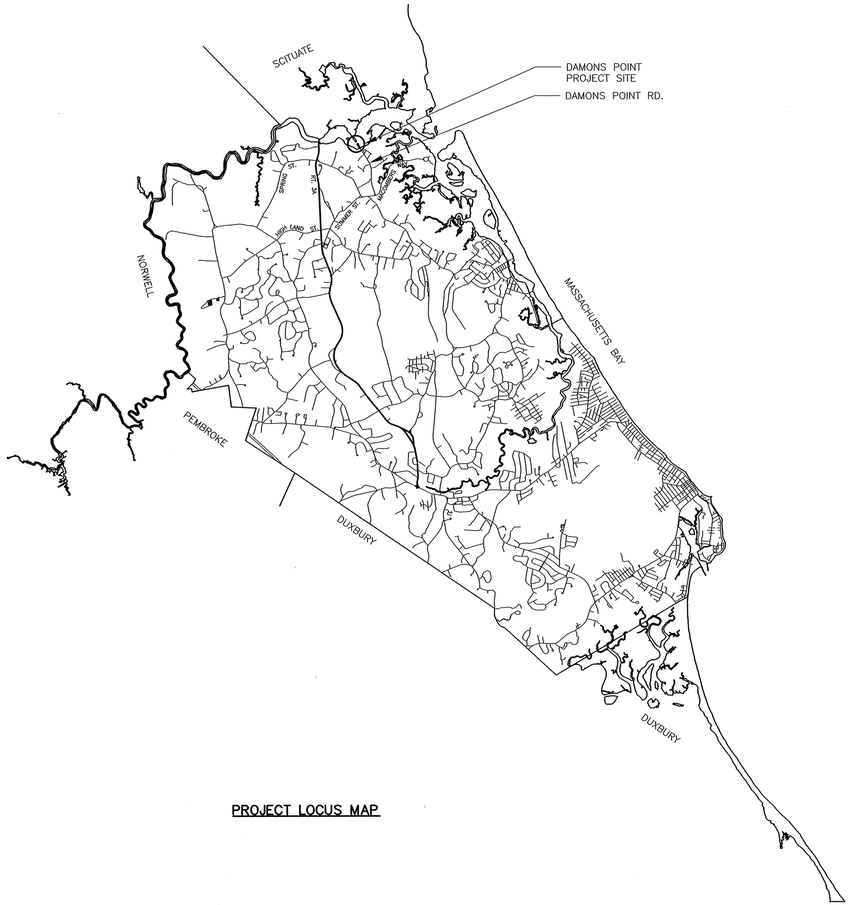
STEPHEN HOCKING, CHAIRMAN
ROBERT SHAUGHNESSY, VICE CHAIRMAN

DEPARTMENT OF PUBLIC WORKS

THOMAS REYNOLDS, SUPERINTENDENT

TOWN ENGINEER

RODERIC PROCACCINO



PROJECT LOCUS MAP

INDEX

DWG. NO.	DRAWING NAME
1	DAMONS POINT REVETMENT RESTORATION
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HALEY AND WARD, INC.
ENGINEERS
MAYNARD, MASSACHUSETTS
MAY, 2015

DEPARTMENT OF PUBLIC WORKS
TOWN OF MARSHFIELD, MASSACHUSETTS

DAMONS POINT REVETMENT RESTORATION

Haley and Ward, Inc.
63 GREAT ROAD, SUITE 200,
MAYNARD, MASSACHUSETTS 01754-2097
PHONE: (978) 648-6025 FAX: (978) 648-6068
www.haleyward.com

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1	NOV. 2014	TCS
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2	MAY, 2015	CLIENT

SHEET NO.: 1 OF 11
CONTRACT NO.: 2014-23
SCALE: NO SCALE
DATE DRAWN: MAY, 2015
DRAWN BY: LJC_JWG
FILE NO.: MSH_002-001.DWG

DWG. NO.

1

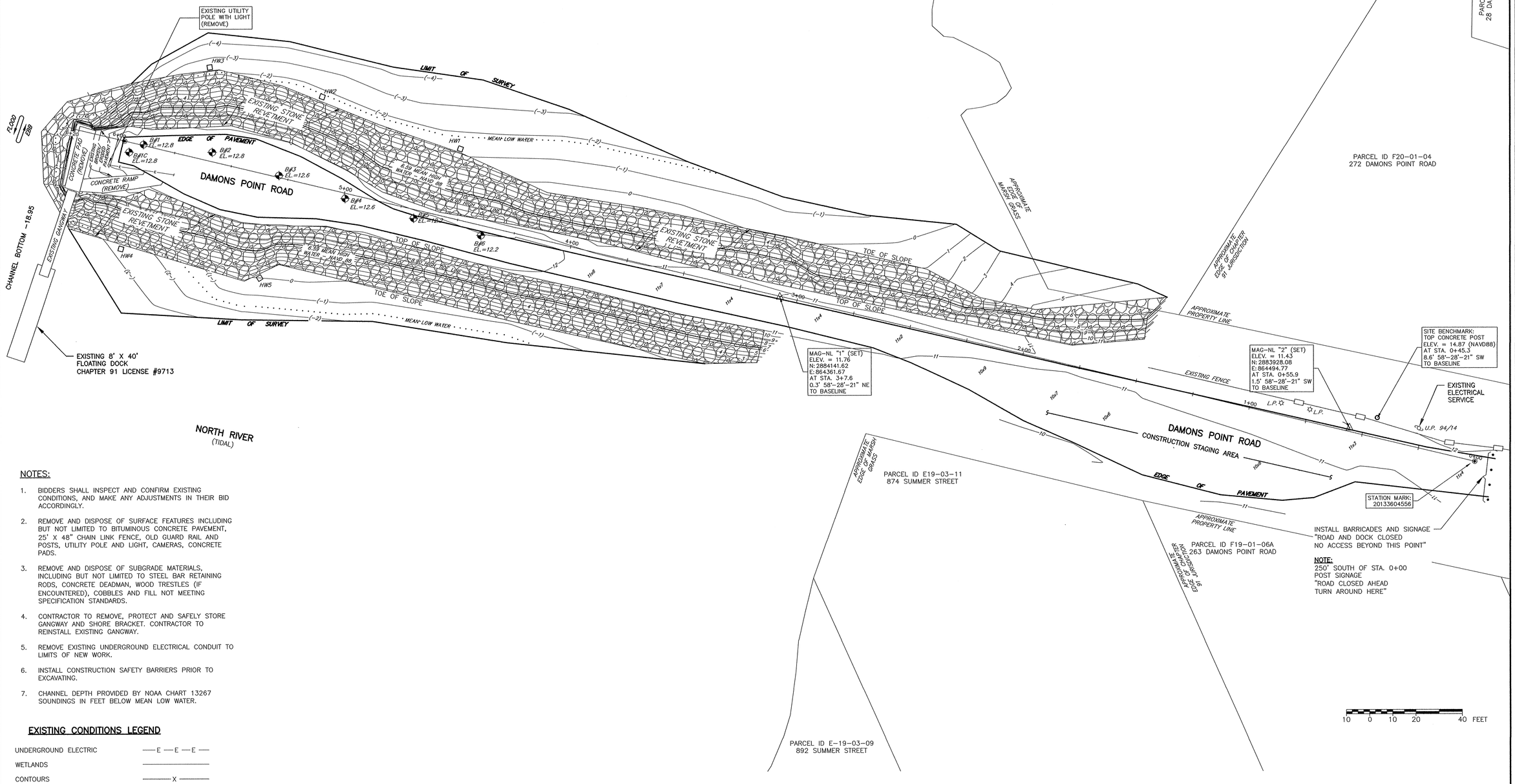
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TIDAL DATA FROM STA. 8445425, SUBORDINATE TO 8443970, BOSTON
DAMONS POINT DATA = BOSTON DATA X 0.89

TIDAL BENCH MARK 5138 A 1990 USED FOR DATUM CONVERSION TO NAVD88
EL. 10.15 (NAVD88) – EL. (TIDAL EL.) = –5.30 (DIFFERENCE IN DATUMS)

TIDE DESIGNATION	=	8443970 TIDAL EL. (FT.)	8445425 TIDAL EL. (FT.)	NAVD88 EL. (FT.)	NGVD 1929 EL. (FT.)
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MEAN HIGH WATER	=	13.36	11.89	6.59	5.78
MEAN SEA LEVEL	=	8.73	7.77	2.47	1.66
MEAN TIDE LEVEL	=	8.61	7.66	2.36	1.55
MEAN LOW WATER	=	3.87	3.44	–1.86	–2.67
MEAN LOWER LOW WATER	=	3.52	3.13	–2.17	–2.98

* CONDITIONS OBSERVED DURING SURVEY 9/12/13



NOTES:

1. BIDDERS SHALL INSPECT AND CONFIRM EXISTING CONDITIONS, AND MAKE ANY ADJUSTMENTS IN THEIR BID ACCORDINGLY.
2. REMOVE AND DISPOSE OF SURFACE FEATURES INCLUDING BUT NOT LIMITED TO BITUMINOUS CONCRETE PAVEMENT, 25' X 48" CHAIN LINK FENCE, OLD GUARD RAIL AND POSTS, UTILITY POLE AND LIGHT, CAMERAS, CONCRETE PADS.
3. REMOVE AND DISPOSE OF SUBGRADE MATERIALS, INCLUDING BUT NOT LIMITED TO STEEL BAR RETAINING RODS, CONCRETE DEADMAN, WOOD TRESTLES (IF ENCOUNTERED), COBBLES AND FILL NOT MEETING SPECIFICATION STANDARDS.
4. CONTRACTOR TO REMOVE, PROTECT AND SAFELY STORE GANGWAY AND SHORE BRACKET. CONTRACTOR TO REINSTALL EXISTING GANGWAY.
5. REMOVE EXISTING UNDERGROUND ELECTRICAL CONDUIT TO LIMITS OF NEW WORK.
6. INSTALL CONSTRUCTION SAFETY BARRIERS PRIOR TO EXCAVATING.
7. CHANNEL DEPTH PROVIDED BY NOAA CHART 13267 SOUNDINGS IN FEET BELOW MEAN LOW WATER.

EXISTING CONDITIONS LEGEND

UNDERGROUND ELECTRIC	—E—E—E—
WETLANDS	————
CONTOURS	———X———
MEAN HIGH WATER (MHW)	————
HIGH TIDE LINE (HTL) [CURRENT TIDAL EPOCH]	—·—·—·—
MEAN LOW WATER (MLW)	· · · · · ·
SOIL BORING	⊠
SOIL SAMPLE	□

DEPARTMENT OF PUBLIC WORKS
TOWN OF MARSHFIELD, MASSACHUSETTS

DAMONS POINT REVETMENT RESTORATION EXISTING CONDITIONS

Haley and Ward, Inc.
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REVISED	DATE	BY	CLIENT
1	FEB. 2015		

SHEET NO.: 2 OF 11
CONTRACT NO.: 2014-23
SCALE: 1" = 20'
DATE DRAWN: MAY, 2015
DRAWN BY: JWG
FILE NO.: MSH_002-002.DWG

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2

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CONSTRUCTION NOTES:

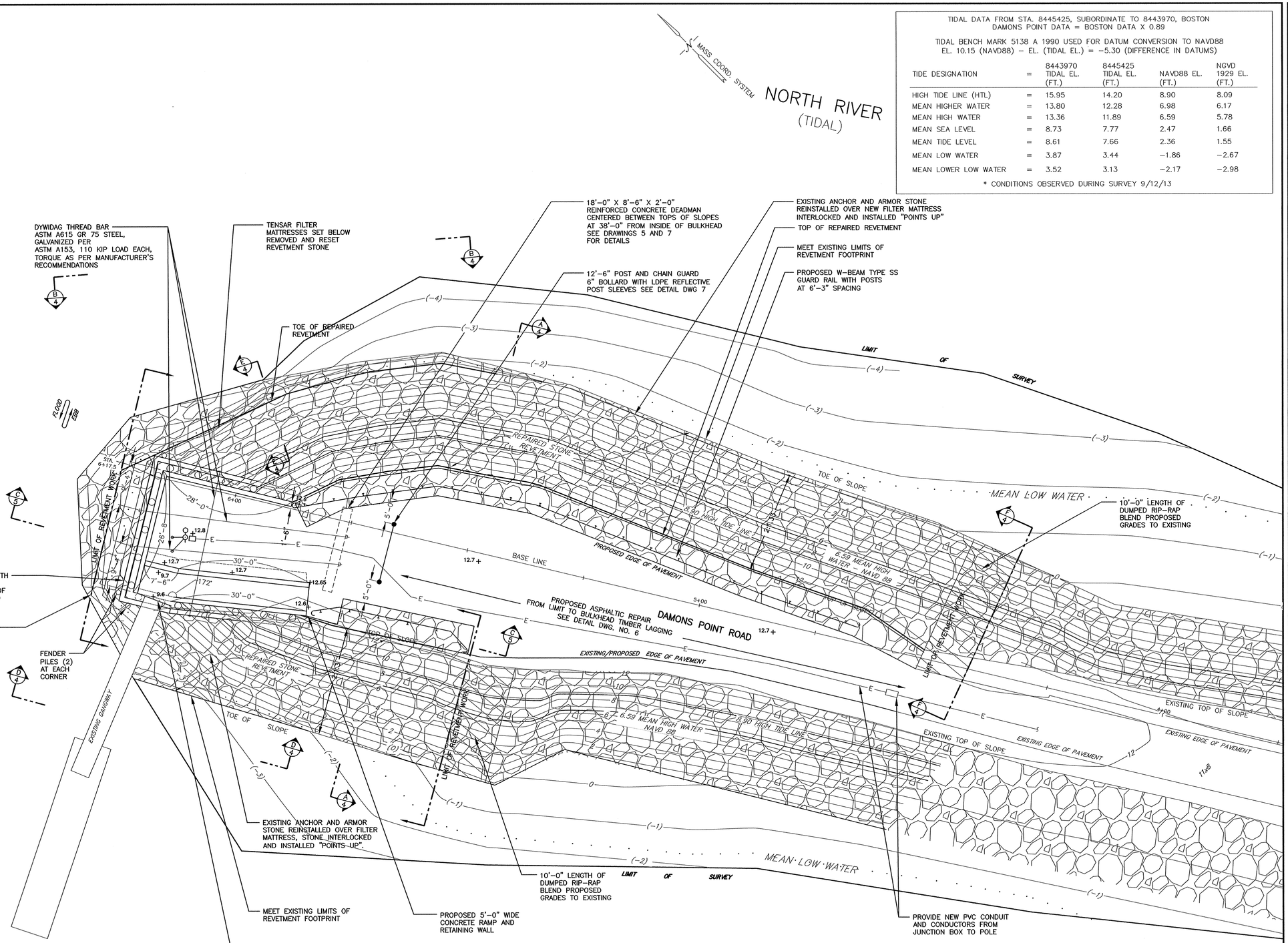
1. CONTRACTOR TO PRE–TRENCH TO ELEVATION –3.0' AT ALL PILE LOCATIONS. ANY SHIFTING OF PILE LOCATIONS SHALL BE REVIEWED WITH ENGINEER PRIOR TO DRIVING PILES. ALL DISTURBED AREAS BELOW HIGH WATER SHALL BE COVERED WITH MARINE MATTRESSES SPECIFIED FOR EROSION CONTROL.
2. CONTRACTOR TO REMOVE & DISPOSE CONCRETE FILL BEHIND EXISTING BULKHEAD AND 3/4 YD BLOCK.
3. FINISH GRADE AT TOE OF SLOPE TO MATCH EXISTING GRADE AT TOE OF SLOPE.
4. REMOVE EXISTING ARMOR STONE TO PLACE FILTER MATTRESS.
5. RE–INSTALL ARMOR STONE AS SPECIFIED AND INDICATED.
6. CHANNEL DEPTH PROVIDED BY NOAA CHART 13267 SOUNDINGS IN FEET BELOW MEAN LOW WATER.

TIDAL DATA FROM STA. 8445425, SUBORDINATE TO 8443970, BOSTON
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* CONDITIONS OBSERVED DURING SURVEY 9/12/13



EXISTING CONDITIONS LEGEND

- UNDERGROUND ELECTRIC —E—E—E—
- WETLANDS
- CONTOURS —X—
- MEAN HIGH WATER (MHW)
- HIGH TIDE LINE (HTL) [CURRENT TIDAL EPOCH]
- MEAN LOW WATER (MLW) . . . . . .

DEPARTMENT OF PUBLIC WORKS
TOWN OF MARSHFIELD, MASSACHUSETTS

DAMONS POINT REVETMENT RESTORATION PROPOSED WORK

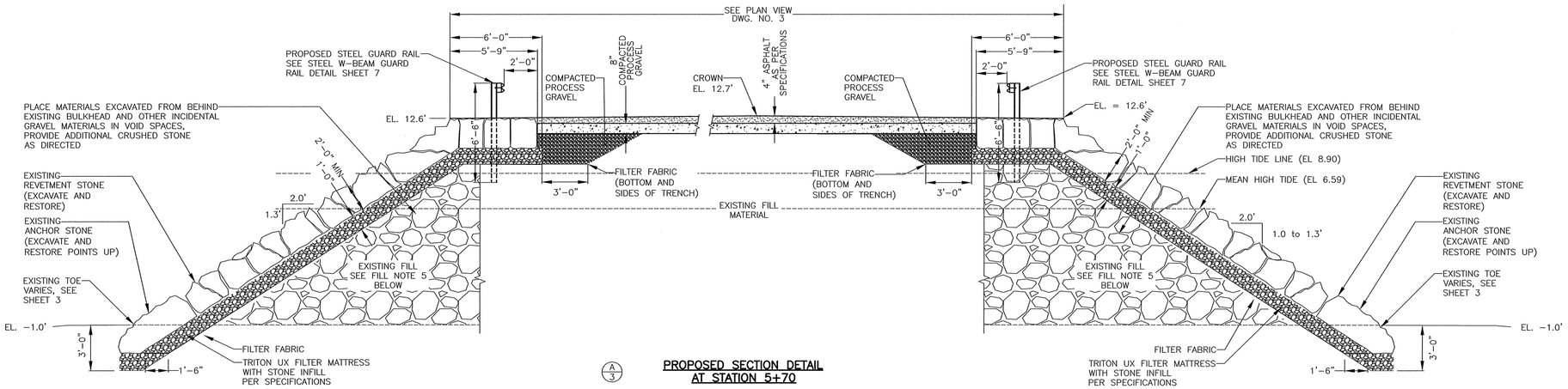
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1	SEPT 2014	JO
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SHEET NO.: 3 OF 11
CONTRACT NO.: 2014–23
SCALE: 1" = 10'–0"
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DRAWN BY: JWG
FILE NO.: MSH_002–003.DWG

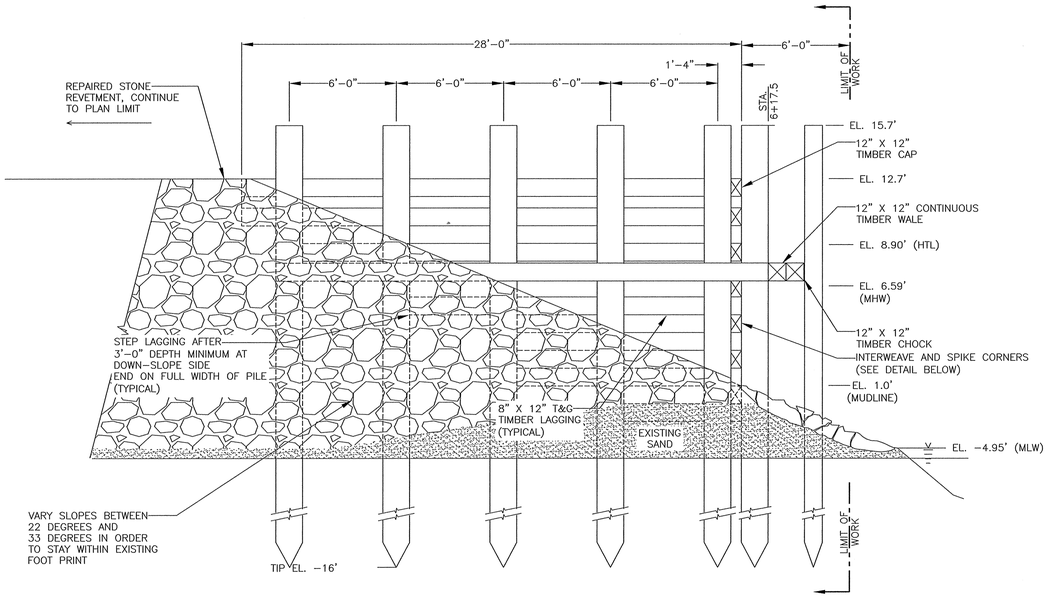
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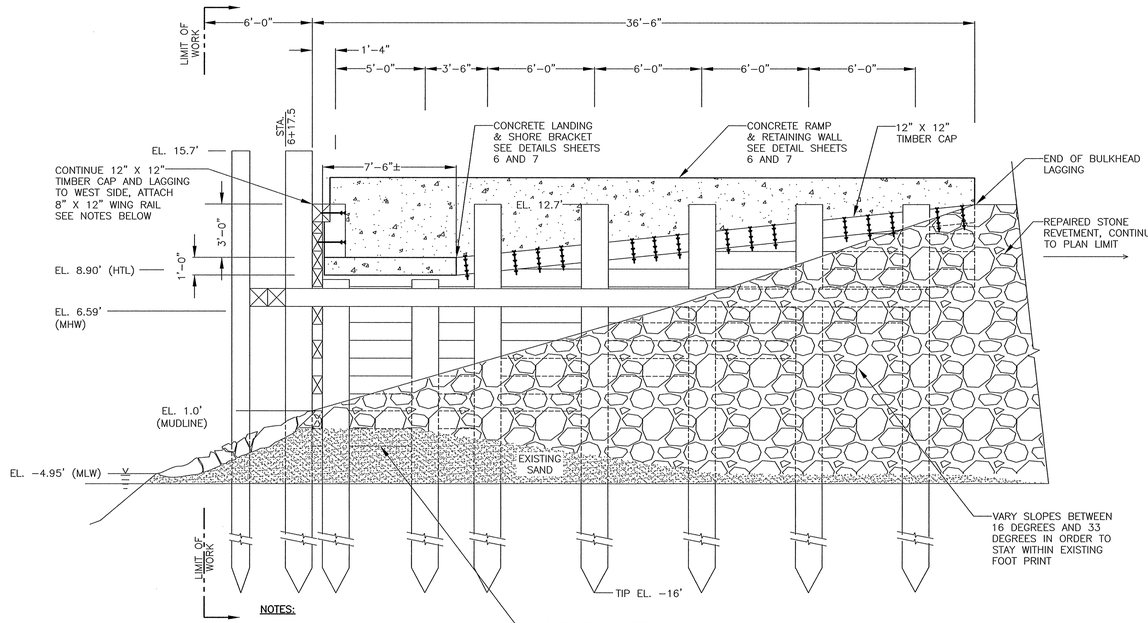
A/3 **PROPOSED SECTION DETAIL AT STATION 5+70**

SCALE: 1/4" = 1'-0"



B/3 **ELEVATION VIEW EAST SIDE**

SCALE: 1/4" = 1'-0"



NOTES:

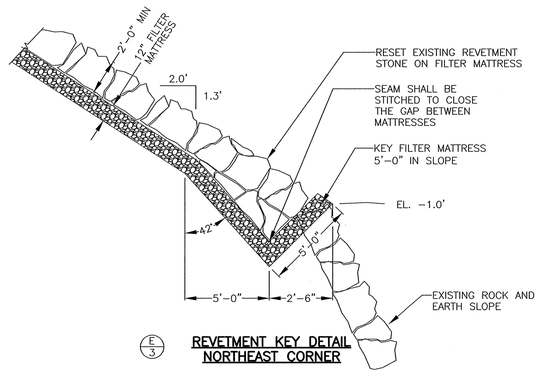
1. FASTEN 8" X 12" SOLID WING RAIL WITH 16" X 3/4" GALVANIZED SCREW LAGS.
2. FASTEN 12" X 12" TIMBER CAP TO 8 X 12" LAGGING WITH 16" X 3/4" GALVANIZED SCREW LAGS AT 16" O.C.

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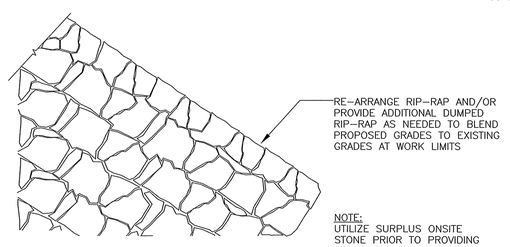
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MEAN LOWER LOW WATER	=	3.52	3.13	-2.17	-2.98

* CONDITIONS OBSERVED DURING SURVEY 9/12/13



E/3 **REVETMENT KEY DETAIL NORTHEAST CORNER**

STA. 5+50 TO 6+24
NOT TO SCALE



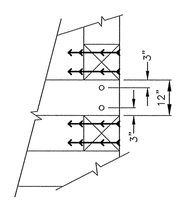
NOTE:
UTILIZE SURPLUS ONSITE STONE PRIOR TO PROVIDING STONE FROM OFFSITE

F/3 **DUMPED RIP-RAP DETAIL**

NOT TO SCALE

D/3 **ELEVATION VIEW WEST SIDE**

SCALE: 1/4" = 1'-0"



NOTE:

1. FASTEN 8" X 12" TIMBER LAGGING CORNERS WITH 12" X 3/4" GALVANIZED LAG SCREWS

INTERWOVEN LAGGING DETAIL

NOT TO SCALE

CONSTRUCTION NOTES:

1. FINISH GRADE AT TOE OF SLOPE TO MATCH EXISTING GRADE AT TOE OF SLOPE.
2. CONTRACTOR TO PRE-TRENCH TO ELEVATION OF -3.0' AT ALL PILE LOCATIONS. ANY SHIFTING OF PILE LOCATIONS SHALL BE REVIEWED WITH ENGINEER PRIOR TO DRIVING PILES. ALL DISTURBED AREAS BELOW HIGH WATER SHALL BE COVERED WITH MARINE MATTRESSES SPECIFIED FOR EROSION CONTROL.
3. REMOVE EXISTING TOE PROTECTION AND SOIL, TO A DEPTH OF 3'-0" BELOW PROPOSED GRADES, UNLESS NOTED OTHERWISE.
4. INSTALL FILTER MATTRESS AND RE-INSTALL ARMOR STONE OVER IT.
5. RAILINGS NOT SHOWN FOR CLARITY. FOR RAILING DETAILS SEE SHEET 9.

GENERAL NOTES:

1. PROVIDE ADDITIONAL ARMOR STONE AS NEEDED.
2. ANCHOR STONES TO BE SIX (6)-TON MINIMUM.
3. ANY NEW ARMOR STONES PROVIDED TO BE ROUGH ANGULAR GRANITE QUARRY STONE, HAVING AT LEAST THREE (3)-FLAT FACES TO ENABLE THE STONES TO BE PROPERLY LOCKED TOGETHER TO FORM A COMPACT MASS.
4. ANY NEW ARMOR STONES PROVIDED TO WEIGH BETWEEN 1500 lbs. TO 2500 lbs, WITH 50% AT 2000 lbs.

STONE FILL NOTE:

5. RE-GRADE AND RE-CHINK EXISTING ARMOR STONE FLAT SIDE UP TO PROVIDE CONSISTENT SLOPE AND SUPPORT FOR FILTER MATTRESS. AFTER ARMOR STONE IS REMOVED, SHAPE EXISTING BANK TO SPECIFIED SLOPE TO SUPPORT FILTER MATTRESSES.

DEPARTMENT OF PUBLIC WORKS
TOWN OF MARSHFIELD, MASSACHUSETTS

DAMONS POINT REVETMENT RESTORATION REVETMENT PROFILES

Haley and Ward, Inc.
63 GREAT ROAD, SUITE 200,
MAYNARD, MASSACHUSETTS 01754-2097
PHONE: (978) 648-6025 FAX: (978) 648-6068
www.haleyward.com

COMMONWEALTH OF MASSACHUSETTS
SCOTT A. LOUGHLIN
CIVIL
No. 49,210
REGISTERED PROFESSIONAL ENGINEER

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-	SEPT. 2014	JO	
1	REVISED	BY	
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2	MAY, 2015	CLIENT	

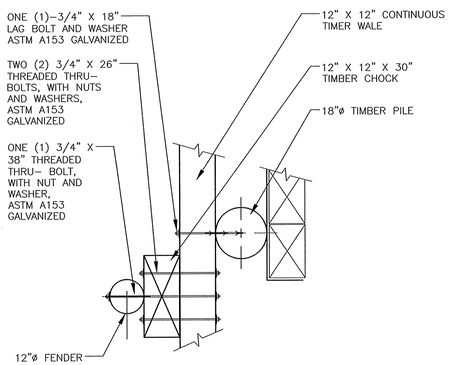
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DATE DRAWN: MAY, 2015
DRAWN BY: LJC_WG
FILE NO.: MSH_002-004.DWG

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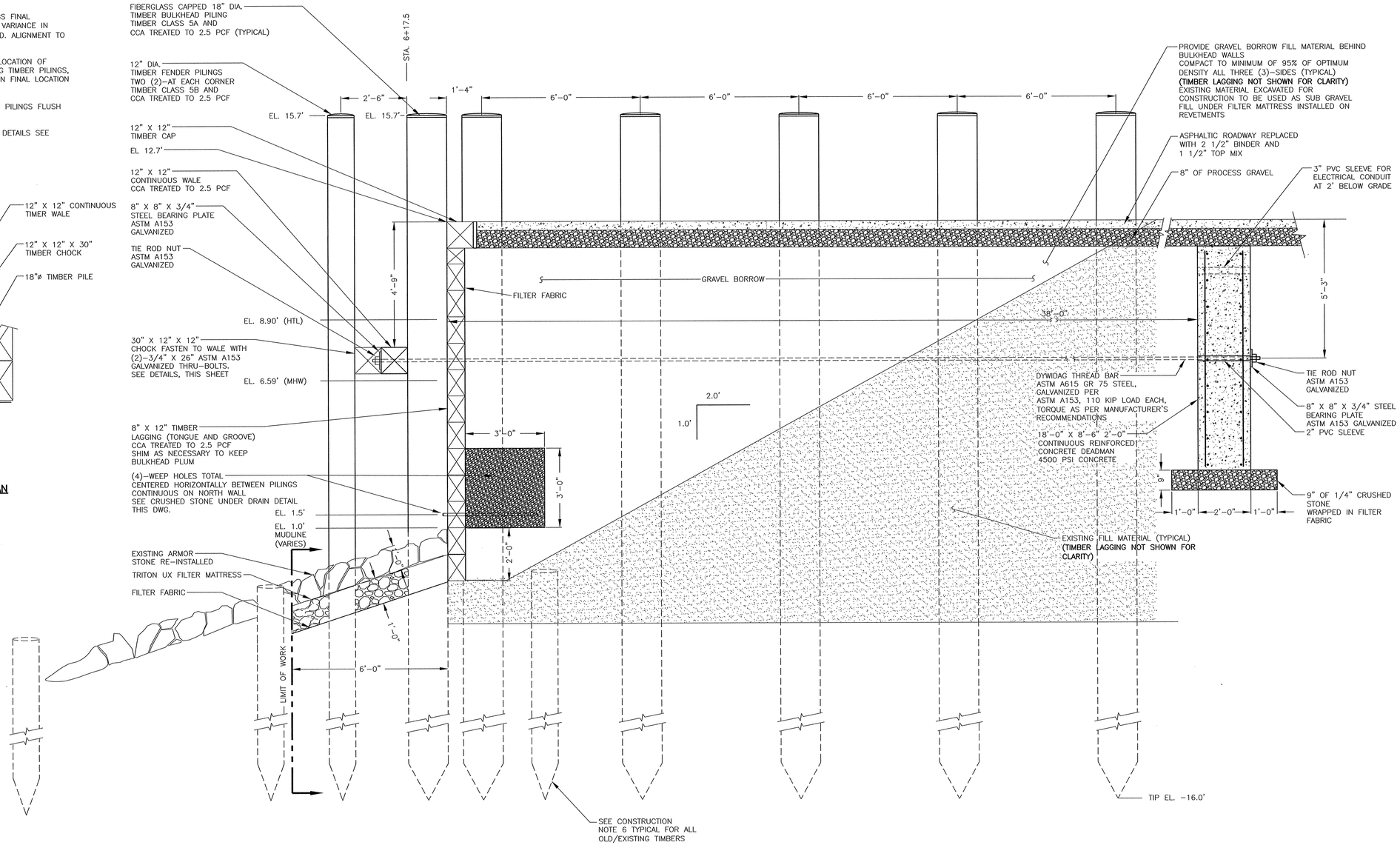
CONSTRUCTION NOTES:

1. FINISH GRADE AT TOE OF SLOPE TO MATCH EXISTING GRADE AT TOE OF SLOPE.
2. EXCAVATE 2'–0" BELOW GRADE TO PLACE FILTER MATTRESS AT APRON ON NORTH END.
3. RE–INSTALL ARMOR STONE TO MATCH EXISTING GRADE AT NORTH END.
4. DUE TO THE NUMBER OF EXISTING TIMBER PILINGS FINAL PLACEMENT OF NEW PILINGS MAY CREATE MINOR VARIANCE IN LENGTH AND/OR WIDTH OF THE TIMBER BULKHEAD. ALIGNMENT TO REMAIN SQUARE AND STRAIGHT. *
5. * FINAL BASE ELEVATION WILL VARY WITH FINAL LOCATION OF BULKHEAD PILINGS DUE TO THE NUMBER EXISTING TIMBER PILINGS, CONTRACTOR WILL BE ALLOWED SOME VARIANCE IN FINAL LOCATION OF BULKHEAD TIMBER PILING ROWS.
6. WHERE ENCOUNTERED: CUT OLD/EXISTING TIMBER PILINGS FLUSH WITH PROPOSED SUB–GRADE.
7. RAILINGS NOT SHOWN FOR CLARITY. FOR RAILING DETAILS SEE SHEET 9.



SOUTHWEST CORNER PLAN VIEW

NOT TO SCALE



TIDAL DATA FROM STA. 8445425, SUBORDINATE TO 8443970, BOSTON
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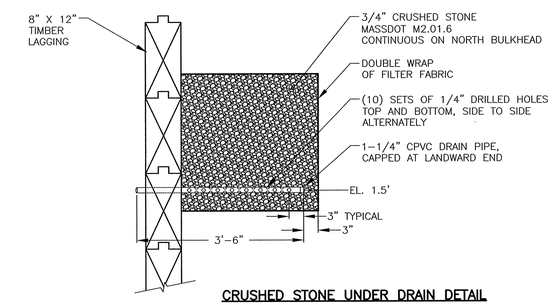
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* CONDITIONS OBSERVED DURING SURVEY 9/12/13

C/3 **BULKHEAD SECTION VIEW**

SCALE: 1/2" = 1'–0"



CRUSHED STONE UNDER DRAIN DETAIL

NOT TO SCALE

DEPARTMENT OF PUBLIC WORKS
TOWN OF MARSHFIELD, MASSACHUSETTS

DAMONS POINT REVETMENT RESTORATION BULKHEAD SECTION VIEW

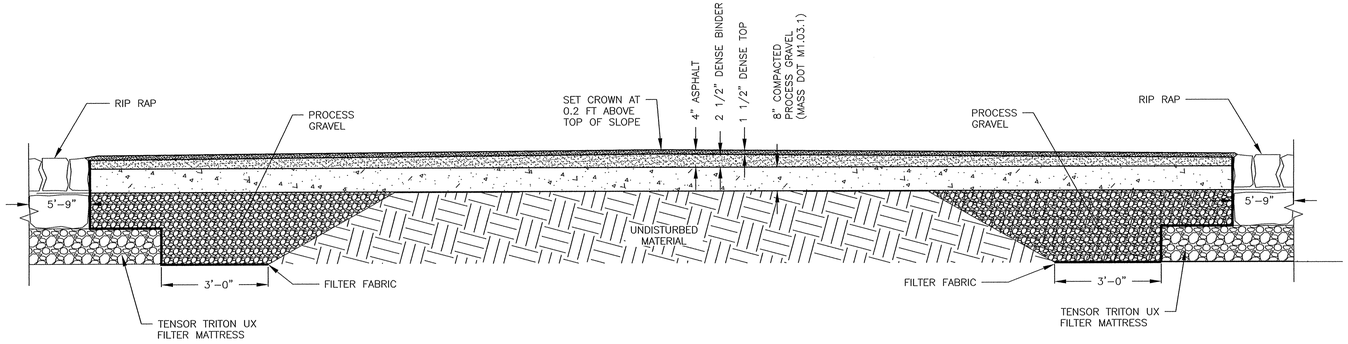
Haley and Ward, Inc.
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MAYNARD, MASSACHUSETTS 01754–2097
PHONE: (978) 648–6025 FAX: (978) 648–6068
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			2	MAY. 2015	CLIENT

SHEET NO.: 5 OF 11
CONTRACT NO.: 2014–23
SCALE: AS NOTED
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FILE NO.: MSH_002–005.DWG

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5

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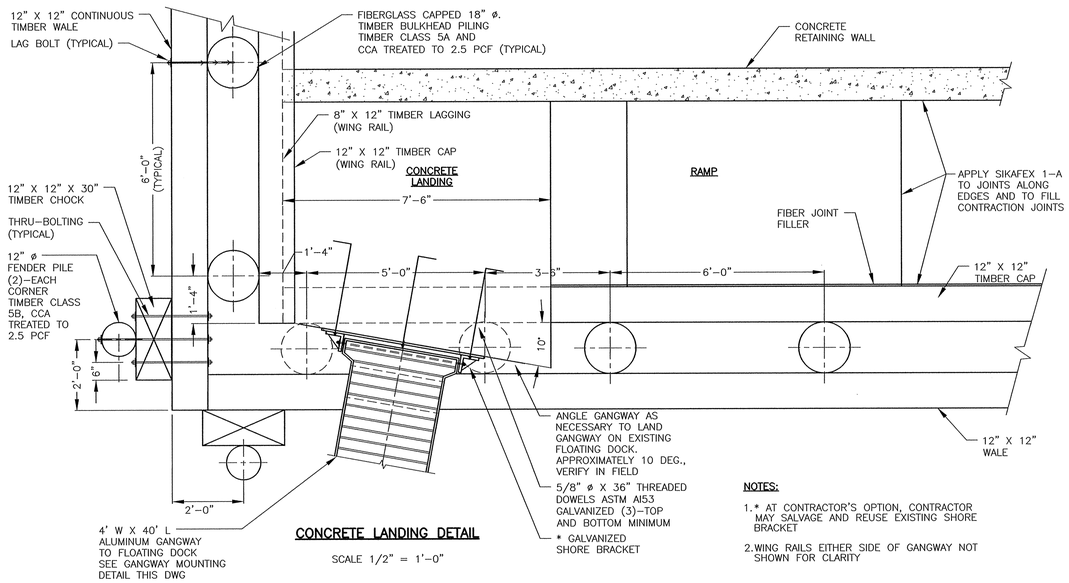


NOTES:

1. PLACE 2 1/2" COMPACTED DEPTH DENSE BINDER AND
2. 1 1/2" COMPACTED DEPTH OF DENSE TOP MIX.
3. AT TRANSITION TO EXISTING PAVING MAKE A SECOND SAW CUT ONE (1) FOOT BEYOND INITIAL CUT.
4. COMPACT SUB-BASE SIMILAR TO COMPACTION OF NEW PROCESS GRAVEL.
5. INSTALL ASPHALTIC PAVING AND RS-1 EMULSION AND SAND AT ASPHALTIC JOINT.

ASPHALTIC PAVING DETAIL

NOT TO SCALE



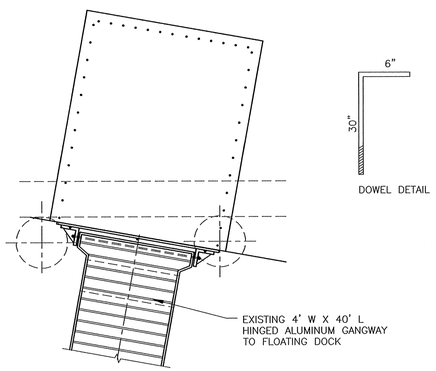
NOTES:

1.* AT CONTRACTOR'S OPTION, CONTRACTOR MAY SALVAGE AND REUSE EXISTING SHORE BRACKET

2.WING RAILS EITHER SIDE OF GANGWAY NOT SHOWN FOR CLARITY

CONCRETE LANDING DETAIL

SCALE 1/2" = 1'-0"



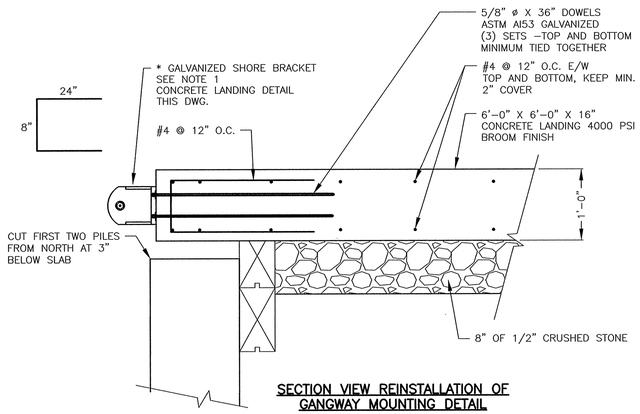
DOWEL DETAIL

NOTES:

1. CONTRACTOR TO RE-INSTALL EXISTING GANGWAY.
2. PROVIDE AS NECESSARY: SAW CUTTING, CASTING, DOWELING, BOLTING, HINGE ROD, NUTS, WASHERS AND ANCHORING ALL TO BE THE SAME SIZE AS EXISTING.

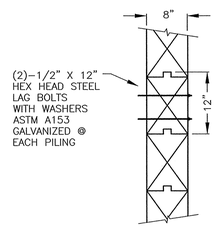
EXISTING GANGWAY MOUNTING DETAIL

NOT TO SCALE



SECTION VIEW REINSTALLATION OF GANGWAY MOUNTING DETAIL

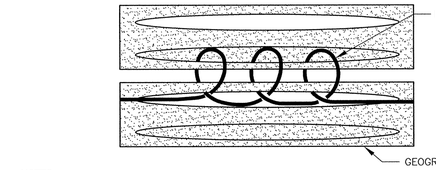
NOT TO SCALE



TONGUE AND GROOVE TIMBER LAGGING DETAIL

NOT TO SCALE

NOTE: CCA TREATED TO 2.5 PCF

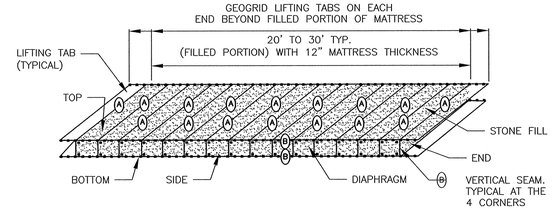


NOTES:

1. ALL CUT ENDS OF BRAID MATERIAL SHALL BE KNOTTED WITHIN 1/2" TO 2" OF THE END TO PREVENT RAVELING OF BRAID.
2. AT ALL ENDS OF ALL BRAIDED SEAMS THE BRAID SHALL BE SECURELY KNOTTED TO THE GEOGRID.
3. AT ALL ENDS OF ALL PIECES OF BRAID MATERIAL USED, THE BRAID SHALL BE KNOTTED TO SPLICE IT TO THE NEXT PIECE OF BRAID, OR TO SECURE IT TO THE GEOGRID. EACH BRAIDED SEAM SHALL BE CONTINUOUS, WITH SECURELY KNOTTED SPLICES ALLOWED. THE BRAID SHALL BE SECURELY KNOTTED TO THE GEOGRID AT A SPACING NOT TO EXCEED 6 FT ALONG ANY SEAM.
4. THE BRAID SHALL BE STITCHED THROUGH EACH PAIR OF APERTURES ALONG THE SEAM AT LEAST ONCE, AND THE MINIMUM NUMBER OF STITCHES PER FOOT ALONG THE SEAM SHALL BE SIX (6). THE SPACING OF STITCHES ALONG EACH SEAM SHALL BE REASONABLY UNIFORM.
5. ALL KNOTS SHALL BE TIED IN A MANNER TO PREVENT SLIPPING AND CINCHING.
6. THE WRAPS ALONG THE SEAM SHALL BE SUFFICIENTLY TIGHT TO CLOSE THE GAP BETWEEN THE ADJACENT PIECES OF GEOGRID, BUT SHALL NOT BE OVER-TIGHTENED SUCH THAT THE GEOGRID BINDS ALONG THE SEAM.
7. SEE SPECIFICATION APPENDICES FOR DETAIL OF TEMPORARY WORK PROTECTION MATTRESS.

TYPICAL STITCHED SEAM DETAILS

NOT TO SCALE



Ⓐ INDICATES BODKIN CONNECTION USING 3/8" DIAMETER HDPE BODKIN ROD

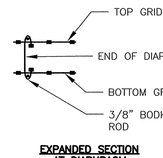
Ⓑ INDICATES BRAIDED SEAM USING 3/16" DIAMETER HIGH UV HDPE BRAID

NOTES:

1. ENDS, TOP, BOTTOM, SIDES AND ANY EXTRA LENGTH USED FOR LIFTING OR ANCHORING PURPOSES SHALL BE COMPOSED OF TENSAR UXTRITON 200 GEOGRID.
2. INTERNAL DIAPHRAGMS SHALL BE COMPOSED OF TENSAR UXTRITON 100 GEOGRID.
3. NOMINAL WIDTH OF UNITS: 5FT (FILLED), 4.3 FT (UNFILLED).
4. TYPICAL THICKNESS (FILLED): 12 INCHES;
5. PLASTIC CABLES TIES MAY BE USED TO SECURE BODKIN CONNECTORS IN POSITION PRIOR TO TENSIONING OR FILLING OF MATTRESS UNITS.

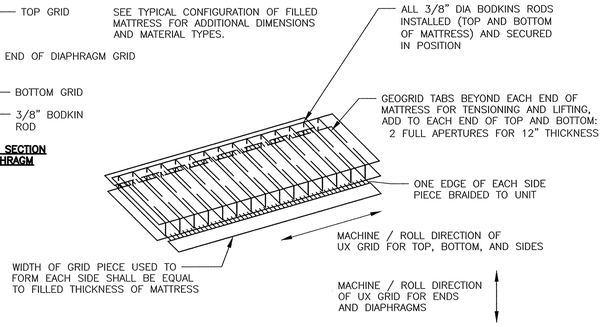
TYPICAL CONFIGURATION OF FILLED MATTRESS UNITS

NOT TO SCALE



EXPANDED SECTION AT DIAPHRAGM

SEE TYPICAL CONFIGURATION OF FILLED MATTRESS FOR ADDITIONAL DIMENSIONS AND MATERIAL TYPES.



TYPICAL CONFIGURATION OF FABRICATED MATTRESS

NOT TO SCALE

NOTE:

TYPICAL SPACING OF DIAPHRAGMS IS EVERY THREE APERTURE LENGTHS. A SHORTER SPACING MAY BE USED IN ORDER TO MATCH THE REQUIRED MATTRESS LENGTH. LENGTH OF END PIECES AND INTERNAL DIAPHRAGMS PIECES SHALL BE:
FOR 12" (FILLED) MATTRESS THICKNESS: 2 GRID APERTURES LONG;

DEPARTMENT OF PUBLIC WORKS
TOWN OF MARSHFIELD, MASSACHUSETTS

DAMONS POINT REVETMENT RESTORATION DETAILS

Haley and Ward, Inc.
63 GREAT ROAD, SUITE 200,
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PHONE: (978) 648-6025 FAX: (978) 648-6068
www.haleyward.com

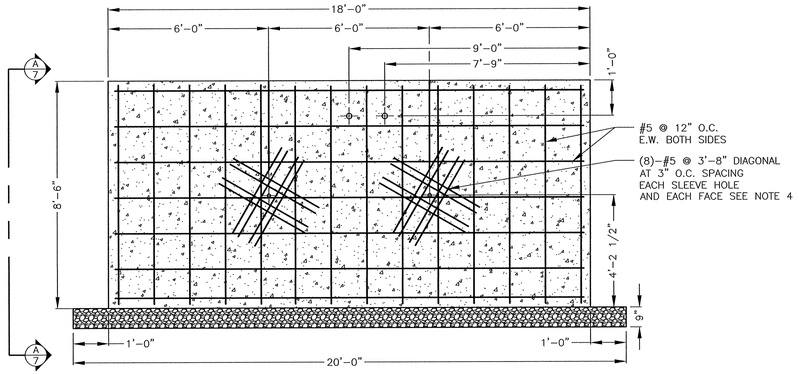
SCOTT A. ADLER DATE: 2015

CHECKED	DATE	BY
REVISED	DATE	BY
1	FEB. 2015	CLIENT

SHEET NO.: 6 OF 11
CONTRACT NO.: 2014-23
SCALE: AS NOTED
DATE DRAWN: MAY, 2015
DRAWN BY: LJC\JWG
FILE NO.: MSH_002-007.DWG

DWG. NO.
6

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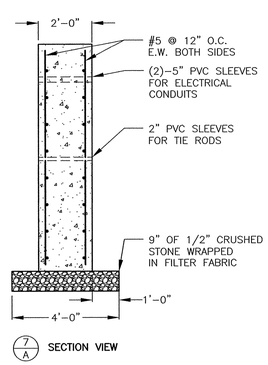


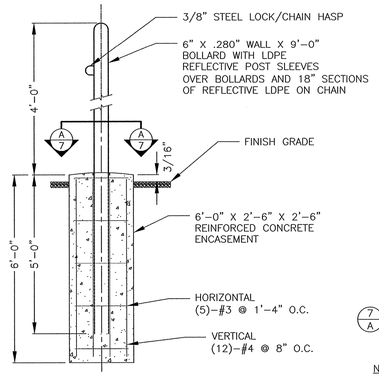
NOTES:

1. REINFORCE MOUNT AT 3" INSIDE FACE BOTH SIDES.
2. 1/2" CRUSHED STONE SHALL CONFORM TO THE REQUIREMENTS OF MASSDOT 1988 STANDARD SPECIFICATIONS FOE HIGHWAYS AND BRIDGES, SECTION M2.01.
3. PROVIDE 4500 PSI CONCRETE.
4. INSIDE RE-BARS MUST HAVE 2" MINIMUM CLEARANCE FROM TIE ROD SLEEVE HOLE.

CONTINUOUS CONCRETE DETAIL

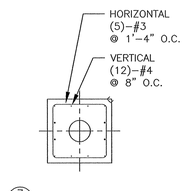
NOT TO SCALE





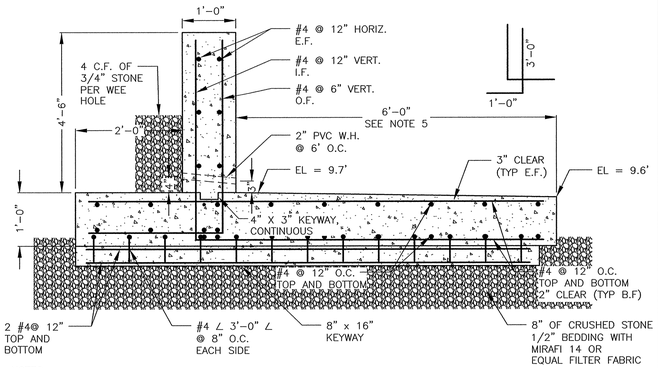
CHAIN POST DETAIL

NOT TO SCALE



NOTE:

REINFORCING TYPICAL
FOR EACH CHAIN POST

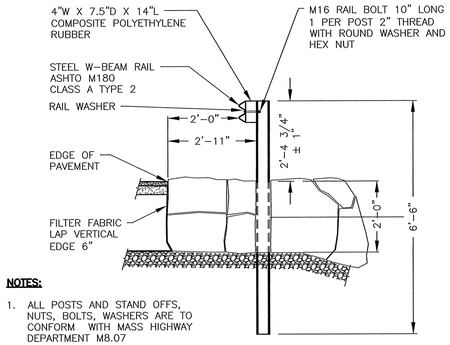


NOTES:

1. CONSTRUCT 1/2" CONTRACTION JOINTS @ 8'-0" O.C. ALONG RAMP SECTION.
2. CONSTRUCT 3'-6" RAIL FENCE ALONG INSIDE OF WALL WHERE HEIGHT ABOVE SIDEWALK IS ≥ 1'-0". SEE DETAIL DWG 9.
3. EPOXY-COATED REBAR, SALT-RESISTANT CONC. DESIGN 4000 PSI.
4. SLOPE WALL AND RAMP PER SITE PLANS.
5. LANDING WIDTH MAY VARY FROM 6' TO 7 1/2', DEPENDING ON ANGLE REQUIRED TO CAPTURE GANGWAY.
6. LAPS SHALL BE A MINIMUM OF 36 DIAMETERS OF THE BAR UNLESS OTHERWISE NOTED.

RAMP AND RETAINING WALL DETAIL

VIEW FROM NORTH
NOT TO SCALE

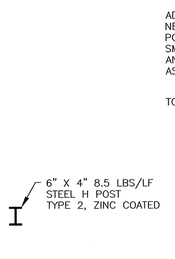


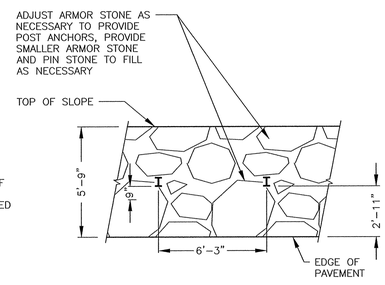
NOTES:

1. ALL POSTS AND STAND OFFS, NUTS, BOLTS, WASHERS ARE TO CONFORM WITH MASS HIGHWAY DEPARTMENT M8.07
2. ALL RAILS TO CONFORM WITH AASHTO M180-CLASS A TYPE 2

GUARD RAIL DETAIL

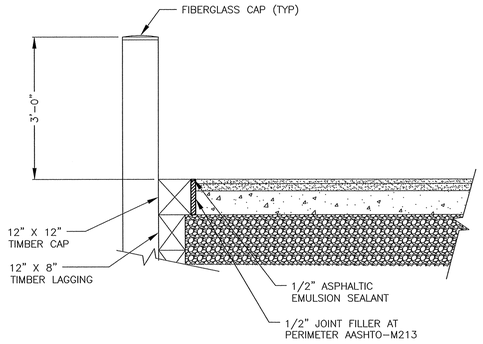
NOT TO SCALE





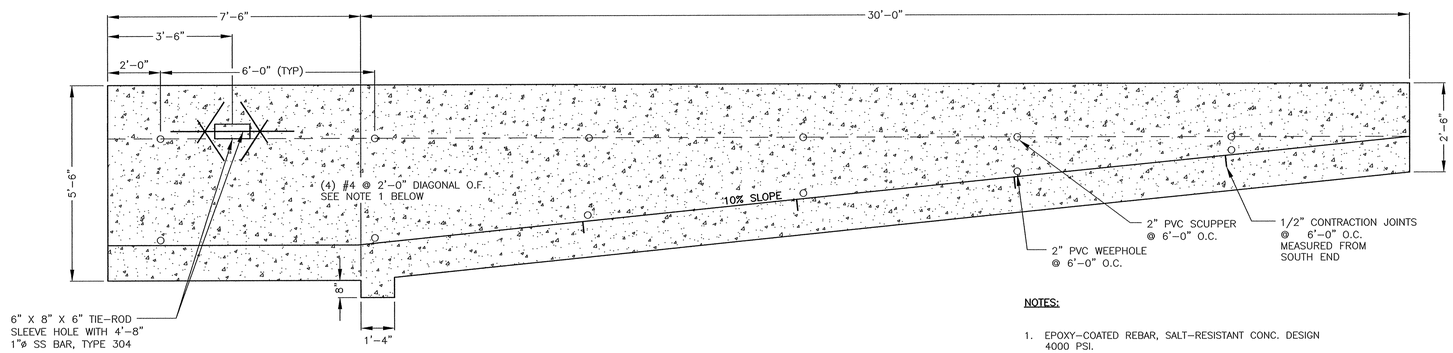
STEEL W-BEAM GUARD RAIL MODIFIED POST DETAIL

NOT TO SCALE



BULKHEAD SURFACE EDGING DETAIL

NOT TO SCALE



NOTE:

1. INSIDE RE-BARS MUST HAVE 2" MINIMUM CLEARANCE FROM TIE ROD SLEEVE HOLE.

RAMP/WALL KEYWAY DETAIL

NOT TO SCALE

NOTES:

1. EPOXY-COATED REBAR, SALT-RESISTANT CONC. DESIGN 4000 PSI.
2. SLOPE WALL AND RAMP PER SITE PLANS.
3. FOR REINFORCING DETAILS FOR RAMP AND RETAINING WALL SEE RAMP AND RETAINING WALL DETAIL THIS DRAWING.

DEPARTMENT OF PUBLIC WORKS
TOWN OF MARSHFIELD, MASSACHUSETTS

DAMONS POINT REVETMENT RESTORATION DETAILS

Haley and Ward, Inc.
63 GREAT ROAD, SUITE 200,
MAYNARD, MASSACHUSETTS 01754-2097
PHONE: (978) 648-6025 FAX: (978) 648-6068
www.haleyward.com

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1	FEB. 2015	CLIENT
2	MAY, 2015	CLIENT

SHEET NO.: 7 OF 11
CONTRACT NO.: 2014-23
SCALE: AS NOTED
DATE DRAWN: MAY, 2015
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FILE NO.: MSH_002-008.DWG

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7

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CONSTRUCTION NOTES:

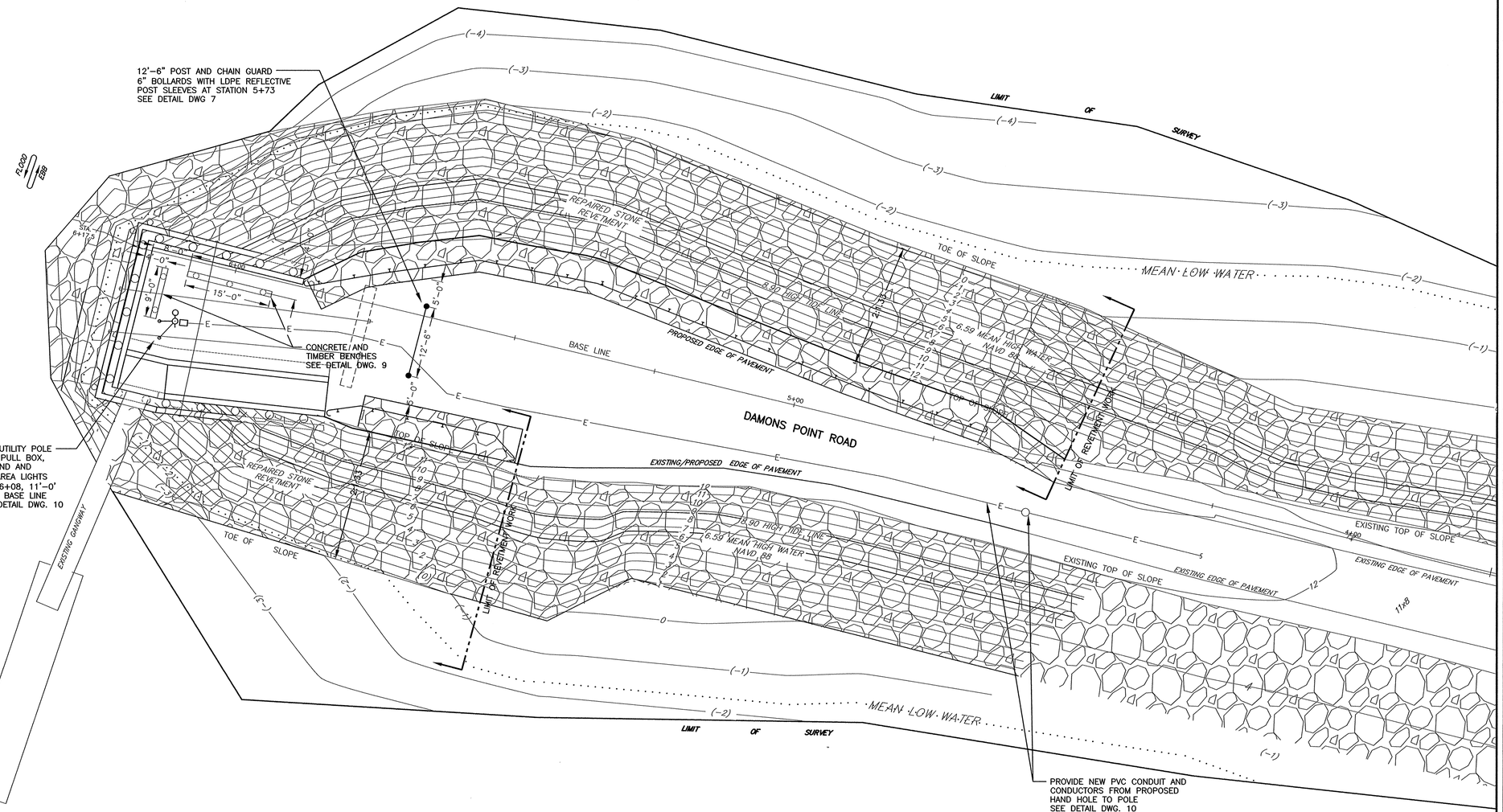
1. CONTRACTOR TO USE CAUTION WHEN EXCAVATING FOR BENCH SUPPORT COLUMNS ON WEST SIDE TO AVOID DISTURBING TIE-BACK BAR AT 5'-3" OF DEPTH.

TIDAL DATA FROM STA. 8445425, SUBORDINATE TO 8443970, BOSTON
DAMONS POINT DATA = BOSTON DATA X 0.89

TIDAL BENCH MARK 5138 A 1990 USED FOR DATUM CONVERSION TO NAVD88
EL. 10.15 (NAVD88) – EL. (TIDAL EL.) = –5.30 (DIFFERENCE IN DATUMS)

TIDE DESIGNATION	=	8443970 TIDAL EL. (FT.)	8445425 TIDAL EL. (FT.)	NAVD88 EL. (FT.)	NGVD 1929 EL. (FT.)
HIGH TIDE LINE (HTL)	=	15.95	14.20	8.90	8.09
MEAN HIGHER WATER	=	13.80	12.28	6.98	6.17
MEAN HIGH WATER	=	13.36	11.89	6.59	5.78
MEAN SEA LEVEL	=	8.73	7.77	2.47	1.66
MEAN TIDE LEVEL	=	8.61	7.66	2.36	1.55
MEAN LOW WATER	=	3.87	3.44	–1.86	–2.67
MEAN LOWER LOW WATER	=	3.52	3.13	–2.17	–2.98

* CONDITIONS OBSERVED DURING SURVEY 9/12/13



EXISTING CONDITIONS LEGEND

UNDERGROUND ELECTRIC	—E—E—E—
WETLANDS	
CONTOURS	———X———
MEAN HIGH WATER (MHW)	
HIGH TIDE LINE (HTL) [CURRENT TIDAL EPOCH]	
MEAN LOW WATER (MLW)	. . . . .

GRAPHIC SCALE
5 0 5 10 20 FEET

DEPARTMENT OF PUBLIC WORKS
TOWN OF MARSHFIELD, MASSACHUSETTS

DAMONS POINT REVETMENT RESTORATION APPURTENANCES

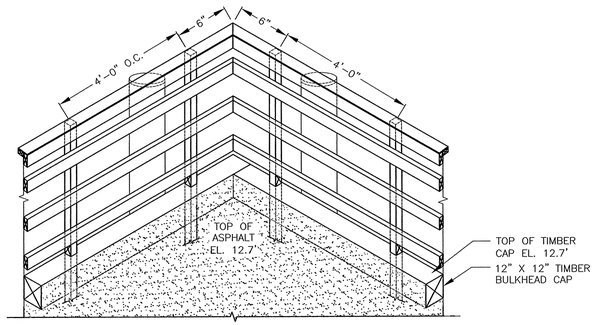
Haley and Ward, Inc.
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1	SEPT. 2014	JO
REVISED	DATE	BY
1	FEB. 2015	CLIENT
2	MAY, 2015	CLIENT

SHEET NO.: 8 OF 11
CONTRACT NO.: 2014-23
SCALE: 1" = 10'-0"
DATE DRAWN: MAY, 2015
DRAWN BY: JWG
FILE NO.: MSH_002-008.DWG

DWG. NO.
8

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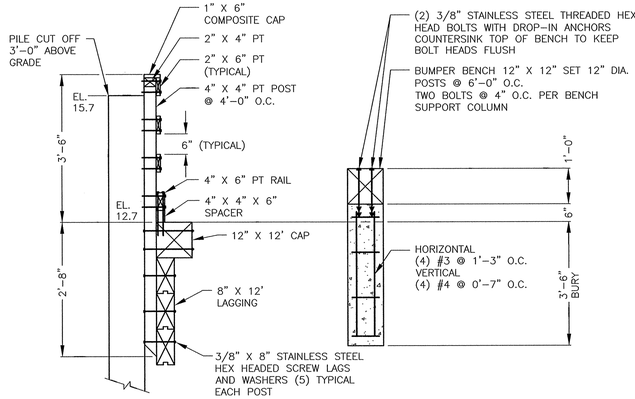


NOTES:

1. ASSEMBLE RAILINGS AND CAPS WITH STAINLESS STEEL SCREWS.
2. LENGTH TO PENETRATE A MINIMUM OF 1 1/4".

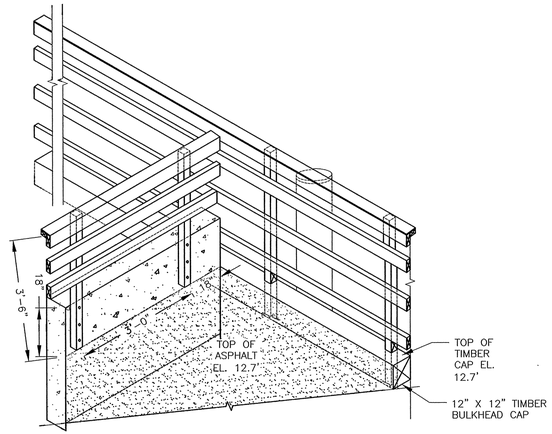
RAILING DETAIL

(NORTH EAST CORNER VIEW)
NOT TO SCALE



BUMPER/BENCH RAIL FENCE DETAIL (AT BULKHEAD)

NOT TO SCALE

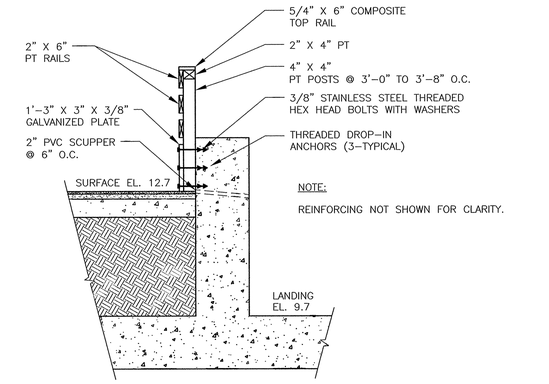


NOTES:

1. BUTT UP AGAINST NORTH WALL RAILING, DO NOT JOIN.
2. CONTINUE NORTH WALL TO END OF BULKHEAD.

RETAINING WALL RAILING DETAIL

(NORTH WEST CORNER VIEW)
NOT TO SCALE

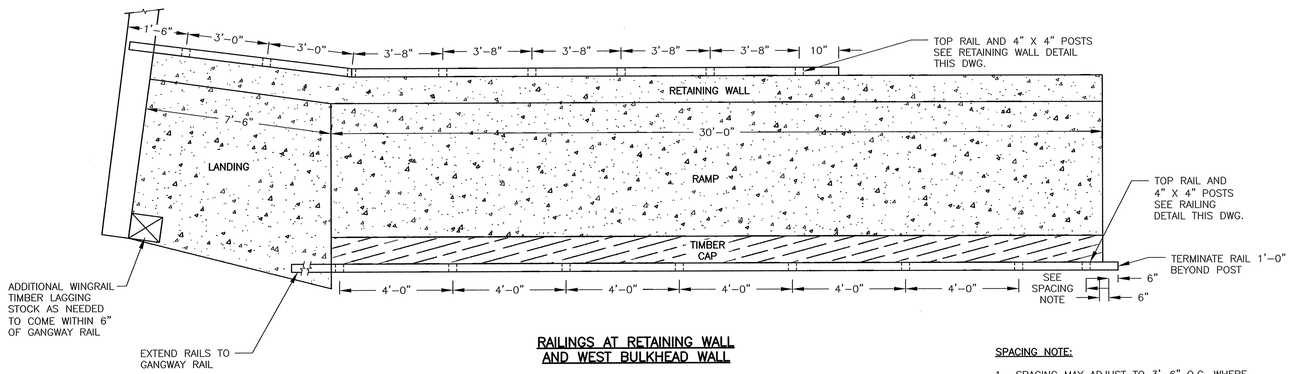


NOTE:

REINFORCING NOT SHOWN FOR CLARITY.

RAMP/RETAINING WALL RAILING DETAIL

NOT TO SCALE



RAILINGS AT RETAINING WALL AND WEST BULKHEAD WALL

NOT TO SCALE

SPACING NOTE:

1. SPACING MAY ADJUST TO 3'-6" O.C. WHERE INTERFERENCE WITH PILINGS OCCURS.

DEPARTMENT OF PUBLIC WORKS
TOWN OF MARSHFIELD, MASSACHUSETTS

DAMONS POINT REVETMENT RESTORATION RAILING DETAILS

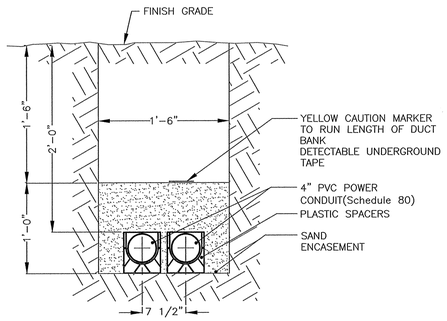
Haley and Ward, Inc.
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SHEET NO.: 9 OF 11
CONTRACT NO.: 2014-23
SCALE: AS NOTED
DATE DRAWN: MAY, 2015
DRAWN BY: LJC
FILE NO.: MSH_002-009.DWG

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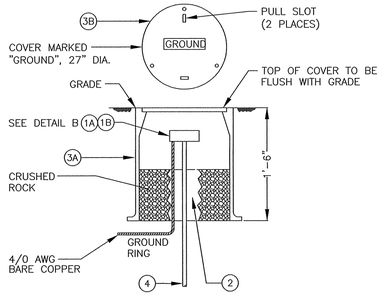
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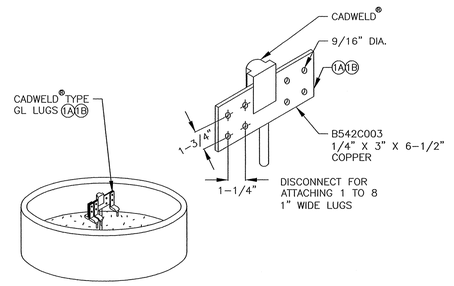


1. CONTRACTOR TO EXCAVATE TRENCH AND COMPLETE BACK FILLING AND COMPACTION WORK.
2. CONTRACTOR TO FURNISH AND INSTALL DUCTS.
3. SAND ENCASEMENT REQUIRED FOR ALL DUCTS.
4. CONTRACTOR TO FURNISH AND INSTALL SAND ENCASEMENT

ELECTRICAL CONDUIT IN SAND ENCASEMENT TRENCH

NOT TO SCALE





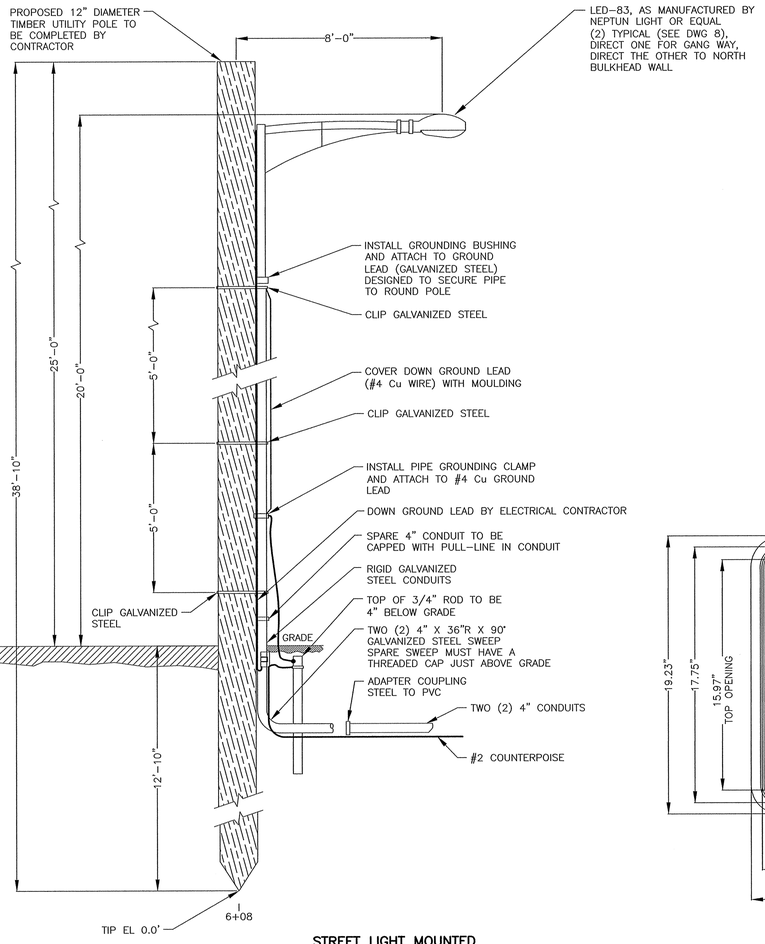
DETAIL B

NOT TO SCALE

ITEM NUMBER	QUANTITY	DESCRIPTION	MANUFACTURER	CAT #
1A	1	CONNECTION BUS BAR TO GND ROD	ERICO, INC. OR EQUAL	CR #200
1B	1	GROUND BAR	HARGER, INC. OR EQUAL	CB1438
2		EARTH ENHANCEMENT MATERIAL	HARGER	ULTRA FILL
2B	3	2 HOLE TINNED COPPER LUGS	HARGER, INC. OR EQUAL	OXL1422D
3A & B	1	INSPECTION HOUSING AND COVER	HARGER, INC. OR EQUAL	GAW121218HD
4	1	GROUND ROD, 3/4" X 10' COPPER CLAD	HARGER OR EQUAL	3410

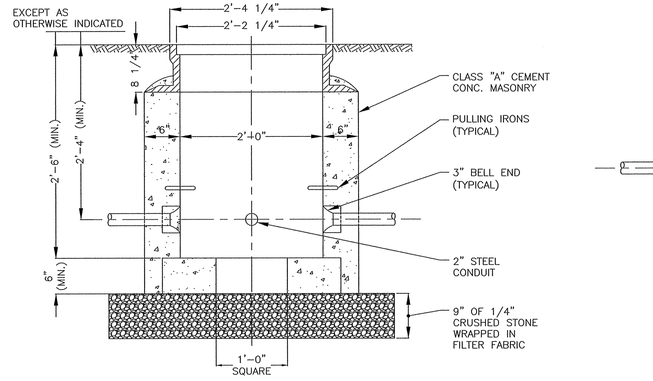
PROPOSED GROUND INSTALLATION

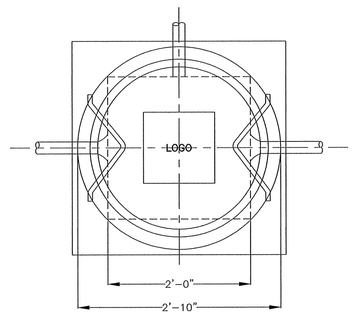
NOT TO SCALE



STREET LIGHT MOUNTED POLE ARRANGEMENT

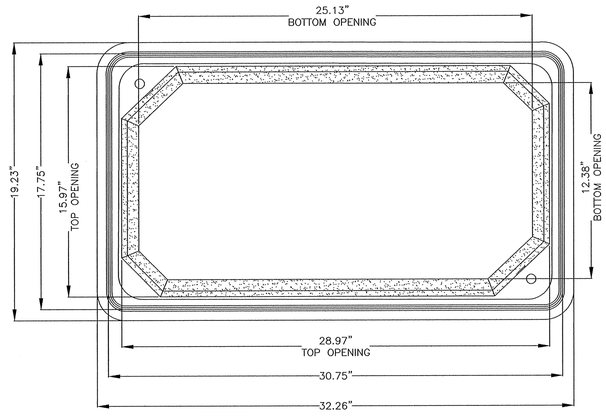
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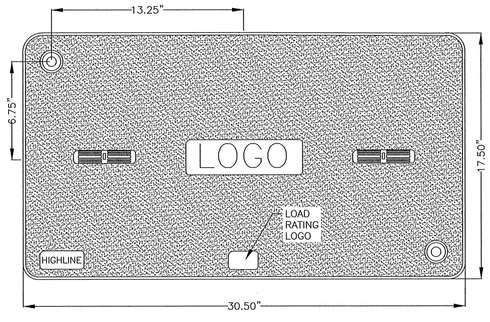


ELECTRIC HAND HOLE DETAIL

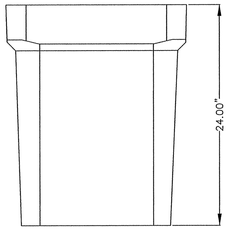
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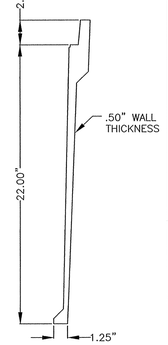
BOX TOP VIEW



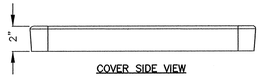
COVER TOP VIEW



BOX SIDE VIEW



BOX SIDEWALL VIEW



COVER SIDE VIEW

ELECTRIC PULL BOX DETAIL

NOT TO SCALE

DEPARTMENT OF PUBLIC WORKS
TOWN OF MARSHFIELD, MASSACHUSETTS

DAMONS POINT REVETMENT RESTORATION ELECTRICAL DETAILS

Haley and Ward, Inc.
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2	MAY, 2015	CLIENT

SHEET NO.: 10 OF 11
CONTRACT NO.: 2014-23
SCALE: AS NOTED
DATE DRAWN: MAY, 2015
DRAWN BY: LJC_WG
FILE NO.: MSH_002-010.DWG

DWG. NO.

10

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J. A. McCue
WELL DRILLING, TEST BORING
71 Water Street, Pembroke MA
(781)826-9235
Commonwealth of Massachusetts Reg. #392
JOB LOCATION Damons Point Road, Marshfield MA
PROJECT NAME Proposed repairs
DATE STARTED 4/5/2014
DATE FINISHED 4/5/2013

Page 1 of 2
HOLE NO. B-1C
LINE & STATION
OFFSET
SURFACE LEVEL
WATER LEVEL 8' 6" at completion
BORING FOREMAN J. McCue
INSPECTOR John Obrien

SCALE IN FEET	SAMPLE DEPTH FROM	TO	30" BLOWS PER 6" ON SAMPLER	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS	SAMPLE NO.
					Augered to 15'	
					** Note - Took 3 attempts to drill through layer of boulders at 8'	
5'						
10'						
15'				15'		
	15'	17'	3 - 4		Loose, brown, fine to medium coarse sand and silt	S-1
			3 - 5	17'		
	18'	19'	8 - 7		Medium dense, brown fine to coarse sand and silt some gravel	S-2
20'	19'	20'	3 - 3		Loose, brown, silt with some fine sand	S-2A
25'	23'	25'	3 - 3			S-3
			3 - 4			
				22'		
	28'	30'	3 - 3		Loose, gray, silt with fine sand some soft clay	S-4
30'			3 - 3			
35'						
	35'	37'	1 - 2			S-5
			2 - 2			

REMARKS: Used 6" solid stem augers to 15' 3" flush joint casing/ wash boring method to bottom of boring

PROPORTIONS USED: TRACE = 0 to 10% SOME = 10 to 35% AND = 35 to 50%

BORING LOG B-1C

PAGE 1

J. A. McCue
WELL DRILLING, TEST BORING
71 Water Street, Pembroke MA
(781)826-9235
Commonwealth of Massachusetts Reg. #392
JOB LOCATION Damons Point Road, Marshfield MA
PROJECT NAME Proposed repairs
DATE STARTED 4/5/2014
DATE FINISHED 4/5/2013

Page 2 of 2
HOLE NO. B-1C
LINE & STATION
OFFSET
SURFACE LEVEL
WATER LEVEL 8' 6" at completion
BORING FOREMAN J. McCue
INSPECTOR John Obrien

SCALE IN FEET	SAMPLE DEPTH FROM	TO	30" BLOWS PER 6" ON SAMPLER	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS	SAMPLE NO.
	40'	42'	2 - 2		Loose gray, clayey silt	S-6
			2 - 3			
45'	44'	46'	3 - 2			S-7
			2 - 3			
				49'		
50'	49'	50'	16 - 15	50'	Medium dense, grayfan, fine sand and silt with gravel	S-8
	50'	51'	13 - 16		Medium dense, gray/ tan fine sand and silt	S-8A
55'				55'		
	55'	57'	16 - 27		Dense to very dense, gray/ brown, fine sand and silt some gravel	S-9
			26 - 28	58'		
60'	59'	61'	24 - 25		Dense to very dense, brown, fine to coarse sand, gravel and silt	S-10
			23 - 25			
	63'	65'	19 - 29 OE #300			S-11
65'			31 - 10 OE #300	65'		
					Bottom of boring is 65'	

REMARKS: Used 6" solid stem augers to 15' 3" flush joint casing/ wash boring method to bottom of boring

OE = open end rod used #300 = 300 pound hammer used

PROPORTIONS USED: TRACE = 0 to 10% SOME = 10 to 35% AND = 35 to 50%

BORING LOG B-1C

PAGE 2

MSH-002 MARSHFIELD

J. A. McCue
WELL DRILLING, TEST BORING
71 Water Street, Pembroke MA
(781)826-9235
Commonwealth of Massachusetts Reg. #392
JOB LOCATION Damons Point Road, Marshfield MA
PROJECT NAME Proposed repairs
DATE STARTED 9/18/2013
DATE FINISHED 9/18/2013

Page 1 of 1
HOLE NO. B-1
LINE & STATION
OFFSET
SURFACE LEVEL
WATER LEVEL 9' at completion
BORING FOREMAN J. McCue
INSPECTOR John Obrien

SCALE IN FEET	SAMPLE DEPTH FROM	TO	30" BLOWS PER 6" ON SAMPLER	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS	SAMPLE NO.
				1'	Augered through asphalt to 1'	
	1'	3'	15 - 18		Dense, brown, fine to coarse sand, gravel and silt, some boulders	S-1
			14 - 15	3'		
	3'	5'	10 - 9		Medium dense, brown, fine to coarse sand and silt, some gravel	S-2
5'			9 - 10			
	5'	6' 4"	7 - 9	6'		S-3
			100 (4")		Cored through boulder from 6' 4" to 8'	
				8'		
10'	9'	11'	1 - 1		Very loose to loose, brown, fine to coarse sand, gravel and silt	S-4
			2 - 3	12'		
					Medium dense, gray, fine sand and silt, trace of peat, wood in sample	
15'	14'	16'	9 - 12			S-5
			11 - 8		Encountered an old wood pile at 14'	
				18'		
					Drove casing into old wood pile to 18', bottom of boring is 18'	

REMARKS: Used 3" flush joint casing/ wash boring method, cored with an NX roller bit

PROPORTIONS USED: TRACE = 0 to 10% SOME = 10 to 35% AND = 35 to 50%

BORING LOG B-1

J. A. McCue
WELL DRILLING, TEST BORING
71 Water Street, Pembroke MA
(781)826-9235
Commonwealth of Massachusetts Reg. #392
JOB LOCATION Damons Point Road, Marshfield MA
PROJECT NAME Proposed repairs
DATE STARTED 4/5/2014
DATE FINISHED 4/5/2013

Page 2 of 2
HOLE NO. B-1C
LINE & STATION
OFFSET
SURFACE LEVEL
WATER LEVEL 8' 6" at completion
BORING FOREMAN J. McCue
INSPECTOR John Obrien

SCALE IN FEET	SAMPLE DEPTH FROM	TO	30" BLOWS PER 6" ON SAMPLER	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS	SAMPLE NO.
	40'	42'	2 - 2		Loose gray, clayey silt	S-6
			2 - 3			
45'	44'	46'	3 - 2			S-7
			2 - 3			
				49'		
50'	49'	50'	16 - 15	50'	Medium dense, grayfan, fine sand and silt with gravel	S-8
	50'	51'	13 - 16		Medium dense, gray/ tan fine sand and silt	S-8A
55'				55'		
	55'	57'	16 - 27		Dense to very dense, gray/ brown, fine sand and silt some gravel	S-9
			26 - 28	58'		
60'	59'	61'	24 - 25		Dense to very dense, brown, fine to coarse sand, gravel and silt	S-10
			23 - 25			
	63'	65'	19 - 29 OE #300			S-11
65'			31 - 10 OE #300	65'		
					Bottom of boring is 65'	

REMARKS: Used 6" solid stem augers to 15' 3" flush joint casing/ wash boring method to bottom of boring

OE = open end rod used #300 = 300 pound hammer used

PROPORTIONS USED: TRACE = 0 to 10% SOME = 10 to 35% AND = 35 to 50%

BORING LOG B-2

J. A. McCue
WELL DRILLING, TEST BORING
71 Water Street, Pembroke MA
(781)826-9235
Commonwealth of Massachusetts Reg. #392
JOB LOCATION Damons Point Road, Marshfield MA
PROJECT NAME Proposed repairs
DATE STARTED 9/19/2013
DATE FINISHED 9/19/2013

Page 1 of 1
HOLE NO. B-3
LINE & STATION
OFFSET
SURFACE LEVEL
WATER LEVEL 11' at completion
BORING FOREMAN J. McCue
INSPECTOR John Obrien

SCALE IN FEET	SAMPLE DEPTH FROM	TO	30" BLOWS PER 6" ON SAMPLER	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS	SAMPLE NO.
				1'	Augered through asphalt to1'	
	1'	3'	22 - 41		Very dense, brown, fine to coarse, sand, gravel and silt some boulders	S-1
			79 - 20	3'		
	3'	5'	5 - 5		Medium dense to loose, brown, fine to coarse sand and silt, with gravel	S-2
5'			4 - 5			
	5'	7'	4 - 4		Loose, brown, fine to coarse sand, gravel and silt	S-3
			5 - 4			
	7'	9'	5 - 4			S-4
			4 - 5			
10'	9'	11'	5 - 4			S-5
			4 - 4	11'		
	11'	13'	2 - 2		Loose, brown, fine sand and silt, some gravel	S-6
			3 - 2	13'		
	13'	15'	5 - 4		Loose, brown, fine to coarse sand and silt, some gravel	S-7
15'			4 - 2	15'		
	15'	17'	1 (12")		Very loose, grey, silt and fine sand	S-8
			1 (12")			
	18'	20'	2 - 1			S-9
20'			2 - 2	20'		
					Bottom of boring is 20'	

REMARKS:

PROPORTIONS USED: TRACE = 0 to 10% SOME = 10 to 35% AND = 35 to 50%

BORING LOG B-3

J. A. McCue
WELL DRILLING, TEST BORING
71 Water Street, Pembroke MA
(781)826-9235
Commonwealth of Massachusetts Reg. #392
JOB LOCATION Damons Point Road, Marshfield MA
PROJECT NAME Proposed repairs
DATE STARTED 9/20/2013
DATE FINISHED 9/20/2013

Page 1 of 1
HOLE NO. B-4
LINE & STATION
OFFSET
SURFACE LEVEL
WATER LEVEL 11' at completion
BORING FOREMAN J. McCue
INSPECTOR John Obrien

SCALE IN FEET	SAMPLE DEPTH FROM	TO	30" BLOWS PER 6" ON SAMPLER	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS	SAMPLE NO.
				1'	Augered through asphalt to1'	
	1'	3'	37 - 27		Very dense, brown, fine to coarse sand, gravel and silt some boulders	S-1
			28 - 23	3'		
	3'	5'	15 - 14		Medium dense, brown, fine to coarse sand and silt, some gravel, piece of wood from 7' to 9'	S-2
5'			14 - 13			
	5'	7'	7 - 7			S-3
			3 - 3			
	7'	9'	5 - 13			S-4
			12 - 4			
10'	9'	11'	3 - 3		Loose, brown, fine to coarse sand and silt, some gravel	S-5
			3 - 4			
	12'	14'	4 - 5			S-6
			4 - 5			
15'				15'		
	15'	17'	3 - 2		Very loose, brown, fine sand and silt	S-7
			1 - 2	17'		
	18'	20'	4 - 4		Very loose, gray/black, silt and fine sand	S-8
20'			5 - 5	20'		
					Bottom of boring is 20'	

REMARKS:

PROPORTIONS USED: TRACE = 0 to 10% SOME = 10 to 35% AND = 35 to 50%

BORING LOG B-4

J. A. McCue
WELL DRILLING, TEST BORING
71 Water Street, Pembroke MA
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Commonwealth of Massachusetts Reg. #392
JOB LOCATION Damons Point Road, Marshfield MA
PROJECT NAME Proposed repairs
DATE STARTED 9/20/2013
DATE FINISHED 9/20/2013

Page 1 of 1
HOLE NO. B-5
LINE & STATION
OFFSET
SURFACE LEVEL
WATER LEVEL 11' at completion
BORING FOREMAN J. McCue
INSPECTOR John Obrien

SCALE IN FEET	SAMPLE DEPTH FROM	TO	30" BLOWS PER 6" ON SAMPLER	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS	SAMPLE NO.
				1'	Augered through asphalt to1'	
	1'	3'	28 - 26		Very dense, brown, fine to coarse sand, gravel and silt some boulders	S-1
			22 - 17	3'		
	3'	5'	17 - 13		Medium dense, brown, fine to coarse sand and silt, some gravel	S-2
5'			11 - 11			
	5'	7'	7 - 3	6'		S-3
			2 - 4		Loose, brown, fine to coarse sand and silt, some gravel	
	7'	9'	2 - 3			S-4
			3 - 4			
10'	9'	11'	3 - 2			S-5
			2 - 3			
	11'	13'	5 - 4			S-6
			4 - 3			
	13'	15'	5 - 4			S-7
15'			4 - 4	15'		
	15'	17'	3 - 2		Loose, gray, silt with fine sand	S-8
			1 (12")			
	18'	20'	2 - 2			S-9
20'			2 - 3	20'		
					Bottom of boring is 20'	

REMARKS:

PROPORTIONS USED: TRACE = 0 to 10% SOME = 10 to 35% AND = 35 to 50%

BORING LOG B-5

J. A. McCue
WELL DRILLING, TEST BORING
71 Water Street, Pembroke MA
(781)826-9235
Commonwealth of Massachusetts Reg. #392
JOB LOCATION Damons Point Road, Marshfield MA
PROJECT NAME Proposed repairs
DATE STARTED 9/20/2013
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Page 1 of 1
HOLE NO. B-6
LINE & STATION
OFFSET
SURFACE LEVEL
WATER LEVEL 11' at completion
BORING FOREMAN J. McCue
INSPECTOR John Obrien

SCALE IN FEET	SAMPLE DEPTH FROM	TO	30" BLOWS PER 6" ON SAMPLER	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS	SAMPLE NO.
				1'	Augered through asphalt to1'	
	1'	3'	26 - 26	2'	Very dense, brown, fine to coarse sand, gravel and silt	S-1
			11 - 10		Medium dense, brown, fine to coarse sand and silt, some gravel	
	3'	5'	11 - 7			S-2
5'			6 - 6			
	5'	7'	3 - 2		Loose, brown, fine to coarse sand and silt	S-3
			2 - 2			
	7'	9'	3 - 4			S-4
			4 - 5			
10'	9'	11'	3 - 5	10'		S-5
			5 - 5		Medium dense, brown, fine to coarse sand and silt	
	11'	13'	6 - 7	12'		S-6
			4 - 6		Loose, brown, fine to coarse sand and silt	
	13'	15'	4 - 3			S-7
15'			2 - 4	15'		
	15'	17'	2 - 4		Loose, grey silt with fine sand	S-8
			3 - 4			
	18'	20'	4 - 5			S-9
20'			3 - 4	20'		
					Bottom of boring is 20'	

REMARKS:

PROPORTIONS USED: TRACE = 0 to 10% SOME = 10 to 35% AND = 35 to 50%

BORING LOG B-6

DEPARTMENT OF PUBLIC WORKS
TOWN OF MARSHFIELD, MASSACHUSETTS

DAMONS POINT REVETMENT RESTORATION BORING LOGS

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11

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