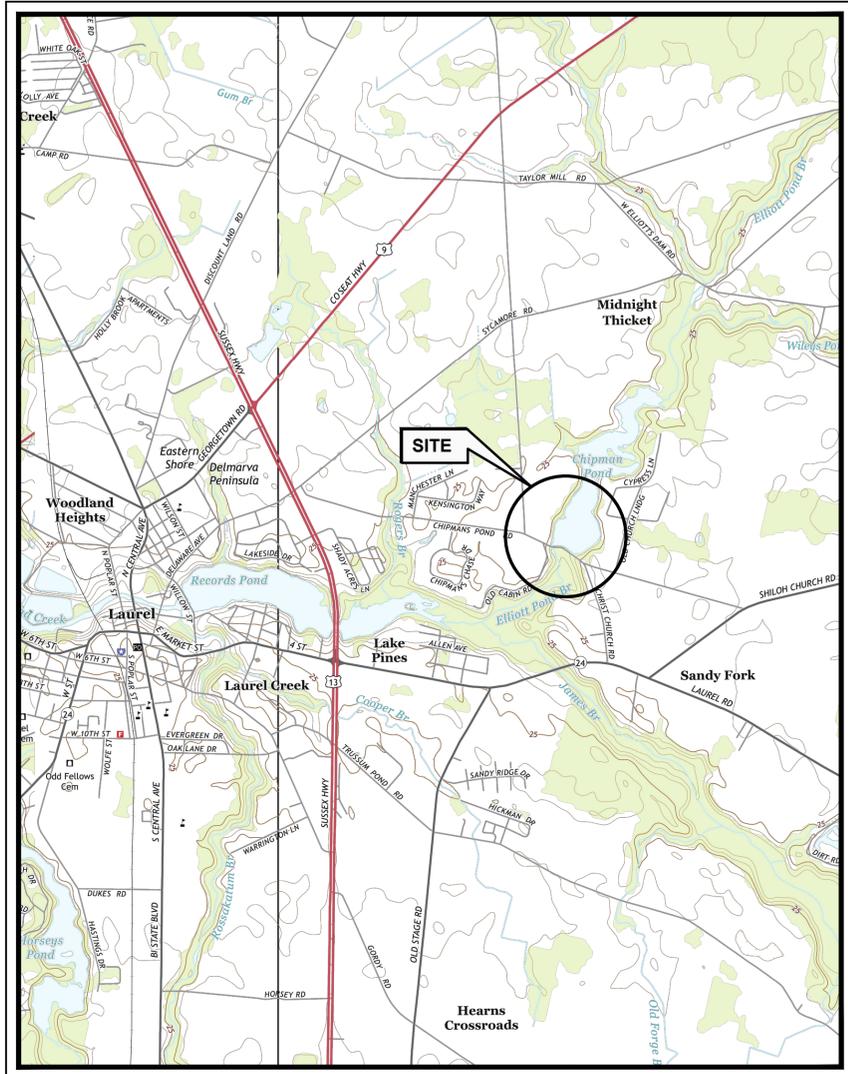


I:\DE-DO\REC-12804-61925-FLOOD-HAZ-INGEN\DOCS\1-CHIPMANS POND\DWG\SHEETS\49818-CH-C000-FD.DWG, 02/02/2017 4:23PM



ADAPTED FROM: LAUREL, DE U.S.G.S. 7.5 MIN. QUAD DATED 2014

**SITE LOCATION MAP**  
SCALE: 1"=2,000'

## CONTRACT DRAWINGS

# IMPROVEMENTS TO DELAWARE DAMS

# IMPROVEMENTS TO CHIPMANS POND DAM

CONTRACT NO.: NAT17001-DAMCONST

STATE OF DELAWARE, DNREC  
DIVISION OF WATERSHED STEWARDSHIP  
DOVER, DELAWARE

FEBRUARY 2017



## O'BRIEN & GERE

O'BRIEN & GERE ENGINEERS, INC.



*Robert R. Bowers*  
ROBERT R. BOWERS, P.E.  
DE. P.E. NO. 14412

IT IS A VIOLATION OF LAW FOR ANY PERSON UNLESS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER TO ALTER THIS DOCUMENT.

GENERAL ABBREVIATIONS

<b>"A"</b>		<b>"D"</b>		<b>"J"</b>		<b>"R"</b>	
& AB AC ACI ADD'L ADJ. AFF AFG AISC ALT. ALUM. ANSI AOBE APPD. APPROX. ASCE ASPH. ASTM AUTO AUX. AVG. AWS AWWA	AND AT ANCHOR BOLTS ABBREVIATION ACRE ACTUAL CUBIC FEET PER MINUTE AMERICAN CONCRETE INSTITUTE ADDITIONAL ADJUSTABLE ABOVE FINISHED FLOOR ABOVE FINAL GRADE AMERICAN INSTITUTE OF STEEL CONSTRUCTION ALTERNATE ALUMINUM AMERICAN NATIONAL STANDARDS INSTITUTE AS ORDERED BY ENGINEER APPROVED APPROXIMATE AMERICAN SOCIETY OF CIVIL ENGINEERS ASPHALT AMERICAN SOCIETY FOR TESTING AND MATERIALS AUTOMATIC AUXILIARY AVERAGE AMERICAN WELDING SOCIETY AMERICAN WATER WORKS ASSOCIATION	DISCH. DIV. DN. DP DPCO DPDT DPST DV DWG. DWL.	DISCHARGE DIVISION DOWN DIFFERENTIAL PRESSURE DECK PLATE CLEAN OUT DOUBLE POLE DOUBLE THROW DOUBLE THROW SINGLE THROW DIAPHRAGM VALVE DRAWING DOWEL	JST. JT.	JOIST JOINT	R RCP RD RECT. RED. REM. REF. REINF. REQ'D. REV. RM. RO ROW RR RT RX	RADIUS or RISER REINFORCED CONCRETE PIPE ROAD RECTANGLE or RECTANGULAR REDUCE or REDUCER REMOVE REFERENCE REINFORCE REQUIRED REVISED or REVISION ROOM ROUGH OPENING RIGHT-OF-WAY RAILROAD RIGHT REMOVE EXISTING
<b>"B"</b>		<b>"E"</b>		<b>"K"</b>		<b>"S"</b>	
B/ BAV B/E BF BFF BFG BFP BFV BITM. BLDG. BLK. BM. BOC BOCA BOF BOP BOT. BOW BRG. BRK. BS BSMT. BV BW	BOTTOM OF BALL VALVE BOTTOM ELEVATION BLIND FLANGE BELOW FINISHED FLOOR BELOW FINISHED GRADE BACK FLOW PREVENTER BACK FLOW (PREVENTER) VALVE BITUMINOUS BUILDING BLOCK BEAM or BENCHMARK BOTTOM OF CURB or BACK OF CURB BUILDING OFFICIAL'S & CODE ADMINISTRATION BOTTOM OF FOOTING BOTTOM OF PIPE BOTTOM BOTTOM OF WALL BEARING BRICK BOTH SIDES BASEMENT BUTTERFLY VALVE BUTT WELD	E. EA. ECV EF EJ EL ELEC. ELEV. ELL. EMBED. EMER. EMH ENGR. ENT. EO EOP EOS EQ. EQUIP. EQUIV. ETR EW EX.orEXIST. EXC. EXP EXP. STR.	EAST EACH ELECTRIC CHECK VALVE EACH FACE EXPANSION JOINT ELEVATION ELECTRIC or ELECTRICAL ELEVATION ELBOW EMBEDMENT EMERGENCY ELECTRIC MANHOLE ENGINEER ENTRANCE ELECTRIC OPERATOR EDGE OF PAVEMENT EDGE OF SHOULDER EQUAL EQUIPMENT EQUIVALENT EXISTING TO REMAIN EACH WAY EXISTING EXCAVATION EXPANSION or EXPOSED EXPOSED STRUCTURE	K. KCMIL KFT K-FT KGV KSF	KIPS (1K = 1000 POUNDS) THOUSAND CIRCULAR MILS KIP FOOT KIPS PER FOOT KNIFE GATE VALVE KIPS PER SQUARE FOOT	S SAN. S/C SCFM SCH. SD SE SEC. SECT. SEW. SF SHT. SICPP	SIGN or SOUTH SANITARY SITE/CIVIL STANDARD CUBIC FEET PER MINUTE SCHEDULE STORM DRAIN SOUTH EAST SECOND or SECONDARY SECTION SEWER SILT FENCE or SQUARE FOOT SHEET SMOOTH INTERIOR CORRUGATED POLYETHYLENE PIPE SLIDE GATE SIMILAR STORM INLET SEDIMENT TRAP STEEL JOIST STORM MANHOLE SOLVENT WELDED SPECIFICATION SQUARE SANITARY SEWER or STAINLESS STEEL SUB-SOIL DRAIN STORM or STREET STATION STANDARD STIFFENER STEEL STRUCTURAL STORM SEWER SLUICE GATE SUSPEND or SUSPENDED SOUTH WEST or SIDEWALK STORM WATER MANAGEMENT SYMMETRICAL or SYMMETRICALLY
<b>"C"</b>		<b>"F"</b>		<b>"M"</b>		<b>"T"</b>	
CANTIL. CB C/C CEM. CEM MORT CF CFM CFS CHAN. CI CISP CJ CL. CLR. CMH CMP CMU CO COL. COMBO. COMPT. CONC. CONN. CONST. CONST. JT. CONT. CONT'D. CONTR. CONTR. JT. COORD. CORR. CORRUG. CPC CRS. CS CSES. CSP CTR. Cu. CU. CV CX CY	CANTILEVER CATCH BASIN CENTER TO CENTER CEMENT CEMENT MORTAR CUBIC FEET CUBIC FEET PER MINUTE CUBIC FEET PER SECOND CHANNEL CAST IRON CAST IRON SOIL PIPE CONTROL JOINT CENTERLINE CLEAR COMMUNICATION MANHOLE CORRUGATED METAL PIPE CONCRETE MASONRY UNIT CLEAN OUT COLUMN COMBINATION COMPARTMENT CONCRETE CONNECTION CONSTRUCTION CONSTRUCTION JOINT CONTINUE or CONTINUOUS CONTINUED CONTRACT or CONTRACTOR CONTRACTION JOINT COORDINATE CORRIDOR CORRUGATED CHLORINATED POLYVINYL CHLORIDE COURSE CARBON STEEL or CASCADE STEPS COURSES CORRUGATED STEEL PIPE CENTER COPPER CUBIC CHECK VALVE CONNECT TO EXISTING CUBIC YARD	F/ FD FDN. F1E FEE FF F/F FFE FG FH FIG. FILL FIN. FL FLG. FLV FM FOC FPM FPS FR FRC FS FT FTG. FUT. FV F/W	FACE OF FLOOR DRAIN FOUNDATION FLANGE ONE END FLANGED EACH END FINISH FLOOR FACE TO FACE FINISH FLOOR ELEVATION FINISHED GRADE FIRE HYDRANT FIGURE FILL LINE FINISH FLOOR FLANGE FLAP VALVE FORCE MAIN FACE OF CONCRETE FEET PER MINUTE FEET PER SECOND FRAME FIBER REINFORCED CONCRETE FAR SIDE FEET or FOOT FOOTING FUTURE FIELD VERIFY FACE OF WALL	M. MAN. MAS. MATL. MAX. MD MECH. MEZZ. MFD. MFG. MFR. MGD MH MIN. MISC. MO MOD. MON. MOV. MTD. MTL. MV MW	MAIN CONTRACTOR MANUAL MASONRY MATERIAL MAXIMUM METAL DECK MECHANICAL MEZZANINE MANUFACTURED MANUFACTURING MANUFACTURER MILLION GALLONS PER DAY MANHOLE MINIMUM MISCELLANEOUS MASONRY OPENING MODIFICATION MONUMENT MOTOR OPERATED VALVE MOUNTED METAL MUD VALVE MONITORING WELL	T. T/ T&B TBR T/EL T&G TGL THK. THRD. TMH TOB TOC TOF TOL. TOP TOS TOT. TOW TYP.	TANGENT or TOP TOP OF TOP AND BOTTOM TO BE REMOVED TOP ELEVATION TONGUE AND GROOVE THEORETICAL GRADE LINE THICK THREADED TELEPHONE MANHOLE TOP OF BLOCK TOP OF CURB TOP OF FOOTING TOLERANCE TOP OF PIPE or TOP OF PLANK TOP OF SLAB or TOP OF STEEL TOTAL TOP OF WALL TYPICAL
<b>"G"</b>		<b>"H"</b>		<b>"N"</b>		<b>"U"</b>	
GAL. GALV. GB GEN GLV GOVT. GPH GPM GR GRTG. GS GV GW.	GALLON(S) GALVANIZED GRADE BEAM GENERAL GLOBE VALVE GOVERNMENT GALLONS PER HOUR GALLONS PER MINUTE GRADE OR GUARD RAIL OR GUIDE RAIL CRATING GALVANIZED STEEL GATE VALVE GRAVEL GROUNDWATER	HDPE HDW. HGT. HORIZ. HP HPT HS HT. HV HYD.	HIGH DENSITY POLYETHYLENE HARDWARE HEIGHT HORIZONTAL HORSE POWER HIGH POINT HIGH STRENGTH HEIGHT HAND VALVE HYDRANT	N. N/A NAT. NC NE NF NIC NO or # NOM. NOR. NPT NRS NS NTS NW	NORTH or NORTHING NOT APPLICABLE NATURAL NORMALLY CLOSED NORTH EAST NEAR FACE NOT IN CONTRACT NORMALLY OPEN or NUMBER NOMINAL NORMAL NATIONAL PIPE THREAD NON-RISING STEM NEAR SIDE NOT TO SCALE NORTH WEST	UD UG. UGE U.N.O. U/S USGS	UNDER DRAIN UNDERGROUND UNDERGROUND ELECTRIC UNLESS NOTED OTHERWISE UNDERSIDE OR UP STREAM UNITED STATES GEOLOGICAL SURVEY
<b>"I"</b>		<b>"O"</b>		<b>"P"</b>		<b>"V"</b>	
D DEG. DEMO. DEPT. DESCR. DET. DI DIA. or Ø DIAG. DIM. DIP	DRAIN DEGREE DEMOLISH or DEMOLITION DEPARTMENT DESCRIPTION DETAIL DUCTILE IRON DIAMETER DIAGONAL or DIAGRAM DIMENSION DUCTILE IRON PIPE	ID IF INCL IND. INFO. INSUL. IP IPF	IDENTIFICATION NUMBER or INSIDE DIAMETER INSIDE FACE INCH or INCHES or INVERT INCLUDED or INCLUDING INDUSTRIAL INFORMATION INSULATED or INSULATION IRON PIPE IRON PIN FOUND	OC OD OF OFALL. OFCI OFOI OH. OHE OPNG. OPP. OSHA OVFLOW. OZ.	ON CENTER OUTSIDE DIAMETER OUTSIDE FACE OUTFALL OWNER FURNISHED CONTRACTOR INSTALLED OWNER FURNISHED OWNER INSTALLED OVERHEAD OVERHEAD ELECTRIC OPENING OPPOSITE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION OVERFLOW OUNCE	VC VERT. VIF VOL.	VITRIFIED CLAY VERTICAL VERIFY IN FIELD VOLUME
<b>"Q"</b>		<b>"R"</b>		<b>"X"</b>		<b>"Y"</b>	
QTY. QUAL.	QUANTITY QUALITY	PAR. PCP PE PERF. PF PI PIV PL PLV PLWD. PNT. POC PP PREFAB. PRI. PROP. PSF PSI PT PV PVC PVT	PARALLEL PRECAST CONCRETE PLANK POLYETHYLENE PERFORATED PARSHALL FLUME POINT OF INTERSECTION PINCH VALVE PROPERTY LINE PLUG VALVE PLYWOOD POINT POINT OF CONNECTION POLYPROPYLENE PREFABRICATED PRIMARY PROPOSED POUNDS PER SQUARE FOOT POUNDS PER SQUARE INCH PRESSURE TREATED PLUG VALVE POLYVINYL CHLORIDE PAVEMENT	XS YD. YR.	EXTRA STRONG YARD YEAR		

INDEX OF DRAWINGS

SHT NO.	TITLE	REVISION
000	TITLE SHEET	REV. B
<b>GENERAL</b>		
G-1	ABBREVIATIONS, DRAWING INDEX & METHODS OF SECTIONING	REV. B
G-2	EXISTING CONDITIONS SITE PLAN	REV. B
G-3	DEMOLITION PLAN	REV. B
G-4	PROPOSED IMPROVEMENTS PLAN	REV. B
G-5	PROPOSED IMPROVEMENTS LAYOUT & GEOMETRY PLAN	REV. B
G-6	EROSION & SEDIMENTATION CONTROL PLAN & NOTES	REV. B
G-7	CONTRACTOR AREAS & EROSION & SEDIMENTATION CONTROL	REV. B
G-8	EROSION & SEDIMENTATION CONTROL NOTES AND DETAILS	REV. B
<b>STRUCTURAL</b>		
S-1	STRUCTURAL GENERAL NOTES & SPECIFICATIONS	REV. B
S-2	GATE FOUNDATION PLANS	REV. B
S-3	STRUCTURAL FRAMING PLANS	REV. B
S-4	STRUCTURAL FRAMING SECTIONS & DETAILS SHEET 1	REV. B
S-5	STRUCTURAL FRAMING SECTIONS & DETAILS SHEET 2	REV. B
S-6	BULKHEAD SECTIONS & DETAILS	REV. B
S-7	HANDRAIL FABRICATION DETAILS	REV. B
<b>MECHANICAL</b>		
M-1	NEW GATES, TRASH RACK & STOP LOG GUIDE DETAILS	REV. B
<b>REFERENCE DRAWINGS</b>		
REF-1	BORING LOGS	-

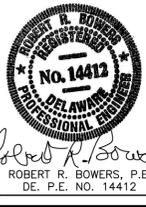
METHOD OF SECTIONING AND DETAILING

THE DRAWING UPON WHICH A SECTION, VIEW, OR DETAIL HAS BEEN TAKEN AND THE DRAWING UPON WHICH THE SECTION, VIEW, OR DETAIL HAS BEEN SHOWN IS CROSS-REFERENCED WITH SYMBOLS AS FOLLOWS.

DRAWING WHERE SECTION IS TAKEN	DRAWING WHERE DETAIL IS TAKEN
<p>THE DESIGNATION IN THE UPPER HALF OF THE CIRCLE IS THE SECTION NUMBER. THE BOTTOM DESIGNATION REFERS TO THE DRAWING NUMBER ON WHICH THE SECTION CAN BE FOUND.</p>	<p>THE DESIGNATION IN THE UPPER HALF OF THE CIRCLE IS THE DETAIL LETTER. THE BOTTOM DESIGNATION REFERS TO THE DRAWING NUMBER ON WHICH THE DETAIL CAN BE FOUND.</p>
DRAWING WHERE SECTION IS SHOWN	DRAWING WHERE DETAIL IS SHOWN
<p><b>SECTION</b></p> <p>THIS IS SHOWN UNDER EACH SECTION. THE TOP DESIGNATION IS THE SECTION NUMBER. THE BOTTOM DESIGNATION REFERS TO THE DRAWING NUMBER WHERE THE SECTION HAS BEEN TAKEN.</p>	<p><b>DETAIL</b></p> <p>THIS IS SHOWN UNDER EACH DETAIL. THE TOP DESIGNATION IS THE DETAIL LETTER. THE BOTTOM DESIGNATION REFERS TO THE DRAWING NUMBER WHERE THE DETAIL HAS BEEN TAKEN.</p>

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IN CHARGE OF	RRB				
DESIGNED BY	MAD				
CHECKED BY	DRP				
DRAWN BY	MK				
		0	02/02/2017	ISSUED FOR BID	RRB
		NO.	DATE	REVISION	INT.

O'BRIEN & GERE ENGINEERS, INC  
EAST NORRITON, PA

STATE OF DELAWARE DNREC  
DIVISION OF WATERSHED STEWARDSHIP  
IMPROVEMENTS TO DELAWARE DAMS  
DOVER, DELAWARE

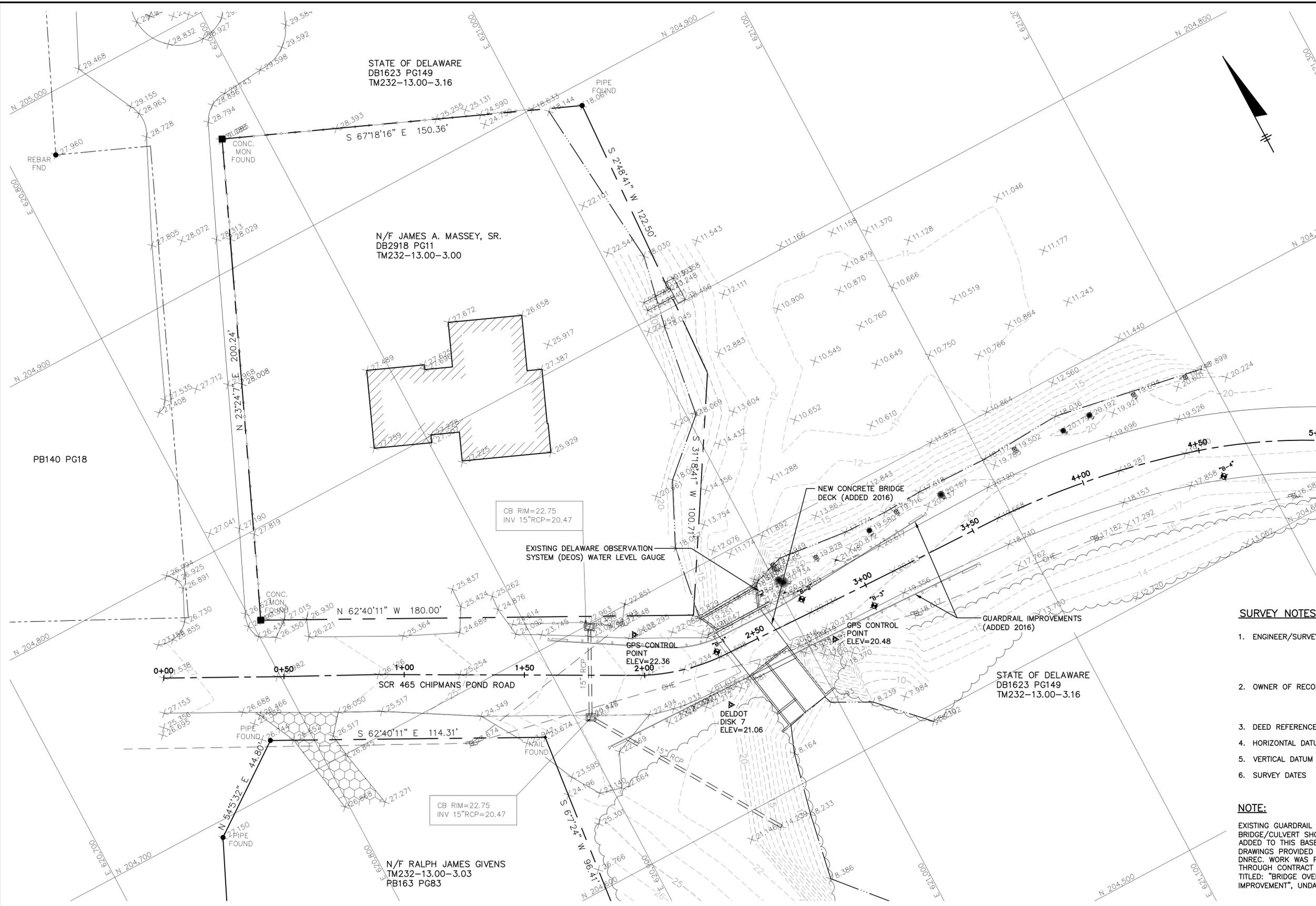
DNREC CONTRACT No.: NAT17001-DAMCONST

GENERAL  
IMPROVEMENTS TO CHIPMANS POND DAM  
ABBREVIATIONS, DRAWING INDEX &  
METHOD OF SECTIONING

FILE NO.  
12804.61925 - G01

DATE  
02/02/2017

G-1

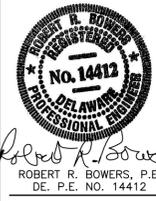


- LEGEND:**
- 30— MAJOR ELEVATION CONTOUR
  - 31— MINOR ELEVATION CONTOUR
  - EDGE OF WATER
  - ⊗15° DECIDUOUS TREE & SIZE
  - ⊗18° CONIFER TREE & SIZE
  - ▨ RIP RAP
  - ▨ CONCRETE
  - ~ TREELINE
  - "B-1" Ⓧ EXISTING BORING
  - △ GPS CONTROL POINT
  - ⊖ OVERHEAD ELECTRIC
  - ⊖ EXISTING SIGN

**SURVEY NOTES — CHIPMANS POND DAM:**

1. ENGINEER/SURVEYOR \* AXIOM ENGINEERING, L.L.C.  
18 CHESTNUT STREET  
GEORGETOWN, DE 19947  
PHONE: (302) 855-0810  
FAX: (302) 855-0812
2. OWNER OF RECORD \* DNREC  
STATE OF DELAWARE  
P.O. BOX 778  
DOVER, DE 19903
3. DEED REFERENCE \* BOOK 1623, PAGE 149
4. HORIZONTAL DATUM \* NAD83 DELAWARE STATE PLANE
5. VERTICAL DATUM \* NAVD88
6. SURVEY DATES \* AUGUST 13, 2015  
SEPTEMBER 14, 2015  
SEPTEMBER 16, 2015

**NOTE:**  
EXISTING GUARDRAIL AND NEW CONCRETE DECK SLAB OVER BRIDGE/CULVERT SHOWN ON THESE PLANS HAS BEEN ADDED TO THIS BASE SURVEY AUGUST 23, 2016 FROM DRAWINGS PROVIDED TO O'BRIEN & GERE ENGINEERS BY DNREC. WORK WAS PERFORMED IN 2016 BY DELDOT THROUGH CONTRACT NO. T201503301, BRIDGE NO. 3-362, TITLED: "BRIDGE OVER 3-362 CHIPMANS POND-GUARDRAIL IMPROVEMENT", UNDATED.



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IN CHARGE OF	RRB				
DESIGNED BY	SMS				
CHECKED BY	DRP				
DRAWN BY	MK				
	0	02/02/2017	ISSUED FOR BID	RRB	
	NO.	DATE	REVISION	INT.	

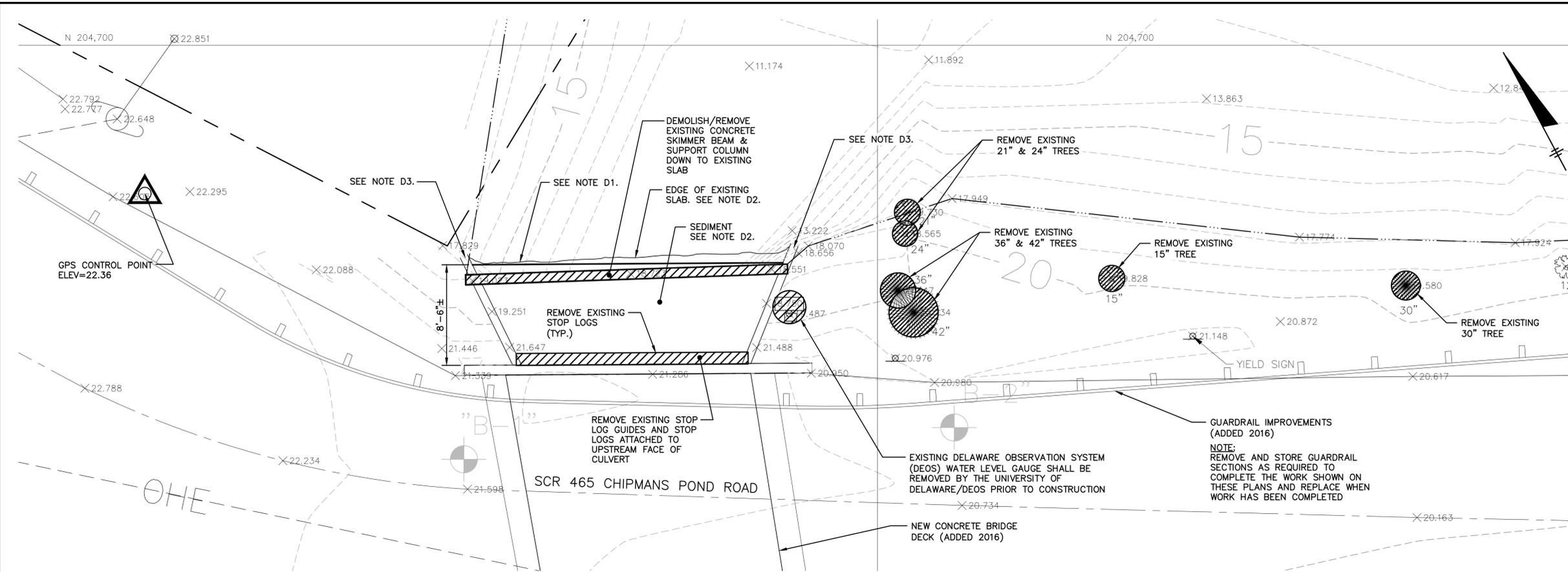
**O'BRIEN & GERE ENGINEERS, INC**  
EAST NORRITON, PA

STATE OF DELAWARE DNREC  
DIVISION OF WATERSHED STEWARDSHIP  
IMPROVEMENTS TO DELAWARE DAMS  
DOVER, DELAWARE

DNREC CONTRACT No.: NAT17001-DAMCONST

GENERAL IMPROVEMENTS TO CHIPMANS POND DAM EXISTING CONDITIONS SITE PLAN	FILE NO. 12804.61925 -G02	G-2
	DATE 02/02/2017	

SAVED: 9/13/16 11:10 AM  
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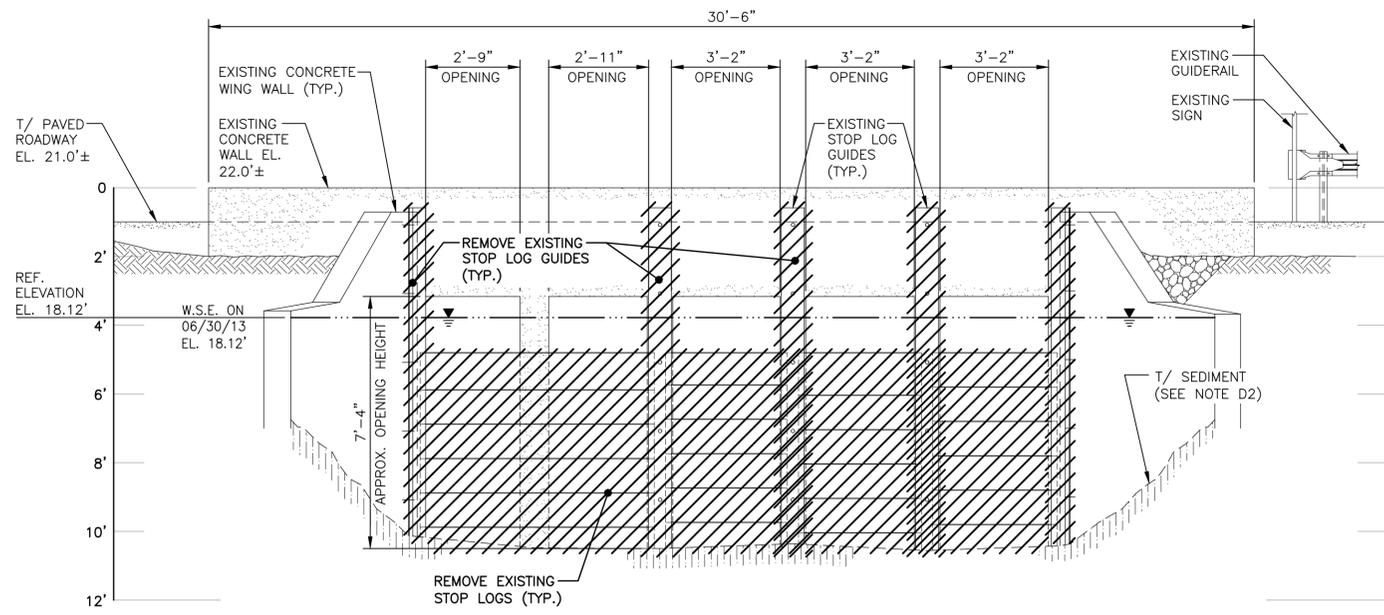
**EXISTING CULVERT - DEMOLITION PLAN**

SCALE: 1"=5'

- LEGEND:**
- 30- MAJOR ELEVATION CONTOUR
  - 31- MINOR ELEVATION CONTOUR
  - - - EDGE OF WATER
  - 15" DECIDUOUS TREE & SIZE
  - 18" CONIFER TREE & SIZE
  - ▨ RIP RAP
  - ▨ CONCRETE
  - ~ TREELINE
  - ⊕ "B-1" EXISTING BORING
  - △ GPS CONTROL POINT
  - - - OVERHEAD ELECTRIC
  - ⊙ EXISTING SIGN
  - ▨ DEMOLISH/REMOVE STRUCTURE

**DEMOLITION NOTES:**

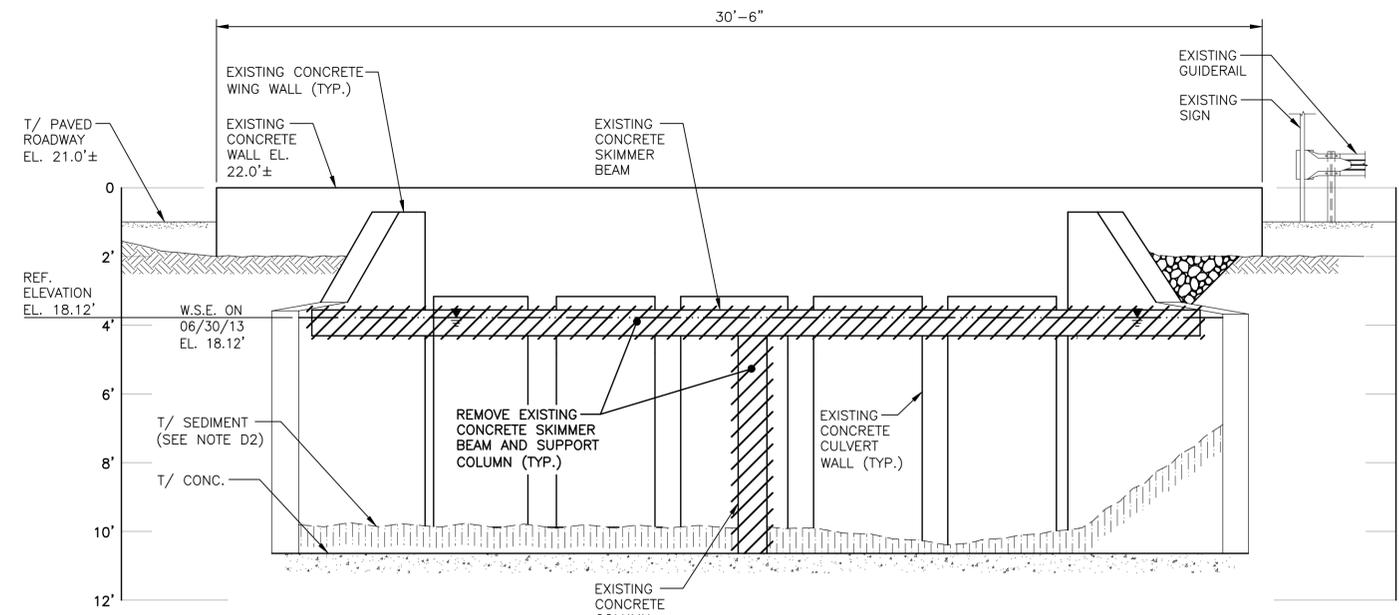
- D1. CONTRACTOR TO DIG TEST PIT AT EDGE OF EXISTING SLAB TO VERIFY SLAB THICKNESS AND TO ESTABLISH THE SLAB FOUNDATION CONDITIONS (BEARING ON SOIL, PILE SUPPORTED, WOOD OR METAL SHEETING, ETC.). FOR BIDDING PURPOSES, THE CONTRACTOR SHALL ASSUME THE TEST PIT IS 5 FT WIDE, 5 FT LONG, AND 3 FT DEEP. LOCATION TO BE DETERMINED IN THE FIELD BY THE ENGINEER AT THE START OF WORK, AFTER THE EXISTING STRUCTURE IS DEWATERED. SIZE AND DEPTH OF TEST PIT MAY CHANGE AT THE DISCRETION OF THE ENGINEER DURING CONSTRUCTION.
- D2. EDGE OF SLAB PROFILE AND SEDIMENT DEPTH SHOWN ARE BASED UPON DIVING REPORT FINDINGS PRESENTED IN "PROJECT 29-070-01, AGREEMENT 1433, TASK 6 - UNDERWATER BRIDGE INSPECTIONS, LETTER REPORT OF APRON INVESTIGATION AT STRUCTURE 3362-456" PREPARED BY COLLINS ENGINEERS, INC AND DATED SEPTEMBER 4, 2013. THE ACTUAL SLAB EDGE PROFILE AND SEDIMENT DEPTH MAY DIFFER FROM WHAT IS SHOWN ON THESE DRAWINGS. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS OF THE STRUCTURE WITHIN THE LIMITS OF THE WORK.
- D3. END OF WING WALL LOCATION IS UNKNOWN. CONTRACTOR TO V.I.F. (TYP BOTH WALLS)



**EXISTING CULVERT ELEVATION**

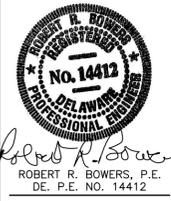
SCALE: 3/8"=1'-0"

NOTE: COLUMN AND BEAM NOT SHOWN FOR CLARITY.



**EXISTING COLUMN AND BEAM ELEVATION**

SCALE: 3/8"=1'-0"



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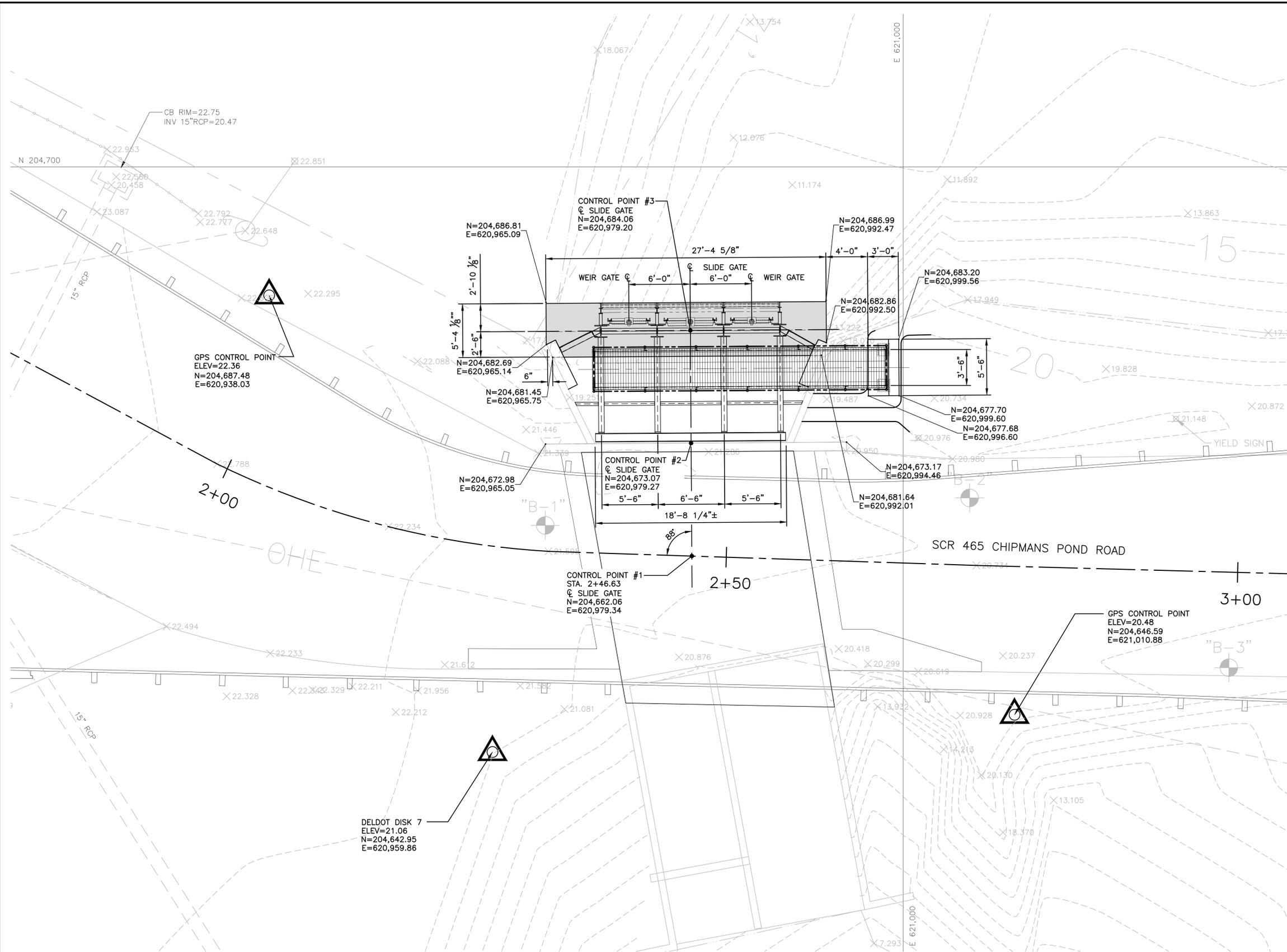
IN CHARGE OF	RRB				
DESIGNED BY	SMS				
CHECKED BY	DRP				
DRAWN BY	MK				
NO.	02/02/2017	ISSUED FOR BID		RRB	
		REVISION		INT.	



STATE OF DELAWARE DNREC  
 DIVISION OF WATERSHED STEWARDSHIP  
 IMPROVEMENTS TO DELAWARE DAMS  
 DOVER, DELAWARE

DNREC CONTRACT No.: NAT17001-DAMCONST	
GENERAL IMPROVEMENTS TO CHIPMANS POND DAM	FILE NO. 12804.61925 -G03
DEMOLITION PLAN	DATE 02/02/2017
	G-3

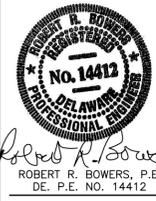




- LEGEND:**
- 30--- MAJOR ELEVATION CONTOUR
  - 31--- MINOR ELEVATION CONTOUR
  - EDGE OF WATER
  - ⊗15° DECIDUOUS TREE & SIZE
  - ⊗18° CONIFER TREE & SIZE
  - ▨ RIP RAP
  - ▨ CONCRETE
  - ~ TREELINE
  - ⊗ "B-1" EXISTING BORING
  - △ GPS CONTROL POINT
  - OVERHEAD ELECTRIC
  - ⊕ EXISTING SIGN

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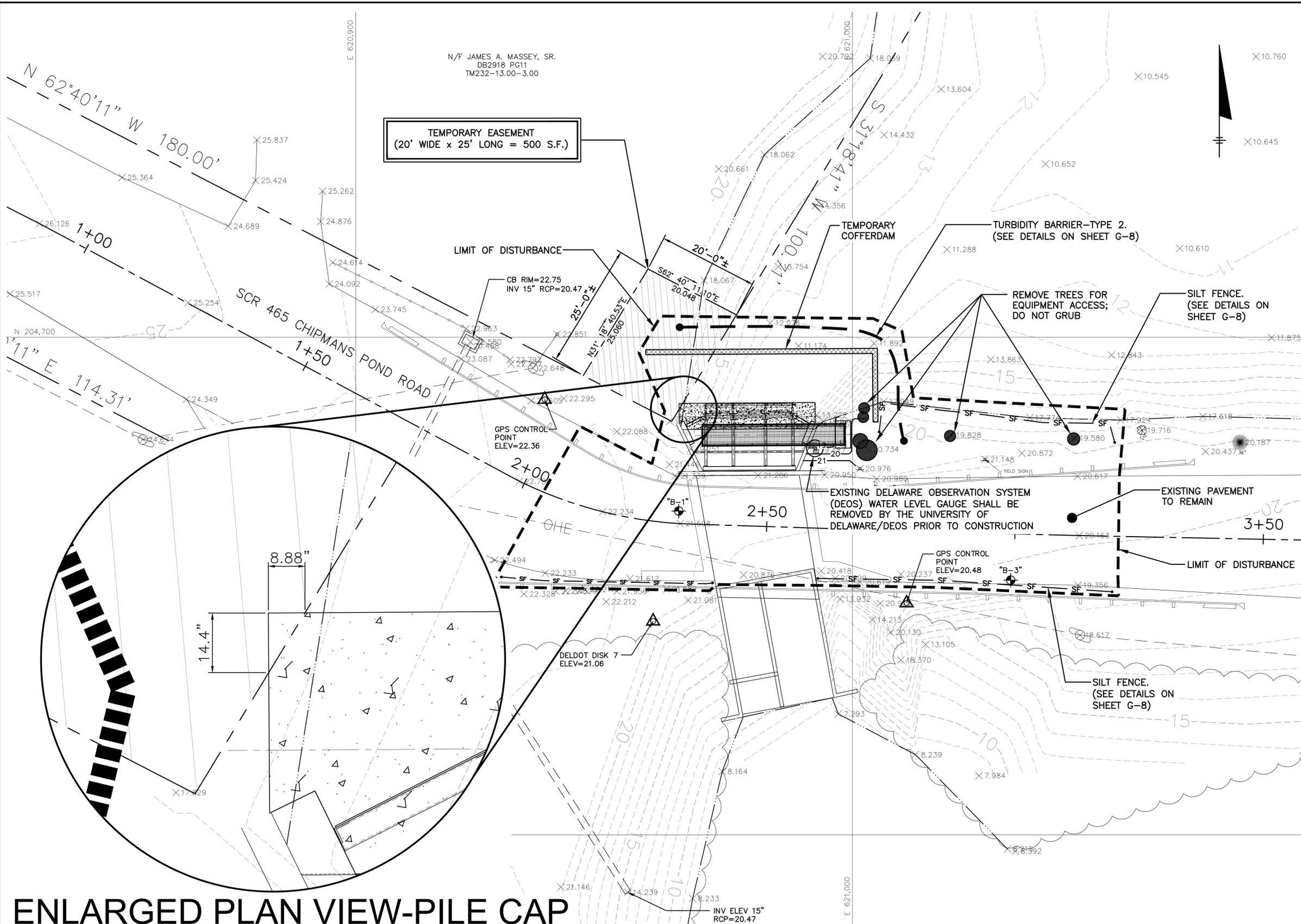


IN CHARGE OF	RRB				
DESIGNED BY	SMS				
CHECKED BY	DRP				
DRAWN BY	MK				
		0	02/02/2017	ISSUED FOR BID	RRB
		NO.	DATE	REVISION	INT.

  
**O'BRIEN & GERE ENGINEERS, INC**  
 EAST NORRITON, PA

**STATE OF DELAWARE DNREC**  
 DIVISION OF WATERSHED STEWARDSHIP  
 IMPROVEMENTS TO DELAWARE DAMS  
 DOVER, DELAWARE

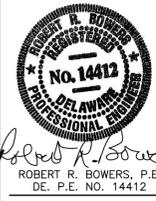
DNREC CONTRACT No.: NAT17001-DAMCONST		G-5
GENERAL IMPROVEMENTS TO CHIPMANS POND DAM PROPOSED IMPROVEMENTS LAYOUT & GEOMETRY PLAN	FILE NO. 12804.61925 -G05 DATE 02/02/2017	



- LEGEND:**
- 30--- MAJOR ELEVATION CONTOUR
  - 31--- MINOR ELEVATION CONTOUR
  - --- EDGE OF WATER
  - 15' DECIDUOUS TREE & SIZE
  - 18' CONIFER TREE & SIZE
  - ▭ RIP RAP
  - ▭ CONCRETE
  - TREELINE
  - ⊕ "B-1" EXISTING BORING
  - △ GPS CONTROL POINT
  - OVERHEAD ELECTRIC
  - ⊕ EXISTING SIGN
  - LIMIT OF DISTURBANCE
  - SF --- SILT FENCE
  - TURBIDY BARRIER
  - ▭ TEMPORARY COFFERDAM

- SEQUENCE OF CONSTRUCTION**
- THE FOLLOWING IS A GENERAL SEQUENCE OF CONSTRUCTION INTENDED AS A GENERAL OUTLINE OF EARTH DISTURBANCE ACTIVITIES AND INSTALLATION OF EROSION AND SEDIMENTATION CONTROL MEASURES. THE CONTRACTOR MAY ADJUST THE TIMING AND SEQUENCE OF CERTAIN ACTIVITIES AS NECESSARY, PROVIDED THAT THE INTENDED EROSION CONTROL MEASURES ARE IN PLACE AND FUNCTIONAL PRIOR TO EARTH DISTURBANCE ACTIVITIES OCCURRING.
1. DELINEATE APPROVED LIMITS OF DISTURBANCE WITH SURVEY STAKES AND FLAGS OR ORANGE CONSTRUCTION FENCING. CONTRACTOR SHALL NOT PERFORM ANY EARTH DISTURBANCE ACTIVITIES OUTSIDE OF THE APPROVED LIMITS OF DISTURBANCE.
  2. INSTALL OFFSITE SIGNAGE ACCORDING TO THE APPROVED DETOUR PLAN AS NEEDED TO CLOSE CHIPMANS POND ROAD TO TRAFFIC.
  3. INSTALL SILT FENCE ALONG SHORELINE OF CHIPMANS POND AND SOUTHERN SIDE OF CHIPMANS POND ROAD AS INDICATED ON THE EROSION AND SEDIMENT CONTROL PLANS.
  4. REMOVE TREES AS NEEDED FOR EQUIPMENT ACCESS. DO NOT GRUB OR STRIP TOPSOIL.
  5. INSTALL TURBIDITY BARRIER, TEMPORARY COFFERDAM AND OTHER CONTROL OF WATER MEASURES AS NEEDED TO BYPASS NORMAL FLOW TO THE DOWNSTREAM CHANNEL.
  6. DEMOLISH EXISTING SKIMMER BEAM AND SUPPORT COLUMN, AND SAWCUT EDGE OF EXISTING CONCRETE APRON.
  7. INSTALL PILES AND CONCRETE FOUNDATIONS FOR NEW OUTLET GATES AND ACCESS BRIDGE. PERFORM ANY REPAIRS TO THE EXISTING CONCRETE APRON AND HEADWALL AS DIRECTED.
  8. INSTALL STEEL FRAMING AND NEW OUTLET GATES ACCORDING TO THE APPROVED PLANS AND DETAILS.
  9. INSTALL CONCRETE ABUTMENT AND STEEL WALKWAY AND HANDRAILS.
  10. STABILIZE ALL DISTURBED AREAS WITH TOPSOIL SEEDING AND STRAW MULCH.
  11. ONCE NEW OUTLET STRUCTURE AND GATES HAVE BEEN TESTED FOR WATERTIGHTNESS AND PROPER FUNCTION, REMOVE TURBIDITY BARRIER AND TEMPORARY UPSTREAM COFFERDAM TO ALLOW NORMAL FLOW TO PASS THROUGH THE NEW OUTLET STRUCTURE.
  12. REMOVE TEMPORARY FLOW BYPASS MEASURES AND RESTORE AREAS WITH TOPSOIL SEEDING AND STRAW MULCH OR PAVEMENT RESTORATION AS NEEDED.
  13. SWEEP EXISTING PAVEMENT AND DELINEATE AREAS FOR REPAIR. PERFORM MILL AND OVERLAY ACCORDING TO DELDOT STANDARDS AS NECESSARY.
  14. ONCE ALL DISTURBED AREAS HAVE ACHIEVED PERMANENT STABILIZATION CONSISTING OF A MINIMUM 80% UNIFORM PERENNIAL VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER, NOTIFY DNREC CONSTRUCTION REVIEWER TO SCHEDULE FINAL SITE INSPECTION. UPON AUTHORIZATION OF THE CONSTRUCTION REVIEWER REMOVE ALL REMAINING TEMPORARY SOIL EROSION AND SEDIMENT CONTROL BMP'S INCLUDING SILT FENCE, ETC. ANY AREA DISTURBED DURING THE REMOVAL OF A TEMPORARY BMP SHALL BE IMMEDIATELY STABILIZED WITH TOPSOIL SEEDING AND STRAW MULCH.

# ENLARGED PLAN VIEW-PILE CAP



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CHECKED BY	DRP				
DRAWN BY	MK				
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		REVISION		INT.	

**O'BRIEN & GERE ENGINEERS, INC**  
EAST NORRITON, PA

STATE OF DELAWARE DNREC  
DIVISION OF WATERSHED STEWARDSHIP  
IMPROVEMENTS TO DELAWARE DAMS  
DOVER, DELAWARE

DNREC CONTRACT No.: NAT17001-DAMCONST

GENERAL  
IMPROVEMENTS TO CHIPMANS POND DAM  
EROSION & SEDIMENTATION  
CONTROL PLAN & NOTES

FILE NO. 12804.61925-G06	<b>G-6</b>
DATE 02/02/2017	



**LEGEND:**

- 30--- MAJOR ELEVATION CONTOUR
- 31--- MINOR ELEVATION CONTOUR
- --- EDGE OF WATER
- 15' DECIDUOUS TREE & SIZE
- 18' CONIFER TREE & SIZE
- RIP RAP
- CONCRETE
- TREELINE
- "B-1" EXISTING BORING
- GPS CONTROL POINT

**LEGEND (CONT.):**

- OVERHEAD ELECTRIC
- EXISTING SIGN
- LIMIT OF DISTURBANCE
- SF --- SILT FENCE
- SECURITY FENCE
- TURBIDITY BARRIER
- TEMPORARY COFFERDAM
- SURVEYED PROPERTY BOUNDARY
- PROPERTY BOUNDARY OBTAINED FROM GIS (SEE NOTE 2)

**PROPERTY SURVEY NOTES:**

- ENGINEER/SURVEYOR \* AXIOM ENGINEERING, L.L.C.  
18 CHESTNUT STREET  
GEORGETOWN, DE 19947  
PHONE: (302) 855-0810  
FAX: (302) 855-0812
- OWNER OF RECORD DNREC  
STATE OF DELAWARE  
DOVER, DE 19903
- DEED REFERENCE \* BOOK 1623, PAGE 149
- HORIZONTAL DATUM \* NAD83 DELAWARE STATE PLANE
- VERTICAL DATUM \* NAVD88
- SURVEY DATES \* AUGUST 13, 2015  
SEPTEMBER 14, 2015  
SEPTEMBER 16, 2015

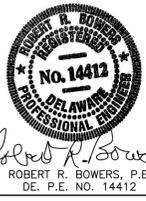
**NOTES:**

- EXISTING GUARDRAIL AND NEW CONCRETE DECK SLAB OVER BRIDGE/CULVERT SHOWN ON THESE PLANS HAS BEEN ADDED TO THIS BASE SURVEY AUGUST 23, 2016 FROM DRAWINGS PROVIDED TO O'BRIEN & GERE ENGINEERS BY DNREC. WORK WAS PERFORMED IN 2016 BY DELDOT THROUGH CONTRACT NO. T201503301, BRIDGE NO. 3-362, TITLED: "BRIDGE OVER 3-362 CHIPMANS POND-GUARDRAIL IMPROVEMENT", UNDATED.
- ADJACENT PROPERTY BOUNDARIES DATA SET OBTAINED FROM DELAWARE GIS DATAMIL. IT WAS ORIGINALLY DEVELOPED AS PART OF A PROJECT INVOLVING THE DELAWARE OFFICE OF STATE PLANNING COORDINATION, SUSSEX COUNTY, AND THE NATURE CONSERVANCY. IT IS MAINTAINED BY THE SUSSEX COUNTY MAPPING AND ADDRESSING DEPARTMENT. THESE BOUNDARIES ARE ONLY A VISUAL REPRESENTATION AND NOT ENGINEERING ACCURATE.

**SEQUENCE OF CONSTRUCTION**

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O'BRIEN & GERE ENGINEERS, INC  
EAST NORRITON, PA

STATE OF DELAWARE DNREC  
DIVISION OF WATERSHED STEWARDSHIP  
IMPROVEMENTS TO DELAWARE DAMS  
DOVER, DELAWARE

DNREC CONTRACT No.: NAT17001-DAMCONST

GENERAL  
IMPROVEMENTS TO CHIPMANS POND DAM  
CONTRACTOR AREAS & EROSION  
& SEDIMENTATION CONTROL

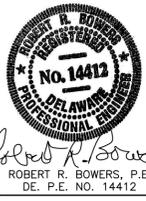
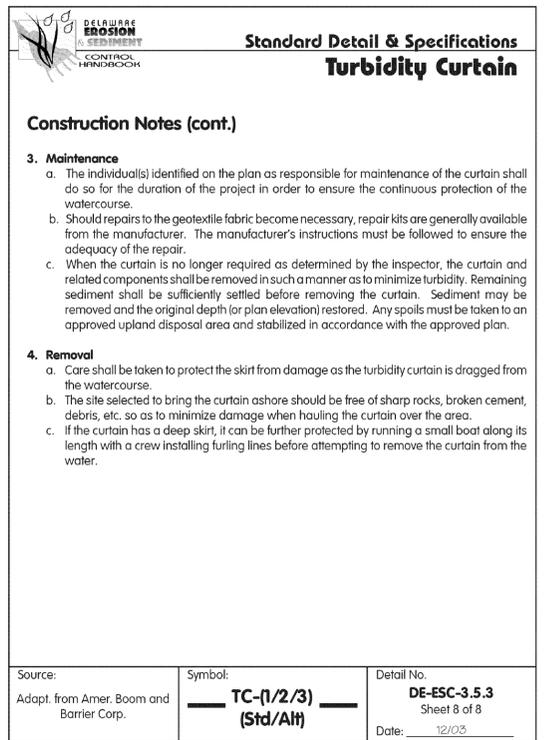
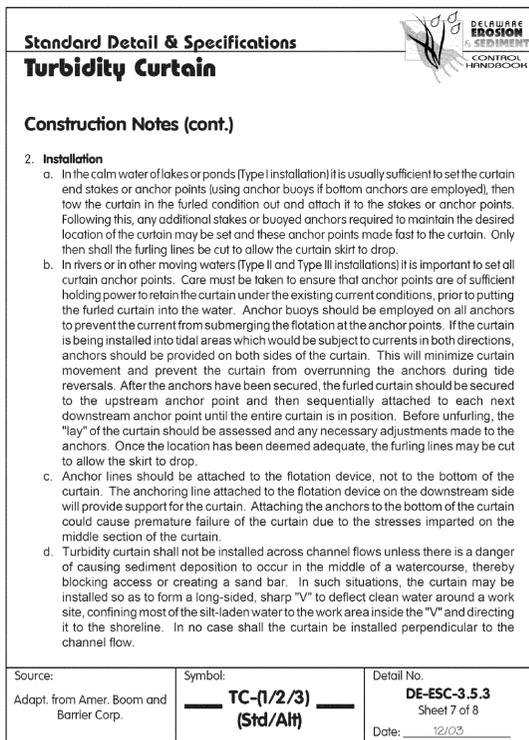
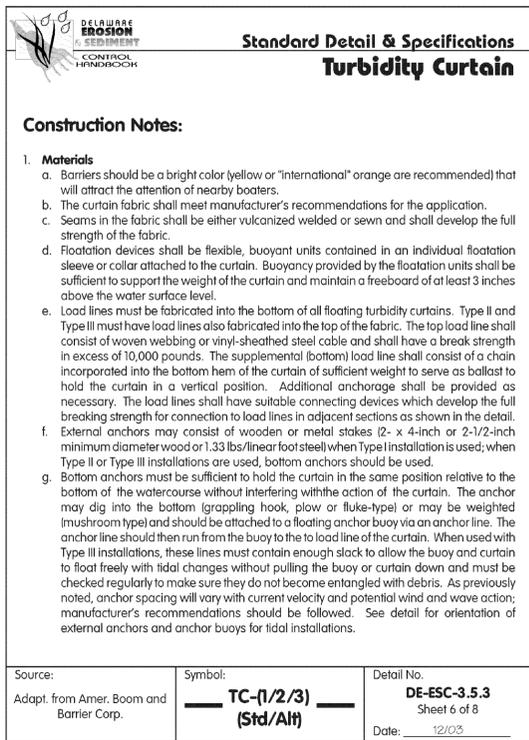
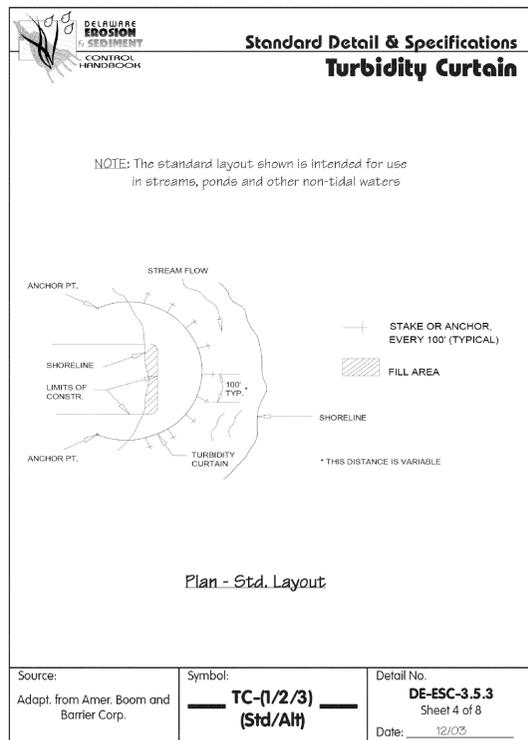
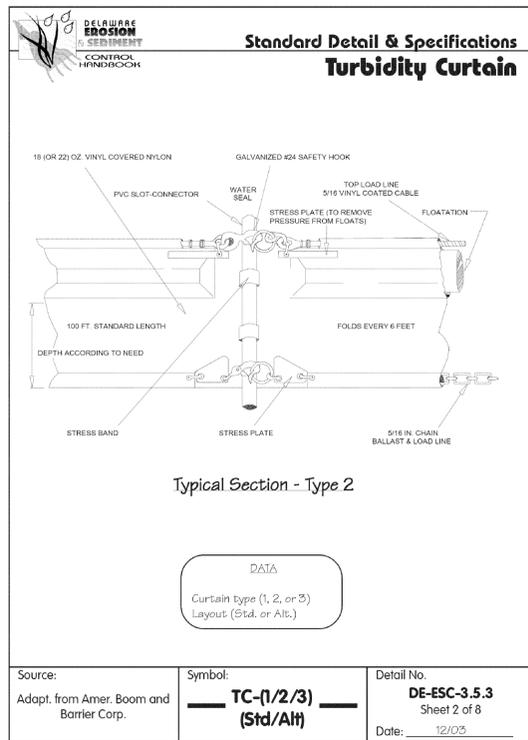
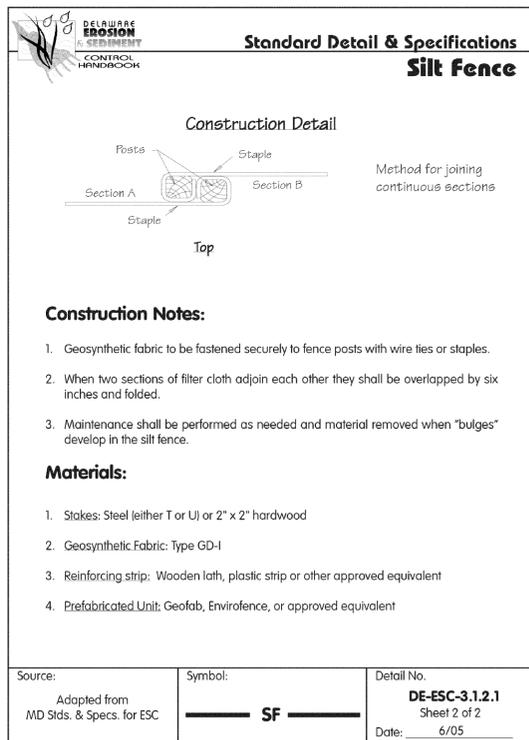
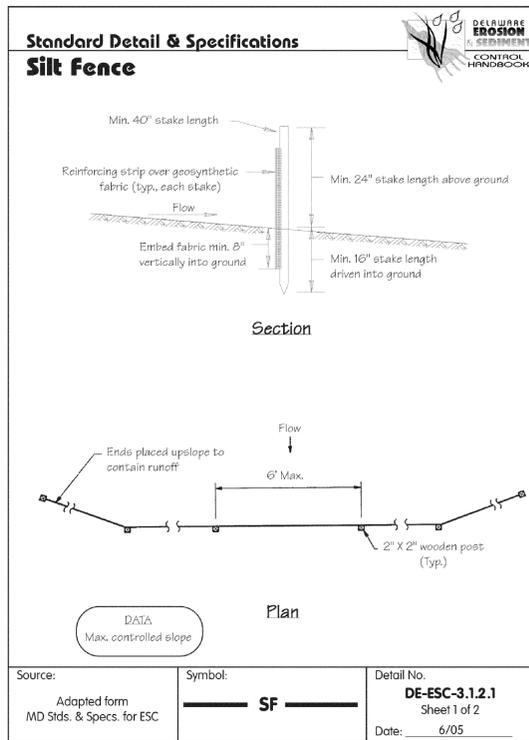
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02/02/2017

G-7

**EROSION AND SEDIMENT CONTROL NOTES**

- ALL SEDIMENT AND EROSION CONTROL PRACTICES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT DELAWARE EROSION AND SEDIMENT CONTROL HANDBOOK.
- DNREC HAS OBTAINED ALL NECESSARY ENVIRONMENTAL PERMITS. CONSTRUCTION SHALL BEGIN AFTER THE RECEIPT OF ALL NECESSARY FEDERAL, STATE, COUNTY AND LOCAL PERMITS. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL PERMITS HAVE BEEN OBTAINED AND THAT COPIES ARE AVAILABLE ON THE PROJECT SITE. THE CONTRACTOR IS RESPONSIBLE FOR PERFORMING ANY PRE-CONSTRUCTION NOTIFICATIONS REQUIRED AS GENERAL OR SPECIAL CONDITIONS OF ANY PERMIT.
- AT LEAST SEVEN (7) DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, THE CONTRACTOR SHALL INVITE ANY AND ALL SUBCONTRACTORS INVOLVED IN THOSE ACTIVITIES, THE LANDOWNERS, THE EROSION AND SEDIMENTATION CONTROL PLAN PREPARER AND THE DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL (DNREC) SEDIMENT AND STORMWATER PROGRAM TO A PRE-CONSTRUCTION MEETING ON THE PROJECT SITE.
- ANY CONCERNS BY THE CONTRACTOR REGARDING THE PROPOSED EROSION AND SEDIMENT CONTROL PLANS AND/OR DETAILS MUST BE SUBMITTED AT THE PRE-CONSTRUCTION MEETING. ANY DEVIATION FROM THE APPROVED EROSION AND SEDIMENT CONTROL PLANS REQUIRES WRITTEN APPROVAL BY DNREC.
- IF THE APPROVED PLAN NEEDS TO BE MODIFIED, ADDITIONAL SEDIMENT AND STORMWATER CONTROLS MAY BE REQUIRED AS DEEMED NECESSARY BY DNREC.
- AT LEAST THREE (3) WORKING DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES SHALL NOTIFY MISS-UTILITY OF DELMARVA (TELEPHONE 811) 800-282-8555 OR 800-441-8355 FOR BURIED UTILITY LOCATIONS.
- REVIEW AND/OR APPROVAL OF THE EROSION AND SEDIMENT CONTROL PLAN(S) SHALL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR COMPLIANCE WITH THE REQUIREMENTS OF THE SEDIMENT AND STORMWATER REGULATIONS, NOR SHALL IT RELIEVE THE CONTRACTOR FROM ANY ERRORS OR OMISSIONS IN THE APPROVED PLANS.
- ALL APPLICABLE EROSION AND SEDIMENT CONTROL PRACTICES MUST BE IN PLACE PRIOR TO ANY EARTH DISTURBANCE ACTIVITIES, INCLUDING CLEARING AND GRUBBING, EXCAVATION, GRADING OR UTILITY WORK.
- THE DNREC SEDIMENT AND STORMWATER PROGRAM MUST BE NOTIFIED AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF EARTH DISTURBANCE ACTIVITIES. FAILURE TO DO SO CONSTITUTES A VIOLATION OF DELAWARE SEDIMENT AND STORMWATER REGULATIONS.
- THE LIMITS OF DISTURBANCE (LOD) LINE IS TO BE STAKED BY THE CONTRACTOR AS SHOWN ON THE FINAL APPROVED E&S PLANS PRIOR TO ANY DISTURBANCE.
- FOLLOWING SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION CONTROLS SHALL BE COMPLETED WITHIN FOURTEEN (14) CALENDAR DAYS.
- THE CONTRACTOR WILL BE RESPONSIBLE TO PROVIDE A RESPONSIBLE INSPECTOR WITH A CERTIFICATION OF TRAINING AT A DNREC SPONSORED OR APPROVED TRAINING COURSE FOR THE CONTROL OF EROSION AND SEDIMENT DURING CONSTRUCTION (I.E. A BLUE CARD HOLDER). THE BLUE CARD HOLDER SHALL PREPARE AN INSPECTION REPORT AFTER EACH INSPECTION. REPORTS SHALL INCLUDE THE DATE THAT ALL IDENTIFIED DEFICIENCIES MUST BE RESOLVED AND ARE TO BE SIGNED BY THE BLUE CARD HOLDER. INSPECTION REPORTS SHALL BE EMAILED OR FAXED TO THE CONTRACTOR, ENGINEER AND TO THE DNREC SEDIMENT AND STORMWATER PROGRAM OR AS DIRECTED AT THE PRECONSTRUCTION MEETING.
- ANY REQUEST TO DEVIATE FROM THE WEEKLY INSPECTIONS MUST BE APPROVED IN WRITING BY DNREC.
- ANY ERODED AREAS SHALL BE STABILIZED AND ANY ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF IN AN APPROPRIATE MANNER.



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DRAWN BY	MK	0	02/02/2017	ISSUED FOR BID	RRB
		NO.	DATE	REVISION	INT.



STATE OF DELAWARE DNREC  
 DIVISION OF WATERSHED STEWARDSHIP  
 IMPROVEMENTS TO DELAWARE DAMS  
 DOVER, DELAWARE

DNREC CONTRACT No.: NAT17001-DAMCONST

GENERAL IMPROVEMENTS TO CHIPMANS POND DAM EROSION & SEDIMENTATION CONTROL NOTES & DETAILS	FILE NO. 12804.61925 - G08	G-8
	DATE 02/02/2017	

**STRUCTURAL GENERAL NOTES:**

- THE FOLLOWING NOTES APPLY, UNLESS OTHERWISE NOTED OR SHOWN ON PLANS.
- ALL WORK SHALL CONFORM TO THE LATEST EDITIONS OF THE REFERENCES LISTED IN THESE GENERAL NOTES. WHERE CONFLICTS ARISE BETWEEN THE SPECIFICATIONS, REFERENCES, NOTES, & DRAWINGS, THE MOST STRINGENT REQUIREMENT SHALL GOVERN.
- WORK THESE STRUCTURAL DRAWINGS WITH THE GENERAL, CIVIL, & MECHANICAL DRAWINGS. VERIFY & COORDINATE DIMENSIONS ON THE STRUCTURAL DRAWINGS WITH WHAT IS SHOWN ON THE GENERAL, CIVIL, & MECHANICAL DRAWINGS.
- SECTIONS & DETAILS SHOWN ON THE DRAWINGS ARE TYPICAL, UNLESS NOTED OTHERWISE. USE SIMILAR CONSTRUCTION AT LOCATIONS NOT SPECIFICALLY DETAILED.
- THE CONTRACTOR SHALL VERIFY AND/OR ESTABLISH ALL EXISTING SITE CONDITIONS BEFORE BEGINNING THE WORK. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY IF THE FIELD CONDITIONS DO NOT PERMIT THE INSTALLATION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- THE CONTRACTOR SHALL MAINTAIN THE STRUCTURAL INTEGRITY AND SERVICEABILITY OF THE EXISTING STRUCTURES WITHIN THE WORK AREA.
- JOB SITE SAFETY ALONG WITH CONSTRUCTION MEANS & METHODS ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
- CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND PRODUCT DATA AS INDICATED. THE ENGINEER SHALL HAVE A MINIMUM OF TEN (10) BUSINESS DAYS TO REVIEW THESE SUBMITTALS. THE SUBMITTALS SHALL BEAR THE CONTRACTOR'S STAMP OF APPROVAL WHICH SHALL CONSTITUTE CERTIFICATION THAT HE HAS VERIFIED ALL CONSTRUCTION CRITERIA, MATERIALS, & SIMILAR DATA & HAS CHECKED EACH DRAWING FOR COMPLETENESS, COORDINATION, & COMPLIANCE WITH THE CONTRACT DOCUMENTS. SHOP DRAWINGS THAT ARE REPRODUCTIONS/COPIES OF THE CONTRACT DRAWINGS SHALL BE REJECTED.
- ALL MATERIALS SHALL BE STORED TO PROTECT THEM FROM THE ELEMENTS.

**FOUNDATION & GEOTECHNICAL NOTES:**

- ALL FOUNDATIONS FOR THIS PROJECTS ARE DEEP FOUNDATIONS UNLESS NOTED OTHERWISE ON THE DRAWINGS. THE DEEP FOUNDATION SYSTEM CONSISTS OF GROUPS OF FRICTION PILES CAST INTO A REINFORCED CONCRETE PILE CAP.
- ALL PILES SHALL BE STEEL H-PILES. MINIMUM TIP & PILE HEAD ELEVATIONS, LOCATIONS, BATTER FROM THE VERTICAL, ETC ARE SHOWN ON THE STRUCTURAL DRAWINGS. DESIGN COMPRESSION CAPACITY=30 kips, DESIGN TENSION CAPACITY=19 kips.
- NATIVE SOILS UNDER THE CONCRETE PILE CAPS SHALL BE EVALUATED BY THE ENGINEER BEFORE CONCRETE PLACEMENT. THERE SHALL BE NO STANDING WATER OR DELETERIOUS MATERIAL WITHIN THE EXCAVATION AT THE TIME OF CONCRETE PLACEMENT, AND THE SOIL SHALL BE CAPABLE OF SAFELY SUPPORTING 2,000 PSF. IF NATIVE SOILS ARE NOT SATISFACTORY, THE ENGINEER WILL DIRECT THE CONTRACTOR TO OVER-EXCAVATE AND PLACE No. 57 AGGREGATE OR FLOWABLE FILL TO BOTTOM OF PILE CAP ELEVATION.
- STRUCTURAL BACKFILL SHALL BE PLACED LOOSE IN 8 IN. MAXIMUM LIFTS AND COMPACTED TO NOT LESS THAN 90% OF MAXIMUM DRY DENSITY ACCORDING TO ASTM D1557.
- EXCAVATED SOILS SHALL BE STOCKPILED FOR REUSE AS COMPACTED BACKFILL SUITABLE TO THE ENGINEER. IF ENCOUNTERED, UNSUITABLE SOILS & MATERIALS SUCH AS ORGANICS, DEBRIS, & PLASTIC FINE GRAINED SOILS SHALL BE SEPARATED FROM THE STOCKPILED BACKFILL. IF EXCAVATED SOILS ARE NOT SUITABLE OR IF INSUFFICIENT QUANTITY OF SUITABLE EXCAVATED SOILS ARE RECOVERED, IMPORTED FILL COMPLYING WITH ASTM D2487, GROUPS SM, SW, & SP, MAY BE USED.

**CAST-IN-PLACE CONCRETE NOTES:**

- FOR CONCRETE WORK, FOLLOW EM 1110-2-2104 "STRENGTH DESIGN FOR REINFORCED-CONCRETE HYDRAULIC STRUCTURES" US ARMY CORPS OF ENGINEERS AS SUPPLEMENTED BY ACI 301 AND 318. FOLLOW ACI 306R FOR COLD WEATHER CONCRETE WORK AND ACI 305R FOR HOT WEATHER CONCRETE WORK. FOLLOW ACI 315 DETAILING CONCRETE REINFORCEMENT AND ACCESSORIES.
- CONCRETE MIX SHALL BE PROPORTIONED IN ACCORDANCE TO ACI 318 AND SHALL MEET THE MINIMUM REQUIREMENTS HEREIN. CONTRACTOR SHALL SUBMIT LABORATORY TEST REPORTS FOR CONCRETE MATERIALS, MIX DESIGNS TO THE ENGINEER FOR REVIEW BEFORE PROCUREMENT OF MATERIALS AND EXECUTION OF THE CONCRETE WORK.
- MINIMUM 28-DAY CONCRETE COMPRESSIVE STRENGTH: 4,000 P.S.I.
- MAXIMUM WATER TO CEMENTITIOUS MATERIALS RATIO: 0.45
- MAXIMUM DESIGN SLUMP (+/- 1"):  
BEFORE ADDING HIGH-RANGE WATER REDUCER.....2" TO 4"  
AFTER ADDING HIGH-RANGE WATER REDUCER.....7" (ABS MAX)
- PORTLAND CEMENT: ASTM C150 TYPE 1A OR 2A. USE ONLY ONE BRAND THROUGHOUT THE PROJECT UNLESS OTHERWISE ACCEPTABLE TO THE ENGINEER.
- THE FOLLOWING MATERIALS MAY BE USED TO REDUCE THE PORTLAND CEMENT PORTION OF THE CEMENTITIOUS MATERIALS CONTENT, BUT THESE MATERIALS MAY NOT EXCEED 20% OF THE TOTAL CEMENTITIOUS MATERIALS CONTENT:  
  
POZZOLANS: ASTM C618 CLASS C OR F  
GROUND GRANULATED BLAST FURNACE SLAG: ASTM C989, GRADE 80.
- CONCRETE SHALL BE AIR ENTRAINED 5% TO 7%. AIR ENTRAINMENT ADMIXTURE SHALL CONFORM TO C260 AND SHALL BE COMPATIBLE WITH OTHER ADMIXTURES.

**CAST-IN-PLACE CONCRETE NOTES (CONTINUED):**

- THE CONTRACTOR MAY USE THE FOLLOWING ADMIXTURES:  
  
WATER-REDUCER: ASTM C 494 TYPE A  
WATER-REDUCER/RETARDER: ASTM C 494 TYPE D  
WATER-REDUCER/ACCELERATOR: ASTM C 494 TYPE E  
HIGH-RANGE WATER REDUCER: ASTM 494 TYPE F OR G  
  
NOTE: CALCIUM CHLORIDE IS NOT PERMITTED IN ANY ADMIXTURE.
- NORMAL WEIGHT AGGREGATES SHALL BE COARSE AND FINE AGGREGATES CONFORMING TO ASTM C-33. LIMIT COARSE AGGREGATE SIZE IN ACCORDANCE TO ACI 318.
- CAST SIX (6) TEST CYLINDERS FOR EACH DAY'S POUR: 3 FIELD CURED AND 3 LABORATORY CURED. TEST 1 FIELD CURED AND 1 LABORATORY CURED CYLINDER AT 7 DAYS AND AT 28 DAYS, HOLD THE LAST TWO IN RESERVE. CONTRACTOR SHALL NOTE THE TRUCK AND BATCH NUMBER AND THE LOCATION OF WHERE THE SAMPLED CONCRETE WAS PLACED ON EACH TEST CYLINDER. CONTRACTOR SHALL SUBMIT TEST RESULTS TO THE ENGINEER.
- THE CONTRACTOR SHALL ENGAGE A TESTING AGENCY ACCEPTABLE TO THE ENGINEER TO PERFORM MATERIAL EVALUATION TESTS AND TO DESIGN CONCRETE MIXES.
- CHAMFER EXPOSED CORNERS OF CONCRETE 3/4 IN UNLESS NOTED OTHERWISE.
- CONCRETE REINFORCING: DEFORMED BARS, ASTM A-615, GRADE 60
- ALL LAP SPLICES FOR DEFORMED BARS SHALL BE CLASS "B" SPLICES UNLESS NOTED OTHERWISE. IF USED, MECHANICAL COUPLERS SHALL MEET ACI 318 REQUIREMENTS.
- SUBMIT SHOP DRAWINGS FOR CONCRETE REINFORCING DETAILING, FABRICATION, BENDING, AND PLACEMENT. SHOP DRAWINGS SHALL COMPLY WITH ACI 315 REQUIREMENTS AND SHALL SHOW BAR SCHEDULES, STIRRUP SPACING, BENT BAR DIAGRAMS, AND ARRANGEMENT OF CONCRETE REINFORCEMENT.
- CAST-IN-PLACE CONCRETE COVER FOR REINFORCING U.N.O. ON THE DRAWINGS:  
CONCRETE CAST AGAINST EARTH ..... 4"  
ALL OTHER CONCRETE:  
#6 BAR & LARGER ..... 2"  
#5 BAR & SMALLER ..... 2"
- THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND CONSTRUCTION OF ALL FORMWORK AND FALSEWORK REQUIRED FOR THE CONCRETE WORK. FORMWORK FOR CAST-IN-PLACE CONCRETE SHALL BE CONSTRUCTED TO BE SUBSTANTIAL AND UNYIELDING THAT WILL CONFORM TO THE SPECIFIED DIMENSIONS AND PROVIDE SMOOTH SURFACES. FORMWORK CONSTRUCTION SHALL CONFORM TO ACI MANUAL OF CONCRETE PRACTICE ACI 347 CH.2, PART 2.4. FORM RELEASE AGENTS SHALL BE NON-STAINING COMMERCIAL FORMULATION WITH MAXIMUM 350 g/L VOLATILE ORGANIC COMPOUNDS. FORMWORK MAY BE REMOVED ONCE THE CONCRETE TEST CYLINDERS HAVE ATTAINED 75% OF 28-DAY COMPRESSIVE STRENGTH. FORMS SHALL BE REMOVED IN SUCH A WAY AS TO PREVENT DAMAGE TO THE CONCRETE.
- THE CONCRETE SHALL BE MOIST-CURED BY ONE OR BOTH THE FOLLOWING METHODS:  
MOISTURE-RETAINING COVER, COMPLYING WITH ASTM C171  
CURING COMPOUND COMPLYING WITH ASTM C309, TYPE 1
- WHERE REQUIRED, LOCATE CONSTRUCTION JOINTS IN THE CENTER-1/3 OF SPAN, AND NOT CLOSER THAN 3 FT. FROM AN SUPPORTING PILE.
- CONSTRUCTION JOINTS SHALL HAVE A SHEAR KEY 1-1/2 IN. DEEP x 1/3-JOINT-WIDTH. ALSO PROVIDE A TENSION CLASS "B" LAP OF REINFORCING. USE ROUGHENED JOINT WHERE INDICATED ON THE DRAWINGS. PROVIDE 6" HEAVY DUTY PVC WATERSTOP (GREENSTREAK TYPE 749 OR APPROVED EQUAL).
- CONTRACTOR SHALL PROVIDE CONTROL JOINTS AS INDICATED ON THE DRAWINGS.

**STRUCTURAL STEEL & ALUMINUM NOTES:**

- FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO "THE MANUAL OF STEEL CONSTRUCTION - ALLOWABLE STRENGTH DESIGN", FOURTEENTH EDITION, 2010, AMERICAN INSTITUTE OF STEEL CONSTRUCTION INCLUDING ANSI/AISC 360-10 "SPECIFICATIONS FOR STRUCTURAL STEEL BUILDING", SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH STRENGTH BOLTS, AND AISC CODE OF STANDARD PRACTICE, EXCEPT SECTIONS 7.9.
- ALL WELDING SHALL BE PERFORMED BY CERTIFIED WELDERS AND SHALL CONFORM TO "STRUCTURAL WELDING CODE - STEEL ANSI/AWS D1.1-2010" AND "STRUCTURAL WELDING CODE - ALUMINUM ANSI/AWS D1.2" AMERICAN WELDING SOCIETY.
- WIDE FLANGES, CHANNELS, WT'S, HP'S, AND OTHER STRUCTURAL SHAPES: ASTM A992 OR ASTM A572, GRADE 50.
- STEEL PLATES, BARS, AND ANGLES: ASTM A36.
- HOLLOW STRUCTURAL SECTIONS: (SQUARE OR RECT.) ASTM A500, GRADE B.
- HOLLOW STRUCTURAL SECTIONS: (ROUND) ASTM A501.
- STAINLESS STEEL FOR STRUCTURAL SHAPES, BARS, & PLATES: ASTM A304
- ALUMINUM ALLOY FOR STRUCTURAL SHAPES: 6061 T-6 . APPLY BITUMINOUS TAR COATING TO ALUMINUM SURFACES IN CONTACT WITH DISSIMILAR METALS.
- ALL BOLTED CONNECTIONS SHALL BE AS INDICATED ON THE DRAWINGS. SLIP-CRITICAL BOLTS ARE MARKED "SC" ON THE DRAWINGS AND SHALL BE PRE-TENSIONED TO 29 kips IN ACCORDANCE WITH AISC REQUIREMENTS FOR 3/4" DIA. BOLTS.
- ANCHOR BOLTS SHALL CONFORM TO ASTM A307 WITH OVERSIZED WASHER OR PLATE HEADED ENDS. HOOKED ANCHORS ARE NOT PERMITTED.
- WELDING ELECTRODES: E70-XX SERIES FOR STEEL. PROVIDE ALUMINUM ALLOY 5356 FOR ALUMINUM WELDS.
- HOT-DIP GALVANIZING: ASTM A123.
- NONMETALLIC, NON-SHRINK GROUT: ASTM C1107. MINIMUM COMPRESSIVE STRENGTH AT 28-DAYS = 5,000 PSI.
- CEMENT GROUT: PORTLAND CEMENT, ASTM C150, TYPE I. MINIMUM COMPRESSIVE STRENGTH AT 28-DAYS = 5,000 PSI.
- GAS CUTTING OF MAIN STRUCTURAL MEMBERS IN THE FIELD WILL NOT BE PERMITTED.
- SUBMIT SHOP DRAWINGS FOR FABRICATION AND ERECTION OF STRUCTURAL STEEL. CLEARLY INDICATE COORDINATED DIMENSIONS OF MECHANICAL UNITS, FLOOR OR ROOF PENETRATIONS, ETC. SHOP AND ERECTION DRAWINGS MUST SHOW ALL SHOP AND FIELD WELDS.
- THE GENERAL CONTRACTOR AND STEEL ERECTOR SHALL NOTIFY THE ENGINEER OF ANY FABRICATION OR ERECTION ERRORS OR DEVIATIONS AND RECEIVE WRITTEN APPROVAL BEFORE ANY FIELD CORRECTIONS ARE MADE.
- ALL STEEL SHALL BE HOT-DIP GALVANIZED, UNLESS NOTED OTHERWISE ON THE DRAWINGS. SPIRAL WELDED PIPE PILES SHALL BE PLAIN STEEL.
- FIELD WELDED SURFACES WITHIN FOUR (4") INCHES OF WELD SHALL BE CLEANED AND GROUND SMOOTH. AFTER WELDING COAT THE EXPOSED AREA WITH APPROPRIATE PRIMER/PANTS AS REQUIRED.
- VISUALLY INSPECT ALL FILLET WELDS. TEN PERCENT (10%) OF ALL FILED FILLET WELDS IN PRIMARY CONNECTIONS AND MULTI-PASS WELDS SHALL BE TESTED BY THE MAGNETIC PARTICLE METHOD, OR AS OTHERWISE STATED IN THE SPECIFICATIONS.
- FIELD TEST BOLTED CONNECTIONS IN ACCORDANCE WITH AISC SPECIFICATIONS.
- WHERE SLIP-CRITICAL BOLTS ARE INDICATED ON THE DRAWINGS, THE CONNECTION FAYING SURFACES SHALL BE VISIBLY ROUGHENED TO MEET RCSC SECTION 3.2.2(C) REQUIREMENTS.



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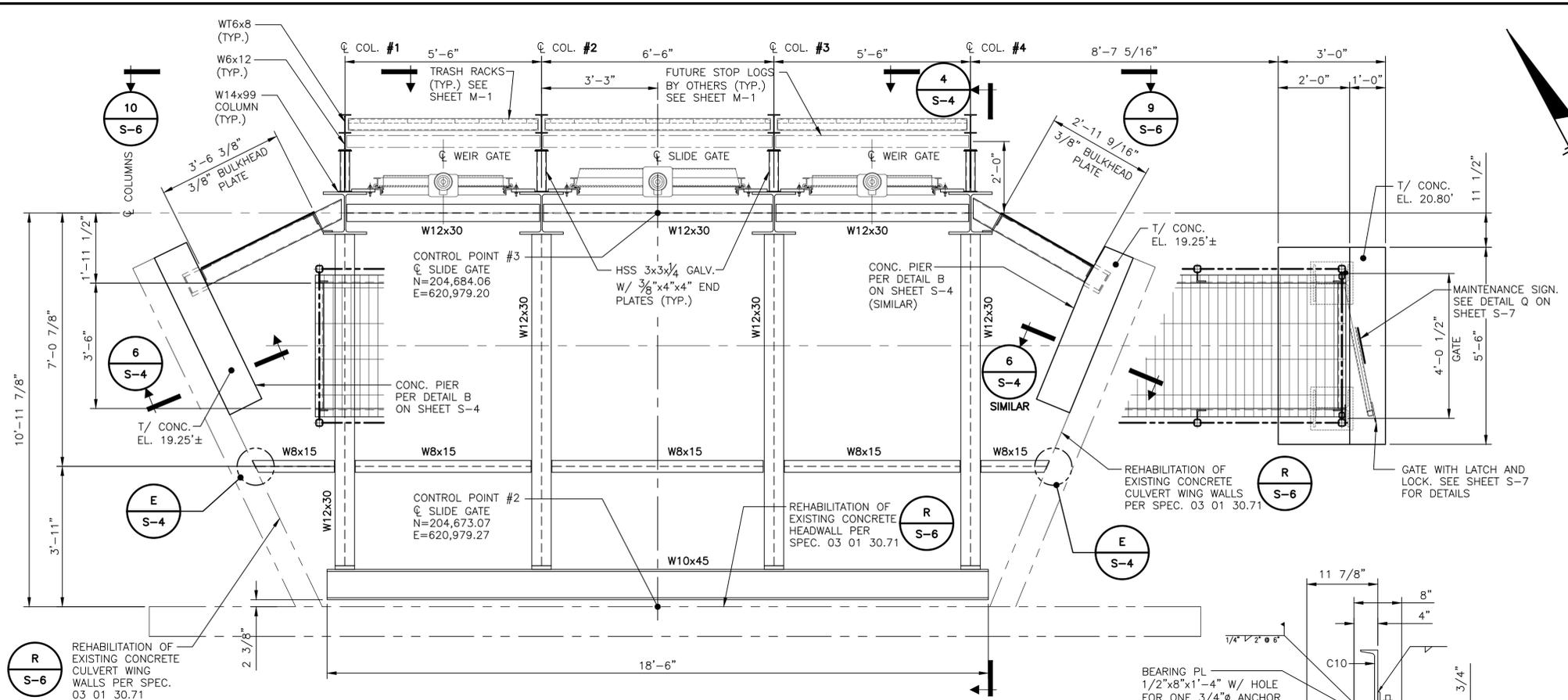
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DESIGNED BY	MAD				
CHECKED BY	DRP				
DRAWN BY	MK				
		0	02/02/2017	ISSUED FOR BID	RRB
		NO.	DATE	REVISION	INT.



STATE OF DELAWARE DNREC  
DIVISION OF WATERSHED STEWARDSHIP  
IMPROVEMENTS TO DELAWARE DAMS  
DOVER, DELAWARE

DNREC CONTRACT No.: NAT17001-DAMCONST	
STRUCTURAL IMPROVEMENTS TO CHIPMANS POND DAM STRUCTURAL GENERAL NOTES AND SPECIFICATIONS	FILE NO. 12804.61925 -S01 DATE 02/02/2017
	S-1

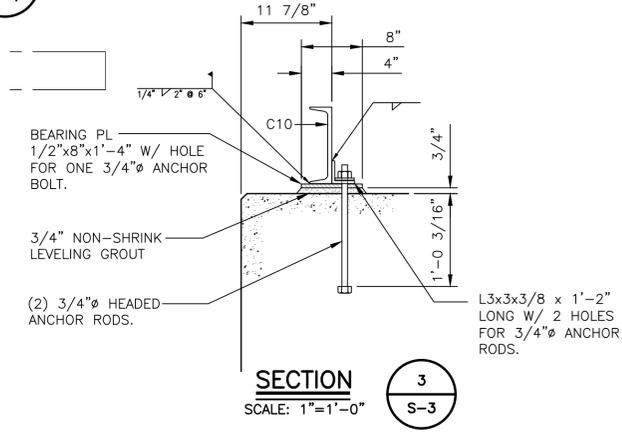




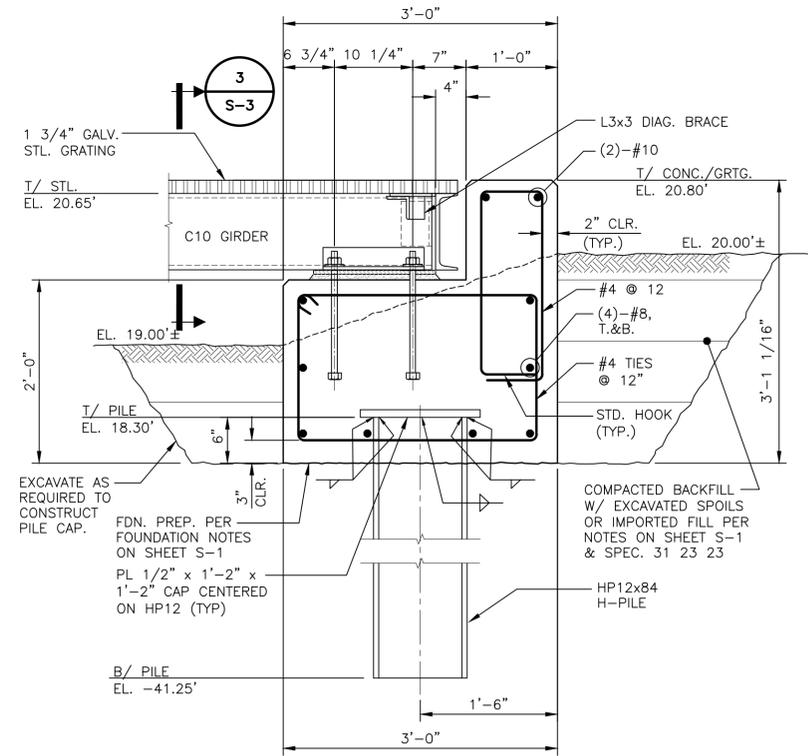
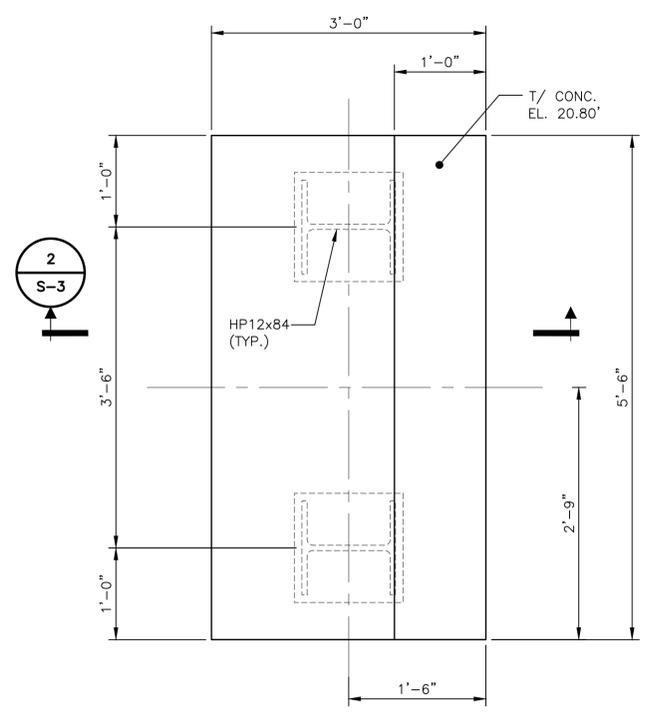
**GATE SUPPORT STRUCTURAL FRAMING PLAN @ EL. 19.82'**  
SCALE: 1/2"=1'-0"

**PLAN NOTES:**

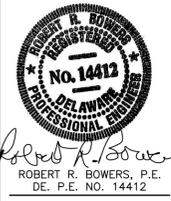
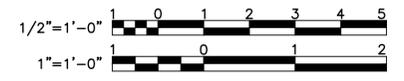
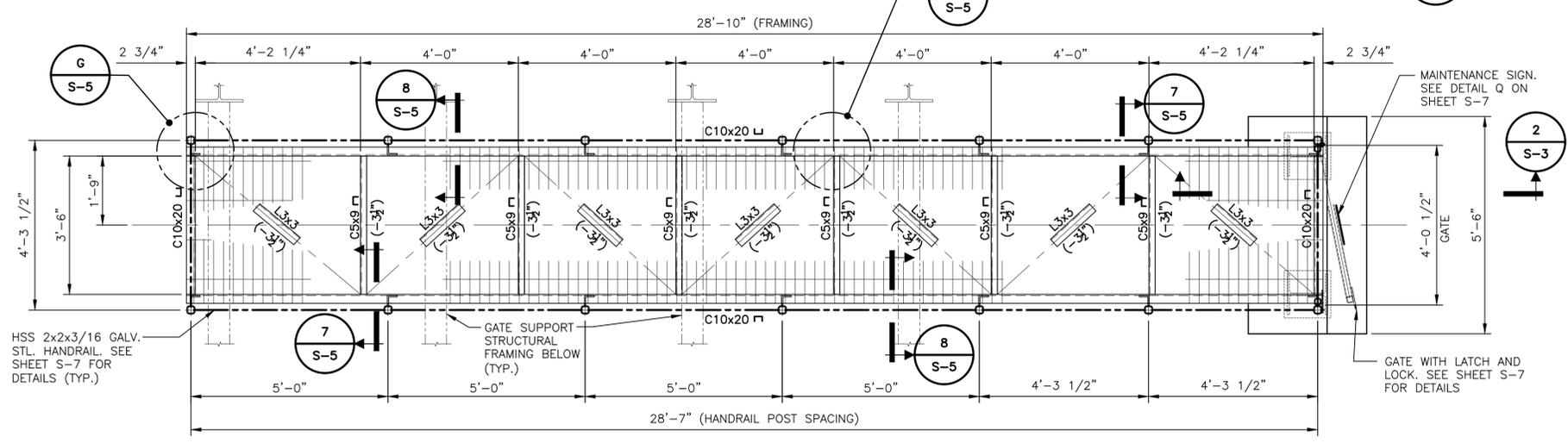
- SEE SHEET S-1 FOR STRUCTURAL NOTES AND MATERIAL SPECIFICATIONS.
- ALL STEEL SHALL BE HOT-DIPPED GALVANIZED PER STRUCTURAL STL. & ALUMINUM NOTES ON SHEET S-1.



**ACCESS PLATFORM FOUNDATION PLAN @ EL. 20.80'**  
SCALE: 1"=1'-0"



**GATE ACCESS PLATFORM FRAMING PLAN @ EL. 20.80'**  
SCALE: 1/2"=1'-0"



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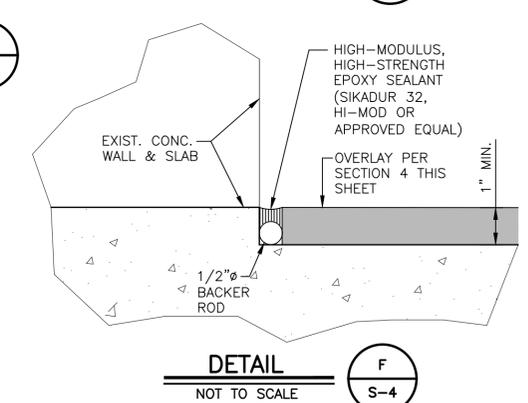
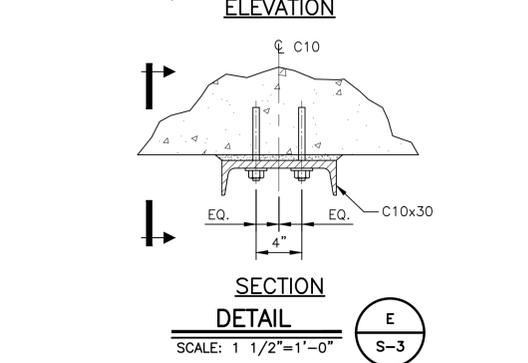
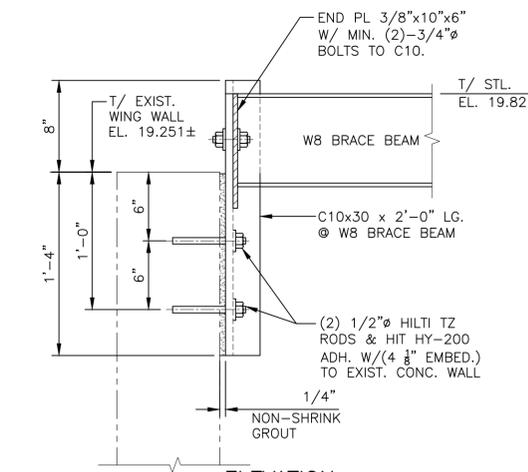
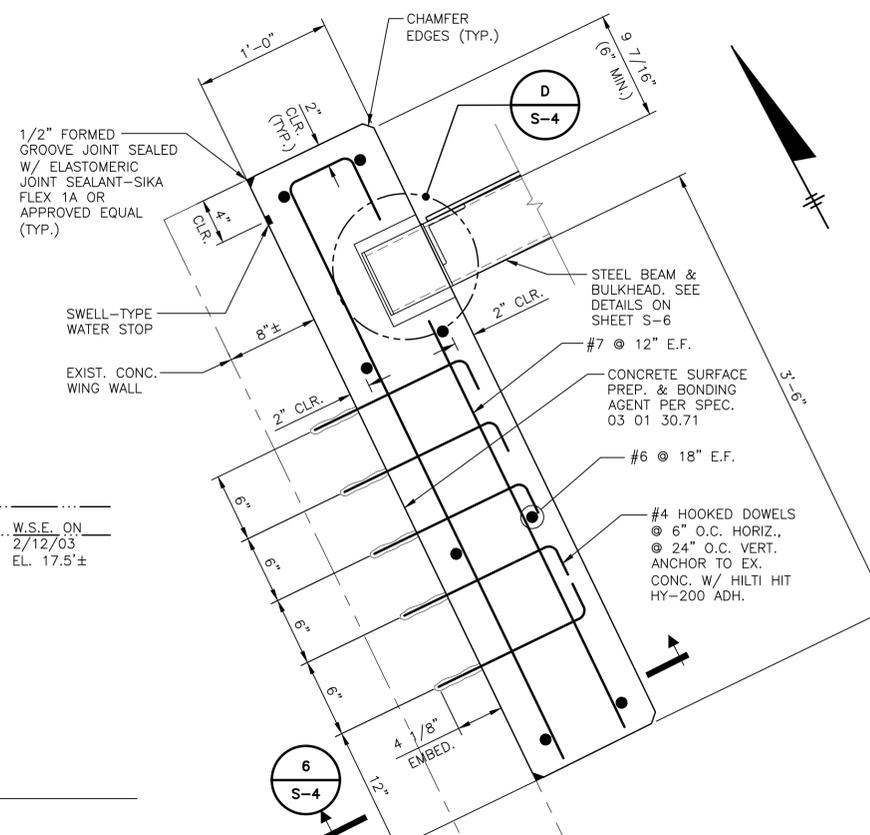
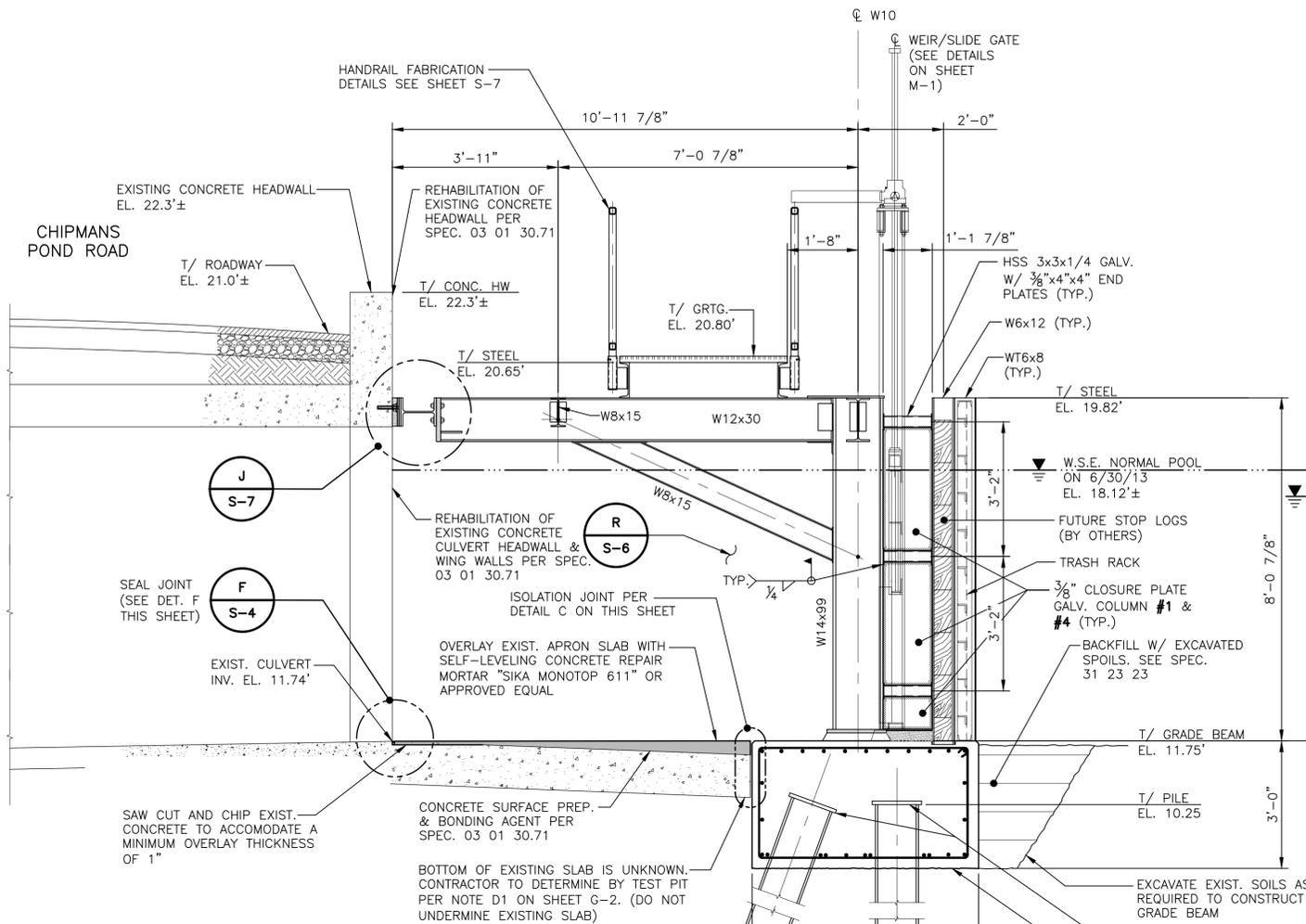
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		REVISION		INT.	

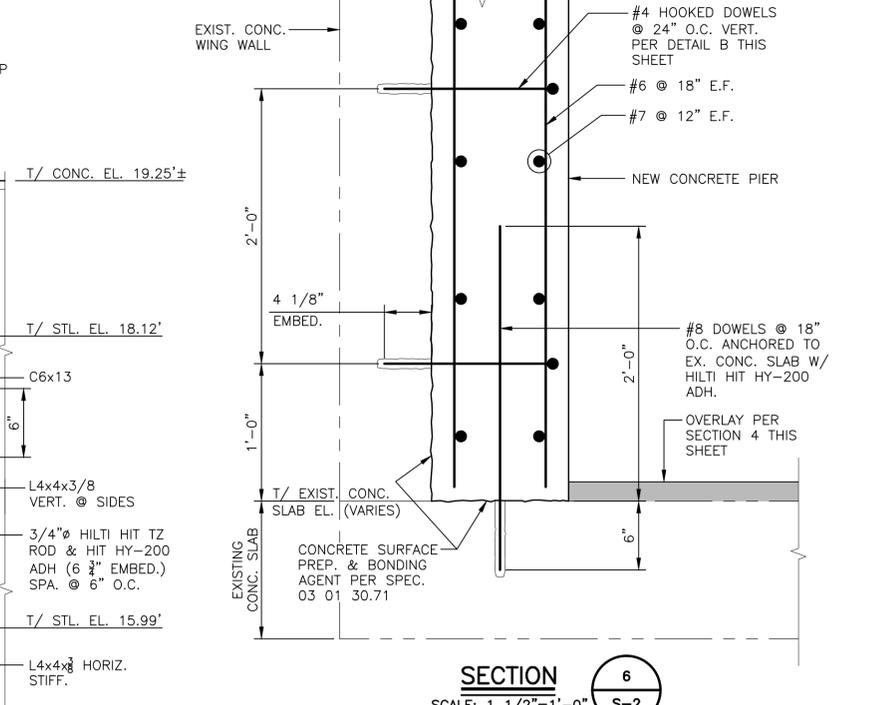
**O'BRIEN & GERE ENGINEERS, INC**  
EAST NORRITON, PA

STATE OF DELAWARE DNREC  
DIVISION OF WATERSHED STEWARDSHIP  
IMPROVEMENTS TO DELAWARE DAMS  
DOVER, DELAWARE

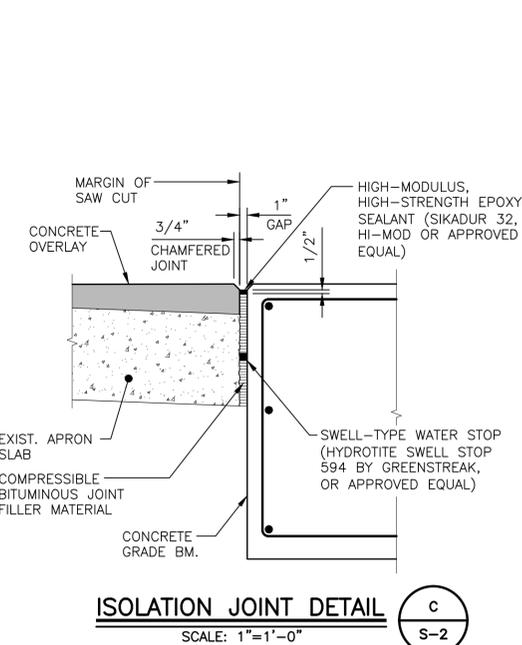
DNREC CONTRACT No.: NAT17001-DAMCONST		FILE NO.	S-3
STRUCTURAL IMPROVEMENTS TO CHIPMANS POND DAM		12804.61925-S03	
STRUCTURAL FRAMING PLANS		DATE	02/02/2017



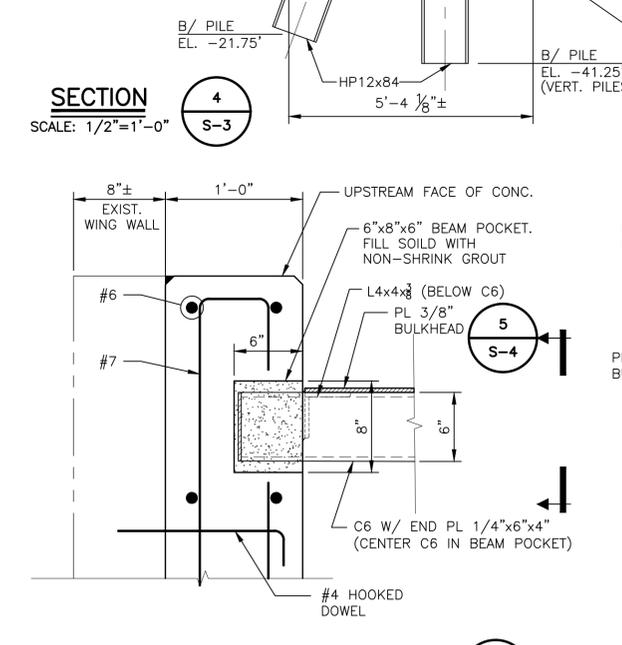
**BULKHEAD SIDE PIER PLAN-EAST PIER SHOWN (WEST SIMILAR)**  
SCALE: 1 1/2"=1'-0"



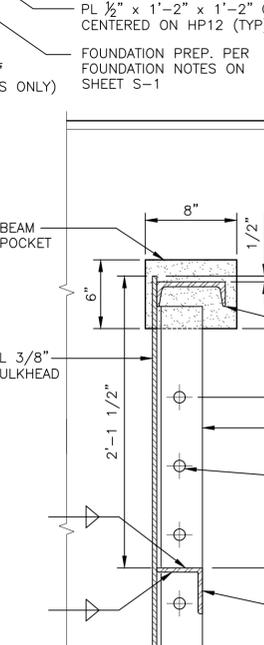
**SECTION 6**  
SCALE: 1 1/2"=1'-0"



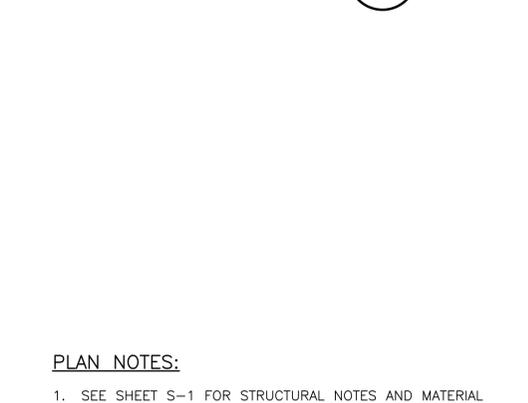
**ISOLATION JOINT DETAIL C**  
SCALE: 1"=1'-0"



**BEAM POCKET PLAN DETAIL D**  
SCALE: 1 1/2"=1'-0"

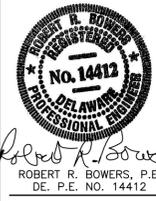


**SECTION 5**  
SCALE: 1 1/2"=1'-0"



**SECTION 6**  
SCALE: 1 1/2"=1'-0"

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DRAWN BY	MK				
NO.	02/02/2017	ISSUED FOR BID		RRB	
NO.	DATE	REVISION		INT.	



STATE OF DELAWARE DNREC  
DIVISION OF WATERSHED STEWARDSHIP  
IMPROVEMENTS TO DELAWARE DAMS  
DOVER, DELAWARE

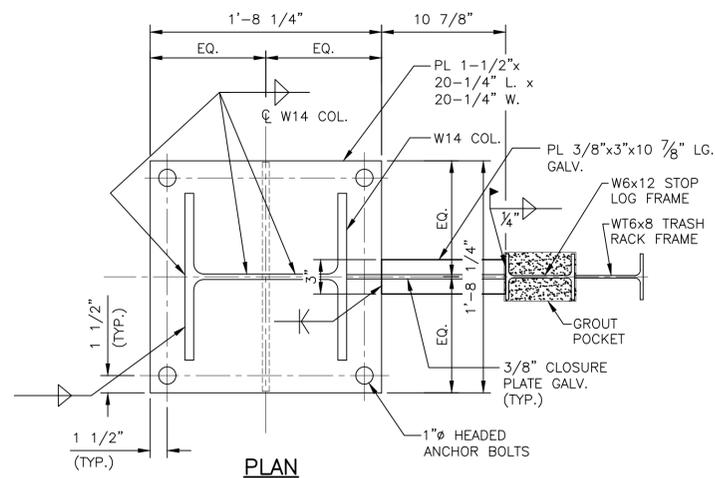
DNREC CONTRACT No.: NAT17001-DAMCONST

STRUCTURAL  
IMPROVEMENTS TO CHIPMANS POND DAM  
STRUCTURAL FRAMING  
SECTIONS & DETAILS SHEET 1

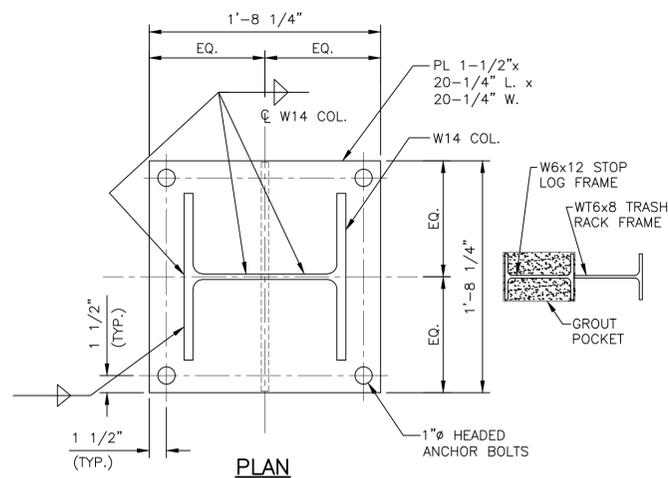
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DATE 02/02/2017

S-4

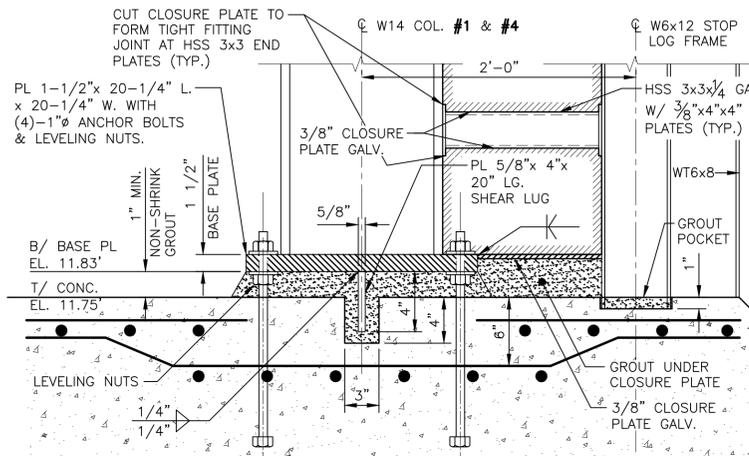
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**PLAN**



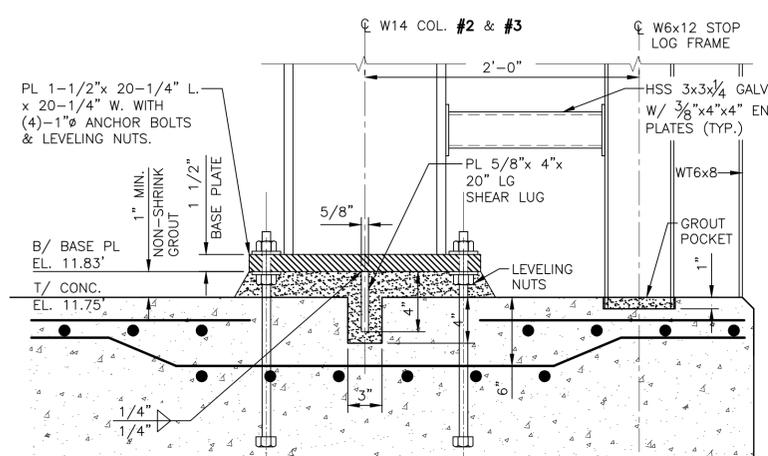
**PLAN**



**SECTION**

**COLUMN #1 & #4 BASE PLATE DETAIL**

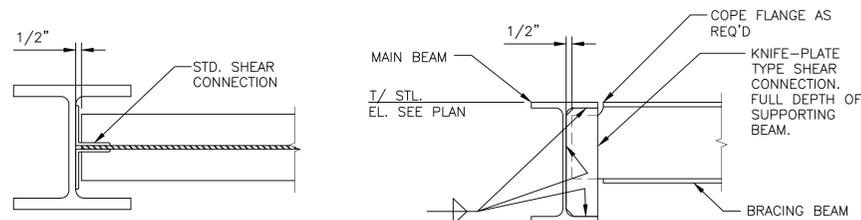
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**SECTION**

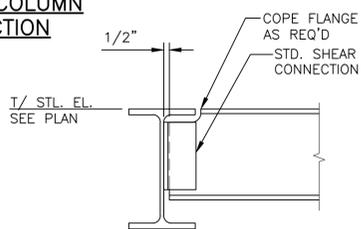
**COLUMN #2 & #3 BASE PLATE DETAIL**

SCALE: 1-1/2"=1'-0"



**BEAM TO COLUMN CONNECTION**

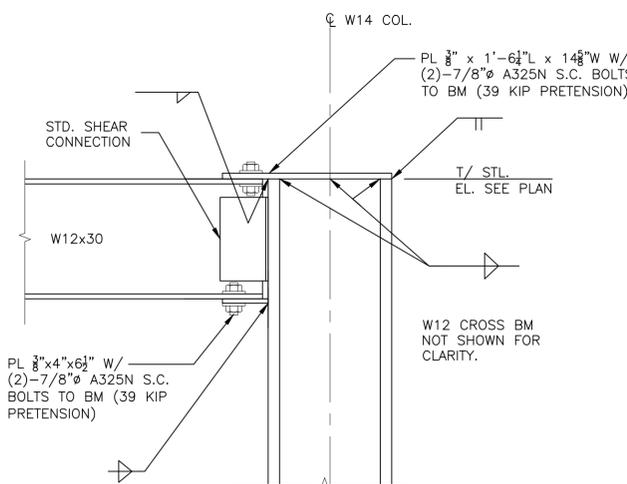
**BRACING BEAM CONNECTION DETAIL**



**BEAM TO BEAM CONNECTION**

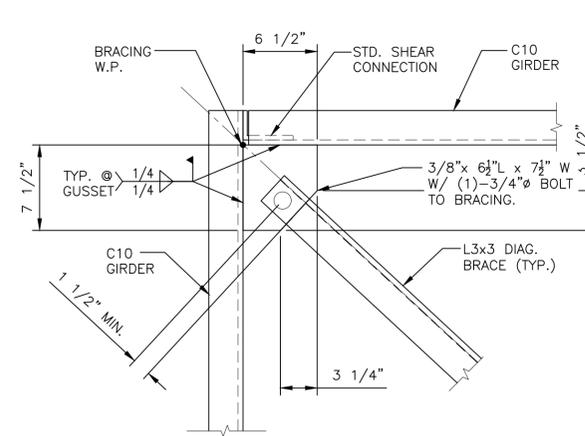
**TYPICAL STANDARD SHEAR CONNECTION DETAILS**

NOT TO SCALE



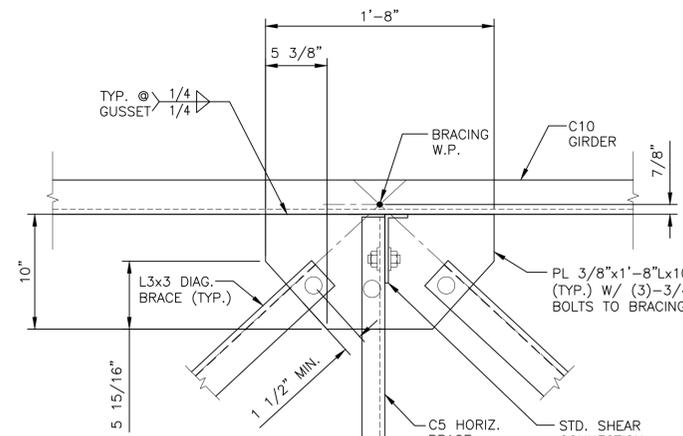
**BEAM TO COLUMN MOMENT CONNECTION DETAIL**

SCALE: 1-1/2"=1'-0"



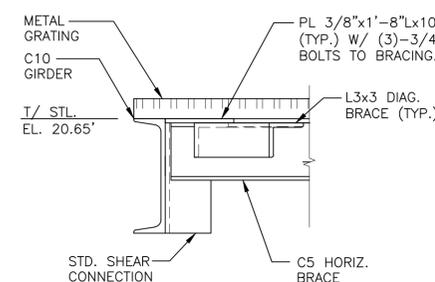
**CORNER BRACING DETAIL PLAN VIEW**

SCALE: 1-1/2"=1'-0"



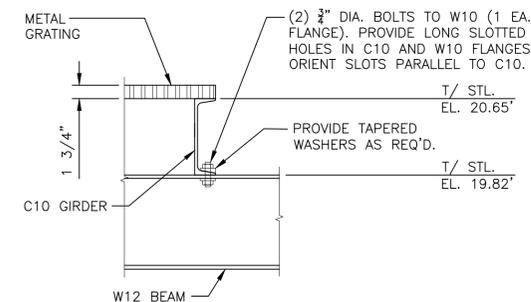
**INTERMEDIATE BRACING DETAIL PLAN VIEW**

SCALE: 1-1/2"=1'-0"



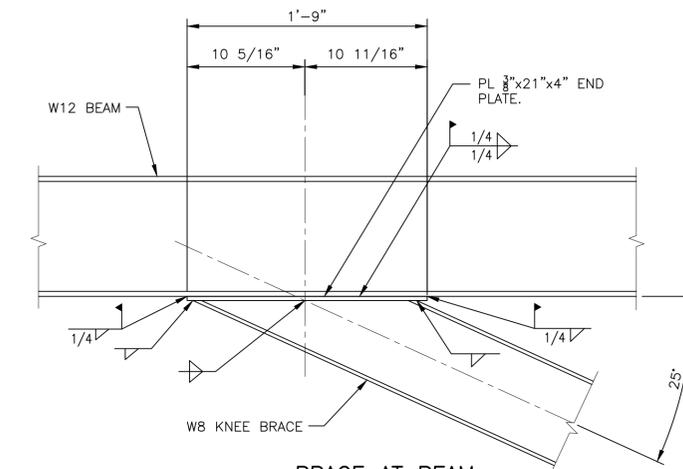
**BRACING DETAIL SECTION VIEW**

SCALE: 1-1/2"=1'-0"

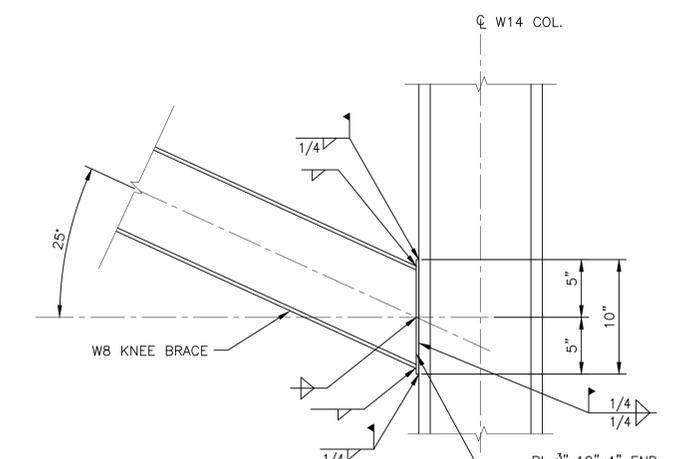


**SECTION @ BRIDGE GIRDER/ GATE FRAME BEAM CONNECTION**

SCALE: 1"=1'-0"



**BRACE AT BEAM**



**BRACE AT COLUMN**

**KNEE BRACE END PLATE DETAILS**

SCALE: 1-1/2"=1'-0"

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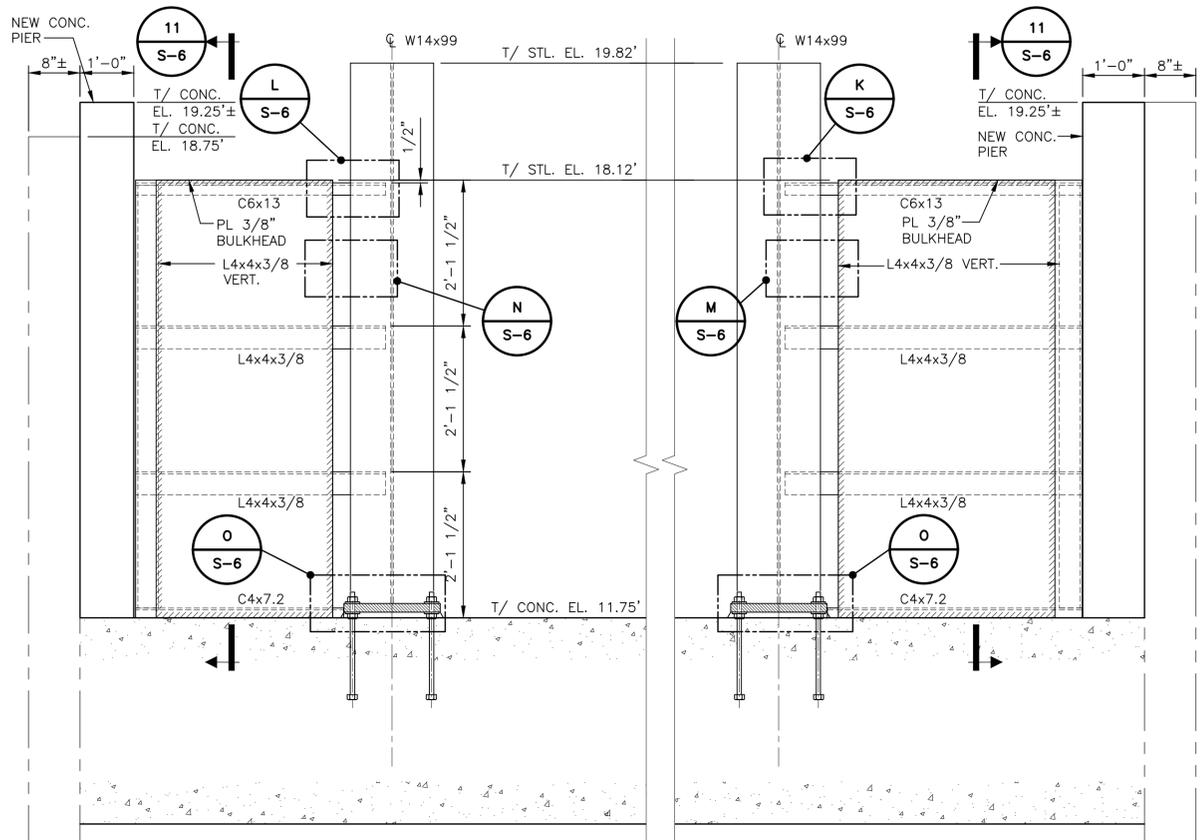
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DRAWN BY	MK				
	0	02/02/2017	ISSUED FOR BID	RRB	
	NO.	DATE	REVISION	INT.	

**O'BRIEN & GERE ENGINEERS, INC**  
 EAST NORRITON, PA

**STATE OF DELAWARE DNREC**  
 DIVISION OF WATERSHED STEWARDSHIP  
 IMPROVEMENTS TO DELAWARE DAMS  
 DOVER, DELAWARE

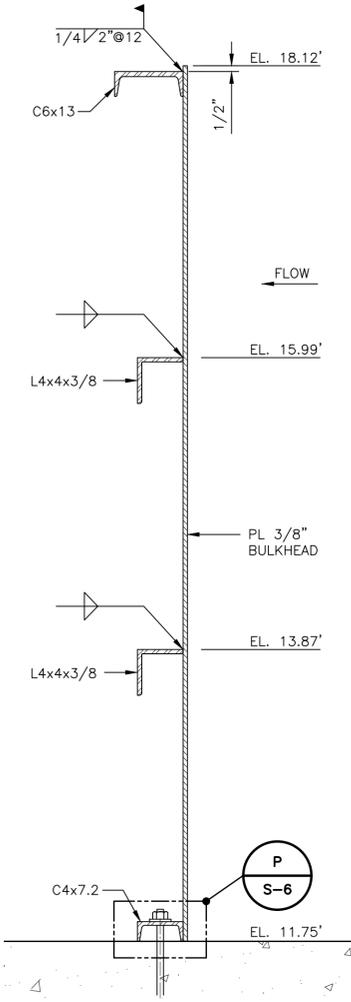
**DNREC CONTRACT No.: NAT17001-DAMCONST**  
 STRUCTURAL  
 IMPROVEMENTS TO CHIPMANS POND DAM  
 STRUCTURAL FRAMING  
 SECTIONS & DETAILS SHEET 2

FILE NO.  
 12804.61925 -S05  
 DATE  
 02/02/2017

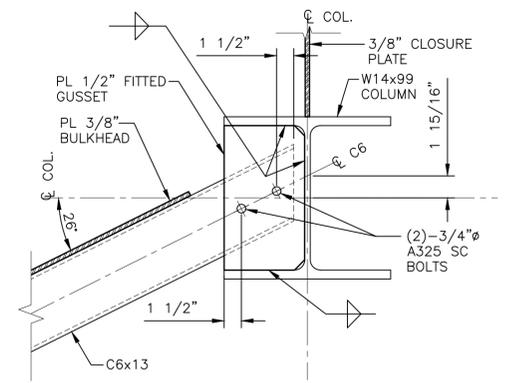


**ELEVATION @ EAST BULKHEAD**  
**LOOKING DOWNSTREAM**  
SCALE: 3/4"=1'-0"  
9  
S-3

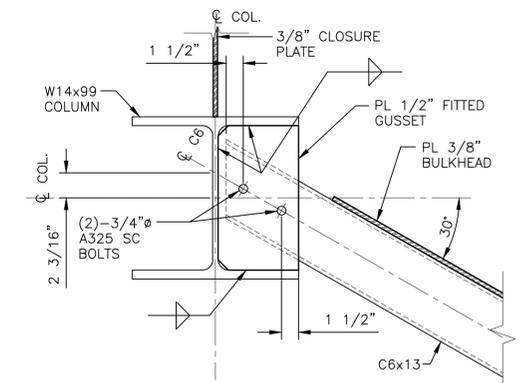
**ELEVATION @ WEST BULKHEAD**  
**LOOKING DOWNSTREAM**  
SCALE: 3/4"=1'-0"  
10  
S-3



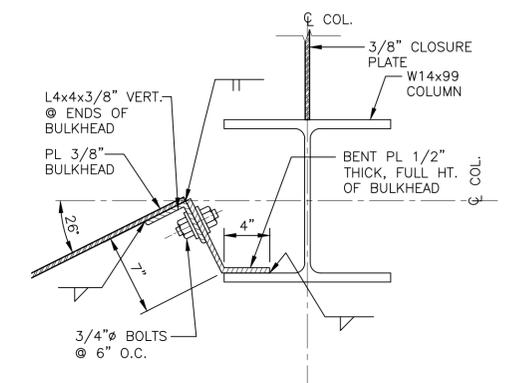
**BULKHEAD SECTION**  
SCALE: 1-1/2"=1'-0"  
11  
S-6



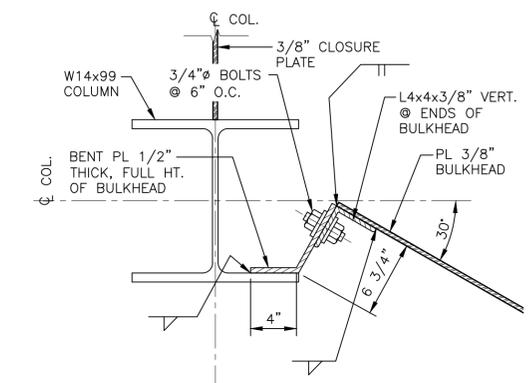
**DETAIL @ WEST BULKHEAD**  
**W14 BRACE CONNECTION**  
SCALE: 1-1/2"=1'-0"  
K  
S-6



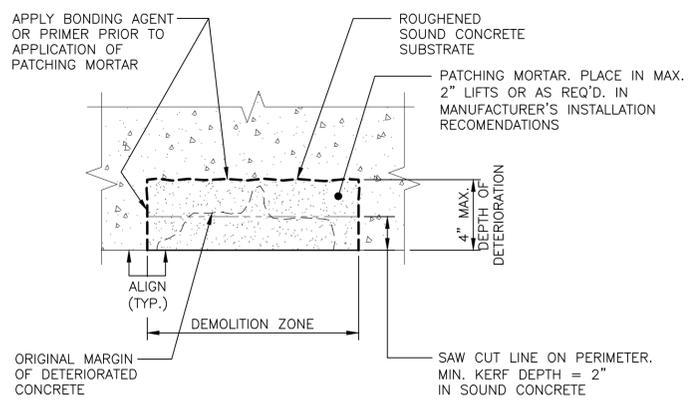
**DETAIL @ EAST BULKHEAD**  
**W14 BRACE CONNECTION**  
SCALE: 1-1/2"=1'-0"  
L  
S-6



**DETAIL @ WEST BULKHEAD**  
**BULKHEAD TO COLUMN CONNECTION**  
SCALE: 1-1/2"=1'-0"  
M  
S-6

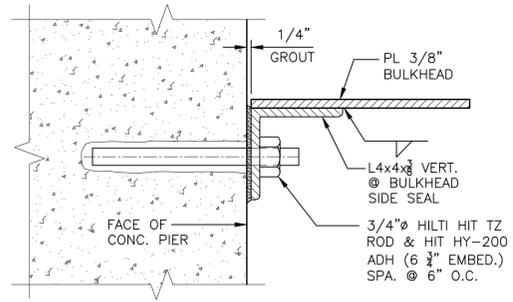


**DETAIL @ EAST BULKHEAD**  
**BULKHEAD TO COLUMN CONNECTION**  
SCALE: 1-1/2"=1'-0"  
N  
S-6



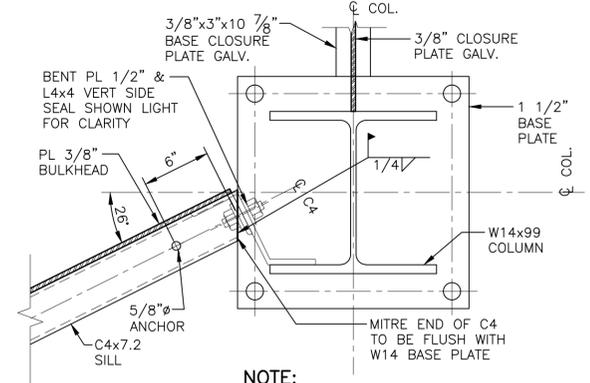
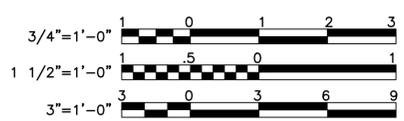
**SPALLING AND DETERIORATION REPAIR <4" DEEP**  
**CONC. REPAIR DETAIL**  
SCALE: 3"=1'-0"  
R  
S-4

**NOTES:**  
1. THIS DETAIL SHALL BE APPLICABLE TO DELAMINATED OR DETERIORATED ZONES OF CONCRETE LOCATED ON FACE OF EXIST. WALL MORE THAN OR EQUAL TO 8" AWAY FROM THE TOP OF THE WALL. WHERE DELAMINATED OR DETERIORATED ZONE IS LESS THAN 8" AWAY FROM THE TOP OF THE WALL, THE REPAIR SHALL EXTEND TO THE TOP OF THE WALL.



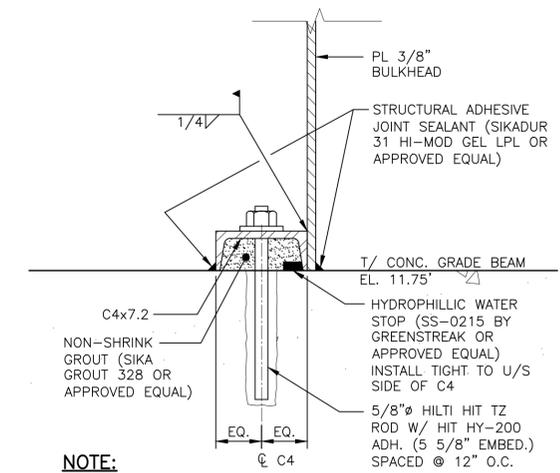
**BULKHEAD SIDE SEAL DETAIL**  
SCALE: 3"=1'-0"  
P  
S-6

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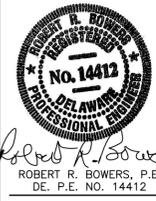
**DETAIL @ WEST BULKHEAD**  
**CORNER SEAL @ W14 COLUMN**  
SCALE: 1-1/2"=1'-0"  
O  
S-6

**NOTE:**  
DETAIL @ WEST BULKHEAD SHOWN. EAST BULKHEAD SIMILAR



**BULKHEAD SILL DETAIL**  
SCALE: 1-1/2"=1'-0"  
P  
S-6

**NOTE:**  
PROVIDE MIN. 2 GROUT HOLES IN C4 WEB TO INSTALL NON-SHRINK GROUT. SEAL HOLES W/ STRUCTURAL ADH. JOINT SEALANT AFTER C4 ANNUAL SPACE IS COMPLETELY FILLED.



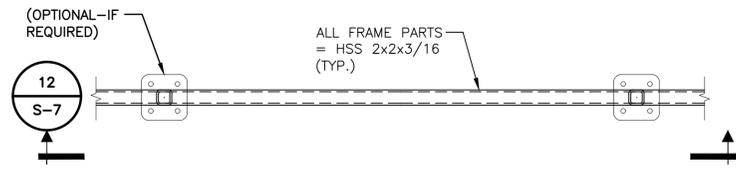
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NO.	02/02/2017	ISSUED FOR BID		RRB	
		REVISION		INT.	



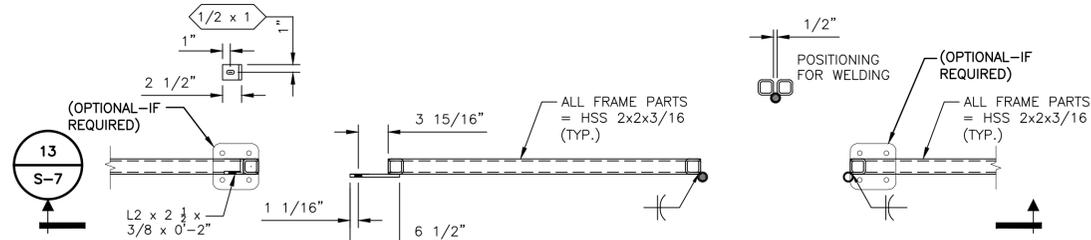
STATE OF DELAWARE DNREC  
DIVISION OF WATERSHED STEWARDSHIP  
IMPROVEMENTS TO DELAWARE DAMS  
DOVER, DELAWARE

DNREC CONTRACT No.: NAT17001-DAMCONST	
STRUCTURAL IMPROVEMENTS TO CHIPMANS POND DAM BULKHEAD SECTIONS & DETAILS	FILE NO. 12804.61925-S06
	DATE 02/02/2017
	S-6



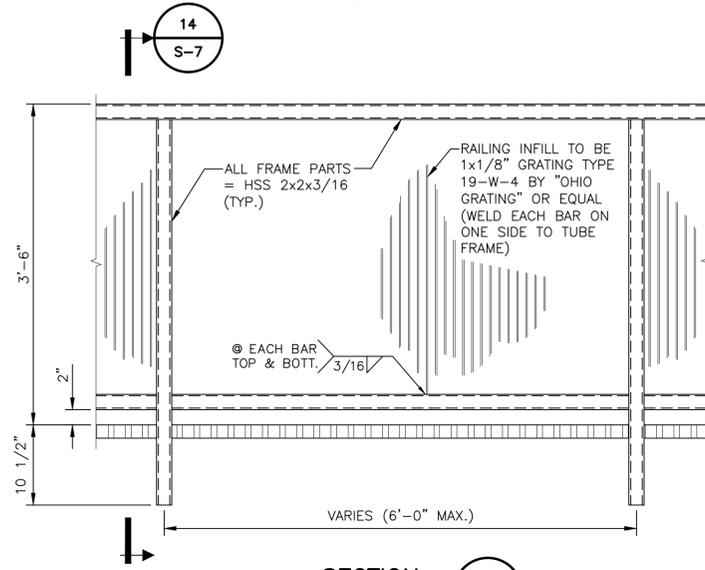
PLAN - TYPICAL SPAN

SCALE: 1"=1'-0"



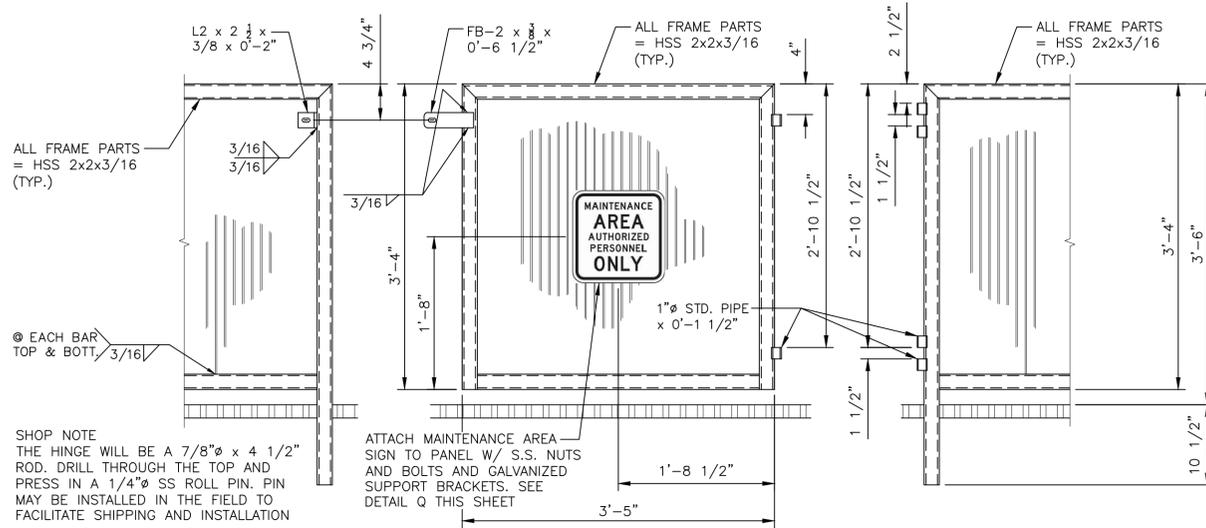
PLAN - AT GATE

SCALE: 1"=1'-0"



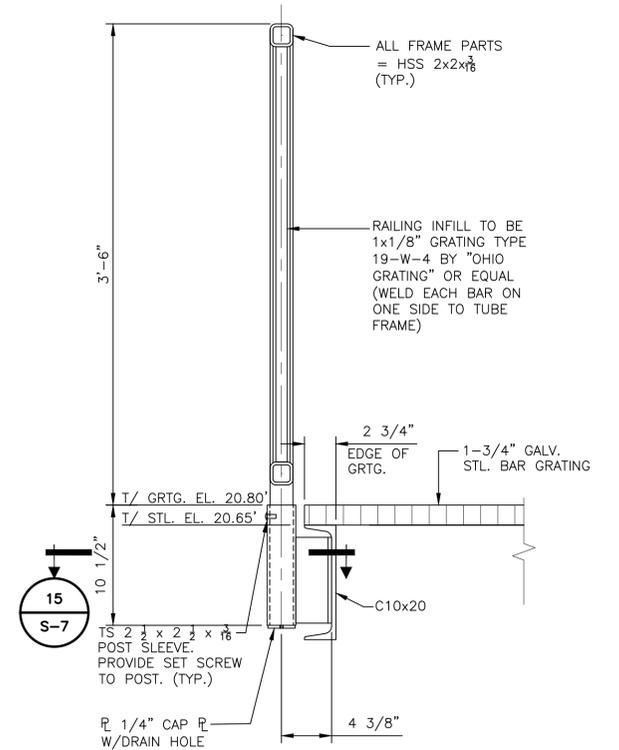
SECTION 12

SCALE: 1"=1'-0"



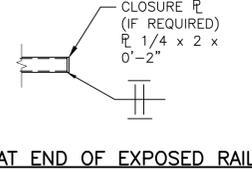
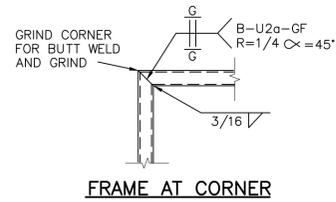
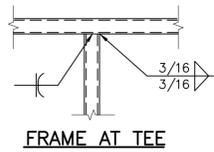
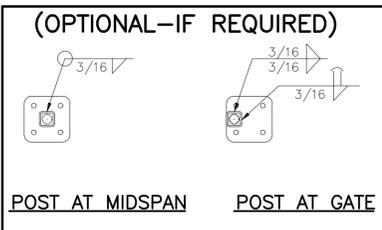
SECTION 13

SCALE: 1"=1'-0"



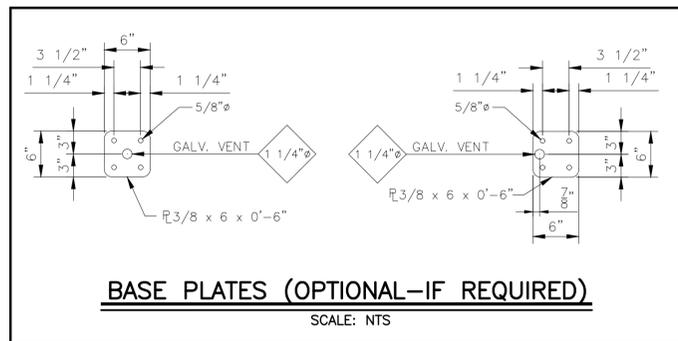
SECTION 14

SCALE: 1-1/2"=1'-0"



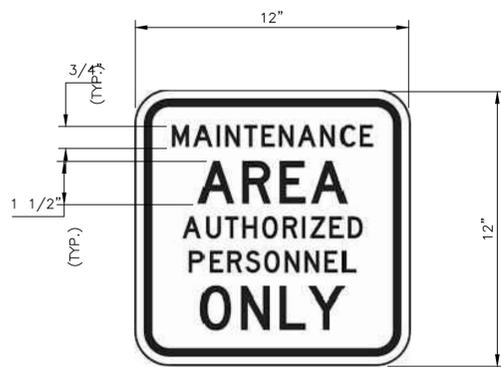
WELD CRITERIA

SCALE: NTS



BASE PLATES (OPTIONAL-IF REQUIRED)

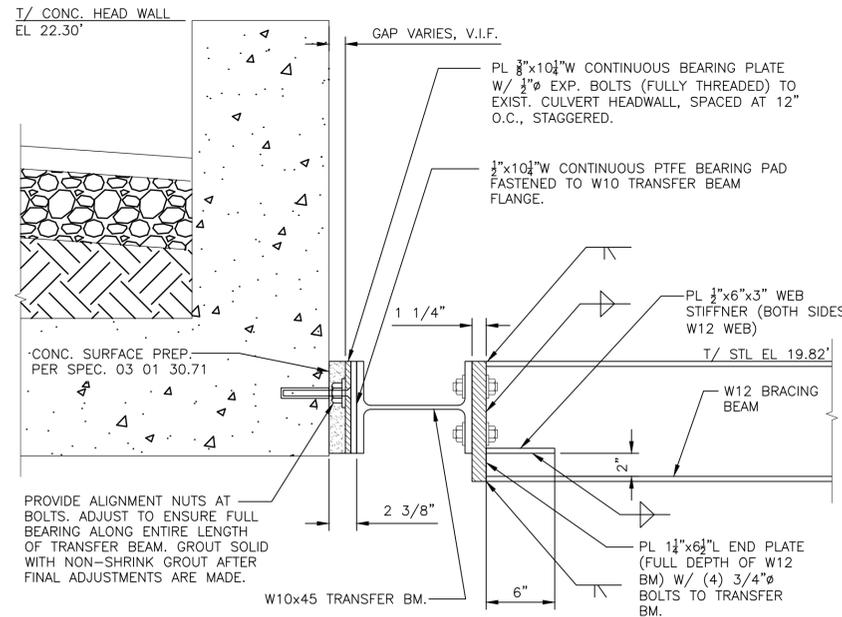
SCALE: NTS



MAINTENANCE AREA SIGN

DETAIL Q

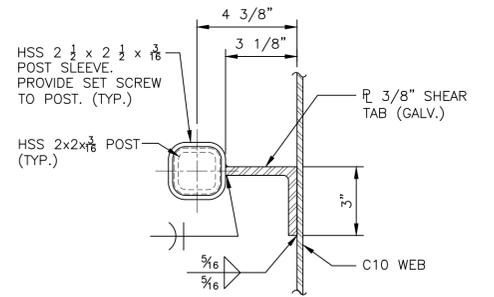
SCALE: 1-1/2"=1'-0"



TRANSFER BEAM TO EXIST. CULVERT-JOINT DETAIL

SCALE: 1-1/2"=1'-0"

J S-4

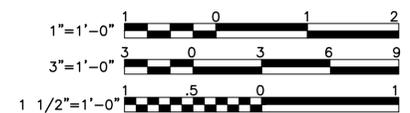


SECTION 15

SCALE: 3"=1'-0"

PLAN NOTES:

- 1. SEE SHEET S-1 FOR STRUCTURAL NOTES AND MATERIAL SPECIFICATIONS.
2. ALL STEEL SHALL BE HOT-DIPPED GALVANIZED PER STRUCTURAL STL. & ALUMINUM NOTES ON SHEET S-1.



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THIS DRAWING WAS PREPARED AT THE SCALE INDICATED. INACCURACIES IN THE STATED SCALE MAY BE INTRODUCED WHEN DRAWINGS ARE REPRODUCED BY ANY MEANS. USE THE GRAPHIC SCALE BAR TO DETERMINE THE ACTUAL SCALE.

Table with columns: IN CHARGE OF, DESIGNED BY, CHECKED BY, DRAWN BY, NO., DATE, REVISION, ISSUED FOR BID, RRB INT.

O'BRIEN & GERE ENGINEERS, INC EAST NORRITON, PA

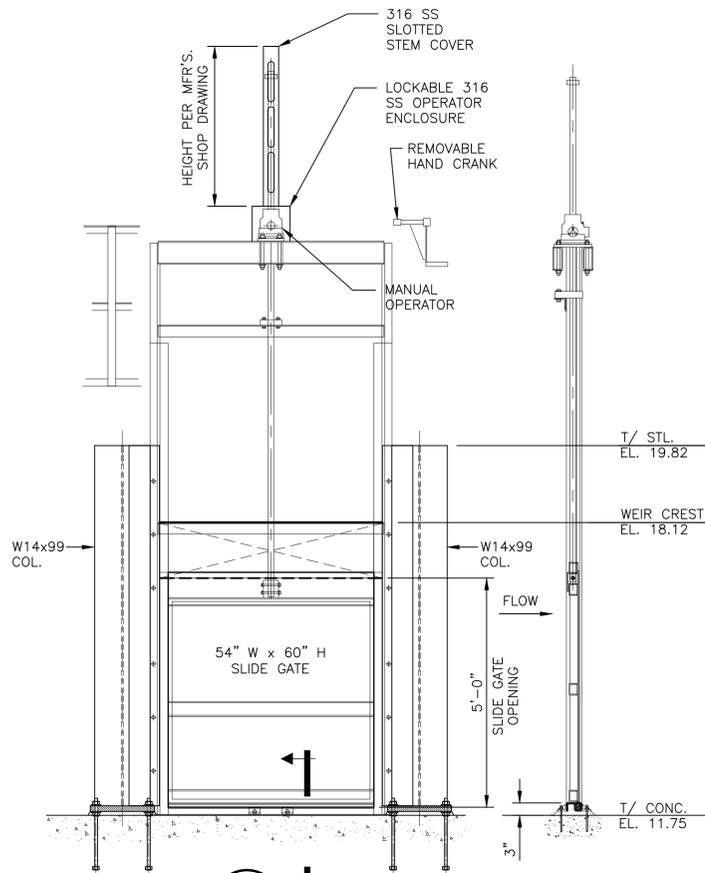
STATE OF DELAWARE DNREC DIVISION OF WATERSHED STEWARDSHIP IMPROVEMENTS TO DELAWARE DAMS DOVER, DELAWARE

DNREC CONTRACT No.: NAT17001-DAMCONST

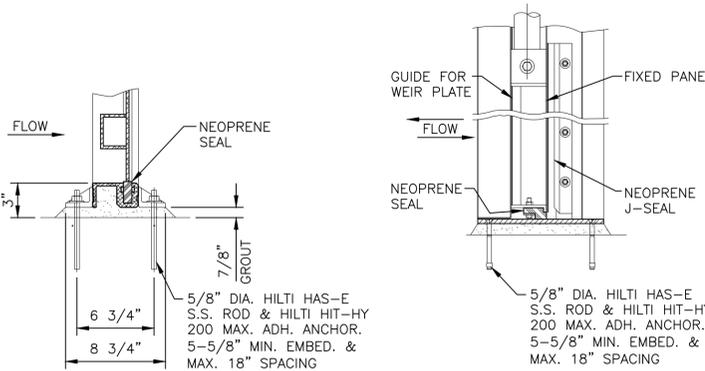
STRUCTURAL IMPROVEMENTS TO CHIPMANS POND DAM HANDRAIL FABRICATION DETAILS

FILE NO. 12804.61925 -S07 DATE 02/02/2017

S-7

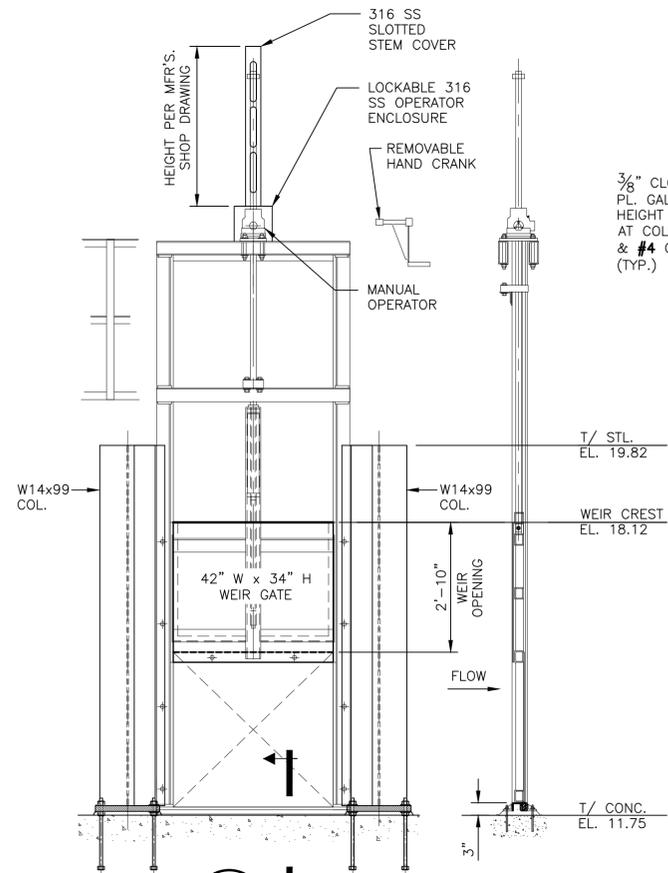


**FACE-MOUNTED  
SELF CONTAINED SLIDE GATE**  
SCALE: 1/2"=1'-0"

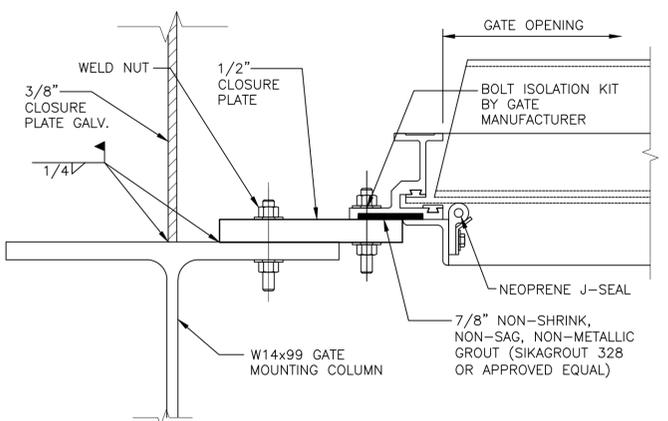


**SECTION 1**  
NOT TO SCALE

**SECTION 2**  
NOT TO SCALE



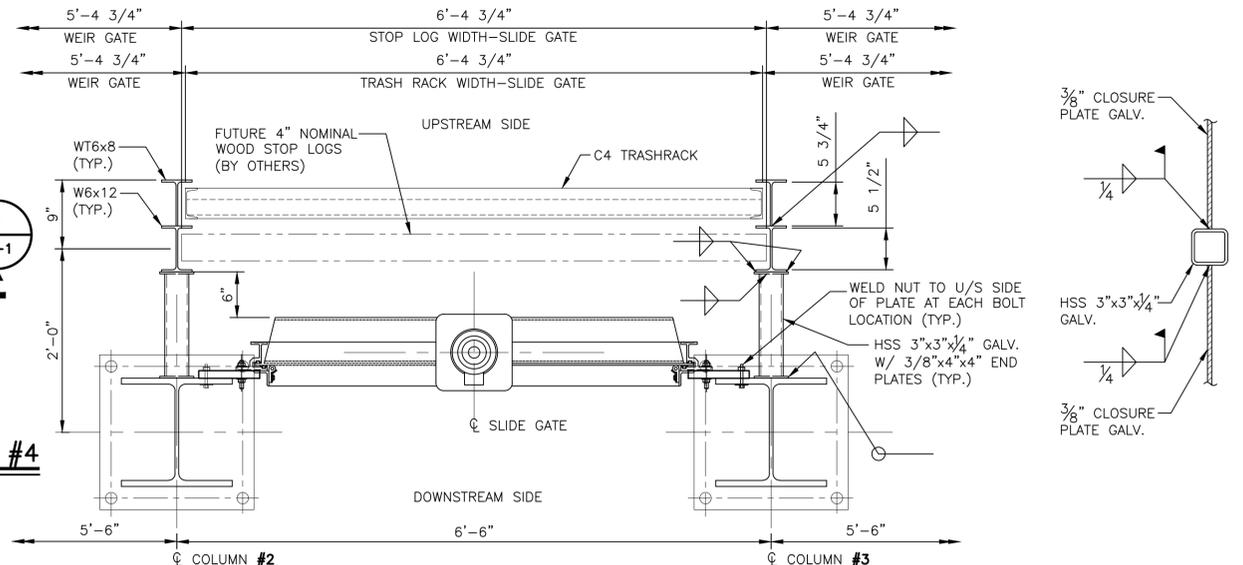
**FACE-MOUNTED  
SELF CONTAINED WEIR GATE**  
SCALE: 1/2"=1'-0"



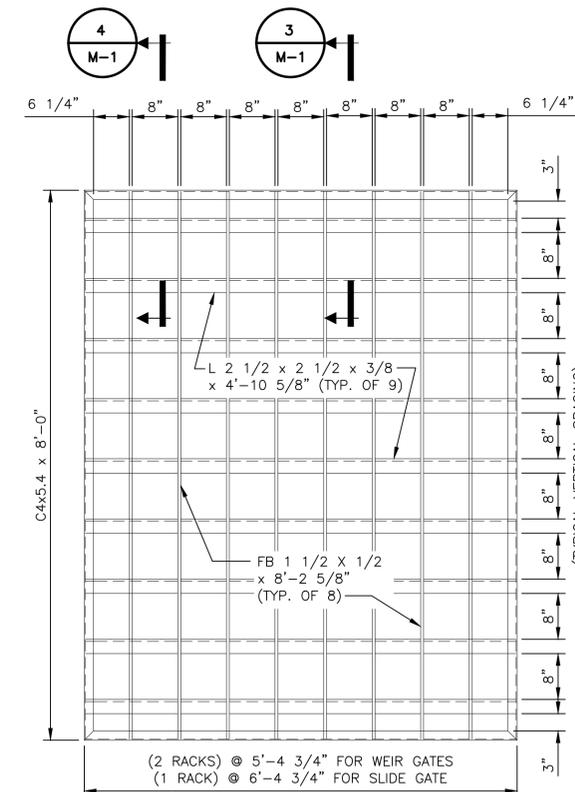
**GATE MOUNTING DETAIL**  
NOT TO SCALE

**PLAN GENERAL NOTES:**

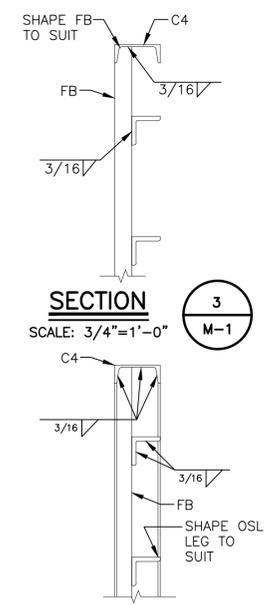
- CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS PRIOR TO ORDERING GATES OR PROCEEDING WITH ANY FABRICATION WORK.
- ALUMINUM SURFACES IN CONTACT WITH CONCRETE TO BE FIELD COATED WITH ONE COAT OF COAL TAR EPOXY.
- DETAILS SHOWN ON THIS DRAWING ARE REPRESENTATIVE OF GENERAL ARRANGEMENTS/INSTALLATION REQUIREMENTS FOR THE STYLE OF GATE.
- OPERATORS SHOWN ARE REPRESENTATIVE AND ARE NOT RELATED TO THE STYLE OF GATE. REFER TO MANUFACTURER'S SHOP DRAWING FOR SPECIFICATION OF OPERATOR.
- ALL ANCHOR BOLTS SHALL BE STAINLESS STEEL INSTALLED PER MANUFACTURER'S REQUIREMENTS.
- GATES SHALL HAVE A NON-SHRINK, NON-SAG, NON-METALLIC GROUT BETWEEN THE STAINLESS STEEL FRAME AND CARBON STEEL STRUCTURAL SHAPE. PROVIDE ISOLATION KITS FOR THE FASTENERS.
- SEE SHEET S-1 FOR STRUCTURAL NOTES AND MATERIAL SPECIFICATIONS.
- ALL STEEL SHALL BE HOT-DIPPED GALVANIZED PER STRUCTURAL STL. & ALUMINUM NOTES ON SHEET S-1.



**STEEL TRASH RACK & STOP LOG GUIDE ASSEMBLY DETAIL**  
SCALE: 1" = 1'-0"



**ELEVATION  
STEEL TRASH RACK DETAIL - (1) RACK PER BAY**  
SCALE: 3/4" = 1'-0"



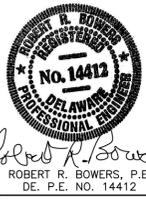
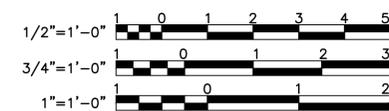
**CROSS SECTION**

**SECTION 3**  
SCALE: 3/4"=1'-0"

**SECTION 4**  
SCALE: 3/4"=1'-0"

**NOTE:**

- HOT DIP GALVANIZE ALL STEEL TRASH RACKS.



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IN CHARGE OF	RRB				
DESIGNED BY	MK				
CHECKED BY	DRP				
DRAWN BY	MK				
NO.	02/02/2017	ISSUED FOR BID		RRB	
		REVISION		INT.	

**O'BRIEN & GERE ENGINEERS, INC**  
EAST NORRITON, PA

**STATE OF DELAWARE DNREC**  
DIVISION OF WATERSHED STEWARDSHIP  
IMPROVEMENTS TO DELAWARE DAMS  
DOVER, DELAWARE

<b>DNREC CONTRACT No.: NAT17001-DAMCONST</b>		FILE NO.	M-1
<b>MECHANICAL IMPROVEMENTS TO CHIPMANS POND DAM NEW GATE, TRASH RACK &amp; STOP LOG GUIDE DETAILS</b>		12804.61925-M01	
		DATE	
		02/02/2017	

BORING #B # 1	DATE DRILLED: 8-18-04
STATION: 4+55	OFFSET: 7' L1, CENTER
CASING SIZE: 3 1/4" HOLLOW STEW AUGER	ELEVATION:
SAMPLER: SPLIT-BARREL	
ENERGY PER BLOW (AVERAGE):	
WEIGHT OF HAMMER (W/H):	WEIGHT OF ROD (W/R):
COMMENTS:	

SAMPLE NO.	DEPTH	BLOWS/	SAMPLE DESCRIPTION	REMARKS	CLASS
1	0.0'	10	Moist dense brown silty fine to coarse sand w/trace of gravel and clay.		A-2-4 (0)
	1.5'	20			
			12" Recovery		
2	2.5'	5	Wet stiff light brown fine sandy silt w/trace of coarse sand and clay.		A-4 (0)
	4.0'	7			
			16" Recovery		
3	5.0'	4	Saturated medium dense light brown fine sand w/some coarse sand, trace of silt and gravel.		A-3 (0)
	6.5'	8			
			18" Recovery		
4	7.5'	4	Saturated medium dense light brown fine to coarse sand w/trace of silt and gravel.		A-3 (0)
	9.0'	10			
			18" Recovery		
5	10.0'	2	Saturated very loose light gray fine sand w/some silt, trace of coarse sand.		A-2-4 (0)
	11.5'	1			
			18" Recovery		
6	15.0'	2	Saturated loose light gray fine to coarse sand w/some silt, trace of gravel.		A-2-4 (0)
	16.5'	2			
			18" Recovery		
7	20.0'	4	Saturated loose light gray fine to coarse sand w/some gravel, trace of silt.		A-1-b (0)
	21.5'	4			
			18" Recovery		
8	25.0'	3	Saturated loose yellowish orange silty fine sand w/trace of coarse sand.		A-2-4 (0)
	26.5'	5			
			18" Recovery		
9	30.0'	2	Saturated medium dense brown fine sand w/some coarse sand, gravel and silt.		A-2-4 (0)
	31.5'	8			
			18" Recovery		
10	35.0'	8	Saturated medium dense orange fine to coarse sand w/some silt, trace of gravel.		A-2-4 (0)
	36.5'	18			
			18" Recovery		
11	40.0'	4	Saturated firm gray fine sandy silt w/trace of clay, organic matter and gravel.		A-4 (0)
	41.5'	4			
			18" Recovery		
12	45.0'	3	Saturated very stiff gray fine sandy silt w/some organic matter, trace of coarse sand.		A-4 (0)
	46.5'	14			
			18" Recovery		
13	50.0'	4	Saturated stiff gray clayey silt w/some fine sand and clay, trace of organic matter.		A-4 (7)
	51.5'	7			
			18" Recovery		
14	55.0'	3	Saturated firm light gray silt w/some clay, trace of fine sand.		A-4 (2)
	56.5'	3			
			18" Recovery		
15	60.0'	10	Saturated hard gray fine sandy clay w/trace of coarse sand.		A-6 (6)
	61.5'	25			
			18" Recovery		
16	65.0'	7	Saturated very stiff light gray fine sandy silt w/trace of coarse sand and clay.		A-4 (0)
	66.5'	11			
			18" Recovery		
17	70.0'	14	Saturated dense gray silty fine sand.		A-2-4 (0)
	71.5'	27			
			18" Recovery		
18	75.0'	18	Saturated dense gray fine sand w/trace of silt.		A-3 (0)
	76.5'	20			
			18" Recovery		
19	78.5'	24	Saturated dense gray fine sand w/trace of silt.		A-3 (0)
	80.0'	12			
			18" Recovery		
			( END )		

BORING #B # 2	DATE DRILLED: 8-19-04
STATION: 5+00	OFFSET: 10' L1, C.L.
CASING SIZE: 3 1/4" HOLLOW STEW AUGER	ELEVATION:
SAMPLER: SPLIT-BARREL	
ENERGY PER BLOW (AVERAGE):	
WEIGHT OF HAMMER (W/H):	WEIGHT OF ROD (W/R):
COMMENTS:	

SAMPLE NO.	DEPTH	BLOWS/	SAMPLE DESCRIPTION	REMARKS	CLASS
1	0.0'	7	Moist medium dense brown fine to coarse sand w/some silt, trace of gravel.		A-2-4 (0)
	1.5'	14			
			16" Recovery		
2	2.5'	7	Moist loose gray fine sand w/some coarse sand and silt, trace of gravel.		A-2-4 (0)
	4.0'	5			
			16" Recovery		
3	5.0'	1	Wet very loose light gray silty fine sand w/some coarse sand, trace of gravel.		A-2-4 (0)
	6.5'	1			
			18" Recovery		
4	7.5'	1	Saturated very loose dark gray silty fine sand w/some coarse sand, trace of organic matter.		A-2-4 (0)
	9.0'	2			
			18" Recovery		
5	10.0'	4	Saturated medium dense gray fine sand w/some silt and coarse sand, trace of gravel.		A-2-4 (0)
	11.5'	7			
			18" Recovery		
6	15.0'	3	Saturated loose light gray fine to coarse sand w/some silt, trace of gravel.		A-2-4 (0)
	16.5'	6			
			18" Recovery		
7	20.0'	4	Saturated medium dense light gray fine to coarse sand w/some silt, trace of gravel.		A-2-4 (0)
	21.5'	7			
			18" Recovery		
8	25.0'	2	Saturated loose orange fine sand w/some silt, trace of coarse sand.		A-2-4 (0)
	26.5'	6			
			18" Recovery		
9	30.0'	4	Saturated medium dense orange fine to coarse sand w/some silt, trace of gravel.		A-2-4 (0)
	31.5'	10			
			18" Recovery		
10	35.0'	15	Saturated very dense brown gravel and fine sand w/some coarse sand and silt.		A-1-b (0)
	36.5'	12			
			18" Recovery		
11	40.0'	2	Saturated firm dark gray fine sandy silt w/some organic matter, trace of clay, coarse sand and gravel.		A-4 (0)
	41.5'	5			
			18" Recovery		
12	45.0'	4	Saturated medium dense gray silty fine sand w/trace of organic matter and coarse sand.		A-2-4 (0)
	46.5'	13			
			18" Recovery		
13	50.0'	4	Saturated medium dense dark gray silty fine sand w/trace of coarse sand and organic matter.		A-2-4 (0)
	51.5'	8			
			18" Recovery		
14	55.0'	5	Saturated stiff light gray silt w/trace of gravel, clay and fine sand.		A-4 (1)
	56.5'	7			
			18" Recovery		
15	60.0'	12	Saturated hard gray fine sandy silt w/some clay, trace of coarse sand.		A-4 (0)
	61.5'	22			
			18" Recovery		
16	65.0'	6	Saturated stiff light gray fine sandy silt w/trace of coarse sand.		A-4 (0)
	66.5'	2			
			18" Recovery		
17	70.0'	5	Saturated very stiff gray fine sandy silt.		A-4 (0)
	71.5'	10			
			18" Recovery		
18	75.0'	10	Saturated dense gray silty fine sand.		A-2-4 (0)
	76.5'	21			
			18" Recovery		
19	78.5'	8	Saturated medium dense gray silty fine sand w/trace of organic matter.		A-2-4 (0)
	80.0'	14			
			18" Recovery		
			( END )		

BORING #B # 3	DATE DRILLED: 8-19-04
STATION: 5+25	OFFSET: 7' R1, C.L.
CASING SIZE: 3 1/4" HOLLOW STEW AUGER	ELEVATION:
SAMPLER: SPLIT-BARREL	
ENERGY PER BLOW (AVERAGE):	
WEIGHT OF HAMMER (W/H):	WEIGHT OF ROD (W/R):
COMMENTS:	

SAMPLE NO.	DEPTH	BLOWS/	SAMPLE DESCRIPTION	REMARKS	CLASS
1	0.0'	3	Moist medium dense brown fine to coarse sand w/some silt, trace of gravel.		A-2-4 (0)
	1.5'	10			
			12" Recovery		
2	2.5'	3	Wet loose brownish gray fine to coarse sand w/some silt, trace of gravel.		A-2-4 (0)
	4.0'	3			
			14" Recovery		
3	5.0'	3	Saturated loose brown fine sand w/some coarse sand and silt, trace of gravel.		A-2-4 (0)
	6.5'	3			
			18" Recovery		
4	7.5'	1	Saturated very loose gray silty fine sand w/some coarse sand and gravel.		A-2-4 (0)
	9.0'	1			
			18" Recovery		
5	10.0'	1	Saturated very loose dark gray fine sand w/some silt and coarse sand, trace of gravel.		A-2-4 (0)
	11.5'	2			
			18" Recovery		
6	15.0'	8	Saturated medium dense light gray silty fine sand w/some coarse sand, trace of gravel.		A-2-4 (0)
	16.5'	4			
			18" Recovery		
7	20.0'	2	Saturated loose greenish gray fine sand w/some silt, trace of coarse sand and gravel.		A-2-4 (0)
	21.5'	5			
			18" Recovery		
8	25.0'	3	Saturated loose greenish gray fine sand w/some silt, trace of coarse sand.		A-2-4 (0)
	26.5'	5			
			18" Recovery		
9	30.0'	3	Saturated loose greenish gray fine sand w/some coarse sand and silt, trace of gravel.		A-2-4 (0)
	31.5'	6			
			18" Recovery		
10	35.0'	5	Saturated medium dense gray silty fine sand w/trace of coarse sand and gravel.		A-2-4 (0)
	36.5'	2			
			18" Recovery		
11	40.0'	2	Saturated firm gray fine sandy silt w/trace of coarse sand, gravel and clay.		A-4 (0)
	41.5'	3			
			18" Recovery		
12	45.0'	4	Saturated firm gray fine sandy silt w/trace of gravel and coarse sand.		A-4 (0)
	46.5'	3			
			18" Recovery		
13	50.0'	8	Saturated medium dense gray silty fine sand w/trace of coarse sand and organic matter.		A-2-4 (0)
	51.5'	13			
			18" Recovery		
14	55.0'	5	Saturated stiff gray fine sandy silt w/trace of clay and coarse sand.		A-4 (0)
	56.5'	6			
			18" Recovery		
15	60.0'	6	Saturated medium dense light gray silty fine sand w/trace of coarse sand, clay and gravel.		A-2-4 (0)
	61.5'	12			
			18" Recovery		
16	65.0'	8	Saturated very stiff light gray fine sandy silt w/trace of gravel and clay.		A-4 (0)
	66.5'	15			
			18" Recovery		
17	70.0'	10	Saturated hard dark gray fine sandy silt w/trace of gravel.		A-4 (0)
	71.5'	21			
			18" Recovery		
18	75.0'	8	Saturated medium dense dark gray silty fine sand.		A-2-4 (0)
	76.5'	16			
			18" Recovery		
19	78.5'	12	Saturated dense dark gray silty fine sand.		A-2-4 (0)
	80.0'	25			
			18" Recovery		
			( END )		

NOTES:

- BORING INFORMATION OBTAINED FROM DRAWINGS TITLED "SOIL BORINGS SHEET #1 & SOIL BORINGS SHEET #2" NOT DATED, SHEETS 22 & 23 OF 38, OF "BRIDGE 3-362 ON CHIPMANS POND RD (5465) OVER CHIPMANS POND" CONTRACT NO. 25-073-01, PROVIDED BY STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION.

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IN CHARGE OF	RRB				
DESIGNED BY	MAD				
CHECKED BY	DRP				
DRAWN BY	MK				
		0	02/02/2017	ISSUED FOR BID	RRB
		NO.	DATE	REVISION	INT.



STATE OF DELAWARE DNREC  
DIVISION OF WATERSHED STEWARDSHIP  
IMPROVEMENTS TO DELAWARE DAMS  
DOVER, DELAWARE

DNREC CONTRACT No.: NAT17001-DAMCONST

STRUCTURAL  
IMPROVEMENTS TO CHIPMANS POND DAM  
BORING LOGS

FILE NO.  
12804.61925 -R01  
DATE  
02/02/2017

REF-1