

Upper Lightning Lake Water Level Management
Environmental Assessment Worksheet

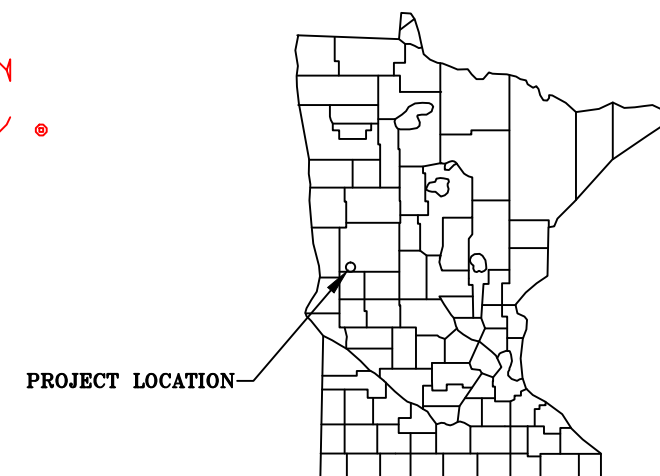
Attachment B

Preliminary Design Plans for Structure and Upstream Channel

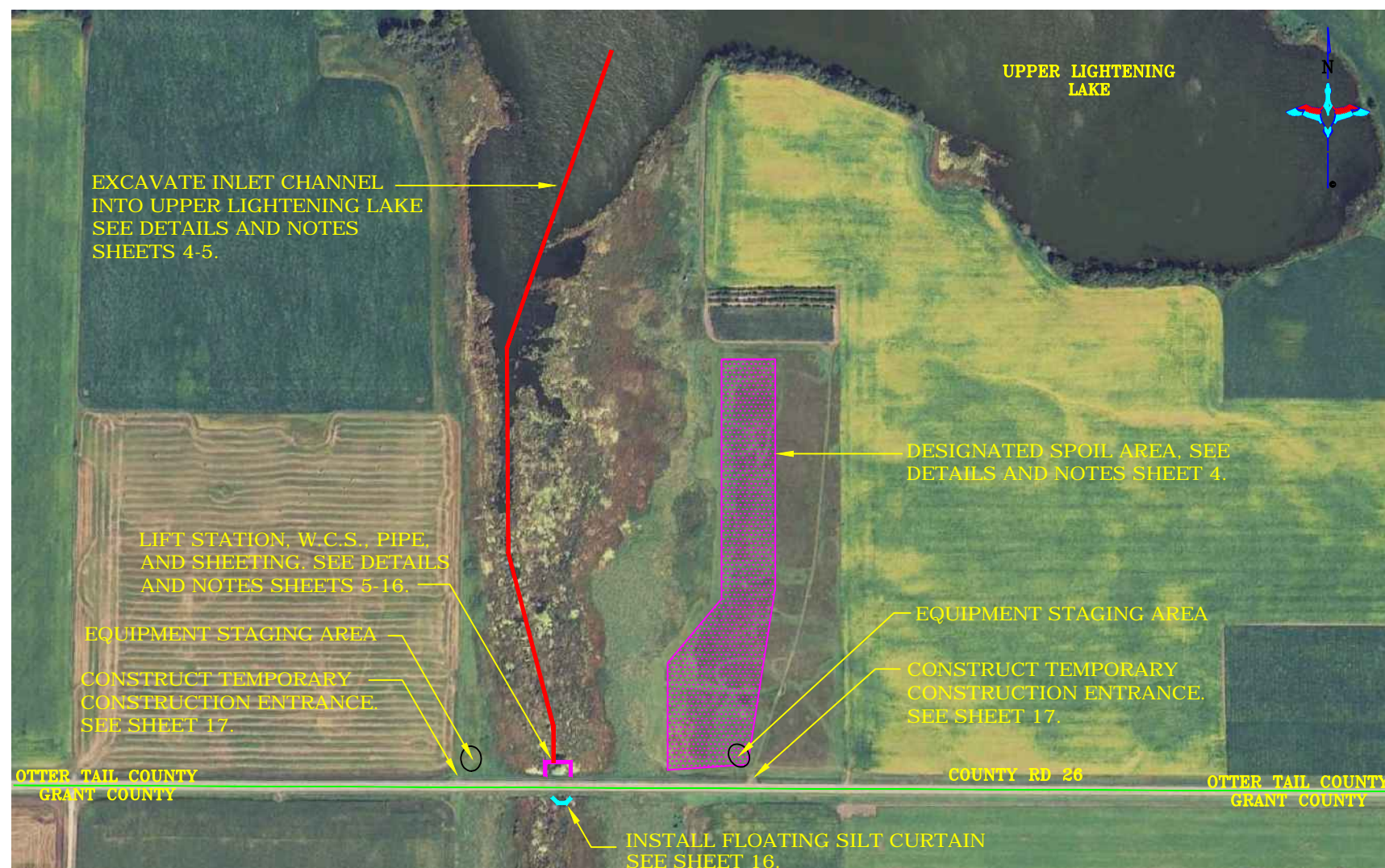


SECTION 36 TOWNSHIP 131N, RANGE 44W
OTTER TAIL COUNTY, MN

IN COOPERATION WITH
MINNESOTA DEPARTMENT OF NATURAL RESOURCES



MINNESOTA



MAP POINT "▲" IS LOCATED AT INTERSECTION OF STATE HWY 55 AND COUNTY HWY 11
LOCATED IN WENDELL, MN. TO SITE FROM MAP POINT, GO NORTH ON COUNTY HWY 11
±0.5 MILES TO INTERSECTION OF COUNTY HWY 11 & COUNTY HWY 26. GO WEST ON
COUNTY HWY 26 ±3 MILES TO PROJECT SITE LOCATED ON NORTH SIDE OF HIGHWAY.



VICINITY MAP
NOT TO SCALE

PLAN INDEX


- | | |
|-------|---|
| 1 | PROJECT LOCATION MAPS |
| 2 | ESTIMATED QUANTITIES AND CONSTRUCTION NOTES |
| 3 | PROJECT TOPOGRAPHY |
| 4 | PLAN & PROFILE INLET CHANNEL, DETAILS AND NOTES |
| 5 | PLAN VIEW STRUCTURES AND STAKING LAYOUT |
| 6-8 | INTAKE SLOPED END & LIFT STATION DETAILS |
| 9-10 | DIP/SHEETING DETAILS AND NOTES |
| 11-12 | WATER CONTROL STRUCTURE DETAILS AND NOTES |
| 13 | HANDRAIL DETAILS |
| 14 | GALVANIZED STOPLOG STORAGE BOX |
| 15 | 24"Ø RCP DETAILS AND NOTES |
| 16 | PLAN VIEW EROSION CONTROL |
| 17 | STORM WATER POLLUTION PREVENTION PLAN |

LOCATION MAP
NOT TO SCALE

PROJECT AGENCY/OWNER CONTACTS:
KEVIN KOTTS or TODD CALL
MN DNR-GLENWOOD OFFICE
320-634-4573

PROJECT ENGINEER:
DOUG LIPETZKY, P.E.
FOR DUCKS UNLIMITED, INC.
DU - BISMARCK, ND
701-355-3552

IF THESE PLANS ARE NOT PLOTTED AND/OR REPRODUCED AT THE ORIGINAL SIZE OF 24"x 36" ANY SCALE REFERENCED HEREIN SHOULD BE DISREGARDED AND THE PLANS SHOULD BE CONSIDERED "NOT TO SCALE."

Revision Number	Sheet Number	Revisions	Date	By	I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.	 DUCKS UNLIMITED INC. GREAT PLAINS REGIONAL OFFICE DATE: 2-5-2014 SHEET NO. 1 OF 17	PROJECT NO. MN-332-2 UPPER LIGHTENING LAKE PUMP COVER SHEET	DESIGNED BY: D. DRAWN BY: M. SURVEYED BY: G. CHECKED BY: .
				Douglas J. Lipetzky, P.E. for Ducks Unlimited, Inc.	Date		APPROVED BY:	APPROVED BY:

This material, data and information is the property of Ducks Unlimited, Inc. It may not be used or reproduced for any purpose without the prior written consent of an authorized agent of Ducks Unlimited, Inc. Ducks Unlimited, Inc. makes no representation or warranty of any kind regarding this material, data and information, including, but not limited to, the accuracy of the material, data and information or its suitability for any purpose. All use of the material, data and information is at the user sole risk. By using any of this material, data and information, user agrees that Ducks Unlimited, Inc. is not responsible for their use of the material, data and information or the results thereof.

ESTIMATED QUANTITIES:

NOTE	SPEC.#	ITEM	UNIT	QUANTITY
1	201	MOBILIZATION	LUMP SUM	1
2	202	SITE PREPARATION	LUMP SUM	1
2	202	SITE PREPARATION-DISKING	ACRE	4.0
3	203	EXCAVATION		
		MAIN CHANNEL	LINEAR FEET	2,850
		SIDE CHANNEL	LINEAR FEET	60
4	204	EMBANKMENT	CUBIC YARDS	692
5	301	WATER CONTROL STRUCTURE		
5		DOUBLE PRECAST 10'x10' SLOPED END SECTION SQ. CORNER	LUMP SUM	1
5		VERTICAL DOUBLE PRECAST 10'x8' REINFORCED CONCRETE BOX "LIFT STATION" SQ. CORNER	LUMP SUM	1
5		MODIFIED PRECAST 8'x6' REINFORCED CONCRETE UTILITY BOX	LUMP SUM	1
	302	STRUCTURE & CULVERT APPURTENANCES		
		ALUMINUM CANAL GATE WITH CAST IRON PEDESTAL AND GEARED LIFT	EACH	2
		ALUMINUM HATCH WITH SERIES X RETRO GRATE (54"x 42")	EACH	2
		FLAP VALVE FOR 12" DIP "COMPRESSION STYLE"	EACH	2
	303	CULVERT SUPPLY & INSTALLATION		
		24"Ø RCP, GASKETED, CLASS III	LINEAR FEET	24
		12"Ø DIP, PRESSURE CLASS 250	LINEAR FEET	45
	305	RIPRAP, REVETMENT & AGGREGATE PLACEMENT		
6		RIPRAP (DU CLASS II)	TON	90
7		¾"-1½" CLEAR ROCK	TON	160
8		MnDOT CLASS 5 GRAVEL	TON	120
	307	SHEET PILE MATERIAL	SQUARE FEET-PLAN	1,678
	307	SHEET PILE INSTALLATION	SQUARE FEET-PLAN	1,678
	307	PILE PRO CF 90 OR CF TEE 20 L.F. LONG MATERIAL & INSTALLATION	EACH	2
	309	STRUCTURAL STEEL		
		PILE CAP, ANGLES BOLTED TO LIFT STATION, AND FILLER PLATES	LUMP SUM	1
		CONTROL PANEL ENCLOSURE	LUMP SUM	1
		ALUMINUM STOPLOGS	LUMP SUM	1
		ALUMINUM CLEANING RAKE	LUMP SUM	1
		GALVANIZED HANDRAILS AND CHAIN ASSEMBLY MOUNTED TO SHEETING	LUMP SUM	1
		GALVANIZED STEEL GRATING	SQUARE FEET	63
		GALVANIZED STOPLOG CHANNELS, PLATES, BOLTS, HANDRAIL, LIFTING HOOKS & LOCKING ROD FOR W.C.S.	LUMP SUM	1
		GALVANIZED TRASH SCREEN AND HANDRAIL FOR INTAKE DOUBLE PRECAST SLOPED END SECTION	LUMP SUM	1
		GALVANIZED STOPLOG STORAGE BOX	EACH	1
9	313	5,000 GPM PUMP (12" HYDROMATIC MODEL S12L SUBMERSIBLE NON-CLOG PUMP OR APPROVED EQUAL (5,000 GPM AT 12-19 FT TDH)	EACH	2
	313	CONTROL PANEL WITH VARIABLE FREQUENCY DRIVE	LUMP SUM	1
	315	PUMP AND PANEL ELECTRICAL CONNECTIONS	LUMP SUM	1
10		TRAFFIC CONTROL	LUMP SUM	1
11		COFFERDAM	LUMP SUM	1
12	401	FLOATING SILT FENCE/CURTAIN	LINEAR FEET	40
12	401	STANDARD SILT FENCE	LINEAR FEET	300
12	401	MnDOT CAT. 3 EROSION BLANKET	SQUARE YARD	420
12	401	12"Ø STRAW WATTLES	LINEAR FEET	60
13		TEMPORARY CONSTRUCTION ENTRANCE	EACH	2
12	401	STORM WATER PERMIT	LUMP SUM	1
14	402	SEEDING	ACRE	4.0
14	402	MULCHING	ACRE	4.0

¾"-1½" CLEAR ROCK BEDDING

LOCATION	QUANTITY
BEDDING & BACKFILL FOR SLOPED END AND LIFT STATION	120 TON
BEDDING & BACKFILL RCP	20 TON
BEDDING W.C.S. AND MISC.	20 TON
TOTAL	160 TON

SEEDING & MULCHING

LOCATION	QUANTITY
STRUCTURE AREA	0.1 ACRES
SPOIL MATERIAL FROM CH. EXCAVATION	3.9 ACRES
TOTAL	4.0 ACRES

SEED MIX

Mixture: 350			
Common Name	PLS Rate		% of Mix Component
	kg/ha	lb/ac	
Bluestem, big	3.4	3.0	21.5
Indian grass	2.8	2.5	18.0
Bluestem, little	2.8	2.5	18.0
Grama, sideoats	3.4	3.0	21.5
Wild-rye, Canadian	2.2	2.0	14.0
Switch grass	1.1	1.0	7.0
Grass Totals	15.7	14.0	100.0
Common Name	Bulk Rate		% of Mix Component
	kg/ha	lb/ac	
Winter Wheat*	62.7	56.0	80.0
Rye-grass, annual	12.5	11.2	16.0
Wheatgrass, slender	3.1	2.8	4.0
Cover Crop Totals	78.3	70.0	100.0
Mesic Forbs Mixture	0.6	0.5	100.0
GRAND TOTALS:	94.6	84.5	100.0
*Oats to be substituted for spring plantings			
Application: Native mix for general roadside areas.			

SEED MIX NOTE: MINNESOTA DNR SHALL APPROVE FINAL SEED MIX. IF MIX DIFFERS FROM THAT SHOWN, DNR WILL PROVIDE A LOCAL NATIVE SEED MIX.

UTILITIES NOTE

BEFORE THE START OF CONSTRUCTION, THE OWNER OF ANY UTILITIES INVOLVED MUST BE NOTIFIED. THE EXCAVATOR/CONTRACTOR IS RESPONSIBLE FOR GIVING THIS NOTICE BY CALLING "GOPHER STATE ONE CALL" AT 800-252-1166 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION. NOTE: THERE ARE OVERHEAD POWER LINES AND POWER POLE IN THE CONSTRUCTION AREA.

CONSTRUCTION NOTES:

- 1) BID ITEM FOR MOBILIZATION SHALL INCLUDE THE SUPPLY OF ALL LABOR, MATERIAL AND EQUIPMENT TO TRANSPORT ALL NEEDED LABOR, MATERIAL AND EQUIPMENT TO AND FROM A PROJECT SITE TO SUCCESSFULLY COMPLETE THAT PROJECT AS SHOWN ON THE PLANS OR DESCRIBED BY THE ENGINEER. CONTRACTOR SHALL ASSUME MULTIPLE MOBILIZATIONS TO RETURN WHEN WATER LEVELS HAVE LOWERED OR DURING WINTER MONTHS TO CONSTRUCT FULL INLET CHANNEL AS SHOWN.
- 2) THE PAY QUANTITY FOR THE SITE PREPARATION BID ITEM SHALL INCLUDE STRIPPING BENEATH EMBANKMENT PAD FOOTPRINT, BORROW AREA, AND WATER CONTROL STRUCTURES. THE CONTRACTOR SHALL PLACE MIN. 6" TOPSOIL OVER ALL DISTURBED AREAS AND LEVEL SUITABLE ENOUGH FOR SEEDING & MULCHING, AS DETERMINED BY THE DU FIELD ENGINEER.

- 2) THE BID ITEM "SITE PREPARATION-DISKING" IS FOR DISKING THE SPOIL AREAS AND TRAILS WHERE POSSIBLE WITH TWO PASSES (MINIMUM) WITH A HEAVY DUTY DISK TO PREPARE THE SEEDBED. ONLY THE ACTUAL AREA DISKED WILL BE PAID FOR.
- 3) BID ITEM FOR EXCAVATION-MAIN CHANNEL & SIDE CHANNEL IS TO CONSTRUCT CHANNELS FROM STRUCTURE LOCATION OUT INTO UPPER LIGHTNING LAKE. ALL MATERIAL WILL BE REMOVED FROM WETLAND AND HAULED TO DESIGNATED WASTE/BORROW AREA AS NOTED IN THESE PLANS. PAYMENT WILL BE BASED ON LINEAR FEET. CONTRACTOR WILL ONLY BE PAID FOR THE EXACT AMOUNT OF LINEAR FEET EXCAVATED IN THE FIELD. CONTRACTOR SHALL INCLUDED ALL COSTS ASSOCIATED WITH CHANNEL EXCAVATION AND NOTED IN THESE PLANS. SEE MORE DETAILS SHEET 4.
- 4) BID ITEM FOR EMBANKMENT SHALL BE FOR HAULING, PLACING, AND COMPACTING MATERIAL FOR THE EMBANKMENT PAD. THE QUANTITY INCLUDES THE SITE PREPARATION VOLUME PLUS 15% FOR SHRINKAGE. THIS IS A PLAN QUANTITY, THERE WILL BE NO ADJUSTMENT MADE FOR INCREASE OR DECREASE TO QUANTITY. BORROW AREA IS LOCATED ON PRIVATE GROUND WITHIN SPOIL AREA. CONTRACTOR AND DU FIELD ENGINEER WILL EXCAVATE TEST HOLE TO FIND SUFFICIENT MATERIAL. EMBANKMENT MATERIAL WILL BE MINED, DELIVERED TO SITE, PLACED, AND COMPACTED WITHIN STRUCTURE AREA AS DETAILED IN THESE PLANS. SPOIL MATERIAL WILL BE USED TO FILL VOID AFTER ALL MATERIAL HAS BEEN PLACED AND COMPACTED. EMBANKMENT MATERIAL WILL BE PLACED AND COMPACTED AS DESCRIBED IN EMBANKMENT SPECIFICATION 204. EMBANKMENT MATERIAL REQUIRED BENEATH EXISTING GROUND AROUND WATER CONTROL STRUCTURE, SLOPED END, LIFT STATION, AND 24"Ø RCP SHALL BE CONSIDERED INCIDENTAL TO THOSE LINE ITEMS.
- 5) BID ITEMS UNDER SPECIFICATION 301 "WATER CONTROL STRUCTURES" SHALL INCLUDE ANY SURFACE OR SUBSURFACE WATER CONTROL NEEDED TO ALLOW INSTALLATION OF THE STRUCTURES. ANY FOREIGN MATERIAL PLACED IN A WETLAND FOR THE PURPOSE OF WATER CONTROL SHALL BE REMOVED IN ITS ENTIRETY AFTER COMPLETION OF CONSTRUCTION.
 - DOUBLE PRECAST 10'x10' SLOPED END SECTION SQUARE CORNER SHALL INCLUDE 16 L.F. STRUCTURE WITH SMOOTH DOWNSTREAM SURFACE (NO MALE JOINT), DROPPED END WALL, TIE RODS, CONCEAL PRODUCTS, AND ANY OTHER ITEMS NEEDED TO COMPLETE STRUCTURE AS DETAILED THESE SHEETS. TRASH SCREEN, CLEANING RAKE, AND HANDRAIL WILL BE BID UNDER SEPARATE LINE ITEM.
 - VERTICAL DOUBLE PRECAST 10'x8' REINFORCED CONCRETE BOX CULVERT "LIFT STATION" WITH SQUARE CORNERS SHALL INCLUDE RISER SECTIONS WITH CIRCULAR KNOCKOUTS FOR 30" CANAL GATES, RECTANGULAR KNOCKOUT NEAR BOTTOM OF CENTER WALL, 14"Ø CIRCULAR KNOCKOUTS FOR 12"Ø DIP OUTLET PIPE, 8" CONCRETE COVER (OR THICKNESS RECOMMENDED BY SUPPLIER) WITH KNOCKOUT FOR HATCH OPENINGS, 12" THICK MONOLITHIC BASE, CONCEAL PRODUCTS, TIE RODS, CONCRETE COLLAR, GROUTING IN VOIDS AROUND 12" DIPs, AND ANY OTHER ITEMS NEEDED TO COMPLETE STRUCTURE AS DETAILED THESE SHEETS. ALUMINUM HATCHES, CANAL GATES, PUMPS, CONTROL PANEL AND ELECTRICAL WORK WILL BE BID UNDER SEPARATE LINE ITEMS.
 - MODIFIED PRECAST 8'x6' UTILITY BOX SHALL INCLUDE GALVANIZED PLATES CAST ALONG SIDES OF STRUCTURE, CONCRETE COLLAR AROUND RCP, GROUTING IN VOIDS AROUND DIPs, MONOLITHIC BASE, CIRCULAR KNOCKOUTS FOR 12" DIPs, 24"Ø RCP AND ANY OTHER ITEMS NEEDED TO COMPLETE STRUCTURE AS DETAILED THESE SHEETS. GRATING, HANDRAILS, STOPLOGS, STORAGE BOX AND STOPLOG GUIDES WILL BE BID UNDER SEPARATE LINE ITEMS.

- 6) BID ITEM FOR RIPRAP DU CLASS II IS FOR CHANNELS BOTTOM AND SIDE SLOPES NEXT TO STRUCTURES AS SHOWN SHEET 5. NON-WOVEN FILTER FABRIC IS REQUIRED BENEATH ALL ROCK RIPRAP AND SHALL BE SECURED TO SLOPES AND BOTTOM USING PINS AS NOTED SPECIFICATION 303. QUANTITIES ARE BASED ON TONS. CONTRACTOR SHALL PROVIDE SCALE TICKETS WITH WEIGHTS INCLUDING TARE WEIGHTS, GROSS WEIGHTS, AND NET WEIGHTS OF MATERIAL DELIVERED. RIPRAP SUPPLY SOURCE SHALL BE IDENTIFIED FOR INSPECTION BY THE DNR FOR INVASIVE SPECIES PRIOR TO TRANSPORTING ONSITE.
- 7) BID ITEM FOR ¾"-1½" CLEAR ROCK IS FOR BEDDING & BACKFILLING THE LIFT STATION, BEDDING THE SLOPED END SECTION, BEDDING & BACKFILLING RCP OUTLET PIPE, AND BEDDING WATER CONTROL STRUCTURE. THE DU FIELD ENGINEER WILL HAVE THE AUTHORITY TO ADD/DECREASE QUANTITY BASED ON SITE CONDITIONS AND SOIL FOUNDATION. CONTRACTOR WILL ONLY BE PAID FOR THE AMOUNT OF ROCK USED. QUANTITY IS BASED ON TONS. CONTRACTOR SHALL PROVIDE SCALE TICKETS WITH WEIGHTS INCLUDING TARE WEIGHTS, GROSS WEIGHTS AND NET WEIGHTS OF MATERIAL DELIVERED.
- 8) BID ITEM FOR MNDOT CLASS 5 GRAVEL IS FOR SURFACING THE COUNTY HIGHWAY SLOPE AND TRANSITIONING ROAD SHOULDER TO EMBANKMENT TOP AS DETERMINED IN THE FIELD. CONTRACTOR WILL BE REQUIRED TO STRIP 6" DEPTH OF TOPSOIL PRIOR TO GRAVEL PLACEMENT. MATERIAL SHALL BE PLACED AND COMPACTED AS DETERMINED IN THE FIELD. MnDOT CLASS 5 GRAVEL SHALL BE APPROVED PRIOR TO DELIVERY ONSITE. QUANTITY IS BASED ON TONS. CONTRACTOR SHALL PROVIDE SCALE TICKETS INCLUDING TARE WEIGHTS, GROSS WEIGHTS, AND NET WEIGHTS OF MATERIAL DELIVERED.
- 9) THE BID ITEM FOR "5,000 GPM PUMP" INCLUDES THE 12" HYDROMATIC MODEL S12L NON-CLOG ELECTRICAL SUBMERSIBLE PUMP (OR APPROVED EQUAL), MOTOR, BASE ELBOW & SEALING FLANGE, TOP ELBOW, FLOATS, SWITCHES, GUIDE RAIL BRACKETS, RAILS, STAINLESS STEEL METAL INTERLOCKED POWER CORD PROTECTIVE SLEEVES ON PUMP POWER CORDS AND FLOAT SWITCHES, HANGER FOR FLOAT CORDS, STAINLESS STEEL LIFTING CHAIN ASSEMBLY, AND ANY OTHER FEATURES NECESSARY TO PROVIDE A COMPLETE OPERATIONAL PUMPING UNIT. SEE NOTES ON SHEET 8. THE COST OF CONTROL PANEL AND ELECTRICAL WORK SHALL BE INCLUDED IN SEPARATE BID ITEMS.

- 10) THE BID ITEM FOR TRAFFIC CONTROL IS FOR SUPPLYING, LOCATING, AND MAINTAINING ALL TRAFFIC CONTROL SIGNS DURING THE CONSTRUCTION. ADEQUATE SIGNING IN ACCORDANCE WITH MN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES SHALL BE PROVIDED TO INCLUDE WARNING SIGNS SUCH AS "ROAD WORK AHEAD" AND/OR "SHOULDER WORK" WITH FLASHING LIGHTS LOCATED ½ MILE EAST AND WEST OF PROJECT SITE AS REQUIRED. CONTRACTOR SHALL MAINTAIN TWO-WAY TRAFFIC ON COUNTY ROAD UNLESS CERTAIN CONSTRUCTION ACTIVITIES WILL NOT ALLOW. AT SUCH TIME, FLAG PERSONS SHALL BE UTILIZED TO DIRECT TRAFFIC. ANY MNDOT/OTTER TAIL COUNTY SIGNING REQUIREMENTS SHALL BE ADHERED TO.
- 11) THE COST OF ANY COFFERDAM THAT MAY BE NEEDED FOR LIFT STATION AND WATER CONTROL STRUCTURE INSTALLATION SHALL BE INCLUDED IN THE BID ITEM FOR "COFFERDAM." THE BID SHALL INCLUDE BORROW REMOVAL, LOADING, HAULING, INSTALLING, REMOVAL, AND RECLAIMING. ALL MATERIAL SHALL BE REMOVED FROM WETLAND UPON COMPLETION OF PROJECT. THE CONTRACTOR CAN BORROW FROM SAME SOURCE AS EMBANKMENT MATERIAL. CONTRACTOR WILL BE REQUIRED TO RECLAIM AREA SUITABLE ENOUGH FOR SEEDING & MULCHING.
- 12) SEVERAL BID ITEMS ARE INCLUDED FOR STORM WATER MANAGEMENT AND POLLUTION CONTROL. SUCH BIDS SHALL INCLUDE THE SUPPLY, INSTALLATION AND MAINTENANCE OF FLOATING SILT FENCE/CURTAIN, STANDARD SILT FENCE, 12" BIO-ROLLS (STRAW WATTLES), AND MnDOT CATEGORY 3 EROSION CONTROL BLANKET. THE EXACT LOCATION AND QUANTITY WILL BE DETERMINED IN THE FIELD. EROSION CONTROL MEASURES SHALL BE INSTALLED CONCURRENTLY OR WITHIN 24 HOURS AFTER THE START OF WORK AND WILL BE MAINTAINED FOR THE DURATION OF THE PROJECT. SEE SHEETS 16-17. CONTRACTOR WILL BE PAID AT THE UNIT PRICE BID FOR THE ACTUAL QUANTITY INSTALLED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSTALL, INSPECT AND MAINTAIN THE BEST MANAGEMENT PRACTICE MEASURES REQUIRED TO PREVENT SILT AND POLLUTION RUNOFF. IF ADDITIONAL ITEMS NOT LISTED ON THE UNIT PRICE TABLE ARE NEEDED, THOSE SHALL BE CONSIDERED EXTRA WORK. THE CONTRACTOR WILL ALSO BE REQUIRED TO OBTAIN THE STORMWATER PERMIT FOR CONSTRUCTION ACTIVITIES PRIOR TO THE START OF THE CONSTRUCTION.
- 13) TWO "TEMPORARY CONSTRUCTION ACCESS" LOCATIONS HAVE BEEN IDENTIFIED. SEE SHEETS 1 & 11 FOR DETAILS. ANY CHANGE IN LOCATION SHALL BE APPROVED BY THE DU FIELD ENGINEER.
- 14) BID ITEM FOR "SEEDING" SHALL INCLUDE THE EQUIPMENT AND LABOR REQUIRED TO LEVEL AND PREPARE TOPSOIL FOR SEEDING AND MULCHING IN DISTURBED AREAS ON THE PROPERTY AS IDENTIFIED BY THE DU FIELD ENGINEER. THE "SITE PREPARATION-DISKING" BID ITEM SHOULD COVER THE COST OF MOST OF THIS REQUIRED PREPARATION.

THE CONTRACTOR IS RESPONSIBLE FOR SUPPLYING THE SEED MIX NOTED ON THIS SHEET, AND PLACING THE SEED IN ACCORDANCE WITH THESE PLANS AND DU SPECIFICATION 402. ANY VARIANCE REQUESTED FROM THE SEED MIX SHOWN THAT RESULTS IN A COST INCREASE WILL BE CONSIDERED EXTRA WORK AND PAID FOR AS SUCH. PAYMENT FOR "SEEDING" SHALL BE BASED ON ACTUAL ACRES SEEDED AFTER FINAL COMPLETION OF THE PROJECT AS DETERMINED BY THE DU FIELD ENGINEER.

WEED-FREE MnDOT TYPE 1 OR TYPE III MULCH SHALL BE APPLIED TO ALL AREAS SEEDED, AS DIRECTED BY THE DU FIELD ENGINEER. MULCH SHALL BE EVENLY APPLIED AT A 2.0 TON/ACRE RATE. PAYMENT WILL BE BASED ON ACTUAL ACRES MULCHED AFTER FINAL COMPLETION OF PROJECT. THE AREA WILL BE DETERMINED BY DU FIELD ENGINEER.


A NOTE CONCERNING INVASIVE SPECIES REQUIREMENTS

THE MINNESOTA DNR OPERATION ORDER 113 REQUIRES PREVENTING OR LIMITING THE INTRODUCTION, ESTABLISHMENT AND SPREAD OF INVASIVE SPECIES DURING ACTIVITIES ON PUBLIC WATER AND DNR ADMINISTERED LANDS. THE CONTRACTOR SHALL PREVENT INVASIVE SPECIES FROM ENTERING INTO OR SPREADING WITHIN A PROJECT SITE BY CLEANING EQUIPMENT AND CLOTHING PRIOR TO ARRIVING AT THE PROJECT SITE. THE DNR SHALL INSPECT ALL EQUIPMENT AND CLOTHING AT THE STAGING AREA DETERMINED AT THE PRE-CONSTRUCTION MEETING.

IF EQUIPMENT OR CLOTHING ARRIVES AT THE PROJECT SITE WITH SOIL, AGGREGATE MATERIAL, MULCH, VEGETATION (INCLUDING SEEDS) OR ANIMALS, IT SHALL BE CLEANED BY CONTRACTOR FURNISHED TOOL OR EQUIPMENT (BRUSH/BROOM, COMPRESSED AIR, OR PRESSURE WASHER) AT THE STAGING AREA. THE CONTRACTOR SHALL DISPOSE OF MATERIAL CLEANED FROM EQUIPMENT AND CLOTHING AT A LOCATION DETERMINED BY THE OWNER. IF MATERIAL CANNOT BE DISPOSED OF ONSITE, SECURE MATERIAL PRIOR TO TRANSPORT (SEALED CONTAINER, COVERED TRUCK, OR WRAP WITH TARP) AND LEGALLY DISPOSE OF OFFSITE.

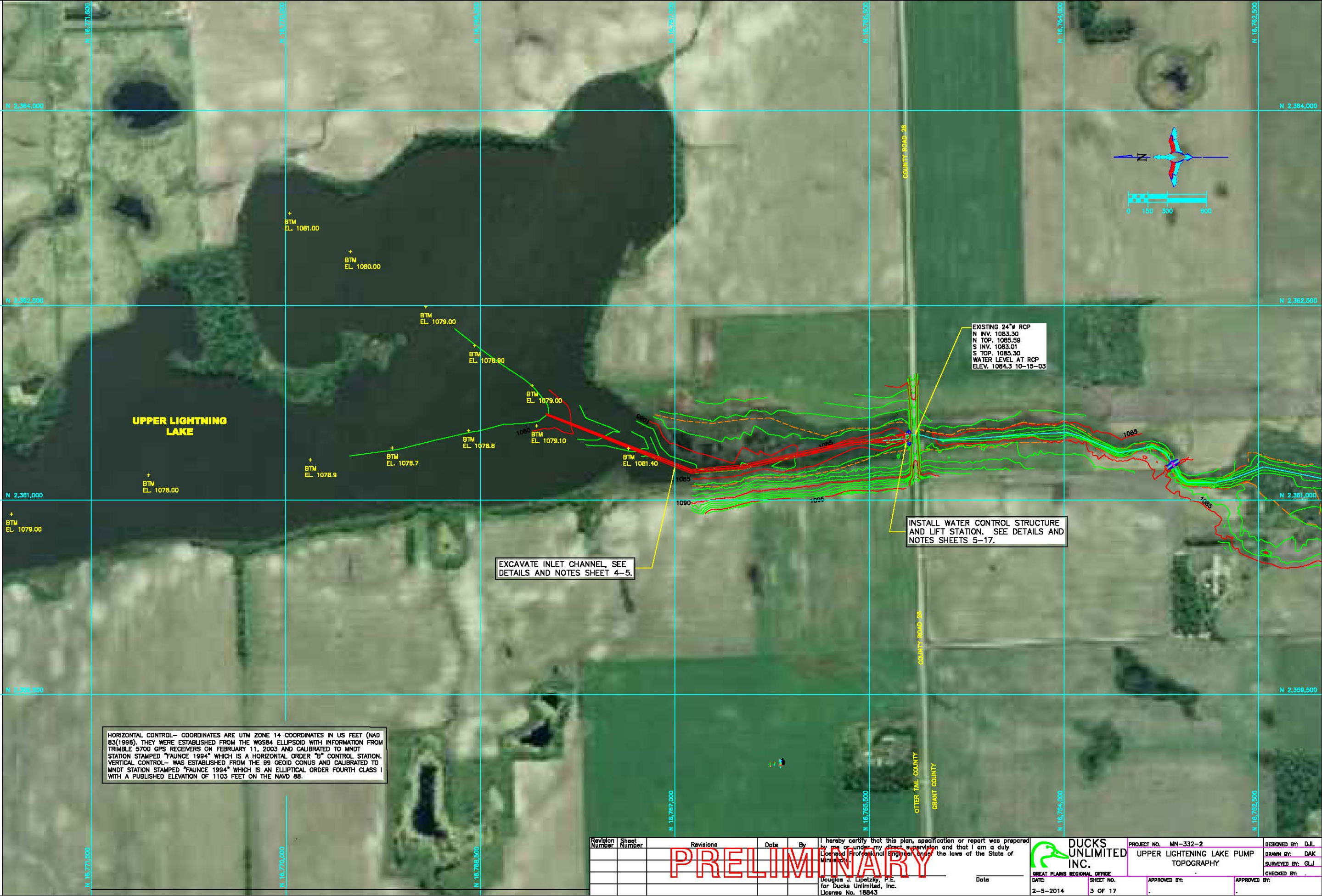
IF WORK IS PERFORMED WITHIN A WATER BODY, THE CONTRACTOR SHALL CLEAN EQUIPMENT AND CLOTHING AS NOTED ABOVE, PRIOR TO ENTERING AND LEAVING THE WATER BODY. DRAIN ALL WATER FROM EQUIPMENT WHERE WATER MIGHT BE TRAPPED, SUCH AS TANKS, PUMPS, HOSES, SILT CURTAINS, AND WATER RETAINING COMPONENTS OF BOATS/BARGES.

THE SOURCES OF ALL IMPORTED MATERIAL SHALL BE INSPECTED FOR INVASIVE SPECIES BY THE DNR PRIOR TO TRANSPORTING.

Revision Number	Sheet Number	Revisions	Date	By	I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.	 DUCKS UNLIMITED INC. GREAT PLAINS REGIONAL OFFICE DATE: 2-5-2014 SHEET NO. 2 OF 17	PROJECT NO. MN-332-2	DESIGNED BY: DJL
							UPPER LIGHTENING LAKE PUMP	DRAWN BY: MLO
							ESTIMATED QUANTITIES AND CONSTRUCTION NOTES	SURVEYED BY: GLJ
								CHECKED BY:
								APPROVED BY:

Douglas J. Lipetzky, P.E.
for Ducks Unlimited, Inc.
License No. 18843

Date



HORIZONTAL CONTROL- COORDINATES ARE UTM ZONE 14 COORDINATES IN US FEET (NAD 83(1996)). THEY WERE ESTABLISHED FROM THE WGS84 ELLIPSOID WITH INFORMATION FROM TRIMBLE 5700 GPS RECEIVERS ON FEBRUARY 11, 2003 AND CALIBRATED TO MNDT STATION STAMPED "FAUNCE 1994" WHICH IS A HORIZONTAL ORDER "3" CONTROL STATION. VERTICAL CONTROL- WAS ESTABLISHED FROM THE 99 GEOID CONUS AND CALIBRATED TO MNDT STATION STAMPED "FAUNCE 1994" WHICH IS AN ELLIPTICAL ORDER FOURTH CLASS I WITH A PUBLISHED ELEVATION OF 1103 FEET ON THE NAVD 88.

EXCAVATE INLET CHANNEL, SEE DETAILS AND NOTES SHEET 4-5.

EXISTING 24" RCP
N INV. 1083.30
N TOP. 1085.59
S INV. 1083.01
S TOP. 1085.30
WATER LEVEL AT RCP
ELEV. 1084.3 10-15-03


INSTALL WATER CONTROL STRUCTURE AND LIFT STATION. SEE DETAILS AND NOTES SHEETS 5-17.

Revision Number	Sheet Number	Revisions	Date	By

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Douglas J. Lipetzky, P.E.
for Ducks Unlimited, Inc.
License No. 15843

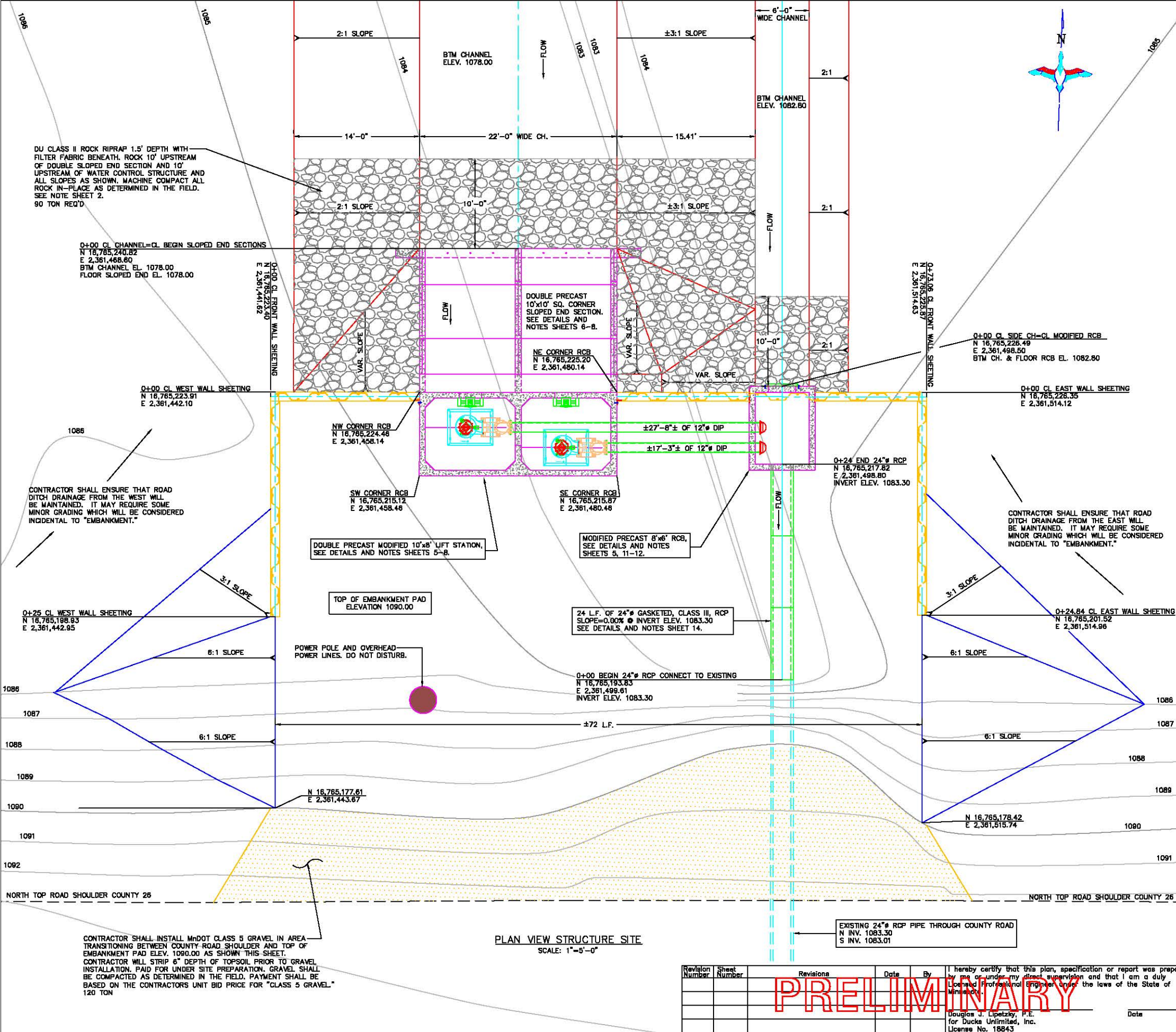
Date

**DUCKS
UNLIMITED
INC.**
GREAT PLAINS REGIONAL OFFICE

PROJECT NO. MN-332-2
UPPER LIGHTNING LAKE PUMP
TOPOGRAPHY

DESIGNED BY: DJL
DRAWN BY: DAK
SURVEYED BY: GLJ
CHECKED BY:

DATE: 2-5-2014
SHEET NO. 3 OF 17
APPROVED BY:
APPROVED BY:



SITE PREPARATION NOTE ON EMBANKMENT PAD:

12" DEPTH TOPSOIL SHALL BE STRIPPED FROM BENEATH THE EMBANKMENT PAD AND STOCKPILED PRIOR TO PLACING FILL. UPON COMPLETION OF COMPACTED EMBANKMENT FILL, CONTRACTOR SHALL PLACE MIN. 6" DEPTH TOPSOIL OVER TOP OF PAD AND SIDE SLOPES ALONG ROAD WAY. ANY ADDITIONAL TOPSOIL SHALL BE PLACED ALONG 6:1 SLOPES TO FLATTEN AND THICKEN SUCH.

THE CONTRACTOR SHALL LEVEL ALL TOPSOIL SUITABLE ENOUGH FOR SEEDING & MULCHING, AS DETERMINED BY DU FIELD ENGINEER. PAYMENT FOR STRIPPING, STOCKPILING, REMOVAL/DEPOSITING, AND PLACEMENT SHALL BE PAID FOR BASED ON THE CONTRACTOR'S UNIT BID PRICE FOR "SITE PREPARATION."

EMBANKMENT/BORROW AREA NOTE:

COHESIVE EMBANKMENT MATERIAL 692 C.Y.-P (INCLUDES 15% FOR SHRINKAGE AND 146 C.Y.-P SITE PREPARATION) SHALL COME FROM ONSITE BORROW AREA SHOWN SHEET 1 & 4. THE BORROW AREA IS LOCATED ON THE EAST SIDE OF THE EXISTING CATTAILS SLOUGH AND PROPOSED INLET CHANNEL IN CRP GRASS. THE DU FIELD ENGINEER AND CONTRACTOR WILL EXCAVATE TEST HOLES WITHIN AREA OUTLINED TO DETERMINE WHERE ADEQUATE FILL SHALL BE TAKEN. @ MIN. THE MATERIAL SHALL CONSIST OF A COHESIVE LEAN CLAY WITH CLOSE TO OPTIMUM MOISTURE. DESIGNATED BORROW AREA IS ALSO DESIGNATED WASTE AREA FOR CHANNEL SPOIL MATERIAL. CONTRACTOR WILL MINE MATERIAL PRIOR TO DEPOSITING SPOIL. BORROW AREA SHALL BE FILLED WITH CHANNEL EXCAVATION MATERIAL AS DETERMINED IN THE FIELD AND BE LEVELED SUITABLE ENOUGH FOR SEEDING & MULCHING AS NOTED SHEET 4. CONTRACTOR WILL FILL AREA INSIDE SHEET PILE AND UP TO COUNTY ROAD SLOPE TO ELEVATION 1090.00 AS SHOWN THIS SHEET. MATERIAL WILL BE PLACED AND COMPACTED AS DESCRIBED IN EMBANKMENT SPECIFICATION 204. QUANTITY IS BASED ON THE NEW EMBANKMENT TEMPLATE OVER EXISTING GROUND PLUS SITE PREPARATION AND 15% FOR SHRINKAGE. THIS IS A PLAN QUANTITY. THERE WILL BE NO ADJUSTMENT MADE FOR INCREASE OR DECREASE TO QUANTITY. THIS DOES NOT INCLUDE 6:1 AND 3:1 SLOPES ALONG COUNTY HWY SLOPE AND SHEETING. CONTRACTOR CAN USE SUITABLE EXCAVATED CHANNEL SPOIL MATERIAL OR EXCAVATION MATERIAL FOR WATER CONTROL STRUCTURES AS APPROVED BY THE DU FIELD ENGINEER. SUCH WORK IS CONSIDERED "INCIDENTAL". COHESIVE CLAY MATERIAL REQUIRED AROUND WATER CONTROL STRUCTURES BENEATH EXISTING GROUND TEMPLATE IS CONSIDERED "INCIDENTAL" TO WATER CONTROL STRUCTURES.

PAYMENT FOR EMBANKMENT CONSTRUCTION: MATERIAL, HAULING, PLACING, COMPACTING, AND RECLAIMING BORROW AREA SHALL BE PAID FOR BASED ON THE CONTRACTOR'S UNIT BID PRICE FOR "EMBANKMENT."

MNDOT CLASS 5 GRAVEL SURFACING NOTE:

CONTRACTOR WILL FILL AREA BETWEEN EMBANKMENT PAD ELEVATION 1090.00 AND COUNTY ROAD SLOPE WITH MNDOT CLASS 5 GRAVEL, AS SHOWN THIS SHEET. CONTRACTOR WILL STRIP 6" DEPTH OF TOPSOIL OVER OUTLINED AREA PRIOR TO CLASS 5 PLACEMENT. SUCH WORK SHALL BE PAID FOR UNDER SITE PREPARATION. CONTRACTOR WILL CREATE A GRADUAL TRANSITION BETWEEN COUNTY ROAD SHOULDER AND EMBANKMENT PAD AS DETERMINED BY DU FIELD ENGINEER AND COUNTY OFFICIALS. MATERIAL SHALL BE APPROVED PRIOR TO DELIVERY ONSITE. CONTRACTOR WILL BE WILL REQUIRED TO COMPACT CLASS 5 MATERIAL, AS DETERMINED BY DU FIELD ENGINEER. TOTAL OF 120 TON HAS BEEN INCLUDED FOR SUCH WORK.

PAYMENT FOR MNDOT CLASS 5 GRAVEL: MATERIAL, HAULING, PLACING, & COMPACTING SHALL BE PAID FOR BASED ON THE CONTRACTOR'S UNIT BID PRICE FOR "CLASS 5 GRAVEL."

ESTIMATED QUANTITIES:	
EMBANKMENT:	
SITE PREPARATION (12" DEPTH)	146 C.Y.-P
COMPACTED EMBANKMENT FILL	455 C.Y.-P
TOTAL (INCLUDES 15% FOR SHRINKAGE)	692 C.Y.-P
RIPRAP:	
DU CLASS II ROCK RIPRAP	90 TON
MNDOT CLASS 5 GRAVEL:	
CLASS 5 GRAVEL	120 TON

CONTRACTOR SHALL INSTALL MNDOT CLASS 5 GRAVEL IN AREA TRANSITIONING BETWEEN COUNTY ROAD SHOULDER AND TOP OF EMBANKMENT PAD ELEV. 1090.00 AS SHOWN THIS SHEET. CONTRACTOR WILL STRIP 6" DEPTH OF TOPSOIL PRIOR TO GRAVEL INSTALLATION. PAID FOR UNDER SITE PREPARATION. GRAVEL SHALL BE COMPACTED AS DETERMINED IN THE FIELD. PAYMENT SHALL BE BASED ON THE CONTRACTOR'S UNIT BID PRICE FOR "CLASS 5 GRAVEL" 120 TON

PLAN VIEW STRUCTURE SITE
SCALE: 1"=5'-0"

Revision Number	Sheet Number	Revisions	Date	By

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Douglas J. Lipetzky, P.E.
for Ducks Unlimited, Inc.
License No. 18843

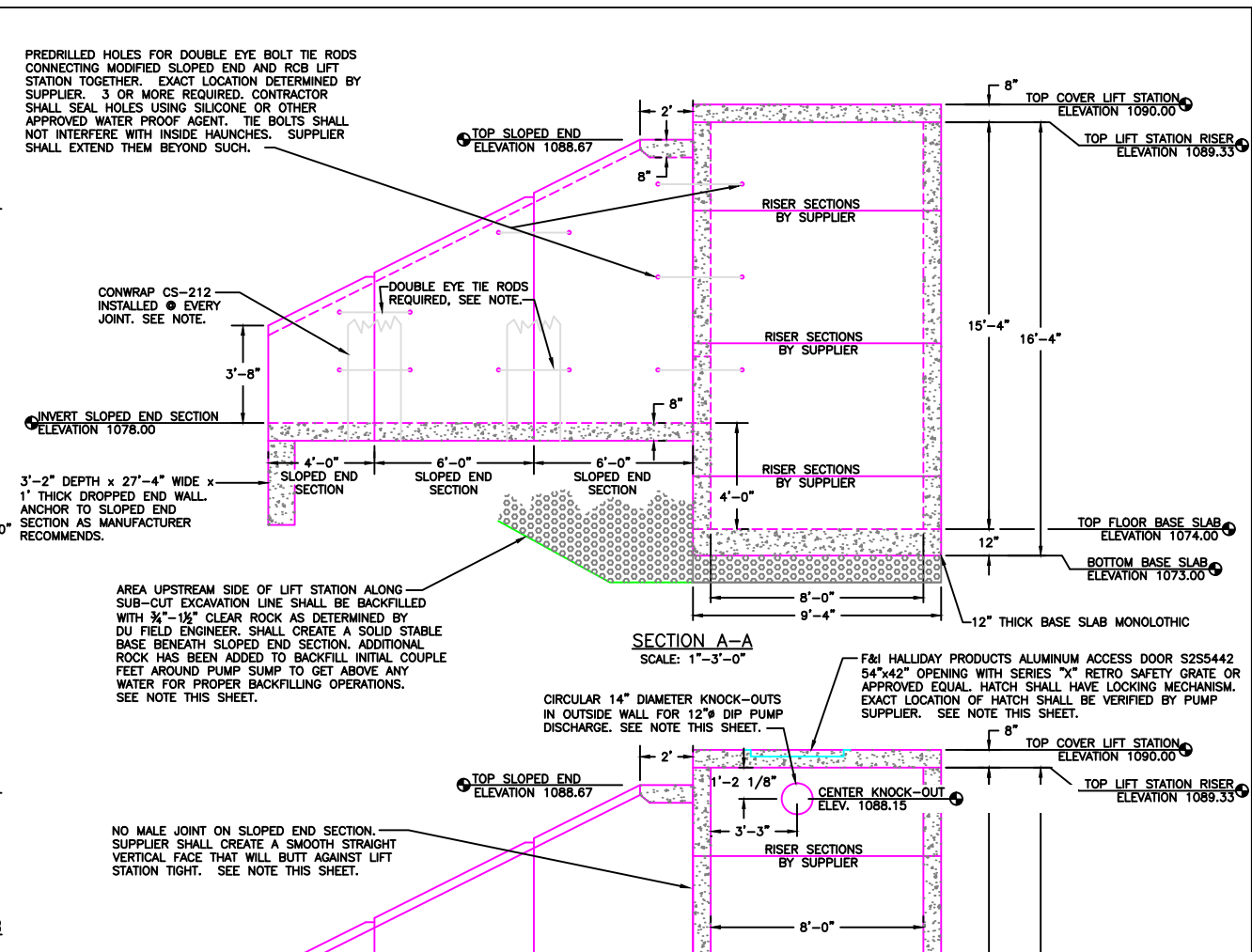
Date: _____

DUCKS UNLIMITED INC.
GREAT PLAINS REGIONAL OFFICE

PROJECT NO. MN-332-2
UPPER LIGHTENING LAKE PUMP
PLAN VIEW STAKING LAYOUT

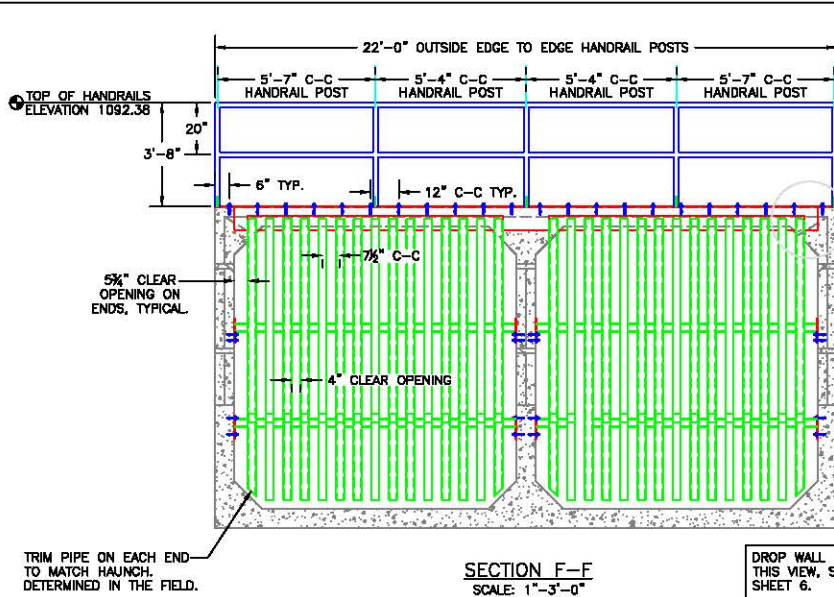
DESIGNED BY: DJL
DRAWN BY: MLO
SURVEYED BY: CLJ
CHECKED BY: _____

DATE: 2-5-2014
SHEET NO. 5 OF 17
APPROVED BY: _____
APPROVED BY: _____

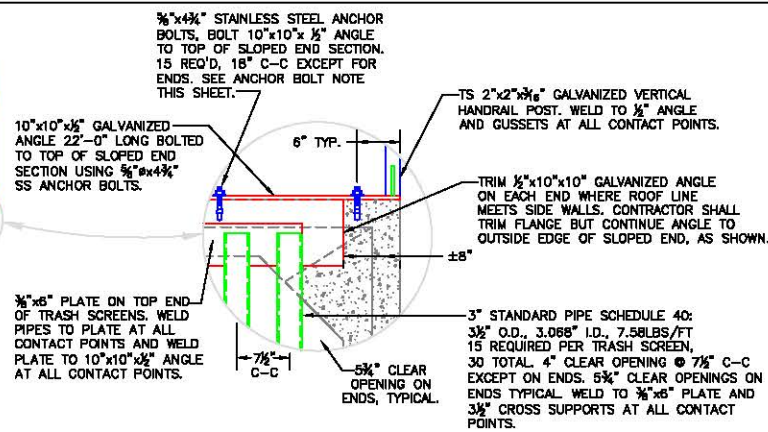


-
- TOP COVER LIFT STATION
ELEVATION 1090.00
- TOP LIFT STATION RISER
ELEVATION 1089.33
- TOP SLOPED END
ELEVATION 1088.67
- PRECAST DOUBLE 10'x10' SLOPED
END SECTION SQ. CORNER WITH NO
MALE JOINT ON DOWNSTREAM SIDE.
SEE DETAILS THIS SHEET.
- TRASH SCREENS NOT
SHOWN THIS VIEW,
SEE DETAILS AND
NOTES ON SHEET 7.
- INVERT SLOPED END SECTION
ELEVATION 1078.00
- BTM ROCK BEDDING
ELEVATION 1073.00
- BTM ROCK BEDDING
ELEVATION 1071.50
- 8" ROOF
- 8"
- 10'-0"
- 30"Ø OPENING IN
LIFT STATION FOR
CANAL GATE.
- 10'-0"
- 30"Ø OPENING IN
LIFT STATION FOR
CANAL GATE.
- 8" BASE
- 27'-4"
- 18"
- 10'-0"
- 10'-0"
- 8"
- ESTIMATED QUANTITIES:
- PRECAST DOUBLE 10'x10' SQ. CORNER SLOPED END SECTION 16 L.F. LONG 1 E.A.
- PRECAST DROPPED WALL 27'-4" L x 3'-2" D x 12" T 1 E.A.
- PRECAST DOUBLE 10'x8' SQ. CORNER REINFORCED CONCRETE BOX LIFT STATION 16.33 L.F. TALL
- PRECAST REINFORCED CONCRETE COVER 8" THICK WITH KNOCK-OUT FOR HATCH'S 1 E.A.
- HEAVY DUTY DOUBLE EYE BOLT TIE RODS WITH WASHERS AND NUTS 14 REQ'D MIN.
- 3/4"-1" CLEAR ROCK BEDDING AND BACKFILL FOR LIFT STATION/SLOPED END 120 TON
- DROPPED END WALL NOT
SHOWN THIS VIEW.
- SECTION D-D
SCALE: 1"=3'-0"
- | Revision
Number | Sheet
Number | Revisions |
|--------------------|-----------------|-----------|
| | | |
| | | |
| | | |
| | | |
- PRELIMINARY

Revision Number	Sheet Number	Revisions	Date	By	<p>I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.</p> <p>Douglas J. Lipetzky, P.E. for Ducks Unlimited, Inc. License No. 18843</p>	<p>DUCKS UNLIMITED INC.</p> <p>GREAT PLAINS REGIONAL OFFICE</p> <p>DATE: 2-5-2014</p> <p>SHEET NO: 6 OF 17</p>	<p>PROJECT NO. MN-332-2</p> <p>UPPER LIGHTENING LAKE PUMP PRECAST SLOPED END AND LIFT STATION DETAILS</p>	<p>DESIGNED BY: DLJ</p> <p>DRAWN BY: MLO</p> <p>SURVEYED BY: GLJ</p> <p>CHECKED BY: .</p>
-----------------	--------------	-----------	------	----	--	--	---	---

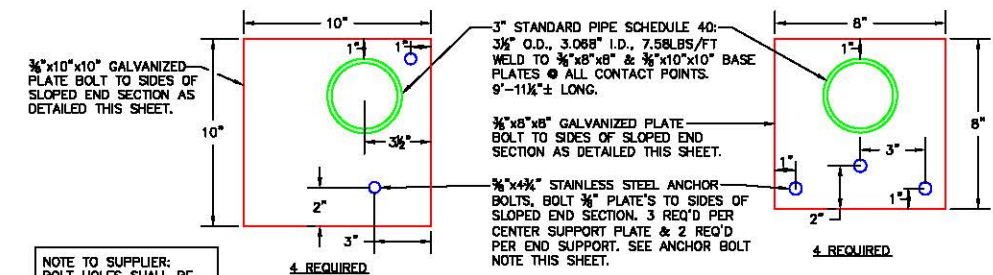


SECTION F-F
SCALE: 1"=3'-0"



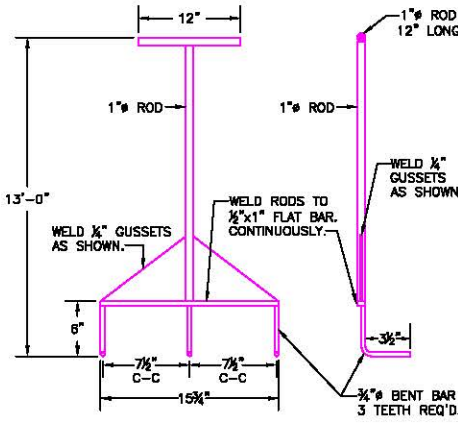
STAINLESS STEEL ANCHOR BOLT NOTES:
CONTRACTOR SHALL FOLLOW STEPS LISTED BELOW WHEN INSTALLING STAINLESS STEEL ANCHOR BOLTS. THE COST OF SUCH SHALL BE CONSIDERED INCIDENTAL TO "STRUCTURAL STEEL."

- 1) ALL ANCHORS SHALL BE STAINLESS STEEL STUD ANCHORS SIZED AS SHOWN.
- 2) ANCHOR HOLES SHALL BE DRILLED TO PROPER DEPTHS & DIAMETERS, AND CLEAN FREE OF CONCRETE DUST USING AIR HOSE OF SOME TYPE.
- 3) "RED HEAD EPOXY" OR OTHER ENGINEER APPROVED EPOXY ADHESIVE SHALL BE PLACED IN HOLE PRIOR TO SETTING ANCHORS. CONTRACTOR WILL USE EPOXY IN EVERY LOCATION OF STAINLESS STEEL ANCHOR BOLTS. (AVAILABLE @ www.fastenal.com)
- 4) ANCHOR NUTS SHALL BE TIGHTENED TO MANUFACTURER'S RECOMMENDED TORQUE SPECIFICATION.



HORIZONTAL SUPPORT PLATE'S DETAIL
NOT TO SCALE

NOTE TO SUPPLIER: BOLT HOLES SHALL BE DRILLED @ 3/4" SO THAT 3/8" SS ANCHOR BOLTS PROTRUDE THROUGH.



ALUMINUM CLEANING RAKE DETAIL
NOT TO SCALE

CLEANING RAKE NOTE:
CONTRACTOR SHALL PROVIDE THE AGENCY WITH SOME TYPE OF RAKE TO ALLOW CLEANING OF TRASH SCREENS. THE RAKE SHALL BE MADE FROM ALUMINUM. DETAIL SHOWN IS AN EXAMPLE OF RAKE TO BE PROVIDED. STEEL FABRICATOR CAN CHANGE DESIGN PROVIDED THEY PROVIDE SHOP DRAWINGS TO DU ENGINEER PRIOR TO FABRICATION. ONE RAKE IS REQUIRED FOR THIS PROJECT.

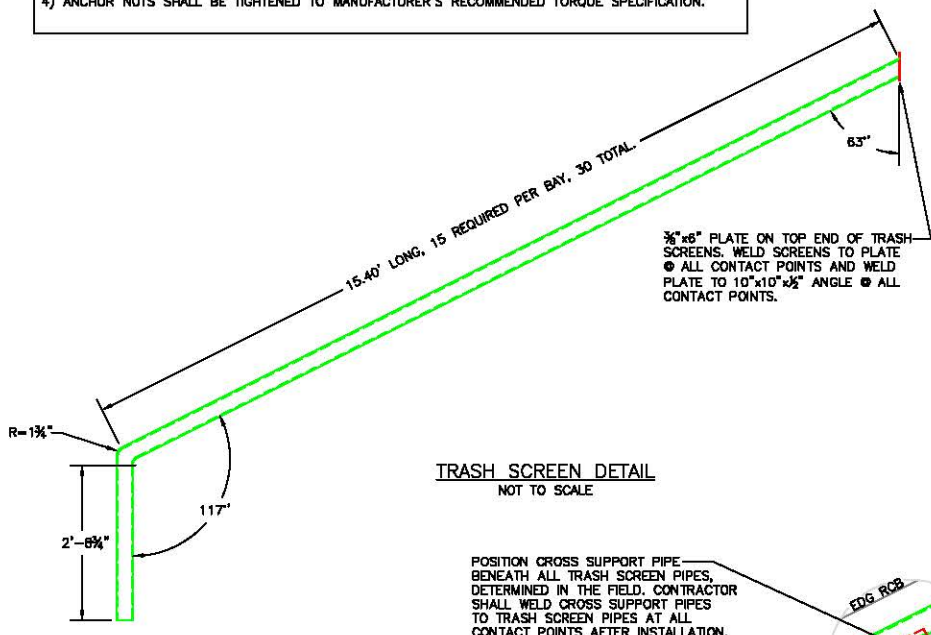
MATERIALS LIST*

1/2"x10"x10"x22'-0" LONG GALVANIZED ANGLE	1 REQ'D
3/8"x4 1/4" STAINLESS STEEL ANCHOR BOLTS	35 REQ'D
3/8"x4 1/4" GALVANIZED GUSSET PLATES FOR HANDRAIL	10 REQ'D
TS 2"x2"x3/8" GALVANIZED HANDRAIL POSTS 3'-8" LONG	5 REQ'D
TS 2"x2"x3/8" GALVANIZED HANDRAIL	53 L.F.
3/8"x8" GALVANIZED PLATE 9'-11 1/4" LONG ON ENDS OF PIPES	2 REQ'D
3" SCH. 40 PIPE GALV. 3 1/2" O.D., 3.068" I.D. 15.40' ± L. PLUS LEG	30 REQ'D
3" SCH. 40 PIPE GALV. 3 1/2" O.D., 3.068" I.D. 9'-11 1/4" ± L.	4 REQ'D
3/8"x8"x8" BASE PLATE CROSS SUPPORTS GALVANIZED	4 REQ'D
3/8"x10"x10" BASE PLATE CROSS SUPPORTS GALVANIZED	4 REQ'D
ALUMINUM CLEANING RAKE	1 REQ'D

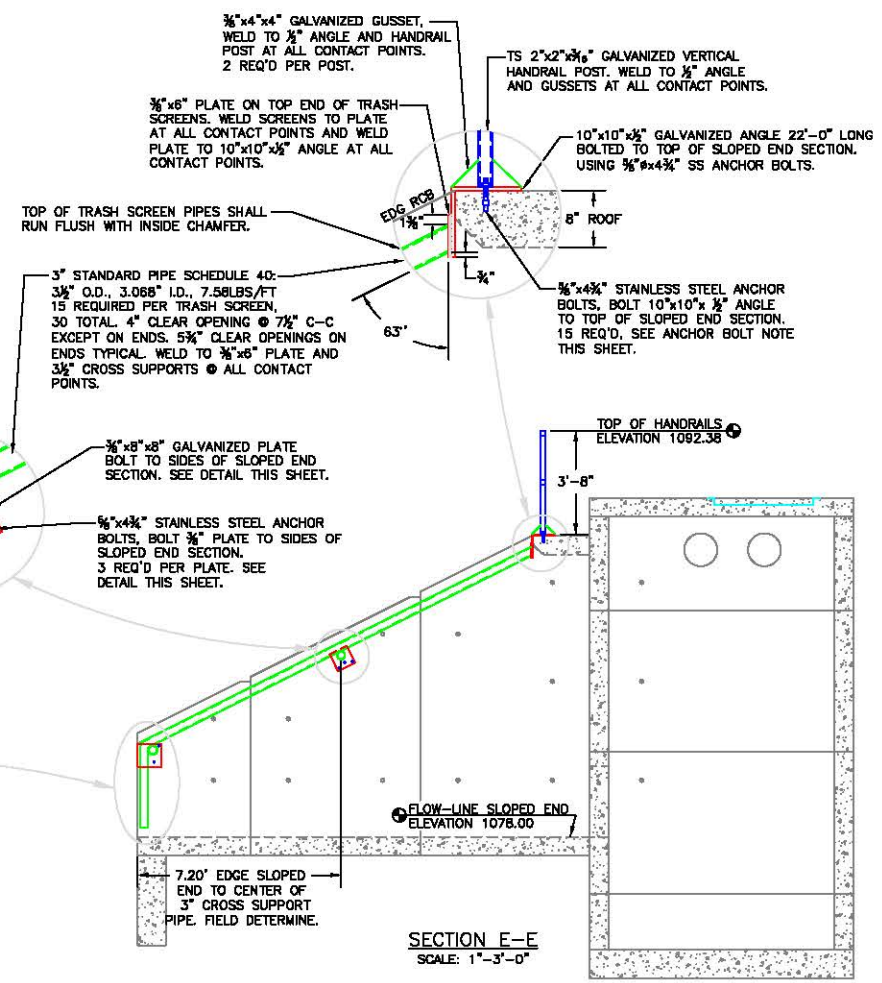
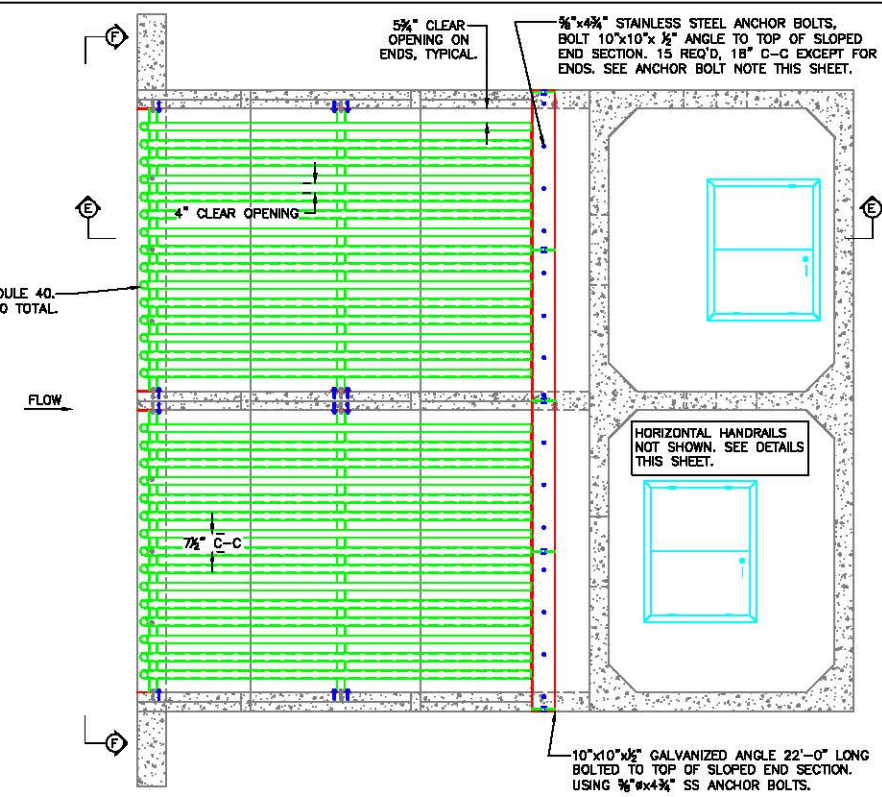
*THIS LIST IS PROVIDED FOR INFORMATION ONLY. ADDITIONAL MATERIALS NOT LISTED HERE MAY BE REQUIRED. BIDDER IS RESPONSIBLE FOR VERIFYING ALL QUANTITIES. ALSO, ADDITIONAL LENGTH OF STEEL STOCK BEYOND WHAT'S LISTED HERE MAY BE REQUIRED TO ALLOW FOR FABRICATION.

FABRICATION NOTE:
THE FABRICATOR SHALL VERIFY ALL DIMENSIONS WITH PRECAST SUPPLIER PRIOR TO FABRICATION. DIMENSIONS LISTED HERE MAY VARY BASED UPON BOX SIZE AND TRUE AS-BUILT MEASUREMENTS. IT WILL BE UP TO THE CONTRACTOR TO ENSURE A TIGHT FIT IN THE FIELD. ANY ADDITIONAL WORK REQUIRED TO FIT TRASH SCREEN ACCORDING TO PLANS OR DU FIELD ENGINEER REQUEST WILL BE AT THE CONTRACTOR'S EXPENSE.

GALVANIZATION NOTE:
ALL STEEL REQUIRED FOR HANDRAIL AND TRASH SCREENS WILL BE GALVANIZED AFTER FABRICATION. ANY DAMAGE TO STEEL OR FIELD WELDING WILL BE RE-COATED WITH A COLD GALVANIZATION PAINT ACCORDING TO DU FIELD ENGINEER. FABRICATOR SHALL GET TRUE AS-BUILT MEASUREMENTS FROM PRECAST SUPPLIER PRIOR TO FABRICATION TO ELIMINATE AS MUCH FIELD WELDING.



TRASH SCREEN DETAIL
NOT TO SCALE



SECTION E-E
SCALE: 1"=3'-0"

Revision Number	Sheet Number	Revisions	Date	By	Notes

PRELIMINARY

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Douglas J. Lipetzky, P.E.
for Ducks Unlimited, Inc.
License No. 18843

Date

DUCKS UNLIMITED INC.
GREAT PLAINS REGIONAL OFFICE
DATE: 2-5-2014
SHEET NO. 7 OF 17

PROJECT NO. MN-332-2
UPPER LIGHTENING LAKE PUMP
TRASH SCREEN & HANDRAIL
DETAILS SLOPED END SECTION

DESIGNED BY: DJL
DRAWN BY: MLO
SURVEYED BY: CLJ
CHECKED BY:
APPROVED BY:
APPROVED BY:

- TWO (2) 12" HYDROMATIC MODEL S12L SUBMERSIBLE NON-CLOG PUMPS OR APPROVED EQUAL
- 5,000 GPM AT TDH RANGE 12-19 FEET.
- IMPELLER AS RECOMMENDED BY SUPPLIER.
- 40 HP MOTOR, 870 RPM, 60 HERTZ OR AS RECOMMENDED BY THE PUMP SUPPLIER.
- 230V 3-PHASE MOTOR, 230 VOLT WITH SOFT-START.
- 12" BASE ELBOW & PUMP SEALING FLANGE.
- PUMP FLOATS WITH MERCURY SWITCHES AS NOTED IN DU SPEC 401A.
- PUMP DISCHARGES ARE 12" DUCTILE IRON PIPES (DIP).
- STAINLESS STEEL UPPER & LOWER GUIDE RAIL BRACKETS.
- STAINLESS STEEL METAL INTERLOCKED POWER CORD PROTECTIVE SLEEVES ON PUMP POWER CORDS & FLOAT SWITCHES.
- STAINLESS STEEL HANGER FLOAT CORDS MOUNTED INSIDE ACCESS COVER.
- STAINLESS STEEL PUMP LIFTING BAIL.
- STAINLESS STEEL PUMP LIFTING CHAIN ASSEMBLY.

VARIABLE FREQUENCY DRIVE (VFD) CAPABLE OF CONVERTING SINGLE-PHASE INPUT TO THREE-PHASE INCLUDING ANTI-CONDENSATION HEATER. PANEL SHALL BE SELF-CONTAINED IN A NEMA TYPE 3R OR TYPE 4 SURROUNDING. DISCONNECT WILL BE INSIDE OF CONTROL PANEL, THEREFORE, PANEL MUST BE "SERVICE ENTRANCE RATED." SEE SPECIFICATION 401A. A STEEL ENCLOSURE SHALL BE FABRICATED AROUND CONTROL PANEL WITH MINIMUM 6" CLEARANCE, HINGED DOORS AND LOCKING MECHANISM SHALL BE INCLUDED WITH SUCH. SEE NOTE & PICTURES THIS SHEET.

THE PUMP SUPPLIER SHALL VERIFY PUMP SPECIFICATIONS AND SUGGEST ALTERNATIVES AS REQUIRED FOR CONSIDERATION BY THE DU ENGINEER. SHOP DRAWINGS AND MATERIAL SPECIFICATIONS SHEETS WILL BE REQUIRED FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION. IF AN ALTERNATIVE PUMP OR PUMP FEATURE IS PROPOSED, SHOP DRAWINGS AND MATERIAL SPECIFICATIONS SHALL BE SUBMITTED.

- DOUBLE 10'x 8' BOX x 16'-4" HEIGHT SQUARE CORNER REINFORCED CONCRETE VERTICAL BOX CULVERT WITH 12" THICK MONOLITHIC BASE.
- 8" THICK CONCRETE COVER OR AS DESIGNED BY PRE-CAST SUPPLIER, WITH KNOCKOUT FOR HATCHES.
- (2) 20 54"x 42" ALUMINUM HATCH-HALLIDAY SERIES S2S5442 OR APPROVED EQUAL WITH SERIES "X" RETRO GRATE MOUNTED ON INSIDE OF HATCH OPENINGS. ALUMINUM HATCHES SHALL BE EQUIPPED TO ALLOW LOCKING BY THE AGENCY. HATCHES SHALL HAVE FABRICATED BRACKET TO HOLD 1/2" DIA. CABLES.
- (2) 20 30" DIAMETER CIRCULAR KNOCKOUTS ON UPSTREAM SIDE W/ CANAL GATE MOUNTED TO SUCH.
- 30" WIDE x 24" HIGH RECTANGULAR KNOCKOUT IN CENTER WALL OF RCB LOCATED 1' ABOVE BOTTOM TO ALLOW WATER TO BE DRAWN FROM BOTH TANKS.
- THREE (3) 14"± CIRCULAR KNOCKOUTS FOR 12"± DIP DISCHARGE.

* FRESNO 7600 FABRICATED ALUMINUM CANAL GATE OR APPROVED EQUAL. CANAL GATE SHALL INCLUDE MINIMUM FRAME, STAINLESS STEEL HARDWARE, POLY BARS "J" SEAL SEAT, STAINLESS STEEL STEM WITH CAST IRON BRONZE BUSHED STEM GUIDES, CAST IRON PEDESTAL AND GEARED LIFT. CANAL GATE IS FLAT BACK FOR WALL MOUNT. CONTRACTOR SHALL PROVIDE A "WATERTIGHT" SEAL BETWEEN INSIDE FACE LIFT STATION AND GATE. 2 GATES REQUIRED.

THE SET POINT LEVEL CONTROLLER SHALL BE A SELF-CONTAINED MICROPROCESSOR CONTROLLED SYSTEM CAPABLE OF MONITORING AN 4-20mA SIGNAL AND CONTROLLING 6 RELAY OUTPUT CHANNELS. THE ANALOG INPUT CHANNEL SHALL HAVE A 0.1% RESOLUTION AND INCORPORATE NOISE FILTERING AND AVERAGING. AN ON BOARD 24 VDC EXCITATION VOLTAGE SHALL BE AVAILABLE TO POWER 2 WIRE 4-20mA TRANSDUCERS. EACH RELAY OUTPUT CHANNEL SHALL PROVIDE A NORMALLY OPEN AND NORMALLY CLOSED POTENTIAL FREE CONTACT AND SHALL BE CAPABLE OF SWITCHING 10A AT 250 VAC.

THE CONTROLLER SHALL BE CAPABLE OF DISPLAYING THE MEASURED LEVEL ON A 8-CHARACTER ALPHANUMERIC LED DISPLAY AND 20-SEGMENT BAR GRAPH. THE 8-CHARACTER DISPLAY SHALL BE AVIONICS GRADE AND SHALL REMAIN SHARP AND CLEAR VIEWED FROM 10 FEET AWAY EVEN IN DIRECT SUNLIGHT. THE CONTROLLER SHALL BE CAPABLE OF ENERGIZING THE 6 RELAY OUTPUTS AS THE MEASURED LEVEL RISES OR FALLS ABOVE OR BELOW EACH ONE OF THE RELAY SET POINT.

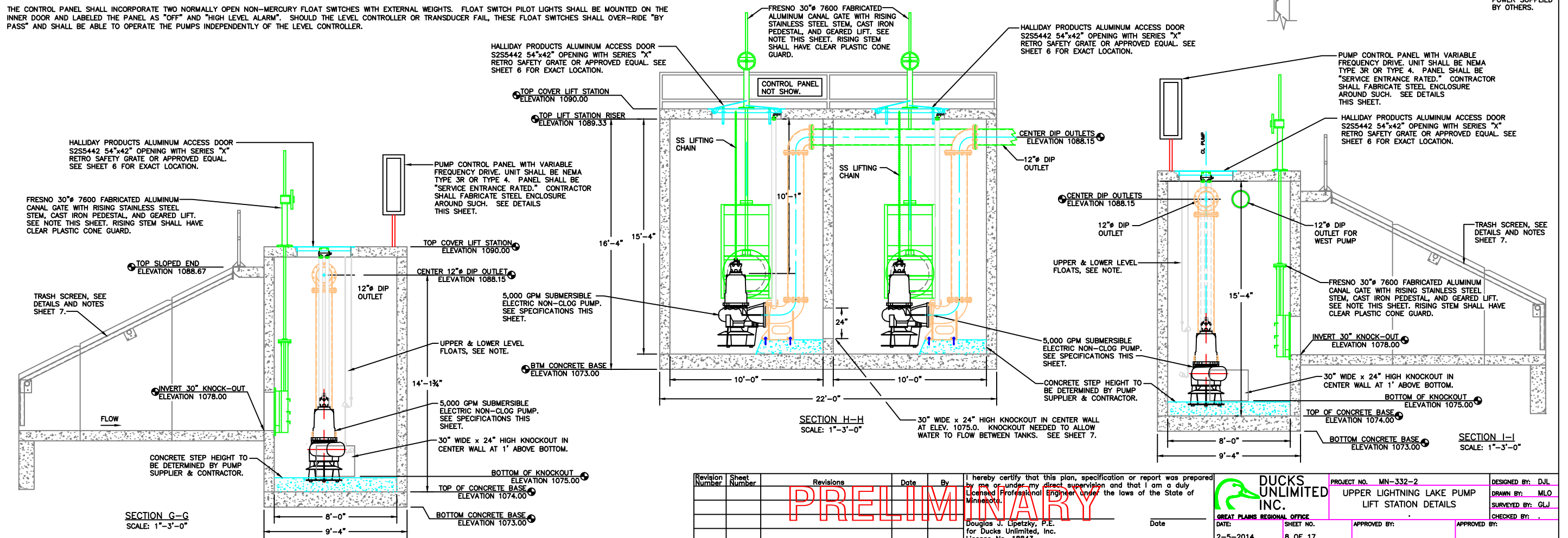
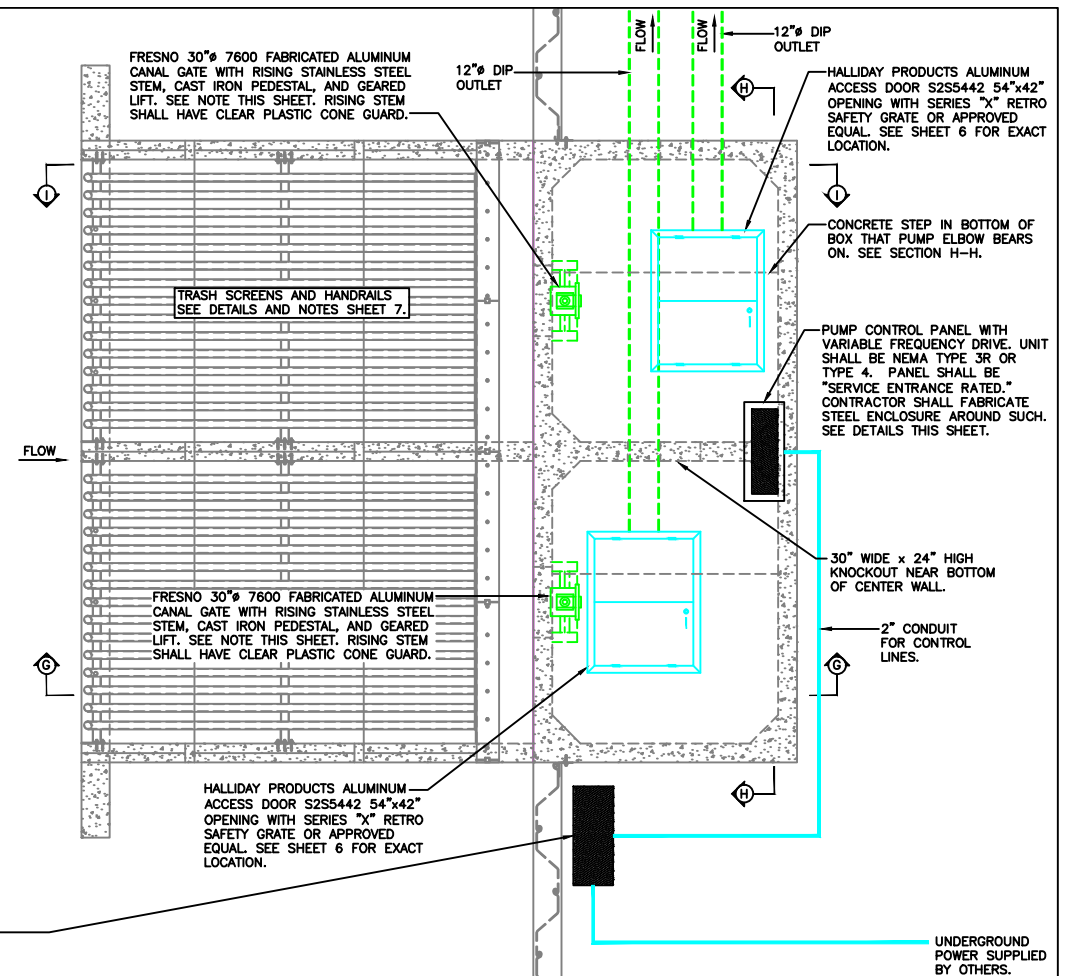
THE CONTROLLER SHALL ALLOW THE USER TO NAVIGATE THROUGH THE CONFIGURATION MODE AND ADJUST SET POINTS VALUES VIA THE FRONT KEYPAD. THE CONTROLLER SETUP SHALL BE SIMPLE AND SHALL NOT REQUIRE THE USE OF A LAPTOP COMPUTER. A SIMULATION MODE SHALL BE AVAILABLE FOR USERS TO MANUALLY INCREASE OR DECREASE THE LEVEL VALUE FROM THE KEYPAD AS TO TEST THE RELAY OUTPUT SEQUENCE OPERATION. THE SIMULATION MODE SHALL END AUTOMATICALLY WHEN THE USER RELEASES THE KEYPAD BUTTONS AND THE ACTUAL LEVEL MONITORING IS RESUMED. LEVEL CONTROLLER SHALL BE MANUFACTURED BY SJE-RHOMBUS MODEL SP6R OR APPROVED EQUAL.

THE CONTROL PANEL SHALL INCORPORATE TWO NORMALLY OPEN NON-MERCURY FLOAT SWITCHES WITH EXTERNAL WEIGHTS. FLOAT SWITCH PILOT LIGHTS SHALL BE MOUNTED ON THE INNER DOOR AND LABELED THE PANEL AS "OFF" AND "HIGH LEVEL ALARM". SHOULD THE LEVEL CONTROLLER OR TRANSDUCER FAIL, THESE FLOAT SWITCHES SHALL OVER-RIDE "BY PASS" AND SHALL BE ABLE TO OPERATE THE PUMPS INDEPENDENTLY OF THE LEVEL CONTROLLER.

PICTURES SHOW EXAMPLE OF A STEEL ENCLOSURE AROUND A PUMP CONTROL PANEL. REQUIREMENTS ARE AS FOLLOWS:

- * FABRICATE 3"x 3"x 1/4" ANGLE FRAME AROUND ENTIRE INSIDE OF ENCLOSURE.
* ATTACH 3/8" THICK STEEL PLATE ON BACK & TWO SIDES. TOP IS OPEN FOR VENTILATION.
* WELD PLATE TO ANGLE FRAME@ ALL CONTACT POINTS.
* PROVIDE 6" MINIMUM CLEARANCE BETWEEN EDGE OF CONTROL PANEL AND STEEL ENCLOSURE.
* FABRICATE SWINGING DOORS ON FRONT USING FOUR (4) HINGES. EACH HINGE SHALL HAVE A GREASE ZERK ATTACHED TO ALLOW GREASING.
* PROVIDE A LOCKING BAR CAPABLE OF ACCEPTING BAR LOCK FROM AGENCY (HEAVY DUTY).
* PROVIDE PLENUM OR ANGLE AT BOTTOM OF VERTICAL LEGS SUPPORTS TO ANCHOR TO CONCRETE.
* ATTACH TO CONCRETE WITH FOUR (4) STAINLESS STEEL 3/8" ANCHOR BOLTS.
* CLEAN RUST-FREE & SUPPLY ONE COAT OF ZINK BASE PRIMER AND TWO COATS OF EARTH-TONE PAINT AS APPROVED BY AGENCY.
* ENCLOSURE WILL BE PAID FOR BASED ON THE CONTRACTOR'S UNIT BID PRICE FOR "CONTROL PANEL ENCLOSURE."
* KEITH TOPEL (320-815-4579) WILL FABRICATE CONTROL PANEL ENCLOSURE, OTHER SUPPLIERS MAY BE INTERESTED & ABLE AS WELL.

LAKE REGION ELECTRIC COOPERATIVE WILL PROVIDE POWER FROM A CONNECTION POINT TO A TRANSFORMER/METER SOCKET NEAR THE PUMP LOCATION. THE COST FOR THE ELECTRICAL SUPPLY TO THE TRANSFORMER/METER SOCKET (INCLUDING THE METER SOCKET) WILL BE PAID DIRECTLY BY DUCKS UNLIMITED. THE CONTRACTOR IS RESPONSIBLE FOR THE BURIED LINE AND CONNECTIONS FROM THE METER SOCKET TO THE CONTROL PANEL TO THE PUMP. THE EXAC LOCATION FOR THE TRANSFORMER METER SOCKET IS UNKNOWN AT THIS TIME, HOWEVER, FOR BIDDING PURPOSES THE CONTRACTOR SHALL ASSUME THE METER SOCKET WILL BE WITHIN 50' OF THE PUMP CONTROL PANEL LOCATION. IF ADDITIONAL ELECTRIC LINE BEYOND 50' IS REQUIRED, IT WILL BE CONSIDERED EXTRA WORK AND PAID FOR AS SUCH. THE COST OF THE ELECTRICAL WORK STARTING AT THE METER SOCKET SHALL BE PAID FOR BASED ON THE CONTRACTOR'S UNIT BID PRICE FOR "ELECTRICAL CONNECTIONS."



Revision Number	Sheet Number	Revisions	Date	By
		PRELIM		

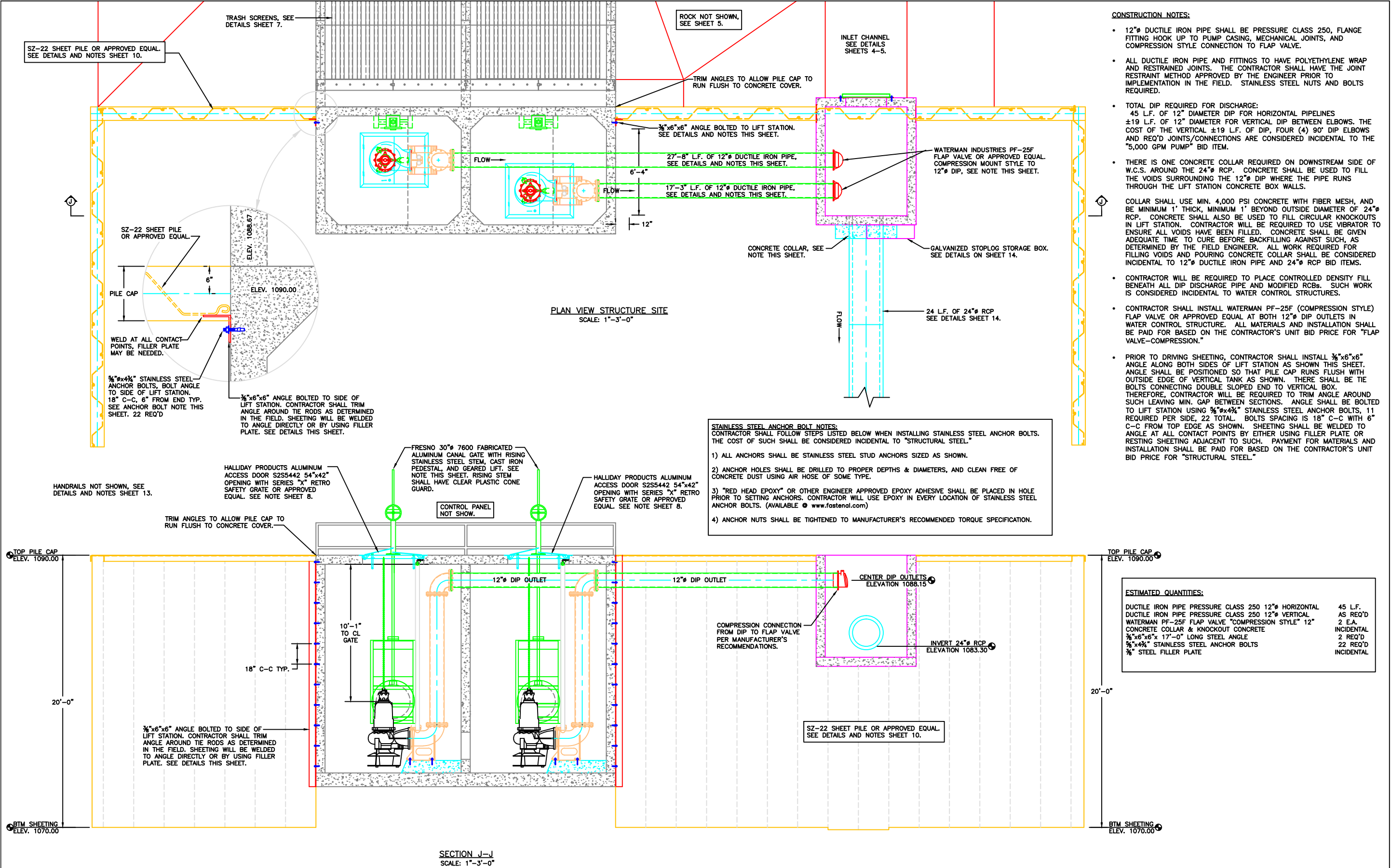
I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Douglas J. Lipetzky, P.E.
for Ducks Unlimited, Inc.

Date


**DUCKS
UNLIMITED
INC.**
 GREAT PLAINS REGIONAL OFFICE
 DATE: 2-5-2014 SHEET NO. 8 OF 10

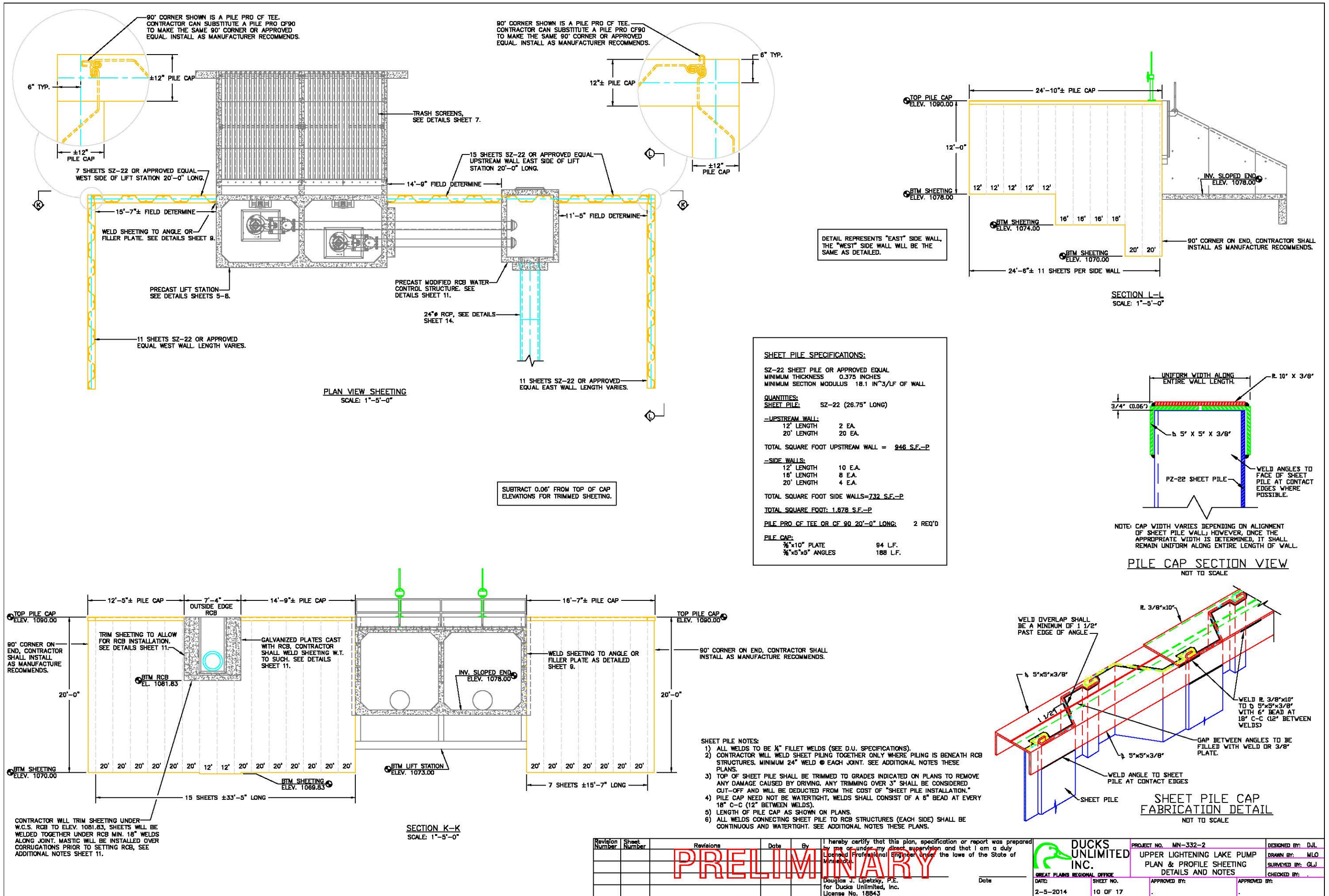
PROJECT NO.	MN-332-2	DESIGNED BY:	DJL
		DRAWN BY:	MLD
UPPER LIGHTNING LAKE PUMP LIFT STATION DETAILS		SURVEYED BY:	GLJ
		CHECKED BY:	
APPROVED BY:		APPROVED BY:	

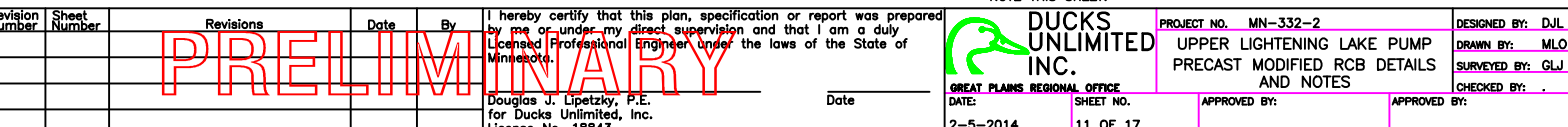


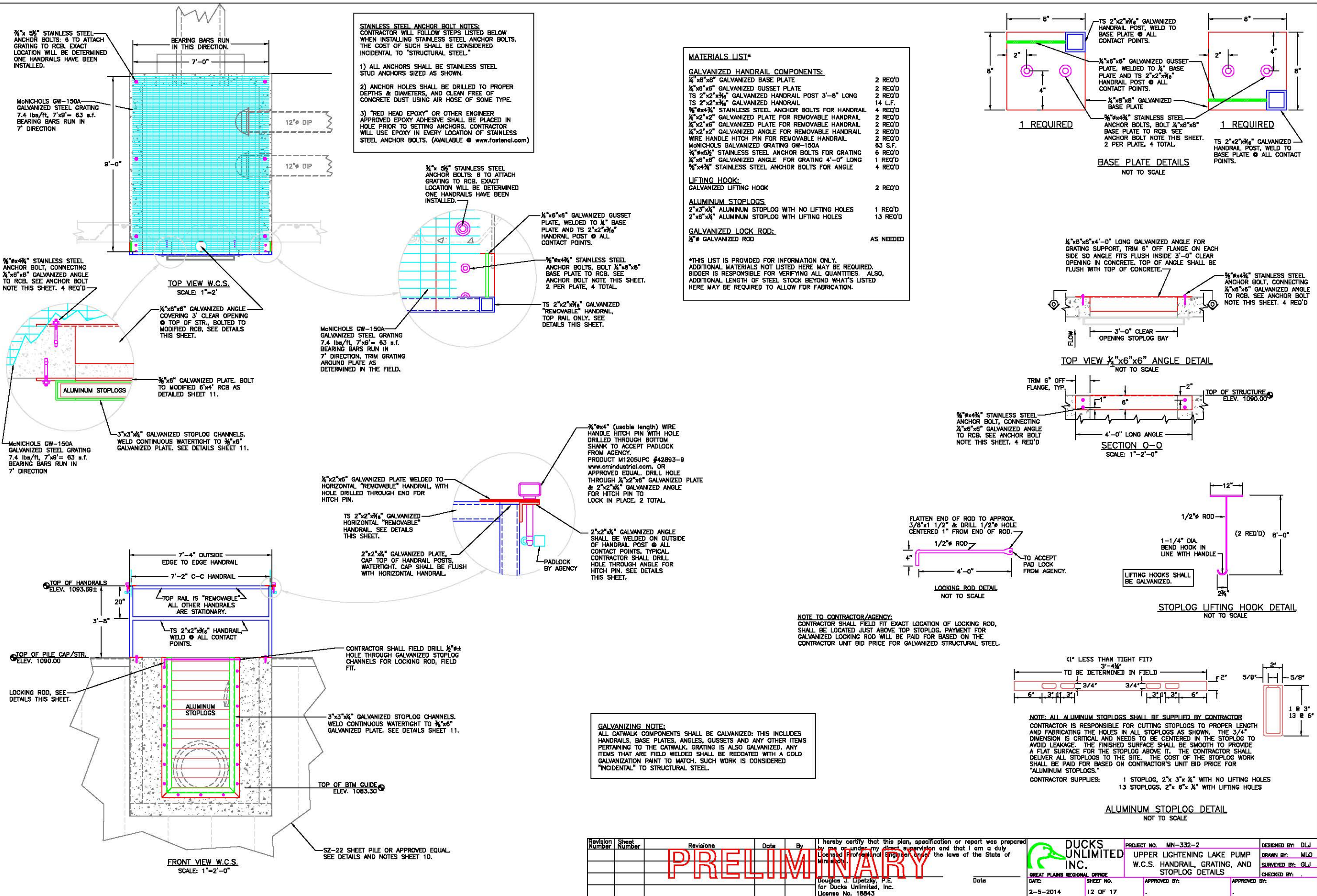
- CONSTRUCTION NOTES:**
- 12" DUCTILE IRON PIPE SHALL BE PRESSURE CLASS 250, FLANGE FITTING HOOK UP TO PUMP CASING, MECHANICAL JOINTS, AND COMPRESSION STYLE CONNECTION TO FLAP VALVE.
 - ALL DUCTILE IRON PIPE AND FITTINGS TO HAVE POLYETHYLENE WRAP AND RESTRAINED JOINTS. THE CONTRACTOR SHALL HAVE THE JOINT RESTRAINT METHOD APPROVED BY THE ENGINEER PRIOR TO IMPLEMENTATION IN THE FIELD. STAINLESS STEEL NUTS AND BOLTS REQUIRED.
 - TOTAL DIP REQUIRED FOR DISCHARGE:
45 L.F. OF 12" DIAMETER DIP FOR HORIZONTAL PIPELINES
±19 L.F. OF 12" DIAMETER FOR VERTICAL DIP BETWEEN ELBOWS. THE COST OF THE VERTICAL ±19 L.F. OF DIP, FOUR (4) 90° DIP ELBOWS AND REQ'D JOINTS/CONNECTIONS ARE CONSIDERED INCIDENTAL TO THE "5,000 GPM PUMP" BID ITEM.
 - THERE IS ONE CONCRETE COLLAR REQUIRED ON DOWNSTREAM SIDE OF W.C.S. AROUND THE 24" RCP. CONCRETE SHALL BE USED TO FILL THE VOIDS SURROUNDING THE 12" DIP WHERE THE PIPE RUNS THROUGH THE LIFT STATION CONCRETE BOX WALLS.
 - COLLAR SHALL USE MIN. 4,000 PSI CONCRETE WITH FIBER MESH, AND BE MINIMUM 1' THICK, MINIMUM 1' BEYOND OUTSIDE DIAMETER OF 24" RCP. CONCRETE SHALL ALSO BE USED TO FILL CIRCULAR KNOCKOUTS IN LIFT STATION. CONTRACTOR WILL BE REQUIRED TO USE VIBRATOR TO ENSURE ALL VOIDS HAVE BEEN FILLED. CONCRETE SHALL BE GIVEN ADEQUATE TIME TO CURE BEFORE BACKFILLING AGAINST SUCH, AS DETERMINED BY THE FIELD ENGINEER. ALL WORK REQUIRED FOR FILLING VOIDS AND POURING CONCRETE COLLAR SHALL BE CONSIDERED INCIDENTAL TO 12" DUCTILE IRON PIPE AND 24" RCP BID ITEMS.
 - CONTRACTOR WILL BE REQUIRED TO PLACE CONTROLLED DENSITY FILL BENEATH ALL DIP DISCHARGE PIPE AND MODIFIED RCBs. SUCH WORK IS CONSIDERED INCIDENTAL TO WATER CONTROL STRUCTURES.
 - CONTRACTOR SHALL INSTALL WATERMAN PF-25F (COMPRESSION STYLE) FLAP VALVE OR APPROVED EQUAL AT BOTH 12" DIP OUTLETS IN WATER CONTROL STRUCTURE. ALL MATERIALS AND INSTALLATION SHALL BE PAID FOR BASED ON THE CONTRACTOR'S UNIT BID PRICE FOR "FLAP VALVE-COMPRESSION."
 - PRIOR TO DRIVING SHEETING, CONTRACTOR SHALL INSTALL 3/8"x6"x6" ANGLE ALONG BOTH SIDES OF LIFT STATION AS SHOWN THIS SHEET. ANGLE SHALL BE POSITIONED SO THAT PILE CAP RUNS FLUSH WITH OUTSIDE EDGE OF VERTICAL TANK AS SHOWN. THERE SHALL BE TIE BOLTS CONNECTING DOUBLE SLOPED END TO VERTICAL BOX. THEREFORE, CONTRACTOR WILL BE REQUIRED TO TRIM ANGLE AROUND SUCH LEAVING MIN. GAP BETWEEN SECTIONS. ANGLE SHALL BE BOLTED TO LIFT STATION USING 3/8"x4 1/2" STAINLESS STEEL ANCHOR BOLTS, 11 REQUIRED PER SIDE, 22 TOTAL. BOLTS SPACING IS 18" C-C WITH 6" C-C FROM TOP EDGE AS SHOWN. SHEETING SHALL BE WELDED TO ANGLE AT ALL CONTACT POINTS BY EITHER USING FILLER PLATE OR RESTING SHEETING ADJACENT TO SUCH. PAYMENT FOR MATERIALS AND INSTALLATION SHALL BE PAID FOR BASED ON THE CONTRACTOR'S UNIT BID PRICE FOR "STRUCTURAL STEEL."

- STAINLESS STEEL ANCHOR BOLT NOTES:**
CONTRACTOR SHALL FOLLOW STEPS LISTED BELOW WHEN INSTALLING STAINLESS STEEL ANCHOR BOLTS. THE COST OF SUCH SHALL BE CONSIDERED INCIDENTAL TO "STRUCTURAL STEEL."
- ALL ANCHORS SHALL BE STAINLESS STEEL STUD ANCHORS SIZED AS SHOWN.
 - ANCHOR HOLES SHALL BE DRILLED TO PROPER DEPTHS & DIAMETERS, AND CLEAN FREE OF CONCRETE DUST USING AIR HOSE OF SOME TYPE.
 - "RED HEAD EPOXY" OR OTHER ENGINEER APPROVED EPOXY ADHESIVE SHALL BE PLACED IN HOLE PRIOR TO SETTING ANCHORS. CONTRACTOR WILL USE EPOXY IN EVERY LOCATION OF STAINLESS STEEL ANCHOR BOLTS. (AVAILABLE @ www.fastenal.com)
 - ANCHOR NUTS SHALL BE TIGHTENED TO MANUFACTURER'S RECOMMENDED TORQUE SPECIFICATION.

ESTIMATED QUANTITIES:	
DUCTILE IRON PIPE PRESSURE CLASS 250 12" HORIZONTAL	45 L.F.
DUCTILE IRON PIPE PRESSURE CLASS 250 12" VERTICAL	AS REQ'D
WATERMAN PF-25F FLAP VALVE "COMPRESSION STYLE" 12"	2 E.A.
CONCRETE COLLAR & KNOCKOUT CONCRETE	INCIDENTAL
3/8"x6"x6" 17'-0" LONG STEEL ANGLE	2 REQ'D
3/8"x4 1/2" STAINLESS STEEL ANCHOR BOLTS	22 REQ'D
3/8" STEEL FILLER PLATE	INCIDENTAL







STAINLESS STEEL ANCHOR BOLT NOTES:
CONTRACTOR WILL FOLLOW STEPS LISTED BELOW WHEN INSTALLING STAINLESS STEEL ANCHOR BOLTS. THE COST OF SUCH SHALL BE CONSIDERED INCIDENTAL TO "STRUCTURAL STEEL."

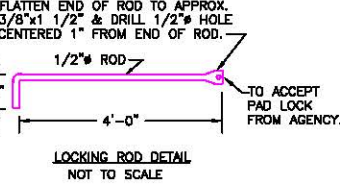
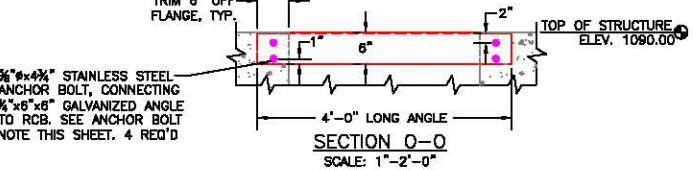
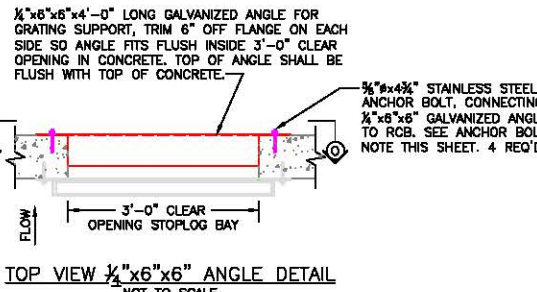
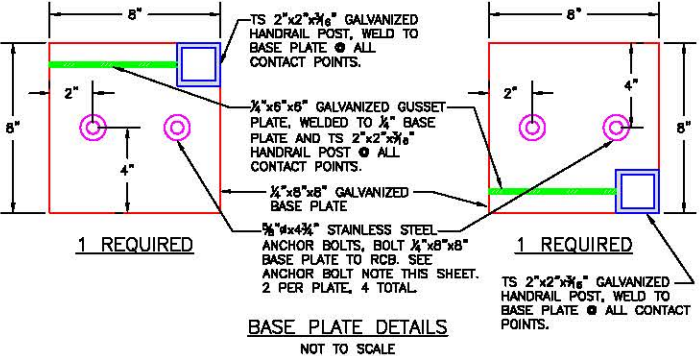
1) ALL ANCHORS SHALL BE STAINLESS STEEL STUD ANCHORS SIZED AS SHOWN.

2) ANCHOR HOLES SHALL BE DRILLED TO PROPER DEPTHS & DIAMETERS, AND CLEAN FREE OF CONCRETE DUST USING AIR HOSE OF SOME TYPE.

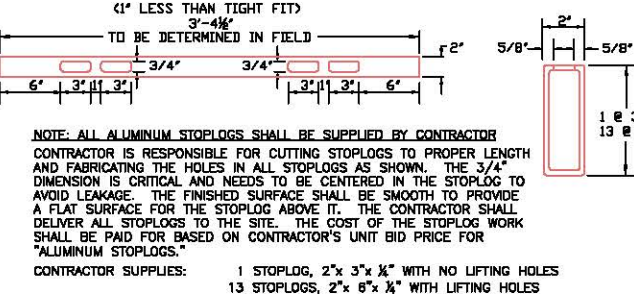
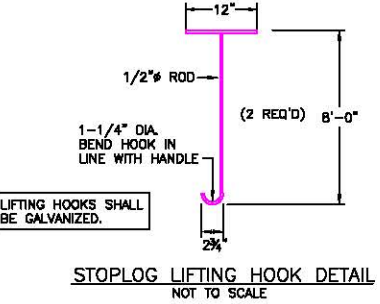
3) "RED HEAD EPOXY" OR OTHER ENGINEER APPROVED EPOXY ADHESIVE SHALL BE PLACED IN HOLE PRIOR TO SETTING ANCHORS. CONTRACTOR WILL USE EPOXY IN EVERY LOCATION OF STAINLESS STEEL ANCHOR BOLTS. (AVAILABLE @ www.fastenal.com)

MATERIALS LIST*	
GALVANIZED HANDRAIL COMPONENTS:	
1/2"x6"x8" GALVANIZED BASE PLATE	2 REQ'D
1/2"x6"x8" GALVANIZED GUSSET PLATE	2 REQ'D
TS 2"x2"x1/2" GALVANIZED HANDRAIL POST 3'-8" LONG	2 REQ'D
TS 2"x2"x1/2" GALVANIZED HANDRAIL	14 L.F.
3/8"x4 1/4" STAINLESS STEEL ANCHOR BOLTS FOR HANDRAIL	4 REQ'D
1/2"x2"x2" GALVANIZED PLATE FOR REMOVABLE HANDRAIL	2 REQ'D
1/2"x2"x8" GALVANIZED PLATE FOR REMOVABLE HANDRAIL	2 REQ'D
1/2"x2"x2" GALVANIZED ANGLE FOR REMOVABLE HANDRAIL	2 REQ'D
WIRE HANDLE HITCH PIN FOR REMOVABLE HANDRAIL	83 S.F.
McNICHOLS GALVANIZED GRATING GW-150A	6 REQ'D
3/8"x5/8" STAINLESS STEEL ANCHOR BOLTS FOR GRATING	1 REQ'D
1/2"x6"x8" GALVANIZED ANGLE FOR GRATING 4'-0" LONG	4 REQ'D
3/8"x4 1/4" STAINLESS STEEL ANCHOR BOLTS FOR ANGLE	4 REQ'D
LIFTING HOOK:	
GALVANIZED LIFTING HOOK	2 REQ'D
ALUMINUM STOPLOGS	
2"x3"x6" ALUMINUM STOPLOG WITH NO LIFTING HOLES	1 REQ'D
2"x6"x6" ALUMINUM STOPLOG WITH LIFTING HOLES	13 REQ'D
GALVANIZED LOCK ROD:	
1/2" GALVANIZED ROD	AS NEEDED

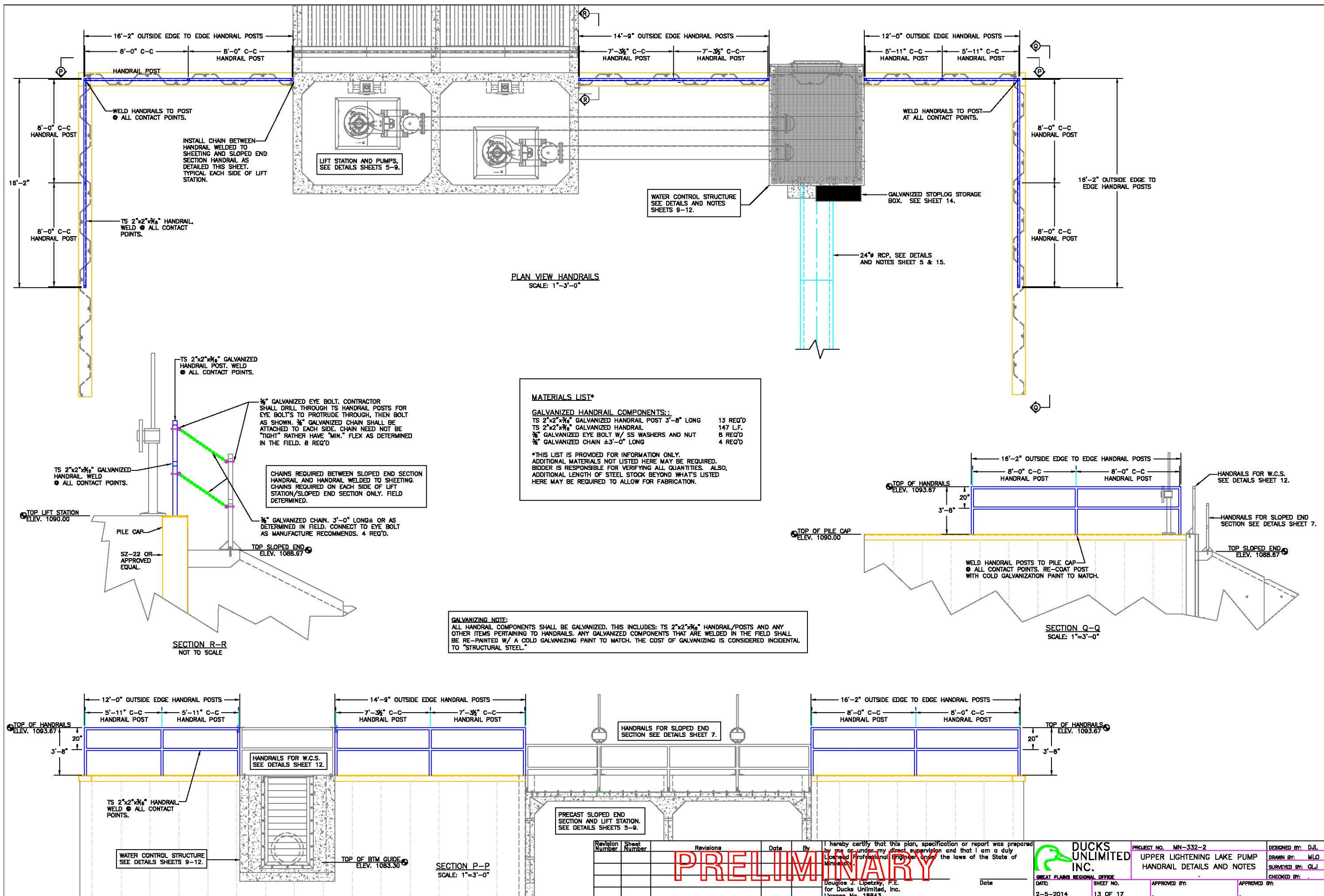
*THIS LIST IS PROVIDED FOR INFORMATION ONLY. ADDITIONAL MATERIALS NOT LISTED HERE MAY BE REQUIRED. BIDDER IS RESPONSIBLE FOR VERIFYING ALL QUANTITIES. ALSO, ADDITIONAL LENGTH OF STEEL STOCK BEYOND WHAT'S LISTED HERE MAY BE REQUIRED TO ALLOW FOR FABRICATION.

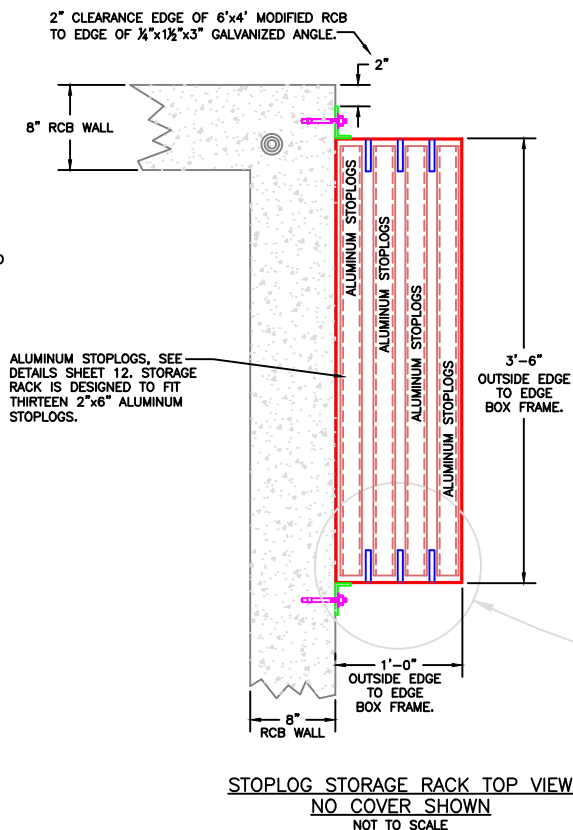
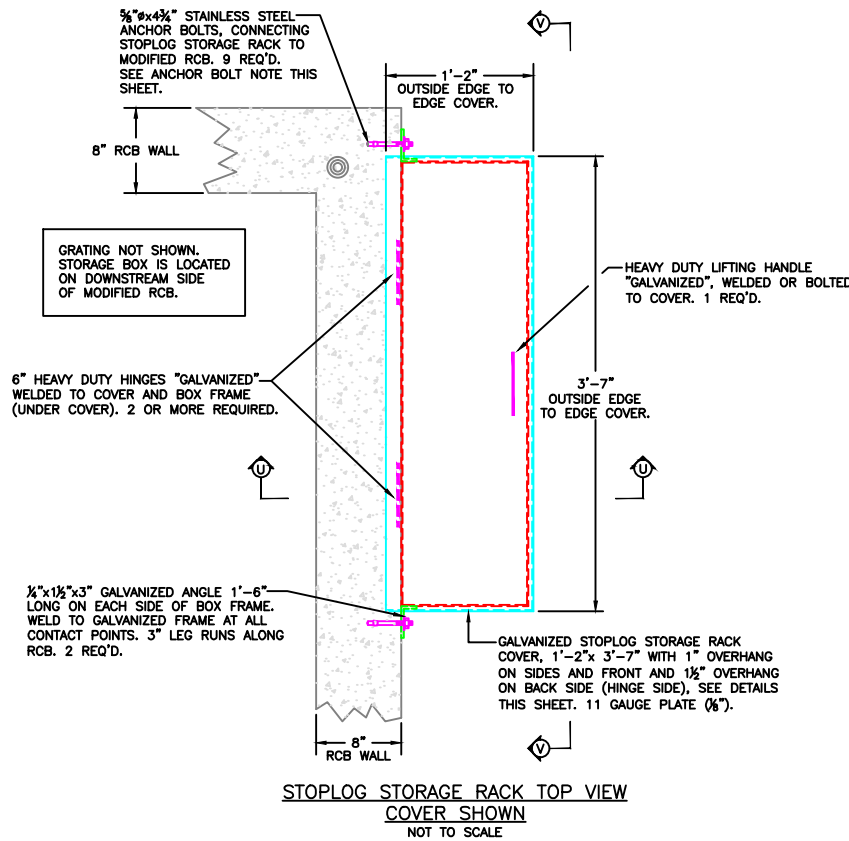


NOTE TO CONTRACTOR/AGENCY:
CONTRACTOR SHALL FIELD FIT EXACT LOCATION OF LOCKING ROD, SHALL BE LOCATED JUST ABOVE TOP STOPLOG. PAYMENT FOR GALVANIZED LOCKING ROD WILL BE PAID FOR BASED ON THE CONTRACTOR UNIT BID PRICE FOR GALVANIZED STRUCTURAL STEEL.



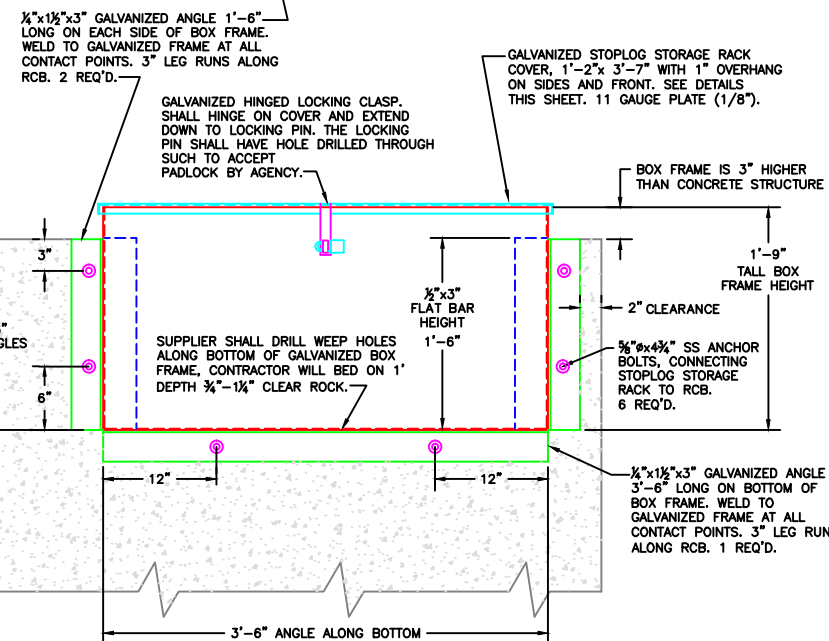
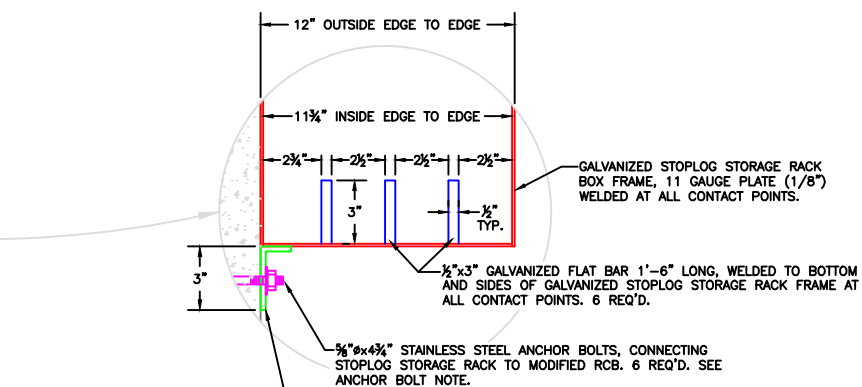
GALVANIZING NOTE:
ALL CATWALK COMPONENTS SHALL BE GALVANIZED: THIS INCLUDES HANDRAILS, BASE PLATES, ANGLES, GUSSETS AND ANY OTHER ITEMS PERTAINING TO THE CATWALK. GRATING IS ALSO GALVANIZED. ANY ITEMS THAT ARE FIELD WELDED SHALL BE RECOATED WITH A COLD GALVANIZATION PAINT TO MATCH. SUCH WORK IS CONSIDERED "INCIDENTAL" TO STRUCTURAL STEEL.





STOPLOG STORAGE BOX NOTES:

- BOX FRAME AND COVER SHALL BE 11 GAUGE (1/8" THICK) AND BE WELDED AT ALL CONTACT POINTS.
- COVER SHALL HAVE A 1" OVER HANG ON SIDES AND FRONT. SUPPLIER CAN BEND PLATE OR WELD SMALL ANGLES TO ACHIEVE SUCH.
- ALL STOPLOG STORAGE BOX COMPONENTS SHALL BE GALVANIZED.
- SUPPLIER SHALL DRILL WEEP HOLES IN BOTTOM OF BOX AS NEEDED.
- 1/2"x3" FLAT BARS SPACERS SHALL BE WELDED AT ALL CONTACT POINTS ALONG BOTTOM AND TACK WELDED (6" BEADS SPACED APART) ALONG BOTH SIDES OF BAR STOCK SUFFICIENT ENOUGH TO WITH STAND FIELD USE.
- SUPPLIER SHALL USE HEAVY DUTY HINGES, LIFTING HANDLE, LOCKING CLASP, AND LOCKING PIN.
- STOPLOG STORAGE BOX WILL BE BOLTED TO RCB USING 5/8"x4 3/4" STAINLESS STEEL ANCHOR BOLTS AS SHOWN.
- LIFTING HOOKS MAY NEED TO BE PROVED SO CONTRACTOR CAN HOIST IN-PLACE WITH MACHINERY.
- CONTRACTOR WILL BED STORAGE BOX ON 1' PLUS 3/4"-1 1/4" CLEAR ROCK TO DRAIN WATER THROUGH WEEP HOLES.
- PAYMENT FOR STOPLOG STORAGE BOX AND ALL COMPONENTS DETAILED THIS SHEET SHALL BE BASED ON THE CONTRACTOR'S UNIT BID PRICE FOR "GALVANIZED STOPLOG STORAGE BOX."



STAINLESS STEEL ANCHOR BOLT NOTES:
CONTRACTOR WILL FOLLOW STEPS LISTED BELOW WHEN INSTALLING STAINLESS STEEL ANCHOR BOLTS. THE COST OF SUCH SHALL BE CONSIDERED INCIDENTAL TO "STRUCTURAL STEEL."

- ALL ANCHORS SHALL BE STAINLESS STEEL STUD ANCHORS SIZED AS SHOWN.
- ANCHOR HOLES SHALL BE DRILLED TO PROPER DEPTHS & DIAMETERS, AND CLEAN FREE OF CONCRETE DUST USING AIR HOSE OF SOME TYPE.
- "RED HEAD EPOXY" OR OTHER ENGINEER APPROVED EPOXY ADHESIVE SHALL BE PLACED IN HOLE PRIOR TO SETTING ANCHORS. CONTRACTOR WILL USE EPOXY IN EVERY LOCATION OF STAINLESS STEEL ANCHOR BOLTS. (AVAILABLE @ www.fastenal.com)

Revision Number	Sheet Number	Revisions	Date	By

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Douglas J. Lipetzky, P.E.
for Ducks Unlimited, Inc.
License No. 18843

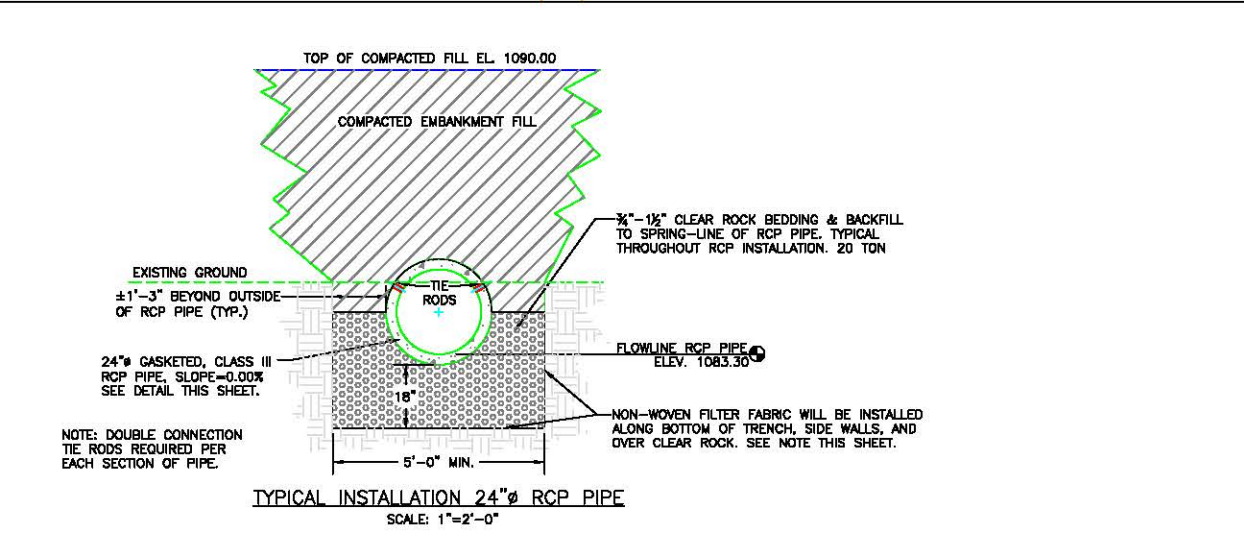
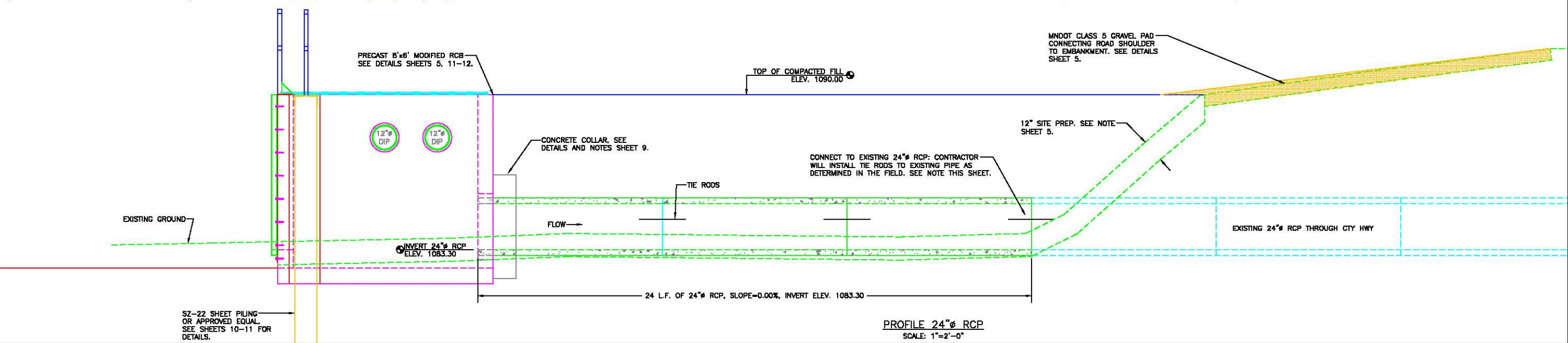
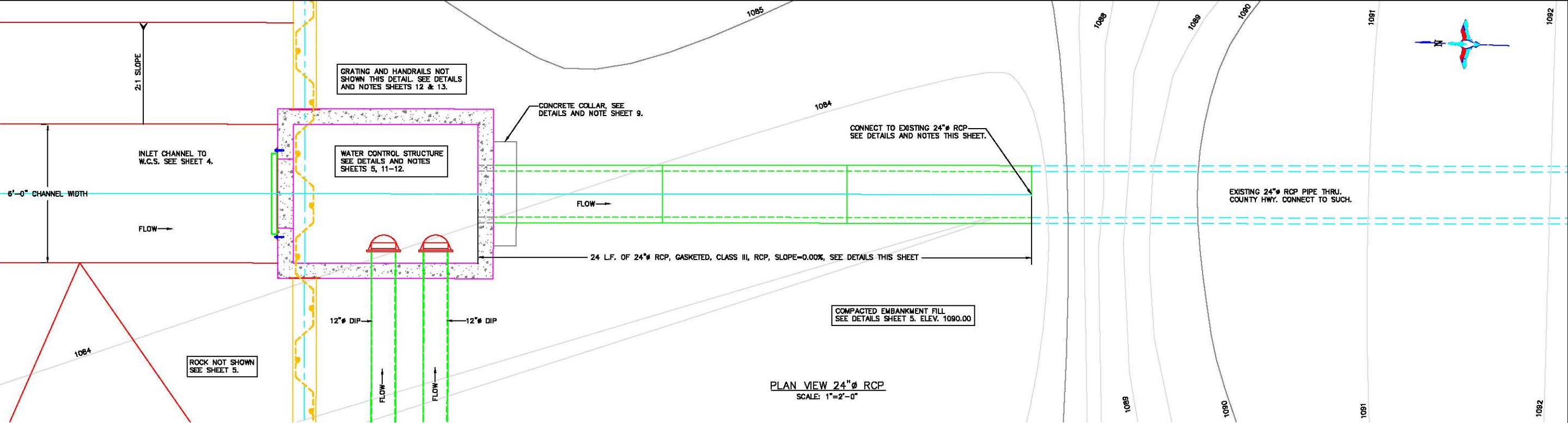
Date

DUCKS UNLIMITED INC.
GREAT PLAINS REGIONAL OFFICE
DATE: 2-5-2014
SHEET NO. 14 OF 17

PROJECT NO. MN-332-2
UPPER LIGHTNING LAKE PUMP
STOPLOG STORAGE BOX DETAILS

DESIGNED BY: DJL
DRAWN BY: MLO
SURVEYED BY: GJ/MO
CHECKED BY: DJL

APPROVED BY:
APPROVED BY:



24" RCP INSTALLATION:

CONTRACTOR SHALL INSTALL 24 LINEAL FEET OF 24" RCP, CLASS III, GASKETED JOINT AT A SLOPE OF 0.00%. TYPICAL INSTALLATION WILL BE 1.5' DEPTH OF ROCK BEDDING AND BACKFILL TO SPRING-LINE OF PIPE. CONTRACTOR SHALL MACHINE COMPACT ROCK TO ENSURE ALL VOIDS HAVE BEEN FILLED. NON-WOVEN FILTER FABRIC WILL BE INSTALLED UNDER, OVER, AND ALONG SIDES OF ROCK FOR THE ENTIRE TRENCH WIDTH AND LENGTH, PRIOR TO INSTALLING RCP. NON-WOVEN FILTER FABRIC SHALL BE CONSIDERED "INCIDENTAL" TO RCP INSTALLATION. DOUBLE CONNECTION TIE RODS SHALL BE INSTALLED PER EACH SECTION OF PIPE AS MANUFACTURER RECOMMENDS. CONTRACTOR WILL BE REQUIRED TO INSTALL TIE RODS TO EXISTING RCP. SUCH WORK SHALL BE INCLUDED IN RCP INSTALLATION. IF CONNECTION TO EXISTING RCP DOES NOT FIT "WATER TIGHT," THEN CONTRACTOR WILL BE REQUIRED TO POUR A CONCRETE COLLAR AROUND SUCH AS DETERMINED IN THE FIELD. SUCH WORK WILL BE CONSIDERED "INCIDENTAL" TO RCP INSTALLATION. PAYMENT FOR MATERIALS (RCP, TIE RODS, NON-WOVEN FILTER FABRIC, CONCRETE, ETC.), HAULING, AND PLACEMENT SHALL BE PAID FOR BASED ON THE CONTRACTOR'S UNIT BID PRICE FOR "24" RCP."

ESTIMATED QUANTITIES:

24" GASKETED, CLASS III, RCP	24 L.F.
DOUBLE EYE BOLT TIE RODS	6 REQ'D
3/4"-1 1/2" CLEAR ROCK BEDDING/BACKFILL	20 TON

Revision Number	Sheet Number	Revisions	Date	By

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Douglas J. Lipetzky, P.E.
for Ducks Unlimited, Inc.
License No. 18843

Date

DUCKS UNLIMITED INC.
GREAT PLAINS REGIONAL OFFICE

DATE: 2-5-2014

SHEET NO. 15 OF 17

APPROVED BY: .

APPROVED BY: .

DESIGNED BY: DJL

DRAWN BY: MLO

SURVEYED BY: CLJ

CHECKED BY: .

PROJECT NO. MN-332-2

UPPER LIGHTENING LAKE PUMP RCP DETAILS

STORM WATER POLLUTION PREVENTION PLAN

THE Minnesota General Permit Authorization to Discharge Stormwater Associated with Construction Activity issued on August 1, 2013 shall apply for this project.

ABBREVIATIONS

MNDNR: Minnesota Department of Natural Resources
FWS: United States Fish & Wildlife Service
MPCA: Minnesota Pollution Control Agency

NARRATIVE

Project Limits: See Sheets 3-4 of these plans for the project limits. These sheets show the embankment and lift station location, the inlet channel excavation, spoil areas and areas to be seeded.

SITE DESCRIPTION

Project Description: The purpose of the project is to provide a means to allow the lowering of Upper Lightning Lake to original runoff levels, which may promote better water quality and clear water and plant growth in the shallow lake. The lift station/pump is being located adjacent to the County road to reduce impacts that would be required if it was located closer to the lake. However, an inlet channel is needed to bring water from the lake to the lift station. Gravity discharge through the water control structure and existing road culvert will be used to the extent possible. The road culvert invert is at elevation 1083.3 and the lake bottom at ±1078-1079. Therefore, the pumps will be used to remove water below the road culvert elevation. Minor fill is required for the embankment. The spoil from the channel will all be removed from any wetland areas, and hauled and blended into an existing agricultural field.

Site Map(s): See map on cover sheet of plans.

Major Soil Disturbing Activities (check all that apply):

- ☐ Clearing & Grubbing
- ☒ Grading & Shaping
- ☒ Cutting & Filling
- ☐ Other (describe):

Total Project Area: 4.5 Acres
Total Area to Be Disturbed: 4.5 Acres
Existing Impervious Area: 0.0 Acres
Proposed Impervious Area: 0.0 Acres

Name of Receiving Water Body/Bodies: Prior to this plan being implemented, the channel immediately downstream will be cleaned/maintained. The channel is an intermittent stream that flows through Swift WMA and Kube WMA (also known as Denton Slough). Denton Slough is at the downstream end of the channel maintenance project. This intermittent stream continues south approximately 1.5 stream miles downstream from Denton Slough, then turns west and runs about four miles before joining the Rabbit River. The Rabbit River eventually flows into the Bois de Sioux River and onto the Red River. See maps on Sheets 1 & 16 for wetlands within one mile downstream of the site. The existing channel downstream of Denton Slough is a well defined drainage channel.

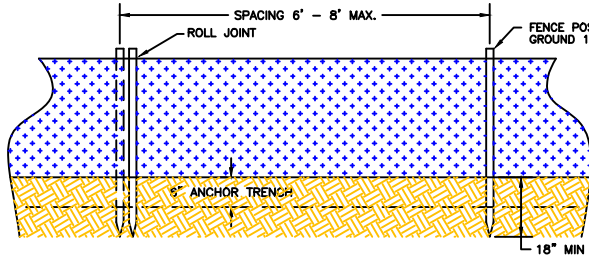
Discharges to Special Or Impaired Waters: The project does not have a discharge point within 1 mile of a special water or a water that is impaired for sediment or a sediment related parameter of the permit.

Discharges to Calcareous Fen: The project does not have a discharge to a Calcareous fen.

Endangered or Threatened Species: The project area has not been identified for endangered or threatened species.

Historic Places or Archeological Sites: Historical places or archeological sites have been addressed by the MNDNR.

Quantities Tabulation for All BMPs: See estimated quantities and construction notes in plans.



ROLL JOINTS

SILT FENCE DETAIL
NOT TO SCALE

PROJECT CONTACTS AND RESPONSIBILITIES

The Contractor is responsible for cosigning and being familiar with the MPCA General Permit for storm water discharges associated with a construction site. When a conflict arises between the permit and this plan sheet, the permit shall govern.

The Contractor is responsible for implementation of the SWPPP and installation, inspection and maintenance of the erosion prevention and sediment control BMP's before and during construction.

The Contractor is required to have a person designated and on the project site who has been trained and certified as either an Erosion/ Sediment Control Inspector/Installer or in Erosion/Sediment Control Site Management.

The Minnesota Department of Natural Resources (MNDNR), Glenwood Office, is responsible for long term operation and maintenance of the permanent storm water management system. The MNDNR is responsible for removal of the standard and floating silt fence after final stabilization is accomplished. Also, the MNDNR is responsible for filing a Notice of Termination with MPCA upon final stabilization.

The Contractor and MNDNR contact information is provided in the contract documents and on Sheet 1 of the project plans.

Douglas J. Lipetzky, P.E., Regional Engineering Supervisor for Ducks Unlimited, Inc. prepared the SWPPP. He successfully completed the "Design of Storm Water Pollution Prevention Plans" training course sponsored by the University of Minnesota (Nov. 16-17, 2009, Mankato, MN) and recertification course (Feb. 4, 2013, St. Cloud, MN). His certification expires May 31, 2016.

SPILL NOTIFICATION

In the event of a spill, the contractor's site superintendent will make the appropriate notification(s), consistent with the following procedures:

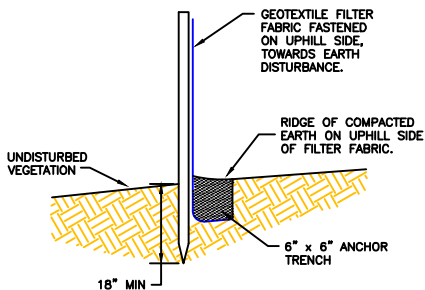
- A reportable spill is a quantity of more than 5 gallons of petroleum which must be reported immediately to the MPCA.
- Any spill of oil or hazardous substance to waters of the state must be reported immediately by telephone to the MPCA.
- MPCA Contact for Environmental Emergencies: 24 Hour (651) 649-5451 or (800) 422-0798

CONSTRUCTION CHANGES

When changes are made to the construction project that will require alterations in the temporary erosion controls of the site, the Storm Water Pollution Prevention Plan (SWPPP) will be amended to provide appropriate protection to disturbed areas, all storm water structures, and adjacent waters. The SWPPP will be retained in a designated place for review over the course of the project.

NRCS Soil Survey for Otter Tail County, Minnesota					
NRCS Soils	Map Unit	Unified Soil	Percent Passing	Estimated Area	Percent
Description (Surface)	Name	Classification (Surface)	200 Sieve	In AOI	of AOI
Quam	1239	ML, OL, CL	75-90	3.8	84%
Rolls	1240	CL	60-80	0.7	16%
Total for Area of Interest				4.5	100%

SILT FENCE NOTES:
WOOD POST SHALL BE A MINIMUM OF 1 1/2" x 1 1/2".
CONSTRUCT SILT FENCE FROM A CONTINUOUS ROLL IS POSSIBLE BY CUTTING LENGTHS TO AVOID JOINTS. IF A JOINT IS NECESSARY, USE THE DETAIL SHOWN OR OTHER APPROVED METHOD.



ORDER OF CONSTRUCTION ACTIVITIES

(Stabilization measures shall be initiated as soon as possible, but in no case later than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. However, at locations adjacent to surface water, such stabilization shall occur within 24 hours after construction activity has ceased.)

- Install erosion and sediment control measures.
- Proceed with embankment and lift station construction.
- Stabilize embankment area with temporary erosion and sediment control measures.
- Complete inlet channel excavation and spoil placement.
- Stabilize trails and other areas disturbed by construction activities with temporary erosion and sediment control measures.
- Complete final grading.
- Complete permanent erosion and sediment control measures.

LOCATION OF SWPPP REQUIREMENTS IN PROJECT PLAN

See Sheets 2, 4 and 15 for erosion control measures and notes.

EROSION AND SEDIMENT CONTROLS

(Check all that apply)

Stabilization Practices (See Erosion and Sediment Control Details in Plan Sheets)

- ☒ Temporary or Permanent Seeding
- ☐ Sod Placement
- ☐ Planting
- ☒ Mulching (Straw or Cellulose Fiber)
- ☒ Erosion Control Blankets or Mats
- ☒ Vegetation Buffer Strips
- ☒ Roughened Surface (e.g. tracking)
- ☒ Gabions-Gabion Mattress
- ☒ Other: Riprap

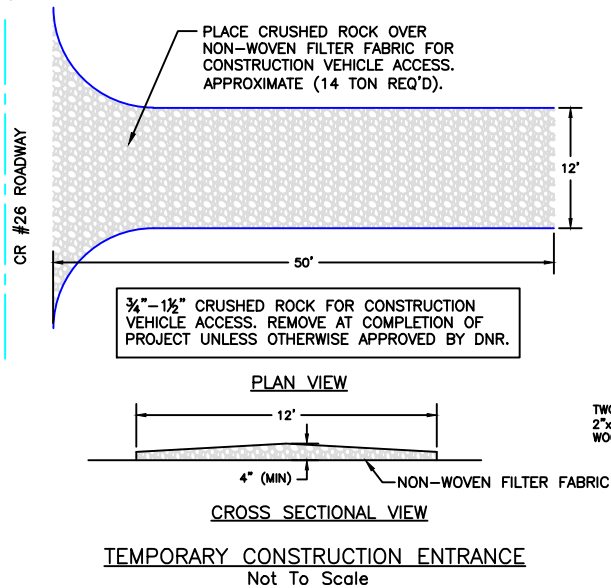
Structural Temporary Erosion and Sediment Controls

- ☒ Silt Fence
- ☐ Temporary Berm
- ☐ Temporary Slope Drain
- ☒ Straw Wattles or Rolls
- ☐ Diversion Channels/Swales
- ☐ Channel Liners (TRM)
- ☒ Stone Rip Rap
- ☐ Rock Check Dams
- ☐ Sediment Traps/Basins
- ☒ Inlet Protection
- ☐ Outlet Protection
- ☐ Surface Inlet Protection
- ☐ Curb Inlet Protection
- ☒ Stabilized Construction Entrances
- ☐ Other

Wetland Avoidance:

Will construction and/or erosion and sediment controls impinge on regulated wetlands? ☒ Yes ☐ No
If yes, the project and erosion and sediment control impacts have been included in the total project wetland impacts and have been included in the 404 permit process with the USACE.

Storm Water Management: Storm water management will be handled by temporary controls outlined in "EROSION AND SEDIMENT CONTROLS" above, and any permanent controls needed to meet permanent storm water management needs in the post construction period.



Revision Number	Sheet Number	Revisions	Date	By

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
Date _____
Douglas J. Lipetzky, P.E.
for Ducks Unlimited, Inc.
License No. 18843

DUCKS UNLIMITED INC.
GREAT PLAINS REGIONAL OFFICE
DATE: 2-5-2014
SHEET NO. 17 OF 17

PROJECT NO. MN-332-2
UPPER LIGHTNING LAKE
STORM WATER POLLUTION PREVENTION PLAN
DESIGNED BY: DJL
DRAWN BY: DJL
SURVEYED BY: GLJ
CHECKED BY: .
APPROVED BY: .

Pollution Prevention Management Measures

- Solid Wastes** - Collected sediment, asphalt, and concrete millings, floating debris, paper, plastic, fabric, construction and demolition debris and other wastes must be disposed of properly and must comply with the MPCA disposal requirements.
- Hazardous Materials** - Oil, gasoline, paint and any hazardous substances must be properly stored, including secondary containment, to prevent spills, leaks or other discharge. Restricted access to storage areas must be provided to prevent vandalism. Storage and disposal of hazardous waste must be in compliance with MPCA regulations.
- Vehicle Washing** - External washing of trucks and other construction vehicles must be limited to a defined area of the site. Runoff must be contained and waste properly disposed of. No engine degreasing is allowed on site.
- Concrete Washout Onsite** - All liquid and solid wastes generated by concrete washout operation must be contained in a leak-proof containment facility or impermeable liner. A compacted clay liner that does not allow washout liquids to enter ground water is considered an impermeable liner. The liquid and solid wastes must not contact the ground, and there must not be runoff from the concrete washout operation or areas. Liquid and solid wastes must be disposed of properly and in compliance with MPCA regulations. A sign must be installed adjacent to each washout facility to inform concrete equipment operators to utilize the proper facilities.

MAINTENANCE AND INSPECTION

Maintenance and Inspection Practices

- Inspections will be conducted at least one time per week and after a storm event of 0.50 inches or greater.
- All controls will be maintained in good working order. Necessary repairs will be initiated within 24 hours of the site inspection report or as soon as field conditions allow access.
- Where work has been suspended due to frozen ground conditions, the required inspections and maintenance must take place as soon as runoff occurs at the site or prior to resuming construction, whichever comes first.
- Where parts of the construction site have undergone final stabilization, but work remains on other parts of the site, inspections of the stabilized areas may be reduced to once per month.
- Silt fence will be inspected for depth of sediment and for tears in order to ensure the fabric is securely anchored. Sediment buildup will be removed from the silt fence when it reaches 1/2 of the height of the silt fence. All silt fences must be repaired, replaced, or supplemented when they become nonfunctional or the sediment reaches 1/2 of the height of the fence.
- Sediment basins and traps will be checked. Sediment will be removed when the depth reaches approximately 50 percent of the structure's capacity.

