

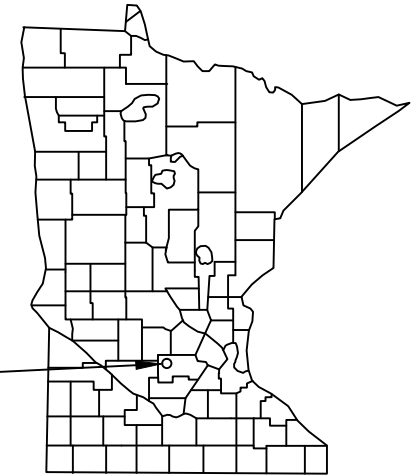
DUCKS UNLIMITED

# DUCKS UNLIMITED, INC.

## EAGLE LAKE

SECTION 4 TOWNSHIP 115N, RANGE 30W  
MCLEOD COUNTY, MN

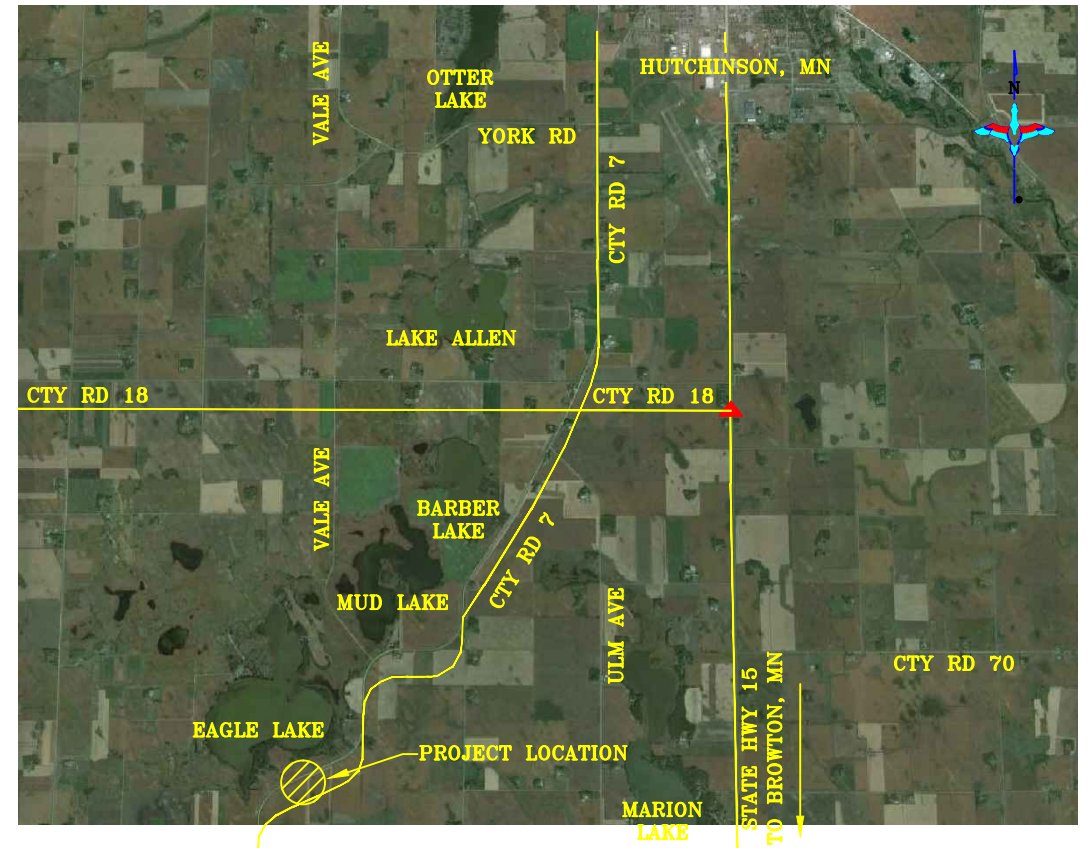
IN COOPERATION WITH  
BUFFALO CREEK WATERSHED DISTRICT  
AND MINNESOTA DEPARTMENT OF NATURAL RESOURCES



PROJECT LOCATION

MINNESOTA

MAP POINT "▲" IS LOCATED @ INTERSECTION OF STATE HWY 15 AND COUNTY ROAD 18 (150TH STREET) LOCATED ±2 MILES SOUTH OF HUTCHINSON, MN TO SITE FROM MAP POINT: HEAD WEST ON COUNTY ROAD 18 (150TH STREET) ±1 MILE TO INTERSECTION OF COUNTY ROAD 18 & COUNTY ROAD 7. HEAD SOUTH ON COUNTY ROAD 7 ±3.5 MILES TO ACCESS POINT ON WEST SIDE OF ROAD. LAT: 44° 47' 36.7" LONG: 94° 26' 10.8"



VICINITY MAP  
NOT TO SCALE

**PLAN INDEX**

- 1 PROJECT LOCATION MAPS
- 2 ESTIMATED QUANTITIES AND CONSTRUCTION NOTES
- 3 SITE PLAN
- 4 PROJECT SITE PLAN
- 5 PLAN & PROFILE INLET CHANNEL
- 6 PLAN & PROFILE OUTLET CHANNEL
- 7 PLAN & PROFILE EMBANKMENT
- 8 SHEET PILE DETAILS
- 9 STOPLOG GUIDE & CATWALK DETAILS
- 10 HANDRAIL & GRATING DETAILS
- 11 FISH BARRIER DETAILS
- 12 FISH BARRIER DETAILS
- 13 STOPLOG STORAGE BOX DETAILS
- 14 HIGHWAY STRUCTURE MODIFICATIONS
- 15 EROSION CONTROL PLAN
- 16 STORM WATER POLLUTION PREVENTION PLAN

LOCATION MAP  
NOT TO SCALE

**PROJECT CONTACTS:**  
COREY HENKE  
BUFFALO CREEK WATERSHED DISTRICT  
320-587-9143

JOE STANGEL  
NICOLLET DNR OFFICE  
507-225-3572

JIM STREIFEL, P.E.  
DU - BISMARCK, ND  
701-355-3551

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
1	11, 12	Add fish barrier to weir structure	1/29/14	MLO
2	14	Add handrail to Hwy. structure	1/29/14	MLO
3	4,6,14	Add riprap at outlet Hwy. culvert	1/29/14	MLO
4	2,6	Modify notes	1/20/14	JS

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.

*James A. Streifel*  
James A. Streifel, P.E.  
for Ducks Unlimited, Inc.  
License No. 47359

2-5-2014  
Date

	PROJECT NO. MN-451-1	DESIGNED BY: JAS
	EAGLE LAKE COVER SHEET	DRAWN BY: MLO
GREAT PLAINS REGIONAL OFFICE	SHEET NO. 1	CHECKED BY: GLJ
DATE: 1-29-2014	APPROVED BY:	APPROVED BY:

ESTIMATED QUANTITIES				
NOTE	SPEC.#	ITEM	UNIT	QUANTITY
1	201	MOBILIZATION	LS	1
2	202	SITE PREPARATION	LS	1
3	203	EXCAVATION - INLET CHANNEL	L.F.	218
4	204	EXCAVATION - OUTLET CHANNEL	L.F.	806
5	304	EMBANKMENT	C.Y.-P	345
6	305	RIPRAP, REVETMENT AND AGGREGATE PLACEMENT		
6		CLASS I RIPRAP	TDN	34
6	305	CLASS II RIPRAP	TDN	97
6	305	CLASS III RIPRAP	TDN	100
6	305	CLASS IV RIPRAP	TDN	42
7	307	SHEET PILE MATERIALS	S.F.	1068
7	307	SHEET PILE INSTALLATION	S.F.	1068
	308	H-PILE	L.F.	63
8	309	STRUCTURAL STEEL		
8	309	PILE CAP	L.S.	1
8	309	STOPLOG GUIDES (GALVANIZED)	L.S.	1
8	309	CATWALK (GALVANIZED)	L.S.	1
8	309	ALUMINUM STOPLOGS	L.S.	1
8	309	STOPLOG STORAGE BOX (GALVANIZED)	L.S.	1
8	309	STOPLOG LIFTING HOOKS	EA.	2
		ALUMINUM STOPLOG LOCK DEVICE	EA.	2
8	309	GALVANIZED HANDRAIL FOR RCB	L.S.	1
8	309	GALVANIZED FISH FINGERS	L.S.	1
9	311	REMOVAL OF EXISTING STRUCTURE	L.S.	1
10		MISCELLANEOUS		
10		MODIFY CONCRETE CONTROL SECTION	L.S.	1
11		CLEARING AND GRUBBING	L.S.	1
12	401	STORMWATER MANAGEMENT AND POLLUTION CONTROL		
12	401	SILT FENCE	L.F.	350
12	401	12" BIO-ROLLS	L.F.	260
12	401	TEMPORARY ROCK DITCH CHECK	L.S.	1
12	401	EROSION CONTROL BLANKET	S.Y.	560
12	401	STORMWATER PERMIT FOR CONSTRUCTION	L.S.	1
12	401	CONSTRUCTION ACCESS - CLASS 5 GRAVEL	TDN	17
13	402	SEEDING AND MULCHING	ACRE	1

RIPRAP SCHEDULE				
LOCATION	CLASS I	CLASS II	CLASS III	CLASS IV
STRUCTURE-D-S FILLING VOIDS	34 TDN			
STRUCTURE - UPSTREAM		67 TDN		
STRUCTURE - DOWNSTREAM SLOPES			100 TDN	
STRUCTURE-CHANNEL BOTTOM				42 TDN
HWY. CULVERT OUTLET		30 TDN		

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**CONSTRUCTION NOTES:**

- 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.
- SITE PREPARATION BID ITEM SHALL INCLUDE STRIPPING BENEATH EMBANKMENT FOOTPRINT, BORROW/SPOIL AREA, AND OUTLET CHANNEL SLOPES. TOPSOIL SHALL BE STOCKPILED AND REPLACED OVER COMPLETED EMBANKMENT, BORROW/SPOIL AREA AND CHANNEL SIDESLOPES. BID ITEM SHALL INCLUDE LEVELING AND DRAGGING OR DISK PRIOR TO PLACEMENT OF SEED MIX.
- BID ITEM FOR INLET CHANNEL EXCAVATION SHALL INCLUDE ALL WORK REQUIRED TO EXCAVATE THE INLET CHANNELS AS SHOWN ON THE PLANS. ALL SPOIL MATERIAL MUST BE REMOVED FROM ANY WETLAND AREA AND DEPOSITED IN THE DESIGNATED SPOIL AREA AS SHOWN ON SHEET 4. A SECOND MOBILIZATION MAY BE REQUIRED TO COMPLETE INLET CHANNEL EXCAVATION FOLLOWING DRAWDOWN OF LAKE LEVELS. SPOIL MATERIAL SHALL BE LEVELED AND TOPSOIL PLACED OVER COMPLETED SURFACE.
- BID ITEM FOR OUTLET CHANNEL EXCAVATION SHALL INCLUDE ALL WORK REQUIRED TO EXCAVATE OUTLET CHANNEL AS SHOWN ON THE PLANS. MATERIAL SHALL BE PLACED IN BORROW/SPOIL AREA AS SHOWN ON SHEET 4 AND LEVELED PRIOR TO REPLACEMENT OF TOPSOIL.
- BID ITEM FOR EMBANKMENT SHALL INCLUDE ALL WORK REQUIRED TO HAUL, PLACE AND COMPACT FILL MATERIAL TO CONSTRUCT ABUTMENTS AS STAKED IN THE FIELD. THE ESTIMATED QUANTITY OF 345 C.Y.-P INCLUDES 15% ESTIMATED SHRINKAGE. IF WATER IS REQUIRED TO OBTAIN THE SPECIFIED COMPACTION OF 95% OF THE STANDARD PROCTOR, IT WILL BE CONSIDERED INCIDENTAL TO THE EMBANKMENT BID ITEM. MATERIAL SHALL BE OBTAINED FROM THE DESIGNATED BORROW AREA AS SHOWN ON SHEET 4.
- BID ITEM FOR RIPRAP DU CLASS I, II, III & IV IS AS SHOWN ON THE PLANS AND RIPRAP SCHEDULE THIS SHEET. NON-WOVEN FILTER FABRIC IS REQUIRED BENEATH ALL ROCK RIPRAP AND SHALL BE SECURED TO SLOPES AND BOTTOM USING PINS AS NOTED IN SPECIFICATION 305. EXCAVATION REQUIRED FOR ROCK RIPRAP AND PLACEMENT SHALL ALSO BE PAID FOR UNDER THIS LINE ITEM. CONTRACTOR WILL BE PAID FOR THE ACTUAL QUANTITY INSTALLED. 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 FWS FOR INVASIVE SPECIES PRIOR TO TRANSPORTING ONSITE.
- SHEET PILE MATERIAL SHALL BE SZ-22 OR APPROVED EQUAL. MINIMUM THICKNESS OF 0.375" (3/8") AND MINIMUM SECTION MODULUS 18.1<sup>3</sup>.
- BID ITEMS FOR STRUCTURAL STEEL SHALL INCLUDE ALL INDIVIDUAL LINE ITEMS LISTED UNDER THIS HEADING AND INCLUDE ALL MATERIALS AND LABOR REQUIRED FOR COMPLETE INSTALLATION AS SHOWN ON THE PLANS. ANY GALVANIZED ITEMS LISTED REQUIRING FIELD WELDING SHALL BE RE-PAINTED WITH A COLD GALVANIZED SPRAY.
- BID ITEM FOR REMOVAL OF EXISTING STRUCTURES SHALL BE FOR REMOVING AND SALVAGING EXISTING ROCK RIPRAP AT THE EXISTING SHEET PILE STRUCTURE. SALVAGED ROCK SHALL THEN BE PLACED ON THE UPSTREAM SIDE OF THE EMBANKMENT SLOPES AS SHOWN ON SHEET 7. SALVAGING EXISTING ROCK AND PLACING IT AS DIRECTED SHALL BE CONSIDERED INCIDENTAL TO STRUCTURE REMOVAL. BID ITEM SHALL ALSO INCLUDE REMOVING AND DISPOSING OF EXISTING SHEET PILE STRUCTURE OFF-SITE.
- BID ITEM MISCELLANEOUS - MODIFY CONCRETE CONTROL SECTION SHALL BE FOR SAW CUTTING THE CONCRETE BOX TO WIDTH AND ELEVATION SHOWN ON THE PLANS. IT SHALL INCLUDE ALL WORK REQUIRED TO CONTROL LAKE DISCHARGES AND DE-WATERING. CONCRETE MATERIAL SHALL BE DISPOSED OF OFF SITE.
- BID ITEM FOR CLEARING AND GRUBBING SHALL INCLUDE THE REMOVAL OF TREES AND BRUSH ALONG OUTLET CHANNEL, INLET CHANNEL, EMBANKMENTS, SPOIL AREA AND ANY MISCELLANEOUS AREAS IDENTIFIED BY THE DU FIELD ENGINEER. CONTRACTOR SHALL DISPOSE OF TREES AND BRUSH BY CHIPPING, MARKETING OR REMOVAL FROM THE SITE. SEE NOTE SHEET 6.
- THE BID ITEM FOR STORM WATER MANAGEMENT AND POLLUTION CONTROL SHALL INCLUDE THE SUPPLY, INSTALLATION AND MAINTENANCE OF SILT FENCE, 12" BIO-ROLLS, & MNDOT CATEGORY 3 EROSION CONTROL BLANKET. EXACT LOCATION AND QUANTITY MAY VARY DEPENDING UPON ACTUAL SITE CONDITIONS. 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. CONTRACTOR WILL BE PAID AT THE UNIT PRICE BID FOR THE ACTUAL QUANTITY INSTALLED. IT IS THE CONTRACTORS 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.
- BID ITEM SEEDING AND MULCHING SHALL INCLUDE THE EQUIPMENT AND LABOR REQUIRED TO LEVEL AND PREPARE TOPSOIL FOR SEEDING, SUPPLY OF SPECIFIED SEED MIX, PLACEMENT OF SEED AND MULCH AS DESCRIBED IN SPECIFICATION 402 AND 402 SPECIAL PROVISION ON ALL DISTURBED AREAS. MNDOT TYPE 1 MULCH SHALL BE APPLIED TO ALL AREAS SEEDED AS DIRECTED BY THE DU FIELD ENGINEER. PAYMENT WILL BE BASED ON ACTUAL ACRES SEEDED AND MULCHED AFTER FINAL COMPLETION OF PROJECT, THIS WILL BE DETERMINED BY DU FIELD ENGINEER.

**A NOTE CONCERNING INVASIVE SPECIES REQUIREMENTS**

THE MINNESOTA DNR/USFWS OPERATION ORDER 113 REQUIRES PREVENTING OR LIMITING THE INTRODUCTION, ESTABLISHMENT AND SPREAD OF INVASIVE SPECIES DURING ACTIVITIES ON PUBLIC WATER AND USFWS 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.

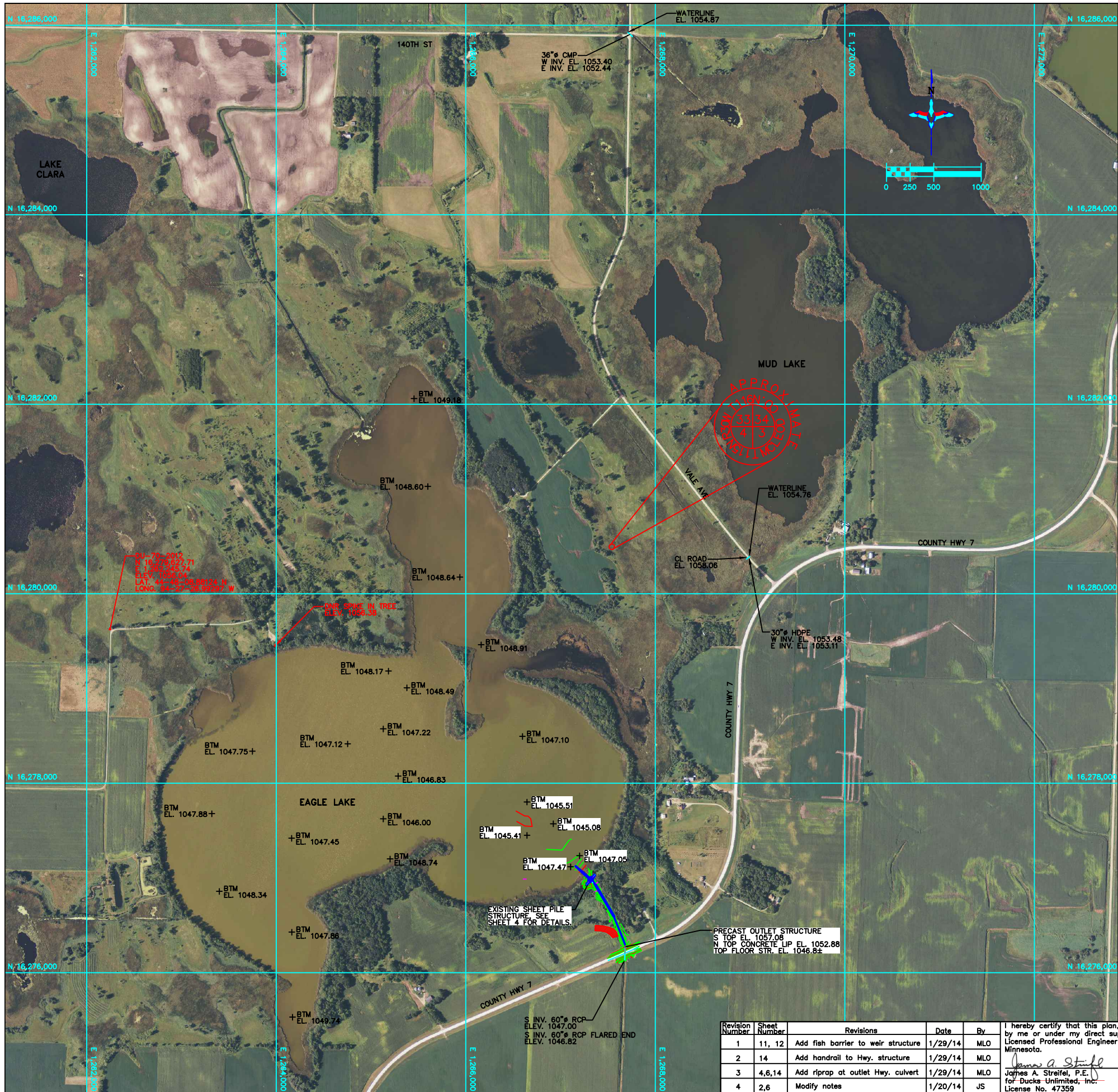
IF WORK IS PERFORMED WITHIN A WATER BODY, THE CONTRACTOR SHALL CLEAN EQUIPMENT AND CLOTHING AS NOTED ABOVE, PRIOR TO ENTERING AND LEAVING THE WATER BODY. DRAIN ALL WATER FROM EQUIPMENT WHERE WATER MIGHT BE TRAPPED, SUCH AS TANKS, PUMPS, HOSES, SILT CURTAINS, AND WATER RETAINING COMPONENTS OF BOATS/BARGES.

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

**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.

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.  James A. Strafel, P.E. for Ducks Unlimited, Inc. License No. 47359	2-5-2014 Date		PROJECT NO. MN-451-1	DESIGNED BY: JAS					
1	11, 12	Add fish barrier to weir structure	1/29/14	MLO						GREAT PLAINS REGIONAL OFFICE DATE: 1-29-2014 SHEET NO. 2	EAGLE LAKE ESTIMATED QUANTITIES AND CONSTRUCTION NOTES	DRAWN BY: MLO		
2	14	Add handrail to Hwy. structure	1/29/14	MLO									APPROVED BY:	CHECKED BY:
3	4,6,14	Add riprap at outlet Hwy. culvert	1/29/14	MLO										
4	2,6	Modify notes	1/20/14	JS										



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*James A. Streifel*  
 James A. Streifel, P.E.  
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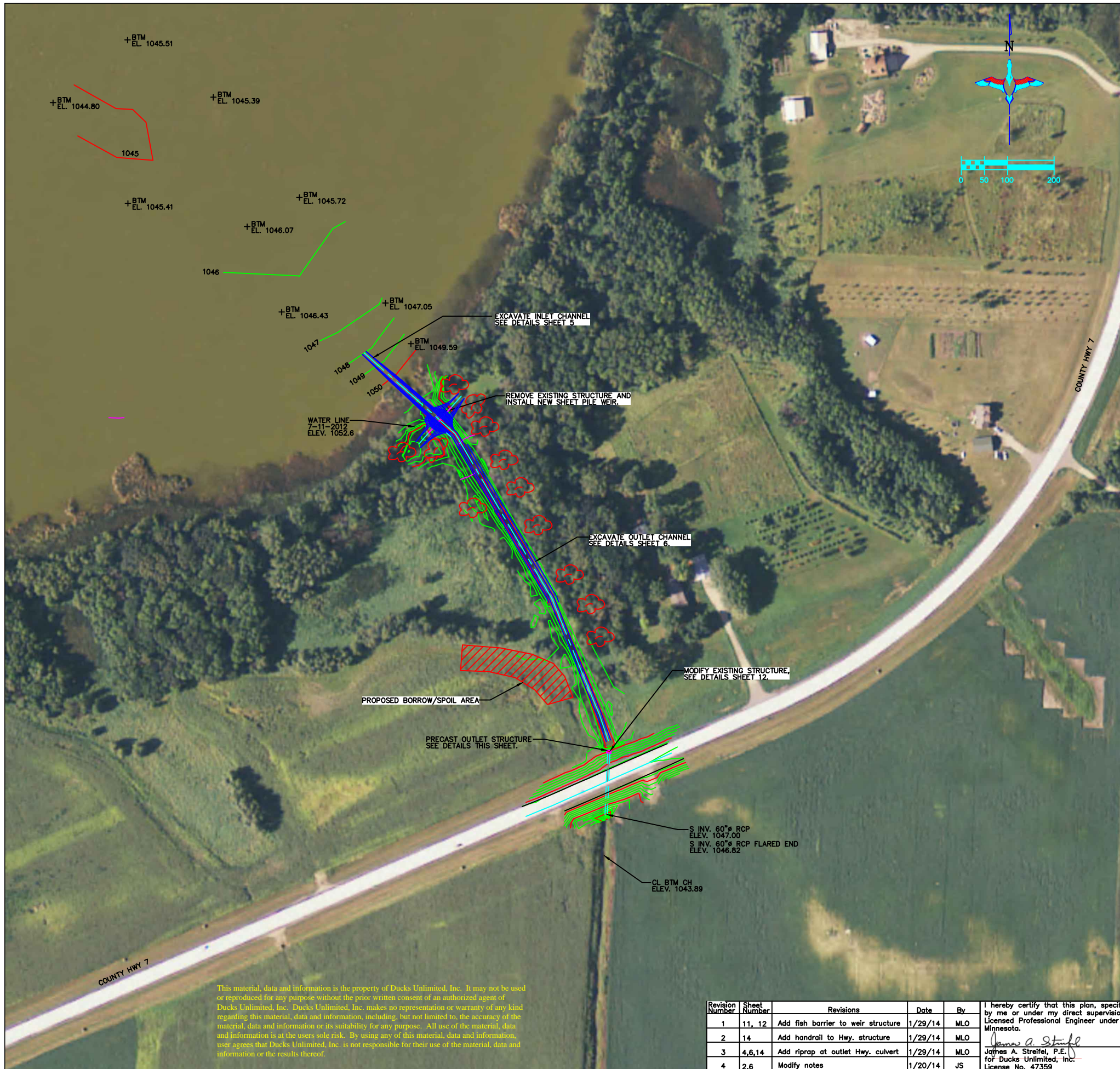
2-5-2014  
Date

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

PROJECT NO. MN-451-1  
**EAGLE LAKE SITE PLAN**

DESIGNED BY: JAS  
 DRAWN BY: MLO  
 SURVEYED BY: GLJ  
 CHECKED BY: .

DATE: 1-29-2014 SHEET NO. 3 APPROVED BY: . APPROVED BY: .



LOOKING NORTH EXISTING SHEET PILE STR.



LOOKING EAST EXISTING SHEET PILE STR.



LOOKING SW CTY HWY STR.

LEGEND	
	CULTIVATION LINE
	ROAD
	TREES

**HORIZONTAL CONTROL** - coordinates are UTM Zone 15 grid coordinates in US feet [NAD 83 (CORS 96)]. They were established from the WGS84 Ellipsoid with information from Trimble R-62 survey grade GPS receivers on July 10, 2012 and calibrated to an OPUS position occupied for 5 hours and 13 minutes and sent to NGS for Solution.

**VERTICAL CONTROL** - was established from the Geoid 09 CONUS and calibrated to a DNR Lake Water Level report for Eagle Lake in McLeod county dated 4-14-54 to 4-26-2006 bench mark listed at elevation 1056.37 feet on the NGVD 29 and set 4-26-2006. The description of this bench mark is "at access on NW side of lake, horizontal 1/8" spike in notched SW side of a 1.9' cottonwood, 63' from WE, 34' E of CL of access road."

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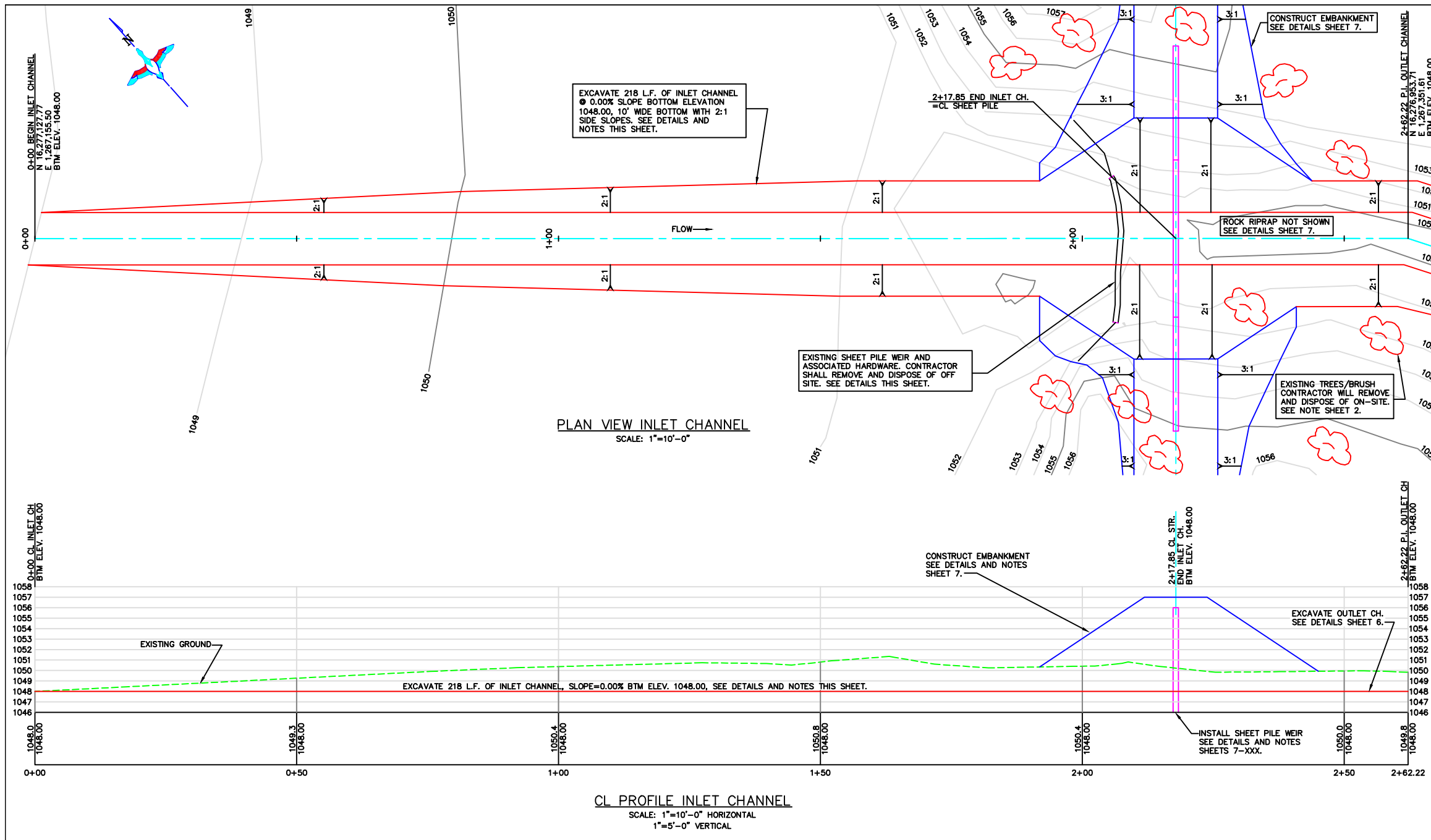
James A. Streifel, P.E.  
 for Ducks Unlimited, Inc.  
 License No. 47359

2-5-2014  
Date

**DUCKS UNLIMITED INC.**  
 GREAT PLAINS REGIONAL OFFICE  
 DATE: 1-29-2014 SHEET NO. 4

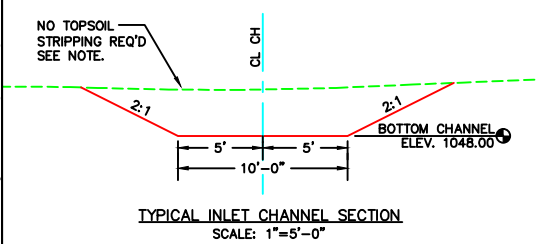
PROJECT NO. MN-451-1  
**EAGLE LAKE PROJECT SITE PLAN**  
 APPROVED BY:

DESIGNED BY: JAS  
 DRAWN BY: MLO  
 SURVEYED BY: GLJ  
 CHECKED BY:  
 APPROVED BY:



**ESTIMATED QUANTITIES:**  
 INLET CHANNEL STATIONS 0+00-2+17.85: 236 C.Y.\*  
 \*THIS IS FOR INFORMATION ONLY. PAYMENT WILL BE BASED ON LINEAR FOOT.

**ESTIMATED QUANTITIES:**  
 INLET CHANNEL EXC. STATIONS 0+00-2+17.85:  
 218 LINEAR FEET  
 PAYMENT WILL BE BASED ON LINEAR FOOT BASIS, CONTRACTOR SHALL INCLUDE ALL COSTS ASSOCIATED WITH "CHANNEL EXCAVATION" AS NOTED THIS SHEET.



**CHANNEL EXCAVATION NOTES:**  
 -INLET CHANNEL: CONTRACTOR SHALL EXCAVATE 10' WIDE 2:1 SLOPE CHANNEL @ BOTTOM ELEV. 1048.00, ALL SPOIL MATERIAL SHALL BE REMOVED FROM WETLAND AND DEPOSITED IN DESIGNATED WASTE AREA SHOWN SHEETS 1, 4, & 6. NO TOPSOIL STRIPPING REQUIRED WITHIN EXISTING CHANNEL FOOTPRINT. CONTRACTOR SHALL LEVEL ALL TOPSOIL SUITABLE FOR SEEDING & MULCHING AS DETERMINED BY DU FIELD ENGINEER. CONTRACTOR SHALL INCLUDE A SECOND MOBILIZATION TO RETURN WHEN WATER LEVELS HAVE LOWERED SUITABLE ENOUGH TO FINISH FULL INLET CHANNEL AS SHOWN.  
 PAYMENT IS BASED ON LINEAR FOOT: THIS SHALL INCLUDE BUT NOT LIMITED TO: EXCAVATOR, DOZER, TRUCKS, OPERATORS, LABORERS, MATS AND SECOND MOBILIZATION TO RETURN WHEN WATER LEVELS HAVE LOWERED TO FINISH FULL INLET CHANNEL AS SHOWN. THERE WILL BE SEPARATE LINE ITEMS FOR INLET & OUTLET CHANNEL EXCAVATIONS, CONTRACTOR SHALL INCLUDE ALL COSTS ASSOCIATED WITH CHANNEL EXCAVATION WORK AS NOTED. EXCAVATION REQUIRED FOR RIPRAP IS CONSIDERED "INCIDENTAL" TO THAT LINE ITEM.

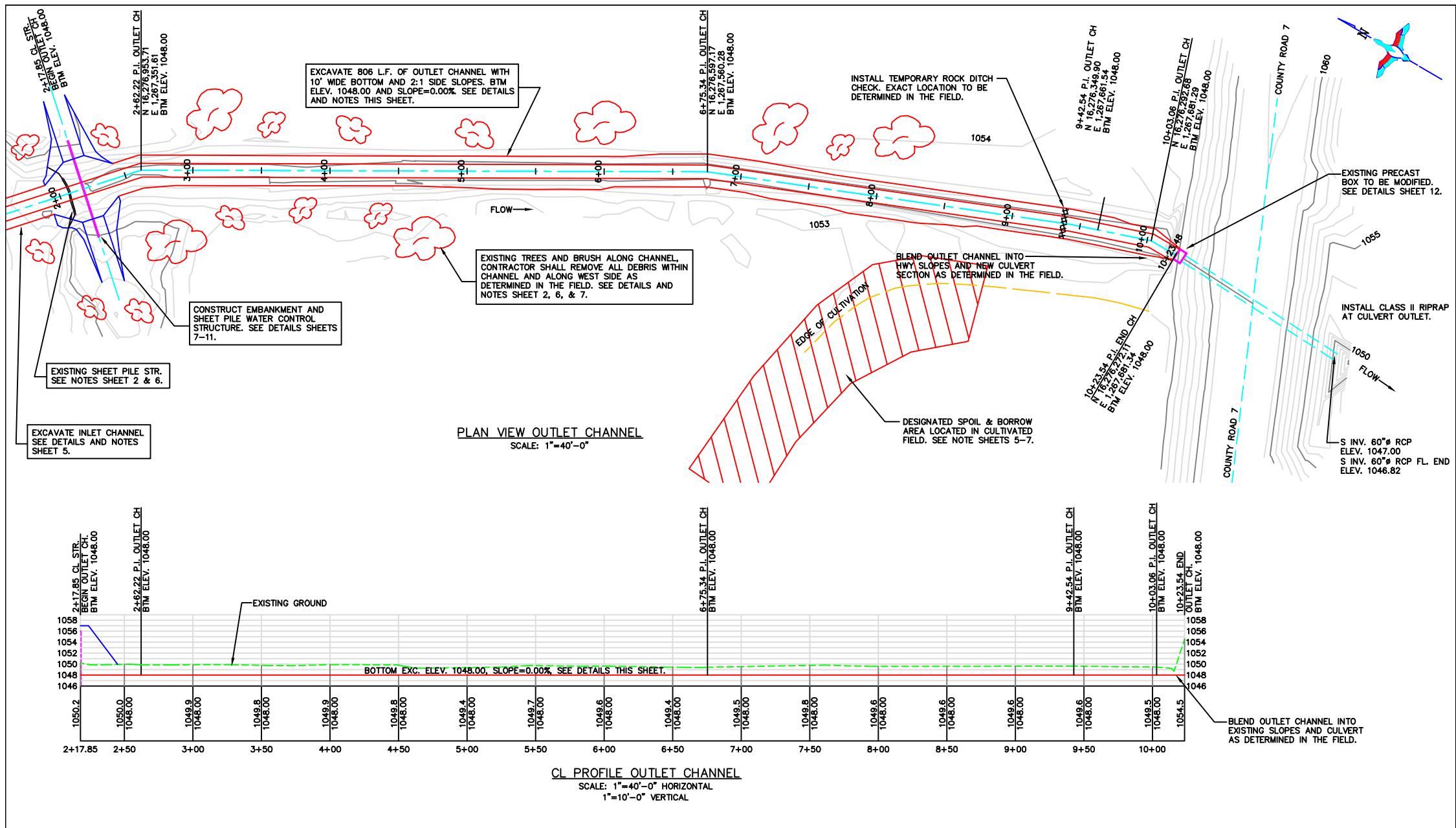


**REMOVAL OF EXISTING STRUCTURE NOTE:**  
 CONTRACTOR SHALL REMOVE THE EXISTING SHEET PILE WEIR AND ASSOCIATED HARDWARE, SUCH MATERIAL SHALL BECOME PROPERTY OF THE CONTRACTOR FOR PROPER DISPOSAL OFF-SITE. THIS SHALL INCLUDE BUT NOT LIMITED TO SHEETING, PILE CAP AND GUIDES. EXISTING ROCK RIPRAP SHALL BE SALVAGED AND USED ON UPSTREAM EMBANKMENT SLOPES. SALVAGED ROCK WILL NOT BE CONSIDERED RIPRAP INSTALLATION AND SHALL BE CONSIDERED INCIDENTAL TO STRUCTURE REMOVAL. PAYMENT FOR REMOVAL EXISTING SHEET PILE STRUCTURE AND ASSOCIATED HARDWARE SHALL BE PAID FOR BASED ON THE CONTRACTORS UNIT BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE."

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 License No. 47359  
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**DUCKS UNLIMITED INC.**  
 GREAT PLAINS REGIONAL OFFICE  
 PROJECT NO. MN-451-1  
 EAGLE LAKE  
 PLAN & PROFILE INLET CHANNEL  
 DETAILS AND NOTES  
 DESIGNED BY: JAS  
 DRAWN BY: MLO  
 SURVEYED BY: GLJ  
 CHECKED BY:  
 APPROVED BY:  
 DATE: 1-29-2014  
 SHEET NO. 5



**ESTIMATED QUANTITIES:**  
 OUTLET CHANNEL STATIONS 2+17.85-10+23.54: 869 C.Y.\*

\*THIS IS FOR INFORMATION ONLY. PAYMENT WILL BE BASED ON LINEAR FOOT.

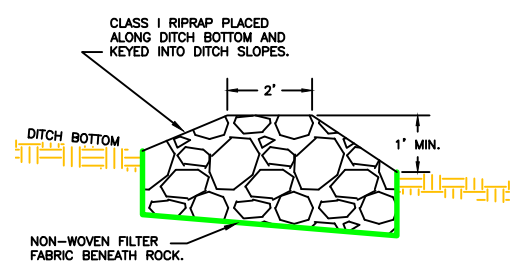
**ESTIMATED QUANTITIES:**  
 OUTLET CHANNEL EXC. STATIONS 2+17.85-10+23.54:  
 806 LINEAR FEET

PAYMENT WILL BE BASED ON LINEAR FOOT BASIS. CONTRACTOR SHALL INCLUDE ALL COSTS ASSOCIATED WITH "CHANNEL EXCAVATION" AS NOTED THIS SHEET.

**CHANNEL EXCAVATION NOTES:**

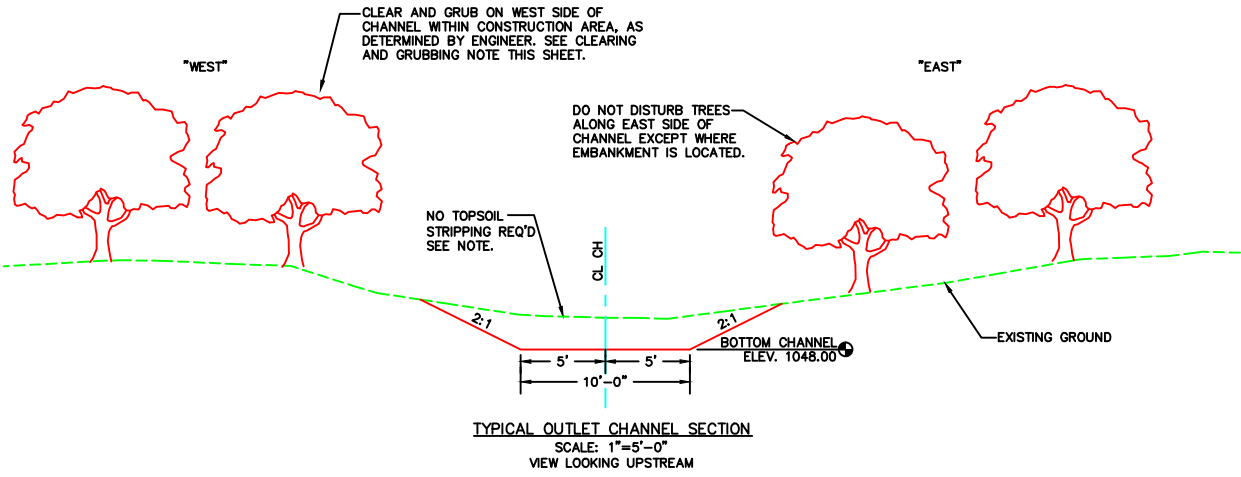
-OUTLET CHANNEL: CONTRACTOR SHALL EXCAVATE 10' WIDE 2:1 SLOPE CHANNEL @ BOTTOM ELEV. 1048.00. ALL SPOIL MATERIAL SHALL BE REMOVED FROM WETLAND/CHANNEL AND DEPOSITED IN DESIGNATED WASTE AREA SHOWN SHEETS 1, 3, & 6. NO TOPSOIL STRIPPING REQUIRED WITHIN EXISTING CHANNEL FOOTPRINT. CONTRACTOR SHALL LEVEL ALL TOPSOIL SUITABLE FOR SEEDING & MULCHING AS DETERMINED BY DU FIELD ENGINEER.

PAYMENT IS BASED ON LINEAR FOOT: THIS SHALL INCLUDE BUT NOT LIMITED TO: EXCAVATOR, DOZER, TRUCKS, OPERATORS, LABORERS, AND MATS. THERE WILL BE SEPARATE LINE ITEMS FOR INLET & OUTLET CHANNEL EXCAVATIONS, CONTRACTOR SHALL INCLUDE ALL COSTS ASSOCIATED WITH CHANNEL EXCAVATION WORK AS NOTED. EXCAVATION REQUIRED FOR RIPRAP IS CONSIDERED "INCIDENTAL" TO THAT LINE ITEM.



**CLEARING & GRUBBING NOTE:**

THE CONTRACTOR SHALL REMOVE EXISTING TREES AND BRUSH ALONG OUTLET CHANNEL, INLET CHANNEL, EMBANKMENTS, DESIGNATED SPOIL AREAS AND ANY MISCELLANEOUS AREAS IDENTIFIED BY THE DU FIELD ENGINEER. CONTRACTOR SHALL DISPOSE OF TREES, BRUSH, STUMPS AND OTHER DEBRIS BY CHIPPING, MARKETING OR OTHERWISE REMOVING FROM THE SITE. CHIPPED DEBRIS MAY BE DISPOSED OF ON SITE BY LEVELING ALONG THE WEST SIDE OF DITCH. CONTRACTOR WILL LIMIT TREE/BRUSH REMOVAL ALONG EAST SIDE OF OUTLET CHANNEL EXCEPT WHERE EMBANKMENT WILL BE LOCATED. TREES/BRUSH ALONG THE WEST SIDE WILL BE CLEARED AS NOTED ABOVE. PAYMENT FOR TREE AND BRUSH REMOVAL WILL BE PAID FOR BASED ON THE CONTRACTORS UNIT BID PRICE FOR "CLEARING & GRUBBING."



Revision Number	Sheet Number	Revisions	Date	By
1	11, 12	Add fish barrier to weir structure	1/29/14	MLO
2	14	Add handrail to Hwy. structure	1/29/14	MLO
3	4,6,14	Add riprap at outlet Hwy. culvert	1/29/14	MLO
4	2,6	Modify notes	1/20/14	JS

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James A. Streifel, P.E.  
for Ducks Unlimited, Inc.  
License No. 47359

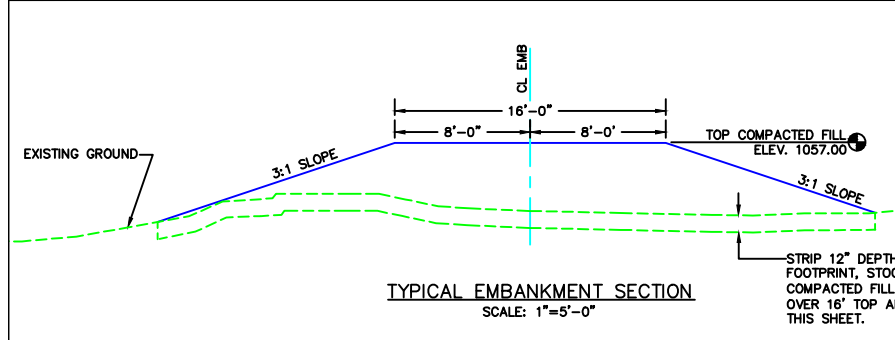
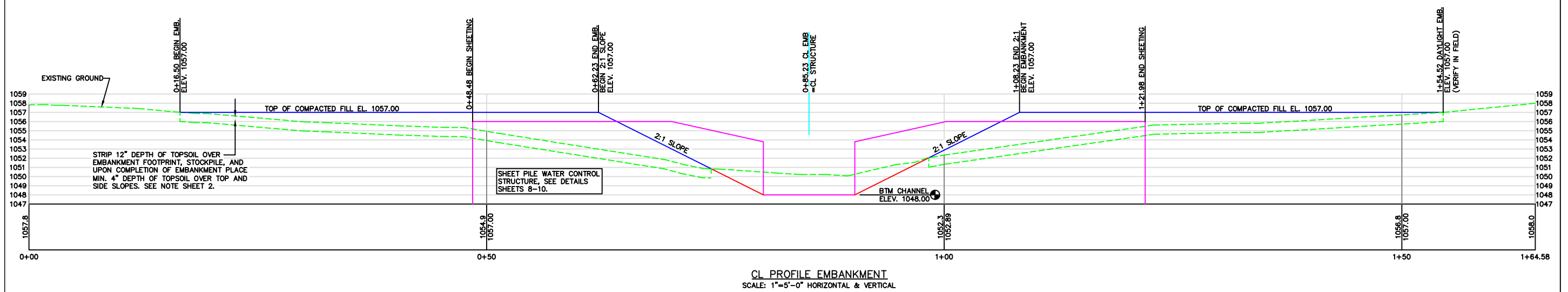
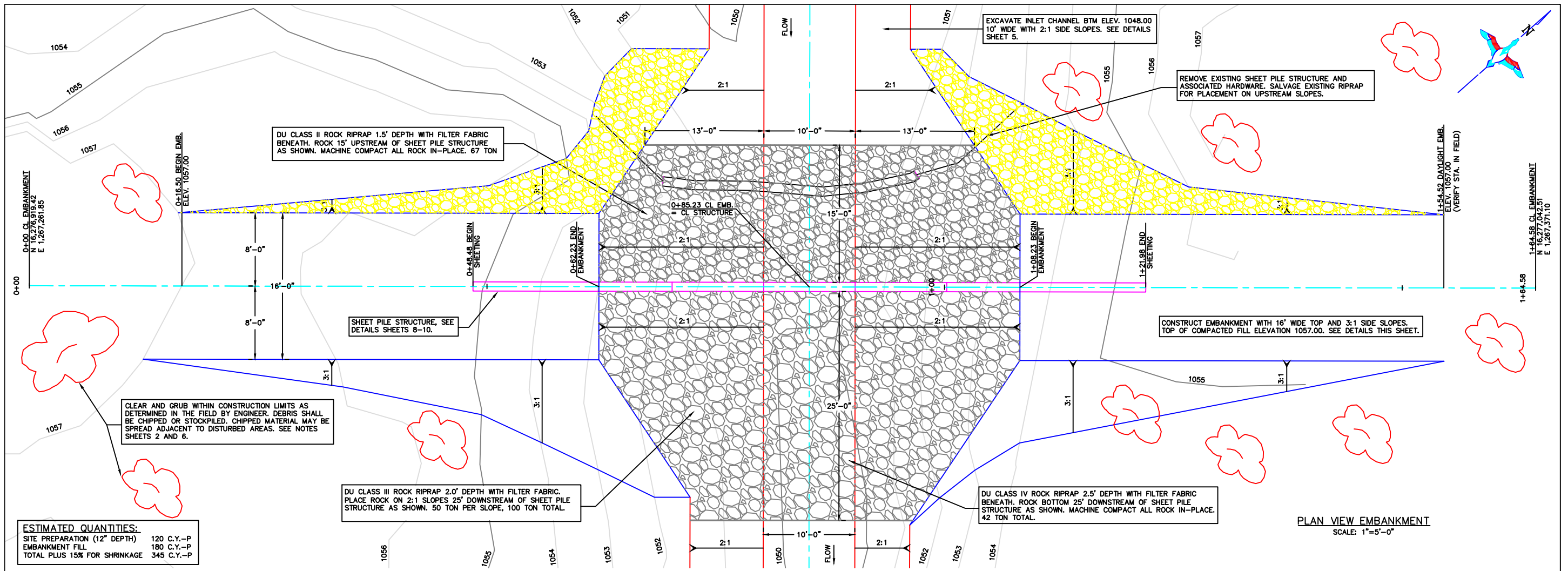
DATE: 2-5-2014

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

PROJECT NO. MN-451-1  
EAGLE LAKE  
PLAN & PROFILE OUTLET CHANNEL  
DETAILS AND NOTES

DESIGNED BY: JAS  
DRAWN BY: MLO  
SURVEYED BY: GLJ  
CHECKED BY:

DATE: 1-29-2014  
SHEET NO. 6  
APPROVED BY:



**SITE PREPARATION NOTE ON EMBANKMENT:**

12" DEPTH TOPSOIL SHALL BE STRIPPED FROM BENEATH THE EMBANKMENT FOOTPRINT AND STOCKPILED PRIOR TO PLACING FILL. UPON COMPLETION OF COMPACTED EMBANKMENT FILL, CONTRACTOR SHALL PLACE MIN. 4" TOPSOIL OVER UPSTREAM/DOWNSTREAM SLOPES AND TOP OF EMBANKMENT. ANY ADDITIONAL TOPSOIL SHALL BE PLACED ALONG DOWNSTREAM SLOPES TO FLATTEN AND THICKEN SUCH.

THE CONTRACTOR SHALL LEVEL ALL TOPSOIL SUITABLE ENOUGH FOR SEEDING & MULCHING. PAYMENT FOR STRIPPING (12" DEPTH UNDER EMBANKMENT), STOCKPILING, AND PLACEMENT SHALL BE PAID FOR BASED ON THE CONTRACTOR'S UNIT BID PRICE FOR "SITE PREPARATION."

**EMBANKMENT/BORROW AREA NOTE:**

DESIGNATED BORROW AREA IS LOCATED AS SHOWN ON SHEETS 1 AND 4. DESIGNATED BORROW AREA IS ALSO THE DESIGNATED SPOIL AREA. CONTRACTOR SHALL REMOVE ALL REQUIRED CL MATERIAL BEFORE SPOILING ANY MATERIAL FROM CHANNEL EXCAVATION. EMBANKMENT MATERIAL SHALL BE PLACED AND COMPACTED AS DESCRIBED IN EMBANKMENT SPECIFICATION 204.

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

Revision Number	Sheet Number	Revisions	Date	By
1	11, 12	Add fish barrier to weir structure	1/29/14	MLO
2	14	Add handrail to Hwy. structure	1/29/14	MLO
3	4,6,14	Add riprap at outlet Hwy. culvert	1/29/14	MLO
4	2,6	Modify notes	1/20/14	JS

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*James A. Streifel*  
 James A. Streifel, P.E.  
 for Ducks Unlimited, Inc.  
 License No. 47359

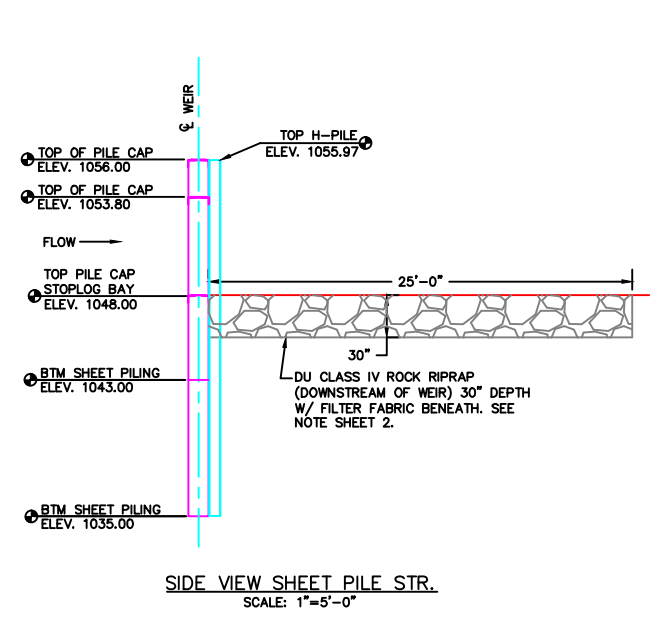
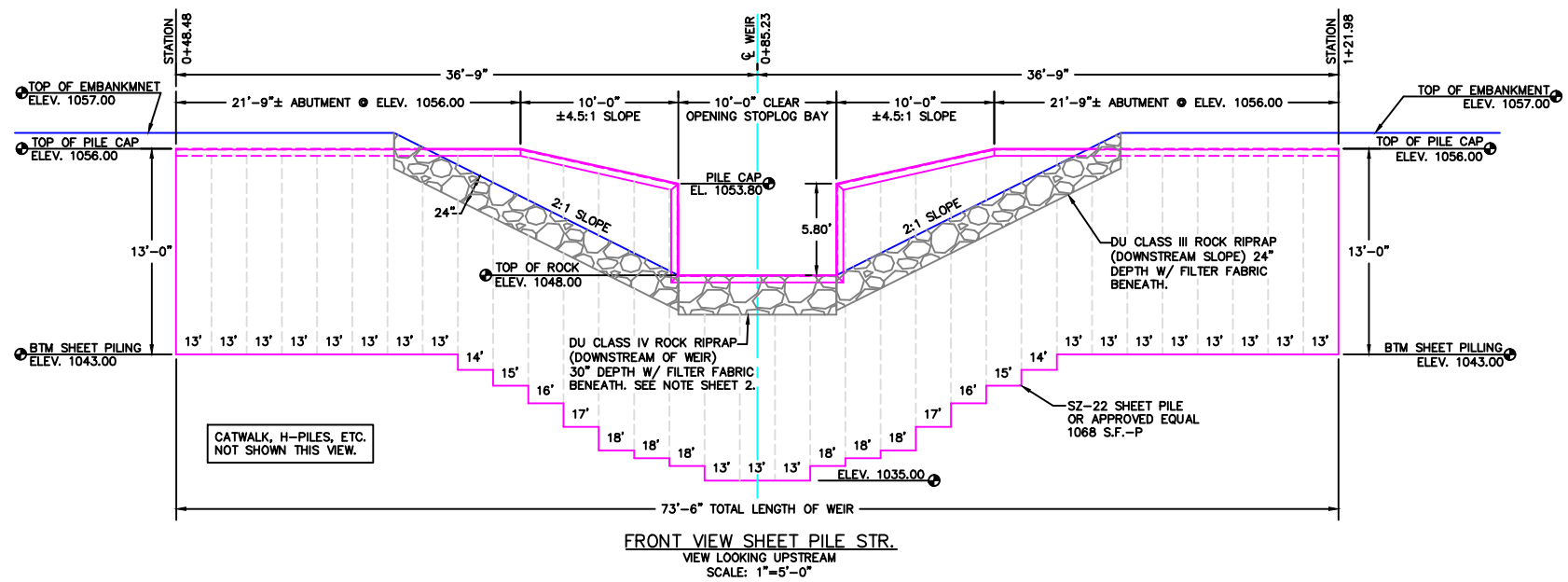
2-5-2014  
 Date

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

PROJECT NO. MN-451-1  
 EAGLE LAKE  
 PLAN & PROFILE EMBANKMENT  
 DETAILS AND NOTES

DESIGNED BY: JAS  
 DRAWN BY: MLO  
 SURVEYED BY: GLJ  
 CHECKED BY:

DATE: 1-29-2014  
 SHEET NO. 7  
 APPROVED BY:



**SHEET PILE SPECIFICATIONS:**

SZ-22 SHEET PILE OR APPROVED EQUAL  
MINIMUM THICKNESS 0.375 INCHES  
MINIMUM SECTION MODULUS 18.1 IN<sup>3</sup>/LF OF WALL

**QUANTITIES:**

SHEET PILE:	SZ-22 (26.75" WIDE)
13' LENGTH	19 EA.
14' LENGTH	2 EA.
15' LENGTH	2 EA.
16' LENGTH	2 EA.
17' LENGTH	2 EA.
18' LENGTH	6 EA.

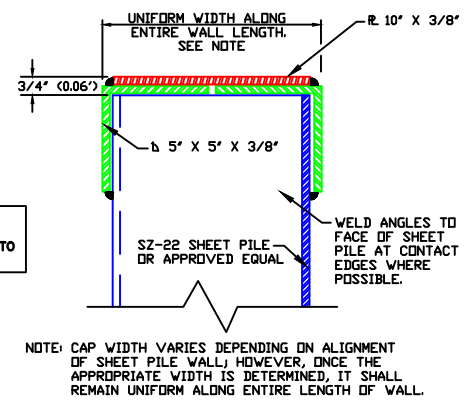
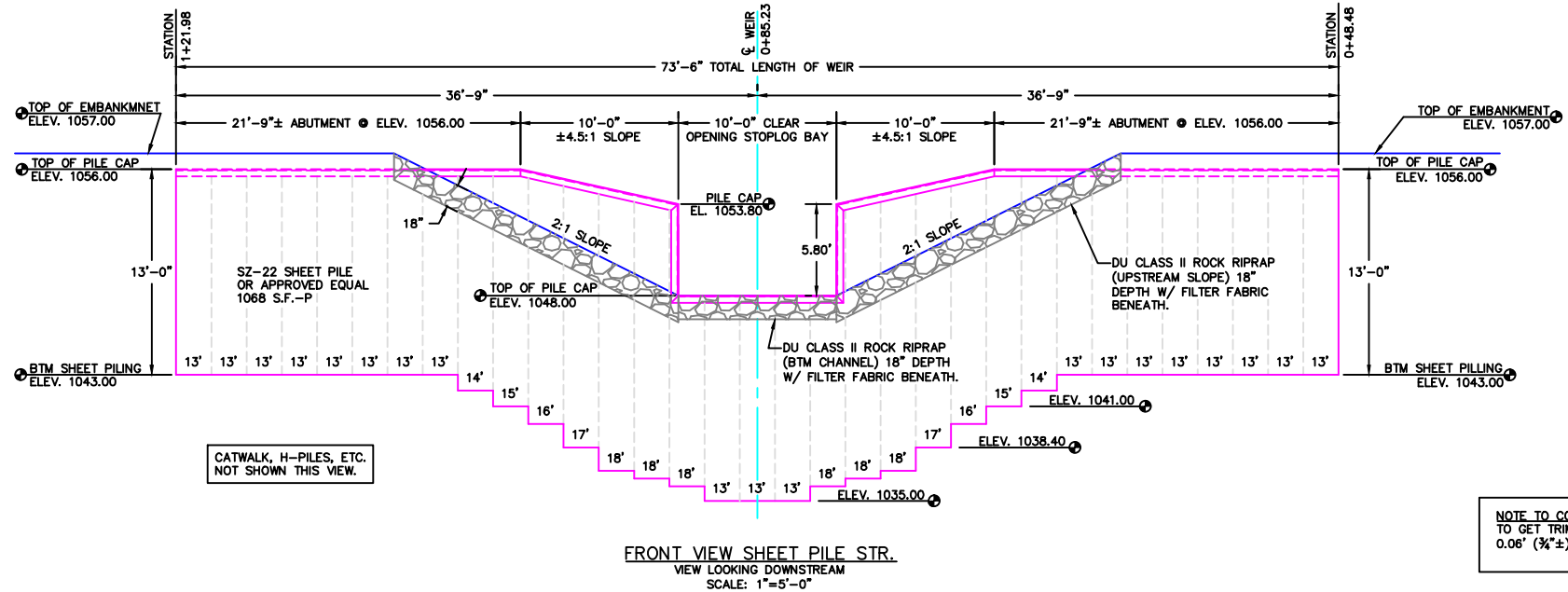
TOTAL SQUARE FOOT = 1068 S.F.-P

**PILE CAP:**

3/4"x10" PLATE	86 L.F.
3/8"x5"x5" ANGLES	172 L.F.

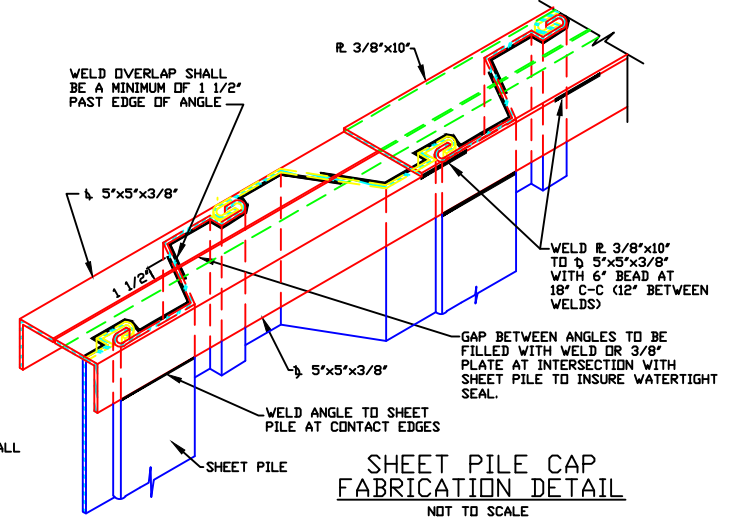
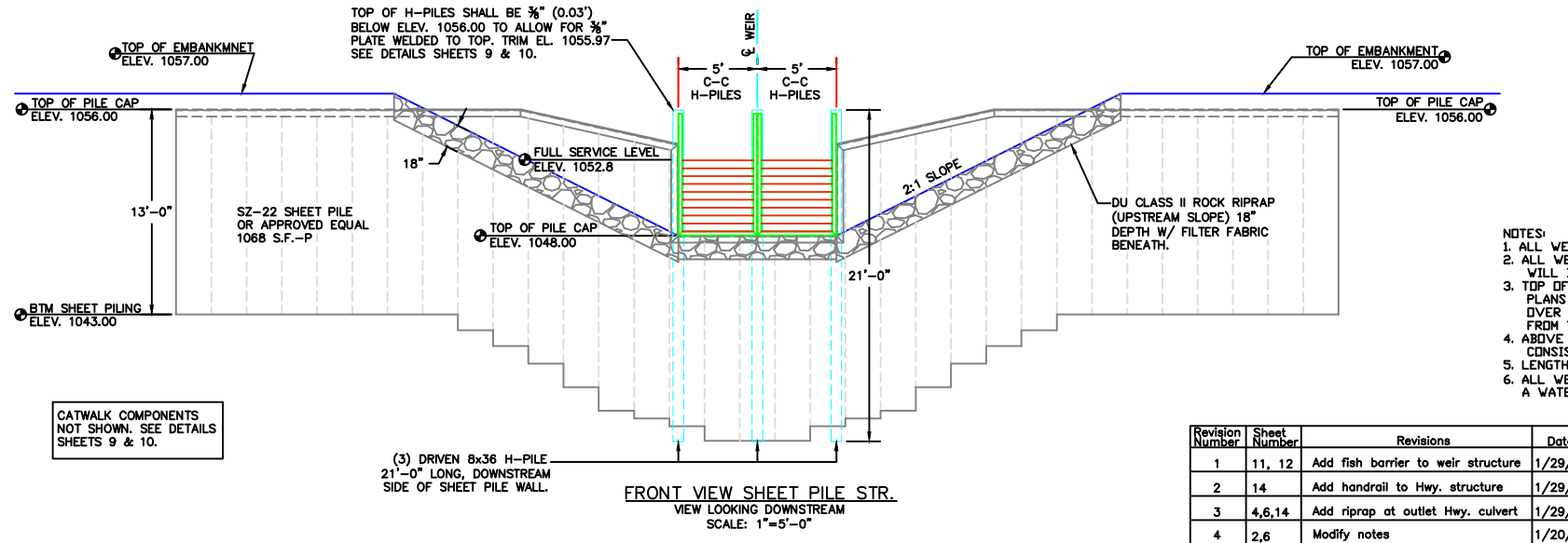
**DRIVEN H-PILES:**

8x36 DRIVEN H-PILES	63 L.F.
---------------------	---------



NOTE: ALL WELDS AT OR BELOW ELEV. 1053.80 SHALL BE CONTINUOUS, WATERTIGHT AND SUBJECT TO LAMPING TO ENSURE WATERTIGHT SEAL.

NOTE TO CONTRACTOR:  
TO GET TRIMMED ELEVATIONS SUBTRACT 0.06' (3/4"±) FROM TOP OF CAP ELEVATIONS.



- NOTES:
- ALL WELDS TO BE 1/4" FILLET WELDS (SEE D.U. SPECIFICATIONS).
  - ALL WELDS WILL BE SUBJECT TO LAMPING. ANY AREAS FAILING WILL BE REWELDED BEFORE ACCEPTANCE OF PROJECT.
  - TOP OF SHEET PILE SHALL BE TRIMMED TO GRADES INDICATED ON PLANS TO REMOVE ANY DAMAGE CAUSED BY DRIVING. ANY TRIMMING OVER 3" SHALL BE CONSIDERED CUT-OFF AND WILL BE DEDUCTED FROM THE COST OF "SHEET PILE INSTALLATION".
  - ABOVE ELEV. 1053.80 PILE CAP NEED NOT BE WATERTIGHT, WELDS SHALL CONSIST OF A 6" BEAD AT 18" C-C (12" BETWEEN WELDS).
  - LENGTH OF PILE CAP AS SHOWN ON PLANS.
  - ALL WELDS AROUND STOPLOG BAY TO BE CONTINUOUS TO INSURE A WATERTIGHT SEAL.

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1	11, 12	Add fish barrier to weir structure	1/29/14	MLO
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3	4,6,14	Add riprap at outlet Hwy. culvert	1/29/14	MLO
4	2,6	Modify notes	1/20/14	JS

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*James A. Streifel*  
James A. Streifel, P.E.  
for Ducks Unlimited, Inc.  
License No. 47359

2-5-2014  
Date

**DUCKS UNLIMITED INC.**  
GREAT PLAINS REGIONAL OFFICE  
DATE: 1-29-2014 SHEET NO. 8

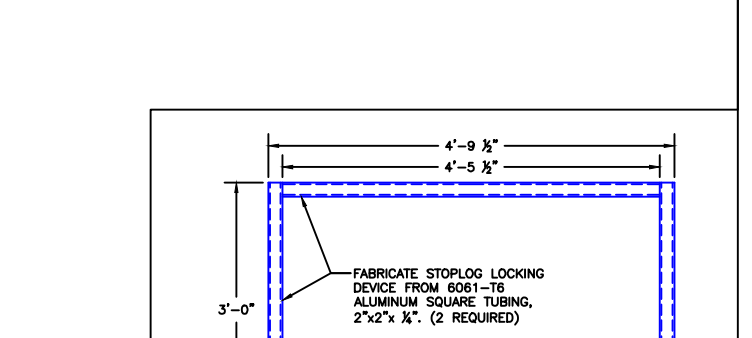
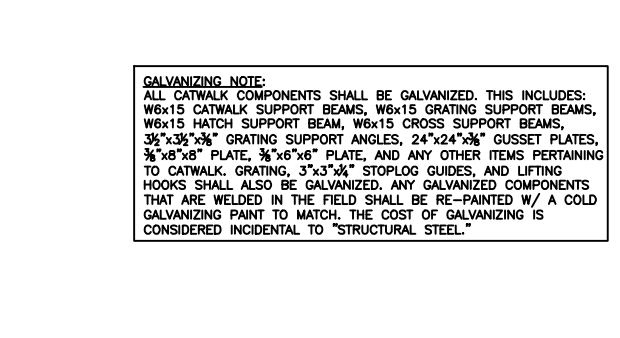
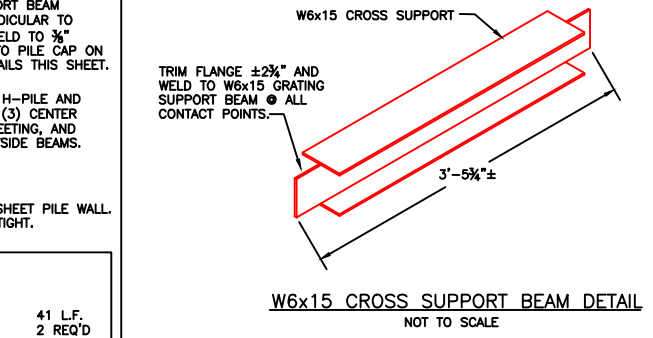
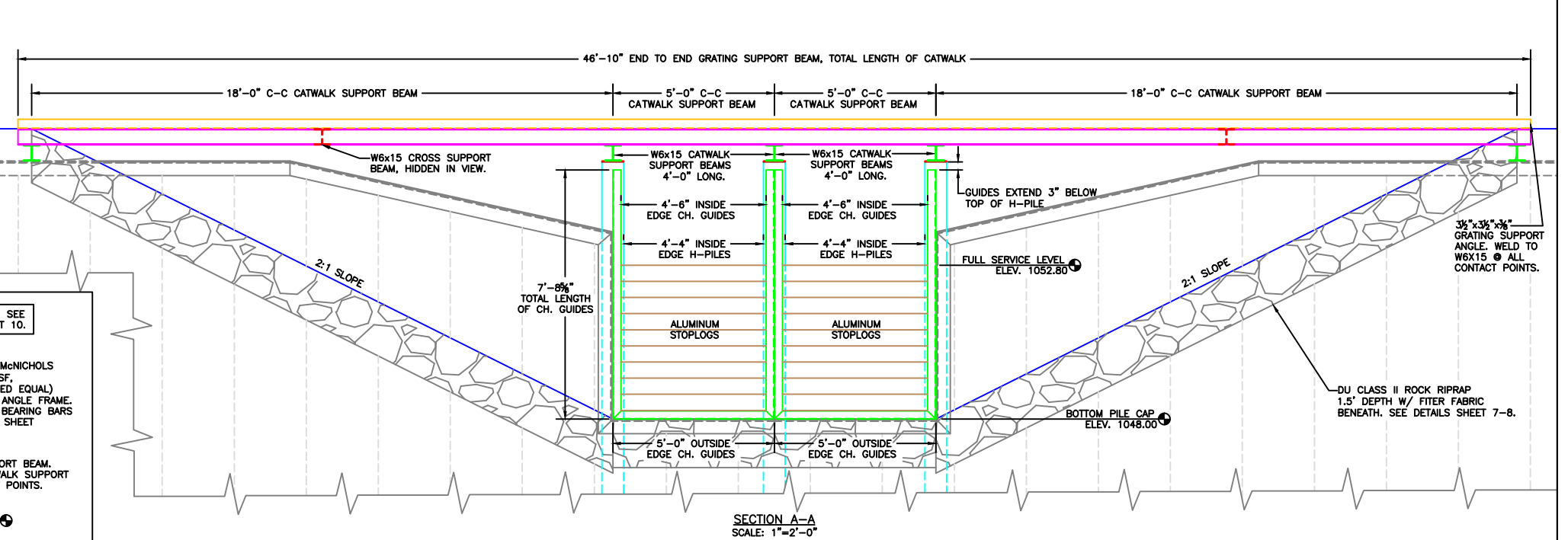
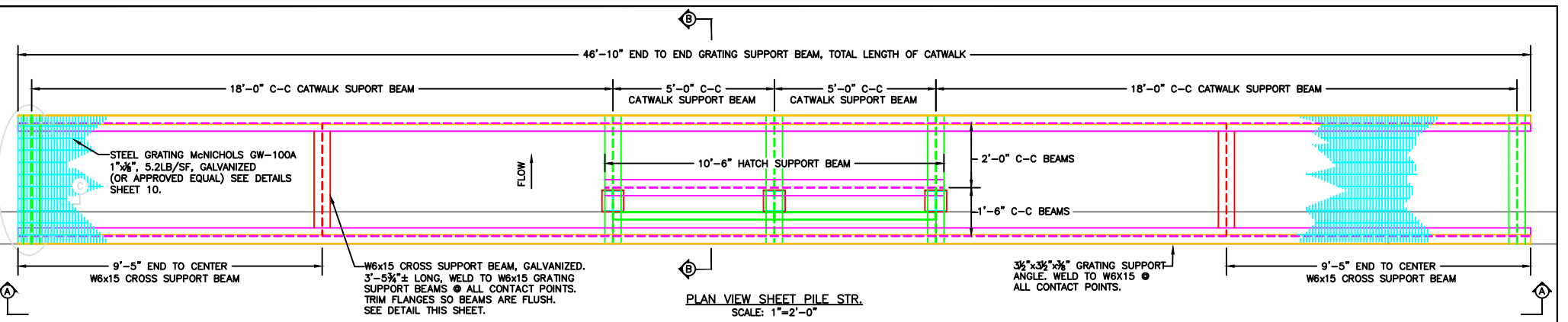
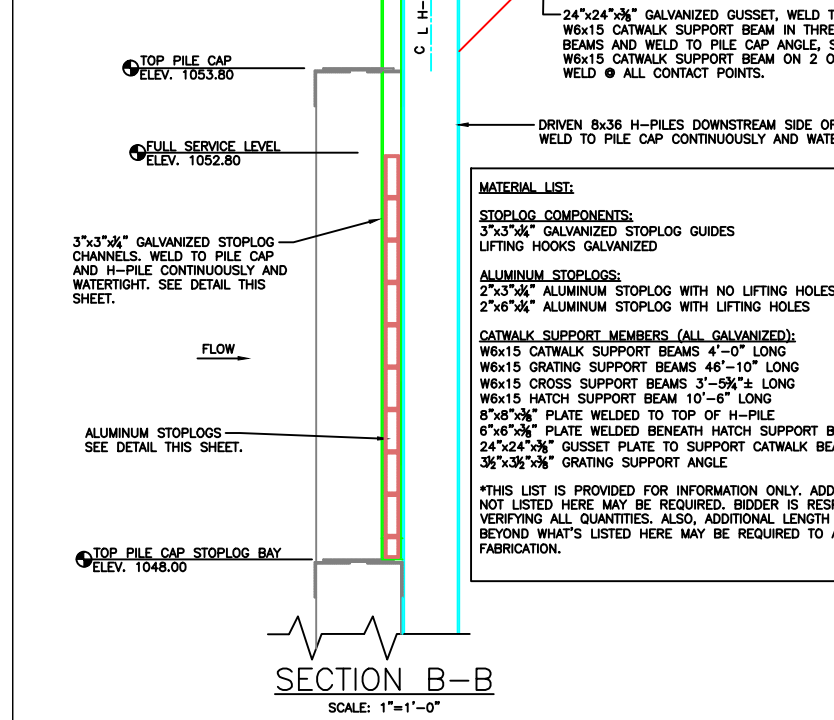
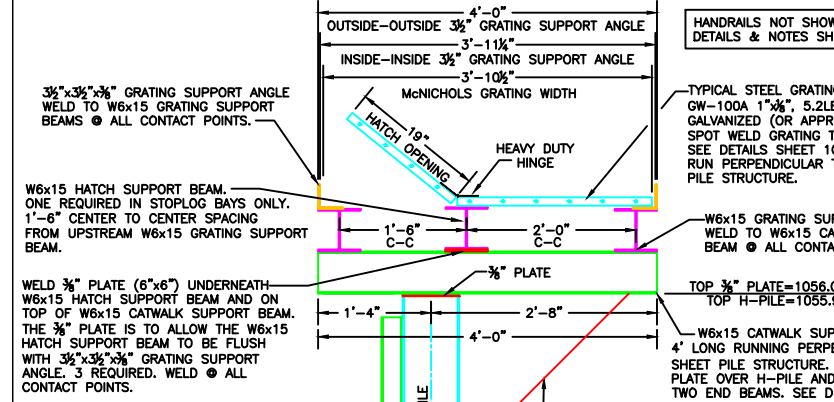
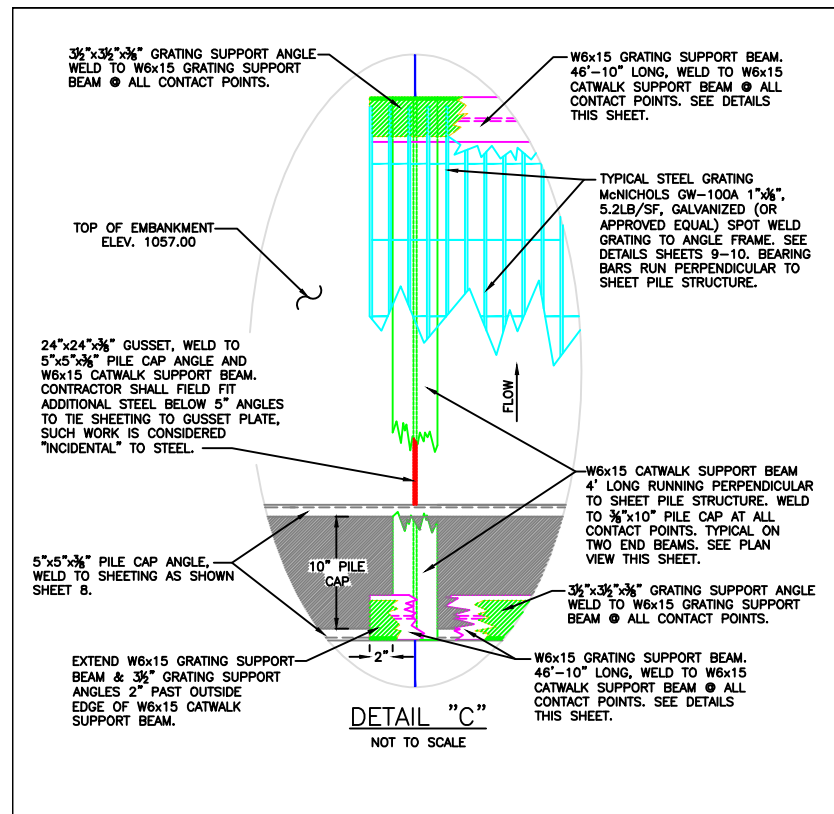
PROJECT NO. MN-451-1  
EAGLE LAKE  
SHEET PILE DETAILS

DESIGNED BY: JAS  
DRAWN BY: MLO  
SURVEYED BY: GLJ  
CHECKED BY: .  
APPROVED BY: .

CATWALK COMPONENTS NOT SHOWN. SEE DETAILS SHEETS 9 & 10.

(3) DRIVEN 8x36 H-PILE 21'-0" LONG, DOWNSTREAM SIDE OF SHEET PILE WALL.





**MATERIAL LIST:**

**STOPLOG COMPONENTS:**

3"x3"x3/4" GALVANIZED STOPLOG GUIDES	41 L.F.
LIFTING HOOKS GALVANIZED	2 REQ'D

**ALUMINUM STOPLOGS:**

2"x3"x3/4" ALUMINUM STOPLOG WITH NO LIFTING HOLES	2 REQ'D
2"x6"x3/4" ALUMINUM STOPLOG WITH LIFTING HOLES	18 REQ'D

**CATWALK SUPPORT MEMBERS (ALL GALVANIZED):**

W6x15 CATWALK SUPPORT BEAMS 4'-0" LONG	5 REQ'D
W6x15 GRATING SUPPORT BEAMS 46'-10" LONG	2 REQ'D
W6x15 CROSS SUPPORT BEAMS 3'-5 3/4"± LONG	2 REQ'D
W6x15 HATCH SUPPORT BEAM 10'-6" LONG	1 REQ'D
8"x8"x3/8" PLATE WELDED TO TOP OF H-PILE	2 REQ'D
6"x6"x3/8" PLATE WELDED BENEATH HATCH SUPPORT BEAM	3 REQ'D
24"x24"x3/8" GUSSET PLATE TO SUPPORT CATWALK BEAM	5 REQ'D
3/2"x3/2"x3/8" GRATING SUPPORT ANGLE	94 L.F.

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**GALVANIZING NOTE:**  
ALL CATWALK COMPONENTS SHALL BE GALVANIZED. THIS INCLUDES: W6x15 CATWALK SUPPORT BEAMS, W6x15 GRATING SUPPORT BEAMS, W6x15 HATCH SUPPORT BEAM, W6x15 CROSS SUPPORT BEAMS, 3/2"x3/2"x3/8" GRATING SUPPORT ANGLES, 24"x24"x3/8" GUSSET PLATES, 3/8"x8"x8" PLATE, 3/8"x6"x6" PLATE, AND ANY OTHER ITEMS PERTAINING TO CATWALK. GRATING, 3"x3"x3/4" STOPLOG GUIDES, AND LIFTING HOOKS SHALL ALSO BE GALVANIZED. ANY GALVANIZED COMPONENTS THAT ARE WELDED IN THE FIELD SHALL BE RE-PAINTED W/ A COLD GALVANIZING PAINT TO MATCH. THE COST OF GALVANIZING IS CONSIDERED INCIDENTAL TO "STRUCTURAL STEEL."

Revision Number	Sheet Number	Revisions	Date	By
1	11, 12	Add fish barrier to weir structure	1/29/14	MLO
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3	4, 6, 14	Add riprap at outlet Hwy. culvert	1/29/14	MLO
4	2, 6	Modify notes	1/20/14	JS

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License No. 47359

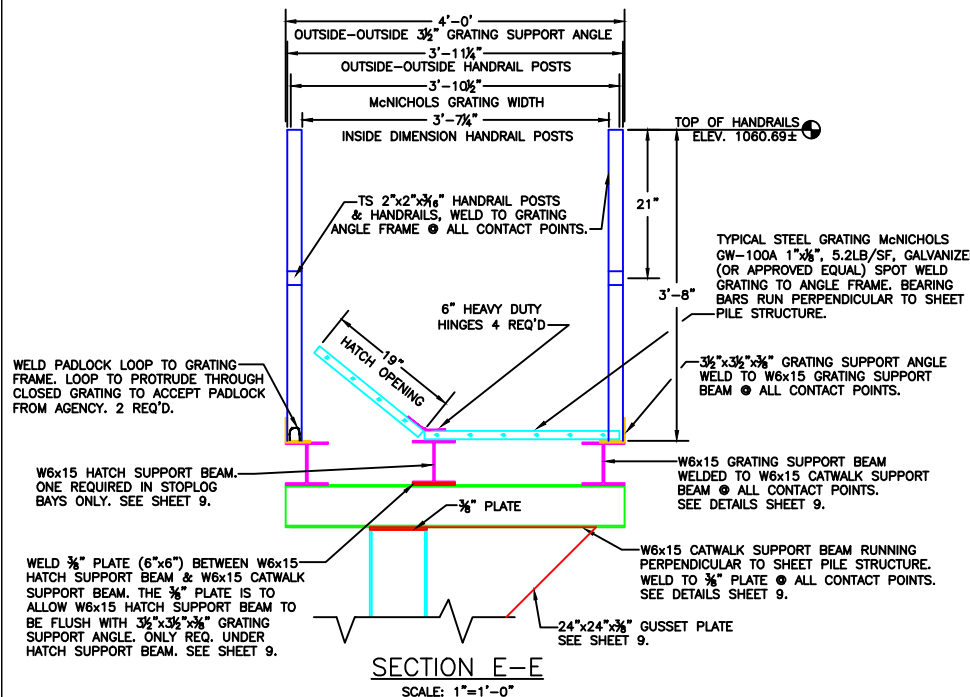
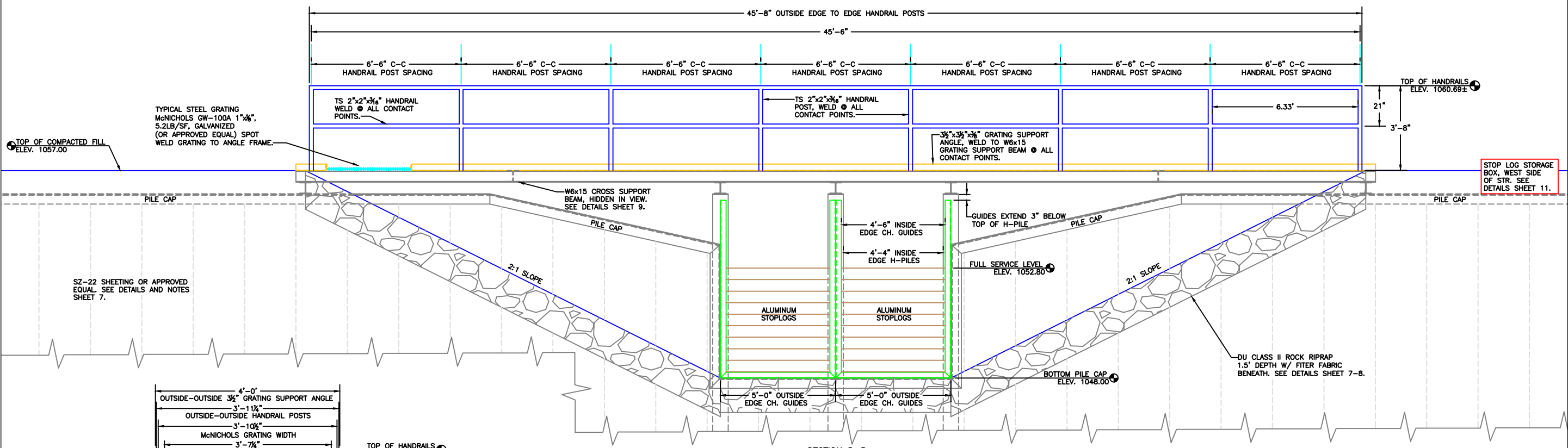
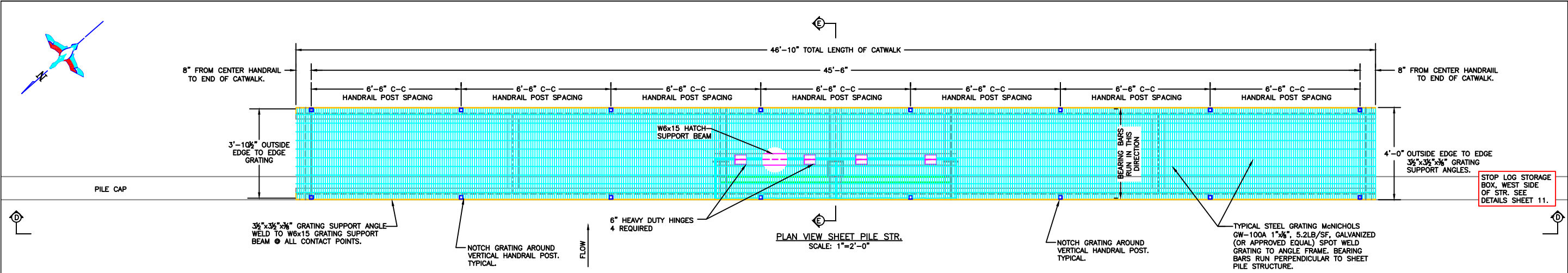
DATE: 2-5-2014

**DUCKS UNLIMITED INC.**  
GREAT PLAINS REGIONAL OFFICE  
DATE: 1-29-2014 SHEET NO. 9

PROJECT NO. MN-451-1  
EAGLE LAKE  
STOPLOG GUIDES & CATWALK  
DETAILS

DESIGNED BY: JAS  
DRAWN BY: MLO  
SURVEYED BY: GLJ  
CHECKED BY:

APPROVED BY:



**MATERIAL LIST:**

**CATWALK COMPONENTS: (ALL GALVANIZED)**

McNICHOLS GALVANIZED BAR GRATING	182 S.F.
TS 2"x2"x3/8" HANDRAIL POSTS 3'-8" LONG	16 REQ'D
TS 2"x2"x3/8" HANDRAIL	178 L.F.
6" HEAVY DUTY HINGES	4 REQ'D
LOCKING LOOP	2 REQ'D

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**GALVANIZING NOTE:**  
ALL CATWALK COMPONENTS SHALL BE GALVANIZED. THIS INCLUDES: TS 2"x2"x3/8" HANDRAIL/POSTS, HEAVY DUTY HINGES, LOCKING LOOP, AND ANY OTHER ITEMS INCLUDED WITH CATWALK. ANY GALVANIZED COMPONENTS THAT ARE WELDED IN THE FIELD SHALL BE RE-PAINTED W/ A COLD GALVANIZING PAINT TO MATCH. THE COST OF GALVANIZING IS CONSIDERED INCIDENTAL TO "STRUCTURAL STEEL."

Revision Number	Sheet Number	Revisions	Date	By
1	11, 12	Add fish barrier to weir structure	1/29/14	MLO
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4	2,6	Modify notes	1/20/14	JS

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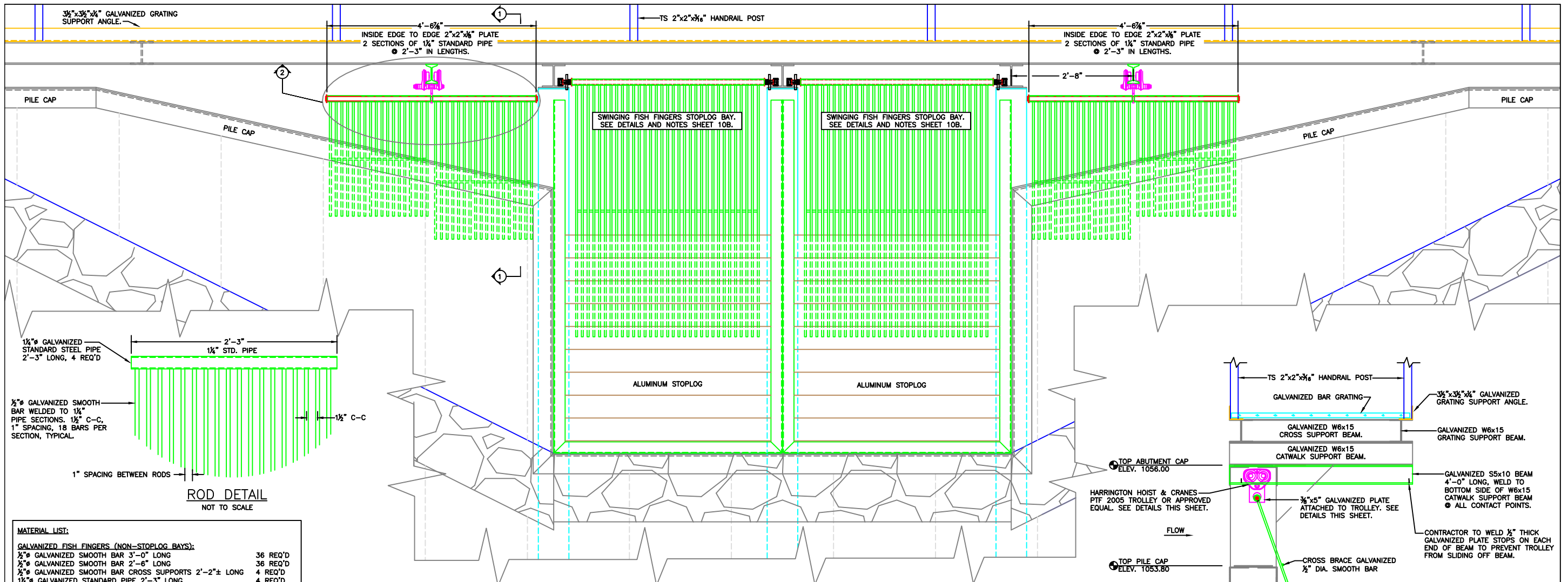
*James A. Streifel, P.E.*  
for Ducks Unlimited, Inc.  
License No. 47359

2-5-2014  
Date

**DUCKS UNLIMITED INC.**  
GREAT PLAINS REGIONAL OFFICE  
DATE: 1-29-2014 SHEET NO. 10

PROJECT NO. MN-451-1  
EAGLE LAKE  
HANDRAIL & GRATING DETAILS

DESIGNED BY: JAS  
DRAWN BY: MLO  
SURVEYED BY: GLJ  
CHECKED BY: .  
APPROVED BY: .

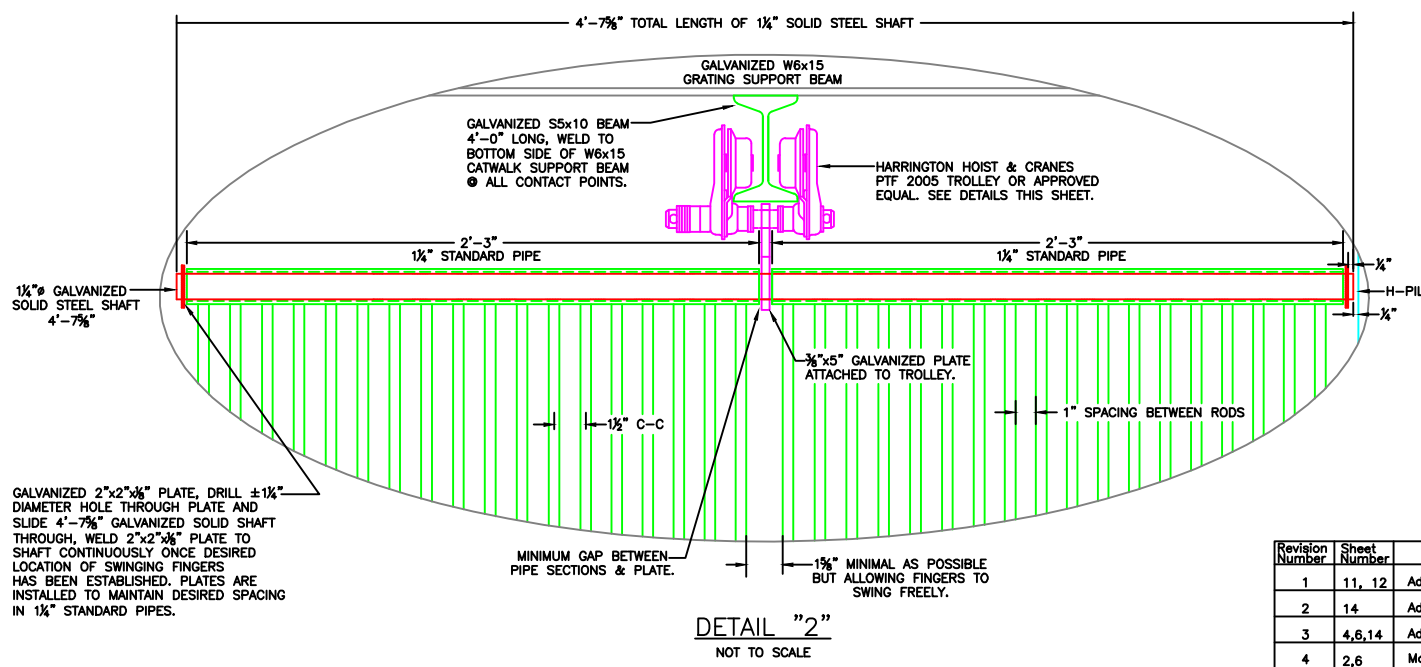


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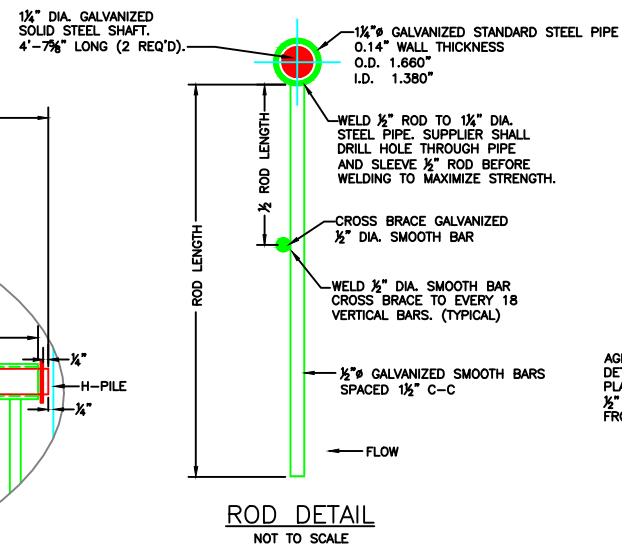
<b>GALVANIZED FISH FINGERS (NON-STOPLUG BAYS):</b>	
1/2" GALVANIZED SMOOTH BAR 3'-0" LONG	36 REQ'D
1/2" GALVANIZED SMOOTH BAR 2'-6" LONG	36 REQ'D
1/2" GALVANIZED SMOOTH BAR CROSS SUPPORTS 2'-2 1/2" LONG	4 REQ'D
1 1/4" GALVANIZED STANDARD PIPE 2'-3" LONG	4 REQ'D
1 1/4" GALVANIZED SOLID STEEL SHAFT 4'-7 1/8" LONG	2 REQ'D
2"x2" GALVANIZED PLATES	4 REQ'D
S5x10 GALVANIZED BEAMS 4'-0" LONG	2 REQ'D
HARRINGTON HOISTS & CRANES PTF 2005 TROLLEY	2 REQ'D
3/8"x5" GALVANIZED PLATE ATTACHED TO TROLLEY	2 REQ'D
1/2" THICK GALVANIZED PLATE STOPS FOR TROLLEY	8 REQ'D

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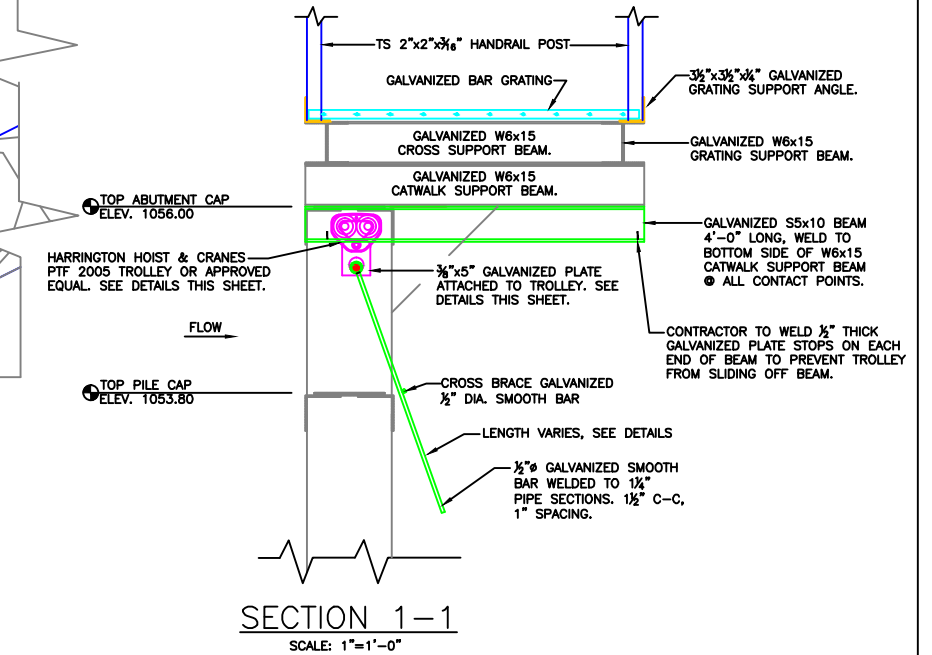
**FRONT VIEW FISH FINGERS**  
STANDING ON UPSTREAM SIDE OF  
STRUCTURE LOOKING DOWNSTREAM  
SCALE: 1"=1'-0"



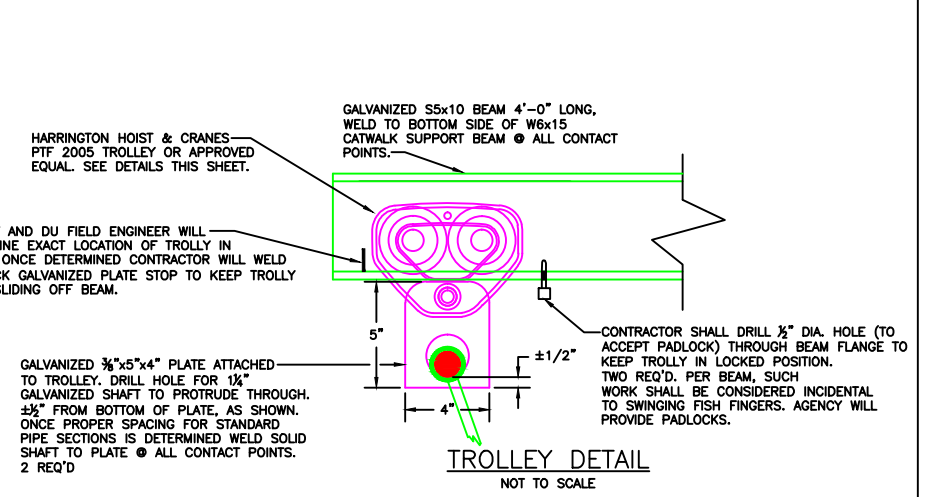
**DETAIL "2"**  
NOT TO SCALE



**ROD DETAIL**  
NOT TO SCALE



**SECTION 1-1**  
SCALE: 1"=1'-0"



**TROLLEY DETAIL**  
NOT TO SCALE

Revision Number	Sheet Number	Revisions	Date	By
1	11, 12	Add fish barrier to weir structure	1/29/14	MLO
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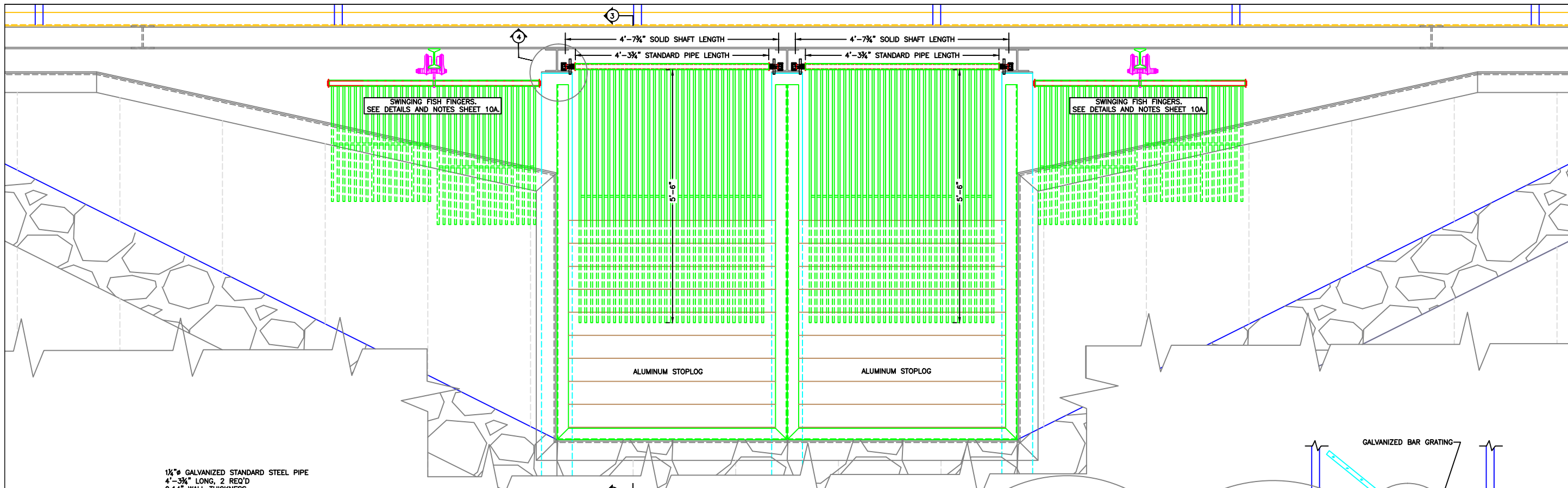
2-5-2014  
Date

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

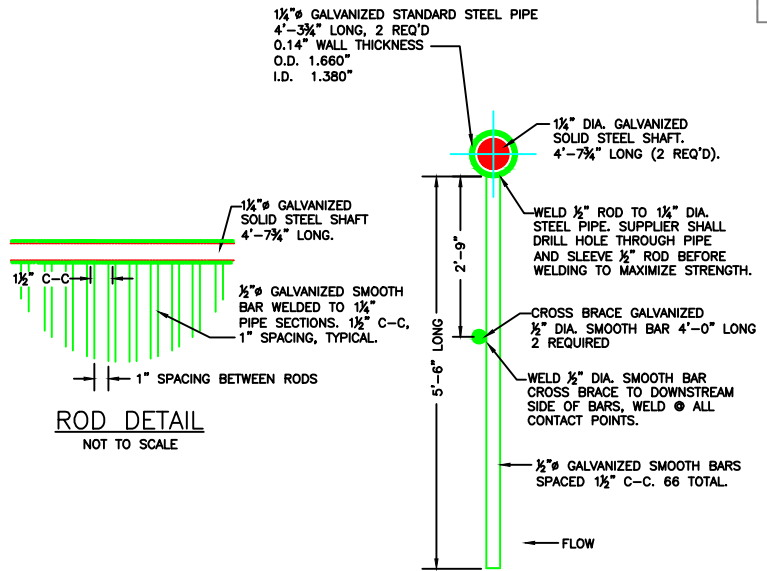
PROJECT NO. MN-451-1  
EAGLE LAKE  
FISH BARRIER DETAILS

DESIGNED BY: JAS  
DRAWN BY: MLO  
SURVEYED BY: GLJ  
CHECKED BY:

DATE: 1-29-2014  
SHEET NO. 11  
APPROVED BY:

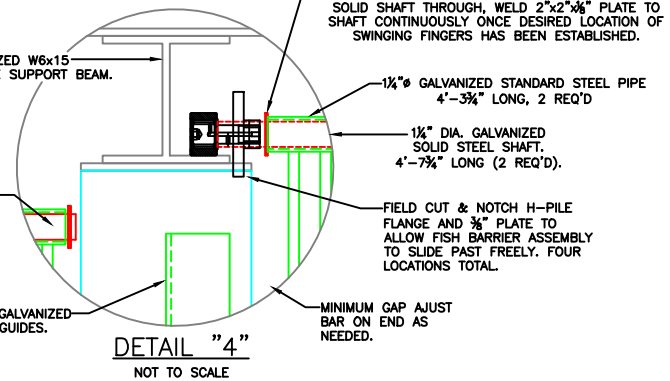


FRONT VIEW FISH FINGERS STOPLOG BAY  
STANDING ON UPSTREAM SIDE OF  
STRUCTURE LOOKING DOWNSTREAM  
SCALE: 1"=1'-0"

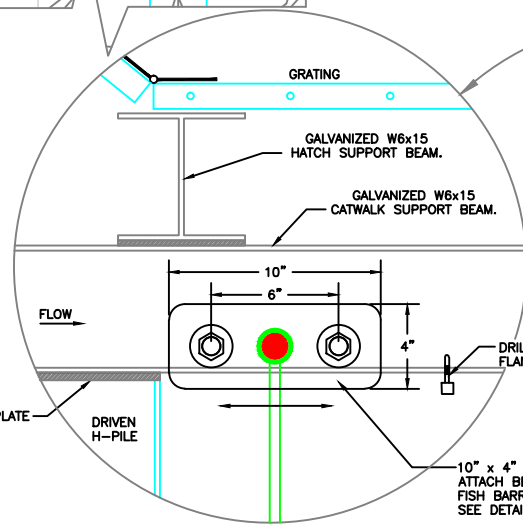


ROD DETAIL  
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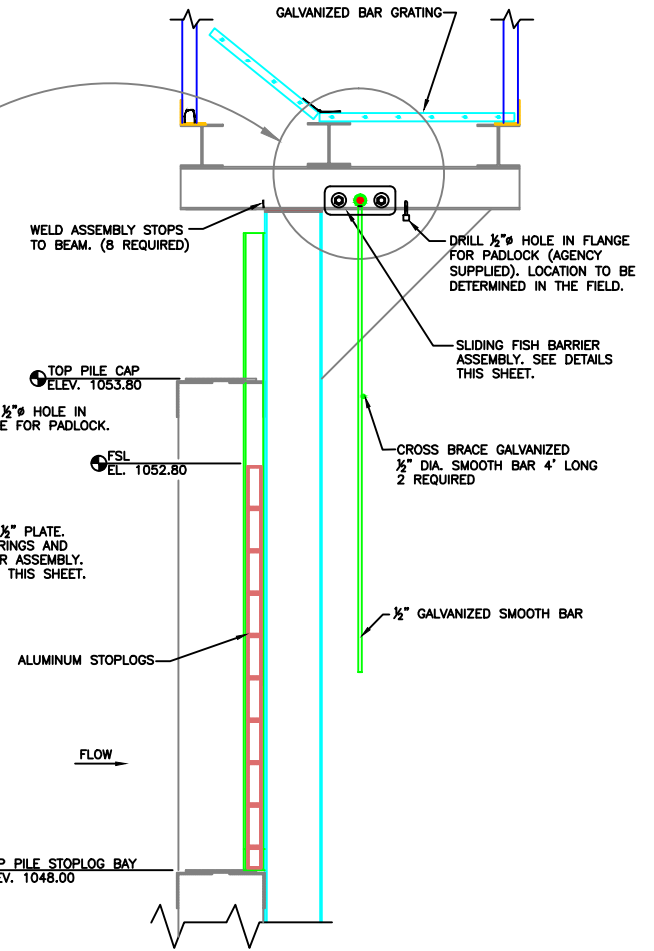
ROD DETAIL  
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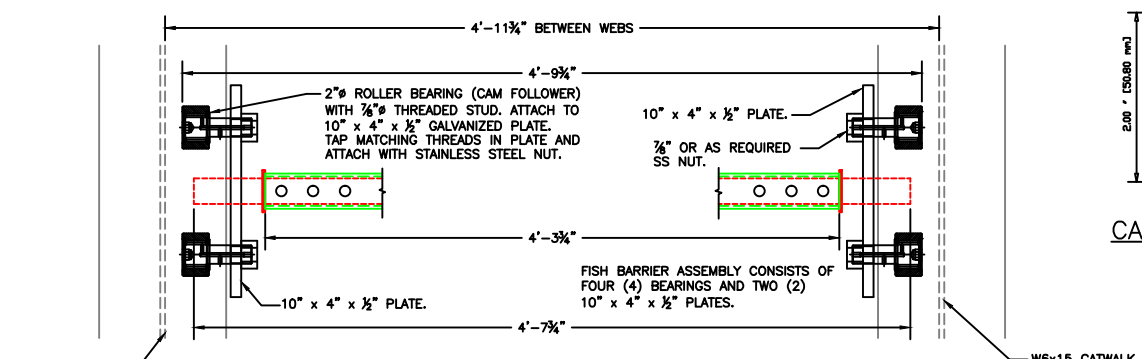
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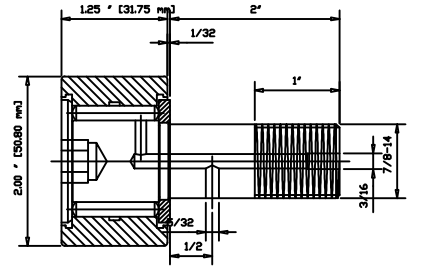
SLIDING FISH BARRIER DETAIL  
NOT TO SCALE



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



PLAN VIEW SLIDING FISH BARRIER ASSEMBLY  
NOT TO SCALE



CAM FOLLOWER (BEARING) DETAIL  
NOT TO SCALE

**MATERIAL LIST:**

Quantity	Description
66 REQ'D	GALVANIZED FISH FINGERS (STOPLOG BAYS):
2 REQ'D	1/2" GALVANIZED SMOOTH BAR 5'-6" LONG
2 REQ'D	1/2" GALVANIZED SMOOTH BAR CROSS SUPPORT 4' LONG
2 REQ'D	1 1/4" GALVANIZED STANDARD PIPE 4'-3 3/4" LONG
2 REQ'D	1 1/4" GALVANIZED SOLID STEEL SHAFT 4'-7 3/4" LONG
4 REQ'D	2"x2"x 3/8" GALVANIZED PLATES
4 REQ'D	10"x4"x 1/2" GALVANIZED PLATE
8 REQ'D	2" CAM FOLLOWER (BEARING) w/2" STUD ASSEMBLY STOPS FOR BEAM
8 REQ'D	2" CAM FOLLOWER (BEARING) w/2" STUD ASSEMBLY STOPS FOR BEAM

\*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.

Revision Number	Sheet Number	Revisions	Date	By
1	11, 12	Add fish barrier to weir structure	1/29/14	MLO
2	14	Add handrail to Hwy. structure	1/29/14	MLO
3	4,6,14	Add riprap at outlet Hwy. culvert	1/29/14	MLO
4	2,6	Modify notes	1/20/14	JS

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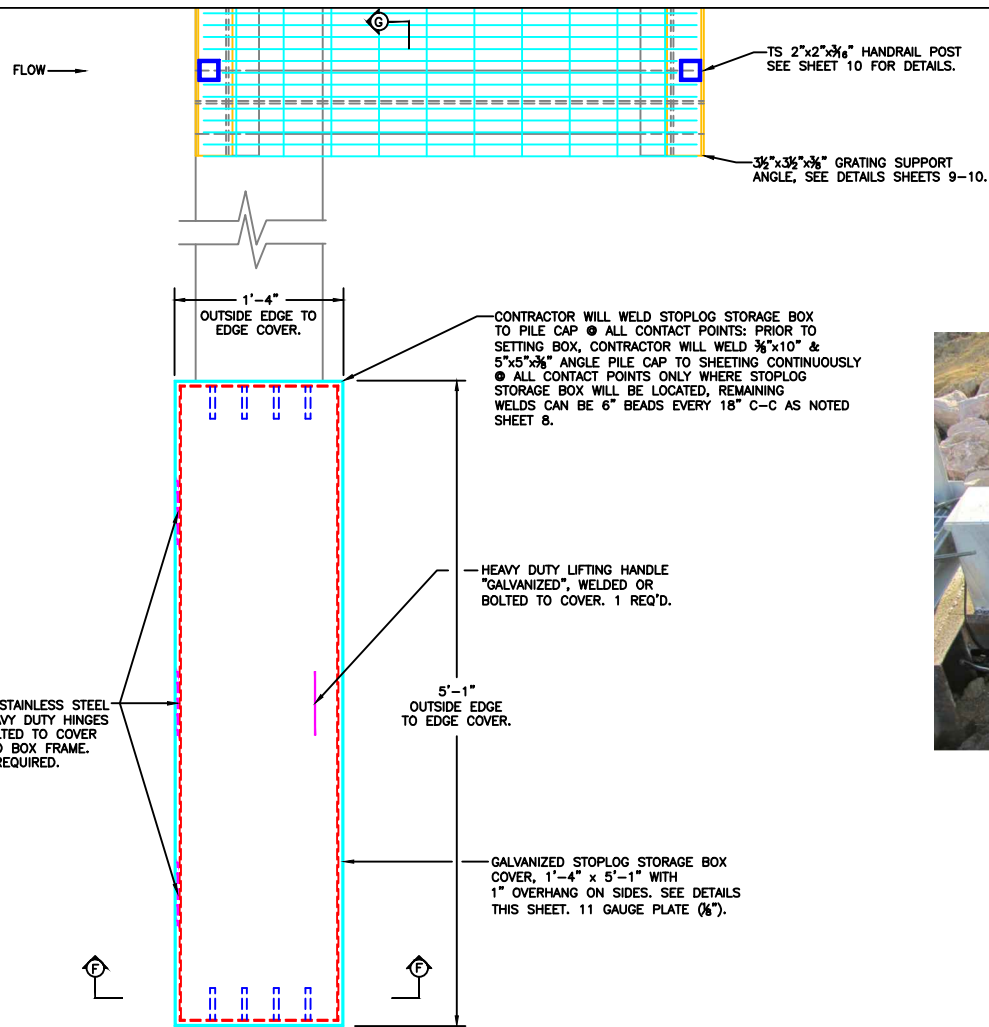
*James A. Streifel*  
James A. Streifel, P.E.  
for Ducks Unlimited, Inc.  
License No. 47359

2-5-2014  
Date

**DUCKS UNLIMITED INC.**  
GREAT PLAINS REGIONAL OFFICE  
DATE: 1-29-2014 SHEET NO. 12

PROJECT NO. MN-451-1  
EAGLE LAKE  
FISH BARRIER DETAILS

DESIGNED BY: JAS  
DRAWN BY: MLO  
SURVEYED BY: GLJ  
CHECKED BY: .  
APPROVED BY: .



STOPLOG STORAGE RACK TOP VIEW  
COVER SHOWN  
NOT TO SCALE

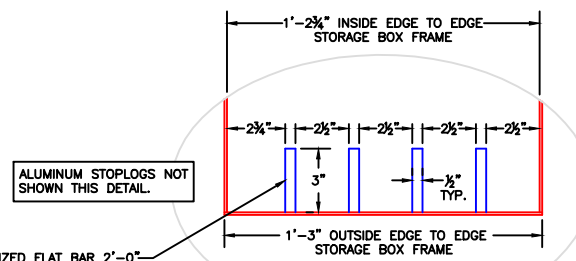
- STOPLOG STORAGE BOX NOTES:**
- BOX FRAME AND COVER SHALL BE 11 GAUGE ( $\frac{1}{8}$ " THICK) AND BE WELDED @ ALL CONTACT POINTS.
  - COVER SHALL HAVE A 1" OVER HANG ON ALL SIDES.
  - ALL STOPLOG STORAGE BOX COMPONENTS SHALL BE GALVANIZED.
  - SUPPLIER SHALL DRILL WEEP HOLES IN BOTTOM OF BOX ONLY WHERE STORAGE BOX OVERHANGS SHEET PILE CAP (OUTSIDE EDGES).
  - $\frac{1}{2}$ "x3" FLAT BARS SPACERS SHALL BE WELDED @ ALL CONTACT POINTS ALONG BOTTOM AND TACK WELDED (3" BEADS SPACED APART) ALONG BOTH SIDES OF BAR STOCK SUFFICIENT ENOUGH TO WITHSTAND FIELD USE.
  - SUPPLIER SHALL USE STAINLESS STEEL HEAVY DUTY HINGES, LIFTING HANDLE, LOCKING HASP AND LOCKING PIN.
  - STOPLOG STORAGE BOX WILL BE WELDED TO  $\frac{3}{8}$ "x10" PILE CAP @ ALL CONTACT POINTS. PRIOR TO INSTALLING STORAGE BOX, THE CONTRACTOR SHALL WELD  $\frac{3}{8}$ "x10" PILE CAP & 5"x5"x $\frac{3}{8}$ " ANGLES CONTINUOUSLY TO SHEET PILING ONLY WHERE BOX FRAME IS LOCATED. REMAINING WELDS CAN BE 6" BEADS, 18" C-C AS NOTED ON SHEET 8.
  - LIFTING HOOKS MAY NEED TO BE PROVIDED SO CONTRACTOR CAN LIFT AND PLACE.
  - PAYMENT FOR STOPLOG STORAGE BOX AND ALL COMPONENTS DETAILED ON THIS SHEET SHALL BE BASED ON THE CONTRACTORS UNIT PRICE BID FOR "GALVANIZED STOPLOG STORAGE BOX."



EXAMPLE OF STORAGE BOX MADE BY HALLA INDUSTRIES

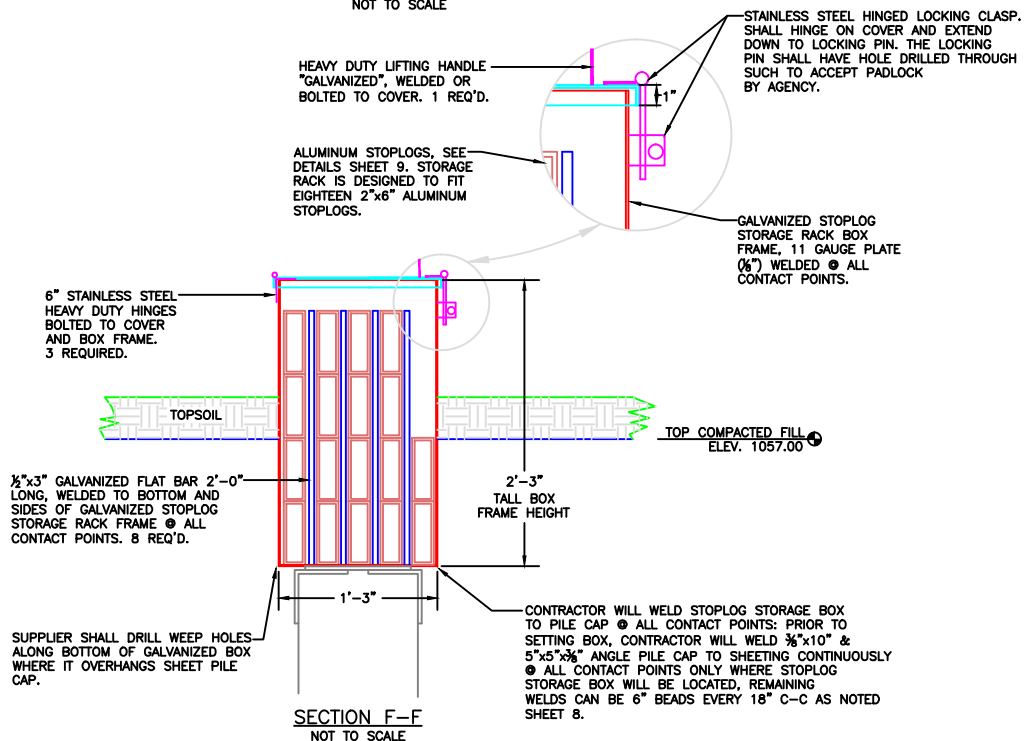
ALUMINUM STOPLOGS, SEE DETAILS SHEET 9. STORAGE RACK IS DESIGNED TO FIT EIGHTEEN 2"x6" ALUMINUM STOPLOGS.

GALVANIZED STOPLOG STORAGE RACK BOX FRAME, 11 GAUGE PLATE ( $\frac{1}{8}$ " WELDED @ ALL CONTACT POINTS.



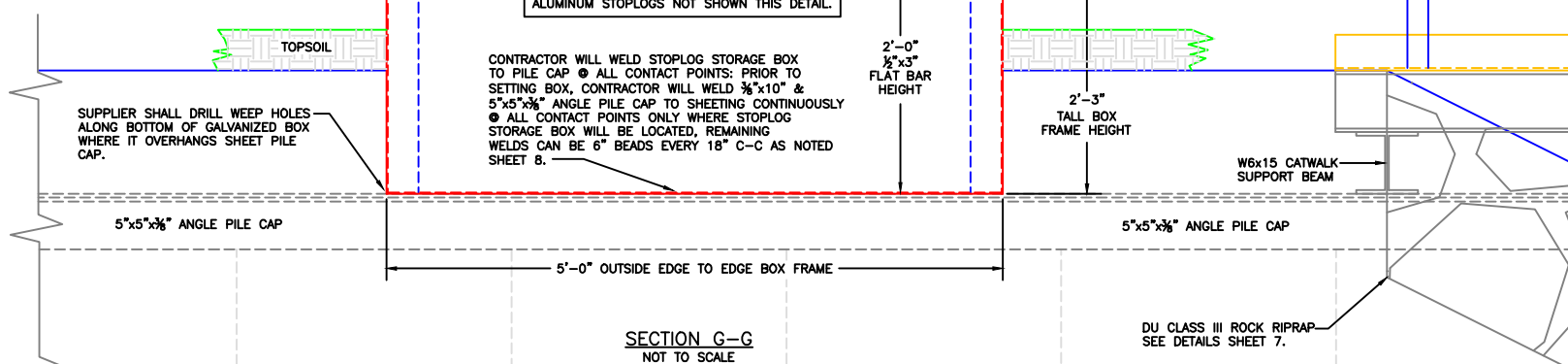
STOPLOG STORAGE RACK TOP VIEW  
NO COVER SHOWN  
NOT TO SCALE

$\frac{1}{2}$ "x3" GALVANIZED FLAT BAR 2'-0" LONG, WELDED TO BOTTOM AND SIDES OF GALVANIZED STOPLOG STORAGE RACK FRAME @ ALL CONTACT POINTS. 8 REQ'D.



SECTION F-F  
NOT TO SCALE

$\frac{1}{2}$ "x3" GALVANIZED FLAT BAR 2'-0" LONG, WELDED TO BOTTOM AND SIDES OF GALVANIZED STOPLOG STORAGE RACK FRAME @ ALL CONTACT POINTS. 8 REQ'D.



SECTION G-G  
NOT TO SCALE

Revision Number	Sheet Number	Revisions	Date	By
1	11, 12	Add fish barrier to weir structure	1/29/14	MLO
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4	2, 6	Modify notes	1/20/14	JS

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*James A. Streifel*  
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License No. 47359

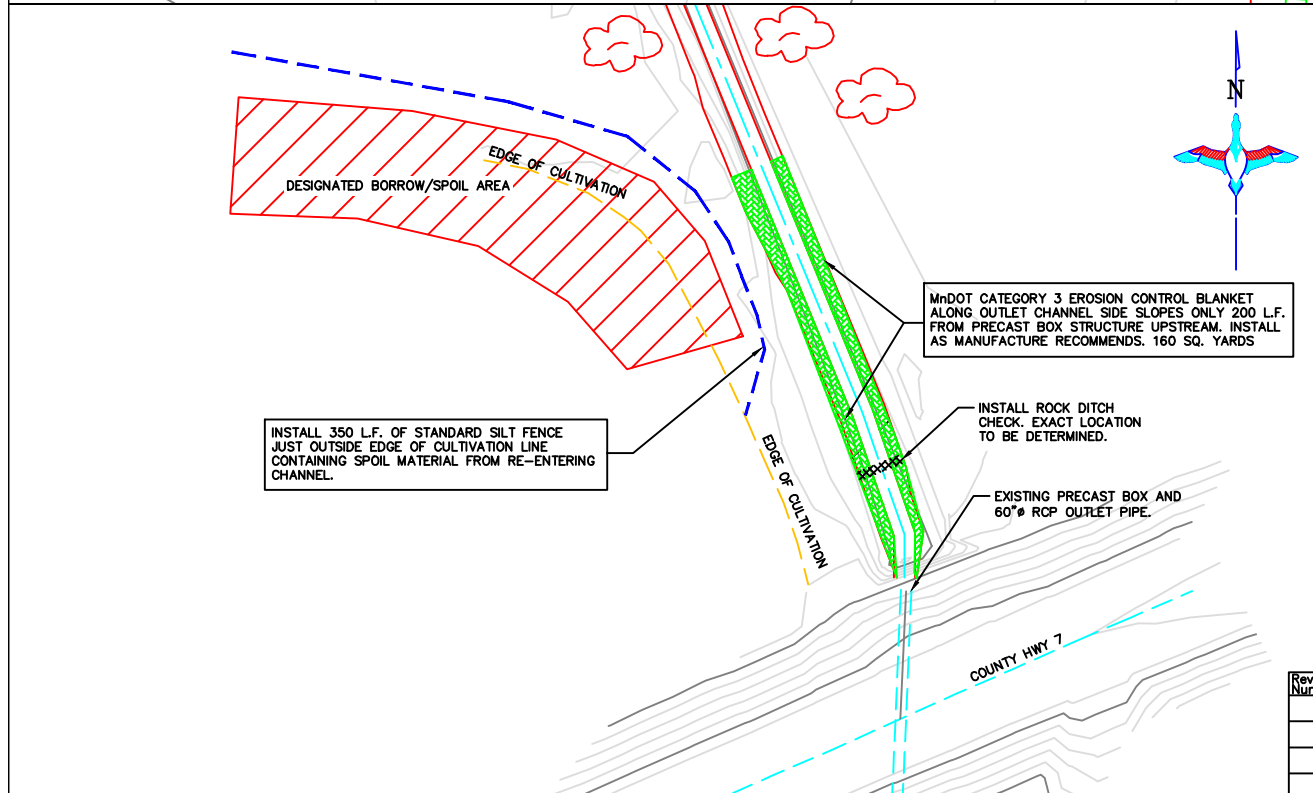
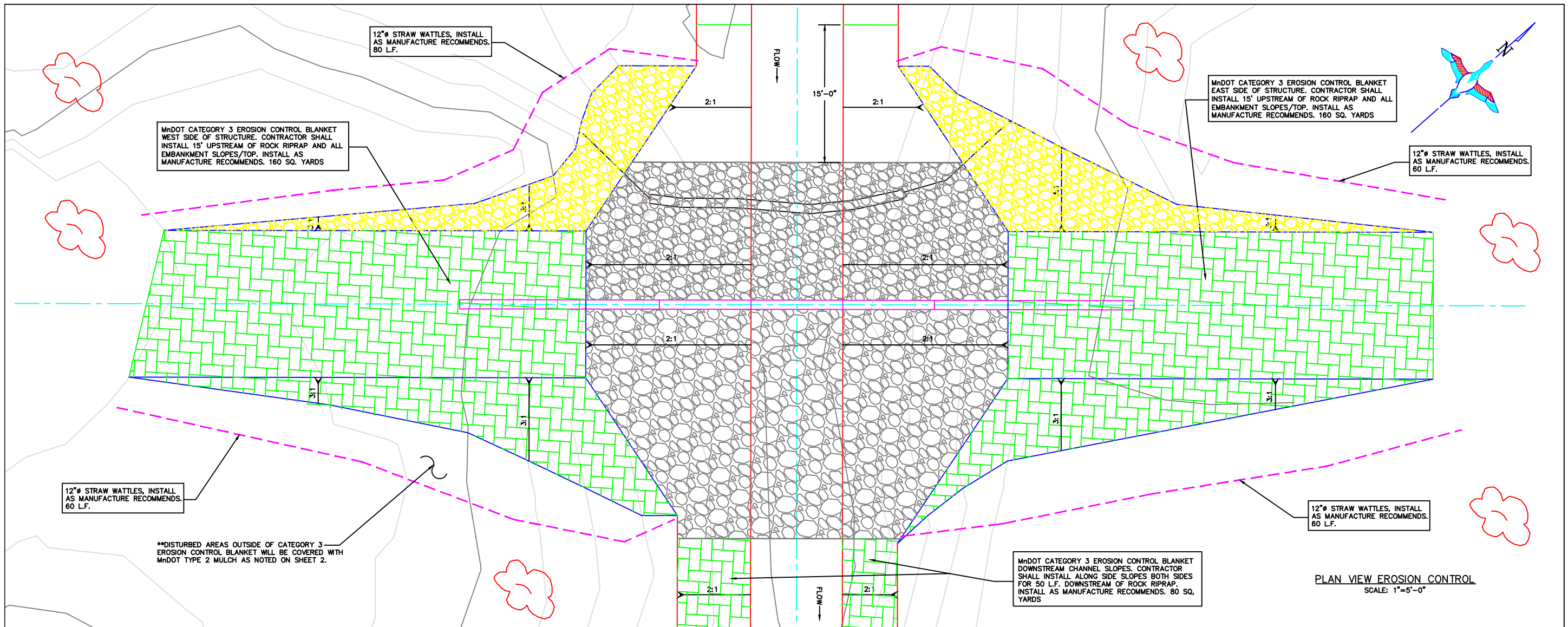
2-5-2014  
Date

**DUCKS UNLIMITED INC.**  
GREAT PLAINS REGIONAL OFFICE  
DATE: 1-29-2014 SHEET NO. 13

PROJECT NO. MN-451-1  
EAGLE LAKE  
STOPLOG STORAGE BOX DETAILS

DESIGNED BY: JAS  
DRAWN BY: MLO  
SURVEYED BY: GLJ  
CHECKED BY: .  
APPROVED BY: .





**MnDOT CATEGORY 3 EROSION CONTROL BLANKET:**

WEST SIDE OF STRUCTURE AREA: 160 SQ. YARDS  
 EAST SIDE OF STRUCTURE AREA: 160 SQ. YARDS  
 OUTLET CHANNEL D-S RIPRAP: 80 SQ. YARDS  
 OUTLET CHANNEL U-S PRECAST BOX: 160 SQ. YARDS  
 TOTAL: 560 SQ. YARDS

**12" # STRAW WATTLES:**

NW SIDE OF EMBANKMENT: 80 L.F.  
 SW SIDE OF EMBANKMENT: 60 L.F.  
 NE SIDE OF EMBANKMENT: 60 L.F.  
 SE SIDE OF EMBANKMENT: 60 L.F.  
 TOTAL: 260 L.F.

**STANDARD SILT FENCE:**

OUTSIDE OF CULTIVATION LINE: 350 L.F. TOTAL

**MNDOT TYPE 1 MULCH: 2.0 TON\***  
 \*Mulch applied at 2.0 Ton/Acre with disking

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
Gramma, sideoats	3.4	3.0	21.5
Wild-rye, Canadian	2.2	2.0	14.0
Switch grass	1.1	1.0	7.0
<b>Grass Totals</b>	<b>15.7</b>	<b>14.0</b>	<b>100.0</b>
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
<b>Cover Crop Totals</b>	<b>78.3</b>	<b>70.0</b>	<b>100.0</b>
Mesic Forbs Mixture	0.6	0.5	100.0
<b>GRAND TOTALS:</b>	<b>94.6</b>	<b>84.5</b>	<b>100.0</b>

\*Oats to be substituted for spring plantings  
 Application: Native mix for general roadside areas.

- SEQUENCE OF CONSTRUCTION ACTIVITIES AND BMP IMPLEMENTATION**
1. Install construction access.
  2. Clear and grub construction site.
  3. Perform site preparation work at structure site and proposed borrow area. Install silt fence perimeter control.
  4. Complete structure work and install temporary ditch check.
  5. Clean out channel downstream of structure.
  6. Following initial lake drawdown, perform inlet channel work. If water is still flowing out of the during channel work, install floating silt curtain or other approved BMP's. Cost will be considered "Extra Work".
  7. Seed and mulch disturbed areas.
  8. Remove temporary rock check.
  9. Inspect all BMP's.
  10. Minnesota DNR will be responsible for the removal of all other temporary BMP's including silt fence and bio rolls following satisfactory seed germination.
- SEQUENCE OF CONSTRUCTION EVENTS MAY BE ALTERED BY THE CONTRACTOR AS LONG AS BMP'S ARE IMPLEMENTED ACCORDINGLY. CONTRACTOR SHALL PROVIDE MODIFIED SCHEDULE AND BMP IMPLEMENTATION.

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

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 for Ducks Unlimited, Inc.  
 License No. 47359

DATE: 2-5-2014

**DUCKS UNLIMITED INC.**  
 GREAT PLAINS REGIONAL OFFICE  
 DATE: 1-29-2014 SHEET NO. 15

PROJECT NO. MN-451-1  
 EAGLE LAKE  
 EROSION CONTROL PLAN VIEWS

DESIGNED BY: JAS  
 DRAWN BY: MLO  
 SURVEYED BY: GLJ  
 CHECKED BY: .  
 APPROVED BY: .

