

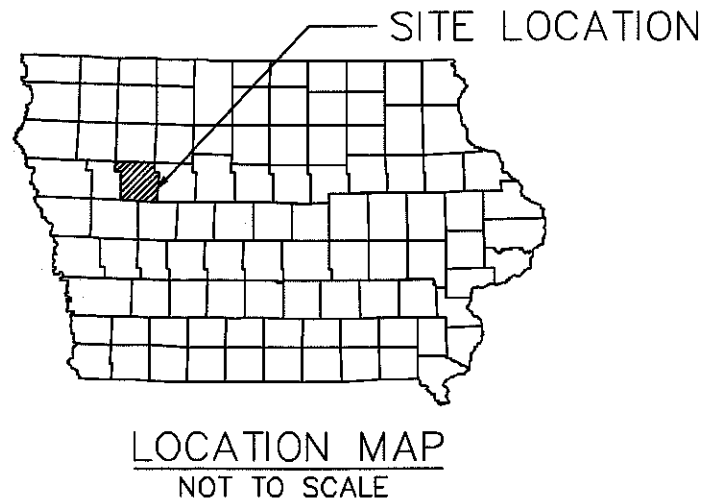
# ENHANCEMENT PROJECT REBID

## GRANT PARK RACCOON RIVER AUBURN, IOWA

**DEVELOPER**

IOWA DEPARTMENT OF NATURAL RESOURCES  
 ATTN: GLENN HARMAN, ENVIRONMENTAL SPECIALIST SENIOR  
 LAND AND WATERS BUREAU, CONSERVATION AND RECREATION DIVISION  
 COLD SPRINGS FISHERIES MANAGEMENT OFFICE  
 57744 LEWIS RD.  
 LEWIS, IA 51544  
 PH: (515) 971-3962  
 EMAIL: GLENN.HARMAN@DNR.IOWA.GOV

INDEX OF SHEETS	
G000	COVER SHEET
GRANT PARK	
C100	GRANT PARK GENERAL NOTES
C200	GRANT PARK PLAN VIEW
C300	CROSS VANE DESIGN TYPICALS
C400	CROSS VANE PROFILE VIEW
C500	TOE WOOD TYPICAL CROSS SECTION
C600	J-HOOK TYPICAL
C700	BOAT RAMP DETAILS
C800	BOAT RAMP DETAILS



**OWNER**

SAC COUNTY CONSERVATION BOARD

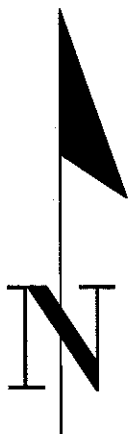
CHRIS BASS, DIRECTOR  
 2970 280TH STREET, SAC CITY, IOWA 50523  
 PH: (712)662-530  
 EMAIL: SACCDCON@FRONTIERNET.NET

QUANTITIES	
1.	3,000 UNITS OF TOE WOOD BANK STABILIZATION
2.	1,900 CY OF BANK SHAPING FOR TOE WOOD CONSTRUCTION
3.	170 3'X3'X3' WEIR STONE, 2.5 MINIMUM SPECIFIC GRAVITY.
4.	700 TONS CLASS 'B' RIPRAP
5.	33.4 SY 6-INCH REINFORCED PCC PAVEMENT
6.	40 SY REINFORCED PCC BOAT RAMP PUSH-IN SLAB
7.	50 TONS CLASS 'A' CRUSHED STONE
8.	100 TONS CLASS 'D' RIPRAP
9.	11,000 SQUARE FEET OF 700 GRAM COIR EROSION FABRIC
10.	11.7 TONS MACADAM STONE
11.	LUMP SUM SURFACE RESTORATION
12.	LUMP SUM NPDES GENERAL PERMIT #2
13.	LUMP SUM MOBILIZATION

**AUTHORIZATION TO BID**

*Glenn Harman* 10/17/18  
 AUTHORIZATION - PARKS | WILDLIFE | FISHERIES | LAW ENFORCEMENT | FORESTRY DATE

*Chris Bass* 10/17/18  
 ENGINEERING BUREAU CHIEF DATE



	Iowa Department of Natural Resources Lands and Waters Bureau Conservation and Recreation Division	COVER SHEET	GLENN HARMAN	3-29-2017
			G000	PROJECT NO. 18.01.81.07

**GENERAL NOTES:**

1. PRIOR TO ANY EXCAVATION AT THE SITE, THE CONTRACTOR SHALL EXAMINE ANY APPLICABLE DRAWINGS AVAILABLE FROM THE PROJECT MANAGER/ENGINEER, AND CONSULT WITH PROJECT MANAGER/ENGINEER'S TO DETERMINE POSSIBLE UTILITY LOCATIONS AND DEPTHS. NO COMPENSATION WILL BE ALLOWED FOR DAMAGE RESULTING FROM FAILURE TO COMPLY WITH THIS REQUIREMENT.
2. ALL DEBRIS SPILLED ON THE PUBLIC R.O.W. SHALL BE PICKED UP BY THE CONTRACTOR AT THE END OF EACH WORK DAY.
3. ALL WORK SHALL BE IN ACCORDANCE WITH OSHA CODES AND STANDARDS. NOTHING INDICATED ON THESE DRAWINGS SHALL RELIEVE THE CONTRACTOR FROM COMPLYING WITH ANY APPROPRIATE SAFETY REGULATIONS.
4. FIELD VERIFY EXISTING GRADES AND LOCATIONS OF EXISTING UTILITIES, CONDUIT LINES, POLES, TREES, PAVING, BUILDINGS AND OTHER SITE STRUCTURES PRIOR TO DEMOLITION OR CONSTRUCTION AND IMMEDIATELY INFORM THE PROJECT MANAGER/ENGINEER OF ANY DISCREPANCIES.
5. CONTRACTOR SHALL PROTECT EXISTING UTILITIES, CONDUIT LINES, POLES, TREES, PAVING, BUILDINGS, SHORELINE AND OTHER STRUCTURES.
6. CONTRACTOR TO CONSULT WITH SAC COUNTY CONSERVATION BOARD (OWNER) AND DNR ON: STORAGE LOCATION OF MATERIALS, WORK AREA, JOB OFFICE AND EMPLOYEE PARKING. CONSULT WITH THE SAC COUNTY CONSERVATION BOARD AND DNR IF CONSTRUCTIONS LIMITS NEED TO BE MODIFIED FROM THAT ILLUSTRATED ON THE PLAN.
7. THE CONTRACTOR WILL HOLD OWNER AND DNR HARMLESS FROM ANY AND ALL CLAIMS OF ANY TYPE WHATSOEVER RESULTING FROM DAMAGES TO ADJOINING PUBLIC OR PRIVATE PROPERTY, INCLUDING REASONABLE ATTORNEY FEES INCURRED TO THE OWNER. FURTHER, IF THE CONTRACTOR FAILS TO TAKE NECESSARY STEPS TO PROMPTLY REMOVE EARTH SEDIMENTATION OR DEBRIS WHICH COMES ONTO ADJOINING PUBLIC OR PRIVATE PROPERTY, THE OWNER MAY, BUT NEED NOT, REMOVE SUCH ITEMS AND DEDUCT THE COST THEREOF FROM THE AMOUNTS DUE TO THE CONTRACTOR.
8. IN THE EVENT THAT THERE IS EXCESS SOIL, THAT SOIL SHALL BE SPREAD ON SITE AS PER OWNER AND DNR DIRECTION. ALL EXCESS SPOILS ARE TO BE SPREAD TO A DEPTH OF LESS THAN 6 INCHES AS PER PERMIT REQUIREMENTS.
9. CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS OUTSIDE OF THE STREAM, INCLUDING ACCESS PATHS AND OVERBANK AREAS.
10. CONTRACTOR SHALL REPLACE ANY FENCE DISTURBED DURING CONSTRUCTION TO OWNERS SATISFACTION.
11. CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN EROSION CONTROL UNTIL ESTABLISHMENT OF PERMANENT GROUND COVER.
12. TRAFFIC CONTROL DEVICES, PROCEDURES, AND LAYOUTS SHALL CONFORM TO THE CURRENT EDITION OF THE MANUAL FOR UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS (MUTCD).
13. CONTRACTOR SHALL WORK WITH OWNER TO COORDINATE A SUITABLE AND SAFE ACCESS TO THE PROJECT SITE.
14. DNR TO PROVIDE CONSTRUCTION STAKING AND CONSTRUCTION MANAGEMENT IN CONJUNCTION WITH OWNER.
15. ALL WORK SHALL CONFORM TO THE IOWA DOT STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015.

**EROSION CONTROL NOTES:**

1. DISTURB THE LEAST AREA AS POSSIBLE TO COMPLETE THE SCOPE OF THE PROJECT.
2. ALL SEDIMENT AND EROSION CONTROL PRACTICES WILL BE INSPECTED AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS BY RESPONSIBLE PERSONNEL. ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE BEST MANAGEMENT PRACTICES SHALL BE MADE IMMEDIATELY. INSPECTION ARE THE RESPONSIBILITY OF THE CONTRACTOR.
3. SOIL STABILIZATION WILL BE INITIATED ON ALL DISTURBED AREAS WHERE CONSTRUCTION ACTIVITY WILL NOT OCCUR FOR A PERIOD OF MORE THAN 21 CALENDAR DAYS BY THE 14TH DAY AFTER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED. THIS SEQUENCE SHALL REPEAT AS GROUND COVER IS REMOVED BY SUBSEQUENT CONSTRUCTION ACTIVITY.
4. GENERAL CONTRACTOR SHALL IMPLEMENT ALL EROSION CONTROL ACTIVITY WITH THE ASSISTANCE OF THE UTILITY SUBCONTRACTORS, BUILDING CONTRACTORS AND SUPPLIERS.
5. APPLY FREQUENT LIGHT WATER TO GROUND SURFACE, AS REQUIRED TO CONTROL DUST.
6. UPON COMPLETION AT CONSTRUCTION, SEED ALL DISTURBED AREAS PER PROJECT SPECIFICATIONS.
7. MAINTENANCE OF ALL TEMPORARY AND PERMANENT EROSION CONTROL MEASURES IS THE RESPONSIBILITY OF THE CONTRACTOR.
8. LOCATION OF SOLID WASTE CONTAINER AND PORTABLE RESTROOM TO BE SPECIFIED BY CONTRACTOR AND APPROVED BY ENGINEER/PROJECT MANAGER.
9. WHERE CONSTRUCTION VEHICLE ACCESS ROUTES INTERSECT PAVED PUBLIC ROADS, PROVISIONS SHALL BE MADE TO MINIMIZE THE TRANSPORT OF SEDIMENT BY VEHICULAR TRAFFIC ONTO PAVED SURFACES. WHERE SEDIMENT IS TRANSPORTED ONTO A PUBLIC ROAD SURFACE, THE ROAD SHALL BE CLEANED THOROUGHLY AT THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM THE BY SHOVELING OR SWEEPING AND TRANSPORTED TO A SEDIMENT CONTROL DISPOSAL AREA. STREET WASHING SHALL BE ALLOWED ONLY AFTER SEDIMENT IS REMOVED IN THIS MANNER. THIS PROVISION SHALL APPLY TO INDIVIDUAL SUBDIVISIONS LOTS AS WELL TO LARGER LAND DISTURBING ACTIVITIES.
10. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED, UNLESS OTHERWISE AUTHORIZED BY THE IMPLEMENTING AGENCY. TRAPPED SEDIMENT AND THE DISTURBED SOIL AREAS RESULTING FROM THE DISPOSITION OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION AND SEDIMENT.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING NPDES GENERAL PERMIT #2 AS REQUIRED. CONTRACTOR SHALL PREPARE AND MAINTAIN STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AS ARE REQUIRED.
12. THE CONTRACTOR IS RESPONSIBLE FOR EROSION CONTROL SEEDING WITH 12 LBS. PER ACRE ANNUAL RYEGRASS.

**CLEARING AND GRUBBING FOR TOE WOOD CONSTRUCTION:**

**DESCRIPTION:**

1. CLEARING: REMOVE TREES 3 INCHES IN DIAMETER INCLUDING ROOT MASS AND STOCKPILE. SEPARATE TREES 8 INCHES IN DIAMETER FOR USE IN STRUCTURE OF BENCH AND SMALLER CUTTINGS FOR FILLING VOIDS.
2. GRUBBING: REMOVE STUMPS, INCLUDING ROOTS, TO A DEPTH OF 12 INCHES.
3. REMOVAL OF LOGS AND DOWN TIMBER: REMOVE LOGS AND DOWNED TIMBER ENCOUNTERED IN THE WORK AREA. IF TREES ARE NOT ROTTEN THEN THEY CAN BE USED IN THE BENCH.

**CONSTRUCTION:**

1. USE THE LARGEST LOGS STOCKPILED FOR FOUNDATION OR FOOTER LOGS AS APPROVED BY IOWA DNR ENGINEER.
2. THE ANGLE BETWEEN THE BANK AND THE INSIDE OF THE PROTRUDING LOG, MEASURED FROM THE CONVERGENCE OF THE BANK TANGENT TO THE INSIDE OF THE LOG TANGENT SHOULD BE BETWEEN 15' AND 25'.
3. PLACE ROOT WAD LOGS CANTILEVERED OVER FOUNDATION LOGS.
4. PLACE FILLER MATERIAL (E.G. SMALL LOGS, LIMBS, TREE TOPS AND BRUSH) PARALLEL TO ROOT WADS.
5. ADD TEMPORARY COUNTER WEIGHTS TO SUBMERGE LOGS.
6. PLACE SHALLOW BACKFILL TO WEIGHT LOGS AND REMOVE COUNTER WEIGHTS.
7. PLACE ADDITIONAL BACKFILL OVER CUTTINGS.

**METHOD OF MEASUREMENT:**

1. TREES 3 INCHES IN DIAMETER OR GREATER WILL B COUNTED AND THE CIRCUMFERENCE WILL BE MEASURED AT A HEIGHT OF 18 INCHES ABOVE THE GROUND. THE DIAMETER WILL BE CALCULATED BY MEASURING THE CIRCUMFERENCE TO THE NEAREST INCH AND DIVIDING BY 3.14 TO CALCULATE THE NUMBER OF UNITS FOR PAYMENT. REFER TO TABLE 1 FOR UNITS.
2. LOGS AND DOWNED TIMBER 3 INCHES IN DIAMETER OR GREATER WILL BE MEASURED IN A MANNER SIMILAR TO THAT USED FOR TREES.
3. BRUSH WILL BE MEASURED IN SQUARE FEET AND CONVERTED TO UNITS BY USING A RATE OF 0.8 UNITS PER 100 SQUARE FEET OF BRUSH.
4. VEGETATION REMOVAL WILL NOT BE MEASURED FOR PAYMENT.

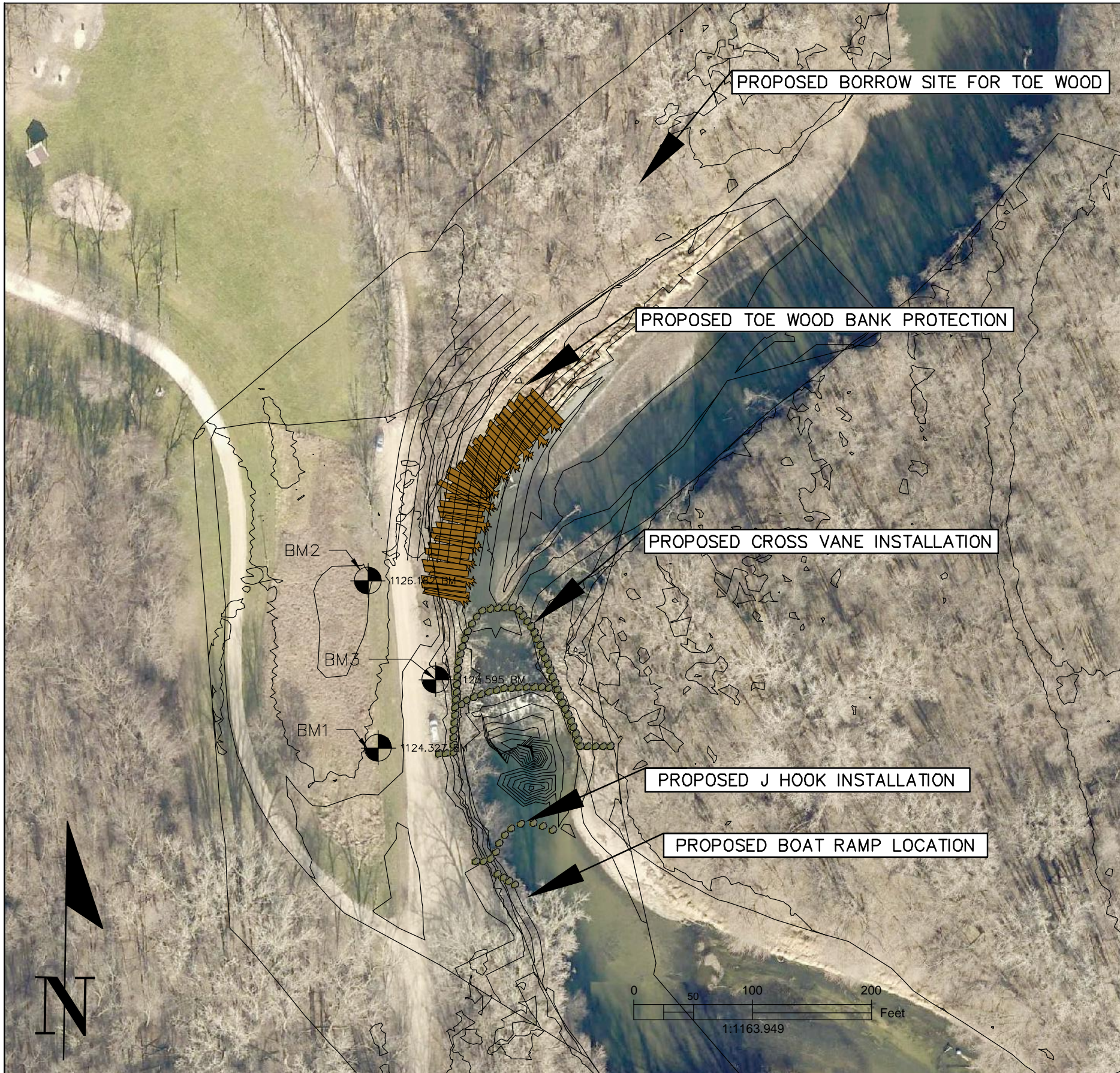
TABLE 1 SIZE DIAMETER	UNIT
3" TO 6" INCLUSIVE	1.6
OVER 6" TO 9" INCLUSIVE	3.9
OVER 9" TO 12" INCLUSIVE	6.7
OVER 12" TO 15" INCLUSIVE	9.4
OVER 15" TO 18" INCLUSIVE	13.5
OVER 18" TO 24" INCLUSIVE	22.0
OVER 24" TO 30" INCLUSIVE	29.0
OVER 30" TO 36" INCLUSIVE	50.0
OVER 36" TO 42" INCLUSIVE	80.0
OVER 42" TO 48" INCLUSIVE	120.0
OVER 48" TO 60" INCLUSIVE	160.0

**BASIS OF PAYMENT:**

1. PAYMENT FOR GRUBBING TREES FOR TOE WOOD WILL BE MADE ON A CONTRACT UNIT PRICE BASED ON TABLE 1. IOWA DNR HAS ESTIMATED THE NO. OF UNITS TO COMPLETE THE TOE WOOD AND IS LISTED IN THE QUANTITIES TABLE ON THE COVER PAGE.

**SUMMARY OF WORK:**

1. MOBILIZE TO SITE.
2. OBTAIN ANY NECESSARY STORMWATER EROSION, AND SEDIMENTATION CONTROL PERMITS.
3. PREPARE TEMPORARY SITE FOR PUSH IN PORTION OF CONCRETE RAMP.
4. POOR PUSH IN CONCRETE RAMP ACCORDING TO SPECIFICATIONS AND BEGIN WORKING ON OTHER PORTIONS OF THE PROJECT WHILE CONCRETE CURES.
5. CLEAR AND GRUB ANY TREES AND CONSTRUCT TEMPORARY ACCESS INTO THE RIVER.
6. STOCK PILE TREES FOR TOE WOOD BANK CONSTRUCTION.
7. STAKE AND CONSTRUCT ROCK WEIR CROSS VEIN TO SPECIFIED DIMENSIONS.
8. MOBILIZE TO TOE WOOD SITE AND PREPARE BANK FOR TOE WOOD CONSTRUCTION.
9. STABLE EROSION CONTROL FABRIC PRIOR TO BACKFILLING OVER LOGS TO PRODUCE AN ENCAPSULATED SOIL LIFT.
10. PREPARE SITE FOR PUSH IN CONCRETE RAMP.
11. PUSH IN CONCRETE RAMP AND FORM UP REMAINING SECTIONS OF BOAT RAMP ACCORDING TO SPECIFICATIONS.
12. CONSTRUCT OUT OF WATER SECTIONS OF THE CONCRETE RAMP.
13. STABILIZE ALL DISTURBED AREAS THAT ARE NOT RESTORED.
14. SPREAD EROSION CONTROL SEEDING.
15. DEMOBILIZE FROM SITE.



**NOTES:**

1. IOWA DNR ENGINEER WILL STAKE LOCATION OF J-HOOK. LOCATION IS UPSTREAM OF NEW BOAT RAMP.
2. GAPS SHOWN IN TYPICAL DRAWING WILL BE INSPECTED BY IOWA DNR ENGINEER DURING CONSTRUCTION.
3. THE VANE AREA PORTION OF THE STRUCTURE IS 20-30° MEASURED UPSTREAM FROM THE TANGENT LINE WHERE THE VANE INTERCEPTS THE BANK.
4. THE VANE SLOPE EXTENDING FROM THE INTERCEPT OF THE STRUCTURE WITH THE BANK SHOULD NOT EXCEED 7%.
5. THE STRUCTURE INTERCEPTS THE BANK AT AN ELEVATION OF 1120'.
6. THE ROCK SIZING FOR THE STRUCTURE HAS A MAXIMUM SIZING OF 3.5' AND A MINIMUM SIZING OF 3' IN MEDIAL DIAMETER.
7. THE FLATTEST STONES SHOULD BE USED FOR THE TOP OF THE STRUCTURE TO MAINTAIN A CONSISTENT SLOPE ON THE VANE ARM.
8. IRREGULAR STONES CAN BE USED FOR THE FOOTERS.
9. THE ENTIRE STRUCTURE WILL BE HELD TO A .1' TOLERANCE ON THE ELEVATION AND WILL BE INSPECTED BY IOWA DNR THROUGHOUT THE CONSTRUCTION.
10. ROCK SIZING SHOULD BE APPROVED BY IOWA DNR ENGINEER.
11. SMALLER ROCK SIZING IN THE ORDER OF 2-2.5 MEDIAL DIAMETER CAN BE USED FOR SILLED PORTION OF STRUCTURE. SILLED PORTION OF VANE STRUCTURE IS BURIED REFER TO VANE TYPICAL FOR CLARIFICATION.
12. EXCESS RIP/RAP ALREADY ON SITE IS TO REMAIN IN PLACE UNLESS NECESSARY TO MOVE DURING CONSTRUCTION. THE BANKS SHALL BE RESTORED TO PRE-CONSTRUCTION CONDITION AND CONTRACTOR SHALL WORK WITH DNR ENGINEER TO PROVIDE FISHING ACCESS TO CONSTRUCTED WEIR IN THE FORM OF STEPPING STONES USING EXISTING ROCK ON SITE.

	NORTHING	EASTING	ELEVATION
BM1	3562814.53	4543783.48	1124.33
BM2	3562955.45	4543774.58	1126.18
BM3	3562871.88	4543831.78	1123.60



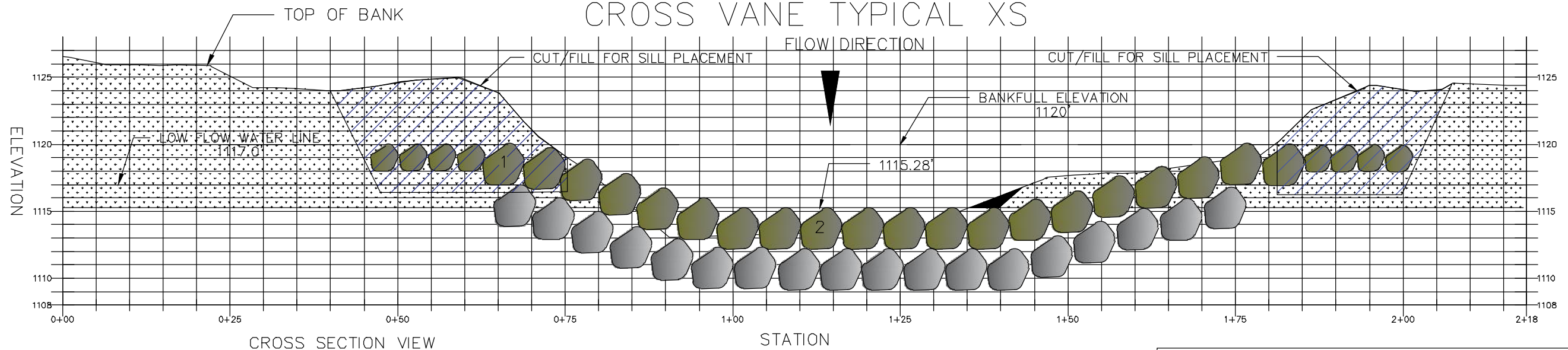
Iowa Department of Natural Resources  
Lands and Waters Bureau  
Conservation and Recreation Division

GRANT PARK PLAN  
VIEW

GLENN HARMAN  
C200

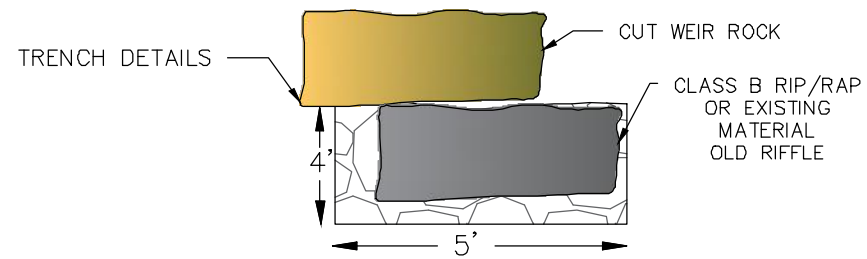
3-29-2017  
AS SHOWN

# CROSS VANE TYPICAL XS

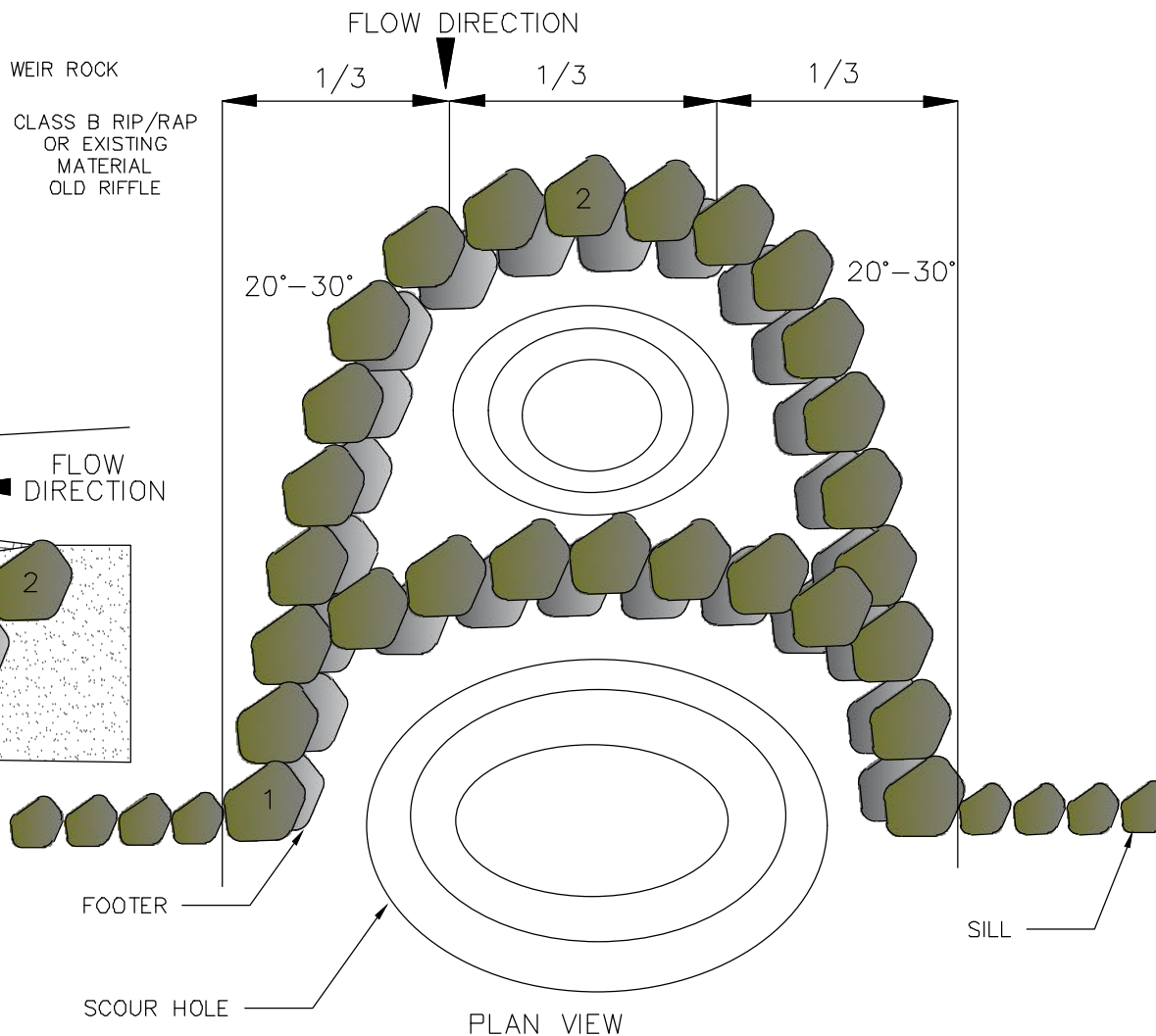


CROSS SECTION VIEW

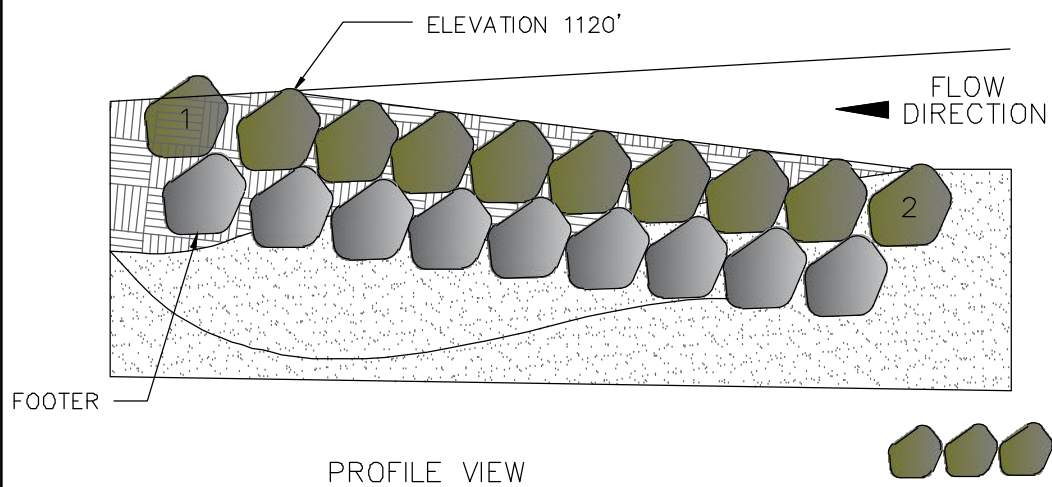
STATION



TRENCH DETAILS



PLAN VIEW



PROFILE VIEW

NOTES:

1. IOWA DNR ENGINEER WILL STAKE THE LOCATION OF THE CROSS VANE STRUCTURE.
2. FISH SPACING GAPS WILL BE EXPECTED BY IOWA DNR ENGINEER IN THE FIELD DURING CONSTRUCTION.
3. THE VANE ARM PORTIONS OF THE STRUCTURE IS 20-30° MEASURED UPSTREAM FROM THE TANGENT LINE WHERE THE VANE INTERCEPTS THE BANK.
4. THE VANE SLOPE EXTENDING FROM THE INTERCEPT OF THE STRUCTURE WITH THE BANK SHOULD NOT EXCEED 7%.
5. THE STRUCTURE INTERCEPTS THE BANK AT AN ELEVATION OF 1120'.
6. THE ROCK SIZING FOR THE STRUCTURE HAS A MAXIMUM SIZING OF 3.5' AND A MINIMUM SIZING OF 3' IN MEDIAL DIAMETER.
7. USE 3'-3.5' WEIR STONES, WITH A SPECIFIC GRAVITY OF AT LEAST 2.5 (EX: QUARTZITE, GRANITE, DOLOMITE, ETC). LIMESTONE IS NOT ALLOWED. FOR THE TOP OF STRUCTURE WITH CLASS B RIP/RAP USED FOR FOOTER STONE. USE THE LARGEST OF THE CLASS B UNDER THE TOP BOULDER AS SHOWN IN TRENCH DETAIL. FILL WITH SMALL CLASS B OR SMALLER EXCESS FIELD STONE FROM THE SITE.
8. THE ENTIRE STRUCTURE WILL BE HELD TO A .1' TOLERANCE ON THE ELEVATION AND WILL BE INSPECTED BY IOWA DNR THROUGHOUT THE CONSTRUCTION.
9. ROCK SIZING SHOULD BE APPROVED BY IOWA DNR ENGINEER BEFORE PLACEMENT.
10. SMALLER ROCK SIZING IN THE ORDER OF 2-2.5 MEDIAL DIAMETER CAN BE USED FOR SILLED PORTION OF STRUCTURE.
11. THE EXISTING SCOUR HOLE CAN BE FILLED TO A MAXIMUM DEPTH OF 10' USING EXISTING RIFFLE STONE DROPPED INTO THE HOLE TO ACHIEVE ELEVATIONS FOR NEW CROSS VANE STRUCTURE.
12. EXISTING RIFFLE ROCK CAN BE USED FOR CONSTRUCTION OF CROSS VANE PROVIDED IT MEETS THE DNR ENGINEERS REQUIREMENTS. EXISTING RIFFLE ROCK CAN ALSO BE USED AS FOOTER MATERIAL.



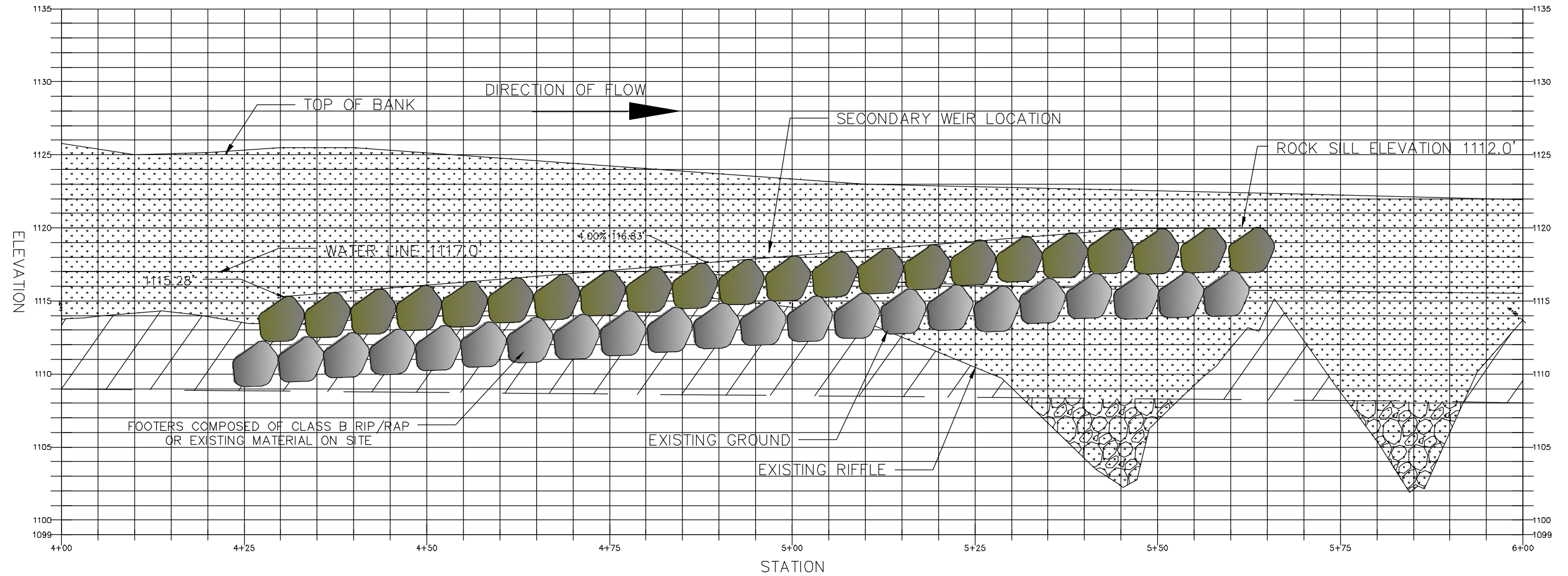
Iowa Department of Natural Resources  
Lands and Waters Bureau  
Conservation and Recreation Division

CROSS VANE DESIGN  
TYPICALS

GLENN HARMAN  
C300

3-29-2017  
AS SHOWN

# Design Profile



## NOTES:

1. TOP OF WEIR STARTS AT STATION 4+30.00 WITH A CENTER ELEVATION OF 1115'.28 AND EXTENDING TO 1120'.
2. FILL EXISTING SCOUR HOLE WITH MATERIAL FROM EXISTING RIFFLE MATERIAL.
3. SORT EXISTING ROCK BY SIZE AND USE THE SMALLER ROCK, LESS THAN 2.0' IN MEDIAL DIAMETER FOR FILLING THE SCOUR HOLE. SORT ANY LARGE FLAT STONES TO BE USED AS WEIR FOOTER MATERIAL.
4. MAINTAIN EXISTING SCOUR HOLE DEPTH OF 8-10'
5. WEIR ROCK PLACEMENT IS TO MEET A VERTICAL TOLERANCE OF 0.1' AND WILL BE INSPECTED BY FIELD ENGINEER DURING CONSTRUCTION.
6. SECONDARY WEIR TOP LOCATION IS AT 4+96.91 AND ARCS TO THE OUTWARD ARMS OF CROSS VANE AT NO MORE THAN 5%. THE CENTER ELEVATION OF THE SECONDARY WEIR IS 1114.48.
7. CONTRACTOR IS TO WORK WITH THE FIELD ENGINEER TO SET THE LOCATION OF THE SECONDARY WEIR TO ENSURE THAT THERE IS NO MORE THAN A .8' DROP FROM PRIMARY WEIR TO SECONDARY WEIR.
8. FOOTER SHOULD BE COMPOSED OF CLASS B RIP/RAP OR EXISTING MATERIAL WITH 75% OF THE STONE WITH A SIZE  $\geq$  3.0 IN MEDIAL DIAMETER. REFER TO CROSS VANE TYPICAL XS FOR FOOTER DETAIL.
9. TOP OF WEIR STRUCTURES IS TO BE CONSTRUCTED OF 3X3X3 OR LARGER WEIR STONE WITH A SPECIFIC GRAVITY OF AT LEAST 2.5.

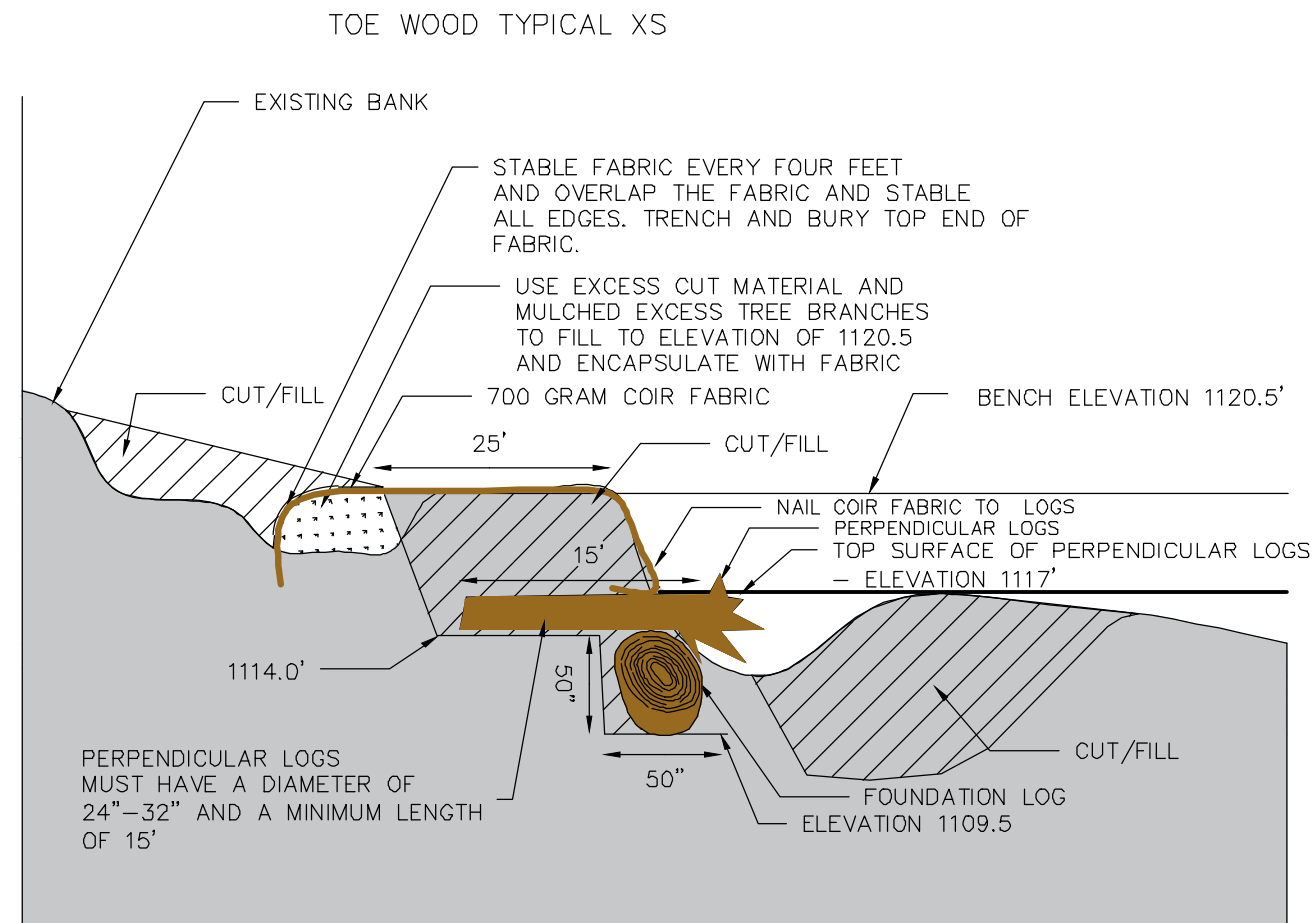


Iowa Department of Natural Resources  
Lands and Waters Bureau  
Conservation and Recreation Division

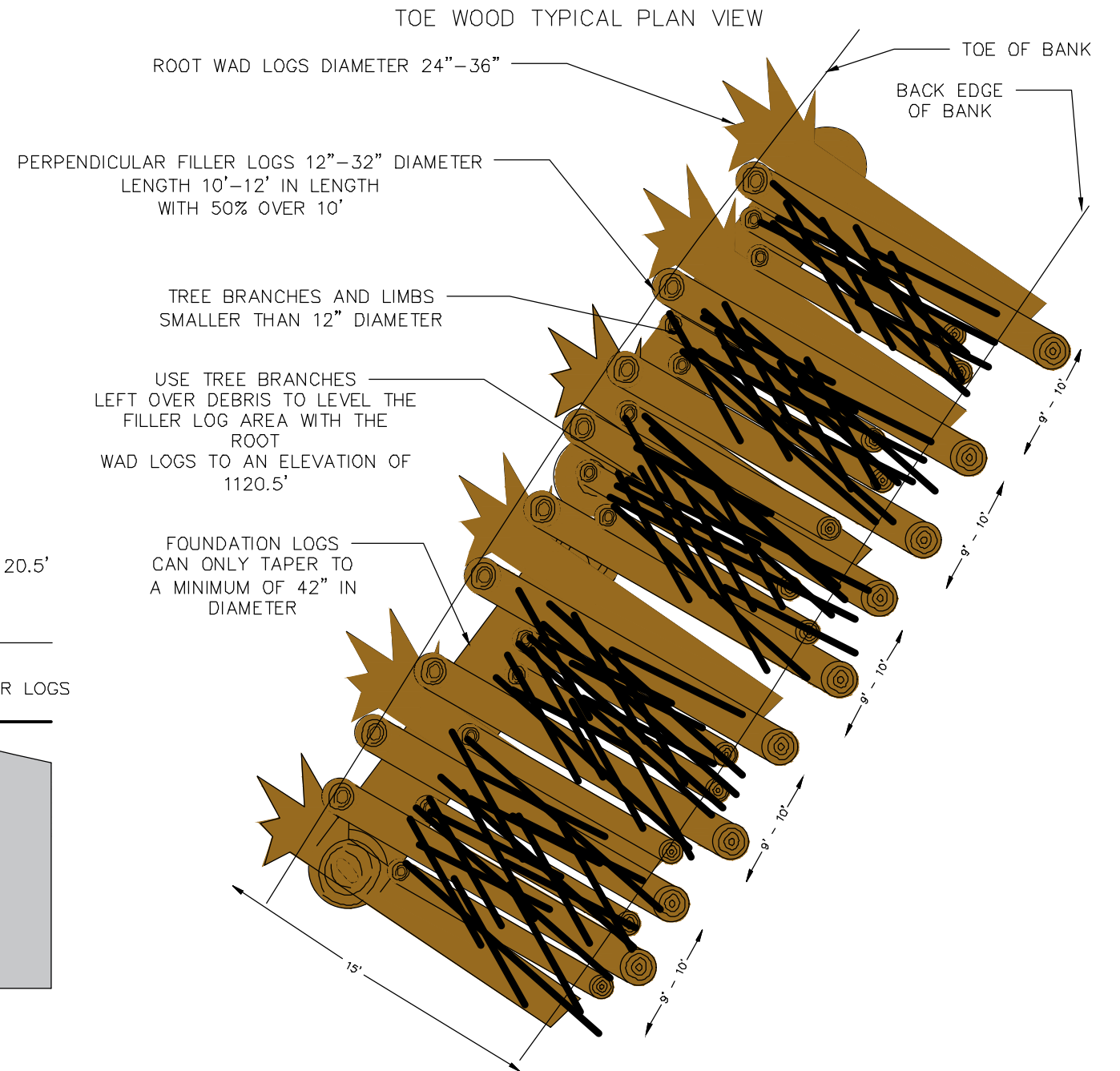
CROSS VANE  
PROFILE VIEW

GLENN HARMAN  
C400

3-29-2017  
AS SHOWN



NOTE: CUT/FILL FOR THE TOE WOOD CONSTRUCTION IS TO BE BALANCED



NOTES:

1. CUT THE BANK BY REMOVING THE BANK MATERIAL AS SHOWN IN THE TYPICAL XS. THE MATERIAL SHOULD BE STOCKPILED AND USED AS FILL AFTER THE PLACEMENT OF THE TOE WOOD PROTECTION.
2. THE TOE WOOD SECTION WILL BE STAKED BY IDNR AND THE TOTAL LENGTH OF THE BENCH IS 200'
3. LOGS ARE TO BE REMOVED INCLUDING THE ROOT BALL FROM THE BORROW SITE TO THE NORTH WEST OF THE BANK TO BE ARMORED. CLEAR THE AREA AND SORT THE TREES BY SIZE FOR PLACEMENT.
4. ONCE ENOUGH MATERIAL HAS BEEN REMOVED PLACE THE FOOTER LOGS. THE FOOTER LOGS WILL CROSS EACH OTHER TO FORM A PARALLEL LINE ALONG THE BANK. ALL FOOTER LOGS SHOULD HAVE A DIAMETER OF 42"–50".
5. ALL FOOTER LOG PLACEMENTS WILL BE IN COORDINATION WITH ENGINEER IN THE FIELD AND INSPECTED BEFORE PLACING PERPENDICULAR FILLER LOGS.
6. PLACE ROOT WAD LOGS CANTILEVERED OVER THE FOUNDATION LOGS. THE MINIMUM CIRCUMFERENCE FOR ALL ROOT WAD LOGS SHOULD BE 36" AT THE BASE JUST ABOVE THE ROOT BALL AND TAPER TO MINIMUM DIAMETER OF 24". THE LENGTH OF THE ROOT WAD LOGS SHOULD MEASURE AT LEAST 15' MEASURED JUST ABOVE THE ROOT WAD.
7. ADD A TEMPORARY COUNTER WEIGHT TO SUBMERGE THE LOGS AND PREVENT THEM FROM FLOATING. REMOVE THE COUNTERWEIGHT AS BACKFILLING OF THE BENCH PROCEEDS.
8. ROOT WADS LOGS ARE TO BE SPACED 9'–10' MEASURED FROM THE CUT END OF THE TREE AS SHOWN IN THE PLAN VIEW. IN THE EVENT THAT THERE ARE MORE ROOT WADS BEYOND THE DESIRED SPACING THEN THE SPACING CAN BE REDUCED, HOWEVER THE SPACING SHOULD BE NO LESS THAN 6'.
9. FILL THE SPACES BETWEEN THE ROOT WAD LOGS WITH ADDITIONAL LOGS WITH A DIAMETER FROM 30"–12 AND A LENGTH OF 10'–15'. 50% OF THE PERPENDICULAR LOGS SHOULD BE 15'. ANY EXCESS PORTION OF THE LOG SHOULD BE JAMMED INTO THE BACK OF THE BANK TO ENSURE THAT THE LOGS DO NOT STICK OUT BEYOND THE BASE OF THE ROOT WAD LOGS. THE ROOT WAD ON THE ROOT WAD LOGS SHOULD BE THE ONLY PORTION OF THE TOE PROTECTION VISIBLE PAST THE EDGE OF THE BANK AND SHOULD NOT STICK OUT PAST THE BANK MORE THAN 3'. PLACE FILLER MATERIAL (E.G., SMALL LOGS, LIMBS, TREE TOPS AND BRUSH) PARALLEL TO THE ROOT WADS TO NO MORE THAN THE HEIGHT OF THE ROOT WAD LOGS.
10. NAIL 700 GRAM COVER EROSION CONTROL FABRIC ONTO THE ROOT WADS LEAVE IN PLACE SO THAT IT CAN BE ROLLED OVER THE BACKFILLED BENCH AND STABLED. THE EROSION FABRIC IS TO BE LAID PARALLEL WITH THE FOUNDATION LOGS SO THAT IT CAN BE PULLED OVER THE SOIL CREATING AN ENCAPSULATED SOIL LIFT. THE END OF THE FABRIC SHOULD BE TRENCHED 2' AND FILLED WITH SOIL.
11. COMPACT BACKFILL SOIL BY DRIVING OVER IT WITH HEAVY EQUIPMENT.
12. ANY EXCESS TREE BRUSH MATERIAL THAT IS NOT USED AS FILL MATERIAL IN THE BENCH SHOULD BE CHIPPED AND USED AS FILL MATERIAL IN THE DIRECT VICINITY OF THE BENCH OR CAN BE SPREAD THINLY (LESS THAN 0.5') IN THE ADJACENT FLOOD PLAIN
13. PULL THE PREVIOUSLY NAILED COVER EROSION FABRIC OVER THE BACKFILLED BENCH. OVERLAP EACH SECTION BY 6" AND USE METAL LANDSCAPE STAPLES EVERY 4' TO STAKE DOWN THE FABRIC..
14. PROVIDE TEMPORARY EROSION CONTROL SEEDING AT 12LB. PER ACRE OF ANNUAL RYE.

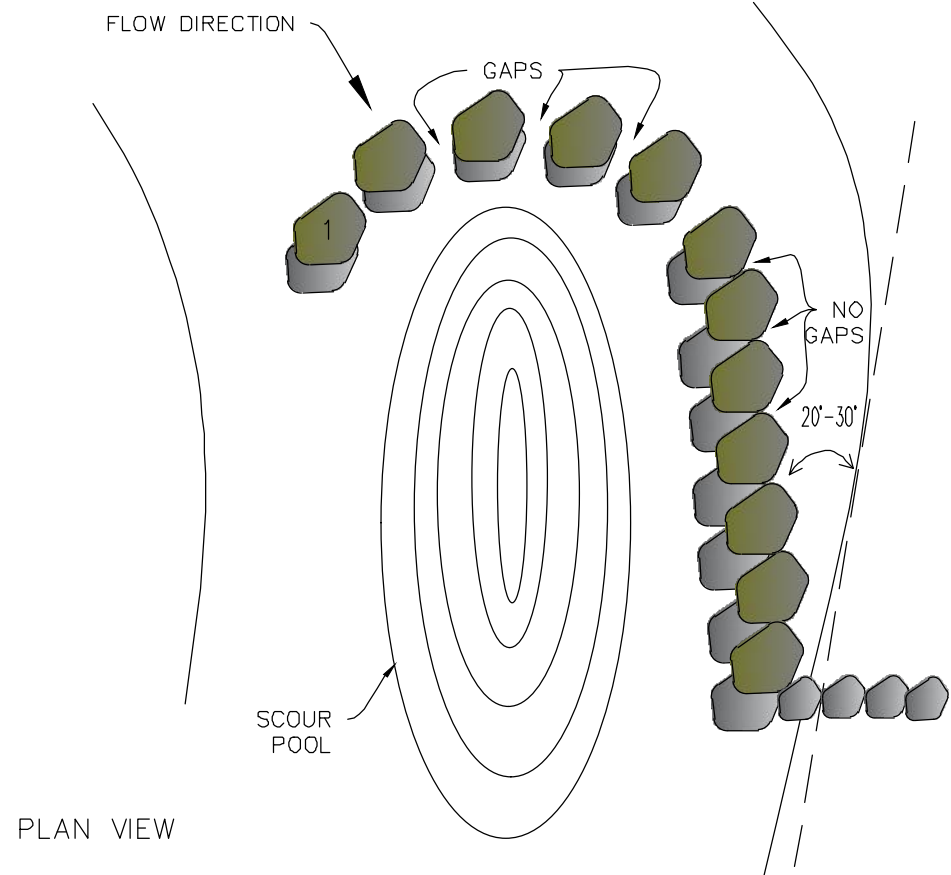


Iowa Department of Natural Resources  
Lands and Waters Bureau  
Conservation and Recreation Division

TOE WOOD TYPICAL  
CROSS SECTION

GLENN HARMAN  
C500

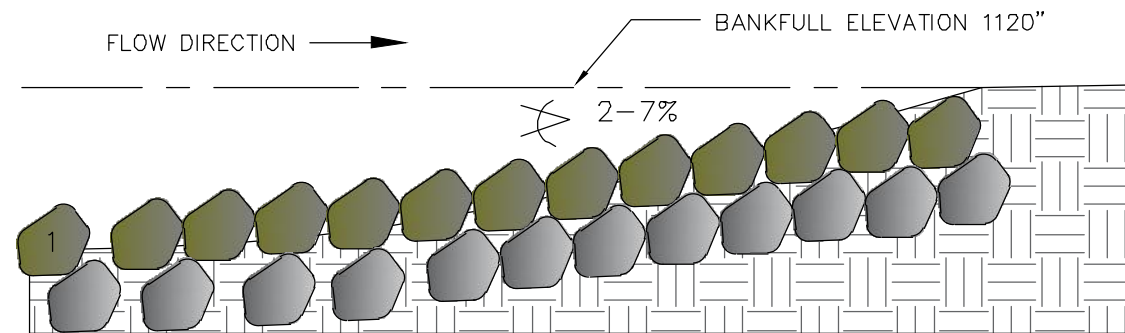
3–29–2017  
AS SHOWN



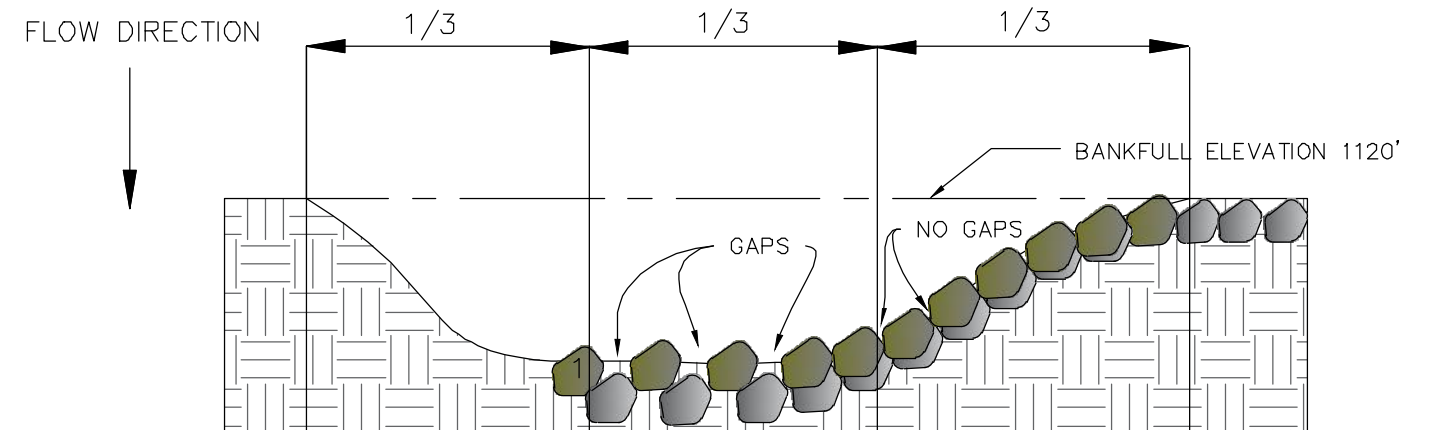
NOTES:

1. IOWA DNR ENGINEER WILL STAKE LOCATION OF J-HOOK. LOCATION IS UPSTREAM OF NEW BOAT RAMP.
2. GAPS SHOWN IN TYPICAL DRAWING WILL BE INSPECTED BY IOWA DNR ENGINEER DURING CONSTRUCTION.
3. THE VANE ARE PORTION OF THE STRUCTURE IS 20-30° MEASURED UPSTREAM FROM THE TANGENT LINE WHERE THE VANE INTERCEPTS THE BANK.
4. THE VANE SLOPE EXTENDING FROM THE INTERCEPT OF THE STRUCTURE WITH THE BANK SHOULD NOT EXCEED 7%.
5. THE STRUCTURE INTERCEPTS THE BANK AT AN ELEVATION OF 1120'.
6. THE ROCK SIZING FOR THE STRUCTURE HAS A MAXIMUM SIZING OF 3.5' AND A MINIMUM SIZING OF 3' IN MEDIAL DIAMETER.
7. THE FLATTEST STONES SHOULD BE USED FOR THE TOP OF THE STRUCTURE TO MAINIAIN A CONSISTENT SLOPE ON THE VANE ARM.
8. IRREGULAR STONES CAN BE USED FOR THE FOOTERS.
9. THE ENTIRE STRUCTURE WILL BE HELD TO A .1' TOLERANCE ON THE ELEVATION AND WILL BE INSPECTED BY IOWA DNR THROUGHOUT THE CONSTRUCTION.
10. ROCK SIZING SHOULD BE APPROVED BY IOWA DNR ENGINEER.
11. SMALLER ROCK SIZING IN THE ORDER OF 2-2.5 MEDIAL DIAMETER CAN BE USED FOR SILLED PORTION OF STRUCTURE.

TYPICAL J-HOOK PLAN VIEW



TYPICAL J-HOOK PROFILE VIEW:



TYPICAL J-HOOK CROSS SECTION VIEW:



Iowa Department of Natural Resources  
Lands and Waters Bureau  
Conservation and Recreation Division

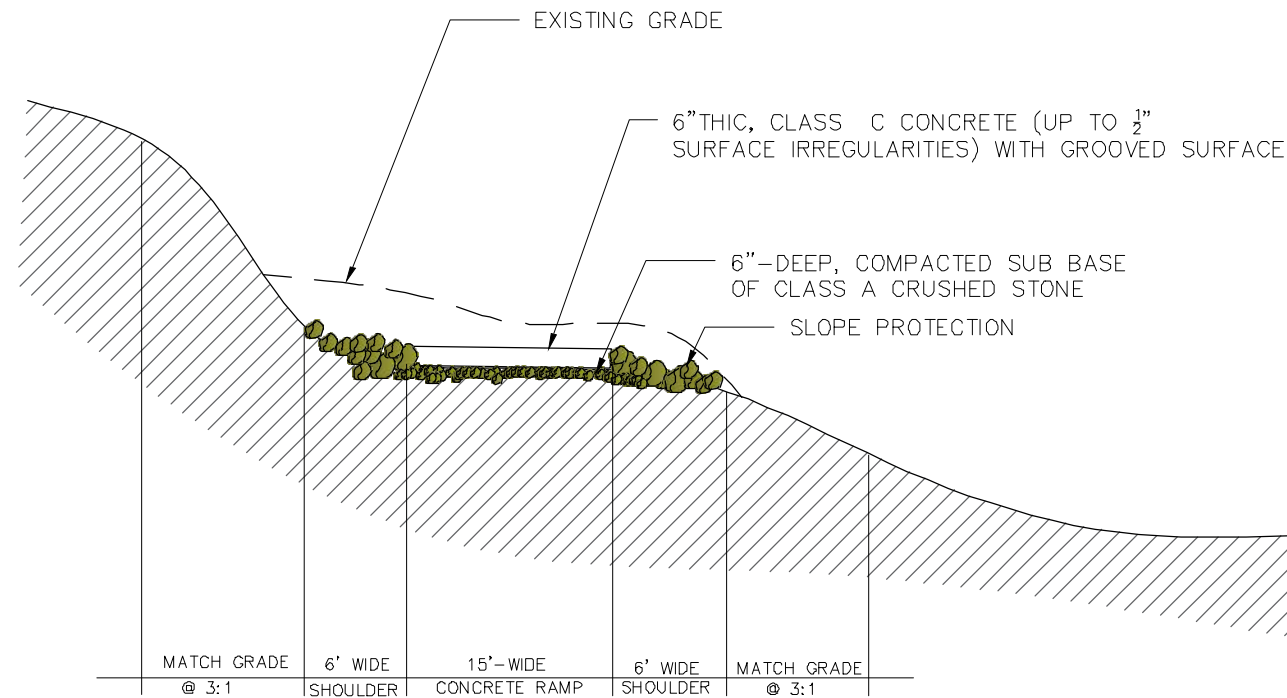
J-HOOK TYPICAL

GLENN HARMAN

3-28-2017

C600

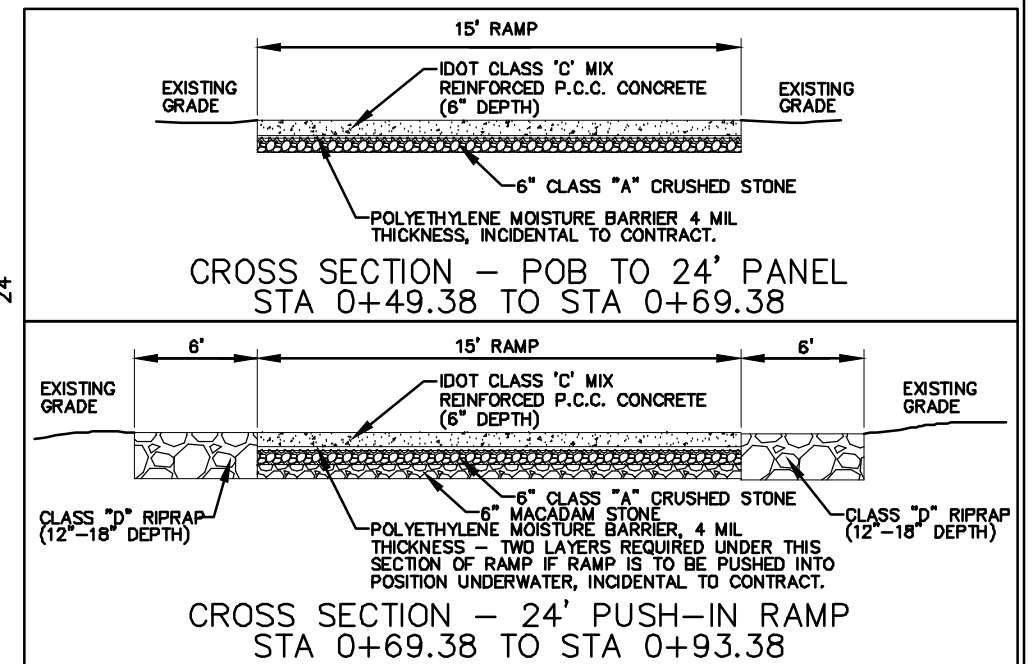
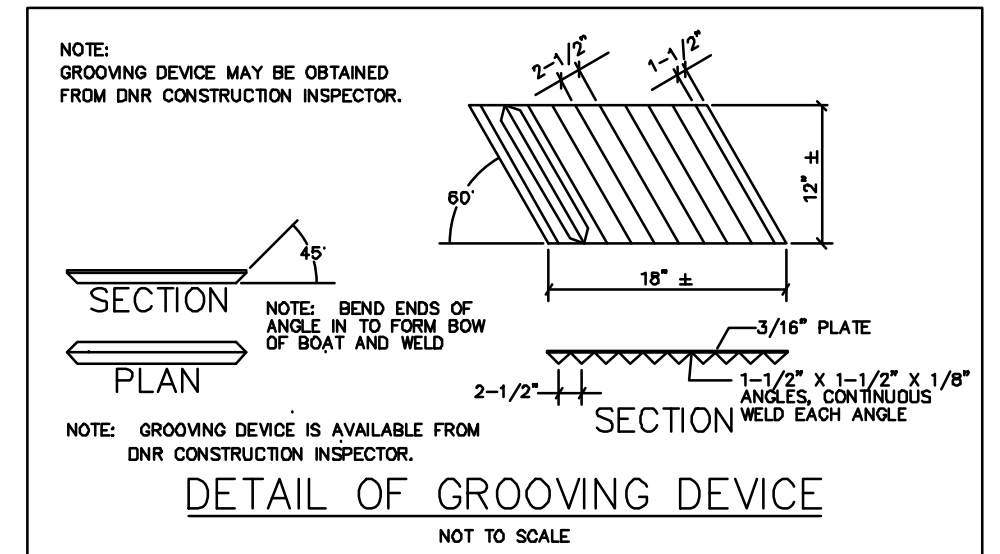
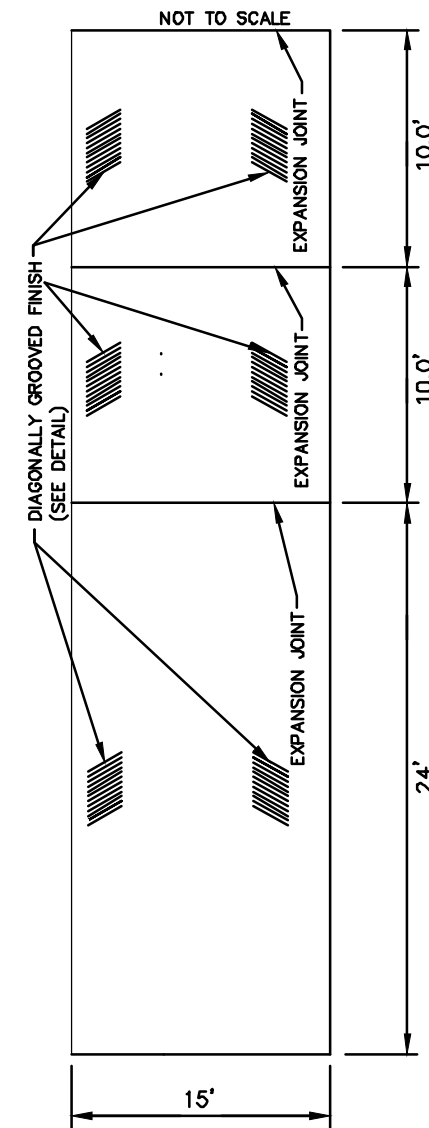
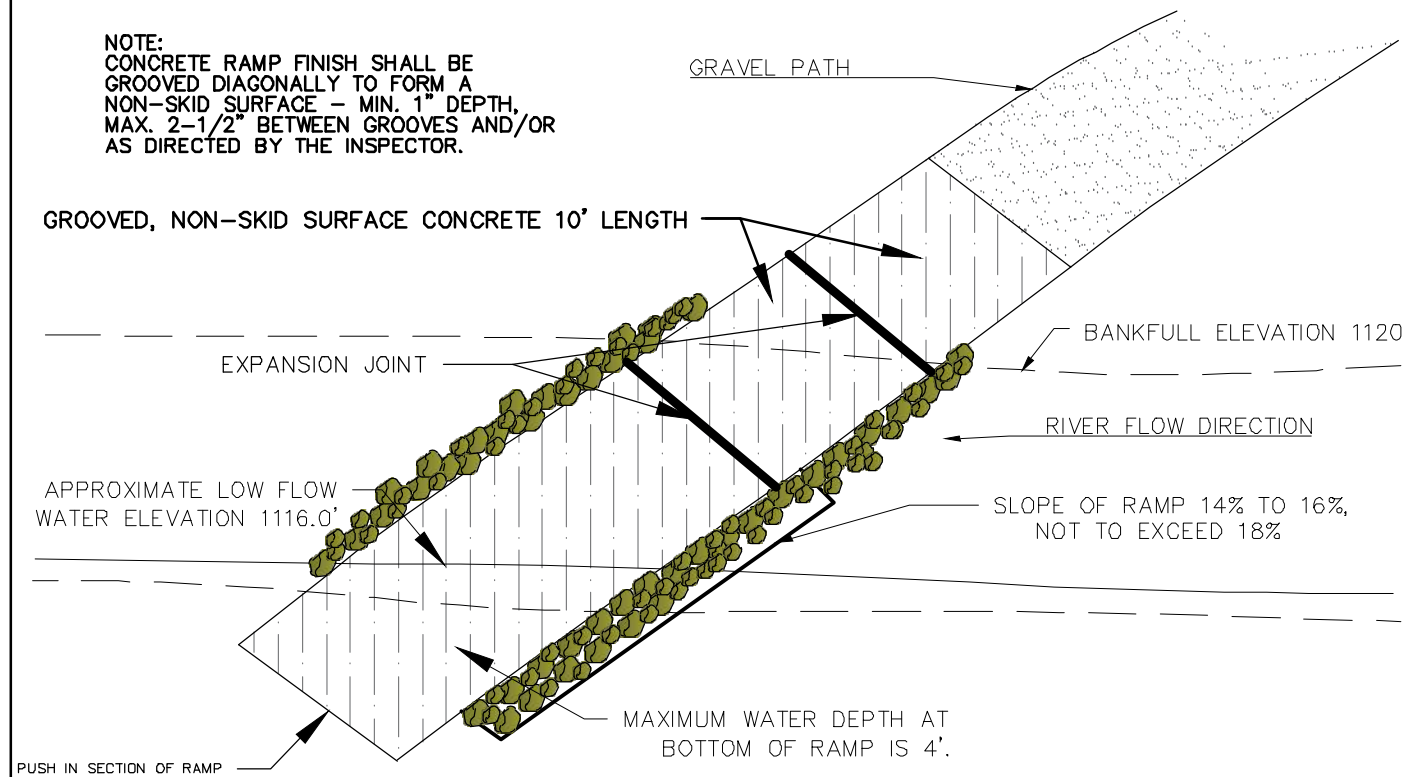
AS SHOWN



- NOTES:
1. PLACE RIP/RAP STONE IN WATER TO WITHIN SIX INCHES OF THE FINAL SUB GRADE OF CONCRETE SLAB. PLACE GRADE STAKES AND STRING LINE ON POSTS IN WATER TO SET GRADE.
  2. PLACE SIX INCHES OF CLASS A CRUSHED STONE ( $\frac{3}{4}$  INCH) ON TOP OF RIP/RAP AND FILL VOIDS. AFTER FILLING VOIDS THERE SHOULD BE A MINIMUM OF 2" OF CRUSHED STONE ON TOP OF RIP/RAP, AND BASE SHOULD BE TO FINAL GRADE.
  3. BUILD TEMPORARY FILL TO GRADE FOR POURING THE UNDERWATER PORTION OF THE RAMP. TEMPORARY FILL LOCATION LOCATED NEXT TO RAMP LOCATION. REFER TO PLAN VIEW FOR DETAILS ON LOCATION. SAND FOR TEMPORARY FILL IS LOCATED IN THIS LOCATION
  4. PLACE 2" OF CLASS A CRUSHED STONE ( $\frac{3}{4}$  INCH) ON TOP OF TEMPORARY FILL.
  5. POUR CONCRETE (4,000 PSI) FOR SLAB IN PLACE ON TEMPORARY FILL, WITH TWO LAYERS OF 6 MIL POLYETHYLENE ON TOP OF SUB GRADE. TAKE A MINIMUM OF TWO TEST CYLINDERS FOR TESTING.
  6. LET PUSHED SECTION CURE FOR A MINIMUM OF TWO WEEKS, UNLESS SEVEN DAY TEST RESULTS EXCEED 3,200 POUNDS.
  7. TEST ONE CYLINDER AT SEVEN DAYS FOR COMPRESSIVE STRENGTH; IF GREATER THAN 3,200 PSI THEN RAMP SECTION CAN BE PUSHED INTO PLACE. SECOND CYLINDER WOULD BE USED FOR TEST AT FOURTEEN DAYS IF FIRST CYLINDER DID NOT MEET 3,200 PSI
  8. BEND EXPOSED REBAR AT TOP END OF UNDERWATER SLAB. PLACE WOOD TIMBERS (4" PLANKS ARE USUALLY SUFFICIENT, PUT TIMBER UP TO 12" BY 12" HAS BEEN USED) UP AGAINST END OF SECTION.
  9. USE DOZER, LOADER OR LARGE BACKHOE TO PUSH SECTION INTO PLACE, TAKING CARE TO FOLLOW PROPOSED ALIGNMENT AND GRADE.
  10. CHECK FINAL LOCATION AND GRADE AGAINST STRING LINE AND GRADE STAKES. IF SLAB IS NOT TO PROPER GRADE IT CAN BE REMOVED BY PLACING A CABLE AROUND SLAB AND PULLING IT OUT OF THE WATER WITH A DOZER. GRADE CAN THEN BE CORRECTED AND SLAB RE-PUSHED.
  11. USE SMALLER PORTIONS OF CLASS D RIP/RAP TO ARMOR EDGES OF BOAT RAMP.
  12. CONCRETE RAMP FINISH SHALL BE GROOVED DIAGONALLY TO FORM A NON-SKID SURFACE - MIN 1" DEPTH, MAX. 2-1/2" BETWEEN GROOVES AND OR AS DIRECTED BY THE FIELD ENGINEER.

TYPICAL CONCRETE LAUNCH SECTION:

TYPICAL CONCRETE LAUNCH DESIGN:



Iowa Department of Natural Resources  
Lands and Waters Bureau  
Conservation and Recreation Division

BOAT RAMP  
DETAILS

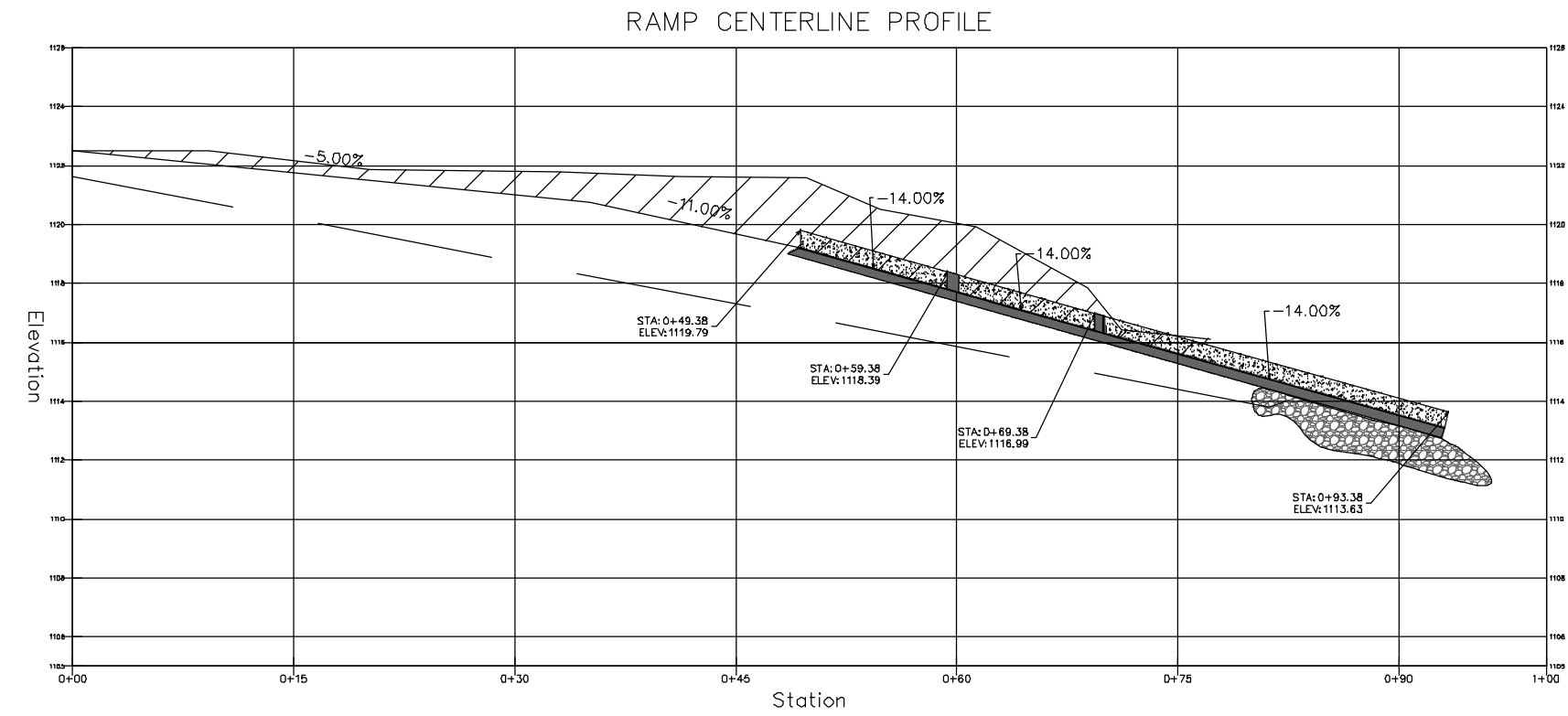
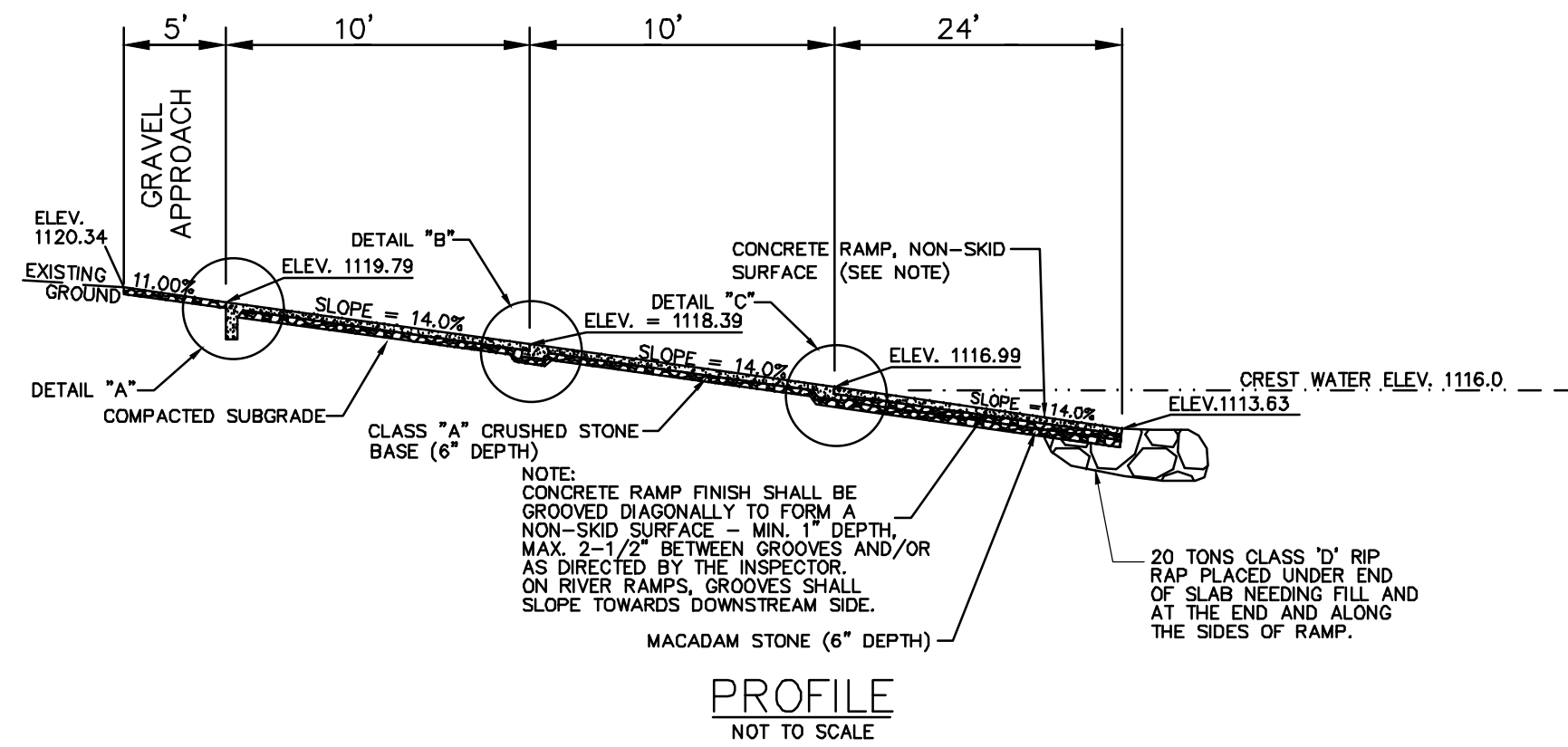
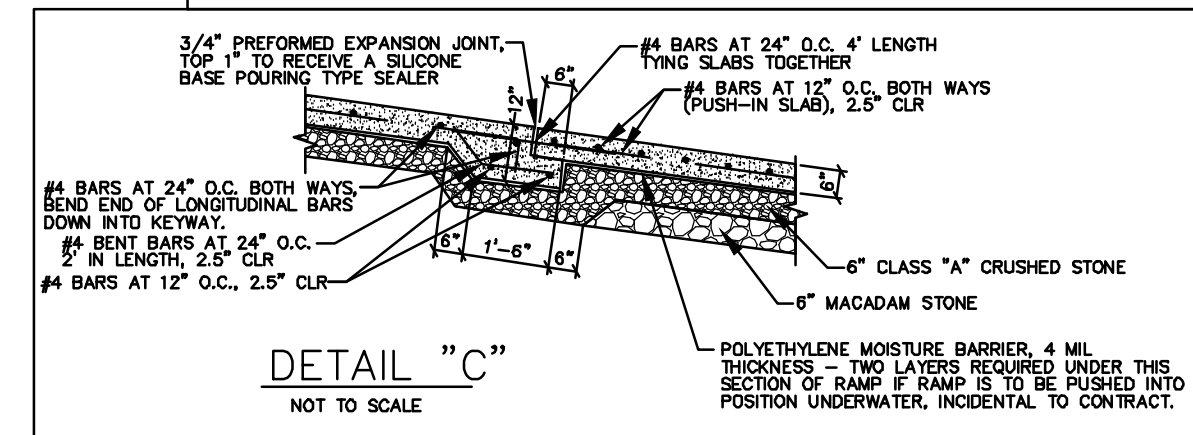
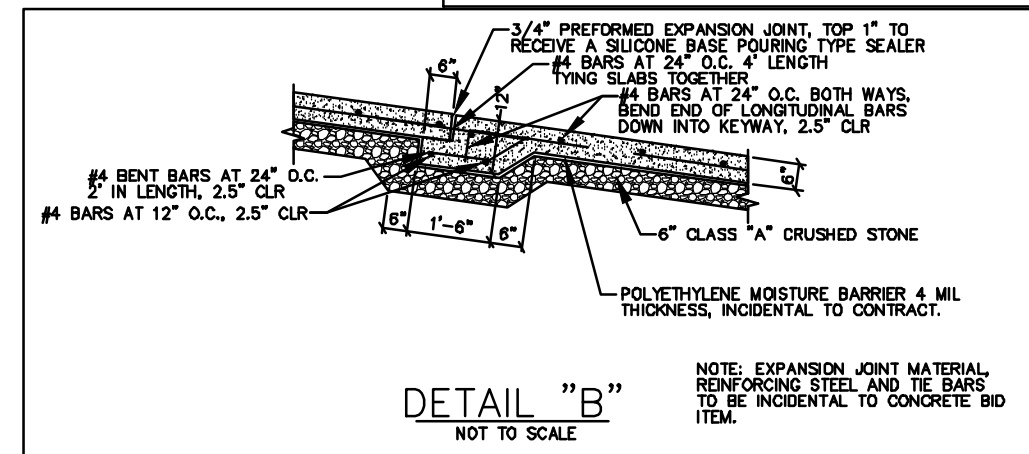
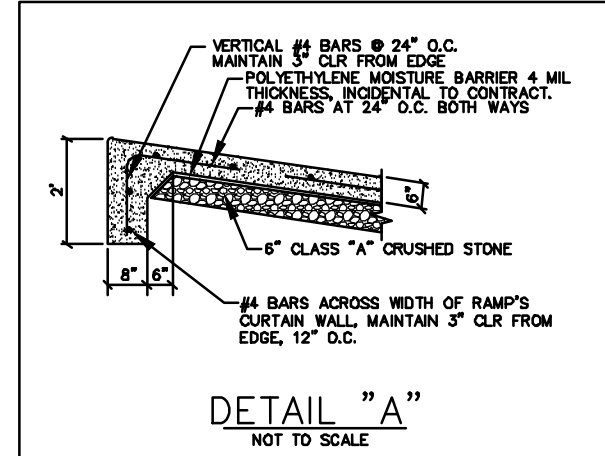
GLENN HARMAN  
C700

3-29-2017  
AS SHOWN



## GENERAL NOTES

1. ALL CONCRETE SHALL CONFORM TO CLASS 'C' MIX IDOT SPECIFICATIONS SERIES 2012.
2. ALL EXPOSED EDGES OF CONCRETE TO BE BEVELED WITH 3/4" CHAMFER STRIPS OR 1/2" RADIUS TOOLED EDGE.
3. THE TOP 1" OF ALL EXPANSION JOINTS TO RECEIVE A SILICAONE BASE POURING TYPE SEAL.
4. EXPANSION JOINTS - 3/4" PREFORMED RESILIENT FILLER MATERIAL.
5. REINFORCING STEEL - GRADE 40 - DEFORMED EPOXY COATED REBAR.
6. THAT PORTION OF THE RAMP TO BE PLACED BELOW THE WATERLINE MAY BE FORMED ABOVE THE WATERLINE AND CAREFULLY PUSHED INTO POSITION UNDERWATER TO THE LOCATION AND ELEVATION AS SHOWN ON THE PLAN AND AS APPROVED BY THE INSPECTOR. THE REMAINING SECTIONS OF THE RAMP SHALL BE FORMED AND POURED IN PLACE.



Iowa Department of Natural Resources  
Lands and Waters Bureau  
Conservation and Recreation Division

BOAT RAMP  
DETAILS

GLENN HARMAN  
C800

3-28-2017  
AS SHOWN