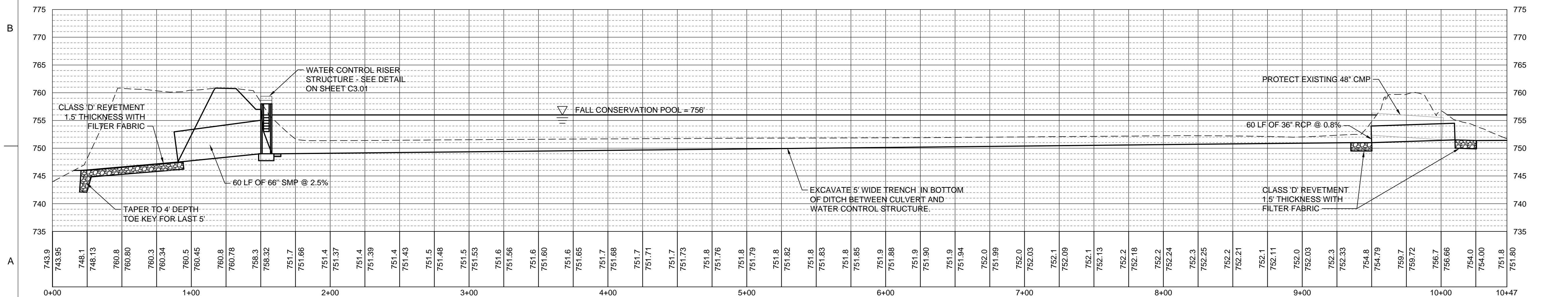
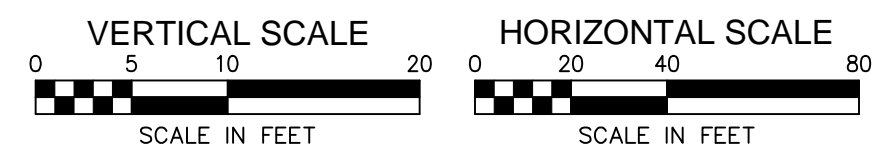
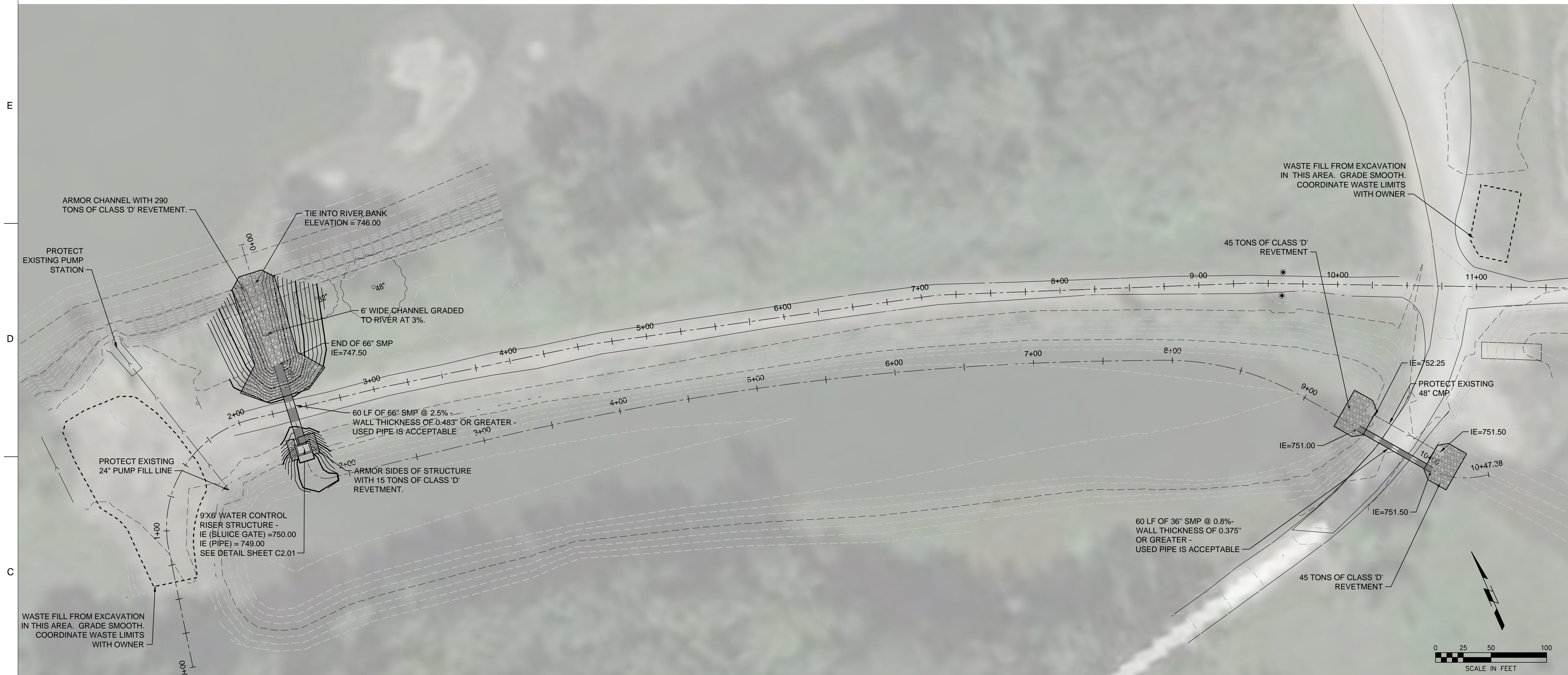


**RICHARDS MARSH
DIKE RENOVATION**

IOWA DEPARTMENT OF
NATURAL RESOURCES
WARREN COUNTY, IOWA
DAS PROJECT # 8733.00



KEY PLAN

DRAWN JRM
APPROVED LTM
ISSUED FOR CONSTRUCTION
DATE 8-6-2015
FIELD BOOK

PROJECT NO.: 4135420

**WATER CONTROL
STRUCTURE PLAN
AND PROFILE**

C1.01

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 WARREN COUNTY, IOWA
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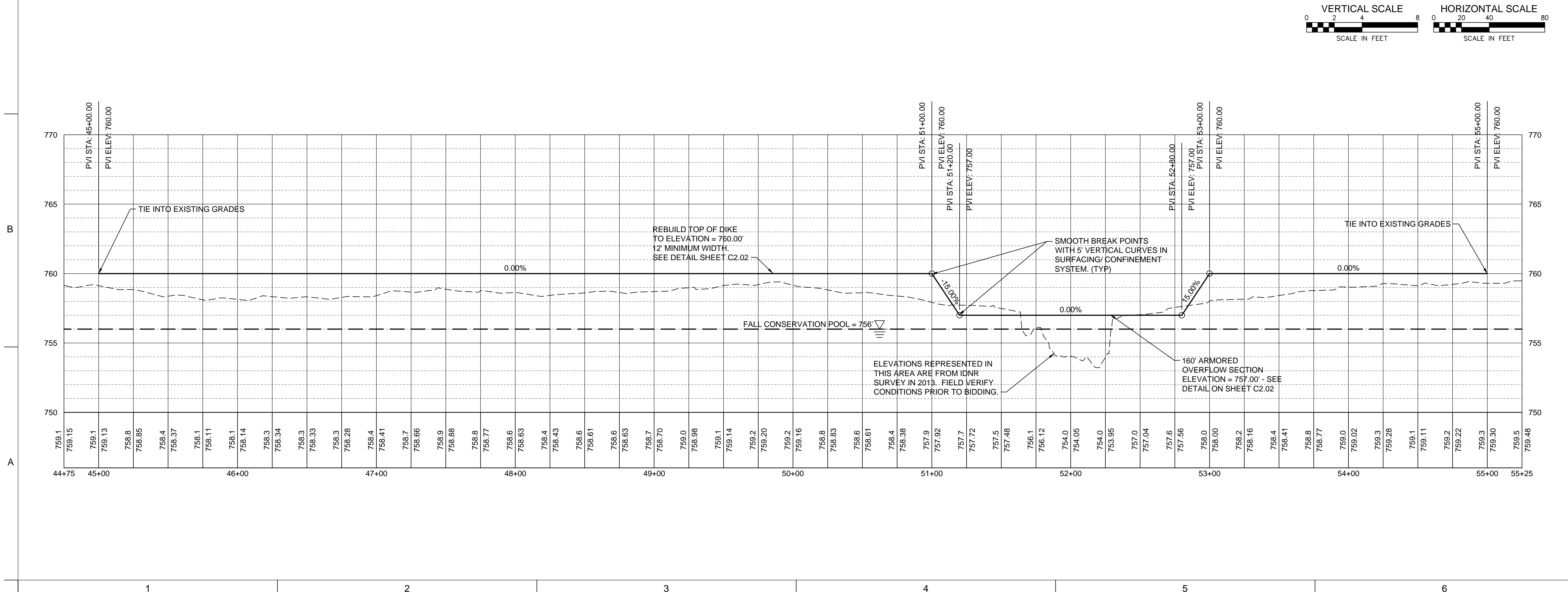
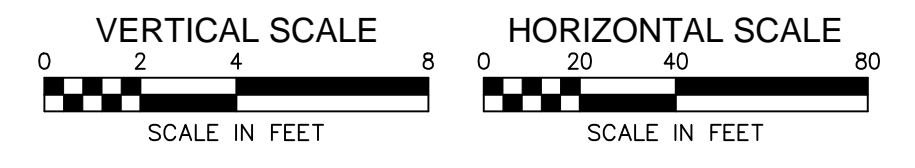
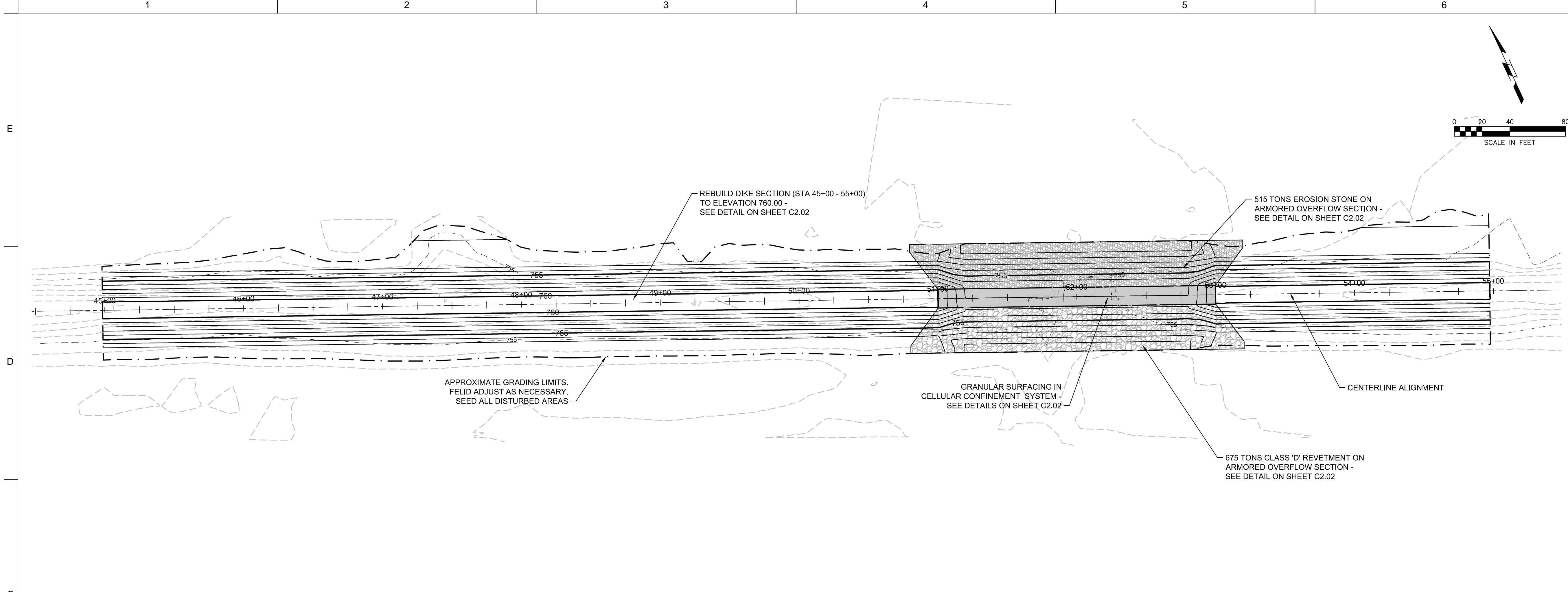
KEY PLAN

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**OVERFLOW STRUCTURE
 PLAN AND PROFILE**

C1.02



**RICHARDS MARSH
DIKE RENOVATION**

IOWA DEPARTMENT OF
NATURAL RESOURCES

WARREN COUNTY, IOWA
DAS PROJECT # 8733.00

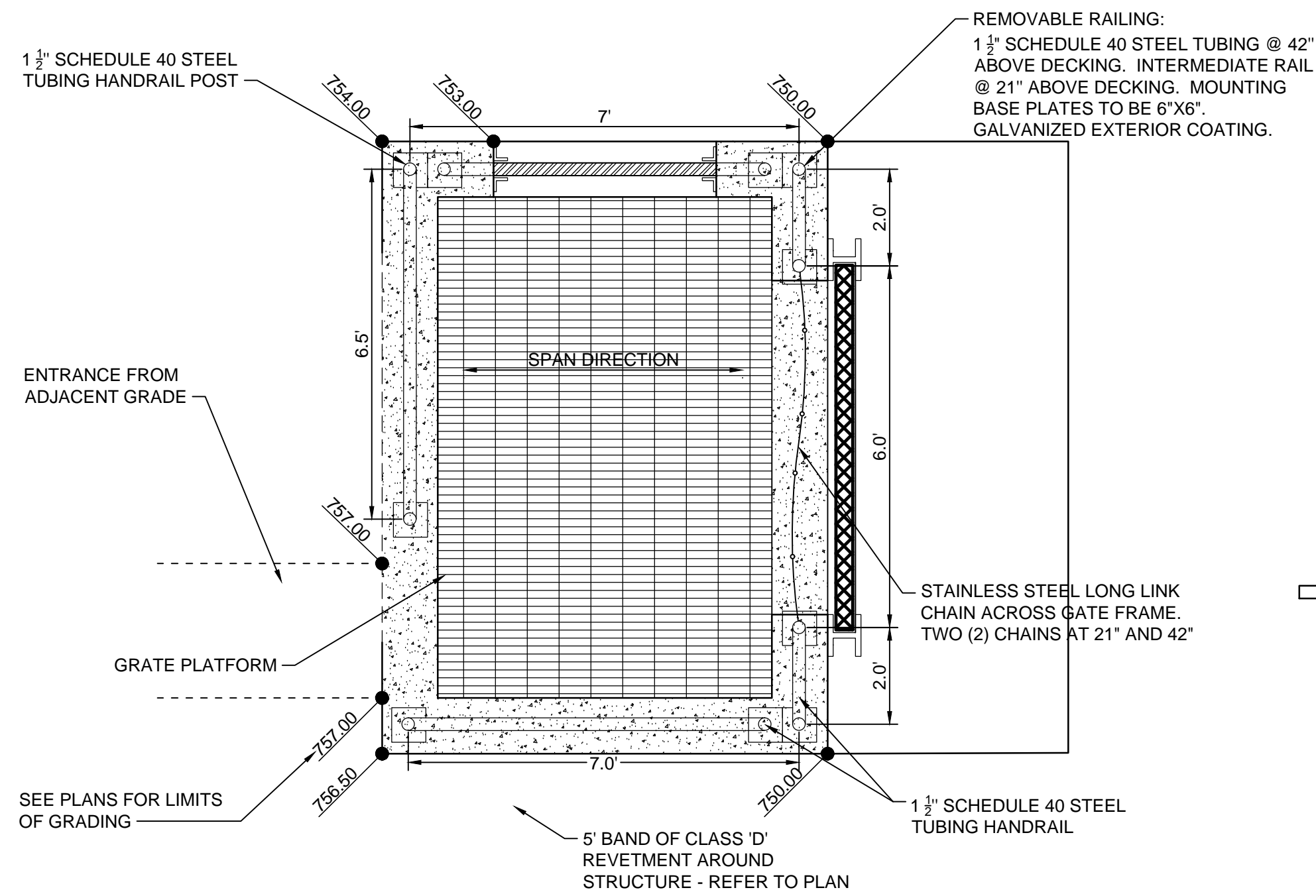
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| APPROVED | LTM |
| ISSUED FOR | CONSTRUCTION |
| DATE | 8-6-2015 |
| FIELD BOOK | |

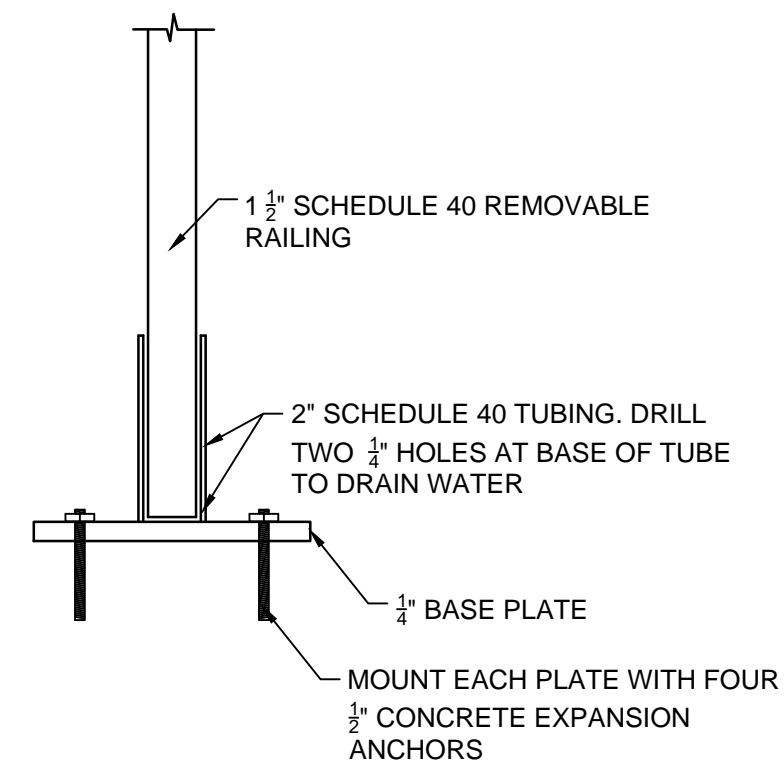
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**WATER CONTROL
STRUCTURE DETAILS**

C2.01



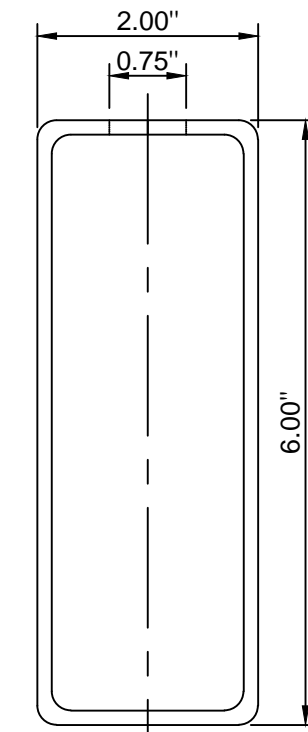
4 WATER CONTROL STRUCTURE HANDRAIL POST LAYOUT
NTS



NOTE:
TWO (2) LIFTING HOOKS REQUIRED

1 1/4" DIAMETER INSIDE
BEND. HOOK TO BE IN
LINE WITH HANDLE.

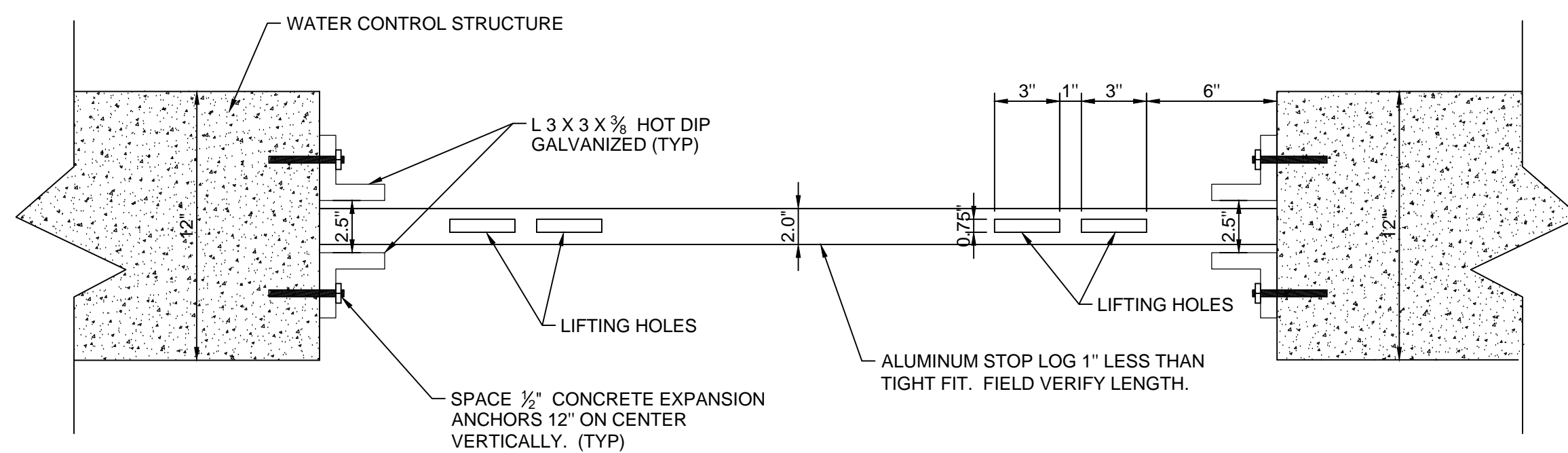
2 STOP LOG LIFTING HOOK
NTS



NOTE:
SEVEN (7) ALUMINUM STOP-LOGS SHALL BE PROVIDED BY CONTRACTOR. CONTRACTOR IS RESPONSIBLE FOR CUTTING STOP-LOGS AS SHOWN. THE 0.75" DIMENSION IS CRITICAL AND NEEDS TO BE CENTERED IN THE STOP-LOG TO AVOID LEAKAGE. THE FINISHED SURFACE SHALL BE SMOOTH TO PROVIDE A FLAT SURFACE FOR THE STOP-LOG ABOVE IT. THE CONTRACTOR SHALL DELIVER ALL STOP-LOGS TO THE SITE. THE COST OF THE STOP-LOG WORK IS INCIDENTAL TO THE OUTLET CONTROL STRUCTURE.

STOP LOG CROSS SECTION
NTS

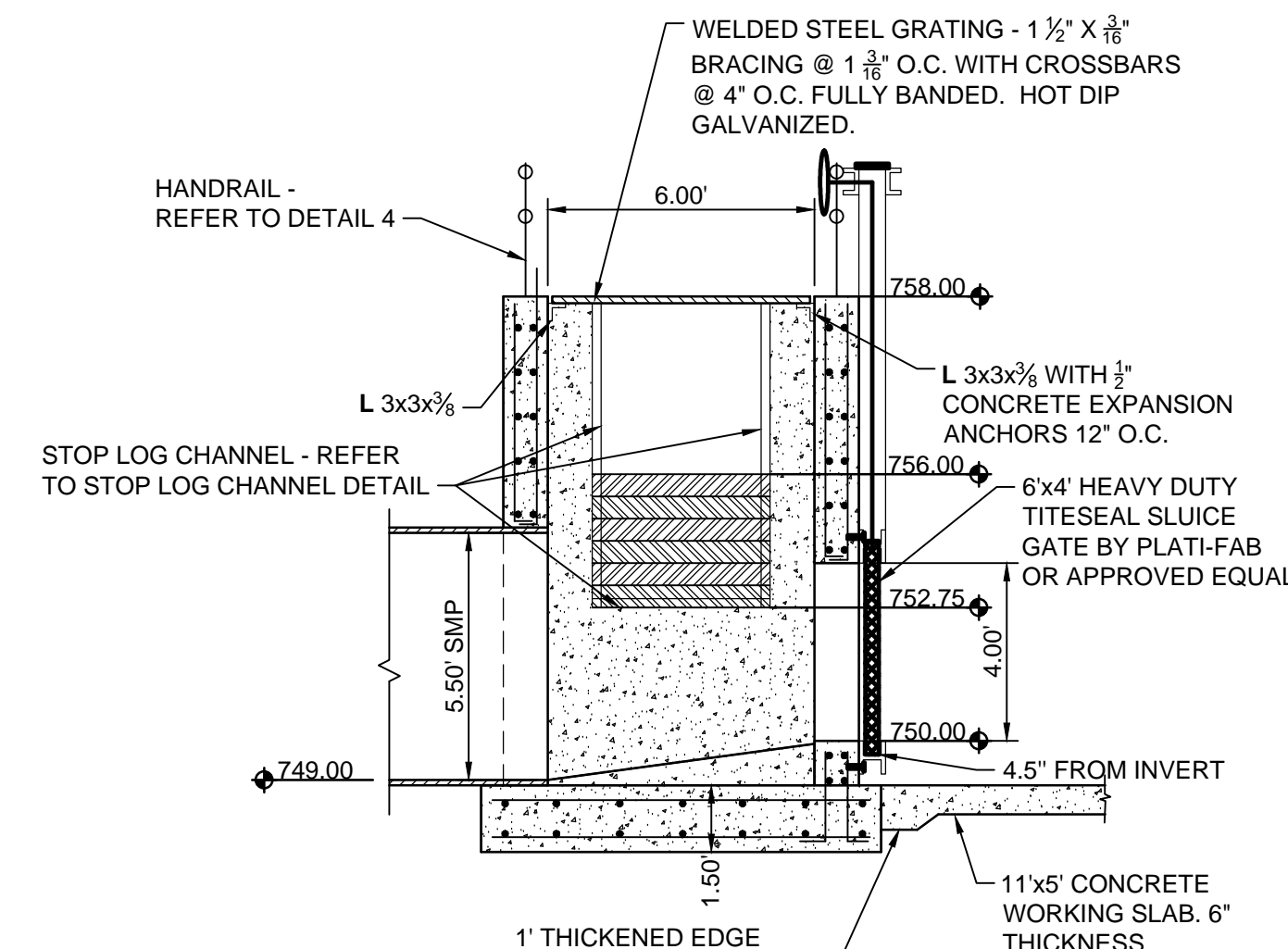
NOTE:
CONTRACTOR TO DRILL 3/8" HOLES IN TOP OF STOP LOG CHANNELS AND PROVIDE TWO (2) PADDLE LOCKS TO LOCK THROUGH CHANNELS TO PREVENT LOGS FROM BEING LIFTED OUT WHEN LOCK IS IN PLACE.



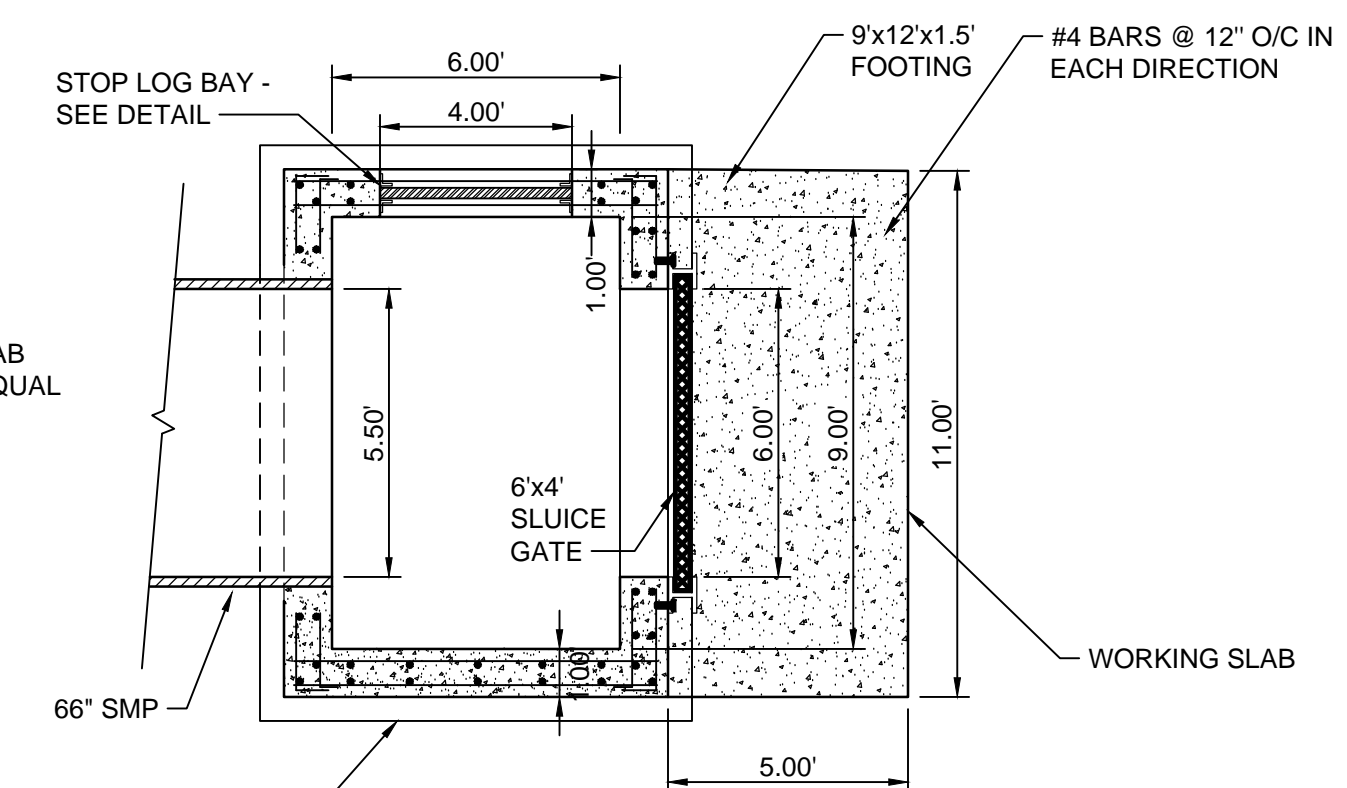
3 STOP LOG AND CHANNEL DETAIL
NTS

NOTE:
ALL STEEL GRATING AND ANGLE TO BE HOT DIP GALVANIZED. ALL ANCHORS TO BE STAINLESS STEEL. PROVIDE OWNER WITH SHOP DRAWINGS OF ALL WATER CONTROL STRUCTURE COMPONENTS FOR REVIEW PRIOR TO CONSTRUCTION.

NOTE:
SLUICE GATE TO BE SELF CONTAINED 6' WIDE BY 4' HIGH TO MOUNT ON STRUCTURE SURFACE AND COVER 6'X4' OPENING. COMPOSITE FRP GATE BODY WITH A MAX DEFLECTION L/360 AT 7' SEATING HEAD. STAINLESS STEEL FRAME AND OPERATING STEM. 2:1 LIFT WITH REMOVABLE HAND WHEEL TO BE PLACED AT 36" ABOVE GRATING OR AT LOCATION PER MANUFACTURER'S RECOMMENDATION. INSTALL PER MANUFACTURERS RECOMMENDATION.



SECTION
1/4"=1'-0"



PLAN
1/4"=1'-0"

1 WATER CONTROL STRUCTURE
NTS

**RICHARDS MARSH
DIKE RENOVATION**

IOWA DEPARTMENT OF
NATURAL RESOURCES

WARREN COUNTY, IOWA
DAS PROJECT # 8733.00

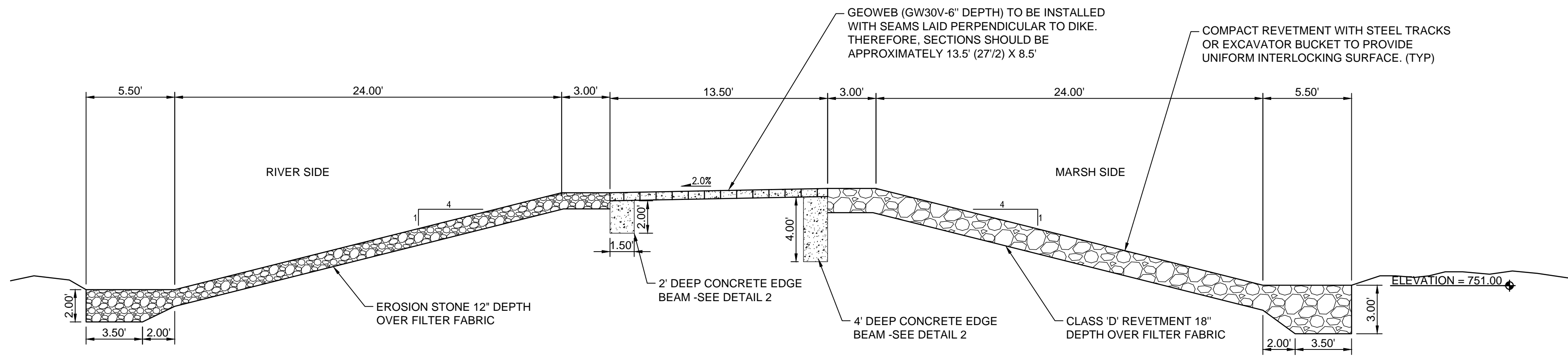
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DRAWN: JRM
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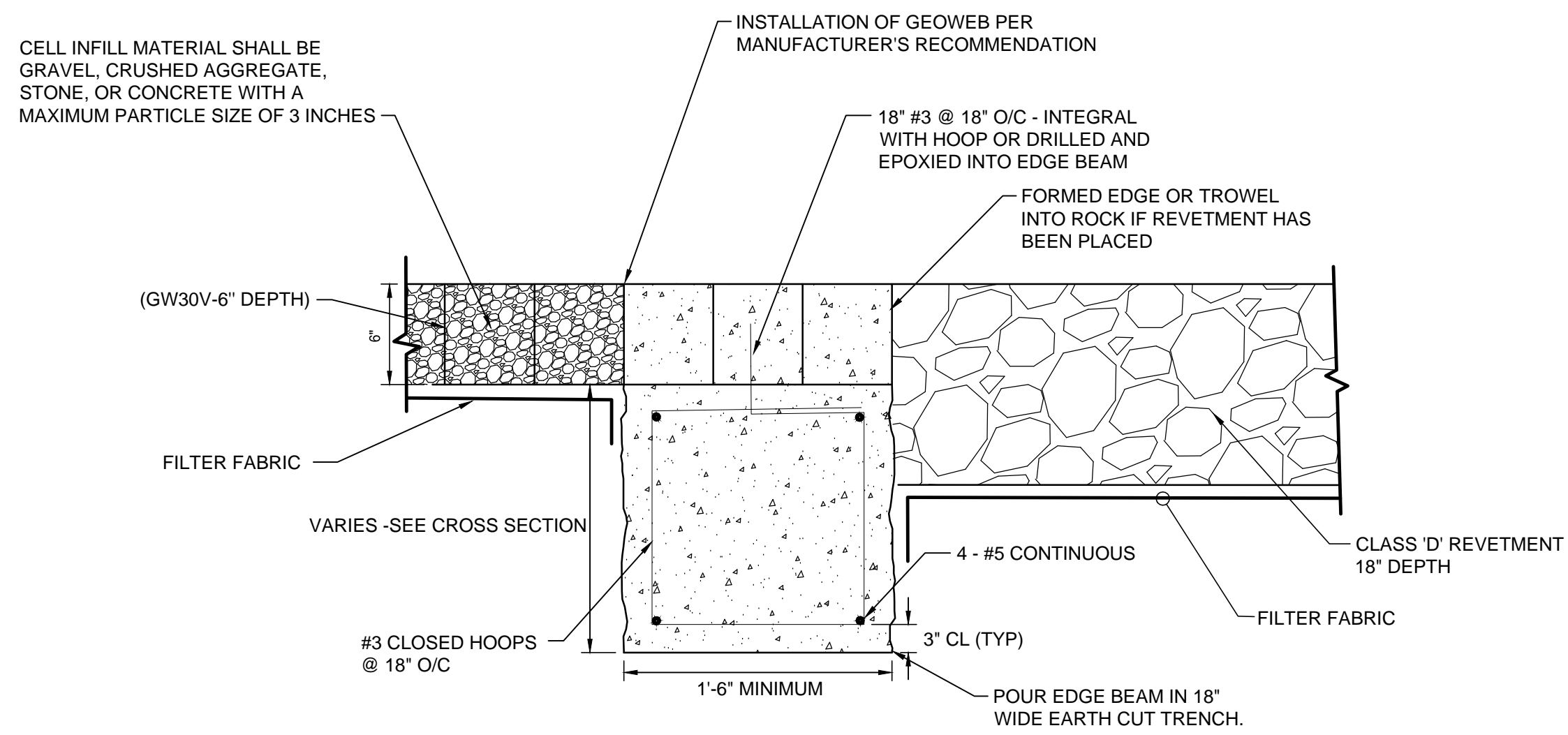
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**OVERFLOW STRUCTURE
DETAILS**

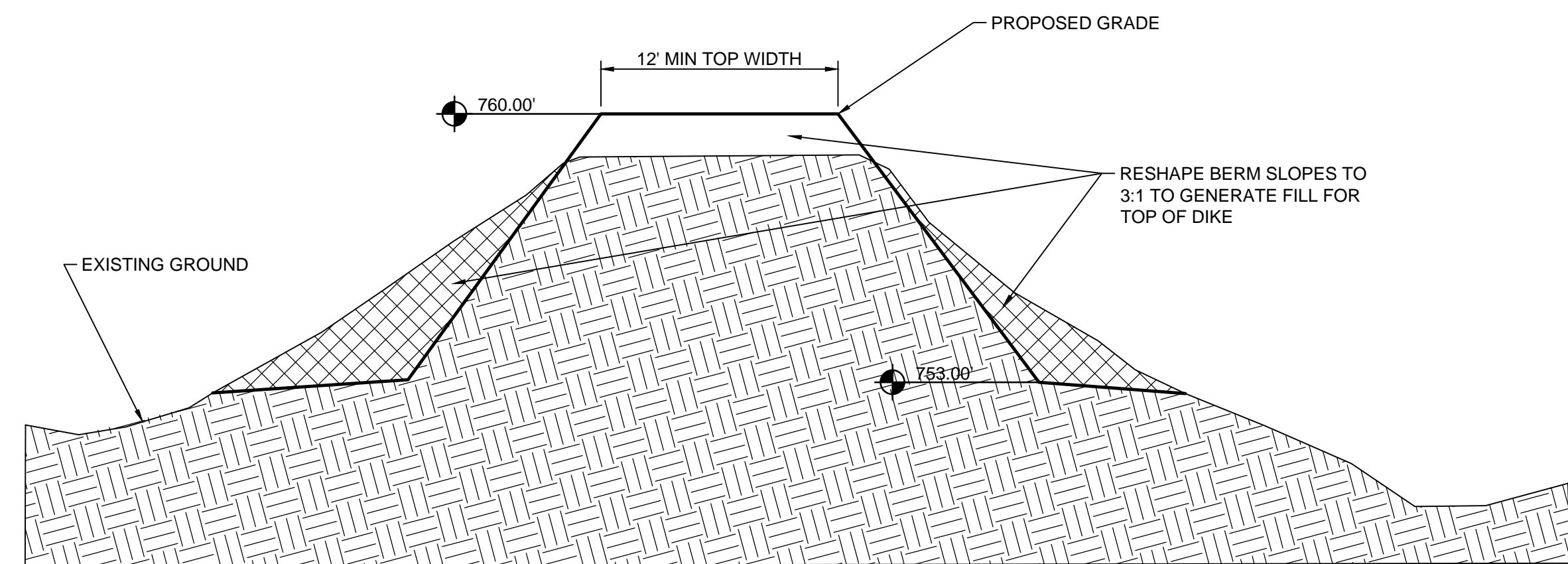
C2.02



7 TYPICAL SPILLWAY CROSS SECTION
NTS



6 CELLULAR CONFINEMENT SYSTEM EDGE BEAM
NTS



5 DIKE RECONSTRUCTION CROSS SECTION
NTS

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SPECIFICATIONS:

SITE PREPARATION

PART 1 GENERAL

1.1 SCOPE

A. SITE PREPARATION WORK SHALL CONSIST OF CLEARING, GRUBBING, STRIPPING, REFUSE REMOVAL, BANK SLOPING AND STRUCTURE REMOVAL ON THE SITE AS NECESSARY TO RID THE SITE OF ALL UNDESIRABLE MATERIALS ON OR NEAR THE SURFACE AND PREPARE THE SITE FOR THE STRUCTURE. ALL WOODY GROWTH WITHIN THE CONSTRUCTION AREA SHALL BE CLEARED AND ALL STUMPED AND ROOTS ONE INCH IN DIAMETER OR LARGER SHALL BE GRUBBED FROM THE SITE. THE WORK SHALL ALSO CONSIST OF THE REMOVAL AND DISPOSAL OF STRUCTURES (INCLUDING FENCES) THAT MUST BE REMOVED TO PERFORM OTHER ITEMS OF WORK.

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION

3.1 FOUNDATION PREPARATION

A. THE CONSTRUCTION AREAS SHALL BE STRIPPED OF ALL UNSUITABLE MATERIALS SUCH AS ORGANIC MATTER, GRASSES, WEEDS, SOD, DEBRIS, AND STONES LARGER THAN 6 INCHES IN DIAMETER.

B. IN AN EARTH EMBANKMENT FOUNDATION AREA, ALL CHANNEL BANKS AND SHARP BREAKS SHALL BE SLOPED TO NO STEEPER THAN 1.5 HORIZONTAL TO 1 VERTICAL.

C. THE FOUNDATION AREA SHALL BE THOROUGHLY SCARIFIED BEFORE PLACEMENT OF FILL MATERIAL. THE SURFACE SHALL HAVE MOISTURE ADDED OR SHALL BE COMPACTED IF NECESSARY SO THAT THE FIRST LAYER OF FILL MATERIAL CAN BE COMPACTED AND BONDED TO THE FOUNDATION.

3.2 STRIPPED MATERIAL DISPOSAL

A. SUITABLE SOIL MATERIAL SHALL BE STOCKPILED FOR USE AS TOPSOIL. THE OTHER STRIPPED MATERIALS SHALL BE BURIED, REMOVED FROM THE SITE, OR DISPOSED OF AS DIRECTED BY THE OWNER OR THE OWNER'S ENGINEER.

B. STOCKPILED MATERIALS AROUND A CONSTRUCTION SITE SHOULD BE PLACED SO AS NOT TO HINDER SUBSEQUENT CONSTRUCTION OPERATIONS.

END OF SECTION - SITE PREPARATION

EXCAVATION

PART 1 GENERAL

1.1 SCOPE

A. THE WORK SHALL CONSIST OF THE EXCAVATION REQUIRED BY THE DRAWINGS AND SPECIFICATIONS AND DISPOSAL OF THE EXCAVATED MATERIALS.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.1 USE OF EXECUTED MATERIALS

A. SUITABLE MATERIALS FROM THE SPECIFIED EXCAVATIONS SHALL BE USED IN THE CONSTRUCTION OF REQUIRED PERMANENT EARTH FILL. THE SUITABILITY OF MATERIALS FOR SPECIFIC PURPOSES SHALL BE DETERMINED BY THE OWNER.

3.2 DISPOSAL OF WASTE MATERIAL

A. ALL SURPLUS OR WASTE MATERIAL SHALL BE DISPOSED OF IN AREAS SHOWN ON THE DRAWINGS OR AS APPROVED BY THE OWNER'S ENGINEER. THE WASTE MATERIAL SHALL BE SMOOTHED AND SLOPED TO PROVIDE DRAINAGE.

3.3 STRUCTURE AND TRENCH EXCAVATION

A. STRUCTURE OR TRENCH EXCAVATIONS WILL CONFORM TO ALL SAFETY REQUIREMENTS OF OSHA.

END OF SECTION - EXCAVATION

EARTHFILL

PART 1 GENERAL

1.1 SCOPE

A. THE WORK SHALL CONSIST OF THE CONSTRUCTION OF EARTH FILLS REQUIRED BY THE DRAWINGS AND SPECIFICATIONS.

PART 2 PRODUCTS

2.1 MATERIALS

A. ALL FILL MATERIALS SHALL BE OBTAINED FROM REQUIRED EXCAVATIONS.

PART 3 EXECUTION

3.1 FOUNDATION PREPARATION

A. FOUNDATIONS FOR EARTHFILL SHALL BE STRIPPED TO REMOVE VEGETATION AND OTHER UNSUITABLE MATERIALS. FOUNDATION SURFACES SHALL BE SCARIFIED TO A MINIMUM DEPTH OF 2 INCHES.

B. FOUNDATION AND ABUTMENT SURFACES SHALL NOT BE SLOPED STEEPER THAN 1.5 HORIZONTAL TO 1 VERTICAL UNLESS OTHERWISE SHOWN ON THE DRAWINGS.

3.2 PLACEMENT

A. FILL SHALL NOT BE PLACED UNTIL THE REQUIRED EXCAVATION AND FOUNDATION PREPARATION HAVE BEEN COMPLETED AND THE FOUNDATION HAS BEEN INSPECTED AND APPROVED BY THE OWNER. FILL SHALL NOT BE PLACED UPON A FROZEN SURFACE, NOR SHALL SNOW, ICE, OR FROZEN MATERIAL BE INCORPORATED IN THE FILL.

B. ADJACENT TO STRUCTURES OR PIPES, FILL SHALL BE PLACED IN A MANNER WHICH WILL PREVENT DAMAGE. THE HEIGHT OF THE FILL ADJACENT TO STRUCTURES OR PIPES SHALL BE INCREASED AT APPROXIMATELY THE SAME RATE ON ALL SIDES.

END OF SECTION - EARTHFILL

C. THE MATERIALS USED THROUGHOUT THE EARTH FILL SHALL BE ESSENTIALLY UNIFORM. SELECTIVE PLACEMENT SHALL BE AS SHOWN ON THE DRAWINGS OR APPROVED BY THE OWNER'S ENGINEER.

D. IF THE SURFACE OF ANY LAYER BECOMES TOO HARD AND SMOOTH FOR PROPER BOND WITH THE SUCCEEDING LAYER, IT SHALL BE SCARIFIED TO A DEPTH OF NOT LESS THAN 2 INCHES BEFORE THE NEXT LAYER IS PLACED.

E. THE TOP SURFACES OF EMBANKMENTS SHALL BE MAINTAINED APPROXIMATELY LEVEL DURING CONSTRUCTION, EXCEPT THAT A CROSS-SLOPE OF APPROXIMATELY 2% SHALL BE MAINTAINED TO ENSURE EFFECTIVE DRAINAGE.

3.3 CONTROL OF MOISTURE CONTENT

A. THE MOISTURE CONTENT OF THE FILL MATERIAL SHALL BE ADEQUATE FOR OBTAINING THE REQUIRED COMPACTION. MATERIAL THAT IS TOO WET SHALL BE DRIED TO MEET THIS REQUIREMENT, AND MATERIAL THAT IS TOO DRY SHALL HAVE WATER ADDED AND MIXED UNTIL THE REQUIREMENT IS MET.

B. THE MOISTURE CONTENT OF THE FILL MATERIAL SHALL BE SUCH THAT A BALL FORMED WITH THE HANDS DOES NOT CRACK OR SEPARATE WHEN STRUCK SHARPLY WITH A PENCIL AND WILL EASILY RIBBON OUT BETWEEN THE THUMB AND FINGER.

C. EARTH FOUNDATIONS UNDER AND ADJACENT TO CONCRETE STRUCTURES SHALL BE PREVENTED FROM DRYING AND CRACKLING BEFORE CONCRETE AND BACKFILL ARE PLACED.

D. THE APPLICATION OF WATER TO THE FILL MATERIALS SHALL BE ACCOMPLISHED AT THE BORROW AREAS INSOFAR AS POSSIBLE.

3.4 COMPACTION

A. EARTH FILL SHALL BE PLACED AND SPREAD IN HORIZONTAL, LOOSE LIFTS. THE MAXIMUM THICKNESS OF A LIFT OF FILL BEFORE COMPACTION SHALL BE 9 INCHES, UNLESS OTHERWISE INDICATED ON THE DRAWINGS. COMPACTION SHALL BE ACCOMPLISHED WITH A SHEEP'S FOOT ROLLER MEETING IDOT SECTION 2001.05A, TAMPING-TYPE ROLLERS.

B. FILL ADJACENT TO STRUCTURE AND PIPE CONDUITS SHALL BE PLACED IN LAYERS NOT MORE THAN 4 INCHES THICK AND COMPACTED TO A DENSITY EQUIVALENT TO THAT OF A SURROUNDING FILL BY HAND TAMPING, MANUALLY DIRECTED POWER TAMPERS, OR PLATE VIBRATORS. CARE SHOULD BE TAKEN SO THAT COMPACTION AROUND THE SPILLWAY PIPE DOES NOT CAUSE UPLIFT OF THE PIPE RESULTING IN A VOID BENEATH THE PIPE. HAND TAMPING ONLY SHALL BE USED TO COMPACT THE EARTHFILL UNDER THE BOTTOM HALF OF CIRCULAR PIPES. EQUIPMENT SHALL NOT BE OPERATED WITHIN 2 FEET OF ANY STRUCTURE OR PIPE.

C. COMPACTING OF FILL ADJACENT TO CONCRETE STRUCTURES SHALL NOT BE STARTED UNTIL THE CONCRETE IS 7 DAYS OLD.

END OF SECTION - EARTHFILL

PIPE

PART 1 GENERAL

1.1 SCOPE

A. THE WORK SHALL CONSIST OF FURNISHING AND INSTALLING SMOOTH METAL PIPE (SMP) AS SHOWN ON THE DRAWINGS.

B. SUBMIT PRODUCT DATA TO OWNER FOR REVIEW.

PART 2 PRODUCTS

2.1 MATERIALS

A. SMOOTH METAL PIPE, SIZE AND WALL THICKNESS AS INDICATED ON DRAWINGS. USED PIPE IS ACCEPTABLE.

PART 3 EXECUTION

3.1 HANDLING AND STORAGE

A. PIPE SHALL BE DELIVERED TO THE JOB SITE AND HANDLED BY MEANS WHICH PROVIDE ADEQUATE SUPPORT TO THE PIPE AND DOES NOT SUBJECT IT TO UNDUE STRESSES OR DAMAGE. WHEN HANDLING AND PLACING PIPE, CARE SHALL BE TAKEN TO PREVENT IMPACT BLOWS.

3.2 TRENCHING

PIPE CONDUITS SHALL BE INSTALLED IN TRENCHES IN ACCORDANCE TO THE FOLLOWING METHOD:

A. BACKHOE CONSTRUCTED TRENCH - MATERIAL AND EXECUTION OF TRENCHED BACKFILL AROUND PIPE SHALL BE IN ACCORDANCE WITH EARTHFILL SPECIFICATIONS.

3.3 LAYING AND BEDDING THE PIPE

A. PIPE CONDUITS AND FITTINGS SHALL BE INSTALLED AS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN. THE PIPE SHALL BE LAID SO THAT THERE IS NO REVERSAL OF GRADE BETWEEN JOINTS, UNLESS OTHERWISE SHOWN THE DRAWINGS.

1. PIPE SHALL BE FIRMLY AND UNIFORMLY SUPPORTED THROUGHOUT THE ENTIRE LENGTH.

2. EARTH BEDDING. WHEN BEDDING IS SPECIFIED, THE PIPE SHALL BE FIRMLY AND UNIFORMLY BEDDED IN A SHAPED BEDDING GROOVE THAT CLOSELY CONFORMS TO THE BOTTOM OF THE PIPE FOR A DEPTH OF EQUAL TO A MINIMUM OF 1 INCH OR 5 PERCENT OF THE DIAMETER OF THE PIPE, WHICHEVER IS GREATER. THE BEDDING MATERIAL SHALL BE FREE OF ROCKS OR STONES GREATER THAN 0.5 INCH DIAMETER AND EARTH CLOUDS GREATER THAN 2 INCH DIAMETER.

3.4 BACKFILL

A. WITHIN 2 FEET OF THE PIPE, BACKFILL SHALL BE CAREFULLY PLACED AND COMPACTED BY MEANS OF HAND TAMPING OR MANUALLY DIRECTED POWER TAMPERS OR PLATE VIBRATORS TO FORM A CONTINUOUS UNIFORM SUPPORT AROUND THE PIPE. MAXIMUM THICKNESS OF LAYERS BEFORE COMPACTION WITHIN 2 FEET OF THE PIPE SHALL BE 4 INCHES AND AT MORE THAN 2 FEET FROM THE PIPE A MAXIMUM THICKNESS BEFORE COMPACTION SHALL BE 9 INCHES. UNLESS OTHERWISE SPECIFIED, THE INITIAL BACKFILL SHALL BE COMPACTED TO A DENSITY EQUIVALENT TO THAT OF THE ADJACENT FILL OR FOUNDATION MATERIALS.

END OF SECTION - PIPE

RIPRAP

PART 1 GENERAL

1.1 SCOPE

A. THE WORK SHALL CONSIST OF FURNISHING AND INSTALLING RIPRAP AS SHOWN ON THE DRAWINGS.

B. SUBMIT PRODUCT DATA TO OWNER FOR REVIEW.

PART 2 PRODUCTS

2.1 MATERIALS

A. FILTER FABRIC: COMPOSED OF A NON-WOVEN MATERIAL, CONFORMING TO IOWA DOT ARTICLE 4191.01B

B. RIP RAP: CONFORM TO IOWA DOT SECTION 4130 CLASS D REVETMENT GRADATION.

B.A. CONSIST OF SOUND AND DURABLE LIMESTONE, DOLOMITE, OR QUARTZITE

B.B. BROKEN CONCRETE OR RUBBLE IS NOT ACCEPTABLE

PART 3 EXECUTION

3.1 INSTALLATION

A. PREPARE SUBGRADE TO CROSS-SECTION AND GRADES AS SHOWN ON PLANS.

B. PLACE RIPRAP ON FILTER FABRIC OVERLAPPED A MINIMUM OF 6 INCHES.

END OF SECTION - RIPRAP

CONCRETE

PART 1 GENERAL

1.1 SCOPE

THIS SECTION INCLUDES THE REQUIREMENTS FOR THE CONCRETE USED IN CONCRETE EDGE BEAMS AND ANY CONCRETE WORK ASSOCIATED WITH THE WATER CONTROL STRUCTURE. MATERIALS, MIXING, AND EQUIPMENT FOR ALL CONCRETE WORK, UNLESS OTHERWISE SPECIFIED, SHALL CONFORM TO IOWA DEPARTMENT OF TRANSPORTATION SPECIFICATIONS FOR AIR-ENTRAINED TYPE C-4 MIX WITH TYPE I CEMENT.

PART 2 PRODUCTS

A. CONCRETE

A.A. COMPRESSIVE STRENGTH: 2800 PSI @ 7 DAYS AND 4000 PSI @ 28 DAYS

A.B. COARSE AGGREGATE DURABILITY SHALL BE CLASS II DURABILITY COMPLYING WITH IOWA DOT SECTION 4115

A.C. SLUMP: 0.5" TO 4"

A.D. AIR CONTENT: 8.0% ± 2.0%

A.E. REINFORCING STEEL: SHALL BE ASTM A615 GRADE 60, AND SHALL HAVE A PROTECTIVE COATING OF EPOXY APPLIED BY ELECTROSTATIC SPRAY METHOD IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM A775.

A.F. PROVIDE OWNERS REPRESENTATIVE WITH CONCRETE MIX DESIGN AND SUPPLIER FOR APPROVAL.

PART 3 EXECUTION NOT USED

END OF SECTION - CONCRETE



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