

BLANCHE PARK RESERVOIR DAM RECONSTRUCTION

DELTA COUNTY

WATER DIVISION 4

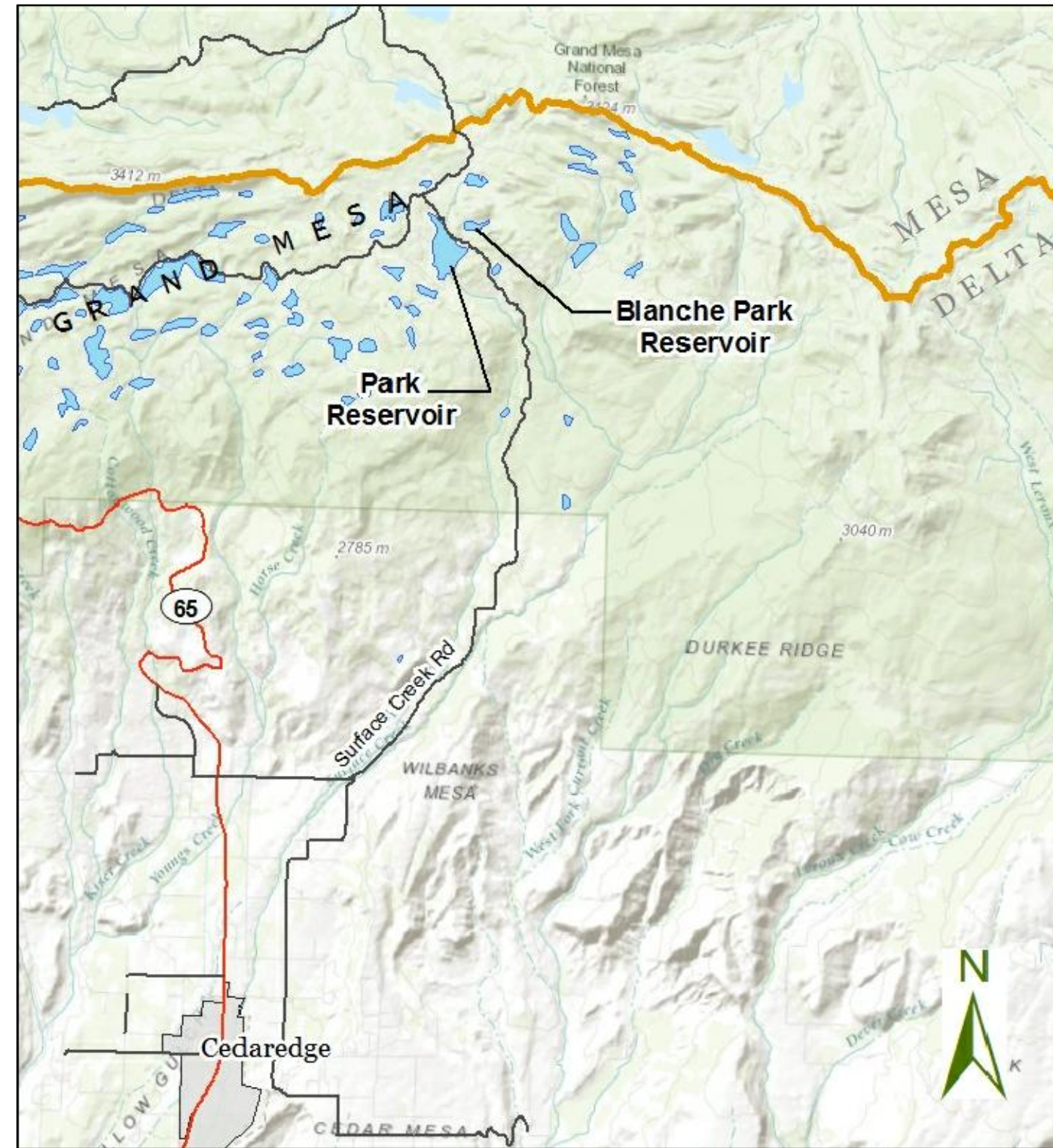
WATER DISTRICT 40

DAM I.D. NUMBER 400119

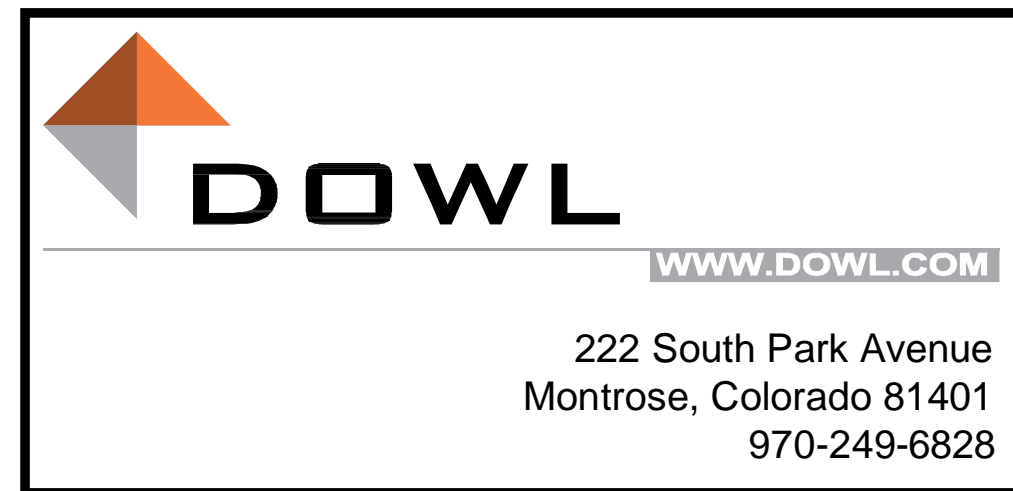
OWNER



P.O. BOX 129
CEDAREGE, CO 81413
SIGNATORY: AUSTIN M. KEISER, PRESIDENT



VICINITY MAP

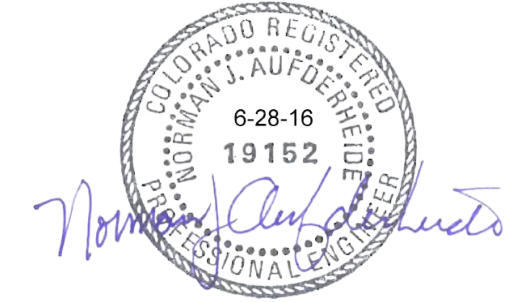


LIST OF DRAWINGS ARE CONTAINED ON SHEET 2.

I HEREBY DECLARE THAT THESE PLANS FOR THE BLANCHE PARK RESERVOIR DAM RECONSTRUCTION WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION FOR THE COLORADO DIVISION OF WATER RESOURCES AS OF THE

28TH DAY OF JUNE, 2016.

Norman J. Aufderheide
NORMAN J. AUFDERHEIDE, P.E.
COLORADO P.E. No. 19152



APPROVED ON THE ___ DAY OF ___, 20__.

STATE ENGINEER _____

WILLIAM T. MCCORMICK III, COLORADO P.E. No. 29127
CHIEF, DAM SAFETY BRANCH

THESE PLANS REPRESENT THE AS-CONSTRUCTED CONDITIONS OF BLANCHE PARK RESERVOIR DAM RECONSTRUCTION TO THE BEST OF OUR KNOWLEDGE AND JUDGMENT, BASED IN PART ON INFORMATION FURNISHED BY OTHERS AS OF THE

___ DAY OF ___, 20__.

NORMAN J. AUFDERHEIDE, P.E.
COLORADO P.E. No. 19152

COLORADO STATE ENGINEER FILE NUMBER

CONSTRUCTION FILE NO: **C-2011A**

SHEET 1

1 OF 15 SHEETS

SUMMARY OF ESTIMATED QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	TOTAL
1	SITE PREPARATION - STOCKPILE TOPSOIL	C.Y.	700
2	EXCAVATION (OLD DAM EMBANKMENT, OUTLET WORKS, TOE DRAIN TRENCH, & KEYWAY TRENCH)	C.Y.	2,700
3	EMBANKMENT BACKFILL	C.Y.	10,600
4	OUTLET WORKS	L.F.	130
5	INLET STRUCTURE	EACH	1
6	PRECAST OUTLET STRUCTURE	EACH	1
7	GATE CONTROL HAND WHEEL STRUCTURE, GATE AND STEM ASSEMBLY	L.F.	58
8	HEAVY RIPRAP (NOMINAL SIZE [d50] = 12" TO 18")	C.Y.	1120
9	SAND DIAPHRAGM AND OUTLET DRAIN PIPE	L.S.	1
10	6" Ø SLOTTED TOE DRAIN PIPE AND FILTER MATERIAL	L.F.	120
11	SPILLWAY CONCRETE WEIR	C.Y.	8
12	MOBILIZATION / DEMOBILIZATION	L.S.	1

- ① THESE QUANTITIES ARE FOR INFORMATION ONLY.
- ② INCLUDES CLEARING, GRUBBING, STRIPPING, STOCKPILING OF TOPSOIL AND SURFACE PREPARATION.
- ③ INCLUDES BORROW AREA PROCESSING AND RECLAMATION, HAUL, MATERIAL COMPACTION, AND PLACEMENT OF TOPSOIL.
- ④ INCLUDES STRUCTURE EXCAVATION AND BACKFILL, FURNISHING AND PLACING OF FILTER MATERIAL AND PIPE COMPLETE-IN-PLACE.

MATERIAL TESTING SCHEDULE				
THE ENGINEER MAY TEST ANY LIFT OF FILL AT ANY TIME, LOCATION, OR ELEVATION. THE CONTRACTOR MUST NOTIFY THE ENGINEER AND ENSURE THAT THE MINIMUM TESTING FREQUENCY IS OBTAINED PER THE FOLLOWING TABLE:				
ZONE	MATERIAL*	PLACEMENT REQUIREMENTS	GRADATION TEST	TESTING FREQUENCY
EMBANKMENT FILL	ON-SITE REUSE OR MILITARY PARK STOCKPILE IMPORT	95% STD. PROCTOR, 0 TO 4% OPT MOISTURE	-200 SIEVE	ONE/2000 C.Y.
			ATTERBRG LIMITS	ONE/2000 C.Y.
STILLING BASIN RIPRAP	NATIVE STONE	DUMPED AND MACHINE ADJUSTED		N/A
DRAIN	FILTER MATERIAL	65-75% RELATIVE DENSITY PER ASTM 4253/54	SIEVE ANALYSIS	AS DETERMINED BY THE ENGINEER

* SEE BOUND SPECIFICATIONS FOR DETAILED MATERIAL DESCRIPTIONS

LEGEND

- EXISTING DAM EMBANKMENT REMOVAL
- PROPOSED RIPRAP, SEE PLAN FOR SIZE
- LIMITS OF EXCAVATION
- LIMITS OF EMBANKMENT FILL
- EXISTING CONTOURS
- PROPOSED CONTOURS

ABBREVIATIONS

- | | | | |
|----------|-------------------------|--------|----------------------------------|
| APPROX. | - APPROXIMATE | MH | - MANHOLE |
| AP | - ANGLE POINT | MAT. | - MATERIAL |
| @ | - AT | MAX. | - MAXIMUM |
| & | - AND | MIN. | - MINIMUM |
| CO | - CLEAN OUT | MISC. | - MISCELLANEOUS |
| CLR. | - CLEAR | N | - NORTHING |
| ⊕ | - CENTERLINE | N.I.C. | - NOT IN CONTRACT |
| CH | - CHORD | N.T.S. | - NOT TO SCALE |
| CH L | - CHORD LENGTH | O.C. | - ON CENTER |
| CMP | - CORRUGATED METAL PIPE | OW STA | - OUTLET WORKS STATIONING |
| CONC. | - CONCRETE | P.C. | - POINT OF CURVE |
| CONT. | - CONTINUOUS | P.C.C. | - POINT OF COMPOUND CURVE |
| CP | - CONTROL POINT | P.I. | - POINT OF INTERSECTION |
| CRWN | - CROWN | P.T. | - POINT OF TANGENCY |
| CY | - CUBIC YARDS | P.V.C. | - POLYVINYL CHLORIDE |
| D50 | - DIAMETER OF 50% | P.V.I. | - POINT OF VERTICAL INTERSECTION |
| DIA. Ø | - DIAMETER | R | - RADIUS |
| DIM. | - DIMENSION | RD STA | - ROAD STATIONING |
| DIST. | - DISTANCE | REINF. | - REINFORCING |
| DWG. | - DRAWING | REQD. | - REQUIRED |
| E | - EASTING | SCH. | - SCHEDULE |
| E.F. | - EACH FACE | SHT. | - SHEET |
| EL. | - ELEVATION | SP STA | - SPILLWAY STATIONING |
| ELEV. | - ELEVATION | SPEC. | - SPECIFICATIONS |
| EQ. | - EQUAL | SS | - STAINLESS STEEL |
| EXIST. | - EXISTING | STA. | - STATION |
| E.W. | - EACH WAY | STD. | - STANDARD |
| FIN. GRD | - FINISHED GRADE | S.Y. | - SQUARE YARD |
| FL | - FLOWLINE | TYP. | - TYPICAL |
| FT | - FOOT (FEET) | U.B.C. | - UNIFORM BUILDING CODE |
| GALV | - GALVANIZED | U.N.O. | - UNLESS NOTED OTHERWISE |
| G.B. | - GRADE BREAK | VAR. | - VARIES |
| HORZ. | - HORIZONTAL | VERT. | - VERTICAL |
| HWL | - HIGH WATER LINE | V.C. | - VERTICAL CURVE |
| IN | - INCH | V.P.I. | - VERTICAL POINT OF INTERSECTION |
| INV | - INVERT | V.P.T. | - VERTICAL POINT OF TANGENCY |
| L | - LENGTH (ARC LENGTH) | V-PAN | - VALLEY PAN |
| LF | - LINEAR FOOT | W/ | - WITH |
| L.P. | - LOW POINT | W.W.F. | - WELDED WIRE FABRIC |
| LS | - LUMP SUM | | |

FINE FILTER MEDIA GRADATION SPECIFICATION

SIEVE SIZE	% PASSING (BY DRY WT)
3/4 INCH	100
3/8 INCH	100
#4	95-100
#8	80-100
#16	50-85
#30	25-60
#50	5-30
#100	0-10
#200	0-2

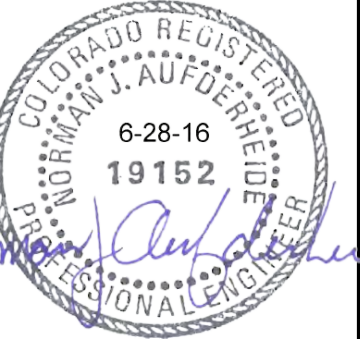
SHEET INDEX

- 1 COVER SHEET
- 2 GENERAL NOTES, QUANTITIES, LEGEND AND SHEET INDEX
- 3 RESERVOIR SITE PLAN
- 4 DAM SITE PLAN
- 5 EXCAVATION PLAN AND PROFILE
- 6 EXCAVATION AND DAM CROSS-SECTIONS
- 7 OUTLET WORKS PLAN AND PROFILE
- 8 OUTLET WORKS DETAILS
- 9 FILTER SAND DIAPHRAGM DETAILS
- 10 INLET STRUCTURE DETAILS
- 11 OUTLET STRUCTURE DETAILS
- 12 SUPPORT STRUCTURES AND GATE STEM DETAILS
- 13 SPILLWAY PLAN AND PROFILE, SECTIONS AND DETAILS
- 14 TOE DRAIN PLAN, PROFILE AND DETAILS
- 15 TOE DRAIN CROSS-SECTIONS

GENERAL NOTES

1. THESE CONSTRUCTION DRAWINGS ARE SUPPLEMENTED WITH THE BOUND TECHNICAL SPECIFICATIONS FOR THE BLANCHE PARK DAM REPAIR. AN ENGINEER SEALED COPY OF BOTH DOCUMENTS MUST BE MAINTAINED AT THE JOBSITE DURING ALL PHASES OF CONSTRUCTION. BOTH DOCUMENTS MUST ALSO CONTAIN APPROVAL STATEMENTS SIGNED AND SEALED BY THE STATE ENGINEER.
2. THIS PROJECT FALLS UNDER THE COLORADO STATE ENGINEER'S OFFICE FOR DAM SAFETY RULES AND REGULATIONS FOR JURISDICTIONAL EMBANKMENT DAMS. THE CONTRACTOR, BY STARTING THIS PROJECT, ACKNOWLEDGES THAT HE IS FULLY AWARE OF THE CURRENTLY ADOPTED RULES AND REGULATIONS AND HOW THEY PERTAIN TO THEIR CONSTRUCTION PRACTICES AND SCHEDULING.
3. THE OWNER WILL PROVIDE MATERIAL TESTING, CONSTRUCTION, ENGINEERING OVERSIGHT, INSPECTION, AND CONTROL SURVEYING AS PER THE PLANS.
4. THE CONTRACTOR IS TO PROVIDE A STORM WATER MANAGEMENT PLAN, A TRAINED STORMWATER PLAN MANAGER, AND MAINTAIN THE PLAN ELEMENTS AT ALL SITES RELATED TO THE CONSTRUCTION PROJECT UNTIL FINAL PAYMENT AND RELEASE IS MADE. A COPY OF THE PLAN SHALL BE PROVIDED TO THE ENGINEER FOR REVIEW AND APPROVAL. THE PLAN WILL THEN BE PROVIDED TO THE OWNER FOR INCLUSION IN THE MASTER STORMWATER MANAGEMENT PLAN FOR THE BLANCHE PARK DAM REPAIR. THE STORMWATER MANAGEMENT PLAN SHALL ALSO INCLUDE HOW DUST CONTROL WILL BE MAINTAINED.
5. ALL CHANGE ORDERS MUST BE APPROVED BY THE STATE ENGINEER'S OFFICE OF COLORADO AS WELL AS THE PROJECT ENGINEER. THIS WILL NECESSITATE A LONGER PERIOD FOR REVIEW AND APPROVALS.
6. PRIOR TO PLACING ANY EMBANKMENT FILL, THE EXPOSED SUBGRADES SHOULD BE SCARIFIED TO A MINIMUM DEPTH OF 12 INCHES, MOISTURE CONDITIONED TO 1-4% OVER OPTIMUM AND COMPACTIONED TO A MINIMUM RELATIVE COMPACTION OF 95% OF STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D698). EMBANKMENT FILL SHOULD BE PLACED IN LOOSE LIFTS WITH THICKNESS OF 8 INCHES OR LESS, MOISTURE CONDITIONED TO 1-4% OVER OPTIMUM AND COMPACTIONED TO A MINIMUM RELATIVE COMPACTION OF 95% OF STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D698). THE FILL SHOULD BE PROCESSED TO A "UNIFORM" MOISTURE CONTENT PRIOR TO PLACEMENT.
7. BASED ON THE DESIGN CONFIGURATION AND STABILITY ANALYSIS, WE ARE RECOMMENDING THAT THE EMBANKMENT MATERIAL CONTAIN AT LEAST 35% FINES, LESS THAN 10% GRAVEL WITH MAXIMUM PARTICLE SIZE OF 4 INCHES, AND HAVE A LIQUID LIMIT BETWEEN 40 AND 50 AND A PLASTICITY INDEX BETWEEN 20 AND 30.

REV	DATE	DESCRIPTION



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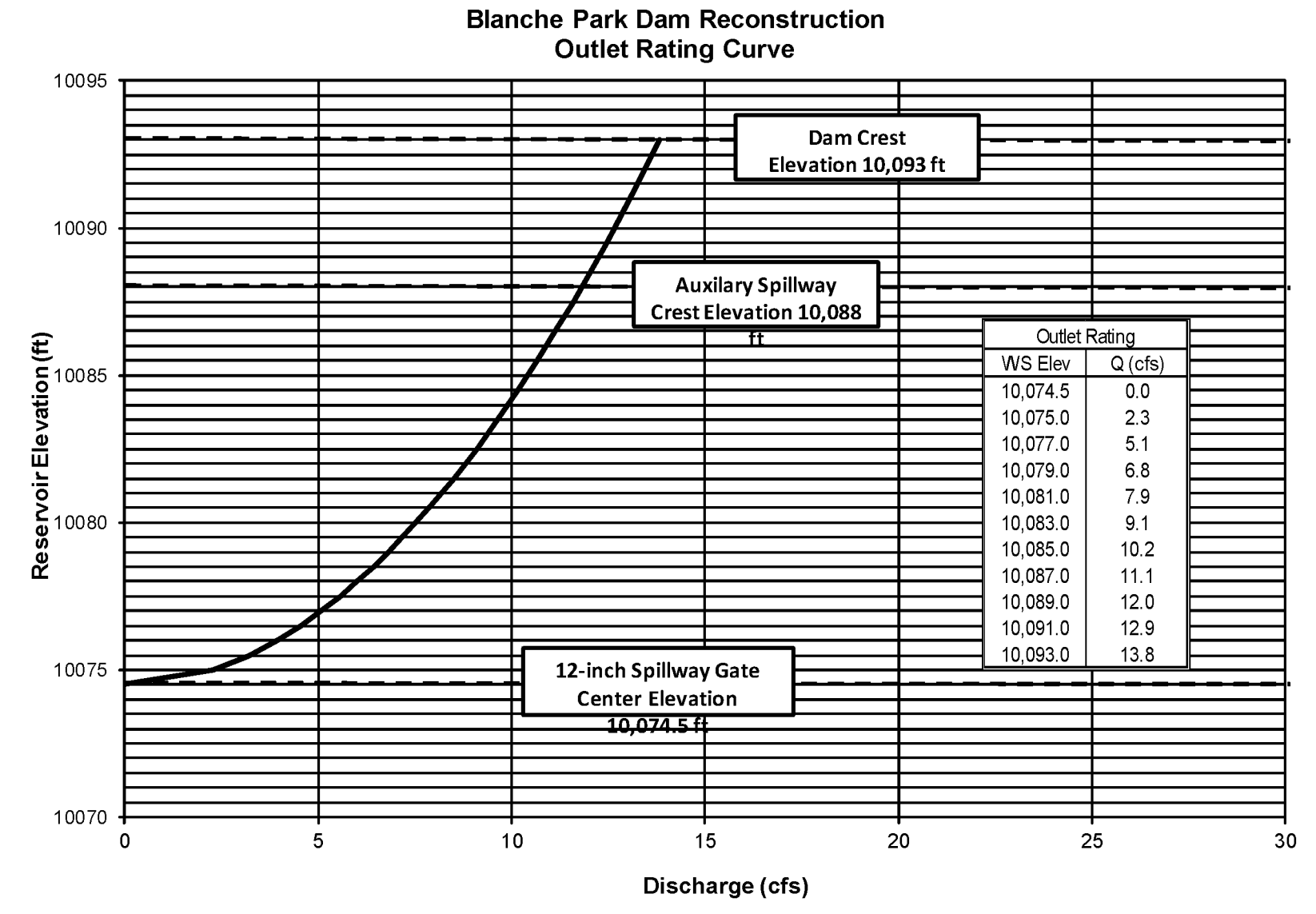
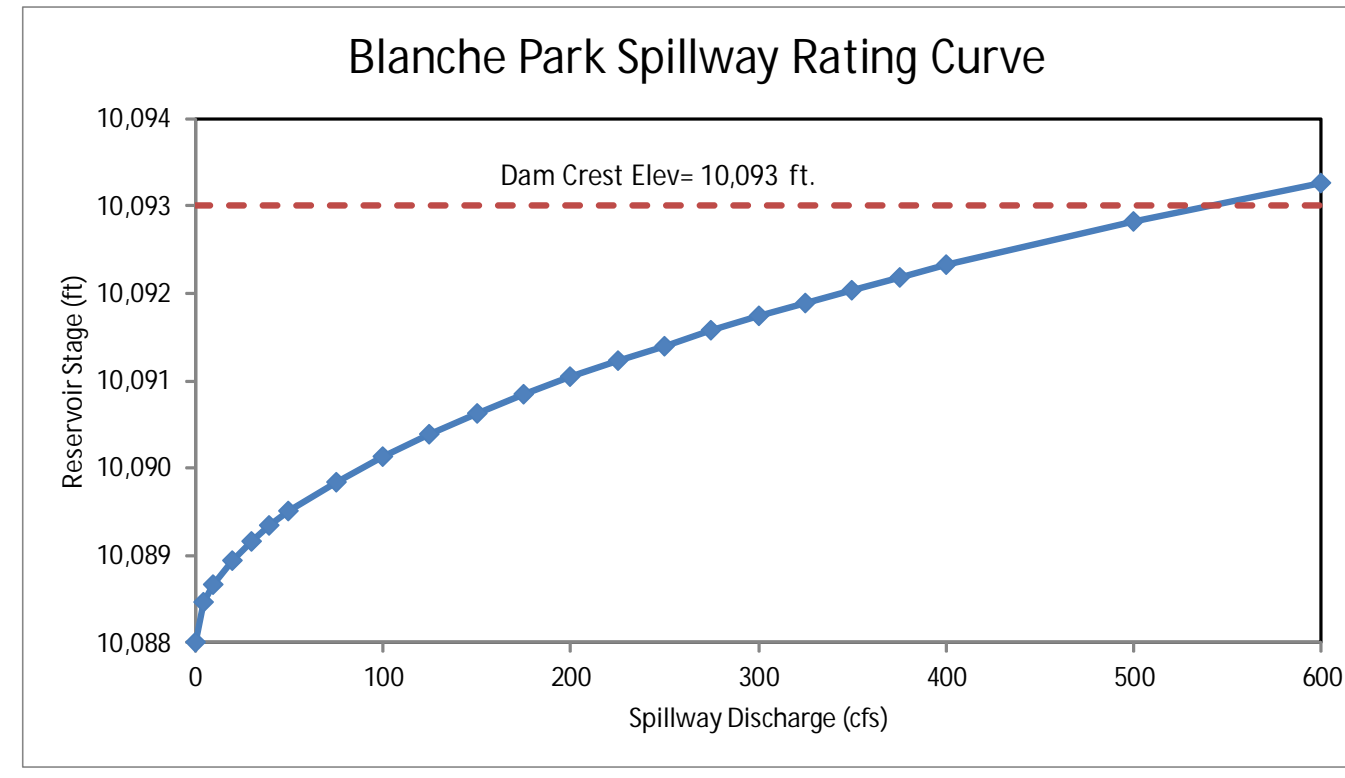
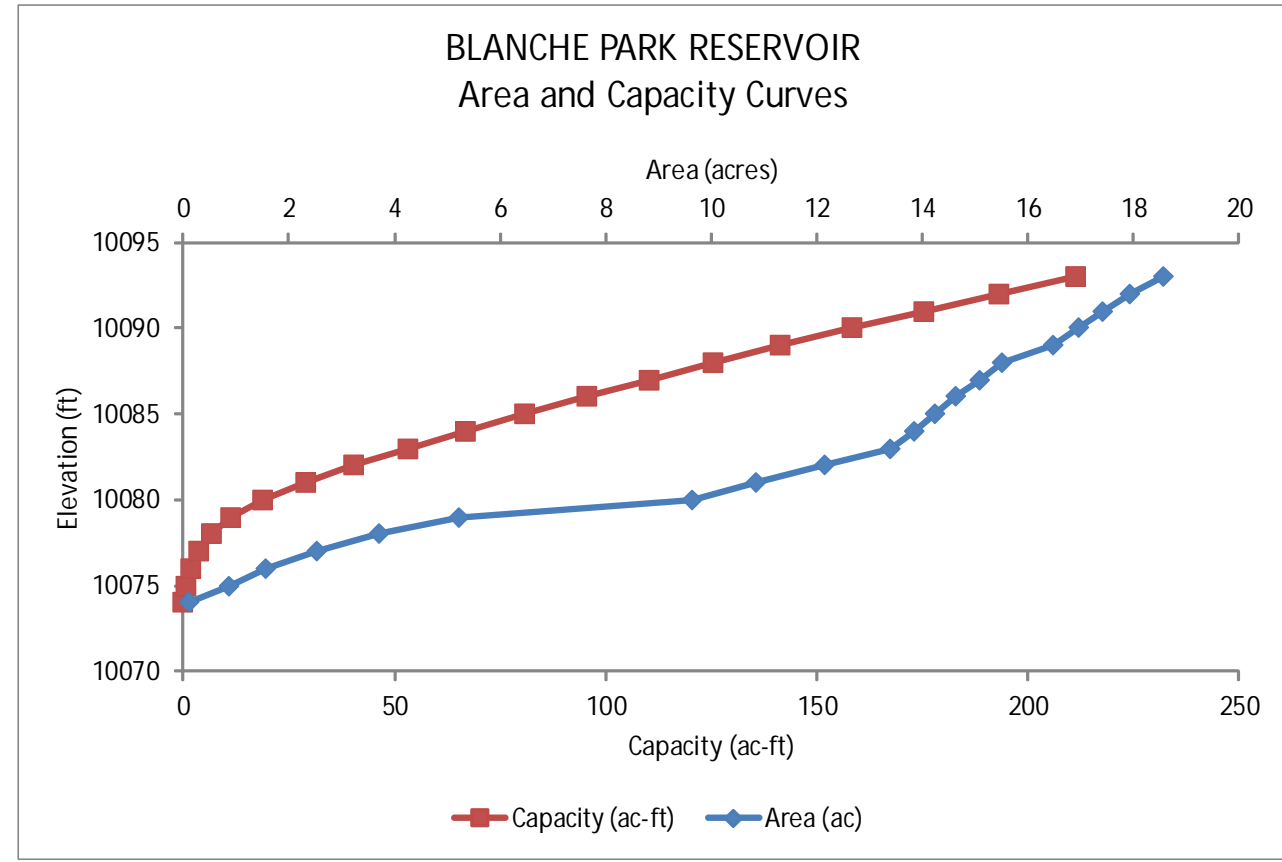
BLANCHE PARK RESERVOIR
 DAM RECONSTRUCTION
 GENERAL NOTES, QUANTITIES, LEGEND
 AND SHEET INDEX

PROJECT 22-74081
 DATE 06/27/16

COLORADO STATE ENGINEER FILE NUMBER

C-2011A SHEET 2
 2 OF 15

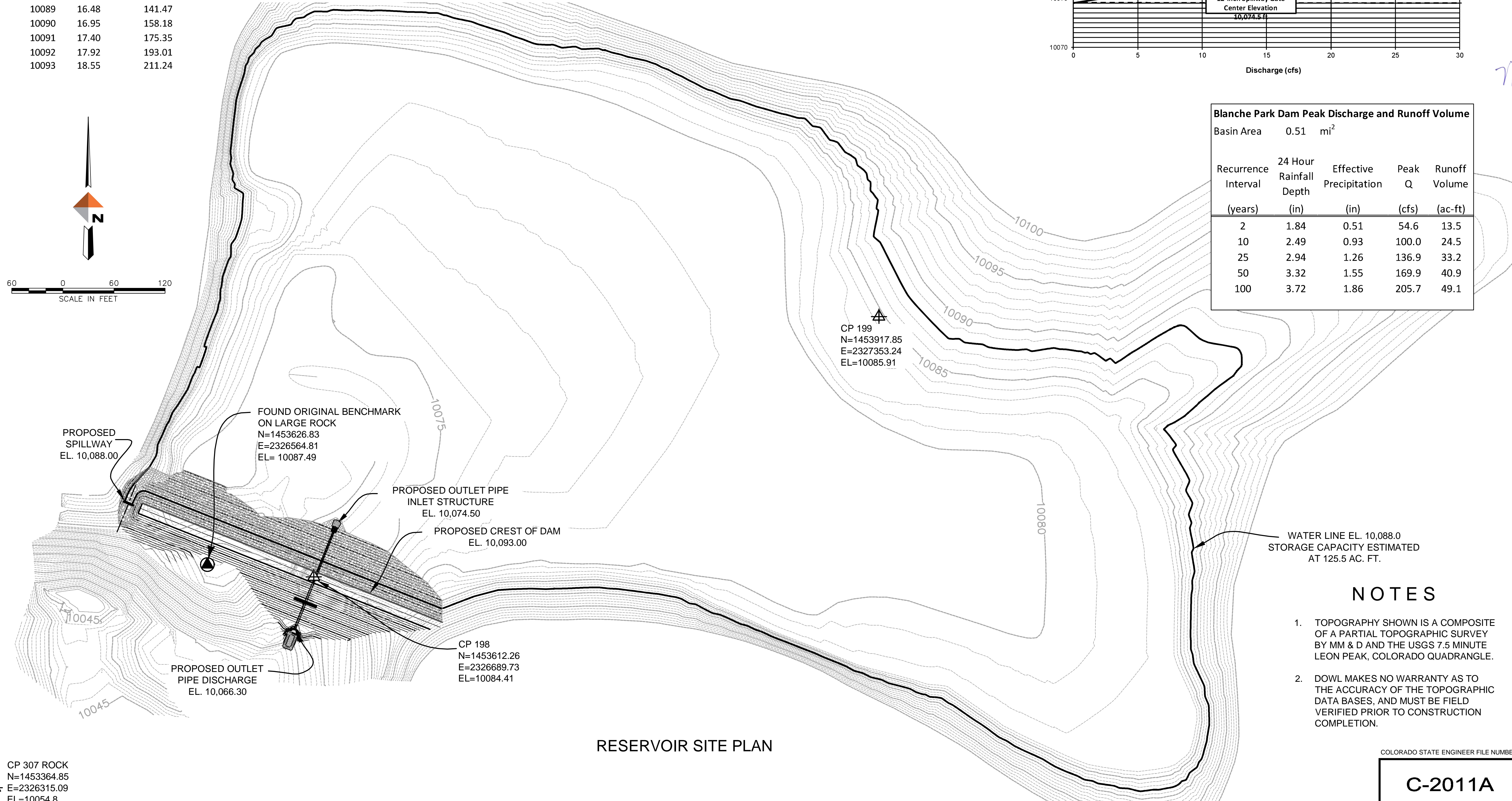
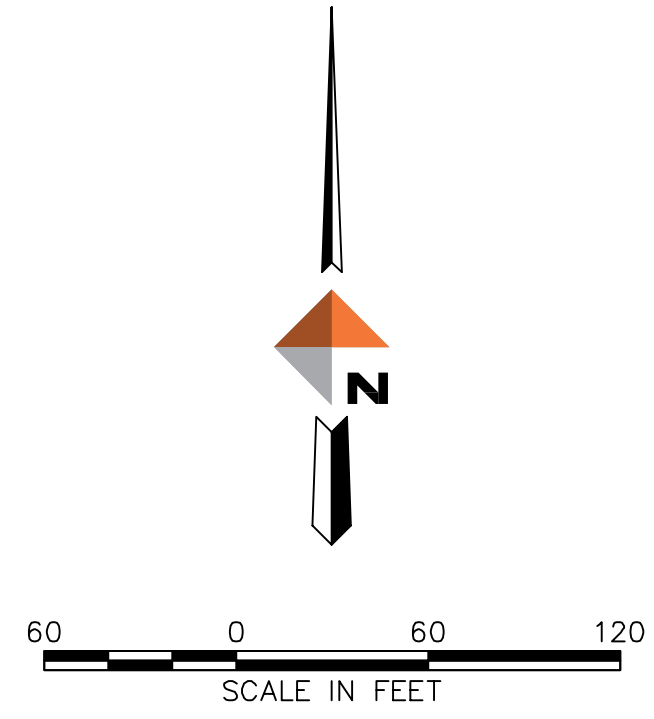
Elev (ft)	Area (ac)	Acc. Storage (ac-ft)
10074	0.12	0.00
10075	0.87	0.49
10076	1.55	1.70
10077	2.52	3.74
10078	3.70	6.85
10079	5.22	11.32
10080	9.65	18.75
10081	10.85	29.00
10082	12.15	40.50
10083	13.38	53.27
10084	13.84	66.88
10085	14.23	80.91
10086	14.64	95.35
10087	15.07	110.20
10088	15.50	125.48
10089	16.48	141.47
10090	16.95	158.18
10091	17.40	175.35
10092	17.92	193.01
10093	18.55	211.24



Blanche Park Dam Peak Discharge and Runoff Volume

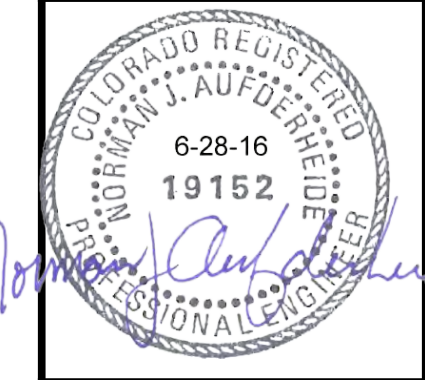
Basin Area 0.51 mi²

Recurrence Interval (years)	24 Hour Rainfall Depth (in)	Effective Precipitation (in)	Peak Q (cfs)	Runoff Volume (ac-ft)
2	1.84	0.51	54.6	13.5
10	2.49	0.93	100.0	24.5
25	2.94	1.26	136.9	33.2
50	3.32	1.55	169.9	40.9
100	3.72	1.86	205.7	49.1



- NOTES**
- TOPOGRAPHY SHOWN IS A COMPOSITE OF A PARTIAL TOPOGRAPHIC SURVEY BY MM & D AND THE USGS 7.5 MINUTE LEON PEAK, COLORADO QUADRANGLE.
 - DOWL MAKES NO WARRANTY AS TO THE ACCURACY OF THE TOPOGRAPHIC DATA BASES, AND MUST BE FIELD VERIFIED PRIOR TO CONSTRUCTION COMPLETION.

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BLANCHE PARK RESERVOIR DAM RECONSTRUCTION RESERVOIR SITE PLAN

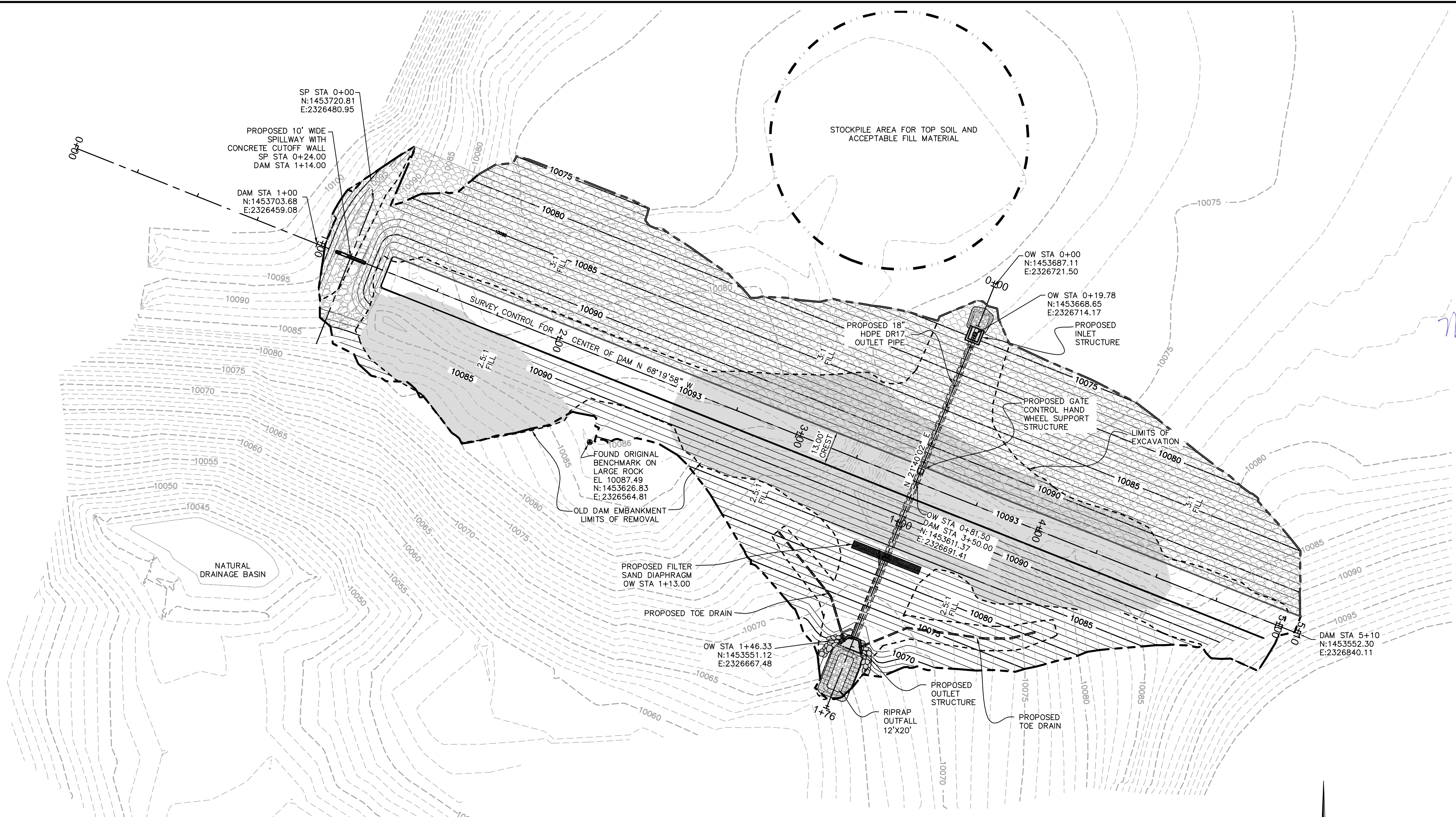
DELTA COUNTY COLORADO

PROJECT 22-74081
 DATE 06/27/16

COLORADO STATE ENGINEER FILE NUMBER

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CP 307 ROCK
 N=1453364.85
 E=2326315.09
 EL=10054.8



NOTES

- DAM STA = CENTERLINE OF DAM STATIONING
- SP STA = CENTERLINE OF SPILLWAY STATIONING
- OW STA = CENTERLINE OF OUTLET WORKS STATIONING
- RD STA = CENTERLINE OF DAM ACCESS ROAD STATIONING
- REFER TO SHEET 2 FOR LEGEND
- REFER TO SHEET 3 FOR ADDITIONAL CONTROL POINTS

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**BLANCHE PARK RESERVOIR
 DAM RECONSTRUCTION
 DAM SITE PLAN**

COLORADO
 DELTA COUNTY

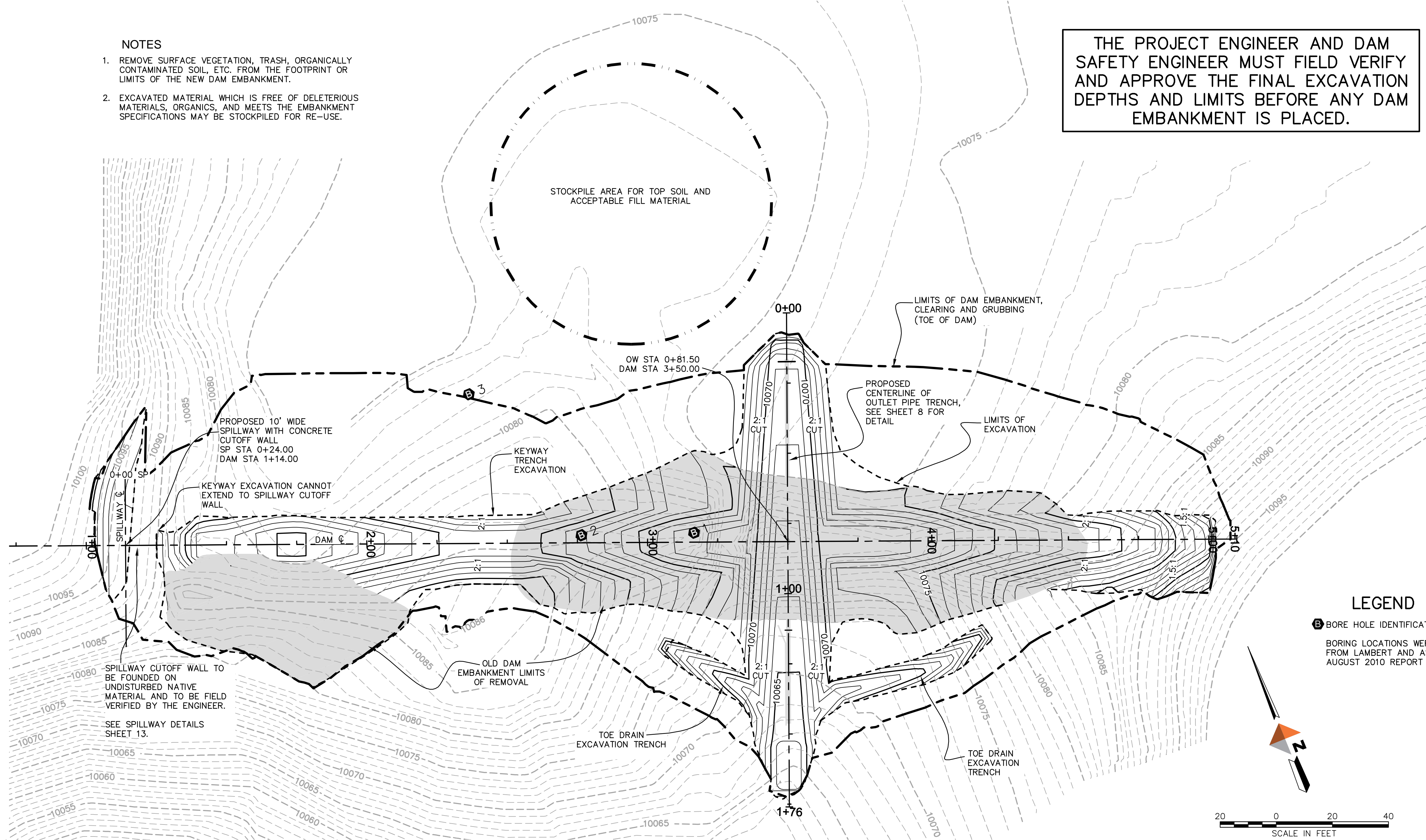
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NOTES

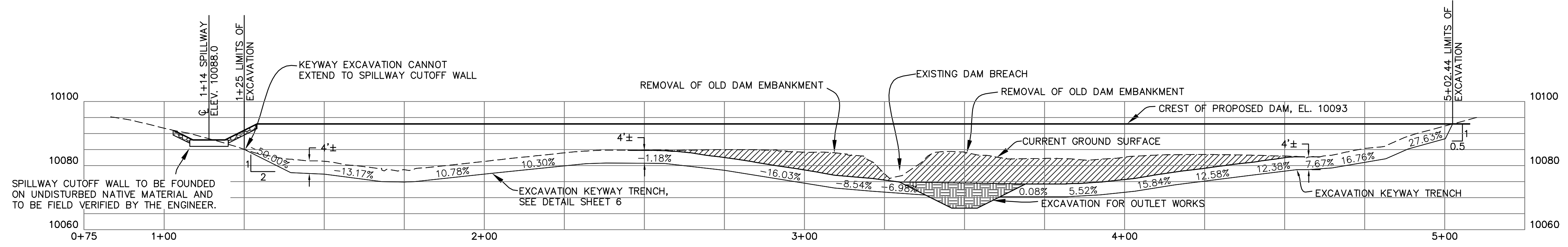
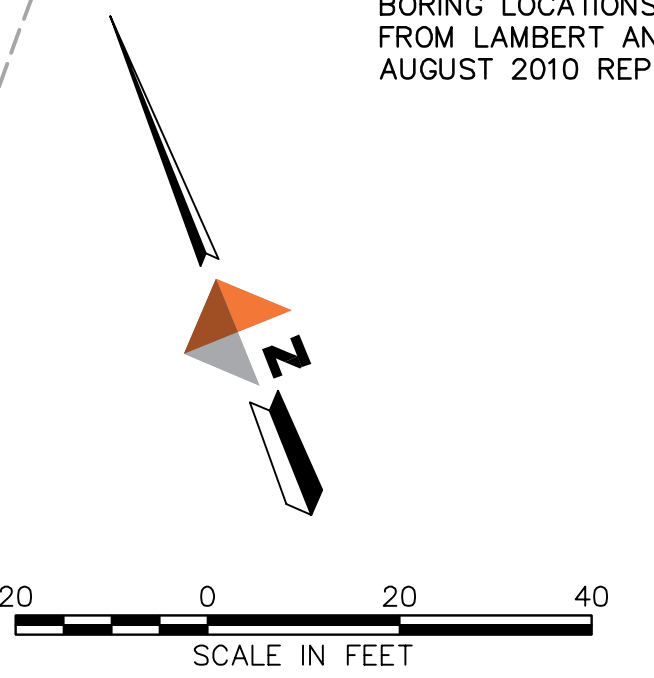
- 1. REMOVE SURFACE VEGETATION, TRASH, ORGANICALLY CONTAMINATED SOIL, ETC. FROM THE FOOTPRINT OR LIMITS OF THE NEW DAM EMBANKMENT.
- 2. EXCAVATED MATERIAL WHICH IS FREE OF DELETERIOUS MATERIALS, ORGANICS, AND MEETS THE EMBANKMENT SPECIFICATIONS MAY BE STOCKPILED FOR RE-USE.

THE PROJECT ENGINEER AND DAM SAFETY ENGINEER MUST FIELD VERIFY AND APPROVE THE FINAL EXCAVATION DEPTHS AND LIMITS BEFORE ANY DAM EMBANKMENT IS PLACED.



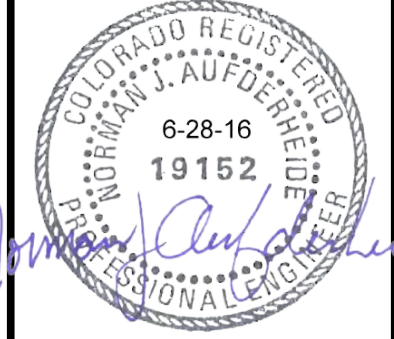
LEGEND

- Ⓟ BORE HOLE IDENTIFICATION
- BORING LOCATIONS WERE ESTIMATED FROM LAMBERT AND ASSOCIATES AUGUST 2010 REPORT



PROFILES ALONG CENTERLINE OF DAM FOR TOP OF DAM, OUTLET WORKS EXCAVATION AND KEYWAY TRENCH

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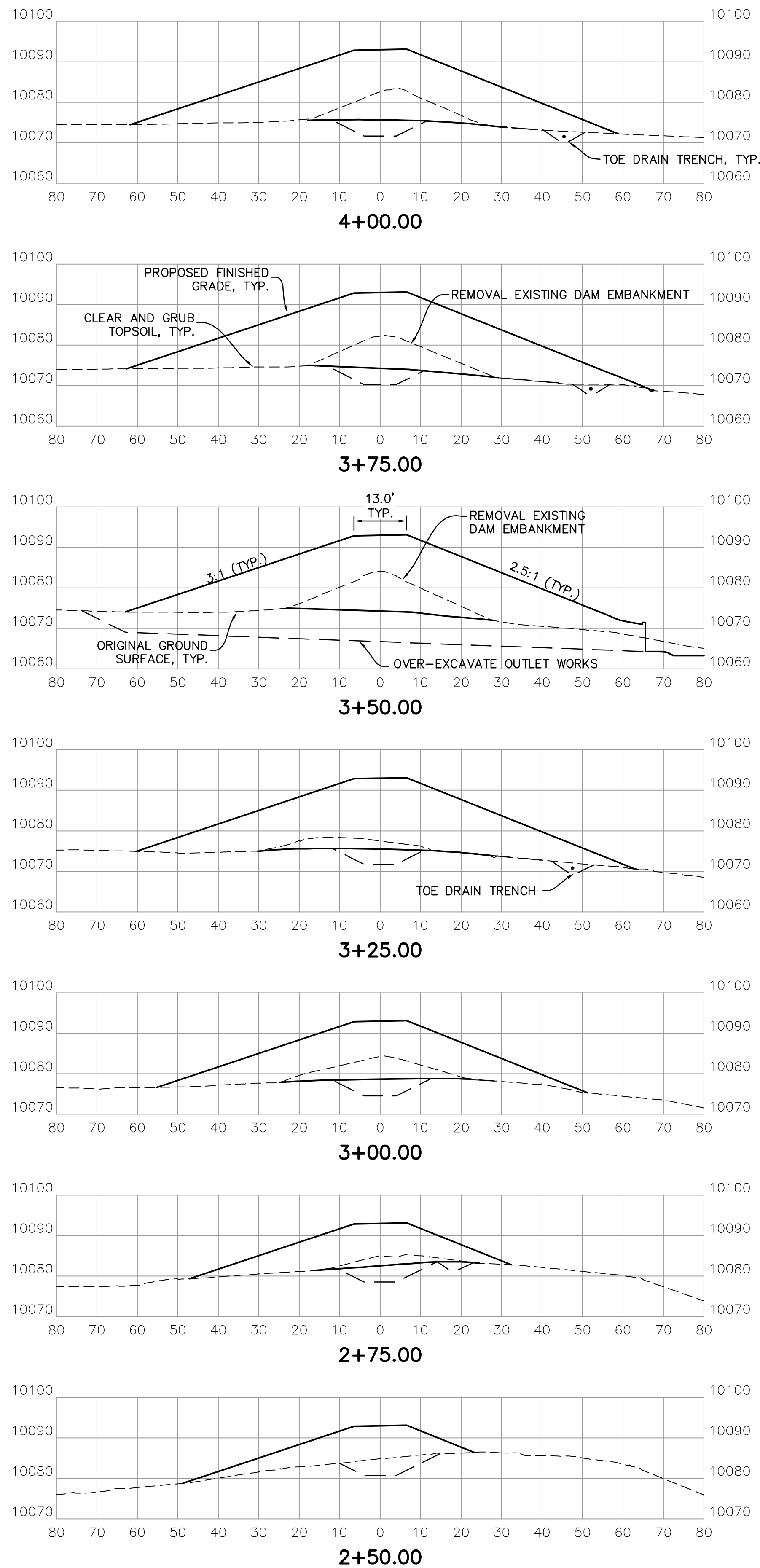
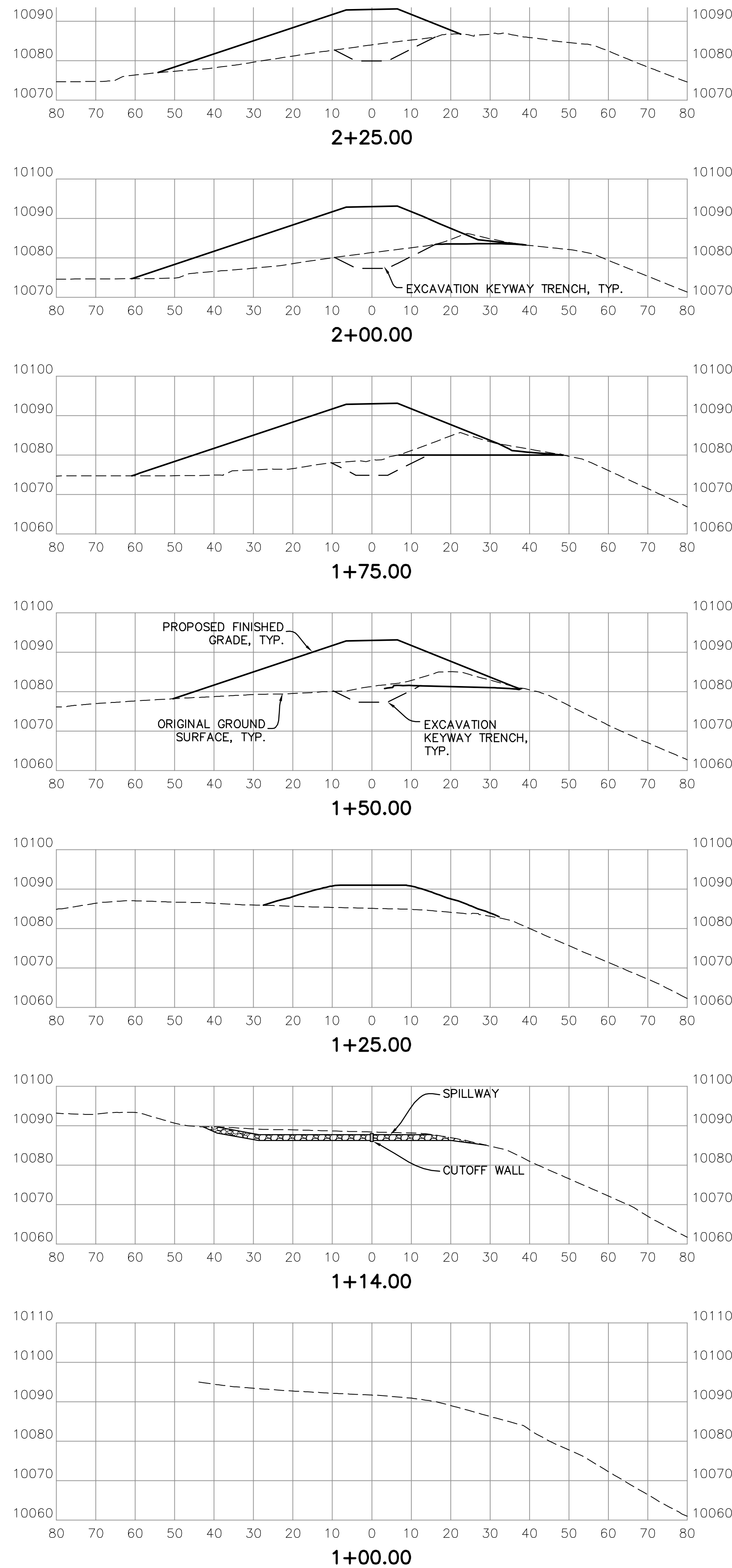
BLANCHE PARK RESERVOIR
 DAM RECONSTRUCTION
 EXCAVATION PLAN AND PROFILE

PROJECT 22-74081
 DATE 06/27/16

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C-2011A

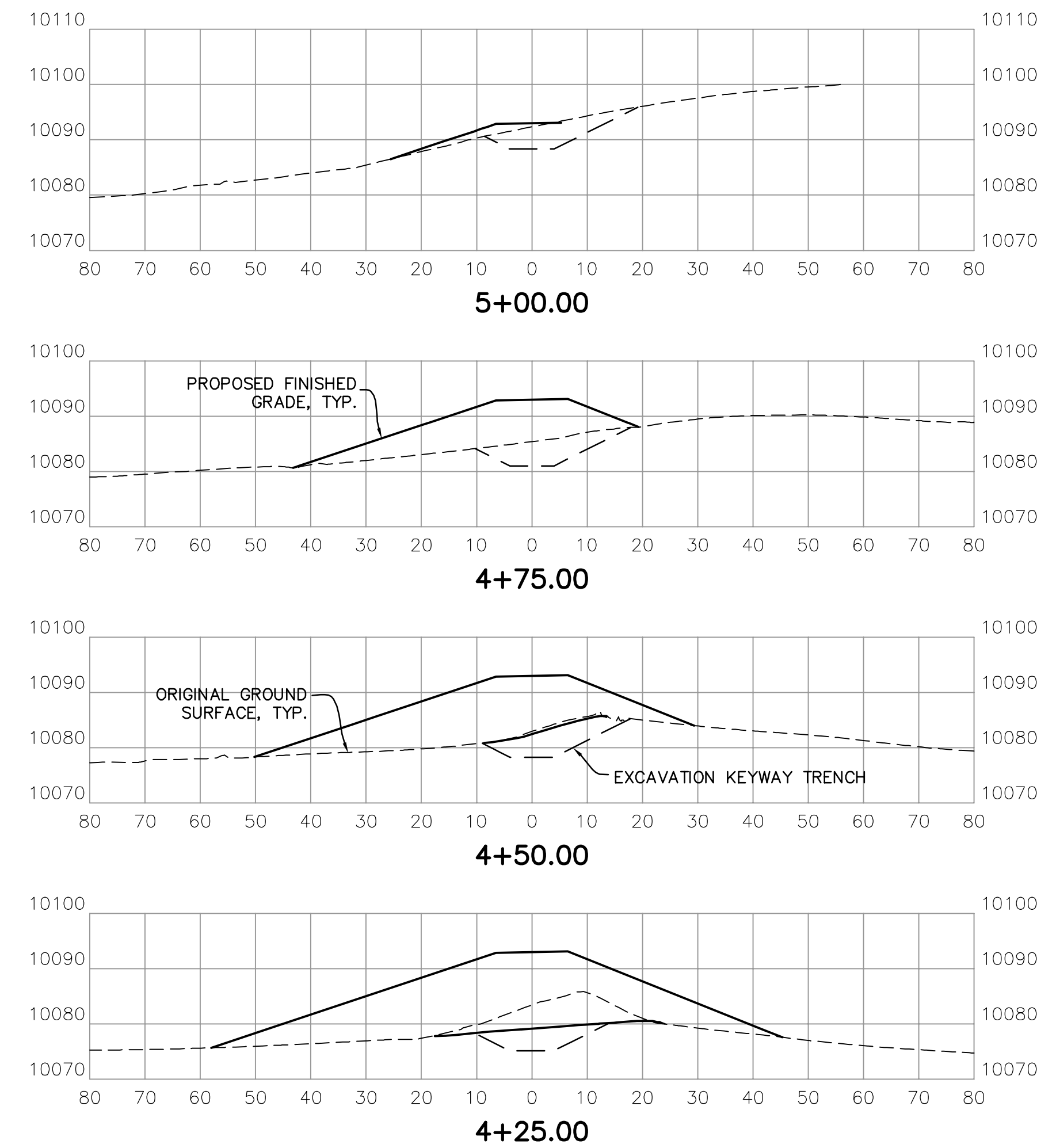
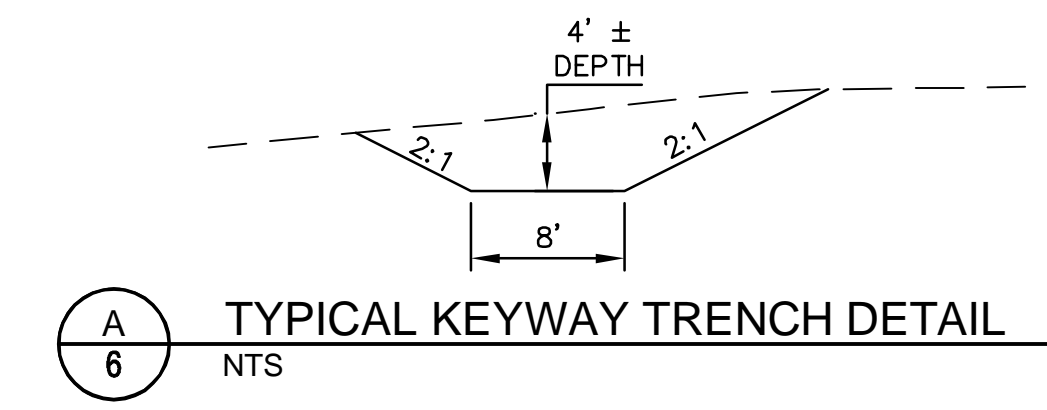
SHEET 5
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EARTHWORK QUANTITIES

EXCAVATION	UNITS	QUANTITY	NOTES
REMOVE 6" TOPSOIL	CY	700	
REMOVE EXISTING DAM EMBANKMENT	CY	1,064	
OUTLET WORK TRENCH	CY	670	
KEYWAY TRENCH	CY	870	
TOE DRAIN TRENCH	CY	80	
TOTAL ESTIMATED EXCAVATION	CY	3,384	

EMBANKMENT	UNITS	QUANTITY	NOTES
DAM EMBANKMENT	CY	10,594	FILL SHRINK FACTOR 1.1
RIPRAP ON UPSTREAM DAM EMBANKMENT (NOT SPILLWAY)	CY	1120	D ₅₀ =12", 18" THICK



REV	DATE	DESCRIPTION



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**BLANCHE PARK RESERVOIR
DAM RECONSTRUCTION
EXCAVATION AND DAM CROSS-SECTIONS**
DELTA COUNTY
COLORADO

PROJECT 22-74081
DATE 06/27/16

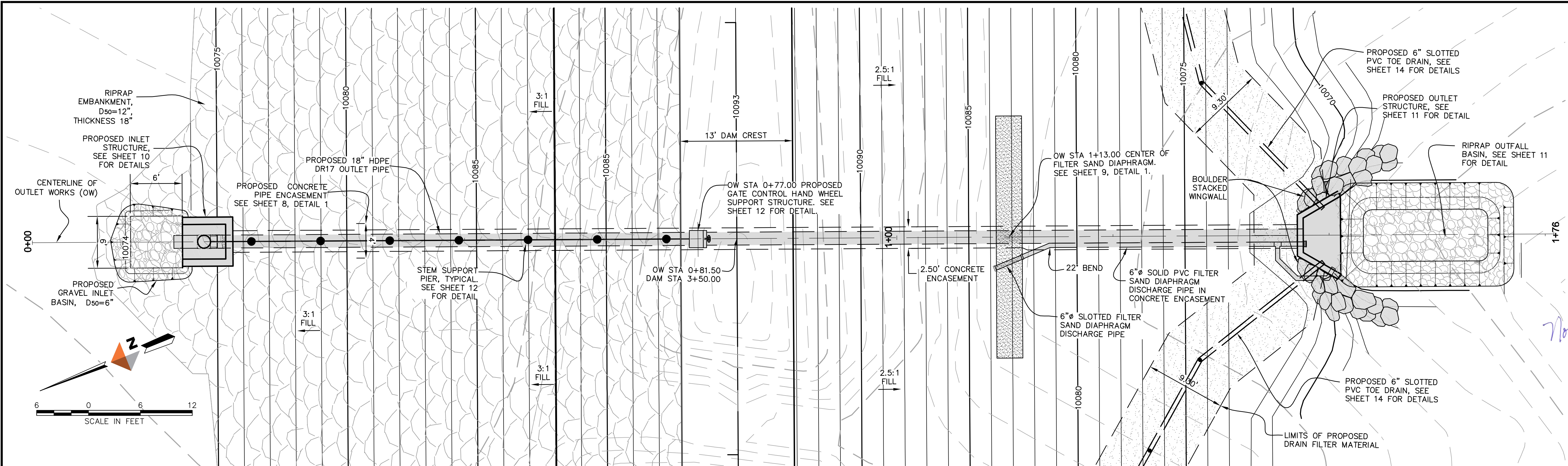
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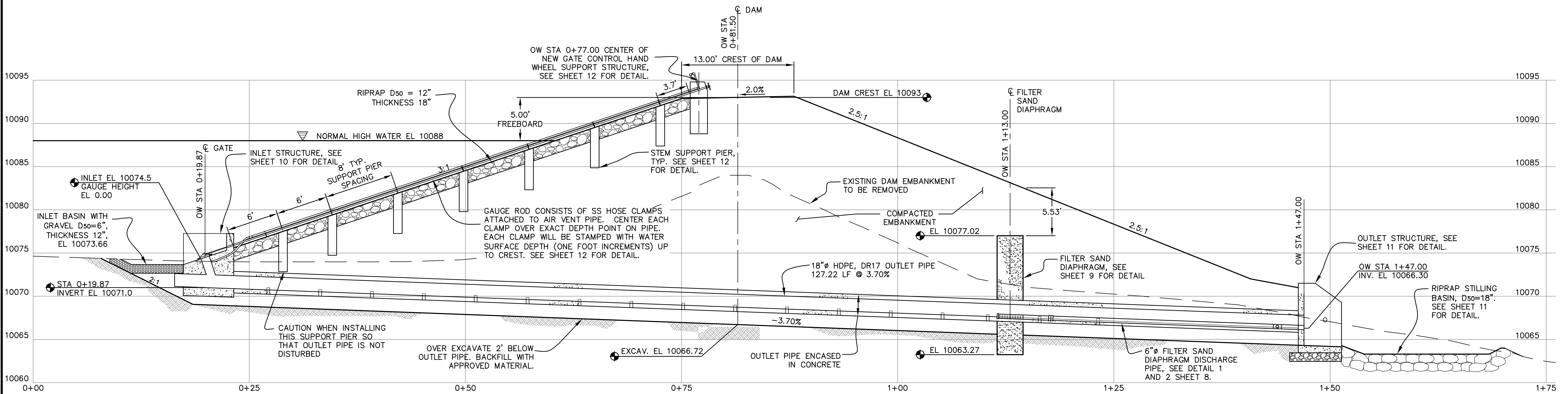
SHEET 6
6 of 15

DOWLHKM FILE No: XXX-XX

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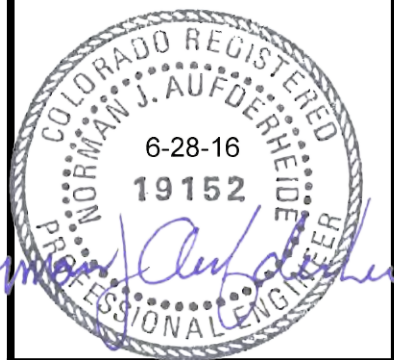


OUTLET WORKS PLAN



OUTLET WORKS PROFILE

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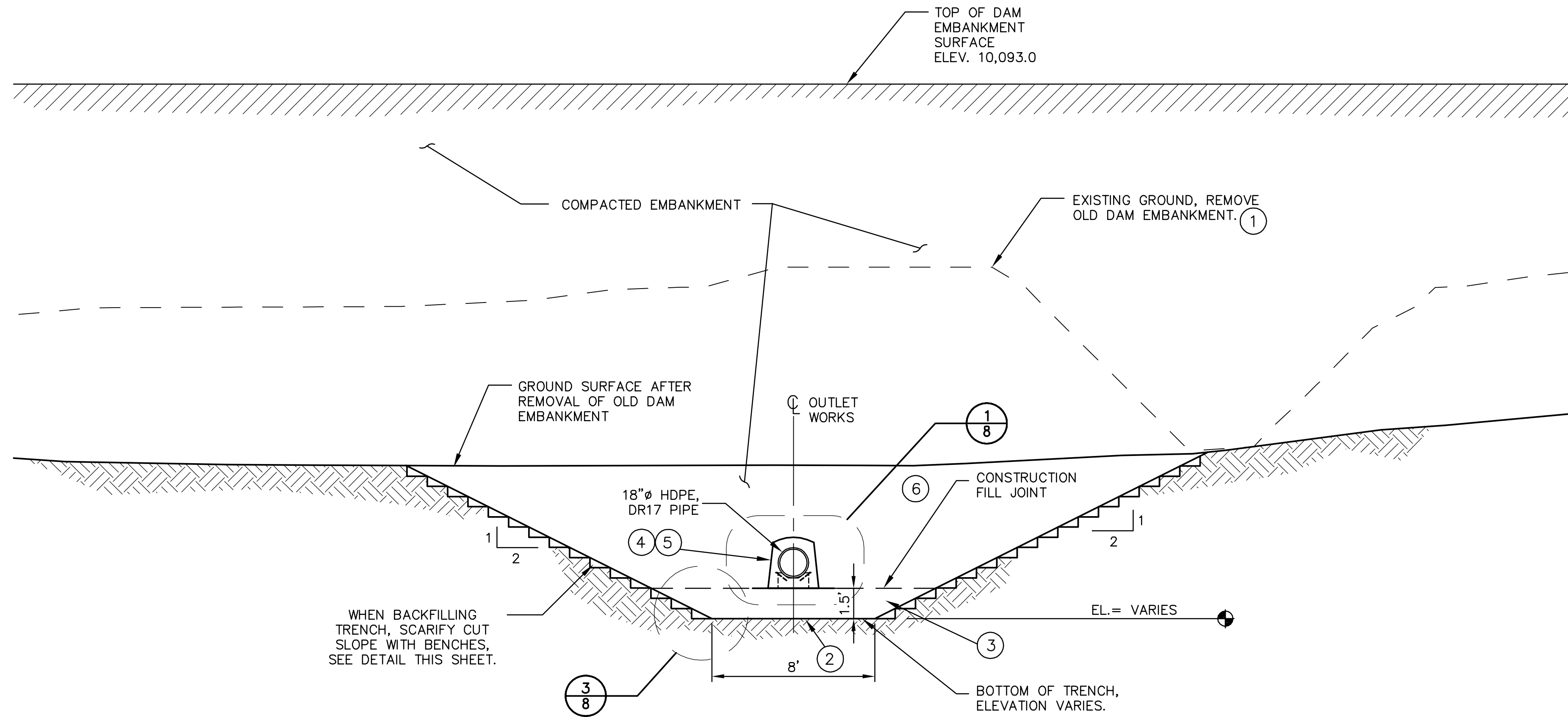
BLANCHE PARK RESERVOIR
 DAM RECONSTRUCTION
 OUTLET WORKS PLAN AND PROFILE
 DELTA COUNTY
 COLORADO

PROJECT 22-74081
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COLORADO STATE ENGINEER FILE NUMBER

C-2011A

SHEET 7
7 of 15

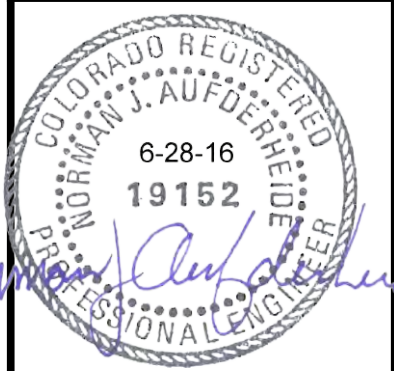


A
8 NTS
OUTLET WORKS TYPICAL TRENCH SECTION

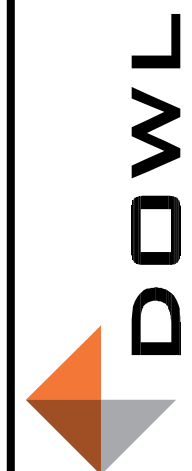
SEQUENCE OF OUTLET WORKS CONSTRUCTION

- 1 REMOVE OLD DAM EMBANKMENT
- 2 OVER-EXCAVATE 2-FT BELOW OUTLET PIPE (8' WIDE TRENCH)
- 3 REPLACE WITH RECONDITIONED COMPACTED EMBANKMENT TO CONSTRUCTION FILL JOINT.
- 4 INSTALL 18" HDPE OUTLET PIPE AND SUPPORT BLOCKS
- 5 ENCASE OUTLET PIPE WITH CONCRETE.
- 6 AFTER CONCRETE IS CURED TO 2000 PSI COMPRESSION STRENGTH, SCARIFY CONSTRUCTION FILL JOINT AND RESUME EMBANKMENT CONSTRUCTION. ALSO ENSURE THAT THE FILL AND CONCRETE INTERFACE IS WELL COMPACTED.

REV	DATE	DESCRIPTION



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COLORADO

**BLANCHE PARK RESERVOIR
DAM RECONSTRUCTION
OUTLET WORKS DETAILS**

DELTA COUNTY

PROJECT 22-74081
DATE 06/27/16

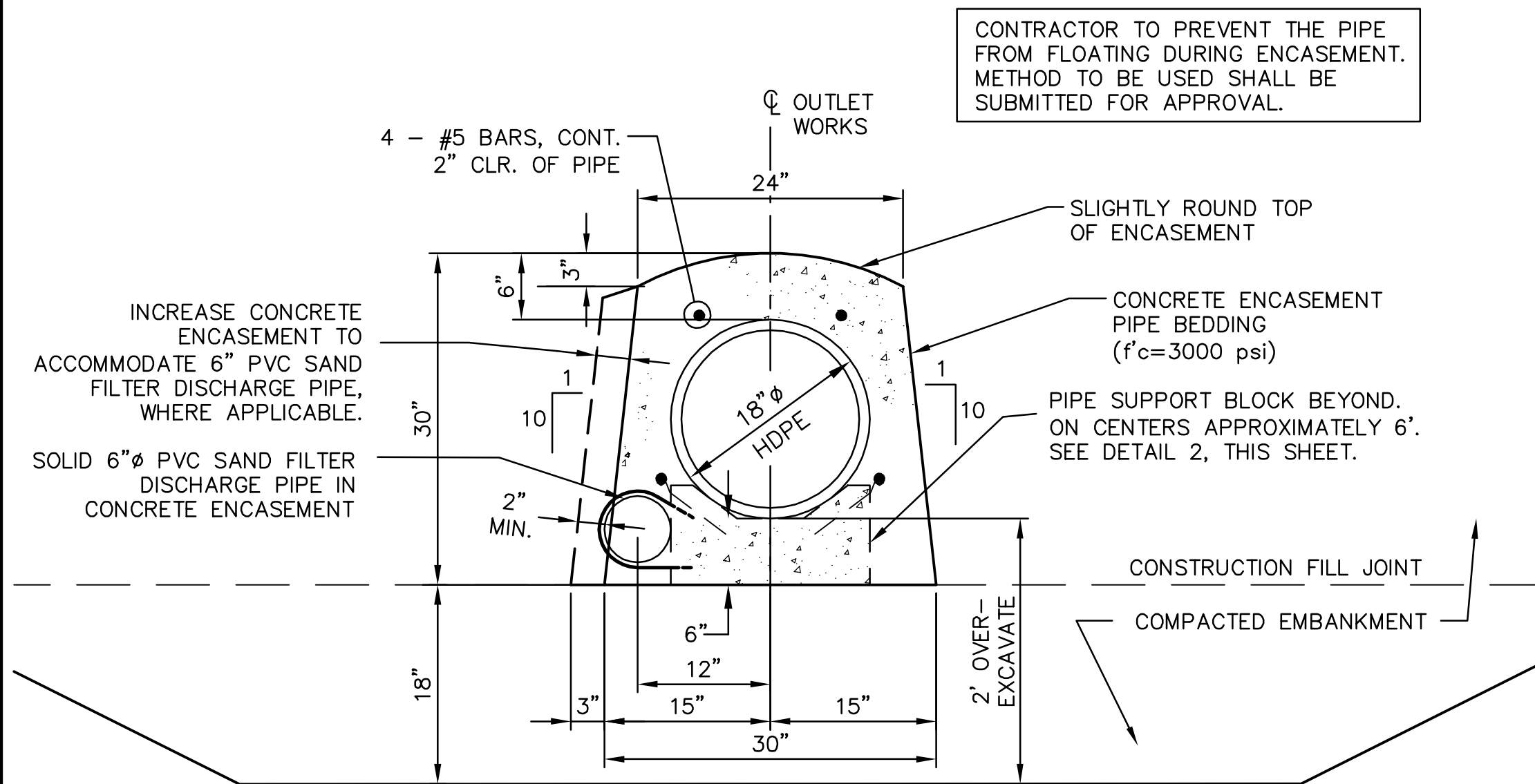
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SHEET

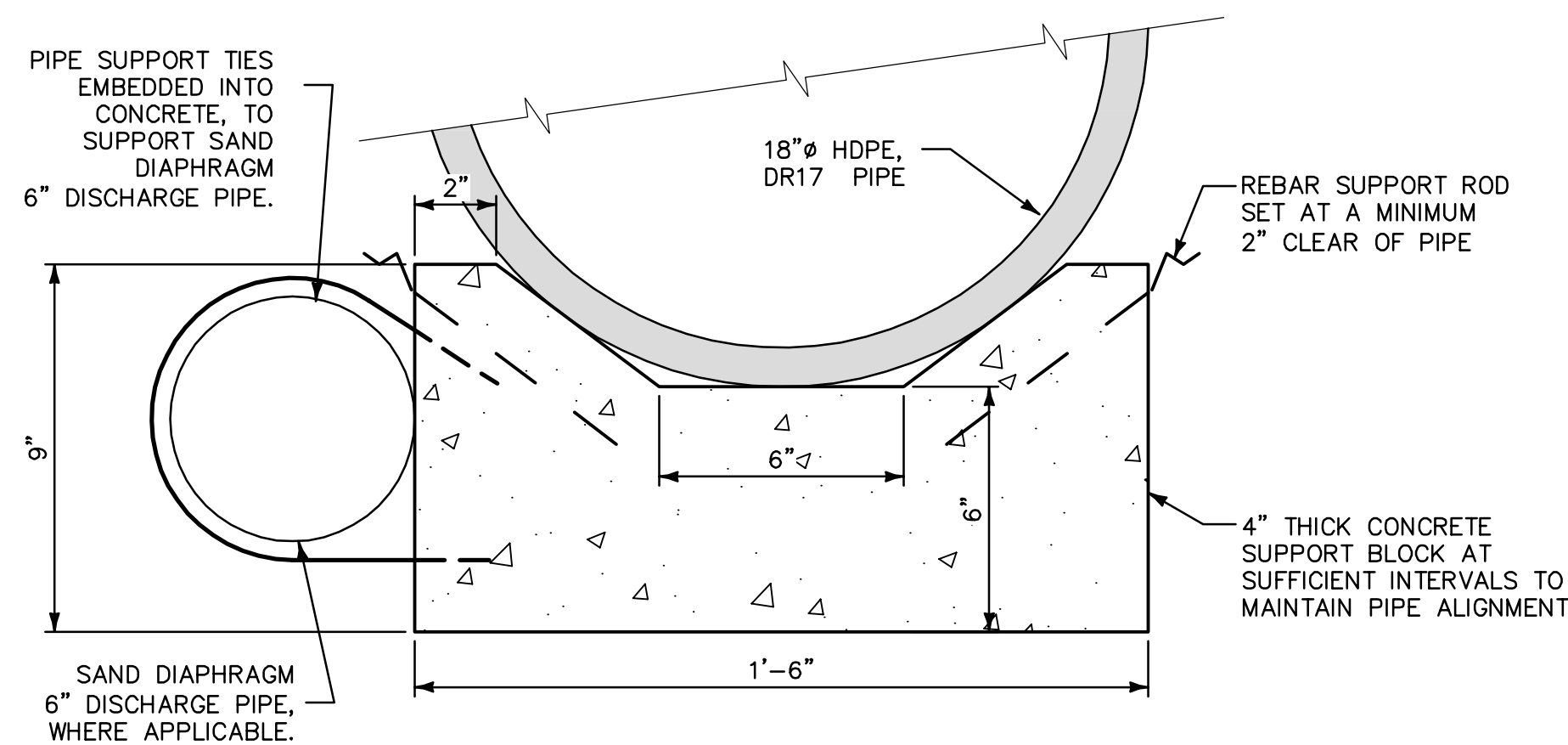
SHEET 8

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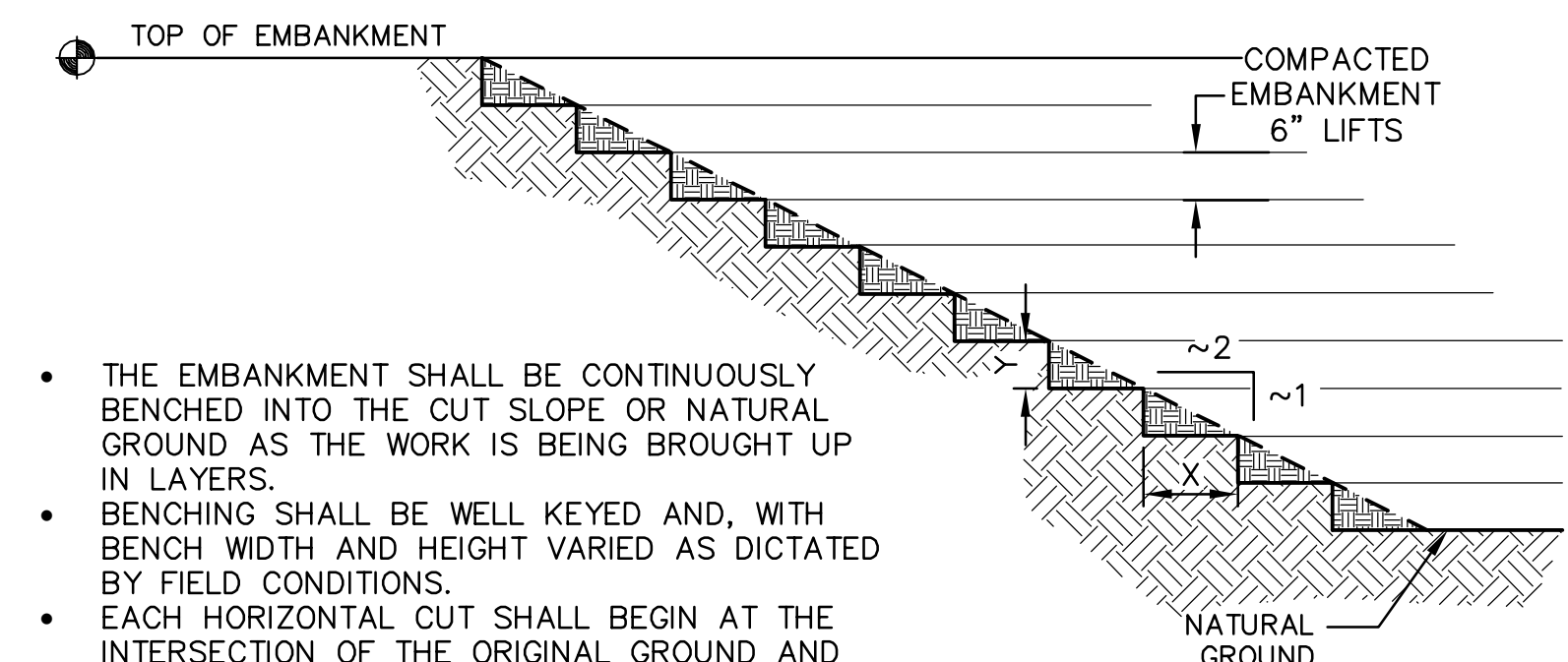


1
8 NTS
18" Ø OUTLET WORKS TYPICAL TRENCH DETAIL

CONTRACTOR TO PREVENT THE PIPE FROM FLOATING DURING ENCASEMENT. METHOD TO BE USED SHALL BE SUBMITTED FOR APPROVAL.



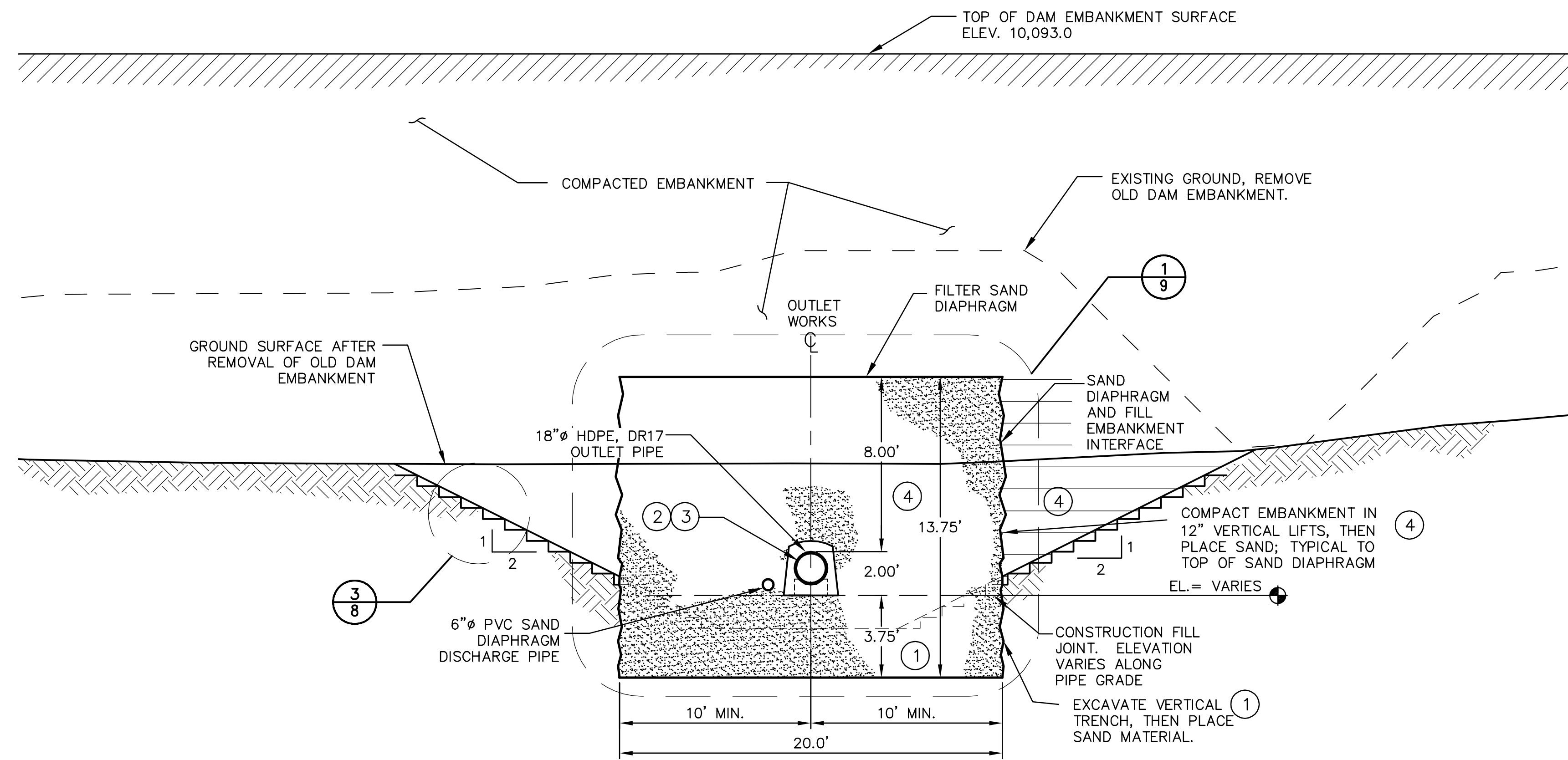
2
8 NTS
PRECAST CONCRETE PIPE SUPPORT BLOCK DETAIL



- THE EMBANKMENT SHALL BE CONTINUOUSLY BENCHED INTO THE CUT SLOPE OR NATURAL GROUND AS THE WORK IS BEING BROUGHT UP IN LAYERS.
- BENCHING SHALL BE WELL KEYED AND, WITH BENCH WIDTH AND HEIGHT VARIED AS DICTATED BY FIELD CONDITIONS.
- EACH HORIZONTAL CUT SHALL BEGIN AT THE INTERSECTION OF THE ORIGINAL GROUND AND THE VERTICAL SIDES OF THE PREVIOUS BENCH.
- EXCAVATION FROM BENCHING SHALL BE COMPACTED ALONG WITH THE NEW EMBANKMENT MATERIAL.

3
8 NTS
TYPICAL INTERFACE BETWEEN EMBANKMENT TO CUT SLOPE OR NATURAL GROUND

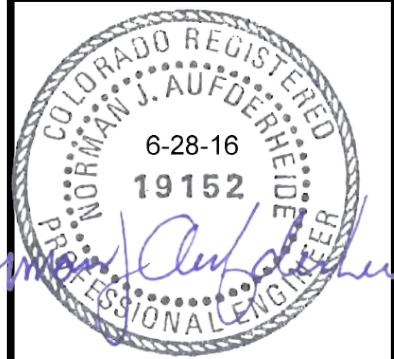
C-2011A



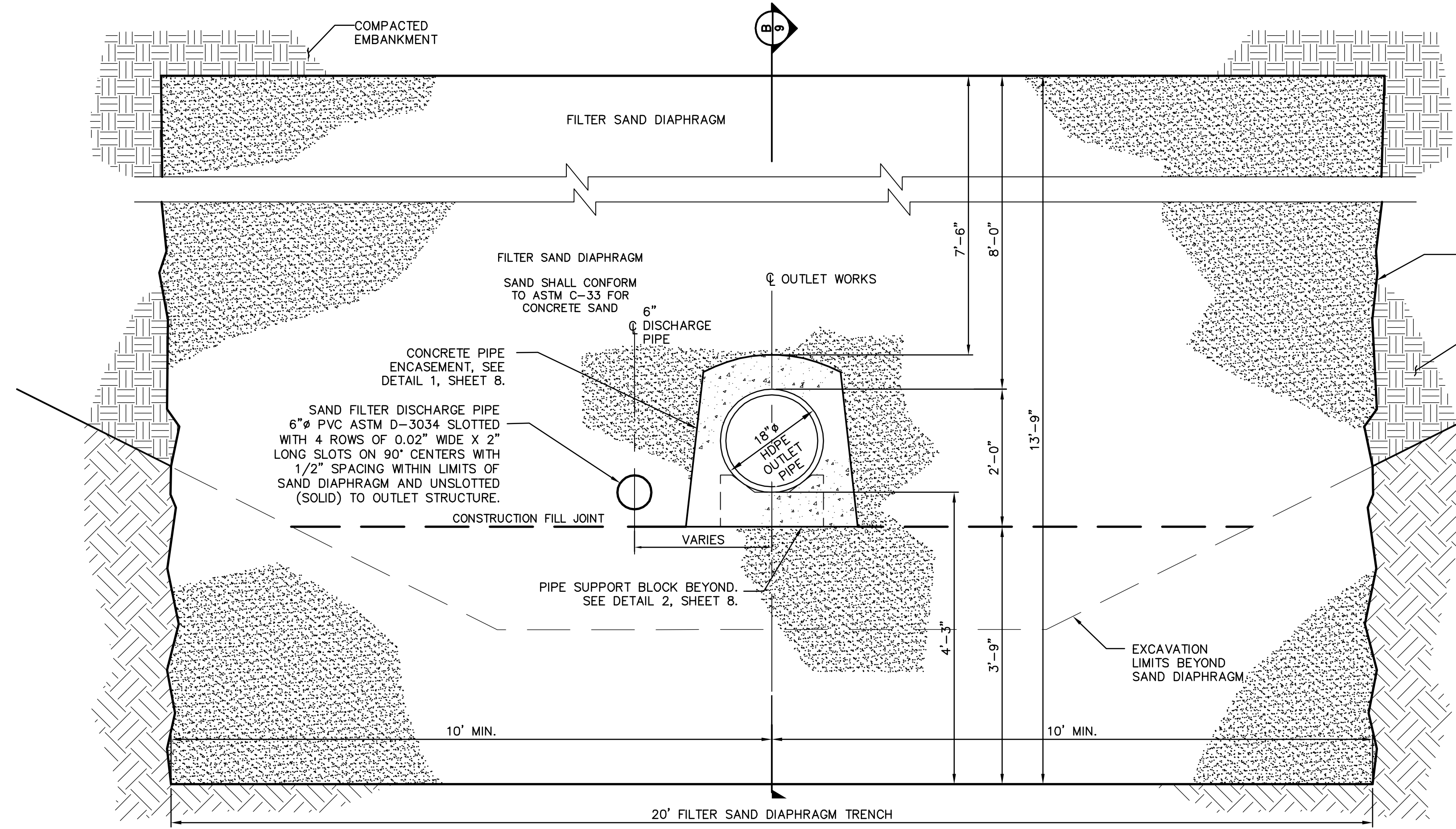
A
9
FILTER SAND DIAPHRAGM TYPICAL SECTION
NTS

- SUGGESTED SEQUENCE OF FILTER SAND DIAPHRAGM CONSTRUCTION (Refer to SECTION A/9). CONTRACTOR SHALL SUBMIT ALTERNATIVE METHOD(S) FOR APPROVAL BY THE ENGINEER.
- 1 CONSTRUCT COMPACTED EMBANKMENT TO BASE OF CONCRETE ENCASMENT AND THEN EXCAVATE THE LOWER PORTION OF THE FILTER DIAPHRAGM TO MINIMUM DIMENSIONS NOTED (3.75'x20')
 - 2 INSTALL 18" HDPE OUTLET PIPE AND SUPPORT BLOCKS
 - 3 PLACE CONCRETE FORMS FOR PIPE ENCASMENT WITH OUTLET PIPE SUPPORT TIES EMBEDDED INTO CONCRETE. PIPE HOLD DOWN METHOD PER CONTRACTOR.
 - 4 AFTER CONCRETE HAS ATTAINED MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI, PLACE AND COMPACT EMBANKMENT IN MAXIMUM 12 INCH LIFTS LEAVING MINIMUM 10 FOOT LONG BY 3 FOOT WIDE SLOT ON BOTH SIDES OF ENCASED PIPE FOR THE FILTER SAND TO BE PLACED AND COMPACTED. CONTINUE WITH THIS PROCESS UNTIL THE FULL HEIGHT OF THE FILTER SAND DIAPHRAGM IS COMPLETE. THEN RESUME EMBANKMENT COMPACTION AS NORMAL.

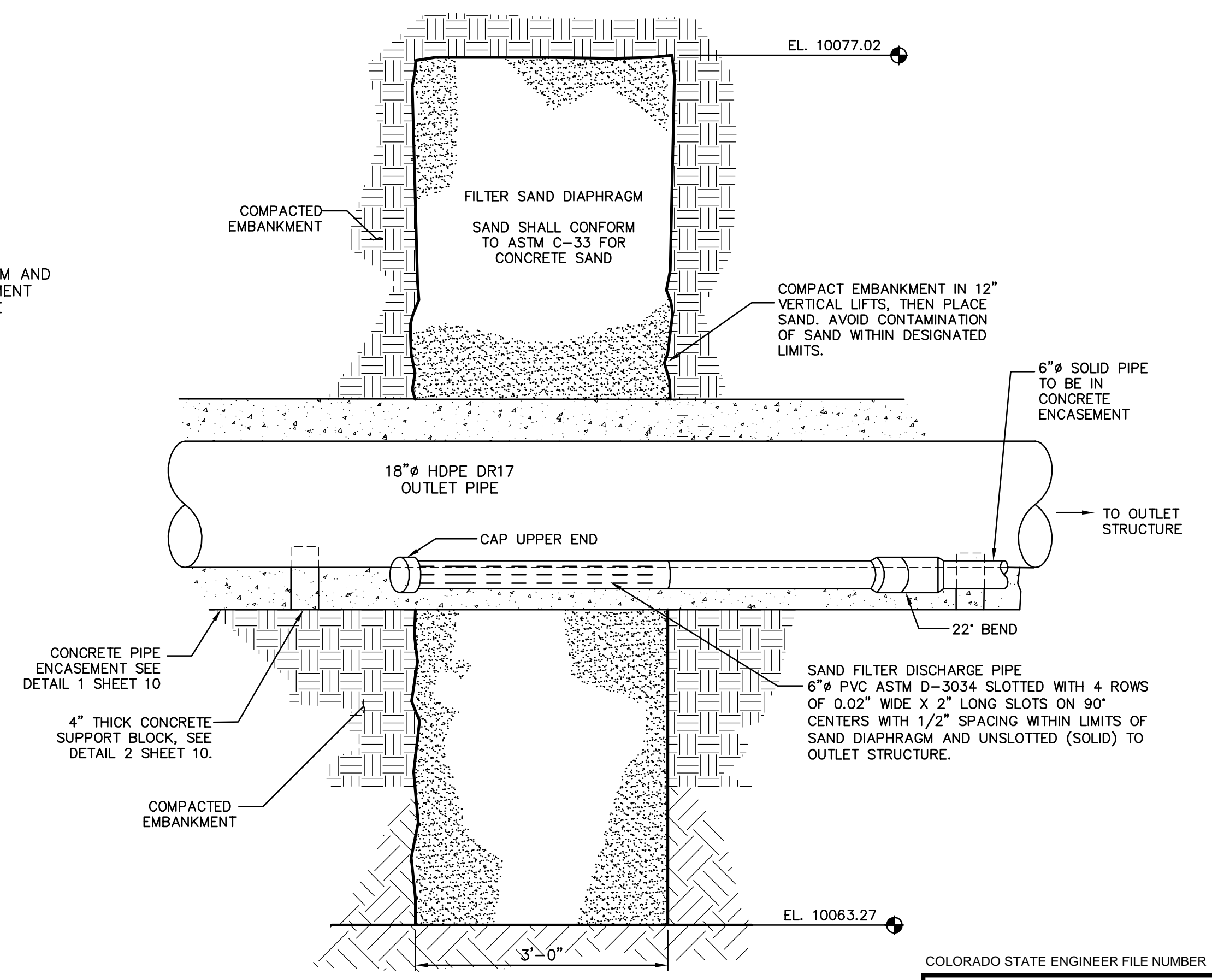
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1
9
FILTER SAND DIAPHRAGM TYPICAL DETAIL
NTS



B
9
FILTER SAND DIAPHRAGM SECTION
NTS

BLANCHE PARK RESERVOIR
DAM RECONSTRUCTION
FILTER SAND DIAPHRAGM DETAILS

DELTA COUNTY
COLORADO

PROJECT 22-74081
DATE 06/27/16

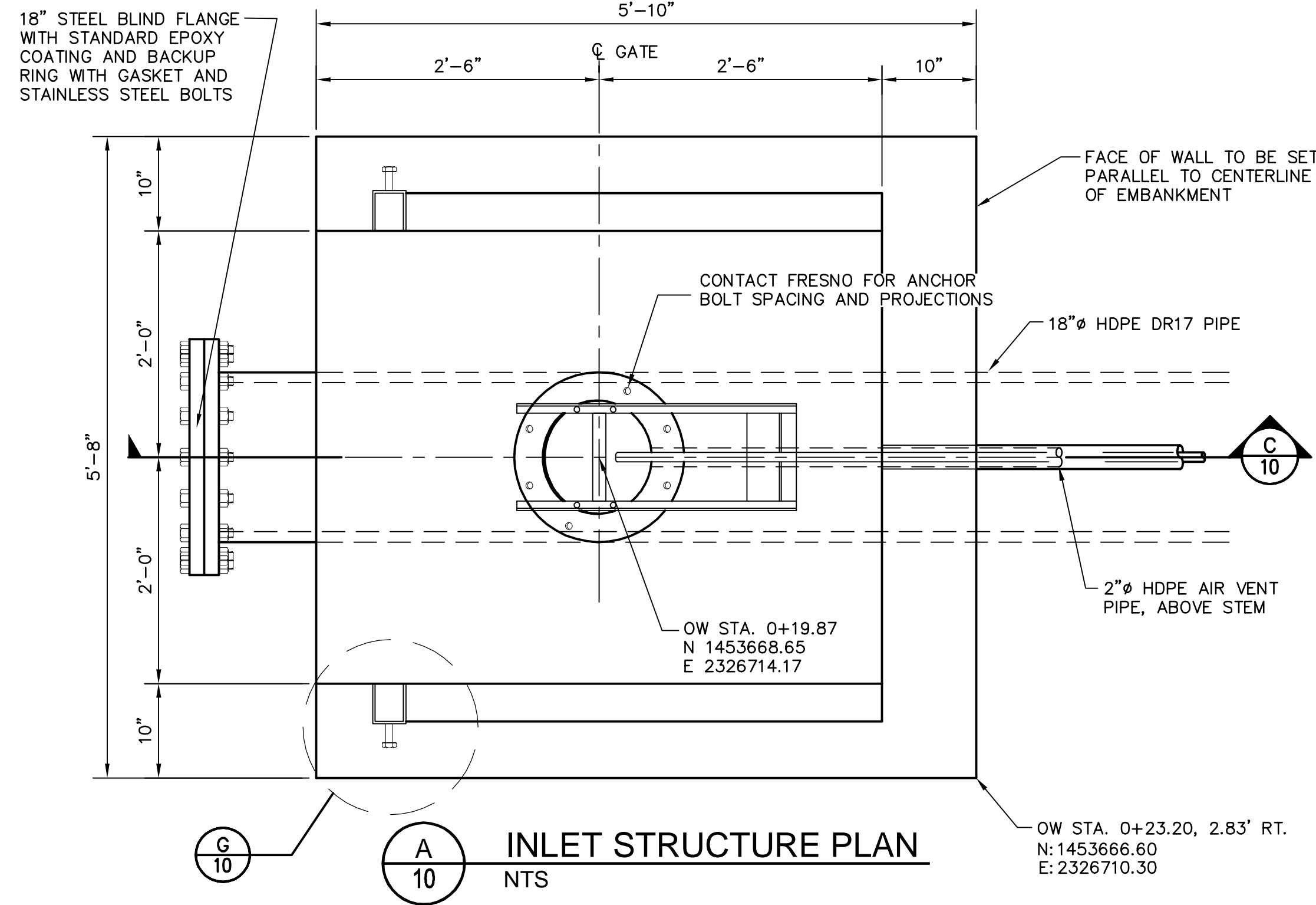
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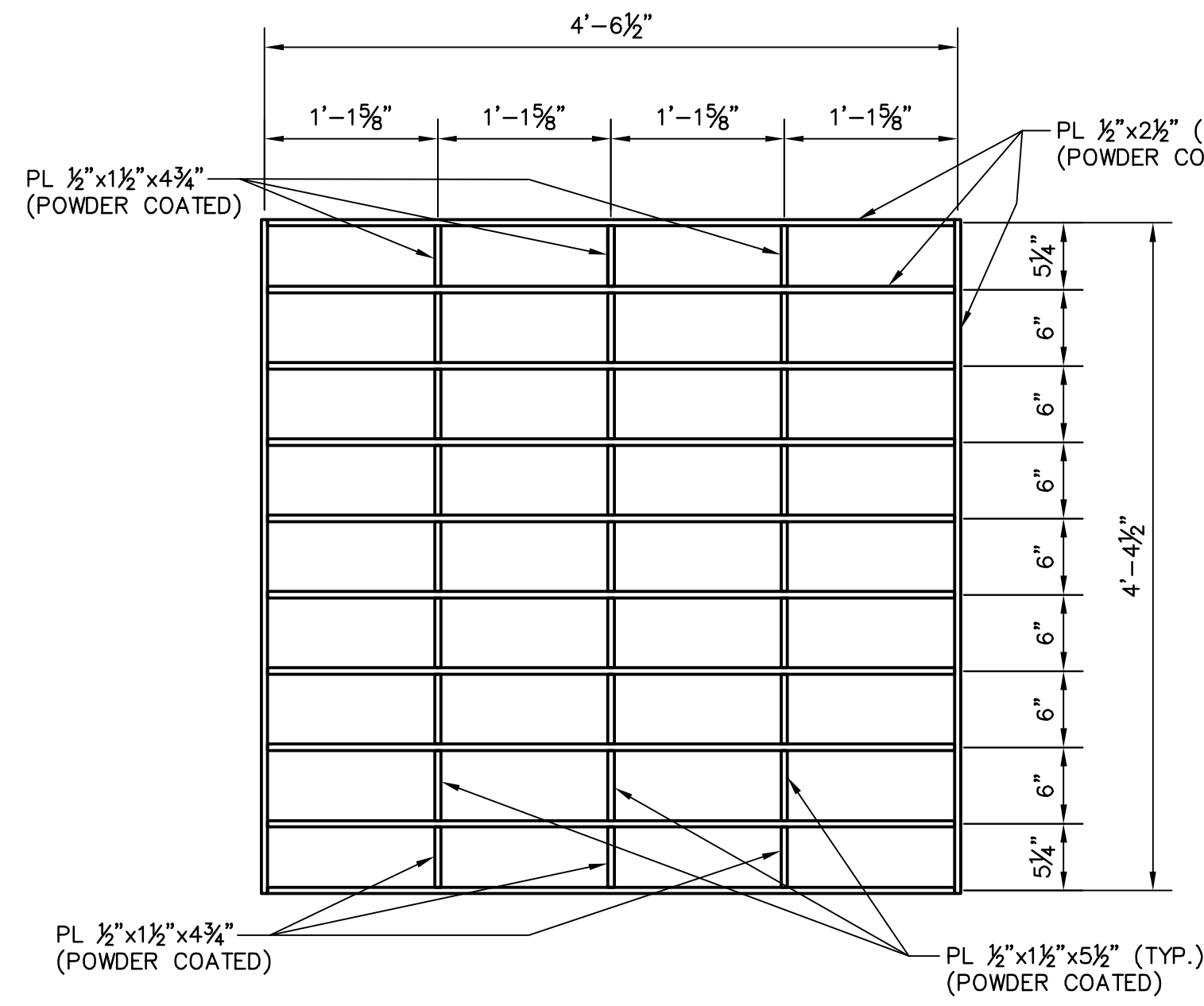
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SHEET
SHEET 9
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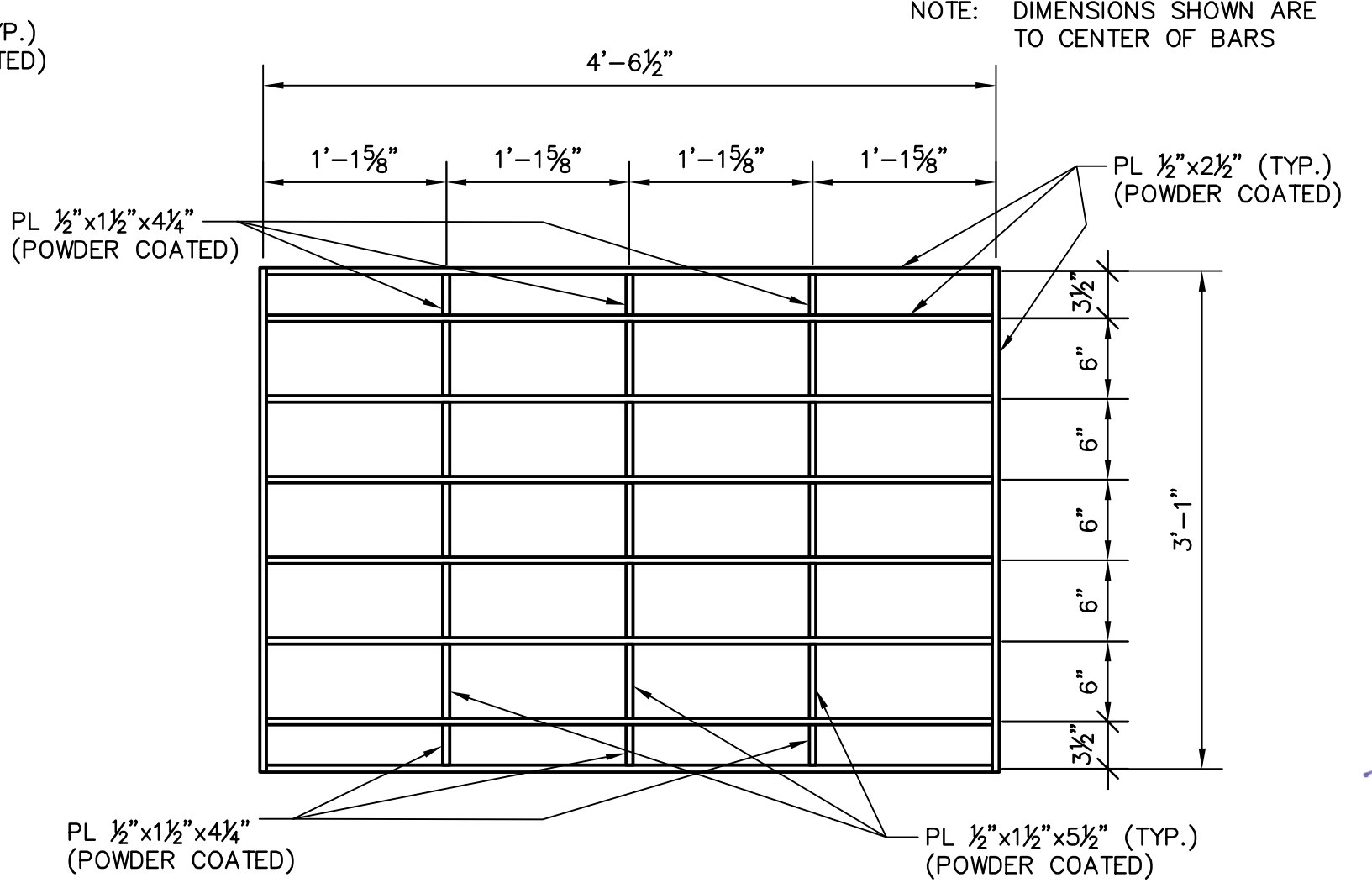
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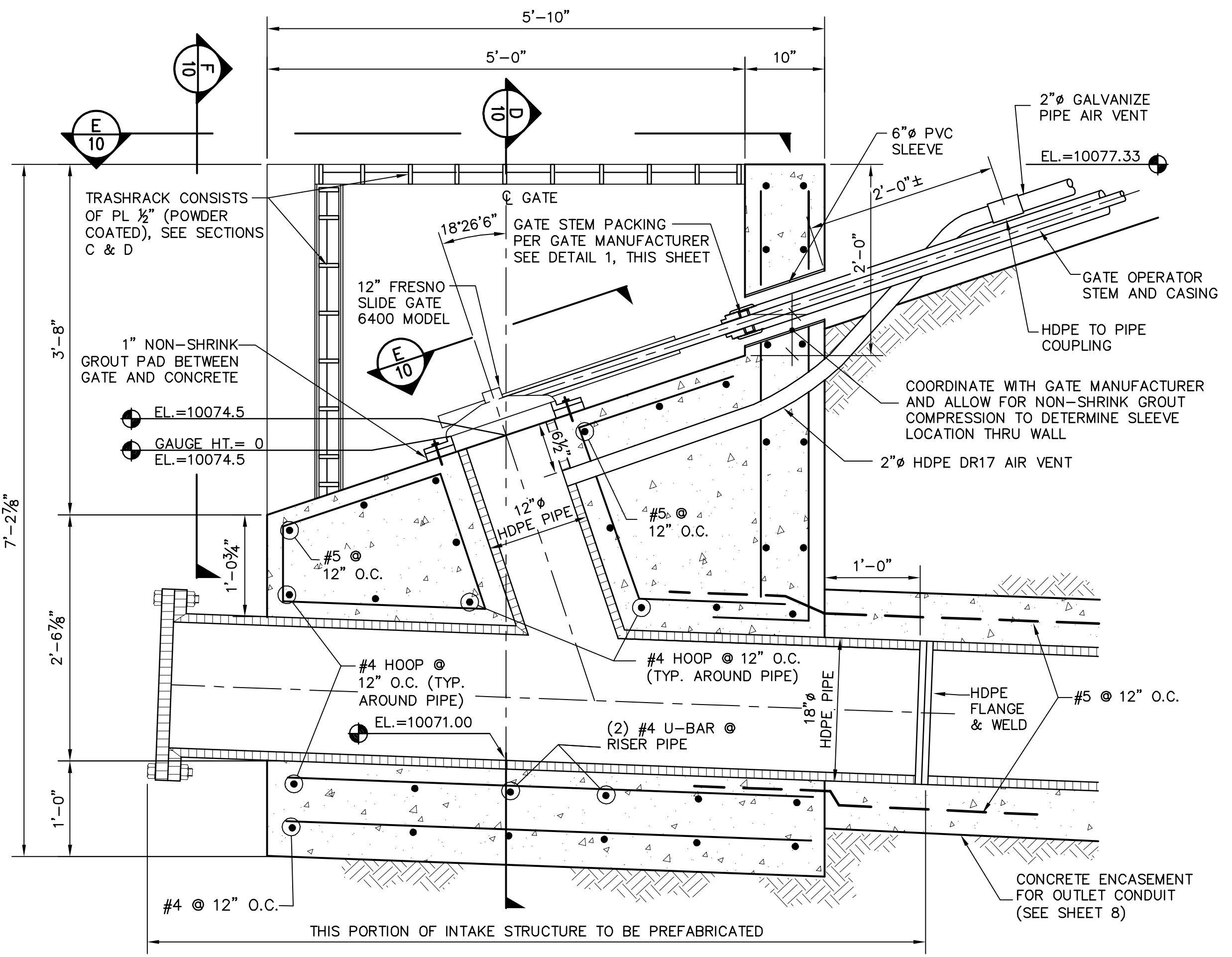
A INLET STRUCTURE PLAN
NTS



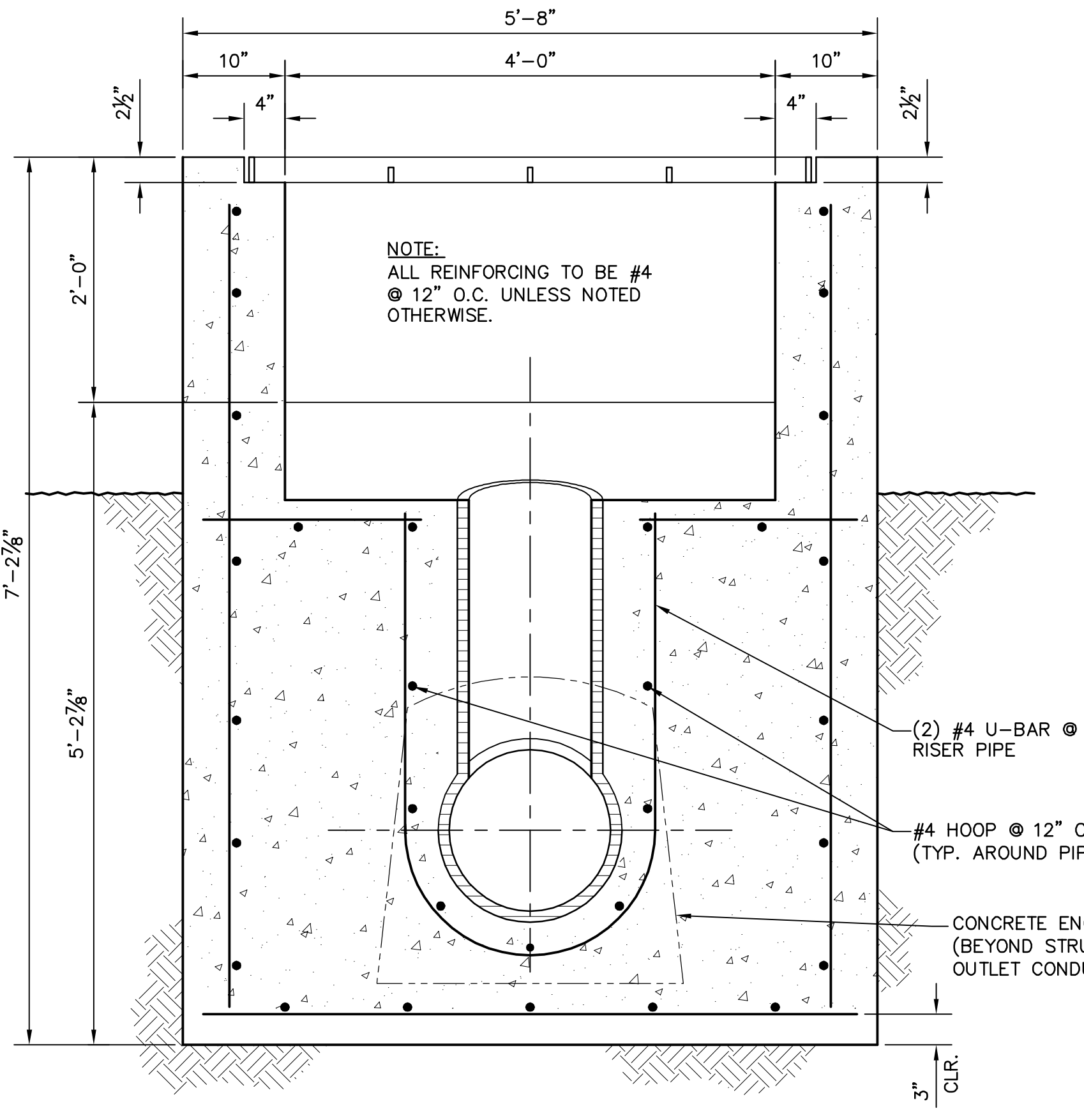
E TOP TRASH RACK PLAN
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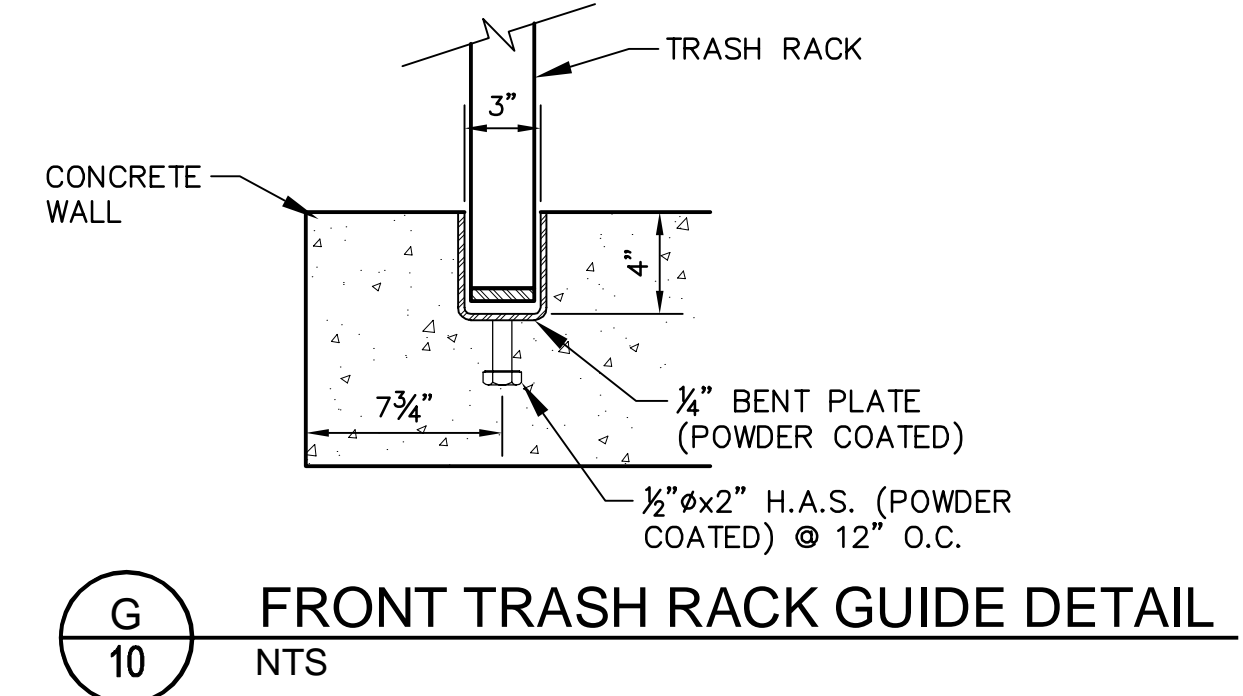
F FRONT TRASH RACK ELEVATION
NTS



C INLET STRUCTURE DETAIL
NTS

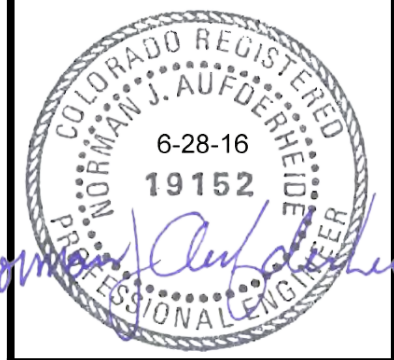


D INLET STRUCTURE SECTION
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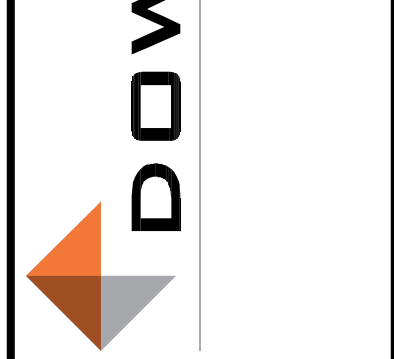


G FRONT TRASH RACK GUIDE DETAIL
NTS

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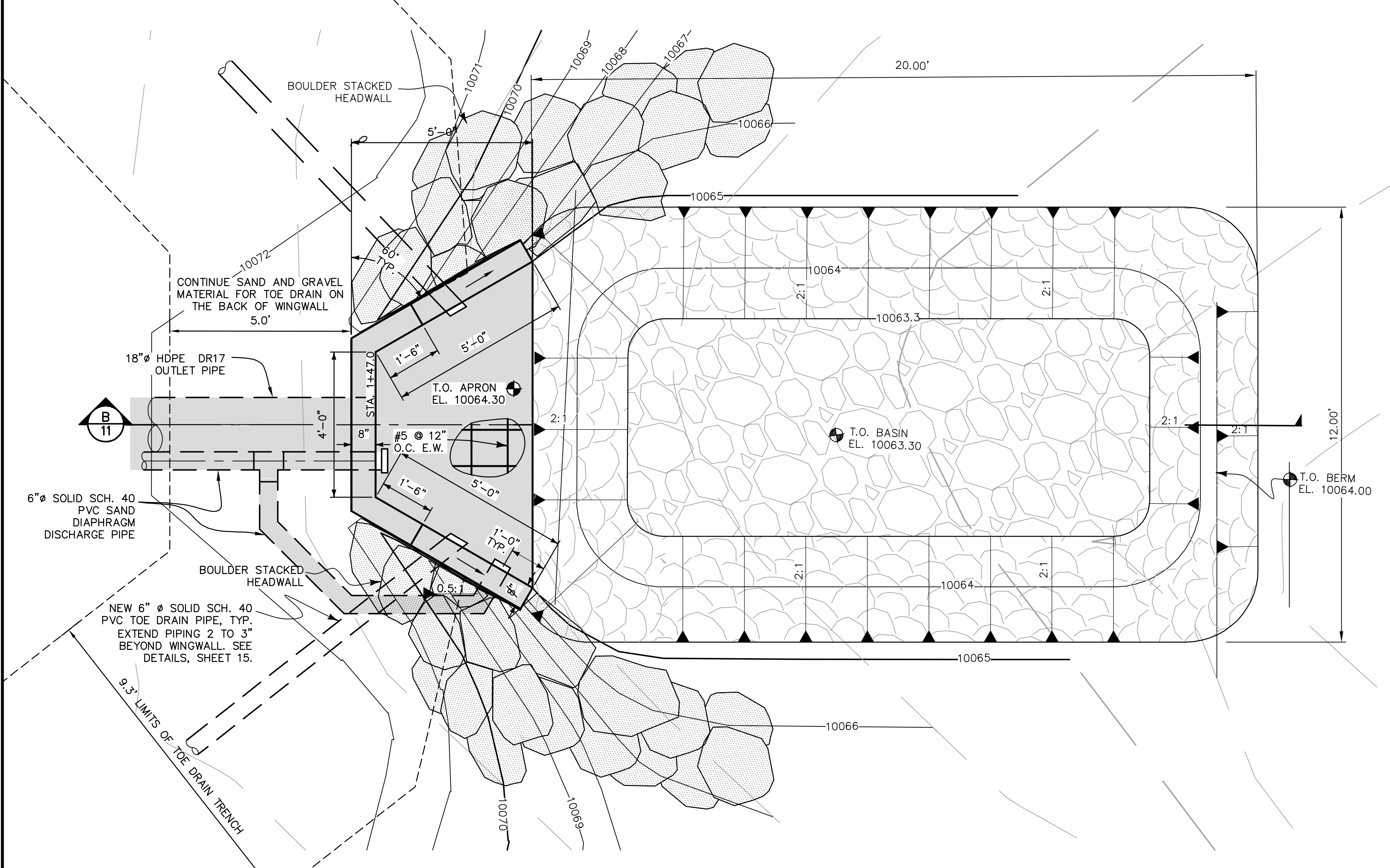
BLANCHE PARK RESERVOIR
DAM RECONSTRUCTION
INLET STRUCTURE DETAILS

COLORADO STATE ENGINEER FILE NUMBER
C-2011A

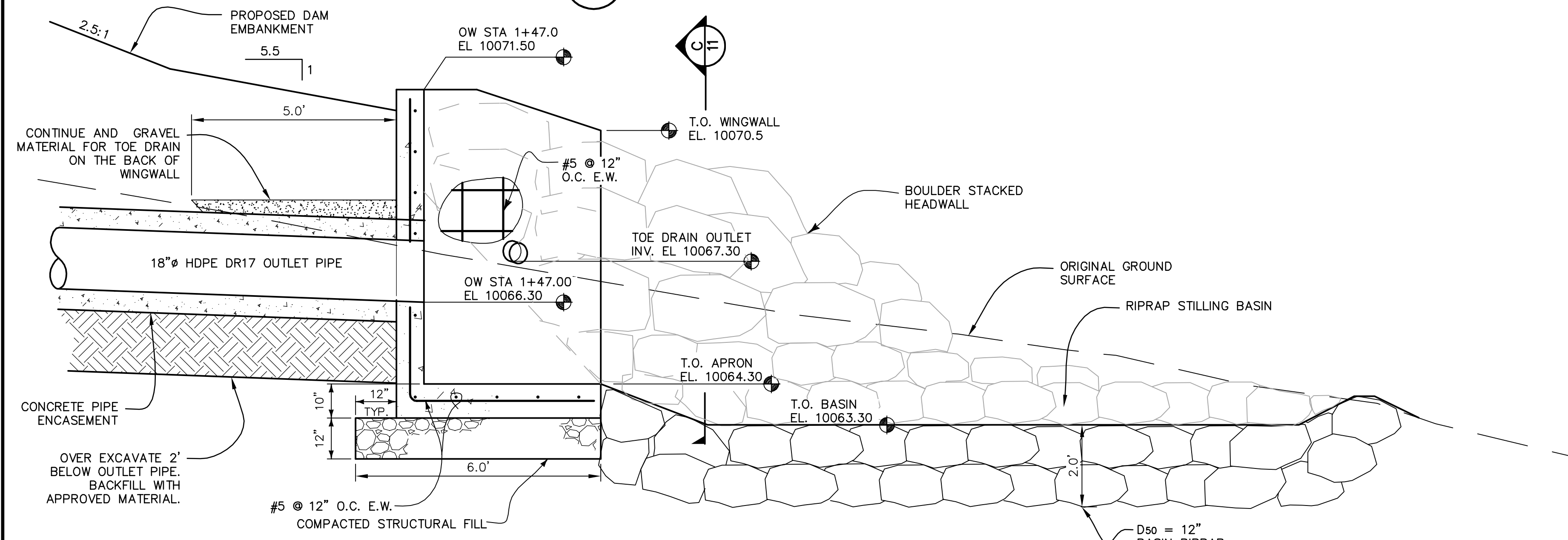
DELTA COUNTY

PROJECT 22-74081
DATE 06/27/16

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10 OF 15



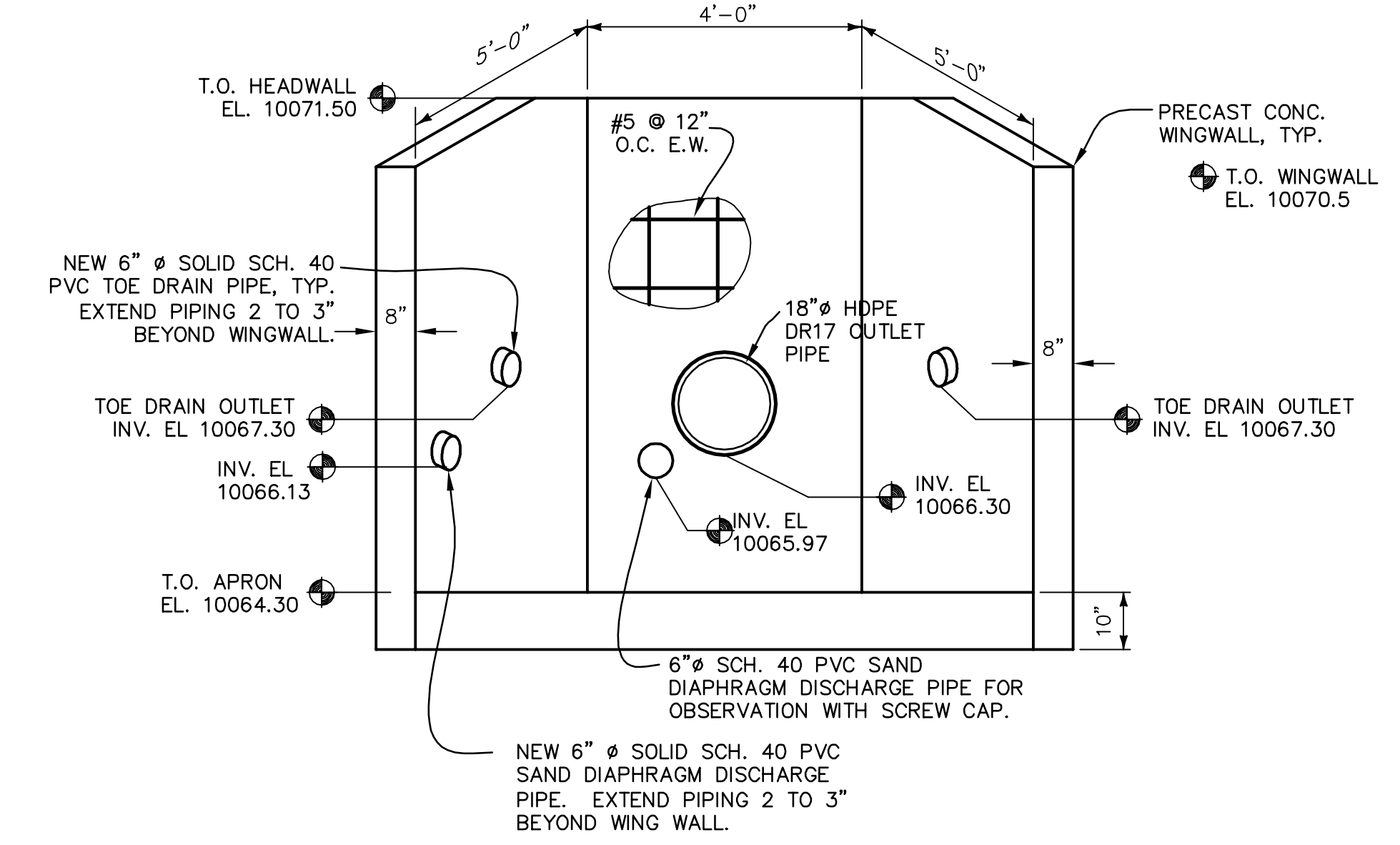
A 11 OUTLET STRUCTURE PLAN
NTS



B 11 OUTLET STRUCTURE SECTION
NTS

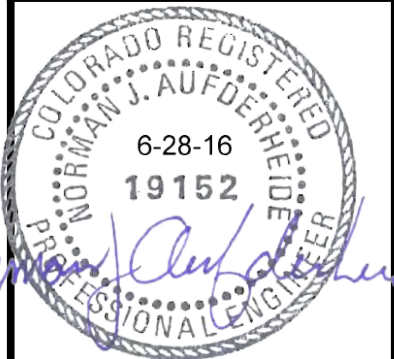
OUTLET STRUCTURE NOTES

1. PRECAST STRUCTURES SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
2. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI.
3. REINFORCING STEEL SHALL CONFORM TO ASTM A615, A616, OR A617, GRADE 60.
4. CHAMFER ALL EXPOSED EDGES 3/4\".
5. PLACE RODENT SCREENS FABRICATED FROM 1/4\" SQ. OPENING HARDWARE CLOTH IN OUTLET ENDS OF TOE DRAIN PIPES.



C 11 OUTLET ELEVATION AT WINGWALL
NTS

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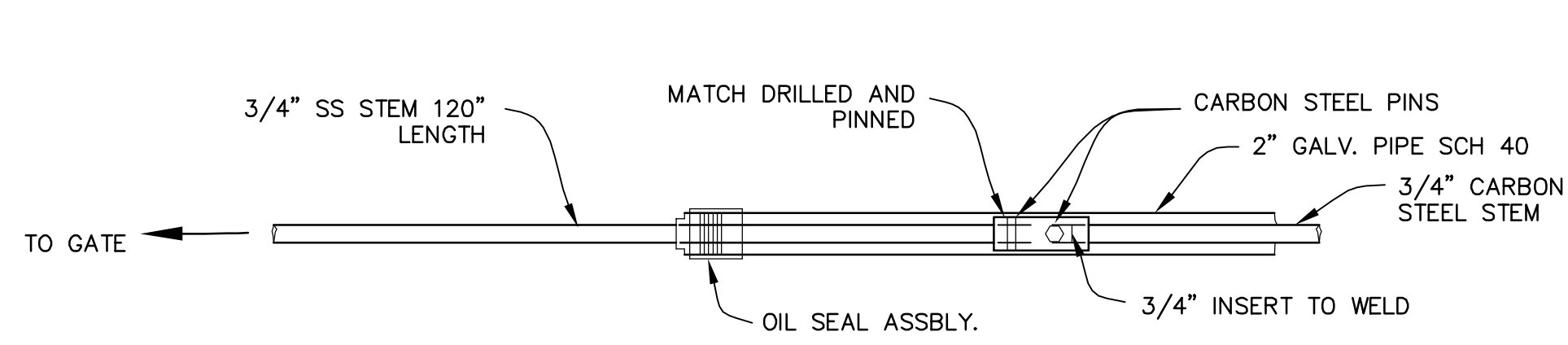
**BLANCHE PARK RESERVOIR
 DAM RECONSTRUCTION
 OUTLET STRUCTURE DETAILS**

DELTA COUNTY
 COLORADO

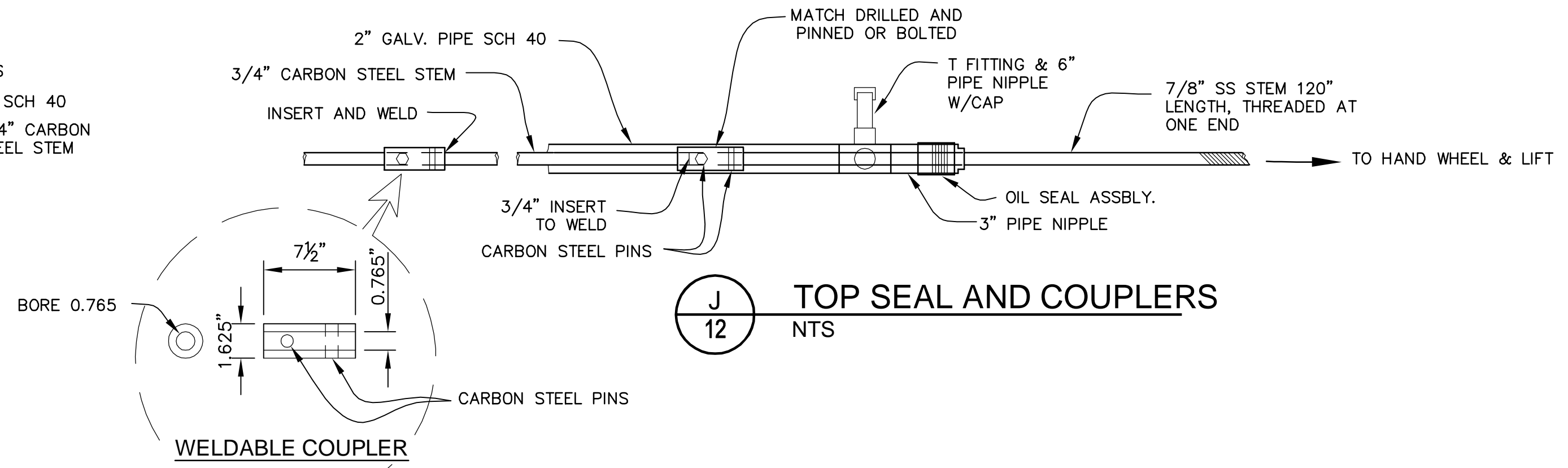
PROJECT 22-74081
 DATE 06/27/16

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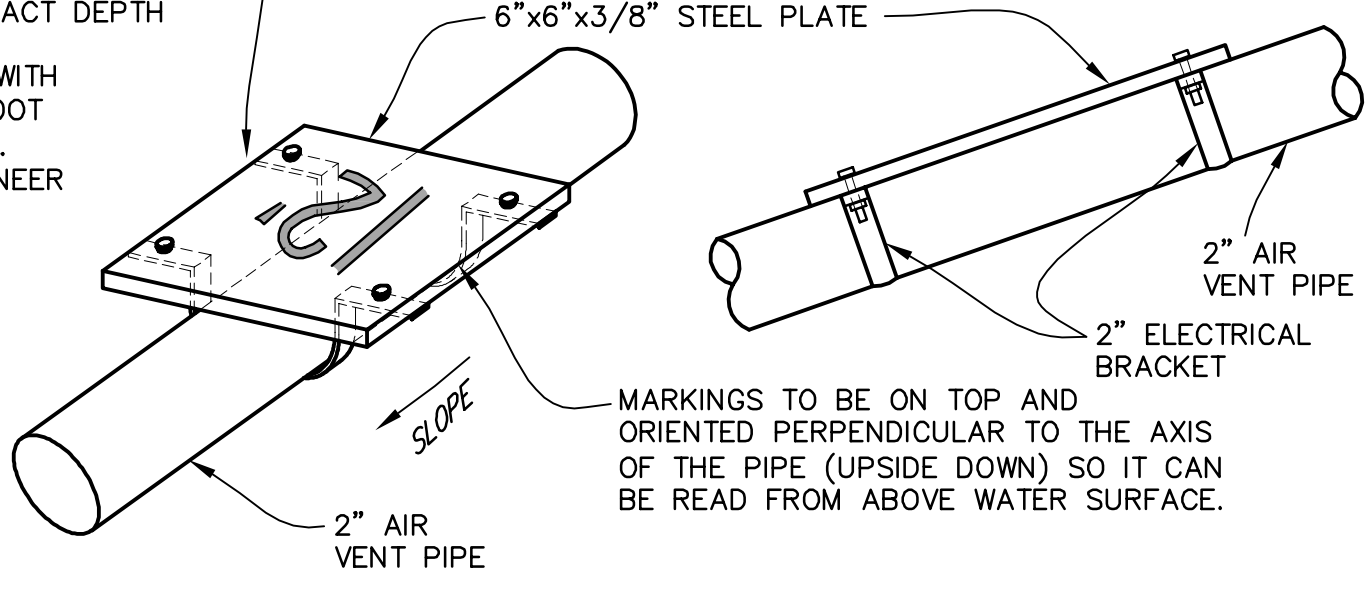
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NTS
BOTTOM SEAL AND COUPLERS



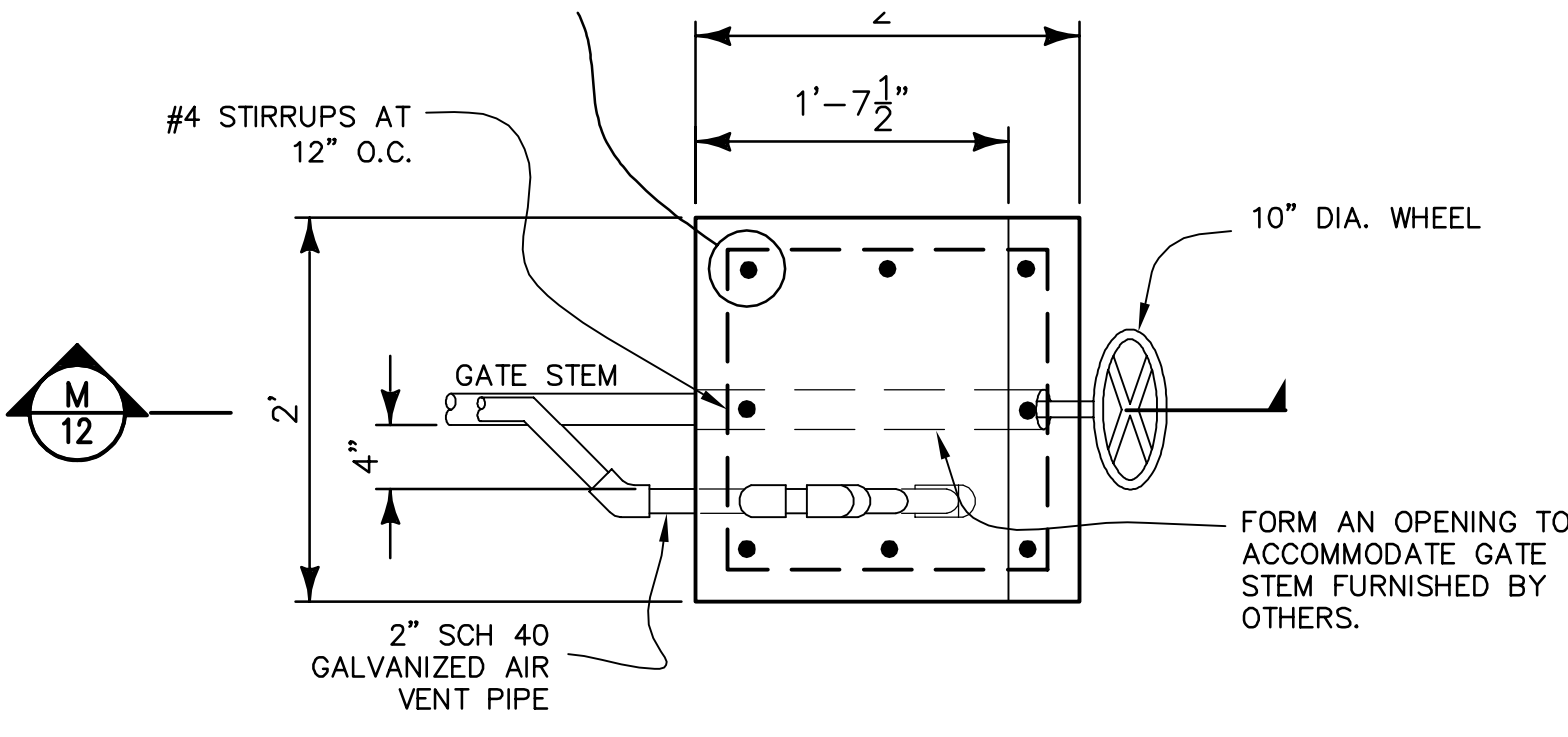
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12
NTS
TOP SEAL AND COUPLERS

WELDABLE COUPLER

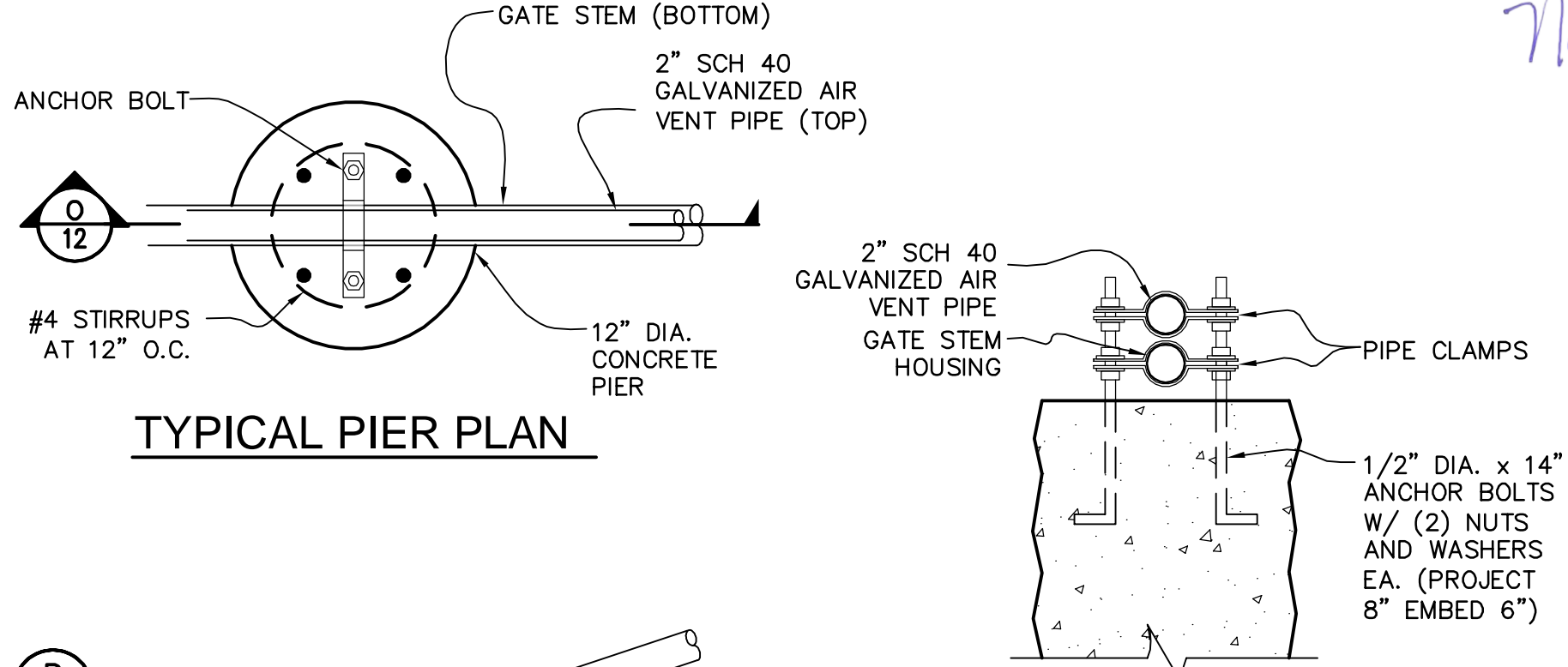
1. GAUGE ROD CONSISTS OF 6"x6"x3/8" STEEL PLATE WITH TWO 2" GALVANIZED STEEL ELECTRICAL BRACKETS ATTACHED TO 2" AIR VENT PIPE.
2. CENTER TOP OF PLATE OVER EXACT DEPTH POINT ON PIPE.
3. EACH PLATE WILL BE STAMPED WITH WATER SURFACE DEPTH (ONE FOOT INCREMENTS) UP TO DAM CREST.
4. COORDINATE WITH DIVISION ENGINEER WATER COMMISSIONER.
5. ALSO SEE PROFILE SHEET 7.



K
12
NTS
GAUGE ROD SS CLAMP DETAIL

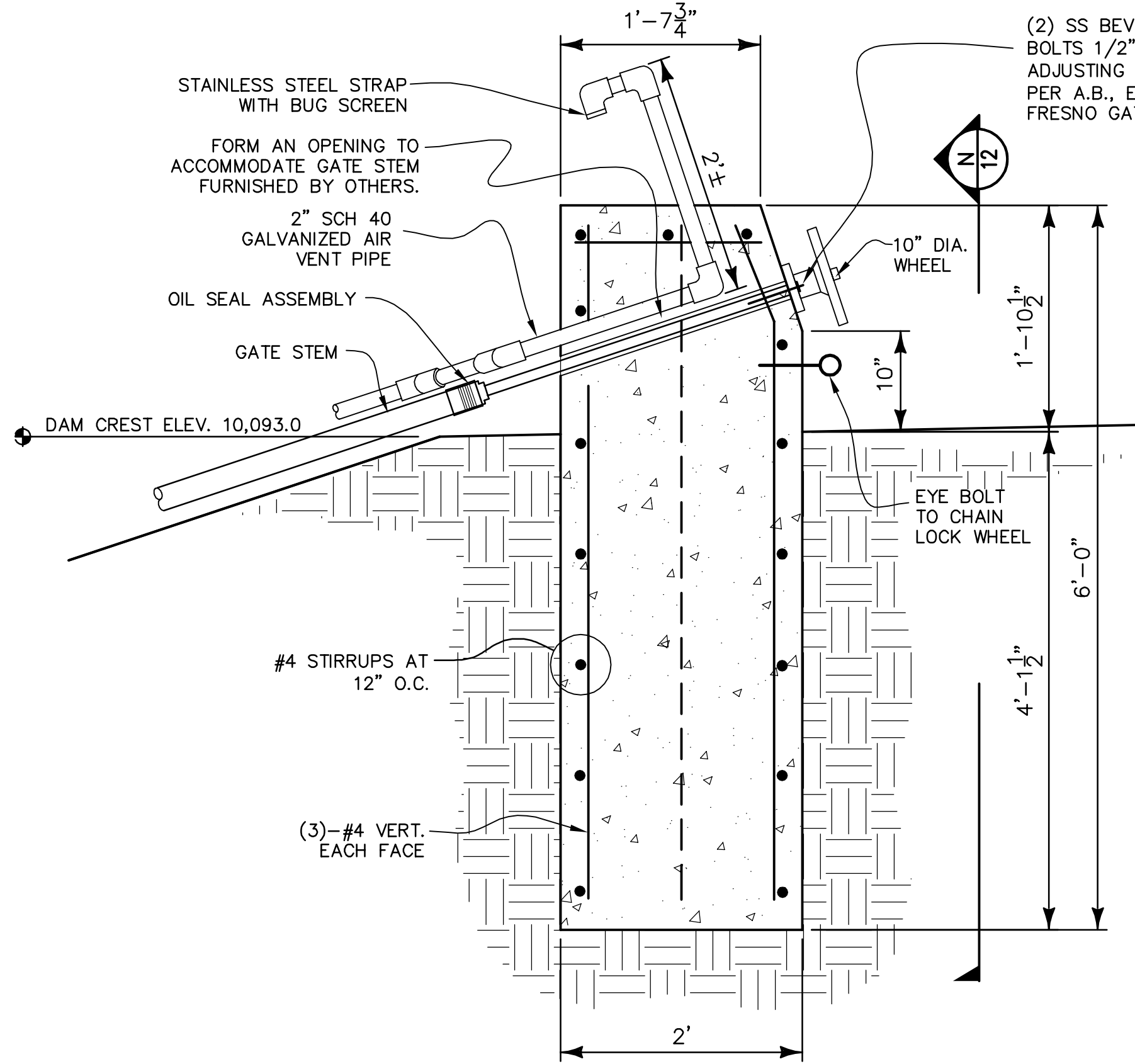


L
12
NTS
GATE CONTROL HAND WHEEL SUPPORT STRUCTURE PLAN

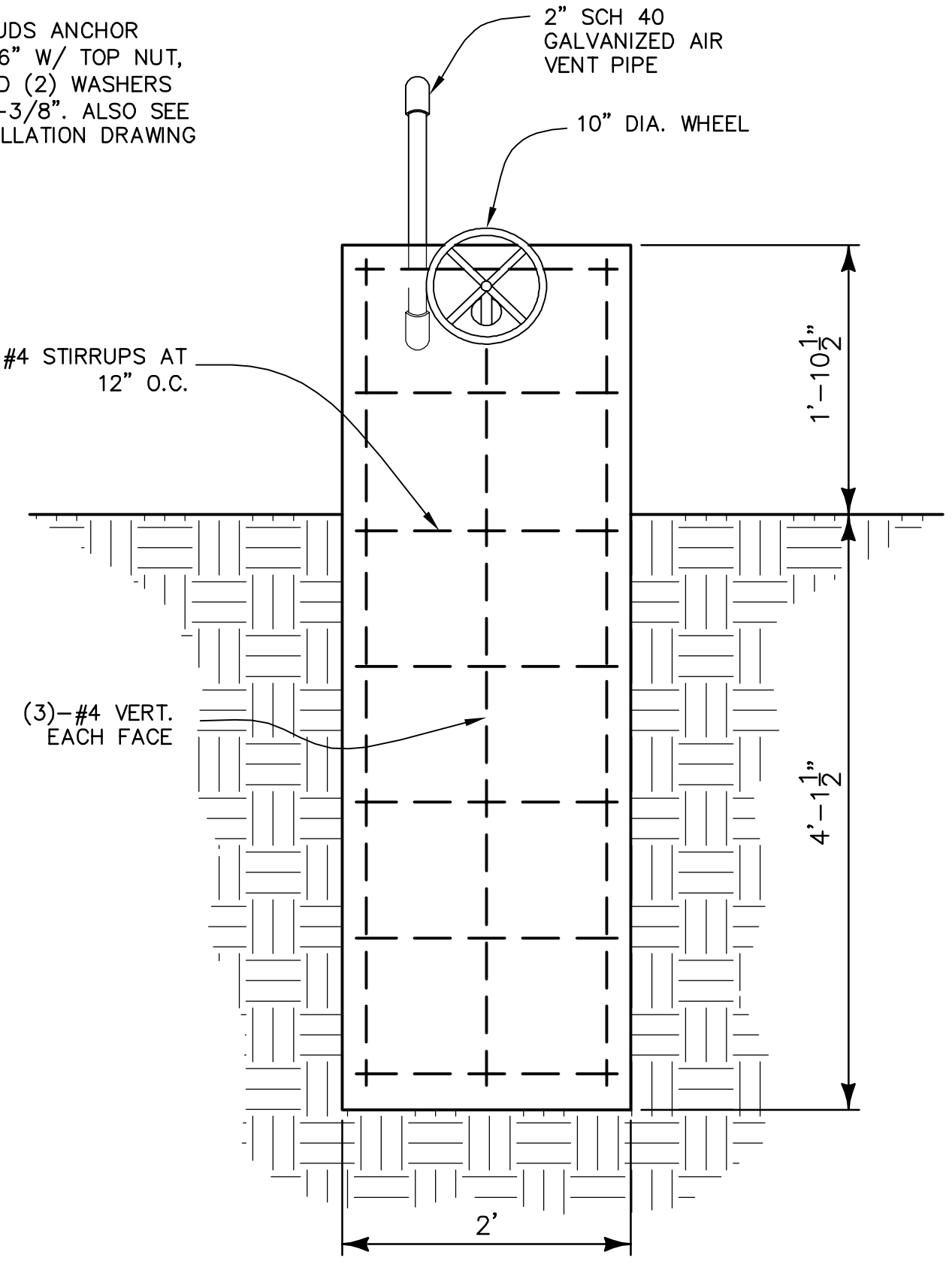


TYPICAL PIER PLAN

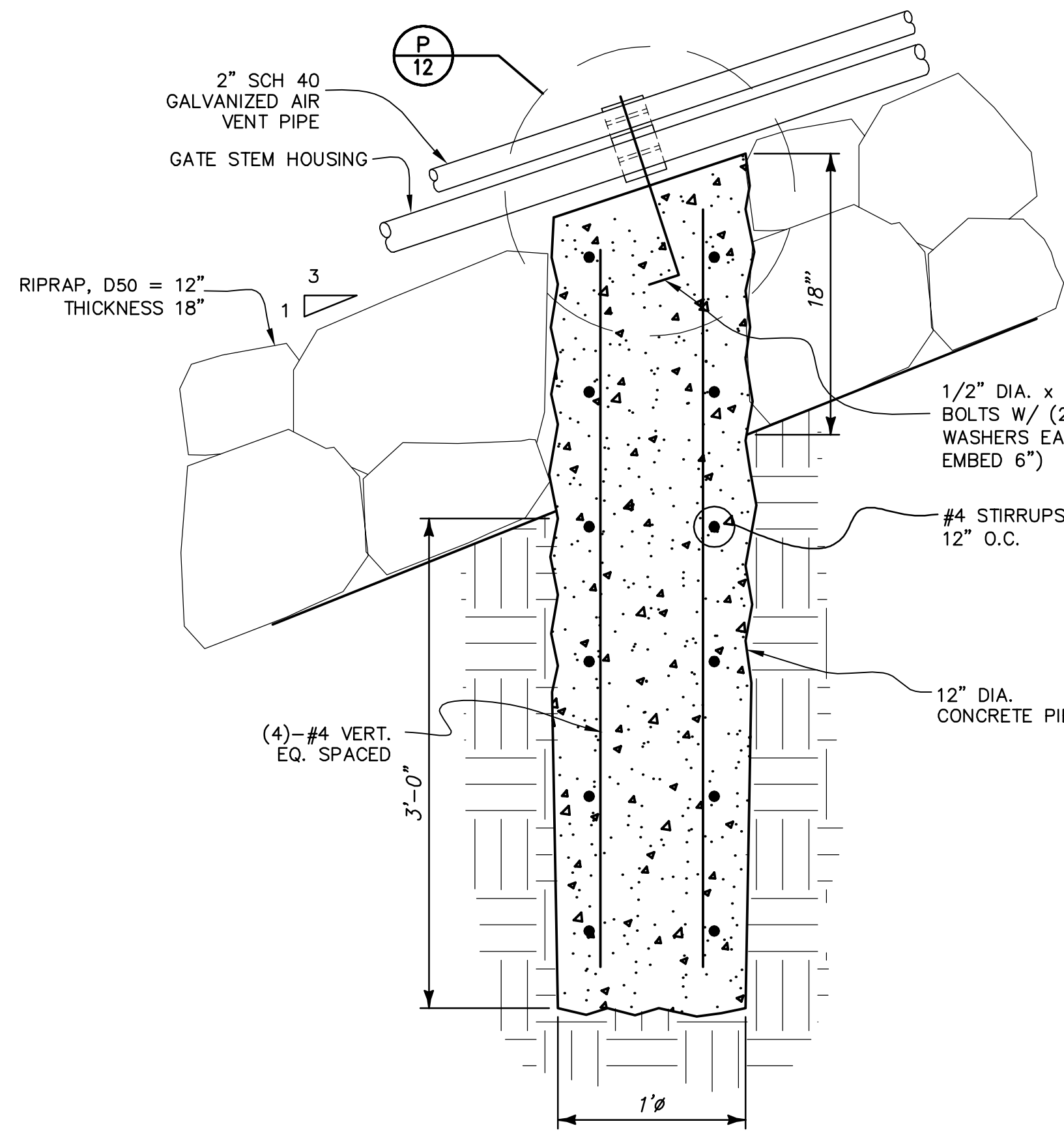
P
12
NTS
STEM HOUSING CLAMP DETAIL



M
12
NTS
GATE CONTROL HAND WHEEL SUPPORT STRUCTURE SECTION

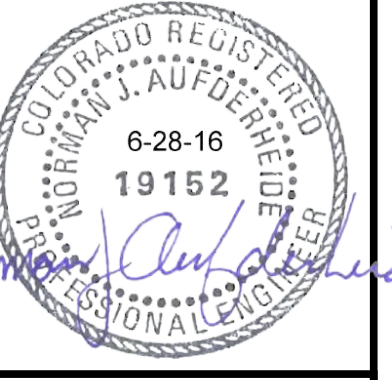


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12
NTS
GATE CONTROL HAND WHEEL SUPPORT STRUCTURE FRONT ELEVATION



O
12
NTS
TYPICAL PIER SECTION

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DAM RECONSTRUCTION
SUPPORT STRUCTURES AND GATE STEM DETAILS
DELTA COUNTY, COLORADO

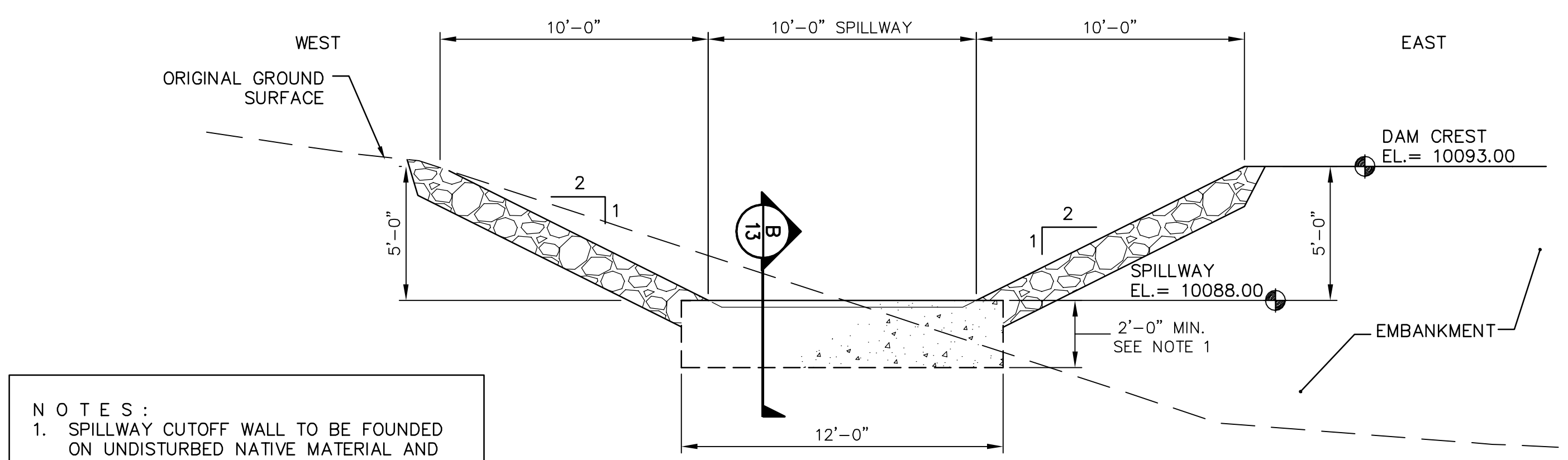
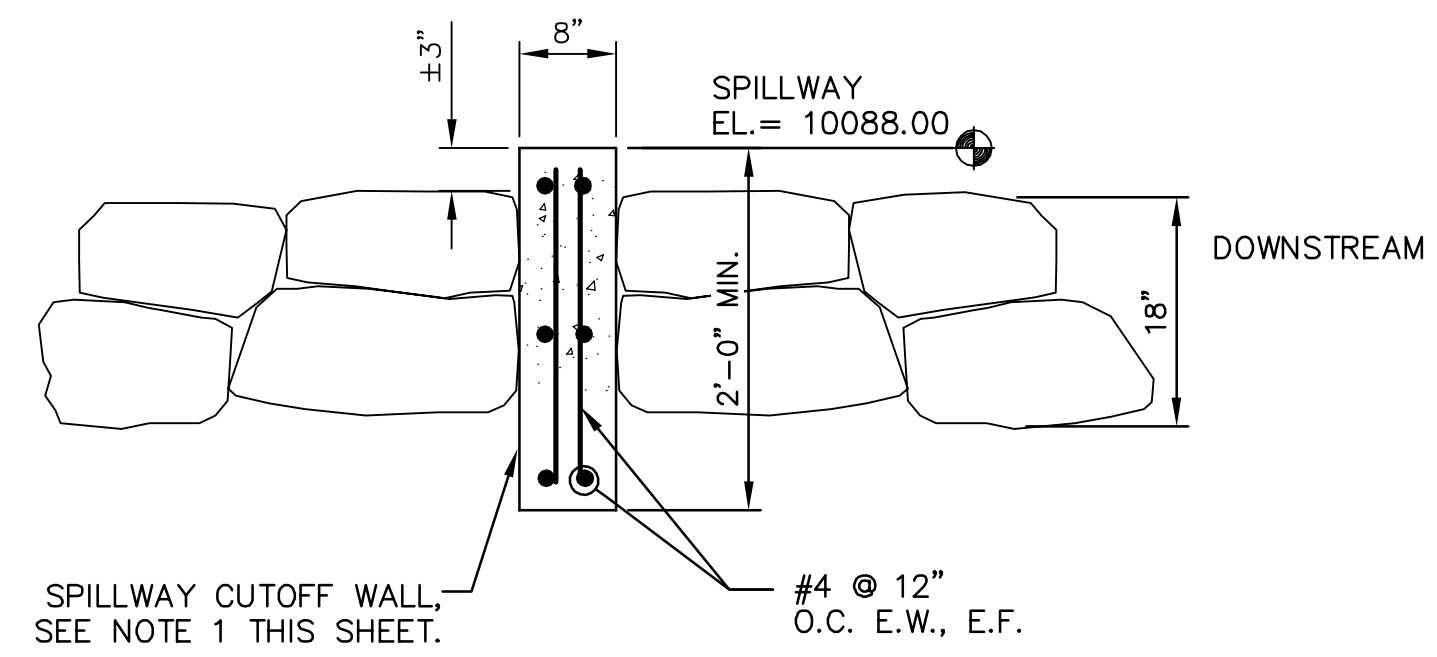
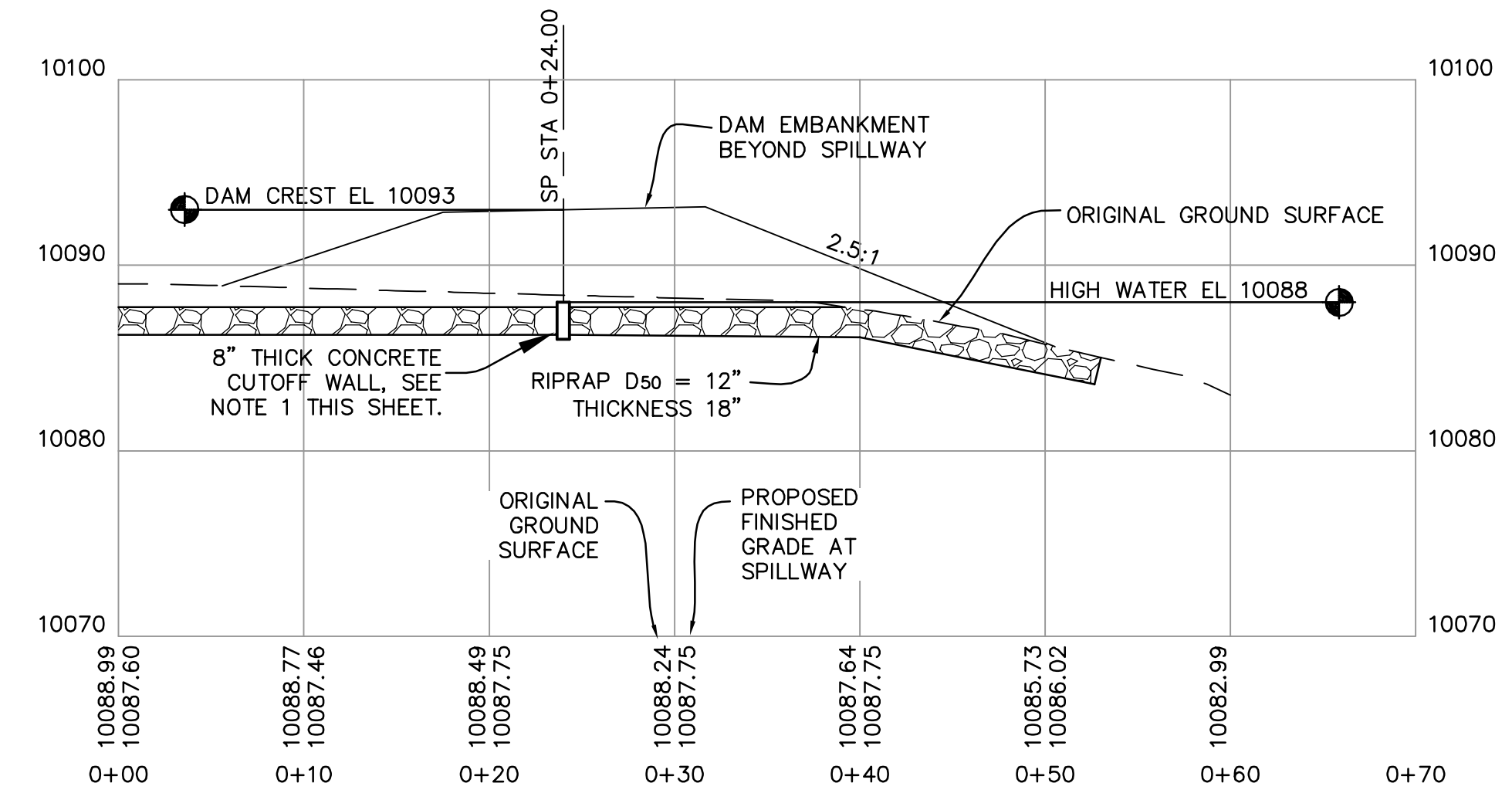
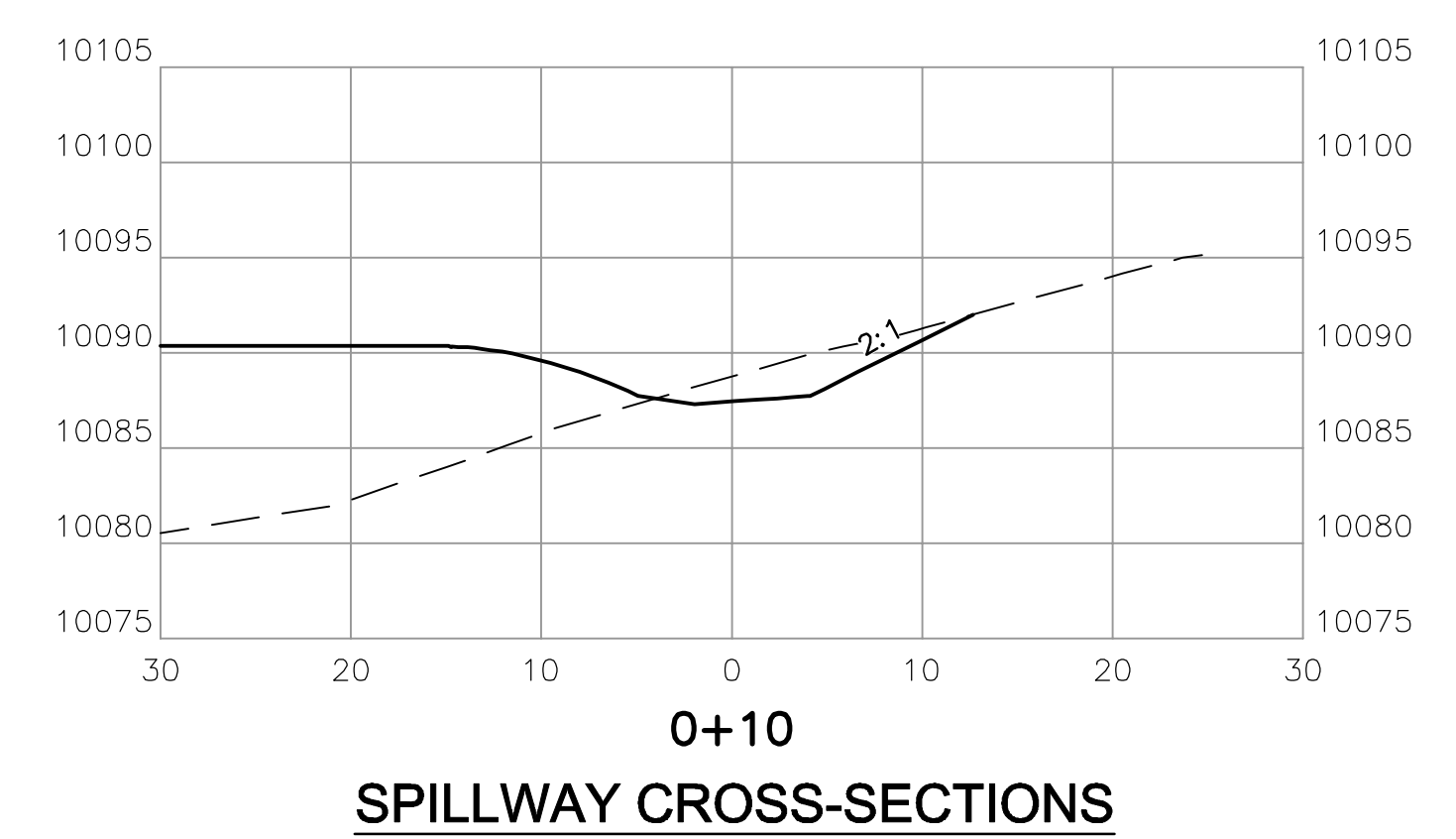
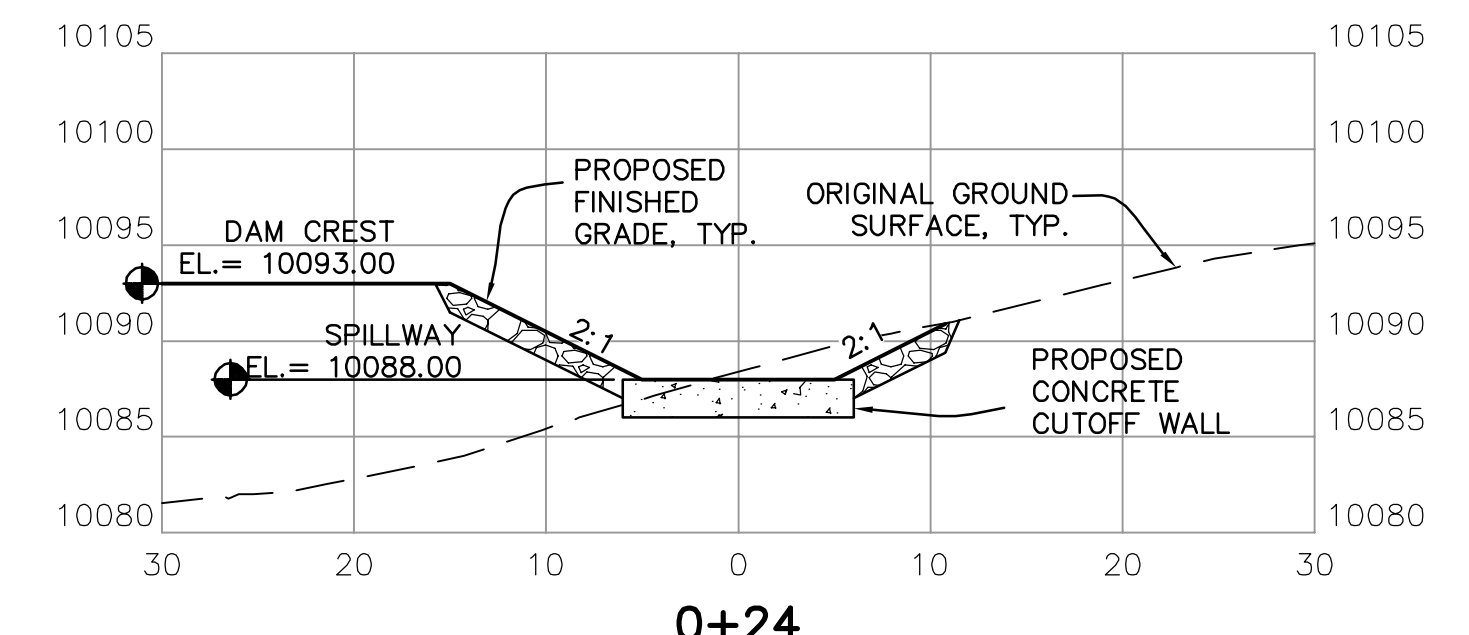
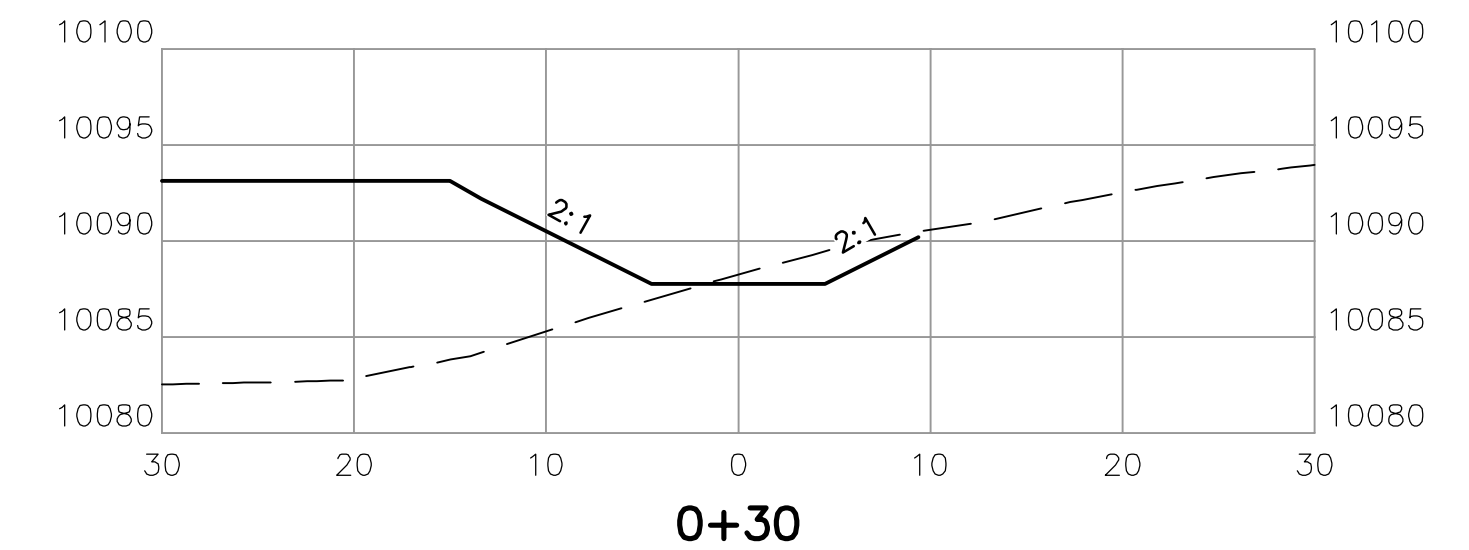
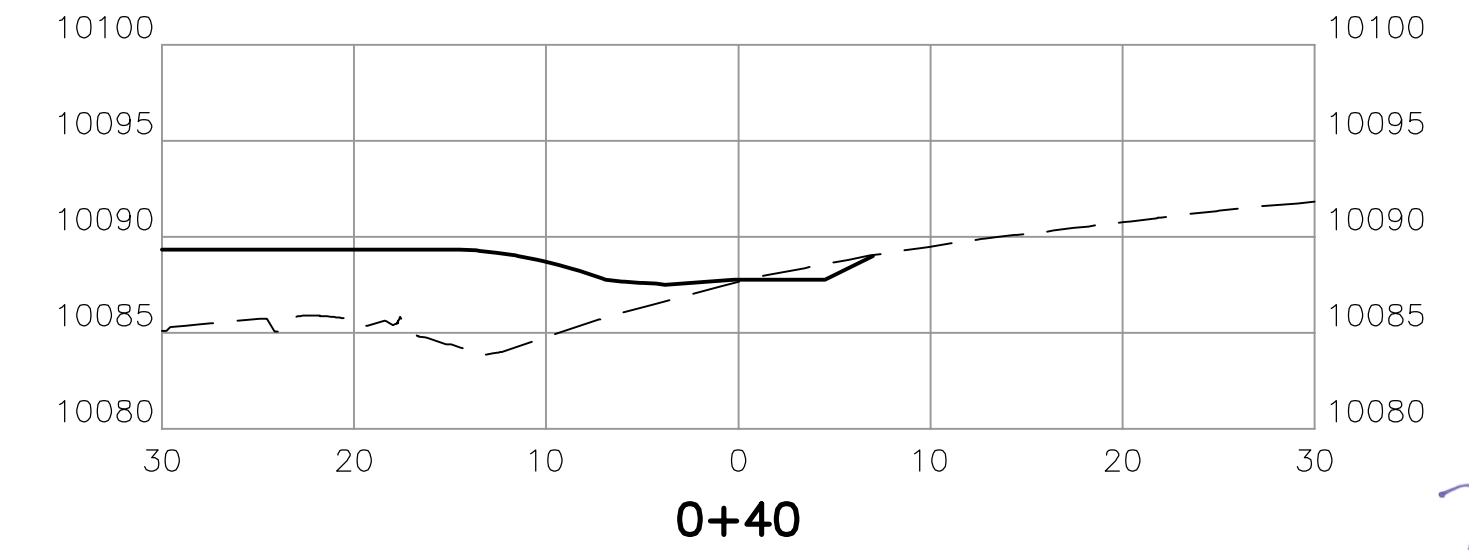
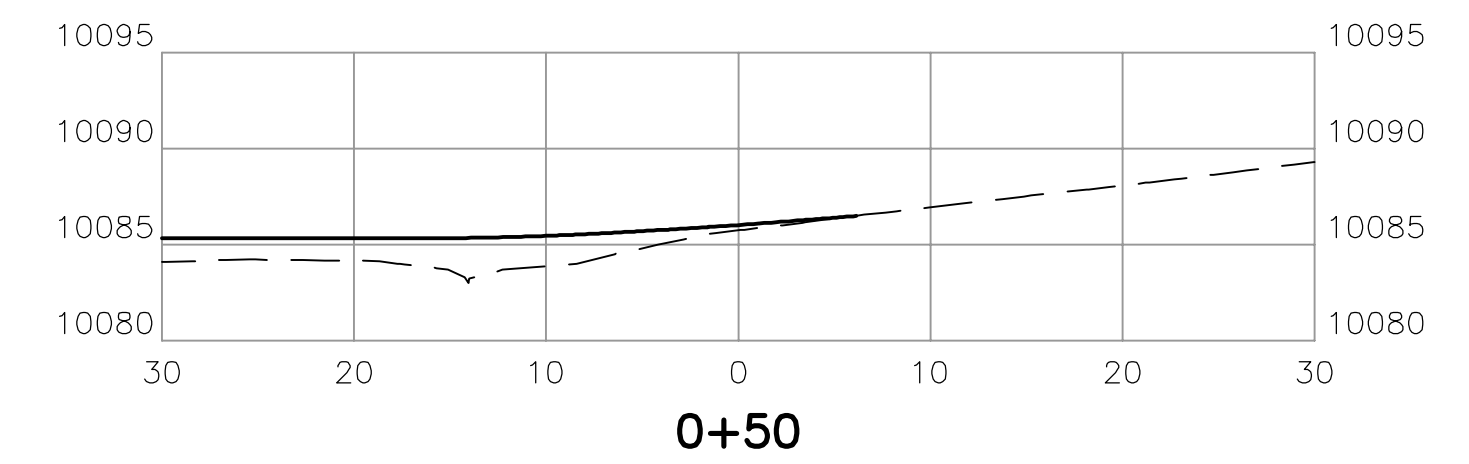
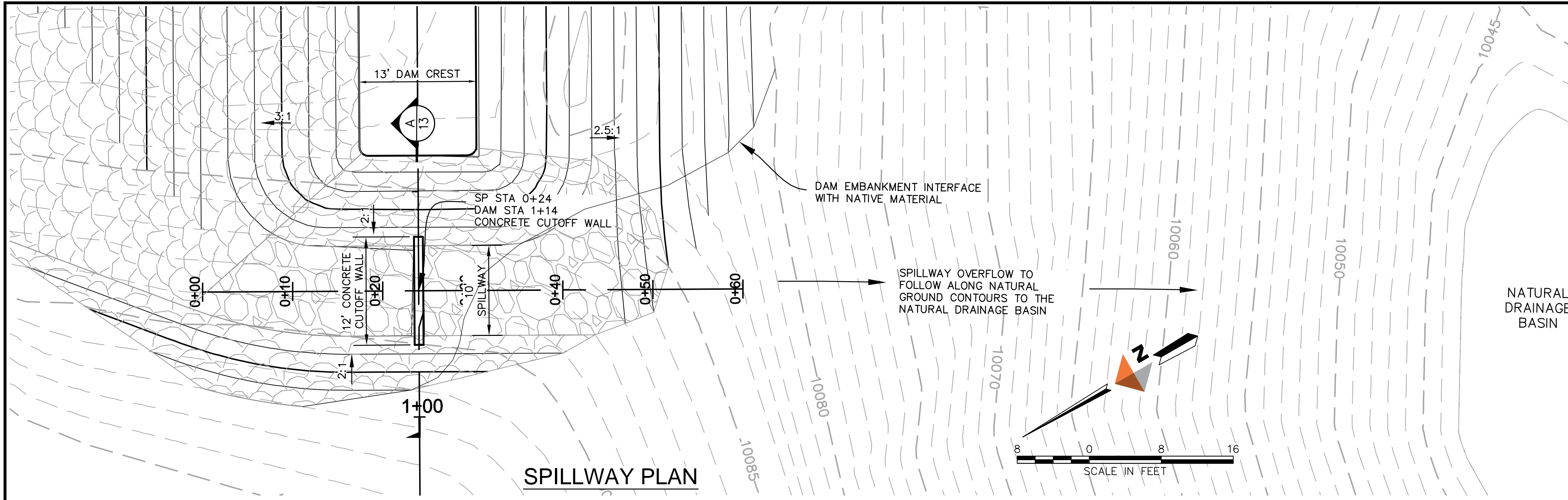
PROJECT 22-74081
DATE 06/27/16

COLORADO STATE ENGINEER FILE NUMBER
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12 OF 15

DOWLHKM FILE No: XXX-XX

G:\22\74081-01\65CAD\Civil\A14-Base-BlanchePark.dwg PLOT DATE: 2016-06-28 11:35 USER: dcastillo



NOTES:
 1. SPILLWAY CUTOFF WALL TO BE FOUNDED ON UNDISTURBED NATIVE MATERIAL AND TO BE FIELD VERIFIED BY THE ENGINEER.

REV	DATE	DESCRIPTION



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BLANCHE PARK RESERVOIR
 DAM RECONSTRUCTION
 SPILLWAY PLAN AND PROFILE

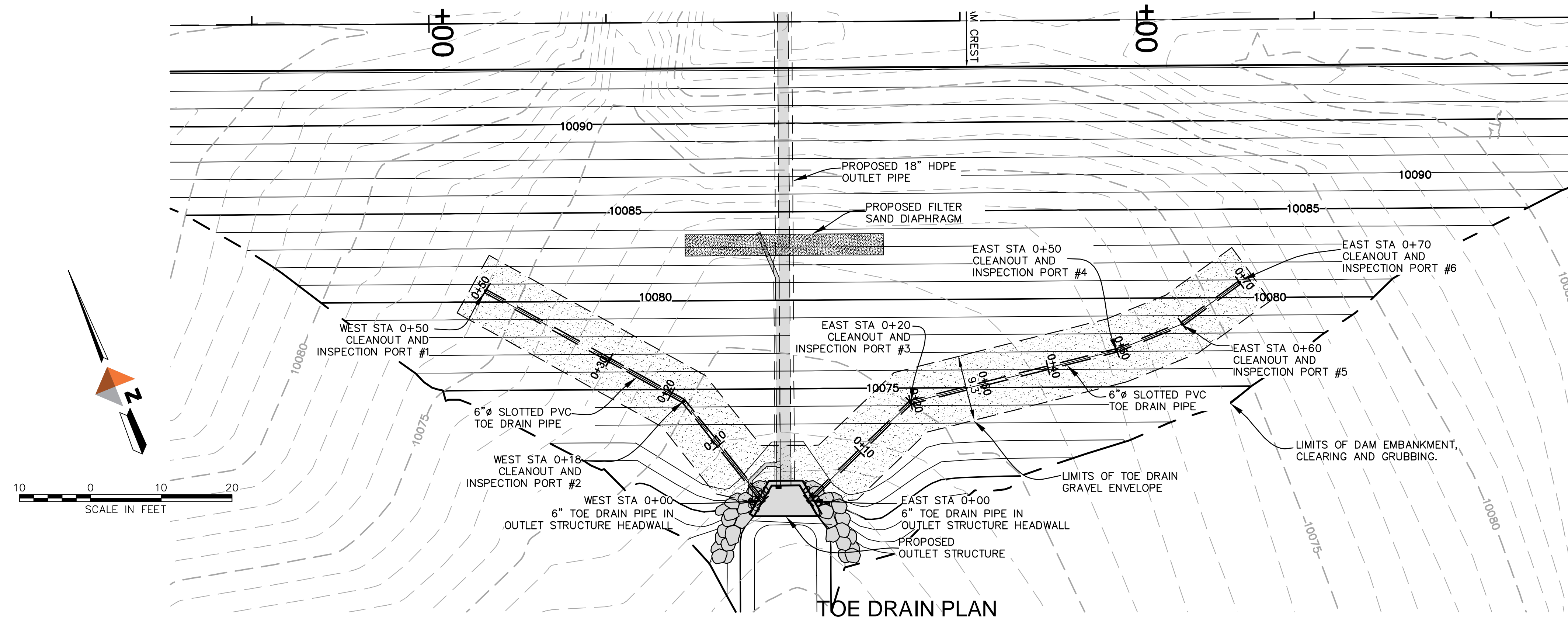
COLORADO
 DELTA COUNTY

PROJECT 22-74081
 DATE 06/27/16

COLORADO STATE ENGINEER FILE NUMBER

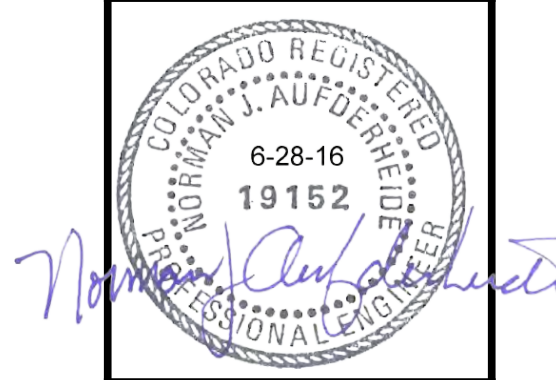
C-2011A

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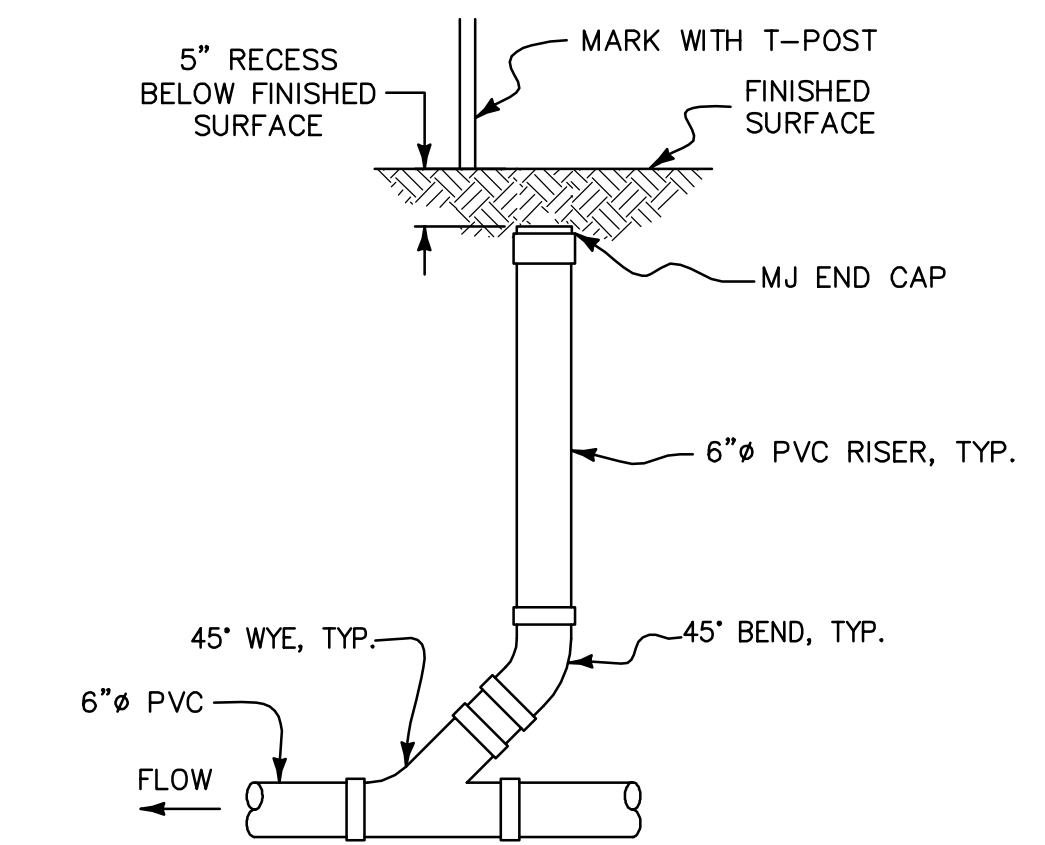
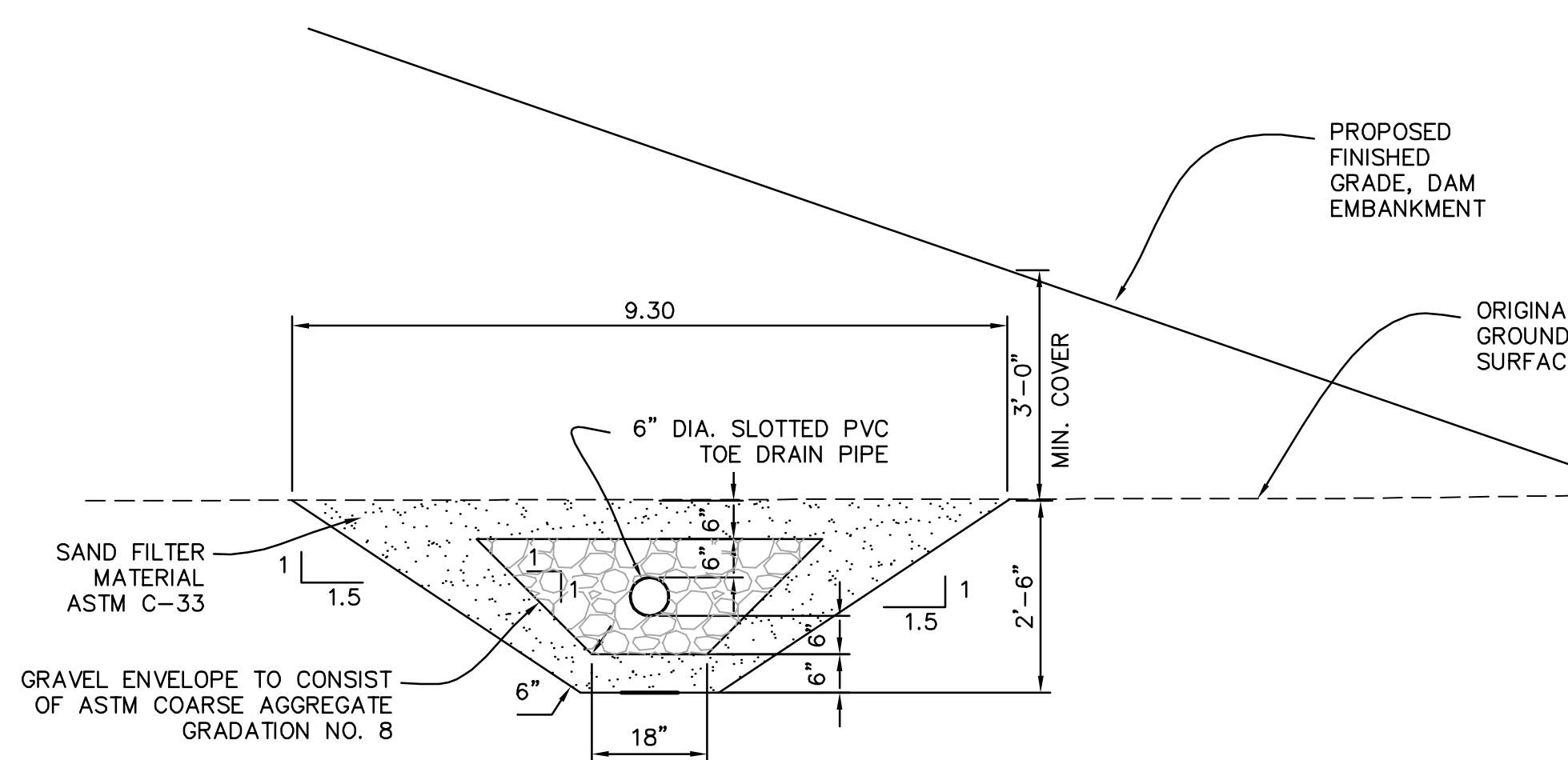
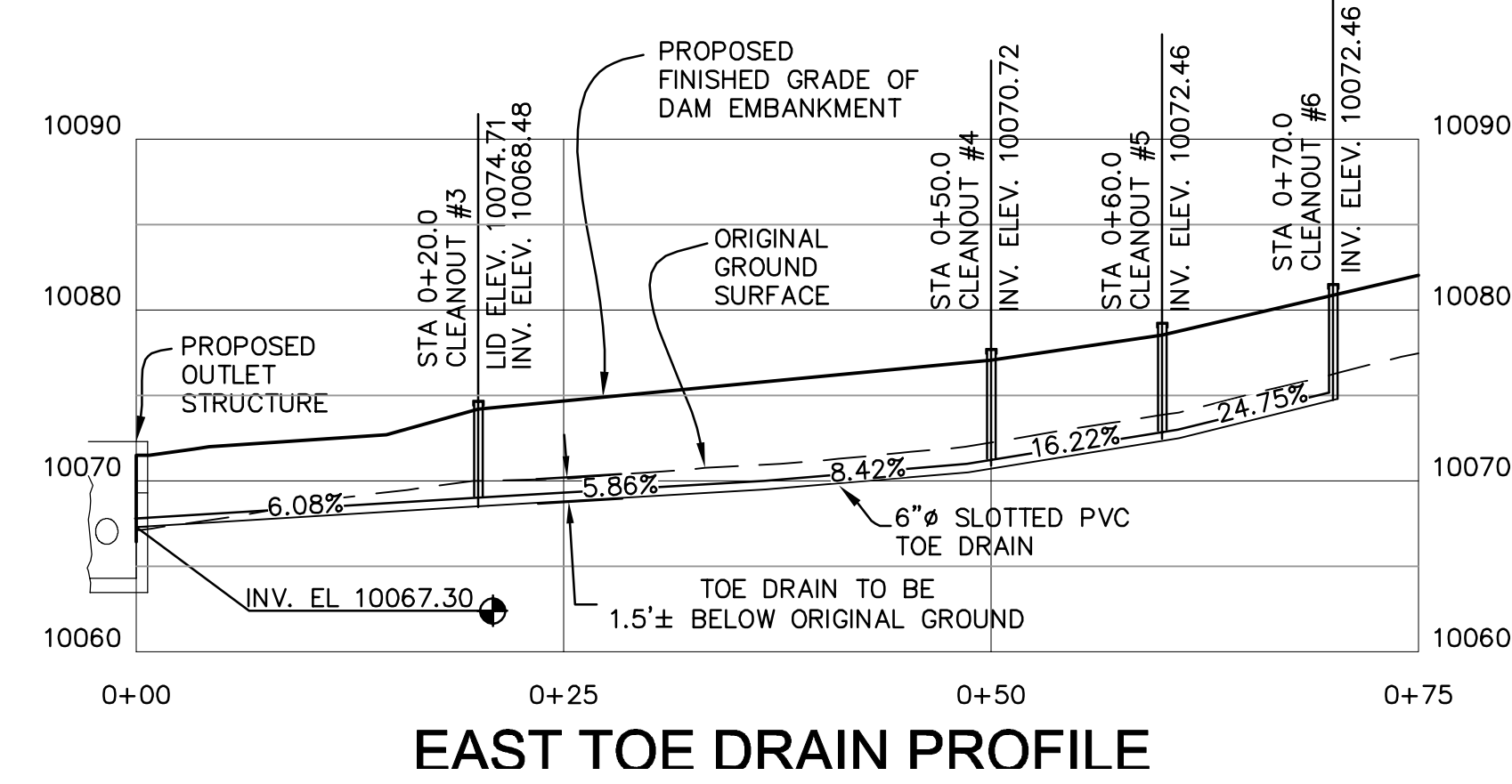
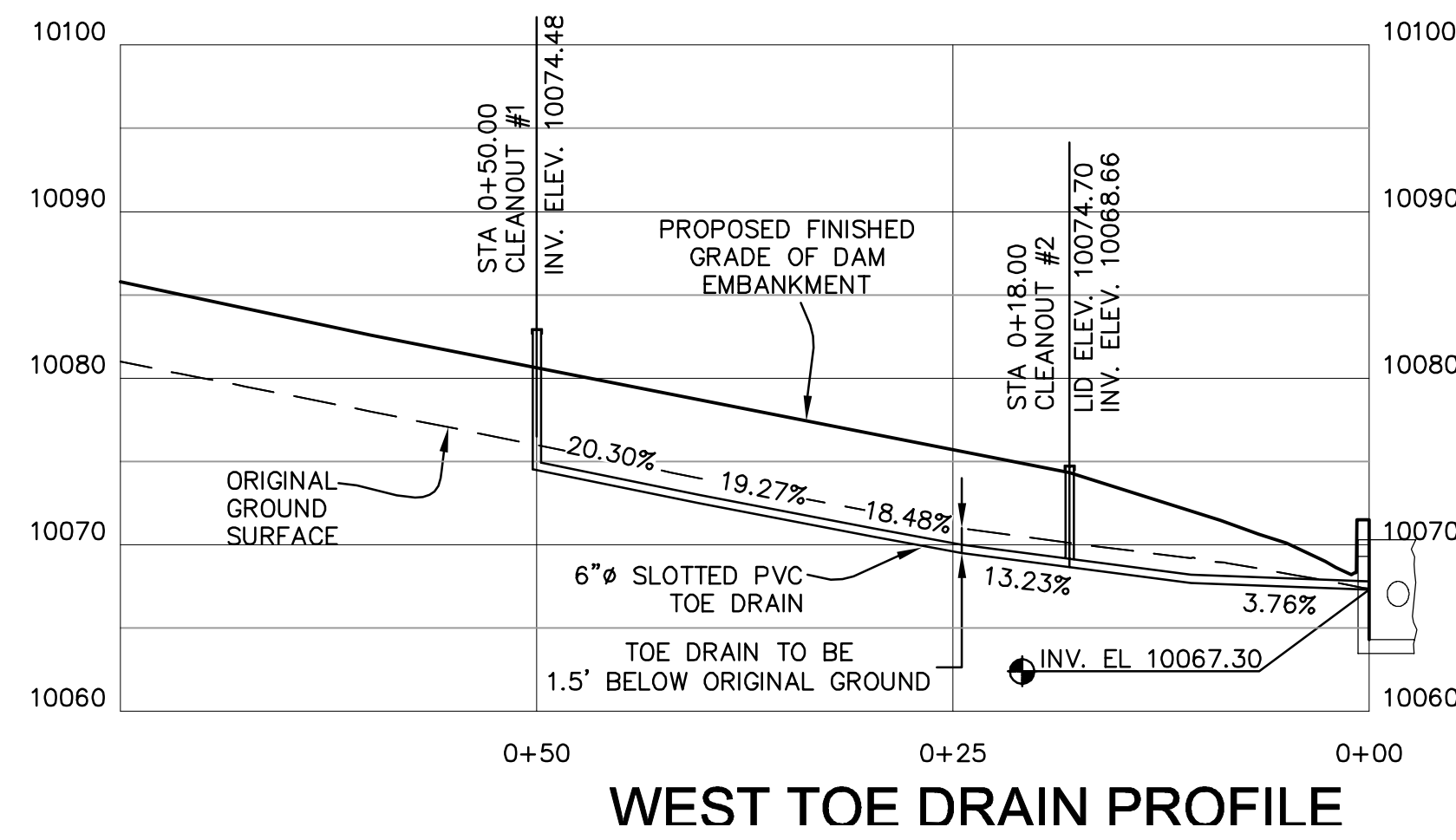


NOTES:

1. REMOVE SURFACE VEGETATION, TRASH, ORGANICALLY CONTAMINATED SOIL, ETC. FROM THE FOOTPRINT OR LIMITS OF THE NEW DAM EMBANKMENT.
2. EXCAVATED MATERIAL WHICH IS FREE OF DELETERIOUS MATERIALS, ORGANICS, AND MEETS THE EMBANKMENT SPECIFICATIONS MAY BE STOCKPILED FOR RE-USE.
3. PLACE EMBANKMENT FILL MATERIAL IN MAXIMUM LOOSE LIFTS OF 6 INCHES AND COMPACT TO AT LEAST 95% STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D698). THE MOISTURE CONTENT OF THE EMBANKMENT FILL SHALL BE 0% TO 4% OF OPTIMUM.



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A
 15 NTS
 TOE DRAIN TYPICAL TRENCH DETAIL

B
 15 NTS
 TOE DRAIN TYPICAL CLEANOUT INSPECTION PORT DETAIL

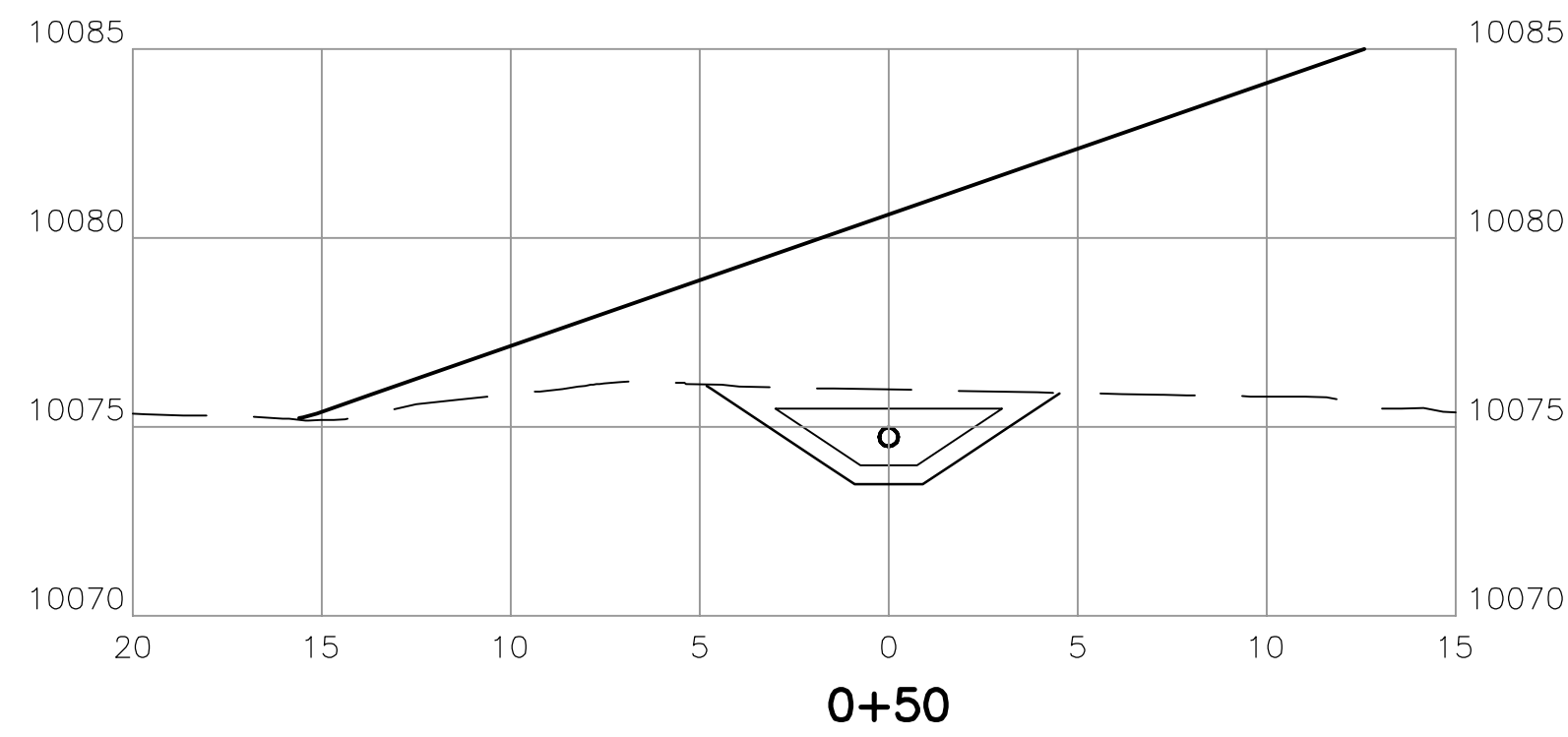
BLANCHE PARK RESERVOIR
 DAM RECONSTRUCTION
 TOE DRAIN PLAN, PROFILE AND DETAILS
 DELTA COUNTY
 COLORADO

PROJECT 22-74081
 DATE 06/27/16

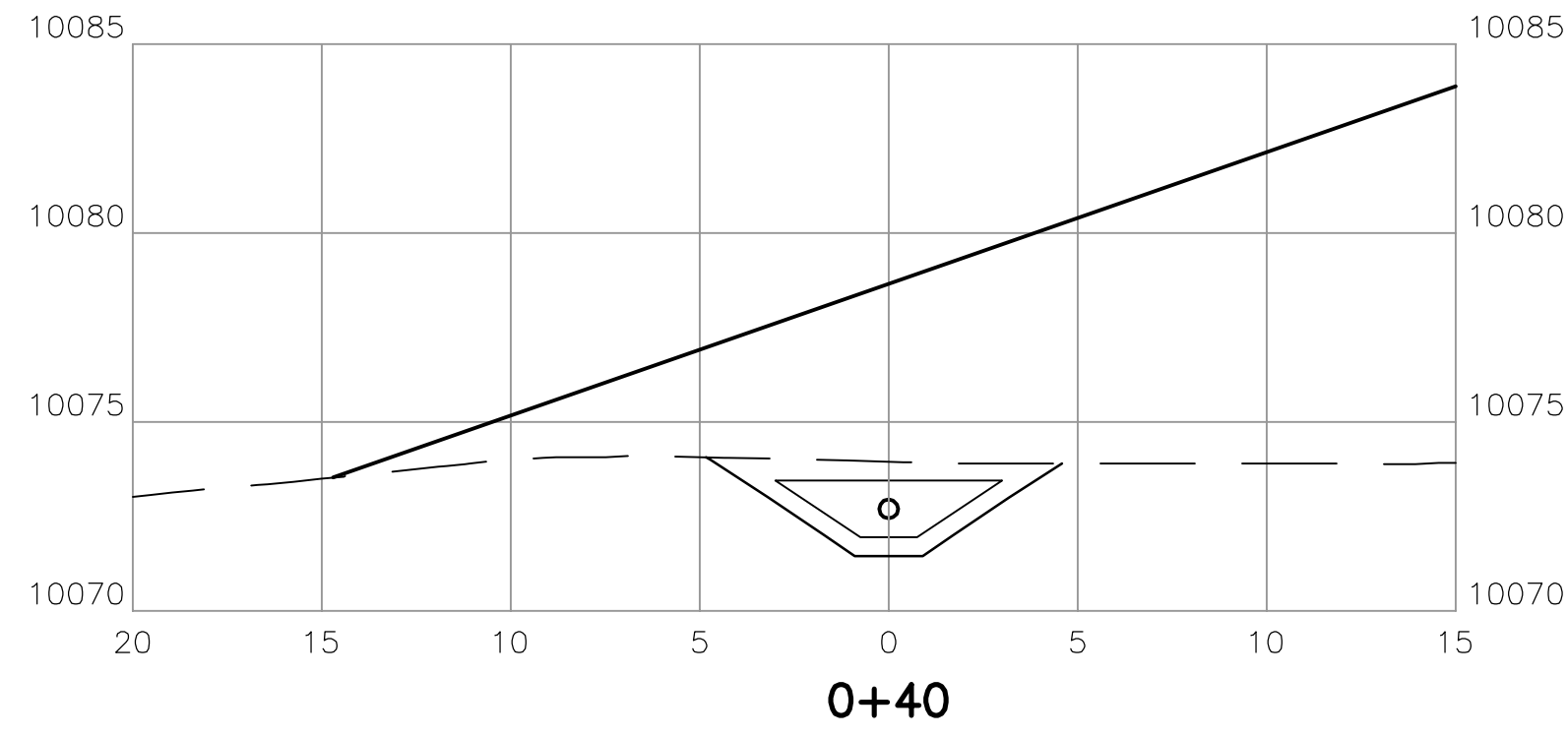
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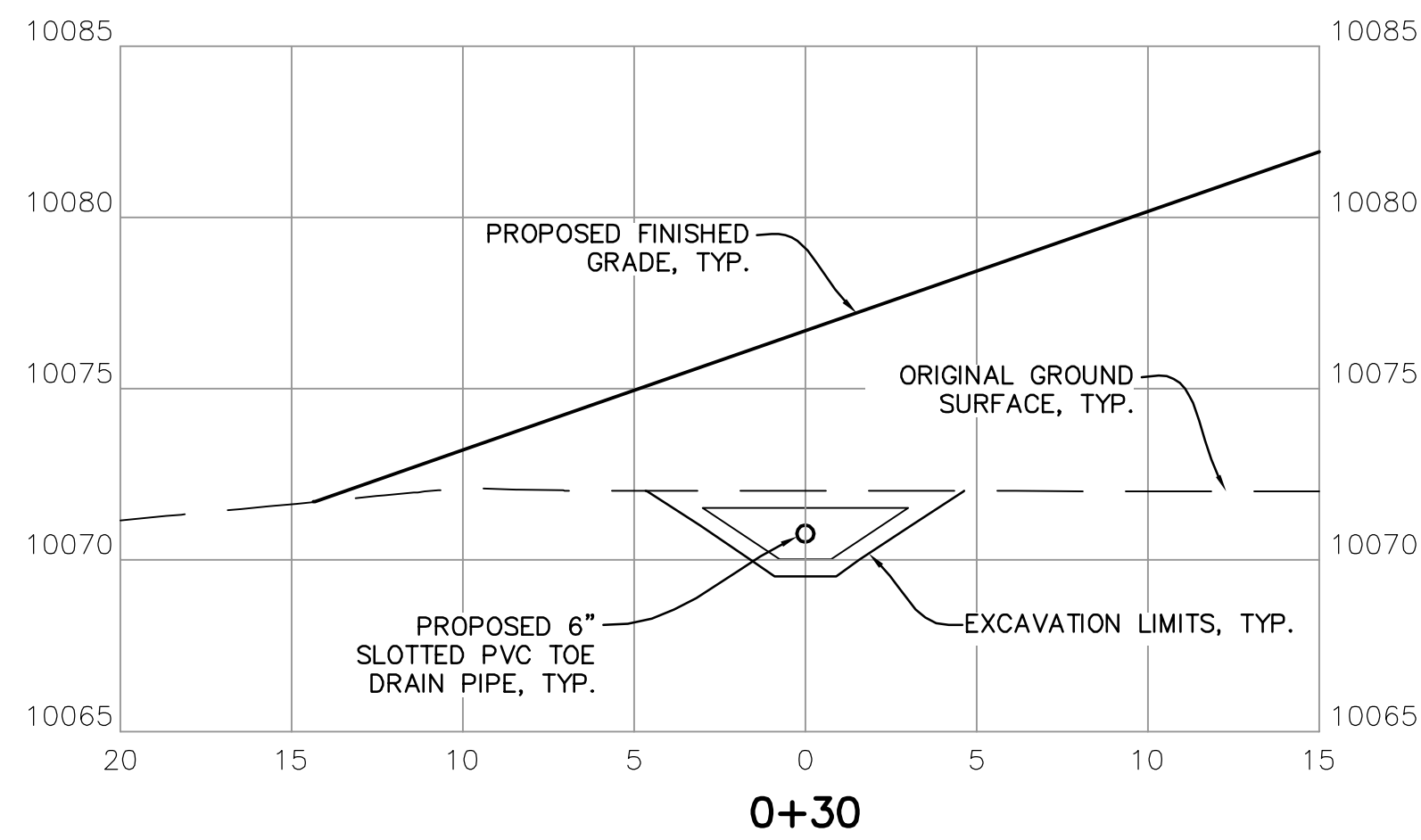
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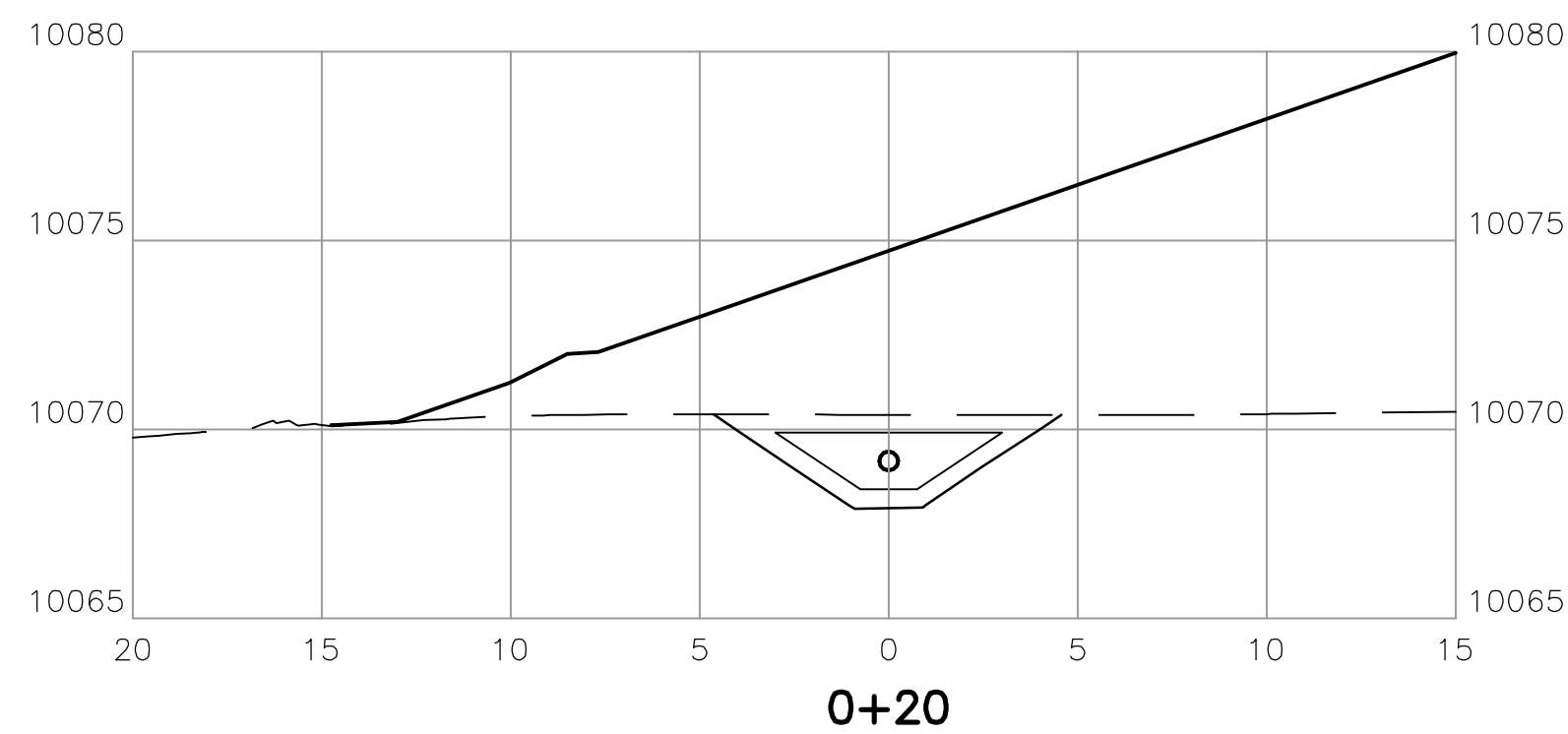
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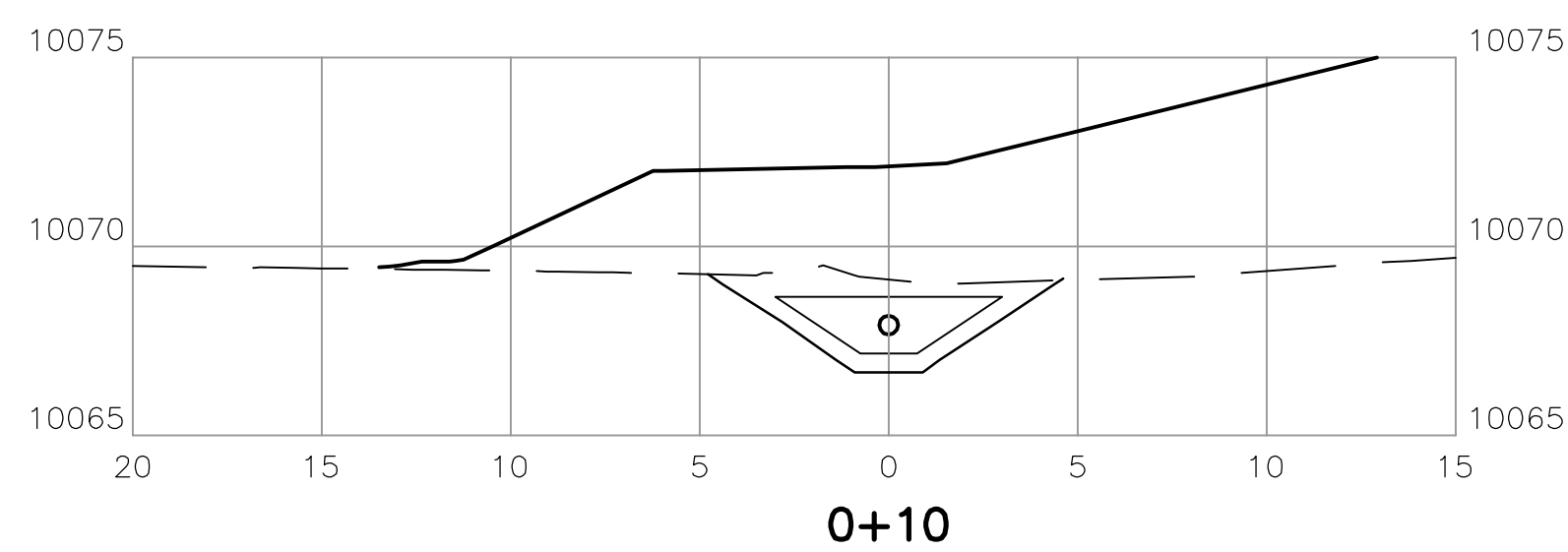
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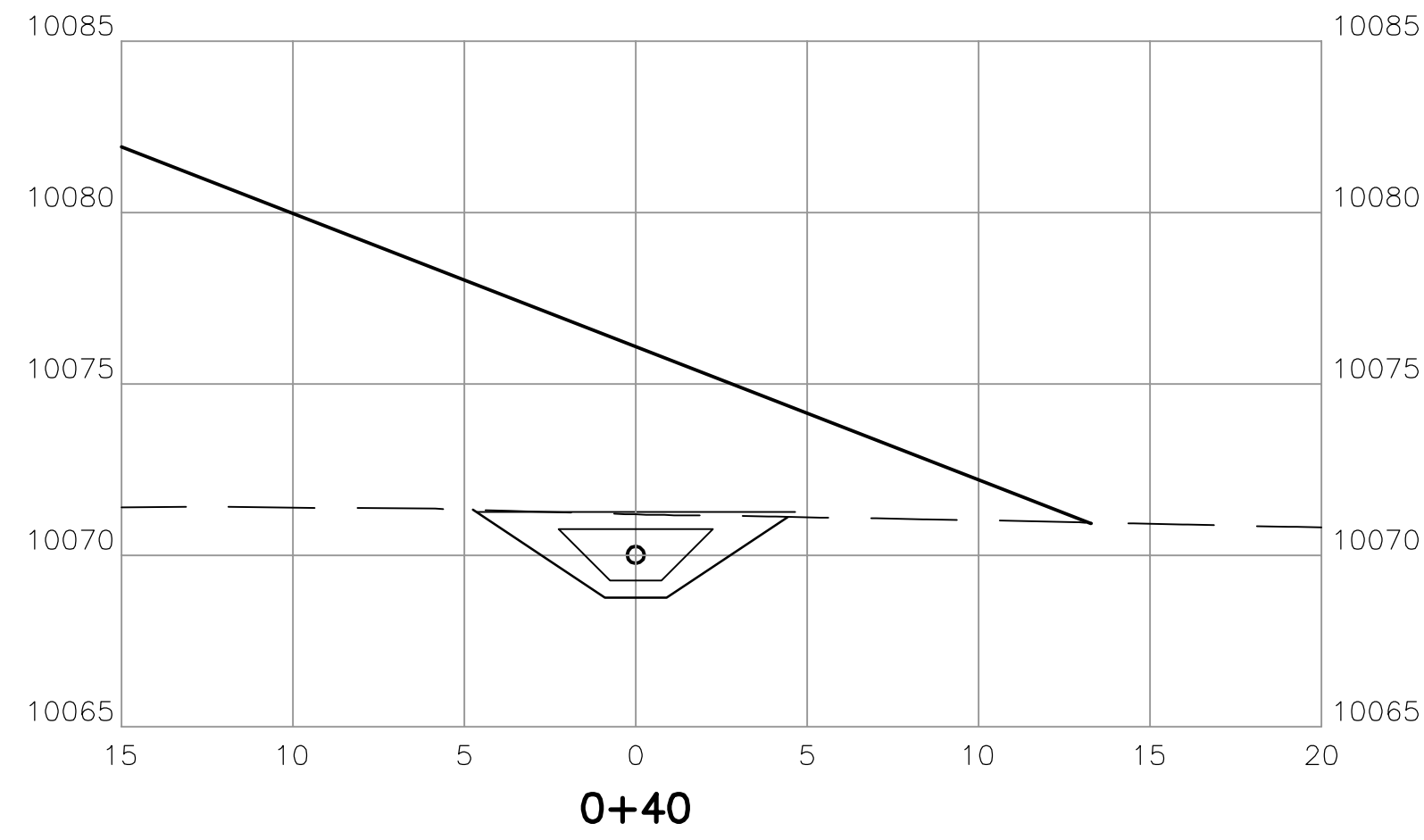


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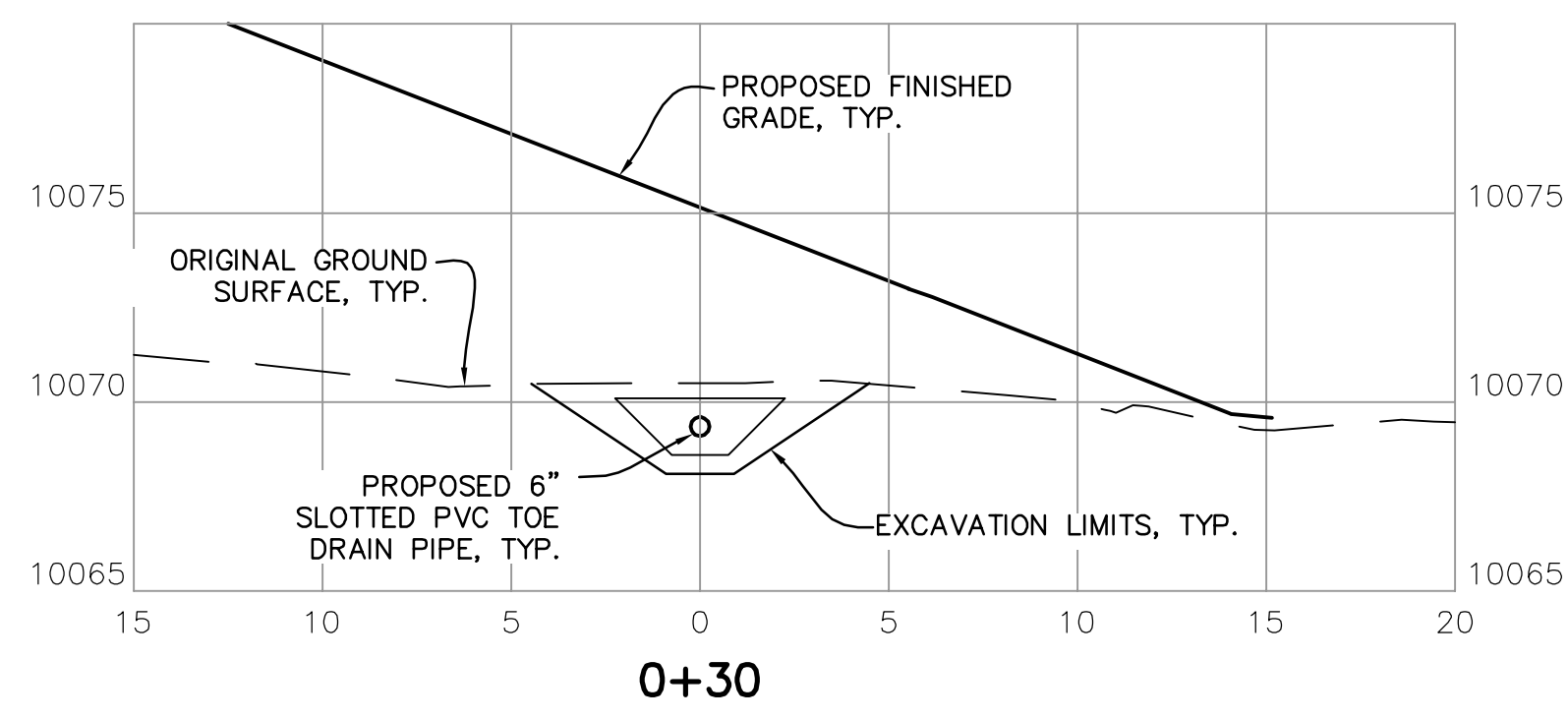


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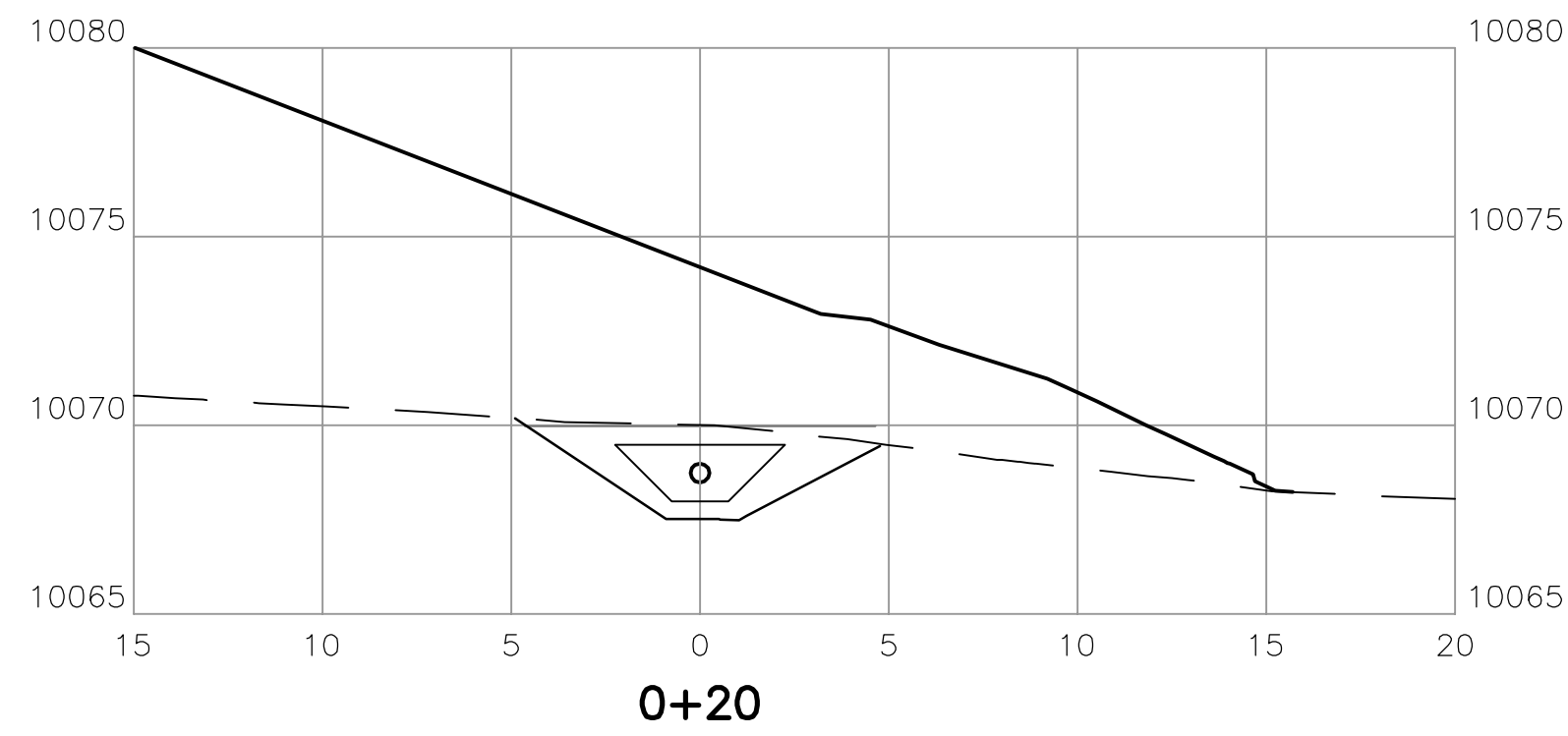
WEST TOE DRAIN



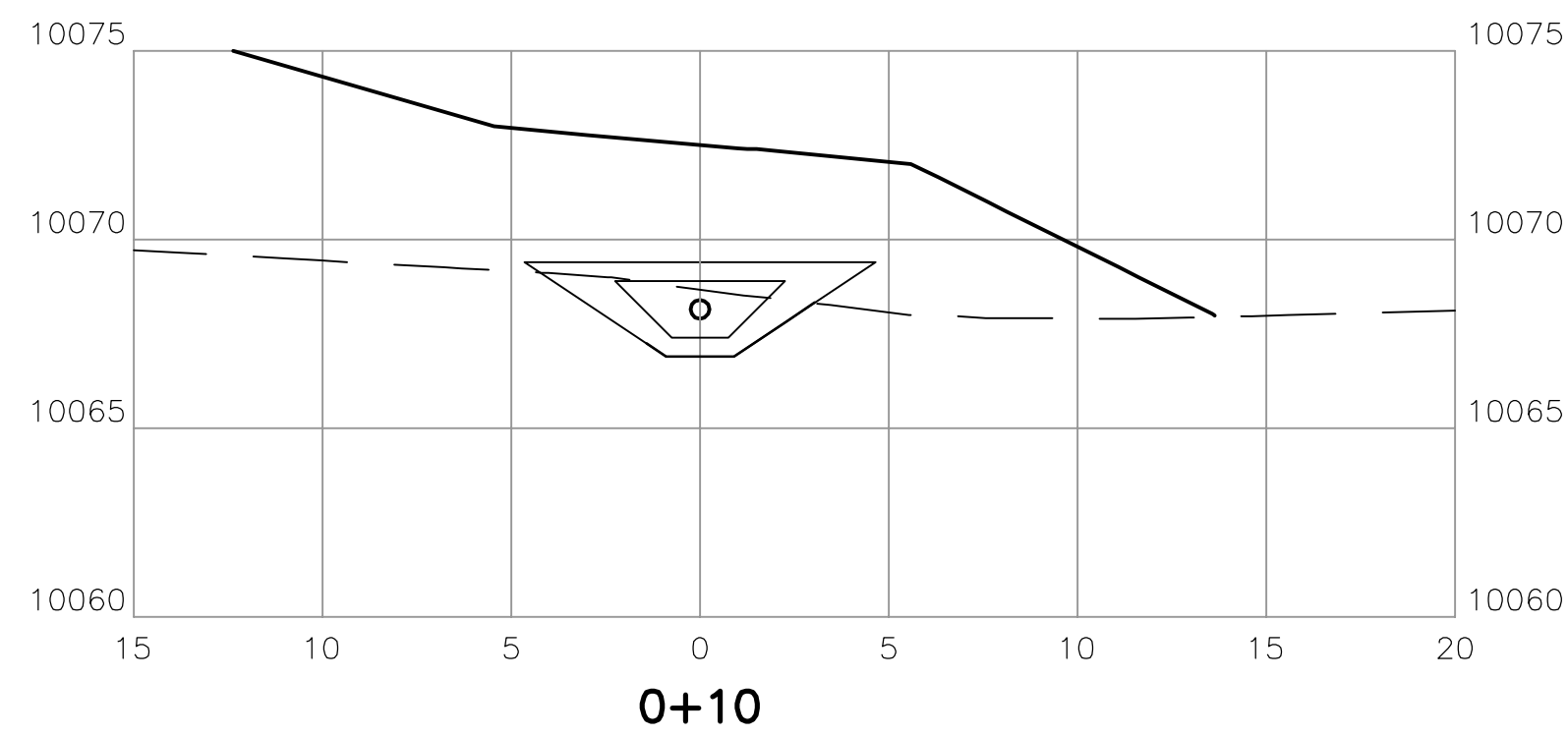
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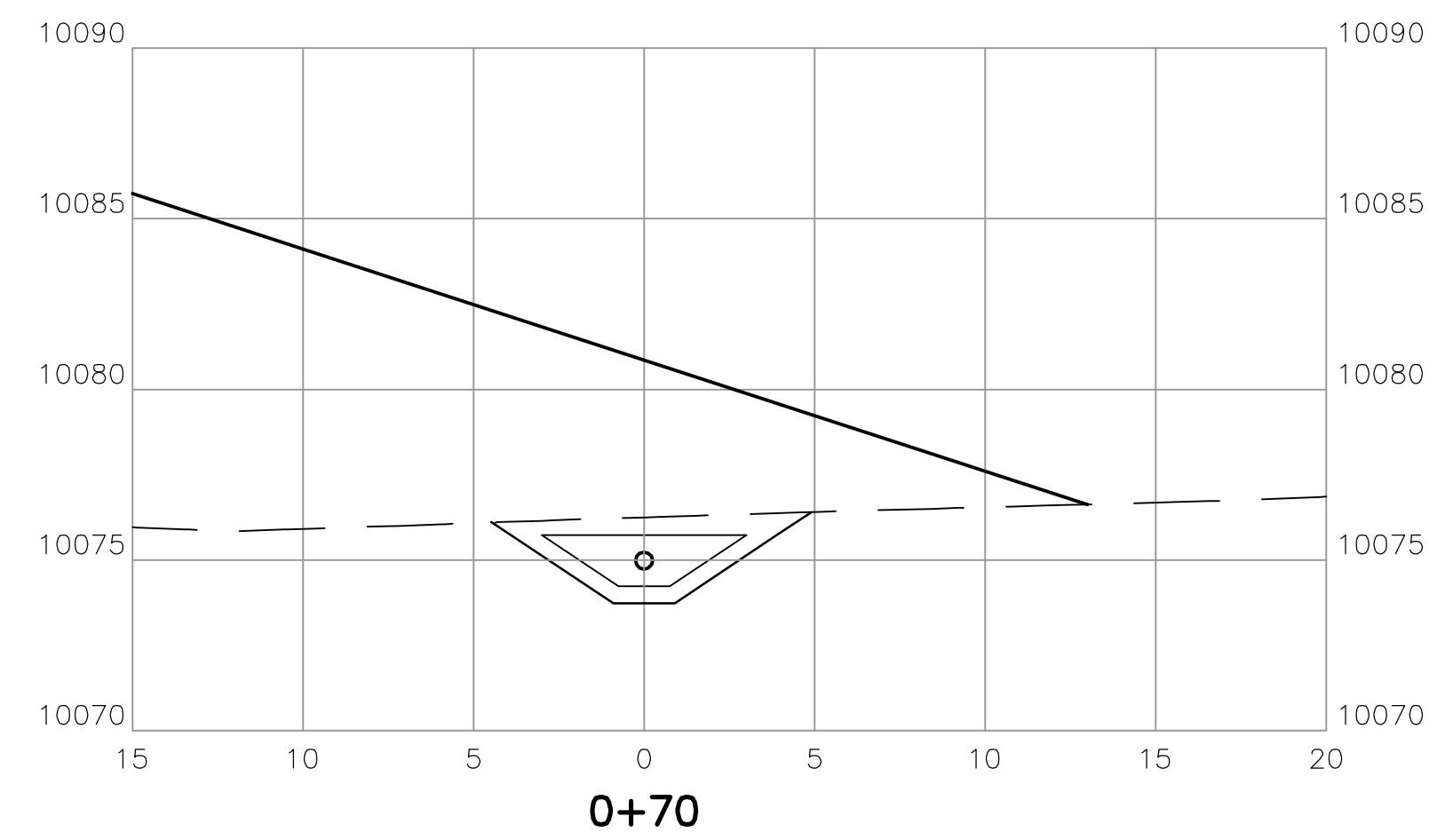


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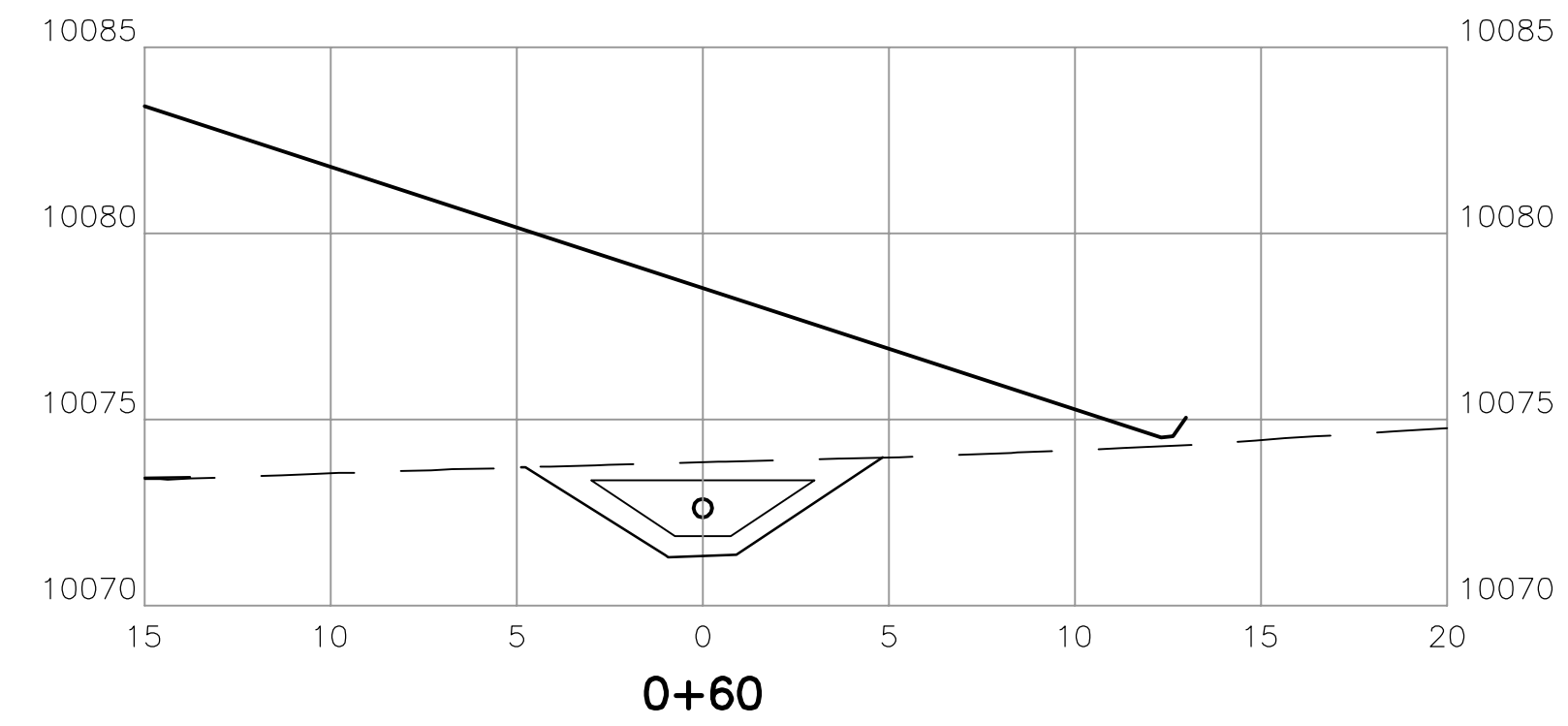


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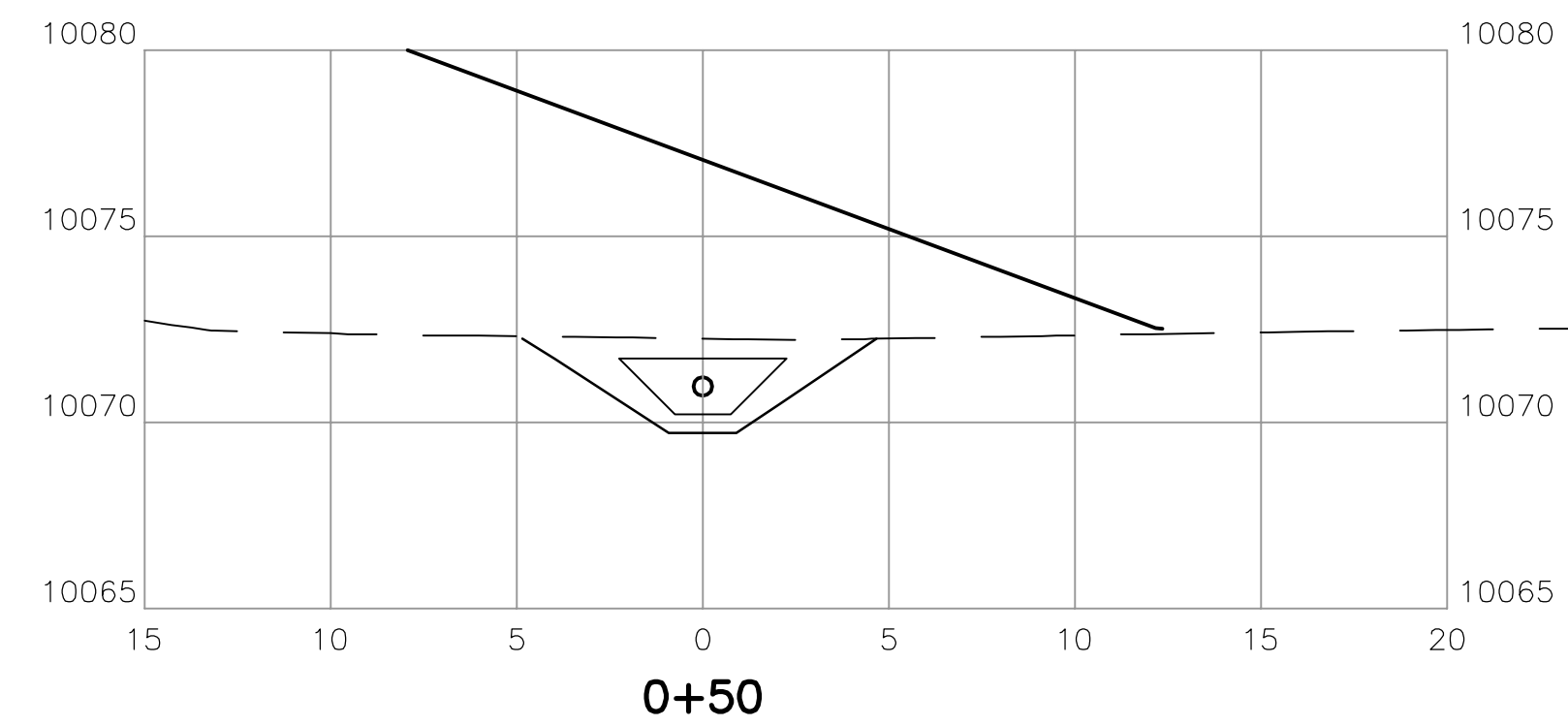
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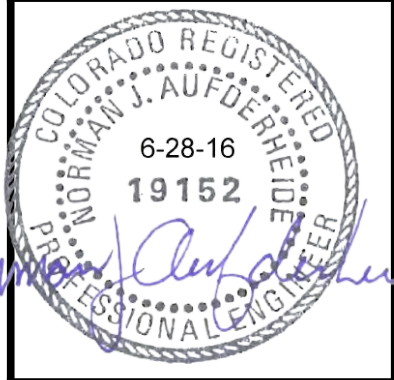


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BLANCHE PARK RESERVOIR
 DAM RECONSTRUCTION
 TOE DRAIN CROSS-SECTIONS
 DELTA COUNTY
 COLORADO

PROJECT 22-74081
 DATE 06/27/16

COLORADO STATE ENGINEER FILE NUMBER

C-2011A SHEET 15
 15 OF 15

***BLANCHE PARK RESERVOIR DAM RECONSTRUCTION
WATER DIVISION #4, WATER DISTRICT #40
DAM ID: 400119
CONSTRUCTION FILE NUMBER C-2011A
TECHNICAL SPECIFICATIONS***

**Prepared For: Grand Mesa Water Conservancy District
P.O. Box 129
Cedaredge, CO 81413**

**Prepared By: DOWL, LLC
222 South Park Avenue
Montrose, CO 81401
Phone (970) 249-6828**

BLANCHE PARK RESERVOIR DAM RECONSTRUCTION

WATER DIVISION #4, WATER DISTRICT #40

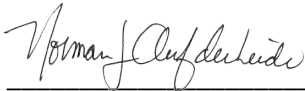
DAM ID: 400119

CONSTRUCTION FILE NUMBER C-2011A

DELTA COUNTY, COLORADO

I HEREBY DECLARE THAT THESE TECHNICAL SPECIFICATIONS FOR CONSTRUCTION OF THE BLANCHE PARK RESERVOIR DAM RECONSTRUCTION WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION FOR THE COLORADO DIVISION OF WATER RESOURCES AS OF THE

28th DAY OF June, 2016



NORMAN J. AUFDERHEIDE, P.E.
COLORADO P.E. No. 19152



ON BEHALF OF THE COLORADO DIVISION OF WATER RESOURCES, THE UNDERSIGNED DOES HEREBY ACCEPT THESE TECHNICAL SPECIFICATIONS FOR CONSTRUCTION OF THE BLANCHE PARK RESERVOIR DAM RECONSTRUCTION.

APPROVED ON THE ____ DAY OF _____, 2016.

BY:

STATE ENGINEER

WILLIAM T. MCCORMICK III, P.E.
COLORADO P.E. No. 29127
CHIEF, DAM SAFETY BRANCH

Table of Contents

DIVISION 1 - GENERAL REQUIREMENTS

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01011	SITE CONDITIONS	3
01012	SITE ACCESS	5
01020	PRE-CONSTRUCTION CONFERENCE AND PROGRESS MEETINGS	6
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DIVISION 1

SECTION 01000

GENERAL CONDITIONS

1.0 GENERAL

The work covered by this Contract will conform to the Colorado Division of Water Resources *"Rules and Regulations for Dam Safety and Dam Construction"* as currently adopted, as administered by the State Engineer's Office.

1.1 PROJECT PLANS

Approved plans and specifications shall not be materially changed without the prior written approval of the State Engineer.

1.2 STATE ENGINEER'S AUTHORITY

The State Engineer has the authority to require material used and the work for construction to be accomplished according to the rules and regulations. Construction shall not be considered complete (i.e. final payment) until the State Engineer has accepted the work in writing.

1.3 OWNER'S ENGINEER

The owner's engineer will monitor the quality of the construction as specified in Rule 9 of the Rules and Regulations for Dam Safety and Dam Construction, January 1, 2007.

END OF SECTION 01000

DIVISION 1

SECTION 01010

SUMMARY OF WORK

1.01 GENERAL

The work covered by this Contract will be performed at the site as shown on the construction drawings. The work will be performed on the sites controlled by the Owner.

2.01 PROJECT DESCRIPTION

The project consists of reconstruction of a new dam at the site of the old breached dam and shall include:

- Initial site preparation including excavation of existing embankment material to firm subgrade
- Keyway Excavation into firm subgrade along the length of the dam
- Outlet Drain Pipe construction
- Embankment construction with access road on the south face
- Spillway construction with grout armored discharge

All work included in the contract documents and shown on the drawings and incidental to these items.

END OF SECTION 01010

DIVISION 1

SECTION 01011

SITE CONDITIONS

1.01 SITE INVESTIGATION AND REPRESENTATION

The Contractor acknowledges that he has satisfied himself as to the nature, extent, and location of the work, the general and local conditions, particularly those bearing upon availability of transportation, access to the site, disposal, handling and storage of materials, availability of labor, materials, water, electric power, roads, and uncertainties of weather, or similar physical conditions at the site, the conformation and conditions of the ground, the character of equipment and facilities needed preliminary to and during the prosecution of the work and all other matters which can in any way affect the work or the cost thereof under this Contract.

The Contractor further acknowledges that he has satisfied himself as to the character, quality, and quantity of surface and subsurface materials to be encountered from his inspection of the site and from reviewing any available records of exploratory work furnished by the Contractor, Engineer, Owner, or included in these Documents. Failure by the Contractor to acquaint himself with the physical conditions of the site and all the available information will not relieve him from responsibility for properly estimating the difficulty and cost of successfully performing the work.

The Contractor warrants that because of his examination and investigation of all the previously mentioned data that he can perform the work in a good and competent manner and to the satisfaction of the Owner and Engineer. The Owner assumes no responsibility for any representations made by any of its officers or agents during or prior to the execution of this Contract, unless (1) such representations are expressly stated in the Contract; and (2) the Contract expressly provides that the responsibility is therefore assumed by the Contractor or Owner.

2.01 INFORMATION ON SITE CONDITIONS

Any information obtained by the Engineer regarding site conditions, subsurface information, groundwater elevations, existing construction of site facilities as applicable, and similar data will be available for inspection at the office of the Engineer upon request.

3.01 CONTRACTOR'S RESPONSIBILITY FOR UTILITY PROPERTIES AND SERVICE

Where the Contractor's operations could cause damage or inconvenience to telegraph, telephone, television, power, oil, gas, water, sewer, or irrigation systems; all operations shall be suspended until all arrangements necessary for the protection of these utilities and services have been made by the Contractor.

Notify all utility offices which are affected by the construction operation at least 48-hours in advance. Under no circumstances expose any utility without first obtaining

permission from the appropriate agency. Once permission has been granted, locate, expose, and provide temporary support for all existing underground utilities. Neither the Owner nor its officers or agents shall be responsible to the Contractor for damages because of the Contractor's failure to protect utilities encountered in the work.

In the event of interruption to domestic water, sewer, storm drain, or other utility services because of accidental breakage due to construction operations, promptly notify the proper authority. Cooperate with said authority in restoration of service as promptly as possible and bear all costs of repair. In no case shall interruption of any water or utility service be allowed to exist outside working hours unless prior approval is granted.

4.01 EROSION AND SEDIMENT CONTROL

The Contractor shall be responsible for implementing and maintaining erosion and sediment controls as necessary to prevent soil migration to watercourses and adjacent properties. This site does qualify for permitting from the State of Colorado for construction sediment control. The Contractor shall obtain and prepare the storm water management plan, narrative report, and permit application and submit for permitting no less than 10-days before commencement of any earth disturbing construction activities. These controls shall include dust control and surface runoff controls.

5.01 INTERFERING STRUCTURES

Take necessary precautions to prevent damage to existing structures whether on the surface, above ground, or underground. An attempt has been made to show major structures on the plans. While the information has been compiled from the best available sources, its completeness and accuracy cannot be guaranteed, and it is presented simply as a guide to possible difficulties.

6.01 CONSTRUCTION SURVEYING

Construction surveying shall be performed by the contractor by methods approved by the Engineer. The Engineer shall supply a site benchmark and two reference points to establish the centerline of the dam. These points shall be maintained in the field by the Contractor, any required replacement of these points shall be at the expense of the Contractor.

END OF SECTION 01011

DIVISION 1

SECTION 01012

SITE ACCESS

1.01 HIGHWAY LIMITATIONS

The Contractor shall make his own investigation of the condition of available public and private roads and of clearances, restrictions, bridge load limits, and other limitations affecting transportation and ingress and egress to the site of the work. It shall be the Contractor's responsibility to construct and maintain, at his own expense, any haul roads, staging areas, etc. required for this construction operation.

END OF SECTION 01012

DIVISION 1

SECTION 01020

PRE-CONSTRUCTION CONFERENCE AND PROGRESS MEETINGS

Upon receipt of the Notice-to-Proceed, or at an earlier time if mutually agreeable, the Engineer shall arrange for a preconstruction conference to be attended by the Contractor's Superintendent, the Owner, the Engineer or his representative, the State Engineer or his representative, and representatives of utilities, major subcontractors, and others whose input may be desired.

The purpose of this conference shall be to establish a working understanding between the parties and to discuss the construction schedule, shop drawing submittal and approvals, materials testing schedule, construction inspection schedule, cost breakdown of major lump sum items, applications for payment and their processing, and such other subjects and submittal as may be pertinent to the project.

The Owner's representative and Engineer shall arrange and conduct progress meetings periodically. These meetings shall be attended by the Contractor's superintendent, a representative of the Engineer and representatives of all subcontractors, utilities, etc., that are active on the project site. The purpose of this meeting shall be to expedite the work of any subcontractor or other organization that is not up to schedule, resolve conflicts, and in general, coordinate and expedite the operation of all organizations active at the project site.

END OF SECTION 01020

DIVISION 1

SECTION 01310

CONSTRUCTION SCHEDULE

1.01 GENERAL

Work under this Contract shall be scheduled and performed in such a manner as to result in the least possible disruption and delay. The Contractor shall submit to the Engineer a construction schedule covering the entire project acknowledging completion dates outlined in Section 1310, at the Pre-Construction Conference.

2.01 DETAILED SCHEDULE

At the Pre-Construction Conference the Contractor shall furnish to the Engineer a detailed schedule for orderly completion of the work, showing his planned sequences of operation, and the dates for commencement and completion of all important features of the work.

1. The schedule shall be comprehensive, covering both activities at the site of the work and off-site activities such as design procurement, and fabrication. The schedule shall be orderly and realistic, and shall be revised as necessary to meet this requirement. The Contractor shall promptly advise the Engineer of any occurrence requiring substantial revision of the schedule and shall furnish a revised schedule within two (2) calendar days of such occurrence.
2. The detailed schedule and each revision thereof shall be subject to approval by the Engineer for conformity with the requirements of this Section. The Contractor shall assist the Engineer in reviewing and evaluating each schedule furnished. Disapproved schedules will be returned to the Contractor, shall be revised by him to correct the defects noted, and shall be resubmitted to the Engineer within two (2) calendar days after receipt.

2.02 RESTRICTIONS

The schedule shall account for the following restrictions in phasing of the work:

1. Work on the site shall commence as seasonal conditions dictate.
2. The Contractor shall coordinate with the OWNER all activities that will interfere with access to the site.
3. The reconstruction shall be completed including punch list items germane to Colorado Division of Water Resources dam safety guidelines within the allotted time frame.

END OF SECTION 01310

DIVISION 1

SECTION 01340

SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

1.01 GENERAL

Shop drawings referred to herein shall include shop drawings and other submittal for both shop and field-fabricated items. The Contractor shall submit, as applicable, the following for all prefabricated or manufactured structural, mechanical, electrical, plumbing, process systems, and equipment:

- A. Shop drawings or equipment drawings, including dimensions, size, and location of connections to other work, and weight of equipment.
- B. Catalog information and cuts.
- C. Installation or placing drawings for equipment, drives, and bases.
- D. Supporting calculations for equipment and associated supports specified to be designed by equipment manufacturers or suppliers.
- E. Complete manufacturer's specifications, including materials description and paint system.
- F. Suggested spare parts list with current price information.
- G. List of special tools required for checking, testing, parts replacement, and maintenance. (Special tools are those which have been specially designed or adapted for use on parts of the equipment, which are not customarily and routinely carried by maintenance mechanics.
- H. List of special tools furnished with the equipment.
- I. List of materials and supplies furnished with the equipment.
- J. Special handling instructions.
- K. Requirements for storage and protection prior to installation.
- L. Requirements for routine maintenance required prior to plant startup.
- M. List of all requested exceptions to the Contract Documents.

2.01 CONTRACTOR'S PROCEDURE

The submittal shall include satisfactory identification of items, units, and assemblies in relation to the specification section number, or as provided in the applicable specification section.

Should the Contractor propose any items on his shop drawings, or incorporate an item into the work, and that item should subsequently prove to be defective or otherwise unsatisfactory, (regardless of the Engineer's preliminary review), the Contractor shall, at his own expense, replace the item with another item that will perform satisfactorily.

3.01 PRODUCT DATA AND SAMPLES

Where required in the Specifications, and as determined necessary by the Engineer, test specimens or samples of materials, appliances, and fittings to be used or offered for use in connection with the work shall be submitted to the Engineer at the Contractor's expense, with information as to their sources, with all cartage charges prepaid, and in such quantities and sizes as may be required for proper examination and tests to establish the quality or equality thereof, as applicable.

All samples and test specimens shall be submitted in ample time to enable the Engineer to make any tests or examinations necessary, without delay to the work. The Contractor will be held responsible for any loss of time due to this neglect or failure to deliver the required samples to the Engineer, as specified.

Samples also shall be taken during the course of the work, as required by the Engineer.

Laboratory tests and examinations that the Owner elects to make in its own laboratory will be made at no cost to the Contractor, except that, if a sample of any material or equipment proposed for use by the Contractor fails to meet the Specifications, the cost of testing subsequent samples shall be borne by the Contractor.

All tests required by the Specifications to be performed by an independent laboratory shall be made, and the samples therefore furnished shall be at the sole expense of the Contractor.

Material used in the work shall conform to the submitted samples and test certificates as approved by the Engineer.

END OF SECTION 01340

SECTION 01400

QUALITY CONTROL

1.0 SITE INVESTIGATION AND CONTROL

- A. The Contractor shall verify all dimensions in the field and shall check field conditions continuously during construction. The Contractor shall be solely responsible for any inaccuracies built into the work due to his failure to comply with this requirement.
- B. The Contractor shall inspect related and appurtenant work and shall report in writing to the Engineer any conditions that will prevent proper completion of the work. Failure to report any such conditions shall constitute acceptance of all site conditions, and any required removal, repair, or replacement caused by unsuitable conditions shall be performed by the Contractor at his sole cost and expense.

2.0 INSPECTION OF THE WORK

- A. The work shall be conducted under the general observation of the Engineer and shall be subject to inspection by representatives of the Engineer acting on behalf of the Owner to insure strict compliance with the requirements of the Contract Documents. Such inspection may include mill, plant, shop, or field inspection, as required. The Engineer shall be permitted access to all parts of the work, including plants where materials or equipment are manufactured or fabricated.
- B. The presence of the Engineer or any inspector(s), however, shall not relieve the Contractor of the responsibility for the proper execution of the work in accordance with all requirements of the Contract Documents. Compliance is a duty of the Contractor, and said duty shall not be avoided by any act or omission on the part of the Engineer or any inspector(s).
- C. All materials and articles furnished by the Contractor shall be subject to rigid inspection, and no materials or articles shall be used in the work until they have been inspected and accepted by the Engineer or his authorized representative. No work shall be backfilled, buried, cast in concrete, hidden or otherwise covered until it has been inspected by the Engineer or his authorized representative. Any work so covered in the absence of inspection shall be subject to uncovering. Where uninspected work cannot be uncovered, such as in concrete cast over reinforcing steel, all such work shall be subject to demolition, removal, and reconstruction under proper inspection and no addition payment will be allowed therefore.

3.01 TIME OF INSPECTION AND TESTS

Samples and test specimens required under these Specifications shall be furnished and prepared for testing in ample time for the completion of the necessary tests and analysis before said articles or materials are to be used. The Contractor shall furnish and prepare all required test specimens at his own expense.

Whenever the Contractor is ready to backfill, bury, cast in concrete, hide, or otherwise cover any work under the Contract, he shall notify the Engineer not less than 48-hours in advance to request inspection before beginning any such work of covering. Failure of the Contractor to notify the Engineer at least 48-hours in advance of any such inspections shall be reasonable cause for the Engineer to order a sufficient delay in the Contractor's schedule to allow time for such inspections and any remedial or corrective work required, and all costs of such delays, including its effect upon other portions of the work, shall be borne by the Contractor.

3.02 STATE ENGINEERS INSPECTIONS

The Contractor shall give the Engineer 7-days advanced notice of site preparation, keyway excavation, outlet works excavation, outlet works concrete encasemen and filter sand diaphragm construction, and toe drain construction, so that the State Engineer can receive 5-days advanced notice. The Contractor shall give the Engineer 12-days advanced notice of project completion so that State Engineer can be given 10-days notice.

4.0 SAMPLING AND TESTING

- A. When not otherwise specified, all sampling and testing shall be in accordance with the methods prescribed in the current standards of the ASTM, as applicable to the class and nature of the article or materials considered; however, the Owner reserves the right to use any generally-accepted system of inspection which, in the opinion of the Engineer will insure the Owner that the quality of the workmanship is in full accord with the Specifications.
- B. Any waiver of any specific testing or other quality assurance measures, whether or not such waiver is accompanied by a guarantee of substantial performance as a relief from the specified testing or other quality assurance requirements as originally specified, and whether or not such guarantee is accompanied by a performance bond to assure execution of any necessary corrective or remedial work, shall not be construed as a waiver of any technical or qualitative requirements of the Specifications.
- C. Notwithstanding the existence of such waiver, the Engineer shall reserve the right to make independent investigations and tests as specified in the following Subparagraph and, upon failure of any portion of the work to meet any of the qualitative requirements of the Specifications, shall be reasonable cause for the Engineer to require the removal or correction and reconstruction of any such work.

- D. In addition to any other inspection or quality assurance provisions that may be specified, the Engineer shall have the right to independently select, test, and analyze, at the expense of the Owner, additional test specimens of any or all of the materials to be used.

Results of such tests and analysis shall be considered along with the tests or analysis made by the Contractor to determine compliance with the applicable specifications for the materials so tested or analyzed; provided, that wherever any portion of the work is discovered, as a result of such independent testing or investigation by the Engineer, which fails to meet the requirements of the Specifications, all costs of such independent inspection and investigation, and all costs of removal, correction, and reconstruction or repair of any such work shall be borne by the Contractor.

5.0 RIGHT OF REJECTION

- A. The Engineer, acting for the Owner shall have the right, at all times and places, to reject any articles or materials to be furnished hereunder which, in any respect, fail to meet the requirements of these Specifications, regardless of whether the defects in such articles or materials are detected at the point of manufacture or after completion of the work at the site. If the Engineer or inspector, through an oversight or otherwise, has accepted materials or work which is defective or which is contrary to the Specifications, such material, no matter in what stage or condition of manufacture, delivery, or erection, may be rejected by the Engineer for the Owner.
- B. The Contractor shall promptly remove rejected articles or materials from the site of the work after notification of rejection.
- C. All costs of removal and replacement of rejected articles or materials as specified herein shall be borne by the Contractor.

6.0 GUARANTEE

For a period of one (1) year, commencing on the date of final acceptance or the date that the substantial completion letter is sent, the Contractor shall upon receipt of notice in writing from the Owner, promptly make all repairs arising out of the faulty materials, workmanship, or equipment. Prior acceptance of the work in no way shall waive the Contractor's responsibility to repair any portion of the work performed under this contract. The Owner is hereby authorized to make such repairs, if ten days after giving such notice to the Contractor, the Contractor has failed to make or undertake the repairs. In cases of emergency, where in the Owner's opinion, delay could cause serious loss or damage, repairs may be made without notice being sent to the Contractor, and the expenses in connection therewith shall be charged to the Contractor.

END OF SECTION 01400

DIVISION 1

SECTION 01500

CONSTRUCTION FACILITIES

1.01 GENERAL

The Contractor shall set up construction facilities in a neat and orderly manner. The Contractor shall be responsible for providing the site to establish the temporary construction facilities, where not specifically provided for in the Contract.

2.01 SECURITY

The Contractor shall at all times provide such permanent and temporary fencing, and employ such security guards, as may be necessary to restrict unauthorized entry to the site. Contractor shall abide by the Owner's security requirements.

3.01 CONTRACTOR'S PLANT AND EQUIPMENT

- A. General It shall be the Contractor's responsibility to provide plant and equipment that is adequate for the performance of the work under this Contract within the time specified. All plant and equipment shall be kept in satisfactory operating condition, shall be capable of safely and efficiently performing the required work, and shall be subject to inspection and approval by the Engineer at any time within the duration of the Contract. All work hereunder shall conform to the applicable requirements of the OSHA Standards for Construction.
- B. Separate Contracts Whenever portions of the work hereunder are let under separate contracts, all of the provisions of this Section shall apply to each such prime contractor, including the requirements for separate field offices and communications facilities.
- C. Construction Lighting All work conducted at night or under conditions of deficient daylight shall be suitably lighted to insure proper work and to afford adequate facilities for inspection and safe working conditions.

4.01 UTILITIES

- A. Water Supply All drinking water on the site during construction shall be furnished by the Contractor and shall be bottled water or water furnished in approved dispensers.
- B. Water Connections The Contractor shall not make connection to, or draw water from, any irrigation ditch without first obtaining permission of the authority having jurisdiction over the use of said ditch and from the agency owning the affected water system.

- C. Removal of Water Connections Before final acceptance of the work on the project, all temporary connections and piping installed by the Contractor shall be entirely removed, and all affected improvements shall be restored to their original condition, or better, to the satisfaction of the Engineer and to the agency owning the affected utility.
- D. Power The Contractor shall provide, at his own expense, all necessary power required for his operations under the Contract, and shall provide and maintain all temporary power lines required to perform the work in a safe and satisfactory manner. Temporary electric power installation shall meet the construction safety requirements of OSHA, State and other governing agencies.
- E. Communication Contractor shall provide his own telephone or communication system at the site as required to complete the project.

5.01 SAFETY

- A. General Appropriate first aid facilities and supplies shall be kept and maintained by the Contractor at the site of the work. All persons within the construction area shall be required to wear protective helmets, protective eye wear as required, and steel toed safety shoes. In addition, all employees of the Contractor and his subcontractors shall be provided with, and required to use, personal protective and life saving equipment as set forth in Subpart E of the OSHA Safety and Health Standards for Construction (29 CFR 1926).
- b. Public Safety During the performance of the work, the Contractor shall erect and maintain temporary fences, bridges, railings, and barriers and shall take all other necessary precautions and place proper guards for the prevention of accidents and he shall erect and maintain suitable and sufficient lights and other signals.

6.01 PROJECT SIGN

No project sign is required.

7.01 SANITARY FACILITIES

The Contractor shall provide and maintain sanitary facilities (toilet and hand sanitation) for his employees and his subcontractors' employees that will comply with the regulations of the local and State Departments of Health and as directed by the Engineer.

8.01 STORAGE OF MATERIALS

Materials shall be so stored as to insure the preservation of their quality and fitness for the work. When considered necessary by the Engineer, they shall be placed on wooden platforms or other hard, clean surfaces, and not on the ground. Delicate instruments and materials subject to vandalism shall be placed under locked cover and, if necessary, provided with temperature control as recommended by the manufacturer. Stored materials shall be located to facilitate prompt inspection. Private property shall not be used for storage purposes without the written permission of the Owner or lessee.

Section 01620-C contains additional requirements for storage of equipment.

END OF SECTION 01500

DIVISION 1

SECTION 01560

TEMPORARY CONTROLS

1.01 SITE MAINTENANCE

The Contractor shall keep the work site clean and free from rubbish and debris. Materials and equipment shall be removed from the site when they are no longer necessary. Upon completion of the work and before final acceptance, the work site shall be cleared of equipment, unused materials, and rubbish to present a clean and neat appearance.

2.01 DISPOSAL OF WASTE MATERIAL

When burning is not prohibited or restricted by law, pile all combustible material within the designated or approved cleared area and dispose of by burning. Remove material from the site that is not combustible or not practicable to burn. Accomplish burning and disposal in accordance with all Federal, State, and local laws relating to fire prevention, air pollution control, and other restrictions in regard to burning materials. When burning is prohibited, dispose of waste materials in accordance with the governing agency safety and health requirements.

If perishable material is burned, it shall be burned under the constant care of competent security guards with adequate water at such times and in such a manner that anything designated to remain on the property, or other adjacent property will not be jeopardized. Burning shall be done in accordance with applicable laws and ordinances. No burning will be allowed on the Owner's property.

3.01 "NO BURNING" PERIODS

During periods when burning operations are prohibited by local, State or Federal authorities, haul combustible material and debris from the site. If approved, pile where it will not interfere with the work and burn when prohibition against burning is removed.

4.01 AIR POLLUTION CONTROL

The Contractor shall not discharge smoke, dust, and other contaminants into the atmosphere that violate the regulations of any legally constituted authority. He shall also abate dust nuisance by cleaning, sweeping, and sprinkling with water, or other means as necessary. The use of water, in amounts that result in mud on paved streets, is not acceptable as a substitute for sweeping or other methods.

5.01 NOISE CONTROL

No noise control restrictions apply.

6.01 DUST ABATEMENT

The Contractor shall furnish all labor, equipment, and means required and shall carry out effective measures wherever and whenever and as often as necessary to prevent his operation from producing dust in amounts damaging to property, cultivated vegetation, or domestic animals, or causing a nuisance to persons living in or occupying buildings in the vicinity. The Contractor shall conform to all local, state, and federal dust abatement ordinances. The Contractor shall be responsible for any damage resulting from any dust originating from his operations. The dust abatement measures shall be continued until the Contractor is relieved of further responsibility by the Engineer. No separate payment will be allowed for dust abatement measures and all costs thereof shall be included in the Contractor's bid price.

7.01 RUBBISH CONTROL

During the progress of the work, the Contractor shall keep the site of the work and other areas used by him in a neat and clean condition, and free from any accumulation of rubbish. The Contractor shall dispose of all rubbish and waste materials of any nature occurring at the work site, and shall establish regular intervals of collection and disposal of such materials and waste. He shall also keep his haul roads free from dirt, rubbish, and unnecessary obstructions resulting from his operations. Equipment and material storage shall be confined to areas approved by the Engineer. Disposal of all rubbish and surplus materials shall be off the site of construction, at the Contractor's expense, all in accordance with local codes and ordinances governing locations and methods of disposal, and in conformance with all applicable safety laws, and to the particular requirements of Subpart H, Section 1926.252 of the OSHA Safety and Health Standards for Construction.

8.01 SANITATION

- A. Toilet Facilities. Portable chemical toilets shall be provided wherever needed for the use of employees. Toilets at construction job sites shall conform to the requirements of Subpart D, Section 1926.51 of the OSHA Standards for Construction.
- B. Sanitary and Other Organic Wastes. The Contractor shall establish a regular collection of all sanitary and organic wastes. All wastes and refuse from sanitary facilities provided by the Contractor or organic material wastes from any other source related to the Contractor's operations shall be disposed of away from the site in a manner satisfactory to the Engineer and in accordance with all laws and regulations pertaining thereto. Disposal of all such wastes shall be at the Contractor's expense.

9.01 CHEMICALS

The containers of all chemicals used during project construction or furnished for project operation; whether defoliant, soil sterilant, herbicide, pesticide, disinfectant, reactant or other classification, shall show approval of either the U.S. Environmental Protection

Agency or the U.S. Department of Agriculture. Use of all such chemicals and disposal of residues shall be in strict accordance with the printed instructions of the manufacturer.

10.01 EROSION CONTROL

Plan and execute construction and earthwork by methods to control surface drainage and sediment transport from cuts and fills, and from borrow and waste disposal areas to prevent erosion and sedimentation. Periodically inspect earthwork to detect any evidence of the start of erosion, apply corrective measures as required to control erosion.

11.01 FAILURE TO EXECUTE

Failure to execute any of the temporary controls shall be sufficient cause for the Owner to stop forward progression of the work and hold progress payments until acceptable limits and standards are met.

12.01 COSTS

All costs in connection with the work specified herein will be considered incidental to the project.

END OF SECTION 01560

DIVISION 1

SECTION 01620

PROTECTION OF MATERIALS AND EQUIPMENT

1.0 GENERAL

Materials and equipment shall be shipped, handled, stored, and installed by methods that will prevent damage to the items. Damaged items will not be permitted as part of the work except in cases of minor damage that have been satisfactorily repaired and are acceptable to the Engineer.

2.0 PIPE

Pipe and appurtenances shall be handled, stored, and installed as recommended by the manufacturer. Pipes with soft coatings such as galvanizing, paint, or the like shall be stored to protect the coating from physical damage or other deterioration and shall only be handled with padded, wide slings. Pipes shipped with interior bracing shall have the bracing removed only when recommended by the pipe manufacturer.

3.0 EQUIPMENT

- A. Definition For the purpose of this section, equipment means any mechanical and other items with one or more moving parts requiring an electrical, pneumatic, electronic, or hydraulic connection.
- B. Packing and Marking All equipment shall be adequately and effectively protected against damage from moisture, dust, handling, or other cause during transport from manufacturer's premises to site. Each item or package shall be clearly marked with the number unique to the specification reference covering the item. Each separate portion of plant shall receive, as far as practicable, a fitting or distinguishing mark that shall be shown on the packing lists.

Stiffeners shall be used where necessary to maintain shapes and to give rigidity. Parts of equipment shall be delivered in assembled or sub-assembled units where possible.

- C. Storage of Equipment During the interval between delivery and installation, all equipment to be incorporated into the project shall be stored in enclosed, weather tight structures. Environmental controls such as heaters or protective encapsulation shall be provided to ensure against condensation and moisture damage. In the event prolonged (more than 90 days) storage is required for any item of rotative equipment, the Contractor shall institute a preventive maintenance program that shall include grease protection of bare

metal surfaces, periodic indexing of rotating parts, renewal of grease in bearings and any procedures recommended by the manufacturer.

The Contractor shall maintain adequate records to demonstrate full compliance with these requirements. All equipment shall be available for inspection by the Engineer. No equipment shall be placed on its foundations until authorized by the Engineer.

The Contractor shall obtain full coverage insurance covering all stored equipment against loss due to fire, flood, windstorm, and tsunami. Evidences of insurance demonstrating compliance with this requirement shall be filed with the Engineer.

- D. Protection of Equipment After Installation After all installation, all equipment shall be protected from damage, including but not limited to, dust, abrasive particles, debris and dirt generated by the placement, chipping, sandblasting, cutting, finishing and grinding of new or existing concrete, terrazzo and metal; and the fumes, particulate matter, and splatter from welding, brazing and painting of new or existing piping and equipment. The Contractor is advised that as minimum, vacuum cleaning, blowers with filters, protective shielding, and other dust suppression methods will be required at all times to adequately protect all equipment. During concreting, including finishing, all equipment that may be affected by cement dust must be completely covered. During painting operations, all grease fittings and similar openings shall be covered to prevent the entry of paint. Electrical switchgear, unit substation, and motor load centers shall not be installed until after all concrete work and sandblasting in those areas have been completed and accepted.

4.0 DELIVERY OF MATERIAL OR EQUIPMENT

The Owner's personnel or representatives of the Owner will not accept materials or equipment deliveries for the Contractor.

END OF SECTION 01620

DIVISION 1

SECTION 01710

RESTORATION AND CLEANUP

At all times during the work, keep the premises clean and orderly. Do not dump waste oil, rubbish or other similar materials on the ground. Upon completion of the work, repair all damage caused by equipment, remove temporary facilities, and leave the project free of rubbish or excess materials of any kind, all to the satisfaction of the Engineer.

END OF SECTION 01710

DIVISION 1

SECTION 01720

RECORD DRAWINGS

The Contractor shall maintain, at the job site, one set of full size contract drawings marked to show any deviations that have been made from the contract drawings or approved shop drawings, including buried or concealed construction and utility features that are revealed during the course of construction. The onsite contract drawings must include the State Engineer's approval seal. Special attention shall be given to recording the horizontal and vertical location of all buried features that differ from the locations indicated, or which were not indicated on the contract drawings. Said record drawings shall be supplemented by any detailed sketches as necessary or directed, to indicate fully, the work as actually constructed.

Record drawings shall be accessible to the Engineer at all times during the construction period and shall be delivered to the Engineer within 5-days after completion of the work.

Requests for partial payments will not be approved if the record drawings are not kept current, and request for final payment will not be approved until the completed record drawings, showing all variations between the work "as-constructed" and as originally shown on the contract drawings or other contract documents, has been delivered to the Engineer. The Engineer in turn will deliver the record drawings to the State Engineer with the appropriate header indicating "As-Constructed" on the title page.

END OF SECTION 01720

DIVISION 1

SECTION 01730

DIVERSION AND CARE OF WATER

Stream flows are required downstream for water rights demands. Maintain flows through the dam and construction area at the volume and duration as required by the local irrigation rights holders. Coordinate all stream flow diversion and dam releases with Owner.

Construct the necessary ditches and structures and take some precautions as necessary to protect the work. Divert or pump stream flow, groundwater, surface water, and other water and drain the construction area so the work may be completed in a satisfactory and timely manner. Drain or otherwise dewater all structural excavations and other areas as required to permit a satisfactory operation at all times. In the event the construction area is overtopped and flooded, clean up and repair the damage, dry out or remove all material in embankments deemed too wet for proper fill material by the Engineer, at the Contractor's inclusive expense.

END OF SECTION 01730

DIVISION 2

SECTION 02100

SITE PREPARATION

PART 1 - GENERAL

1.01 DESCRIPTION

Site preparation includes clearing, grubbing and stripping of all topsoil and excavation of the slump repair area to the dimensions shown on the Construction Plans or as directed in the filed by the Engineer or his representative. Areas include the entire dam footprint plus a minimum of 10 foot margins beyond. All unwanted debris shall be removed from the construction site and disposed of including stripped surface vegetation, soils containing more than 2% by dry weight of organic matter, and other deleterious materials.

1.02 JOB CONDITIONS

The Contractor shall determine the existing condition of the site as it affects this contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 CLEARING AND GRUBBING

Clear areas required for access to site and execution of work of all plant material or debris. All roots larger than 1 inch shall be completely removed from the construction area. Clearing shall also include the removal and disposal of trash piles, rubbish, and fencing.

Remove trees and shrubs within construction area that will impede construction. Protect trees and shrubs not affected by construction.

3.02 STRIPPING AND EXCAVATION

All rocks, vegetation, and loose soil shall be stripped from the an area equivalent to the embankment footprint plus minimum margins of 10 feet beyond to a minimum depth of 6 inches or as directed by the Engineer. The material so removed shall be stockpiled and may be reused as topsoil on face of the embankments. The exposed subgrades shall then be excavated to the line and grade indicated on the excavation plan. Materials which meet the compositional requirements for embankment fill shall be selectively separated from the excavated material and may be stockpiled for re-use in the dam embankment. The base of

excavation shall be compacted to at least 95 (ninety-five) percent of the maximum dry density as determined by the Standard Proctor density test (ASTM D688), and at a moisture content zero to plus 3 (three) percent of optimum water content.

The Engineer and State Engineer must inspect and approve the exposed subgrade prior to the placement embankment fill or outlet works subgrade fill. The Engineer will confirm that the surface of the subgrade is smooth and free of debris, grade stakes, angular rocks, roots, branches, vegetation, mud, ice, or frozen material. If frozen subgrade material is encountered, it shall be removed and replaced by the Contractor, at no cost to Owner. The subgrade shall have no sudden sharp or abrupt changes in grade. The Contractor is responsible for maintaining subgrades in a condition satisfactory to the Engineer.

The Contractor shall protect prepared subgrades, including previously approved subgrade, from weather, construction equipment, or other factors.

3.03 REMOVAL

Remove debris from site and dispose of in a manner acceptable to the Engineer. The Contractor shall be responsible for locating an acceptable disposal site and all costs associated with such debris disposal.

END OF SECTION 02100

DIVISION 2

SECTION 02200

EARTHWORK

PART 1 - GENERAL

1.01 WORK INCLUDED

Work included in this section involves processing of material obtained on site from excavated slump area and areas essential to construction, importing and stockpiling of materials unavailable on-site, disposal of waste, drain filter material placement, embankment backfill placement, topsoil placement and re-vegetation.

1.02 RELATED WORK

Section 01011	Site Conditions
Section 01400	Quality Control
Section 02100	Site Preparation

1.03 REFERENCES

Commercial Standards:

ASTM D422	Method for Particle-Size Analysis of Soils.
ASTM D698	Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, using 5.5-lb (2.5 kg) Rammer and 12-in (300-mm) Drop.
ASTM D2487	Classification of Soils for Engineering Purposes
ASTM D2922	Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D3017	Test Methods for Moisture Content
ASTM D2434	Standard Test Method for Permeability of Granular Soils (Constant Head)

1.04 DEFINITIONS

- A. Suitable Material: Excavated material from the site or imported material from off-site meeting the requirements of structural fill or embankment backfill material.
- B. Unsuitable Material: Excavated material from the site that does not meet the requirements of structural fill or embankment backfill. Unsuitable material shall be removed from the construction site, stockpiled, and graded to drain away from the site.

- D. Embankment backfill: Fill placed on prepared subgrade and fine and coarse filter media for construction of the dam per the construction plans.
- E. Borrow Material: Material imported from an on-site or off-site location or imported from an off-site source approved by the Engineer. The Military Park stockpile will be the primary source of import material for the project.
- F. Well-graded: Well-graded defines a mixture of particle sizes that have no specific concentration or lack of one or more sizes. Well-graded is used to define a soil type that, when compacted, produces a strong, relatively incompressible soil mass free from significant voids and deleterious voids.
- G. Segregation: Separation and subsequent nesting of larger particles in a soil mass such that finer particles do not completely fill the voids between the larger particles. Segregation also refers to lenses or layers of finer material that are not intermixed with coarser particles in accordance with the specified gradation.
- H. Coverage or Passes: Refers to making sufficient trips with specific equipment to completely cover the entire area being compacted.
- I. Filter Media Material: Select material that falls within the gradation specification range for toe drain and sand filter diaphragm backfill as described in Item 2.02(B) below.

1.05 SUBMITTAL

The contractor must provide the following submittals:

1. Plans and procedures for handling flood flows and dewatering excavations are subject to Engineer approval. Approval of plans and procedures for handling flood flows and dewatering does not relieve the Contractor of full responsibility and liability for care of water during construction. Refer to 1.12 FLOOD FLOWS AND OTHER WATER.
2. Certification, test results, source, and samples for all imported material.
3. Manufacturer's specifications for compaction equipment.
4. A plan for processing onsite materials to be re-used as embankment fill and/or material from other essential excavation.

Please note that construction shall not commence until the above items are approved by the Engineer and the State Engineer.

1.06 QUALITY ASSURANCE

- A. Provide soil testing during excavation and placement of fill materials in accordance with Section 01400.
- B. DOWL, LLC shall perform all compaction testing during construction.
- C. Testing frequency is included on Drawing # 2 of the construction drawings.

1.07 MATERIAL ACCEPTANCE

Imported and Reuse Material: Embankment material shall meet the following requirements; contain at least 35% fines, less than 10% gravel with maximum particle size of 4 inches, have a plasticity index between 20 and 30 and a cohesion in the range of 200-500 psf. All tests necessary for determining acceptability of any source for imported and reuse material shall be made by the Engineer. The Engineer shall submit certification that the material conforms to the Specification requirements along with copies of the test results from a before the material is required for use. The source(s) shall be sampled in accordance with ASTM D75. No imported materials shall be delivered to the site until the proposed source and materials tests and accepted in writing by the Engineer. Final acceptance will be based on tests made on samples of material taken from the completed and compacted placement. All testing for final acceptance shall be performed by the Engineer.

1.08 SHORING, SHEETING, BRACING, AND SLOPING

Install and maintain shoring, sheeting, bracing, and sloping of excavations as required by OSHA regulations or any other applicable governmental regulations.

1.09 EXCAVATION SAFETY

The Contractor shall be solely responsible for making all excavations in a safe manner. The Contractor shall provide appropriate measures to retain excavation slopes to ensure that persons working in or near the excavation are protected. All excavations shall comply with applicable Federal, State and local government safety requirements.

1.10 CODES, ORDINANCES, AND STATUTES

The Contractor shall be familiar and comply with, all applicable codes, ordinances, statutes, and bear sole responsibility for the penalties imposed for noncompliance.

1.11 PERMITS

Refer to applicable sections of the GENERAL REQUIREMENTS.

1.12 FLOOD FLOWS AND OTHER WATER

The Contractor shall be responsible for handling and diverting any flood flows, stream flows, or

any other water, including groundwater encountered during the progress of the work. Build, maintain, and operate cofferdams, channels, flumes, sumps, and other temporary works needed to pass floodwater, divert stream flow, or pass other surface water through or around the construction site and away from construction progress. Unless otherwise approved by the Engineer, a diversion must discharge into the same natural watercourse in which it originated. Construct permanent work in areas free of water. The removal of protective works, after having served their purpose, shall be in a manner satisfactory to the Engineer.

For estimation purposes, A Blanche Park Dam Peak Discharge and Runoff Volume Table has been added to Sheet #3 of the drawing set.

PART 2 - EARTHWORK

2.01 GENERAL

- A. The Contractor shall provide all labor, materials, and equipment necessary to accomplish the work specified in this section.
- B. Processing Onsite Materials: Processing of onsite materials shall be limited to screening operations off the dam structure. No processing will be allowed on the dam.
- C. Gradations: The specified gradation limits listed below represent one factor in determining the acceptability of the materials.

2.02 WORK ITEMS

Material descriptions and placement requirements are shown on the Drawings.

A. General

The Engineer and State Engineer must inspect and approve the exposed subgrade prior to the placement of the embankment fill. The Engineer will confirm that the surface of the subgrade is smooth and free of debris, grade stakes, angular rocks, roots, branches, vegetation, mud, ice, or frozen material. If frozen subgrade material is encountered, it shall be removed and replaced by the Contractor, at no cost to Owner. The subgrade shall have no sudden sharp or abrupt changes in grade except where the keyway and outlet works excavation are located. The Contractor is responsible for maintaining subgrades in a condition satisfactory to the Engineer.

The Contractor shall protect prepared subgrades, including previously approved subgrade, from weather, construction equipment or other factors.

Embankment backfill shall be compacted to a minimum ninety-five (95) percent of the maximum dry density as determined by the Standard Proctor density test (ASTM D698), and at a moisture content of zero to plus two (3) percent of optimum water content.

B. Filter Media

Filter media shall be classified as fine and coarse. The fine filter media shall be used as the exterior filter material for the toe drain and as the filter material for the sand filter diaphragm around the outlet pipe system. The coarse filter media shall be used as the interior media (immediately surrounding) of the toe drain pipe. The filter media shall be installed to the general dimensions shown on the construction drawings, or as directed by the Engineer. The **fine filter** media (ASTM C-33) shall be of angular and durable aggregates having a gradation within the following limits:

Passing a 3/4" sieve	100%
Passing a 3/8" sieve	100%
Passing a No. 4 sieve	95 -100%
Passing a No. 8 sieve	80 - 100%
Passing a No. 16 sieve	50 - 85%
Passing a No. 30 sieve	25 - 60%
Passing a No. 50 sieve	10- 30%
Passing a No. 100 sieve	2 - 10%
Passing a No. 200 sieve	0 - 3%

All points on individual grading curves obtained from representative samples of filter drain material shall lie between the boundary limits as defined by smooth curves drawn through the tabulated grading limits plotted on a mechanical analysis diagram. The individual grading curves within these limits shall not exhibit abrupt changes in slope denoting skip grading, scalping of certain sizes or other irregularities that would be detrimental to the proper functioning of the filter. ASTM C33 fine aggregate has been shown to meet the recommended fine filter media gradation envelope. The contractor shall submit a sample of the proposed fine filter media material for gradation, proctor density testing and permeability testing before placement. The tested permeability of the filter drain material shall be greater than 1×10^{-3} cm/sec per ASTM D2434.

The **coarse filter** media shall consist of ASTM coarse aggregate gradation No. 8 which has the following limits:

Passing a 3/4" sieve	100%
Passing a 1/2" sieve	100%
Passing a 3/8" sieve	85-100%
Passing a No. 4 sieve	10- 30%
Passing a No. 8 sieve	0 -10%
Passing a No. 16 sieve	0 -5%

C. Toe Drain

Toe Drain Collection Pipe: A 6" diameter PVC drain pipe conforming to ASTM Specification D-3034, Schedule 40, shall be installed in a minimum 3 foot deep

keyway trench. The pipe shall be slotted only within the limits of the toe area. The pipe slots must be smooth-cut with no roughness. The slotted portion shall be Sch. 40 with 4 rows of .093" wide by 2.0" long on 90 degree centers with 1 inch spacing from Titan Industries, Inc. 800 658-4086, or approved equal. The slotted pipe shall be coupled to a solid discharge pipe that exits in a precast outlet structure.

The slotted toe drain pip shall be surrounded by a minimum of 6 inches of coarse filter media on all sides with the resultant section surrounded by fine filter media minimum thicknesses of 6 inches below and 9 inches beside and above the coarse media.

All fittings for the pipe shall be PVC fittings supplied by the manufacturer of the pipe and intended for use with the specified size and type of pipe. All joints and connections shall be watertight. Glued or slip-on with gasketed joints shall be as provided by the manufacturer.

Discharge solid pipe connected to the toe drain perforated pipe shall terminate at the outfall structure shown on the plans. The unslotted pipe shall be covered with at least 12 inches of hand-compacted backfill before heavy equipment is allowed to operate over it. The toe drain system shall have cleanouts as shown on the construction drawings.

D. Toe Drain Construction

The toe drain is included in the dam design to lower the phreatic surface through the dam, keeping the toe area drier and inherently more stable. Proper function of the toe drain is highly dependent on placement. Therefore, prior to the start of its construction the Contractor shall install a test section of toe drain to demonstrate the effectiveness of the means and methods of construction. The test section shall be exposed to verify: placement of pipe and filter media around the pipe in general accordance with the plan dimensions, that the filter media is not segregated or contaminated, and that the filter media is adequately compacted. The Engineer must approve the location of the test section and be present during its installation.

Prior to placement of filter media material the toe drain keyway subgrade shall be proof-compacted. The fine and coarse filter media material must be transported, stored and placed in such a manner as to prevent contamination and segregation in order to assure the characteristics required for proper function. The fine and coarse filter media material should be placed in maximum 6-inch thick horizontal lifts. The filter drain material should be thoroughly wetted to saturation condition with clean water and compacted with a smooth drum or plate vibratory compactor.

The filter drain material shall be compacted to a dry density between 65% to 95% of relative density per ASTM 4253/54.

Compaction equipment and any other equipment operating on the filter zone shall be clean of soil and any other material that could potentially contaminate the filter media material. Measures should be taken to direct surface water runoff away from the filter media. Filter media that is contaminated from surface runoff, windblown dust, or other material shall be removed. Equipment crossing the filter zone must be avoided.

In order to reduce segregation of the filter media material, the drop height during placement shall be limited to a maximum 4 feet. The use of conveyors, chutes or hopper operations should be avoided unless the Contractor can demonstrate that the operation does not segregate the filter media.

The Contractor shall provide inspection of the toe drain pipe after placement of no more than 25 lineal feet of installation. The line and grade of the toe drain system shall be as shown on the construction drawings.

E. Outlet Works

The outlet works shall consist of an inlet structure with trash grate, an outlet pipe encased in concrete, a sand filter diaphragm, and outlet structure and energy dissipation riprap. The outlet pipe will consist of 18 inch diameter HDPE pipe encased with reinforced concrete. The outlet pipe will be set in a notch having an average depth of 4 feet below top of pipe. The lower 18 inches of the notch will be reconstructed as controlled embankment fill. The fill shall be placed in lifts of 6 inches and compacted to a minimum relative compaction of 95% of Standard Proctor maximum dry density (ASTM D698) at 0-4% over optimum. Then a formed, reinforced concrete encasement will be constructed around the pipe with a bottom width of 30 inches and sides slopes of 1H:10V. The encasement shall be reinforced with two No. 5 bars top and bottom, continuous through the longitudinal axis of the encasement. The outlet pipe shall be chaired on precast concrete support block spaced no more than 6 feet on centers. After the concrete has attained at least 75% of the 3000 psi design strength, embankment fill material may be placed in 6 inch lifts on both sides of the collar and compacted simultaneously to minimize lateral force on the collar. Once the fill reaches the top of the pipe encasement, lighter weight compaction equipment is to be used so that vertical stress to the pipe and encasement is limited.

Approximately 100 feet from the centerline of the outlet inlet pipe, a fine filter media diaphragm will be placed around the outlet pipe and concrete encasement. The fine filter media will be the same material specified for the fine filter media in the toe drain (refer to Section 2.02 (B) for gradation). The minimum thickness of the collar will be three feet and it will be 3 feet wide by 13.75 feet in height. The sand diaphragm will be equipped with a 6 inch diameter slotted drain pipe connected to a solid discharge pipe which is embedded in the fill outlet pipe concrete collar.

The outlet pipe and sand diaphragm drain pipe shall be mounted into a cast-in-place concrete outlet structure per the construction plans which discharges into an armored stilling basin.

The inlet to the outlet pipe will be protected by a 12 inch thick gravel basin ($d_{50}=6''$) and the outlet pipe discharge will be received by a stilling basin armored with riprap ($d_{50}=18''$).

F. Embankment backfill

Embankment material shall be placed upon proof-compacted subgrade or previously compacted embankment fill in approximately horizontal lifts to the lines and grades shown on the drawings. Prior to embankment fill placement, a keyway shall be constructed along the length of the dam to a minimum depth of 4 feet or to firm material as determined by the Engineer at the time of construction. Also prior to embankment fill placement the outlet works structure should be completed per Section E above.

The Contractor shall provide such compaction equipment as is necessary to uniformly compact the embankment material to the required density. No pockets of loose or uncompacted material within the embankment area will be permitted.

Tamping rollers shall be of the sheep's foot type and shall have a minimum ballasted weight of 4000 pounds per foot of width. The drum shall be water or sand-and-water ballasted. The roller shall be equipped with cleaning fingers so designed and attached as to prevent an accumulation of material between tamping feet. The roller shall be self-propelled or pulled by a crawler-type tractor of sufficient power to operate the roller at a speed of approximately 3 miles per hour. The design and operation of the roller will be subject to approval of the Engineer, and the Contractor shall at any time make such minor alterations or adjustments to the operation or equipment, as directed by the Engineer, to secure optimum compaction.

The Contractor will be permitted to use alternative equipment, provided the Contractor can demonstrate to the Engineer that such equipment will adequately compact the fill material to a density not less than that which is specified and that a satisfactory bond can be made between lifts. The water content of the embankment material shall be increased or decreased as directed by the Engineer to achieve maximum density for the compactive effort to be applied.

The embankment material shall consist of material approved by the Engineer and shall contain at least 35% fines, less than 10% gravel with maximum particle size of 4 inches, have a plasticity index between 20 and 30 and a cohesion in the range of 200-500 psf.

Moisture content of the embankment material shall be within the range of zero to 4% wet of optimum, and shall be compacted to a density of at least 95% of maximum dry density as defined by Standard Proctor test (ASTM D-698). Water shall be added, or the material dried as necessary to meet specified moisture requirements.

All rock greater than 4 inches in maximum dimension shall be removed prior to

compaction. Each layer shall be keyed into the existing natural embankment materials on the east and west ends of the embankment by scarifying and benching the added material into the existing natural embankment.

When each layer of material has been conditioned to have the required moisture, it shall be compacted in layers not exceeding 6 inches in loose thickness

If any previously compacted layer of earth fill is too dry or too smooth to bond properly with the layer of earth fill material to be placed thereon, it shall be moistened and disked or scarified in an approved manner to a sufficient depth to provide a satisfactory bonding surface before the earth fill material is placed.

Prior to placement of earth fill on or against the surfaces of previously placed and compacted portions of the dam embankment, all previously placed and compacted materials which have become soft or loose due to exposure to weather, which contain erosion channels or cracks, or which are excessively dry, shall be reworked by removing and replacing, or by re-compacting as directed by the Engineer. The replaced materials shall be compacted as required by these specifications for the type of materials being compacted.

2.03 FIELD DENSITY AND MOISTURE TESTS

The Engineer will determine in-place density and moisture content by any one or combination of the following methods: ASTM D-2922, D-3017, or other methods selected by the Engineer. The Contractor shall cooperate in the performance of density and moisture testing by providing a small level area for the test at a location on the placement designated by the Engineer. The Engineer may test any lift of fill at any time, location, or elevation. Refer to Drawing #2 of the Plans for the minimum material testing schedule which is also noted below:

MATERIAL TESTING SCHEDULE				
THE ENGINEER MAY TEST ANY LIFT OF FILL AT ANY TIME, LOCATION, OR ELEVATION. THE CONTRACTOR MUST NOTIFY THE ENGINEER AND ENSURE THAT THE MINIMUM TESTING FREQUENCY IS OBTAINED PER THE FOLLOWING TABLE:				
ZONE	MATERIAL*	PLACEMENT REQUIREMENTS	GRADATION TEST	TESTING FREQUENCY
EMBANKMENT FILL	ON-SITE REUSE OR MILITARY PARK STOCKPILE IMPORT	95% STD. PROCTOR, 0 TO 4% OPT MOISTURE		MIN. EVERY 1' VERT, LIFT /500' LENGTH/75' WIDTH
			-200 SIEVE	ONE/2000 C.Y.
			ATTERBRG LIMITS	ONE/2000 C.Y.
STILLING BASIN RIPRAP	NATIVE STONE	DUMPED AND MACHINE ADJUSTED		N/A
DRAIN	FILTER MATERIAL	65 -75% RELATIVE DENSITY PER ASTM 4253/54	SIEVE ANALYSIS	AS DETERMINED BY THE ENGINEER

2.04 EROSION AND SEDIMENT CONTROL

Erosion and sediment control for this project shall include the furnishing, installing maintaining and removing erosion and sediment control facilities such as: check dams, sediment barriers, and sediment traps as required to stop erosion and to prevent contamination of adjacent streams and properties. Sediment traps and erosion protections shall remain in place and be maintained until such time as the reservoir has been filled and the downstream area impacted by construction has established 70% re-vegetation density.

When backfill material or other soil is stockpiled for anticipated periods longer than 72 hours, the Contractor shall provide erosion and sedimentation control for the area.

2.05 FINISH GRADING

Finish grading shall be performed after the earthwork involved has been substantially completed. Finish grading will involve any or all of the following items or work as may be applicable or pertinent.

- A. Ditches: All ditches, channels, and canals provided for the conveyance of water shall be trimmed to neat lines and made free of litter, debris, and obstructions.
- B. Structure Sites: All extraneous matter near the structures shall be removed before backfilling. The areas shall be trimmed and shaped as directed. All water pipes, drains and appurtenances shall be cleaned. Embankment slopes need not be finished to a fine degree of perfection, but shall be made as smooth, safe, and slightly as practicable with the compatibility of materials used in construction of the embankments.
- C. Disposal of materials: Dispose of all materials removed in connection with all construction operations in a manner satisfactory to the Owner.
- D. Maintenance: Maintain the finished work until completion of the contract, or, in the case of subgrades, until the subgrades are covered with a subsequent course of material placed under the contract.

2.06 TOPSOIL PLACEMENT

Stockpiled topsoil shall be placed in a single lift of no less than 6 inches over the new embankment backfill area, and any other areas distributed by construction activities, except areas in the reservoir below the normal high water line.

After placing on the finish grades, but before re-vegetation seeding, topsoil shall be tracked by cleaned construction equipment.

2.07 RE-VEGETATION

Native seed mix formula and a mulching method shall be submitted by the Contractor and are to be approved by the Engineer and U.S. Forest Service. The Contractor shall maintain, at his expense, any re-vegetation areas for a minimum period of one year. This shall include, but is not limited to, re-seeding any areas that fail to germinate, active weed control as directed by U.S. Forest Service officials, and replacement of any vegetation that is destroyed by Contractor activities.

Native seeding and mulching shall not be measured separately but shall be paid for at the lump sum price for RE-VEGETATION in the bid schedule.

2.08 CLEAN UP

- A. Remove all unsuitable and excess material, debris and construction material from the site, leaving the site in a neat and orderly condition.
- B. Dispose of removed material in accordance with local regulation and codes.
- C. All remaining soil stockpiles shall be graded to drain away from the site and to match into existing contours and re-vegetated.

END OF SECTION 02200

SECTION 02620

HIGH DENSITY POLYETHYLENE (HDPE) PIPE AND FITTINGS

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

This specification includes but is not limited to the installation of high-density polyethylene, intended for the dam outlet conduit. All work shall comply with the requirements of AWWA Standards C901 and C906 as appropriate.

1.02 REFERENCES

- A. AWWA C901 Polyethylene (PE) Pressure Pipe and Tubing, ½ In. through 3 In. for Water Service
- B. AWWA C906 Polyethylene (PE) Pressure Pipe and Fittings, 4 IN. through 63 In., for Water Distribution and Transmission

1.03 SUBMITTALS

CONTRACTOR shall submit three (3) copies of all certifying documents from suppliers, manufacturer's and sub-contractors regarding the following HDPE pipe characteristics described below:

- A. Use: High Density Polyethylene (HDPE) pipes/fittings selected for use on the PMPLC project shall comply with the specifications contained in this Section. All material used in the production of HDPE water main piping shall be approved by the National Sanitation Foundation (NSF) for use with potable water.
- B. Documentation: Documentation from the resin's manufacturer showing results of the following tests for resin identification:
 - 1. Melt Flow Index ASTM D1238
 - 2. Density ASTM D1505
- C. Manufacturer: All HDPE pipe shall be from a single manufacturer, who is fully experienced, reputable and qualified in the manufacture of the HDPE pipe to be furnished. The pipe shall be designed, constructed and installed in accordance with the best practices and methods and shall comply with these Specifications.
- D. Finished Product Evaluation: Production staff shall check each length of pipe produced for the items listed below. The results of all measurements shall be recorded on production sheets, which become part of the manufacturer's permanent records.
 - 1. Pipe in process shall be checked visually, inside and out for cosmetic defects (grooves, pits, hollows, etc.)
 - 2. Pipe outside diameter shall be measured using a suitable periphery tape

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HIGH DENSITY POLYETHYLENE (HDPE) PIPE AND FITTINGS

- to ensure conformance with ASTM F714 or ASTM D3035, whichever is applicable.
3. Pipe wall thickness shall be measured at 12 equally spaced locations around the circumference at both ends of the pipe to ensure conformance with ASTM F714 or ASTM D3035, whichever is applicable.
 4. Pipe length shall be measured.
 5. Pipe marking shall be examined and checked for accuracy.
 6. Pipe ends shall be checked to ensure they are cut square and clean.
 7. Subject inside surface to a "reverse bend test" to ensure the pipe is free of oxidation (brittleness).
- E. Stress Regression Testing: The polyethylene pipe manufacturer shall provide certification that stress regression testing has been performed on the specific polyethylene resin being utilized in the manufacture of this product. This stress regression testing shall have been done in accordance with ASTM D2837 and the manufacturer shall provide a product supplying a minimum Hydrostatic Design Basis (HDB) of 1,600 psi as determined in accordance with ASTM D2837.
- F. Compatibility: CONTRACTOR is responsible for compatibility between pipe materials, fittings and appurtenances. CONTRACTOR shall submit three (3) copies of all proposed materials, pipe, and fittings for the ENGINEER's approval within ten (10) days of Notice-to-Proceed with the project.
- G. Warranty: The pipe manufacturer shall provide a standard warranty against manufacturing defects of material and workmanship for a period of no less than five years after the final acceptance of the project by the OWNER. The manufacturer shall replace at no expense to the OWNER any defective pipe/fitting material within the warranty period.

PART 2 - PRODUCTS

2.01 MATERIALS FOR HDPE PIPE

- A. Materials used for the manufacture of polyethylene pipe and fittings shall be made from a PE 3408 or approved equal, high density polyethylene resin compound meeting cell classification 345434C per ASTM D3350; and meeting Type III, Class C, Category 5, Grade P34 per ASTM D1238.
- B. High Density Polyethylene (HDPE) pipe 1/2-inch through 3-inch diameter shall comply with AWWA Standard C901.
- C. High Density Polyethylene (HDPE) pipe 4-inch through 12-inch diameter shall

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HIGH DENSITY POLYETHYLENE (HDPE) PIPE AND FITTINGS

comply with AWWA Standard C906.

- D. If rework compounds are required, only those generated in the manufacturer's own plant from resin compounds of the same class and type from the same raw material supplier shall be used.
- E. Dimensions and workmanship shall be as specified by ASTM F714. HDPE fittings and transitions shall meet ASTM D3261. HDPE pipe shall have a minimum density of 0.955 grams per cubic centimeter. All HDPE pipe and fittings shall have a Hydrostatic Design Basis (HDB) of 1,600 psi.
- F. All HDPE pipe and accessories for this project shall be rated for 125 psi at 73.4°F, meeting the requirements of Standard Dimension Ratio (SDR) 17.
- G. The pipe Manufacturer shall certify compliance with the above requirements.

2.02 FITTINGS

- A. All molded fittings shall be fully pressure rated to match the pipe DR pressure rating to which they are made. All fittings shall be molded by the manufacturer. No CONTRACTOR fabricated fittings shall be used unless approved by the ENGINEER.
- B. All fittings shall be installed using butt-fused fittings, thermo-fused fittings/couplings, or flanged adapters and must be approved by the ENGINEER. No size on size wet taps shall be permitted.

2.03 PIPE IDENTIFICATION

- A. The following shall be continuously indent printed on the pipe or spaced at intervals not exceeding 5-feet, as prescribed in AWWA C901 and C906, and shall include:
 - 1. Name and/or trademark of the pipe manufacturer.
 - 2. Nominal pipe size.
 - 3. Dimension ratio.
 - 4. The letters PE followed by the polyethylene grade in accordance with ASTM D1248 followed by the hydrostatic design basis in 100's of psi, e.g., PE 4710.
 - 5. Manufacturing standard reference, e.g., ASTM F714 or D-3035, as required.

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HIGH DENSITY POLYETHYLENE (HDPE) PIPE AND FITTINGS

6. A production code from which the date and place of manufacture can be determined.

PART 3 – EXECUTION

3.01 JOINING METHOD

- A. The pipe shall be joined with butt, heat fusion joints to meet the requirements of ASTM D2657. All joints shall be made in strict compliance with the manufacturer's recommendations. A factory qualified joining technician as designated by pipe manufacturer or experienced, trained technician shall perform all heat fusion joints in the presence of the ENGINEER. Fusion certifications for the field technicians making the welds must be submitted to and approved by the ENGINEER at least five (5) days prior to the proposed start of fusion activities.
- B. Lengths of pipe shall be assembled into suitable installation lengths by the butt-fusion process. All pipe so joined shall be made from the same class and type of raw material made by the same raw material supplier. Pipe shall be furnished in standard laying lengths not to exceed 50 feet and no shorter than 20 feet. Should weather conditions require it, the CONTRACTOR shall, at his own expense, provide a covered fusion facility (tent, enclosed cab, etc.) to ensure that manufacturer recommended cooling times and fusion temperatures are maintained throughout the fusion process.
- C. On days butt fusions are to be made, the first fusion shall be a trial fusion in the presence of the ENGINEER. The following shall apply:
 1. Heating plates shall be inspected for cuts and scrapes. The plate temperature shall be measured at various locations to ensure proper heating/melting per manufacturer's recommendations and approved by the resident project representative.
 2. The fusion or test section shall be cut out after cooling completely for inspection.
 3. The test section shall be at least 12" or 30 times (minimum) the wall thickness in length and 1" or 1.5 times the wall thickness in width (minimum).
 4. The joint shall be visually inspected as to continuity of "beads" from the melted material, and for assurance of "cold joint" prevention (i.e. – joint shall have visible molded material between walls of pipe). Joint spacing between the walls of the two ends shall be a minimum of 1/16" to a maximum 3/16".

SECTION 02620

HIGH DENSITY POLYETHYLENE (HDPE) PIPE AND FITTINGS

5. A daily bent strap test shall be performed by making a trial butt fusion, on the first fusion of the day, and allowing it to cool to ambient temperature. A test section that meets the requirement in item 3 above shall be fused. The strap is then bent so that the ends of the strap touch. Any separation at the fusion is unacceptable, and indicates poor fusion quality. If failure occurs, fusion procedures and/or machine set-up should be changed, and a new trial fusion and bent strap test specimen should be prepared and tested. Field fusion shall not proceed until a test joint has passed the bent strap test. Daily bent strap tests shall continue until the ENGINEER is satisfied with the consistent quality of the fusion welds. The costs of time and material to provide these bent strap tests shall be included in the linear footage cost for HDPE pipe installation and no additional payment will be made for these tests.
- D. Polyethylene flange adapters at pipe material transitions shall be backed up by stainless steel flanges conforming to ANSI B16.1 and shaped as necessary to suit the outside dimensions of the pipe. The flange adapter assemblies shall be connected with corrosion resisting bolts and nuts of Type 316 Stainless Steel as specified in ASTM A726 and ASTM A307. All bolts shall be tightened to the manufacturer's specified torques. Bolts shall be tightened alternatively and evenly.

3.02 INSTALLATION

- A. High Density Polyethylene (HDPE) Pipe shall be installed in accordance with the instruction of the manufacturer, as shown on the Drawings, as recommended in AWWA Manual M55 – "PE Pipe, Design and Installation" and as specified herein. A factory qualified joining technician as designated by the pipe manufacturer shall perform all heat fusion joints. Certification of fusion qualifications will be required for all fusion technicians employed in joining HDPE pipe for this project. Proof of certification shall be submitted to the ENGINEER prior to commencing HDPE fusion procedures. All fusion joints shall be recorded by a fusion data recording device. Required data for each fusion joint shall be, at a minimum, the time, date, temperature and pressure used to create that joint. Additionally, a station number and/or joint identification number shall be assigned to each fusion joint. The CONTRACTOR shall download this data to a CD-ROM format and provide this data to the ENGINEER weekly. Payment for linear footage of heated fused HDPE pipe will only be made for those joints for which data has been recorded and provided to the ENGINEER.
- B. Care shall be taken in loading, transporting and unloading to prevent injury to the pipe. Pipe or fitting shall not be dropped. All pipe or fitting shall be examined before installation, and no piece shall be installed which is found to be defective. Any damage to the pipe shall be repaired as directed by the ENGINEER. If any defective pipe is discovered after it has been installed, it shall be removed and replaced with a sound pipe in a satisfactory manner by the CONTRACTOR, at his

SECTION 02620

HIGH DENSITY POLYETHYLENE (HDPE) PIPE AND FITTINGS

own expense.

- C. Care shall be taken during transportation of the pipe such that it will not be cut, kinked or otherwise damaged.
- D. Ropes, fabric or rubber protected slings and straps shall be used when handling pipes. Chains, cables or hooks inserted into the pipe ends shall not be used. Two slings spread apart shall be used for lifting each length of pipe.
- E. Pipes shall be stored on level ground, preferably turf or sand, free of sharp objects, which could damage the pipe. Stacking of the polyethylene pipe shall be limited to a height that will not cause excessive deformation of the bottom layers of pipes under anticipated temperature conditions. Where necessary due to ground conditions, the pipe shall be stored on wooden sleepers, spaced suitably and of such width as not to allow deformation of the pipe at the point of contact with the sleeper or between supports. Protect HDPE pipe from ultraviolet radiation.
- F. Pipe shall be stored on clean level ground to prevent undue scratching or gouging. The handling of the pipe shall be in such a manner that the pipe is not damaged by dragging it over sharp and cutting objects. The maximum allowable depth of cuts, scratches or gouges on the exterior of the pipe is 5 percent of wall thickness. The interior pipe surface shall be free of cuts, gouges or scratches.
- G. Pipe shall be laid to lines and grade shown on the Drawings with bedding and backfill as shown on the Drawings.
- H. Sections of pipe with cuts, scratches or gouges exceeding 5 percent of the pipe wall thickness shall be removed completely and the ends of the pipeline rejoined. **No payment will be made for sections of pipe removed due to excessive cuts, scratches or gouges. Replacement of any HDPE pipe removed due to excessive cuts, scratches or gouges will be made by the CONTRACTOR at no additional expense to the OWNER.**
- I. The pipe shall be joined by the method of thermal butt fusion, as outlined in PART III – Execution, Section 3.1 Joining Method. All joints shall be made in strict compliance with the manufacturer's recommendations.
- J. Flanged connection of the polyethylene pipe shall consist of the following:
 - 1. A polyethylene flange shall be thermally butt-fused, at the manufacturer, to the stub end of the pipe.
 - 2. A 316 stainless steel back up ring shall mate with a 316 stainless steel flange.
 - 3. 316 stainless steel bolts and nuts shall be used.
- K. Flange connections shall be provided with a full-face neoprene gasket.

SECTION 02620

HIGH DENSITY POLYETHYLENE (HDPE) PIPE AND FITTINGS

L. Open Trench Installation:

1. The centerline of the pipe shall not deviate from a straight line drawn between the centers of the openings at the ends of the pipe by more than 1/16-in per foot of length. If a piece of pipe fails to meet this requirement check for straightness, it shall be rejected and removed from the site. Laying instructions of the manufacturer shall be explicitly followed.
2. Good alignment shall be preserved during installation. Deflection of the pipe shall occur only at those places on design drawings and as approved by the ENGINEER. Fittings, in addition to those shown on the Drawings, shall be used only if necessary or required by the ENGINEER.
3. Precautions shall be taken to prevent flotation of the pipe in the trench.
4. The contractor's placement methods must be approved by the Engineer.

3.04 TESTING

- A. Pressure testing shall be conducted per Manufacturer's recommendations and as approved by the ENGINEER.
- B. The HDPE pipe shall be field-tested. CONTRACTOR shall supply all labor, equipment, material, gages, pumps, meters and incidentals required for testing. Each main shall be pressure tested upon completion of the pipe laying and backfilling operations, including placement of any required temporary roadway surfacing.
- C. The pipe shall be hydrostatically tested at 100 psi unless otherwise approved by the ENGINEER.
- D. Pressure testing procedure shall be per Manufacturer's recommendations or as follows:
 1. Fill line slowly with water. Maintain flow velocity less than 2 feet per second.
 2. Expel air completely from the line during filling and again before applying test pressure. Air shall be expelled by means of taps at points of highest elevation.
 3. Apply initial test pressure and allow to stand without makeup pressure for two to three hours, to allow for diametric expansion or pipe stretching to stabilize.

SECTION 02620

HIGH DENSITY POLYETHYLENE (HDPE) PIPE AND FITTINGS

4. After this equilibrium period, apply the specified test pressure and turn the pump off. The final test pressure shall be held for a minimum of four hours.
 5. Upon completion of the test, the pressure shall be bled off from a location other than the point where the pressure is monitored. The pressure drop shall be witnessed by the ENGINEER at the point where the pressure is being monitored.
- F. All visible leaks are to be repaired regardless of the amount of leakage.
- G. The CONTRACTOR must submit his plan for testing to the ENGINEER for review at least 10 days before starting the test and shall notify the ENGINEER a minimum of 48 hours prior to test.

END OF SECTION 02620

SECTION 03300

CAST-IN-PLACE CONCRETE

1.01 General

1.02 Quality Assurance

Standard for measuring, mixing, transporting and placing of concrete shall be ACI-304.

Standard for measuring, mixing and delivery of ready mixed concrete shall be ASTM C-94, except that time in mixer after water has been added at batch plant is limited to 1-1/2 hours.

Cold weather and hot weather concreting shall be placed according to recommended practices in ACI-306 and 305 respectively.

1.03 Testing

Owner shall be responsible for payment of testing services required in this Section. See Section 01400.

Testing laboratory shall be notified as far ahead of pour as practical but not less than 24 hours.

Concrete tests will be made by an approved independent testing laboratory at the direction of the Engineer. Testing shall be performed at least once each day of placement but not less than once for each 50 yards placed in any one day, or as directed by the Engineer. One set of concrete test cylinders must be cast and tested for each concrete placement.

Tests shall be made for 7-day and 28-day strengths. Four cylinders shall be molded for each test; one for 7-day test, two for 28-day test, and one for hold.

Obtain samples in accordance with ASTM C-172. Mold and cure specimens in accordance with ASTM C-31. Test specimens in accordance with ASTM C-39. Report all test results to the Engineer on the same day as the tests are made.

2.01 Products

2.02 Materials

Portland Cement:	ASTM C-150, Type II, sulfate resistant cement, alkali content not to exceed 0.6%.
Water:	Potable.
Coarse Aggregate:	ASTM C-33, Table II, Size 57.
Fine Aggregate:	ASTM C-33.
Chemically Reactive Stain:	Lithochrome Chemstain (Scofield).
Color Hardener:	Lithochrome Color Hardener (Scofield).

SECTION 03300

CAST-IN-PLACE CONCRETE

Sealer: Cementone Clear Sealer (Scofield).

2.03 Mixing

Design concrete mixes in accordance with ACI 613 to obtain 3,000 psi 28-day compressive strength unless otherwise indicated on the plans.

Use of water reducing admixture if needed in concrete shall be submitted for approval.

Proportion in accordance with manufacturer's recommendations. Delivery tickets shall state the amount and kind of admixture.

Maximum slumps shall conform to the following:

3"

Air Content: 4% to 6%

Slump and air content are to be measured at the point of concrete placement.

3.01 Execution

Cleaning Forms, Reinforcement and Equipment

Before placing the concrete, clean the equipment involved. Remove all debris and foreign material from the forms. Remove all concrete laitance from the reinforcing steel.

Wet the wood forms and masonry units in contact with the concrete.

No wood other than built-in bucks or nailing blocks will be permitted to remain permanently inside the forms.

3.02 Placing

Convey the concrete from the mixer to the place of final deposit by methods which will prevent segregation of aggregate or loss of material. Place concrete at such a rate that it is at all times plastic and to insure a practically continuous flow. Concrete not in place 1-1/2 hours after the water has been added at batch plant will be rejected by the Engineer.

Place the concrete as nearly as practicable in its final position to avoid segregation due to rehandling or flowing. Do not deposit concrete that has partially hardened or been retempered.

Do not place concrete during rain unless adequate protection has been provided.

SECTION 03300

CAST-IN-PLACE CONCRETE

Thoroughly compact all concrete by suitable means during the placing and work around the reinforcement and embedded items and into the corners of the forms. Use vibrators to aid in the placement of the concrete, operated by experienced personnel. Design forms to withstand the action of the vibrators.

3.03 Curing

Protect concrete from freezing. Use thermal blankets and min/max thermometers to ensure adequate protection against freezing. Remove and replace all frozen concrete at no expense to the Owner.

Protect freshly deposited concrete from premature drying and maintain without drying at a relatively constant temperature for the period of time necessary for the hydration of the cement and proper hardening of the concrete.

Curing shall immediately follow the finishing operation. Keep concrete continuously moist for at least 7 days using one of the following materials or methods:

Curing compounds, as approved by the Engineer. Use unpigmented paraffin base curing compound at all exterior flatwork.

Continuous sprinkling.

Absorptive mat or fabric continuously wet.

Sand or other covering kept continuously wet.

Polyethylene film securely held in place.

Waterproof paper conforming to ASTM C-171, joints taped, Type 1 or 2.

Prevent rapid drying of the concrete at the end of the curing period.

During the curing period, protect the concrete from damaging mechanical disturbances, particularly load stresses, heavy shock, and excessive vibration. Protect all finished concrete surfaces from damage caused by construction equipment, materials or methods.

END OF SECTION .

BLANCHE PARK RESERVOIR DAM RECONSTRUCTION

DELTA COUNTY

WATER DIVISION 4

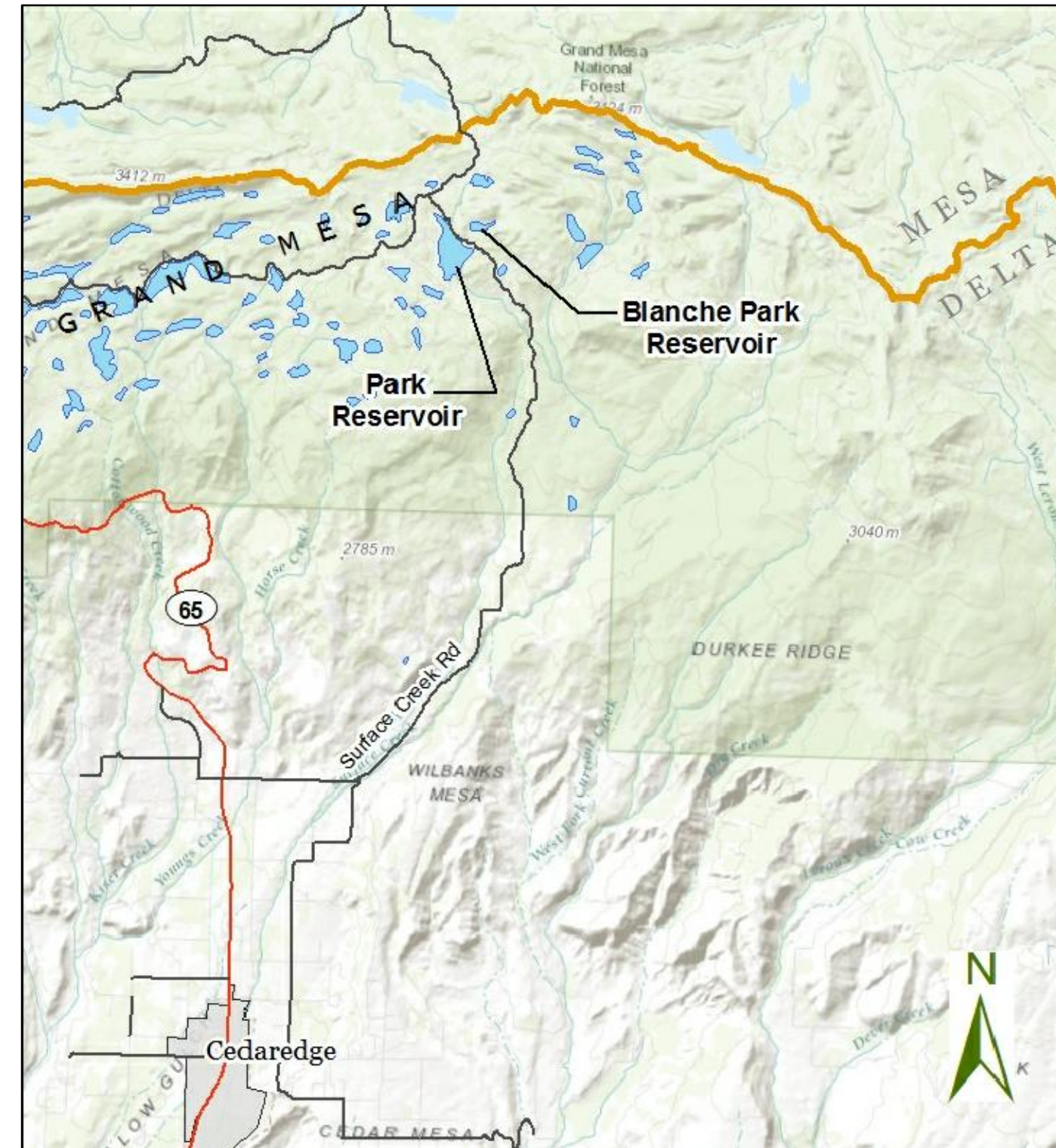
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DAM I.D. NUMBER 400119

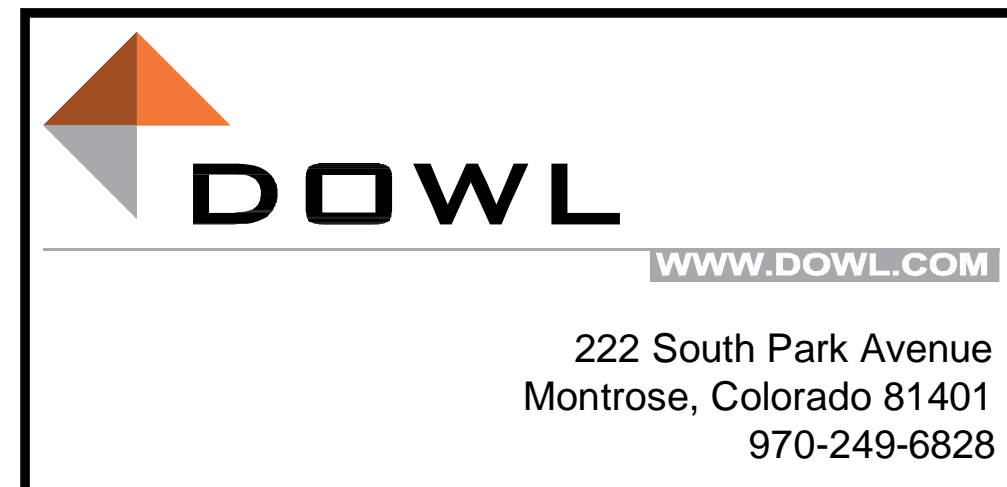
OWNER



P.O. BOX 129
CEDAREGE, CO 81413
SIGNATORY: AUSTIN M. KEISER, PRESIDENT



VICINITY MAP



LIST OF DRAWINGS ARE CONTAINED ON SHEET 2.

I HEREBY DECLARE THAT THESE PLANS FOR THE BLANCHE PARK RESERVOIR DAM RECONSTRUCTION WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION FOR THE COLORADO DIVISION OF WATER RESOURCES AS OF THE

28TH DAY OF JUNE, 2016.

Norman J. Aufderheide
NORMAN J. AUFDERHEIDE, P.E.
COLORADO P.E. No. 19152



APPROVED ON THE 7th DAY OF July, 2016.

Dick Wolfe
STATE ENGINEER

WILLIAM T. MCCORMICK III, COLORADO P.E. No. 29127
CHIEF, DAM SAFETY BRANCH

THESE PLANS REPRESENT THE AS-CONSTRUCTED CONDITIONS OF BLANCHE PARK RESERVOIR DAM RECONSTRUCTION TO THE BEST OF OUR KNOWLEDGE AND JUDGMENT, BASED IN PART ON INFORMATION FURNISHED BY OTHERS AS OF THE

____ DAY OF _____, 20____.

NORMAN J. AUFDERHEIDE, P.E.
COLORADO P.E. No. 19152

COLORADO STATE ENGINEER FILE NUMBER

CONSTRUCTION FILE NO: C-2011A

SHEET 1

1 OF 15 SHEETS

BLANCHE PARK RESERVOIR DAM RECONSTRUCTION

WATER DIVISION #4, WATER DISTRICT #40

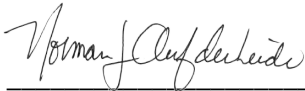
DAM ID: 400119

CONSTRUCTION FILE NUMBER C-2011A

DELTA COUNTY, COLORADO

I HEREBY DECLARE THAT THESE TECHNICAL SPECIFICATIONS FOR CONSTRUCTION OF THE BLANCHE PARK RESERVOIR DAM RECONSTRUCTION WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION FOR THE COLORADO DIVISION OF WATER RESOURCES AS OF THE

28th DAY OF June, 2016



NORMAN J. AUFDERHEIDE, P.E.
COLORADO P.E. No. 19152



ON BEHALF OF THE COLORADO DIVISION OF WATER RESOURCES, THE UNDERSIGNED DOES HEREBY ACCEPT THESE TECHNICAL SPECIFICATIONS FOR CONSTRUCTION OF THE BLANCHE PARK RESERVOIR DAM RECONSTRUCTION.

APPROVED ON THE 7th DAY OF July, 2016.

BY:

Dick Wolfe

STATE ENGINEER

WILLIAM T. MCCORMICK III, P.E.
COLORADO P.E. No. 29127
CHIEF, DAM SAFETY BRANCH

GRAND MESA WATER CONSERVANCY DISTRICT
P.O. Box 129
Cedaredge, Colorado 81413

November 8, 2016

Re: Blanch Park WSRF Grant (POGG1 2015-71) - Gunnison RT

Mr. Craig Godbout, Program Manager
Colorado Water Conservation Board
Water Supply Planning Section
Denver, CO

Mr. Godbout, Board Members and Staff

The Grand Mesa Water Conservancy District was awarded a grant from the Gunnison Basin Roundtable to be used toward the preparation and construction of the rebuilding of the Blanche Park Reservoir. The CWCB has paid to us all the funds that were awarded and this letter is to finalize our relationship regarding this grant.

This project has not been constructed yet and will not be scheduled for construction until the summer/fall of 2017. The project was part of a two reservoir project which utilized materials from one site to build the second reservoir. There were issues with the engineering company and the Dam Safety Engineer from the beginning which were attributed to the engineer that we hired. From his work we were able to get the first reservoir built but issues came up as the engineer began the design of the second structure which caused the District to release him from the job. With a new engineering firm on the job which required starting over on the design. We had hopes that the plans could be finished and approved by summer 2015. In April 2015, several board members met with the Army Corp of Engineers where we learned that they were going to require the water rights to be converted to the site and we had to have the EPA sign off along with all the state and federal permits. That requirement shut us down due the length of time it takes to get through water court. January of 2016, the Forest Service representative that we were working with died unexpectedly leaving a huge void in the USFS program which essentially shut us down while the new administration was hired and acquainted with the project. As of this timeframe, the only requirement that has been placed upon us is the Environmental Assessment which is in the public comment period. With that in hand, we should be ready to construct the Blanche Park Reservoir next summer.

I have forwarded a set of construction plans as completed by Dowl Engineering, of Montrose for your inspection and file. These plans have been approved by the Dam Safety Engineers in both District 4 & 5.

Thank You very much for making the resources available to the Gunnison Basin Roundtable and the award of this grant to the Grand Mesa Water Conservancy District.

Sincerely,

A handwritten signature in blue ink, appearing to read 'A. Keiser', with a long horizontal flourish extending to the right.

Austin M. Keiser, President
Grand Mesa Water Conservancy District

notices

to advertise, call 242-1313, monday-friday, 8-5, or log on anytime to gjclassifieds.com

notices

Psalm 126:3
"Behold sons (children) are a gift from the Lord; the fruit of the womb is a reward." Pray for reborn children and their families.

personals

Maya's Massage Service
970-210-2615

legal notices

NOTICE OF HEARING ON PROPOSED ANNEXATION OF LANDS

TO THE CITY OF GRAND JUNCTION, COLORADO

NOTICE IS HEREBY GIVEN that at a regular meeting of the City Council of the City of Grand Junction, Colorado, held on the 19th day of October, 2016, the following Resolution was adopted:

...feet; thence N 89° 52' 58" W, a distance of 33.21 feet; thence S 00° 07' 10" E, along the West line of said Pine Estates Filing No. Two, a distance of 662.01 feet to a point on the South line of the NE 1/4 NW 1/4 of said Section 19; thence N 89° 38' 55" W, along said South line, a distance of 192.34 feet, more or less, to a point being the Southeast corner of Summer Glen Subdivision, as same is recorded in Book 4065, Page 547, Public Records of Mesa County, Colorado; thence N 00° 36' 18" W, along the East line of said Summer Glen Subdivision, a distance of 1294.18 feet, more or less, to a point on the South right of way for Riverside Parkway; thence S 89° 39' 18" E, along said South right of way, a distance of 238.48 feet, more or less, to the Point of Beginning.

CONTAINING 6.359 Acres or 276,984 Square Feet, more or less, as described WHEREAS, the Council has found and determined that the petition complies substantially with the provisions of the Municipal Annexation Act and a hearing should be held to determine whether or not the lands should be annexed to the City by Ordinance.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF

legal notices

THE CITY OF GRAND JUNCTION:
1. That a hearing will be held on the 7th day of December, 2016, in the City Hall auditorium, located at 250 North 5th Street, City of Grand Junction, Colorado, at 7:00 PM to determine whether one-sixth of the perimeter of the area proposed to be annexed is contiguous with the City; whether a community of interest exists between the territory and the city; whether the territory proposed to be annexed is urban or will be urbanized in the near future; whether the territory is integrated or is capable of being integrated with said City; whether any land in single ownership has been divided by the proposed annexation without the consent of the landowner; whether any land held in identical ownership comprising more than twenty acres which, together with the buildings and improvements thereon, has an assessed valuation in excess of two hundred thousand dollars is included without the landowner's consent; whether any of the land is now subject to other annexation proceedings; and whether an election is required under the Municipal Annexation Act of 1965.

2. Pursuant to the State's Annexation Act, the City Council determines that the City may now, and hereby

Hearing: 12-6-2016
Published: November 4, 2016.

NOTICE OF OPPORTUNITY TO COMMENT

PROPOSED DAM MAINTENANCE PROJECT
Blanche Park Reservoir Dam Reconstruction Environmental Assessment

Grand Mesa, Uncompahgre and Gunnison National Forests
Grand Valley Ranger District
Mesa County, Colorado
The Forest Service is seeking initial scoping comments on the proposed Blanche Park Reservoir Reconstruction Project. The project site is located in Mesa County near Forest Service Road 125 on the Grand Mesa, at approximately Section 35, Township 11 South, Range 94 West, of the Sixth Principal Meridian. The scoping package is available for review at the Grand Valley Ranger District, 2777 Crossroads Boulevard, Suite 1, Grand Junction, Colorado 81506; or, online at: <http://www.fs.usda.gov/goto/BlancheParkDamReconstr> uction. The Blanche Park Reservoir Reconstruction Project is subject to comment pursuant to 36 CFR 218, Subparts A and C. Only those who submit timely project specific written comments during a designated

legal notices

public comment period will be eligible to file an objection. Individuals or representatives of an entity submitting comments must sign the comments or verify identity upon request. The Forest Service will accept initial scoping comments on this proposal for 30 days following publication of this legal notice which is the exclusive means for calculating the comment period. Commenters should not rely upon dates or timeframes provided by any other source. Comments may be mailed to the Grand Valley Ranger District; Attn: Blanche Park Reservoir Reconstruction, 2777 Crossroads Boulevard, Suite 1, Grand Junction, Colorado 81506; delivered to the address shown above during business hours (M-F 8:00am to 4:30pm); or, submitted by FAX (970) 874-8691. Submit electronic comments, in common (.doc, .pdf, .rtf, .txt) formats, to: comments-rocky-mountain-gmug@fs.fed.us with Subject: Blanche Park Reservoir Reconstruction Project. Names of commenters will be part of the public record. For more information, contact Matthew Dare at mdare@fs.fed.us or call (970) 874-6651. USDA is an equal opportunity provider, employer and lender.
Published: November 4, 2016.

notice, go to http://www.blm.gov/office/lands/leasing_regulations.html. Comments can be provided at blm_co_mltv_comments@blm.gov
Published: November 4, 2016.

DISTRICT COURT, MESA COUNTY, COLORADO
MESA COUNTY JUSTICE CENTER, 125 North Spruce, Grand Junction, CO
Case No. 16JV299
SUMMONS
THE PEOPLE OF THE STATE OF COLORADO,
in the Interest of:
HARMONY GREEN (DOB: 03/13/2003) and SABRINA GREEN (DOB: 08/19/2004),
Children,
and Concerning:
MARLENA GREEN and RYAN GREEN,
Respondents.

TO: MARLENA GREEN:
YOU ARE HEREBY NOTIFIED that a verified petition has been filed in the above-named Court in which it is represented to the Court that HARMONY GREEN and SABRINA GREEN are alleged to be dependent or neglected pursuant to C.R.S. Section 19-3-102 (1) (a), (b), (c) and (d) of the Colorado Children's Code, as amended, for the reasons set forth more fully in said Petition.

legal notices

YOU ARE FURTHER NOTIFIED that the Court has set an initial advisement hearing on the Petition on November 14, 2016, at 2:30 p.m. before the Honorable Kevin R. Kennedy, Courtroom No. 3. The District Court is located in the Mesa County Justice Center, 125 North Spruce, Grand Junction, CO 81501. You are hereby notified to be and appear before the Court at said time.

YOU ARE FURTHER NOTIFIED that termination of parent-child legal relationship is a possible remedy under this proceeding, if requested by subsequent motion.

WITNESS my hand and seal of said Court this 24th day of October, 2016.
CHARLENE BENTON,
District Court Clerk (SEAL)
Dusty Curfman
Deputy Clerk
Published: November 4, 2016.

DEPARTMENT OF HOMELAND SECURITY

FEDERAL EMERGENCY MANAGEMENT AGENCY
Proposed Flood Hazard Determinations for the City of Grand Junction and Unincorporated Areas of Mesa County, Colorado and Case No. 16-08-0727P. The Department of Homeland Security's Federal Emergency Management Agency (FEMA) solicits

POST-BUDGETS WILL BE CONSIDERED AT A REGULAR MEETING OF THE BOARD OF DIRECTORS TO BE HELD AT THE OFFICE OF THE DISTRICT ON DECEMBER 13, 2016, AT 10:00 A.M.
ANY INTERESTED ELECTOR WITHIN SUCH GRAND VALLEY DRAINAGE DISTRICT MAY INSPECT THE PROPOSED BUDGETS AND FILE OR REGISTER ANY OBJECTIONS IN WRITING THERETO AT ANY TIME PRIOR TO DECEMBER 13, 2016, WHICH WILL BE THE HEARING FOR THE FINAL ADOPTION OF THE BUDGETS.

DATED THIS 4TH DAY OF OCTOBER, 2016
BOARD OF DIRECTORS
GRAND VALLEY DRAINAGE DISTRICT
Cody Davis, Secretary
Published: October 30, December 4, 2016.

NOTICE OF MESA COUNTY MAJOR SUBDIVISION ADMINISTRATIVE REVIEW PROCESS

The following projects have been submitted for administrative review. To be considered all comments must be submitted in writing and received by the project planner at Mesa County Planning Division at P. O. Box 20,000, Grand Junction, CO 81502-5001 on or before December

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9, 2017.
2016-01
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city

548 N 23rd Street
Well maintained home, conveniently located, features low maintenance professional landscaping, paved parking, vinyl siding, upgraded low-e vinyl windows, hardwood and ceramic tile floors.
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northwest

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