May 08, 2018 - 4:41pm

SET NO.

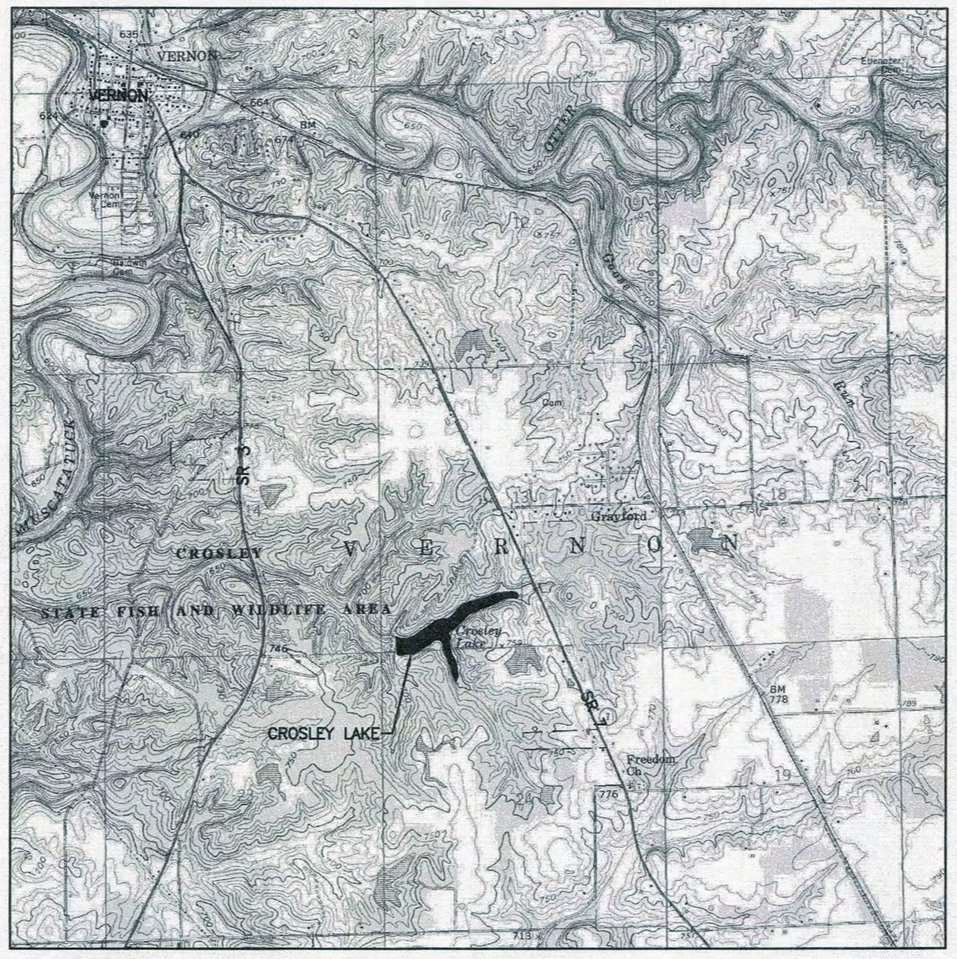
INDIANA DEPARTMENT OF NATURAL RESOURCES

CROSLEY FISH AND WILDLIFE AREA

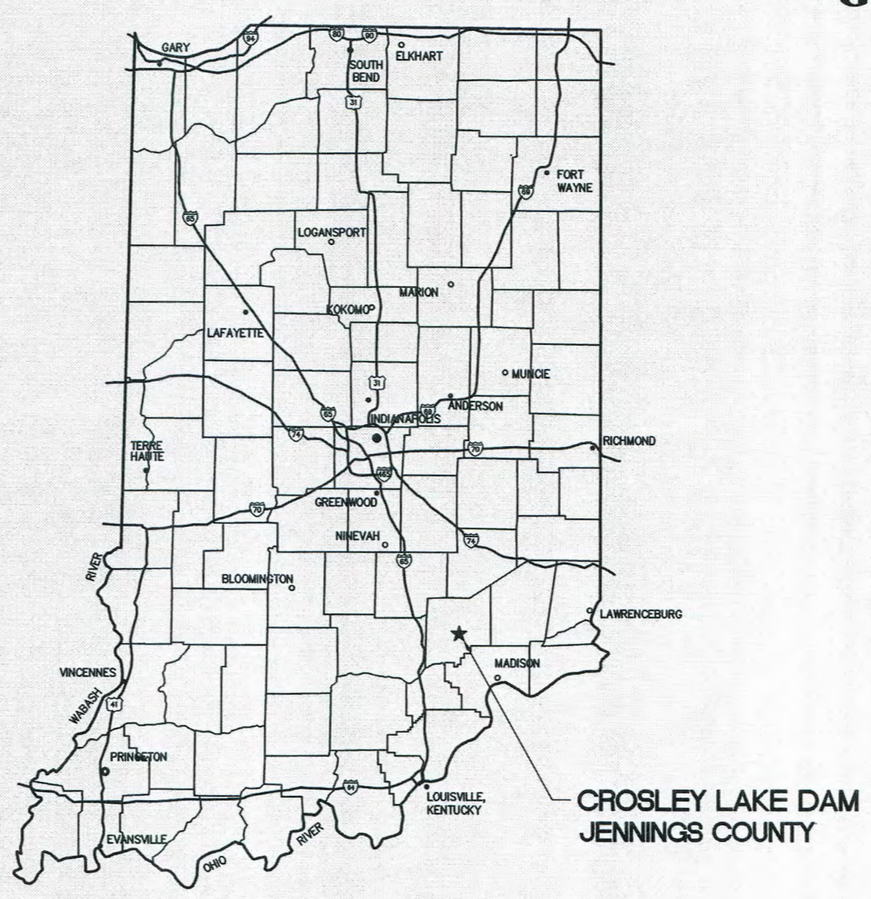
DAM IMPROVEMENTS PROJECT

PROJECT NO. ENG1802321631/E020098

MAY 2018



LOCATION MAP
NO SCALE



GENERAL LOCATION MAP
NO SCALE

IDNR DIRECTOR - CAMERON F. CLARK
GOVERNOR OF INDIANA - ERIC J. HOLCOMB

COMMONWEALTH ENGINEERS, INC.

APPROVED BY: Roger M. Kottlowski — 5/9/18
ROGER M. KOTTLOWSKI
INDIANA P.E. NO. PE20374
DATE :

CERTIFIED BY: Drew O. Flamion — May 9, 2018
DREW O. FLAMION
INDIANA P.E. NO. PE11100003
DATE :

CONTRACT NO. : D13038

ROGER M. KOTTLOWSKI REGISTERED No. 20374 STATE OF INDIANA PROFESSIONAL ENGINEER

DREW O. FLAMION REGISTERED No. PE11100003 INDIANA PROFESSIONAL ENGINEER

00-01-13038-TITLE.dwg 1

P:\Clients A-L\DNR\D13038 Crosley Lake Dam\ACAD\A-CURRENT\DRAWINGS\00-02-13038-INDEX.DWG

NOTIFICATION INFORMATION

OWNER:
STATE OF INDIANA
VIA DEPARTMENT OF NATURAL RESOURCES
DIVISION OF ENGINEERING
402 WEST WASHINGTON STREET, W299
INDIANAPOLIS, IN 46204
(317)232-4150

PROPERTY MANAGER:
IDNR CROSLEY FISH AND WILDLIFE
2010 S. STATE HIGHWAY 3
NORTH VERNON, IN 47265
(812)346-5596
CHAD SPRINGER, IDNR CROSLEY MGR.

ENGINEER:
COMMONWEALTH ENGINEERS, INC.
7256 COMPANY DRIVE
INDIANAPOLIS, IN 46237
(317)888-1177

GEOTECHNICAL ENGINEER:
EARTH EXPLORATION, INC
7770 W. NEW YORK ST.
INDIANAPOLIS, IN 46214
P: (317)273-1690
F: (317)273-2250

STRUCTURAL ENGINEER:
CE SOLUTIONS, INC.
10 SHOSHONE DRIVE
CARMEL, IN 46032
P: (317)818-1912
F: (317)818-1911

GENERAL NOTES:

1. THE PURPOSE OF THIS PROJECT IS TO BRING CROSLEY LAKE DAM (STATE ID 40-7) TO STATE COMPLIANCE FOR THE SIGNIFICANT HAZARD RATING.
2. ONLY VISIBLE ABOVE GROUND UTILITY INFRASTRUCTURE OR ACTUAL FIELD MARKINGS DESIGNATING EXISTANCE OF A BURIED UTILITY OR UTILITY PROVIDING AS-BUILT/BEST AVAILABLE MAPPING ARE INCLUDED ON THE PLANS, WITHIN THE SPECIFIC PROJECT LIMITS. BURIED UTILITIES WERE LOCATED AT THE SITE THROUGH INDIANA 811 LOCATING SERVICE (1-800-382-5544). LOCATION OF SUCH UTILITIES, SHOWN WITHIN THESE PLANS, ARE SUBJECT TO THE ACCURACY STANDARDS AS ESTABLISHED BY INDIANA CODE 8-1-26. NO ATTEMPT HAS BEEN MADE AS PART OF THE SURVEY TO OBTAIN OR SHOW DATA CONCERNING SIZE, DEPTH, CONDITION OR CAPACITY OF SAID BURIED UTILITIES, UNLESS SPECIFICALLY NOTED OR SHOWN ON THE PLANS. THE ENGINEER, OWNER OR ASSOCIATED CONSULTANTS/PERSONNEL DO NOT CERTIFY AS TO THE ACCURACY OR COMPLETENESS OF THE BURIED UTILITIES SHOWN HERE-IN.
3. OTHER BURIED UTILITIES MAY BE IN PROJECT AREA, MARK ALL UTILITIES BEFORE CONSTRUCTION. PRIOR TO ANY EXCAVATION TAKING PLACE ON SITE, CONTACT INDIANA UNDERGROUND 811 AND THE APPROPRIATE UTILITY COMPANY FOR LOCATION OF ALL LINES.
4. PORTIONS OF THE EXISTING FEATURES SHOWN WERE DRAWN USING 2013 DIGITAL ORTHO-PHOTOGRAPHY DATA. ALL BEARINGS SHOWN ON THE PLANS ARE ASSUMED.
3. VERIFY ALL EXISTING CONDITIONS PRIOR TO CONSTRUCTION AND REPORT ANY DISCREPANCIES TO THE OWNER.
5. INFORMATION ON THIS DRAWING IS INTENDED ONLY FOR THE IDENTIFIED PROJECT SHOWN ON THIS DRAWING.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING ALL REQUIREMENTS OF GOVERNMENT AGENCIES AND PERMITS.
7. INFORMATION ON THIS DRAWING IS INTENDED ONLY FOR THE IDENTIFIED PROJECT SHOWN ON THIS DRAWING.
8. EROSION CONTROL SILT FENCES OR INLET PROTECTION DEVICES SHALL BE PLACED BELOW ALL AREAS DISTURBED DURING CONSTRUCTION AND THAT DRAINS TO WATERWAYS, PRIOR TO COMMENCING WITH WORK ACTIVITIES.
9. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS PRIOR TO CONSTRUCTION AND/OR ORDERING MATERIAL AND REPORT ANY DISCREPANCIES TO THE ENGINEER IN WRITING.
10. DURING EXCAVATION OPERATIONS, SEGREGATE OUT ALL TOPSOIL AND STOCKPILE FOR SUBSEQUENT USE IN AREAS TO BE SEEDED OR SODDED. EXTRA CARE SHALL BE TAKEN TO AVOID MIXING STOCKPILED MATERIAL WITH OBJECTIONABLE MATERIAL.
11. THE CONTRACTOR SHALL TAKE ALL RESPONSIBILITY FOR ANY INJURY OR DAMAGE RESULTING TO PERSONS OR PROPERTY BECAUSE OF SUCH WORK.
12. REFER TO THE GEOTECHNICAL REPORT FOR INFORMATION RELATING TO THE EXISTING SUBSURFACE SOIL CONDITIONS. SHEET 3 CONTAINS THE SOIL/ROCK BORING LOCATIONS. REFER TO THE SPECIFICATIONS FOR THE GEOTECHNICAL REPORT AND SOIL/ROCK BORING LOCATIONS, LOGS, FINDINGS AND RECOMMENDATIONS.
13. THE REMOVAL OF EXISTING EMBANKMENT SHALL BE BASED ON THE RECOMMENDATIONS NOTED IN THE GEOTECHNICAL REPORT, THESE PLANS AND AS OBSERVED DURING CONSTRUCTION IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER. THE EXISTING SIDE SLOPES OF THE DAM SHALL BE PROTECTED FROM POSSIBLE EROSION TO DOWNSTREAM AREAS.
14. CONTRACTOR SHALL PROVIDE A PLAN OF OPERATION, WHICH SHALL INCLUDE: SAFETY MEASURES TO PROTECT THE PUBLIC FROM CONTRACTOR'S WORK, CONSTRUCTION MEANS AND METHODS FOR EACH SECTION OF WORK, CONSTRUCTION PHASING AND PROVISIONS TO MAINTAIN DRAINAGE DURING CONSTRUCTION (INCLUDING HANDLING HIGH INTENSITY STORM EVENTS SUCH AS THE 100-YEAR). ENGINEER AND OWNER MUST APPROVE PLAN OF OPERATION PRIOR TO CONSTRUCTION. EXISTING SPILLWAY SHALL REMAIN IN OPERATION AS LONG AS POSSIBLE DURING CONSTRUCTION, UNTIL SUCH TIME, CONSTRUCTION AND STARTUP OF THE NEW SPILLWAY STRUCTURE IS COMPLETE.
15. CONTRACTOR SHALL BE ALLOWED TO DRAWDOWN AND MAINTAIN THE LAKE AT ELEVATION 684.00. REFER TO CONTRACT DETAILED SPECIFICATIONS FOR DETAILS AND ADDITIONAL REQUIREMENTS.
16. IT IS THE INTENT THAT ALL RIPRAP, AND TURF REINFORCEMENT MATERIALS SHALL BE KEYED IN THE SIDE SLOPES ACCORDING TO THE PLANS AND IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. ALL SUCH MATERIALS SHALL BLEND IN SMOOTHLY TO ADJACENT LAND AREAS. ADD ADDITIONAL TOPSOIL WITHIN THE EDGES OF RIP-RAP AREAS WHERE A TRANSITION TO SEEDED AREAS BEGIN IN ORDER TO ACCOUNT FOR SETTLEMENT OF SOIL.

PLAN LEGEND

EXISTING FEATURES

- EXISTING UTILITY POLE
- EXISTING GUY ANCHOR
- EXISTING SIGN
- EXISTING BOLLARD
- B-1 — SOIL BORING LOCATION WITH ROCK CORING
- RC-1 — ROCK BORING LOCATION
- C.P. — CONTROL POINT LOCATION
- PROPERTY CORNER/MARKER FOUND
- EXISTING TREE
- EXISTING TREE LINE
- EXISTING RIPRAP
- EXISTING STORM INLET/DROP BOX
- EXISTING STORM PIPE/CULVERT
- EXOHE — EXISTING OVERHEAD ELECTRICAL LINE
- EXBE — EXISTING BURIED ELECTRICAL LINE
- EXW — EXISTING WATER LINE
- WATER VALVE
- FIRE HYDRANT
- EXISTING WATER METER
- X — EXISTING FENCE
- EXISTING DITCH
- 795 — EXISTING CONTOUR
- EXISTING APPROX. PROPERTY LINE
- EXISTING APPROX. SECTION LINE
- EXISTING LAKE EDGE OF WATER

PROPOSED FEATURES

- RIPRAP
- STONE PAVEMENT (PLAN) OR STONE/GRAVEL (DETAILS AND PROFILES)
- ARTICULATED CONCRETE BLOCK
- CONCRETE
- 795 — CONTOURS
- CONSTRUCTION LIMITS
- DITCH FLOW LINE
- PIPE
- MANHOLE
- CLEANOUT
- SF SF SF SF — SILT FENCE
- CHAIN LINK FENCE
- FW FW FW — FIBER WATTLE

PLAN SHEET INDEX

PROJECT ALTERNATES:

THE PROJECT CONSIST OF THREE ALTERNATES AND ARE SHOWN ON PLAN SHEET 4.

ALTERNATE 1: ADD GROUTED IN PLACE RIPRAP ON FILTER FABRIC
LOCATION: PRINCIPAL SPILLWAY CHANNEL; PRINCIPAL SPILLWAY WALL LINE 'W' APPROXIMATE STATION 21+31 TO APPROXIMATE STATION 22+46 RIGHT OF CENTERLINE.
SPECIFICATION REFERENCE: DETAIL SPECIFICATION 08 RIPRAP

ALTERNATE 2: ADD PRESSURE GROUTING
LOCATION: AT PRINCIPAL SPILLWAY CREST AND DAM CREST; DAM CENTERLINE LINE 'A' APPROXIMATE STATION 10+00 TO APPROXIMATE STATION 11+40
SPECIFICATION REFERENCE: DETAIL SPECIFICATION 13 PRESSURE GROUTING

ALTERNATE 3: ADD ARTICULATED CONCRETE BLOCK MAT HARD ARMOR IN-LIEU OF HYDROTURF CS SYSTEM
NOTE: ARTICULATED CONCRETE BLOCK MAT OPTION IS SHOWN ON PLANS. REFER TO SHEET 09 AND SHEET 15 FOR ADDITIONAL DETAILS
LOCATION: AT EMERGENCY SPILLWAY; LINE 'E'
SPECIFICATION REFERENCE: DETAIL SPECIFICATION 09 ARTICULATED CONCRETE BLOCK MATS AND 19 HYDROTURF CS SYSTEM

Indiana 811 — Know what's below. Call before you dig.
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(ITS THE LAW)

REVISIONS

No.	DATE	DESCRIPTION	REVISED BY

LOREN O. FLAMION — REGISTERED — No. PE11100003 — INDIANA — PROFESSIONAL ENGINEER

COMMONWEALTH ENGINEERS, INC.™
A wealth of resources to master a common goal.
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Indianapolis, IN 46237
(317) 888-1177
1419 W. Lloyd Expressway, Suite 401
Evansville, IN 47710
(812) 474-1177
9604 Coldwater Road, Suite 203
Fort Wayne, IN 46825
(260) 494-3223

DRAWN BY:	ALR
DESIGNED BY:	DOF
CHECKED BY:	RMK
DATE:	MAY 2018
JOB NO:	D13038
SCALE:	AS NOTED

INDIANA DEPARTMENT OF NATURAL RESOURCES
CROSLEY FISH & WILDLIFE AREA - CROSLEY LAKE
DAM IMPROVEMENTS PROJECT

PROJECT NO. ENG1802321631/E020098

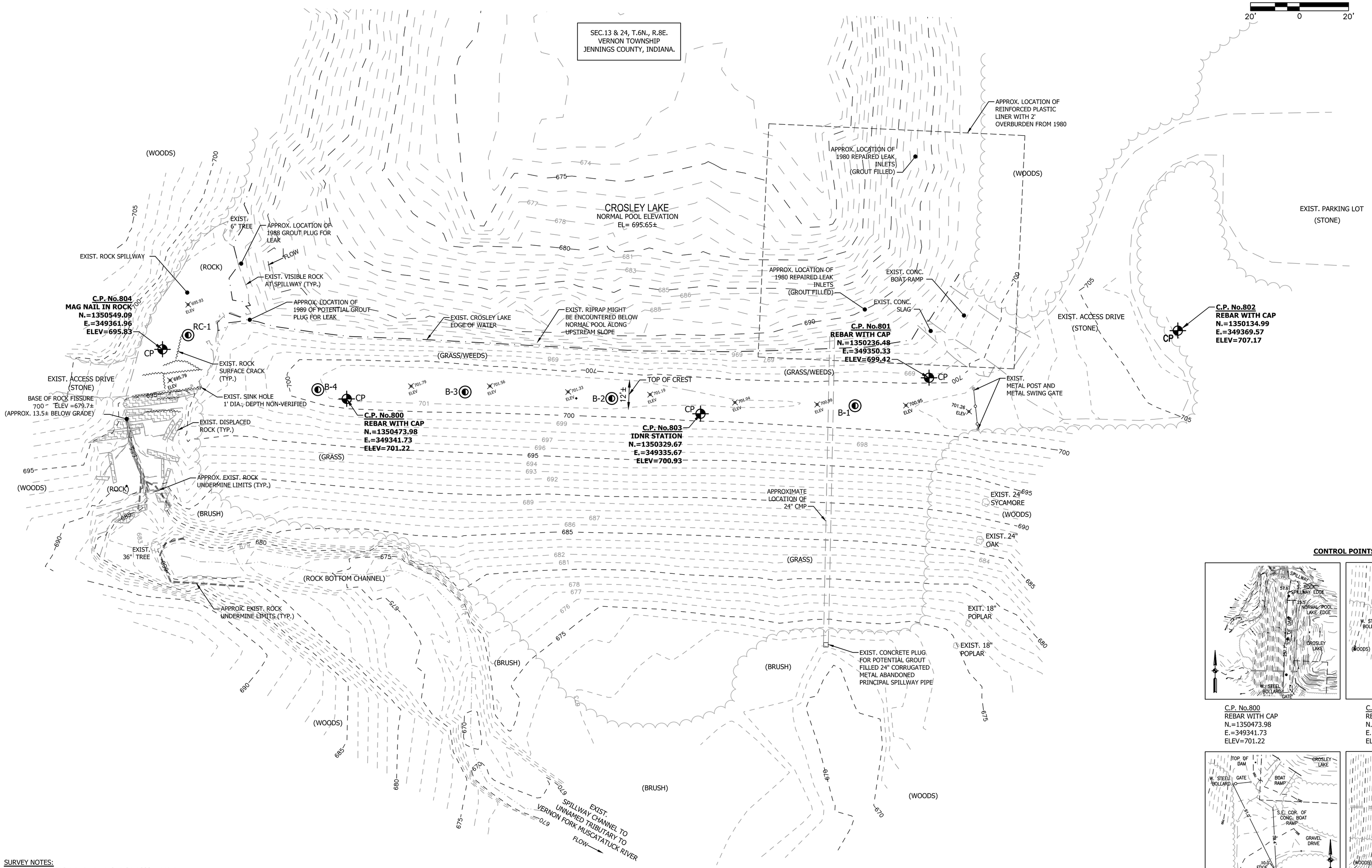
DRAWING INDEX SHEET, LEGENDS, SYMBOLS AND PROJECT NOTES

DRAWING NO. 02

P:\Clients A-L\DNR\D13038 Crosley Lake Dam\ACAD\A-CURRENT\DRAWINGS\00-03-13038-SITE SURVEY.dwg

SEC.13 & 24, T.6N., R.8E.
VERNON TOWNSHIP
JENNINGS COUNTY, INDIANA.

SCALE: 1" = 20'
20' 0 20'



CONTROL POINTS

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REBAR WITH CAP
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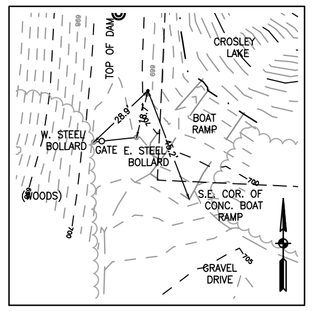

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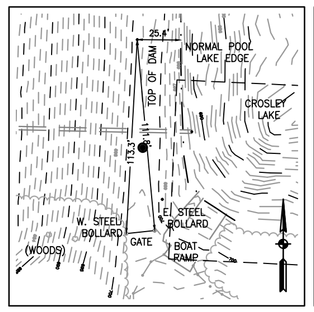

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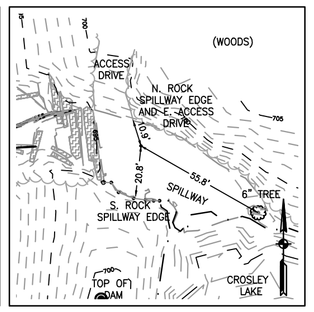

C.P. No.804
MAG NAIL IN ROCK
N.=1350549.09
E.=349361.96
ELEV=695.83

SURVEY NOTES:
1. ELEVATIONS PROVIDED ARE BASED ON 1988 NAVD DATUM.
2. TO CONVERT TO 1929 NGVD DATUM FROM 1988 DATUM, ADD 0.42± FEET. NOTE CONVERSION IS APPROXIMATE ONLY, NOT INTENDED FOR SURVEY USE.
3. COORDINATES PROVIDED ARE BASED ON GPS INDIANA STATE PLANE EAST, FOR ZONE 1301.
4. CROSLEY LAKE BATHYMETRIC SURVEY, CONTOUR & ELEVATION DATA, BELOW NORMAL POOL, COMPLETED ON MARCH 26, 2003 BY EARTH EXPLORATION INC.
5. MODIFICATION TO ORIGINAL BATHYMETRIC SURVEY WAS COMPLETED BY COMMONWEALTH ENGINEERS, INC., WHERE ACTUAL RECENT SURVEY SUPERSEDED SUCH DATA.

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CERTIFICATE OF AUTHORIZATION
REGISTERED
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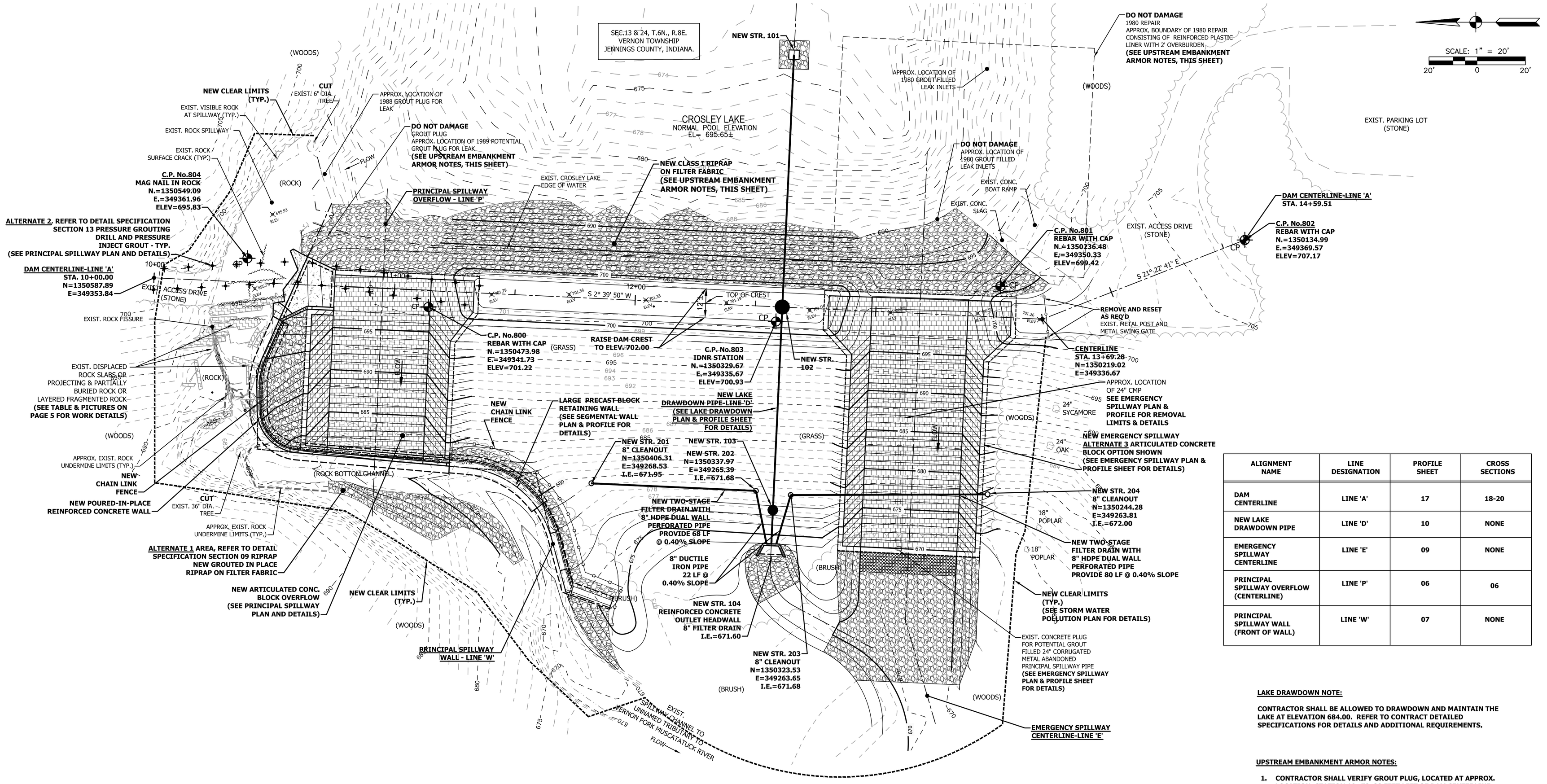
INDIANA DEPARTMENT OF NATURAL RESOURCES
CROSLEY FISH & WILDLIFE AREA - CROSLEY LAKE
DAM IMPROVEMENTS PROJECT

PROJECT NO. ENG1802321631/E020098

SITE SURVEY

DRAWING NO.
03
3 OF 26



ALIGNMENT NAME	LINE DESIGNATION	PROFILE SHEET	CROSS SECTIONS
DAM CENTERLINE	LINE 'A'	17	18-20
NEW LAKE DRAWDOWN PIPE	LINE 'D'	10	NONE
EMERGENCY SPILLWAY CENTERLINE	LINE 'E'	09	NONE
PRINCIPAL SPILLWAY OVERFLOW (CENTERLINE)	LINE 'P'	06	06
PRINCIPAL SPILLWAY WALL (FRONT OF WALL)	LINE 'W'	07	NONE

LAKE DRAWDOWN NOTE:

CONTRACTOR SHALL BE ALLOWED TO DRAWDOWN AND MAINTAIN THE LAKE AT ELEVATION 684.00. REFER TO CONTRACT DETAILED SPECIFICATIONS FOR DETAILS AND ADDITIONAL REQUIREMENTS.

UPSTREAM EMBANKMENT ARMOR NOTES:

1. **CONTRACTOR SHALL VERIFY GROUT PLUG, LOCATED AT APPROX. LOCATION: STATION 10+72, 22 FEET LEFT OF DAM CENTERLINE - LINE 'A'. EVIDENCE OF CONCRETE IS VISIBLE NEAR THE SURFACE. CONTRACTOR SHALL ENSURE NO DAMAGE IS DONE TO THE PLUG. IF ENCOUNTERED, CONTRACTOR SHALL CAREFULLY EXPOSE ALONG THE PLUG AND ALLOW ENGINEER AND OWNER TO EVALUATE.**
2. **PRIOR TO INSTALLING EMERGENCY SPILLWAY AND UPSTREAM RIPRAP ARMOR, CONTRACTOR SHALL VERIFY THE EXISTENCE OF THE 1980 REPAIR (STATION 12+75 to 13+75, LEFT OF DAM CENTERLINE - LINE 'A'), CONSISTING OF FILLING LEAK INLETS WITH GROUT AND INSTALLING REINFORCED PLASTIC LINER WITH TWO FEET OF OVERBURDEN. 1980 PLANS INDICATE THAT THE REINFORCED PLASTIC LINER LOCATION WAS TO BE INSTALLED DEPENDENT UPON LEAK INLET LOCATION, WHICH IS UNKNOWN. CONTRACTOR SHALL CAREFULLY EXPOSE PLASTIC LINER, WITHOUT DAMAGE, TO VERIFY LIMITS AND ALLOW ENGINEER AND OWNER TO EVALUATE. IF 1980 REPAIR IS ENCOUNTERED, WITHIN PROPOSED RIPRAP LIMITS, INTENT IS TO PROTECT THE EXIST LINER FROM DAMAGE AND MINIMIZE RIPRAP FOOTPRINT, WHICH SHALL BE ENGINEER AND OWNER DECISION.**

SURVEY NOTES:
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5. MODIFICATION TO ORIGINAL BATHYMETRIC SURVEY WAS COMPLETED BY COMMONWEALTH ENGINEERS, INC., WHERE ACTUAL RECENT SURVEY SUPERSEDED SUCH DATA.

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DRAWN BY:	ALR
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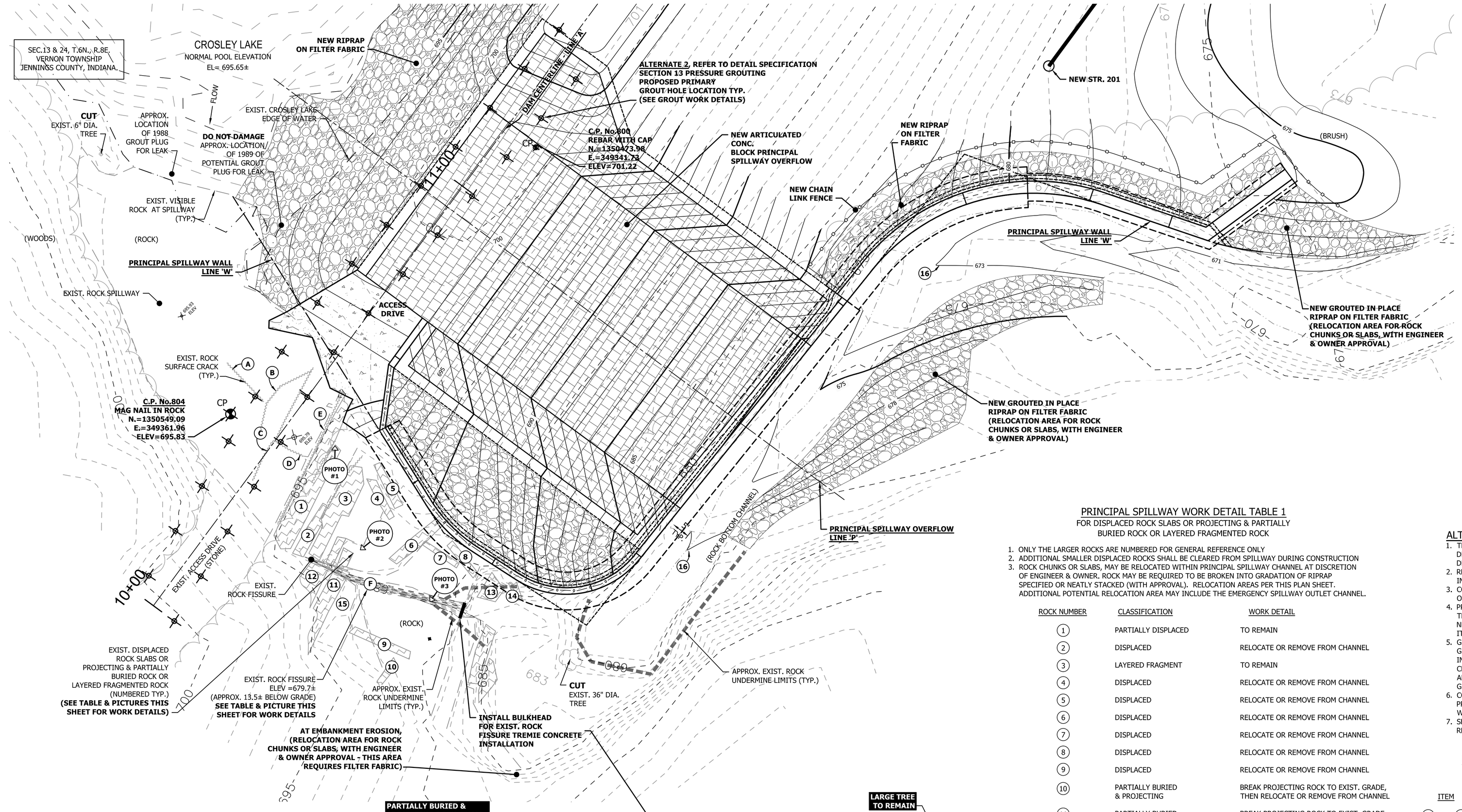
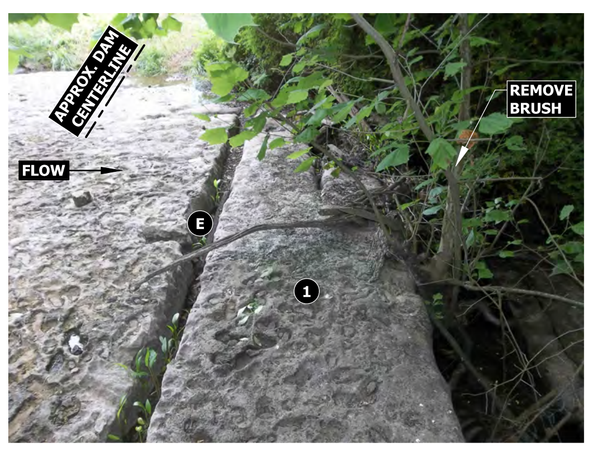
INDIANA DEPARTMENT OF NATURAL RESOURCES
CROSLEY FISH & WILDLIFE AREA - CROSLEY LAKE
DAM IMPROVEMENTS PROJECT

PROJECT NO. ENG1802321631/E020098

SITE PLAN

DRAWING NO. 04





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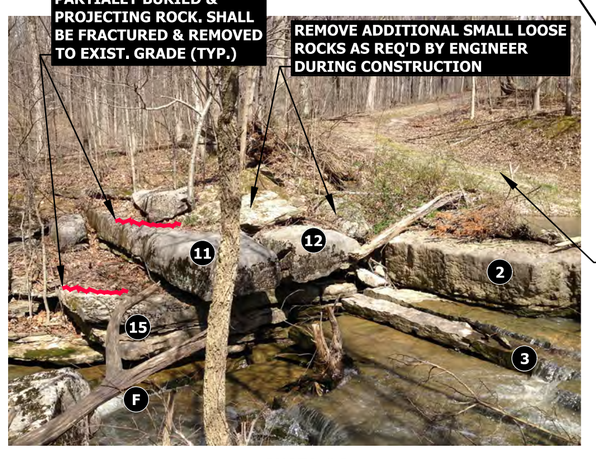

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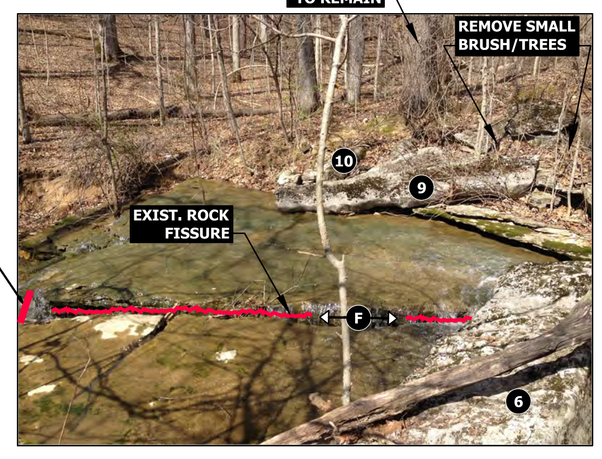

PHOTO # 3

PRINCIPAL SPILLWAY WORK DETAIL TABLE 1

FOR DISPLACED ROCK SLABS OR PROJECTING & PARTIALLY BURIED ROCK OR LAYERED FRAGMENTED ROCK

1. ONLY THE LARGER ROCKS ARE NUMBERED FOR GENERAL REFERENCE ONLY
2. ADDITIONAL SMALLER DISPLACED ROCKS SHALL BE CLEARED FROM SPILLWAY DURING CONSTRUCTION
3. ROCK CHUNKS OR SLABS, MAY BE RELOCATED WITHIN PRINCIPAL SPILLWAY CHANNEL AT DISCRETION OF ENGINEER & OWNER. ROCK MAY BE REQUIRED TO BE BROKEN INTO GRADATION OF RIPRAP SPECIFIED OR NEATLY STACKED (WITH APPROVAL). RELOCATION AREAS PER THIS PLAN SHEET. ADDITIONAL POTENTIAL RELOCATION AREA MAY INCLUDE THE EMERGENCY SPILLWAY OUTLET CHANNEL.

ROCK NUMBER	CLASSIFICATION	WORK DETAIL
(1)	PARTIALLY DISPLACED	TO REMAIN
(2)	DISPLACED	RELOCATE OR REMOVE FROM CHANNEL
(3)	LAYERED FRAGMENT	TO REMAIN
(4)	DISPLACED	RELOCATE OR REMOVE FROM CHANNEL
(5)	DISPLACED	RELOCATE OR REMOVE FROM CHANNEL
(6)	DISPLACED	RELOCATE OR REMOVE FROM CHANNEL
(7)	DISPLACED	RELOCATE OR REMOVE FROM CHANNEL
(8)	DISPLACED	RELOCATE OR REMOVE FROM CHANNEL
(9)	DISPLACED	RELOCATE OR REMOVE FROM CHANNEL
(10)	PARTIALLY BURIED & PROJECTING	BREAK PROJECTING ROCK TO EXIST. GRADE, THEN RELOCATE OR REMOVE FROM CHANNEL
(11)	PARTIALLY BURIED & PROJECTING	BREAK PROJECTING ROCK TO EXIST. GRADE, THEN RELOCATE OR REMOVE FROM CHANNEL
(12)	PARTIALLY BURIED & PROJECTING	BREAK PROJECTING ROCK TO EXIST. GRADE, THEN RELOCATE OR REMOVE FROM CHANNEL
(13)	PARTIALLY BURIED & PROJECTING	RELOCATE OR REMOVE FROM CHANNEL
(14)	PARTIALLY BURIED & PROJECTING	RELOCATE OR REMOVE FROM CHANNEL
(15)	PARTIALLY BURIED & PROJECTING	RELOCATE OR REMOVE FROM CHANNEL
(16)	LAYERED ROCK CHANNEL BOTTOM	INSTALL SMALL V-SWALE TO REDIRECT LOW FLOWS AWAY FROM WALL (CONTRACTOR CHIPPING LIMITS NOT TO BE WITHIN 5' OF BASE OF WALL)

ALTERNATE 2: PRESSURE GROUT WORK DETAILS:

1. THIS WORK IS CONSIDERED ALTERNATE 2. REFER TO TECHNICAL DOCUMENTS, DETAIL SPECIFICATION SECTION 13 PRESSURE GROUTING FOR ALTERNATE DESCRIPTION AND SPECIFIC WORK DETAILS.
2. REFER TO DAM CENTERLINE PROFILE LINE 'A' FOR ADDITIONAL GROUTING INFORMATION.
3. CONTRACTOR SHALL SUBMIT A DETAILED WORKING PLAN DESCRIBING ALL OPERATIONS AND PHASES OF SAID WORK.
4. PRIOR TO COMMENCING ANY GROUT WORK, CONTRACTOR SHALL DRAWDOWN THE LAKE TO ELEVATION 684.00. CONTRACTOR SHALL COMPLETE ANY NECESSARY SURFACE TREATMENT AND DENTAL CONCRETE WORK, INCLUDING ITEM 'F' EXIST ROCK FISSURE.
5. GENERAL PROJECT INSTALLATION SHALL CONSIST OF TWO TOWS OF PRIMARY GROUT HOLES BEING PROVIDED. THE HOLES FOR EACH ROW SHALL BE INSTALLED AT AN INCLINED 15° ANGLE (IN OPPOSING DIRECTIONS) TO FORM A CRISSCROSS. THE PRIMARY HOLES SHALL BE SPACED TEN (10) FEET MAXIMUM IN ALL DIRECTIONS, WITH THE ROWS BEING OFFSET AND STAGGERED. PRIMARY GROUT HOLES SHALL BE DRILLED TO MINIMUM ELEVATION OF 665.00.
6. CONTRACTOR SHALL START AND COMPLETE THE FURTHEST DOWNSTREAM PRIMARY ROW PRIOR TO COMMENCING UPSTREAM PRIMARY DRILL AND GROUT WORK.
7. SECONDARY, TERTIARY GROUTING (NOT SHOWN ON THE PLANS) SHALL BE AS REQUIRED BASED ON IN-FIELD CONDITIONS, WITH OWNER APPROVAL ONLY.

PRINCIPAL SPILLWAY WORK DETAIL TABLE 2

FOR TREATMENT OF ROCK SURFACES

ITEM	CLASSIFICATION	WORK DETAIL
(A) - (D)	THIN SURFACE CRACK	NO PERMANENT REPAIR REQUIRED, MAY REQUIRE SURFACE TREATMENT FOR PRESSURE GROUT OPERATIONS. (ALTERNATE 2)
(E)	FISSURE/CHANNEL	CLEAN AND PREPARE FISSURE/CHANNEL AND APPLY DENTAL CONCRETE MIX, POUR SHALL BE CONTINUATION OF NEW ACCESS DRIVE FOUNDATION. INSTALL TWO NO. 4 BARS LENGTH OF FISSURE TO ACCESS DRIVE.
(F)	FISSURE	CLEAN AND PREPARE FISSURE INSTALL BULKHEAD/FORMWORK TO CONTAIN INSTALLATION OF DENTAL TREMIE CONCRETE. FINAL CONCRETE SHALL BE THREE INCHES BELOW EXISTING ROCK SURFACE ELEVATION

SURVEY NOTES:
1. ELEVATIONS PROVIDED ARE BASED ON 1988 NAVD DATUM.
2. TO CONVERT TO 1929 NGVD DATUM FROM 1988 DATUM, ADD 0.42± FEET. NOTE CONVERSION IS APPROXIMATE ONLY, NOT INTENDED FOR SURVEY USE.
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4. CROSLEY LAKE BATHYMETRIC SURVEY, CONTOUR & ELEVATION DATA, BELOW NORMAL POOL, COMPLETED ON MARCH 26, 2003 BY EARTH EXPLORATION INC.
5. MODIFICATION TO ORIGINAL BATHYMETRIC SURVEY WAS COMPLETED BY COMMONWEALTH ENGINEERS, INC., WHERE ACTUAL RECENT SURVEY SUPERSEDED SUCH DATA.

Indiana 811 Know what's below. Call before you dig.
OR 1-800-382-5544
(ITS THE LAW)

REVISIONS

No.	DATE	DESCRIPTION	REVISED BY

DREW O. FLAMION REGISTERED No. PE11100003 INDIANA PROFESSIONAL ENGINEER

COMMONWEALTH ENGINEERS, INC.
A wealth of resources to master a common goal.
7256 Company Dr.
Indianapolis, IN 46237
(317) 888-1177
1419 W. Lloyd Expressway, Suite 401
Evansville, IN 47710
(812) 474-1177
9604 Coldwater Road, Suite 203
Fort Wayne, IN 46825
(260) 494-3223

DRAWN BY:	ALR
DESIGNED BY:	DOF
CHECKED BY:	RMK
DATE:	MAY 2018
JOB NO:	D13038
SCALE:	AS NOTED

INDIANA DEPARTMENT OF NATURAL RESOURCES
CROSLEY FISH & WILDLIFE AREA - CROSLEY LAKE
DAM IMPROVEMENTS PROJECT

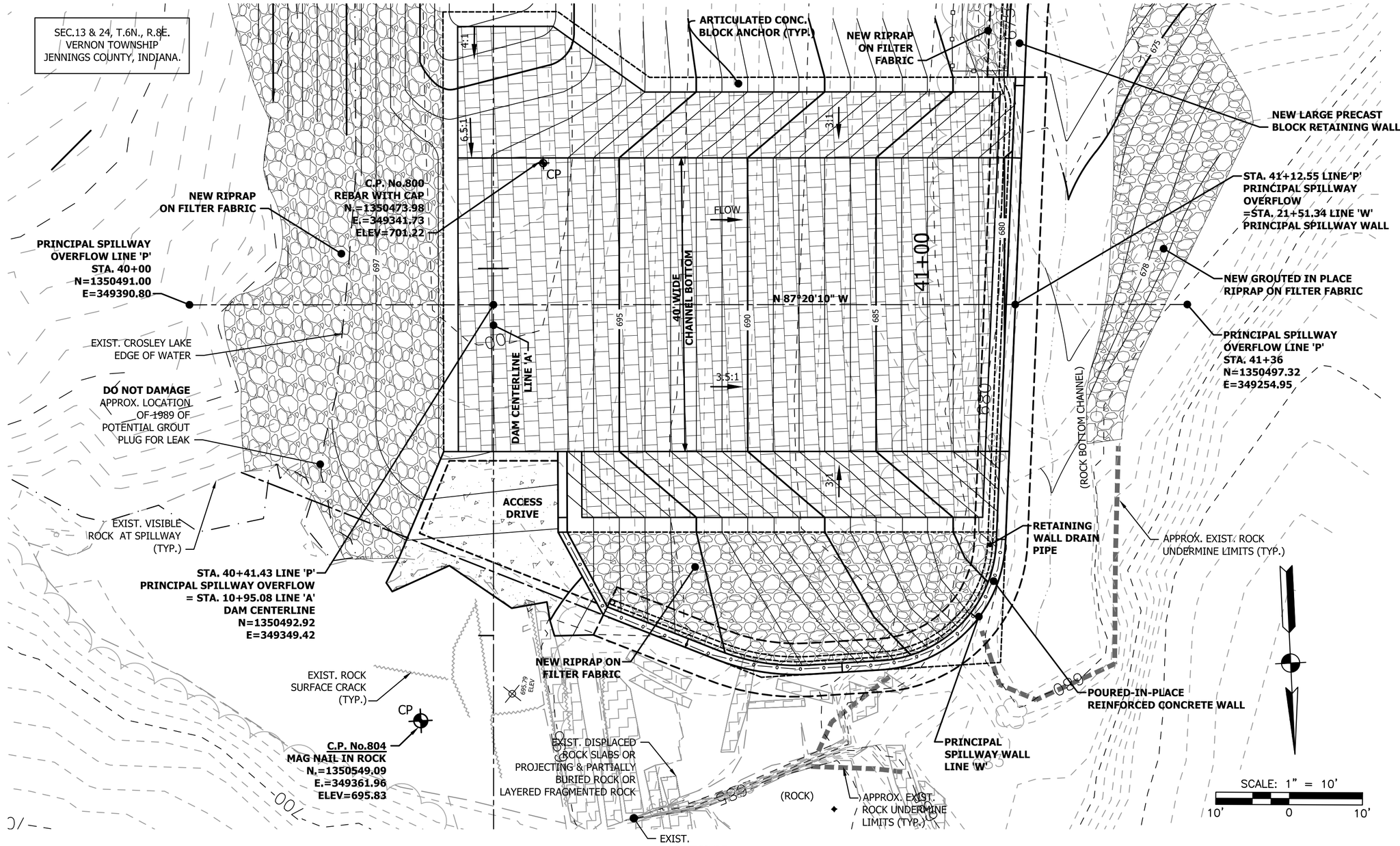
PROJECT NO. ENG1802321631/E020098

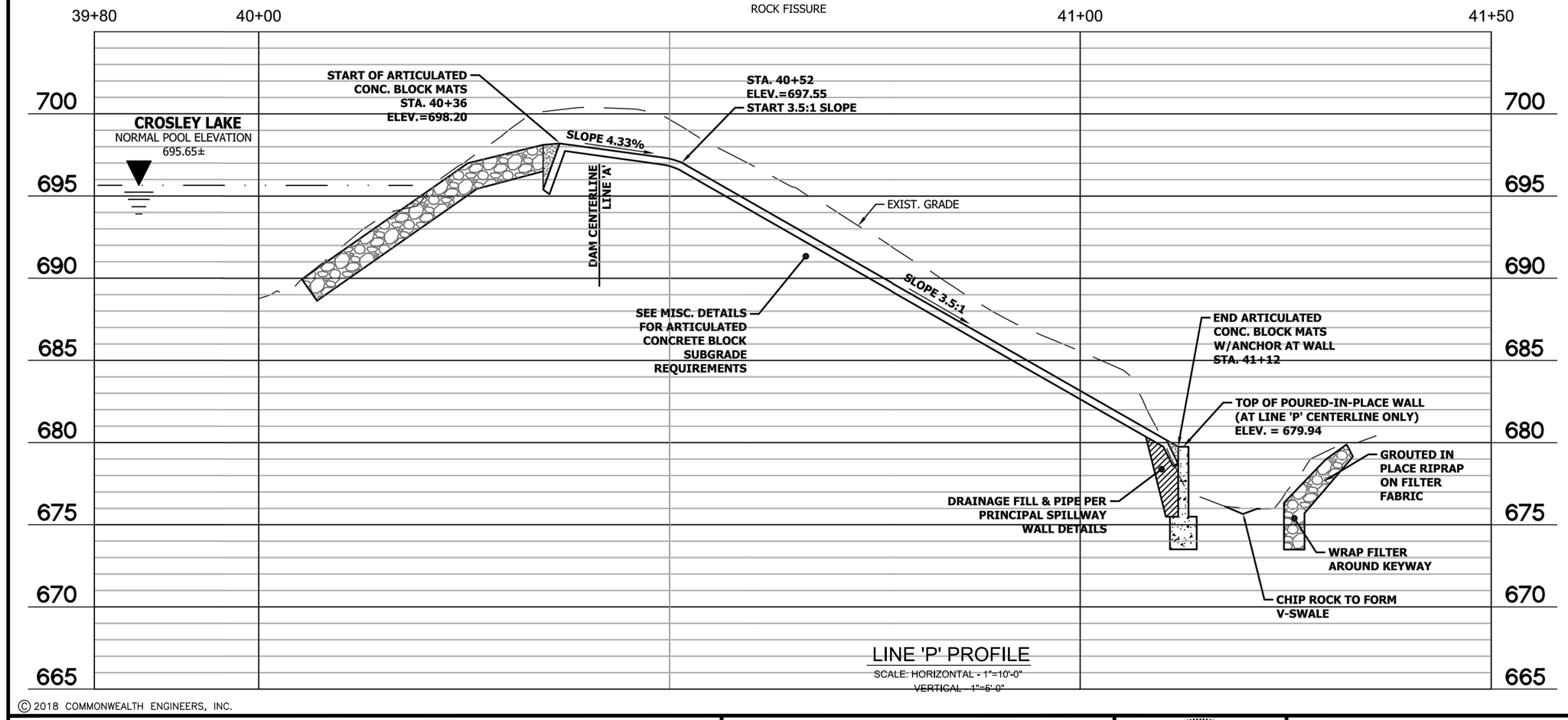
EXISTING PRINCIPAL SPILLWAY
CHANNEL IMPROVEMENTS

DRAWING NO. 05

5 OF 26

SEC.13 & 24, T.6N., R.8E.
VERNON TOWNSHIP
JENNINGS COUNTY, INDIANA.

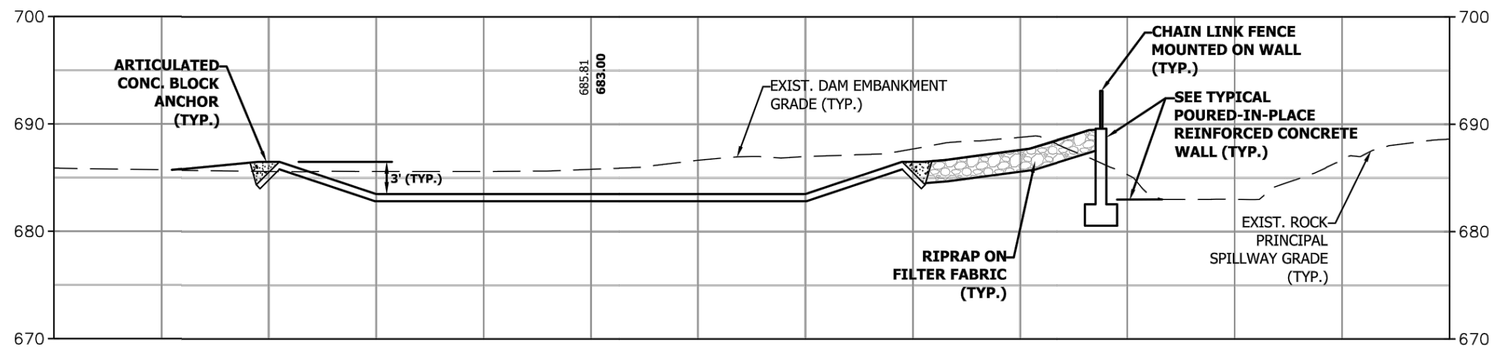




LINE 'P' PROFILE

SCALE: HORIZONTAL - 1"=10'-0"
VERTICAL - 1"=5'-0"

40+98.83



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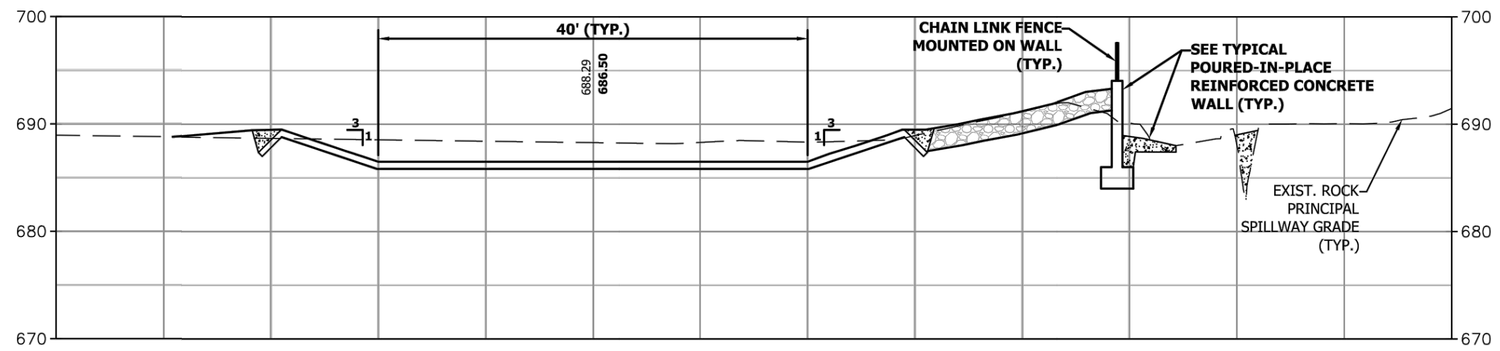
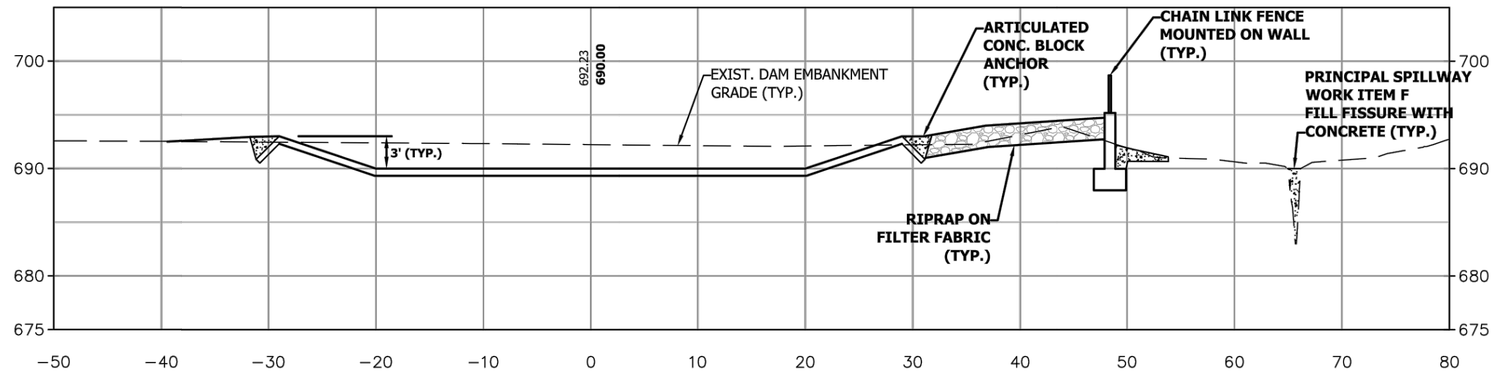
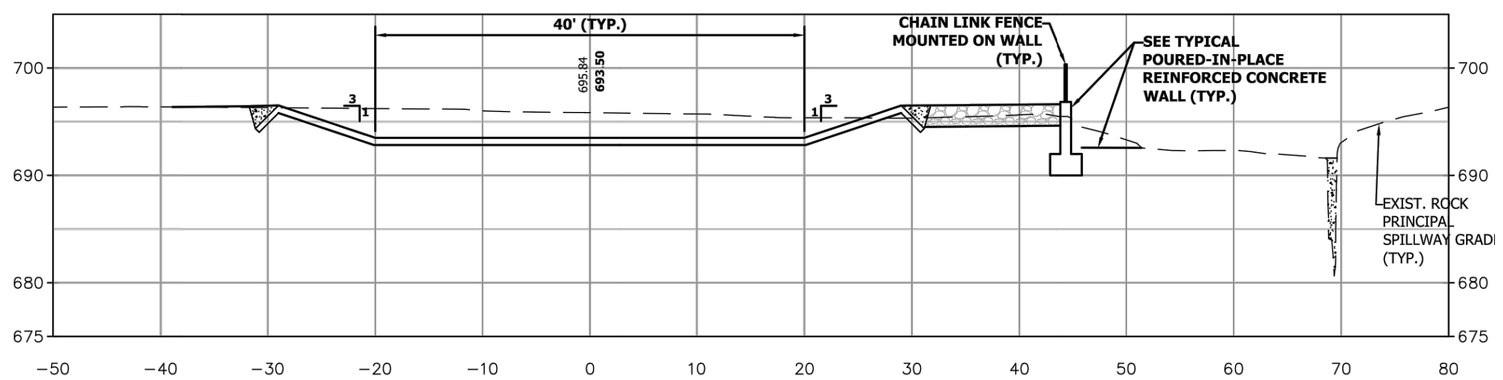


40+76.08



40+63.83



ACB PRINCIPAL SPILLWAY OVERFLOW - LINE 'P' CROSS SECTIONS

SCALE: HORIZONTAL - 1"=10'-0"
VERTICAL - 1"=10'-0"
NOTE: CROSS SECTIONS LOOKING DOWNSTREAM

SURVEY NOTES:
1. ELEVATIONS PROVIDED ARE BASED ON 1988 NAVD DATUM.
2. TO CONVERT TO 1929 NGVD DATUM FROM 1988 DATUM, ADD 0.42± FEET. NOTE CONVERSION IS APPROXIMATE ONLY, NOT INTENDED FOR SURVEY USE.
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GENERAL NOTES::
1. FOR ACTUAL WALL ELEVATIONS, REFER TO SHEET 7. CROSS SECTIONS SHOWN ON THIS SHEET FOR REFERENCE ONLY.

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REVISIONS

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INDIANA
REGISTERED
PROFESSIONAL ENGINEER

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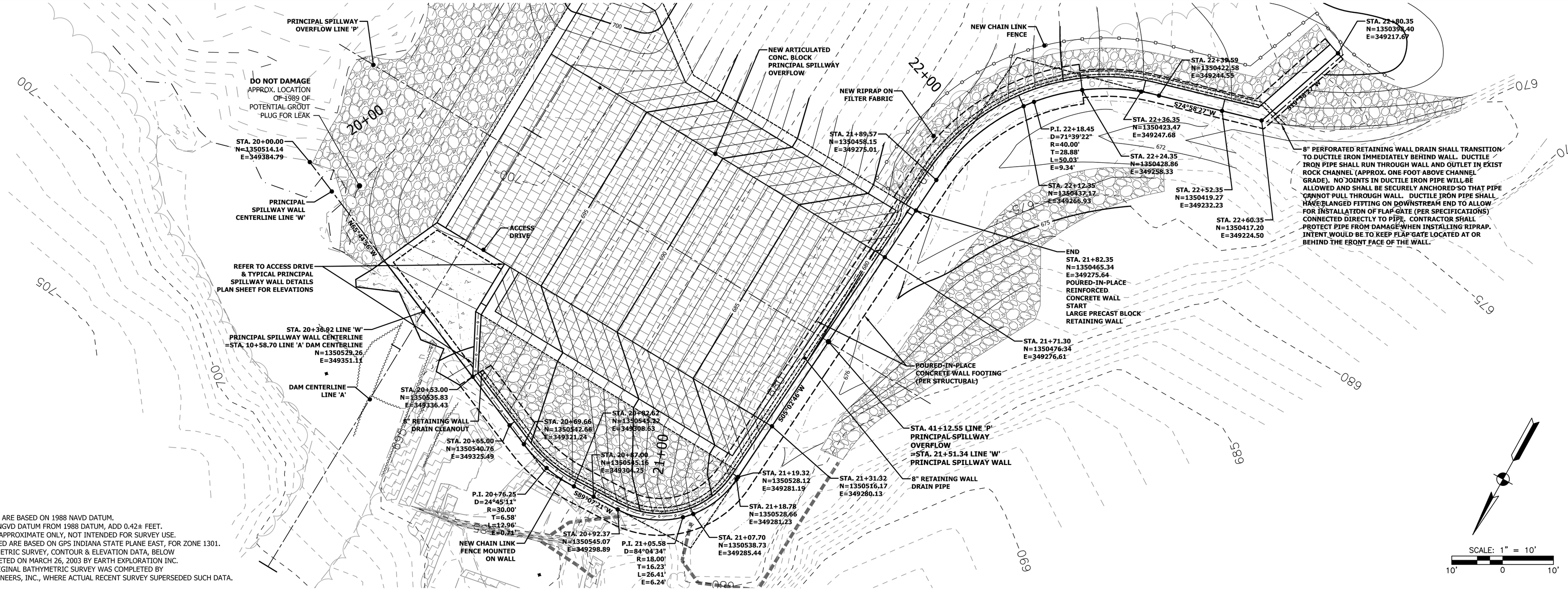
SCALE:	AS NOTED

INDIANA DEPARTMENT OF NATURAL RESOURCES
CROSLEY FISH & WILDLIFE AREA - CROSLEY LAKE
DAM IMPROVEMENTS PROJECT

PROJECT NO. ENG1802321631/E020098

PRINCIPAL SPILLWAY ARTICULATED CONCRETE BLOCK OVERFLOW-LINE 'P'
PLAN, PROFILE, CROSS SECTIONS & DETAILS

DRAWING NO. 06



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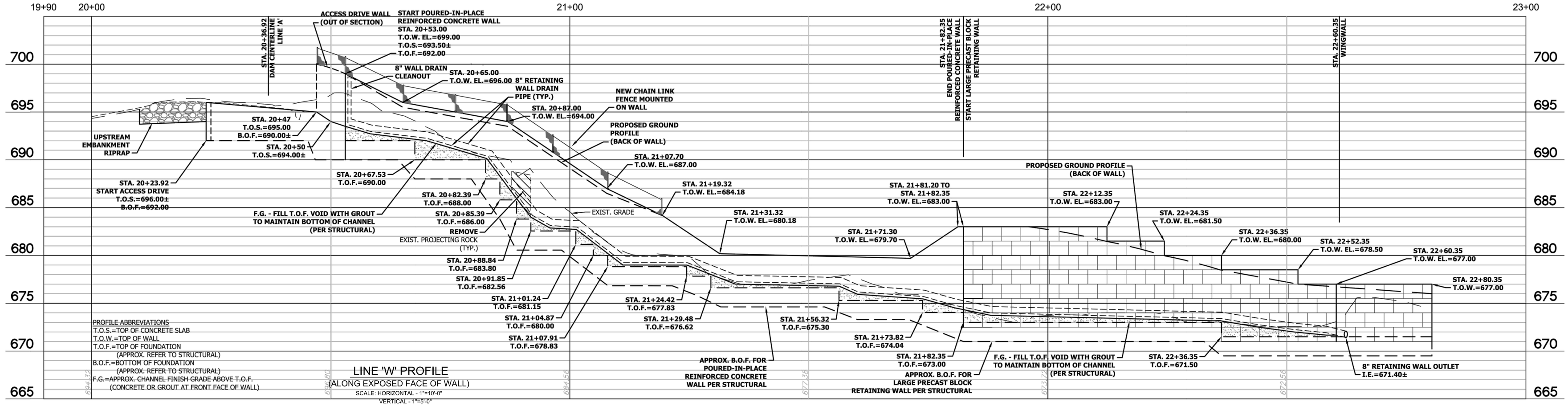
SCALE: 1" = 10'
10' 0 10'



PROFILE ABBREVIATIONS
T.O.S.=TOP OF CONCRETE SLAB
T.O.W.=TOP OF WALL
T.O.F.=TOP OF FOUNDATION (APPROX. REFER TO STRUCTURAL)
B.O.F.=BOTTOM OF FOUNDATION (APPROX. REFER TO STRUCTURAL)
F.G.=APPROX. CHANNEL FINISH GRADE ABOVE T.O.F. (CONCRETE OR GROUT AT FRONT FACE OF WALL)

LINE 'W' PROFILE
(ALONG EXPOSED FACE OF WALL)
SCALE: HORIZONTAL - 1"=10'-0"
VERTICAL - 1"=5'-0"

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REVISIONS

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DRAWN BY:	ALR
DESIGNED BY:	DOF
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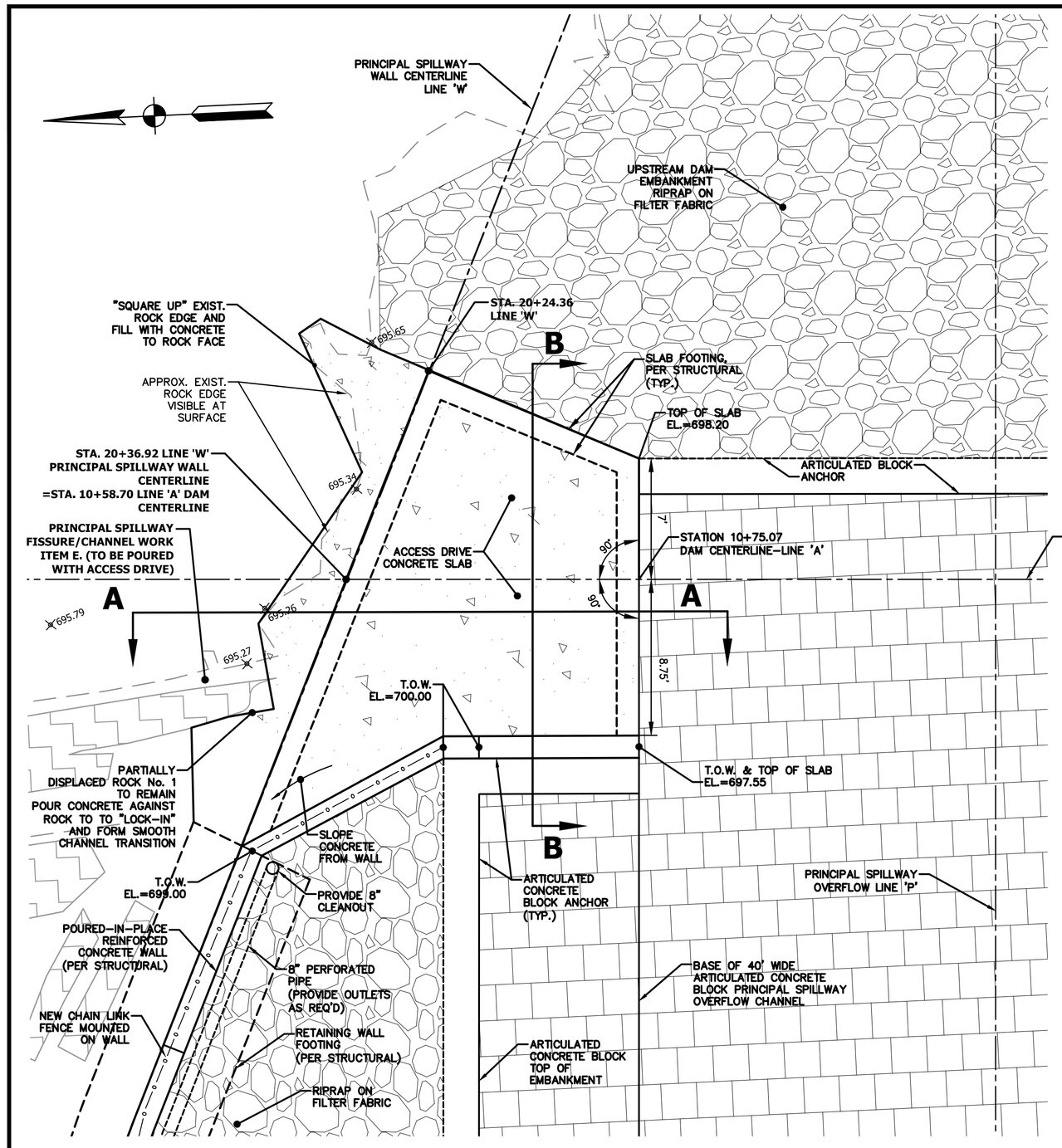
JOB NO:	D13038
SCALE:	AS NOTED

INDIANA DEPARTMENT OF NATURAL RESOURCES
CROSLEY FISH & WILDLIFE AREA - CROSLEY LAKE
DAM IMPROVEMENTS PROJECT

PROJECT NO. ENG1802321631/E020098

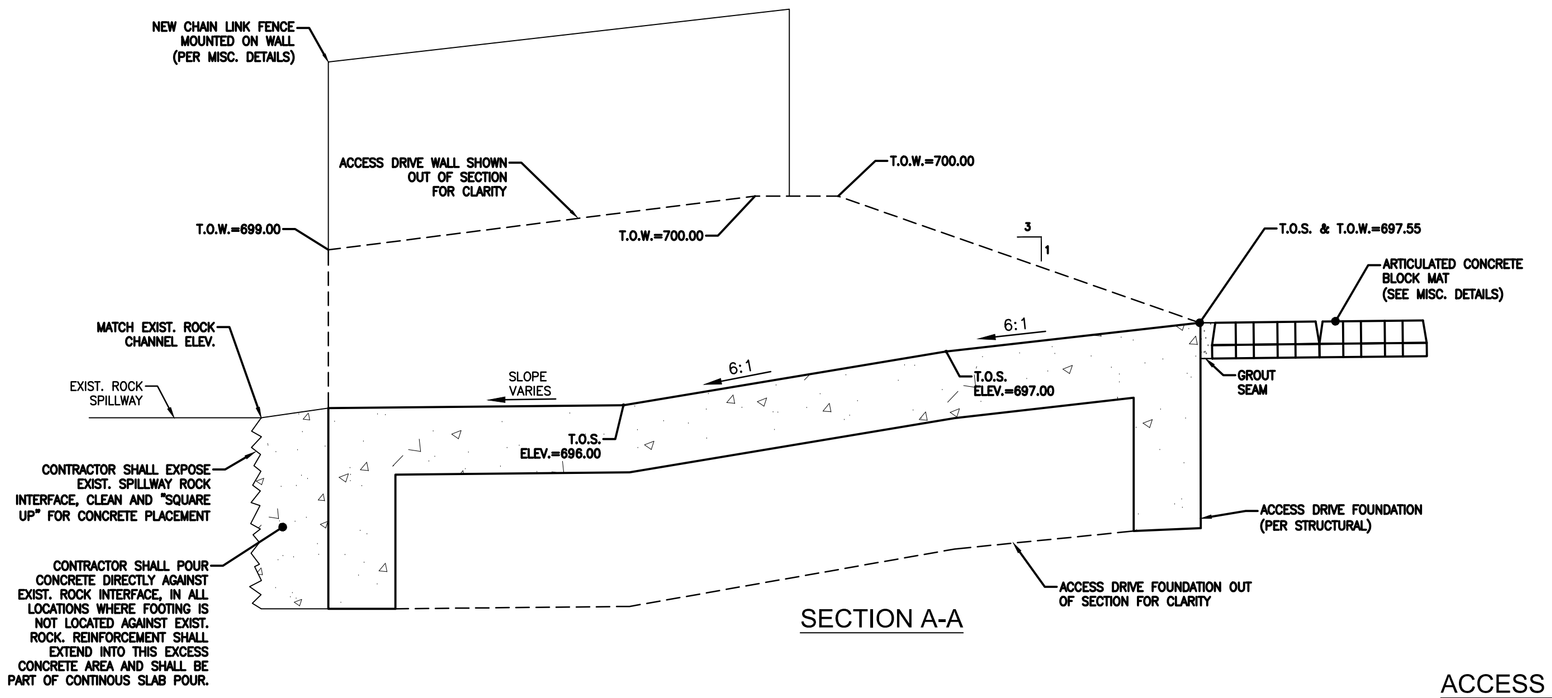
PRINCIPAL SPILLWAY WALL - LINE 'W'
(ALONG EXPOSED FACE OF WALL)
PLAN AND PROFILE

DRAWING NO. 07



ACCESS DRIVE DETAILS

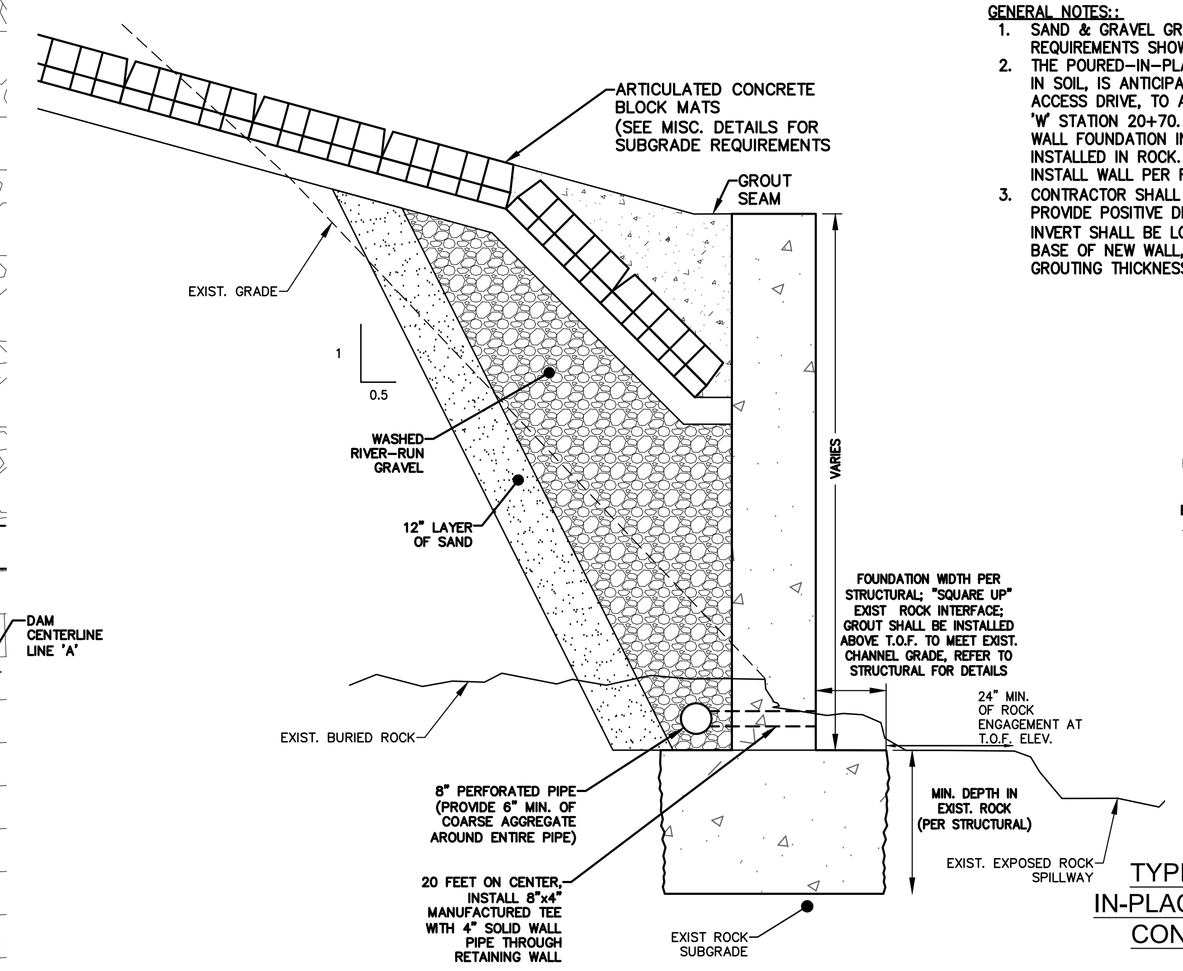
SCALE: 1"=5'



SECTION A-A

ACCESS DRIVE TYPICAL SECTIONS

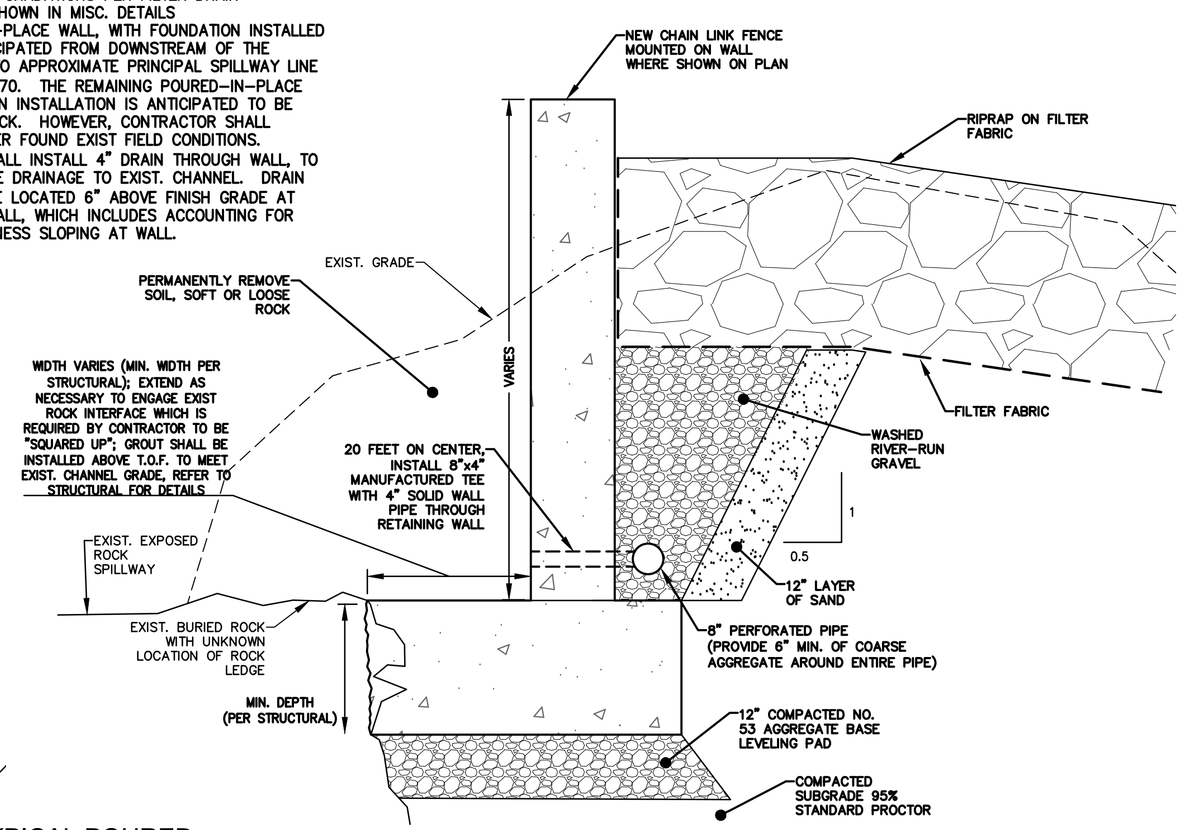
SCALE: 1"=2'



FOUNDATION IN ROCK

GENERAL NOTES::

1. SAND & GRAVEL GRADATIONS PER FILTER DRAIN REQUIREMENTS SHOWN IN MISC. DETAILS
2. THE POURED-IN-PLACE WALL, WITH FOUNDATION INSTALLED IN SOIL, IS ANTICIPATED FROM DOWNSTREAM OF THE ACCESS DRIVE, TO APPROXIMATE PRINCIPAL SPILLWAY LINE 'W' STATION 20+70. THE REMAINING POURED-IN-PLACE WALL FOUNDATION INSTALLATION IS ANTICIPATED TO BE INSTALLED IN ROCK. HOWEVER, CONTRACTOR SHALL INSTALL WALL PER FOUND EXIST FIELD CONDITIONS.
3. CONTRACTOR SHALL INSTALL 4" DRAIN THROUGH WALL, TO PROVIDE POSITIVE DRAINAGE TO EXIST. CHANNEL. DRAIN INVERT SHALL BE LOCATED 6" ABOVE FINISH GRADE AT BASE OF NEW WALL, WHICH INCLUDES ACCOUNTING FOR GROUTING THICKNESS SLOPING AT WALL.



FOUNDATION IN SOIL

TYPICAL POURED IN-PLACE REINFORCED CONCRETE WALL

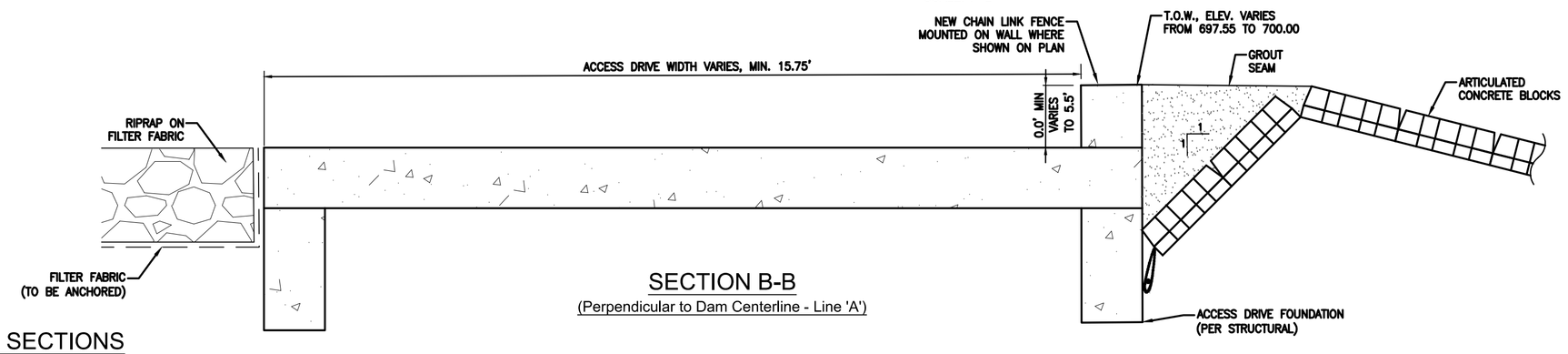
NOT TO SCALE

NOTE:

1. CONTRACTOR SHALL PROVIDE EXPOSED FINISH ON BOTH SIDES OF RETAINING WALL, TOP TWO BLOCKS.
2. LARGE PRECAST BLOCK MANUFACTURER SHALL PROVIDE ALL NECESSARY CALCULATIONS SUPPORTING BLOCK SIZING. SHOWN SIZES ARE APPROXIMATE ONLY.
3. SAND & GRAVEL GRADATIONS PER FILTER DRAIN REQUIREMENTS SHOWN IN MISC. DETAILS.
4. CONTRACTOR SHALL INSTALL 4" DRAIN THROUGH WALL, TO PROVIDE POSITIVE DRAINAGE TO EXIST. CHANNEL. DRAIN INVERT SHALL BE LOCATED 6" ABOVE FINISH GRADE AT BASE OF NEW WALL, WHICH INCLUDES ACCOUNTING FOR GROUTING THICKNESS SLOPING AT WALL.

TYPICAL LARGE PRECAST BLOCK RETAINING WALL DETAIL

SCALE: 1"=2'



SECTION B-B

(Perpendicular to Dam Centerline - Line 'A')

REVISIONS

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INDIANA DEPARTMENT OF NATURAL RESOURCES
CROSLEY FISH & WILDLIFE AREA - CROSLEY LAKE
DAM IMPROVEMENTS PROJECT

PROJECT NO. ENG1802321631/E020098

ACCESS DRIVE & TYPICAL
PRINCIPAL SPILLWAY WALL DETAILS

DRAWING NO.

08

P:\Clients A-L\DNR\D13038 Crosley Lake Dam\ACAD\A-CURRENT\DRAWINGS\00-09-13038-EMERGENCY SPILLWAY Plan and Profile.dwg

SEC.13 & 24, T.6N., R.8E.
VERNON TOWNSHIP
JENNINGS COUNTY, INDIANA.

APPROX. LOCATION OF 1980 GROUT FILLED LEAK INLETS

EXIST. CONC. SLAG

C.P. No.304
REBAR WITH CAP
N.=1350236.48
E.=349350.33
ELEV.=699.42

DO NOT DAMAGE
APPROX. LOCATION OF 1980 GROUT FILLED LEAK INLETS
(SEE UPSTREAM EMBANKMENT ARMOR NOTES, PLAN SHEET 04)

STA.30+66.96 LINE 'E' EMERGENCY SPILLWAY
=STA. 13+18.26 LINE 'A' DAM CENTERLINE
N=1350269.97
E=349339.04

LINE 'E'
STA. 30+00.00
N=1350266.86
E=349405.93

EMERGENCY SPILLWAY CENTERLINE LINE 'E'

CROSLEY LAKE
NORMAL POOL ELEVATION
EL= 695.65±

DO NOT DAMAGE
1980 REPAIR
APPROX. BOUNDARY OF 1980 REPAIR CONSISTING OF REINFORCED PLASTIC LINER WITH 2' OVERBURDEN
(SEE UPSTREAM EMBANKMENT ARMOR NOTES, PLAN SHEET 04)

NEW RIPRAP ON FILTER FABRIC

NEW STR. 101

DAM CENTERLINE LINE 'A'

NEW STR. 102

NEW LAKE DRAWDOWN PIPE

ARTICULATED CONCRETE BLOCK ANCHOR (TYP.)

EXIST. APPROX. LOCATION OF 24" CMP (REMOVE AS NOTED)

NEW TWO-STAGE FILTER DRAIN WITH 8" HDPE DUAL WALL PERFORATED PIPE

NEW STR. 203

NEW STR. 103

NEW STR. 104

EXIST. CONCRETE PLUG FOR POTENTIAL GROUT FILLED 24" CORRUGATED METAL ABANDONED PRINCIPAL SPILLWAY PIPE
(SEE PIPE REMOVAL NOTES THIS SHEET)

NEW STR. 204

PROVIDE 4 ROWS OF OFFSETTING PERCUSSION EARTH ANCHORS (TYP.)

CLASS II RIPRAP ON FILTER FABRIC

(WOODS)

(GRASS)

(BRUSH)

BOTTOM OF CHANNEL

FLOW

0.001% SLOPE

LINE 'E'
STA. 32+39.09
N=1350263.51
E=349168.83

ENSURE POSITIVE DRAINAGE IS PROVIDED TO OUTLET CHANNEL

LINE 'E'
STA. 31+94.77
N=1350275.92
E=349211.37

CONCRETE ARMOR UNIT ENERGY DISSIPATORS (SEE MISC. DETAILS)

SCALE: 1" = 10'
10' 0 10'

PIPE REMOVAL NOTES:
1. CONTRACTOR SHALL CAREFULLY EXPOSE ABANDONED PRINCIPAL SPILLWAY PIPE TO VERIFY EXISTENCE PRIOR TO EXCAVATING FOR EMERGENCY SPILLWAY.
2. IF PIPE EXIST, CONTRACTOR SHALL OBTAIN ELEVATION, LOCATION & APPROXIMATE SLOPE OF PIPE TO DETERMINE APPROXIMATE REMOVAL LIMITS AND DIRECTION OF PIPE ON UPSTREAM EMBANKMENT.
3. CONTRACTOR SHALL REMOVE TO MIN. LIMITS SHOWN OR AS DETERMINED BY ENGINEER & OWNER.
4. CONTRACTOR SHALL CUT PIPE AT LIMITS AND ALLOW ENGINEER & OWNER TO REVIEW INTERIOR OF EXIST. PIPE TO EVALUATE POTENTIAL VOID WITHIN PIPE.

SURVEY NOTES:
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29+50 30+00 31+00 32+00 32+50

705 700 695 690 685 680 675 670 665 662

DAM CENTERLINE LINE 'A'

FILTER DRAIN STA. 31+42

CLASS II RIPRAP STA. 32+15

START OF ARTICULATED BLOCK MATS STA.30+61 ELEV. 698.20

STA. 30+76 ELEV.=697.65 START 3.25:1 SLOPE

SLOPE 4.33%

36" MIN.

GENERAL PIPE REMOVAL LIMITS (SEE PIPE REMOVAL NOTES)

CROSLEY LAKE
NORMAL POOL ELEVATION
695.65±

EXIST. GRADE

SLOPE 3.25:1

VERIFY POTENTIAL EXIST. GROUT FILLED 24" CORRUGATED METAL ABANDONED SPILLWAY PIPE

PERCUSSION EARTH ANCHOR (TYP.)

END OF ARTICULATED BLOCK MATS STA. 31+66 ELEV.=670.00

MIN. 42" THICKNESS OF CLASS II RIPRAP ON FILTER FABRIC

6' MIN. RADIUS

CONCRETE ARMOR UNIT ENERGY DISSIPATORS (SEE MISC. DETAILS)

INSTALL TURF REINFORCEMENT FOR ALL DISTURBANCES TO OUTLET CHANNEL

CONTRACTOR TO PROVIDE APPROX. 21" OF COMPACTED SOIL SEPARATION BETWEEN TOP OF FILTER DRAIN, FINE AGGREGATE AND SUBGRADE OF ARTICULATED BLOCK MATS

@ 0.001% MIN. SLOPE TO OUTLET CHANNEL

FILTER FABRIC

ANCHOR TURF REINFORMENT (UNDER RIPRAP, MIN. 5')

BASE BID HARD ARMOR - HYDROTURF CS SYSTEM:
1. BASE BID EMERGENCY SPILLWAY SHALL BE FOR THE INSTALLATION OF HYDROTURF CS SYSTEM PER DETAIL SPECIFICATION SECTION 19 HYDROTURF. WITHIN THAT SPECIFICATION SECTION, PRODUCT INSTALLATION DETAILS AND REQUIREMENTS ARE PROVIDED.
2. THE HYDROTURF CS SYSTEM EXTENDS BEYOND THE TOE OF THE DAM, SUBSEQUENTLY THE CONCRETE ARMOR UNIT INSTALLATION WILL BE SHIFTED DOWNSTREAM AND LESS RIPRAP WILL BE UTILIZED. THE END OF THE RIPRAP SHALL REMAIN AT STATION 32+15.

ALTERNATE 3 HARD ARMOR - ARTICULATED CONCRETE BLOCKS:
1. ALTERNATE 3 ARTICULATED CONCRETE BLOCK MAT OPTION IS SHOWN FOR THE EMERGENCY SPILLWAY PLANS. REFER TO DETAIL SPECIFICATION 09 ARTICULATED CONCRETE BLOCK MATS FOR DETAILS.

LINE 'E' PROFILE
SCALE: HORIZONTAL - 1"=10'-0"
VERTICAL - 1"=5'-0"

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CROSLEY FISH & WILDLIFE AREA - CROSLEY LAKE
DAM IMPROVEMENTS PROJECT

PROJECT NO. ENG1802321631/E020098

EMERGENCY SPILLWAY - LINE 'E'
PLAN AND PROFILE

DRAWING NO. 09

P:\Clients A-L\DNR\D13038 Crosley Lake Dam\ACAD\A-CURRENT\DRAWINGS\00-10-13038-LAKE DRAWDOWN Plan.dwg

SEC.13 & 24, T.6N., R.8E.
VERNON TOWNSHIP
JENNINGS COUNTY, INDIANA.

CROSLEY LAKE
NORMAL POOL ELEVATION
695.65±

DO NOT DAMAGE
1980 REPAIR
APPROX. BOUNDARY OF 1980 REPAIR CONSISTING OF REINFORCED PLASTIC LINER WITH 2' OVERBURDEN
(SEE UPSTREAM EMBANKMENT ARMOR NOTES, PLAN SHEET 04)

NEW STR. 101
LAKE DRAWDOWN INTAKE & CONCRETE ANCHOR
N=1350322.15
E=349446.48

NEW RIPRAP ON FILTER FABRIC

NEW STR. 102
60" DIA. MH WITH FILLER PIPE AND VALVE
N=1350327.03
E=349341.70

(BRUSH)

(GRASS)

NEW STR. 103
48" DIA. MH WITH VALVE
N=1350330.95
E=349257.43

NEW STR. 203
8" CLEANOUT

NEW CLASS I RIPRAP ON 6" OF COMPACTED No. 53 AGGREGATE ON COMPACTED SUBGRADE

EMERGENCY SPILLWAY RIPRAP

SCALE: 1" = 10'
10' 0 10'

51+00 52+00 53+00 12+50

LINE 'D'

REVETMENT RIPRAP LEVELING PAD MIN. 12' x 12' & 24" THICK

CP

NEW LAKE DRAWDOWN PIPE

C.P. No.803
IDNR STATION
N.=1350329.67
E.=349335.67
ELEV=700.93

30" MIN. (TYP.) TO ALLOW FOR COMPACTION EQUIPMENT

NEW STR. 202
8" CLEANOUT

8" DUCTILE IRON PIPE

NEW STR. 104
POURED-IN-PLACE CONCRETE OUTLET HEADWALL
N=1350331.61
E=349243.00

GRADUALLY TAPER CHANNEL BOTTOM FROM HEADWALL WIDTH TO 6'

15'

NEW TWO-STAGE FILTER DRAIN WITH 8" HDPE DUAL WALL PERFORATED PIPE

DAM CENTERLINE LINE 'A'

GENERAL NOTE:
SEE LAKE DRAWDOWN DETAIL SHEET FOR INDIVIDUAL STRUCTURE DETAILS.

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50+40 51+00 52+00 53+00 53+60

705 700 695 690 685 680 675 670 665 660

NEW STR. 102
RIM=702.00

DAM CENTERLINE STA. 52+61 'LINE A'

NEW RIPRAP (SEE DETAIL ON STORM WATER POLLUTION PREVENTION DETAIL SHEET)

NEW TOP OF BERM ELEV.= 702.00

NEW DUCTILE IRON FITTING AS REQ'D

CROSLEY LAKE
NORMAL POOL ELEVATION
695.65±

EXIST. GRADE

NEW FLEXIBLE EXPANSION JOINT (NOT TO BE USED FOR TRANSITIONING GRADE, INSTALL FITTING)

SLOPE 2.5%

SLOPE 2.5%

HIGH POINT INV.= 693.73

24" MIN.

NEW 8" DUCTILE IRON PIPING

WITHIN EMBANKMENT, CONTRACTOR SHALL INSTALL LAKE DRAWDOWN PIPE PER IMPERVIOUS FLEXIBLE PIPE BEDDING & BACKFILL DETAIL

NEW 8" DUCTILE IRON OR FUSIBLE HDPE PIPING

NEW DUCTILE IRON FITTING AS REQ'D

STAINLESS STEEL SCREEN

LAKE DRAIN INTAKE ELEV.= 678.0±

NEW CONCRETE PIPE COLLARS INSTALL AT 10' ON CENTER WITH MIN. 6 COLLARS REQUIRED

NEW STR. 103
RIM=677.00

COMPACTED BACKFILL

BOTTOM LAKE ELEVEVATION
673.00±

NEW FLEXIBLE EXPANSION JOINT (NOT TO BE USED FOR TRANSITIONING GRADE, INSTALL FITTING)

NEW CONCRETE PIPE COLLARS INSTALL AT 7' ON CENTER WITH MIN. 10 COLLARS REQUIRED

NEW STR. 101
LAKE DRAWDOWN INTAKE & CONCRETE ANCHOR ON REVETMENT RIPRAP LEVELING PAD

NEW STR. 104
OUTLET HEADWALL

INSTALL TURF REINFORCEMENT MATS

EMERGENCY SPILLWAY RIPRAP ON FILTER FABRIC

FINAL GRADE

SLOPE 1.0% MIN.

INV.= 671.60

ANCHOR TURF REINFORMENT MAT (MIN. 5' UNDER RIPRAP)

BOTTOM OF HEADWALL = 671.60

6" OF COMPACTED No. 53 AGGREGATE ON COMPACTED SUBGRADE

15' L.F. NEW CLASS I RIPRAP

ANCHOR TURF REINFORCEMENT MAT (MIN. 5' UNDER RIPRAP)

LAKE DRAWDOWN SWALE @ 2.42%± SLOPE

673.00 673.00 675.01 685.48 685.20 672.89 671.62

LINE 'D' PROFILE

SCALE: HORIZONTAL - 1"=10'-0"
VERTICAL - 1"=5'-0"

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DIRECTION O. FLAMION REGISTERED No. PE11100003 INDIANA PROFESSIONAL ENGINEER

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Fort Wayne, IN 46825
(260) 494-3223

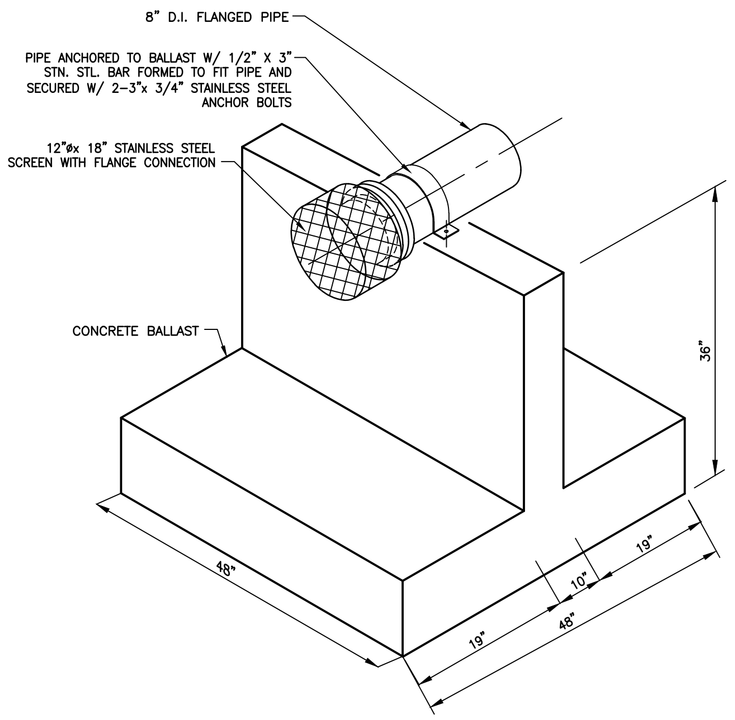
DRAWN BY:	ALR
DESIGNED BY:	DOF
CHECKED BY:	RMK
DATE:	MAY 2018
JOB NO:	D13038
SCALE:	AS NOTED

INDIANA DEPARTMENT OF NATURAL RESOURCES
CROSLEY FISH & WILDLIFE AREA - CROSLEY LAKE
DAM IMPROVEMENTS PROJECT

PROJECT NO. ENG1802321631/E020098

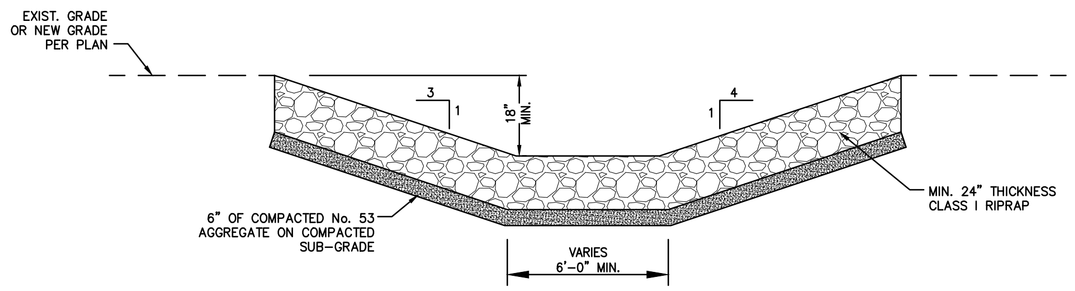
LAKE DRAWDOWN - LINE 'D'
PLAN AND PROFILE

DRAWING NO.
10
10 OF 26



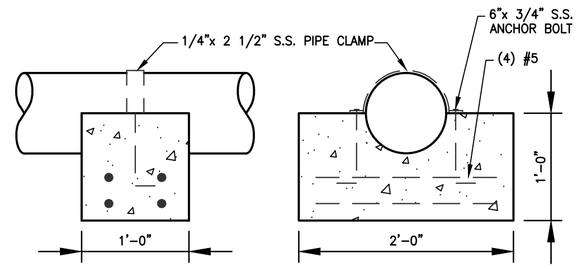
NEW STR. 101
LAKE DRAWDOWN &
INTAKE CONCRETE ANCHOR DETAIL

NOT TO SCALE



LAKE DRAWDOWN
OUTLET CHANNEL DETAIL

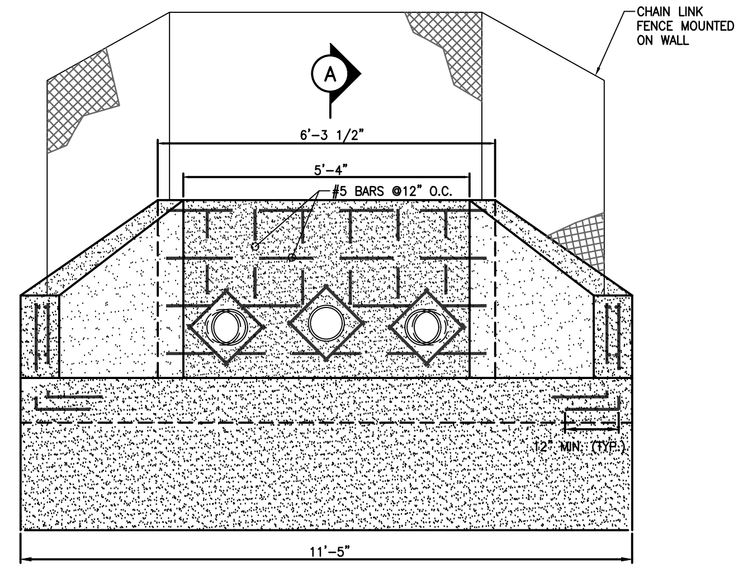
NOT TO SCALE
(LOOKING DOWNSTREAM)

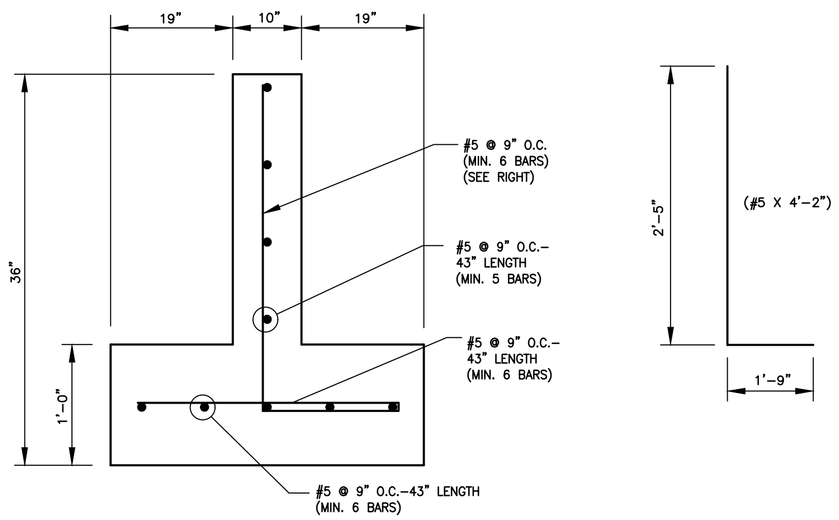


NOTE:
CONCRETE ANCHOR IS APPROX. 1.8 CF~260 LBS

CONCRETE PIPE COLLAR ANCHOR

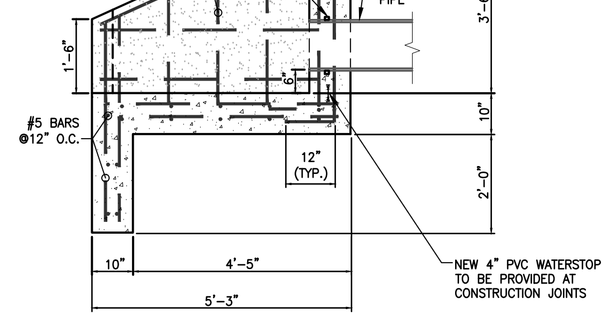
NOT TO SCALE



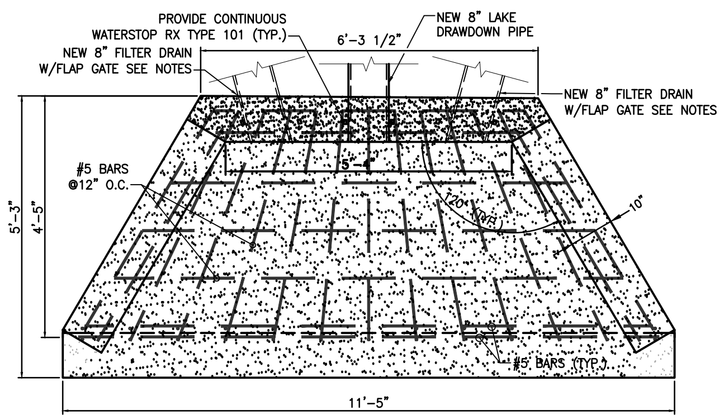


NEW STR. 101
LAKE DRAWDOWN & INTAKE
CONCRETE ANCHOR-STEEL REINFORCING

NOT TO SCALE



SECTION A-A



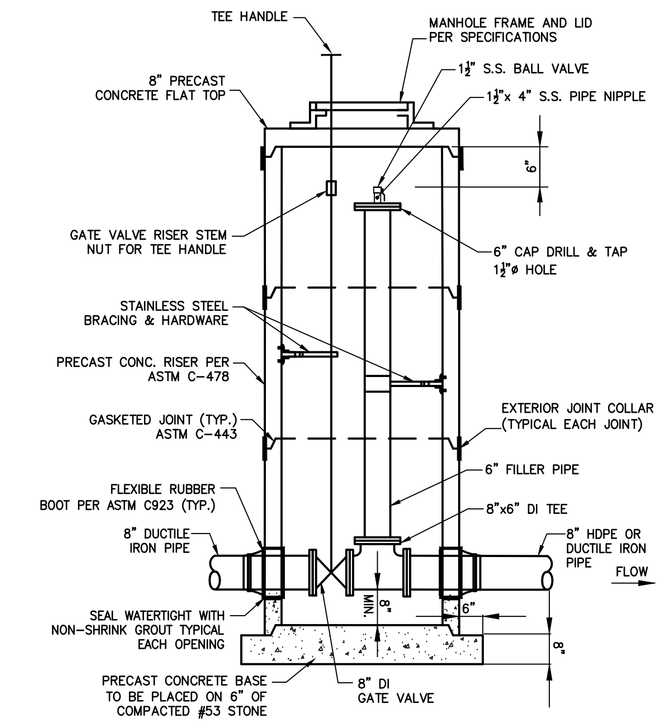
PLAN

FRONT ELEVATION

NOTES:

1. CONCRETE TO BE CLASS 'D' MIN. 4500 PSI @ 28 DAYS.
2. PROVIDE MIN. 2" CONCRETE COVER UNLESS OTHERWISE NOTED.
3. 3/4" CHAMFER ON ALL EXPOSED EDGES.
4. REAR FACES OF WINGS AND HEADWALLS TO BE WATERPROOFED, IN ACCORDANCE WITH SPECIFICATIONS.
5. INSTALL CHAIN LINK FENCE ON TOP OF STRUCTURE. FENCE SHALL BE MOUNTED TO TOP OF STRUCTURE WALLS. CHAIN LINK FENCE NOT SHOWN ON ALL PLAN & SECTIONS FOR CLARITY.
6. CONTRACTOR SHALL INSTALL TWO WALL MOUNTED FLAP GATES FOR THE TWO 8" FILTER EMBANKMENT DRAINS. FLAP GATE IS NOT REQUIRED FOR THE LAKEDRAWDOWN PIPE. REFER TO SPECIFICATIONS FOR GATE REQUIREMENTS. NOTE FLAP GATES ARE NOT SHOWN FOR CLARITY.

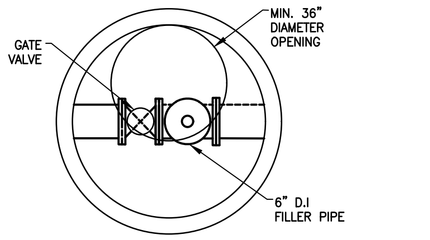
NEW STR. 104 POURED IN PLACE
CONCRETE OUTLET HEADWALL DETAIL



NOTE:
1. FILLER PIPE AND GATE VALVE RISER STEM SHALL BE CENTERED IN MANHOLES
2. PROVIDE PERMANENT REMOVABLE SUPPORT OR BLOCKING UNDER GATE VALVE & TEE
3. MANHOLE FRAME SHALL BE LOCATED TO THE EDGE OF THE GATE VALVE TO ALLOW OWNER TO EXERCISE VALVE FROM ABOVE GRADE AND PROVIDE THE OWNER BEST ALLOWABLE MAN ACCESS TO THE VALVE FOR FUTURE MAINTENANCE. OPERATING STEM NUT SHALL BE LOCATED TO WITHIN 6-INCHES OF THE BOTTOM OF THE PRECAST CONCRETE FLAT TOP OF THE MANHOLE. THE STEM SHALL BE ANCHORED OR FASTENED TO THE STRUCTURE AS REQUIRED BY THE MANUFACTURER.
4. ALL INTERNAL DUCTILE IRON FITTINGS AND PIPE SHALL BE SUPPLIED WITH FIELD COAT OF PAINT PER SPECIFICATIONS

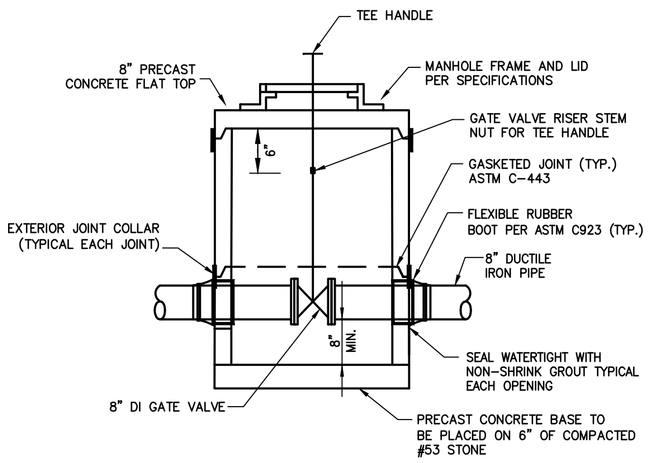
60" DIAMETER
STR. 102 MANHOLE DETAIL

NOT TO SCALE



NOTES:
ALL FASTENERS USED SHALL BE STAINLESS STEEL. POSITION OF BRACING & SUPPORTS SHALL NOT CONFLICT WITH MANHOLE ACCESS.

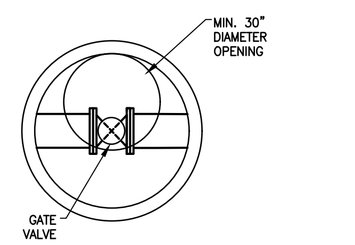
PLAN



NOTE:
1. PROVIDE PERMANENT REMOVABLE SUPPORT OR BLOCKING UNDER GATE VALVE.
2. MANHOLE FRAME SHALL BE LOCATED TO THE EDGE OF THE GATE VALVE TO ALLOW OWNER TO EXERCISE VALVE FROM ABOVE GRADE AND PROVIDE THE OWNER BEST ALLOWABLE MAN ACCESS TO THE VALVE FOR FUTURE MAINTENANCE. OPERATING STEM NUT SHALL BE LOCATED TO WITHIN 6-INCHES OF THE BOTTOM OF THE PRECAST CONCRETE FLAT TOP OF THE MANHOLE. THE STEM SHALL BE ANCHORED OR FASTENED TO THE STRUCTURE AS REQUIRED BY THE MANUFACTURER.
3. ALL INTERNAL DUCTILE IRON FITTINGS AND PIPE SHALL BE SUPPLIED WITH FIELD COAT OF PAINT PER SPECIFICATIONS

48" DIAMETER
STR. 103 MANHOLE DETAIL

NOT TO SCALE



NOTES:
ALL FASTENERS USED SHALL BE STAINLESS STEEL. POSITION OF BRACING & SUPPORTS SHALL NOT CONFLICT WITH MANHOLE ACCESS.

PLAN

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INDIANA DEPARTMENT OF NATURAL RESOURCES
CROSLEY FISH & WILDLIFE AREA - CROSLEY LAKE
DAM IMPROVEMENTS PROJECT

PROJECT NO. ENG1802321631/E020098

LAKE DRAWDOWN DETAILS

DRAWING NO.
11
11 OF 26

P:\Clients A-L\DNR\D13038 Crosley Lake Dam\ACAD\A-CURRENT\DRAWINGS\00-12-13038-SWPPP.dwg

SCALE: 1" = 20'

20' 0 20'

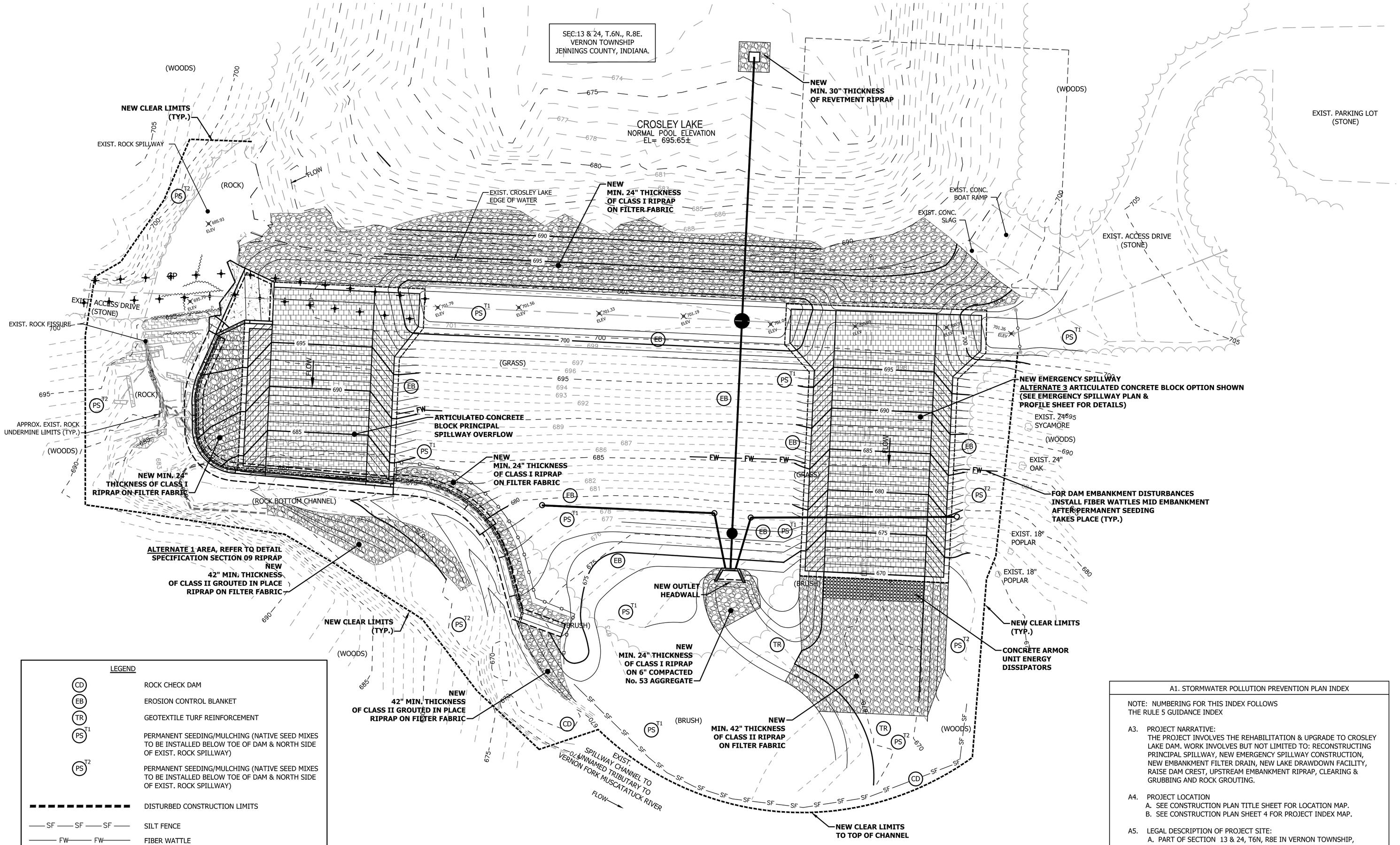
NOTE: THE FOLLOWING IS A PARTIAL LIST OF THE MEASURES REQUIRED. SEE PLANS AND SPECIFICATIONS FOR ADDITIONAL MEASURES.

1. CONTRACTOR TO COORDINATE LOCATION OF STAGING AREA WITH THE OWNER. CONTRACTOR SHALL ALSO PROVIDE A CONCRETE WASHOUT LOCATION AND VEHICLE FUELING/MAINTAINENCE LOCATION WITH A SYSTEM USED TO CONTAIN THE POLLUTANTS ASSOCIATED WITH THESE ACTIVITIES.
2. CONTRACTOR TO PROVIDE A STABLE CONSTRUCTION ENTRANCE WHERE CONSTRUCTION TRAFFIC WILL BE TRAVERSING BETWEEN SOIL SURFACES AND PAVED ROADWAYS (SEE S.W.P.P.P. DETAILS).
3. TEMPORARY CULVERTS SHALL BE REQUIRED AT ALL AREAS WITH CONCENTRATED FLOWS. HEAVY CONSTRUCTION TRAFFIC SHALL HAVE LIMITED ACCESS ALONG THE CREST OF THE DAM.
4. ALL EXPOSED FINISH GRADE DISTURBED AREAS, SHALL BE STABILIZED WITH PERMANENT SEEDING. TEMPORARY EROSION CONTROL BLANKETS SHALL BE USED IN CONCENTRATED FLOW AREAS SUCH AS DITCHES, SWALES, AND STREAM BANKS. AREAS THAT ARE NOT SUBJECT TO CONCENTRATED FLOWS, BUT HAVE SLOPES THAT ARE 4:1 OR STEEPER SHALL BE MULCH SEEDED. IF DISTURBED AREAS REMAIN INACTIVE FOR MORE THAN 15 DAYS, TEMPORARY SEED SHALL BE INSTALLED FOR TEMPORARY SURFACE STABILIZATION.
5. SILT FENCE SHALL BE USED AS A SEDIMENT BARRIER WHERE STORM WATER RUNOFF FROM DISTURBED AREAS ARE EXPECTED TO SHEET DRAIN TO UNDISTURBED AREAS.
6. TEMPORARY SEDIMENT TRAPS SHALL BE USED AT THE DOWNSTREAM END OF DISTURBED AREAS WITHIN DITCHES OR SWALES WHERE CONCENTRATED FLOW OCCURS AND IS EXPECTED TO DRAIN TO UNDISTURBED AREAS OR STORM SEWER END SECTIONS.
7. INLET PROTECTION SHALL BE USED ON STORM STRUCTURES RECEIVING STORM WATER THROUGH OPEN CASTINGS. SILT FENCE INLET PROTECTION SHALL BE USED WHEN SURFACE AROUND INLET IS UNPAVED, AND SAND BAGS SHALL BE USED WHEN SURFACE AROUND INLET IS PAVED.
8. SEE MISCELLANEOUS DETAIL SHEETS FOR ADDITIONAL STORM WATER POLLUTION PREVENTION MEASURE DETAILS.
9. AFTER COMPLETION OF CONTRACT, OR AS REQUESTED BY OWNER, THE CONTRACTOR SHALL REMOVE ALL TEMPORARY EROSION CONTROL ITEMS AND ALL ACCUMULATED DEPOSITS. AS REQUIRED, CONTRACTOR SHALL PROVIDE MULCHED SEEDING OR SOD TO ESTABLISH ORIGINAL CONDITIONS PRIOR TO CONSTRUCTION.
10. ADDITIONAL DISTURBED AREAS, NOT SHOWN WITHIN THIS PLAN, SHALL BE PROVIDED PERMANENT SEEDING PER THE DETAILED SPECIFICATION REQUIREMENTS. THIS MAY INCLUDE, BUT NOT LIMITED TO: ANY BORROW MATERIAL SITES, ACCESS AND STAGING AREAS, AND ANY TEMPORARY CONSTRUCTION ACCESS DRIVES.

GENERAL POLLUTION PREVENTION NOTES:

1. OTHER BURIED UTILITIES MAY BE IN PROJECT AREA. THE LOCATION OF UNDERGROUND UTILITIES SHALL BE VERIFIED BY CALLING TOLL FREE 1-800-382-5544 AT LEAST 2 DAYS PRIOR TO ANY DIGGING IN THE AREA.
2. EROSION CONTROL SILT FENCES SHALL BE PLACED BELOW ALL AREAS THAT ARE DISTURBED DURING CONSTRUCTION AND THAT DRAIN TO WATERWAYS.
3. DURING EXCAVATION OPERATIONS, SEGREGATE OUT ALL TOPSOIL AND STOCKPILE FOR SUBSEQUENT USE IN AREAS TO BE SEEDED. EXTRA CARE SHALL BE TAKEN TO AVOID MIXING STOCKPILED MATERIAL WITH OBJECTIONABLE MATERIAL.
4. ALL DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALE SHOWN ON PLANS, SECTIONS AND DETAILS. DRAWINGS SHALL NOT BE SCALED FOR CONSTRUCTION PURPOSES.
5. NOTES AND DETAILS ON THE DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS.
6. NEITHER THE OWNER NOR THE ENGINEER WILL ENFORCE SAFETY MEASURES OR REGULATIONS. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, DESIGN, CONSTRUCT AND MAINTAIN ALL SAFETY DEVICES, INCLUDING SHORING AND BRACING AND SHALL BE SOLELY RESPONSIBLE FOR CONFORMING TO ALL LOCAL, STATE AND FEDERAL SAFETY AND HEALTH STANDARDS, LAWS AND REGULATIONS. SITE OBSERVATION VISITS BY THE ENGINEER SHALL NOT INCLUDE INSPECTION OF THE ABOVE SAFETY ITEMS.

SURVEY NOTES:
1. ELEVATIONS PROVIDED ARE BASED ON 1988 NAVD DATUM.
2. TO CONVERT TO 1929 NGVD DATUM FROM 1988 DATUM, ADD 0.42± FEET. NOTE CONVERSION IS APPROXIMATE ONLY, NOT INTENDED FOR SURVEY USE.
3. COORDINATES PROVIDED ARE BASED ON GPS INDIANA STATE PLANE EAST, FOR ZONE 1301.
4. CROSLEY LAKE BATHYMETRIC SURVEY, CONTOUR & ELEVATION DATA, BELOW NORMAL POOL, COMPLETED ON MARCH 26, 2003 BY EARTH EXPLORATION INC.
5. MODIFICATION TO ORIGINAL BATHYMETRIC SURVEY WAS COMPLETED BY COMMONWEALTH ENGINEERS, INC., WHERE ACTUAL RECENT SURVEY SUPERSEDED SUCH DATA.



LEGEND

CD	ROCK CHECK DAM
EB	EROSION CONTROL BLANKET
TR	GEOTEXTILE TURF REINFORCEMENT
PS T1	PERMANENT SEEDING/MULCHING (NATIVE SEED MIXES TO BE INSTALLED BELOW TOE OF DAM & NORTH SIDE OF EXIST. ROCK SPILLWAY)
PS T2	PERMANENT SEEDING/MULCHING (NATIVE SEED MIXES TO BE INSTALLED BELOW TOE OF DAM & NORTH SIDE OF EXIST. ROCK SPILLWAY)
	DISTURBED CONSTRUCTION LIMITS
SF SF SF	SILT FENCE
FW FW	FIBER WATTLE

PLAN LEGEND

APP. P	APPROXIMATE PROPERTY LINE
	EXISTING PARKING/ROAD
760	EXISTING CONTOUR
	EXISTING FLOW LINE
760	PROPOSED CONTOUR
	PROPOSED RIPRAP

A1. STORMWATER POLLUTION PREVENTION PLAN INDEX

NOTE: NUMBERING FOR THIS INDEX FOLLOWS THE RULE 5 GUIDANCE INDEX

A3. PROJECT NARRATIVE:
THE PROJECT INVOLVES THE REHABILITATION & UPGRADE TO CROSLEY LAKE DAM. WORK INVOLVES BUT NOT LIMITED TO: RECONSTRUCTING PRINCIPAL SPILLWAY, NEW EMERGENCY SPILLWAY CONSTRUCTION, NEW EMBANKMENT FILTER DRAIN, NEW LAKE DRAWDOWN FACILITY, RAISE DAM CREST, UPSTREAM EMBANKMENT RIPRAP, CLEARING & GRUBBING AND ROCK GROUTING.

A4. PROJECT LOCATION
A. SEE CONSTRUCTION PLAN TITLE SHEET FOR LOCATION MAP.
B. SEE CONSTRUCTION PLAN SHEET 4 FOR PROJECT INDEX MAP.

A5. LEGAL DESCRIPTION OF PROJECT SITE:
A. PART OF SECTION 13 & 24, T6N, R8E IN VERNON TOWNSHIP, JENNINGS COUNTY INDIANA
B. LATITUDE 38° 57' 21" NORTH
LONGITUDE 85° 35' 30" WEST

A7. HUC (14 DIGIT):
05120207070010

A11. RECEIVING WATERS:
UNNAMED TRIBUTARY TO VERNON FORK MUSCATATUCK RIVER

A13. 100 YEAR FLOOD ELEVATION:
SEE FLOOD MAP ON S.W.P.P.P. DETAIL SHEET

C5. POST CONSTRUCTION MAINTENANCE
THE OWNER WILL BE RESPONSIBLE FOR THE MONITORING AND MAINTENANCE OF EACH POST CONSTRUCTION STORM WATER POLLUTION PREVENTION MEASURE.

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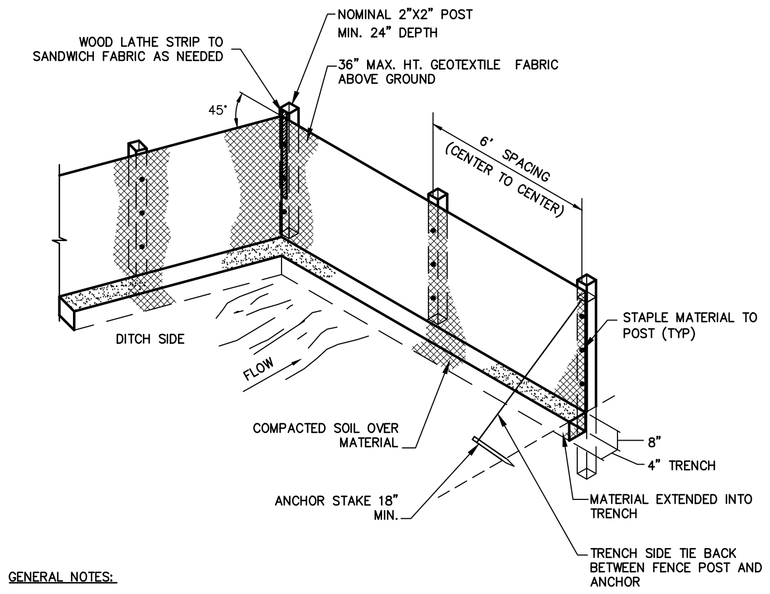
DAM IMPROVEMENTS PROJECT

PROJECT NO. ENG1802321631/E020098

STORM WATER POLLUTION PREVENTION PLAN

DRAWING NO. 12

12 OF 26

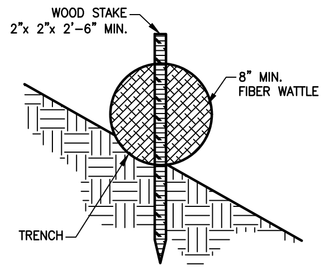


GENERAL NOTES:

1. SILT FENCES SHOULD BE INSTALLED PRIOR TO MAJOR SOIL DISTURBANCE.
2. FENCES SHALL BE INSTALLED BETWEEN THE TRENCH AND ANY DRAINAGE DITCHES OR SWALES.
3. FENCES SHALL ALSO BE INSTALLED AROUND THE STOCKPILED SOILS.
4. THE GEOTEXTILE SHALL BE FREE FROM DEFECTS, TEARS, PUNCTURES, FLAWS, DETERIORATION OR DAMAGE INCURRED DURING MANUFACTURE, TRANSPORTATION, STORAGE, OR INSTALLATION.
5. TIE BACKS SHALL BE PLACED AS REQUIRED.

SILT FENCE

NOT TO SCALE



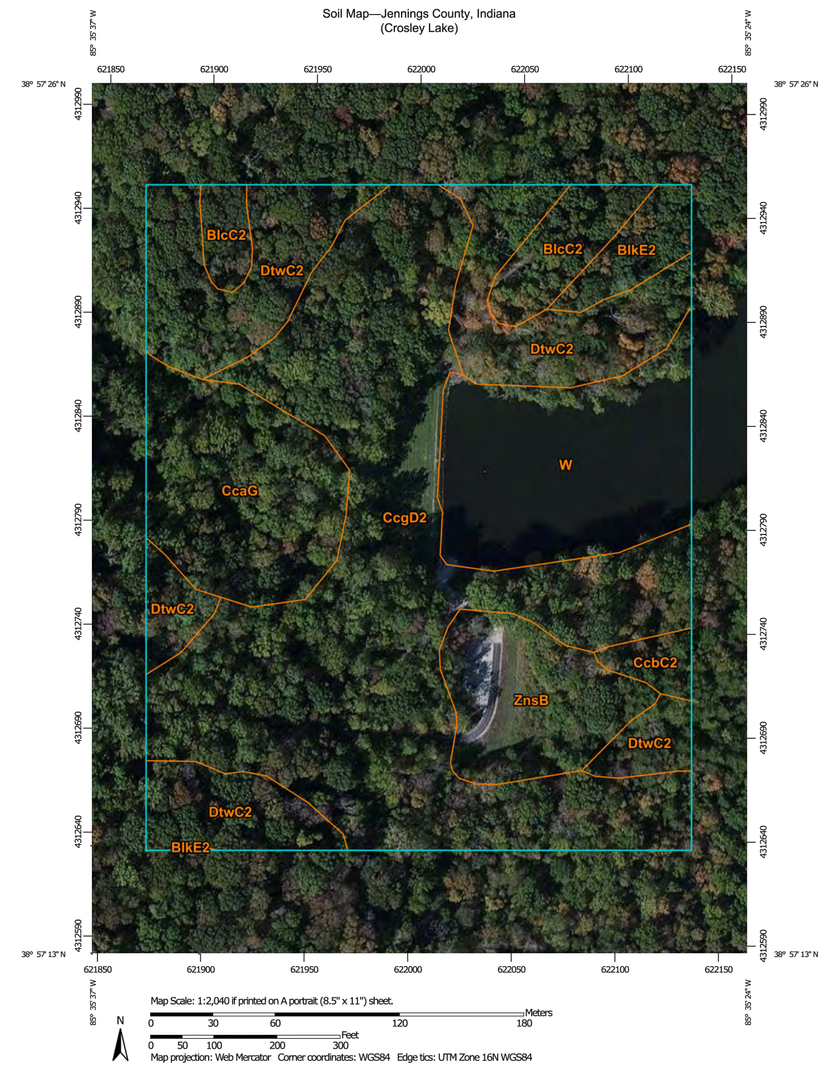
ROLLED EROSION CONTROL PRODUCT (SILT FENCE ALTERNATIVE)

NOT TO SCALE

Map Unit Legend

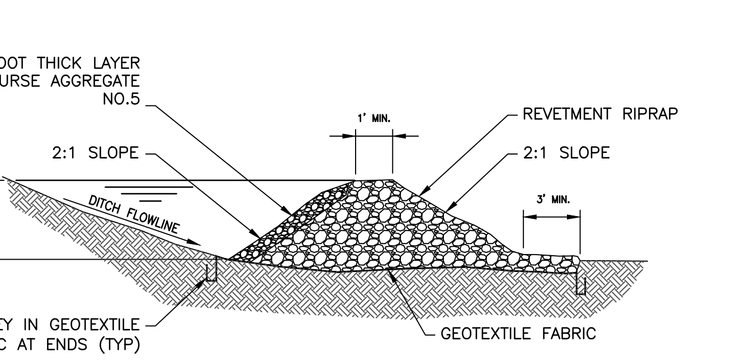
Jennings County, Indiana (IN079)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BlcC2	Blocher, soft black shale substratum-Jennings-Deputy silt loams, 6 to 12 percent slopes, eroded	0.9	4.3%
BlkE2	Bonnell-Blocher-Hickory silt loams, 12 to 25 percent slopes, eroded	0.5	2.3%
CcaG	Caneyville-Rock outcrop complex, 25 to 60 percent slopes	2.2	10.4%
CcbC2	Caneyville-Zenas silt loams, karst, rolling, eroded	0.2	1.2%
CcgD2	Caneyville and Grayford silt loams, 12 to 25 percent slopes, eroded	8.7	41.5%
DtwC2	Deputy silt loam, 6 to 15 percent slopes, eroded	4.3	20.8%
W	Water	2.6	12.6%
ZnsB	Zenas silt loam, karst, undulating	1.5	7.0%
Totals for Area of Interest		**20.9**	**100.0%**

SOILS MAP LEGEND



USDA Natural Resources Conservation Service — Web Soil Survey, National Cooperative Soil Survey — 2/4/2016 Page 1 of 3

SOILS MAP



SECTION PERPENDICULAR TO FLOWLINE

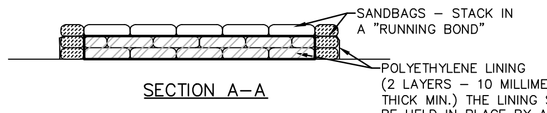
SECTION PARALLEL TO FLOWLINE

GENERAL NOTES:

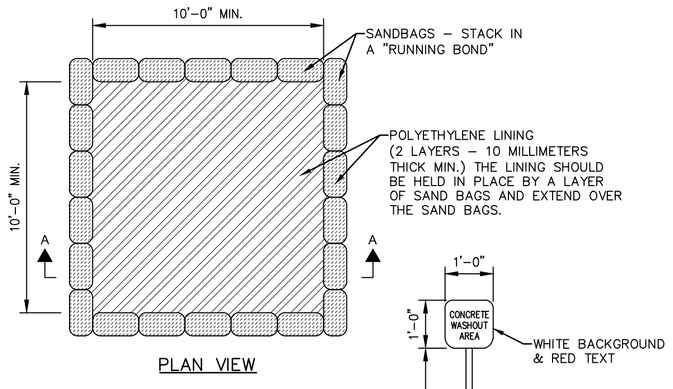
1. RIPRAP DITCH CHECK DAMS SHALL BE PLACED SUCH THAT THE TOP OF THE DOWNSTREAM CHECK DAM IS AT THE SAME ELEVATION AS THE TOE OF THE ADJACENT UPSTREAM CHECK DAM.
2. AFTER COMPLETION OF CONTRACT, OR AS REQUESTED BY OWNER, THE CONTRACTOR SHALL REMOVE ALL TEMPORARY EROSION CONTROL ITEMS, REMOVE ALL ACCUMULATED DEPOSITS AND, AS REQUIRED, SEED AND MULCH OR SOD AS REQUIRED TO ESTABLISH AREA TO CONDITION PRIOR TO CONSTRUCTION.

ROCK CHECK DAM DETAIL

NOT TO SCALE



SECTION A–A

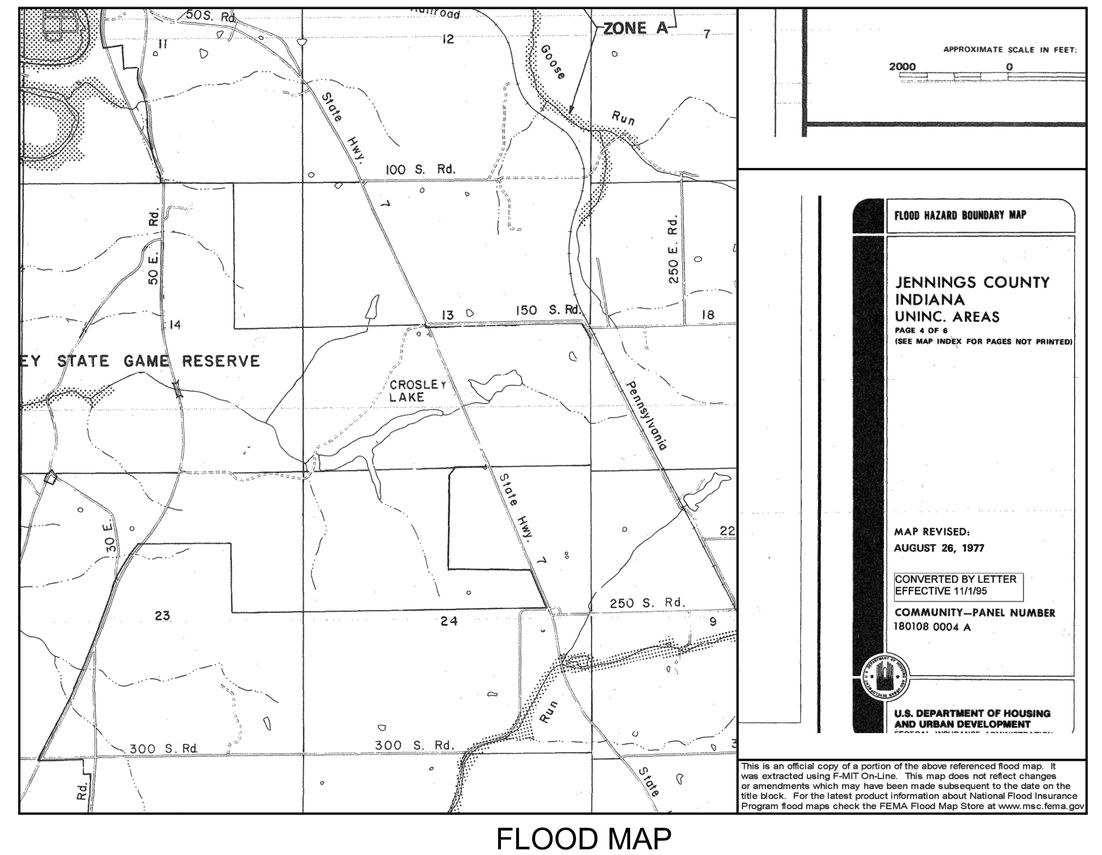


PLAN VIEW

NOTE:
DUE TO SITE CONSTRAINTS THE MINIMUM INTERIOR DIMENSION MAY BE ADJUSTED TO FIT THE SITE. THE STRUCTURE'S INTERIOR FOOTAGE OF 100 S.F. MUST BE MAINTAINED AND THE CONTRACTOR SHALL SUBMIT ANY DESIGN ALTERATIONS TO THE ENGINEER. CONCRETE WASHOUT STRUCTURE SHALL BE RE-LOCATED CLOSE TO AREAS RECEIVING CONCRETE, AS CONSTRUCTION PROGRESSES.

CONCRETE WASHOUT DETAIL

NOT TO SCALE



FLOOD MAP

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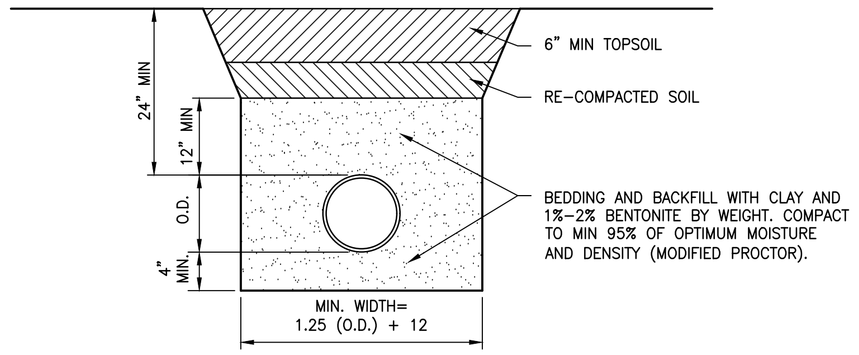
INDIANA DEPARTMENT OF NATURAL RESOURCES
CROSLEY FISH & WILDLIFE AREA - CROSLEY LAKE
DAM IMPROVEMENTS PROJECT

PROJECT NO. ENG1802321631/E020098

STORM WATER POLLUTION PREVENTION DETAILS

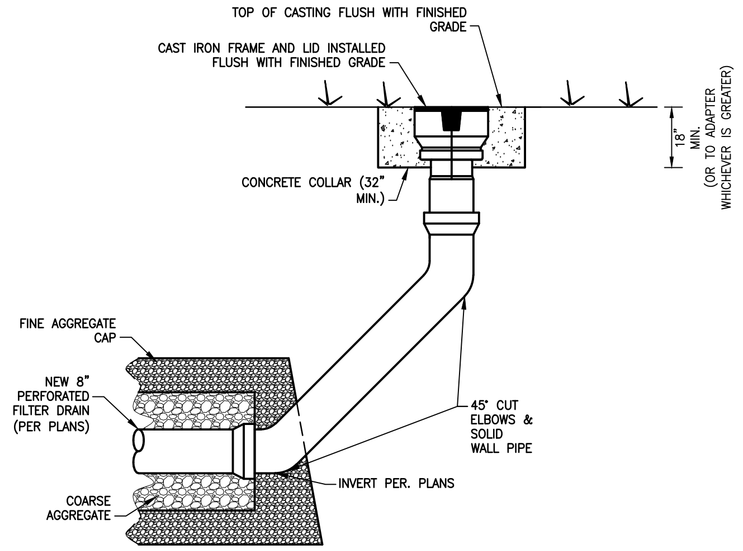
DRAWING NO. 13

13 OF 26



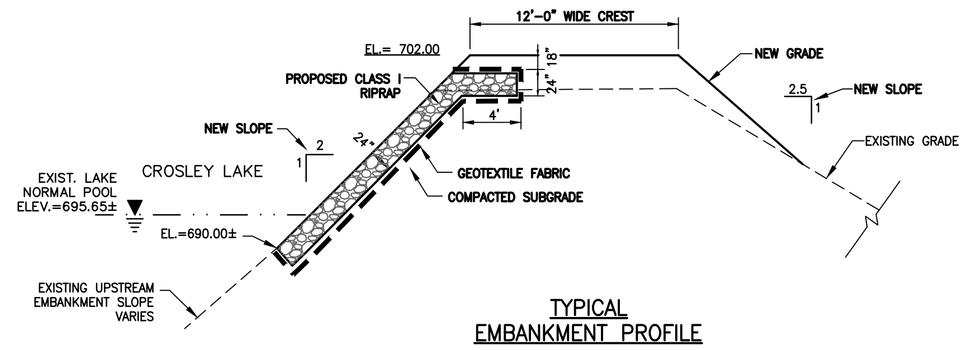
IMPERVIOUS FLEXIBLE PIPE BEDDING AND BACKFILL DETAIL

NOT TO SCALE

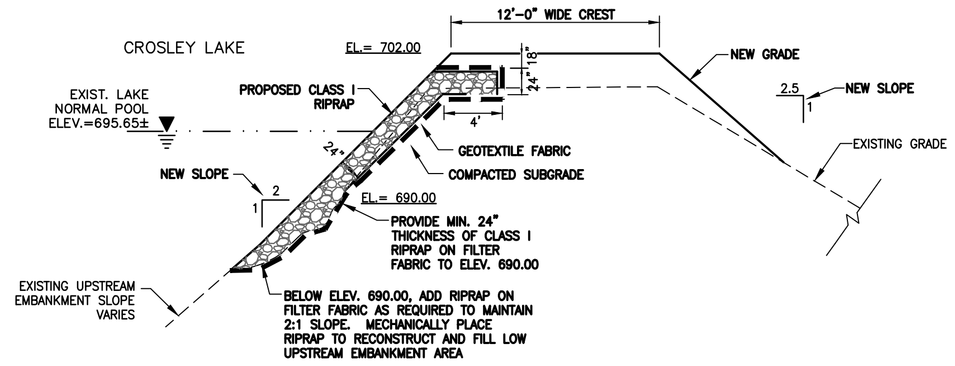


8" CLEANOUT DETAIL

NOT TO SCALE



TYPICAL EMBANKMENT PROFILE



EMBANKMENT PROFILE WITH RIPRAP PLACEMENT BELOW ELEV. 690.00

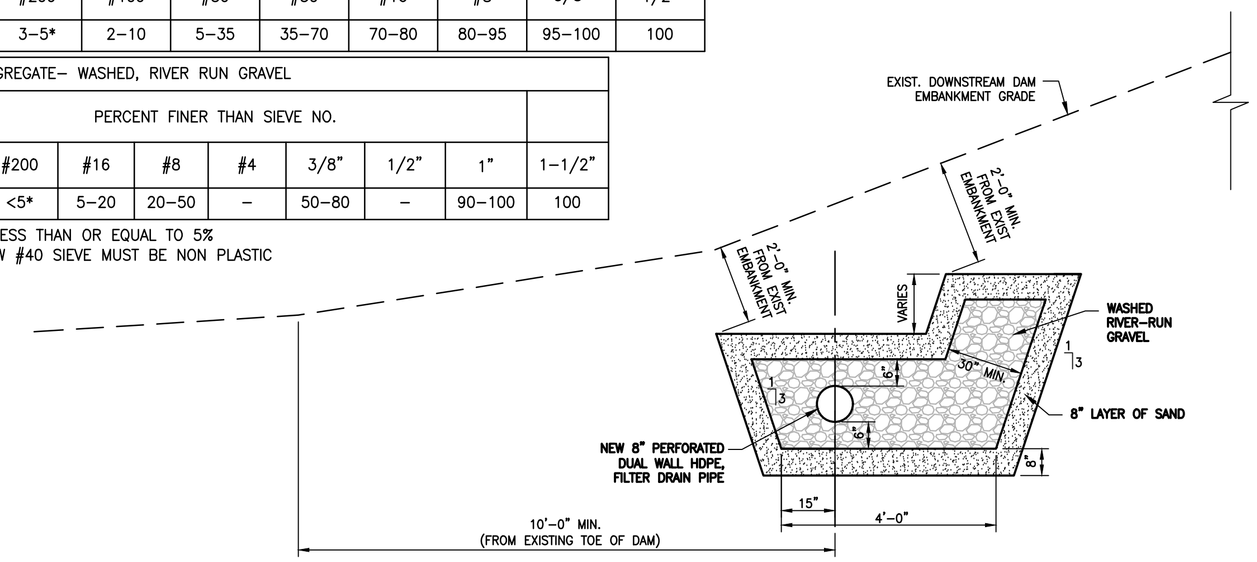
CREST RAISE & UPSTREAM EMBANKMENT RIPRAP DETAILS

NOT TO SCALE

FINE AGGREGATE – SAND								
	PERCENT FINER THAN SIEVE NO.							
	#200	#100	#50	#30	#16	#8	3/8"	1/2"
FINE	3–5*	2–10	5–35	35–70	70–80	80–95	95–100	100

COARSE AGGREGATE– WASHED, RIVER RUN GRAVEL								
	PERCENT FINER THAN SIEVE NO.							
	#200	#16	#8	#4	3/8"	1/2"	1"	1-1/2"
COARSE	<5*	5–20	20–50	–	50–80	–	90–100	100

*MUST BE LESS THAN OR EQUAL TO 5%
FINES BELOW #40 SIEVE MUST BE NON PLASTIC

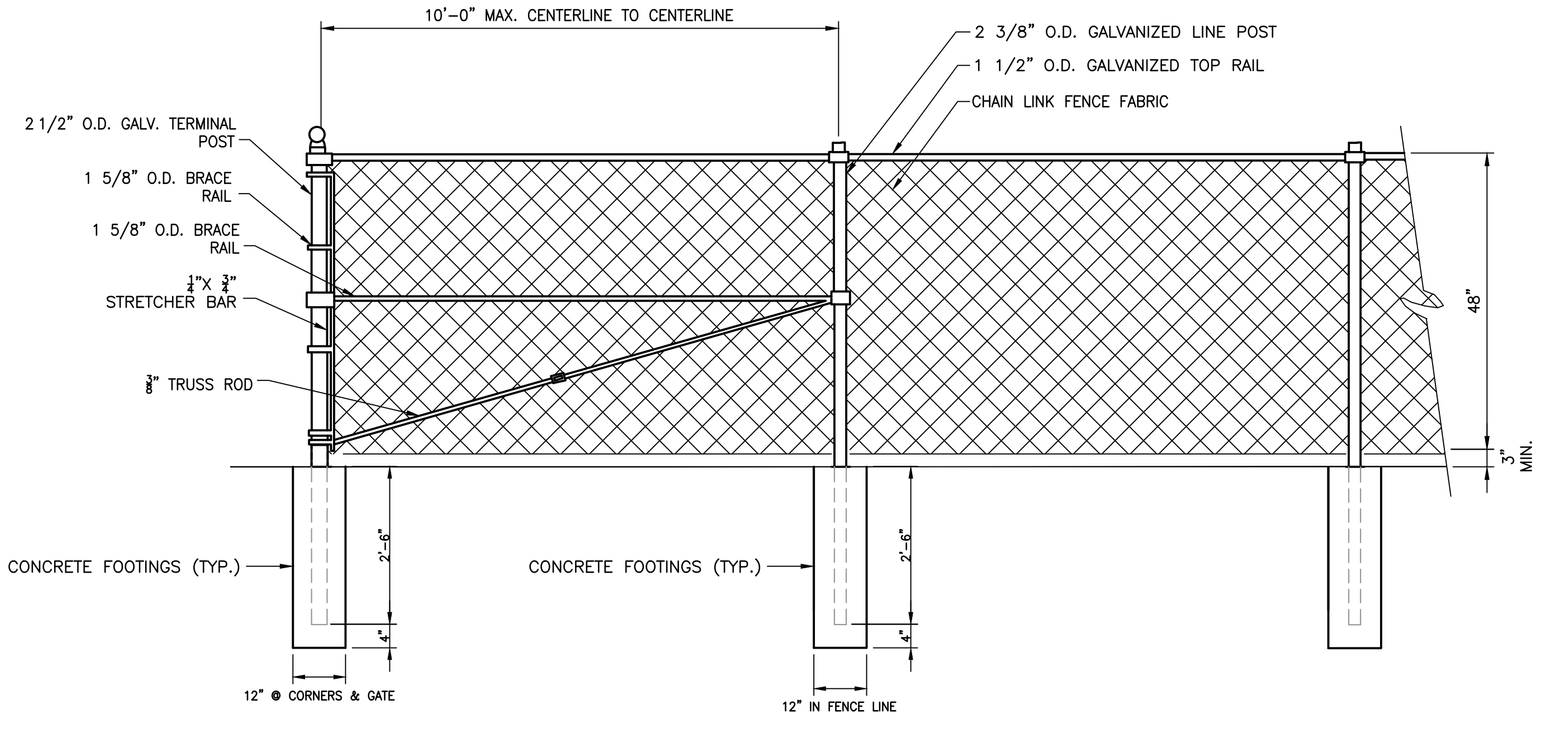


FILTER DRAIN GENERAL NOTES:

1. DUCTILE IRON PIPE SHALL BE INSTALLED FROM OUTLET HEADWALL TO FIRST 8" CLEANOUT. REFER TO IMPERVIOUS FLEXIBLE PIPE BEDDING AND BACKFILL DETAIL FOR DUCTILE IRON PIPE INSTALLATION.
2. MIN. FILTER DRAIN SLOPE = 0.40%
3. COMPACTION AND TESTING REQUIREMENTS PER DETAILED SPECIFICATIONS.
4. PROVIDE FINE AGGREGATE FOR CAP FOR COARSE AGGREGATE IN ALL LOCATIONS, INCLUDING TERMINAL CLEANOUTS. AT NO POINT SHALL EMBANKMENT SOIL BE IN DIRECT CONTACT WITH THE COARSE AGGREGATE.

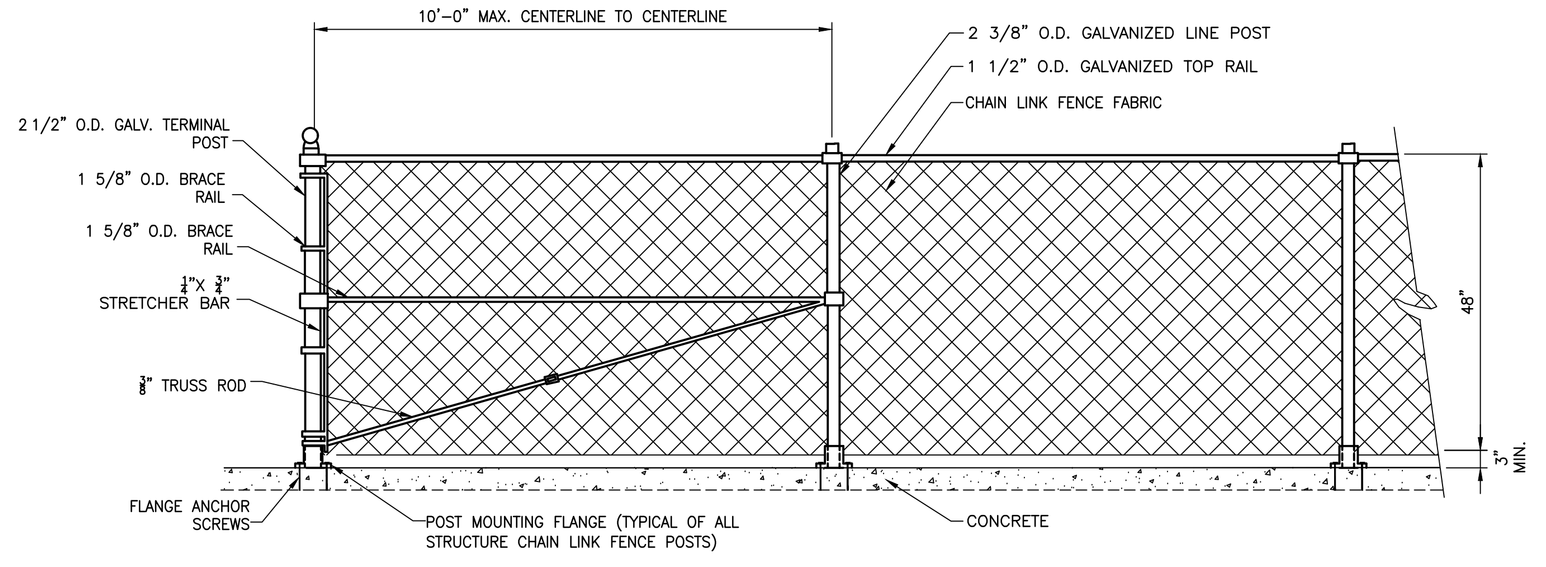
FILTER DRAIN DETAIL

NOT TO SCALE



STRUCTURE CHAIN LINK FENCE DETAIL-PLACED IN SOILS

NO SCALE



STRUCTURE CHAIN LINK FENCE DETAIL-PLACED ON CONCRETE

NO SCALE

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DESIGNED BY:	DOF
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JOB NO:	D13038
SCALE:	AS NOTED

INDIANA DEPARTMENT OF NATURAL RESOURCES
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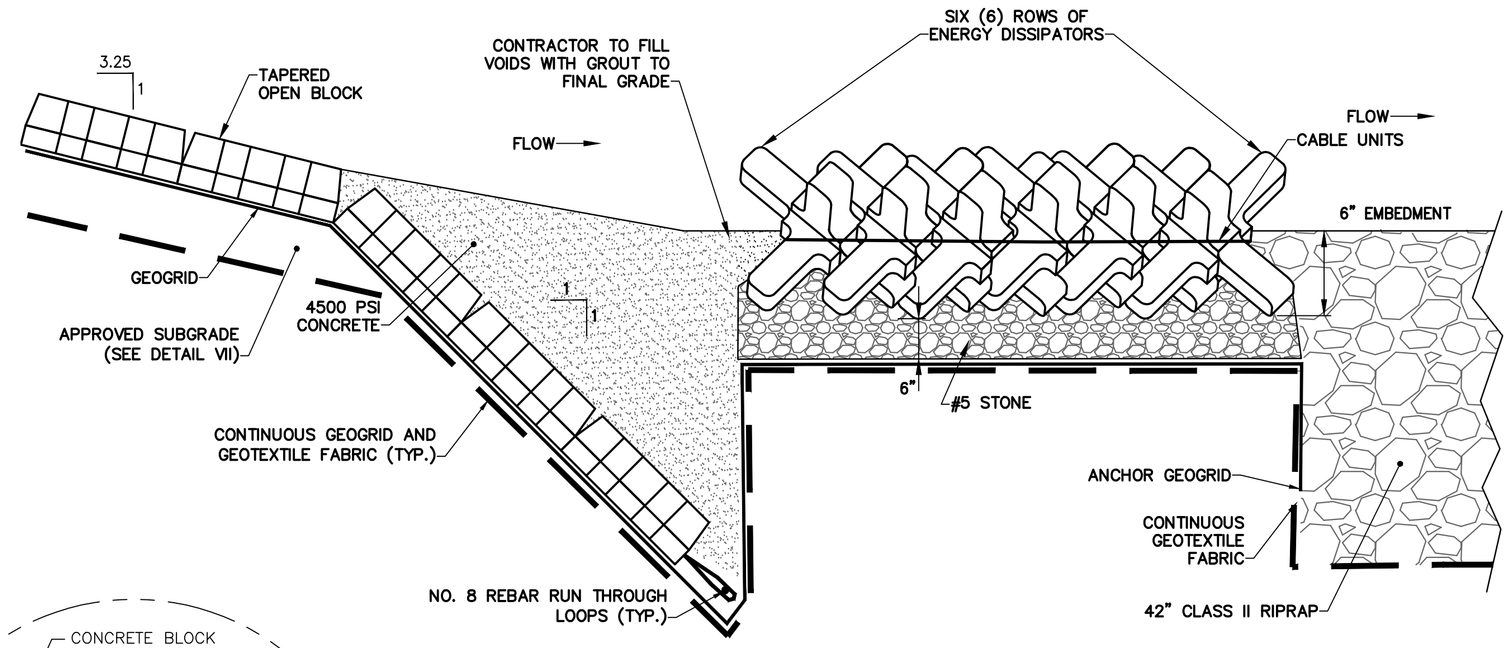
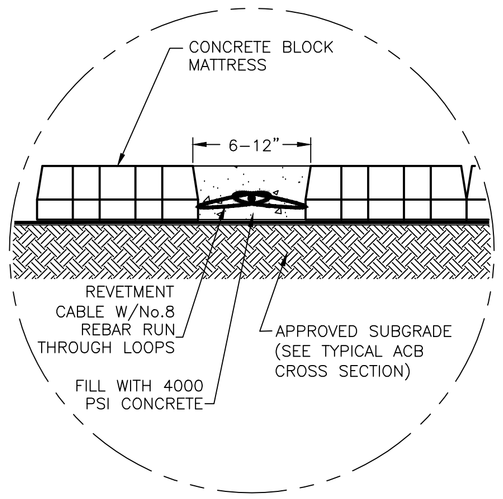
MISCELLANEOUS DETAILS

DRAWING NO. 14



ACB EMERGENCY SPILLWAY DOWNSTREAM TERMINATION

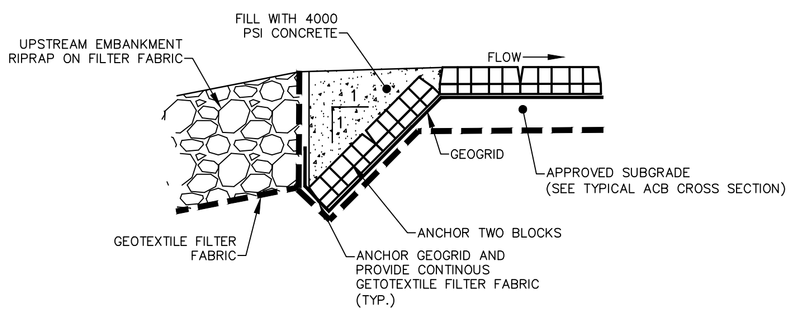
NOT TO SCALE



SECTION VIEW

ACB TYPICAL GROUT SEAM

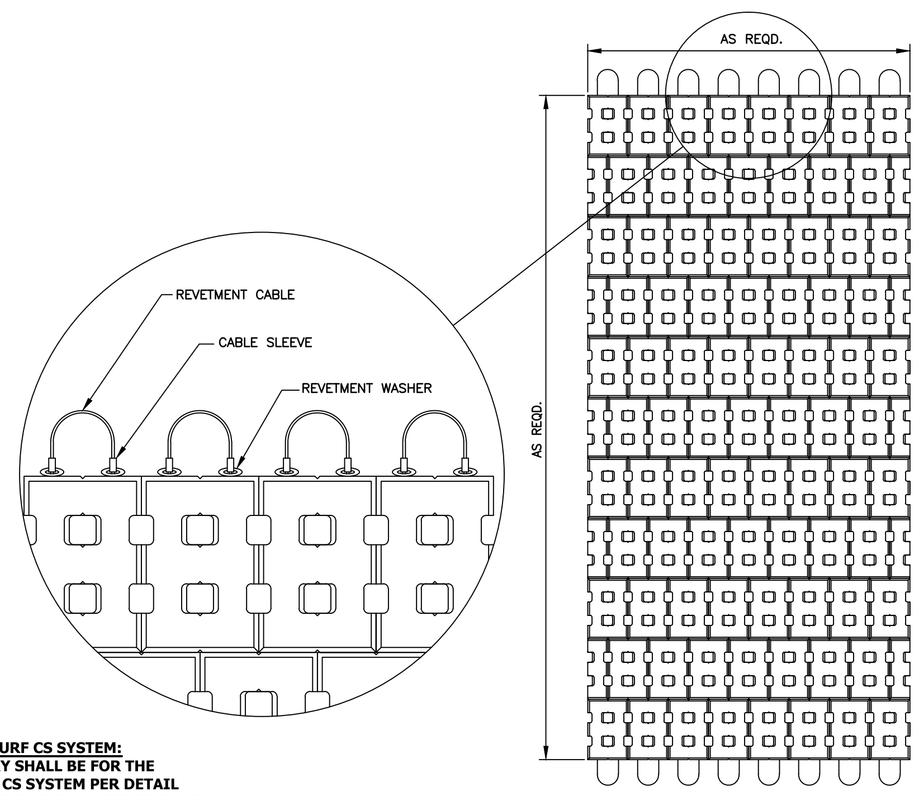
NOT TO SCALE



PROFILE VIEW

ACB TYPICAL UPSTREAM TERMINATION

NOT TO SCALE



PLAN VIEW

ACB TYPICAL MAT LAYOUT

NOT TO SCALE

BASE BID HARD ARMOR - HYDROTURF CS SYSTEM:

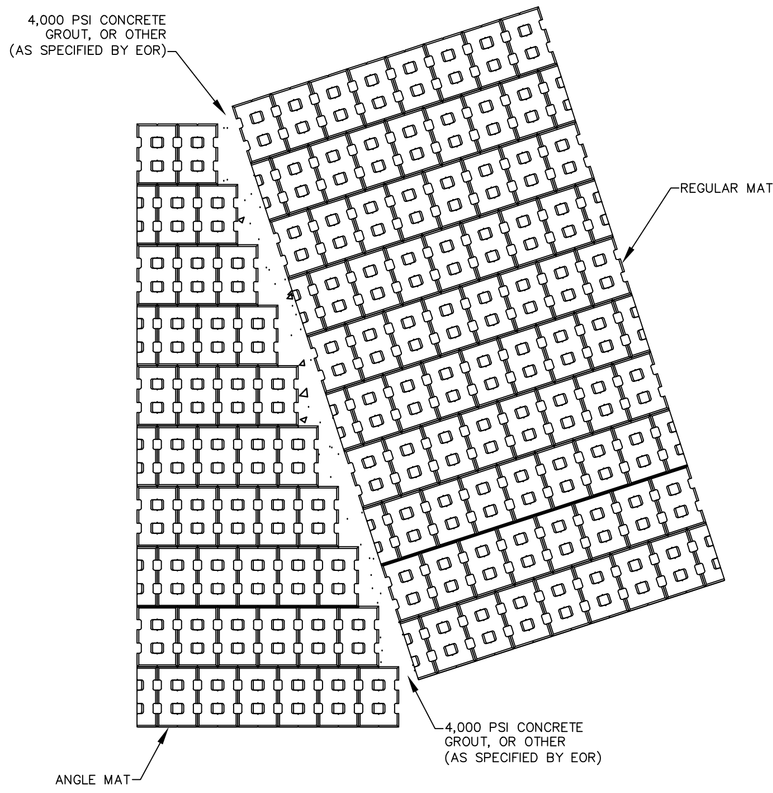
1. BASE BID EMERGENCY SPILLWAY SHALL BE FOR THE INSTALLATION OF HYDROTURF CS SYSTEM PER DETAIL SPECIFICATION SECTION 19 HYDROTURF. WITHIN THAT SPECIFICATION SECTION, PRODUCT INSTALLATION DETAILS AND REQUIREMENTS ARE PROVIDED.

2. THE HYDROTURF CS SYSTEM EXTENDS BEYOND THE TOE OF THE DAM, SUBSEQUENTLY THE CONCRETE ARMOR UNIT INSTALLATION WILL BE SHIFTED DOWNSTREAM AND LESS RIPRAP WILL BE UTILIZED. THE END OF THE RIPRAP SHALL REMAIN AT STATION 32+15 (PER SHEET 9).

3. GEOGRID AND FILTER FABRIC SHALL BE INSTALLED UNDER CONCRETE ARMOR UNITS AND ANCHORED UNDER HYDROTURF CS SYSTEM DOWNSTREAM FOUR (4) FT. DEEP CONCRETE ANCHOR TRENCH (REFER TO DETAIL SPECIFICATION SECTION 19 LIST OF FIGURES).

ALTERNATE 3 HARD ARMOR - ARTICULATED CONCRETE BLOCKS:

1. ALTERNATE 3 ARTICULATED CONCRETE BLOCK MAT OPTION IS SHOWN FOR THE EMERGENCY SPILLWAY PLANS. REFER TO DETAIL SPECIFICATION 09 ARTICULATED CONCRETE BLOCK MATS FOR DETAILS.

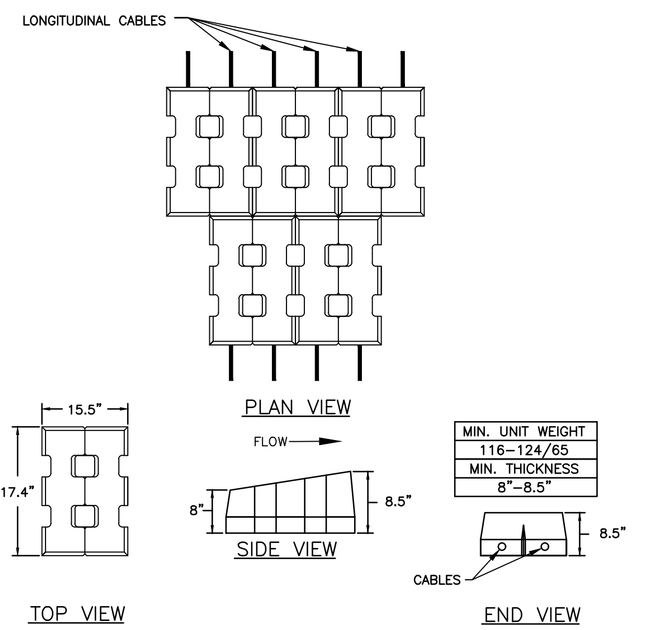


NOTES:

ANGLE MATS WILL BE CONSTRUCTED BY OMITTING THE REQUIRED UNITS SO THE REQUIRED MAT DIMENSIONS CAN BE OBTAINED.

ACB TYPICAL ANGLE MAT

NOT TO SCALE



PLAN VIEW

TOP VIEW

SIDE VIEW

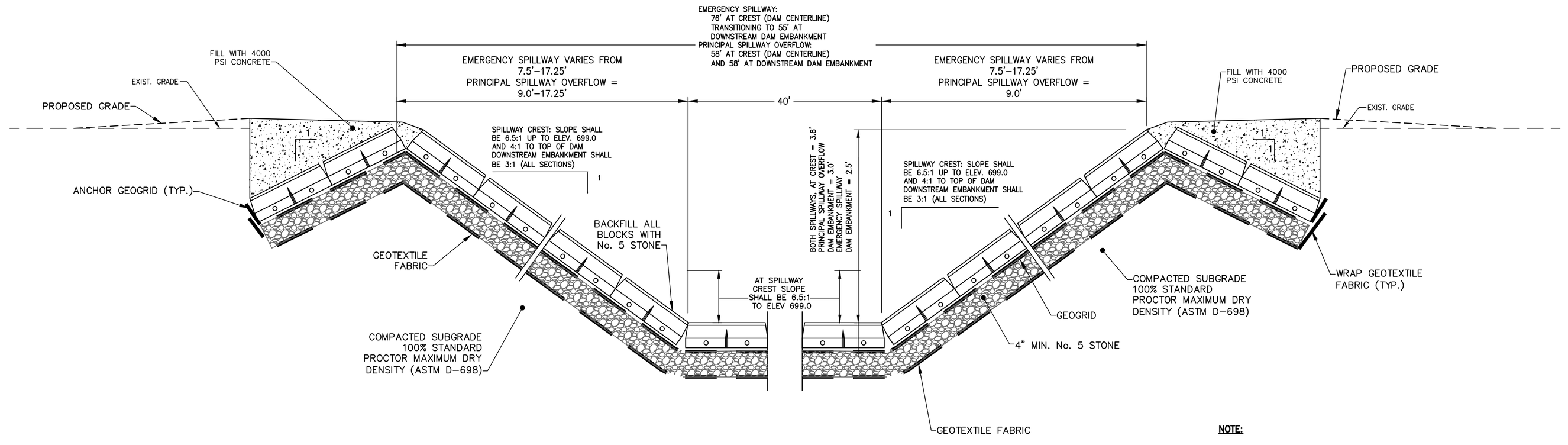
END VIEW

GENERAL ARTICULATED CONCRETE BLOCK NOTE:

MANUFACTURER'S REPRESENTATIVE SHALL BE ON-SITE & PROVIDE NECESSARY OVERSIGHT TO ENSURE CONTRACTOR INSTALLS PER MANUFACTURER'S RECOMMENDATION

TAPERED OPEN BLOCK UNIT DIMENSIONS

NOT TO SCALE



TYPICAL ACB CROSS SECTION (LOOKING DOWNSTREAM)

NOT TO SCALE

NOTE:

SEE TYPICAL PRINCIPAL SPILLWAY WALL DETAILS FOR ACB INSTALLATION AGAINST POURED-IN-PLACE WALL

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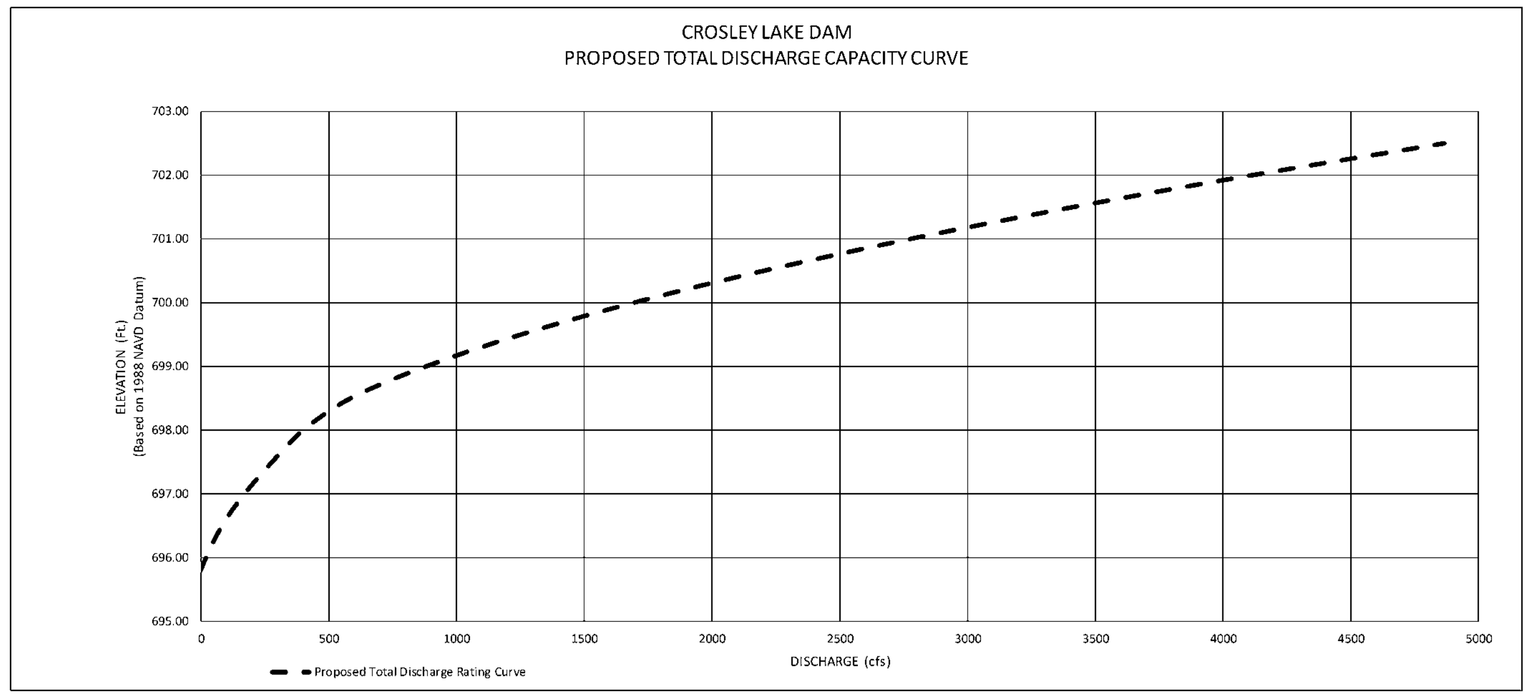
CROSLEY FISH & WILDLIFE AREA - CROSLEY LAKE DAM IMPROVEMENTS PROJECT

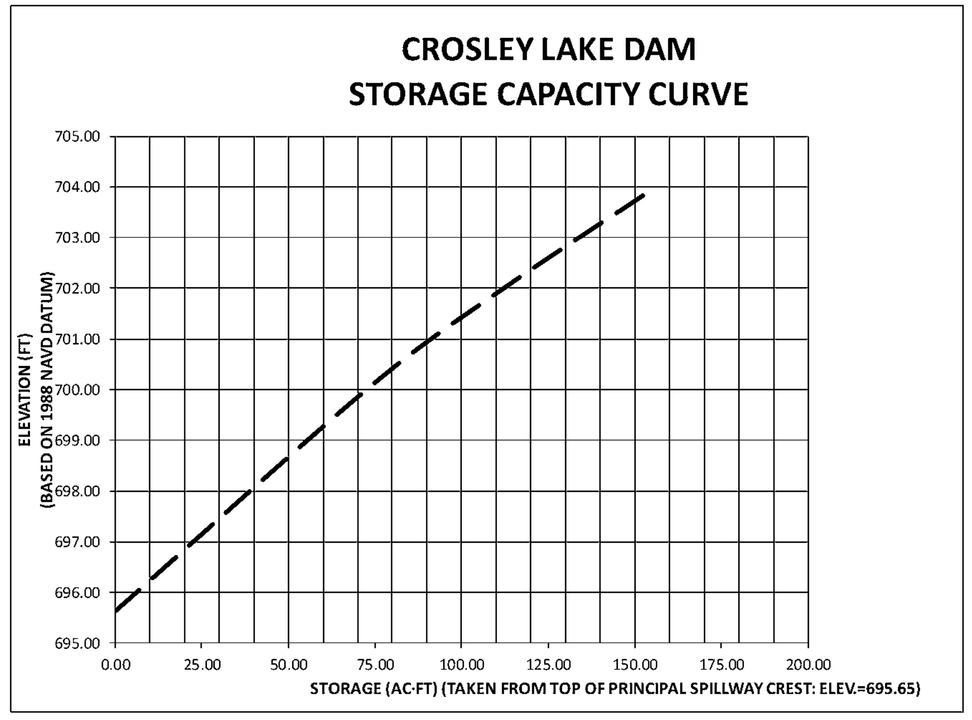
PROJECT NO. ENG1802321631/E020098

MISCELLANEOUS DETAILS

DRAWING NO. 15

15 OF 26





PHYSICAL DATA

HAZARD CLASSIFICATION	SIGNIFICANT
DRAINAGE AREA (SQ MI)	APPROX. 1.01 SQ MI
TIME OF CONCENTRATION, TC (HRS)	0.82 HRS.
RUNOFF CURVE NUMBER	74
(AMC II CONDITIONS)	II

STRUCTURAL DATA

PRINCIPAL ROCK SPILLWAY	
MATERIAL	ROCK/CONCRETE/RIPRAP
LENGTH	240 FT.
SIZE	VARIES - IRREGULAR CHANNEL
HEIGHT	WALL HEIGHT VARIES: 3 FT TO 8 FT
WIDTH	VARIES: 25 FT TO 35 FT
CREST ELEV/AREA	695.65 EX. ROCK CHANNEL
WEIR LENGTH	32 FT EX. ROCK CHANNEL
PRINCIPAL SPILLWAY OVERFLOW	
MATERIAL	ARTICULATED CONCRETE BLOCK
BASE WIDTH	40 FT
SIDE SLOPE	3:1
CREST ELEV/AREA/STOR	698.20
SHAPE	TRAPEZOID
N' VALUE	0.025 ACB
LENGTH/SLOPE OF SPILLWAY	80 FT/1.0% CREST TO 3.5:1 SLOPE
ARMORING	ARTICULATED CONCRETE BLOCK
EMERGENCY SPILLWAY	
MATERIAL	ARTICULATED CONCRETE BLOCK/CONCRETE UNITS/RIPRAP
BASE WIDTH	40 FT
SIDE SLOPE	3:1
CREST ELEV/AREA/STOR	698.20
SHAPE	TRAPEZOID
N' VALUE	0.025 ACB
LENGTH/SLOPE OF SPILLWAY	160 FT/1.0% CREST TO 3.25:1 SLOPE TO 0.001% AT TOE
ARMORING	ARTICULATED CONCRETE BLOCK/CONCRETE UNITS/RIPRAP
TOP OF DAM	
ELEV	702.00
AREA	NORMAL POOL (EL. 695.65±) = 14.6± AC
	MAX WATER SURFACE (EL. 702.00±)= 21.1± AC
STORAGE	92.95 AC/FT FROM NORMAL POOL (695.65) TO
	CREST OF DAM -MAX WATER SURFACE (702.00)
FREEBOARD	3.8 FT (100-YR FREQUENCY)
	0.6 FT (50% PMP)
LENGTH OF DAM	340 FT
CHANNEL OUTLET ELEV	670.00

HYDROLOGIC/HYDRAULIC DATA

DESCRIPTION (UNITS)	VALUE
BASIN HYDROLOGY	RURAL
RAINFALL (IN)	13.75 IN
DURATION (HRS)	6 HRS
%PMP OR - YR FREQUENCY	50% PMP
RUNOFF (IN)	25.29 IN
RUNOFF (ACRE-FT)	1,736 AC-FT.
PEAK INFLOW (CFS)	3,714 CFS
PRINCIPAL/EMERGENCY SPILLWAY	
MAX. DISCHARGE - 50% PMP (CFS)	
PRIMARY ROCK SPILLWAY	1,639 CFS
40' WIDE PRINCIPAL SPILLWAY OVERFLOW	754 CFS
40' WIDE EMERGENCY SPILLWAY	873 CFS
MAX. VELOCITY - AT OPENING (FPS)	
PRIMARY ROCK SPILLWAY	8 FPS
40' WIDE PRINCIPAL SPILLWAY OVERFLOW	6 FPS
40' WIDE EMERGENCY SPILLWAY	6 FPS
MAX. VELOCITY - EXIT CHANNEL (FPS)	
PRIMARY ROCK SPILLWAY	18 FPS
40' WIDE PRINCIPAL SPILLWAY OVERFLOW	25 FPS
40' WIDE EMERGENCY SPILLWAY	27 FPS
BREACH ANALYSIS	N/A
SHAPE OF BREACH	N/A
WIDTH (FT)	N/A
SIDESLOPE	N/A
TIME TO FAILURE (HRS)	N/A
IMMEDIATE DOWNSTREAM ELEV. (FT)	
PRIMARY ROCK SPILLWAY	670.00
40' WIDE PRINCIPAL SPILLWAY OVERFLOW	675.00 - 678.00
40' WIDE EMERGENCY SPILLWAY	670.00

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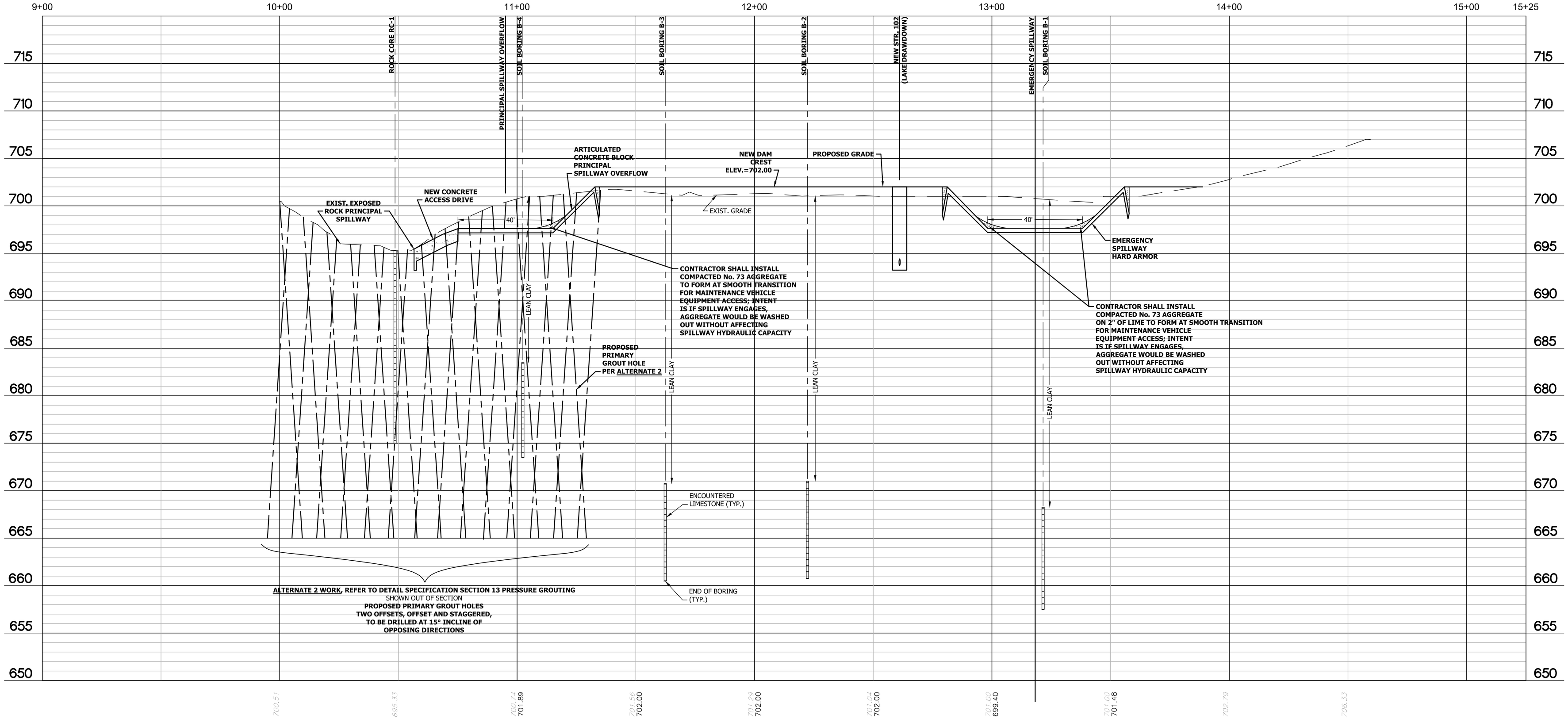
DAM IMPROVEMENTS PROJECT

PROJECT NO. ENG1802321631/E020098

HYDROLOGIC AND HYDRAULICS DATA

DRAWING NO.
16
16 OF 26



DAM CENTERLINE - PROFILE LINE 'A'

SCALE: HORIZONTAL - 1"=20'-0"
VERTICAL - 1"=5'-0"

SURVEY NOTES:
1. ELEVATIONS PROVIDED ARE BASED ON 1988 NAVD DATUM.
2. TO CONVERT TO 1929 NGVD DATUM FROM 1988 DATUM, ADD 0.42± FEET. NOTE CONVERSION IS APPROXIMATE ONLY, NOT INTENDED FOR SURVEY USE.
3. COORDINATES PROVIDED ARE BASED ON GPS INDIANA STATE PLANE EAST, FOR ZONE 1301.
4. CROSLEY LAKE BATHYMETRIC SURVEY, CONTOUR & ELEVATION DATA, BELOW NORMAL POOL, COMPLETED ON MARCH 26, 2003 BY EARTH EXPLORATION INC.
5. MODIFICATION TO ORIGINAL BATHYMETRIC SURVEY WAS COMPLETED BY COMMONWEALTH ENGINEERS, INC., WHERE ACTUAL RECENT SURVEY SUPERSEDED SUCH DATA.

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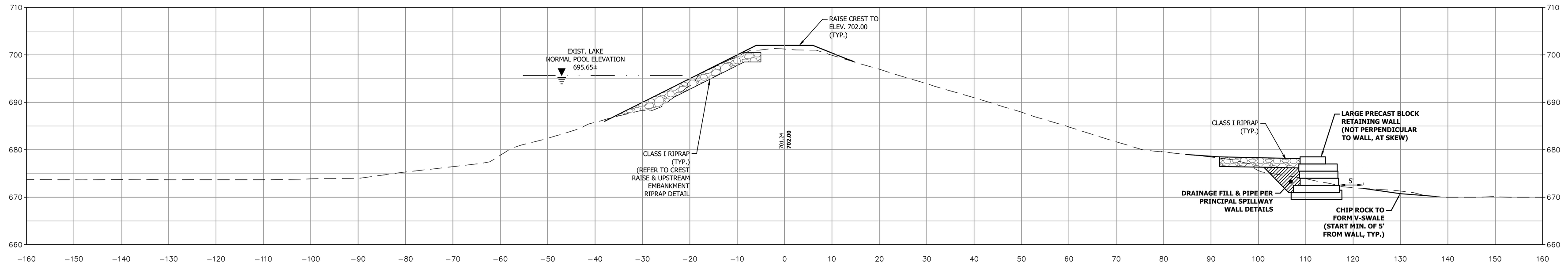
DAM CENTERLLINE PROFILE - LINE 'A'

DRAWING NO. 17

17 OF 26

11+75.00



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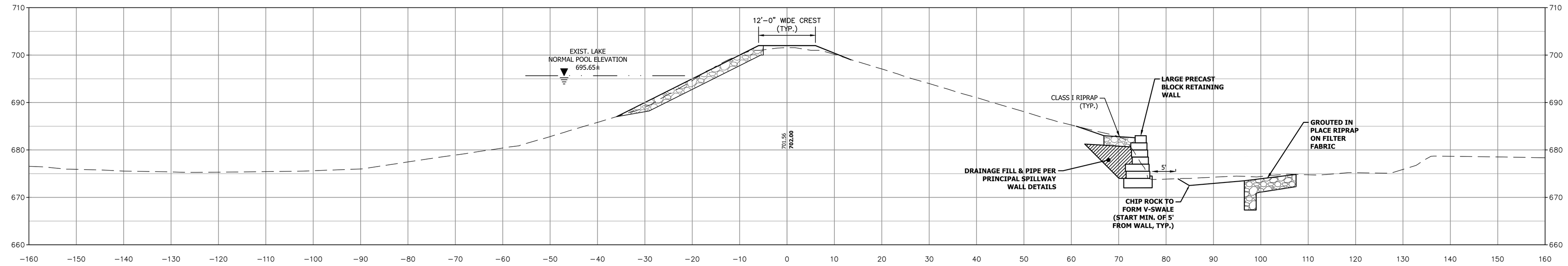

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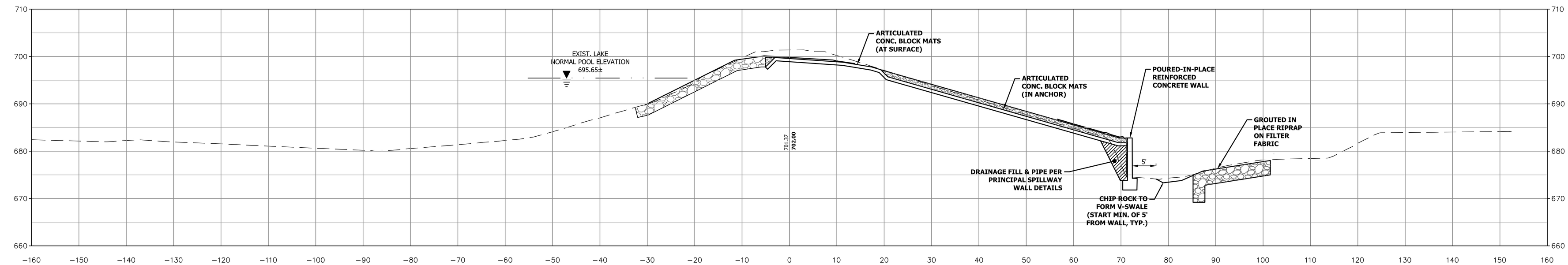

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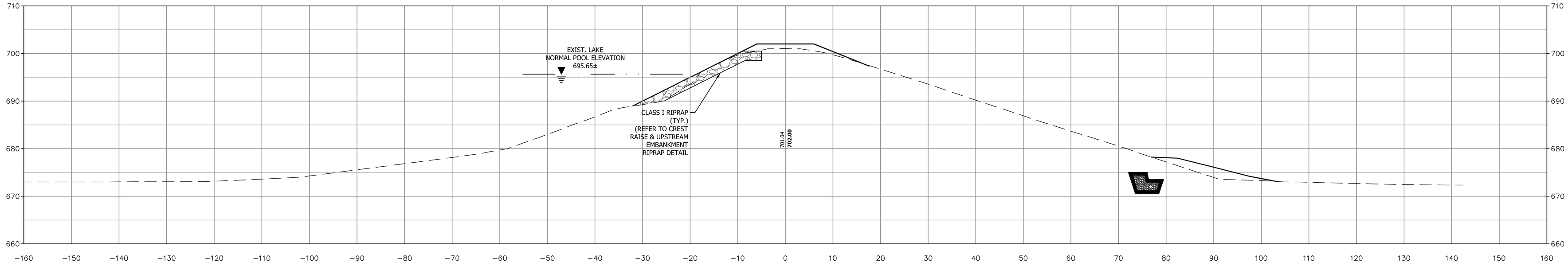
DAM CROSS SECTIONS - LINE 'A'

DRAWING NO. 18

P:\Clients A-L\DNR\D13038 Crosley Lake Dam\ACAD\A-CURRENT\DRAWINGS\CIVIL SURFACE.dwg

12+50.00



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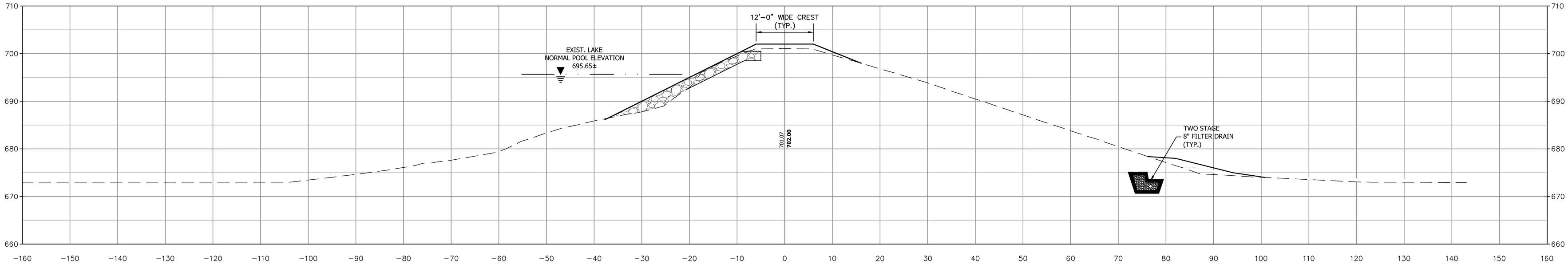

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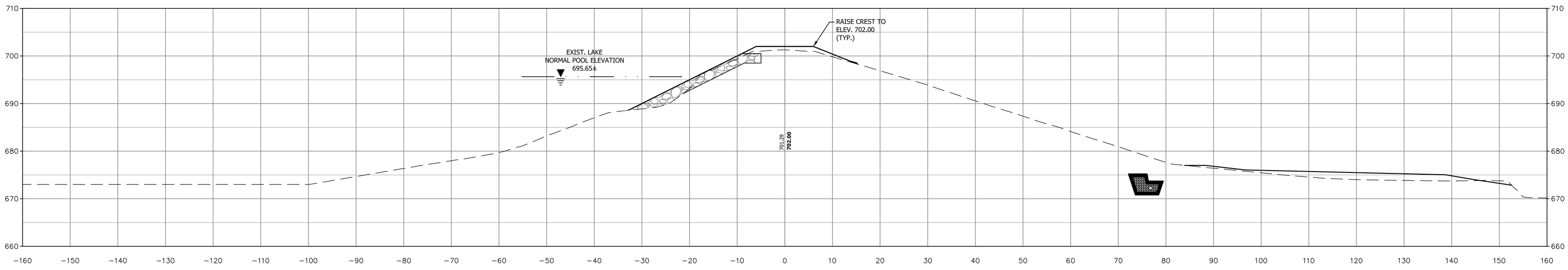

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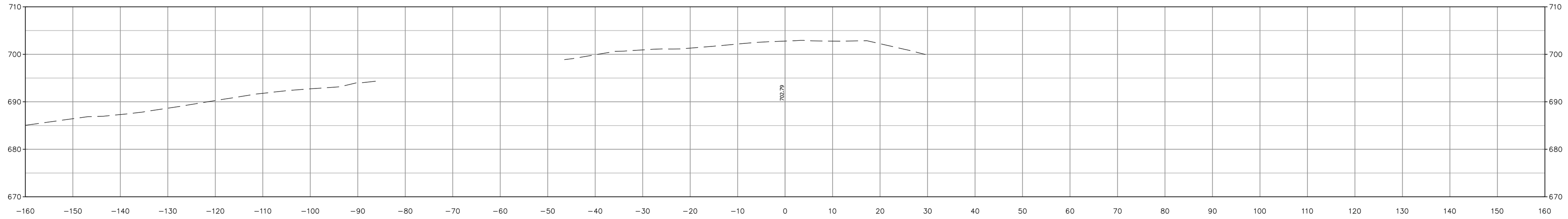
DAM CROSS SECTIONS - LINE 'A'

DRAWING NO.
19
19 OF 26

14+00.00



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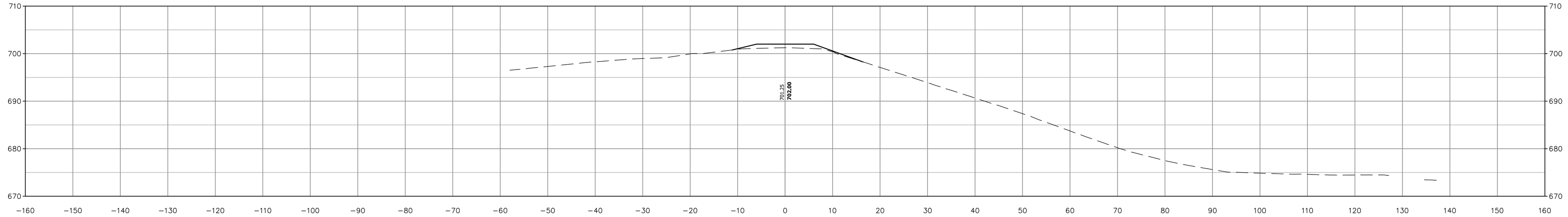

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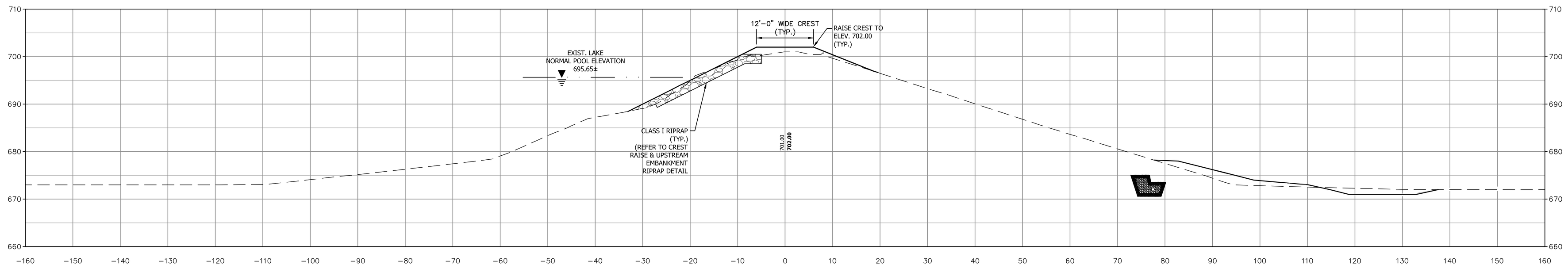

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No.	DATE	DESCRIPTION	REVISED BY

DREW O. FLAMION REGISTERED No. PE11100003 INDIANA PROFESSIONAL ENGINEER

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A wealth of resources to master a common goal.

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DRAWN BY:	ALR
DESIGNED BY:	DOF
CHECKED BY:	RMK
DATE:	MAY 2018
JOB NO:	D13038
SCALE:	AS NOTED

INDIANA DEPARTMENT OF NATURAL RESOURCES
CROSLEY FISH & WILDLIFE AREA - CROSLEY LAKE
DAM IMPROVEMENTS PROJECT

PROJECT NO. ENG1802321631/E020098

DAM CROSS SECTIONS - LINE 'A'

DRAWING NO. 20

GENERAL

1. The structure has been designed for the in-service loads only. The methods, procedures, and sequences of construction are the responsibility of the Contractor. Supporting formwork for the concrete construction shall not be removed before the concrete has gained sufficient strength to safely support the dead and superimposed loads which will be subsequently applied. The Contractor shall take all necessary precautions to maintain and ensure the integrity of the structure at all stages of construction.

2. All work shall be performed in accordance with the Indiana Building Code, 2014 Edition (2012 International Building Code, first printing, with Indiana Amendments).

3. Do not determine dimensions by "scaling" off the plans. The Contractor shall accept all risk associated with "scaling" and shall be responsible for all inadequate work resulting therefrom. Questions regarding missing or conflicting dimensions shall be directed, in writing, to the Structural Engineer.

4. Principal openings in the structure are indicated on the structural drawings. Refer to the architectural, mechanical, electrical, and plumbing drawings for sleeves, curbs, inserts, etc. not herein indicated. Openings in slabs with a maximum side dimension or diameter of 10 inches or less shall not require additional framing or reinforcement, unless noted otherwise. The location of sleeves or openings not shown in structural members shall be approved by the Structural Engineer.

5. The location of sleeves or openings not shown in structural members shall be approved by the Structural Engineer.

FOUNDATIONS

1. Exterior footings shall bear 3'-0" minimum below finish grade and shall bear on undisturbed soil.

2. Foundation excavation and all other soils related work shall be performed in accordance with the geotechnical engineering report prepared by Earth Exploration, Inc. dated April 3, 2009 and all associated supplements (EEI Report No. E019901B).

3. Foundation and soils related work shall be performed under the direct supervision of a qualified Geotechnical Engineer.

4. Foundation excavations shall be made to plan elevations. The soil conditions beneath foundations shall then be inspected by a qualified Geotechnical Engineer. If the underlying soils are found to be unacceptable, one of the following procedures shall be followed:

   A. Remove the unacceptable soil and backfill with an engineered structural fill in accordance with the geotechnical engineering report or inspecting Geotechnical Engineer.

   B. Lower the footing to an acceptable soil. Contact the Structural Engineer for potential modifications to the foundation system.

5. Subgrade structural elements subjected to differential lateral soil pressure shall be adequately braced until the structural elements which provide lateral restraint have been placed and allowed to cure for a minimum of 7 days.

6. Excavations for foundations shall be cleaned and hand tamped to a uniform surface. Foundation excavations shall be adequately protected against detrimental change in condition from disturbance, rain, freezing, etc. Surface runoff shall not be allowed to enter the excavation.

7. Foundation conditions noted during construction, which differ from those described in the geotechnical report shall be reported to the Structural Engineer and Geotechnical Engineer before further construction is attempted.

8. Center all column and wall footings under the column or wall above unless otherwise indicated.

9. Subgrade structural elements subjected to differential lateral soil pressure shall be adequately braced until the structural elements which provide lateral restraint have been placed and allowed to cure for a minimum of 7 days or reached 70-percent of its specified 28-day compressive strength (f'c).

CONCRETE

1. Reinforced concrete has been designed in accordance with the latest editions of the Building Code Requirements for Reinforced Concrete (ACI 318) and Environmental Engineering Concrete Structures (ACI 350R) by the American Concrete Institute (ACI).

2. Slabs-on-grade shall be constructed in accordance with the latest edition of the Guide for Concrete Floor and Slab Construction (ACI 302.1R).

3. Mixing, transporting, and placing of concrete shall conform to the latest edition of the Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete (ACI 211.1) and the Standard Specifications for Structural Concrete (ACI 301). Concrete curing shall conform to the latest editions of the Standard Practice for Concrete Curing (ACI 308) and the Standard Specification for Curing Concrete (ACI 308.1). In case of a discrepancy, the plans and specifications shall govern.

4. Unless noted otherwise, concrete shall have natural sand fine aggregate and normal weight coarse aggregates conforming to ASTM C33, and Type II Portland Cement conforming to ASTM C150. The Contractor shall submit a mix design for each proposed class of concrete. Mix designs shall indicate proportions by weight, water-cement ratio, slump, air content, synthetic fiber size and quantity, sieve analyses of fine and coarse aggregates, standard deviation analysis, and required average strength and documentation of average strength verifying compliance with ACI 318. The Contractor shall not vary from the mix design without approval from the Structural Engineer.

5. Unless noted otherwise, fly ash may be used as a pozzolan to replace a portion of the Portland Cement in a concrete mix. Fly ash, when used, shall conform to ASTM C618, Type C. Concrete mixes using fly ash shall be proportioned to account for the properties of the specific fly ash used and to account for the specific properties of the fly ash concrete thus resulting. The ratio of the amount of the fly ash to the total amount of fly ash plus cement in the mix shall not exceed 20 percent.

6. Ground granulated blast-furnace slag (GGBFS) may be used to replace a portion of the Type II Portland Cement in a concrete mix. Ground granulated blast-furnace slag, when used, shall conform to ASTM C989, Grade 100 or 120. Concrete mixes using GGBFS shall be proportioned to account for the properties of the specific GGBFS used and to account for the specific properties of the GGBFS concrete thus resulting. The ratio of the amount of the GGBFS to the total amount of GGBFS plus cement in the mix shall not exceed 40 percent.

7. Water-reducing admixtures conforming to ASTM C494 may be used in the concrete mix design. Maximum slump shall be 5 inches for mixes containing water-reducing admixtures and 5 to 8 inches for mixes containing high range water-reducing admixtures.

8. Concrete compressive strength tests shall be performed in accordance with ASTM C39. Copies of the test results shall be forwarded to the Structural Engineer. One set of specimens shall be taken for each day's pour of appreciable size and for each 50 cubic yards in accordance with the latest edition of ASTM C31. Each set shall include one specimen tested at 7 days, 2 specimens tested at 28 days and one specimen retained in reserve. These test cylinders shall be laboratory cured.

9. When the ambient temperature is expected to fall below 40 degrees during the course of a concrete pour or subsequent curing period, it shall be placed and cured in accordance with the latest edition of Cold Weather Concreting (ACI 306R) and an additional set of concrete test cylinders shall be made. These cylinders shall be stored immediately adjacent to, and cured under the same conditions as the building concrete. Special curing boxes are not permitted for these test cylinders.

10. Concrete mixed, transported, placed, and cured under conditions of high ambient temperature, low humidity, solar radiation, or high winds shall conform to the latest edition of Hot Weather Concreting (ACI 305R) and an additional set of concrete test cylinders shall be made. These cylinders shall be stored immediately adjacent to, and cured under the same conditions as the building concrete. Special curing boxes are not permitted for these test cylinders.

11. Slump tests shall be made prior to and following the addition of plasticizers. Where concrete is placed by pumping methods, concrete for test cylinders and slump tests shall be taken at the point of final placement.

12. Water shall not be added to the concrete at the job site. The Contractor is responsible for coordinating a pumpable and workable mix without the addition of water at the job site. The use of plasticizers, retardants and other additives shall be at the option of the Contractor subject to the approval of the Structural Engineer. Follow the recommendations of the manufacturer for the proper use of additives. Use of calcium chloride or other chloride bearing salts is prohibited.

13. Place concrete in a manner so as to prevent segregation of the mix. Delay floating and troweling operations until the concrete has lost surface water sheen or all free water. Do not sprinkle free cement on the slab surface. Finishing of slab surfaces shall conform to the latest editions of ACI 302.1R and ACI 304R (Guide for Measuring, Mixing, Transporting and Placing Concrete).

14. Maintain concrete in a moist condition for at least 5 days at ambient temperatures above 70 degrees, and at least 7 days at ambient temperatures above 50 degrees. Curing compounds or moisture retention covers shall be used for all non-formed surfaces. Formed surfaces shall be cured by leaving forms in place. During hot, dry weather, keep forms moist by sprinkling. When forms are removed prior to the end of the curing period, apply curing compound to the exposed surfaces.

15. Protect finished concrete surfaces from damage, rain, hail, running water, other injurious effects.

16. Protect the concrete surface between finishing operations on hot, dry days or any time plastic shrinkage cracks could develop by using wet burlap, plastic membranes or fogging.

17. Horizontal and vertical joints are not permitted in concrete construction except where indicated.

18. Construction joints and/or contraction joints at locations other than where indicated shall be submitted to the Structural Engineer for approval.

19. Construction joints shall be prepared by roughening the contact surface in an approved manner to a full amplitude of approximately 1/4 inch leaving the contact surface clean and free of laitance.

20. Provide 3/4 inch chamfers on all exposed corners of concrete except those abutting masonry.

21. Earth cuts shall not be used as forms ("bank forming") for vertical or sloping surfaces unless otherwise approved by the Structural Engineer. Where bank forming is permitted, the concrete element shall be increased at least 3 inches on all sides exposed to earth to account for possible soil contamination during concrete placement.

CONCRETE SCHEDULE

CONCRETE SCHEDULE						
CLASS	f_c'	AIR CONTENT	MIN. CEMENT: LB/CY (SACKS/CY)	MAX. WATER/ CEMENT: RATIO	CONCRETE PLACEMENT	REMARKS
A	4,500 psi	6% ± 1%	611 (6.5)	0.45	footings and retaining walls	

REINFORCING STEEL

1. Reinforcing bar detailing, fabricating, and placing shall conform to the latest edition of the following standards: Specifications for Structural Concrete for Buildings (ACI 301), ACI Detailing Manual (SP66). The latest editions of Concrete Reinforcing Steel Institute's Reinforcing Bar Detailing and Placing Reinforcing Bars may also be used.

2. Provide standard bar chairs, slab bolsters, spacers, etc. as required to maintain concrete protection specified. Reinforcing steel shall be tied to prevent displacement during concrete placement.

3. Reinforcement bars shall not be tack welded, welded, heated or cut unless otherwise indicated or approved by the Structural Engineer.

4. Welding of reinforcement bars, when approved by the Structural Engineer, shall conform to the latest edition of American Welding Society Standard D1.4. Electrodes for shop and field welding of reinforcement bars shall conform to ASTM A233, Class E90XX.

5. Concrete cover over reinforcement, unless otherwise noted, shall be as specified in the latest editions of ACI 318 and ACI 350 with the most stringent requirements governing.

6. Unless noted otherwise, splicing of reinforcing bars shall conform to the latest edition of ACI 318.

CONCRETE REINFORCING STEEL LAP SPLICE SCHEDULE			
BAR SIZE	TENSION SPLICE		COMPRESSION SPLICE
	TOP BAR	OTHER	
#3	21"	16"	12"
#4	28"	24"	15"
#5	35"	30"	19"
#6	42"	36"	23"
#7	49"	42"	26"
#8	56"	48"	30"
#9	63"	57"	34"
#10	76"	66"	38"
#11	93"	72"	42"

7. Horizontal bars in walls and continuous wall footings shall be bent at corners and intersections in such a way that continuity is provided through the joint. Separate corner bars of the same size and spacing as the horizontal reinforcing may be substituted for the bent portion of the continuous bars.

8. Unless noted otherwise, provide 2-#5 bars (one each face) around unframed openings and diagonally at reentrant corners of vertical height offsets in concrete walls. Place bars parallel to the sides of the opening and extend 24 inches beyond corners.

9. The Contractor shall prepare detailed working or shop drawings to enable him to fabricate, erect and construct all parts of the work in accordance with the drawings and specifications and shall submit one reproducible copy and one blue line copy to the Structural Engineer for review prior to fabrication. These shop drawings will be reviewed for design concepts only. The Contractor shall be responsible for all dimensions, accuracy, and fit of work.

POST-INSTALLED EXPANSION/ADHESIVE ANCHORS

1. Post-installed anchors shall only be used where specified on the Construction Documents. The Contractor shall obtain approval from the Structural Engineer prior to installing the post-installed anchors in place of missing or misplaced cast-in-placed anchors.

2. Care shall be taken in placing post-installed anchors to avoid conflicts with existing reinforcing steel.

3. Post-installed anchors shall be installed by qualified personnel in accordance with the drawings and specifications.

4. Post-installed anchors shall be installed by qualified personnel in accordance with the Manufacturer's Printed Installation Instructions (MPII), the drawings and specifications. Installation of adhesive anchors shall be performed by personnel trained to install adhesive anchors. Contractor shall submit installer training cards with anchor package.

5. Post-installed anchors shall be HILTI type as manufactured by HILTI Fastening Systems or approved equivalent. Substitution requests must be submitted by the Contractor to the Structural Engineer for review. Provide back-up technical data that demonstrates that the substituted product is capable of achieving the equivalent performance values (minimum) of the specified products using the appropriate design procedure and/or standard(s) as required by the building code.

6. Masonry cores receiving post-installed anchors shall be filled with course grout. Grout must comply with IBC Section 2103.12 or IRC Section R609.1.1, as applicable. Alternatively, the grout must have a minimum compressive strength, when tested in accordance with ASTM C1019, equal to its specified strength, but not less than 2,000 psi. Post-installed anchors shall not be installed in a masonry mortar joints.

7. The Contractor shall inspect the masonry or concrete surface at each proposed post-installed anchor location prior to installation. If the anchor locations align with mortar joints or the masonry or concrete is honeycombed, cracked or otherwise unsound, the post-installed anchors shall be repositioned so as to be located in sound material and be in accordance with the manufacturer's minimum spacing and edge distance requirements.

8. Adhesive anchors shall be subject to the following additional requirements:
   A. Anchors shall meet the requirements of ACI 355.2 (mechanical anchors) and ACI 355.4 (adhesive anchors).
   B. Proof loading of adhesive anchors is not required.
   C. Anchors shall not be installed in concrete cured less than 21-days
   D. Anchors shall not be installed until the concrete has reached a minimum compressive strength of 2,500 psi.
   E. Concrete temperature must be greater than 50 °F and less than 80 °F prior to installation of the anchors unless otherwise permitted by the MPII.
   F. Anchors shall be installed in holes drilled with the HILTI Hollow Drill Bit (TE-CD (SDS Plus) or TE-YD (SDS Max)) and HILTI VC 20/40 Vacuum (VC 20-U or VC 40-U). Follow the MPII for size and depth of holes required.
   G. The acceptability of certification other than the ACI/CRSI Adhesive Anchor Installer Certification shall be the responsibility of the Structural Engineer.
   H. Adhesive anchors installed in horizontal or upwardly inclined orientations to resist sustained tension loads shall be continuously inspected during installation by an inspector specially approved for that purpose by the building official. The special inspector shall furnish a report to the licensed design professional and building official that the work covered by the report has been performed and that the materials used and the installation procedures used conform to the approved contract documents and MPII.

NON-SHRINK GROUT

1. Grout shall be a high early strength, non-metallic, shrinkage resistant (when tested in accordance with the latest edition of ASTM C827 or CRD-C621), premixed, non-corrosive, non-staining, synthetic fiber reinforced product conforming to the requirements of the latest edition of ASTM C1107 and containing Portland Cement, silica sands, shrinkage compensating agents and fluidity improving compounds.

2. Synthetic fibers shall be virgin (non-recycled) nylon or polypropylene fibers conforming to ASTM C1116, Type III. Fibers shall be introduced into the mix at the plant in accordance with the manufacturer's recommendations. The Contractor shall submit the mix design, including the fiber size and quantity, to the Structural Engineer for approval prior to construction. The Contractor shall take adequate measures to manage any difficulty in concrete finishing associated with the use of the fibers. Apply at a rate of 1.5-LBS/CYD.

3. Grout compressive strength tests shall be performed in accordance with the latest edition of ASTM C109, with a restraining plate placed over the molds.

4. Grout shall be installed in accordance with the manufacturer's instructions.

5. Grout shall be placed in a non-sag, flowable state. Grout shall be cured according to manufacturer's recommendations.

DESIGN

1. Building Code: Indiana Building Code, 2014 Edition (2012 International Building Code, first printing, with Indiana Amendments).

2. Soil information:

Allowable net bearing pressure:	2000 psf (assumed)
Unit weight of soil	125 pcf (assumed)
Active lateral earth pressure coefficient, Ka	0.46 (assumed)
Coefficient of friction between soil and concrete footing	0.30 (assumed)

3. Concrete:

28 day compressive strength (f'c)	See Schedule

4. Reinforcing steel (deformed bars of new billet steel):

Stirrup and tie	ASTM A615, Grade 60
Weldable (Low-Alloy)	ASTM A706, Grade 60
Otherwise	ASTM A615, Grade 60

5. Non-shrink grout:

28 day compressive strength	6,500 psi

6. Wind loads:

Basic wind speed (3-second gust)	115 mph
Importance factor, Iw	1.0
Exposure	C

7. Seismic loads:

Seismic importance factor, Ie	1.0
Mapped Spectral Response Acceleration at Short Periods, Ss	16.6% g
Mapped Spectral Response Acceleration at 1 Second, S1	9.1% g
Site Class	D (assumed)
Design Spectral Response Acceleration at Short Periods, Sds	17.7% g
Design Spectral Response Acceleration at 1 Second, Sd1	14.6% g
Seismic Design Category	C

SPECIAL NOTES TO THE OWNER

1. Under normal conditions and for conventional structures such as the subject structure, reinforced concrete will develop cracks. The cracks are due to inherent shrinkage of the concrete, creep, ambient temperature variation, and restraining effects of vertical and other structural elements.

2. The cracks formed are normally cosmetic. The concrete maintains its serviceability and strength requirements. It is possible that a number of hairline cracks, which would normally spread over a wide area, will integrate into a single crack with a width exceeding 0.01 inch. It is emphasized that although special effort is made to reduce the potential causes and number of such cracks, it is not practical to provide total articulation and thereby achieve complete inhibition of all cracks.

3. The majority of these cracks develop within the first three years of service. Cracks which are wider than 0.01 inch may require sealing or epoxy injection.

4. The object of the joints provided in the structure is to allow movement. Movements due to creep and shrinkage may be noticeable at joints up to two years after construction, beyond which movements due to variations in temperature will persist.

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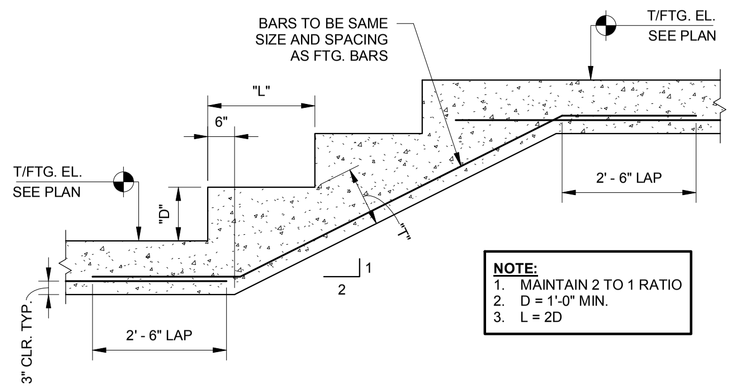
INDIANA DEPARTMENT OF NATURAL RESOURCES
CROSLEY FISH & WILDLIFE AREA - CROSLEY LAKE
DAM IMPROVEMENTS PROJECT

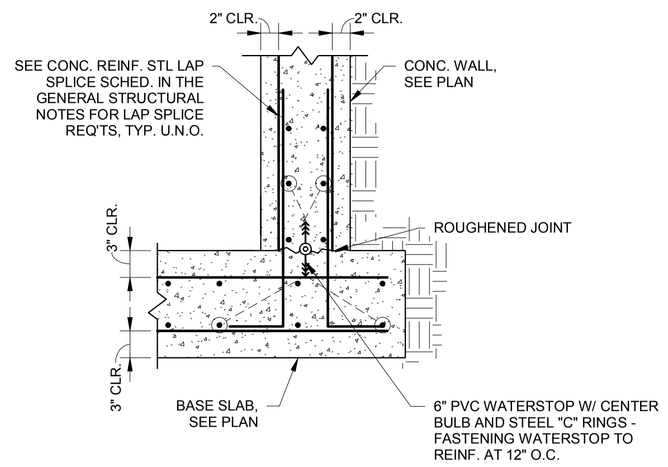
PROJECT NO. E020098

GENERAL STRUCTURAL NOTES

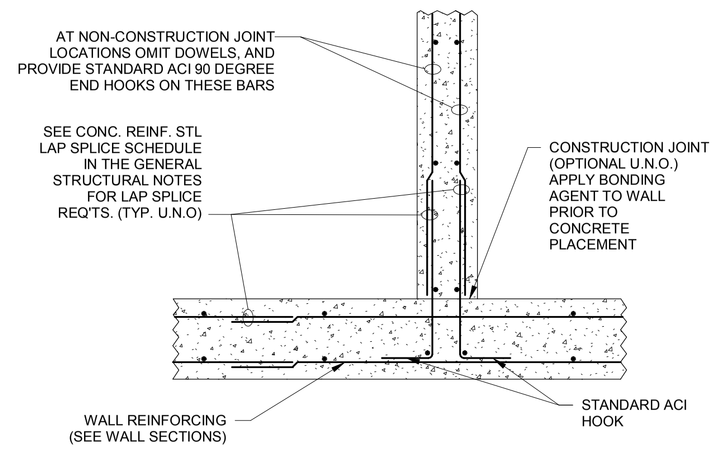
DRAWING NO.
S1-1
21 OF 26



9 S1-2 TYPICAL STEP FOOTING
1/2" = 1'-0"

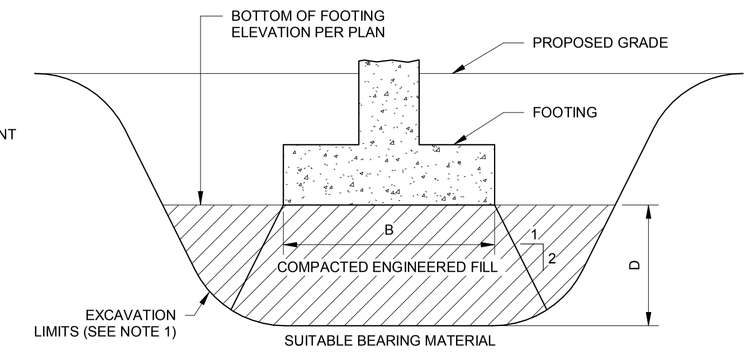


6 S1-2 TYPICAL WALL TO BASE SLAB
1" = 1'-0"



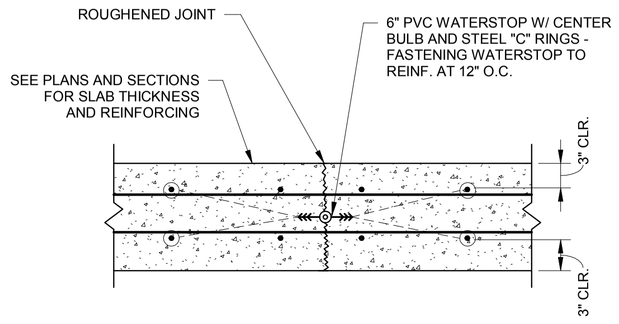
WALL REINFORCING - PLAN VIEW
(BOTH FACES)

3 S1-2 TYP. CONC. WALL INTERSECTION
1/8" = 1'-0"



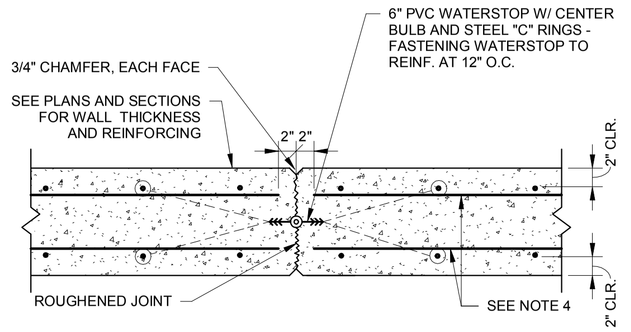
NOTES:
1. DEWATER EXCAVATION AS REQUIRED.
2. WIDTH OF EXCAVATION SHALL EQUAL WIDTH OF FOOTING PLUS DEPTH OF UNDERCUT (W=B+D).

1 S1-2 TYP. FOOTING IN UNDERCUT AREA
1" = 1'-0"



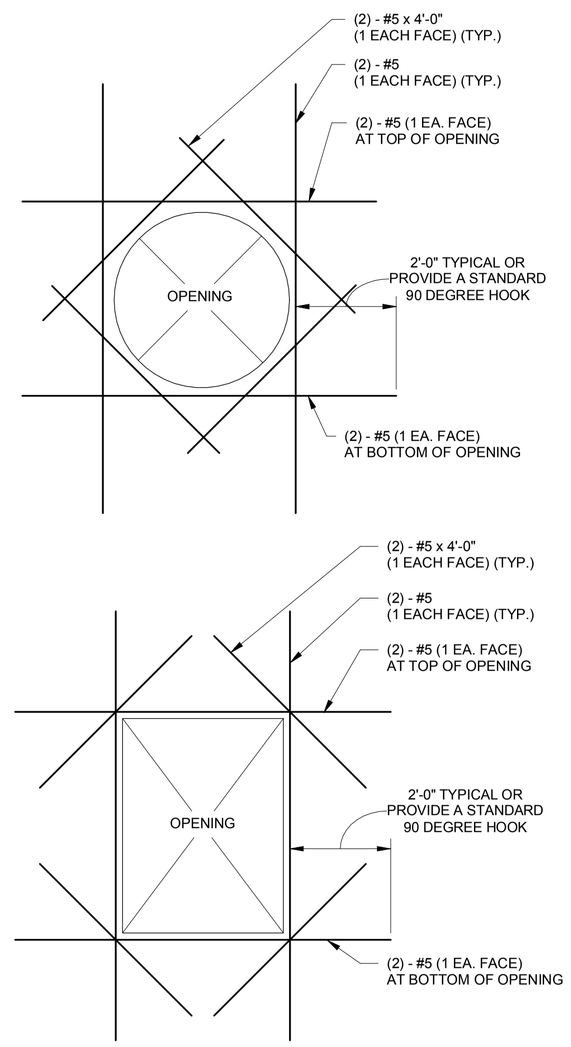
NOTES:
1. ALL REINFORCING TO BE CONTINUOUS THRU JOINT.
2. CONSTRUCTION JOINT SPACING NOT TO EXCEED 75'-0".
3. SEE SOIL REPORT FOR UNDERSLAB PREPARATION AND COMPACTION.
4. SEE GENERAL STRUCTURAL NOTES FOR LAP SPLICE REQUIREMENTS.

7 S1-2 TYP. BASE SLAB CONSTRUCTION JT.
1" = 1'-0"

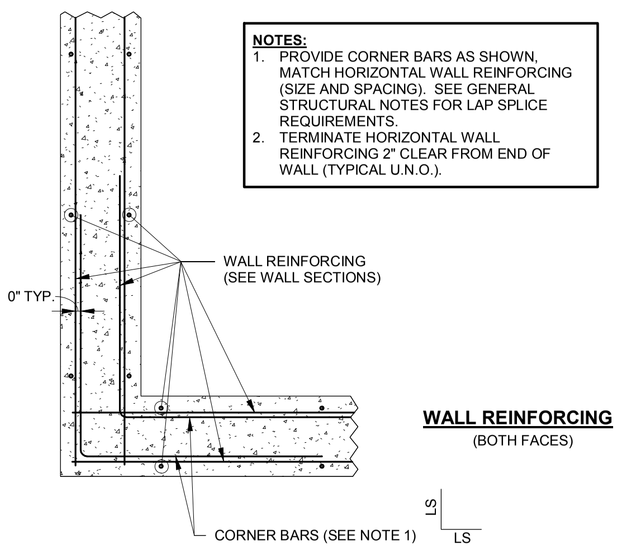


NOTES:
1. UNLESS NOTED OTHERWISE, CONSTRUCTION JOINT SPACING NOT TO EXCEED 75 FEET.
2. 50% OF THE HORIZ. REINF. STEEL SHALL BE CONTINUOUS THRU JOINT. HORIZONTAL BARS THAT STOP SHORT OF JOINT SHALL BE FABRICATED ACCORDINGLY AND SHALL NOT BE FIELD CUT. CONTINUOUS AND DISCONTINUOUS HORIZ. BARS SHALL BE ALTERNATED ALONG WALL HEIGHT.
3. CONSTRUCTION JOINTS SHALL NOT OCCUR WITHIN 5'-0" OF A CORNER.
4. SEE GENERAL STRUCTURAL NOTES FOR LAP SPLICE REQUIREMENTS.

4 S1-2 TYP. WALL CONSTRUCTION JOINT
1" = 1'-0"

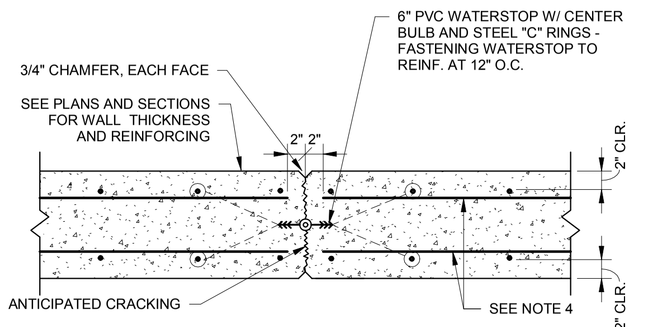


2 S1-2 TYP. OPENING IN CONCRETE WALL
1/8" = 1'-0"



WALL REINFORCING
(BOTH FACES)

TYPICAL CONCRETE WALL CORNER REINFORCEMENT - PLAN VIEW
8 S1-2 1/8" = 1'-0"



NOTES:
1. UNLESS NOTED OTHERWISE, CONTRACTION JOINT SPACING NOT TO EXCEED 25 FEET.
2. 50% OF THE HORIZ. REINF. STEEL SHALL BE CONTINUOUS THRU JOINT. HORIZONTAL BARS THAT STOP SHORT OF JOINT SHALL BE FABRICATED ACCORDINGLY AND SHALL NOT BE FIELD CUT. CONTINUOUS AND DISCONTINUOUS HORIZ. BARS SHALL BE ALTERNATED ALONG WALL HEIGHT.
3. CONTRACTION JOINTS SHALL NOT OCCUR WITHIN 5'-0" OF A CORNER.
4. SEE GENERAL STRUCTURAL NOTES FOR LAP SPLICE REQUIREMENTS.

5 S1-2 TYP. WALL CONTRACTION JOINT
1" = 1'-0"

NOTES:
1. WHERE VERTICAL REINFORCING IS INTERRUPTED BY THE OPENING, ONE HALF OF THE INTERRUPTED STEEL SHALL BE ADDED TO EACH SIDE OF THE OPENING. USE FULL LENGTH BARS.
2. THIS DETAIL APPLIES TO ALL OPENINGS IN CONCRETE WALLS UNLESS DETAILED OTHERWISE ON THE PLANS.

2 S1-2 TYP. OPENING IN CONCRETE WALL
1/8" = 1'-0"

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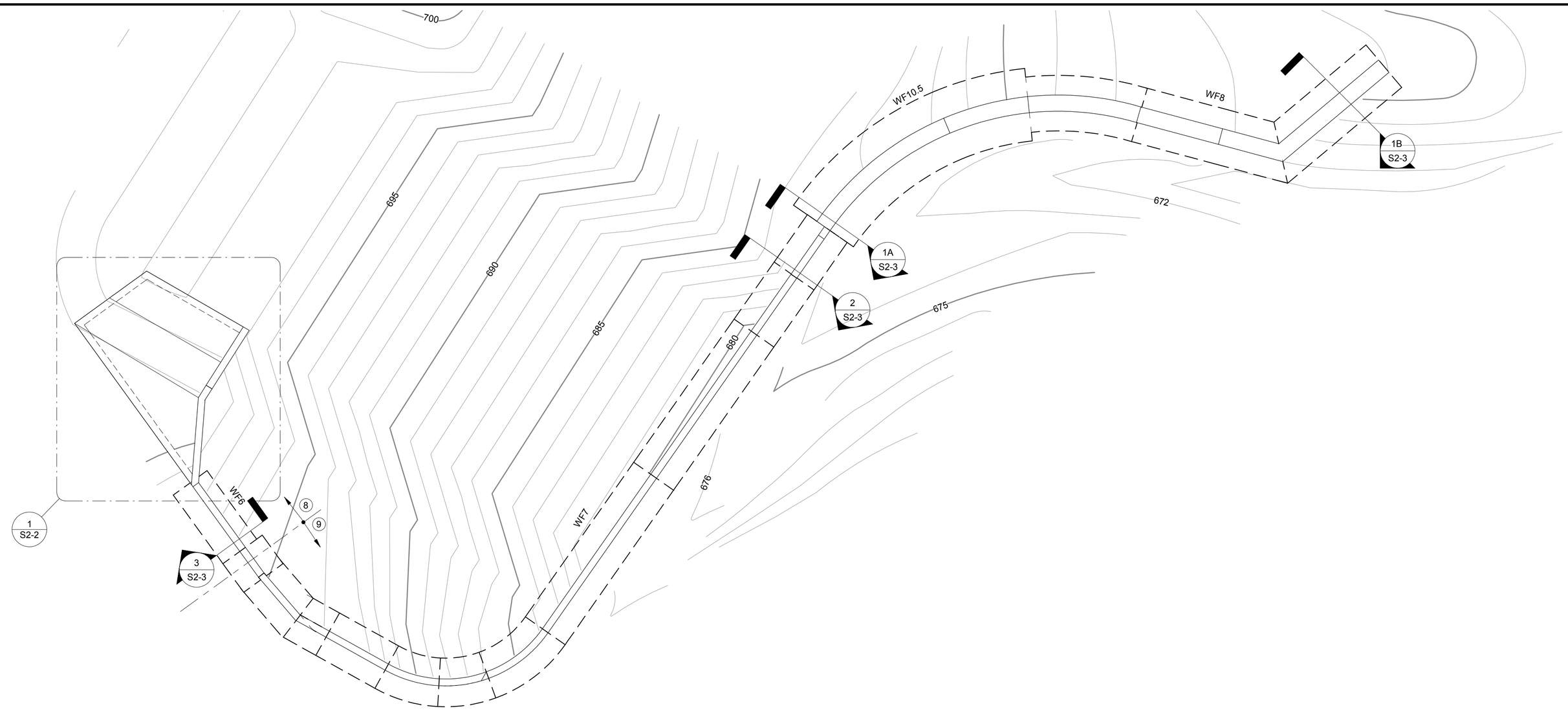
INDIANA DEPARTMENT OF NATURAL RESOURCES
CROSLEY FISH & WILDLIFE AREA - CROSLEY LAKE
DAM IMPROVEMENTS PROJECT

PROJECT NO. E020098

TYPICAL STRUCTURAL DETAILS - CONCRETE

DRAWING NO.
S1-2
22 OF 26



FOUNDATION PLAN NOTES

○ INDICATES NOTE REFERENCED IN PLAN

1. SEE THE S1-SERIES SHEETS FOR GENERAL STRUCTURAL NOTES AND TYPICAL STRUCTURAL DETAILS.
2. GENERAL CONTRACTOR TO COORDINATE ALL OPENING, PIPE SLEEVES, EMBEDDED ITEMS, HANDRAILS, GRATING, ETC. WITH THE PROCESS DRAWINGS.
3. ALL DIMENSIONS AND ELEVATIONS SHALL BE VERIFIED PRIOR TO FABRICATION, CONSTRUCTION OR ERECTION. THE GENERAL CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR ANY DISCREPANCIES.
4. SEE SITE PLAN FOR ALL FINAL GRADE ELEVATIONS.
5. SEE GEOTECHNICAL REPORT FOR ALL BACKFILLING AND COMPACTION REQUIREMENTS BEHIND WALLS AND UNDER BASE SLABS.
6. GENERAL CONTRACTOR SHALL SUBMIT A CONSTRUCTION JOINT (CJ) AND CONTRACTION JOINT (CT) LOCATION PLAN TO THE STRUCTURAL ENGINEER FOR REVIEW PRIOR TO CONCRETE PLACEMENT.
7. SEE DETAILS 4/S1-2 AND 5/S1-2 FOR WALL CONSTRUCTION JOINT AND WALL CONTRACTION JOINT REQUIREMENTS.

(8) FOUNDATION OF RETAINING WALL ANTICIPATED IN SOIL.

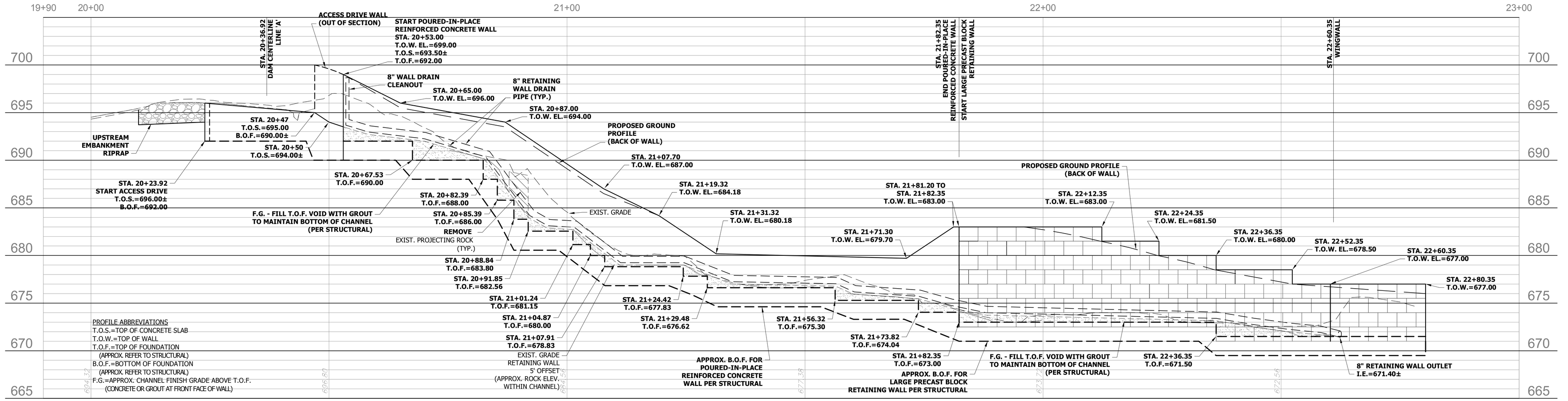
(9) FOUNDATION OF RETAINING WALL ANTICIPATED IN ROCK.

1 S2-1 OVERALL FOUNDATION PLAN

1" = 10'-0"

2 S2-1 LINE 'W' PROFILE

1" = 10'-0" - HORIZONTAL
1" = 5'-0" - VERTICAL



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02.02.18

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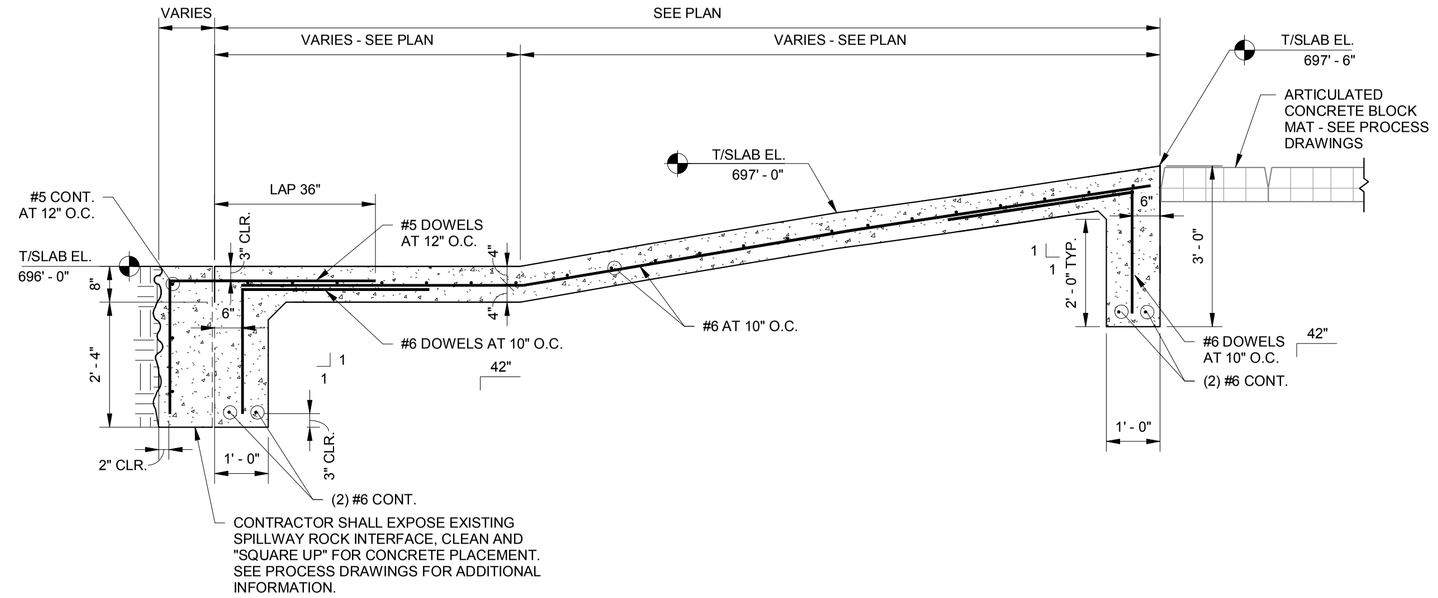
DESIGNED BY:	JDT
CHECKED BY:	JDT
DATE:	01/19/18
JOB NO:	16-107
SCALE:	AS NOTED

INDIANA DEPARTMENT OF NATURAL RESOURCES
CROSLEY FISH & WILDLIFE AREA - CROSLEY LAKE
DAM IMPROVEMENTS PROJECT

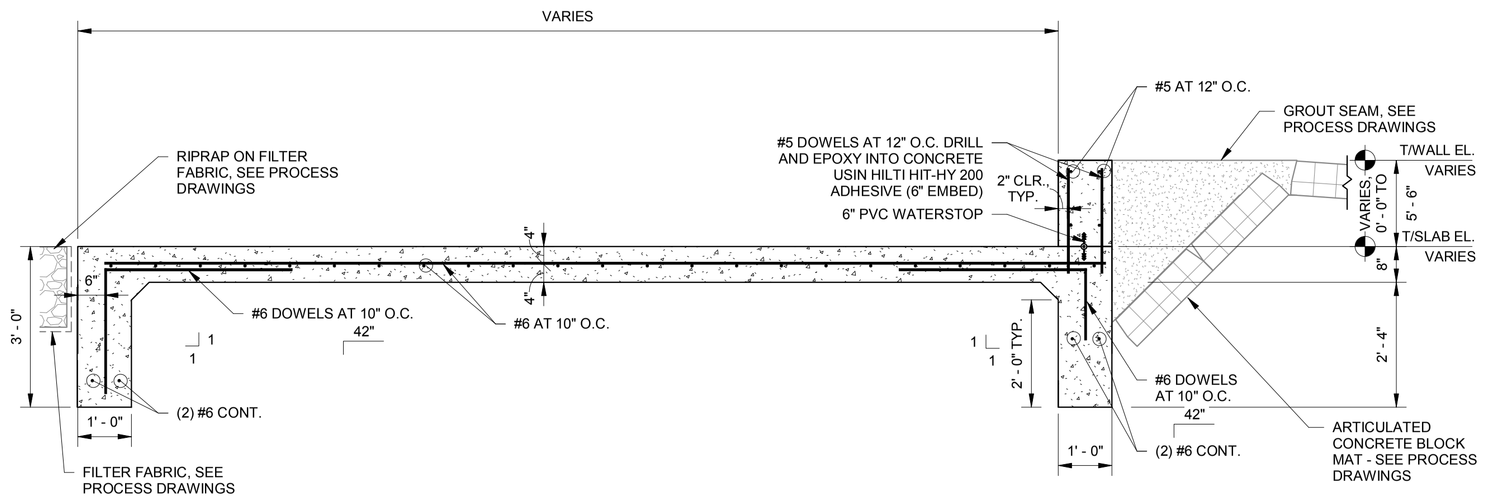
PROJECT NO. E020098

OVERALL FOUNDATION PLAN
AND RETAINING WALL PROFILE

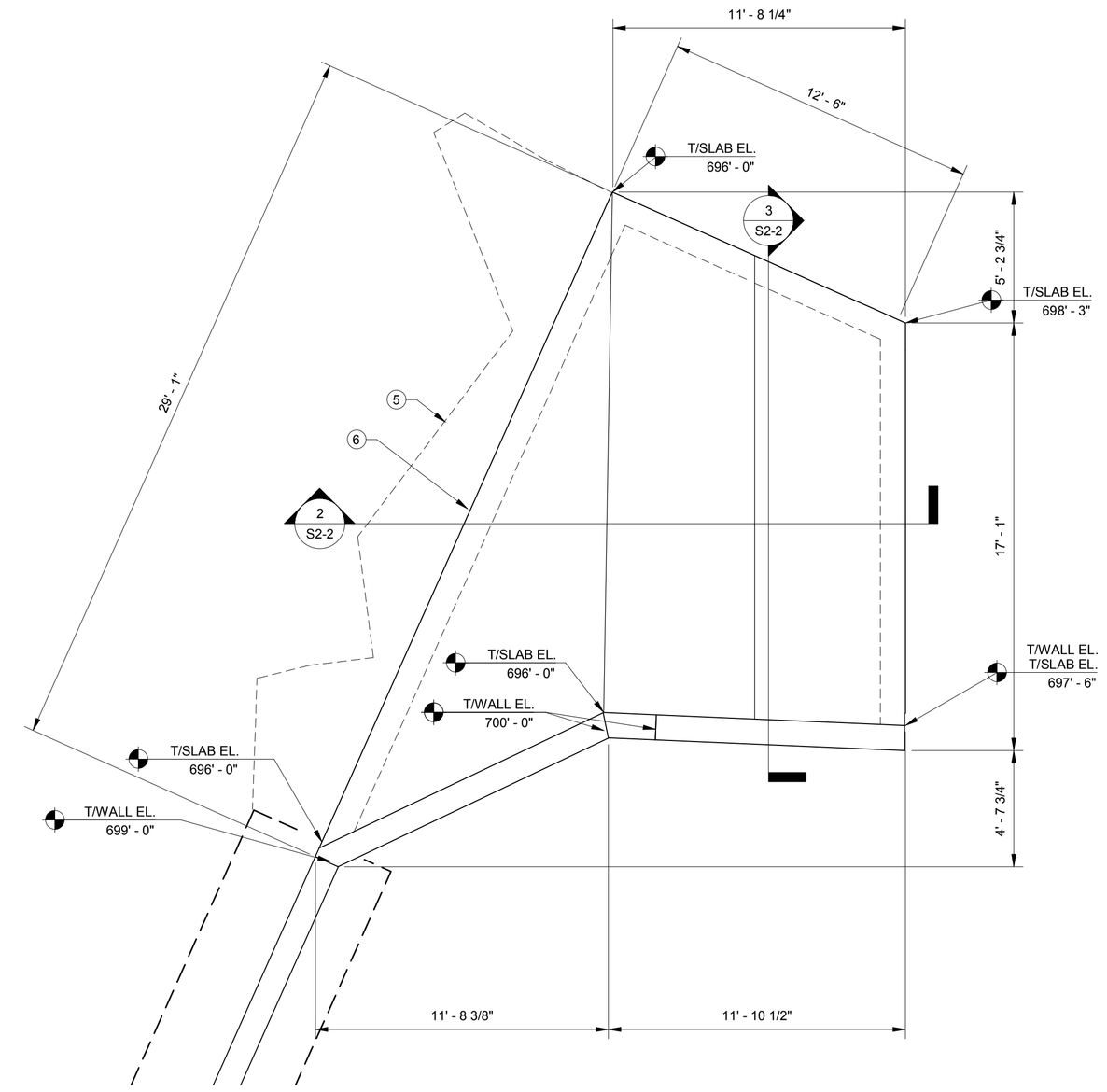
DRAWING NO.
S2-1
23 OF 26



2 / S2-2 **SECTION**
1/2" = 1'-0"



3 / S2-2 **SECTION**
1/2" = 1'-0"



1 / S2-1 **ACCESS DRIVE - ENLARGED FOUNDATION PLAN**
1/4" = 1'-0"

FOUNDATION PLAN NOTES

- ◯ INDICATES NOTE REFERENCED IN PLAN
1. SEE THE S1-SERIES SHEETS FOR GENERAL STRUCTURAL NOTES AND TYPICAL STRUCTURAL DETAILS.
2. ALL DIMENSIONS AND ELEVATIONS SHALL BE VERIFIED PRIOR TO FABRICATION, CONSTRUCTION OR ERECTION. THE GENERAL CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR ANY DISCREPANCIES.
3. SEE SITE PLAN FOR ALL FINAL GRADE ELEVATIONS.
4. SEE GEOTECHNICAL REPORT FOR ALL BACKFILLING AND COMPACTION REQUIREMENTS BEHIND WALLS AND UNDER BASE SLABS.
5. APPROXIMATE EXISTING ROCK EDGE. SEE PROCESS DRAWINGS FOR ADDITIONAL INFORMATION.
6. GENERAL CONTRACTOR - FIELD VERIFY TOP OF CONCRETE SLAB ELEVATIONS PRIOR TO CONCRETE PLACEMENT. TOP OF CONCRETE SLAB ELEVATION TO MATCH EXISTING TOP OF ROCK ELEVATIONS.

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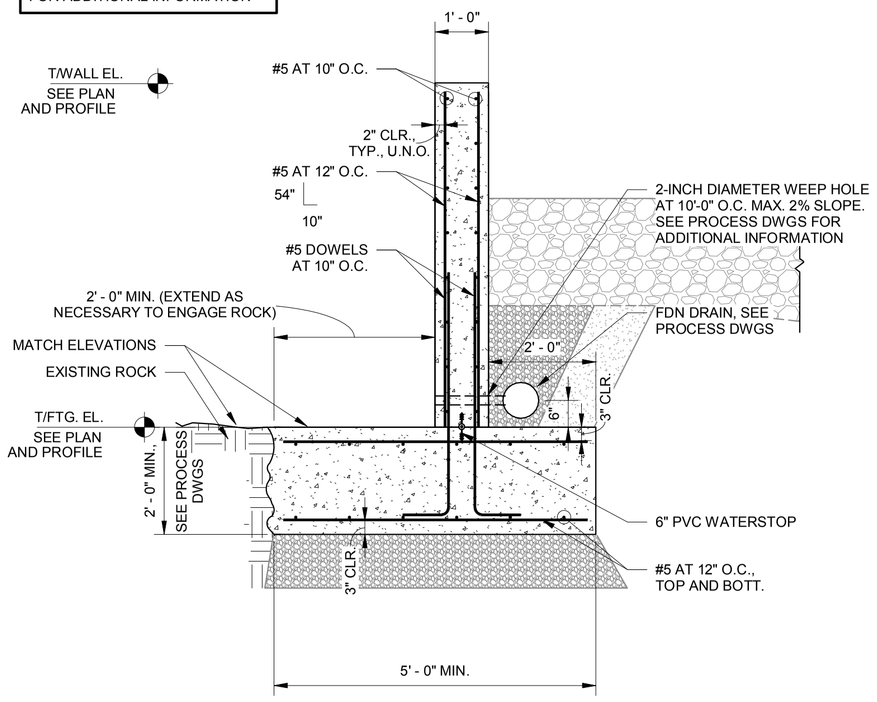
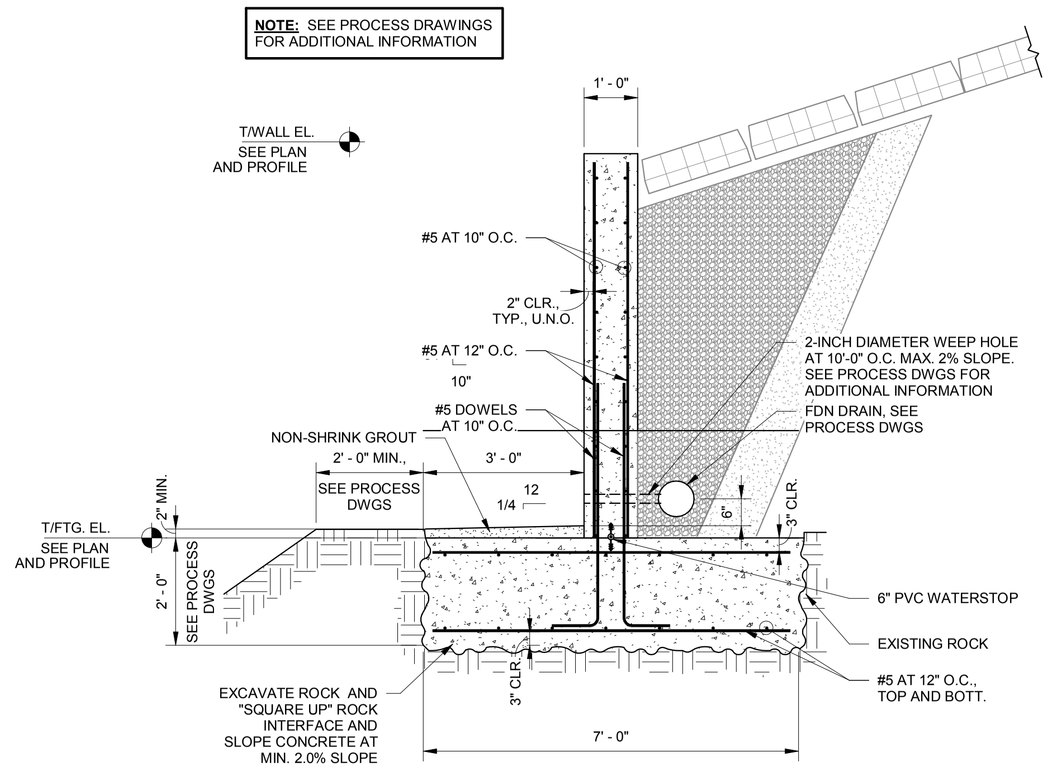
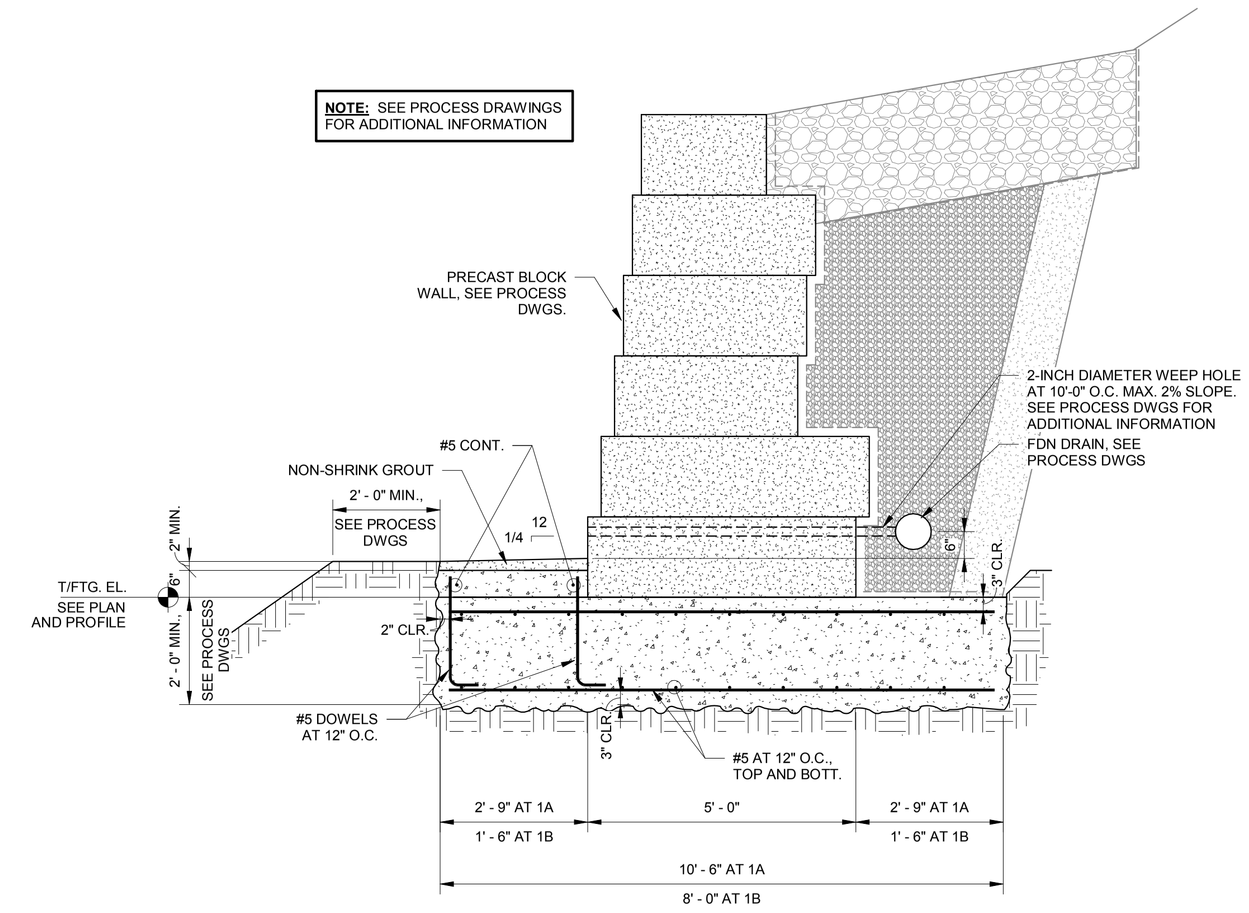
ACCESS DRIVE - ENLARGED FOUNDATION PLAN,
SECTIONS, AND DETAILS

DRAWING NO.
S2-2
24 OF 26







3 S2-3 FOUNDATION WALL IN SOIL
1/2" = 1'-0"

2 S2-3 FOUNDATION WALL IN ROCK
1/2" = 1'-0"

1 S2-3 PRECAST BLOCK RETAINING WALL
1/2" = 1'-0"

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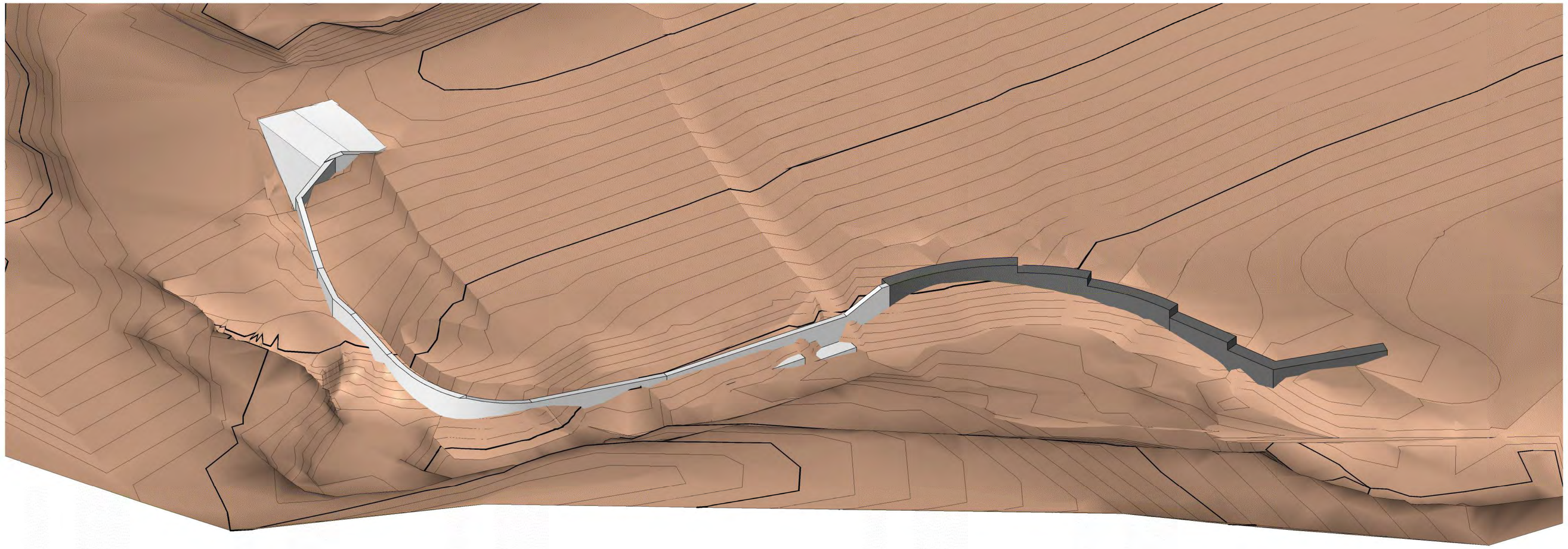
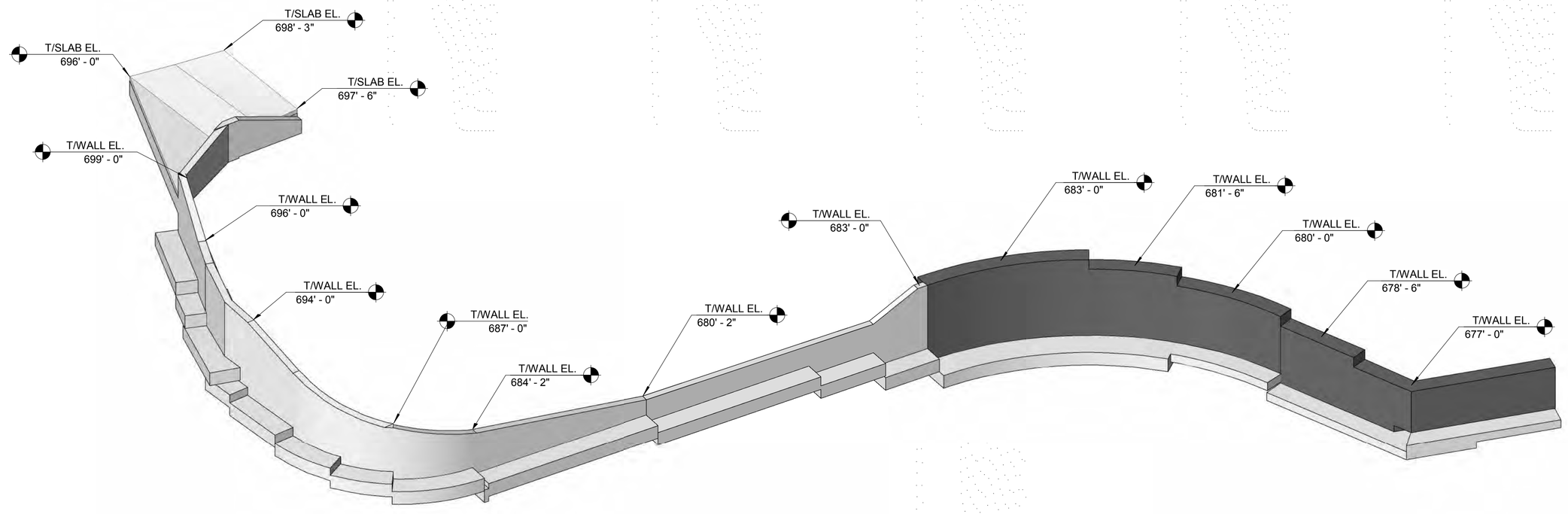
PROJECT NO. E020098

RETAINING WALL
SECTIONS AND DETAILS

DRAWING NO.
S2-3
25 OF 26



1 S2-4 ISOMETRIC



2 S2-4 ISOMETRIC

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ISOMETRIC VIEWS

DRAWING NO.

S2-4