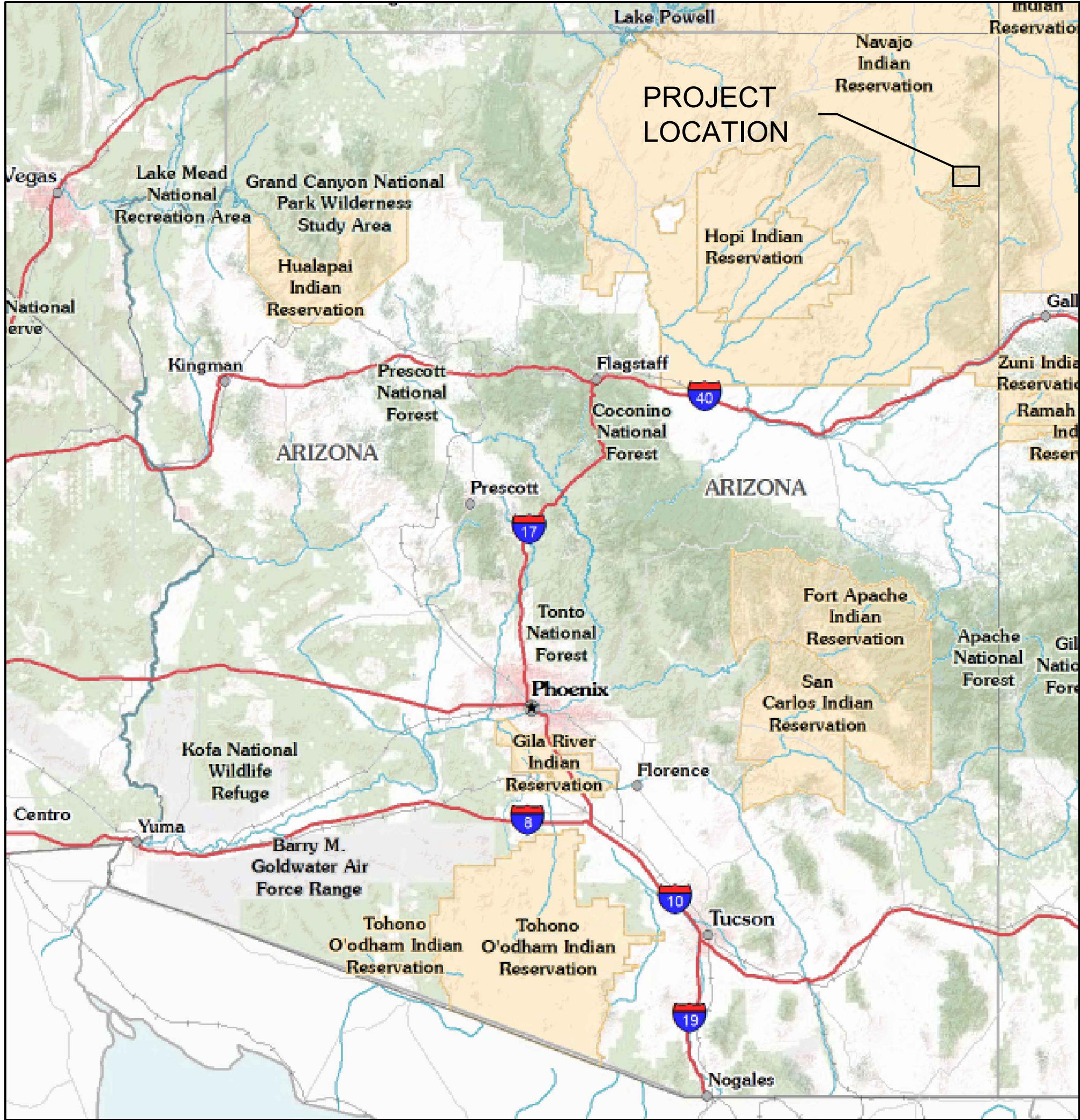


TSIALE DAM MODIFICATION
BUREAU OF INDIAN AFFAIRS
REGIONAL SAFETY OF DAMS PROGRAM
ARIZONA

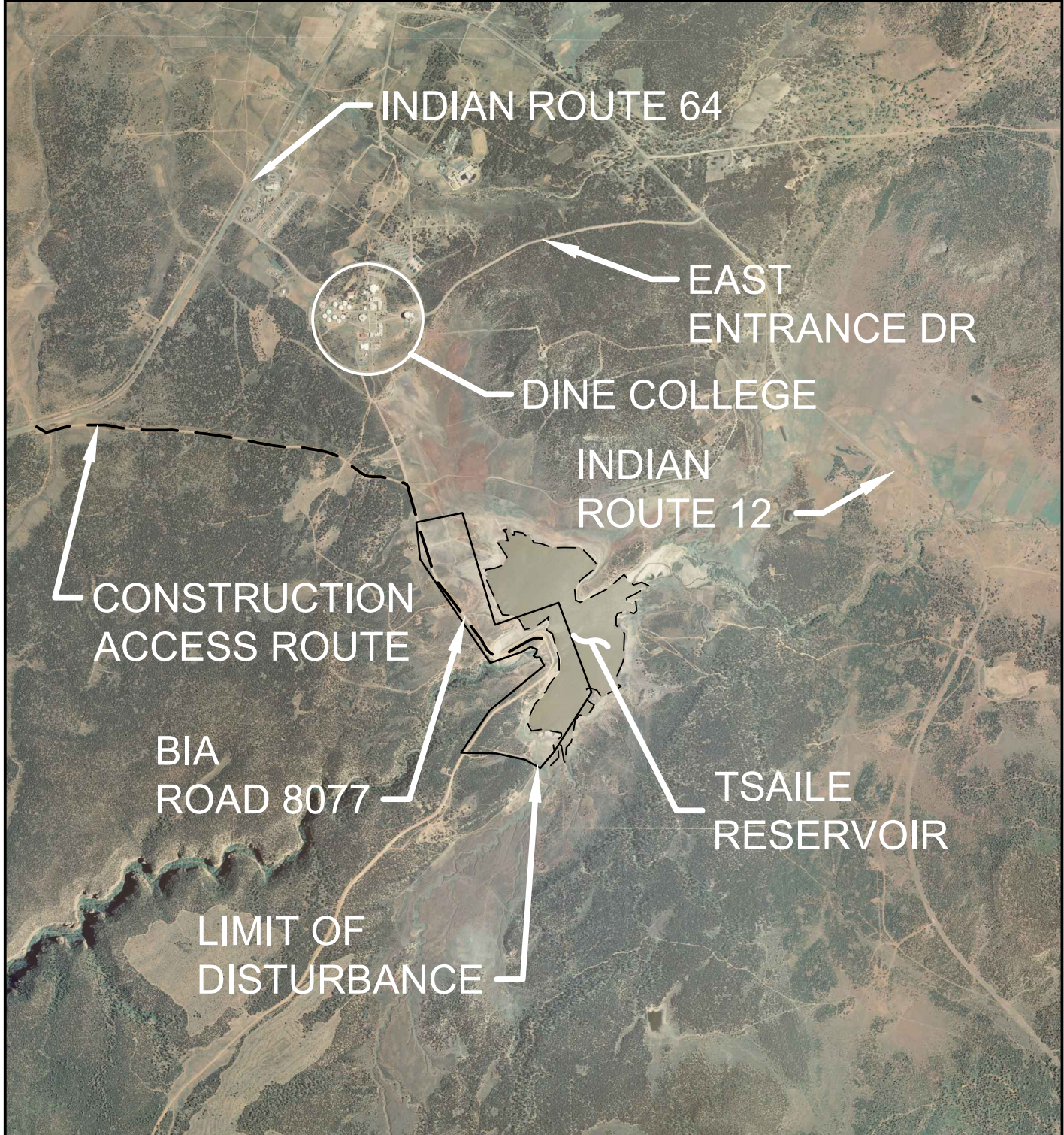
LIST OF DRAWINGS

SHEET NUMBER	SHEET TITLE
G-1	COVER SHEET, LOCATION MAP AND LIST OF DRAWINGS
G-2	GENERAL ABBREVIATIONS AND LEGEND
G-3	GENERAL CONSTRUCTION NOTES
G-4	PLAN OF BORROW AREAS AND STAGING AREA
G-5	HYDRAULIC INFORMATION
C-1	PLAN OF EXISTING CONDITIONS AND DEMOLITION
C-2	PLAN OF RECENT EXPLORATIONS
C-3	SUBSURFACE PROFILES
C-4	SUBSURFACE PROFILES
C-5	GENERAL PLAN OF MODIFICATIONS
C-6	FOUNDATION EXCAVATION PLAN AND GROUTING
C-7	EXCAVATION SECTION AND GROUTING DETAIL
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C-9	EMBANKMENT PROFILE
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C-20	GEOTECHNICAL INSTRUMENTATION DETAILS
C-21	BIA ROAD 8077 SITE PLAN
C-22	BIA ROAD 8077 PLAN AND PROFILE
C-23	BIA ROAD 8077 PLAN AND PROFILE
C-24	BIA ROAD 8077 PLAN AND PROFILE WITH CULVERT CROSSING
C-25	BIA ROAD 8077 CULVERT CROSSING DETAILS
C-26	BIA ROAD 8077 SPILLWAY CROSSING DETAILS
C-27	BIA ROAD 8077 CHANNEL CROSSING DETAILS
C-28	10' ACCESS ROAD PLAN AND PROFILE
C-29	TEMPORARY ROAD SITE PLAN
C-30	TEMPORARY ROAD PLAN AND PROFILE
C-31	TEMPORARY ROAD PLAN AND PROFILE
C-32	TEMPORARY ROAD PLAN AND PROFILE AND ROAD SECTIONS
C-33	OUTLET WORKS PLAN AND PROFILE
C-34	TEMPORARY CONSTRUCTION SIGNAGE AND PERMANENT SIGNAGE
C-35	BIA ROAD 8077 GUARDRAIL DETAILS
C-36	EROSION AND SEDIMENT CONTROL NOTES
S-1	STRUCTURAL NOTES
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S-10	CONTROL ROOM SECTIONS & ELEVATIONS
S-11	OUTLET DISSIPATION STRUCTURE
S-12	DETAILS
S-13	DETAILS
S-14	DETAILS
S-15	DETAILS



STATE OF ARIZONA

NOT TO SCALE



PROJECT LOCATION

NOT TO SCALE

APPROVED:

PEARL CHAMBERLIN, P.E. - BIA - NRC

DATE _____

JACK BYERS, P.E. - BIA - CHIEF SOD

DATE _____

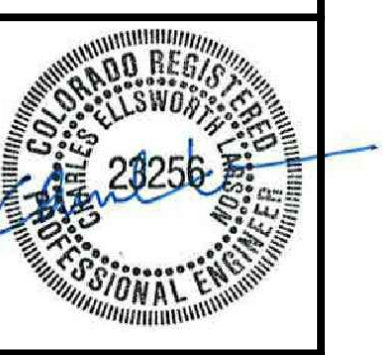
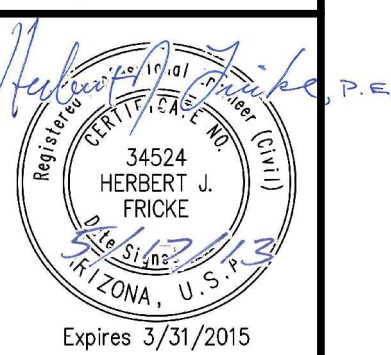
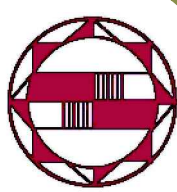
DEBORA MILLER, P.E., PhD - ITR

DATE _____

TARA SCHUTTER, P.E. - ITR

DATE _____

Cooper Zietz Engineers, Inc.

[illegible]COVER SHEET, LOCATION MAP AND LIST OF
DRAWINGS

TSAILLE DAM MODIFICATION
BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL SAFETY OF DAMS PROGRAM - ARIZONA

SHEET 1 of 56

G-1

CAD FILE: G:\clients\Bureau Of Indian Affairs\128437 Tsalle\Civil\CADD\ACAD\Production Drawings\60% Design Set\Latest\2General Notes.dwg
LAYOUT: GENERAL ABBREVIATIONS AND LEGEND
PLOTTED: 11/18/2013 5:14 PM
BY: roberto.ruiz-salas

GENERAL NOTES

1. LOCATION AND NATURE OF EXISTING UTILITIES SHOWN ON THE DRAWINGS ARE APPROXIMATE. FIELD LOCATE ALL UTILITIES, WHETHER SHOWN ON THE DRAWINGS OR NOT. PRIOR TO EXCAVATION, PROTECT ALL UTILITIES IN PLACE UNLESS DESIGNATED FOR REMOVAL OR REPLACEMENT.
2. VERIFY AND CHECK ALL DIMENSIONS AND DETAILS ON THE CONSTRUCTION DRAWINGS AND SPECIFICATIONS FOR ANY DISCREPANCY. ANY DISCREPANCY SHALL BE BROUGHT TO THE ATTENTION OF THE COR FOR CLARIFICATION.
3. WORK INCIDENTAL TO THE CONTRACT AND NECESSARY TO COMPLETE THE PROJECT, ALTHOUGH NOT SPECIFICALLY REFERRED TO ON THE CONTRACT DOCUMENTS, SHALL BE FURNISHED AND PERFORMED BY THE CONTRACTOR.
4. IN PERFORMING ALL WORK, THE CONTRACTOR SHALL EXERCISE DUE CARE AND CAUTION NECESSARY TO AVOID ANY DAMAGE TO AND IMPAIRMENT IN THE USE OF ANY EXISTING UTILITY LINE. ANY DAMAGE INFLICTED ON EXISTING UTILITY LINES RESULTING FROM THE CONTRACTOR'S OPERATIONS SHALL BE IMMEDIATELY REPAIRED OR RESTORED AS DIRECTED BY THE COR AT THE CONTRACTOR'S EXPENSE. BEFORE DISRUPTING SERVICE OF ANY UTILITY, THE CONTRACTOR SHALL CONTACT AND COORDINATE HIS WORK WITH THE RESPONSIBLE UTILITY AUTHORITY.
5. ALL CONSTRUCTION LINES, GRADES AND SURVEY MONUMENT STAKEOUTS SHALL BE MADE BY SURVEYORS, LICENSED IN THE STATE OF ARIZONA.
6. THE CONTRACTOR SHALL NOTIFY THE COR 14 DAYS IN ADVANCE OF OPENING OR EXPANDING ANY EXCAVATIONS OR PITS FOR ON-SITE BORROW, SO THAT A DETERMINATION CAN BE MADE AS TO THE SUITABILITY OF THE BORROW MATERIAL TO BE INCORPORATED INTO THE CONSTRUCTION.
7. PERMITS TO BE OBTAINED BY CONTRACTOR SHALL BE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
8. DIMENSIONS TAKE PRECEDENCE OVER SCALE.
9. THE CONTRACTOR SHALL PROVIDE TO THE COR "AS BUILT" DRAWINGS OF ALL NEW UTILITIES, STRUCTURES AND EMBANKMENTS UPON COMPLETION OF WORK.
10. CONTRACTOR SHALL, AT HIS/HER OWN EXPENSE, FURNISH, INSTALL AND MAINTAIN TEMPORARY UTILITY SERVICES THROUGHOUT THE CONSTRUCTION PERIOD AND REMOVE SAID UTILITIES UPON COMPLETION OF THE WORK.
11. THE CONTRACTOR SHALL OBSERVE AND COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS REQUIRED FOR THE PROTECTION OF PUBLIC HEALTH, SAFETY, AND ENVIRONMENTAL QUALITY, HISTORICAL ARTIFACTS, THREATENED AND ENDANGERED SPECIES HABITAT, AND CULTURAL RESOURCES.
12. PRIOR TO EXCAVATION, THE CONTRACTOR IS REQUIRED TO CONTACT THE ARIZONA ONE CALL CENTER AT (800) 782-5345

GRADING NOTES

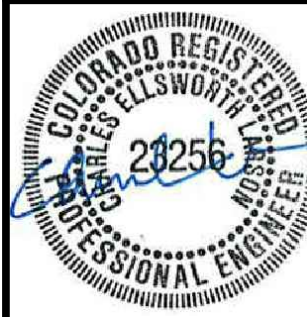
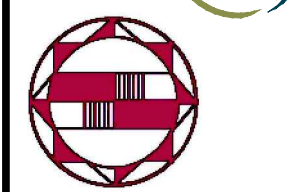
1. ALL GRADING WORK SHALL CONFORM TO THE REGULATIONS OUTLINED IN THE SPECIFICATIONS.
2. THE CONTRACTOR SHALL REMOVE ALL SILT AND DEBRIS DEPOSITED IN DRAINAGE FACILITIES, ROADWAYS AND OTHER AREAS RESULTING FROM HIS/HER WORK. THE COSTS INCURRED FOR ANY NECESSARY REMEDIAL ACTION BY THE NAVAJO NATION SHALL BE PAYABLE BY THE CONTRACTOR.
3. THE CONTRACTOR, AT HIS/HER OWN EXPENSE, SHALL KEEP THE PROJECT AND SURROUNDING AREAS FREE FROM DUST NUISANCES, PURSUANT TO LOCAL/STATE REGULATIONS.
4. THE CONTRACTOR SHALL SEED OR PROTECT ALL SLOPES AND EXPOSED AREAS FROM EROSION IMMEDIATELY AFTER THE GRADING WORK HAS BEEN COMPLETED. SEED MIX SHALL BE APPROVED BY COR.
5. THE CONTRACTOR SHALL REMOVE ALL VEGETATION AND STRIP GROUND TO MINIMUM 6-INCH DEPTH BEFORE PLACING STOCKPILES ON NATURAL GROUND SURFACE.
6. ALL TREES THAT NEED TO BE TRIMMED OR REMOVED SHALL BE FLAGGED FOR APPROVAL BY THE COR.

SOLID WASTE NOTES

1. UNLESS OTHERWISE SPECIFIED, THE CONTRACTOR IS RESPONSIBLE FOR THE PROPER HANDLING, TRANSPORTATION, STORAGE AND/OR DISPOSAL OF ALL WASTE GENERATED BY THIS CONSTRUCTION INCLUDING GRUBBING AND EXCESS EXCAVATED MATERIAL. ANY MATERIAL BROUGHT TO THE LOCAL GOVERNMENT LANDFILLS WILL BE SUBJECT TO THE INSTITUTED TIPPING FEE SYSTEM, WITH NO EXCEPTIONS OR EXEMPTION. THE LANDFILL FEE SHALL BE INCLUDED IN THE CONTRACTOR'S COST.
2. IF A LOCAL GOVERNMENT LANDFILL IS USED, THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE ALL NECESSARY LABOR, EQUIPMENT, MATERIALS AND SUPPLIES TO PROPERLY TRANSPORT THE WASTE TO THE LANDFILL.

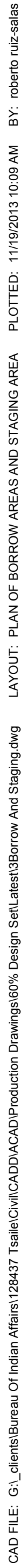
SURVEY NOTES

1. ALL TOPOGRAPHY, COORDINATES, AND ELEVATIONS SHOWN ARE IN GRID ARIZONA STATE PLANE COORDINATE SYSTEM, ARIZONA EAST ZONE, U.S. SURVEY FEET, NAD 83 HORIZONTAL DATUM AND NAVD 88 VERTICAL DATUM. THE TOPOGRAPHY WAS GENERATED BY USBR FROM AERIAL SURVEY DATED NOVEMBER 2006.



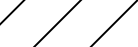
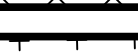
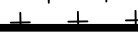
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PROJECT NO.	128437			
DRAWN BY	R. RUIZ-SALAS			
CHECKED BY	C. LARSON			
FILE NAME	1	TEMPORARY ROAD REALIGNMENT	C2 / M/F	11-22-2013
	NO.	DESCRIPTION	BY	DATE
2General Notes.dwg				
REVISIONS				

G-3	GENERAL CONSTRUCTION NOTES	TSAILE DAM MODIFICATION BUREAU OF INDIAN AFFAIRS NAVAJO REGIONAL SAFETY OF DAMS PROGRAM - ARIZONA	SHEET	3 of 56
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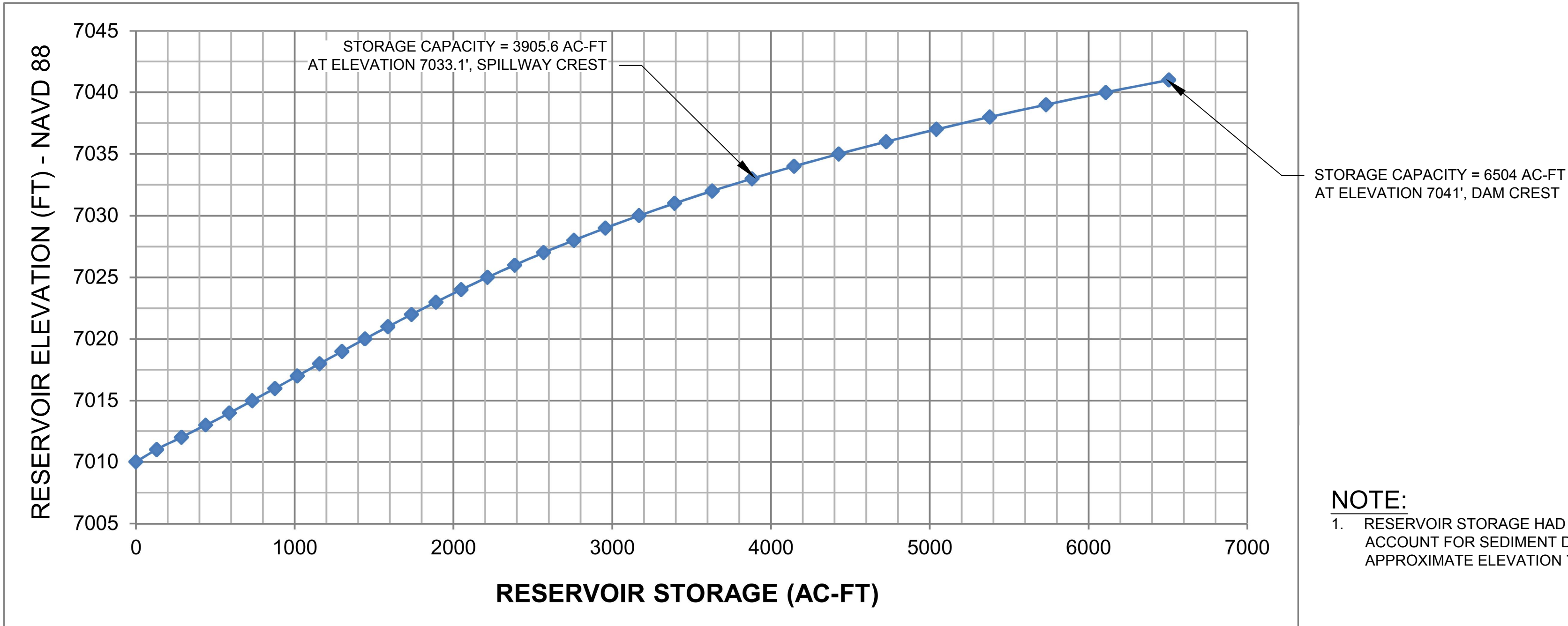
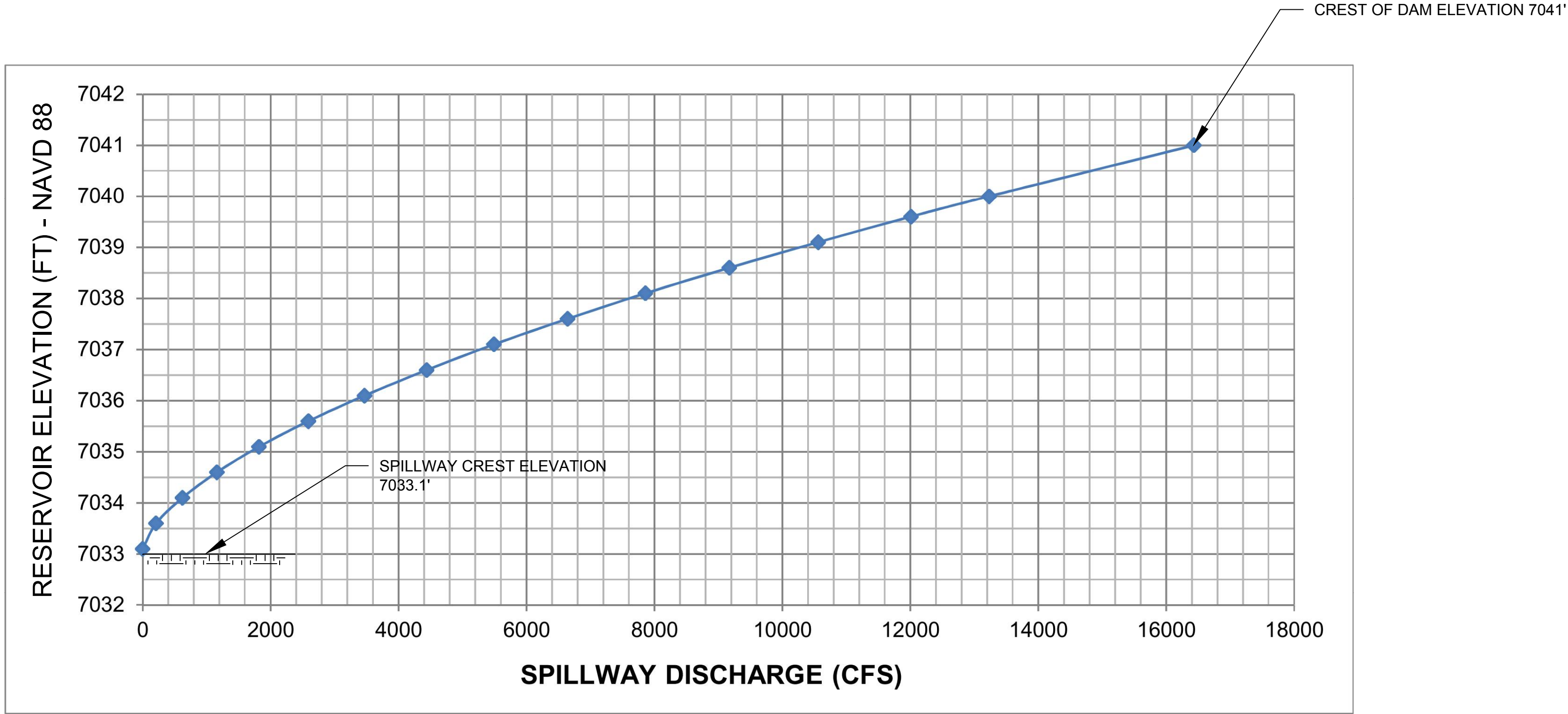


SUPPLEMENTAL BORROW AREA A3		
POINT #	NORTHING	EASTING
D-9	1918506.04	983006.6291
D-10	1918523.849	983061.4704
D-11	1918631.33	983229.0645
D-12	1918574.619	983315.4984
D-13	1918633.894	983396.9613
E-2	1918585.162	983789.9059
E-1	1918601.175	983498.4291
E-6	1918282.604	983421.575
E-5	1918132.874	983637.4186



- | LEGEND | |
|---|-------------------------------------|
| --- 390 --- | EXISTING INDEX CONTOURS (10') |
| | EXISTING INTERMEDIATE CONTOURS (2') |
|  | LIMIT OF DISTURBANCE |
|  | STAGING AREA |
|  | BORROW AREA A1 |
|  | BORROW AREA A2 |
|  | SUPPLEMENTAL BORROW AREA A3 |
|  | SPILLWAY RIPRAP BORROW AREA |

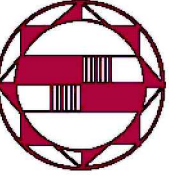
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NOTE:
1. RESERVOIR STORAGE HAD BEEN ADJUSTED TO ACCOUNT FOR SEDIMENT DEPOSITION TO APPROXIMATE ELEVATION 7010' IN 2012.

RESERVOIR ELEVATION (FT) NAVD 88	SPILLWAY DISCHARGE (CFS)
7033.1	0
7033.6	210
7034.1	620
7034.6	1160
7035.1	1820
7035.6	2590
7036.1	3470
7036.6	4440
7037.1	5490
7037.6	6640
7038.1	7860
7038.6	9170
7039.1	10560
7039.6	12010
7040	13230
7041	16430

RESERVOIR ELEVATION (FT) NAVD 88	RESERVOIR STORAGE (AC-FT)
7010	0
7011	130
7012	287
7013	440
7014	588
7015	732
7016	875
7017	1016
7018	1157
7019	1299
7020	1442
7021	1587
7022	1736
7023	1890
7024	2048
7025	2214
7026	2386
7027	2567
7028	2757
7029	2957
7030	3169
7031	3392
7032	3629
7033	3879
7034	4145
7035	4426
7036	4725
7037	5041
7038	5376
7039	5731
7040	6107
7041	6504



Cooper Zietz Engineers, Inc.



KLEINFELDER



20256

DATE: 11-22-2013

PROJECT NO: 128437

DRAWN BY: R. RUIZ-SALAS

CHECKED BY: C. LARSON

FILE NAME: 5Hydraulic info.dwg

HYDRAULIC INFORMATION

TSALE DAM MODIFICATION
BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL SAFETY OF DAMS PROGRAM - ARIZONA

SHEET

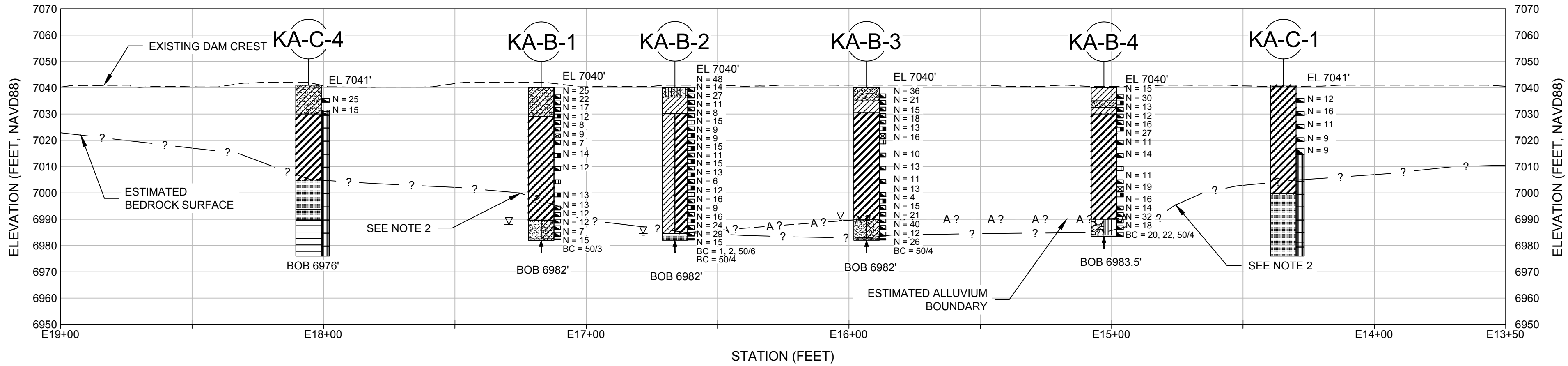
5 of 56

G-5

CAD FILE: G:\clients\Bureau Of Indian Affairs\128437 Tsale\civil\CADD\CAD Production Drawings\6% Design Set\Layout\7\Subsurface Profiles.dwg LAYOUT: PLAN OF RECENT EXPLORATIONS PLOTTED: 11/18/2013 5:18 PM BY: roberto.ruiz-salas

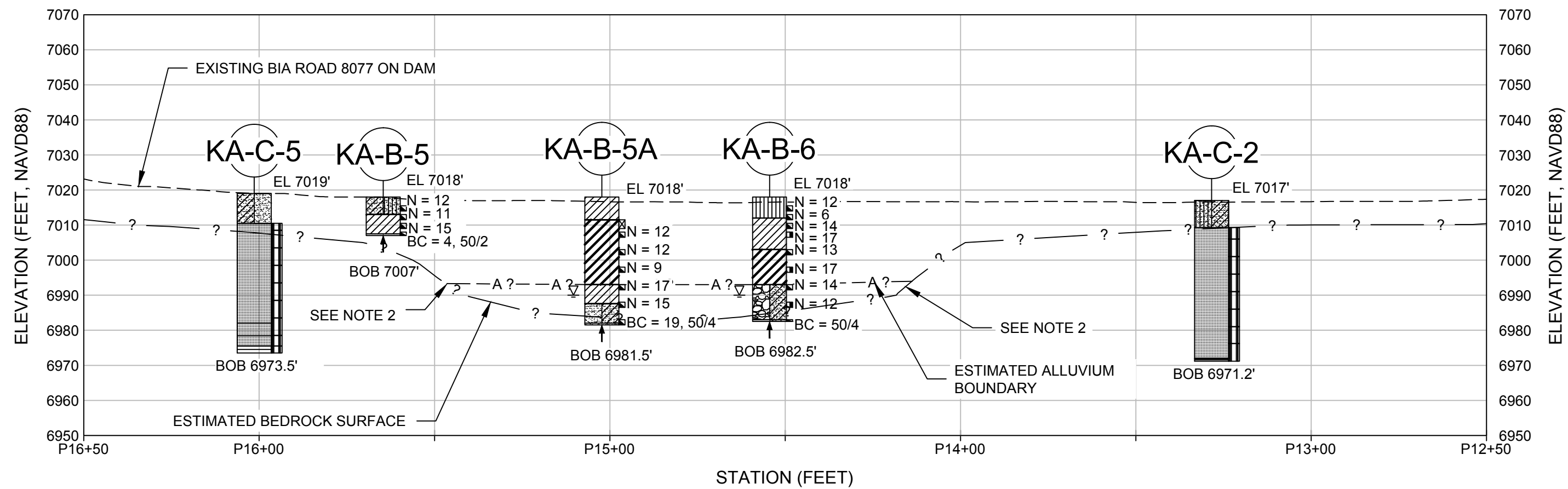


CAD FILE: G:\clients\Bureau Of Indian Affairs\22637 Tsale Civil\CAD\CAD Production Drawings\67% Design Set\Subsurface Profiles.dwg LAYOUT: SUBSURFACE PROFILES (1 OF 2) PLOTTED: 11/18/2013 5:18 PM BY: roberto.ruiz-salas



SUBSURFACE SECTION
EXISTING DAM CREST ALIGNMENT

A
C-2

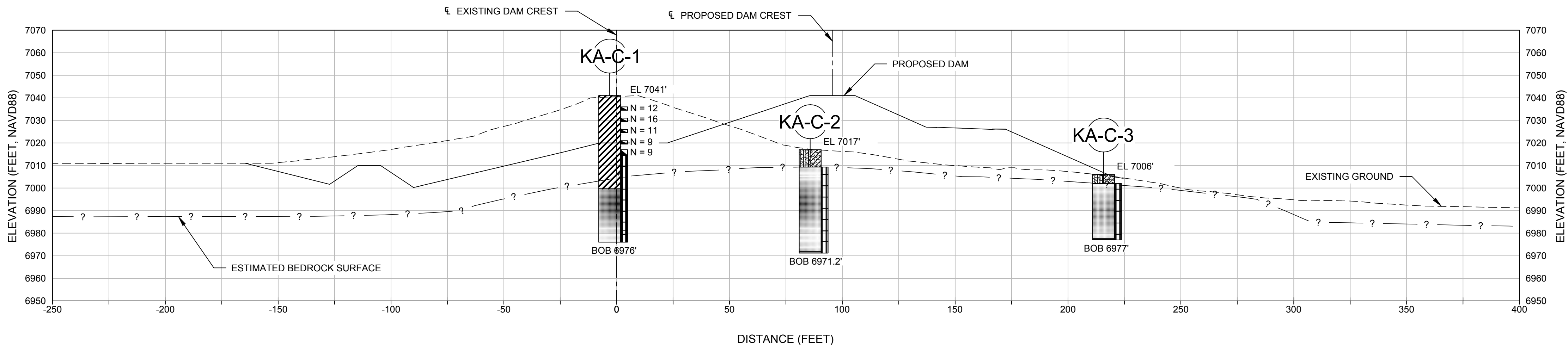


SUBSURFACE SECTION
EXISTING BIA ROAD 8077 ON DAM

B
C-2

NOTES:

1. THE SUBSURFACE INVESTIGATION INFORMATION IS PRESENTED TO INDICATE SOME OF THE CONDITIONS THAT MAY BE ENCOUNTERED DURING CONSTRUCTION AND IS OFFERED AS SUPPLEMENTARY INFORMATION ONLY. SUBSURFACE INFORMATION WAS DIRECTLY OBTAINED ONLY AT SPECIFIED LOCATIONS AND NECESSARILY INDICATES SUBSURFACE CONDITIONS ONLY AT THE RESPECTIVE PLAN LOCATION, DEPTHS PENETRATED, AND ONLY AT THE TIME OF THE EXPLORATION. THE CONTRACTOR IS TO MAKE HIS OWN INTERPRETATION OF ALL SUBSURFACE MATERIALS AND CONDITIONS. THE GOVERNMENT AND THE ENGINEER DO NOT ASSUME ANY RESPONSIBILITY WITH RESPECT TO THE SUFFICIENCY OR ACCURACY OF BORINGS MADE, OR OF THE LOGS OF BORINGS. MORE DETAILED SUBSURFACE INFORMATION CAN BE FOUND IN SPECIFICATION SECTION 53 10 00 - GEOLOGIC INVESTIGATIONS, AND SECTION 53 20 00 - RECORDS OF GEOLOGIC AND SUBSURFACE INVESTIGATIONS.
2. OVERHANGS AND STEEP SLOPES ARE EXPECTED IN THE ORIGINAL CREEK CHANNEL BANKS. SEE DETAIL (C-10) FOR TREATMENT.



SUBSURFACE SECTION
PROPOSED OUTLET CONDUIT ALIGNMENT

C
C-2



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KLEINFELDER
engineers • architects • planners



REVISIONS	
NO.	DESCRIPTION
1	TEMPORARY ROAD REALIGNMENT
BY	CZ / KLF
DATE	11-22-2013

DATE	PROJECT NO.	DRAWN BY	CHECKED BY	FILE NAME
11-22-2013	128437	R. RUIZ-SALAS	C. LARSON	7\Subsurface Profiles.dwg

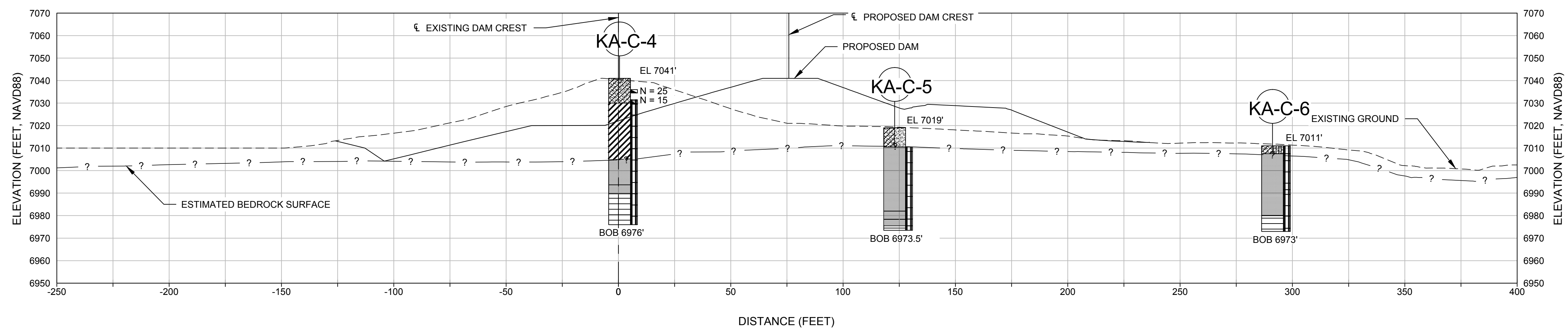
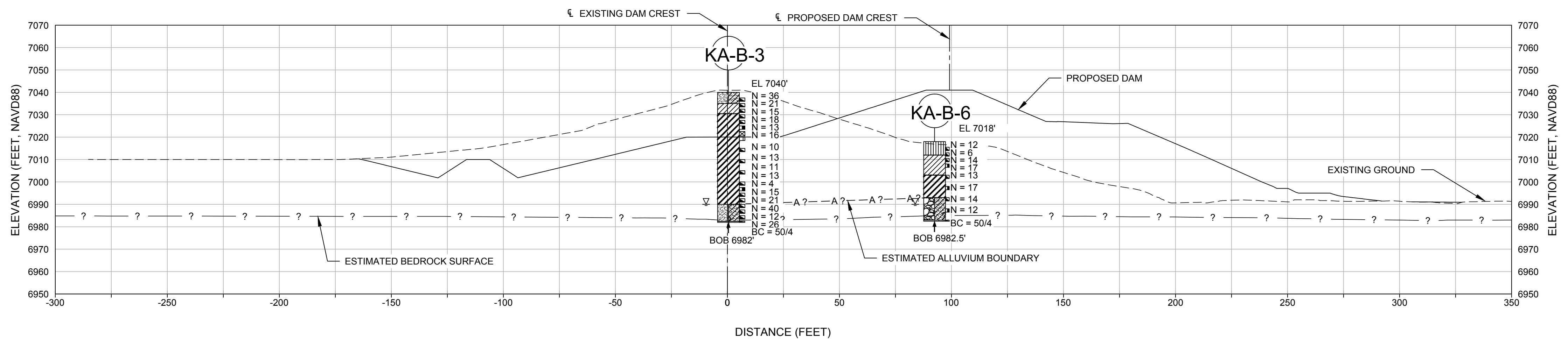
SUBSURFACE PROFILES

TSALE DAM MODIFICATION
BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL SAFETY OF DAMS PROGRAM - ARIZONA

SHEET

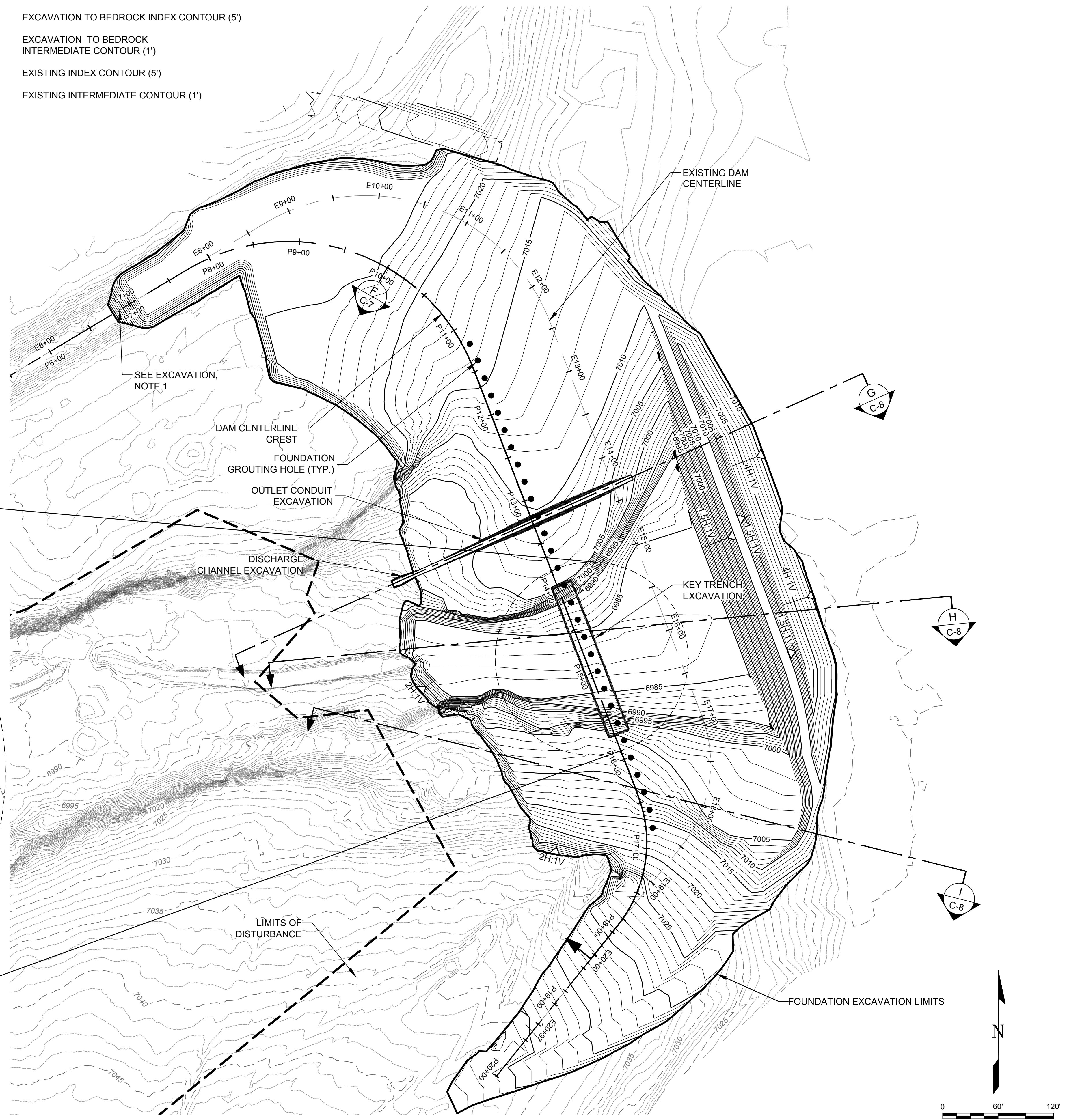
8 of 56

C-3

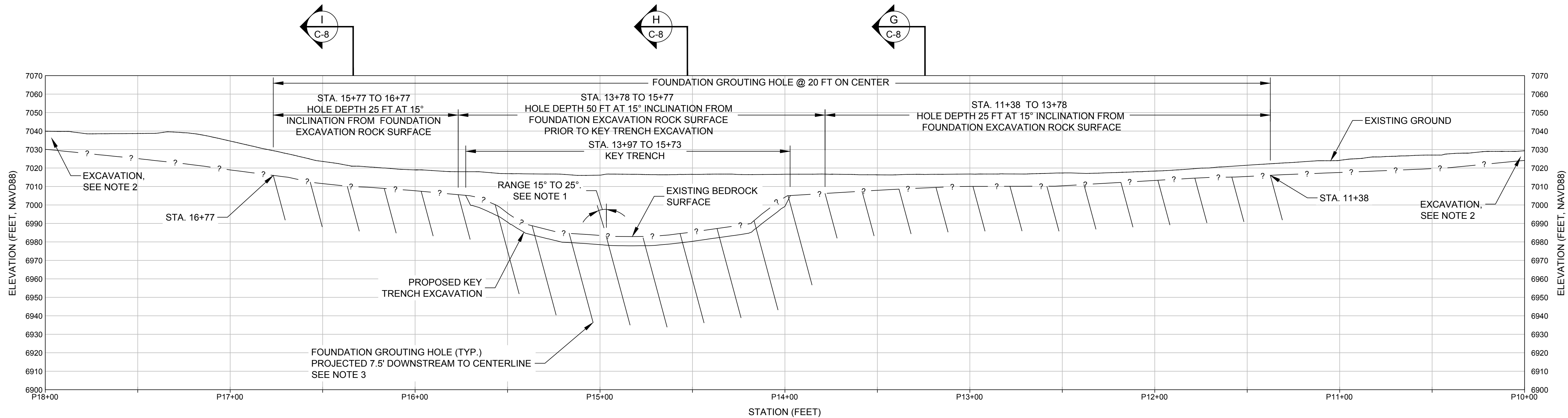


1. REMOVE EXISTING DAM EMBANKMENT TO THE GRADES SHOWN BETWEEN STA E6+88 AND E20+97.
2. THE PORTION OF THE BEDROCK SURFACE SHOWN ON THE EXCAVATION PLAN THAT UNDERLIES THE EXISTING DAM IS AN ESTIMATED SURFACE THAT IS PROVIDED FOR ILLUSTRATION PURPOSES AND FOR DEVELOPMENT OF CONTRACTOR'S PROPOSAL ONLY. THIS PORTION OF THE BEDROCK SURFACE WAS DEVELOPED BASED ON APPROXIMATE TOPOGRAPHIC INFORMATION FROM THE PHASE II EVALUATION AND STUDY OF TSAILE DAM, PREPARED BY ENGINEERS TESTING LABORATORIES, INC., 1980, AND FROM EXPLORATION BORINGS THAT ENCOUNTERED ROCK AS DESCRIBED IN THE TSAILE DAM CONCEPTUAL DESIGN REPORT, PREPARED BY THE USBR, 2007, AND IN THE GEOTECHNICAL DATA REPORT, TSAILE DAM MODIFICATION, PREPARED BY KLEINFELDER, INC., 2013. THE INTENT OF THE EXCAVATION PLAN IS TO REMOVE OVERLYING SOIL, COLLUVIUM, ALLUVIUM, AND LOOSE ROCK TO EXPOSE IN-PLACE ROCK THAT CAN BE CLEANED TO MAKE ACCEPTABLE FOR THE DAM FOUNDATION, OR THAT CAN BE FURTHER IMPROVED BY FOUNDATION PREPARATION METHODS, AS SPECIFIED HEREIN, TO BE ACCEPTABLE FOR THE DAM FOUNDATION. EXCAVATE ROCK WITHIN THE LIMITS SHOWN FOR THE KEY TRENCH, OUTLET CONDUIT TRENCH, AND DISCHARGE CHANNEL.
3. CONTRACTOR IS RESPONSIBLE FOR SELECTING THE MEANS AND METHODS FOR PROTECTING EXCAVATION, FOUNDATION PREPARATION AND ALL OTHER WORK FROM GROUNDWATER AND SURFACE WATER PER THE PROJECT SPECIFICATIONS. THIS INCLUDES BUT IS NOT LIMITED TO SELECTING THE CONSTRUCTED ELEVATION OF ANY TEMPORARY WATER CONTROL BERM. HYDROLOGIC INFORMATION IS AVAILABLE IN THE SPECIFICATION SECTION 51 00 00 INFORMATION AVAILABLE TO OFFERORS.
4. CONTRACTOR IS RESPONSIBLE FOR CLEAN-UP, REPAIRING DAMAGES AND REWORK AS NEEDED AS A RESULT OF TEMPORARY WATER CONTROL BERM OR OTHER WATER CONTROL MEASURES FAILURE.

_____	EXCAVATION TO BEDROCK INDEX CONTOUR (5')
_____	EXCAVATION TO BEDROCK INTERMEDIATE CONTOUR (1')
- - - - -	EXISTING INDEX CONTOUR (5')
-----	EXISTING INTERMEDIATE CONTOUR (1')



CAD FILE: G:\clients\Bureau Of Indian Affairs\128437 TsaleCovilleCADD\ACAD\Production Drawings\67% Design Set\Layout\Excavation Plan And Profile.dwg LAYOUT: EXCAVATION SECTIONS & DETAILS (1 OF 2) PLOTTED: 11/18/2013 5:23 PM BY: rodrigo.ruiz-salas



NOTE:

- EVALUATE INFLUENCE OF HOLE ANGLE IN TEST GROUT HOLES. CONTRACTING OFFICER'S REPRESENTATIVE TO APPROVE HOLE ANGLE FOR PRODUCTION GROUTING, WHICH MAY BE ADJUSTED BASED ON GROUTING OR ROCK CONDITIONS ENCOUNTERED.
- EXCAVATE EXISTING DAM BETWEEN LIMITS SHOWN ON DRAWING C-6.
- ONLY PRIMARY GROUT HOLES SHOWN. SUPPLEMENTAL GROUT HOLES WILL BE DETERMINED BY COR BASED ON FIELD CONDITIONS.

0 30' 60'
HORIZONTAL = VERTICAL SCALE

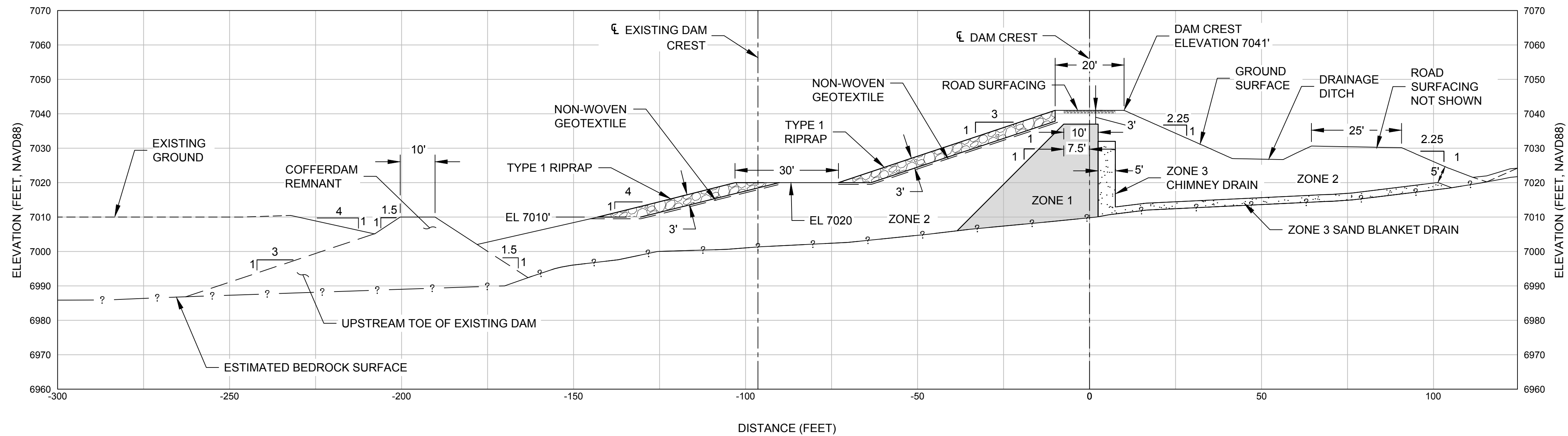
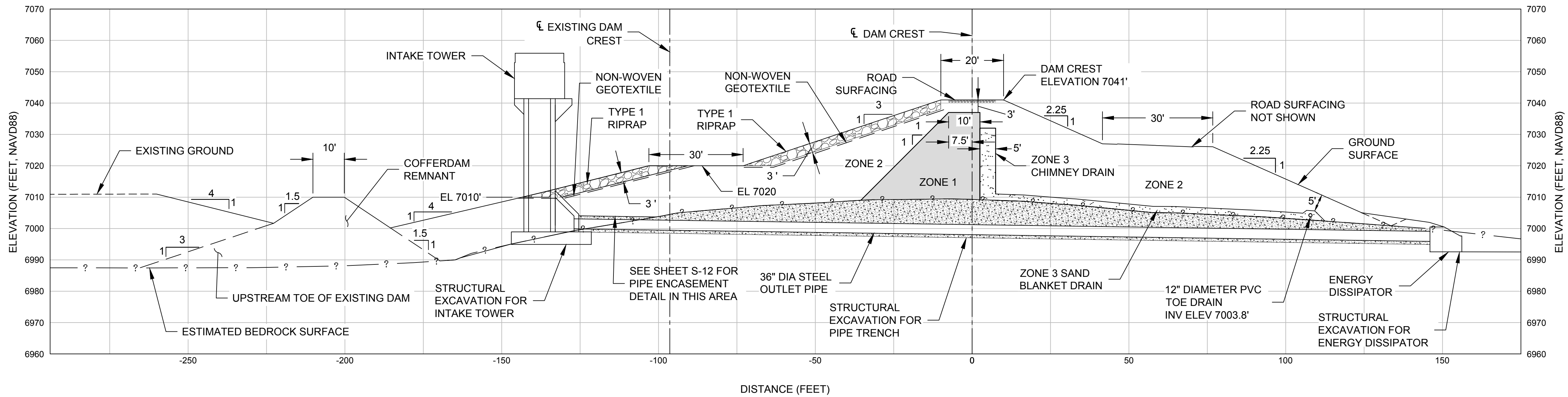


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				1	NO.				
				CZ / KLF		BY		DATE	
								11-22-2013	

EXCAVATION SECTION AND GROUTING DETAIL

TSALE DAM MODIFICATION
BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL SAFETY OF DAMS PROGRAM - ARIZONA

SHEET 12 of 56



DATE	11-22-2013	PROJECT NO.	128437	DRAWN BY	R. RUIZ-SALAS	CHECKED BY	C. LARSON	FILE NAME	11Max Section.dwg
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		DESCRIPTION				NO.		REVISIONS	

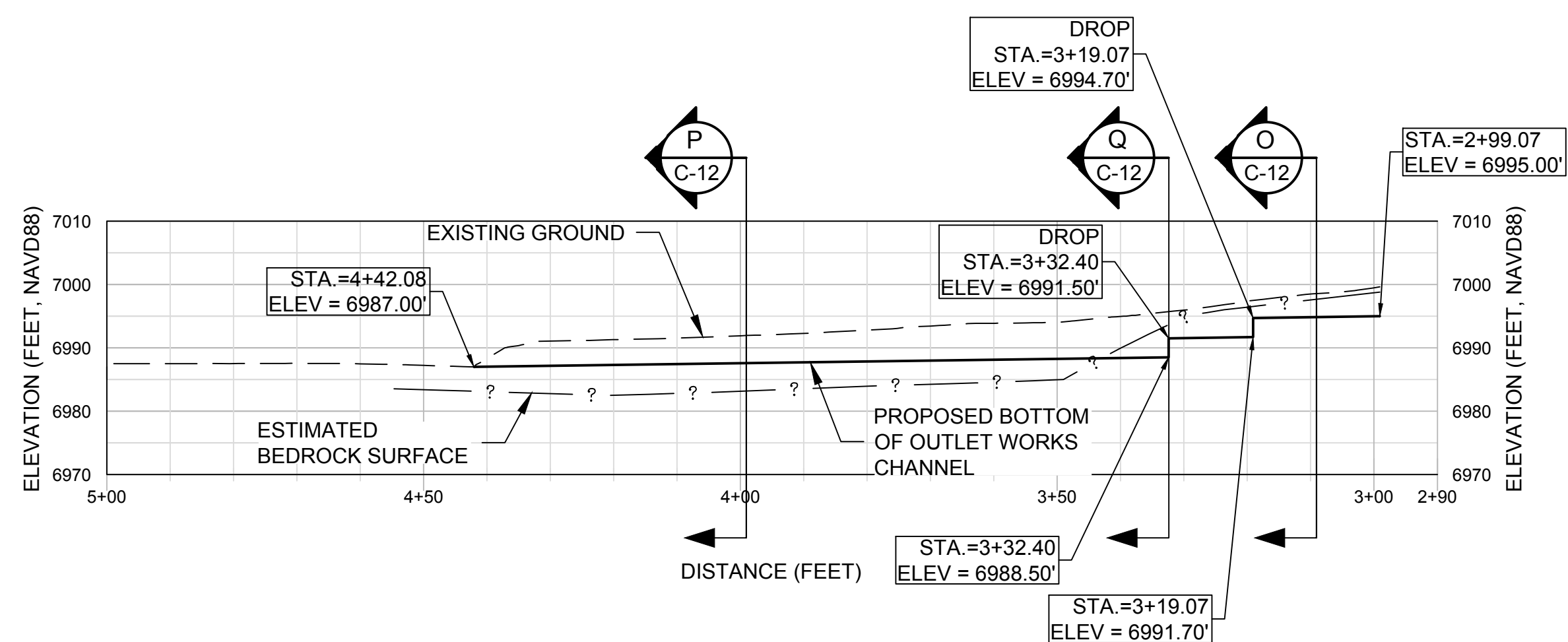
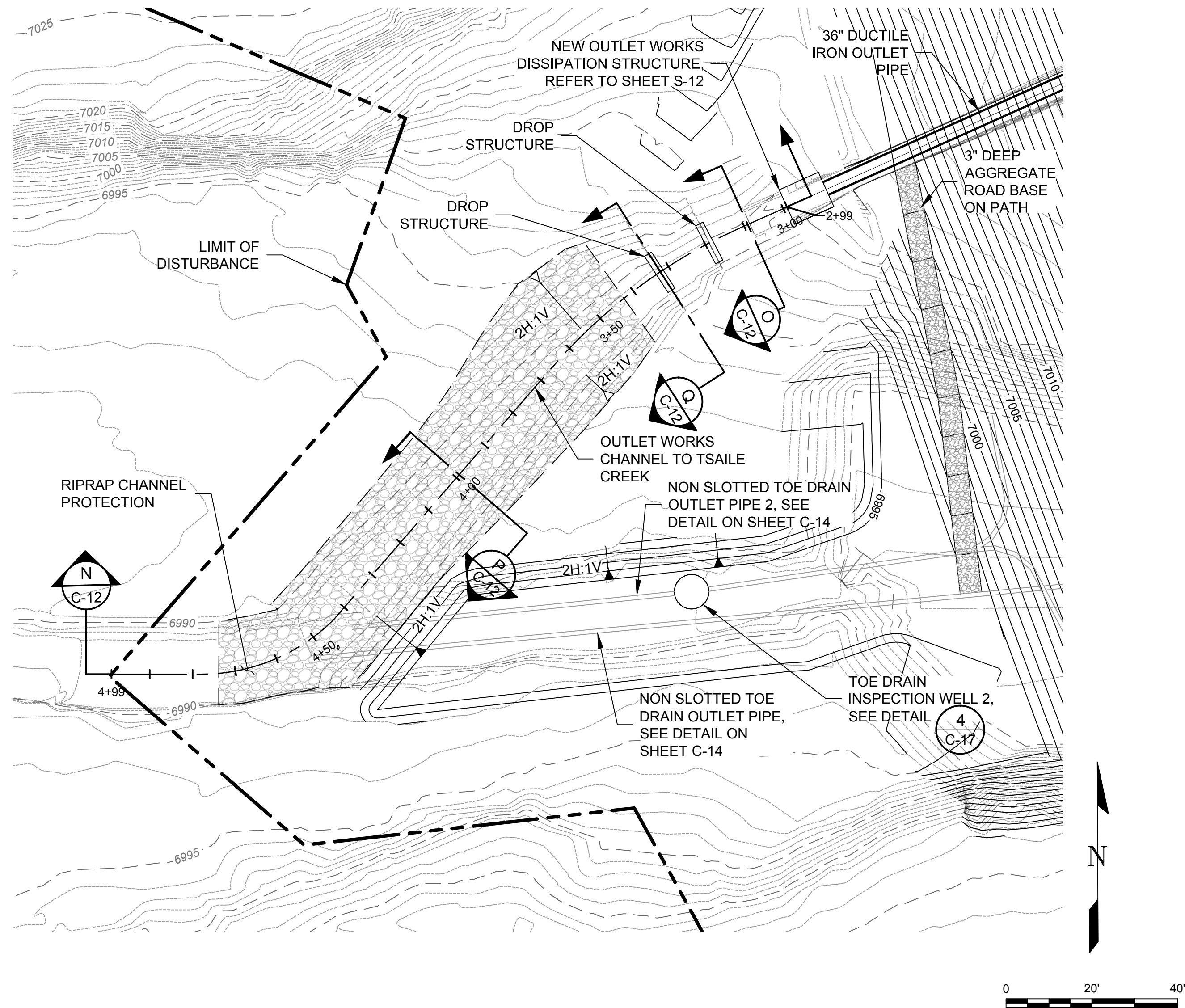
ABUTMENT SECTIONS

TSAILE DAM MODIFICATION
 BUREAU OF INDIAN AFFAIRS
 NAVAJO REGIONAL SAFETY OF DAMS PROGRAM - ARIZONA

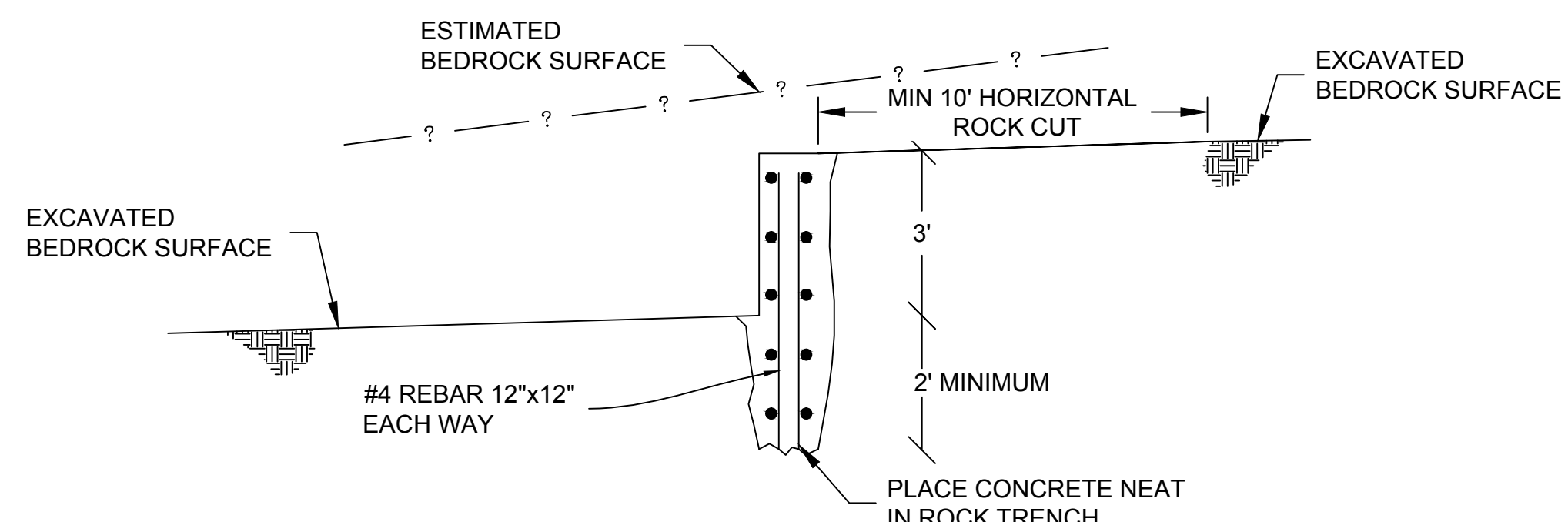
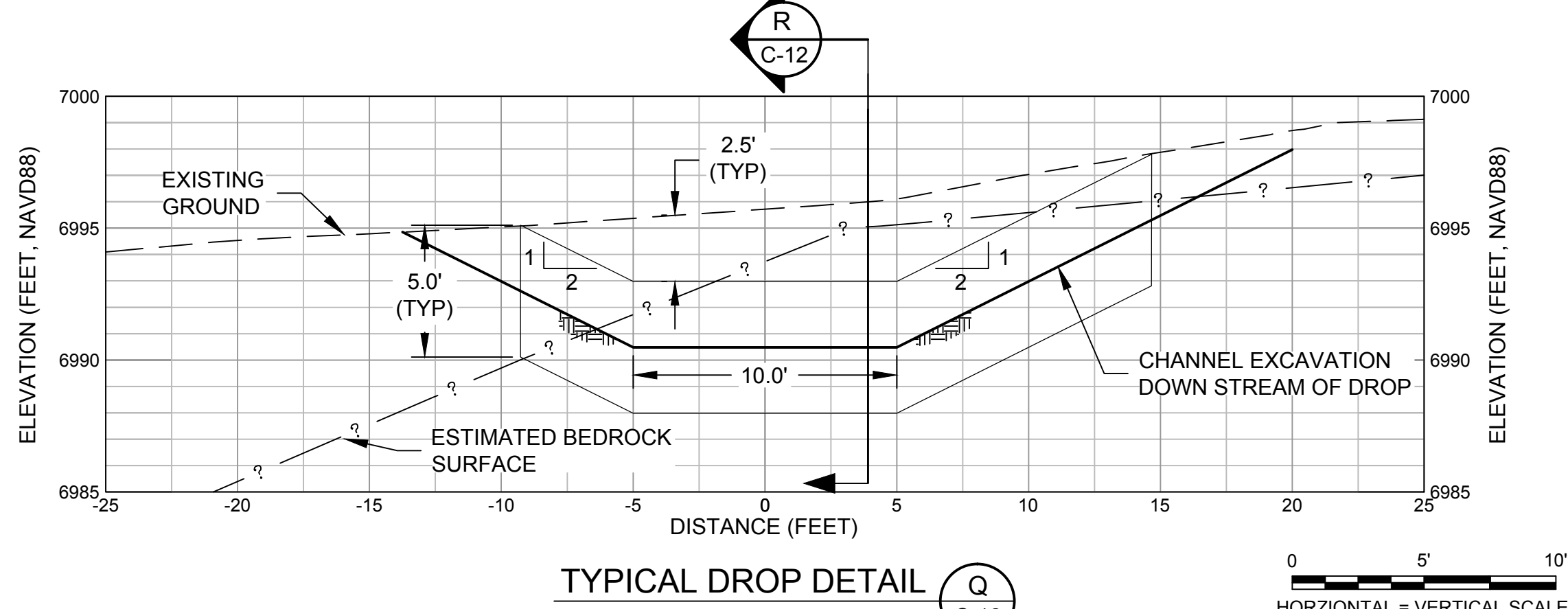
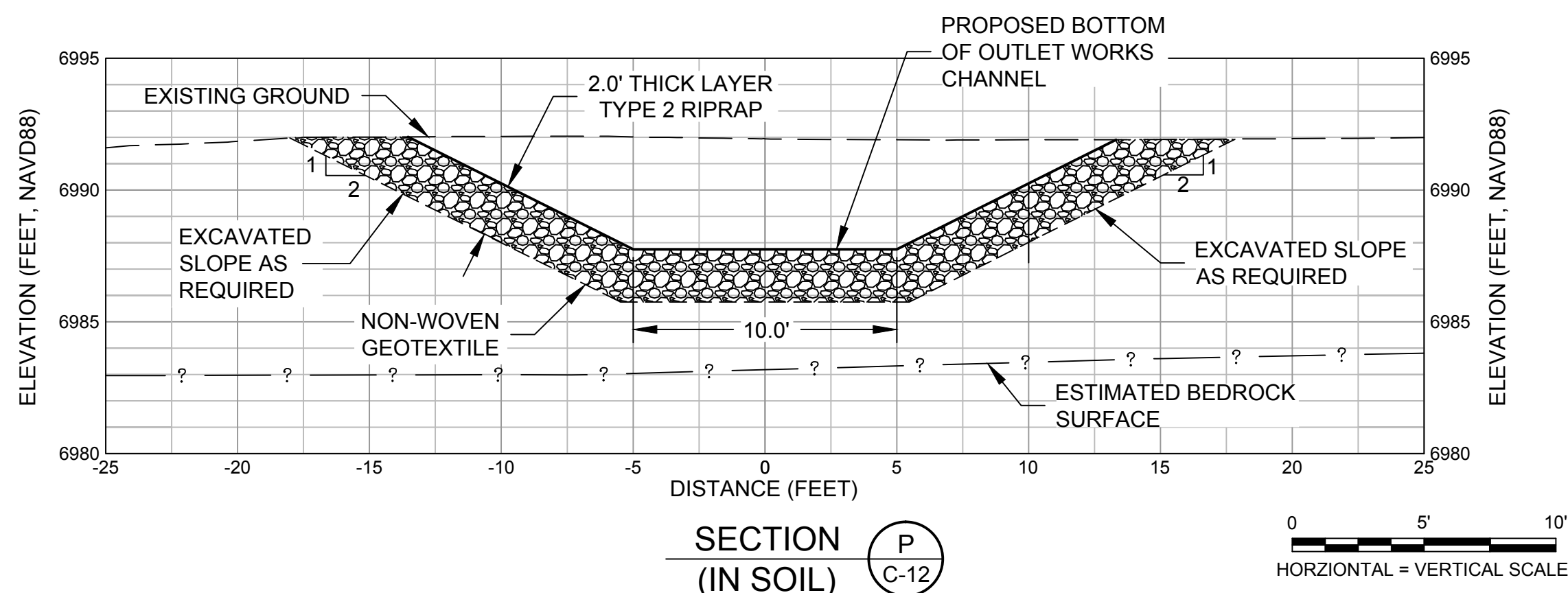
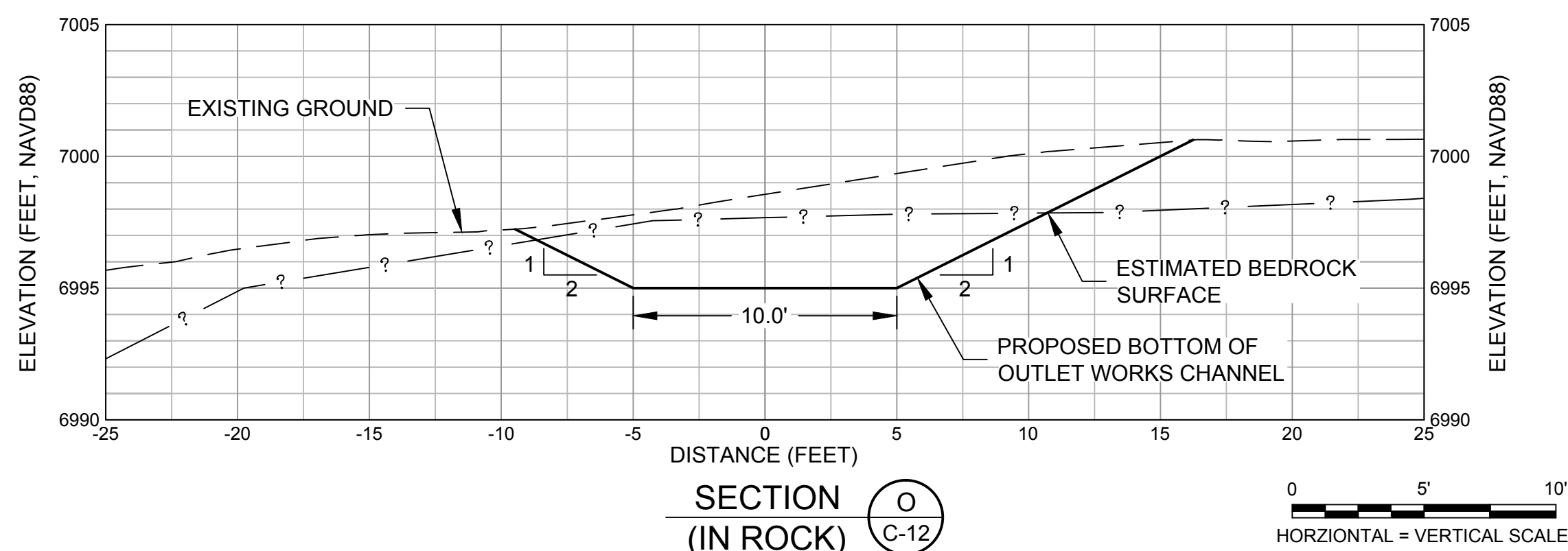
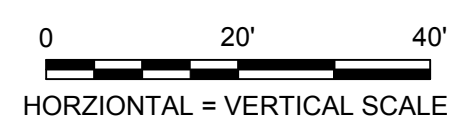
SHEET

16 of 56

C-11



OUTLET WORKS CHANNEL PROFILE
N
C-12



SECTION
NTS
R
C-12

DATE		PROJECT NO.		DRAWN BY		CHECKED BY		FILE NAME		REVISIONS	
11-22-2013	128437	R. RUIZ-SALAS		C. LARSON		1	TEMPORARY ROAD REALIGNMENT	CZ / KLF	11-22-2013	DATE	
							DESCRIPTION			BY	
										NO.	

OUTLET WORKS CHANNEL PLAN AND PROFILE

TSAILLE DAM MODIFICATION
BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL SAFETY OF DAMS PROGRAM - ARIZONA

SHEET 17 of 56

C-12

CONTROL POINTS:

LEFT TOE DRAIN			
POINT #	NORTHING	EASTING	DESCRIPTION
1	1920323.8	983819.1	BEGIN
2	1920331.8	983742.2	PI
3	1920333.6	983736.4	PI
4	1920336.0	983733.6	PI
5	1920411.1	983693.9	INSPECTION WELL 1

MIDDLE LEFT TOE DRAIN			
POINT #	NORTHING	EASTING	DESCRIPTION
6	1920374.8	983703.7	BEGIN
7	1920415.0	983682.5	BC
8	1920418.2	983678.6	PC
9	1920419.6	983673.8	PC
10	1920419.1	983668.7	EC
11	1920409.4	983603.1	INSPECTION WELL 2

TOE DRAIN OUTFALL PIPE 1			
POINT #	NORTHING	EASTING	DESCRIPTION
0+00	1920411.1	983693.9	INSPECTION WELL 1
1+78	1920394.1	983516.9	END

RIGHT TOE DRAIN			
POINT #	NORTHING	EASTING	DESCRIPTION
16	1920605.8	983652.6	BEGIN. CLEANOUT
17	1920572.0	983648.6	PI
5	1920411.1	983693.9	INSPECTION WELL 1

MIDDLE RIGHT TOE DRAIN			
POINT #	NORTHING	EASTING	DESCRIPTION
12	1920450.5	983672.7	BEGIN
13	1920431.0	983676.6	BC
14	1920426.1	983675.7	PC
15	1920421.9	983672.9	PC
10	1920419.1	983668.7	EC, END

TOE DRAIN OUTFALL PIPE 2			
POINT #	NORTHING	EASTING	DESCRIPTION
0+00	1920409.4	983603.1	INSPECTION WELL 2
0+80	1920401.1	983524.1	END

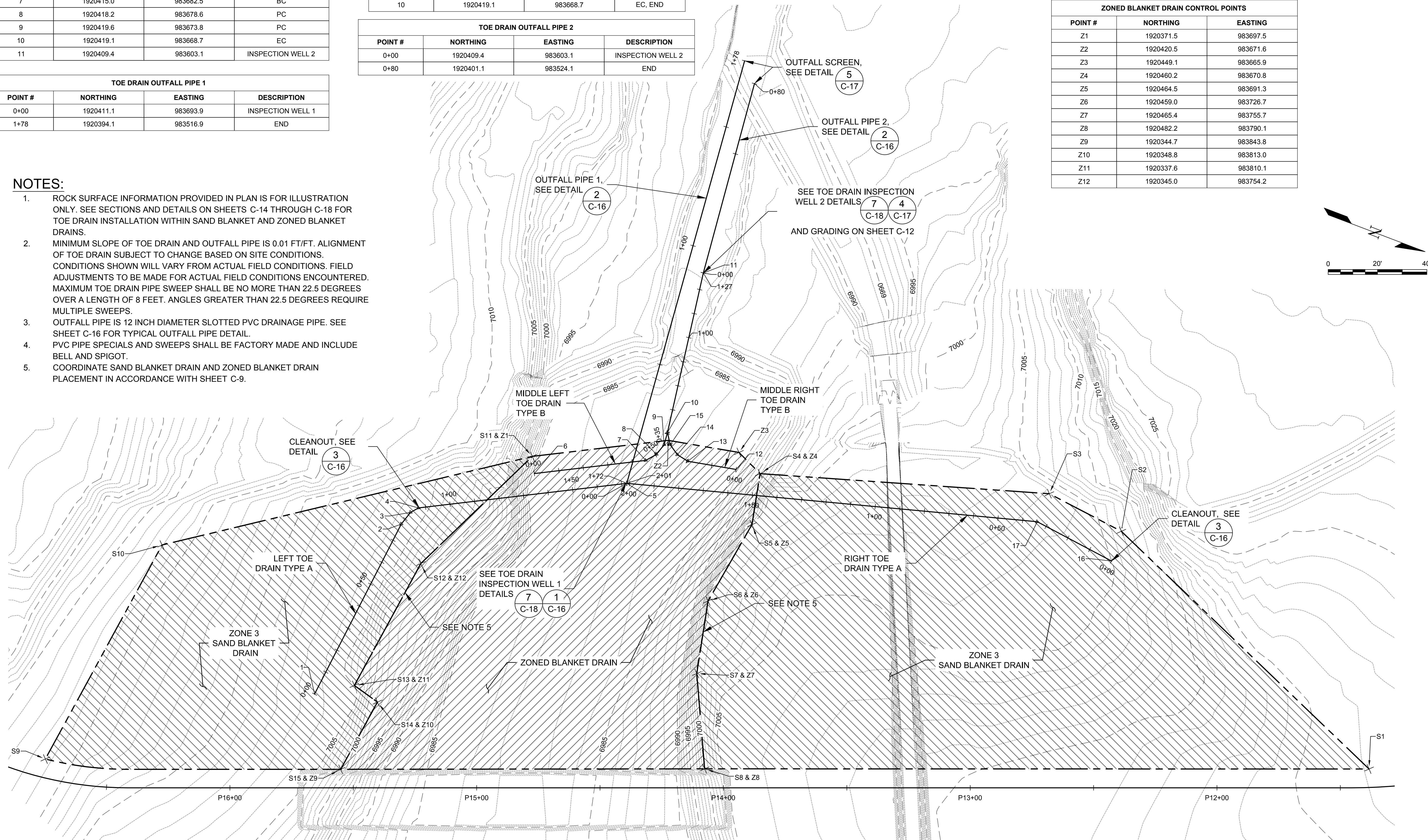
RIGHT ZONE 3 CONTROL POINTS		
POINT #	NORTHING	EASTING
S1	1920733.5	983693.8
S2	1920605.1	983639.9
S3	1920572.4	983636.2
S4	1920460.2	983670.8
S5	1920464.5	983691.3
S6	1920459.0	983726.7
S7	1920465.4	983755.7
S8	1920482.2	983790.1

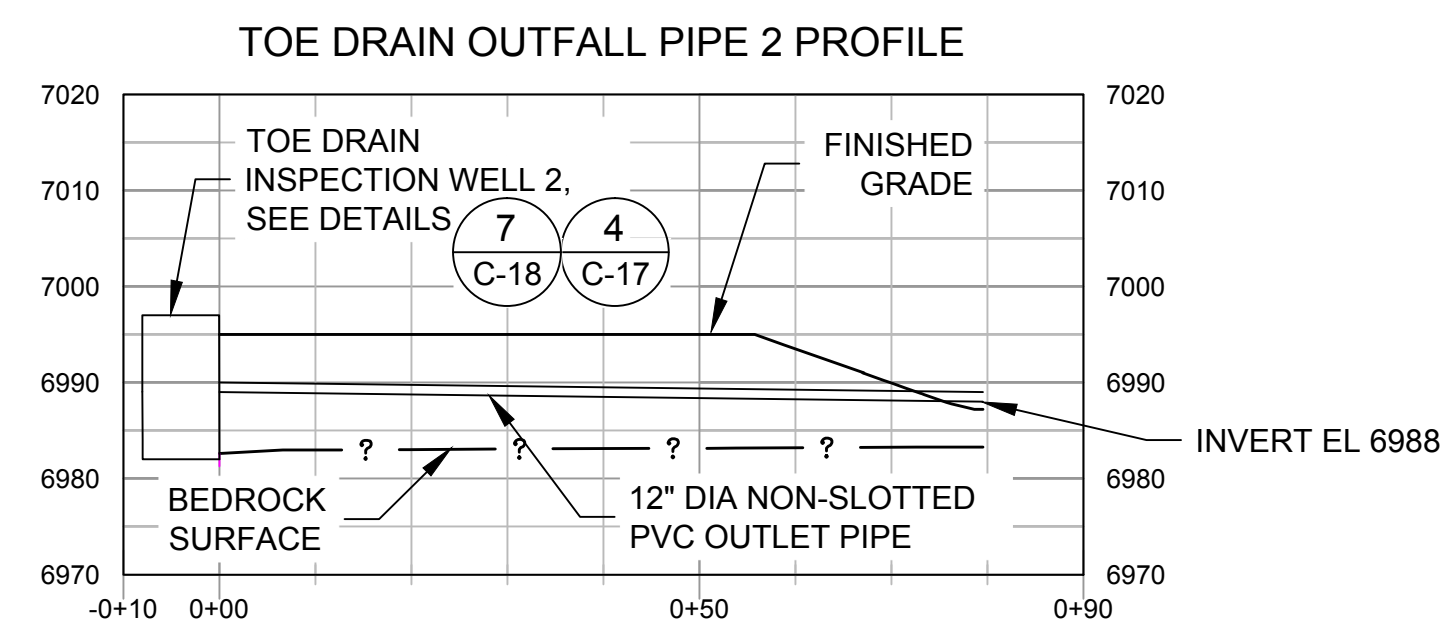
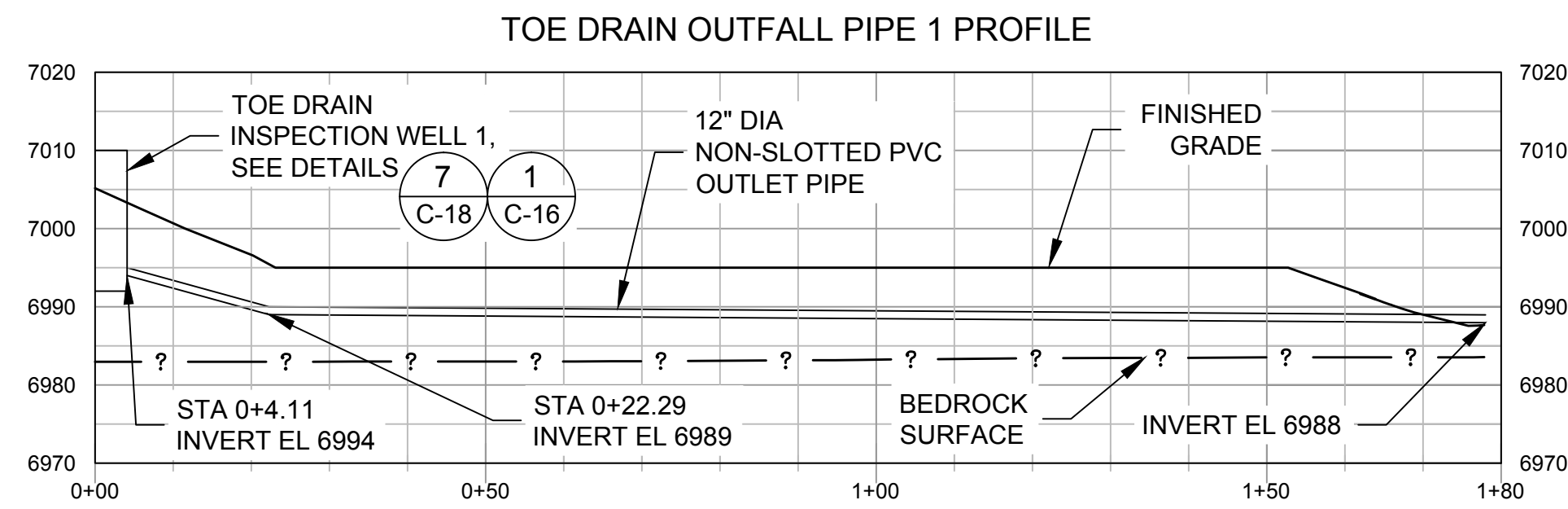
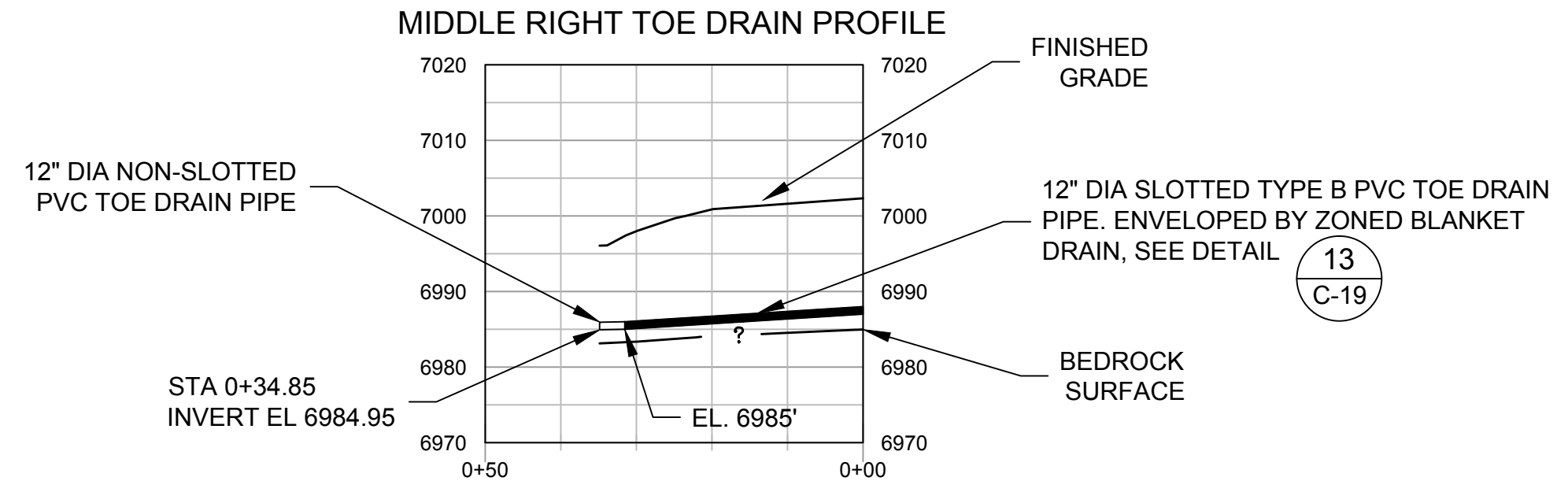
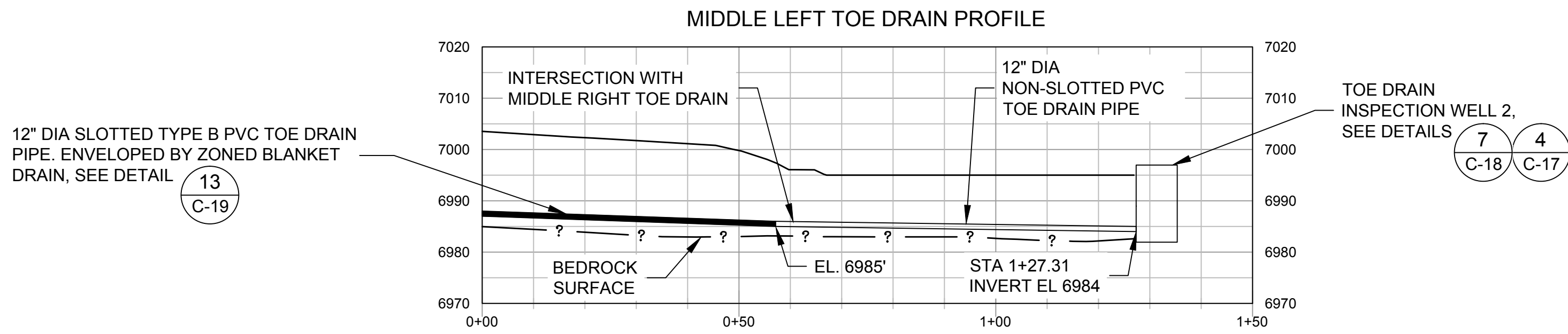
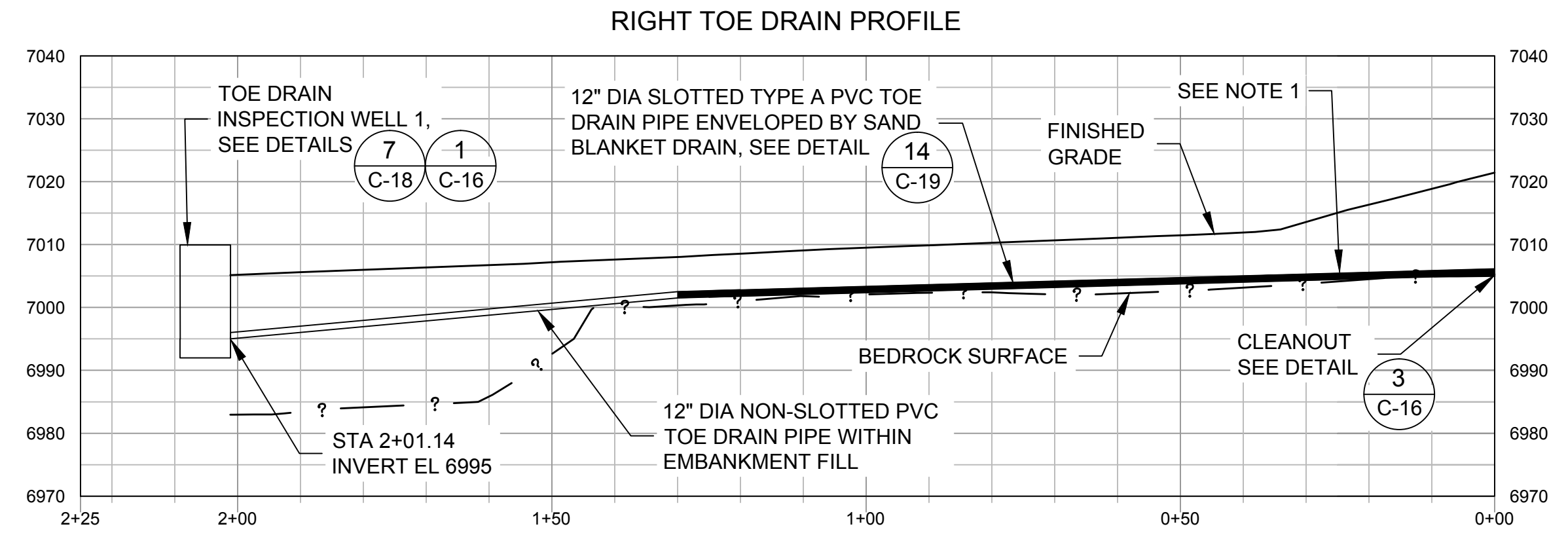
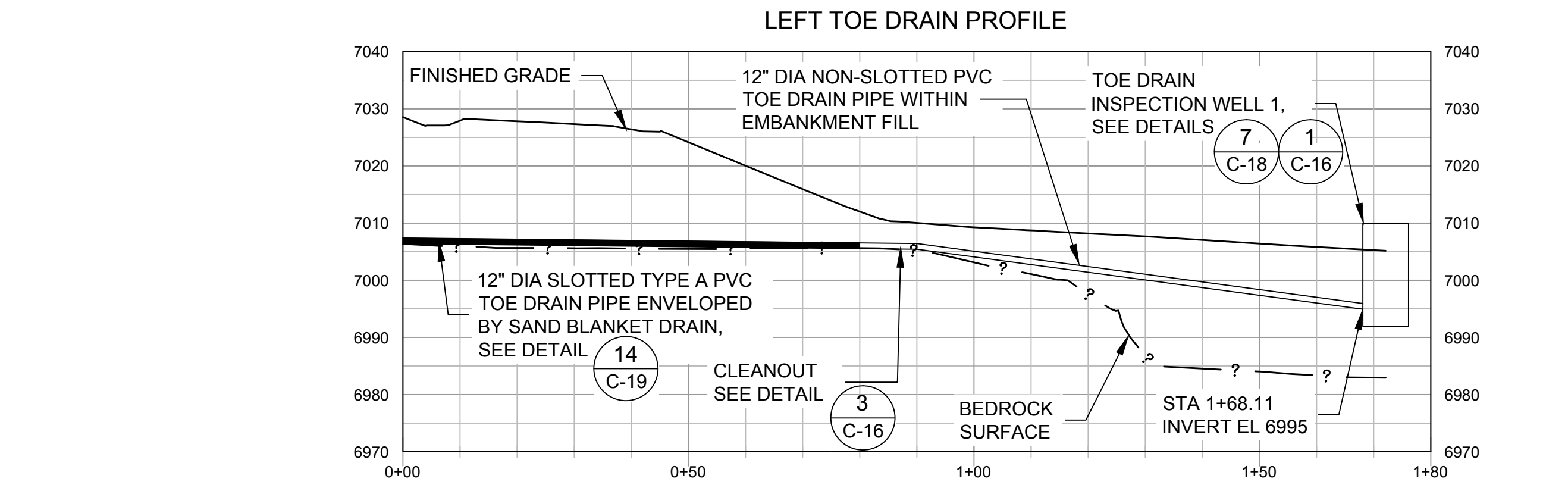
LEFT ZONE 3 CONTROL POINTS		
POINT #	NORTHING	EASTING
S9	1920231.5	983882.9
S10	1920244.4	983785.0
S11	1920371.5	983697.5
S12	1920345.0	983754.2
S13	1920337.6	983810.1
S14	1920348.8	983813.0
S15	1920344.7	983843.8

ZONED BLANKET DRAIN CONTROL POINTS		
POINT #	NORTHING	EASTING
Z1	1920371.5	983697.5
Z2	1920420.5	983671.6
Z3	1920449.1	983665.9
Z4	1920460.2	983670.8
Z5	1920464.5	983691.3
Z6	1920459.0	983726.7
Z7	1920465.4	983755.7
Z8	1920482.2	983790.1
Z9	1920344.7	983843.8
Z10	1920348.8	983813.0
Z11	1920337.6	983810.1
Z12	1920345.0	983754.2

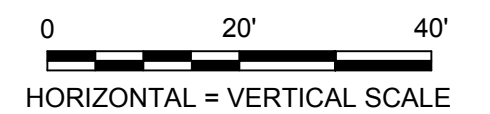
- NOTES:

1. ROCK SURFACE INFORMATION PROVIDED IN PLAN IS FOR ILLUSTRATION ONLY. SEE SECTIONS AND DETAILS ON SHEETS C-14 THROUGH C-18 FOR TOE DRAIN INSTALLATION WITHIN SAND BLANKET AND ZONED BLANKET DRAINS.
2. MINIMUM SLOPE OF TOE DRAIN AND OUTFALL PIPE IS 0.01 FT/FT. ALIGNMENT OF TOE DRAIN SUBJECT TO CHANGE BASED ON SITE CONDITIONS. CONDITIONS SHOWN WILL VARY FROM ACTUAL FIELD CONDITIONS. FIELD ADJUSTMENTS TO BE MADE FOR ACTUAL FIELD CONDITIONS ENCOUNTERED. MAXIMUM TOE DRAIN PIPE SWEEP SHALL BE NO MORE THAN 22.5 DEGREES OVER A LENGTH OF 8 FEET. ANGLES GREATER THAN 22.5 DEGREES REQUIRE MULTIPLE SWEEPS.
3. OUTFALL PIPE IS 12 INCH DIAMETER SLOTTED PVC DRAINAGE PIPE. SEE SHEET C-16 FOR TYPICAL OUTFALL PIPE DETAIL.
4. PVC PIPE SPECIALS AND SWEEPS SHALL BE FACTORY MADE AND INCLUDE BELL AND SPIGOT.
5. COORDINATE SAND BLANKET DRAIN AND ZONED BLANKET DRAIN PLACEMENT IN ACCORDANCE WITH SHEET C-9.





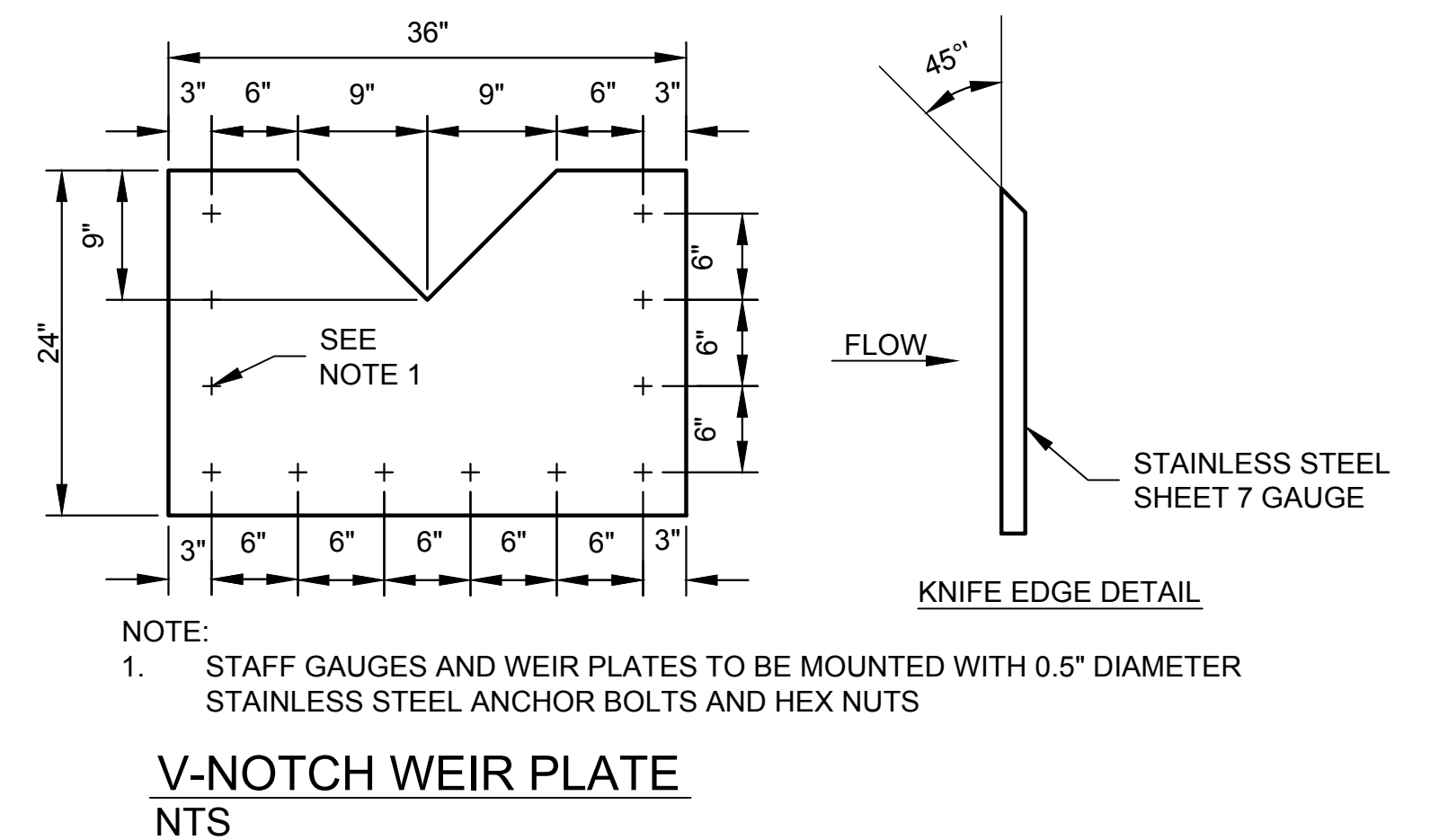
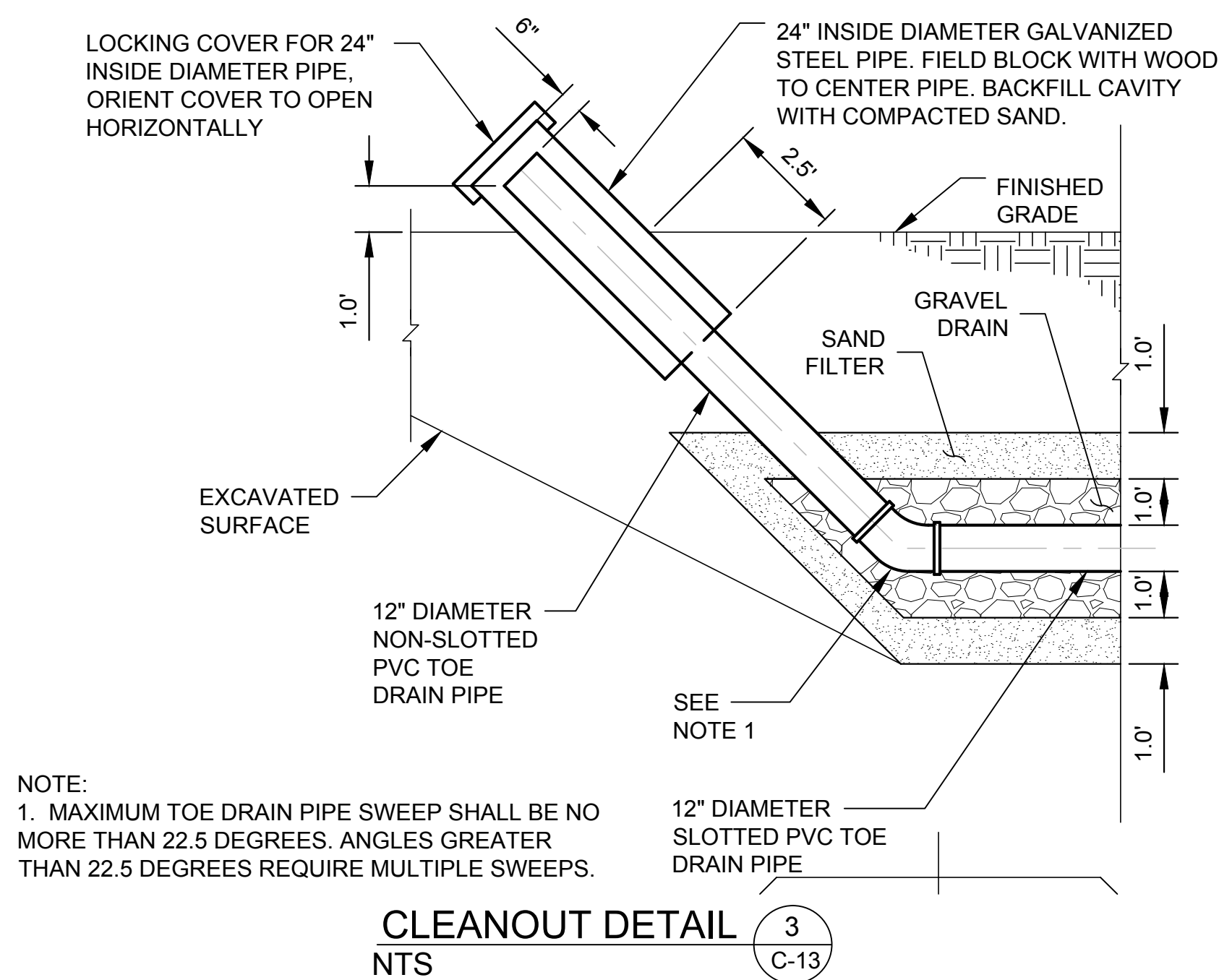
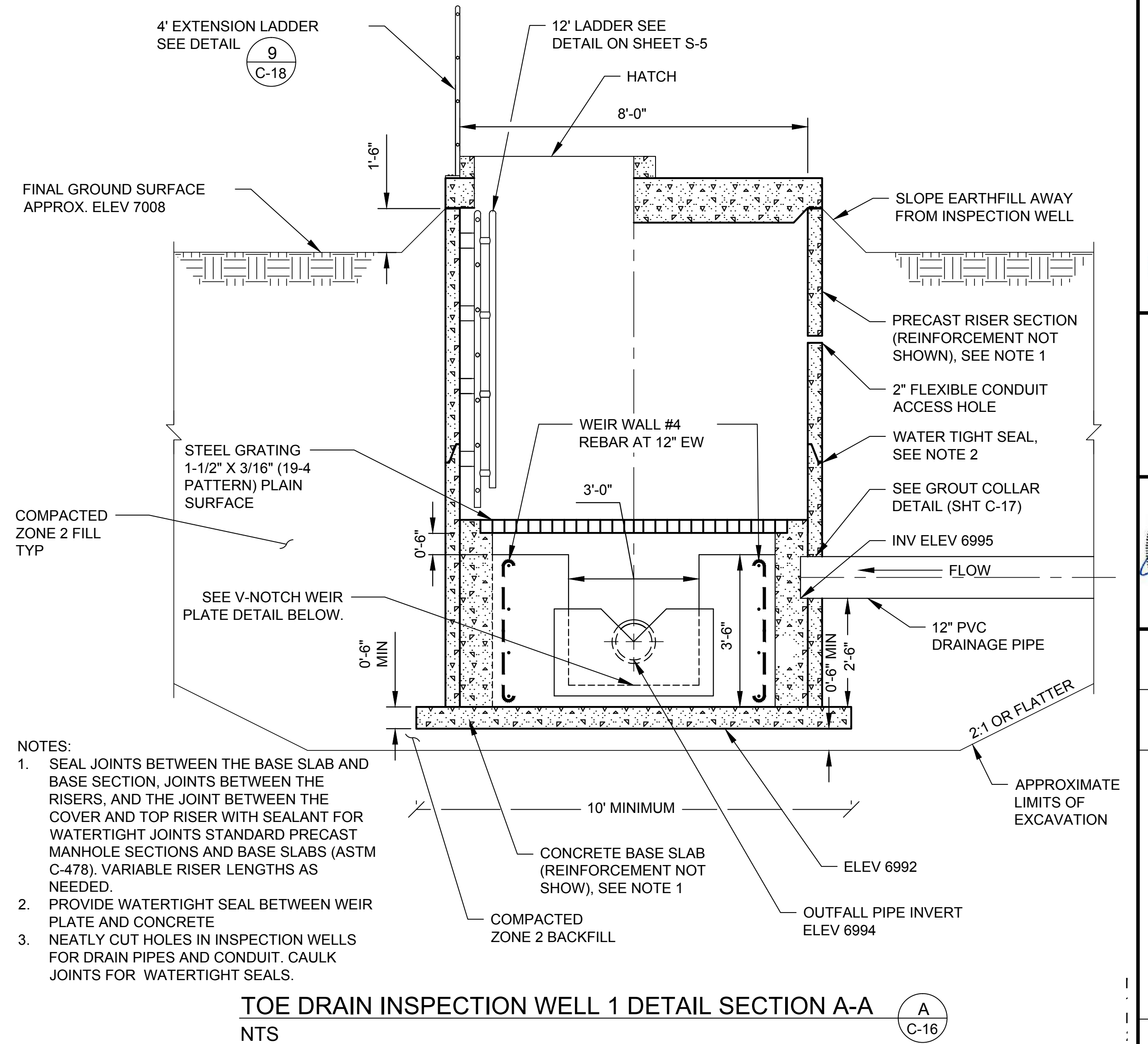
NOTE:
1. PLACE LOCATOR TAPE ABOVE ALL TOE DRAIN PIPE.

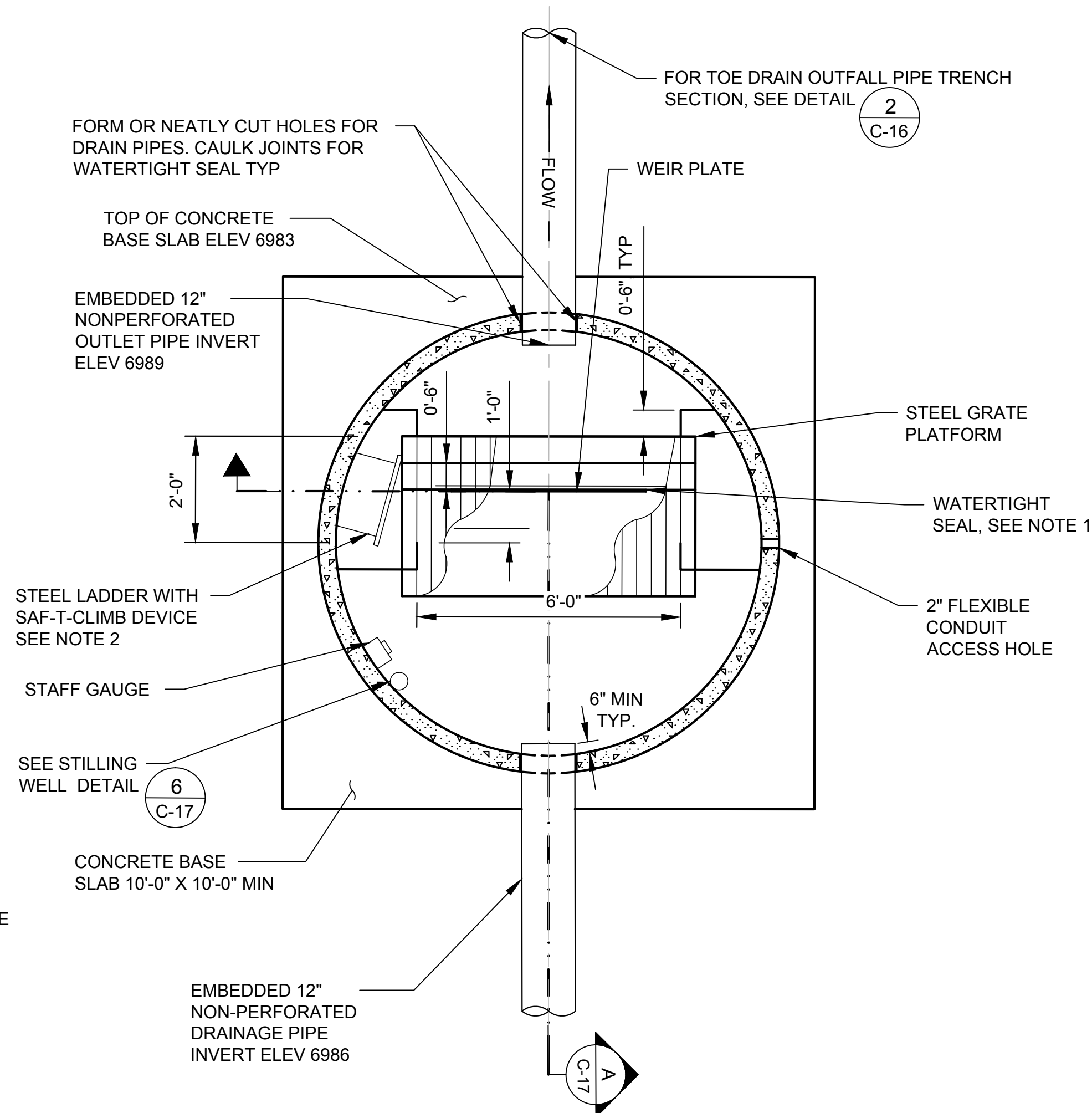


DATE	PROJECT NO.	DRAWN BY	CHECKED BY	FILE NAME	REVISIONS
11-22-2013	128437	R. RUIZ-SALAS	C. LARSON	13 Toe Drain Plan-Profile.dwg	
					NO.
					DESCRIPTION
					BY
					DATE

TOE DRAIN PROFILES

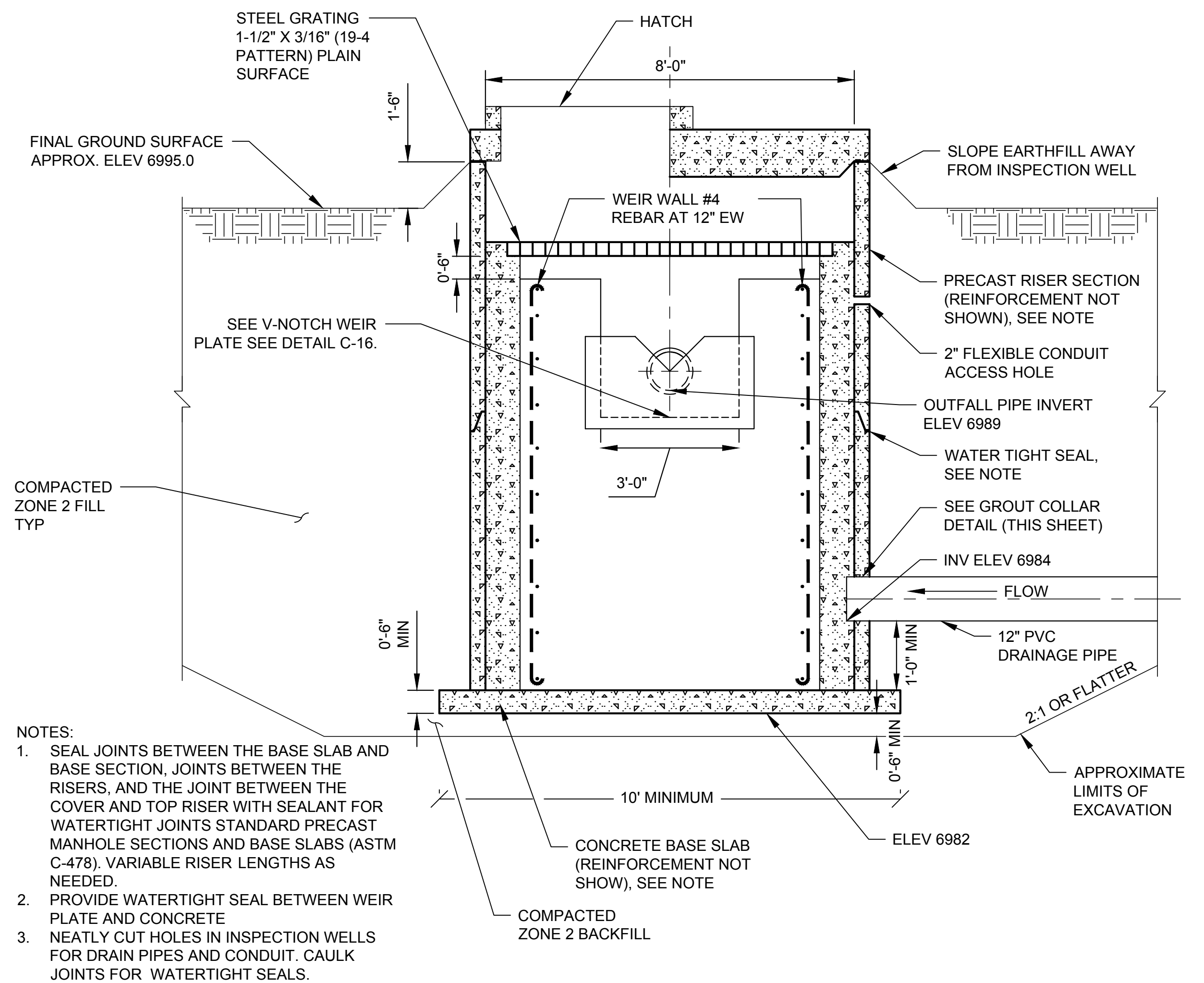
TS/ALIE DAM MODIFICATION
BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL SAFETY OF DAMS PROGRAM - ARIZONA





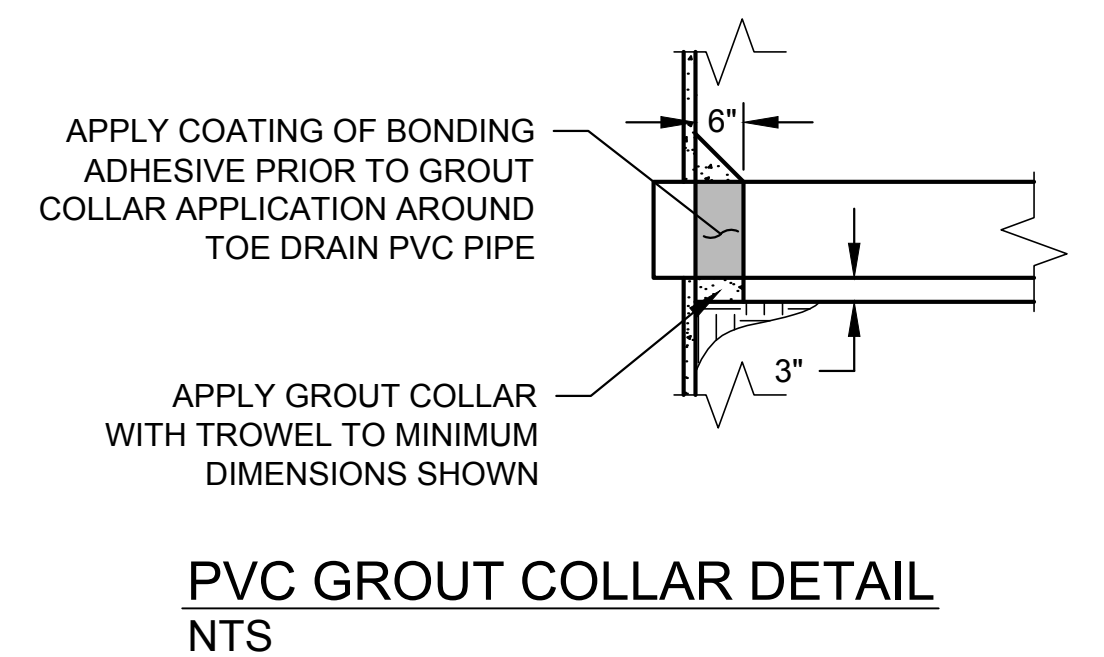
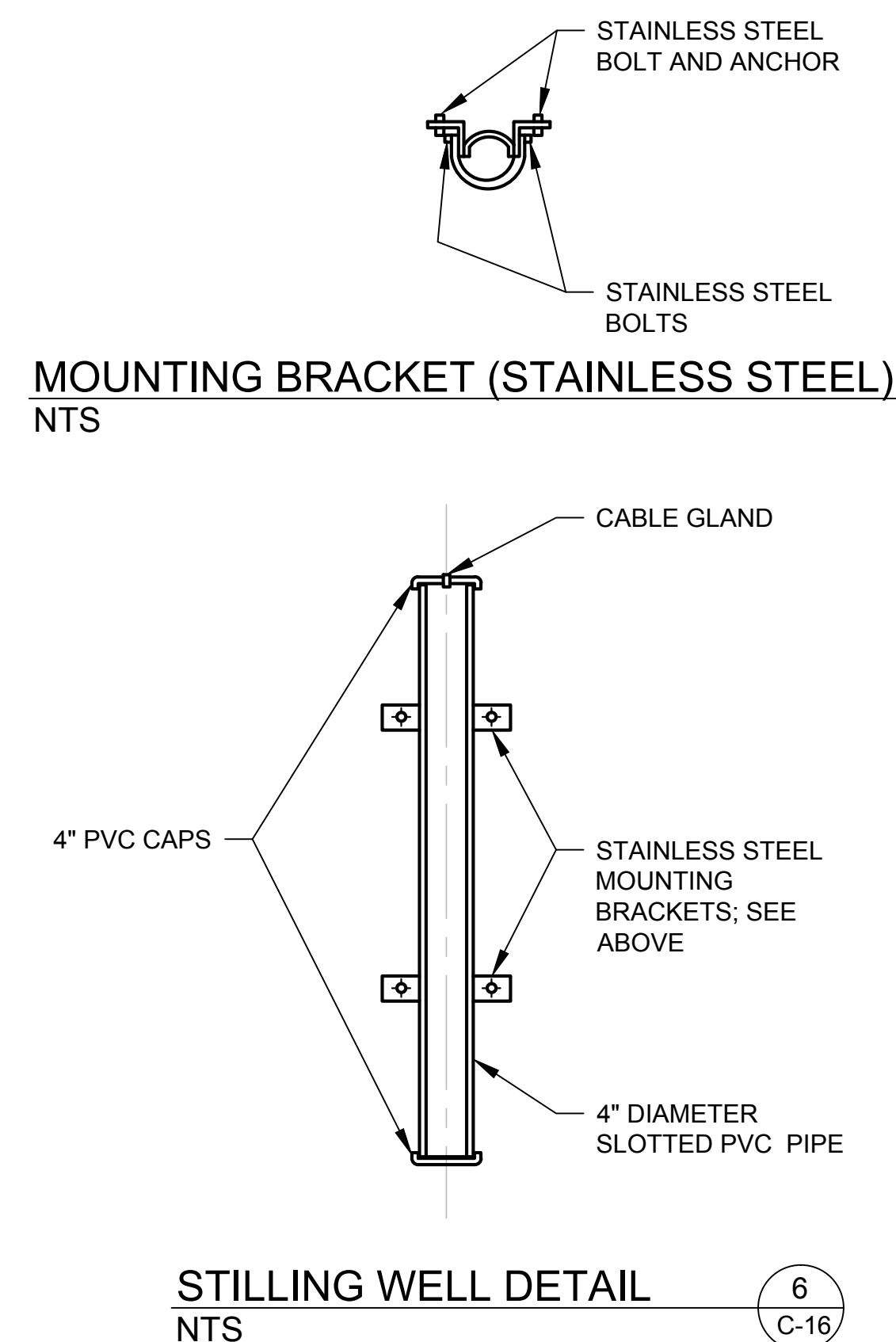
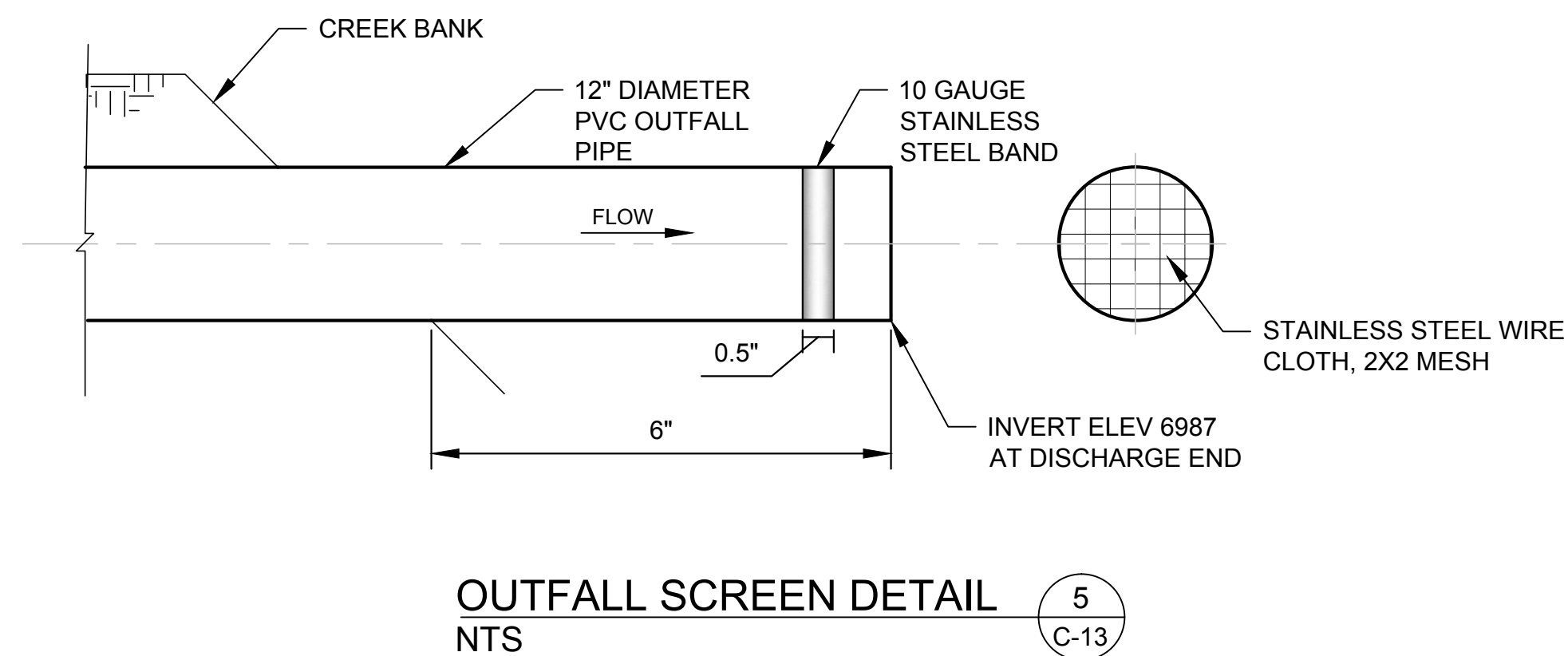
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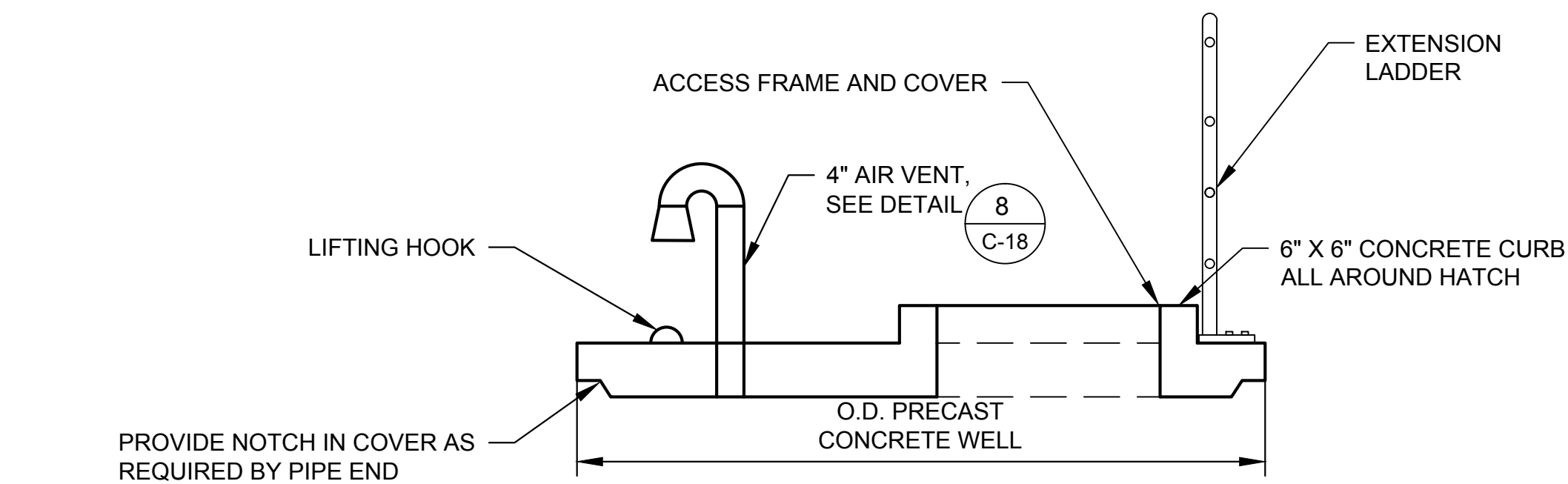
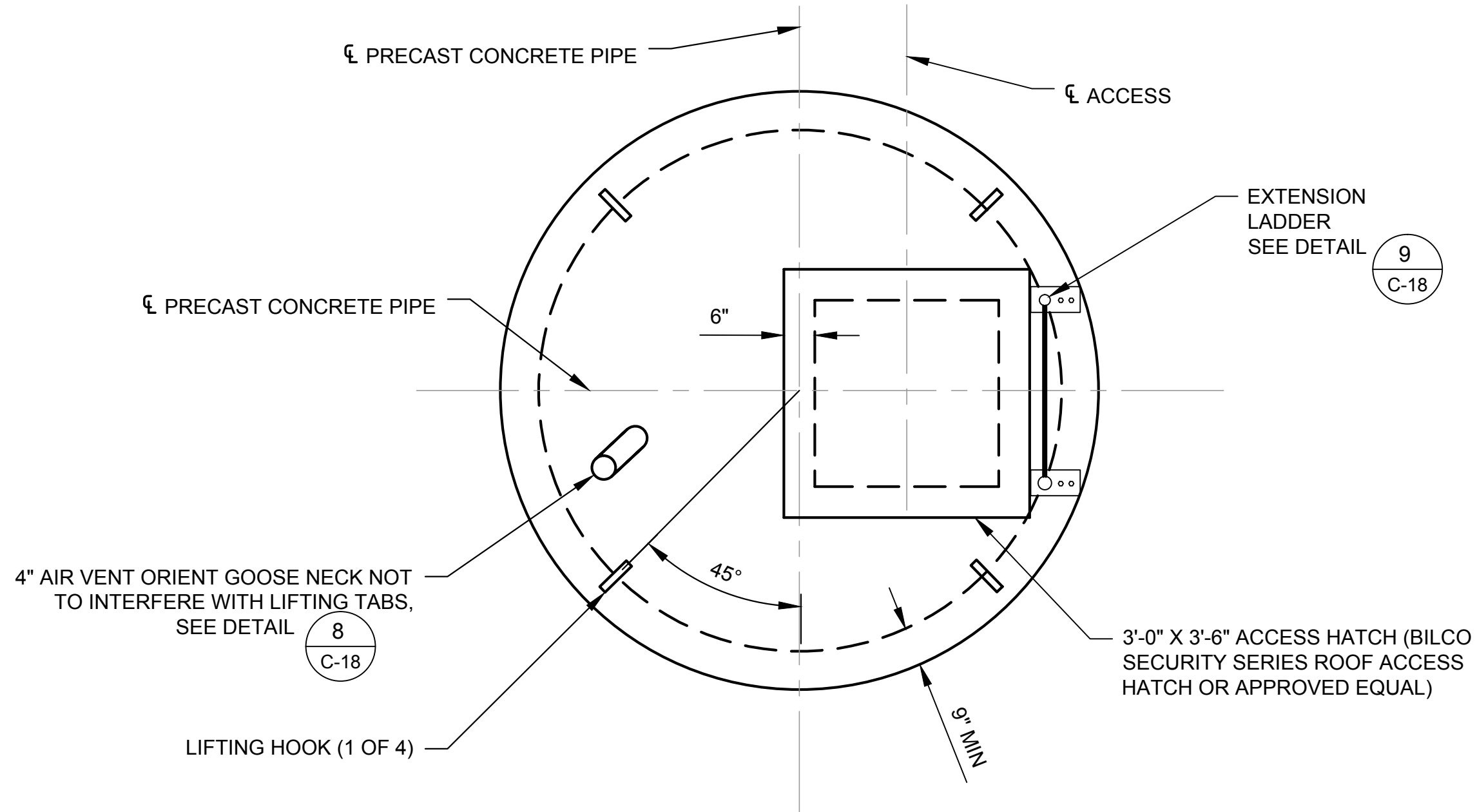
1. PROVIDE WATERTIGHT SEAL BETWEEN WEIR PLATE AND CONCRETE.
2. THE FINAL LOCATION OF THE ACCESS LADDERS SHALL BE PLACED AS DIRECTED IN THE FIELD BY THE COR.
3. PIPE AND INSPECTION WELL WEIR INVERTS SHALL BE AS SHOWN ON DRAWINGS.



NOTES:

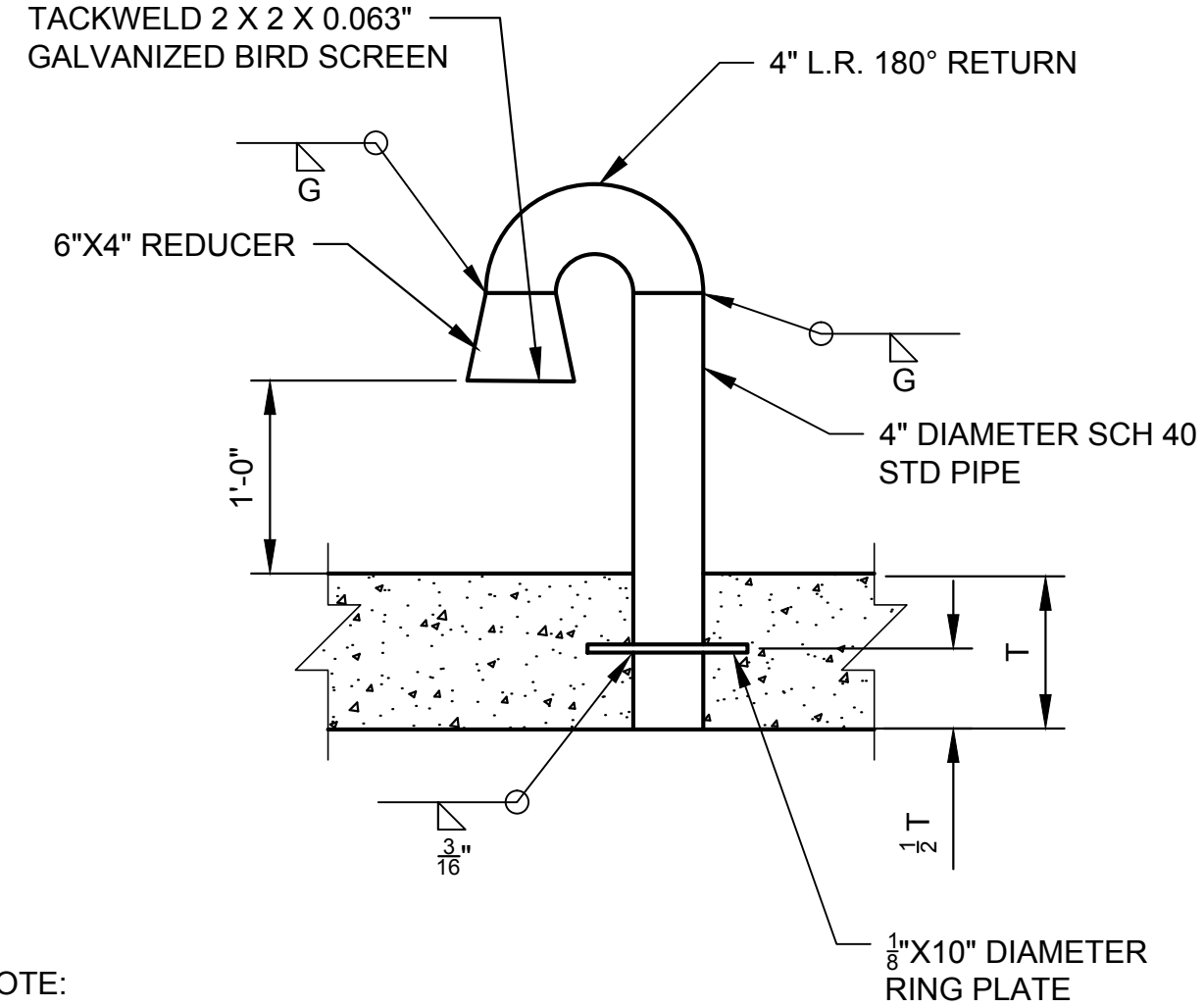
1. SEAL JOINTS BETWEEN THE BASE SLAB AND BASE SECTION, JOINTS BETWEEN THE RISERS, AND THE JOINT BETWEEN THE COVER AND TOP RISER WITH SEALANT FOR WATERTIGHT JOINTS STANDARD PRECAST MANHOLE SECTIONS AND BASE SLABS (ASTM C-478). VARIABLE RISER LENGTHS AS NEEDED.
2. PROVIDE WATERTIGHT SEAL BETWEEN WEIR PLATE AND CONCRETE
3. NEATLY CUT HOLES IN INSPECTION WELLS FOR DRAIN PIPES AND CONDUIT. CAULK JOINTS FOR WATERTIGHT SEALS.



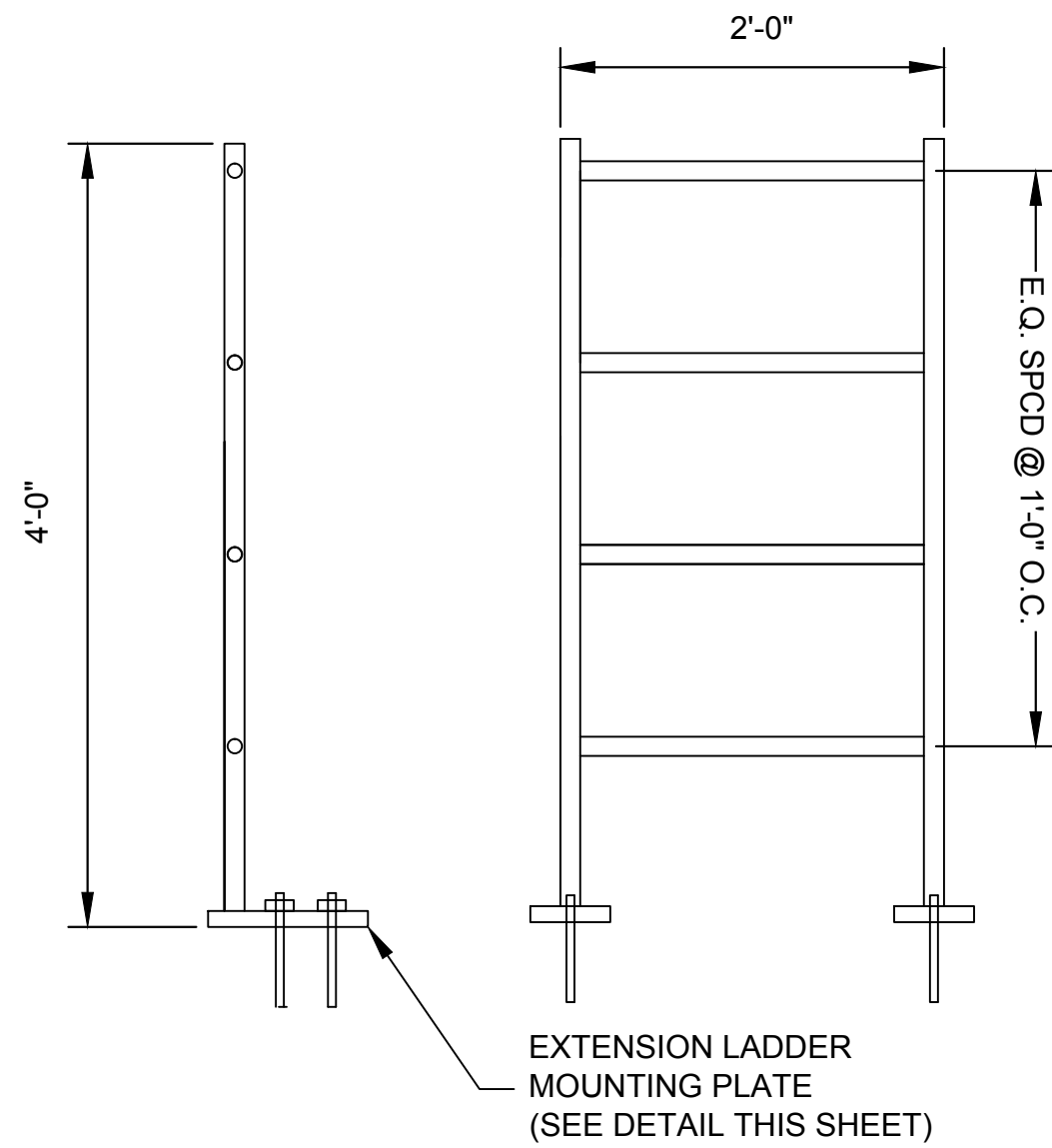


INSPECTION WELL COVER DETAIL
NTS

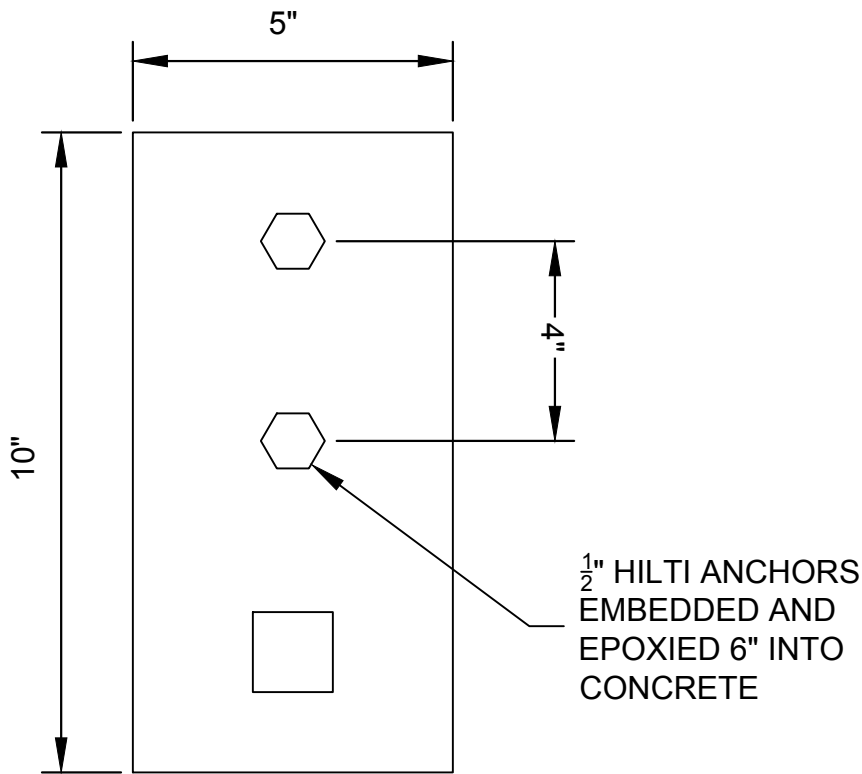
7
C-13



8
C-18

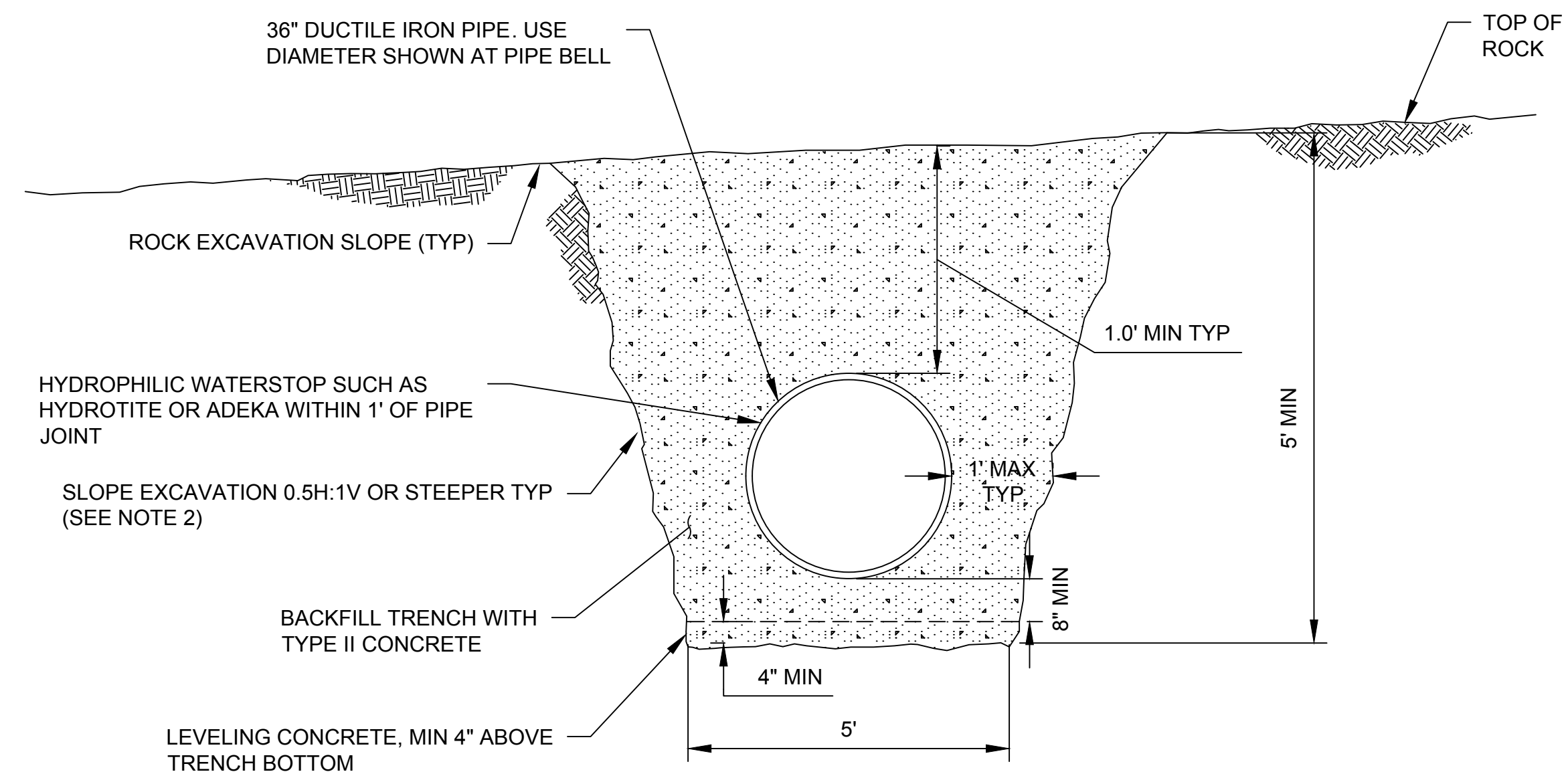


EXTENSION LADDER MOUNTING PLATE DETAIL
NTS

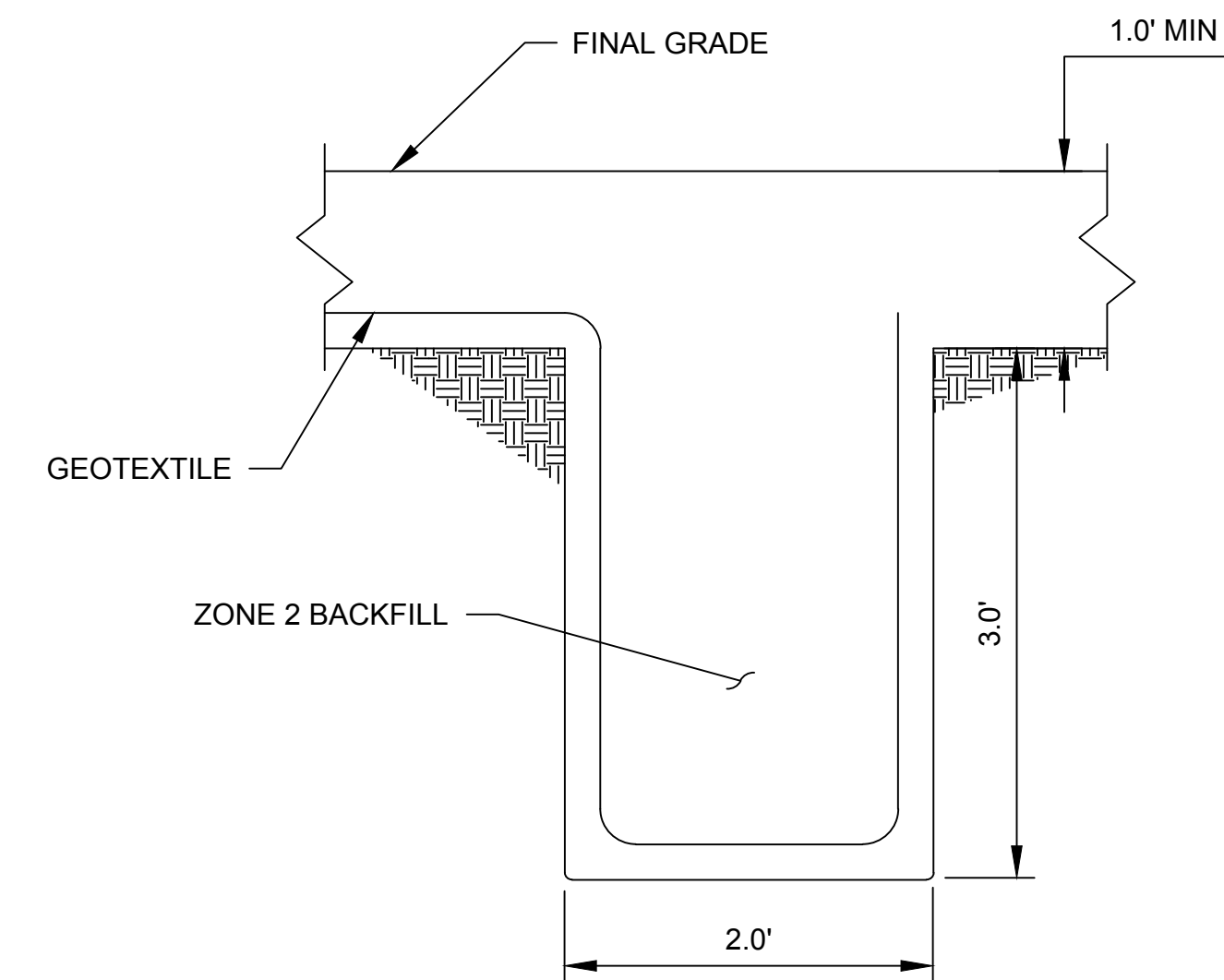


EXTENSION LADDER DETAIL
NTS

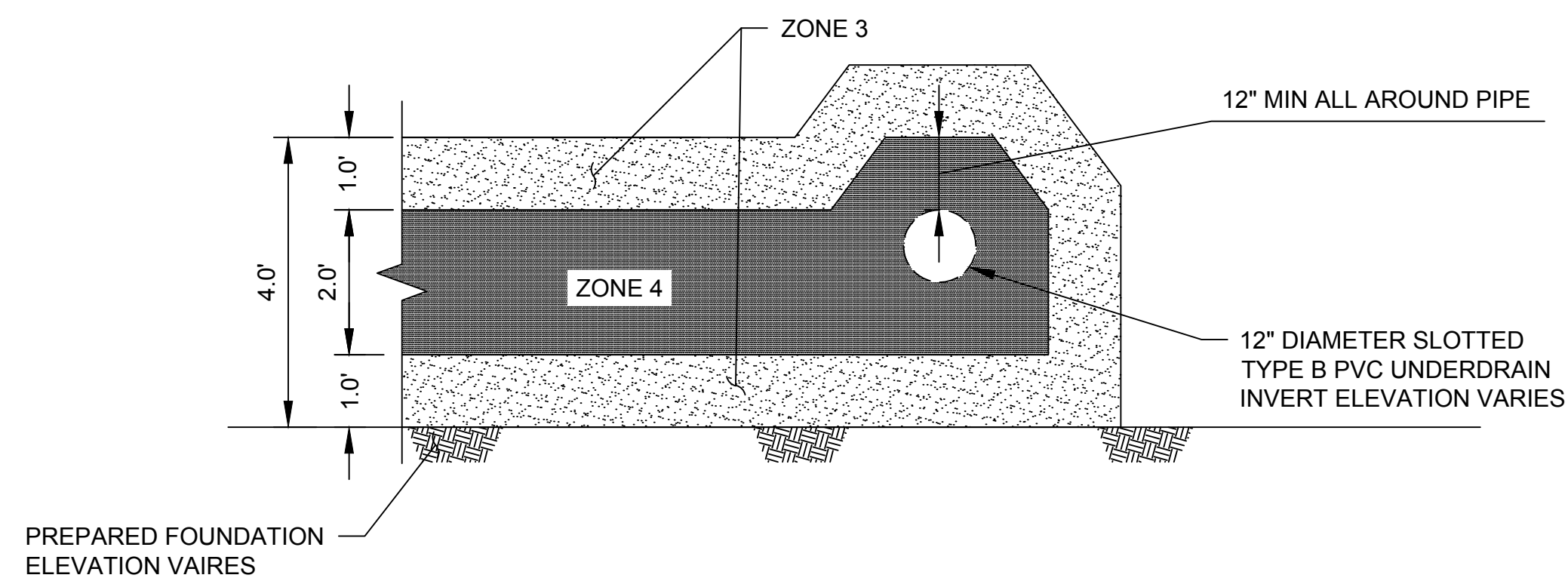
9
C-16



OUTLET CONDUIT EXCAVATION AND BACKFILL



GEOTEXTILE ANCHOR TRENCH
NTS



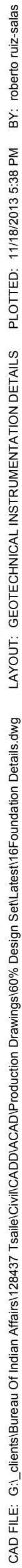
ZONED BLANKET DRAIN AND TOE DRAIN
NTS

SAND BLANKET DRAIN

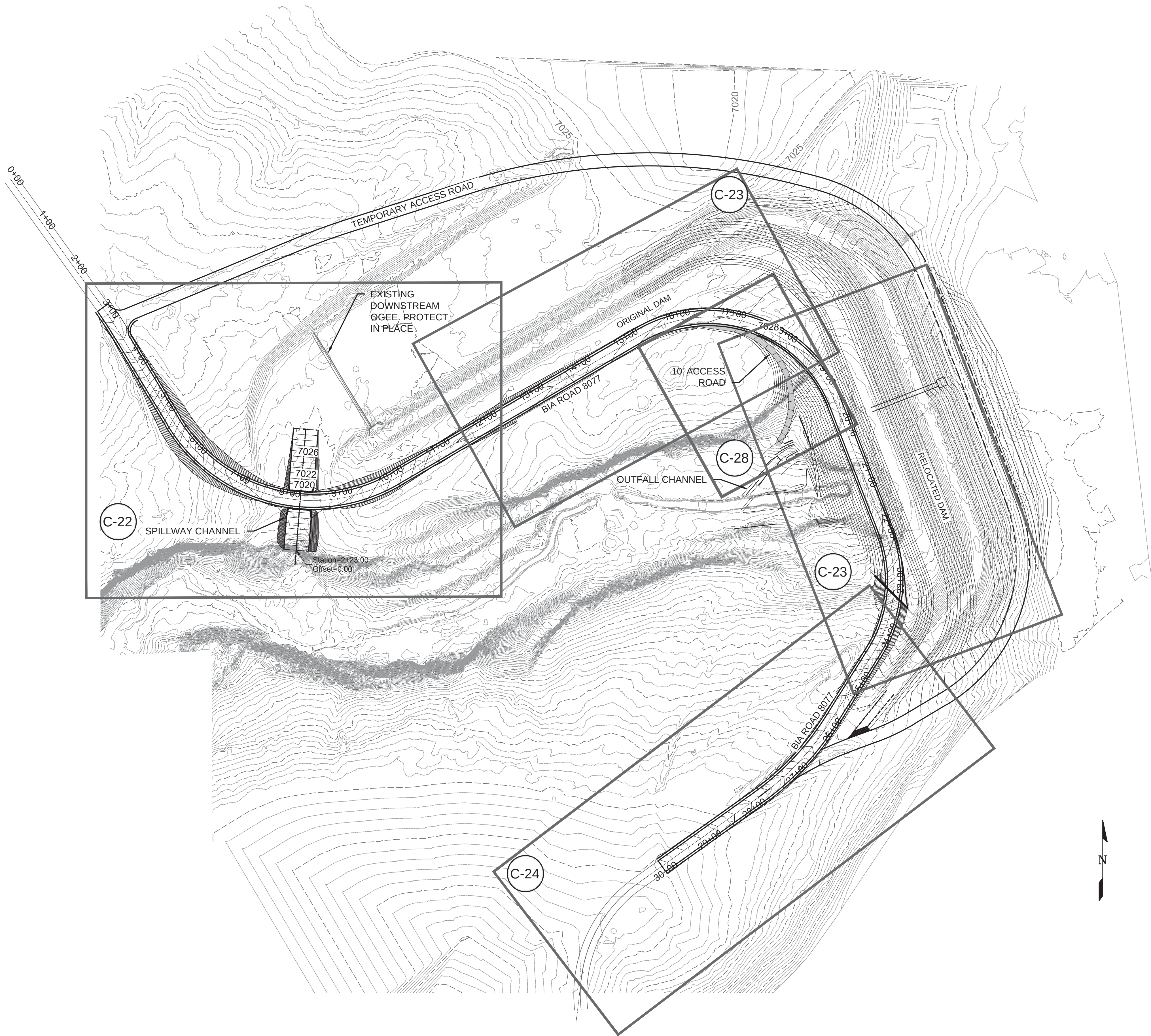
TABLE 1			
CASE	WIDTH OF FEATURES (W)	DEPTH OF FEATURES (D)	TREATMENT
1	2 INCHES OR LESS	3 TIMES THE WIDTH	SLUSH GROUT
2	2 INCHES TO 5 FOOT	3 TIMES THE WIDTH OR TO A DEPTH WHERE OPENING (F) IS 0.5 INCHES OR LESS	DENTAL CONCRETE
3	GREATER THAN 5 FOOT	3 TIMES THE WIDTH OR AS APPROVED BY THE COR	DENTAL CONCRETE

TYPICAL FOUNDATION TREATMENT

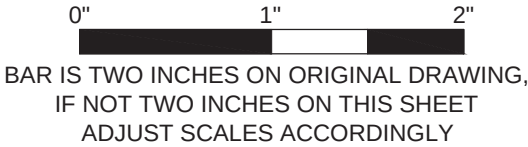
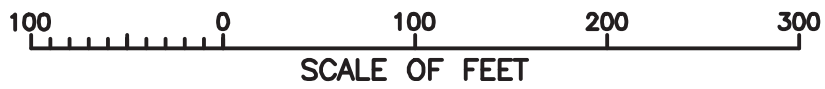
 Cooper Zietz Engineers, Inc.  KLEINFELDER Bright People. Bright Solutions.						
CIVIL DETAILS TSAILLE DAM MODIFICATION BUREAU OF INDIAN AFFAIRS NAVAJO REGIONAL SAFETY OF DAMS PROGRAM - ARIZONA	DATE	11-22-2013				
	PROJECT NO.	128437				
	DRAWN BY	R. RUIZ-SALAS				
	CHECKED BY	C. LARSON	1	TEMPORARY ROAD REALIGNMENT	CZ / KLF	11-22-2013
	FILE NAME		NO.	DESCRIPTION	BY	DATE
16Foundation_Details.dwg		REVISIONS				

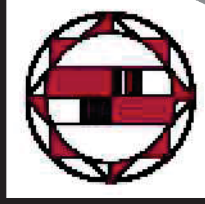


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SITE PLAN - BIA ROAD 8077 SHEET INDEX





Cooper Zietz Engineers, Inc.



KLEINFELDER
Smart People. Right Solutions.

DATE	11/22/2013	PROJECT NO.	128437	DRAWN BY	NLO	CHECKED BY	PEK	DESIGNED BY	ME	NO.	1	DESCRIPTION	TEMPORARY ROAD REALIGNMENT	BY	CZ / KLF	DATE	11-22-2013
REVISIONS																	

BIA ROAD 8077
SITE PLAN

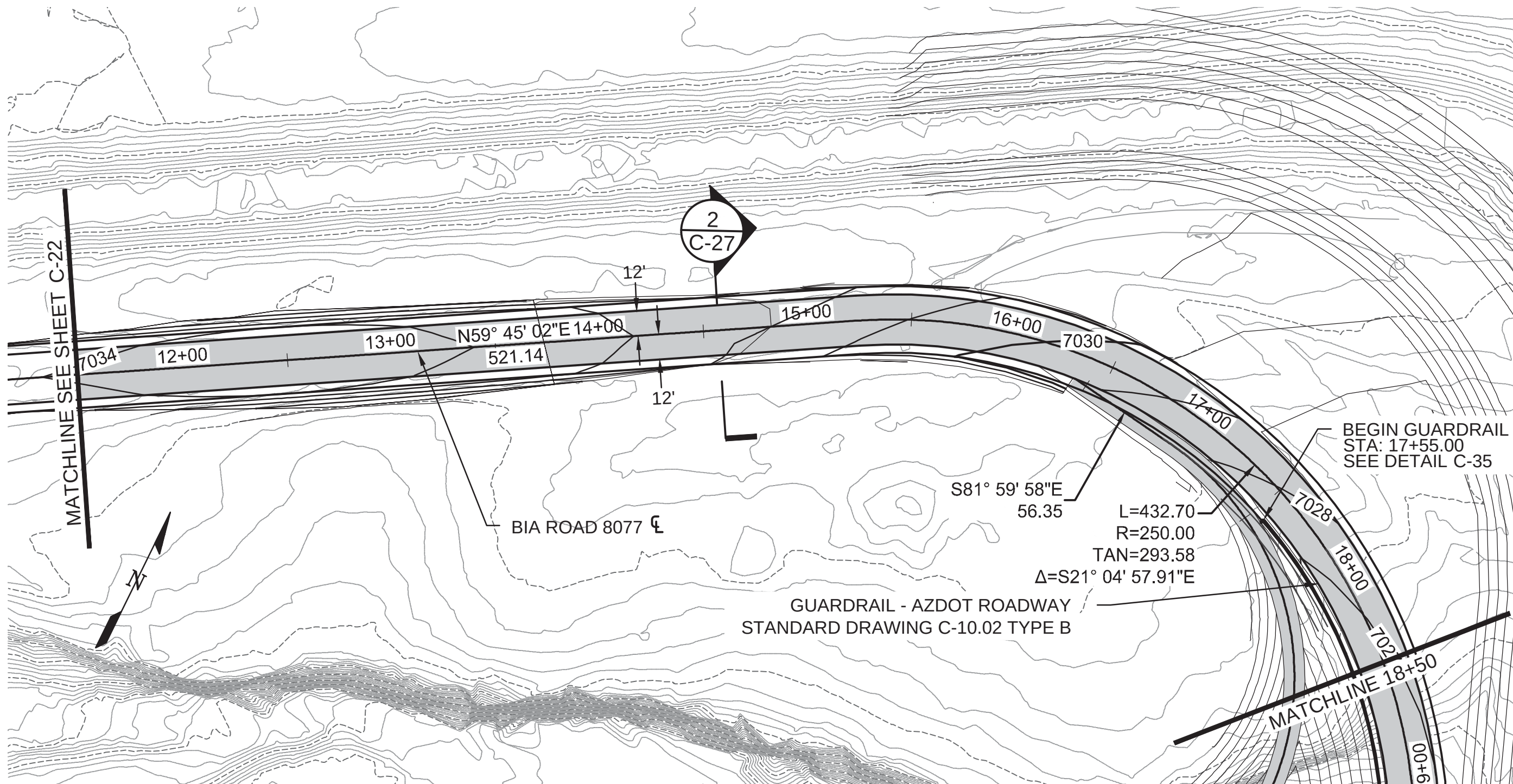
TSALE DAM MODIFICATION
BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL SAFETY OF DAMS - ARIZONA

SHEET 26 of 56

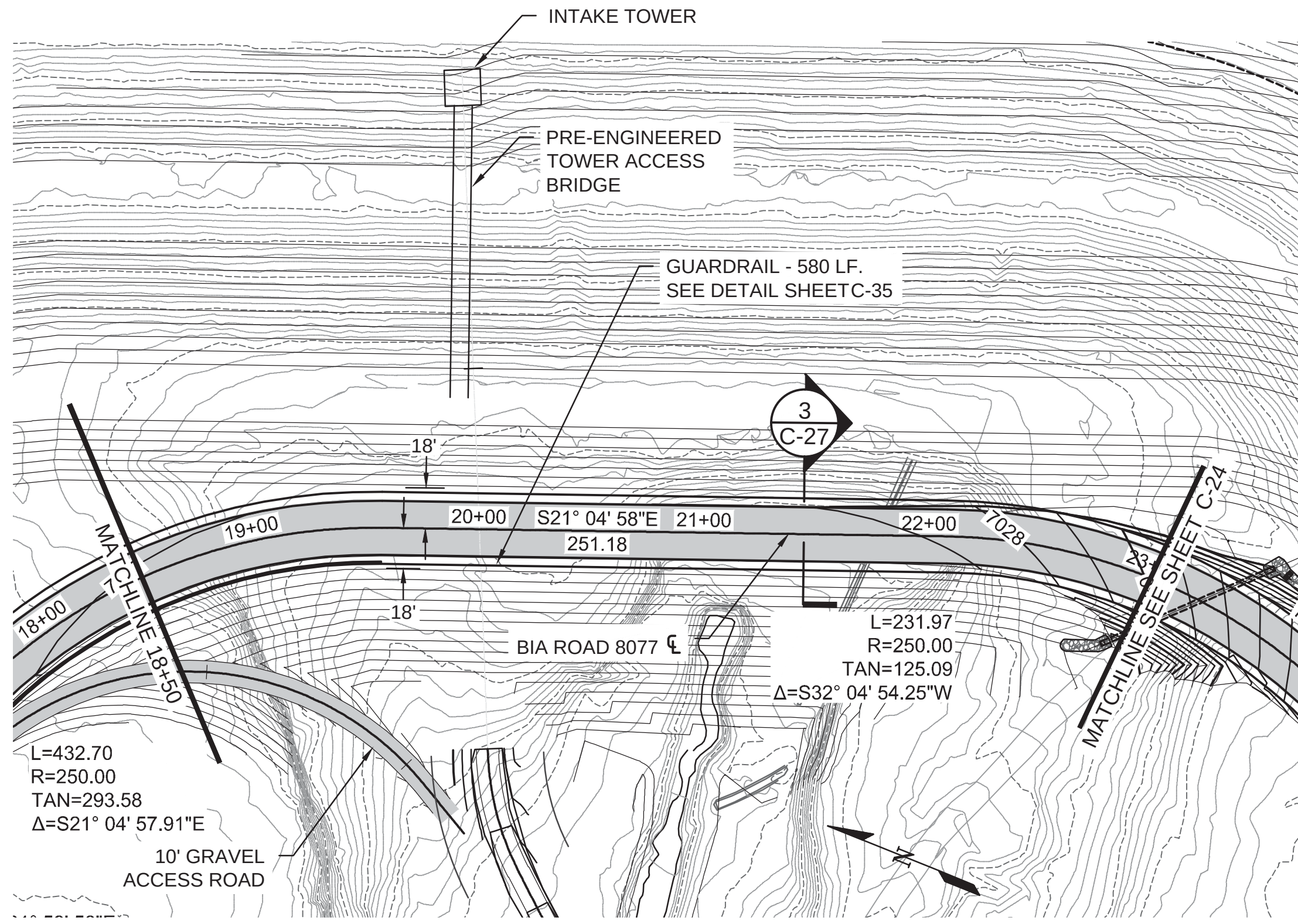
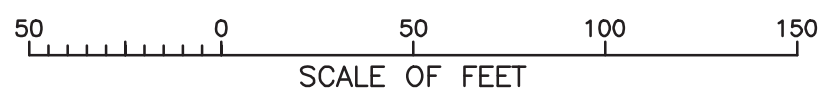


- 0" 1" 2"
- BAR IS TWO INCHES ON ORIGINAL DRAWING.
IF NOT TWO INCHES ON THIS SHEET
ADJUST SCALES ACCORDINGLY

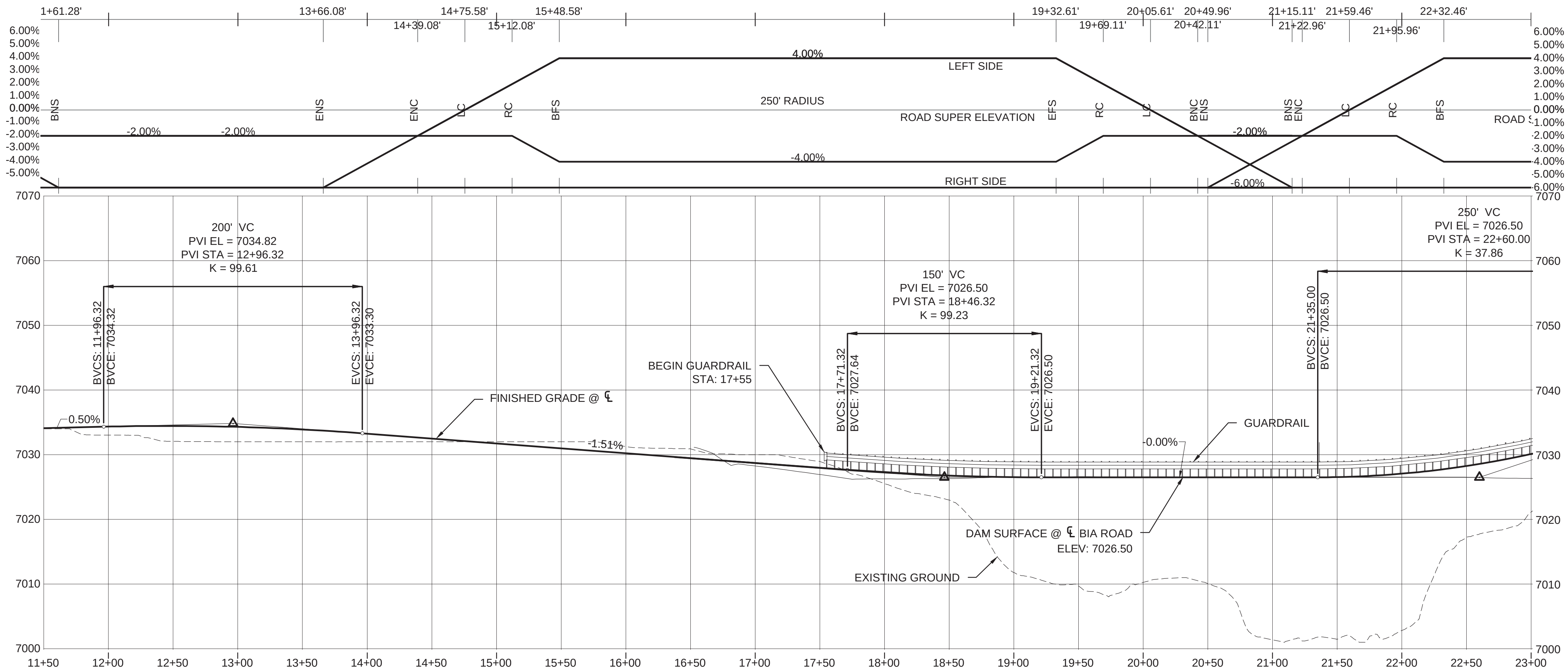
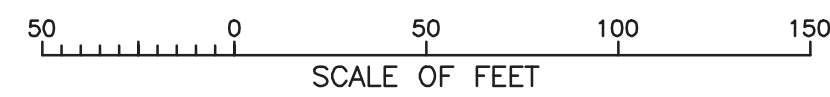
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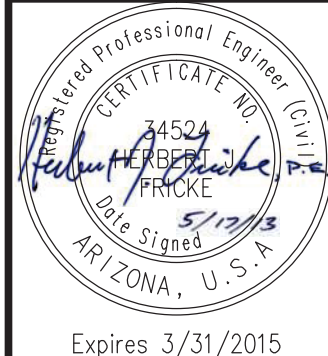
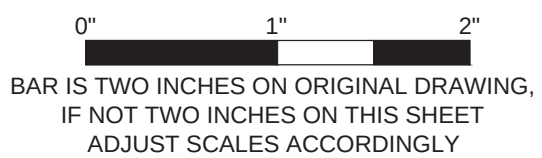
BIA ROAD 8077 PLAN STA: 11+50 TO STA: 18+00



BIA ROAD 8077 PLAN STA: 18+00 TO STA: 24+50

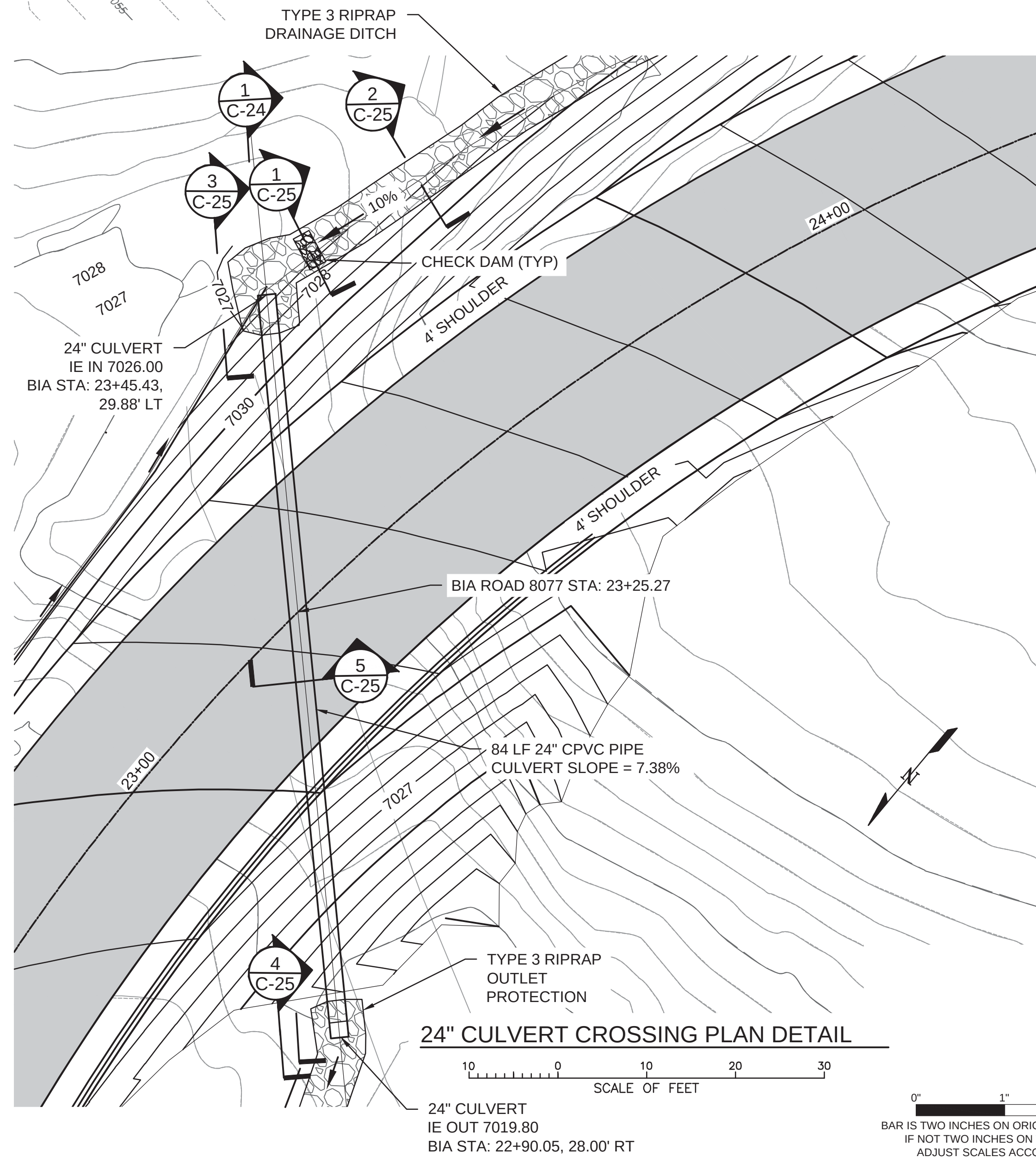
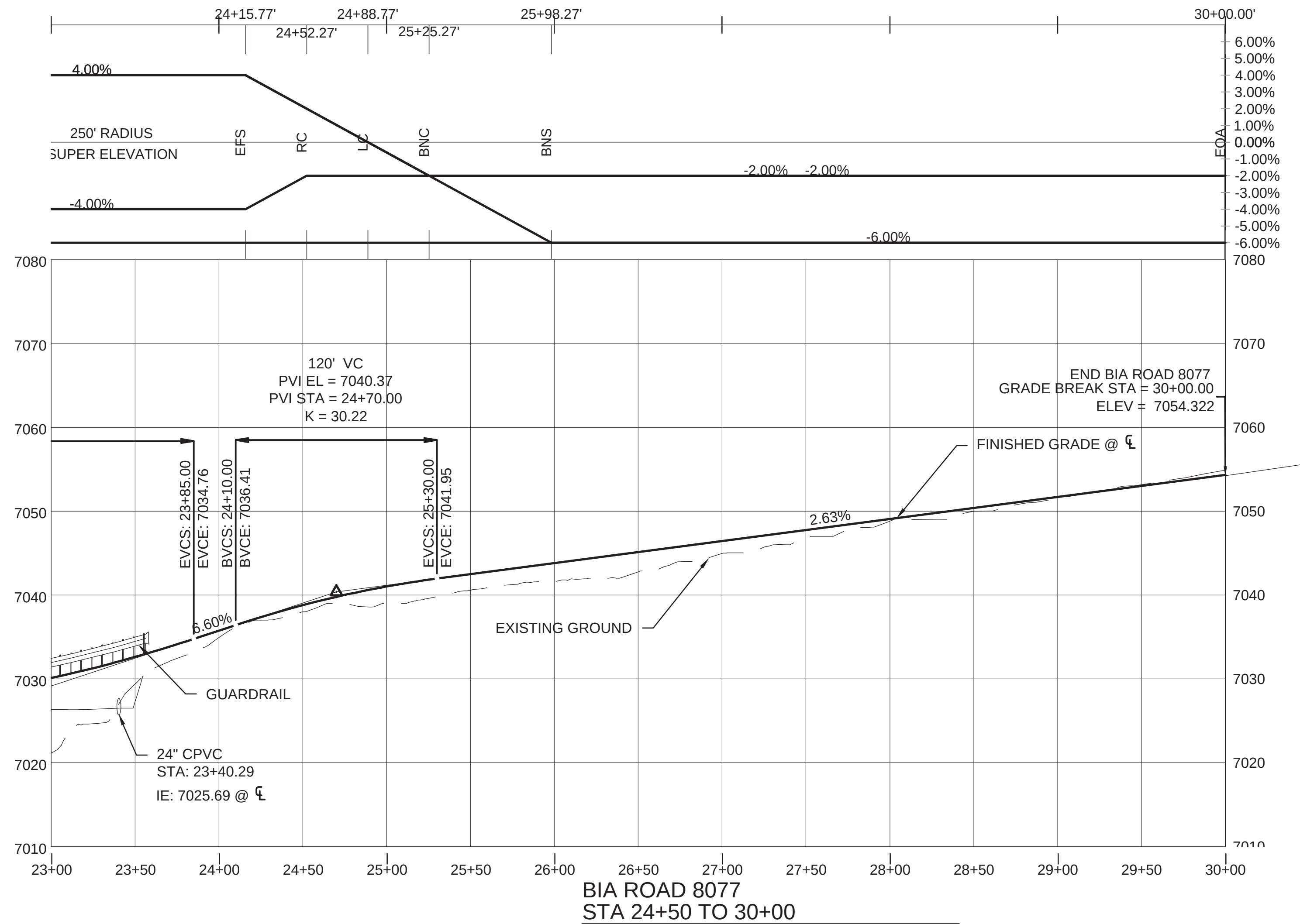
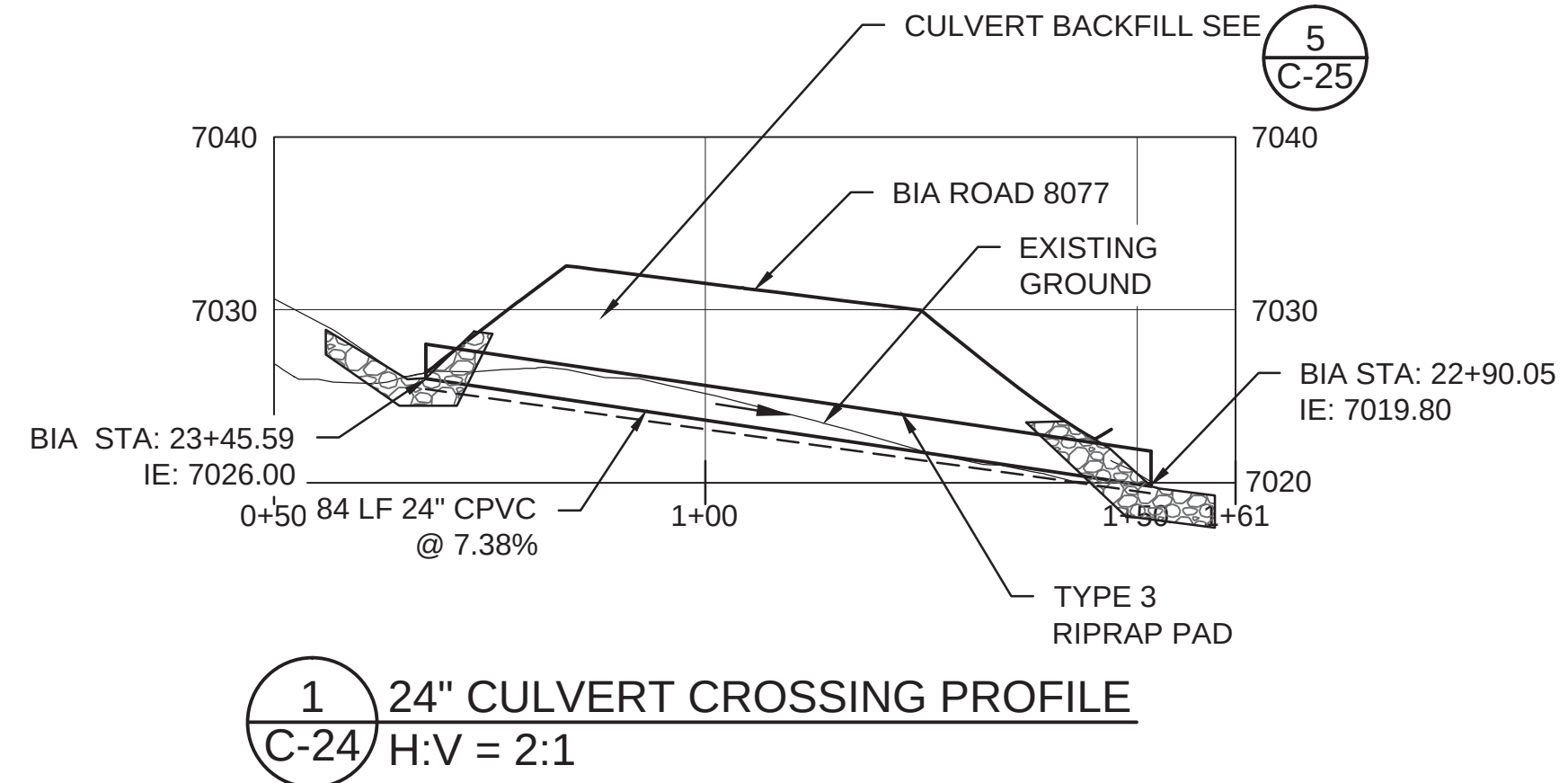
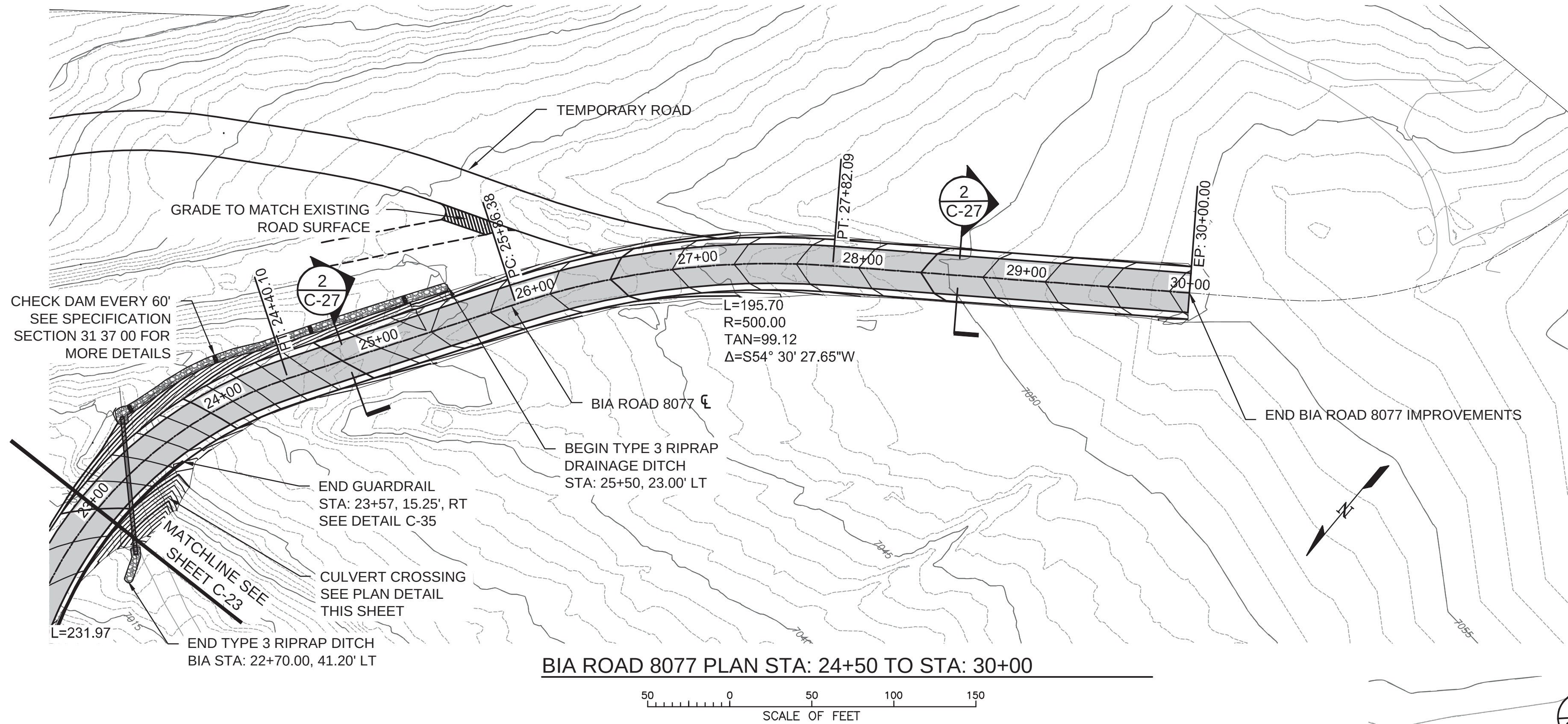


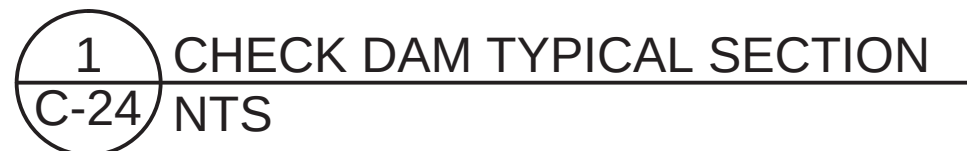
BIA ROAD 8077
STA 11+50 TO 24+50



DATE	PROJECT NO.	DRAWN BY	CHECKED BY	DESIGNED BY	FILENAME
11/22/2013	128437	NLO	PEK	ME	1117_T1_C23.dwg
NO.	DESCRIPTION	BY	DATE	REVISIONS	
1	TEMPORARY ROAD REALIGNMENT	CZ / KLF	11-22-2013		

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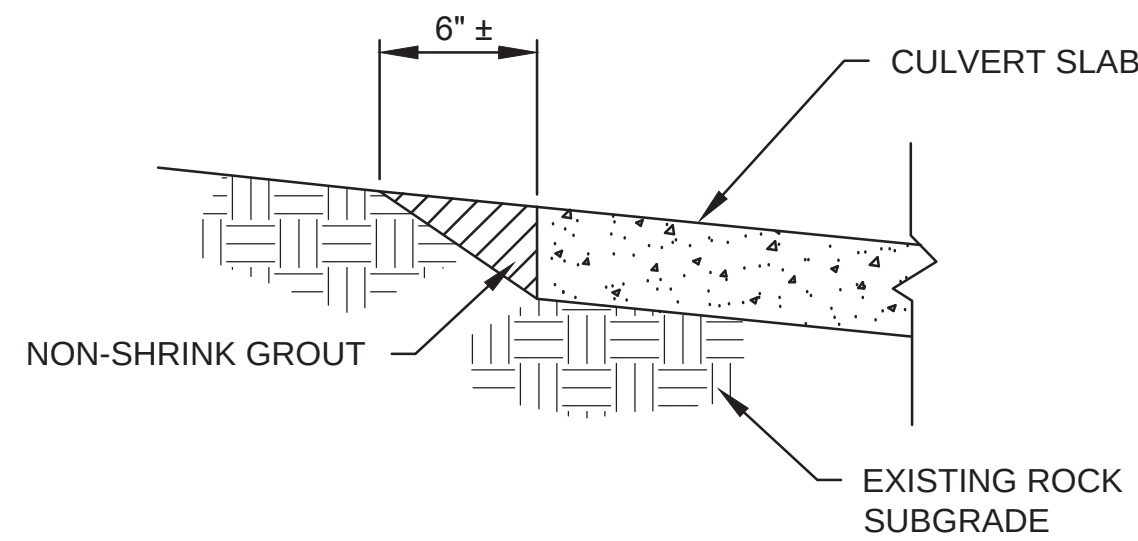




3 PIPE INLET SECTION
C-24 NTS

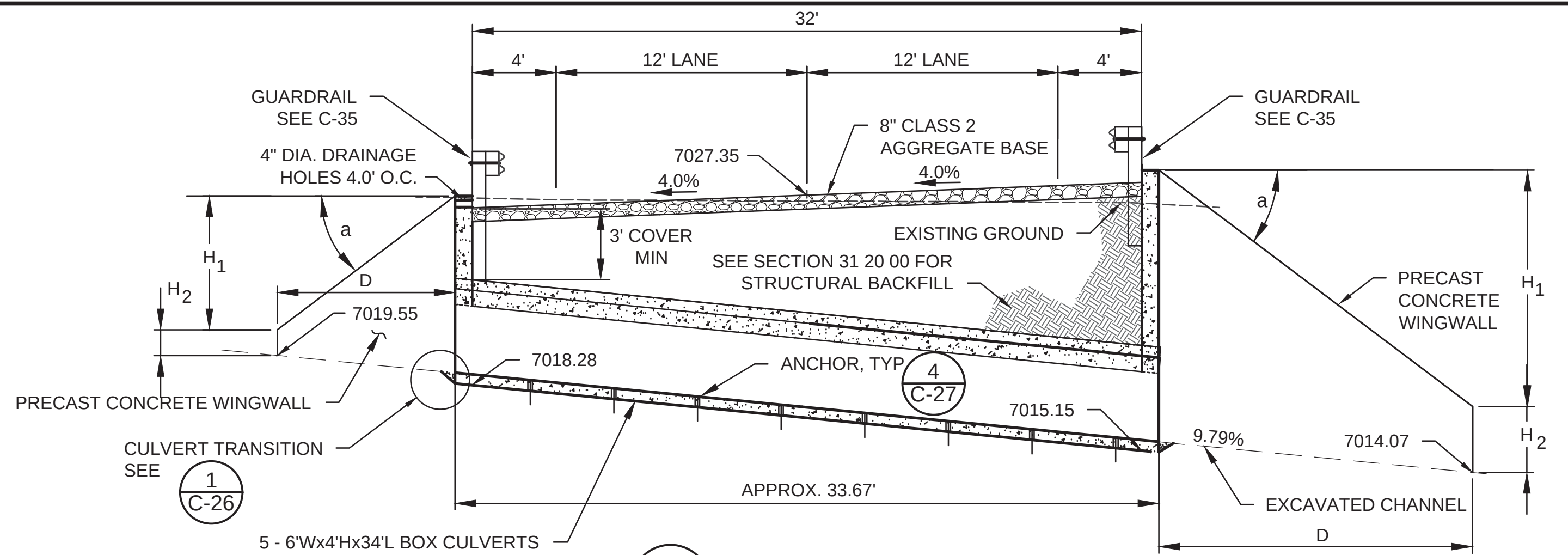


C-25

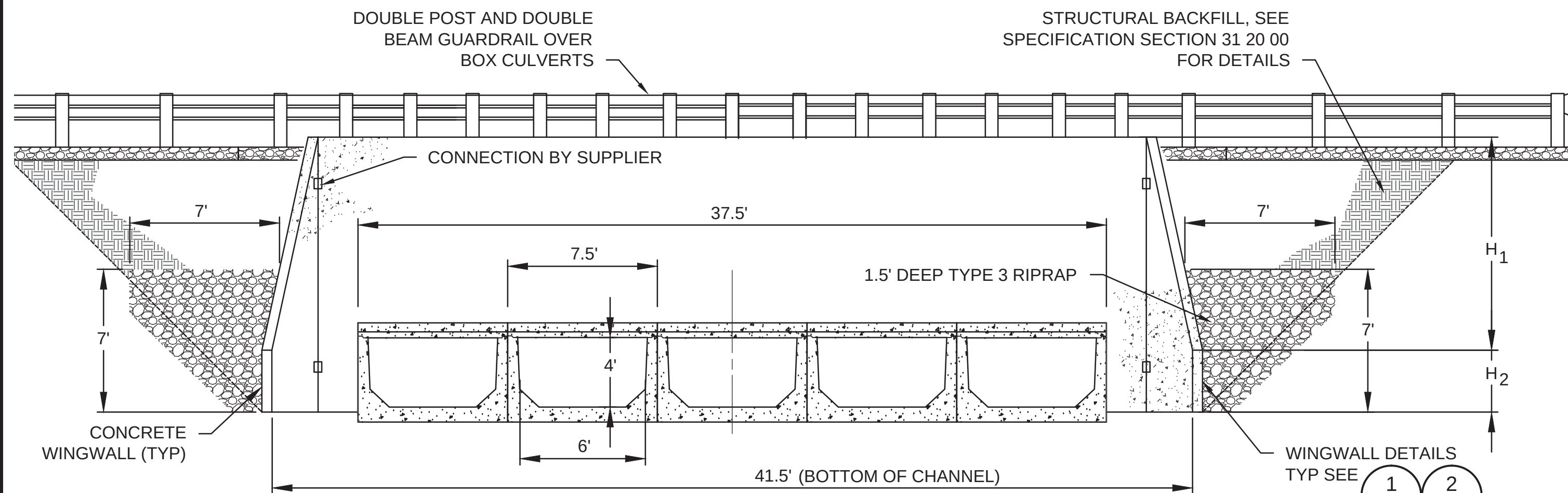


1 C-26 CULVERT TRANSITION DETAIL
NTS

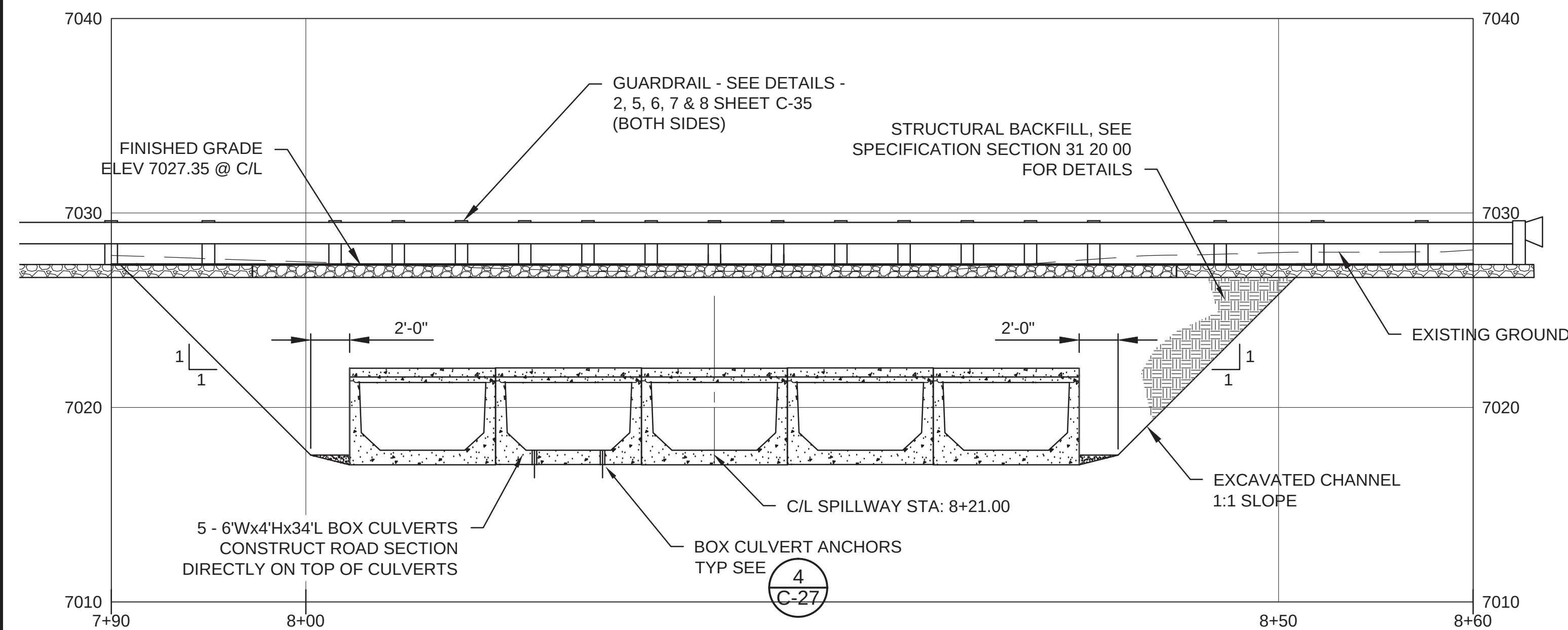
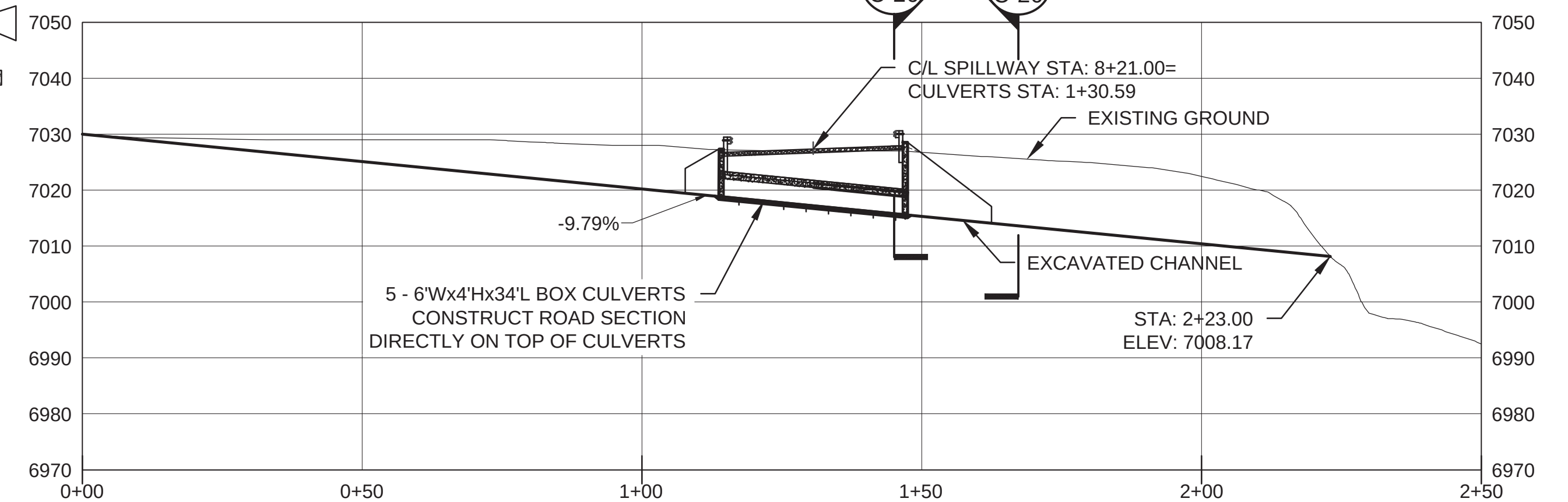
MEASUREMENT TABLE FOR HEADWALLS AND WINGWALLS				
	MEASURE	INLET	OUTLET	
HEIGHT	H ₁	6.4'	11.3'	
HEIGHT	H ₂	1.2'	3.1'	
WINGWALL DECLINATION ANGLE	a	37°	37°	
FLARE ANGLE	b	15°	8°	
HEADWALL WIDTH	A	41.1'	41.2'	
WINGWALL PERPENDICULAR DISTANCE	D	8.2'	15.5'	



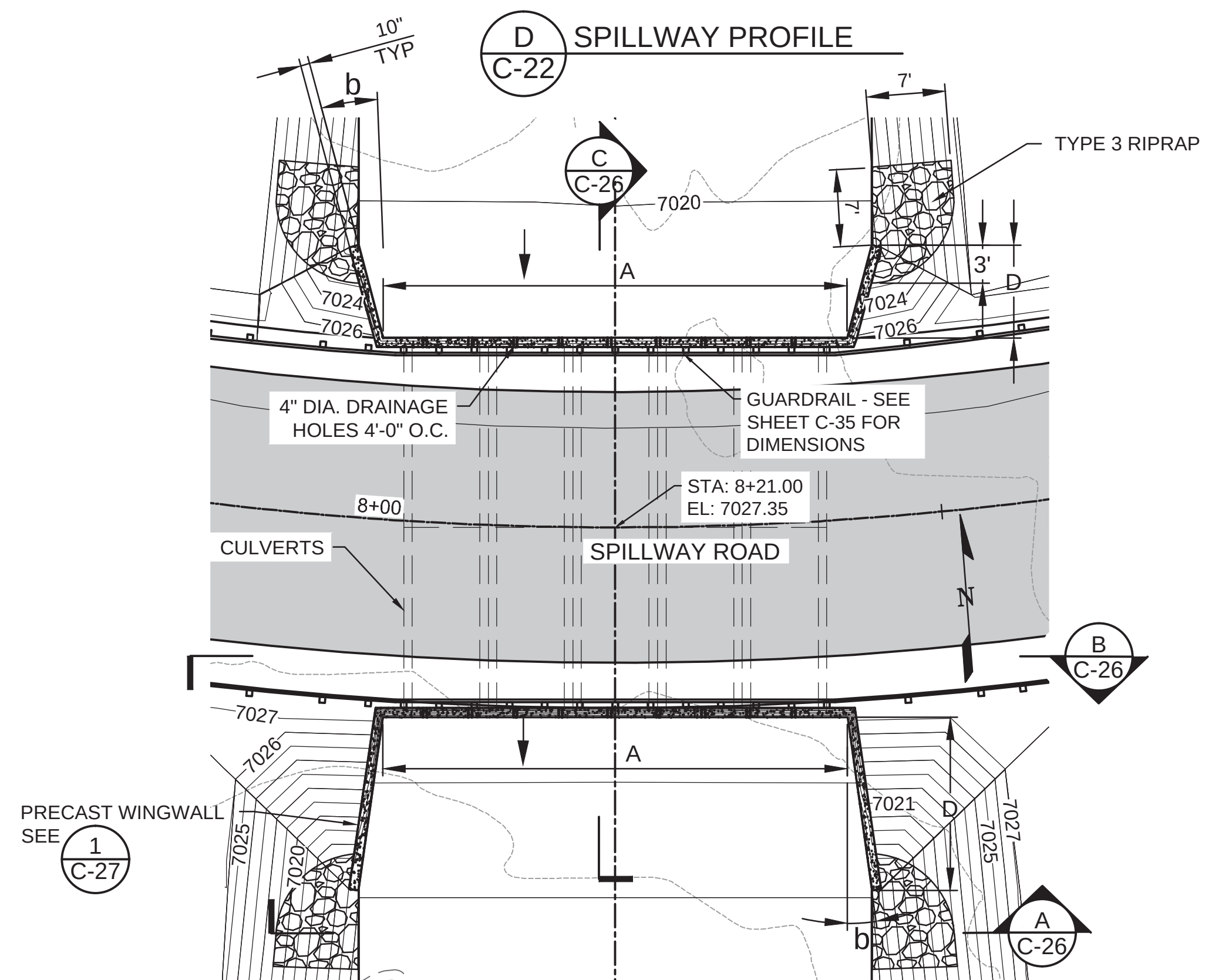
C C-22 BIA ROAD 8077 SECTION @ STA: 8+25



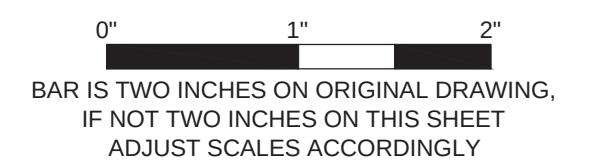
A C-26 WINGWALL AND HEADWALL AT OUTLET
SCALE OF FEET

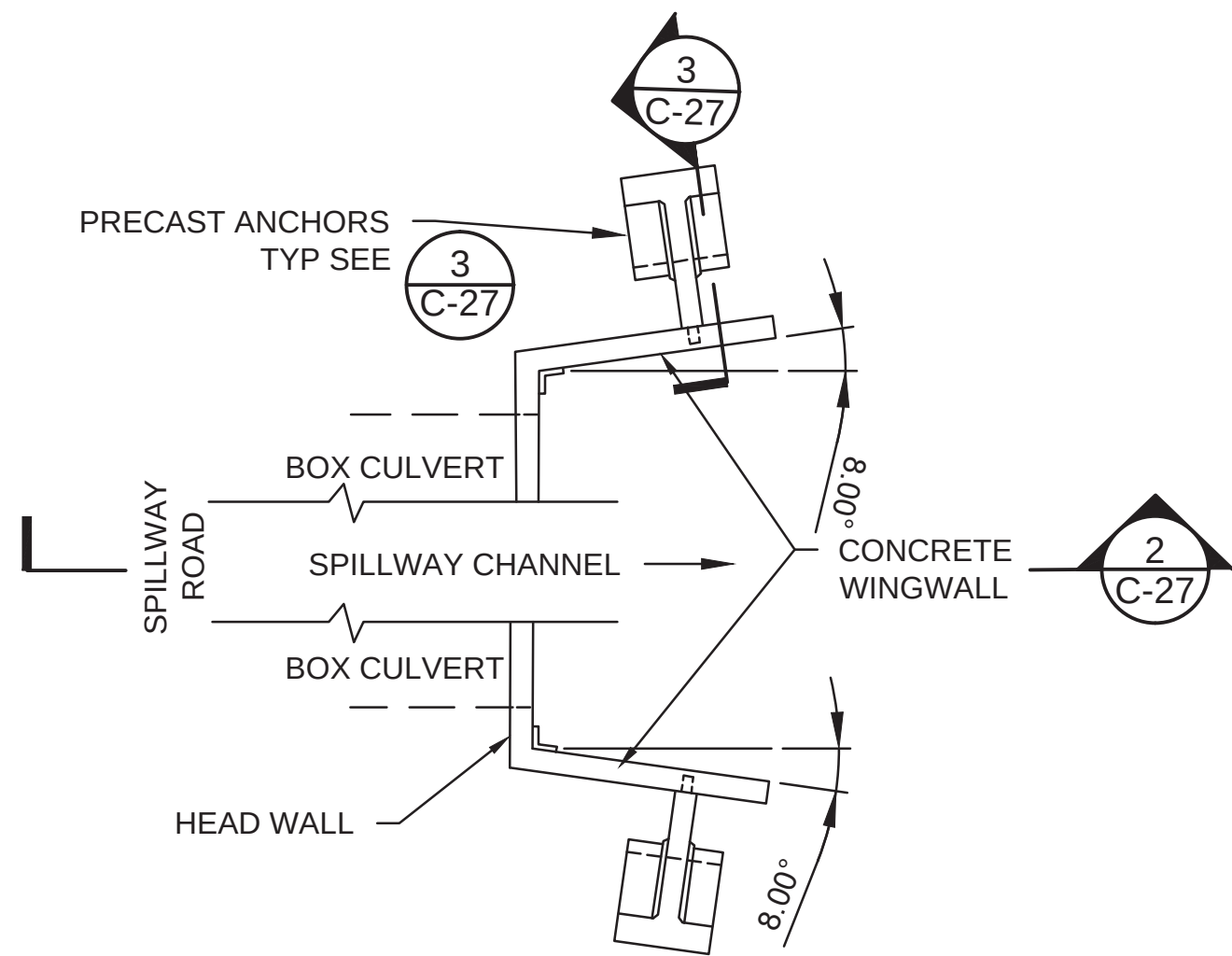


B C-26 SPILLWAY ELEVATION AT CENTERLINE

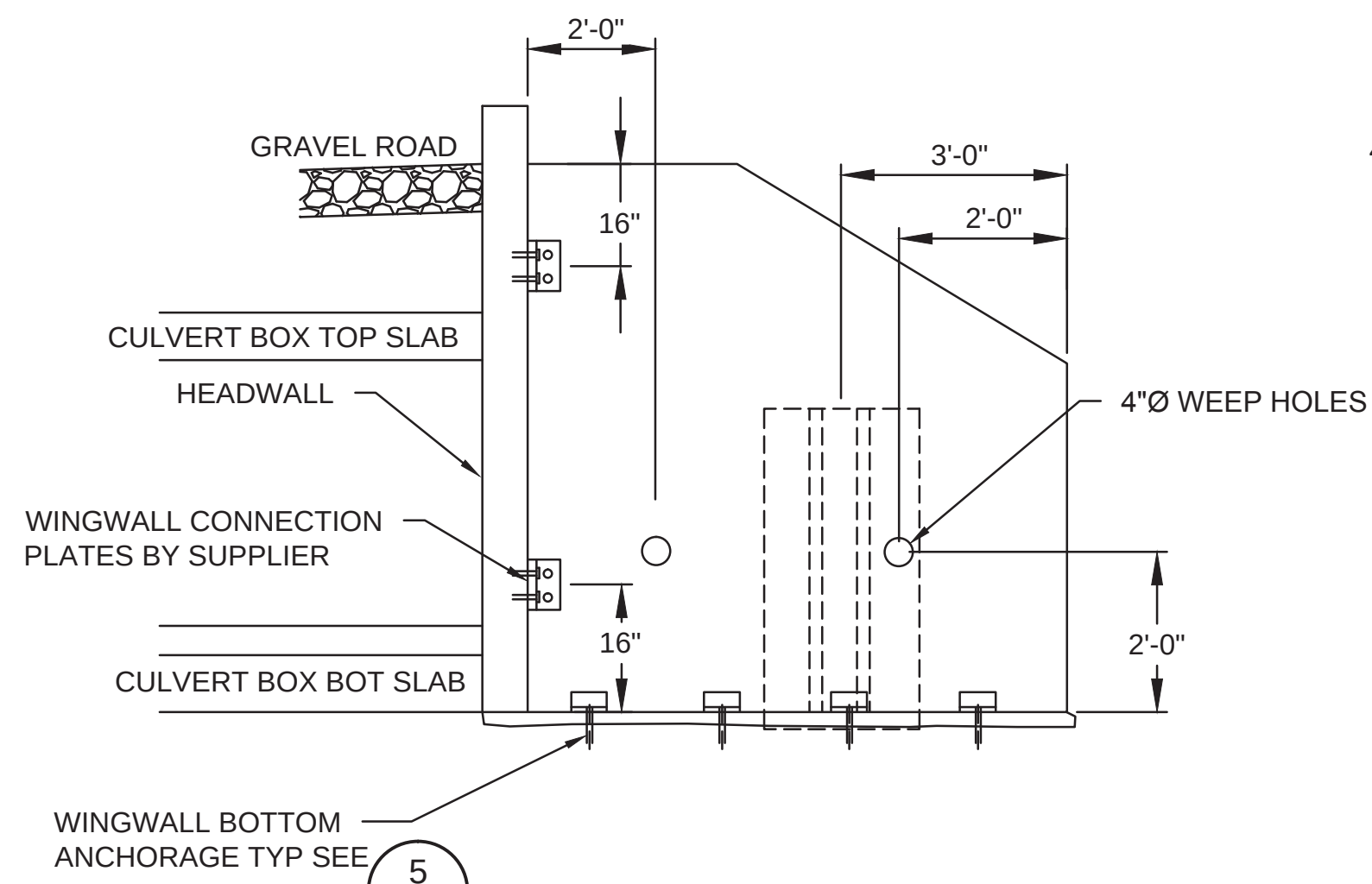


E C-26 BIA ROAD 8077 WING WALL PLAN
SCALE OF FEET

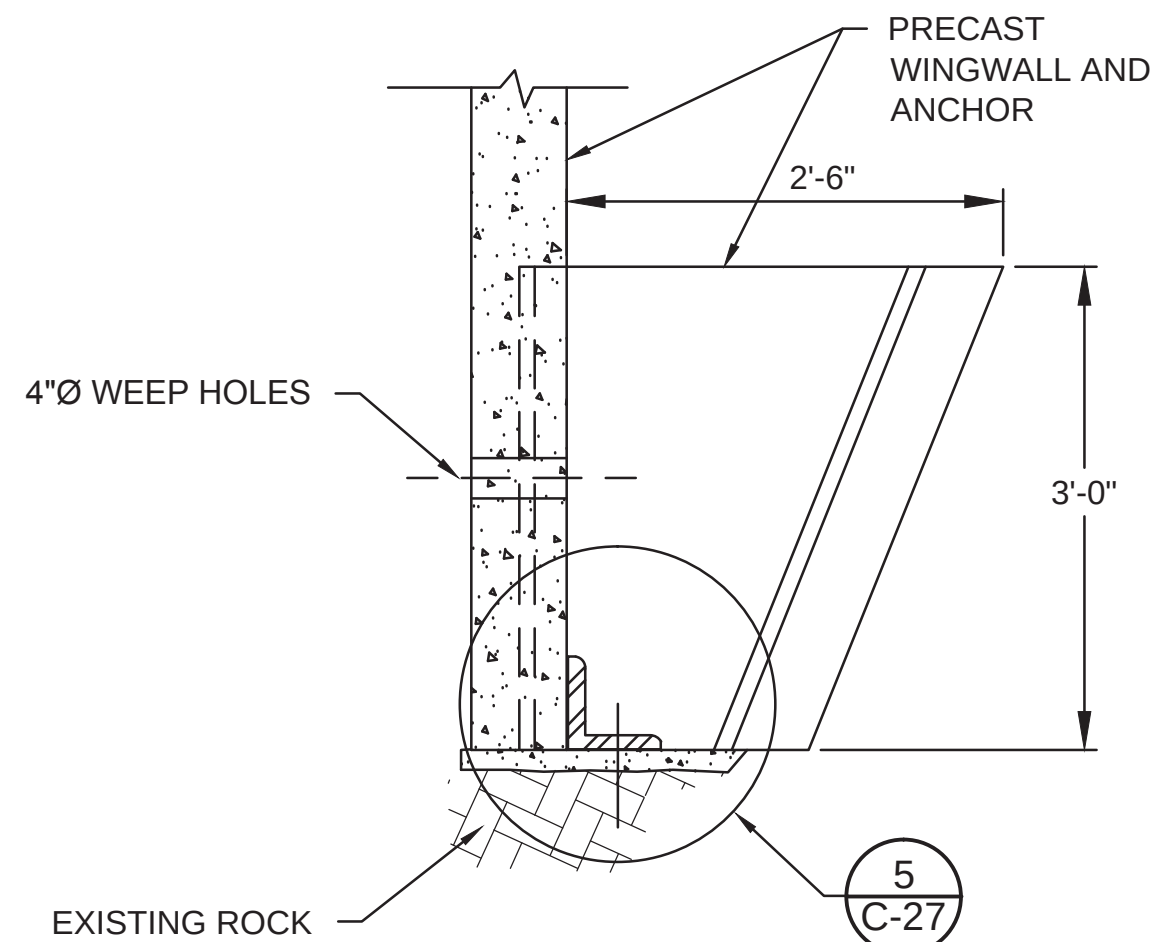




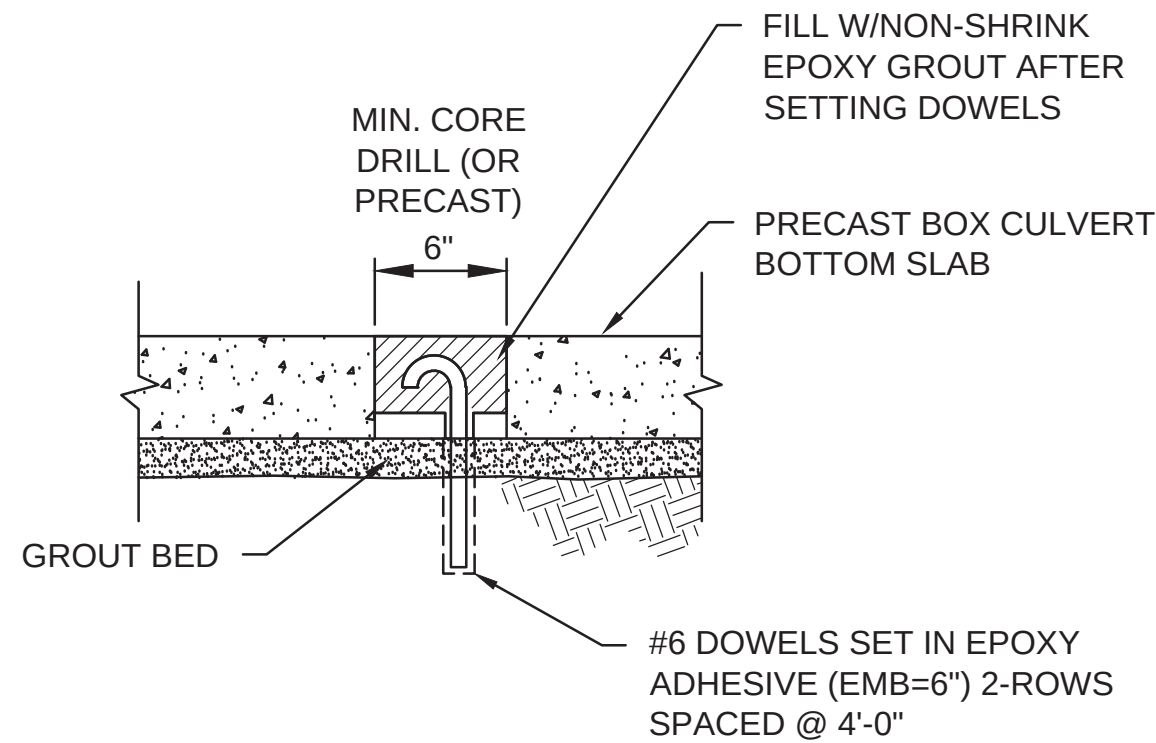
1 WING WALL (OUTLET) PLAN
C-27 NTS



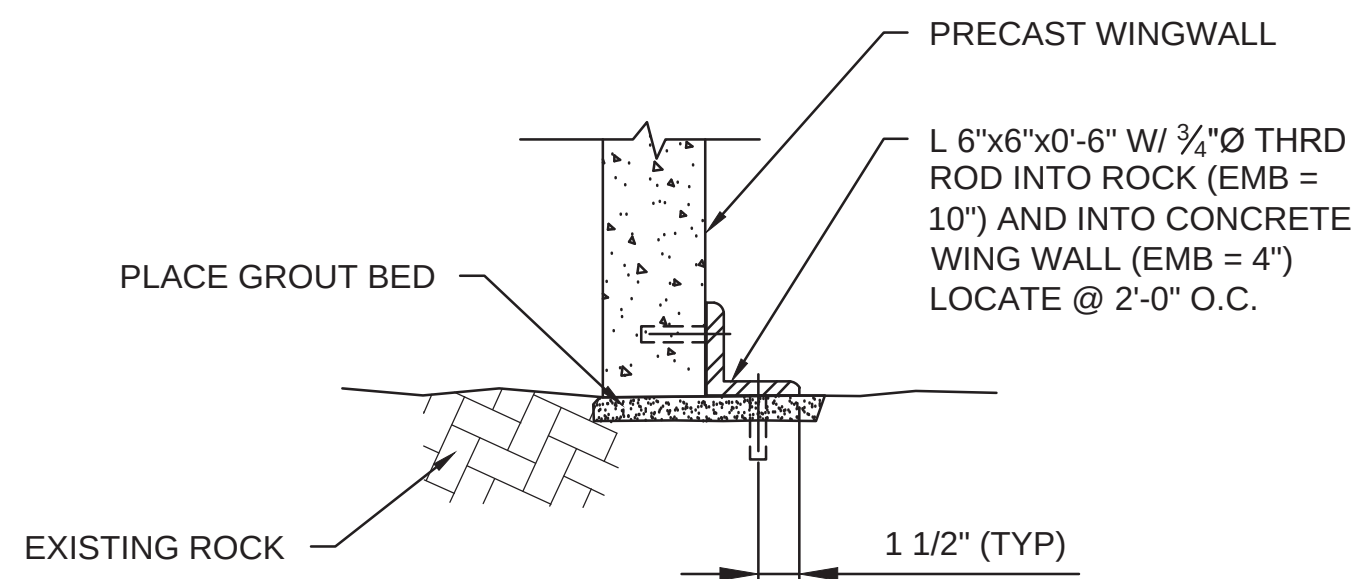
2 WING WALL (OUTLET) SECTION
C-27 NTS



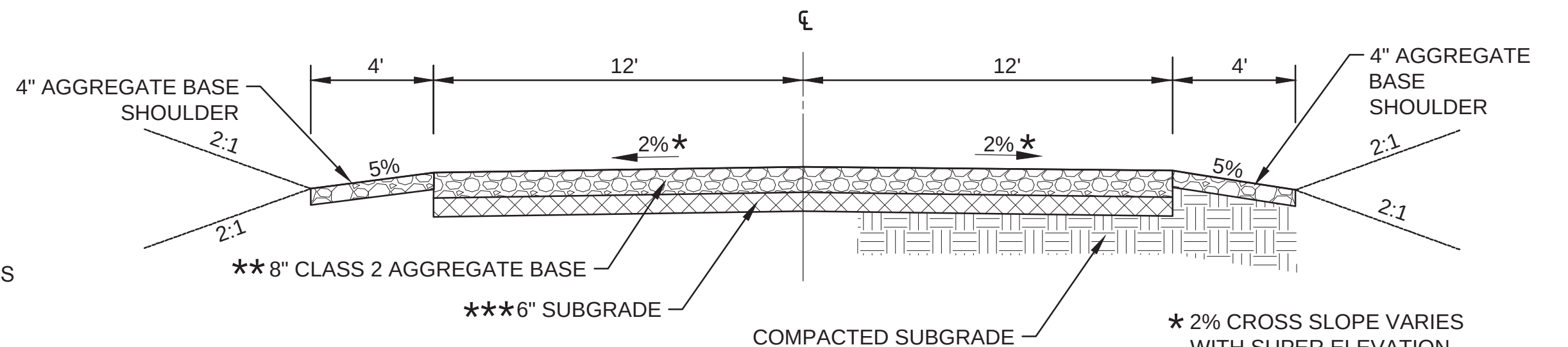
3 PRECAST ANCHORS
C-27 NTS



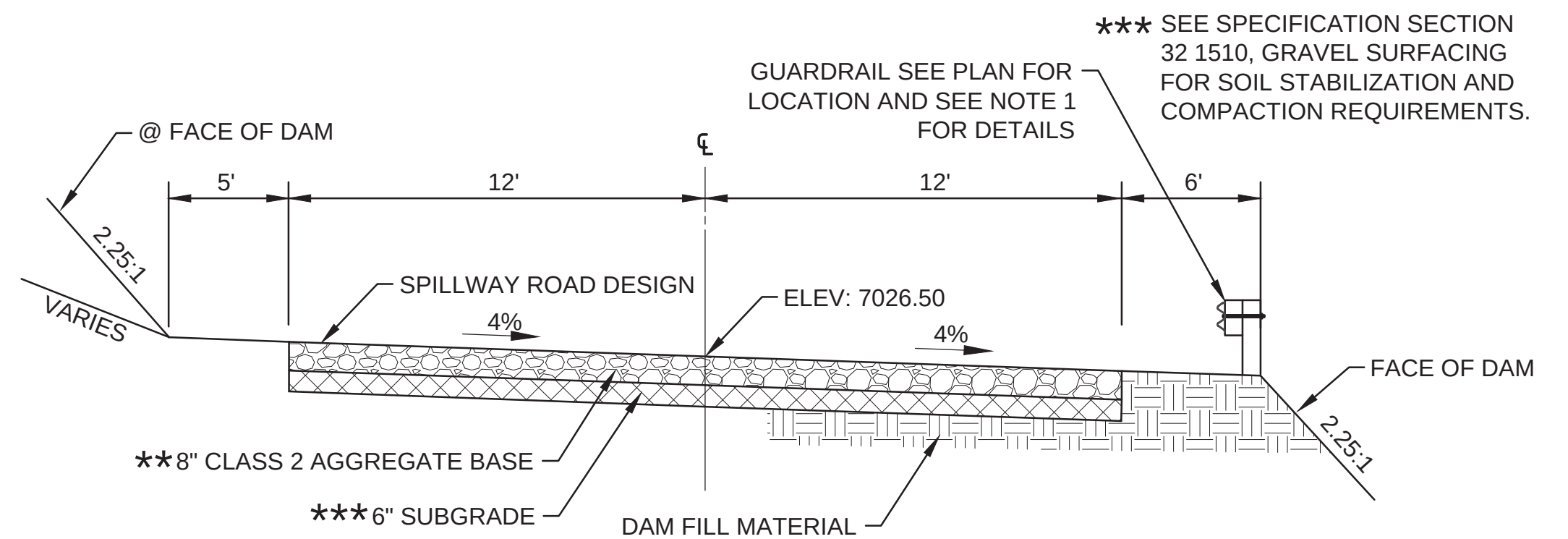
4 BOX CULVERT ANCHORAGE
C-26 NTS



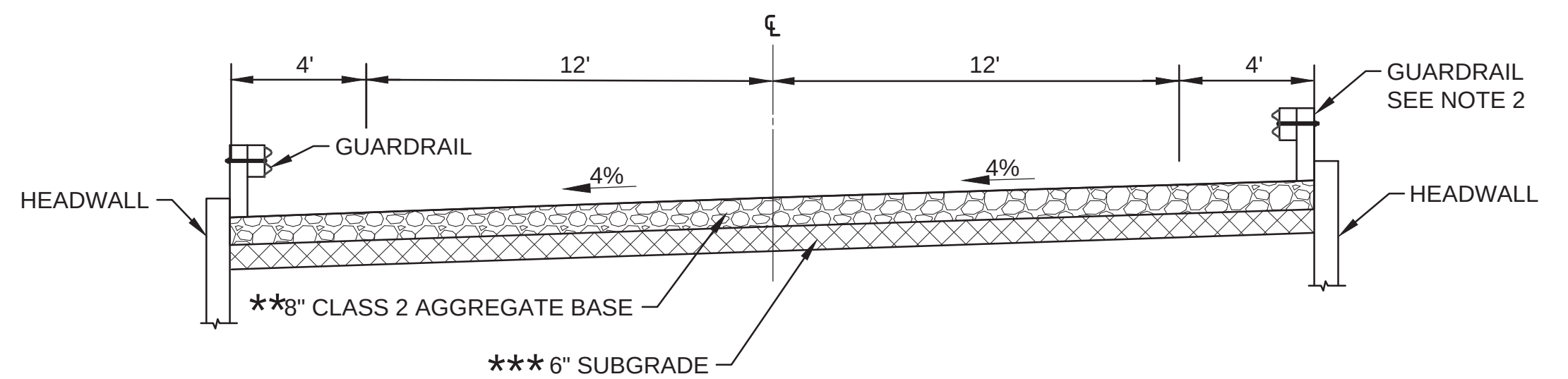
5 WINGWALL BOTTOM ANCHORAGE
C-27 NTS



2 BIA ROAD 8077 TYPICAL SECTION
VAR NTS



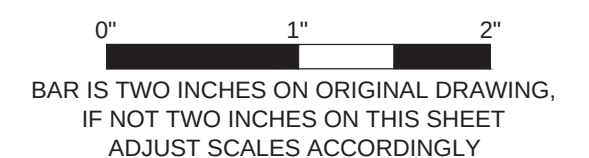
3 BIA ROAD 8077 SECTION AT DAM
STA: 16+50 TO 22+10
C-23 NTS



4 BIA ROAD 8077 SECTION AT SPILLWAY CROSSING
STA: 7+80 TO STA 8+60
C-22 NTS

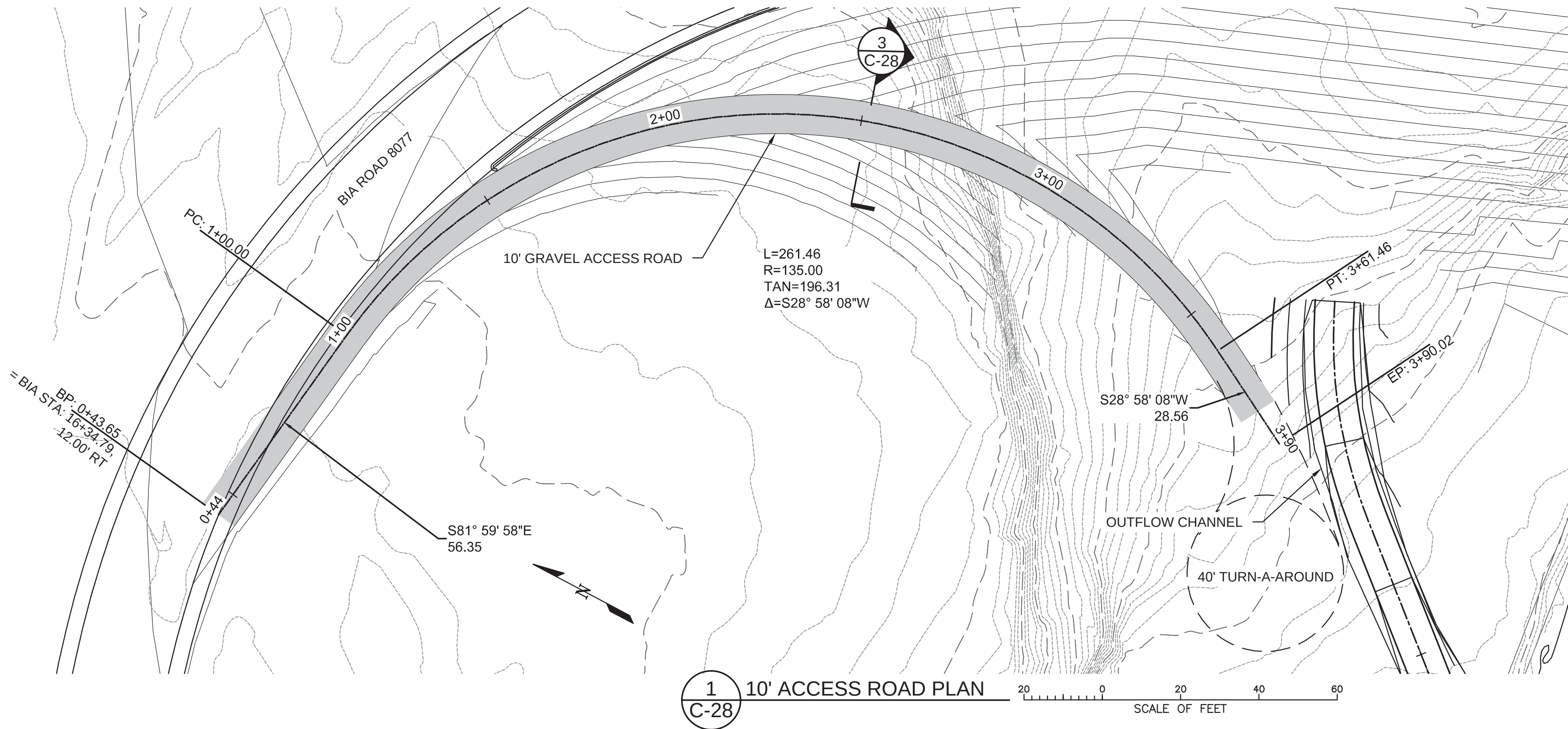
NOTES:

1. INSTALL TYPICAL GUARDRAIL AS INDICATED ON SHEET C-35 PER DETAIL 4/C-35.
2. INSTALL TYPICAL GUARDRAIL PER DETAILS 4/ C-35 FROM STA:7+82 TO STA: 8+01 AND FROM STA: 8+40 TO STA: 8+60. INSTALL GUARDRAILS PER DETAILS 6/C-35 AND 7/C-35 FROM STA: 8+01 TO 8+40.

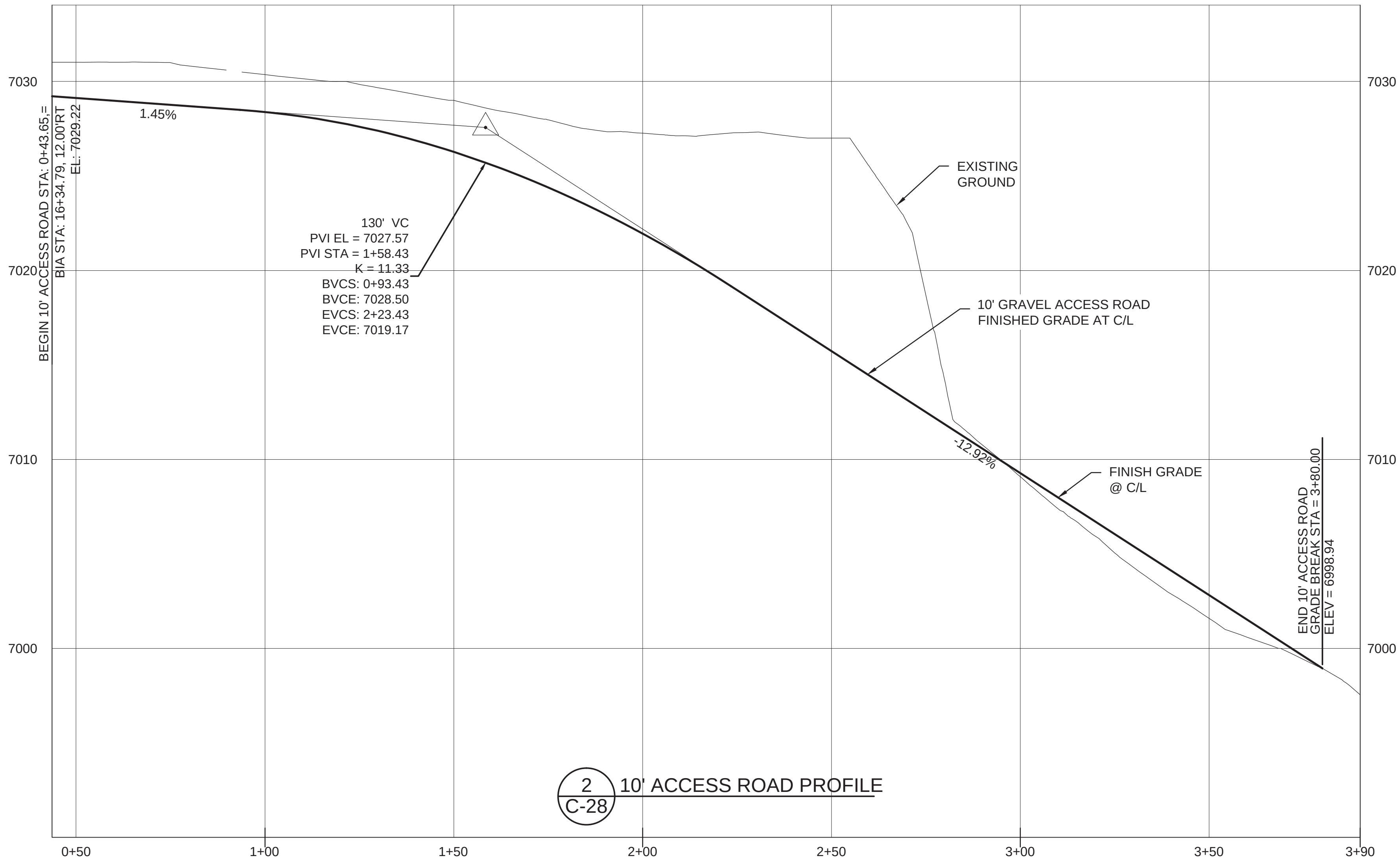


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DESCRIPTION	BY	DATE	REVISIONS	NO.	
TEMPORARY ROAD REALIGNMENT	CZ / KLF	11-22-2013		1	

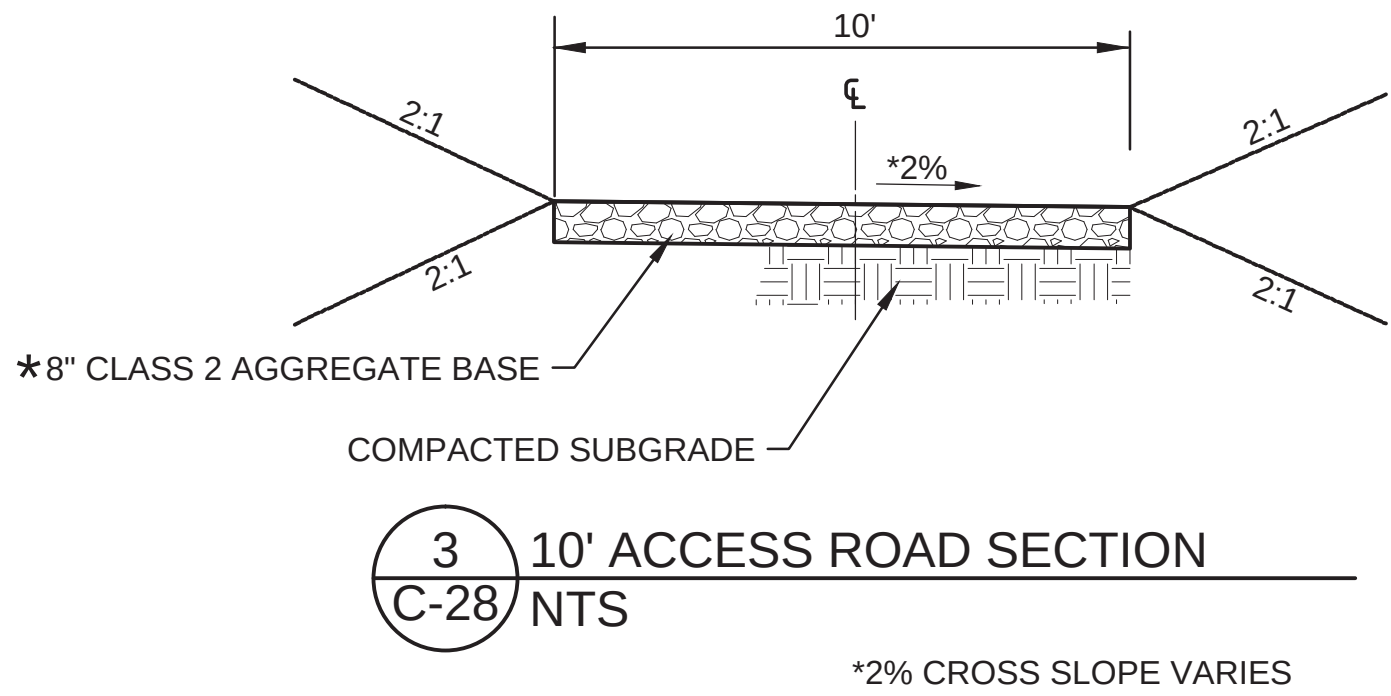
CAD FILE: \\TAD\DE\Projects\2011\117 BIA IPSOD\DOT\Task Order 1 - Tsalle Dam Rehabilitation CAD\2 Sheets\Chili117_TL_C-28.dwg LAYOUT: 10' ACCESS ROAD PLOTTED: 11/21/2013 4:47 PM BY: rlsbk



1 10' ACCESS ROAD PLAN
C-28



2 10' ACCESS ROAD PROFILE
C-28



3 10' ACCESS ROAD SECTION
C-28 NTS

0" 1" 2"
BAR IS TWO INCHES ON ORIGINAL DRAWING.
IF NOT TWO INCHES ON THIS SHEET
ADJUST SCALES ACCORDINGLY

Cooper Zietz Engineers, Inc.


Engineering Solutions



DATE	PROJECT NO.	DRAWN BY	CHECKED BY	DESIGNED BY	FILENAME	REVISIONS			
						NO.	BY	DATE	DESCRIPTION
11/22/2013	128437	NLO	PEK	ME	1117_TL_C-28.dwg	1	CZ/KLF	11-22-2013	TEMPORARY ROAD REALIGNMENT

10' ACCESS ROAD
PLAN AND PROFILE

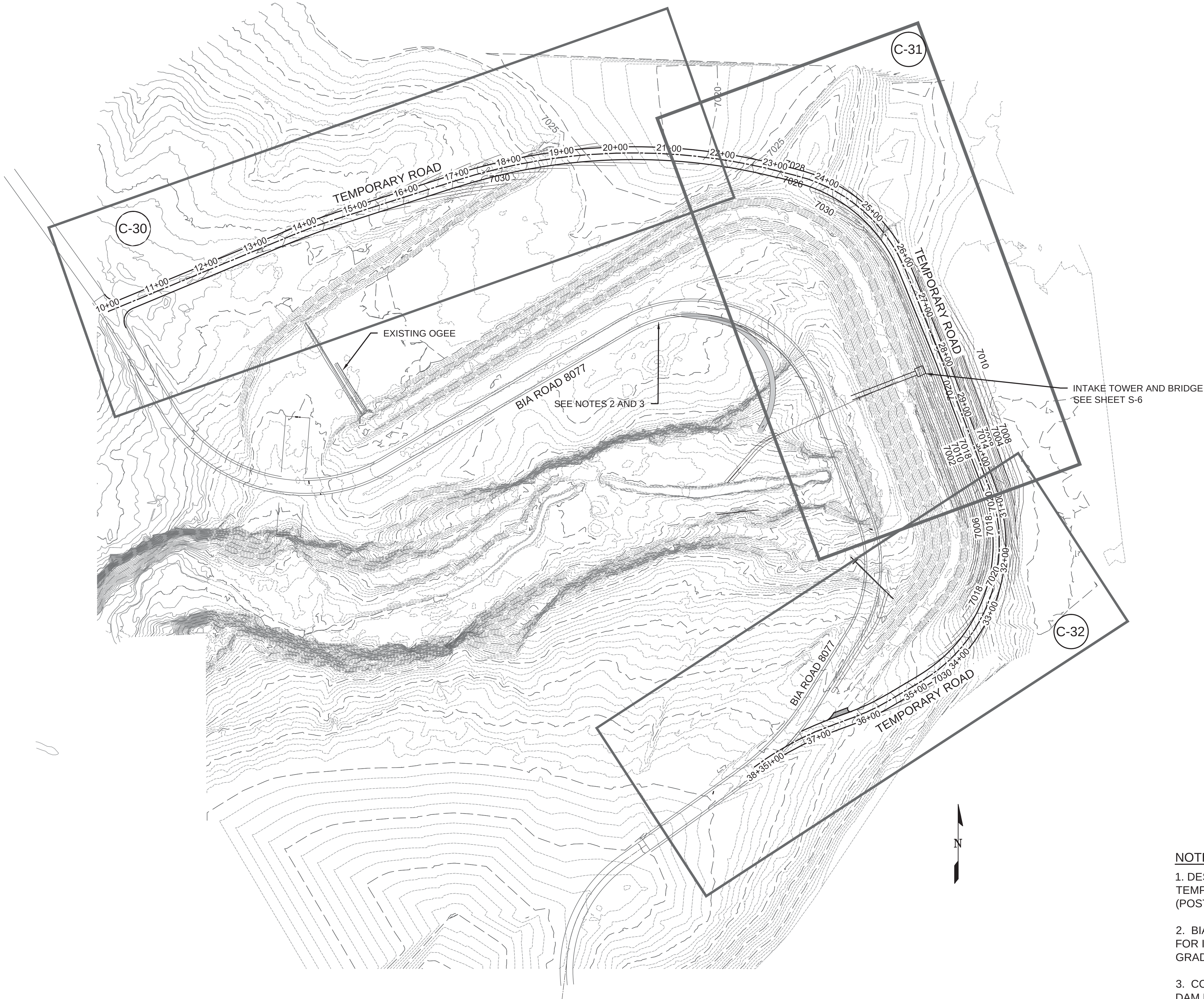
TSALLE DAM MODIFICATION
BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL SAFETY OF DAMS - ARIZONA

SHEET

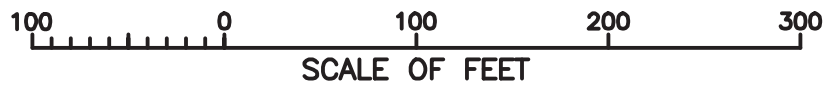
33 of 56

C-28

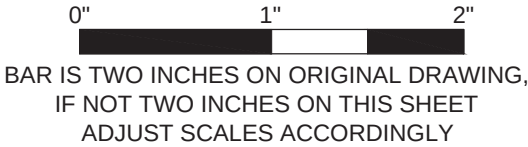
CAD FILE: \\TANDEM\Projects\2011\11-17 BIA IP500 IDQITask Order 1 - Tsale Dam Rehab CAD02-Sheets\CH1117.TL_C-29.dwg LAYOUT: TEMPORARY ACCESS/ROAD 11/21/2013 4:54 PM BY: nlsko



SITE PLAN - TEMPORARY ROAD SHEET INDEX



- NOTES:**
1. DESIGN SPEED FOR TEMPORARY ROAD= 30 MPH (POSTED SPEED = 25 MPH)
 2. BIA ROAD 8077 SHOWN ONLY FOR INFORMATION SEE C-21 FOR GRADING.
 3. CONTOURS FOR RELOCATED DAM NOT SHOWN.

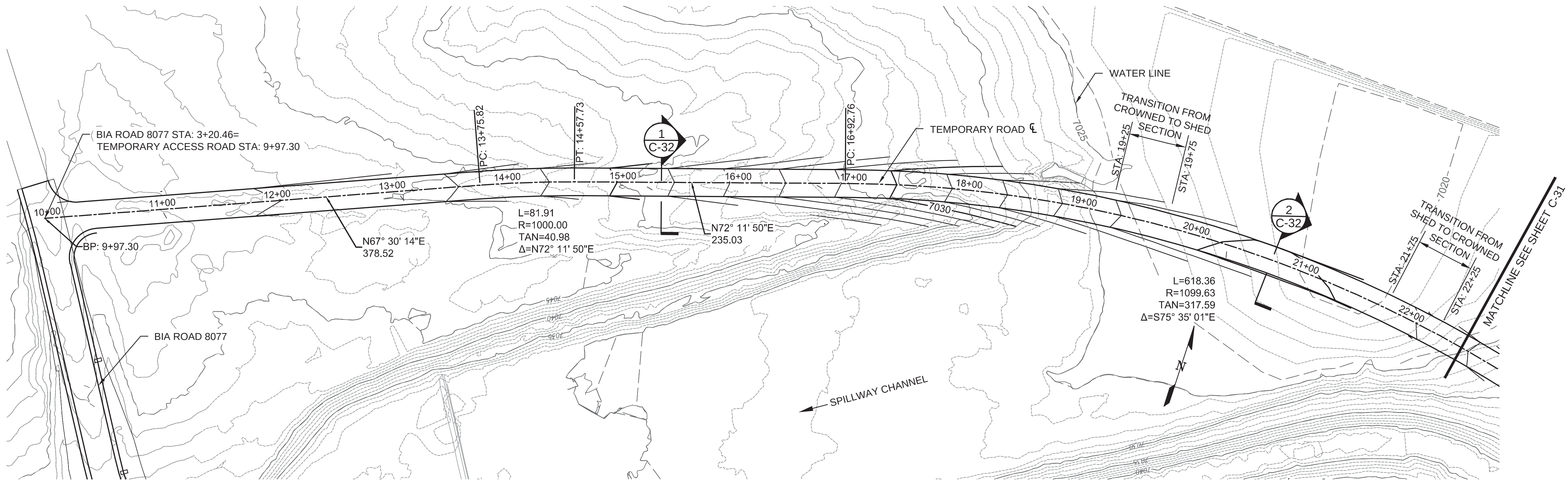


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NO.	1	DESCRIPTION	TEMPORARY ROAD REALIGNMENT	BY	CZ / KLF	DATE	11-22-2013	REVISIONS			

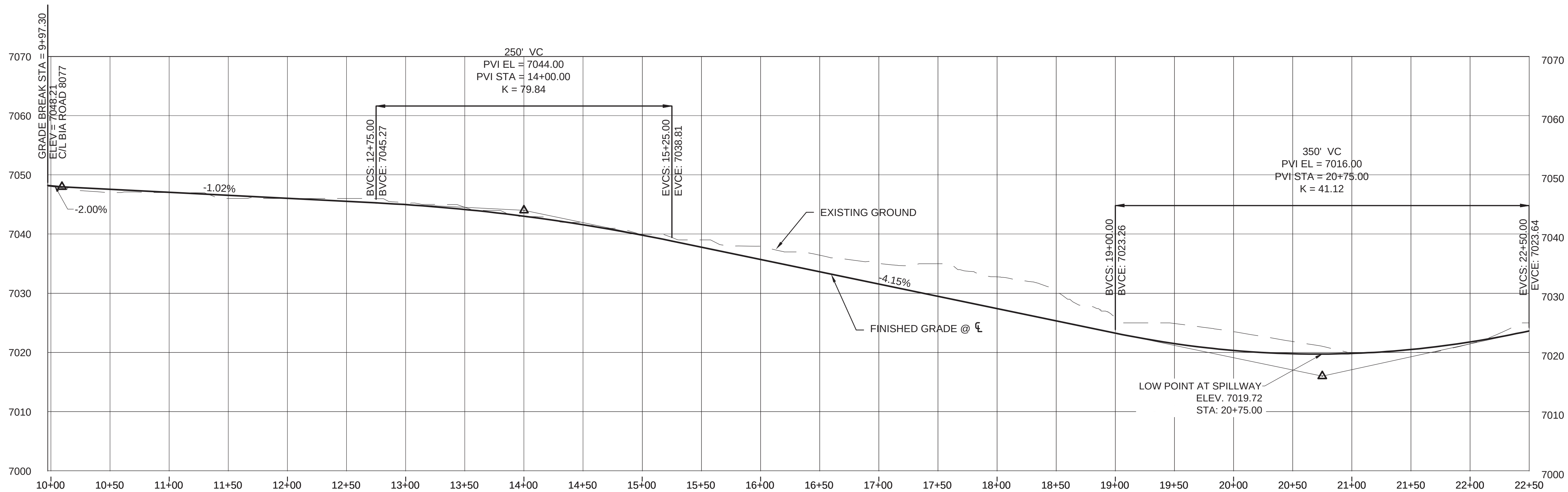
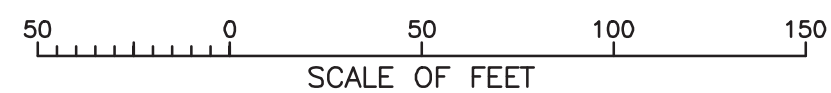
TEMPORARY ROAD
SITE PLAN

TSALE DAM MODIFICATION
BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL SAFETY OF DAMS - ARIZONA

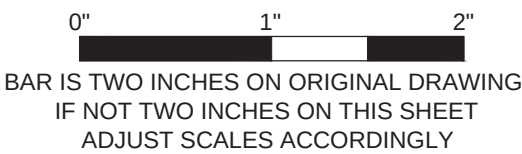




TEMPORARY ROAD PLAN STA: 9+97.30 TO STA: 22+00



TEMPORARY ROAD PROFILE



Cooper Zietz Engineers, Inc.





REVISIONS	
NO.	DESCRIPTION
1	TEMPORARY ROAD REALIGNMENT

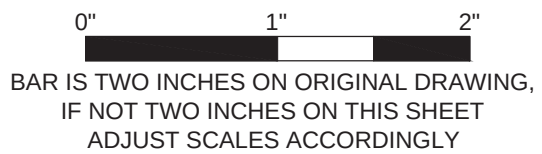
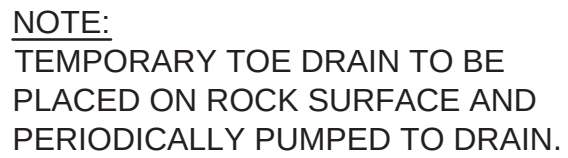
DATE	PROJECT NO.	DRAWN BY	CHECKED BY	DESIGNED BY	FILENAME
11/22/2013	128437	NLO	PEK	ME	1117_T1_C-30.dwg

TEMPORARY ROAD
PLAN AND PROFILE

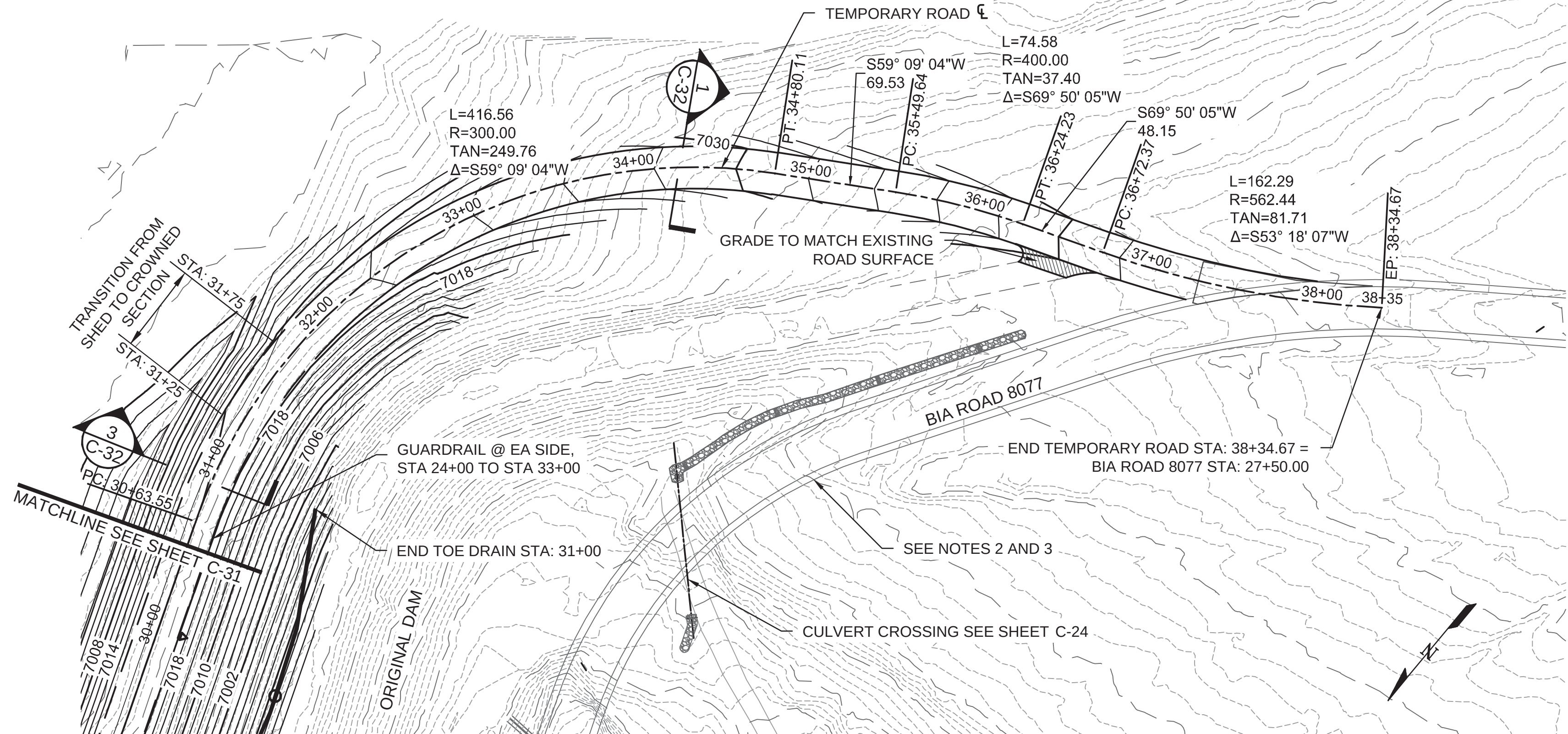
TS/SALE DAM MODIFICATION
BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL SAFETY OF DAMS - ARIZONA

SHEET 35 of 56

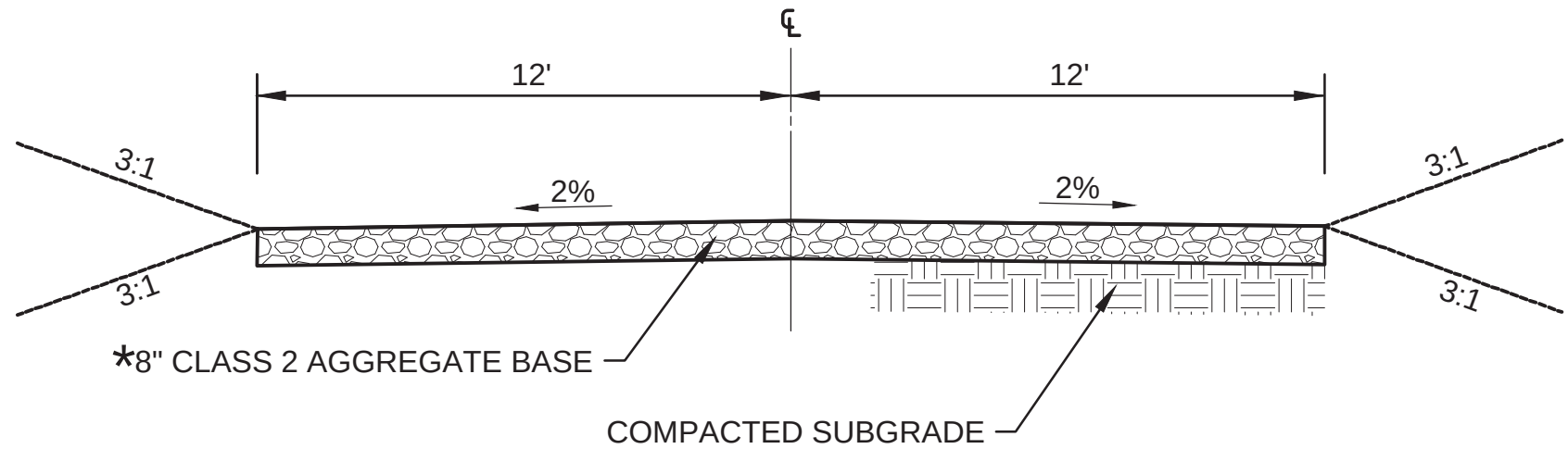
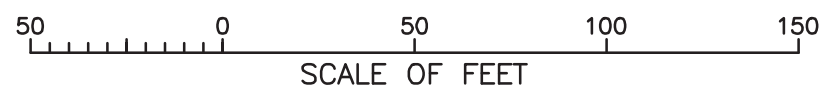
C-30



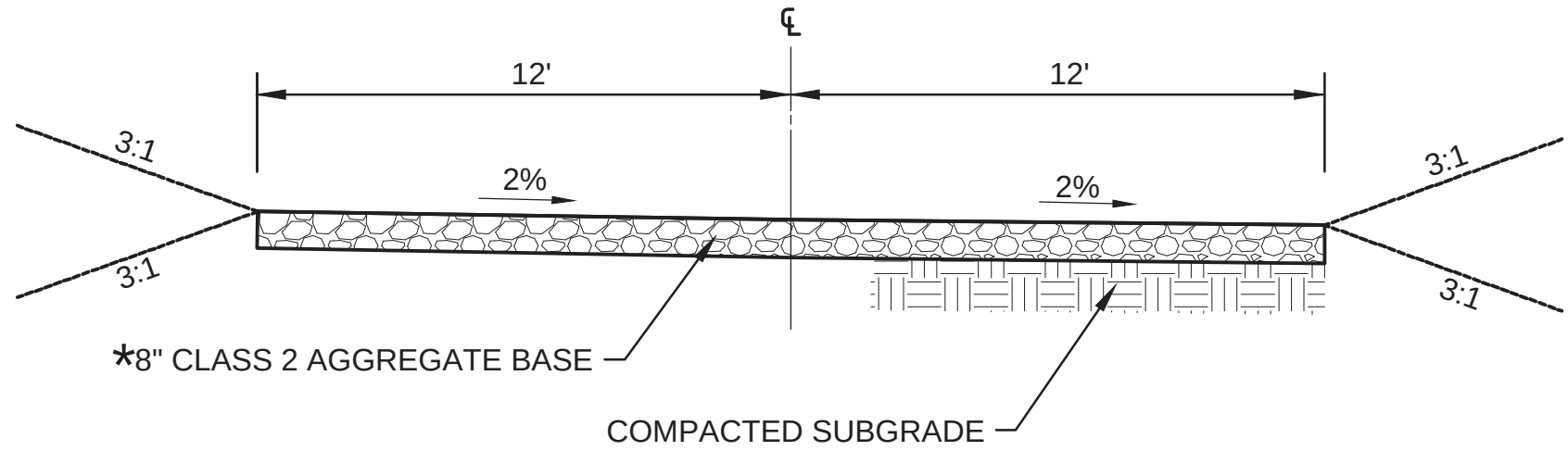
CAD FILE: \\TANKE\Projects\2011\11-17 BIA IPSOD IDQITask Order 1 - Tsale Dam Rehab CAD2-Sheets\CH1117_TL_C-32.dwg LAYOUT: PLAN AND PROFILE\BIA IPSOD\BIA IPSOD\CH1117_TL_C-32.dwg



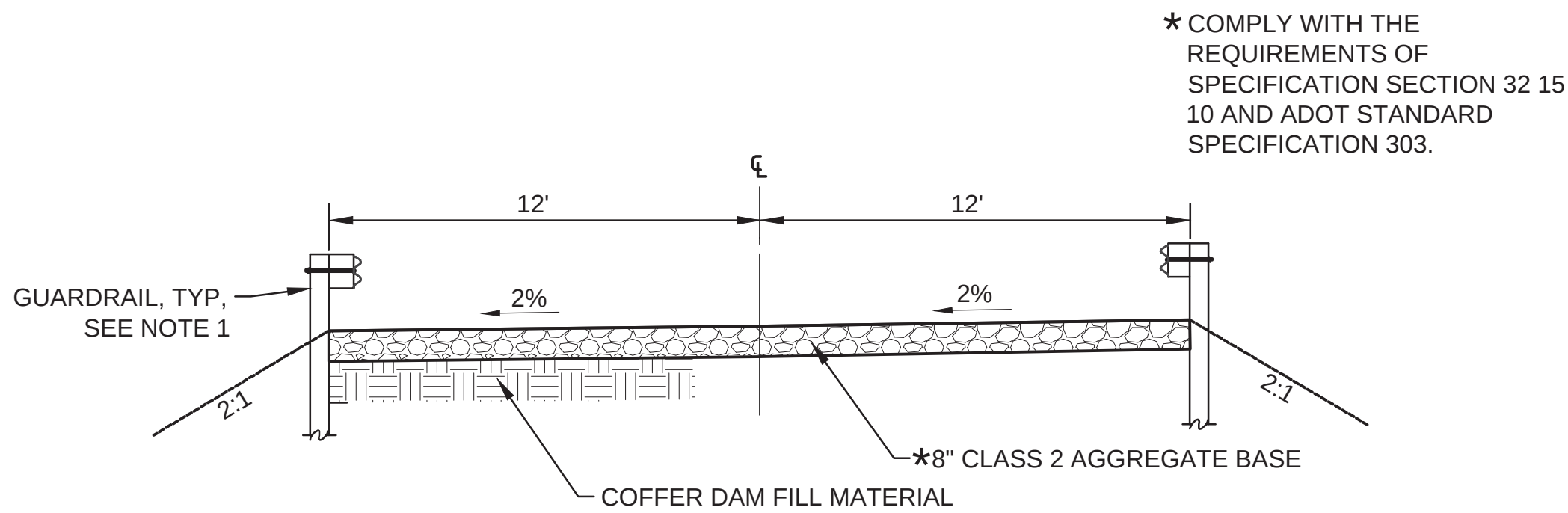
TEMPORARY ROAD PLAN STA: 32+00 TO STA: 38+61.22



24' TEMPORARY ROAD CROWNED SECTION
STA: 10+09.30 TO STA: 19+50.00
STA: 22+00.00 TO STA: 25+20.00
STA: 31+50.00 TO STA: 37+42.70
1
VAR
NTS



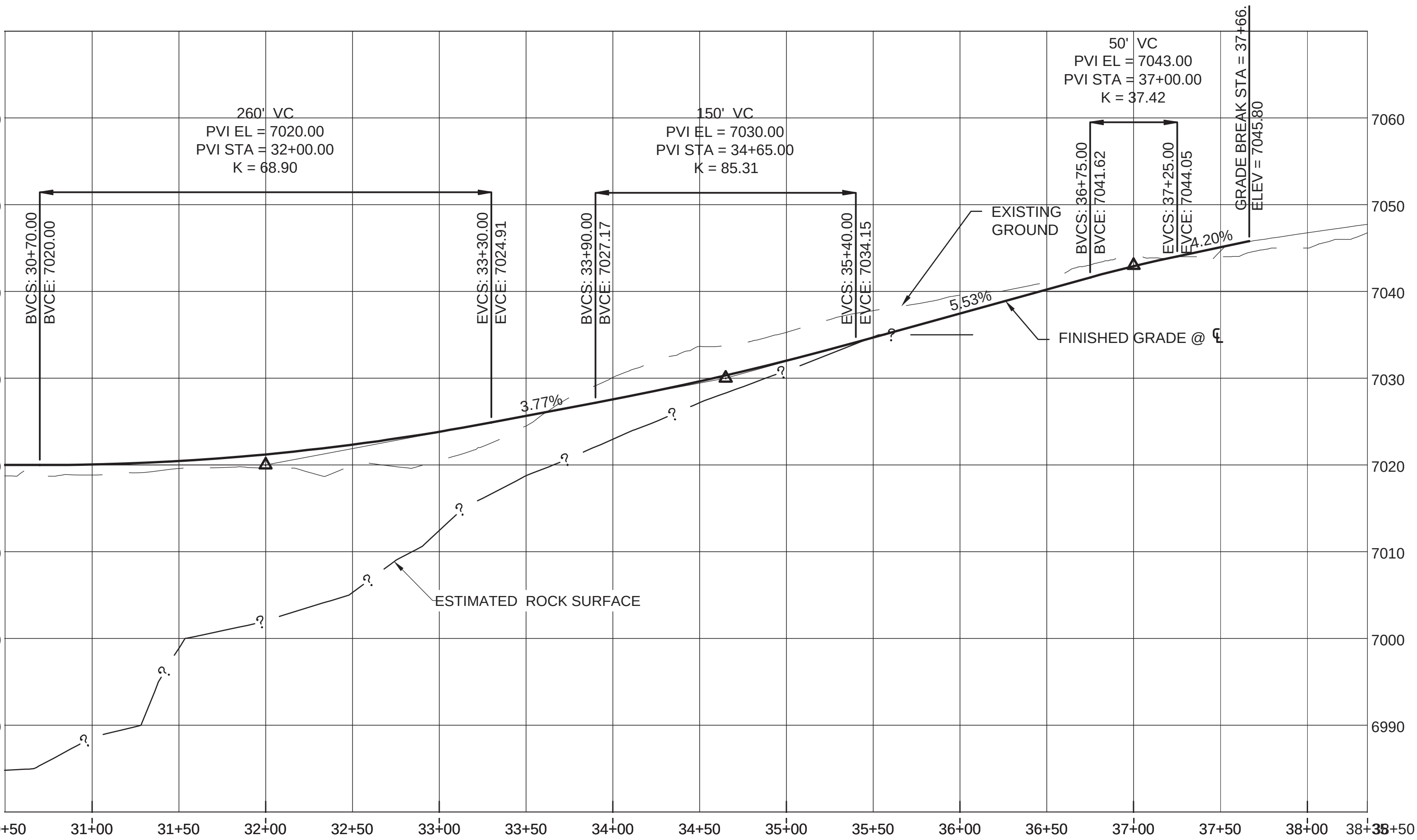
24' TEMPORARY SECTION AT SPILLWAY CROSSING
STA: 19+50.00 TO STA: 22+00.00
2
C-30
NTS



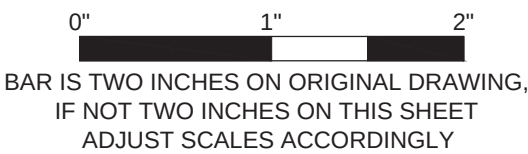
24' TEMPORARY SECTION
ON TOP OF THE COFFER DAM
STA: 25+20.00 TO STA: 31+50.00
3
VAR
NTS

* COMPLY WITH THE
REQUIREMENTS OF
SPECIFICATION SECTION 32.15
10 AND ADOT STANDARD
SPECIFICATION 303.

NOTE:
1. INSTALL GUARDRAIL FROM
STATION 24+00 TO 33+00. FOR
GUARDRAIL DETAIL SEE 4/C-35.
2. BIA ROAD 8077 SHOWN ONLY
FOR INFORMATION SEE C-21 FOR
GRADING.
3. CONTOURS FOR RELOCATED
DAM NOT SHOWN.



TEMPORARY ROAD PROFILE



Cooper Zietz Engineers, Inc.





DATE	PROJECT NO.	DRAWN BY	CHECKED BY	DESIGNED BY	FILENAME	NO.	DESCRIPTION	REVISIONS
11/22/2013	128437	NLO	PEK	ME	1117_TL_C-32.dwg	1	TEMPORARY ROAD REALIGNMENT	

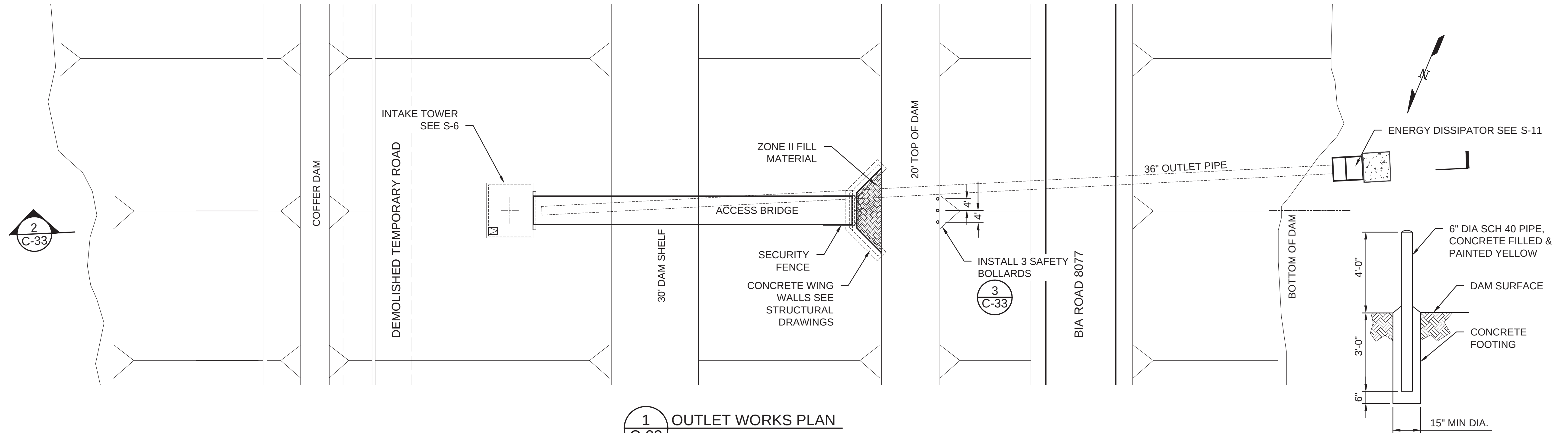
TEMPORARY ROAD
PLAN AND PROFILE AND ROAD SECTIONS

TSALE DAM MODIFICATION
BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL SAFETY OF DAMS - ARIZONA

SHEET

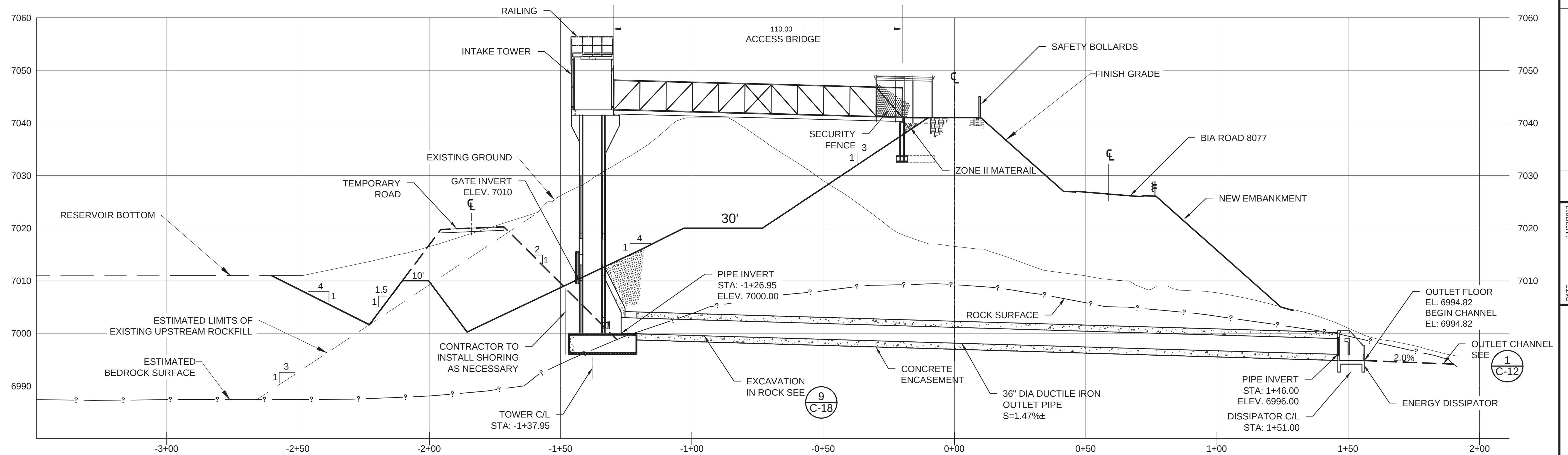
37 of 56

C-32



1 OUTLET WORKS PLAN
C-33

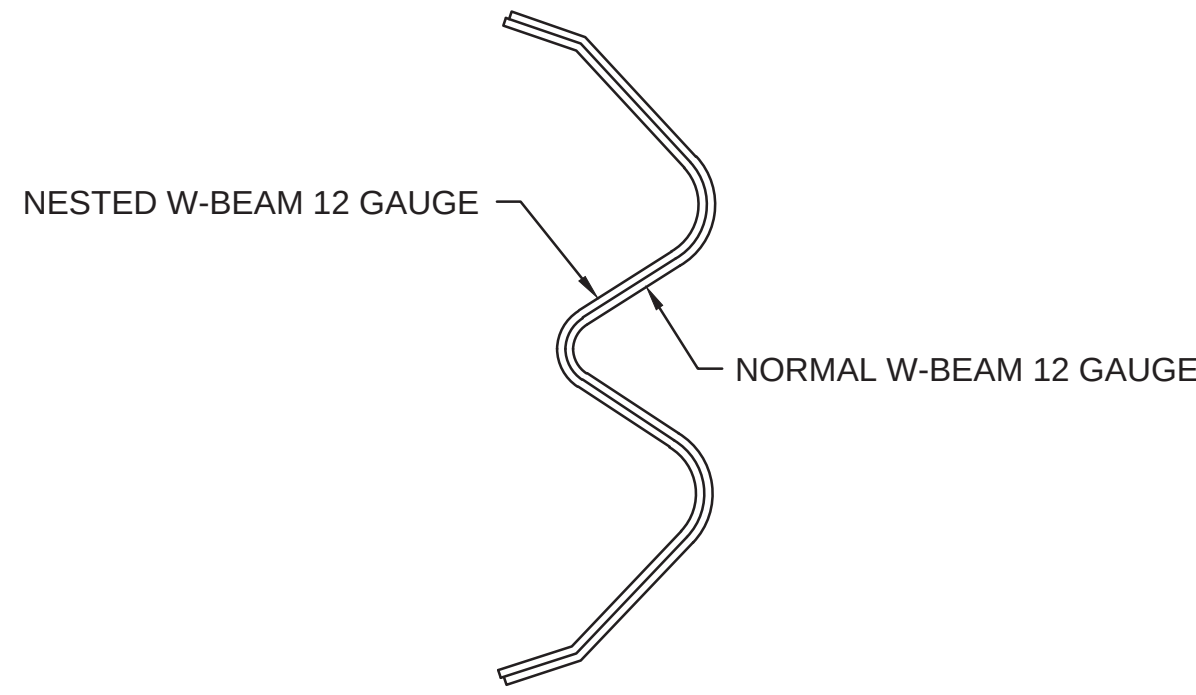
3 SAFETY BOLLARD DETAIL
C-33



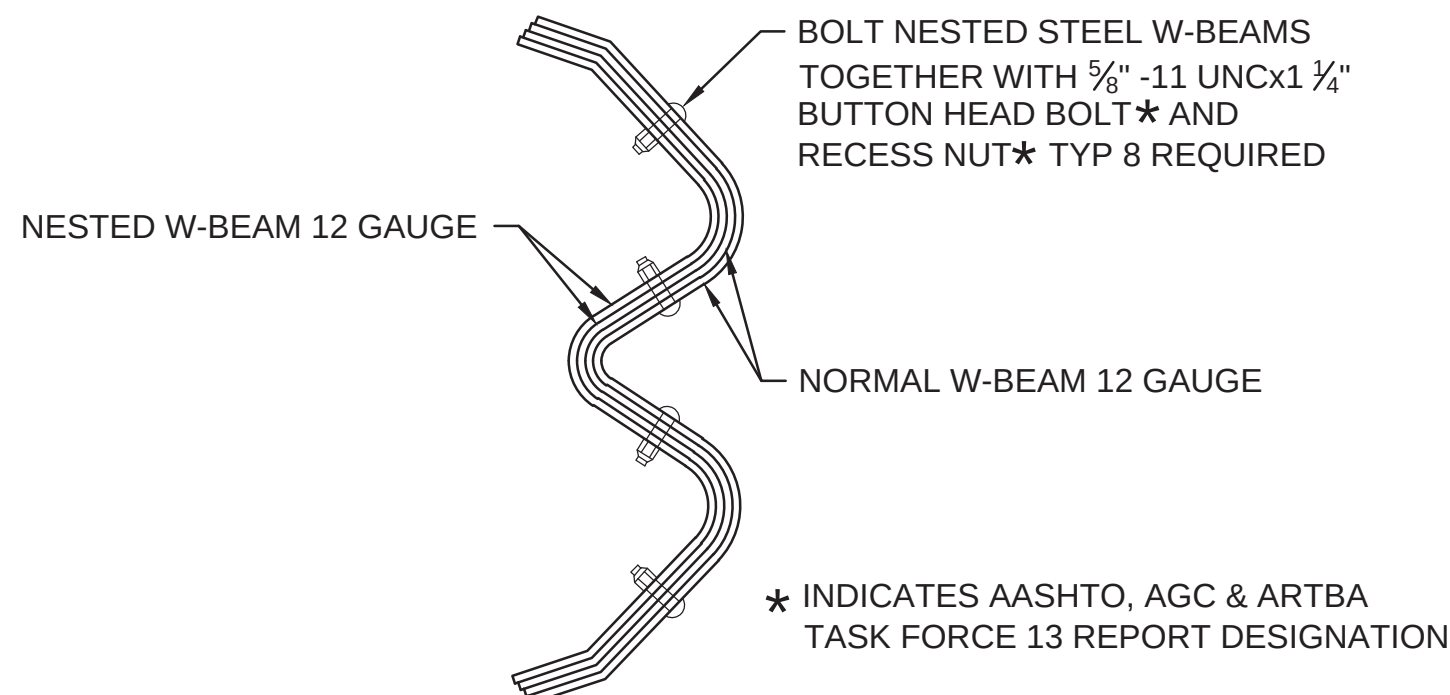
2 OUTLET WORKS PROFILE
C-33

0" 1" 2"
BAR IS TWO INCHES ON ORIGINAL DRAWING,
IF NOT TWO INCHES ON THIS SHEET
ADJUST SCALES ACCORDINGLY

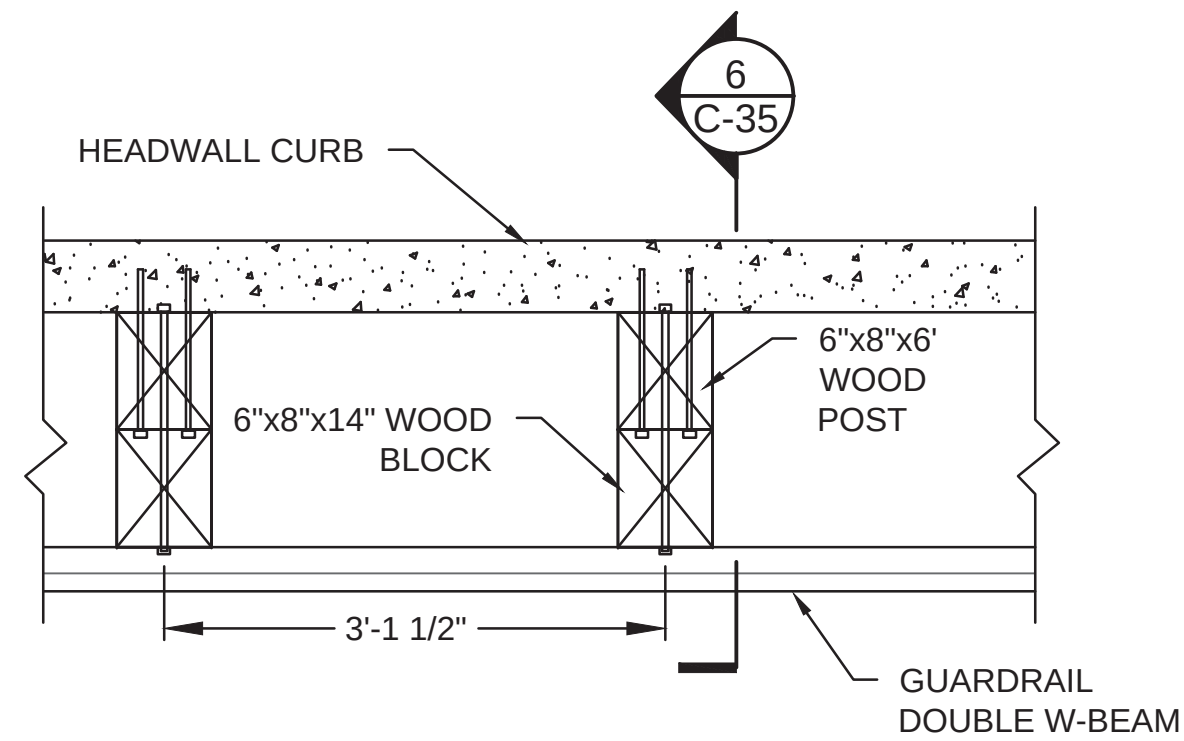
DATE	PROJECT NO.	DRAWN BY	CHECKED BY	DESIGNED BY	FILENAME	NO.	BY	DATE	REVISIONS
11/22/2013	128437	NLO	PEK	ME	1117 T1_C-33.dwg	1	CZ / KLF	11-22-2013	TEMPORARY ROAD REALIGNMENT



1 W-BEAMS GUARDRAIL DETAIL
C-35 NTS



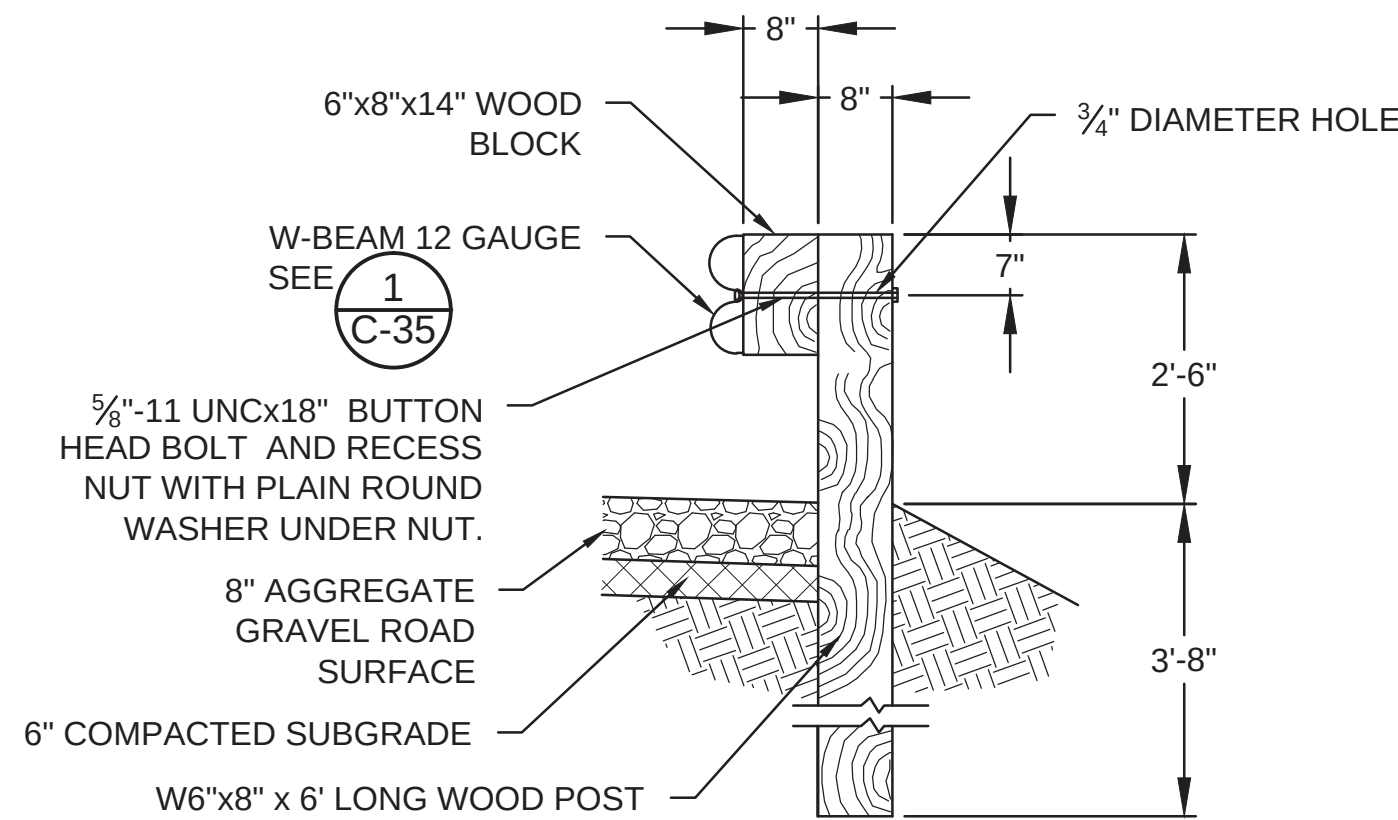
2 DOUBLE W-BEAMS GUARDRAIL DETAIL
C-35 NTS STA: 8+01 TO STA: 8+40



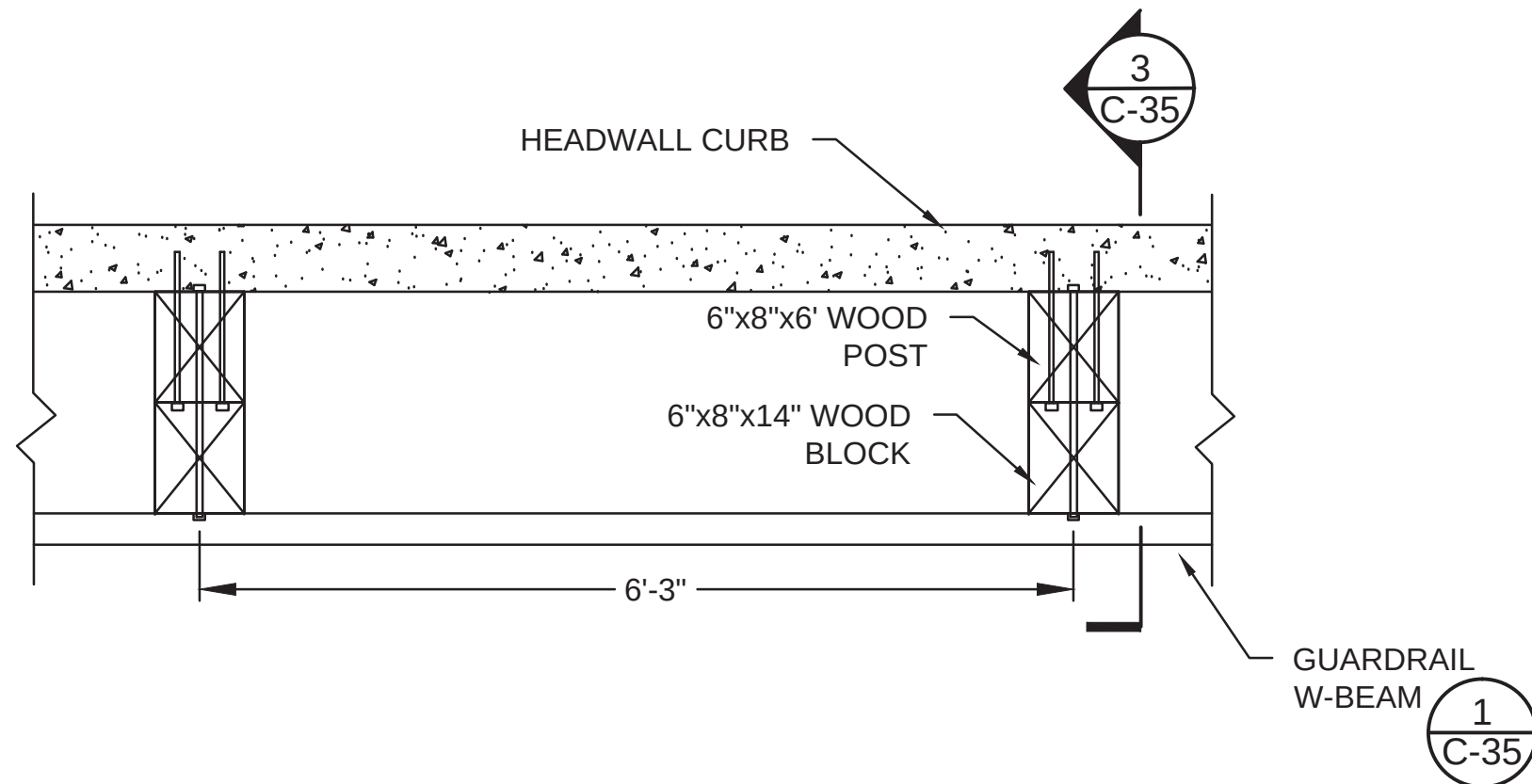
3 GUARDRAIL WOOD POST
DETAIL PLAN AT HEADWALLS
C-35 NTS STA: 8+01 TO STA: 8+40

GUARDRAIL GENERAL NOTES:

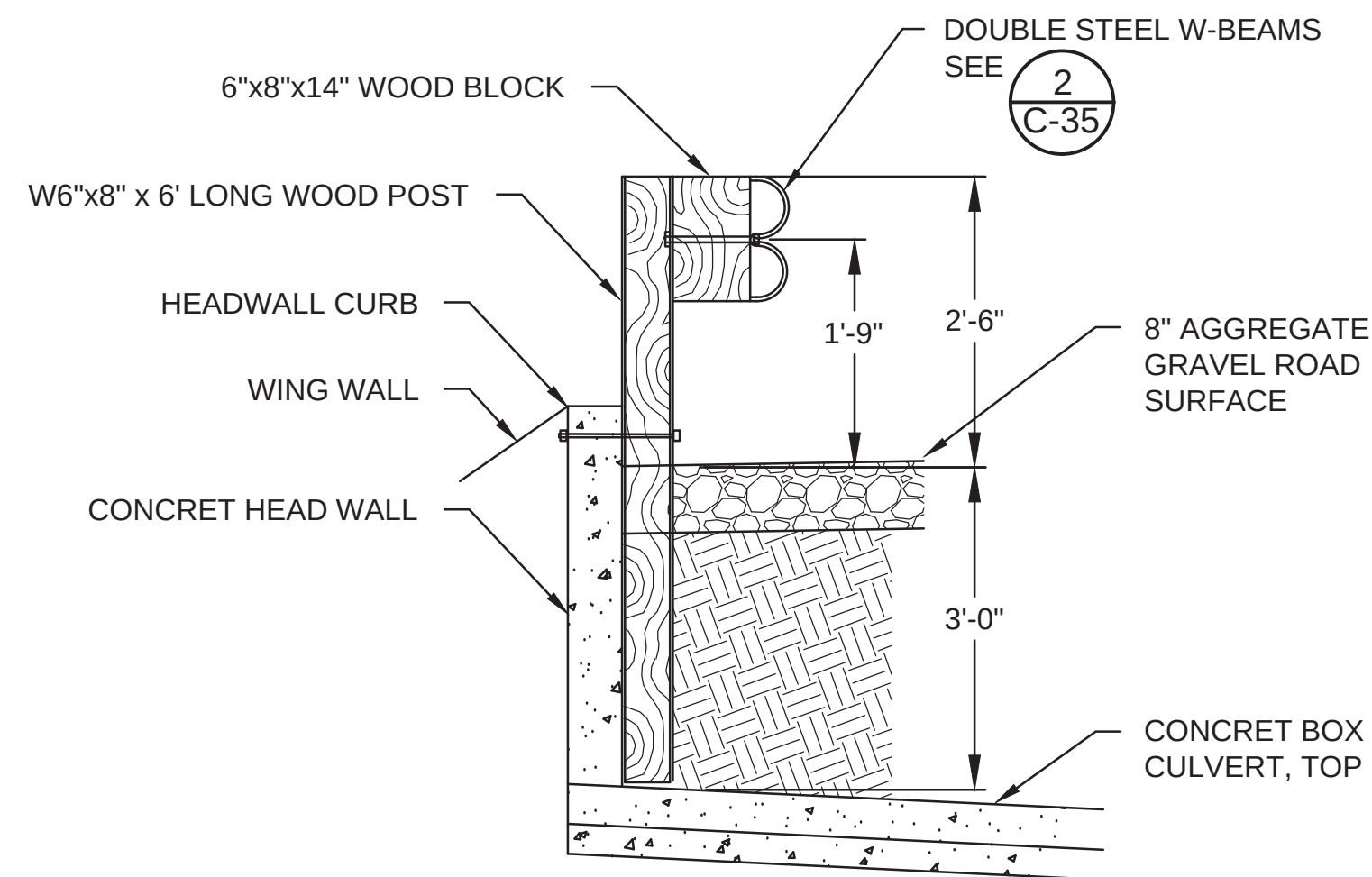
1. THE TANGENT TERMINAL SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND CURRENT APPROVED DRAWINGS INCLUDING ALL DETAILS, HARDWARE, HARDWARE QUANTITIES, AND OTHER INFORMATION.
2. SEE DESIGN SPECIFICATION SECTION 34 71 13, GUARDRAIL, FOR THE MATERIAL AND INSTALLATION REQUIREMENTS.
3. SEE STATE OF ARIZONA DOT STANDARD DRAWINGS: C-10.02, C-10.03, AND C-10.06 FOR MORE DETAILS.



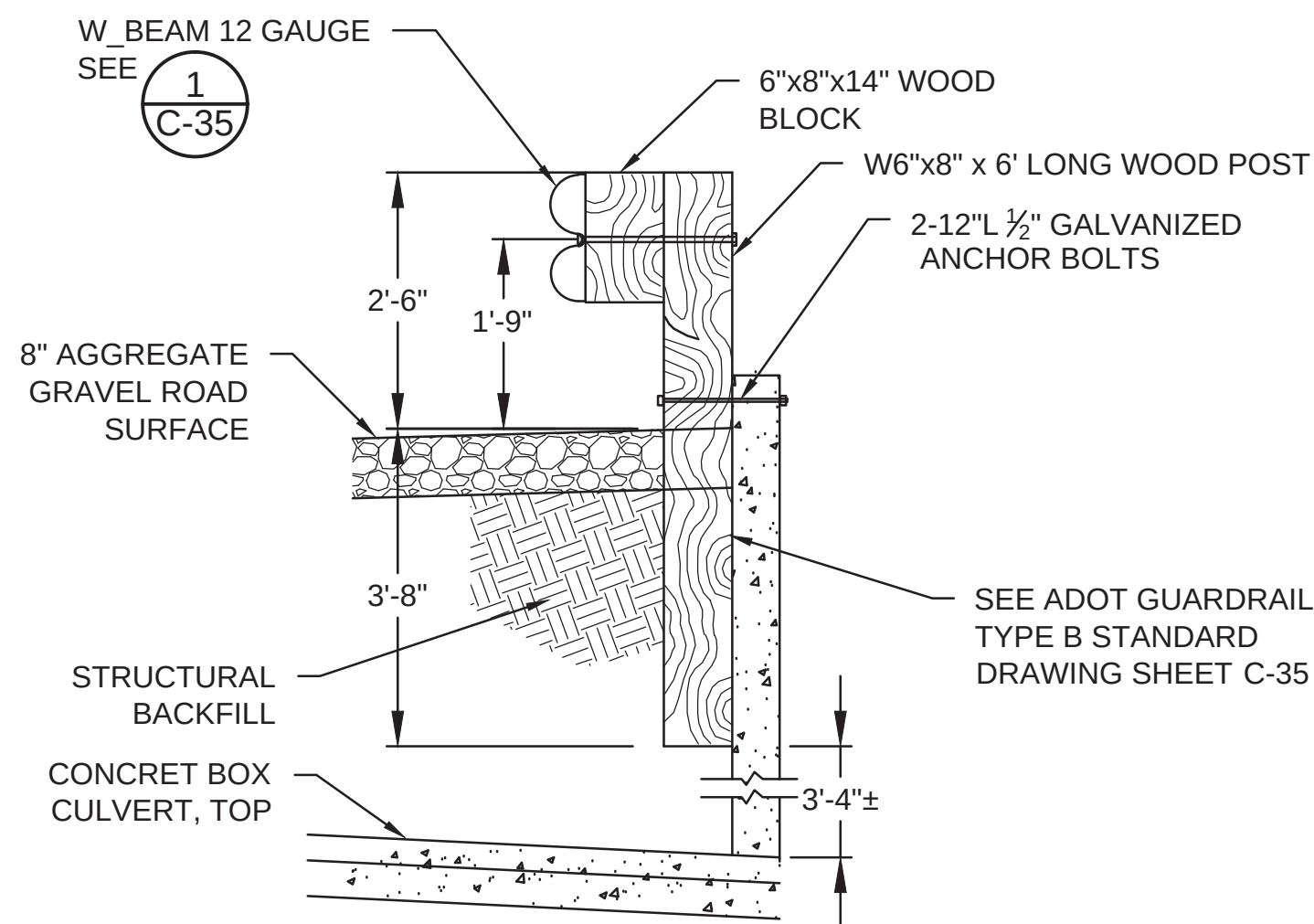
4 TYPICAL GUARDRAIL POST-SECTION
AZDOT C-10.02 TYPE B STANDARD DETAIL
C-35 NTS



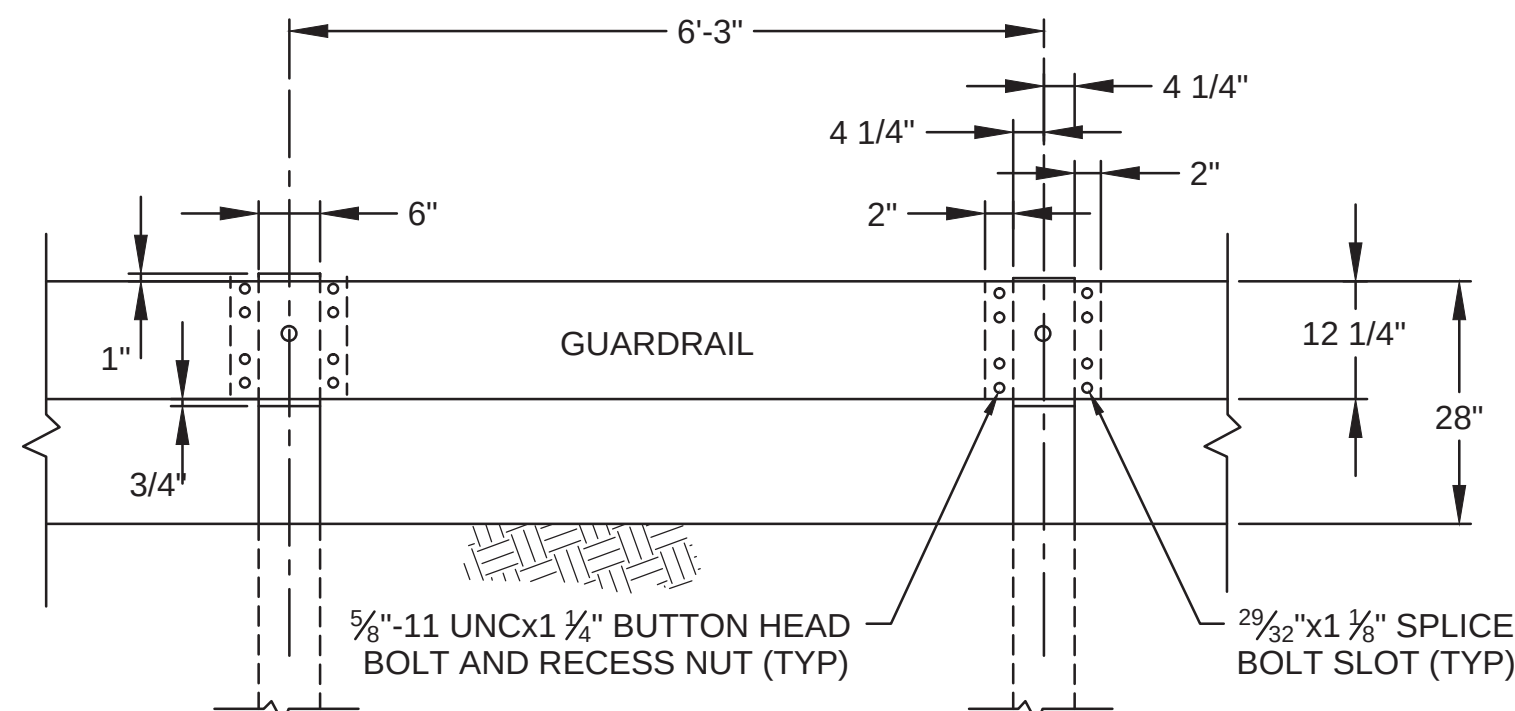
5 GUARDRAIL WOOD POST DETAIL PLAN
C-35 NTS



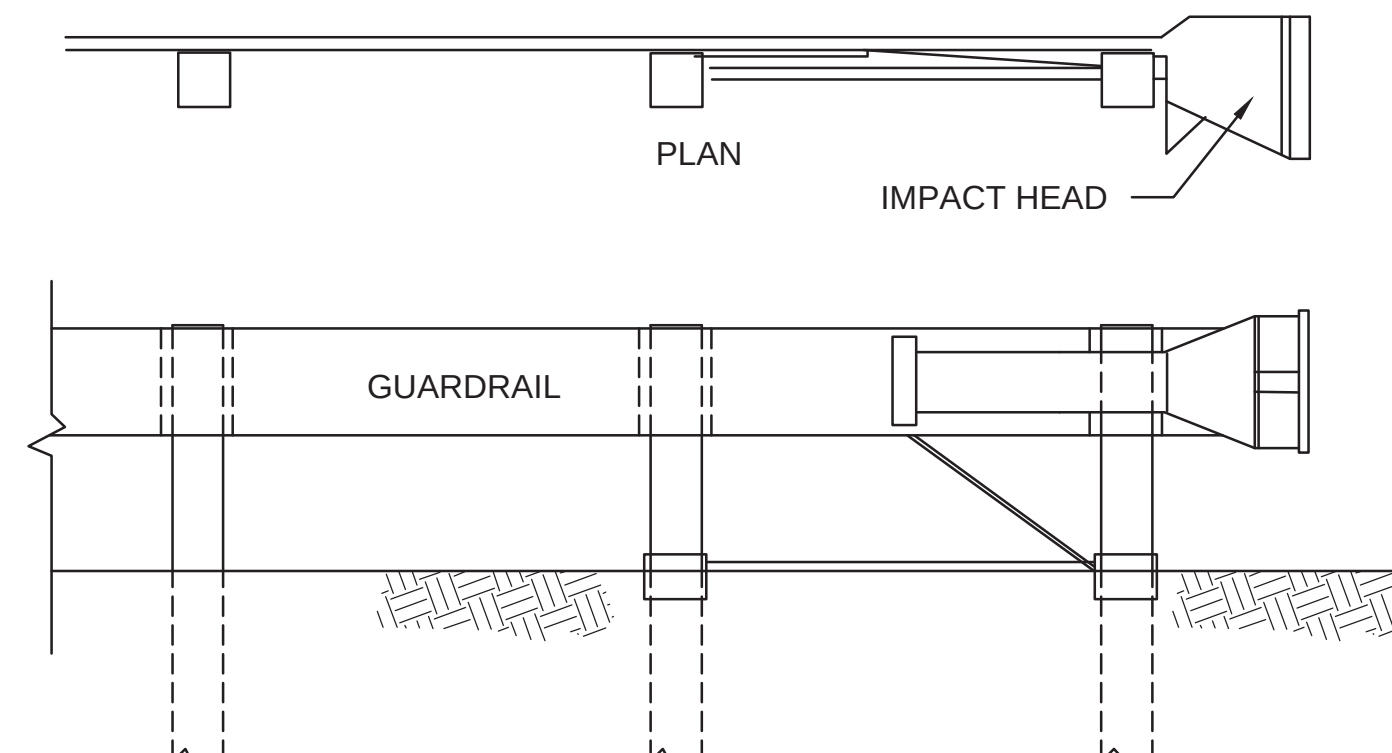
6 GUARDRAIL WOOD POST-SECTION WITH DOUBLE BEAMS
AT BOX CULVERT (NORTH SIDE OF ROAD ONLY)
C-35 NTS STA: 8+01 TO STA: 8+40



7 GUARDRAIL WOOD POST-SECTION
AT BOX CULVERT (SOUTH SIDE OF ROAD ONLY)
C-35 NTS STA: 8+01 TO STA: 8+40



8 GUARDRAIL ELEVATION DETAIL
C-35 NTS



9 TYPICAL TANGENT TERMINAL
C-35 NTS

STORM WATER POLLUTION, EROSION AND SEDIMENT CONTROL REQUIREMENTS

GENERAL NOTES:

1.

IT IS CONTRACTOR'S RESPONSIBILITY TO PREPARE THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AND OBTAIN THE REQUIRED PERMITS.
([HTTP://CFPUB.EPA.GOV/NPDES/STORMWATER/SWCATS.CFM](http://cfpub.epa.gov/npdes/stormwater/swcats.cfm))
2.

THE CONTRACTOR'S SWPPP SHALL COMPLY WITH THE REQUIREMENTS OF THE ARIZONA STATEWIDE STORMWATER MANAGEMENT PLAN (SSWMP) AND THE PROVISIONS OF THE ARIZONA POLLUTANT DISCHARGE ELIMINATION SYSTEM (AZPDES) STORMWATER PROGRAM.
3.

EROSION CONTROLS, BOTH TEMPORARY AND PERMANENT, SHALL BE INSTALLED IN ACCORDANCE WITH PHASING PROVISIONS IN THE APPROVED SWPPP AND COORDINATED WITH THE RELATED CONSTRUCTION.
4.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL EROSION AND POLLUTION CONTROL DEVICES IN PROPER FUNCTIONING CONDITION AT ALL TIMES.
5.

HYDROMULCH SHALL BE APPLIED WITH GRASS SEED AT A RATE OF 2000 LB/ACRE. USE PRE-GERMINATED GRASS SEED.
6.

HYDROSEED AND MULCH SHALL BE APPLIED WITH A BONDING AGENT.
7.

GRASS MIX TO BE ANNUAL RYEGRASS, 40% BY WEIGHT, AND TURF-TYPE FESCUE, 60% BY WEIGHT. APPLICATION RATE TO BE 100 LBS. MINIMUM PER ACRE.
8.

FERTILIZATION FOR GRASS SEED SHALL BE IN ACCORDANCE WITH SUPPLIER'S RECOMMENDATION. ANY FERTIZER APPLIED WITHIN 50 FEET OF THE DRAINAGE SWALE MUST BE NON-PHOSPHORUS FERTILIZER.
9.

STRAW BALES MAY BE NECESSARY ALONG THE SEDIMENT FENCE WHERE THE FENCE DOES NOT FOLLOW THE GROUND CONTOUR TO ACT AS CHECK DAMS.
10.

GROUND COVER MUST BE INSTALLED AND FUNCTIONING IMMEDIATELY AFTER FILL AND GRADING OCCURS OR NO LATER THAN OCTOBER 1st.
11.

APPROVAL OF THIS EROSION AND SEDIMENT CONTROL (ESC) PLAN DOES NOT CONSTITUTE AN APPROVAL OF PERMANENT ROAD OR DRAINAGE DESIGN (E.G. SIZE AND LOCATION OR ROADS, PIPES, RESTRICTORS, CHANNELS, RETENTION FACILITIES, UTILITIES, ETC.)
12.

THE IMPLEMENTATION OF THESE ESC PLANS AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE APPLICANT/CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED AND VEGETATION/LANDSCAPING IS ESTABLISHED.
13.

THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY FLAGGED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE FLAGGED CLEARING LIMITS SHALL BE PERMITTED. THE FLAGGING SHALL BE MAINTAINED BY THE APPLICANT/CONTRACTOR FOR THE DURATION OF CONSTRUCTION.
14.

THE ESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO INSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT ENTER THE DRAINAGE SYSTEM, ROADWAYS, OR VIOLATE APPLICABLE WATER STANDARDS.
15.

THE ESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE 3 CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DO NOT LEAVE THE SITE.
16.

THE ESC FACILITIES SHALL BE INSPECTED DAILY AND AFTER EACH STORM EVENT BY THE APPLICANT/CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING. THE ESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITHIN 48 HOURS FOLLOWING A STORM EVENT.
17.

AT NO TIME SHALL MORE THAN ONE FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE WITHIN A TRAPPED CATCH BASIN. ALL CATCH BASINS AND CONVEYANCE LINES SHALL BE CLEANED PRIOR TO PAVING. THE CLEANING OPERATION SHALL NOT FLUSH SEDIMENT LADEN WATER INTO THE DOWNSTREAM SYSTEM.
18.

STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.
19.

SUPPLEMENTARY WET WEATHER MEASURES SHALL BE IN PLACE AND FUNCTIONING BY NOVEMBER 1 AND REMAIN OPERATIONAL UNTIL APRIL 30TH. SEEDING MEASURES MUST OCCUR BY SEPTEMBER 1.
20.

SUPPLEMENTARY WET WEATHER MEASURES ARE IN ADDITION TO BASE MEASURES. BEFORE REMOVAL OF EROSION CONTROL MEASURES, VEGETATION MUST BE RE-ESTABLISHED.
21.

TOPSOIL STABILIZATION:

a.

PRIOR TO THE EXCAVATION, ALL 6 INCHES OF TOPSOIL SHALL BE REMOVED AND STOCKPILED AT LOCATIONS OUT OF THE WAY OF CONSTRUCTION AS INDICATED ON THE DRAWINGS AND WILL BE USED FOR RECLAMATION.

b.

UNDER NO CIRCUMSTANCES WILL TOPSOIL BE USED AS FILL MATERIAL IN THE CONSTRUCTION PROCESS.

c.

STOCKPILED TOPSOIL SHALL BE STABILIZED IF CONSTRUCTION WILL LAST LONGER THAN ONE YEAR. USE SEED MIXTURE DEVELOPED FOR THE NAVAJO NATION.

22. THERE ARE THREE MAJOR LAND RESOURCE AREAS LOCATED ON THE NAVAJO NATION; NORTHERN; DESERT; PINYON/JUNIPER WOODLAND AND PONDEROSA PINE WOODLANDS.

a.

SITE: PINON JUNIPER WOODLAND AND PONDEROSA PINE WOODLAND (TABLE A SEED MIXTURE)

DESCRIPTION OF VEGETATION COVER IN AREA;

TREES AND SHRUBS - PONDEROSA PINE, PINON, JUNIPER, SAGEBRUSH, RABBITBRUSH

GRASSES - BLUE GRAMA, INDIAN RICEGRASS, WESTERN WHEATGRASS

SOILS - LOAM, CLAY LOAMS, CLAYS

TABLE A - SEED MIXTURE TO USE FOR PINON, JUNIPER AND PONDEROSA PINE WOODLAND

SPECIES	CULTIVAR	POUNDS/PLS/ACRE
Western Wheatgrass	Arriba	3.0
Streambank Wheatgrass		2.0
Intermediate Wheatgrass		3.0
Indian Ricegrass	Paloma	2.0
Blue Gramma	Hachita	2.0
Sideoats Grama		2.0
Little Bluestem		2.0
Rocky Mountain Penstemon		1.0
TOTAL PLS/ACRE		17.0

- b.

SEEDING DATES: SEEDING IS RECOMMENDED FROM JUNE 15 TO AUGUST 30. THIS PERIOD IS PRIOR TO OR THE BEGINNING OF THE NAVAJO NATION MONSOON SEASON AND WOULD BE BENEFICIAL FOR SEED GERMINATION AND GROWTH. A DORMANT SEEDING CAN BE COMPLETED FROM NOVEMBER 1 TO DECEMBER 15 IF UNABLE TO SEED FROM JUNE TO AUGUST. THE SEED WILL LAY DORMANT DURING WINTER MOISTURE AND GERMINATE IN THE SPRING. DEVIATION FROM THESE DATES MAY HINDER PROPER GERMINATION AND GROWTH.
- c.

SIT: NORTHERN DESERT (TABLE B SEED MIXTURE)

DESCRIPTION OF VEGETATION COVER IN AREA;

TREES AND SHRUBS - GREASEWOOD, FOURWING SALTBUUSH

GRASSES - ALKALI SACATON, INDIAN RICEGRASS, GALLETA

SOILS - LOAM, SAND, SANDY LOAMS

TABLE B - SEED MIXTURE TO USE FOR NORTHERN DESERT

SPECIES	CULTIVAR	POUNDS/PLS/ACRE
Alkali Sacaton		2.0
Galleta	Viva	2.0
Indian Ricegrass	Paloma	2.0
Western Wheatgrass	Arriba	3.0
Intermediate Wheatgrass		3.0
Scarlet Globemallow		0.5
TOTAL PLS/ACRE		12.5

- d.

SEEDING DATES: SINCE THIS IS CONSIDERED TO BE DESERT TYPE AREA, IT IS RECOMMENDED TO COMPLETE A DORMANT SEEDING FROM NOVEMBER 1 TO DECEMBER 15. THIS IS WHEN THIS AREA RECEIVES MOST OF ITS MOISTURE. THE SEED WILL LAY DORMANT DURING WINTER MOISTURE AND GERMINATE IN THE SPRING. SEEDING FROM JUNE 15 TO AUGUST 30 IS OPTIONAL.
- e.

SEEDBED PREPARATION: CONTOUR AREA SO FURROWS GO ACROSS THE FLOW OF ANY WATER (RAINFALL, SNOWMELT). REPLACE SOIL (1-4 FEET OF SOIL STOCKPILED FOR RECLAMATION. SEEDBED WILL BE CLEAN AND FIRM, DISK A MAXIMUM OF TWO TIMES, CREATING IDEAL SOIL CONDITIONS FOR SEED ADHERENCE. DIRT CLOUDS WILL BE BROKEN DOWN. TOPSOIL WILL BE REPLACED. RESEEDING WILL BE COMPLETED ON THE CONTOUR.
- f.

METHOD OF SEEDING: ALL SEEDING WILL BE COMPLETED MECHANICALLY USING A TRACTOR AND GRAIN DRILL. BROADCAST SEEDING WILL ONLY BE USED TO SEED STEEP SLOPES, WHICH THE TRACTOR AND DRILL CANNOT ACCESS.
- g.

FERTILIZER: FERTILIZER WILL BE USED IF NO TOPSOIL HAS BEEN SALVAGED FOR RECLAMATION PURPOSES. WE RECOMMEND USING A FERTILIZER HIGH IN PHOSPHORUS AND POTASSIUM, WHICH WILL PROMOTE ROOT DEVELOPMENT AND INITIAL GROWTH OF THE PLANTS.

REFERENCES AND RESOURCES

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY (ADEQ), ARIZONA DEPARTMENT OF TRANSPORTATION STATEWIDE PERMIT FOR DISCHARGES TO WATERS OF THE UNITED STATES UNDER THE ARIZONA POLLUTANT DISCHARGE ELIMINATION SYSTEM PROGRAM, AUGUST 2008.

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY (ADEQ) - ARIZONA DEPARTMENT OF TRANSPORTATION CONSENT ORDER 2004.

ARIZONA DEPARTMENT OF TRANSPORTATION (ADOT), *EROSION AND POLLUTION CONTROL MANUAL: FOR HIGHWAY DESIGN AND CONSTRUCTION*, JANUARY 25, 2005.

ARIZONA DEPARTMENT OF TRANSPORTATION (ADOT), *STATEWIDE STORM WATER MANAGEMENT PLAN*, FEBRUARY 2005 (3RD REVISION).

ARIZONA DEPARTMENT OF TRANSPORTATION (ADOT), LANDSCAPE DESIGN GUIDELINES FOR URBAN HIGHWAYS, MAY 1988.

ENVIRONMENTAL PROTECTION AGENCY (EPA), *NATIONAL MANAGEMENT MEASURES TO CONTROL NONPOINT SOURCE POLLUTION FROM URBAN AREAS*, NOVEMBER 2005, [WWW.EPA.GOV/OWOW/NPS/URBANMM](http://www.epa.gov/owow/nps/urbanmm)

FEDERAL HIGHWAY ADMINISTRATION (FHWA), STORM WATER BEST MANAGEMENT PRACTICES IN AN ULTRA-URBAN SETTING: SELECTION AND MONITORING, FHWA A-EP-00-002, 2000, U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION, WASHINGTON, DC, STORMWATER BEST MANAGEMENT PRACTICES IN AN ULTRA-URBAN SETTING: SELECTION AND MONITORING, [HTTP://WWW.FHWA.DOT.GOV/ENVIRONMENT/ULTRAURB/INDEX.HTM](http://www.fhwa.dot.gov/environment/ultraurb/index.htm)

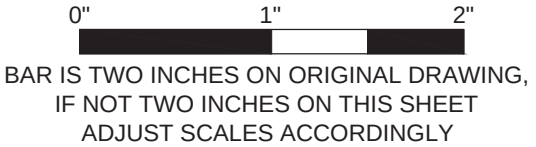
MINTON, G., *STORMWATER TREATMENT: BIOLOGICAL, CHEMICAL AND ENGINEERING PRINCIPLES*, 2005

BMPs FOR CONSTRUCTION PHASES

REFER TO ADOT STANDARD SPECIFICATION, SECTION 810, EROSION CONTROL AND POLLUTION PREVENTION, FOR A COMPLETE LIST OF AVAILABLE BMPs AND THE REQUIREMENTS.

NOTE: EROSION CONTROLS, BOTH TEMPORARY AND PERMANENT, SHALL BE INSTALLED IN ACCORDANCE WITH PHASING PROVISIONS IN THE APPROVED SWPPP AND COORDINATED WITH THE RELATED CONSTRUCTION.

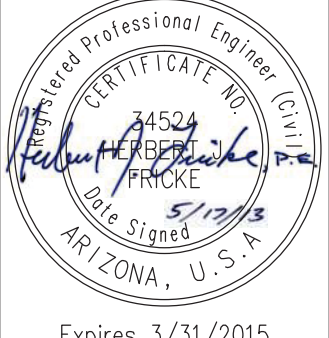
Off-road, Overland Flow Erosion Control
• Decomposed Granite Cover • Erosion Control Blankets • Impervious Cover • Riprap • Seed Mix • Slope Modification and New Slope Construction • Wire-tied Rock (Rock check Dam)
Roadway Drainage Conveyance
• Bridge Drainage Systems • Catch Basins and Downdrain Conduits • Culverts • Impervious Channel Lining • Inlet Protection • Outlet Protection • Pervious Channel Lining • Rainwater Harvesting • Spillways
Water Quality and Treatment
• ADOT Approved Vendor Treatment Devices • Bioretention • Filtration Structures • Infiltration Basin • Infiltration Trench • Vegetated Filter Strips



CAD FILE: ITANCADE\Projects\2011\11-17 BIA IPSCD IDQITask Order 1 - Tsale Dam Rehab CAD02-SheetCWB117_T1_C36.dwg LAYOUT: BIA ROAD B077 PLOTTED: 11/21/2013 4:58 PM BY: jnsko

Cooper Zietz Engineers, Inc.





EROSION AND SEDIMENT CONTROL NOTES

TSALE DAM MODIFICATION
BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL SAFETY OF DAMS - ARIZONA

DATE: 11/22/2013
PROJECT NO.: 128437
DRAWN BY: NLO
CHECKED BY: PEK
DESIGNED BY: ME
FILENAME: 1117_T1_C36.dwg

1

TEMPORARY ROAD REALIGNMENT

DESCRIPTION

BY

DATE

1

NO.

REVISIONS

SHEET 41 of 56

C-36

STRUCTURAL NOTES

GENERAL

1. THESE NOTES ARE GENERAL IN NATURE. REFER TO THE SPECIFICATION FOR FURTHER REQUIREMENTS AND CLARIFICATION. IN CASE OF CONFLICT, THE SPECIFICATIONS SHALL GOVERN.
2. ALL CONSTRUCTION SHALL CONFORM TO THE REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE (IBC) 2009 EDITION, AS WELL AS LOCAL CODES AND REGULATIONS.
3. DESIGN CRITERIA:

WIND SPEED	90 MPH	EXPOSURE B
SEISMIC ZONE	S (0.2 SEC) = 0.25g,	
	S (1.0 SEC) = 0.05g	
SNOW LOADS(GROUND)	50 PSF	
SOIL BEARING CAPACITY	4,000 PSF	
4. PRE-MANUFACTURED ITEMS-FOR THESE ITEMS (PRE-ENGINEERED BRIDGE, ETC.), IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL SPANS AND DIMENSIONS PRIOR TO ORDERING THE ITEMS.
5. THIS STRUCTURE AND ALL OF ITS PARTS MUST BE ADEQUATELY BRACED AGAINST WIND,LATERAL EARTH AND SEISMIC FORCES UNTIL THE PERMANENT LATERAL-FORCE RESISTING SYSTEMS HAVE BEEN CONSTRUCTED AND ALL ATTACHMENTS AND CONNECTIONS NECESSARY FOR THE STABILITY OF THE STRUCTURE AND ITS PARTS HAVE BEEN MADE.
6. ALL FEATURES OF CONSTRUCTION NOT FULLY SHOWN SHALL BE OF THE SAME TYPE AND CHARACTER AS SHOWN FOR SIMILAR CONDITIONS, SUBJECT TO REVIEW BY THE COR.
7. ALL PRODUCTS AND MATERIALS USED BY THE CONTRACTOR SHALL BE APPLIED, PLACED, ERECTED OR INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
8. SPECIAL INSPECTION AND REPORTING AND COMPLIANCE PROCEDURES, IN ACCORDANCE WITH CHAPTER 17 OF THE I.B.C., SHALL BE PROVIDED FOR THIS STRUCTURE, AND SHALL INCLUDE SPECIAL INSPECTION.

- A. **REINFORCING STEEL:**
PERIODIC SPECIAL INSPECTION IS REQUIRED DURING PLACING OF STEEL IN STRUCTURAL REINFORCED CONCRETE AND REINFORCED MASONRY.
- B. **STRUCTURAL CONCRETE:**
CONTINUOUS SPECIAL INSPECTION IS REQUIRED DURING THE PLACING OF CONCRETE AT STRUCTURALLY REINFORCED CONCRETE AREAS.
- C. **CAST-IN-PLACE ANCHOR BOLTS:**
CONTINUOUS SPECIAL INSPECTION IS REQUIRED DURING THE INSTALLATION OF ALL BOLTS.
- D. **EXPANSION AND/OR EPOXY BOLTS INSTALLED INTO CONCRETE**
CONTINUOUS SPECIAL INSPECTION IS REQUIRED DURING INSTALLATION OF ALL BOLTS.

FOUNDATIONS:

1. EXCAVATIONS FOR FOOTINGS SHALL BE CLEAN AND FREE OF DELETERIOUS MATTER SUCH AS ROOTS, ORGANICS AND OTHER DEBRIS.
2. ALL FOOTINGS SHALL BEAR ON UNDISTURBED NATIVE MATERIAL OR CLEAN, WELL-GRADED AND COMPACTED CRUSHED ROCK.

CONCRETE:

1. ALL CONCRETE WORK SHALL CONFORM TO THE REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE, LATEST EDITION, AND AMERICAN CONCRETE INSTITUTE (ACI). ("WORK" IS DEFINED AS INCLUDING BUT NOT LIMITED TO FORMING, MIXING, TRANSPORTING, PLACING AND CURING OF THE CONCRETE.)
2. CONCRETE SHALL BE READY-MIX CONFORMING TO ASTM C-94 WITH 1 INCH MAXIMUM AGGREGATE, 3- TO 5-INCH SLUMP, 5% MINIMUM AIR ENTRAINMENT AND A COMPRESSIVE STRENGTH OF 4,000 PSI AT 28 DAYS.

3. CHAMFER ALL EXPOSED CORNERS 3/4".

CONCRETE REINFORCEMENT:

1. REINFORCING STEEL SHALL CONFORM TO ASTM A-615 GRADE 60. DETAIL AND PLACE PER CODE ACI 315 AND MANUAL ACI 318.
2. UNLESS OTHERWISE SHOWN, REINFORCE ALL WALLS AND SLABS WITH 0.25% EACH WAY AND TWO ADDITIONAL NO. 5 BARS ADDITIONAL AT TOP, BOTTOM, AND SIDES OF ALL OPENINGS EXCEEDING 12 INCHES IN EITHER DIRECTION. PROVIDE 2'-6"x2'-6" CORNER BARS OR TERMINATE HORIZONTAL WALL STEEL WITH 90-DEGREE HOOK AT CORNERS AND INTERSECTIONS EXCEPT AS OTHERWISE NOTED.
3. UNLESS NOTED OTHERWISE, LAP CONTINUOUS BARS IN CONCRETE: 36 DIAMETERS HORIZONTAL AND VERTICAL. MINIMUM LAP 1'-6".
4. CONCRETE REINFORCING SHALL HAVE MINIMUM COVER OF CONCRETE AS FOLLOWS:
 - 1" STRUCTURAL SLABS NOT EXPOSED TO WEATHER OR IN CONTACT WITH THE GROUND.
 - 1-1/2" BEAMS AND SLABS EXPOSED TO WEATHER.
 - 2" WALLS, SLABS IN CONTACT WITH LIQUID CONTENTS.
 - 3" BOTTOM BARS IN FOOTINGS AND BASE SLABS, AND WHERE CAST AGAINST OR PERMANENT CONTACT w/SOIL.

MISCELLANEOUS STEEL:

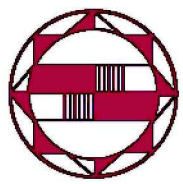
1. STRUCTURAL STEEL SHALL BE ASTM A-36. DETAIL, FABRICATE AND ERECT PER LATEST AISC.
2. WELDING SHALL BE DONE BY CERTIFIED WELDERS AND PER AISC AND AWS STANDARDS.
3. BOLTS, ANCHOR BOLTS AND OTHER THREADED FASTENERS PER ASTM A-307.
4. PIPE PER ASTM A-53.
5. GALVANIZE ALL MISCELLANEOUS STEEL UNLESS NOTED OTHERWISE.

ALUMINUM

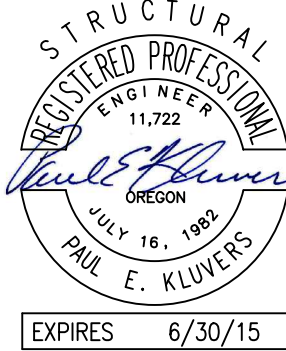
1. ALUMINUM CONSTRUCTION SHALL CONFORM TO THE LATEST EDITION OF THE ALUMINUM CONSTRUCTION MANUAL OF THE ALUMINUM ASSOCIATION.
2. UNLESS OTHERWISE INDICATED, STRUCTURAL ALUMINUM SHALL BE ALLOY 6061-T6 AS SPECIFIED IN ASTM B-221.
3. WHERE ALUMINUM IS IN CONTACT WITH CONCRETE OR MASONRY SURFACES, CONTACT SURFACE SHALL BE COATED WITH HEAVY ALKALI-RESISTANT BITUMINOUS PAINT.
4. BOLTS, ANCHORS, AND THREADED FASTENERS FOR ALUMINUM COMPONENTS TO BE STAINLESS STEEL CONFORMING TO ASTM F593C.
5. WELDING SHALL BE DONE BY CERTIFIED WELDERS AND PER AISC AND AWS STANDARDS.



BAR IS TWO INCHES ON ORIGINAL DRAWING,
IF NOT TWO INCHES ON THIS SHEET
ADJUST SCALES ACCORDINGLY



Cooper Zietz Engineers, Inc.



DATE	11/22/2013			
PROJECT NO.	128437			
DRAWN BY	JM			
CHECKED BY	PEK	1	TEMPORARY ROAD REALIGNMENT	CZ / KLF
DESIGNED BY	PEK		DESCRIPTION	BY
				DATE

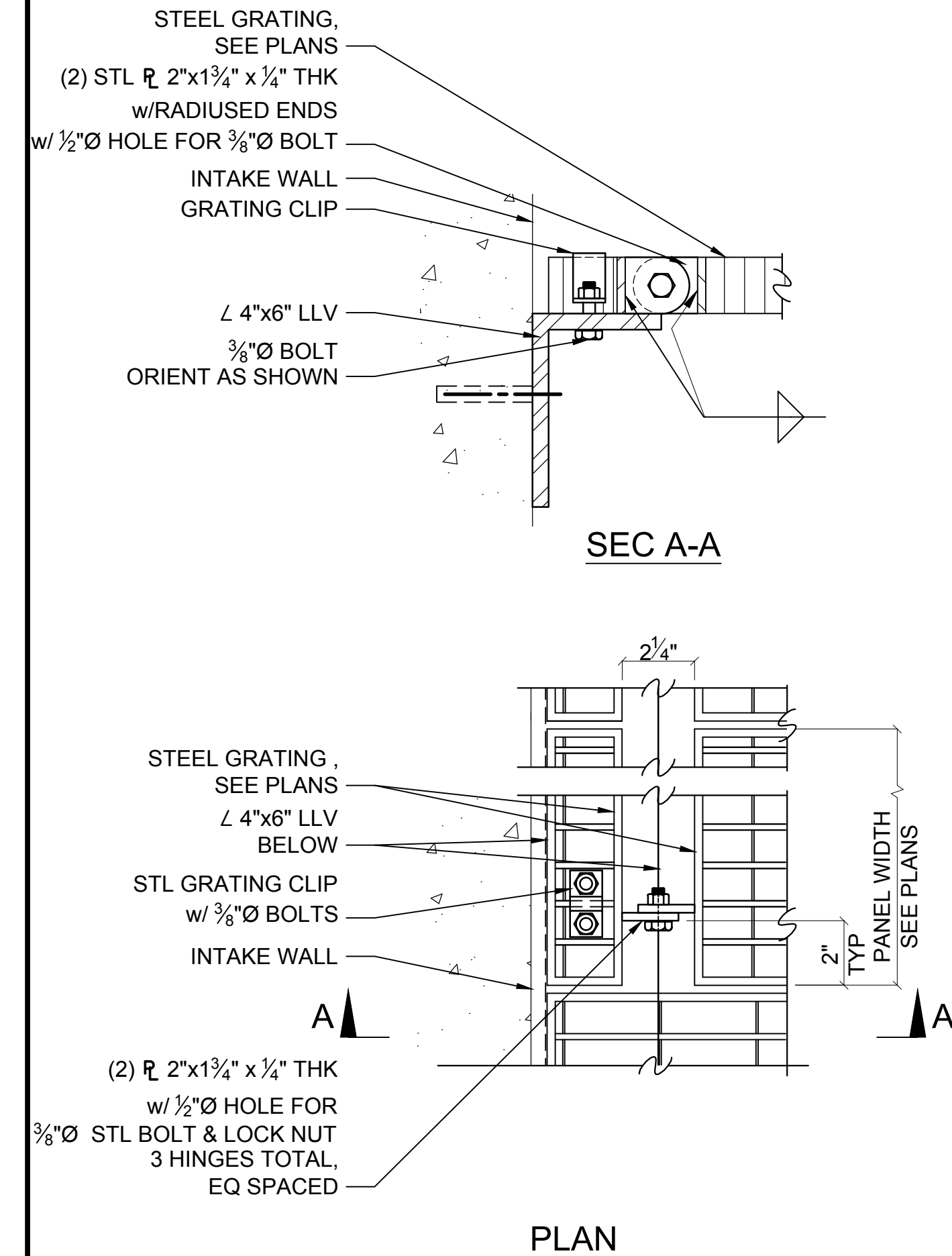
STRUCTURAL NOTES

TSAILLE DAM MODIFICATION
BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL SAFETY OF DAMS - ARIZONA

SHEET 42 of 50

S-1

CAD FILE: P:201111-17 BIA IPSCD ID:01 Task Order 1 - Tsale Dam Rehabilitation CAD2 Sheets Structural 1117_T1_S-2.dwg
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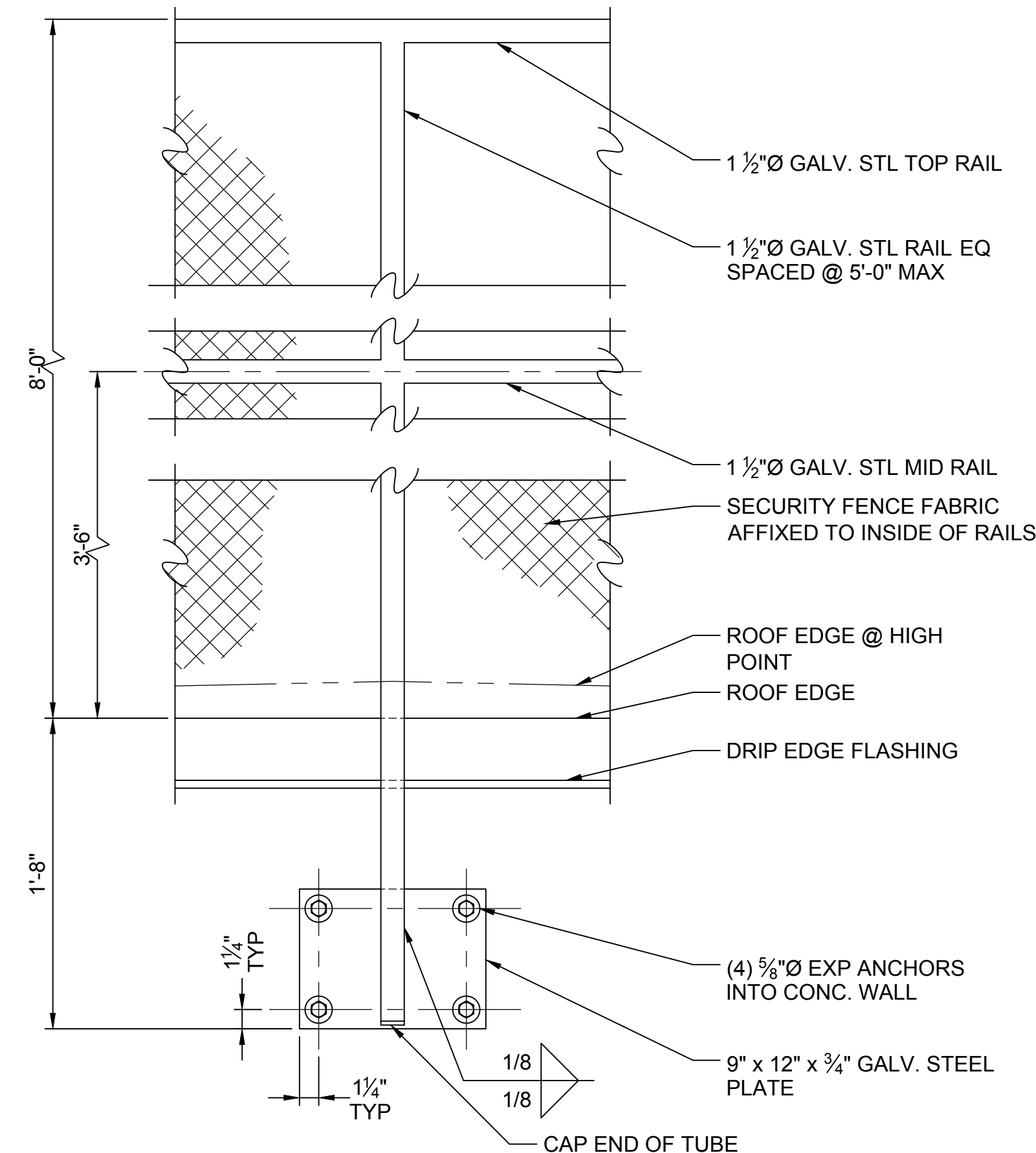


1 TYPICAL GRATING HINGE
VAR SCALE: 3" = 1'-0"

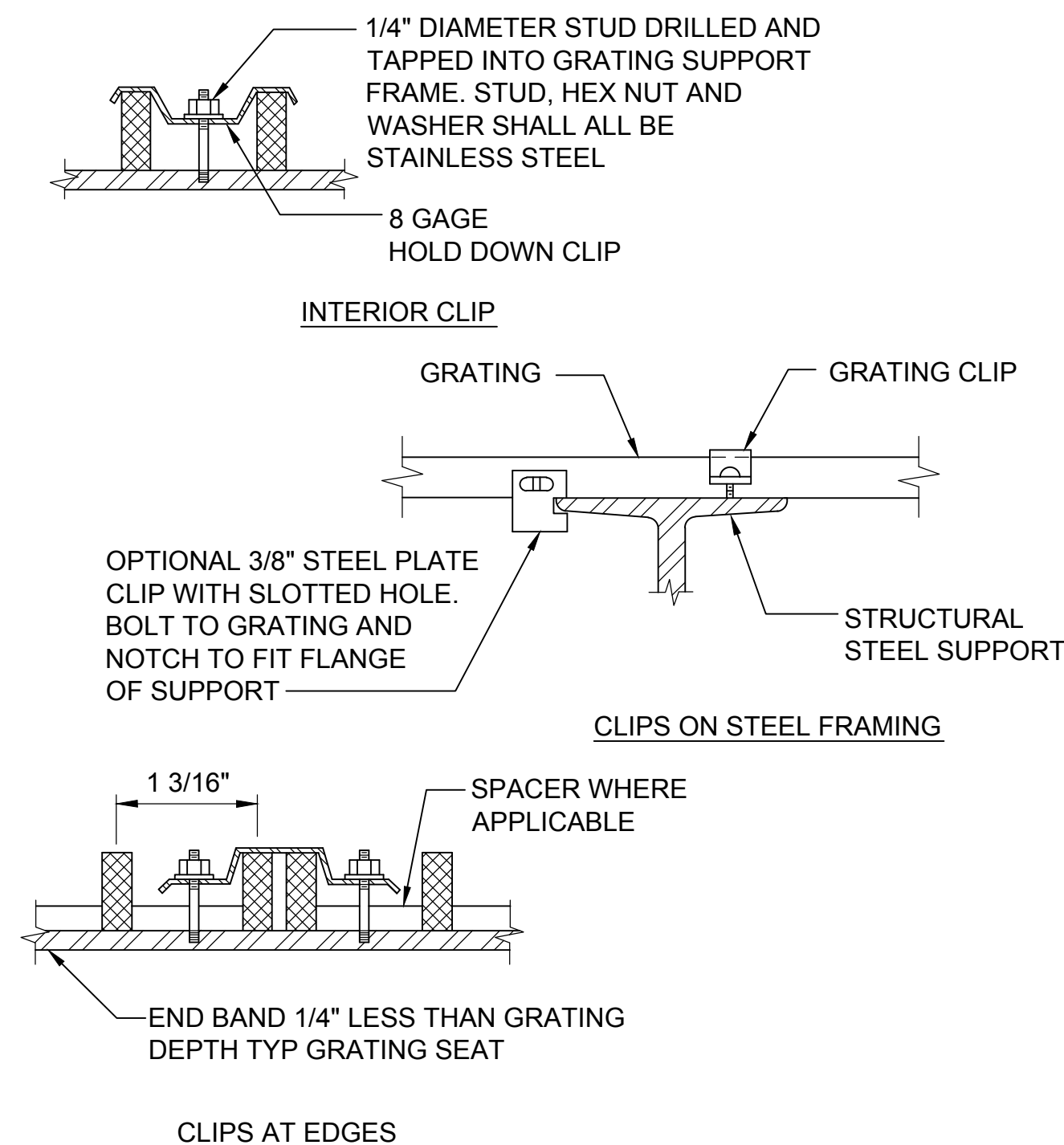
GALVANIZED STEEL GRATING SCHEDULE	
BEARING BAR SIZE	CLEAR SPAN
1 1/2 x 1/8	UP TO 3'-6"
2 x 3/16	4'-0"
2 1/2 x 3/16	5'-0"
SEE PLANS	5'-0"

- GRATING NOTES:
- UNLESS OTHERWISE SPECIFIED OR INDICATED ON THE DRAWINGS, ALL GRATINGS, COVERPLATE SUPPORT ANGLES, CHANNELS AND BEAMS SHALL BE GALVANIZED STEEL. STAINLESS STEEL WHERE NOTED ONLY.
 - GRATING SHALL CONFORM TO THE METAL BAR GRATING MANUAL OF THE NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS, LATEST EDITION.
 - GALVANIZED STEEL GRATING SHALL BE SWAGED AND FORGED.
 - UNLESS OTHERWISE SPECIFIED, PROVIDE 4 GRATING CLIPS APPROXIMATELY 4" FROM THE CORNERS OF EACH PIECE. ADJACENT PIECES MAY BE ANCHORED WITH ONE CLIP AND TWO STUDS, SEE DETAIL 6/S-2.
 - GRATING SHALL BE REMOVABLE.
 - CLEAR SPAN SHALL BE PLAN DIMENSION, FACE TO FACE OF OPENING.

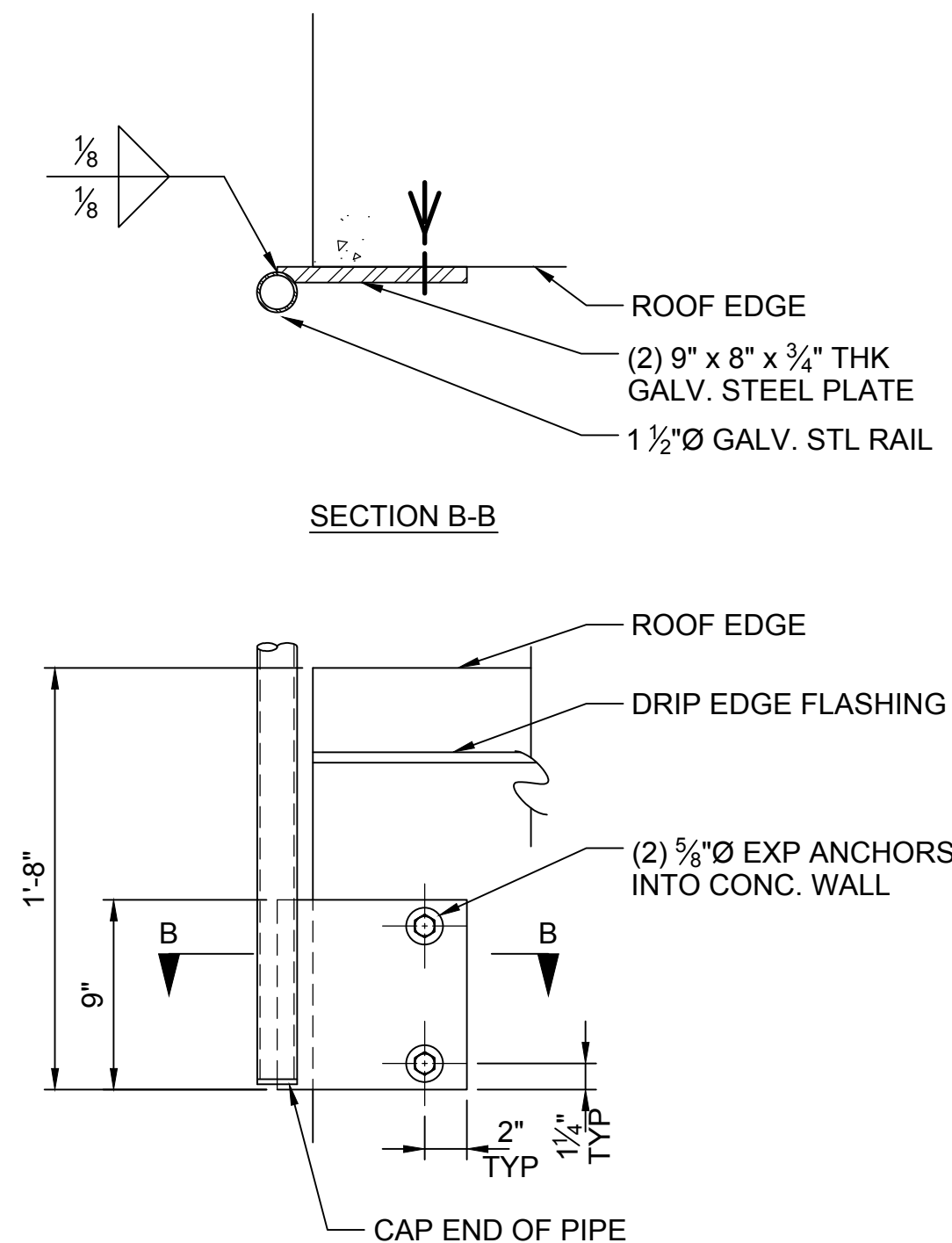
5 GRATING SCHEDULE & NOTES
VAR SCALE: NTS



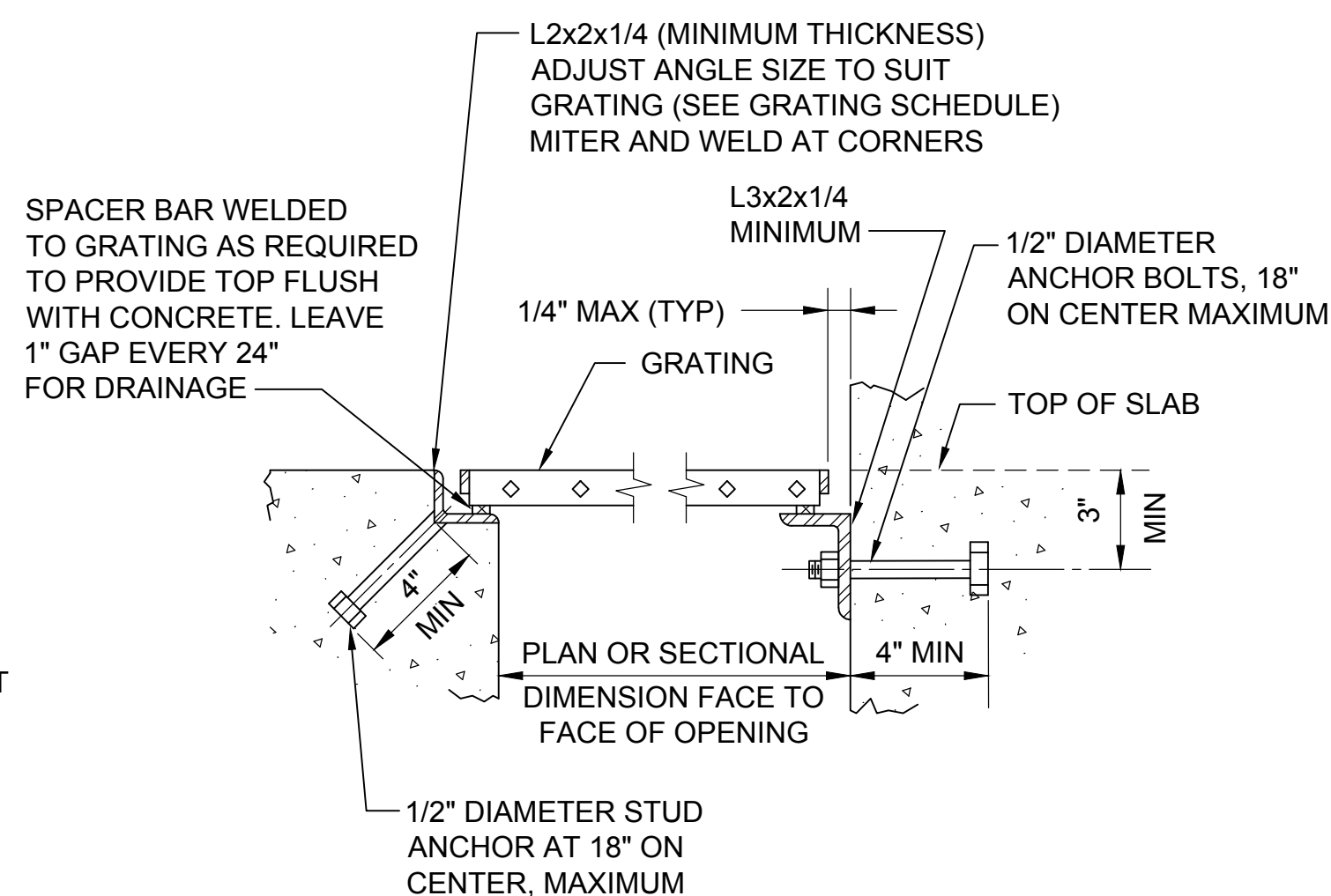
2 TYPICAL ROOF FENCE CONNECTION
VAR SCALE: 1 1/2" = 1'-0"



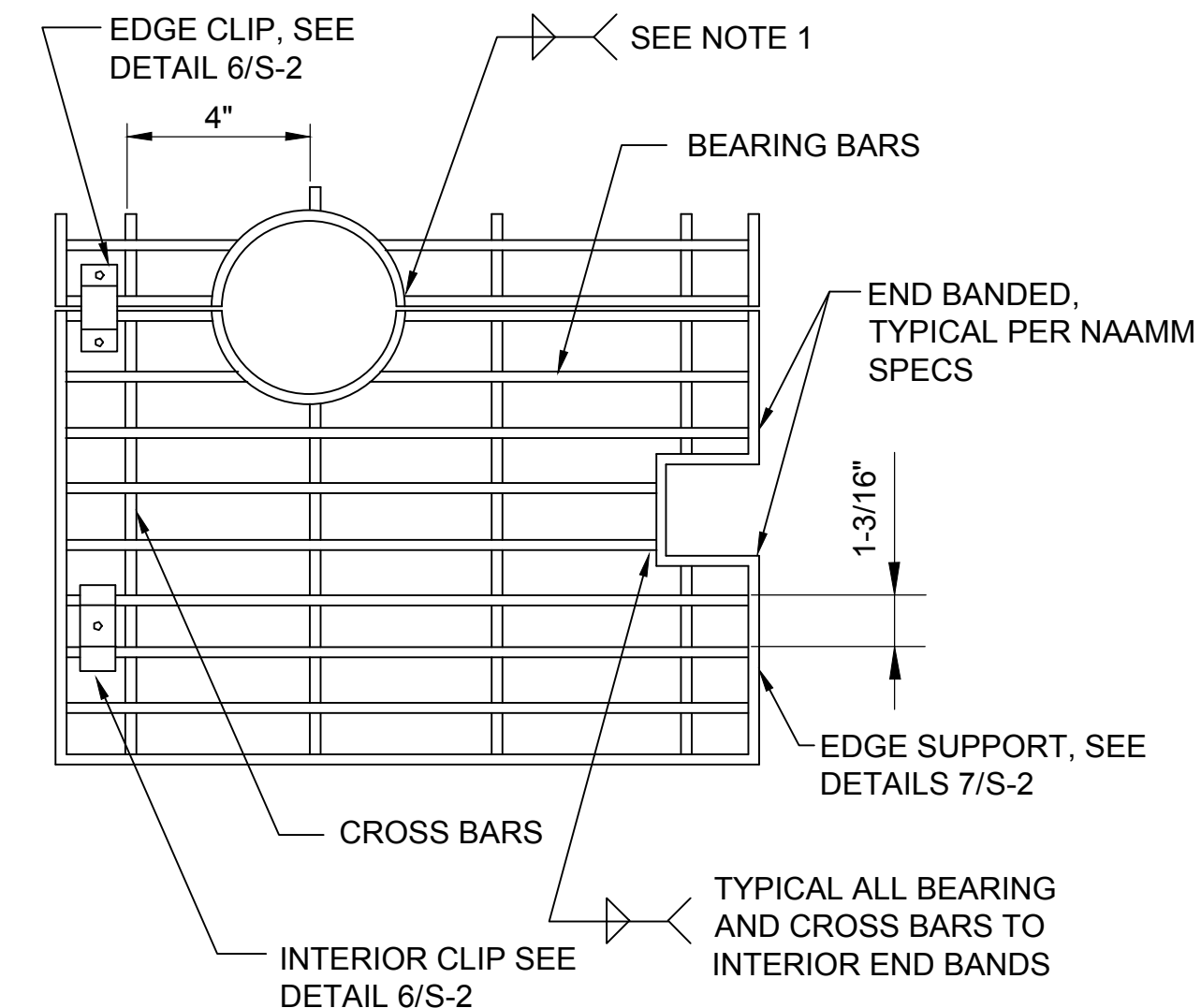
6 GRATING CLIPS
VAR SCALE: NTS



3 ROOF CORNER FENCE CONNECTION
VAR SCALE: 1 1/2" = 1'-0"

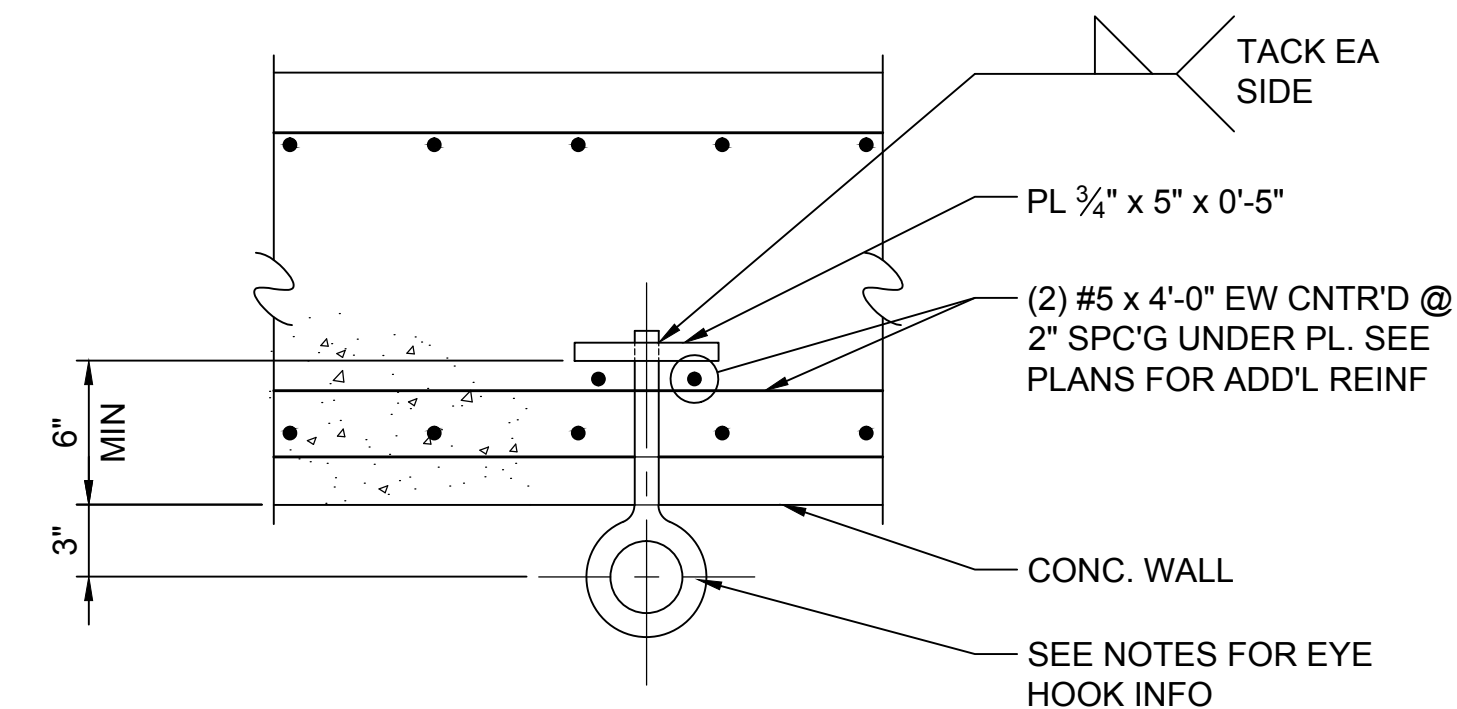


7 GRATING SUPPORT AT CONCRETE
VAR SCALE: NTS



- NOTES:
- TYPICAL ALL BEARING AND CROSS BARS TO INTERIOR END BANDS
 - FOR ADDITIONAL INFORMATION, SEE DETAIL 5/S-2

4 GRATING PLAN
VAR SCALE: NTS

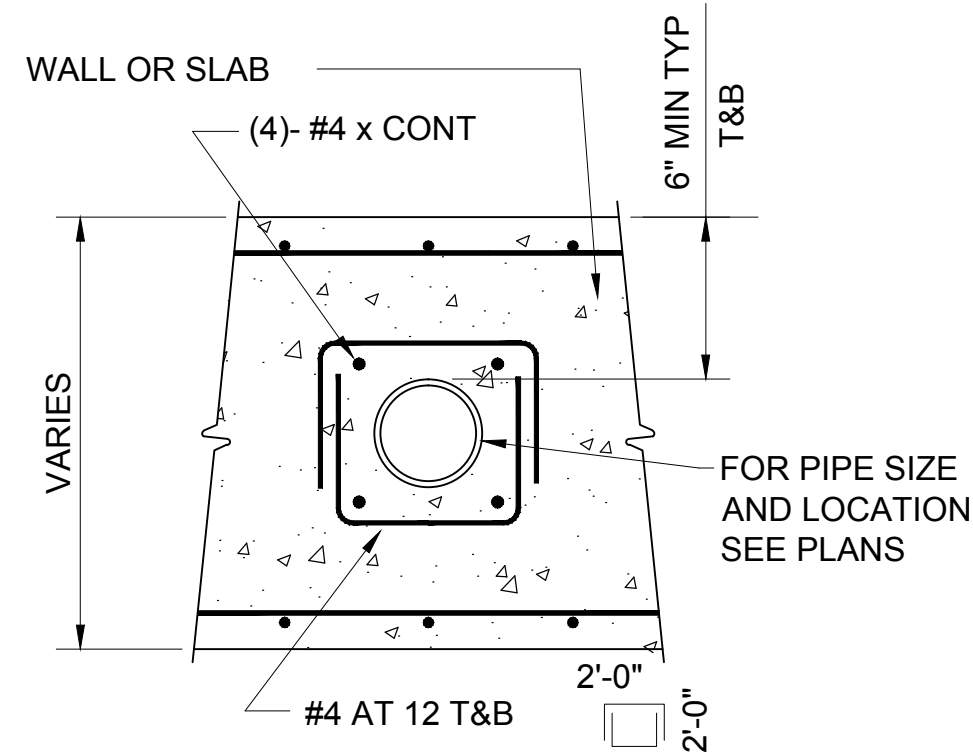


- NOTES:
- MINIMUM LOAD RATING FOR HOOK IS 2000 LBS.
 - 3/4" GALV FORGED ASTM A307 EYE BOLT. EYE SHALL BE STRONG ENOUGH TO DEVELOP FULL STRENGTH OF BOLT IN TENSION.
 - 1 1/2" MIN. INSIDE EYE DIA. FOR USE WITH 1" DIA SAFETY ATTACHMENT
 - SUBMIT DATA ON EYE BOLT WITH SHOP DRAWINGS

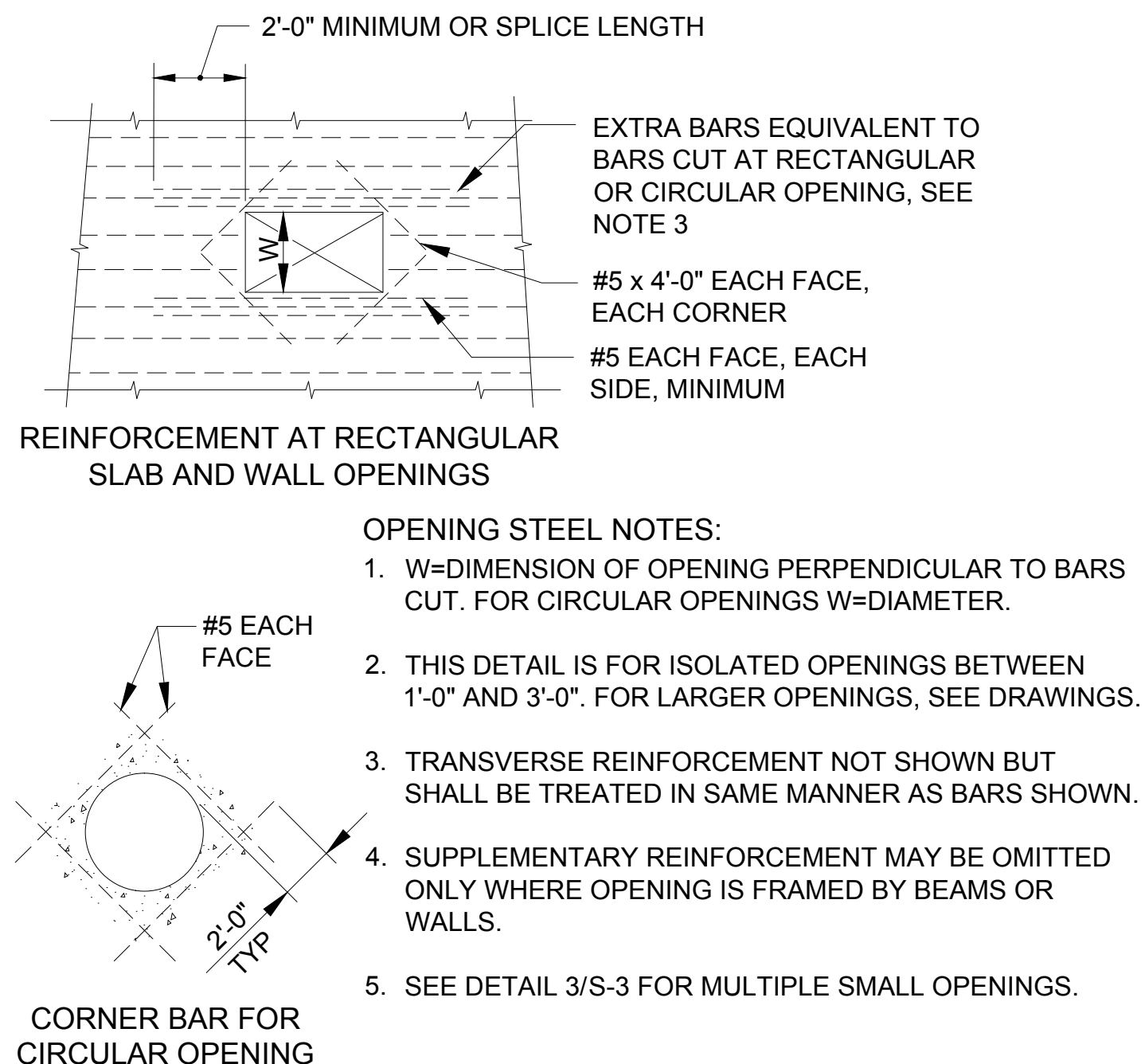
8 FALL PROTECTION HOOKS
VAR SCALE: 1 1/2" = 1'-0"

0" 1" 2"
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IF NOT TWO INCHES ON THIS SHEET
ADJUST SCALES ACCORDINGLY

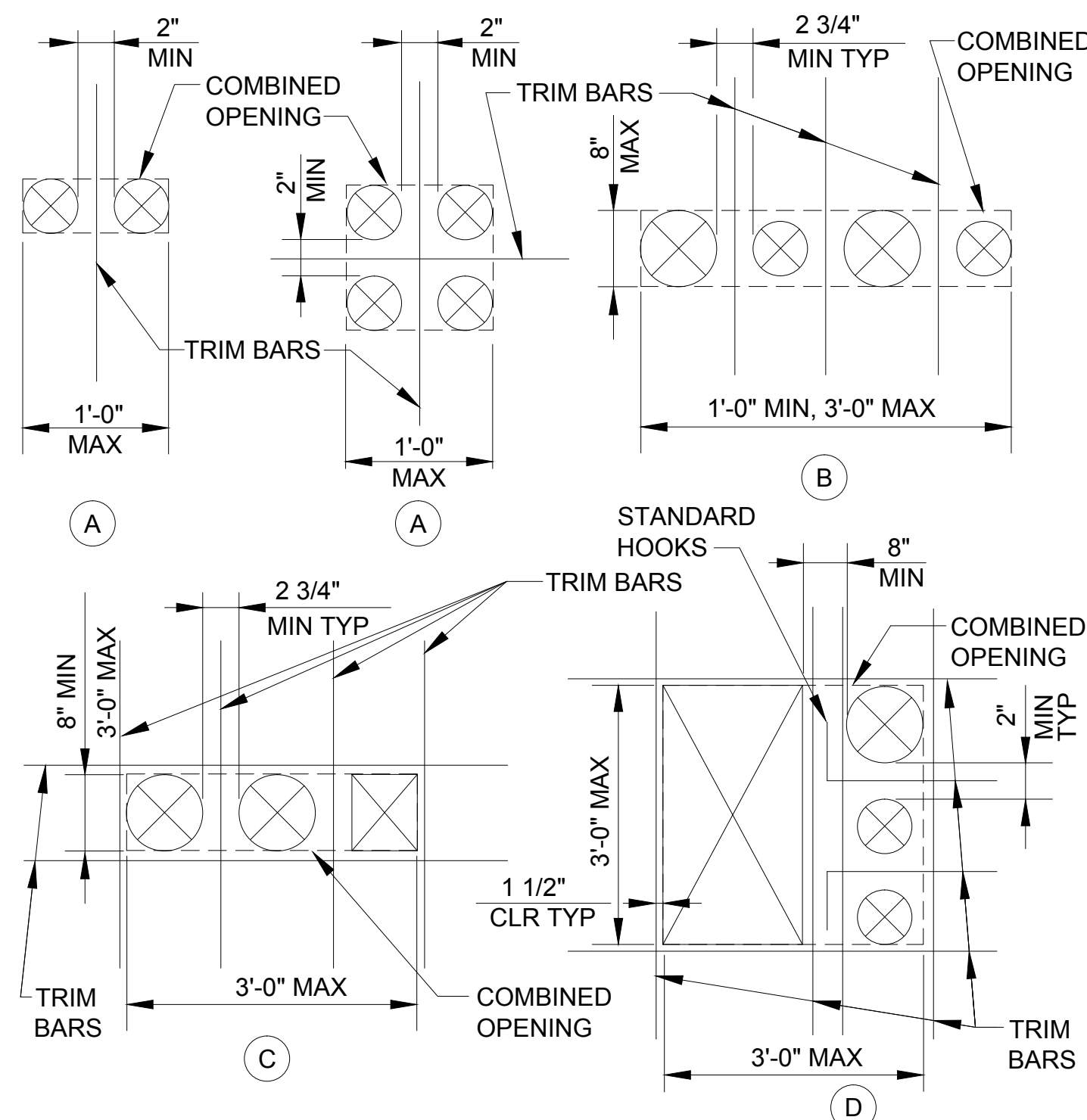
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LAYOUT: Plans Sections Details
PLOTED: 11/21/2013 4:56 PM BY: adam



1
VAR TYPICAL PIPE ENCASEMENT
DETAIL
SCALE: NTS



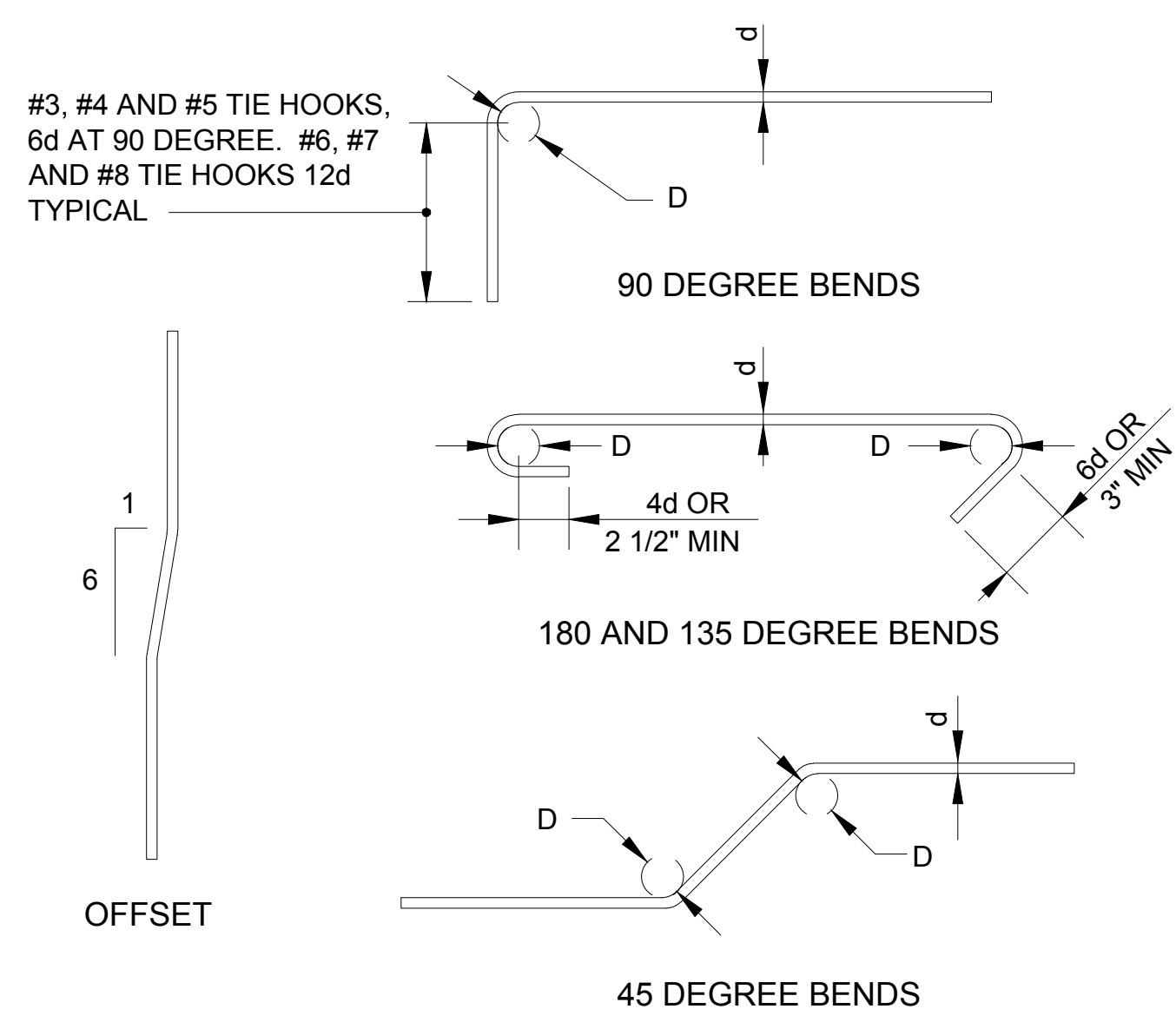
2
VAR REINFORCEMENT AT SLAB
AND WALL OPENINGS
DETAIL
SCALE: NTS



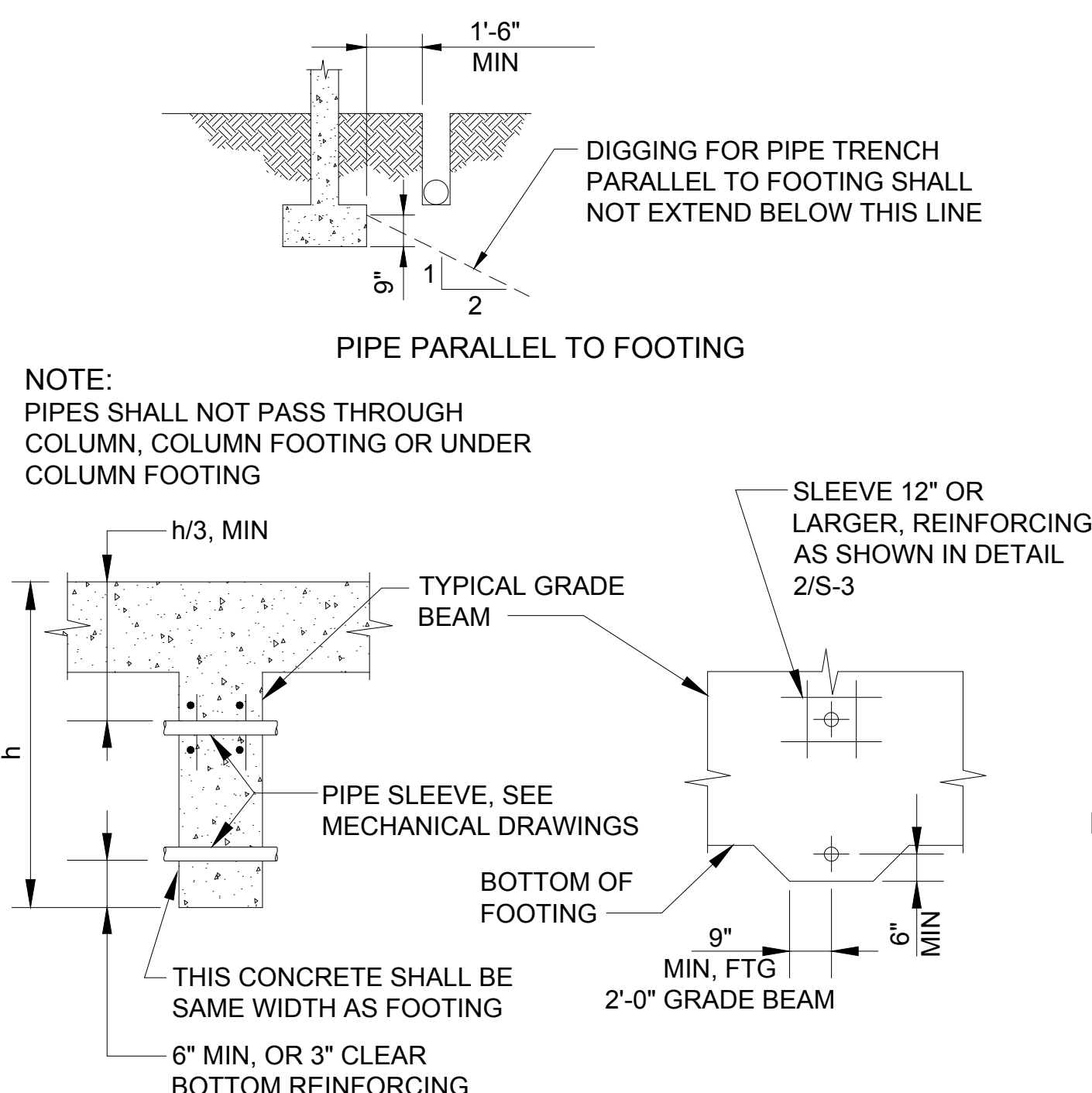
3
VAR TRIM BARS
DETAIL
SCALE: NTS

- TRIM BAR NOTES:
1. SLAB OPENINGS WHICH ARE CLOSER TO ONE ANOTHER THAN THE DIAMETER OR SHORTER SIDE OF THE LARGER OF THE TWO ARE CONSIDERED TO FORM A COMBINED OPENING.
 2. THESE DIAGRAMS ARE FOR COMBINED OPENINGS WHOSE LARGER DIMENSION DOES NOT EXCEED 3'-0". SEE DRAWINGS FOR OPENINGS LARGER THAN 3'-0".
 3. TRIM BAR EXTENSION PAST EDGES OF COMBINED OPENINGS SHALL BE 1'-0" FOR #4 BARS, 1'-6" FOR #5 BARS, AND ONE DEVELOPMENT LENGTH FOR LARGER BARS.
 4. DISPLACE SLAB PRINCIPAL REINFORCEMENT TO EACH SIDE OF COMBINED OPENING OR PLACE BETWEEN INDIVIDUAL OPENINGS. DO NOT CUT SLAB PRINCIPAL REINFORCEMENT.
 5. SEE DETAIL 2/S-3 FOR TRIM BARS FOR ISOLATED SLAB OPENINGS.
 6. SUBMIT SPECIAL SITUATIONS TO COR FOR REVIEW.

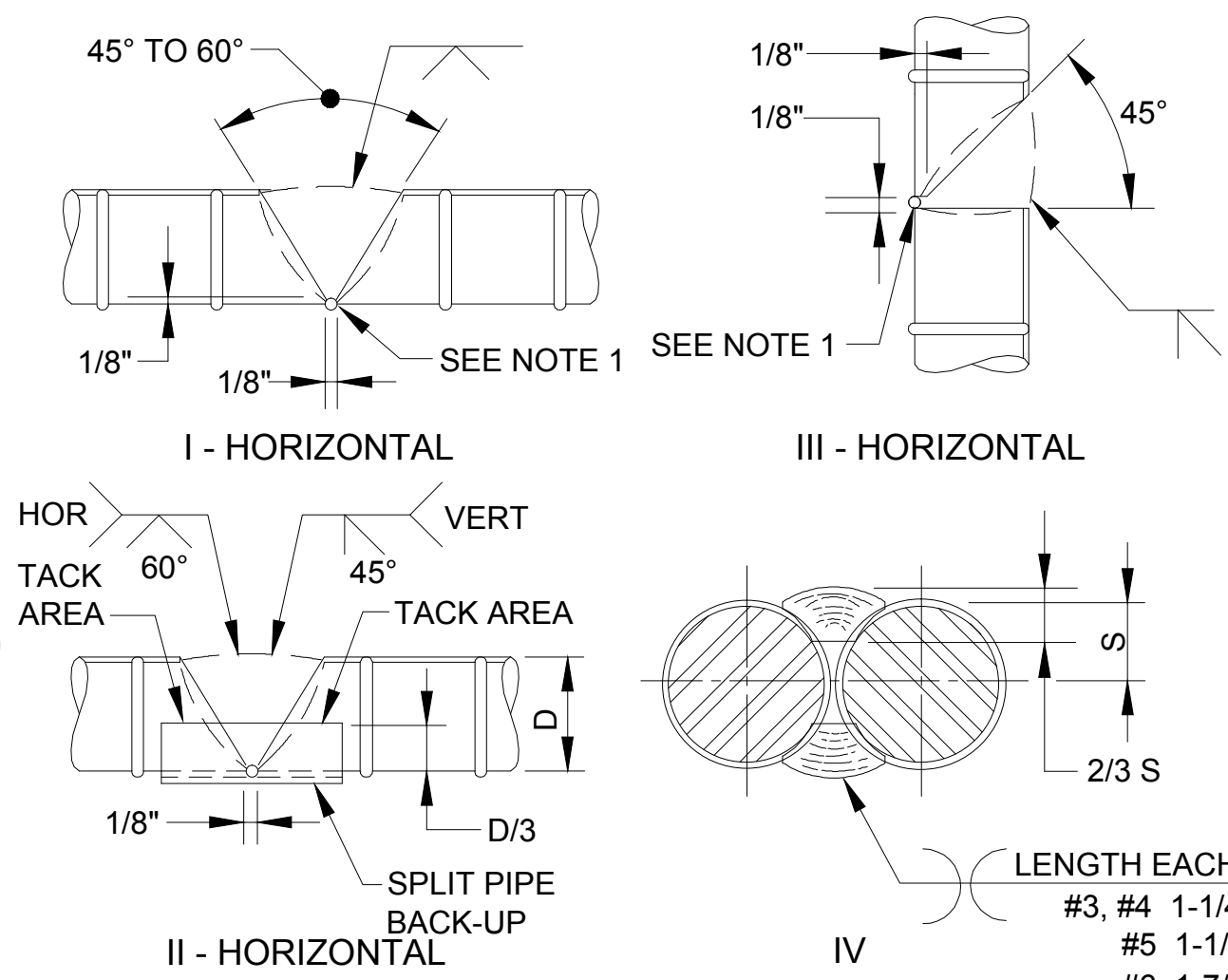
- TRIM BAR REQUIREMENTS:
- A IF THE COMBINED OPENING IS SMALLER THAN 1'-0", PROVIDE (1) #4 TOP AND BOTTOM BETWEEN OPENINGS.
 - B IF THE LARGER DIMENSION OF A COMBINED OPENING EXCEEDS 1'-0" BUT THE SMALLER DIMENSION IS LESS THAN OR EQUAL TO 8", AND PROVIDED THE COMBINED OPENING IS ALIGNED WITH THE PRINCIPAL REINFORCEMENT, PROVIDE (1) #4 TOP AND BOTTOM BETWEEN OPENINGS.
 - C IN ALL OTHER CASES WHERE OPENINGS ARE ARRANGED IN A SINGLE LINE, PROVIDE (1) #4 TOP AND BOTTOM BETWEEN OPENINGS AND (1) #5 TOP AND BOTTOM AROUND PERIMETER OF COMBINED OPENING.
 - D WHERE INDIVIDUAL OPENINGS OF A COMBINED OPENING FORM TWO OR MORE ROWS, THE ROWS SHALL BE SEPARATED BY AT LEAST 8" OF CONCRETE. PROVIDE (2) #4 TOP AND BOTTOM BETWEEN ROWS OF OPENINGS, (1) #4 TOP AND BOTTOM BETWEEN OPENINGS IN THE PERPENDICULAR DIRECTION, AND (1) #5 TOP AND BOTTOM AROUND THE PERIMETER OF COMBINE OPENING. PROVIDE STANDARD HOOKS WHERE BARS TERMINATE WITHIN THE COMBINED OPENING.



4
VAR TYPICAL REINFORCING BAR ENDS
DETAIL
SCALE: NTS

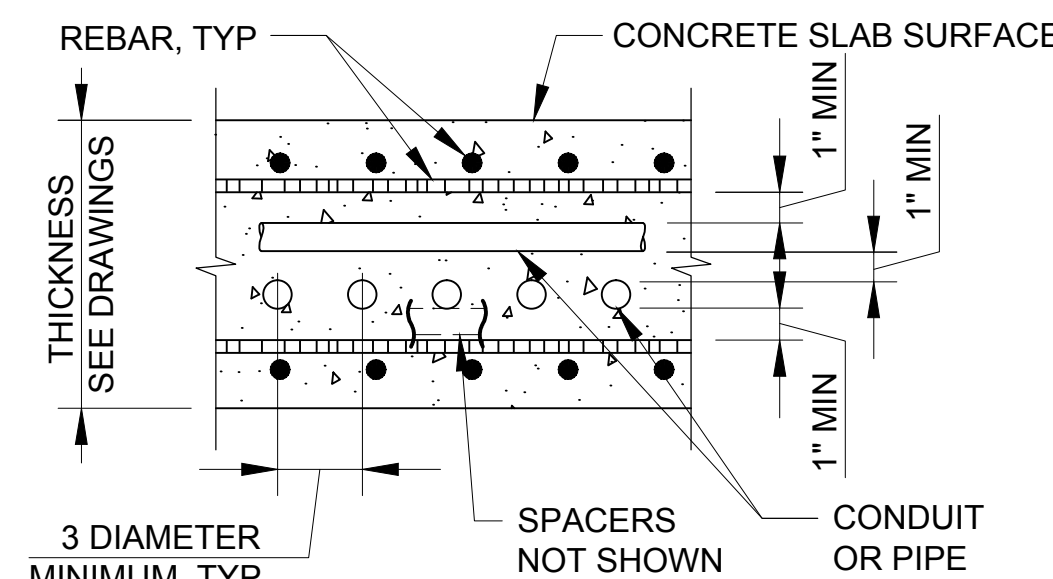


5
VAR PIPING AT FOOTINGS
AND GRADE BEAMS
DETAIL
SCALE: NTS



6
VAR REINFORCING WELD SPLICE
DETAIL
SCALE: NTS

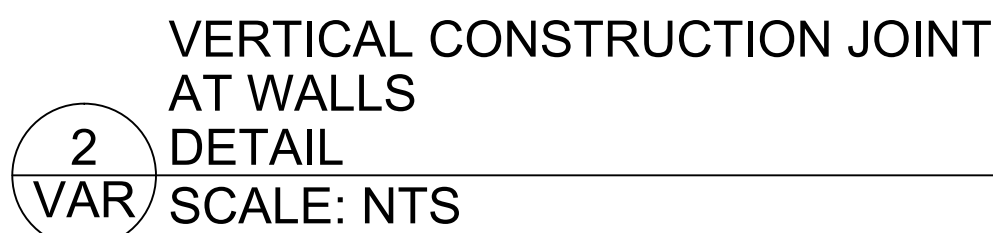
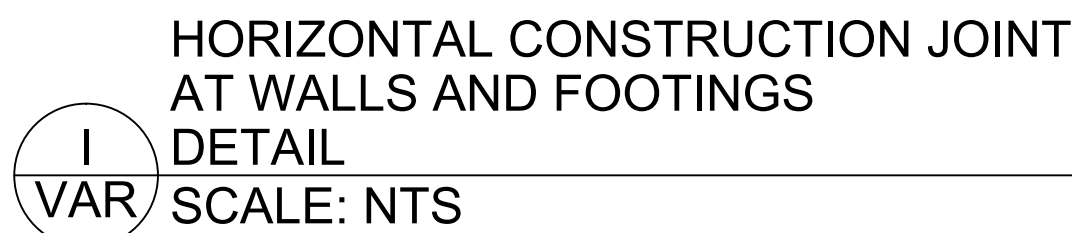
- REINFORCING WELDING NOTES:
1. CHIP, GRIND OR GOUGE TO SOUND METAL BEFORE WELDING OTHER SIDE.
 2. DETAIL I AND III FOR #9 AND LARGER. DETAIL II FOR #8 AND SMALLER. DETAIL IV FOR #6 AND SMALLER.
 3. E70 ELECTRODE FOR GRADE 40. E90 ELECTRODE FOR GRADE 60.
 4. SEE AWS D1.4 FOR WELDING PROCESS AND OTHER DETAILS.
 5. CONTINUOUS SPECIAL INSPECTION REQUIRED EXCEPT DETAIL IV, #5 AND SMALLER.



7
VAR CONCRETE EMBEDDED
CONDUITS OR PIPES
DETAIL
SCALE: NTS

- NOTES:
1. CONTRACTOR SHALL SUBMIT PROPOSED EMBEDDED CONDUIT/PIPE LAYOUT TO THE COR FOR APPROVAL. NO CONDUIT OR PIPE SHALL BE INSTALLED WITHIN CONCRETE FORMWORK PRIOR TO APPROVAL OF LAYOUT. SUBMITTAL SHALL HAVE SUFFICIENT INFORMATION TO VERIFY CONCRETE COVERS AND CONDUIT/PIPE SPACINGS.
 2. WHERE APPROVED BY THE COR FOR PLACEMENT WITHIN CONCRETE ELEMENTS, ALL CONDUITS AND PIPES EMBEDDED WITHIN A CONCRETE ELEMENT SHALL:
 - A. NOT BE LARGER IN OUTSIDE DIAMETER THAN 1/3 THE OVERALL THICKNESS OF THE CONCRETE SLAB OR WALL THAT THEY ARE EMBEDDED IN;
 - B. NOT BE SPACED CLOSER THAN 3 DIAMETERS OR WIDTHS ON CENTER;
 - C. HAVE A MINIMUM OF 2 INCHES OF COVER FROM THE NEAREST CONCRETE SURFACE AND A MINIMUM OF 1 INCHES FROM THE NEAREST REBAR;
 - D. NOT BE EMBEDDED IN CONCRETE BEAMS, STRUTS OR COLUMNS;
 - E. NOT BE PIPE OR CONDUIT OF ALUMINUM CONSTRUCTION;
 - F. NOT SIGNIFICANTLY IMPAIR THE STRENGTH OF CONSTRUCTION
 3. CONDUIT SHALL BE SUPPORTED WITH ALL PLASTIC CONDUIT SPACERS, REBAR SPACERS OR SOLID CONCRETE BRICK.

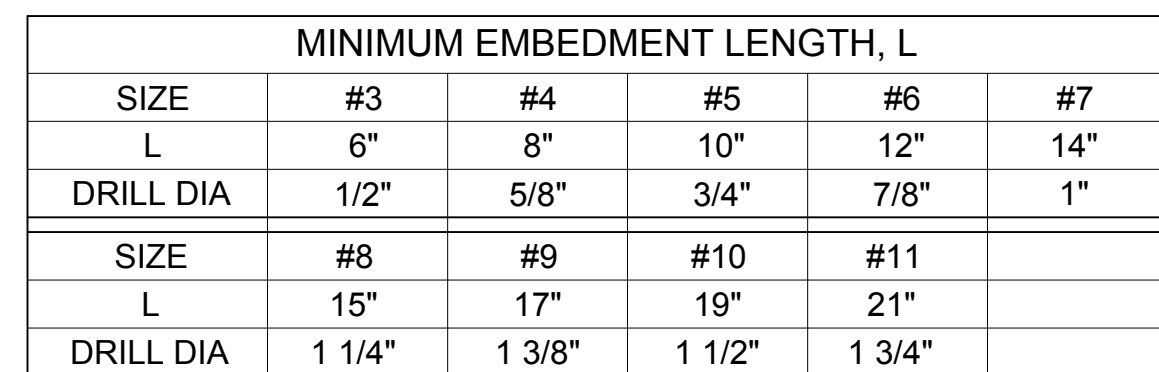
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IF NOT TWO INCHES ON THIS SHEET
ADJUST SCALES ACCORDINGLY



- 3
VAR
- LIFTING EYE
DETAIL
SCALE: NTS



- 4
VAR
- ANCHORS
DETAIL
SCALE: NTS



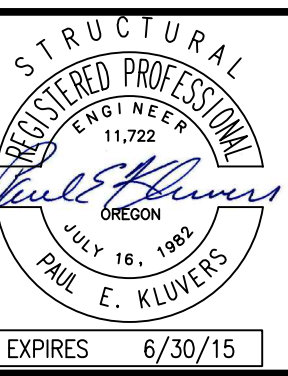
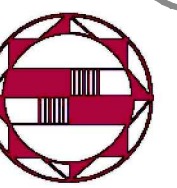
5 DETAIL
VAR SCALE: NTS



- TWO-PART DOWEL SYSTEM
DETAIL
SCALE: NTS



- MECHANICAL BAR SPLICE
DETAIL
SCALE: NTS

[illegible]

DOOR & FRAME
DETAIL
SCALE: 1 1/2" = 1'-0"

HINGE
DETAIL
SCALE: 3" = 1'-0"

FRAME
DETAIL
SCALE: 3" = 1'-0"

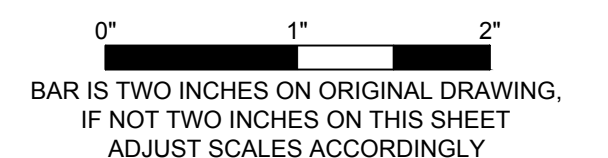
SECTION A-A

LATCH
DETAIL

2
S-5

SCALE: 3" = 1'-0"

5 LADDER
VAR) DETAIL
SCALE: NTS



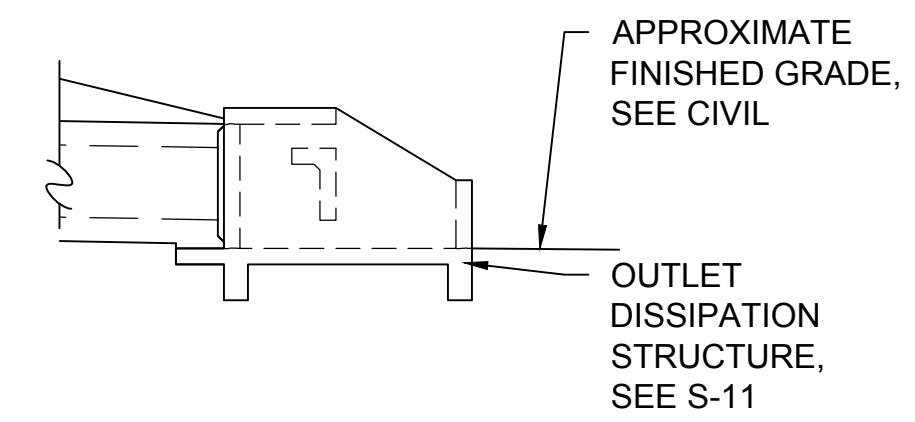
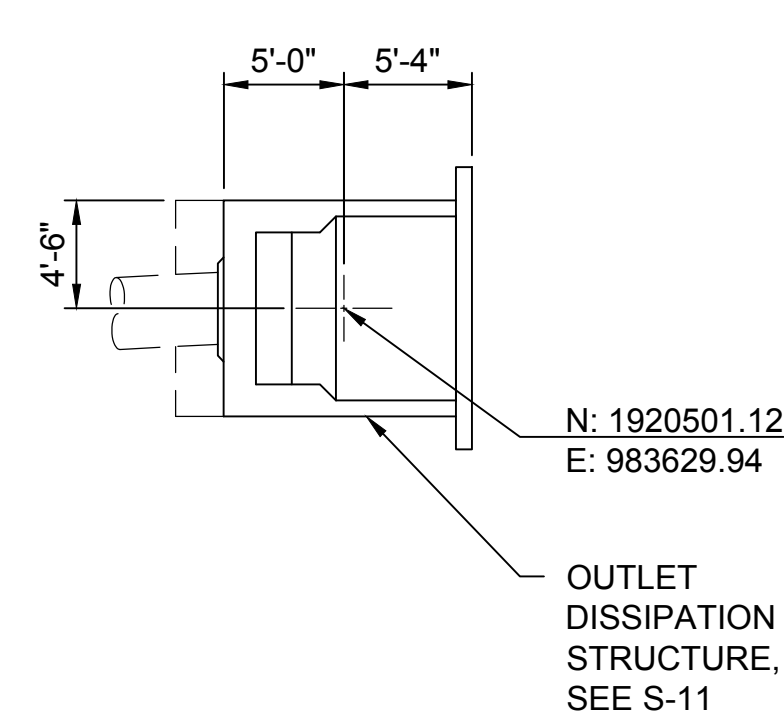
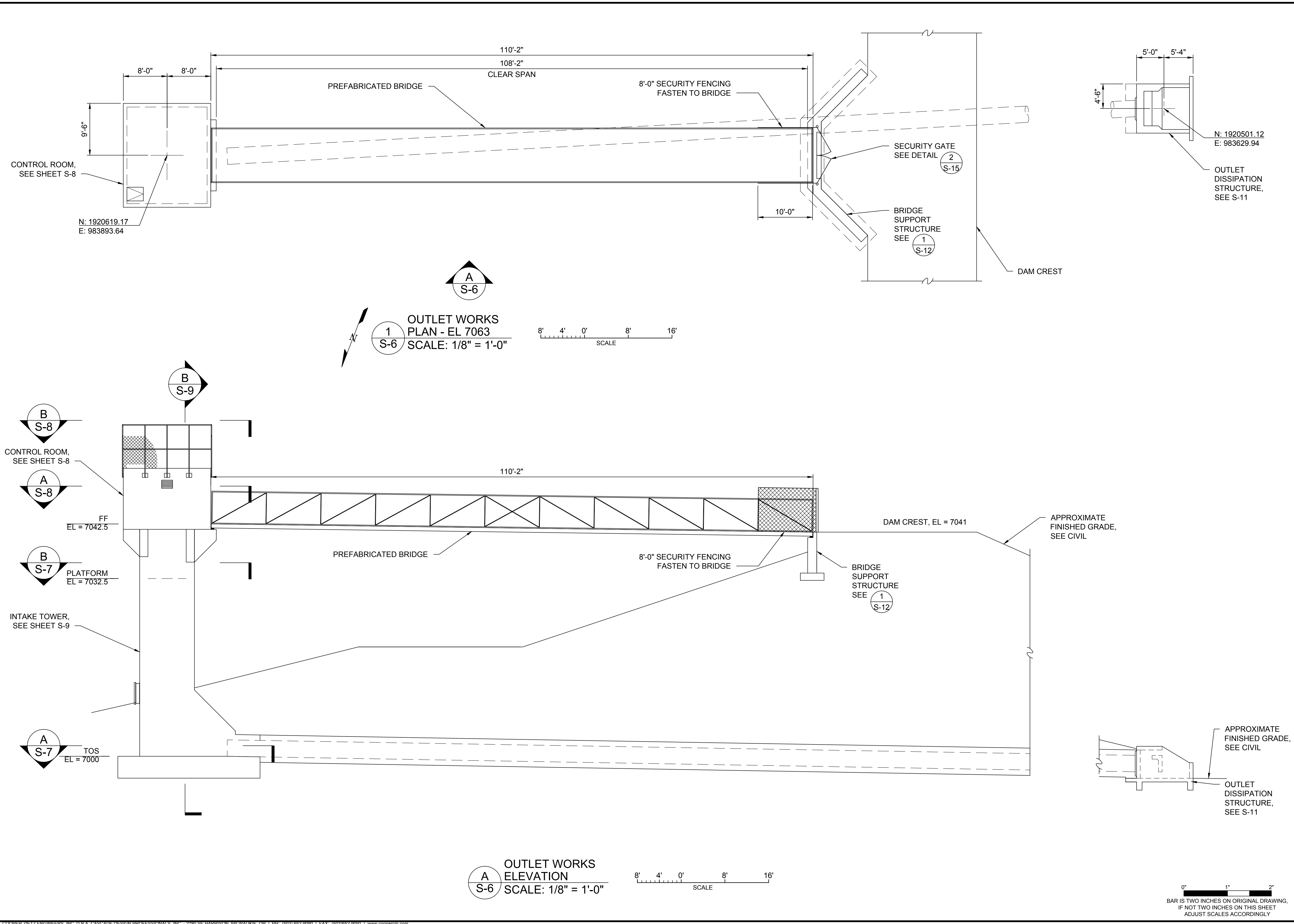
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PROJECT NO.	128437				
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CHECKED BY	PEK				
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FILENAME 1117_T1_S-5.dwg			NO.	BY	DATE
			DESCRIPTION		
			REVISIONS		

STANDARD STRUCTURAL DETAILS	TSAILE DAM MODIFICATION BUREAU OF INDIAN AFFAIRS NAVAJO REGIONAL SAFETY OF DAMS - ARIZONA
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S-5

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CAD FILE: P:201111-17 BIA IPSOD ID:01Task Order 1 - Tsale Dam Rehabilitation CAD2 Sheets\Structural\1117_T1_S-6.dwg PLOTTED: 11/21/2013 4:58 PM BY: adam LAYOUT: Plans Sections Details



Cooper Zietz Engineers, Inc.


KLEINFELDER
High Peak Registrations



DATE	PROJECT NO.	DRAWN BY	CHECKED BY	DESIGNED BY	FILENAME
11/22/2013	128437	JM	PEK	PEK	1117_T1_S-6.dwg

NO.	DESCRIPTION	BY	DATE
1	TEMPORARY ROAD REALIGNMENT	CZ / KLF	11-22-2013

OUTLET WORKS
PLAN AND ELEVATION

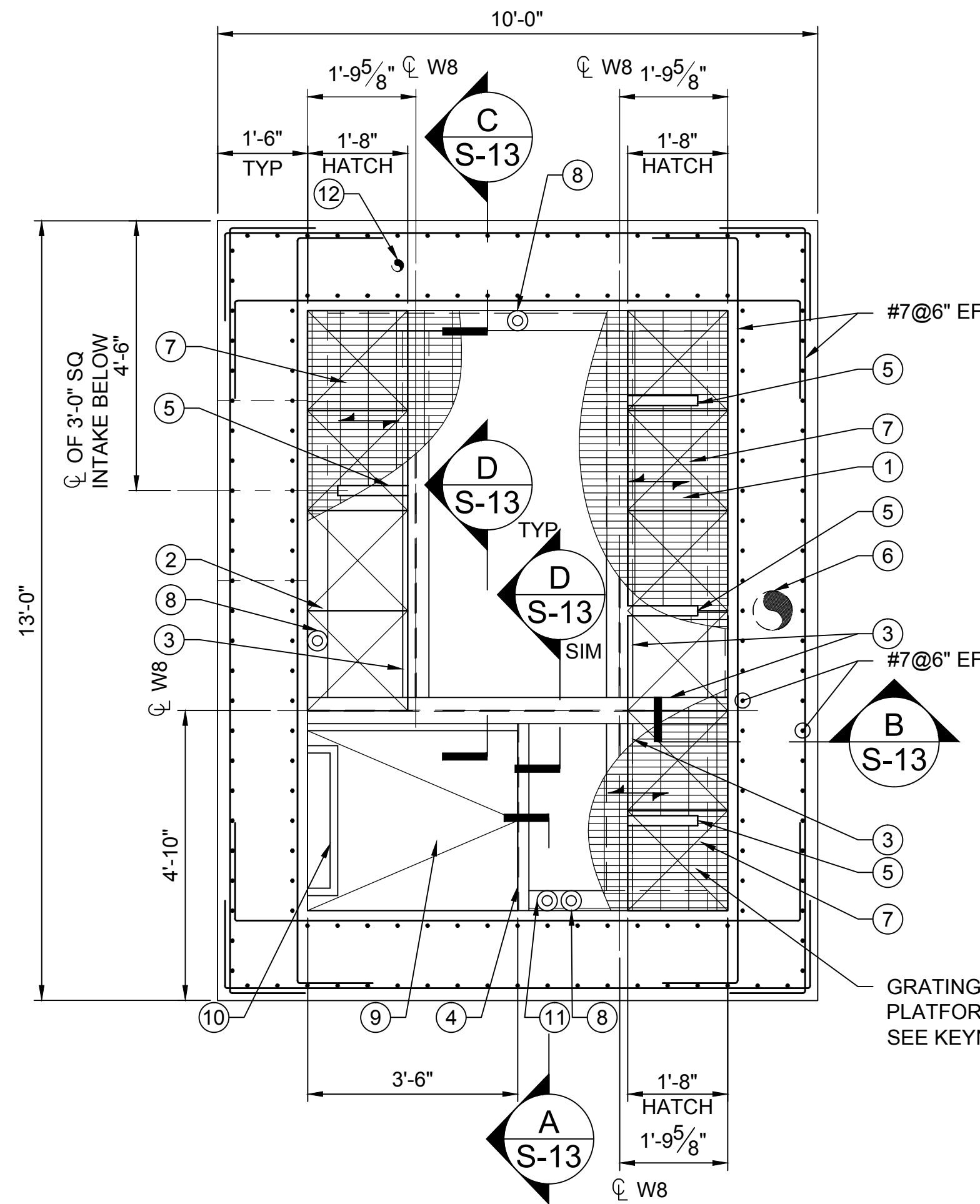
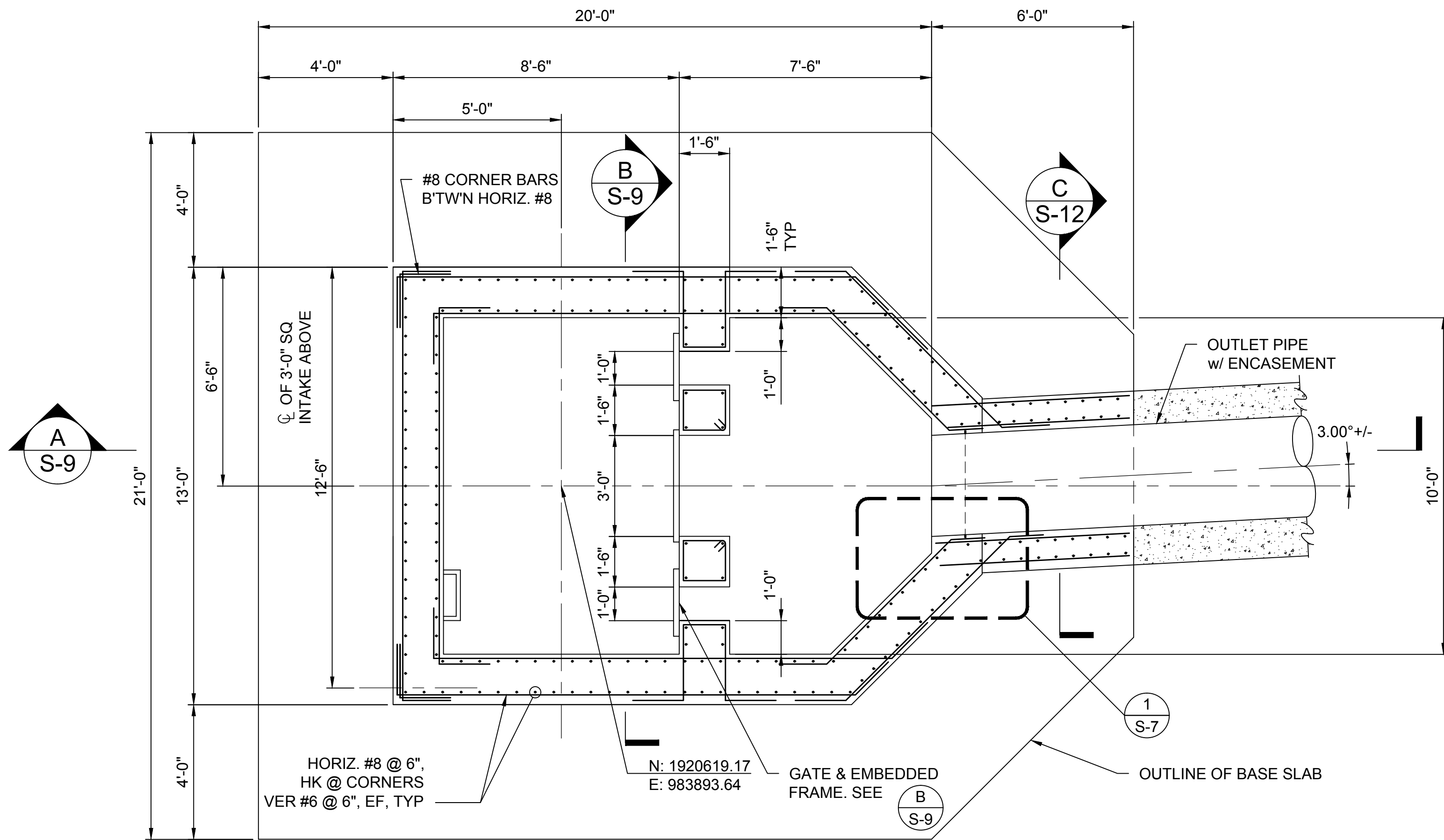
TSALE DAM MODIFICATION
BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL SAFETY OF DAMS - ARIZONA

SHEET

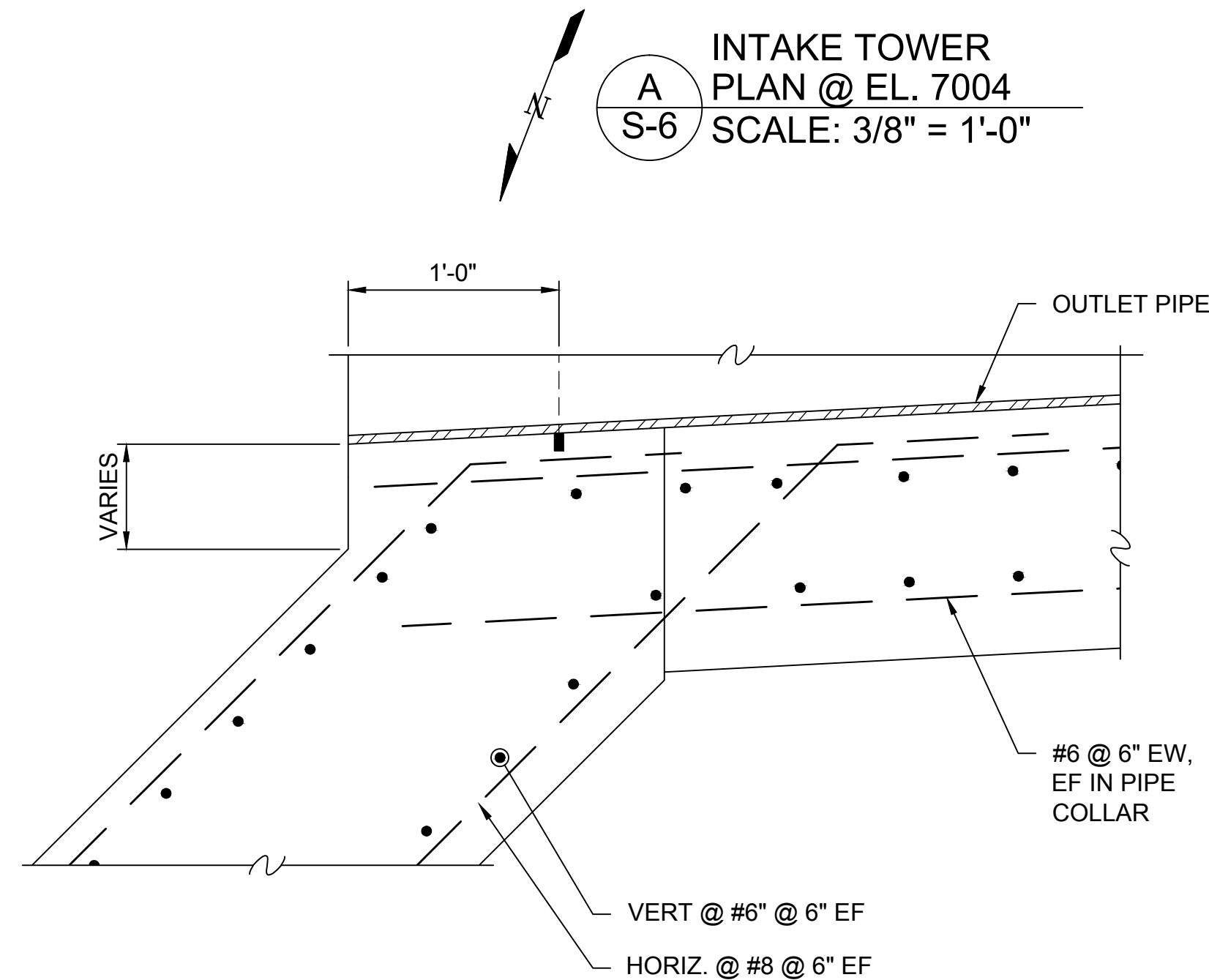
47 of 56

S-6

CAD FILE: P:20111117 BIA IPSO ID:01Task Order 1 - Tsale Dam Rehab CAD2-Structural1117_T1_S-7.dwg
LAYOUT: Plans - Sections - Details
PLOTTED: 11/22/2013 8:09 AM BY: adam



- KEYNOTES:
- STEEL GRATING $1\frac{1}{2}'' \times \frac{3}{16}''$ (19-4 PATTERN) PLAIN SURFACE
($\longleftrightarrow$ INDICATES SPAN DIRECTION)
 - GRATING SUPPORT ANGLE AT PERIMETER OF SHAFT, $\angle 4 \times 6 \times \frac{1}{2}$ (LLV) w/ $\frac{5}{8}'' \varnothing$ EPOXY ADHESIVE ANCHORS @ 1'-6" MAX. SPACING (EMBED. = 4")
 - W8x18 GRATING SUPPORT BEAM
 - C8x11.5 BEAM
 - COORDINATE OPENINGS IN GRATING FOR GATE OPERATOR SHAFTS. SEE ALSO SHEET S-2
 - VENT PIPE
 - 1'-8" x 1'-8" REMOVABLE GRATING PANELS FOR GATE ACCESS (3 LOCATIONS)
 - HOOKS FOR FALL PROTECTION, FIELD LOCATE
 - 3'-0" x 3'-6" OP'NG w/ HINGED GRATE & SECURE POINT.
 - LADDER w/ SAF-T-CLIMB SYSTEM
 - HOOK FOR SECURING HATCH w/ CHAIN & CARABINER WHEN IN OPEN POSITION. LOCATE 4'-0" ABOVE GRATE.
 - EMBED 2" $\varnothing$ PIPE FOR WSE PRESSURE TRANSDUCER



1 WALL DETAIL
SCALE: 1 1/2" = 1'-0"

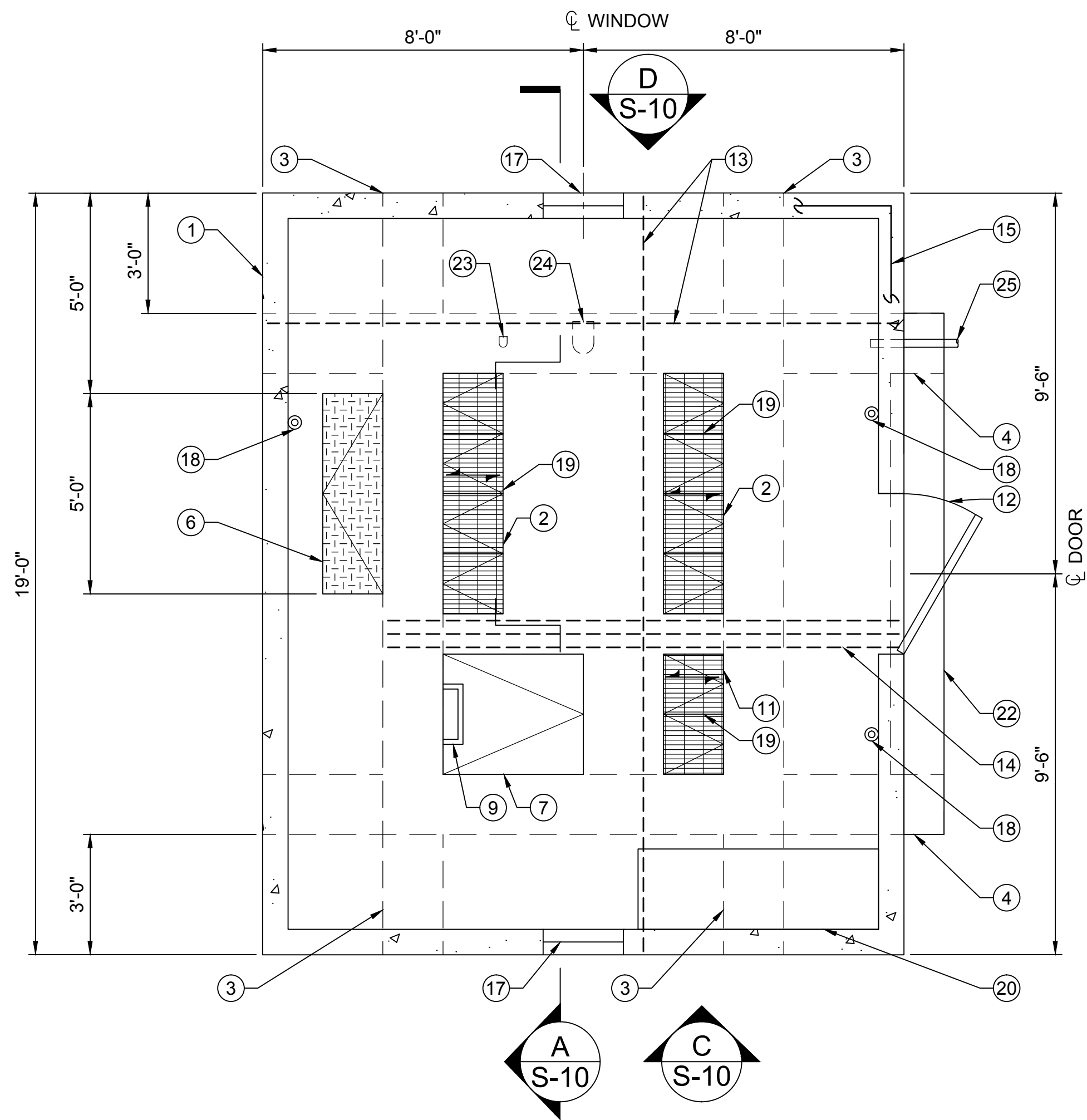
A INTAKE TOWER
PLAN @ EL. 7004
SCALE: 3/8" = 1'-0"

B INTAKE TOWER PLATFORM
PLAN @ EL 7032.5
SCALE: 1/2" = 1'-0"

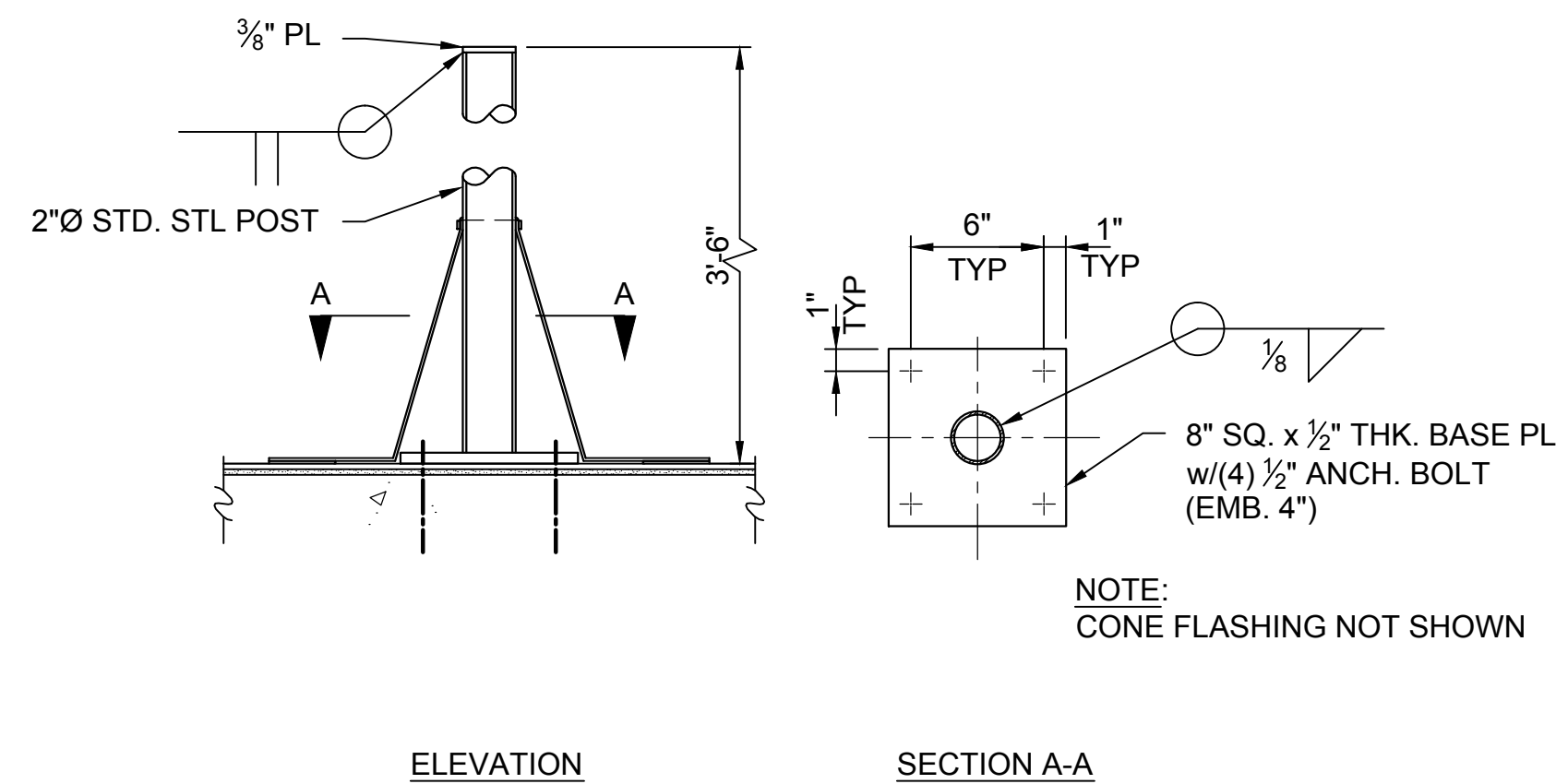
0" 1" 2"
BAR IS TWO INCHES ON ORIGINAL DRAWING.
IF NOT TWO INCHES ON THIS SHEET
ADJUST SCALES ACCORDINGLY

Cooper Zietz Engineers, Inc.		KLEINFELDER	
STRUCTURAL		REGISTERED PROFESSIONAL ENGINEER JULY 16, 1980 PAUL E. KLINERS EXPIRES 6/30/15	
DATE	11/22/2013	PROJECT NO.	128437
DRAWN BY	JM	CHECKED BY	PEK
DESIGNED BY	PEK	FILENAME	1117_T1_S-7.dwg
INTAKE TOWER PLANS		TSALE DAM MODIFICATION BUREAU OF INDIAN AFFAIRS NAVAJO REGIONAL SAFETY OF DAMS - ARIZONA	
SHEET		48 of 56	
S-7			

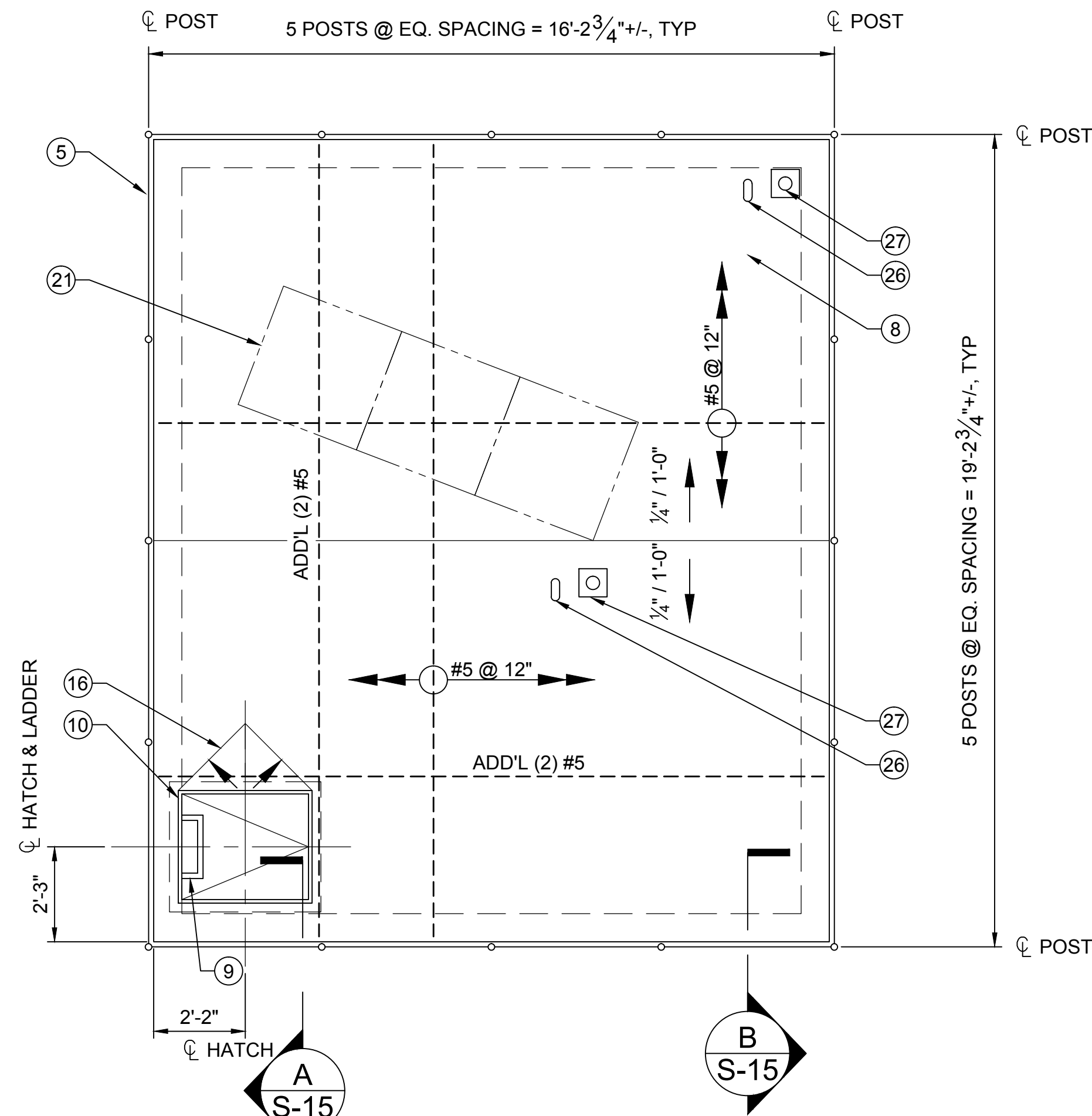
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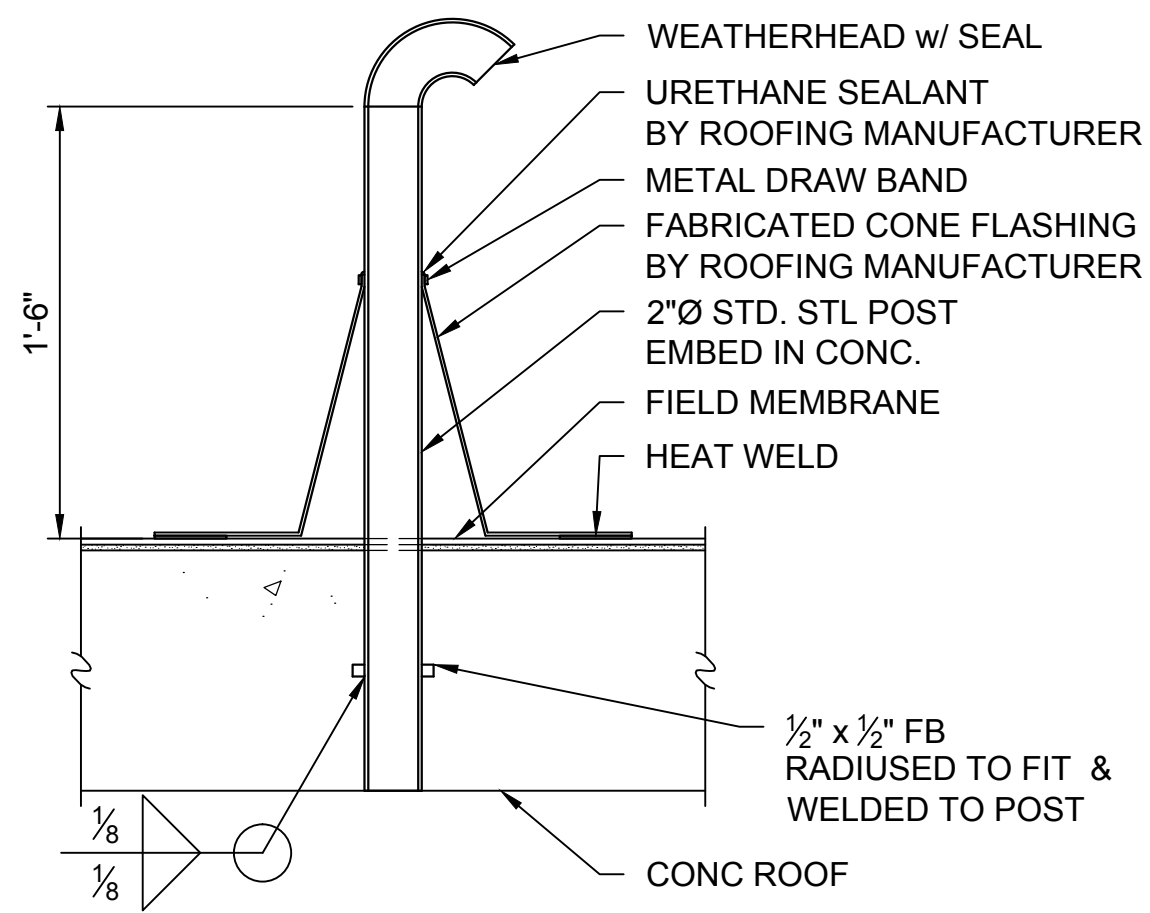
A S-6
CONTROL ROOM
FLOOR PLAN
SCALE: 3/8" = 1'-0"



1 S-8
TYPICAL
MOUNTING POLE
SCALE: 1 1/2" = 1'-0"



B S-6
CONTROL ROOM
ROOF PLAN
SCALE: 3/8" = 1'-0"



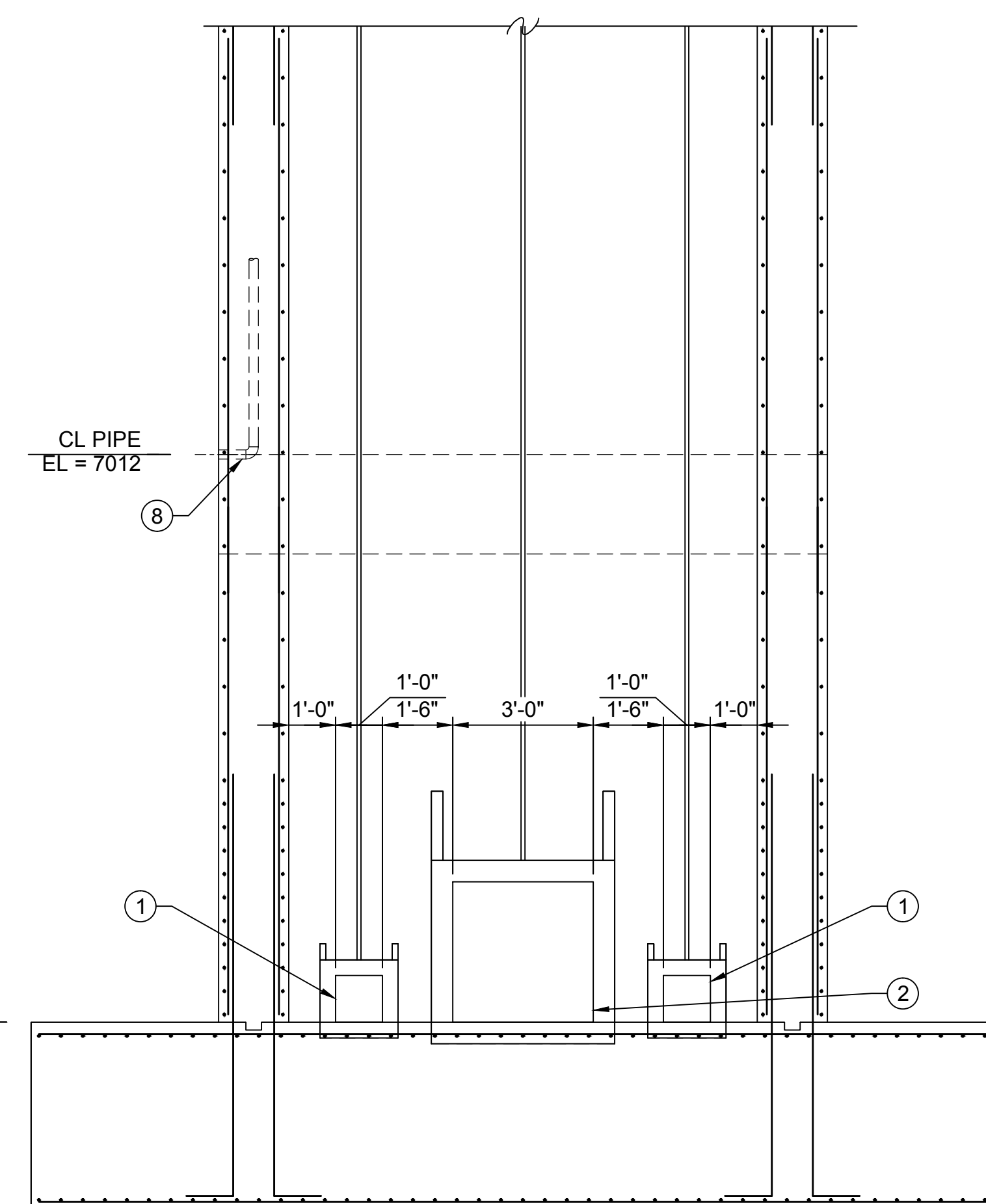
2 S-8
TYPICAL
ROOF CONDUIT
SCALE: 1 1/2" = 1'-0"

KEYNOTES:

- 8" CONC. CONTROL ROOM WALL w/#5 @ 12" EW CTRD IN WALL
- 1'-6" x 1'-6" HINGED GRATING SECTIONS FOR 6'-0" FLOOR OP'NG w/STEEL GRATING 1 1/2" x 3/16" (19-4 PATTERN) PLAIN SURFACE (→ INDICATES SPAN DIRECTION)
- CORBELS FOR PLATFORM SUPPORT
- CORBELS FOR PLATFORM / BRIDGE SUPPORT
- SECURITY FENCE AT PERIMETER OF ROOF, SEE DETAIL (2 S-2)
- 1'-6" x 5'-0" ACCESS HATCH IN PLATFORM w/1/2" DIAMOND PLATE COVER
- 3'-0" x 3'-0" ACCESS HATCH w/ COVER
- 8" MIN. CONC. ROOF (→ DENOTES DIRECTION OF SLOPE)
- FIXED LADDER w/ SAF-T-CLIMB DEVICE
- 3'-0" x 3'-6" ACCESS HATCH w/INTERIOR LOCK (BILCO TYPE "SS-50C" w/ INTERIOR DEADBOLT, OR APPROVED EQUAL)
- 1'-6" x 1'-6" SECTIONS FOR 3'-0" OP'NG w/STEEL GRATING 1 1/2" x 3/16" (19-4 PATTERN) PLAIN SURFACE (→ INDICATES SPAN DIRECTION)
- 4'-0"W x 6'-8"H SECURITY DOOR
- FLOOR SLAB REINF. #6 @ 12" EW, T&B, ADD'L #6 @ EDGES OF EA. OP'NG. EXTEND 2' BEYOND CORNERS
- ADD'L (3) #6 T&B
- (2) #6 CONT. @ SLAB PERIMETER, HOOK @ CORNERS
- BUILT UP CRICKET @ ROOF HATCH. SLOPE 1/4" / 1'-0" MINIMUM
- FIXED METAL LOUVER, TYP. SEE DETAIL (5 S-12)
- HOOKS FOR FALL PROTECTION, LOCATE IN FIELD
- INSTALL LIFTING EYE IN CEILING ABOVE, COORDINATE LOCATIONS w/ COR SEE (3 S-4)
- STEEL BENCH 2'-0" x 6'-0" FOR HYD. PUMPS.
- SOLAR PANEL SYSTEM, COORDINATE LOCATION w/ COR.
- BRIDGE SUPPORT BEAM
- OUTLET FOR 2"Ø HDPE FOR FUTURE WSE PRESSURE TRANSDUCER
- OUTLET FOR 6"Ø HDPE PIPE FOR FUTURE FLOAT SWITCHES
- WALL PENETRATION FOR 2"Ø CONDUIT
- ROOF PENETRATION FOR CONDUIT, SEE DETAIL (2 S-8)
- MOUNTING POLE, SEE DETAIL (1 S-8)

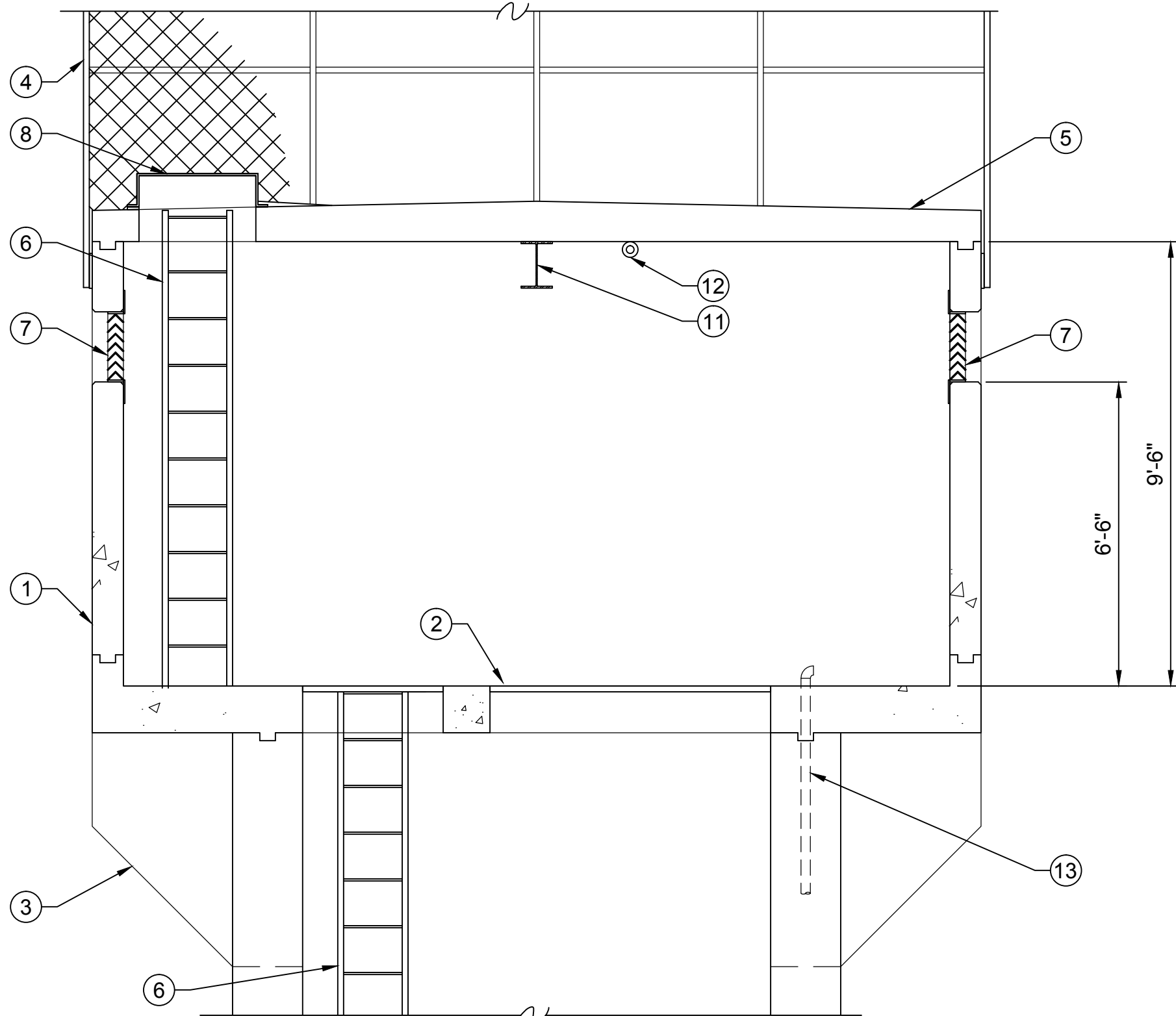
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BAR IS TWO INCHES ON ORIGINAL DRAWING.
IF NOT TWO INCHES ON THIS SHEET
ADJUST SCALES ACCORDINGLY

DATE	PROJECT NO.	DRAWN BY	CHECKED BY	DESIGNED BY	FILENAME	REVISIONS
11/22/2013	128437	JM	PEK	PEK	1117_T1_S-8.dwg	
						1 TEMPORARY ROAD REALIGNMENT
						2
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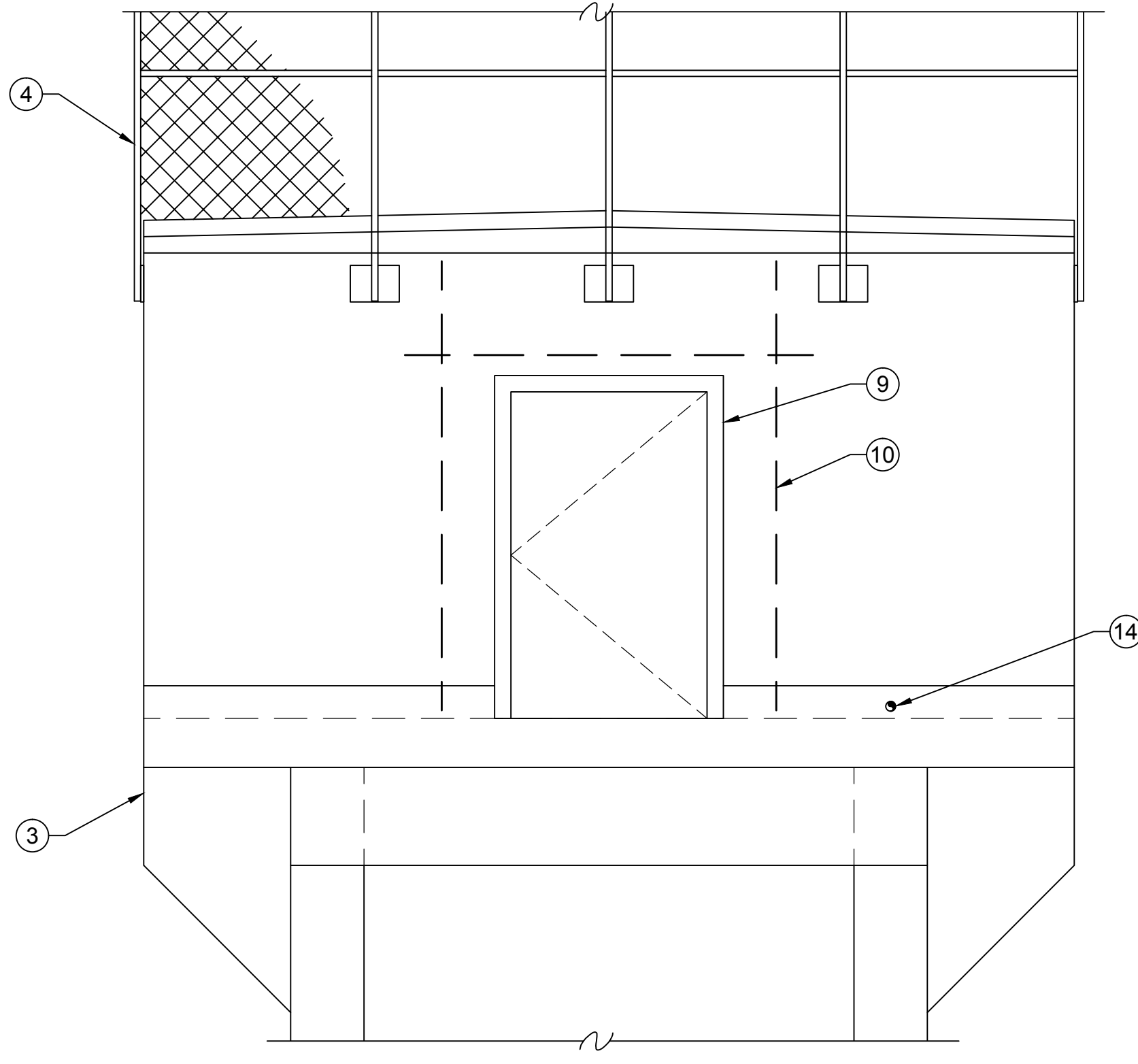


- 0" 1" 2"
- BAR IS TWO INCHES ON ORIGINAL DRAWING,
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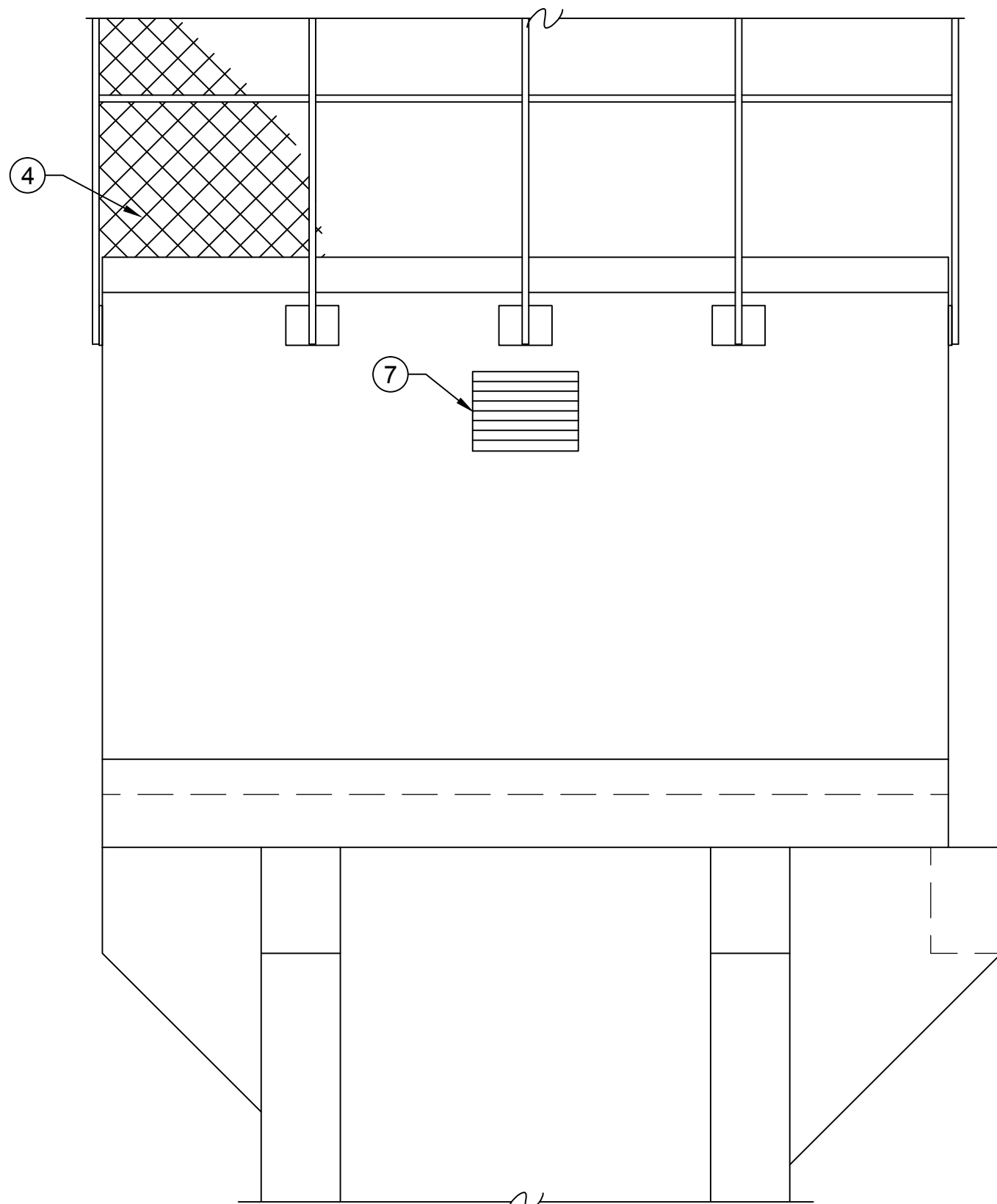
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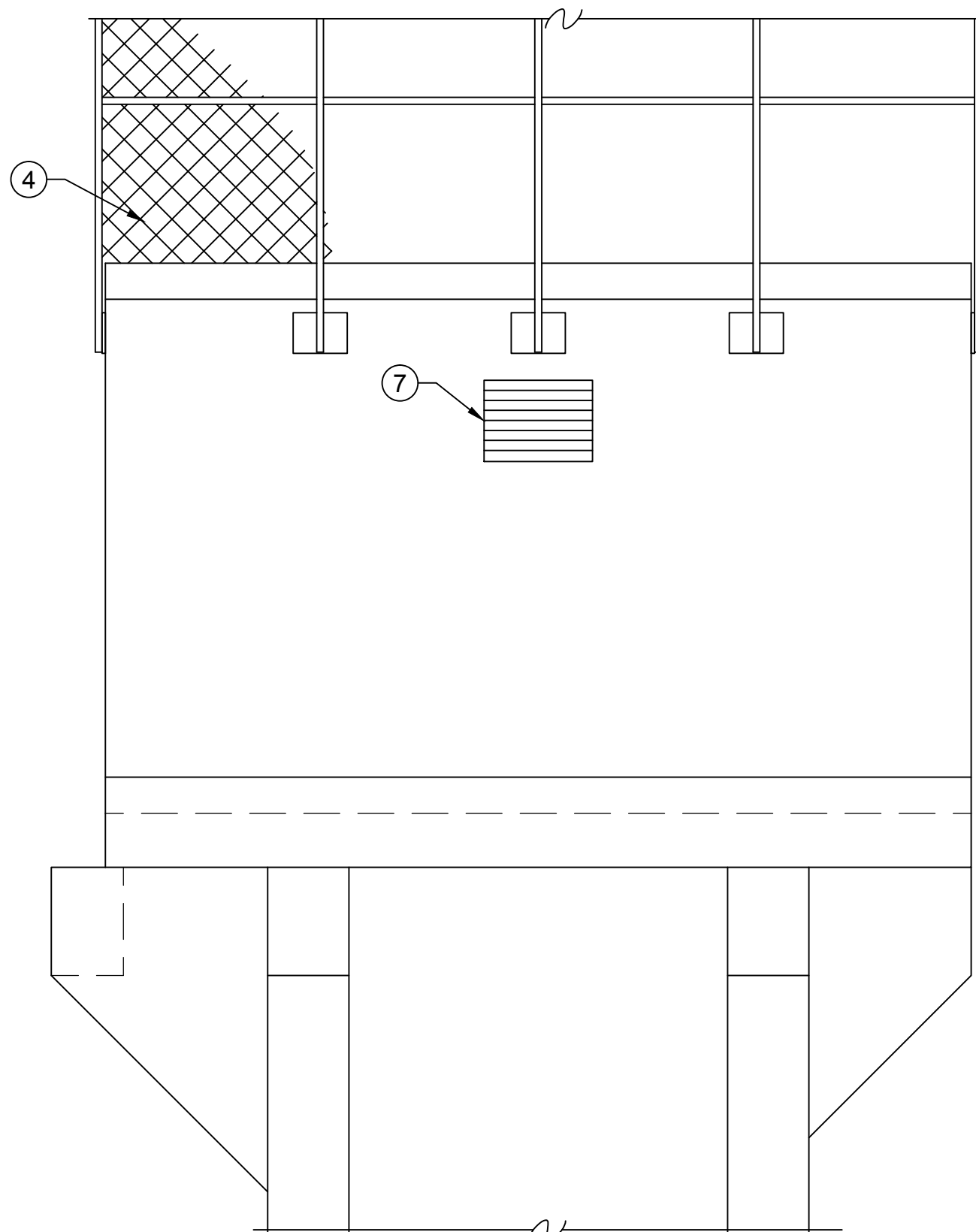
A
S-8
CONTROL ROOM
SECTION - LOOKING EAST
SCALE: 3/8" = 1'-0"



B
S-8
CONTROL ROOM
WEST ELEVATION
SCALE: 3/8" = 1'-0"



C
S-8
CONTROL ROOM
NORTH ELEVATION
SCALE: 3/8" = 1'-0"



D
S-8
CONTROL ROOM
SOUTH ELEVATION
SCALE: 3/8" = 1'-0"

GENERAL NOTES:

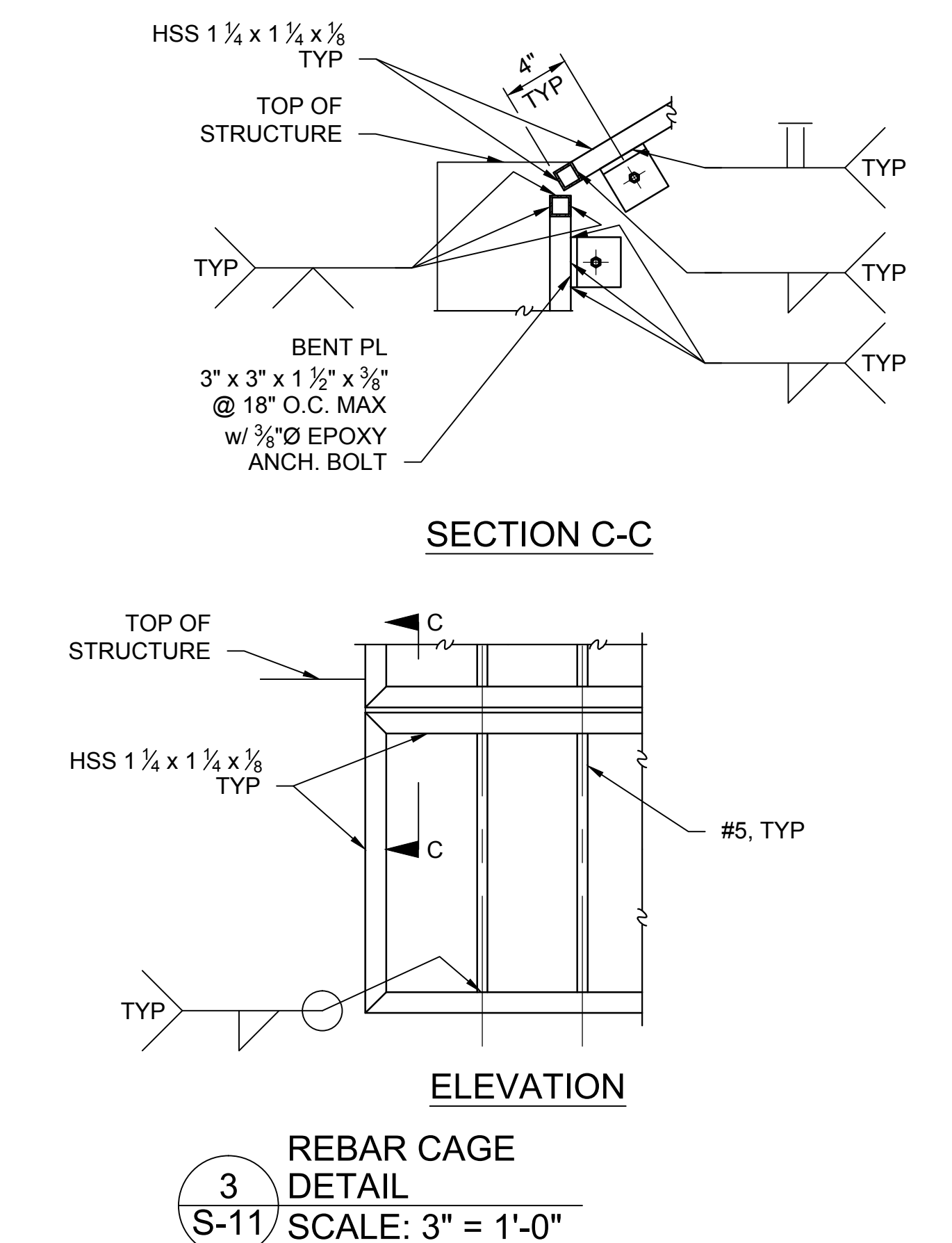
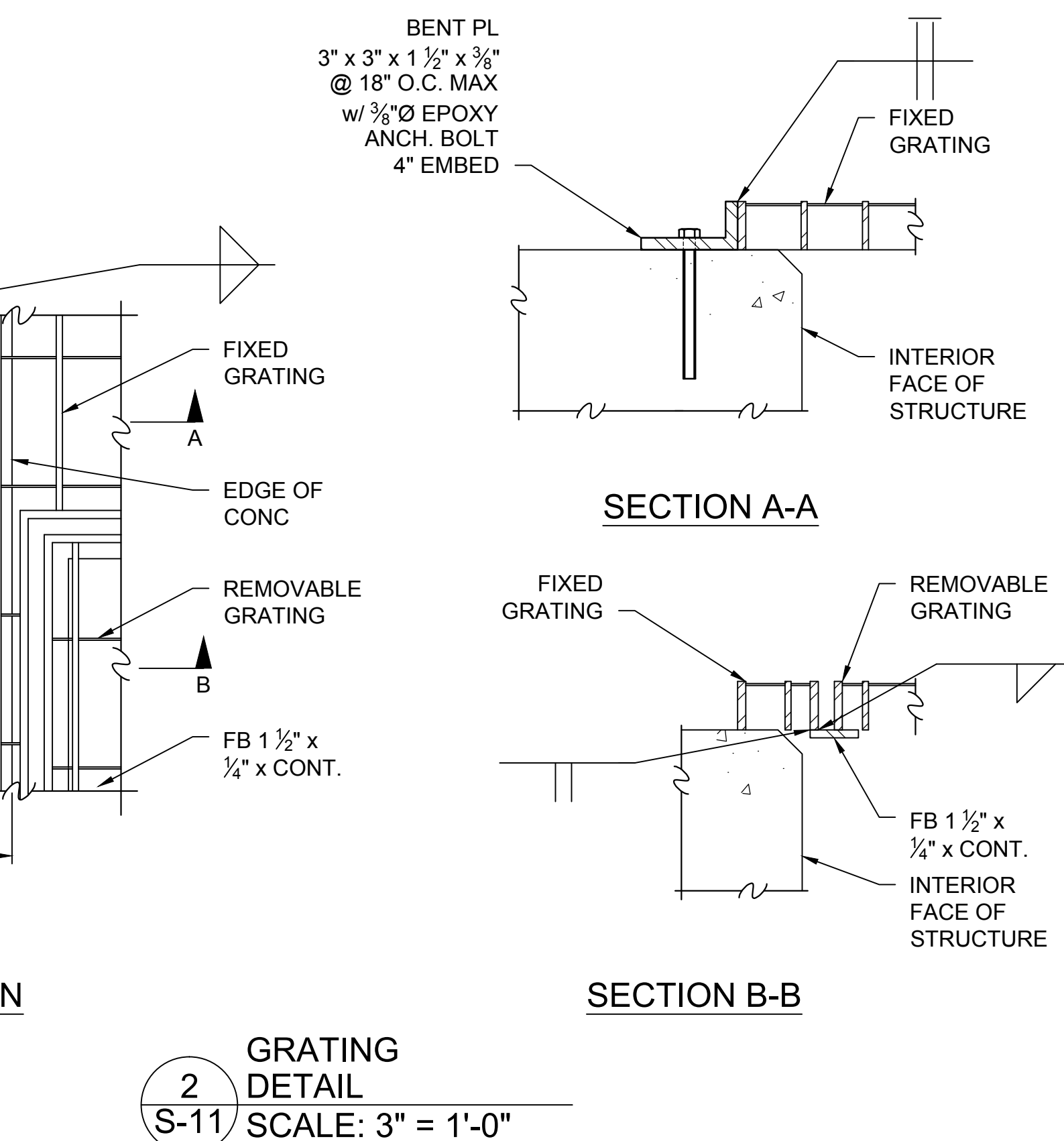
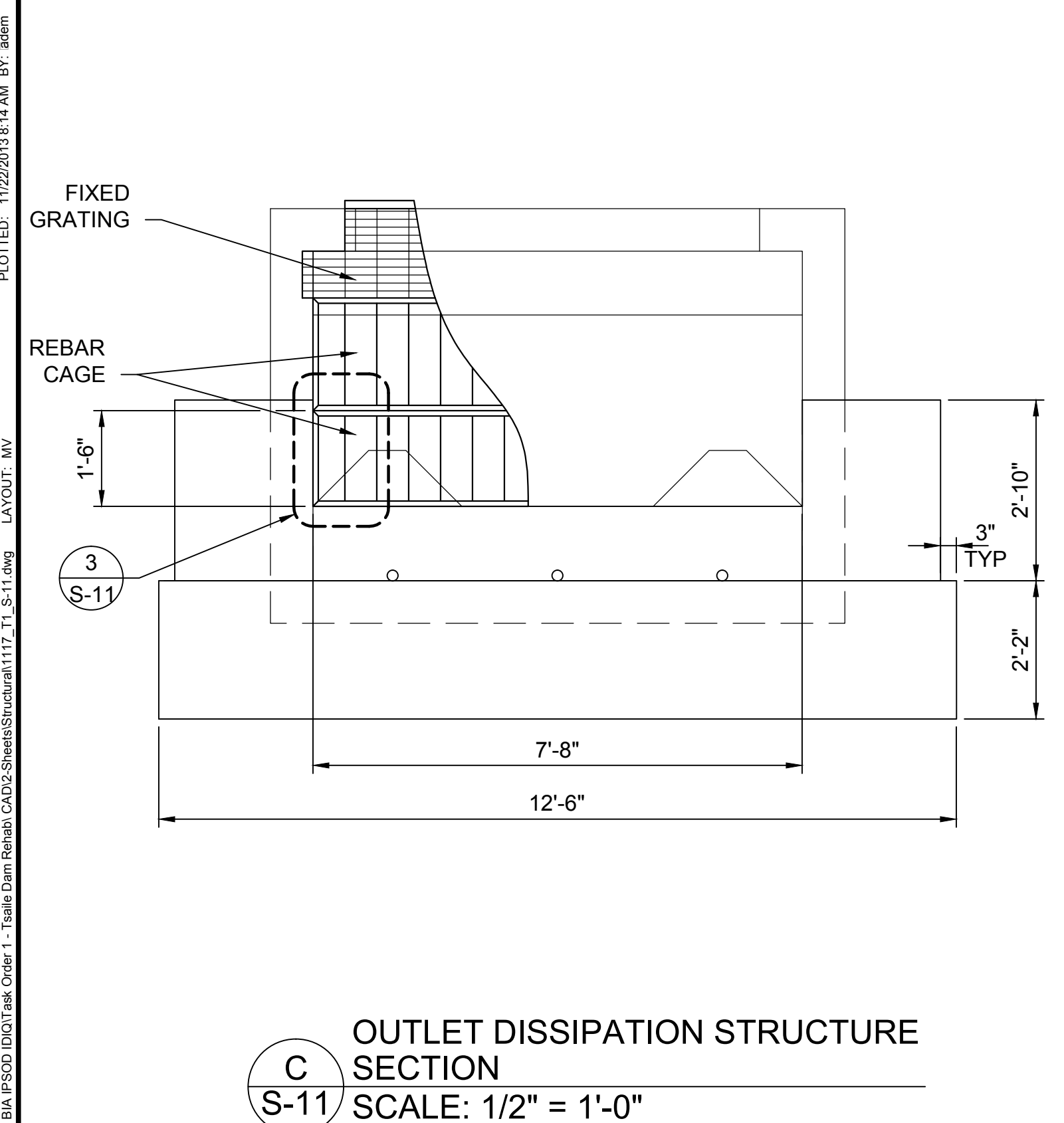
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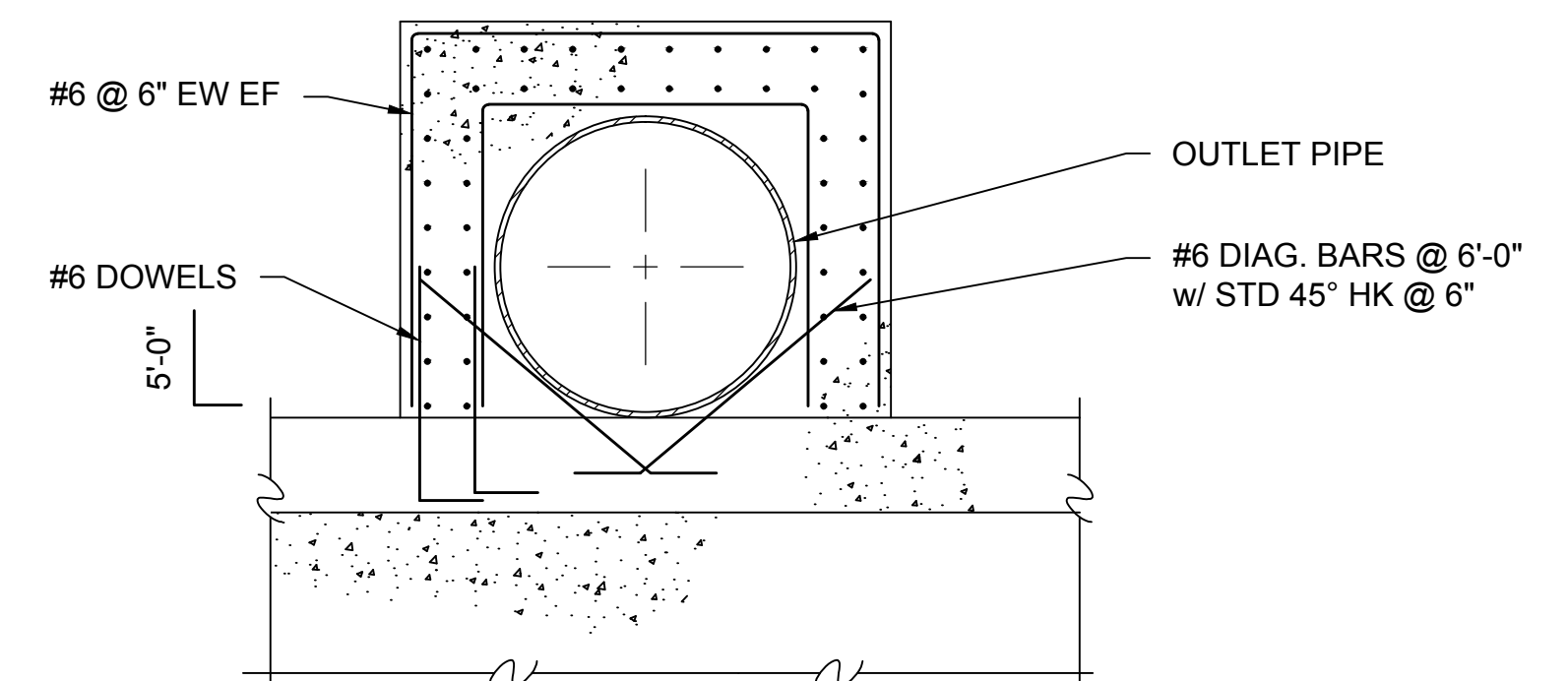
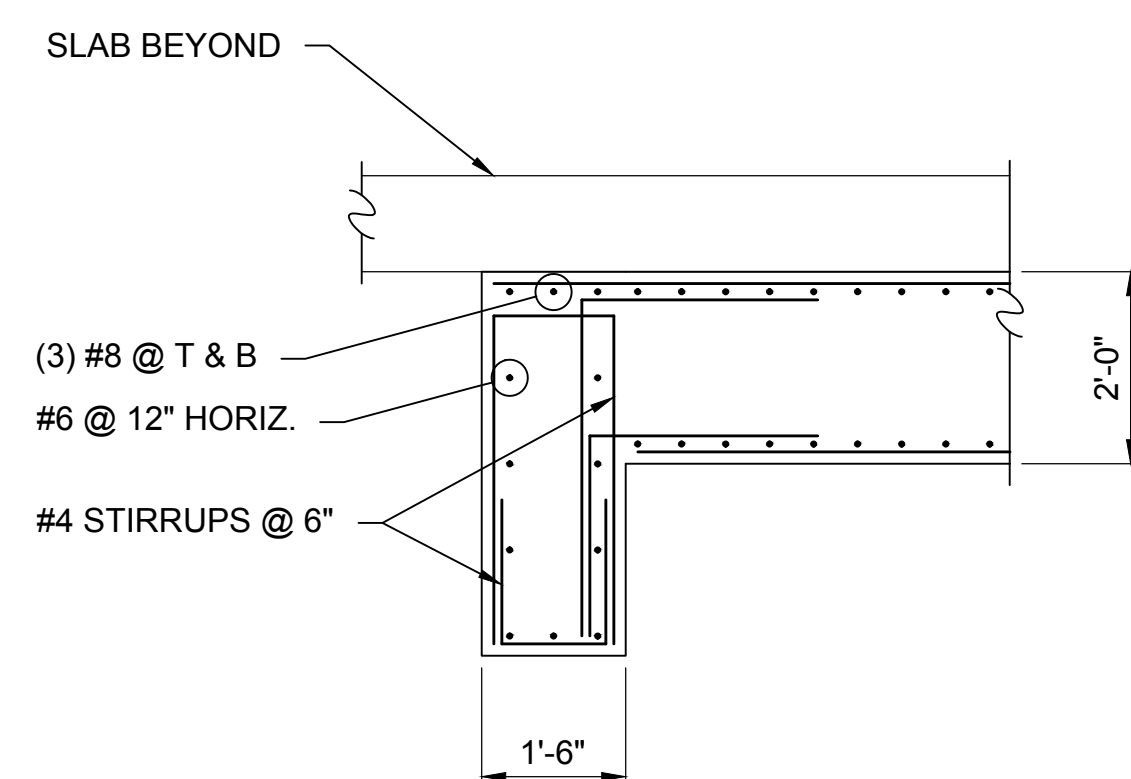
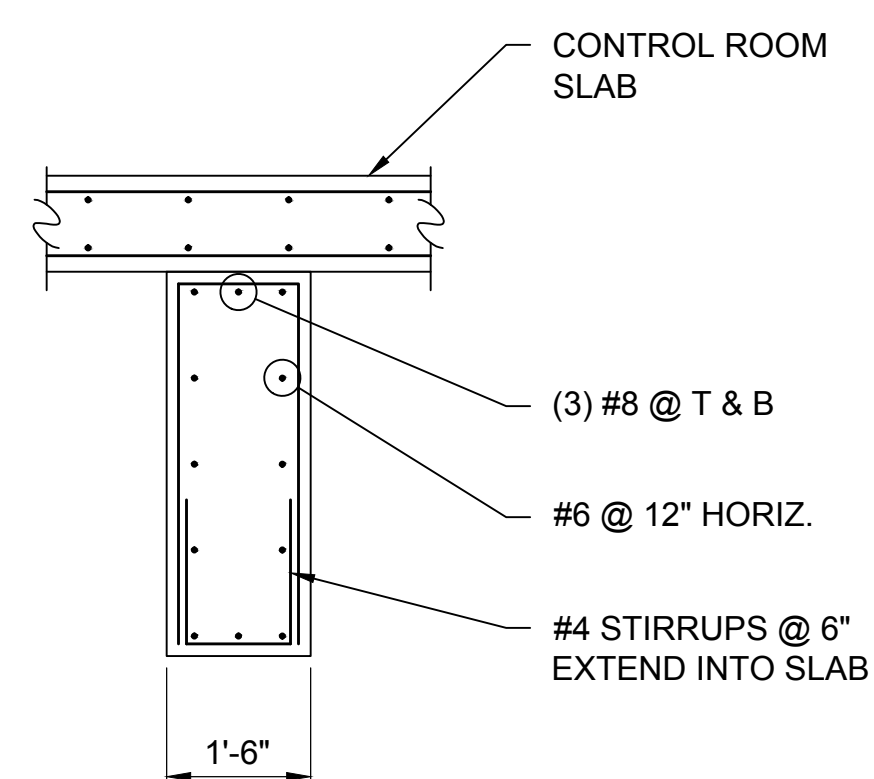
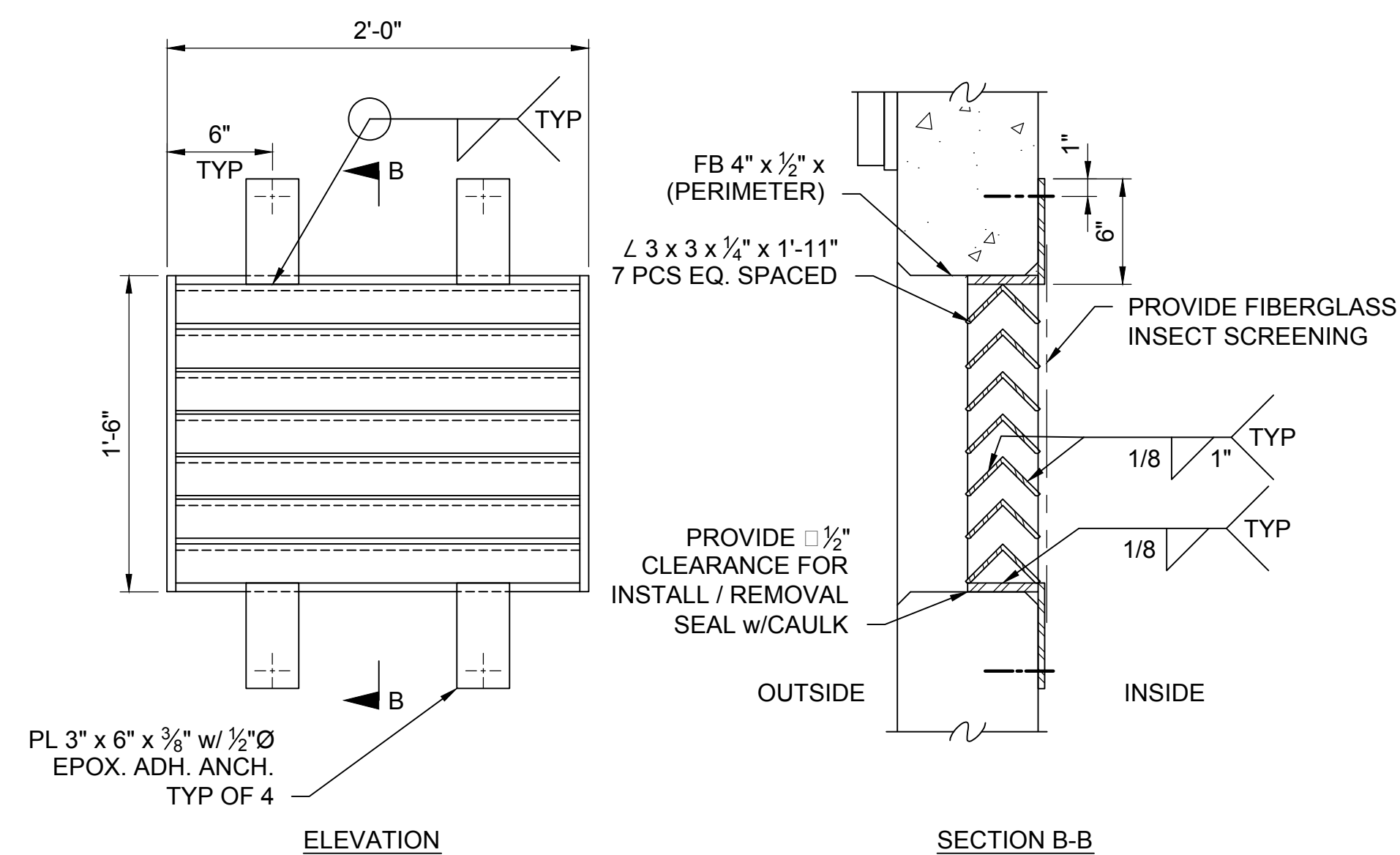
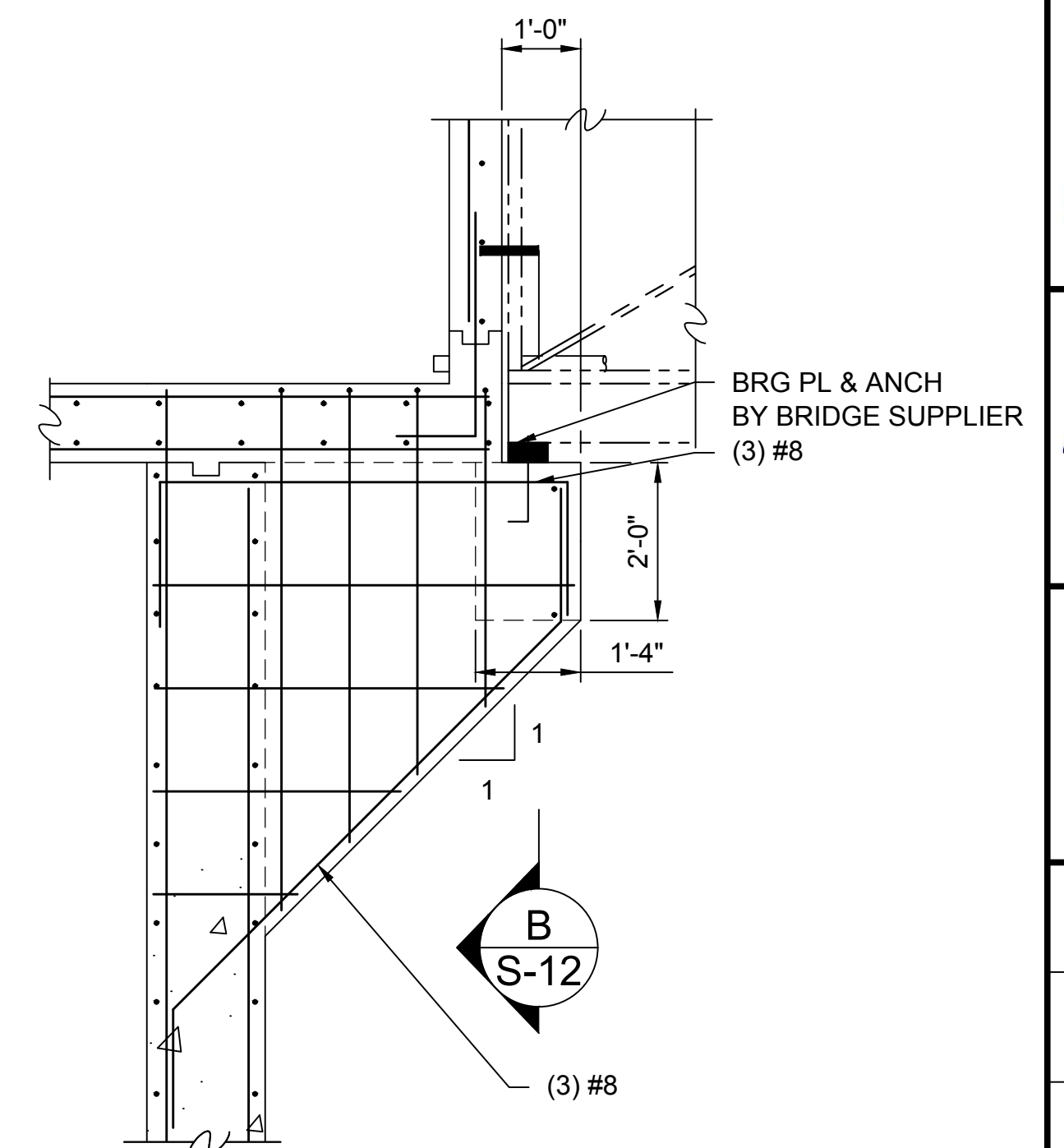
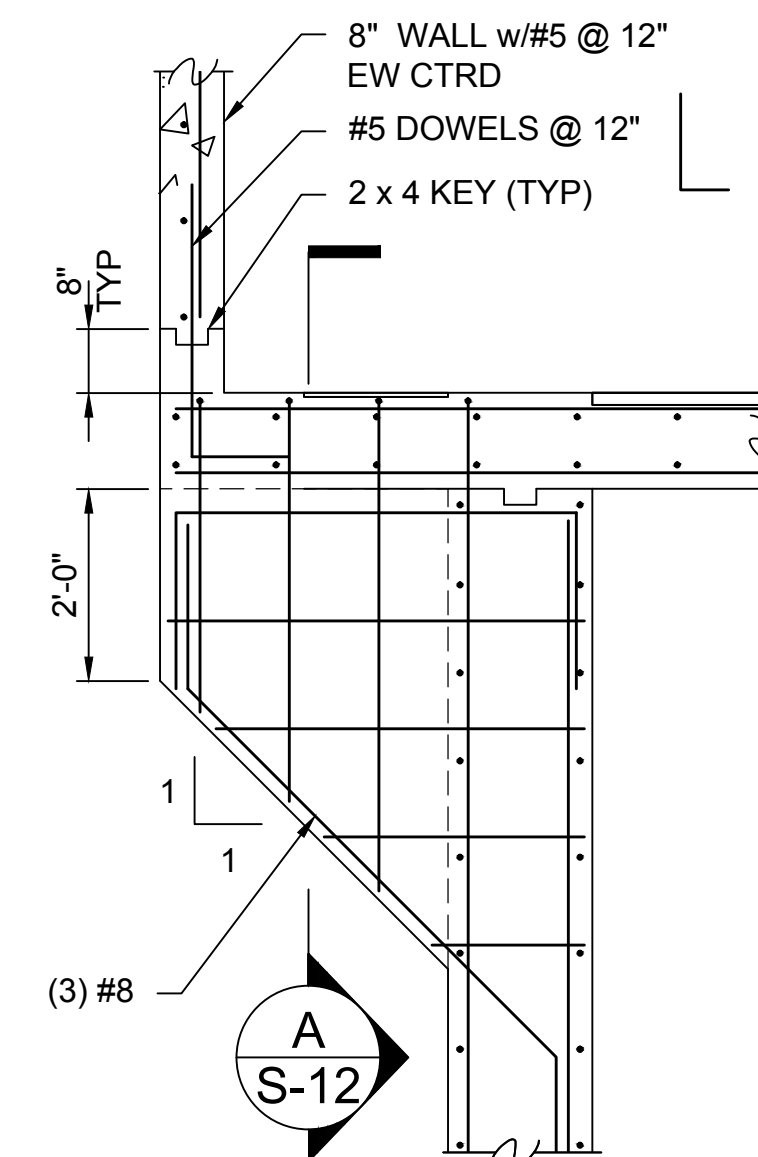
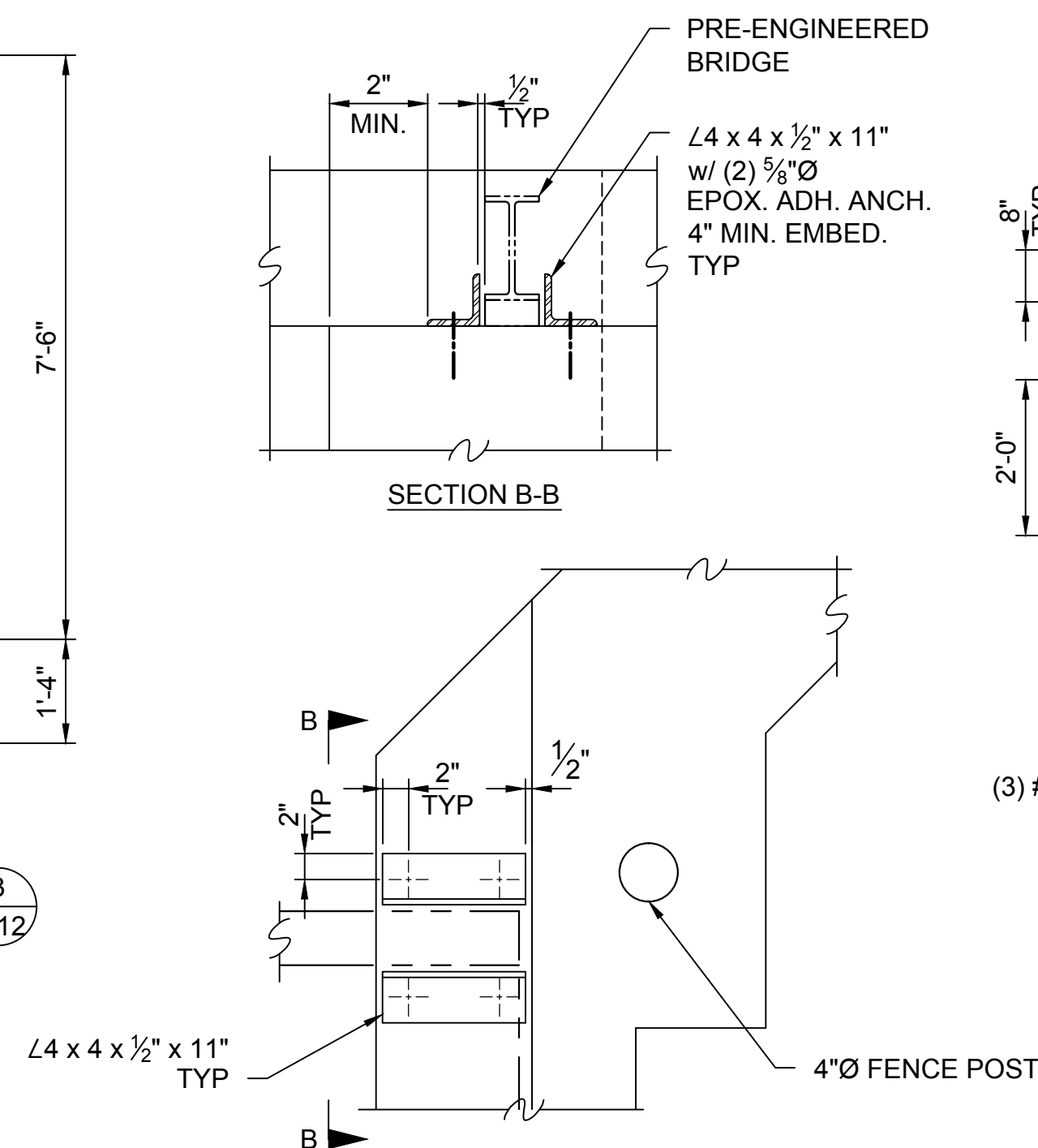
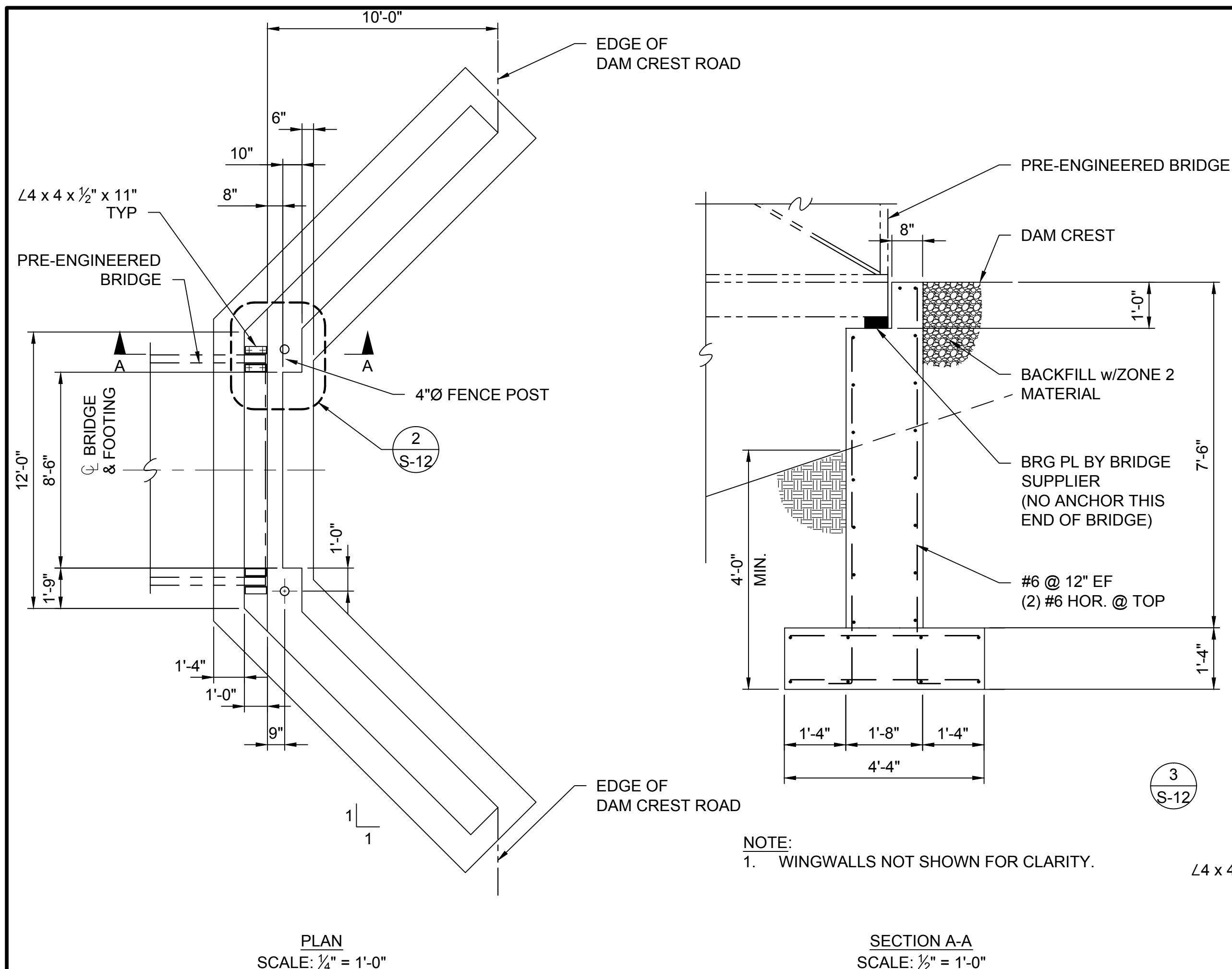
KEYNOTES:

- ① 8" CONC. CONTROL ROOM WALL
② 1'-6" x 6'-0" FLOOR OP'NG
③ CORBELS FOR PLATFORM SUPPORT
④ 6'-0" SECURITY FENCE
⑤ 8" MIN. CONC. ROOF
⑥ FIXED LADDER w/ SAF-T-CLIMB DEVICE
⑦ FIXED METAL LOUVER, 1'-6"H x 2'-0"W SEE DETAIL ⑤ S-12
⑧ ROOF HATCH
⑨ 4'-0"W x 6'-8"H SECURITY DOOR
⑩ PROVIDE ADD'L (2) #5 @ SIDES & TOP OF OP'NGS. EXTEND 2'-0" BEYOND CORNERS
⑪ HOIST BEAM S12 x 31.8 FOR HOIST w/ 2 -TON LIFTING CAPACITY. BEAM TO BE CENTERED OVER DOORWAY. SEE DETAIL ① S-13
⑫ LIFTING EYE, COORDINATE LOCATIONS w/COR, SEE DETAIL ③ S-4
⑬ 2"Ø EMBEDDED HDPE PIPE FOR FUTURE WSE PRESSURE TRANSDUCER
⑭ 2"Ø GALVANIZED CONDUIT FROM DAM CREST

0" 1" 2"
BAR IS TWO INCHES ON ORIGINAL DRAWING.
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Cooper Zietz Engineers, Inc.		KLEINFELDER Professional Engineers Oregon	
STRUCTURAL REGISTERED PROFESSIONAL ENGINEER PAUL E. KLEINFELDER JULY 16, 1980 EXPIRES 6/30/15			
DATE	11/22/2013	PROJECT NO.	128437
DRAWN BY	JM	CHECKED BY	PEK
DESIGNED BY	PEK	FILENAME	1117_T1_S-10.dwg
CONTROL ROOM SECTIONS & ELEVATIONS		TSALLE DAM MODIFICATION BUREAU OF INDIAN AFFAIRS NAVAJO REGIONAL SAFETY OF DAMS - ARIZONA	
SHEET		51 of 56	
S-10			

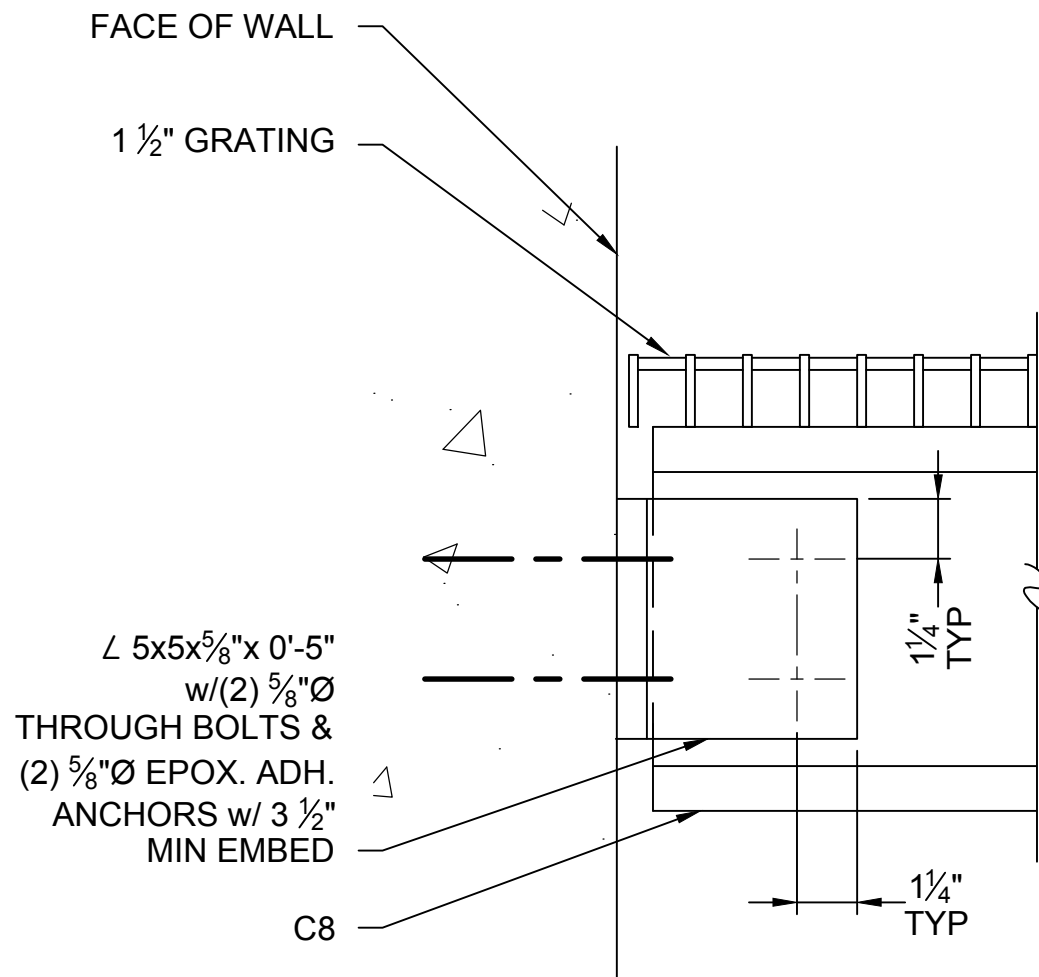




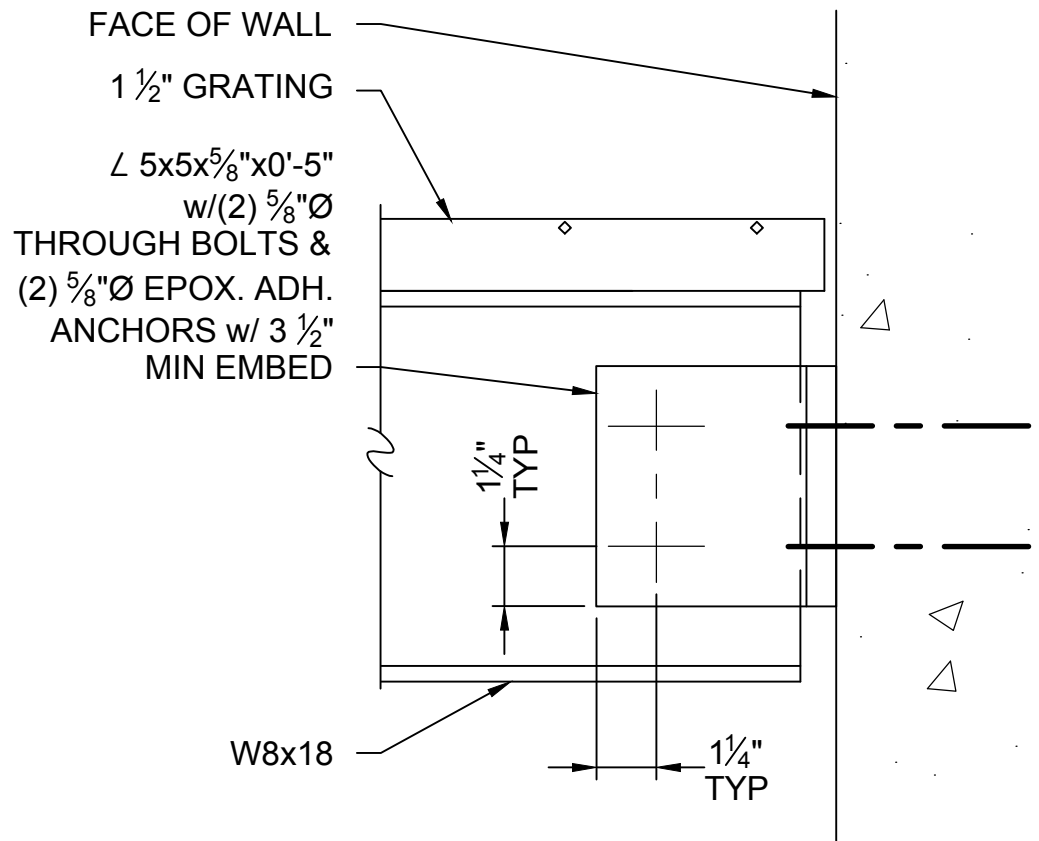
DATE	PROJECT NO.	DRAWN BY	CHECKED BY	NO.	DESCRIPTION	BY	DATE
11-22-2013	128437	JMI	PEK	1	TEMPORARY ROAD REALIGNMENT	CZ / KLF	11-22-2013

S-12

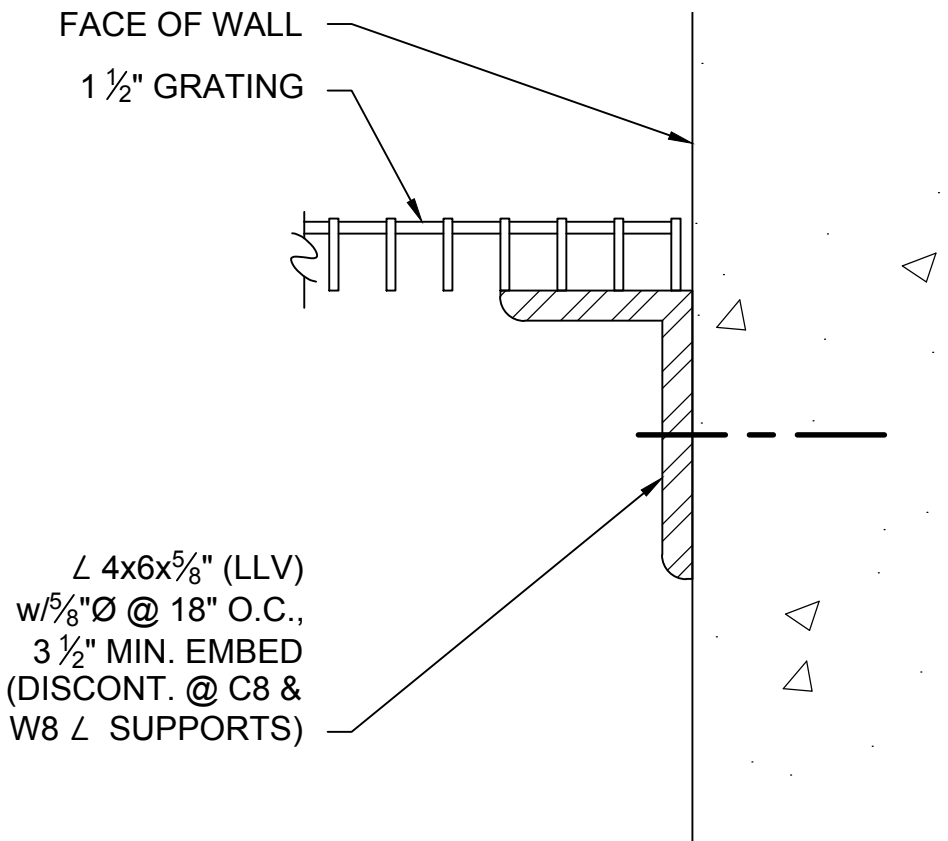
53 of 56	DETAILS	TSALE DAM MODIFICATION BUREAU OF INDIAN AFFAIRS NAVAJO REGIONAL SAFETY OF DAMS - ARIZONA
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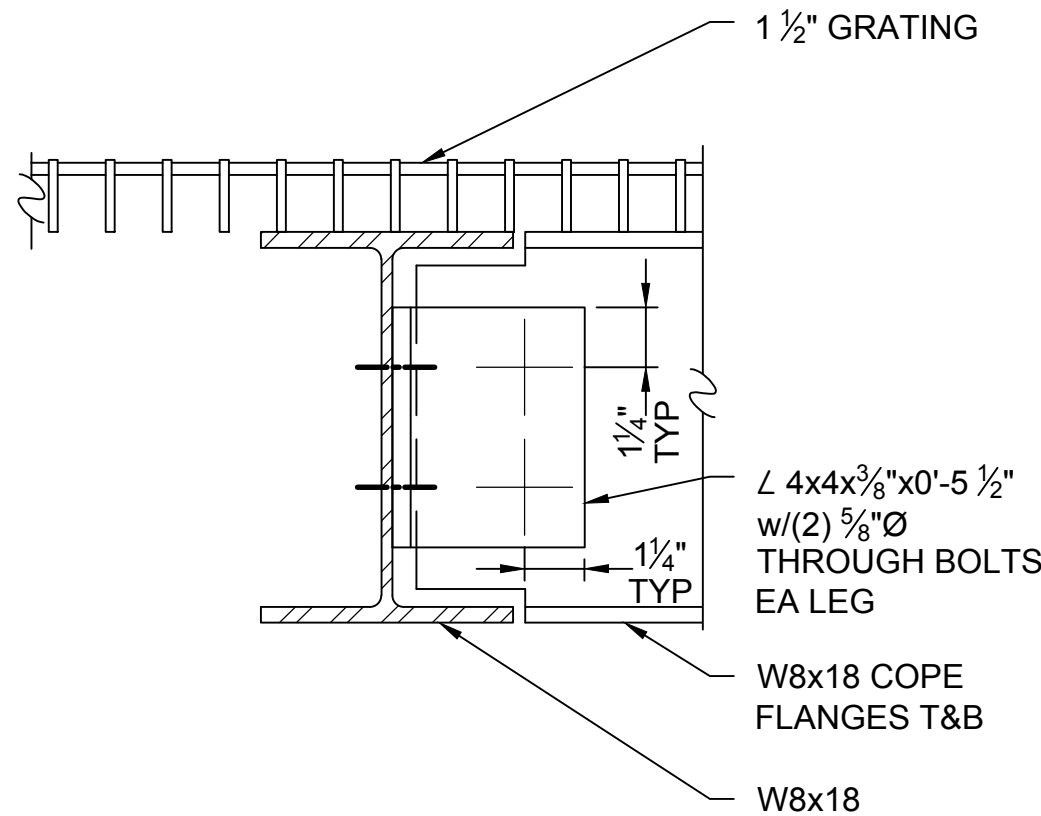
A
C8/WALL
CONNECTION
SECTION
SCALE: 3" = 1'-0"



B
W8/WALL
CONNECTION
SECTION
SCALE: 3" = 1'-0"

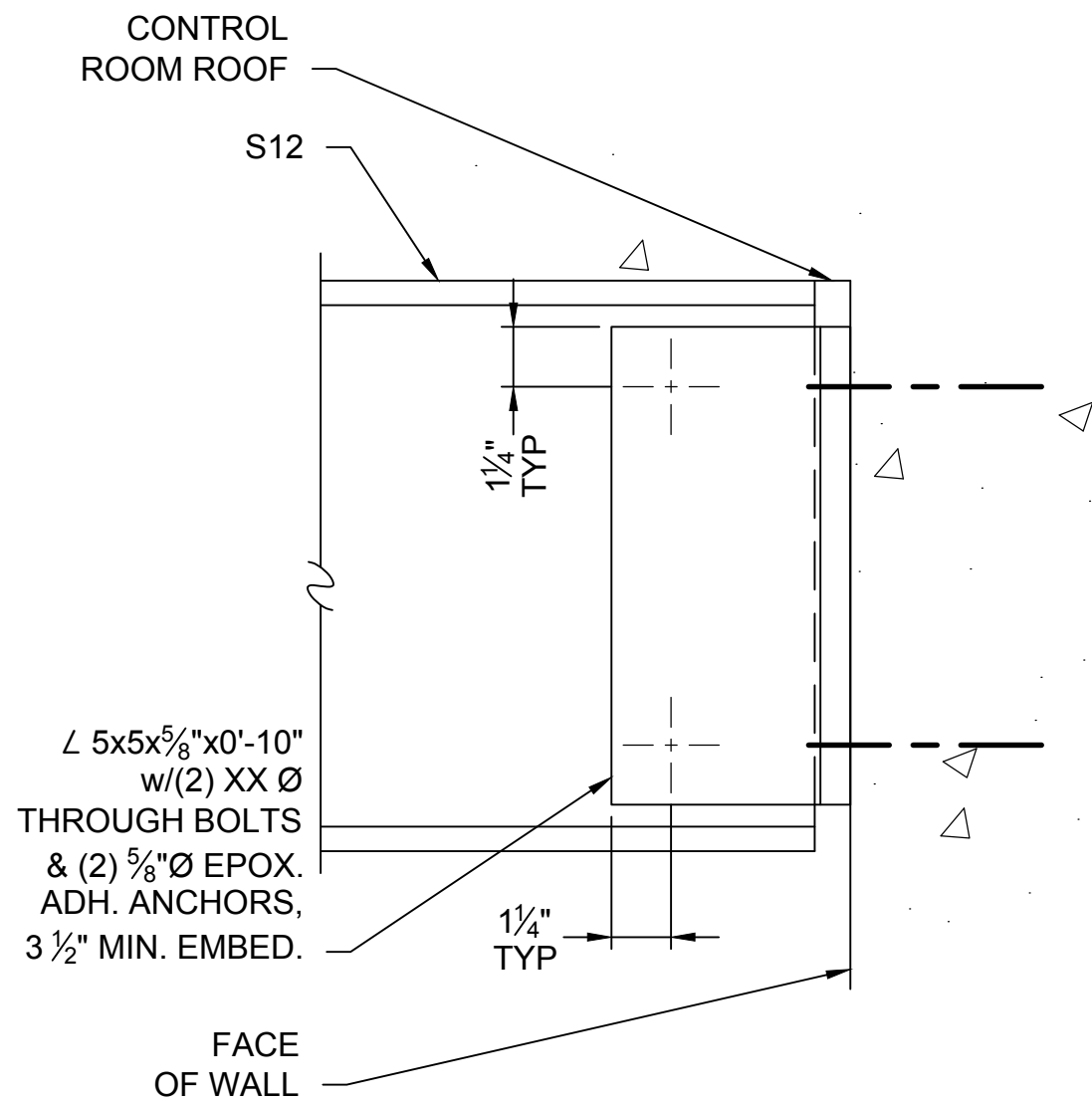


C
GRATING SUPPORT/WALL
CONNECTION
SECTION
SCALE: 3" = 1'-0"



NOTE:
1. C8/W8 CONNECTION @ SIM.

D
W8 / W8 CONNECTION
SECTION
SCALE: 3" = 1'-0"



1
HOIST BEAM / WALL CONNECTION
DETAIL
SCALE: 3" = 1'-0"

0" 1" 2"
BAR IS TWO INCHES ON ORIGINAL DRAWING.
IF NOT TWO INCHES ON THIS SHEET
ADJUST SCALES ACCORDINGLY

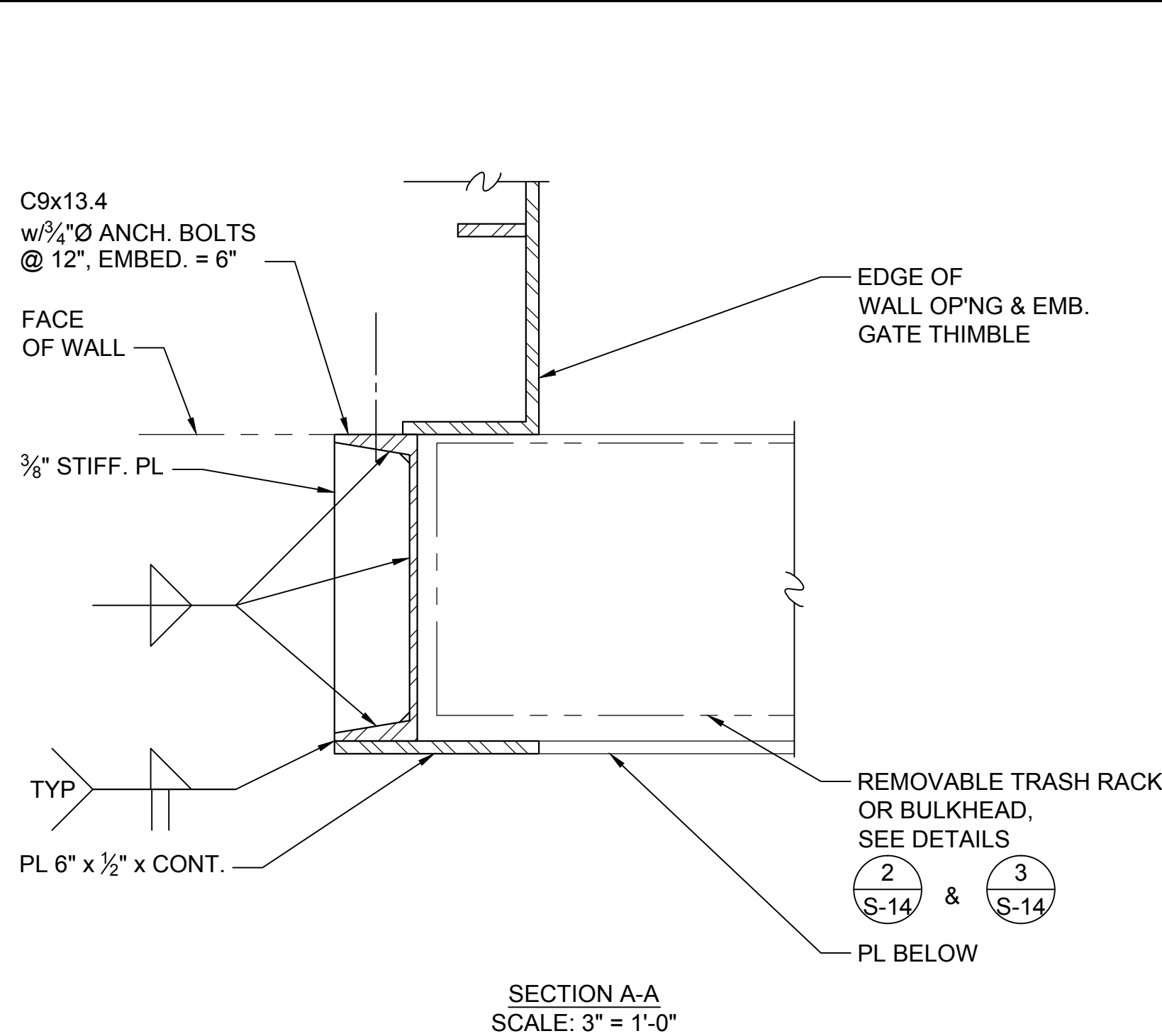
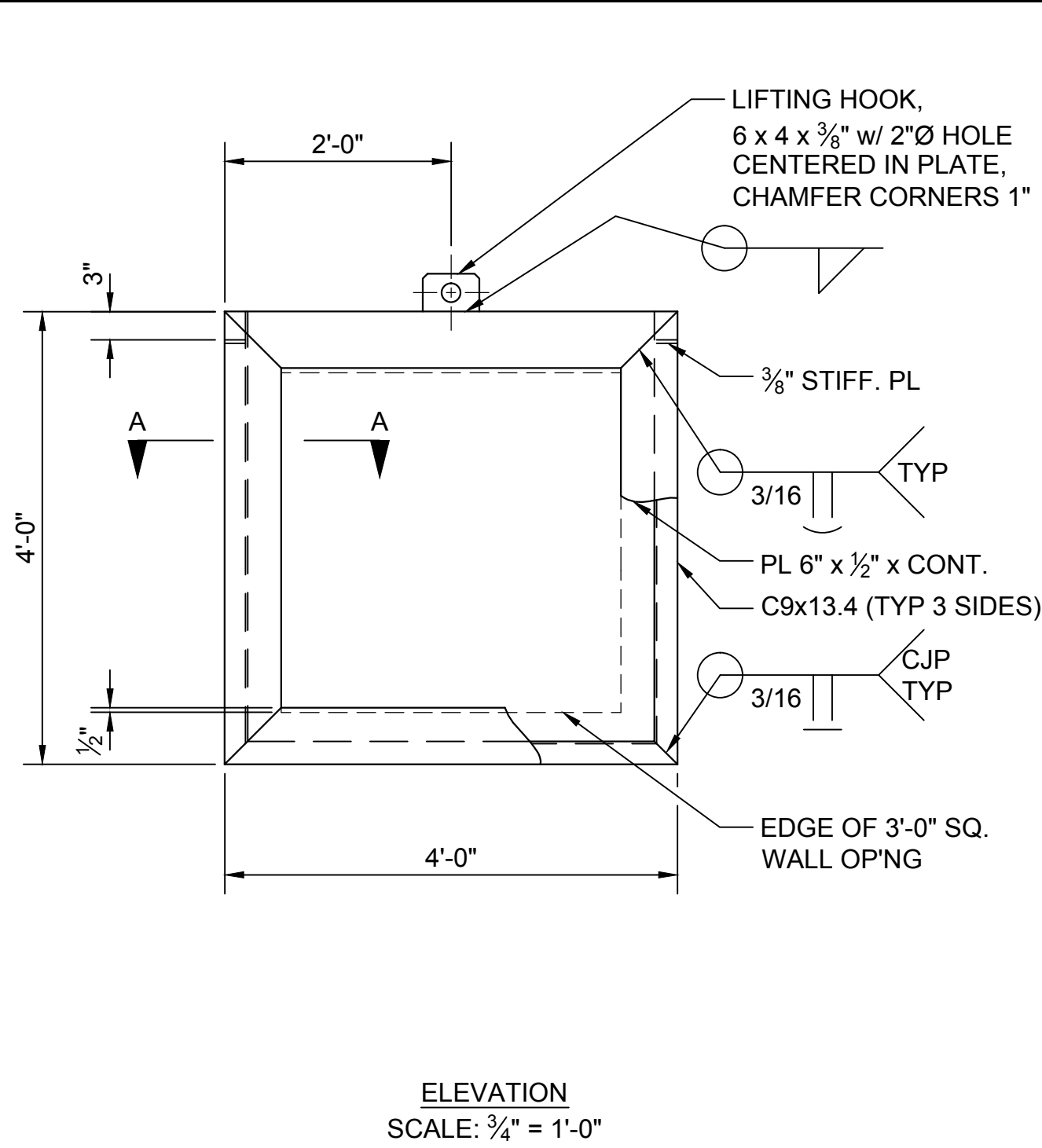
Cooper Zietz Engineers, Inc.

DATE	11/22/2013	PROJECT NO.	128437	DRAWN BY	JM	CHECKED BY	PEK	DESIGNED BY	PEK	FILENAME	1117_T1_S-13.dwg							
DETAILS TSALE DAM MODIFICATION BUREAU OF INDIAN AFFAIRS NAVAJO REGIONAL SAFETY OF DAMS - ARIZONA																		
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NO.	DESCRIPTION	BY	DATE															
1	TEMPORARY ROAD REALIGNMENT	CZ / KLF	11-22-2013															

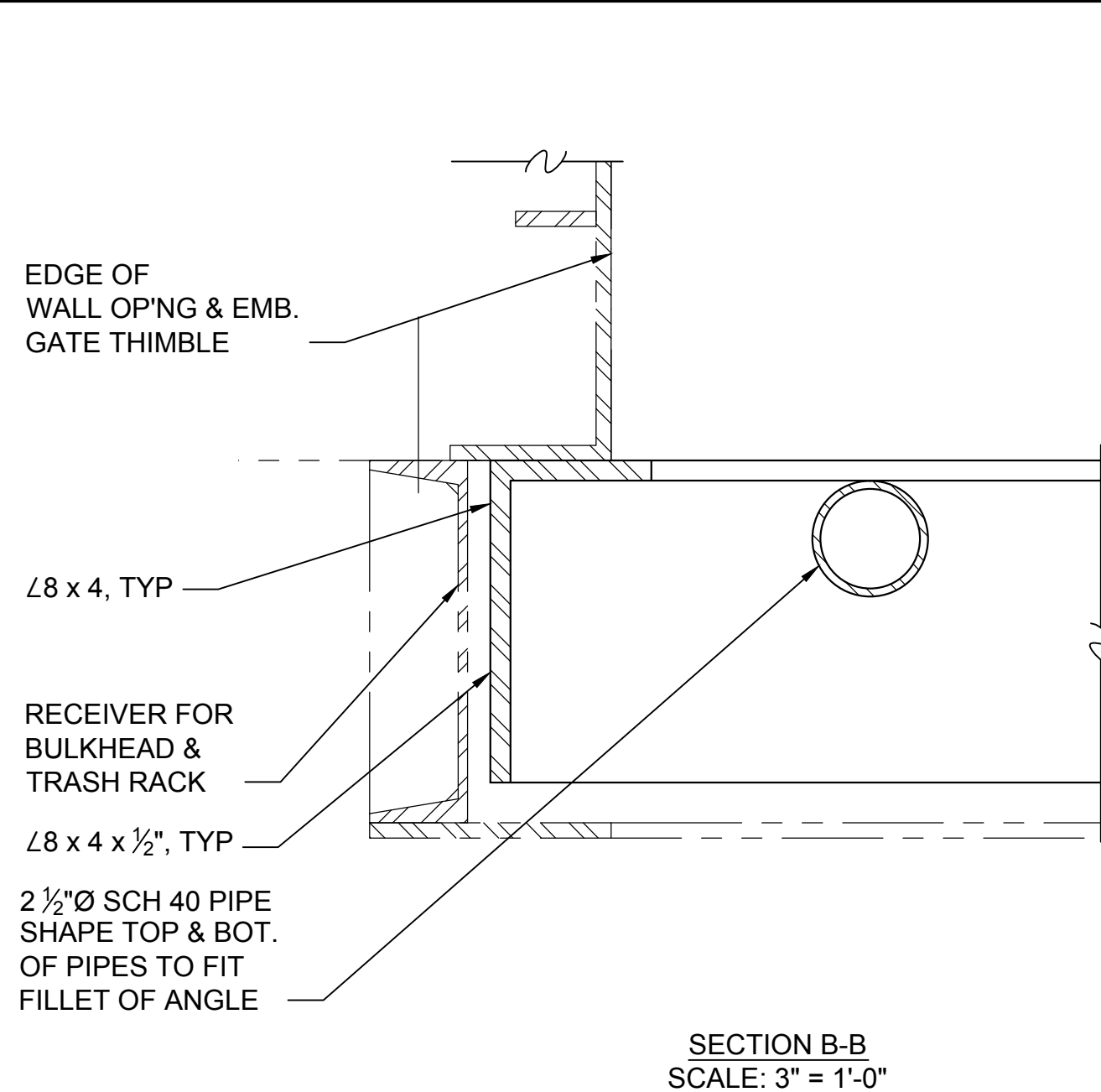
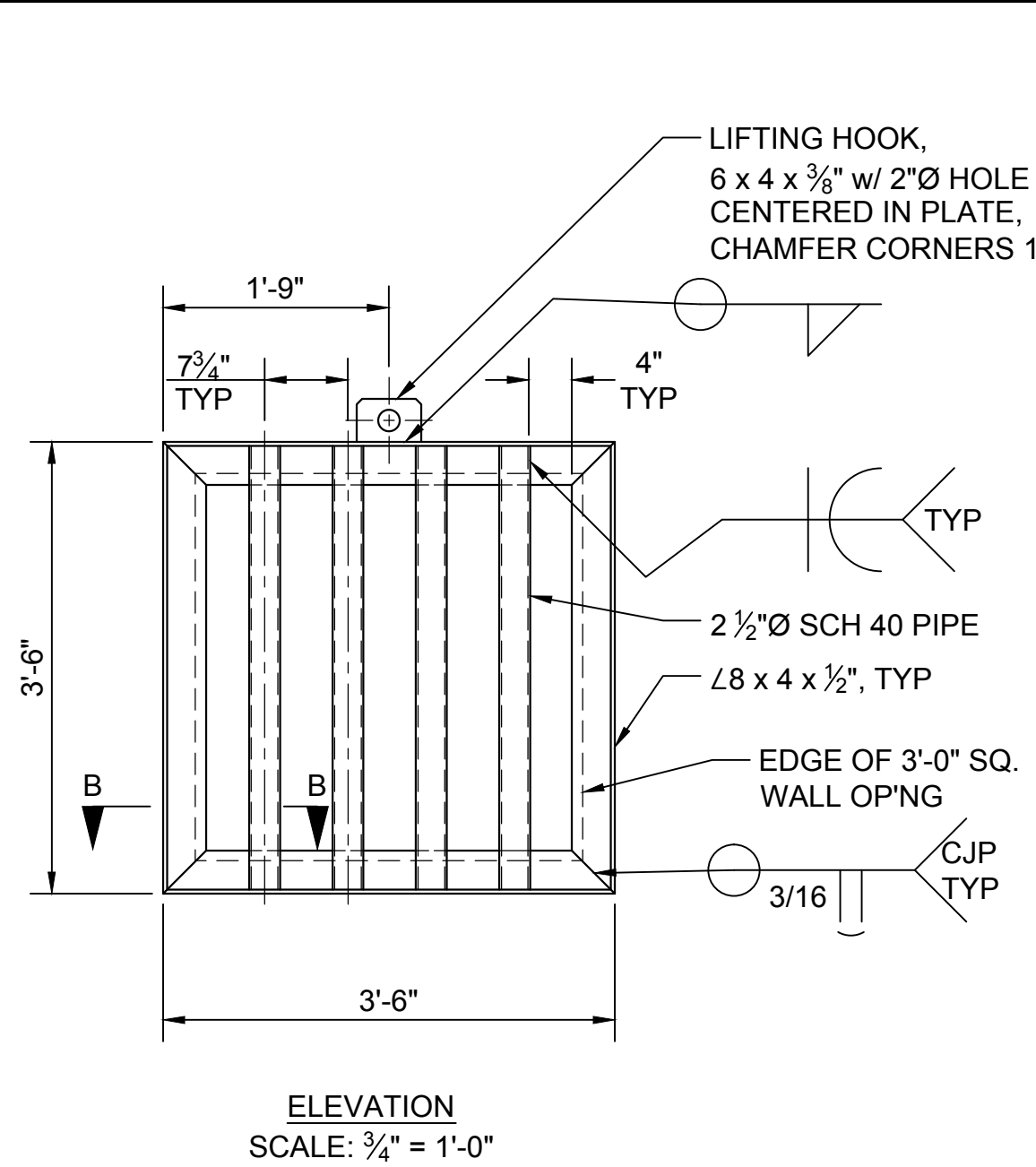
SHEET

54 of 56

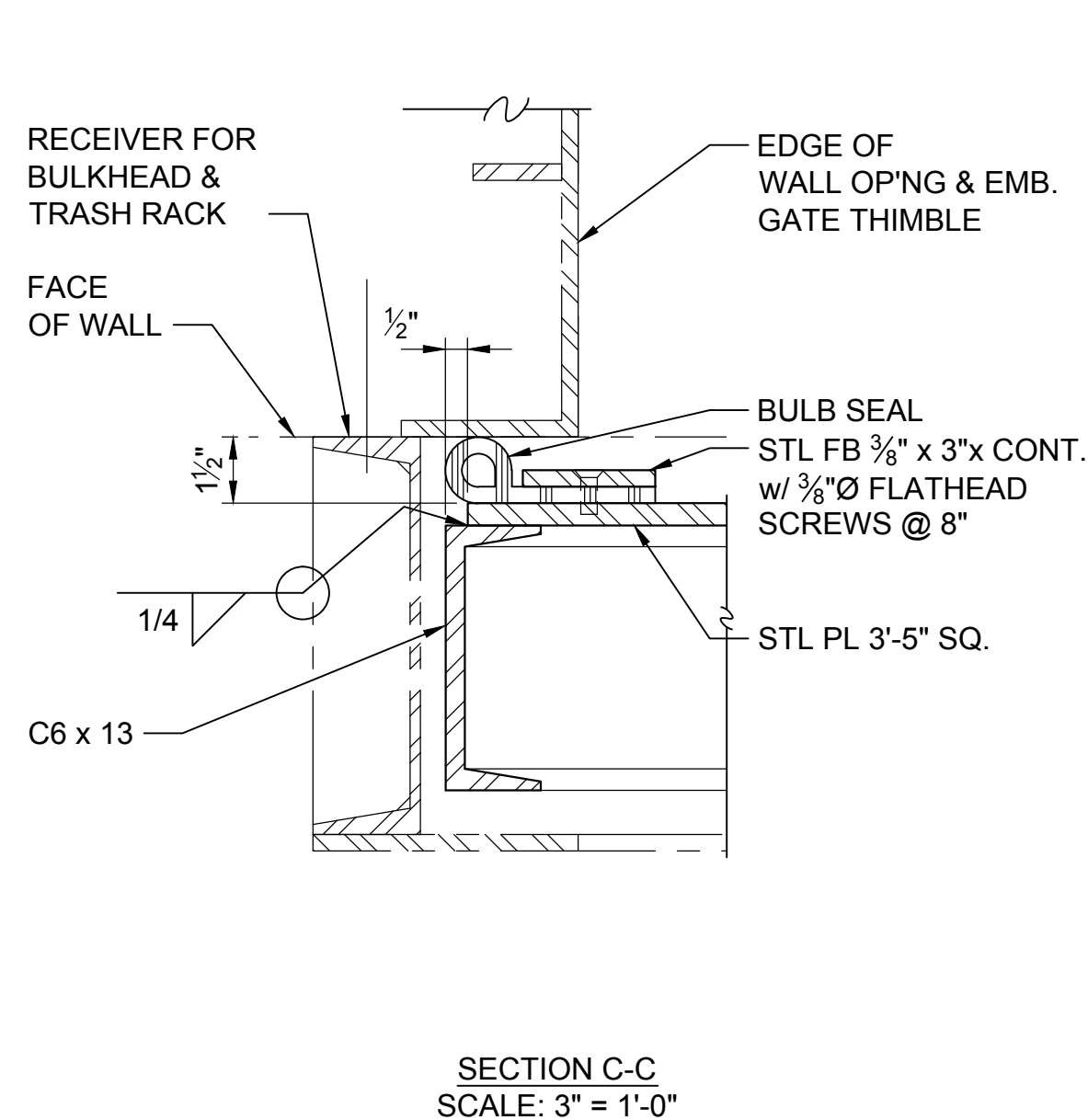
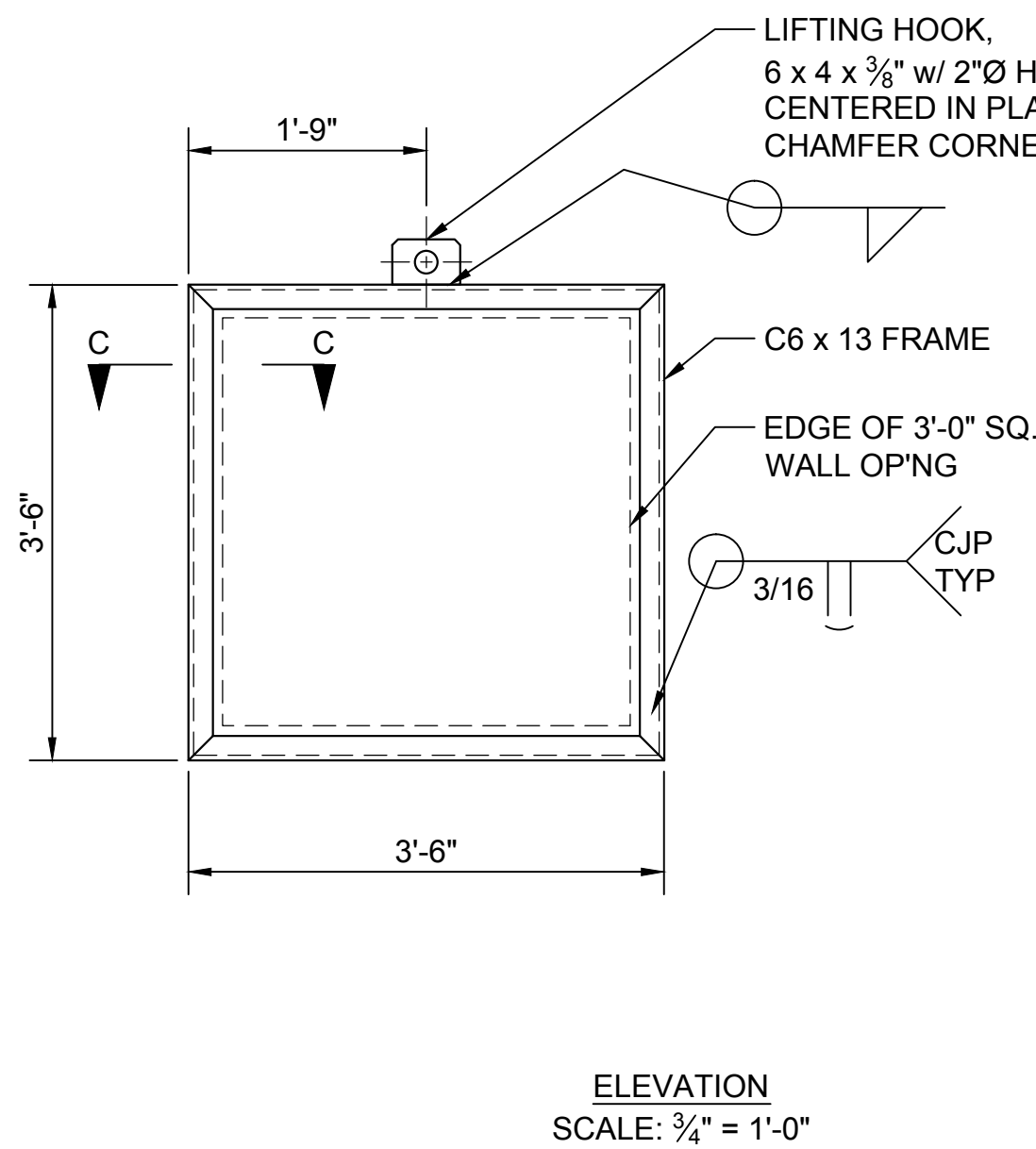
S-13



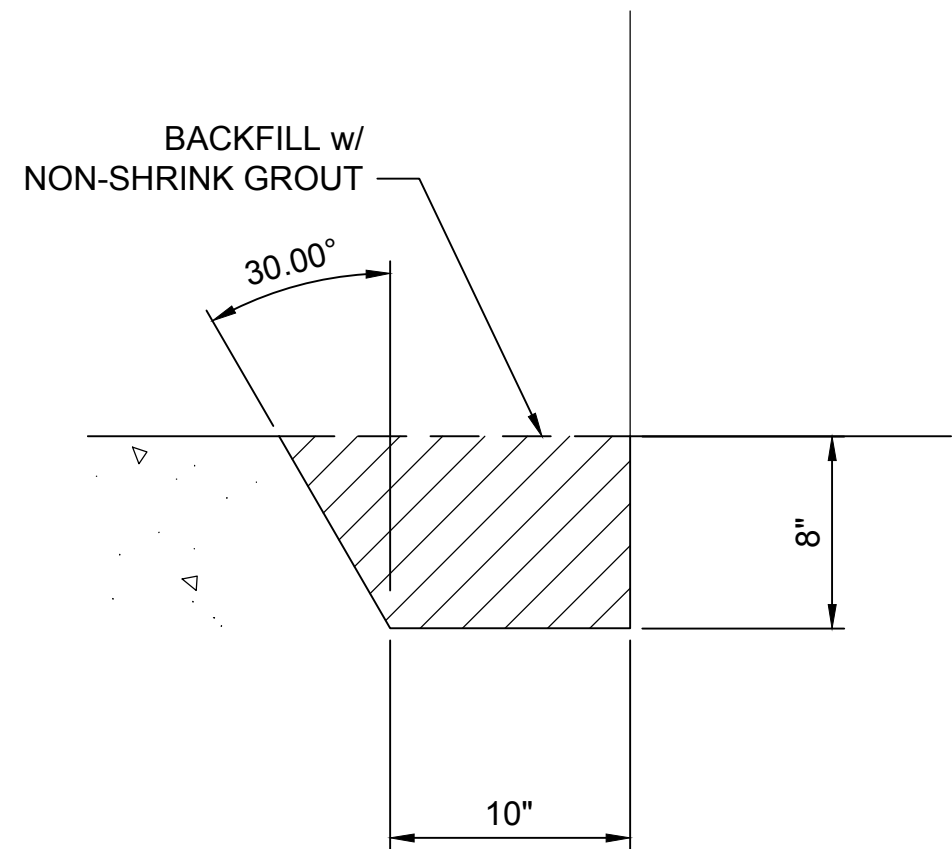
1
S-9
RECEIVER
FOR TRASH RACK / BULKHEAD
DETAIL
SCALE: AS NOTED



2
S-14
REMOVABLE TRASH RACK
DETAIL
SCALE: AS NOTED

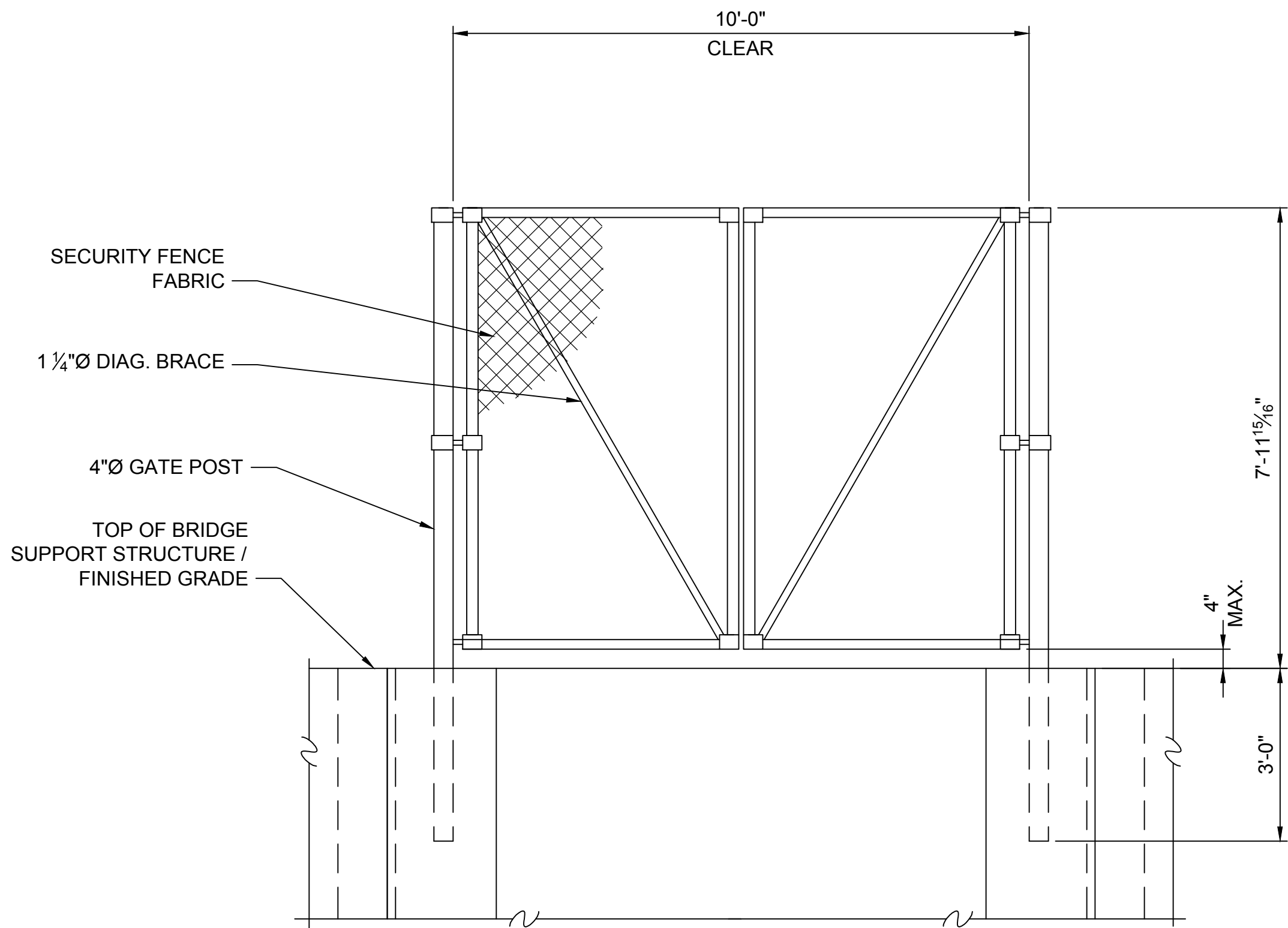


3
S-14
REMOVABLE BULKHEAD
DETAIL
SCALE: AS NOTED

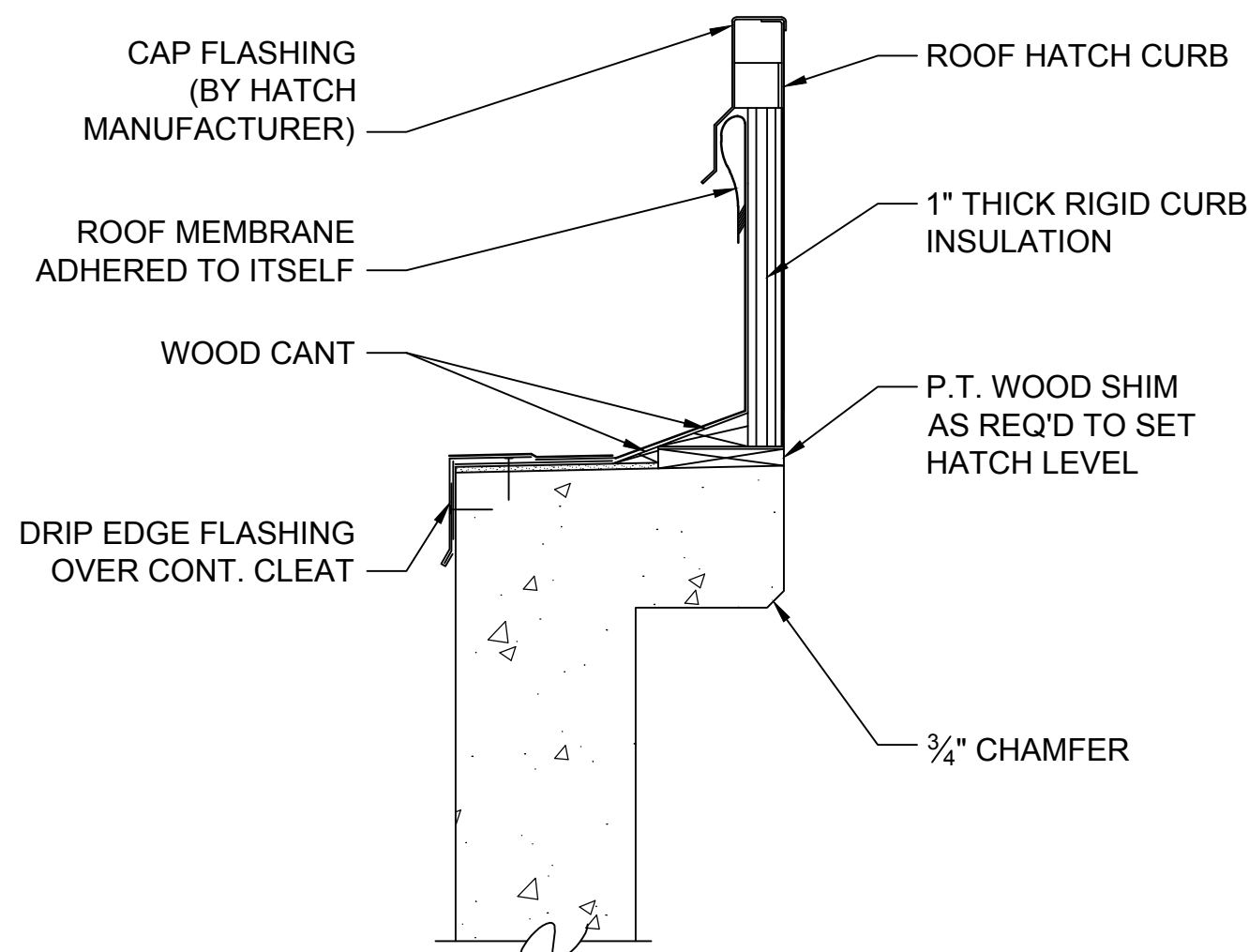


NOTE:
SS SLIDE GATES NOT SHOWN FOR CLARITY

1
S-10 GATE FRAME BLOCKOUT
DETAIL
SCALE: 1 1/2" = 1'-0"

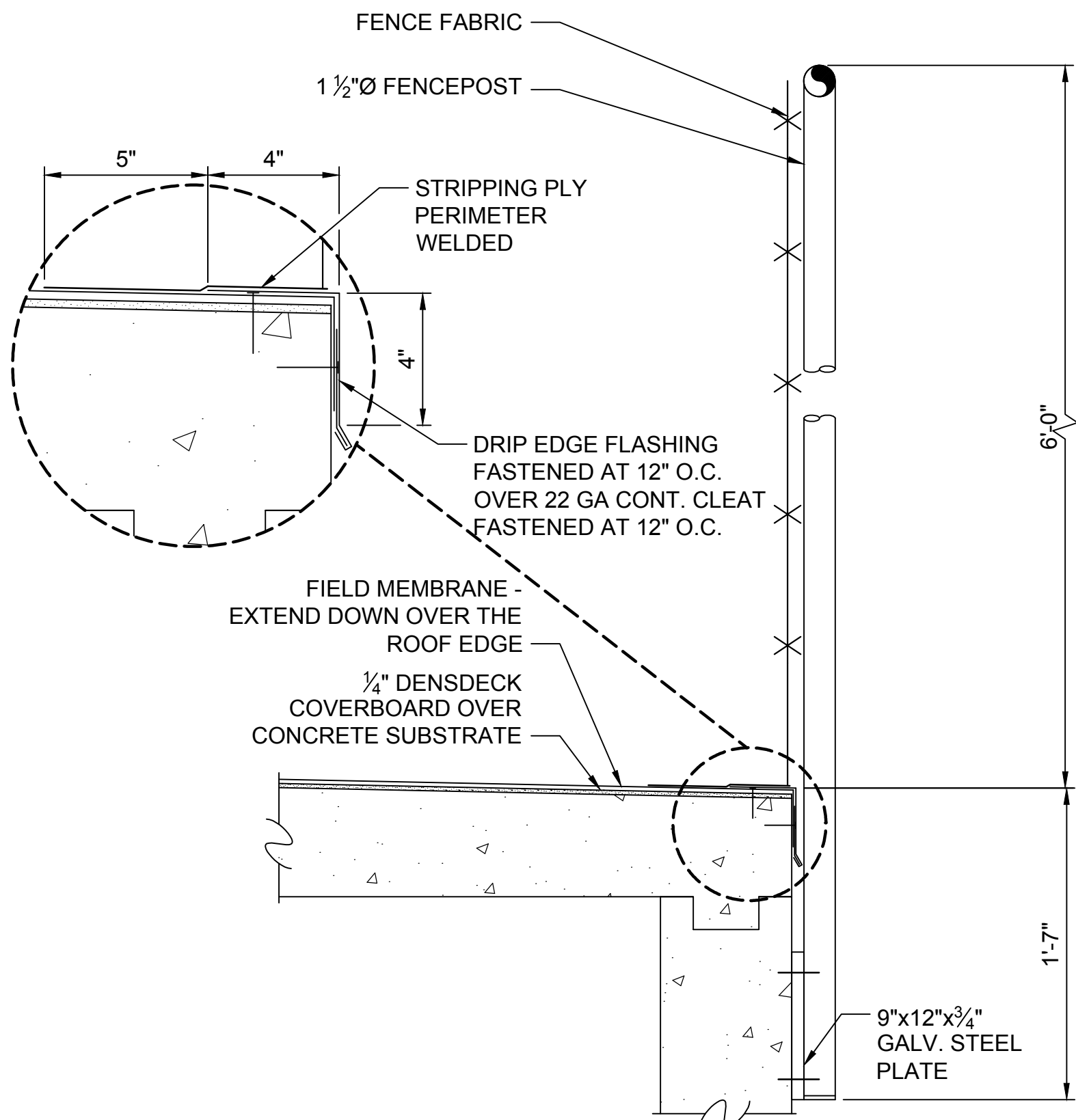


2
S-6 SECURITY GATE
DETAIL
SCALE: 1/2" = 1'-0"



NOTE:
ROOF HATCH COVER NOT SHOWN
FOR CLARITY

A
S-8 ROOF HATCH
SECTION
SCALE: 1 1/2" = 1'-0"



B
S-8 ROOF EDGE
SECTION
SCALE: 1 1/2" = 1'-0"

0" 1" 2"
BAR IS TWO INCHES ON ORIGINAL DRAWING.
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Cooper Zietz Engineers, Inc.

REVISIONS		BY		DATE	
NO.	DESCRIPTION	NO.	BY	DATE	
1	TEMPORARY ROAD REALIGNMENT		CZ / KLF	11-22-2013	

DETAILS

TS/SALE DAM MODIFICATION
BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL SAFETY OF DAMS - ARIZONA

DATE	11/22/2013	PROJECT NO.	128437	DRAWN BY	JM	CHECKED BY	PEK	DESIGNED BY	PEK	FILENAME	1117_T1_S-15.dwg
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SHEET 56 of 56

S-15

COOPER ZIETZ ENGINEERS, INC. D.B.A. CASCADE DESIGN PROFESSIONALS, INC. - 2780 SE HARRISON, MILWAUKIE, OR | PH: (503) 652-9080 | FAX: (503) 652-9091 | www.cooperzm.com