

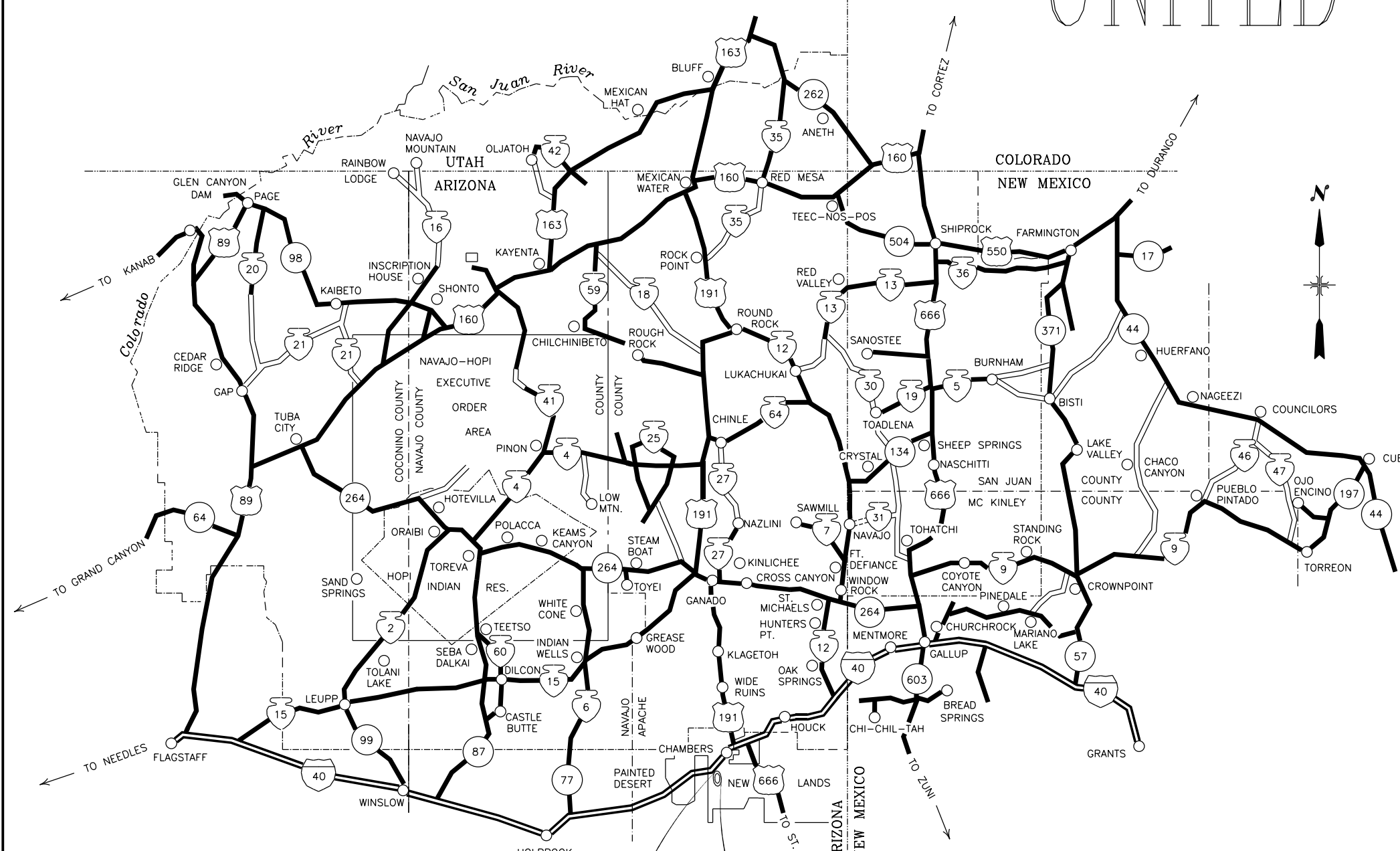
UNITED STATES DEPARTMENT OF THE INTERIOR  
 BUREAU OF INDIAN AFFAIRS  
 NAVAJO REGION  
 ROUTE



RIO PUERCO WASH  
 BRIDGE AND APPROACH ROADWAY

CONSTRUCTION PLANS APPROVED  
 DATE: 01/17/2014

REVISED CONSTRUCTION PLANS  
 DATE: 08/18/2016



NAVAJO RESERVATION MAP  
 N.T.S.

PROJECT N2007(1-1)1,2&4

DESIGN DATA

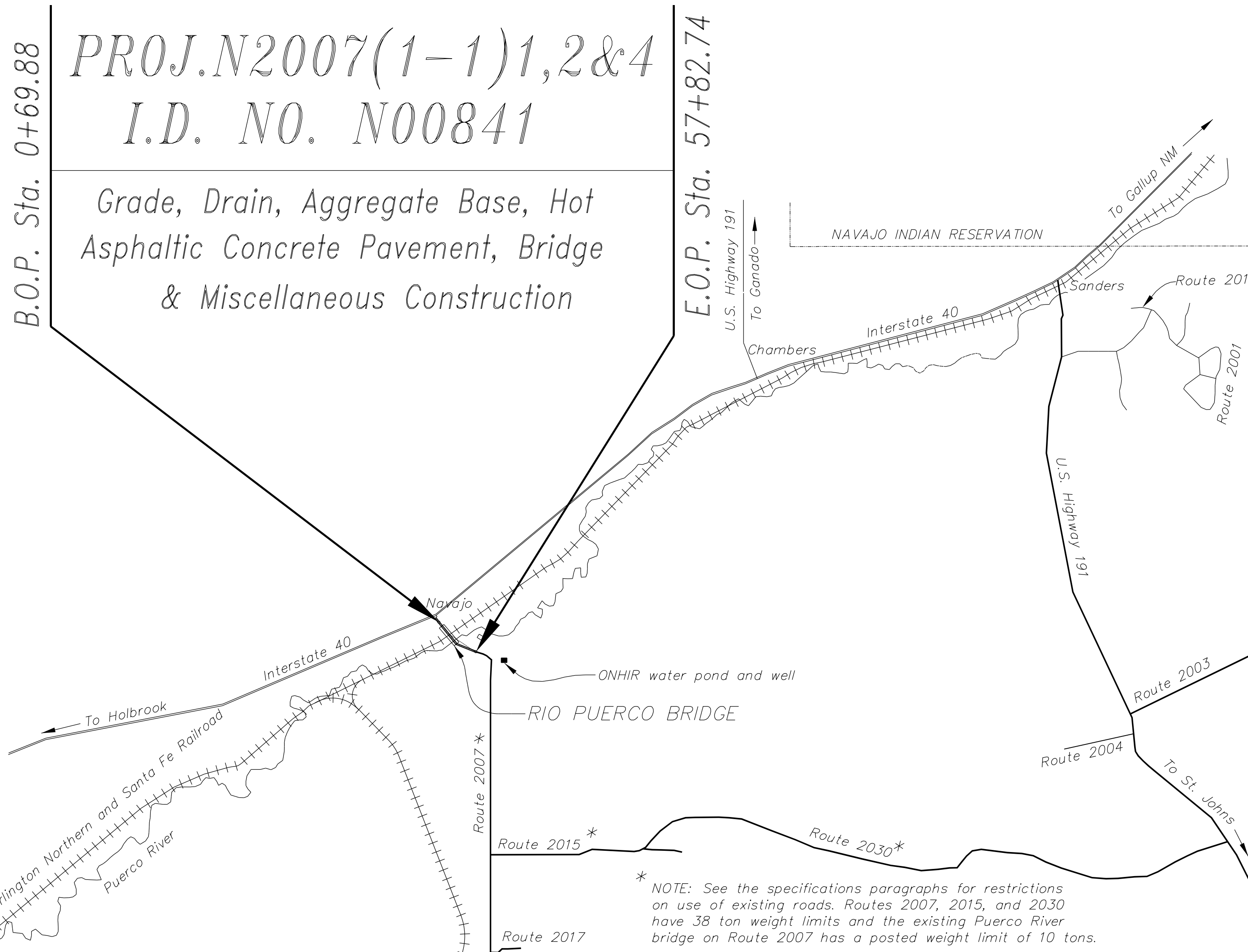
Design Speed	50 mph
Maximum Curvature	4°
Maximum Gradient	6%
Minimum Passing Sight Distance	1835.93 Ft.
Minimum Stopping Sight Distance	425.00 Ft.
Average Daily Traffic 2015	327 vpd
Future ADT (2035)	868 vpd
R.O.W. Width	See Table

N2007 RIGHT-OF-WAY TABLE

STATION TO STATION	Width (Lt.) Ft.	Width (Lt.) Ft.
0+68.94 to 19+58.69	50.00	
19+60.09 to 28+93.53	75.00	
28+93.53 to 57+82.74	100.00	
0+68.94 to 19+53.05		50.00
19+47.42 to 31+46.09		150.00
31+53.63 to 57+82.74		50.00

LENGTH OF PROJECT

STATION TO STATION	FEET	MILES
B.O.P. Station 0+69.88	2413.12	0.4570
B.O.B. Station 24+83.00	524.50	0.0993
E.O.B. Station 30+07.50	2775.24	0.5256
E.O.P. Station 57+82.74		
<b>TOTAL</b>	<b>5712.86</b>	<b>1.0819</b>



PROJ. N2007(1-1)1,2&4  
 I.D. NO. N00841  
 Grade, Drain, Aggregate Base, Hot  
 Asphaltic Concrete Pavement, Bridge  
 & Miscellaneous Construction

B.O.P. Sta. 0+69.88

E.O.P. Sta. 57+82.74

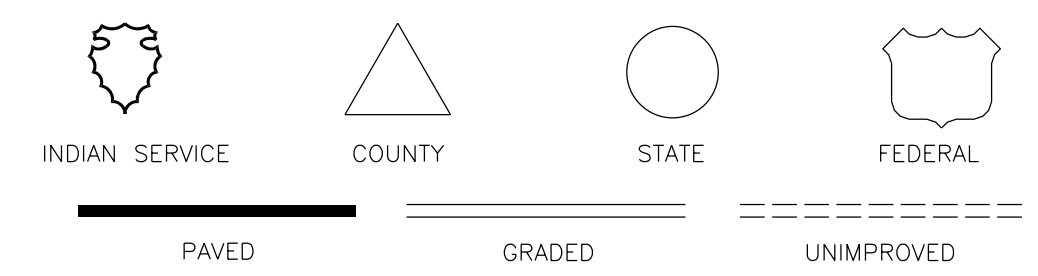
\* NOTE: See the specifications paragraphs for restrictions on use of existing roads. Routes 2007, 2015, and 2030 have 38 ton weight limits and the existing Puerco River bridge on Route 2007 has a posted weight limit of 10 tons.

INDEX TO SHEETS

SHEET No.	DESCRIPTION
1	TITLE SHEET
2	TYPICAL CROSS SECTION
3	GENERAL NOTES
4	ESTIMATED QUANTITIES
5-9	PLAN AND PROFILE SHEETS
10	ALIGNMENT AND CONTROL POINTS
11-12	FRONTAGE ROAD, PLAN & PROFILE AND DETOUR DETAILS
13	GABION LAYOUT DETAILS
14	DITCH CHANNEL PLAN & PROFILE SHEET
15	TEMPORARY TRAFFIC CONTROL
16	PERM. ROADSIDE, T.O. DETAIL & PAVEMENT MARKINGS
17	STANDARD GUARDRAIL DETAIL SKT 350
18a,18b&18c	STANDARD GUARDRAIL BARRIER SKT-350 END TREATMENT
19	STRUCTURE QUANTITIES
20	PERMANENT SIGNING DETAIL
21	LAP SPLICE U-CHANNEL BREAKAWAY SYSTEM
22-23	STORMWATER POLLUTION & EROSION/SEDIMENT CONTROL DETAILS
24-25	PRECAST CONCRETE CATTLEGUARD DETAILS
26	STANDARD PIPE INSTALLATION AND DITCH DETAILS
27	PLACED RIPRAP DOWN DRAIN DETAIL
28	STANDARD FENCING DETAIL w/ TYPE I & II GATE
29	STANDARD CHAINLINK FENCE DETAIL
30	STANDARD MILE POST DETAIL
31	SIGNALS AND TURNOUT W/ CONCRETE PADS DETAILS
32	MISCELLANEOUS DETAILS
33	PIPE CROSS-SECTION
34-37	CROSS-SECTION FROM STA. 5+20 TO STA. 7+55
38	18' TYPE III LOCKABLE GATE DETAILS
B1-B25	BRIDGE DESIGN PLANS & QUANTITIES

LEGEND

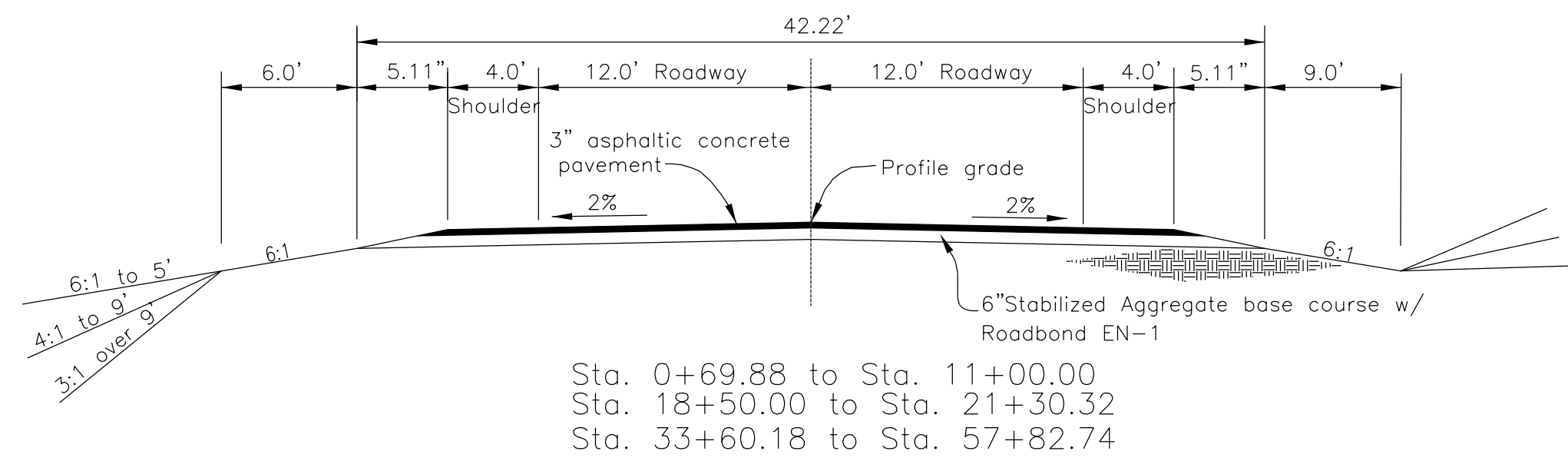
STATE LINE	---
RESERVATION LINE	---
COUNTY LINE	---
TOWNSHIP or RANGE LINE	---
SECTION LINE	---
NATIONAL FOREST LINE	---
HIGHWAY RIGHT-OF-WAY LINE	---
UNFENCED PROPERTY	---
SECTION CORNER and 1/4 CORNER	---
POWER LINE and POLES	---
TELEPHONE LINE and POLES	---
POLE GUY and ANCHOR	---
TRAFFIC SIGN	---
GUARD RAIL	---
DELINEATOR	---
BARBED WIRE FENCE	---
WOVEN WIRE FENCE	---
CATTLE GUARD	---
CULVERTS	---
CONCRETE BOX CULVERTS	---
GROUND LINE - EARTH	---
GROUND LINE - ROCK	---
EXISTING ROAD	---
SIDE ROAD TURNOUT	---
TREES and SHRUBS	---
CHANNEL or DITCH	---
DIKE or DITCH BLOCK	---
RIP-RAP	---
RAILROAD TRACK	---
GAS LINE	---
IRRIGATION LINE	---
WELL	---
DWELLING	---
SCHOOL	---
CHURCH	---
WINDMILL	---
RIGHT-OF-WAY MONUMENT	---



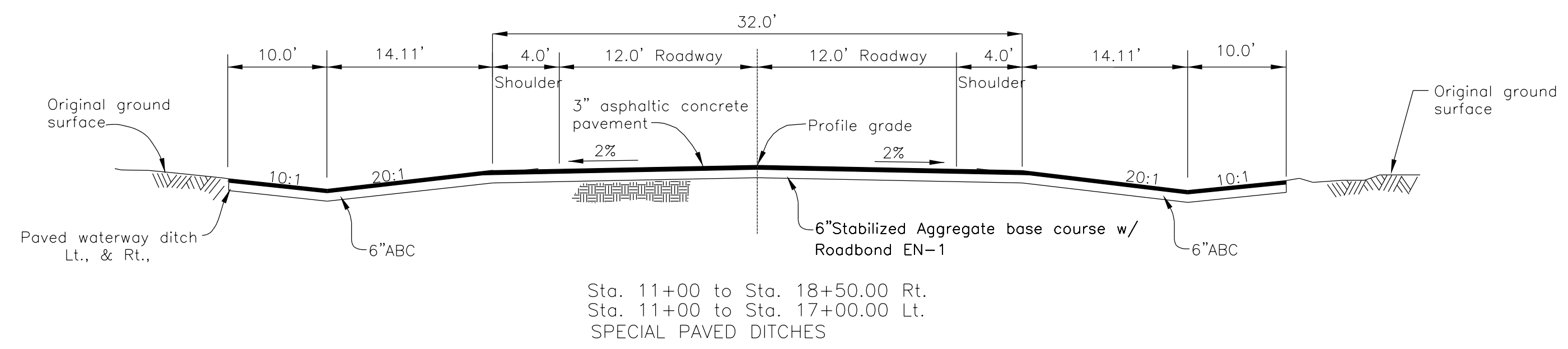
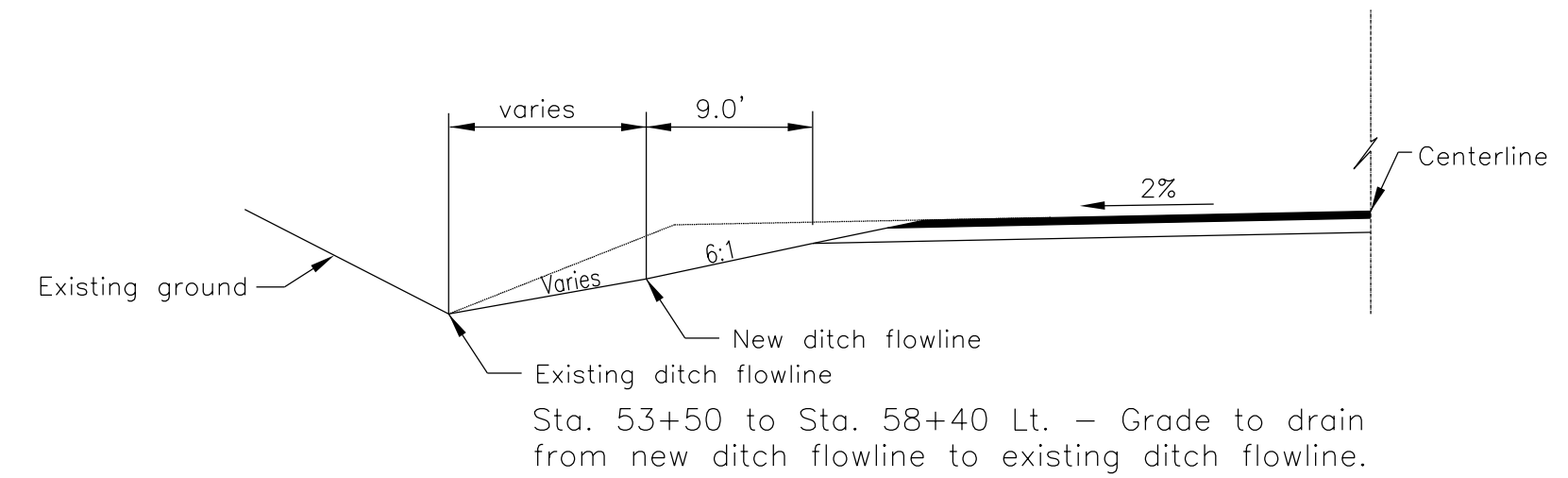
U. S. DEPARTMENT OF THE INTERIOR  
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 NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

<p>RECOMMENDED APPROVAL</p> <p>AGENCY ROAD ENGINEER: <u>Alfonso Nolasco</u> 08/28/2012 DATE</p> <p>REGIONAL DIVISION MANAGER: <u>Sharon A. Pinto</u> 08/28/2012 DATE</p> <p>PLANNING &amp; DESIGN BRANCH CHIEF: <u>Sharon A. Pinto</u> 08/28/2012 DATE</p>	<p>APPROVAL</p> <p>Sharon A. Pinto 08/28/2012 DATE              REGIONAL DIRECTOR</p>
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TYPICAL ROAD SECTIONS

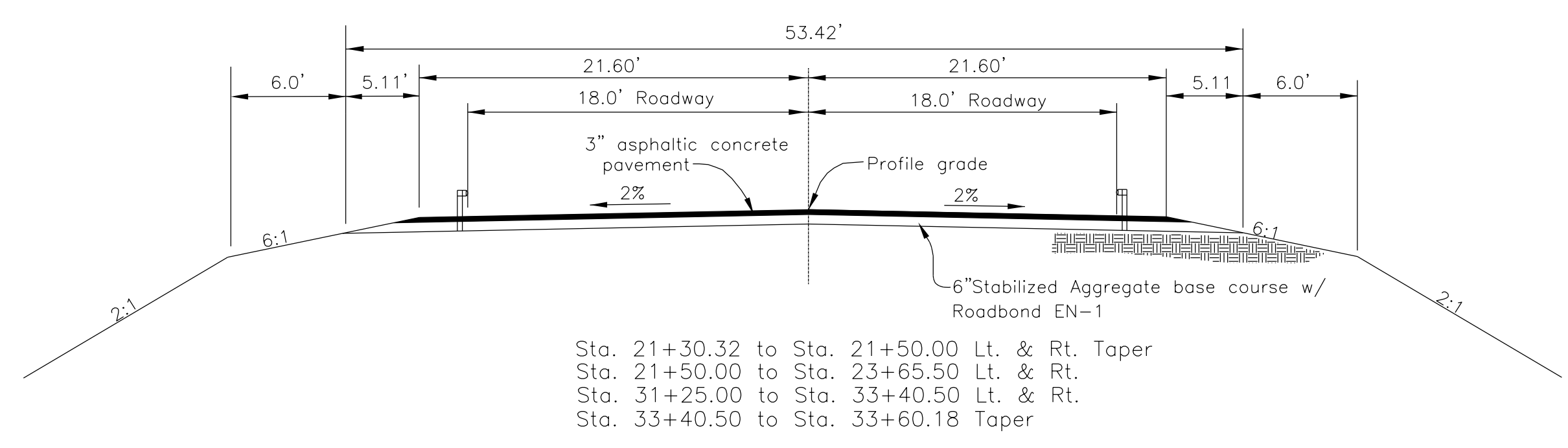


SEE SHEET 11&13 FOR FRONTAGE ROAD TYPICAL CROSS SECTION.



- SPECIAL PAVED DITCH NOTES:**
- 1-Constructed the paved ditches as shown through residential area on right and left.
  - 2-The paved ditch structural section shall match the roadway section (3 inches of asphalt over 6 inches of ABC) for the entire width and length of the ditch. The ABC course to extend 6 inches beyond all free asphalt edges.
  - 3-The paved ditch inslope shall be 20:1 starting at the roadway shoulder NO 6:1 EDGE TAPER TO BE INSTALLED.
  - 4-At driveways the paved backslope shall be lengthen to the right of way line or at PCC driveways, to the existing PCC pavement.
  - 5-The backslope grade shall be adjusted to fit each existing driveway as directed by the COR/AOTR.
  - 6-At roadway turnout at sta.14+50 Lt., carry paved ditch around the radius to the right of way line on the north side of the turnout. On the south side restart the paved ditch at the right of way line

- SEQUENCING NOTES:**
- 1-The Contractor shall be required to break up all of the existing asphaltic concrete pavement structure in accordance with Section 204.09(b) of FP-03, including all existing paved turnouts. The Contractor has the option to utilized cold milling machine or other construction method to break up the existing pavement structure.
  - 2-After processing the existing pavement, the contractor shall build up the subgrade with the material along with additional borrow with moisture and density control per Section 204 of FP-03.
  - 3-At all new and reconstructed turnouts, and mainline, the contractor shall furnish and place 6\"/>

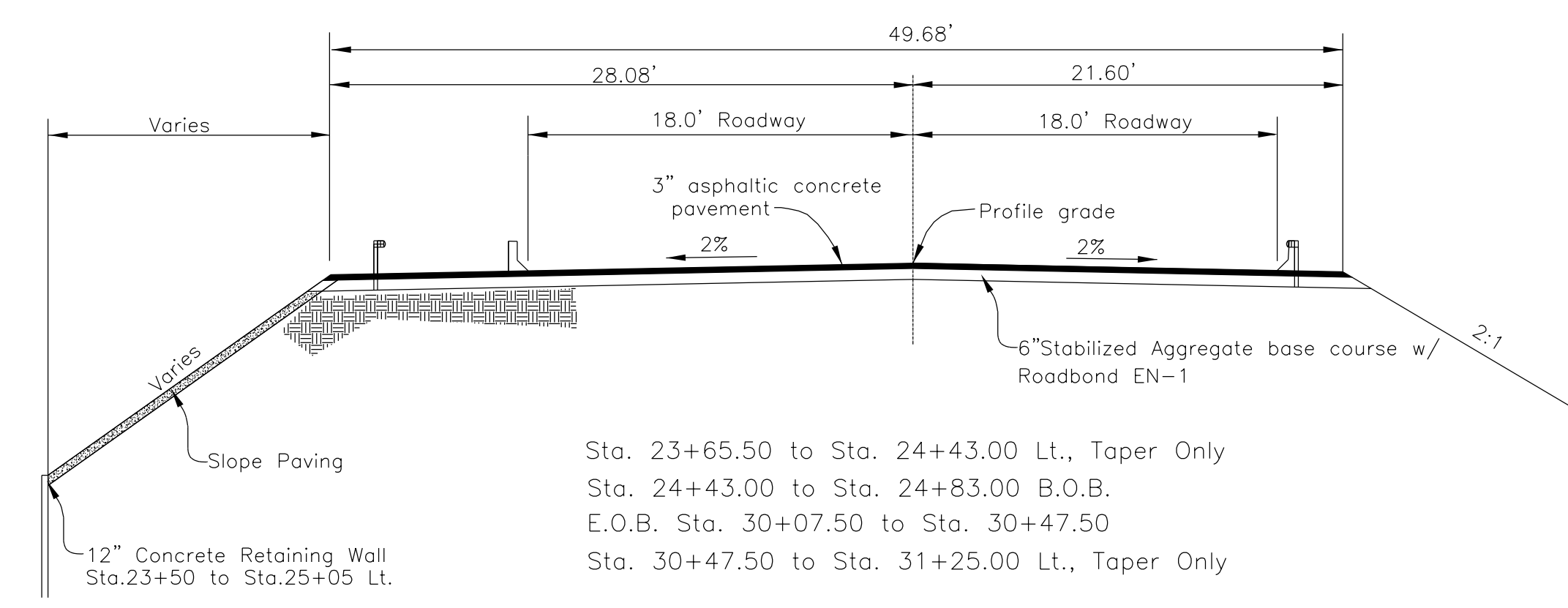


TURNOUT LOCATIONS

STATION	LOC.	SIZE	TYPE	REMARKS
3+40	Lt.	40' x 34'	A	Reconstruct existing T.O. to match existing concrete at R/W line. Remove existing 24\"/>
8+27	Rt.	14' x 34'	A	Reconstruct existing T.O.-No cattleguard w/type I gate and pipe.
11+41	Lt.	16' x 34'	A	Reconstruct existing T.O.-No cattleguard or pipe.
11+71	Rt.	16' x 34'	A	Reconstruct existing T.O.-No cattleguard or pipe.
12+30	Rt.	24' x 34'	A	Reconstruct existing T.O.-No cattleguard or Pipe.
12+65	Lt.	16' x 34'	A	Reconstruct existing T.O.-No cattleguard or Pipe.
13+34	Rt.	24' x 34'	A	Reconstruct existing T.O.-to match existing PCC driveway for new Business.
14+40	Rt.	24' x 34'	A	Reconstruct existing T.O.-to match existing PCC driveway.
14+50	Lt.	24' x 34'	A	Reconstruct existing T.O.-to newlands office.
15+16	Rt.	16' x 34'	A	Reconstruct existing T.O.-to match existing PCC driveway.
15+85	Rt.	16' x 34'	A	Reconstruct existing T.O.-to match existing PCC driveway.
15+85	Lt.	16' x 34'	A	Reconstruct existing T.O.-No cattleguard or pipe.
16+55	Rt.	16' x 34'	A	Reconstruct existing T.O.-to match existing PCC driveway.
17+25	Rt.	16' x 34'	A	Reconstruct existing T.O.-to match existing PCC driveway.
17+94	Rt.	16' x 34'	A	Reconstruct existing T.O.-to match existing PCC driveway.
19+75	Rt.	24' x 34'	A	Reconstruct existing T.O.-Paved 50' from C/L and install new cspc
19+75	Lt.	24' x 34'	A	Reconstruct existing T.O.-@ 113' skew-relocate 3-unit cattleguard 180' Lt of C/L on old 66 Route, pass the proposed BNSF Service Road Intersection. Pave Turnout to new cattleguard location match existing service road and turnout @ 100'.

SPECIAL ROADWAY TYPICAL AND SPECIAL DITCH LOCATION

Station To Station	Roadway Width to Hinge		Remarks
	Lt.	Rt.	
6+60.00 To 11+00.00	16.00 ft.	16.00 ft.	Special Ditch Grade
10+90.00 To 11+00.00	16.00 ft.	16.00 ft.	Special Ditch Grade
11+00.00 To 17+00.00	---	16.00 ft.	Special Paved Ditch, Rt.
11+00.00 To 17+00.00	16.00 ft.	---	Special Paved Ditch, Lt.
20+30.32 To 21+50.00	Varies	Varies	19.68 ft. Taper Lt. & Rt.
21+50.00 To 23+65.50	21.60 ft.	21.60 ft.	Guardrail Location:
23+65.50 To 24+43.00	21.60 ft.	21.60 ft.	77.50 ft. of Taper with Guardrail, Left Side.
24+43.00 To 24+83.00	27.08 ft.	21.60 ft.	1:1 1/2 at Fill Slope Location, Lt.
24+83.00 To 30+07.50	---	---	Bridge Location.
30+07.50 To 30+47.50	27.08 ft.	21.60 ft.	2:1 at Fill Slope Location, Lt. & Rt.
30+47.50 To 31+25.00	27.08 ft.	21.60 ft.	77.50 ft. of Taper with Guardrail, Left Side.
31+25.00 To 33+40.50	21.60 ft.	21.60 ft.	Guardrail Location.
33+40.50 To 33+60.18	---	---	19.68 ft. Taper Lt. and Rt.



REVISED: 08-15-2016

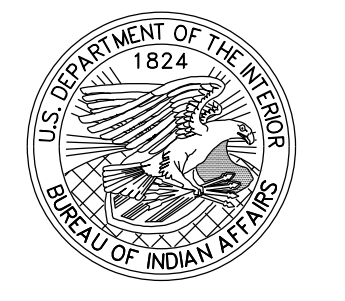
BASIS ESTIMATED QUANTITIES

ITEM NO.	DESCRIPTION	GRADE	UNITS	APPLICATION	FRONTAGE ROAD
30101-2000	Untreated Aggregate Base Course	"D"	140 lbs/ft <sup>3</sup>	6" Mainline, - 4" Turnout	6" Service Road BNSF
30413-1000	Aggregate Stabilization with Roadbond	EN-1			
40201-0500	Hot Asphalt Concrete Pavement Class "B"	"B"	150 lbs/ft <sup>3</sup>	3" Mainline, - 2" Turnout	2" Service Road BNSF
40502-0800	Asphalt Cement	PG58-28	0.9806 L/kg	6% by Total Weight HACP	
41101-5000	Asphalt Prime Coat	PEP	2.53 gal/ton	0.30 gal/sq. yd. top of ABC	

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TYPICAL CROSS SECTION

DRAWN BY: Gerald.Hood DATE: 5/7/2009  
DESIGNED BY: NRDOT DATE: 5/7/2009  
REVISED: 08/15/2016 BY: Peterson.Yazzie  
ANNOTATION SCALE: Full Size 1=1  
FILENAME: Sht.2\_Typical Sections Sheet.dgn



J:\DESIGN\Users\DESIGN2\CURRENT PROJECT\PROJECT\_093008\N00\_New\_Lands\N2007(1-1)2&4\_092308\N2007 DESIGN DATA\_092508\CADD Files 01-18-2013\N2007 Plans 01-18-2013

AREA	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1,2&4	3	63

**GENERAL NOTES:**

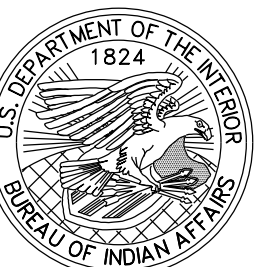
1. ALL WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS (FP-03 ENGLISH UNITS), AND THE SUPPLEMENTAL SPECIFICATIONS FOR THIS PROJECT.
2. ALL PERMANENT AND TEMPORARY ROADSIDE SIGNS, AND PAVEMENT MARKINGS SHALL BE PLACED IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS (LATEST EDITION) AND IN ACCORDANCE WITH THE DETAILS ON THESE PLANS. PLACEMENT OF "STOP" BAR, PERMANENT TRAFFIC SIGNS AND PAVEMENT MARKINGS SHALL BE FIELD ADJUSTED AS DIRECTED BY THE COR/AOTR, AT NO ADDITIONAL COST TO THE GOVERNMENT.
3. THE TEMPORARY TRAFFIC CONTROL DETAILS SHOWN REFLECTS GENERAL REQUIREMENTS FOR THIS PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR PREPARING AND SUBMITTING A TRAFFIC CONTROL PLAN IN ACCORDANCE WITH THESE DETAILS, TAKING INTO ACCOUNT THE CONTRACTOR'S CONSTRUCTION SEQUENCING PLAN, MUTCD, AND THE SUPPLEMENTAL SPECIFICATIONS FOR SECTION 635-TEMPORARY TRAFFIC CONTROL. THE CONTRACTOR SHALL ALSO SUBMIT A COPY OF HIS TRAFFIC CONTROL PLAN, RELATED TO I-40 FRONTAGE ROAD AND RAILROAD CROSSING, TO THE ARIZONA DEPARTMENT AND TRANSPORTATION (DIANA ARMUO (928)524-5455), AND BURLINGTON NORTHERN & SANTA FE (BNSF) (2)-WEEKS PRIOR TO START OF CONSTRUCTION.
4. THE DESIGN FEATURES INCLUDING HORIZONTAL AND VERTICAL ALIGNMENTS, TYPICAL SECTIONS, AND OTHER DESIGN DETAILS SHOWN SHALL NOT BE ALTERED OR MODIFIED IN ANYWAY DURING CONSTRUCTION WITHOUT THE EXPRESSED WRITTEN DIRECTION AND WRITTEN APPROVAL OF THE NAVAJO REGION OFFICE-DIVISION OF TRANSPORTATION (NRDOT) DIVISION MANAGER THROUGH THE AWARDDING OFFICIAL (AO), UNLESS OTHERWISE NOTED IN THESE PLANS OR SPECIFICATIONS. DRAINAGE STRUCTURES AND TURNOUTS SHALL BE INSTALLED AS SHOWN WITH ONLY MINOR CORRECTIONS IN LOCATION, SKEW, AND/OR INVERT ELEVATIONS AS NEEDED TO FIT FIELD CONDITIONS. TURNOUTS MAY NOT BE SHIFTED MORE THAN 5.0 METERS FROM THE LOCATIONS SHOWN ON THE PLANS WITHOUT THE WRITTEN APPROVAL OF THE NRDOT DIVISION MANAGER THROUGH THE AWARDDING OFFICIAL.
5. THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY AND EXPENSE FOR DISPOSAL OF TRASH AND/OR CONSTRUCTION DEBRIS IN ACCORDANCE WITH SECTIONS 107 AND 203 OF THE FP-03 AS WELL AS ANY AND ALL PERMIT REQUIREMENTS. THIS WORK SHALL BE INCIDENTAL OBLIGATIONS OF THE CONTRACTOR.
6. THE BIDDER SHALL READ AND MAKE CAREFUL EXAMINATION OF THE PLANS, SPECIFICATIONS, QUANTITIES, MATERIAL, SURVEYING REQUIREMENTS, AND VISIT THE SITE OF THE PROPOSED CONSTRUCTION TO BECOME FAMILIAR WITH THE SITE CONDITIONS AND LIMITATIONS BEFORE MAKING A PROPOSAL. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY AND ALL ERRORS RESULTING FROM THE FAILURE TO MAKE SUCH AN EXAMINATION. ANY INFORMATION DERIVED FROM THE MAPS, PLANS, SPECIFICATIONS, PROFILES, DRAWINGS OR THE ENGINEER, SHALL NOT RELIEVE THE CONTRACTOR FROM ANY RISK OR FROM FULFILLING THE TERMS OF THE CONTRACT. THERE ARE SEVERAL AREAS WITH LIMITED WORKING ROOM WITHIN THE PROJECT RIGHT-OF-WAY, AND/OR WITH EXISTING FEATURES WITHIN OR NEAR THE PROJECT RIGHT-OF-WAY, THAT WILL REQUIRE "SPECIAL" CONSTRUCTION PROCEDURES.
7. THE CONTRACTOR IS REQUIRED TO SUBMIT A REVISED PIPE LIST TO THE NRDOT, PLANNING & DESIGN BRANCH CHIEF THROUGH THE AOTR/COR, BASED ON THE FIELD STAKING IN ACCORDANCE WITH SECTION 152 OF THE CONTRACT SUPPLEMENTAL SPECIFICATION. THE APPROVAL OF ANY AND ALL REVISED PIPE LISTS WITH ACCOMPANYING DRAWINGS IS RENDERED AS A SERVICE ONLY AND IS NOT CONSIDERED A GUARANTEE OF MEASUREMENTS, QUANTITIES, INSTALLATION PROCEDURES, AND/OR DIMENSIONS, NOR SHALL IT BE CONSIDERED AS RELIEVING THE CONTRACTOR FROM COMPLYING WITH THE CONTRACT SPECIFICATIONS AND DESIGN PLANS. THE CONTRACTOR IS HEREBY NOTIFIED THAT UNDER NO CIRCUMSTANCE SHALL ANY DRAINAGE STRUCTURE(S) BE INSTALLED BELOW THE NATURAL FLOW LINE OF THE WASH, CHANNEL, ARROYO, OR DITCH LINE.
8. NO WORK SHALL BE PERFORMED OR GROUND DISTURBED OUTSIDE OF THE DESIGNATED CONSTRUCTION LIMITS IN ACCORDANCE WITH SECTION 107 OF THE FP-03 WITHOUT WRITTEN APPROVAL BY THE NRDOT DIVISION MANAGER UNLESS OTHERWISE SHOWN AND LABELED ON THESE PLANS AS "CONSTRUCTION ZONE". IN NO CASE SHALL ANY WORK BE PERFORMED OUTSIDE THE DESIGNATED RIGHTS-OF-WAY LIMITS WITHOUT WRITTEN APPROVAL FROM THE NRDOT DIVISION MANAGER, UNLESS OTHERWISE SHOWN AND LABELED OUT ON THESE PLANS AS "CONSTRUCTION ZONE". THE CONSTRUCTION LIMIT IS THE CATCH POINT EARTHWORK LIMIT PLUS 3.0 METERS, (OR AS DIRECTED BY COR/AOTR) NOT TO EXCEED THE RIGHT-OF-ENTRY LIMITS.
9. THE DETAILS SHOWN ON THE STORM WATER POLLUTION AND EROSION/SEDIMENT CONTROL DETAILS ARE GENERAL REQUIREMENTS TO BE USED BY THE CONTRACTOR IN PREPARING A STORM WATER POLLUTION PREVENTION PLAN ALONG WITH THE REQUIREMENTS IN SECTION 157 OF THE SUPPLEMENTAL SPECIFICATION AND SPECIAL CONTRACT REQUIREMENTS. THE SWPPP IS REQUIRED AT THE DRAINAGE PIPE REPLACEMENT LOCATIONS, ACCESS ROAD TO RAILROAD TRACKS & RIO PUERCO RIVER, ANYWHERE WHERE THERE IS GROUND DISTURBING ACTIVITIES, AND MATERIALS STOCKPILES. THE CONTRACTOR IS REQUIRED TO SUBMIT COURTESY COPY OF THE APPROVED SWPPP TO THE ARIZONA DEPARTMENT ENVIRONMENTAL QUALITY (ADEQ) OFFICE (602) 771-4245.NICOLE CORONADO @ nm1@azdeq.gov
10. THE QUANTITIES SHOWN ARE FOR ESTIMATING PURPOSES ONLY AND TO COMPARE AND CANVAS BIDS. ACTUAL PAY QUANTITIES WILL BE DETERMINED IN THE FIELD FOR AUTHORIZED CHANGES THAT AFFECT THE QUANTITIES. ANY OVER-RUN OR UNDER-RUN OF QUANTITIES SHALL BE SUBJECT TO FAR 52.211-18, VARIATION IN ESTIMATED QUANTITY.
11. ALL TURNOUT/DRIVEWAYS, AS CALLED FOR ON THESE PLANS, SHALL EITHER BE CONSTRUCTED, REBUILT, RESHAPED AND/OR REMOVED UP TO THE RIGHT-OF-WAY LIMITS. ALL TURNOUTS SHALL BE PAVED TO THE CATTLEGUARD, THEN FROM THE BACK OF CATTLEGUARD TO THE R/W LINE. PLACE AGGREGATE BASE FOR ALL 14.0' WIDE TURNOUTS. PLACE AGGREGATE AND HOT ASPHALTIC CONCRETE FOR TURNOUTS WIDER THAN 14.0' TO MATCH THE STRUCTURAL SECTION. REQUIRED GRADING, SHAPING, AND EARTH COMPACTION OUTSIDE OF THE RIGHT-OF-WAY, TO CONNECT NEW TURNOUTS TO THE EXISTING ROADWAY/DRIVEWAY (AS SHOWN ON THE PLANS OR AS DIRECTED BY THE AOTR/COR) SHALL BE INCIDENTAL TO BID ITEM 20102-0000. ANY REQUIRED AGGREGATE BASE AND/OR ASPHALT MATERIAL SHALL BE PAID FOR UNDER THE APPROPRIATE BID ITEMS FOR THIS WORK AS SHOWN IN THE BID SCHEDULE.
12. THE CONTRACTOR SHALL BE REQUIRED TO OBLITERATE ALL EXISTING ABANDONED TURNOUTS/ROADWAY WITHIN THE RIGHT-OF-WAY LIMITS, AND ANY EXISTING TURNOUTS/ROADWAY OUTSIDE OF THE RIGHT-OF-WAY THAT ARE DESIGNATED ON THE PLANS FOR OBLITERATION. OBLITERATION SHALL BE AS PER FP-03, METHOD 2. SCARIFICATION SHALL BE TO A DEPTH OF 12-INCH OF THE SCARIFIED SURFACE SHALL BE LEFT ROUGH, WITH 4-INCH TO 12-INCH HIGH RIDGES PERPENDICULAR TO THE EXISTING ROAD CENTERLINE. ROADWAY OBLITERATION INCLUDES GRADING DRAINAGE CHANNELS ACROSS THE OLD ROADBED, TO RE-ESTABLISH NATURAL DRAINAGE CHANNELS AND/OR TO OPEN CHANNELS FOR THE NEWLY INSTALLED (IN NEW ROADWAY) DRAINAGE STRUCTURES. THIS WORK TO BE INCIDENTAL WORK UNDER BID ITEM 20304-1000. PERMANENT SEEDING AND STRAW MULCHING SHALL BE APPLIED TO ALL AREAS WITHIN THE CONSTRUCTION LIMITS. SEEDING AND MULCHING TO BE PAID UNDER ITEM 62510-1000.
13. STRUCTURAL EXCAVATION AND BEDDING/BACKFILL OF ALL DRAINAGE STRUCTURES SHALL BE CONSIDERED INCIDENTAL TO THE INSTALLATION OF STRUCTURES, BEDDING AND BACKFILL MATERIAL SHALL MEET ALL REQUIREMENTS OF FP-03, SECTIONS 209 AND 704. APPROVED EXCESS EXCAVATION MATERIAL MAY BE USED TO REBUILD TURNOUTS, EARTHEN DITCH BLOCKS, AND/OR PLACED ALONG ROADWAY SHOULDERS AS EMBANKMENT IN AREAS ADJACENT TO THE REMOVAL AND AS DIRECTED BY THE COR/AOTR.
14. ALL FURROW AND DRAINAGE DITCHES SHALL BE STAKED AND GRADED TO DRAIN UP TO THE RIGHT-OF-WAY LIMITS. EARTHEN DITCH BLOCKS, DIKES AND DITCHES SHALL BE CONSTRUCTED AS SHOWN ON THESE PLANS AND/OR ADDED AT LOCATIONS DESIGNATED BY THE COR/AOTR. ALL DITCH BLOCKS, DIKES AND FURROW DITCHES SHALL BE PAID FOR UNDER THE APPROPRIATE BID ITEMS FOR THIS WORK AS SHOWN IN THE BID SCHEDULE. AT ALL DRAINAGE PIPE REPLACEMENTS, INSTALLATIONS, EXTENSIONS, AND IN-PLACE PIPE CLEANING LOCATIONS, THE CONTRACTOR SHALL CLEAN, REGRADE, AND RESHAPE THE INLET AND OUTLET CHANNELS TO THE RIGHT-OF-WAY LINE AS DIRECTED BY THE COR/AOTR.
15. IMMEDIATELY PRIOR TO PLACING EMBANKMENT, AGGREGATE BASE AND/OR RECYCLED MATERIAL, THE TOP 6-INCH OF THE ORIGINAL GROUND, OR FINISHED SUBGRADE (INCLUDING TURNOUTS) SHALL BE CHECKED FOR COMPACTION AND GRADE. IF COMPACTION DOES NOT MEET THE MINIMUM SPECIFIED COMPACTION AND TOLERANCE REQUIREMENTS, THE ORIGINAL GROUND AND/OR SUBGRADE SHALL BE RE-WATERED AND/OR SCARIFIED AS NEEDED AND RE-COMPACTED TO THE REQUIRED DENSITY AND TOLERANCE, AT THE CONTRACTOR'S EXPENSE. IN NO CASE SHALL ANY EMBANKMENT OR SURFACING MATERIAL (INCLUDING BASECOURSE) BE PLACED ON FROZEN, MUDDY OR UNSTABLE NATURAL GROUND OR SUBGRADE.
16. THE EARTHWORK TABLE SHOWN IS TO ASSIST THE CONTRACTOR IN ESTABLISHING A BID UNDER THE EARTHWORK ITEMS SHOWN IN THE BID SCHEDULE. ANY BORROW MATERIAL CALLED FOR ON THE PLANS SHALL BE TAKEN FROM CONTRACTOR IDENTIFIED SOURCES OUTSIDE THE RIGHT-OF-WAY LIMITS. IT IS THE SOLE RESPONSIBILITY AND EXPENSE OF THE CONTRACTOR TO PROVIDE ANY NECESSARY BORROW MATERIAL FOR THIS PROJECT INCLUDING ALL NECESSARY PERMITS. ALL EXCAVATION, BORROW AND EMBANKMENT MATERIAL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEMS 20401-0000 AND 20403-0000.
17. THE LOCATION OF UTILITIES AS SHOWN IN THESE PLANS ARE APPROXIMATE AND ARE ONLY TO ASSIST THE CONTRACTOR IN COMPLETING THE WORK. THE CONTRACTOR SHALL CONTACT ALL UTILITY OWNERS PRIOR TO STARTING ANY CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL CONTACT THE ARIZONA BLUE STAKES AT 1-800-782-5348, AND NAVAJO TRIBAL UTILITY AUTHORITY (NTUA) AT (928)-729-5721, PRIOR TO STARTING ANY CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL VERIFY ALL UTILITIES AND THEIR LOCATIONS WITH THE UTILITY OWNERS PRIOR TO CONSTRUCTION. ANY UTILITIES DAMAGED DUE TO NEGLIGENCE OF THE CONTRACTOR SHALL BE RESTORED TO CODE REQUIREMENTS AT THE CONTRACTOR'S EXPENSE.
18. THE CONTRACTOR SHALL REMOVE, CLEAN, AND STOCKPILE ALL SALVAGEABLE EXISTING CULVERTS, CATTLE GUARDS AND FENCING MATERIALS, ETC., AS CALLED FOR ON THESE PLANS AND SECTIONS 203 AND 607. ALL SALVAGEABLE MATERIALS, EXCEPT THE BNSF AND COUNTY PROPERTY, SHALL BE STOCKPILED IN A DESIGNATED LOCATION FOR COMMUNITY USE. AOTR SHALL COORDINATE THIS WITH BNSF AND COUNTY PROPERTY REMOVED AS PART OF THIS PROJECT SHALL BE OFFERED TO THE COUNTY AND BNSF. IF THEY ACCEPT, THE MATERIAL SHALL BE HAUL AND STOCKPILED INSIDE THE RAILROAD'S PROPERTY LINE FOR BNSF PICK UP. ANY MATERIALS DETERMINED TO BE UNSALVAGEABLE BY THE COR/AOTR SHALL BE DISPOSED OF BY THE CONTRACTOR IN ACCORDANCE WITH SECTIONS 107, AND 203. THE SALVAGE WORK SHALL BE INCLUDED IN THE APPROPRIATE UNIT PRICE BID ITEMS FOR SECTIONS 203 AND/OR 607.
19. THE ROADWAY TYPICAL SECTION SHOWN IS THE BASIC TEMPLATE TO WHICH THE PROJECT IS TO BE STAKED AND BUILT. HOWEVER, THERE WILL BE LOCATIONS WHERE, DUE TO EXISTING GROUND CONDITIONS, TURNOUTS, CULVERTS OR OTHER STRUCTURES, ETC., THE SHOWN TYPICAL SLOPES CANNOT BE CONSTRUCTED. IN THIS CASE, THE NRDOT PLANNING & DESIGN BRANCH CHIEF, THROUGH THE COR/AOTR, SHALL BE CONSULTED FOR CHANGES IN THE TYPICAL SECTIONS, DESIGN SLOPES, AND/OR OTHER ADJUSTMENTS BEFORE PROCEEDING WITH THE WORK UNLESS NOTED OTHERWISE ON THE PLANS. THE FINAL CONSTRUCTED ROAD SECTION SHALL BE BASED ON THE GOVERNMENT FURNISHED COMPUTERIZED STAKING REPORT AS ADJUSTED TO FIT FIELD CONDITIONS. THE CONTRACTOR SHALL STAY WITHIN THE LIMITS OF CONSTRUCTION, UNLESS OTHERWISE APPROVED. IN NO CASE SHALL THE CUT AND FILL BACK SLOPES BE BUILT STEEPER THAN THE MAXIMUM ALLOWED IN THE ROADWAY TYPICAL SECTION SHOWN.
20. THE CONTRACTOR SHALL SAW CUT (FULL DEPTH) THE EXISTING ASPHALT PAVEMENT (INCLUDING TURNOUTS) WHERE NEW ASPHALT IS TO TIE INTO THE OLD ASPHALT PAVEMENT AT THE LOCATIONS NOTED ON THE PLANS. THE CONTRACTOR SHALL MATCH THE NEW ASPHALTIC CONCRETE PAVEMENT SURFACE TO EXISTING PAVEMENT SECTION AT TIE-IN POINTS AND TO PROVIDE FOR A SMOOTH TRANSITION AS DIRECTED BY THE COR/AOTR. ALL SAWED PAVEMENT EDGES TO RECEIVE ASPHALT TACK COAT. THIS WORK SHALL BE INCIDENTAL TO BID ITEM 40201-0500 AS SHOWN IN THE BID SCHEDULE.
21. ANY EXISTING OR NEW ROADSIDE FEATURES OR OTHER IMPROVEMENTS NEGLIGENTLY DAMAGED BY THE CONTRACTOR, DURING CONSTRUCTION, SHALL BE RESTORED/REPLACED IN EQUAL OR BETTER CONDITION AT THE CONTRACTOR'S EXPENSE.
22. REMOVAL AND RE-ATTACHMENT OF FENCING REQUIRED TO COMPLETE SPECIFIED WORK AT DRAINAGE STRUCTURES, CATTLE GUARDS, GATES, TURNOUTS, RIPRAP, ETC., SHALL BE CONSIDERED INCIDENTAL TO THE BID ITEMS RELATED TO THE WORK. REMOVAL AND RE-ATTACHMENT OF FENCING REPAIRS, TEMPORARY FENCING AND/OR REMOVAL AND RE-ATTACHMENT OF FENCING, SHALL BE COMPLETED IN THE SAME WORK DAY SO AS NOT TO ALLOW LIVESTOCK ONTO THE PROJECT. IF WIRE TENSION IS LOST IN THE EXISTING FENCE, THE CONTRACTOR SHALL RE-TIGHTEN THE FENCE AS DIRECTED BY THE COR/AOTR.
23. THE CONTRACTOR SHALL REMOVE BIA ROUTE N2007 EXISTING ROADSIDE SIGNS THAT INTERFERE WITH ROAD CONSTRUCTION AND/OR CONTRADICT THE CONTRACTOR'S TEMPORARY TRAFFIC CONTROL PLAN, AT THE START OF THE CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE COR/AOTR AT LEAST THREE (3) WORKING DAYS IN ADVANCE OF SUCH SIGN REMOVAL. THESE ROADSIDE SIGNS SHALL BE SALVAGED AND TAKEN TO THE NEW LANDS MAINTENANCE YARD. SIGNS NEEDED FOR SAFETY/INFORMATION SHALL BE TEMPORARILY RESEAL AS DIRECTED BY THE COR/AOTR. ALL COUNTY ROUTE SIGNS SHALL BE REMOVED AND STOCKPILED, AND NOTIFY THE MAINTENANCE DEPARTMENT AT (928)-688-2928 FOR MATERIAL PICK UP. THIS WORK SHALL BE CONSIDERED AN INCIDENTAL OBLIGATION OF THE CONTRACTOR.
24. GRADE AND SHAPE THE SHOULDER AND DITCHES (AS DIRECTED BY COR/AOTR) FROM THE SUBGRADE HINGE POINTS TO AND INCLUDING THE EXISTING DITCH LINE AREAS FOR THE CONSTRUCTION OF RIPRAP DITCH LININGS, SLOPE PROTECTION, AND RUNDOWNS. THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE RIPRAP ITEMS SHOWN IN THE BID SCHEDULE.
25. AT MAJOR DRAINAGE STRUCTURES AND LIVESTOCK PASS LOCATIONS THAT SPECIFY REPLACING OR INSTALLING WING FENCES, THE CONTRACTOR SHALL TIE WING FENCES TO THE EXISTING STRUCTURES IN ACCORDANCE WITH THE DETAILS ON SHEET 28 OF 63. IF NO CORNER FENCE POST/BRACE/STRAIN EXISTS AT TIE-IN TO RIGHT-OF-WAY FENCE, THE CONTRACTOR SHALL INSTALL A STRAIN POST ASSEMBLY AS PER PLAN SHEET 28 OF 63. ANY EXISTING CATTLE PASS CLOSURES ARE TO BE REMOVED. THIS WORK TO BE INCIDENTAL TO BID ITEM 61921-1000, AND NO ADDITIONAL PAYMENT SHALL BE MADE.
26. ALL RIGHT-OF-WAY REFERENCE MARKERS SHALL BE LABELED IN THE ENGLISH UNITS OF MEASURE, ALL EXISTING AND NEW BRASS CAPS SHALL BE STAMPED WITH BOTH ALIGNMENT STATIONING AND ELEVATIONS IN ENGLISH, UNLESS OTHERWISE NOTED UNDER SECTION 152 OF THE SUPPLEMENTAL SPECIFICATIONS. ANY EXISTING R/W MONUMENTS AND BRASS CAPS MISSING SHALL BE RE-SURVEYED IN TO THEIR ORIGINAL POSITION AND LABELED AND STAMPED ACCORDINGLY. ALL EXISTING REFERENCE MARKERS SHALL BE SAND BLASTED, CLEAN, AND REPAINTED WITH ENGLISH STATIONS. ANY MISSING OR DAMAGED MARKERS SHALL BE RE-SURVEYED AND REPLACED. THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEMS 62101-0000 AND 62102-0000.
27. DUE TO NARROW RIGHT-OF-WAY WIDTHS, THE COMPLETE TURNOUT RADIUS CAN NOT BE CONSTRUCTED AT NUMEROUS TURNOUTS. AT THESE LOCATIONS THE CONTRACTOR SHALL CONSTRUCT THE PLANNED RADIUS, BUT END THE RADIUS AT THE RIGHT-OF-WAY LIMIT. THE ACTUAL TURNOUT WIDTH (AT THE RIGHT-OF-WAY LINE) WILL BE WIDER THAN THE WIDTH GIVEN ON THE PLANS.
28. THE GEO-TECHNICAL REPORT FOR THIS PROJECT SHALL BE PROVIDED UPON WRITTEN REQUEST FROM THE CONTRACTOR THRU COR/AOTR.
29. ROADWAY ENDAREA AND PIPE CROSS SECTION DRAWINGS WILL BE PROVIDED IN EITHER HARD COPY OR ELECTRONIC FORMAT UPON WRITTEN REQUEST FROM THE CONTRACTOR THRU CO/AO.
30. ANY EXISTING MAIL BOXES, ADVERTISING BILLBOARDS, OR HOUSE ADDRESS SIGNS LOCATED ALONG THE ROADWAY PRISM SHALL BE REMOVED AND RE-INSTALLED OUTSIDE OF THE RIGHT-OF-WAY LIMIT OR AS DIRECTED BY THE COR/AOTR. THE CONTRACTOR SHALL NOTIFY THE US-POSTAL SERVICE AND ATTEMPT TO CONTACT ALL AFFECTED RESIDENTS TEN (10) WORKING DAYS PRIOR TO RESETTING MAIL BOX (ES). THIS WORK SHALL BE INCIDENTAL TO BID ITEM 20304-1000.
31. AT THE COMPLETION OF THE CONSTRUCTION, THE CONTRACTOR SHALL INSPECT THE INTERIOR OF ALL NEWLY INSTALLED OR EXTENDED/CLEANED CULVERTS, CATTLEGUARDS, AND/OR OTHER EXISTING DRAINAGE STRUCTURES. THESE STRUCTURES SHALL BE MAINTAINED IN A CLEAN CONDITION, FREE OF SILT AND OTHER DEBRIS UNTIL FINAL ACCEPTANCE OF THE PROJECT. THIS WORK SHALL BE CONSIDERED AN INCIDENTAL OBLIGATIONS OF THE CONTRACTOR UNDER THE APPROPRIATE BID ITEMS, FOR SECTIONS 602, 603, 607, AND 619.
32. THERE ARE NUMBER OF LOCATIONS WHERE RIPRAP, CHANNEL FLOWLINE GRADING, TURNOUTS, ETC., WILL REQUIRE WORK AND IMPROVEMENTS PLACED THROUGH AND BEYOND THE RIGHT-OF-WAY FENCING LOCATIONS. IN THESE LOCATIONS, THE RIGHT-OF-WAY FENCING SHALL BE ADJUSTED (POST SPACING, VERTICAL ALIGNMENT, POST INSTALLATIONS THROUGH RIPRAP, RIGHT-OF-WAY MONUMENT/MARKER ADJUSTMENT, ETC.) AS DIRECTED BY THE COR/AOTR. THIS WORK TO BE INCIDENTAL TO BID ITEM 61901-1000, 62101-0000, AND 62102-0000, AND NO ADDITIONAL PAYMENT WILL BE MADE.
33. IT IS EXPECTED A REVISED/FINAL RIGHTS-OF-WAY GRANT OF EASEMENT BE DEVELOPED DURING THE CONSTRUCTION OF THE N2007 PROJECT. THE CONTRACTOR SHALL NOT SURVEY FOR OR INSTALL R.O.W. MONUMENTS AND MARKERS OR FENCINGS UNTIL EXPRESSLY APPROVED BY THE NRDOT DIVISION MANAGER. RIGHT-OF-WAY FENCING CAN BE PLACED AT ALL ARCHAEOLOGICAL SITES IF SPECIFIED ON THE PLANS.

**REVISED: 08-15-2016**

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF INDIAN AFFAIRS  
NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

**GENERAL NOTES**

DRAWN BY: Peterson.Yazzie DATE: 7/16/2011  
DESIGNED BY: NRDOT DATE: 7/16/2011  
REVISED: 8/15/2016 BY: Peterson.Yazzie  
ANNOTATION SCALE: Full Size 1=1  
FILENAME: Sht\_3\_General Notes\_ 012813.dgn



ROADWAY AND BRIDGE ESTIMATED QUANTITIES

Table with columns: ITEM NO., DESCRIPTION, N2007-QUANTITY, Frontage/Access Rd., RIO PUERCO Bridge, UNIT. Lists various construction items like Mobilization, Roadway Excavation, Aggregate Base Course, etc.

Table with columns: Description, Location, Offset, New aggregate base course, Aggregate stabilization Roadbed, HACP (ton), Asphalt Paving (ton), Asphalt Prime Coat (ton), Remark. Lists detailed quantities for various roadway sections and turnouts.

Summary table with columns: REGION (NAVAJO), STATE (ARIZONA), RESERVATION (NAVAJO), ROUTE (N2007), PROJECT NO. (N2007(1-1)2&4), SHEET (4), TOTAL SHEETS (63).

ITEM 61903-1210 - 4 UNIT CATTLEGUARD NO GATE. Table with columns: STATION, LOCATION, DESCRIPTION. Includes entries for station 19+25.0 and 57+82.7.

ITEM 20304-1000 - REMOVAL OF STRUCTURE & OBSTRUCTIONS

Table with columns: STATION, LOCATION, REMARKS. Details removal of structures and obstructions at various stations along the roadway.

ITEM 20401-0000 - EARTHWORK QUANTITIES

Table with columns: STATION - STATION, CUT (yd³), FILL (yd³), BORROW (yd³), WASTE (yd³). Shows earthwork quantities for various station ranges.

\* 20% Shrinkage Factor applied

ITEM 61902-0010 - 16' TURNOUT NO GATE -9 REQ'D.

Table with columns: STATION, LOCATION, DESCRIPTION. Lists details for reconstructing 16' turnouts at various stations.

ITEM 61902-0020 - 24' TURNOUT NO GATE - 7 REQ'D.

Table with columns: STATION, LOCATION, DESCRIPTION. Lists details for reconstructing 24' turnouts at various stations.

ITEM 60701-1000 - REMOVING, CLEANING, STOCKPILING SALVAGEABLE CSPC

Table with columns: STATION, LOCATION, SIZE, REMARKS. Details removal and stockpiling of CSPC at various stations.

ITEM 61902-1300 - 14' TURNOUT w/TYPE 1 GATE

Table with columns: STATION, LOCATION, DESCRIPTION. Details reconstructing 14' turnouts with Type 1 gates.

ITEM 61901-1000 - BARBED WIRE FENCING

Table with columns: STATION TO STATION, LOCATION, REMARKS. Details barbed wire fencing at various stations.

61701-5000; GUARDRAIL SYSTEM, SGR-04b, TYPE PDE WITH STK 350 TERMINAL SECTION

Table with columns: STATION TO STATION, LOCATION, LENGTH (ft), Remarks. Details guardrail system installation at various stations.

ITEM 61903-1100 - 24' TURNOUT w/3 UNIT CATTLEGUARD & TYPE II GATE

Table with columns: STATION, LOCATION, DESCRIPTION. Details reconstructing 24' turnouts with cattleguard and Type II gate.

ITEM 61903-0810 - 40' Turnout w/No Gate

Table with columns: STATION, LOCATION, DESCRIPTION. Details reconstructing 40' turnout with no gate.

ITEM 61921-0000 - REMOVE AND RESET FENCE @ 675 L.F.

Table with columns: STATION TO STATION, LOCATION, REMARKS. Details removing and resetting fence at various stations.

ITEM 61901-2100 - CHAIN LINK FENCE w/2-12' SWINGING GATE

Table with columns: STATION TO STATION, LOCATION, DESCRIPTION. Details installing chain link fence with swinging gates.

ITEM 62901-1100 - EROSION CONTROL MATTING, TYPE IV

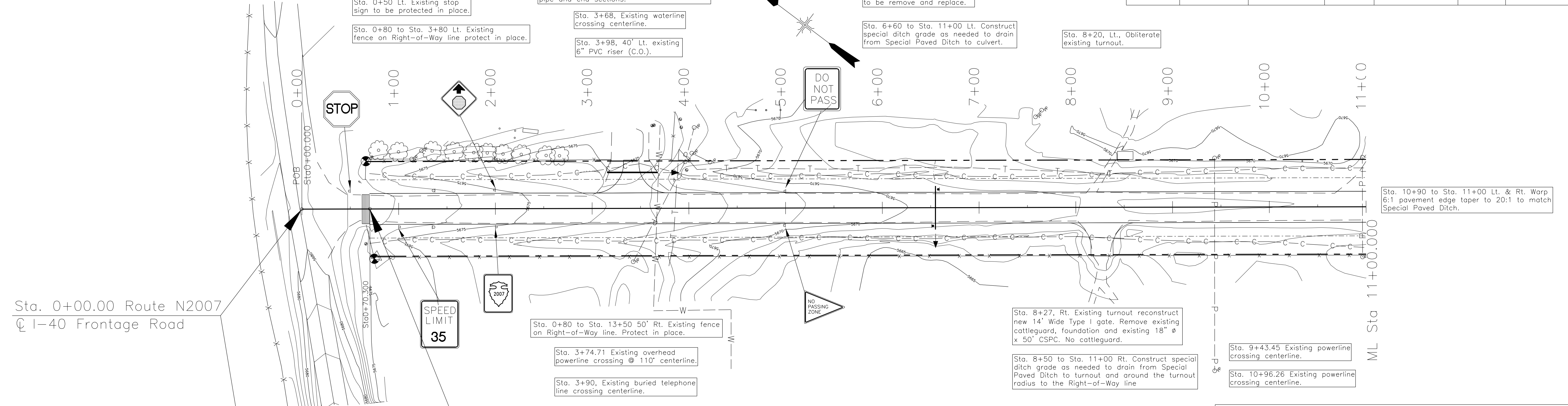
Table with columns: STATION, LOCATION, HEIGHT, LENGTH, 2:1 Factor, QUANTITY (S.Y.). Details erosion control matting quantities.

REVISED ON 8/16/2016

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS. ESTIMATED QUANTITIES. Includes logo and contact information for Peterson.Yazzie and Gerald.Hood.

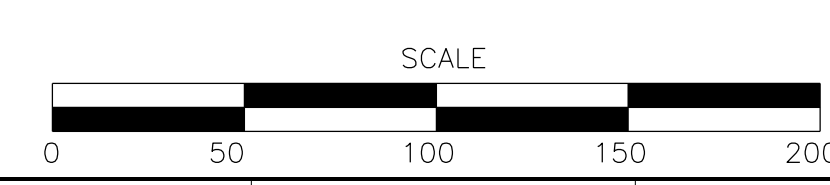
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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1,2&4	5	63

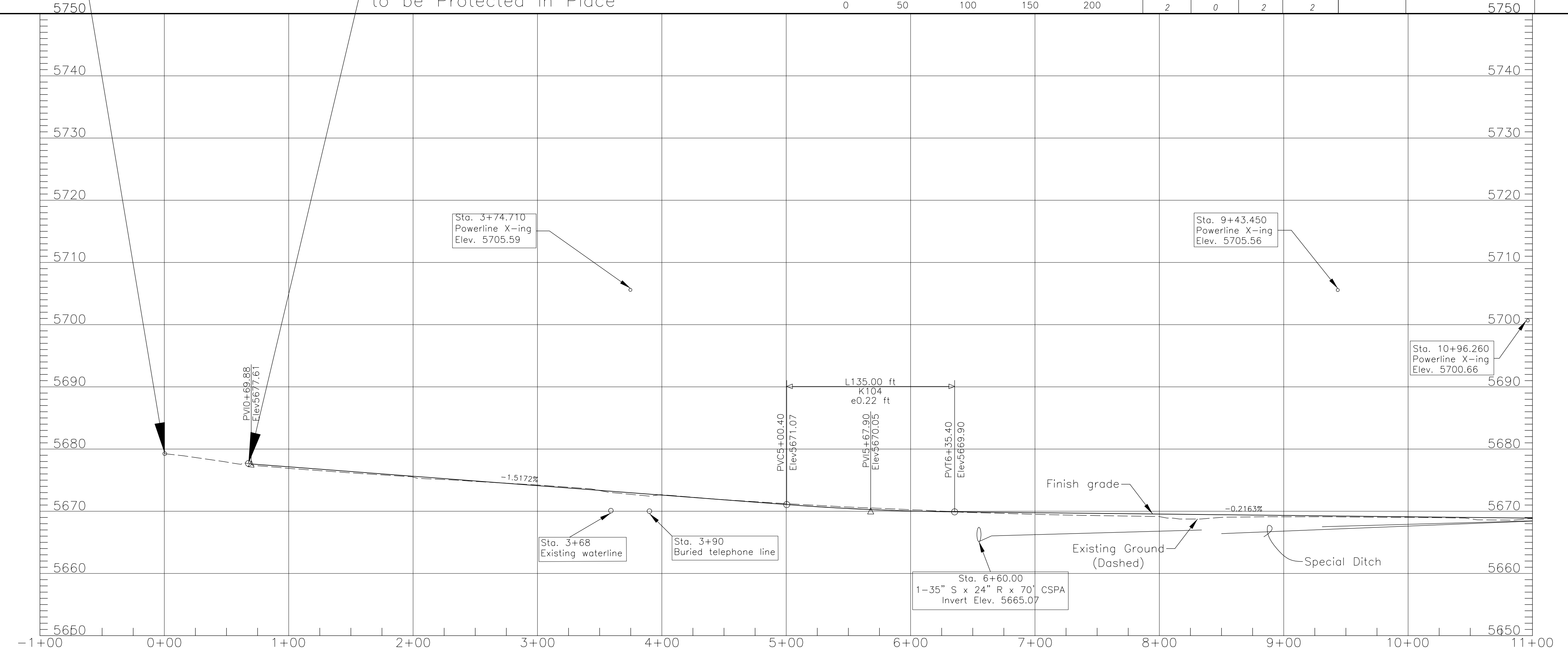


Sta. 0+00.00 Route N2007  
 ☐ I-40 Frontage Road

B.O.P. Station 0+69.88  
 Existing 5-Units Cattleguard  
 to be Protected in Place

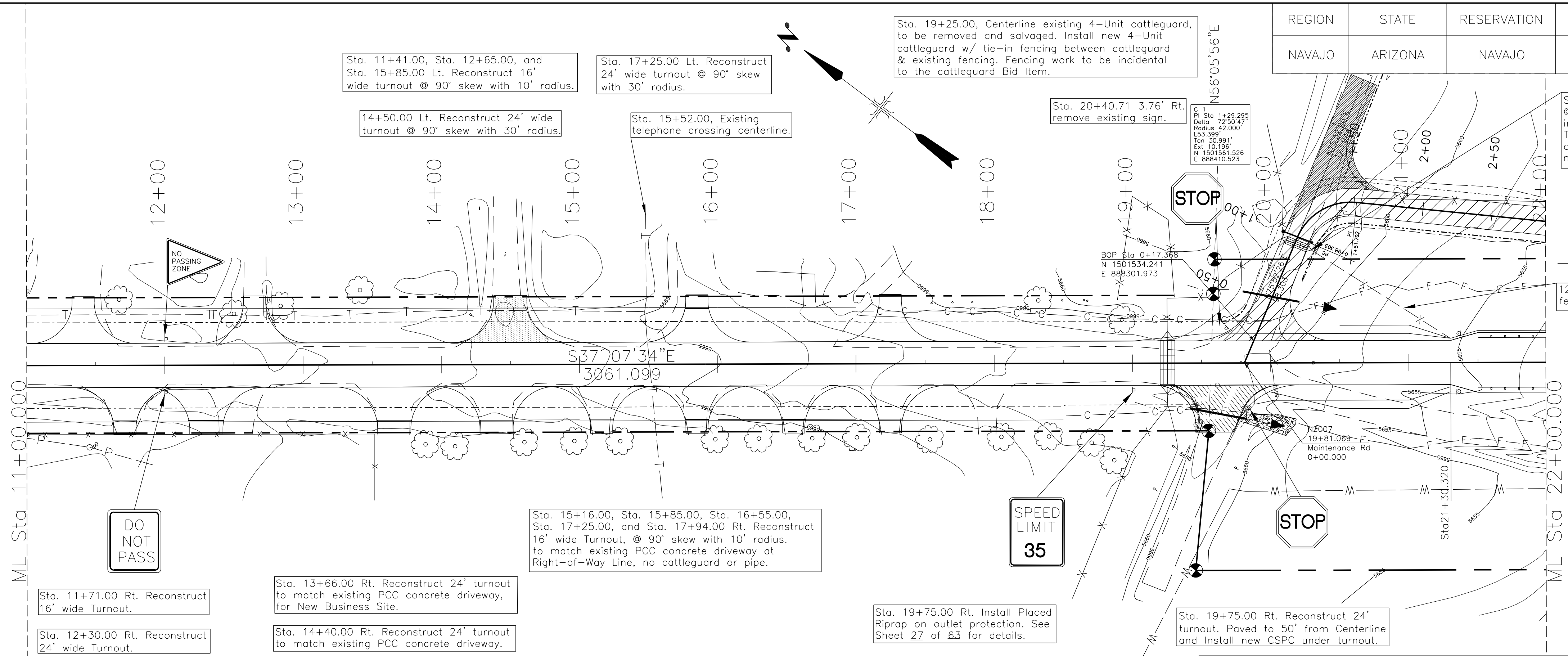


DELINEATORS		OBJECT MARKER		RIGHT OF-WAY MONUMENTS	DRAINAGE STRUCTURES				
Type "1a"	Type "1b"	Type 2	Station		Structure	Skew No.	D.A. (ac.)	Remarks	
2	0	2	2	2	3+55.00	1-24" x 68' CSPC	90°	N/A	Under I.O.-Lt.,
					6+60.00	1-35" S x 24" R x 70' CSPA	90°	N/A	Remove/Salvaged Existing 30" CSPC



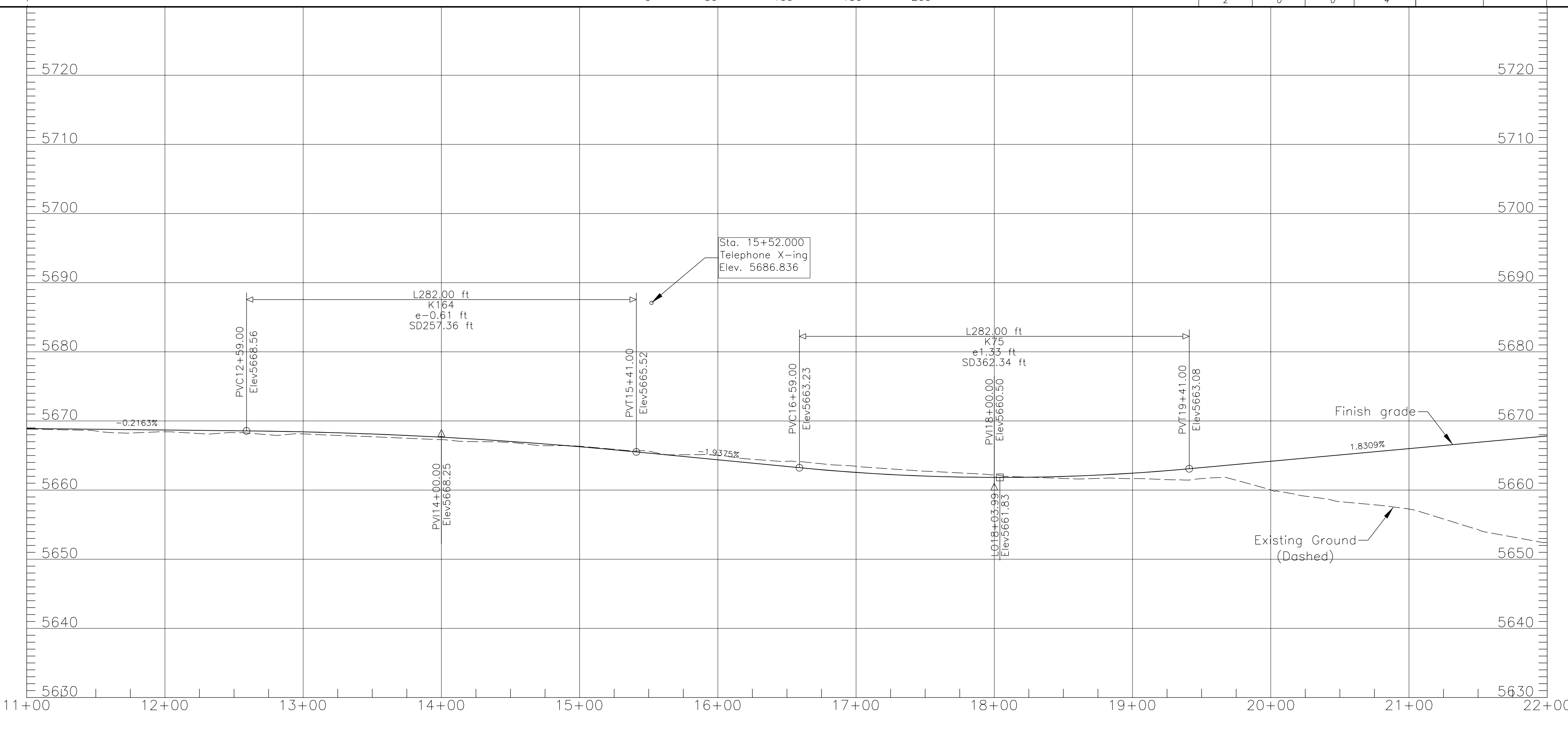
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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)2&4	6	63

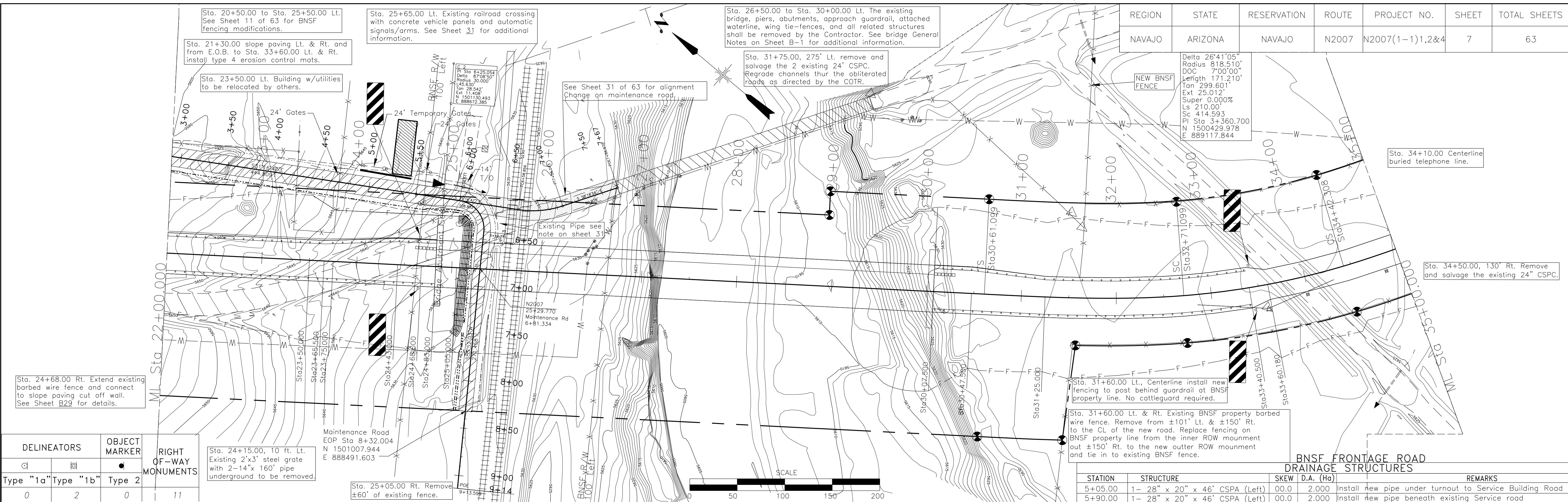


Note: The 30 ft radii for the driveways within the paved ditch area (except the roadway Sta. 14+50 Lt.) only extend from the paved ditch flow line to the right of way line as shown.

DELINEATORS		OBJECT MARKER		RIGHT OF-WAY MONUMENTS	DRAINAGE STRUCTURES		
GL	BL	Type 1a	Type 1b		Station	Structure	Remarks
2	0	0	0	4	19+75.00 Rt.	1-24" x 40" CSCP	N/A
					0+50.00 Lt.	1-28" x 20" x 50' CSPA	Install new pipe under Turnout to Service Building Road

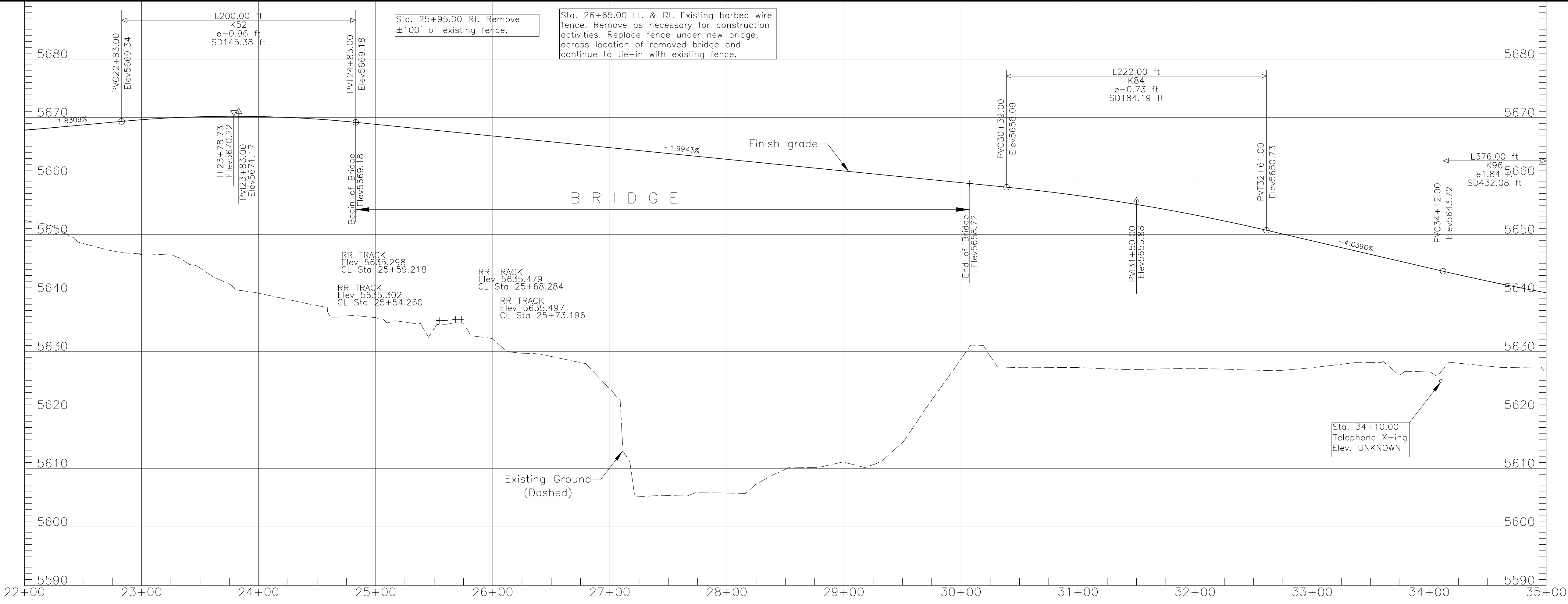


Revised 12/12/2013



DELINEATORS		OBJECT MARKER	RIGHT OF-WAY MONUMENTS
Type "1a"	Type "1b"	Type 2	
0	2	0	11

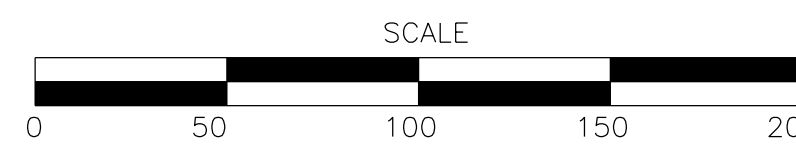
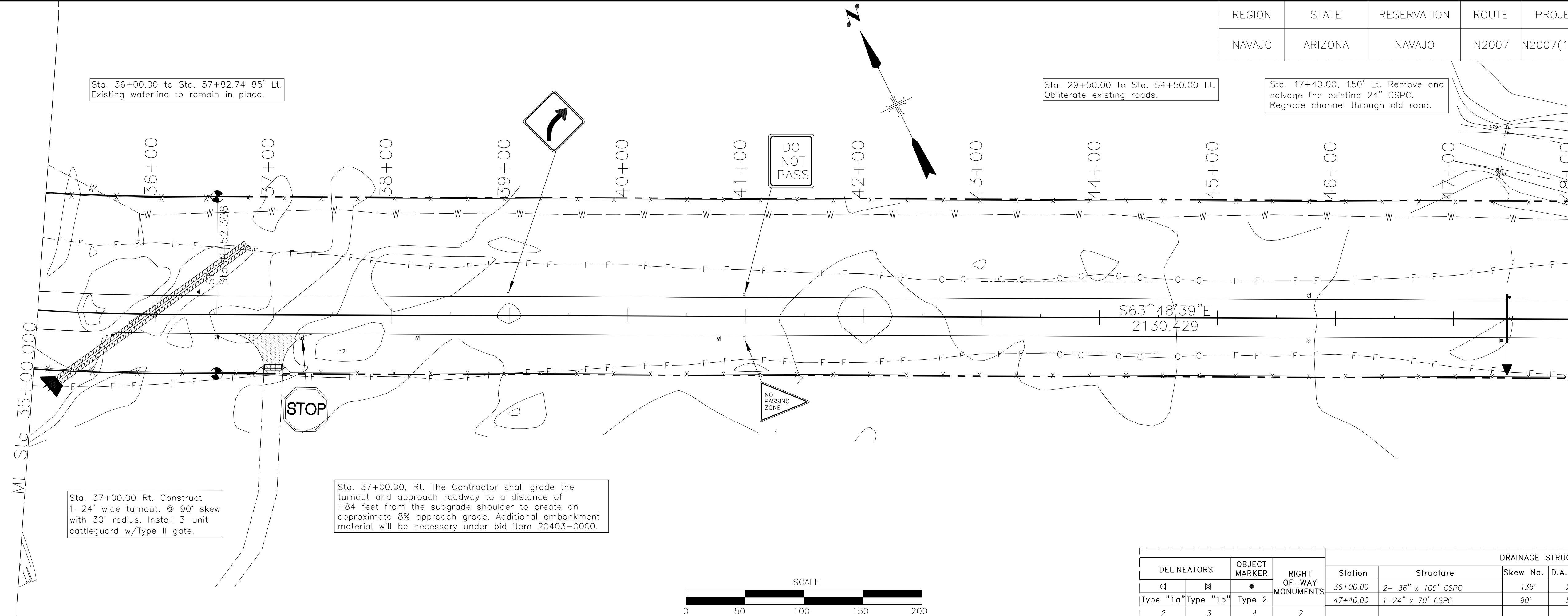
STATION	STRUCTURE	SKEW	D.A. (Ho)	REMARKS
5+05.00	1- 28" x 20" x 46' CSPA (Left)	00.0	2.000	Install new pipe under turnout to Service Building Road
5+90.00	1- 28" x 20" x 46' CSPA (Left)	00.0	2.000	Install new pipe beneath existing Service road



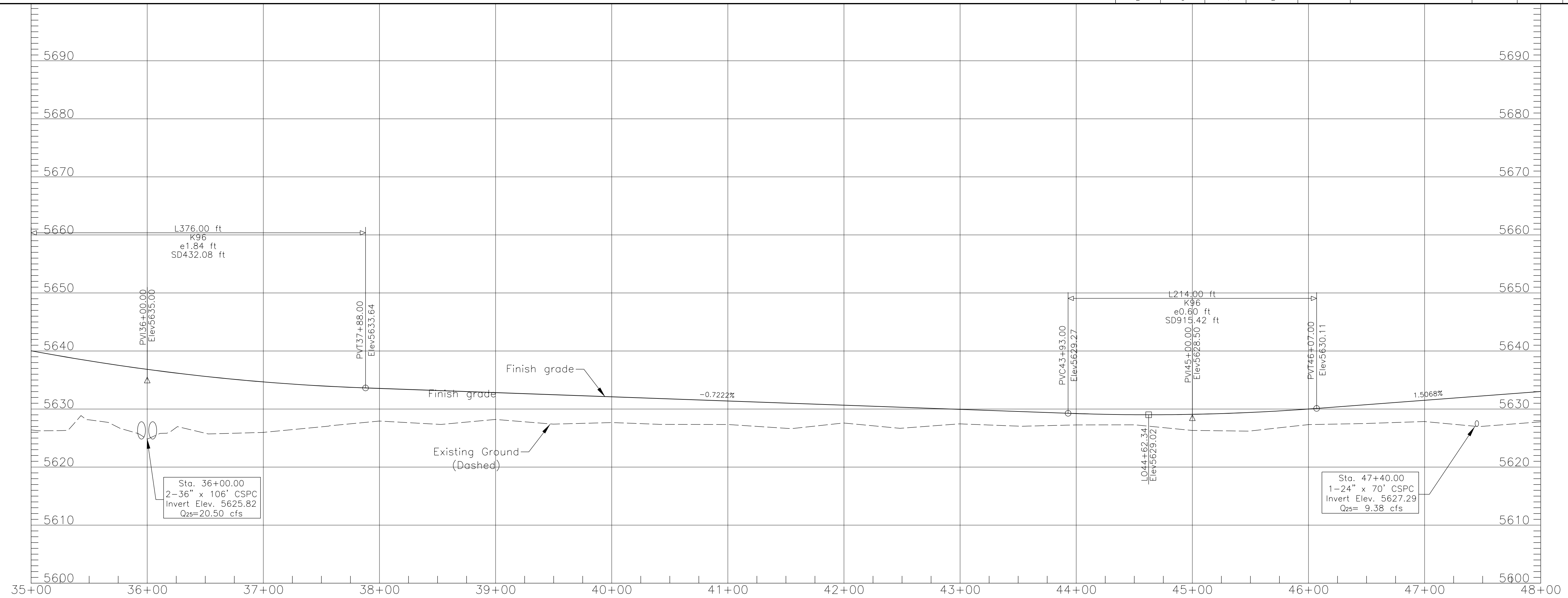
Revised  
8/15/2016

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1,2&4	8	63

REVISED:8/16/16



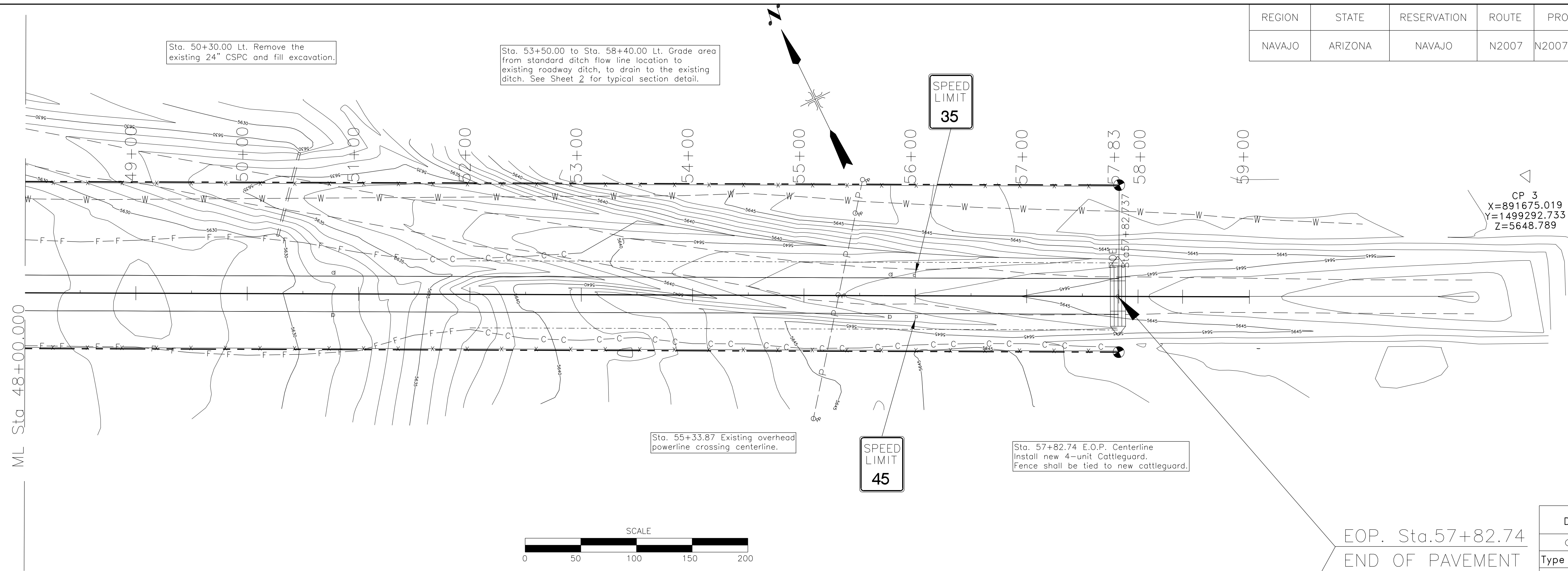
DELINEATORS				OBJECT MARKER		RIGHT OF-WAY MONUMENTS		DRAINAGE STRUCTURES			
Type "1a"	Type "1b"	Type 2	Type 3	Station	Structure	Skew No.	D.A. (Ac.)	Remarks			
2	3	4	2	36+00.00	2-36" x 105' CSPC	1.35'	20	with Riprap at outlet			
				47+40.00	1-24" x 70' CSPC	90'	5	Relief pipe, Reshape drainage			



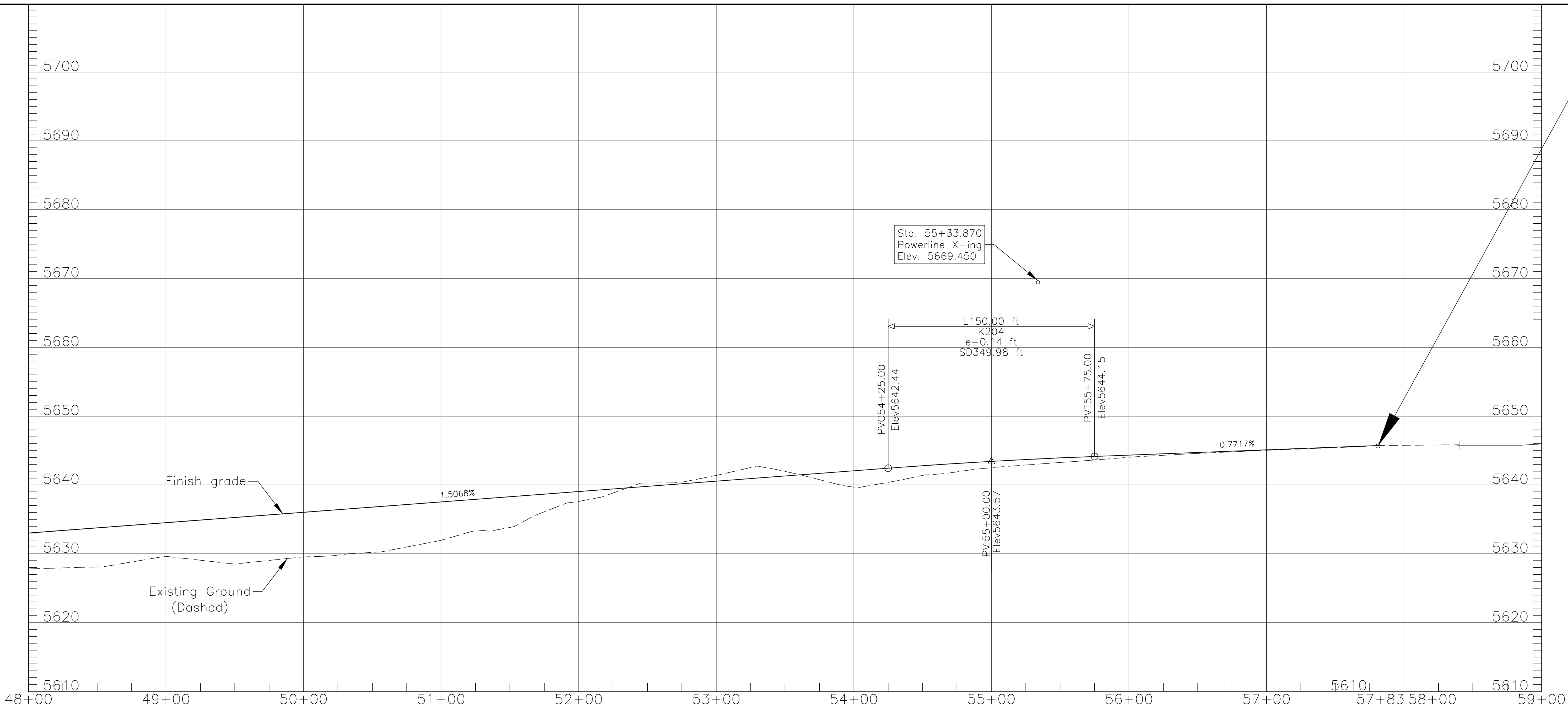


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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1,2&4	9	63



DELINEATORS		OBJECT MARKER	RIGHT OF-WAY MONUMENTS
Type "1a"	Type "1b"	Type 2	
4	0	0	2



Sta. 57+82.74 to Sta. 58+40.00 Lt. & Rt. Taper new roadway template to existing 28 ft. wide asphalt roadway. Sawcut Existing Pavement, Grade and shape ditch line tie in as needed for drainage.

EOP. Sta. 57+82.74  
END OF PAVEMENT

CP 4  
X=891746.962  
Y=1499007.058  
Z=5648.549

CP 3  
X=891675.019  
Y=1499292.733  
Z=5648.789

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1,2&4	10	63

\* SPC-NAD83-AZ-E  
CSF: 1.0003293134 (0.9996708050) U.S. SURVEY FOOT

N2007 HORIZONTAL ALIGNMENT TABLE REPORT \*

Point Type	Station	Direction	Style:	Northing	Easting	Radius	Length	Delta / Theta	Rotation Direction
POB	00+00.000		Tangent	1,503,109.49	887,089.42				
TS	30+61.099	S37°07'34"E	Tangent	1,500,668.85	888,937.01				
TS	30+61.099	S37°07'34"E	Clothoid	1,500,668.85	888,937.01				
SPI	32+01.220		Clothoid	1,500,557.13	889,021.59		210.00	7°21'00"	Left
SC	32+71.099		Clothoid	1,500,507.11	889,070.71				
SC	32+71.099		Arc	1,500,507.11	889,070.71				
PI	33+57.017		Arc	1,500,445.80	889,130.90	818.51	171.21	11°59'05"	Left
CC			Arc	1,501,080.57	889,654.75				
CS	34+42.308	S63°48'39"E	Arc	1,500,398.33	889,202.52				
CS	34+42.308		Clothoid	1,500,398.33	889,202.52				
SPI	35+12.418		Clothoid	1,500,359.59	889,260.95		210.00	7°21'00"	Left
ST	36+52.308		Clothoid	1,500,297.75	889,386.69				
ST	36+52.308	S63°48'39"E	Tangent	1,500,297.75	889,386.69				
POE	57+82.737		Tangent	1,499,357.52	891,298.41				

N2007 FRONTAGE ROAD ALIGNMENT \*

DESCRIPT	STATION	DIRECTION	NORTHING (ft)	EASTING(ft)
POB	0+00.000	N 75°52'26" E	1,501,529.971	888,285.138
PC	0+98.303	N 75°52'26" E	1,501,553.962	888,380.469
PI	1+29.295	S 31°16'47" E	1,501,561.526	888,410.523
PT	1+51.702	S 31°16'47" E	1,501,535.039	888,426.614
PC	5+96.511	S 31°16'47" E	1,501,154.886	888,657.566
PI	6+25.054	S 55°52'03" W	1,501,130.493	888,672.385
PT	6+42.141	S 55°52'03" W	1,501,114.478	888,648.760
POE	9+13.599	S 55°52'03" W	1,500,962.160	888,424.063

N2007 CONTROL POINTS \*

POINTS DESCRIPTION	STATION	LOCATION OFFSET (FT.)	NORTHING	EASTING	ELEVATION
102	33+56.704	25.012	1500429.978	889117.844	5,627.110
113	33+56.704	25.012	1500843.914	888977.977	5,626.370
122	26+38.067	-194.521	1501123.547	888836.777	5,632.681
129	29+32.510	-203.417	1500894.154	889021.587	5,631.985
808	31+63.893	-73.288	1500633.547	889056.937	5,627.260
CP1	31+52.056	-88.679	1500651.986	889061.887	5,627.424
CP2		50.209	1503016.643	887096.738	5,676.494
CP3			1499292.733	891675.019	5,648.789
CP4			1499007.058	891746.962	5,648.549

\*\* UTILITY CROSSING INFORMATION

STATION	DESCRIPTION	LOCATION	DEPTH	HEIGHT	SKEW	OWNER	REMARKS
1+10.00	Power pole with anchor	50' Left	-	-	-	Navajo Tribal Utility Authority	To Remain in Place
3+68.00	Water Line	CL	3 ft.	-	90°	Navajo Tribal Utility Authority	To Remain in place
3+74.71	Power Line	CL	-	20 ft.	110°	Navajo Tribal Utility Authority	To Remain in Place
3+90.00	Telephone Line	CL	-	-	-	Unknown	To Remain in Place
3+95.00	Power pole	47' Left	-	-	-	Navajo Tribal Utility Authority	To Remain in Place
3+98.00	6-inch PVC Riser	40' Left	-	-	-	Navajo Tribal Utility Authority	To Remain in Place
9+43.45	Power Line	CL	-	20 ft.	90°	Navajo Tribal Utility Authority	To Remain in Place
10+96.26	Power Line	CL	-	20 ft.	90°	Navajo Tribal Utility Authority	To Remain in Place
15+52.00	Telephone Line	CL	-	-	-	Casing may be required	To be relocate by owner
25+00 to 32+00	Water line	Lt. & Rt.	Varies	-	-	Navajo Tribal Utility Authority	To be relocate by owner
25+20.00	Signal control panel and battery box	30', left	-	-	-	BNSF	To Remain In Place
33+40 - 34+40	Buried Telephone Line	Lt. & Rt.	-	-	60°	Table Top Telephone Co.	To Remain In Place
35+50 to 57+83	Water Line	85' Left	3 ft.	-	-	Navajo Tribal Utility Authority	To Remain In Place
55+31.00	Power Line	CL	-	20 ft.	100°	Navajo Tribal Utility Authority	To Remain In Place

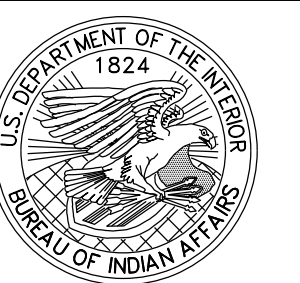
\*\* Remarks related to work by owners is work to be required by B.I.A. for Construction of Roadway and Structures. Actual work required / performed by utility owner(s) may vary.

REVISED ON  
12/12/2013

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF INDIAN AFFAIRS  
NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

ALIGNMENT TABLE AND CONTROL POINTS AND UTILITY CROSSING

DRAWN BY: Peterson.Yazzie DATE: 5/3/2010  
DESIGNED BY: NRDOT DATE: 5/3/2010  
REVISED: 1/25/2013 BY: Peterson.Yazzie  
ANNOTATION SCALE: 1:10  
FILENAME: Sht.10\_Alignment Table.dgn



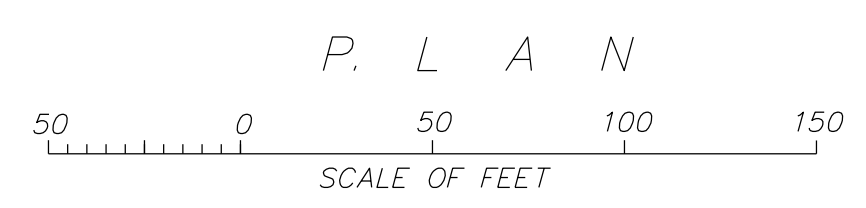
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**BNSF FRONTAGE ROAD**

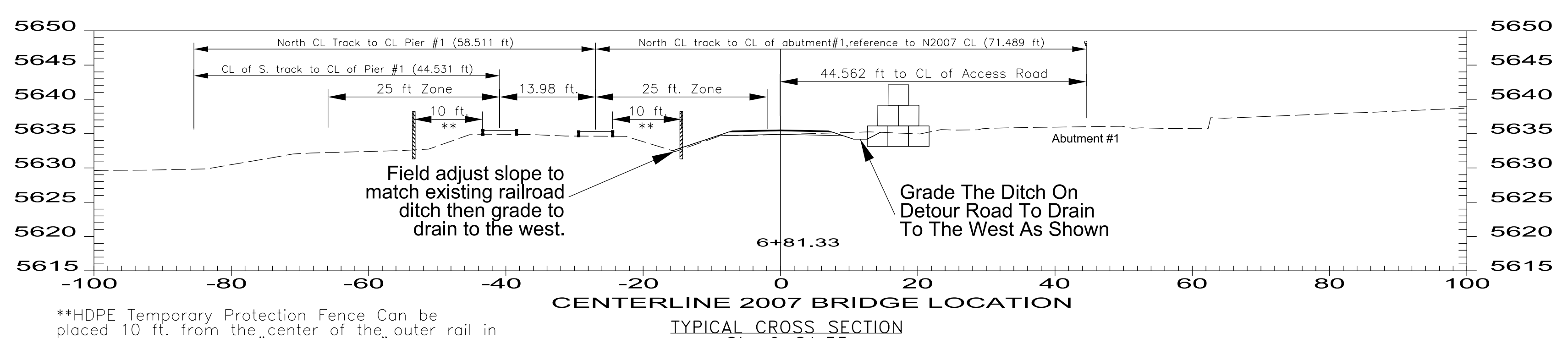
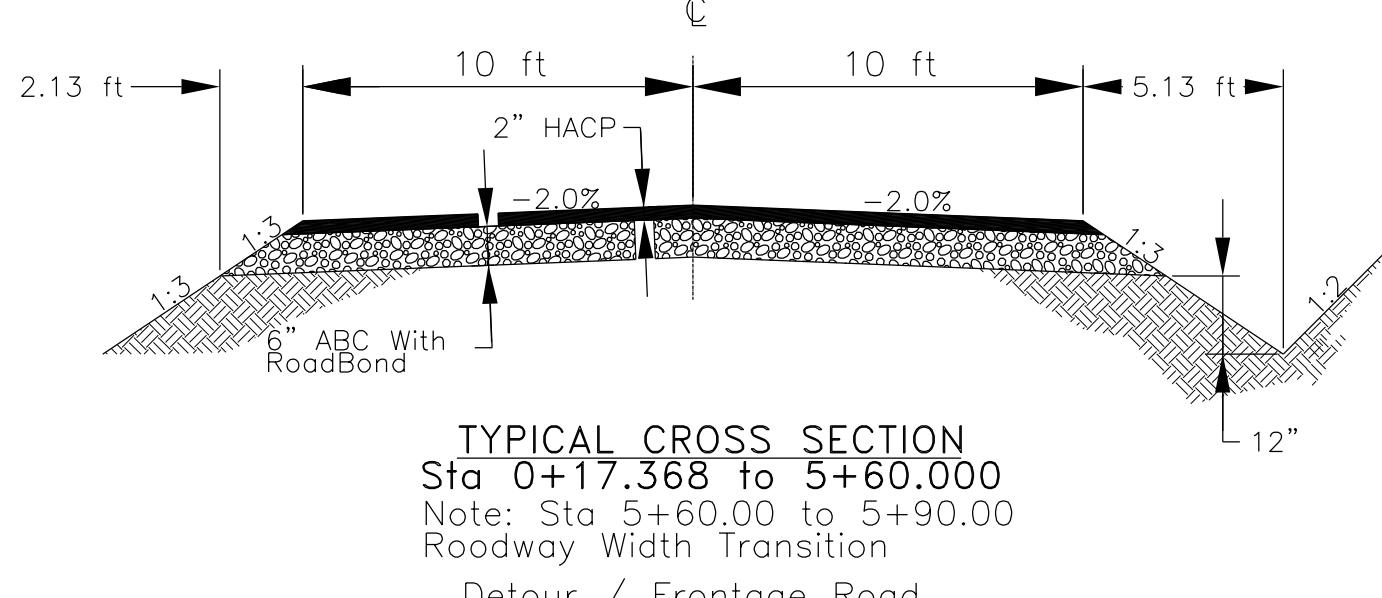
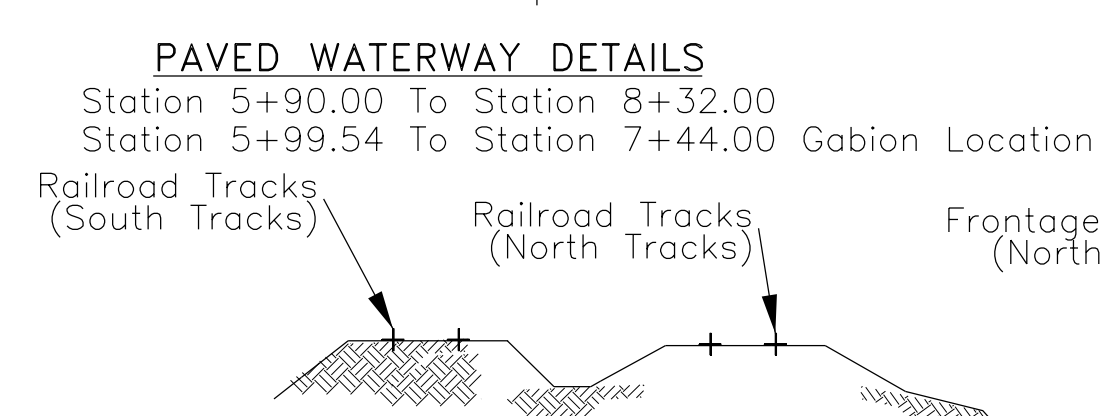
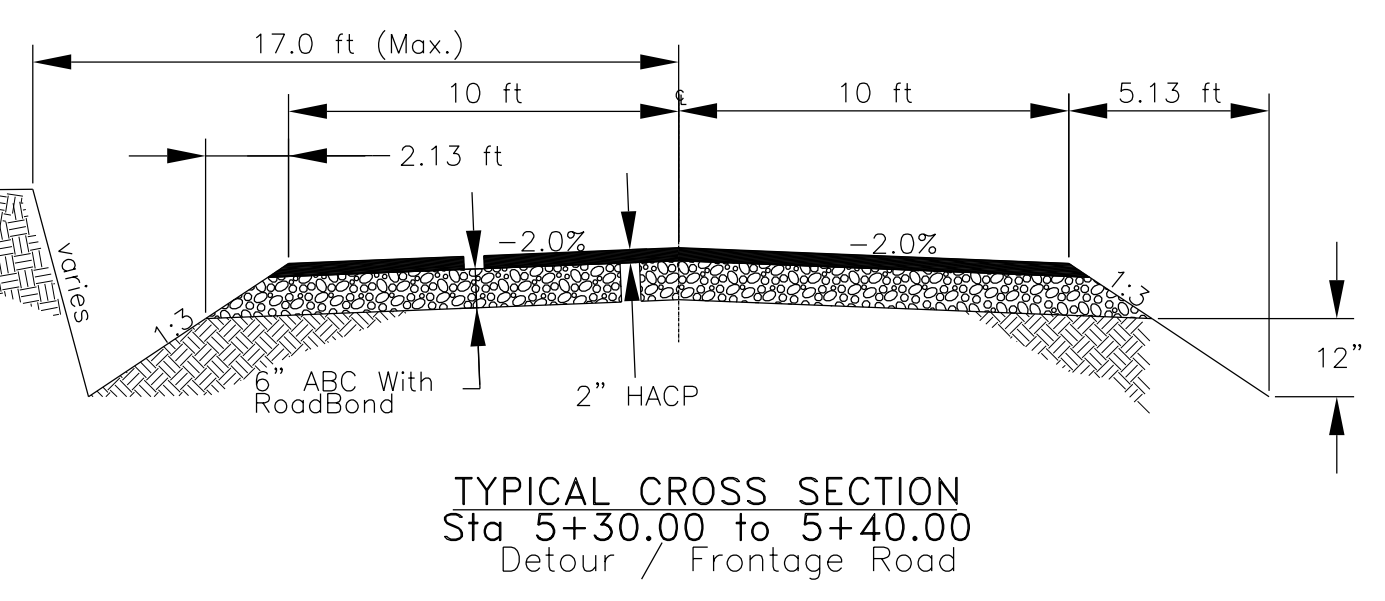
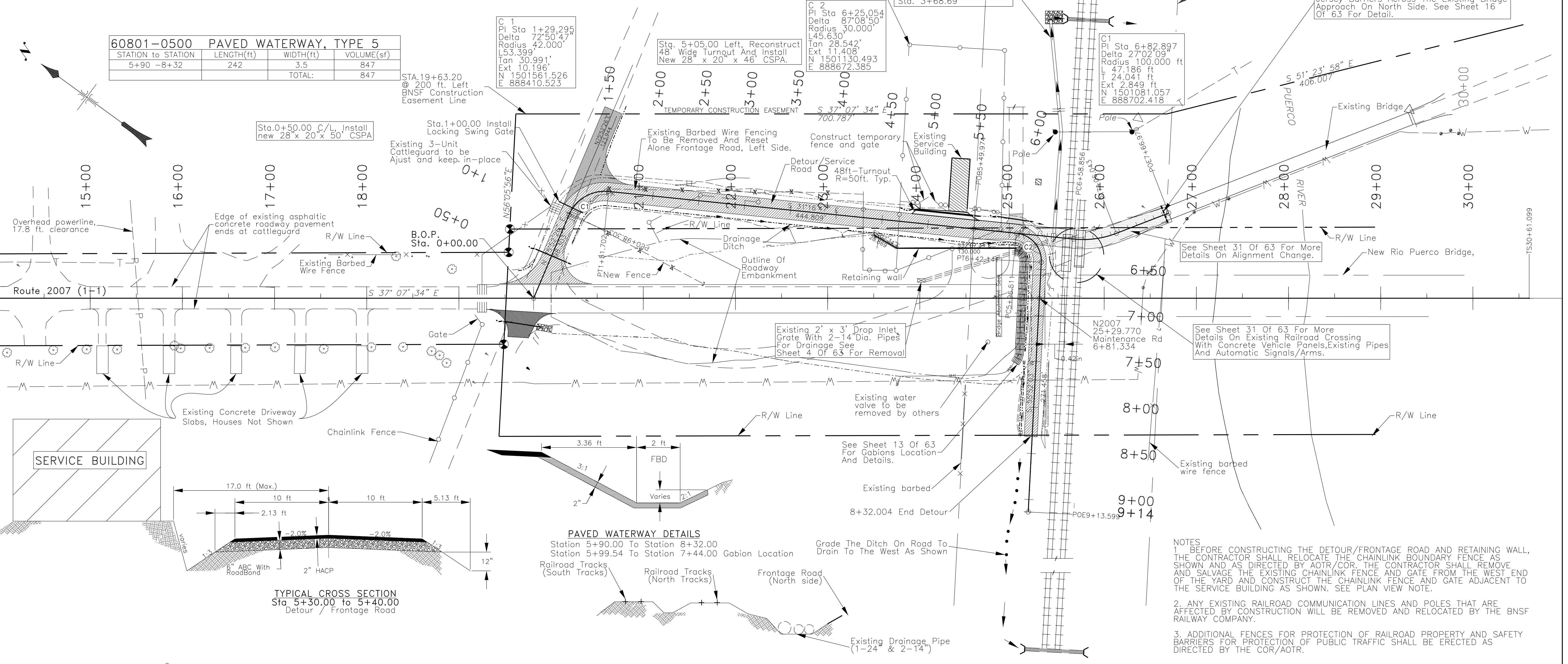
DRAINAGE STRUCTURES				
STATION	STRUCTURE	SKEW No.	D.A. (Ha.)	REMARKS
0+50.00	1- 28" x 20" x 50' CSPA (Left)	00.0	2.000	Install new pipe under turnout to Service Building Road
5+05.00	1- 28" x 20" x 46' CSPA (Left)	00.0	2.000	Install new pipe under turnout to Service Building Road
5+90.00	1- 28" x 20" x 46' CSPA (Left)	00.0	2.000	Install new pipe under turnout to existing Service road

60801-0500 PAVED WATERWAY, TYPE 5			
STATION TO STATION	LENGTH(ft)	WIDTH(ft)	VOLUME(sf)
5+90 - 8+32	242	3.5	847
TOTAL:			847

\*Sta. 23+30 To \*Sta. 24+90 Lt. Remove \*270' Of Existing Chain Link Fence Including 2 Swing Gates. Reset Fencing/Gates As Temporary Chain Fencing At Location Shown. Construct Temporary Steel Posts Installations As Directed By COR/AOTR To Provide Security And Working Gates For BNSF.



REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)2&4	11	63



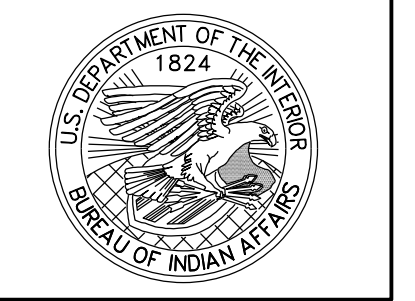
- NOTES**
- BEFORE CONSTRUCTING THE DETOUR/FRONTAGE ROAD AND RETAINING WALL, THE CONTRACTOR SHALL RELOCATE THE CHAINLINK BOUNDARY FENCE AS SHOWN AND AS DIRECTED BY AOTR/COR. THE CONTRACTOR SHALL REMOVE AND SALVAGE THE EXISTING CHAINLINK FENCE AND GATE FROM THE WEST END OF THE YARD AND CONSTRUCT THE CHAINLINK FENCE AND GATE ADJACENT TO THE SERVICE BUILDING AS SHOWN. SEE PLAN VIEW NOTE.
  - ANY EXISTING RAILROAD COMMUNICATION LINES AND POLES THAT ARE AFFECTED BY CONSTRUCTION WILL BE REMOVED AND RELOCATED BY THE BNSF RAILWAY COMPANY.
  - ADDITIONAL FENCES FOR PROTECTION OF RAILROAD PROPERTY AND SAFETY BARRIERS FOR PROTECTION OF PUBLIC TRAFFIC SHALL BE ERRECTED AS DIRECTED BY THE COR/AOTR.

REVISED ON 8/15/2016

UNITED STATES  
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NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

**FRONTAGE AND DETOUR BYPASS ROAD DETAILS**

DRAWN BY:	DESIGN2	DATE:	2/24/05
DESIGNED BY:	B.O.R.	DATE:	2/24/05
REVISED:	08/15/2016	FILENAME:	Maint-detour.dgn
BY:	DESIGN2	SCALE:	NTS



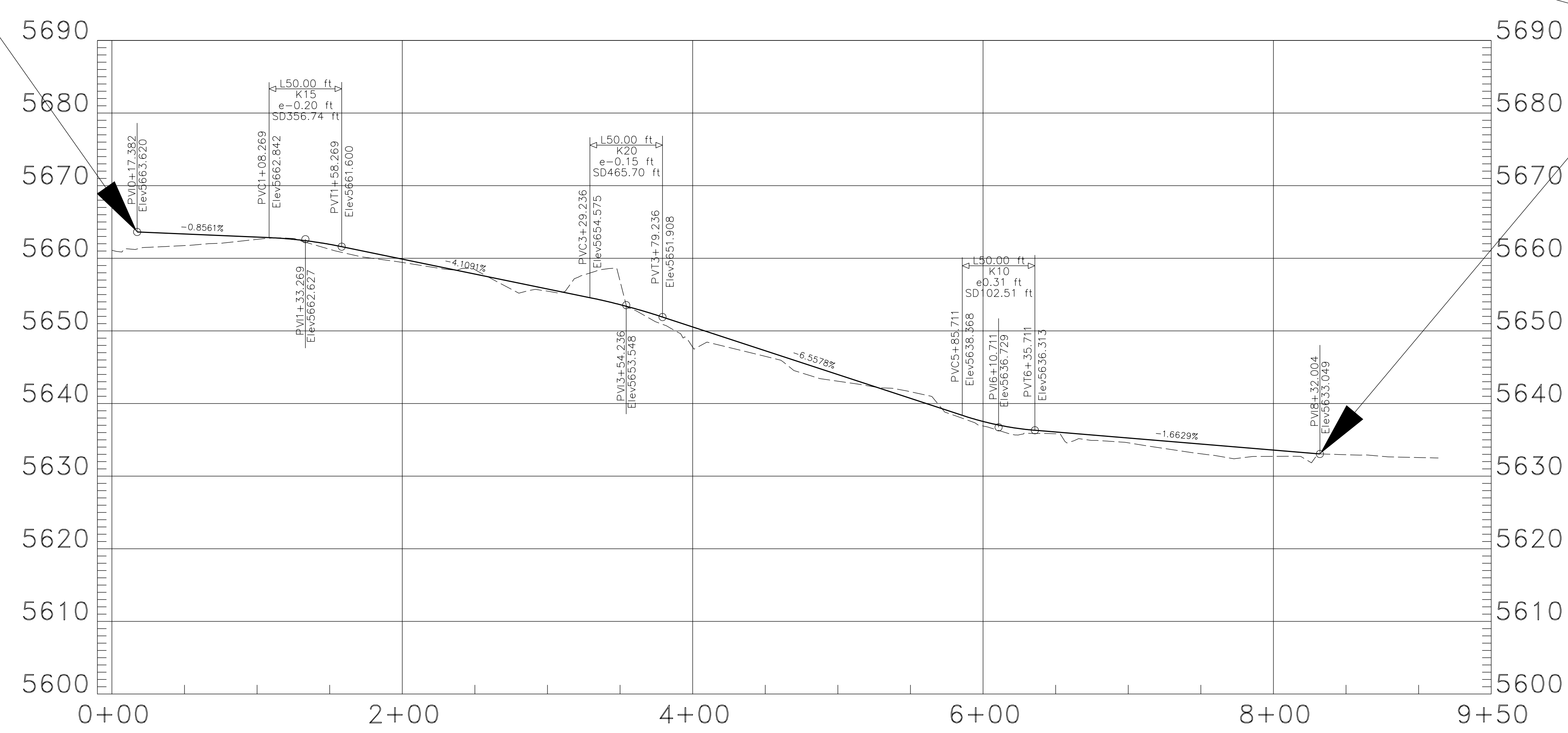
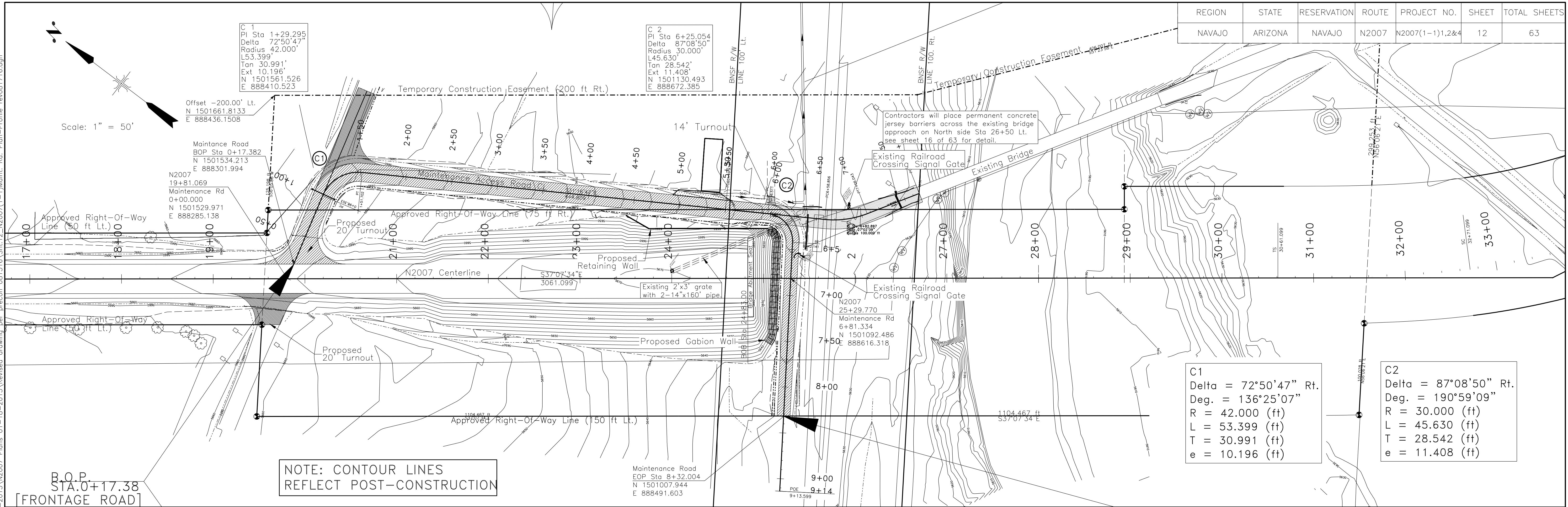
Note: The Contractor Shall Provide Drainage Ditches As Directed By COR/AOTR To Protect Railroad Property From Damage Caused By Surface Water Runoff.  
RBIA-8-001-24

\*\*HDPE Temporary Protection Fence Can be placed 10 ft. from the center of the outer rail in accordance with BNSF "Foul of Track" Zone requirements where flaggers may not be required. The Contractor must request to BNSF for the "Foul of Track" Zone requirements to be allowed.

Note: Sta. 5+60.00 to 5+90.00 Roadway Width Transition Frontage Road Under The Bridge

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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
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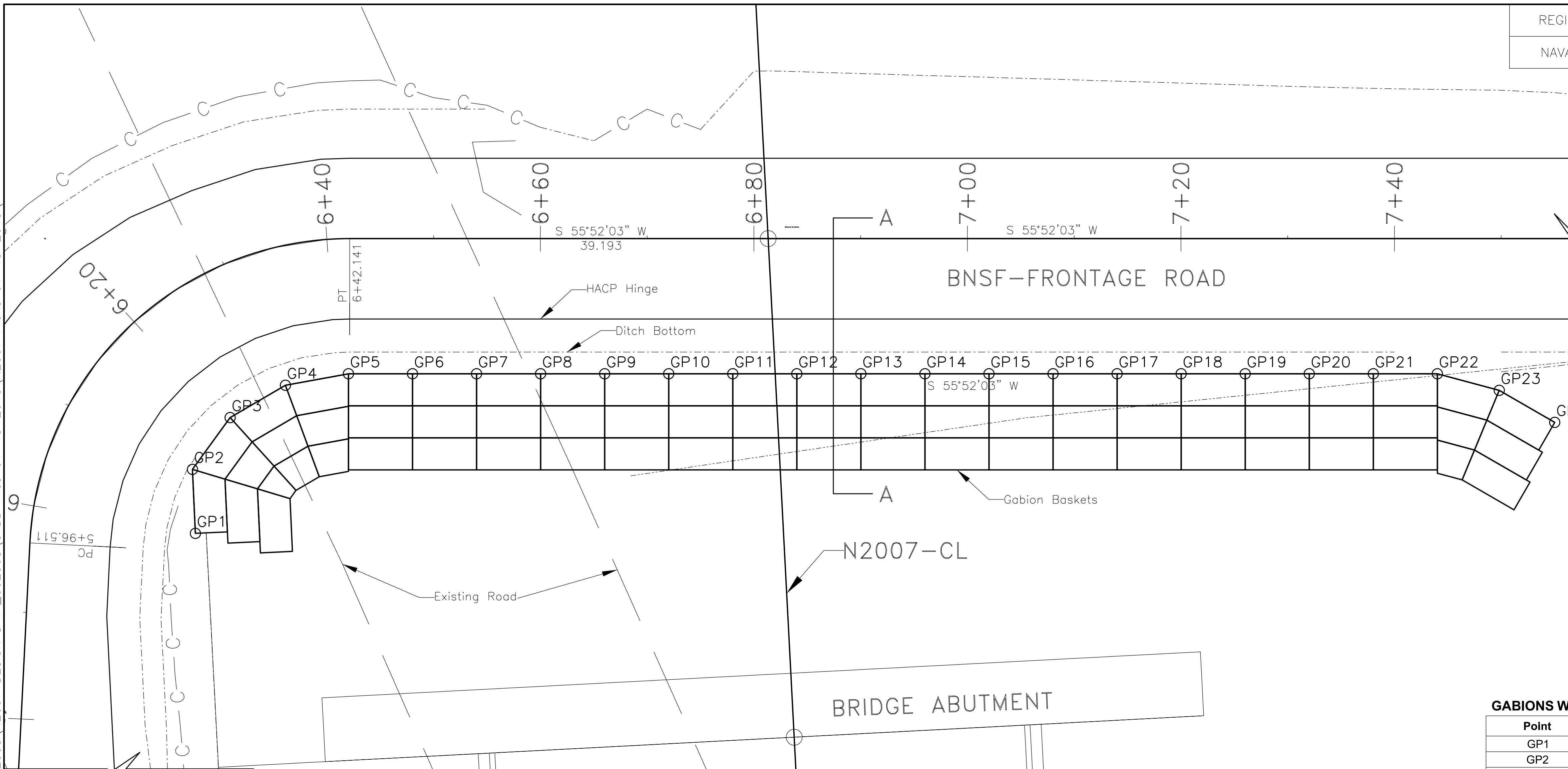


LEGEND	
	Existing Railroad X-ing Signal Gate
	Existing Waterline Valve
	Existing Traffic Signs
	Concrete Pad At Railroad X-ing
	Waterline
	Fence
	Existing Road
	Right-Of-Way Line
	Temporary Construction Easement
	Proposed Roadway CL
	Railroad Tracks
	Existing Ditch Bottom
	Existing Guardrail
	Telephone Line
	Existing Concrete Pipe With Headwalls
	Flow or Drainage Line

Revised: 8/17/2016

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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1,2,4	13	63

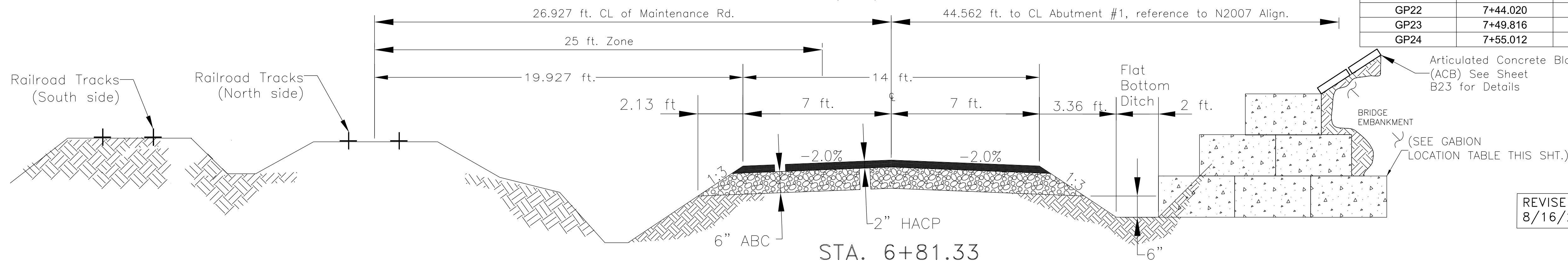
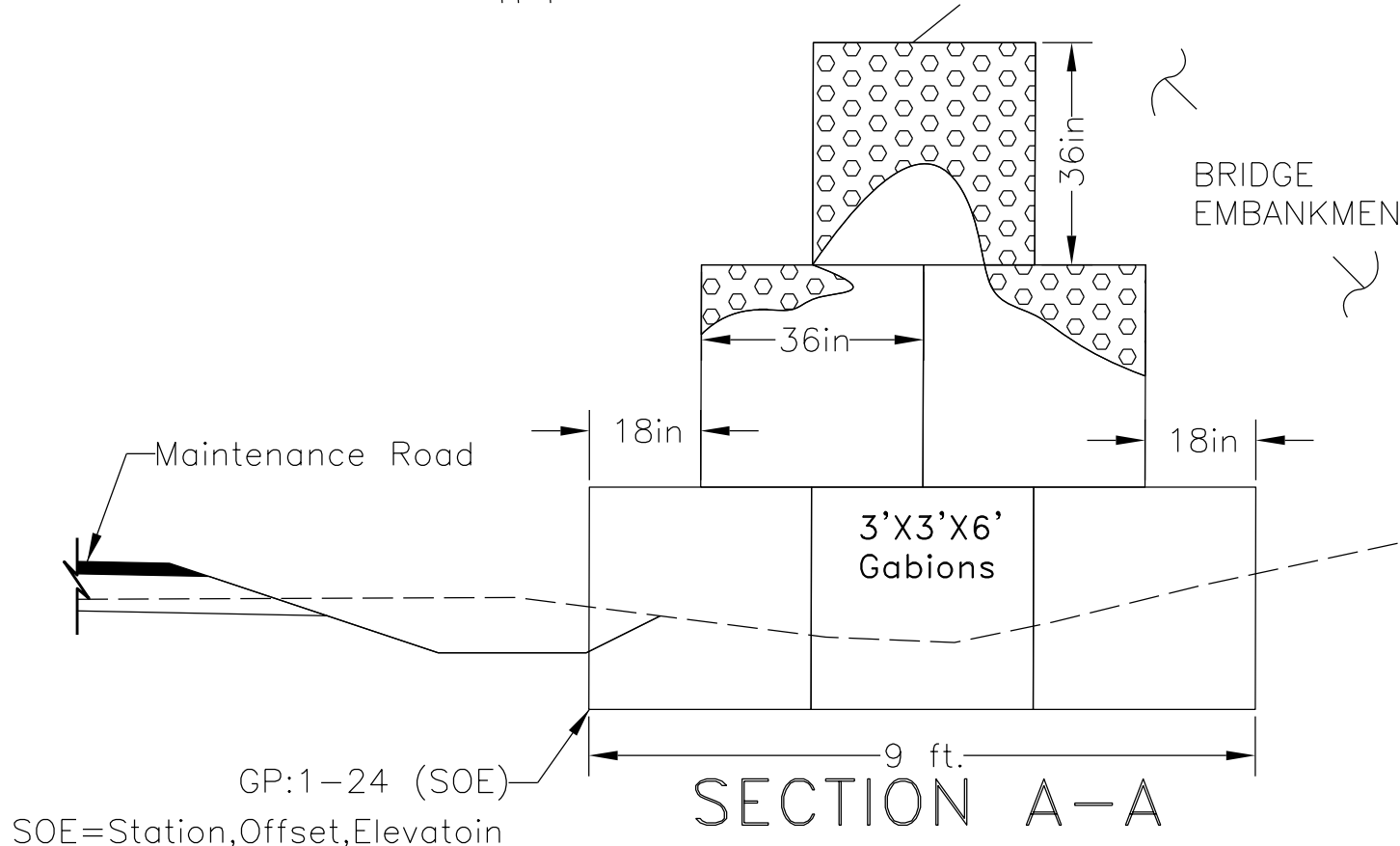


- NOTES
1. Frontage Road with retaining wall must be constructed to finish subgrade to use as detour, before bridge approach work can proceed.
  2. Any existing railroad communication lines and poles that are affected by construction will be removed and relocated by the BNSF Railway Company.
  3. Additional temporary safety fences (Orange HDPE plastic fence) for protection of railroad traffic and public traffic shall be erected as directed by the COR/AOTR 25' left and right of centerline of railroad tracks under new bridge full length.
  4. After the detour road is no longer required, the detour road shall be scarified graded and compacted as specified to construct the railroad frontage road to the plan and profile grades, shown on sheet 12 of 63. The frontage road shall be 2" of asphaltic concrete over 6" of ABC material, finish asphalt top width to be 20' wide. Shoulder and ditch slopes to match detour road typical.
  5. The Contractor shall coordinate with the BNSF railway, the relocation of the existing at-grade railroad crossing for the detour road. This coordination shall include, but not necessary be limited to the items listed in the following notes.
    - a. The BNSF Railway shall remove and relocate the existing concrete vehicle panels, the existing flashing lights and arms, and all controls to establish the detour road. See Sheet 31 of 63 for relocation details.
    - b. The Contractor shall survey and stake out the centerline of the detour road crossing, extend the existing N2007 roadway CMP to cross the detour road, place asphalt or cold mix around and between the concrete panels to anchor in place and grade the detour road as needed to access the new crossing.
    - c. The BNSF Railway estimates N2007 will need to be closed for one(1) 8 hour day in order to relocate the at-grade crossing. The Contractor shall provide all necessary traffic control and advance notification of the public for the closing and detour.
    - d. After the detour is no longer required, the contractor shall remove the approaches to the crossing as directed by the COR/AOTR in conjunction with the BNSF Railway.

BRIDGE ABUTMENT

GABIONS WALL LAYOUT TABLE

Point	Frontage Rd.	Offset (ft.)	Northing	Easting	Elevation
GP1	5+99.935	15.347	1,501,145.442	888,645.234	5633.132
GP2	6+10.539	13.048	1,501,140.636	888,648.826	5633.132
GP3	6+21.069	12.658	1,501,134.640	888,648.627	5633.132
GP4	6+31.500	12.655	1,501,129.227	888,646.039	5633.132
GP5	6+41.932	12.66	1,501,125.025	888,641.756	5633.132
GP6	6+48.020	12.66	1,501,121.658	888,636.790	5633.132
GP7	6+54.020	12.66	1,501,118.291	888,631.823	5633.132
GP8	6+60.020	12.66	1,501,114.925	888,626.857	5633.132
GP9	6+66.020	12.66	1,501,111.558	888,621.890	5633.132
GP10	6+72.020	12.66	1,501,108.191	888,616.924	5633.132
GP11	6+78.020	12.66	1,501,104.825	888,611.957	5633.132
GP12	6+84.020	12.66	1,501,101.458	888,606.991	5633.132
GP13	6+90.020	12.66	1,501,098.091	888,602.025	5633.132
GP14	6+96.020	12.66	1,501,094.725	888,597.058	5633.132
GP15	7+02.020	12.66	1,501,091.358	888,592.092	5633.132
GP16	7+08.020	12.66	1,501,087.991	888,587.125	5633.132
GP17	7+14.020	12.66	1,501,084.625	888,582.159	5633.132
GP18	7+20.020	12.66	1,501,081.258	888,577.192	5633.132
GP19	7+26.020	12.66	1,501,077.891	888,572.226	5633.132
GP20	7+32.020	12.66	1,501,074.525	888,567.259	5633.132
GP21	7+38.020	12.66	1,501,071.158	888,562.293	5633.132
GP22	7+44.020	12.66	1,501,067.792	888,557.326	5633.132
GP23	7+49.816	14.213	1,501,065.825	888,551.658	5633.132
GP24	7+55.012	17.213	1,501,065.393	888,545.674	5633.132



REVISED ON  
8/16/2016

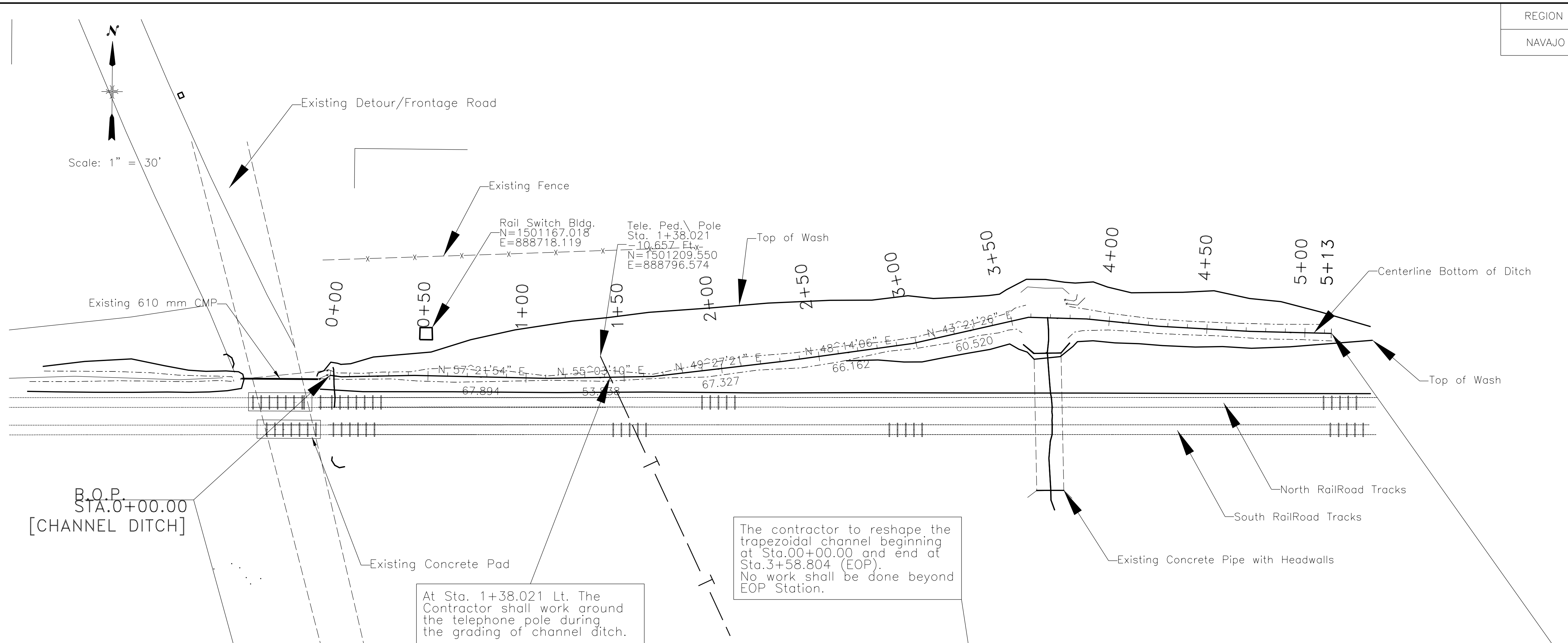
UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF INDIAN AFFAIRS  
NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

GABION LOCATION  
DETAILS

DRAWN BY: B.O.R. DATE: 06/13/11  
DESIGNED BY: Design 2 DATE: 06/03/11  
REVISED: 8/16/16 FILENAME: Gabion Details  
BY: B.O.R. SCALE: 1:10 (Horiz. & Vert.)

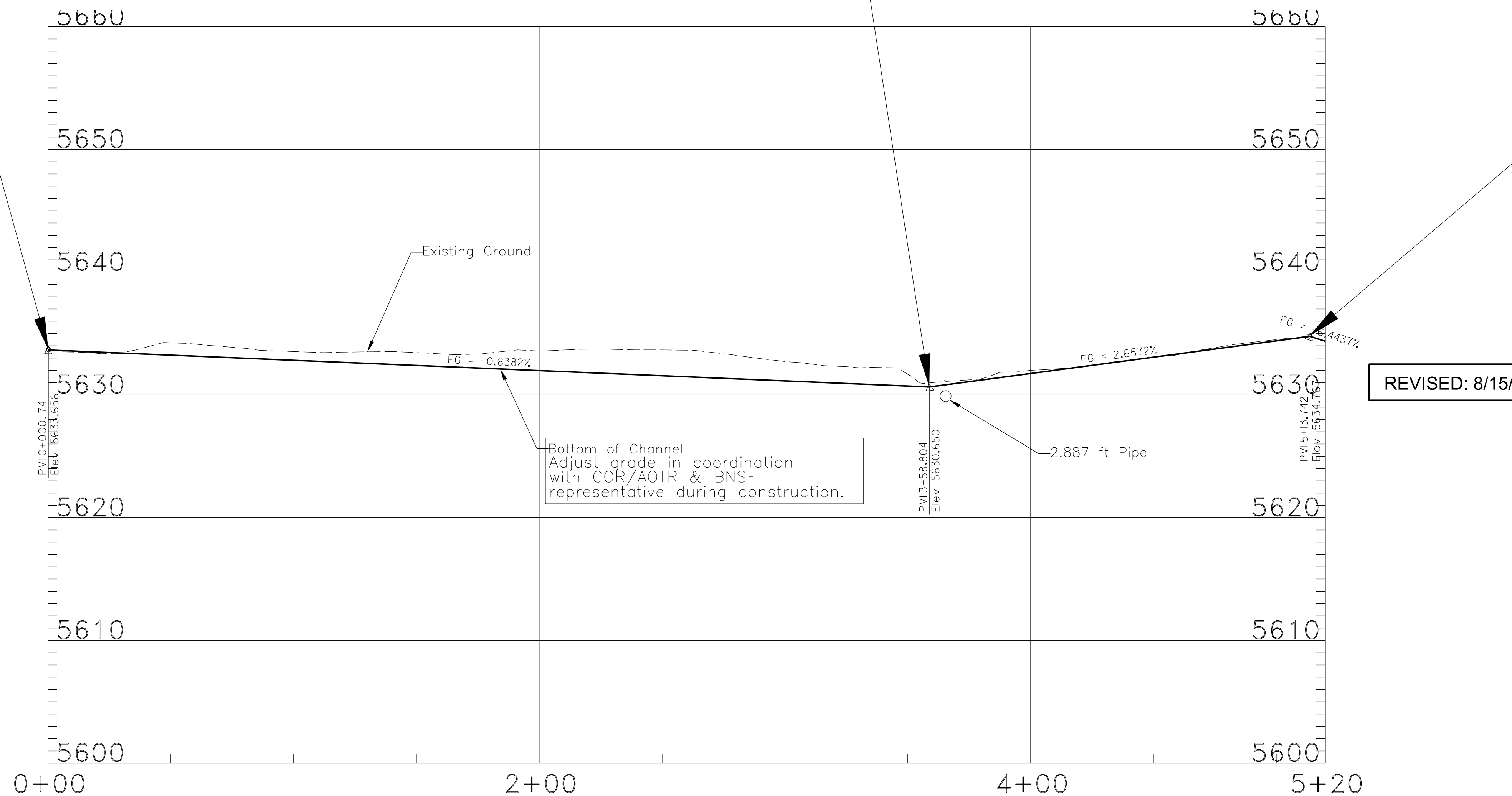
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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)2&4	14	63



Alignment Name: BNSF CHANNEL ALIGNMENT  
 Alignment Description: BNSF N. DRAINAGE CHANNEL  
 Alignment Datum: SPC-AZ83-E

Element:	Station	Northing	Easting
Linear	0+000.000	1501124.670	888687.554
POB	500		
PI	44	0+05.737	1501127.178
Tangential Direction:		N 64°04'37"E	
Tangential Length:		5.737	
Linear	0+05.737	1501127.178	888692.714
PI	45	0+43.063	1501148.559
Tangential Direction:		N 55°03'10"E	
Tangential Length:		37.326	
Linear	0+43.063	1501148.559	888723.309
PI	46	1+10.957	1501185.174
Tangential Direction:		N 57°21'54"E	
Tangential Length:		67.894	
Linear	1+10.957	1501185.174	888780.484
PI	47	1+64.795	1501216.013
Tangential Direction:		N 55°03'10"E	
Tangential Length:		53.838	
Linear	1+64.795	1501216.013	888824.614
PI	48	2+32.122	1501259.778
Tangential Direction:		N 49°27'21"E	
Tangential Length:		67.327	
Linear	2+32.122	1501259.778	888875.777
PI	49	2+98.284	1501303.847
Tangential Direction:		N 48°14'06"E	
Tangential Length:		66.162	
Linear	2+98.284	1501303.847	888925.125
PI	50	3+58.804	1501347.850
Tangential Direction:		N 43°21'26"E	
Tangential Length:		60.52	
Linear	3+58.804	1501347.850	888966.675
PI	51	3+88.404	1501363.654
Tangential Direction:		N 57°43'46"E	
Tangential Length:		29.6	
Linear	3+88.404	1501363.654	888991.703
PI	52	4+25.713	1501381.262
Tangential Direction:		N 61°50'25"E	
Tangential Length:		37.309	
Linear	4+25.713	1501381.262	889024.596
PI	53	4+71.979	1501404.866
Tangential Direction:		N 59°19'22"E	
Tangential Length:		46.266	
Linear	4+71.979	1501404.866	889064.387
PI	54	5+13.472	1501427.144
Tangential Direction:		N 57°31'37"E	
Tangential Length:		41.493	



CHANNEL DITCH STA. 5+13.472

**LEGEND**

- Existing Railroad X-ing Signal Gate
- Concrete Pad At Railroad X-ing
- Fence
- Existing Road
- Proposed Roadway CL
- Railroad Tracks
- Existing Ditch Bottom
- Existing Concrete Pipe With Headwalls

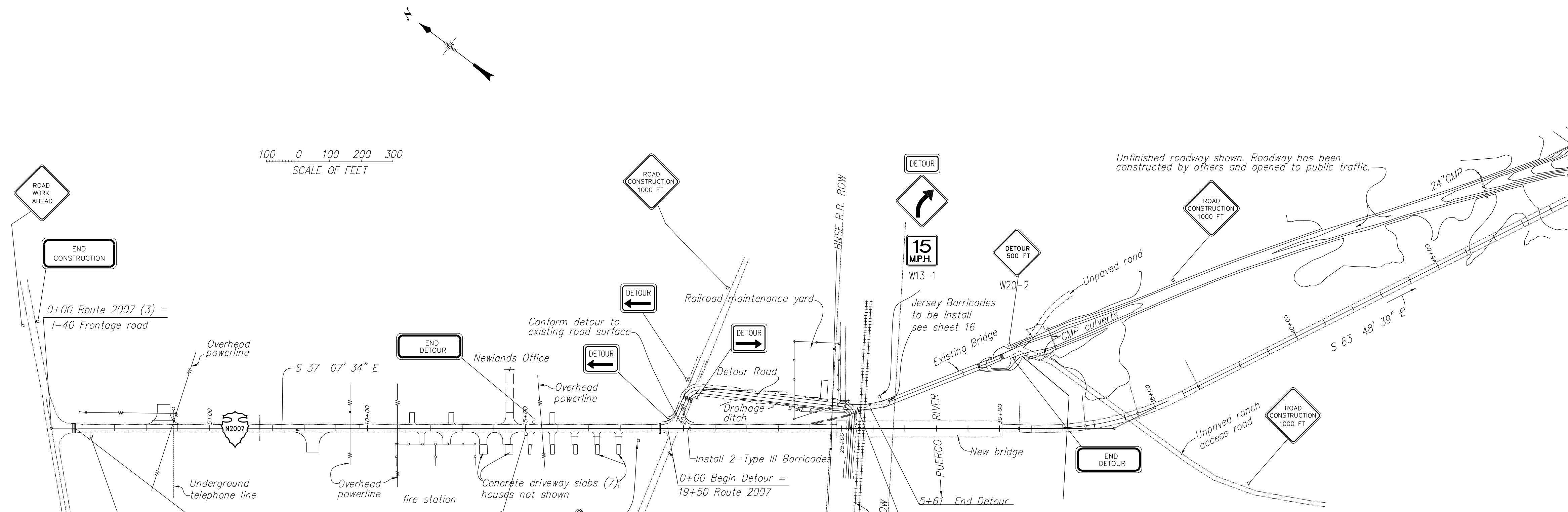
REVISED: 8/15/2016

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 NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

**DITCH CHANNEL PLAN AND PROFILE SHEET**

DRAWN BY: NRODOT DATE: 5/17/13  
 DESIGNED BY: NRODOT DATE: 5/17/13  
 REVISED: 8/15/16 FILENAME: PLPDITCH\_CHANNEL  
 BY: B.O.R. SCALE: NTS

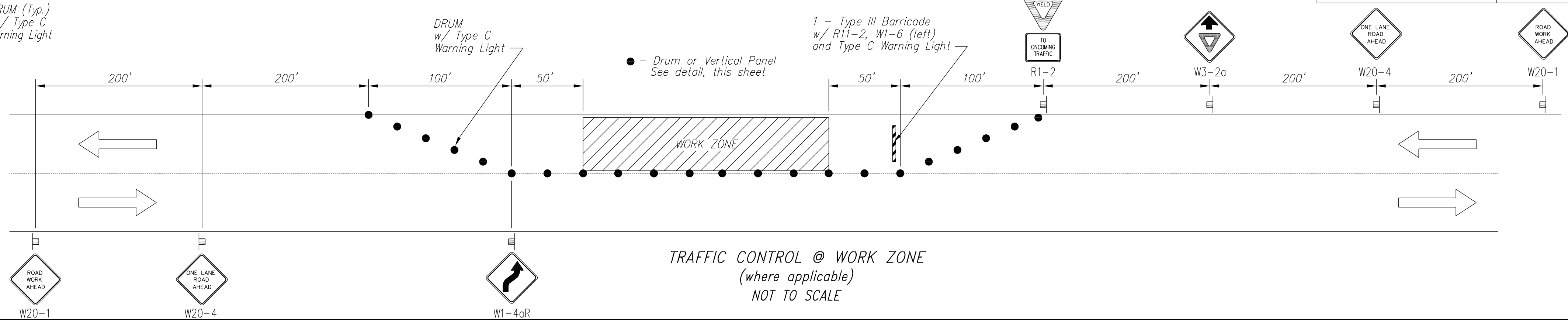
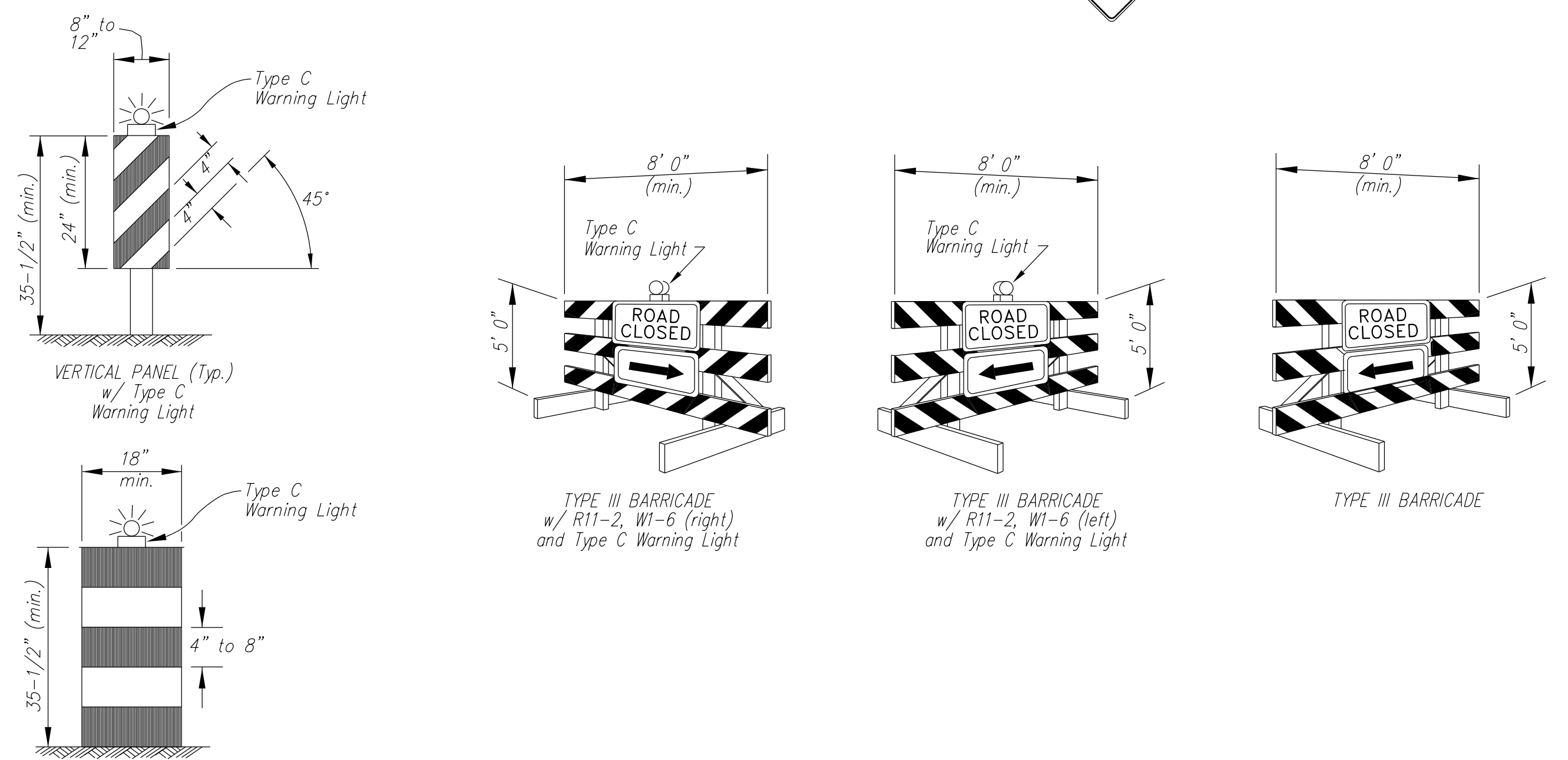
AREA	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1,2&4	15	63



- ### GENERAL NOTES
- All Traffic Control Devices shall be in accordance with the MUTCD (Latest Edition and amendments) and the supplemental specifications for this project.
  - The Traffic Control details shown are only a guide. The Contractor is solely responsible for preparing and implementing a Traffic Control Plan (TCP) in accordance with these details, Section 635 of FP-0.3, and the MUTCD under Contract Item 63501-0000. Any additional traffic control devices called for on the Contractor's TCP will not be measured for payment but shall be considered incidental to the bid items for traffic control shown in the bid schedule.
  - See General Notes on 3 of 63 and the supplemental specifications for additional TCP requirements.
  - Signs W20-1, W20-1a, G20-1, and G20-2a shall be placed at the project limits and remain in place through the duration of the project.
  - The Contractor shall construct the frontage/detour road to the typical section on Plan Sheet 11 to subgrade only. After the road is no longer required, as detour, the Contractor shall complete the construction as Plan Sheets 11 and 12.
  - It is the responsibility of the Contractor to maintain the existing roadway and/or detour in a drivable condition during construction. The cost of any detour roads (including all detour related earthwork, temporary drainage structure and maintenance) shall be considered incidental to the Temporary Traffic Control bid items.
  - At the end of each working day, it will be the Contractor's responsibility to provide a driving surface free of obstructions. Access to all adjoining properties and BIA/County system routes shall be maintained at all times (day and night).
  - All traffic control devices (except at detour road locations and as noted in note #4 above) such as construction signs, drums, barricades, etc., shall be removed to a location at least 32 feet from the edge of the shoulder when construction is not in progress.
  - During construction operations, traffic shall be moved through the work zone using pilot cars (as required). Applicable signs and other items (two-way radio contact) related to the pilot cars and traffic control shall be considered incidental obligations of the Contractor.
  - The Contractor has the option to either use drums or vertical panels, but shall not use a combination of both. No traffic cones are allowed.
  - At locations where new road construction intersects existing roadways and at tie-ins with existing roads at the end of the new construction, "Special Traffic Control" procedures shall be included as needed in the Contractor's TCP. These include, but are not necessarily limited to the following: Type III barricades with "Road Closed/ detour sign", flaggers, drums, etc.
  - The Traffic Control on this project shall be coordinated with the project construction schedule. The Contractor's TCP shall reflect this coordination.
  - The Contractor may install temporary HDPE plastic fence 15 feet out from the outside rail of the railroad tracks so that all work, equipment, and materials are kept outside these limits. This fence installation shall be paid for under bid item 61901-3400. This may reduce the need for railroad flaggers.

### TEMPORARY TRAFFIC CONTROL SIGNS

DESIGNATION	DETAIL	MINIMUM SIZE (inch)	DESIGNATION	DETAIL	MINIMUM SIZE (inch)
M4-9R		30" x 24"	W13-1		18" x 18"
M4-9L		30" x 24"	W20-1		48" x 48"
R1-2		36" x 36" x 36"	W20-1		48" x 48"
SUPPLEMENTAL PLATE		30" x 24"	W20-4		48" x 48"
G20-2		60" x 24"	W1-1L		30" x 30"
Type III Barricade w/ R11-2, W1-6 (right) and Type C Warning Light		As Shown	W1-3L		30" x 30"
Type III Barricade w/ R11-2, W1-6 (left) and Type C Warning Light		As Shown	W1-3R		30" x 30"
Type III Barricade		As Shown	W3-2a		36" x 36"
Drums or Vertical Panels		As Shown			



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### TEMPORARY TRAFFIC CONTROL

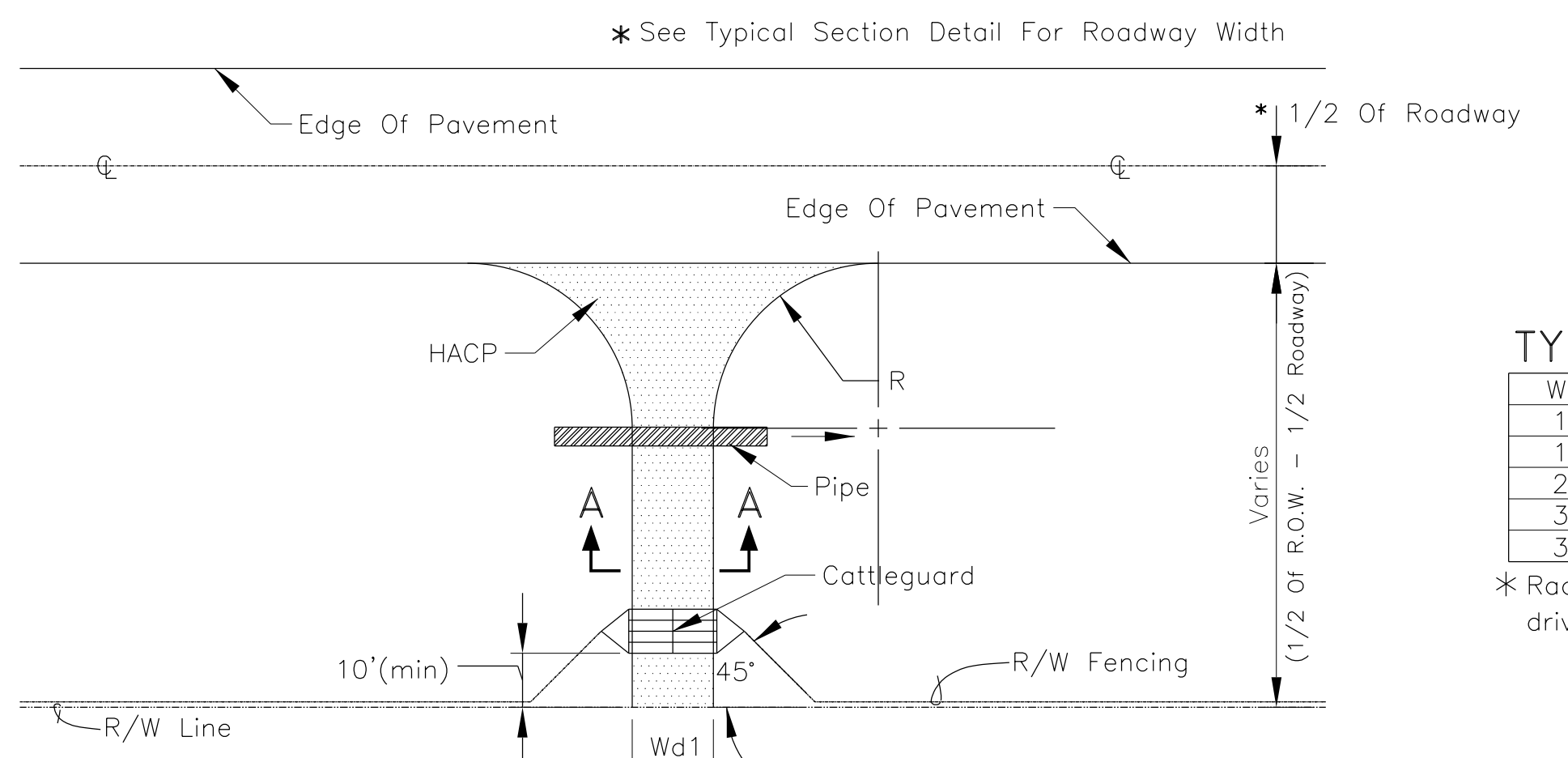
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DESIGNED BY: NRDOT	DATE: 5/7/2009
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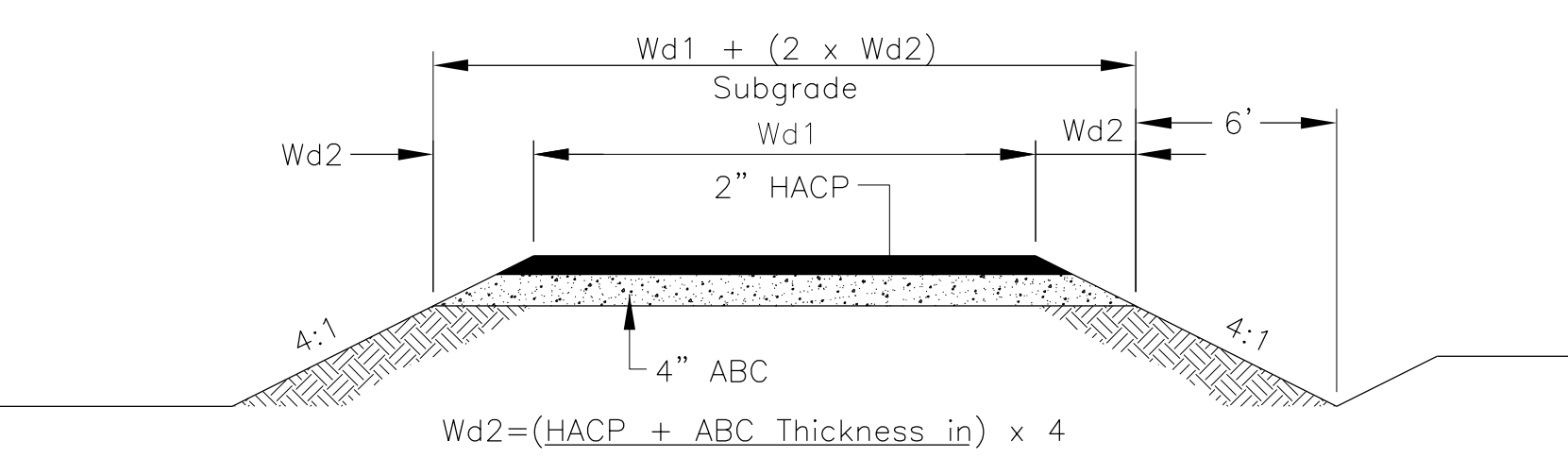
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1,2&4	16	63

PERMANENT ROADSIDE SIGNS

STATION	LOC.	SIZE DETAIL NO.	DESCRIPTION	SIGN PANEL SIZE	AREA OF SIGN ft <sup>2</sup>	NO. OF POSTS	POST WEIGHT lb/ft	TOTAL PANELS
				INCH				
19+68.00 19+86.00	Lt. Rt.	R1-1 R1-1		30" x 30"	6.25	2 2	2.00	2
1+00.00 19+00.00 56+00.00	Rt. Rt. Lt.	R2-1(35)		24" x 30"	5.0	1 1 1	2.75	3
56+00.00	Rt.	R2-1(45)		24" x 30"	5.0	1	2.75	1
2+00.00	Rt.	M-1		18" x 24"	3.0	1	2.75	1
39+00.00	Lt.	W1-2R		30" x 30"	6.25	2	2.00	1
5+00.00 12+00.00 41+00.00	Lt. Rt. Lt.	M-1		24" x 30"	5.0	1 1 1	2.75	3
5+00.00 12+00.00 41+00.00	Rt. Lt. Rt.	R4-1		48" x 48" x 36"	5.55	2 2 2	2.00	3
2+00.00	Lt.	W3-1a		30" x 30"	6.25	2	2.00	1
63302-0003 Sign Installation, 1 Post & Hardware: 2.75 lbs/ft.____ 38.00 sq.ft.								
63302-0010 Sign Installation, 2 Post & Hardware: 2.00 lbs/ft.____ 41.65 sq.ft.								



TYPICAL TYPE "A" TURNOUT Special width turnouts at Sta.3+55 Lt. and Sta.13+34 Rt., to be constructed similar, Radii to be 30'.

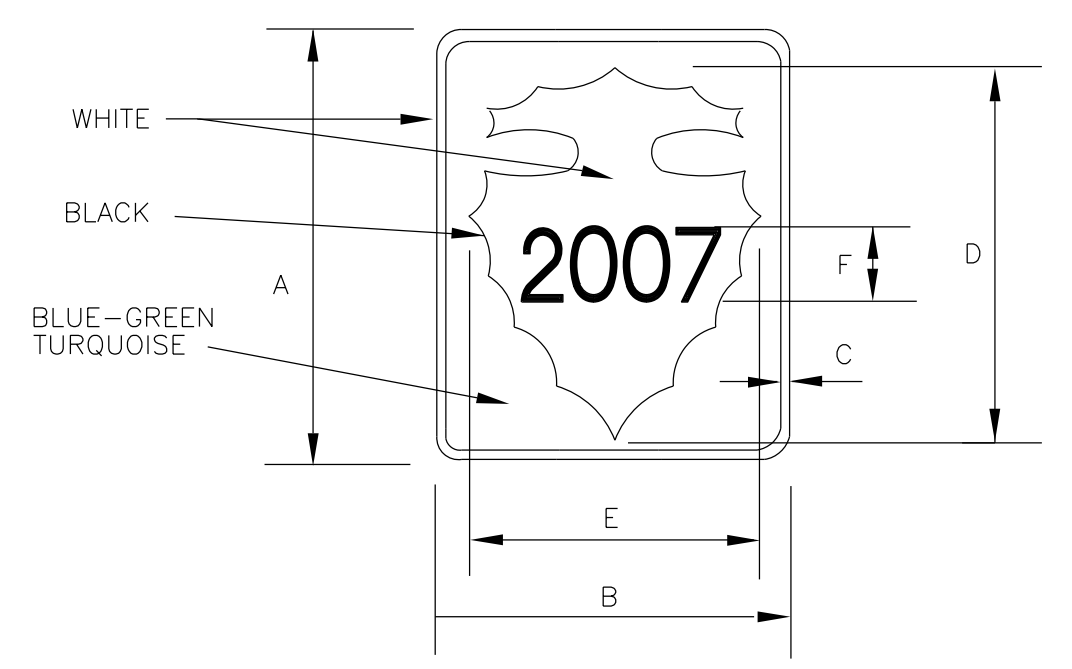


SECTION A-A Modify turnout shoulder/ditch grading to fit existing drainage and ground conditions, if directed by the C.O.R./AOTR

TYPE "A" TURNOUT

Wd1	Cattleguard	R *
14'	2-Unit	30'
16'	3-Unit	30'
24'	4-Unit	50'
30'	5-Unit	50'
30'	6-Unit	50'

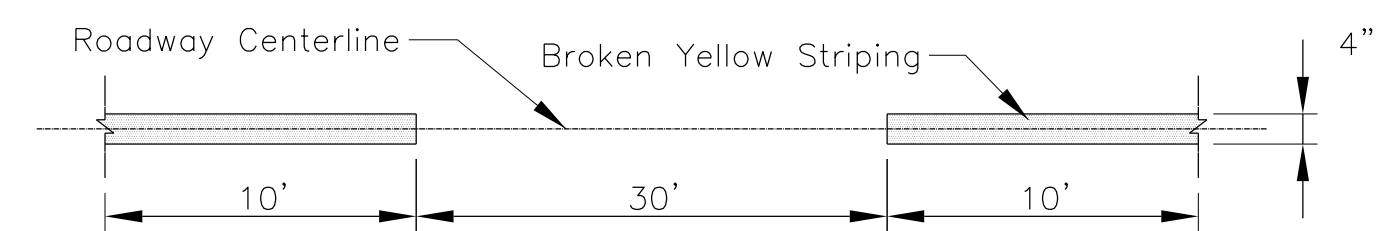
\* Radius 10', for housing street/driveway approaches.



SIGN	DIMENSION inches					F = NUMERALS					
	A	B	C	D	E	DIGITS IN ROUTE	1	2	3	4	
MIN.	24"	18"	1/2"	19-1/2"	13-1/2"	SIZE	14	1 1/2"	12"	9"	8"

63401-1610 PAVEMENT MARKINGS: SOLID YELLOW

STATION TO STATION	LOCATION	DESCRIPTION	LENGTH (Ft.)
0+69.879 To 5+00.00	Center-Right	Solid Yellow	430.12
0+69.879 To 5+00.00	Center-Left	Solid Yellow	430.12
12+00.00 To 41+00.00	Center-Right	Solid Yellow	2,900.00
12+00.00 To 41+00.00	Center-Left	Solid Yellow	2,900.00
<b>TOTAL:</b>			<b>6,660.24</b>



TYPICAL PAVEMENT MARKING "BROKEN YELLOW" (See Table For Location)

STOP SIGN and STOP BAR location

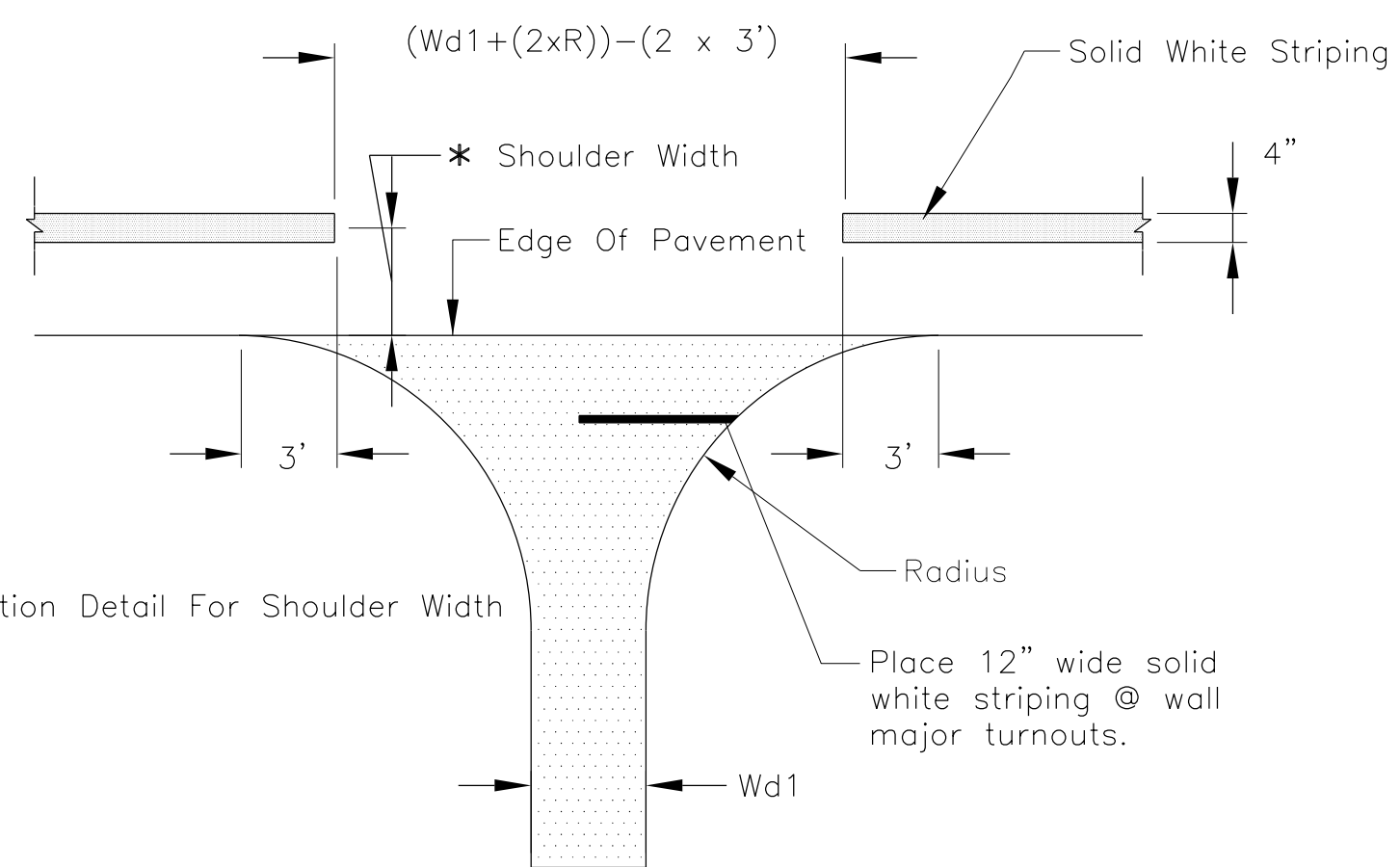
Radius of turnout (ft)	X (ft)	y' (ft)	y' + L0 (ft)	Length of Stop Line
10.00	5.00	5.00	7.00	1/2 Roadway width + Y
20.00	10.00	10.00	8.50	1/2 Roadway width + Y
30.00	15.00	15.00	10.00	1/2 Roadway width + Y
40.00	20.00	20.00	11.00	1/2 Roadway width + Y
50.00	25.00	25.00	12.50	1/2 Roadway width + Y

63401-1520 PAVEMENT MARKINGS: SOLID WHITE

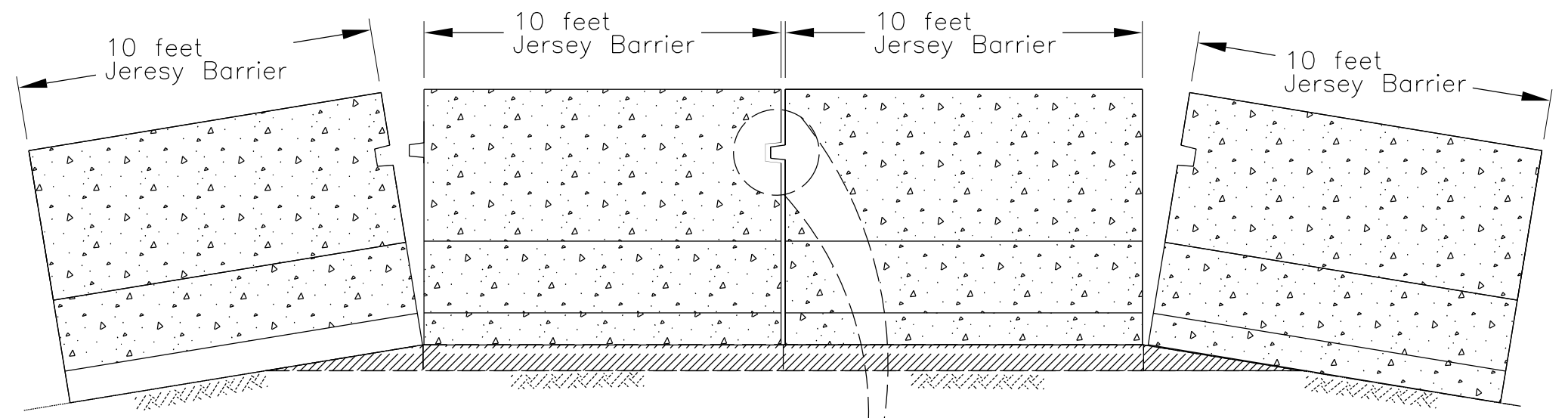
STATION TO STATION	LOCATION	DESCRIPTION	LENGTH (Ft.)
0+69.879 To 57+82.74	Right	Solid White	5,712.86
Minus (1) 14' T.O. @ 68'			-68.00
Minus (6) 16' T.O. @ 70'			-420.00
Minus (5) 24' T.O. @ 118'			-590.00
<b>SUB-TOTAL:</b>			<b>4,634.86</b>
0+69.879 To 57+82.74	Left	Solid White	5,712.86
Minus (1) 40' T.O. @ 134'			-134.00
Minus (3) 16' T.O. @ 70'			-210.00
Minus (3) 24' T.O. @ 118'			-354.00
<b>SUB-TOTAL:</b>			<b>5,014.86</b>
<b>GRAND-TOTAL:</b>			<b>9,649.72</b>

63401-1510 PAVEMENT MARKINGS: BROKEN YELLOW

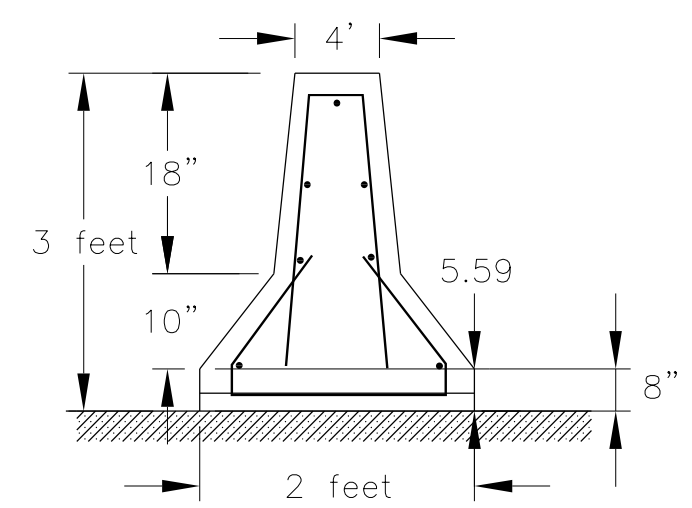
STATION TO STATION	LOCATION	DESCRIPTION	LENGTH (Ft)
5+00.00 To 12+00.00	Center	Broken Yellow	700.00
41+00.00 To 57+82.74	Center	Broken Yellow	1,682.74
<b>TOTAL:</b>			<b>2,382.74</b>



See Typical Section Detail For Shoulder Width (See Table For Location)



STA. 26+50.00 ± PRECAST CONCRETE JERSEY BARRIER ON FRONTAGE ROADWAY ON EXISTING BRIDGE APPROACH



SIDE VIEW

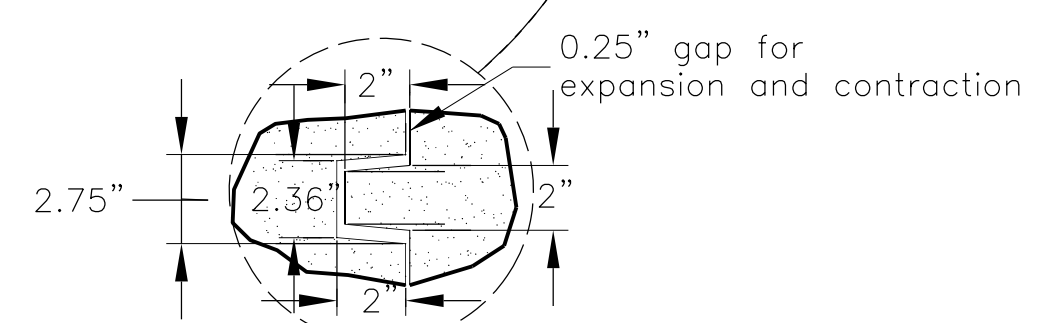
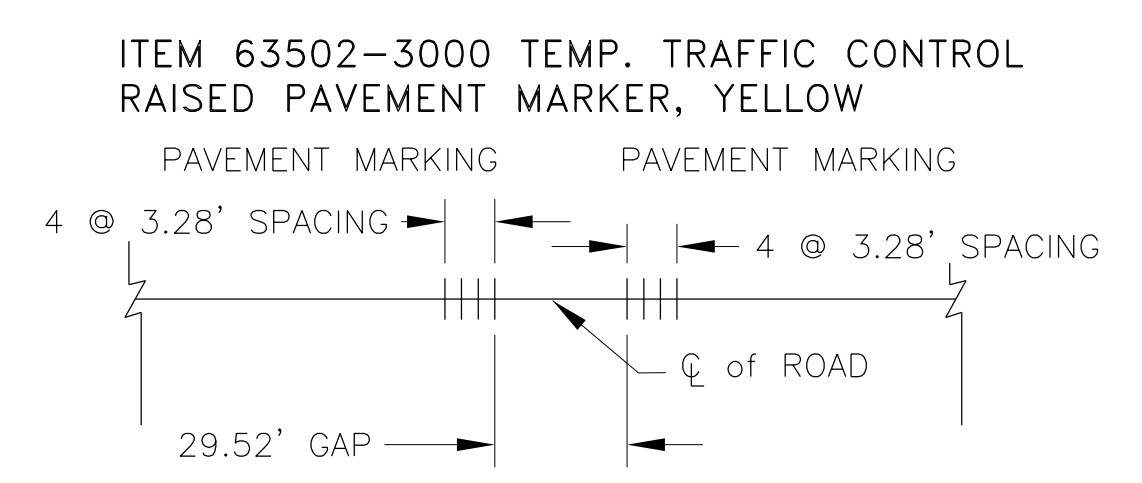
MAINTENANCE/DETOUR ROAD

63401-1510 PAVEMENT MARKINGS: SOLID YELLOW

STATION TO STATION	LOCATION	DESCRIPTION	LENGTH (ft)
0+17.38 To 5+40.00	Center	Solid Yellow	522.62
<b>TOTAL:</b>			<b>522.62</b>

63502-3000 TTC, RAISED PAVEMENT MARKINGS:

63502-3000 TTC, RAISED PAVEMENT MARKERS @ 700 TOTAL



- (a). The Precast Jersey Barrier shall be install on the North side of the existing bridge approach as shown and location determined by AOTR.
- (b). The Precast Jersey Barrier construction shall meet the requirements of Safety-Shape Barrier (SGM11a-b) in the AASHTO-AGC-ARTBA Joint Committee Task Force 13 Report.

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF INDIAN AFFAIRS  
NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

PERMANENT PAVEMENT MARKINGS  
ROADSIDE SIGNS & TURNOUT DETAIL

DRAWN BY: Gerald.Hood	DATE: 5/7/2009
DESIGNED BY: NRDOT	DATE: 5/7/2009
REVISED: 6/4/2013	BY: Gerald.Hood
ANNOTATION SCALE: Full Size 1=1	
FILENAME: Sht.16_PermSign & T.O Details.dgn	

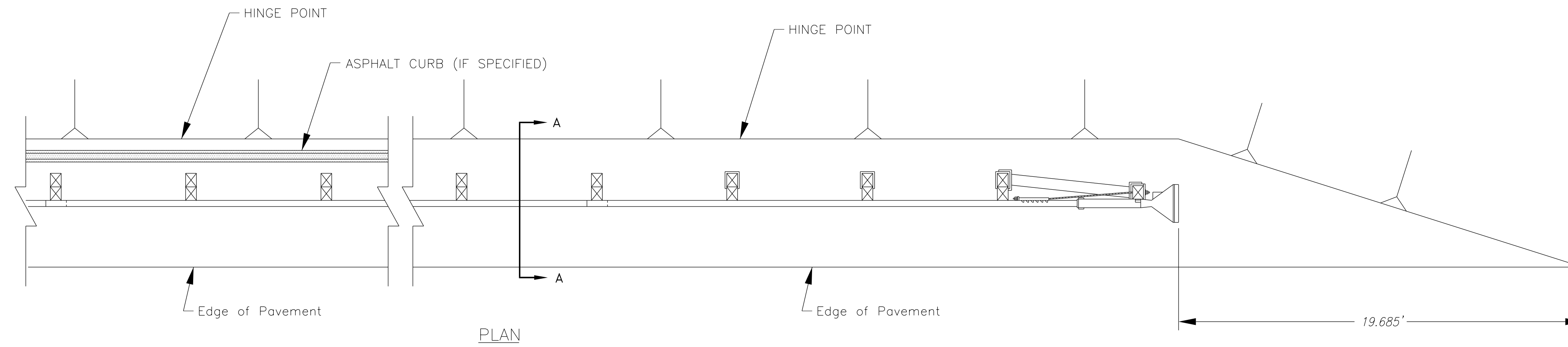
J:\CURRENT PROJECT\_093008\N00\_New\_Lands\N2007(1-1)2&4\_092308\N2007 DESIGN DATA\_092508\CADD Files 01-18-2013\N2007 Plans 01-18-2013



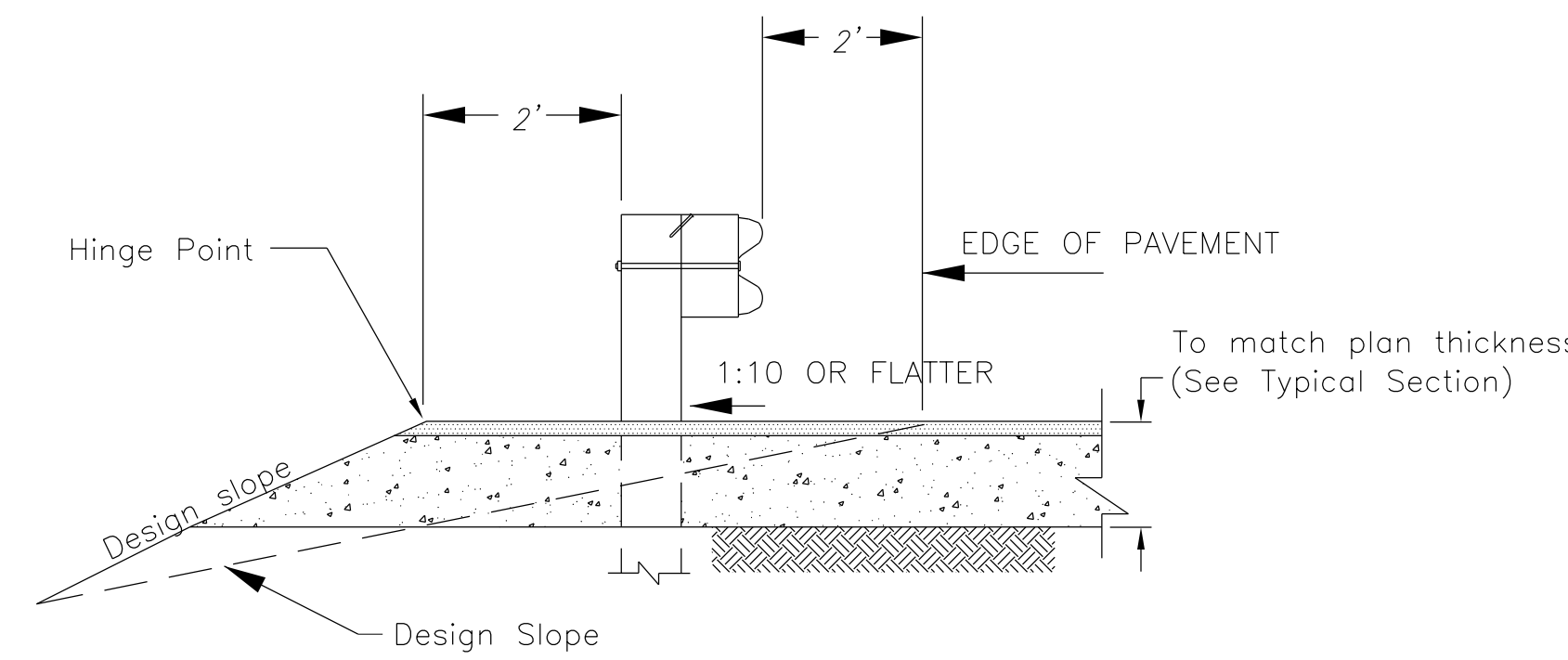
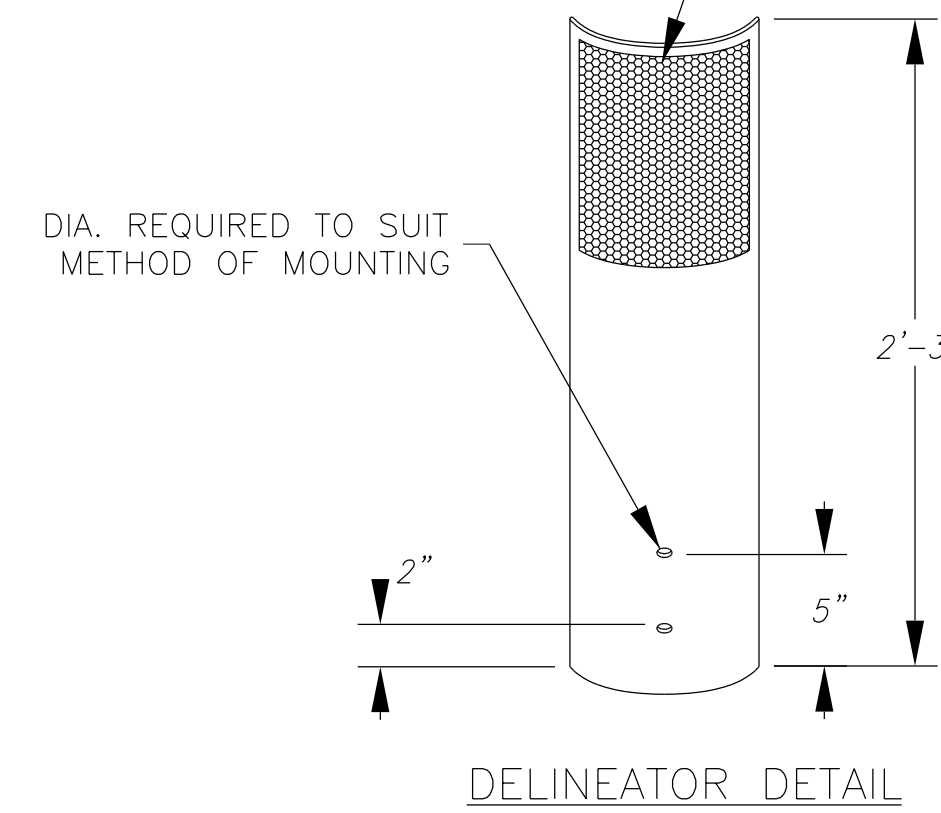
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1,2&4	17	63

**GENERAL NOTES**

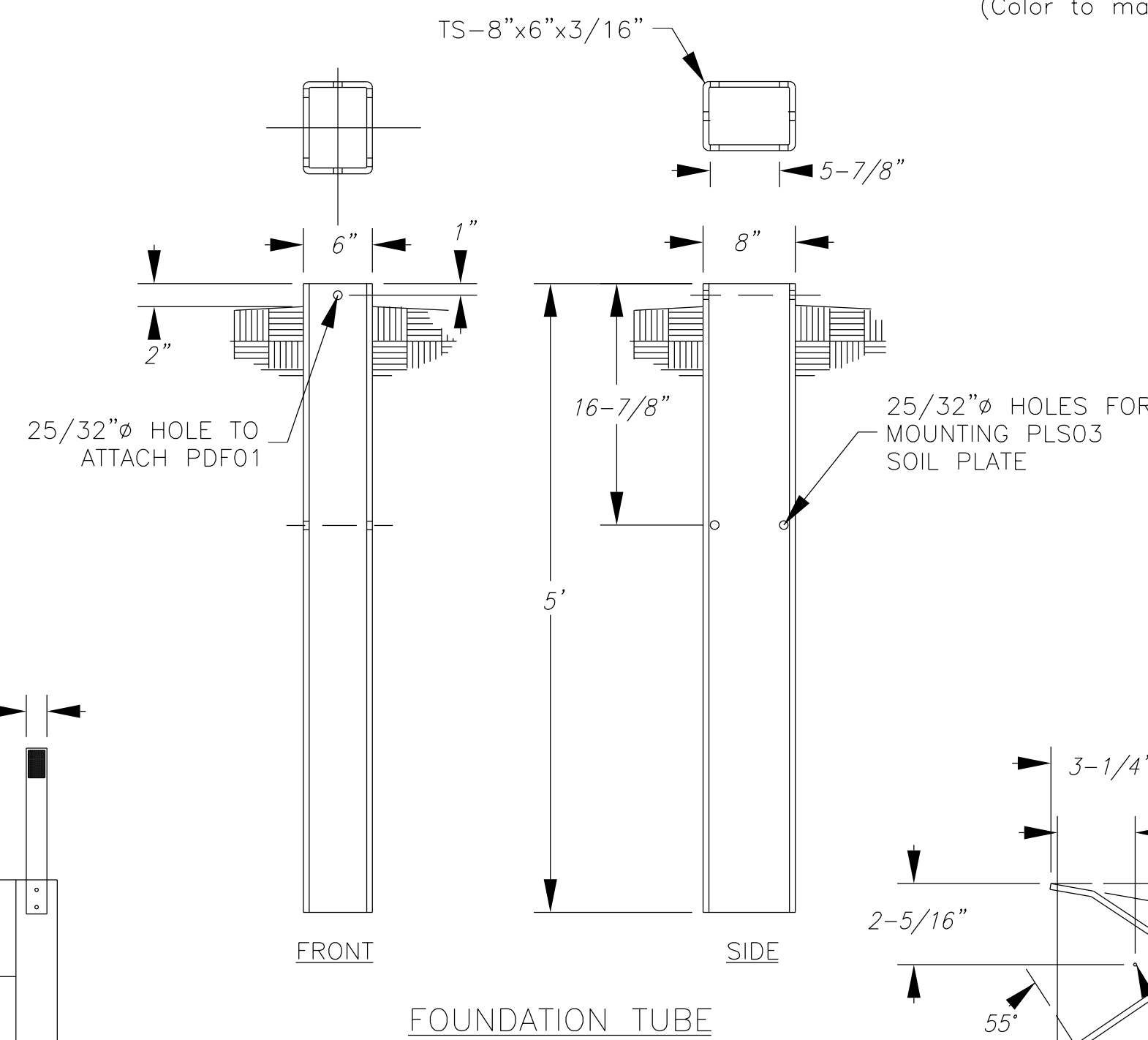
- ALL W-BEAMS, THREE-BEAMS, END TREATMENT, AND TERMINAL CONNECTORS SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M-180, CLASS A, TYPE-II SPECIFICATION. ALL HARDWARE SHALL CONFORM TO ASTM A-325, AND BE GALVANIZED IN ACCORDANCE WITH ASTM A-153.
- ALL STRUCTURAL STEEL ITEMS SHALL CONFORM TO AASHTO M183/ ASTM A36, AND BE GALVANIZED IN ACCORDANCE WITH AASHTO M111 SPECIFICATION.
- WIRE ROPE, FITTINGS, AND ASSEMBLIES OF HARDWARE SHALL CONFORM TO AASHTO M-30, TYPE-2 SPECIFICATION AND A CLASS B ZINC COATING.
- WOOD POSTS AND BLOCKS SHALL BE ROUGH SAWN LUMBER OR TYPE S4S HAVING MINIMUM BENDING STRENGTH OF 8.27 MPa (SINGLE MEMBER) AND MEETING AASHTO M-168. ALL POSTS AND BLOCK SHALL BE TREATED IN ACCORDANCE WITH AASHTO M-133 SPECIFICATION.
- ALL EMBANKMENT AND AGGREGATE BASE MATERIAL SHALL BE COMPACTED TO 95% OF MAXIMUM DRY DENSITY.
- THE EMBANKMENT MATERIAL AND PLACING THEREOF SHALL BE INCIDENTAL TO EARTHWORK ITEMS AND NO DIRECT PAYMENT SHALL BE MADE.
- THE CONTRACTOR SHALL BE REQUIRED TO COMPACT THE BACKFILL AND ASPHALT ALL AROUND EACH GUARDRAIL POSTS WITH HAND TAMPERS TO INSURE INTEGRITY OF THE PAVEMENT AND GUARDRAIL, AND TO PREVENT SEEPAGE OF WATER INTO THE PAVEMENT FROM THE GUARDRAIL POST HOLES. THIS WORK SHALL BE INCIDENTAL OBLIGATIONS OF THE WORK DESCRIBED HEREIN.
- THE COST OF THE SKT-350 ASSEMBLY AND PLACING THEREOF SHALL BE CONSIDERED INCIDENTAL TO ITEM 61701-1250, WHICH INCLUDES BREAKAWAY POSTS, STEEL FOUNDATION TUBE, AND HARDWARE.
- PLACEMENT OF HOT ASPHALTIC CONCRETE AND AGGREGATE BASE MATERIAL FOR GUARDRAIL WIDENING SHALL BE INCLUDED WITH ITEMS 30101-2000 AND 40201-0500.
- FURNISHING AND PLACEMENT OF REFLECTIVE SHEETING AND TABS SHALL BE CONSIDERED INCIDENTAL TO ITEM 61701-1250 AND NO DIRECT PAYMENT SHALL BE MADE.
- ALL RELATED PATENT RIGHTS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AS PER SECTION 107.01 OF THE FP-03
- GUARDRAIL POSTS TO BE INSTALLED PER SECTION 617.03 WITH THE PROPER HOLE TOLERANCE OF 9/16". FAILURE OF THE CONTRACTOR TO INSTALL THE GUARDRAIL POST INCORRECTLY SHALL RESULT IN THE GUARDRAIL BEING REJECTED AND RE-INSTALLED AT THE CONTRACTOR'S ENTIRE EXPENSE.



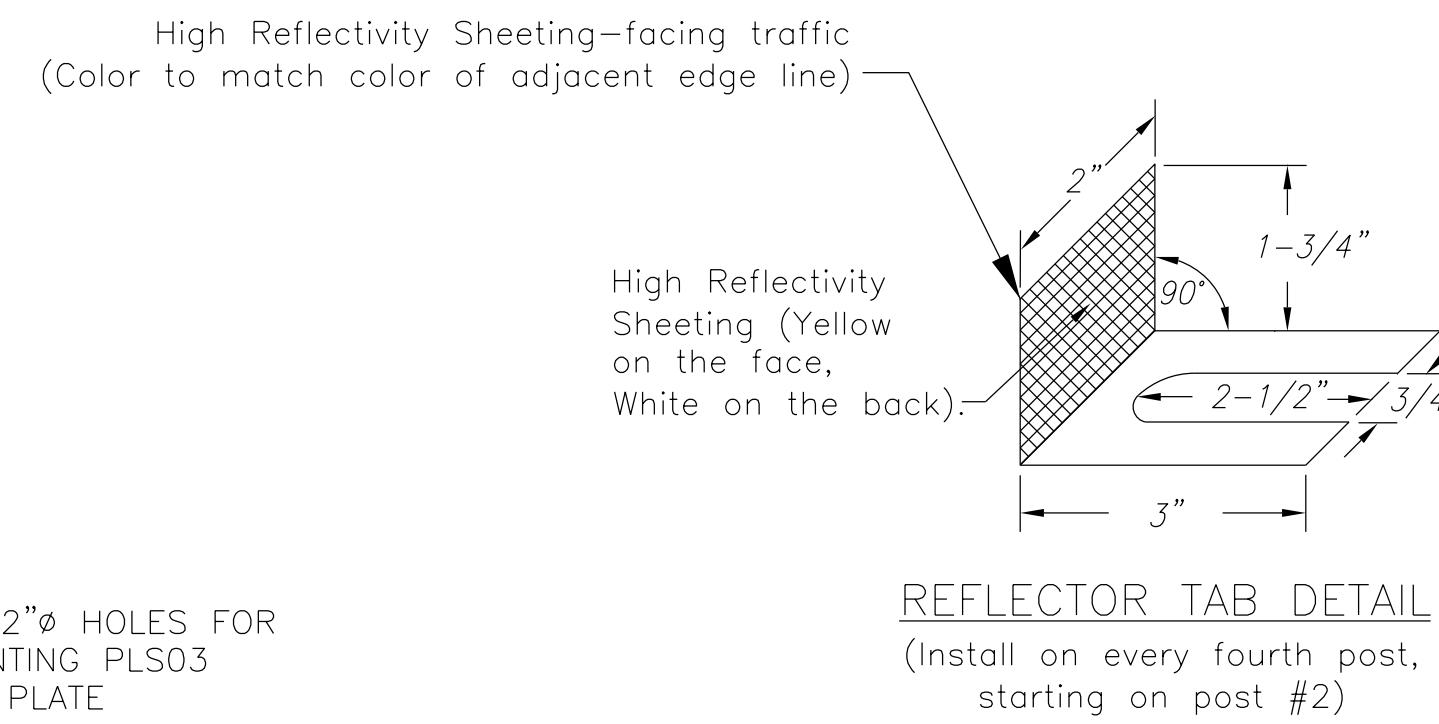
3"x12" REFLECTIVE SHEETING  
(THE COLOR OF THE SHEETING SHALL CONFORM TO THE COLOR OF THE ADJACENT EDGE LINE WHITE)



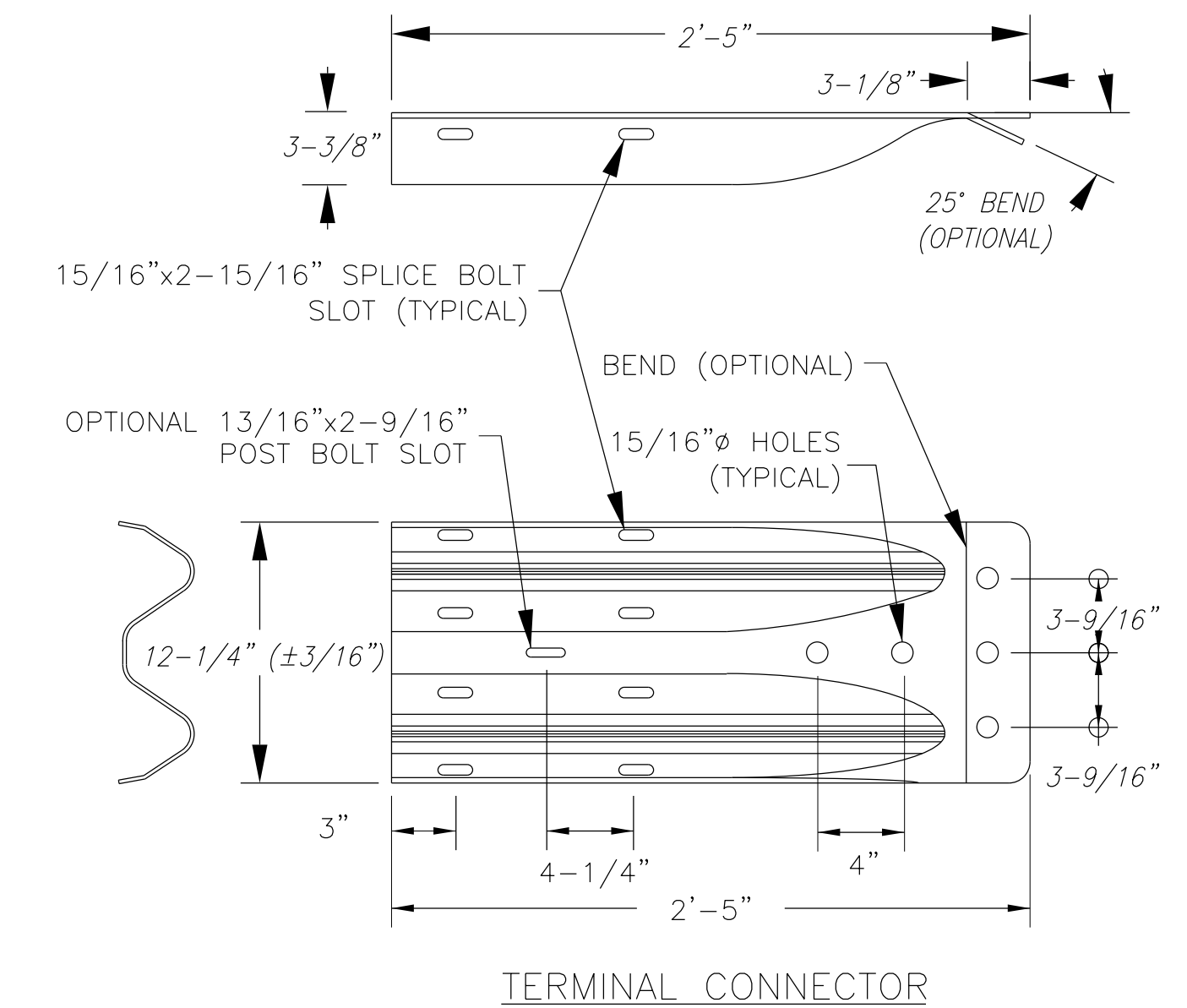
**SECTION A-A**  
Without Asphalt Curb



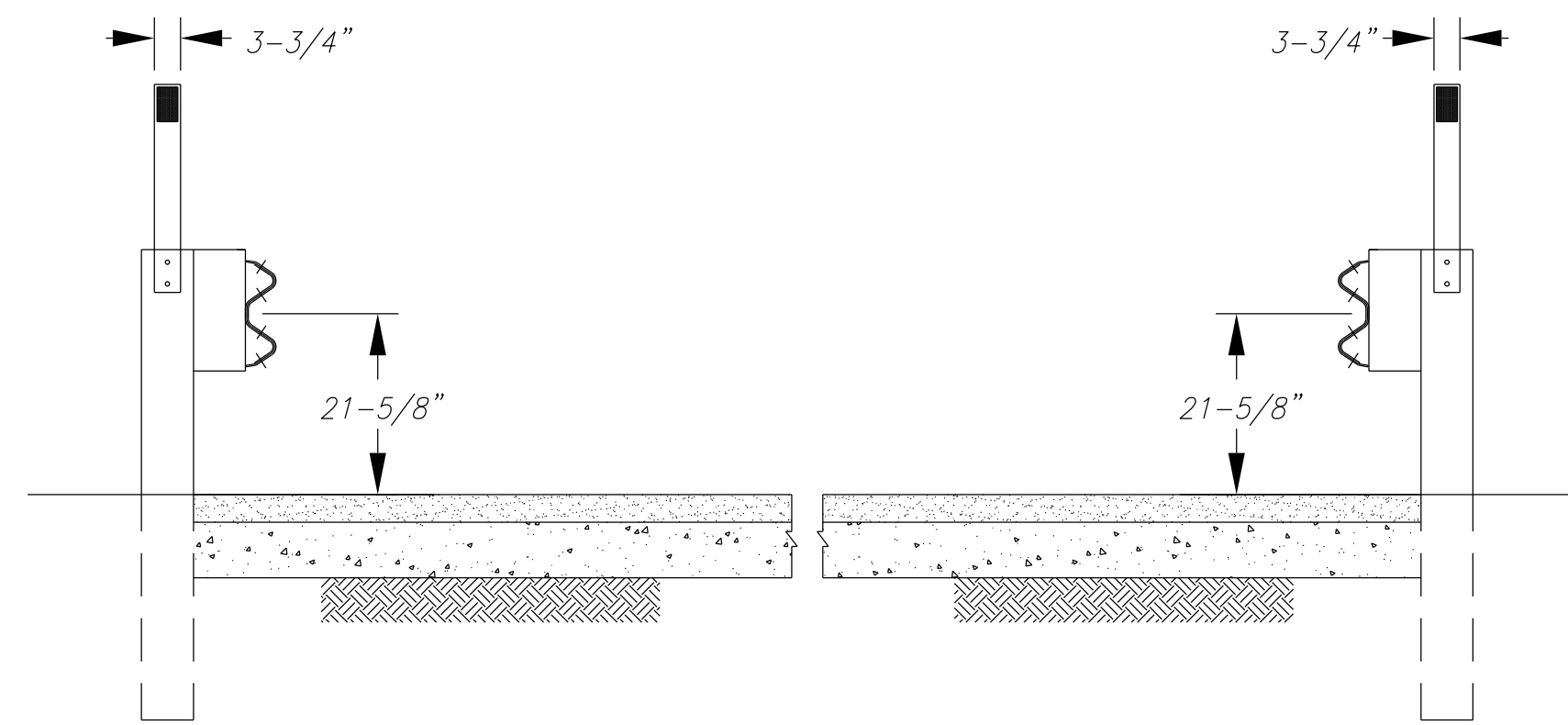
**FOUNDATION TUBE**



**REFLECTOR TAB DETAIL**  
(Install on every fourth post, starting on post #2)

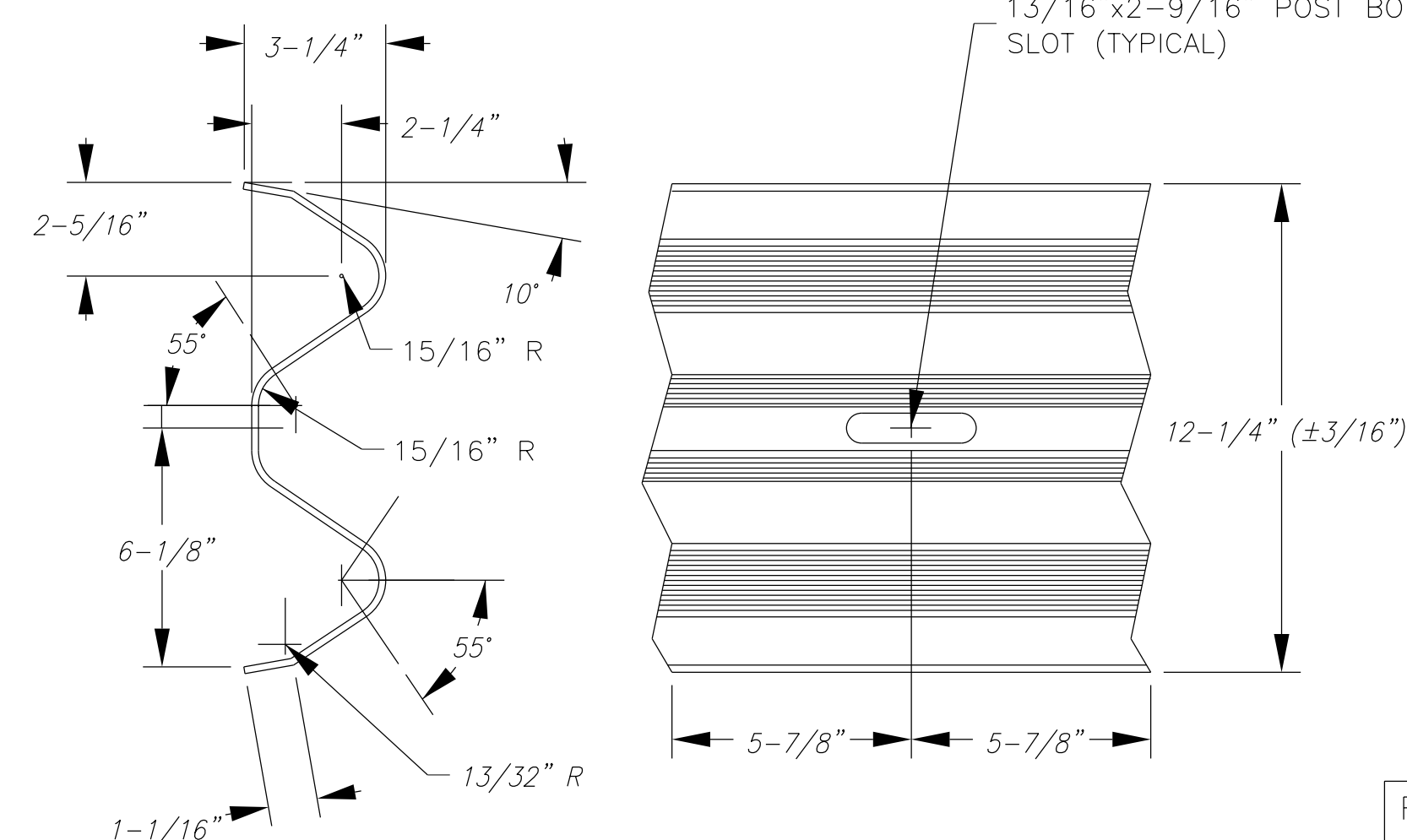


**TERMINAL CONNECTOR**



**GUARDRAIL MOUNTED DELINEATOR**

The delineator shall be placed at 18'-9" spacing, around the outside of horizontal curve, or where the guardrail conflicts with Type "1a" delineator located on tangent segment of roadway.



**SECTION THRU GUARDRAIL ELEMENT**

REVISED: 8/16/2016

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF INDIAN AFFAIRS  
NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION  
**STANDARD GUARDRAIL DETAIL**  
**SKT-350 PLUS**

DRAWN BY: Gerald.Hood	DATE: 5/6/2009
DESIGNED BY: NRDOT	DATE: 5/6/2009
REVISED: 8/16/2016	BY: Peterson.Yazzie
ANNOTATION SCALE: Full Size 1=1	
FILENAME: Sht.17_Guardrail ET Plus2.dgn	



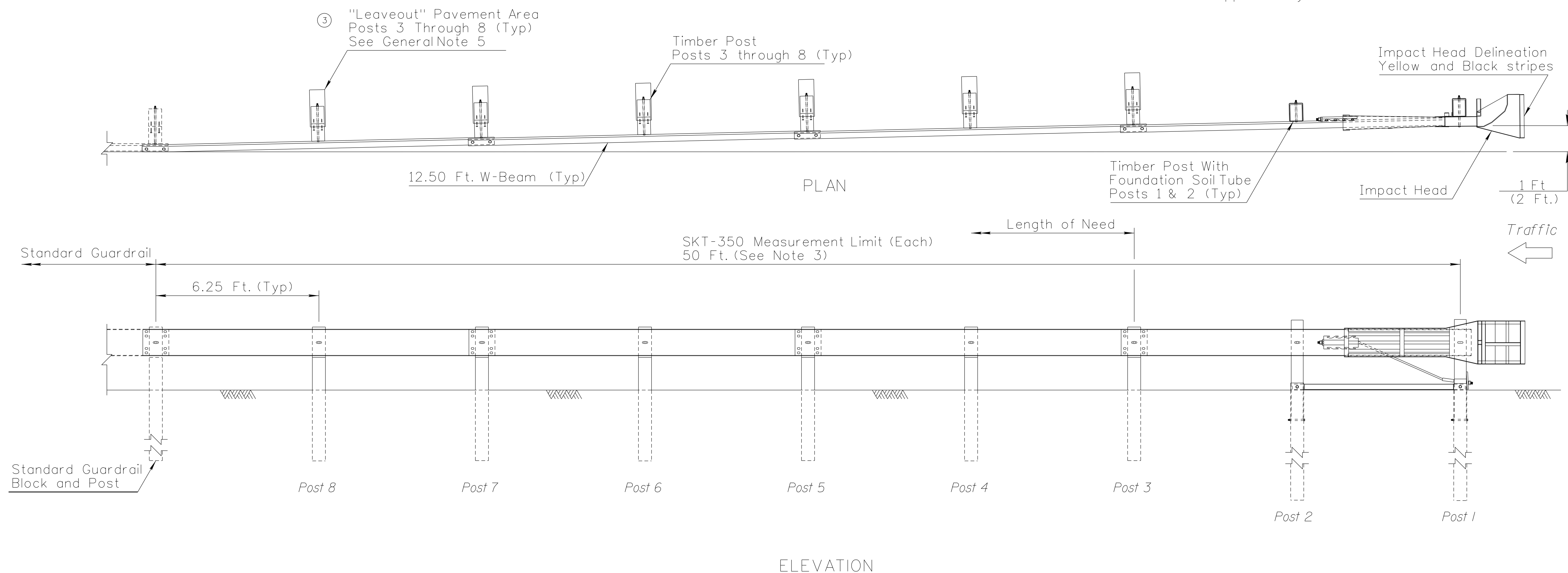
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REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
NAVAJO	AZ	NAVAJO	N2007	N2007(1-1)1,2&4	18a	63

● FOR ELEVATIONS ABOVE 4002 (Ft.), USE THE VALUES IN PARENTHESES

GENERAL NOTES

1. This detail is for roadway layout only.
2. The SKT-350 shall be installed in accordance with the manufacturer's specifications and current approved drawings including all details, hardware, hardware quantities, and other information as shown in these plans.
3. The 50 Ft. W-Beam length shall consist of four 12.50 Ft. sections, the end section being a proprietary split rail.
4. See specifications and other drawings and details in these plans.
- ③ 5. "Leaveouts" in asphaltic concrete shall be provided in the AC pavement around the guardrail posts at the locations and dimensions specified on the Road Systems Inc. approved drawing (SKT-350 Sht 3 of 3) shown in these plans. "Leaveout" material shall consist of a 1-sack grout mix or other non-cohesive material as approved by the NRDOT Materials Unit.



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REVISED ON  
4/21/2015

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
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NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

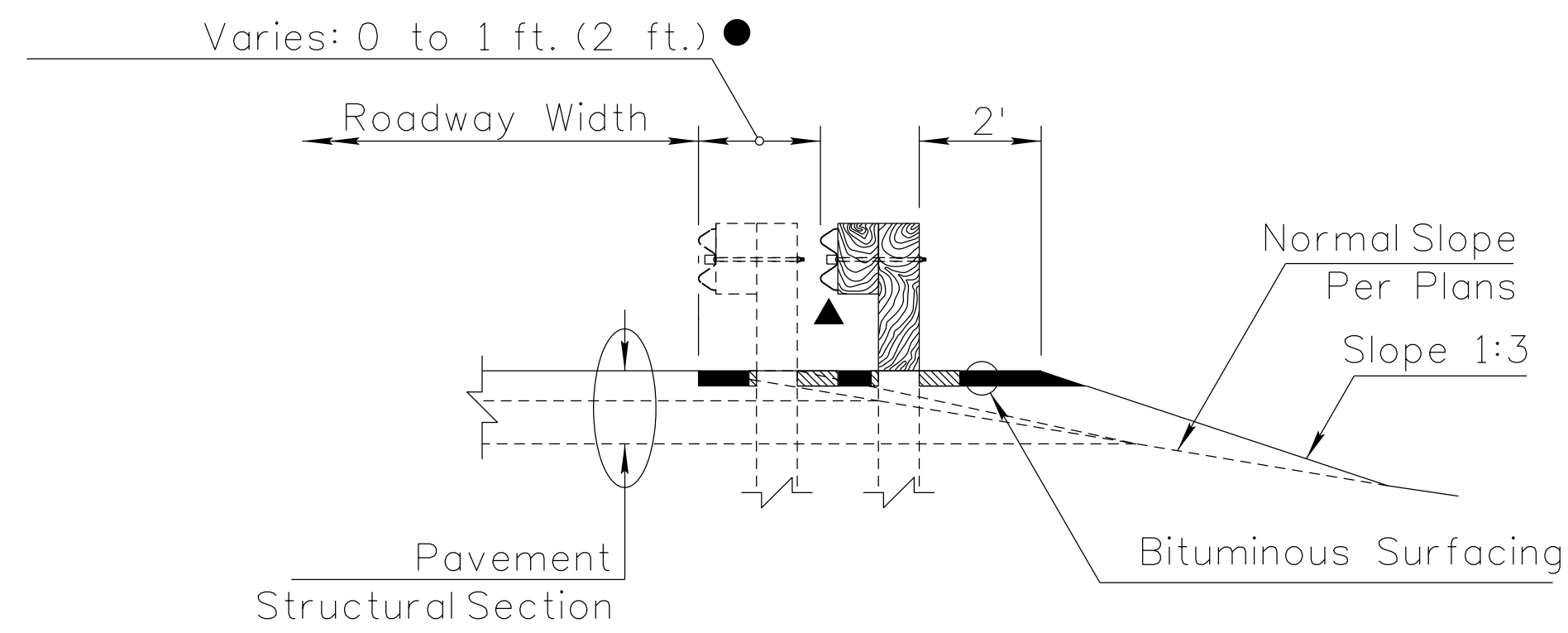
**GUARDRAIL END TREATMENT**  
**SKT-350 LAYOUT; SHEET 1 of 3**

Designed by: BIA NRD-DOT Structural Unit		
Drawn by: - - -		Date: 2/13/2015
Revised by: - - -		Date: - - -
File Name: SKT-350 Sht 1 of 3_2015-02-13		

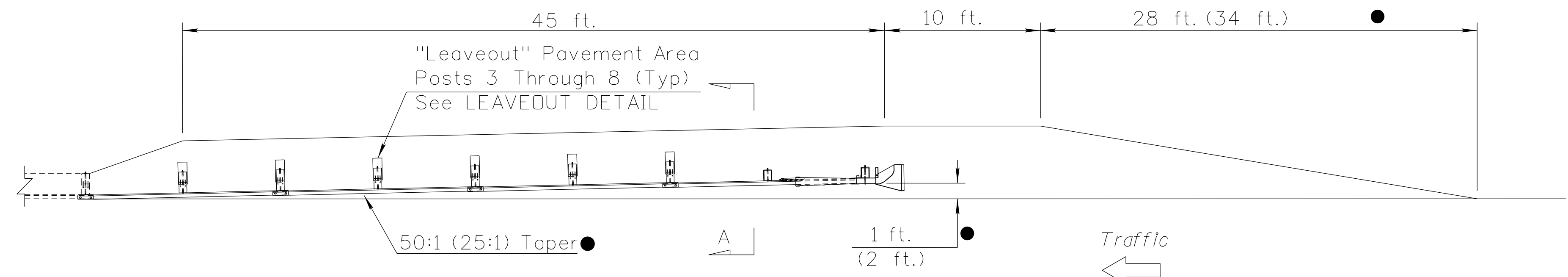
REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
NAVAJO	AZ	NAVAJO	N2007	N2007(1-1),2&4	18b	63

● FOR ELEVATIONS ABOVE 4002 (ft.), USE THE VALUES IN PARENTHESES

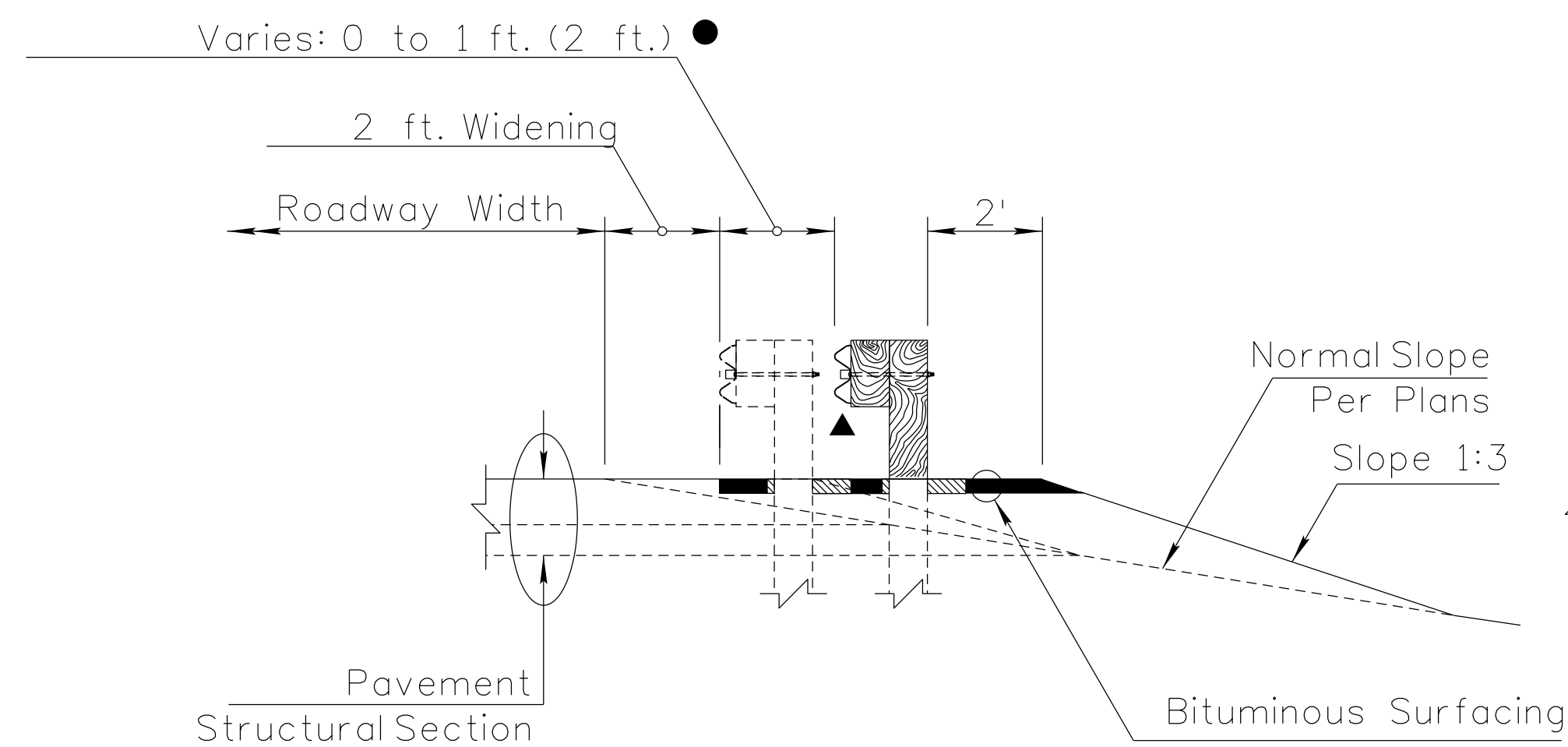
▲ Top of Rail to Roadway Surface = 28"



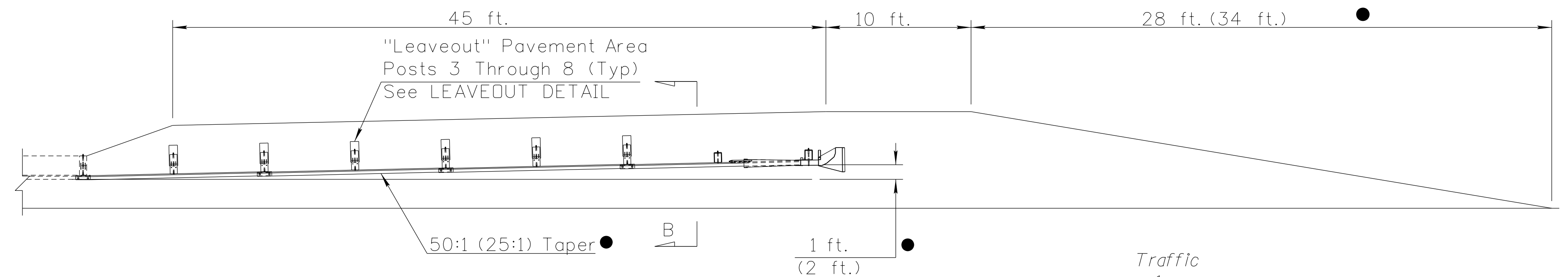
TYPE A SECTION



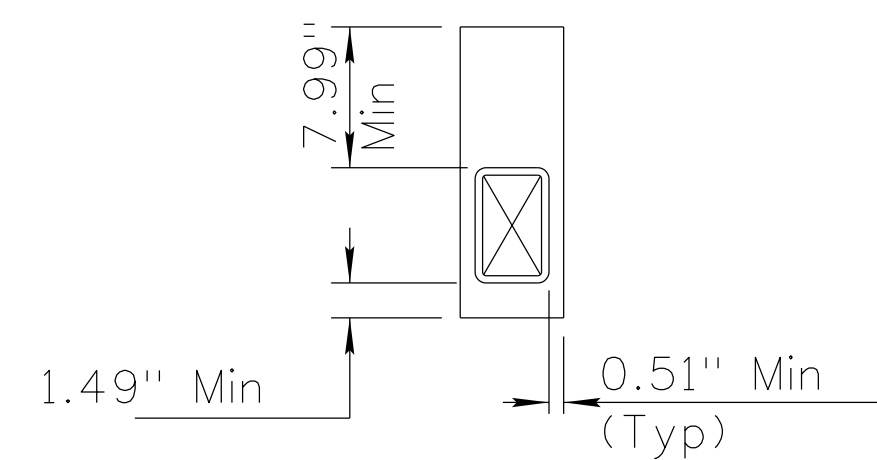
TYPE A GUARDRAIL INSTALLATION  
(FACE OF RAIL AT EDGE OF PAVEMENT)



TYPE B SECTION



TYPE B GUARDRAIL INSTALLATION  
(FACE OF RAIL OFFSET 2 ft. FROM NORMAL EDGE OF PAVEMENT)



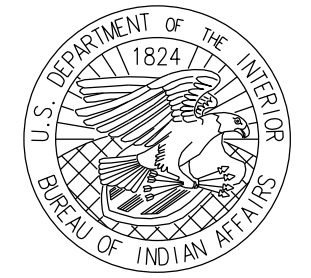
LEAVEOUT DETAIL

REVISED ON  
4/21/2015

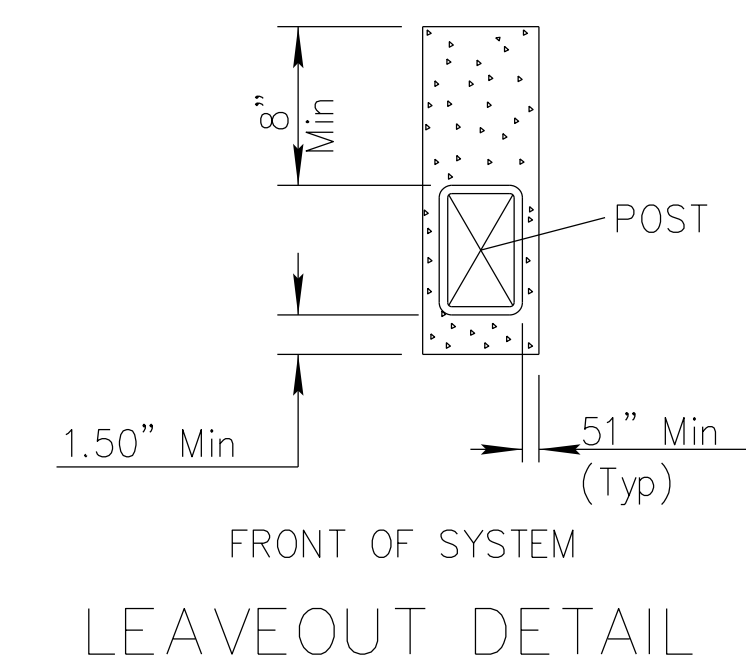
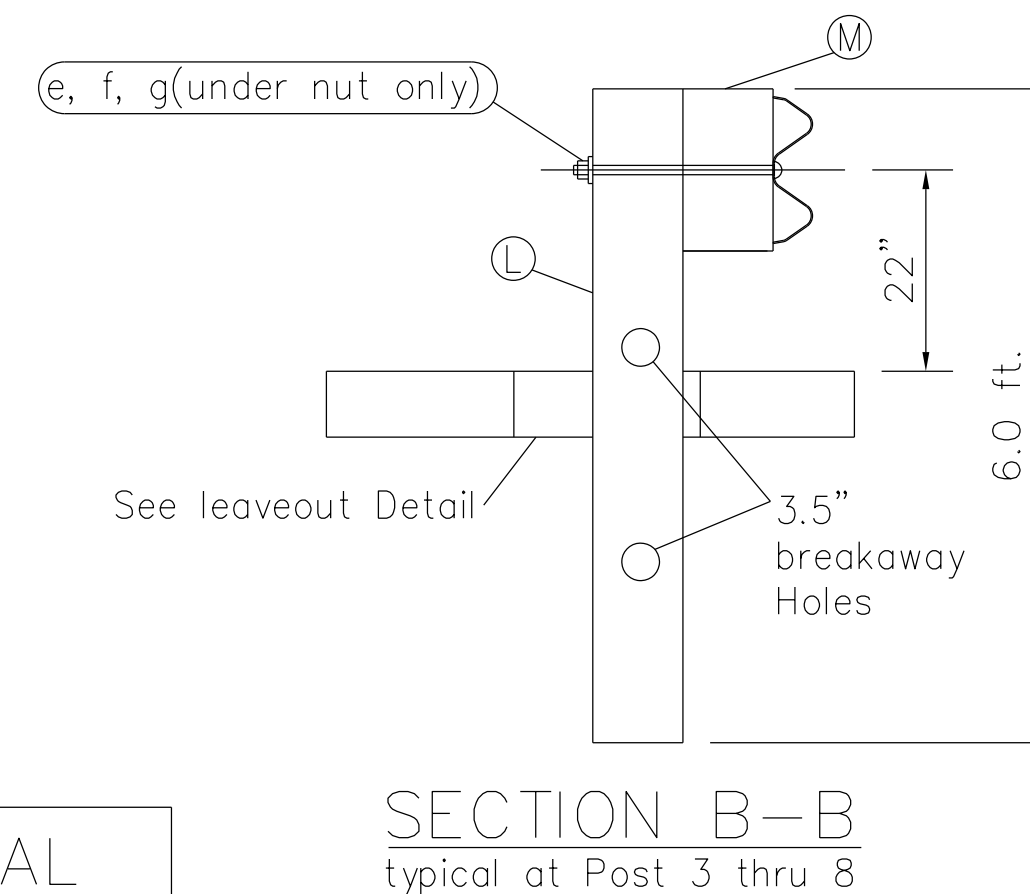
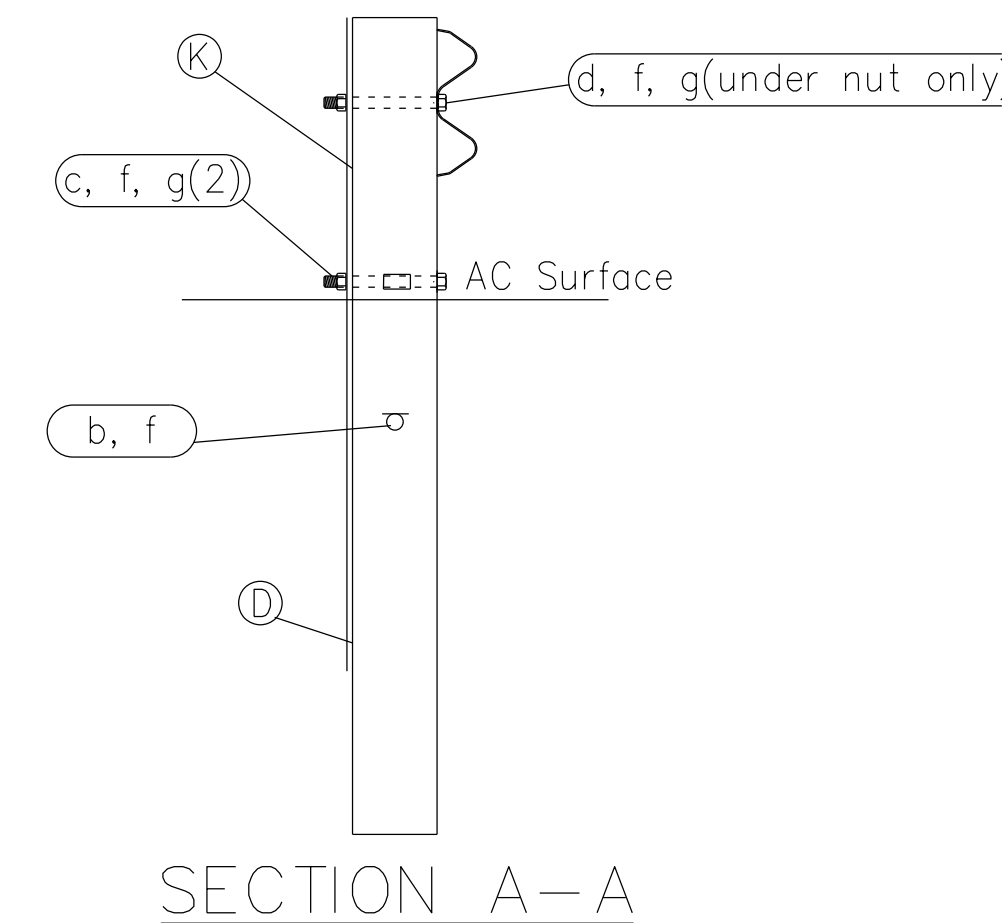
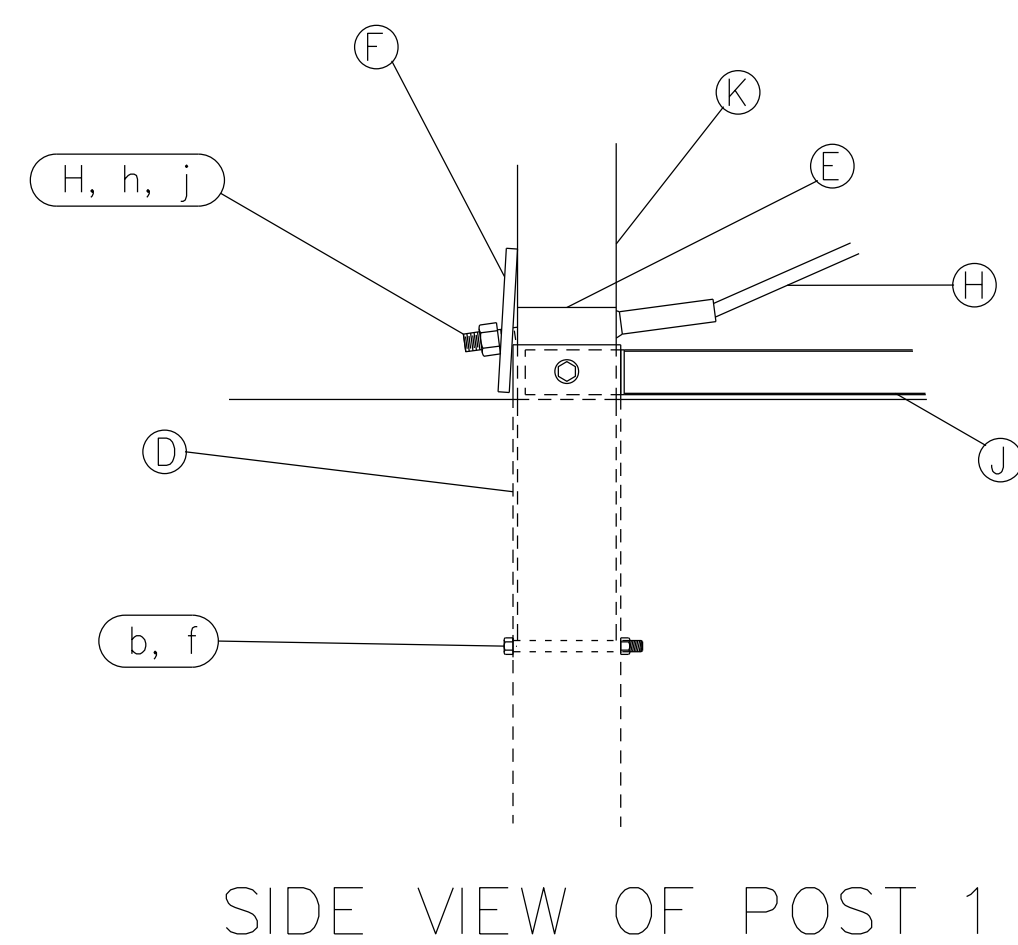
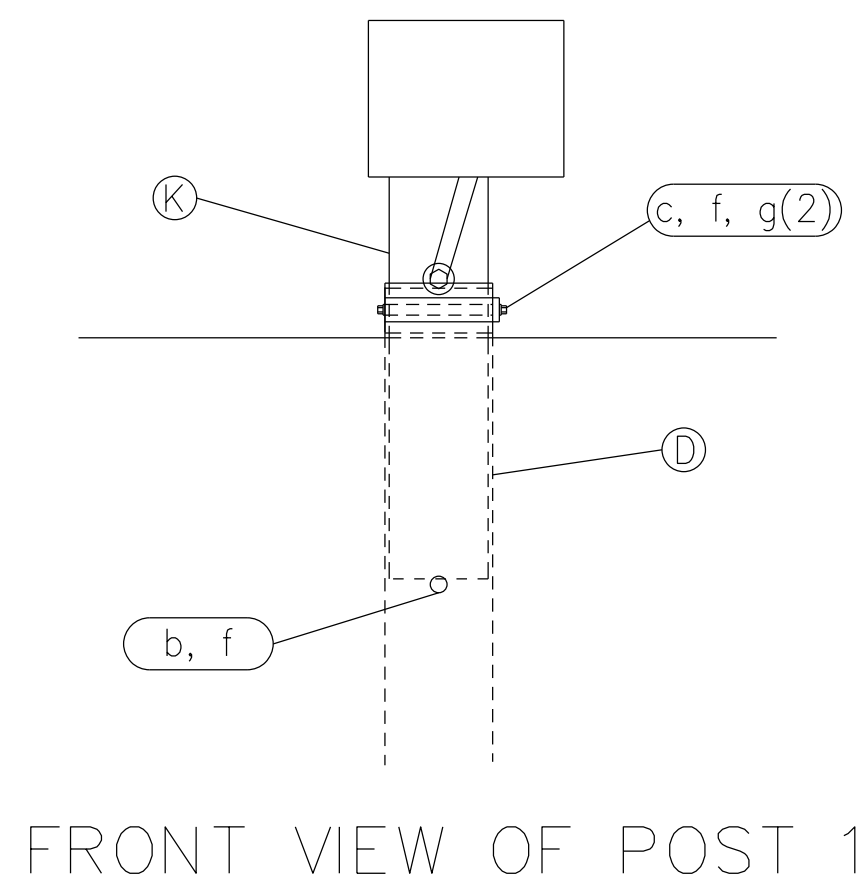
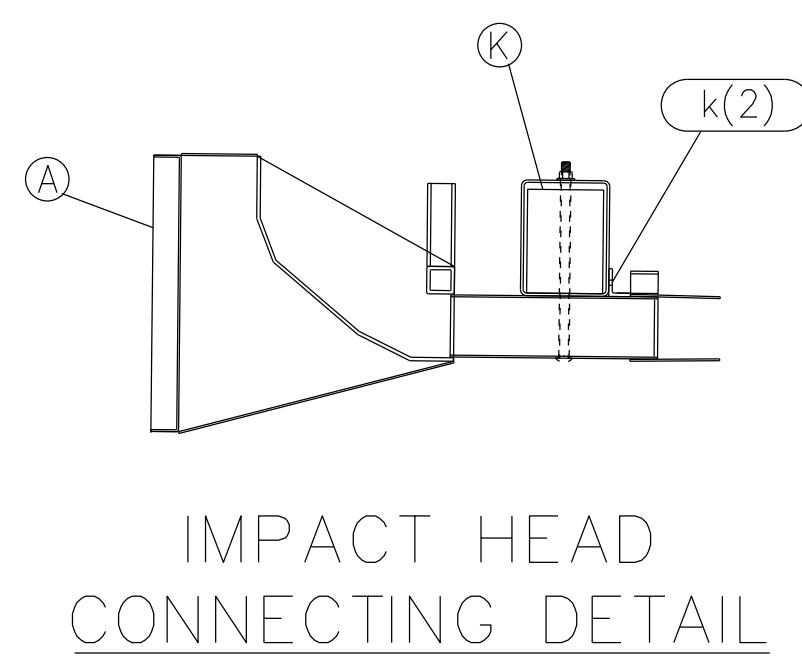
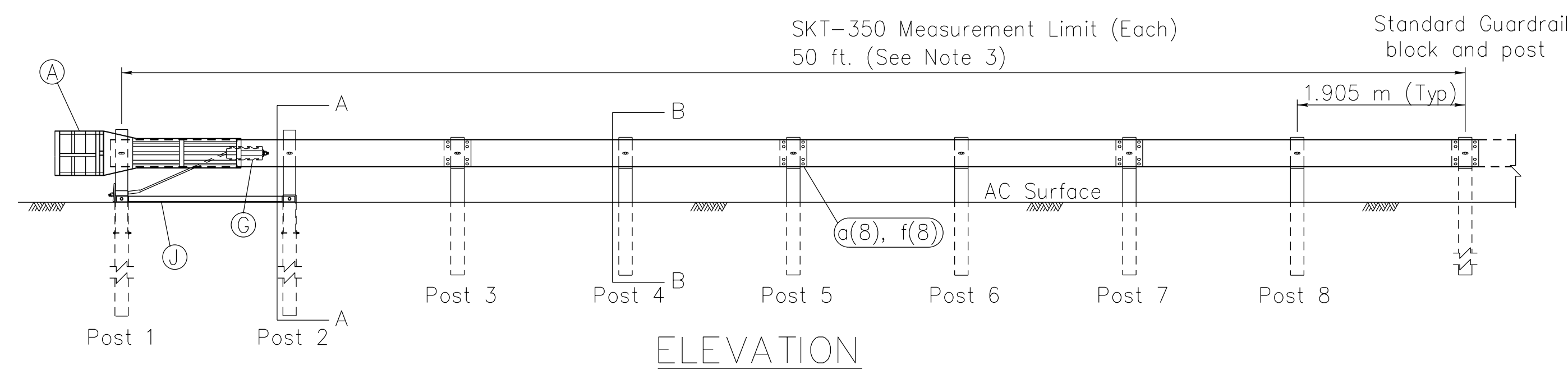
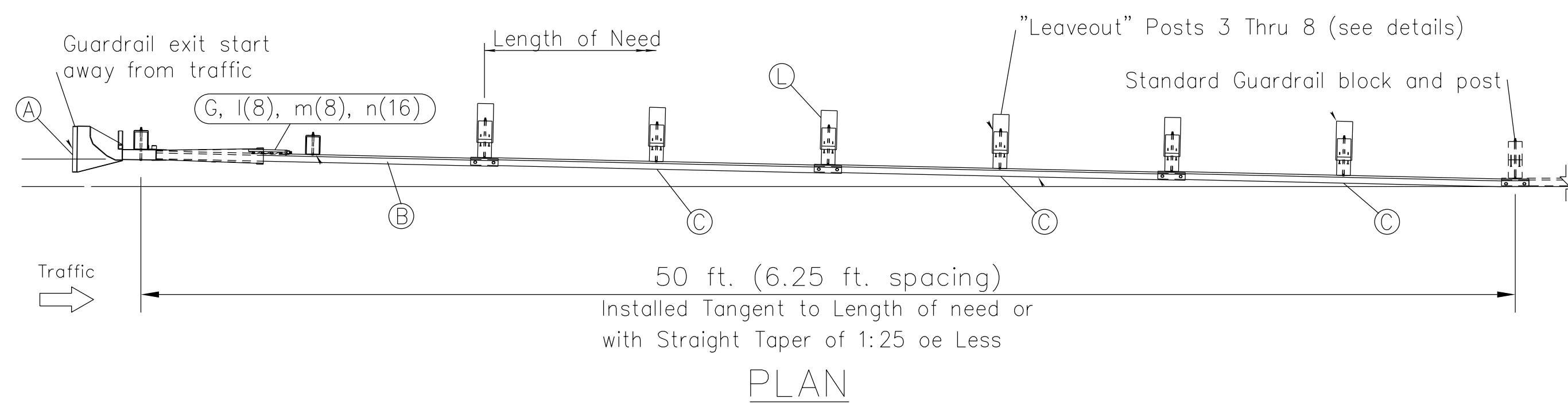
UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF INDIAN AFFAIRS  
NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

**GUARDRAIL END TREATMENT**  
SKT-350 LAYOUT; SHEET 2 of 3

Designed by: BIA NRO-DOT Structural Unit	Date: 2/13/15
Drawn by: - - -	Date: - - -
Revised by: - - -	Date: - - -
File Name: SKT-350 Sht 2 OF 3_2015-02-13	

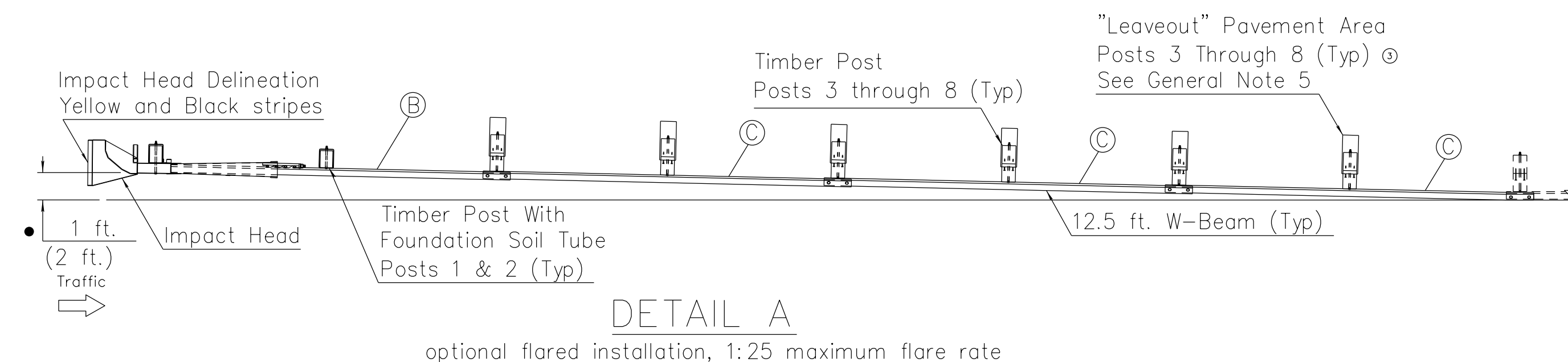


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Leaveout Requirement:

For posts 3 through 8, leaveouts in the asphaltic concrete pavement, as shown in Section B-B and LEAVEOUT DETAIL, around guardrail posts shall be provided where asphalt thickness exceeds 1.53" nominal (2" max) and where the asphalt extends more than 18" behind the posts. The leaveout shall be used at the post locations indicated and the leaveout material to place in the void shall consist of a 1-sack grout mix or other non-cohesive material as approved by the NRDOT Materials Unit.



- GENERAL NOTES
1. Breakaway posts are required with the Sequential Kinking Terminal.
  2. All bolts, nuts, cable assemblies, cable anchors and bearing plates shall be galvanized.
  3. The SKT can be flared at a rate of 1:25 to prevent the impact head from encroaching on the shoulder. The flare is not required and may be decreased or eliminated for specific installations.
  4. The soil tubes shall not protrude more than 4" above ground (measured along a 4.92 ft. chord). Site grading may be necessary to meet this requirement.
  5. The soil tubes may be driven with an approved driving head. Soil tubes should not be driven with the post in the tube. If the tubes are placed in drilled holes, the backfill material must be satisfactorily compacted to prevent settlement.
  6. When rock is encountered during excavation, a 1 ft. Dia. post hole, 20" into rock may be used if approved by the engineer. Granular material will be placed in the bottom of the hole approx. 2.51" deep to provide drainage. The soil tubes will be field cut to length, placed in the hole and backfilled with adequately compacted material excavated from the hole.
  7. The breakaway cable assembly must be taut. A locking device, (vice-grips or channel-lock pliers) should be used to prevent the cable from twisting when tightening nuts.
  8. A special site evaluation should be considered prior to using the SKT where there is less than 25 ft. between the outlet side of the SKT and any adjacent driving lane.
  9. The wood blockouts should be "toe-nailed" to the wood posts to prevent them from turning when the wood shrinks.
  10. Guardrail splice shall be overlapped in the direction of adjacent traffic.
  11. Bill of materials and some of the details herein were provided by Road Systems Inc.

REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
NAVAJO	AZ	NAVAJO	N2007	N2007(1-1)1,2&4	18c	63

Code	QTY.	BILL OF MATERIALS	ITEM#
A	1	IMPACT HEAD	S3000
B	1	W-BEAM GUARDRAIL END SECTION, 12 GA., 12.5 ft.	FS1303
C	3	W-BEAM GUARDRAIL, 12 ga., 12.5 ft RAIL ELEMENTS	G1203
D	2	FOUNDATION SOIL TUBE, 6" x 8" x 6'	E731
E	1	PIPE SLEEVE	E740
F	1	BEARING PLATE, 8" x 8" x 0.63"	E750
G	1	CABLE ANCHOR BOX	S760
H	1	BCT CABLE ANCHOR ASSEMBLY	E770
J	1	GROUND STRUT	E780
K	2	5.51" x 7.51" x 3.75" WOOD POSTS	P650
L	6	6" x 8" x 6" WOOD CRT POST	P671
M	6	6" x 8" x 14" TIMBER BLOCKOUT	P675
HARDWARE			
a	32	0.63" Dia. x 1.25" SPLICE BOLT	B580122
b	2	0.63" Dia. x 7.52" HEX BOLT	B580754
c	2	0.63" Dia. x 10" HEX BOLT	B581004
d	1	0.63" Dia. x 7.52" H.G.R. BOLT (post 2 only)	B581002
e	6	0.63" Dia. x 18" H.G.R. BOLT (posts 3-8)	B581802
f	43	0.63" Dia. H.G.R. NUT	N050
g	11	H.G.R. WASHER	W050
h	2	0.98" ANCHOR CABLE HEX NUT	N100
j	2	0.98" ANCHOR CABLE WASHER	W100
k	2	0.37" X 3" LAG SCREW	E350
l	8	CABLE ANCHOR BOX SHOULDER BOLTS	SB58A
m	8	0.50" A325 STRUCTURAL NUTS	N055A
n	16	1.06" OD x 0.55" ID A325 STR. WASHER	W050A

APPROVED AS NCHRP 350 T3 TERMINAL

REVISED ON  
4/21/15

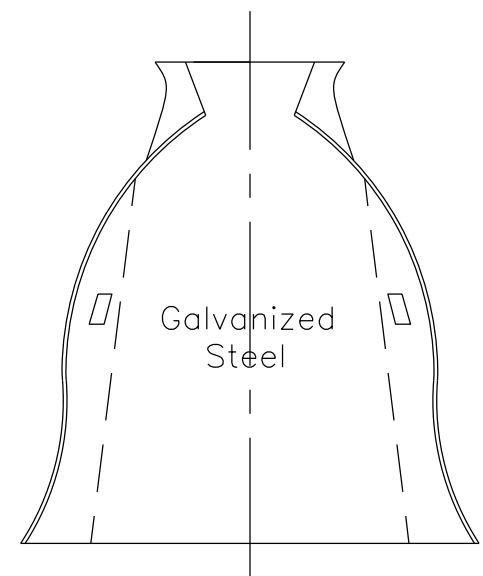
UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF INDIAN AFFAIRS  
NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

GUARDRAIL END TREATMENT  
SKT-350 LAYOUT; SHEET 3 of 3

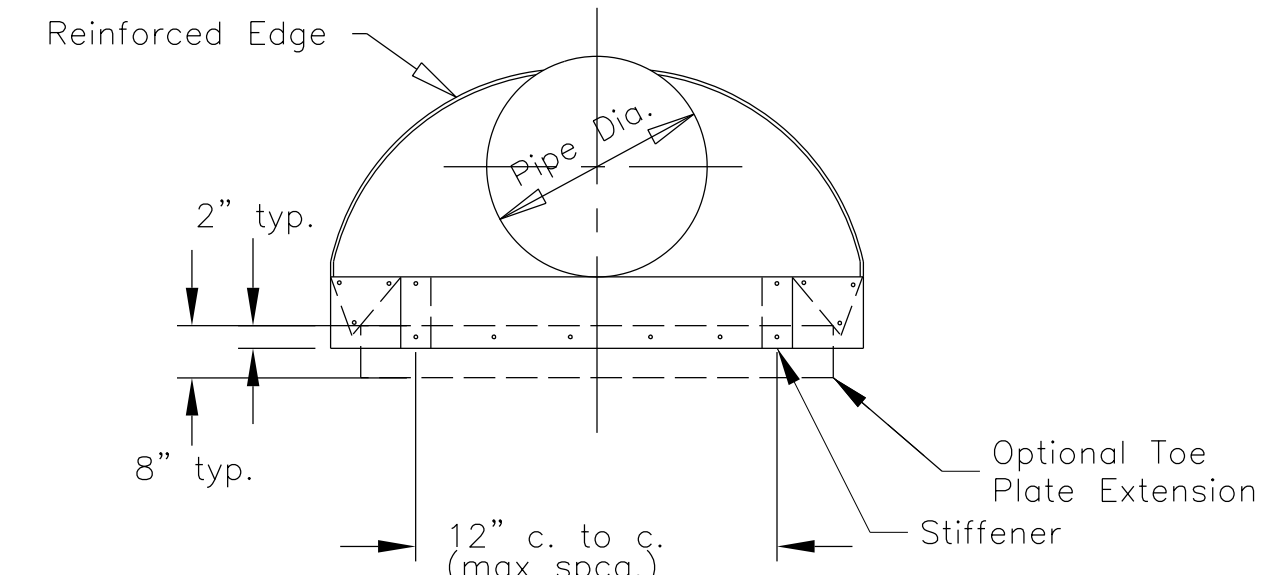
Designed by: BIA NRO-DOT Structural Unit	
Drawn by: dc	
Revised by: - - -	
Date: 2/13/2015	
Date: - - -	
File Name: SKT-350 Sht 3 of 3_2015-02-13	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1,2&4	19	63

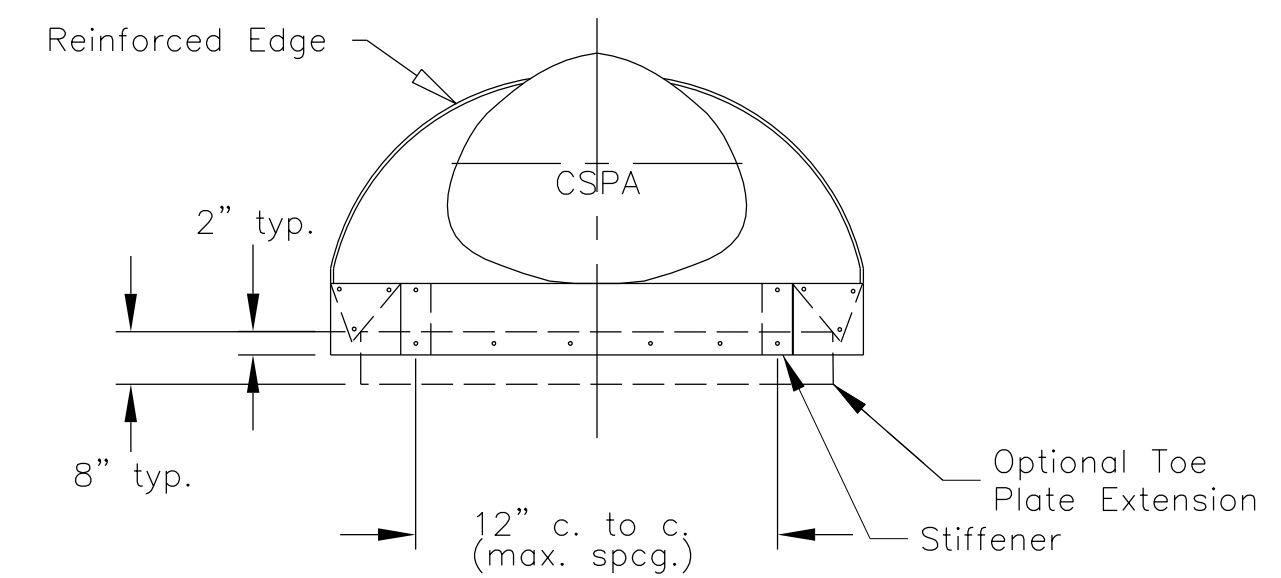
ESTIMATED STRUCTURE QUANTITIES		ITEM NO.	25101-2000	60201-0810	60201-0910	60202-0510	60202-0610	60210-0810	60210-1010	60211-0910	60211-1010
			Placed Riprap, Class 2								
			24" CSPC-16 Gauge 2 2/3" x 1/2" Corrugation								
			36" CSPC-16 Gauge 2 2/3" x 1/2" Corrugation								
			28" Span x 20" Rise CSPC-16 Gauge 2 2/3" x 1/2" Corrugation								
			35" Span x 24" Rise CSPC-16 Gauge 2 2/3" x 1/2" Corrugation								
			End Section For 24" CSPC-16 Gauge								
			End Section For 36" CSPC-16 Gauge								
			End Section For 28" Span x 20" Rise CSPC-16 Gauge								
			End Section For 35" Span x 24" Rise CSPC-16 Gauge								
STATION	LOCATION	STRUCTURE DESCRIPTION	SKEW NO.	c.y.	ft.	ft.	ft.	ft.	Ea.	Ea.	Ea.
3+55.00	Lt.	1-24" x 68' CSPC (Under Turnout Lt.)			68'				2		
6+60.00	℄	1-35" Span x 24" Rise x 70' CSPA With End Section	90°				70'			1	
19+75.00	Rt.	1-24" x 40' CSPC (Under Turnout Rt.)		5.62	40'				2		
36+00.00	℄	2-36" x 106' CSPC	135°	33.22		212'				2	
47+40.00	℄	1-24" x 70' CSPC	90°		70'				1		
Sub-total :				38.84	178'	212'	0	70'	5	2	0
MAINTENANCE ROAD RIGHT TURNOUT TO EXISTING BRIDGE											
0+50.00	℄	1-28" Span x 20" Rise x 50' CSPA With End Section	90°			50'				2	
5+05.00	Lt.	1-28" Span x 20" Rise x 46' CSPA With End Section	90°			46'				2	
5+90.00	Lt.	1-28" Span x 20" Rise x 46' CSPA With End Section	90°			46'				2	
370 ft	--	Trapezoidal Channel Lining with Class-2 Rip Rap		27.0							
Sub-total :				0	0	0	142'	0	0	0	0
GRAND TOTAL :				66.0	178'	212'	142'	70'	5	2	6



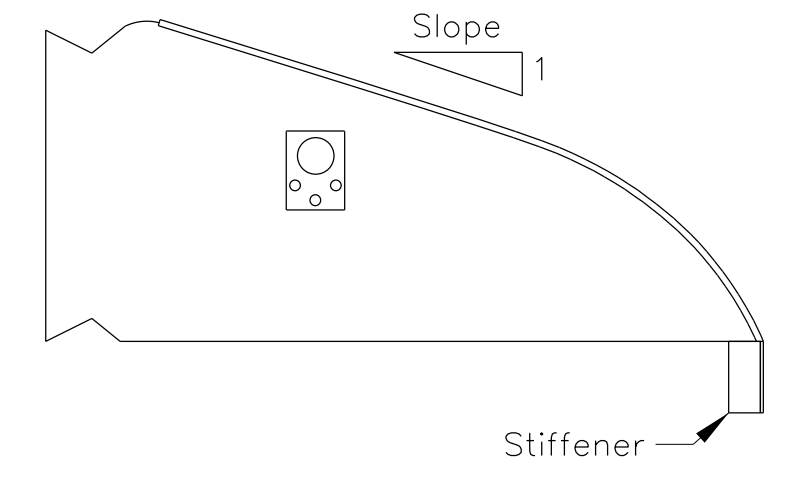
PLAN



ELEVATION



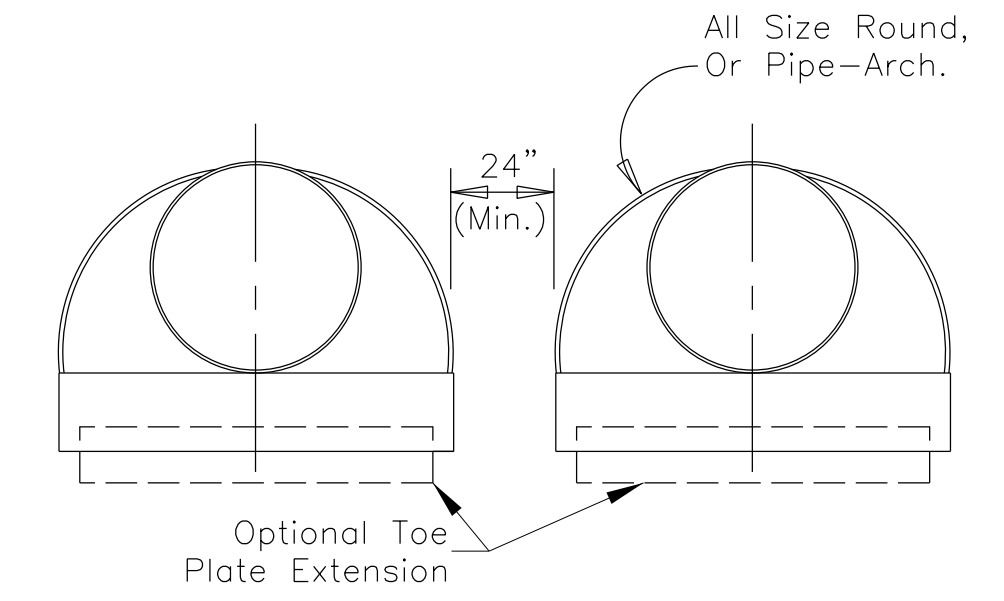
ELEVATION



TYPICAL CROSS SECTION

GENERAL NOTES

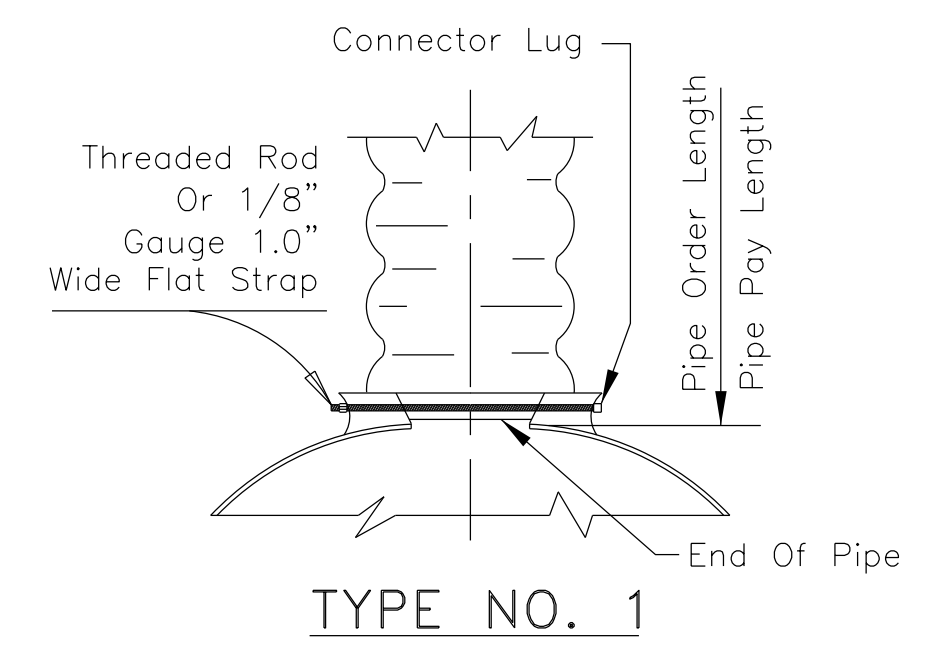
- FOR MULTIPLE INSTALLATION OF ALL TYPES, A MINIMUM OF A 24" SPACING MEASURED ALONG THE HORIZONTAL BETWEEN FLARED END SECTIONS AT THEIR WIDEST CROSS SECTION SHALL BE USED.
- ALL THREE (3) PIECE BODIES TO HAVE 0.109" THICKNESS SIDES AND 0.138" THICKNESS CENTER PANELS. WIDTH OF CENTER PANELS TO BE GREATER THAN 20% OF THE PIPE PERIPHERY. MULTIPLE PANEL BODIES TO HAVE LAP SEAMS WHICH ARE TO BE TIGHTLY JOINED BY 0.375" Ø GALVANIZED RIVETS OR BOLTS.
- END SECTIONS FOR STEEL PIPE-ARCHES: FOR THE 77" x 52" AND 83" x 57" SIZES, REINFORCED EDGE TO BE SUPPLEMENTED BY 2" x 0.25" GALVANIZED ANGLES. THE ANGLES TO BE ATTACHED BY 0.375" DIA. GALVANIZED NUTS AND BOLTS. ANGLE REINFORCEMENT WILL BE PLACED UNDER THE CENTER PANEL SEAMS.
- END SECTIONS FOR STEEL CIRCULAR PIPES: FOR 60" Ø THRU 84" Ø SIZES, REINFORCED EDGE TO BE SUPPLEMENTED WITH GALVANIZED STIFFENER ANGLES. THE ANGLES WILL BE 2" x 2" x 0.25" FOR 60" Ø THRU 72" Ø, AND 2.52" x 2.52" x 0.25" FOR 78" Ø AND 84" Ø. THE ANGLES TO BE ATTACHED BY 0.375" Ø GALVANIZED NUTS AND BOLTS.
- WELDING SHALL NOT BE PERMITTED IN CONNECTING END SECTIONS TO CONNECTOR SECTIONS OR CONNECTOR SECTIONS TO PIPE.
- TYPE NO. 1 STEEL END SECTION, CONNECT END SECTION WITH THREADED ROD WITH CONNECTOR LUG, FOR 24" Ø ROUND PIPE AND 28" x 20" CSPA.
- TYPE NO. 2 STEEL END SECTION, CONNECT END SECTION WITH THREADED ROD WITH ROD HOLDER FOR 30" Ø AND 36" Ø ROUND PIPE AND 17" x 13" THRU 57" x 38" CSPA.
- TYPE NO. 3 STEEL END SECTION, THE CONNECTION INCLUDES 12" OF THE PIPE LENGTH AS A CONNECTOR SECTION FOR PIPE ARCH SIZES 64" x 43" THRU 84" x 57" AND ROUND PIPE SIZES 42" Ø THRU 84" Ø. GAGES OF CONNECTOR SECTION SHALL BE THE SAME AS THE END SECTIONS AS MENTION ABOVE. THE CONNECTOR SECTION WILL BE ATTACHED TO THE END SECTION BY 0.374" Ø GALVANIZED RIVETS OR BOLTS APPROXIMATELY 6" CENTERS.
- HELICALLY CORRUGATED PIPE, FOR TYPE NO. 5 AND TYPE NO. 3 THE DIMPLE BAND OR CORRUGATED PIPE CONNECTOR SECTION SHALL BE ATTACHED TO THE END SECTION BY 0.374" Ø GALVANIZED STEEL RIVETS OR BOLTS SPACED AT APPROXIMATELY 6" CENTERS.
- TYPE NO. 1, TYPE NO. 2, AND TYPE NO. 3 CONNECTIONS MAY BE USED WITH WELDED SEAMS HELICALLY CORRUGATED PIPE WITH RE-ROLLED ENDS. RE-ROLLED ENDS SHALL INCLUDE A MINIMUM OF TWO (2) ANNULAR CORRUGATIONS OF THE SAME SIZE AS THE PIPE CORRUGATIONS.
- ALL CUT ENDS OF PIPE MUST BE CLEANED AND EITHER GALVANIZED OR PAINTED AT THE FABRICATION PLANT USING GALVANIZED-ZINC PAINT PER THE MANUFACTURES RECOMENDATIONS WITH MATERIAL CERTIFICATIONS SUBMITTED.



MULTIPLE INSTALLATION SPACING

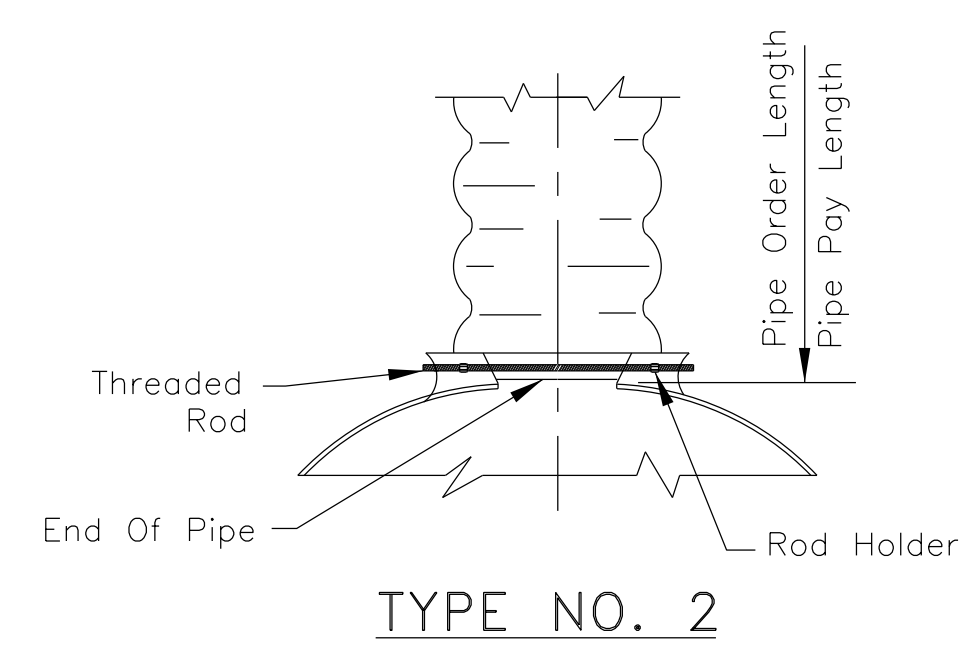
NOTE: At Roadway Culverts Place End Sections On Inlet End Only.  
At Driveway Culverts Place End Sections On Both Ends.

REVISED ON  
12/12/2013



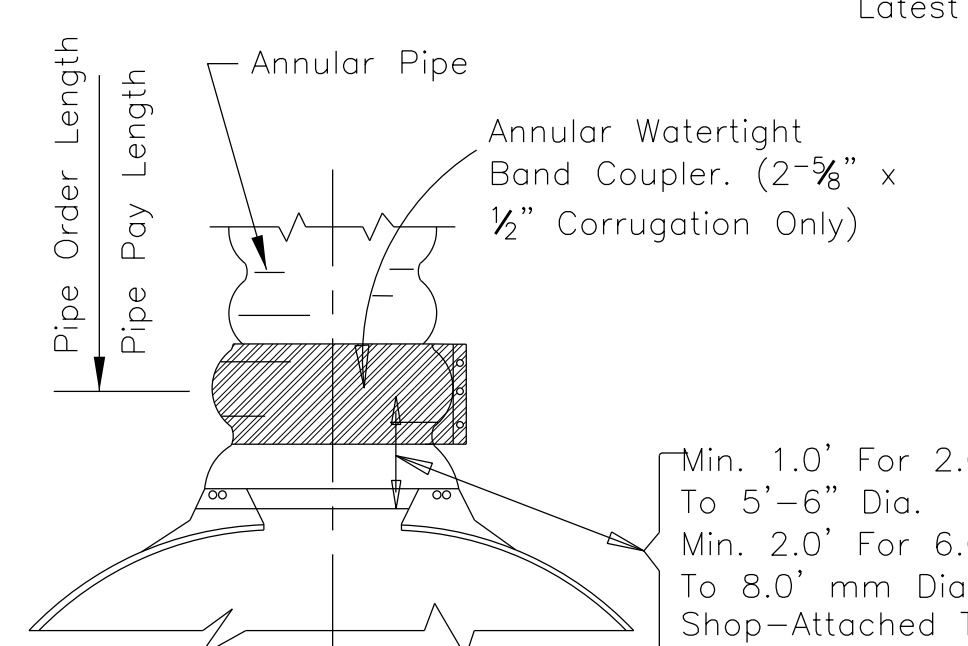
TYPE NO. 1

For 1.0' Thru 2.0' CSPC & 3'-3/8" x 1'-8" CSPA (See Note No. 6)



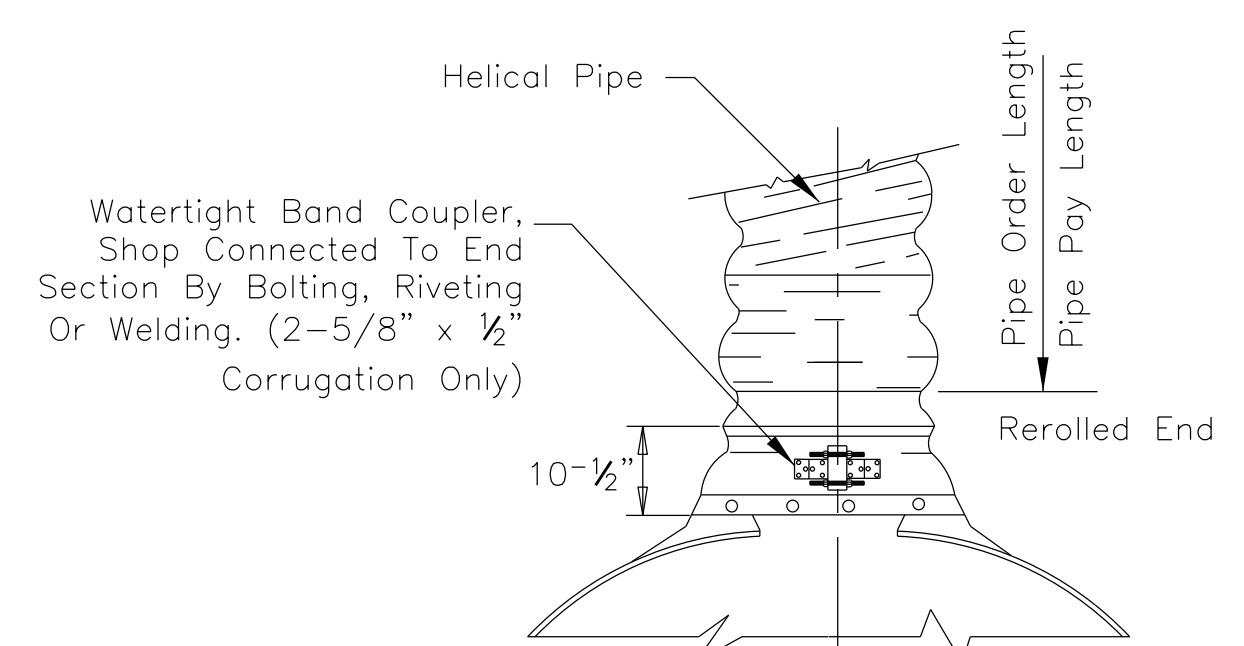
TYPE NO. 2

For 2'-6" & 3.0' CSP And 1'-5" x 1'-1" thru 4'-9" x 3'-2" CSPA Only (See Note No. 7)



TYPE NO. 3

Min. 1.0' For 2.0' To 5'-6" Dia.  
Min. 2.0' For 6.0' To 8.0' mm Dia.  
Shop-Attached To End Section By Bolting, Riveting Or Welding. (See Note No. 8)



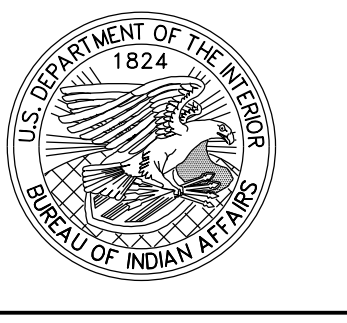
TYPE NO. 5

(SEE NOTE NO. 6)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF INDIAN AFFAIRS  
NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

STRUCTURE QUANTITIES

DRAWN BY: Gerald.Hood	DATE: 5/7/2009
DESIGNED BY: NRDOT	DATE: 5/7/2009
REVISED: 1/28/2013	BY: Peterson.Yazzie
ANNOTATION SCALE: Full Size 1=1	
FILENAME: Sht.19_Drainage Str. Quantity.dgn	



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**CHART TO DETERMINE SINGLE POST SIZE**

POST SIZE	K FACTOR (B x A)	B DIMENSION (Feet)													A(ft <sup>2</sup> ) SIGN AREA
		5	6	7	8	9	10	11	12	13	14	15	16		
2.00 lb/ft	DOES NOT APPLY	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.7	3.4	3.2	2.9	2.8		
2.25 lb/ft		5.1	5.1	5.1	5.1	5.1	5.1	4.6	4.2	3.9	3.6	3.4	3.2		
2.75 lb/ft		6.7	6.7	6.7	6.7	6.7	6.7	6.0	5.5	5.1	4.7	4.4	4.1		
3.00 lb/ft		7.3	7.3	7.3	7.3	7.3	7.3	6.7	6.2	5.6	5.1	5.0	5.0		
4.00 lb/ft		9.4	9.4	9.4	9.4	9.4	9.4	9.4	8.6	8.0	7.5	7.0	7.0		

**CHART TO DETERMINE DOUBLE POST SIZE**

POST SIZE	K FACTOR (B x A)	B DIMENSION (Feet)													A(ft <sup>2</sup> ) SIGN AREA
		5	6	7	8	9	10	11	12	13	14	15	16		
2.00 lb/ft	97.00	19.4	16.1	13.8	12.1	10.8	9.7	8.8	8.1	7.5	6.9	6.5	6.1		
2.25 lb/ft	109.00	21.9	18.2	15.6	13.7	12.2	10.9	9.9	9.1	8.4	7.8	7.3	6.8		
2.75 lb/ft	142.00	28.4	23.7	20.3	17.8	15.8	14.2	12.9	11.8	10.9	10.1	9.5	8.9		
3.00 lb/ft	174.00	34.8	29.0	24.9	21.8	19.3	17.4	15.8	14.5	13.4	12.4	11.6	10.9		
4.00 lb/ft	241.00	48.2	40.2	34.4	30.1	26.8	24.1	21.9	20.1	18.5	17.2	16.1	15.1		

**CHART TO DETERMINE THREE POST SIZE**

POST SIZE	K FACTOR (B x A)	B DIMENSION (Feet)													A(ft <sup>2</sup> ) SIGN AREA
		5	6	7	8	9	10	11	12	13	14	15	16		
2.00 lb/ft	145.00	29.0	24.2	20.7	18.1	16.1	14.5	13.2	12.1	11.2	10.4	9.7	9.1		
2.25 lb/ft	164.00	32.8	27.3	23.4	20.5	18.2	16.4	14.9	13.7	12.6	11.7	10.9	10.3		
2.75 lb/ft	213.00	42.6	35.5	30.4	26.6	23.6	21.3	19.3	17.7	16.3	15.2	14.2	13.3		
3.00 lb/ft	261.00	52.2	43.5	37.3	32.6	29.0	26.1	23.7	21.7	20.0	18.6	17.4	16.3		
4.00 lb/ft	361.00	72.2	60.1	51.5	45.1	40.1	36.1	32.8	30.0	27.7	25.8	24.0	22.5		

**GENERAL NOTES**

- The contractor shall be required to adjust the length of sign support posts. This work shall be included in the unit price for the appropriate bid items shown in the bid schedule.
- Sign dimension equal to or in exceed of 30" x 30" size shall be install with a minimum of two (2) steel posts.

**Illustration of posts/weight determination:**

REQUIRED: Determine Post Requirement  
For a 5.00 ft. wide x 4.00 ft. high traffic Sign.  
Located On A Rural Highway.

GIVEN:  
W=5.00 ft.  
D=4.00 ft.  
C = 6.00 ft., for Rural areas

SOLUTION: 1)  $B = C + (D/2)$   
 $B = 6.00 \text{ ft.} + (4 \text{ ft.}/2)$   
 $B = 8.00 \text{ ft.}$

2)  $A = W \times D$   
 $A = 5.00 \text{ ft.} \times 4.00 \text{ ft.}$   
 $A = 20 \text{ ft.}^2$

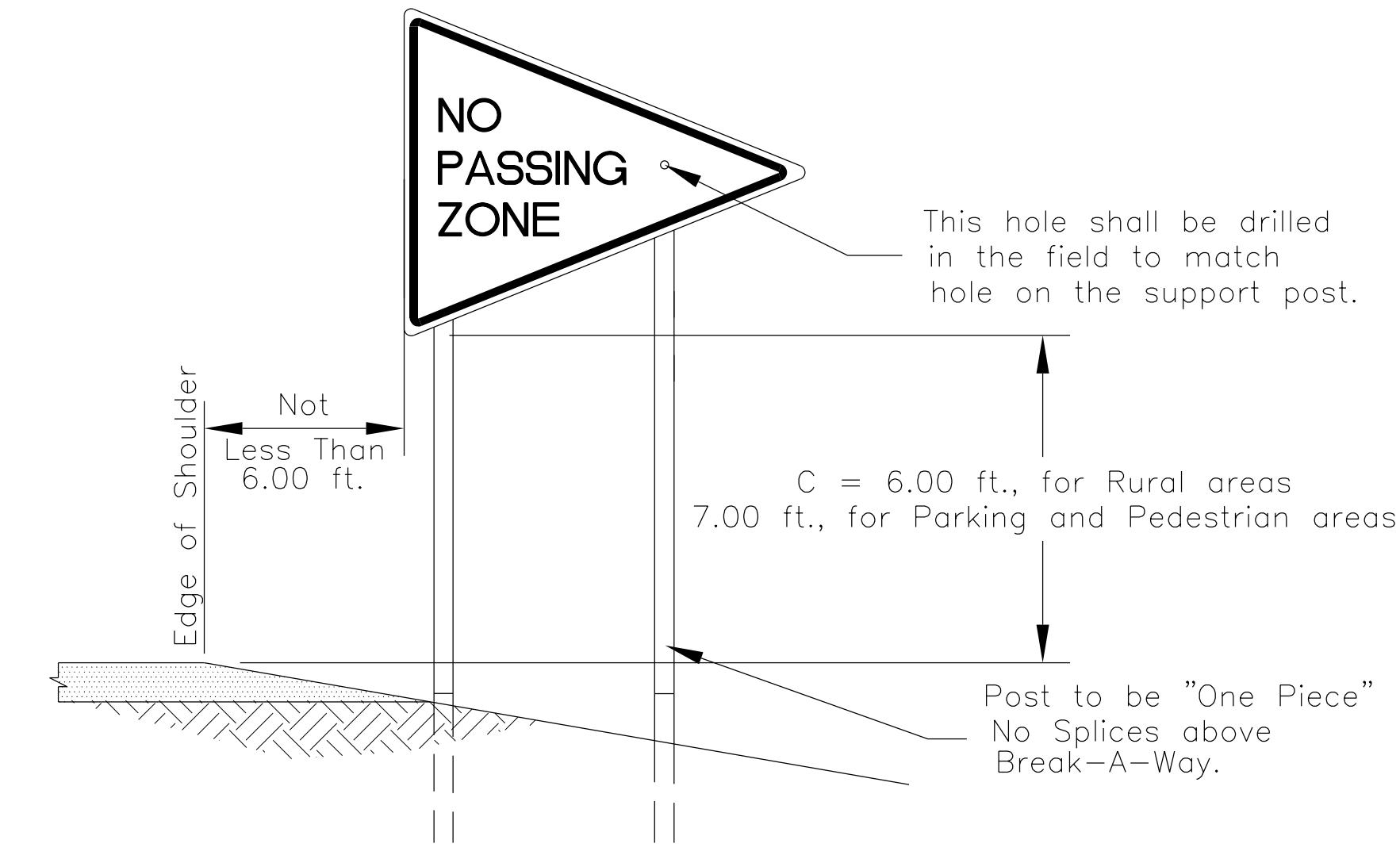
3) K factor =  $A \times B$   
 $K = 20 \times 8$   
 $K = 160$

4. Begin with single post chart for column of B=8.00 ft. and continue down until area of sign equal or exceed 20 sq./ft. or down the K factor column until the value equals or exceeds 160. Both the Area and K factor exceed the single post chart so go to the double post chart.

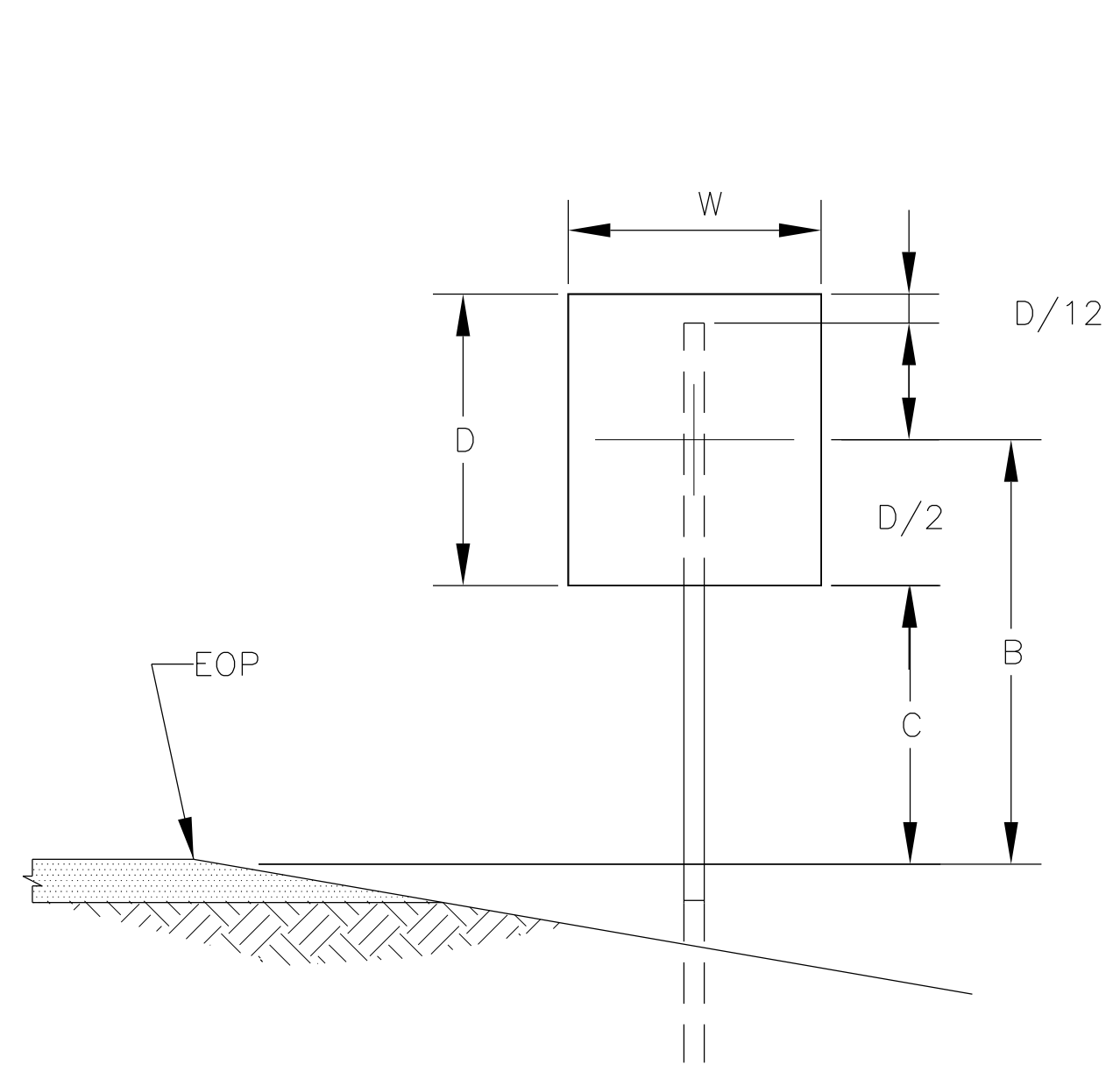
Select two (2) Posts of 3.00 lb/ft.  
Yields a factor of 174  
Which Is Optimum.

EXAMPLE:

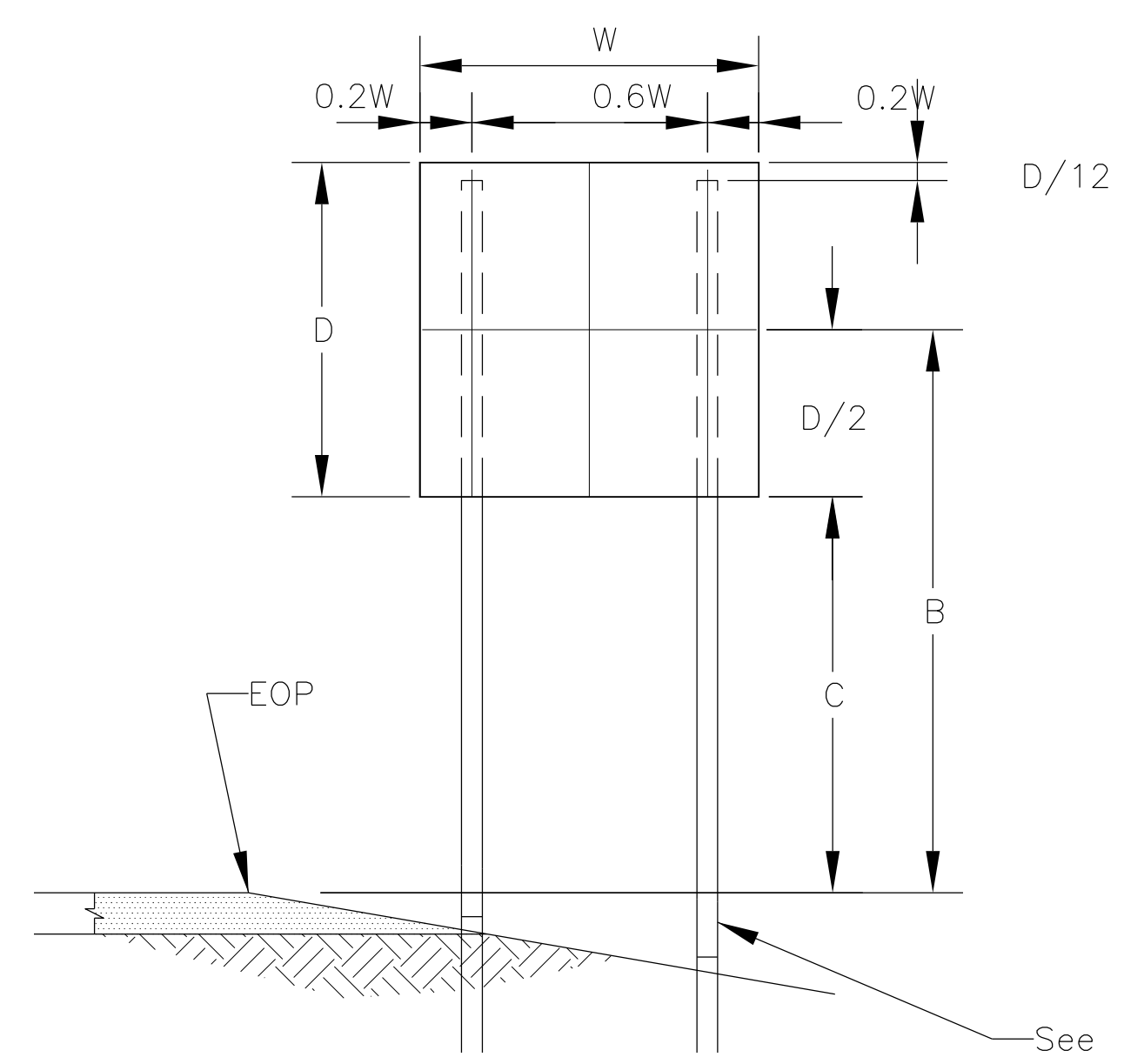
K factor	Post weight	B=8
142	2.75 lb/ft	17.8
174	3.00 lb/ft	21.8
241	4.00 lb/ft	30.1



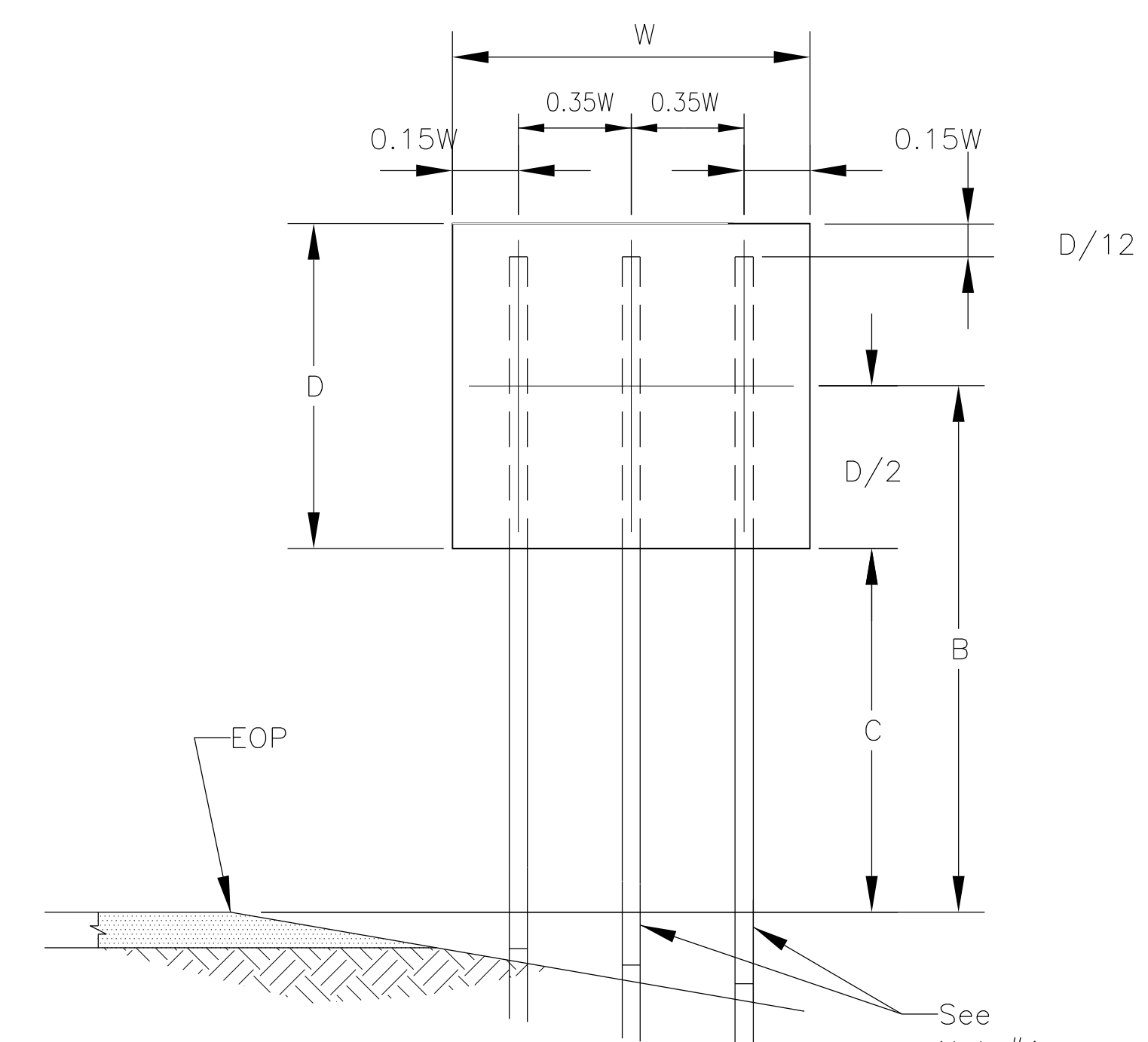
TYPICAL ROADSIDE SIGN LOCATION



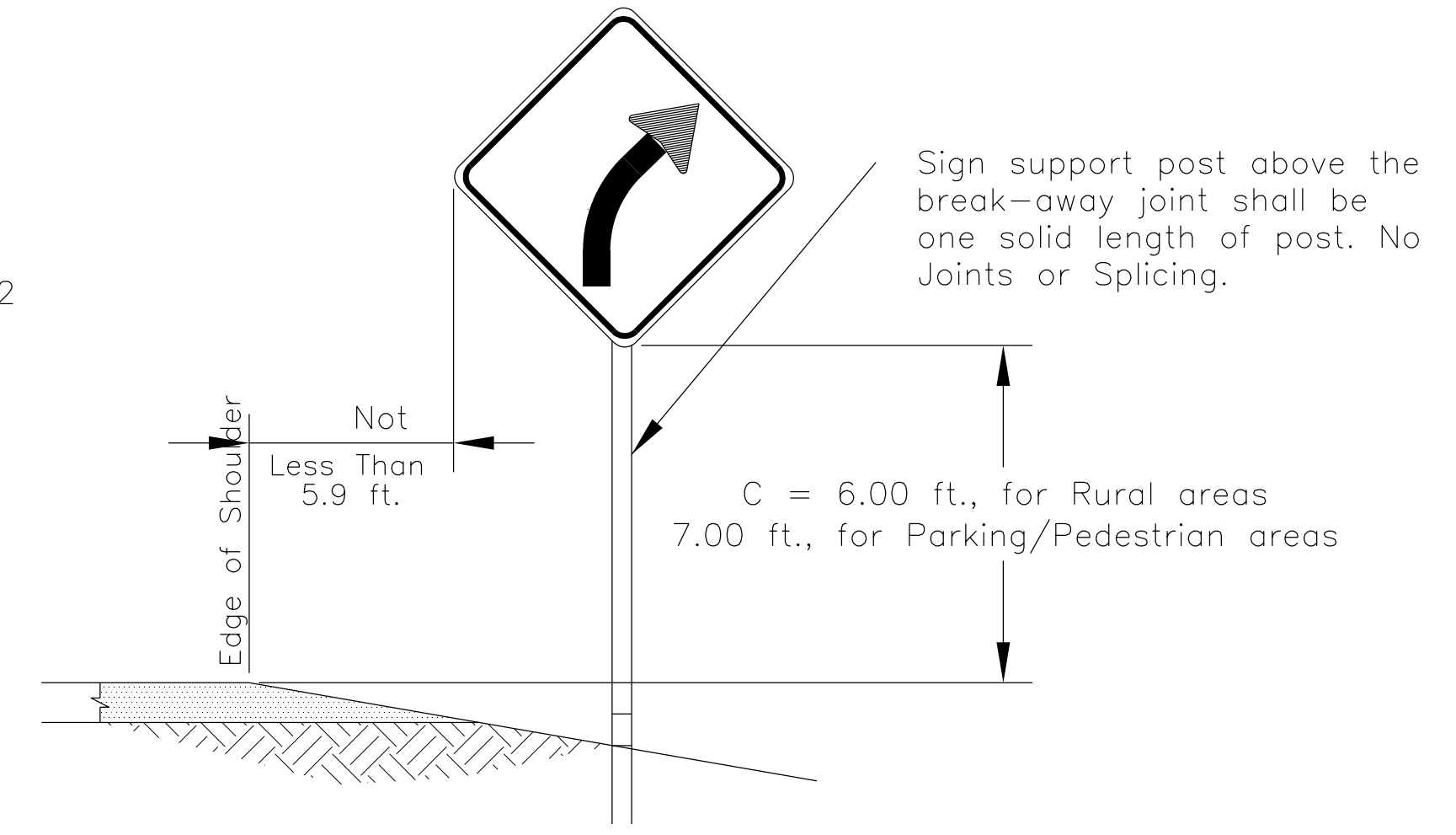
SINGLE POST SIZE (typ.)



DOUBLE POST SIZE (typ.)



THREE POST SIZE (typ.)

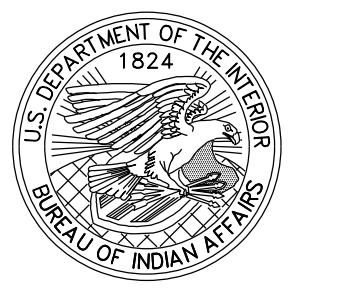


TYPICAL ROADSIDE SIGN LOCATION

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF INDIAN AFFAIRS  
NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

**PERMANENT SIGNING DETAIL**

DRAWN BY: Gerald.Hood DATE: 5/7/2009  
DESIGNED BY: NRDOT DATE: 5/7/2009  
REVISED: 1/25/2013 BY: Peterson.Yazzie  
ANNOTATION SCALE: Full Size 1=1  
FILENAME: Sht.20 Perm Sign Std Details1.dgn



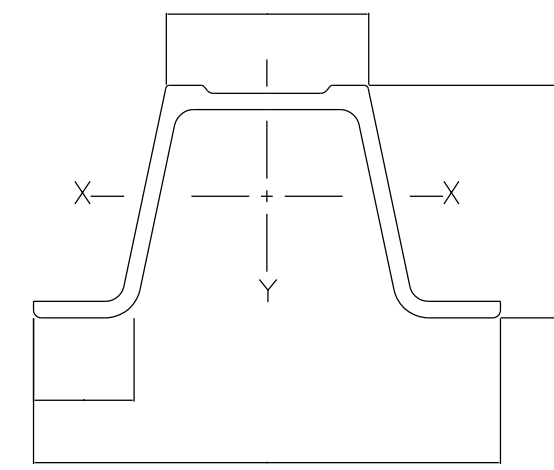
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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1,2&4	21	63

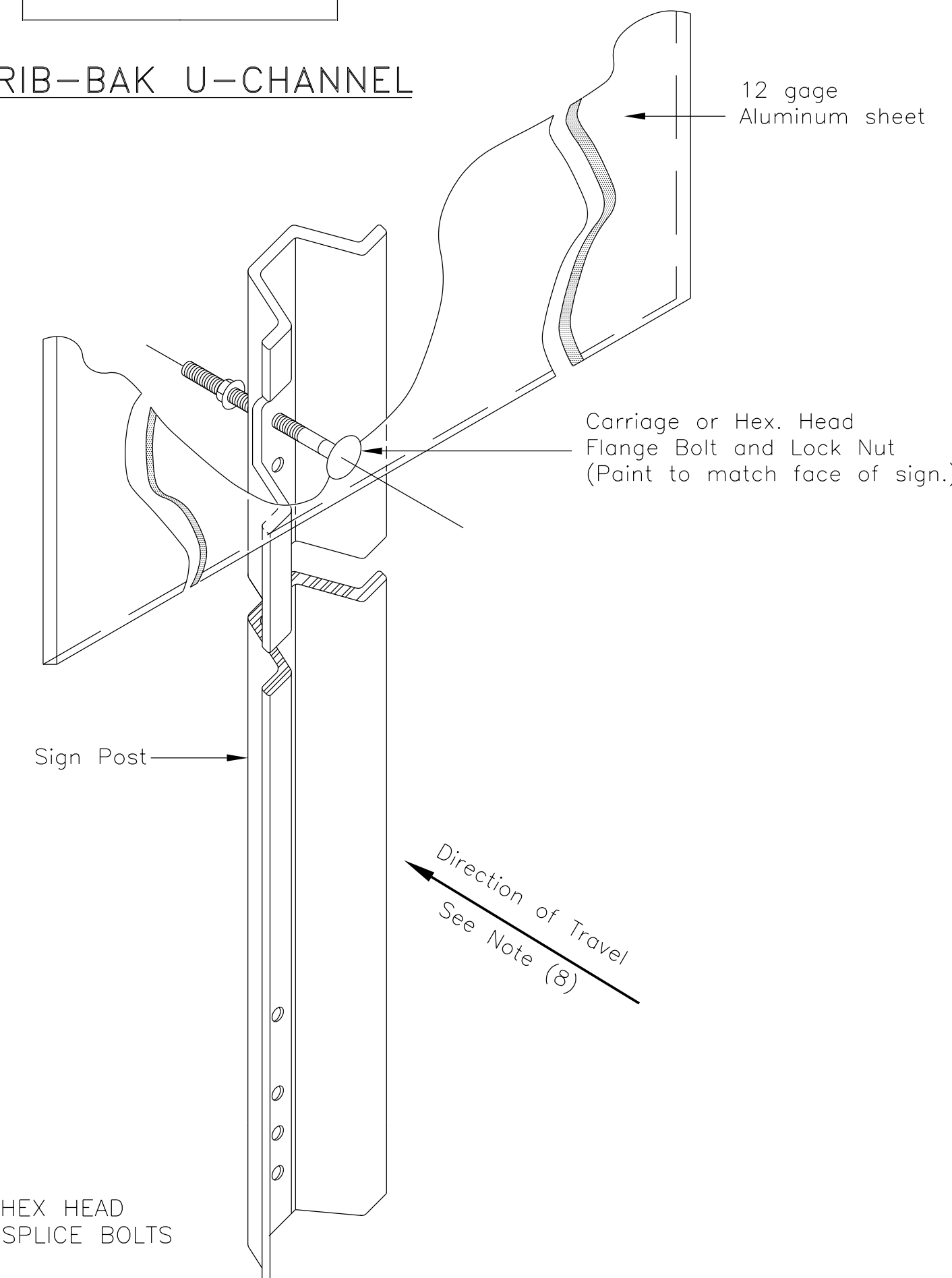
RIB-BAK U-CHANNEL SIGN SUPPORTS

WEIGHT *lb/ft	DIMENSIONS (inches)				AREA in <sup>2</sup>	X-X AXIS		Y-Y AXIS	
	A	B	C	D		in <sup>4</sup>	in <sup>3</sup>	in <sup>4</sup>	in <sup>3</sup>
2.0	1.462	3.062	1.278	.669	.556	.155	.195	.422	.276
2.5	1.516	3.062	1.278	.669	.701	.208	.249	.550	.359
2.75	1.536	3.062	1.278	.669	.756	.228	.270	.598	.391
3.0	1.881	3.500	1.336	.834	.840	.376	.340	.837	.478
4.0	1.968	3.500	1.336	.834	1.112	.540	.467	1.147	.655

\* ±5%

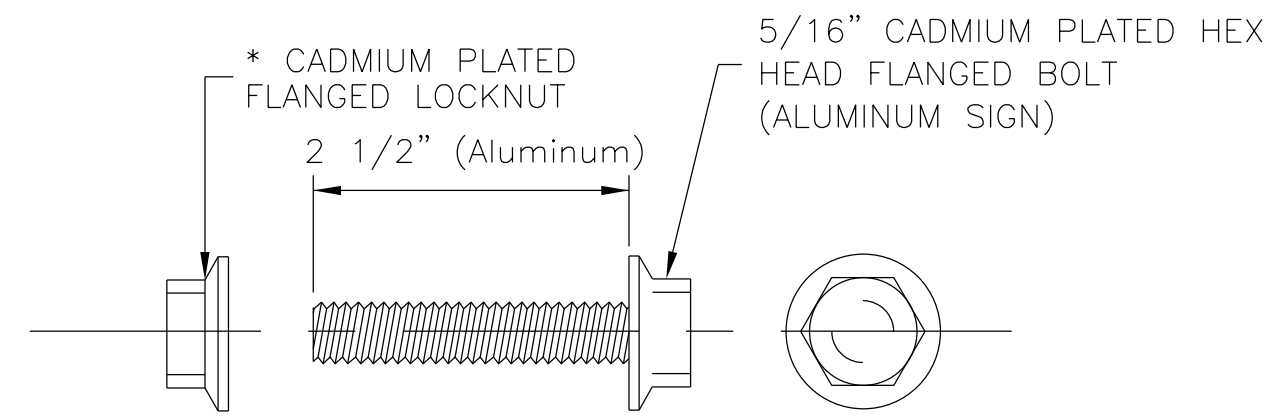


RIB-BAK U-CHANNEL



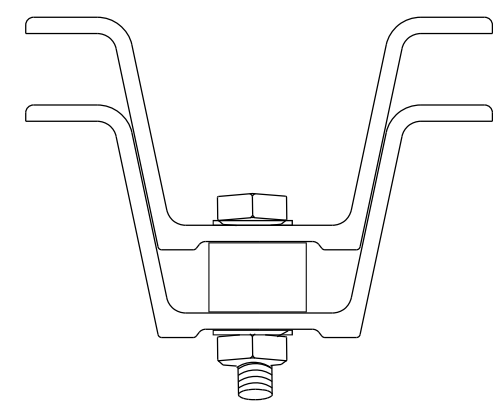
GENERAL NOTES

1. BASE POST AND SIGN POST SHALL BE RIB-BAK U-CHANNEL FABRICATED FROM HOT ROLLED CARBON STEEL BARS CONFORMING TO THE REQUIREMENTS OF ASTM A499. YIELD POINT OF THE STEEL SHALL BE 550 MPa (MINIMUM) TENSILE SHALL BE 689.47 MPa (MINIMUM).
2. POSTS SHALL BE A UNIFORM, MODIFIED, FLANGED CHANNEL SECTION OF THE RIB-BAK DESIGN. WEIGHT OF THE POSTS SHALL BE AS SPECIFIED BY THE USER, ±5% BEFORE PUNCHING. THE POSTS SHALL BE PUNCHED WITH WITH CONTINUOUS 3/8" HOLES ON 1" CENTERS FOR THE ENTIRE LENGTH OF THE POST.
3. THE POSTS SHALL BE MACHINE STRAIGHTENED TO HAVE A SMOOTH UNIFORM FINISH, FREE FROM DEFECTS AFFECTING THEIR STRENGTH, DURABILITY, OR APPEARANCE. ALL HOLES AND ROUGH EDGES SHALL BE FREE FROM BURRS. THE PERMISSIBLE TOLERANCE FOR STRAIGHTNESS SHALL BE WITHIN 1/4" IN 5 FEET
4. POSTS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM A 123. BOLTS, NUTS, WASHERS AND SPACER SHALL BE CADMIUM PLATED IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM A 165 OR ZINC PLATED IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM B 633.
5. SPLICE HARDWARE SHALL CONSIST OF TWO FULLY THREADED, 5/16" x 1 1/2" GRADE 9 PLATED, HEX HEAD BOLTS, WITH FLAT WASHERS, AND SELF LOCKING HEX NUTS PER POST. IN ADDITION, ONE 3/4" x 5" PLATED SPACER BAR SHALL BE USED, PER POST, TO STIFFEN THE SPLICE CONNECTION. EACH SPACER BAR SHALL BE DRILLED AND TAPPED WITH 5/16"-18 UNC THREADS. THE SPACER SHALL BE FABRICATED FROM HOT ROLLED CARBON STEEL BARS CONFORMING TO ASTM A 36 OR M 1020. BOLTS SHALL BE RED IN COLOR, WITH THE HEAD MARKING "M180".
6. BOLTS AND LOCK NUT HARDWARE FOR SIGN ATTACHMENT SHALL BE HEX HEAD FLANGE TYPE, SIZE SHALL BE 5/16"-18 UNC.
7. AN APPROVED ALTERNATE BREAKAWAY POST ASSEMBLY MAY BE SUBMITTED TO THE C.O.R. FOR REVIEW AND APPROVAL.
8. SUPPLEMENTAL SIGNS ON THE OPPOSITE SIDE OF ROAD SHALL HAVE THE POST REVERSED SO THAT RIB-BAK IS FACING AWAY FROM THE OPPOSING TRAFFIC.
9. THE POST SHALL BE COATED WITH A BAKED ON GREEN ALKYD RESIN, PAINT, PAINTED WITH A POLYESTER POWDER OR GALVANIZED PER NOTE 4 ABOVE. POWDER COATING SHALL CONFORM TO AASHTO M 284-08.

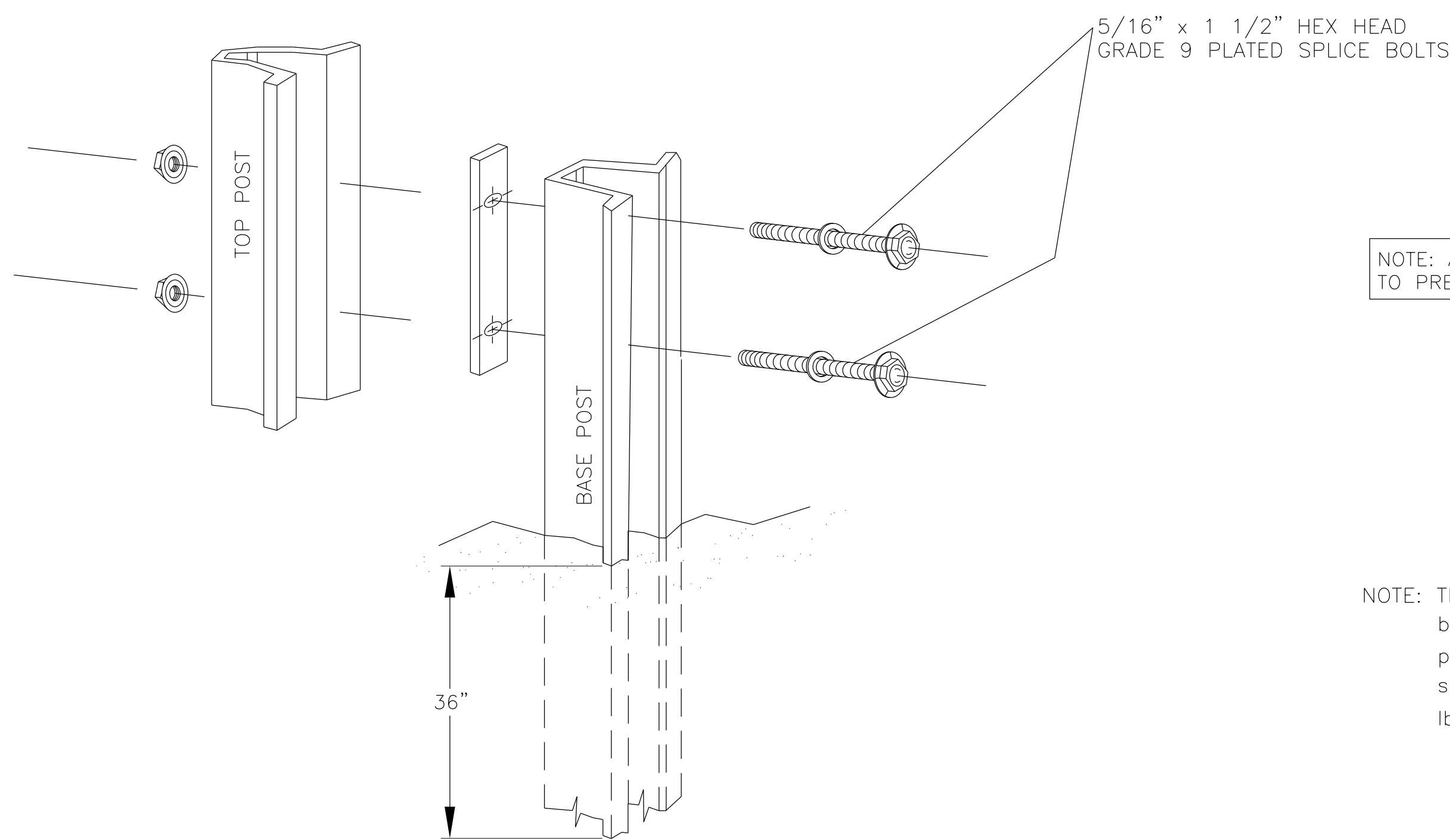


BOLTS AND LOCKNUT - SIGN ATTACHMENT

\* FLANGED LOCKNUT REQUIRED FOR CARRIAGE AND HEX.



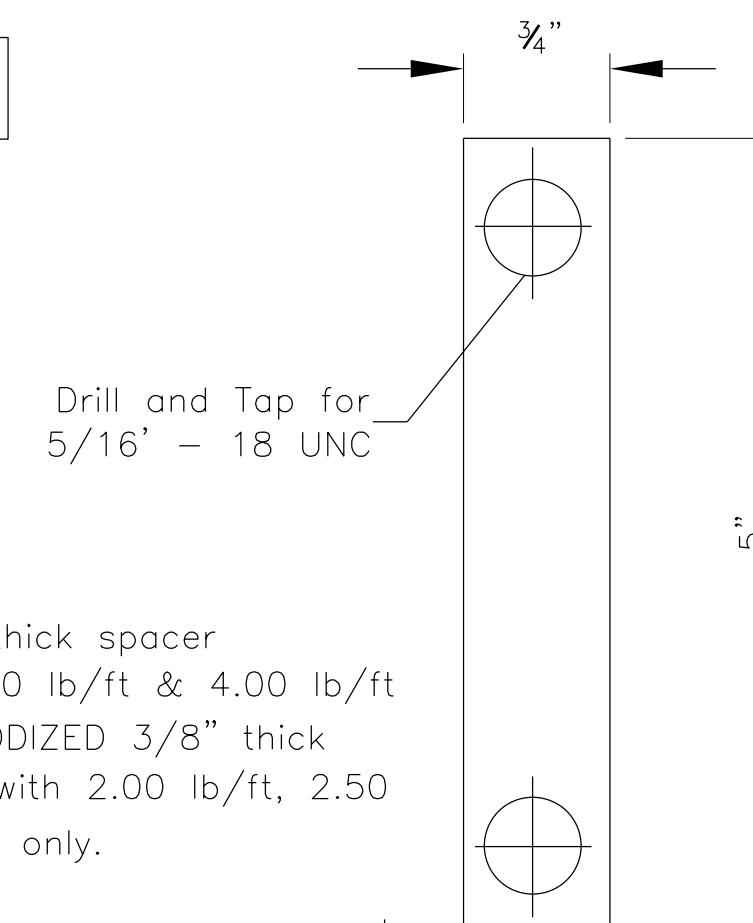
LAP SPLICE - TOP VIEW



LAP SPLICE CONNECTION DETAIL

NOTE: ALL BOLTS TO BE "BURRED" TO PREVENT LOOSENING

NOTE: The GOLD ANODIZED 1/2" thick spacer bar is to be used with 3.00 lb/ft & 4.00 lb/ft posts only. The SILVER ANODIZED 3/8" thick spacer bar is to be used with 2.00 lb/ft, 2.50 lb/ft, and 2.75 lb/ft posts only.



LAP SPLICE SPACER BAR


INSTALLATION PROCEDURE

- STEP 1: DRIVE BASE POST TO WITHIN APPROXIMATELY ONE FEET ABOVE GROUND LEVEL. PLACE ONE BOLT AND CUT WASHER IN FIFTH HOLE FROM THE TOP, AND SECURELY TIGHTEN THREADED SPACER ONTO BOLT.
- STEP 2: DRIVE BASE POST TO 4" ABOVE GROUND LEVEL. PLACE REMAINING BOLT AND CUT WASHER IN FIRST HOLE FROM THE END, AND SECURELY TIGHTEN THREADED SPACER ONTO BOLT.
- STEP 3: DIG OUT APPROXIMATELY 2" FROM AROUND BACK OF GROUND POST TO ALLOW ROOM FOR TOP POST TO BE ATTACHED.
- STEP 4: NEST TOP POST ONTO PROTRUDING BASE POST BOLTS, THROUGH THE FIRST AND FIFTH HOLES OF THE TOP POST.
- STEP 5: PLACE A SELF-LOCKING FLANGE NUT ON EACH BOLT. TIGHTEN NUTS AND TAMP EARTH AROUND POST FIRMLY.

UNITED STATES  
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**LAP SPLICE U-CHANNEL  
BREAKAWAY SYSTEM**

DRAWN BY: Gerald.Hood	DATE: 5/7/2009
DESIGNED BY: NRDOT	DATE: 5/7/2009
REVISED: 1/25/2013	BY: Peterson.Yazzie
ANNOTATION SCALE: Full Size 1=1	
FILENAME: Sht.21 Perm Sign Std Details2.dgn	

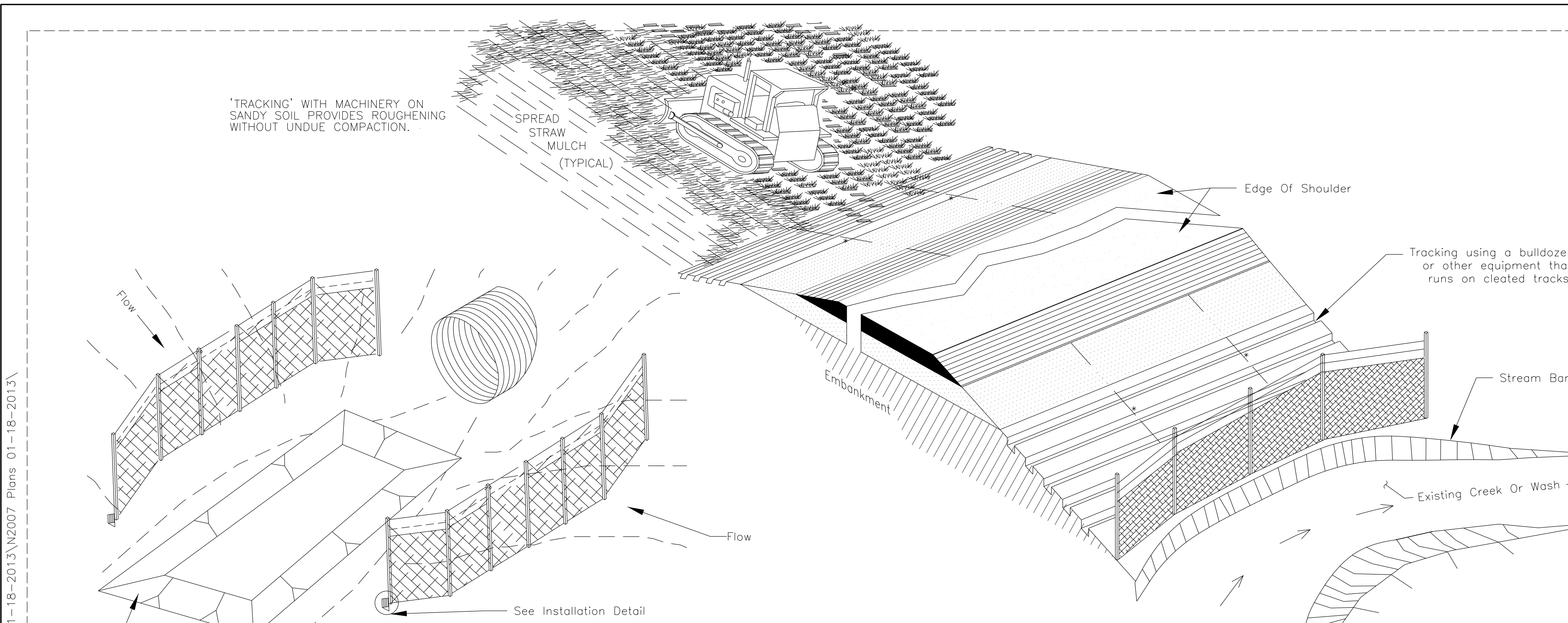


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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1,2&4	22	63

**GENERAL NOTES**

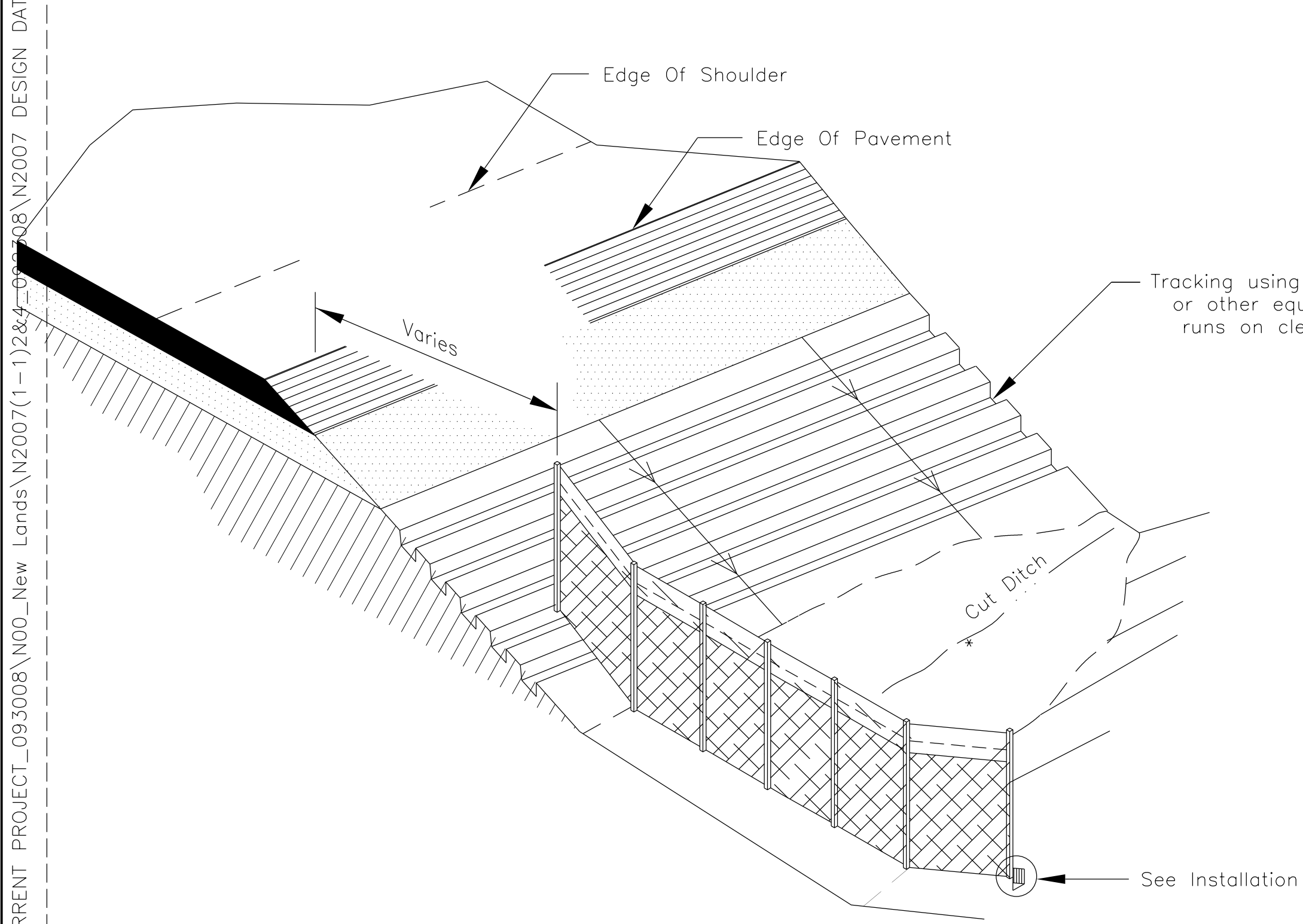
1. THE CONTRACTOR SHALL PREPARE AND SUBMIT A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IN FULL DETAIL FOR ALL PHASES OF THE WORK FOR REVIEW AND APPROVAL AT LEAST 14 CALENDAR DAYS BEFORE IMPLEMENTATION. THE PLAN SHALL MEET THE REQUIREMENTS HEREIN AND SECTION 157 OF THE FP-03 AS MODIFIED IN THE SUPPLEMENTAL SPECIFICATION. SEE SPECIAL CONTRACT REQUIREMENTS FOR NPDES PERMIT REQUIREMENTS.
2. THE SILT FENCING CONSISTS OF 36" SEDIMENT CONTROL FABRIC CLOTH WITH BURIED-TOE, AND STEEL POSTS (TEE OR U TYPE) SPACED AT 6.56' WITH 3/32" SIZE WELDED WIRE BACK-UP FENCE.
3. WOVEN WIRE FABRIC TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT THE TOP AND MID-SECTION. GEOTEXTILE MATERIAL FOR SILT FENCING SHALL BE TYPE-V UNDER SUB-SECTION 714.01 OF FP-03.
4. WHEN TWO SECTION OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY 6" AND FOLDED. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.
5. SILT FENCE SHALL BE INSTALLED PARALLEL TO THE TOE OF ALL ROADWAY EMBANKMENT FILLS IN LOCATIONS WHERE THE TOE OF THE FILLS ARE WITHIN 6.56' OF EXISTING STREAMS, CREEKS OR WASHES; IN AREAS WITH HIGHLY EROSION SOILS AND/OR WHERE EMBANKMENTS ARE AT A 1:3 OR STEEPER SLOPE. THE SILT FENCE SHALL BE PLACED 3' TO 6' DOWNHILL FROM THE TOE OF THE FILL AND IN ACCORDANCE WITH SECTION 157 OF THE FP-03 AND THE SUPPLEMENTAL SPECIFICATIONS.
6. STRAW BALES MAY BE USED AT THE TOP OF CUT BACKSLOPES AND FOR DIKES PROVIDED THEY ARE PROPERLY ANCHORED WITH STEEL FENCE POSTS OR 2" x 2" x 4' WOOD STAKES (TWO PER BALE) ANCHORED 508 mm INTO THE NATURAL GROUND. STRAW BALES SHALL BE CERTIFIED 0.5% WEED FREE. DO NOT USE STRAW BALES IN AREAS OF CONCENTRATED FLOW AND CUT DITCHES.
7. FURNISHING AND PLACEMENT OF SILT FENCE MATERIAL AND OTHER EROSION CONTROL MEASURES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 15708-1000.
8. SEDIMENT/SILT FENCING SHALL BE PLACED AT ALL LOCATIONS WHERE EMBANKMENTS HAVE SLOPE DISTANCES OF 100' OR GREATER. THE SEDIMENT FENCING WILL BE PLACED AT THE TOE OF SLOPES OFFSET 3-6 FEET.
9. THE CONTRACTOR SHALL INSPECT AND MAINTAIN ALL SWPPP MEASURES WEEKLY AND AFTER EACH SIGNIFICANT STORM EVENT (I.E. 1" OF MOISTURE IN 24 HOURS).



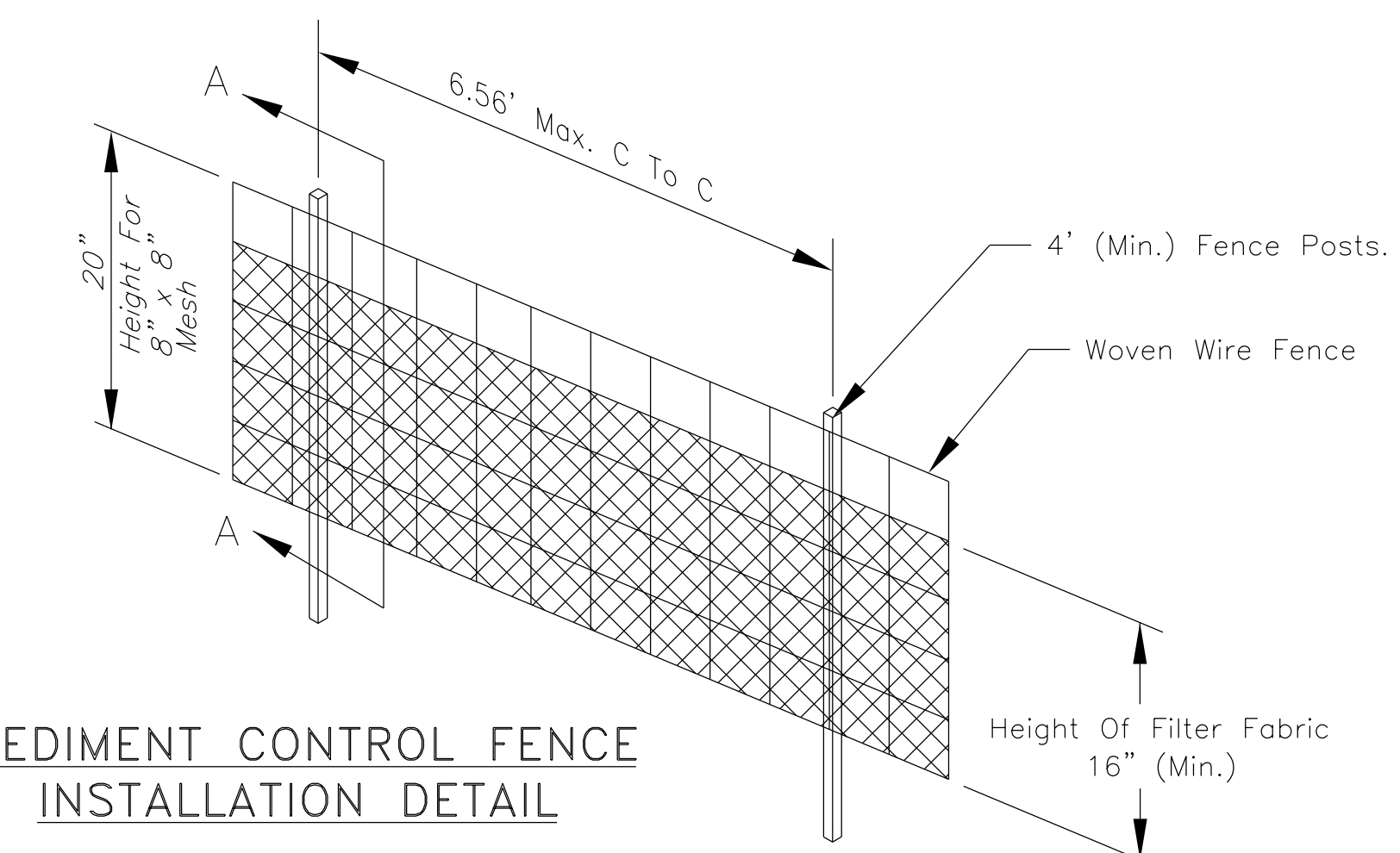
**EROSION & SEDIMENT CONTROL FENCE ALONG EDGE OF STREAM BANK (TOE OF SLOPE)**



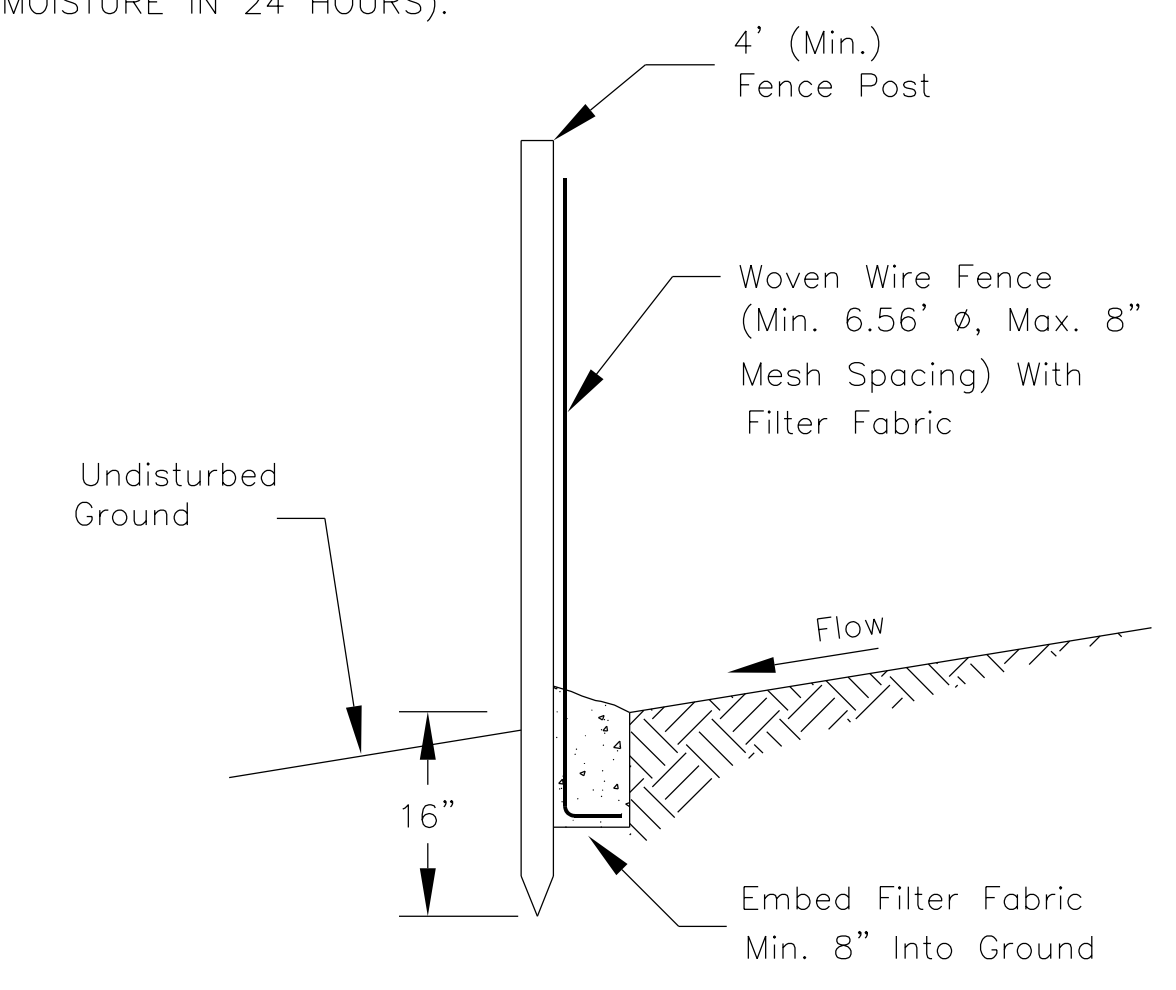
**EROSION & SEDIMENT CONTROL FENCE AT DRAINAGE STRUCTURE**



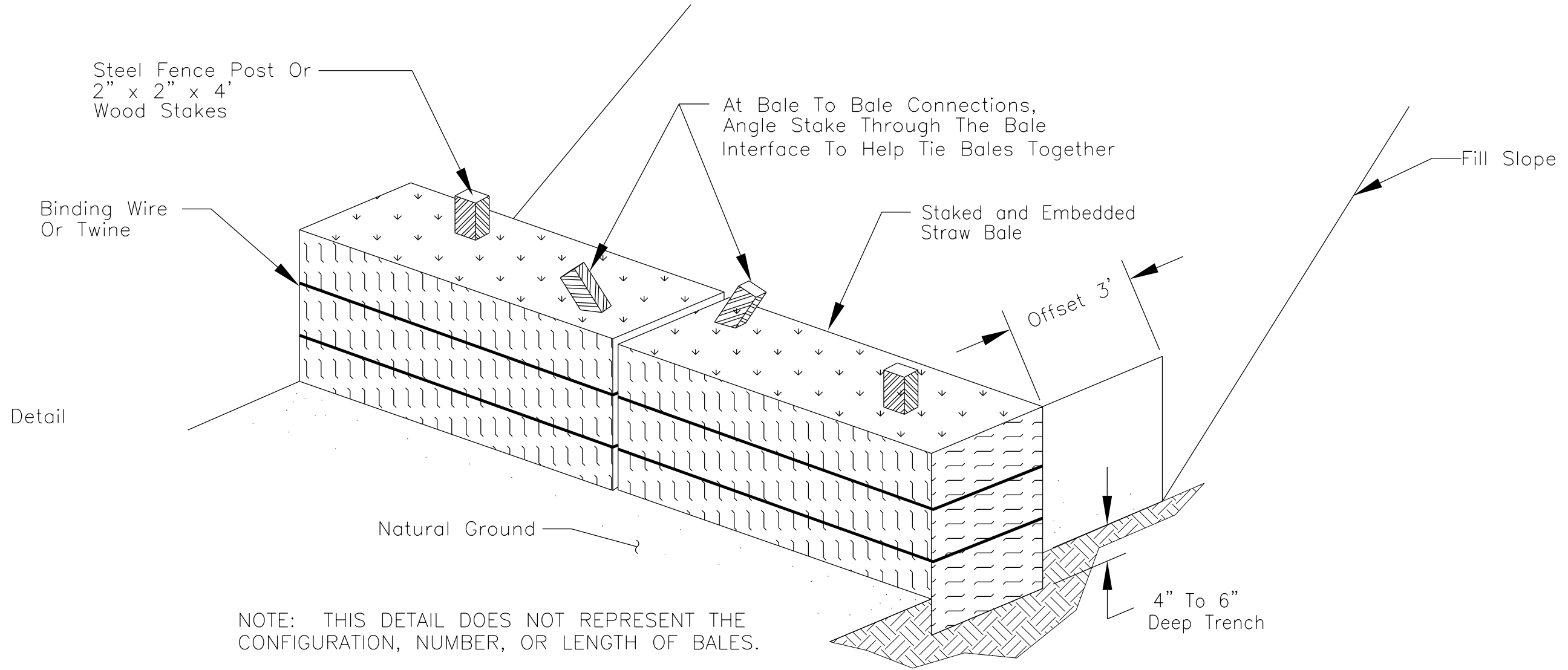
**EROSION & SEDIMENT CONTROL FENCE IN MINOR SWALES OR CUT DITCHES (APPROX 197' SPACING FOR FABRIC)**



**SEDIMENT CONTROL FENCE INSTALLATION DETAIL**



**SECTION A-A**



NOTE: THIS DETAIL DOES NOT REPRESENT THE CONFIGURATION, NUMBER, OR LENGTH OF BALES.

**TYPICAL STRAW BALE STAKING AND TRENCHING DETAIL**

**UNITED STATES**  
**DEPARTMENT OF THE INTERIOR**  
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 NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

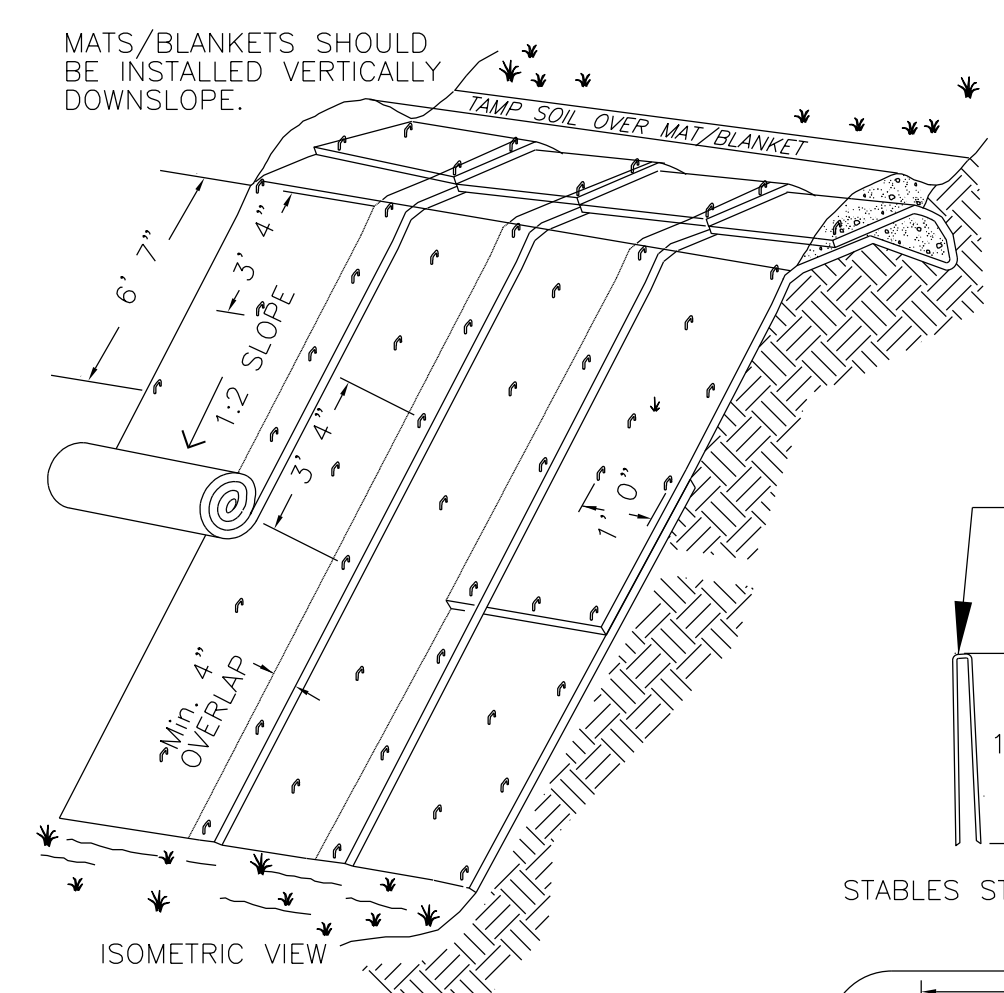
**STORMWATER POLLUTION & EROSION**  
**SEDIMENT CONTROL DETAILS**

DRAWN BY: Gerald.Hood	DATE: 5/6/2009
DESIGNED BY: NRDOT	DATE: 5/6/2009
REVISED: 1/25/2013	BY: Peterson.Yazzie
ANNOTATION SCALE: Full Size 1=1	
FILENAME: Sht.22 Erosion Control Details1.dgn	

J:\DESIGN\Users\DESIGN2\CURRENT PROJECT\_093008\NDO\_New\_Lands\N2007(1-1)2&4-01\08\N2007 DESIGN DATA\_092508\CADD Files 01-18-2013\N2007 Plans 01-18-2013

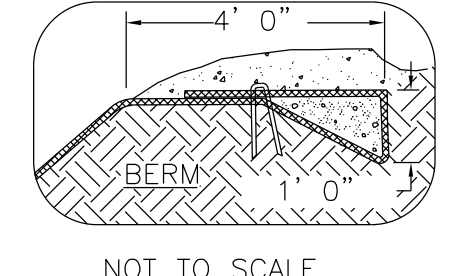


REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1,2&4	23	63

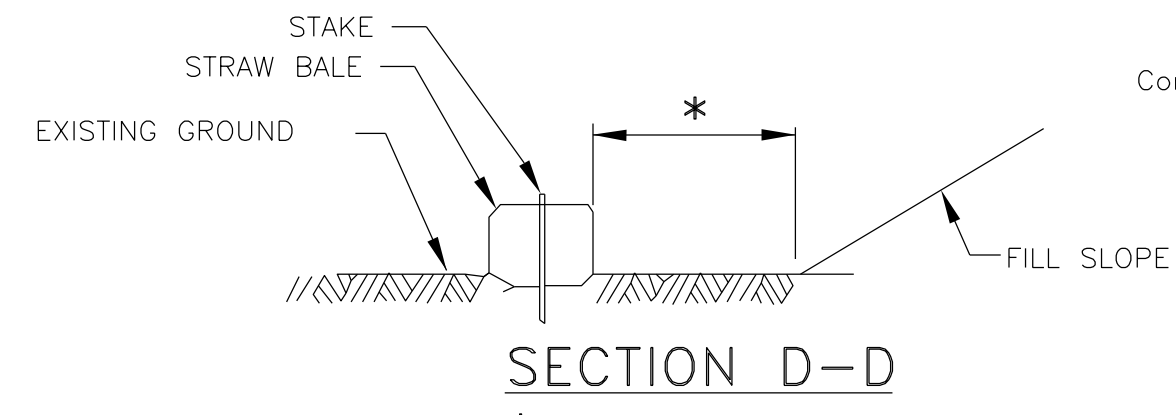


**TYPICAL SLOPE SOIL STABILIZATION**

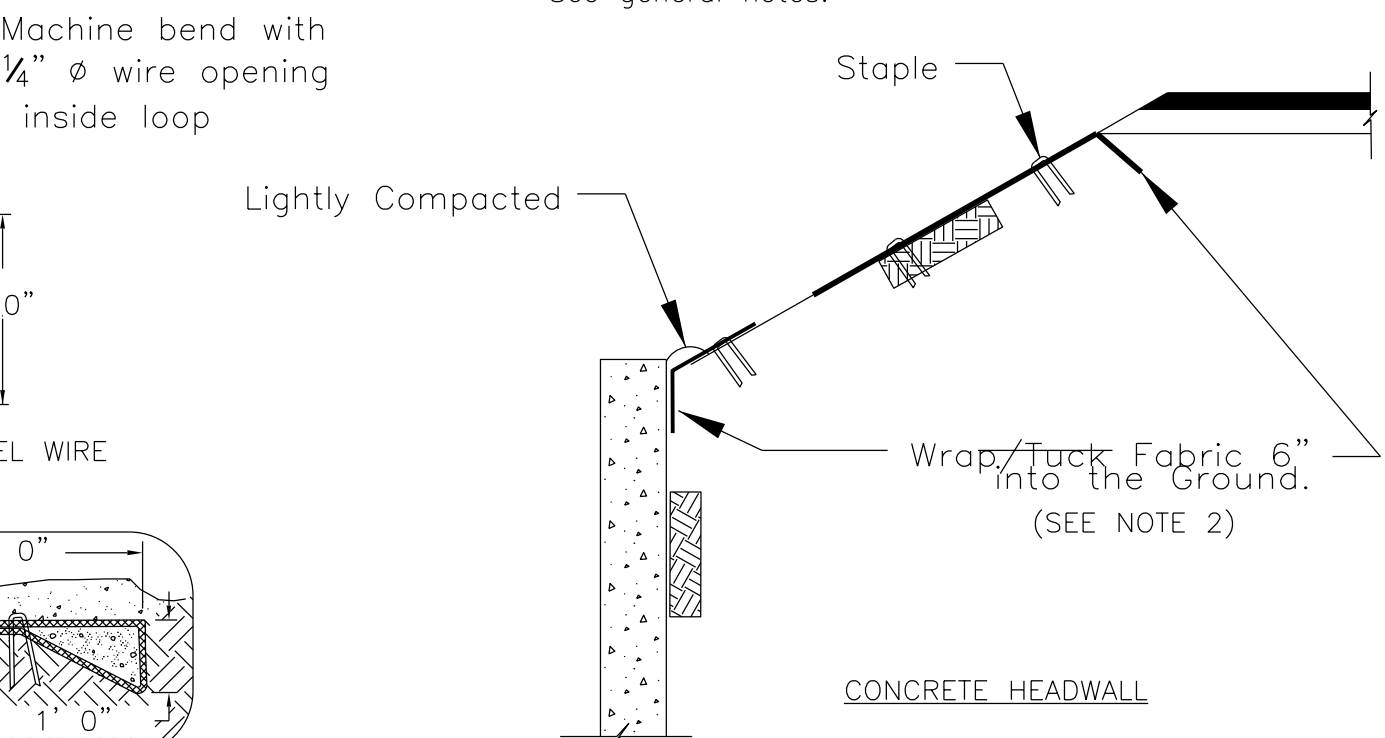
- NOTES:
- SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/BLANKETS SHALL HAVE GOOD SOIL CONTACT.
  - APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
  - LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.



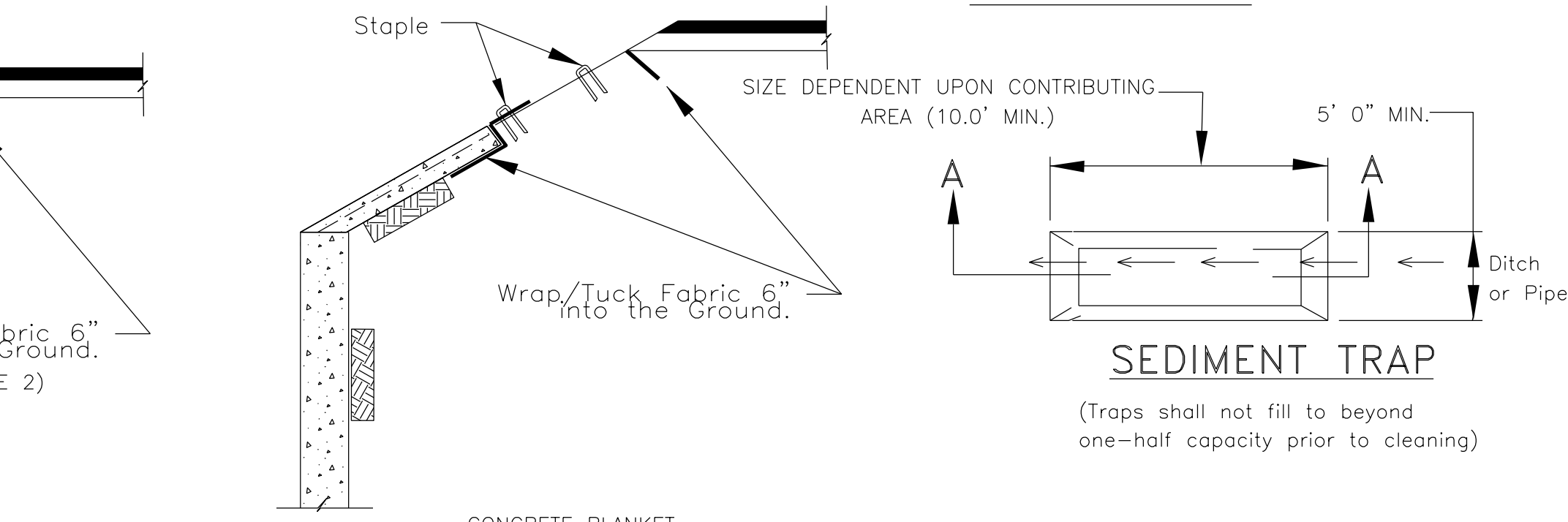
EROSION BLANKETS & TURF REINFORCEMENT MATS SLOPE INSTALLATION



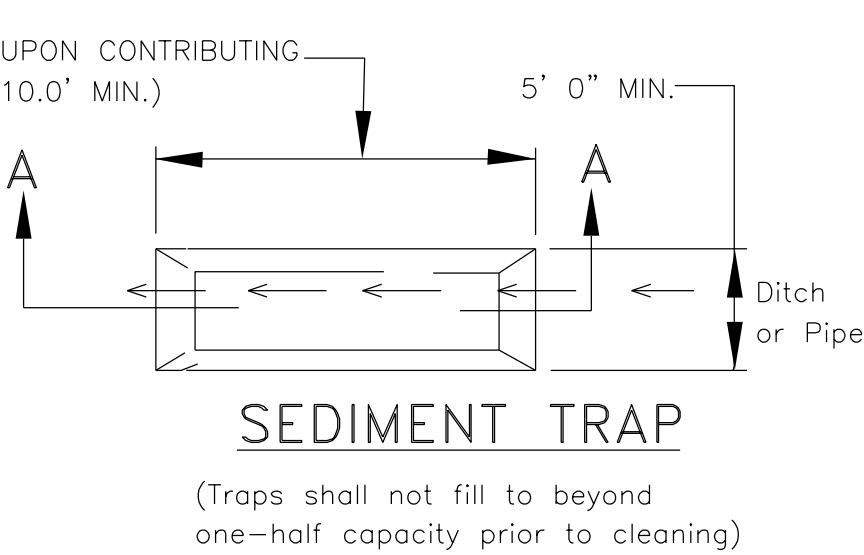
**SECTION D-D**



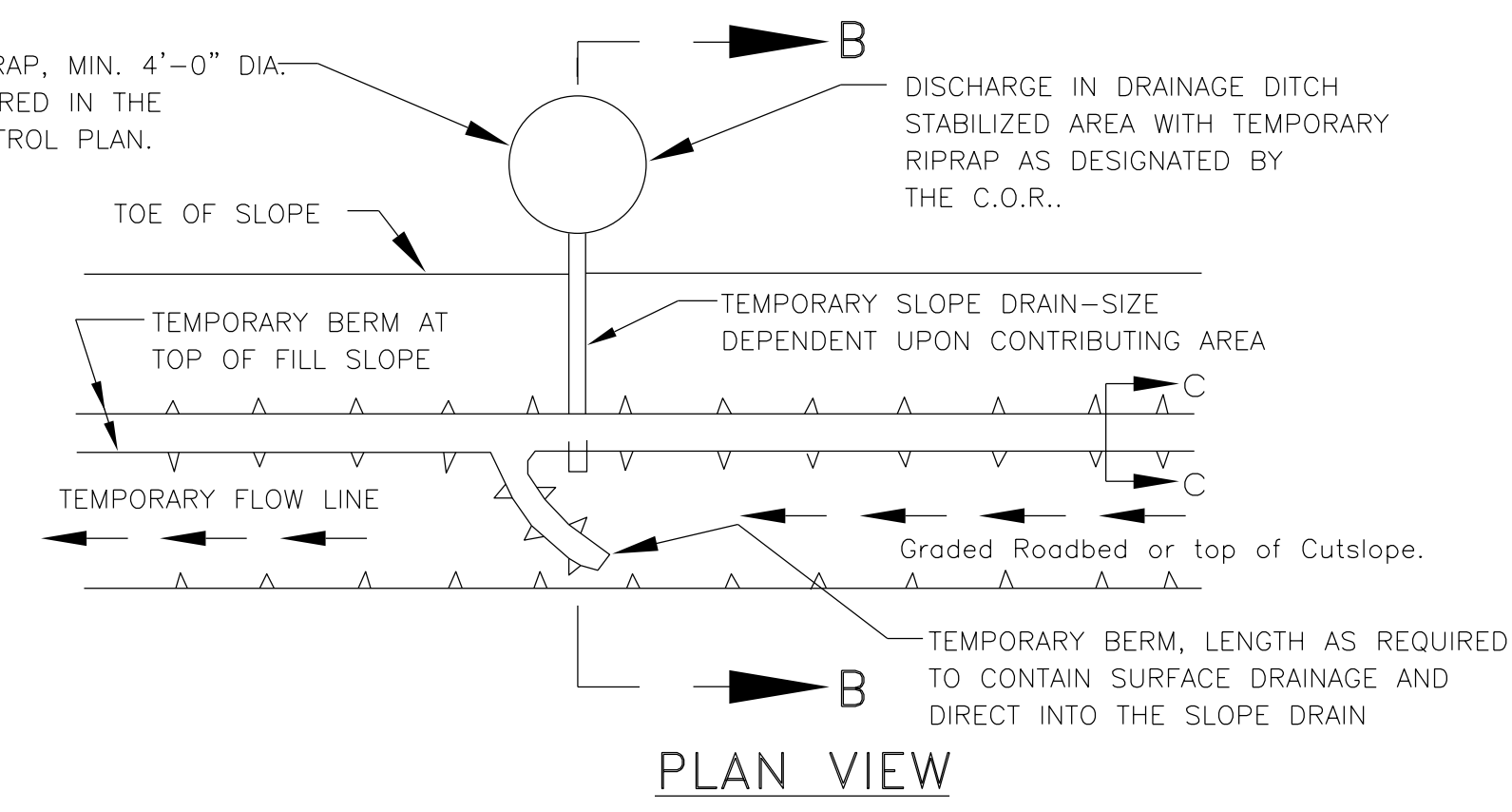
**SECTION A-A**



**SEDIMENT TRAP**

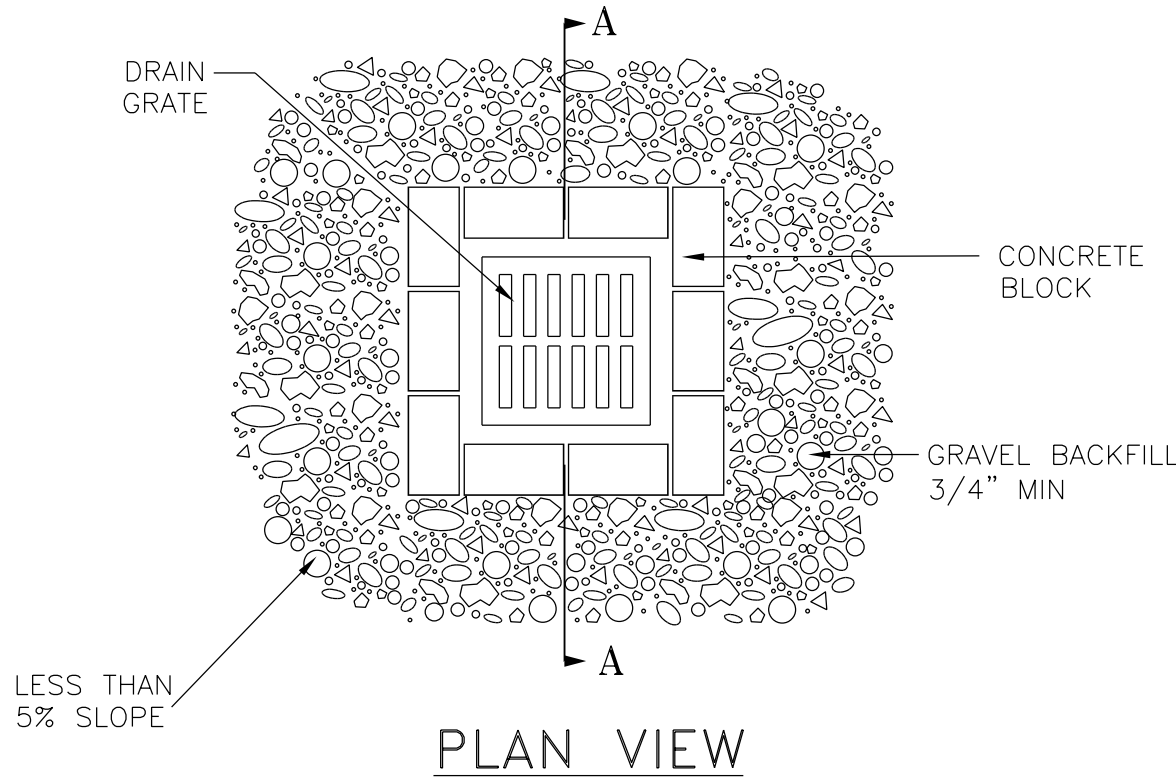


TEMPORARY CLASS I RIPRAP, MIN. 4'-0" DIA. AND 9" THICK, AS REQUIRED IN THE APPROVED EROSION CONTROL PLAN.

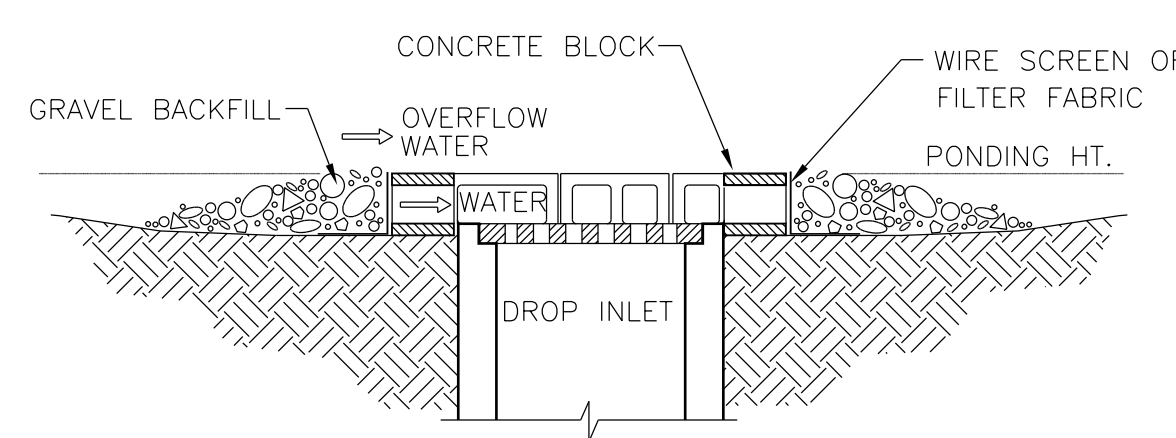


**PLAN VIEW**

- GENERAL NOTES**
- SEE SHEET 22 OF 63 FOR ADDITIONAL NOTES AND DETAILS.
  - THE CONTRACTOR SHALL INSTALL GEOTEXTILE FABRIC, TYPE IV, AROUND CONCRETE STRUCTURE, AS FOLLOWS:
    - Constructure finish grading around structure to be placed.
    - Cut trenches for footing of slab.
    - Install 4' of Geotextile Fabric anchored on floor and top, along the cut face of trench as shown.
    - Place concrete forms, reinforcements, and subsequent concrete.
  - CONSTRUCT SEDIMENT BASIN AND TRAPS, EROSION CHECKS, AND/OR FILTERS IN STRATEGIC LOCATIONS ON THE PROJECT TO FILTER STORM RUNOFF BEFORE IT LEAVES THE PROJECT CONSTRUCTION LIMITS OR ENTERS A STREAM AS SHOWN IN THE APPROVED SWPPP.
  - CLEAN ALL SEDIMENT BASIN AND TRAPS OF ACCUMULATED SEDIMENT WHEN HALF FULL OF SEDIMENT.
  - USE DRAIN PIPE, RIPRAP, GEOTEXTILE FABRIC, OR GRASS-LINED WATERWAY FOR TEMPORARY SLOPE DRAINS TO CHANNEL RUNOFF DOWN SLOPES. CHANNEL WATER INTO SLOPE DRAINS WITH STRAW BALES, WATTLES, OR EARTH BERMS CONSTRUCTED AT THE TOP OF A CUT SLOPE. ANCHOR SLOPE DRAINS TO THE SLOPE.
  - THE CONTRACTOR SHALL ADJUST THE DIMENSIONS AND/OR LOCATIONS OF TEMPORARY SEDIMENT AND EROSION CONTROL DEVICES TO FIT ACTUAL FIELD CONDITIONS.
  - REMOVE AND DISPOSE OF EROSION CONTROL MEASURES WHEN THE PERMANENT EROSION CONTROL MEASURES ARE SATISFACTORILY ESTABLISHED, DRAINAGE DITCHES, AND CHANNELS ARE LINED AND STABILIZED, IN ACCORDANCE WITH SECTION 157 OF FP-03.



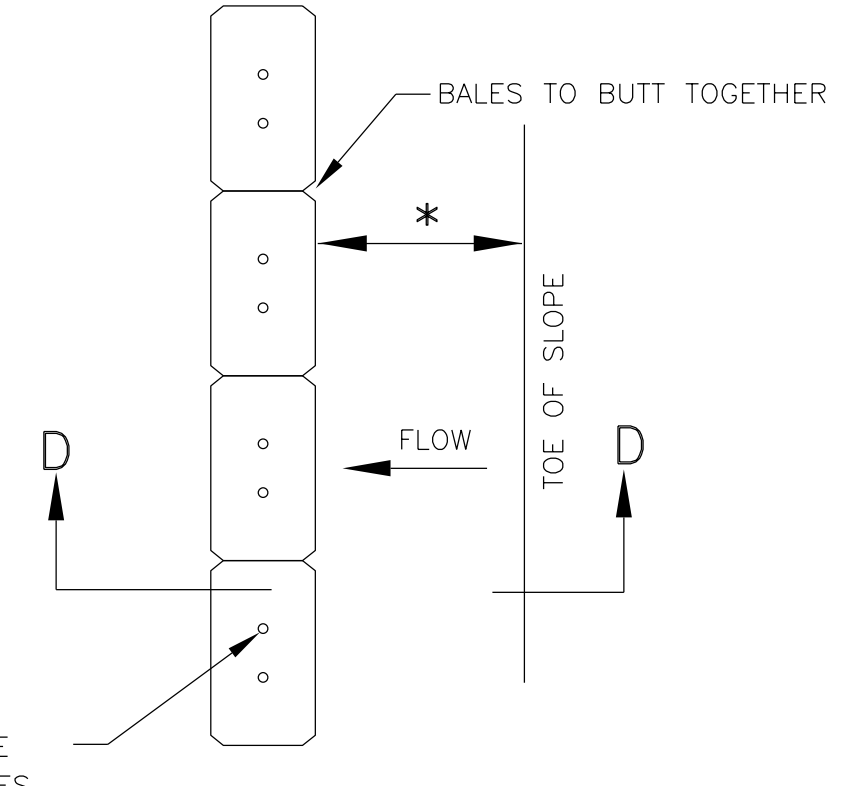
**PLAN VIEW**



**SECTION A - A**

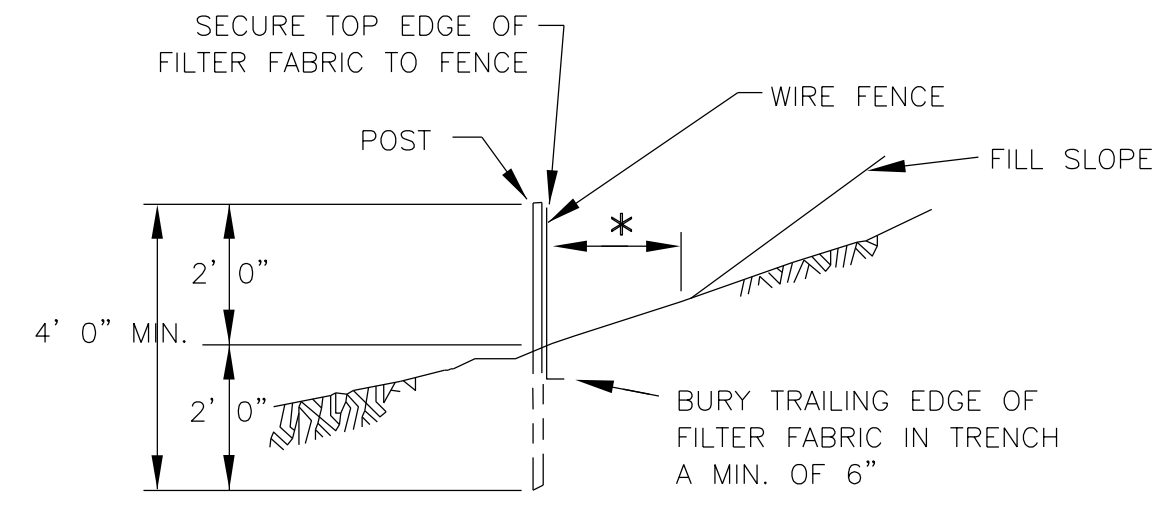
- NOTES:
- DROP INLET SEDIMENT BARRIERS ARE TO BE USED FOR SMALL, NEARLY LEVEL DRAINAGE AREAS. (LESS THAN 5%)
  - EXCAVATE A BASIN OF SUFFICIENT SIZE ADJACENT TO THE DROP INLET.
  - THE TOP OF THE STRUCTURE (PONDING HEIGHT) MUST BE WELL BELOW THE GROUND ELEVATION DOWNSLOPE TO PREVENT RUNOFF FROM BYPASSING THE INLET. A TEMPORARY DIKE MAY BE NECESSARY ON THE DOWNSLOPE SIDE OF THE STRUCTURE.

BLOCK AND GRAVEL DROP INLET SEDIMENT BARRIER

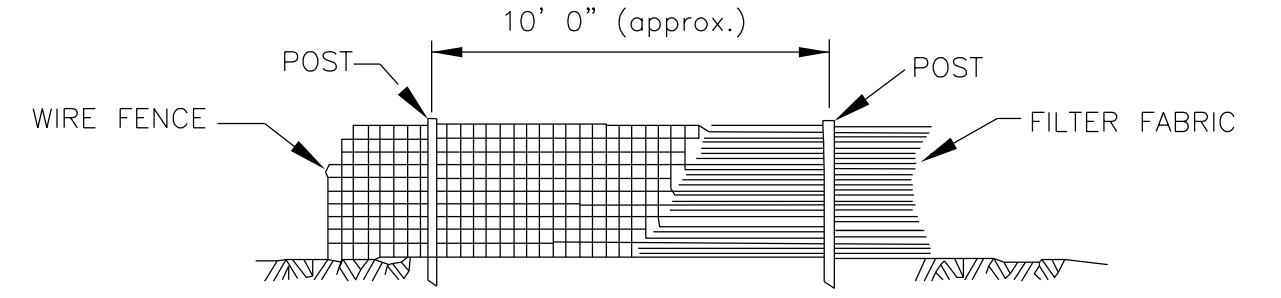


**PLAN STRAW BALE SILT BARRIER**

\* See general notes.

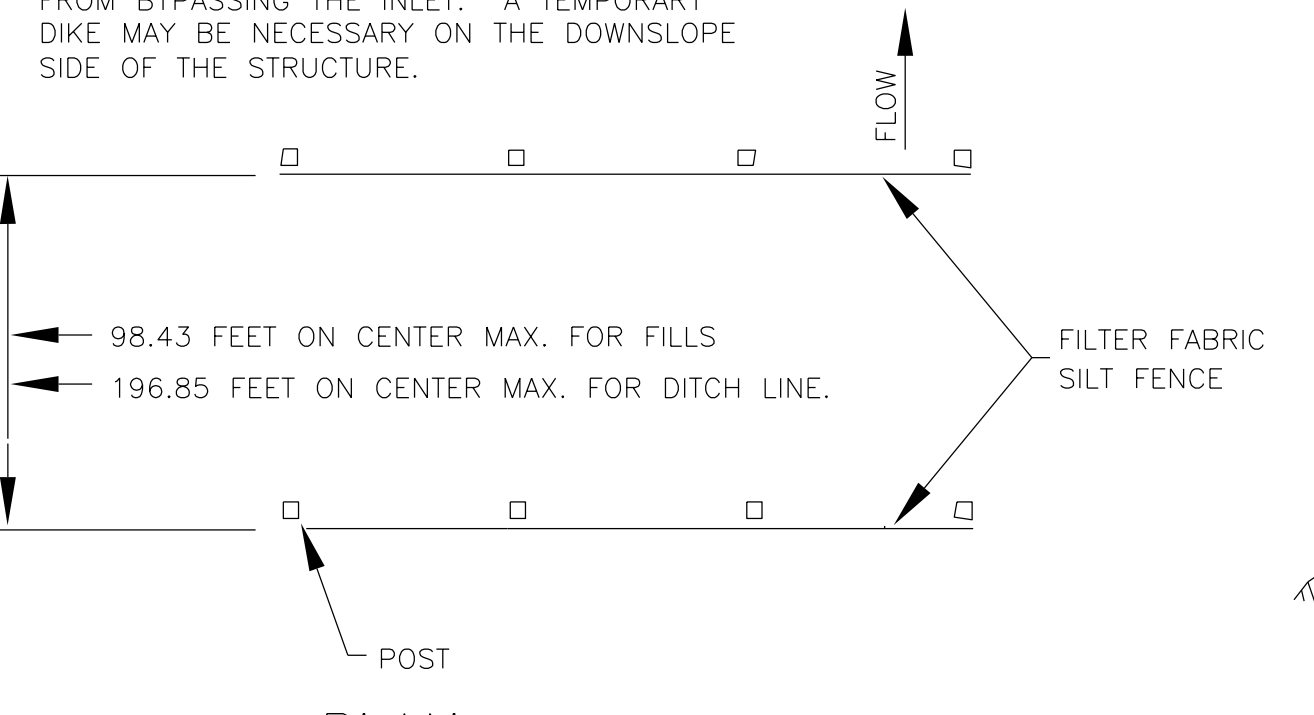


**SECTION B-B**

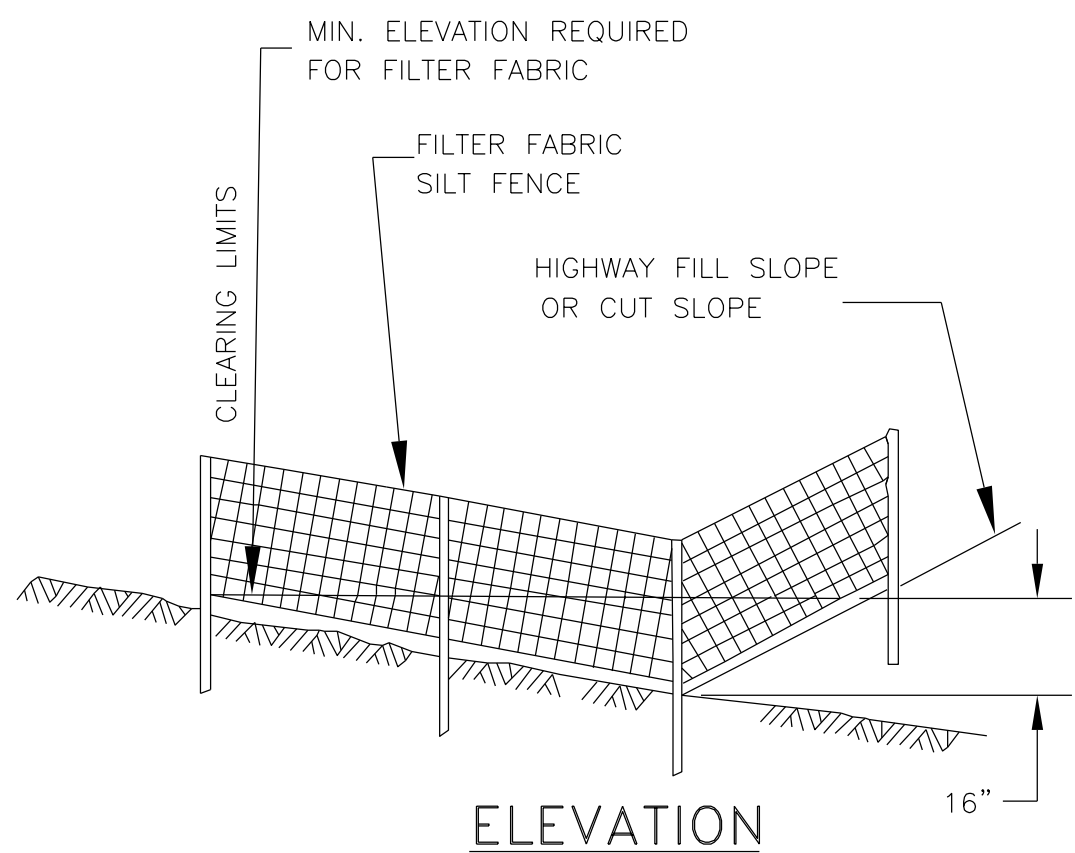


**FILTER FABRIC SILT FENCE**

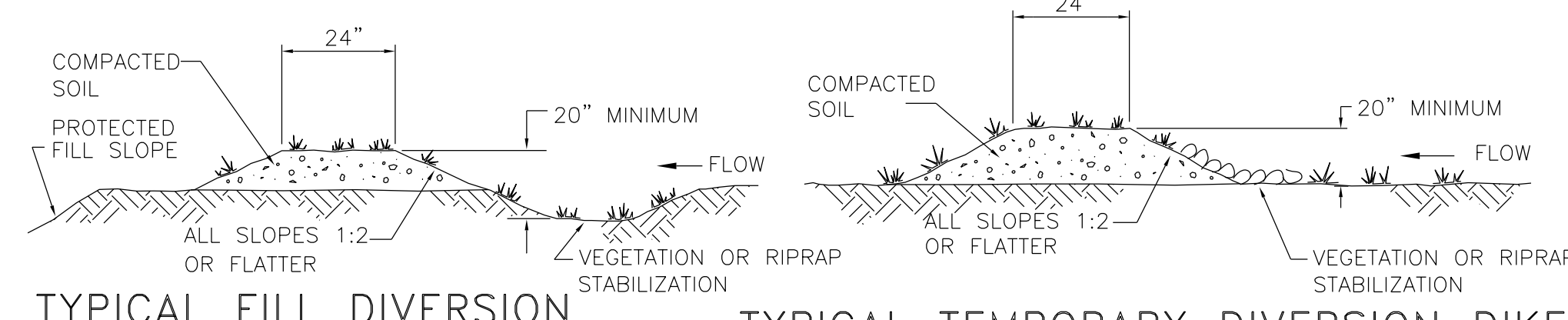
\* See general notes.



**PLAN SILT FENCE EROSION CHECK**



**ELEVATION**

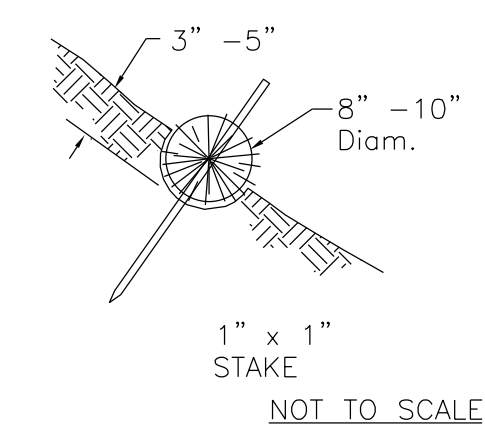
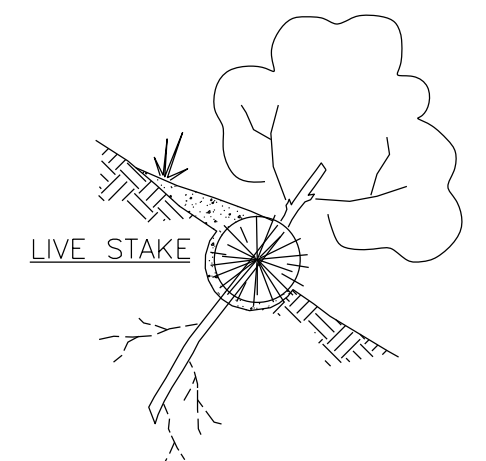
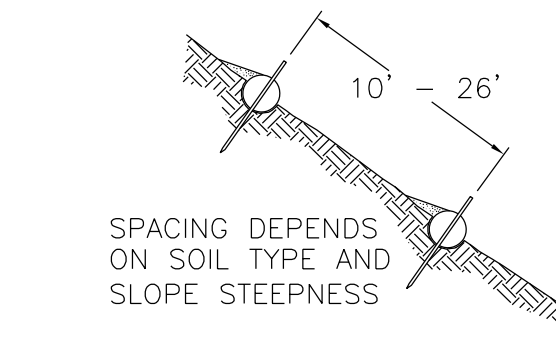
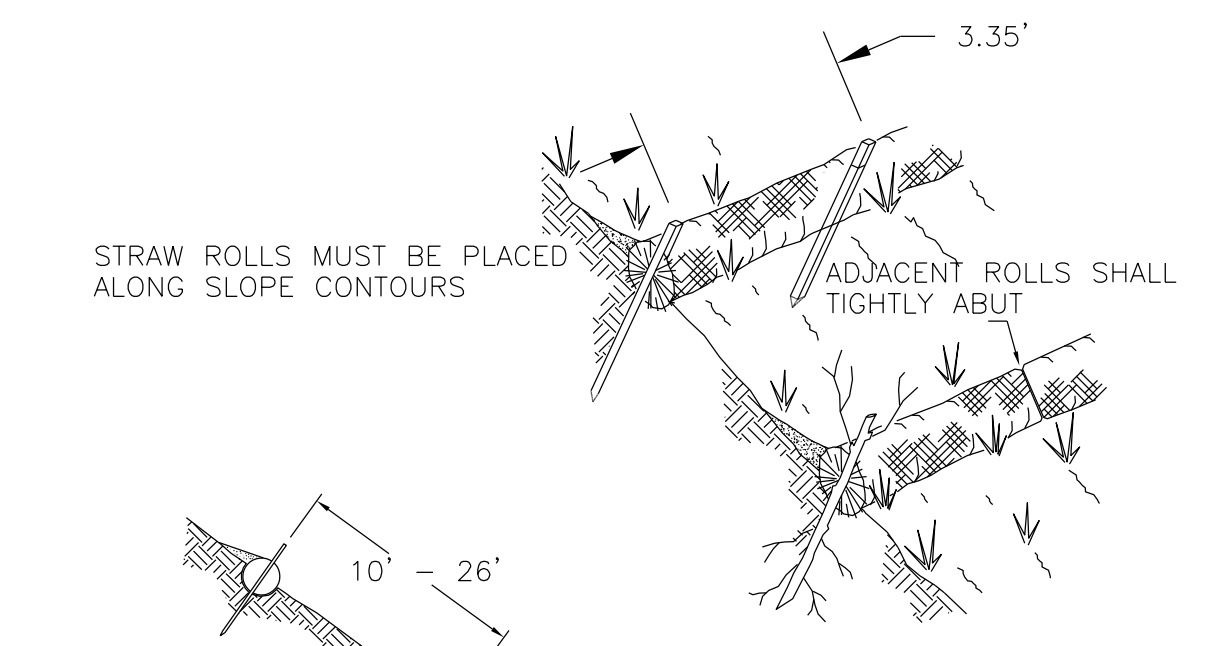


**TYPICAL FILL DIVERSION**

**TYPICAL TEMPORARY DIVERSION DIKE**

- NOTES:
- THE CHANNEL BEHIND THE DIKE SHALL HAVE POSITIVE GRADE TO A STABILIZED OUTLET.
  - THE DIKE SHALL BE ADEQUATELY COMPACTED TO PREVENT FAILURE.
  - THE DIKE SHALL BE STABILIZED WITH TEMPORARY OR PERMANENT SEEDING OR RIPRAP.
  - THE DIVERSION DIKE SHALL EXTEND TO THE BOTTOM OF CUT BACK SLOPE AND INTERCEPT THE CUT DITCH.

TEMPORARY DIVERSION DIKE




- NOTE:
- STRAW ROLL INSTALLATION REQUIRES THE PLACEMENT AND SECURE STAKING OF THE ROLL IN A TRENCH, 3"-5" DEEP, DUG ON CONTOUR. RUNOFF MUST NOT BE ALLOWED TO RUN UNDER OR AROUND ROLL.

STRAW ROLLS

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**DEPARTMENT OF THE INTERIOR**  
**BUREAU OF INDIAN AFFAIRS**  
 NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

**SEDIMENT CONTROL DETAILS**  
**EROSION/SEDIMENT CONTROL DETAIL**

DRAWN BY: Gerald.Hood    DATE: 5/6/2009  
 DESIGNED BY: NRDOT    DATE: 5/6/2009  
 REVISED: 1/25/2013    BY: Peterson.Yazzie  
 ANNOTATION SCALE: Full Size 1=1  
 FILENAME: Sht.23\_Erosion Control Details2.dgn

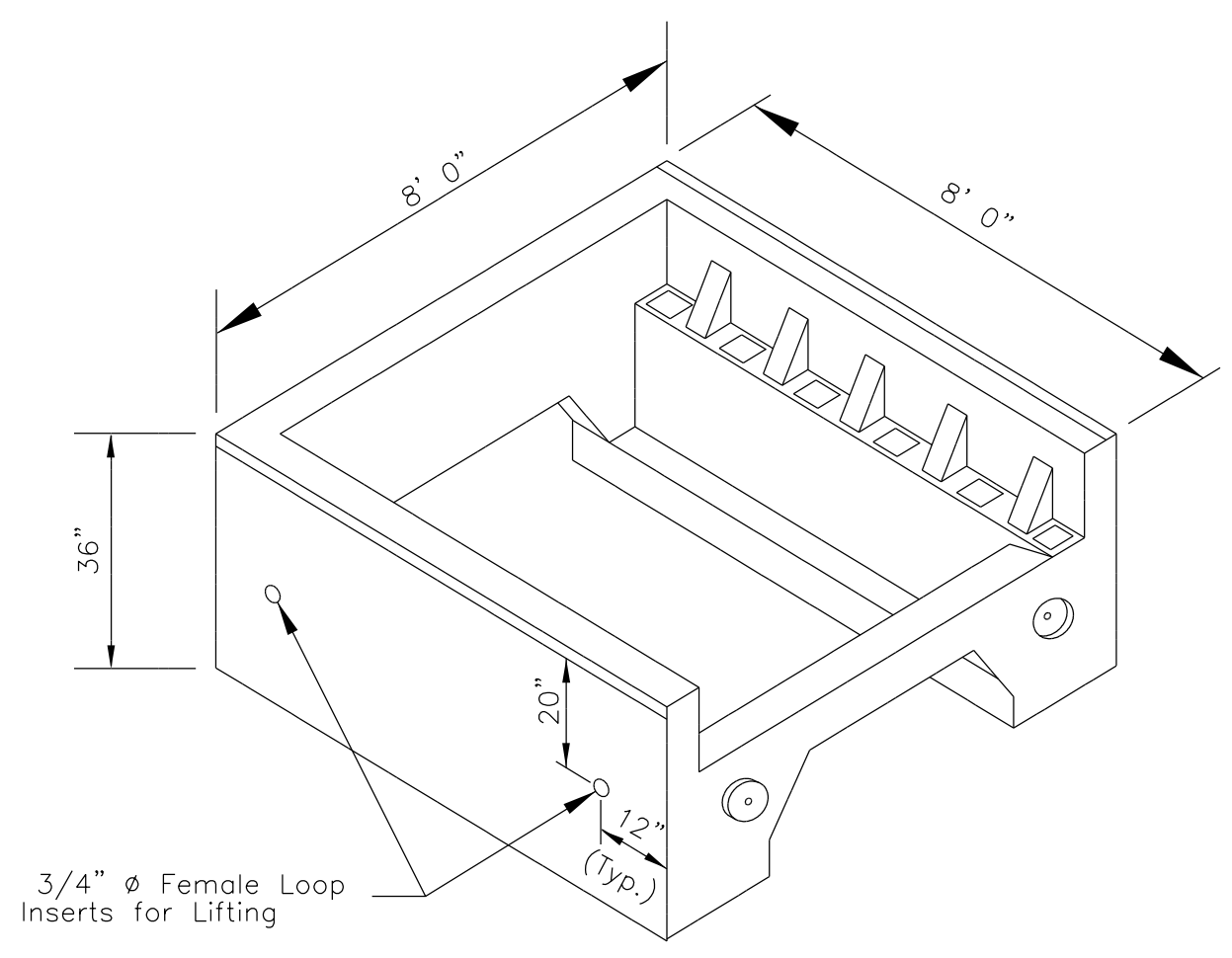


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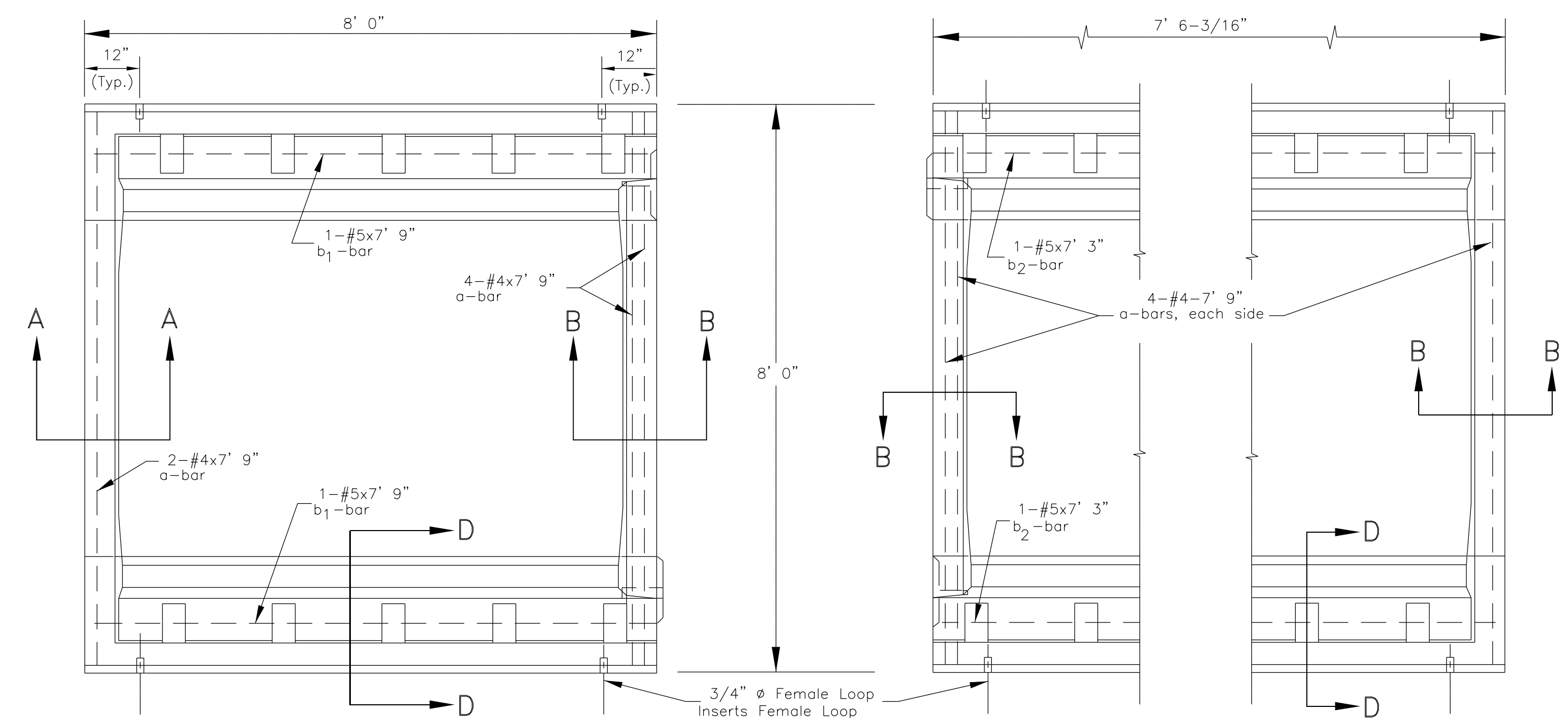
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1,2&4	24	62

**GENERAL NOTE:**

- Precast concrete shall attain 28-day compressive strength of 4,000 psi (minimum) in accordance with AASHTO T22 (ASTM C-39). The concrete shall be Class A(AE) conforming to Section 552 of FP-03.
- Reinforcing steel shall conform to ASTM A615, Grade 420. All structural steel shall conform to AASHTO M-183.
- The Contractor shall slope the bases of the cattle guards as required to provide roadway crowns or superelevation as shown on the plans.
- Bolts, washers, and nuts shall be galvanized to meet the requirements of AASHTO M 111 or AASHTO M298.
- All traffic grill unit, and wing brace structural steel and pipe, including the steel angles shall receive one (1) primer coat, one (1) intermediate coat, and one (1) finish coat in accordance with Section 563, Point System 2, of FP-03.
- Wing braces shall be considered subsidiary items to the cattleguard unit.
- The Contractor has the option to use all steel frame cattleguard. If the Contractor elects to substitute for the steel frame cattleguard, he/her shall show they are more cost effective with supporting data. The Contractor is responsible for all patent protection rights, shop drawings, material certifications, and mill test reports. However, no steel frame cattleguard shall be used for concrete drainage pad cattleguard locations.
- Elastomeric bearing pads shall be seal with epoxy adhesive prior to the installation of traffic grill unit.
- Design Data: Design according to AASHTO LRFD Bridge Design Specifications, third edition, 2004.  
Design Loads: HS20 and Design Tandem with 33% impact.



ISOMERIC VIEW - END UNIT

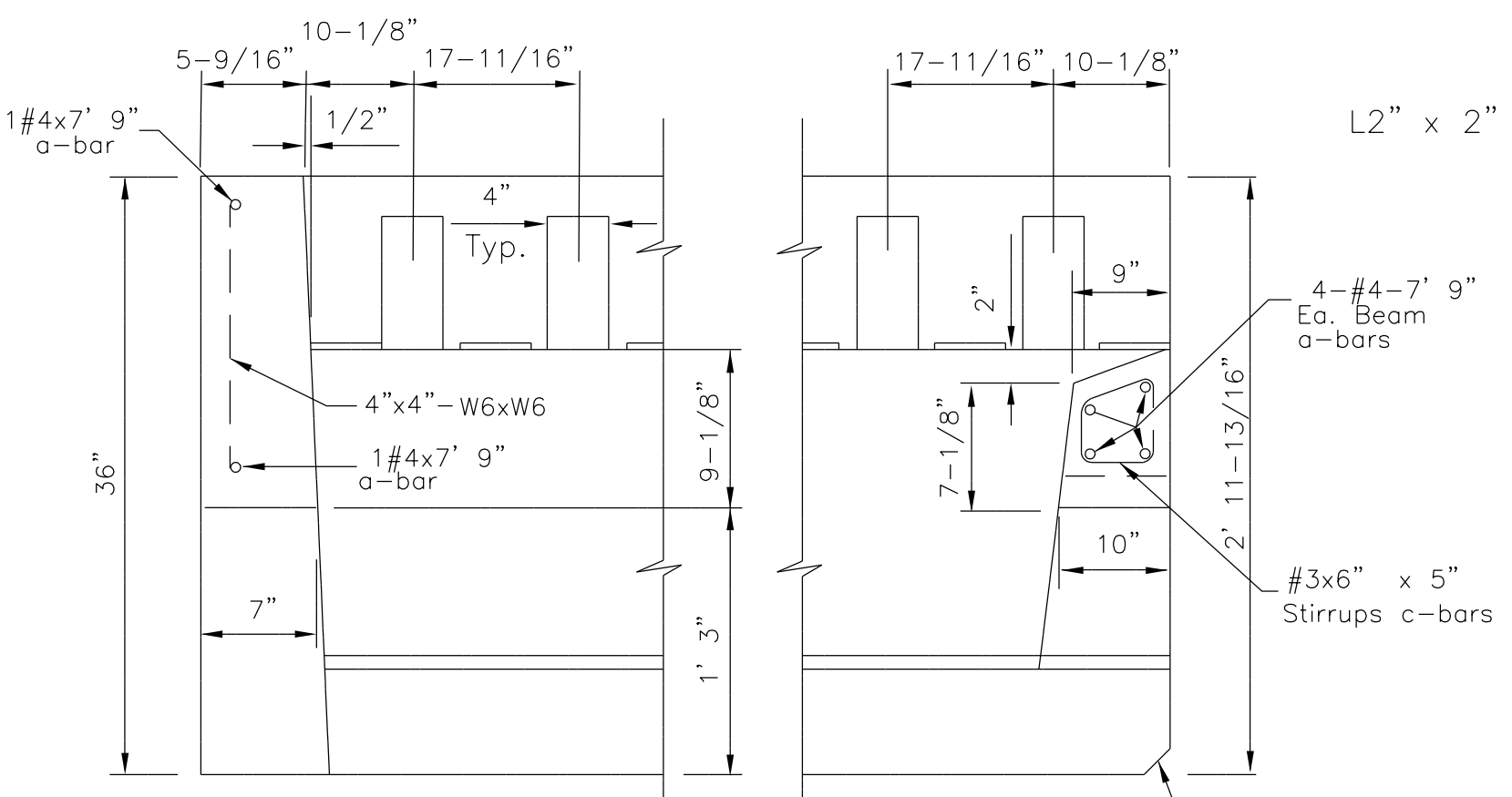


PLAN - END UNIT

PLAN - INTERMEDIATE UNIT

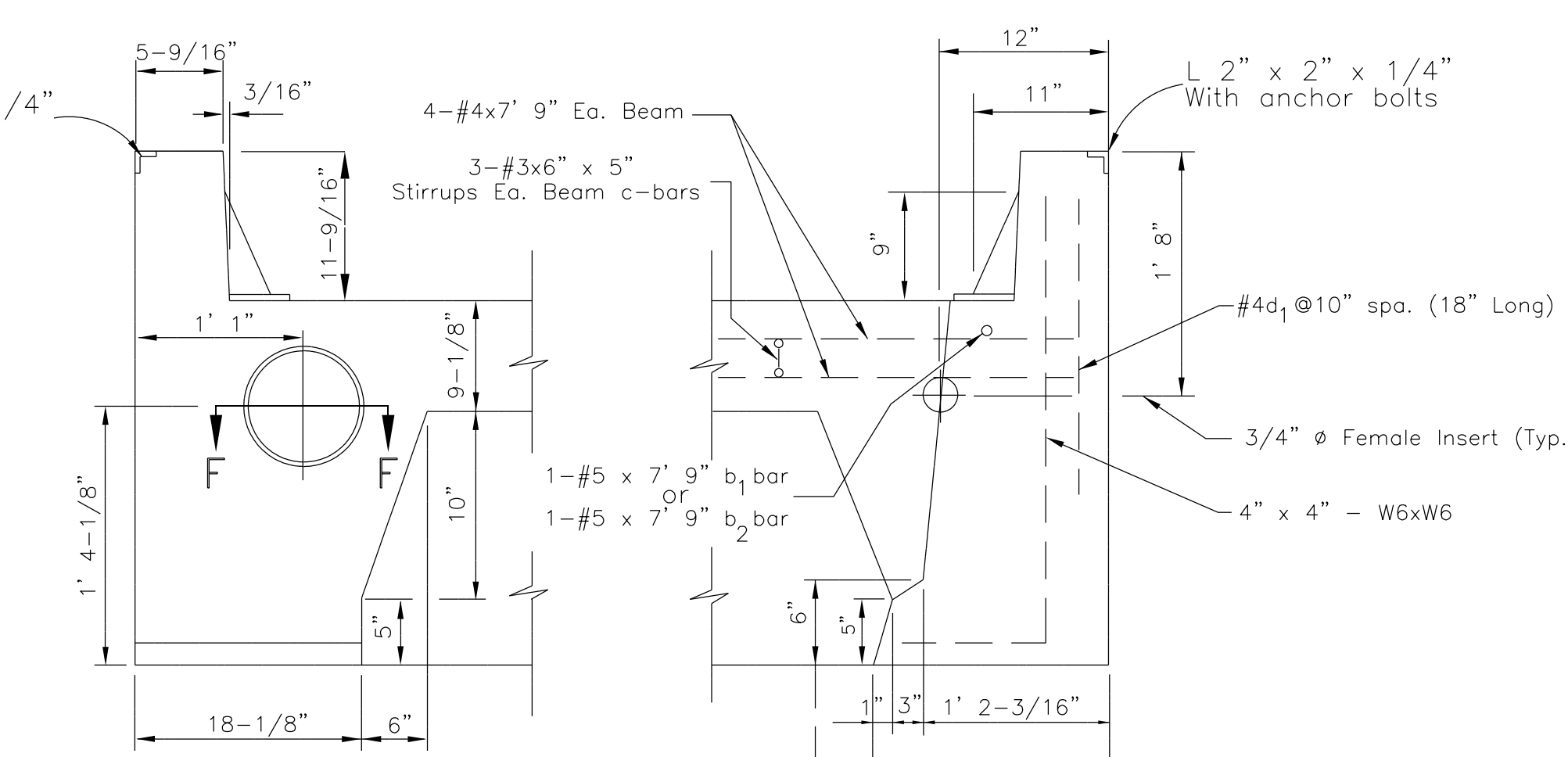
**REINFORCING STEEL SCHEDULE**

STRAIGHT BARS				BENT BARS				BENDING DIAGRAMS
MARK	NO.	SIZE	LENGTH	MARK	NO.	SIZE	LENGTH	
END UNIT								
a	6	4	7' 9"					
b <sub>1</sub>	2	5	7' 9"					
c				3	3		2' 0"	
D <sub>1</sub>	20	4	1' 6"					
INTERMEDIATE UNIT								
a	8	4	7' 9"					
b <sub>2</sub>	2	5	7' 3"					
c				6	3		2' 0"	
D <sub>1</sub>	18	4	1' 6"					



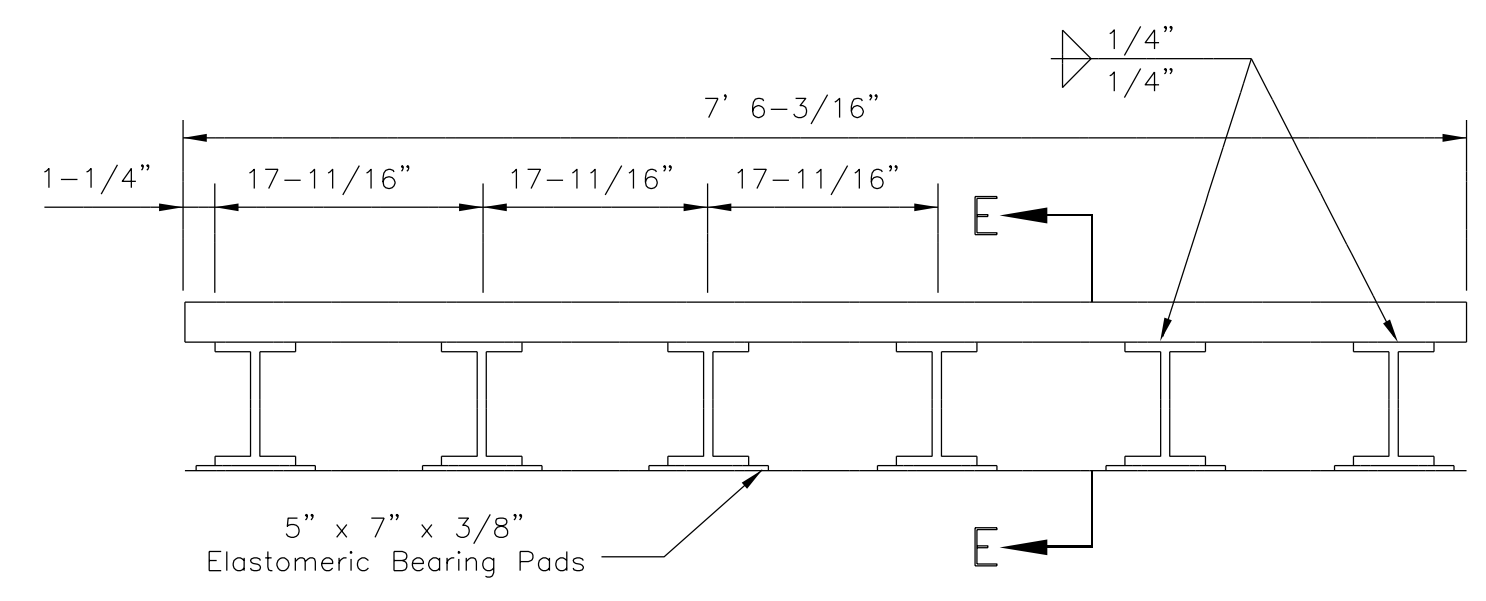
SECTION A-A

SECTION B-B

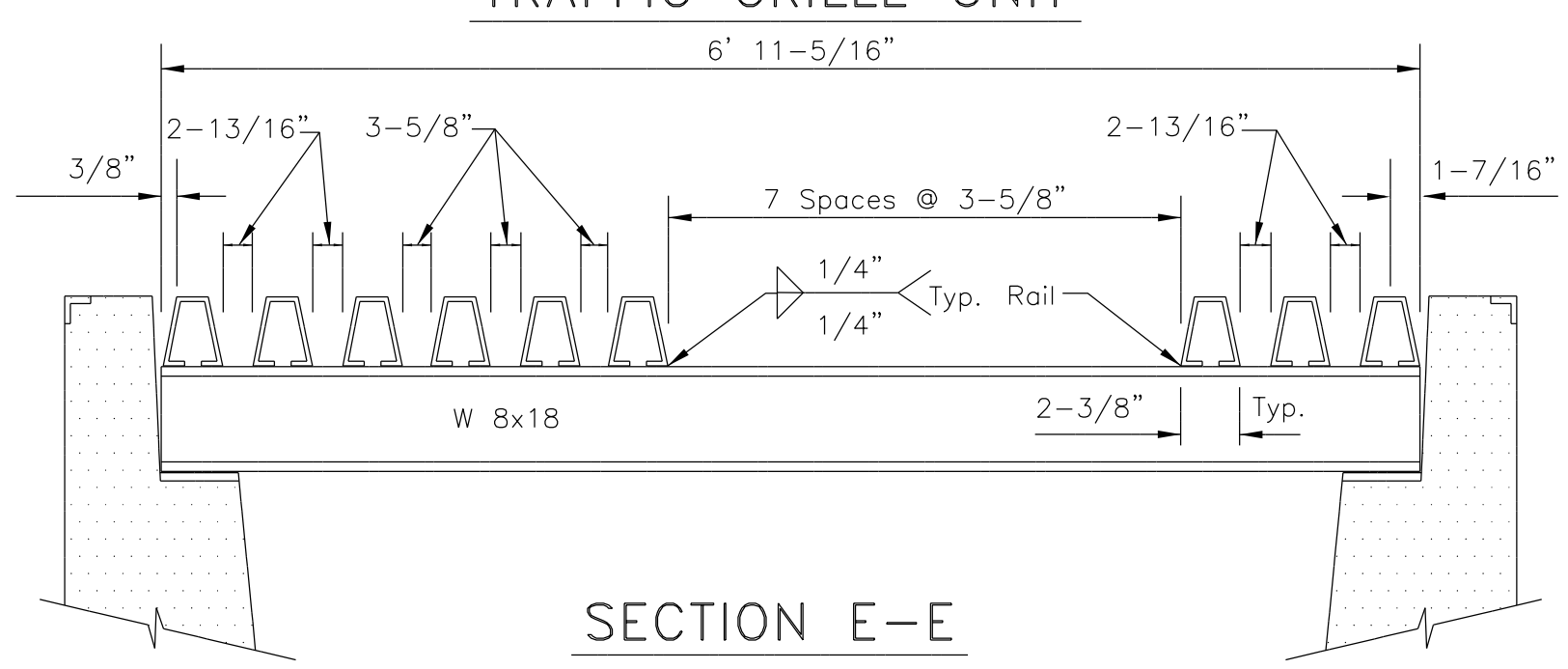


KEY LOCATION

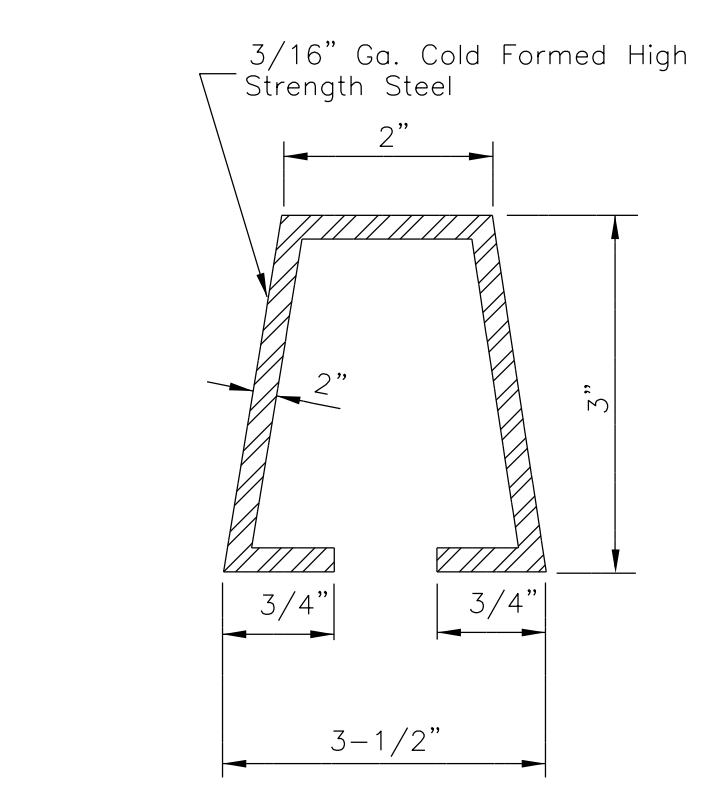
SECTION D-D



TRAFFIC GRILLE UNIT

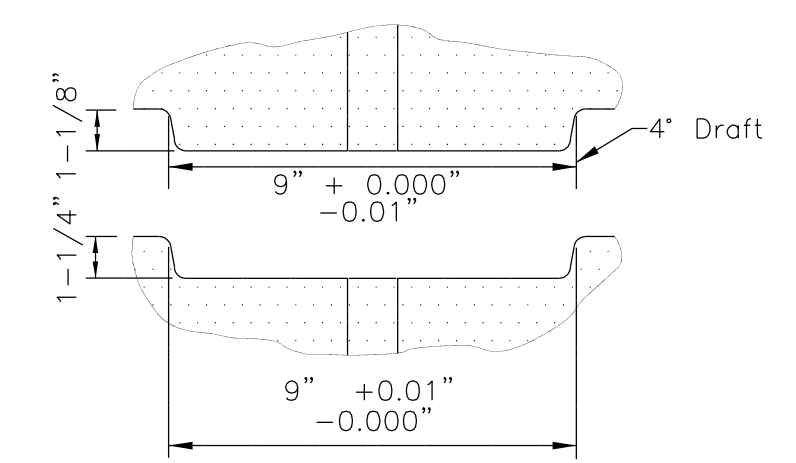


SECTION E-E

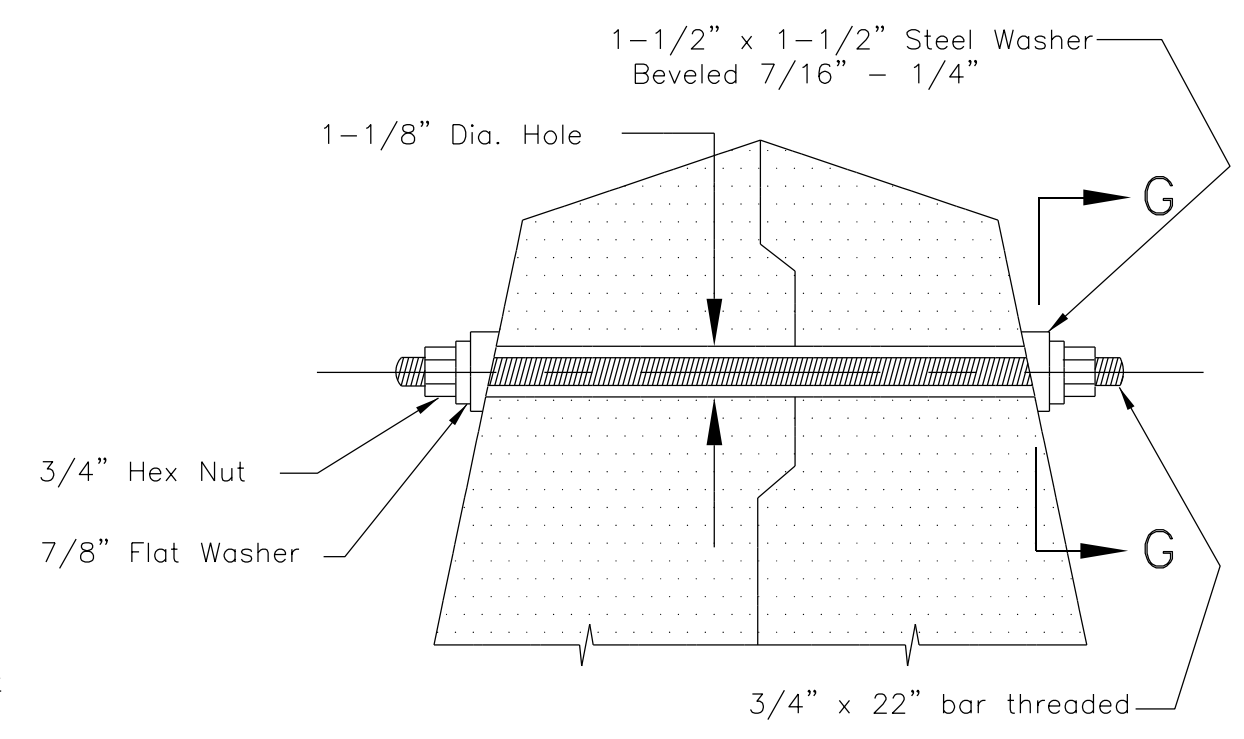


STEEL CROSSBAR SECTION

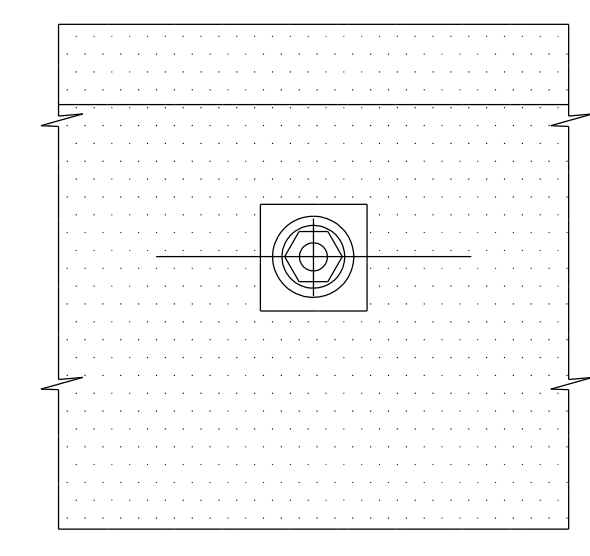
15 Req'd for 1 Grid



SECTION F-F



TIE BOLT DETAIL




SECTION G-G

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
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NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

**PRECAST CONCRETE  
CATTLEGUARD DETAILS**

DRAWN BY: Gerald.Hood	DATE: 5/7/2009
DESIGNED BY: NRDOT	DATE: 5/7/2009
REVISED: 1/25/2013	BY: Peterson.Yazzie
ANNOTATION SCALE: Full Size 1=1	
FILENAME: Sht.24_Precast Cattleguard Std.dgr	



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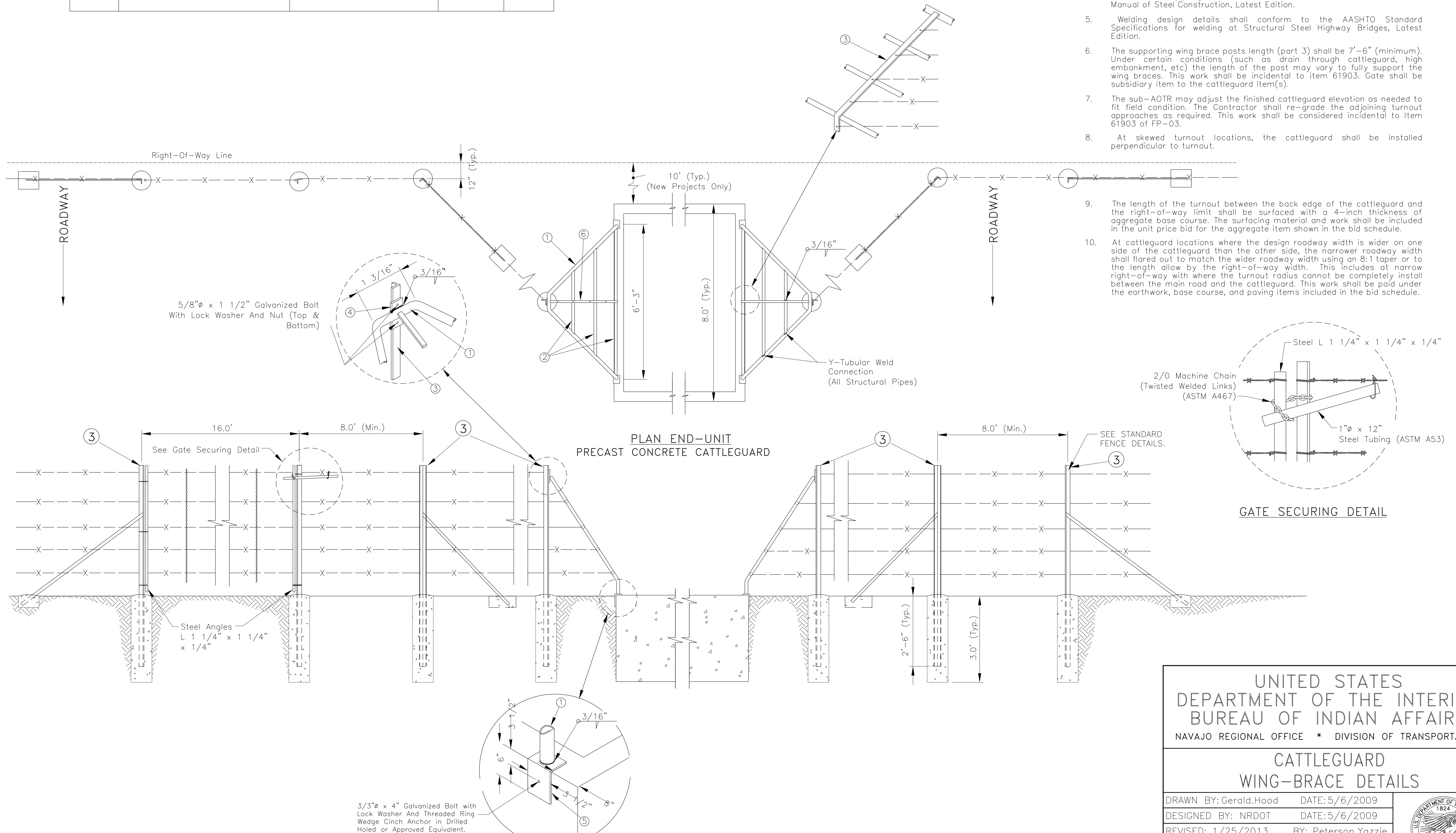
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1,2&4	25	63

**ESTIMATED MATERIAL LIST**

PART NO.	MATERIAL	SIZE AND THICKNESS	LENGTH	QUANTITY
1	Structural Steel Pipe	2 1/2" $\phi$ Nominal	14'-2"	2
2	Structural Steel Pipe	1 1/4" $\phi$ Nominal	13'-9"	2
3	Steel Angle (See Note 4 & 6)	L 2 1/2" x 2 1/2" x 3/8"	7' 6-3/16"	2
4	Steel Plate	3 1/2" x 3/8"	7"	2
5	Steel Angle	L 6" x 3 1/2" x 3/8"	3 1/2"	4
6	Bar	1" x 1/4"	5' 6-1/8"	2
	Bolts, Nuts and Washers	As Shown		

**GENERAL NOTES**

- Structural pipe shall conform to ASTM A53-93a, Grade B. All other structural steel shall conform to ASTM-A36.
- Bolts, nuts, and washers shall be galvanized in accordance with AASHTO M111 (ASTM A123).
- All wing brace structural steel and pipe shall receive one (1) primer coat, one (1) intermediate coat, and one (1) finish coat in accordance with Section 563, Paint System 2 of FP-03.
- All structural pipe joints shall be fabricated in accordance with AISC Manual of Steel Construction, Latest Edition.
- Welding design details shall conform to the AASHTO Standard Specifications for welding at Structural Steel Highway Bridges, Latest Edition.
- The supporting wing brace posts length (part 3) shall be 7'-6" (minimum). Under certain conditions (such as drain through cattleguard, high embankment, etc) the length of the post may vary to fully support the wing braces. This work shall be incidental to item 61903. Gate shall be subsidiary item to the cattleguard item(s).
- The sub-AOTR may adjust the finished cattleguard elevation as needed to fit field condition. The Contractor shall re-grade the adjoining turnout approaches as required. This work shall be considered incidental to Item 61903 of FP-03.
- At skewed turnout locations, the cattleguard shall be installed perpendicular to turnout.
- The length of the turnout between the back edge of the cattleguard and the right-of-way limit shall be surfaced with a 4-inch thickness of aggregate base course. The surfacing material and work shall be included in the unit price bid for the aggregate item shown in the bid schedule.
- At cattleguard locations where the design roadway width is wider on one side of the cattleguard than the other side, the narrower roadway width shall flared out to match the wider roadway width using an 8:1 taper or to the length allow by the right-of-way width. This includes at narrow right-of-way with where the turnout radius cannot be completely install between the main road and the cattleguard. This work shall be paid under the earthwork, base course, and paving items included in the bid schedule.



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**CATTLEGUARD  
 WING-BRACE DETAILS**

DRAWN BY: Gerald.Hood	DATE: 5/6/2009
DESIGNED BY: NRDOT	DATE: 5/6/2009
REVISED: 1/25/2013	BY: Peterson.Yazzie
ANNOTATION SCALE: Full Size 1=1	
FILENAME: Sht.25_C-GuardWingBraceDetails.dgn	

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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N007	N2007(1-1)1,2&4	26	63

Minimum width necessary for proper jointing and compaction under haunches and at side of pipe (Max. pay width = 18')

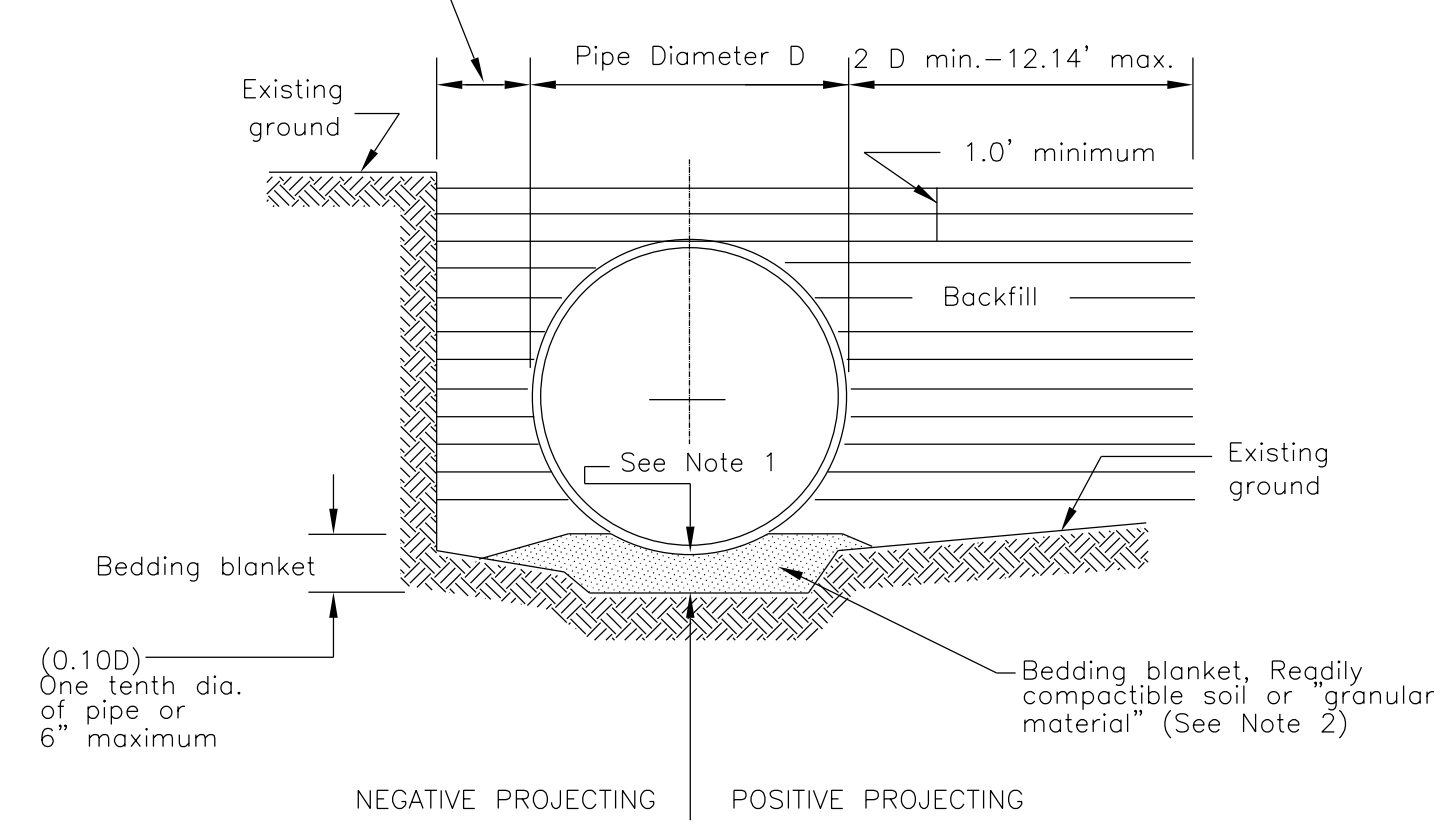


FIG. A. CLASS C BEDDING

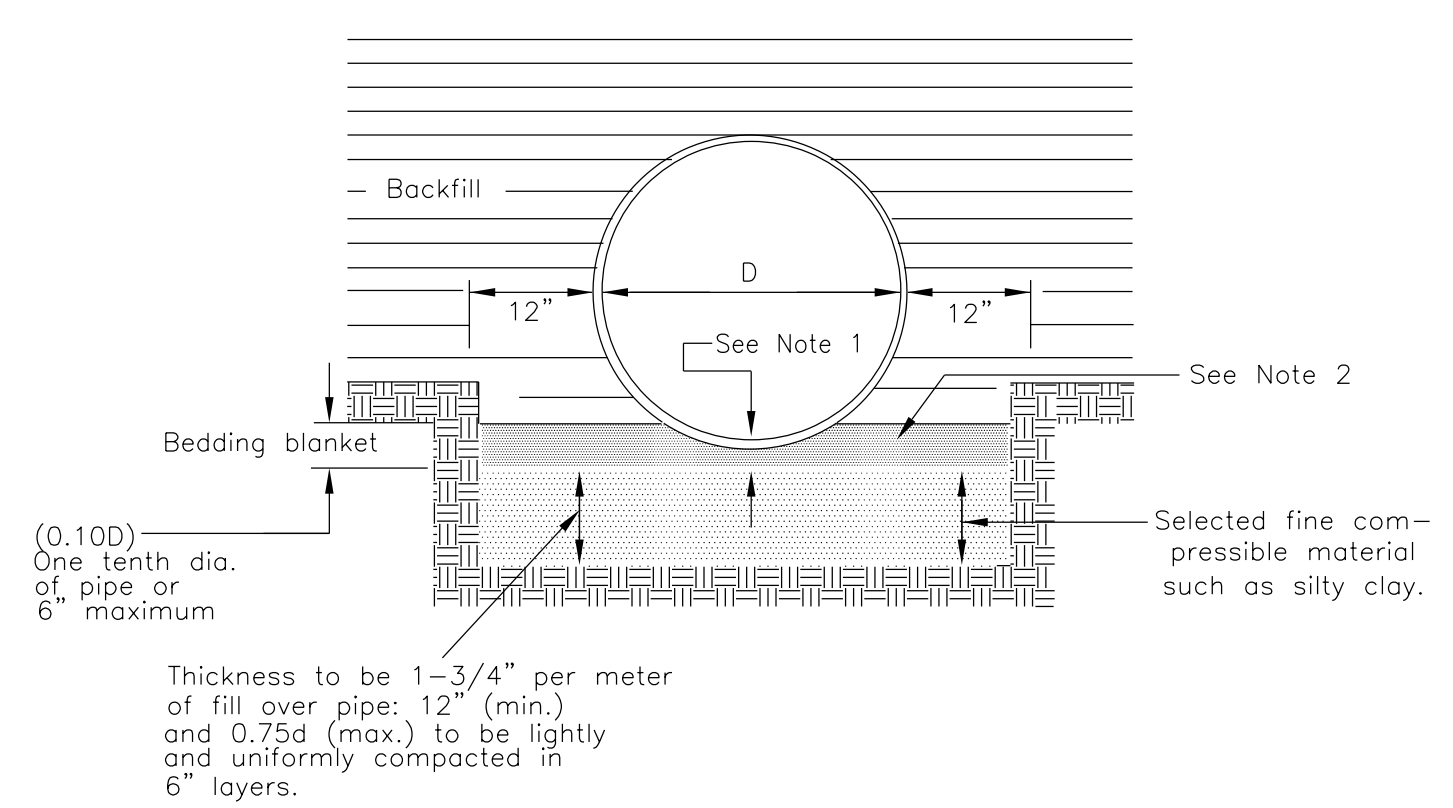


FIG. B ROCK BEDDING

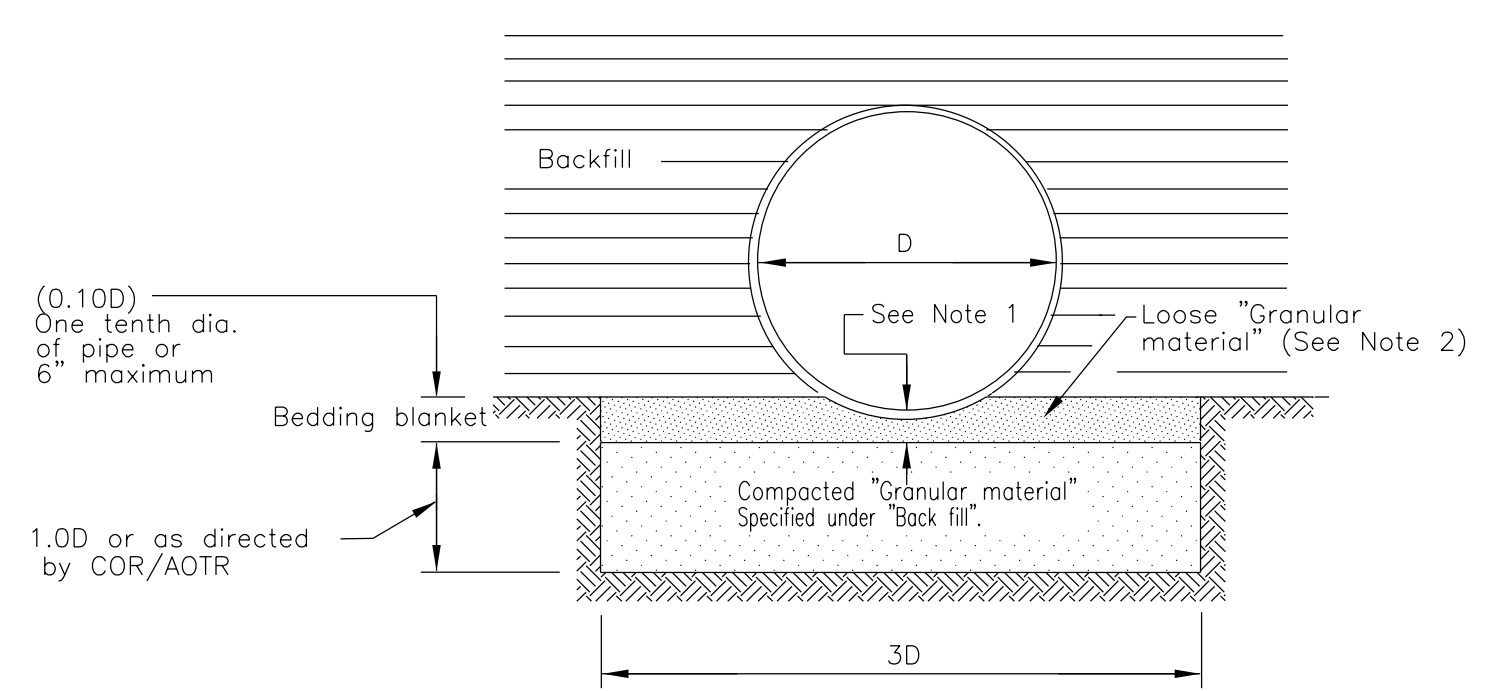
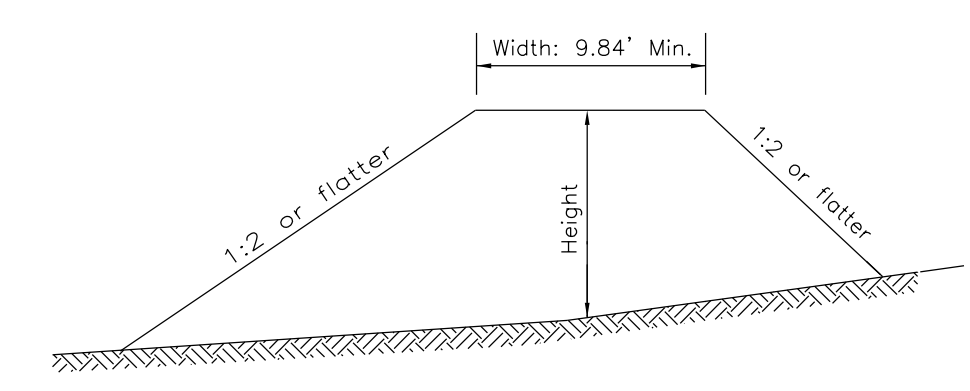
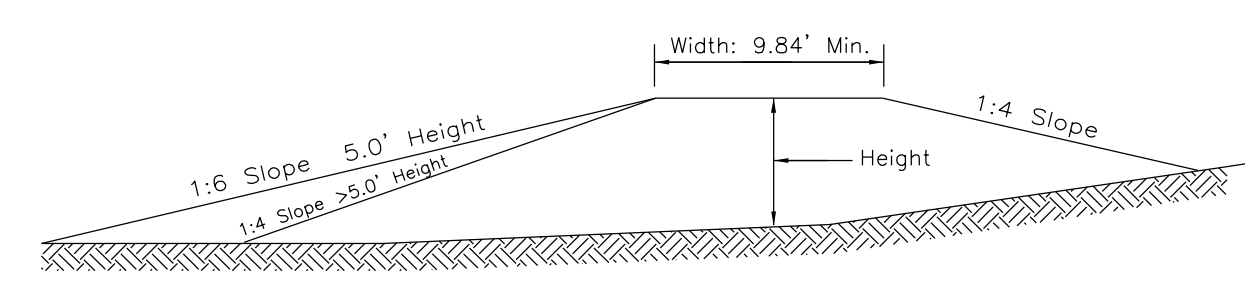


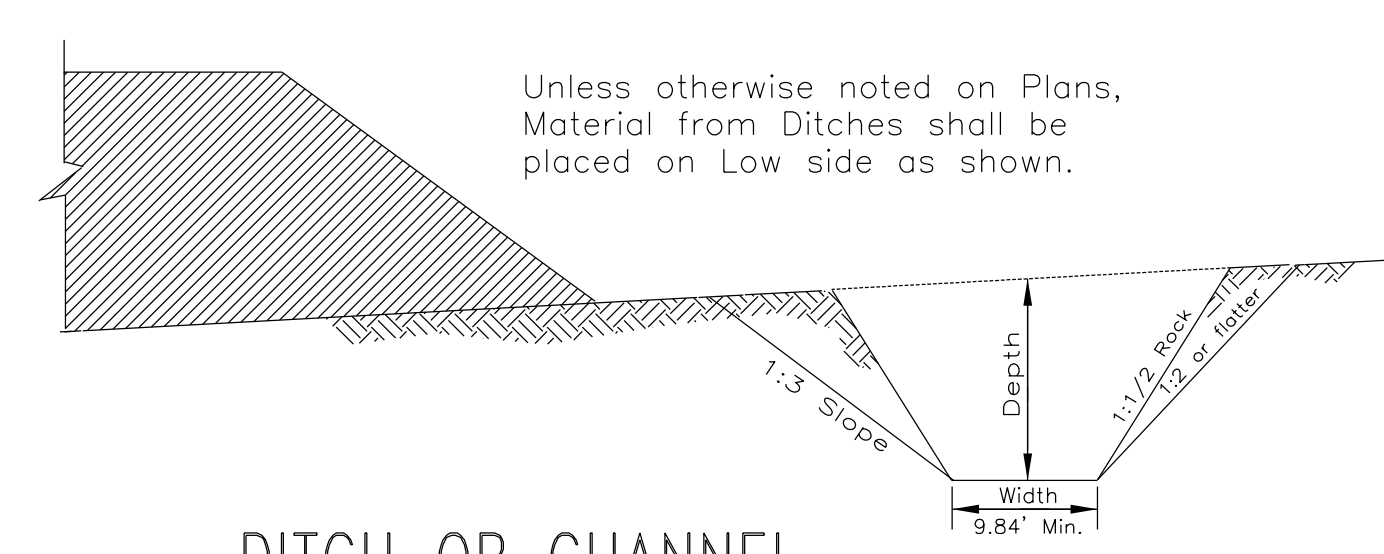
FIG. C. FOUNDATION STABILIZATION BEDDING



TYPE "A" DIKE

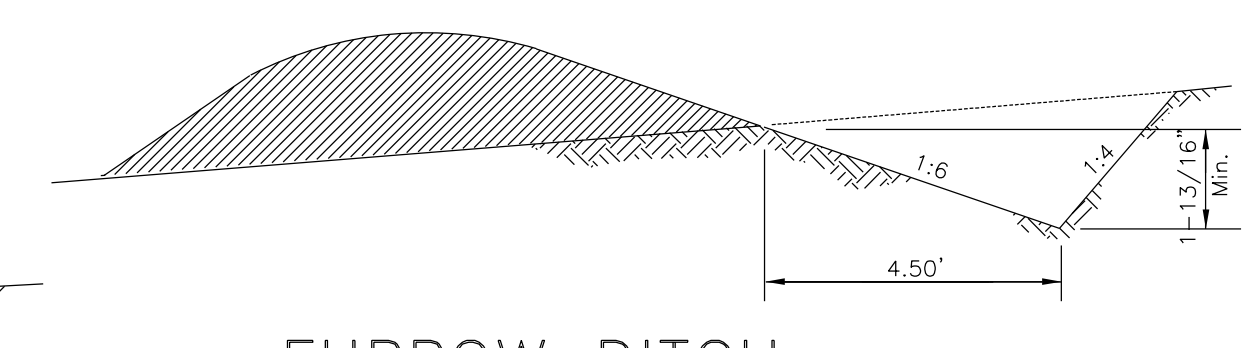


TYPE "B" DIKE



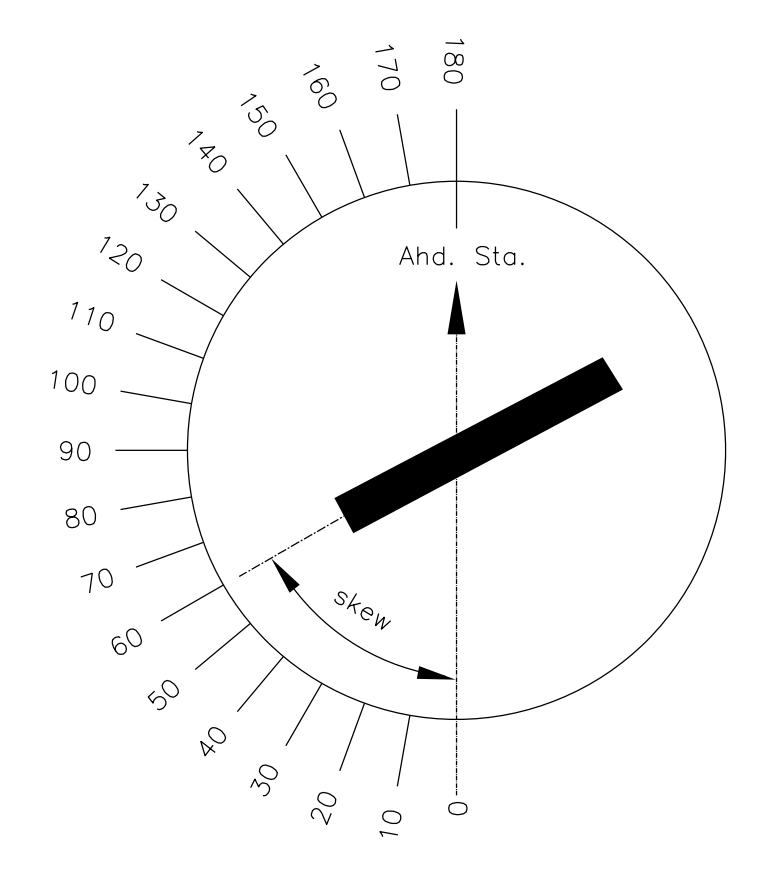
DITCH OR CHANNEL

Note: DIMENSIONS OF DITCHES AND DIKES as shown on plans are respectively width, depth or height and length.

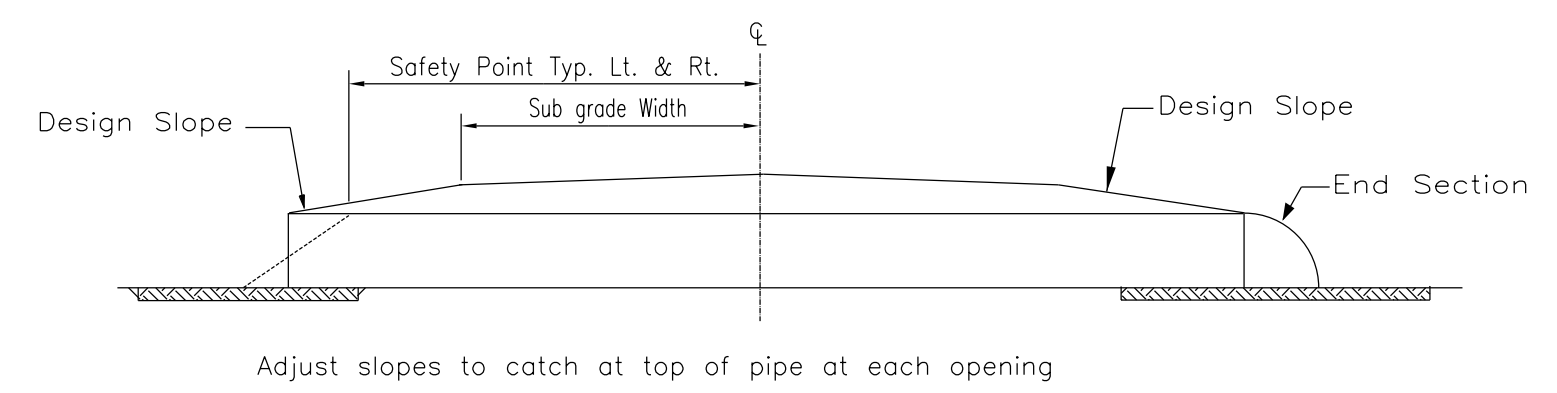


FURROW DITCH

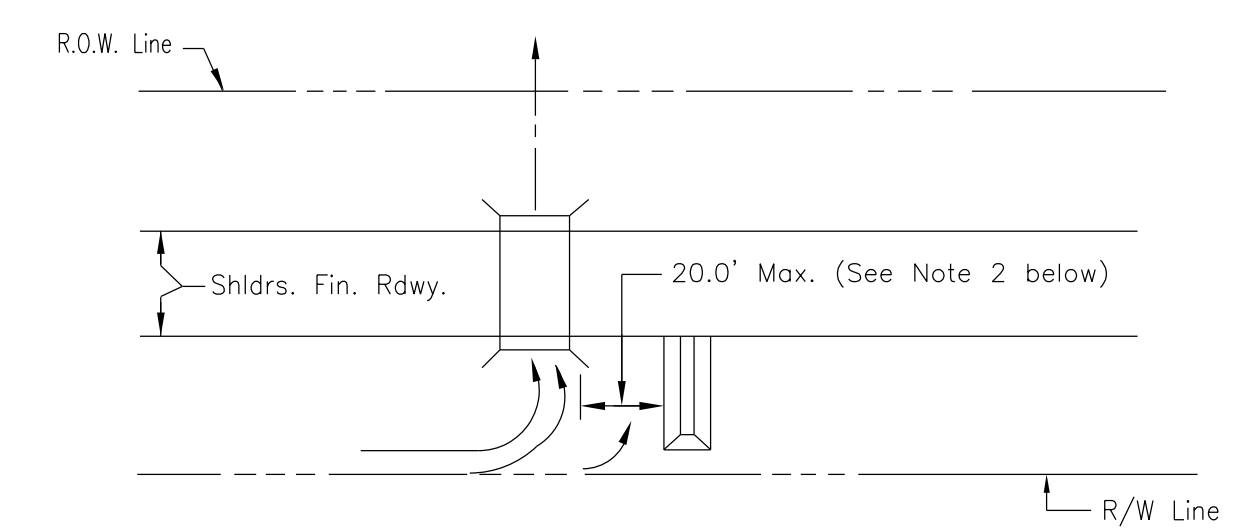
DITCH BLOCK DETAILS



STRUCTURE SKEW DIAGRAM



TYPICAL PIPE INSTALLATION



TYPICAL DITCH BLOCK INSTALLATION AT STRUCTURE

1. Ditch Block at structures to be so placed that they create a water cushion. Elevation top of Ditch Block shall be 6" above elevation of top of pipe unless otherwise shown.
2. Ditch Block shall be located a distance equal to the largest dimension of Box Culvert or pipe from the face of the drainage structure. In no case shall the distance exceed 20.0'.

GENERAL NOTES

1. PLACE LOOSE BEDDING ROUGHLY SHAPED TO BOTTOM OF PIPE, THEN COMPACTED UNDER HAUNCHES AFTER PIPE PLACEMENT.
2. SEE SECTION 204, 209, 602, AND 704 OF FP-2003, INCLUDING THE SUPPLEMENTAL SPECIFICATION FOR ADDITIONAL NOTES.
3. ALL DRAINAGE STRUCTURE MATERIAL SHALL BE UNLOADED AND HANDLED WITH REASONABLE CARE. NO STRUCTURE SHALL BE DRAGGED OR ALLOWED TO STRIKE ANY HARD SURFACE DURING PLACEMENT. ANY DAMAGED STRUCTURE SHALL BE REPAIRED OR REPLACED, BY THE CONTRACTOR, AT NO ADDITIONAL COST TO THE GOVERNMENT.
4. ALL STRUCTURAL PLATE PIPE STRUCTURES SHALL BE ASSEMBLED AND INSTALLED IN ACCORDANCE WITH THE FABRICATOR'S RECOMMENDATION.
5. BACKFILL MATERIAL SHALL BE PLACED 12-INCH (MIN.) TO 40-INCH (MAX.) PIPE DIAMETER WIDTH ON THE SIDES AND 12-INCH OVER THE PIPE. BACKFILL MATERIAL BEYOND THESE LIMITS SHALL BE REGULAR EARTHWORK EMBANKMENT MATERIAL. THE BACKFILL MATERIAL SHALL BE APPROVED BY THE AOTR/COR PRIOR TO ITS USE AND SHALL BE PLACED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.
6. PONDING OR JETTING PIPE BACKFILL SHALL NOT BE PERMITTED.
7. ALL PIPE EXCAVATION, BACKFILLING, DE-WATERING, PUMPING OR COFFERDAMS REQUIRED TO PROPERLY INSTALL THE DRAINAGE PIPE SHALL BE CONSIDERED INCIDENTAL TO COMPLETION OF THE PROJECT AND NO ADDITIONAL PAYMENT SHALL BE MADE.
8. MULTIPLE PIPE INSTALLATIONS SHALL BE PLACED 24-INCH BETWEEN END SECTIONS UNLESS OTHERWISE DIRECTED BY THE AOTR/COR OR AS SHOWN ON THE PLANS.
9. ALL PIPES SHALL BE PROTECTED BY A COVER OF NOT LESS THAN 36-INCH OF EMBANKMENT ABOVE PIPE BEFORE ANY HEAVY EQUIPMENT IS ALLOWED TO PASS OVER THE STRUCTURE(S) DURING CONSTRUCTION.
10. ALL DRAINAGE STRUCTURES SHALL BE INSTALLED AT THE ORIGINAL GROUND LINE AND SLOPE TO ASSURE POSITIVE DRAINAGE UP TO THE R.O.W. LIMITS. IN NO CASE SHALL THE PIPE(S) BE PLACED BELOW THE ORIGINAL GROUND ELEVATIONS. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO COMPLETION OF PROJECT AND NO ADDITIONAL PAYMENT SHALL BE MADE.
11. AT DRAINAGE PIPE REPLACEMENTS, INSTALLATIONS, EXTENSIONS, AND IN-PLACE PIPE CLEANING LOCATIONS, THE CONTRACTOR SHALL RESHAPE, REGRADE AND CLEAN THE INLET AND OUTLET CHANNELS TO THE RIGHT-OF-WAY LINE AND/OR EXISTING DRAINAGE CHANNEL, TO PRODUCE SMOOTH FLOWS AT CULVERT INTAKES AND DISCHARGES AS DIRECTED BY THE AOTR/COR. THIS WORK SHALL BE INCIDENTAL TO BID ITEMS UNDER SECTIONS 602, 603, AND 607.
12. ALL CULVERTS UNDER TURNOUTS AND DRIVEWAYS SHALL BE PLACED AT THE PROPOSED DITCH FLOWLINE. THE CONTRACTOR SHALL BE REQUIRED TO FIELD ADJUST THE PROFILE GRADES OVER PIPE AS DIRECTED BY THE AOTR/COR TO PROVIDE FOR THE MINIMUM COVER.
13. TYPE "B" DIKE SHALL BE USED ON THIS PROJECT UNLESS OTHERWISE NOTED ON THE PLANS. EMBANKMENT MATERIAL NEEDED TO BUILD EARTHEN DIKES SHALL BE CONSIDERED INCIDENTAL TO ITEM 20443-2000.
14. IF DIRECTED BY THE AOTR/COR TO BETTER FIT FIELD CONDITIONS, TO MORE SMOOTHLY DIRECT THE FLOW INTO THE PIPE AND/OR LESSEN THE WATER'S IMPACT ON THE FACE OF THE DITCH BLOCKS, THE DITCH BLOCK TO BE CURVED. THIS WORK TO BE INCIDENTAL TO BID ITEM 20443-2000.

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF INDIAN AFFAIRS  
NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

STANDARD PIPE INSTALLATION  
AND DITCH DETAILS

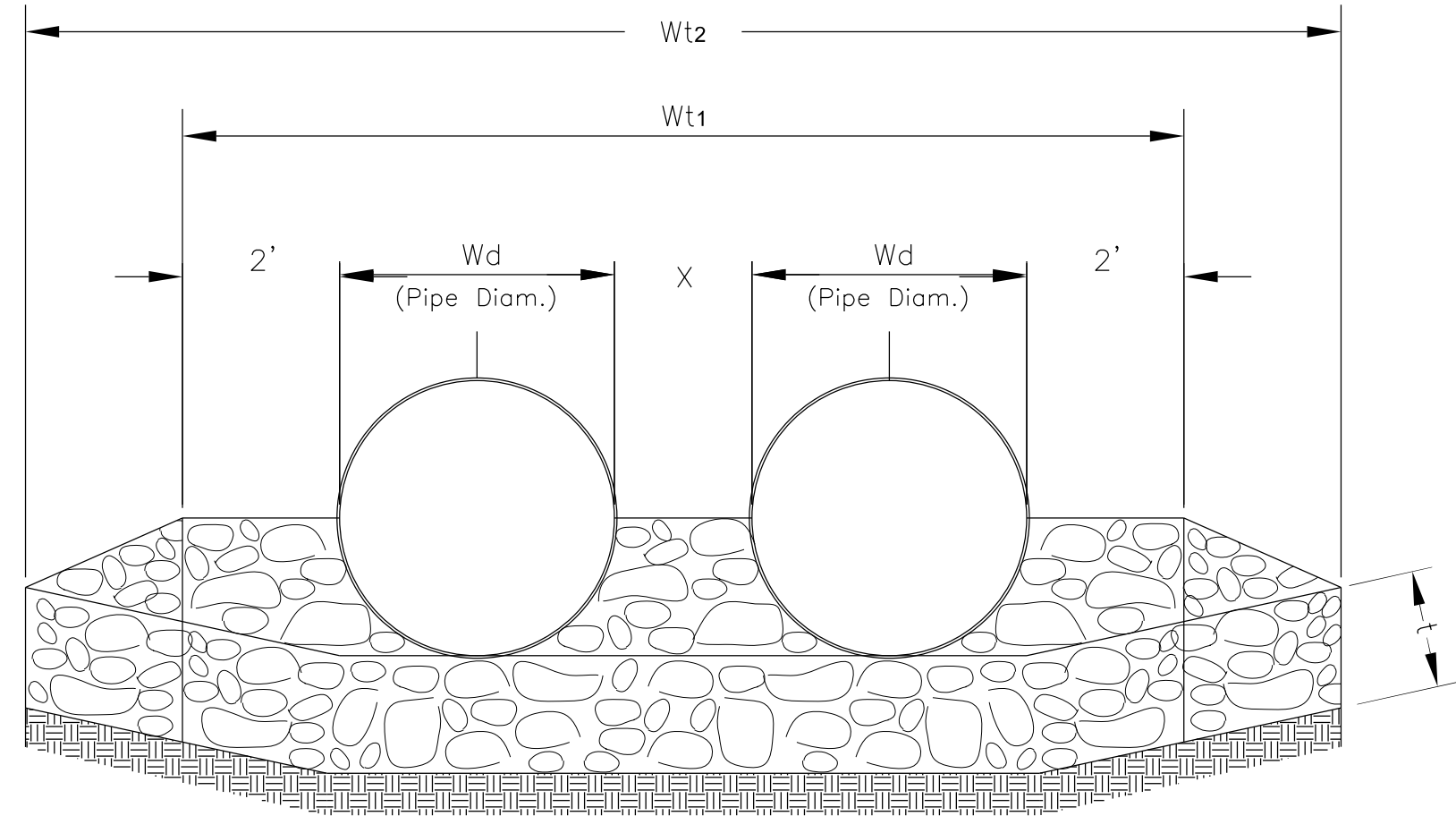
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DESIGNED BY: NRDOT	DATE: 5/7/2009
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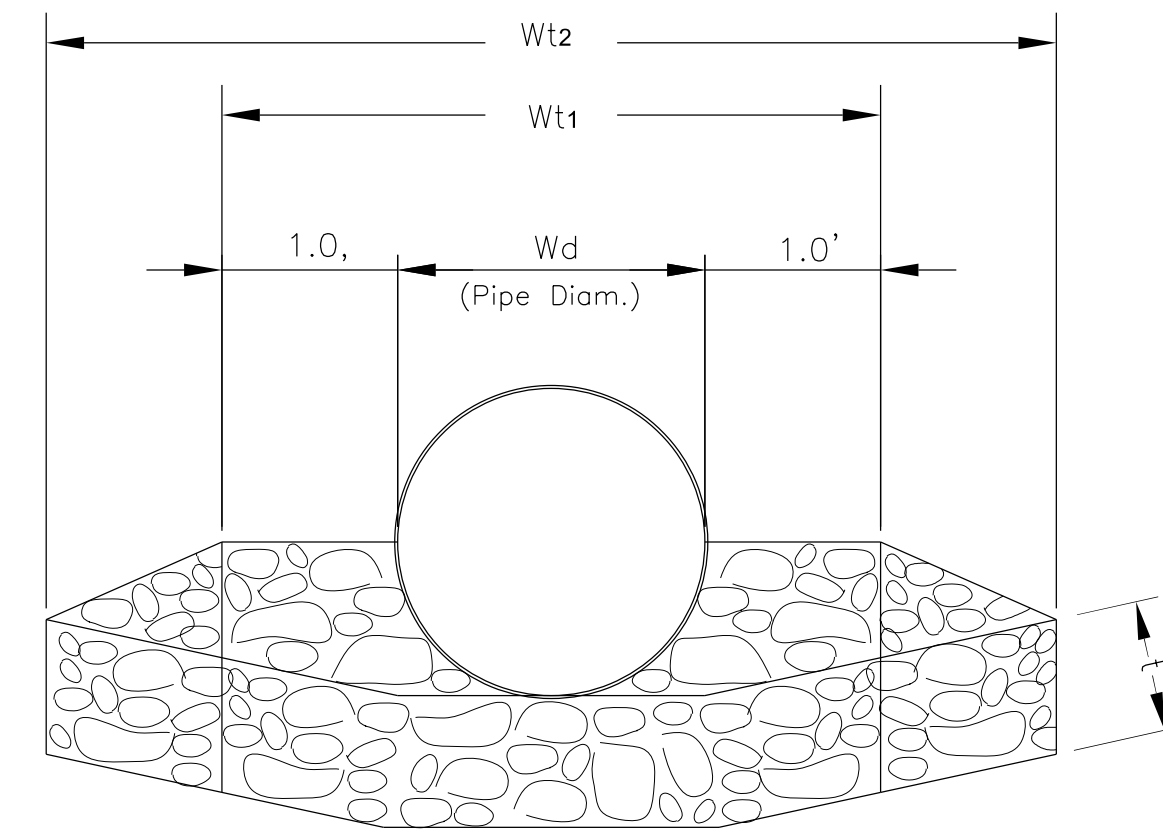
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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1,2&4	27	63



SECTION A-A - DOUBLE BARREL

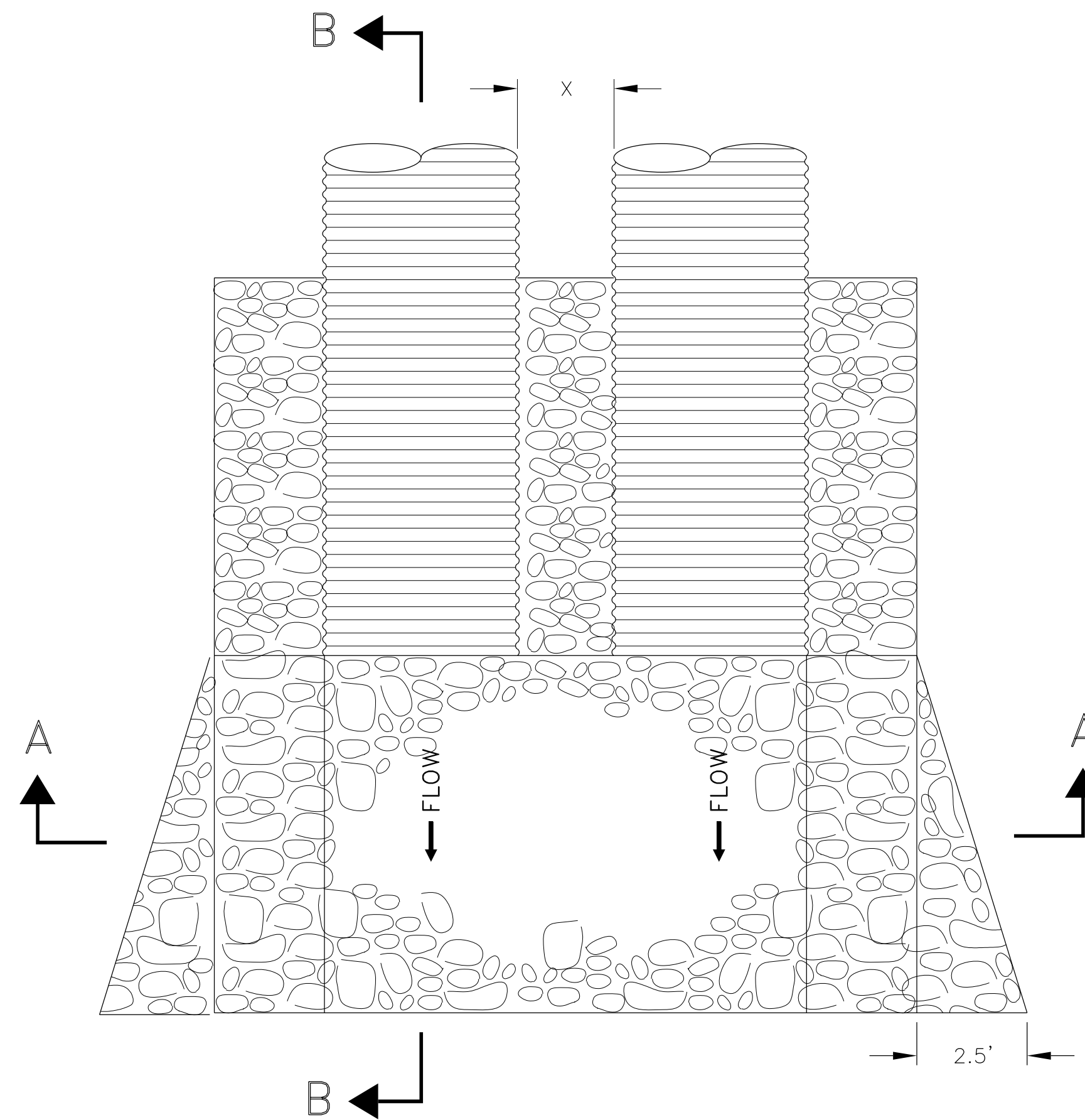
Distance Between Pipe's	
X = 72"	For 24" $\phi$ CSPC
X = 82"	For 30" $\phi$ CSPC
X = 93"	For 36" $\phi$ CSPC



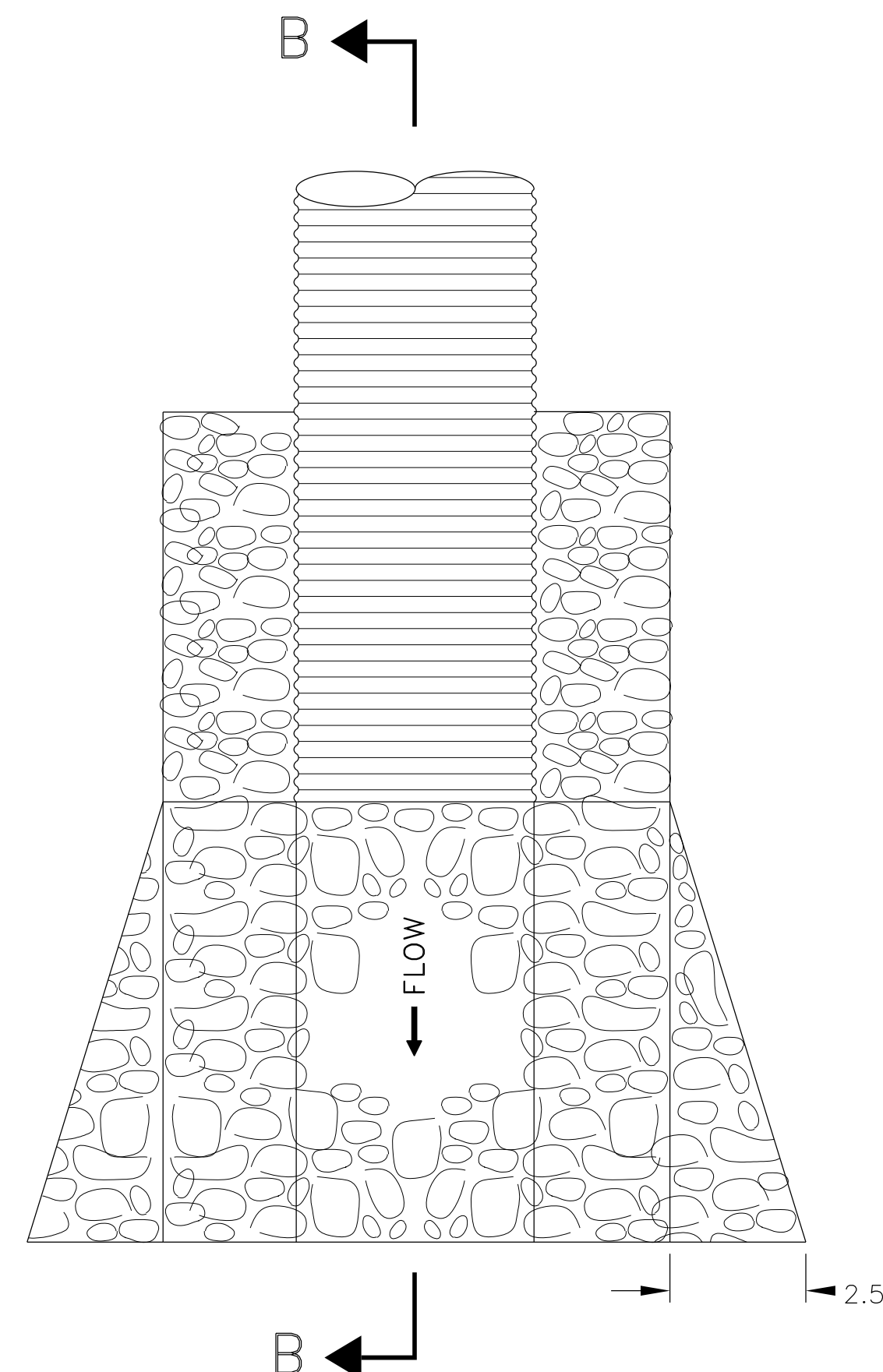
SECTION A-A - SINGLE BARREL

**GENERAL NOTES**

1. WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE STANDARD SPECIFICATION FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS [FP-03].
2. THE QUANTITIES SHOWN ARE ONLY AN ESTIMATE. ACTUAL QUANTITIES SHALL BE DETERMINED IN THE FIELD. THE CONTRACTOR WILL BE REQUIRED TO MAKE ANY NECESSARY ADJUSTMENTS IN THE FIELD TO MATCH EXISTING FIELD CONDITIONS. THESE FIELD ADJUSTMENTS ARE THE OBLIGATIONS OF THE CONTRACTOR.
3. EXCAVATION FOR RIPRAP BELOW FLOW LINE AS SHOWN SHALL BE CONSIDERED INCIDENTAL TO ITEM 25101-2000.
4. STONE SIZE SHALL CONFORM TO FP-03, TABLE 705-1, CLASS 2.
5. FILTER FABRIC TYPE IV-B SHALL BE INSTALLED UNDER ALL RIP RAP AND SHALL CONFORM TO SECTION 251, FP-03, AND SHALL BE CONSIDERED INCIDENTAL TO ITEM 25101-2000.
6. THE TOP OF THE RIPRAP SHALL BE INSTALLED TO MATCH THE EXISTING OR FINISHED GROUND ELEVATIONS.
7. FILTER FABRIC SHALL BE TUCKED OR EMBEDDED 16" INTO EMBANKMENT ALONG ALL EDGES AS SHOWN. FILTER FABRIC IS NOT REQUIRED UNDER GROUTED RIPRAP.
8. RIPRAP DOWN DRAIN SHALL BE CARRIED DOWN SLOPE TO INTERSECTION OF FILL SLOPE AND EXTENDED UNTIL A 2% OR LESS GRADE IS ACHIEVED BEFORE TERMINATION.
9. FOR GROUTED RIPRAP, FILL ALL ROCK VOIDS WITH GROUT AS FP-03 SECTION 251. LEAVE 0.5 TO .25 OF THE RIP RAP SURFACE ROCK EXPOSED.
10. THE QUANTITIES SHOWN ARE ONLY AN ESTIMATE. ACTUAL QUANTITIES SHALL BE DETERMINED IN THE FIELD. THE PROJECT MANAGER, AOTR/COR, AND CONTRACTOR SHALL REVIEW ALL ROCK CUT AREAS AFTER THE CONSTRUCTION OF DITCHES, DOWN DRAINS, AND RIPRAP BASINS HAVE BEEN "ROUGH IN". IF IN THE OPINION OF THE AOTR/COR, THAT THE ROCK CUT IS STABLE, THE AOTR/COR MAY ELECT TO DELETE SECTIONS OF THE RIP RAP PROTECTION.



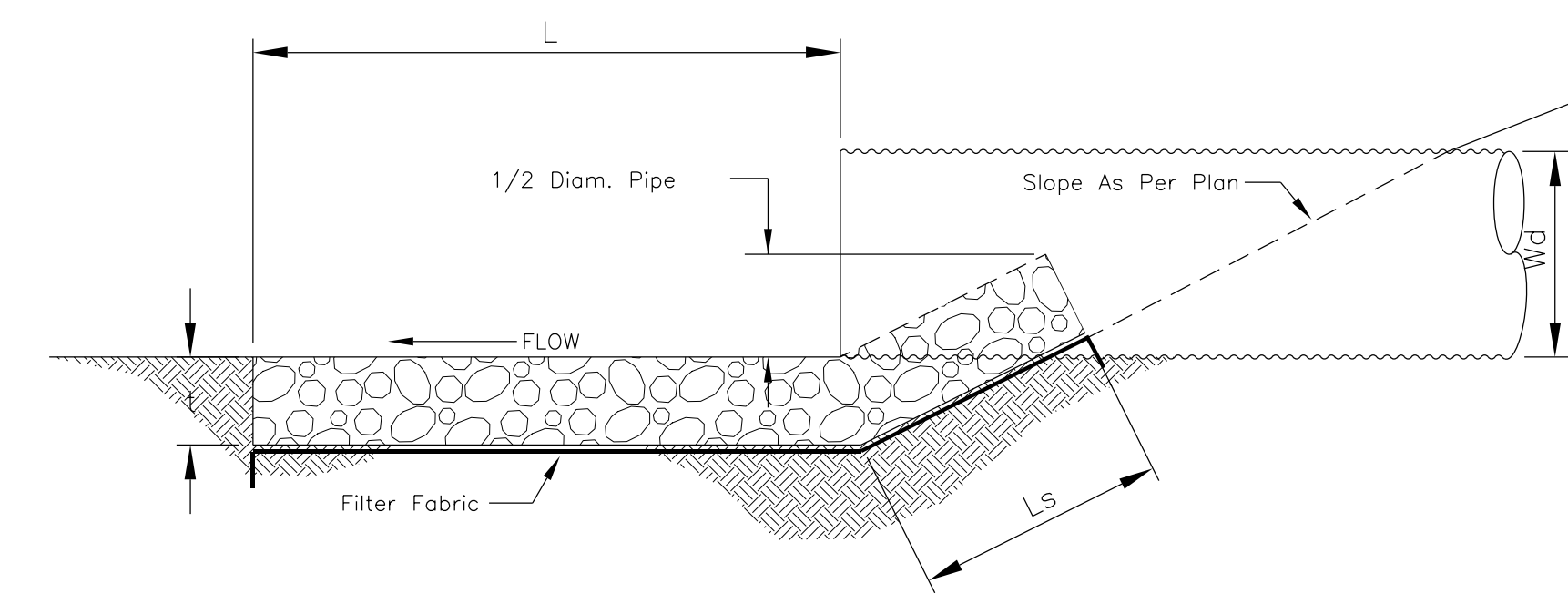
PLAN - DOUBLE BARREL



PLAN - SINGLE BARREL

**ITEM 25101-2000 ESTIMATED QUANTITIES: PLACED RIPRAP, CLASS 2**

STATION	STRUCTURE	LOCATION	Wd (FT.)	Wt. (FT.)	Wt.(FT.)	t(Inch)	L(Ft.)	VOLUME (cu yd)
19+75.00	1-24" @ 90	Outlet	2.0'	4.0	9.0	18	10.0	5.62
36+00.00	2-36" @ 135	Outlet	3.0	17.75	22.75	18	7.87	33.22
TOTAL								38.84

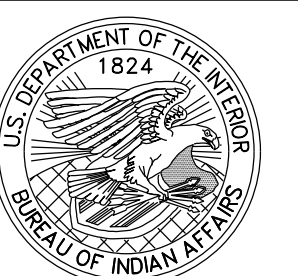


SECTION B-B

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF INDIAN AFFAIRS  
NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

**PLACE RIPRAP  
DROWN DRAIN DETAIL**

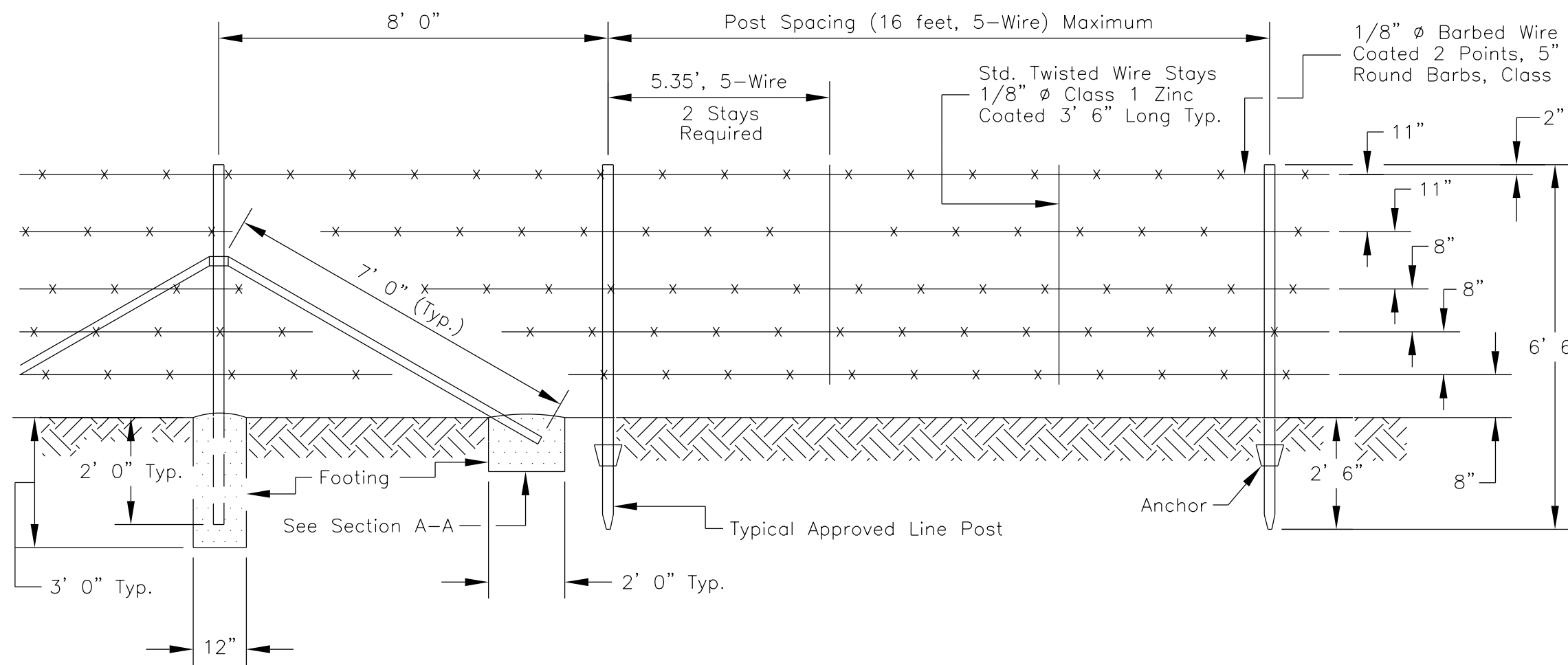
DRAWN BY: Gerald.Hood    DATE: 5/7/2009  
 DESIGNED BY: NRDOT    DATE: 5/7/2009  
 REVISED: 1/25/2013    BY: Peterson.Yazzie  
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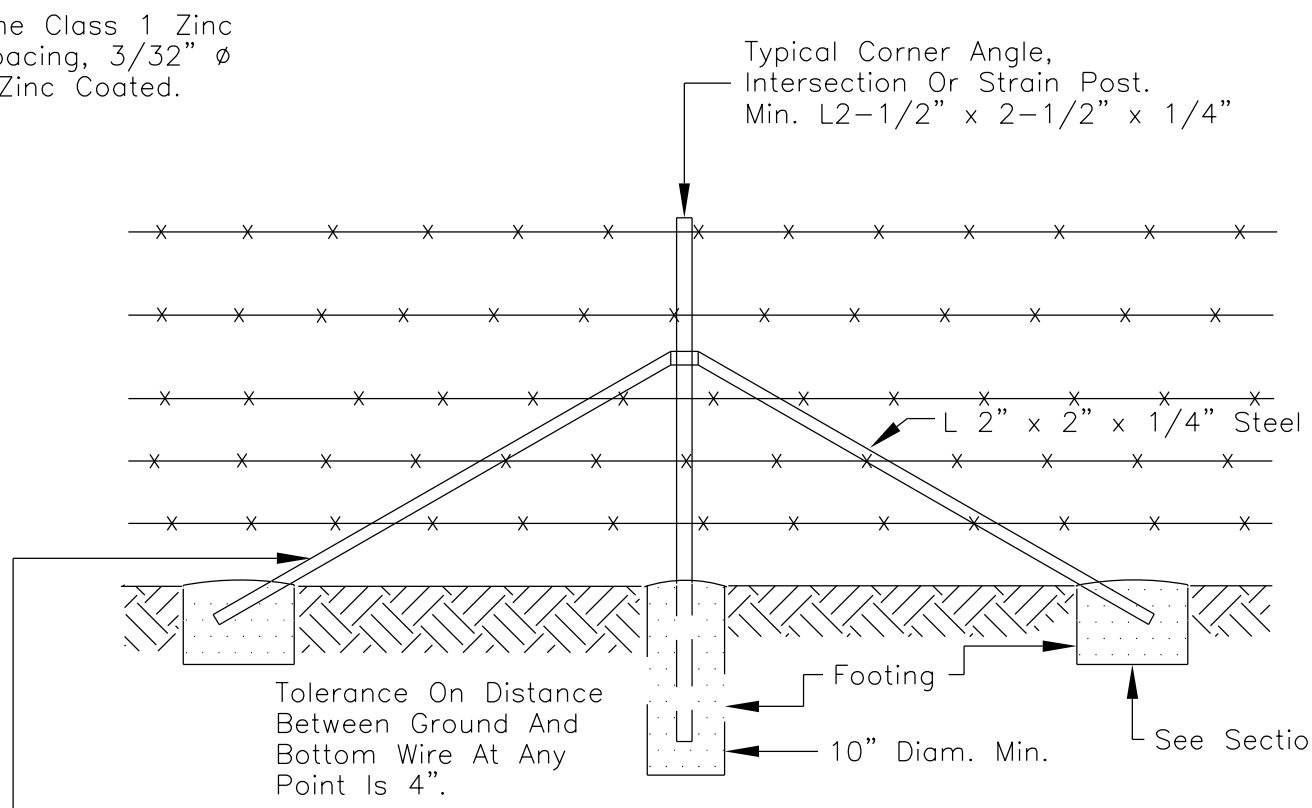
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1,2&4	28	63

**GENERAL NOTES**

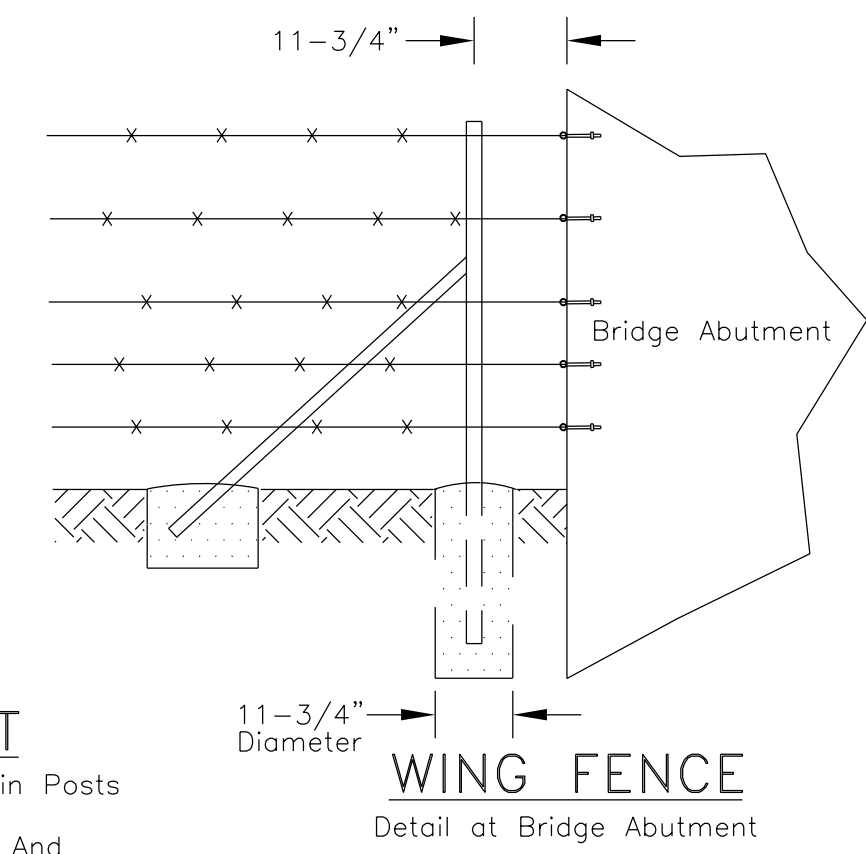
- CORNER, GATE, INTERMEDIATE BRACE POSTS AND LINE POSTS SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M 281-88. METAL POST AND BRACES SHALL BE FABRICATED FROM RAIL, BILLETS, OR COMMERCIAL GRADE STEEL CONFORMING WITH THE REQUIREMENT OF ASTM A 702.
- LINE POSTS SHALL BE FABRICATED IN ACCORDANCE WITH AASHTO M 281. SECTION 7.1.2 WHICH INCLUDES THE ANCHOR PLATES.
- WHEN LINE POST ANCHORS ARE OMITTED, DUE TO CHANGE IN SOIL CONDITIONS SUCH AS ROCK, THEN THE POSTS SHALL BE SET IN CONCRETE. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO ITEM 61901-1000.
- TIE WIRE, WIRE FASTENERS OR WIRE CLIPS FOR FASTENING BARBED & WOVEN FABRIC FENCING TO THE STEEL POSTS SHALL BE 1/8" (Diam.) STEEL WIRE, CLASS 1 (ZINC COATED), SOFT TEMPER AND MEET THE REQUIREMENTS OF ASTM A 641. FURNISHING AND PLACEMENT OF FASTENERS SHALL BE INCLUDED WITH ITEM 61901-1000.
- CONCRETE FOR ANCHORS, POST HOLES, ETC. SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3.6 KSI IN 28 DAYS AND SHALL CONFORM TO SECTION 601 OF THE FF-03. FURNISHING AND PLACEMENT OF CONCRETE SHALL BE INCLUDED WITH ITEM 61901-1000.
- TWO SPLICES ON THE SAME LINE BETWEEN THE STRAIN POST ASSEMBLIES SHALL NOT BE PERMITTED. NO SPLICES SHALL BE PLACED CLOSER THAN 100 FEET OF ANY POST ASSEMBLIES.
- CONNECT ALL R.O.W. FENCING TO CATTLEGUARDS, CULVERTS (GREATER THAN 48" Diam.), CONCRETE STRUCTURES, AND BRIDGES AS SHOWN ON THESE PLANS AND/OR AS DIRECTED BY THE C.O.R./AOTR.
- CLEARING AND GRUBBING SHALL INCLUDE SHAPING AND/OR REMOVAL OF SMALL MOUNDS NECESSARY TO PRESENT A SMOOTH UNIFORM APPEARANCE OF BOTH GROUND AND FENCING LINE. THIS WORK SHALL BE INCIDENTAL TO THE INSTALLATION OF FENCING AND NO ADDITIONAL PAYMENT SHALL BE MADE.
- ALL DRILLING INTO ROCK MATERIAL, ETC. SHALL BE INCIDENTAL TO THE INSTALLATION OF FENCING AND NO ADDITIONAL PAYMENT SHALL BE MADE.
- THE CONTRACTOR SHALL BE REQUIRED TO INSTALL SAG WEIGHTS WHERE VERTICAL CLEARANCE BETWEEN THE BOTTOM WIRE AND NATURAL GROUND IS 2 FEET OR GREATER. THIS WORK SHALL BE INCIDENTAL TO THE INSTALLATION OF FENCING.
- GATE CLOSURE DEVICE SHALL BE STEEL PIPE, NPS 3/4" (1" Ø) SCHEDULE 40, CONFORMING TO THE REQUIREMENT OF ASTM A 53. THE GATE CLOSURE STEEL CHAIN SHALL BE WELDED TO THE STEEL PIPE AND ANGLE IRON FENCE POST. THIS WORK SHALL BE INCIDENTAL TO THE INSTALLATION OF FENCING AND NO ADDITIONAL PAYMENT SHALL BE MADE.
- CONTRACTOR SHALL BE REQUIRED TO INSTALL SAG WEIGHTS WHERE VERTICAL CLEARANCE BETWEEN THE BOTTOM WIRE AND NATURAL GROUND IS 24 INCH OR GREATER. THIS WORK SHALL BE INCIDENTAL TO THE INSTALLATION OF FENCING.



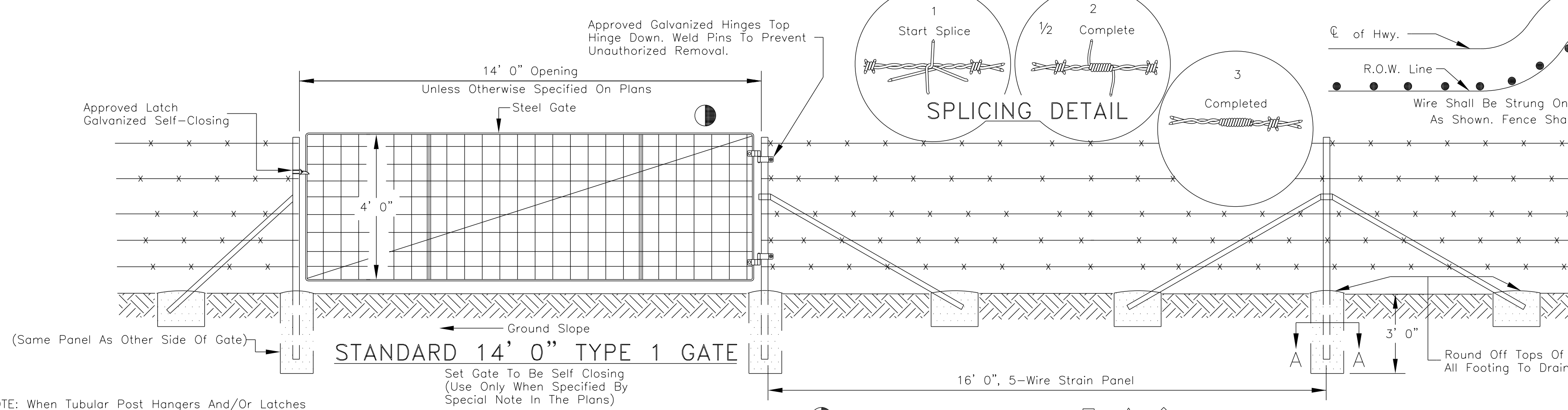
**STANDARD 5 LINE GALVANIZED BARBED WIRE PANEL**



**STANDARD STRAIN POST**  
 To Be Placed @ 650 feet Max. Intervals. Strain Posts With Braces Shall Be Installed At All Corners (R/W Corners Etc.) And Angles Exceeding 15° And Fence Intersections. A Third Brace, In Line With Cross Fence, Required At Intersection.



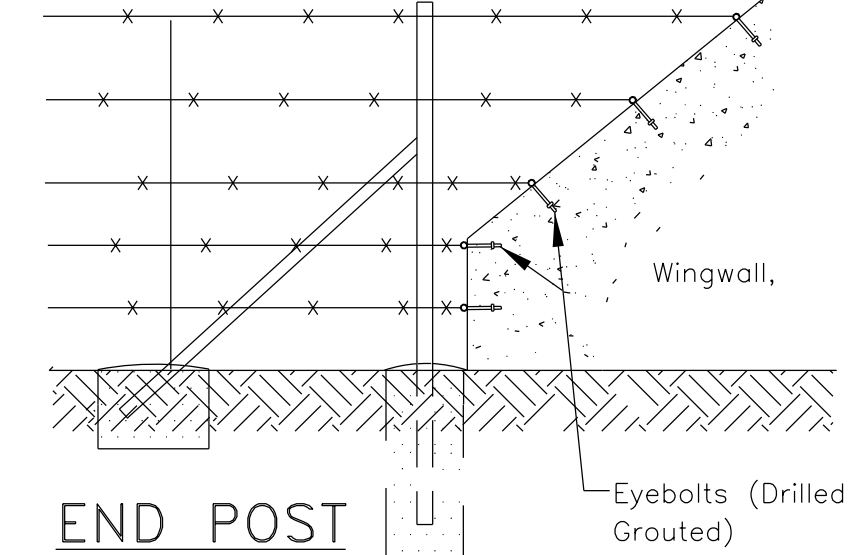
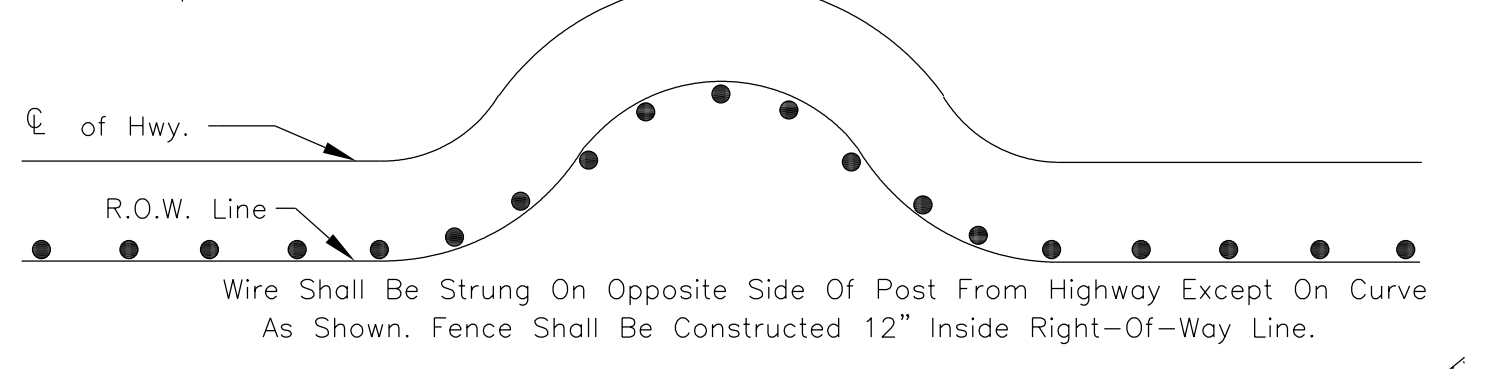
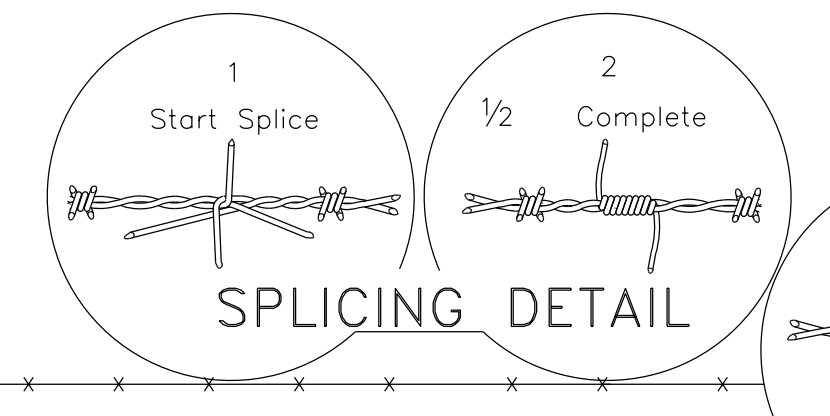
**WING FENCE**  
 Detail at Bridge Abutment



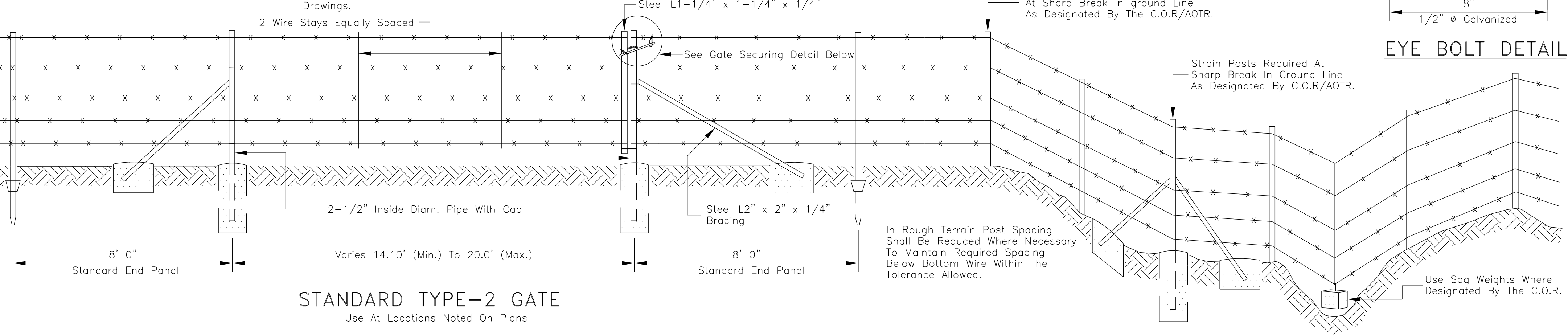
**STANDARD 14' 0" TYPE 1 GATE**

NOTE: When Tubular Post Hangers And/Or Latches Are Used, It Shall Be Drilled For A Single 1-1/8" Ø Min. Drive Pin To Prevent Rotation Of The Hangers And/Or Latches.

For Gate Details At Cattle guard Location See Standard Cattle guard Drawings.

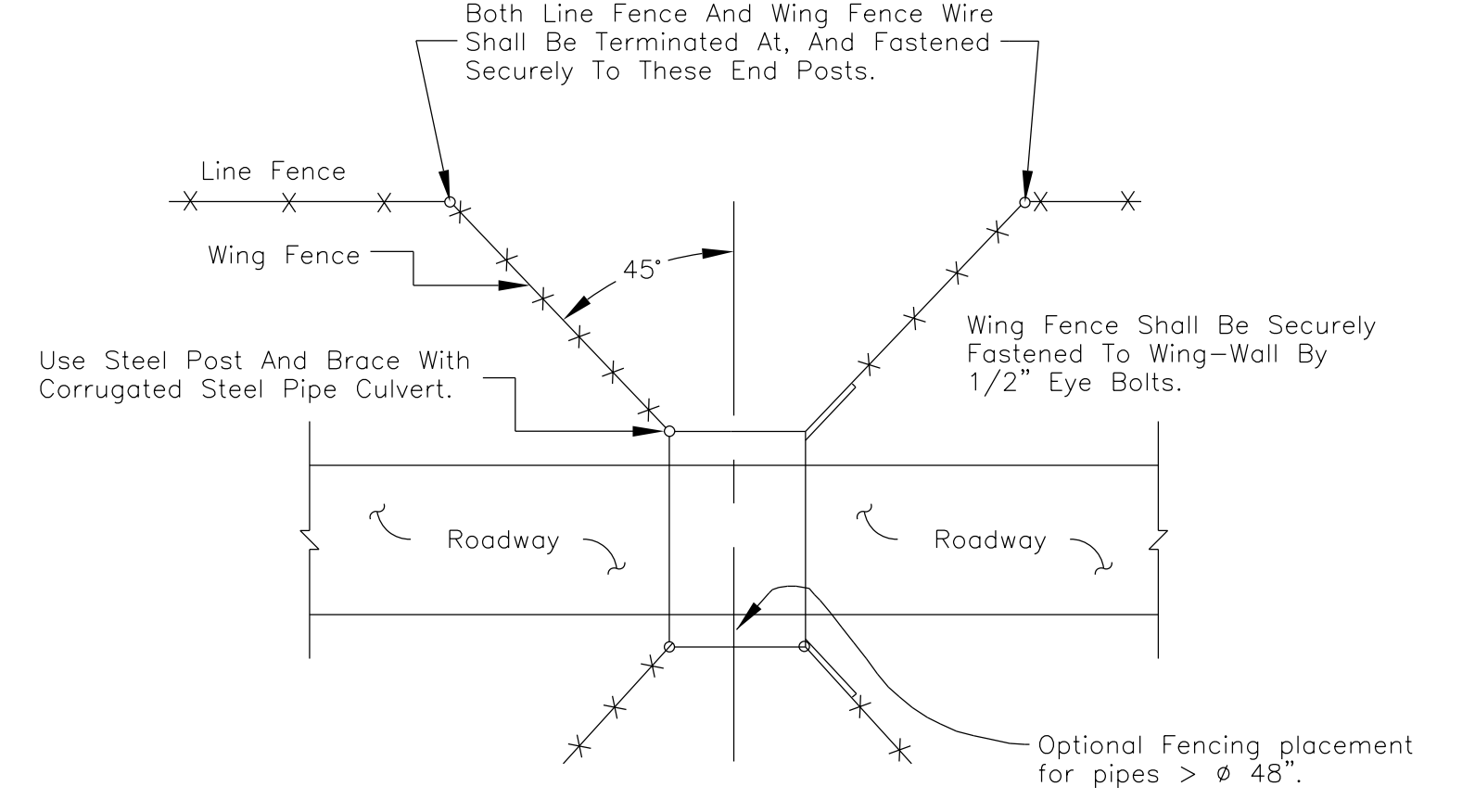


**END POST**



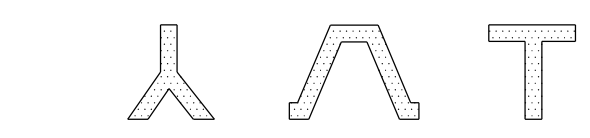
**STANDARD TYPE-2 GATE**  
 Use At Locations Noted On Plans

**EYE BOLT DETAIL**

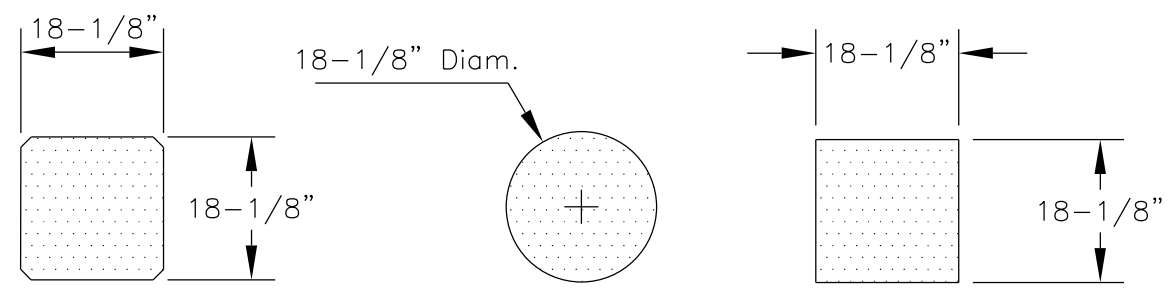


**WING FENCE DETAIL**

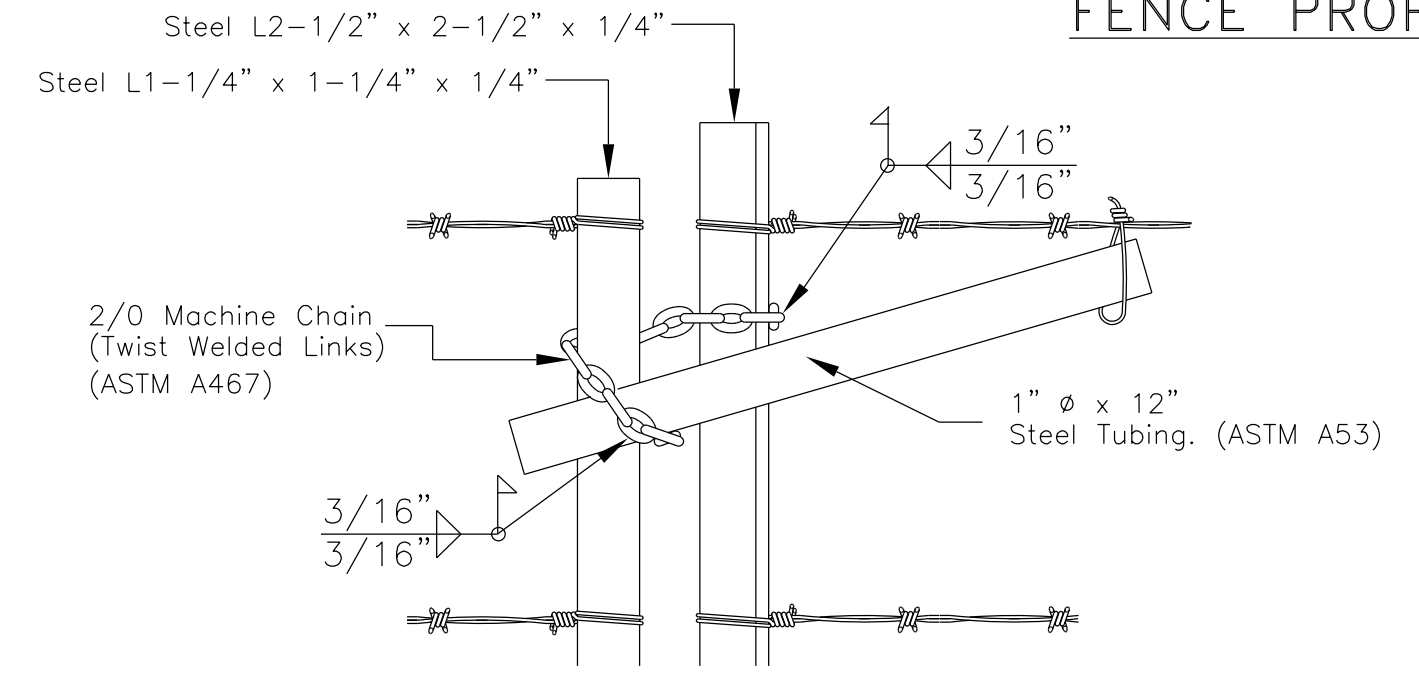
This Detail Shall Be Used Where Stock Passes Or Large Drainage Structures > 48" Ø Are Called For On Plans Unless Otherwise Directed By The C.O.R./AOTR.



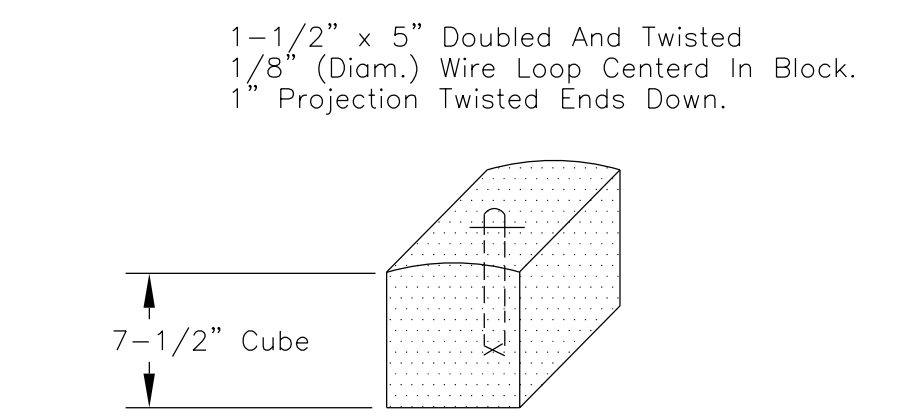
**TYPICAL STEEL POST SECTION**



**SECTION A-A**  
 (Alternates)




**GATE SECURING DETAIL**



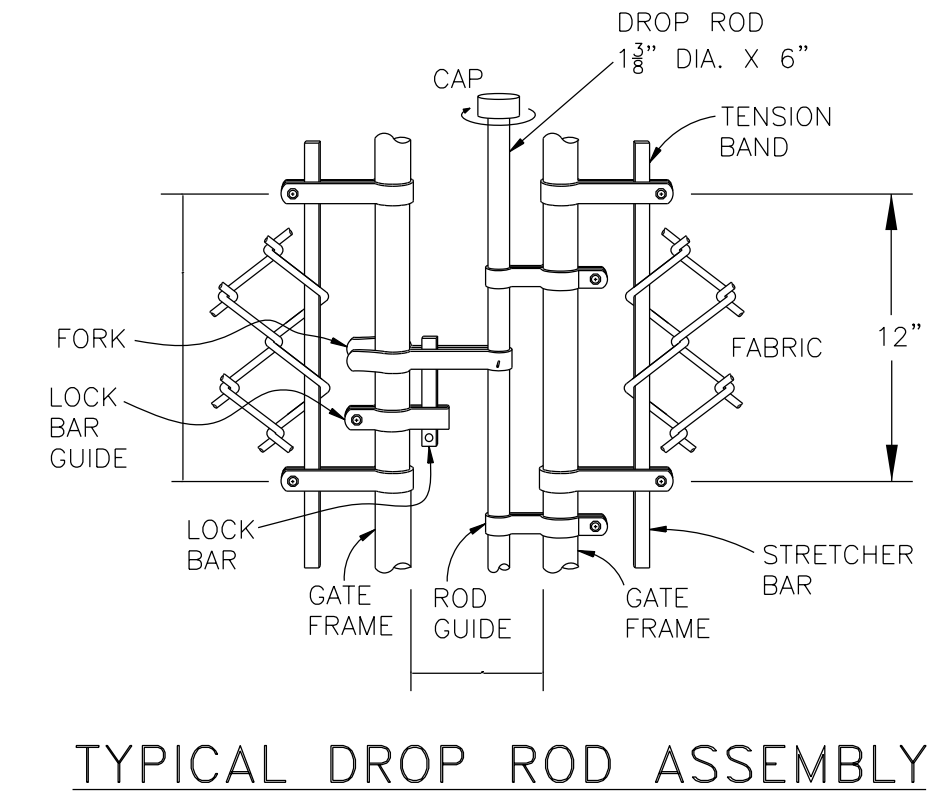
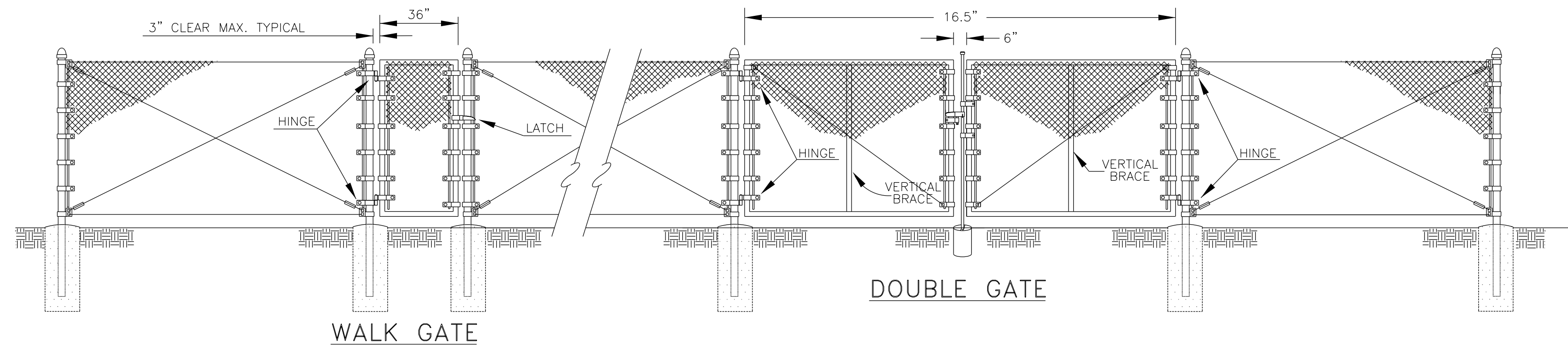
**CONCRETE SAG WEIGHT DETAIL**

**UNITED STATES**  
**DEPARTMENT OF THE INTERIOR**  
**BUREAU OF INDIAN AFFAIRS**  
 NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION  
**STANDARD FENCING DETAIL**  
**w/TYPE I & II GATE**

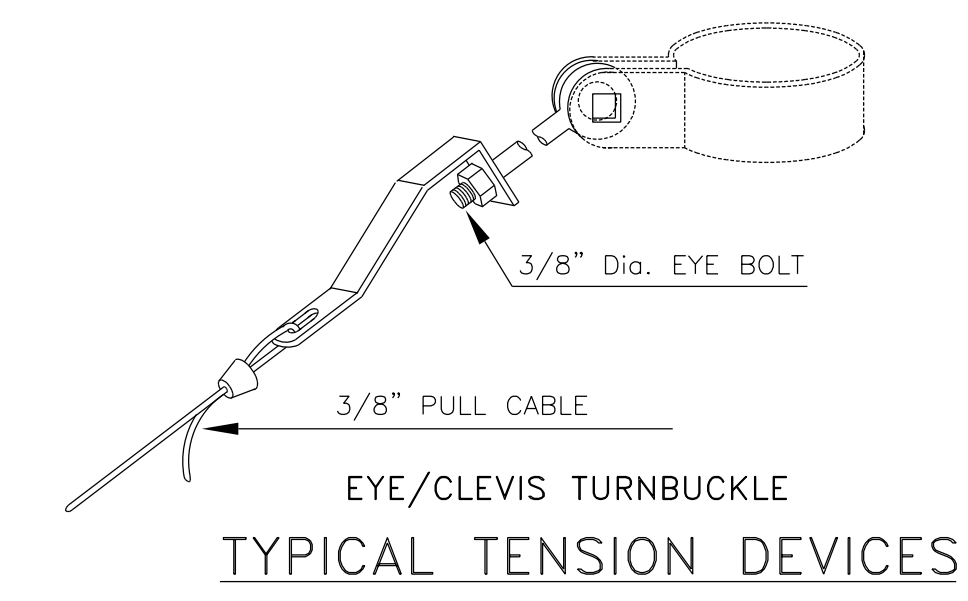
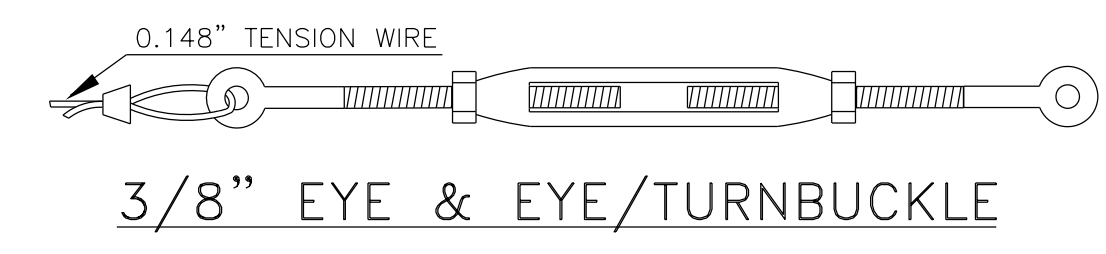
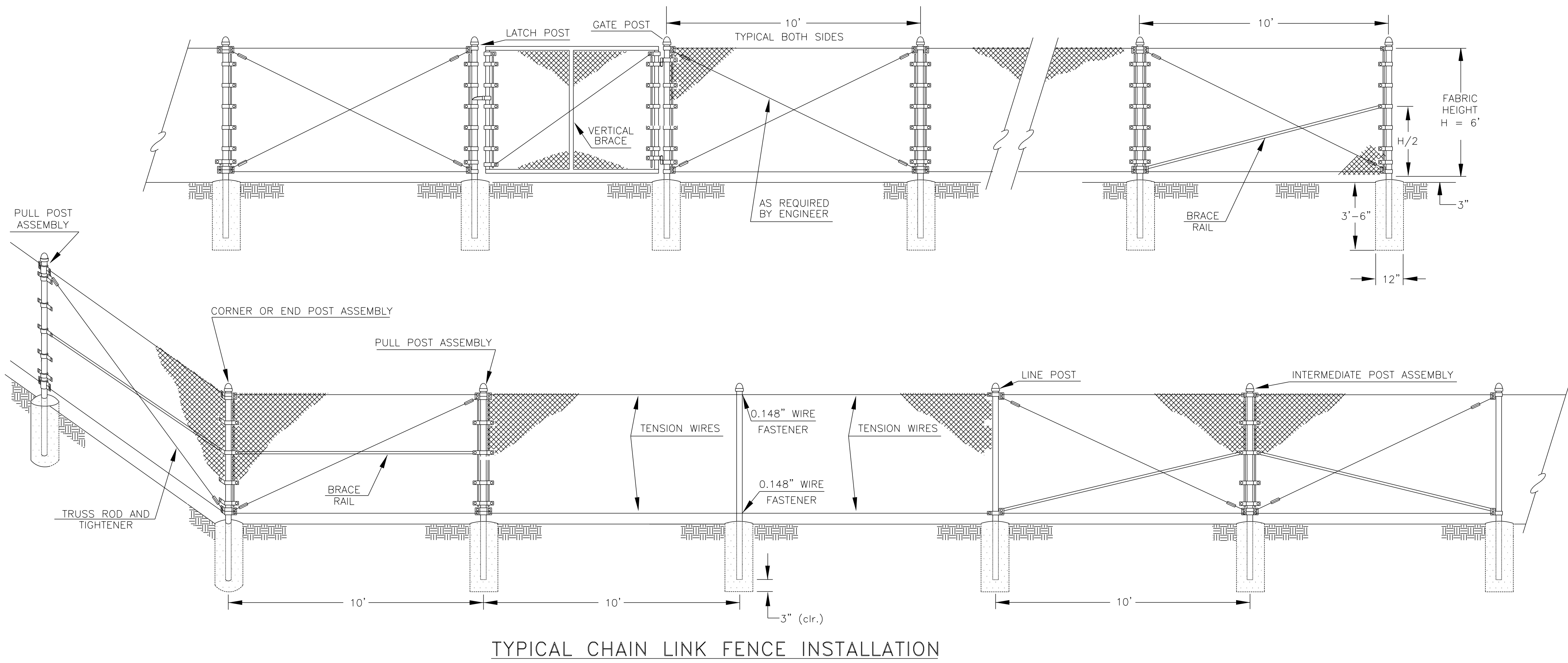
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DESIGNED BY: NRDOT	DATE: 5/6/2009
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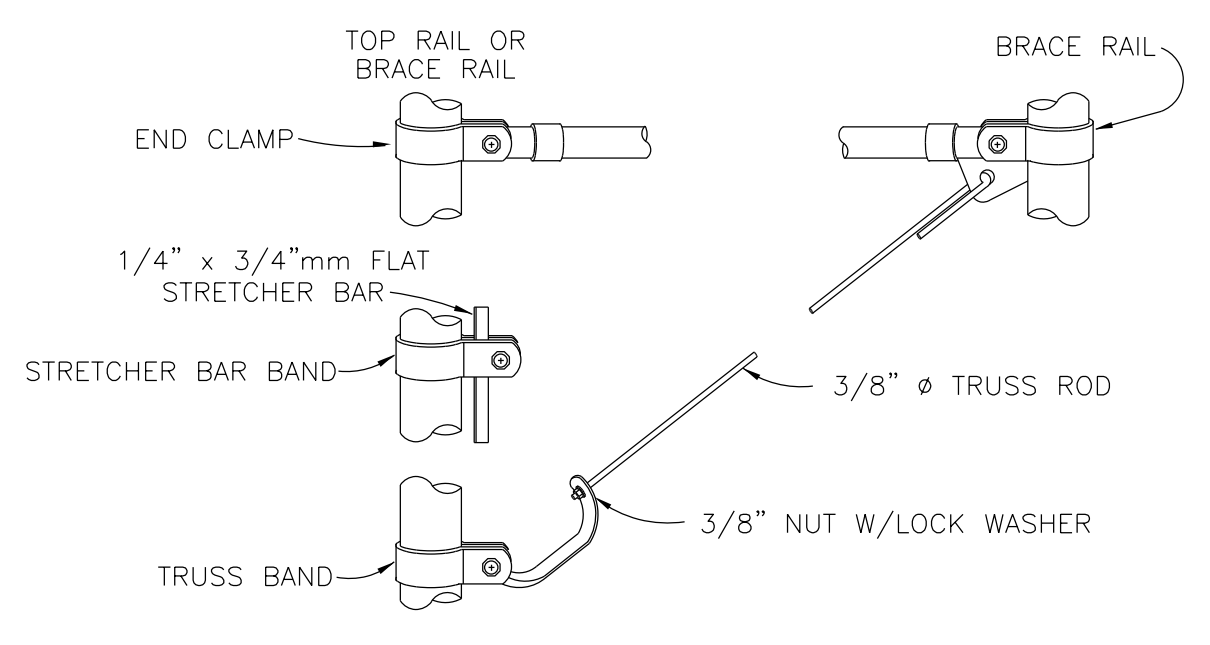
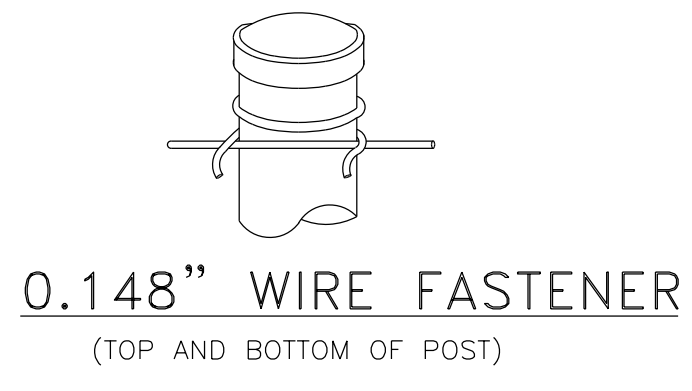
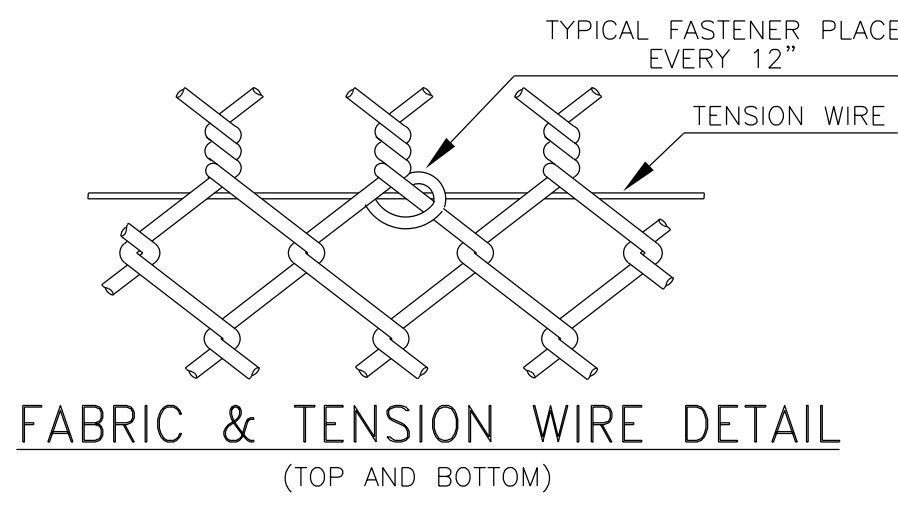
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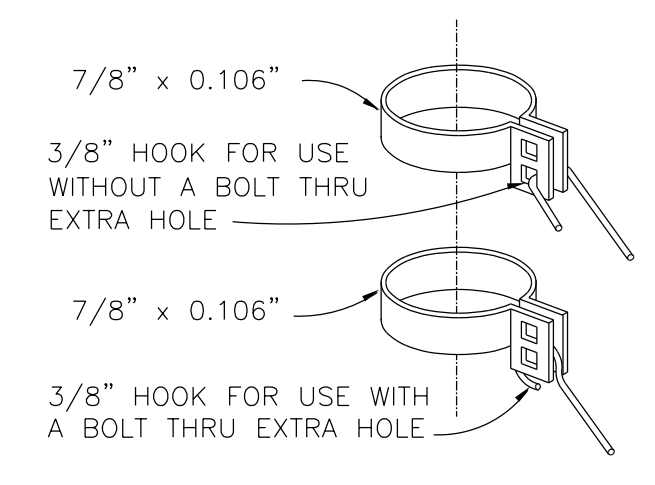
- ### GENERAL NOTES
- POSTS SHALL BE ROUND PIPE, H-SECTION OR ROLL FORMED AND SHALL CONFORM TO THE NOMINAL DIMENSIONAL REQUIREMENTS SHOWN ON THE PLANS. IN ADDITION, THE MATERIAL OF WHICH POST ARE FABRICATED SHALL HAVE A NOMINAL THICKNESS, BEFORE GALVANIZING, OF NOT LESS THAN 0.111 INCH.
  - CHAIN LINK FABRIC SHALL BE EITHER ZINC-COATED OR ALUMINUM-COATED STEEL WIRE FENCE FABRIC. ZINC-COATED STEEL FABRIC SHALL CONFORM TO THE REQUIREMENTS OF ASTM A392, CLASS 1 COATING. ALUMINUM-COATED STEEL FABRIC SHALL CONFORM TO THE REQUIREMENTS OF ASTM A491, WITH A MINIMUM WEIGHT OF COATING OF 0.40 OUNCE PER SQUARE FOOT OF WIRE SURFACE AREA. FABRIC SHALL BE 11 GAUGE FOR ALL FENCE FABRIC 60 INCHES OR LESS IN HEIGHT AND SHALL BE 9 GAUGE FOR FABRICS GREATER THAN 60 INCHES IN HEIGHT.
  - TENSION WIRES SHALL BE 7 GAUGE (0.177 INCH DIAMETER) COIL SPRING STEEL WIRE WITH A MINIMUM TENSILE STRENGTH OF 75,000 PSI, AND SHALL BE ZINC-COATED OR ALUMINUM-COATED.
  - TRUSS RODS SHALL BE 3/8-INCH DIAMETER ADJUSTABLE RODS. TRUSS TIGHTENERS SHALL HAVE A STRAP THICKNESS OF NOT LESS THAN 1/4-INCH.
  - STRETCHER BARS SHALL BE 3/16-INCH BY 3/4-INCH STEEL FLAT BARS. STRETCHER BAR BANDS SHALL BE 1/8-INCH BY 1-INCH PREFORMED STEEL BANDS.
  - BOTTOM TENSION WIRE SHALL BE 5-INCHES FROM TOP OF CROWN ON CONCRETE FOOTINGS.
  - INTERMEDIATE POST ASSEMBLIES SHALL BE SPACED AT 500 FOOT INTERVALS OR MIDWAY BETWEEN PULL POSTS WHEN THE DISTANCE BETWEEN SUCH POSTS IS LESS THAN 1,000 FEET AND MORE THAN 500 FEET.
  - CHAIN LINK FENCE POST DIAMETERS SHALL BE , AS FOLLOWS:
    - 1.66" O.D. TOP & BRACE RAILS AND GATE FRAMES TO 6' WIDTH.
    - 1.90" O.D. FOR LINE POSTS AND GATE FRAMES TO 13' WIDTH.
    - 2.875" O.D. FOR END POSTS, CORNER POSTS AND GATE POSTS FOR SINGLE GATE OPENINGS TO 6' WIDTHS.
    - 4.00" O.D. FOR GATE POSTS FOR SINGLE GATE OPENINGS TO 13' WIDTH AND DOUBLE GATE OPENINGS.
  - NEW DOUBLE GATE ASSEMBLIES SHALL INCLUDE ALL MATERIALS AND LABOR BETWEEN AND INCLUDING THE OUTER GATE POSTS. WHEN NEW GATE ASSEMBLIES ARE A PART OF EXISTING FENCE RELOCATION, THE RESET (EXISTING) MATERIAL SHALL STOP AT AND CONNECT TO THE OUTER GATE POSTS. IF THE ADJOINING FENCE IS EQUIPPED WITH A BARBED WIRE TOP, INSTALL A MATCHING BARBED WIRE TOP ON THE GATE ASSEMBLY FROM OUTER GATE POST TO OUTER GATE POST INCLUDING THE GATE LEAF. ON THE GATE LEAF, INSTALL BARBED WIRE SUPPORTS AT BOTH GATE ENDS AND AT EACH VERTICAL BRACE. FENCING BETWEEN GATE ENDS SHALL INCLUDE TOP AND/OR BOTTOM TENSION WIRES OR TOP RAIL AS NEEDED TO MATCH ADJOINING FENCINGS.



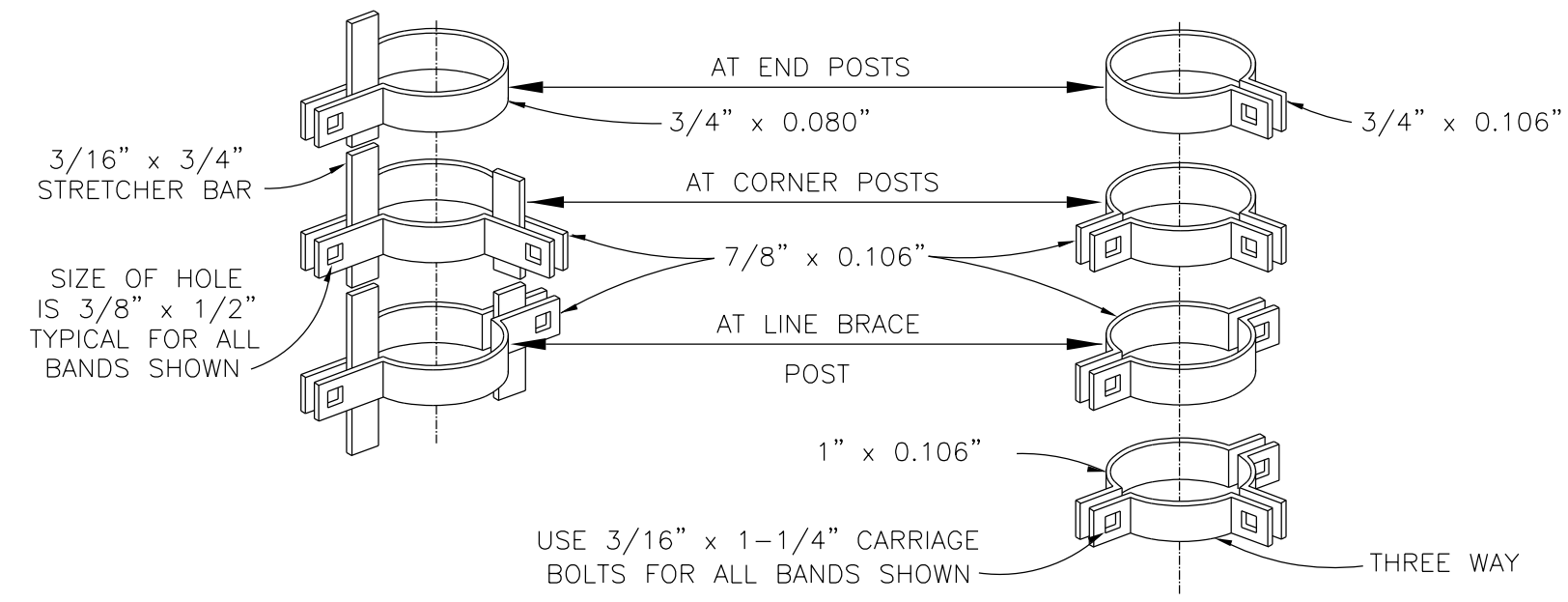
FABRIC HEIGHT	CORNER, END, INTERMEDIATE, GATE, LATCH AND PULL POSTS.					LINE POSTS				
	LENGTH	POST HOLE, DIA. x DEPTH	ROUND (I.D.)	ROLL FORMED		LENGTH	POST HOLE, DIA. x DEPTH	ROUND (I.D.)	H - SECTION	ROLL FORMED "U"
				L-shape	U-shape					
36"	6'-0"	10" x 3'-0"	2.00"	3.50" x 3.50"	2.00" x 1.75"	5'-6"	10" x 2'-6"	1.50"	1.875" x 1.625"	2.00" x 1.75"
48"	7'-0"	10" x 3'-0"	2.00"	3.50" x 3.50"	2.00" x 1.75"	6'-6"	10" x 2'-6"	1.50"	1.875" x 1.625"	2.00" x 1.75"
60"	8'-0"	10" x 3'-0"	2.00"	3.50" x 3.50"	2.00" x 1.75"	7'-6"	10" x 2'-6"	1.50"	1.875" x 1.625"	2.00" x 1.75"
72"	9'-0"	10" x 3'-0"	2.00"	3.50" x 3.50"	2.00" x 1.75"	8'-6"	10" x 2'-6"	1.50"	1.875" x 1.625"	2.00" x 1.75"
> 72"	H + 3'-0"	12" x 3'-0"	2.50"	3.50" x 3.50"	2.50" x 2.50"	H + 2'-6"	12" x 2'-6"	2.00"	2.25" x 2.00"	2.00" x 1.75"



GATE DETAIL



BRACE & TRUSS BANDS



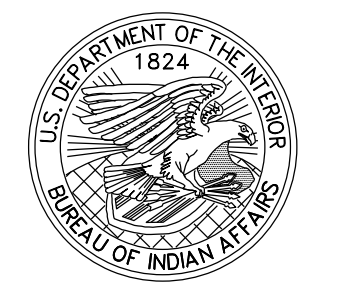
TENSION BANDS

BRACE BANDS

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF INDIAN AFFAIRS  
NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

## CHAIN LINK FENCE DETAILS

DRAWN BY: Gerald.Hood DATE: 1/24/2013  
DESIGNED BY: NRDOT DATE: 1/24/2013  
REVISED: 2/1/2013 BY: Peterson.Yazzie  
ANNOTATION SCALE: Full Size 1=1  
FILENAME: Sht.29\_chain\_link\_fence.dgn

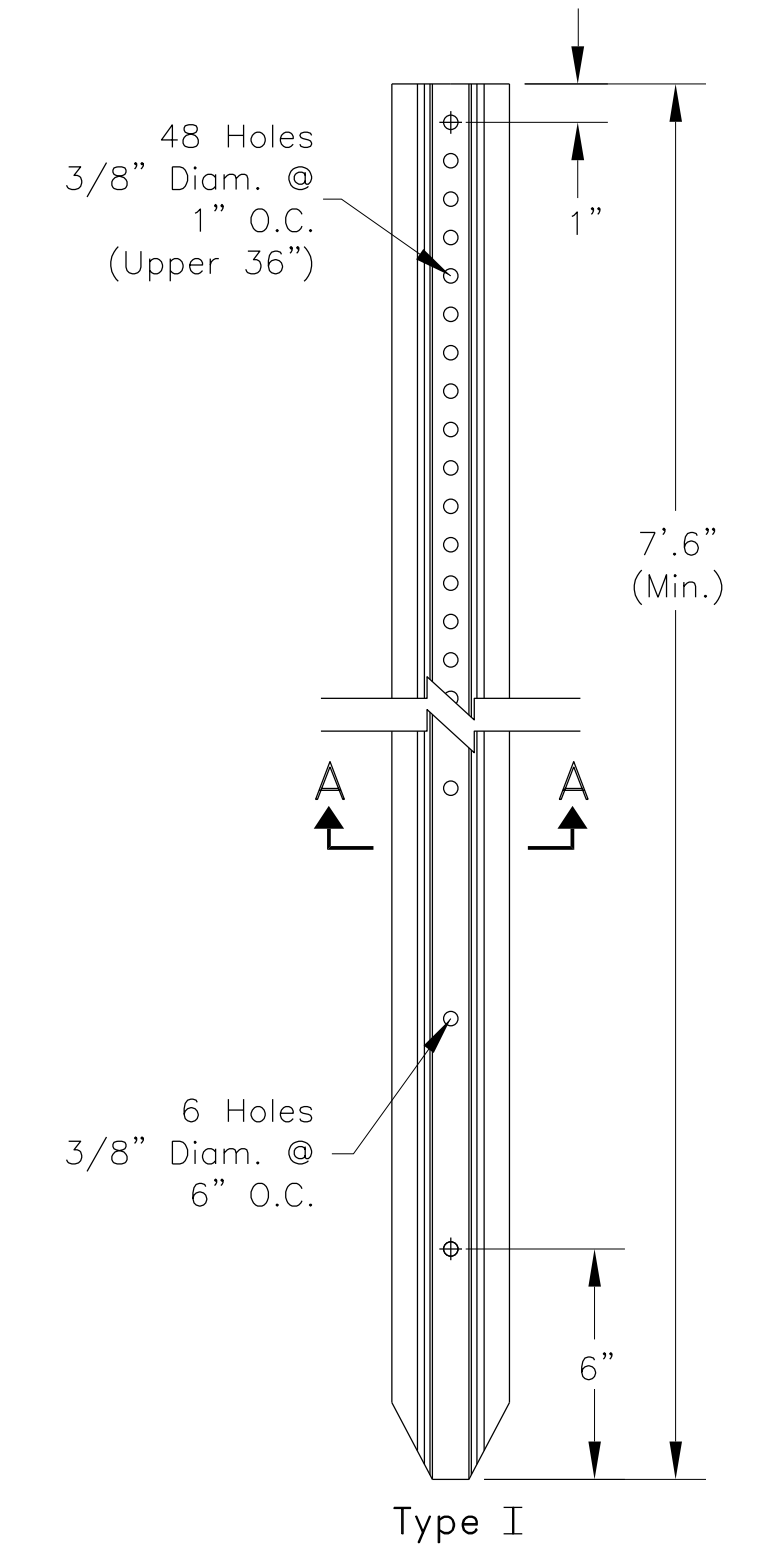
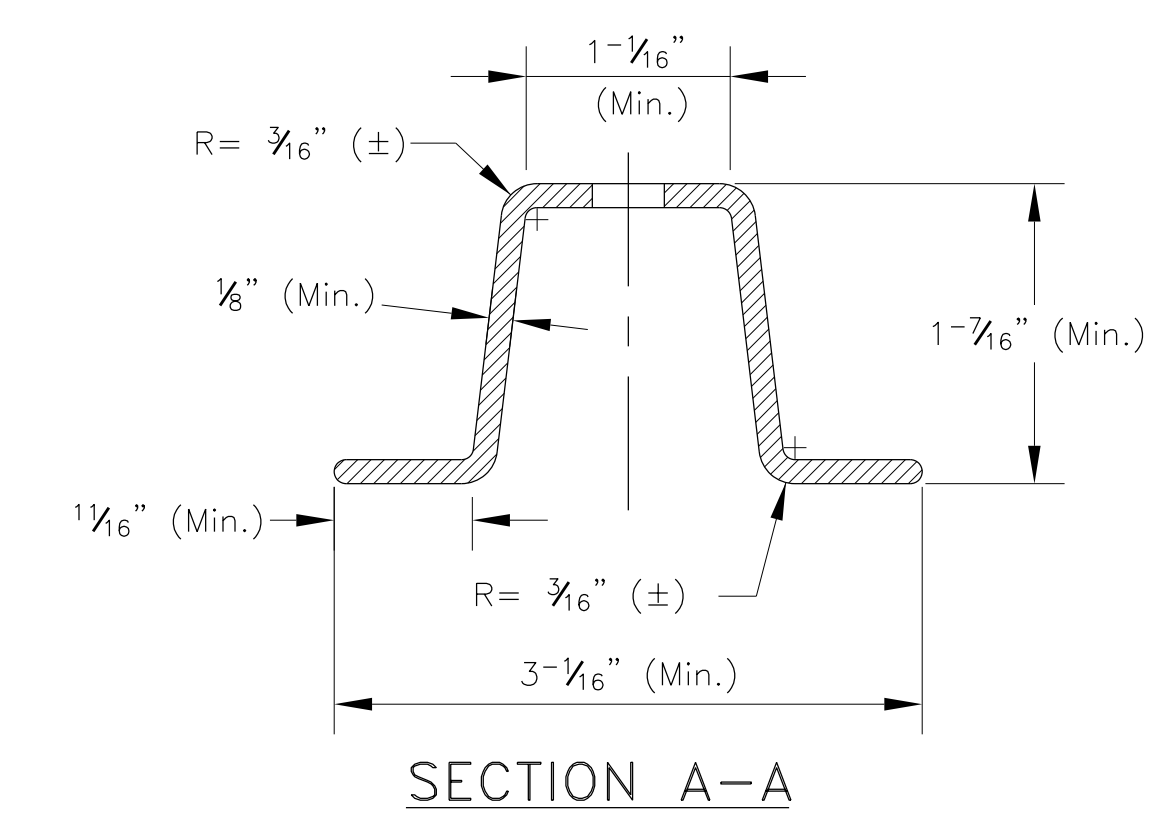
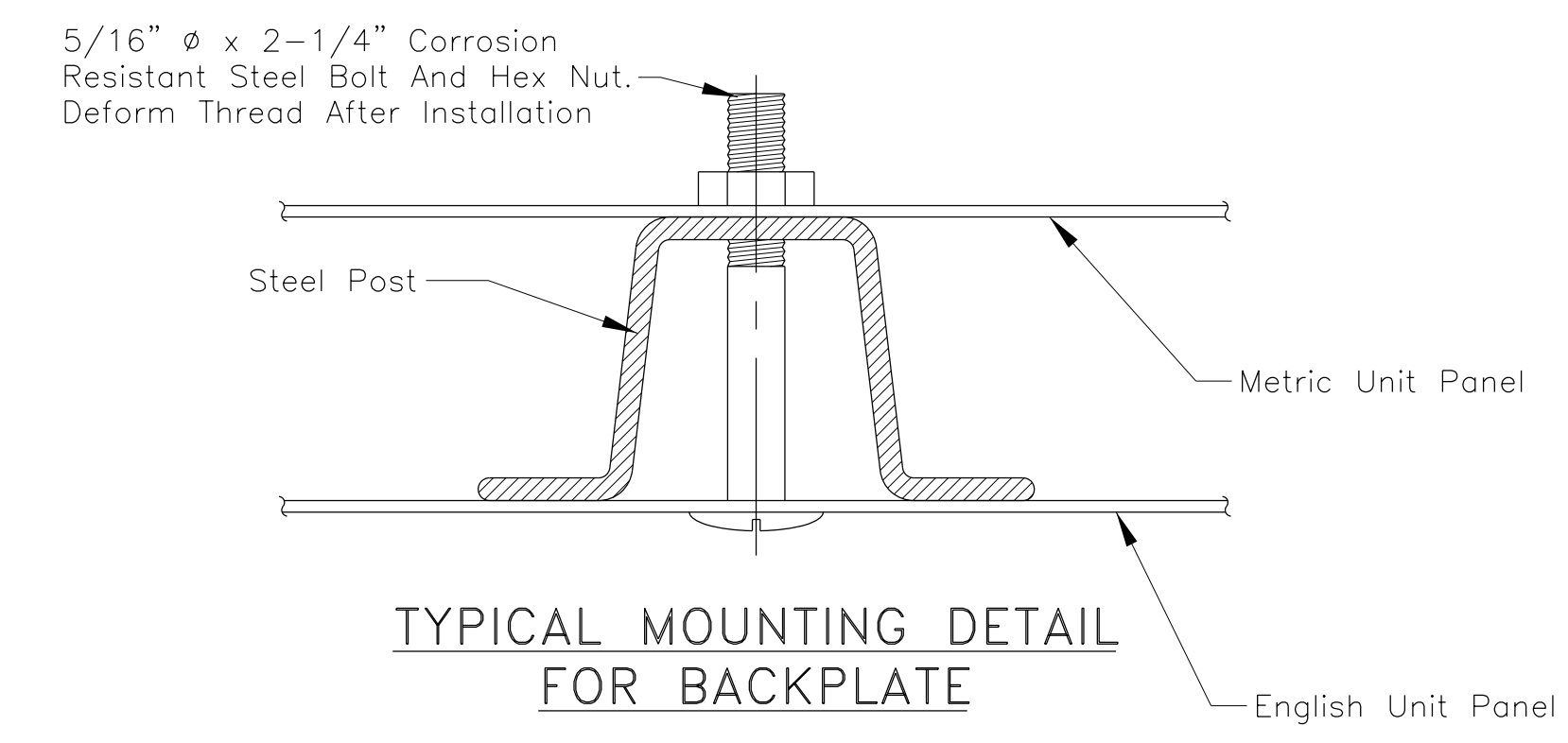
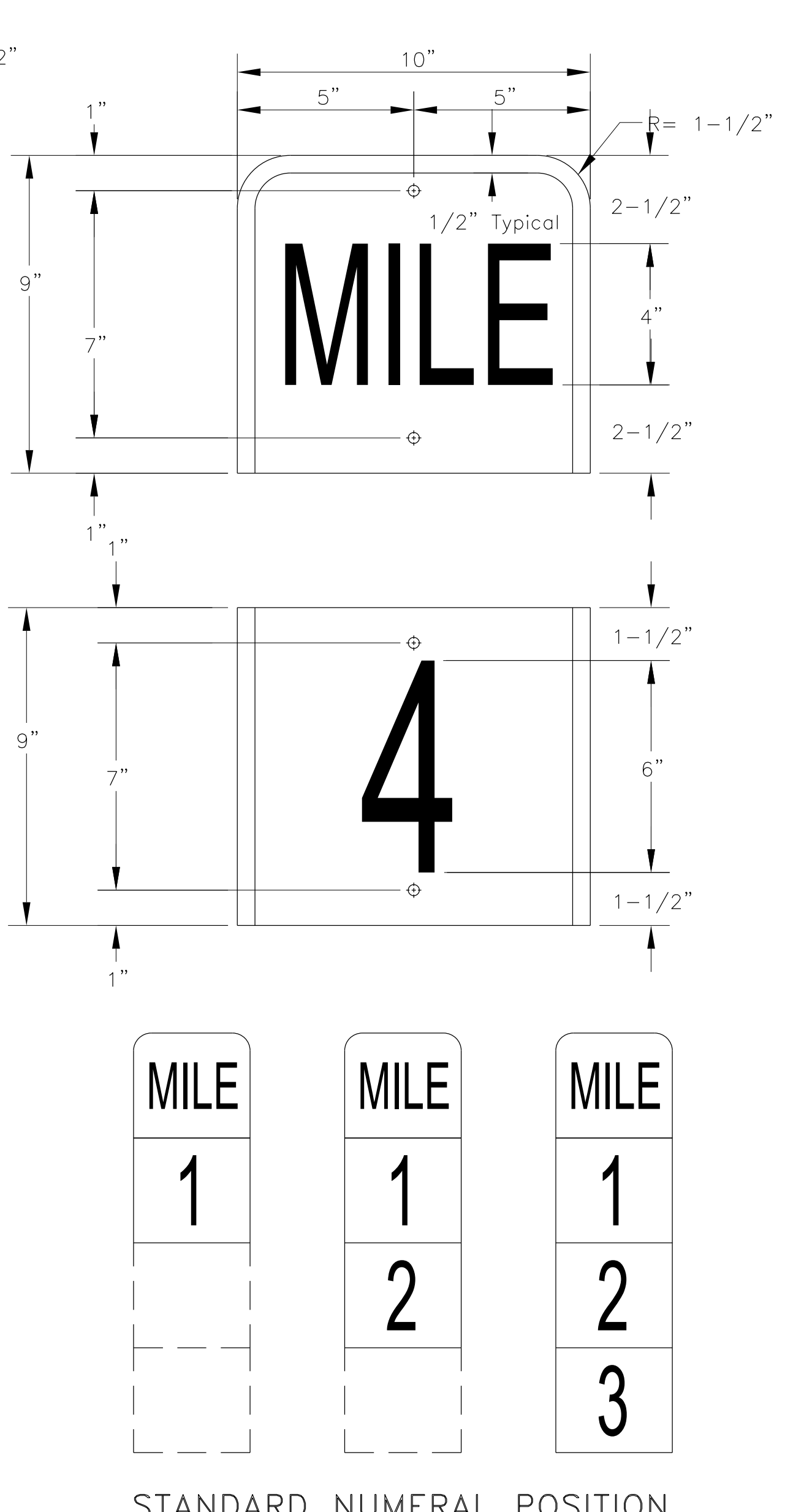
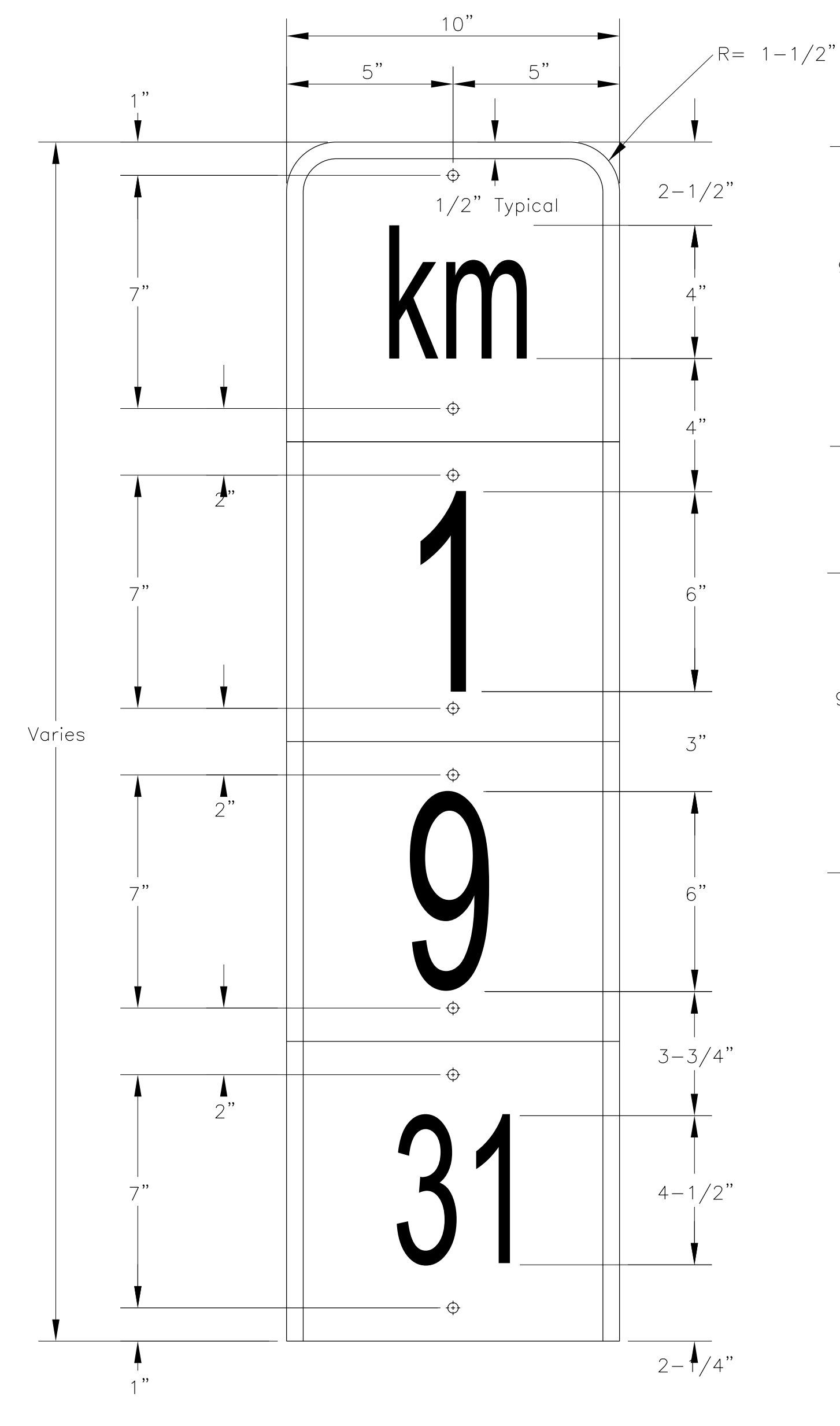
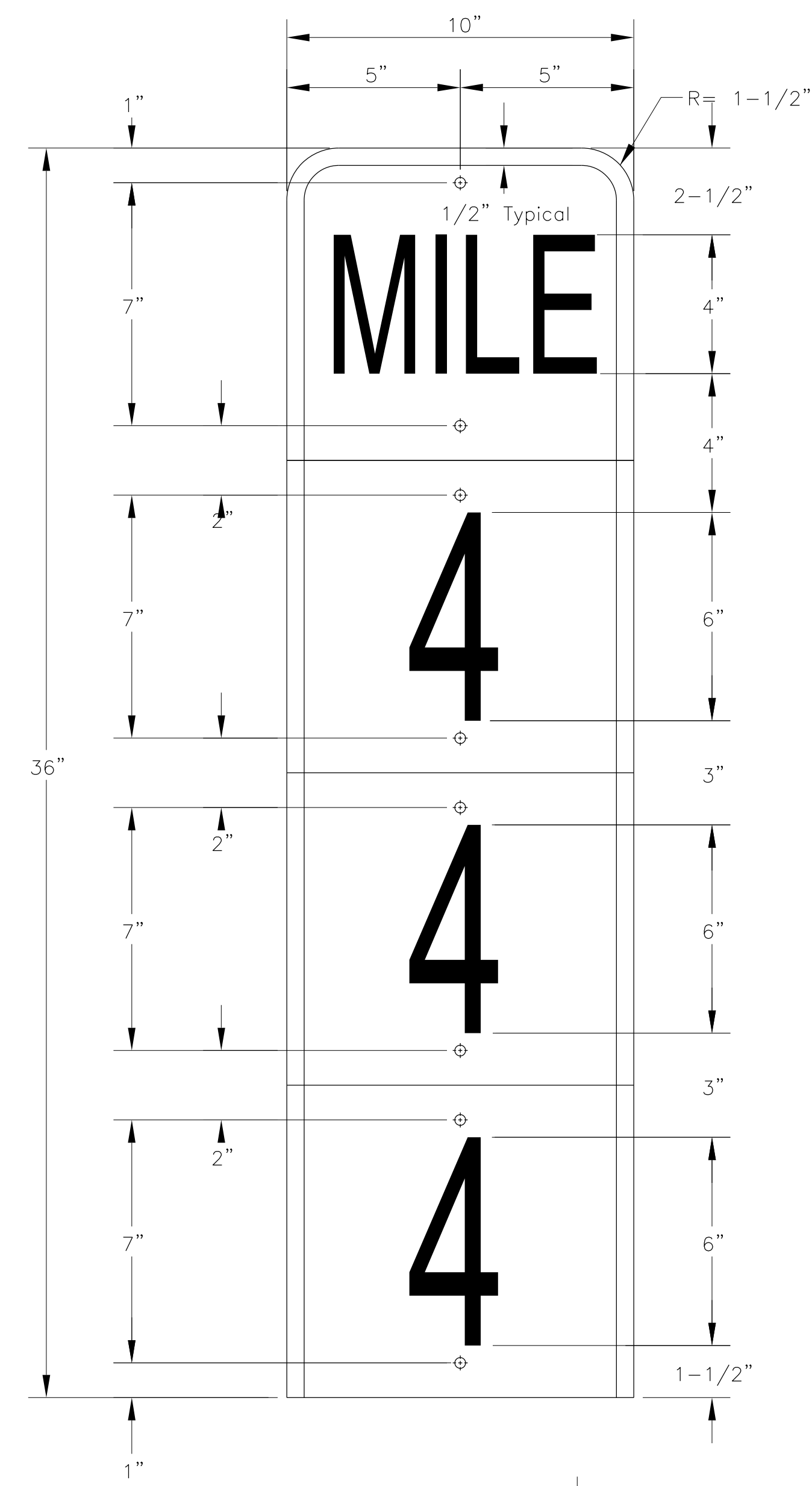


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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1,2&4	30	63

**GENERAL NOTES**

1. THE MILEPOSTS SHALL BE PLACED ON BOTH SIDE OF THE ROADWAY WITH ENGLISH UNITS PANEL ON APPROACHING TRAFFIC AND METRIC UNITS PANEL ON OPPOSING TRAFFIC.
2. MILEPOST PLATES SHALL BE FABRICATED FROM 16 GAGE 3003 H14, 5052-H38 OR 6061-T6 ALUMINUM SHEET.
3. ALL SURFACES TO BE COVERED WITH REFLECTIVE SHEETING SHALL BE PREPARED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE SHEETING MANUFACTURER.
4. THE BORDER AND LEGEND SHALL BE STANDARD REFLECTIVITY SILVER-WHITE. THE BACKGROUND SHALL BE STANDARD REFLECTIVITY GREEN AND MAY BE REVERSE SILK-SCREENED.
5. THE BACK SIDE OF THE ALUMINUM SHEETS SHALL BE ETCHED BY APPROVED METHODS TO REDUCE GLARE FROM REFLECTED SUNLIGHT.
6. STEEL POSTS SHALL CONFORM TO A.S.T.M.-A570 GRADE 30,36 OR 40 AND SHALL NOT WEIGH LESS THAN 2 LB/FT THEY SHALL BE GALVANIZED TO CONFORM TO A.S.T.M.-A123.
7. THE OFFSET DISTANCE SHALL BE 12 INCHES BEHIND THE CUT DITCH ON THE BACK SLOPE BUT NOT MORE THAN 20 FEET FROM THE EDGE OF THE PAVEMENT. IN FILL SECTION THE OFFSET SHALL BE AT THE HINGE POINT (OR AT THE EDGE OF CLEAR RECOVERY ZONE). OFFSET DISTANCE MAY HAVE TO VARY TO FIT EXISTING CROSS SECTION. AT GUARDRAIL LOCATIONS, THE MILE POST SIGNS SHALL LINE UP WITH THE GUARDRAIL POSTS.
8. POST LENGTH SHALL BE DETERMINED IN FIELD BASED ON FINISH GROUND ELEVATION WITH RESPECT TO EDGE OF PAVEMENT ELEVATION.
9. EACH MILE POST INCLUDES 2 SIGNS, ONE POST, AND HARDWARE INSTALLED AND ACCEPTED.



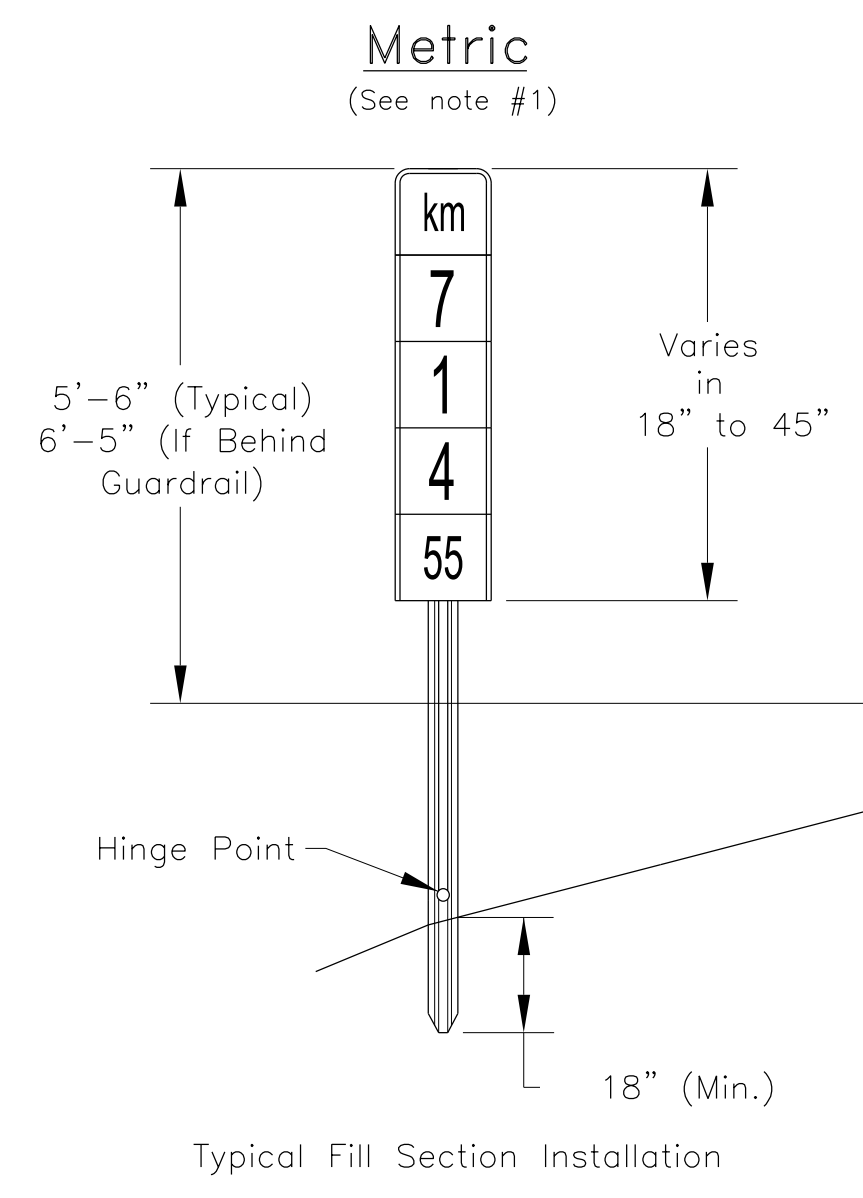
**GALVANIZED STEEL POSTS**

**TYPICAL MILEPOST DETAIL**

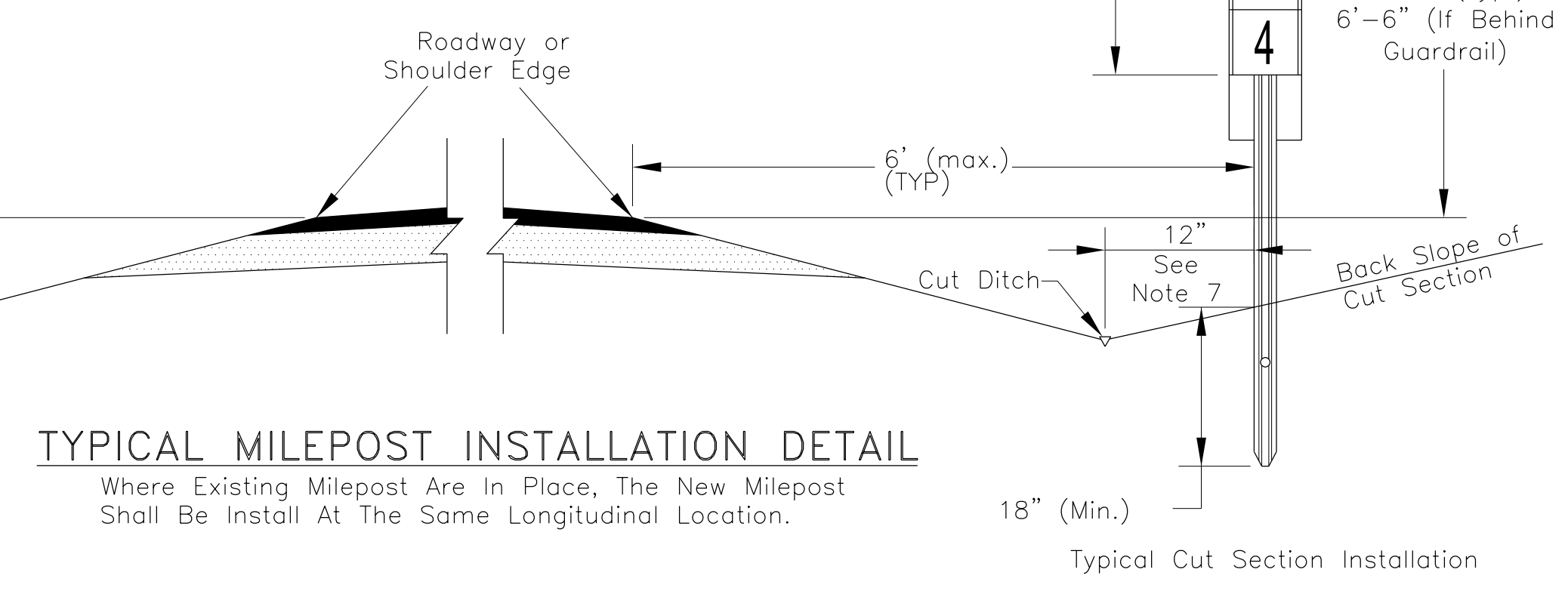
**STANDARD NUMERAL POSITION**

ITEM 63318-1000: MILEPOST,  
1-POST & HARDWARE; 2 lb/ft

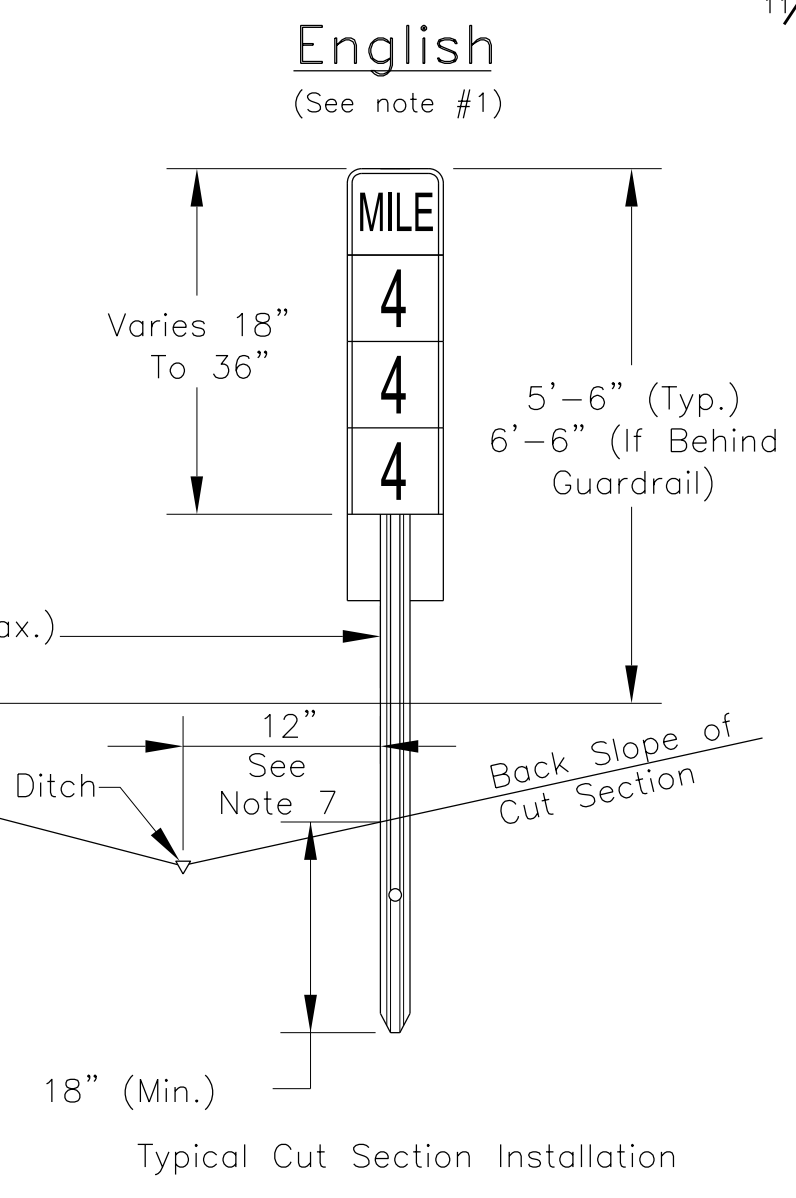
STATION	LOCATION	DESCRIPTION		QUANTITY (Ea.)	
		ENGLISH	METRIC	LEFT	RIGHT
52+80.00	Lt. & Rt.	Mile 1	1.60	2	2
SUB-TOTAL...				2	2
GRAND TOTAL...				4	



Typical Fill Section Installation



**TYPICAL MILEPOST INSTALLATION DETAIL**  
Where Existing Milepost Are In Place, The New Milepost Shall Be Install At The Same Longitudinal Location.




Typical Cut Section Installation

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**STANDARD MILE POST  
DETAIL**

DRAWN BY: Gerald.Hood	DATE: 5/7/2009
DESIGNED BY: NRDOT	DATE: 5/7/2009
REVISED: 1/25/2013	BY: Peterson.Yazzie
ANNOTATION SCALE: Full Size 1=1	
FILENAME: Sht.30_MilepostDetails.dgn	

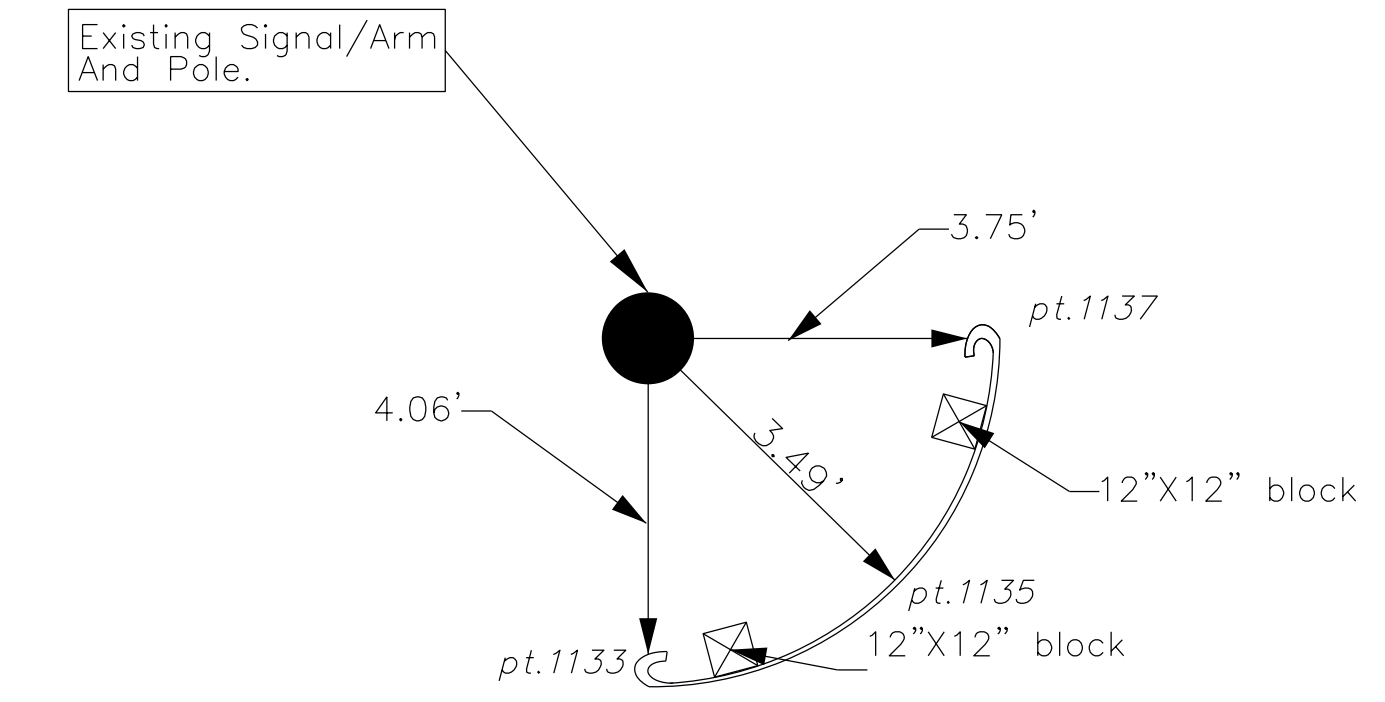
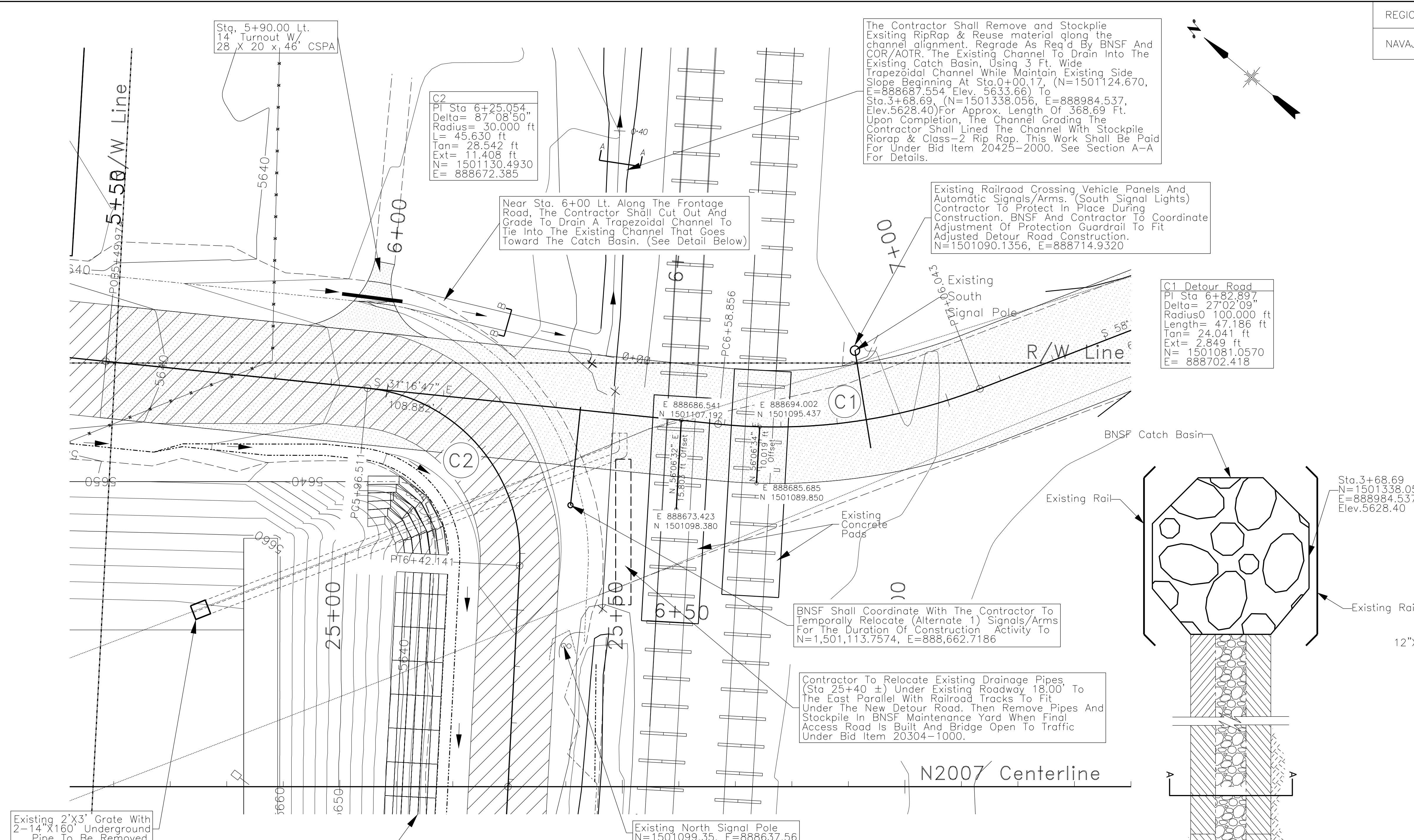


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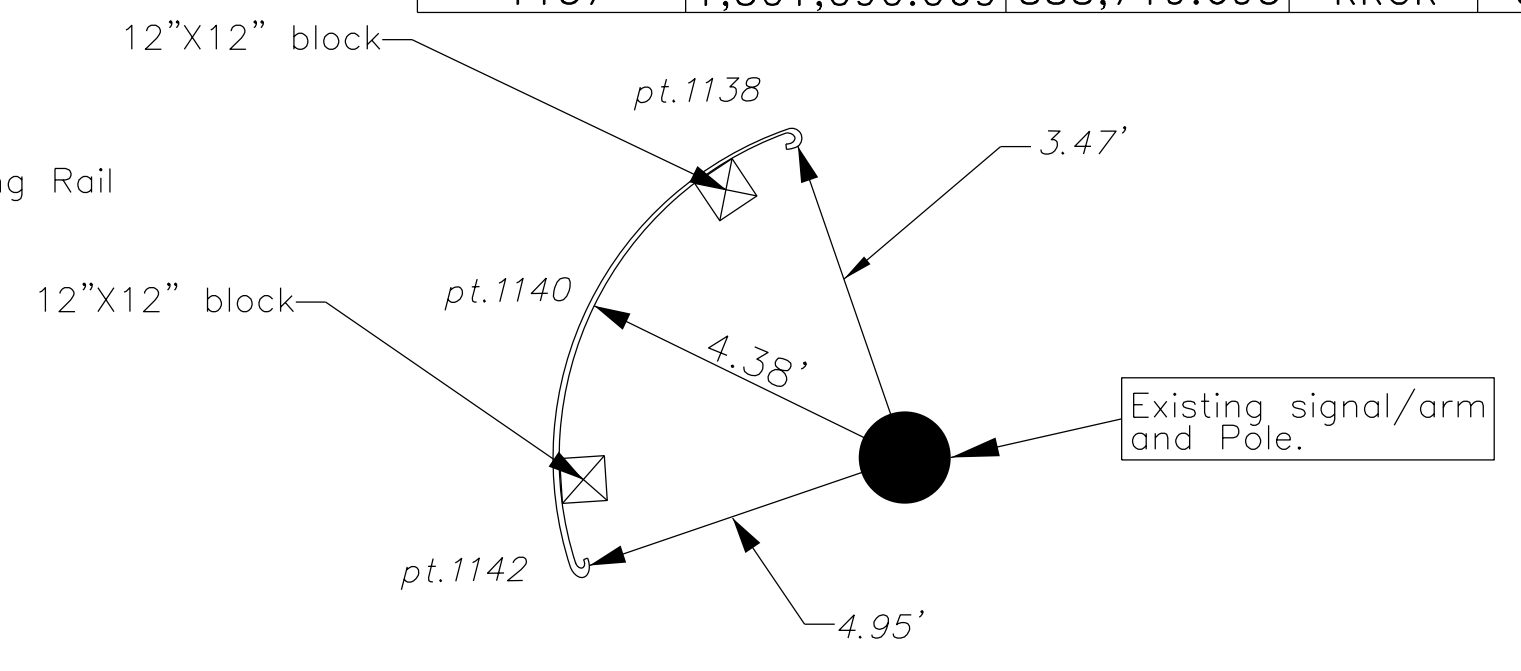


REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)2&4	31	63

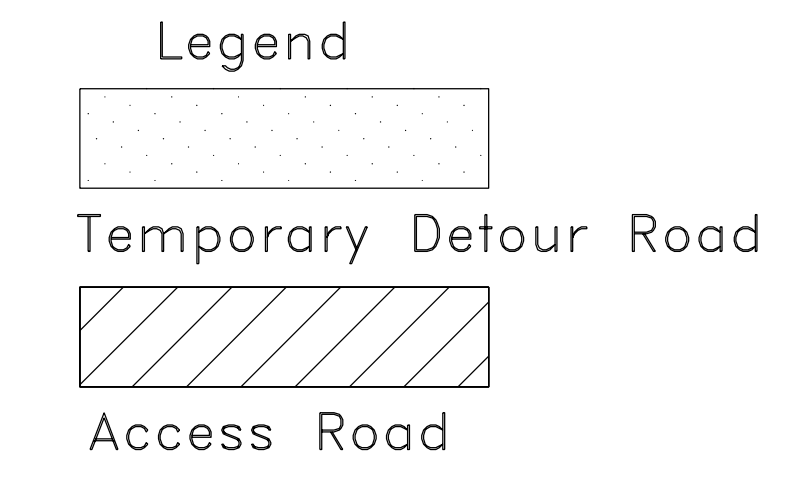
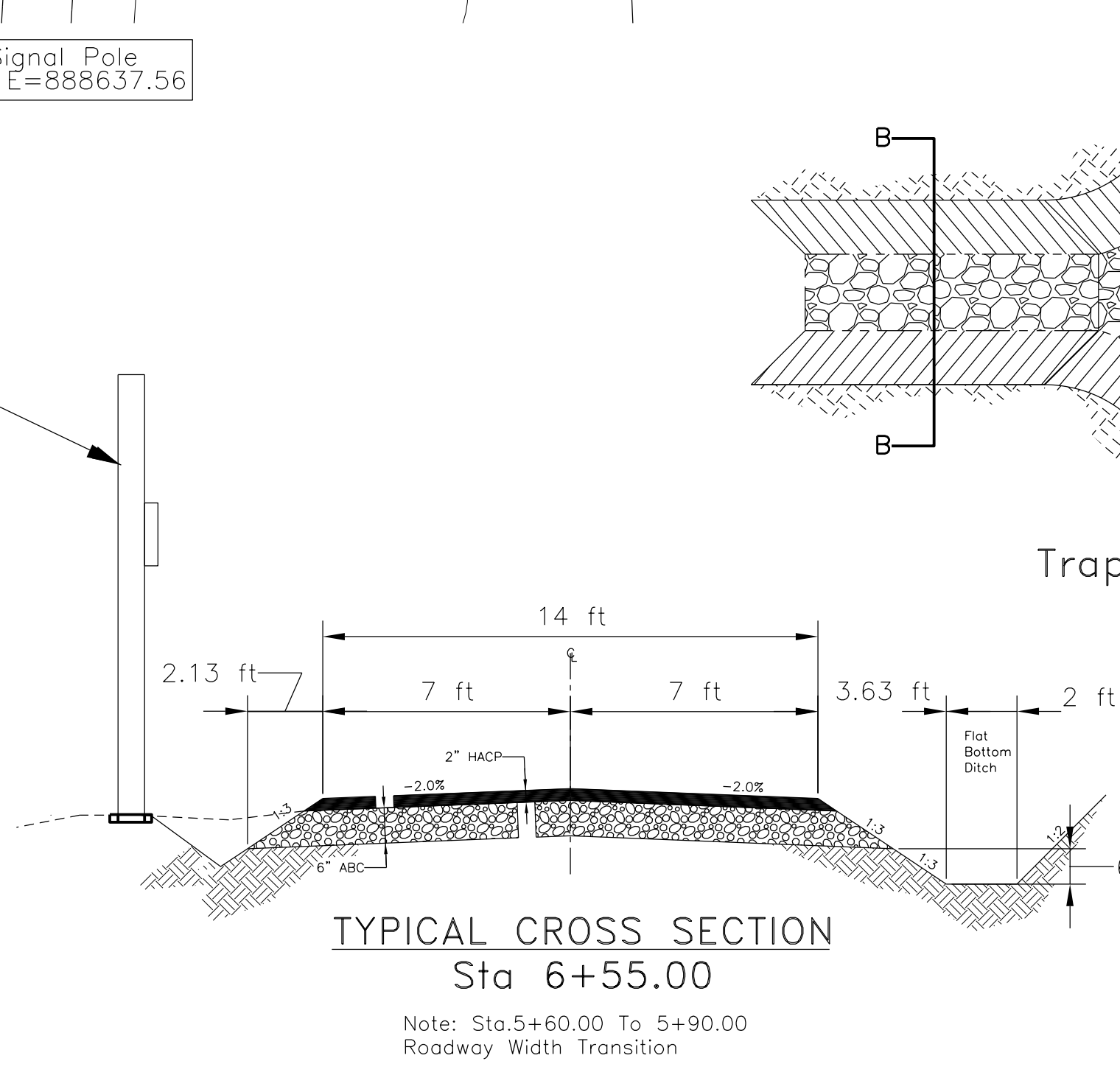
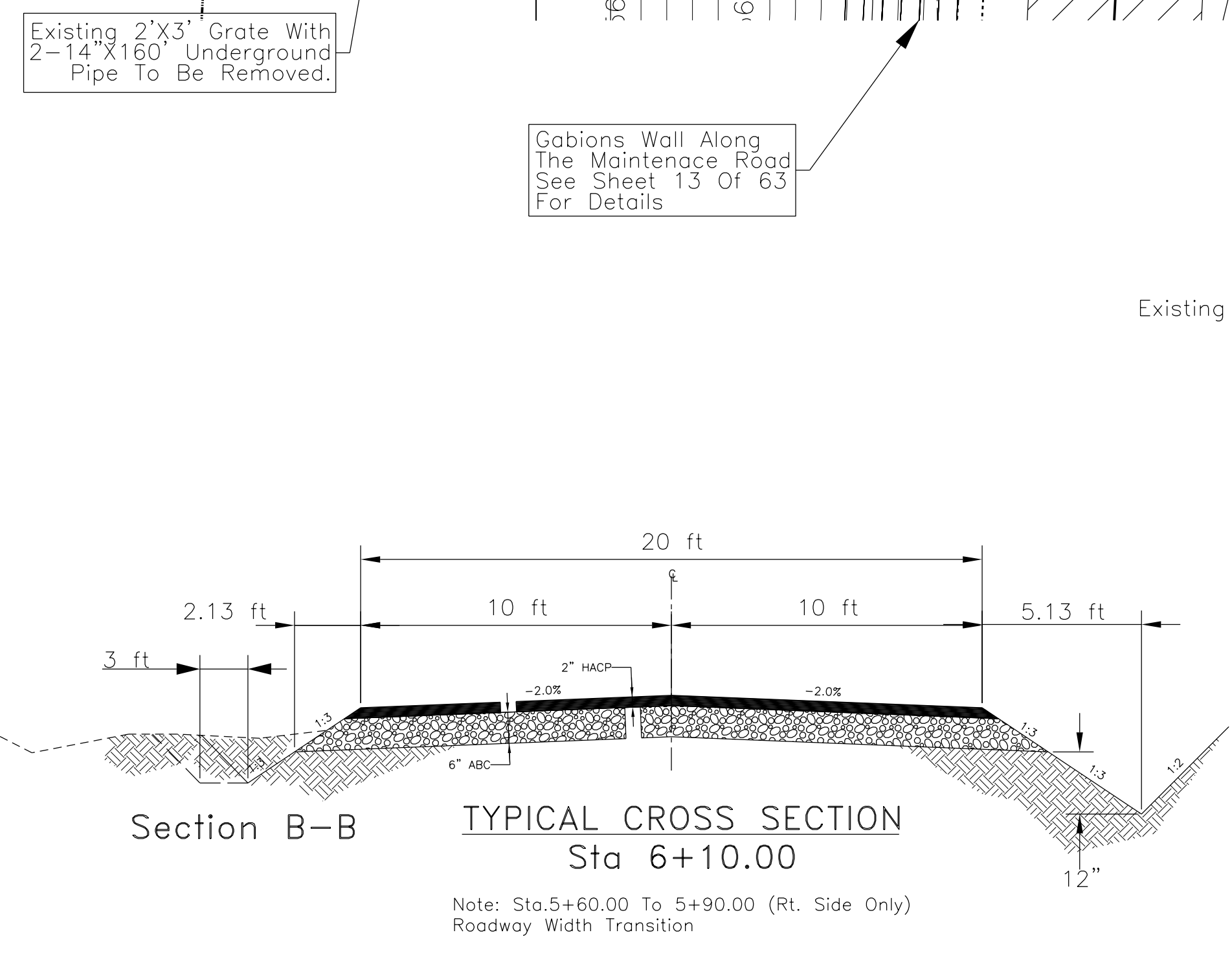
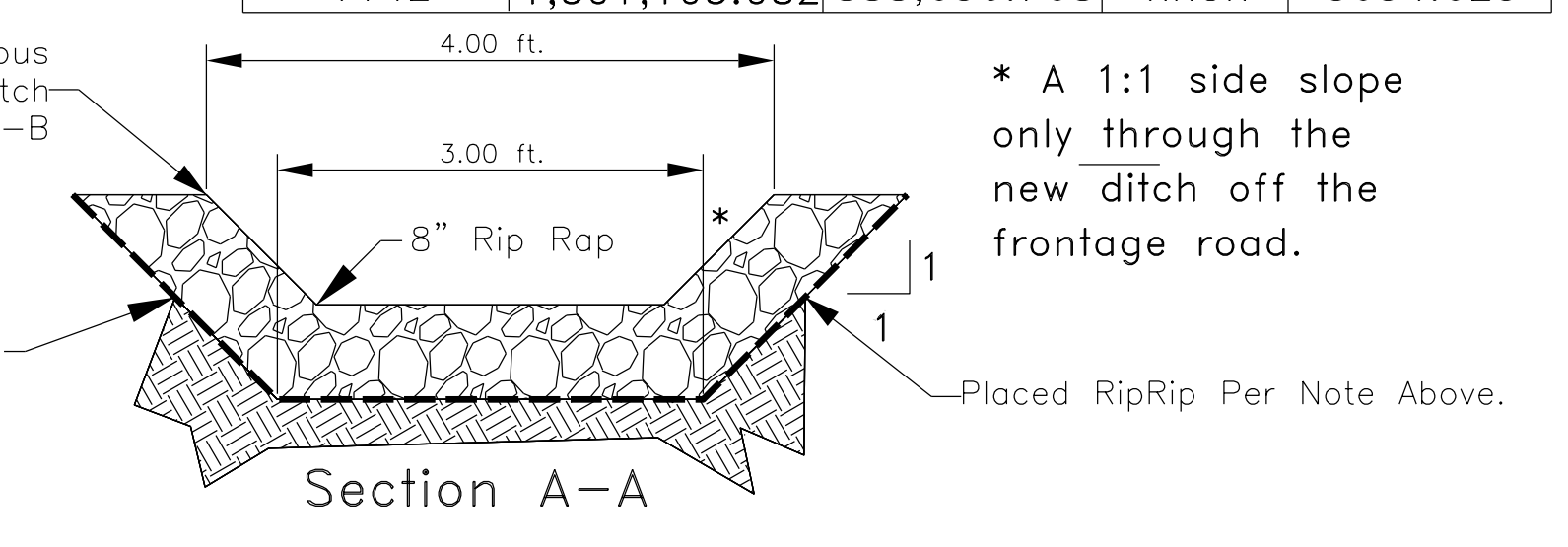
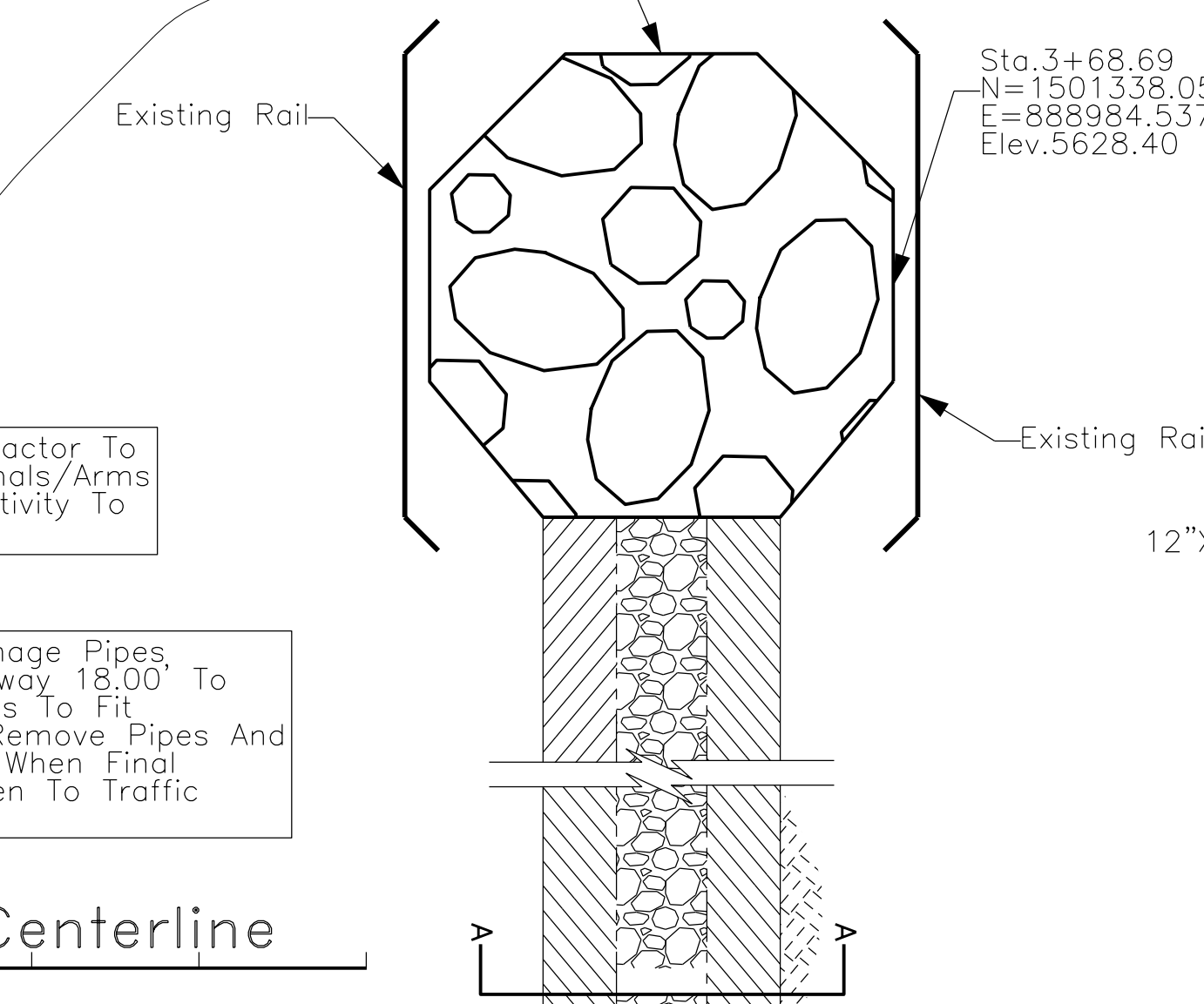
SEE SHEET 13 of 63 FOR NOTES.



POINT NO.	NORTHING	EASTING	CODE	ELEVATION
1133	1,501,090.704	888,711.711	RRGR ST	5634.836
1135	1,501,087.897	888,715.190	RRGR	5634.192
1137	1,501,090.069	888,719.693	RRGR	5634.023



POINT NO.	NORTHING	EASTING	CODE	ELEVATION
1138	1,501,100.182	888,644.241	RRGR ST	5635.458
1140	1,501,104.089	888,641.037	RRGR	5635.645
1142	1,501,103.082	888,636.768	RRGR	5634.623




REVISED: 8/17/2016

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**SIGNAL & TURNOUT WITH CONCRETE PADS DETAILS**

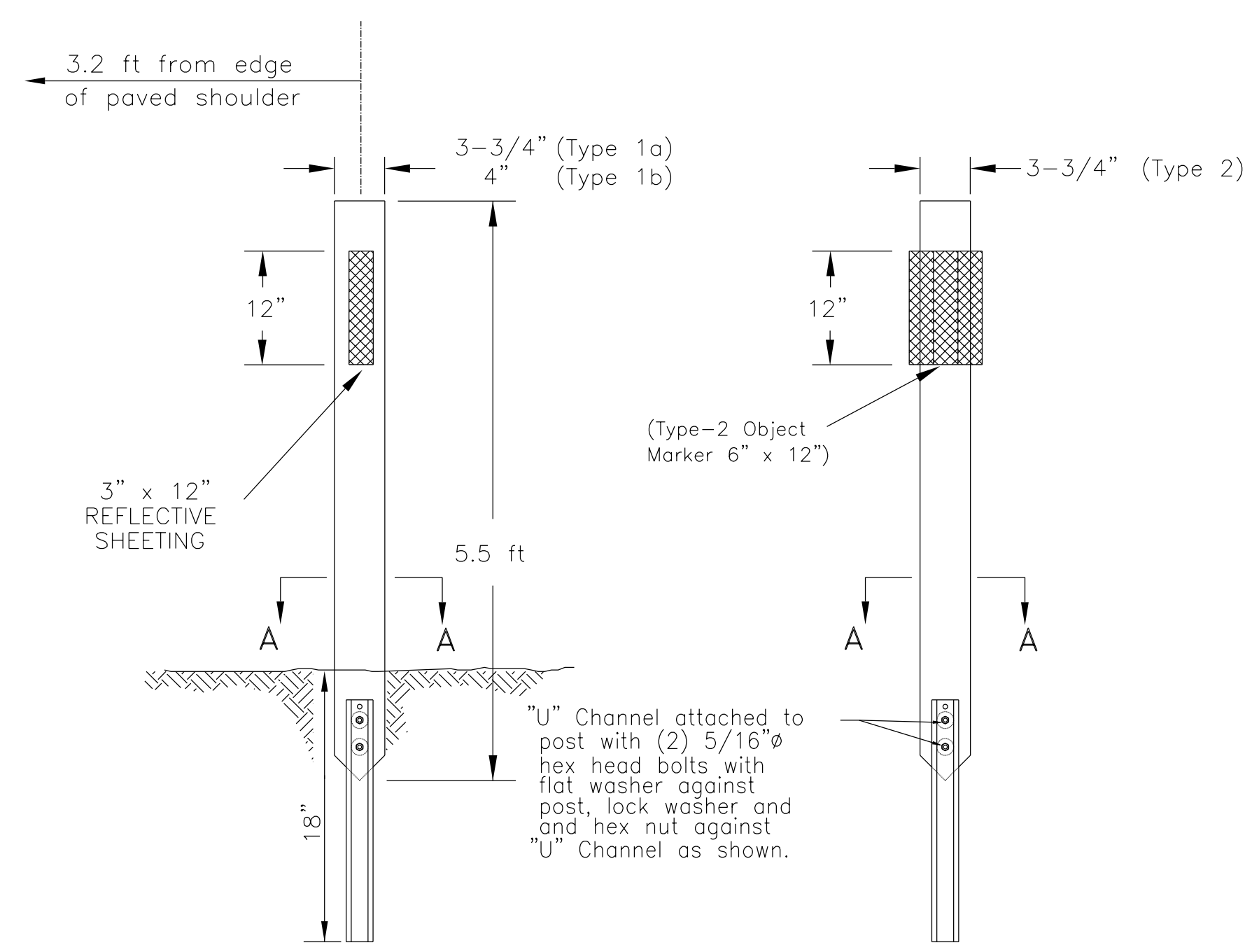
DRAWN BY: DESIGN2	DATE: 2/20/10
DESIGNED BY: B.O.R.	DATE: 2/24/05
REVISED: 08/17/2016	FILENAME: Signal & T.O.dgn
BY: DESIGN2	SCALE: NTS



REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1,2&4	32	63

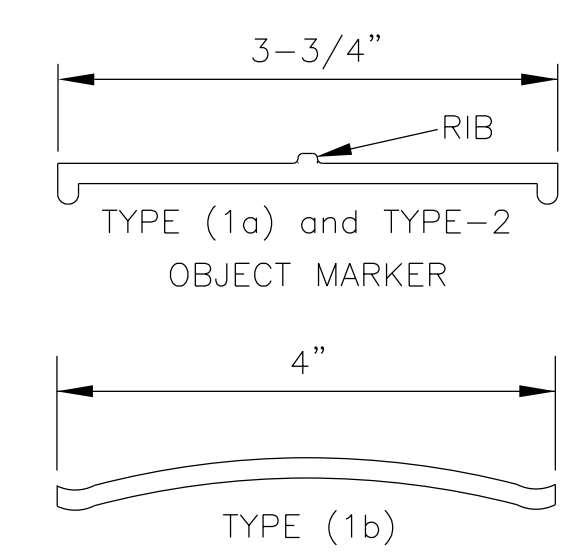
GENERAL NOTES

1. THE CONTRACTOR HAS THE OPTION TO EITHER USE GLASS FIBER OR ENGINEERED PLASTIC TYPE FOR DELINEATOR AND/OR TYPE II OBJECT MARKER. THE CONTRACTOR SHALL NOT USE A COMBINATION OF BOTH, STEEL "U" CHANNEL SHALL BE ATTACHED TO THE DELINEATOR, AND SHALL BE INCLUDED IN CONTRACT ITEM 63309-0010 AND 63309-0020.
2. TYPE "B" DIKE SHALL BE USED ON THIS PROJECT UNLESS OTHERWISE NOTED. EMBANKMENT MATERIAL NEEDED TO BUILD EARTHEN DIKE SHALL BE CONSIDERED INCIDENTAL TO ITEM 20410-2000, FURROW DITCHES, DITCH BLOCKS AND DIKES.

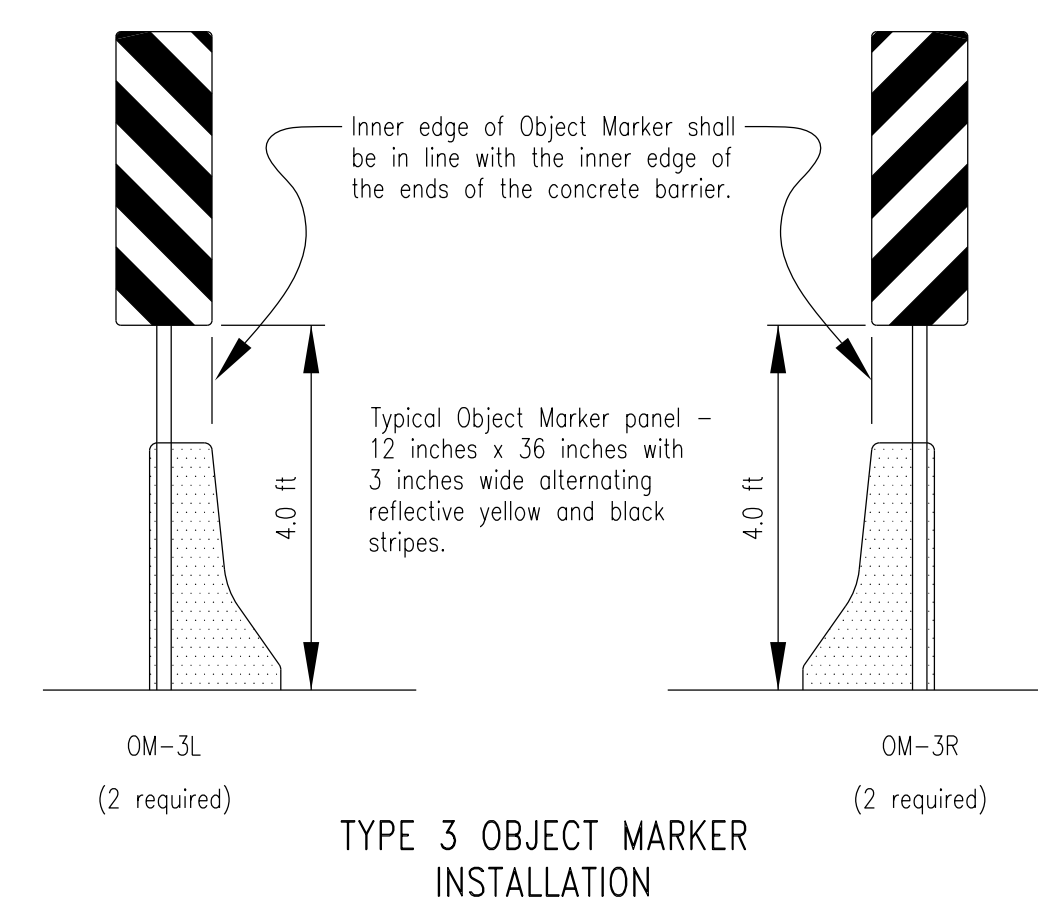


DELINEATOR (FLEXIBLE TYPE)

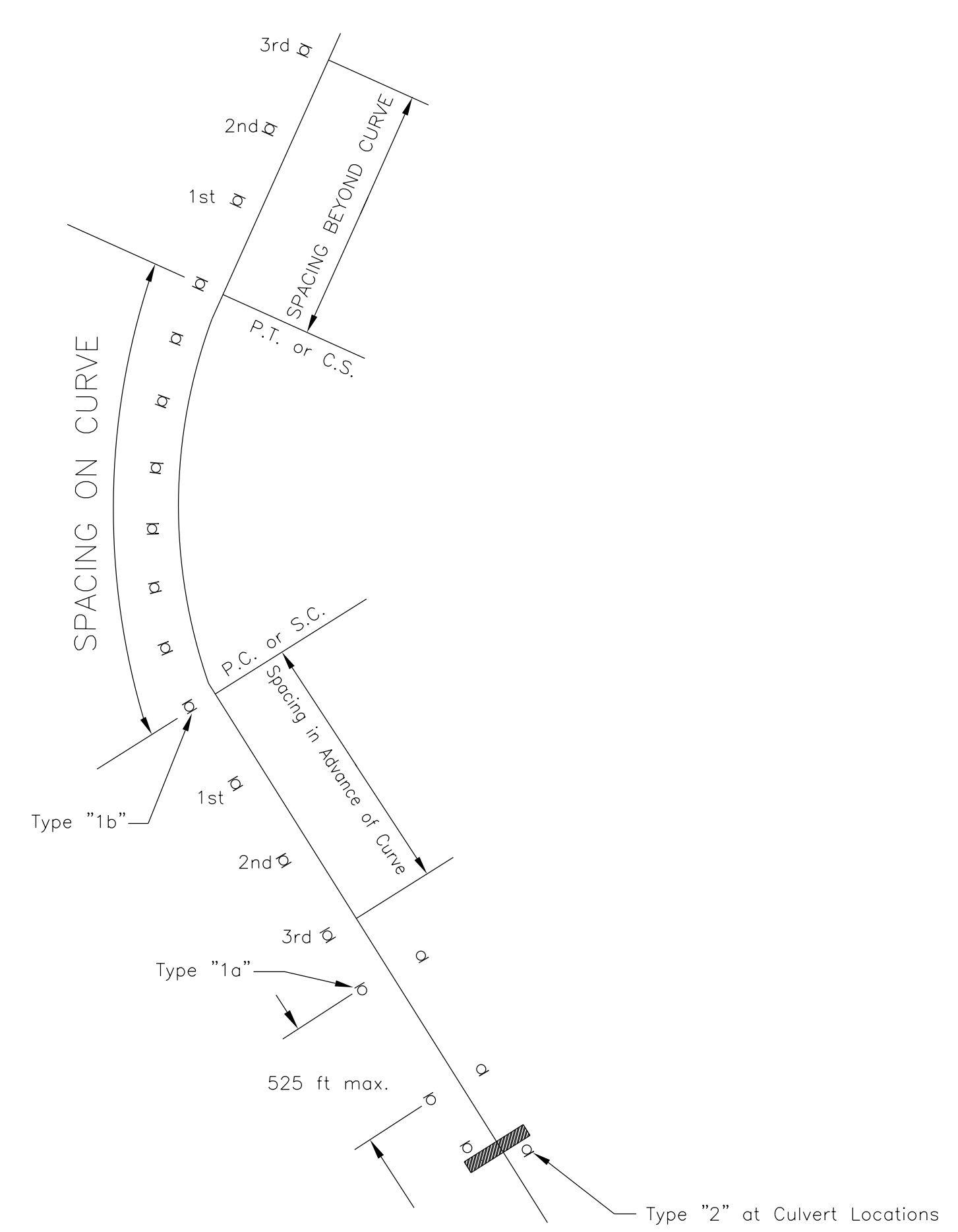
TYPE	POST COLOR	HIGH INTENSITY REFLECTIVE SHEETING
1a	WHITE	WHITE, ONE SIDE
1b	WHITE	WHITE, BOTH SIDES
2	YELLOW	AMBER, ONE SIDE



Glass Fiber Type SECTION A-A



TYPE 3 OBJECT MARKER INSTALLATION



Typical spacing on tangent = 525 ft

Radius of Curve (feet)	Approximate Spacing (S) on Curve (feet)	Spacing on Advance of or Beyond a Curve (feet)		
		A (2S)	B (3S)	C (6S)
50	20	40	60	120
115	25	50	75	150
180	35	70	105	210
250	40	80	120	240
300	50	100	150	300
400	55	110	165	330
500	65	130	195	390
600	70	140	210	420
700	75	150	225	450
800	80	160	240	480
900	85	170	255	510
1000	90	180	270	540
1100	97	194	292	583
1200	102	203	305	610
1300	106	212	318	636
1400	110	220	331	661
1500	114	228	343	685
1600	118	236	354	709
1700	122	244	366	731
1800	125	251	376	753
1900	129	258	387	774
2000	132	265	397	795
2500	148	297	445	891
3000	163	326	489	978
3500	176	352	529	1057
4000	189	377	566	1131
4500	200	400	600	1201
5000	211	422	633	1266
5500	221	443	664	1329
6000	231	463	694	1388
6500	241	482	723	1446
7000	250	500	750	1501
7500	259	518	777	1554

S = 3.0 \* sq. rt.(R-50).  
 Spacing for specific radii may be interpolated from table.  
 The spacing on curves should not exceed 300 feet.  
 Shaded areas denotes to use 300 feet spacings.  
 Delineators should be spaced 200 to 530 feet apart on mainline tangent sections.  
 NOTE: When uniform spacing is interrupted by such features as culverts, signs, driveways, intersections, delineators which would ordinarily be located within the features may be relocated in either direction for a distance not exceeding one quarter of the uniform spacing. Delineators still falling within such features may be eliminated.

63309-0010 Delineators, Type "1a"  
 63309-0020 Delineators, Type "1b"

STATION	LOCATION	DESCRIPTION	Each
1+36.06	Lt. & Rt.	DL_1A	2
21+36.07	Lt. & Rt.	DL_1A	2
45+77.31	Lt. & Rt.	DL_1A	2
50+77.31	Lt. & Rt.	DL_1A	2
55+77.31	Lt. & Rt.	DL_1A	2
TOTAL			10
STATION	LOCATION	DESCRIPTION	Each
33+98.93	Rt.	DL_1B	1
34+83.39	Rt.	DL_1B	1
36+52.31	Rt.	DL_1B	1
38+22.31	Rt.	DL_1B	1
40+77.31	Rt.	DL_1B	1
TOTAL...			5

62101-0000 R/W MONUMENTS  
 62102-0000 Reference Markers

STATION	REQUIRED	LOCATION	REMARK
0+68.940	1	Left	
0+68.940	1	Right	
19+56.340	2	Left	
19+56.340	2	Right	
28+94.000	2	Left	
28+94.000	1	Right	
30+61.099	1	Left	
30+61.099	1	Right	
31+58.000	2	Right	
32+71.099	1	Left	
32+71.099	1	Right	
34+42.308	1	Left	
34+42.308	1	Right	
36+52.308	1	Left	
36+52.308	1	Right	
57+82.737	1	Left	
57+82.737	1	Right	
TOTAL...			21

ITEM 63308-2000 FLEXIBLE TYPE 2 OBJECT MARKER

STATION	LOCATION	QTY.
6+60	Lt. & Rt.	2
36+00	Lt. & Rt.	2
47+40	Lt. & Rt.	2
TOTAL...		6

ITEM 63308-3000 TYPE 3 OBJECT MARKER

STATION	LOCATION	QTY.
24+68.00	Rt.	1 (OM-3R)
24+68.00	Lt.	1 (OM-3L)
33+43.77	Rt.	1 (OM-3R)
33+43.77	Lt.	1 (OM-3L)
TOTAL...		4

NOTE: Included with Bridge Quantities on Sheet B-1

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS  
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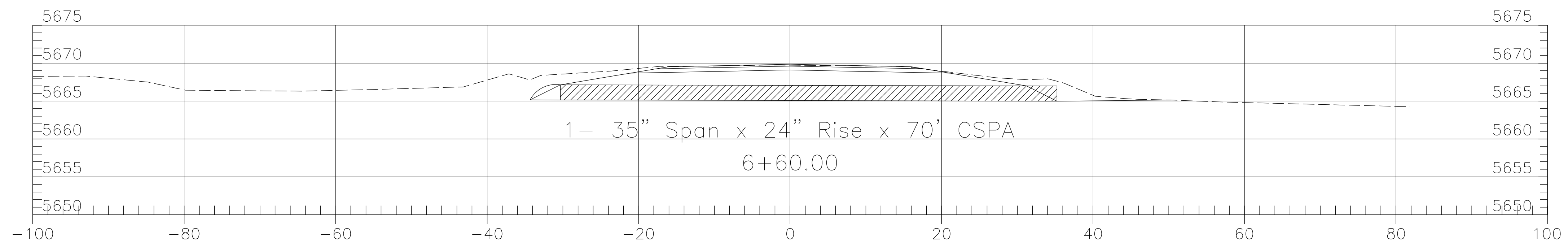
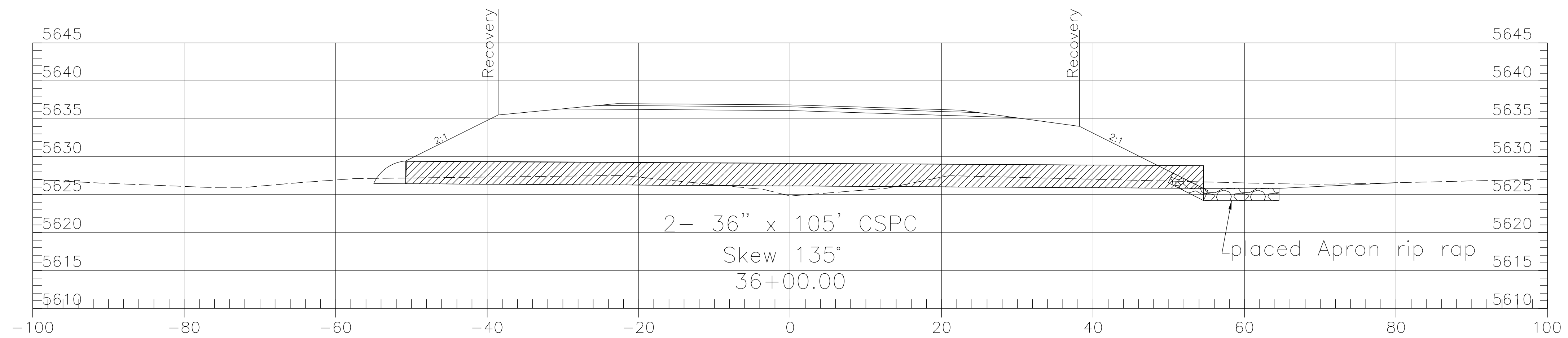
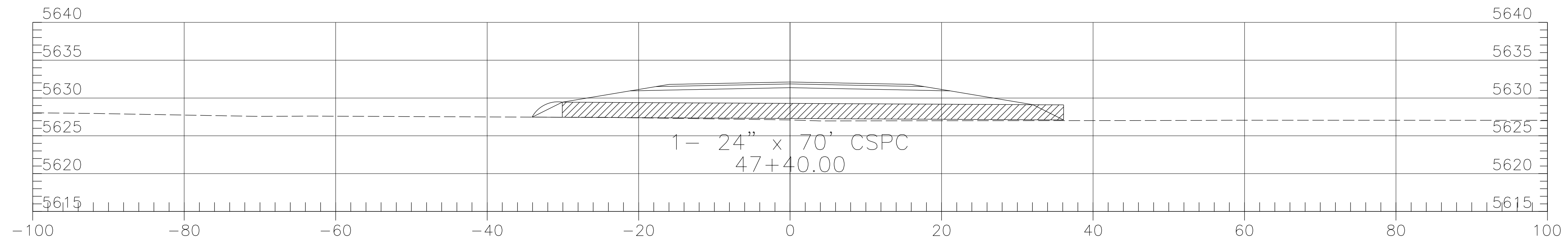
MISCELLANEOUS DETAILS

DRAWN BY: Gerald.Hood	DATE: 5/7/2009
DESIGNED BY: NRDOT	DATE: 5/7/2009
REVISED: 1/25/2013	BY: Peterson.Yazzie
ANNOTATION SCALE: Full Size 1=1	
FILENAME: Sht.32_Delineators&Misc.Details.dgn	



J:\DESIGN\Users\DESIGN2\CURRENT PROJECT\_093008\N00\_New\_Lands\N2007(1-1)2&4\_092308\N2007 DESIGN DATA\_092508\CADD Files 01-18-2013\N2007 Plans 01-18-2013

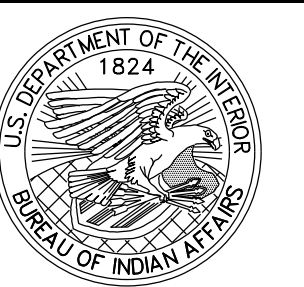
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(2)1,2&4	33	63



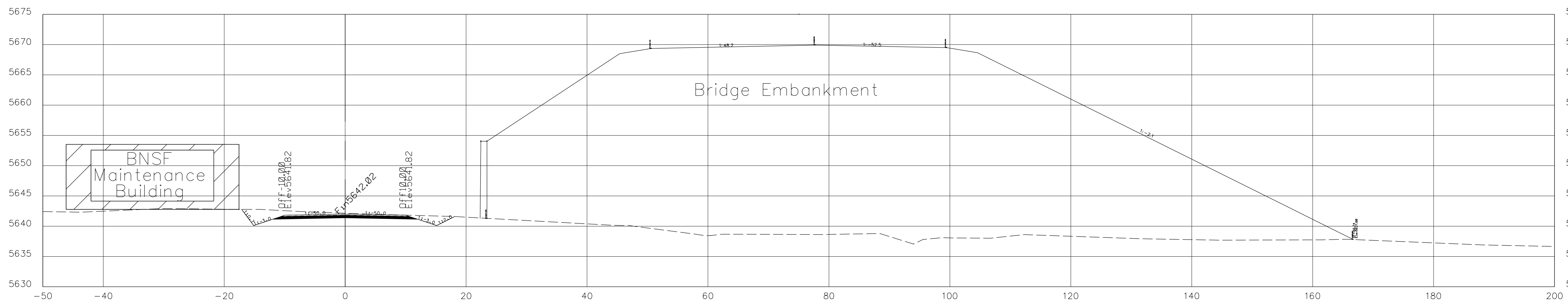
UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF INDIAN AFFAIRS  
NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

## PIPE CROSS SECTIONS

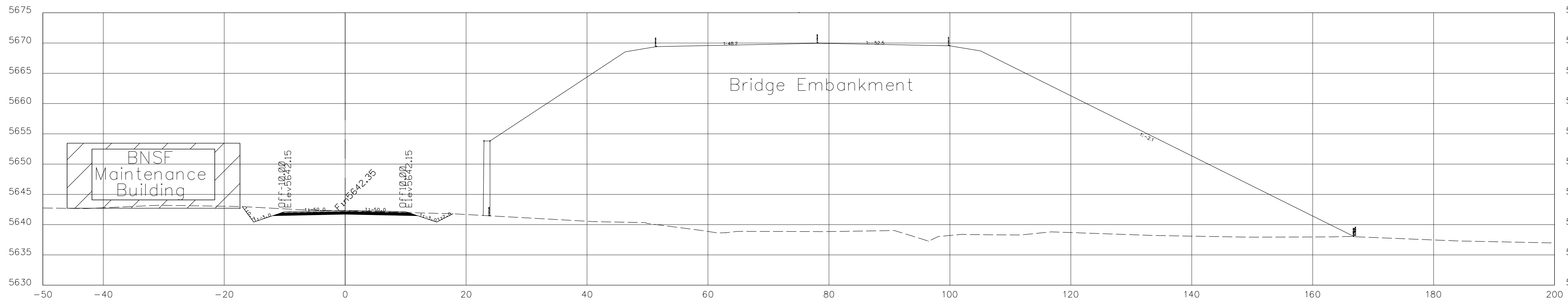
DRAWN BY: B.O.R. DATE: 07/29/05  
DESIGNED BY: Design 2 DATE: 07/29/05  
REVISED: 07/16/11 FILENAME: Pipe X-SEC.dwg  
BY: B.O.R. SCALE: 1:10 (Horiz. & Vert.)



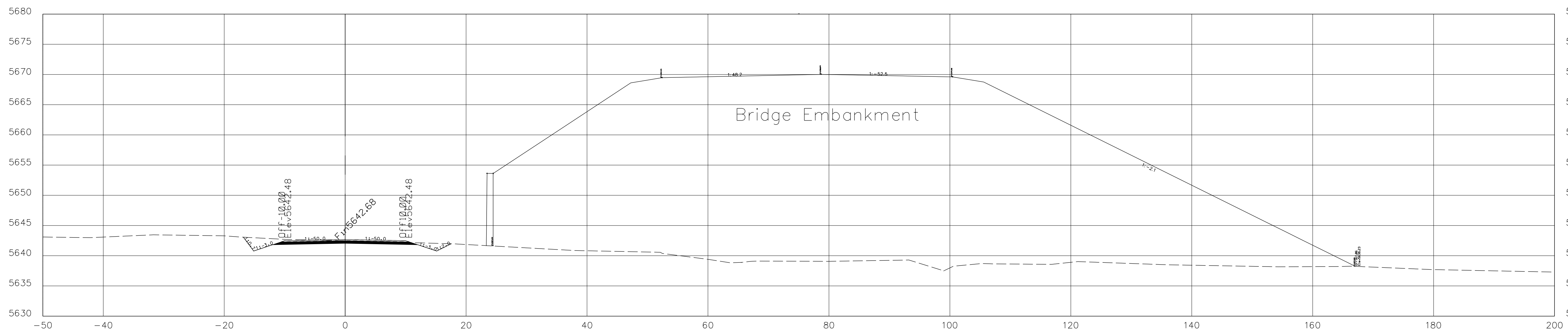
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1,2,4	34	63



5+30.00



5+25.00




5+20.00

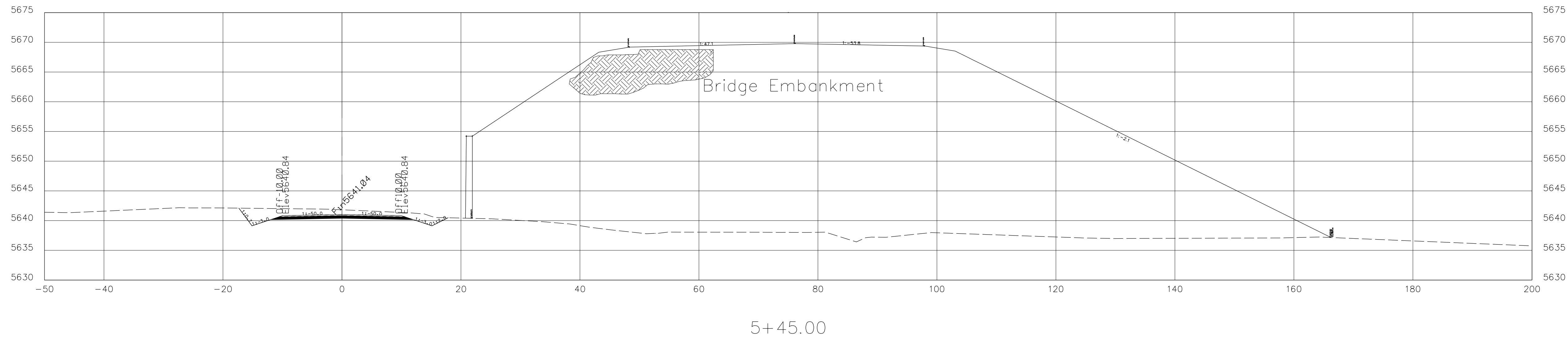
UNITED STATES  
 DEPARTMENT OF THE INTERIOR  
 BUREAU OF INDIAN AFFAIRS  
 NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

**FRONTAGE & DETOUR RD  
 SECTIONS**

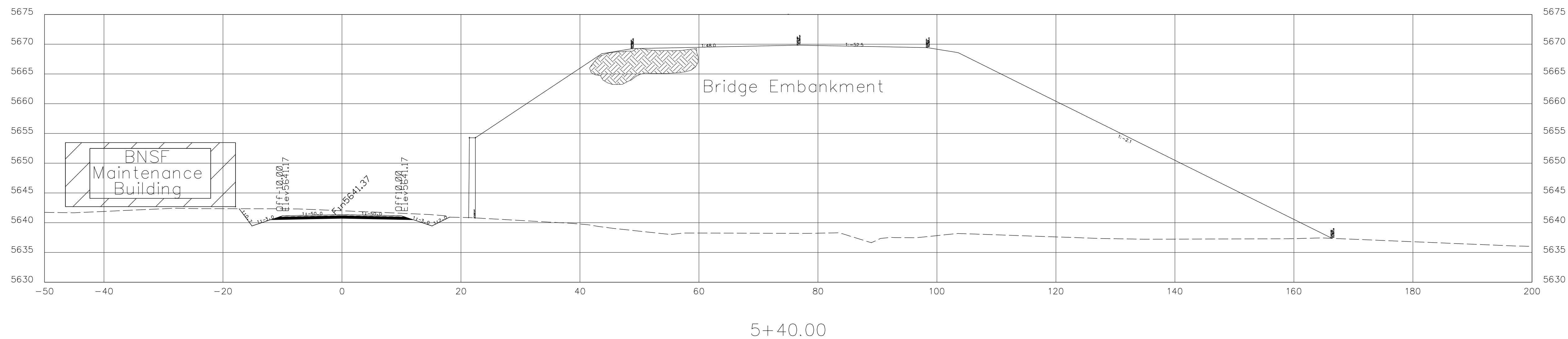
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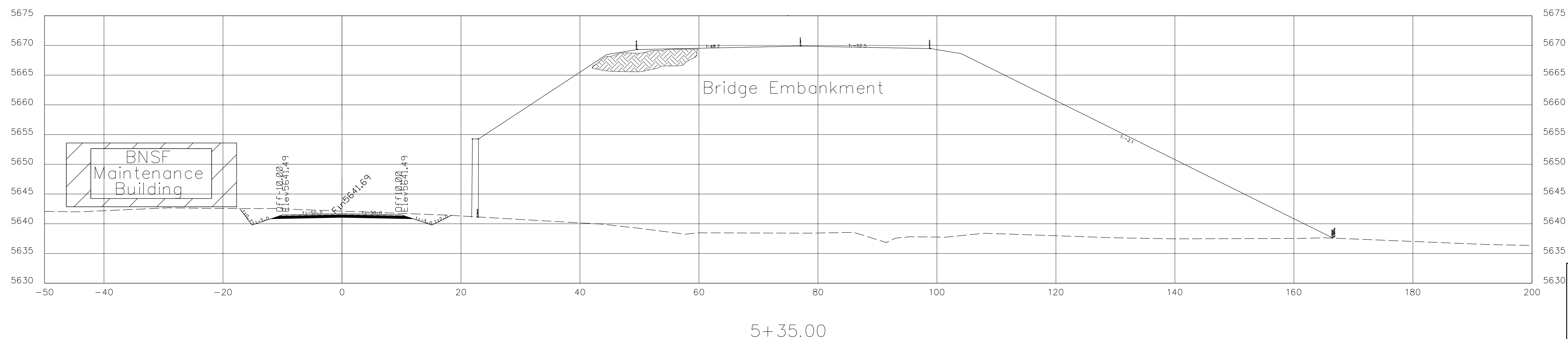
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1,2,4	35	63



5+45.00



5+40.00




5+35.00

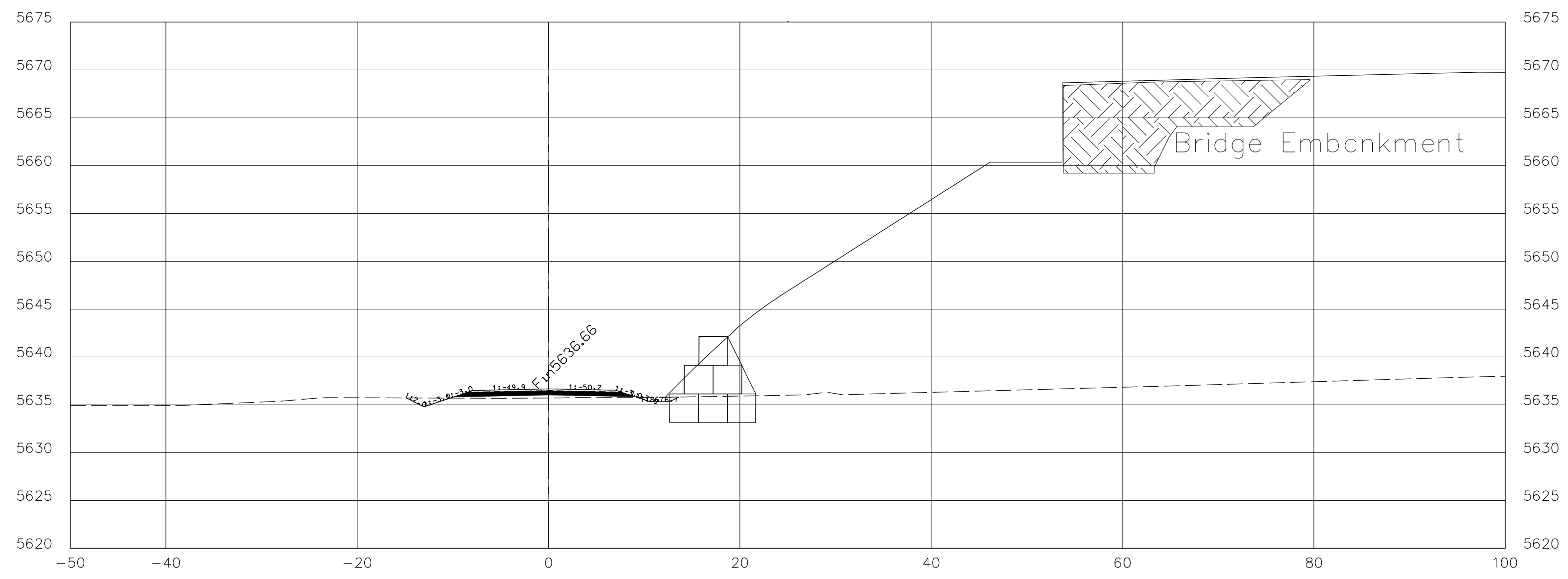
UNITED STATES  
 DEPARTMENT OF THE INTERIOR  
 BUREAU OF INDIAN AFFAIRS  
 NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

**FRONTAGE & DETOUR RD  
 SECTIONS**

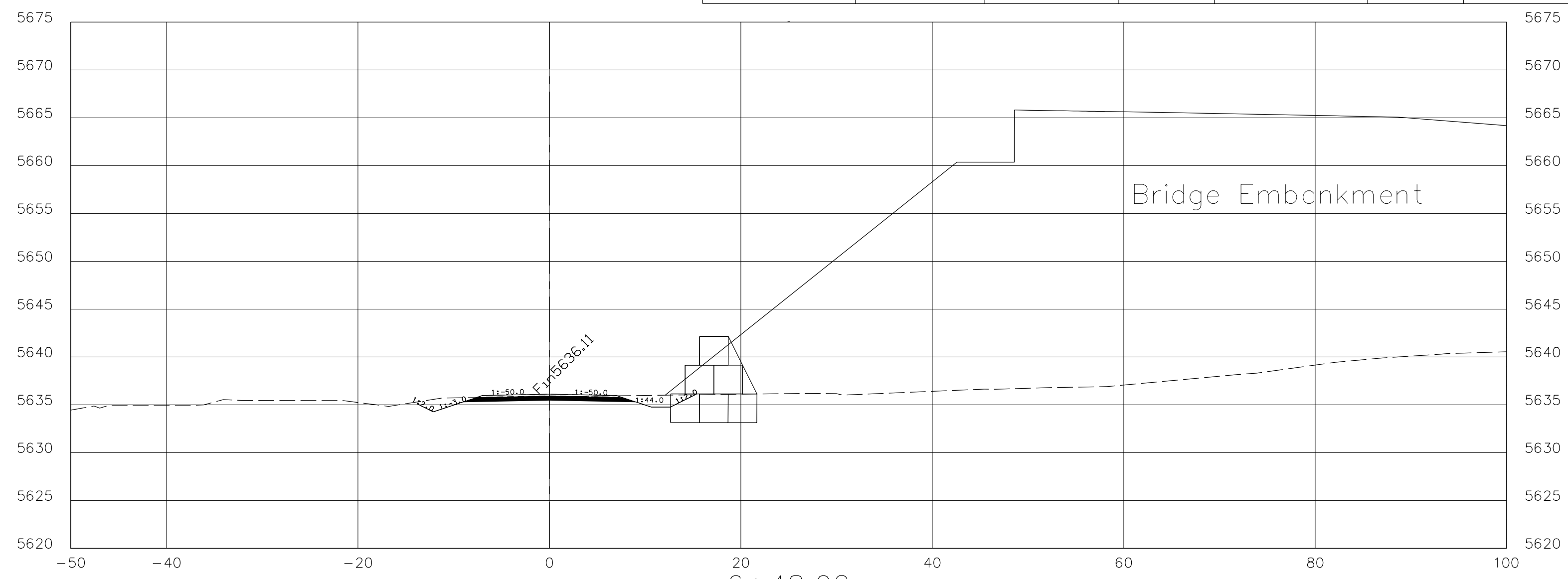
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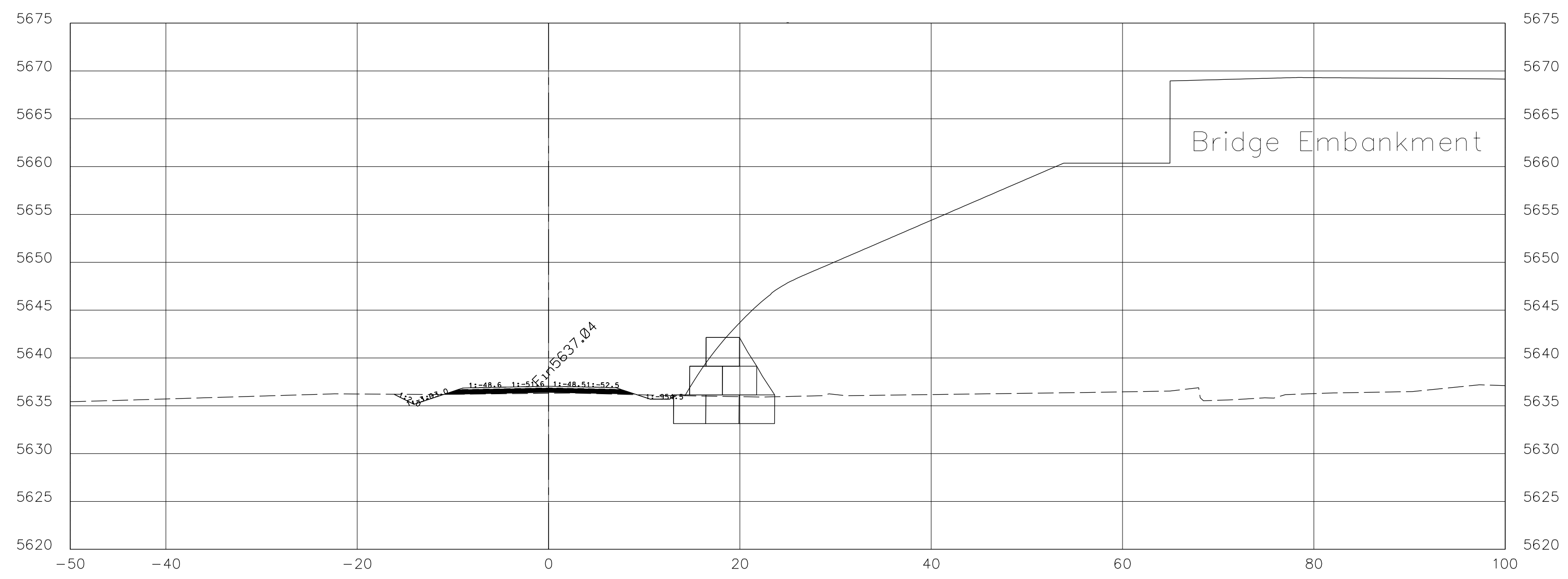
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1,2,4	36	63



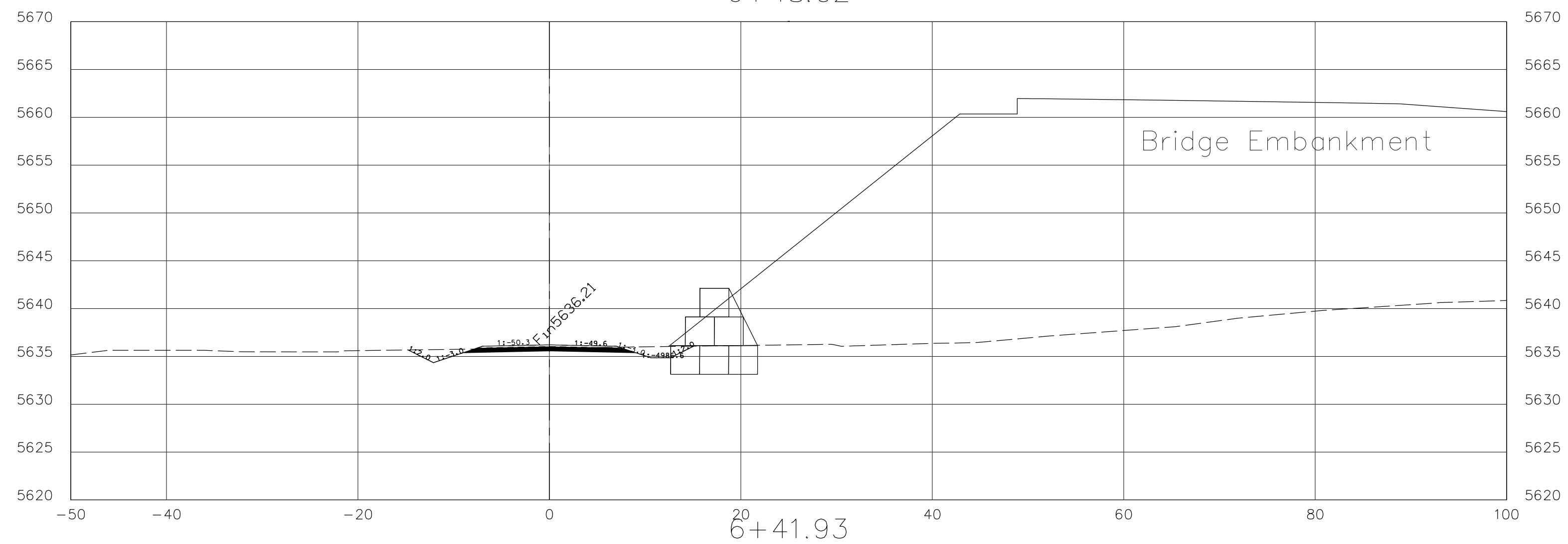
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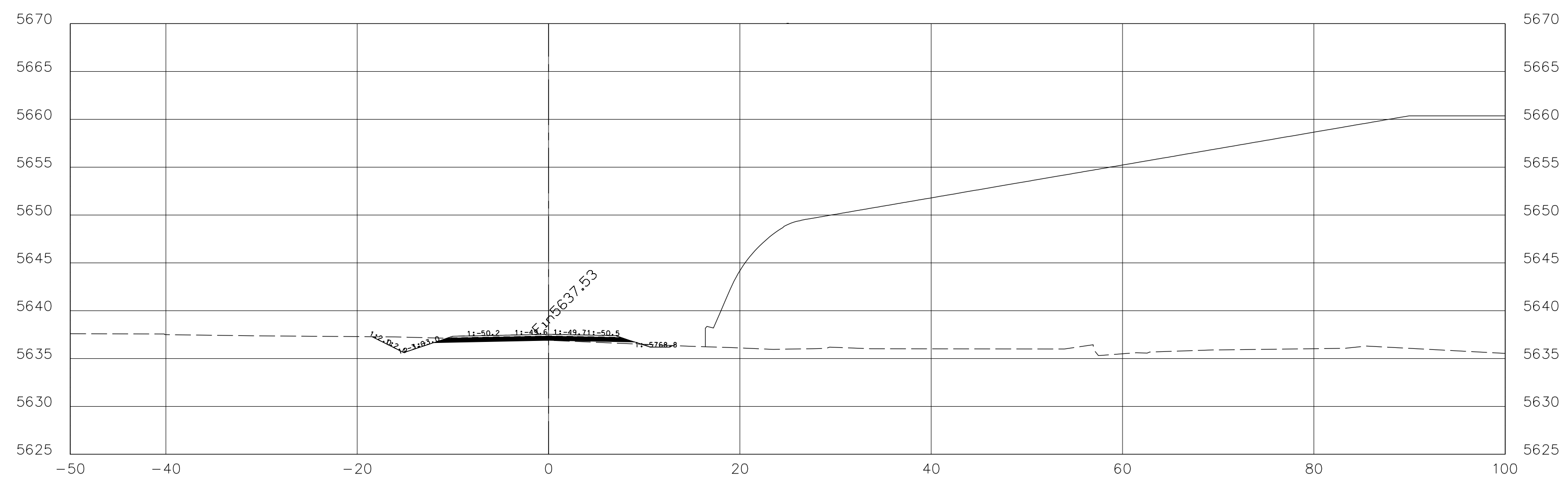
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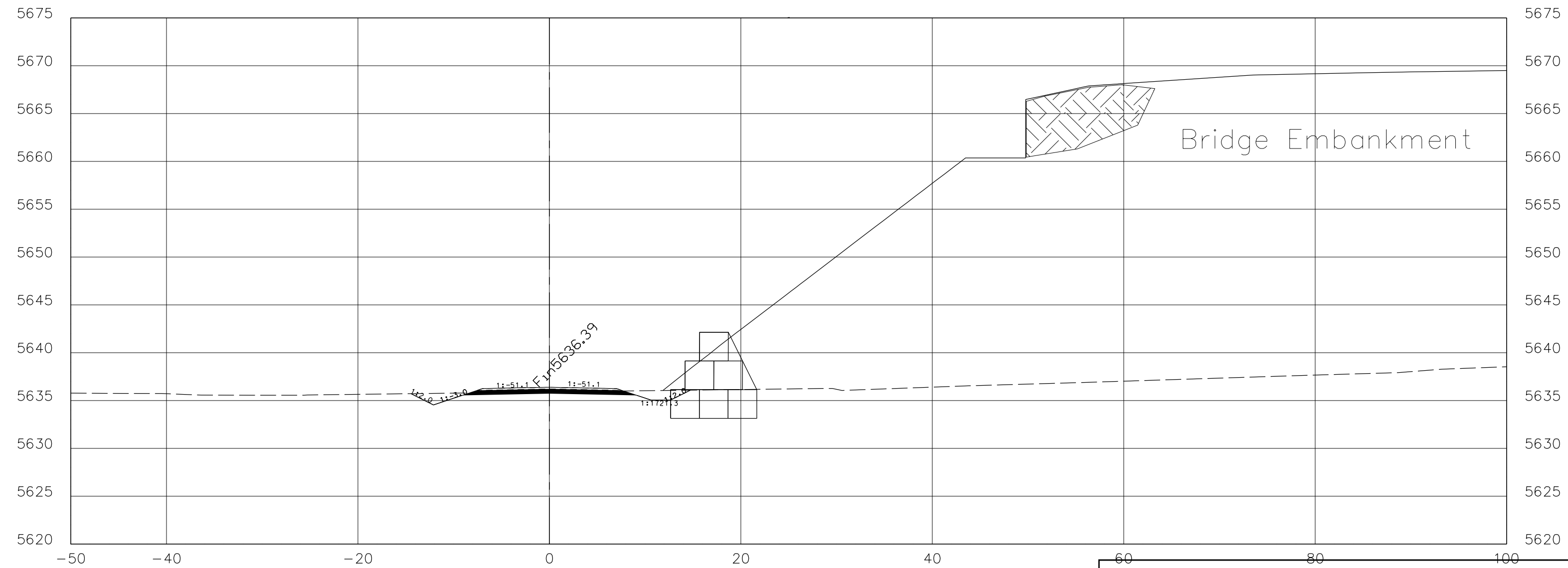
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6+41.93



5+99.93

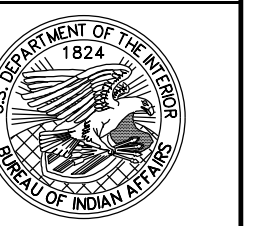


6+31.50

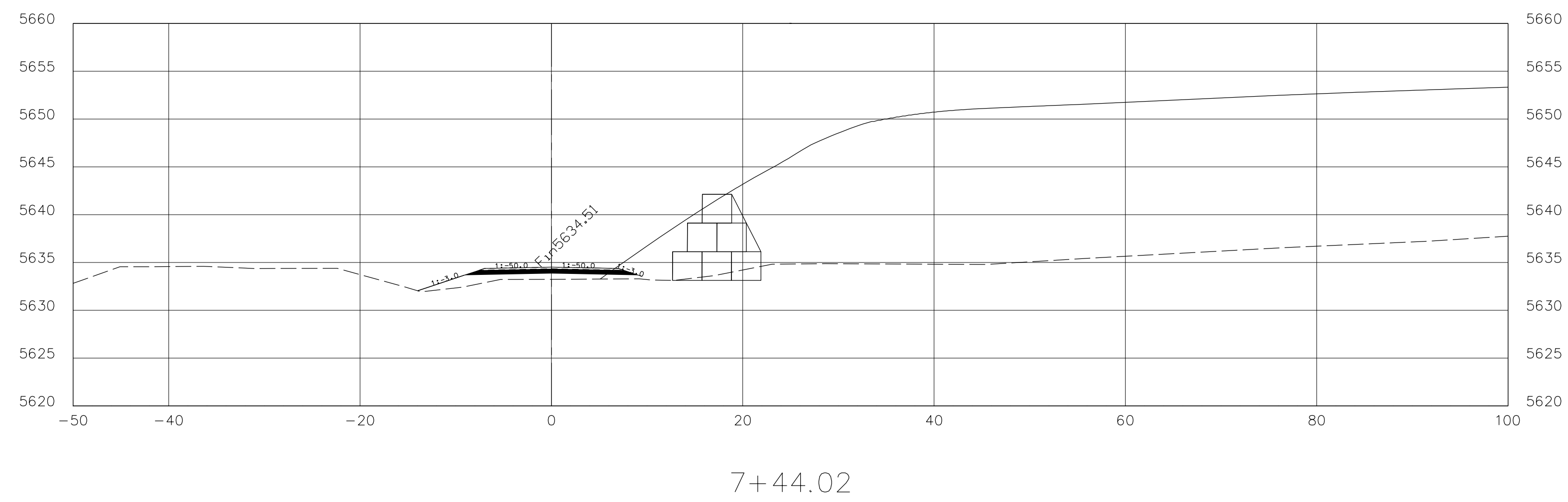
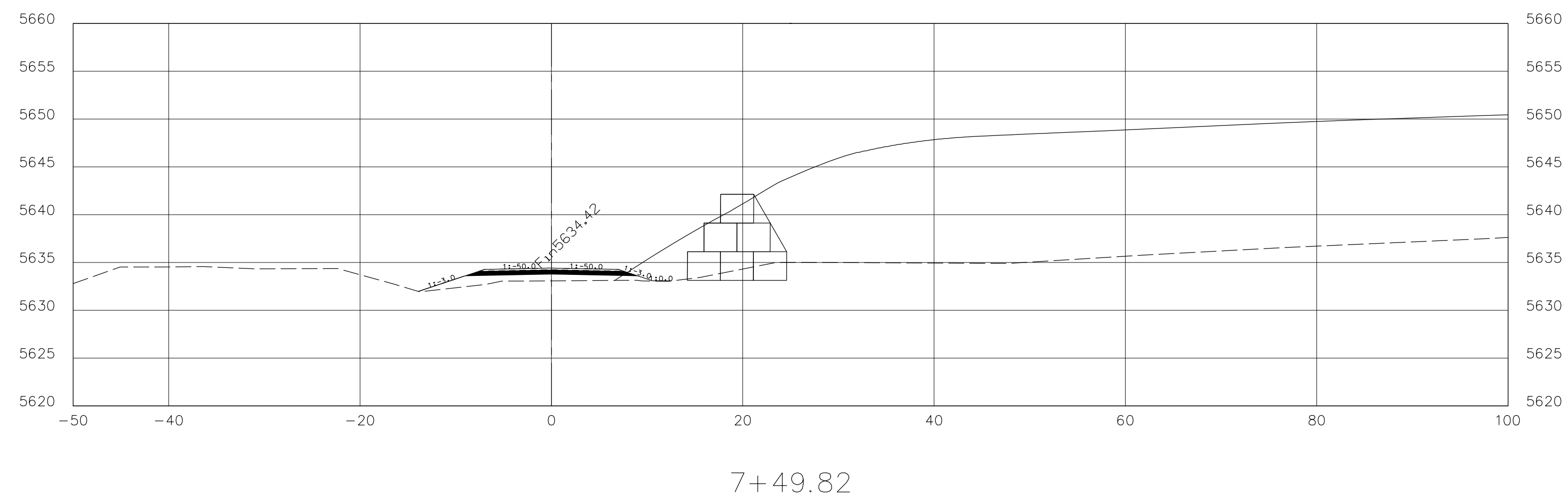
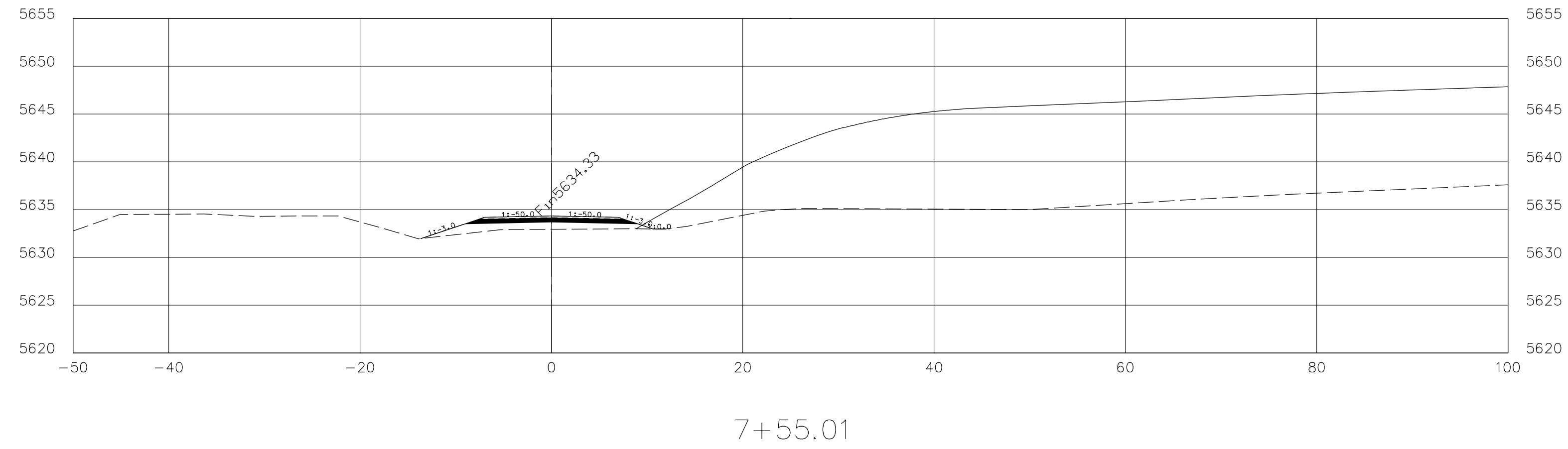
UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF INDIAN AFFAIRS  
NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

FRONTAGE & DETOUR RD  
SECTIONS

DRAWN BY: B.O.R. DATE: 06/03/11  
DESIGNED BY: Design 2 DATE: 06/03/11  
REVISED: 07/11 FILENAME: Pipe.dwg  
BY: B.O.R. SCALE: 1:10 (Horiz. & Vert.)



REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1.2.4	37	63

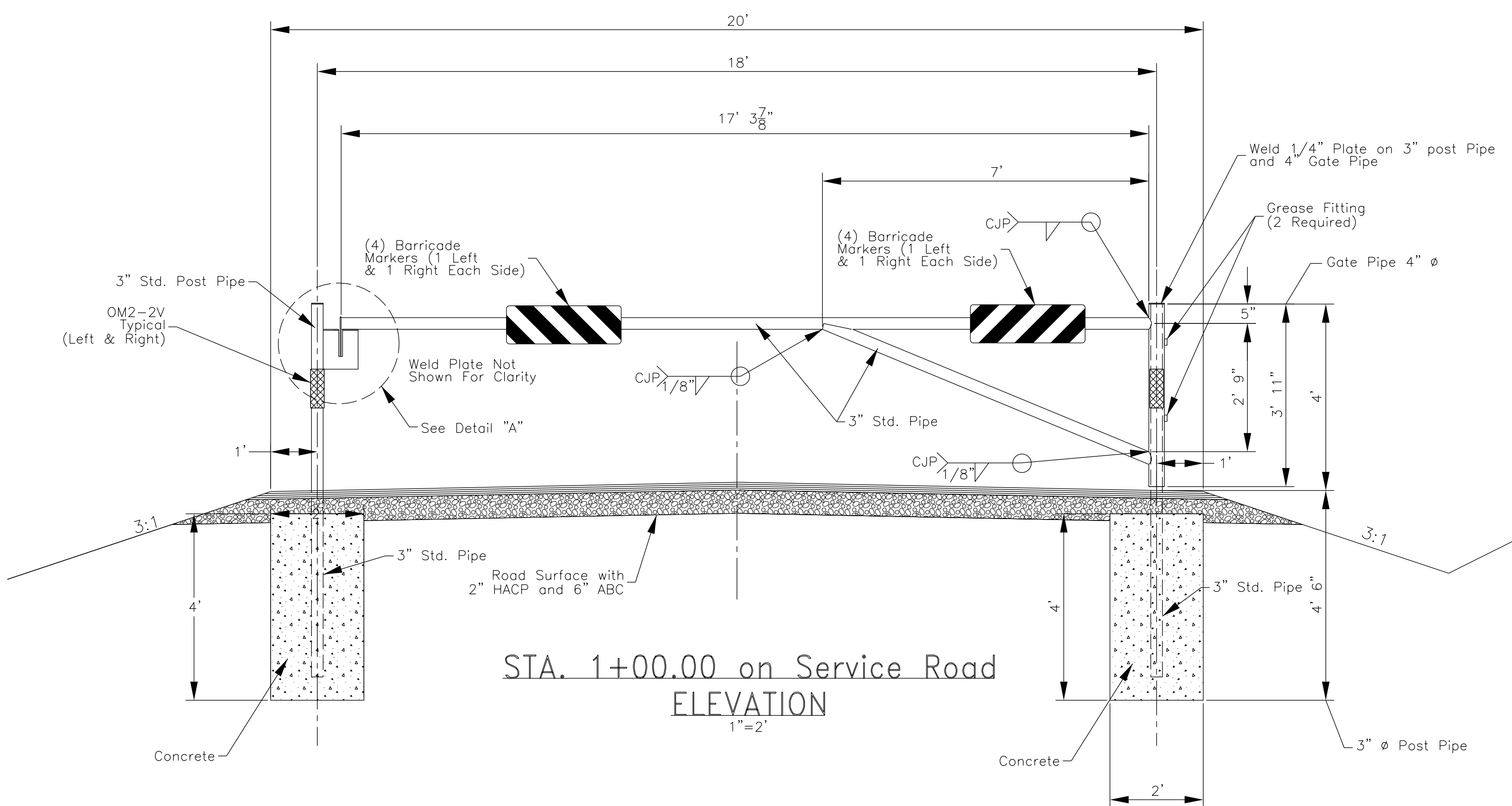


UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION	
FRONTAGE & DETOUR RD SECTIONS	
DRAWN BY: B.O.R.      DATE: 06/03/11	
DESIGNED BY: Design 2      DATE: 06/03/11	
REVISED: 07/11      FILENAME: Pipe.dwg.	
BY: B.O.R.      SCALE: 1:10 (Horiz. & Vert.)	

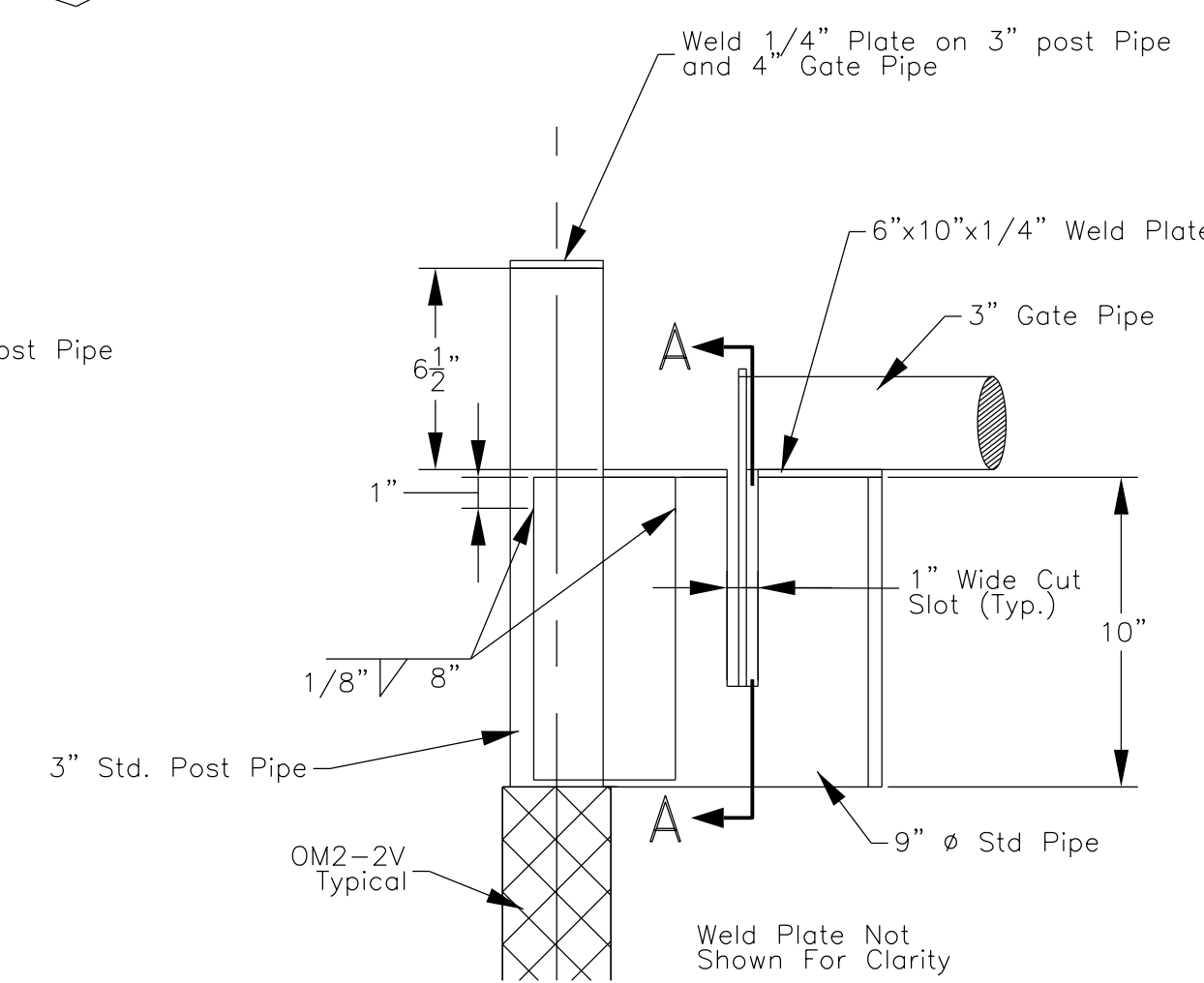
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1,2,4	38	63

**GENERAL NOTES**

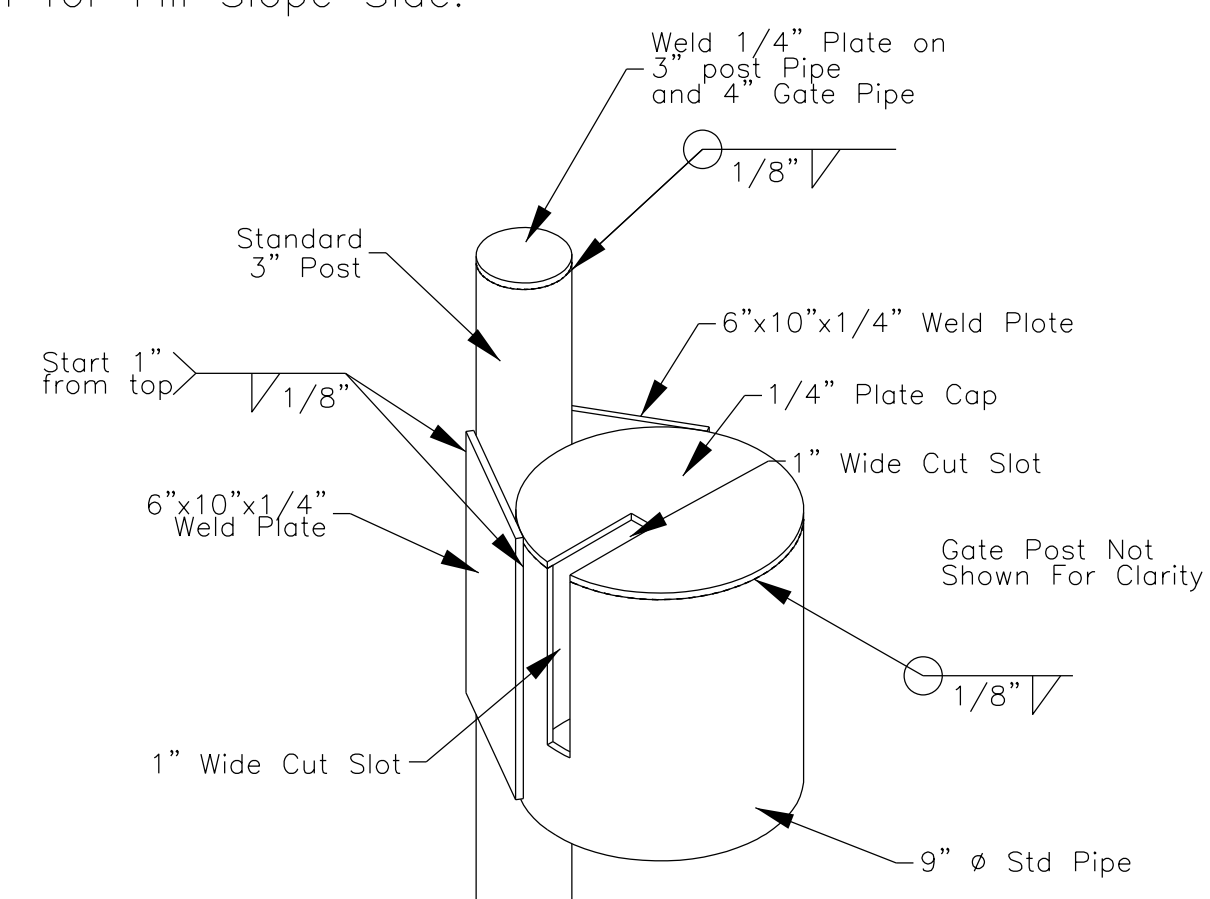
1. All Pipe Shall be ASTM A53 Grade B Steel Pipe
2. Entire Structure Shall Receive a Steel Coating System 5 From FP-03 Table 563-1 or System 7 From Table 563-2 as Applicable. Surface Preparation Shall Conform to FP-03 563.07(b). All Coats will be Shop Applied. Paint Shall Comply With FP-03 708. Color Shall be Traffic Yellow as Approved by the AOTR.
3. Grind All Corner and Welds Smooth.
4. All Materials Shall be Free of Rust.
5. Concrete Shall be 3000 PSI and May be Blended Pre-Approved Bag Mix Conforming to ASTM C-387.
6. Closure Gate Pay Item Includes all Required Attached Signs.
7. Attach all Signs with Vandal-Proof Fitting to be Approved by the AOTR.
8. "OM2-2V" and Barricade Markers Shall Have Retroreflective Sheeting of ASTM D 4956 Type II "Super Engineering Grade".
9. Field Verify Post Length for Fill Slope Side.



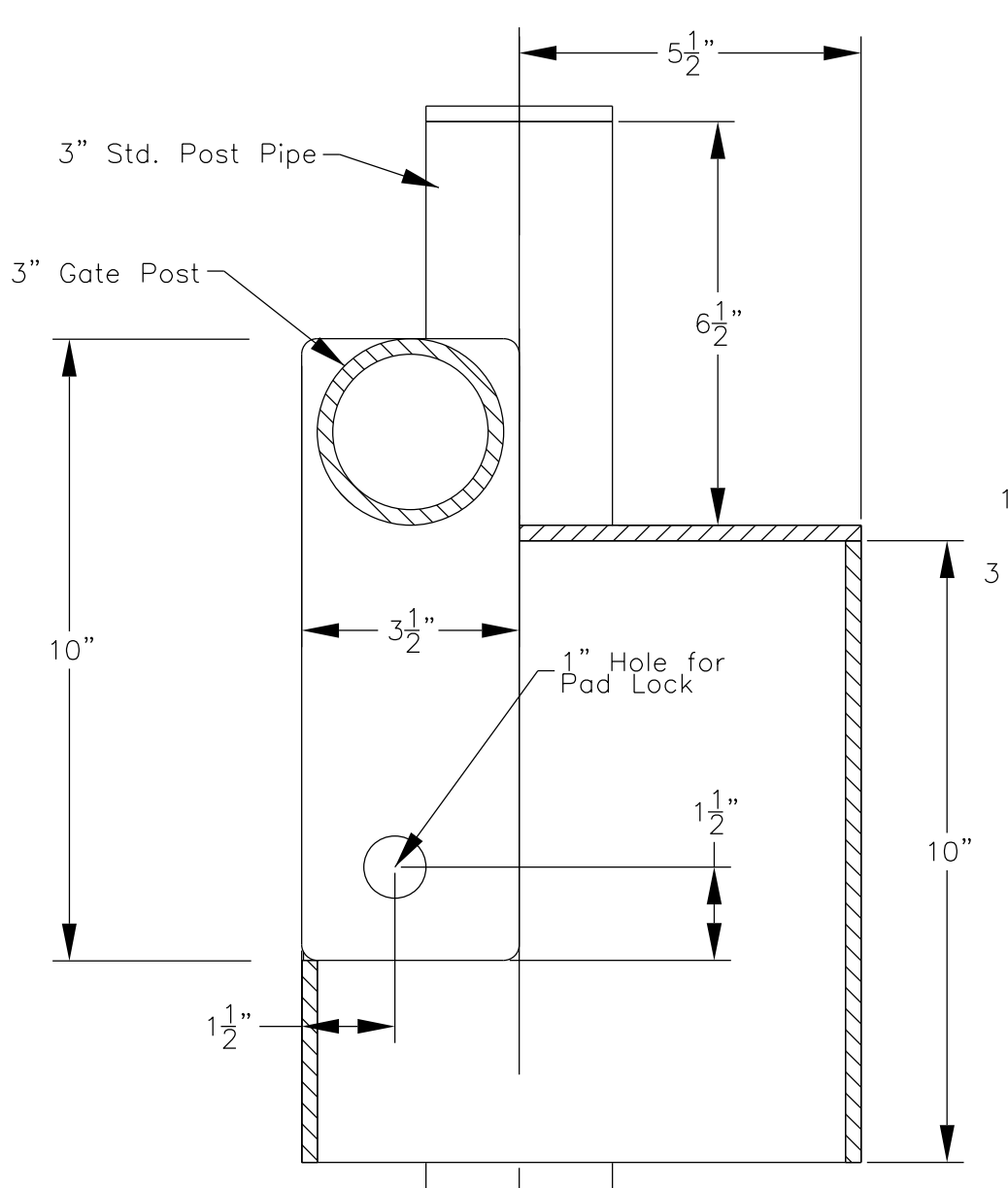
STA. 1+00.00 on Service Road  
ELEVATION  
1"=2'



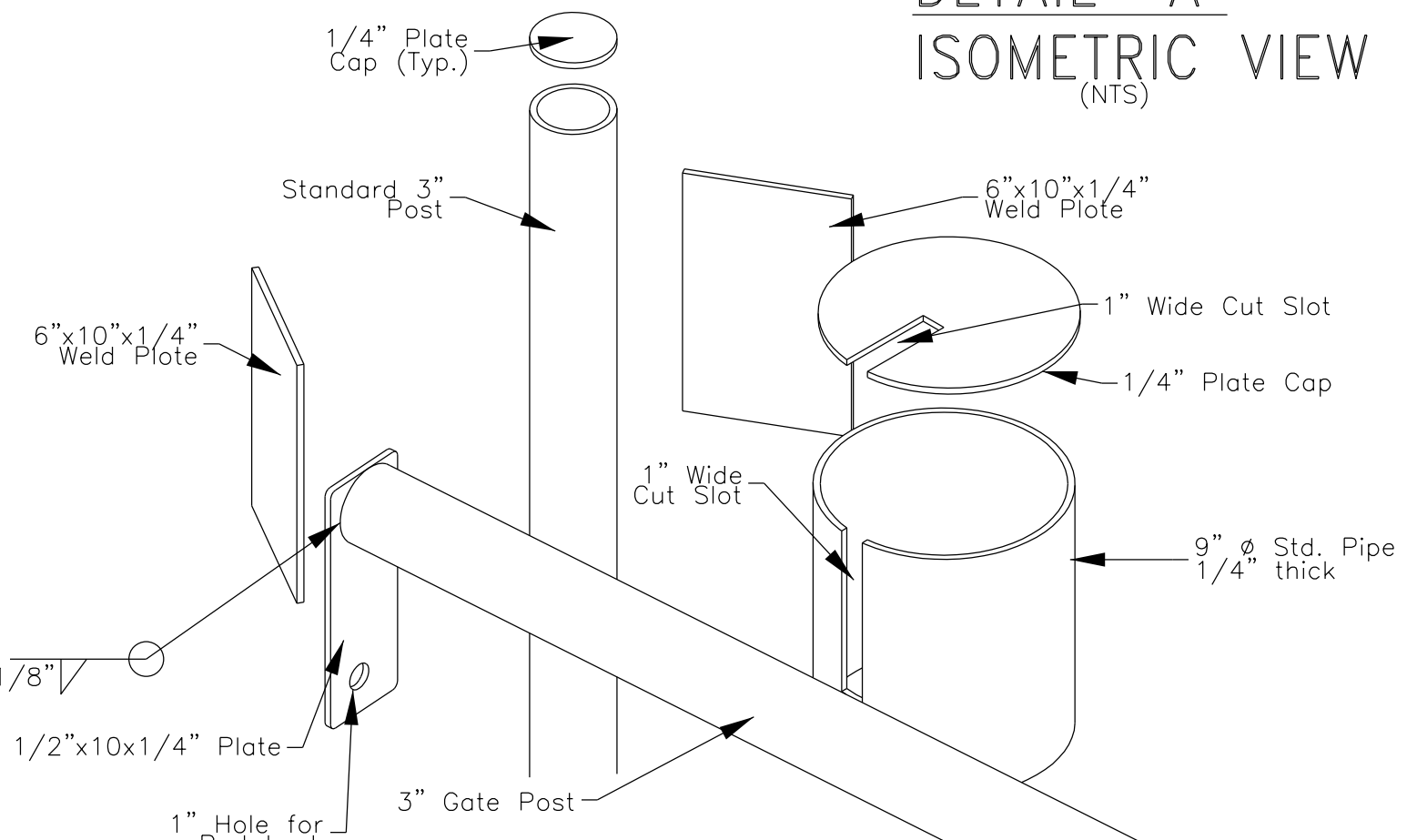
**DETAIL "A"**  
(NTS)



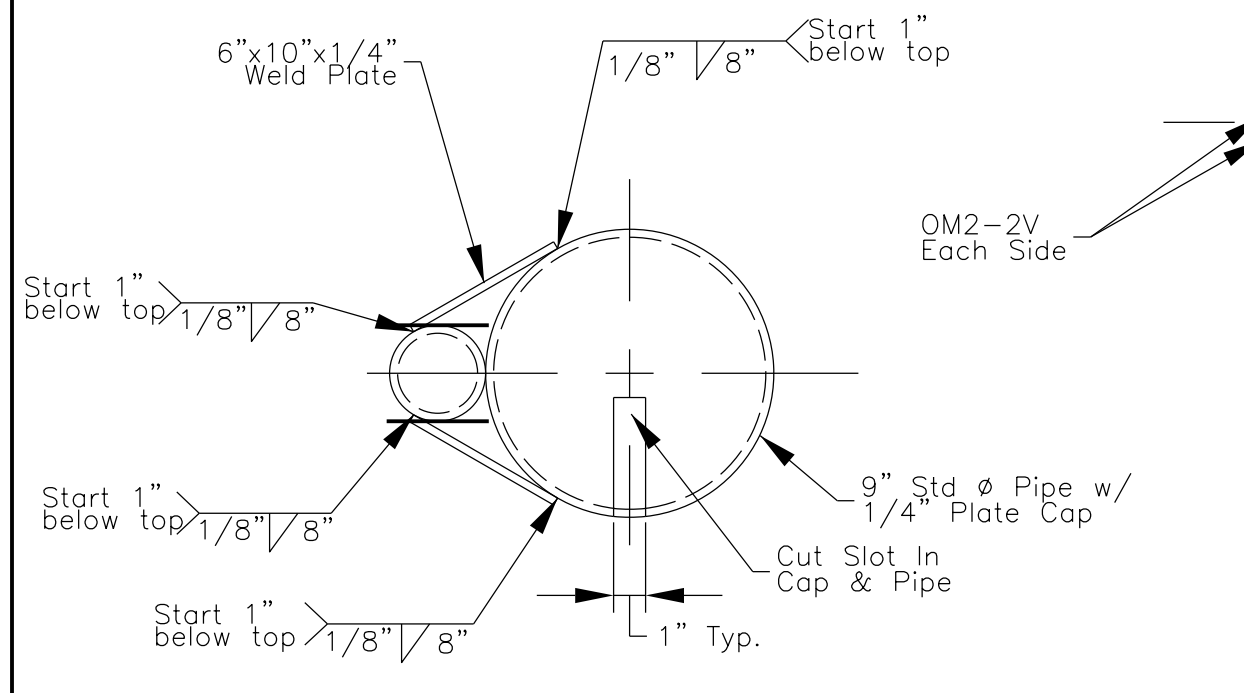
**DETAIL "A"**  
ISOMETRIC VIEW  
(NTS)



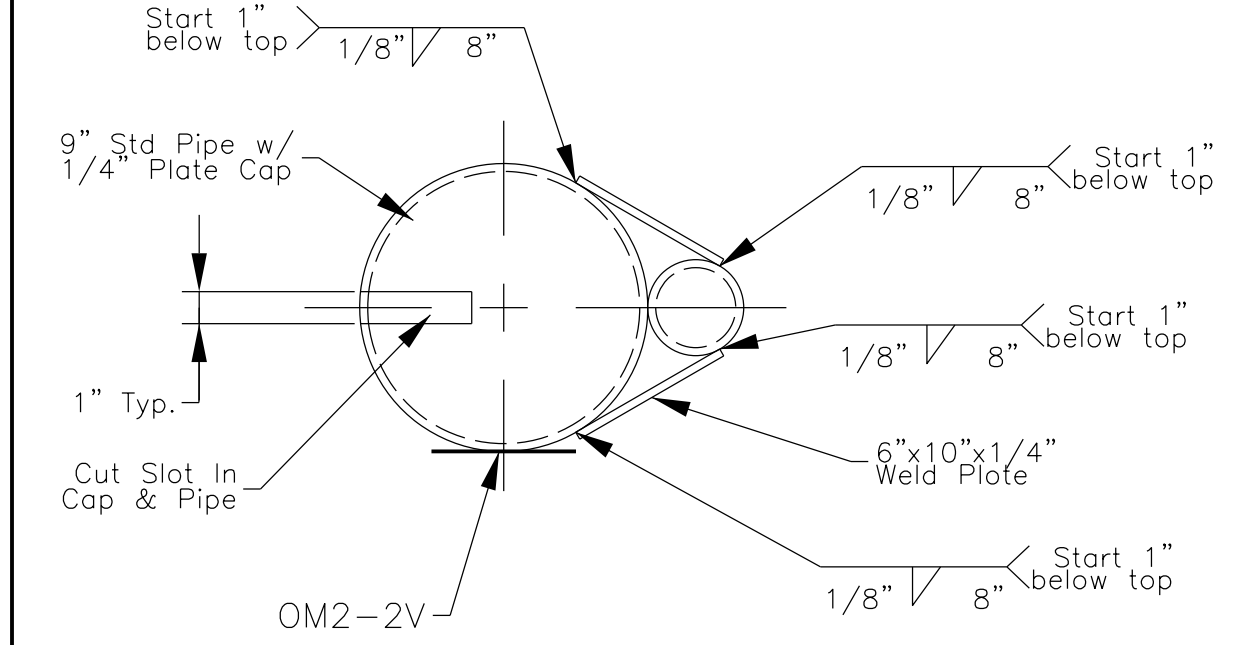
**SECTION A-A**



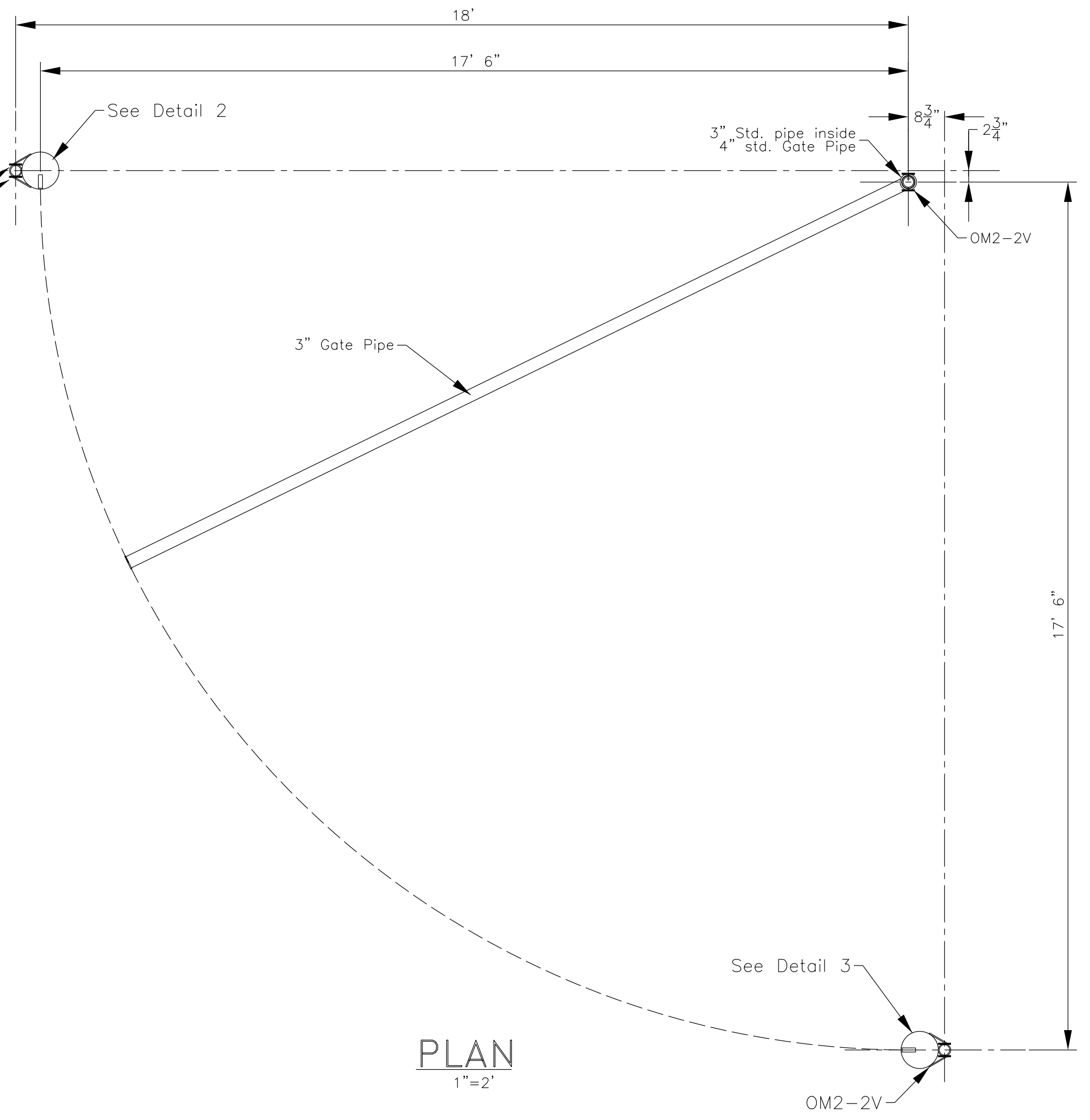
**DETAIL "A"**  
EXPLODED VIEW  
(NTS)



**DETAIL "2"**  
1"= 1/2'



**DETAIL "3"**  
1"= 1/2'



**PLAN**  
1"=2'

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF INDIAN AFFAIRS  
NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

**18' TYPE 3 STEEL  
LOCKING GATE DETAILS**

DRAWN BY: NRDOT DATE: 1/16/2014  
DESIGNED BY: NRDOT DATE: 1/16/2014  
REVISED: 1/16/2014 BY: DESIGN 2  
Locking Gate





BRIDGE GENERAL NOTES

REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	AZ	Navajo	N2007	N2007(1-1)1,2&4	B-1	63

- SPECIFICATIONS: DESIGN: AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, 1992, 15th EDITION. CONSTRUCTION: STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS, FP-03, ENGLISH EDITION, AND SUPPLEMENTAL SPECIFICATIONS.
- UNITS: THIS PROJECT HAS BEEN DESIGNED AND DRAWN USING THE U.S. CUSTOMARY (ENGLISH) SYSTEM OF UNITS. UNLESS OTHERWISE NOTED, ALL VALUES ARE GIVEN IN U.S. CUSTOMARY (ENGLISH) UNITS. SLOPES DESIGNATED ON THESE PLANS ARE IN ACCORDANCE WITH SECTION 101.03(d) OF THE FP-03, i.e.; V:H (VERTICAL : HORIZONTAL).
- DESIGN LOADS: DEAD LOADS; CONCRETE = 150 pcf, STEEL = 490 pcf, FUTURE WEARING SURFACE = 25 psf OF ROADWAY SURFACE, EARTH PRESSURE = FLUID WEIGHING 36 pcf. LIVE LOADS; HS 20-44 PLUS IMPACT. IMPACT = 50/(L+125) WHERE L = SPAN LENGTH IN FEET. MAXIMUM IMPACT FACTOR = 0.30.
- RATINGS: INVENTORY RATING = HS 22.0. OPERATING RATING = HS 36.8.
- DESIGN PARAMETERS: REINFORCED CONCRETE DESIGNED BY LOAD FACTOR DESIGN WITH  $f'c = 4000$  psi AND  $fy = 60,000$  psi. TRANSVERSE DECK SLAB SERVICEABILITY STRESSES LIMITED TO  $f'c = 1,400$  psi AND MAXIMUM STRESS IN REINFORCING STEEL OF  $fs = 20,000$  psi. PRECAST, PRESTRESSED GIRDERS DESIGNED IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, 1992, 15th EDITION CRITERIA. ULTIMATE STRENGTH OF  $\frac{1}{2}$ " DIA. SEVEN WIRE, BRIGHT, STRESS RELIEVED, LOW RELAXATION, PRESTRESSING STRAND SHALL BE 41,300 POUNDS WITH A MINIMUM  $f's = 270,000$  psi.
- CONCRETE: ALL CAST IN PLACE CONCRETE SHALL BE CLASS A(AE) WITH THE 28 DAY COMPRESSIVE STRENGTH INDICATED IN THESE PLANS. THE AIR CONTENT FOR ALL CLASS A(AE) CONCRETE SHALL NOT BE LESS THAN THAT SPECIFIED IN THE FP-03. CONCRETE IN PRECAST, PRESTRESSED CONCRETE GIRDERS SHALL BE CLASS P AND SHALL HAVE THE MINIMUM STRENGTHS INDICATED IN THESE PLANS. CONCRETE FOR THE DECK SLAB AND ALL DIAPHRAGMS SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF  $f'c = 4,500$  psi. ALL OTHER CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF  $f'c = 4,000$  psi. CONCRETE IN PRESTRESSED GIRDERS SHALL HAVE A 28 DAY COMPRESSIVE STRENGTH  $f'c = 6,000$  psi, WITH A MINIMUM INDICATED CONCRETE STRENGTH AT TIME OF TRANSFER OF PRESTRESS OF  $f'ci = 5,400$  psi. CHAMFER EXPOSED CORNERS OF ALL CONCRETE  $\frac{3}{4}$ " UNLESS OTHERWISE SHOWN ON THE PLANS. ALL SUBSTRUCTURE CONCRETE SHALL CONTAIN TYPE II PORTLAND CEMENT. ALL CONCRETE SHALL BE VIBRATED IN ACCORDANCE WITH SPECIFICATIONS. ALL CEMENT SHALL BE LOW ALKALAI CEMENT AND NO ADDITIVES CONTAINING CALCIUM CHLORIDE SHALL BE USED. THE TIME LIMITS FOR CONCRETE DISCHARGE SPECIFIED IN TABLE 552-4 OF THE FP-03 SHALL APPLY. IF CONCRETE CANNOT BE DISCHARGED WITHIN THE SPECIFIED TIME LIMIT, AN ALTERNATE METHOD OF DELIVERY SUCH AS DRY BATCHING, AN ONSITE BATCHING PLANT CONFORMING TO APPLICABLE SPECIFICATIONS, OR AN APPROVED CONCRETE MIX DESIGN CONTAINING SET RETARDING ADMIXTURES SHALL BE USED. ALTERNATE METHODS OF DELIVERY SHALL BE SUBMITTED FOR REVIEW AND APPROVAL PRIOR TO IMPLEMENTATION. APPROVAL OF ALTERNATE METHODS SHALL BE BASED ON DATA FROM PAST USE SHOWING CONFORMANCE TO THE SPECIFICATIONS FOR SIMILAR CONCRETE PLACED IN SIMILARLY REMOTE LOCATIONS. TOP SURFACES OF THE BRIDGE DECK AND APPROACH SLABS, INCLUDING WALK WAY, SHALL BE GIVEN A GROOVED FINISH IN ACCORDANCE WITH SECTION 552.14 (a), (b) AND (c)(1) OF THE FP-03. THE CONCRETE BARRIER AND PARAPET SURFACES, VERTICAL EDGE OF BRIDGE DECK SURFACES AND BOTTOM OF BRIDGE DECK OVERHANG SURFACES SHALL BE GIVEN A CLASS 2 RUBBED FINISH. ALL OTHER CONCRETE SURFACES SHALL BE IN ACCORDANCE WITH SECTION 552.16 OF THE FP-03. ALL STEEL OTHER THAN REINFORCING STEEL EMBEDDED IN CONCRETE SUCH AS EXPANSION JOINTS, GUARD ANGLES, ANCHOR BOLTS, ETC... SHALL BE CONSIDERED INCIDENTAL TO ITEM 55201-0200, STRUCTURAL CONCRETE CLASS A(AE) UNLESS OTHERWISE NOTED.
- REINFORCING STEEL: ALL REINFORCING STEEL SHALL CONFORM TO AASHTO M31, GRADE 60. EPOXY COATED REINFORCING STEEL SHALL ALSO CONFORM TO AASHTO M284. CONVENTIONAL AND EPOXY COATED REINFORCING STEEL SHALL HAVE A MINIMUM YIELD STRENGTH OF  $fy = 60,000$  psi. REINFORCING STEEL SIZES SHOWN ON THESE PLANS ARE U.S. CUSTOMARY (ENGLISH) REINFORCING STEEL SIZES. EPOXY COATED REINFORCING STEEL SHALL BE USED IN THE CONCRETE DECK, ALL DIAPHRAGMS, PARAPETS AND APPROACH SLABS. THE MINIMUM COVER FOR ALL REINFORCING STEEL SHALL BE 2 INCHES UNLESS OTHERWISE SPECIFIED. LENGTHS OF REINFORCING STEEL BARS SHOWN IN PLANS INCLUDE REQUIRED SPLICE LENGTHS FOR SPLICES SHOWN. ANY OTHER SPLICES FOR THE CONVENIENCE OF THE CONTRACTOR AND/OR NOT SHOWN ON THE PLANS SHALL FIRST BE REQUESTED FOR APPROVAL BY THE CONTRACTOR AND SHALL NOT BE UTILIZED UNTIL WRITTEN APPROVAL IS GRANTED BY THE AWARDED OFFICIAL/CONTRACTING OFFICER (AO/CO). REINFORCING STEEL QUANTITIES FOR APPROVED SPLICES FOR THE CONVENIENCE OF THE CONTRACTOR AND NOT SHOWN IN THE PLANS SHALL NOT BE PAID FOR BUT SHALL BE AT THE EXPENSE OF THE CONTRACTOR.
- PRESTRESSING STEEL: PRETENSIONED, PRESTRESSING STEEL STRANDS SHALL BE 270 ksi, 1/2 INCH  $\phi$ , SEVEN WIRE BRIGHT, LOW RELAXATION PRESTRESSING STEEL STRANDS CONFORMING TO AASHTO M203, INCLUDING THE REQUIREMENTS OF SUPPLEMENT 1. EACH STRAND SHALL BE PRETENSIONED TO A TOTAL LOAD OF 31,000 POUNDS AT  $f'si = 0.75$  ( $f's$ ) = 202,500 psi. ESTIMATED LOSSES AND FINAL PRESTRESSED FORCES ARE AS FOLLOWS; SPAN 1 AND 4 GIRDERS = 47,200 psi LOSSES, 23,800 POUNDS PER STRAND; SPAN 2 AND 3 = 48,400 psi LOSSES, 23,600 POUNDS PER STRAND.
- PRESTRESSED CONCRETE GIRDERS: PRESTRESSED CONCRETE GIRDERS SHALL BE MANUFACTURED AS DETAILED IN THESE PLANS. ALL CONCRETE, REINFORCING STEEL, PRESTRESSING STEEL, LIFTING DEVICES, INSERTS AND ACCOMPANYING BOLTS, NEOPRENE ELASTOMERIC BEARING PADS, AND ANY OTHER MATERIALS NECESSARY FOR THE FABRICATION, TRANSPORTATION AND ERECTION OF THE PRESTRESSED CONCRETE GIRDERS SHALL BE CONSIDERED INCIDENTAL TO ITEM 55301-2000 AND ITEM 55301-2010. NEOPRENE ELASTOMERIC BEARING PADS SHALL CONFORM TO AASHTO M251 AND SHALL BE 60 DUROMETER HARDNESS.
- STRUCTURAL STEEL: STRUCTURAL STEEL FOR EXPANSION JOINT RAILS AND PLATES SHALL CONFORM TO AASHTO M270 GR. 36. WELDED ANCHOR STUDS SHALL CONFORM TO AASHTO 169. DIAPHRAGM ANCHOR BOLTS SHALL CONFORM TO ASTM A307. ALL THE ABOVE ITEMS INCLUDING GIRDER SHOE PLATES AND ALL BOLTS, EXCEPT DIAPHRAGM ANCHOR BOLTS, SHALL BE GALVANIZED AFTER FABRICATION.
- WELDING: ALL WELDING SHALL BE IN ACCORDANCE WITH ANSI/AASHTO/AWS D1.5M/D1.5:2008 BRIDGE WELDING CODE, INCLUDING MATERIALS, WORKMANSHIP, INSPECTION AND QUALITY CONTROL. INSPECTION OF SHOP WELDS SHALL BE OUTLINED AND PERFORMED IN THE SHOP AS PART OF THE QUALITY CONTROL PROCESS OF THE FABRICATION PLANT. QUALITY CONTROL PLANS OF THE FABRICATION PLANT SHALL BE SUBMITTED ALONG WITH SHOP DRAWINGS FOR ALL FABRICATED PRODUCTS. INSPECTION OF ALL FIELD WELDS SHALL BE IN ACCORDANCE WITH SPECIAL CONTRACT REQUIREMENT 16(k) AND SHALL BE MEASURED AND PAID UNDER ITEM 15301-0000.
- STRUCTURE TRANSITION RAILINGS: QUANTITIES SHOWN UNDER ITEM 61707-0000 ARE FOR THE THRIEBEAM TRANSITIONS BETWEEN CONCRETE PARAPET AND STANDARD GUARDRAIL SHOWN ON SHEET B-21, INCLUDING THE THRIE BEAM TERMINAL CONNECTOR ATTACHMENT TO THE CONCRETE PARAPET, ALL ATTACHMENT HARDWARE AND WORK, THE W-BEAM TO THRIE BEAM TRANSITION RAIL, ALL POSTS AND BLOCKS AS DETAILED ON SHEET B-21, AND ALL ASSOCIATED HARDWARE. SEE SHEET 3 OF THE ROADWAY PLANS FOR STANDARD GUARDRAIL QUANTITIES AND SHEETS 12 AND 13 OF THE ROADWAY PLANS FOR STANDARD GUARDRAIL DETAILS.
- DRILLED SHAFTS: CASING OF THE DRILLED SHAFTS MAY BE REQUIRED TO PREVENT CAVING OF SURROUNDING MATERIAL. PAYMENT FOR ANY NECESSARY CASING WORK, INCLUDING MATERIALS, EQUIPMENT AND LABOR, SHALL BE INCLUDED IN ITEMS 56501-0600 AND 56501-0800. ITEMS 56501-0600 AND 56501-0800 QUANTITIES INCLUDE DRILLED SHAFTS FROM THE APPROVED TIP ELEVATIONS TO THE BOTTOM OF ABUTMENT CAP ELEVATIONS AT ABUTMENTS, AND FROM THE APPROVED TIP ELEVATIONS TO THE CONSTRUCTION JOINT (CJ) ELEVATIONS SHOWN ON SHEET B-11 FOR ALL PIERS, AND INCLUDES ALL WORK, LABOR, MATERIALS (INCLUDING CONCRETE AND REINFORCING STEEL), EQUIPMENT AND WORKMANSHIP NECESSARY FOR THE CONSTRUCTION OF THE DRILLED SHAFTS. CONSTRUCTION OF THE CONCRETE COLUMNS FROM THE CJ ELEVATIONS TO THE PIER CAPS, INCLUDING THE HORIZONTAL STRUTS SHALL NOT BE PAID UNDER THE DRILLED SHAFT ITEMS BUT SHALL BE MEASURED AND PAID FOR UNDER ITEM 55201-0200, STRUCTURAL CONCRETE, CLASS A(AE) AND ITEM 55401-1000, REINFORCING STEEL, GRADE 60.
- PERMANENT STEEL DECK FORMS: PERMANENT STEEL (STAY IN PLACE) DECK FORMS SHALL BE USED FOR THE CONSTRUCTION OF THE CONCRETE DECK OF SPAN 1. AT THE CONTRACTOR'S OPTION, PERMANENT STEEL (STAY IN PLACE) DECK FORMS MAY ALSO BE USED FOR THE CONSTRUCTION OF THE CONCRETE DECK FOR SPANS 2, 3 AND 4. COMPLETE SHOP DRAWINGS/PLANS, DESIGN CALCULATIONS, AND REQUIREMENTS SHALL BE SUBMITTED FOR REVIEW AND SHALL BE APPROVED IN WRITING BY THE AO/CO PRIOR UTILIZATION OF THE PROPOSED SYSTEM. ALL MATERIALS AND WORK (INCLUDING SUBMITTALS INDICATED ABOVE) SHALL BE IN ACCORDANCE WITH SECTION 562 OF THE FP-03 AND SUPPLEMENTAL SPECIFICATIONS.
- REMOVAL OF EXISTING BRIDGE: EXISTING BRIDGE N666 IS TO REMAIN IN PLACE DURING AND AFTER CONSTRUCTION OF THE NEW BRIDGE. THE APPROACH ROADWAYS TO EXISTING BRIDGE N666 SHALL BE OBLITERATED AFTER THE NEW BRIDGE IS CONSTRUCTED AND TRAFFIC IS USING THE NEW BRIDGE, AND CONCRETE BARRIERS SHALL BE PLACED AT THE ENDS OF THE EXISTING BRIDGE N666 AS SHOWN ELSEWHERE IN THESE PLANS TO PREVENT VEHICLES FROM DIVING ONTO EXISTING BRIDGE N666.
- SPAN 1 CONSTRUCTION: THE CONTRACTOR SHALL COORDINATE THE CONSTRUCTION OF SPAN 1, INCLUDING ABUTMENT 1 AND PIER 1, WITH THE BURLINGTON NORTHERN SANTA FE (BNSF) RAILROAD IN ORDER TO PREVENT ANY UNNECESSARY DOWN TIME OR INTERRUPTION OF TRAIN TRAFFIC THROUGH THE CONSTRUCTION SITE. ALL PROJECT STAKEHOLDERS SHALL BE NOTIFIED OF COORDINATION EFFORTS SO THAT ALL WORK CAN BE PERFORMED AS SMOOTHLY AS POSSIBLE.
- SEE SECTION 107 OF THE SUPPLEMENTAL SPECIFICATIONS FOR SECTION (c) AND (c1), RAIL ROAD REQUIREMENTS. THE CONTRACTOR IS ALSO REFERRED TO THE BNSF AGREEMENT WITH THE BIA, SECTION C-1 FOR ADDITIONAL REQUIREMENTS.
- ARTICULATED CONCRETE BLOCK REVETMENT: THIS WORK SHALL CONSIST OF FURNISHING ALL LABOR, EQUIPMENT AND MATERIALS TO PLACE AN ARTICULATED CONCRETE BLOCK REVETMENT SYSTEM ON THE SLOPES OF THE ABUTMENT EMBANKMENTS AS DETAILED IN THESE PLANS. THE SYSTEM SHALL CONSIST OF 8 FT. BY 16 FT. SECTIONS PLACED ADJACENT TO EACH OTHER AND POSITIVELY CONNECTED BY THE MANUFACTURERS RECOMMENDED METHOD TO PROVIDE A HOMOGENEOUS EROSION PROTECTION SYSTEM. IF NECESSARY, IRREGULARLY SHAPED SECTIONS SHALL BE DESIGNED AND FABRICATED TO FIT CORNERS AND OTHER IRREGULAR AREAS. THE SECTIONS SHALL BE MADE OF CONCRETE BLOCKS INTERCONNECTED Laterally AND TRANSVERSELY BY STAINLESS STEEL CABLES CAST INTO THE CONCRETE BLOCKS. A GEOTEXTILE FABRIC CONFORMING TO SPECIFICATIONS SHALL BE PLACED/ATTACHED TO THE BOTTOM OF EACH SECTION. THE CONCRETE BLOCKS SHALL BE A TRUNCATED PYRAMID SHAPE WITH THE TOP SURFACE 11.5 IN. BY 11.5 IN. SQUARE AND THE BASE SURFACE 15.5 IN. BY 15.5 IN. SQUARE. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND DESIGN DATA FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION AND USE OF THE SYSTEM.
- CONCRETE BARRIER: ALL CONCRETE AND REINFORCING STEEL SHALL BE PAID UNDER ITEMS 55201-0200 AND 55401-2000.
- THE CONTRACTOR SHALL HAVE A QUALIFIED GEOLOGIST PRESENT DURING THE DRILLING OF THE SHAFTS AND SHALL VERIFY THAT THE HOLES FOR THE SHAFTS ARE AT LEAST 3 m INTO COMPETENT SANDSTONE BEFORE DRILLING FOR THE NEXT SHAFT.

BRIDGE ESTIMATED QUANTITIES

ITEM	DESCRIPTION	QUANTITY	UNIT	AS BUILT
20403-0000	Unclassified Borrow (Bridge Abutment Embankments)	9868	c.y.	
25112-3000	Articulated Concrete Block Revetment	2846	s.y.	
25302-1000	Gabions, galvanized coated, Class 2.	721	c.y.	
55201-0200	Structural Concrete Class A(AE)	1888	c.y.	
55301-2000	Precast Prestressed Concrete BT-72 Girder 72", 130'-5" long	12	ea.	
55301-2010	Precast Prestressed Concrete BT-72 Girder 72", 129'-4" long	12	ea.	
55401-1000	Reinforcing Steel, Grade 60	186,034	lb	
55401-2000	Reinforcing Steel, Epoxy Coated, Grade 60	△ 236,909	lb	
56501-0600	Drilled Shafts, 4'-0" diameter	507	lf	
56501-0800	Drilled Shafts, 5'-0" diameter	407	lf	
61707-0000	Structure Transition Railing (Thrie Beam)	75	lf	
61711-5000	Impact Attenuator, QUADGUARD	2	ea.	
61901-1300	Fence, Chain Link Pedestrian Fence	552	lf	
61901-1800	Fence, Chain Link, 60-inch height	552	lf	
63308-3000	Object Markers, Type 3, 1 Post and Hardware; 2.00 lb/ft.	4	ea.	

The quantities shown above are related to bridge construction only and are not included in the quantities shown on Sheet 3. The quantities shown above shall be combined with the quantities shown on Sheet 3 to obtain the total estimated quantities for the entire project. The total estimated quantities for the entire project are shown on the Bid Schedule.

ITEM 61707-0000  
STRUCTURE TRANSITION RAILING

STATION TO STATION	LOCATION	LENGTH (ft)
24+49.83 to 24+68.58	L.T.	18.75
24+49.83 to 24+68.58	R.T.	18.75
30+21.92 to 30+40.67	L.T.	18.75
30+21.92 to 30+40.67	R.T.	18.75
TOTAL:		75.00

The quantities show above include only thrie-beam transitions from concrete barriers to standard guardrail as detailed on Sheet B-21.

ITEM 20403-0000  
UNCLASSIFIED BORROW (Bridge Abutment Embankments)

LOCATION - STATION TO STATION	CUT (c.y.)	FILL (c.y.)	* BORROW (c.y.)	WASTE (c.y.)
ABUT 1 - 24+83.00 to 25+24.98	0	2246	2808	0
ABUT 2 - 29+23.75 to 30+07.50	299	5947	7060	0
TOTAL . . .	299	8193	9868	0

\* 25% Shrinkage Factor applied

NOTE: The quantity shown above is not included in the quantity shown on Sheet 3 for Item 20403-0000.


△ - Revised Item 55401-2000 quantity.

REVISED 04/21/2015

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DEPARTMENT OF THE INTERIOR  
BUREAU OF INDIAN AFFAIRS  
NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

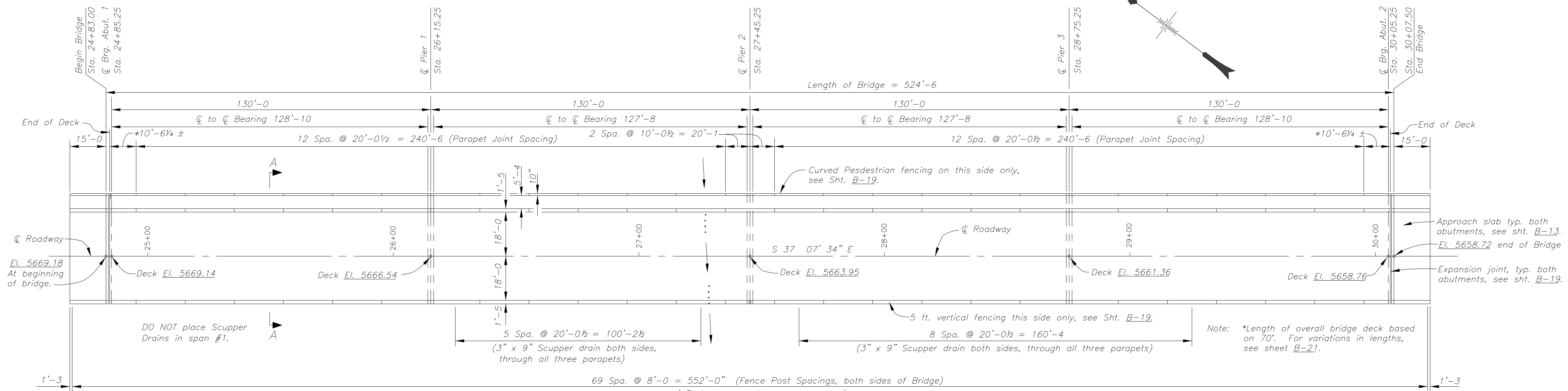
RIO PUERCO BRIDGE  
BRIDGE GENERAL NOTES,  
ESTIMATED QUANTITIES & TABLES

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Drawn by: rsth, dc, cdh	Date: 01/17/14
Revised by: cdh	Date: 04/21/2015
File Name: 01_BIAgrnd	



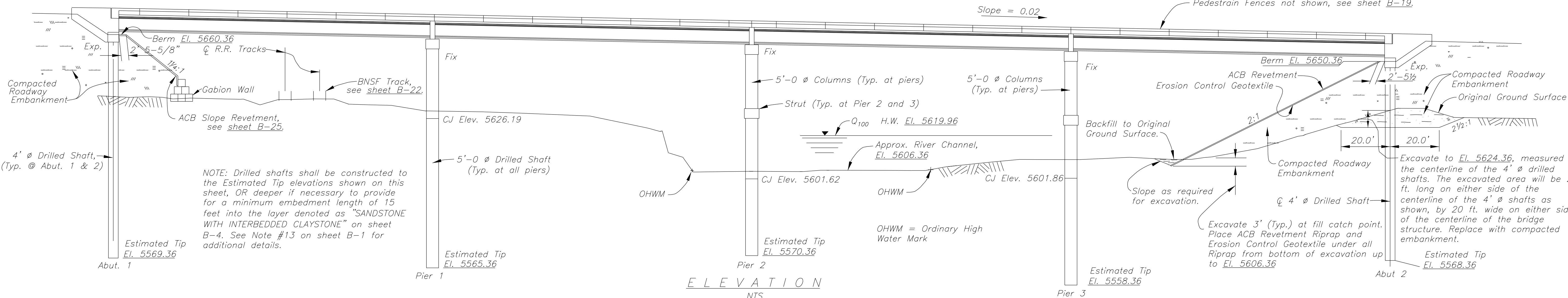
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REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	AZ	Navajo	N2007	N2007(1-1)1,2&4	B-2	63



NOTE: Permanent steel (stay-in-place) deck forms shall be utilized for the construction of Span 1. Permanent steel deck forms may also be used for the construction of Spans 2, 3 and 4 at the Contractor's option. See Sheet B-1, Note #14 for details.

PLAN  
NTS

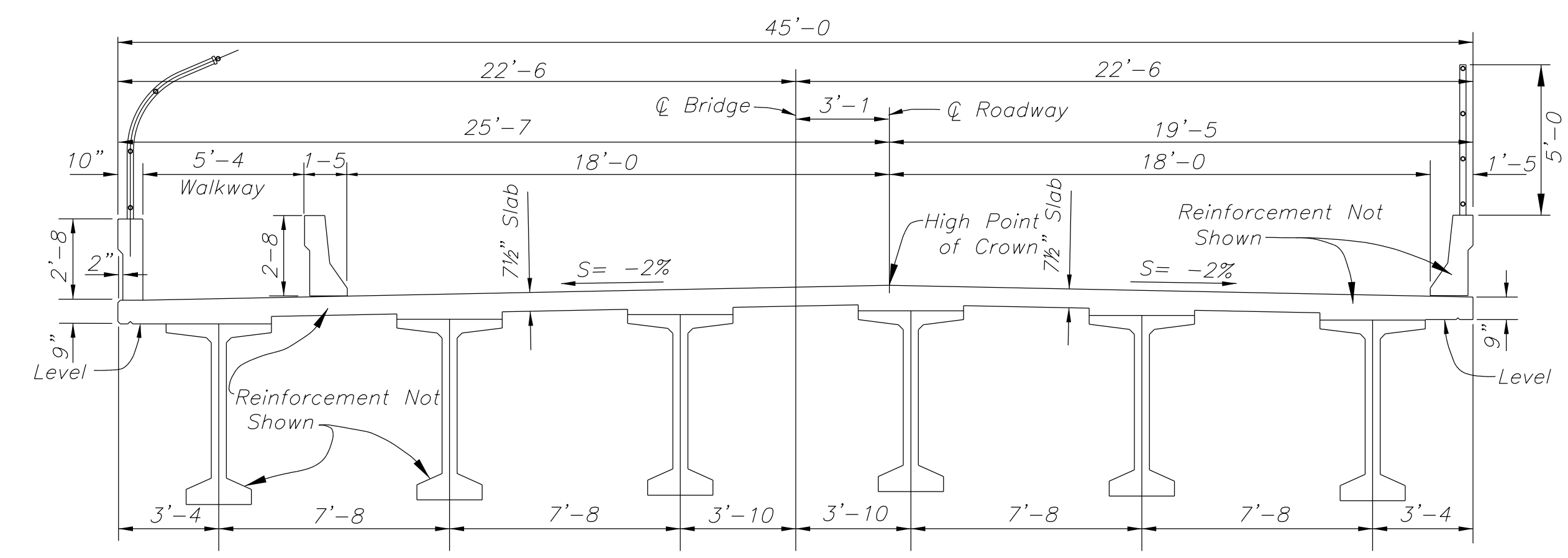


ELEVATION  
NTS

Note: Backfilling of abutment caps and backwalls is restricted to berm elevations shown, prior to girder placement. (Typ. at both abutments).

HYDRAULIC DATA  
 Drainage area = 2160 sq. mi.  
 $Q_{50} = 23,200$  cfs El. 5619.46  $V=10.0$  ft./s  
 $Q_{100} = 26,100$  cfs El. 5619.96  $V=10.0$  ft./s

APPLIED STRUCTURAL LOADS  
 Abutment #1 : 314 tons/shaft (max.)  
 Pier #1 : 527 tons/shaft (max.)  
 Pier #2 : 525 tons/shaft (max.)  
 Pier #3 : 545 tons/shaft (max.)  
 Abutment #2 : 308 tons/shaft (max.)



SECTION A - A  
NTS

NOTE  
 For specific location of the beginning and ending Bridge stations, see Abutment Plan on Sheet B-9.

UNITED STATES  
 DEPARTMENT OF THE INTERIOR  
 BUREAU OF INDIAN AFFAIRS  
 NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

RIO PUERCO BRIDGE  
 STRUCTURE LAYOUT

Designed by: BUREAU OF RECLAMATION  
 Drawn by: BOR, dc, rsh, cdh Date: 01/17/14  
 Revised by: - - Date: - -  
 File Name: 02\_BIA\_plan

I:\PROJECTS\2007\N2007\1-1314\_02\BIA\02\_BIA\_PLAN.dwg, Plot: 01-18-2010 10:00:00 AM, Plot: 01-18-2010 10:00:00 AM, User: bor, PLOT: 01-18-2010 10:00:00 AM

### WEATHERING

**FRESH (W1):** Body of rock that is not oxidized or discolored; fracture surfaces are not oxidized or discolored\*; no separation of grain boundaries; no change of texture and no solutioning. Hammer rings when crystalline rocks are struck.

**SLIGHTLY WEATHERED TO FRESH (W2):\*\***

**SLIGHTLY WEATHERED (W3):** Discoloration or oxidation is limited to surface of, or short distance from fracture; some feldspar crystals are dull; olivine or pyroxene phenocrysts may be altered to iddingsite; fracture surfaces have minor to complete discoloration or oxidation; no visible separation of grain boundaries; texture preserved and minor leaching of soluble minerals may present. Hammer rings when crystalline rocks are struck, body of rock is not weakened by weathering.

**MODERATELY TO SLIGHTLY WEATHERED (W4):\*\***

**MODERATELY WEATHERED (W5):** Discoloration or oxidation extends from fractured, usually throughout body of rock; ferromagnesian minerals are "rusty", feldspar crystals are "cloudy;" all fracture surfaces are discolored or oxidized; partial opening of grain boundaries visible; texture generally preserved, but soluble minerals may be mostly leached. Hammer does not ring when rock is struck, body of rock is slightly weakened.

**INTENSELY TO MODERATELY WEATHERED (W6):\*\***

**INTENSELY WEATHERED (W7):** Body of rock is discolored or oxidized throughout; all feldspar and ferromagnesian minerals are altered to clay to some extent. All fracture surfaces are discolored or oxidized, surface friable; partial separation of grain boundaries, rock is friable; in situ aggregation of granitics common in semi-arid regions; texture altered and leaching of soluble minerals may be complete. Rock has dull sound when struck with hammer, rock is weakened, usually can be broken with moderate to heavy manual pressure or by light hammer blow without reference to planes of weakness.

**VERY INTENSELY WEATHERED (W8):\*\***

**DECOMPOSED (W9):** Body of rock is discolored or oxidized throughout, but resistant minerals such as quartz may be unaltered; all feldspar and ferromagnesian minerals are completely altered to clay; complete separation of grain boundaries (disaggregated), partial or complete remnant rock structure may be preserved, but resembles a soil.

**NOTE:** Weathering categories are established primarily for crystalline rock and those with ferromagnesian minerals, weathering in various sedimentary rocks will not always fit the categories established. The term "weathering" includes all alterations due to any process including surface weathering and hydrothermal alteration.

\*Characteristics of fracture surfaces does not include directional weathering along shear or faults and their associated fracture zones; for example a shear that carries weathering to great depths in a fresh rock mass would not require the whole rock mass to be classified as weathered.

\*\* Combination description are used where equal distribution of both weathering characteristics are present over significant intervals or where characteristics noted are "in between" the diagnostic characteristics.

### SOIL CONSISTENCY

Vary soft	Thumb will penetrate soil more than 1 in. (25 mm).
Soft	Thumb will penetrate soil about 1 in. (25 mm).
Firm	Thumb will indent soil about 1/4 in. (5 mm).
Hard	Thumb will not indent soil but readily indented with thumbnail.
Very hard	Thumbnail will not indent soil.

### BEDROCK HARDNESS / STRENGTH

**EXTREME HARD (H1):** Core, fragment or exposure cannot be scratched with knife or sharp pick; can only be chipped with repeated heavy hammer blows.

**VERY HARD (H2):** Cannot be scratched with knife or sharp pick. Core or fragments breaks with repeated heavy hammer blows.

**HARD (H3):** Can be scratched with knife or sharp pick with difficulty (heavy pressure). Heavy hammer blow required to break specimen.

**MODERATELY HARD (H4):** Can be scratched with knife or sharp pick with light or moderate pressure. Core or fragment breaks with moderate hammer blow.

**MODERATELY SOFT (H5):** \*Can be grooved 1/16 in. (2 mm) deep by knife or sharp pick with (moderately or heavy) pressure. Core or fragment breaks with hammer blow or heavy manual pressure.

**SOFT (H6):** Can be grooved or gouged easily by knife or sharp pick with light pressure, can be scratched with fingernail. Breaks with light to moderate manual pressure.

**VERY SOFT (H7):** Can be readily indented, grooved or gouged with fingernail, or carved with a knife. Breaks with light pressure.

**NOTE:** Bedrock units softer than H7, Very Soft, are described using USCS (soils) consistency descriptors.

### FRACTURE DENSITY

Alpha-numeric descriptor	Descriptor	Criteria
F0	Unfractured	No fractures.
F1	Very slightly fractured	Core recovered mostly in lengths greater than 3 feet ( 1 m).
F2	Slightly to very slightly fractured	
F3	Slightly fractured	Core recovered mostly in lengths from 1 to 3 feet (300 to 1000 mm) with few scattered lengths less than 1 foot (300 mm) or greater than 3 feet (1000 mm).
F4	Moderately to slightly fractured	
F5	Moderately fractured	Core recovered mostly in 0.33 to 1.0 foot (100 to 300 mm) lengths with most lengths about 0.67 foot (200 mm)
F6	Intensity to moderately fractured	
F7	Intensity fractured	Lengths average from 0.1 to 0.33 foot (30 to 100 mm) with scattered fragmented intervals. Core recovered mostly in lengths less than 0.33 foot (100 mm).
F8	Very intensely to intensely fractured	
F9	Very intensely fractured	Core recovered mostly as chips and fragments with a few scattered short core lengths.

### Sedimentary and Pyroclastic rock particle-size descriptors

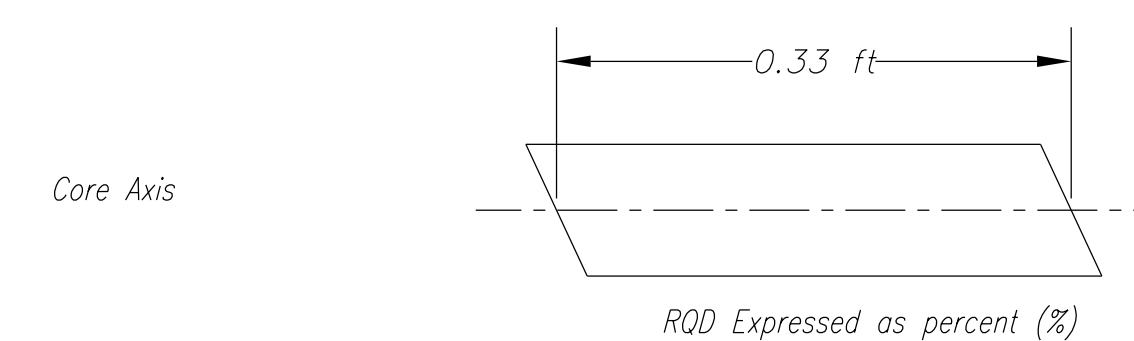
Size in mm (inches)	SEDIMENTARY Rounded, Subrounded, subangular		PYROCLASTIC	
	Particle or fragment	Lithified product	Fragment	Lithified product
300 (12)	Boulder	BOULDER CONGLOMERATE	Boulder	ACGLOMERATE (Boulder, cobble, gravel, and sand)
256 (10)	Cobble	COBBLE CONGLOMERATE	Cobbler	
64 (2.5)	Coarse gravel	PEBBLE CONGLOMERATE	Coarse gravel	
20 (0.8)	Fine gravel		Fine gravel	
4.75 (0.2)	Coarse sand	SANDSTONE (Coarse sand, medium sand and fine sand)	Coarse sand	TUFF (Coarse, gravel to fine sand, and ash)
2.00 (0.08)	Medium sand		Medium sand	
0.42 (0.02)	Fine sand		Fine sand	
0.074 (0.003)	Silt	SILTSTONE/ SHALE	Ash	
0.005	Clay	CLAYSTONE/ SHALE		

### Rock Color

All colors used to describe rock are taken from the Geological Society of America Rock color Chart (7th printing, 1991, with revised text). Unless indicated all colors are described from wet samples.

### ROCK QUALITY DESCRIPTION (RQD)

$$RQD = \frac{\text{Sum of length of solid core pieces greater than or equal to 0.33 ft long}}{\text{Length of the run in feet}} \times 100$$



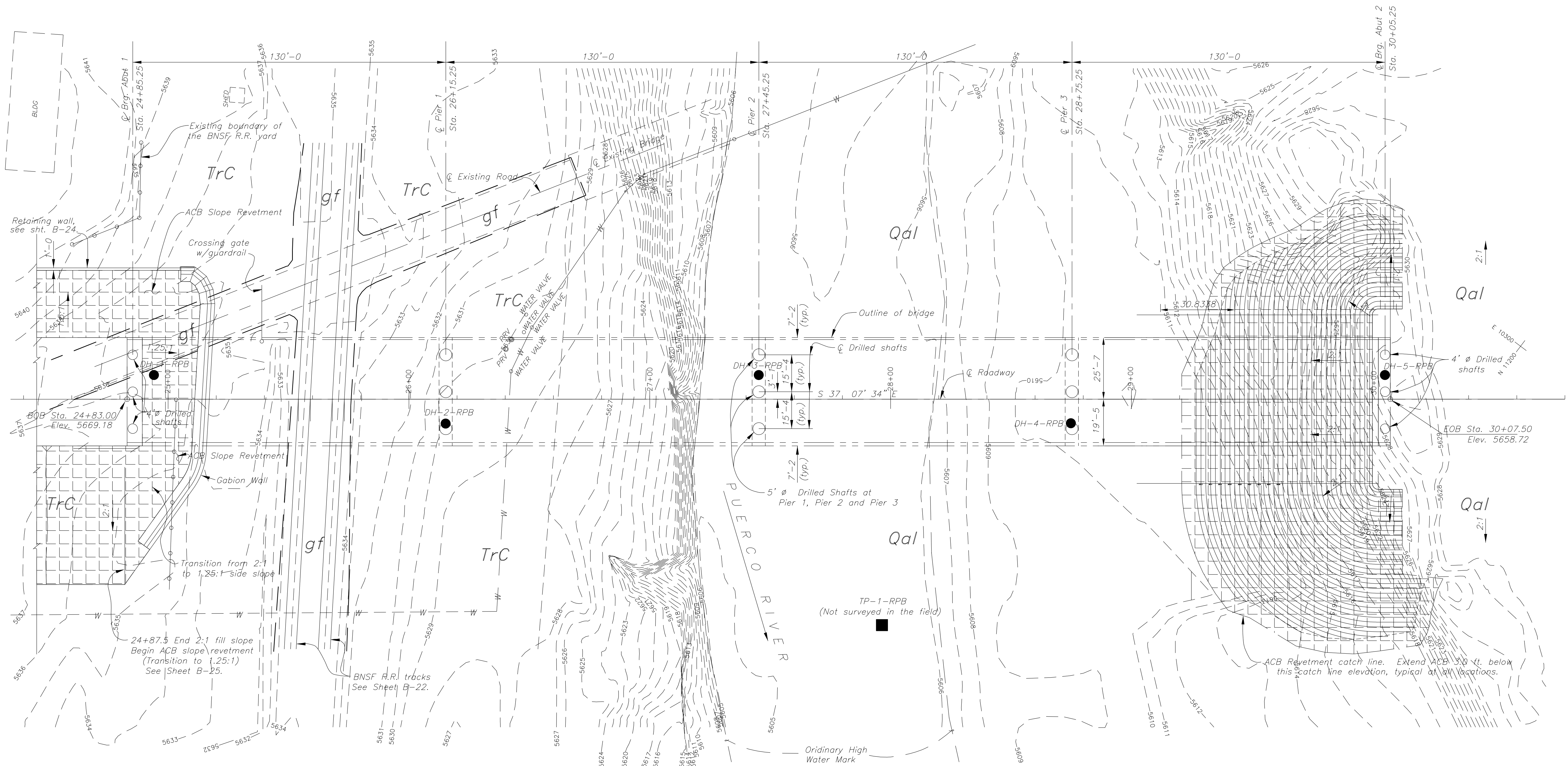
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BUREAU OF INDIAN AFFAIRS  
NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

RIO PUERCO BRIDGE  
STANDARD DESCRIPTIONS AND DESCRIPTIVE  
CRITERIA FOR ROCK

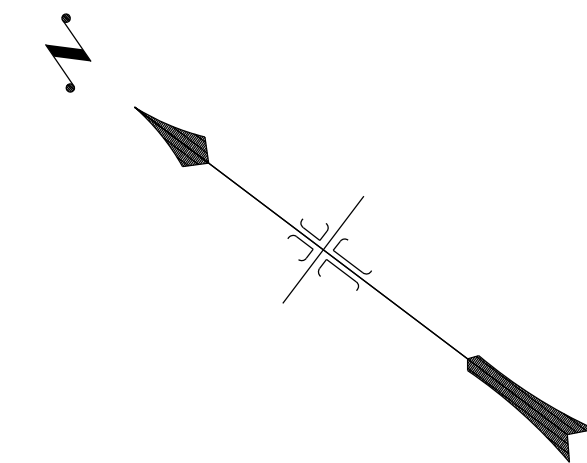
Designed by: BUREAU OF RECLAMATION	
Drawn by: BOR, cdh, rsh	Date: 01/24/13
Revised by: - -	Date: - -
File Name: 03_BIAsoil	







DRILL HOLE	STATION	OFFSET
DH-1-RPB	24+95.25	10' Lt.
DH-2-RPB	26+15.25	10' Rt.
DH-3-RPB	27+45.25	10' Lt.
DH-4-RPB	28+75.25	10' Rt.
DH-5-RPB	30+05.25	10' Lt.



**FOUNDATION PLAN**  
NTS

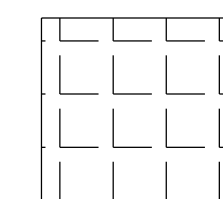
**GEOLOGIC NOTES**

For General Geologic Legend, Explanation, and Notes, see Sheet B-4.

For Standard Descriptions and Descriptive Criteria for Rock, see Sheet B-3.

Qal was not mapped when found in thicknesses of less than 2.5 feet.

For complete descriptions of drill holes, see the geologic logs which can be provided upon written request.



- Articulated Concrete Block-CC20 (ACB) Revetment erosion protection.

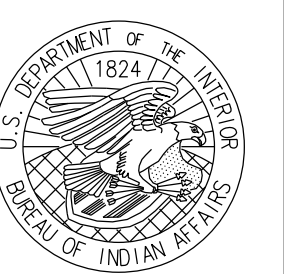
NOTE: The engineering data shown is preliminary only. for final design, see appropriate specification dwg's.

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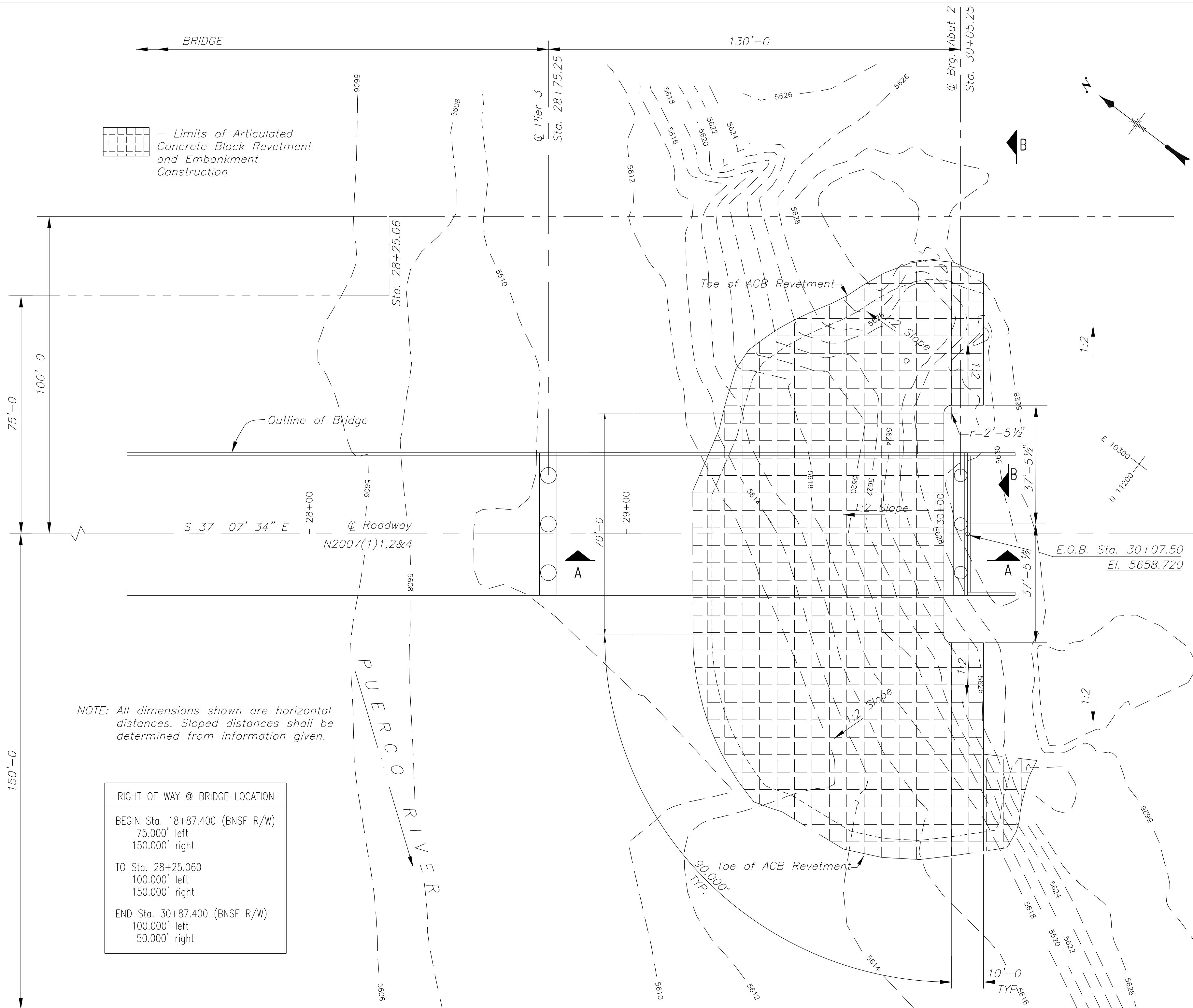
**RIO PUERCO BRIDGE**  
FOUNDATION PLAN  
EXPLORATION AND SURFACE GEOLOGY LOCATION

Designed by: BUREAU OF RECLAMATION	
Drawn by: BOR, rsh, dc, cdh	Date: 01/17/14
Revised by: - -	Date: - -
File Name: 05_Rbio35	



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REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	AZ	Navajo	N2007	N2007(1-1),2&4	B-6	63



**EROSION PROTECTION GENERAL NOTES**

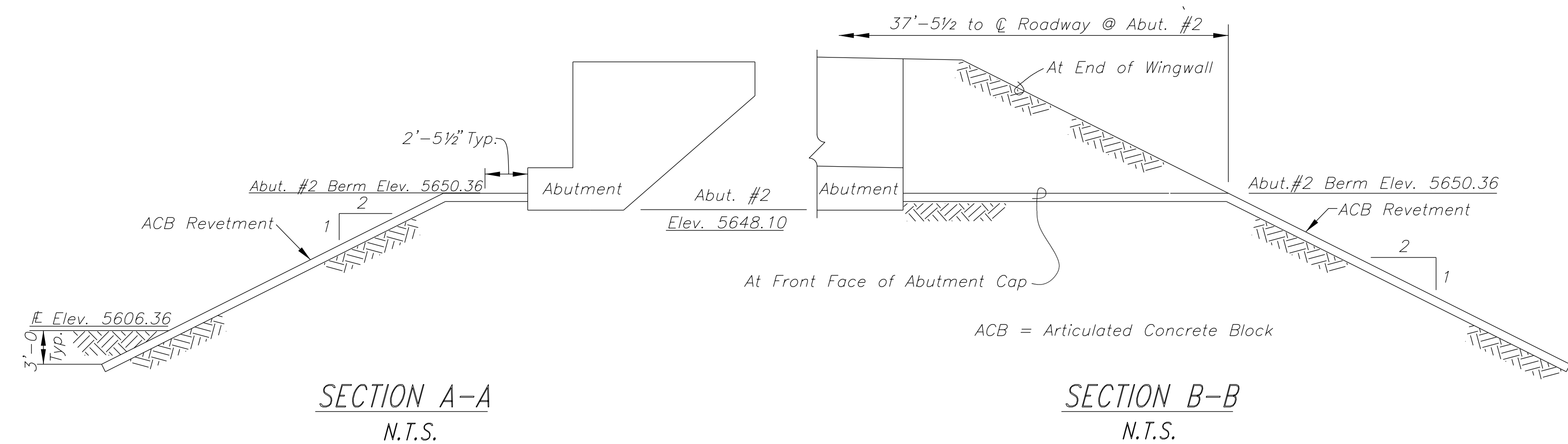
- Articulated Concrete Block (ACB) Revetment shall conform to Section 251 of the FP-03, all applicable Supplemental Specifications and to the details shown in these plans.
- Embankment construction below ACB Revetment shall conform to Section 204 of the FP-03. Excavation for ACB Revetment shall conform to Section 209 of the FP-03. All embankment above natural ground at abutments is included in the quantity for Item 20403-0000, Unclassified Borrow and shall be paid for under Item 20403-0000, Unclassified Borrow. All excavation for ACB Revetment toe construction shall be considered incidental to Item 25112-3000, ACB Revetment and shall not be measured for payment. Suitable excavated material may be used as embankment material on the project as long as the material conforms to the specifications for embankment construction.
- ACB Revetment shall have Erosion Control Geotextile placed below it as shown on this sheet and elsewhere on the plans. Erosion Control Geotextile shall conform to Section 714.01 (a) (4) Type IV-C of the FP-03.
- See sheet B-23 for additional ACB Revetment details. All work involved in the furnishing, fabricating and installation of the ACB Revetment shall be measured and paid for under Item 25112-3000.
- See sheets B-22 through B-25 for ABUTMENT 1 details and installation details.

RIGHT OF WAY @ BRIDGE LOCATION

BEGIN Sta. 18+87.400 (BNSF R/W)	75.000' left	150.000' right
TO Sta. 28+25.060	100.000' left	150.000' right
END Sta. 30+87.400 (BNSF R/W)	100.000' left	50.000' right

LOCATION	CUT(c.y.)	FILL(c.y.)	BORROW(c.y.)	WASTE(c.y.)
LEFT ABUT#2	3,525	618	0	2907
CENTER ABUT#2	415	2225	1810	0
RIGHT ABUT#2	945	2104	1159	0
TOTAL (c.y.)	4,885	4947	62	0

**REVTMENT LAYOUT**  
N.T.S.



**SECTION A-A**  
N.T.S.

**SECTION B-B**  
N.T.S.

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NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

**RIO PUERCO BRIDGE**  
EROSION PROTECTION DETAILS ABUTMENT 2

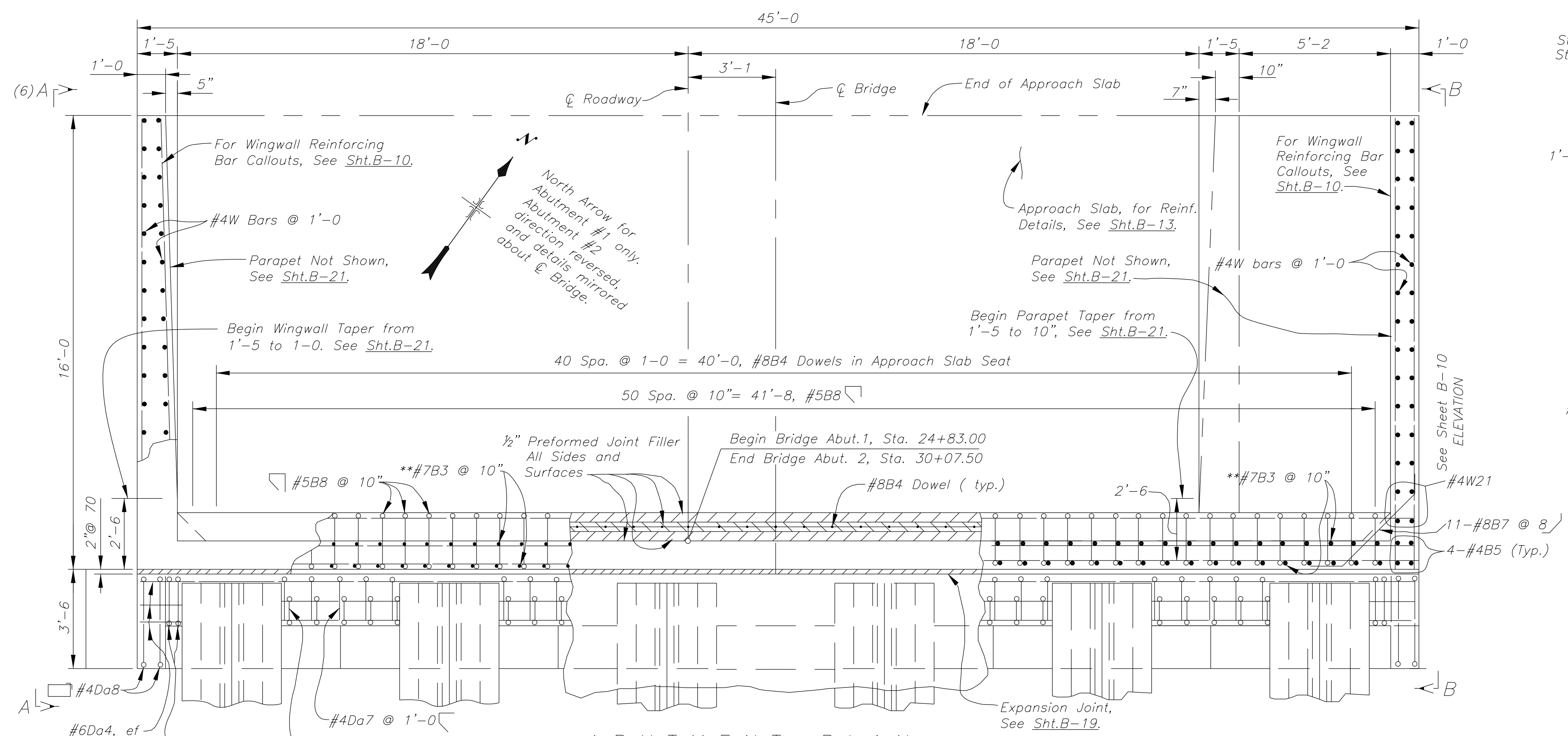
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Drawn by: rsh, dc, cdh	Date: 05/21/14
Revised by: --	Date: --
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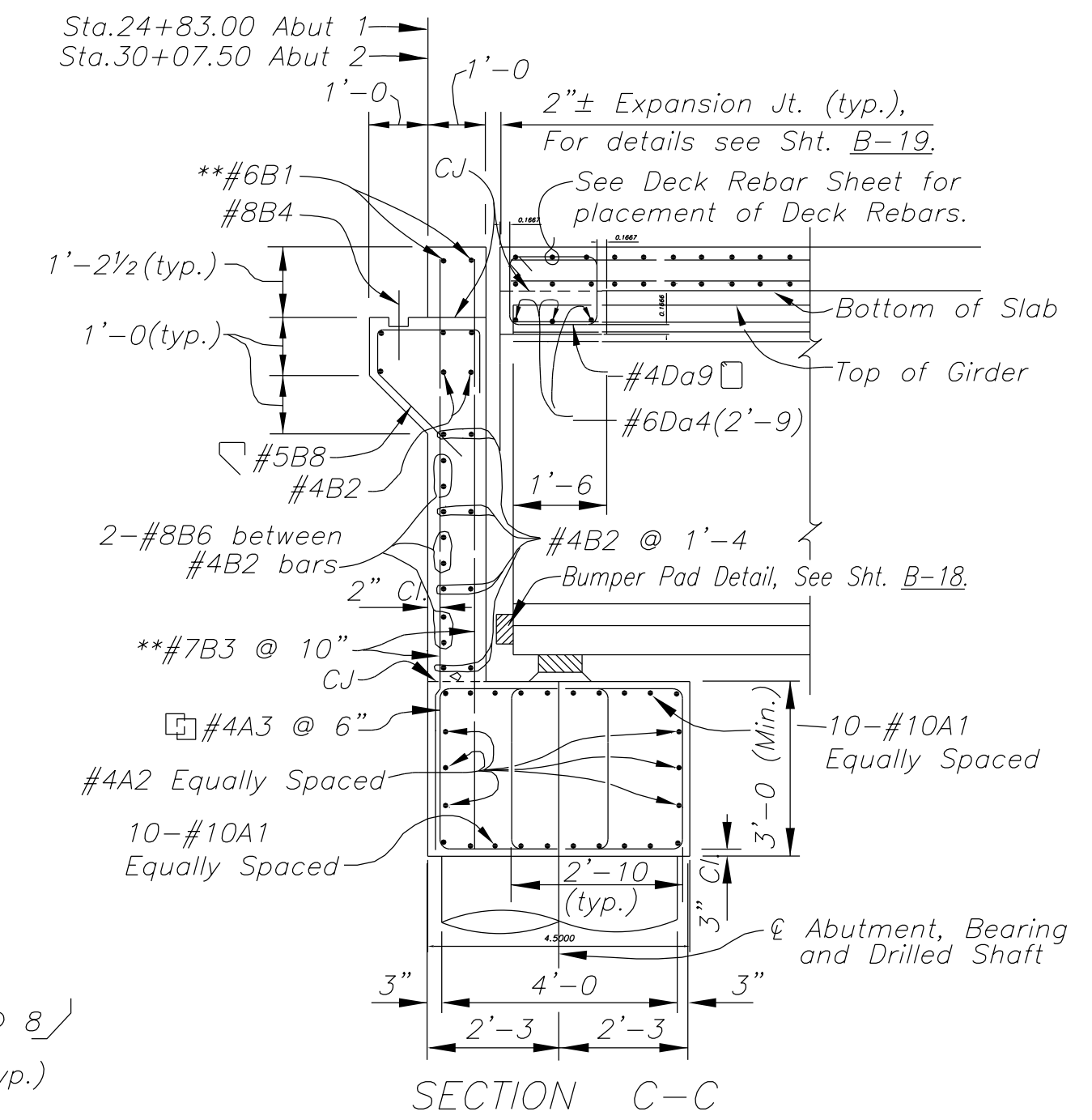




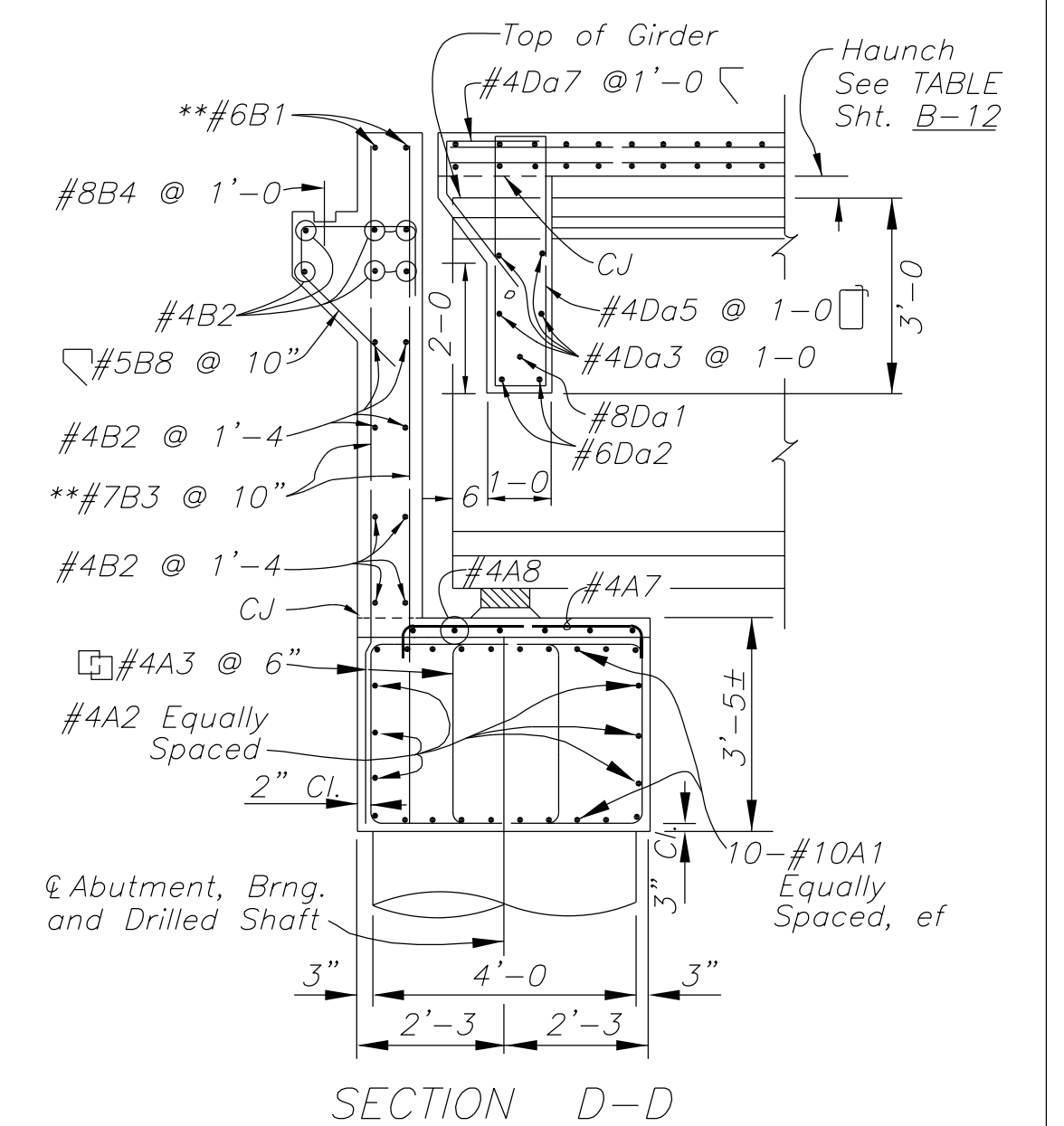
REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	AZ	Navajo	N2007	N2007(1-1)1,2&4	B-9	63



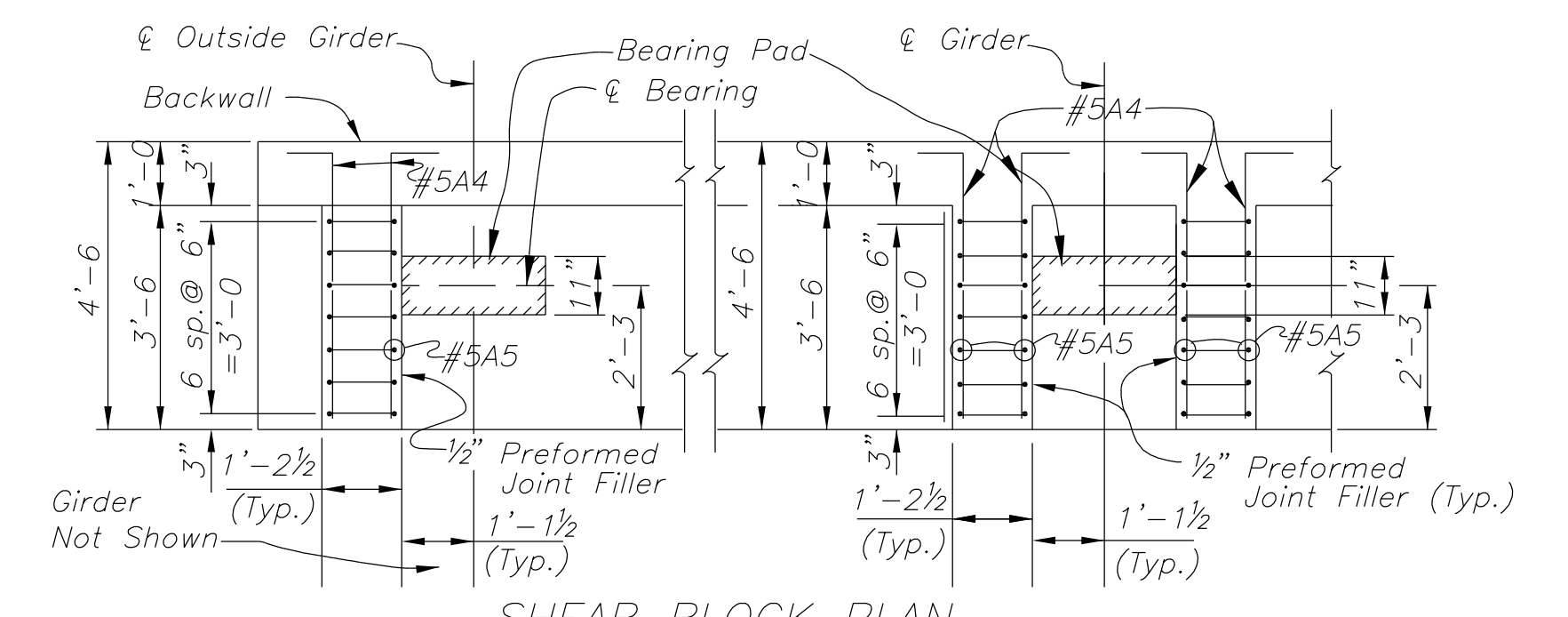
**ABUTMENT PLAN**  
 (ABUTMENT 1 SHOWN, ABUTMENT 2 SIMILAR, MIRRORED ABOUT BRIDGE C)  
 (FOR WINGWALL SECTION A-A & B-B DETAILS, SEE SHEET B-10.)



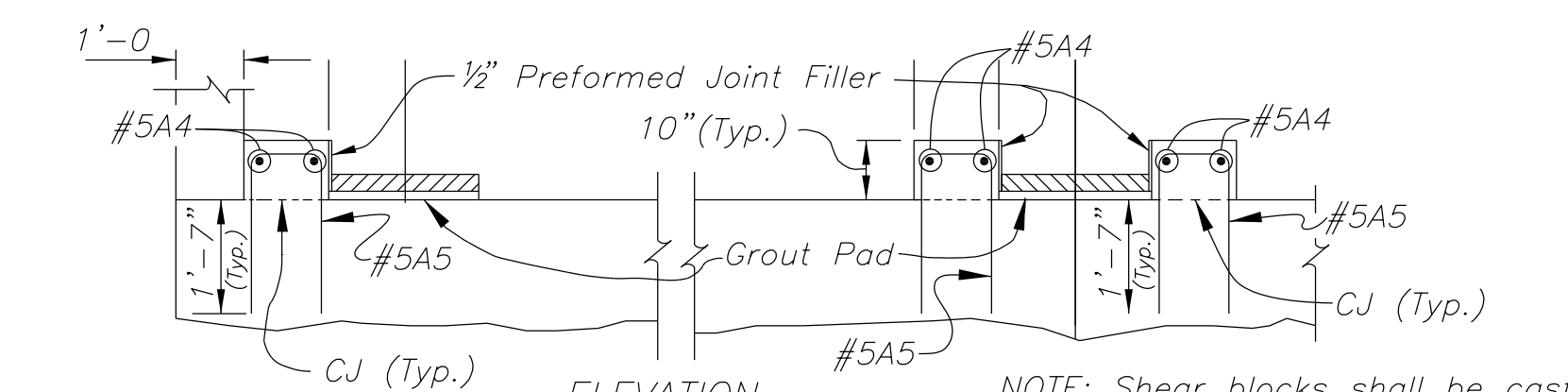
SECTION C-C



SECTION D-D

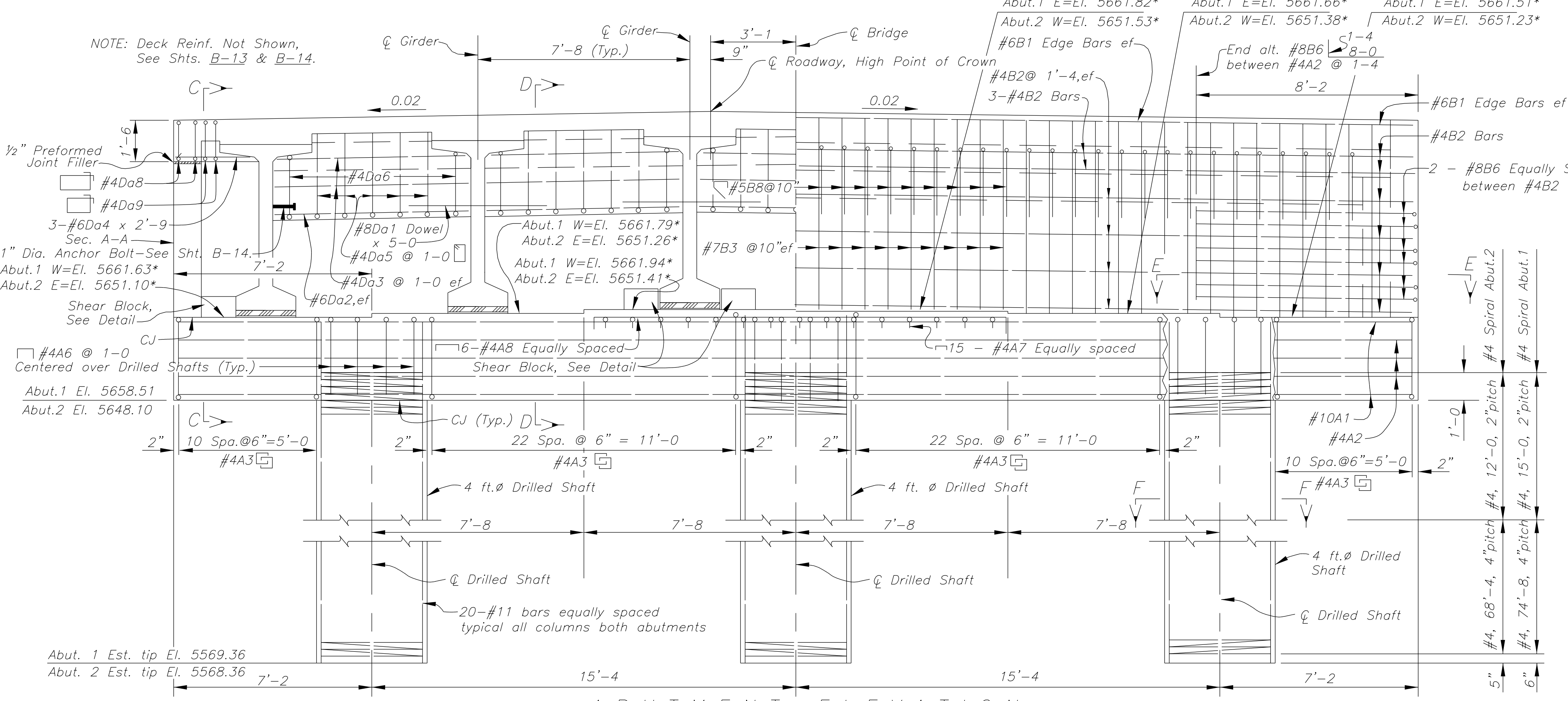


SHEAR BLOCK PLAN



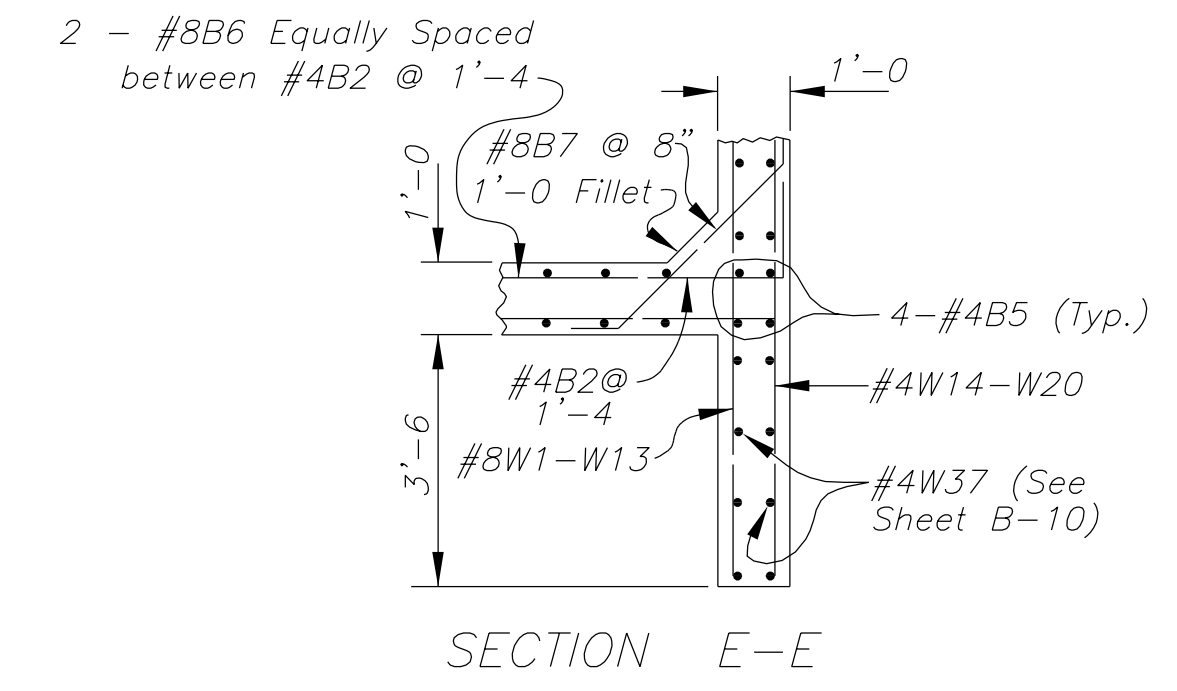
ELEVATION SHEAR BLOCK DETAIL

NOTE: Shear blocks shall be cast only after girders are in place. All reinforcement in shear block is No. 5.

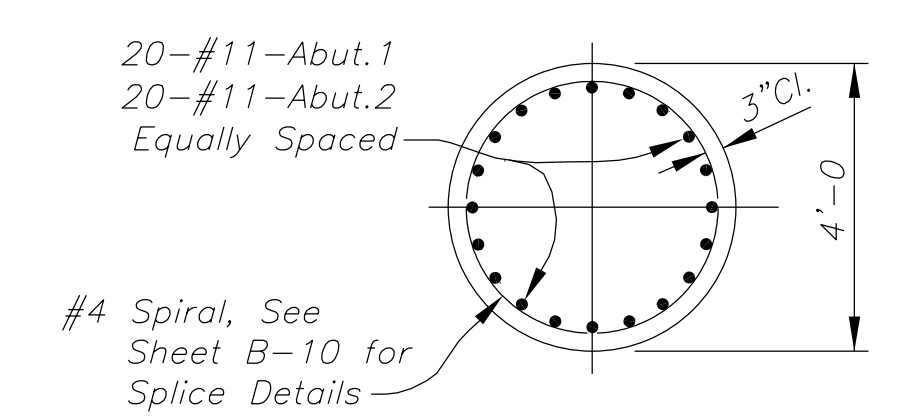


**ABUTMENT ELEVATION**  
 (ABUTMENT 1 SHOWN, ABUTMENT 2 SIMILAR, MIRRORED ABOUT BRIDGE C)  
 (NOTE: FOR TOP OF GROUT PAD ELEVATIONS, SEE DWG. B-11.)

Note: See Column Cage Alignment Detail on Sheet B-18 for cage alignment bars for Abutment's drilled shafts.



SECTION E-E




SECTION F-F

NOTE  
 \* W = West Side = Downstream Side of Abutment 1 and 2.  
 \* E = East Side = Upstream Side of Abutment 1 and 2.  
 \*\* Epoxy Coated Reinforcing bars

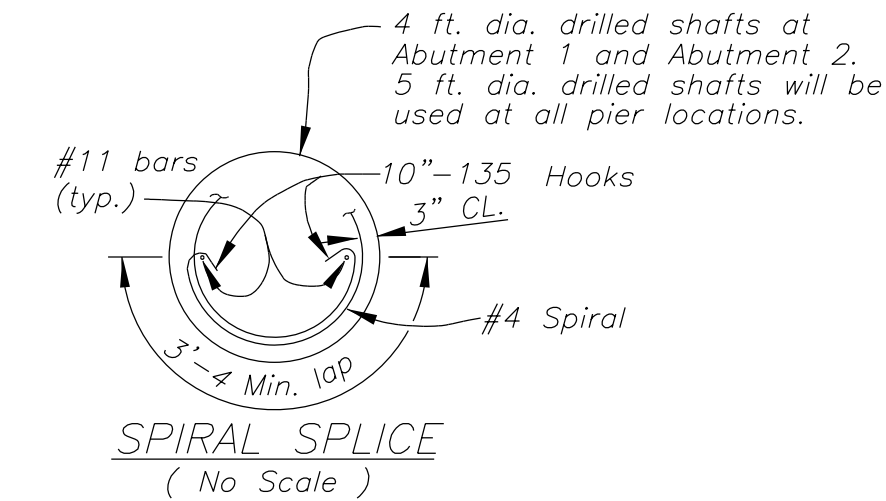
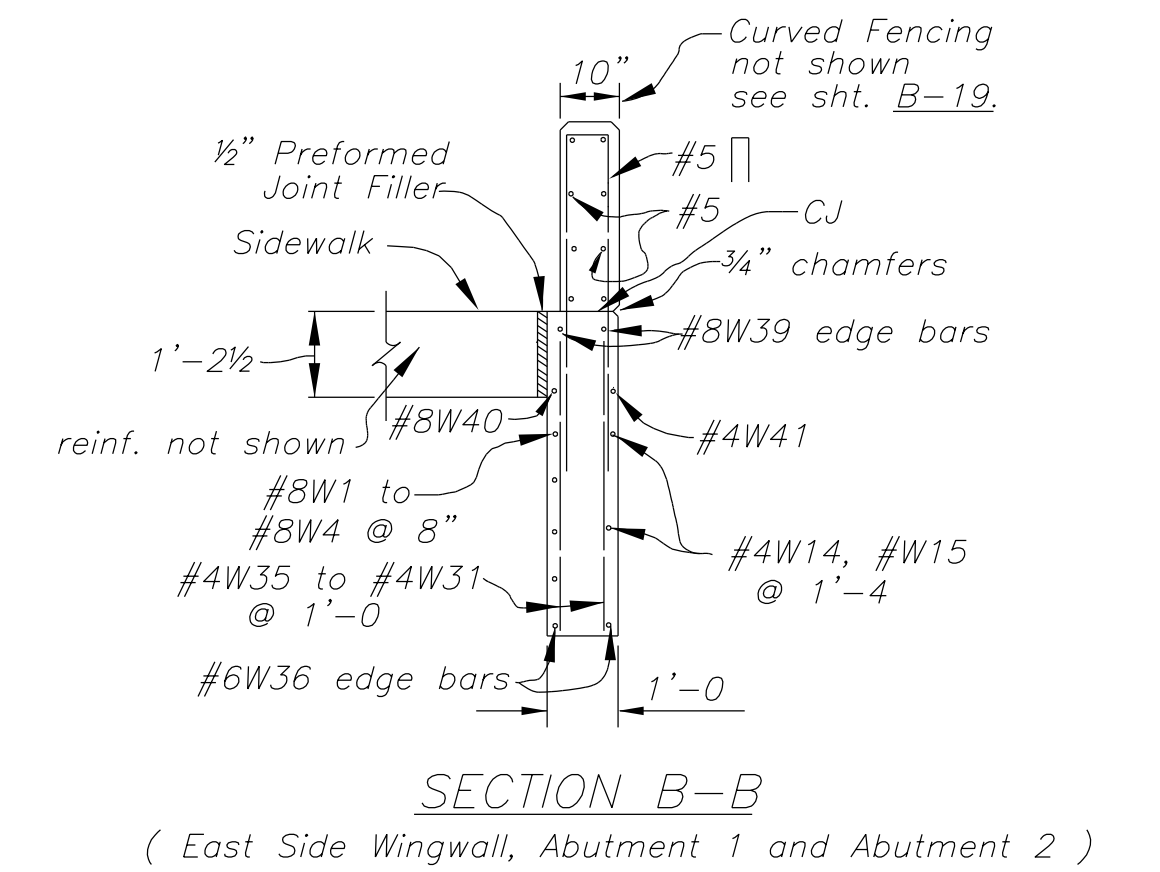
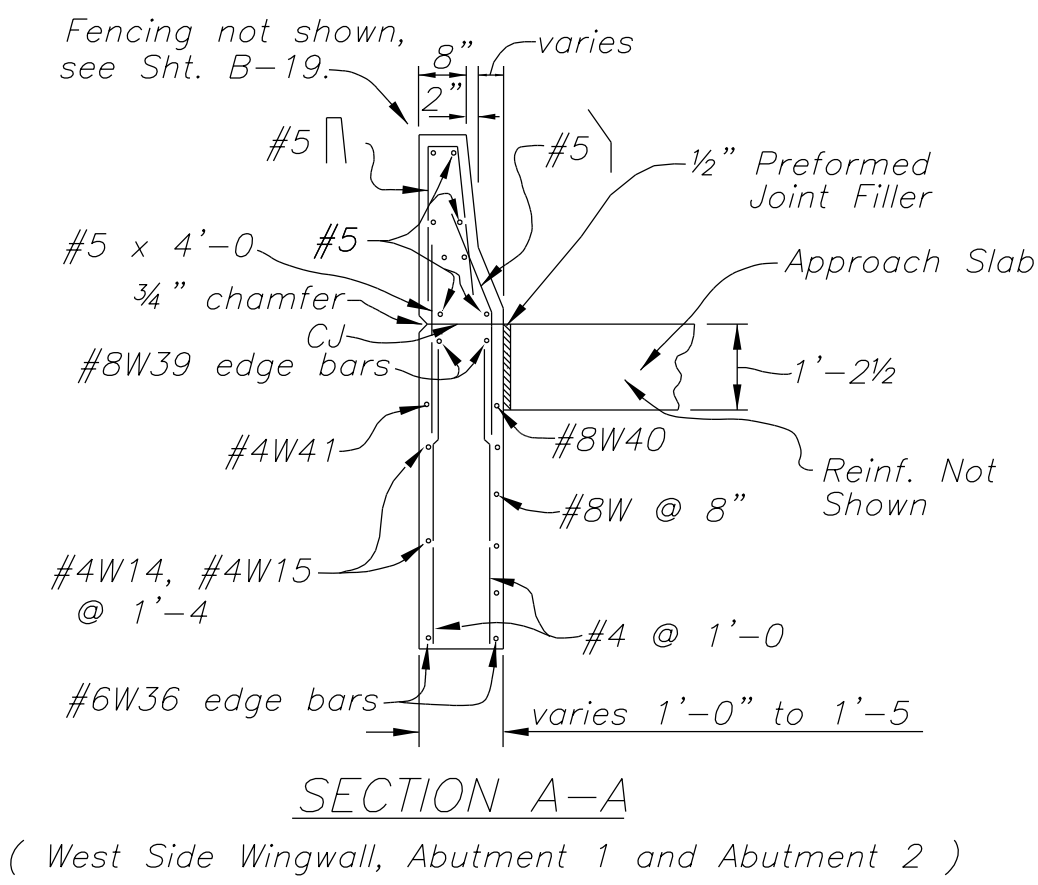
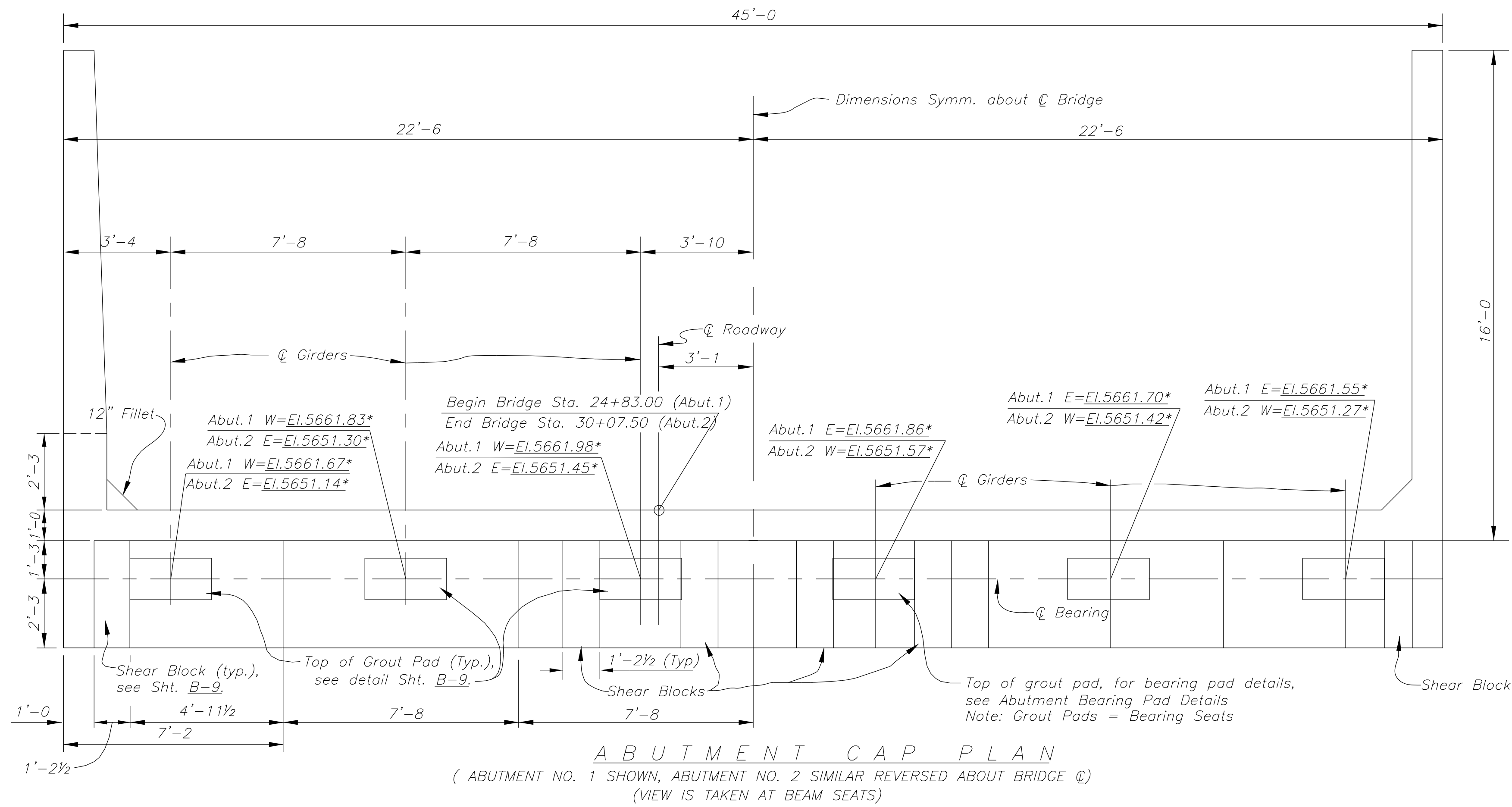
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**BUREAU OF INDIAN AFFAIRS**  
 NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

**RIO PUERCO BRIDGE**  
 ABUTMENT 1 AND ABUTMENT 2  
 DETAILS, SHEET 1

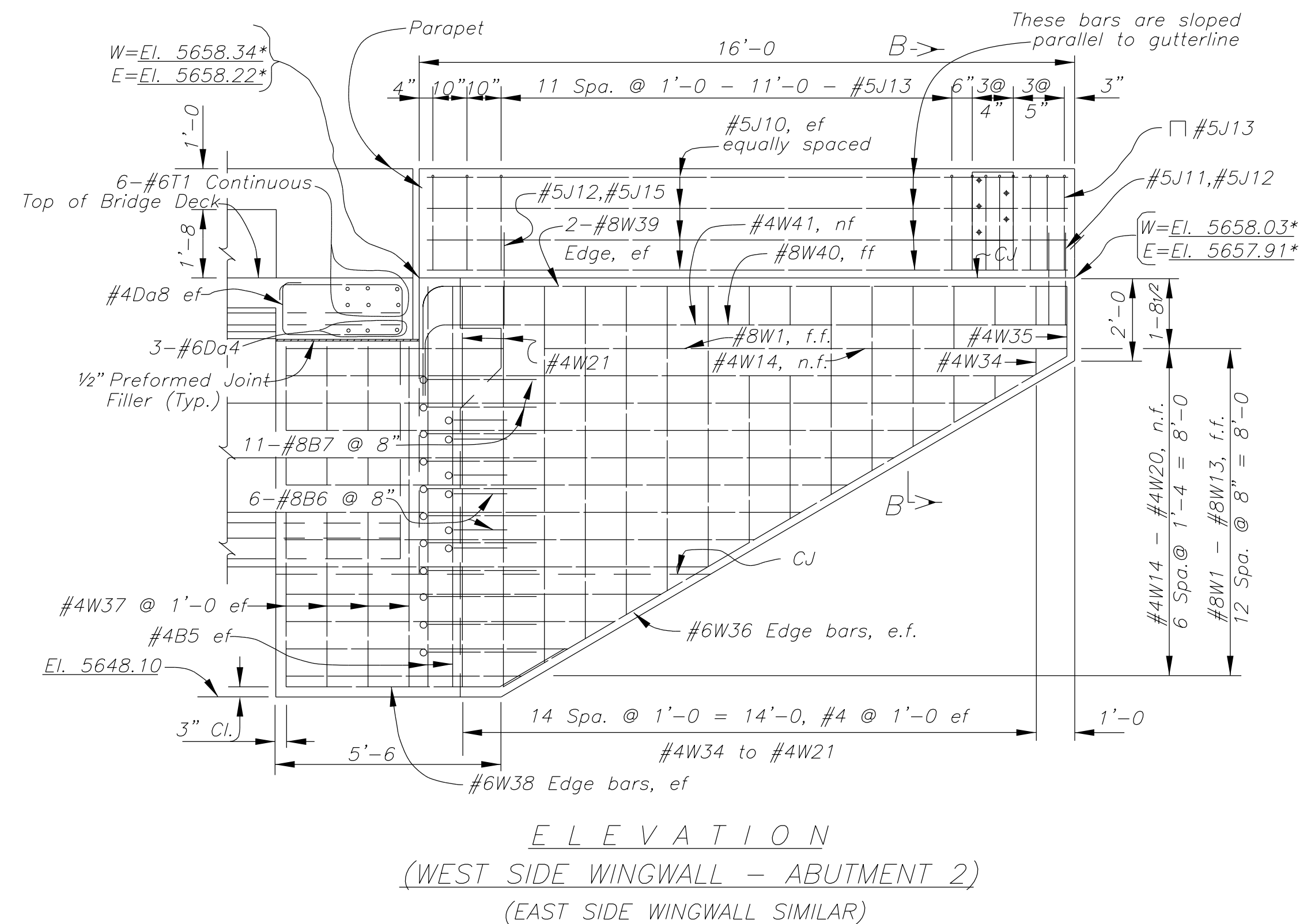
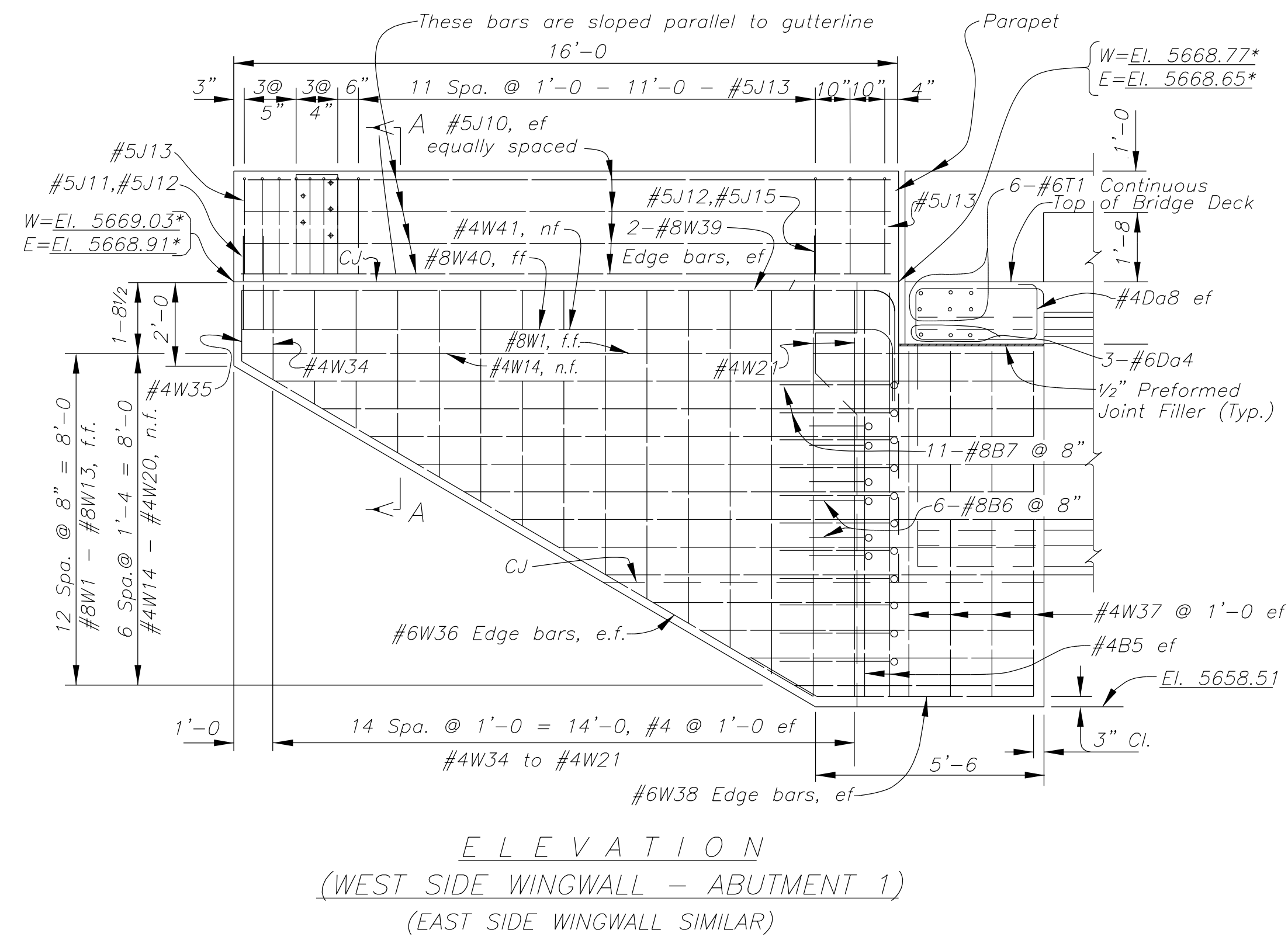
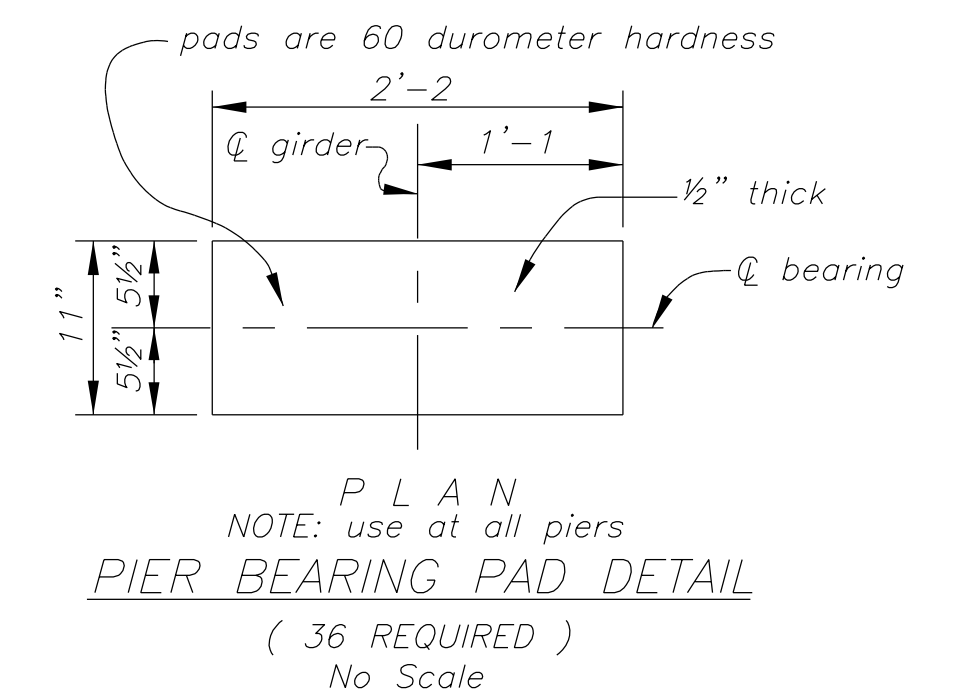
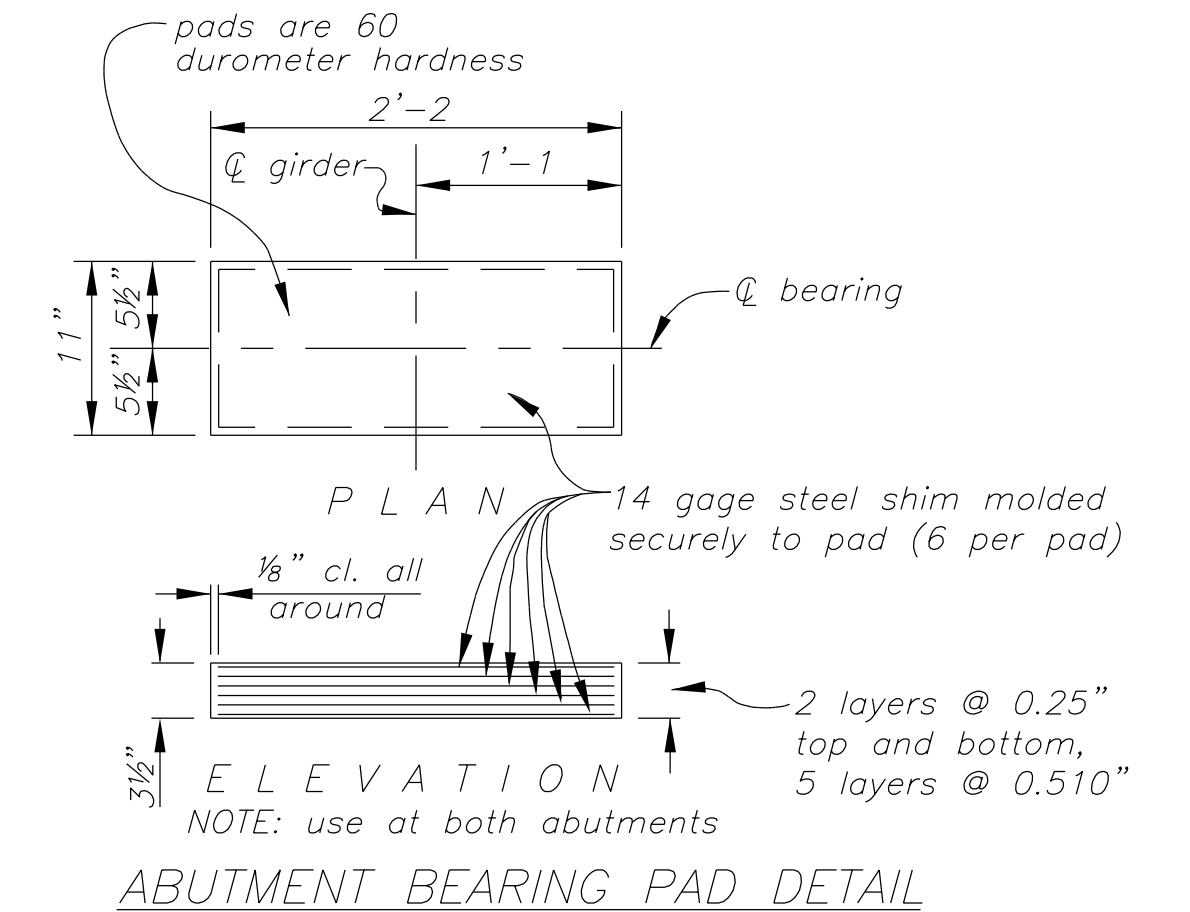
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Drawn by: BOR, dc, rsh	Date:
Revised by:	Date:
File Name: 09_BIabut	



REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	AZ	Navajo	N2007	N2007(1-1)1,2&4	B-10	63



NOTE: Spiral reinf. shall conform to AASHTO M31, Grade 60 (1/2" Ø) or AASHTO M32 (W20 smooth). Splices shall be as detailed. Hooks may be field bent and shall go around vert. #11 bars as shown. Add 1 1/2 turns of spiral and 135° hook with 10" tail at top and bottom of spiral length.

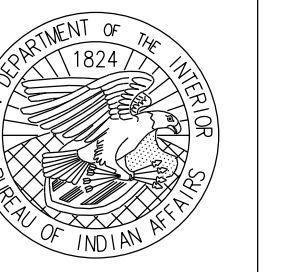


NOTE  
\* W = West Side = Downstream side of abutment 1 and 2  
\* E = East Side = Upstream side of abutment 1 and 2

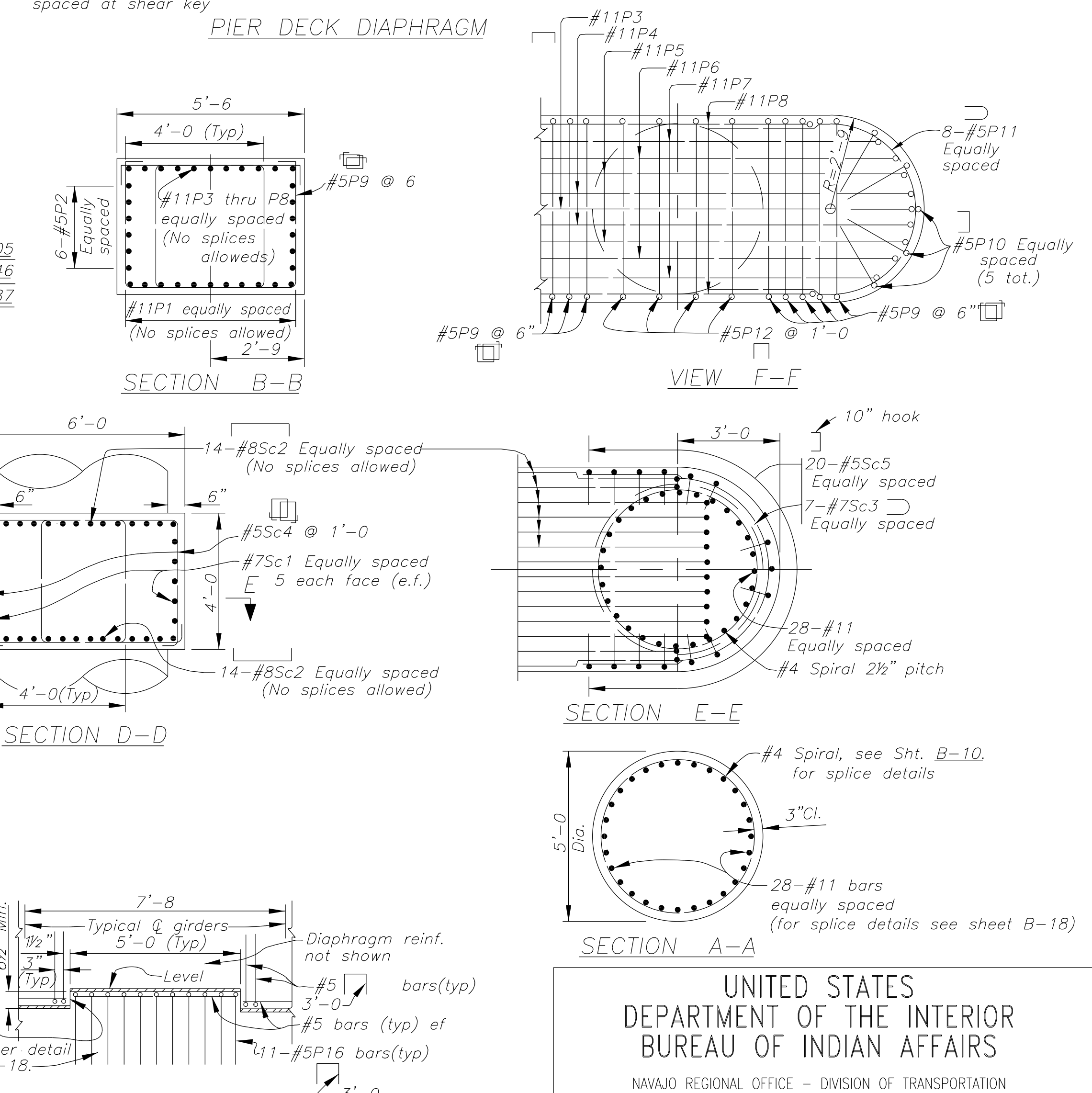
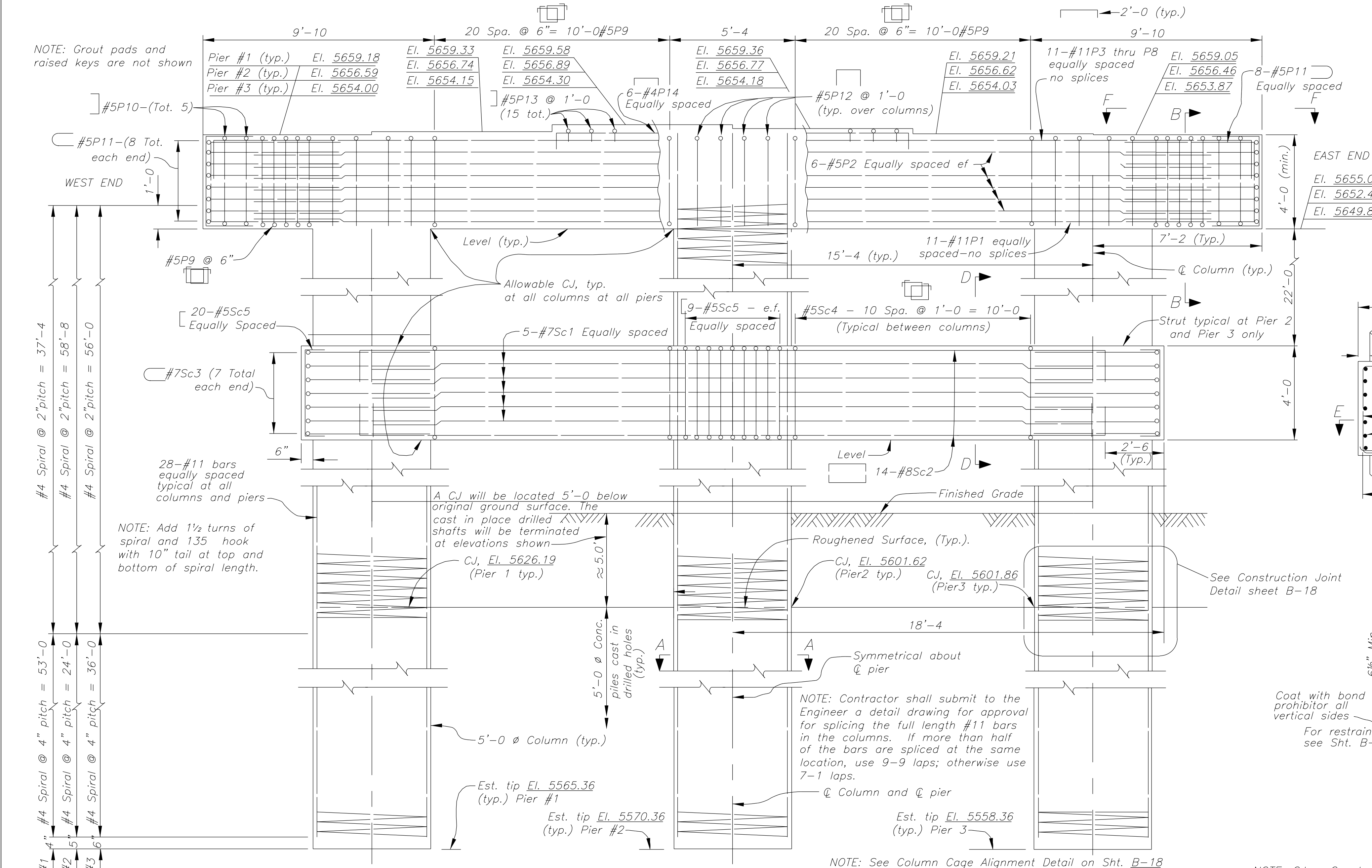
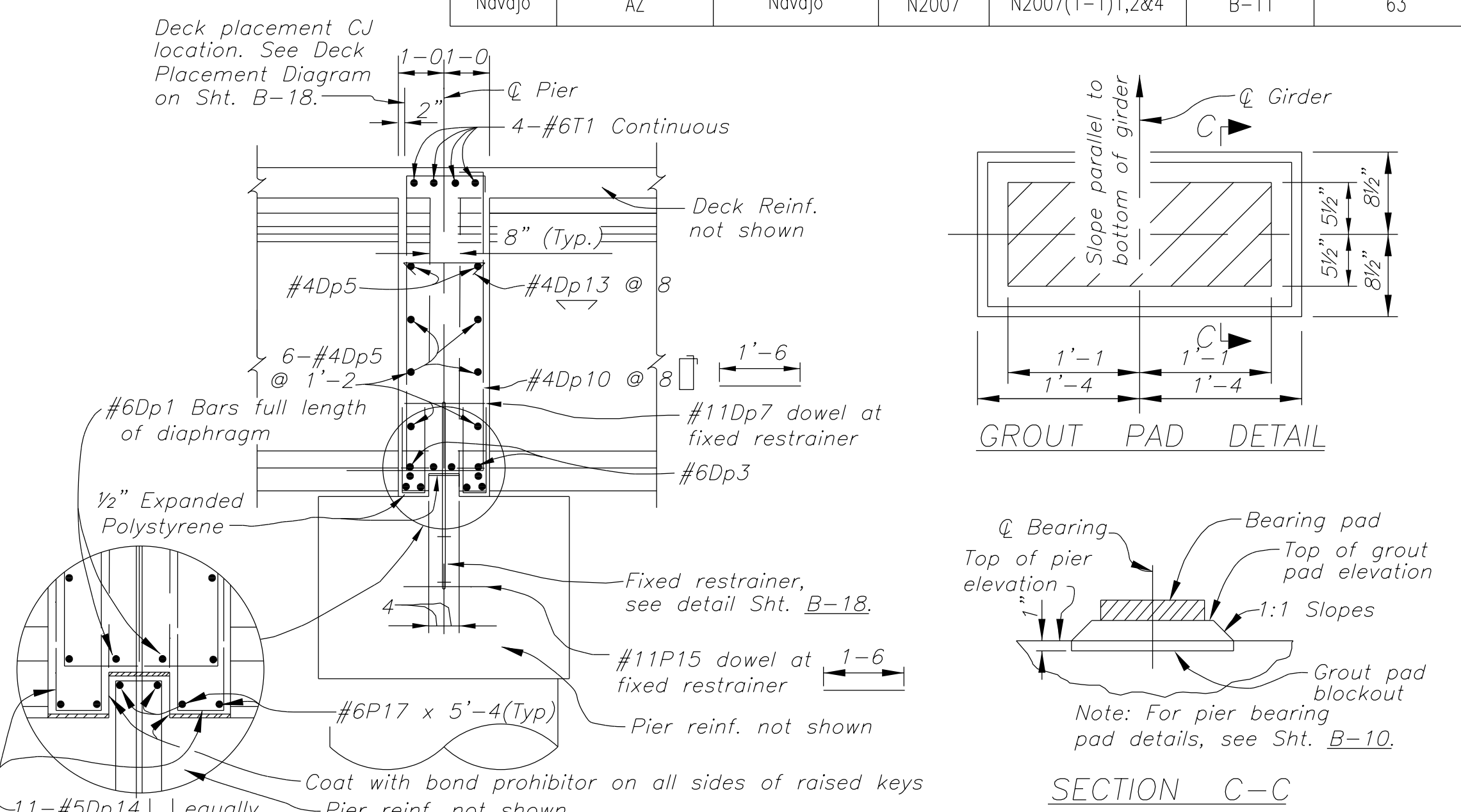
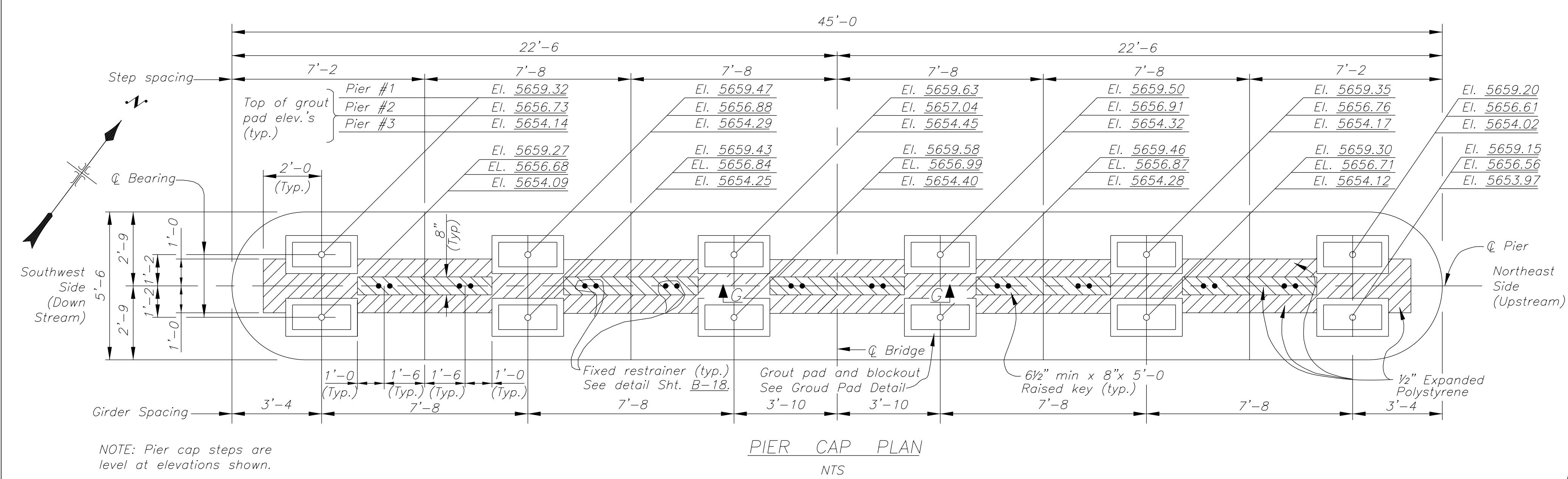
UNITED STATES  
DEPARTMENT OF THE INTERIOR  
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NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

**RIO PUERCO BRIDGE**  
ABUTMENT 1 AND ABUTMENT 2  
DETAILS, SHEET 2

Designed by: BUREAU OF RECLAMATION  
Drawn by: BOR, dc, rsh Date: 01/17/14  
Revised by: - - Date: - -  
File Name: 10\_BIAwing



REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	AZ	Navajo	N2007	N2007(1-1)1,2&4	B-11	63




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 NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

**RIO PUERCO BRIDGE**  
 PIER 1, PIER 2 AND PIER 3  
 DETAILS

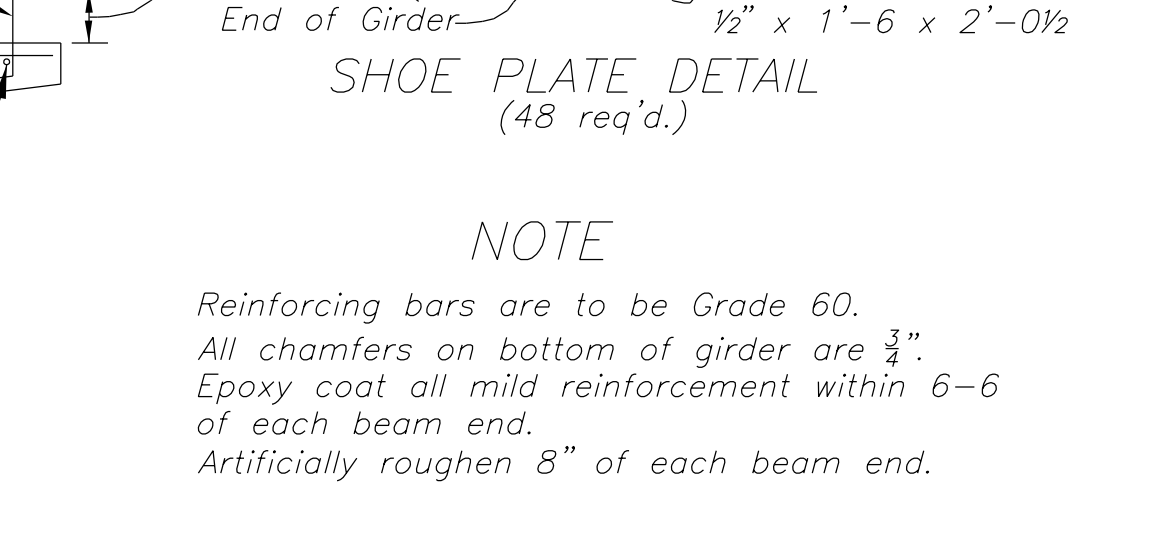
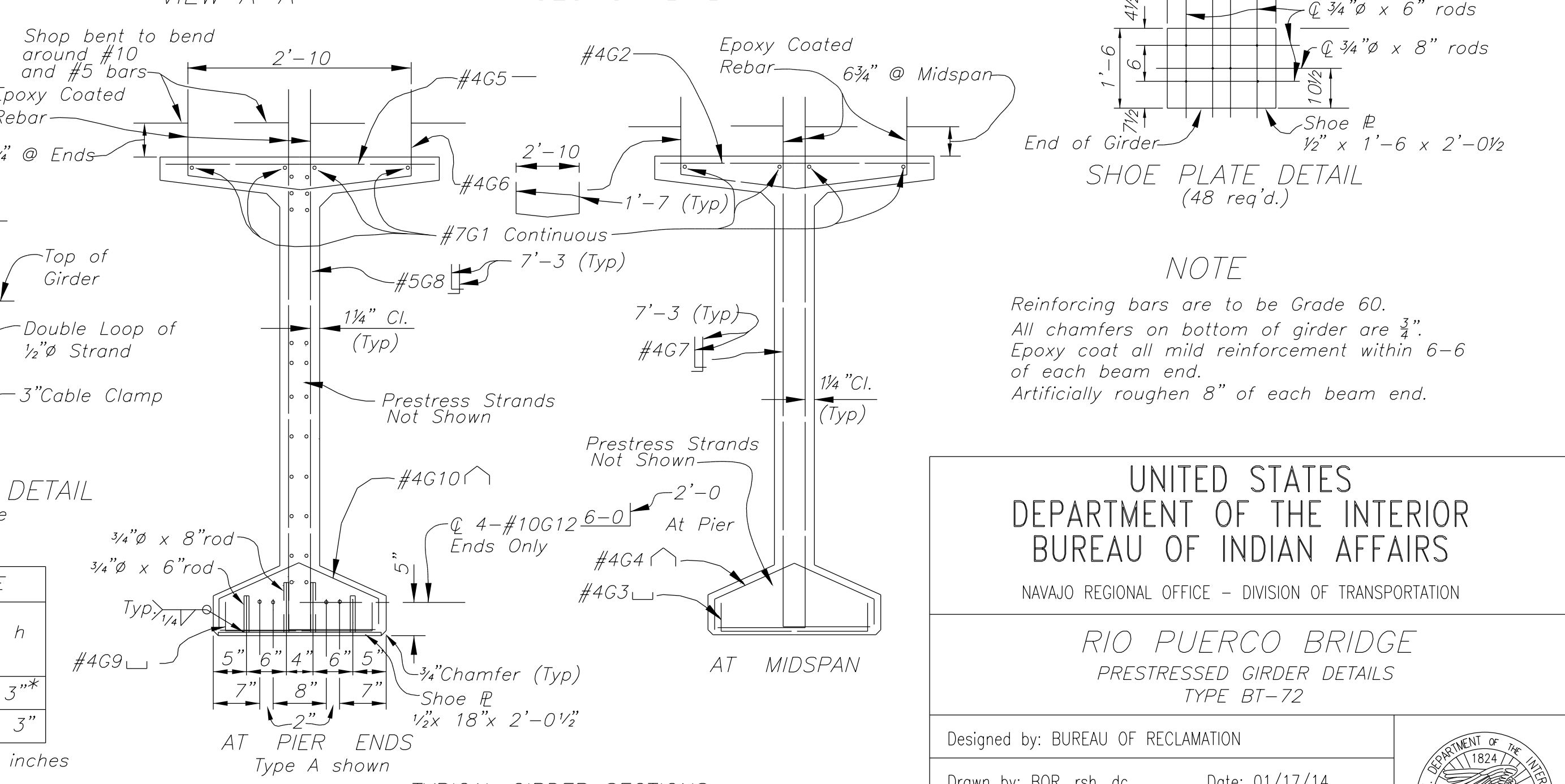
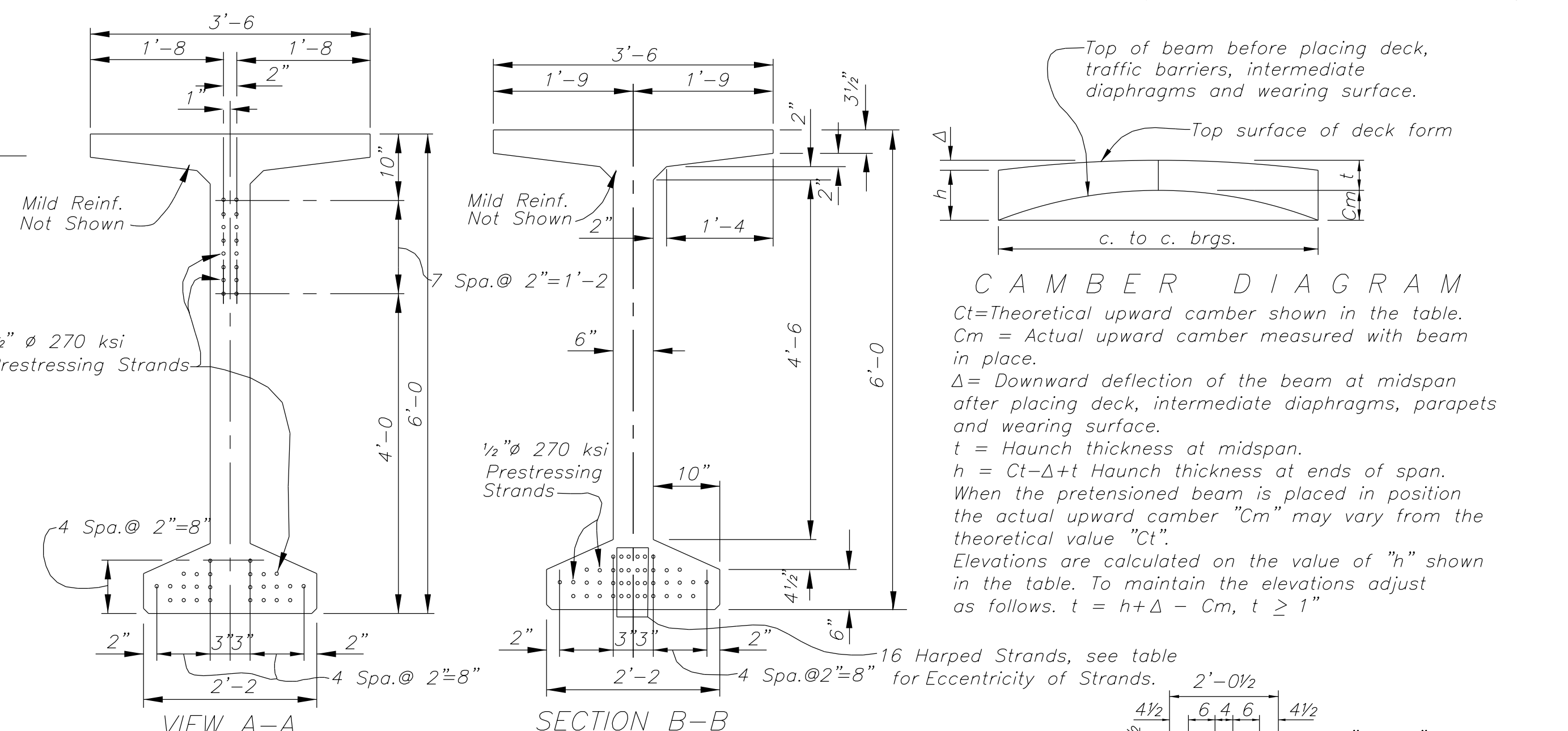
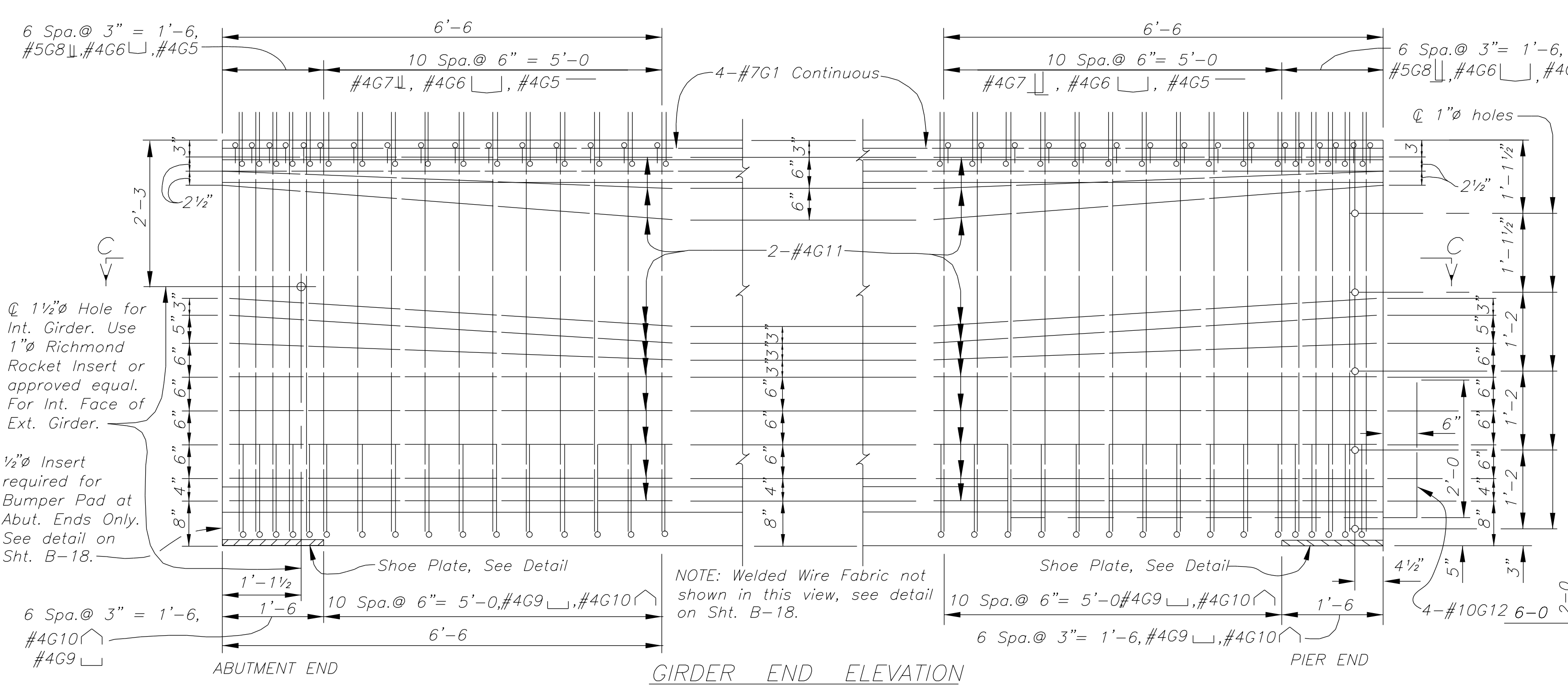
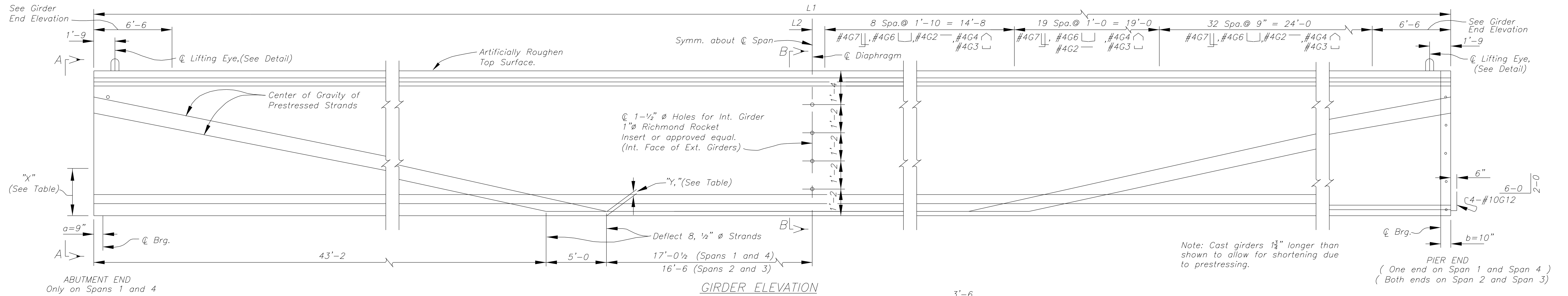
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 Revised by: --  
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Date: 05/22/2014  
 Date: --



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REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	AZ	Navajo	N2007	N2007(1-1),2&4	B-12	63



BRIDGE	SPANS	α°	L <sub>1</sub>	L <sub>2</sub>	a AT ABUTMENTS	b AT PIERS	1/2" 270KSI PRESTRESSED STRANDS		CONCRETE		HAUNCH TABLE				
							TOTAL NUMBER	y-INCHES C.G. of Pre-stressing strands	x-INCHES C.G. of Pre-stressing strands	MIN. COMP. 28 DAY STRENGTH f <sub>c</sub> (psi)	RELEASE STRENGTH f <sub>ci</sub> (psi)	NUMBER OF BEAMS	t	Δ	Ct
RIO PUERCO BRIDGE	1 and 4	90° 00'00"	130'-5"	1'-0 1/2"	9"	10"	42	4.26"	23.52"	6,000	5,400	1 1/8"	2 1/4"	3 1/8"	3"
RIO PUERCO BRIDGE	2 and 3	90° 00'00"	129'-4"	6"	—	10"	42	4.26"	23.52"	6,000	5,400	1 1/8"	2"	3 1/8"	3"


\*This haunch thickness will be 2 1/8" inches at abutment 1 on span 1 only.

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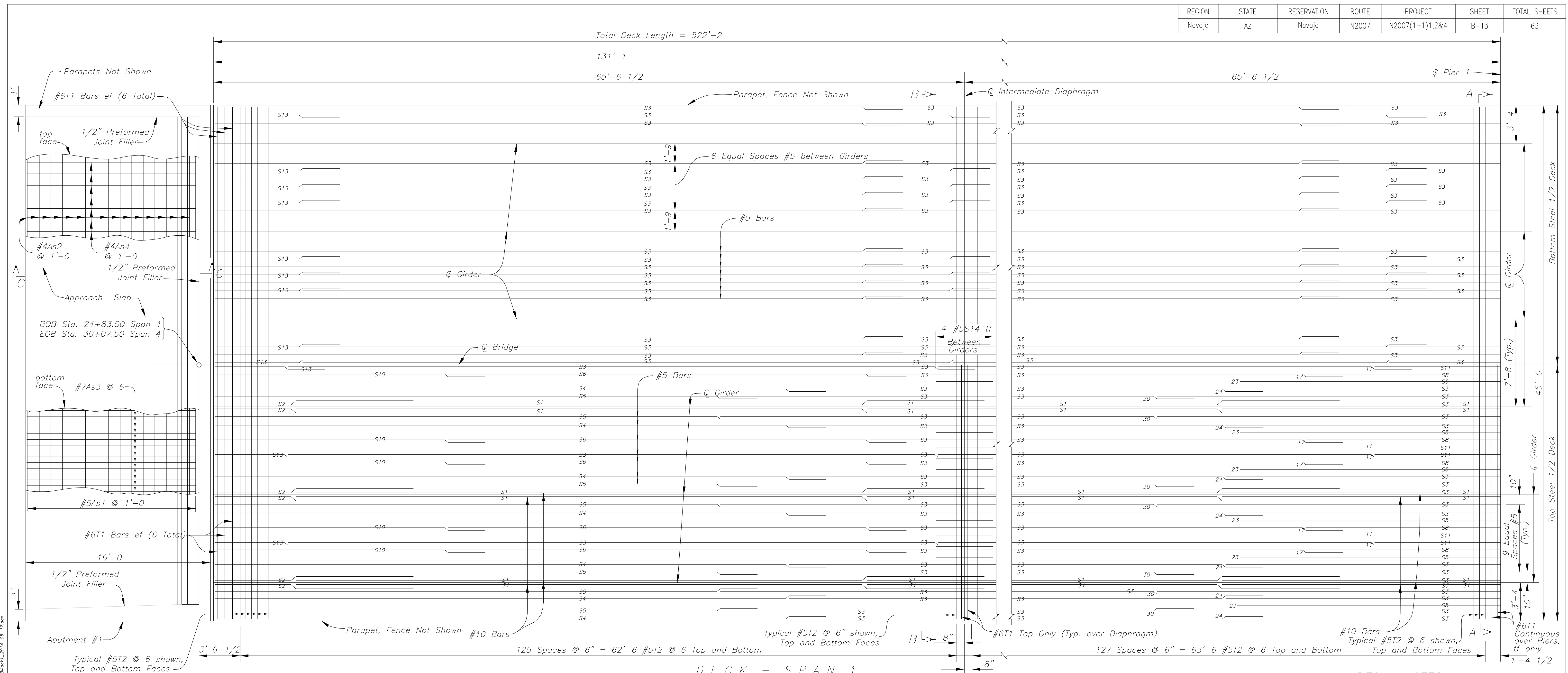
**UNITED STATES**  
**DEPARTMENT OF THE INTERIOR**  
**BUREAU OF INDIAN AFFAIRS**  
 NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

**RIO PUERCO BRIDGE**  
 PRESTRESSED GIRDER DETAILS  
 TYPE BT-72

Designed by: BUREAU OF RECLAMATION	Date: 01/17/14
Drawn by: BOR, rsh, dc	Date: --
Revised by: --	Date: --
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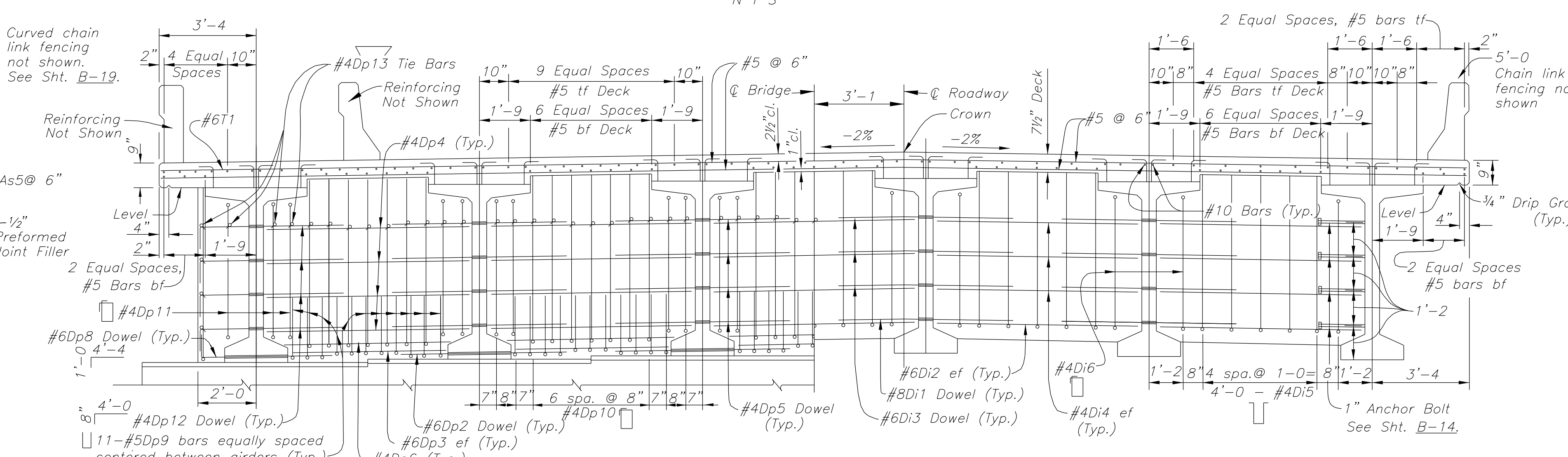
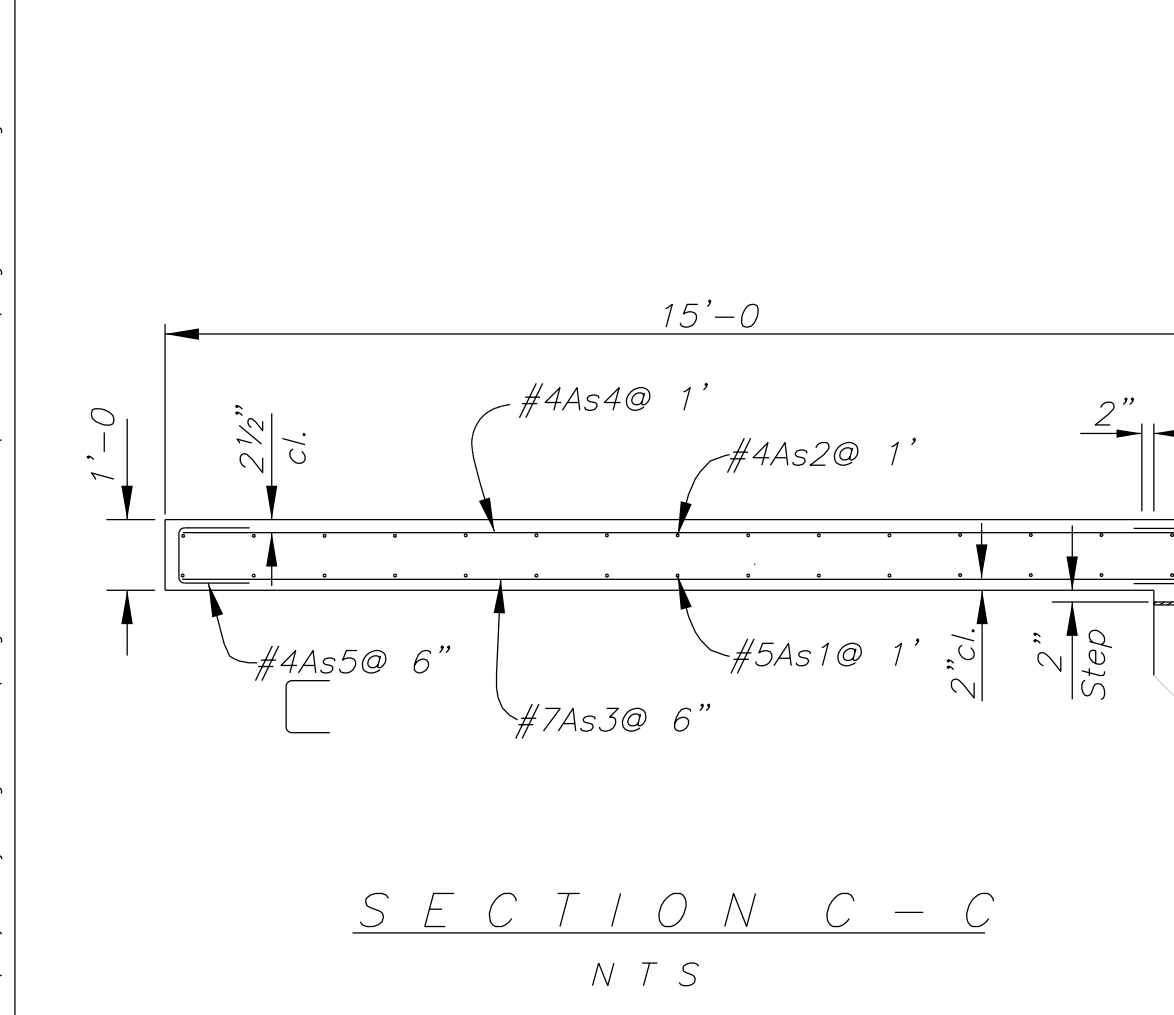
REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	AZ	Navajo	N2007	N2007(1-1),2&4	B-13	63



**DECK - SPAN 1**  
(SPAN 4 - OPPOSITE HAND)  
N T S

**DECK NOTES**

Span #1 reinforcing layout shown, Span #4 reinforcing layout is mirrored about midpoint of bridge.  
 Numbers at ends of bars indicate distance in feet and inches from  $\phi$  Pier to end of the longitudinal bars. Unless otherwise shown, #5 & #10 bars are spliced at these points.  
 All the reinforcement bars in the deck slab are epoxy coated.  
 The #5 reinforcement bar splice length = 39"  
 The #10 reinforcement bar splice length = 123"  
 Mirror longitudinal deck steel about bridge centerline.  
 Alternate #5S13 at each end of the deck.



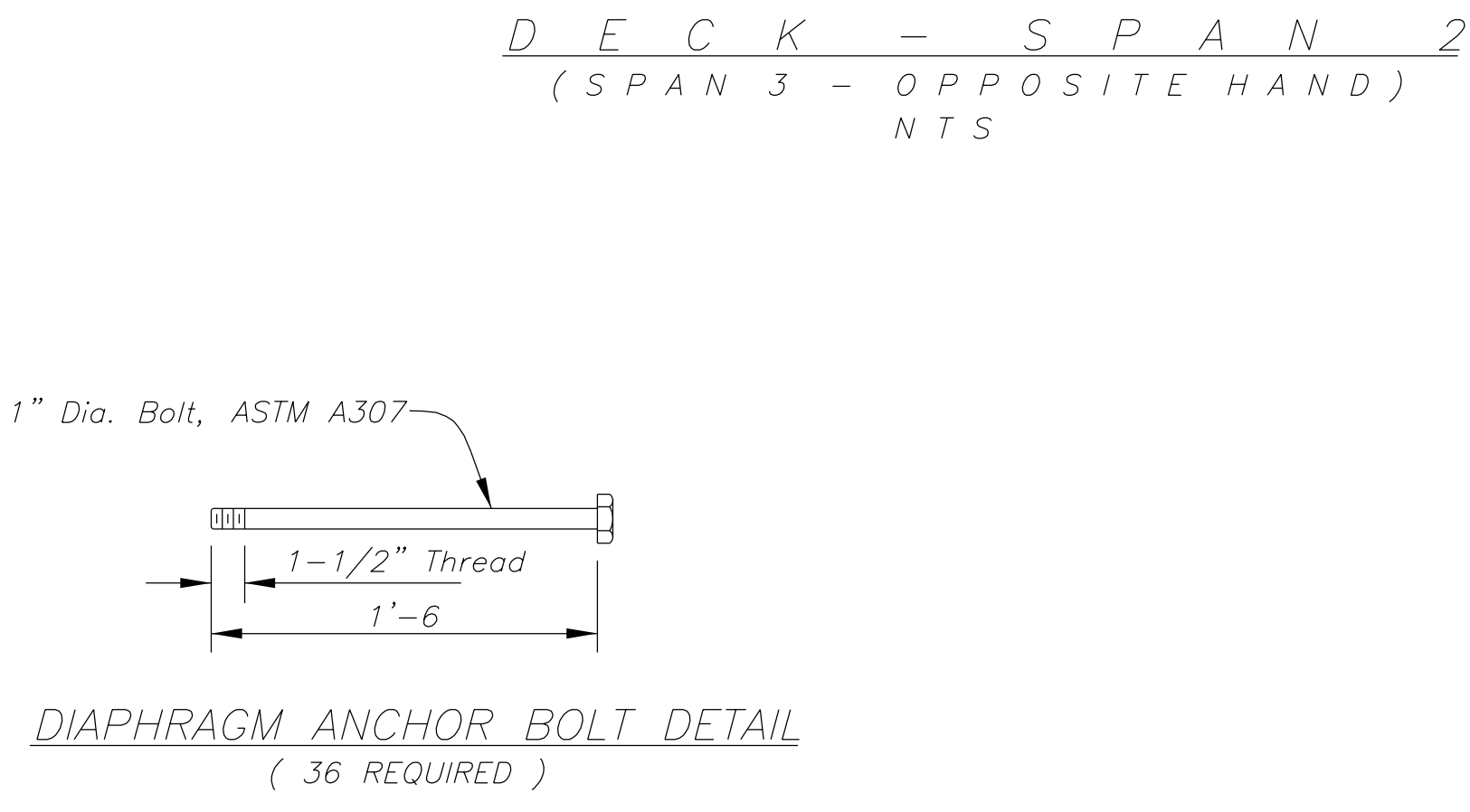
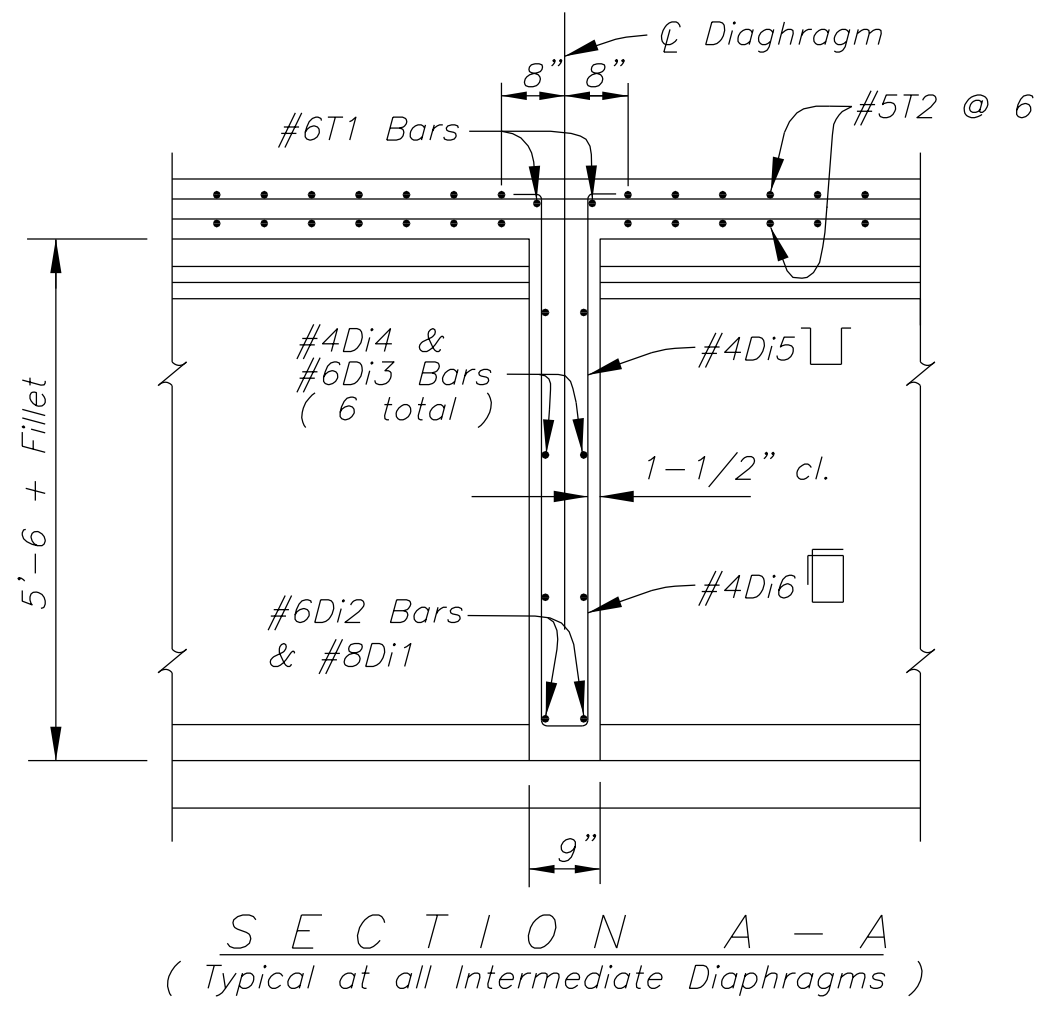
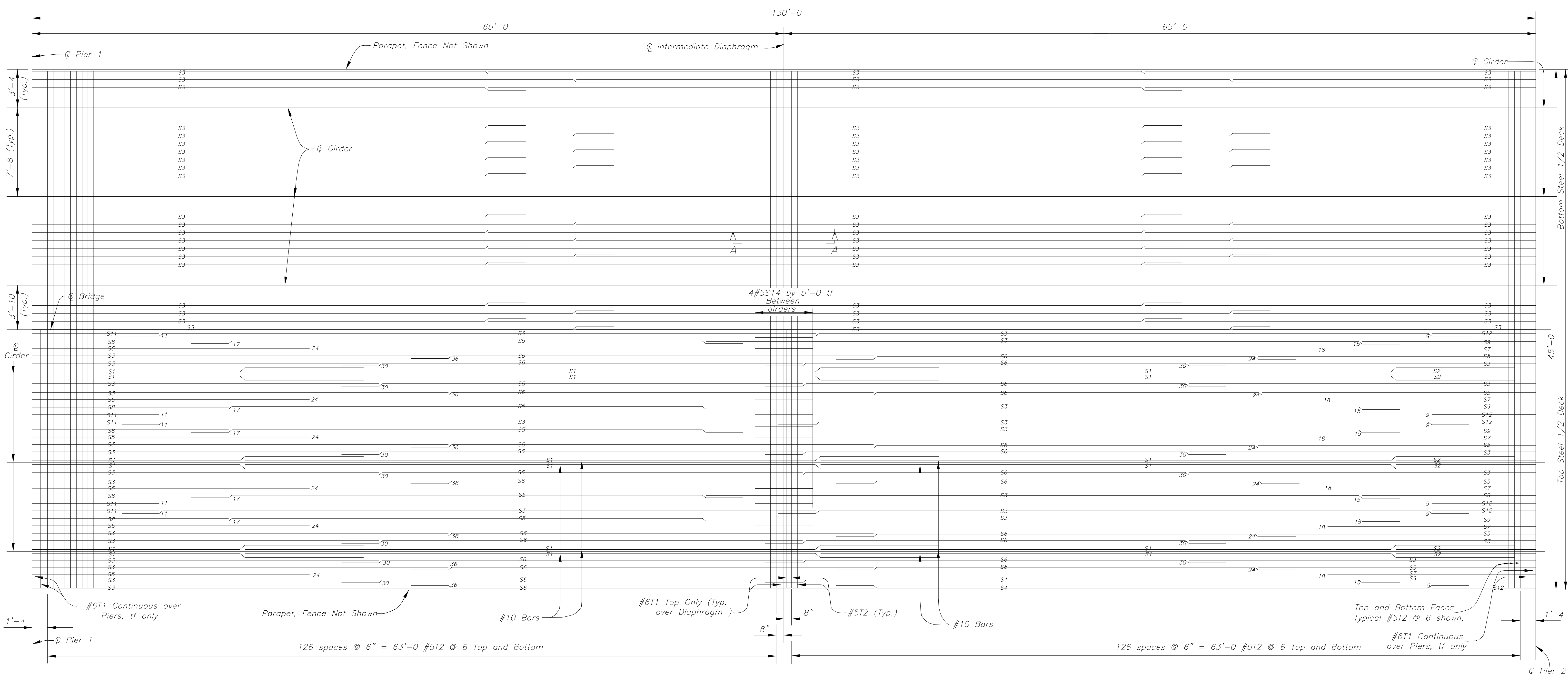
UNITED STATES  
 DEPARTMENT OF THE INTERIOR  
 BUREAU OF INDIAN AFFAIRS  
 NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

**RIO PUERCO BRIDGE**  
 SPAN 1 AND SPAN 4 DETAILS

Designed by: BUREAU OF RECLAMATION  
 Drawn by: BOR, ldh, dc, rsh Date: 05/17/14  
 Revised by: - - Date: - -  
 File Name: 13\_BIAdck1

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REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	AZ	Navajo	N2007	N2007(1-1)1,2&4	B-14	63



DECK - SPAN 2  
(SPAN 3 - OPPOSITE HAND)  
NTS

DECK NOTES

Span #2 reinforcing layout shown, Span #3 reinforcing layout is mirrored about midpoint of bridge.

Numbers at ends of bars indicate distance in feet and inches from ¶ pier to end of the longitudinal bars. Unless otherwise shown, #5 bars, as shown are spliced on at these points.

All the reinforcement bars in the deck slab are epoxy coated.

The #5 reinforcement bar splice length = 39"

The #10 reinforcement bar splice length = 123"

Mirror longitudinal deck steel about bridge centerline

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DEPARTMENT OF THE INTERIOR  
BUREAU OF INDIAN AFFAIRS  
NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

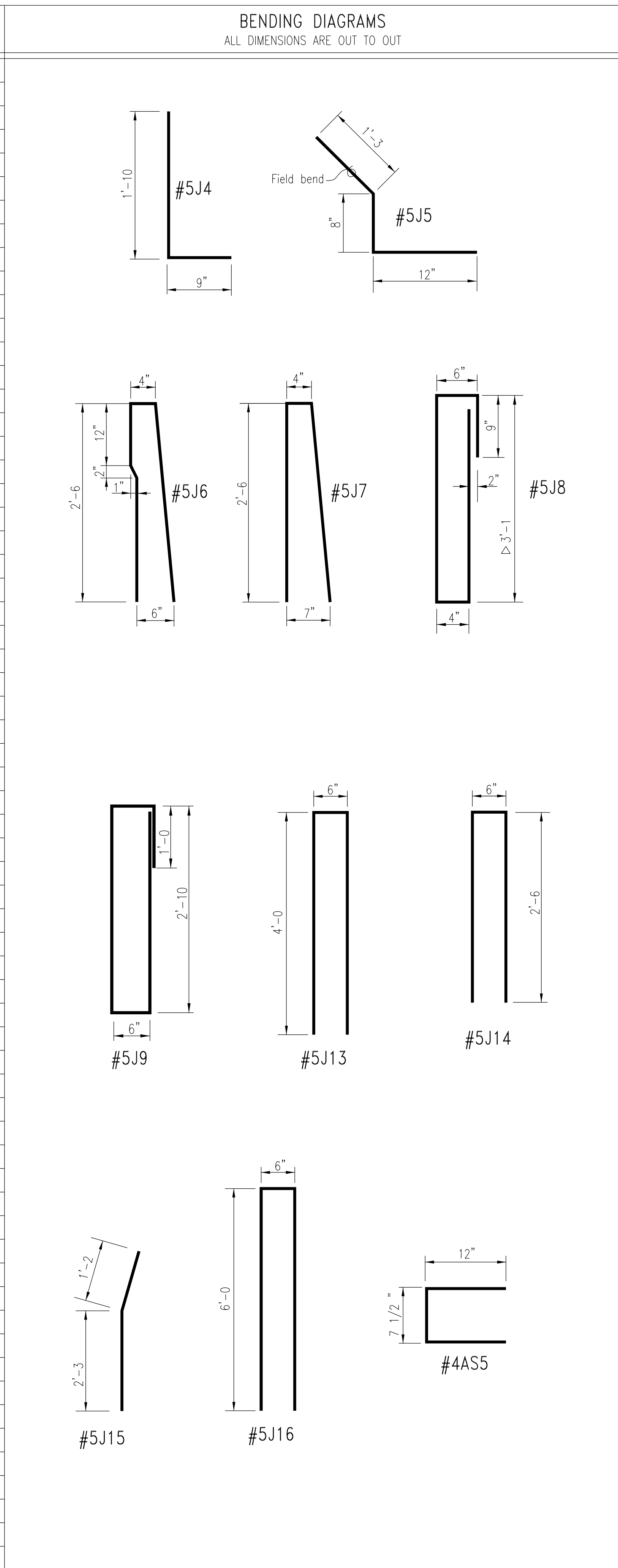
RIO PUERCO BRIDGE  
SPAN 2 AND SPAN 3 - DETAILS

Designed by: BUREAU OF RECLAMATION  
Drawn by: BOR, dc, rsh Date: 05/17/14  
Revised by: - - Date: - -  
File Name: 14\_BIAdck2

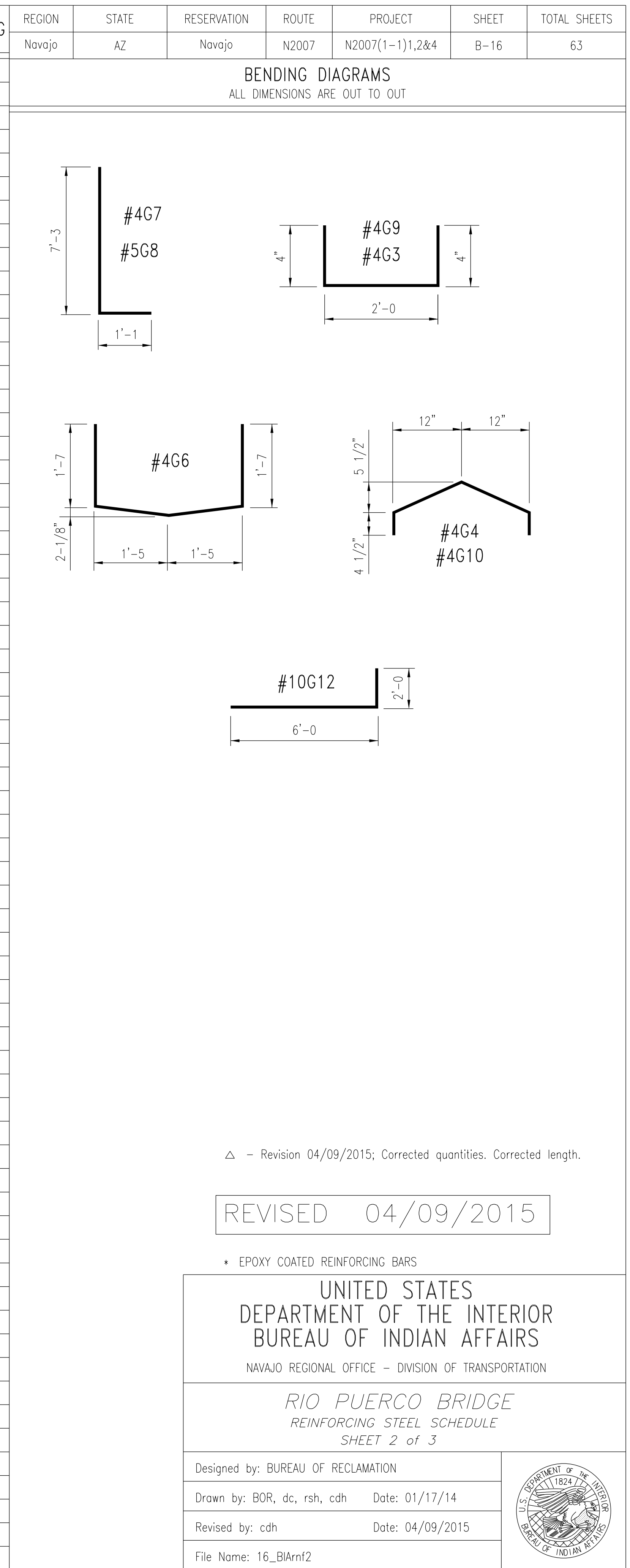
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LOCATION	STRAIGHT BARS				BENT BARS				SPACING
	MARK	QTY.	SIZE	LENGTH	MARK	QTY.	SIZE	LENGTH	
BARRIER / PARAPET WALLS									
Horizontal bars	* 5J1	576	5	19'-6"					As Shown
Horizontal bars	* 5J2	48	5	10'-0"					As Shown
Horizontal bars	* 5J3	48	5	9'-6"					As Shown
Vertical bars					* 5J4	△1042	5	2'-7"	As Shown
Vertical bars					* 5J5	△1042	5	2'-11"	As Shown
Vertical, tie J4 & J5					* 5J6	△1000	5	5'-4"	As Shown
Vertical bars					* 5J7	△32	5	5'-4"	As Shown
Vertical, Sidewalk					* 5J8	△500	5	7'-9"	As Shown
Vertical, Sidewalk					* 5J9	△4	5	7'-8"	As Shown
Horizontal bars	* 5J10	48	5	15'-6"					As Shown
Vertical bars	* 5J11	26	5	3'-0"					As Shown
Vertical bars	* 5J12	42	5	2'-9"					As Shown
Vertical, Transition					* 5J13	△38	5	8'-6"	As Shown
Vertical, Transition					* 5J14	52	5	5'-6"	As Shown
Vertical, Transition					* 5J15	16	5	3'-5"	As Shown
Horizontal, Transition					* 5J16	24	5	12'-6"	As Shown
APPROACH SLABS									
Bottom Face, Transverse	* 5As1	30	5	42'-10"					1'-0"
Top Face, Transverse	* 4As2	30	4	42'-10"					1'-0"
Bottom Face, Longitudinal	* 7As3	172	7	14'-11"					0'-6"
Top Face, Longitudinal	* 4As4	86	4	14'-11"					1'-0"
Edge					* 4As5	344	4	2'-8"	As Shown
BRIDGE DECK									
Deck, Longitudinal, Over Beam	* 10S1	120	10	60'					As Shown
Deck, Longitudinal, Over Beam	* 10S2	24	10	18'					As Shown
Deck, Longitudinal	* 5S3	573	5	60'					As Shown
Deck, Longitudinal	* 5S4	40	5	55'					As Shown
Deck, Longitudinal	* 5S5	84	5	48'					As Shown
Deck, Longitudinal	* 5S6	124	5	40'					As Shown
Deck, Longitudinal	* 5S7	12	5	36'					As Shown
Deck, Longitudinal	* 5S8	20	5	34'					As Shown
Deck, Longitudinal	* 5S9	12	5	30'					As Shown
Deck, Longitudinal	* 5S10	20	5	24'					As Shown
Deck, Longitudinal	* 5S11	20	5	22'					As Shown
Deck, Longitudinal	* 5S12	12	5	18'					As Shown
Deck, Longitudinal	* 5S13	51	5	11'					As Shown
Deck, Top Face	* 5S14	80	5	5'					As Shown
Deck, Transverse, Over Pier	* 6T1	32	6	44'-8"					As Shown
Deck, Transverse	* 5T2	2032	5	44'-8"					As Shown



LOCATION	STRAIGHT BARS				BENT BARS				SPACING
	MARK	QTY.	SIZE	LENGTH	MARK	QTY.	SIZE	LENGTH	
PRESTRESSED BEAMS: (Quantities shown are for one beam only. Cost of furnishing, fabricating and installing reinforcing steel for beams is considered incidental to Item 55301-2000 and 55301-2010.)									
CONVENTIONAL REINFORCING STEEL - G1 THRU G4									
Horizontal	7G1	12	7	44'-9"					As Shown
Stirrups @ Top	4G2	118	4	3'-4"					As Shown
Stirrups @ Bottom up					4G3	118	4	2'-8"	As Shown
Stirrups @ Bottom down					4G4	118	4	2'-10"	As Shown
EPOXY COATED REINFORCING STEEL - G5 THRU G12									
Stirrups @ Top	4G5	32	4	3'-4"					As Shown
Stirrups @ Top up					4G6	150	4	6'-0"	As Shown
Stirrups @ Middle					4G7	276	4	8'-4"	As Shown
Stirrups @ Ends					5G8	24	5	8'-4"	As Shown
Stirrups @ Bottom up					4G9	32	4	2'-8"	As Shown
Stirrups @ Bottom down					4G10	32	4	2'-10"	As Shown
Horizontals @ Ends	4G11	44	4	6'-0"					As Shown
Pier Hooks					10G12	12	10	8'-0"	As Shown

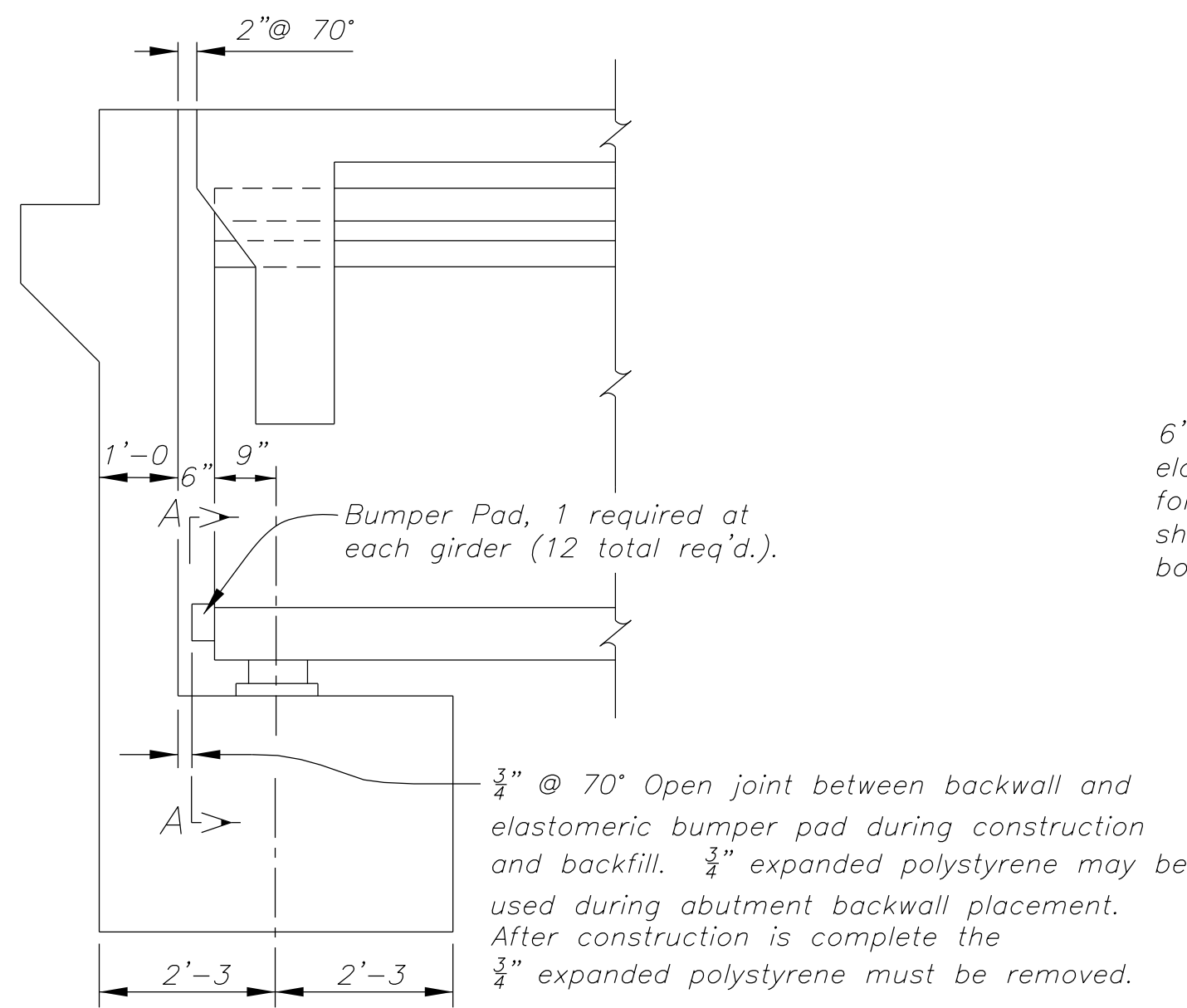


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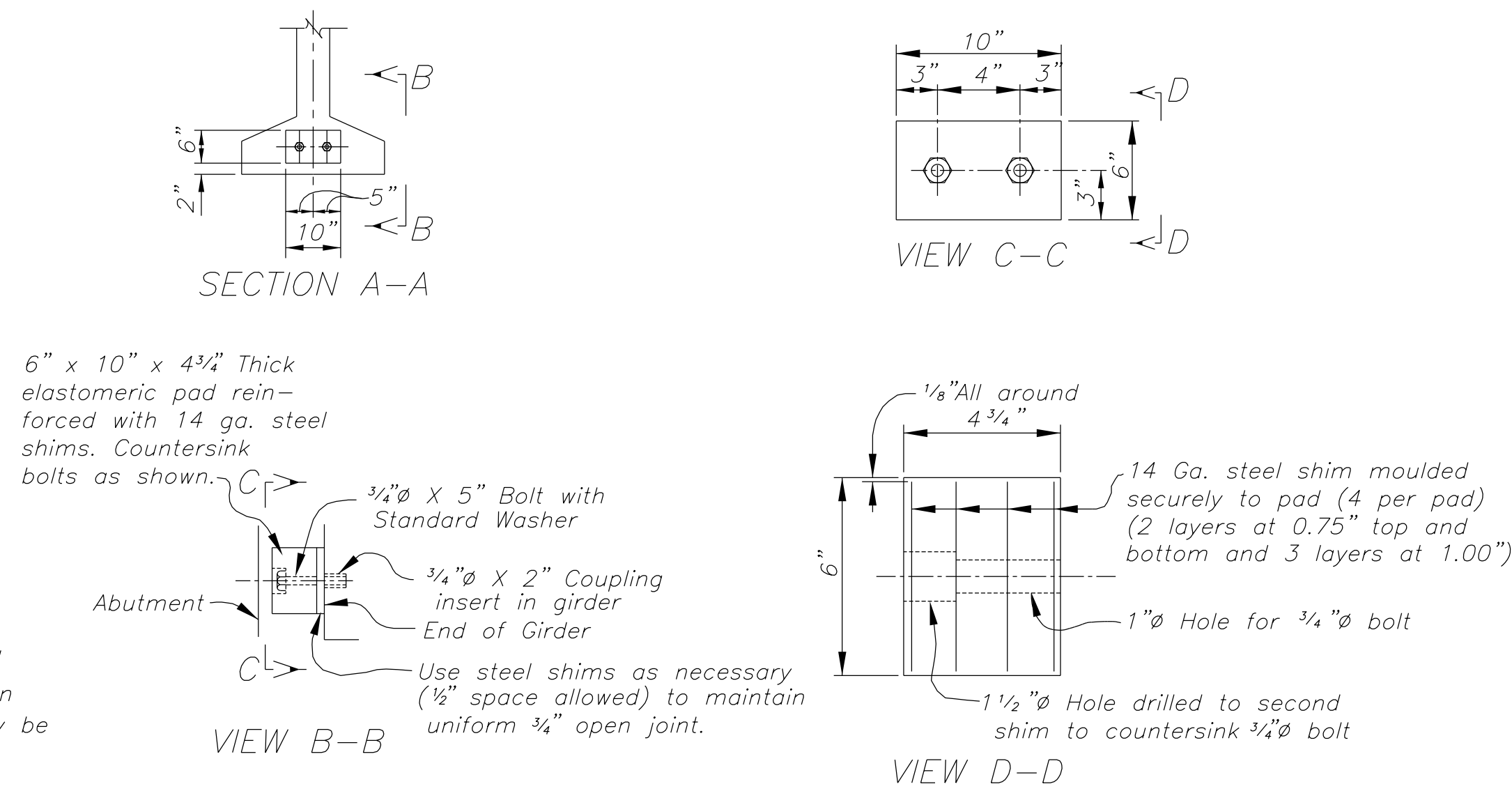




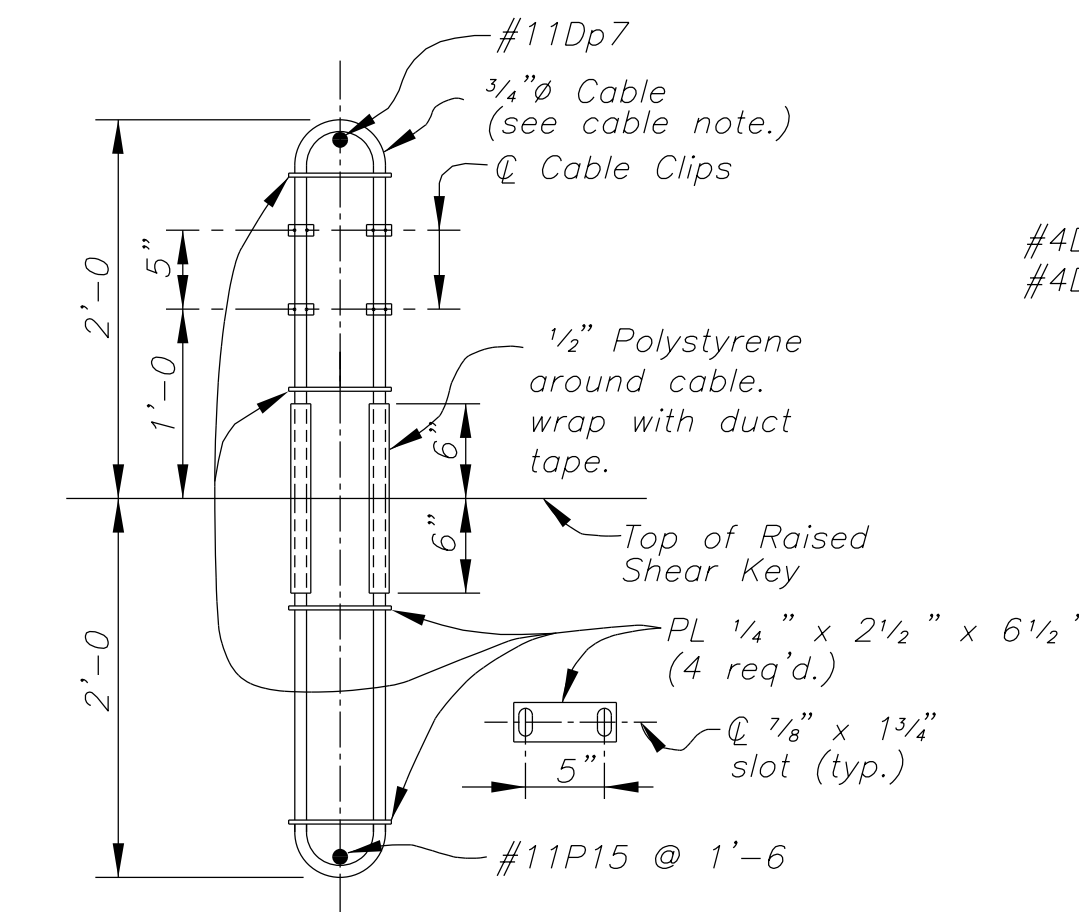
REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	AZ	Navajo	N2007	N2007(1-1)1,2&4	B-18	63



TYPICAL SECTION AT ABUTMENT (B-9)

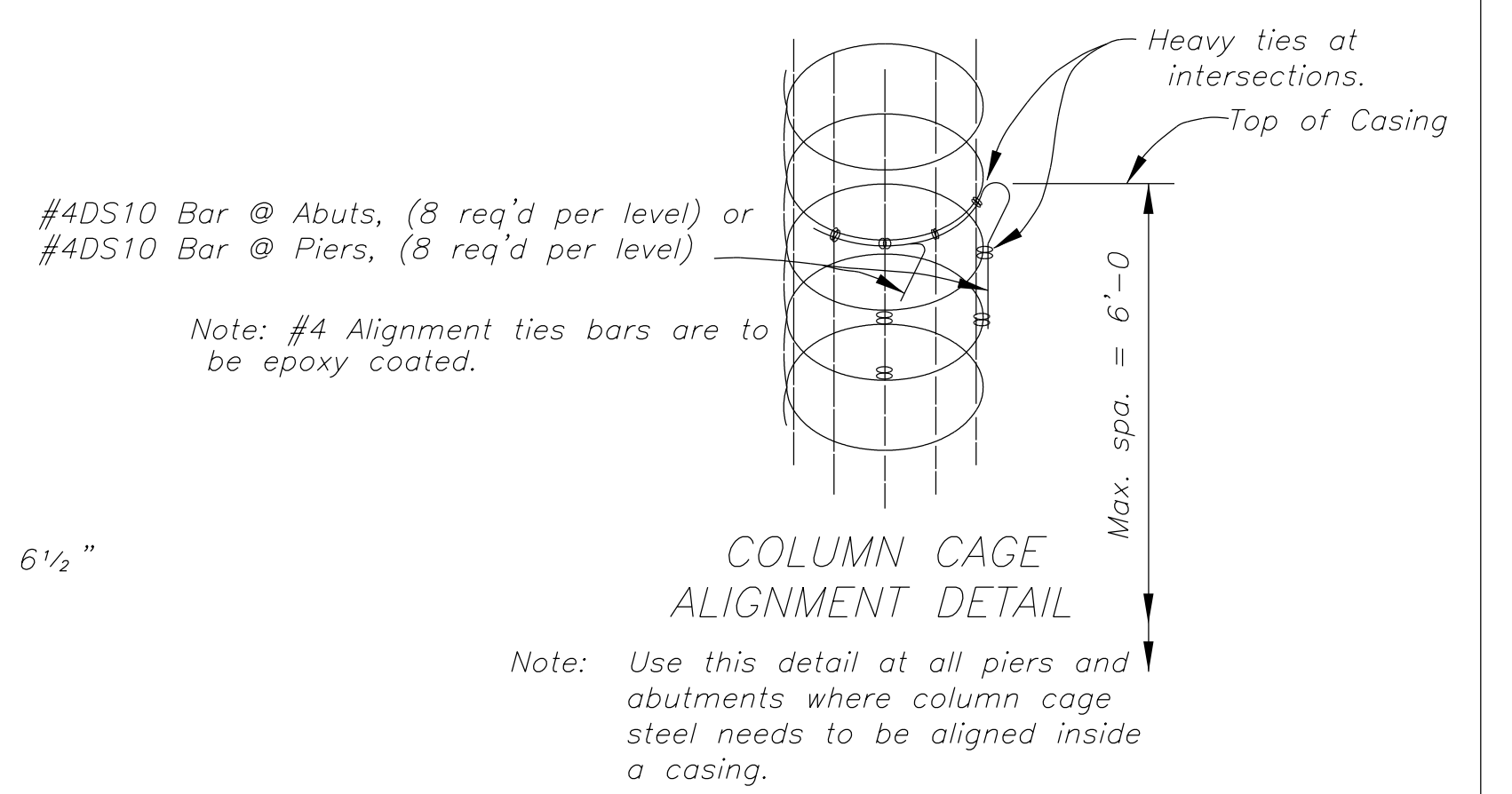


BUMPER PAD DETAILS (B-9)  
(No Scale)



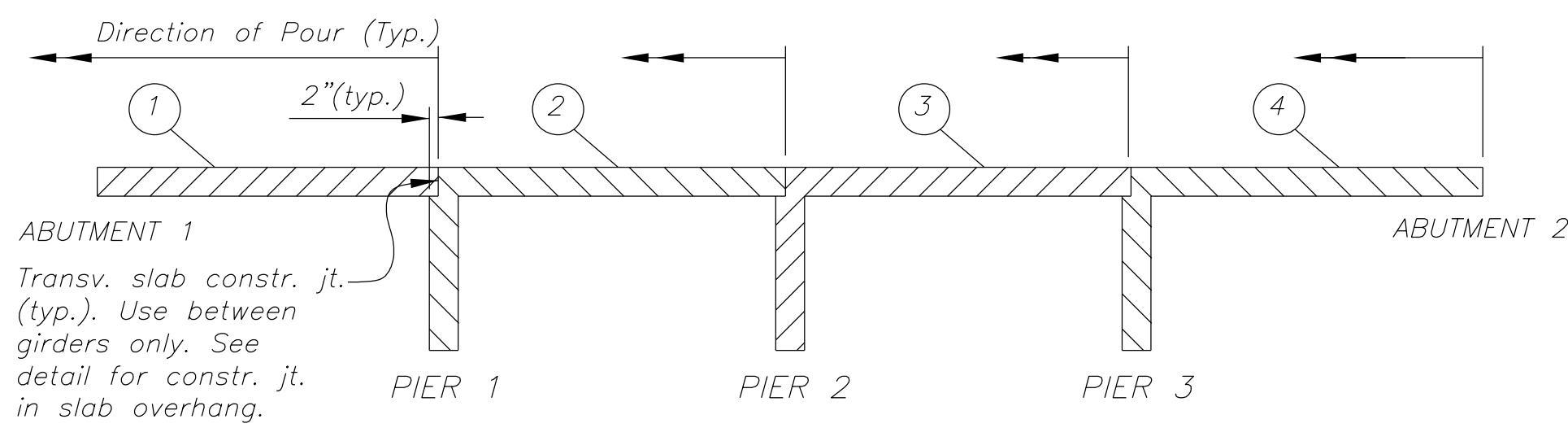
FIXED RESTRAINER DETAIL (B-11)

CABLE NOTE: Restrainer cables shall be 3/4" min. preformed 6 x 19 galvanized wire rope and shall meet the requirement of AASHTO M30 with a min. breaking strength of 42 kips.



COLUMN CAGE ALIGNMENT DETAIL

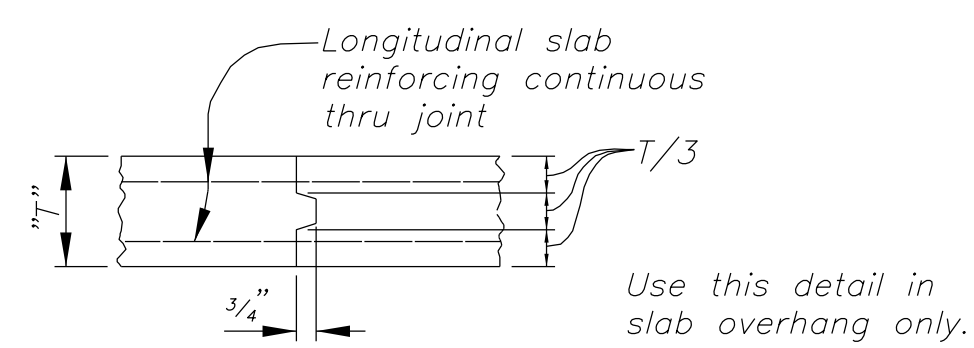
Note: Use this detail at all piers and abutments where column cage steel needs to be aligned inside a casing.



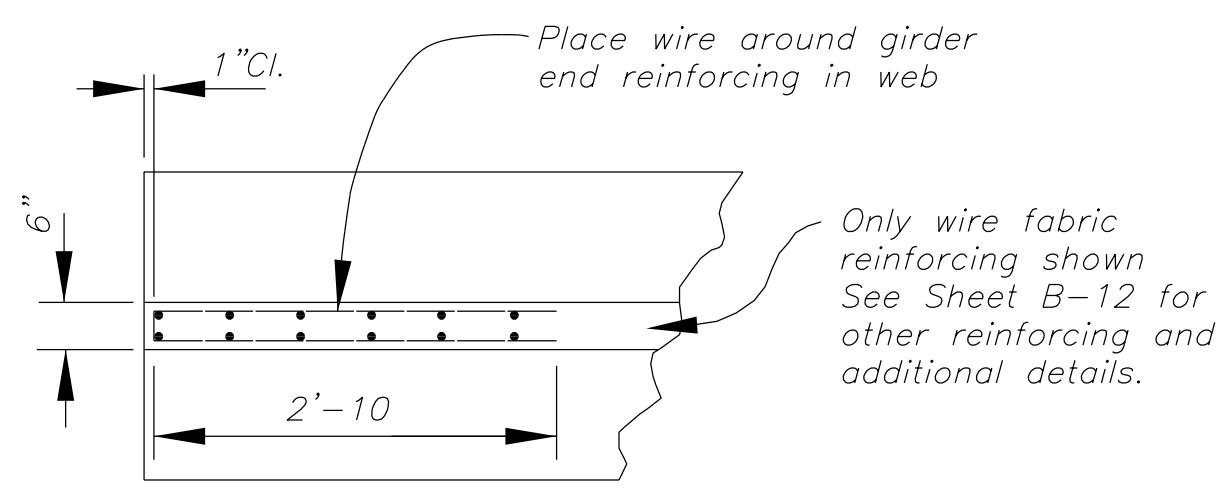
DECK POURING DIAGRAM  
(No Scale)

NOTE: Pour end diaphragms and intermediate diaphragms first. Then deck pours shall be made in numerical sequence and in the direction shown. Place pier diaphragms just before deck closures.

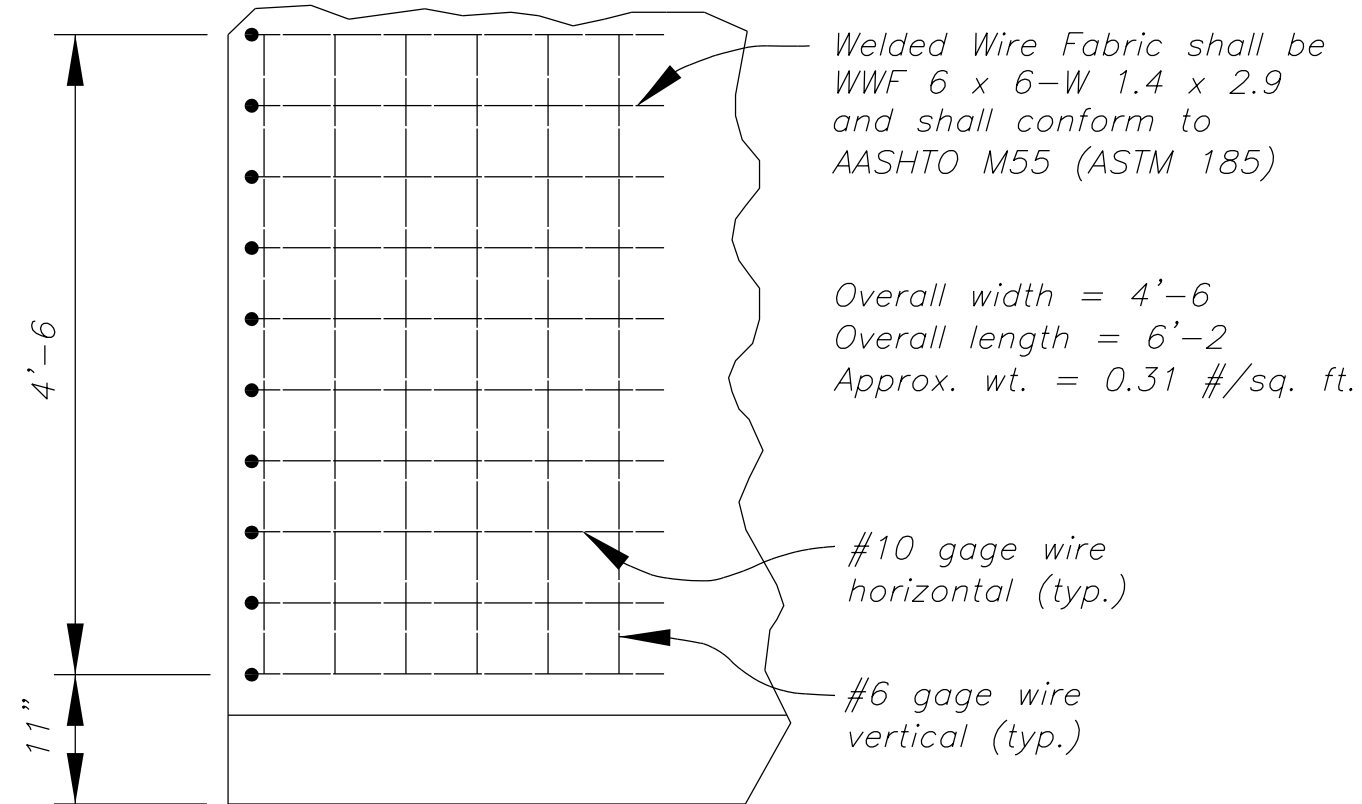
The purpose of this deck pouring diagram is to place all deck concrete on both sides of a pier diaphragm before casting the pier diaphragm. The contractor may submit an alternative sequence to the Engineer for approval provided that it accomplishes the same purpose.



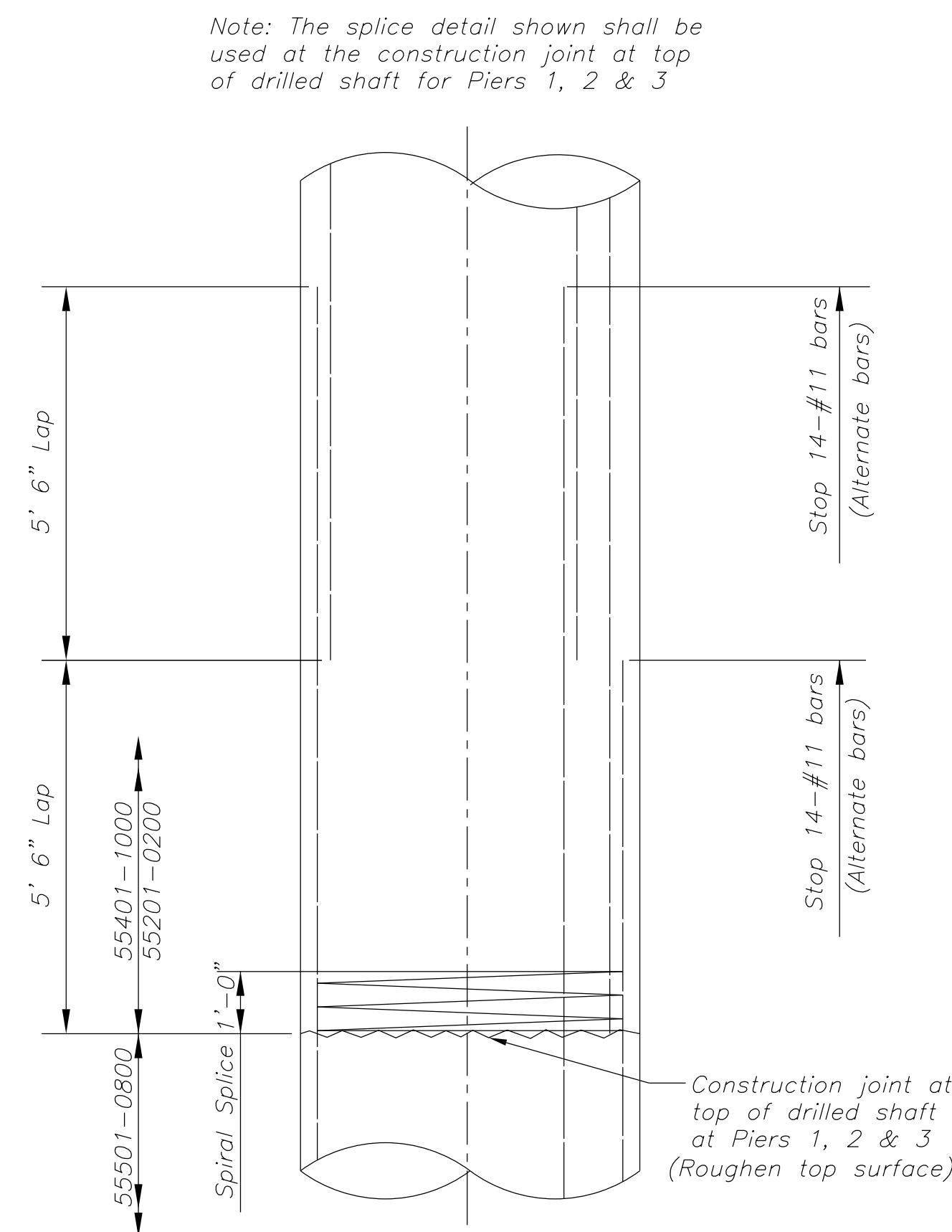
TRANSVERSE SLAB CONSTRUCTION JOINT  
(No Scale)



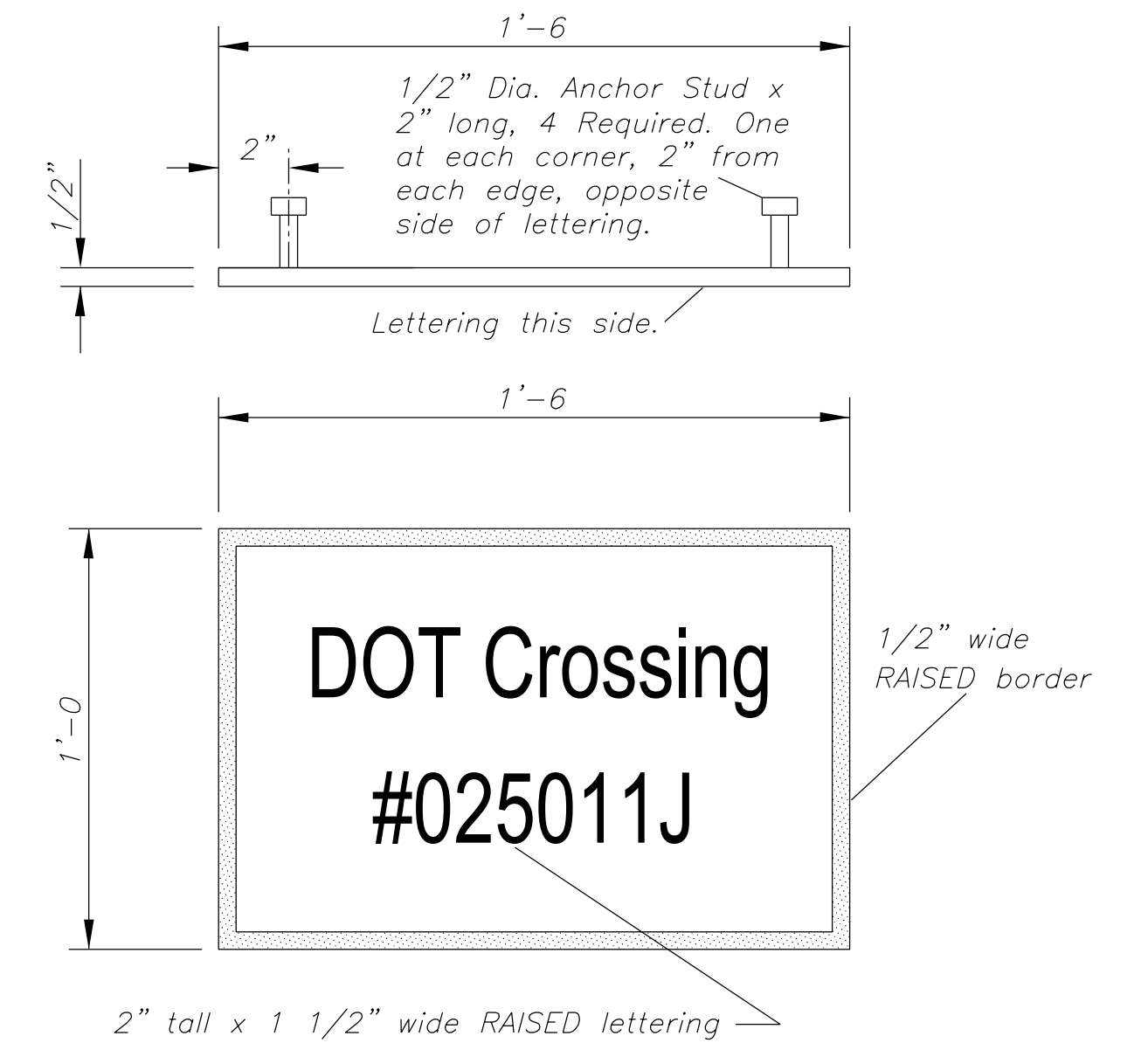
GIRDER END PLAN (B-12)



GIRDER END ELEVATION (B-12)



CONSTRUCTION JOINT DETAIL



DOT CROSSING NUMBER PLAQUE DETAILS

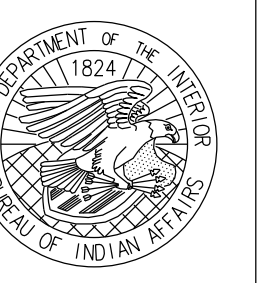
NOTE: DOT Crossing number plaques shall be made of bronze with raised polished lettering and raised polished border conforming to the dimensions shown above. Two (2) bronze plaques are required, one (1) for each end of the bridge. Bronze plaques shall be installed as shown on Sheets B-20 and B-21. Submit shop drawings for bronze plaques for review and approval no later than 45 days prior to fabrication. No ordering of materials or fabrication shall occur before written approval of the shop drawings is obtained by the Contractor. All work for furnishing, fabricating and installing bronze plaques shall be considered an incidental obligation of, and included under, Item 55201-0200, Structural Concrete.

REVISED 04/08/2015

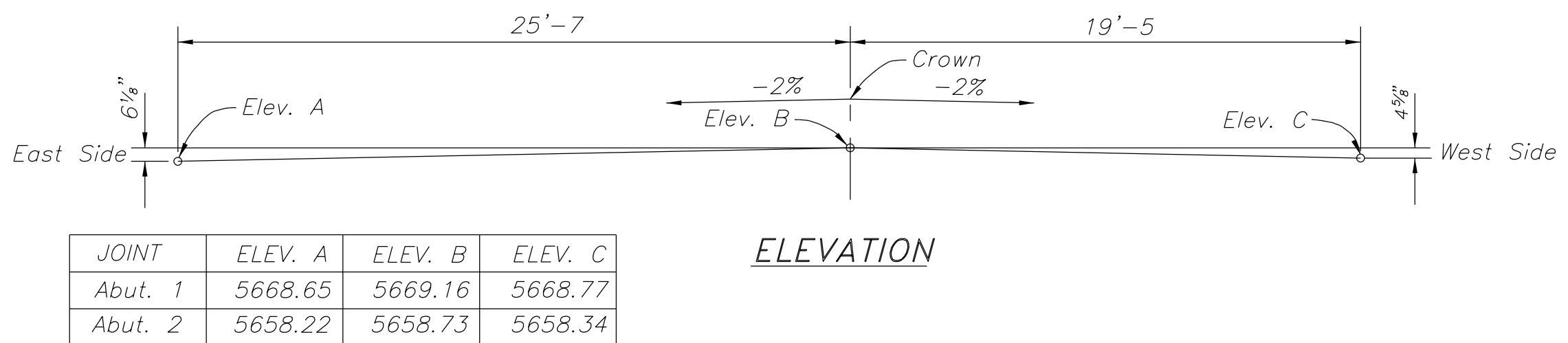
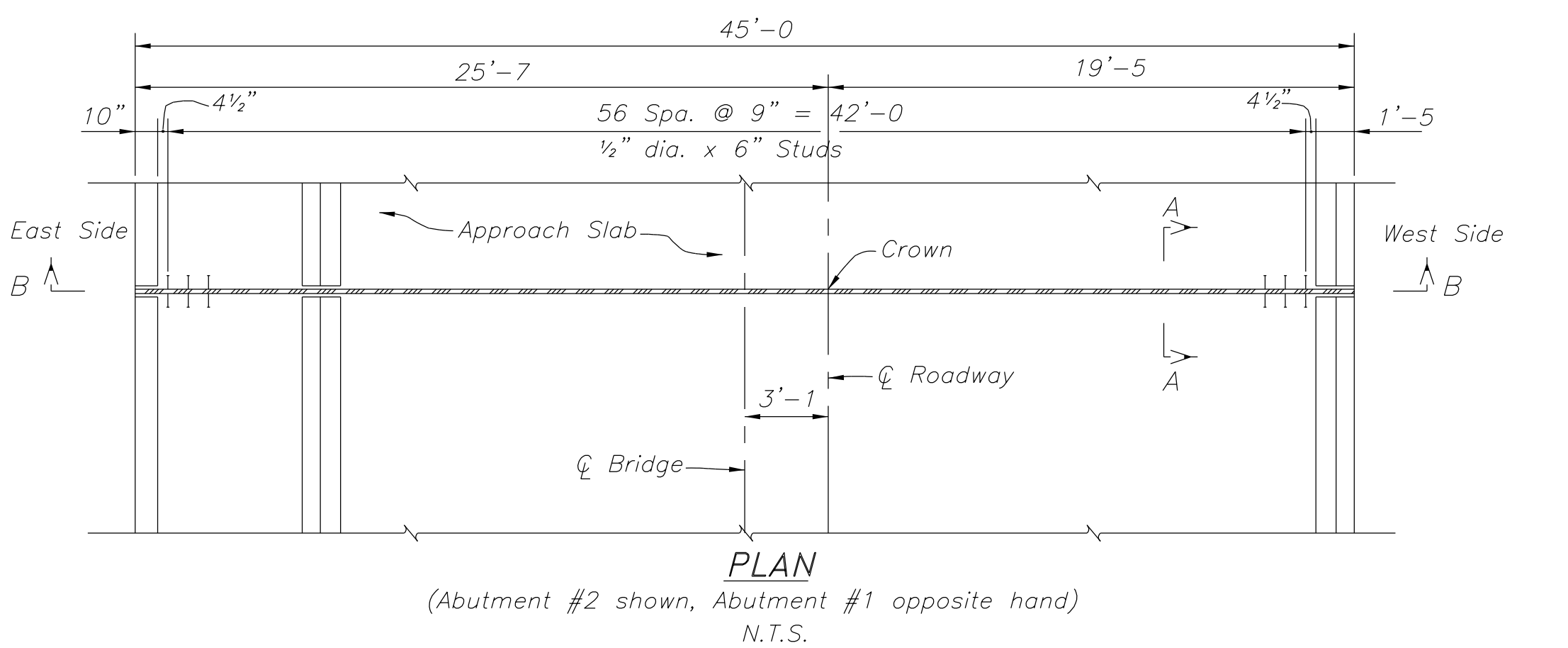
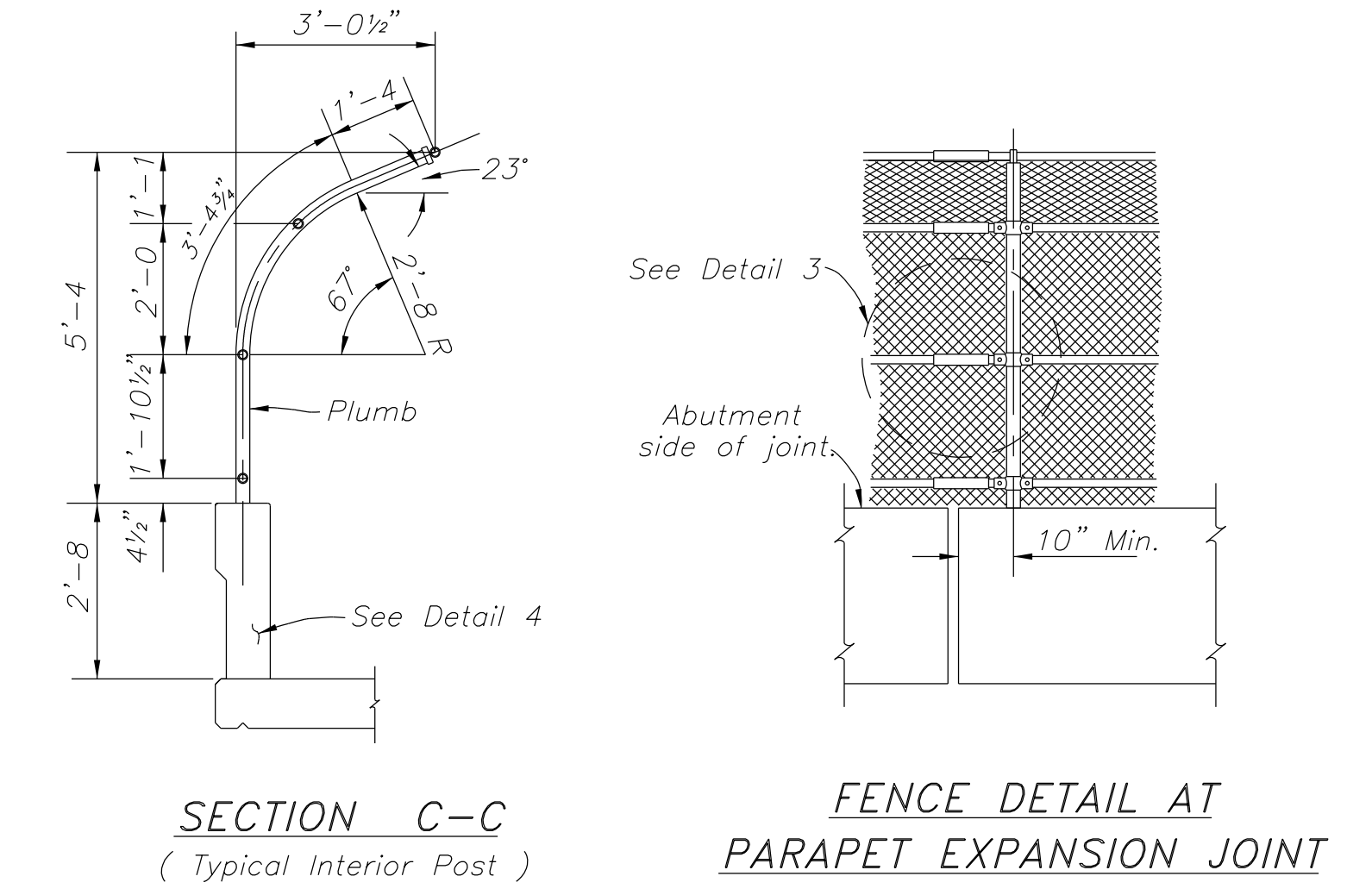
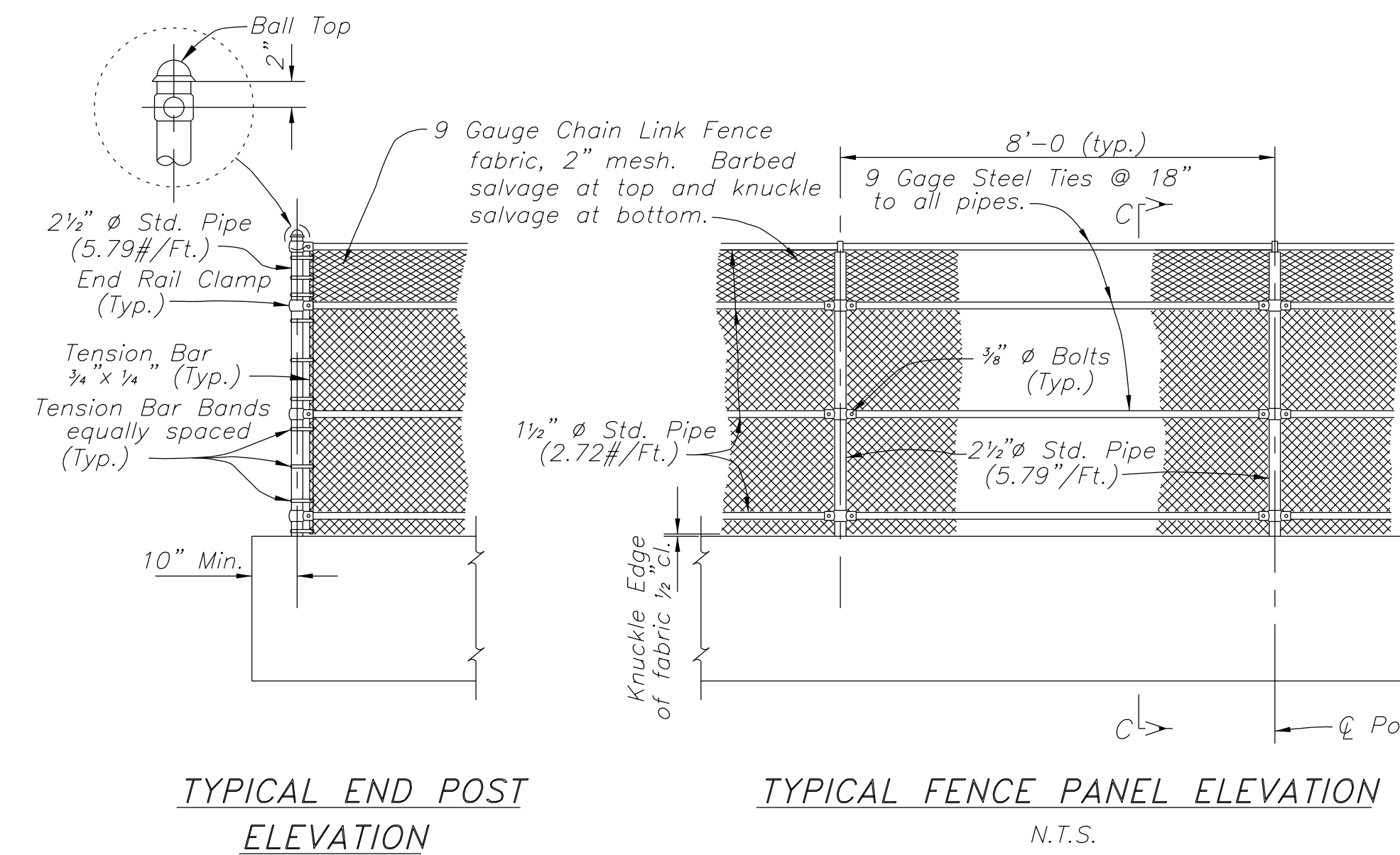
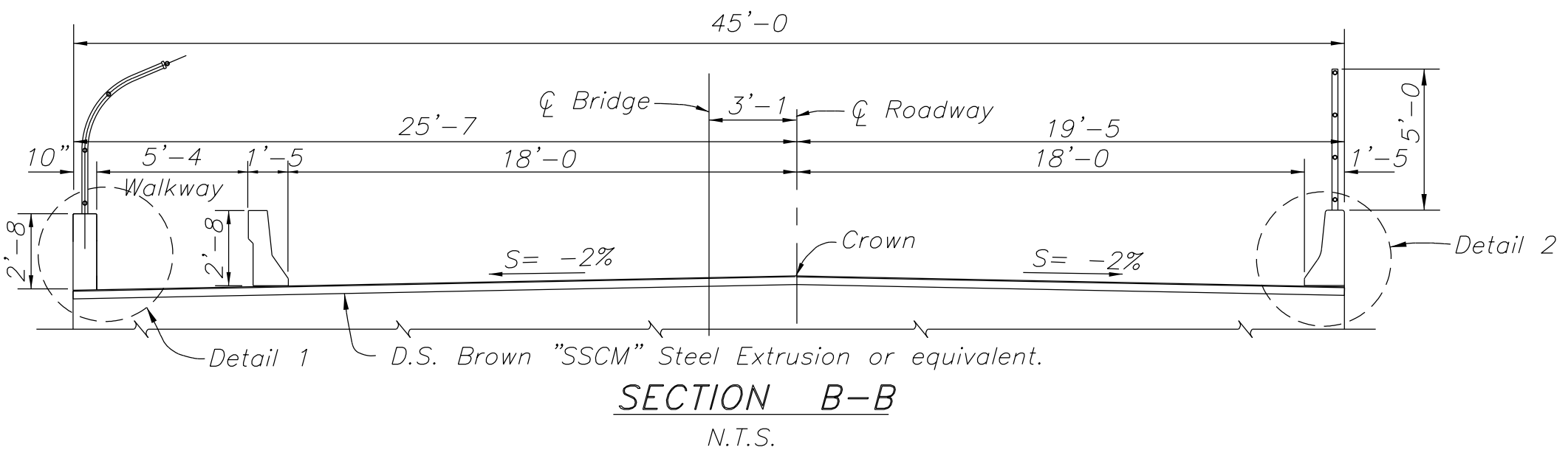
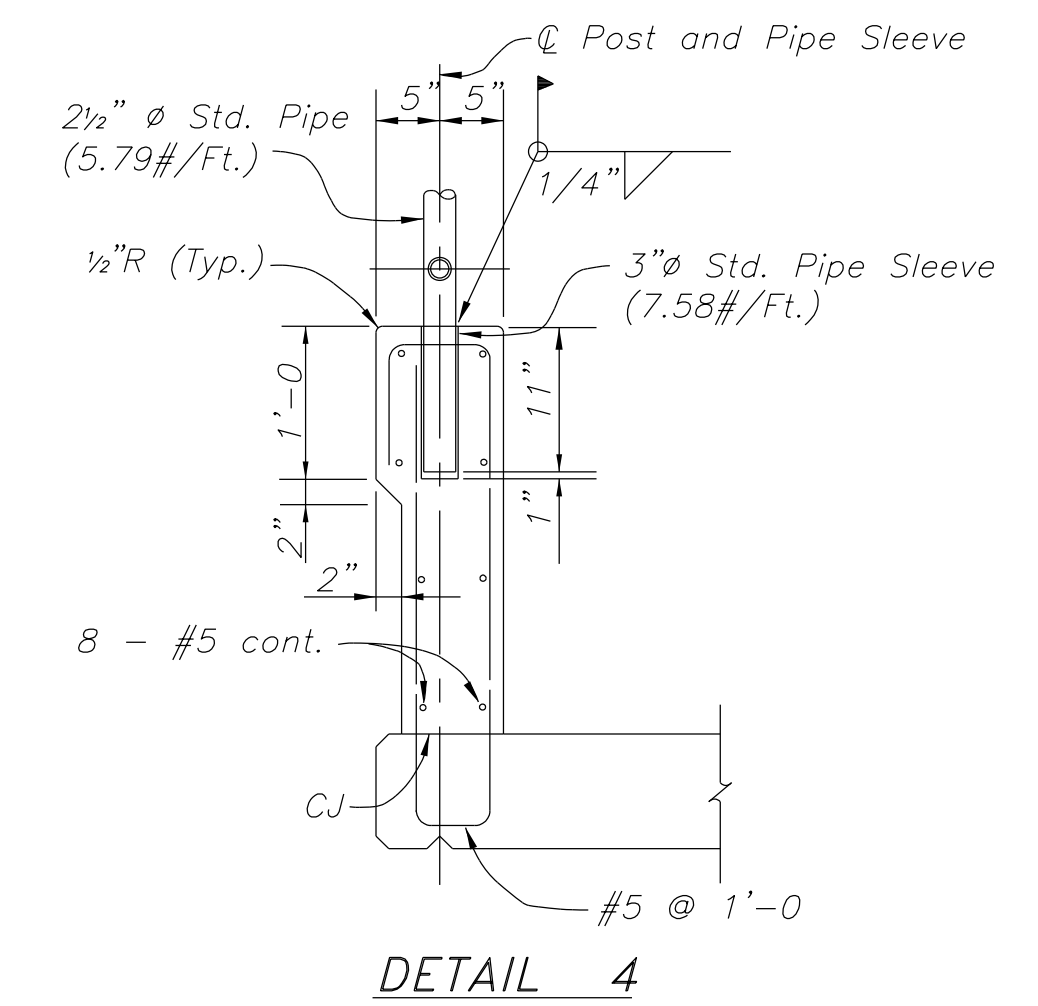
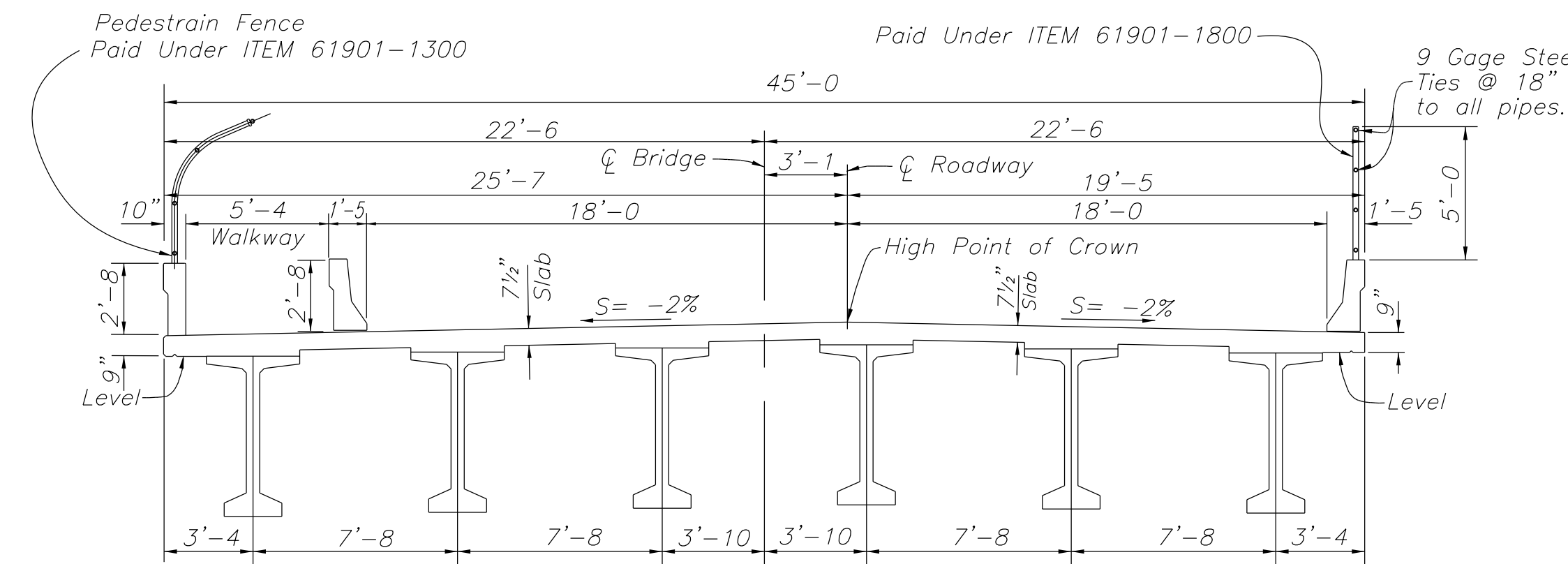
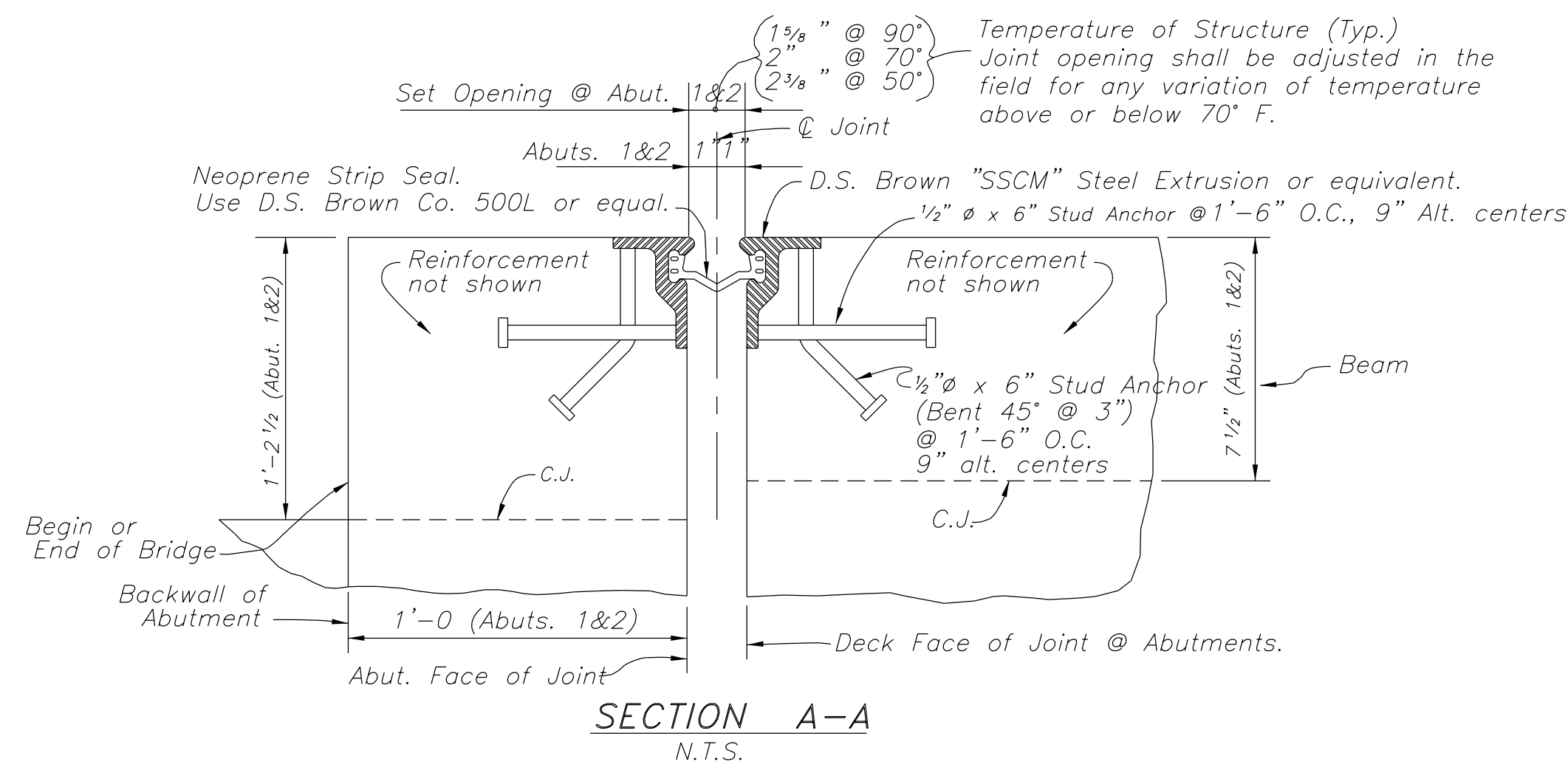
UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF INDIAN AFFAIRS  
NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

RIO PUERCO BRIDGE  
MISCELLANEOUS DETAILS

Designed by: BUREAU OF RECLAMATION  
Drawn by: BOR, dc, rsh, cdh Date: 01/17/14  
Revised by: cdh Date: 04/08/2015  
File Name: 18\_BIAmisc

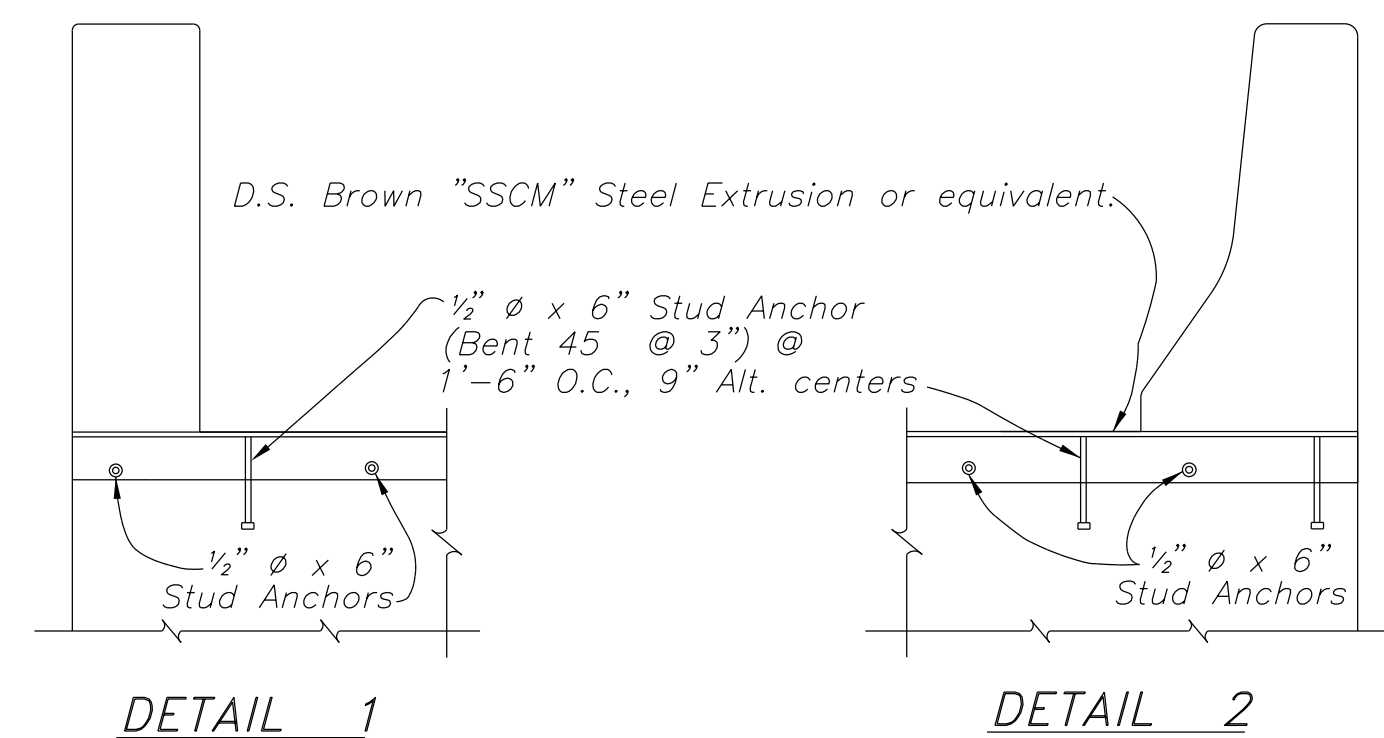
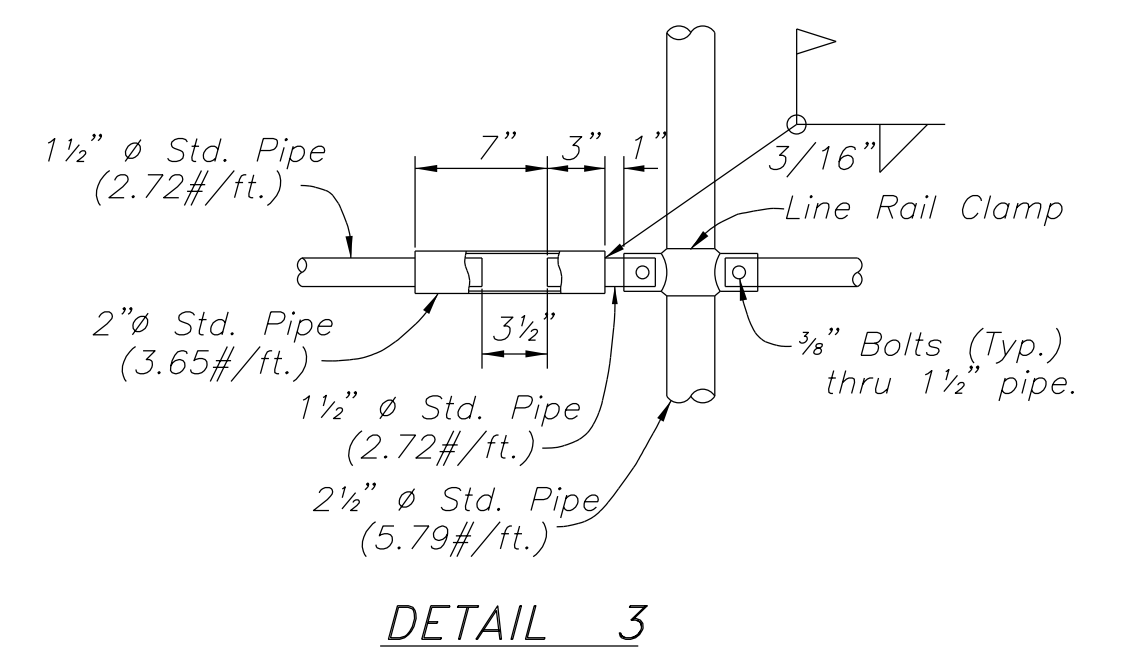


REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	AZ	Navajo	N2007	N2007(1-1)1,2&4	B-19	63



**CHAIN LINK NOTES**

- Chain link fence fabric, posts, fittings and hardware shall conform to AASHTO M181 - Type I or II. For Type 1, the wire fabric coating shall be Class A.
- All galvanizing that has been damaged in handling, transportation or welding shall be repaired by the application of a paste compound of an approved zinc powder and flux.
- All exposed edges shall be smooth.
- All bolt heads shall be to the inside.



**EXPANSION JOINT GENERAL NOTES**

- Contractor shall submit shop drawings for the joint showing all fabrication details and material specifications according to specification requirements.
- The joint shall be installed in accordance with the manufacturer's instructions. A representative of the manufacturer shall be present at the job site during installation.
- Steel extrusions shall conform to AASHTO M270, Grade 36 or Grade 50W (ASTM A709, Grade 36 or Grade 50W). Welded anchors shall conform to AASHTO M169 (ASTM A108). The entire assembly consisting of extrusions and welded anchors shall be galvanized after fabrication. Neoprene strip seal shall conform to the physical properties prescribed in Table 1 of AASHTO 220 (ASTM D2628).

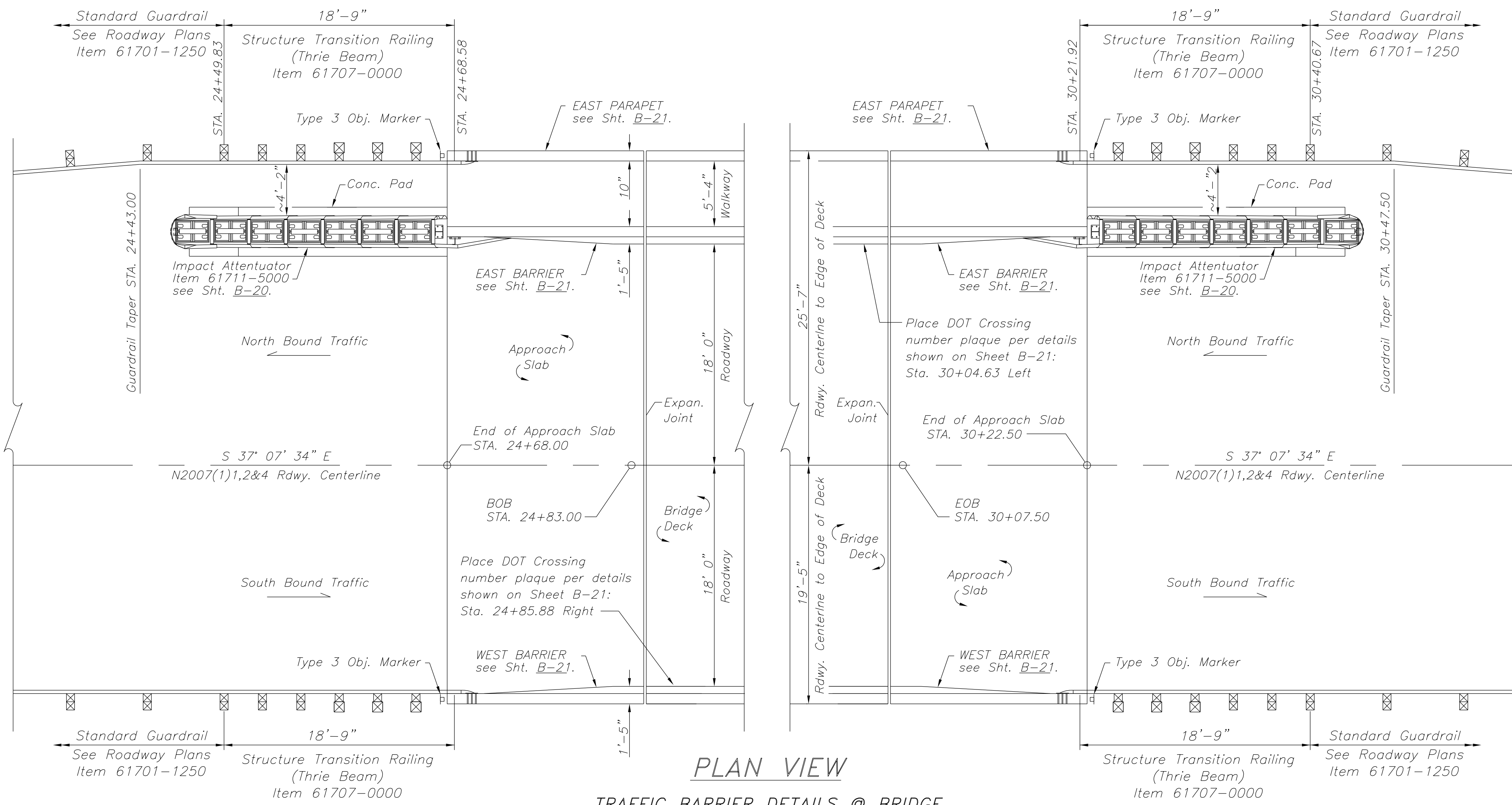
UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF INDIAN AFFAIRS  
NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

RIO PUERCO BRIDGE  
EXPANSION JOINT DETAILS AND  
PEDESTRIAN FENCING DETAILS

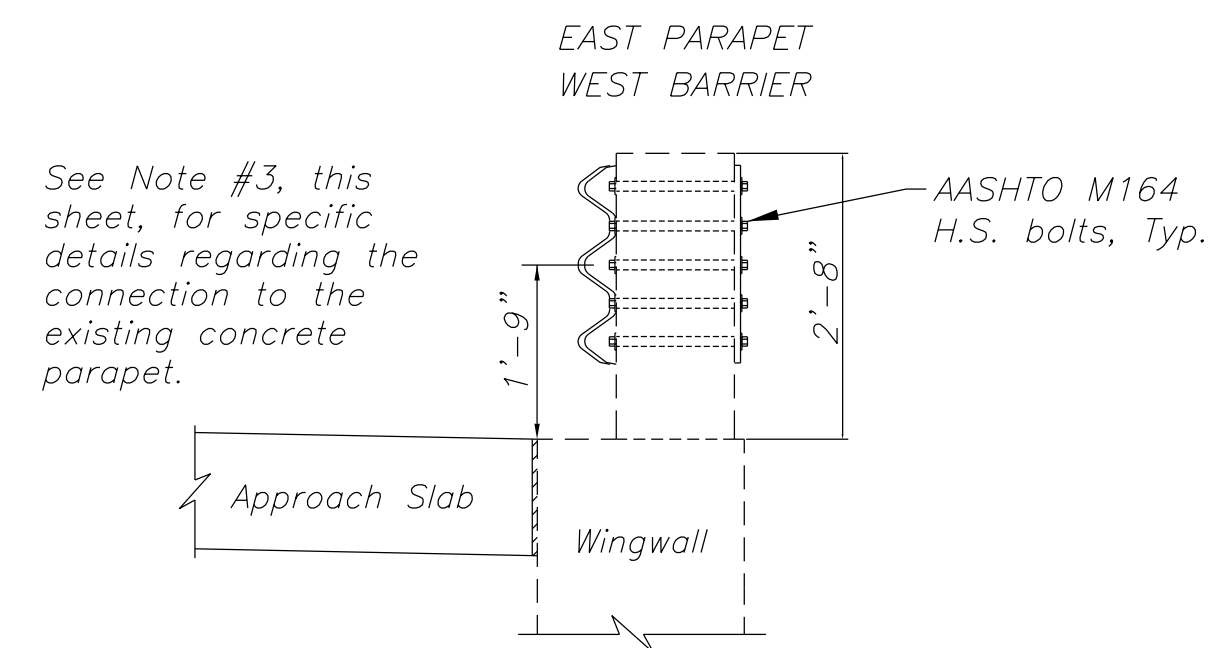
Designed by: BUREAU OF RECLAMATION  
Drawn by: BOR, dc, rsh Date: 01/17/14  
Revised by: -- Date: --  
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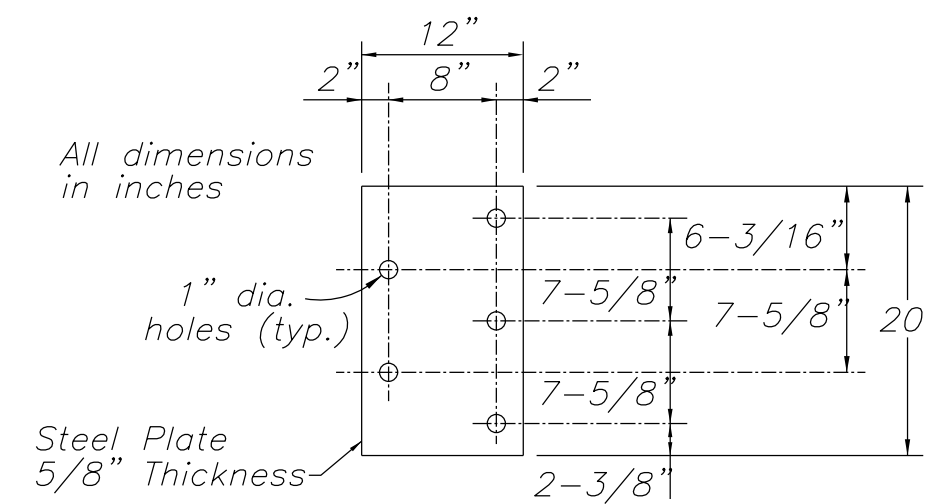
REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	AZ	Navajo	N2007	N2007(1-1)1,2&4	B-20	63



**PLAN VIEW**  
**TRAFFIC BARRIER DETAILS @ BRIDGE**



**SECTION F-F**  
(from Sht. B-21)



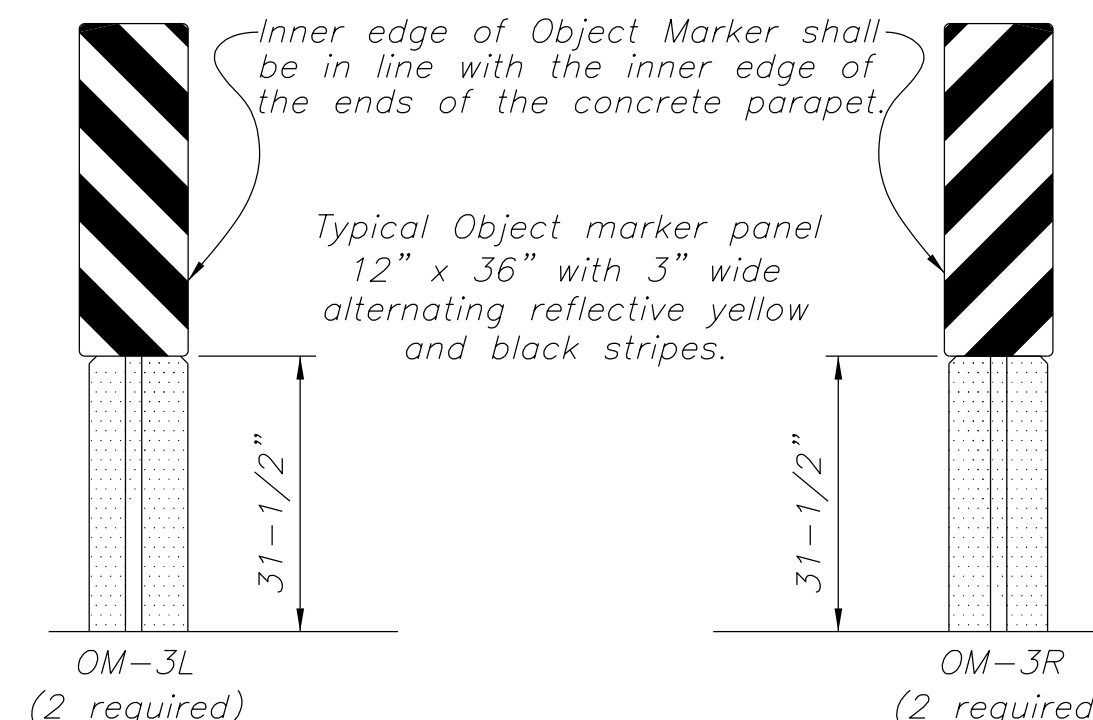
**THRIE BEAM TERMINAL CONNECTOR PLATE**

**STRUCTURE TRANSITION RAILING NOTES**

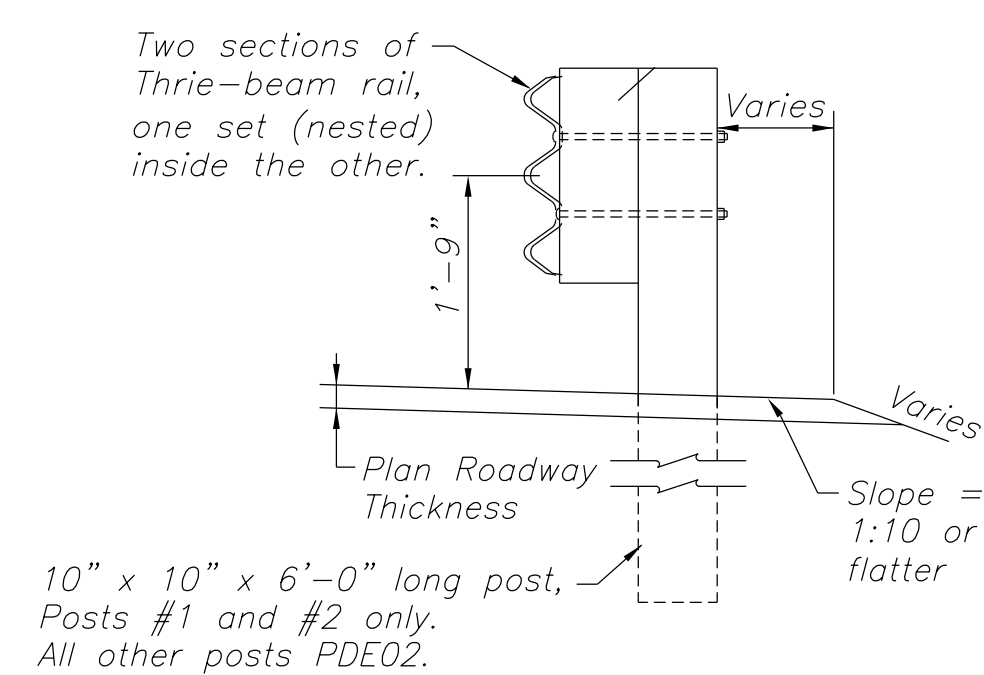
NOTE: See Sheet B-21 for primary details regarding the STRUCTURE TRANSITION RAILING. See Sheet B-21 for location of Section views shown on this sheet.

1. Terminal connectors, metal blocks, block plates shall be furnished and installed with, and shall be incidental to the W-beam guardrail item.
2. The terminal connectors, blocks, and block plates shall be galvanized after fabrication in accordance with ASTM A123.
3. Connect ARTBA Standard RE-8 terminal connectors to barrier/parapet with 4-7/8" high strength bolts. Connect blocks to barrier/parapet with 5/8" high strength bolts. All high strength bolts shall be ASTM A325, Type 3 and shall be galvanized in accordance with ASTM A153.
4. ARTBA Standard RE-4 W-beam back-up plates shall be installed behind guardrail at metal blocks.
5. Structural steel shall conform to ASTM A36, unless otherwise specified.
6. The contractor shall be required to compact the asphalt all around each guardrail post with hand tampers to insure integrity of the pavement and guardrail and to prevent seepage of water into the pavement from the guard rail post holes.

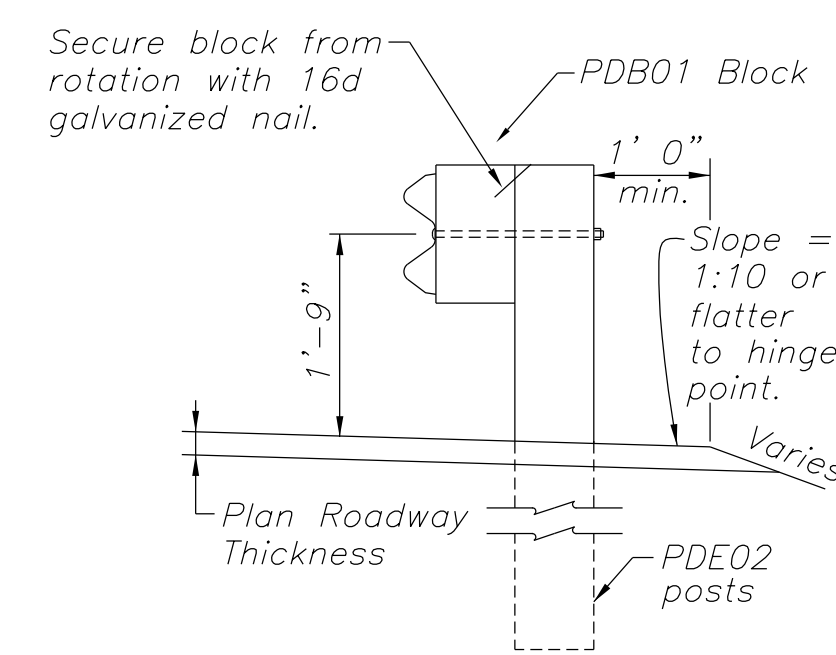
NOTE: Place object marker posts between structure transition rail posts #1 and #2 if object marker posts can not fit between existing wingwall and approach guardrail post #1.



**TYPE 3 OBJECT MARKER @ PARAPET WALLS**  
N.T.S.



**SECTION G-G**  
(from Sht. B-21)



**SECTION H-H**  
(from Sht. B-21)

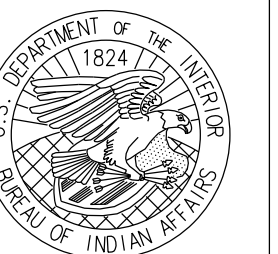
REVISED 04/08/2015

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF INDIAN AFFAIRS

NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

RIO PUERCO BRIDGE  
GUARDRAIL TRANSITION PLAN VIEW

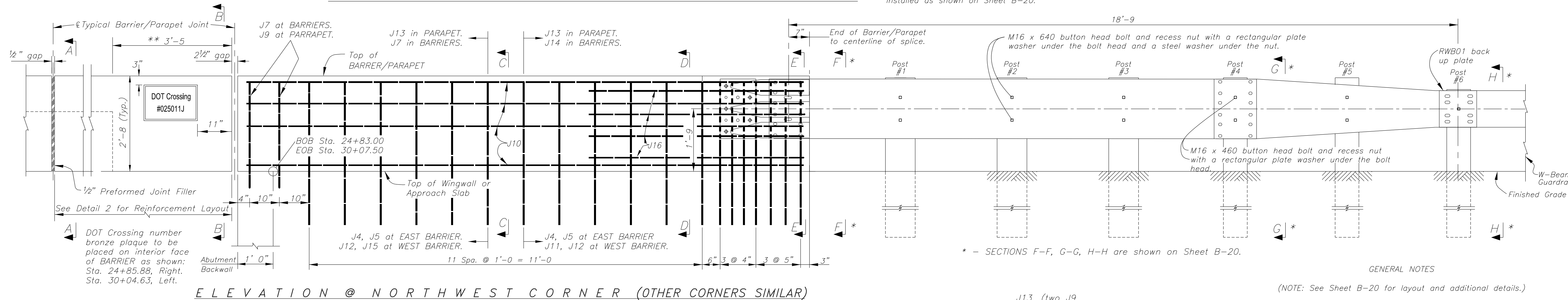
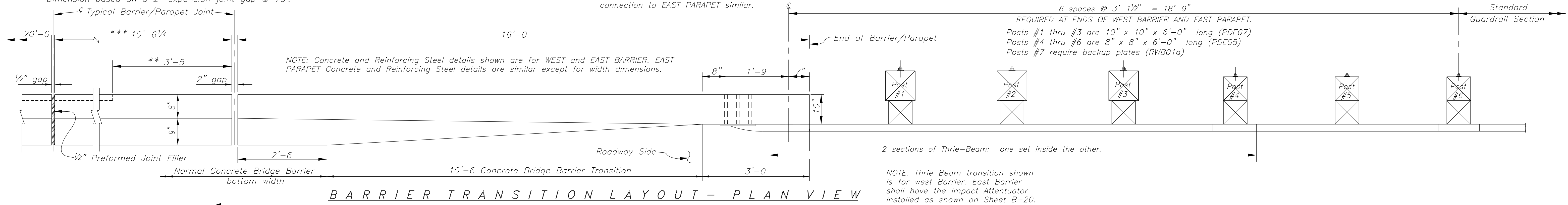
Designed by: CDH - Structural Unit	Date: 01/17/14
Drawn by: rsh, cdh	Date: 04/08/2015
Revised by: cdh	Date: 04/08/2015
File Name: 20_BIAguardrail_layout	



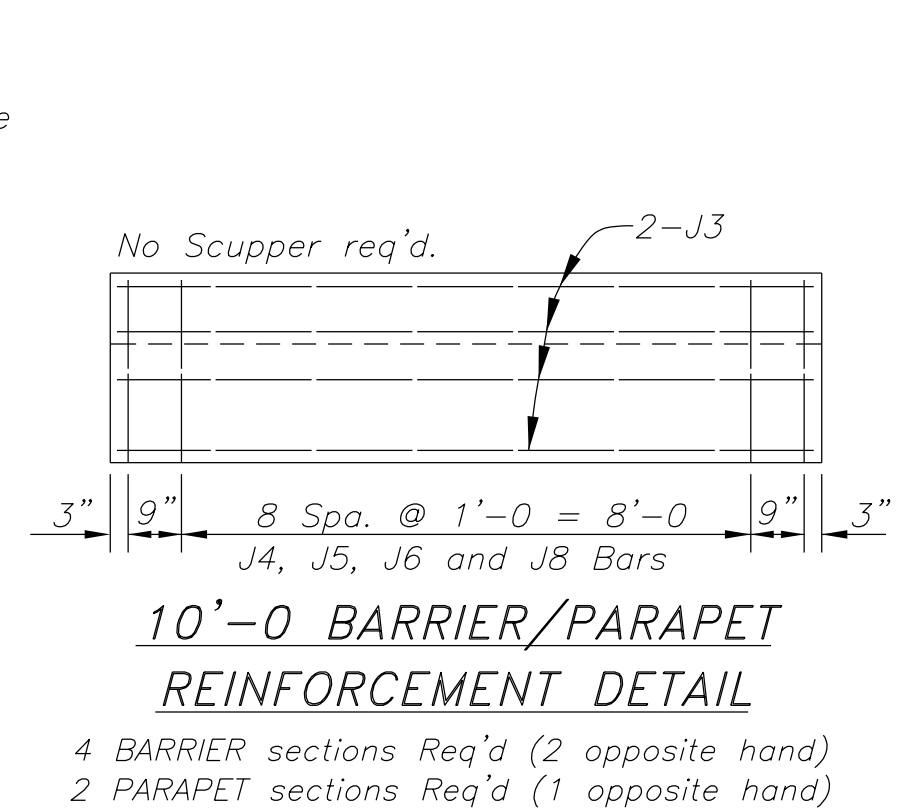
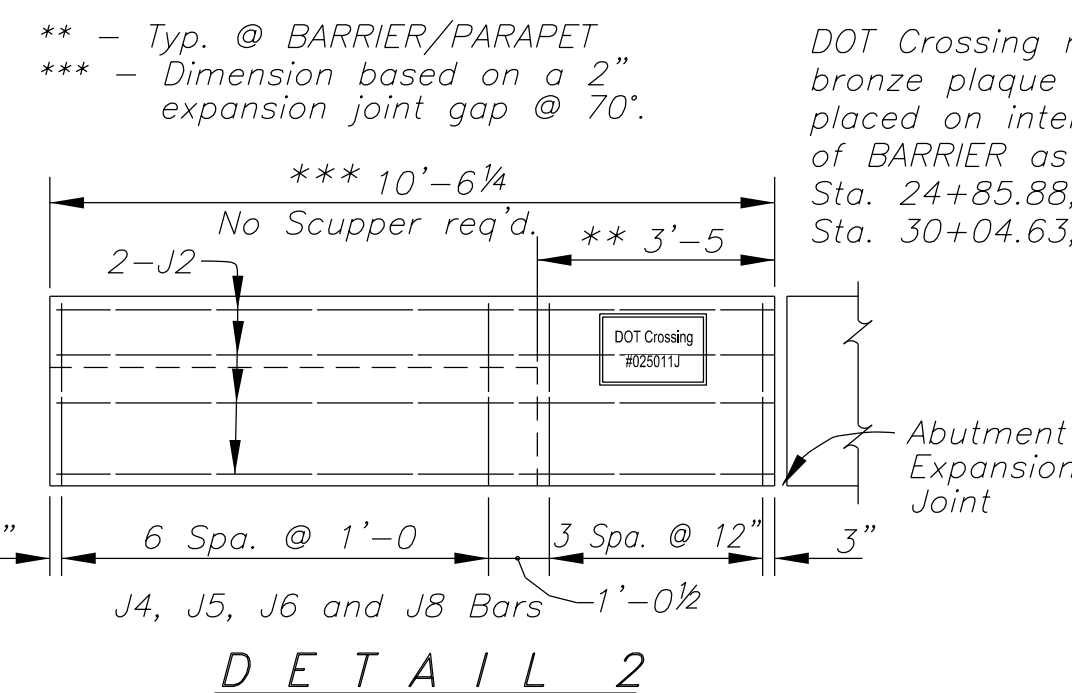
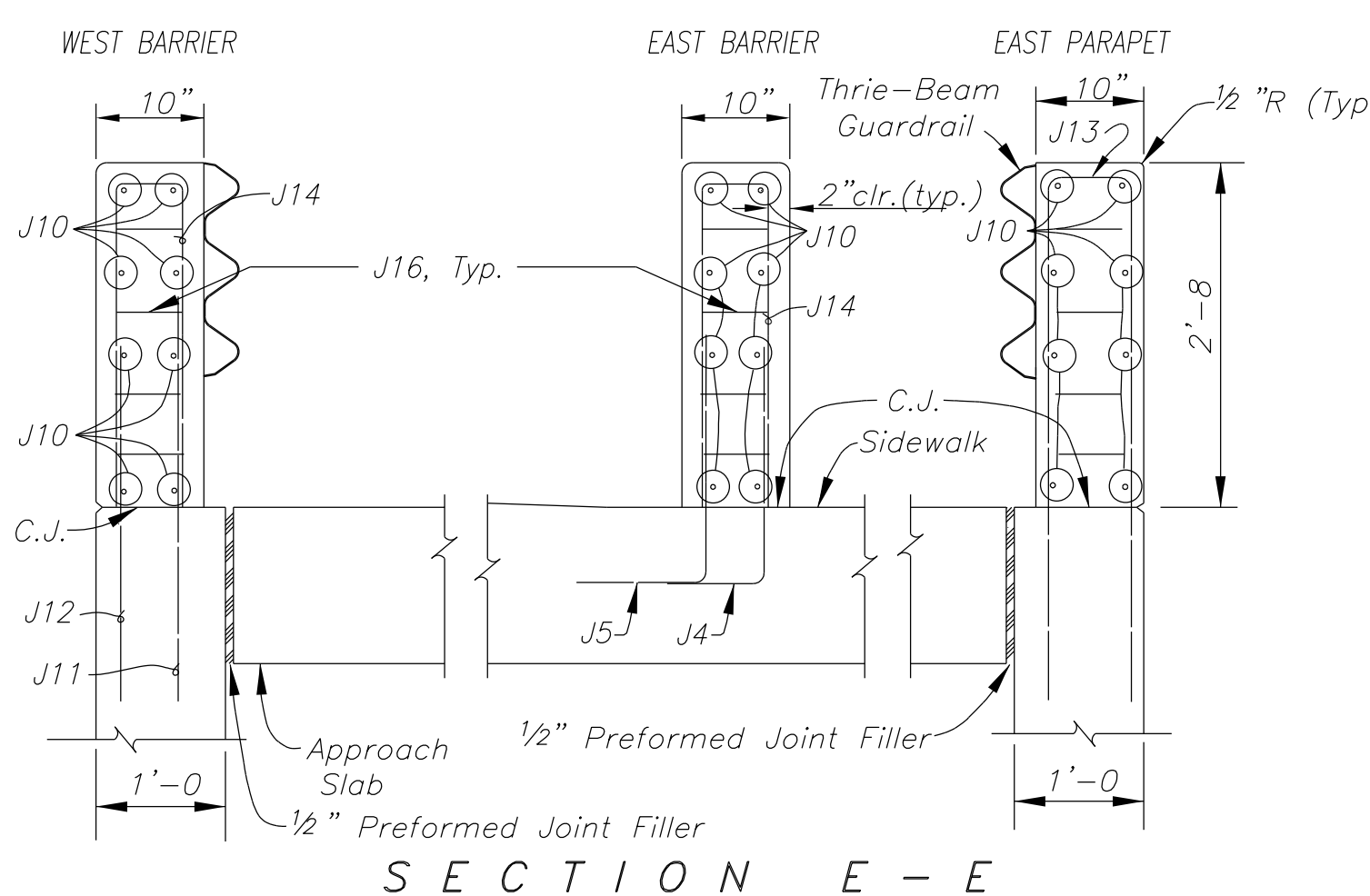
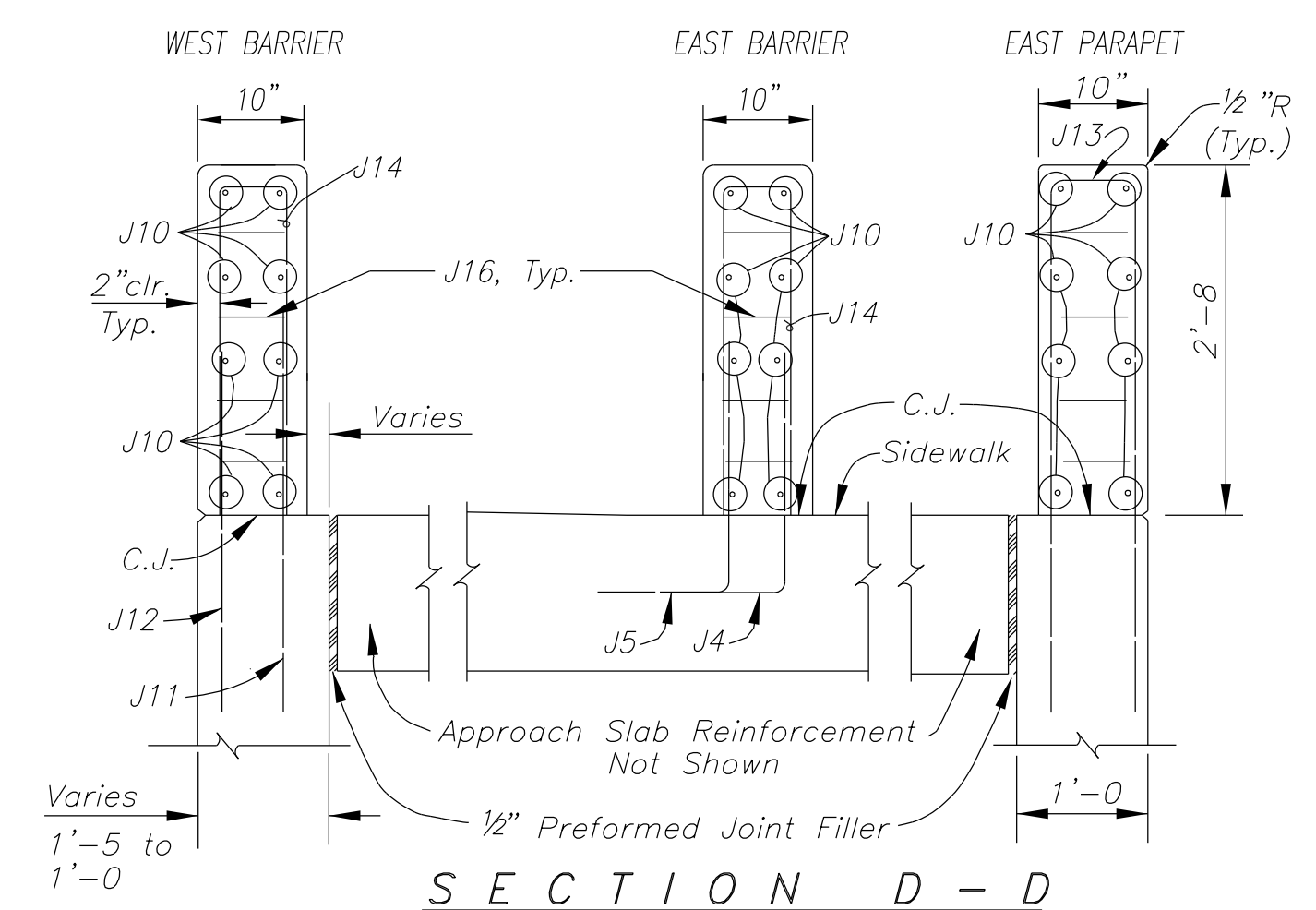
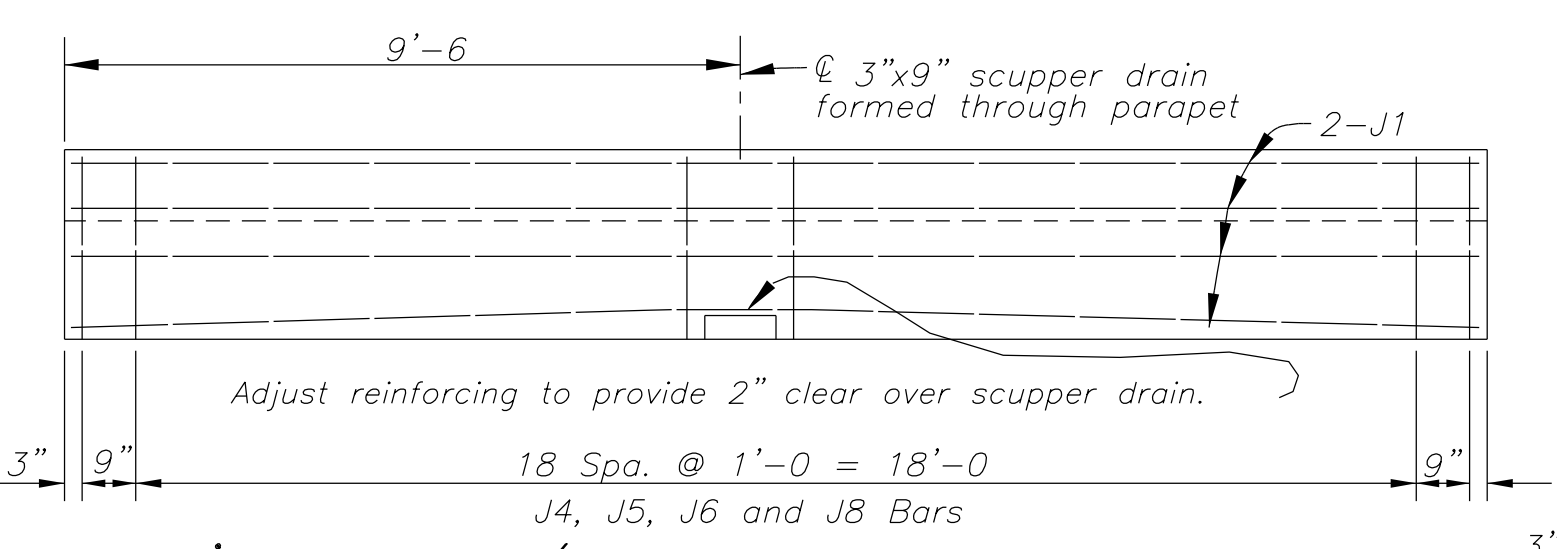
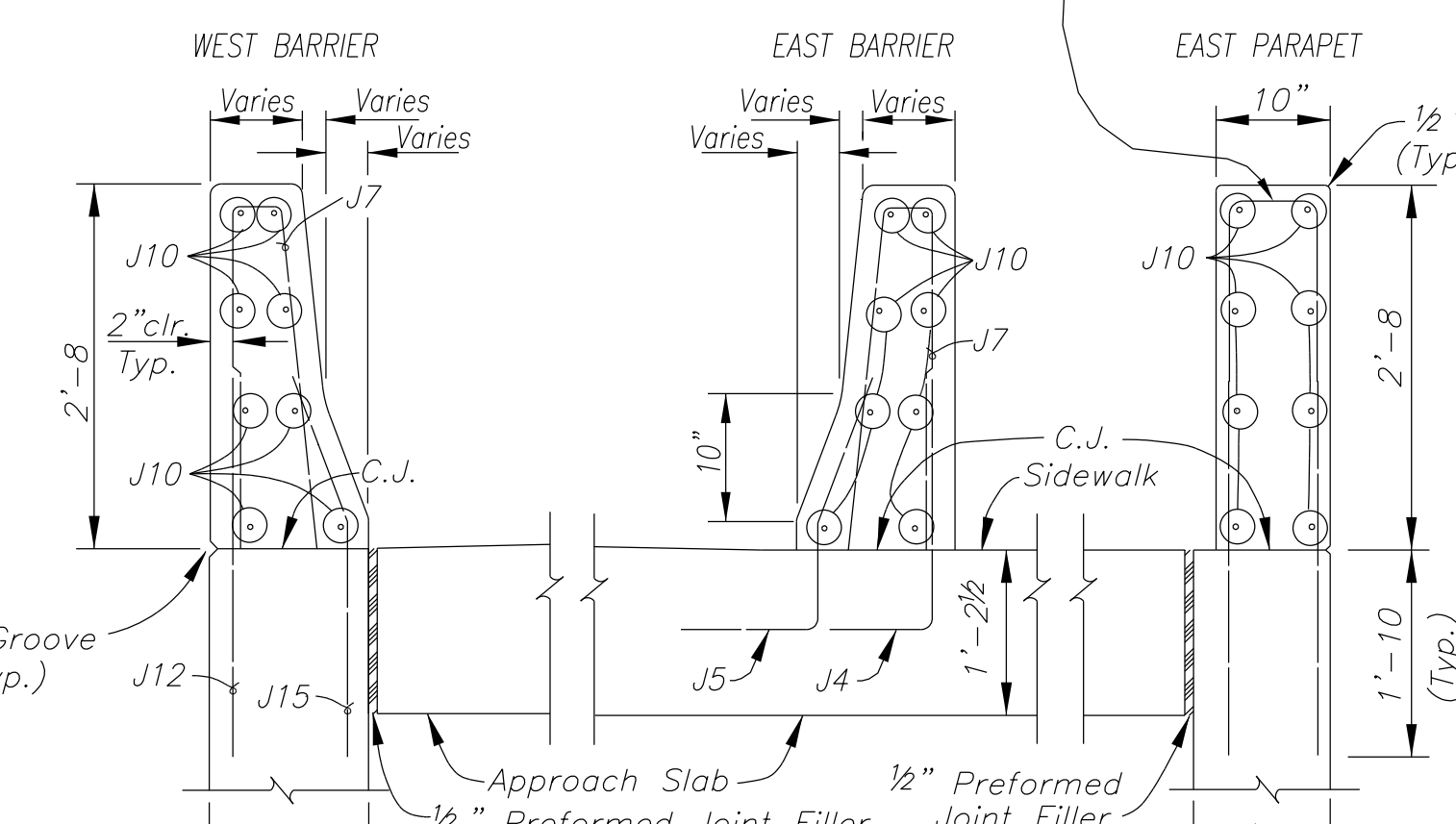
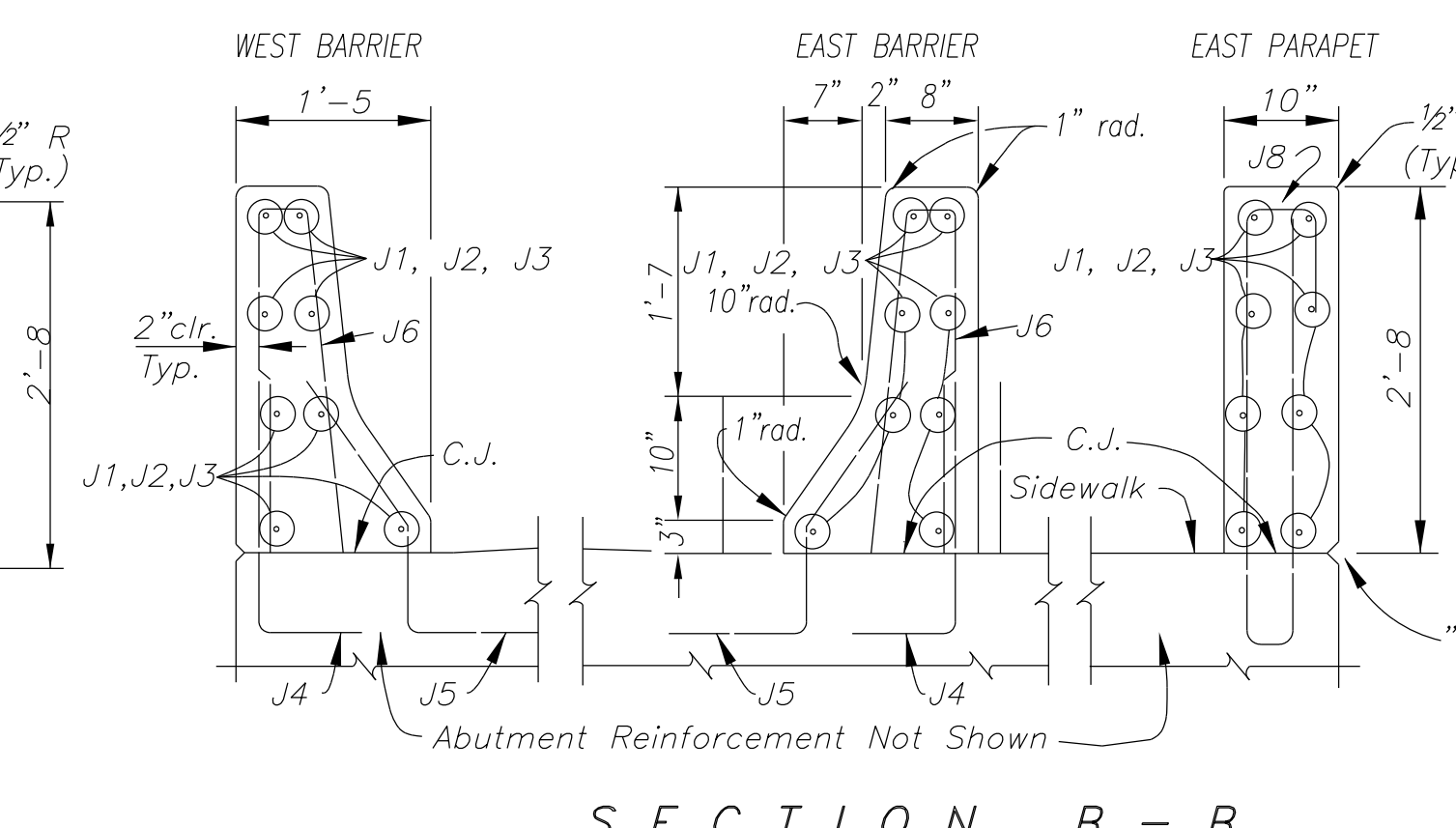
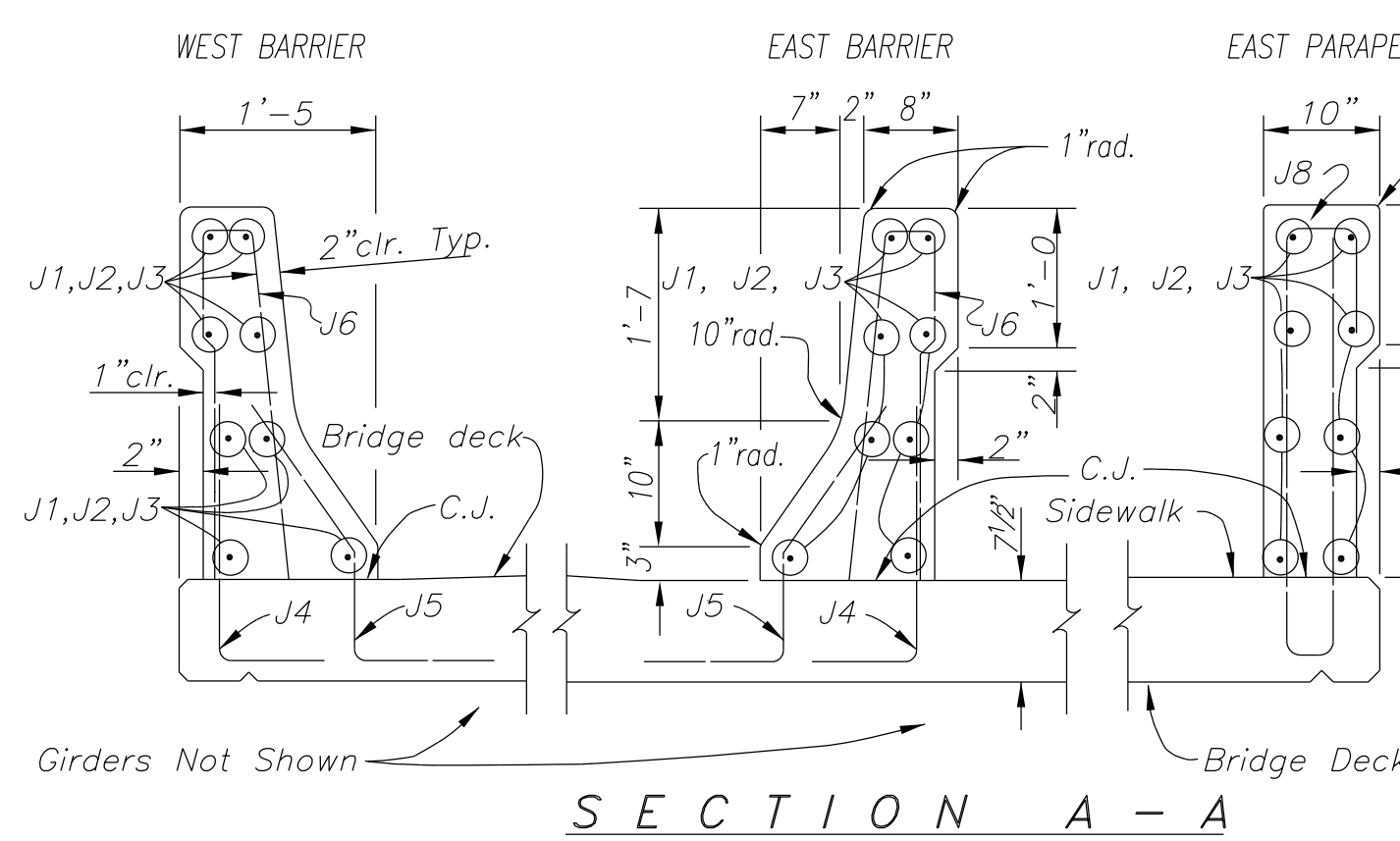
REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	AZ	Navajo	N2007	N2007(1-1)1,2&4	B-21	63

\*\* - Typ. @ Barrier and Parapet.  
 \*\*\* - Dimension based on a 2" expansion joint gap @ 70'.

NOTE: Thrie Beam connection to WEST BARRIER shown. Thrie Beam connection to EAST PARAPET similar.



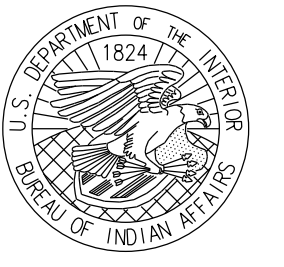
(NOTE: See Sheet B-20 for layout and additional details.)  
 Concrete for parapets and barriers shall have a 28 day strength of  $f'c = 4,000$  p.s.i.  
 Reinforcing steel shall conform to AASHTO M31, Grade 60.  
 Ends of all concrete parapet and barrier shall be provided with connection hardware for Structure Transition Railing and Impact Attenuators.  
 Chamfer all corners  $\frac{3}{4}$ " unless otherwise noted.  
 Chain link fence not shown on these details. For fencing details, see Sht. B-19.  
 All threaded tubular expansion anchors are required to meet or exceed a tensile proof test load of 5,100 lbs. in 4,000 p.s.i. concrete.  
 No steel post to be used for post #1 thru #6 of Structure Transition Rail.



REVISED 04/07/2015

UNITED STATES  
 DEPARTMENT OF THE INTERIOR  
 BUREAU OF INDIAN AFFAIRS  
 NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION  
 RIO PUERCO BRIDGE  
 CONCRETE BARRIER and GUARDRAIL TRANSITION  
 DETAILS

Designed by: BUREAU OF RECLAMATION  
 Drawn by: BOR, cdh, dc, rsh Date: 01/17/14  
 Revised by: cdh Date: 04/07/2015  
 File Name: 21\_BIA\_barr-ADOT

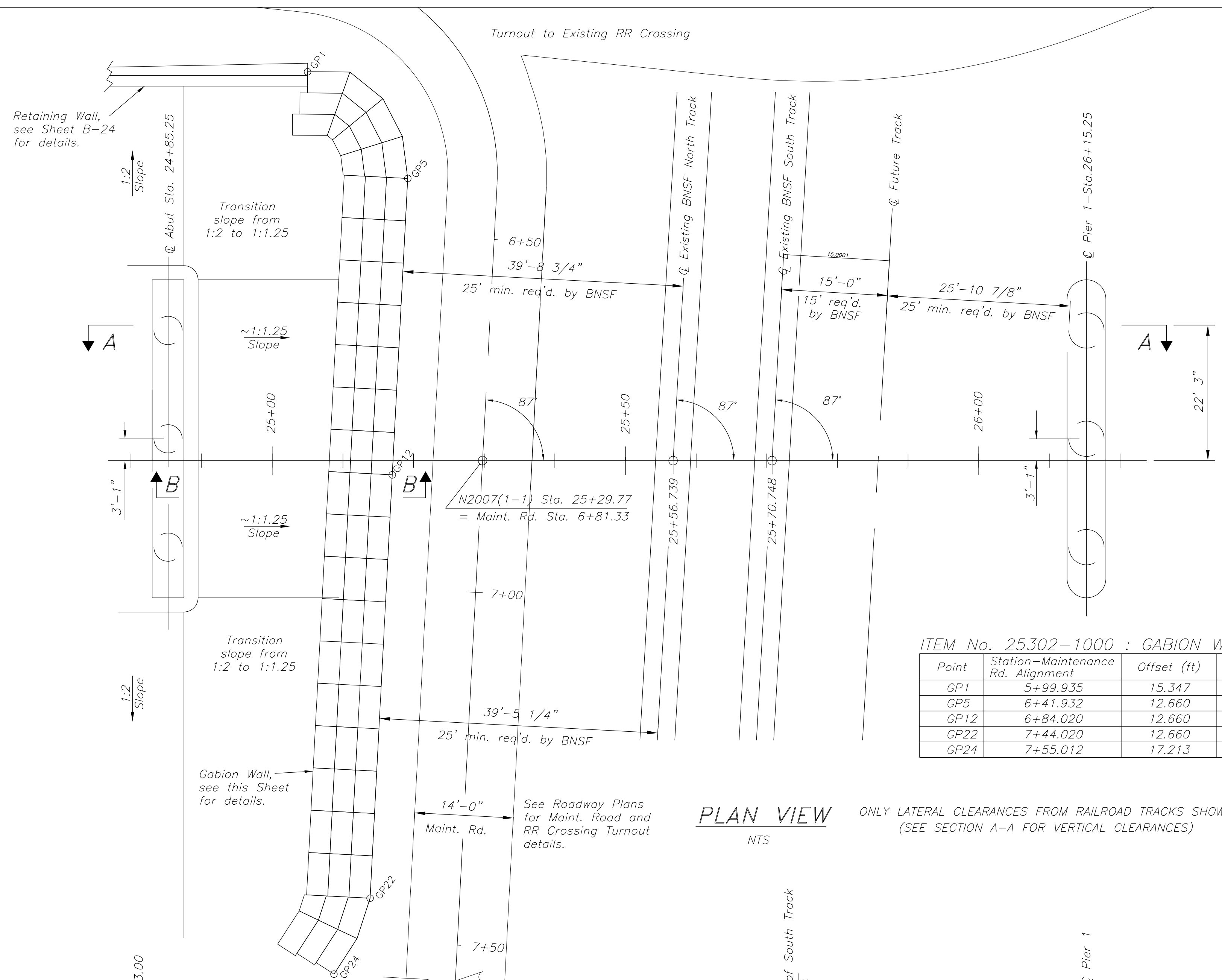


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REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	AZ	Navajo	N2007	N2007(1-1)1,2&4	B-22	63

**GABION NOTES**

- Wire mesh for gabion baskets shall be made from cold drawn steel wire with a minimum diameter of 0.120" conforming to ASTM A641 with a Class 3 zinc coating.
- Tie wire shall be cold drawn steel wire with a minimum diameter of 0.092" conforming to ASTM A641 with a Class 3 zinc coating.
- Rock for filling gabion baskets shall conform to Class 2 rock in Table 705-1 of the FP-03.
- Erosion Control Geotextile under and behind gabions shall conform to Type IV-C of Table 714-4 of the FP-03. Furnishing and installation of Erosion Control Geotextile shall be incidental to Item 25302-1000.
- Backfill material under and behind gabions shall be native material compacted to 95% per Section 253.07 of the FP-03.
- Wire mesh for gabions shall be 6x8 mesh as manufactured by Maccaferri, or an approved equal. Furnishing, fabrication and installation shall be as per the manufacturer's recommendations and instructions. Material information and certifications shall be submitted for review and be approved prior to installation.
- After construction of gabion structures, grade adjacent ground to the Maintenance Road typical section requirements. Material excavated for construction of gabion structures shall be utilized for backfill construction. Partial covering of the gabion structure (base) will be necessary to construct as shown. Material placed as backfill shall be compacted by thorough tamping and/or rolling by construction equipment while avoiding any damage to gabion structures. Any damage to gabion structures shall be repaired or replaced by the Contractor at no additional cost to the Government. All excavation, including all necessary rock excavation, embankment, grading and backfill necessary for the construction of the gabion structures shall be considered incidental to Item 25302-1000.
- All material certifications for gabions and erosion control geotextile shall be submitted for review and shall be approved prior to the use of the material.
- Any unsuitable or unstable material encountered during foundation bed preparation (not attributable to the Contractor's operations) shall be removed and replaced with suitable material as directed by the COR. This work, if necessary, shall be paid for in accordance with Section 109.02(m) of the FP-03.

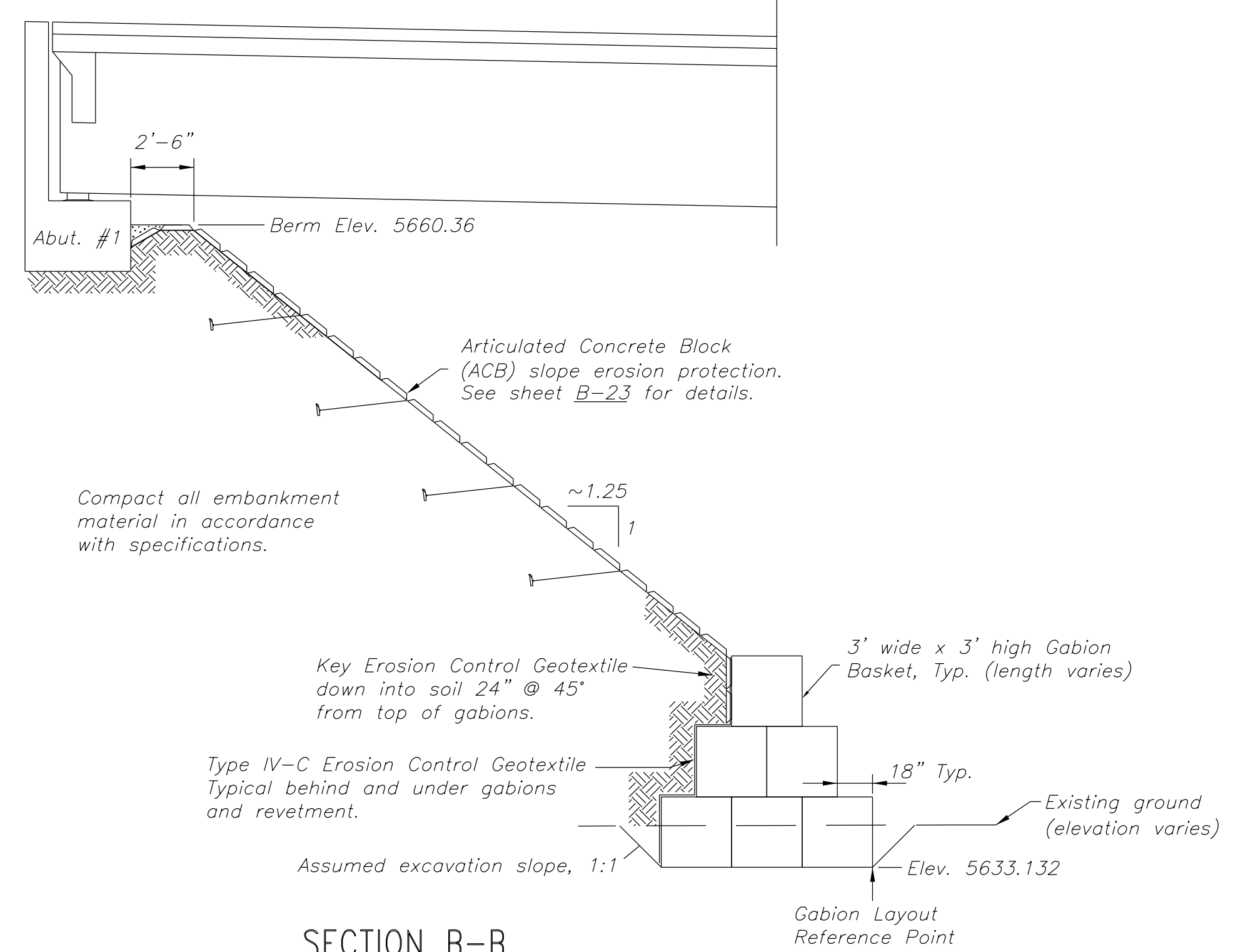


ITEM No. 25302-1000 : GABION WALL LAYOUT TABLE

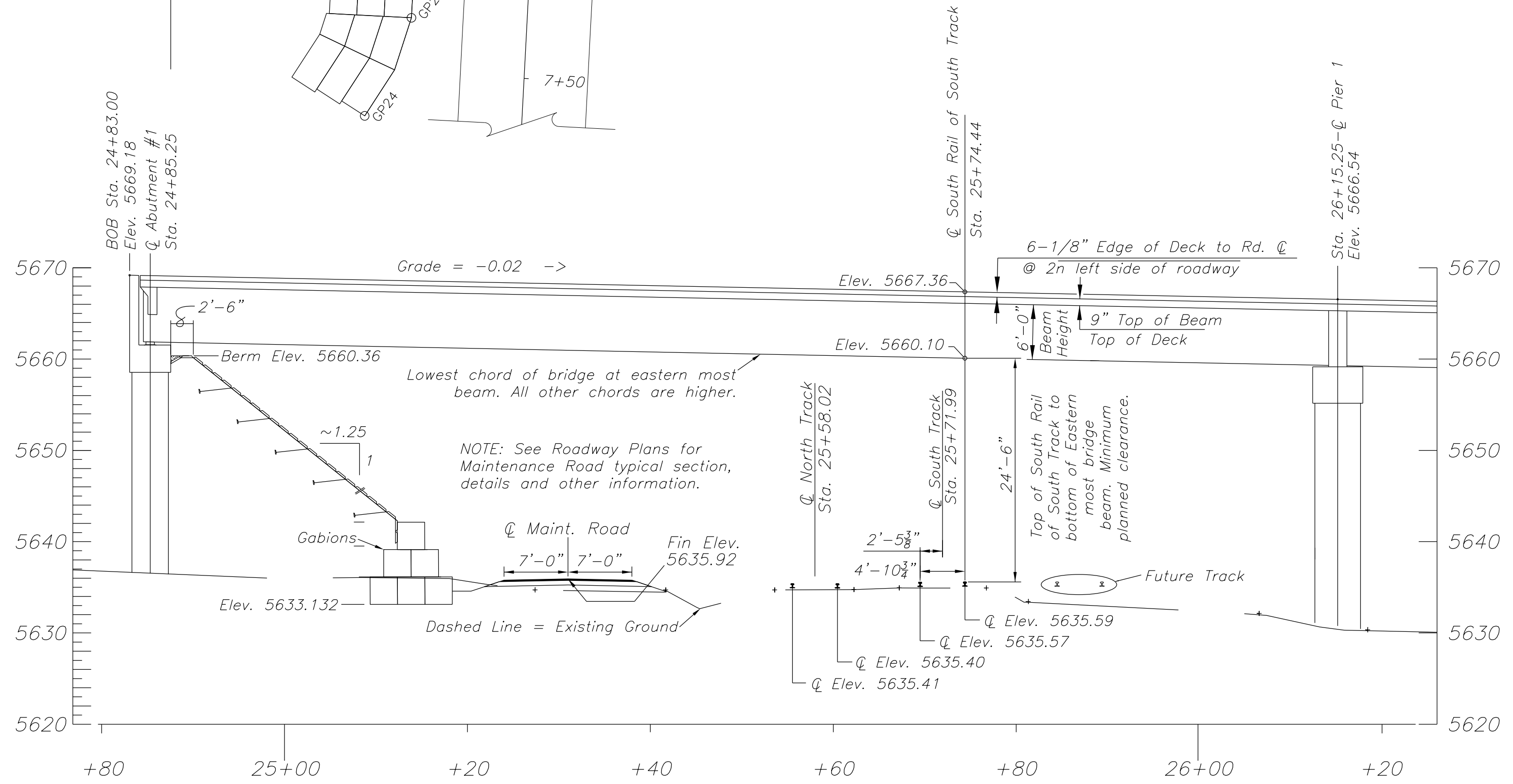
Point	Station-Maintenance Rd. Alignment	Offset (ft)	Elevation
GP1	5+99.935	15.347	5,668.741
GP5	6+41.932	12.660	5,668.458
GP12	6+84.020	12.660	5,668.502
GP22	7+44.020	12.660	5,668.565
GP24	7+55.012	17.213	5,668.667

**PLAN VIEW**  
N.T.S.

ONLY LATERAL CLEARANCES FROM RAILROAD TRACKS SHOWN  
(SEE SECTION A-A FOR VERTICAL CLEARANCES)



**SECTION B-B**  
TYPICAL SECTION THROUGH GABIONS



**SECTION A-A**  
N.T.S.

NOTE: SECTION A-A is a profile view 22'-3" left of Rdwy @, along eastern most beam @ (lowest beam on bridge superstructure)

ONLY VERTICAL CLEARANCES FROM RAILROAD TRACKS SHOWN  
(SEE PLAN VIEW DRAWING FOR LATERAL CLEARANCES)

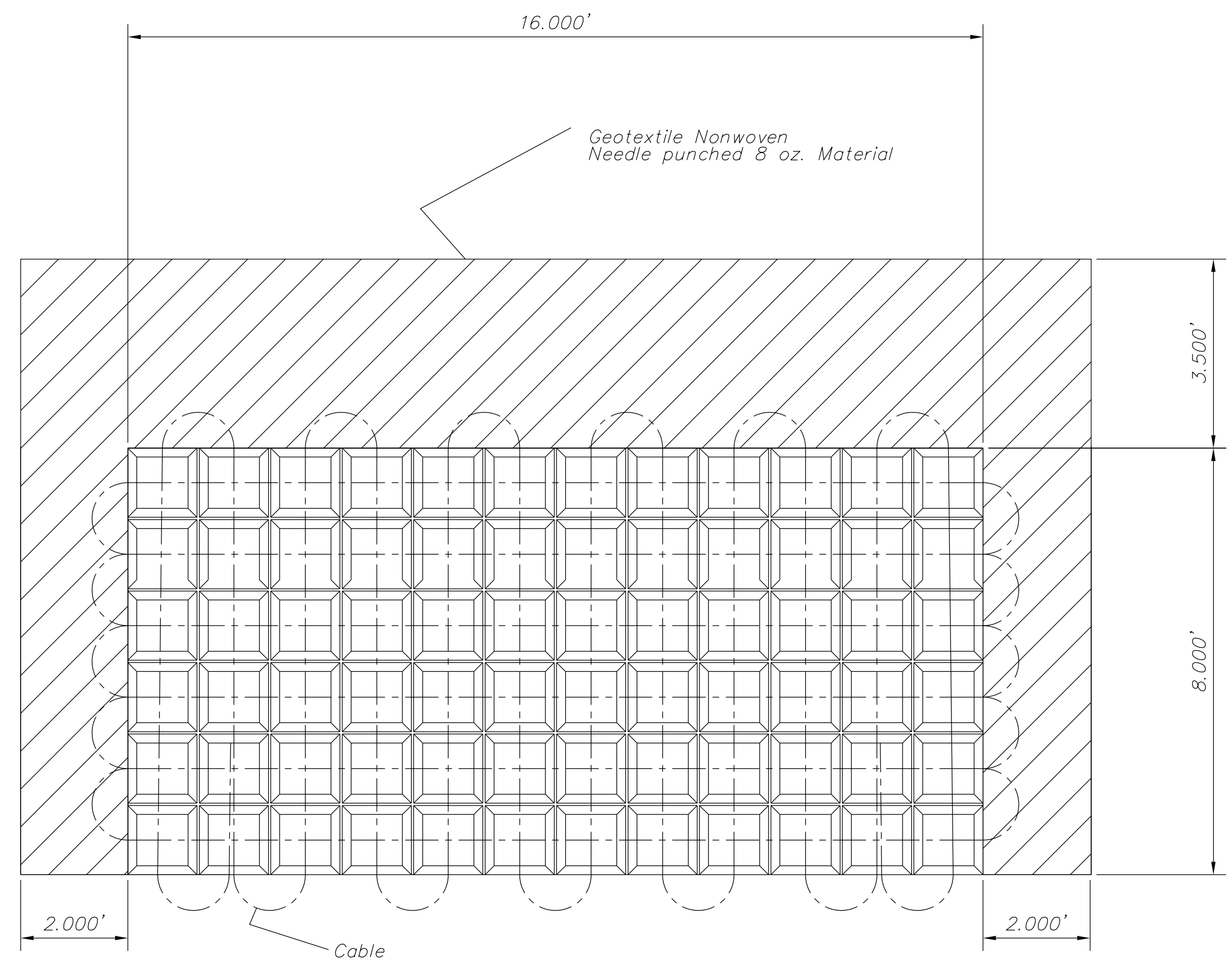
UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF INDIAN AFFAIRS  
NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

**RIO PUERCO BRIDGE**  
RAILROAD CLEARANCES & GABION DETAILS

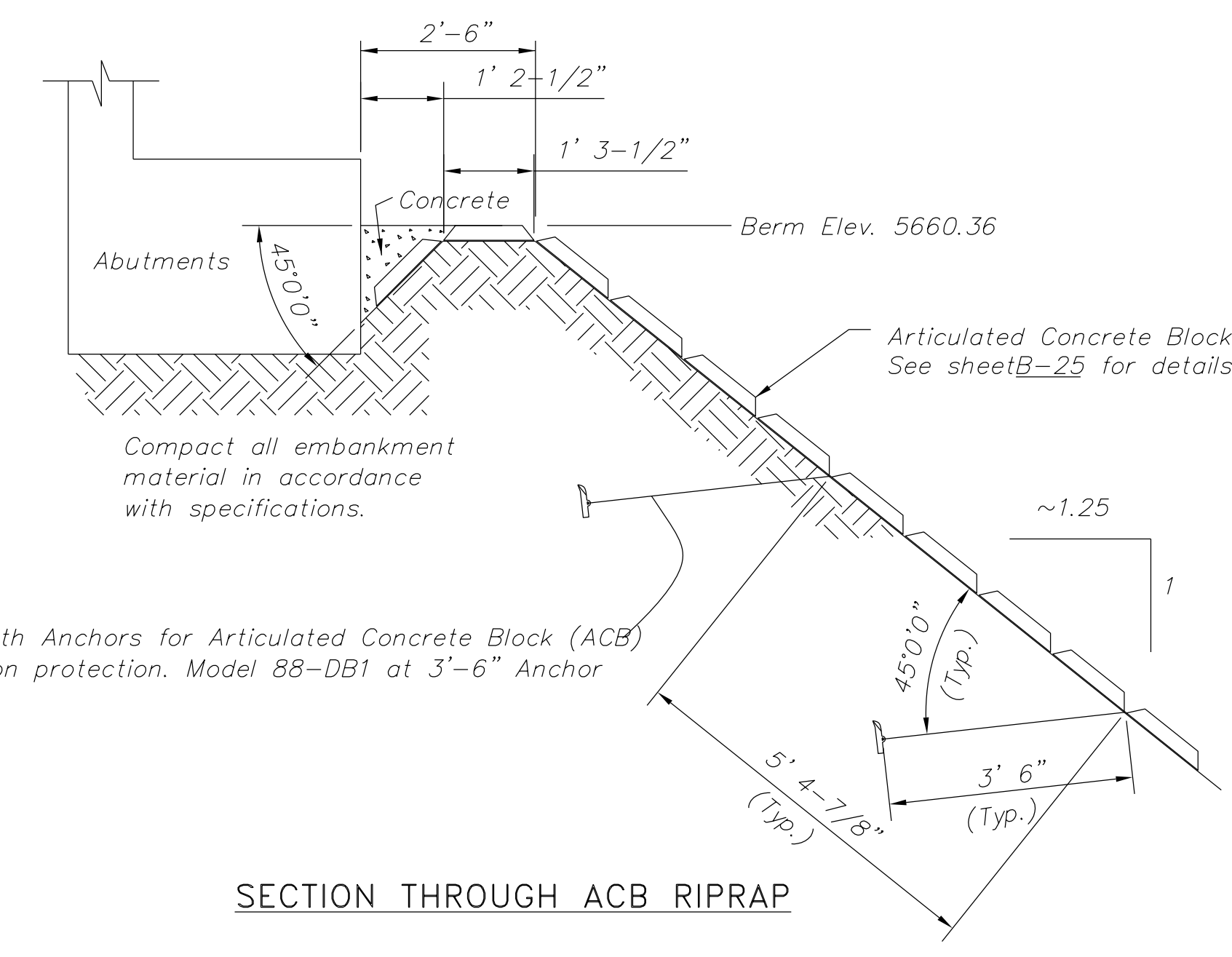
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Drawn by: cdh, rsh Date: 01/17/14  
Revised by: Date:  
File Name: 22\_Rbio42\_CBN



REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1,2&4	B-23	63

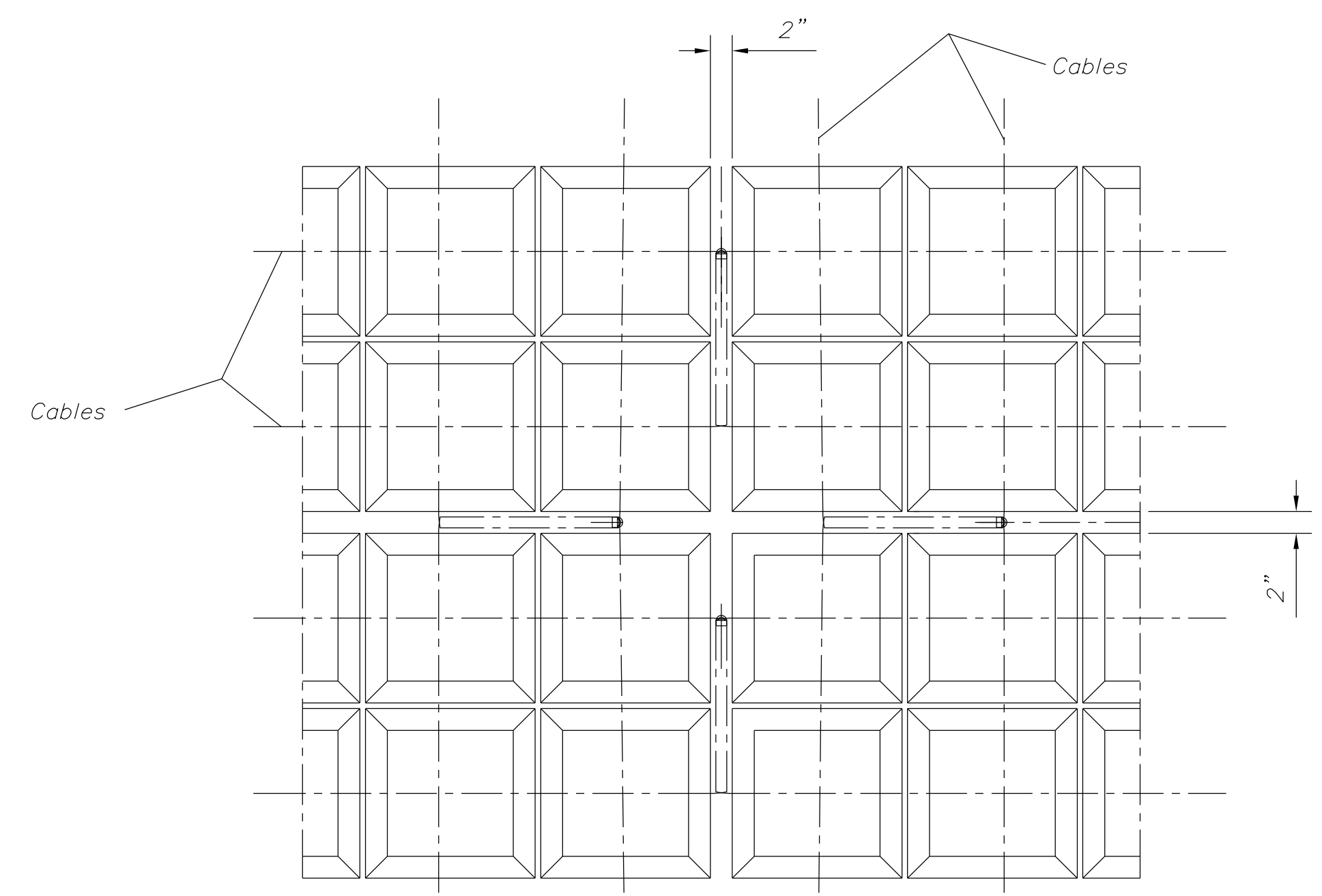


PLAN VIEW  
8,000' x 16,000'  
Articulated Concrete Block Revetment  
(nts)

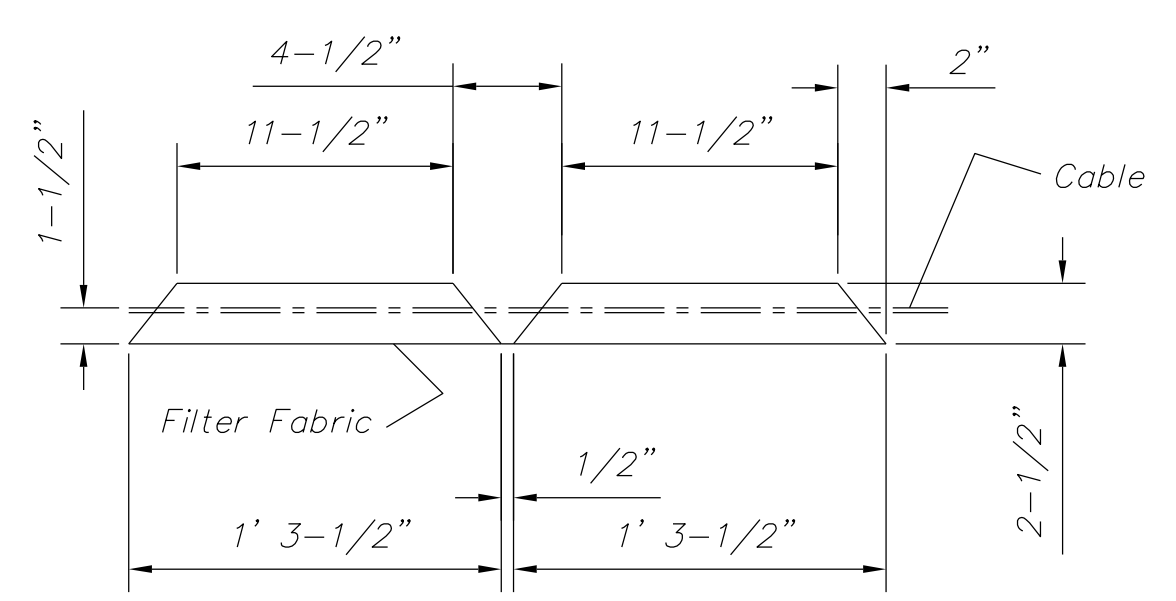
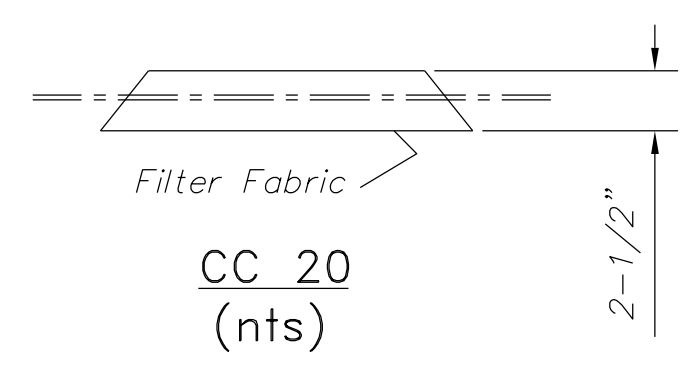


Duckbill Earth Anchors for Articulated Concrete Block (ACB) slope erosion protection. Model 88-DB1 at 3'-6" Anchor

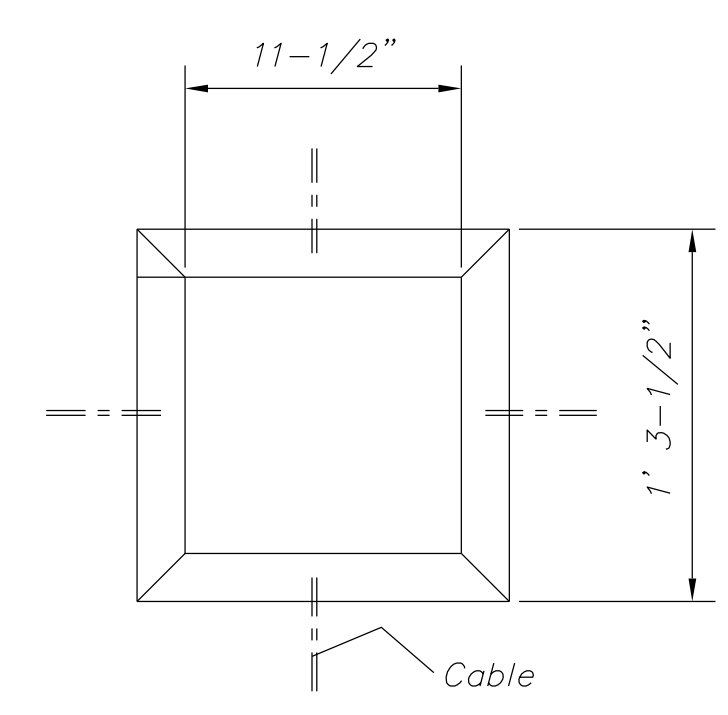
SECTION THROUGH ACB RIPRAP



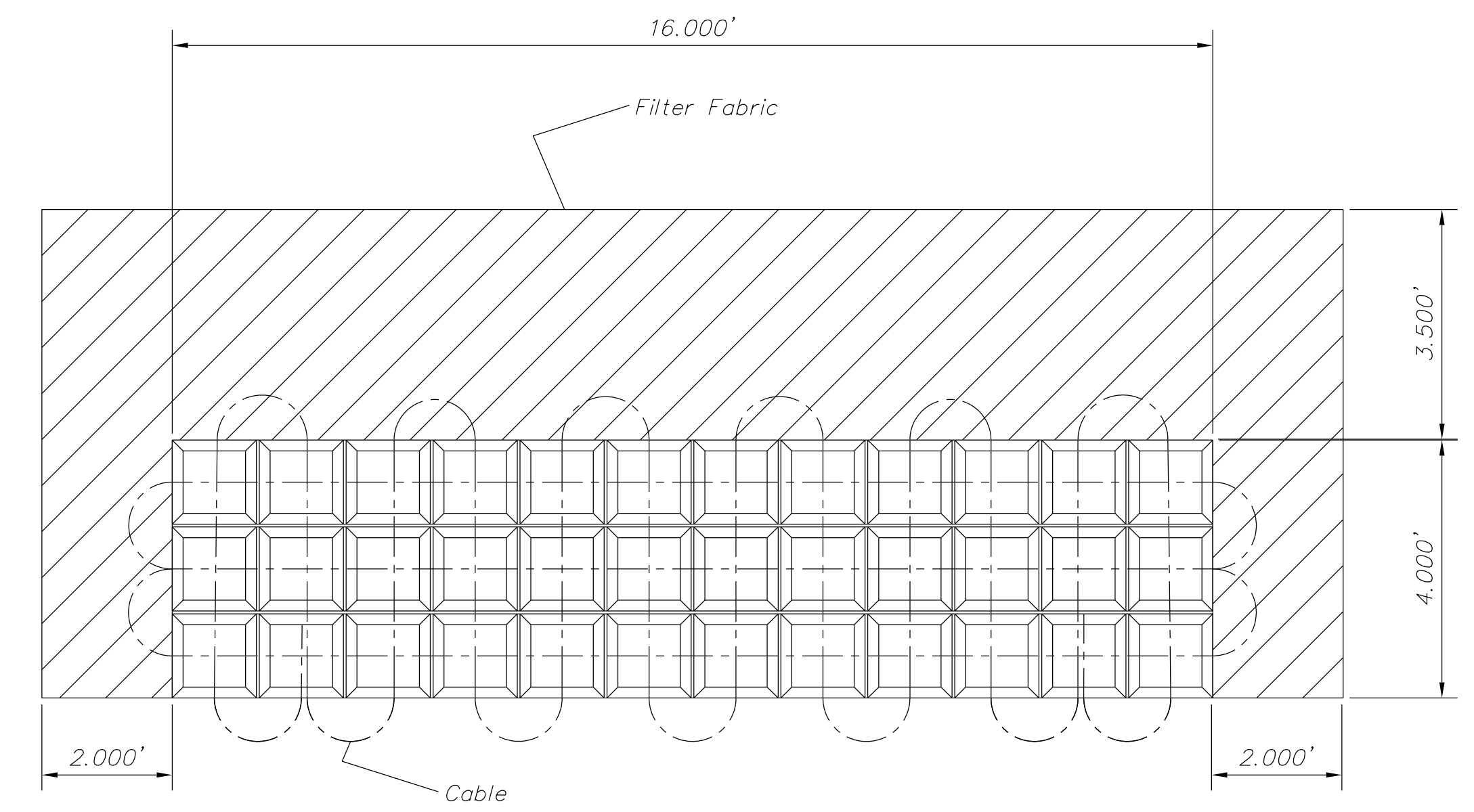
ACB RIPRAP CABLE CLAMPS DETAIL



DETAIL "A"  
(nts)



TOP VIEW  
Concrete Block (Typ.)



PLAN NEW  
4,000' x 16,000'  
Articulated Concrete Block Revetment

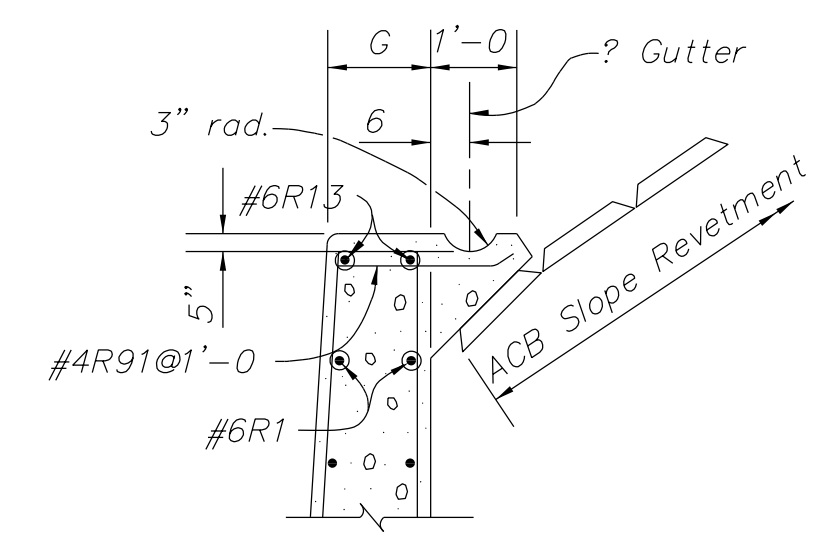
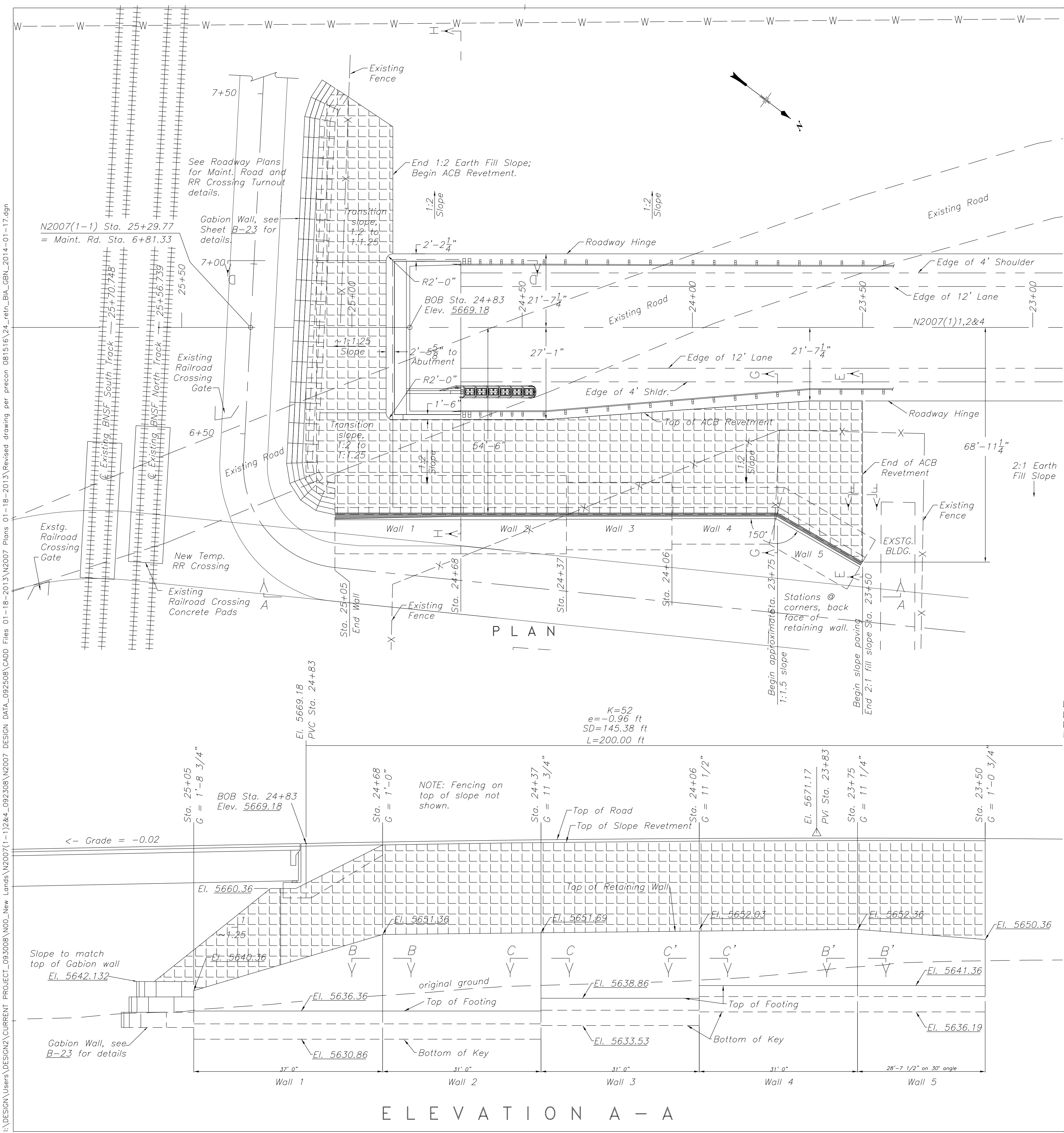
UNITED STATES  
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NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

RIO PUERCO BRIDGE  
ARTICULATED CONCRETE BLOCK CC-20  
SLOPE PROTECTION

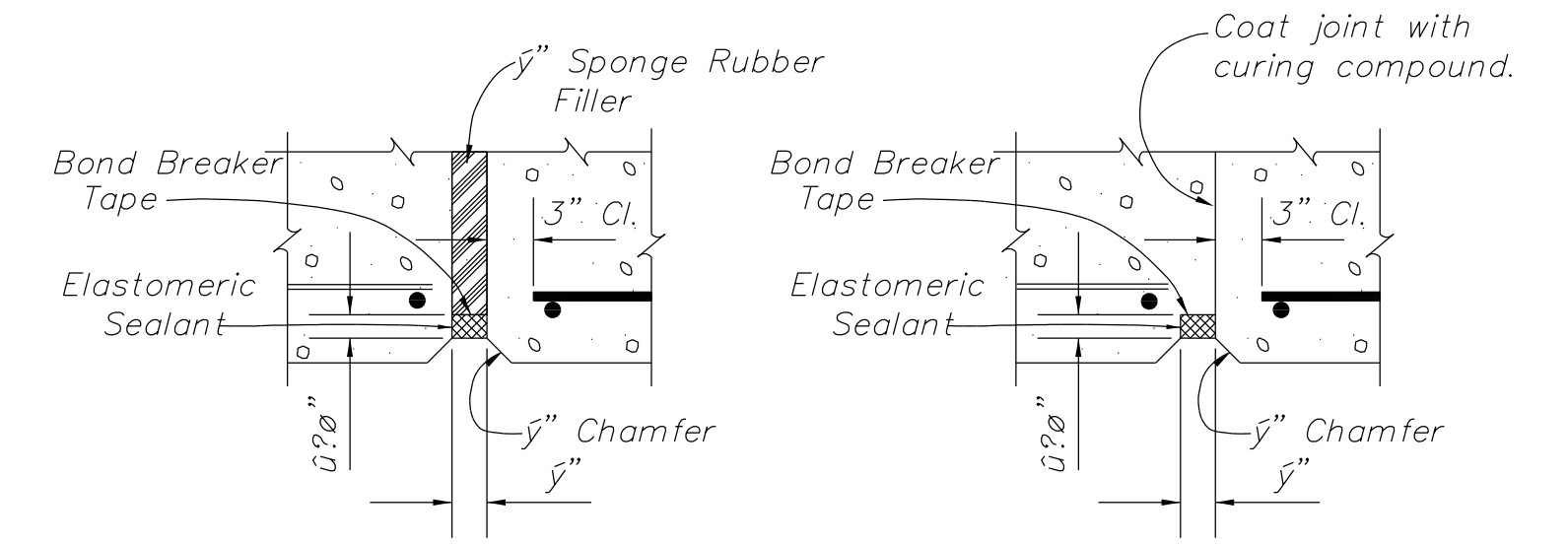
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Drawn by: rsh, cdh	Date: 01/17/14
Revised by:	Date:
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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1,2&4	B-24	63



DETAIL 1



SECTION B-B  
SECTION B'-B'  
SECTION C-C  
SECTION C'-C'

NOTES

Concrete for footing and key shall be placed against solid undisturbed earth or compacted foundation.  
Vary dimension G (top of wall width) uniformly between dimensions shown in Elevation A-A.

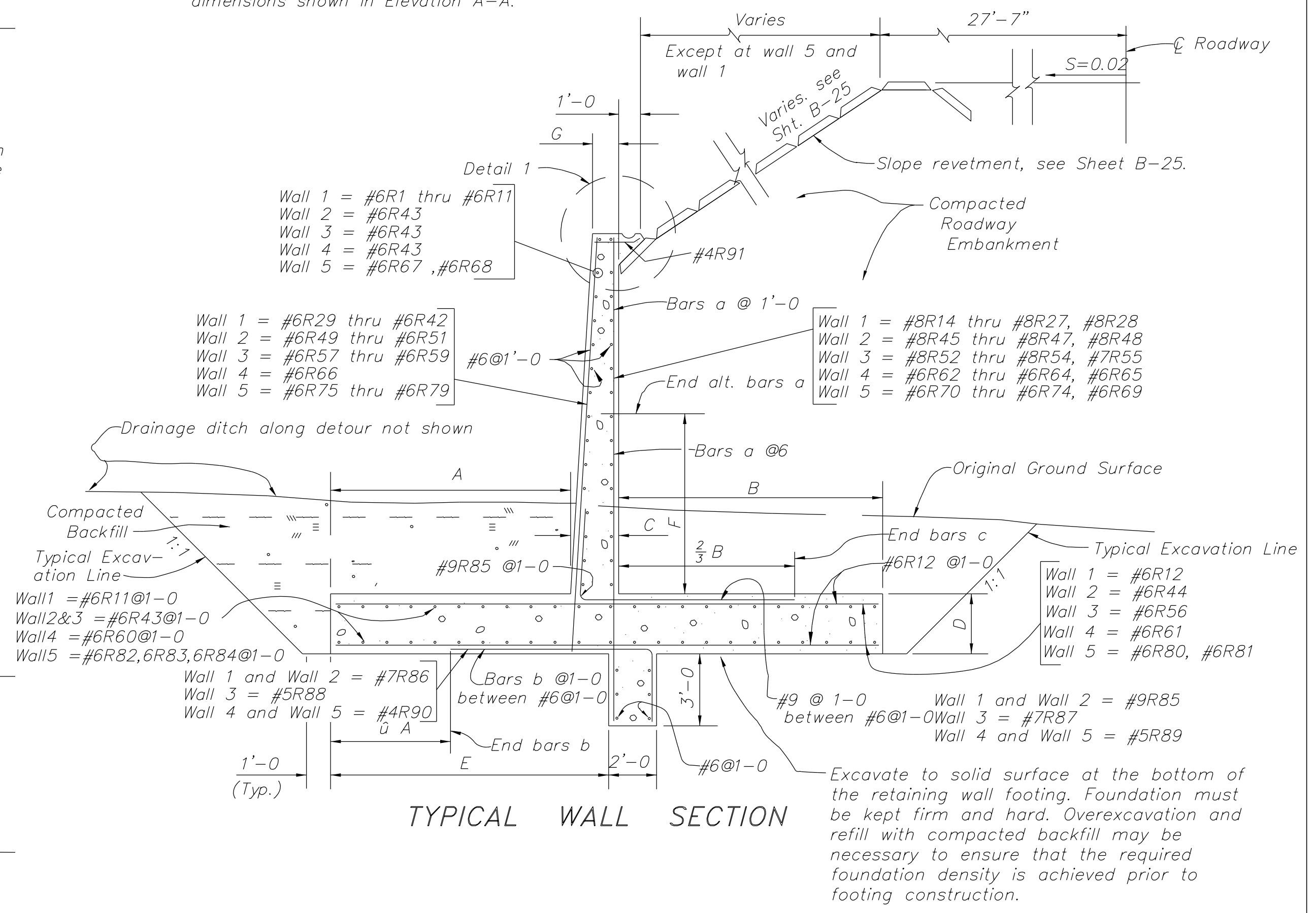


TABLE OF DATA

	DIMENSIONS						REINF. BARS		
	A	B	C	D	E	F	a	b	c
WALL 1	10-0	11-0	2-0	2-6	11-7	7-6	#8	#7	#9
WALL 2	10-0	11-0	2-0	2-6	11-7	7-6	#8	#7	#9
WALL 3	9-0	9-0	1-10	2-4	10-5	6-6	#7	#5	#7
WALL 4	7-6	7-6	1-8	2-2	8-9	5-6	#6	#4	#5
WALL 5	7-6	7-6	1-8	2-2	8-9	5-6	#6	#4	#5

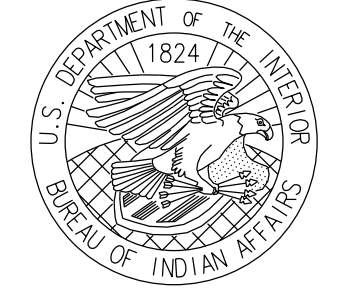
Note: For Dimension G, see Elevation A-A.

UNITED STATES  
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BUREAU OF INDIAN AFFAIRS

NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

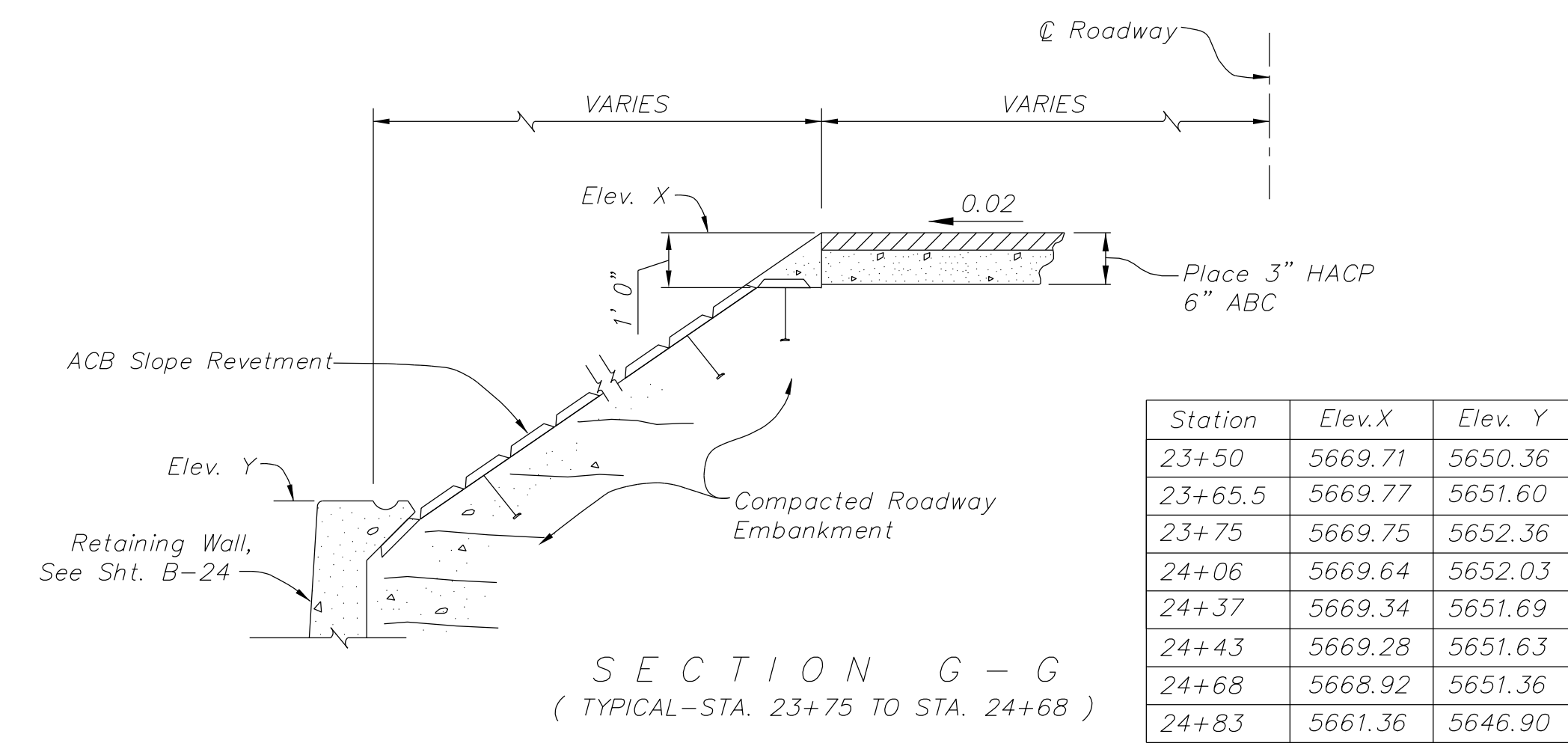
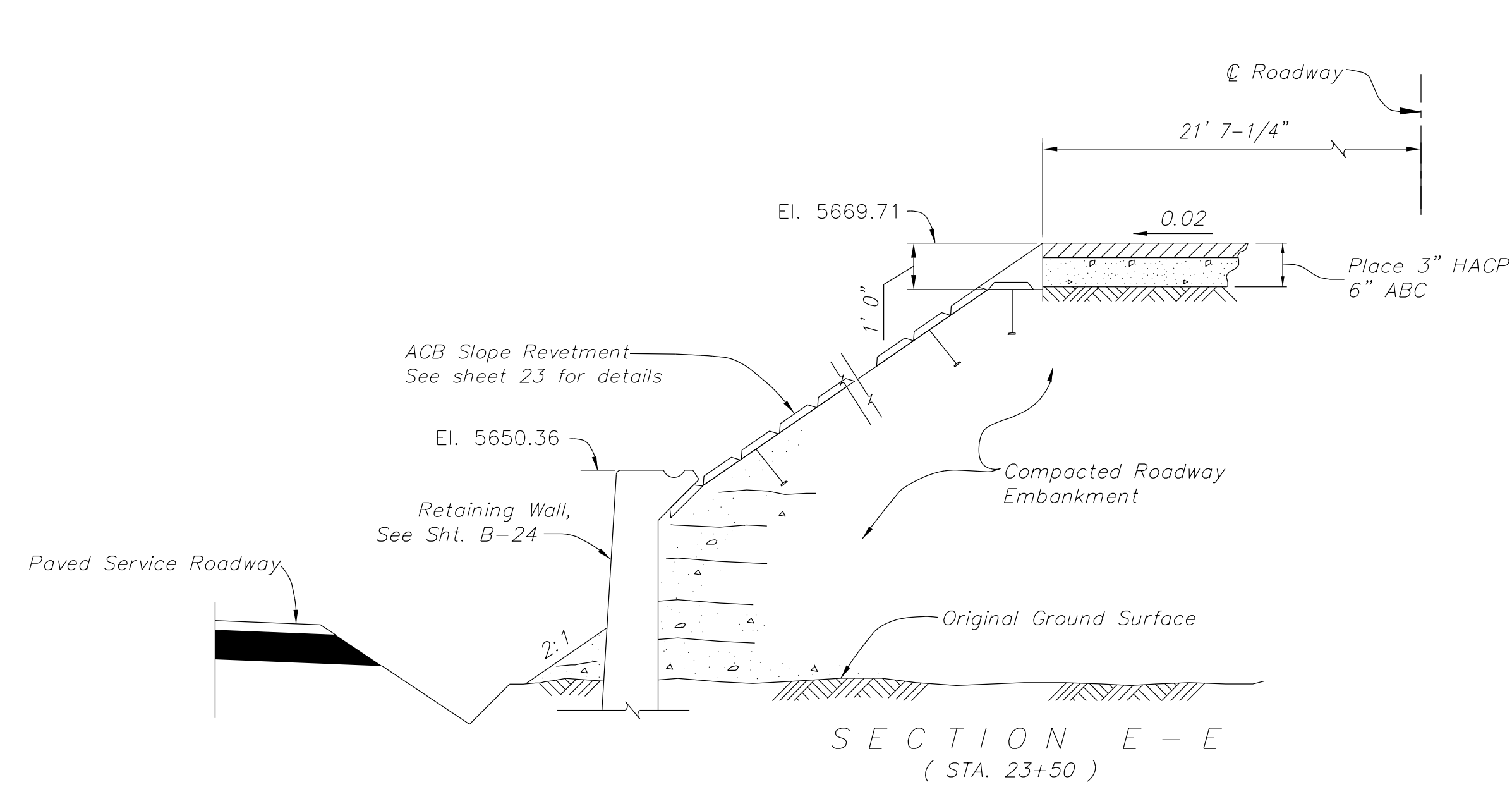
RIO PUERCO BRIDGE  
RETAINING WALL & SLOPE PAVING, SHEET 1 OF 2

Designed by: BUREAU OF RECLAMATION  
Drawn by: BOR, rsh, cdh, dc Date: 01/17/14  
Revised by: Date:  
File Name: 24\_retn\_BIA\_GBN

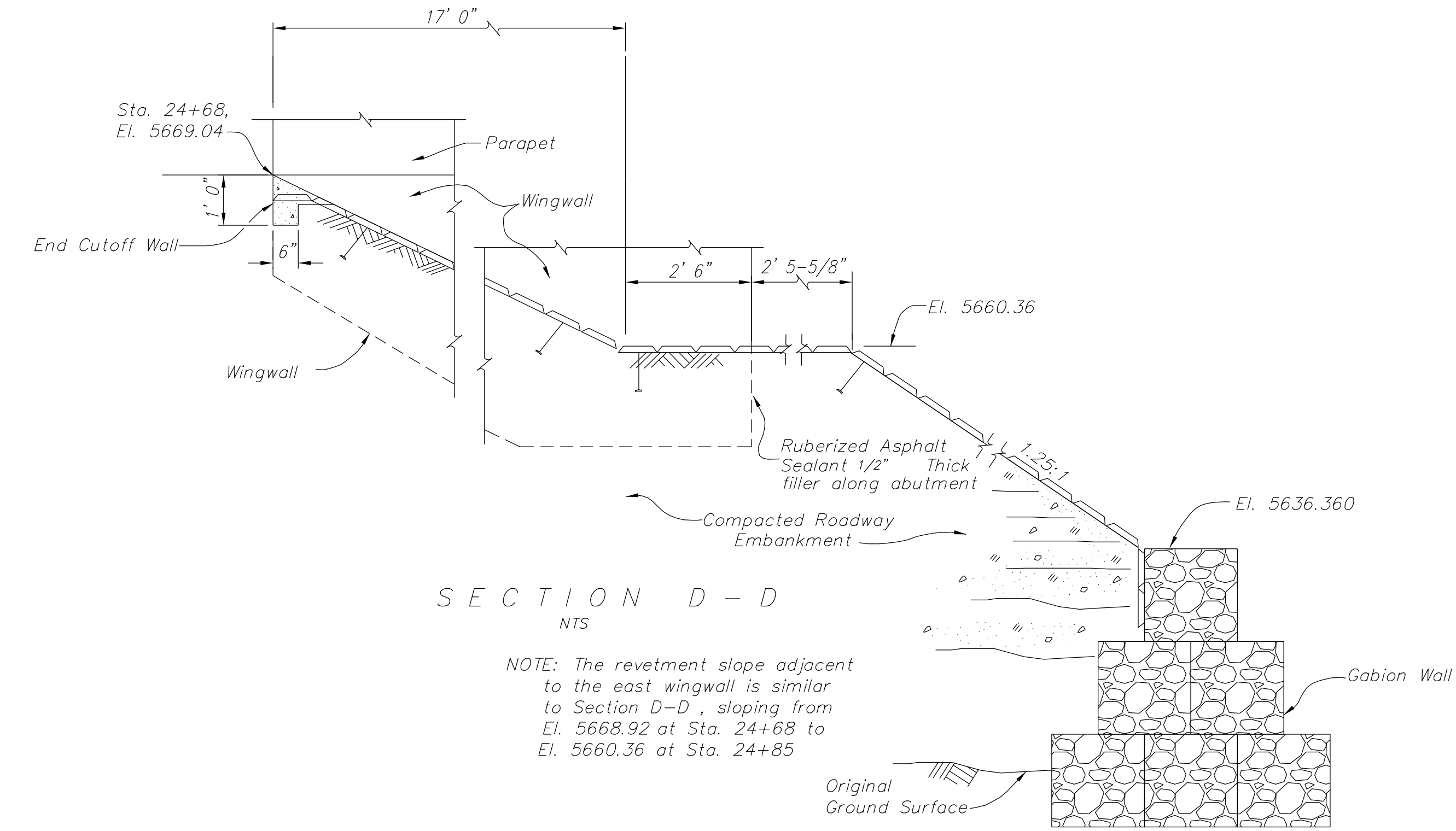




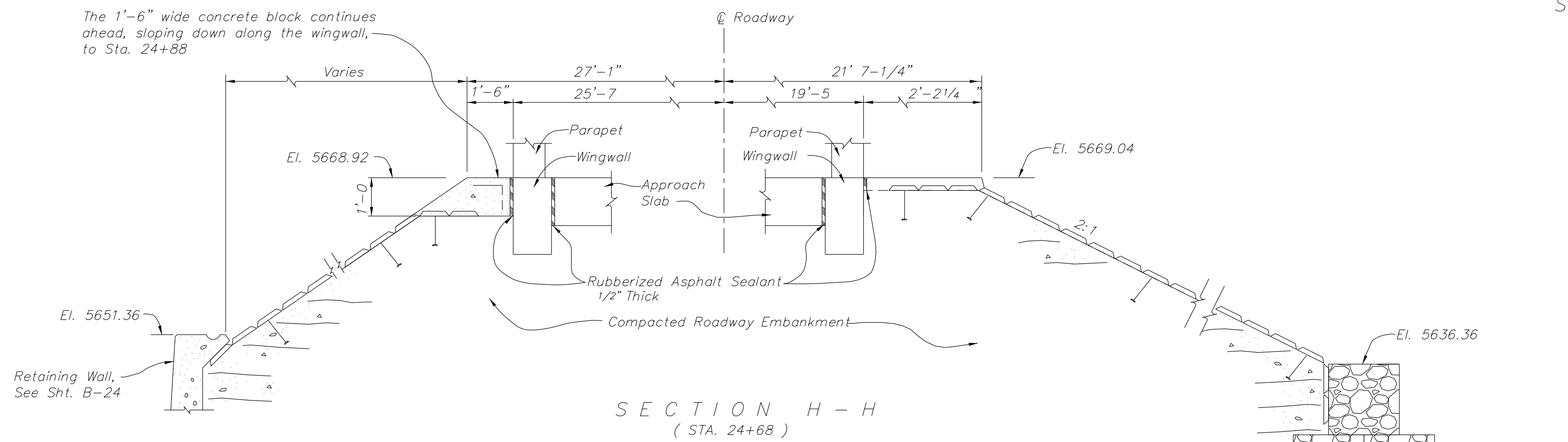
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1,2&4	B-25	63



Station	Elev. X	Elev. Y
23+50	5669.71	5650.36
23+65.5	5669.77	5651.60
23+75	5669.75	5652.36
24+06	5669.64	5652.03
24+37	5669.34	5651.69
24+43	5669.28	5651.63
24+68	5668.92	5651.36
24+83	5661.36	5646.90



NOTE: The revetment slope adjacent to the east wingwall is similar to Section D-D, sloping from El. 5668.92 at Sta. 24+68 to El. 5660.36 at Sta. 24+85



See RETAINING WALL DETAILS sheet B-24 for section locations.

**UNITED STATES**  
**DEPARTMENT OF THE INTERIOR**  
**BUREAU OF INDIAN AFFAIRS**  
 NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

**RIO PUERCO BRIDGE**  
 RETAINING WALL & SLOPE PAVING, SHEET 2 OF 2

Designed by: BUREAU OF RECLAMATION	
Drawn by: BOR, rsh, cdh	
Revised by:	
Date: 01/17/14	
File Name: 25_slope_GBN	

K:\GARDNER\PROJECTS\N2007(1-1)\Drawings\B-25\25\_slope\_GBN.dwg (1/17/14) 07:50:03