

### DESIGN DATA

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

Design Speed 50 mph Maximum Curvature Maximum Gradient Minimum Passing Sight Distance Minimum Stopping Sight Distance Average Daily Traffic 1997 Future ADT (2017) 1835.93 Ft. 425.00 Ft. 1275 vpd 1556 vpd R.O.W. Width See Table

### N2007 RIGHT-OF-WAY TABLE

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	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 B.O.B. Station 24+83.00 E.O.B. Station 30+07.50 E.O.P. Station 57+82.74	2413.12 524.50 2775.24	0.4570 0.0993 0.5256
TOTAL	5712.86	1.0819

I.D. NO. NO0841

Grade, Drain, Aggregate Base, Hot Asphaltic Concrete Pavement, Bridge

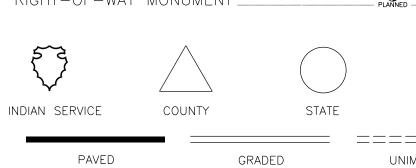
NAVAJO INDIAN RESERVATION -Route 2011 & Miscellaneous Construction —ONHIR water pond and well -RIO PUERCO BRIDGE NOTE: See the specifications paragraphs for restrictions on use of existing roads. Routes 2007, 2015, and 2030 have 38 ton weight limits and the existing Puerco River bridge on Route 2007 has a posted weight limit of 10 tons. *Route 2017* 

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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

RESERVATION LINE COUNTY LINE TOWNSHIP or RANGE LINE HIGHWAY RIGHT-OF-WAY LINE SECTION CORNER and 1/4 CORNER POLE GUY and ANCHOR . TRAFFIC SIGN . DELINEATIOR \_\_\_\_\_ 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... S2088886828652 RAILROAD TRACK GAS LINE IRRIGATION LINE . DWELLING SCHOOL CHURCH\_ WINDMILL RIGHT-OF-WAY MONUMENT





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

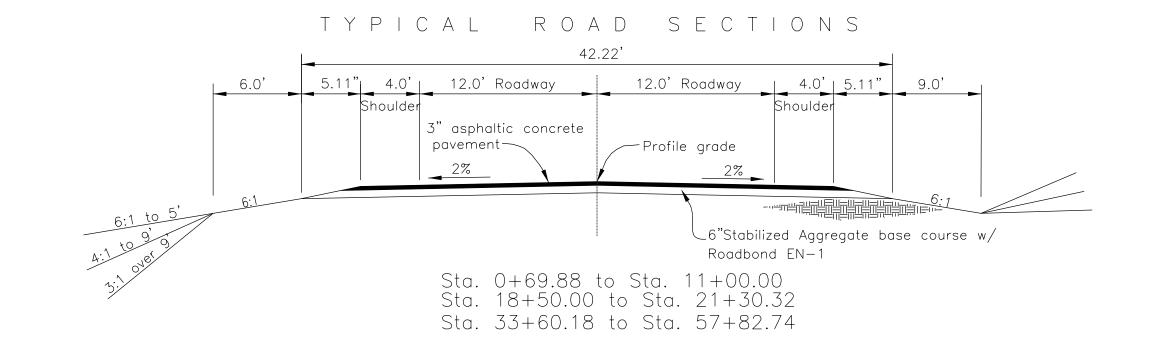
RECOMMENDED APPROVAL 08/28/2012 DATE AGENCY ROAD ENGINEER 08/28/2012 REGIONAL DIVISION MANAGER 08/28/2012

PLANNING & DESIGN BRANCH CHIEF DATE



Sharon A. Pinto REGIONAL DIRECTOR

08/28/2012 DATE



Existing ground

New ditch flowline

Existing ditch flowline

Sta. 53+50 to Sta. 58+40 Lt. - Grade to drain from new ditch flowline to existing ditch flowline.

SEE SHEET 12 FOR FRONTAGE ROAD

TYPICAL CROSS SECTION.

ITEM NO.

DESCRIPTION

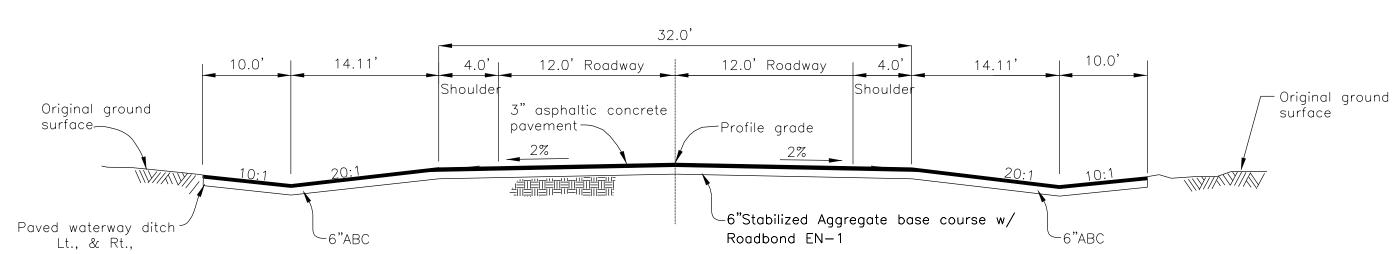
30101-2000 Untreated Aggregate Base Course

40502-0800 Asphalt Cement

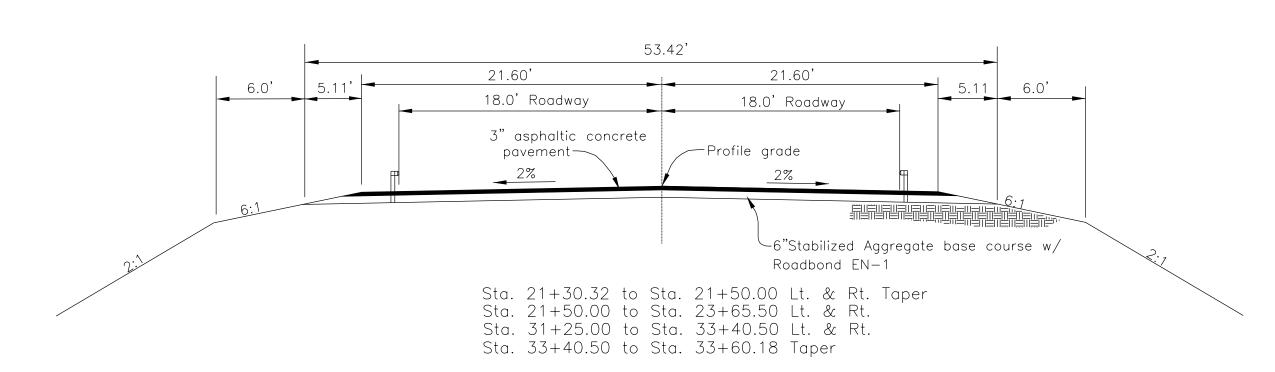
41101-5000 Asphalt Prime Coat

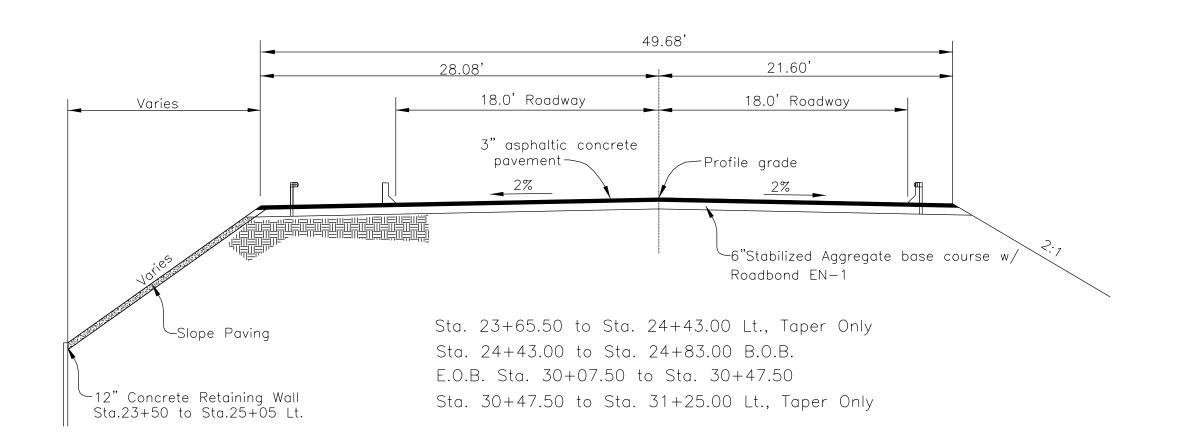
30413-1000 Aggregate Stabilization with Roadbond

40201—0500 Hot Asphalt Concrete Pavement Class "E



Sta. 11+00 to Sta. 18+50.00 Rt. Sta. 11+00 to Sta. 17+00.00 Lt. SPECIAL PAVED DITCHES





### 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

### TURNOUT LOCATIONS

BASIS ESTIMATED QUANTITIES

PG58-28 | 0.9806 L/kg

MC-70 | 2.53 gal/ton

UNITS

140 lbs/ft

150 lbs/ft<sup>3</sup>

GRADE

EN-1

APPLICATION

6" Mainline, - 4" Turnout

3" Mainline, — 2" Turnout

6% by Total Weight HACP

0.30 gal/sq. yd. top of ABC

FRONTAGE ROAD

6" Service Road BNSF

2" Service Road BNSF

STATION	LOC.	SIZE	TYPE	REMARKS
3+40	Lt.	40' x 34'	А	Reconstruct existing T.O. to match existing concrete at R/W line. Remove existing 24" pipe and replace w/new pipe & end sections.
8+27	Rt.	14' × 34'	А	Reconstruct existing T.O.—No cattleguard w/type I gate and pipe.
11+41	Lt.	16' x 34'	А	Reconstruct existing T.O.—No cattleguard or pipe.
11+71	Rt.	16' x 34'	А	Reconstruct existing T.O.—No cattleguard or pipe.
12+30	Rt.	24' × 34'	А	Reconstruct existing T.O.—No cattleguard or Pipe.
12+65	Lt.	16' x 34'	Α	Reconstruct existing T.O.—No cattleguard or Pipe.
13+34	Rt.	24' x 34'	А	Reconstruct existing T.O.—to match existing PCC driveway for new Business.
14+40	Rt.	24' x 34'	А	Reconstruct existing T.O.—to match existing PCC driveway.
14+50	Lt.	24' × 34'	А	Reconstruct existing T.O.—to newlands office.
15+16	Rt.	16' x 34'	Α	Reconstruct existing T.O.—to match existing PCC driveway.
15+85	Rt.	16' × 34'	А	Reconstruct existing T.O.—to match existing PCC driveway.
15+85	Lt.	16' x 34'	А	Reconstruct existing T.O.—No cattleguard or pipe.
16+55	Rt.	16' × 34'	А	Reconstruct existing T.O.—to match existing PCC driveway.
17+25	Rt.	16' x 34'	А	Reconstruct existing T.O.—to match existing PCC driveway.
17+94	Rt.	16' × 34'	А	Reconstruct existing T.O.—to match existing PCC driveway.
19+75	Rt.	24' x 34'	А	Reconstruct existing T.O.—Paved 50' from C/L and install new cspc
19+75	Lt.	24' x 34'	А	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'.

### SEQUENCING NOTES:

1—The Contractor shall be required to break up all of the existing asphaltic concrete pavement structure in accordance with Section 204.10(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" of new aggregate base course material on the finished and approved subgrade. The new placed ABC shall be treated with Roadbond EN—1.

4—The contractor shall then place 3"(2-1.5" lifts) of hot asphalt concrete pavement on the mainline, and all turnouts.

5—The Contractor shall provide for a safe and relatively dust free driving surface throughout the reconstruction process for all school, general traveling public, and local traffic use day and night. The contractor's traffic control and construction sequencing plan shall include these requirements and be submitted for review and approval prior to any ground disturbing activities taking place.

### SPECIAL ROADWAY TYPICAL AND SPECIAL DITCH LOCATION

Station	т	Station	Roadway Wi	dth to Hinge	Remarks
31011011	10 .	31011011	Lt.	Rt.	Kemarks
6+60.00	То	11+00.00	16.00 ft.	16.00 ft.	Special Ditch Grade
10+90.00	То	11+00.00	16.00 ft.	16.00 ft.	Special Ditch Grade
11+00.00	То	17+00.00		16.00 ft.	Special Paved Ditch, Rt.
11+00.00	То	17+00.00	16.00 ft.		Special Paved Ditch, Lt.
20+30.32	То	21+50.00	Varies	Varies	19.68 ft. Taper Lt. & Rt.
21+50.00	То	23+65.50	21.60 ft.	21.60 ft.	Guardrail Location:
23+65.50	То	24+43.00	21.60 ft.	21.60 ft.	77.50 ft. of Taper with Guardrail, Left Side.
24+43.00	То	24+83.00	27.08 ft.	21.60 ft.	1:11/2 at Fill Slope Location, Lt.
24+83.00	То	30+07.50			Bridge Location.
30+07.50	То	30+47.50	27.08 ft.	21.60 ft.	2:1 at Fill Slope Location, Lt. & Rt.
30+47.50	То	31+25.00	27.08 ft.	21.60 ft.	77.50 ft. of Taper with Guardrail, Left Side.
31+25.00	То	33+40.50	21.60 ft.	21.60 ft.	Guardrail Location,
33+40.50	То	33+60.18			19.68 ft. Taper Lt. and Rt.

## UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS

NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

TYPICAL CROSS SECTION

DRAWN BY: Gerald.Hood DATE: 5/7/2009

DESIGNED BY: NRDOT DATE: 5/7/2009

REVISED: 1/31/2013 BY: Peterson.Yazzie

ANNOTATION SCALE: Full Size 1=1

FILENAME: Sht.2\_Typical Sections Sheet.dgn



### 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.
- 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 (ADOT), 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 AWARDING OFFICIAL (A0), 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 AWARDING 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 CALLED OUT ON THESE PLANS AS "CONSTRUCTION ZONE". THE CONSTRUCTION LIMIT IS THE CATCH POINT EARTHWORK LIMIT PLUS 3.0 METERS, 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 ONLY REQUIRED AT THE DRAINAGE PIPE REPLACEMENT LOCATIONS. THE CONTRACTOR IS REQUIRED TO SUBMIT COURTESY COPY OF THE APPROVED SWPPP TO THE NAVAJO NATION WATER QUALITY EPA OFFICE.
- 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.
- THE CONTRACTOR SHALL BE REQUIRED TO OBLITERATE ALL EXISTING ABANDONED TURNOUTS AND 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 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 INCLUDED IN THE BID ITEM 21102-2000. 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 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)-729-5 721, 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.
- 8. 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 UNUSEABLE 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
- 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
- 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 REQUIRING SAID FENCE REMOVAL/RE-ATTACHMENT. 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.
- 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 RESET 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.

- AREA STATE RESERVATION ROUTE PROJECT NO. SHEET TOTAL SHEETS

  NAVAJO ARIZONA NAVAJO N2007 N2007(1-1)1,2&4 3 63
- 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 \_ OF \_. 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 61. 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.
- 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.
- 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.
- JEVELOPED 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.

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: 1/31/2013 BY: Peterson. Yazzie

ANNOTATION SCALE: Full Size 1=1

TLENAME: Sht.3\_General Notes\_ 012813.dgr



Construction Survey and Constructor Quality Constructor Quality Constructor Quality Constructor Quality Constructor Constructor Quality Constructor Co	trol trol ing and Obstructions  ch Blocks ft. wide Supply  ock Revetment Type CC20 ated, Class 2 , Grading Special , Stabilization, Roadbond, EN-1 Pavement, Class B, Grade B, Type III Smoothness	All Req'd. All Req'd. All Req'd. 14,000.00 All Req'd. 12.40 All Req'd. All Req'd. 5,866.99 104,309.80 500.00 0.00 4.82 38.84 0.00 0.00 8,084.18 21,431.00	All Req'd. All Req'd. All Req'd. 7,000.00 All Req'd. 5.00 All Req'd. All Req'd. All Req'd. 719.64 0.00 0.00 369.00 0.03 27.00 0.00 0.00	All Req'd. All Req'd. All Req'd. 7,000.00 All Req'd. 0.00 All Req'd. All Req'd. 0.00 9,868.00 0.00 0.00 0.00 0.00 2,846.00	L.S. L.S. Man-hr. L.S. Ac. L.S. C.Y. C.Y. L.F. L.F. M-Gal. C.Y.
Contractor Quality Contractor Contractor Quality Co	trol trol ing and Obstructions  ch Blocks ft. wide Supply  ock Revetment Type CC20 ated, Class 2 , Grading Special , Stabilization, Roadbond, EN-1 Pavement, Class B, Grade B, Type III Smoothness	14,000.00 All Req'd. 12.40 All Req'd. All Req'd. 5,866.99 104,309.80 500.00 0.00 4.82 38.84 0.00 0.00 8,084.18	All Req'd. 7,000.00 All Req'd. 5.00 All Req'd. All Req'd. 719.64 0.00 0.00 369.00 0.03 27.00 0.00	All Req'd. 7,000.00 All Req'd. 0.00 All Req'd. All Req'd. 0.00 9,868.00 0.00 0.00 0.00	Man-hr. L.S. Ac. L.S. L.S. C.Y. C.Y. L.F. L.F. M-Gal.
Temporary Erosion Condition  14-0000 Temporary Straw Mulch 12-0000 Clearing and Grubbing 14-1000 Removal of Structures 10-0000 Roadway Excavation 10-0000 Roadway Excavation 10-2000 Furrow Ditches and Dit 10-2000 Channel Reshaping, 3 10-0000 Development of Water 10-2000 Placed Riprap Class 2 12-3000 Articulated Concrete Bl 102-1000 Gabions, Galvanized Condition 10-2000 Aggregate Base Course 13-1000 Aggregate Base Course 13-1000 Aggregate Base Course 13-1000 Aggregate Base Course 101-0500 Hot Asphalt Concrete Form 101-0500 Prime Coat, Grade PPE 101-0200 Structural Concrete, Clear 101-2000 Precast Prestressed St 101-2010 Precast Prestressed St	trol ing and Obstructions  ch Blocks ft. wide Supply  ock Revetment Type CC20 ated, Class 2 , Grading Special , Stabilization, Roadbond, EN-1 Pavement, Class B, Grade B, Type III Smoothness	All Req'd.  12.40  All Req'd.  All Req'd.  5,866.99  104,309.80  500.00  0.00  4.82  38.84  0.00  0.00  8,084.18	All Req'd. 5.00 All Req'd. All Req'd. 719.64 0.00 0.00 369.00 0.03 27.00 0.00	All Req'd.  0.00  All Req'd.  All Req'd.  0.00  9,868.00  0.00  0.00  0.00  0.00	L.S. Ac. L.S. L.S. C.Y. C.Y. L.F. L.F. M-Gal.
4-0000 Temporary Straw Mulch 02-0000 Clearing and Grubbing 04-1000 Removal of Structures 01-0000 Roadway Excavation 03-0000 Borrow Excavation * 0-2000 Furrow Ditches and Dit 05-2000 Channel Reshaping, 3 01-0000 Development of Water 01-2000 Placed Riprap Class 2 02-3000 Articulated Concrete BI 02-1000 Gabions, Galvanized Co 01-2000 Aggregate Base Course 01-0500 Hot Asphalt Concrete F 01-0500 Asphalt Cement Grade 01-5000 Prime Coat, Grade PPE 01-0200 Structural Concrete, Class 01-2000 Precast Prestressed St 01-2010 Precast Prestressed St	and Obstructions  ch Blocks  ft. wide  Supply  ock Revetment Type CC20 ated, Class 2 , Grading Special , Stabilization, Roadbond, EN-1  Pavement, Class B, Grade B, Type III Smoothness	12.40 All Req'd. All Req'd. 5,866.99 104,309.80 500.00 0.00 4.82 38.84 0.00 0.00 8,084.18	5.00 All Req'd. All Req'd. 719.64 0.00 0.00 369.00 0.03 27.00 0.00	0.00 All Req'd. All Req'd. 0.00 9,868.00 0.00 0.00 0.00 0.00	Ac. L.S. C.Y. C.Y. L.F. L.F. M-Gal.
Clearing and Grubbing PA-1000 Removal of Structures PA-1000 Roadway Excavation PA-1000 Roadway Excavation PA-1000 Borrow Excavation PA-1000 Borrow Excavation PA-1000 Borrow Excavation PA-1000 Furrow Ditches and Ditered Particulated Particu	and Obstructions  ch Blocks  it. wide  Supply  ock Revetment Type CC20  ated, Class 2  , Grading Special  , Stabilization, Roadbond, EN-1  Pavement, Class B, Grade B, Type III Smoothness	All Req'd. All Req'd. 5,866.99 104,309.80 500.00 0.00 4.82 38.84 0.00 0.00 8,084.18	All Req'd. All Req'd. 719.64 0.00 0.00 369.00 0.03 27.00 0.00	All Req'd. All Req'd. 0.00 9,868.00 0.00 0.00 0.00 0.00	L.S. L.S. C.Y. C.Y. L.F. L.F. M-Gal.
Removal of Structures D1-0000 Roadway Excavation D3-0000 Borrow Excavation * D1-2000 Furrow Ditches and Dit D25-2000 Channel Reshaping, 3 D1-0000 Development of Water D1-2000 Placed Riprap Class 2 D2-1000 Gabions, Galvanized Co D1-2000 Aggregate Base Course D1-2000 Aggregate Base Course D1-0500 Hot Asphalt Concrete F D2-0800 Asphalt Cement Grade D1-5000 Prime Coat, Grade PPE D1-0200 Structural Concrete, Class D1-2000 Precast Prestressed St D1-2010 Precast Prestressed St	ch Blocks  It. wide  Supply  Ock Revetment Type CC20  ated, Class 2  , Grading Special  , Stabilization, Roadbond, EN-1  Pavement, Class B, Grade B, Type III Smoothness	All Req'd. 5,866.99 104,309.80 500.00 0.00 4.82 38.84 0.00 0.00 8,084.18	All Req'd. 719.64 0.00 0.00 369.00 0.03 27.00 0.00	All Req'd.  0.00  9,868.00  0.00  0.00  0.00  0.00	L.S. C.Y. C.Y. L.F. L.F. M—Gal.
O3-0000 Borrow Excavation *  10-2000 Furrow Ditches and Dit 25-2000 Channel Reshaping, 3  01-0000 Development of Water  01-2000 Placed Riprap Class 2  12-3000 Articulated Concrete BI  02-1000 Gabions, Galvanized Co  01-2000 Aggregate Base Course  13-1000 Aggregate Base Course  01-0500 Hot Asphalt Concrete F  02-0800 Asphalt Cement Grade  01-5000 Prime Coat, Grade PPE  01-0200 Structural Concrete, Cla  01-2000 Precast Prestressed St  01-2010 Precast Prestressed St	Supply  Ock Revetment Type CC20  ated, Class 2 , Grading Special , Stabilization, Roadbond, EN-1  Pavement, Class B, Grade B, Type III Smoothness	104,309.80 500.00 0.00 4.82 38.84 0.00 0.00 8,084.18	0.00 0.00 369.00 0.03 27.00 0.00	9,868.00 0.00 0.00 0.00 0.00	C.Y. L.F. L.F. M-Gal.
Furrow Ditches and Dit 25-2000 Channel Reshaping, 3 2 01-0000 Development of Water 01-2000 Placed Riprap Class 2 12-3000 Articulated Concrete Bl 02-1000 Gabions, Galvanized Co 01-2000 Aggregate Base Course 13-1000 Aggregate Base Course 01-0500 Hot Asphalt Concrete Fl 02-0800 Asphalt Cement Grade 01-5000 Prime Coat, Grade PPE 01-0200 Structural Concrete, Cl 01-2000 Precast Prestressed St 01-2010 Precast Prestressed St	Supply  Ock Revetment Type CC20  ated, Class 2 , Grading Special , Stabilization, Roadbond, EN-1  Pavement, Class B, Grade B, Type III Smoothness	500.00 0.00 4.82 38.84 0.00 0.00 8,084.18	0.00 369.00 0.03 27.00 0.00	0.00 0.00 0.00 0.00	L.F. L.F. M—Gal.
25-2000 Channel Reshaping, 3 01-0000 Development of Water 01-2000 Placed Riprap Class 2 12-3000 Articulated Concrete BI 02-1000 Gabions, Galvanized Co 01-2000 Aggregate Base Course 13-1000 Aggregate Base Course 01-0500 Hot Asphalt Concrete F 02-0800 Asphalt Cement Grade 01-5000 Prime Coat, Grade PPE 01-0200 Structural Concrete, Clau 01-2000 Precast Prestressed St 01-2010 Precast Prestressed St	Supply  Ock Revetment Type CC20  ated, Class 2 , Grading Special , Stabilization, Roadbond, EN-1  Pavement, Class B, Grade B, Type III Smoothness	0.00 4.82 38.84 0.00 0.00 8,084.18	369.00 0.03 27.00 0.00	0.00 0.00 0.00	L.F. M—Gal.
Development of Water  01-2000 Placed Riprap Class 2  12-3000 Articulated Concrete Blace Course  01-2000 Aggregate Base Course  13-1000 Aggregate Base Course  01-0500 Hot Asphalt Concrete Blace  02-0800 Asphalt Cement Grade  01-5000 Prime Coat, Grade PPE  01-0200 Structural Concrete, Class  01-2000 Precast Prestressed State  01-2010 Precast Prestressed State  01-20	Supply  ock Revetment Type CC20  ated, Class 2 , Grading Special , Stabilization, Roadbond, EN-1  Pavement, Class B, Grade B, Type III Smoothness	4.82 38.84 0.00 0.00 8,084.18	0.03 27.00 0.00	0.00	M-Gal.
O1-2000 Placed Riprap Class 2 12-3000 Articulated Concrete BI 02-1000 Gabions, Galvanized Co 01-2000 Aggregate Base Course 13-1000 Aggregate Base Course 01-0500 Hot Asphalt Concrete F 02-0800 Asphalt Cement Grade 01-5000 Prime Coat, Grade PPE 01-0200 Structural Concrete, Clause 01-2000 Precast Prestressed St 01-2010 Precast Prestressed St	ock Revetment Type CC20 ated, Class 2 , Grading Special , Stabilization, Roadbond, EN-1 Pavement, Class B, Grade B, Type III Smoothness	38.84 0.00 0.00 8,084.18	27.00 0.00	0.00	
Articulated Concrete BI 02-1000 Gabions, Galvanized Co 01-2000 Aggregate Base Course 13-1000 Aggregate Base Course 01-0500 Hot Asphalt Concrete F 02-0800 Asphalt Cement Grade 01-5000 Prime Coat, Grade PPE 01-0200 Structural Concrete, CI 01-2000 Precast Prestressed St 01-2010 Precast Prestressed St	ated, Class 2 , Grading Special , Stabilization, Roadbond, EN-1 Pavement, Class B, Grade B, Type III Smoothness	0.00 8,084.18		2.846.00	U.I.
01-2000 Aggregate Base Course 13-1000 Aggregate Base Course 01-0500 Hot Asphalt Concrete F 02-0800 Asphalt Cement Grade 01-5000 Prime Coat, Grade PPE 01-0200 Structural Concrete, CF 01-2000 Precast Prestressed St 01-2010 Precast Prestressed St	, Grading Special , Stabilization, Roadbond, EN-1 Pavement, Class B, Grade B, Type III Smoothness	8,084.18	0.00	_,	S.Y.
13-1000 Aggregate Base Course 01-0500 Hot Asphalt Concrete F 02-0800 Asphalt Cement Grade 01-5000 Prime Coat, Grade PPE 01-0200 Structural Concrete, Cla 01-2000 Precast Prestressed St 01-2010 Precast Prestressed St	, Stabilization, Roadbond, EN-1 Pavement, Class B, Grade B, Type III Smoothness	· ·		721.00	C.Y.
Hot Asphalt Concrete F 02-0800 Asphalt Cement Grade 01-5000 Prime Coat, Grade PPE 01-0200 Structural Concrete, CI 01-2000 Precast Prestressed St 01-2010 Precast Prestressed St	Pavement, Class B, Grade B, Type III Smoothness	21.431.00	710.44	0.00	Ton
02-0800 Asphalt Cement Grade 01-5000 Prime Coat, Grade PPE 01-0200 Structural Concrete, Cl 01-2000 Precast Prestressed St 01-2010 Precast Prestressed St		· ·	0.00	0.00	S.Y.
Prime Coat, Grade PPE 01-0200 Structural Concrete, Cl 01-2000 Precast Prestressed St 01-2010 Precast Prestressed St	PG 30-20	3,896.04	266.25	0.00	Ton
O1-0200 Structural Concrete, Cl O1-2000 Precast Prestressed St O1-2010 Precast Prestressed St		233.71	16.13	0.00	Ton Ton
01-2000 Precast Prestressed St 01-2010 Precast Prestressed St		0.00	0.00	1,888.00	C.Y.
01-2010 Precast Prestressed St	ructural Member, BT-72, 130'-5' long girder	0.00	0.00	12.00	Ea.
	ructural Member, BT-72, 129'-4' long girder	0.00	0.00	12.00	Ea.
01-1000 Reinforcing Steel, Grad		0.00	0.00	186,034.00	Lb.
01-2000 Epoxy Coated Reinforci	3	0.00	0.00	236,909.00	Lb.
01-0600 Drilled Shalfs, 4'-0" di		0.00	0.00	507.00	L.F.
01-0800 Drilled Shalfs, 5'-0" di		0.00	0.00	407.00	L.F.
01-0810 24" Corrugated Steel F		178.00	0.00	0.00	L.F.
01-0910 36" Corrugated Steel F 02-0510 28" Span x 20" Rise,	ripe Culvert Corrugated Steel Pipe Arch	212.00	0.00	0.00	L.F. L.F.
<u>'</u>	Corrugated Steel Pipe Arch	70.00	0.00	0.00	L.F.
10-0810 End Section for 24" C	<u> </u>	5.00	0.00	0.00	Ea.
10-1010 End Section for 36" C		2.00	0.00	0.00	Ea.
11-0910 End Section for 28" S	oan, 20'' Rise CSPA	0.00	6.00	0.00	Ea.
11-1010 End Section for 35" Sp	oan, 24" Rise CSPA	1.00	0.00	0.00	Ea.
01-1000 Removing, Cleaning, ar	d Stockpiling Salvageable Culverts	448.00	0.00	0.00	L.F.
01-0500 Paved Waterway, Type		0.00	1,514.30	0.00	S.F.
	04b, Type PDE02 w/ SK-350 End Treatment	1,178.00	0.00	0.00	L.F.
	niling : Thrie Beam Transition at Bridge	0.00	0.00	75.00	L.F.
11—5000 Impact Crash Attenuato 01—1000 Concrete Barrier	or, QUADGUARD or Approved equal	0.00	0.00	2.00	Ea. L.F.
01-1000 Fence, 5 Strand Barbe	d Wire	5,900.00	0.00	0.00	L.F.
,	ge, Pedestrain, Curved 6'-6" Height	0.00	0.00	552.00	L.F.
01-1800 Fence, Chain Link, Brid	ge, Pedestrain, Stright 5'-0" Height	0.00	0.00	552.00	L.F.
01-2100 Fence, Chain Link 7 ft.	High, with 2—24 ft. Swinging Gates (maint. yard)	0.00	150.00	0.00	L.F.
01-3400 Temporary Safety Fenc		200.00	0.00	0.00	L.F.
02-0010 16 ft. wide Turnout w/	3	9.00	0.00	0.00	Ea.
02-0020 24 ft. wide Turnout w/		7.00	0.00	0.00	<u>Ea.</u>
02-1300		2.00	1.00	0.00	Ea. Ea.
02-1600  Gate, Type III, 20 Ft. W 03-0710  18 ft. Type III Lockable		1.00	0.00	0.00	Ea.
03-0810 40 ft. wide Turnout		1.00	0.00	0.00	Ea.
03—1100 Cattleguard, 3 Unit, with	h Type II Gate	1.00	0.00	0.00	Ea.
03—1210 Cattleguard, 4 Unit, wi		3.00	0.00	0.00	Ea.
21—1000 Remove and reset fend	ce	675.00	0.00	0.00	L.F.
01-0000 Right-of-Way Monume	nt	21.00	0.00	0.00	Ea.
02-0000 Reference Marker		21.00	0.00	0.00	Ea.
10-1000 Seeding, Dry Method	Tues IV	8.50	0.00	0.00	Ac.
01—1100 Erosion Control Matting 02—0003 Sign Installation, 1 Pos	, lype IV t and Hardware: 2.75 lb/ft.	2,723.00 38.00	0.00	0.00	S.Y. S.F.
	ts and Hardware: 2.75 lb/ft.	38.00 41.65	0.00	0.00	S.F. S.F.
08—2000 Object Markers, Flexible	· · · · · · · · · · · · · · · · · · ·	6.00	0.00	0.00	 Ea.
3	, w/ 1- Post and Hardware, 2.00 lb/ft.	0.00	0.00	4.00	Ea.
09-0010 Delineators, Flexible, Ty		10.00	0.00	0.00	Ea.
9-0020 Delineators, Flexible, Ty	•	5.00	0.00	0.00	Ea.
	ost and Hardware; 2.00 lb/ft.	4.00	0.00	0.00	Ea.
01—1510 Pavement Markings, Ty		2,383.00	522.62	0.00	L.F.
01—1520 Pavement Markings, Ty		9,650.00	0.00	0.00	L.F.
01—1610 Pavement Markings, Ty		6,661.00	0.00	0.00	L.F.
01-0000 Temporary Traffic Cont		All Req'd.	All Req'd.	0.00	L.S.
02-3000 Temporary Traffic Cont 09-1000 Flaggers	rol, Raised Pavement Markers, Yellow	700.00 8,000.00	0.00	0.00	Ea. Man-hr.
1000 110ggol3				0.00	widii III.

STATION TO STATION	LOCATION	ILLINALIZ
20+50 to 23+75	Lt.	Remove/reset 325' barbed wire fence for BNSF service road
26+65.00	Lt. & Rt.	Remove 350' existing barbed wire fence, as necessary for construction activities. Reset fence under new bridge & across the removed bridge location. Tie reset fence onto existing fence.

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

STATION TO STATION LOCATION DESCRIPTION 150' Install new chain link fence 2—12' swinging gates 23+40.00 to 24+90.00 Left 299 L.F.

ITEM 62901-1100 - FROSION CONTROL MATTING TYPE IV

TILIVI OZJOT T		1031011	CONTROL	MALING	<u>,                                     </u>
STATION	LOCATION	HEIGHT	LENGTH	2:1Factor	QUANTITY (S.Y.)
21+30 to 23+50	Lt.	17.18 Avg.	220	0.7071	296.86
21+30 to 24+68	Rt.	23.09 Avg.	338	0.7071	613.17
30+15 to 33+60	Lt.	33.46 Avg.		0.7071	906.35
21+30 to 24+68	Rt.	33.46 Avg.		0.7071	906.35
		<u> </u>		TOTAL	: 2,722.73 S.Y.

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

Description:	Location:	Offset:	New aggregate base course (ton)	Aggregate stabilization With RoadBond	HACP (ton)	Asphalt Cement PG58-28 (ton)	Asphalt Prime coat (ton)	Remark:
0+69.88 - 21+30.32	mainline	centerline	2,814.20	8,149.00	1,309.00	78.50	9.70	regular roadway section.
21+30.32 - 21+50.00	mainline	centerline	30.80	90.00	14.60	0.90	0.10	tapered guardrail section.
21+50.00 - 23+65.50	mainline	centerline	379.30	1,122.00	182.40	10.90	1.30	constant guardrail section.
23+65.50 - 24+43.00	mainline	centerline	132.30	411.00	68.60	4.10	0.50	tapered guardrail section on left side.
24+43.00 - 24+83.00	mainline	centerline	72.90	227.00	37.90	2.30	0.30	constant guardrail section to Beginning of Bridge.
30+07.50 - 30+47.50	mainline	centerline	72.90	227.00	37.90	2.30	0.30	Ending of Bridge to constant guardrail section.
30+47.50 - 31+25.00	mainline	centerline	132.30	411.00	68.60	4.10	0.50	tapered guardrail section on left side.
31+25.00 - 33+40.50	mainline	centerline	379.30	1,122.00	182.40	10.90	1.30	constant guardrail section.
<u> 33+40.50 - 33+60.18</u>	mainline	centerline	30.80	90.00	14.60	0.90	0.10	tapered guardrail section.
33+60.18 - 57+82.74	mainline	centerline	3,308.80	9,582.00	1,539.10	92.30	11.40	regular roadway section.
turnout	3+40	left	64.00	0.00	39.00	2.37	0.36	40 ft wide x 34 ft driveway to business.
turnout with type 1 gate	8+27	right	32.33	0.00	19.17	1.15	0.18	14 ft wide x 34 ft turnout.
turnout	11+41	left	32.33	0.00	19.17	1.15	0.18	16 ft wide x 34 ft turnout.
turnout	11+71	right	32.33	0.00	19.17	1.15	0.18	16 ft wide x 34 ft turnout.
turnout	12+30	right	42.91	0.00	26.28	1.58	0.24	24 ft wide x 34 ft turnout.
turnout	12+65	left	32.33	0.00	19.17	1.15	0.18	16 ft wide x 34 ft turnout.
turnout	13+34	right	42.91	0.00	26.28	1.58	0.24	24 ft wide x 34 ft turnout.
turnout	14+40	right	42.91	0.00	26.28	1.58	0.24	24 ft wide x 34 ft turnout.
turnout	14+50	left	42.91	0.00	26.28	1.58	0.24	24 ft wide x 34 ft turnout.
turnout	15+16	right	32.33	0.00	19.17	1.15	0.18	16 ft wide x 34 ft turnout.
turnout	15+85	right	32.33	0.00	19.17	1.15	0.18	16 ft wide x 34 ft turnout.
turnout	15+85	left	32.33	0.00	19.17	1.15	0.18	16 ft wide x 34 ft turnout.
turnout	16+55	right	32.33	0.00	19.17	1.15	0.18	16 ft wide x 34 ft turnout.
turnout	17+25	left	42.91	0.00	26.28	1.58	0.24	24 ft wide x 34 ft turnout.
turnout	17+25	right	32.33	0.00	19.17	1.15	0.18	16 ft wide x 34 ft turnout.
turnout	17+94	right	32.33	0.00	19.17	1.15	0.18	16 ft wide x 34 ft turnout.
turnout	19+75	right	42.91	0.00	26.28	1.58	0.24	24 ft wide x 34 ft turnout to old HWY666
turnout	19+75	left	42.91	0.00	26.28	1.58	0.24	24 ft wide x 34 ft turnout to BNSF service road.
turnout with type 2 gate.	37+00	right	42.91	0.00	26.28	1.58	0.24	24 ft wide x 34 ft turnout with 3—unit cattleguard.
, i		subtotal:	8,084.18	21,431.00	3,896.04	233.71	29.58	
0+17.38 - 5+75.00	Frontage	centerline	444.60	0.00	143.90	8.60	1.60	Frontage and Access Road
5+75.00 - 8+32.00	Access	centerline	150.60	0.00	46.90	2.80	0.50	Frontage and Access Road
turnout	1+35.00	left	42.91	0.00	26.28	1.58	0.24	24 ft wide x 80 ft
turnout with type 1 gate	4+80.00	left	32.33	0.00	19.17	1.15	0.18	14 ft wide x 10 ft
turnout	5+30.00	left	20.00	0.00	15.00	1.00	0.18	24 ft wide x 10 ft to BNSF service building.
turnout	6+35.62	left	20.00	0.00	15.00	1.00	0.18	24 ft wide x 20 ft to BNSF track.
		subtotal:	710.44	0.00	266.25	16.13	2.88	
		grand total:	8,794.62	21,431.00	4,162.29	249.84	32.46	

ITEM 61903-1210 - 4 UNIT CATTLEGUARD NO GATE

STATION LOCATION DESCRIPTION 19+25.0 C/L Install new 4 unit cattle guard 31+60.0 C/L Install new 4 unit cattle guard
57+82.7 C/L E.O.P. Install new 4 unit cattle guard

### ITEM 20304-1000 - REMOVAL OF STRUCTURE & OBSTRUCTIONS

	TEIN 2000 1 1000 KEINOVILE OF STROUTURE & OBSTROUTURES						
STATION	LOCATION	REMARKS					
3+55.00	Left.	Remove and salvage metal post & wing fences					
3+33.00	Leit.	at T.O. Set fence material out side R/W line.					
8+27.00	Right	Remove existing cattleguard and foundation					
19+25.00	Centerline	Remove existing 4-unit cattleguard & tie-in					
13123.00	Centernite	fencing back to R/W lines.					
20+40.71	3.76 Rt.	Remove existing sign					
20+30.00 to 24+90.00	Left	Remove meandering 465' barbed wire fence					
23+80.00 to 24+90.00	Left	Remove 110' temporary chainlink fence segments					
25+05.00	Right	Remove ±60' of BNSF barbed wire fencing					
25+95.00	Right	Remove ±100' of BNSF barbed wire fencing					
26+50.00 to 30+00.00	Left	Remove existing bridge SEE NOTE #15 on SHEET B-1					
31+60.00	Rt. & Lt.	Remove ±400' of BNSF property barbed wire fencing					
24+15.00	Left	Remove 2'x3' Steel Metal Grate & 2-14"x ±160' pipe					
	DETOUR — FRONTAGE ROAD						
5+35.00	Left.	Remove 10'x12' concrete slab at West Entrance					
J+33.00	Leit.	of Service Building off Frontage Road					
25+40±	Left	Relocate existing drainage pipes 18' Left under new Detour Road.					

### ITEM 20401-0000 - EARTHWORK QUANTITIES

STATION - STATION	CUT (yd <sup>3</sup> )	FILL (yd <sup>3</sup> )	BORROW (yd <sup>3</sup> )	WASTE (yd <sup>3</sup> )
0+69.88 to 21+60.15	4,281.25	4,281.25	0	0
21+60.15 to 24+83.0	0	32,790.48	0	0
	**** EXCEPTION	N - BRIDGE *	***	
30+07.50 to 57+82.7	1,585.74	73,105.05	71,519.32	0
Sub-total:	5,866.99	110,176.78	104,309.80	0
***	** MAINTENANCI	E/DETOUR ROA	D ****	
0+17.38 to 01+32.5	41.16	41.15	0	0
01+32.52 to 8+32	678.48	154.97	0	523.50
Sub-total:	719.63	196.13	0	523.50
TOTAL:	6.586.63	110.372.91	104.309.80	0

\* 20% Shrinkage Factor applied

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

STATION | LOCATION | DESCRIPTION

STATION	LOCATION	DESCRIPTION
11+41.00	Lt.	Reconstruct 16' turnout
11+71.00	Rt.	Reconstruct 16' turnout
12+65.00	Lt.	Reconstruct 16' turnout
15+16.00	Rt.	Reconstruct 16' turnout to match existing concrete driveway
15+85.00	Lt.	Reconstruct 16' Turnout
15+85.00	Rt.	Reconstruct 16' turnout to match existing concrete driveway
16+55.00	Rt.	Reconstruct 16' turnout to match existing concrete driveway
17+25.00	Rt.	Reconstruct 16' turnout to match existing concrete driveway
17+94.00		Reconstruct 16' turnout to match existing concrete driveway

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

STATION	LOCATION	DESCRIPTION
12+30.00	Rt.	Reconstruct 24' turnout
13+66.00	Rt.	Reconstrurt 24' turnout to match existing concrete driveway
14+40.00	Rt.	Reconstruct 24' turnout to match existing concrete driveway
14+50.00	Lt.	Reconstruct 24' turnout to New Lands Office
17+25.00	Lt.	Reconstruct 24' turnout
19+75.00	Rt.	Reconstruct 24' turnout
19+75.00	Lt.	Reconstruct 24' turnout @ 113 degree skew
MAINTE	NANCE RO	DAD — 24' TURNOUT NO GATE
1+35.00*	Lt.	Reconstruct 24' turnout to Old Hwy. 66
5+30.00*	Lt.	Reconstruct 24' turnout to BNSF Service Building
6+35.62*	Lt.	Reconstruct 24' turnout to existing bridge

\*Reconstruct maint./detour road turnouts with gravel only

### ITEM 60701-1000 - REMOVING, CLEANING, STOCKPILING SALVAGEABLE CSPC STATION | SIZE | REMARKS

STATION	LOCATION	SIZL	KEMAKKS
3+55.00	Turnout Left	1-24" x 68'	To be removed/salvage
6+60.00	C/L	$1-24" \times 70'$	To be removed/salvage
8+27.00	Turnout-Rt.	1-18" x 50'	To be removed/salvage
24+15.00	10'+Lt.	2-14" x 160'	Concrete inlet and under ground drainage
31+75.00	300' Lt./exst'g road	2-24" x 30'	Removed & salvage
34+50.00	130' Rt./exst'g road	1-24" x 30'	To be removed/salvage
47+40.00	150' Lt./exst'g road	1-24" x 50'	To be removed/salvage
50+30.00	C/L	1-24" x 80'	To be removed/salvage

TOTAL: 448 Feet To be\_removed/salvage

ITEM 61902	2-1300 - 1	4' TURNOUT w/TYPE 1 GATE
STATION	LOCATION	DESCRIPTION
8+27.00	Rt.	Reconstruct 14' Turnout
MAINTENAN	CE ROAD -	14' Turnout w/Type 1 Gate
4+80.00	Lt.	Frontage Road

ITEM 61901-1000 - BARBED WIRE FENCING

STATION TO STATION	LOCATION	REMARKS
19+25 - 20+10	Lt.	100' Tie to Cattleguard
20+30-21+52	Lt.	120' Install to Cattleguard & tie to Guardrail
31+60.00	Lt. & Rt.	400' BNSF property fence
31+60-58+00	Lt. & Rt.	5,280 L.F. R/W fence
	TOTAL:	5,900 L.F.

61701-5000; GUARDRAIL SYSTEM, SGR-04b, TYPE PDE WITH ET-PLUS TERMINAL SECTION

STATION TO STATION   LOCATION   LENGTH (ff)		LENGIH (††)	Remarks		
21+50.00	То	24+44.583	Right	294.58	Includes ET Plus, Connect to guardrail transition railing
21+50.00	То	24+44.583	Left	294.58	Includes ET Plus, Tapered guardrail
30+45.917	То	33+40.50	Right	294.58	Includes ET Plus, Straight section guardrail
30+45.917	То	33+40.50	Left	294.58	Includes ET Plus, Tapered guardrail
TOTAL: 1				1,178.33	

| ITEM 61903-1100 - 24' TURNOUT w/3 UNIT CATTLEGUARD & TYPE II GATE | STATION | LOCATION | DESCRIPTION | 37+00.00 | Rt. | Construct 24' turnout w/3 unit cattleguard & Type || Gate

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

STATION LOCATION DESCRIPTION

3+40.00 Lt. Construct 40' turnout w/No Gate

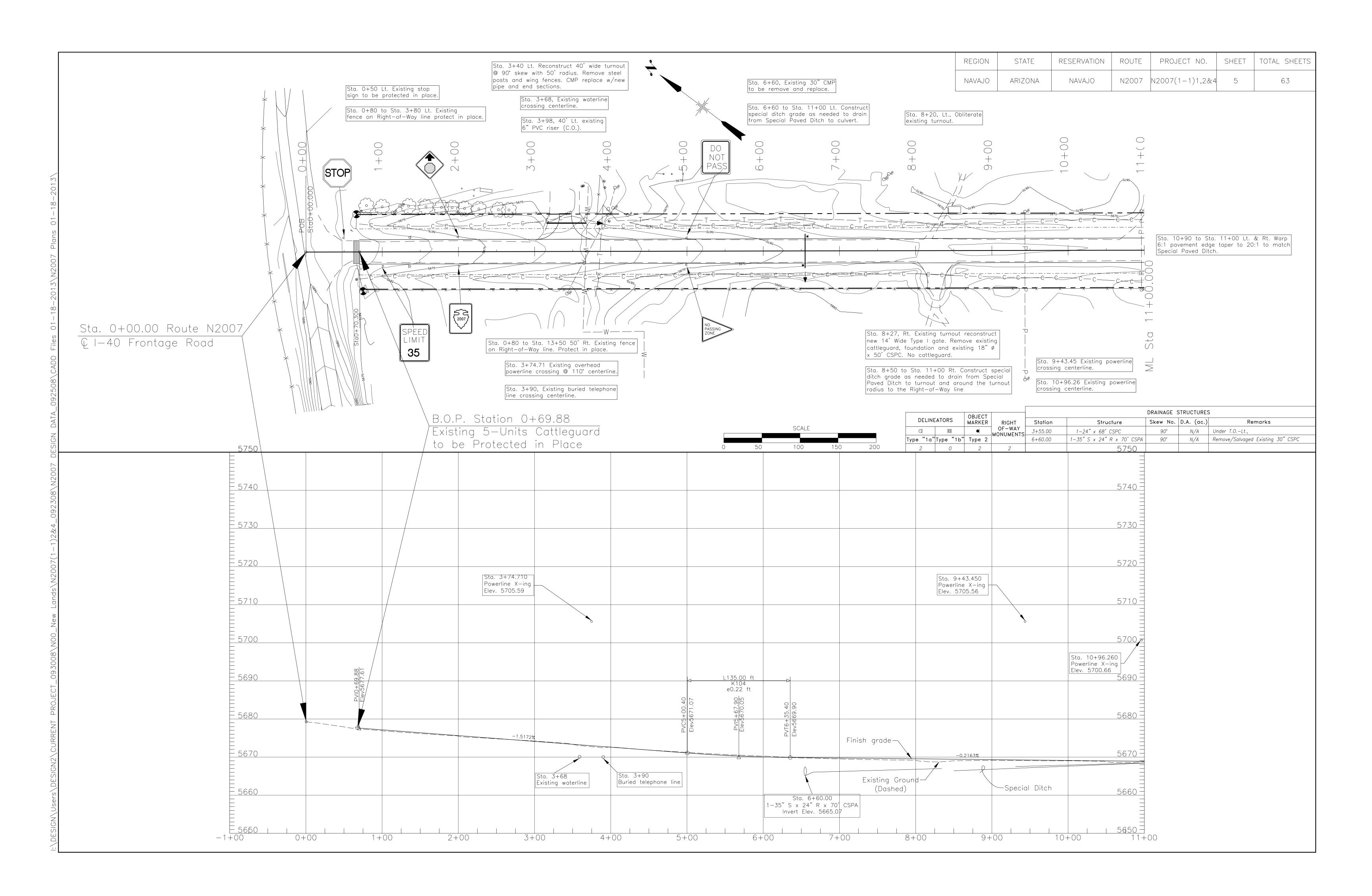
UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

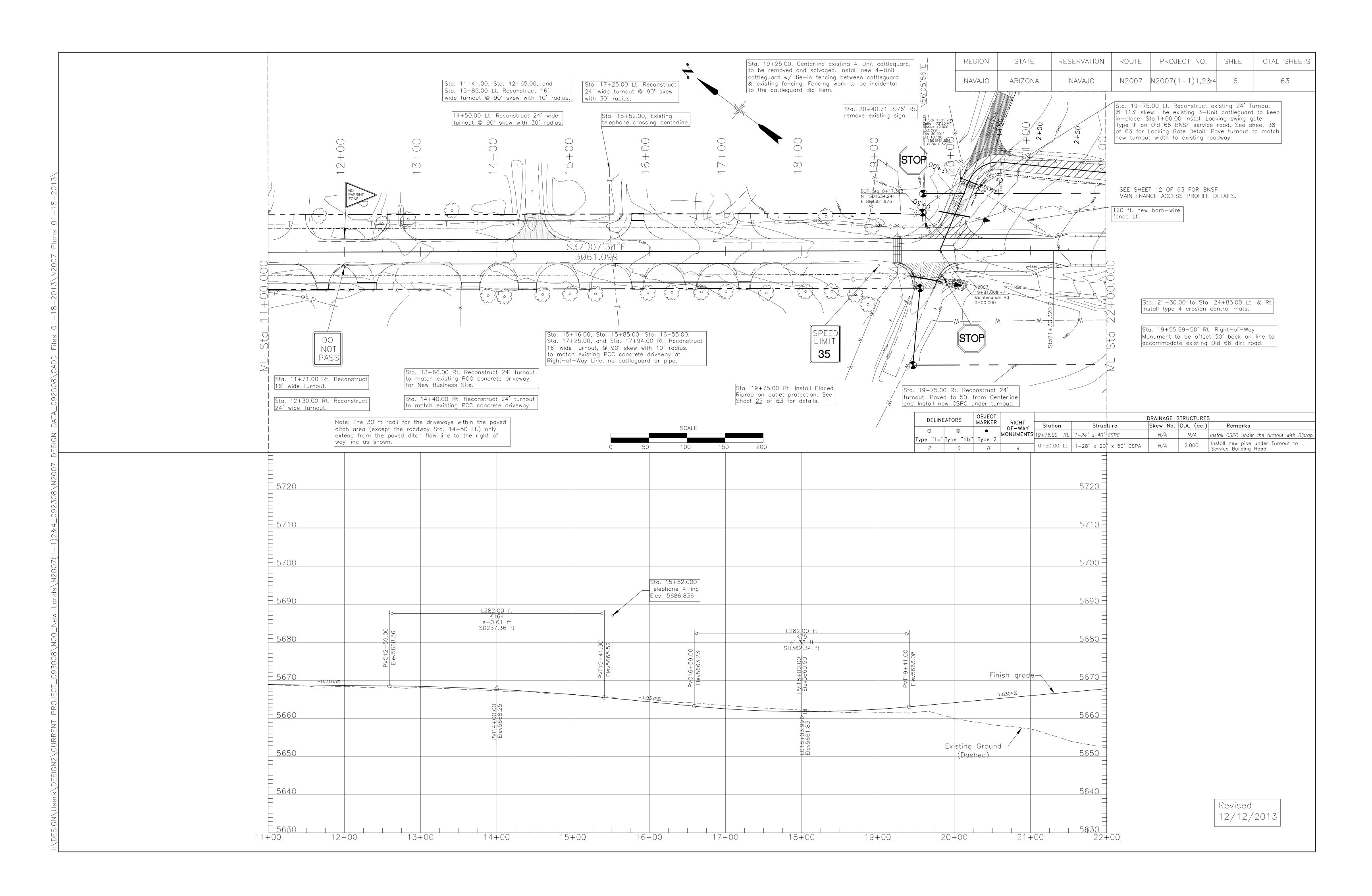
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### ESTIMATED QUANTITIES

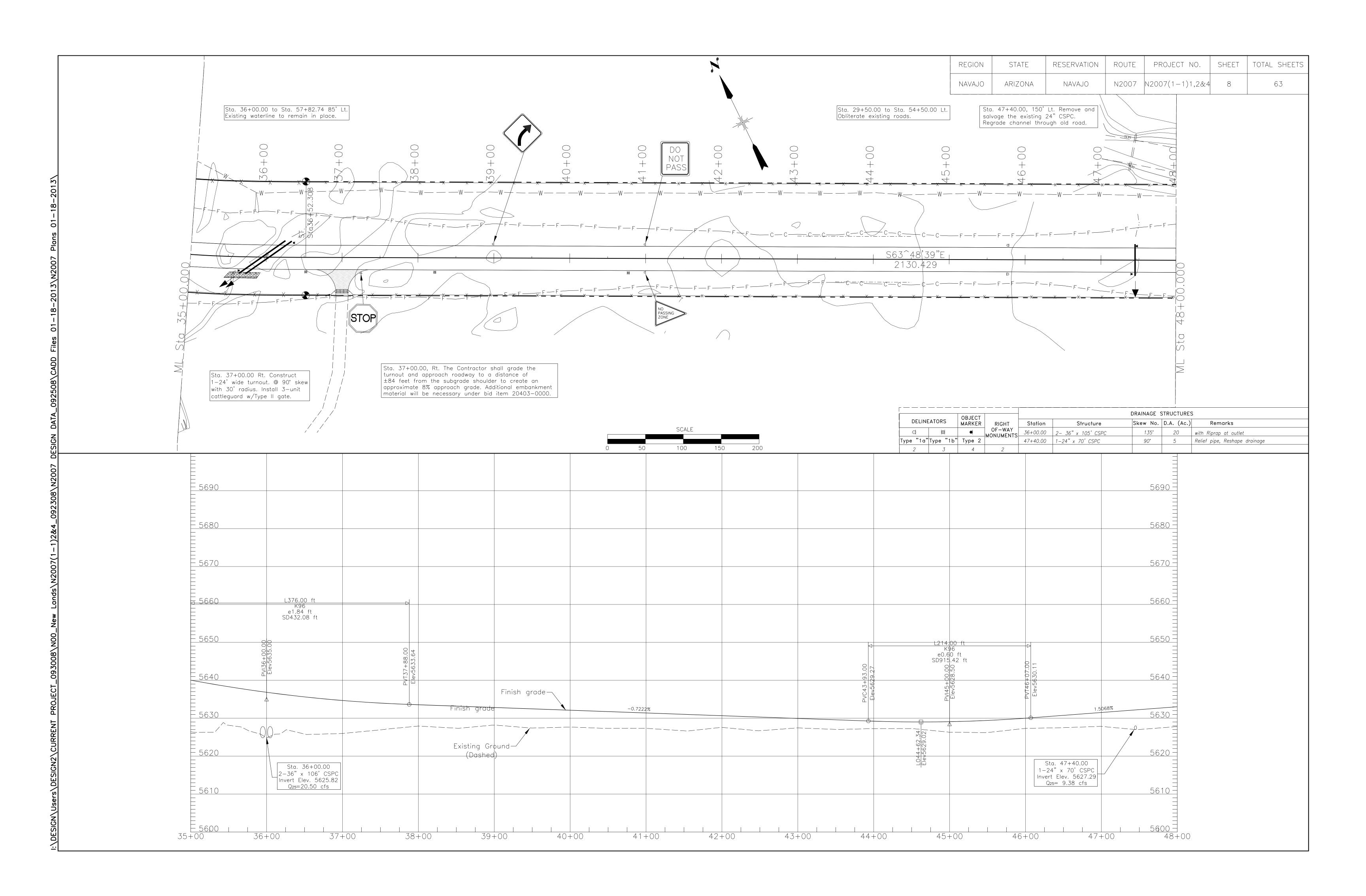
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DESIGNED BY: NRDOT	DATE: 1/28/2013
REVISED: 6/3/2013	BY: Gerald.Hood
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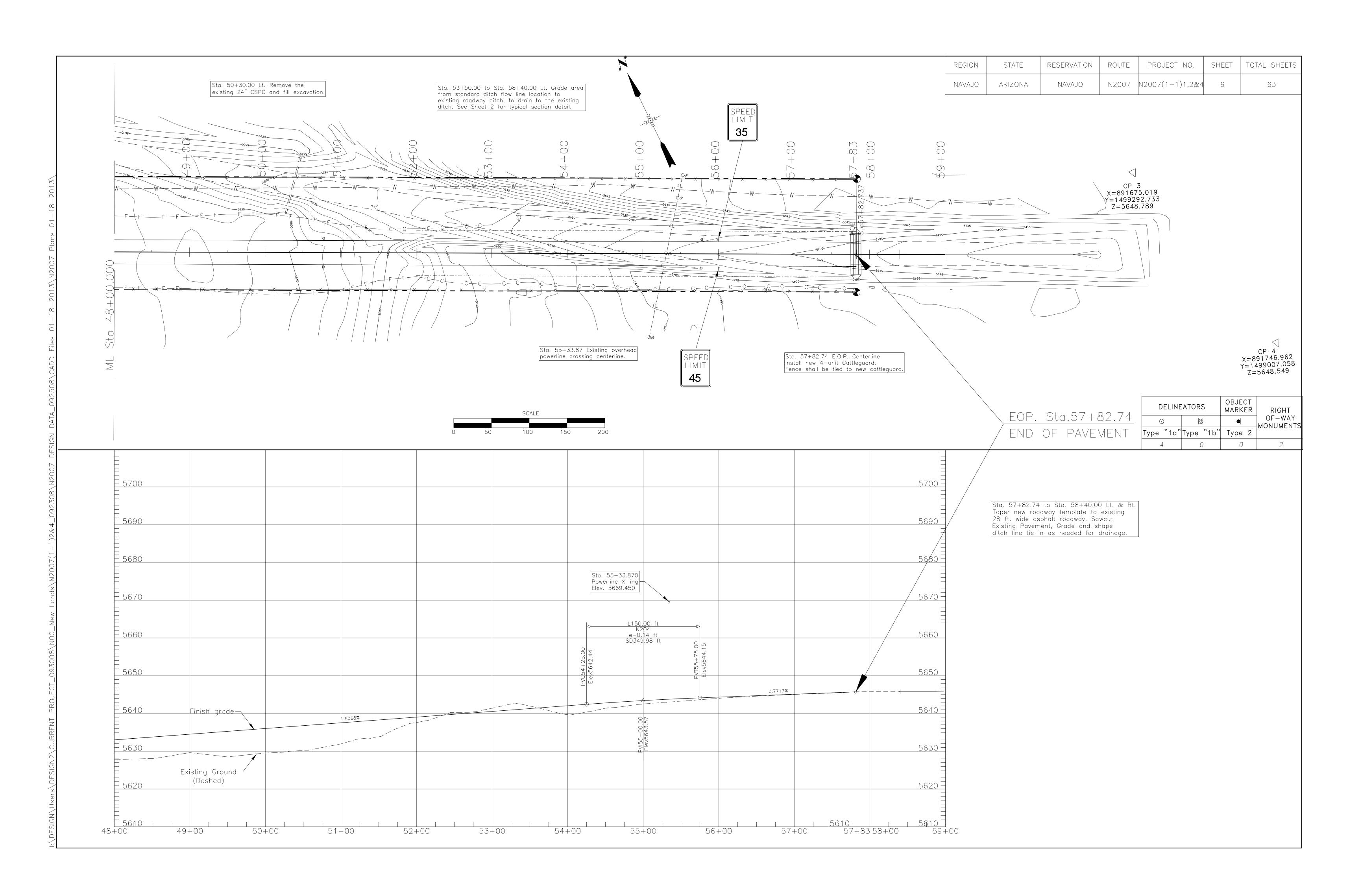












REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
OLAVAN	ARIZONA	OLAVAN	N2007	N2007(1-1)1,2&4	10	63

### N2007 HORIZONTAL ALIGNMENT TABLE REPORT \*

Point	Station	Direction	Style:	Northing	Easting	Radius	Length	Delta /	Rotation
Туре			·					Theta	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				

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

### 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

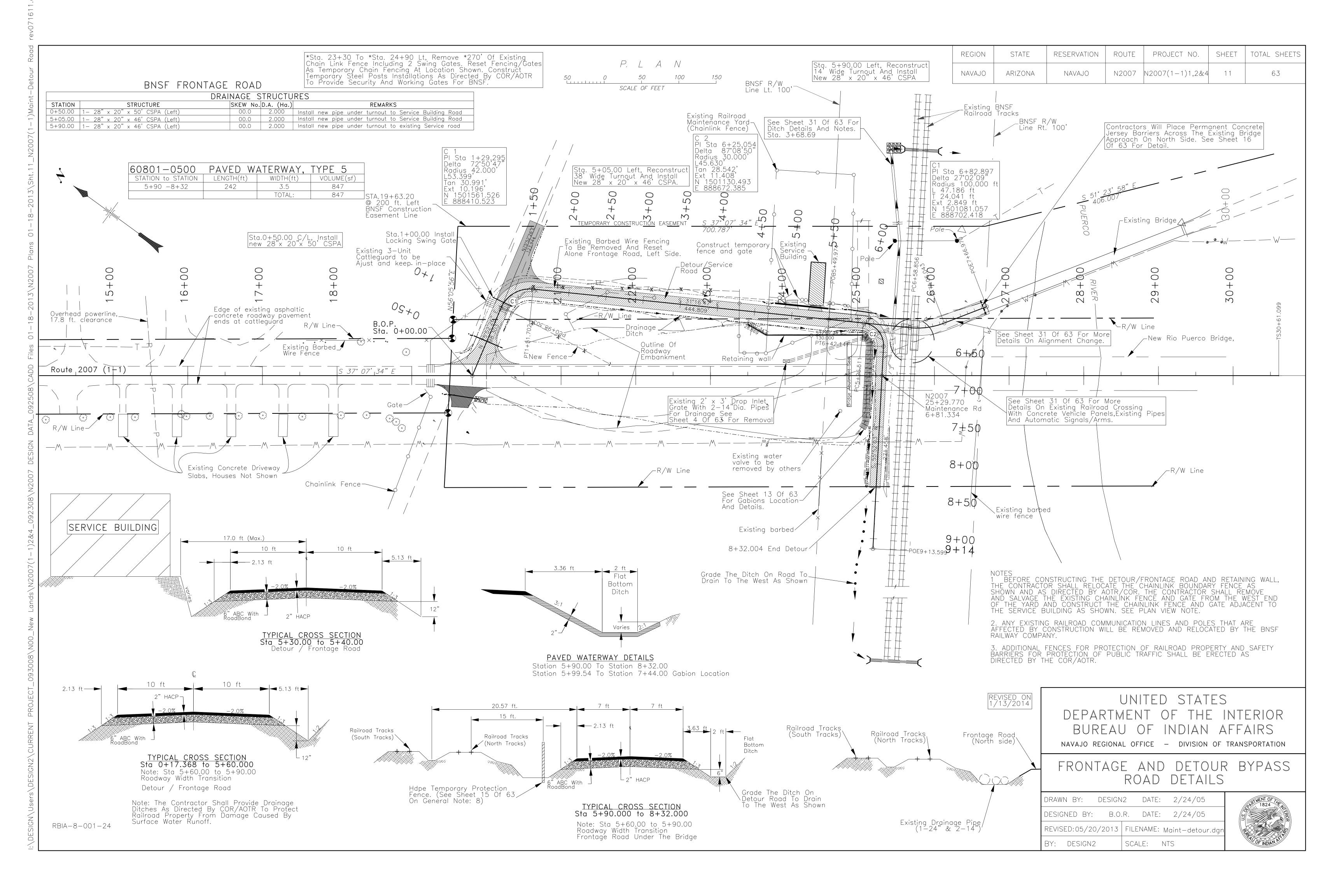
### UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

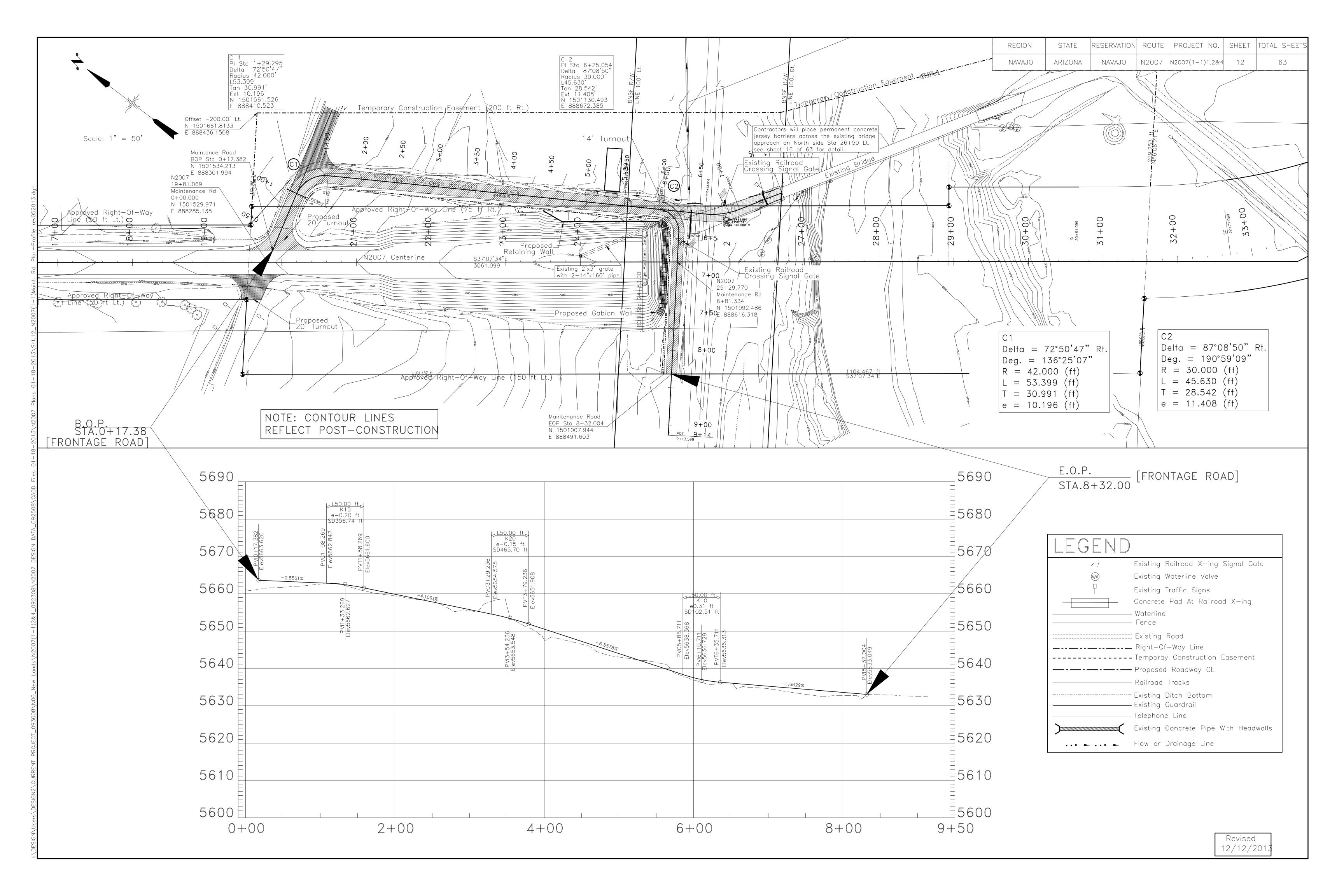
ALIGNMENTENT TABLE AND CONTROL POINTS AND UTILITY CROSSING

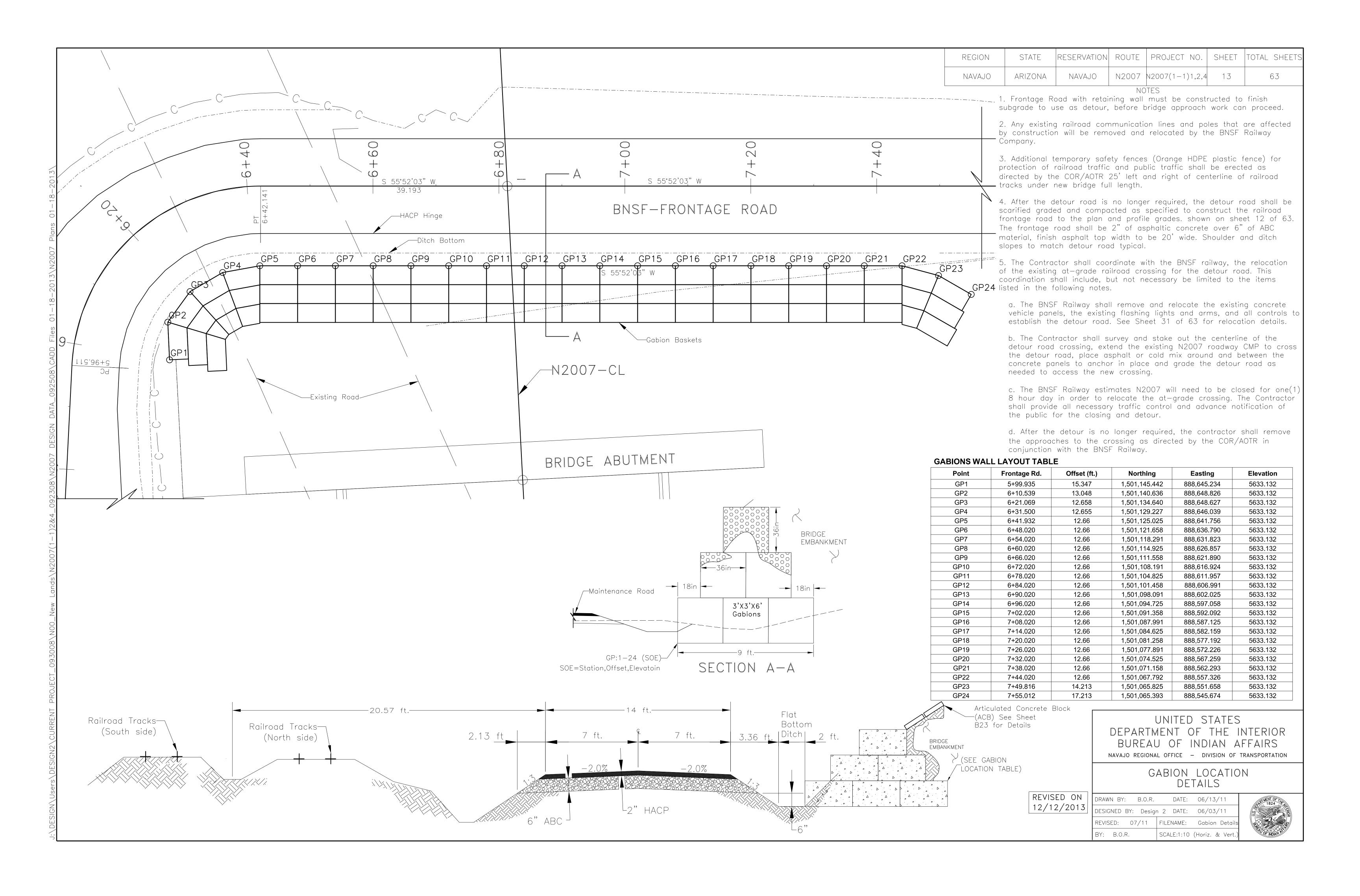
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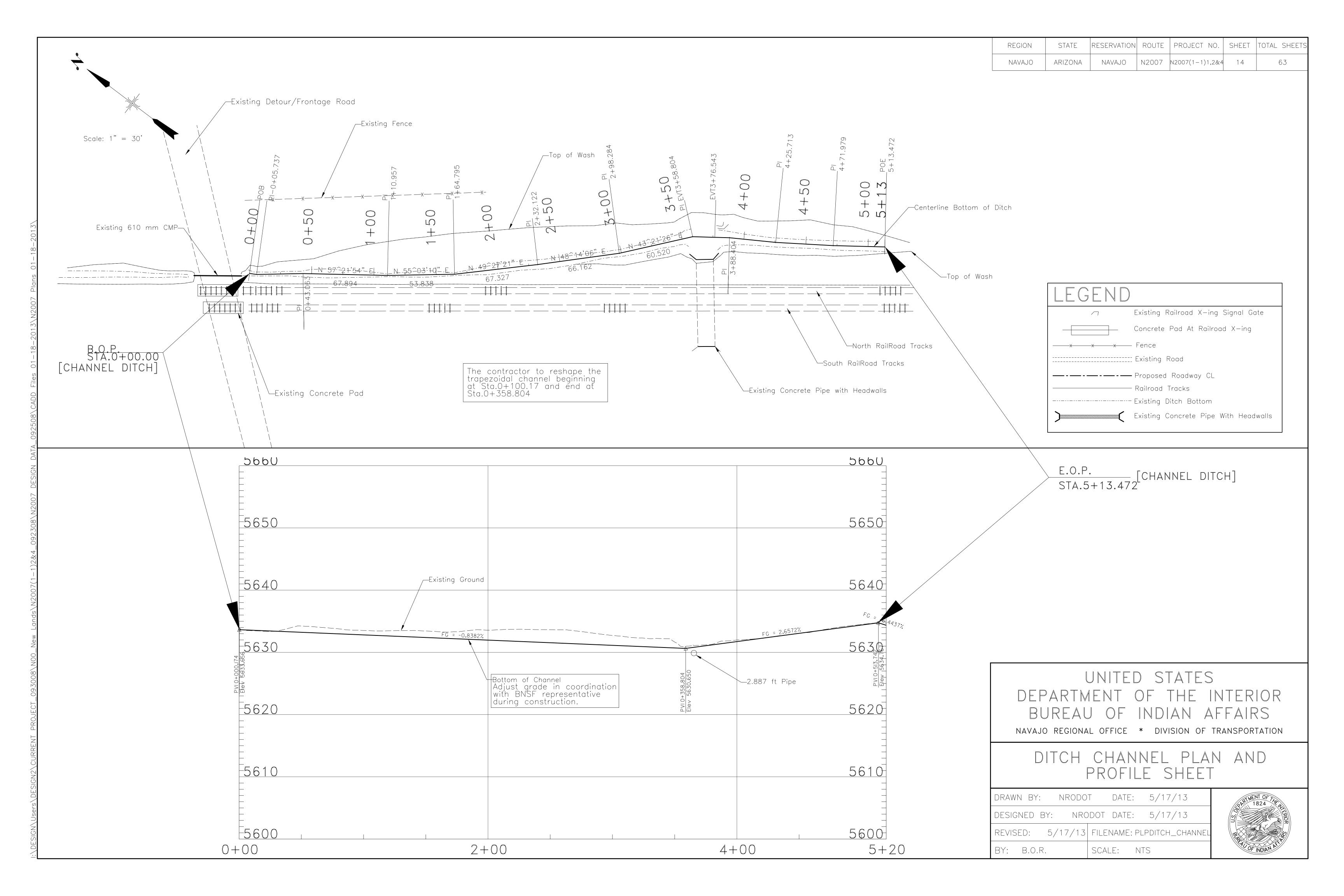
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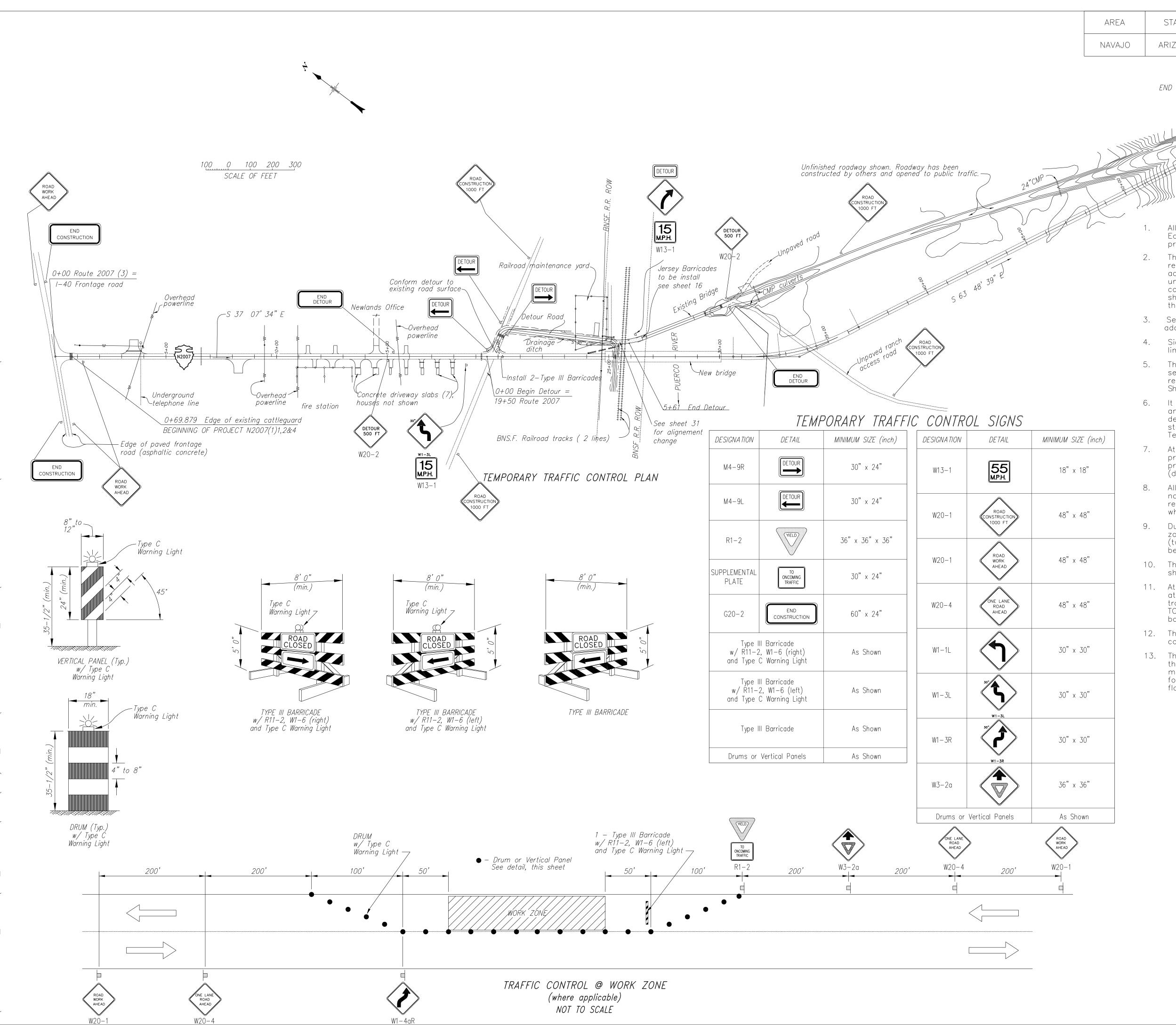












AREA STATE RESERVATION ROUTE PROJECT NO. SHEET TOTAL SHEETS

NAVAJO ARIZONA NAVAJO N2007 N2007(1-1)1,2&4 15 63

57+82.74 Route 2007 (3)=

Existing roadway

END OF PROJECT N2007(1)1,2&4

Install 2-Type III Barrocade

### 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-03, 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.
- 3. See General Notes on 3 of 63 and the supplemental specifications for additional TCP requirements.
- I. 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.
- 5. 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.
- 6. 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.
- 7. At the end of each working day, it will bethe Contractor responsibility to provide a driving surface free of obstructions. Access to all adjoining properties and BA/County system routes shall bemaintained at all times (day and night).
- 8. 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.
- 9. 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.
- 10. 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.
- 11. At locations where new road construction intersects existing roadways and at tie—ins with existing roads at the endof 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.
- 12. The Traffic Control on this project shall be coordinated with the project construction schedule. The Contractor's TCP shall reflect this coordination.
- 13. 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 bit item 61901—3400. This may reduce the need for railroad flaggers.

## UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS

NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

## TEMPORARY TRAFFIC CONTROL

DRAWN BY: Gerald.Hood DATE: 5/7/2009

DESIGNED BY: NRDOT DATE: 5/7/2009

REVISED: 05/20/2013 BY: Gerald.Hood

ANNOTATION SCALE: Full Size 1=1

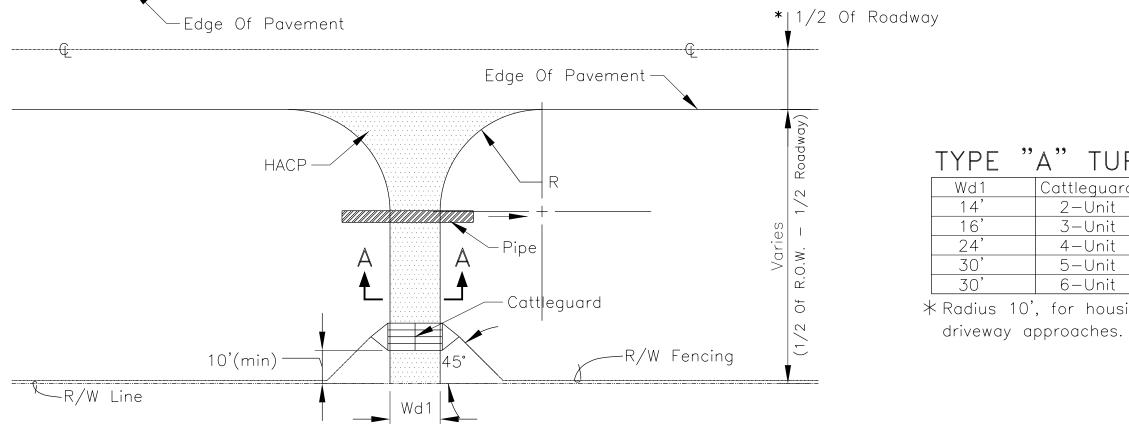
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STATION	LOC.	SIZE DETAIL NO.	DESCRIPTION	SIGN PANEL SIZE INCH	AREA OF SIGN ft <sup>2</sup>	NO. Of POSTS	POST WEIGHT Ib/ft	TOTAL PANELS
19+68.00 19+86.00	Lt. Rt.	R1-1 R1-1	STOP	30" × 30"	6.25	2 2	2.00	2
1+00.00 19+00.00 56+00.00	Rt. Rt. Lt.	R2-1(35)	SPEED LIMIT 35	24" × 30"	5.0	1 1 1	2.75	3
56+00.00	Rt.	R2-1(45)	SPEED LIMIT 45	24" × 30"	5.0	1	2.75	1
2+00.00	Rt.	M – 1	(2007)	18" × 24"	3.0	1	2.75	1
39+00.00	Lt.	W1-2R		30" × 30"	6.25	2	2.00	1
5+00.00 12+00.00 41+00.00	Lt. Rt. Lt.	M – 1	DO NOT PASS	24" × 30"	5.0	1 1 1	2.75	3
5+00.00 12+00.00 41+00.00	Rt. Lt. Rt.	R4-1	NO PASSING ZONE	48" × 48" × 36"	5.55	2 2 2	2.00	3
2+00.00	Lt.	W3-1a		30" × 30"	6.25	2	2.00	1

63302-0010 Sign Installation, 2 Post & Hardware: 2.00 lbs/ft.\_\_\_ 41.65 sq.ft.

★ See Typical Section Detail For Roadway Width



TYPE "A" TURNOUT 4-Unit 5-Unit 6-Unit \*Radius 10', for housing street/

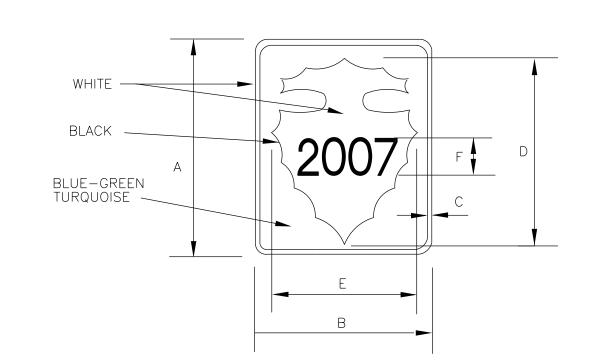
REGION

OLAVAIO

STATE

ARIZONA

OLAVAIO



RESERVATION ROUTE PROJECT NO. SHEET TOTAL SHEETS

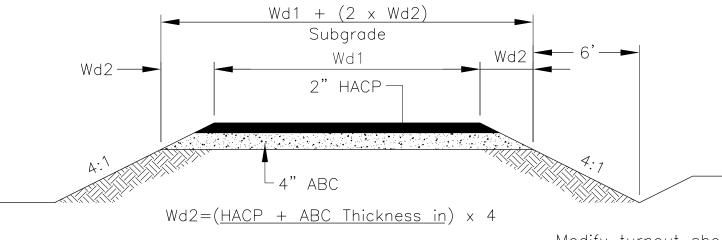
63

16

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

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

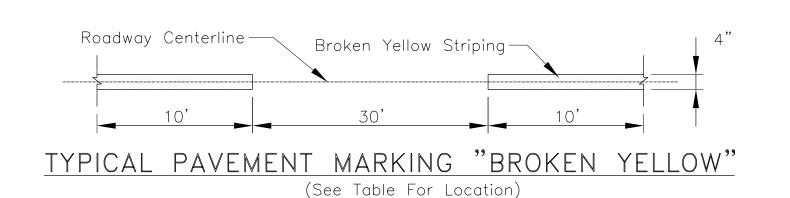
similar, Radii to be 30'.



DIMENSION inches F = NUMERALSSIGN DIGITS IN ROUTE 14 1/2" 12" 1/2" | 19-1/2" | 13-1/2" MIN. 24" 18" SIZE

SECTION A-A

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



STOP SIGN and S	TOP BAR IC	Y (m)=		
Radius of turnout (ft)	X (ft)	y' (ft)	y' + LO (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

### 63401-1610 PAVEMENT MARKINGS: SOLID YELLOW LOCATION DECRIPTION LIENGTH (Ft.) STATION TO STATION

01711011	100	17 (1101)		DEOIM HON	
0+69.879	То	5+00.00	Center-Right	Solid Yellow	430.12
0+69.879	То	5+00.00	CenterL-Left	Solid Yellow	430.12
12+00.00	То	41+00.00	Center-Right	Solid Yellow	2,900.00
12+00.00	То	41+00.00	Center-Left	Solid Yellow	2,900.00
				TOTAL:	6,660.24

63401-1520 PAVEMENT MARKINGS: SOLID WHITE

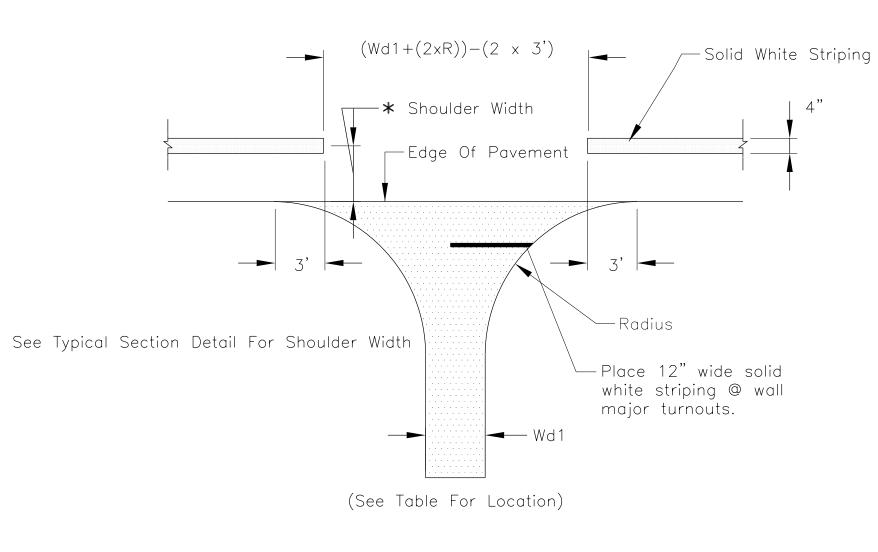
STATION TO STATION	LOCATION	DECRIPTION	LENGTH (Ft.)
0+69.879 To 57+82.74	Right	Solid White	5,712.86
Minus (1) 14' T.O. @ 68		-68.00	
Minus (6) 16' T.O. @ 70	,		-420.00
Minus (5) 24' T.O. @ 118	8'		-590.00
		SUB-TOTAL:	4,634.86
0+69.879 To 57+82.74	Left	Solid White	5,712.86
Minus (1) 40' T.O. @ 13-	4'		-134.00
Minus (3) 16' T.O. @ 70	)		-210.00
Minus (3) 24' T.O. @ 118	8'		-354.00
		SUB-TOTAL:	5,014.86
		GRAND-TOTAL:	9,649.72

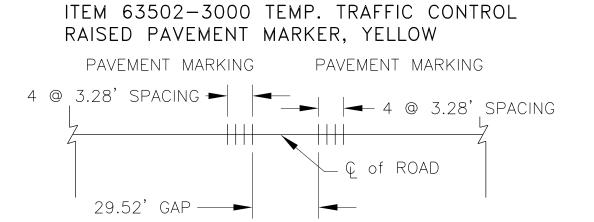
63401-1510 PAVEMENT MARKINGS: BROKEN YELLOW					
STATION	TO S	TATION	LOCATION	DESCRIPTION	LENGTH (Ft)
5+00.00	То	12+00.00	Center	Broken Yellow	700.00
41+00.00	То	57+82.74	Center	Broken Yellow	1,682.74
				TOTAL:	2,382.74

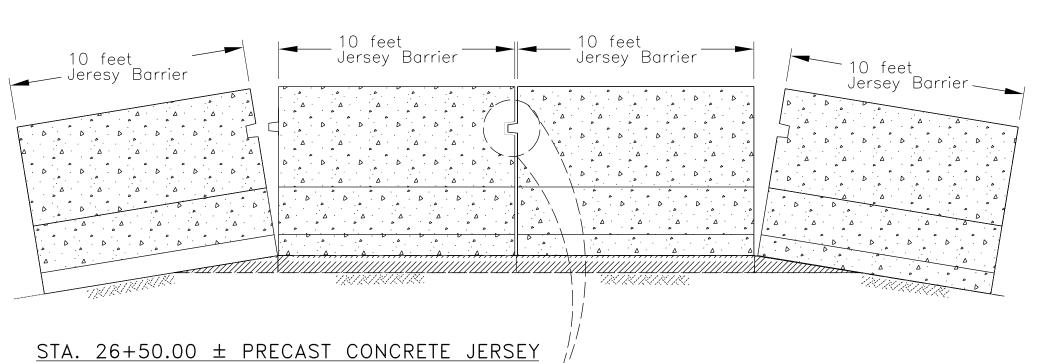
### MAINTENANCE/DETOUR ROAD

63401-151	0 PA	VEMENT	MARKINGS:	SOLID YELI	LOW
STATION	TO ST	ATION	LOCATION	DESCRIPTION	LENGTH (ft)
0+17.38	То	5 + 40.00	Center	Solid Yellow	522.62
				TOTAL:	522.62

63502-3000 TTC, RAISED PAVEMENT MARKINGS: 63502-3000 TTC, RAISED PAVEMENT MARKERS @ 700 TOTAL







0.25" gap for \_\_\_\_expansion and contraction

### PRECAST JOINT DETAIL

(a). The Precast Jersey Barrier shall be install on the North side of the existing bridge approach as shown and location determined by AOTR.

BARRIER ON FRONTAGE ROADWAY ON EXISTING

BRIDGE APPROACH

(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.

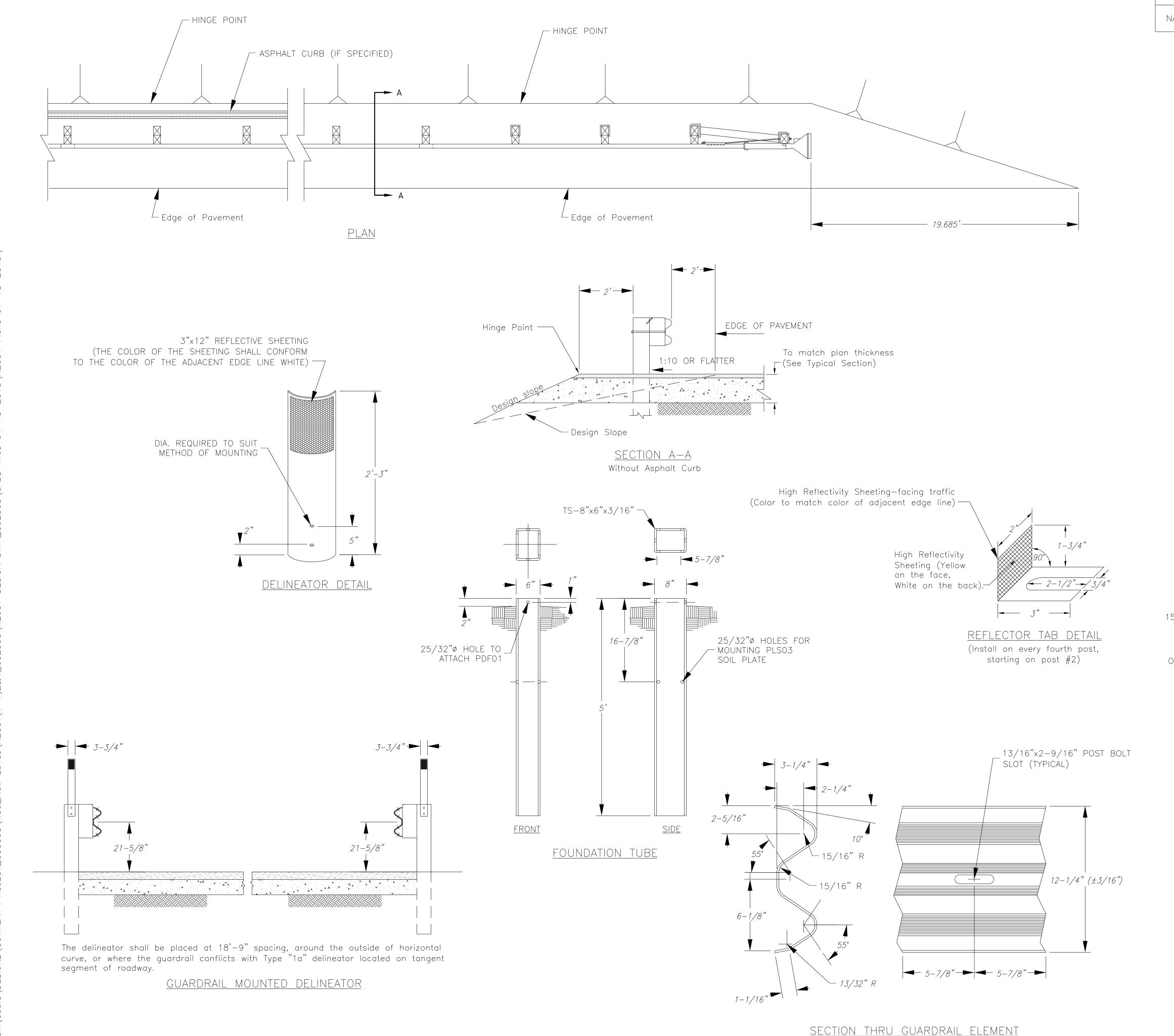
### UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

SIDE VIEW

### 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_PermSi	gn & T.O Details.dgn



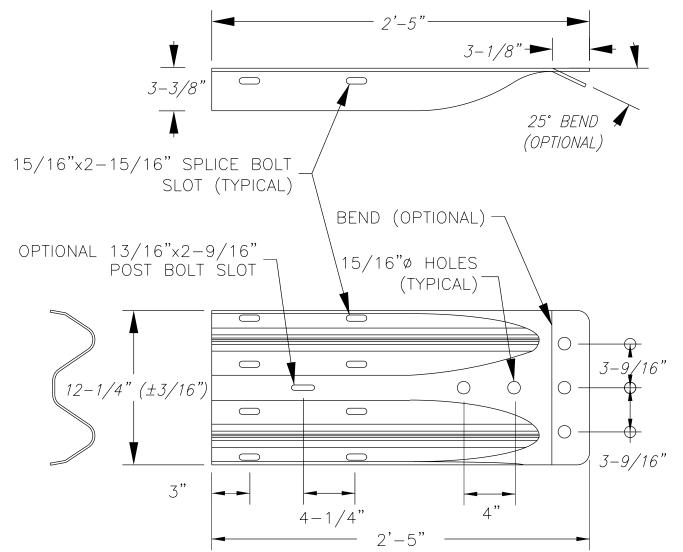


REGION STATE RESERVATION ROUTE PROJECT NO. SHEET TOTAL SHEETS

NAVAJO ARIZONA NAVAJO N2007 N2007(1-1)1,2&4 17 63

### GENERAL NOTES

- 1. ALL W-BEAMS, THRIE-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.
- 2. ALL STRUCTURAL STEEL ITEMS SHALL CONFORM TO AASHTO M183/ ASTM A36, AND BE GALVANIZED IN ACCORDANCE WITH AASHTO M111 SPECIFICATION.
- 3. WIRE ROPE, FITTINGS, AND ASSEMBLIES OF HARDWARE SHALL CONFORM TO AASHTO M-30, TYPE-2 SPECIFICATION AND A CLASS B ZINC COATING.
- 4. 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.
- 5. ALL EMBANKMENT AND AGGREGATE BASE MATERIAL SHALL BE COMPACTED TO 95% OF MAXIMUM DRY DENSITY.
- 6. THE EMBANKMENT MATERIAL AND PLACING THEREOF SHALL BE INCIDENTAL TO EARTHWORK ITEMS AND NO DIRECT PAYMENT SHALL BE MADE.
- 7. 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.
- 8. THE COST OF THE ET2000 ASSEMBLY AND PLACING THEREOF SHALL BE CONSIDERED INCIDENTAL TO ITEM 61701-1250, WHICH INCLUDES BREAKAWAY POSTS, STEEL FOUNDATION TUBE, AND HARDWARE.
- 9. PLACEMENT OF HOT ASPHALTIC CONCRETE AND AGGREGATE BASE MATERIAL FOR GUARDRAIL WIDENING SHALL BE INCLUDED WITH ITEMS 30101-2000 AND 40201-0500.
- 10. FURNISHING AND PLACEMENT OF REFLECTIVE SHEETING AND TABS SHALL BE CONSIDERED INCIDENTAL TO ITEM 61701-1250 AND NO DIRECT PAYMENT SHALL BE MADE.
- 11. ALL RELATED PATENT RIGHTS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AS PER SECTION 107.01 OF THE FP-03
- 12. 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.



TERMINAL CONNECTOR

# UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS

NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

## STANDARD GUARDRAIL DETAIL ET PLUS

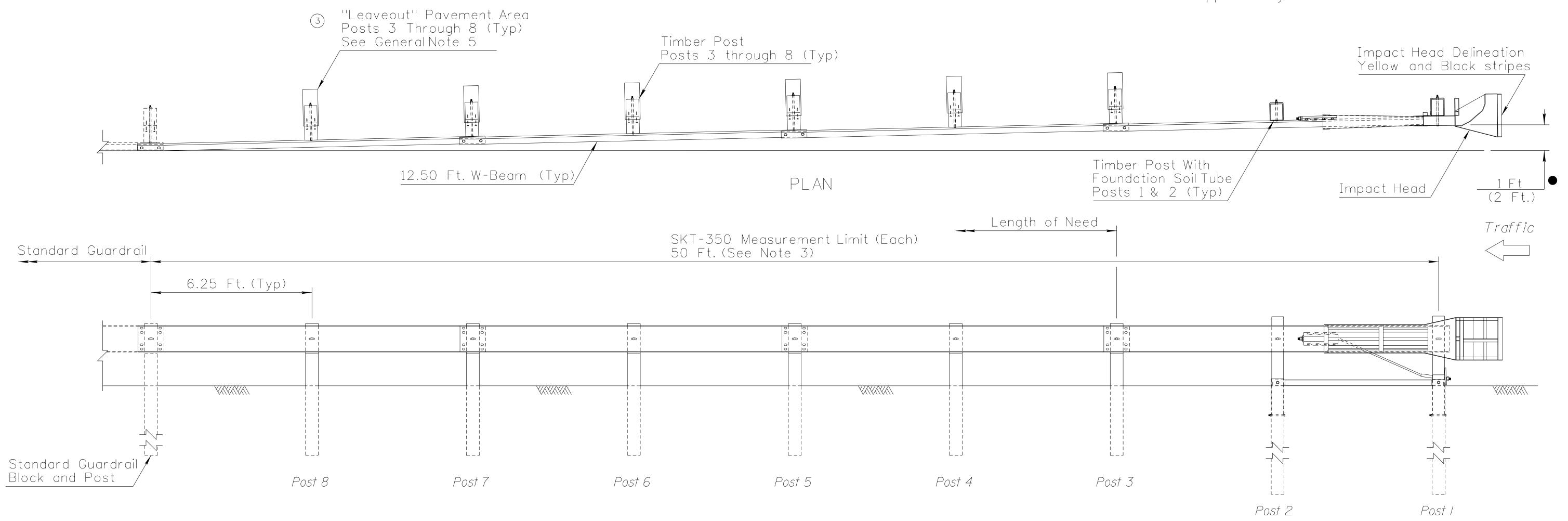
DRAWN BY: Gerald.Hood	DATE:5/6/2009
DESIGNED BY: NRDOT	DATE:5/6/2009
REVISED: 1/28/2013	BY: Peterson.Yazzie
ANNOTATION SCALE: Full	Size 1=1
FILENAME: Sht.17_Guardro	ail ET Plus2.dgn



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

### GENERAL NOTES

- 1. This detail is for roadway layout only.
- 2. The SKT-350 shallbe 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.
- 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.



ELEVATION

## UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS

NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

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

REVISED ON 4/21/2015 Designed by: BIA NRO-DOT StructuralUnit

Drawn by: - - - Date: 2/13/2015

Revised by: - - - Date: - - -

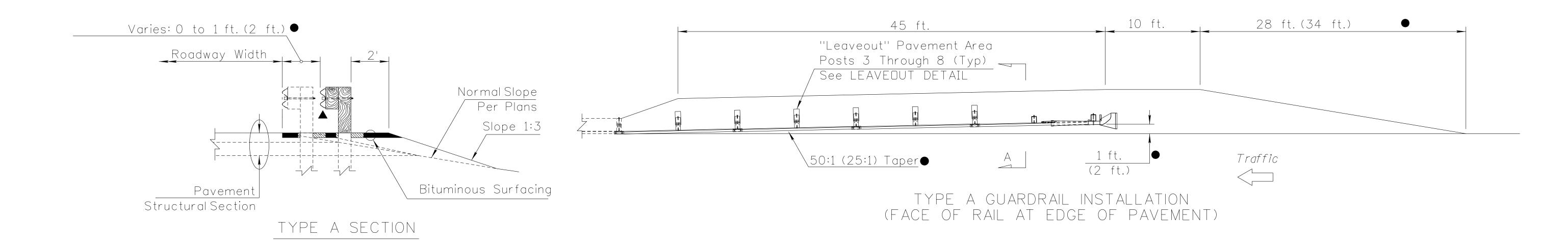
File Name: SKT-350 Sht 1 of 3\_2015-02-13

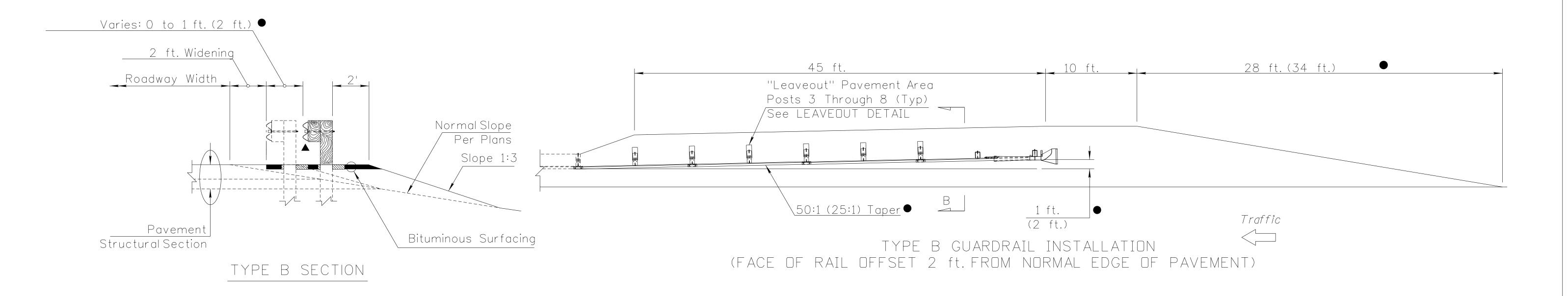


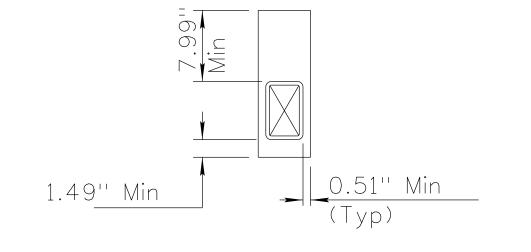
REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
NAVAJO	AZ	NAVAJO	N2007	N2007(1-1)1,2&4	18b	63

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

▲ Top of Rail to Roadway Surface = 28"







LEAVEOUT DETAIL

## UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS

NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

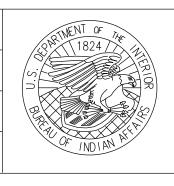
### GUARDRAIL END TREATMENT SKT-350 LAYOUT; SHEET 2 of 3

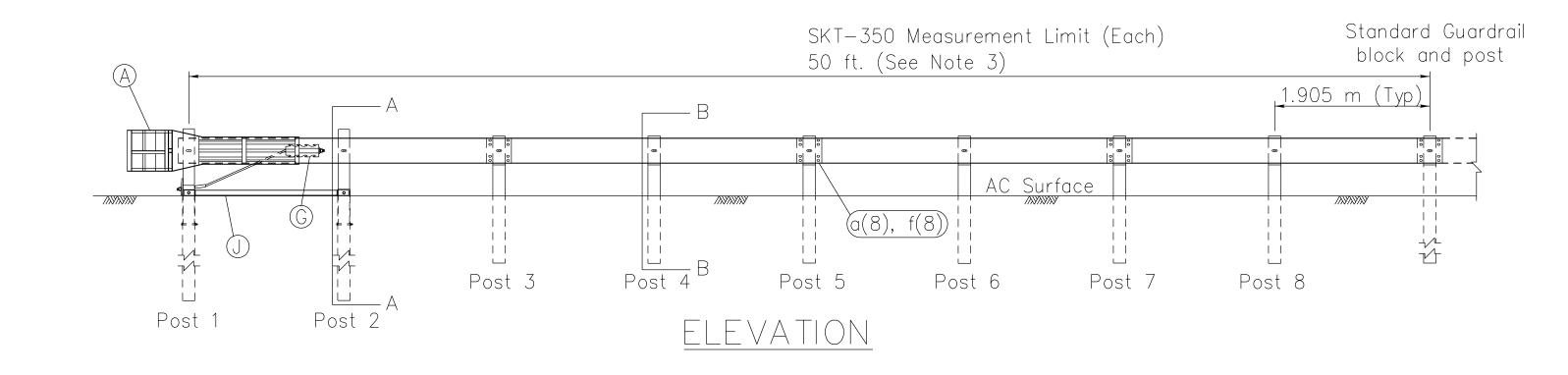
REVISED ON 4/21/2015 Designed by: BIA NRO-DOT Structural Unit

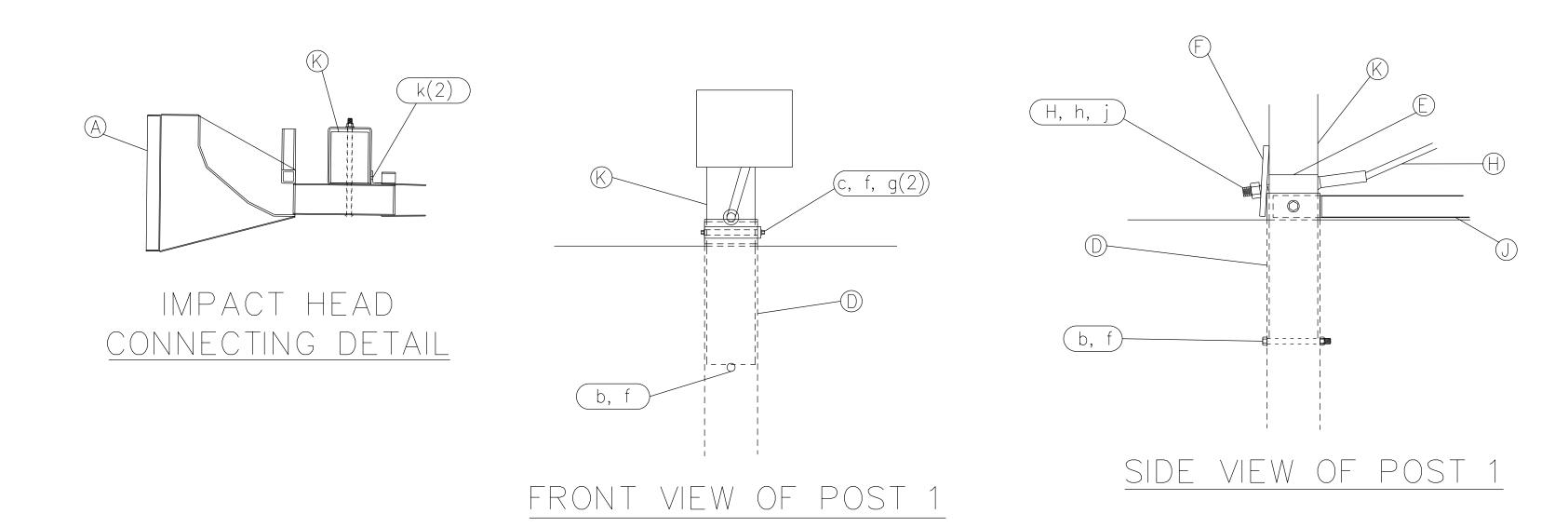
Drawn by: - - - Date: 2/13/15

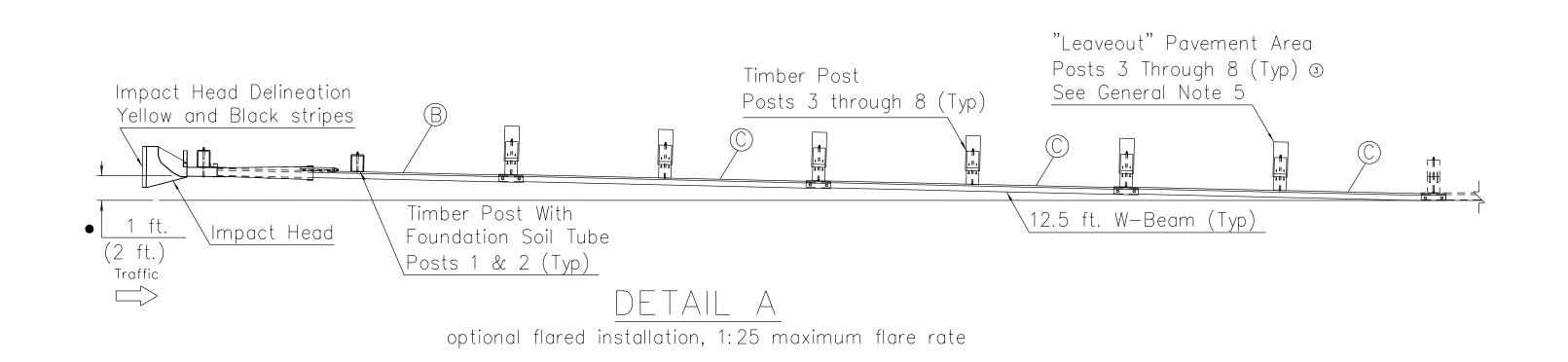
Revised by: - - - Date: - - -

File Name: SKT-350 Sht 2 OF 3\_2015-02-13









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 fot 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.

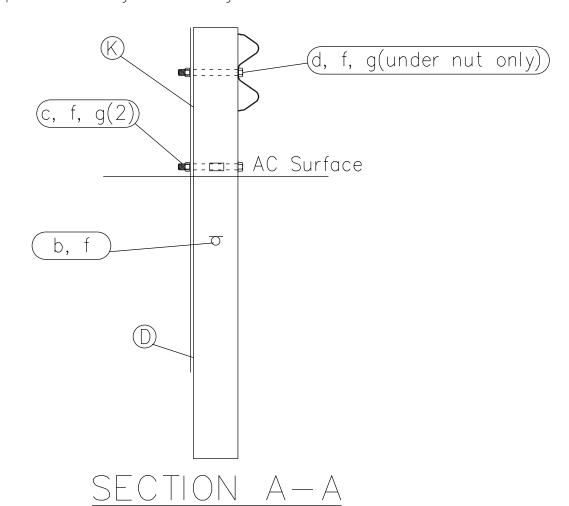
7. The breakaway cable assembly must be taut. A locking device, (vice-grips or channel-lock pliers) should be used to prevent the cable from twisting when tightening nuts.

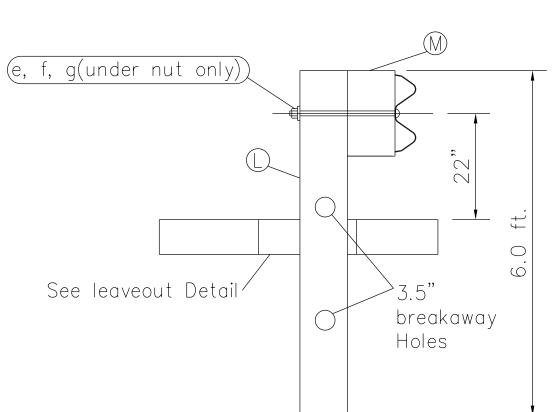
8. A special site evaluation should bee considered prior to using the SKT where there is less than 25 ft. between the outlet side of the SKT and any adjacent driving lane.

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.

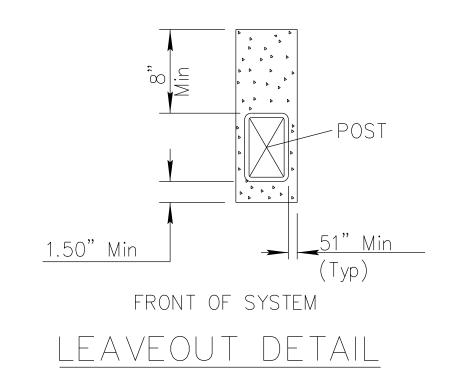




SECTION B-B typical at Post 3 thru 8

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

Code	QTY.	BILL OF MATERIALS	ITEM#
А	1	IMPACT HEAD	S3000
В	1	W-BEAM GUARDRAIL END SECTION, 12 GA., 12.5 ft.	FS1303
С	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
Н	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
М	6	6" x 8" x 14" TIMBER BLOCKOUT	P675
		HARDWARE	
а	32	0.63" Dia. x 1.25" SPLICE BOLT	B580122
b	2	0.63" Dia. x 7.52" HEX BOLT	B580754
С	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
е	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
	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



### Leaveout Requirement:

REVISED ON

4/21/15

For posts 3 through 8, leaveouts in the asphaitic 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 asplalt 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.

# 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

Date: 2/13/2015

Revised by: - - - Date: - 
File Name: SKT-350 Sht 3 of 3\_2015-02-13

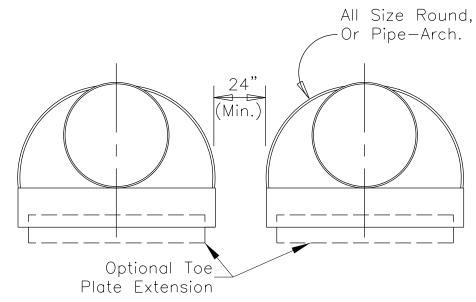


APPROVED AS NCHRP 350 T3 TERMINAL

### ROUTE PROJECT NO. SHEET TOTAL SHEETS STATE RESERVATION REGION OLAVAJO ARIZONA NAVAJO N2007 | N2007(1-1)1,2&419 63

### GENERAL NOTES

- 1. 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.
- 2. 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.
- 3. 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.
- 4. 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 25" FOR 78"ø AND 84" ø. THE ANGLES TO BE ATTACHED BY 0.375" ø GALVANIZED NUTS AND BOLTS.
- 5. WELDING SHALL NOT BE PERMITTED IN CONNECTING END SECTIONS TO CONNECTOR SECTIONS OR CONNECTOR SECTIONS TO PIPE.
- 6. 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.
- 7. 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.
- 8. 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.
- 9. 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.
- 10. 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.
- 11. ALL CUT ENDS OF PIPE MUST BE CLEANED AND EITHER REGALVANIZED 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

# Rerolled End

### UNITED STATES THE INTERIOR OF INDIAN AFFAIRS

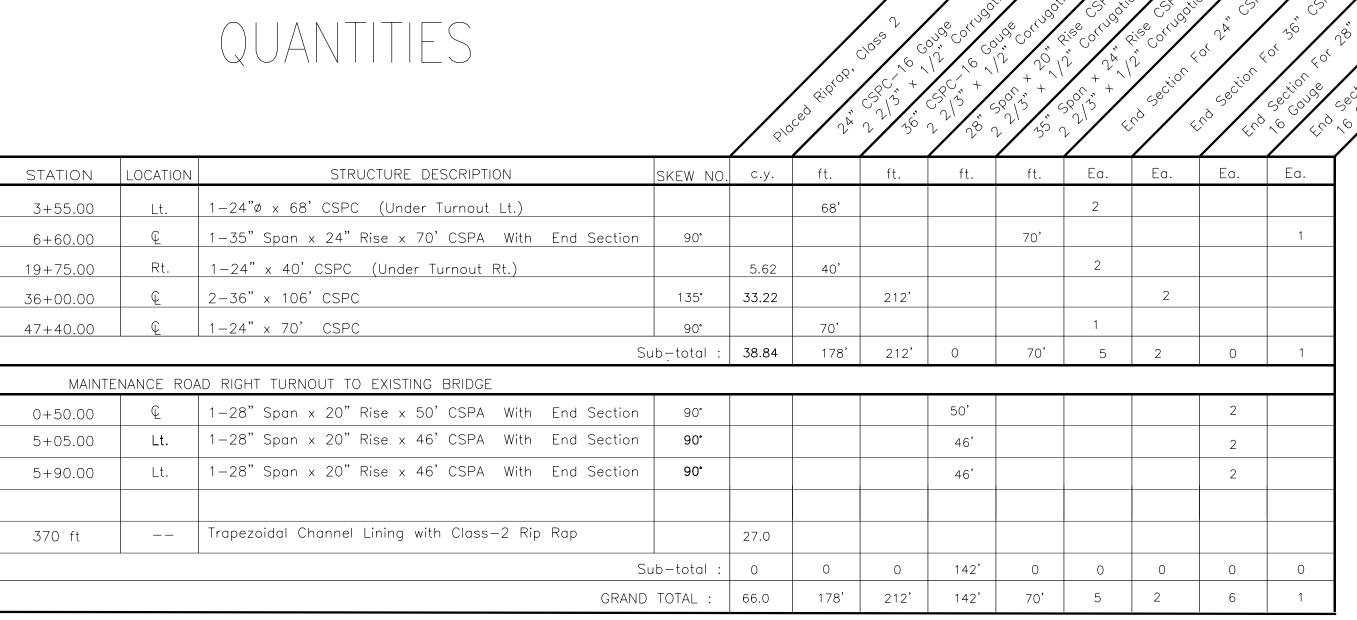
NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

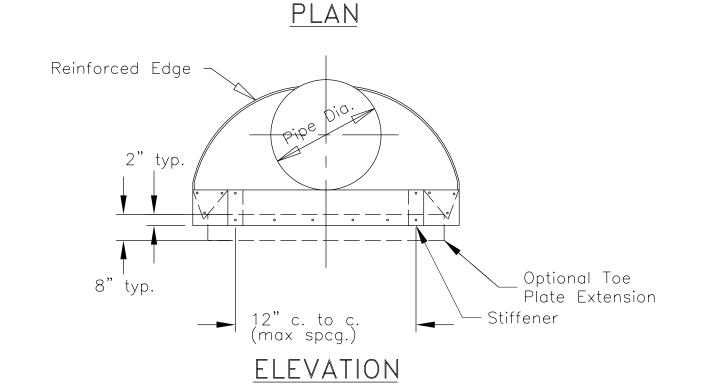
### STRUCTURE QUANTITIES

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

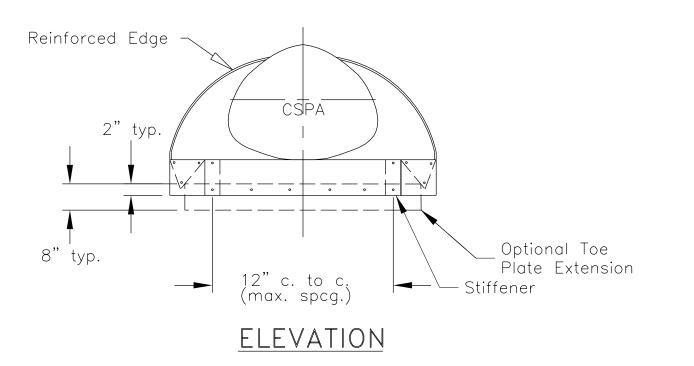


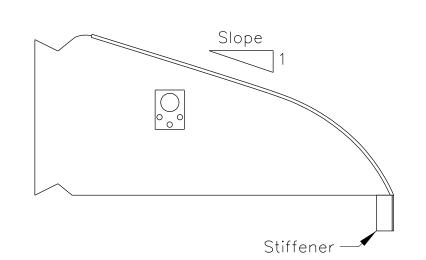




Galvanized

Steel





TYPICAL CROSS SECTION

### **DIMENSIONS:**

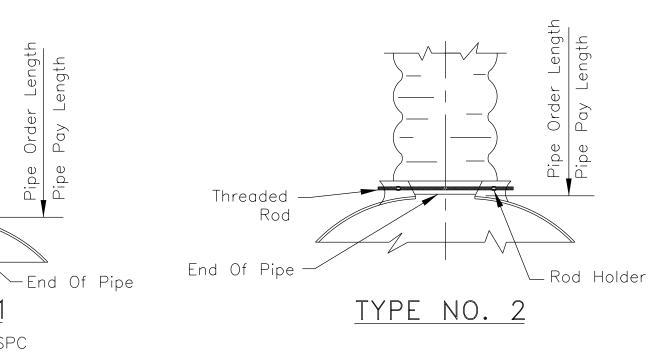
A, B, F, H, & L See Table 2.39, 2.40, And 2.41 In "Handbook Of Steel Drainage & Highway Construction Projects" Latest Editions.

Helical Pipe

TYPE NO. 5

(SEE NOTE NO. 6)

Corrugation Only)



Connector Lug —

TYPE NO. 1

For 1.0' Thru 2.0' CSPC

& 3'-**%**" x 1'-8" CSPA

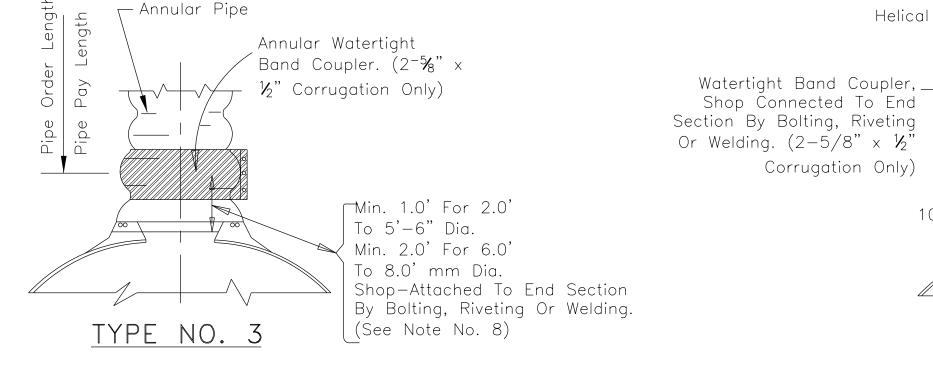
(See Note No. 6)

Threaded Rod

Gauge 1.0"

Wide Flat Strap

Or 1/8"



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

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	OLAVAN	N2007	N2007(1-1)1,2&4	20	63

### GENERAL NOTES

- 1. 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.
- 2. 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)

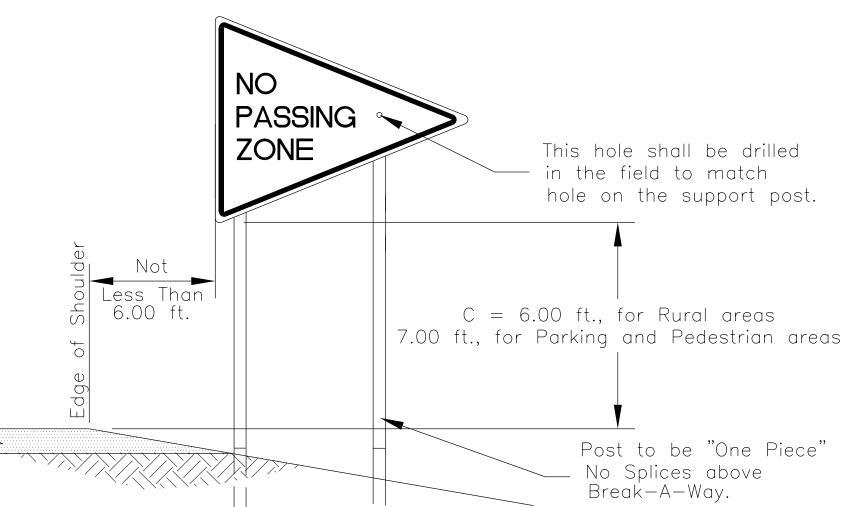
> B = 6.00 ft. + (4 ft/2)B = 8.00 ft.2) A = W X D

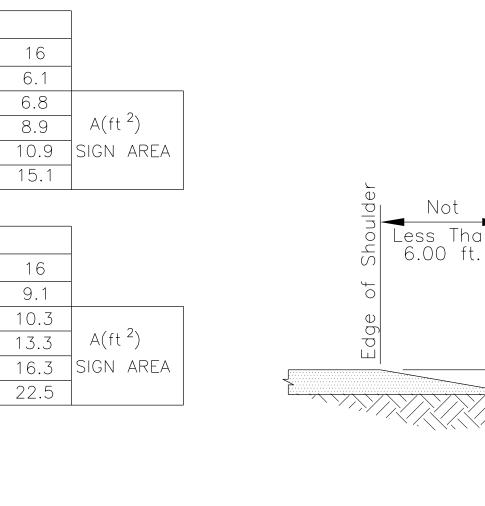
 $A = 5.00 \text{ ft.} \times 4.00 \text{ ft}$  $A = 20 \text{ ft.}^2$ 3) K factor = A X B $K = 20 \times 8$ K = 160

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 equaals or exceeds 160. Both the Area and K factor exceed the single post chart so go to the double post chart.

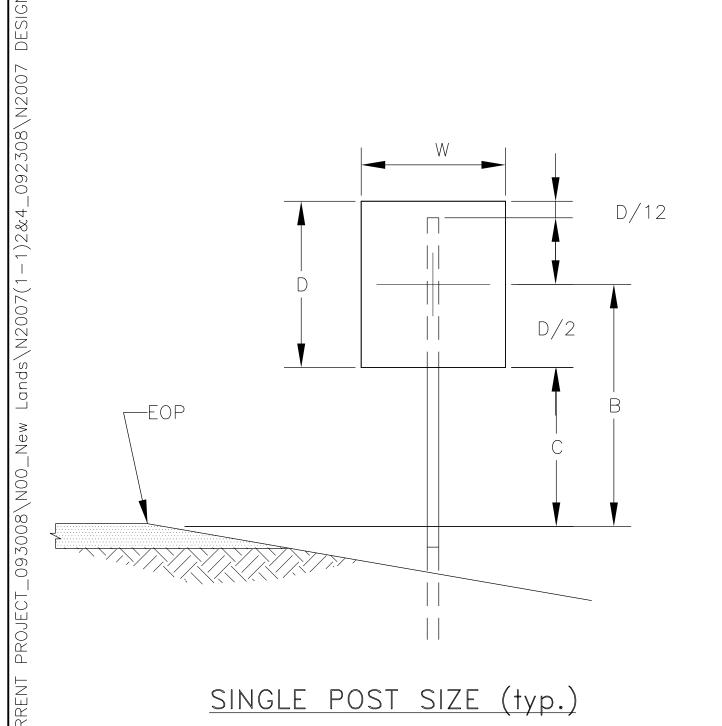
Select two (2) Posts of 3.00 lb/ft. Yields a factor of 174 Which Is Optimum.

EXAMPLE:	K factor	Post weight	B=8	
160	142	2.75 lb/ft	17.8	20
	174	3.00 lb/ft	21.8	
	241	4.00 lb/ft	30.1	





TYPICAL ROADSIDE SIGN LOCATION



K FACTOR

 $(B \times A)$ 

K FACTOR

 $(B \times A)$ 

97.00

109.00

142.00

174.00

241.00

K FACTOR

 $(B \times A)$ 

145.00

164.00

213.00

361.00

3.9

5.1

6.7

7.3

19.4 16.1

21.9 | 18.2

28.4 23.7

34.8 29.0

42.6 35.5

72.2 60.1

261.00 52.2 43.5

3.9

7.3

3.9

3.9

8

24.9 21.8 19.3

5.1 5.1

6.7 6.7

7.3 7.3

9.4 9.4

13.8 | 12.1

15.6 13.7

20.3 | 17.8

23.4 20.5

30.4 26.6

51.5 45.1

29.0 | 24.2 | 20.7 | 18.1 |

POST

SIZE

2.00 lb/ft

2.25 lb/ft

2.75 lb/ft

3.00 lb/ft

4.00 lb/ft

SIZE

2.00 lb/ft

2.25 lb/ft

2.75 lb/ft

3.00 lb/ft

4.00 lb/ft

SIZE

2.00 lb/ft

2.25 lb/ft

2.75 lb/ft

3.00 lb/ft

4.00 lb/ft

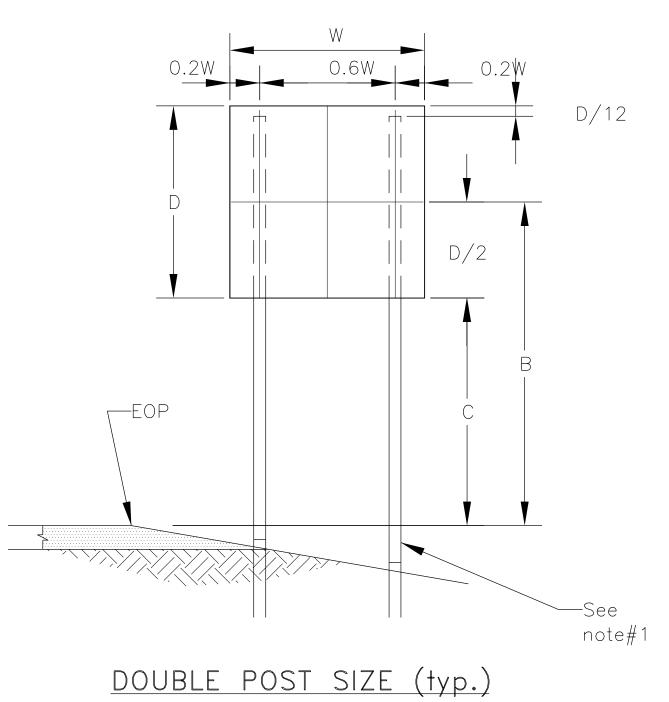


CHART TO DETERMINE SINGLE POST SIZE

10

3.9 3.9

5.1 4.6

6.7 6.0

7.3 7.3

9.4 9.4

10.9 9.9

17.4 15.8

21.3 | 19.3 |

11

8.8

14.2 | 12.9 | 11.8

11

37.3 32.6 29.0 26.1 23.7 21.7 20.0 18.6 17.4

CHART TO DETERMINE DOUBLE POST SIZE

10

9.7

CHART TO DETERMINE THREE POST SIZE

10

12

5.5

6.7

12

8.1

14.5

12

17.7

40.1 36.1 32.8 30.0 27.7 25.8 24.0

3.7

4.2 3.9 3.6

5.1

9.4 8.6 8.0

13

7.5

10.9

13

14.5 | 13.2 | 12.1 | 11.2 | 10.4 | 9.7 | 9.1

16.4 | 14.9 | 13.7 | 12.6 | 11.7 | 10.9 |

9.1 8.4

6.2 5.6

3.4 3.2 2.9

4.7

6.9

7.8

10.1

13.4 | 12.4 | 11.6

16.3 15.2 14.2

3.4

4.4

5.1

6.5

9.5

7.3 6.8

2.8

3.2

7.0

6.1

8.9

10.3

4.1

5.0 SIGN AREA

B DIMENSION (Feet)

3.9

5.1

6.7

7.3

9.4

10.8

12.2

15.8

16.1

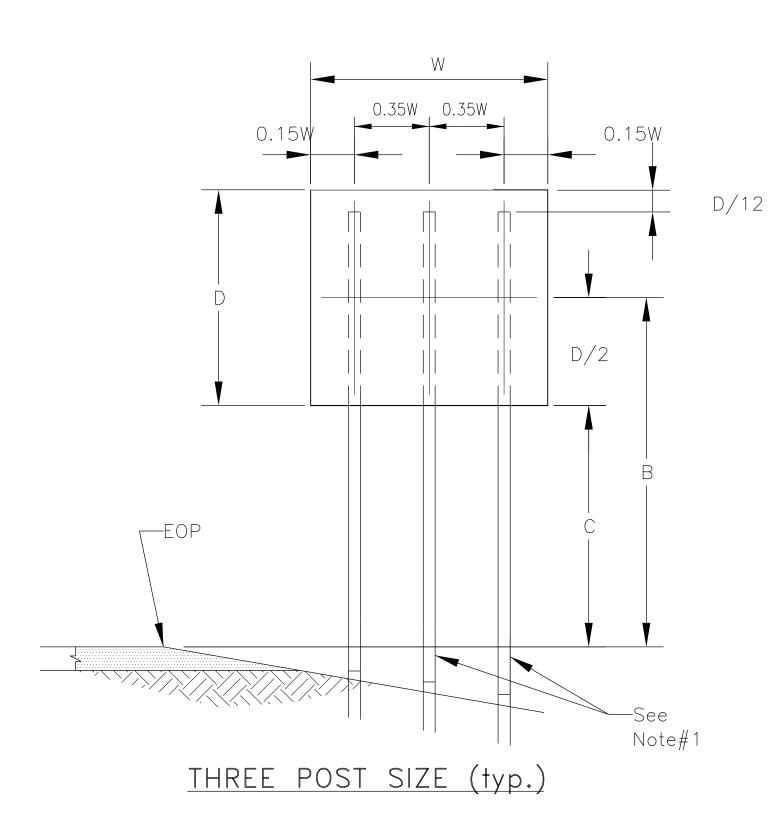
18.2

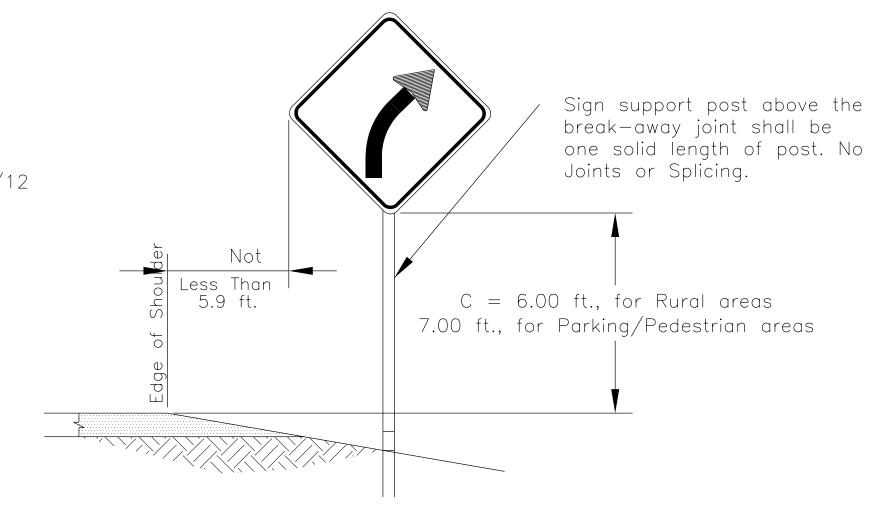
23.6

B DIMENSION (Feet)

48.2 40.2 34.4 30.1 26.8 24.1 21.9 20.1 18.5 17.2

B DIMENSION (Feet)





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

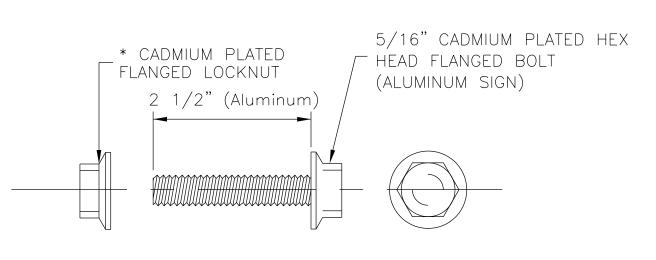
FILENAME: Sht.20 Perm Sign Std Details1.dgr



### RIB-BAK U-CHANNEL SIGN SUPPORTS

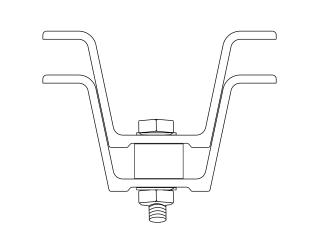
WEIGHT	DIME	ENSION	S (inc	hes)	AREA	X-X	AXIS	Y-Y	AXIS
*Ib/ft	А	В	С	D	in <sup>2</sup>	in <sup>4</sup>	in 3	in <sup>4</sup>	in 3
2.0	1.462	3.062	1.278	.669	.556	.155	.195	.422	.276
2.5	1.516	3.062	1.278	.669	.701	.208	.249	.550	.359
2.75	1.536	3.062	1.278	.669	.756	.228	.270	.598	.391
3.0	1.881	3.500	1.336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

\* ±5%

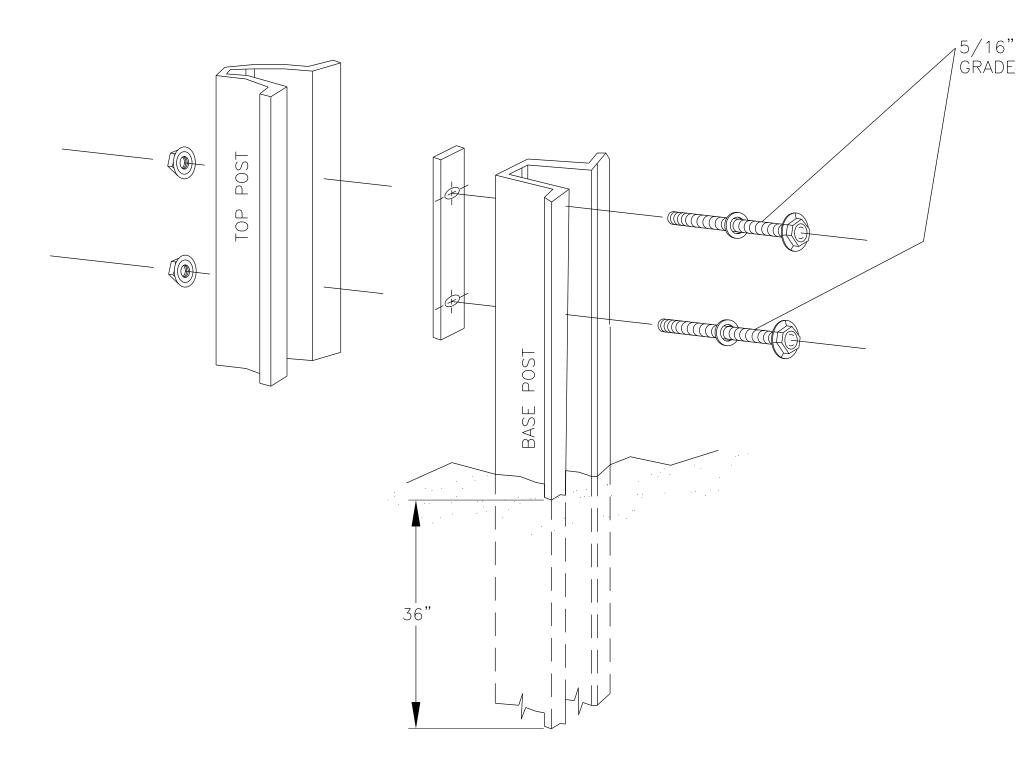


### BOLTS AND LOCKNUT - SIGN ATTACHMENT

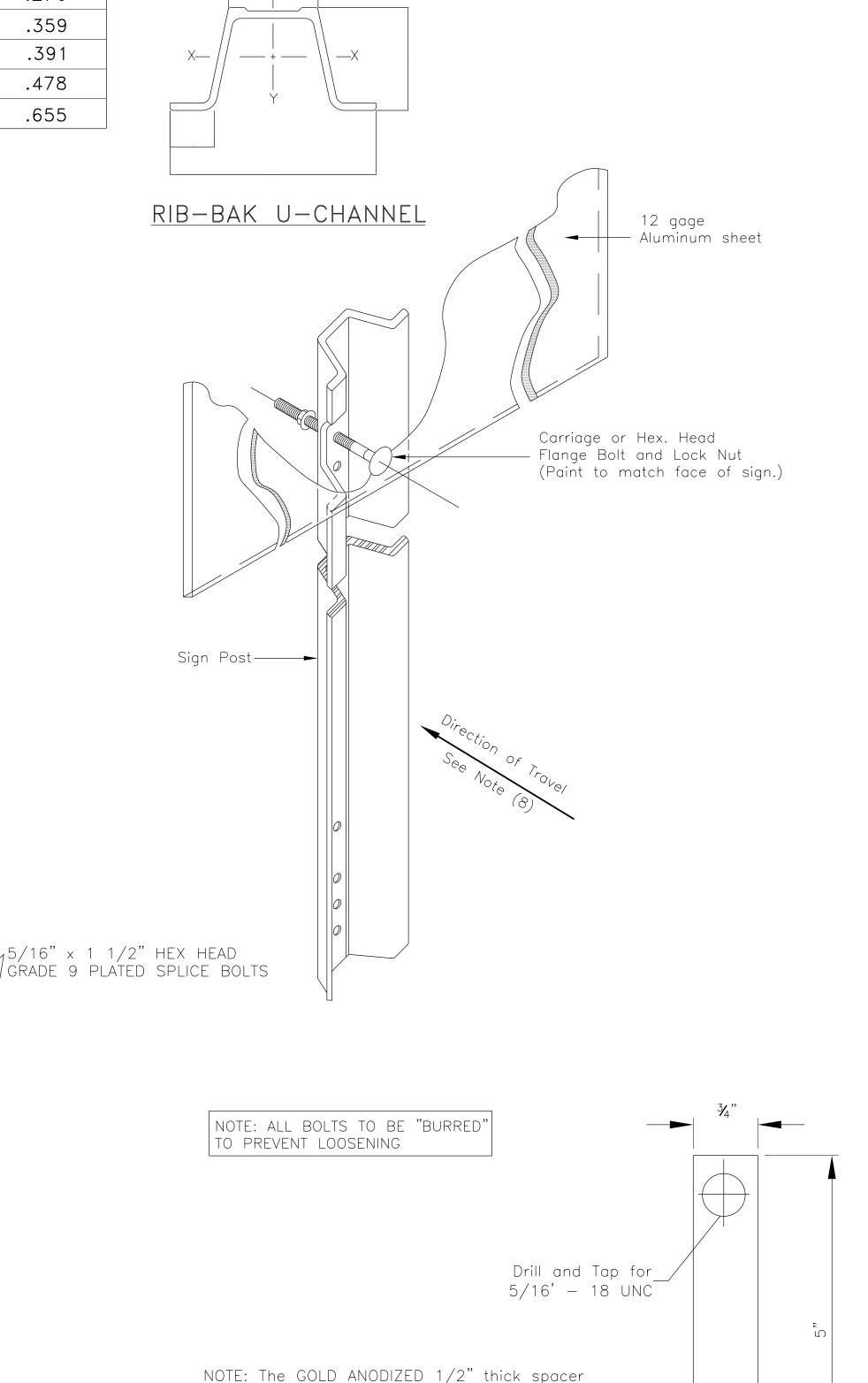
\* FLANGED LOCKNUT REQUIRED FOR CARRIAGE AND HEX.



LAP SPLICE - TOP VIEW



LAP SPLICE CONNECTION DETAIL



bar is to be used with 3.00 lb/ft & 4.00 lb/ft

spacer bar is to be used with 2.00 lb/ft, 2.50

LAP SPLICE SPACER BAR

posts only. The SILVER ANODIZED 3/8" thick

lb/ft, and 2.75 lb/ft posts only.

REGION STATE RESERVATION ROUTE PROJECT NO. SHEET TOTAL SHEETS

NAVAJO ARIZONA NAVAJO N2007 N2007(1-1)1,2&4 21 63

### 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.

### 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 DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS

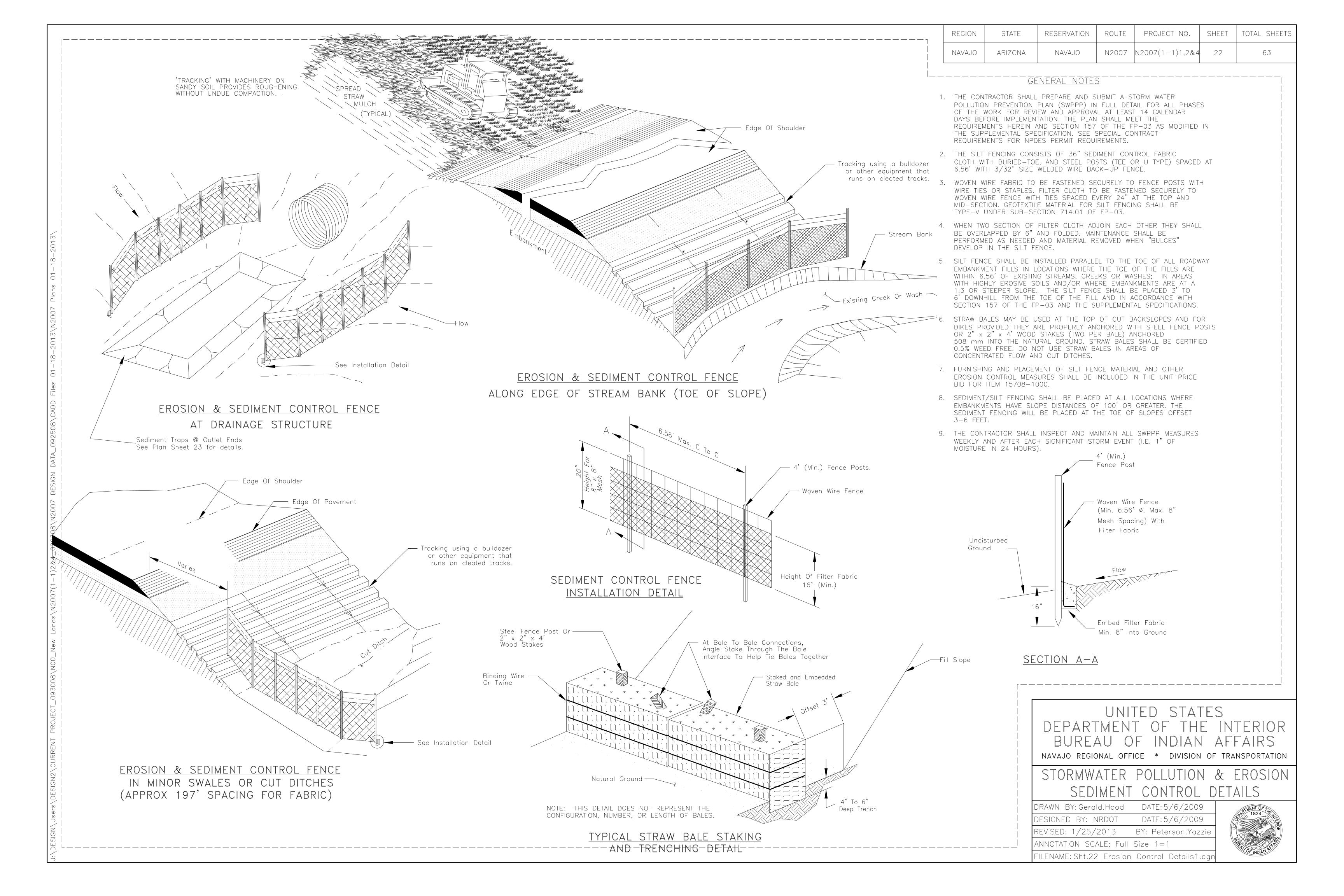
NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

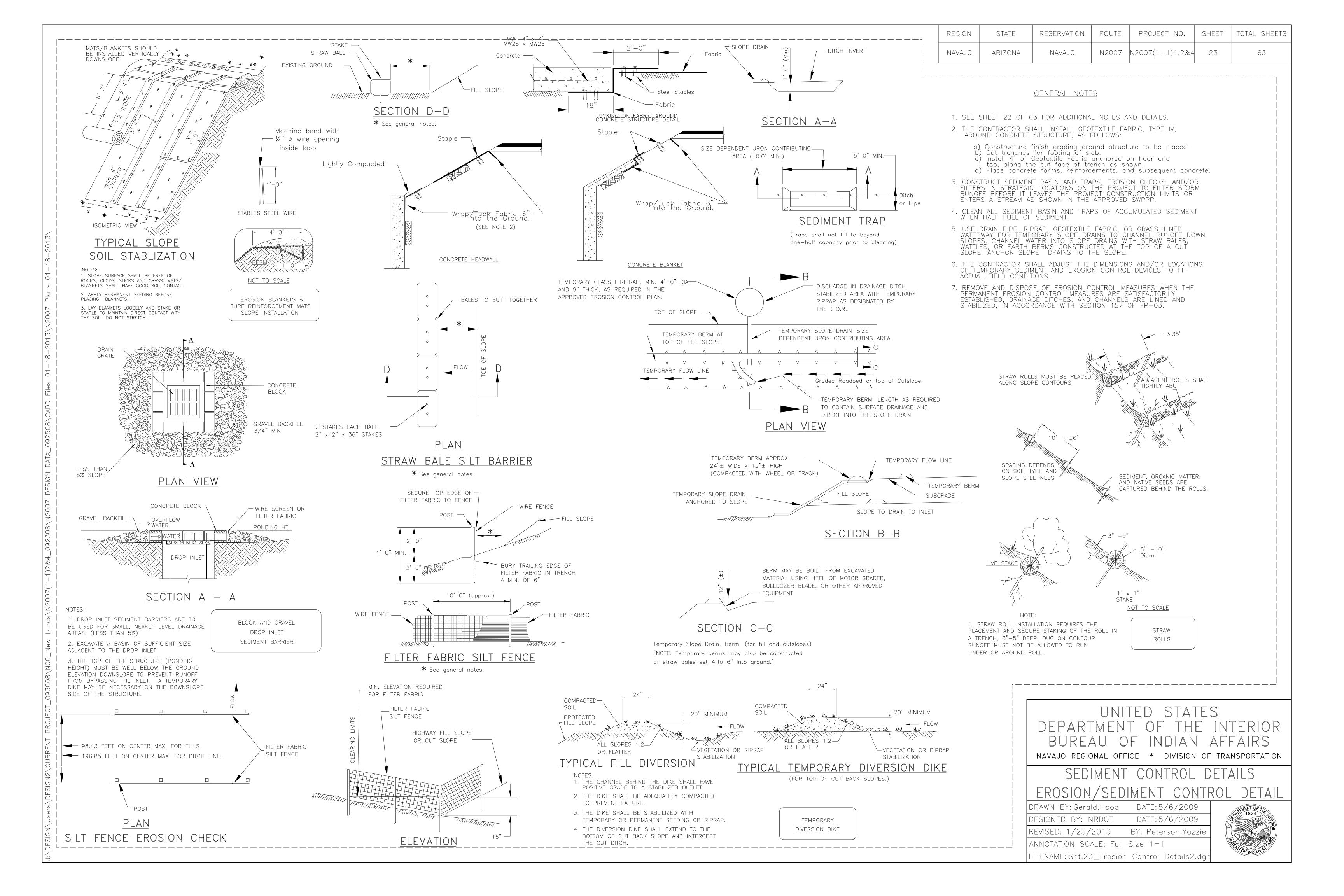
## LAP SPLICE U-CHANNEL BREAKAWAY SYSTEM

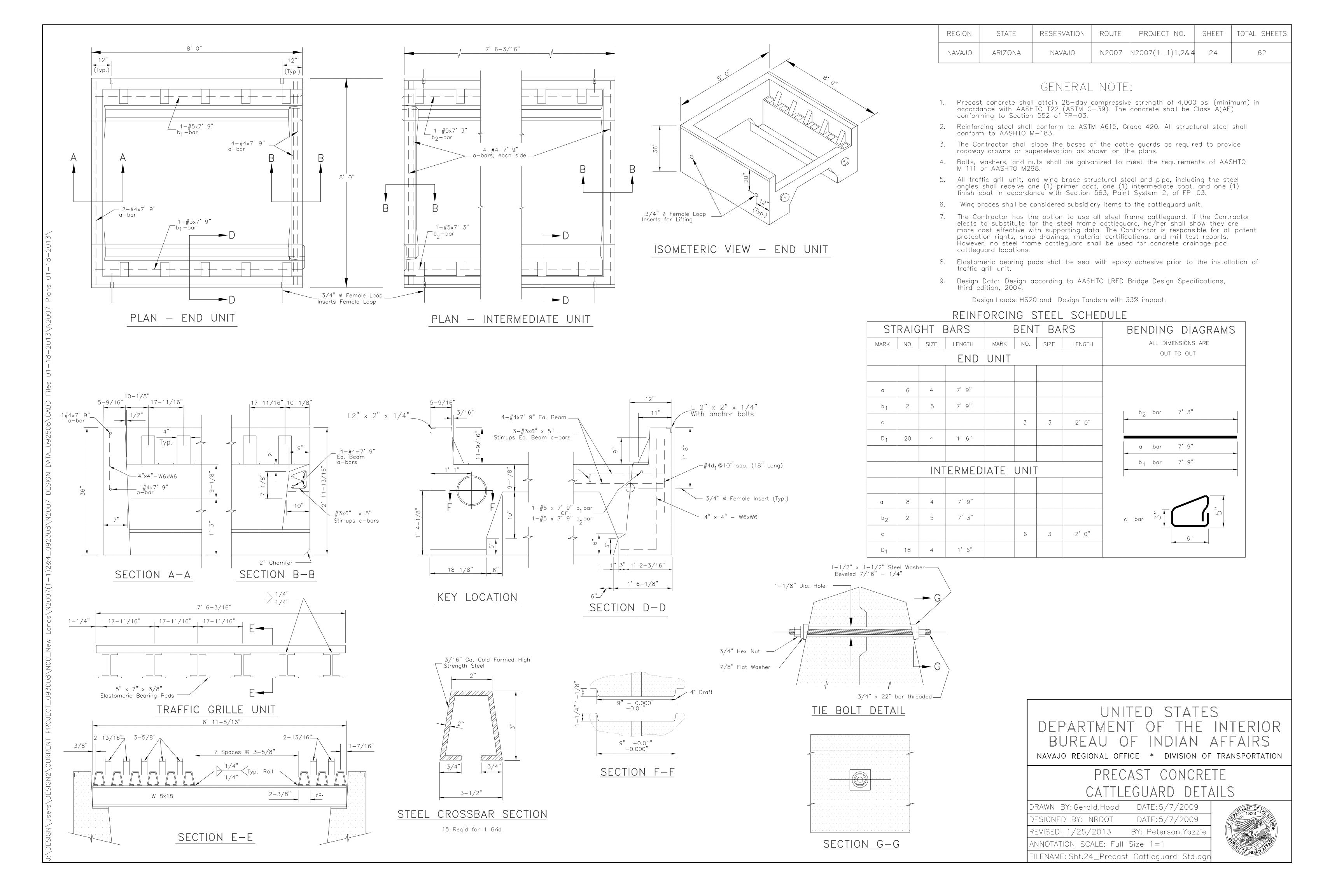
DRAWN BY: Gerald.Hood	DATE: 5/7/2009
DESIGNED BY: NRDOT	DATE:5/7/2009
REVISED: 1/25/2013	BY: Peterson.Yazzie
ANNOTATION SCALE: Full	Size 1=1

ANNOTATION SCALE: Full Size 1=1 FILENAME:Sht.21 Perm Sign Std Details2.dgn









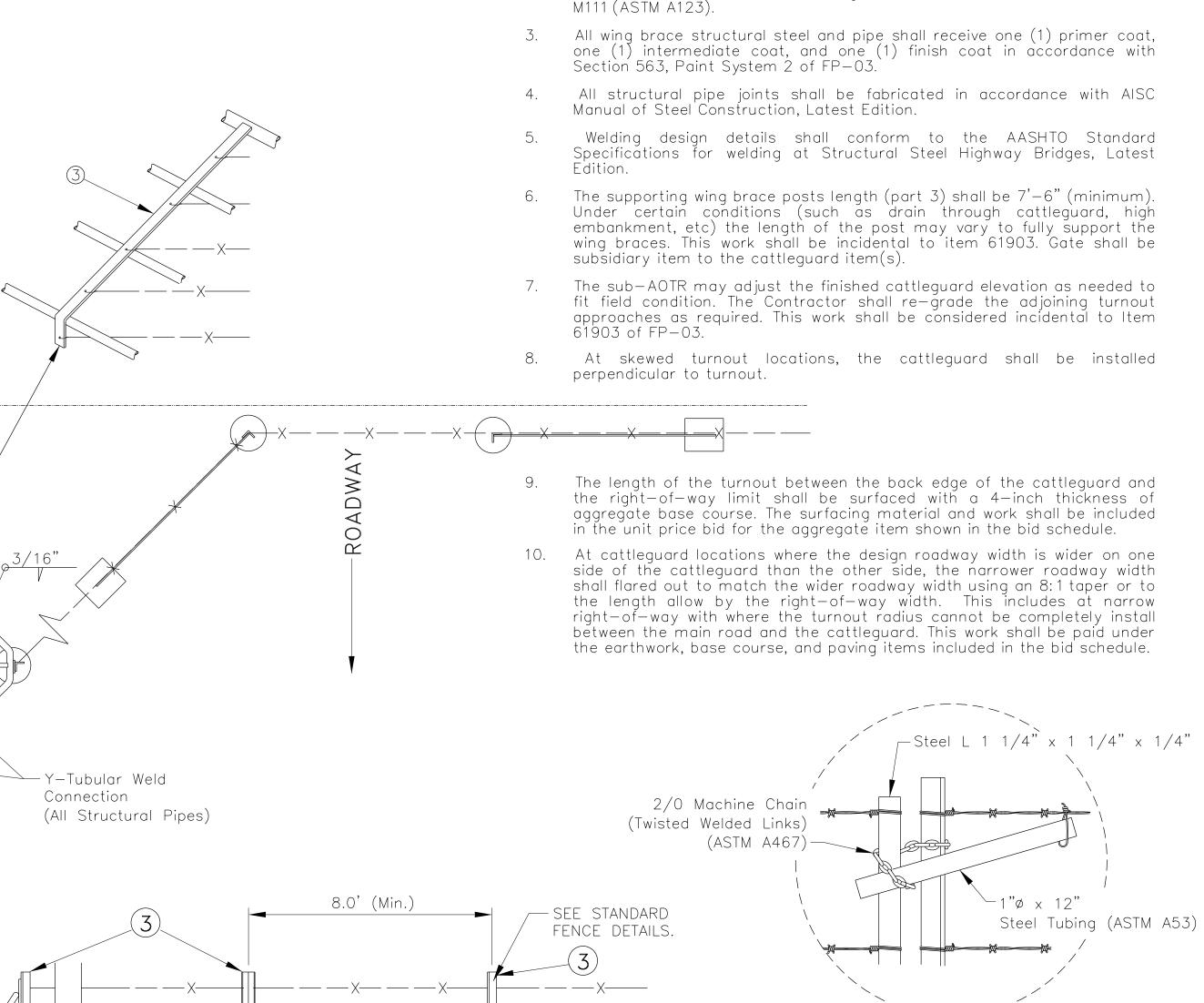
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	OLAVAN	N2007	N2007(1-1)1,2&4	25	63
GENERAL NOTES  1. Structural pipe shall conform to ASTM A53-93a, Grade B. All other structural steel shall conform to ASTM-A36.						
2.	Bolts, nuts, and washers shall be galvanized in accordance with AASHTO					

### ESTIMATED MATERIAL LIST

PART NO.	MATERIAL	SIZE AND THICKNESS	LENGTH	QUANTITY
1	Structural Steel Pipe	2 1/2" Ø Nominal	14'-2"	2
2	Structural Steel Pipe	1 1/4" Ø 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" × 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		

3/3"ø x 4" Galvanized Bolt with Lock Washer And Threaded Ring — Wedge Cinch Anchor in Drilled

Holed or Approved Equivalent.



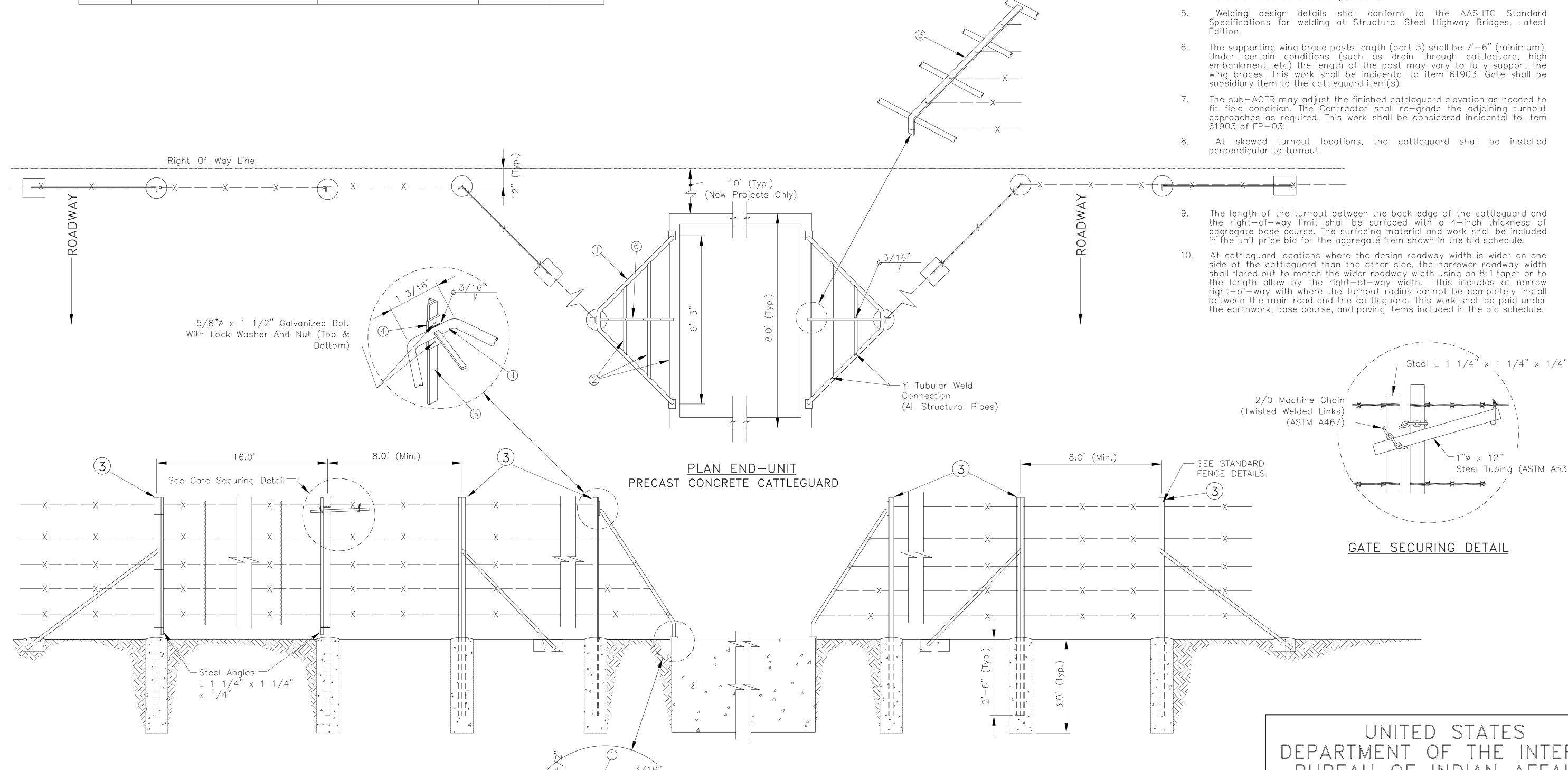


### CATTLEGUARD WING-BRACE DETAILS

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

FILENAME: Sht.25\_C-GuardWingBraceDetails.dg





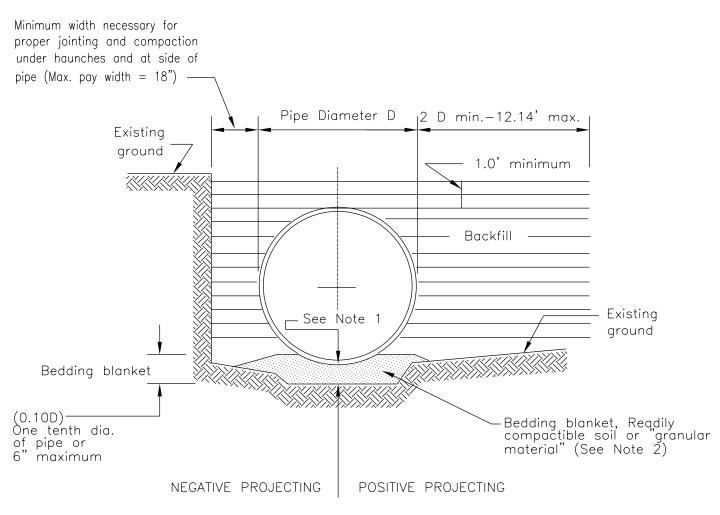


FIG. A. CLASS C BEDDING

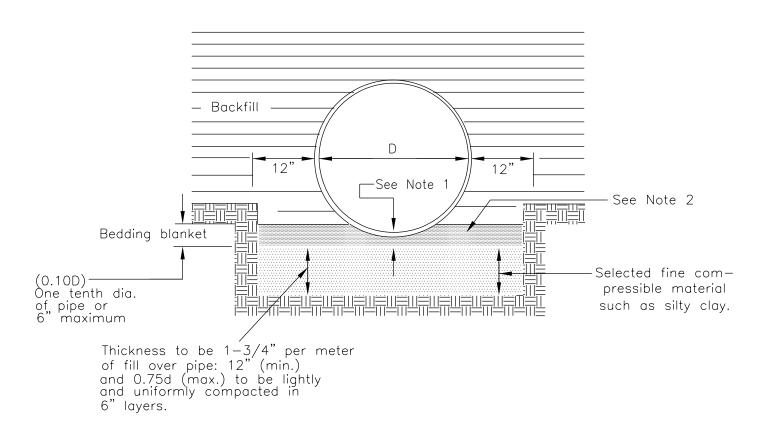


FIG. B ROCK BEDDING

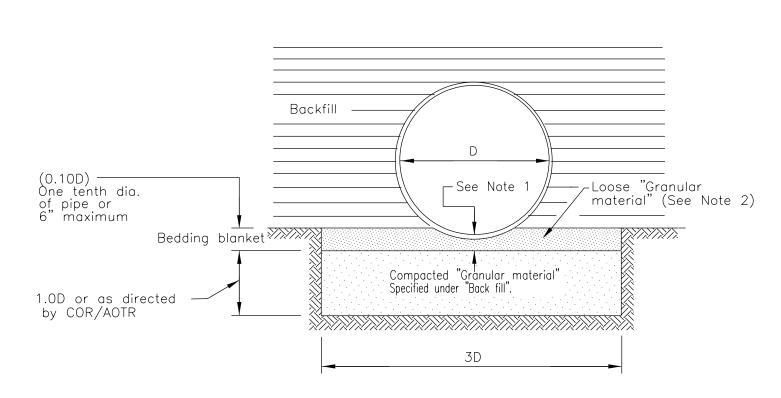
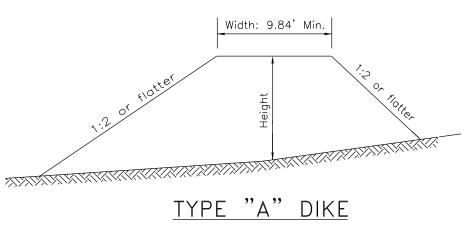


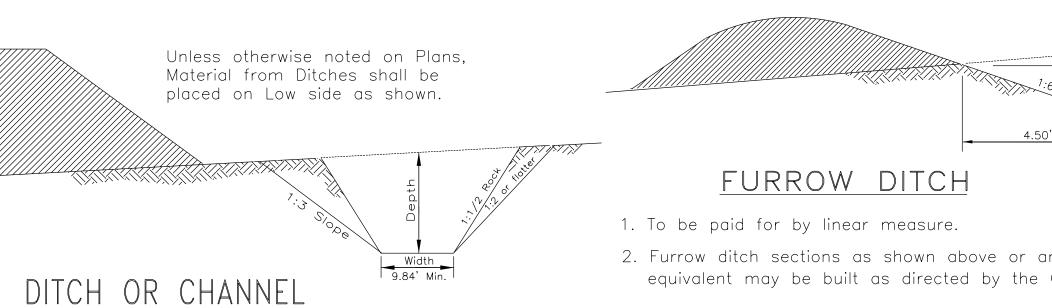
FIG. C. FOUNDATION STABILIZATION BEDDING



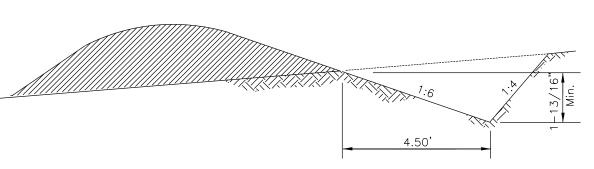
Width: 9.84' Min.

TYPE "B" DIKE

NOTE: When necessary the slope may be flattened to 1:6 with bit. mix or soil cement protection as called for on plans.

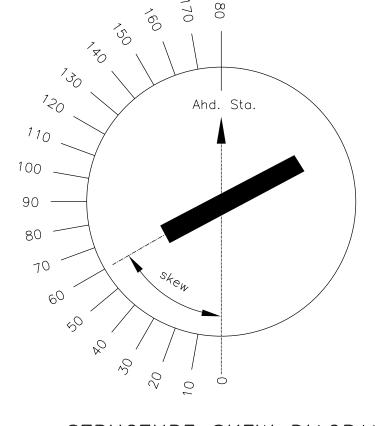


Note: DIMENSIONS OF DITCHES AND DIKES as shown on plans are respectively width, depth or height and length.

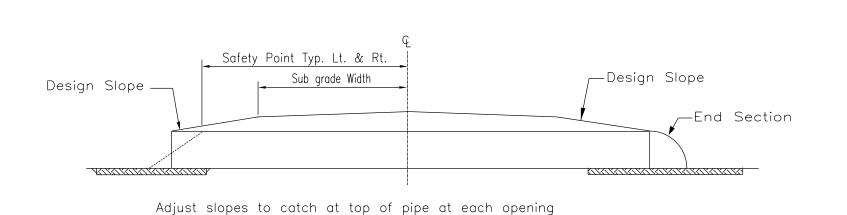


2. Furrow ditch sections as shown above or an approved equivalent may be built as directed by the C.O.R./AOTR

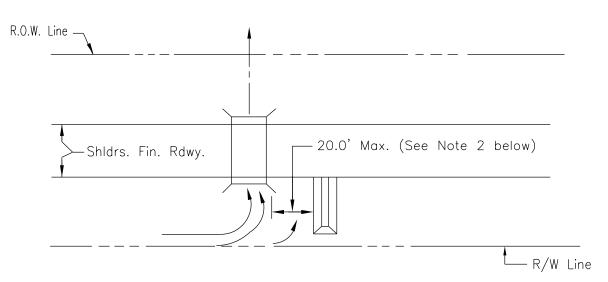
### DITCH BLOCK DETAILS



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

SUPPLEMENTAL SPECIFICATION FOR ADDITIONAL NOTES.

- PLACE LOOSE BEDDING ROUGHLY SHAPED TO BOTTOM OF PIPE, THEN
- COMPACTED UNDER HAUNCHES AFTER PIPE PLACEMENT. SEE SECTION 204, 209, 602, AND 704 OF FP-2003, INCLUDING THE
- 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.
- ALL STRUCTURAL PLATE PIPE STRUCTURES SHALL BE ASSEMBLED AND INSTALLED IN ACCORDANCE WITH THE FABRICATOR'S RECOMMENDATION.
- 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 IT'S USE AND SHALL BE PLACED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.
- PONDING OR JETTING PIPE BACKFILL SHALL NOT BE PERMITTED.
- ALL PIPE EXCAVATION, BACKFILLING, DE-WATERING, PUMPING OR COFFERDAMS REQUIRÉD TO PROPERLY INSTALL THÉ DRAINAGE PIPE SHALL BE CONSIDERED INCIDENTAL TO COMPLETION OF THE PROJECT AND NO ADDITIONAL PAYMENT SHALL BE MADE.
- MULTIPLE PIPE INSTALLATIONS SHALL BE PLACED 24-INCH BETWEEN END SECTIONS UNLESS OTHERWISE DIRECTED BY THE AOTR/COR OR AS SHOWN ON THE PLANS.
- 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 <u>CURVED</u>. THIS WORK TO BE INCIDENTAL TO BID ITEM 20443-2000.

### UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS

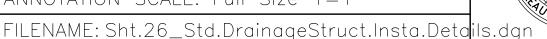
NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

### STANDARD PIPE INSTALLATION DITCH DETAILS

DATE: 5/7/2009 DRAWN BY: Gerald. Hood DESIGNED BY: NRDOT DATE: 5/7/2009 REVISED: 1/25/2013 BY: Peterson.Yazzie

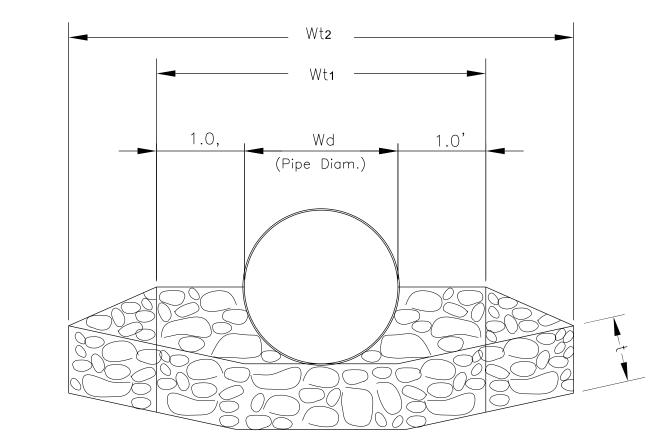
ANNOTATION SCALE: Full Size 1=1





SECTION A-A - DOUBLE BARREL

<u>Distance Between Pipe's</u> X = 72" For 24" Ø CSPC X = 82" For 30" Ø CSPC X = 93" For 36" Ø CSPC



SECTION A-A - SINGLE BARREL

GENERAL NOTES

STATE

ARIZONA

REGION

OLAVAIO

1. WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE STANDARD SPECIFICATION FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS [FP-03].

OLAVAN

RESERVATION ROUTE PROJECT NO. SHEET TOTAL SHEETS

63

 $N2007 \ N2007(1-1)1,2&4 27$ 

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.

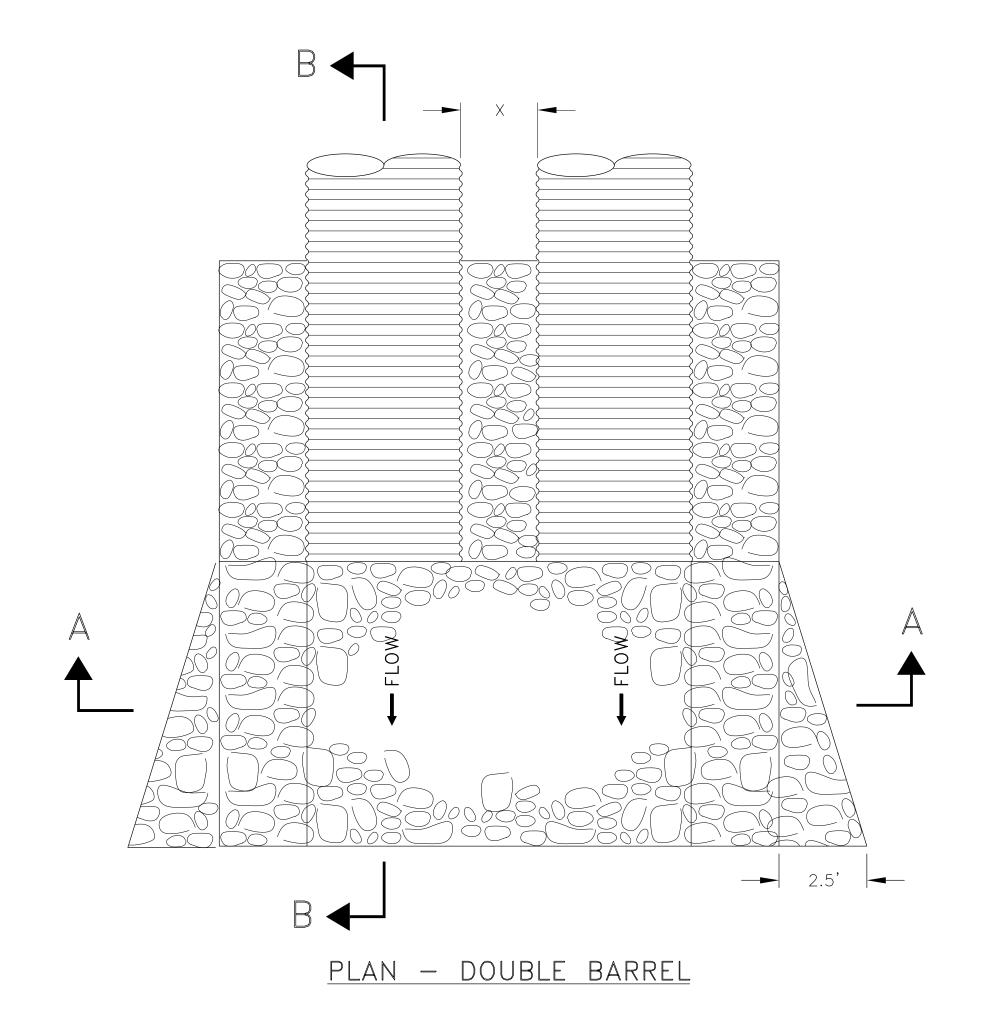
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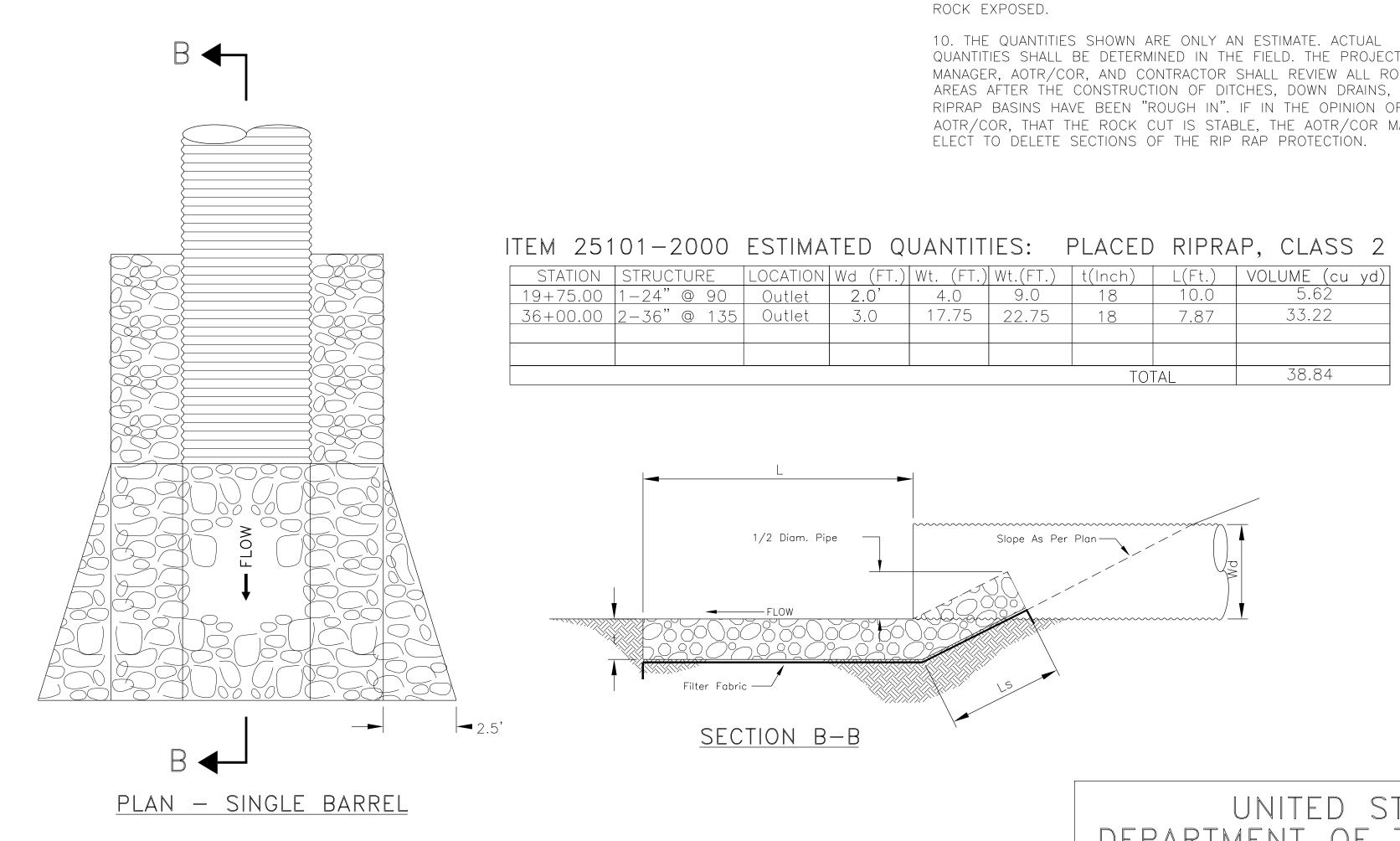
7.87

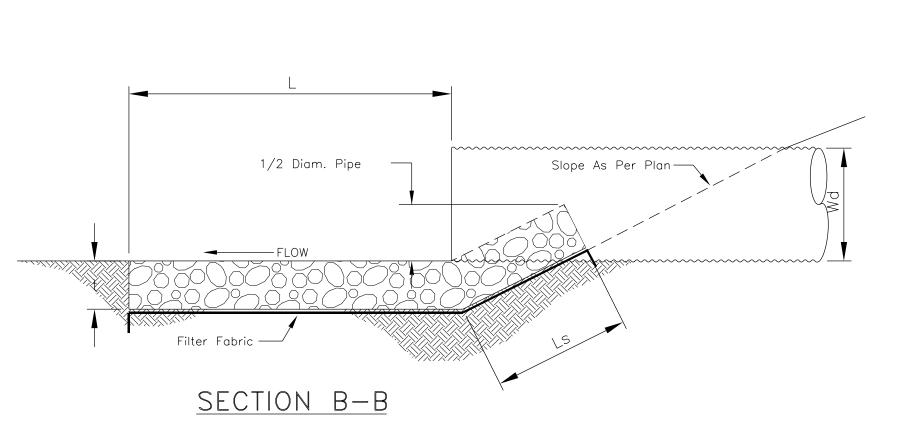
TOTAL

33.22

38.84







3.0

9.0

22.75

17.75

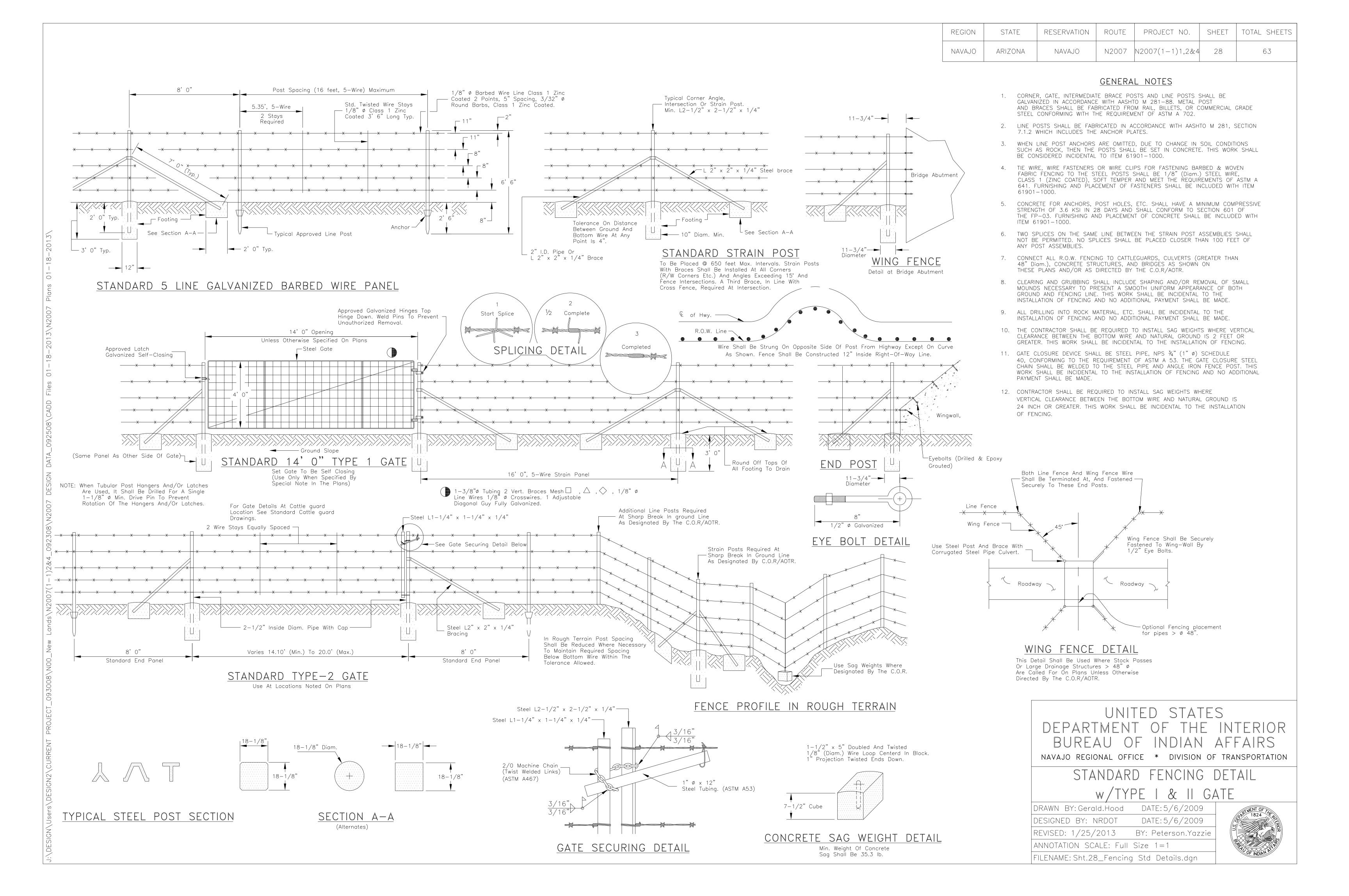
UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS

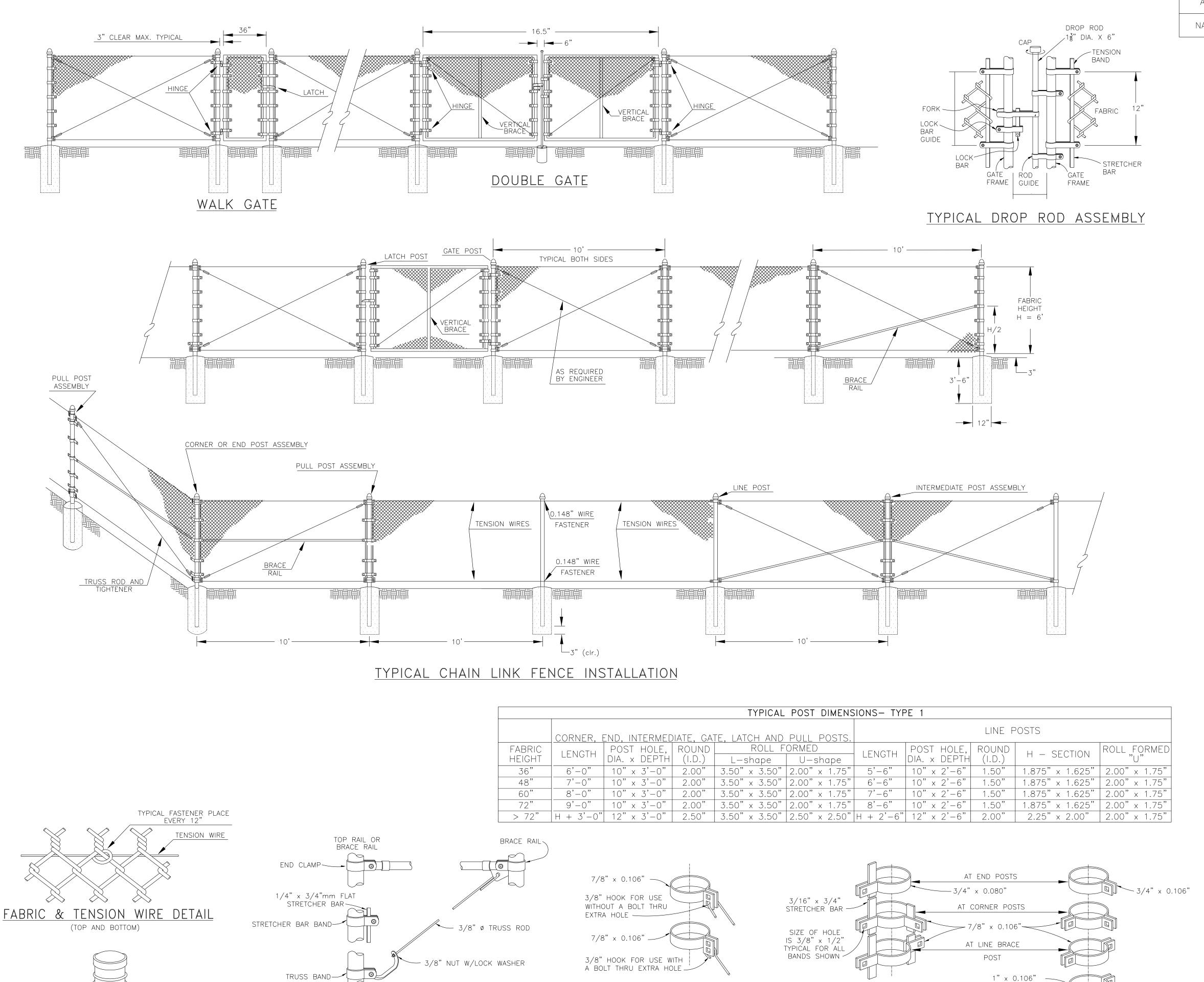
NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

### 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
ANNOTATION SCALE: Full	Size 1=1
FILENAME: Sht 27 Ripran	DowndrainDetails da







NOTE: BANDS TO BE RECTANGULAR FOR H-BEAM POSTS.

BRACE & TRUSS BANDS

GATE DETAIL

0.148" WIRE FASTENER

(TOP AND BOTTOM OF POST)

USE 3/16" x 1-1/4" CARRIAGE BOLTS FOR ALL BANDS SHOWN -

BRACE BANDS

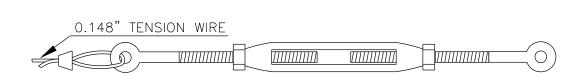
TENSION BANDS

AREA STATE RESERVATION ROUTE PROJECT NO. SHEET TOTAL SHEETS

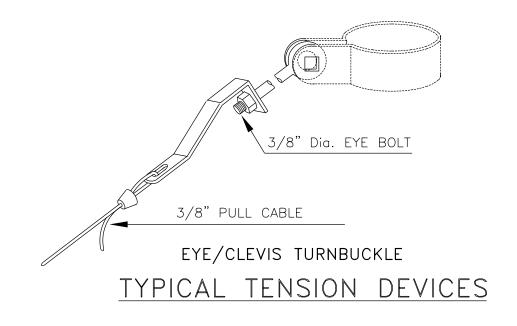
NAVAJO ARIZONA NAVAJO N2007 N2007(1-1)1,2&4 29 63

### 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.
- 2. 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.
- 3. 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.
- 5. 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.
- 6. BOTTOM TENSION WIRE SHALL BE 5-INCHES FROM TOP OF CROWN ON CONCRETE FOOTINGS.
- 7. 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.
- 3. CHAIN LINK FENCE POST DIAMETERS SHALL BE , AS FOLLOWS:
  - a) 1.66" O.D. TOP & BRACE RAILS AND GATE FRAMES TO 6'
  - b) 1.90" O.D. FOR LINE POSTS AND GATE FRAMES TO 13' WIDTH. c) 2.875" O.D. FOR END POSTS, CORNER POSTS AND GATE POSTS FOR SINGLE GATE OPENINGS TO 6' WIDTHS.
- d) 4.00" O.D. FOR GATE POSTS FOR SINGLE GATE OPENINGS TO 13' WIDTH AND DOUBLE GATE OPENINGS.
- 9. 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 LEAFS. ON THE GATE LEAFS, 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.



### 3/8" EYE & EYE/TURNBUCKLE



## 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

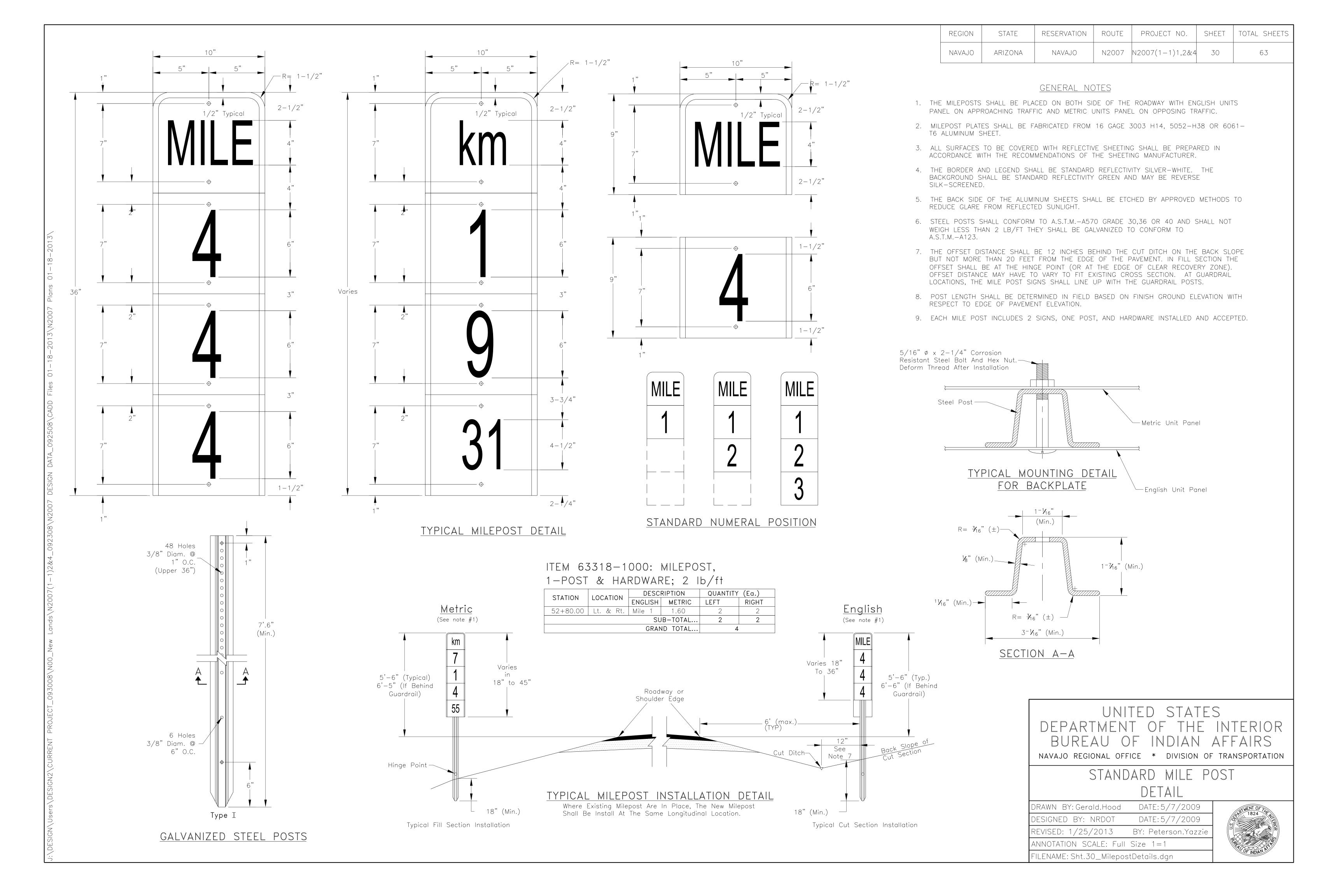
DESIGNED BY: NRDOT DATE: 1/24/2013

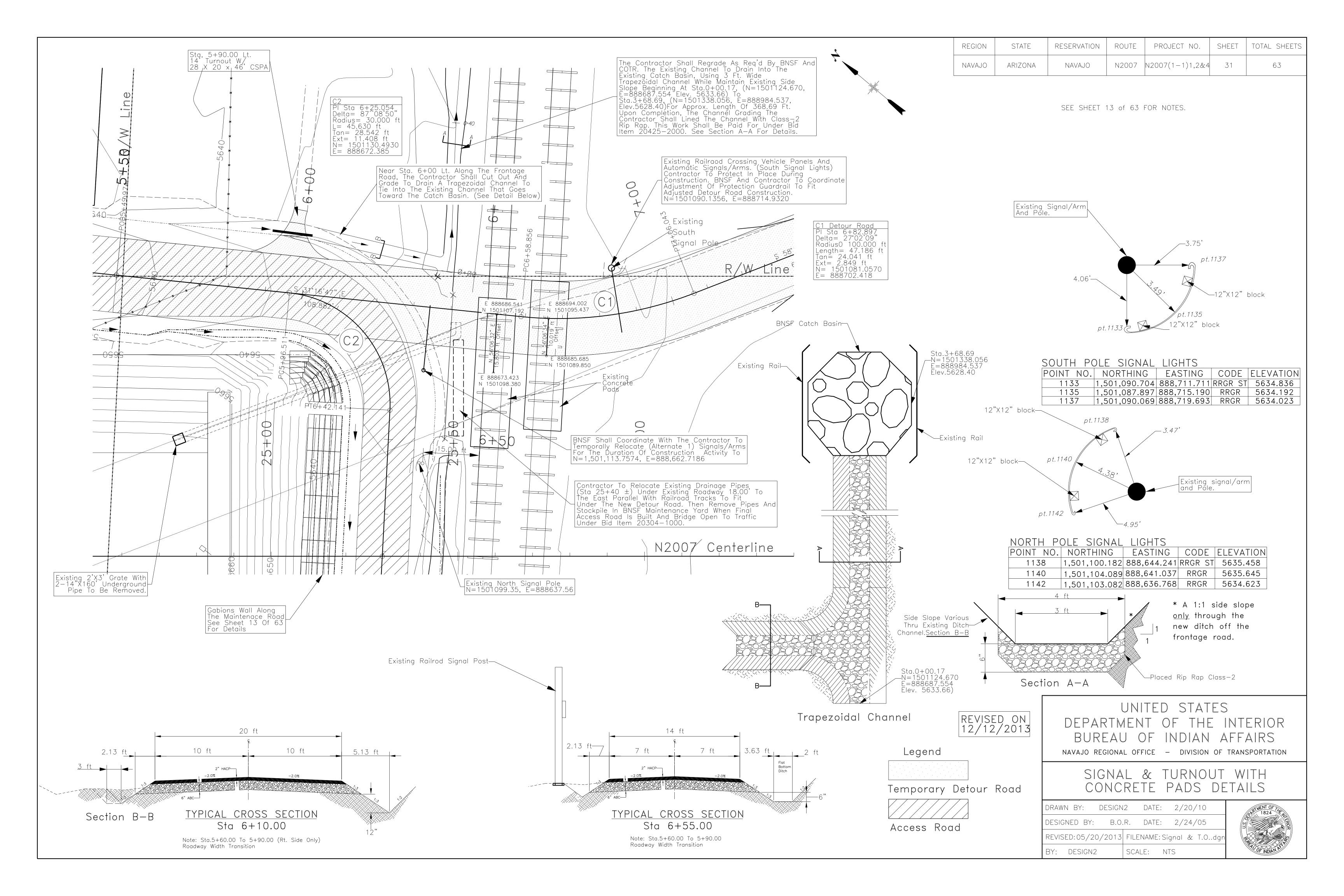
REVISED: 2/1/2013 BY: Peterson.Yazzie

ANNOTATION SCALE: Full Size 1=1

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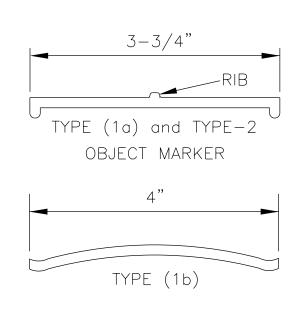




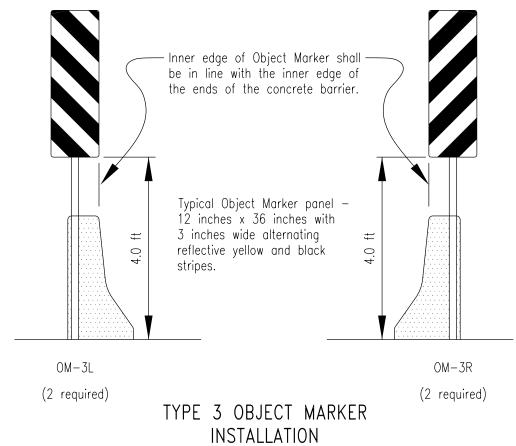
### GENERAL NOTES

- 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.

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



	Inner edge of Object Marker be in line with the inner edg the ends of the concrete ba	ge of
4.0 ft	Typical Object Marker pane 12 inches x 36 inches with 3 inches wide alternating reflective yellow and black stripes.	

Type "2" at Culvert Locations

-3-3/4" (Type 2)

Typical spacing on tangent = 525 ft

525 ft max.

2nd∮

3.2 ft from edge of paved shoulder

3" x 12" REFLECTIVE

SHEETING

3-3/4" (Type 1a) 4" (Type 1b)

5.5 ft

3rd 👌

 $2nd\phi$ 

(Type-2 Object Marker 6" x 12")

"U" Channel attached to post with (2) 5/16"ø hex head bolts with flat washer against post, lock washer and

and hex nut against "U" Channel as shown.

DELINEATOR

(FLEXIBLE TYPE)

	Approximate			
Radius of	Spacing (S) on	Spacing	on Advan	ce of or Beyond a
Curve (feet)	Curve (feet)	Curve (		·
		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			

		· · · / / / · ·	
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	
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

### ITEM 63308-2000 FLEXIBLE

YPE 2 OI	BJECI MA	RKER
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

Included with Bridge Quantities on Sheet B-1

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

STATION	REQUIRED	LOCATION	REMARK
0+68.940	1	Left	
0+68.940	1	Right	
9+56.340	2	Left	
9+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	
TOTA	L 21		

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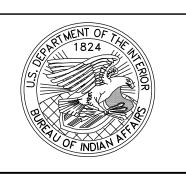
NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

### MISCELLANCEOUS DETAILS

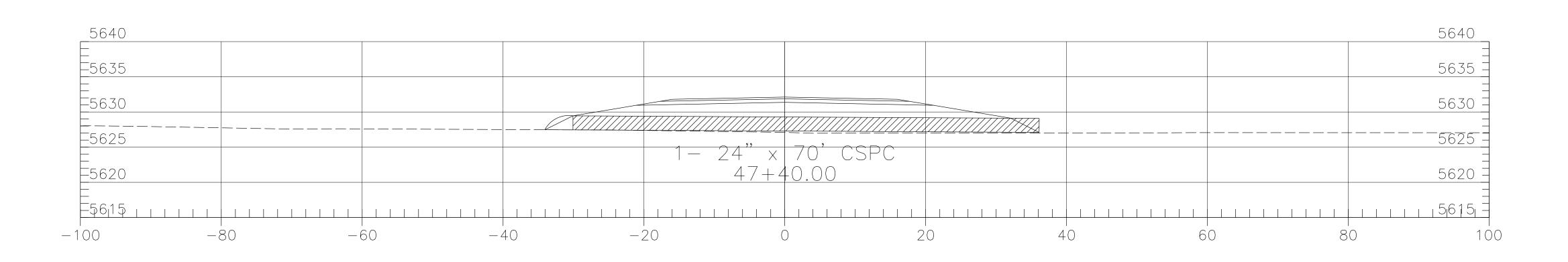
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DESIGNED BY: NRDOT	DATE:5/7/2009	
REVISED: 1/25/2013	BY: Peterson.Yazzie	

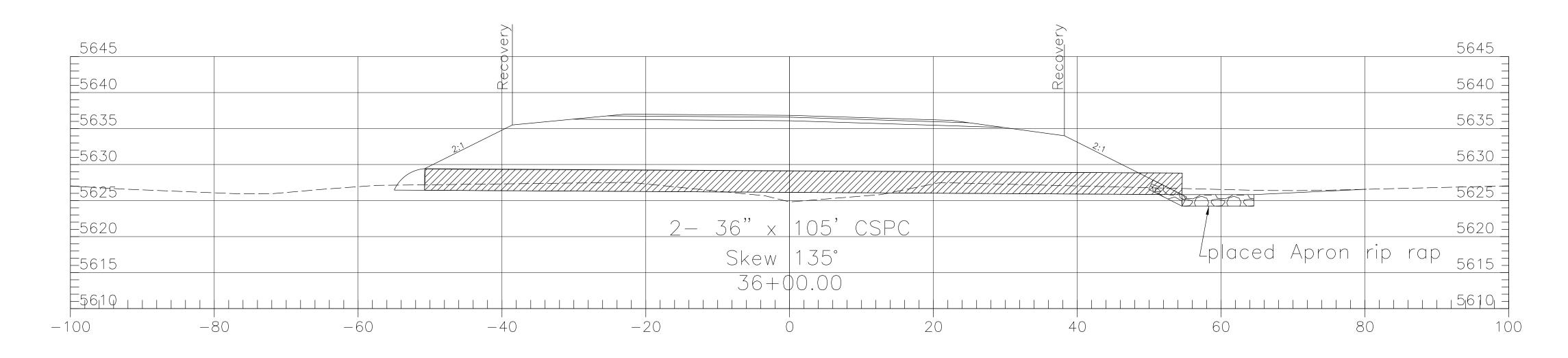
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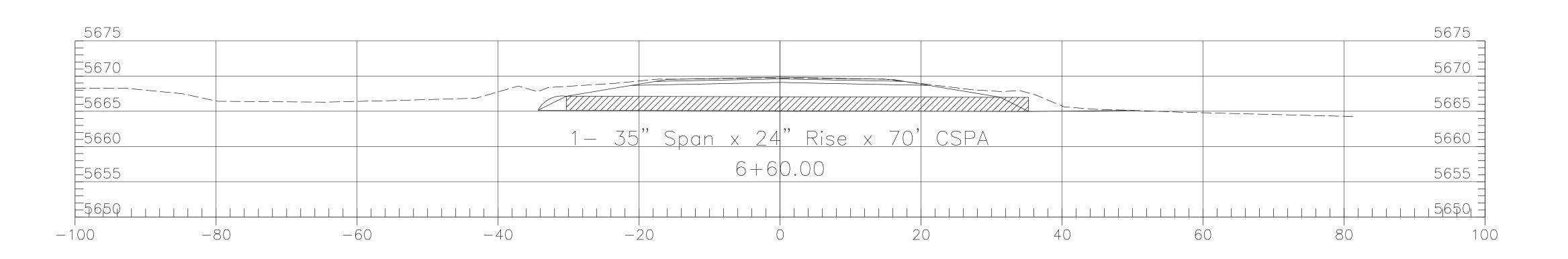




REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	OLAVAN	N2007	N2007(2)1,2&4	33	63







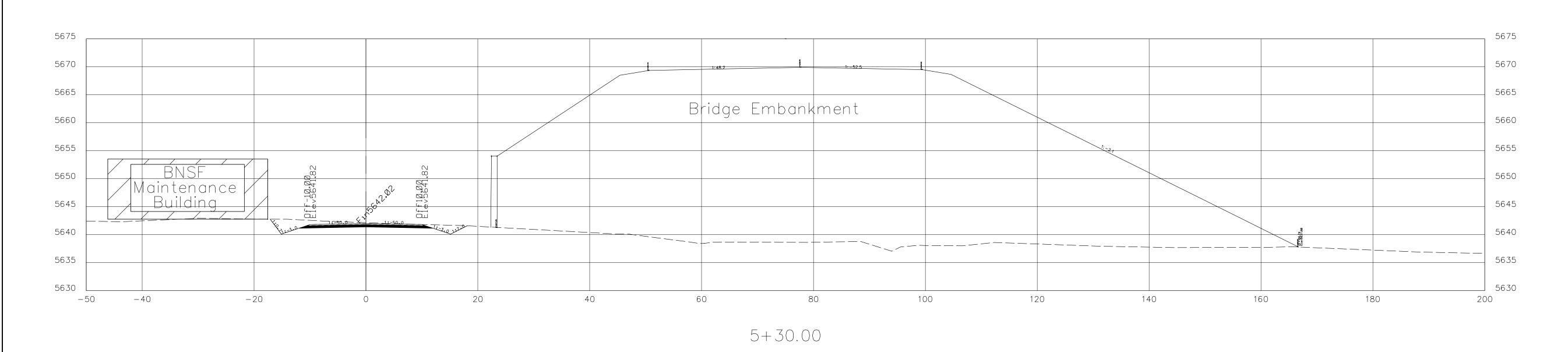
# UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

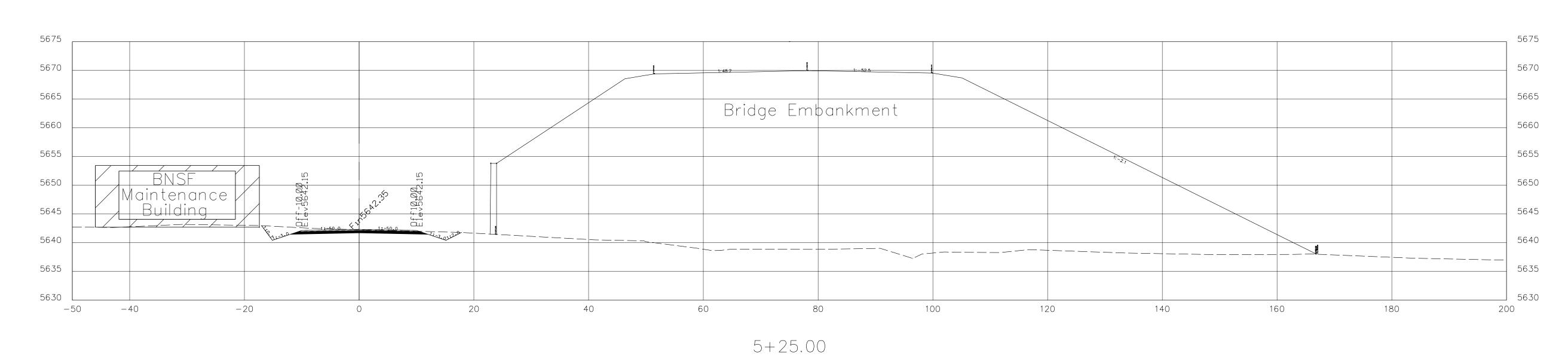
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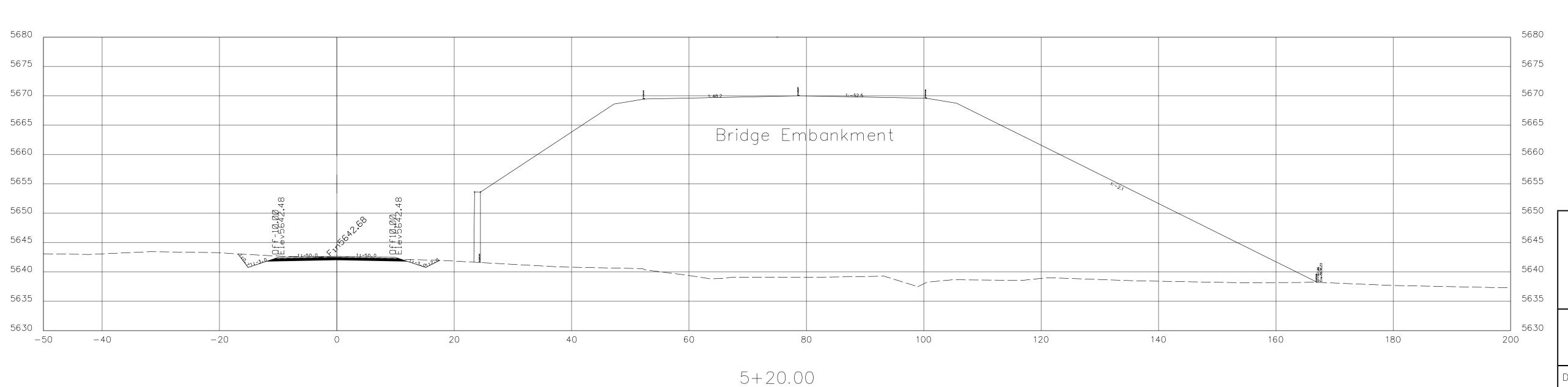
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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1,2,4	34	63







UNITED STATES

DEPARTMENT OF THE INTERIOR

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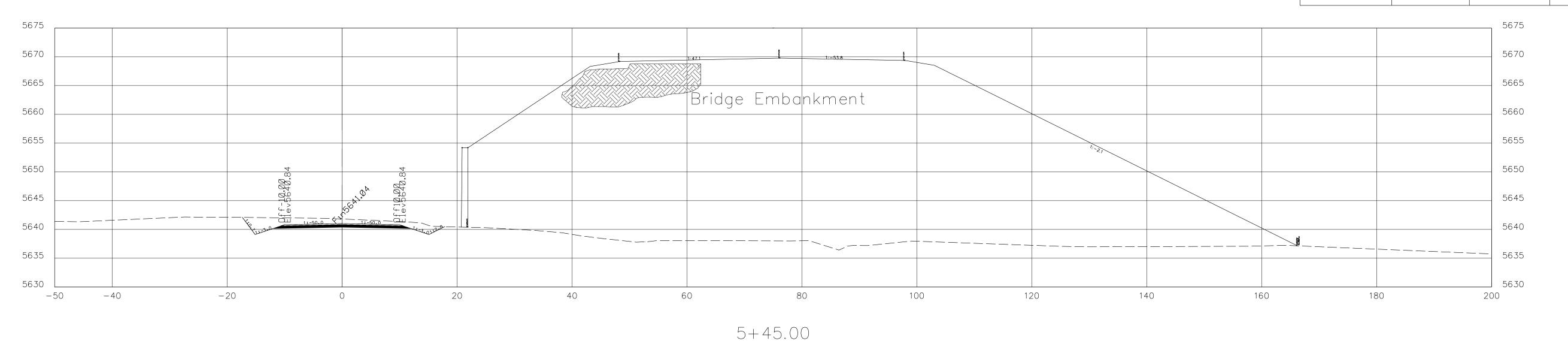
NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

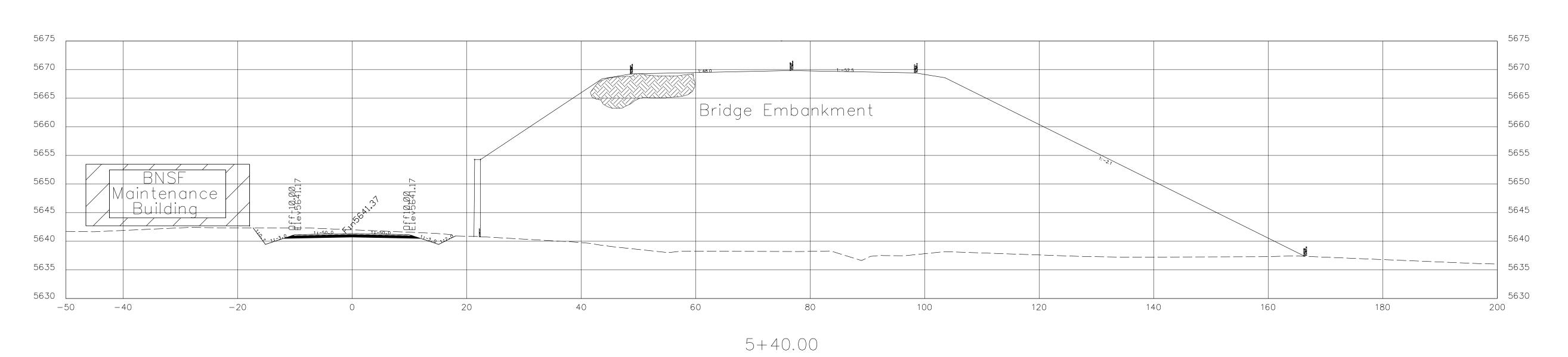
### FRONTAGE & DETOUR RD SECTIONS

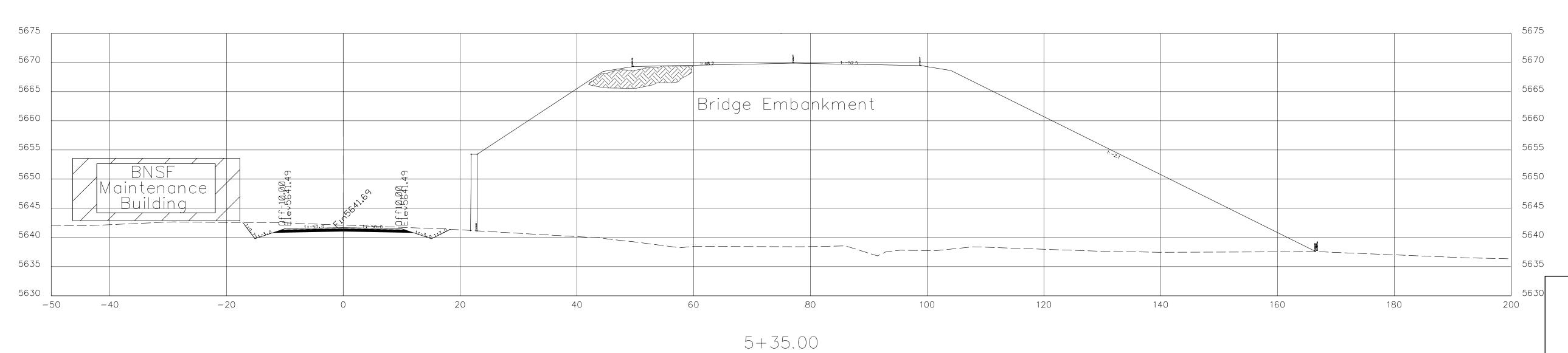
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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1,2,4	35	63







UNITED STATES

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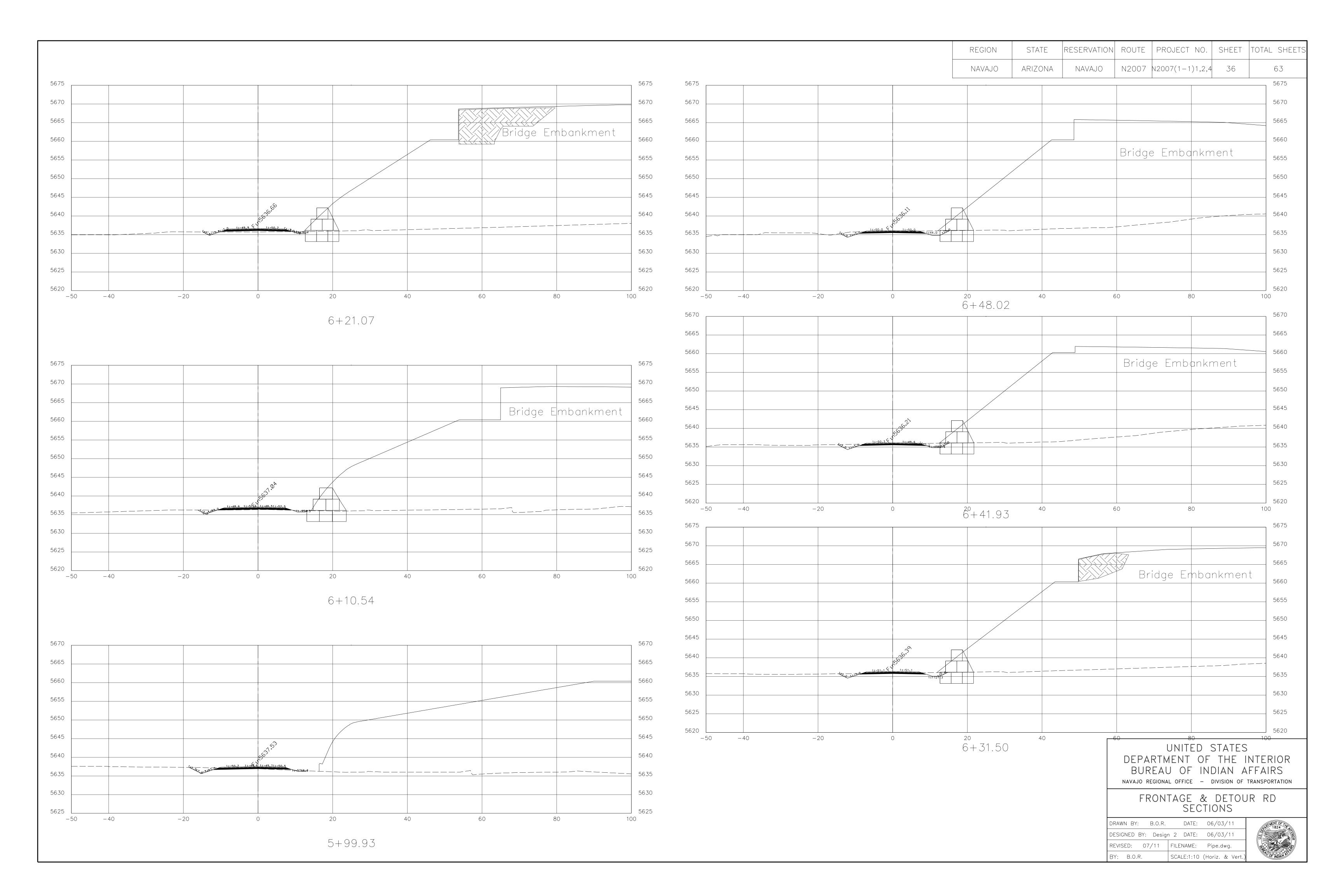
BUREAU OF INDIAN AFFAIRS

NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

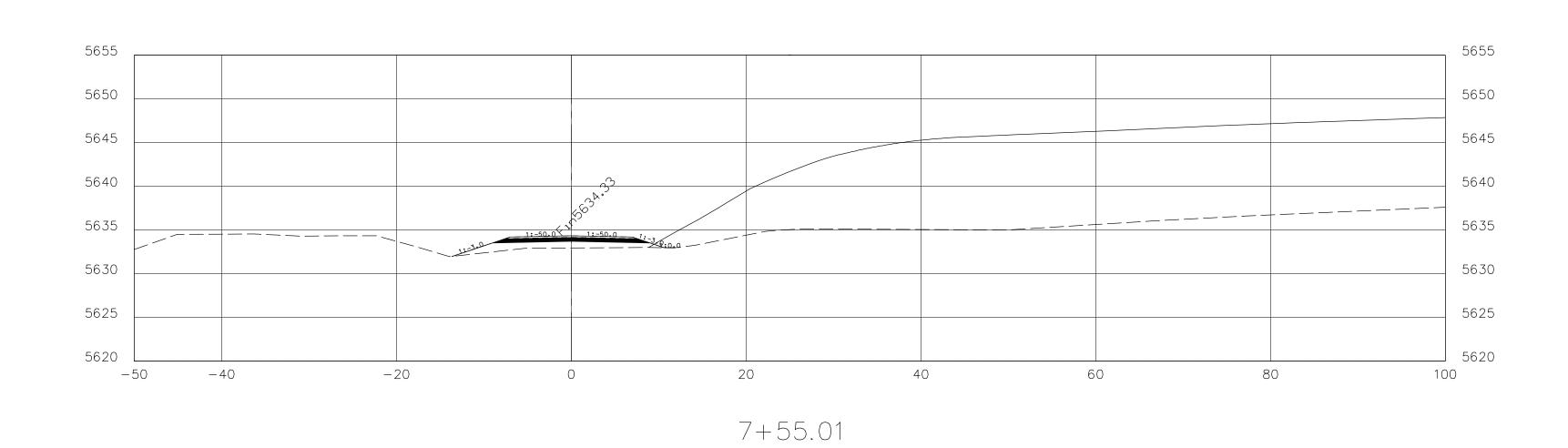
FRONTAGE & DETOUR RD SECTIONS

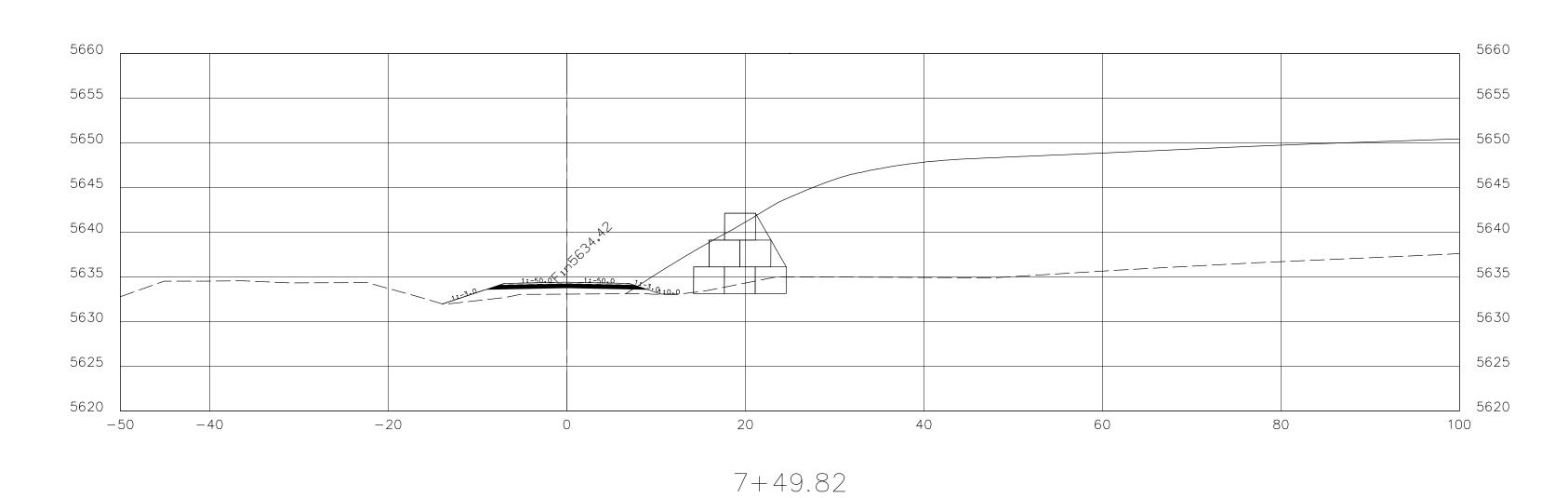
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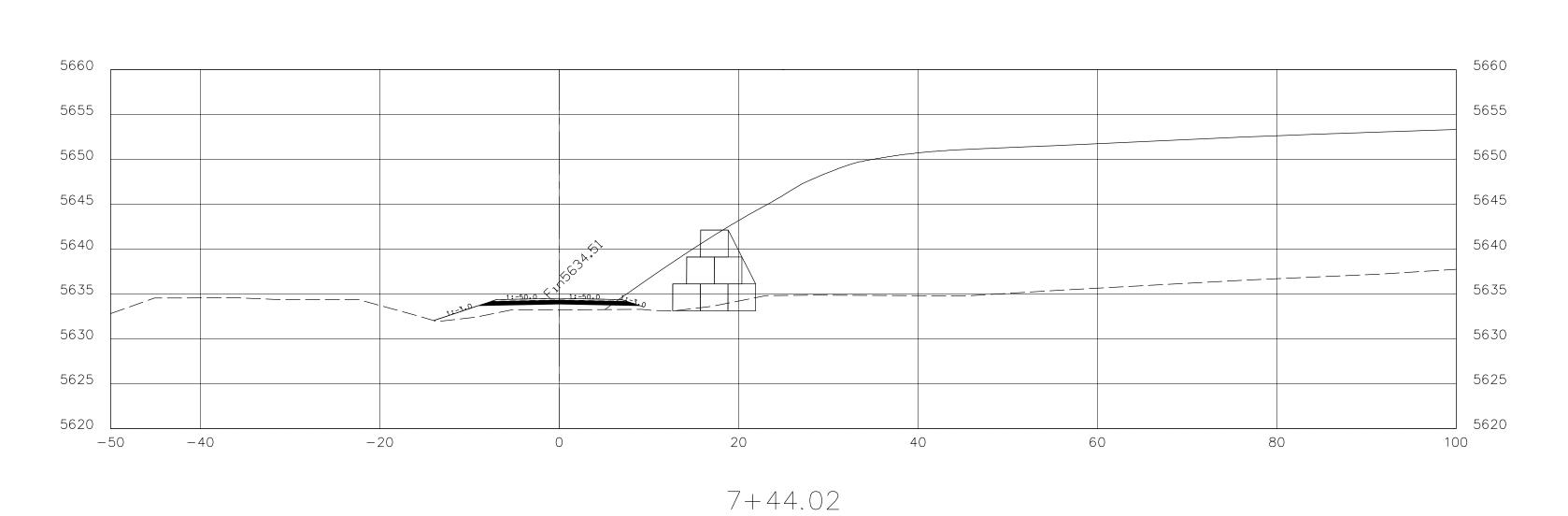




REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N2007	N2007(1-1)1,2,4	37	63







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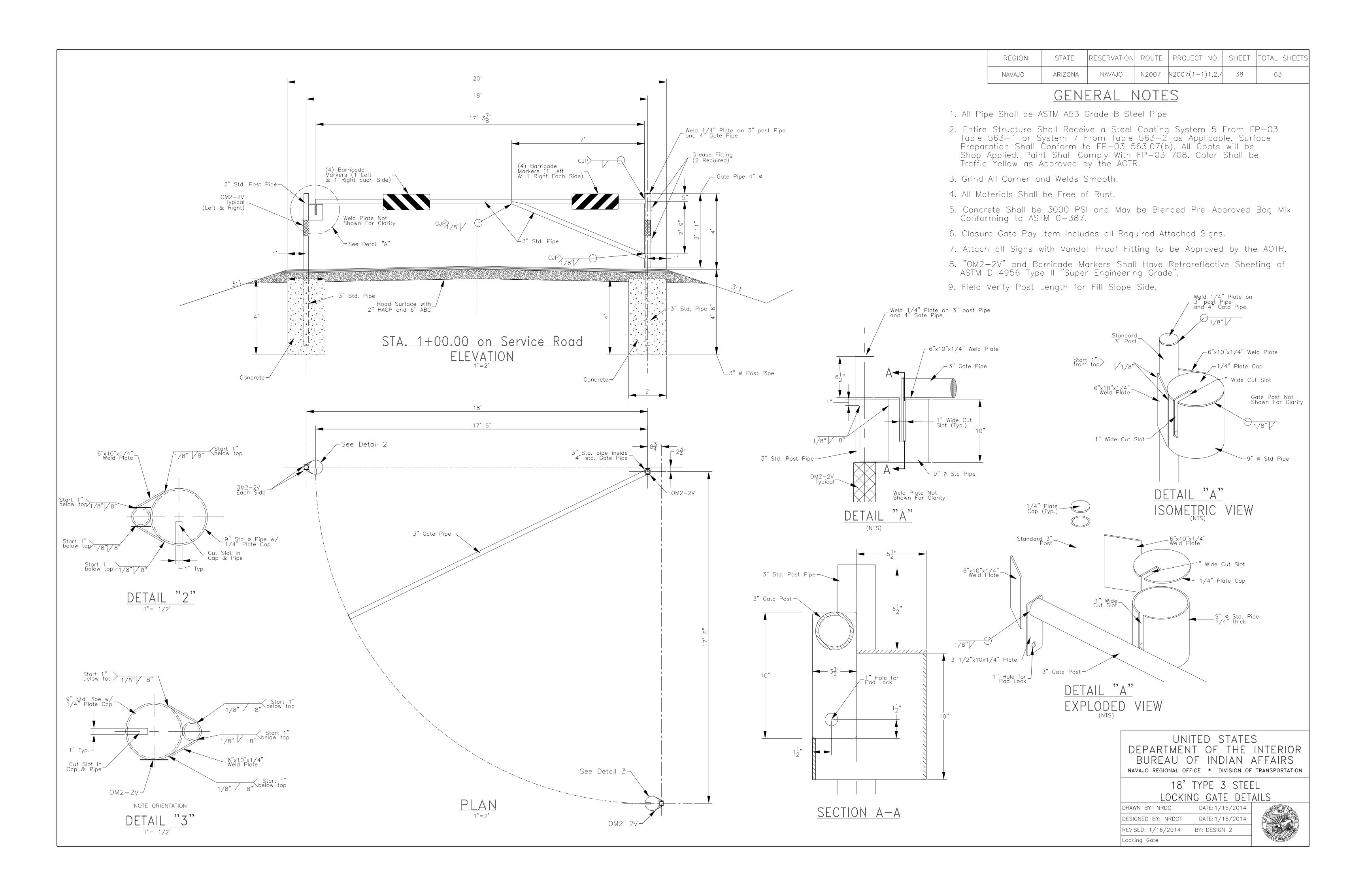
BUREAU OF INDIAN AFFAIRS

NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

# FRONTAGE & DETOUR RD SECTIONS

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DESIGNED BY:	Design	n 2	DATE:	06/03	/11
REVISED: 07	7/11	FILE	NAME:	Pipe.d	wg.
BY: B.O.R.		SCA	LE:1:10	(Horiz.	& Vert





- 1. 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.
- 2. 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).
- 3. 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.
- 4. RATINGS: INVENTORY RATING = HS 22.0. OPERATING RATING = HS 36.8.
- 5. 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 RELEIVED, LOW RELAXATION, PRESTRESSING STRAND SHALL BE 41,300 POUNDS WITH A MINIMUM f's = 270,000 psi.
- 6. 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 I'C = 4,500 psi. ALL OTHER CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF I'C = 4,600 psi. CONCRETE IN PRESTRESSED GIRDERS SHALL HAVE A 28 DAY COMPRESSIVE STRENGTH OF I'C = 6,000 psi. WITH A MINIMUM INDICATED CONCRETE STRENGTH AT TIME OF TRANSERS OF PRESTRESS OF I'C = 4,000 psi. CHAMFER EXPOSED CORNERS OF ALL CONCRETE 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 SHALL BE SUBMITTED FOR REVIEW AND APPRICABLE 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 SUFFICES, VERTICAL EDGE OF BRIDGE DECK SUFFACES AND BOTTOM OF BRIDGE DECK OVERHANG SUFFACES SHALL BE IN ACCORDANCE WITH SECTION 552.16 OF THE FP-03. ALL STEEL OTHER THAN REINFORCING STE
- 7. 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 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 CONVENIENCE OF THE CONTRACTOR. REINFORCING STEEL QUANTITIES FOR APPROVED SPLICES FOR THE CONVENIENCE OF THE CONTRACTOR.
- 8. PRESTRESSING STEEL: PRETENSIONED, PRESTRESSING STEEL STRANDS SHALL BE 270 ksi, 1/2 INCH Ø, 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 fsi = 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.
- 9. 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.
- 10. 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.
- 11. 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.
- 12. 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.
- 13. 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.
- 14. 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.
- 15. 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 DIRVING ONTO EXISTING BRIDGE N666.
- 16. 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.
- 17. 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.
- 18. 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.
- 19. CONCRETE BARRIER: ALL CONCRETE AND REINFORCING STEEL SHALL BE PAID UNDER ITEMS 55201-0200 AND 55401-2000.
- 20. 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.

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

#### 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 Grider 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	16	
55401-2000	Reinforcing Steel, Epoxy Coated, Grade 60	236,909	16	
56501-0600	Drilled Shafts, 4'-0" diameter	507	lf	
56501-0800	Drilled Shafts, 5'-0" diameter	407	lf	
61707-0000	Structure Transistion Railing (Thrie Beam)	75	lf	
61711-5000	Impact Attenuator, QUADGUARD	2	ea.	
61901-1300	Fence, Chain Link Pedestrain 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 quantites 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 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	LT.	18.75
24+49.83 to 24+68.58	RT.	18.75
30+21.92 to 30+40.67	LT.	18.75
30+21.92 to 30+40.67	RT.	18.75
	TOTAL:	75.00

The quantities show above include only thrie-beam transitions from concrete barriers to standard quardrailing 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.

 $\triangle$  - Revised Item 55401-2000 quantity.

REVISED 04/21/2015

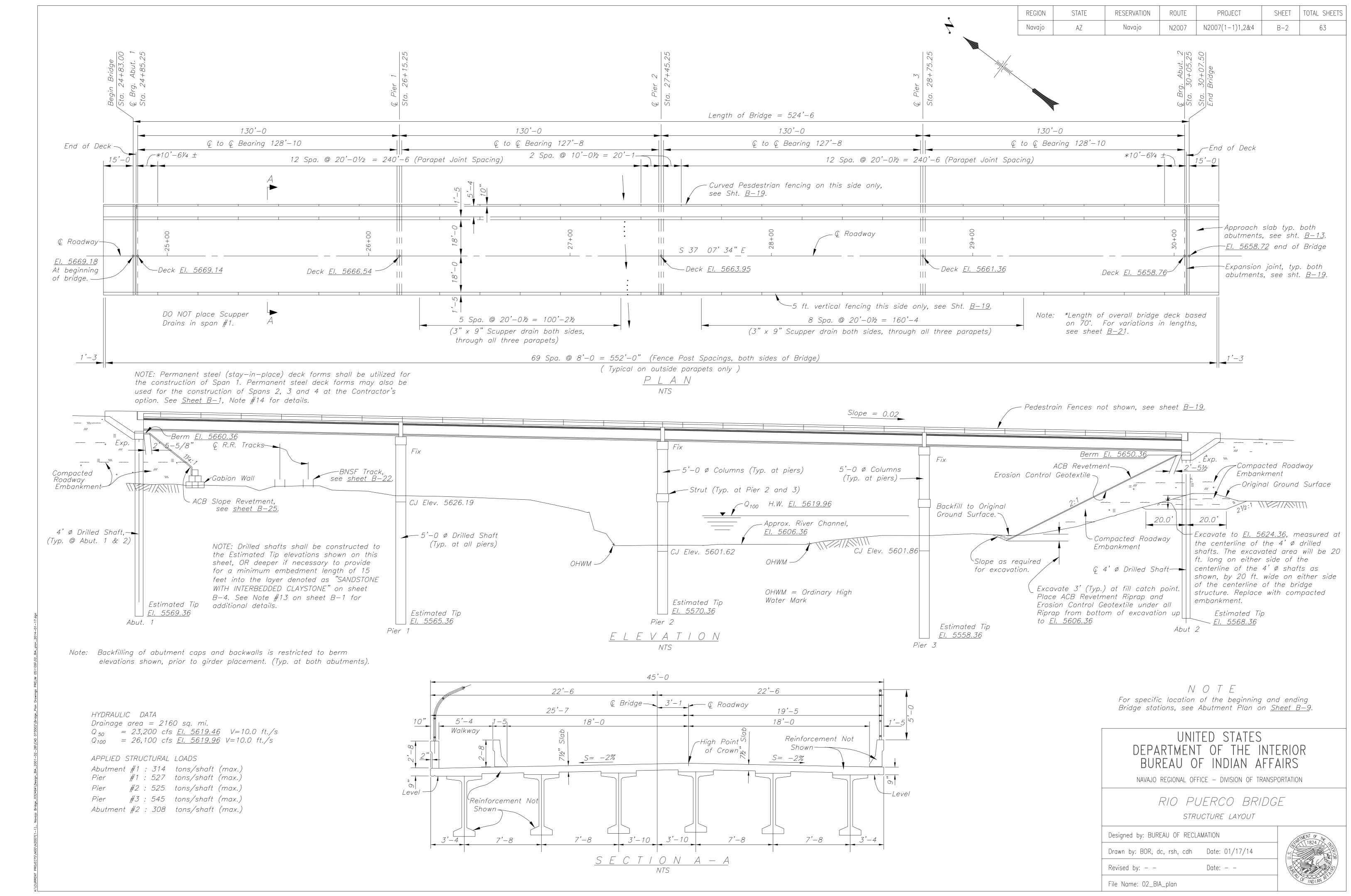
# UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

RIO PUERCO BRIDGE BRIDGE GENERAL NOTES, ESTIMATED QUANTITIES & TABLES

Designed by: cdh	
Drawn by: rsh, dc, cdh	Date: 01/17/14
Revised by: cdh	Date: 04/21/2015

File Name: 01\_BIAgnrl





# 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 situdisaggregation 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 sherars 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 signification 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). Thumb will penetrate soil about 1 in. (25 mm). Thumb will indent soil about 1/4 in. (5 mm). 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	
FDO Unfractured No fractures.	
FD1 Very slightly fractured Core recovered mostly in lengths gre than 3 feet (1 m).	ater
FD2 Slightly to very slightly fractured	
FD3 Slightly fractured Core recovered mostly in lengths from 1 to 3 feet (300 to 1000 mm) with few scattered lengths less than 1 to (300 mm) or greater than 3 feet (1000 mm).	th
FD4 Moderately to slightly fractured	
FD5 Moderately fractured Core recovered mostly in 0.33 to 1 foot (100 to 300 mm) lengths with most lengths about 0.67 foot (200 mm)	7
FD6 Intensity to moderately fractured	
FD7 Intensity fractured Lengths average from 0.1 to 0.33 foot (30 to 100 mm) with scattere fragmented intervals. Core recovered mostly in lengths less than 0.33 foot (100 mm).	
FD8 Very intensely to intensely fractured	

Very intensely Core recovered mostly as chips and

core lengths.

fractured fragments with a few scattered short

# Sedimentary and Pyroclastic rock particle-size descriptors

Size in mm	Rounded,	MENTARY Subrounded, angular	CLASTIC		
(inches)	Particle or Lithified product		Fragment	Lithified product	
300 (12)	Boulder	BOULDER CONGLOMERATE	Boulder		
256 (10) 75 (3)	Cobble	COBBLE CONGLOMERATE	Cobbler	AGGLOMERATE	
64 (2.5) 20	Coarse gravel	- PEBBLE	Coarse gravel	(Boulder, cobble, gravel, and sand)	
(0.8)	Fine gravel	CONGLOMERATE	Fine gravel		
4.75 (0.2)	Coarse sand		Coarse sand		
2.00 (0.08) 0.42	Medium sand	SANDSTONE (Coarse sand, medium sand and fine sand)	Medium sand		
0.02)	Fine sand		Fine sand	TUFF (Coarse, gravel to fine sand,	
(0.003)	Silt	SILTSTONE/ SHALE		and ash)	
0.005	Clay	CLAYSTONE/ SHALE	Ash		

#### Rock Color

N2007

N2007(1-1)1,2&4

TOTAL SHEETS

B-3

All colors used to describe rock are taken from the Geological Society of America Rock color Chart (7th pprinting, 1991, with

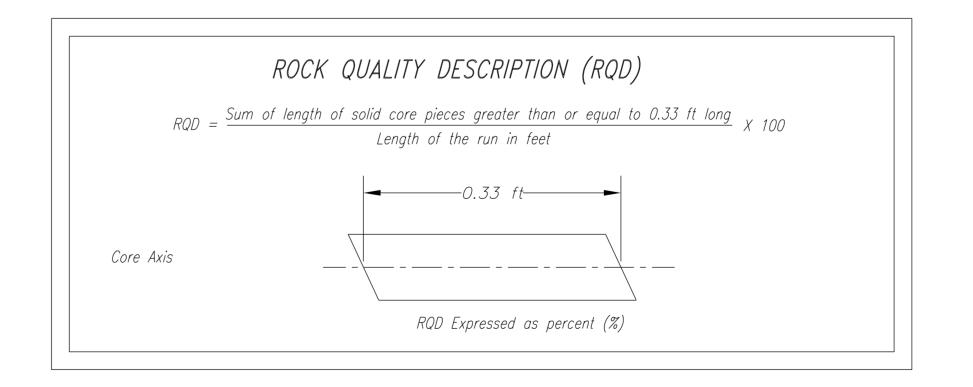
Unless indicated all colors are described from wet samples.

RESERVATION

Navajo

REGION

Navajo



# UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS

NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

RIO PUERCO BRIDGE STANDARD DESCRIPTIONS AND DESCRIPTIVE CRITERIA FOR ROCK

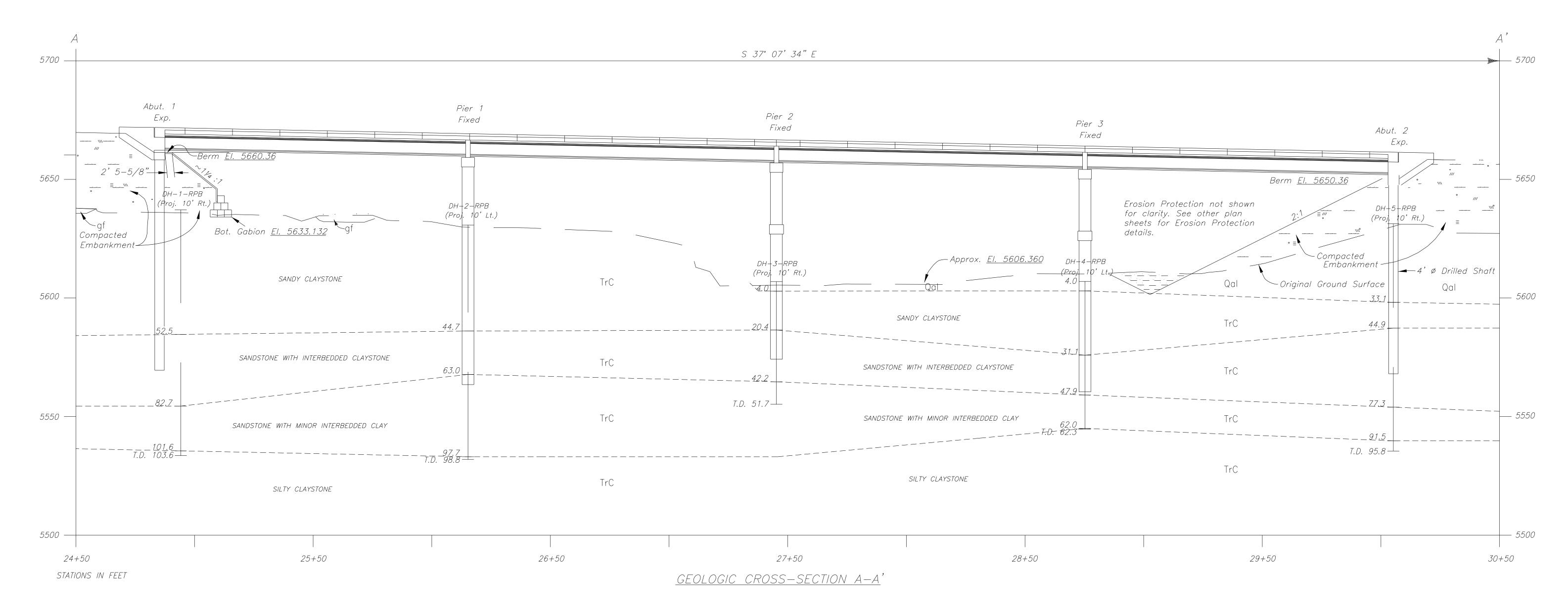
Designed by: BUREAU OF RECLAMATION

Date: 01/24/13 Drawn by: BOR, cdh, rsh

Date: - -Revised by: - -

File Name: 03\_BIAsoil





#### GENERAL GEOLOGIC LEGEND

- gf <u>General Fil</u>l: The railroad tracks have a foundation consisting of poorly graded gravel (GP) that varies in thickness from 1.0 to 3.0 feet. The dirt road is composed of a combination of poorly graded sand (SP) and sandy lean clay s(CL). The roadfill material is the same as the alluvium, but it has been reworked and graded.
- Qal <u>Quaternary Alluvium</u>: In the river channel, alluvium is composed predominately of poorly graded sand (SP) that is generally medium to fine grained, subangular to subrounded, no reaction with HCl, with a trace of subrounded gravel and nonplastic fines. In thicker sections of alluvium (the southern river bank) the poorly graded sand (SP) is interbedded with lenses of sandy lean clay s(CL) and clay seams CL.
- TrC <u>Triassic Chinle Formation</u>: For the purposes of this work, the section of rock encountered on the surface and in drill holes has been divided into four subunits. These units, from top to bottom, consist of a sandy claystone that ranges from 10 to 52 feet thick. A sandstone with interbedded claystone that ranges in thickness from 16 to 32 feet thick. The bottom of this subunit is marked by a pebble conglomerate which ranges in thickness from 1.1 to 3.3 feet. A sandstone with minor interbedded claystone that ranges in thickness from 10 to 35 feet. At the base of the sandstone with minor interbedded clay lies a silty claystone. Since all five drill holes were terminated in or above this unit its thickness is unknown.

# GENERAL GEOLOGIC EXPLANATION

Contact between geologic units, dashed where approximate. Contact between geologic subunits, dashed where SANDY CLAYSTONE approximate. SANDSTONE Location of drill hole. ● DH-1-RPB Approximate location of test pit. TP-1-RPB Stick log, dashed where projected to cross-section. DH-3-RPB (Proj. 10' Lt.) **▼** — Drill hole number, with distance and direction 4.0 SANDY CLAYSTONE Typical abbreviation for geologic unit. 20.35 SANDSTONE WITH Typical name.
INTERBEDDED CLAYSTONE — Depth (feet) and contact of geologic unit. T.D. 51.7 \(\preceq\) —— Total depth (feet).

Location of geologic cross-section.

#### GENERAL GEOLOGIC NOTES

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

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

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

NOTE: Subsurface investigation information has been obtained for designer use only. The Government shall not be responsible for any misinterpretation or assumptions made by the Contractor based on the subsurface investigation information presented on these plans.

NOTE: DRILLED SHAFTS HAVE BEEN DESIGNED TO BE FOUNDED IN THE LAYER DENOTED AS "SANDSTONE WITH INTERBEDDED CLAYSTONE". DRILLED SHAFTS SHALL BE CONSTRUCTED TO THE ESTIMATED TIP ELEVATIONS SHOWN ON THIS SHEET, OR DEEPER IF NECESSARY TO PROVIDE FOR A MINIMUM EMBEDMENT LENGTH OF 15 FEET INTO THE LAYER SPECIFIED LAYER. SEE NOTE #13 ON SHEET B-1 FOR ADDITIONAL DETAILS.

# UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS

NAVAJO REGIONAL OFFICE — DIVISION OF TRANSPORTATION

RIO PUERCO BRIDGE SOIL PROFILE SHEET

Date: - -

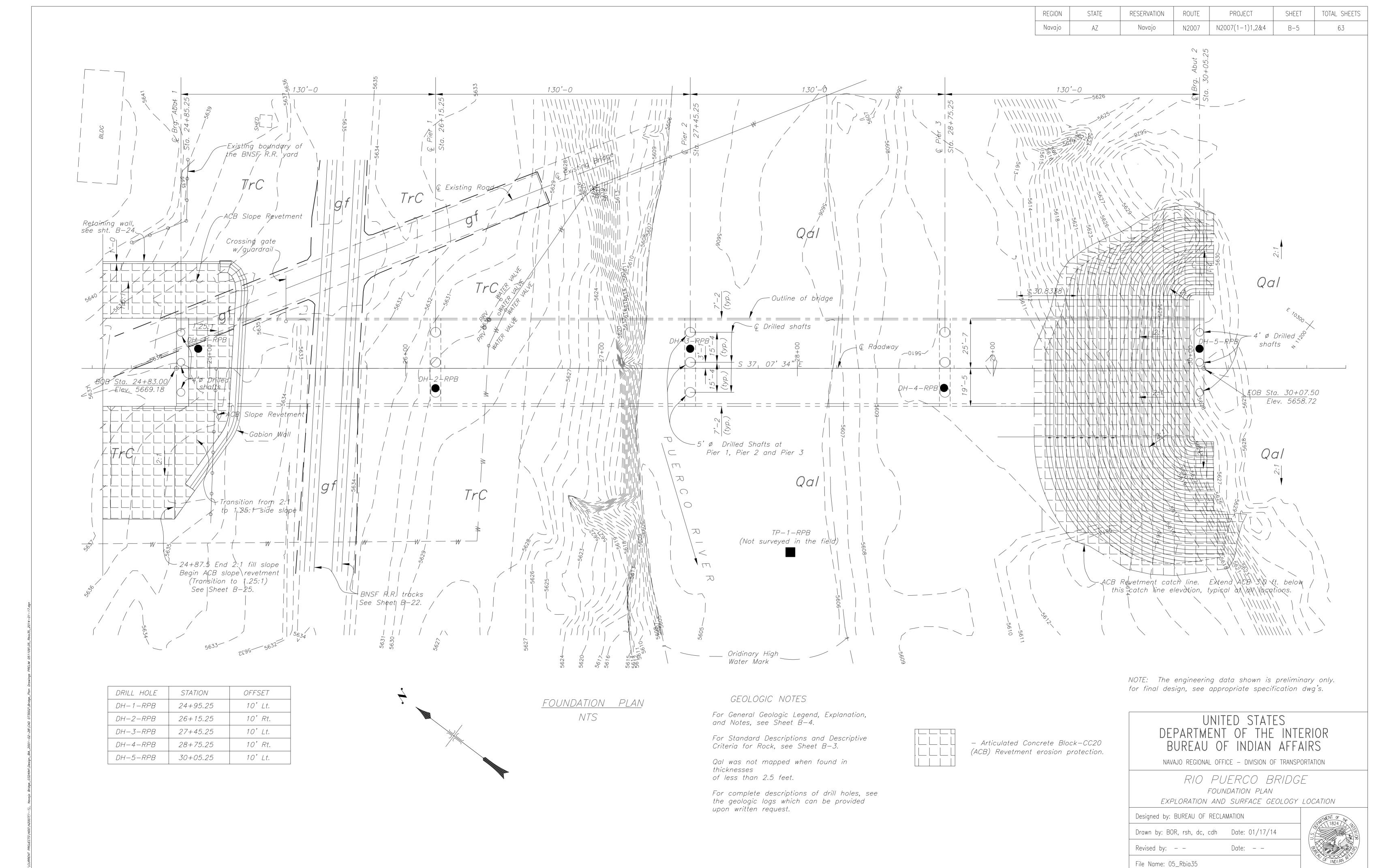
Designed by: BUREAU OF RECLAMATION

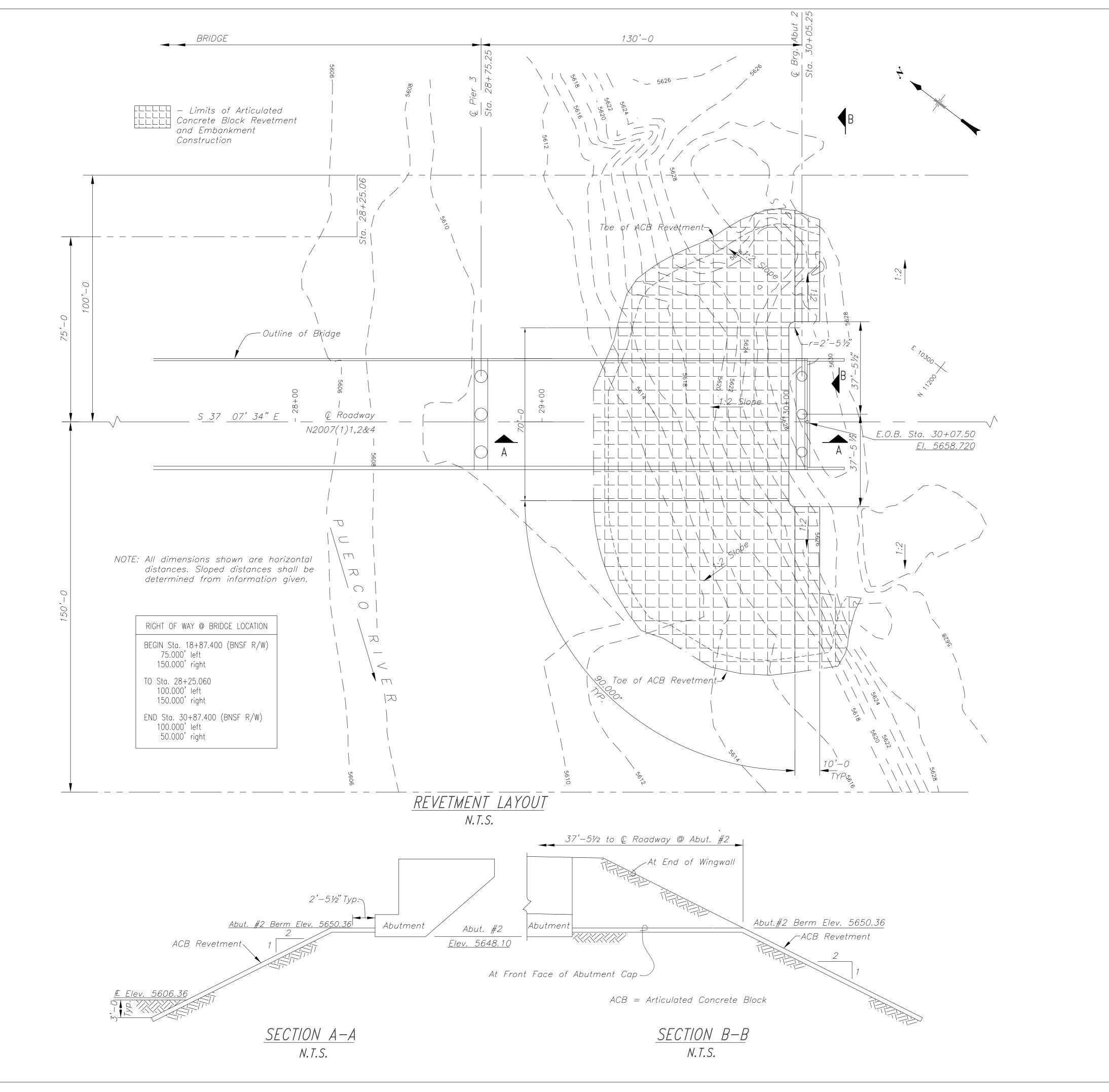
Drawn by: BOR, rsh, dc, cdh Date: 01/17/14

File Name: 04\_BIA0a33034

Revised by: - -







REGIONSTATERESERVATIONROUTEPROJECTSHEETTOTAL SHEETSNavajoAZNavajoN2007N2007(1-1)1,2&4B-663

#### EROSION PROTECTION GENERAL NOTES

- 1. 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.
- 2. 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.
- 3. ACB Revetment shall have Erosion Control Geotextile place 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.
- 4. See sheet B-23 for additional ACB Revetment details. All work involved in the furnishing, fabricating and installation of the ACB Reventment shall be measured and paid for under Item 25112-3000.
- 5. See sheets B-22 through B-25 for ABUTMENT 1 details and installation details

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

# UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS

NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

RIO PUERCO BRIDGE

EROSION PROTECTION DETAILS ABUTMENT 2

Designed by: STRUCTURAL UNIT

Drawn by: rsh, dc, cdh

Revised by: - - Date: - 
File Name: 06\_BIAersn



ESTIMATED DRILLING TIME:

SET-UP AND DRILLING 2

10-HOUR SHIFTS

NA = NOT APPLICABLE

REASON FOR HOLF TERMINATION:

ESTIMATED DRILLING TIME:

(O.N.H.I.R.).

DRILL HOLE DH-1-RPB

PAGE 1 OF 1

HOLE TREMINATED AT THE DISCRETION

10-HOUR SHIFTS

OF OFFICE OF NAVAJO HOPI INDIAN

SET-UP AND DRILLING 2

RELOCATION ON SITE REPRESENTATIVE

NOTE: Subsurface investigation information has been obtained for designer use only. The Government shall not be responsible for any misinterpretation or assumptions made by the Contractor based on the subsurface investigation information presented on these plans.

PAGE 1 OF 1

DRILL HOLE DH-2-RPB

TOTAL SHEETS REGION STATE RESERVATION ROUTE PROJECT SHEET N2007(1-1)1,2&4Navajo Navajo N2007 B-763 GEOLOGIC LOG OF DRILL HOLE DH-3-RPB SHEET 1 OF 1 PROJECT: O.N.H.I.R. STATE: ARIZONA COORDINATES: N. 11444.7 E. 10099.9 GROUND ELEVATION: 5606.96 TOTAL DEPTH: 51.7 ANGLE FROM HORIZONTAL AND BEARING: 90° DEPTH TO BEDROCK: 4.0 HOLE LOGGED BY: R. LUNG REVIEWED BY: GEOLOGIC DESCRIPTION 0.0 TO 4.0 FT. QUATERNARY ALLUVIUM (TrC): POORLY GRADED. SUBANGULAR TO SUBROUNDED SAND WITH (CL)s 100 2.8 57 MINOR AMOUNTS OF FINE GRAVEL. DESCRIPTIONS BASED ON VISUAL ANALYSIS OF CUTTINGS IN AUGERED INTERVALS. 100 5.9 30 4.0 TO 51.7 FT. TRIASSIC CHINLE FORMATION (TrC): 4.0 TO 20.4 FT. SANDY CLAYSTONE: CONDITIONS AND CUTTING IN AUGERED INTERVALS. COLOR RANGES FROM PALE RED (5R 6/2) TO MODERATE RED (5R 4/6). SANDY CLAYSTONE IS THINLY TO MODERATELY BEDDED AND INTENSELY (W7) TO MODERATELY (W5) WEATHERED WITH DEPTH (APPROXIMATELY 10 TO 12 FEET), VERY SOFT (H7) BREAKING WITH LIGHT MANUAL PRESSURE. THE UPPER CONTACT IS UNCONFORMABLE AND SHARP WHILE LOWER CONTACT IS CONFORMABLE AND GRADATIONAL. MINOR SANDSTONE LENSES

DETERMINE FOUNDATION CONDITIONS AT PROPOSED PIER NO. 3 (STA. 27+45.3, OFFSET 10 FT. LT.), PERFORM STANDARD PENETRATION TESTING (SPTS), COLLECT SOIL SAMPLES FOR LABORATORY ANALYSIS AND DETERMINE DRILL SITE AND SET-UP: SITE LOCATED ON ORIGINAL GROUND AT STA. 27+45, ABOUT 20 FEET SOUTH OF THE NORTH BANK OF THE RIVER CME 1250 TRACK MOUNTED EARTH AUGER WITH AUTOMATIC PENETRATION TEST HAMMER; 5 FT. LONG 7-1/2 INCH HOLLOW-STEM FLIGHT AUGERS: 100 9-INCH CARBIDE TIPPED BIT; 1-3/8 IN. I.D. STANDARD SPLIT-SPOON SAMPLER: 5 FT. LONG HO CORE 100 **□** 100 | 56 BARREL WITH SPLIT TUBE INNER BARREL; SURFACE SET, DIAMOND BIT; WATER TESTING EQUIPMENT: NO WATER TESTS REQUIRED. NO DRILL FLUID FROM 0.0 TO 20.2 FT., USED WATER AS DRILL FLUID FROM 20.2 TO 51.7 FT. 11.8 TO 15.9 FT. SANDY CLAYSTONE: DESCRIPTION BASED ON VISUAL ANALYSIS OF DRILLING CONDITIONS AND DRILL FLUID RETURN: INTERVAL (FT.) % RETURN

15.9 TO 16.9 FT. CLAYSTONE VISUALLY CLASSIFIED AS A LEAN TO FAT CLAY WITH; SAND (CL/CH): ABOUT 75% FINES WITH HIGH PLASTICITY, MEDIUM TOUGHNESS, SLOW DILATANCY, HIGH DRY STRENGTH; ABOUT 25% FINE TO COARSE, SUBANGULAR TO SUBROUNDED SAND; MAX. SIZE FINE SAND; MODERATE RED; WEAK REACTION TO HCI.

13.9%; CLAYEY SAND SC. INTERVAL METHOD/ (FT.) BARREL SIZE 16.9 TO 20.2 FT. SANDY CLAYSTONE; DESCRIPTION BASED ON VISUAL 0.0 - 52.5 7-1/2 IN. FA; SPTS AT 5

20.2 – 51.7 HQ CORE CLAY: CL/CH; DRILLING CONDITIONS AND DRILLER'S COMMENTS: 00 - 40 FT AUGERED SMOOTH 40 TO 19.0 FT. AUGERED PREDOMINATELY | SUBROUNDED SAND; MAX. SIZE FINE SAND; MODERATE RED; WEAK SMOOTH; AT 19.0 FT. AUGERED VERY REACTION TO HCI. HARD, PROBABLY FIRST SIGNIFICANT

CASINS RECORD (FA): CASING CASING INTERVAL. SIZE DEPTH DRILLED 7-1/2 IN. 0-20.2 0-20.2

FFATURE: RIO PUFRCO BRIDGE

DEPTH AND ELEV. OF WATER

NOTES

PURPOSE OF HOLE:

DEPTH TO ROCK.

DRILL EQIUPMENT:

AND HQ RODS.

DRILLER:

J. HAYDEN.

DRILL FLUID:

0.0 - 20.2 FA-NA

DRILL FLUID RETURN COLOR:

20.2 - 51.7 REDDISH BROWN

INTERVAL (FT.) COLOR

0.0 – 20.2 FA-NA

DRILLING METHODS:

FT. INTERVALS

REFUSAL.

20.2 - 51.7 90

CHANNEL.

LOCATION: MID CHANNEL OF RIO PUERCO

LEVEL AND DATE MEASURED: SEE NOTES

BEGUN: 8/17/93 FINISHED: 8/18/93

7-1/2 IN. 20.2 20.2-51.7 DEPTH TO WATER DURING DRILLING; NOT DETERMINED.

HOLE COMPLETION: BACKFILLED WITH EXCAVATED MATERIAL. REASON FOR HOLE TERMINATION: OFFICE OF NAVAJO HOPI INDIAN (O.N.H.I.R.)

ESTIMATED DRILLING TIME: 10-HOUR SHIFTS SET-UP AND DRILLING 2

LAB DATA; 74% SAND; 26% FINES; 0% GRAVEL; PI 0%; LL 31%; MC

ANALYSIS OF DRILLING CONDITIONS AND CUTTINGS. 20.2 TO 20.4 FT. CLAYSTONE; VISUALLY CLASSIFIED AS A LEAN TO FAT ABOUT 95% FINES WITH HIGH PLASTICITY, MEDIUM TOUGHNESS, SLOW DILATANCY, HIGH DRY STRENGTH: ABOUT 5% FINE. SUBANGULAR TO

SANDSTONE LENSE AT 20.2 FT. AUGER LAB DATA; 26% SAND; 74% FINES; 0% GRAVEL; PI IS; LL IS; MC 5.5%; LEAN CLAY WITH SAND (CL)s.

20.4 TO 42.2 FT. SANDSTONE WITH INTERBEDDED CLAYSTONE:

COLOR RANGES FROM GRAYISH PINK (5R 8/2) TO VERY LIGHT GRAY (N8) WITH CLAYSTONE INTERBEDS RANGING FROM PALE RED (5R 6/2) TO MODERATE RED (5R 4/6). SANDSTONE IS FINE TO MEDIUM GRAINED, THINLY BEDDED, SLIGHTLY (W3) TO PREDOMINATELY MODERATELY (W5) WEATHERED, AND MODERATELY HARD (H4). VERY INTENSELY FRACTURED (FD9), RECOVERED PREDOMINATELY AS CHIPS AND FRAGMENTS FROM 20.2 TO 21.5 FEET. MODERATELY FRACTURED (FD5), RECOVERED PREDOMINATELY IN LENGTHS FROM 0.33 TO 1.0 FOOT FROM 21.5 TO 25.4 FEET. INTENSELY FRACTURED (FD7), RECOVERED PREDOMINATELY IN LENGTHS FROM 0.1 TO 0.33 FOOT FROM 25.4 TO 26.4 FEET, HOLE TERMINATED AT THE DISCRETION | MODERATELY FRACTURED (FD5), RECOVERED PREDOMINATELY IN LENGTHS FROM 0.33 TO 1.0 FOOT FROM 26.4 TO 39.6 FEET, INTENSELY RELOCATION ON SITE REPRESENTATIVE FRACTURED (FD7), RECOVERED PREDOMINATELY IN LENGTHS FROM 0.1 TO 0.33 FOOT FROM 39.6 TO 42.2 FEET. CLAYSTONE INTERBEDS FNCOUNTERED AT: 29.6 TO 29.9 FT., 36.7 TO 36.9 FT., UPPER CONTACT IS CONFORMABLE AND GRADATIONAL WHILE LOWER CONTACT IS CONFORMABLE AND SHARP. THE LOWER CONTACT IS LACATED AT THE BASE OF A GRAVEL TO PEBBLE CONGLOMERATE FROM 39.6 TO 42.2 FT., THIS CONGLOMERATE IS CLAST SUPPORTED (90%) WITH A MATRIX. CLASTS COMPOSED OF INTENSELY (W7) WEATHERED SANSTONE; LARGEST CLAST 0.15 FT.

> COMMENTS: FA = 7-1/2 IN. FLIGHT AUGER PI = PLASTICITY INDEX IS = INSÚFFICIENT SAMPLE LL = LIQUID LIMIT*MC = MOISTURE CONTENT*

NA = NOT APPLICABLE

RANGING FROM 0.1 TO 0.5 FT. ARE ENCOUNTERED FROM 2.0 TO 5.0 FT. ABOVE THE LOWER CONTACT. 4.0 TO 5.8 FT. SANDY CLAYSTONE: DESCRIPTION BASED ON VISUAL ANALYSIS OF DRILLING CONDITIONS AND CUTTINGS... 5.8 TO 6.8 FT. CLAYSTONE VISUALLY CLASSIFIED AS A LEAN CLAY WITH SAND: (CL)s: ABOUT 80% FINES WITH MEDIUM PLASTICITY, SLOW DILATANCY, HIGH TOUGHNESS, HIGH DRY STRENGTH, ABOUT 20% FINE, SUBANGULAR TO SUBROUNDED SAND, MAX. SIZE FINE SAND; MODERATELY RED; WEAK REACTION WITH HCI.

> MC 12.8%; LEAN CLAY TO CLAYEY SAND CL/SC. 6.8 TO 10.8 FT. SANDY CLAYSTONE: DESCRIPTION BASED ON VISUAL ANALYSIS OF DRILLING

> > CONDITIONS AND CUTTINGS...

10.8 TO 11.8 FT. CLAYSTONE VISUALLY CLASSIFIED AS A LEAN ABOUT 95% FINES WITH MEDIUM PLASTICITY, MEDIUM TOUGHNESS, SLOW DILATANCY, HIGH DRY STRENGTH, ABOUT 5% FINE, SUBANGULAR TO SUBROUNDED SAND, MAX. SIZE FINE SAND;

LAB DATA; 45% SAND; 55% FINES; 0% GRAVEL, PI 17%; LL 35%;

LAB DATA; 45% SAND; 55% FINES; 0% GRAVEL, PI 14%; LL 35%; MC 15.9%; LEAN CLAY TO CLAYEY SAND CL/SC.

MODERATELY RED; WEAK REACTION TO HCI.

42.2 TO 51.7 FT. SANDSTONE WITH MINOR INTERBEDDED CLAY: COLOR RANGES FROM VERY LIGHT GRAY (N8) TO DARK GRAY (N3), FINE TO MEDIUM GRAINED, SUBANGULAR TO SUBROUNDED, LAMINAR TO THINLY BEDDED, SLIGHTLY WEATHERED (W3), AND HARD (H3). SLIGHTLY TO VERY SLIGHTLY FRACTURED (FD2). RECOVERED IN LENGTHS FROM 1.0 TO MORE THAN 3 FEET FROM 42.2 TO 51.7 FEET. UPPER CONTACT IS CONFORMABLE AND SHARP. LOWER CONTACT IS UNKNOWN.

36.7 - 39.1 0.30 WASHED OUT CLAY THROUGHOUT

PROBABLE REASON FOR CORE LOSS: INTERVAL (FT.) AMOUNT INTERPRETATION 22.2 - 26.7 0.15 WASHED OUT CLAY THROUGHOUT

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS

DRILL HOLE DH-3-RPB

NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

RIO PUERCO BRIDGE

BORING LOGS - SHEET 1 OF 2

Designed by: BUREAU OF RECLAMATION

PAGE 1 OF 1

Date: 01/17/14 Drawn by: BOR, rsh, dc

Date: - -Revised by: - -

File Name: 07\_BIAdrillhole1

GEOLOGIC LOG OF DRILL HOLE DH-4-RPB

PROJECT: O.N.H.I.R.

FEATURE: RIO PUERCO BRIDGE

LOCATION: SOUTHERN SIDE OF RIVER CHANNEL

G10

SHEET 1 OF 1

STATE: ARIZONA

31.1 - 37.3 O.8 WASHED OUT CLAY THROUGHOUT

37.3 - 42.3 0.05 WASHED OUT CLAY THROUGHOUT

42.3 - 47.3 0.35 WASHED OUT CLAY THROUGHOUT

DRILL HOLE DH-4-RPB

PAGE 1 OF 1

NOT DETERMINED.

(O.N.H.I.R.)

ESTIMATED DRILLING TIME:

SET-UP AND DRILLING

HOLE COMPLETION:

BACKFILLED WITH EXCAVATED MATERIAL

OFFICE OF NAVAJO HOPI INDIAN RELOCATION ON SITE REPRESENTATIVE

HOLE TERMINATED AT THE DISCRETION

10-HOUR SHIFTS

REASON FOR HOLE TERMINATION:

COORDINATES: N. 11329.25 E. 10162.02 COLLAR ELEVATION: 5607.09

GEOLOGIC LOG OF DRILL HOLE DH-5-RPB SHEET 1 OF 1 FEATURE: RIO PUERCO BRIDGE STATE: ARIZONA COORDINATES: N. 11237.58 E. 10256.43 LOCATION: SOUTH BANK OF THE RIO PUERCO GROUND ELEVATION: 5631.36 BEGUN: 8/19/93 FINISHED: 8/21/93 TOTAL DEPTH: 95.8 ANGLE FROM HORIZONTAL AND BEARING: 90° DEPTH AND ELEV. OF WATER DEPTH TO BEDROCK: 46.0 HOLE LOGGED BY: R. LUNG LEVEL AND DATE MEASURED: SEE NOTES REVIEWED BY: CLASSIFICATION AND NOTES PHYSICAL CONDITION PURPOSE OF HOLE: 0.0 TO 33.1 FT. QUATERNARY ALLUVIUM (QaL): DETERMINE FOUNDATION CONDITIONS AT POORLY GRADED, SUBANGULAR TO SUBROUNDED SAND WITH SM 4 2 15 MINOR AMOUNTS OF FINE GRAVEL AND SILT. INTERBEDED WITH 100 PROPOSED PIER NO. 5 (STA. 30+05.3, SANDY LEAN CLAY BEDS AND SEAMS. DESCRIPTIONS BASED ON OFFSET 10 FT. LT.), PERFORM VISUAL AND LAB ANALYSIS OF SPT SAMPLES OR DRILLING STANDARD PENETRATION TESTING 100 CONDITIONS AND VISUAL ANALYSIS OF CUTTINGS IN AUGERED (SPTs), COLLECT SOIL SAMPLES FOR LABORATORY ANALYSIS AND DETERMINE DEPTH TO ROCK. SP 3 9 33 0.0 TO 4.5 FT. POORLY GRADED, SUBANGULAR TO SUBROUNDED SAND WITH A TRACE OF FINE GRAVEL. DESCRIPTIONS BASED ON DRILL SITE AND SET-UP: SITE LOCATED ON ORIGINAL GROUND AT VISUAL ANALYSIS OF CUTTINGS IN AUGERED INTERVALS. s(CL) 14 7 31 STA. 30+05, 10.0 LT. ABOUT 10 FEET SOUTH OF THE SOUTH BANK OF THE 4.5 TO 5.5 FT. SILTY SAND (SM): RIVER CHANNEL. ABOUT 75% COARSE TO FINE. SUBANGULAR TO SUBROUNDED SAND; ABOUT 25% FINES WITH LOW PLASTICITY. LOW TOUGHNESS, DRILL EQIUPMENT: RAPID DILATANCY, NO DRY STRENGTH; MAX. SIZE COARSE SAND; CME 1250 TRACK MOUNTED DRILL RIG LIGHT BROWN, STRONG REACTION WITH HCL WITH AUTOMATIC PENETRATION TEST SP-SM 21 8 14 HAMMER: 5 FT. LONG 7-1/2 INCH 5593.9 LAB DATA; 51% SAND; 49% FINES; 0% GRAVEL; PI HP; LL NT; MC HOLLOW-STEM FLIGHT AUGERS; 9-INCH 4.2%, POORLY GRADED SAND (SP/GP). CARBIDE TIPPED BIT: 1-3/8 IN. I.D. STANDARD SPLIT-SPOON SAMPLER; 5 5.5 TO 9.5 FT. POORLY GRADED, SUBANGULAR TO SUBROUNDED FT. LONG HQ CORE BARREL WITH SPLIT CL-CH \* SAND WITH MINOR AMOUNTS OF FINE GRAVEL AND SILT. 100 TUBE INNER BARREL; SURFACE SET, DESCRIPTION BASED ON VISUAL ANALYSIS OF CUTTINGS IN DIAMOND BIT; AND HQ RODS. AUGERED INTERVALS. \* \* \* 9.5 TO 10.5 FT. POORLY GRADED SAND (SP): ABOUT 100% WATER TESTING EQUIPMENT; MEDIUM TO FINE, SUBANGULAR TO SUBROUNDED SAND, TRACE OF 100 | 100 | NO WATER TESTS REQUIRED. NONPLASTIC FINES; MAX. SIZE MEDIUM GRAINED SAND; LIGHT BROWN; NO REACTION WITH HCI. DRILLER; J. HAYDEN. LAB DATA; 94% SAND; 6% FINES; 0% GRAVEL; PI NP; LL NT; MC DRILL FLUID: 3.4%, POORLY GRADED SAND (SP-SM). NO DRILL FLUID FROM 0.0 TO 46.0 FT., USED WATER AS DRILL FLUID 10.5 TO 14.5 FT. POORLY GRADED, SUBANGULAR TO FROM 46.0 TO 95.8 FT. SUBROUNDED SAND WITH MINOR AMOUNTS OF FINE GRAVEL. DESCRIPTION BASED ON VISUAL ANALYSIS OF CUTTINGS IN DRILL FLUID RETURN: 100 | 100 AUGERED INTERVALS. INTERVAL (FT.) % RETURN TrC 0.0 - 46.0 FA-NA 14.5 TO 15.5 FT. POORLY GRADED SAND (SP): ABOUT 100% 46.0 – 50.8 90 MEDIUM TO FINE, SUBANGULAR TO SUBROUNDED SAND, TRACE OF *50.8 – 95.8 95* NONPLASTIC FINES; MAX. SIZE MEDIUM GRAINED SAND; LIGHT DRILL FLUID RETURN COLOR: BROWN; NO REACTION WITH HCI (CLAY LENSE PRESENT IN INTERVAL (FT.) COLOR SAMPLE). 0.0 - 46.0 FA-NA 46.0 - 95.8 REDDISH BROWN LAB DATA; 74% SAND; 26% FINES; 0% GRAVEL; PI NP; LL NT; MC 3.9%, SILTY SAND (SM). DRILLING METHODS: INTERVAL METHOD/ (FT.) BARREL SIZE 15.5 TO 19.5 FT. POORLY GRADED, SUBANGULAR TO 0 – 46.0 7–1/2 IN. FA; SPTs AT 5 SUBROUNDED SAND WITH MINOR AMOUNTS OF FINE GRAVEL. FT. INTERVALS DESCRIPTIONS BASED ON VISUAL ANALYSIS OF CUTTINGS IN 46.0 – 95.8 HQ CORE 100 | 100 | AUGERED INTERVALS. DRILLING CONDITIONS AND DRILLER'S 19.5 TO 20.5 FT. SANDY LEAN CLAY (CL): COMMENTS: ABOUT 50% FINES WITH HIGH PLASTICTY, HIGH TOUGHNESS. NO 100 | 100 | 3 0.0 - 33.1 FT. AUGERED SMOOTH; DILATANCY. HIGH DRY STRENGTH: ABOUT 40% MEDIUM GRAINED. 5531.2 33.1 TO 46.0 FT. AUGERED SUNROUNDED TO ROUNDED SAND; MAX. SIZE MEDIUM GRAINED PREDOMINATELY SMOOTH; AT 45.0 FT. SAND; MODERATE BROWN; WEAK REACTION WITH HCI. AUGERED VERY HARD, PROBABLY FIRST SIGNIFICANT SANDSTONE LENSE AT 46.0 FT. AUGER REFUSAL. CASINS RECORD (FA): FA = 7-1/2 IN. FLIGHT AUGER PI = PLASTICITY INDEXCASING CASING INTERVAL. MC = MOISTURE CONTENT LL = LIQUID LIMITSIZE DEPTH DRILLED NP = NON PLASTICNT = NOT TESTED7-1/2 IN. 0-46.0 0-46.0 NA = NOT APPLICABLE SPT = STANDARD PENETRATION TESTING 7-1/2 IN. 46.0 46.0-95.8 DEPTH TO WATER DURING DRILLING; \* MOIST CONT (INP) = 34.5 TO 34.9 12.3 \* SPT = 34.5 TO 34.9 94/0.4

*39.5 TO 40.0 11.4* 

44.5 TO 44.9 13.1

44.0 TO 44.9 100

\* % CORE RECOVERY = 34.0 TO 34.9 100

these plans.

*39.5 TO 40.0 76/0.5* 

44.5 TO 44.9 74/0.4

44.0 TO 44.9 CL/CH

PAGE 1 OF 1

DRILL HOLE DH-5-RPB

\* USCS = 34.0 TO 34.9 CL/CH

NOTE: Subsurface investigation information has been obtained for designer use only. The Government shall not be responsible for any misinterpretation or assumptions made by the Contractor

based on the subsurface investigation information presented on

GEOLOGIC LOG OF DRILL HOLE DH-5-RPB

RESERVATION

Navajo

ROUTE

N2007

FEATURE: RIO PUERCO BRIDGE LOCATION: SOUTH BANK OF THE RIO PUERCO BEGUN: 8/19/93 FINISHED: 8/21/93 DEPTH AND ELEV. OF WATER

LEVEL AND DATE MEASURED: SEE NOTES

G12

COORDINATES: N. 11237.58 E. 10256.43 TOTAL DEPTH: 95.8 DEPTH TO BEDROCK: 46.0

STATE: ARIZONA GROUND ELEVATION: 5631.36 ANGLE FROM HORIZONTAL AND BEARING: 90° HOLE LOGGED BY: R. LUNG REVIEWED BY:

#### CLASSIFICATION AND PHYSICAL CONDITION

REGION

Navajo

CLASSIFICATION AND PHYSICAL CONDITION

PROJECT

N2007(1-1)1,2&4

SHEET

B-8

SHEET 1 OF 1

TOTAL SHEETS

63

G12

LAB DATA; 19% SAND; 81% FINES; 0% GRAVEL; PI 18%; LL 32%; MC 14.7%; LEAN CLAY WITH SAND (CL)s.

20.5 TO 24.5 FT. CLAY WITH A TRACE OF FINE GRAINED SAND SILT. DESCRIPTION BASED ON VISUAL ANALYSIS OF CUTTINGS IN AUGERED INTERVALS.

24.5 TO 25.5 FT. LEAN CLAY (CL): ABOUT 90% FINES WITH HIGH PLASTICITY, HIGH TOUGHNESS. NO DILATANCY. HIGH DRY STRENGTH; ABOUT 10% FINE. SUBANGULAR TO SUBROUNDED SAND; MAX. SIZE MEDIUM SAND; MODERATE BROWN; NO TO STRONG REACTION WITH HCI.

LAB DATA; 25% SAND; 75% FINES; 0% GRAVEL; PI 16%; LL 30%; MC 22.8%, LEAN CLAY WITH SAND (CL).

25.5 TO 27.0 FT. CLAY WITH A TRACE OF FINE GRAINED SAND. DESCRIPTION BASED ON VISUAL ANALYSIS OF CUTTINGS IN AUGERED INTERVALS.

27.0 TO 29.5 FT. POORLY GRADED SUBANGULAR TO SUBROUNDED SAND WITH MINOR AMOUNTS OF FINE GRAVEL. DESCRIPTIONS BASED ON VISUAL ANALYSIS OF CUTTINGS IN AUGERED INTERVALS.

29.5 TO 30.5 FT. POORLY GRADED SAND WITH CLAY (SP-SM): ABOUT 90% COARSE TO FINE, SUBANGULAR TO SUBROUNDED SAND; ABOUT 10% FINES WITH MEDIUM PLASTICITY, MEDIUM TOUGHNESS, NO DILATANCY, MEDIUM DRY STRENGTH; MAX. SIZE COARSE SAND; LIGHT BROWN; NO TO WEAK REACTION WITH HCI.

LAB DATA; 67% SAND; 13% FINES; 0% GRAVEL; PI NP; LL NT; MC 21.6%, SILTY SAND (SM).

30.5 TO 33.1 FT. POORLY GRADED, SUBANGULAR TO SUBROUNDED SAND WITH MINOR AMOUNTS OF FINE GRAVEL. DESCRIPTIONS BASED ON VISUAL ANALYSIS OF CUTTINGS IN AUGERED INTERVALS.

33.1 TO 95.6 FT. TRIASSIC CHINLE FORMATION (TrC):

33.1 TO 44.0 FT. SANDY CLAYSTONE: DESCRIPTION BASED ON VISUAL ANALYSIS OF DRILLING CONDITIONS AND CUTTINGS IN AUGERED INTERVALS. COLOR RANGES FROM PALE RED (5R 6/2) TO MODERATE RED (5R 4/6). SANDY CLAYSTONE IS THINLY TO MODERATELY BEDDED AND INTENSELY (W7) TO MODERATELY (W5) WEATHERED WITH DEPTH (APPROXIMATELY 10 TO 12 FEET). VERY SOFT (M7) BREAKING WITH LIGHT MANUAL PRESSURE. THE UPPER CONTACT IS UNCONFORMABLE AND SHARP WHILE LOWER CONTACT IS CONFORMARIE AND GRADATIONAL MINOR SANDSTONE LENSES RANGING FROM 0.1 TO 0.5 FT. ARE ENCOUNTERED FROM 2.0 TO 5.0 FT. ABOVE THE LOWER CONTACT.

34.5 TO 34.9 FT. CLAYSTONE VISUALLY CLASSIFIED AS A LEAN TO FAT CLAY CL/CM; ABOUT 85% FINES WITH HIGH PLASTICITY, HIGH TOUGHNESS. NO DILATANCY, HIGH DRY STRENGTH; ABOUT 15% FINE. SUBANGULAR TO SUBROUNDED SAND; MAX. SIZE FINE SAND; MODERATE RED; NO REACTION WITH HCI.

LAB DATA: 45% SAND: 55% FINES: 0% GRAVEL: PI 10%: LL 30%: MC 12.3%, LEAN CLAY TO CLAYEY SAND CL/SC.

34.9 TO 39.5 FT. SANDY CLAYSTONE: DESCRIPTION BASED ON DRILLING CONDITIONS AND CUTTINGS.

39.5 TO 40.0 FT. CLAYSTONE VISUALLY CLASSIFIED AS A LEAN TO FAT CLAY CL/CH; ABOUT 85% FINES WITH HIGH PLASTICITY, HIGH TOUGHNESS. NO DILATANCY, HIGH DRY STRENGTH; ABOUT 15% FINE. SUBANGULAR TO SUBROUNDED SAND; MAX. SIZE FINE SAND; MODERATE RED; NO REACTION WITH HCI.

LAB DATA: 38% SAND: 62% FINES: 0% GRAVEL: PI 7%: LL 29%: MC 11.4%, SANDY CLAYEY SILT s(CL-ML).

40.0 TO 44.0 FT. SANDY CLAYSTONE; DESCRIPTION BASED ON DRILLING CONDITIONS AND CUTTINGS.

44.0 TO 44.9 FT. CLAYSTONE VISUALLY CLASSIFIED AS A SANDY LEAN TO FAT CLAY: s(CL-CH); ABOUT 60% FINES WITH HIGH PLASTICITY, HIGH TOUGHNESS, NO DILATANCY, HIGH DRY STRENGTH; ABOUT 40% MEDIUM GRAINED. SUBROUNDED TO ROUNDED SAND: MAX. SIZE MEDIUM GRAINED SAND; MODERATE RED; WEAK REACTION WITH HCI.

LAB DATA; 73% SAND; 27% FINES; 0% GRAVEL; PI NP; LL NT; MC 13.1%, SANDY SILT SM.

44.9 TO 77.3 FT. SANDSTONE WITH INTERBEDDED CLAYSTONE: COLOR RANGES FROM GRAYISH PINK (5R 6/2) TO VERY LIGHT GRAY (N8) WITH CLAYSTONE INTERBEDS RANGING FROM PALE RED (5R 6/2) TO MODERATE RED (5R 4/2). FINE TO MEDIUM GRAINED. THINLY BEDDED, SLIGHTLY (W3) TO PREDOMINATELY MODERATELY (W5) WEATHERED; HARD (H3) TO PREDOMINATELY MODERATELY HARD (H4). MODERATELY FRACTURED (FD3), RECOVERED PREDOMINATELY IN LENGTHS FROM 0.33 TO 1.0 FOOT FROM 46.0 TO 46.6 FEET. INTENSELY FRACTURED (FD7), RECOVERED PREDOMINATELY IN LENGTHS FROM 0.1 TO 0.33 FOOT FROM 46.6 TO 51.6 FEET. MODERATELY FRACTURED (FD5). RECOVERED PREDOMINATELY IN LENGTHS FROM 0.33 TO 1.0 FOOT FROM 51.6 TO 75.1 FEET INTENSELY FRACTURED (FD7), RECOVERED PREDOMINATELY IN LENGTHS FROM 0.1 TO 0.33 FOOT FROM 75.1 TO 77.3 FEET. CLAYSTONE INTERBEDS ENCOUNTERED FROM: 47.3 TO 47.6 FEET., 51.6 TO 54.0 FT., 55.6 TO 56.1 FT., 57.6 TO 58.0 FT., 61.9 TO 62.4 FT., 65.4 TO 66.6 FT., 67.6 TO 69.4 FT., AND 73.4 TO 75.1 FT., FROM 48.6 TO 51.6 FT., GRAVEL TO PEBBLE CONGLOMERATE. CLAST SUPPORTED (90%) WITH A CLAY MATRIX. CLASTS COMPOSED OF INTENSELY WEATHERED SANDSTONE. CONGLOMERATE HAS A STRONG REACTION WITH HCI. UPPER CONTACT IS CONFORMABLE AND GRADATIONAL WHILE LOWER CONTACT IS CONFORMABLE AND SHARP. THE LOWER CONTACT IS INDICATED BY A GRAVEL TO PEBBLE CONGLOMERATE FROM 75.8 TO 77.3 FT. THIS CONGLOMERATE IS CLAST SUPPORTED (90%) WITH A CLAY MATRIX, CLASTS COMPOSED OF INTENSELY (W7) WEATHERED SANDSTONE; LARGEST CLAST 0.15 FT.

77.3 TO 91.5 FT. SANDSTONE WITH MINOR INTERBEDDED CLAY: COLOR RANGES FROM VERY LIGHT GRAY (N8) TO DARK GRAY (N3). FINE TO MEDIUM GRAINED, SUBANGULAR TO SUBROUNDED. LAMINAR TO THINLY BEDDED; SLIGHTLY WEATHERED (W3); MODERATELY HARD (H4) TO HARD (H3). SLIGHTLY TO VERY SLIGHTLY FRACTURED (FD2), RECOVERED IN LENGTHS FROM 1.0 TO MORE THAN 3 FEET FROM 77.3 TO 90.3 FEET. INTENSELY FRACTURED (FD7), RECOVERED PREDOMINATELY IN LENGTHS FROM 0.1 TO 0.33 FOOT FROM 90.3 TO 91.5 FEET. UPPER CONTACT IS CONFORMABLE AND SHARP, LOWER IS CONFORMABLE AND SHARP.

91.5 TO 95.8 FT. SILTY CLAYSTONE: COLOR IS PALE OLIVE (10Y 6/2). MODERATELY TO THICKLY BEDDED. SLIGHTLY WEATHERED TO FRESH (W2) BUT VERY SOFT (H7). SLIGHTLY FRACTURED (FD3). RECOVERED PREDOMINATELY IN LENGTHS FROM 1 TO 3 FEET FROM 91.5 TO 95.8 FEET. UPPER CONTACT IS CONFORMABLE AND SHARP WHILE LOWER CONTACT IS UNKNOWN.

PROBABLE REASON FOR CORE LOSS:

INTERVAL (FT.) AMOUNT INTERPRETATION 55.8 - 60.8 0.2 WASHED OUT CLAY THROUGHOUT 65.8 - 70.8 0.1 WASHED OUT CLAY THROUGHOUT 70.8 - 75.8 0.25 WASHED OUT CLAY THROUGHOUT

> PAGE 1 OF 1 DRILL HOLE DH-5-RPB

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS

NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

RIO PUERCO BRIDGE

BORING LOGS - SHEET 2 OF 2

Designed by: BUREAU OF RECLAMATION

Date: 01/17/14 Drawn by: BOR, rsh, dc

Revised by: - -

CASING RECORD (FA):

NOT DETERMINED.

HOLE COMPLETION;

(O.N.H.I.R.).

CASING CASING INTERVAL.

SIZE DEPTH DRILLED

7-1/2 IN. 0.0-31.1 0.0-31.1

7-1/2 IN. 31.1 31.1-62.3

DEPTH TO WATER DURING DRILLING:

BACKFILLED WITH EXCAVATED MATERIAL.

HOLE TREMINATED AT THE DISCRETION

10-HOUR SHIFTS

REASON FOR HOLE TERMINATION:

ESTIMATED DRILLING TIME:

SET-UP AND DRILLING

OF OFFICE OF NAVAJO HOPI INDIAN

RELOCATION ON SITE REPRESENTATIVE

100 —

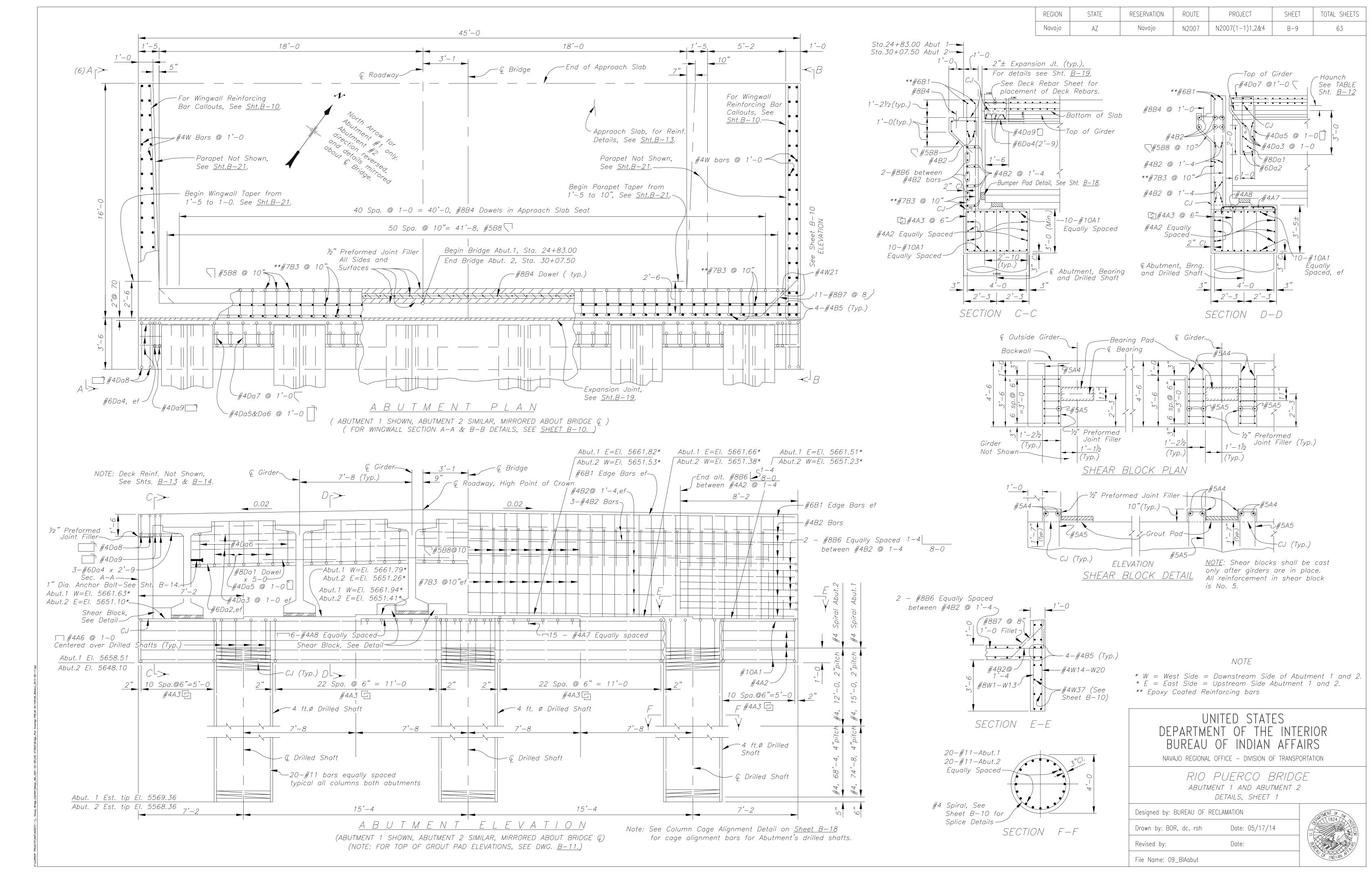
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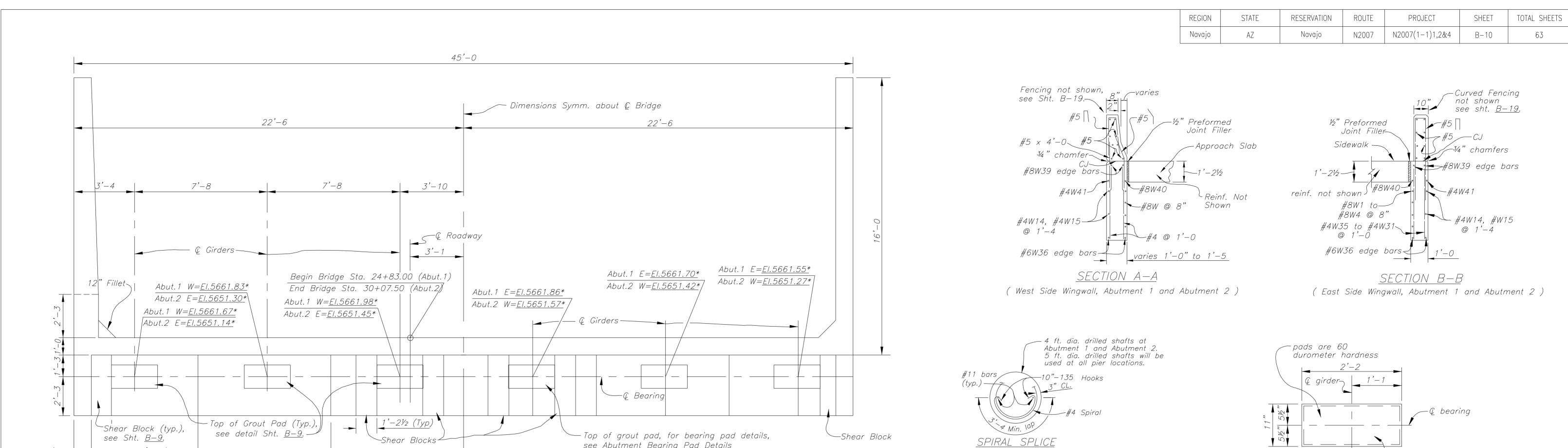
FA = 7-1/2 IN. FLIGHT AUGER

COMMENTS:

Date: - -

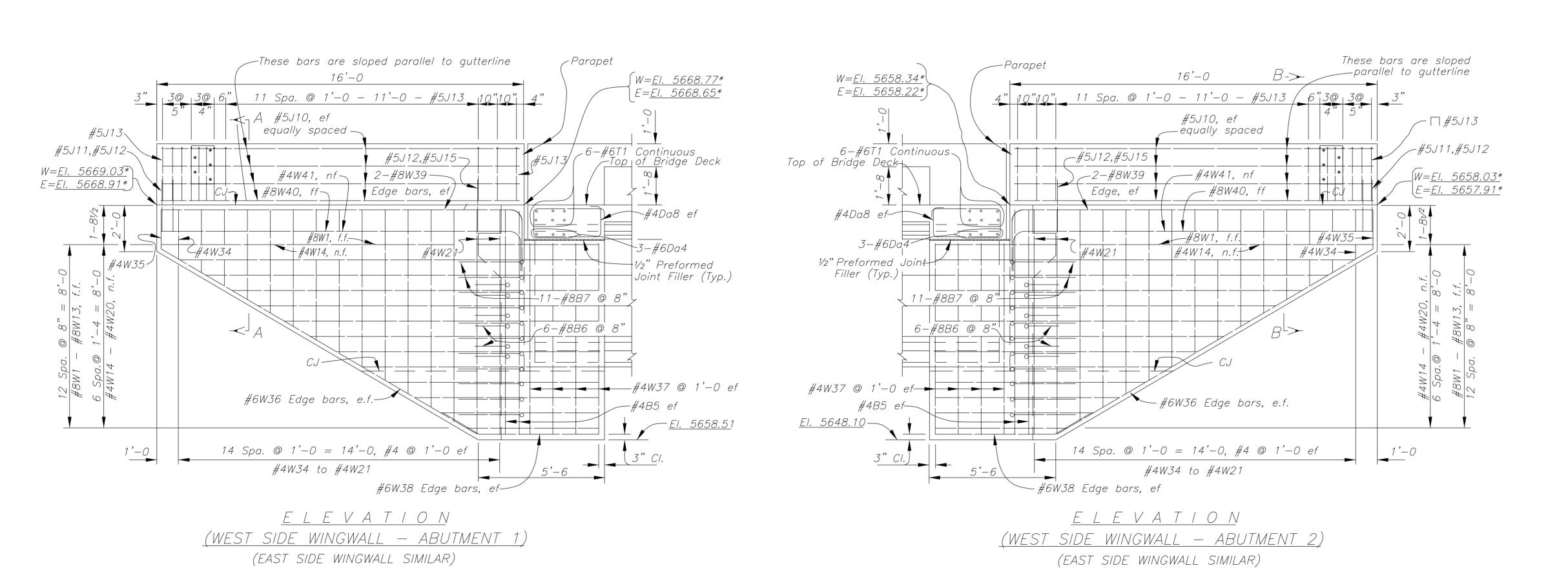
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( No Scale )



see Abutment Bearing Pad Details

Note: Grout Pads = Bearing Seats

-Shear Blocks∠

ABUTMENT CAP PLAN

(VIEW IS TAKEN AT BEAM SEATS)

1'-0

1'-21/2-

4'-111/2

7'-2

7'-8

RIO PUERCO BRIDGE ABUTMENT 1 AND ABUTMENT 2 DETAILS, SHEET 2 Date: 01/17/14

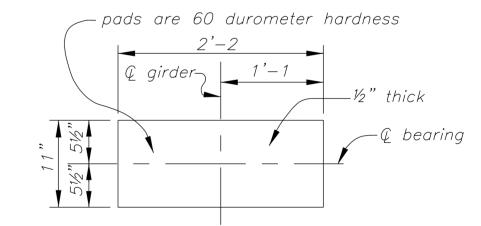
Revised by: - -Date: - -File Name: 10\_BIAwing

-14 gage steel shim molded securely to pad (6 per pad) ½" cl. all around -2 layers @ 0.25" top and bottom, ELEVATION 5 layers @ 0.510"

ABUTMENT BEARING PAD DETAIL

NOTE: use at both abutments

(12 REQUIRED)



P L A N NOTE: use at all piers PIER BEARING PAD DETAIL ( 36 REQUIRED ) No Scale

NOTE

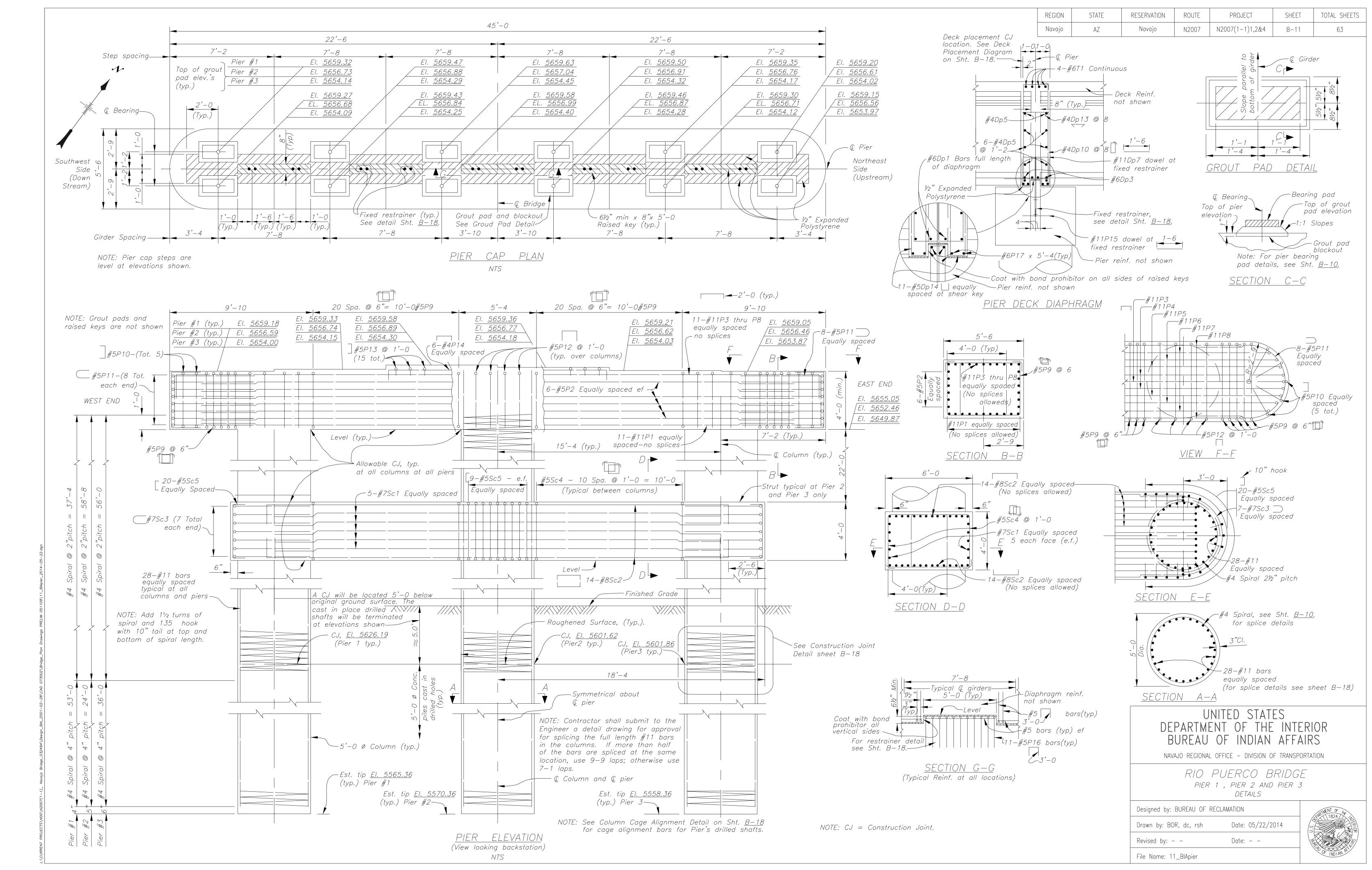
\*  $W = West \ Side = Downstream \ side \ of \ abutment \ 1 \ and \ 2$ \*  $E = East \ Side = Upstream \ side \ of \ abutment \ 1 \ and \ 2$ 

# UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS

NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

Designed by: BUREAU OF RECLAMATION

Drawn by: BOR, dc, rsh



TOTAL SHEETS

63

B-12

REGION

Navajo

RESERVATION

Navajo

Revised by: - -

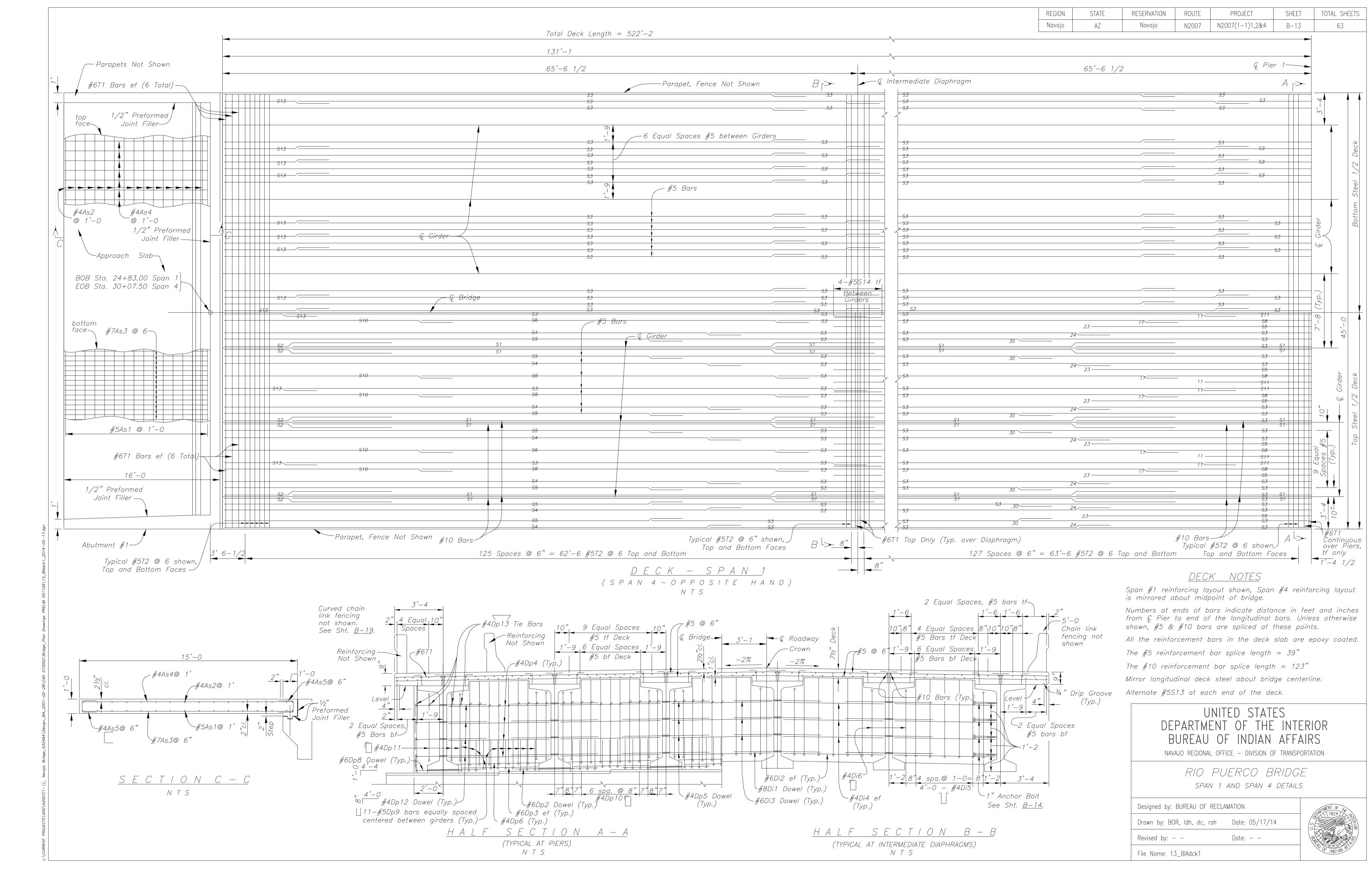
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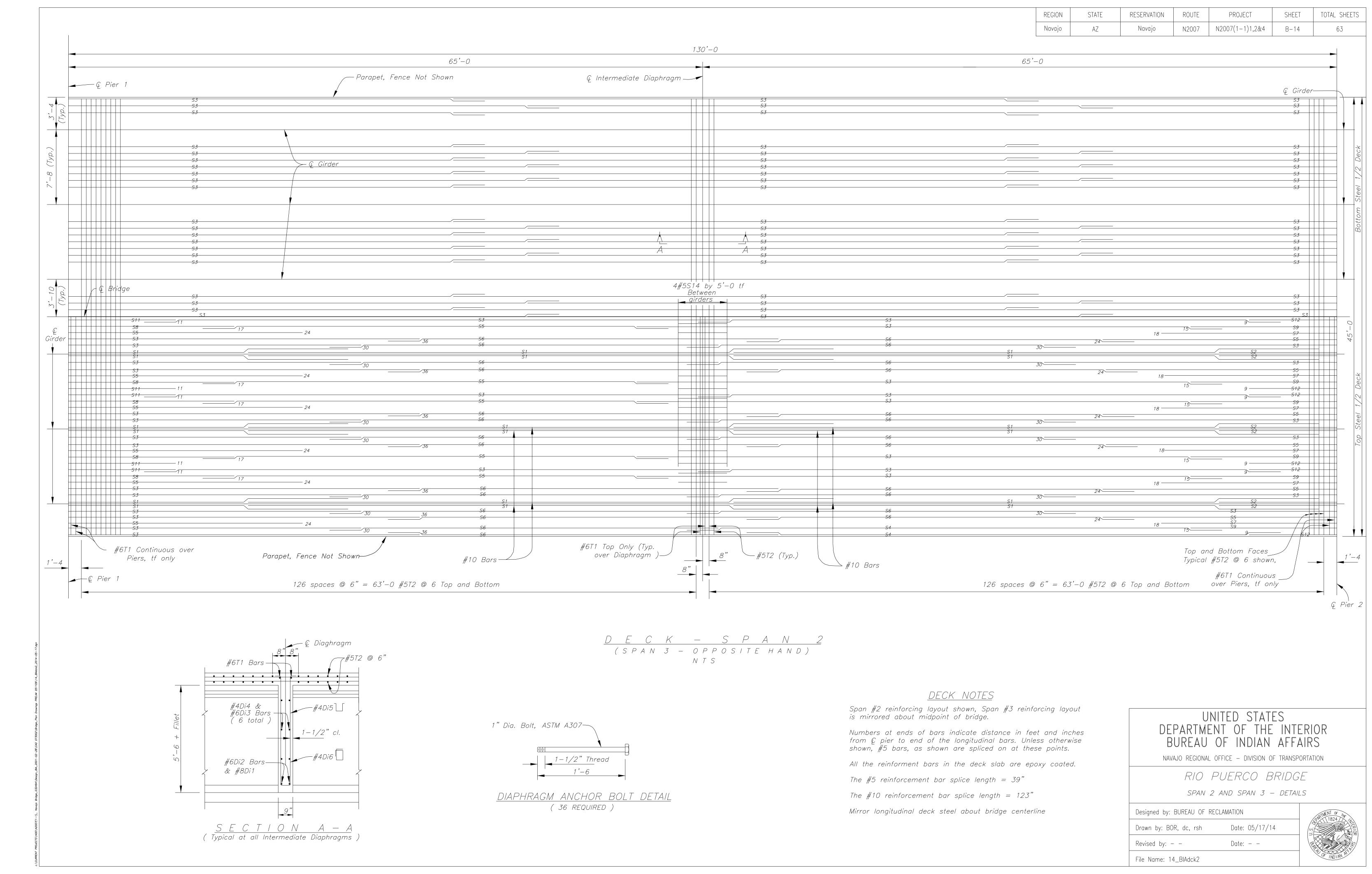
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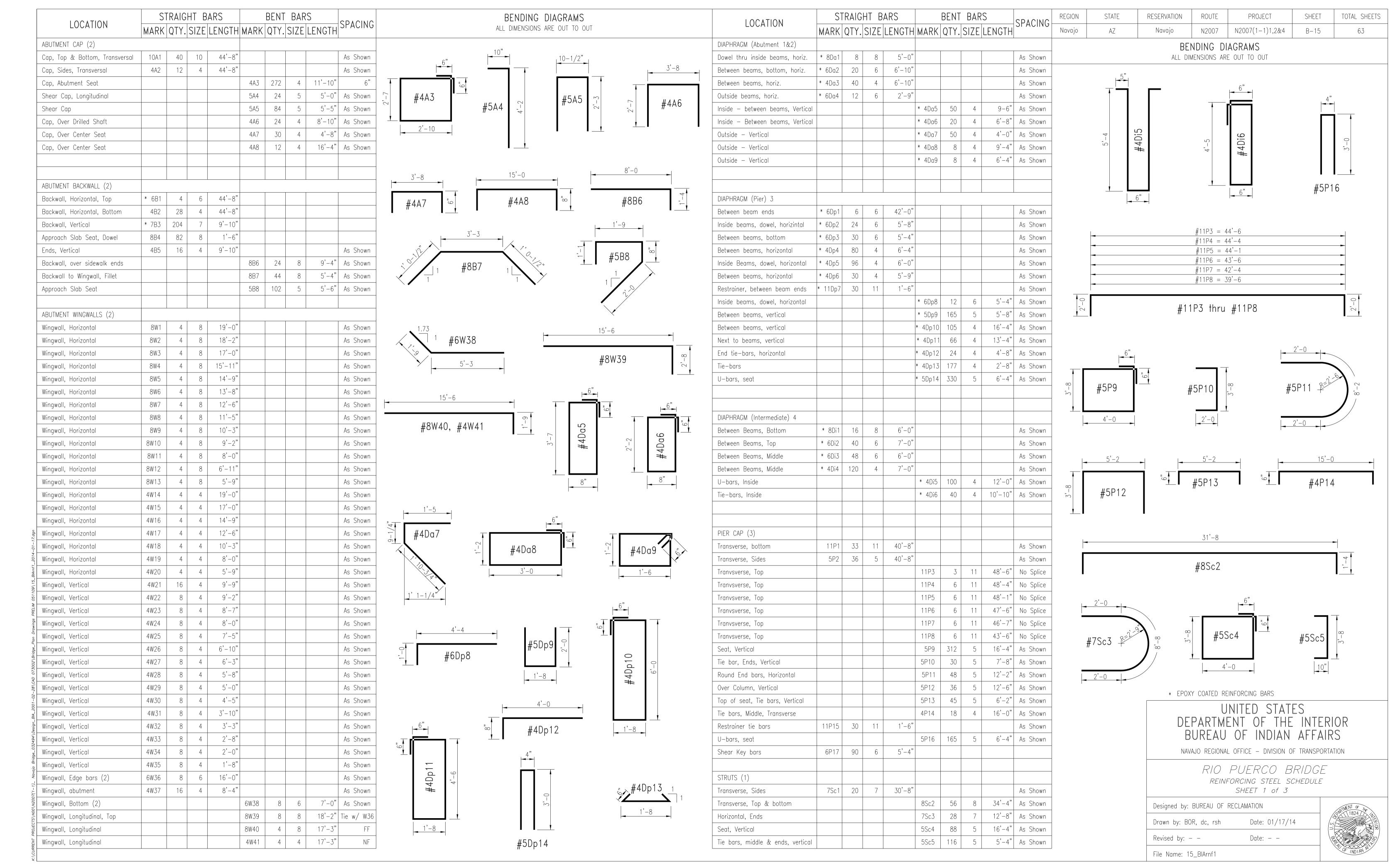
N2007

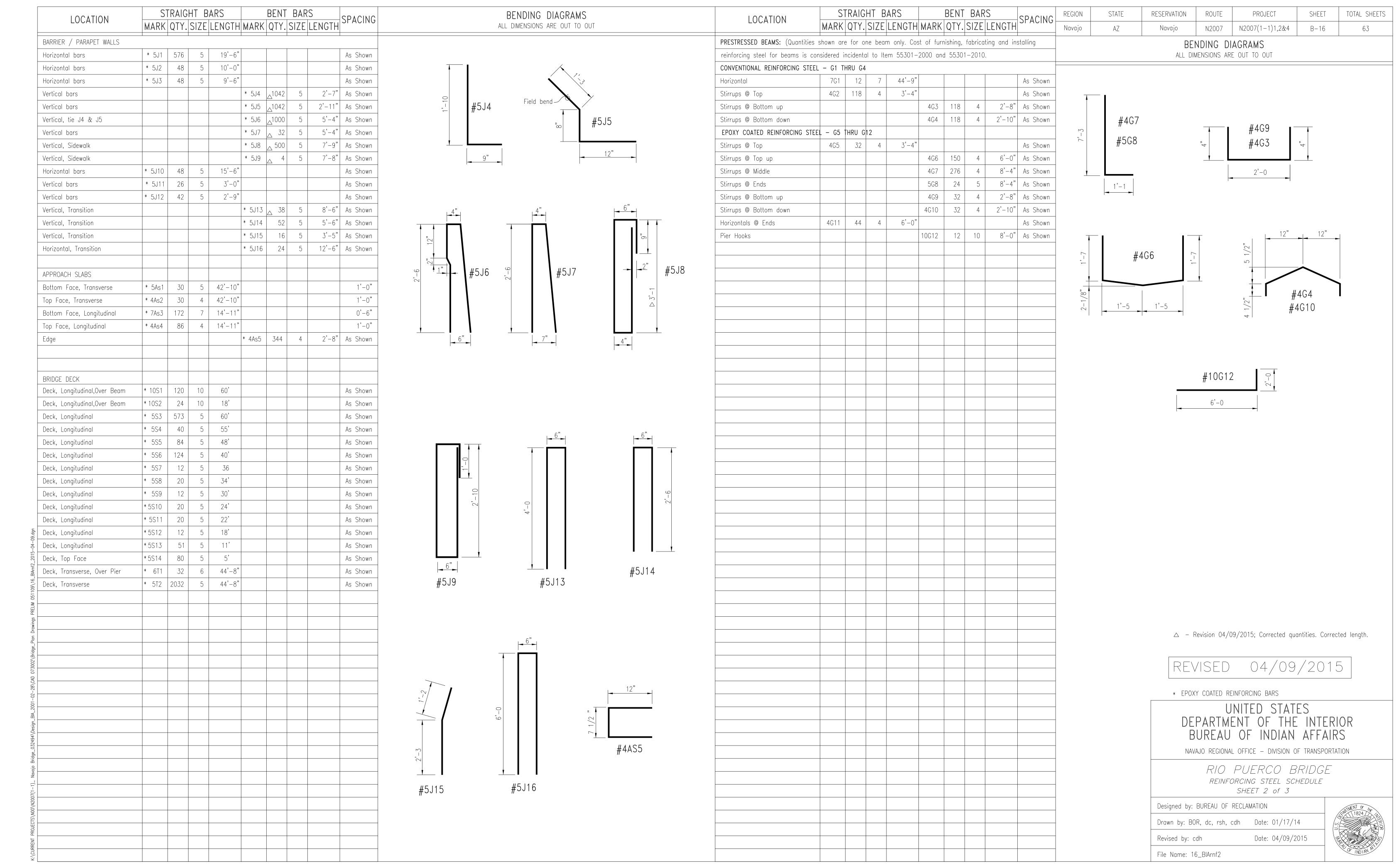
PROJECT

N2007(1-1)1,2&4

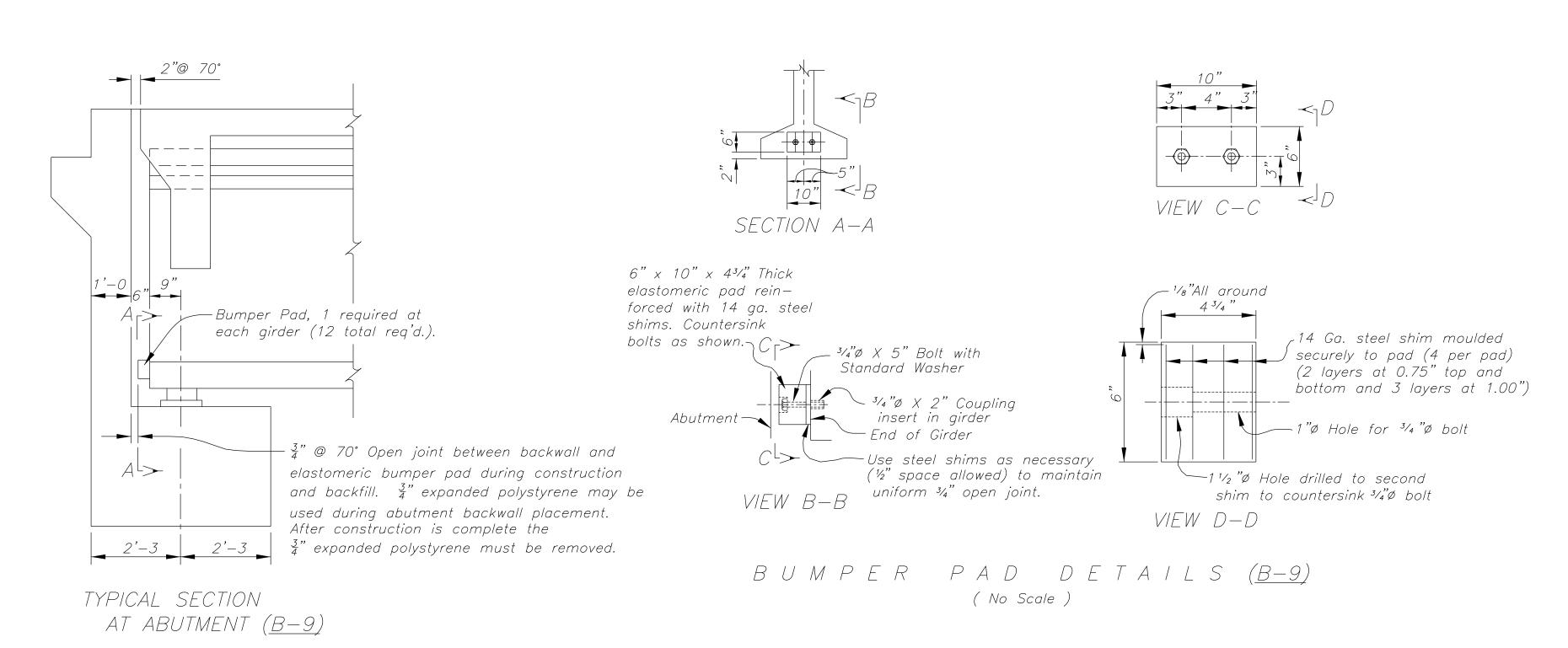


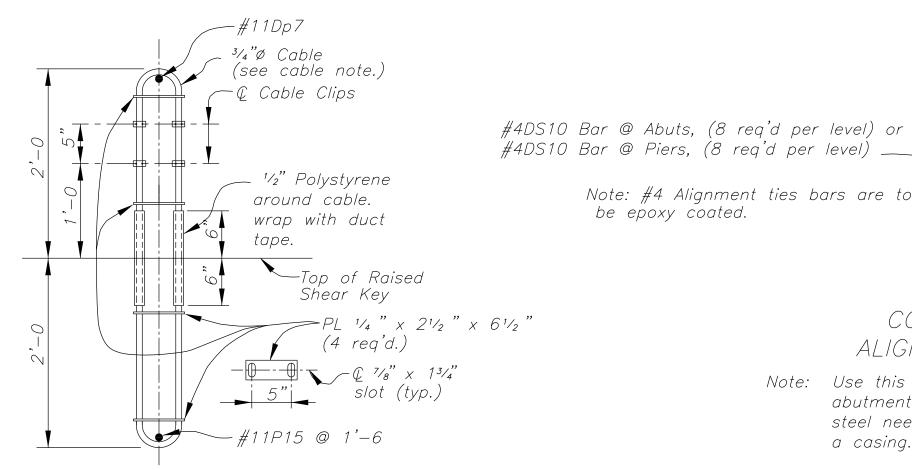












REGION

Navajo

RESERVATION

Navajo

Note: #4 Alignment ties bars are to

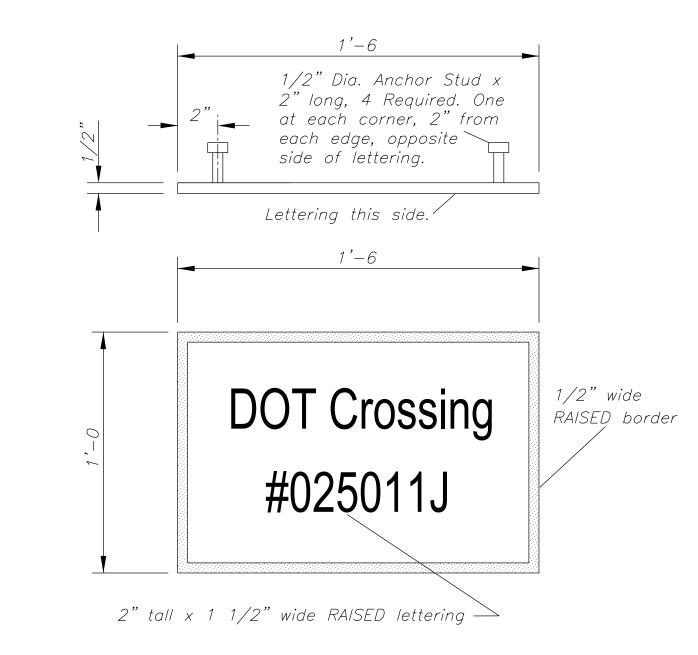
be epoxy coated.

N2007

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.

> Note: The splice detail shown shall be used at the construction joint at top of drilled shaft for Piers 1, 2 & 3



SHEET

B-18

Heavy ties at

intersections.

-Top of Casing

PROJECT

N2007(1-1)1,2&4

COLUMN CAGE

ALIGNMENT DETAIL

abutments where column cage

steel needs to be aligned inside

Note: Use this detail at all piers and

a casing.

TOTAL SHEETS

63

#### 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 plagues are required, one (1) for each end of the bridge. Bronze plagues shall be installed as shown on Sheets B-20 and B-21. Submit shop drawings for bronze plagues 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

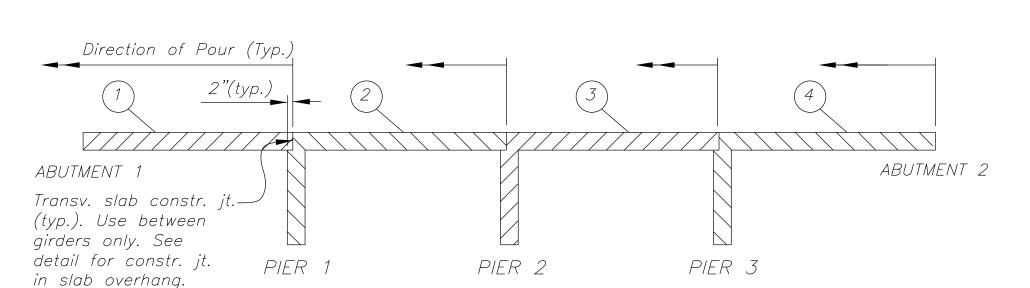
Designed by: BUREAU OF RECLAMATION

Drawn by: BOR, dc, rsh, cdh Date: 01/17/14

Revised by: cdh

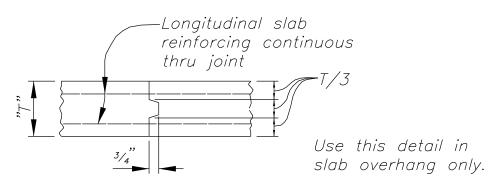
File Name: 18\_BIAmisc

Date: 04/08/2015

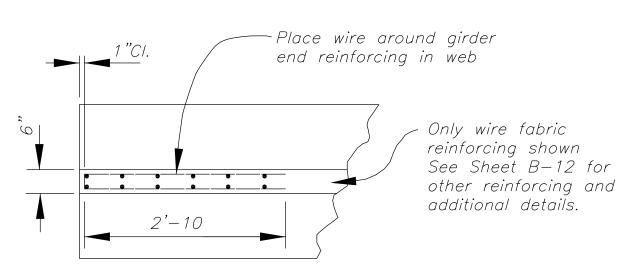


#### DECK POURING DIAGRAM ( No Scale )

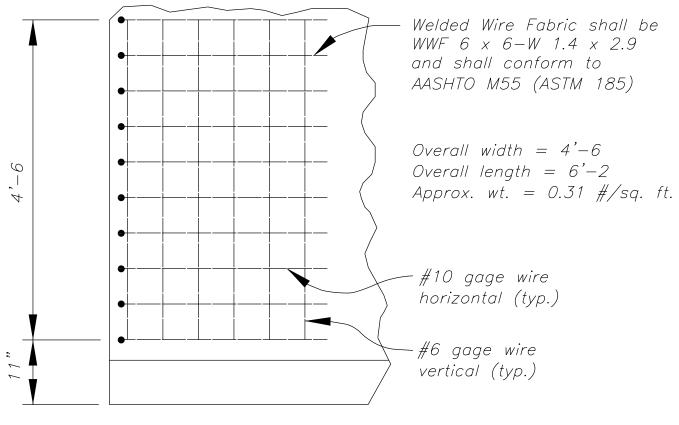
NOTE: Pour end diaphragms and intermediate diaphragms first. Then deck pours shall be made in numerial sequence and in the direction



TRANSVERSE SLAB CONSTRUCTION JOINT ( No Scale )



GIRDER END PLAN (B-12)

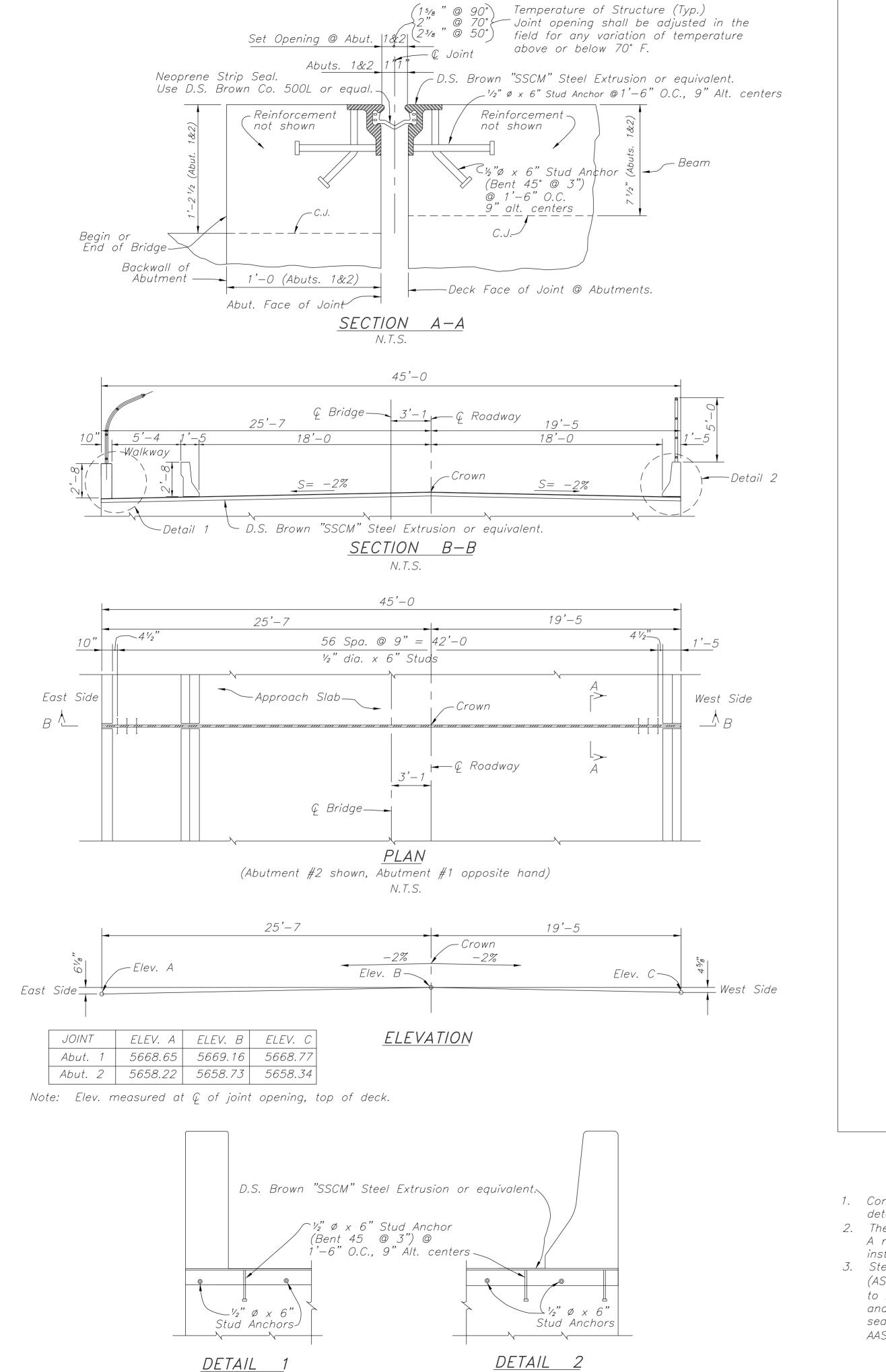


GIRDER END ELEVATION (B-12)

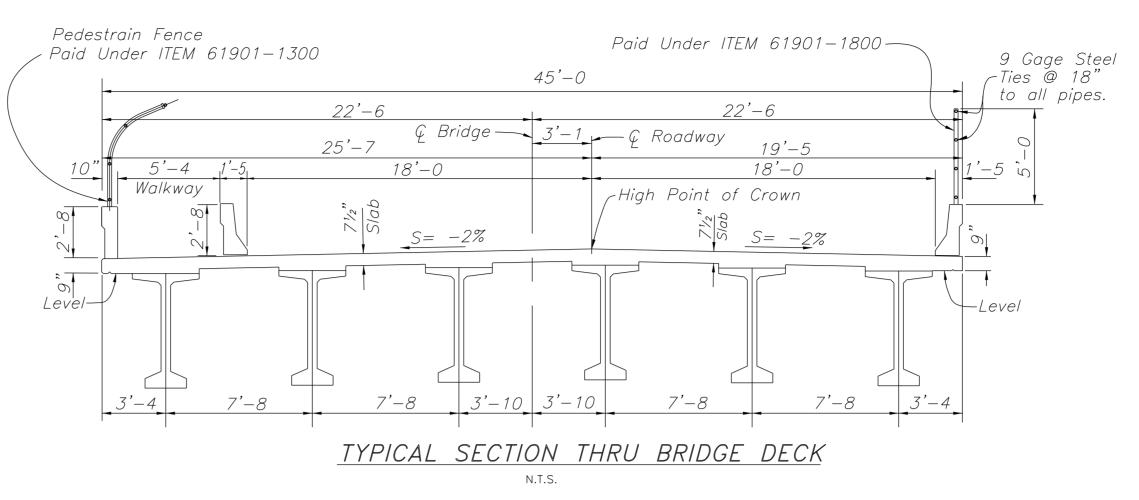
55401-1000 55201-0200 -Construction joint at top of drilled shaft at Piers 1, 2 & 3 (Roughen top surface)

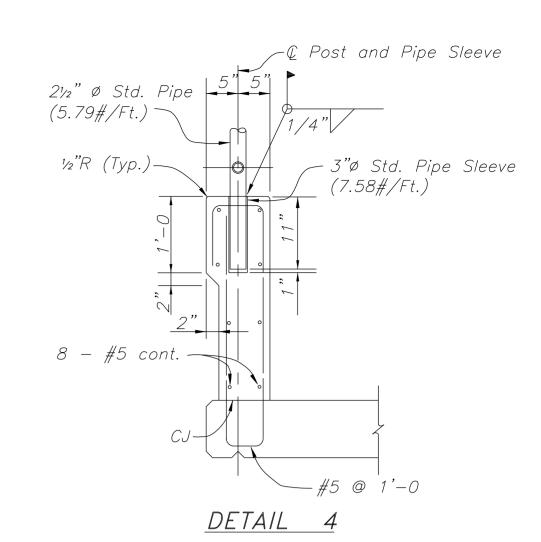
CONSTRUCTION JOINT DETAIL

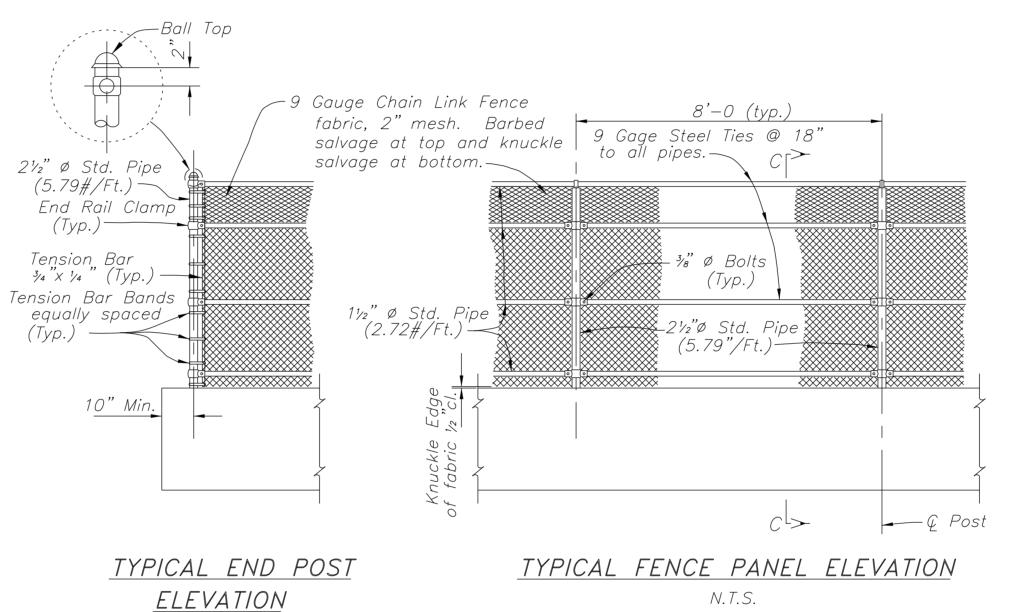
shown. Place pier diaphragms just before deck closures. The purpose of this deck pouring diagram is to place all deck concrete on both sides of a pier diaphragm before casting the pier diaphragm. The contractor may submit an alternative sequence to the Engineer for approval provided that it accomplishes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

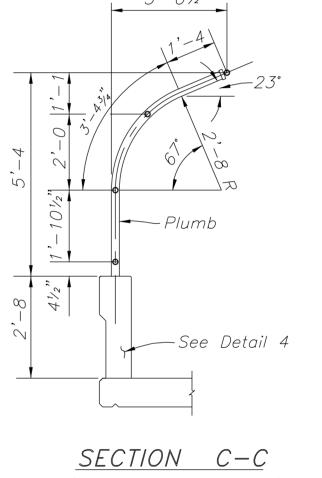


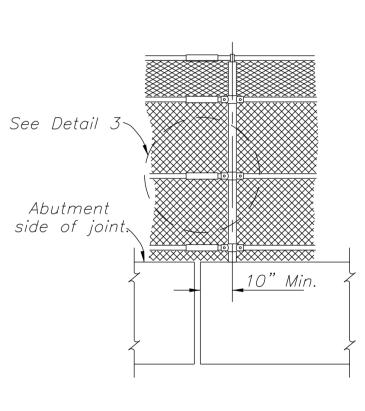












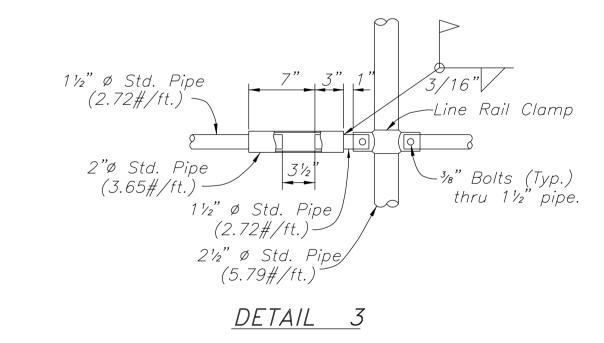
 $\underline{SECTION}$  C-C (Typical Interior Post)

<u>FENCE DETAIL AT</u> PARAPET EXPANSION JOINT

### CHAIN LINK NOTES

- 1. 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.

  2. 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.
- 3. All exposed edges shall be smooth.4. All bolt heads shall be to the inside.



#### EXPANSION JOINT GENERAL NOTES

- 1. Contractor shall submit shop drawings for the joint showing all fabrication
- details and material specifications according to specification requirements.

  2. The joint shall be installed in accordance with the manufacture's instructions. A representative of the manufacture shall be present at the job site during installation.
- 3. 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

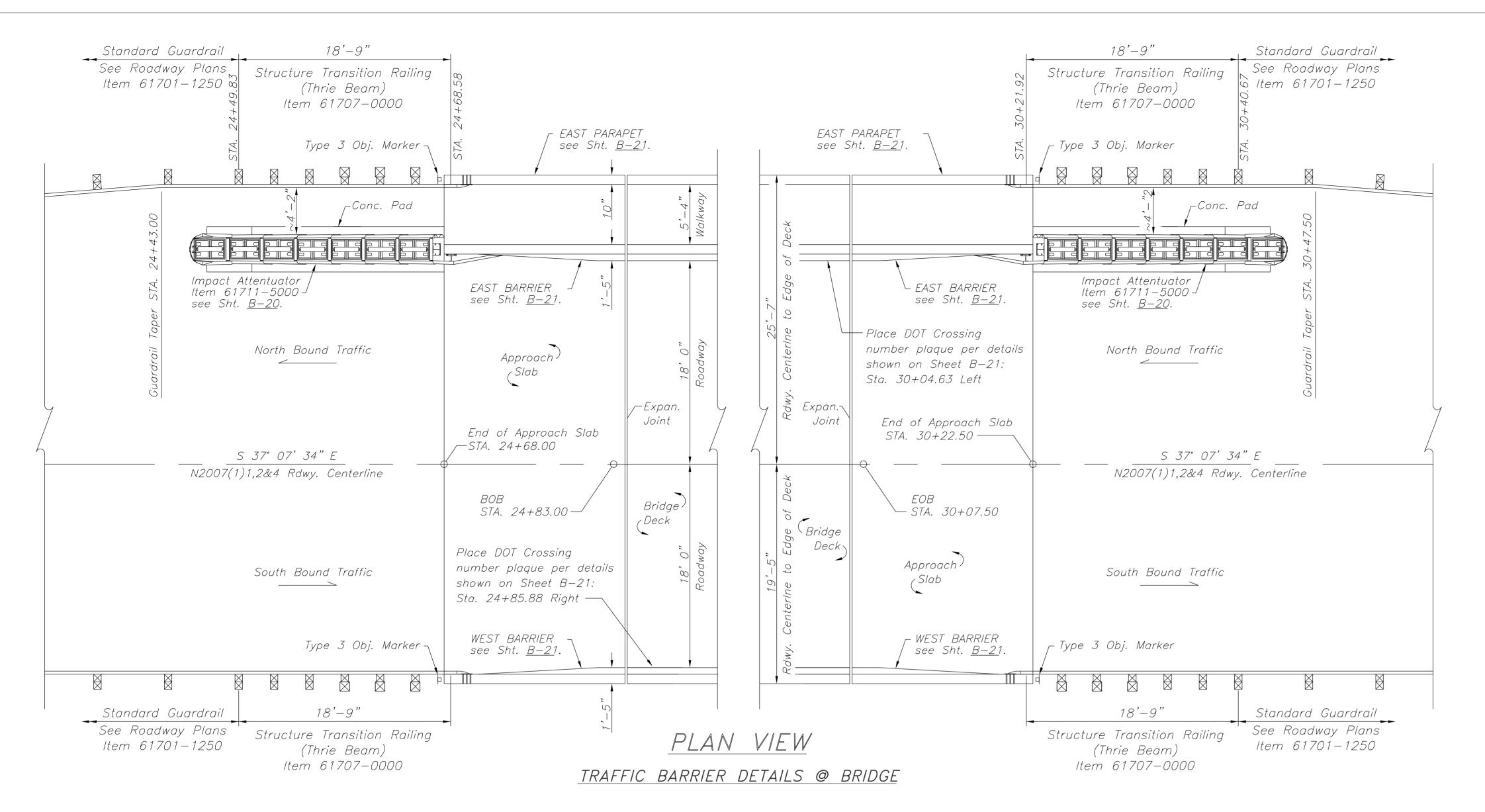
Designed by: BUREAU OF RECLAMATION

Drawn by: BOR, dc, rsh

Revised by: - - Date: - -







STATE RESERVATION ROUTE PROJECT SHEET TOTAL SHEETS REGION N2007 N2007(1-1)1,2&4 Navajo B - 20Navajo 63

### STRUCTURE TRANSITION RAILING NOTES

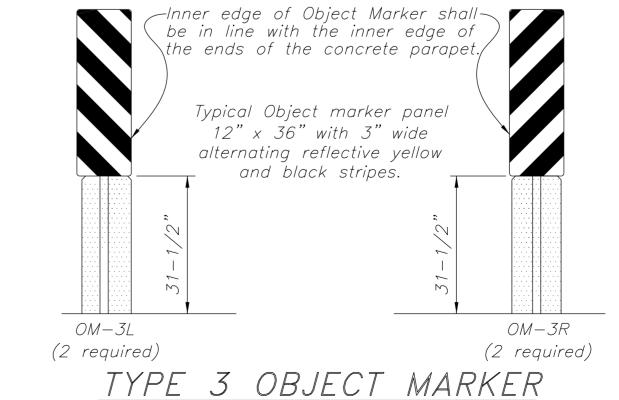
NOTE: See Sheet B-21 for primary details regarding the STRUCTURE TRANSITION RAILING. See Sheet B-21 for location of Section views shown on this sheet.

- 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"ø high strength bolts. Connect blocks to barrier/parapet with 5/8"ø 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 quardrail and to prevent seepage of water into the pavement from the guard rail post

between existing wingwall and approach guardrail post #1. —Inner edge of Object Marker shall— be in line with the inner edge of the ends of the concrete parapet,

NOTE: Place object marker posts between structure transition

rail posts #1 and #2 if object marker posts can not fit



@ PARAPET WALLS

N.T.S.

NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

REVISED 04/08/2015

UNITED STATES

DEPARTMENT OF THE INTERIOR

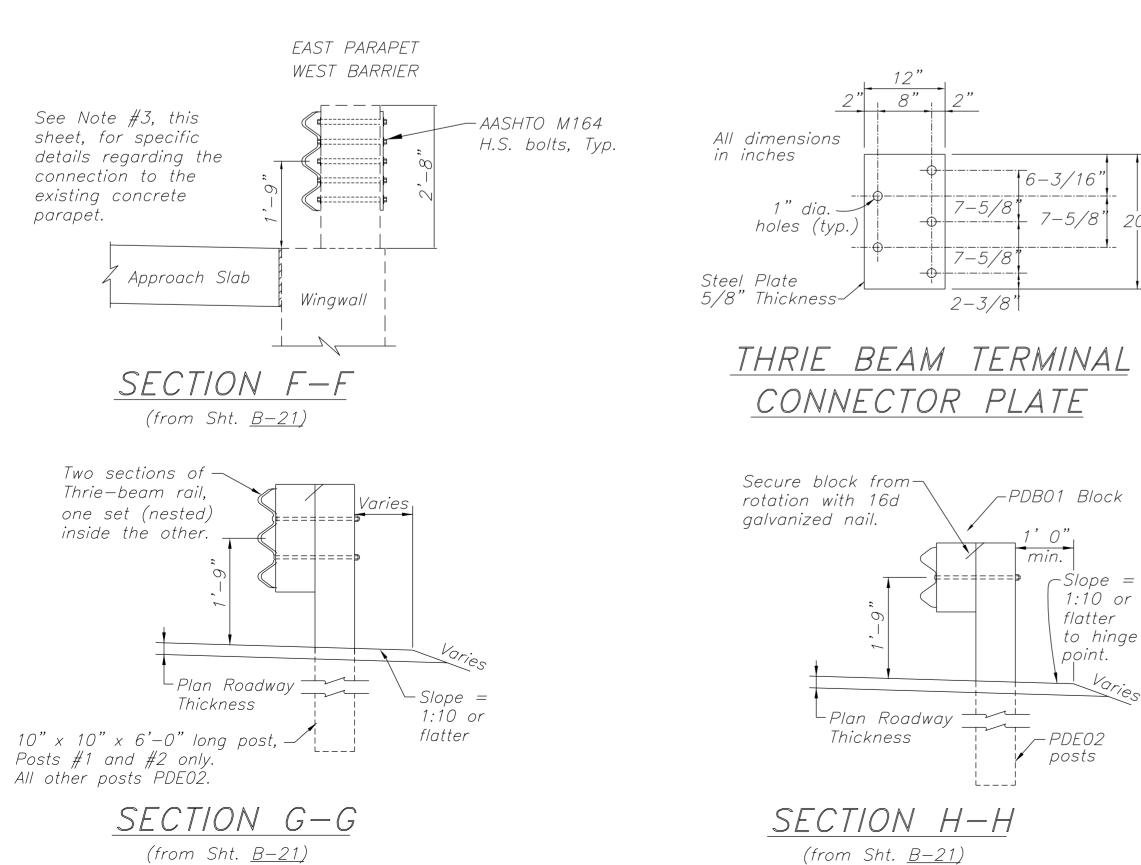
BUREAU OF INDIAN AFFAIRS

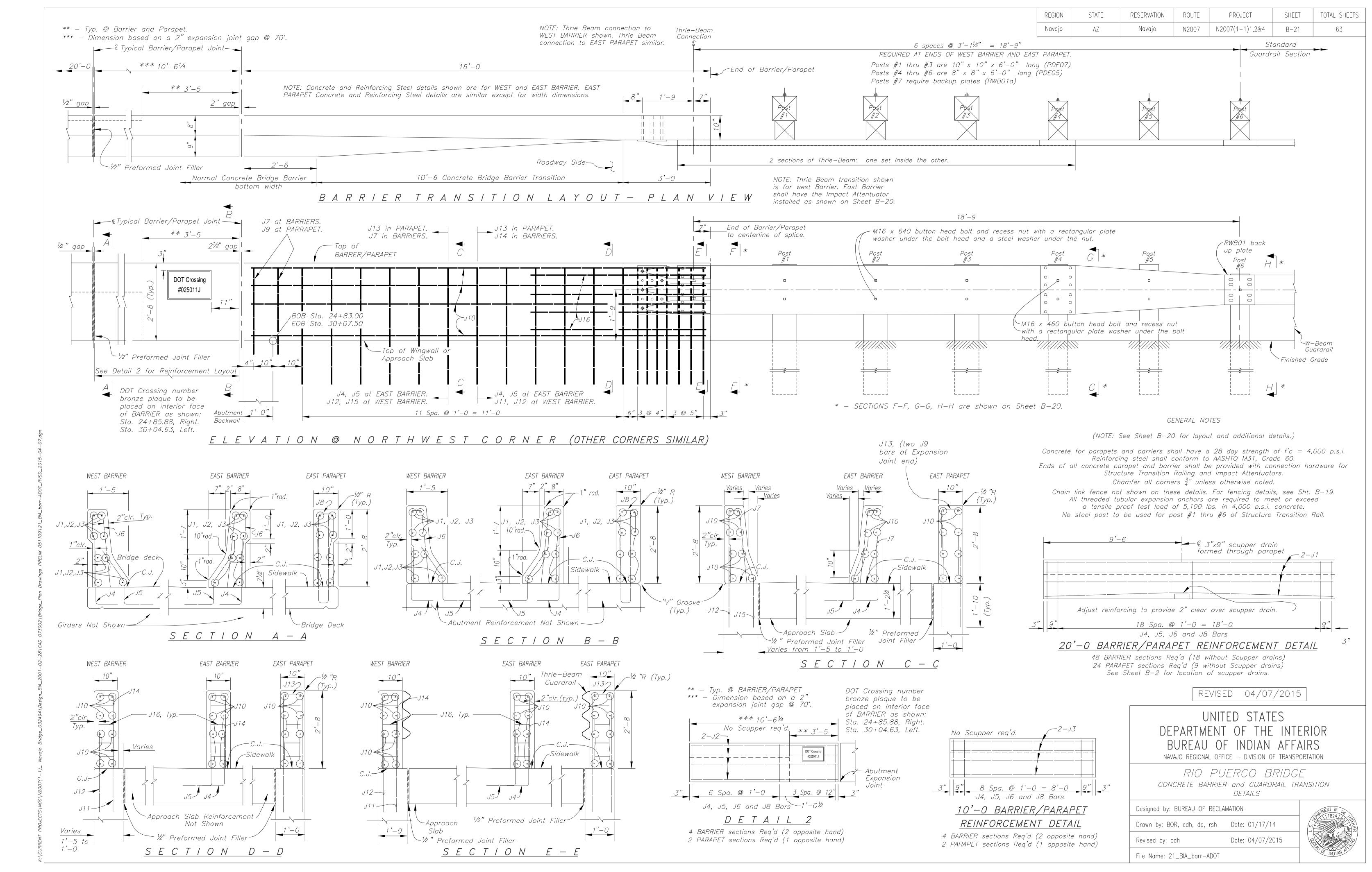
RIO PUERCO BRIDGE GUARDRAIL TRANSITION PLAN VIEW

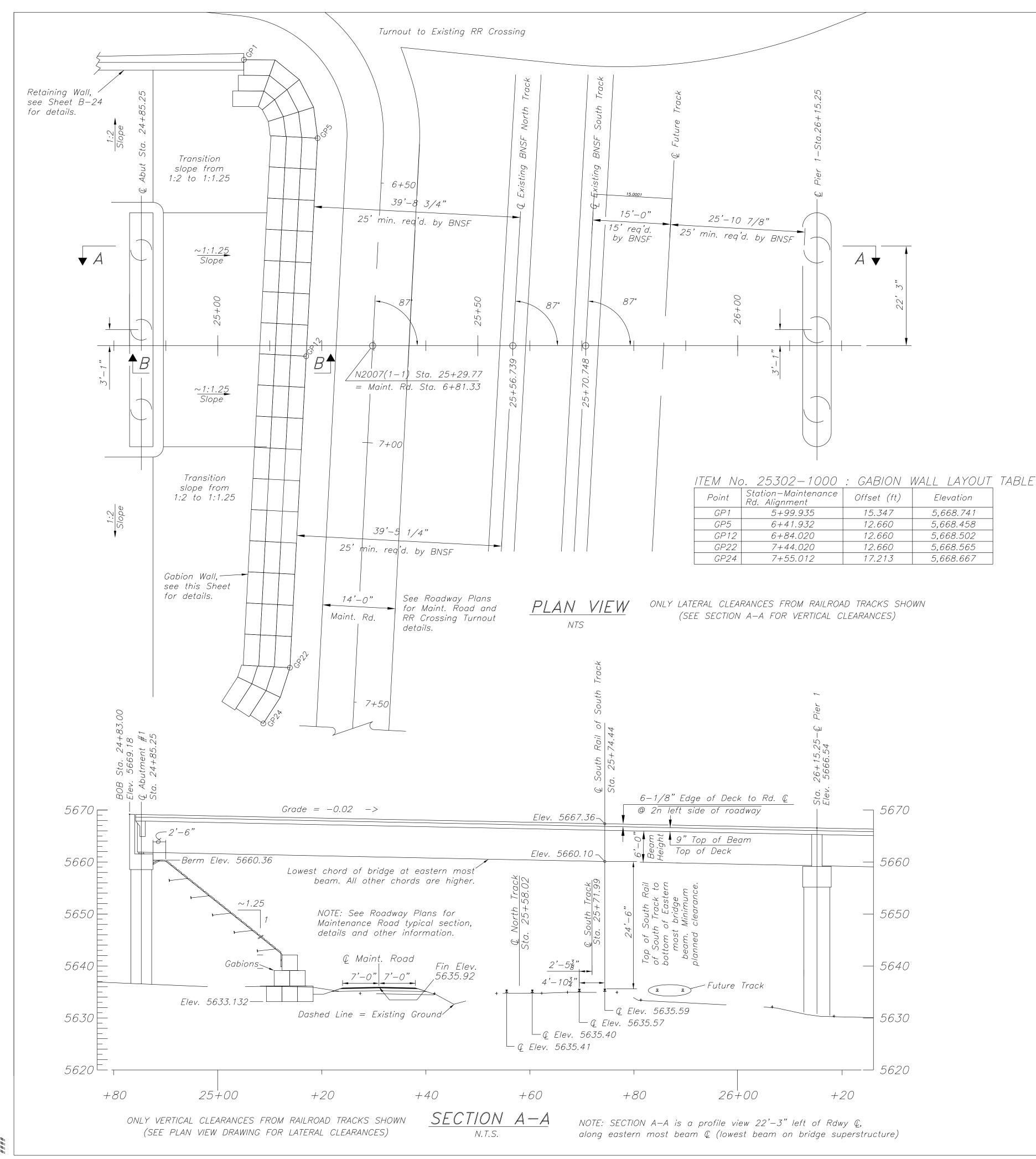
Designed by: CDH - Structural Unit

Date: 01/17/14 Drawn by: rsh, cdh Date: 04/08/2015 Revised by: cdh

File Name: 20\_BIAguardrail\_layout







REGIONSTATERESERVATIONROUTEPROJECTSHEETTOTAL SHEETSNavajoAZNavajoN2007N2007(1-1)1,2&4B-2263

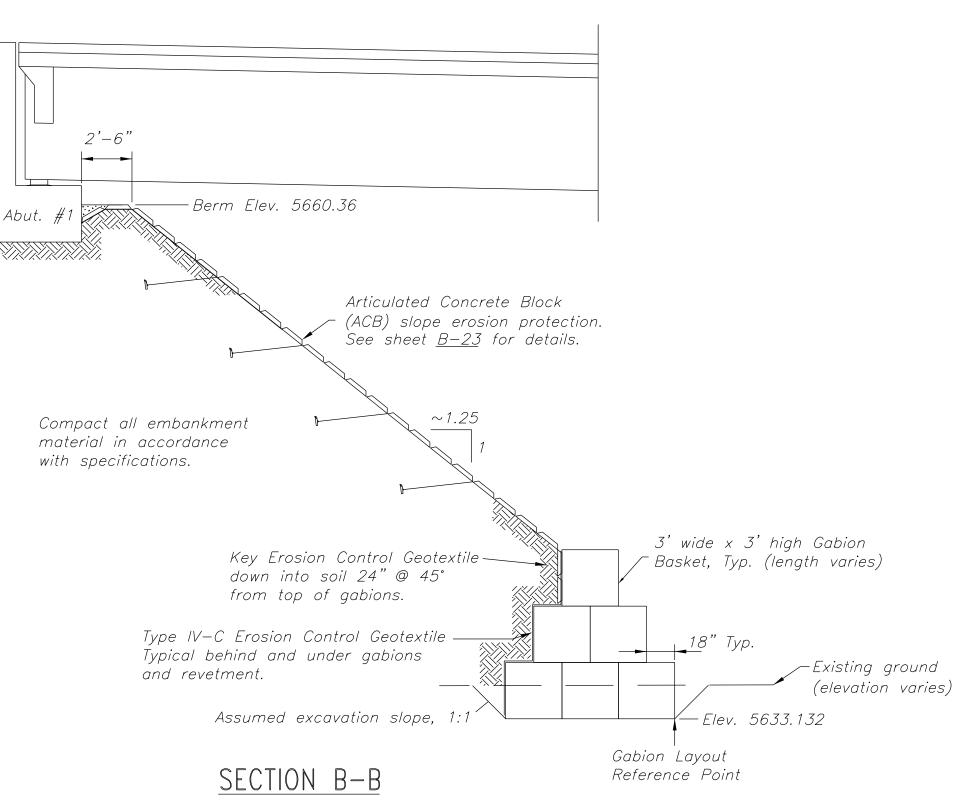
#### GABION NOTES

- 1. 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.
- 2. 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.
- 3. Rock for filling gabion baskets shall conform to Class 2 rock in Table 705–1 of the FP-03.
- 4. 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.
- 5. Backfill material under and behind gabions shall be native material compacted to 95% per Section 253.07 of the FP-03. 6. Wire mesh for gabions shall be 6x8 mesh as manufactured by Maccaferri, or an approved equal.
- e. 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.
- 7. 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.
- 8. All material certifications for gabions and erosion control geotextile shall be submitted for review and shall be approval prior to the use of the material.
- 9. 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.



TYPICAL SECTION THROUGH GABIONS

# UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS

NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

RAILROAD CLEARANCES & GABION DETAILS

RIO PUERCO BRIDGE

Designed by: BUREAU OF RECLAMATION

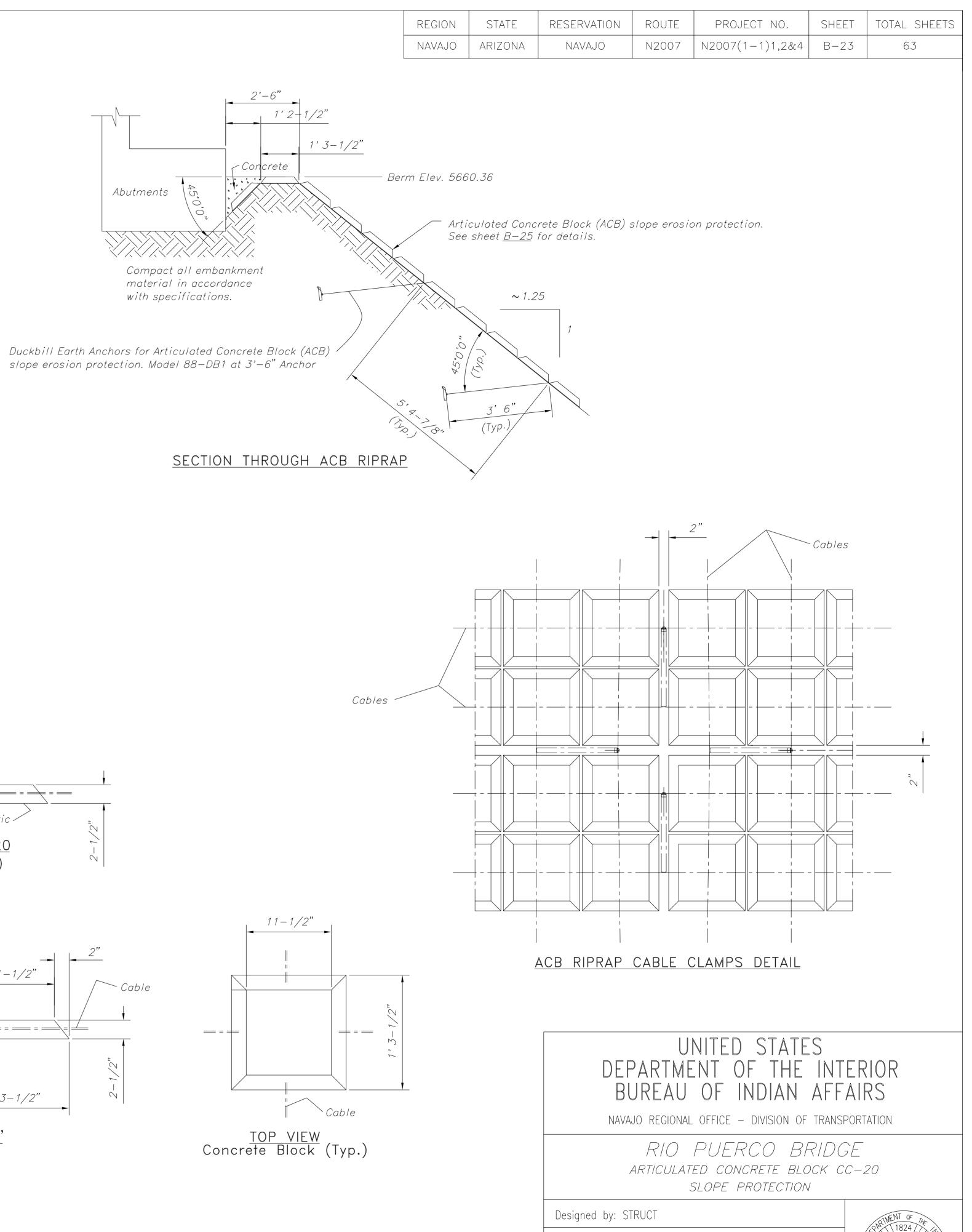
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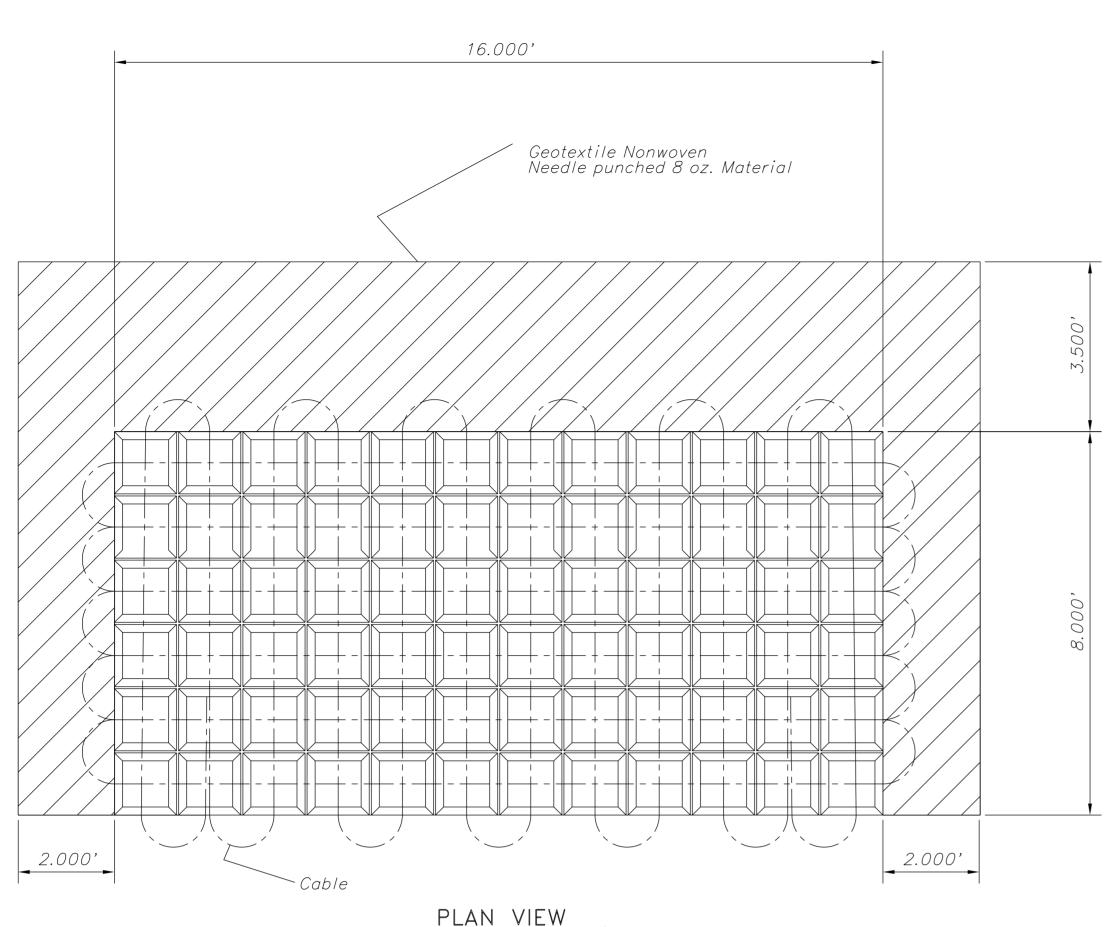
Drawn by: cdh, rsh

Revised by:

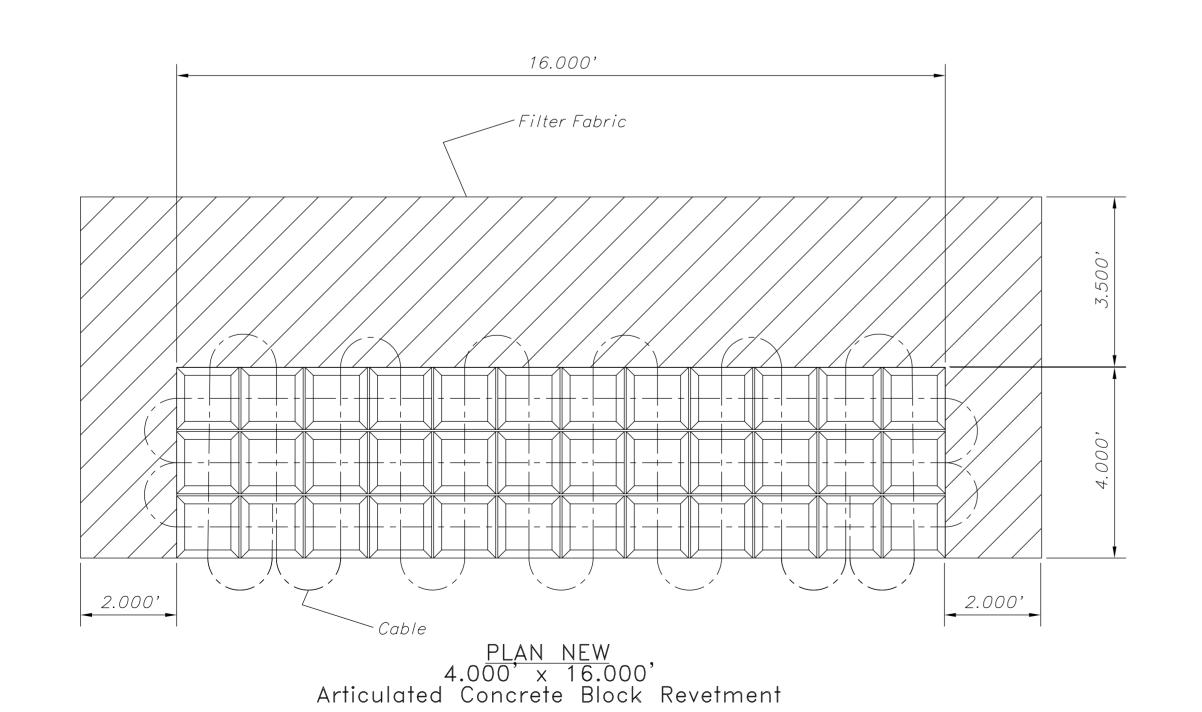
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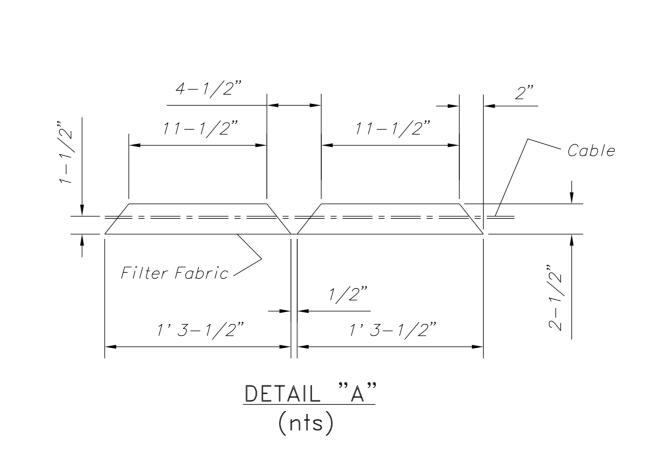
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PLAN VIEW 8.000' x 16.000' Articulated Concrete Block Revetment (nts)



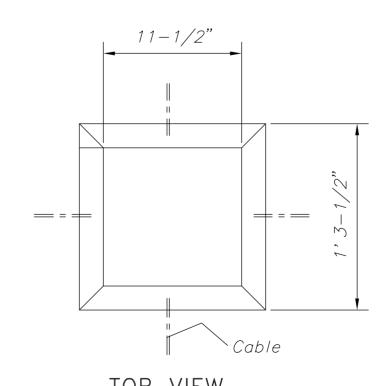


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Filter Fabric ~

<u>CC 20</u>

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Designed by: STRUCT	
Drawn by: rsh, cdh	Date: 01/17/14
Revised by:	Date:

File Name: 23\_slope\_GBN



