NAVAJO
DIVISION OF TRANSPORTATION

ROUTE

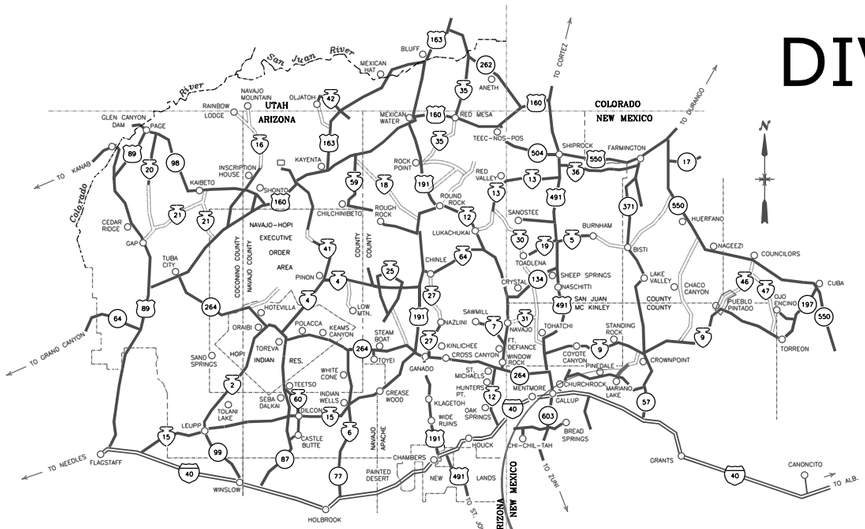
11

5.897 km

I.D. No. N34474

PROJECT N11(1A)1,2,&4

GRADE, DRAIN, AGGREGATE BASE COURSE, HOT ASPHALT CONCRETE PAVEMENT, BRIDGE AND MISCELLANEOUS CONSTRUCTION



NAVAJO RESERVATION MAP
N.T.S.

PROJECT N11(1A)1,2&4

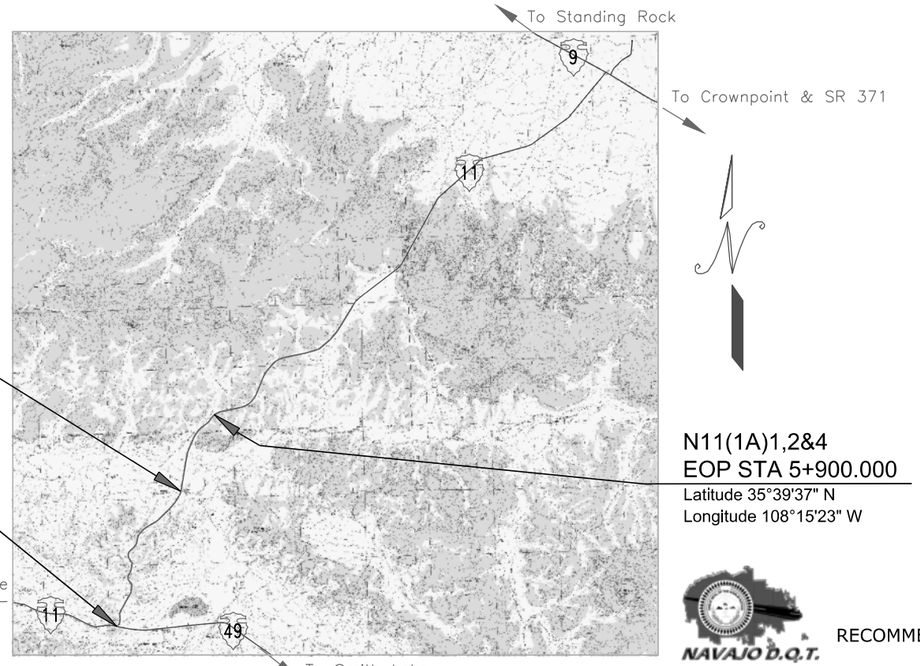
LEGEND

STATE LINE
RESERVATION LINE
COUNTY LINE
TOWNSHIP or RANGE LINE
SECTION LINE
NATIONAL FOREST LINE (SHADING ON INSIDE OF LINE)
HIGHWAY RIGHT-OF-WAY LINE
UNFENCED PROPERTY
CUT LIMITS
FILL LIMITS
SECTION CORNER and 1/4 CORNER
POWER LINE and POLES
TELEPHONE LINE and POLES
TELEVISION LINE
WATER LINE
POLE GUY and ANCHOR
TRAFFIC SIGN
GUARD RAIL (PLANNED / EXISTING)
DELINEATOR (ONE WAY-TYPE 1a / TWO WAY-TYPE 1b)
BARBED WIRE FENCE
WOVEN WIRE FENCE
CATTLE GUARD (GATE)
CULVERTS (PLANNED / EXISTING)
CONCRETE BOX CULVERTS (PLANNED / EXISTING)
GROUND LINE - EARTH
GROUND LINE - ROCK
EXISTING ROAD (WIDTH & TYPE)
SIDE ROAD TURNOUT (PLANNED / EXISTING)
TREES and SHRUBS
CHANNEL or DITCH
DIKE or DITCH BLOCK
PLACED OR GROUTED RIPRAP
WIRE-ENCLOSED RIPRAP
RAILROAD TRACK
WELL
DWELLING
WINDMILL
RIGHT-OF-WAY MONUMENT (PLANNED / EXISTING)
CONTROL POINT (CP #)
BORING LOCATION
OBJECT MARKERS (TYPE II / TYPE III)
GABION CHECK DAM WATERWAY
OBLITERATE ROADWAY
ROLLED EROSION CONTROL PRODUCT
ARTICULATED CONCRETE BLOCK REVETMENT
TOE OF FILL RIPRAP

INDIAN SERVICE — COUNTY — STATE — FEDERAL

PAVED — GRADED — UNIMPROVED

DEREK D. MEIER NEW MEXICO 14504 REGISTERED PROFESSIONAL ENGINEER
10/12/20



STA 3+951.261
BEGINING OF BRIDGE
Latitude 35°36'41" N
Longitude 108°18'52" W

N11(1A)1,2&4
BOP STA 0+002.298
Latitude 35°35'00"N
Longitude 108°19'45"W

N11(1A)1,2&4
EOP STA 5+900.000
Latitude 35°39'37" N
Longitude 108°15'23" W

NAVAJO D.O.T.

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5	SUPERELEVATION DATA
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RIGHT-OF-WAY

LEFT OF CENTERLINE		RIGHT OF CENTERLINE	
STATION TO STATION	WIDTH	STATION TO STATION	WIDTH
0+025.150 to 3+900.000	23 m	0+025.150 to 3+900.000	23 m
3+900.000 to 4+020.000	50 m	3+900.000 to 4+020.000	50 m
4+020.000 to 7+160.000	23 m	4+020.000 to 5+620.000	23 m
7+160.000 to 7+260.000	35 m	5+620.000 to 5+740.000	35 m
7+260.000 to 8+501.595	23 m	5+740.000 to 5+900.000	23 m
8+501.595 to 8+670.000	35 m		
8+670.000 to 10+620.000	23 m		

LENGTH OF PROJECT

STATION TO STATION	LIN. METERS	KILOMETERS
BOP Station 0+002.298	3,948.963	3.949
BOB Station 3+951.261	28.346	0.028
EOB Station 3+979.607	1,920.393	1.920
EOP Station 5+900.000		
TOTAL	5,897.702	5.897

DESIGN CRITERA - N11(1A)2&4

2018 ADT 213 vpd
2033 Estimated ADT 287 vpd
Max. Superelevation 6%

0+002.298 to 1+700.000		1+700.000 to 5+900.000	
Design Speed	60 km/h	Design Speed	80 km/h
Minimum Radius	135 m	Minimum Radius	280 m
Maximum Gradient	7.3%	Maximum Gradient	5.3%
Min. Stopping Sight Distance	85 m	Min. Stopping Sight Distance	130 m
Min. Passing Sight Distance	410 m	Min. Passing Sight Distance	540 m

RECOMMENDED:

DATE:

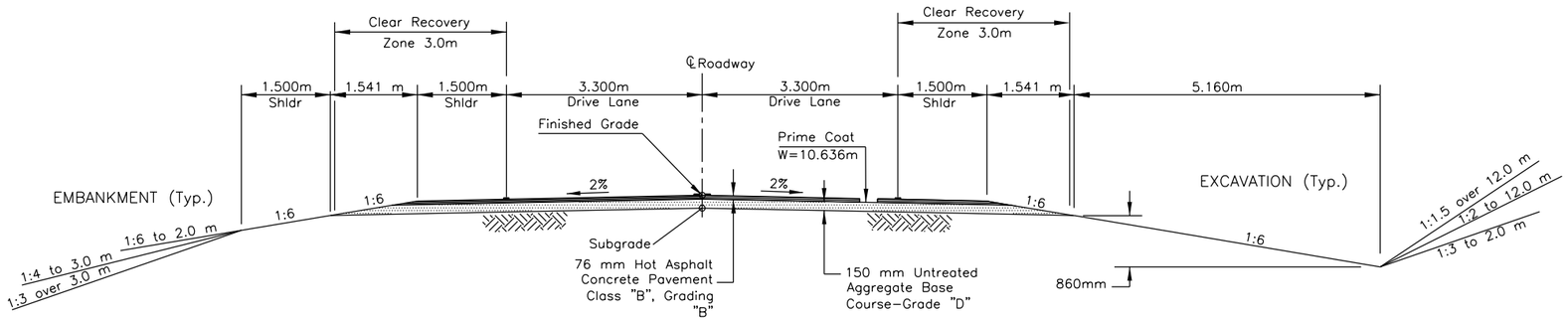
PRINCIPAL ENGINEER
NAVAJO DIVISION OF TRANSPORTATION

APPROVED:

DATE:

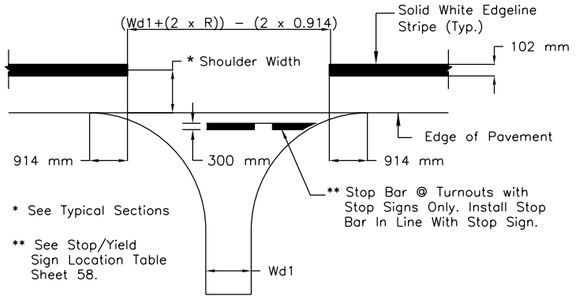
DIRECTOR
NAVAJO DIVISION OF TRANSPORTATION

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	2	82

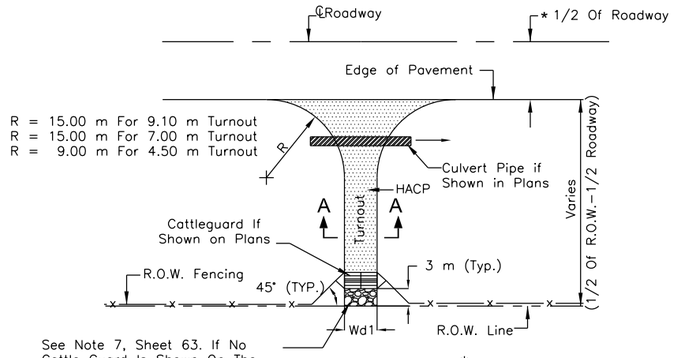


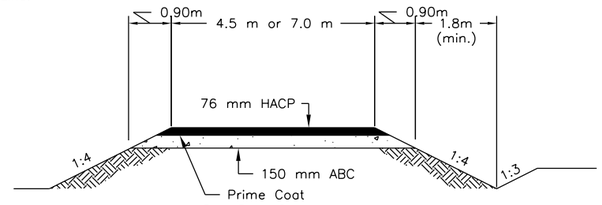
TYPICAL ROADWAY SECTION

Sta 0+005.864 to Sta 3+946.217
Sta 3+984.651 to Sta 5+900.00



TYPICAL PAVEMENT MARKING @ TURNOUT





SECTION A-A

Note: Typical Turnout Dimensions And Structural Section Unless Noted Otherwise On The Plans

TYPICAL TURNOUT

Note: In The Event the Turnout Cattle Guard is Located Within the Turnout Radii, So That the Asphalt/Gravel/Dirt Width is Narrower on the Back Side of the Cattle Guard Than on the Front Side, the Asphalt/Gravel/Dirt Width on the Back Side Shall be Widened to Match the Width on the Front Side and Tapered Back to the Standard Roadway/Driveway Width in 5 Meters. This Work Shall be Included in the Earthwork, Gravel, Asphalt, etc. Bid Items as Appropriate.

TURNOUT EXTENSION NOTE:

The Turnouts Listed Below Will Require Earthwork And Grading Outside The Road Right-Of-Way. This Work Is Necessary To Obtain Acceptable Turnout Grades of ±8.0% Maximum Or To Create Smooth Tie-ins To Existing Turnouts. The Specific Length Of Extensions Required To Meet Acceptable Grades Shall Be Determined By the CM The Width Of Extensions Shall Match The New Driveway Width Given On The Plans. The Cost Of The Extensions Shall Be Incidental To Earthwork Related Road Construction Items. No Earthwork Or Other Measurements Shall Be Taken. Specified Aggregate, Asphalt, Concrete, Or Other Pavement Related Structural Material Will Be Measured And Paid Under The Appropriate Bid Items.

STATION		DIMENSIONS
0+488.000	Rt.	20m Long x 10m Wide
1+550.000	Lt.	20m Long x 20m Wide
2+025.000	Lt.	26m Long x 15m Wide
3+875.000	Lt.	30m Long x 53m Wide (at turnout ℄)
3+875.000	Rt.	24m Long x 57m Wide
4+212.000	Rt.	20m Long x 7m Wide

DEREK D. MEIER
NEW MEXICO
14504
REGISTERED PROFESSIONAL ENGINEER
4/14/20

BASIS OF ESTIMATED QUANTITIES			
ITEM NO.	DESCRIPTION	UNIT WEIGHT	APPLICATION RATE
30101-2000	Untreated Aggregate Base-Grade "D"	2268 kg/m^3	Main Roadway & Turnouts: 150mm
40201-0500	Hot Asphalt Concrete Pavement, Class "B", Grading "B"	2430 kg/m^3	Main Roadway & Turnouts: 1-76mm Lift
41101-5000	Prime Coat, Grade PEP	1056 L/t	1.36 L/sq.m apply to top of UABC

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

TYPICAL ROADWAY SECTIONS

Designed by: WHPacific **Date:** 4/10
Drawn by: WHPacific **Date:** 4/10
Revised by: WHPacific **Date:** 9/11
File Name: N11(1A) TypSec sht 2

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	3	82

1. ALL WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS (FP-14), AND THE SUPPLEMENTAL SPECIFICATIONS FOR THIS PROJECT.

2. ALL PERMANENT AND TEMPORARY ROADSIDE SIGNS 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 CM, AS INCIDENTAL OBLIGATIONS OF THE CONTRACTOR.

3. THE TEMPORARY TRAFFIC CONTROL DETAILS SHOWN REFLECT 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.

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 APPROVAL OF THE GOVERNMENT, UNLESS OTHERWISE NOTED IN THESE PLANS OR SPECIFICATIONS. DRAINAGE STRUCTURES AND TURNOUTS SHALL BE INSTALLED AS SHOWN WITH ONLY MINOR CORRECTIONS IN LOCAITON, 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 APPROVAL OF CM.

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-14 AS WELL AS ANY AND ALL PERMIT REQUIREMENTS. THIS WORK SHALL BE AN OBLIGATION OF THE CONTRACTOR.

6. THE BIDDER SHALL READ AND MAKE CAREFUL EXAMINATION OF THE PLANS, SPECIFICATIONS, QUANTITIES, MATERIAL AND 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, WILL 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 METHODS.

7. THE CONTRACTOR IS REQUIRED TO SUBMIT A REVISED PIPE LIST TO THE CM, BASED ON THE FIELD STAKING, IN ACCORDANCE WITH SECTION 152 OF THE CONTRACT SUPPLEMENTAL SPECIFICATIONS. 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, ARROYO, OR DITCH LINE.

8. NO WORK SHALL BE PERFORMED OR GROUND DISTURBED OUTSIDE OF THE DESIGNATED CONSTRUCTION LIMITS (FP-14, SECTION 107.02), WITHOUT APPROVAL OF THE GOVERNMENT AND CM, UNLESS SPECIFICALLY NOTED/LABELED ON THE PLANS AS "CONSTRUCTION ZONE". UNLESS NOTED OTHERWISE, THE CONSTRUCTION LIMITS ARE THE EARTHWORK CUT/FILL LIMITS PLUS 3 METERS, NOT TO EXCEED THE ROW LIMITS. WORK LIMITS AT DRAINAGE STRUCTURES, CATTLE GUARDS, FENCING, ROW MARKERS, ETC., WILL BE APPROVED BY THE CM. NO WORK SHALL BE PERFORMED OUTSIDE THE ROW LIMITS WITHOUT WRITTEN APPROVAL FROM THE GOVERNMENT, UNLESS SPECIFICALLY NOTED/LABELED ON THE PLANS AS "CONSTRUCTION ZONE".

9. THE DETAILS SHOWN ON THE STORM WATER POLLUTION AND EROSION/SEDIMENT CONTROL DRAWINGS 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 SPECIFICATIONS AND SPECIAL CONTRACT REQUIREMENTS. THE CONTRACTOR IS REQUIRED TO SUBMIT A COURTESY COPY OF THE APPROVED SWPPP TO THE NAVAJO NATION 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 THE STANDARD GENERAL CONDITIONS OF THE CONTRACT DOCUMENTS.

11. ALL TURNOUTS/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 4.5m WIDE TURNOUTS; PLACE AGGREGATE AND HOT ASPHALTIC CONCRETE FOR TURNOUTS WIDER THAN 4.5m TO MATCH THE TURNOUT 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 CM) SHALL BE INCIDENTAL TO BID ITEM 20401-0000. ANY REQUIRED AGGREGATE BASE AND/OR ASPHALT MATERIAL SHALL BE PAID FOR UNDER THE APPROPRIATE BID ITEMS FOR THIS WORK AS SHOWN IN THE BID SCHEDULE.

12. THE CONTRACTOR SHALL, IF CALLED FOR IN THESE PLANS, 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-14, METHOD 2. SCARIFICATION SHALL BE TO A DEPTH OF 300mm. THE SCARIFIED SURFACE SHALL BE LEFT ROUGH, WITH 100mm TO 300mm HIGH RIDGES PERPENDICULAR TO THE EXISTING ROAD CENTERLINE. ROADWAY OBLITERATION INCLUDES GRADING DRAINAGE CHANNELS ACROSS THE OLD ROAD BED, 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 BID ITEM 21101-2000. PERMANENT SEEDING AND STRAW MULCHING SHALL BE APPLIED TO ALL OBLITERATION AREAS. SEEDING AND MULCHING TO BE PAID UNDER ITEM 62510-1000.

13. STRUCTURAL EXCAVATION AND BEDDING/BACKFILL OF ALL DRAINAGE STRUCTURES (CULVERTS AND CONCRETE HEAD/WING WALLS) SHALL BE CONSIDERED INCIDENTAL TO INSTALLATION OF STRUCTURES. BEDDING AND BACKFILL MATERIAL SHALL MEET ALL REQUIREMENTS OF FP-14, SECTIONS 209 AND 704. APPROVED EXCESS EXCAVATION MATERIAL MAY BE USED TO REBUILD TURNOUTS, EARTHEN DITCH BLOCKS, AND/OR BE PLACED ALONG ROADWAY ROW OUTSIDE THE CONSTRUCTION STAKE LIMITS ONLY AS WASTE IN AREAS ADJACENT TO THE REMOVAL AND AS DIRECTED BY THE CM.

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 CM. 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 OR INSTALLATIONS, THE CONTRACTOR SHALL CLEAN, REGRADE, AND RESHAPE THE INLET AND OUTLET CHANNELS TO THE RIGHT-OF-WAY LINE AS DIRECTED BY THE CM. THIS WORK SHALL BE INCIDENTAL TO BID ITEMS UNDER SECTIONS 602, 603, AND 607.

15. IMMEDIATELY PRIOR TO PLACING EMBANKMENT AND AGGREGATE BASE, THE TOP 152 mm OF THE ORIGINAL GROUND, AND FINISHED SUBGRADE (INCLUDING TURNOUTS) SHALL BE CHECKED FOR COMPACTION AND GRADE. IF COMPACTION OR GRADE DOES NOT MEET THE MINIMUM SPECIFIED REQUIREMENTS, THE SUBGRADE SHALL BE 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. AS PER FP-14, SECTION 204.09, BENCHING WILL BE REQUIRED UNDER SOME EMBANKMENTS. THIS WORK SHALL BE CONSIDERED AN INCIDENTAL OBLIGATION OF THE CONTRACTOR.

16. THE EARTHWORK TABLE SHOWN IS TO ASSIST THE CONTRACTOR IN ESTABLISHING A BID UNDER THE EARTHWORK ITEMS SHOWN IN THE BID SCHEDULE. ALL EARTH AND ROCK EXCAVATION, WASTE AND EMBANKMENT MATERIAL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 20401-0000. IF MATERIAL IS APPROVED, THE WASTE MATERIAL SHOWN ON THESE PLANS SHALL BE USED AS NECESSARY TO CONSTRUCT TURNOUTS, EARTHEN DITCH BLOCKS, AND/OR BE PLACED AS DESCRIBED IN NOTE 13.

17. AT ALL TOP EDGES OF CUT SLOPES, THE CONTRACTOR SHALL REMOVE ALL LOOSE AND UNSTABLE ROCK OR ROCK THAT AS DETERMINED BY THE CM, MAY BECOME LOOSE WITHIN 5.0 METER OF THE TOP CUT SLOPE. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO BID ITEM 20401-0000, AND NO ADDITIONAL PAYMENT WILL BE MADE.

18. THE LOCATION OF UTILITIES 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 NEW MEXICO ONE-CALL AT (800)-321-2537, NTUA-928-729-5721, FRONTIER1-800-528-5011, 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.

19. 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 AS DETERMINED BY THE CM SHALL BE TAKEN TO THE BIA CROWNPOINT MAINTENANCE YARD AND STOCKPILED IN A DESIGNATED AREA. ANY MATERIALS DETERMINED TO BE UNUSABLE BY THE CM SHALL BE DISPOSED OF BY THE CONTRACTOR IN ACCORDANCE WITH SECTIONS 107, 109.02(S), AND 203. THE SALVAGE WORK SHALL BE INCLUDED IN THE APPROPRIATE UNIT PRICE BID ITEMS FOR SECTIONS 203 AND/OR 607.

20. 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 SECTION SLOPES CAN NOT BE CONSTRUCTED. IN THIS CASE THE GOVERNMENT, THROUGH THE CM, SHALL BE CONSULTED FOR CHANGES IN THE TYPICAL SECTIONS AND/OR PROFILES SHOWN 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 NOTES 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 SECTIONS BE BUILT STEEPER THAN THE MAXIMUM ALLOWED IN THE ROADWAY TYPICAL SECTION SHOWN.

21. THE CONTRACTOR IS REQUIRED TO SAW CUT THE EXISTING ASPHALT PAVEMENT AT ALL TIE-INS WITH THE NEW ASPHALT PAVEMENT. THE CONTRACTOR SHALL BE REQUIRED TO 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 CM ALL SAWED ASPHALT EDGES TO RECEIVE ASPHALT TACK COAT. THIS WORK SHALL BE INCIDENTAL TO THE PAVING ITEMS SHOWN IN THE BID SCHEDULE.

22. ANY EXISTING OR NEW ROADSIDE FEATURES OR OTHER IMPROVEMENTS NEGLIGENTLY DAMAGED BY THE CONTRACTOR DURING CONSTRUCTION SHALL BE RESTORED TO EQUAL OR BETTER CONDITION AT THE CONTRACTOR'S EXPENSE.

23. THE CONTRACTOR SHALL REMOVE 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 CM AT LEAST THREE (3) WORKING DAYS IN ADVANCE OF SUCH SIGN REMOVAL. THESE ROADSIDE SIGNS SHALL BE STOCKPILED IN A DESIGNATED AREA FOR OWNER (BIA EASTERN AGENCY MAINTENANCE) PICKUP. SIGNS NEEDED FOR SAFETY/INFORMATION SHALL BE TEMPORARILY RESET AS DIRECTED BY THE CM. AT THE COMPLETION OF THE PROJECT, ALL REMAINING ROADWAY SIGNS NOT SPECIFICALLY DESIGNATED ON THE PLANS TO REMAIN, SHALL BE REMOVED, UNLESS DIRECTED OTHERWISE BY THE CM. THIS WORK SHALL BE CONSIDERED AN INCIDENTAL OBLIGATION OF THE CONTRACTOR.

24. GRADE AND SHAPE THE NEW SHOULDER (AS DIRECTED BY THE CM) FROM THE NEW SUBGRADE HINGE POINTS TO AND INCLUDING THE EXISTING DITCH LINE AREAS FOR THE CONSTRUCTION OF DITCH LININGS, SLOPE PROTECTION, AND RIPRAP RUNDOWNS. THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE RIPRAP ITEMS SHOWN IN THE BID SCHEDULE.

25. ALL RIGHT-OF-WAY REFERENCE MARKERS SHALL BE LABELED IN THE METRIC UNITS OF MEASURE. ALL EXISTING AND NEW BRASS CAPS SHALL BE STAMPED WITH BOTH THE ALIGNMENT STATIONING AND ELEVATIONS IN METRIC, UNLESS SPECIFIED OTHERWISE BY THE CM. 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.

26. THE GEOTECHNICAL REPORT FOR THIS PROJECT SHALL BE PROVIDED UPON WRITTEN REQUEST FROM THE CONTRACTOR, THROUGH THE CM. SEE FOLLOWING NOTE # 35.

27. ROADWAY AND PIPE CROSS SECTIONS WILL BE PROVIDED IN EITHER HARD COPY AND/OR ELECTRONIC FORMAT UPON WRITTEN REQUEST FROM THE CONTRACTOR, THROUGH THE CM TO THE GOVERNEMENT.

28. ANY EXISTING MAIL BOXES OR HOUSE ADDRESS SIGNS LOCATED ALONG THE ROADWAY PRISM SHALL BE REMOVED AND RE-INSTALLED OUTSIDE OF THE RIGHT-OF-WAY LIMITS OR AS DIRECTED BY THE CM. THIS WORK SHALL BE INCIDENTAL TO BID ITEM 20304-1000.

29. AT THE COMPLETION OF THE CONSTRUCTION, THE CONTRACTOR SHALL INSPECT THE INTERIOR OF ALL NEWLY INSTALLED OR EXTENDED/CLEANED CULVERTS, CATTLE GUARDS, AND EXISTING DRAINAGE STRUCTURES. THESE STRUCTURES SHALL BE MAINTAINED IN A CLEAN CONDITION, AND FREE OF SILT AND OTHER DEBRIS UNTIL FINAL ACCEPTANCE OF THE PROJECT. THIS WORK SHALL BE CONSIDERED INCIDENTAL OBLIGATIONS OF THE CONTRACTOR UNDER THE APPROPRIATE BID ITEMS, FOR SECTIONS 602, 603, AND 607.

30. AT MAJOR DRAINAGE STRUCTURES AND LIVESTOCK PASS LOCATIONS THAT SPECIFY INSTALLING WING FENCES, THE CONTRACTOR SHALL EITHER TIE WING FENCES TO THE STRUCTURES OR INSTALL FENCE OVER THE STRUCTURE IN ACCORDANCE WITH THE DETAILS ON SHEET 64 OF 82. 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 64 OF 82. THIS WORK TO BE INCIDENTAL TO BID ITEM 61901-1000, AND NO ADDITIONAL PAYMENT SHALL BE MADE.

31. THERE ARE A 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 CM. THIS WORK TO BE INCIDENTAL TO BID ITEMS 61901-1000, 62101-0000, AND 62102-0000, AND NO ADDITIONAL PAYMENT WILL BE MADE.

32. THE CONTRACTOR SHALL NOTIFY THE NAVAJO NATION DOT ENVIRONMENTAL OFFICE 505-371-8394 AS REQUIRED IN THE SPECIAL CONTRACT REQUIREMENT'S SECTION OF THE CONTRACT, PRIOR TO STARTING CONSTRUCTION ACTIVITIES ON THIS PROJECT. TEMPORARY FENCING FOR ARCHAEOLOGY OR OTHER SITES/LOCATIONS TO BE SQUARE LINK, ORANGE, HI-DENSITY HDPE TYPE, AS PER SECTION 710.11 OF THE FP-14. TEMPORARY FENCING TO BE CONSIDERED INCIDENTAL OBLIGATIONS OF THE CONTRACTOR AND NO ADDITIONAL PAYMENTS SHALL BE MADE.

33. IN ADDITION TO THE LOCATIONS SPECIFIED IN THESE PLANS FOR ARTICULATED CONCRETE BLOCK REVETMENT, EXCEPT AS CALLED FOR ON SHEET 55 OF THESE PLANS, THE CONTRACTOR HAS THE OPTION TO USE (IF APPROVED) ARTICULATED CONCRETE BLOCK REVETMENT IN PLACE OF PLACED, WIRE ENCLOSED OR GROUTED RIPRAP. THE CONTRACTOR IS RESPONSIBLE FOR SUPPLYING ALL DESIGNS, DETAILS AND SHOP DRAWINGS REQUIRED FOR USING THE ARTICULATED CONCRETE BLOCK REVETMENT.

34. DOUBLE SWING GATES, WITH TWO (2) 4.27 m TYPE 1 GATE PANELS, ARE REQUIRED ON TURNOUTS AT STA 4+775 LT. INSTALL GATE LATCH AND ANCHOR/GATE STOP AS PER FP-14 SECTION 619. FURNISH A 1 METER LENGTH OF GRADE 30, 8.0mm (5/16 INCH) STEEL CHAIN MEETING ASTM A 413/413M STANDARDS, ONE END OF WHICH IS TO BE WELDED TO ONE GATE PANEL AS DIRECTED BY THE CM. THE WELDED AREA SHALL BE REPAINTED TO MATCH ORIGINAL GATE FINISH.

35. THE GEOTECHNICAL REPORT FOR THIS PROJECT CONTAINS SPECIFIC INFORMATION REGARDING THE DISPOSITION OF MANCOS SHALE LOCATED WITHIN THE PROJECT LIMITS. ANY MANCOS SHALE ENCOUNTERED WILL EITHER BE WASTED OR MAY BE USED IN THE BOTTOM 20% OF THE FILL HEIGHT AND AT LEAST 2.4M (8FT) FROM THE FINAL SURFACE OF THE EMBANKMENT SLOPE. THE CONTRACTOR SHALL OBTAIN A COPY OF THE GEOTECHNICAL REPORT FROM THE GOVERNMENT PRIOR TO BEGINNING ANY ROADWAY EXCAVATION/EMBACKMENT OPERATIONS.

36. THE FINISHED SUBGRADE SOIL CLASSIFICATION AND PI'S WILL BE DETERMINED PRIOR TO SUBGRADE TREATMENT WITH ROADBOND EN-1. THE FINAL LOCATIONS FOR SUBGRADE TREATMENT WILL BE DETERMINED BY THE CM AND PROVIDED TO THE CONTRACTOR PRIOR TO STARTING WORK. PROPOSED DEPTH OF TREATEMENT IS 152mm, WITH A RESULTING CBR OF 47 OR HIGHER.

37. THE CONTRACTOR WILL INCLUDE THE COST OF WATER NEEDED IN ITEMS 20401, ROADWAY EXCAVATION, 20403 UNCLASSIFIED BORROW, 21301-4000 SUBGRADE STABLIZATION, 30101 AGGREGATE BASE. AND 62510 SEEDING IN HIS BID COST FOR THE INDIVIDUAL ITEMS. THE COST FOR WATER WHICH IS NEEDED DURING THE COURSE OF THE PROEJCTS FOR ALL OTHER PURPOSES, INCLUDING DUST CONTROL AND FOUNCADTION COMPATION, WILL ALSO BE INCLUDED IN THE OVERALL BID COST FOR THE PRODUCT. THE CONTRACTOR WILL BE RESPONSIBLE FOR COMPUTING HIS OWN WATER QUANTITIES AND THEN BASING HIS BID ON HIS OWN COMPUTED QUANTITIES.

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NEW MEXICO
14504
REGISTERED PROFESSIONAL ENGINEER
4/14/20

UNITED STATES
'PARTMENT OF THE INTERIOR
REAU OF INDIAN AFFAIRS
REGION OFFICE * DIVISION OF TRANSPORTATION

GENERAL NOTES

Designed by: WHPacific	**Date:** 5/10
Drawn by: WHPacific	**Date:** 5/10
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)-Gen Notes sht 3	

N11(1a) ESTIMATED QUANTITIES

FP-14 ITEM	DESCRIPTION	QUANTITY	UNIT
10901-0000	Extra & Miscellaneous Work Authorized Under Section 109.02 (s)	All Req'd	Lump Sum
15101-0000	Mobilization	All Req'd	Lump Sum
15201-0000	Construction Survey and Staking	All Req'd	Lump Sum
15301-0000	Contractor Quality Control	All Req'd	Lump Sum
15701-0000	Temporary Erosion Control	All Req'd	Lump Sum
15703-1000	Temporary Straw Mulching	20.4	Hectare
20102-0000	Clearing and Grubbing	All Req'd	Lump Sum
20302-0700	Removal of Fence	336	Meter
20304-1000	Removal of Structures and Obstructions	All Req'd	Lump Sum
20401-0000	Roadway Excavation	145,000	Cubic meter
20403-0000	Unclassified Borrow	17,200	Cubic meter
20425-2000	Furrow Ditch	220	Meter
20443-2000	Earthen Dike & Berms (Type "B" Dike)	27	Meter
20802-0000	Foundation Fill	628	Cubic meter
21101-2000	Road Obliteration-Method 2	16,515	Square Meter
21301-4000	Subgrade Stabilization w/Road Bond EN-1, 152 mm Depth	74,737	Square Meter
25101-2000	Placed Riprap, Class 2	440.9	Cubic meter
25110-2000	Grouted Riprap, Class 2	10.0	Cubic meter
25112-2000	Wire Enclosed Riprap, Class 2	1,382	Cubic meter
25127-1020	Articulated Concrete Block Revetment, 140 mm Depth, CC45	494	Square Meter
30101-2000	Untreated Aggregate Base-Grade "D"	23,971	Metric ton
40201-0500	Hot Asphalt Concrete Pavement, Class "B", Grading "B"	11,285	Metric ton
40502-0800	Asphalt Binder PG 58-28	676.8	Metric ton
41101-5000	Asphalt Prime Coat, Grade Penetrating Emulsified Prime (PEP)	82.7	Metric ton
55101-2000	Steel H-Piles 360 X 152, In Place	84	Meter
55115-1000	Preboring, 762 mm ø	30	Meter
55120-0000	Test Piles	21	Meter
55201-0200	Structural Concrete, Class A(AE)	161	Cubic meter
55302-3300	Precast, Prestressed Concrete Beam Type BT1600 27.432m length each	4	Each
55401-1000	Reinforcing Steel, Grade 420	4,249	Kilogram
55401-2000	Reinforcing Steel, Grade 420, Epoxy Coated	14,045	Kilogram
55502-0000	Structural Steel, Furnished, Fabricated, and Erected-Grade 250	2,883	Kilogram
55601-0500	Bridge Railing, Concrete	76.1	Meter
60101-0000	Minor Concrete	0.9	Cubic meter
60201-0810	610 mm Pipe Culvert	252.38	Meter
60201-1810	2134 mm Pipe Culvert	28.04	Meter
60202-0510	711 mm S X 508 mm R, Pipe-Arch Culvert	45.71	Meter
60210-0810	End Section for 610 mm Pipe Culvert	11	Each
60210-1810	End Section For 2134 mm Pipe Culvert	1	Each
60211-0910	End Section For 711 mm S X 508 mm R, Pipe-Arch Culvert	8	Each
60701-1000	Remove, Clean & Stockpile Culverts	34	Meter
61102-2950	150mm Waterline, Polyvinyl Chloride (PVC)	64	Meter
61103-1450	400mm Encasement Pipe, Galvanized Steel	58	Meter
61701-5000	Guardrail System SGR04b, Type PDE02 W/MSKT-TL3-8 End Terminal and Thrie beam guardrail transition	118.12	Meter
61901-1000	Fence, Barbed Wire, 5 Strand	12,368	Meter
61902-5010	Gate, Metal, Type 1, 4267 mm Width	4	Each
61903-0310	2 Unit Cattle Guard, 4900 mm With Type II Gate	7	Each
61903-0710	3 Unit Cattle Guard, 7190 mm With Type II Gate	3	Each
62101-0000	Right Of Way Monument	56	Each
62102-0000	Reference Marker	56	Each
62510-1000	Seeding, Dry Method	17.0	Hectare
62901-1100	Rolled Erosion Control Product, Type 4 (RECP)	29,501	Square Meter
63302-0001	Sign Installation, 1-Post & Hardware: 2.98 kg/m	1.02	Square Meter
63302-0002	Sign Installation, 1-Post & Hardware: 3.35 kg/m	10.26	Square Meter
63302-0010	Sign Installation, 2-Post & Hardware: 2.98 kg/m	0.58	Square Meter
63302-0011	Sign Installation, 2-Post & Hardware: 3.35 kg/m	13.7	Square Meter
63302-0012	Sign Installation, 2-Post & Hardware: 4.10 kg/m	2.65	Square Meter
63306-2000	Object Marker, Glass Fiber Type 2	12	Each
63308-3000	Object Marker, Type 3, With 1-Post & Hardware: 2.98 kg/m	4	Each
63309-0010	Delineator, Type Glass Fiber, Type "1a"	14	Each
63309-0020	Delineator, Type Glass Fiber, Type "1b"	102	Each
63313-0500	Rumble Strip	3	Each
63318-1000	Mile Post, 1-Post & Hardware: 2.98 kg/m	6	Each
63401-1510	Pavement Markings, Solid Yellow, Type "H"	2,491	Meter
63401-1520	Pavement Markings, Solid White, Type "H"	11,517	Meter
63401-1610	Pavement Markings, Broken Yellow, Type "H"	4,999	Meter
63405-3260	Pavement Markings, "Stop" Bar, Solid White, Type "H"-300 mm Wide	4	Each
63501-0000	Temporary Traffic Control	All Req'd	Lump Sum

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	4	82

TBM DATA*

NUMBER	NORTHING	EASTING	ELEVATION	STATION	OFFSET
BM-1	508439.991	785074.264	2195.506	0+026.142	0.835 Rt.
BM-2	508587.587	785107.429	2199.707	0+174.591	16.657 Rt.
BM-3	508780.104	785086.249	2213.241	0+363.798	16.726 Lt.
BM-4	508850.159	785162.807	2215.818	0+459.880	22.306 Rt.
BM-5	509037.047	785224.864	2217.725	0+652.179	20.113 Lt.
BM-6	509197.024	785365.393	2218.374	0+861.556	18.649 Rt.
BM-7	509352.909	785441.700	2219.497	1+027.473	23.451 Rt.
BM-8	509535.344	785343.876	2215.813	1+227.987	21.067 Lt.
BM-9	509675.372	785310.110	2227.126	1+358.490	30.578 Lt.
BM-10	509778.300	785364.661	2235.917	1+465.818	18.319 Lt.
BM-11	509878.903	785434.746	2234.835	1+585.172	12.336 Rt.
BM-12	510089.995	785363.496	2224.872	1+803.362	25.302 Lt.
BM-13	510281.933	785369.996	2223.189	1+978.249	39.446 Lt.
BM-14	510406.234	785517.665	2219.532	2+155.071	30.507 Rt.
BM-15	510473.970	785562.969	2215.902	2+236.290	37.157 Rt.
BM-16	510699.189	785613.471	2201.862	2+457.646	28.228 Lt.
BM-17	510867.268	785818.134	2200.281	2+721.049	16.322 Rt.
BM-18	510967.464	785981.276	2194.421	2+912.483	19.127 Rt.
BM-19	511091.753	786182.135	2193.640	3+148.671	21.796 Rt.
BM-20	511165.038	786288.639	2189.019	3+275.641	20.890 Rt.
BM-21	511443.053	786496.639	2180.213	3+616.252	27.852 Rt.
BM-22	511590.367	786595.489	2170.540	3+792.242	50.218 Rt.
BM-23	511766.471	786678.966	2163.789	3+987.083	45.941 Rt.
BM-24	512020.827	786733.946	2164.685	4+240.970	9.965 Lt.
BM-25	512182.376	786779.956	2167.648	4+409.971	1.850 Lt.
BM-26	512336.702	786810.492	2170.431	4+567.245	1.873 Rt.
BM-27	512491.883	786869.793	2173.954	4+730.276	33.792 Rt.
BM-28	512653.555	786903.269	2177.135	4+896.989	38.070 Rt.
BM-29	512808.303	786954.834	2179.760	5+066.152	43.339 Rt.
BM-30	512953.117	787025.082	2182.659	5+233.728	45.890 Rt.
BM-31	513159.932	787083.992	2186.815	5+440.186	22.226 Lt.
BM-32	513276.934	787185.431	2189.939	5+591.693	28.405 Lt.
BM-33	513394.875	787305.596	2193.291	5+757.475	41.337 Lt.
BM-34	513453.398	787473.296	2200.999	5+924.489	19.116 Rt.

ALIGNMENT DATA*

ALIGN PT.	STATION	BEARING	NORTHING	EASTING
BOP	0+002.298	N 08°55'37" E	508416.565	785069.740
PC C1	0+111.231	N 08°55'37" E	508524.178	785086.643
PI C1	0+141.340	N 00°55'37" W	508553.922	785091.315
PT C1	0+171.300	N 00°55'37" W	508584.027	785090.828
PC C2	0+270.211	N 00°55'37" W	508682.925	785089.227
PI C2	0+355.310	N 30°48'31" E	508768.013	785087.851
PT C2	0+436.034	N 30°48'31" E	508841.102	785131.436
PC C3	0+943.494	N 30°48'31" E	509276.951	785391.341
PI C3	1+053.580	N 26°07'59" W	509371.502	785447.724
PT C3	1+145.239	N 26°07'59" W	509470.334	785399.236
PC C4	1+236.574	N 26°07'59" W	509552.333	785359.007
PI C4	1+345.263	N 30°11'50" E	509649.911	785311.134
PT C4	1+436.154	N 30°11'50" E	509743.851	785365.802
PC C5	1+495.485	N 30°11'50" E	509795.130	785395.644
PI C5	1+571.959	N 11°05'14" W	509861.227	785434.109
PT C5	1+641.757	N 11°05'14" W	509936.273	785419.403
PC C6	1+807.724	N 11°05'14" W	510099.142	785387.487
PI C6	1+910.140	N 29°05'42" E	510199.647	785367.791
PT C6	2+004.091	N 29°05'42" E	510289.140	785417.592
PC C7	2+499.637	N 29°05'42" E	510722.155	785658.555
PI C7	2+611.419	N 57°36'14" E	510819.831	785712.910
PT C7	2+718.569	N 57°36'14" E	510879.721	785807.295
PC C8	3+209.123	N 57°36'14" E	511142.545	786221.501
PI C8	3+371.271	N 26°37'10" E	511229.419	786358.413
PT C8	3+525.478	N 26°37'10" E	511374.380	786431.066
PC C9	4+115.280	N 26°37'10" E	511901.664	786695.335
PI C9	4+244.357	N 09°50'11" E	512017.059	786753.170
PT C9	4+371.585	N 09°50'11" E	512144.238	786775.221
PC C10	4+846.156	N 09°50'11" E	512611.833	786856.295
PI C10	5+276.437	N 50°51'50" E	513035.788	786929.802
PT C10	5+669.628	N 50°51'50" E	513307.366	787263.548
EOP	5+900.000	N 50°51'50" E	513615.426	787642.127

* Coordinates are Modified State Plane NAD 83 NM(W)
Ground To Grid Combined Scale Factor: 0.999600471

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REGISTERED PROFESSIONAL ENGINEER
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DEPARTMENT OF THE INTERIOR
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QUANTITY SUMMARY, TBM DATA, & ALIGNMENT SUMMARY

Designed by: WHPacific	Date: 5/10
Drawn by: WHPacific	Date: 5/10
Revised by: WHPacific	Date: 9/11
File Name: N11(1A)-QTY Sum & Align Data sht 4	

SUPERELEVATION GRADE TABULATIONS

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	5	82

Alignment : N11(1A)

Normal Crown Slope: 2.000%
Maximum Superelevation: 4.000%

Design Speed: 60 km/h – Sta 0+002.298 to 1+700.000
Design Speed: 80 km/h – Sta 1+700.000 to 5+900.000

C1 Degree : 5°00'00" Radius : 349.275 m
Tangent Runout Back: 11.983 Tangent Runout Ahead: 11.983
Runoff Length Back: 18.127 Runoff Length Ahead: 18.127
Transition Length Back: 30.110 Transition Length Ahead: 30.110
Full Super Rate: 3.030%

TRANSITION STATION	STATION	%e LEFT	%e RIGHT
Normal Crown	0+087.102	−2.000%	−2.000%
0% Super	0+099.086	−2.000%	0.000%
Reverse Crown	0+111.069	−2.000%	2.000%
PC 1	0+111.231	−2.027%	2.027%
Full Super	0+117.213	−3.030%	3.030%
Full Super	0+165.318	−3.030%	3.030%
PT 1	0+171.300	−2.027%	2.027%
Reverse Crown	0+171.462	−2.000%	2.000%
0% Super	0+183.445	−2.000%	0.000%
Normal Crown	0+195.428	−2.000%	−2.000%

C2 Degree : 5°50'00" Radius : 299.379 m
Tangent Runout Back: 11.865 Tangent Runout Ahead: 11.865
Runoff Length Back: 19.084 Runoff Length Ahead: 19.084
Transition Length Back: 30.949 Transition Length Ahead: 30.949
Full Super Rate: 3.220%

TRANSITION STATION	STATION	%e LEFT	%e RIGHT
Normal Crown	0+245.559	−2.000%	−2.000%
0% Super	0+257.425	0.000%	−2.000%
Reverse Crown	0+269.290	2.000%	−2.000%
PC 2	0+270.211	2.156%	−2.156%
Full Super	0+276.509	3.220%	−3.220%
Full Super	0+429.737	3.220%	−3.220%
PT 2	0+436.034	2.156%	−2.156%
Reverse Crown	0+436.956	2.000%	−2.000%
0% Super	0+448.821	0.000%	−2.000%
Normal Crown	0+460.686	−2.000%	−2.000%

C3 Degree : 8°36'10" Radius : 203.000 m
Tangent Runout Back: 12.157 Tangent Runout Ahead: 12.157
Runoff Length Back: 22.513 Runoff Length Ahead: 22.513
Transition Length Back: 34.670 Transition Length Ahead: 34.670
Full Super Rate: 3.710%

TRANSITION STATION	STATION	%e LEFT	%e RIGHT
Normal Crown	0+916.233	−2.000%	−2.000%
0% Super	0+928.390	−2.000%	0.000%
Reverse Crown	0+940.547	−2.000%	2.000%
PC 3	0+943.494	−2.485%	2.485%
Full Super	0+950.933	−3.710%	3.710%
Full Super	1+137.800	−3.710%	3.710%
PT 3	1+145.239	−2.485%	2.485%
Reverse Crown	1+148.185	−2.000%	2.000%
0% Super	1+160.342	−2.000%	0.000%
Normal Crown	1+172.500	−2.000%	−2.000%

C4 Degree : 8°36'10" Radius : 203.000 m
Tangent Runout Back: 12.157 Tangent Runout Ahead: 12.157
Runoff Length Back: 22.513 Runoff Length Ahead: 22.513
Transition Length Back: 34.670 Transition Length Ahead: 34.670
Full Super Rate: 3.710%

TRANSITION STATION	STATION	%e LEFT	%e RIGHT
Normal Crown	1+209.314	−2.000%	−2.000%
0% Super	1+221.471	0.000%	−2.000%
Reverse Crown	1+233.628	2.000%	−2.000%
PC 4	1+236.574	2.485%	−2.485%
Full Super	1+244.014	3.710%	−3.710%
Full Super	1+428.715	3.710%	−3.710%
PT 4	1+436.154	2.485%	−2.485%
Reverse Crown	1+439.101	2.000%	−2.000%
0% Super	1+451.258	0.000%	−2.000%
Normal Crown	1+463.415	−2.000%	−2.000%

C5 Degree : 8°36'10" Radius : 203.000 m
Tangent Runout Back: 12.157 Tangent Runout Ahead: 12.157
Runoff Length Back: 22.513 Runoff Length Ahead: 22.513
Transition Length Back: 34.670 Transition Length Ahead: 34.670
Full Super Rate: 3.710%

TRANSITION STATION	STATION	%e LEFT	%e RIGHT
Normal Crown	1+468.224	−2.000%	−2.000%
0% Super	1+480.381	−2.000%	0.000%
Reverse Crown	1+492.538	−2.000%	2.000%
PC 5	1+495.485	−2.485%	2.485%
Full Super	1+502.924	−3.710%	3.710%
Full Super	1+634.318	−3.710%	3.710%
PT 5	1+641.757	−2.485%	2.485%
Reverse Crown	1+644.704	−2.000%	2.000%
0% Super	1+656.861	−2.000%	0.000%
Normal Crown	1+669.018	−2.000%	−2.000%

C6 Degree : 6°14'13" Radius : 280.000 m
Tangent Runout Back: 14.500 Tangent Runout Ahead: 14.500
Runoff Length Back: 29.000 Runoff Length Ahead: 29.000
Transition Length Back: 43.500 Transition Length Ahead: 43.500
Full Super Rate: 4.000%

TRANSITION STATION	STATION	%e LEFT	%e RIGHT
Normal Crown	1+773.794	−2.000%	−2.000%
0% Super	1+788.294	0.000%	−2.000%
Reverse Crown	1+802.794	2.000%	−2.000%
PC 6	1+807.724	2.680%	−2.680%
Full Super	1+817.294	4.000%	−4.000%
Full Super	1+994.521	4.000%	−4.000%
PT 6	2+004.091	2.680%	−2.680%
Reverse Crown	2+009.021	2.000%	−2.000%
0% Super	2+023.521	0.000%	−2.000%
Normal Crown	2+038.021	−2.000%	−2.000%

C7 Degree : 3°58'09" Radius : 440.000 m
Tangent Runout Back: 14.415 Tangent Runout Ahead: 14.415
Runoff Length Back: 26.119 Runoff Length Ahead: 26.119
Transition Length Back: 40.534 Transition Length Ahead: 40.534
Full Super Rate : 3.620%

TRANSITION STATION	STATION	%e LEFT	%e RIGHT
Normal Crown	2+467.721	−2.000%	−2.000%
0% Super	2+482.137	0.000%	−2.000%
Reverse Crown	2+496.552	2.000%	−2.000%
PC 7	2+499.637	2.427%	−2.427%
Full Super	2+508.256	3.620%	−3.620%
Full Super	2+709.950	3.620%	−3.620%
PT 7	2+718.569	2.427%	−2.427%
Reverse Crown	2+721.654	2.000%	−2.000%
0% Super	2+736.069	0.000%	−2.000%
Normal Crown	2+750.484	−2.000%	−2.000%

C8 Degree : 2°59'07" Radius : 585.000 m
Tangent Runout Back: 14.334 Tangent Runout Ahead: 14.334
Runoff Length Back: 23.152 Runoff Length Ahead: 23.152
Transition Length Back: 37.486 Transition Length Ahead: 37.486
Full Super Rate : 3.230%

TRANSITION STATION	STATION	%e LEFT	%e RIGHT
Normal Crown	3+179.277	−2.000%	−2.000%
0% Super	3+193.611	−2.000%	0.000%
Reverse Crown	3+207.945	−2.000%	2.000%
PC 8	3+209.123	−2.164%	2.164%
Full Super	3+216.763	−3.230%	3.230%
Full Super	3+517.838	−3.230%	3.230%
PT 8	3+525.478	−2.164%	2.164%
Reverse Crown	3+526.656	−2.000%	2.000%
0% Super	3+540.990	−2.000%	0.000%
Normal Crown	3+555.324	−2.000%	−2.000%

C9 Degree : 1°59'45" Radius : 875.000 m
Tangent Runout Back: 14.449 Tangent Runout Ahead: 14.449
Runoff Length Back: 19.486 Runoff Length Ahead: 19.486
Transition Length Back: 33.935 Transition Length Ahead: 33.935
Full Super Rate : 2.700%

TRANSITION STATION	STATION	%e LEFT	%e RIGHT
Normal Crown	4+087.775	−2.000%	−2.000%
0% Super	4+102.224	−2.000%	0.000%
PC 9	4+115.280	−2.000%	1.807%
Reverse Crown	4+116.673	−2.000%	2.000%
Full Super	4+121.710	−2.700%	2.700%
Full Super	4+365.155	−2.700%	2.700%
Reverse Crown	4+370.192	−2.000%	2.000%
PT 9	4+371.585	−2.000%	1.807%
0% Super	4+384.641	−2.000%	0.000%
Normal Crown	4+399.090	−2.000%	−2.000%

C10 Degree : 1°31'07" Radius : 1150.000 m
Tangent Runout Back: 14.245 Tangent Runout Ahead: 14.245
Runoff Length Back: 16.777 Runoff Length Ahead: 16.777
Transition Length Back: 31.022 Transition Length Ahead: 31.022
mFull Super Rate : 2.360%

TRANSITION STATION	STATION	%e LEFT	%e RIGHT
Normal Crown	4+820.669	−2.000%	−2.000%
0% Super	4+834.915	0.000%	−2.000%
PC 10	4+846.156	1.578%	−2.000%
Reverse Crown	4+849.160	2.000%	−2.000%
Full Super	4+851.693	2.360%	−2.360%
Full Super	5+664.092	2.360%	−2.360%
Reverse Crown	5+666.624	2.000%	−2.000%
PT 10	5+669.628	1.578%	−2.000%
0% Super	5+680.870	0.000%	−2.000%
Normal Crown	5+695.115	−2.000%	−2.000%



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

SUPERELEVATION DATA

Designed by: WHPacific **Date:** 11/09
Drawn by: WHPacific **Date:** 11/09
Revised by: **Date:**
File Name: N11(1A)–Superelevation sht 5

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	6	82

TURNOUTS AND OTHER LOCATIONS W/CATTLE GUARDS AND GATES

STATION	LOC.	TURNOUT SIZE	CATTLE GUARD 61903-0310 2-UNIT	CATTLE GUARD 61903-0710 3-UNIT	61902-5010 * TYPE I GATE (EA)	* TYPE II GATE (EA)	REMARKS
0+080.000	Lt.	4.5m x 18.2m	1			1	Drain Through Cattle Guard
0+462.000	Lt.	4.5m x 18.2m	1			1	
0+488.000	Rt.	4.5m x 25.2m			1		Construction Zone, Utility Access
0+871.000	Rt.	4.5m x 18.2m	1			1	
1+550.000	Lt.	4.5m x 35.2m	1			1	Construction Zone
1+606.000	Rt.	4.5m x 18.2m	1			1	
2+025.000	Lt.	4.5m x 30.2m	1			1	Construction Zone
3+875.000	Rt.	7.0m x 72.2m		1		1	Construction Zone
3+875.000	Lt.	7.0m x 68.2m		1		1	Construction Zone
4+212.000	Rt.	4.5m x 22.2m	1			1	Construction Zone
4+775.000	Rt.	N/A			1		
4+775.000	Lt.	7.0m x 18.2m			2**		Double Swing Gate, To Windmill/Stock Pond **
5+900.000	℄			1			Placed on Roadway at EOP
		TOTAL	7	3	4	9	Construction Zone

* Type I and Type II gates associated with a cattle guard are included in the cost of the cattle guard. No separate payment will be made. Gates not associated with cattle guards will be paid under appropriate items listed in the Bid Schedule.

** See General Note 34 for additional gate contruction requirment.

EXISTING UTILITY CROSSINGS

LOCATION	DESCRIPTION	SKEW	REMARKS*
0+052.440	Overhead Power Line	92°	Protect In Place
0+056.000	Underground Fiber/Copper Telephone Lines (2)	92°	Work by others–new inner duct line to be placed and lines to relocate by Frontier.
0+109.000	Underground Water Line Crossing	92°	Protect waterline in place. Extend 400mm steel casing to new ROW limits.
0+496.948	Underground Water Line Crossing	97°	Protect In Place
2+326.600	Overhead Power Line	79°	Protect In Place
3+685.000	Underground Water Line Crossing	82°	Protect waterline in place. Install 400mm steal casing with in new ROW limits.
3+762.100	Overhead Power Line	120°	Protect In Place

*Remarks Related to Work by Others is Work Assumed to be Required by the BIA. Actual Work Required/Performed by Utility Owner May Vary.

PAVING QUANTITIES

LOCATION	VOLUME (m^3)	WEIGHT (t)	40201-0500: HOT ASPHALT CONCRETE PAVEMENT,CLASS "B" GRADING "B" t	40502-0800 ASPHALT BINDER PG 52-28 t	41101-5000 PRIME COAT GRADE PEP t
N11	**(APPROXIMATE)**				
0+005.864 to 3+946.217	3,046	7,402	444		54.3
3+984.651 to 5+900.000	1,476	3,587	215		26.4
Guardrail Widening at Bridge Approaches	13	32	2		0.1
TURNOUTS					
0+080 Lt.	7	18	1.08		0.13
0+462 Lt.	7	18	1.08		0.13
0+488 Rt.	9	23	1.38		0.17
0+871 Rt.	7	18	1.08		0.13
1+550 Lt.	7	18	1.08		0.13
1+606 Rt.	7	18	1.08		0.13
2+025 Lt.	7	18	1.08		0.13
3+875 Lt.	15	36	2.15		0.26
3+875 Rt.	15	36	2.15		0.26
4+212 Rt.	7	18	1.08		0.13
4+775 Lt.	18	43	2.58		0.31
TOTAL	4,641	11,285	676.82		82.71

* ITEM 20304-1000: REMOVAL OF STRUCTURES AND OBSTRUCTIONS

STATION	LOCATION	REMARKS
0+025	24 m Lt.	Remove & Salvage Cattle Guard For Owner Pickup
0+027	12 m Rt.	Remove "Keep Your Community Clean" Sign & Place Outside ROW
0+788	16 m Rt.	Move Memorial Outside R.O.W.

*See Note #19 on sheet #3.

30101-2000: UNTREATED AGGREGATE BASE COURSE-GRADE "D"

STATION TO STATION	VOLUME (m^3)	WEIGHT (t)
N11	**(APPROXIMATE)**	
0+005.864 to 3+946.217	6,928	15,712
3+984.651 to 5+900.000	3,356	7,612
Guardrail Widening at Bridge Approaches	27	62
TURNOUTS		
	18	42
0+462 Lt.	18	42
0+488 Rt.	22	50
0+871 Rt.	18	42
1+550 Lt.	18	42
1+606 Rt.	18	42
2+025 Lt.	18	42
3+875 Lt.	34	77
3+875 Rt.	34	77
4+212 Rt.	18	42
4+775 Lt.	38	87
TOTAL	10,565	23,971

ITEM 21102-2000: ROADWAY OBLITERATION, METHOD 2

STATION TO STATION	AREA (m^2)
0+008 to 0+073 Lt.	585
0+933 to 1+101 Lt.	1,157
1+848 to 2+012 Lt.	974
2+166 to 2+309 Rt.	609
3+501 to 3+868 Rt.	3,365
3+882 to 3+923 Rt.	267
3+877 to 3+907 Lt.	241
3+882 to 4+206 Rt.	2,561
4+218 to 4+258 Rt.	126
4+455 to 5+451 Rt.	6,630
TOTAL	16,515



ITEM 61701-5000 GUARDRAIL SYSTEM SGR-04B, TYPE PDE 02 WITH MSKT-TL3-8 END TERMINAL & THRIE BEAM GUARDRAIL TRANSITION

STATION TO STATION	LOCATION	LENGTH (m)	REMARKS
3+908.596 to 3+947.651	Rt.	39.055	1
3+927.646 to 3+947.651	Lt.	20.005	2
3+983.217 to 4+003.222	Rt.	20.005	2
3+983.217 to 4+022.272	Lt.	39.055	1
	TOTAL	118.12	

1= INCLUDES END TERMINAL SYSTEM, STANDARD W-BEAM GUARDRAIL AND THRIE BEAM GUARDRAIL TRANSITION
2= INCLUDES END TERMINAL SYSTEM AND THRIE BEAM GUARDRAIL TRANSITION.

ESTIMATED EARTHWORK QUANTITIES

STATION TO STATION	20401-0000 ROADWAY EXCAVATION CUT(m^3)	FILL (m^3)	WASTE (m^3)	20410-0000 BORROW (m^3)
0+005.864 to 3+945.82	134305	76356	57949	0
BRIDGE STA.3+945.82 to 3+985.05	0	0	0	0
3+985.05 to 5+900.00	7017	65931	0	58914
TURNOUTS	1173	5950	0	4777
PUERCO RIVER CHANNEL GRADING (SHT. 33)	2477	1985	492	0
CHANNEL EROSION STA. 5+862 to 5+900	0	11883	0	11883
SUBTOTAL	144972	162104	58441	75574
PROJECT TOTAL/USE	145000	162200	0	17200

NOTES:
1. A 15% SHRINKAGE FACTOR HAS BEEN APPLIED TO THE FILL QUANTITIES SHOWN PER THE GEOTECH REPORT DATED 8/04/2010. FINAL QUANTITIES SHALL BE BASED ON THE IN-PLACE SURVEYED CROSS SECTION AMOUNTS PER THE FP-14 SPECIFICATIONS AND SUPPLEMENTAL SPECIFICATIONS.

2. CONTRACTOR SHALL PLAN HIS OPERATIONS PROPERLY TO UTILIZE THE EXCESS EXCAVATION MATERIAL (FROM STATION 0+005.864 TO 3+945.82) ON THE PROJECT SITE BEFORE UTILIZING BORROW PIT MATERIAL ON THE JOB.

* ITEM 62101-0000: RIGHT OF WAY MONUMENT
* ITEM 62102-0000: REFERENCE MARKER

STATION	DESCRIPTION	LOCATION	MONUMENT	MARKER
0+025.150	Begin R.O.W. Lt.	23 m Lt.	1	1
0+025.150	Begin R.O.W. Rt.	23 m Rt.	1	1
0+111.231	PC 1	23 m Rt. & Lt.	2	2
0+171.300	PT 1	23 m Rt. & Lt.	2	2
0+270.211	PC 2	23 m Rt. & Lt.	2	2
0+436.034	PT 2	23 m Rt. & Lt.	2	2
0+943.494	PC 3	23 m Rt. & Lt.	2	2
1+145.239	PT 3	23 m Rt. & Lt.	2	2
1+236.574	PC 4	23 m Rt. & Lt.	2	2
1+436.154	PT 4	23 m Rt. & Lt.	2	2
1+495.485	PC 5	23 m Rt. & Lt.	2	2
1+641.757	PT 5	23 m Rt. & Lt.	2	2
1+807.724	PC 6	23 m Rt. & Lt.	2	2
2+004.091	PT 6	23 m Rt. & Lt.	2	2
2+499.637	PC 7	23 m Rt. & Lt.	2	2
2+718.569	PT 7	23 m Rt. & Lt.	2	2
3+209.123	PC 8	23 m Rt. & Lt.	2	2
3+525.478	PT 8	23 m Rt. & Lt.	2	2
3+900.000	POT	23 m & 50 m Lt.	2	2
3+900.000	POT	23 m & 50 m Rt.	2	2
4+020.000	POT	23 m & 50 m Lt.	2	2
4+020.000	POT	23 m & 50 m Rt.	2	2
4+115.280	PC 9	23 m Rt. & Lt.	2	2
4+371.585	PT 9	23 m Rt. & Lt.	2	2
4+846.156	PC 10	23 m Rt. & Lt.	2	2
5+620.000	POC	23 m & 35 m Rt.	2	2
5+669.628	PT 10	35 m Rt. & 23 m Lt.	2	2
5+740.000	POT	35 m Rt. & 23 m Rt.	2	2
5+900.000	EOP	23 m Rt. & Lt.	2	2
		TOTAL	56	56

*See Note #9 on sheet #65.

ITEM 21301-4000: SUBGRADE STABILZATION W / ROADBOND EN-1, 152mm DEPTH

STATION TO STATION	WIDTH (m)	LENGTH (m)	SQUARE METERS
N11			
0+005.864 TO 5+900.000	12.68	5894.14	74737

ITEM No. 61102-2950; 150mm WATERINE, POLYVINYL CHLORIDE (PVC)

STATION	LOCATION:	DESCRIPTION	QUANTITY (m)	REMARKS:
0+109	varies	existing 6" NTUA waterline crossing	14.0	Install 150mm (6") waterline as needed to extend the casing to proposed ROW lines per NTUA details. Final waterline location/extension limits to be verified in the field.
3+685	23m LT to 23m RT	existing 6" NTUA waterline crossing	50.0	Install 150mm (6") waterline as needed to extend the casing to proposed ROW lines per NTUA details. Final waterline location/extension limits to be verified in the field.
		TOTAL:	64.0	

ITEM No. 61103-1450; 400mm ENCASEMENT PIPE, GALVANIZED STEEL

STATION	LOCATION:	DESCRIPTION	QUANTITY (m)	REMARKS:
0+109	varies	existing 6" NTUA waterline crossing	12.0	Install 400mm (16") waterline casing extensions on existing pipe to proposed ROW lines per NTUA details. Final casing location/extension limits to be verified in the field.
3+685	23m LT to 23m RT	existing 6" NTUA waterline crossing	46.0	Install 400mm (16") waterline casing extensions on existing pipe to proposed ROW lines per NTUA details. Final casing location/extension limits to be verified in the field.
		TOTAL:	58.0	

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

QUANTITY TABLES

Designed by: WHPacific **Date:** 5/10
Drawn by: WHPacific **Date:** 5/10
Revised by: WHPacific **Date:** 9/11
File Name: N11(1A)–QTY sht 6

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	7	82

ITEM 63401-1520: PAVEMENT MARKINGS, TYPE "H", SOLID WHITE - 102 mm WIDE

STATION TO STATION	LOCATION	DESCRIPTION	LENGTH (m)
0+005.864 to 5+900.000	Rt.	Solid White	5,894.14
Minus (4) 4.50 m T.O. @ 20.67 m			−82.68
Minus (1) 7.00 m T.O. @ 35.17 m			−35.17
		SUBTOTAL	5,776.29
0+005.864 to 5+900	Lt.	Solid White	5,894.14
Minus (4) 4.50 m T.O. @ 20.67 m			−82.68
Minus (2) 7.00 m T.O. @ 35.17 m			−70.34
		SUBTOTAL	5,741.12
		TOTAL	11,517.41

ITEM 63405-3260: PAVEMENT MARKINGS, "STOP" BAR, SOLID WHITE, TYPE "H" - 300 mm WIDE

STATION	LOCATION	DESCRIPTION	QUANTITY (EA)	REMARKS
0+010	Lt.	STOP BAR	1	
1+550	Lt.	STOP BAR	1	Turnout
1+606	Rt.	STOP BAR	1	Turnout
3+885	Rt.	STOP BAR	1	Turnout
		TOTAL	4	

*ITEM 63401-1510: PAVEMENT MARKINGS, TYPE "H", SOLID YELLOW - 102 mm WIDE

STATION TO STATION	LOCATION	DESCRIPTION	LENGTH (m)
0+025 to 0+600	Rt.	No Passing Right	575
0+025 to 0+740	Lt.	No Passing Left	715
1+180 to 1+641	Rt.	No Passing Right	461
1+340 to 1+740	Lt.	No Passing Left	400
2+400 to 2+580	Rt.	No Passing Right	180
2+640 to 2+800	Lt.	No Passing Left	160
		TOTAL	2,491

*ITEM 63401-1610: PAVEMENT MARKINGS, TYPE "H", BROKEN YELLOW - 102 mm WIDE

STATION TO STATION	LOCATION	DESCRIPTION	LENGTH (m)
0+600 to 0+740	Rt.	One−Way Passing Rt.	140
0+740 to 1+180	℄	Two−Way Passing	440
1+180 to 1+340	Lt.	One−Way Passing Lt.	160
1+641 to 1+740	Rt.	One−Way Passing Rt.	99
1+740 to 2+400	℄	Two−Way Passing	660
2+400 to 2+550	Lt.	One−Way Passing Lt.	150
2+550 to 2+640	℄	Two−Way Passing	90
2+640 to 2+800	Rt.	One−Way Passing	160
2+800 to 5+900	℄	Two−Way Passing	3,100
		TOTAL	4,999

*Exact Location of No Passing Zones Will Be Determined In The Field During Construction.

ITEM 63308-3000: OBJECT MARKER, TYPE 3

CULVERT STATION	DESCRIPTION	LOCATION	EACH
3+946.380	Bridge Loc.	Rt. & Lt.	2
3+984.480	Bridge Loc.	Rt. & Lt.	2
		TOTAL	4

ITEMS 63309-0010 & 63309-0020: DELINEATORS

STATION	LOCATION	TYPE 1a	TYPE 1b
0+141.266	Rt.		1
PT STA 0+171.300	Rt.		1
0+214.937	Lt.		1
PC STA 0+270.211	Lt.		1
0+297.848	Lt.		1
0+325.485	Lt.		1
0+353.123	Lt.		1
0+380.760	Lt.		1
0+408.397	Lt.		1
PT STA 0+436.034	Lt.		1
0+491.308	Lt.		1
0+574.220	Lt.		1
0+581.414	Rt.	1	
0+664.220	Rt.		1
0+831.414	Rt.		1
0+898.662	Rt.		1
0+900.043	Lt.	1	
PC STA 0+943.494	Rt.		1
0+965.910	Rt.		1
0+988.326	Rt.		1
1+010.742	Rt.		1
1+033.158	Rt.		1
1+055.575	Rt.		1
1+077.991	Rt.		1
1+100.407	Rt.		1
1+122.823	Rt.		1
PT STA 1+145.239	Rt.		1
1+190.071	Rt.		1
PC STA 1+236.574	Lt.		1
1+261.523	Lt.		1
1+286.470	Lt.		1
1+311.418	Lt.		1
1+361.312	Lt.		1
1+386.259	Lt.		1
1+411.207	Lt.		1
PT STA 1+436.154	Lt.		1
1+486.049	Lt.		1
PC STA 1+495.485	Rt.		1
1+519.864	Rt.		1
1+544.242	Rt.		1
1+568.621	Rt.		1
1+593.000	Rt.		1
1+677.446	Lt.		1
1+763.650	Rt.		1
PC STA 1+807.724	Lt.		1
1+835.777	Lt.		1
1+863.829	Lt.		1
1+891.882	Lt.		1
1+947.987	Lt.		1
1+976.039	Lt.		1
PT STA 2+004.091	Lt.		1
2+060.196	Lt.		1
2+164.090	Rt.	1	
2+230.774	Lt.		1
2+317.193	Lt.		1
2+324.090	Rt.	1	
2+426.659	Lt.		1
2+484.090	Rt.	1	
PC STA 2+499.637	Lt.		1
2+536.126	Lt.		1
2+572.615	Lt.		1
2+609.104	Lt.		1
2+682.081	Lt.		1
PT STA 2+718.569	Lt.		1
	SUBTOTAL	5	59

ITEMS 63309-0010 & 63309-0020: DELINEATORS

STATION	LOCATION	TYPE 1a	TYPE 1b
2+835.000	Rt.	1	
2+971.547	Lt.		1
3+040.034	Rt.		1
3+130.034	Rt.		1
PC STA 3+209.123	Rt.		1
3+248.667	Rt.		1
3+288.212	Rt.		1
3+327.756	Rt.		1
3+367.301	Rt.		1
3+406.845	Rt.		1
3+446.389	Rt.		1
3+485.934	Rt.		1
PT STA 3+525.478	Rt.		1
3+604.567	Rt.		1
3+620.000	Lt.	1	
3+694.567	Rt.		1
3+780.000	Lt.	1	
3+784.567	Rt.		1
3+935.280	Rt.		1
3+940.000	Lt.	1	
4+025.280	Rt.		1
4+100.000	Lt.	1	
PC STA 4+115.280	Rt.		1
4+166.541	Rt.		1
4+230.000	Rt.		1
4+269.064	Rt.		1
4+320.324	Rt.		1
PT STA 4+371.585	Rt.		1
4+416.156	Lt.	1	
4+461.585	Rt.		1
4+551.585	Rt.		1
4+576.156	Lt.		1
4+641.585	Rt.		1
4+756.156	Lt.		1
4+801.586	Rt.	1	
PC STA 4+846.156	Lt.		1
4+904.976	Lt.		1
4+963.795	Lt.		1
5+022.615	Lt.		1
5+081.434	Lt.		1
5+140.254	Lt.		1
5+199.073	Lt.		1
5+316.712	Lt.		1
5+375.532	Lt.		1
5+434.351	Lt.		1
5+493.171	Lt.		1
5+551.990	Lt.		1
5+610.810	Lt.		1
PT STA 5+669.628	Lt.		1
5+670.000	Rt.	1	
5+759.628	Lt.		1
5+830.000	Rt.	1	
	SUBTOTAL	9	43
	TOTAL	14	102

ITEMS 63306-2000: OBJECT MARKER, GLASS FIBER, TYPE 2

CULVERT STATION	DESCRIPTION	LOCATION	EACH
0+232.000	Pipe Loc.	Inlet & Outlet	2
0+928.000	Pipe Loc.	Inlet & Outlet	2
1+920.000	Cattle Pass Loc.	Inlet & Outlet	2
3+750.000	Pipe Loc.	Inlet & Outlet	2
3+852.000	Pipe Loc.	Inlet & Outlet	2
5+635.000	Pipe Loc.	Inlet & Outlet	2
		TOTAL	12

DEREK D. MEIER
NEW MEXICO
14504
REGISTERED PROFESSIONAL ENGINEER
4/14/20

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

QUANTITY TABLES

Designed by: WHPacific	Date: 5/10
Drawn by: WHPacific	Date: 5/10
Revised by: WHPacific	Date: 9/11
File Name: N11(1A)−QTY sht 7	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	8	82

ESTIMATED DRAINAGE STRUCTURE QUANTITIES

ITEM NO.				60201 -0810	60201 -1810	60202 -0510	60210 -0810	60210 -1810	60211 -0910
				610 mm CSPC-2.77 mm Thickness 68 mm x 13 mm Corrugation	2134 mm CSPC-3.5 mm Thickness 127 mm x 25 mm Corrugation	711 mm S x 508 mm R CSPA-2.77 mm Thickness 68 mm x 13 mm Corrugation	End Section For 610 mm CSPC* 2.77 mm Thickness	End Section For 2134 mm CSPC* 3.5 mm Thickness	End Section For 711 mm S x 508 mm R CSPA * 2.77 mm Thickness
STATION	ha	STRUCTURE DESCRIPTION	SKEW NO	m	m	m	m	EA	EA
0+232.000	0.51	1-610 mm x 31.09 m CSPC	132°	31.09			1		
0+462.000 Lt.	0.17	1-711 mm S x 508 mm R x 9.75 m CSPA	N/A			9.75			2
0+488.000 Rt.	0.16	1-711 mm S x 508 mm R x 9.75 m CSPA	N/A			9.75			2
0+871.000 Rt.	1.01	1-610 mm x 9.75 m CSPC	N/A	9.75			2		
0+928.000	1.03	1-610 mm x 28.65 m CSPC	135°	28.65			1		
1+920.000	0.41	1-2134mm x 28.04 m CSPC Dual Purpose	90°		28.04			1	
2+025.000 Lt.	0.38	1-610 mm x 12.19 m CSPC	N/A	12.19			2		
3+750.000	0.65	1-610 mm x 34.14 m CSPC	115°	34.14			1		
3+852.000	0.66	1-610 mm x 34.14 m CSPC	90°	34.14			1		
4+212.000 Rt.	0.18	1-711 mm S x 508 mm R x 9.14 m CSPA	N/A			9.14			2
4+775.000 Lt.	1.08	1-711 mm S x 508 mm R x 17.07 m CSPA	N/A			17.07			2
5+635.000	9.11	3-610 mm x 34.14 m CSPC	45°	102.42			3		
			TOTAL	252.38	28.04	45.71	11	1	8

* Install End Section on Inlet Side, Except @ Turnout Locations Where End Sections Will Be Installed at Both Ends.

ITEM 25101-2000: PLACED RIPRAP, CLASS 2

STATION	LOCATION	Wd1 (m)	Wd2 (m)	THICKNESS (mm)	ESTIMATED LENGTH (m)	VOLUME (m^3)	REMARKS (Detail Sheet)
2+850 to 2+877	Lt.	3.50	6.50	457	26	45.2	Cut to Fill Transition (Sht 67)
2+990 to 3+010	Rt.	3.50	6.50	457	17	30.9	Cut to Fill Transition (Sht 67)
3+360 to 3+380	Rt.	3.50	6.50	457	19	34.1	Cut to Fill Transition (Sht 67)
3+393 to 3+410	Lt.	3.50	6.50	457	15	27.7	Cut to Fill Transition (Sht 67)
3+680 to 3+714	Lt.	3.50	6.50	457	34	58.0	Cut to Fill Transition (Sht 67)
3+700 to 3+746	Rt.	3.50	6.50	457	44	74.0	Cut to Fill Transition (Sht 67)
					TOTAL	269.9	

SEE SHEET 66 FOR ADDITIONAL QUANTITIES

ITEM 25112-2000: WIRE ENCLOSED RIPRAP, CLASS 2

STATION	LOCATION	Wd1 (m)	Wd2 (m)	THICKNESS (mm)	ESTIMATED LENGTH (m)	VOLUME (m^3)	REMARKS (Detail Sheet)
0+340	Rt.	2.50	N/A	457	22	25.1	Furrow Ditch (Sht. 57)
1+180 to 1+245	Rt.	3.50	6.50	457	64	109.2	Cut to Fill Transition (Sht 67)
1+325	Lt.	2.50	N/A	457	21	24.0	Furrow Ditch (Sht 57)
1+350 to 1+400	Lt.	3.50	N/A	457	50	80.0	Along Existing Erosion (Sht 68)
2+365 to 2+385	Lt.	3.50	6.50	457	20	38.9	Cut to Fill Transition (Sht 67)
2+370 to 2+435	Rt.	3.50	6.50	457	65	110.8	Cut to Fill Transition (Sht 67)
3+946.699	Rt.	2.00	5.00	457	10	14.4	Downdrain (Sht 32 & 67)
3+946.699	Lt.	2.00	5.00	457	10	14.9	Downdrain (Sht 32 & 67)
3+968 to 3+995	Rt.	3.50	6.50	457	30	54.8	Downdrain (Sht 32 & 67)
3+968 to 3+995	Lt.	3.50	6.50	457	35	62.8	Downdrain (Sht 32 & 67)
3+984.169	Rt.	2.00	N/A	457	9	8.2	Downdrain (Sht 32 & 67)
3+984.169	Lt.	2.00	N/A	457	11	10.1	Downdrain (Sht 32 & 67)
5+885 to 5+937	Lt.	10.50	N/A	457	56	261.3	Flat Bottom Ditch (Sht 67)
					TOTAL	814.5	

SEE SHEET 32 & 72 FOR ADDITIONAL QUANITITIES

ITEM 20425-2000: FURROW DITCH

STATION	LOCATION	LENGTH (m)
0+340	Rt.	22
1+325	Lt.	21
1+510	Rt.	13
1+642	Lt.	30
1+653	Rt.	26
4+372	Rt.	29
4+380	Lt.	21
4+775	Rt.	22
5+090	Rt.	36
	TOTAL	220

ITEM 20443-2000: EARTHEN DIKE & BERMS (TYPE "B" DIKE)

CULVERT STATION	LOCATION	APPROX. LENGTH (m)
0+232	Lt.	9
3+750	Rt.	9
5+635	Rt.	9
	TOTAL	27

Note: Skew Ditch Blocks as Directed by the CM.

ITEM 60701-1000: REMOVE, CLEAN & STOCKPILE CULVERT

LOCATION	SIZE (m)	REMARKS
0+016, 25 m Lt.	610 mm x 15.3 m	
3+987, 74 m Rt.	1800 mm x 18.7 m	
TOTAL	34 m	

ITEM 62901-1100: ROLLED EROSION CONTROL PRODUCT, TYPE 4*

STATION TO STATION	LOCATION	QUANTITY (m^2)
0+790 to 0+890	Lt.	687
0+830 to 0+950	Rt.	657
0+990 to 1+050	Rt.	487
1+330 to 1+430	Rt.	1,131
1+410 to 1+610	Lt.	1,353
1+820 to 1+980	Rt.	1,913
1+990 to 2+290	Lt.	2,753
2+010 to 2+330	Rt.	3,399
2+590 to 2+690	Lt.	634
2+590 to 2+850	Rt.	1,483
2+720 to 2+830	Lt.	720
3+050 to 3+330	Rt.	2,793
3+090 to 3+330	Lt.	2,010
3+420 to 3+540	Lt.	1,789
3+550 to 3+690	Rt.	1,359
3+570 to 3+650	Lt.	562
3+750 to 3+830	Lt.	1,125
3+900 to 3+945	Rt.	693
3+900 to 3+945	Lt.	692
5+300 to 5+500	Rt.	2,610
5+610 to 5+670	Lt.	651
	TOTAL	29,501

*At Cut Slopes Specified In These Plans To Be Covered With Erosion Matting Protection, The CM Shall Inspect The Slopes For Existing And Stable Rock Material. If In The Opinion Of The CM, The Cut Slopes Are Sufficiently Stable Due To The Natural Rock, The CM May Delete The Matting In Those Areas.

ESTIMATED FENCING QUANTITIES

STATION TO STATION	61901-1000 FENCE, BARBED WIRE, 5 STRAND (m)	20302-0700 REMOVAL OF FENCE (m)
0+025.150 Lt. to 5+900 Rt.	5,909	
0+025.150 Rt. to 5+900 Lt.	6,099	
0+025 Rt. to 0+025 Lt.		46
0+145 Lt. to 0+182 Lt.		18
3+595 Rt. to 3+603 Lt.		58
5+452 Lt. to 5+471 Lt.		31
5+722 Rt. to 5+900 Rt.		183
SUBTOTAL	12,008	
+3% For Rollling Terrain & Staggered R.O.W. Widths	360	
TOTAL	12,368	336



UNITED STATES
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NAVAJO REGION OFFICE * DIVISION OF TRANSPORTATION

QUANTITY TABLES

Designed by: WHPacific	**Date:** 5/10
Drawn by: WHPacific	**Date:** 5/10
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)-QTY sht 8	

SIGN INSTALLATIONS

STATION	LOC.	SIGN DETAIL NO.	DESCRIPTION	SIGN PANEL SIZE (mm)	AREA OF SIGN (m^2)	NO. of POSTS	kg/m	TOTAL NO. SIGN PANELS
Place at BOP in Location Visible to Southbound N11 Traffic	N/A	W1-7		1219 x 610	0.74	2	4.10	3
		OM4-2		457 x 457	0.21			
		OM4-2		457 x 457	0.21			
0+010	Lt.	R1-1	STOP	914 x 914	0.84	2	3.35	1
1+545	Lt.			610 x 610	0.37	1	2.98	1
1+611	Rt.			610 x 610	0.37	1		1
3+885	Rt.			762 x 762	0.58	2	2.98	1
0+160	Lt.	W3-1a		914 x 914	0.84	2	3.35	1
1+700	Rt.	R2-1(45)	SPEED LIMIT 45	610 X 762	0.46	1	3.35	1
						1		1
5+260	Lt.							
0+080	Rt.	R2-1(35)	SPEED LIMIT 35	610 x 762	0.46	1	3.35	1
1+700	Lt.					1		1
0+040	Rt.	Route No.	11	457 x 610	0.28	1	2.98	1
Eastbound N11 120m West of the N11/N49 Intersection	N/A	M2-1 Route No.	JCT 11	533 x 381 457 x 610	0.20 0.28	1	3.35	2
Westbound N49 120m East of the N11/N49 Intersection	Rt.	M2-1 Route No.	JCT 11	533 x 381 457 x 610	0.20 0.28	1	3.35	2
1+780	Lt.	W3-5	SPEED LIMIT 35	914 x 914	0.84	2	3.35	1
0+065	Lt.	Rte. No. M6-1(R)	11	457 x 610 525 x 375	0.28 0.20	1	3.35	2
Eastbound N11 60m West of the N11/N49 Intersection	N/A	Rte. No. M6-1(L)	11	457 x 610 525 x 375	0.28 0.20	1	3.35	2
0+065	Lt.	Rte. No. M6-1(L)	49	457 x 610 525 x 375	0.28 0.20	1	3.35	2
Eastbound N11 60m West of the N11/N49 Intersection	Rt.	Rte. No. M6-3	49	457 x 610 525 x 375	0.28 0.20	1	3.35	2
Westbound N49 30m East of the N11/N49 Intersection	N/A	W2-2(R)		762 x 762	0.58	2	3.35	1
Eastbound N11 30m West of the N11/N49 Intersection	N/A	W2-2(L)		762 x 762	0.58	2	3.35	1
0+100	Lt.	W2-4		914 x 914	0.84	2	3.35	1
0+800	Rt.	W1-5		762 x 762	0.58	2	3.35	1
2+146	Lt.					2		1

SIGN INSTALLATIONS

STATION	LOC.	SIGN DETAIL NO.	DESCRIPTION	SIGN PANEL SIZE (mm)	AREA OF SIGN (m^2)	NO. of POSTS	kg/m	TOTAL NO. SIGN PANELS
Westbound N49 60m East of the N11/N49 Intersection	Rt.	Rte. No M6-6	11	457 x 610 525 x 375	0.28 0.20	1	3.35	2
0+600	Lt.	W7-1a	7%	1219 x 1219	1.49	2	4.10	1
4+515	Rt.	W11-4		762 x 762	0.58	2	3.35	1
5+035	Lt.					2		1
0+025	Rt.	R4-1	DO NOT PASS	610 x 762	0.46	1	3.35	1
0+740	Lt.					1		1
1+180	Rt.					1		1
1+740	Lt.					1		1
2+400	Rt.					1		1
2+800	Lt.					1		1
0+025	Lt.	W14-3	NO PASSING ZONE	914 x 1219 x 1219	0.52	2	3.35	1
0+740	Rt.					2		1
1+180	Lt.					2		1
1+740	Rt.					2		1
2+400	Lt.					2		1
2+800	Rt.					2		1
0+600	Rt.	R4-2	PASS WITH CARE	610 x 762	0.46	1	3.35	1
1+340	Lt.					1		1
1+641	Rt.					1		1
2+580	Rt.					1		1
2+640	Lt.					1		1
2+350	Rt.	W1-2R		762 x 762	0.58	2	3.35	1
3+700	Lt.					2		1
2+880	Lt.	W1-2L		762 x 762	0.58	2	3.35	1
2+973	Rt.					2		1
5+850	Lt.					2		1
5+750	Rt.	W8-3	PAVEMENT ENDS	914x914	0.84	2	3.35	1

63302-0001: Sign Installation, 1-POST, 2.98 kg/m	TOTAL	1.02 m^2
63302-0002: Sign Installation, 1-POST, 3.35 kg/m	TOTAL	10.26 m^2
63302-0010: Sign Installation, 2-POST, 2.98 kg/m	TOTAL	0.58 m^2
63302-0011: Sign Installation, 2-POST, 3.35 kg/m	TOTAL	13.70 m^2
63302-0012: Sign Installation, 2-POST, 4.10 kg/m	TOTAL	2.65 m^2

Note: See Sheet 10 For Location Of N11/N49 Intersection Signs.

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	9	82

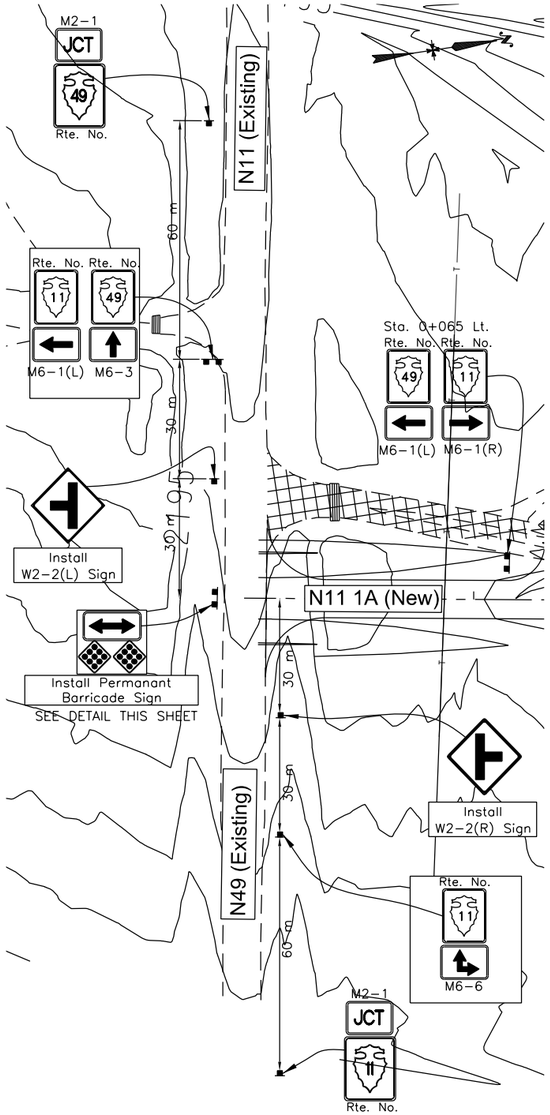
DEREK D. MEIER
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NAVAJO REGION OFFICE * DIVISION OF TRANSPORTATION

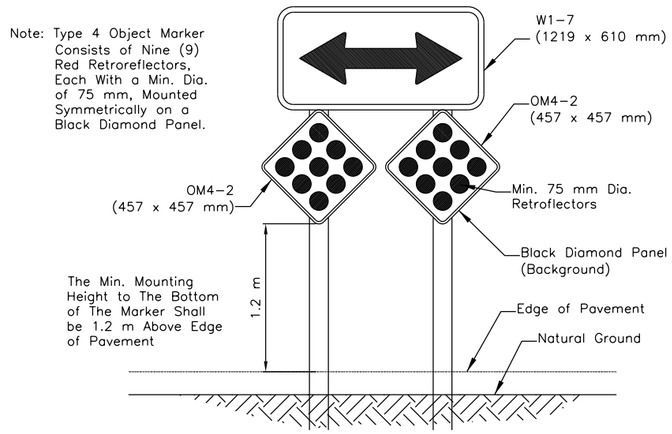
SIGN QUANTITIES

Designed by: WHPacific **Date:** 5/10
Drawn by: WHPacific **Date:** 5/10
Revised by: WHPacific **Date:** 9/11
File Name: N11(1A)-QTY sht 9

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	10	82

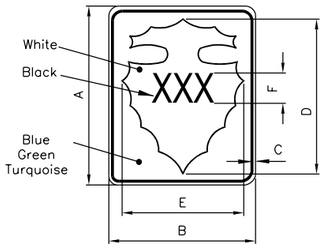


N11/N49 INTERSECTION SIGNING



PERMANENT BARRICADE SIGN

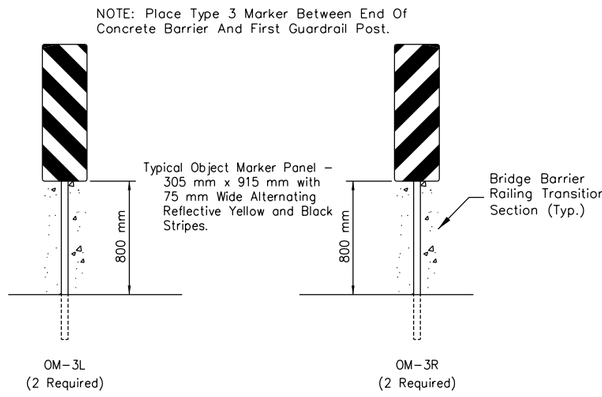
Intersection of N11 with N11/N49



SIGN	DIMENSION (mm)					F NUMERALS-DIMENSIONS (mm)				
	A	B	C	D	E	DIGITS IN ROUTE	1	2	3	4
MIN.	610	457	13	495	343	SIZE & SERIES (mm)	370	296	237	198

ROUTE NO. SIGN DETAIL

N.T.S.



TYPE 3 OBJECT MARKER
BRIDGE RAIL INSTALLATION

N.T.S.



UNITED STATES
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NAVAJO REGION OFFICE * DIVISION OF TRANSPORTATION

SIGN DETAILS

Designed by: WHPacific	**Date:** 5/10
Drawn by: WHPacific	**Date:** 5/10
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)–Sign Details sht 10	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	11	82

CURVE C1	CURVE C2
D = 9°51'14" Lt.	D = 31°44'08" Rt.
Dc= 5°00'00"	Dc= 5°50'00"
R = 349.275m	R = 299.379m
T = 30.109m	T = 85.099m
L = 60.069m	L = 165.823m
e = 3.030%	e = 3.220%
PI	PI
Sta. = 0+141.340	Sta. = 0+355.310
N = 508553.922	N = 508768.013
E = 785091.315	E = 785087.851

021121 WHPacific Project No.

Sta. 0+056.000
Underground telephone & fiber line @ 92 degree skew. Work by others – new inner duct line to be placed and lines to relocated.

Sta. 0+080.000 Lt.
Construct 4.5 m x 18.2 m Turnout
@ 90° Skew w/9.0 m Radius
Install 2–Unit C. Guard w/Type II Gate
Grade to Drain Through Cattle Guard.
See sheet 62 for details.

Sta. 0+056.000
Overhead Power Line Crossing @
Elev. = 2200.00, 92° Skew
Protect in Place

Sta. 0+109.000
6"Water Line Crossing @ 92 degree skew with casing. Protect waterline in place. Extend 150mm PVC waterline and 400mm steel casing to proposed ROW limits per NTUA details.

Sta. 0+145 to 0+182 Lt.
Remove 18 m Existing Woven Wire Fence.
Sta. 0+145 & 0+182 Lt.
Tie R.O.W. Fence to Existing Fence.

Sta. 0+091, 0+129 & 0+167 Lt.
Install Rumble Strips. See Sheet 74 For Details

Sta. 0+008 to 0+073 Lt.
Obliterate Existing Road

Sta. 0+025, 24 m Lt.
Remove & Salvage
Cattle Guard

Sta. 0+016, 25 m Lt.
Remove & Salvage
610 mm CMP Culvert

Obliterate Road

Sta. 0+100 Lt.
Install W2–4 Sign

Sta. 0+160 Lt.
Install W3–1a Sign

Sta. 0+010 Lt.
Install R1–1 Sign

BOP Sta. 0+002.298
N 508416.565
E 785069.740

Grade to Drain

See Sheet 10 for Signing at N11/N49 Intersection

At N11/N49 Intersection
Grade to Drain to East & West Into Existing N11/N49 Roadside Ditches

Sta. 0+025 Lt.
Install W14–3 Sign

Sta. 0+027, 12 m Rt
Remove "Keep Your Community Clean" Sign And Place Outside Right–of–Way.

Sta. 0+025, 23 m Rt. to 40 m Lt.
Remove 46 m Existing Barbed Wire Fence.
Tie R.O.W. Fence to Existing Fence at Each End.

Sta. 0+025 Rt.
Install R4–1 Sign

Sta. 0+040 Rt.
Install Rte. No. Sign

Sta. 0+080 Rt.
Install R2–1(35) Sign

Sta. 0+462.000 Lt.
Construct 4.5 m x 18.2 m Turnout
@ 90° Skew w/9.0 m Radius
Install 2–Unit C. Guard w/Type II Gate
Install 1–711mm S x 508mm R x 9.75 m CSPA w/End Sections at Both Ends

Sta. 0+496.948
Water Line Crossing @ 97° Skew
Protect in Place

Sta. 0+600 Lt.
Install W7–1a Sign

23m R.O.W.

Sta. 0+340 Rt.
Construct Wire–Enclosed Riprap Lined Furrow Ditch

Sta. 0+340 to 0+480 Rt.
Construct Check Dams.
See Sheet 66 for Details.

Sta. 0+488.000 Rt.
Construct 4.5 m x 25.2 m Turnout
@ 90° Skew w/9.0 m Radius
Install Type I Gate
Install 1–711mm S x 508mm R x 9.75m CSPA w/End Sections at Both Ends

Construction Zone

Sta. 0+600 Rt.
Install R4–2 Sign

MATCH LINE STA. 0+700

SCALE
10 0 10 20 30 40 50
(METRIC)

MILEPOSTS	DELINEATORS		OBJECT MARKERS	RIGHT OF-WAY MONUMENTS
	Type "1a"	Type "1b"	Type 2	
0	1	13	2	10

DRAINAGE STRUCTURES

STATION	STRUCTURE	SKEW NO.	D.A. (Ha.)	REMARKS
0+232.000	1–610 mm x 31.09 m CSPC	132°	0.51	End Section & Ditch Block @ Inlet. Placed Riprap @ Outlet
0+462.000 Lt.	1–711 mm S x 508 mm R x 9.75 m CSPA	N/A	0.17	Under Turnout. End Sections @ Both Ends.
0+488.000 Rt.	1–711 mm S x 508 mm R x 9.75 m CSPA	N/A	0.16	Under Turnout. End Sections @ Both Ends.

Existing Power Line
Sta 0+052.440
Clearance = 5.538 m

L=132.000 m
K=18

PVC 0+009.000
ELEV 2194.164

PVI 0+075.000
ELEV 2194.200

PVT 0+141.000
ELEV 2199.040

S=0.0550%

S=7.3333%

Finish Grade = Top of Asphalt

Existing Ground Profile (Dashed)

PVC 0+220.000
ELEV 2204.833

Sta. 0+232.000
1–610 mm x 31.09 m CSPC
Invert Elev. = 2204.261
Q25 = 0.077 m³/s

PVI 0+420.000
ELEV 2219.500

L=400.000 m
K=51

Sta 0+496.948
Existing ±152mm
Water Line Crossing

HI 0+593.718
ELEV 2218.536

PVT 0+620.000
ELEV 2218.469

S=–0.5157%

Sta 0+056.000
Existing Telephone Line Crossing

Sta 0+109.000
Existing 152mm Water Line Crossing w/254mm x 39.6m Long Casing

Begin Profile Sta. 0+005.864
ELEV 2194.162

2230 2225 2220 2215 2210 2205 2200 2195 2190 2185 2180

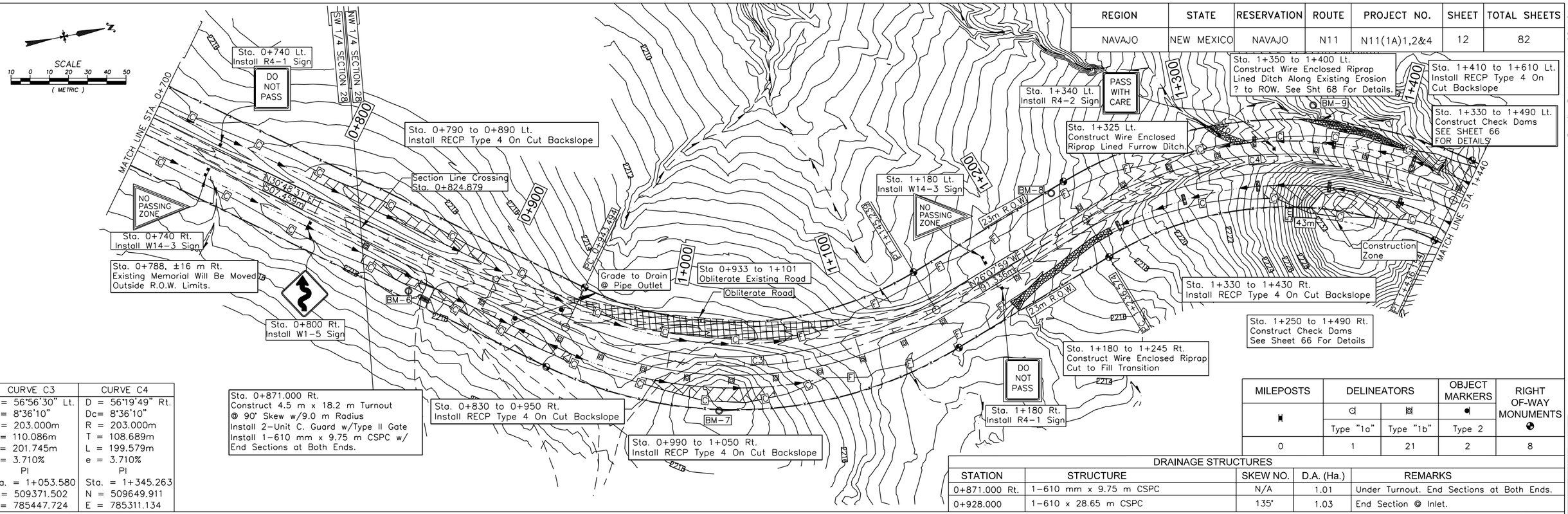
–0+050 0+000 0+050 0+100 0+150 0+200 0+250 0+300 0+350 0+400 0+450 0+500 0+550 0+600 0+650 0+700

DEREK D. MEIER
NEW MEXICO
14504
REGISTERED PROFESSIONAL ENGINEER

10/12/20

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	12	82

WHPacific Project No. 021121

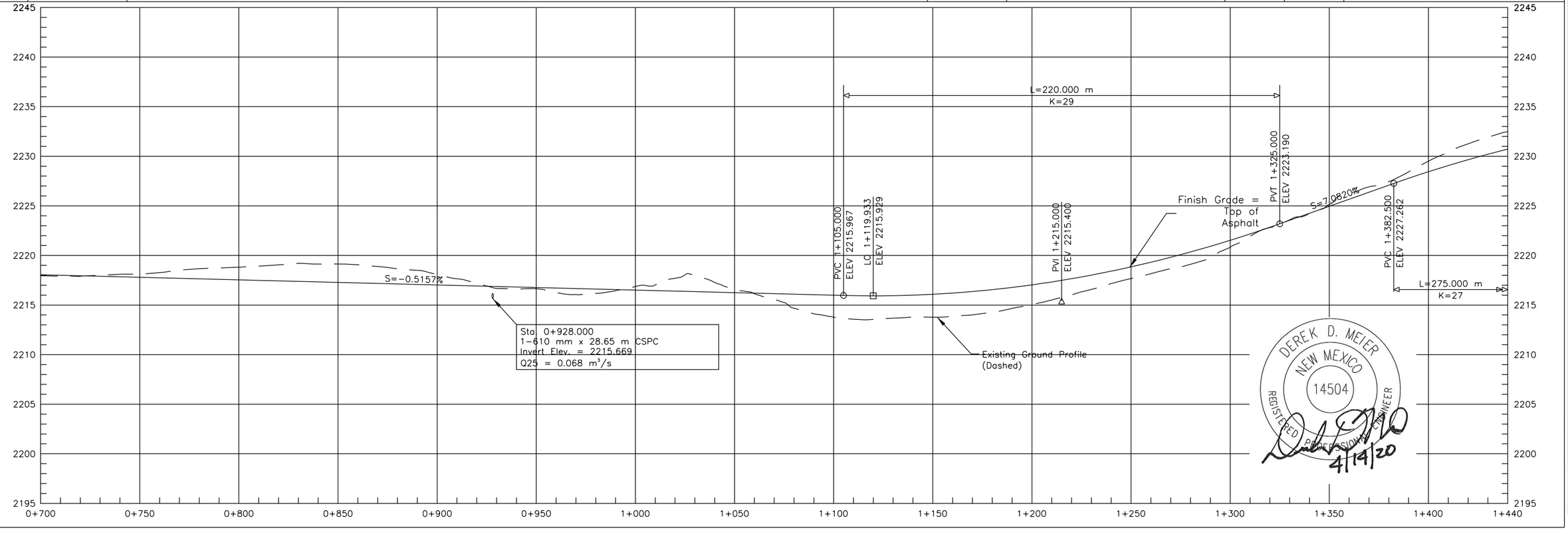


CURVE C3	CURVE C4
D = 56°56'30" Lt.	D = 56°19'49" Rt.
Dc= 8°36'10"	Dc= 8°36'10"
R = 203.000m	R = 203.000m
T = 110.086m	T = 108.689m
L = 201.745m	L = 199.579m
e = 3.710%	e = 3.710%
PI	PI
Sta. = 1+053.580	Sta. = 1+345.263
N = 509371.502	N = 509649.911
E = 785447.724	E = 785311.134

MILEPOSTS	DELINEATORS		OBJECT MARKERS	RIGHT OF-WAY MONUMENTS
	Type "1a"	Type "1b"	Type 2	
0	1	21	2	8

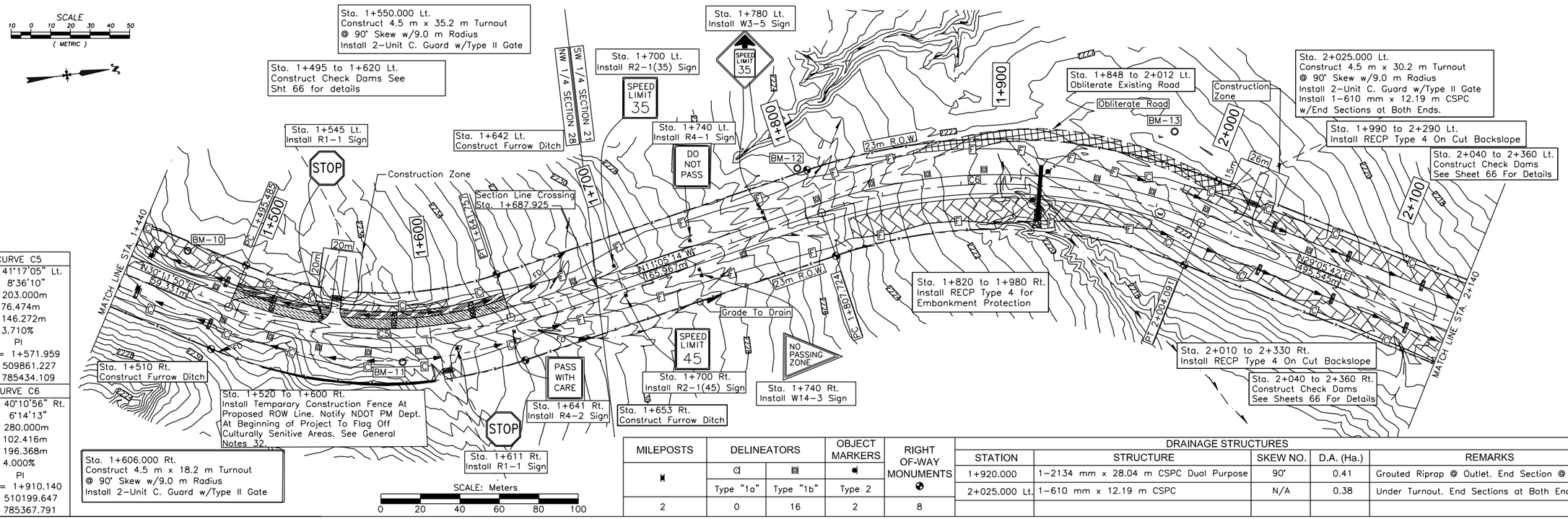
DRAINAGE STRUCTURES

STATION	STRUCTURE	SKEW NO.	D.A. (Ha.)	REMARKS
0+871.000 Rt.	1-610 mm x 9.75 m CSPC	N/A	1.01	Under Turnout. End Sections at Both Ends.
0+928.000	1-610 x 28.65 m CSPC	135°	1.03	End Section @ Inlet.



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NEW MEXICO
14504
REGISTERED PROFESSIONAL ENGINEER
4/14/20

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N11	N11(1a)1,2&4	13	82



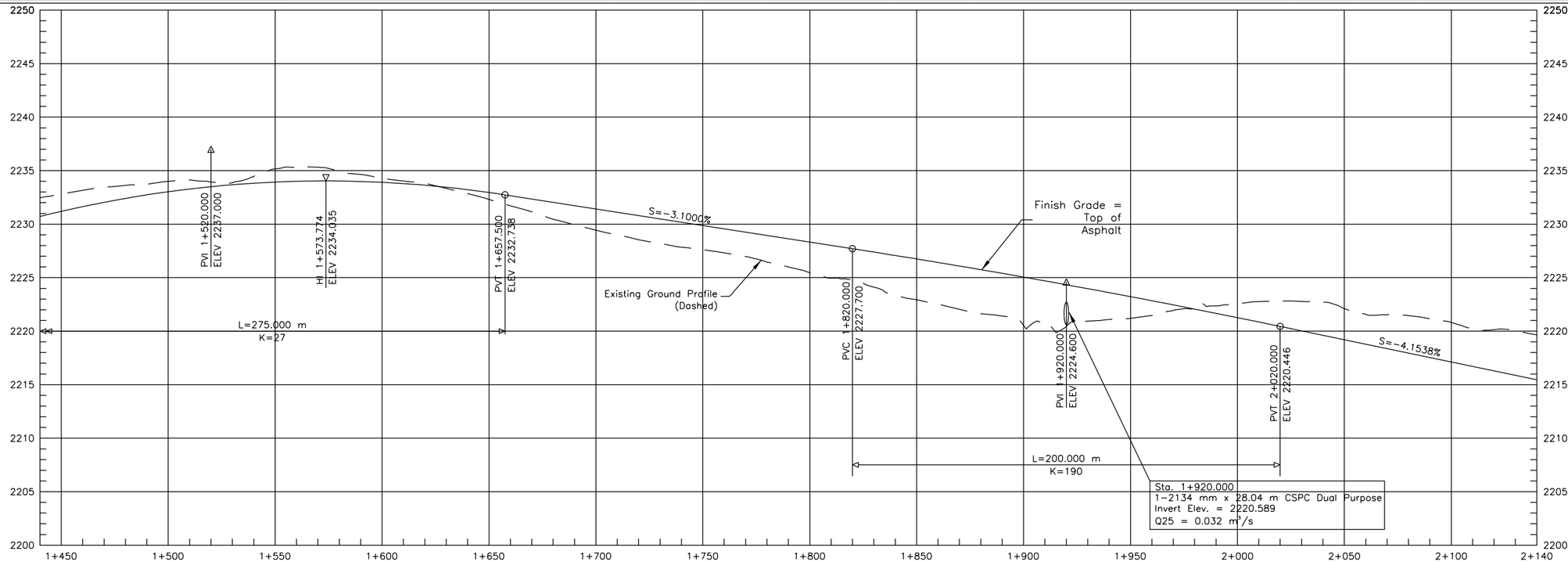
CURVE C5
D = 41°17'05" Lt.
Dc= 8°36'10"
R = 203.000m
T = 76.474m
L = 146.272m
e = 3.710%
PI
Sta = 1+571.959
N = 509861.227
E = 785434.109

CURVE C6
D = 40°10'56" Rt.
Dc= 6°14'13"
R = 280.000m
T = 102.416m
L = 196.368m
e = 4.000%
PI
Sta = 1+910.140
N = 510199.647
E = 785367.791

MILEPOSTS	DELINEATORS		OBJECT MARKERS	RIGHT OF-WAY MONUMENTS
	Ⓒ	Ⓑ		
	Type "1a"	Type "1b"	Type 2	
2	0	16	2	8

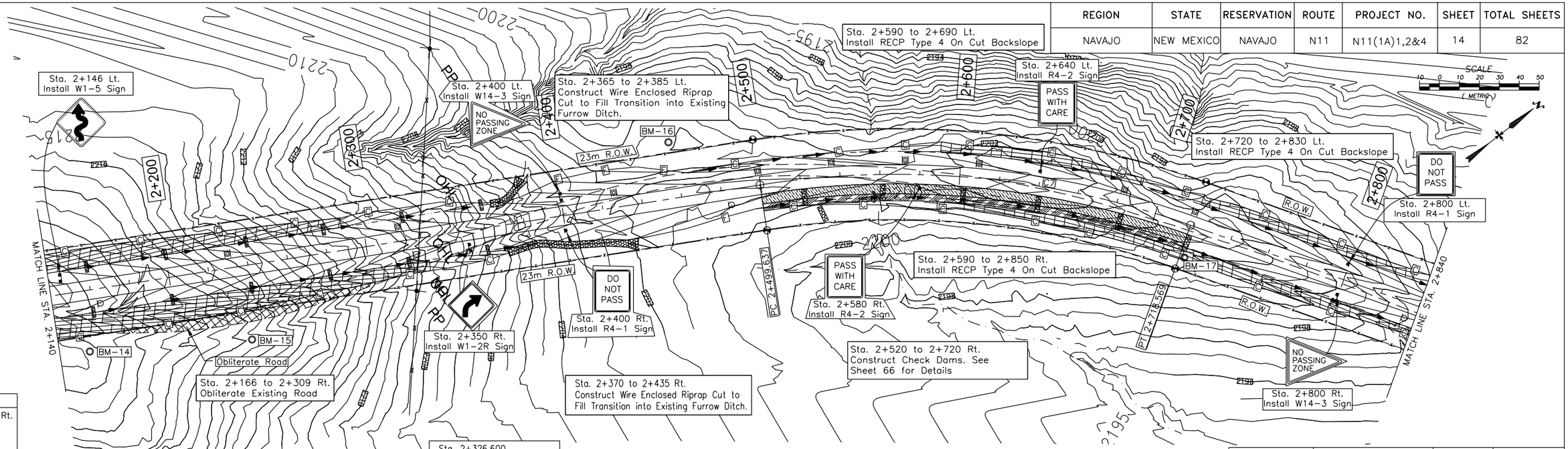
DRAINAGE STRUCTURES

STATION	STRUCTURE	SKEW NO.	D.A. (Ha.)	REMARKS
1+920.000	1-2134 mm x 28.04 m CSPC Dual Purpose	90°	0.41	Grouted Riprap @ Outlet. End Section @ Inlet
2+025.000 Lt.	1-610 mm x 12.19 m CSPC	N/A	0.38	Under Turnout. End Sections at Both Ends.



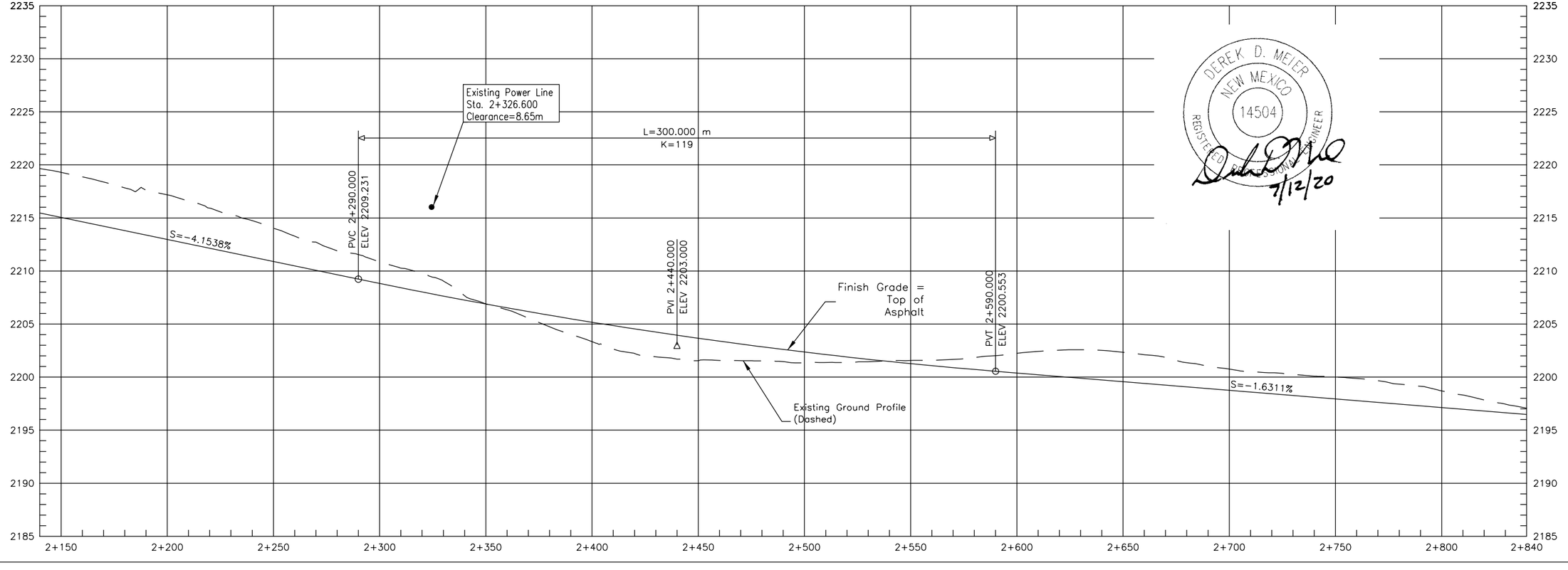
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14504
REGISTERED PROFESSIONAL ENGINEER
4/14/20

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	14	82

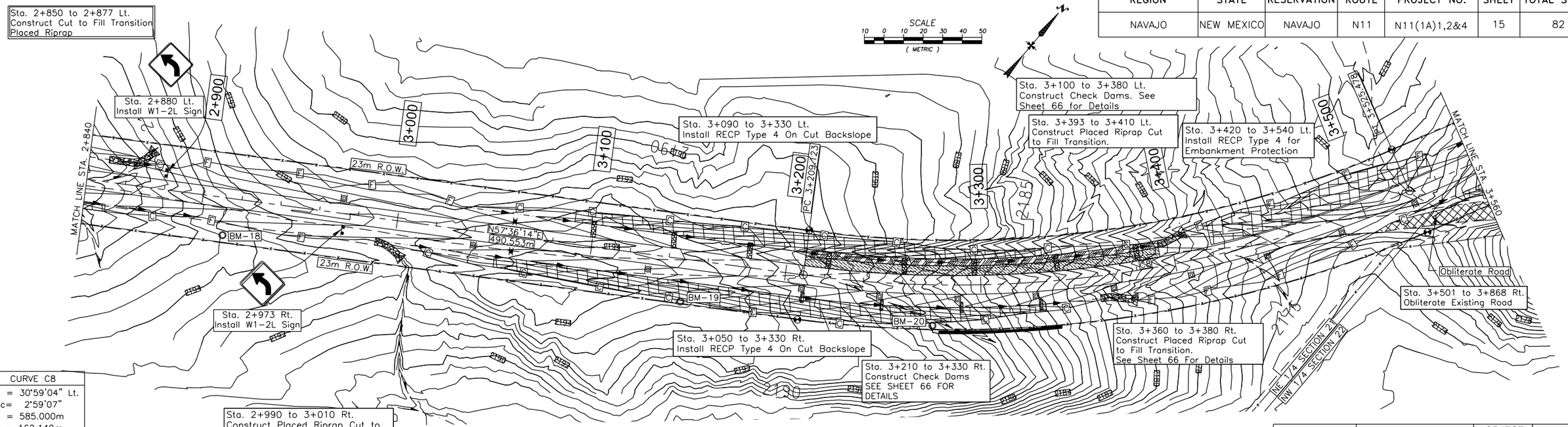


CURVE C7
D = 28°30'32" Rt.
Dc= 3°58'09"
R = 440.000m
T = 111.782m
L = 218.933m
e = 3.620%
PI
Sta = 2+611.419
N = 510819.831
E = 785712.910

MILEPOSTS	DELINEATORS		OBJECT MARKERS	RIGHT OF-WAY MONUMENTS
	Type "1a"	Type "1b"	Type 2	
0	4	9	0	4

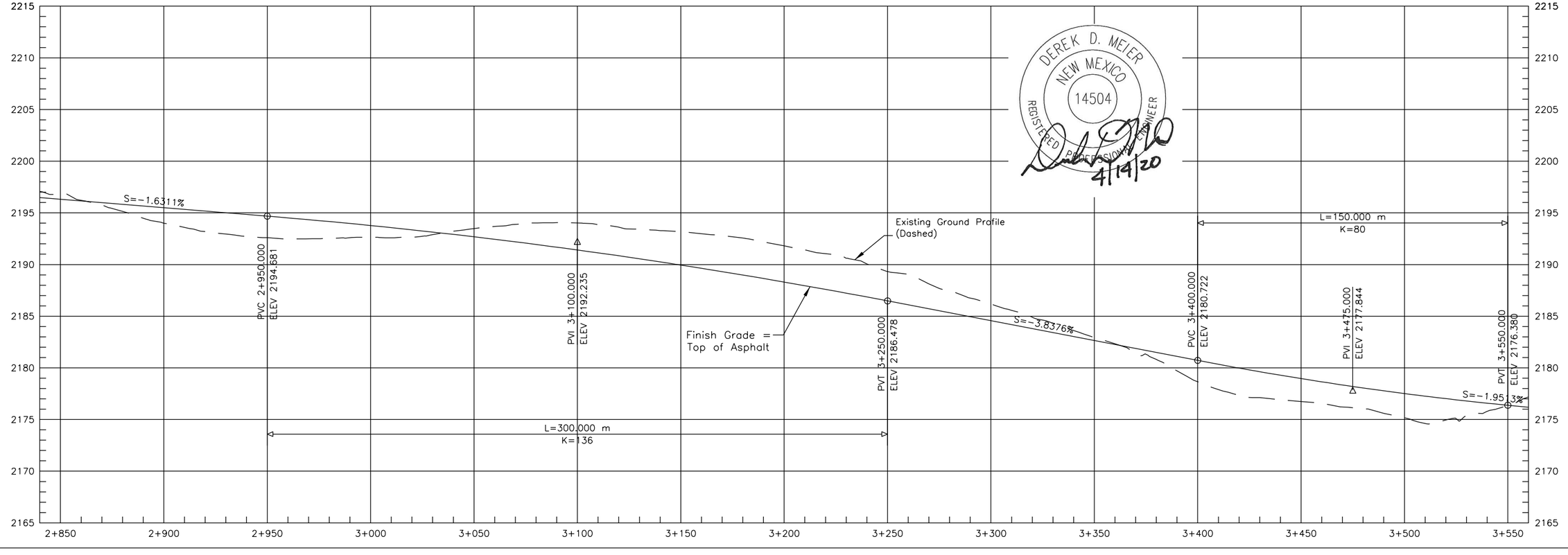


REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	15	82

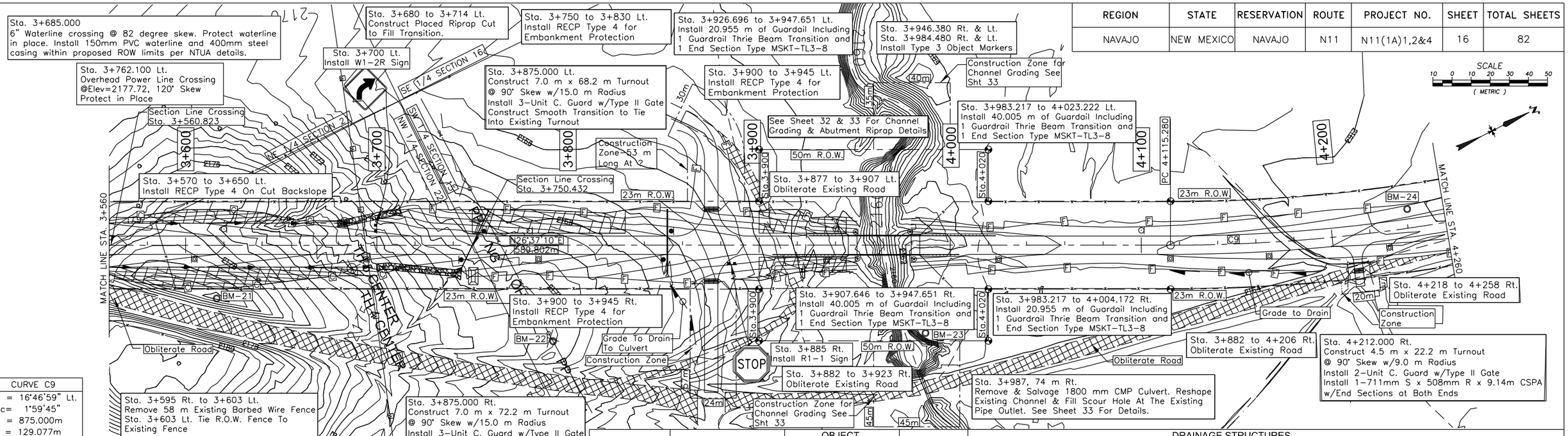


CURVE C8
D = 30°59'04" Lt.
Dc= 2°59'07"
R = 585.000m
T = 162.149m
L = 316.355m
e = 3.230%
PI
Sta = 3+371.271
N = 511229.419
E = 786358.413

MILEPOSTS	DELINEATORS		OBJECT MARKERS	RIGHT OF-WAY MONUMENTS
	Type "1a"	Type "1b"	Type 2	
2	0	12	0	4



REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	16	82

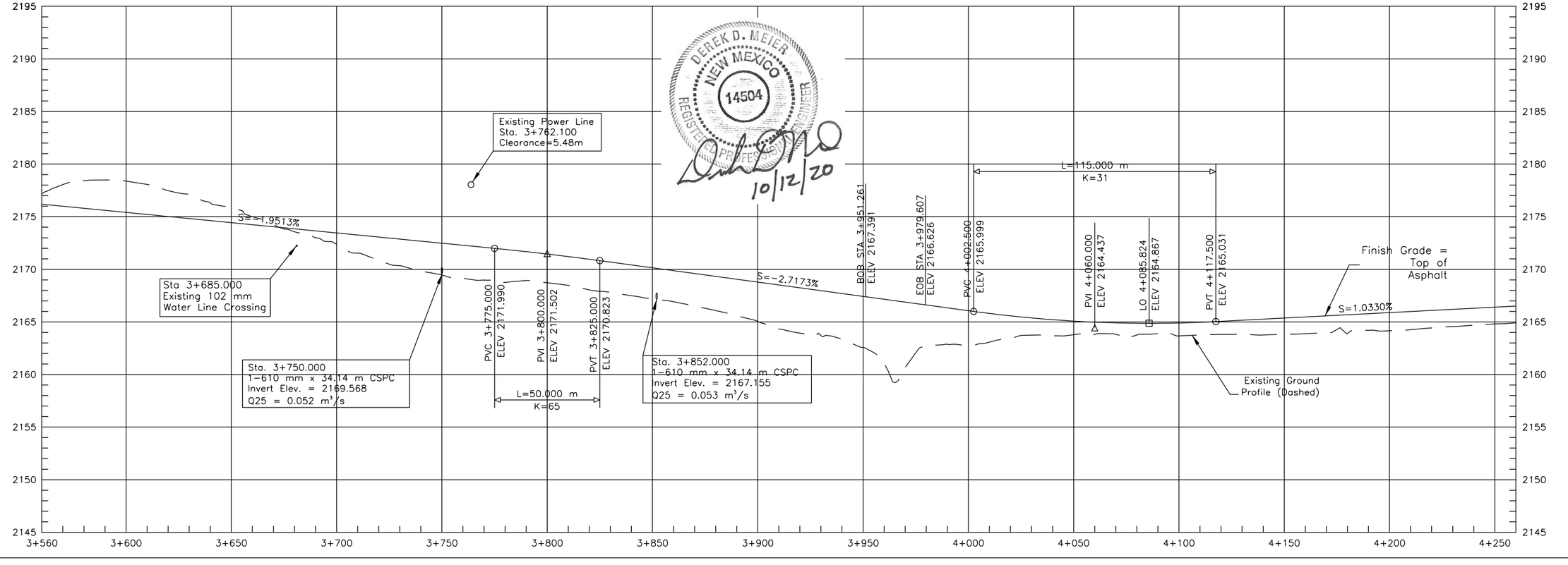


CURVE C9
D = 16°46'59" Lt.
Dc= 1°59'45"
R = 875.000m
T = 129.077m
L = 256.306m
e = 2.700%
PI
Sta = 4+244.357
N = 512017.059
E = 786753.170

MILEPOSTS	DELINEATORS		OBJECT MARKERS		RIGHT OF-WAY MONUMENTS
	Type "1a"	Type "1b"	Type 2	Type 3	
0	4	8	4	4	10

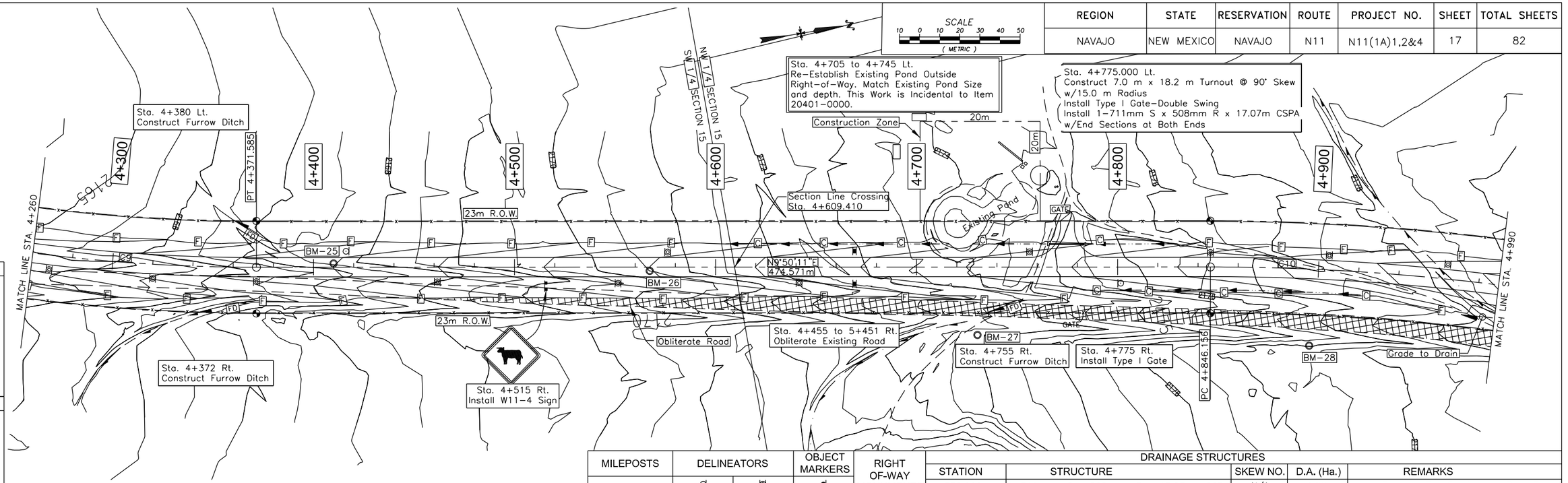
DRAINAGE STRUCTURES

STATION	STRUCTURE	SKEW NO.	D.A. (Ha.)	REMARKS
3+750.000	1-610 mm x 34.14 m CSPC	115°	0.65	Ditch Block & End Section at Inlet.
3+852.000	1-610 mm x 34.14 m CSPC	90°	0.66	End Section at Inlet.
4+212.000 Rt.	1-711 mm S x 508 mm R x 9.14 m CSPA	N/A	0.18	Under Turnout.End Sections at Both Ends.



REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	17	82

SCALE
10 0 10 20 30 40 50
(METRIC)



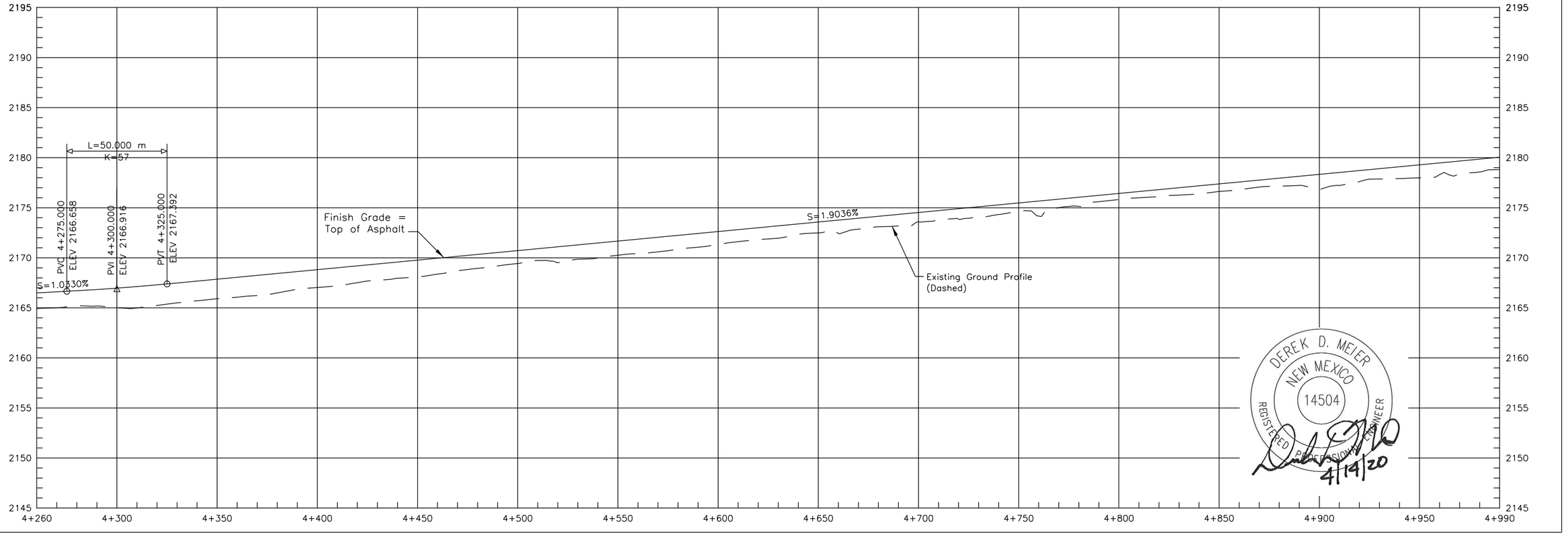
CURVE C9
D = 16°46'59" Lt.
Dc= 1°59'45"
R = 875.000m
T = 129.077m
L = 256.306m
e = 2.700%
PI
Sta = 4+244.357
N = 512017.059
E = 786753.170

CURVE C10
D = 41°01'39" Rt.
Dc= 1°31'07"
R = 1150.000m
T = 430.281m
L = 823.473m
e = 2.360%
PI
Sta = 5+276.437
N = 513035.788
E = 786929.802

MILEPOSTS	DELINEATORS		OBJECT MARKERS	RIGHT OF-WAY MONUMENTS
	Type "1a"	Type "1b"	Type 2	
2	2	11	0	4

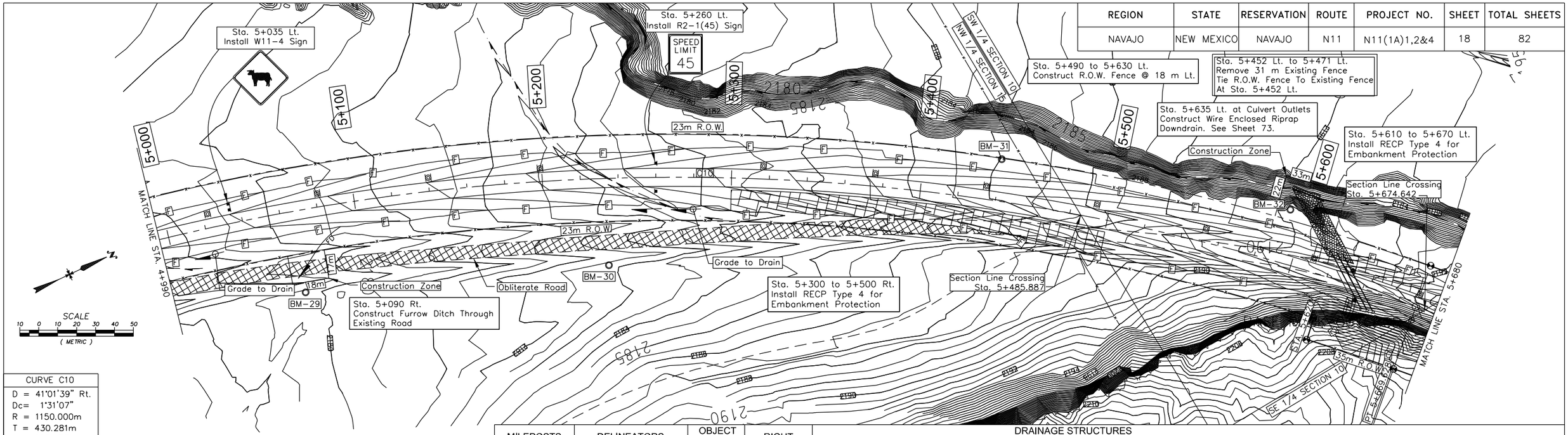
DRAINAGE STRUCTURES

STATION	STRUCTURE	SKEW NO.	D.A. (Ha.)	REMARKS
4+775.000 Lt.	1-711 mm S x 508 mm R x 17.07 m CSPA	N/A	1.08	Under Turnout. End Sections at Both Ends.



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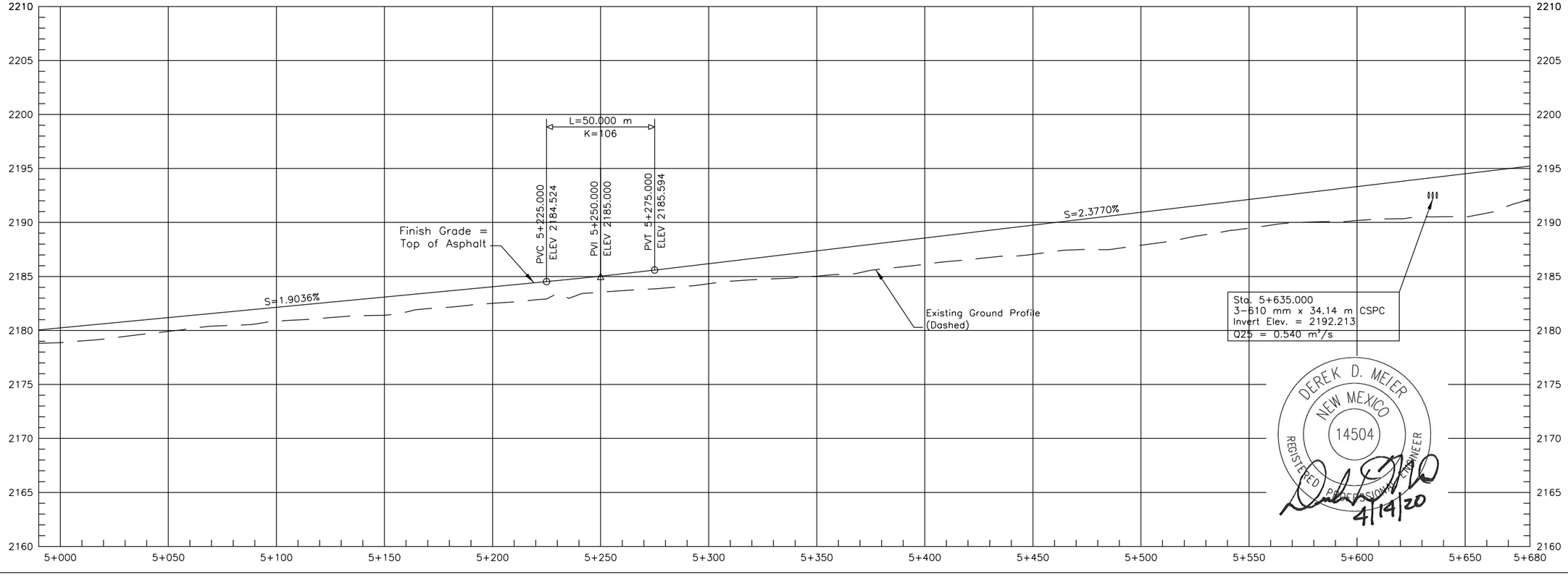
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	18	82



CURVE C10
D = 41°01'39" Rt.
Dc= 1°31'07"
R = 1150.000m
T = 430.281m
L = 823.473m
e = 2.360%
PI
Sta = 5+276.437
N = 513035.788
E = 786929.802

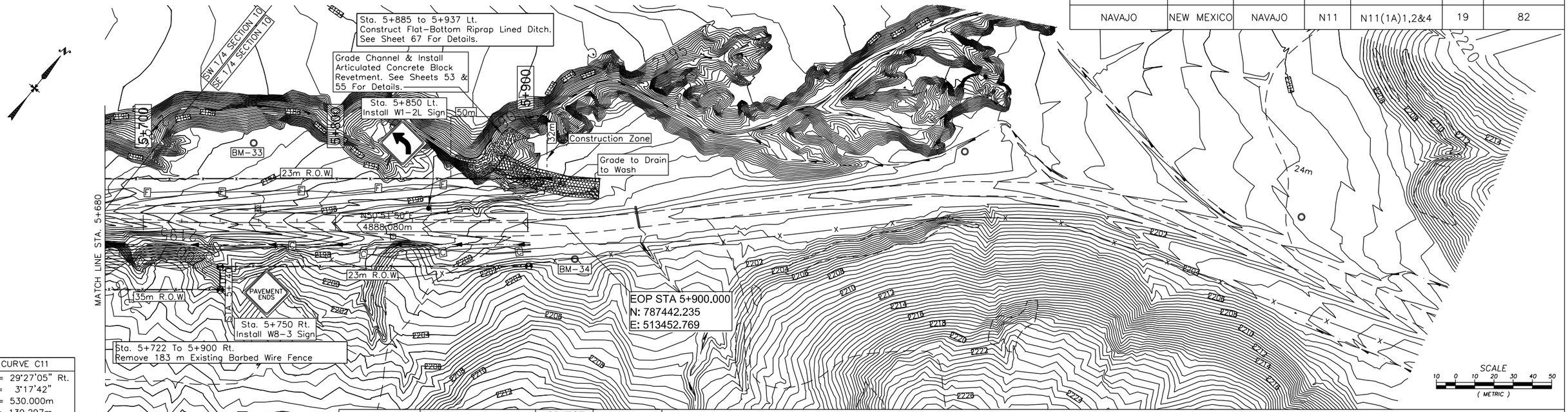
MILEPOSTS	DELINEATORS		OBJECT MARKERS	RIGHT OF-WAY MONUMENTS
	Type "1a"	Type "1b"	Type 2	
0	1	11	2	4

DRAINAGE STRUCTURES				
STATION	STRUCTURE	SKEW NO.	D.A. (Ha.)	REMARKS
5+635.000	3-610 mm x 34.14 m CSPC	45°	9.11	End Section & Ditch Block at Inlet. Wire Enclosed Riprap @ Outlet. See Sheets 73 & 77 For Details.



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NEW MEXICO
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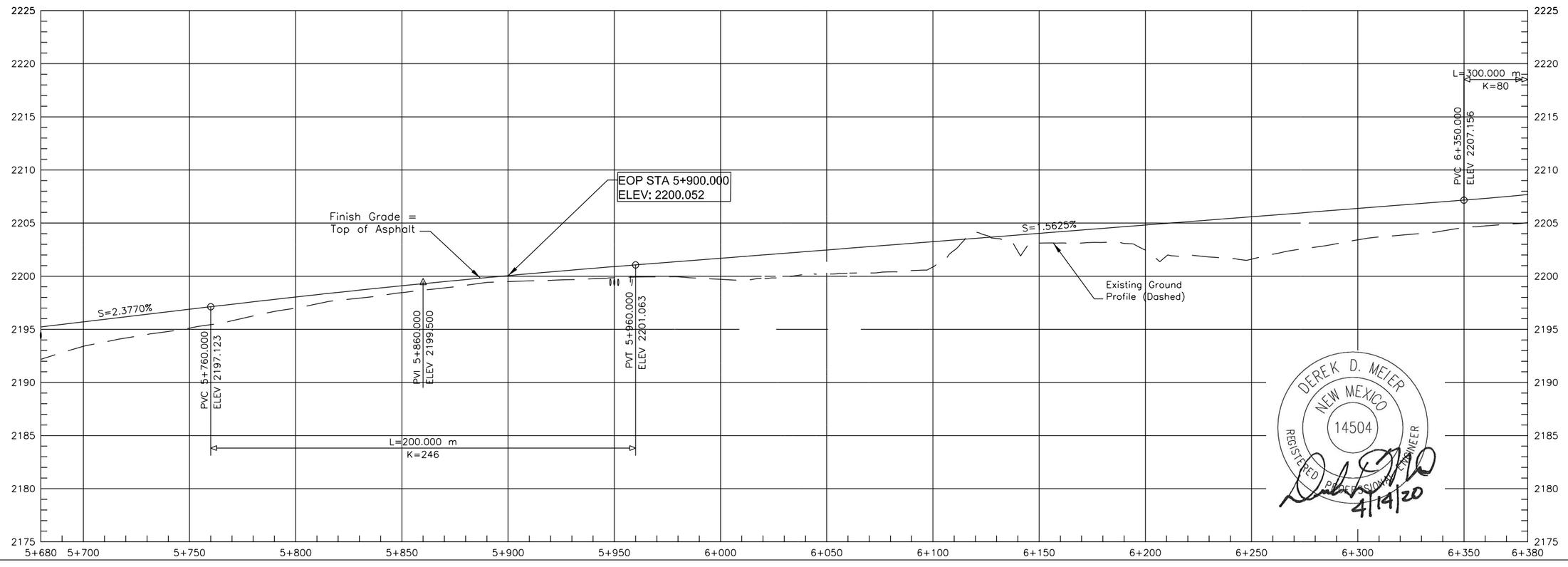
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	19	82



CURVE C11
D = 29°27'05" Rt.
Dc= 3°17'42"
R = 530.000m
T = 139.297m
L = 272.432m
e = 3.370%
PI
Sta = 6+297.005
N = 513703.345
E = 787750.172

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

DRAINAGE STRUCTURES				
STATION	STRUCTURE	SKEW NO.	D.A. (Ha.)	REMARKS



DEREK D. MEIER
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REGISTERED PROFESSIONAL ENGINEER
4/14/20

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	20	82

SCALE
10 0 10 20 30 40 50
(METRIC)

Sta. 6+874.259
Proposed Water Line Crossing
At 52° Skew
Protect in Place

Sta. 6+590.000 Lt.
Construct 7.0 m x 18.2 m Turnout
@ 90° Skew w/15.0 m Radius
Install 3-Unit C. Guard w/Type II Gate Install
1-711 mm S x 508 mm R x 19.51 m CSPA
w/End Sections at Both Ends
Remove Existing 610 mm CMPC

Sta. 6+534 Lt.
Install W1-2L Sign

Sta. 6+460 to 6+
Construct Check Dam

Sta. 6+760 Lt.
Install W14-3 Sign

Sta. 6+950 to 7+050 Lt.
Install RECP Type IV On
Cut Backslope

Sta. 6+904 to 7+133 Lt.
Obliterate Existing Road

Sta. 6+920 Lt.
Install R4-2 Sign

Obliterate Road

Section Line Crossing
Sta. 6+615.169

N80°18'55"E
449.732m

Sta. 6+900 to 6+
Construct Check Dams

Sta. 6+930 to 7+030 Rt.
Install RECP Type IV On
Cut Backslope

Sta. 6+997.000 Rt.
Construct 4.5 m x 25.2 m Turnout
@ 90° Skew w/9.0 m Radius
Install 2-Unit C. Guard w/Type II Gate

Sta. 7+005 Rt.
Install R1-1 Sign

Sta. 7+080 Rt.
Install R4-2 Sign

Sta. 6+380 to 6+820 Rt.
Construct Check Dams

Sta. 6+394 Rt.
Remove Existing Gate
and Gate Posts &
Place Outside R.O.W.

Sta. 6+456 To 6+612 Rt.
Remove 164 m Existing Barbed Wire Fence

Sta. 6+760 Rt.
Install R4-1 Sign

MATCH LINE STA. 6+380

MATCH LINE STA. 7+080

SE 1/4 SECTION 10
SW 1/4 SECTION 11

PC 6+879.875

23m R.O.W.

BM-37
BM-38
BM-39

CURVE C11
D = 29°27'05" Rt.
Dc= 3°17'42"
R = 530.000m
T = 139.297m
L = 272.432m
e = 3.370%
PI
Sta = 6+297.005
N = 513703.345
E = 787750.172

CURVE C12
D = 52°53'35" Lt.
Dc= 4°59'23"
R = 350.000m
T = 174.096m
L = 323.105m
e = 3.860%
PI
Sta = 7+053.969
N = 513831.725
E = 788502.421

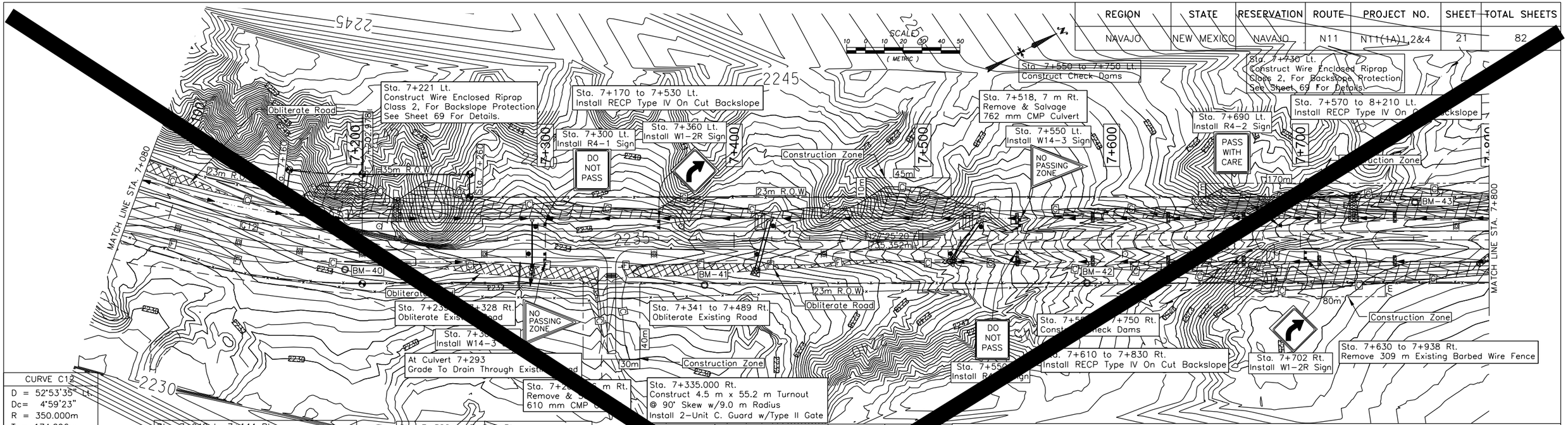
MILE POSTS	DELINEATORS		OBJECT MARKERS	RIGHT OF-WAY MONUMENTS
	Ⓒ	ⓘ		
	Type "1a"	Type "1b"	Type 2	
0			0	4

DRAINAGE STRUCTURES				
STATION	STRUCTURE	SKEW NO.	D.A. (Ha.)	REMARKS
6+590.000 Lt.	1-711 mm S x 508 mm R x 19.51 m CSPA	N/A	0.62	Under Turnout. End Sections at Both Ends.



WORK REMOVED FROM PROJECT SCOPE

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	NT1(1A)1,2&4	21	82

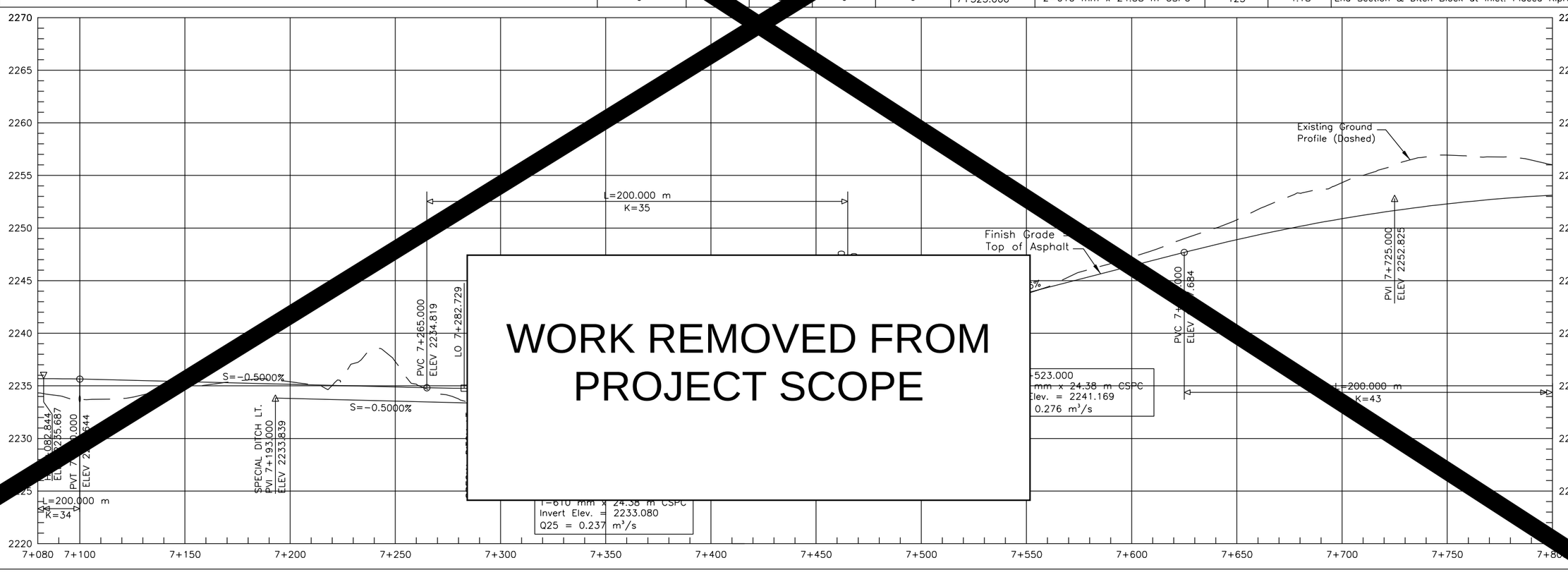


CURVE C12
D = 52°53'35" Lt.
Dc= 4°59'23"
R = 350.000m
T = 174.096m
L = 323.105m
e = 3.86%
PI
Sta = 7+053.969
N = 513831.725
E = 788502.421

POSTS	DELINEATORS		OBJECT MARKERS	RIGHT OF-WAY MONUMENTS
	Type "1a"	Type "1b"	2	
0	8		6	6

DRAINAGE STRUCTURES

STATION	STRUCTURE	SKEW NO.	D.A. (Ha.)	REMARKS
7+293.000	1-610 mm x 24.38 m CSPC	90°	2.96	End Section at Inlet. Placed Riprap @ Outlet.
7+416.000	2-610 mm x 26.21 m CSPC	105°	3.68	End Section & Ditch Block at Inlet. Placed Riprap @ Outlet.
7+523.000	2-610 mm x 24.38 m CSPC	125°	4.18	End Section & Ditch Block at Inlet. Placed Riprap @ Outlet.



WORK REMOVED FROM PROJECT SCOPE

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	22	82

SCALE
10 20 30 40 50
(METRIC)

Sta. 8+094 to 9+828 Lt.
Remove 3,711 m Existing Barbed Wire Fence
Tie R.O.W. Fence To Existing Fence At
Sta. 8+094 and 8+832.

Sta. 8+235.000 Lt.
Construct 4.5 m x 18.2 m Turnout
@ 90° Skew w/9.0 m Radius
Install 2-Unit C. Guard w/Type II Gate
Install 1-711mmS x 508mmR x 9.14m
CSPA w/End Sections at Both Ends
Remove Existing Gate and Place Outside
of R.O.W.

Sta. 8+340 to 8+385 Lt.
Construct Wire Enclosed Riprap
Cut to Fill Transition.

Grade to Drain
From Profile Low
Point to Culvert

Construction
Zone

Section Line Crossing
Sta. 8+135.669

Sta. 7+990 to 8+190 Rt.
Install RECP Type IV On Cut Backslope

Sta. 8+250 to 8+320 Rt.
Install RECP Type IV for
Embankment Protection

Sta. 8+275, 11 m Lt.
Remove & Salvage
610 mm CMP Culvert

Sta. 8+402 to 8+420 Rt.
Construct Wire Enclosed Riprap
Cut to Fill Transition Along
Existing Furrow Ditch

Sta. 8+200 to 8+238 Rt.
Construct Wire Enclosed Riprap
Cut to Fill Transition.

Sta. 7+930 to 8+135.281 Rt.
Construct Gabion Check Dams. See
Sheet 2 for Details

Sta. 8+420 to 8+501.595 Rt.
Construct Gabion Check Dams.
See Sheet 2 for Details

MATCH LINE STA. 7+800

MATCH LINE STA. 8+520

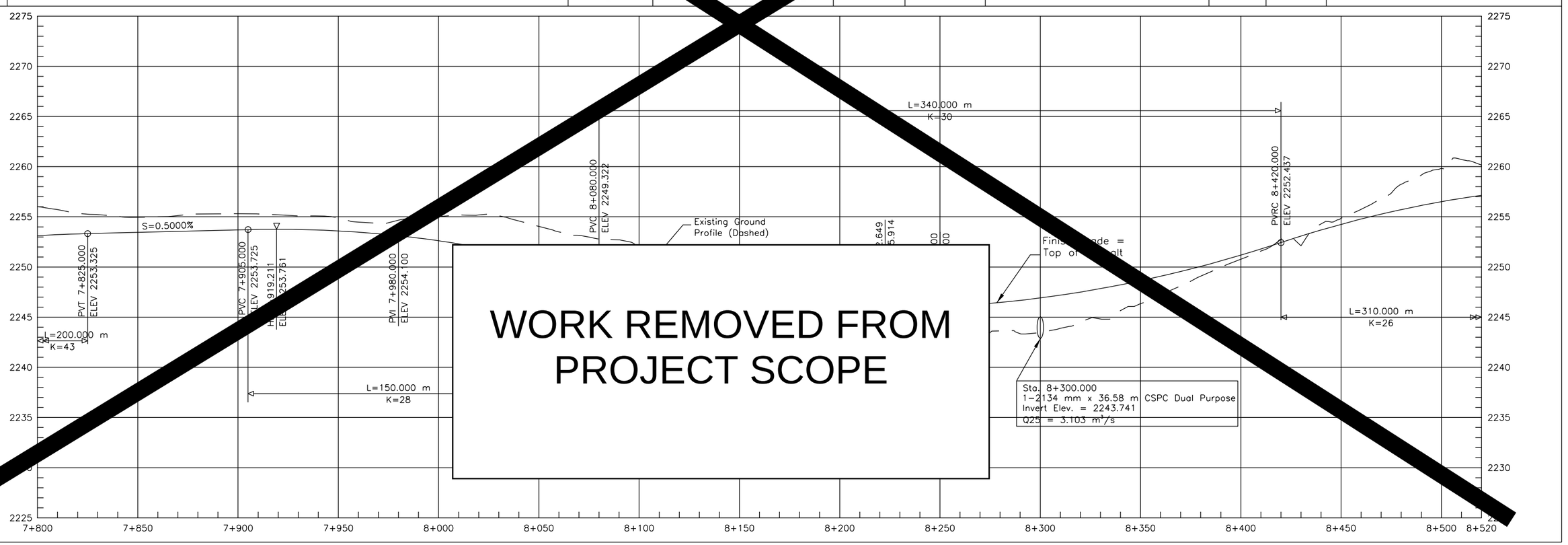
CURVE C13
D = 25°38'48" Rt.
Dc= 3°58'09"
R = 440.000m
T = 100.153m
L = 196.951m
e = 3.620%
PI
Sta = 8+038.483
N = 514727.885
E = 788967.385

CURVE C14
D = 25°08'37" Rt.
Dc= 3°58'09"
R = 440.000m
T = 98.124m
L = 193.089m
e = 3.620%
PI
Sta = 8+406.630
N = 514951.105
E = 789264.347

MONUMENTS	DELINEATORS		OBJECT MARKERS	RIGHT-OF-WAY MONUMENTS
	"1a"	Type "1b"	Ty	
2		16	2	11

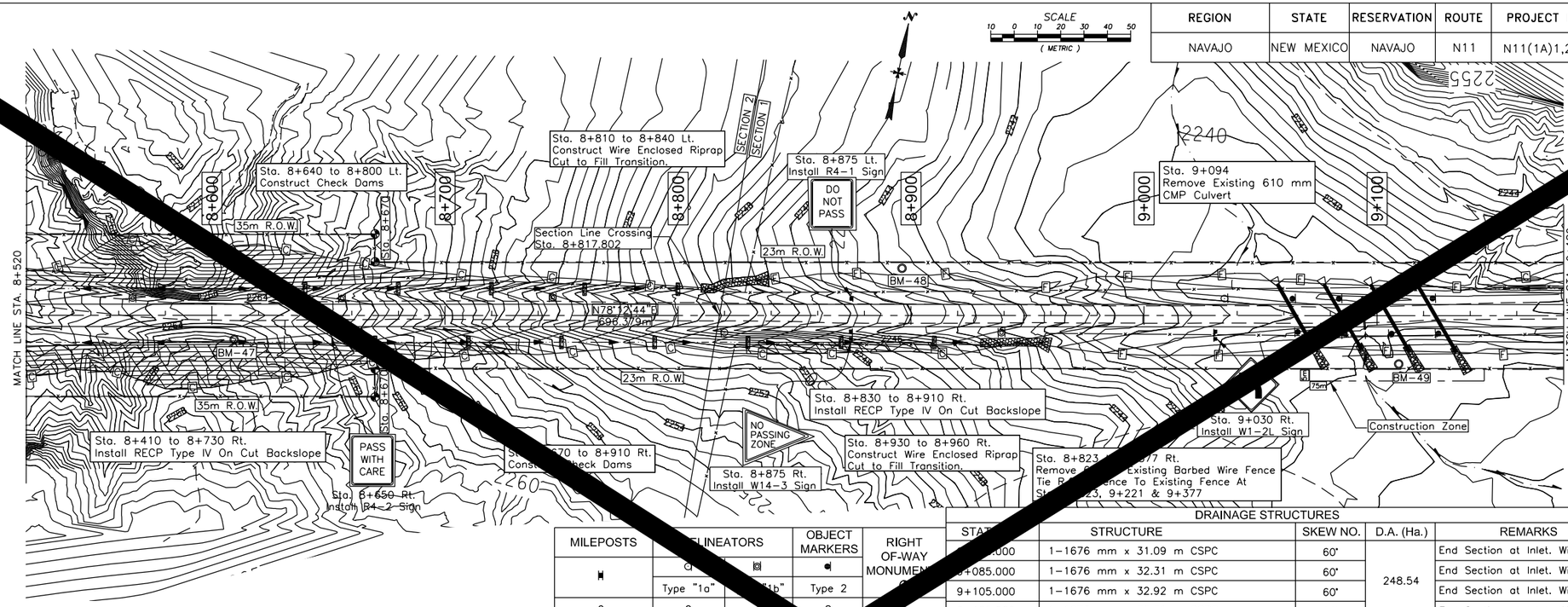
DRAINAGE STRUCTURES

STATION	STRUCTURE	SKEW NO.	D.A. (Ha.)	REMARKS
8+235.000 Lt.	1-711 mm S x 508 mm R x 9.14 m CSPA	N/A	0.39	Under Turnout. End Sections at Both Ends.
8+300.000	1-2134 mm x 36.58 m CSPC Dual Purpose	130°	49.39	End Section at Inlet. Grouted Riprap @ Outlet.



WORK REMOVED FROM
PROJECT SCOPE

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	23	82

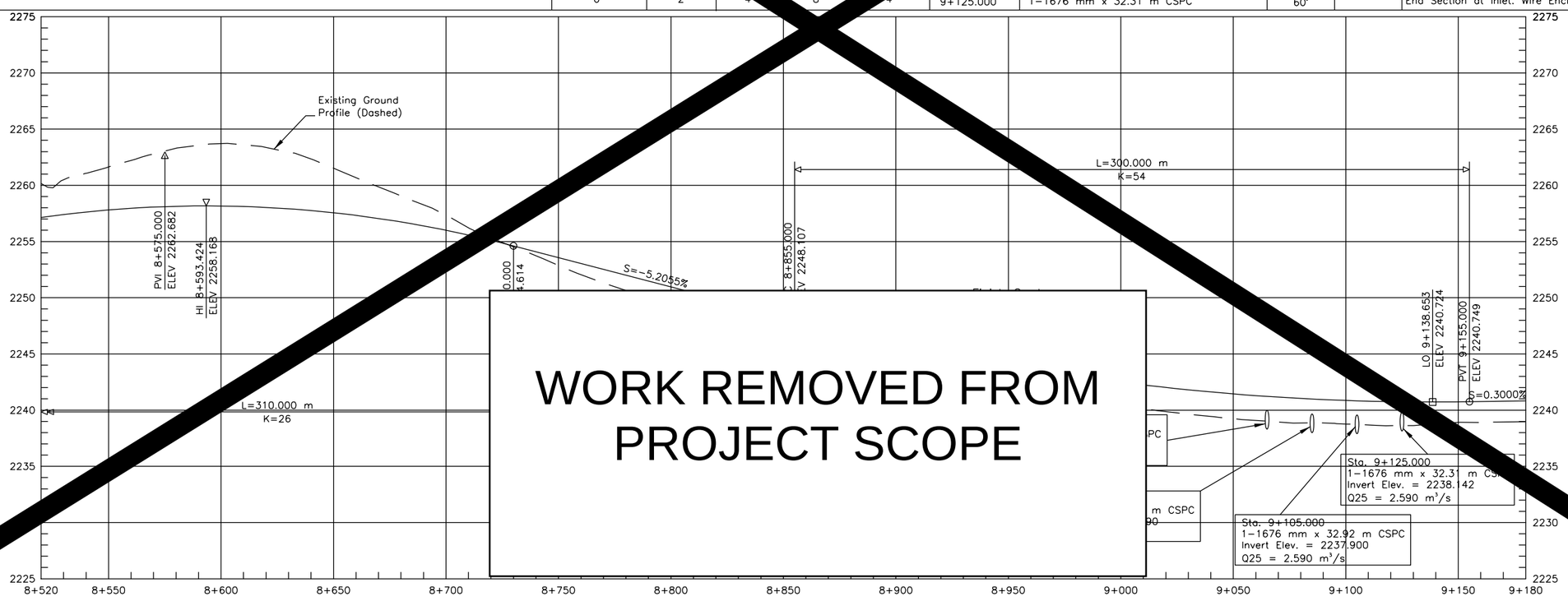


CURVE C14
D = 25°08'37" Rt.
Dc= 3°58'09"
R = 440.000m
T = 98.124m
L = 193.089m
e = 3.620%
PI
Sta = 8+406.630
N = 514951.105
E = 789264.347

MILEPOSTS	DELINEATORS		OBJECT MARKERS	RIGHT OF-WAY MONUMENTS
	Type "1a"	Type "1b"	Type 2	
0	2	4	8	4

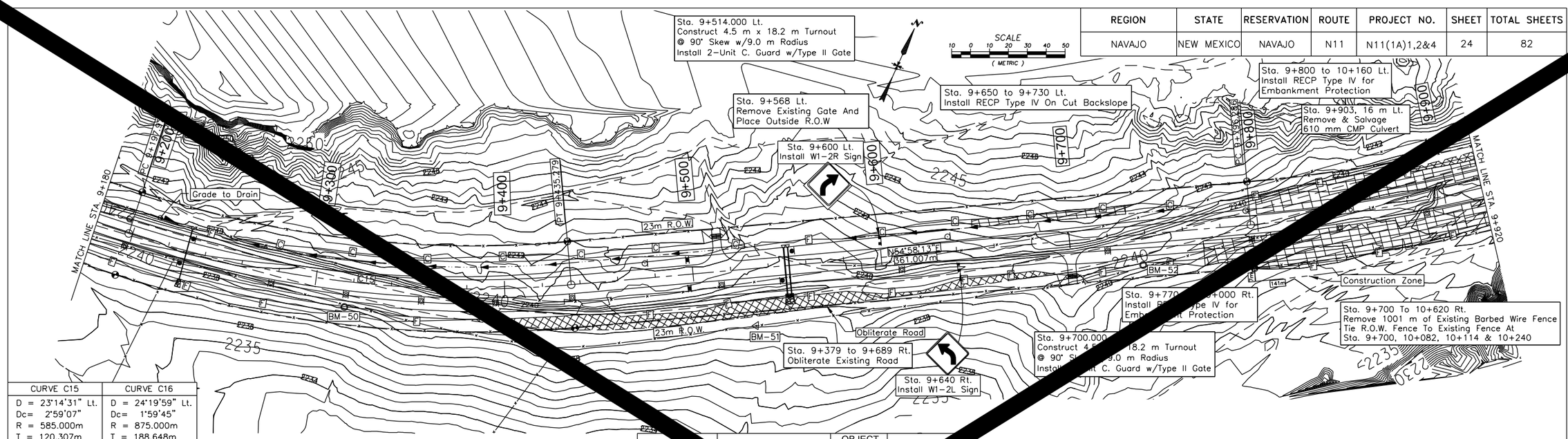
DRAINAGE STRUCTURES

STATION	STRUCTURE	SKEW NO.	D.A. (Ha.)	REMARKS
8+985.000	1-1676 mm x 31.09 m CSPC	60°	248.54	End Section at Inlet. Wire Enclosed Riprap @ Outlet.
9+085.000	1-1676 mm x 32.31 m CSPC	60°		End Section at Inlet. Wire Enclosed Riprap @ Outlet.
9+105.000	1-1676 mm x 32.92 m CSPC	60°		End Section at Inlet. Wire Enclosed Riprap @ Outlet.
9+125.000	1-1676 mm x 32.31 m CSPC	60°		End Section at Inlet. Wire Enclosed Riprap @ Outlet.



WORK REMOVED FROM PROJECT SCOPE

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	24	82



CURVE C15	CURVE C16
D = 23°14'31" Lt.	D = 24°19'59" Lt.
Dc= 2°59'07"	Dc= 1°59'45"
R = 585.000m	R = 875.000m
T = 120.307m	T = 188.648m
L = 237.306m	L = 371.607m
e = 3.230%	e = 2.700%
PI	PI
Sta = 9+318.281	Sta = 9+984.933
N = 515137.989	N = 515522.548
E = 790159.865	E = 790708.465

MILEPO	DELINEATORS		OBJECT MARKERS	RIGHT OF	
				MENTS	
	Type	Type "1b"	Type 2		
2	4	2		6	

DRAINAGE STRUCTURES				
STATION	STRUCTURE	SKEW NO.	D.A. (Ha.)	REMARKS
9+230.000	1-610 mm x 28.65 m CSPC	90°	2.71	End Section at Inlet. Placed Riprap @ Outlet.
9+550.000	2-762 mm x 26.21 m CSPC	90°	14.27	End Section at Inlet. Placed Riprap @ Outlet.



WORK REMOVED FROM
PROJECT SCOPE

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	25	82

SCALE
10 0 10 20 30 40 50
(METRIC)

Sta. 10+551 to 10+620 Lt.
Remove 69 m of Existing Barbed Wire Fence

Sta. 10+620 to 10+760 Lt.
Remove Solid Yellow Pavement Markings & Place Broken Yellow, Type H Markings. Removal Of Pavement Markings To Be Incidental To The Project.
Install R4-2, "Pass Both Ends Here" sign at 10+760 Lt.

Sta. 10+500 Lt.
Install R2-1(45) Sign

SPEED LIMIT 45

Sta. 10+595 Lt.
Existing Sign To Remain

Sta. 10+620 Rt. & Lt.
Tie R.O.W. Fence to Existing R.O.W. Fence.

Sta. 10+775 & 11+060 Lt.
Remove Existing Pavement Ends Signs

Sta. 10+295 Lt.
Install W1-2R Sign

Sta. 10+300 to 10+580 Lt.
Construct Check Dams

Obliterate Road

Sta. 9+874 to 10+081 Lt.
Obliterate Existing Road

MATCH LINE STA. 9+920

10+000 10+100 10+200 10+300 10+400 10+500 10+600

BM-53 BM-54 BM-55 BM-56

23m R.O.W.

N 30°38'13" E
452.107m

Construction Zone

Sta. 10+015 Rt.
Remove Existing Gate at Turnout and Place Outside of R.O.W.

Sta. 10+110 to 10+185 Rt.
Install RECP Type IV for Embankment Protection

Sta. 10+[illegible] Rt.
Remove Existing Gate and Place Outside of R.O.W.

Sta. 10+261, 11 m Lt.
Remove & Salvage 610 mm CMP Culvert

Sta. 10+255 to 10+300 Rt.
Construct Cut to Fill Transition And Tie Into Placed Riprap At Culvert Outlet.

Sta. 10+340 to 10+[illegible] Rt.
Construct Check Dams

EOP Sta. 10+620.000
N 516073.862
E 791034.992

DO NOT PASS

Sta. 10+595 Rt.
Existing Sign To Remain

Sta. 10+965 Lt. & Rt.
Remove Existing No Passing Zone Signing

Sta. 10+620
Remove & Salvage 5-Unit Cattle Guard & 31 m Existing Fence

43m

22m

Sta. 10+100.000 Rt.
Construct 4.3 m x 59.2 m Turnout
@ 80° Skew w/9.0 m Radius
Insall 2-Unit C. Guard w/Type II Gate

Construction Zone

CURVE C16
D = 24°19'59" Lt.
Dc = 1°59'45"
R = 875.000m
T = 188.648m
L = 371.607m
e = 2.700%
PI
Sta = 9+984.933
N = 515522.548
E = 790708.465

EOP Sta. 10+620.000
ELEV 2255.849

Existing Ground Profile (Dashed)

S=3.4101%

L=100.000 m
K=144

PVC. 9+950.000 ELEV 2243.134
PVI 10+000.000 ELEV 2243.284
PVT 10+050.000 ELEV 2243.781

10+305.000 V 2246.315
PVI 10+355.000 ELEV 2246.812
PVI 10+[illegible].000 ELEV [illegible].517

Finish Grade =

S=0.3000%

Sta. 10+017.000
1-1067 mm x 30.48 m CSPC
Invert Elev. = 2240.281
Q25 = 0.793 m³/s

Sta. 9+987.000
1-1067 mm x 32.92 m CSPC
Invert Elev. = 2239.776
Q25 = 0.793 m³/s

Sta. 9+957.000
1-1067 mm x 34.75 m CSPC
Invert Elev. = 2239.356
Q25 = 0.793 m³/s

Sta. 9+927.000
1-1067 mm x 35.97 m CSPC
Invert Elev. = 2239.029
Q25 = 0.793 m³/s

2265 2260 2255 2250 2245 2240 2235 2230 2225 2220

9+920 9+950 10+000 10+050 10+100 10+150 10+200 10+250 10+300 10+350 10+400 10+450 10+500 10+550 10+600 10+640

WORK REMOVED FROM PROJECT SCOPE

MILEPOSTS STATION	DELINEATORS	OBJECT MARKERS	RIGHT OF WAY	DRAINAGE STRUCTURES STRUCTURE	SKEW NO.	D.A. (Ha.)	REMARKS

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	26	82

BRIDGE GENERAL NOTES

1 SPECIFICATIONS: DESIGN; AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 2016, 8TH ED CONSTRUCTION; STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS, FP-14 AND SUPPLEMENTAL SPECIFICATIONS

2 UNITS: THIS PROJECT HAS BEEN DESIGNED AND DRAWN USING THE SI (METRIC) SYSTEM OF UNITS ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS NOTED OTHERWISE ALL REINFORCING MEASUREMENTS ARE TO THE CENTERLINE OF THE BAR UNLESS OTHERWISE SHOWN

3 DESIGN LOADS: DEAD LOADS; CONCRETE = 23 56 kPa/m , STEEL = 76 97 kPa/m , PAVING ALLOWANCE = 1 436 kPa OF ROADWAY SURFACE, STAY-IN-PLACE FORMS = 0 7 kPa, BACKFILL EARTH PRESSURE = 5 66 kPa/m, LIVE LOADS; HL 93 PLUS DYNAMIC FACTOR ON VEHICLE. MS18 VEHICLE WITH 9 34 kN/m LANE LOAD, DYNAMIC FACTOR = 0 33

4 RATINGS. INVENTORY RATING = 1 04 OPERATING RATING 1 48

5 DESIGN CRITERIA: SUPERSTRUCTURE AND SUBSTRUCTURE DESIGNED USING AASHTO LRFD DESIGN BEARINGS DESIGNED USING SERVICE LOAD DESIGN MATERIAL STRENGTHS ARE F'c = 27 6 MPa FOR REINFORCED CONCRETE, Fy = 413 7 MPa FOR REINFORCING STEEL AND Fy = 345 MPa FOR H-PILING CONCRETE IN PRECAST, PRESTRESSED CONCRETE TYPE BT1600 BEAMS SHALL BE CLASS P, F'c = 65 5 MPa and F'ci = 48 2 MPa AT RELEASE OF PRESTRESSING STRANDS

6 CONCRETE: CAST IN PLACE CONCRETE SHALL BE CLASS A(AE) WITH THE MINIMUM DESIGN STRENGTH INDICATED ABOVE AT 28 DAYS THE AIR CONTENT FOR CLASS A(AE) CONCRETE SHALL NOT BE LESS THAN THAT SPECIFIED IN THE FP-14 ALL CONCRETE CAST ON OR BELOW GRADE SHALL BE MADE WITH TYPE II CEMENT THE CONTRACTOR MAY ALSO USE CONCRETE MADE WITH TYPE II CEMENT ELSEWHERE AT NO EXTRA COST TO THE OWNER CHAMFER EXPOSED CORNERS OF ALL CONCRETE 19mm UNLESS OTHERWISE SHOWN THE CONCRETE PLACEMENT TIME LIMITS SPECIFIED IN THE FP-14 SHALL APPLY IF CONCRETE CAN NOT BE DISCHARGED WITHIN THE SPECIFIED TIME LIMIT, ALTERNATIVES SUCH AS DRY BATCHING, A SITE BATCHING PLANT CONFORMING TO THE SPECIFICATIONS OR RETARDANT ADMIXTURES SHALL BE USED IF REQUIRED, SUCH ALTERNATIVES SHALL BE DISCUSSED AT PRE-CONSTRUCTION MEETING AND SHALL BE APPROVED IN WRITING BY CONSTRUCTION MANAGER PRIOR TO USE APPROVAL OF ALTERNATIVE METHODS SHALL BE BASED ON REVIEW OF HISTORICAL DATA FOR IDENTICAL STRENGTH CONCRETE PLACED AT SIMILARLY REMOTE LOCATIONS HISTORICAL DATA SHALL SHOW CONFORMANCE TO THE REQUIRED SPECIFICATIONS ALL STEEL EMBEDDED IN CONCRETE SUCH AS NOSING ANGLES, DECK DRAINS AND EXPANSION JOINTS SHALL BE CONSIDERED INCIDENTAL TO ITEM 55201-0200, STRUCTURAL CONCRETE, CLASS A(AE)

7 FINISHING CONCRETE SURFACES. THE CONCRETE SURFACES LISTED BELOW SHALL RECEIVE A CLASS 2 RUBBED FINISH AS SPECIFIED IN SECTION 552 16 OF THE FP-14 VERTICAL EDGES AND BOTTOM OF THE BRIDGE DECK OVERHANG EXTERIOR SIDES OF THE EXTERIOR BEAMS, EXPOSED SURFACES OF BRIDGE BARRIER RAILING AND TRANSITION SECTIONS, AND EXPOSED SURFACES OF THE SUBSTRUCTURE DOWN TO 300 mm BELOW THE GROUNDLINE ALL OTHER SURFACES OF THE CONCRETE SHALL BE GIVEN A CLASS 1 ORDINARY FINISH

8 DECK SLAB SURFACE TEXTURING. DRIVING SURFACES OF THE BRIDGE DECK AND APPROACH SLAB AND SLEEPER SLAB END BLOCK SHALL BE GIVE A FINISH IN ACCORDANCE WITH SECTIONS 552 14 (a), (b) AND (c)(1) OF THE FP-14

9 REINFORCING STEEL: ALL REINFORCING STEEL SHALL CONFORM TO AASHTO M31, GRADE 420 AND EPOXY COATED REINFORCING STEEL SHALL CONFORM TO AASHTO M284 AND AASHTO M31, GRADE 420 ALL REINFORCING STEEL CONTAINED IN OR PROTRUDING INTO THE BRIDGE DECK, APPROACH SLAB AND SLEEPER SLAB END BLOCK SHALL BE EPOXY COATED THE MINIMUM COVER OF ANY REINFORCING STEEL SHALL BE 50mm UNLESS OTHERWISE SPECIFIED LENGTHS OF REINFORCING STEEL BARS SHOWN INCLUDE REQUIRED SPLICE LENGTHS FOR SPLICES SHOWN ANY ADDITIONAL SPLICES NOT SHOWN IN THE PLANS SHALL BE REQUESTED FOR APPROVAL BY THE CONTRACTOR AND SHALL NOT BE UTILIZED UNTIL WRITTEN APPROVAL IS GRANTED BY THE CONSTRUCTION MANAGER ADDITIONAL REINFORCING STEEL QUANTITIES REQUIRED FOR ADDITIONAL SPLICES NOT SHOWN IN THE PLANS SHALL NOT BE PAID FOR

10 STRUCTURAL STEEL: ALL STRUCTURAL STEEL FOR DIAPHRAGMS AND CONNECTION PLATES SHALL CONFORM TO AASHTO M270, GRADE 250 SHEAR STUDS SHALL CONFORM TO SECTION 717 05 OF THE FP-14 ALL OTHER STRUCTURAL STEEL SHALL CONFORM TO AASHTO REQUIREMENTS AS SHOWN OR NOTED ON THE PLANS

11 ALL SURFACES OF THE STRUCTURAL STEEL SHALL BE BLAST CLEANED IN THE FABRICATION SHOP TO MEET THE REQUIREMENTS OF THE STEEL STRUCTURE PAINTING COUNCIL (SSPC) SSPC-6 AFTER BLAST CLEANING, THE STEEL SHALL BE KEPT CLEAN OF ALL FOREIGN MATERIAL IF THE STEEL BECOMES CONTAMINATED, THE STEEL SHALL BE CLEANED WITH A METHOD APPROVED BY THE CONSTRUCTION MANAGER BEAMS CONTAMINATED WITH CONCRETE OR GROUT SHALL BE WASHED BEFORE THE CONTAMINATE IS ALLOWED TO DRY

12 STAY-IN-PLACE DECK FORMS. PERMANENT STEEL DECK FORMS MAY BE UTILIZED FOR SLAB CONSTRUCTION PROVIDED THAT BOTH TOP AND BOTTOM MATS OF DECK SLAB REINFORCING BARS ARE EPOXY COATED SUBMIT COMPLETE SHOP PLANS, DESIGN CALCULATIONS, and SPECIFICATIONS, IN ACCORDANCE WITH THE SUPPLEMENTAL SPECIFICATIONS FOR SECTION 562 THE DESIGN, CALCULATIONS, AND SHOP DRAWINGS FOR THE PROPOSED FORMING SYSTEMS MUST BE APPROVED BY THE CONSTRUCTION MANAGER PRIOR TO INSTALLATION

13 STEEL PILES: STEEL H-PILES SHALL BE HP 360 X 152 WITH STEEL PILE TIPS CONFORMING TO ASTM A27 PILES SHALL CONFROM TO AASHTO M270, GRADE 345 PILES SHALL BE DRIVEN UTILIZING THE DYNAMIC FORMULA GIVEN IN SECTION 551 05 (B) OF THE FP-14 THE ULTIMATE PILE CAPACITY (RU) SHALL BE THE APPLIED FACTORED STRUCTURAL LOAD DIVIDED BY A RESISTANCE FACTOR OF 0 45 PILES SHALL BE DRIVEN TO THE MINIMUM TIP ELEVATION INDICATED FOR LATERAL LOAD STABILITY AND TO PENETRATE UNSUITABLE STRATA OR LOWER TO GAIN THE REQUIRED ULTIMATE PILE CAPACITY SPLICING SHALL BE IN ACCORDANCE WITH SECTIONS 551 11 AND 551 11 (a) OF THE FP-14 EXCEPT THAT SPLICE DETAILS SHALL BE AS SHOWN IN THE PLANS. PILES SHALL BE DRIVEN TO THE TOLERANCES GIVEN IN SECTION 551 10 OF THE FP-14 AXIAL ALIGNMENT DEVIATIONS SHALL BE MEASURED STARTING FROM THE PLANNED PILE LOCATION AT THE CUTOFF ELEVATION AND SHALL NOT EXCEED THE TOLERANCE GIVEN IN SECTION 551 10 OF THE FP-14 ASSURE CORRECT PILE PLACEMENT AND ALIGNMENT (WITHIN TOLERANCES) BY PROVIDING HORIZONTAL BRACING BETWEEN THE CRANE AND PILE DRIVING LEADS.

14 TEST PILES: THIS BRIDGE PROJECT INCLUDES TEST PILES, SEE SUPPLEMENTAL SPECIFICATIONS, and SECTION 551 07 FOR TEST PILE REQUIREMENTS

15 STRUCTURE EXCAVATION AND BACKFILL: ALL STRUCTURE EXCAVATION AND BACKFILL SHALL BE DONE ACCORDING TO FP-14, SECTION 208 - STRUCTURE EXCAVATION AND BACKFILL FOR SELECT MAJOR STRUCTURES.

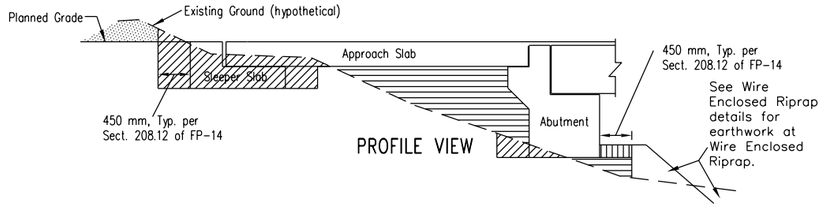
16 CONTRACTOR SHALL VERIFY: IN THE FIELD ALL DIMENSIONS, ELEVATIONS AND DETAILS WHICH WILL BE INVOLVED IN THE NEW CONSTRUCTION BEFORE PROCEEDING WITH NEW WORK.

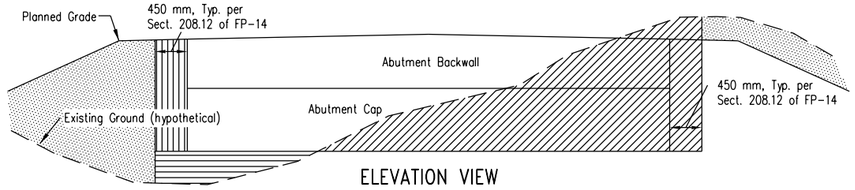
17 PRESTRESSING STEEL: PRESTRESSING STEEL SHALL BE 15 2 MM DIAMETER, SEVEN WIRE, LOW-RELAXATION PRESTRESSING STEEL STRANDS CONFORMING TO AASHTO M203 EACH STRAND SHALL BE PRETENSIONED TO A LOAD OF 586 3 9 KN WHICH CORRESPONDS TO A STRESS EQUAL TO 75% OF FPU AFTER ESTIMATED LOSSES OF 16 55 MPA, THE FINAL EFFECTIVE PRESTRESS FORCE IS 579 4 5 KN PER STRAND

18 PRESTRESSED BEAMS: PRESTRESSED BEAMS SHALL BE MANUFACTURED AS DETAILED IN THESE PLANS. ALL CONCRETE, REINFORCING STEEL, PRESTRESSING STEEL, LIFTING DEVICES, INSERTS, ELASTOMERIC BEARING PADS, AND ANY OTHER MATERIAL NECESSARY FOR THE FABRICATION, TRANSPORT, ERECTION AND INSTALLATION OF THE PRESTRESSED BEAMS SHALL BE INCLUDED IN THE UNIT BID PRICE FOR ITEM 55302-3300 PRECAST, PRESTRESSED CONCRETE BEAM TYPE BT 1600 NEOPRENE ELASTOMERIC BEARINGS PADS SHALL CONFORM TO AASHTO M251 AND SHALL BE 60 DUROMETER HARDNESS. PRESTRESSING STRAND AT ENDS OF BEAMS SHALL BE CUT 15 MM BACK FROM THE SURFACE OF THE BEAM ENDS RESULTING DEPRESSION FROM CUTTING PRESTRESSED STRANDS SHALL BE FILLED WITH AN EPOXY MODIFIED MORTAR AND RUBBED FLUSH TO BEAM ENDS. CLEAN BEAM ENDS OF ALL CARBON FROM TORCH CUTTING AND OTHER FOREIGN MATERIAL

19 WELDING: ALL BRIDGE RELATED WELDING SHALL BE IN CONFORMANCE WITH THE AASHTO/AWS D15M/D15 2015 BRIDGE WELDING CODE, INCLUDING INSPECTION OF ALL WELDS ANY WELDING (EXCEPT TACK WELDING) ON ANY STRUCTURAL MEMBER (MEMBER DESIGNED TO CARRY OR RESIST TRAFFIC OR PEDESTRIAN LOADS) SHALL BE SUBJECT TO VISUAL INSPECTION AND MAGNETIC PARTICLE TESTING BY AN APPROVED AWS CERTIFIED WELDING INSPECTOR, AND SHALL DIRECTED BY THE CONSTRUCTION MANAGER ALL LABOR, EQUIPMENT, MATERIALS AND WORK REQUIRED FOR TESTING BY AN AWS CERTIFIED WELDING INSPECTOR SHALL BE MEASURED AND PAID FOR UNDER ITEM 15301-0000 REFER TO SPECIAL CONTRACT REQUIREMENT PARAGRAPH 16(k)

20 PREBORING: PREBORING IS REQUIRED TO ENSURE ADEQUATE FLEXIBILITY AND TO PREVENT OVERSTRESSING OF ABUTMENT PILES UNDER LONGITUDINAL MOVEMENT DUE TO THERMAL CHANGES, SHRINKAGE AND CREEP. PREBORING SHALL BE IN ACCORDANCE WITH SECTION 551 OF THE FP-14 AND SUPPLEMENTAL SPECIFICATION EXCEPT ONLY AUGURING METHODS SHALL BE USED. THE DIAMETER AND LENGTH OF PREBORING HOLES SHALL BE AS SHOWN ON THE DRAWINGS. FILL PREBORING HOLES WITH LOOSE SAND AFTER PILES HAVE BEEN DRIVEN. ALL PREBORING WORK SHALL BE PAID UNDER BID ITEM 55115-1000-PREBORING, 762 mm Φ





— Structure Excavation below Existing Ground for placement of structures paid under Item 20801-0000 with resulting Structural Backfill up to Planned Grade considered incidental to Item 20801-0000. Work shall conform to Section 208 of the FP-14.

— Foundation Fill from Existing Ground to bottom of structures paid under Item 20802-0000. Work shall conform to Section 208 of the FP-14.

— Structural Backfill adjacent to structures above Existing Ground or above Foundation Fill to the Planned Grade considered incidental to the completion of the structure with no separate payment. Work shall conform to Section 208 of the FP-14.

— Excavation and/or Embankment outside of the limits for work under Section 208 of the FP-14 to be paid under Items 20401-0000 and/or 20403-0000. Work shall conform to Section 204 of the FP-14.

TYPICAL DETAILS FOR EARTHWORK AT BRIDGES

ABBREVIATIONS:

CLR. = CLEAR
SPA. = SPACES
I.F. = INSIDE FACE
O.F. = OUTSIDE FACE
O.C. = ON CENTER
BOT = BOTTOM
EL = ELEVATION
T.O.C. = TOP OF CONCRETE
PBJF = PREMOLDED BITUMINOUS JOINT FILLER
REQ'D = REQUIRED
NTS = NOT TO SCALE
TYP. = TYPICAL
NF = NEAR FACE
FF = FAR FACE
HMWM = HIGH MOLECULAR WEIGHT METHACRYLATE
C.J. = CONSTRUCTION JOINT

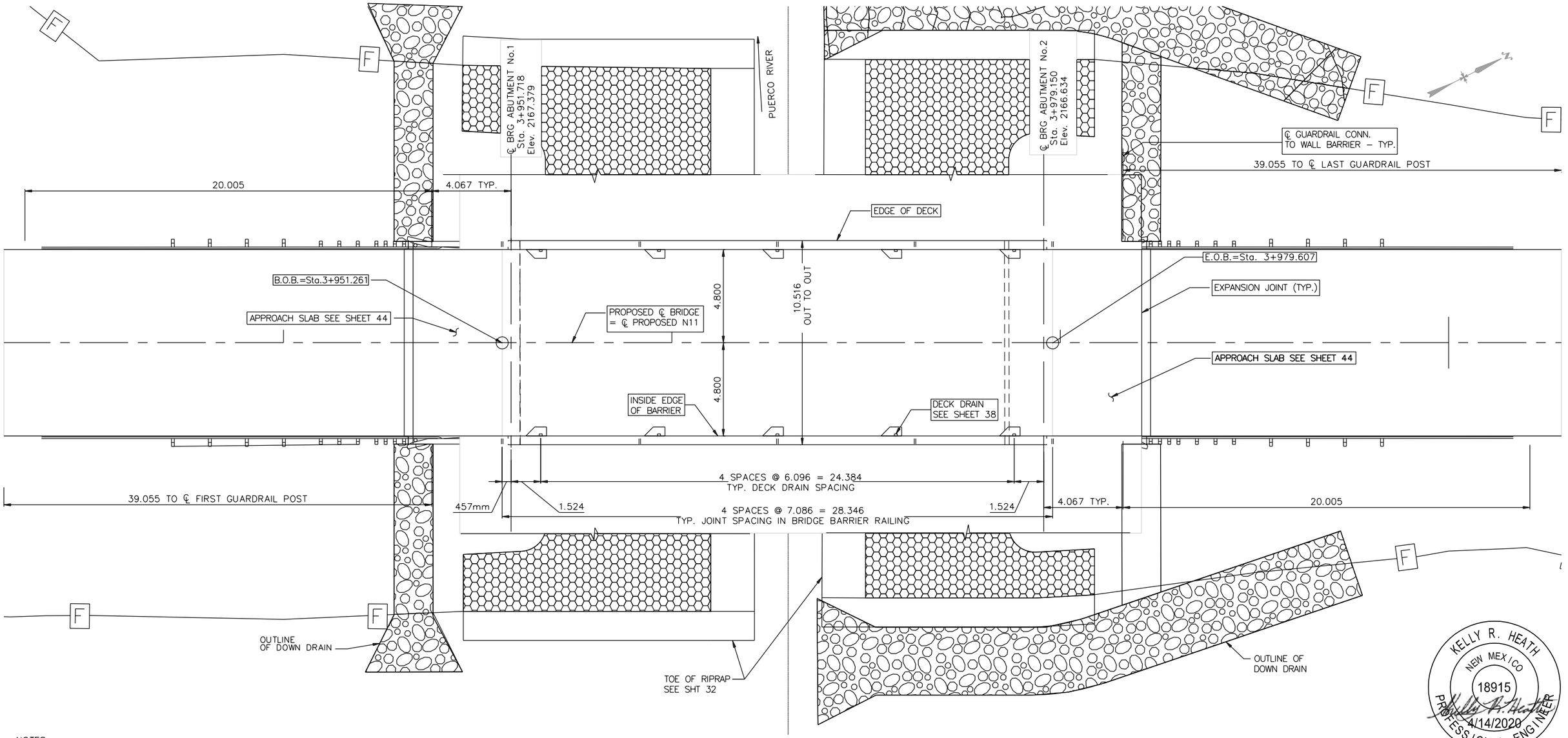
KELLY R. HEATH
NEW MEXICO
18915
PROFESSIONAL ENGINEER
4/14/2020

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

BRIDGE NOTES

Designed by: MAZ	**Date:** 05/10
Drawn by: PG	**Date:** 05/10
Revised by: WHPacific	**Date:** 09/11
File Name: N11(1A)-BridgeNotes sht 26	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	27	82



NOTES:

1. FOR GUARDRAIL DETAILS SEE SHEETS 49–51.
2. FOR BRIDGE BARRIER RAILING DETAILS, SEE SHEETS 46–48.
3. FOR EARTHWORK AT BRIDGE DETAIL, SEE SHEET 26.
4. SEE SHEET 32 FOR ABUTMENT RIPRAP PLAN

STRUCTURE LOCATION PLAN

SCALE N.T.S.

LEGEND

- NEW CONSTRUCTION
- EXISTING FEATURES
- GUARDRAIL
- NEW ROW
- NEW ROW MARKER
- EXISTING DIRT ROAD
- CONTOUR LINE (O.H.W.M.)
- PLACED RIPRAP
- WIRE ENCLOSED RIPRAP

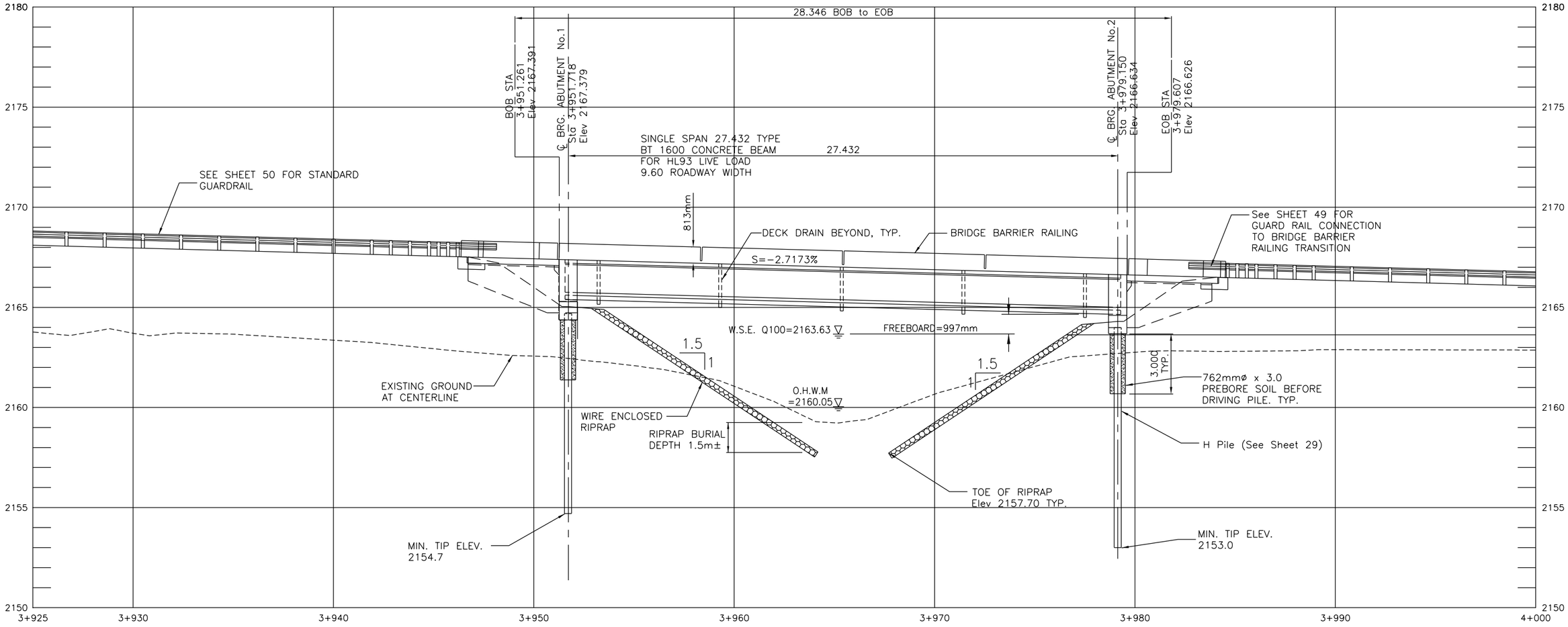
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STRUCTURE LOCATION PLAN

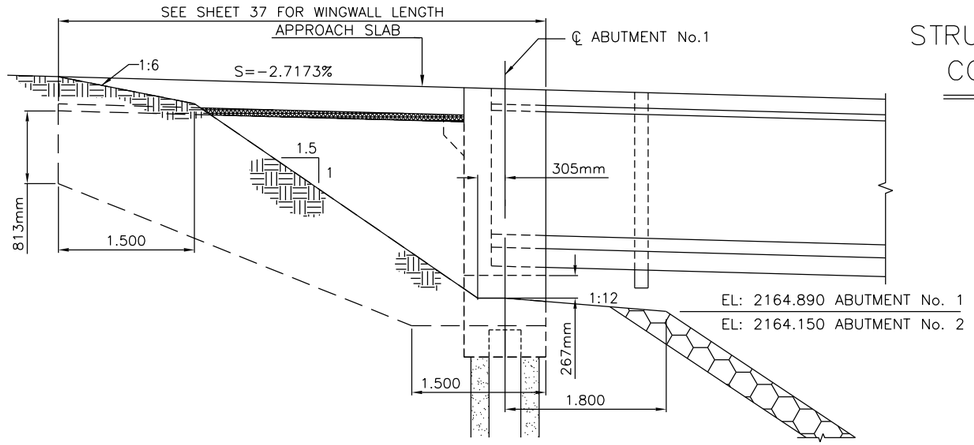
Designed by: MAZ	**Date:** 05/10
Drawn by: PG	**Date:** 05/10
Revised by: WHPacific	**Date:** 09/11
File Name: N11(1A)–Structure–Plan sht 27	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	28	82



STRUCTURE PROFILE ALONG ℄ CONSTRUCTION/ROADWAY

SCALE= N.T.S.



EARTHWORK @ ABUTMENTS

SCALE= N.T.S.

GENERAL NOTES

1. ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE
2. ALL ELEVATIONS ARE IN METERS
3. SLOPE GIVEN IN VERTICAL: HORIZONTAL FORMAT

KELLY R. HEATH NEW MEXICO 18915 PROFESSIONAL ENGINEER 4/14/2020

HYDRAULIC DATA – N11(1A)

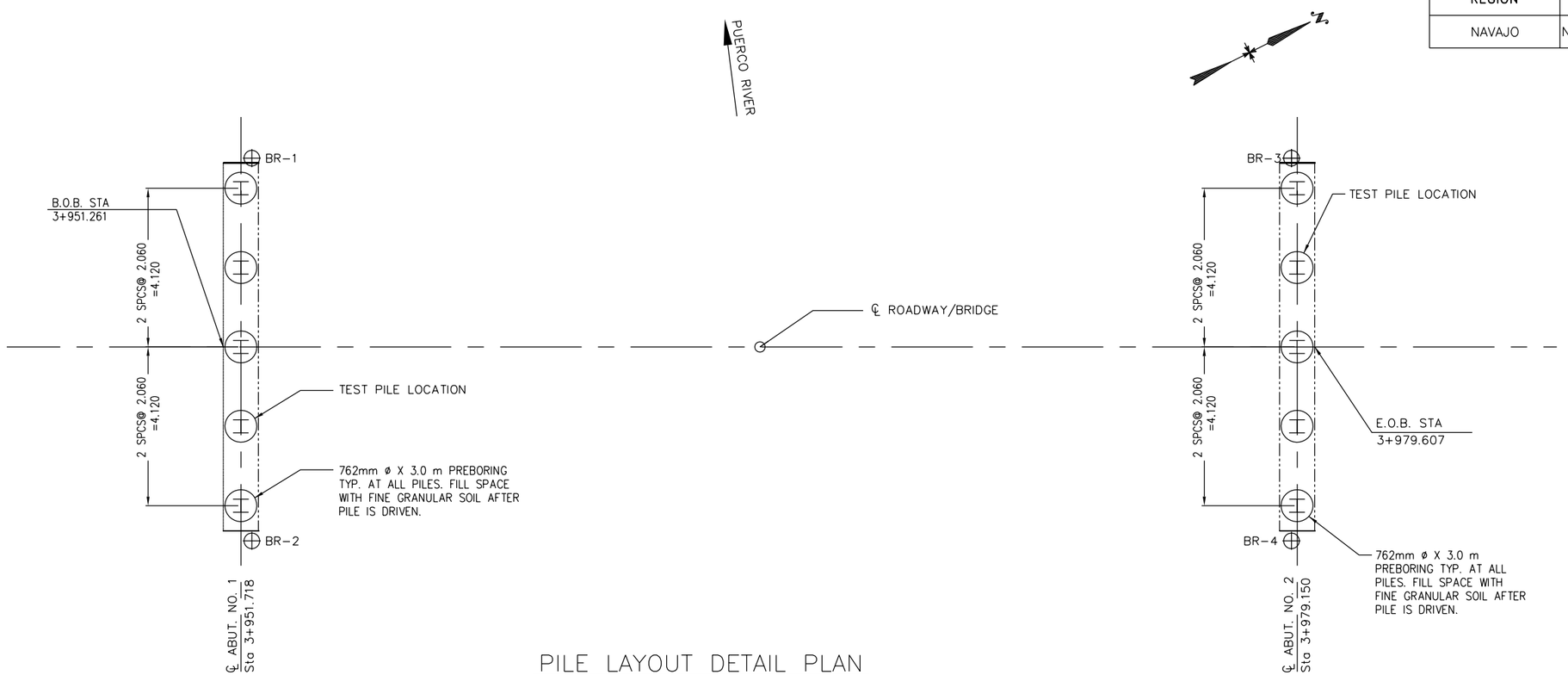
WATERWAY:	Puerco River	
Drainage Area =	247	km?
100 year Flow Rate	130	m^3/s
H.W. Elev. =	2163.63	m
V100 =	3.93	m/s
Freeboard =	997	mm
500 year Flow Rate	319	m^3/s
H.W. Elev. =	2165.78	m
V500 =	4.9	m/s
Scour Depth =	2.62	m
Freeboard =	-1.153	m

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STRUCTURE PROFILE

Designed by: MAZ	**Date:** 12/09	
Drawn by: PAG	**Date:** 12/09	
Revised by: WHPacific	**Date:** 09/11	
File Name: N11(1A)–Structure Profile sht		28

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	29	82



PILE LAYOUT DETAIL PLAN

SCALE = 1:150

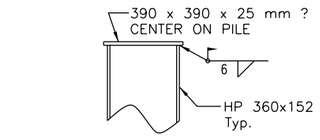
NOTE:
LIMITED DATA IS SHOWN FROM THE GEOTECHNICAL INVESTIGATION PERFORMED FOR THIS PROJECT. UPON REQUEST, A COPY OF THE ORIGINAL GEOTECHNICAL INVESTIGATION REPORT WILL BE FURNISHED. USE OF THE DATA CONTAINED HERE OR IN THE ORIGINAL REPORT IS AT THE DISCRETION OF THE USER WHO IS RESPONSIBLE FOR ALL INTERPRETATIONS OR ASSUMPTIONS BASED ON THIS DATA.

SPACING SHOWN IS AT BOTTOM OF ABUTMENT CAP ELEVATION.

BORE SYMBOL LEGEND

BR# = BORE HOLE NUMBER

⊕ = BORE HOLE LOCATION

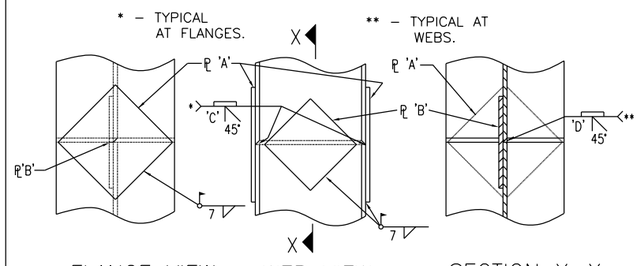


PILE COVER PLATE DETAIL @ ABUTMENTS

N.T.S.

TABLE OF SPLICE PLATE DIMENSIONS AND WELD SIZES				
Pile Size	PL 'A' (mm)	PL 'B' (mm)	Weld Size 'C'	Weld Size 'D'
HP 360 x 152	250 x 250 x 13	200 x 200 x 13	13 mm	13 mm

NOTE: Bevel ends of piles (web and flanges) as shown prior to welding.



STEEL H–PILE SPLICE DETAIL (TYP.)

N.T.S.

BORE HOLE LOCATION

BORE HOLE	ROADWAY ALIGNMENT	NORTHING	EASTING
BR–1	STA. 3+952, 4.8m Lt.	484358.164	797643.042
BR–2	STA. 3+952, 4.8m Rt.	484355.594	797648.213
BR–3	STA. 3+979, 4.8m Lt.	484372.334	797651.635
BR–4	STA. 3+979, 4.8m Rt.	484369.761	797657.533

PILE REQUIREMENTS

LOCATION	PILE TYPE	TEST PILE QUANTITY	PRODUCTION PILE QUANTITY	ESTIMATED LENGTH* (m)	MINIMUM PILE TIP ELEVATION (m)	APPLIED STRUCTURAL LOAD(kN) (FACTORED)	ULTIMATE CAPACITY (kN)
ABUTMENT No. 1	HP 360x152	1	4	10.0	2154.7	1280	2844
ABUTMENT No. 2	HP 360x152	1	4	11.0	2153	1280	2844

* THE AVERAGE ESTIMATED LENGTH INDICATED IN THE PILE REQUIREMENTS TABLE IS FOR ESTIMATING PURPOSES ONLY. THE ACTUAL PILE LENGTHS MAY BE DIFFERENT THAN THOSE INDICATED.

FOUNDATION NOTES

1. THE ABUTMENT PILING SHALL BE HP 360 x 152 H–PILES, CONFORMING TO AASHTO M 270, GRADE 345. PILES SHALL BE EQUIPPED WITH A REINFORCED TIP. THE PILE TIP SHALL BE FREE FROM ANY OBVIOUS DEFECTS AND SHALL BE ACCOMPANIED BY A MILL TEST REPORT STATING THE CHEMICAL AND PHYSICAL PROPERTIES (TENSILE AND YIELD) OF THE STEEL. PILE TIPS SHALL CONFORM TO ASTM A27.
2. THIS BRIDGE PROJECT INCLUDES TEST PILES. SEE SUPPLEMENTAL SPECIFICATIONS SECTION 551 FOR DETAILS, INCLUDING DETERMINATION OF PILE QUANTITIES REQUIRED FOR PROJECT.
3. APPROVED TEST PILES SHALL BECOME PERMANENT PILES IF APPROVED. TEST PILES WILL BE PAID UNDER BID ITEM 55120–0000.
4. FOR ADDITIONAL FOUNDATION NOTES: SEE BRIDGE GENERAL NOTE SHEET.



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NAVAJO REGION OFFICE * DIVISION OF TRANSPORTATION

PILE LAYOUT AND FOUNDATION NOTES

Designed by: MAZ	**Date:** 05/10
Drawn by: PAG	**Date:** 05/10
Revised by: PAG	**Date:** 09/11
File Name: N11(1A) Pile Layout and Foundation Notes sht	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	30	82

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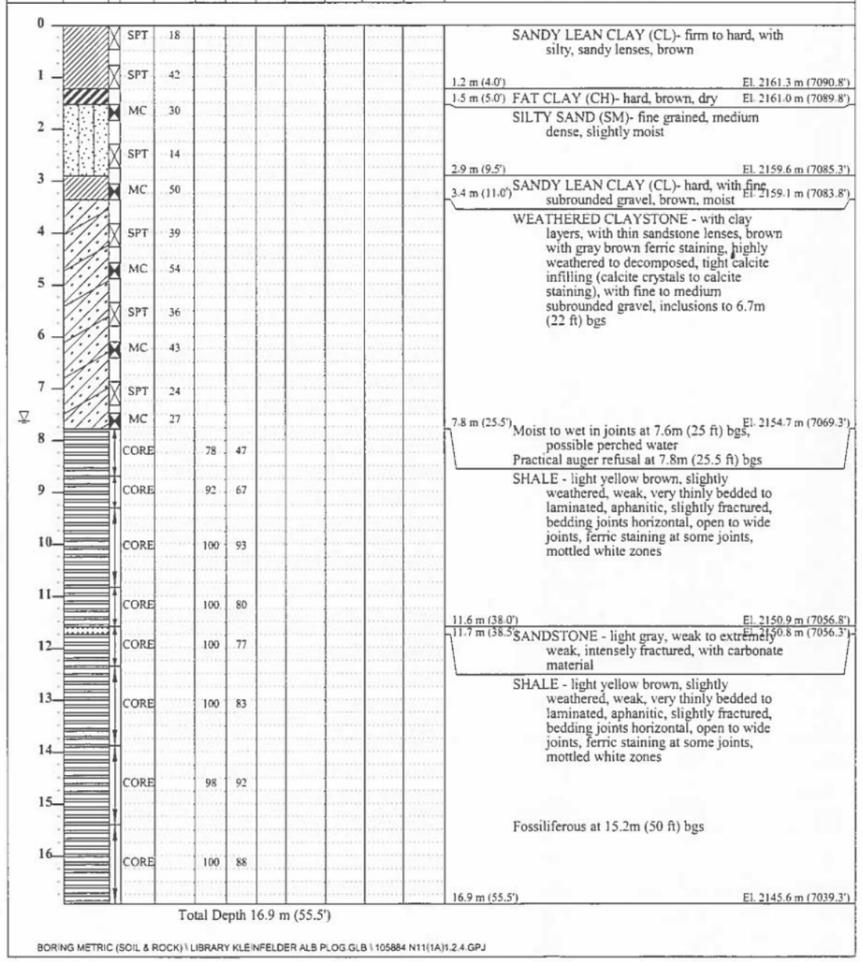
Boring Log

Boring # BR-1
Sheet 1 of 1
Revision: 0

Date	Project Number	Project
Started: 12/14/2009	105884	N11(1A)1,2,4
Completed: 12/14/2009		
Backfilled: 12/14/2009	Rig Type: CME 75	Surface Elevation: 2162.5 m (7094.8') Logged By: R. Stump
Latitude: 35°36.7048'	Longitude: 108°18.9408'	Location: N11(1A) Sta. 3+952 4.8m Lt

Groundwater: Depth, m (ft.) 7.6 (25) | Date 12/14/2009

Sample Type: AUGER - Auger Cuttings; G - Grab Sample; MC - 2.5" O.D. 2.46" I.D. Modified California Sample; SPT - 2" O.D. 1.38" I.D. Tube Sample; U - 3" O.D. 2.42" I.D. Ring Sample; ST - 3" O.D. Thin-Walled Shelby Tube



BORING METRIC (SOIL & ROCK) \ LIBRARY KLEINFELDER ALB PLOG.GLB \ 105884 N11(1A)1.2.4.GPJ

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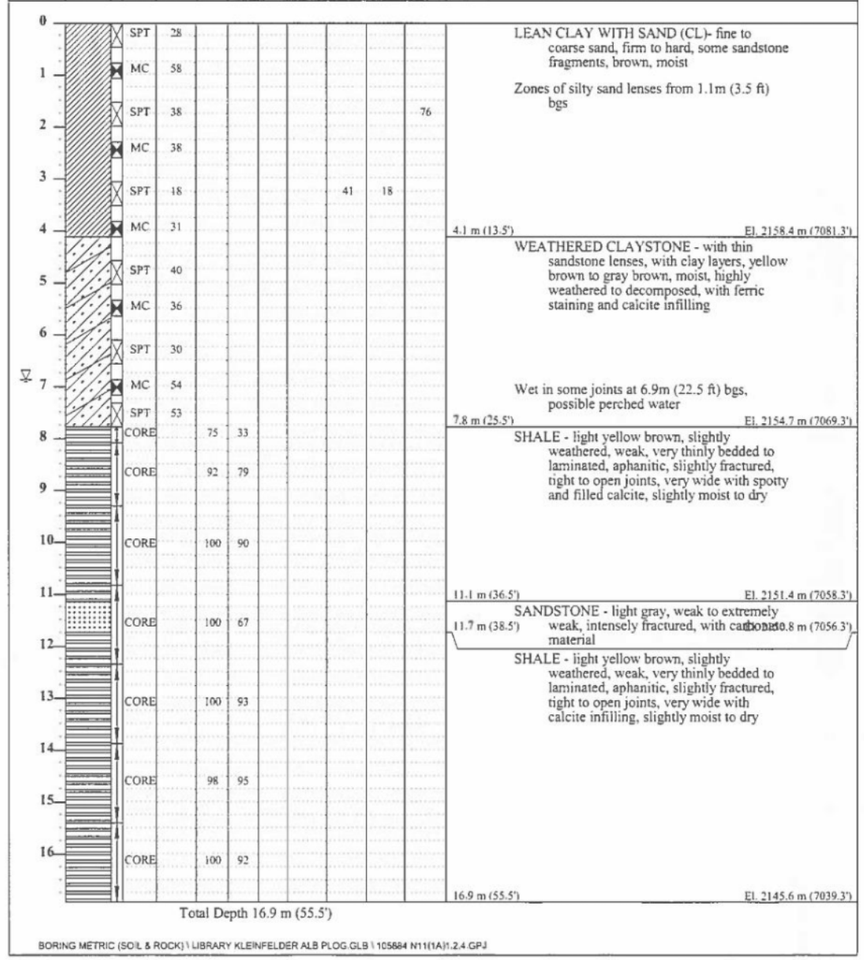
Boring Log

Boring # BR-2
Sheet 1 of 1
Revision: 0

Date	Project Number	Project
Started: 12/15/2009	105884	N11(1A)1,2,4
Completed: 12/15/2009		
Backfilled: 12/15/2009	Rig Type: CME 75	Surface Elevation: 2162.5 m (7094.8') Logged By: R. Stump
Latitude: 35°36.7025'	Longitude: 108°18.9351'	Location: N11(1A) Sta. 3+952 4.8m Rt

Groundwater: Depth, m (ft.) 6.9 (22.5) | Date 12/15/2009

Sample Type: AUGER - Auger Cuttings; G - Grab Sample; MC - 2.5" O.D. 2.46" I.D. Modified California Sample; SPT - 2" O.D. 1.38" I.D. Tube Sample; U - 3" O.D. 2.42" I.D. Ring Sample; ST - 3" O.D. Thin-Walled Shelby Tube



BORING METRIC (SOIL & ROCK) \ LIBRARY KLEINFELDER ALB PLOG.GLB \ 105884 N11(1A)1.2.4.GPJ

NOTE:
INFORMATION CONTAINED IN THE BORING LOGS ON THIS SHEET IS MADE AVAILABLE TO PROSPECTIVE BIDDERS FOR INFORMATIONAL PURPOSES ONLY. THIS INFORMATION WAS DEVELOPED AS ACCURATELY AS POSSIBLE BY THE METHODS USED. THE GOVERNMENT ACCEPTS NO RESPONSIBILITY FOR ANY CONDITIONS ENCOUNTERED WHICH MAY BE AT VARIANCE FROM THE INFORMATION CONTAINED HEREIN.

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

BORING LOGS

Designed by: Kleinfelder	Date: 2009
Drawn by: Kleinfelder	Date: 2009
Revised by:	Date:
File Name: N11(1A)–Boring Logs sht 30	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	31	81

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Boring Log

Boring # BR-3
Sheet 1 of 1
Revision: 0

Date
Started: 12/18/2009
Completed: 12/18/2009
Backfilled: 12/18/2009

Project Number
105884

Project
N11(1A)1,2,4

Rig Type: CME 75
Surface Elevation: 2162.0 m (7093.2')
Logged By: R. Stump

Latitude: 35°36.7176'
Longitude: 108°18.9314'
Location: N11(1A) Sta. 3+979 4.8m Lt

Groundwater
Depth, m (ft.) 7.6 (25) | Date 12/18/2009

Sample Type: AUGER - Auger Cuttings; G - Grab Sample; MC - 2.5" O.D. 2.46" I.D. Modified California Sample; SPT - 2" O.D. 1.38" I.D. Tube Sample; U - 3" O.D. 2.42" I.D. Ring Sample; ST - 3" O.D. Thin-Walled Shelby Tube

Groundwater Depth (m) / Depth (m)	Graphical Log	Sample Taken	Sample Type	Penetration Resistance (Blows / 0.3 m)	% Recovery (Rock)	RQD	Moisture Content (%)	Dry Density (kN/cu. m)	Liquid Limit	Plasticity Index	Percent Passing No. 200 Sieve	Visual Classification
0			SPT	23								SILTY TO SAND LEAN CLAY (CL)- firm to hard, light brown, moist
1			MC	71								
2			SPT	23								2.0 m (6.5') El. 2160.0 m (7086.7')
			MC	43								2.3 m (7.5') SILTY SAND (SM)- fine grained, medium dense, light brown, moist El. 2159.7 m (7085.7')
3			SPT	28								SANDY SILT (ML)- hard, with fine to coarse, angular to subangular gravel, with coarse sand, brown and red brown, moist
4			MC	45			17.9	17.6	45	16		3.8 m (12.5') El. 2158.2 m (7080.7')
			SPT	66								FAT CLAY (CH)- firm, gray with ferric staining in layers, moist 4.4 m (14.5') El. 2157.6 m (7078.7')
5			MC	38								4.9 m (16.0') CLAYEY GRAVEL (GC)- fine to coarse, dense, angular to subangular, red brown, dry El. 2157.1 m (7077.2')
			SPT	25								5.3 m (17.5') El. 2156.7 m (7075.7')
6												SILTY FAT CLAY (CH)- firm, olive brown, moist
7			MC	36								WEATHERED CLAYSTONE - with clay layers, light yellow brown and gray, highly weathered to decomposed, iron staining and spotting in bedding joints, very tight joints
			SPT	32								Very moist a 7.6m (25 ft) bgs, possible perched water
8			SPT	82/9"								8.5 m (28.0') El. 2153.5 m (7065.2')
9			CORE		100	69						SHALE - light gray, moderately weathered to slightly weathered, weak, very thinly bedded to laminated, aphanitic, laminated, slightly fractured to unfractured, fractures widely spaced, tight to moderately open joints, slightly rough, calcite infilling and staining
10												
11			CORE		100	82						11.6 m (38.0') El. 2150.4 m (7055.2')
12												11.9 m (39.0') SANDSTONE - light gray, weak to extremely weak, intensely fractured, with carbonate material El. 2150.1 m (7054.2')
			CORE		97	75						SHALE - light gray, slightly weathered, weak, very thinly bedded to laminated, aphanitic, laminated, slightly fractured to unfractured, fractures widely spaced, tight to moderately open, slightly rough, calcite infilling and staining
13												
14			CORE		100	92						
15												
16			CORE		95	87						16.3 m (53.6') El. 2145.7 m (7039.6')

Total Depth 16.3 m (53.6')

BORING METRIC (SOIL & ROCK) \ LIBRARY KLEINFELDER ALB PLOG GLB \ 105884 N11(1A)1.2.4.GPJ

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Boring Log

Boring # BR-4
Sheet 1 of 1
Revision: 0

Date
Started: 12/15/2009
Completed: 12/17/2009
Backfilled: 12/17/2009

Project Number
105884

Project
N11(1A)1,2,4

Rig Type: CME 75
Surface Elevation: 2163.0 m (7096.5')
Logged By: R. Stump

Latitude: 35°36.7153'
Longitude: 108°18.9249'
Location: N11(1A) Sta. 3+979 4.8m Rt

Groundwater
Depth, m (ft.) 9.3 (30.5) | Date 12/15/2009

Sample Type: AUGER - Auger Cuttings; G - Grab Sample; MC - 2.5" O.D. 2.46" I.D. Modified California Sample; SPT - 2" O.D. 1.38" I.D. Tube Sample; U - 3" O.D. 2.42" I.D. Ring Sample; ST - 3" O.D. Thin-Walled Shelby Tube

Groundwater Depth (m) / Depth (m)	Graphical Log	Sample Taken	Sample Type	Penetration Resistance (Blows / 0.3 m)	% Recovery (Rock)	RQD	Moisture Content (%)	Dry Density (kN/cu. m)	Liquid Limit	Plasticity Index	Percent Passing No. 200 Sieve	Visual Classification
0			SPT	60								SILTY TO SANDY LEAN CLAY (CL)- hard, light brown, dry to moist
1			MC	30			7.3	15.0	NV	NP		With sand lenses from 1.1m (2.5 ft) bgs
			SPT	27								With occasional calcite stringers at 1.5m (5 ft) bgs
2			MC	47								
3			SPT	18								3.7 m (12.0') El. 2159.3 m (7084.5')
4			MC	16			12.8	13.9			90	POORLY GRADED SAND WITH SILT (SP-SM)- fine grained, medium dense, light brown, moist
			SPT	22								4.9 m (16.0') El. 2158.1 m (7080.5')
5			MC	52								WEATHERED CLAYSTONE - with thin sandstone lenses, with clay layers
6			SPT	36								
7			MC	42								
8			SPT	21								
			SPT	30								
9			SPT	48								
10			SPT	50/5"								Perched water at 9.3m (30.5) bgs
												10.1 m (33.0') El. 2152.9 m (7063.5')
11			CORE		95	86						SHALE - gray with variated white, slightly weathered, weak, very thinly bedded to laminated, aphanitic, bedding joints horizontal, slightly fractured to unfractured, tight to moderately open joints, calcite infilling, fracture staining, moist to dry
12			CORE		88	62						0.03m (1 in) of sandstone layer, white, moist, extremely weak at 12.2m (40 ft) bgs
												13.0 m (42.5') El. 2150.0 m (7054.0')
13												13.1 m (43.0') SANDSTONE - light gray, moist, weak to extremely weak, intensely fractured, with carbonate material El. 2149.9 m (7053.5')
14			CORE		98	82						SHALE - gray with variated white, slightly weathered, weak, very thinly bedded to laminated, aphanitic, bedding joints horizontal, slightly fractured to unfractured, tight to moderately open joints, calcite infilling, fracture staining, moist to dry
15			CORE		100	91						
16			CORE		100	78						
			CORE		72	55						16.8 m (55.0') El. 2146.2 m (7041.5')

Total Depth 16.8 m (55.0')

BORING METRIC (SOIL & ROCK) \ LIBRARY KLEINFELDER ALB PLOG GLB \ 105884 N11(1A)1.2.4.GPJ

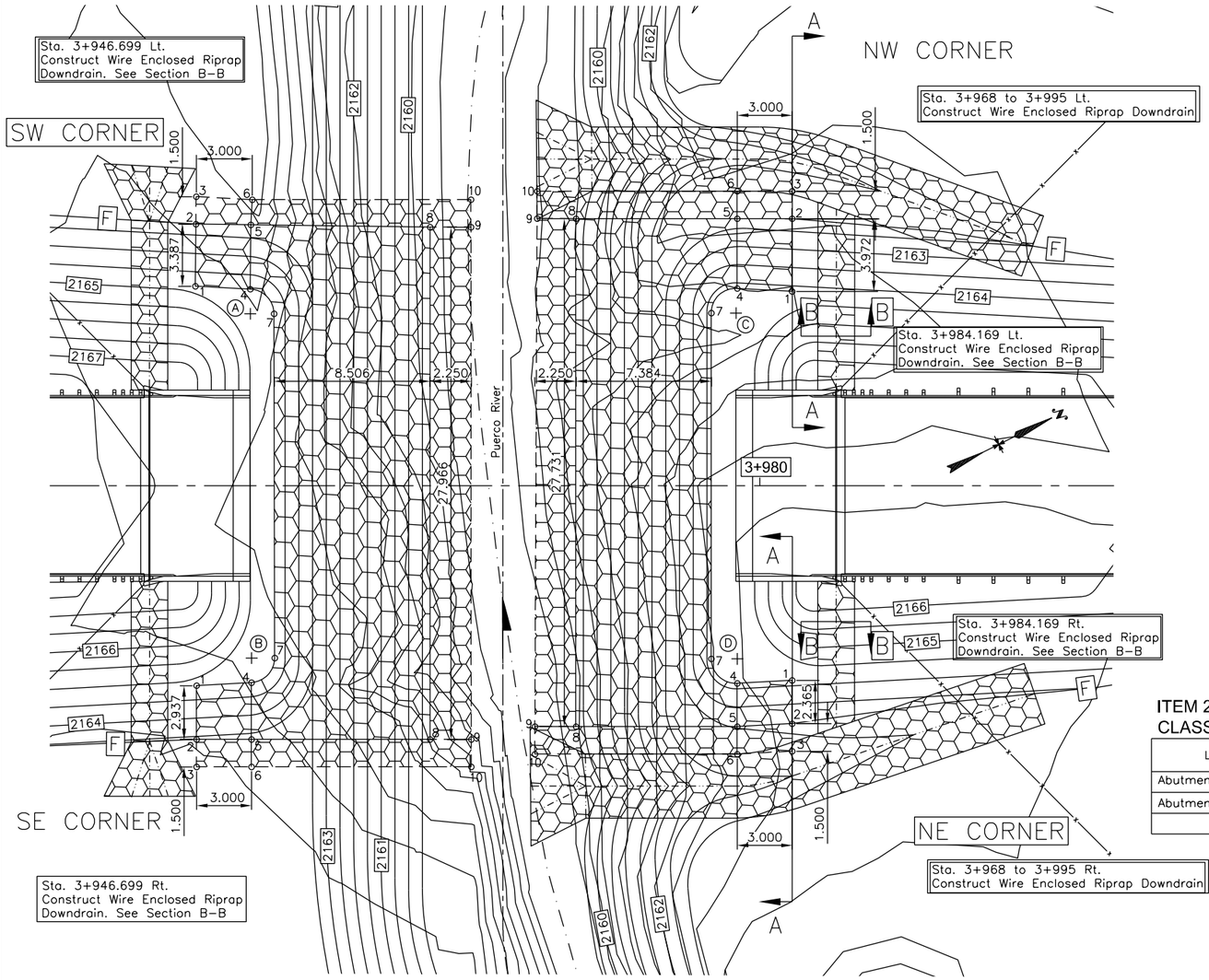
NOTE:
INFORMATION CONTAINED IN THE BORING LOGS ON THIS SHEET IS MADE AVAILABLE TO PROSPECTIVE BIDDERS FOR INFORMATIONAL PURPOSES ONLY. THIS INFORMATION WAS DEVELOPED AS ACCURATELY AS POSSIBLE BY THE METHODS USED. THE GOVERNMENT ACCEPTS NO RESPONSIBILITY FOR ANY CONDITIONS ENCOUNTERED WHICH MAY BE AT VARIANCE FROM THE INFORMATION CONTAINED HEREIN.

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BORING LOGS

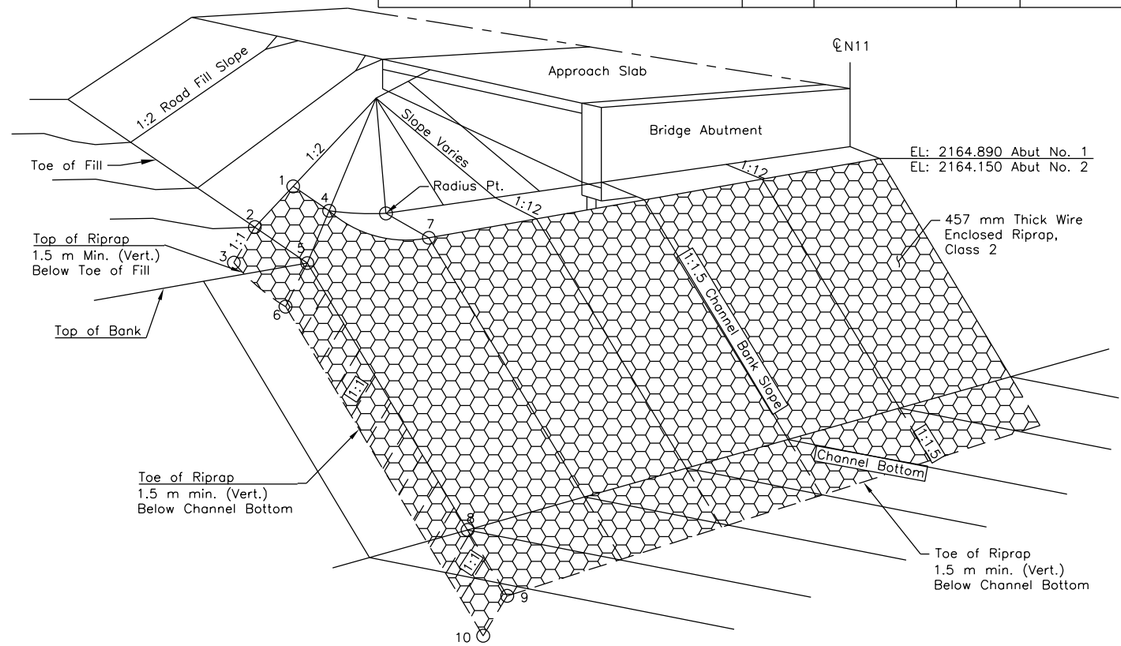
Designed by: Kleinfelder	**Date:** 2009
Drawn by: Kleinfelder	**Date:** 2009
Revised by:	**Date:**
File Name: N11(1A)–Boring Logs sht 30	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	32	82



ABUTMENT RIPRAP LAYOUT

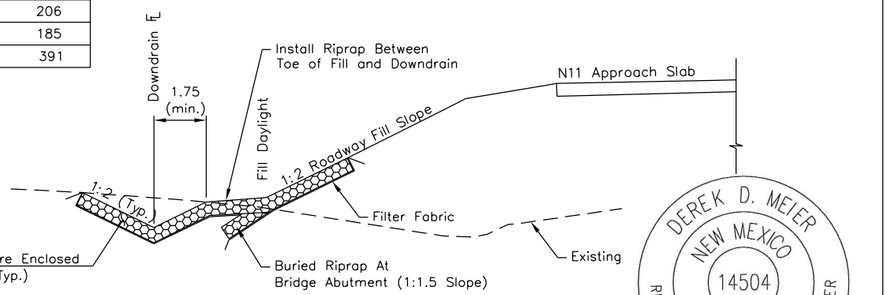
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ISOMETRIC VIEW

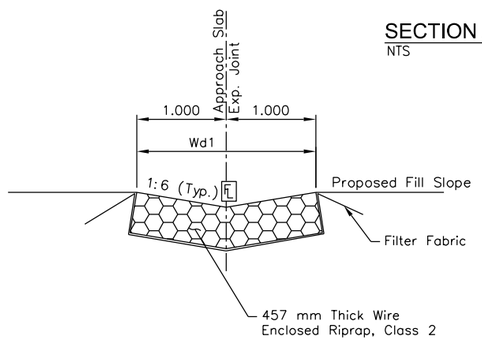
ITEM 25112-2000: WIRE ENCLOSED RIPRAP, CLASS 2 - AT BRIDGE ABUTMENTS

LOCATION	THICKNESS (mm)	VOLUME (m³)
Abutment No. 1	457	206
Abutment No. 2	457	185
TOTAL		391



SECTION A-A

NTS



SECTION B-B

NTS

RADIUS POINTS			
POINT	NORTHING	EASTING	RADIUS
A	511760.080	786613.860	1.343
B	511751.710	786630.690	1.343
C	511783.784	786625.698	1.343
D	511775.326	786642.573	1.343

NOTES

1. SEE SHEET 67 FOR WIRE ENCLOSED RIPRAP DETAILS AND NOTES.
2. SEE SHEET 33 FOR GRADING DETAILS.
3. SEE SHEET 8 FOR DOWNDRAIN QUANTITIES.

SW CORNER			
Pt. No.	NORTHING	EASTING	ELEVATION
1	511758.069	786611.170	2164.890
2	511759.616	786608.156	2163.197
3	511760.302	786606.820	2161.697
4	511760.699	786612.673	2164.890
5	511762.278	786609.533	2163.197
6	511762.960	786608.341	2161.697
7	511761.235	786614.438	2164.890
8	511770.950	786614.019	2159.045
9	511772.962	786615.027	2157.545
10	511773.634	786613.686	2156.045

SE CORNER			
Pt. No.	NORTHING	EASTING	ELEVATION
1	511748.358	786630.692	2164.890
2	511747.042	786633.318	2163.422
3	511746.370	786634.659	2161.922
4	511751.109	786631.889	2164.890
5	511749.724	786634.662	2163.422
6	511749.052	786636.003	2161.922
7	511752.847	786631.257	2164.890
8	511758.434	786639.028	2159.395
9	511760.446	786640.036	2157.895
10	511759.774	786641.377	2156.395

NW CORNER			
Pt. No.	NORTHING	EASTING	ELEVATION
1	511787.055	786626.020	2164.150
2	511788.834	786622.469	2162.164
3	511789.507	786621.128	2160.664
4	511786.450	786624.532	2164.150
5	511786.156	786621.127	2162.164
6	511786.828	786619.786	2160.664
7	511782.583	786625.096	2164.150
8	511778.289	786617.183	2159.045
9	511776.399	786616.226	2157.545
10	511777.073	786614.896	2156.045

NE CORNER			
Pt. No.	NORTHING	EASTING	ELEVATION
1	511777.542	786645.001	2164.150
2	511776.482	786647.115	2162.968
3	511775.808	786648.458	2161.468
4	511774.790	786643.804	2164.150
5	511773.731	786645.919	2162.968
6	511773.095	786647.278	2161.468
7	511774.125	786641.971	2164.150
8	511765.863	786641.976	2159.395
9	511763.867	786640.964	2157.895
10	511763.185	786642.311	2156.395

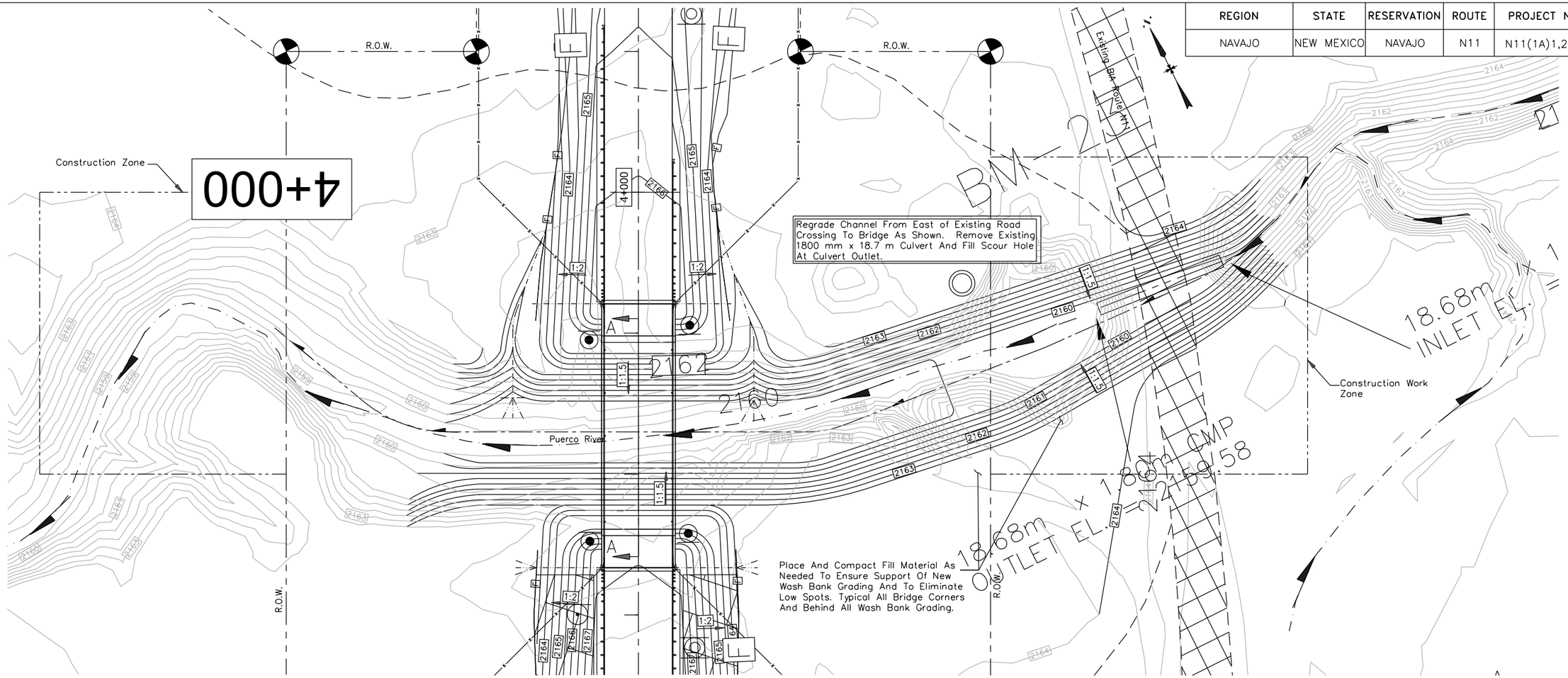


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NAVAJO REGION OFFICE * DIVISION OF TRANSPORTATION

ABUTMENT RIPRAP PLAN AND DETAILS

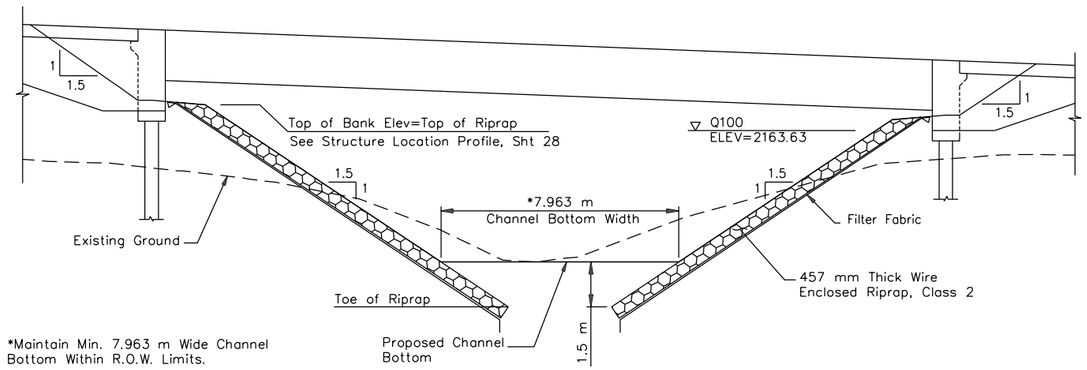
Designed by: WHPacific	**Date:** 5/10
Drawn by: WHPacific	**Date:** 5/10
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)–Bridge Grading sht 32	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	33	82



CHANNEL GRADING PLAN

SCALE = 1:300



SECTION A-A

NTS

NOTE:
All Channel Excavation, Embankment, Grading And Shaping Shall Be As Per FP-14, Section 204, And Included In Bid Item 20401-0000.

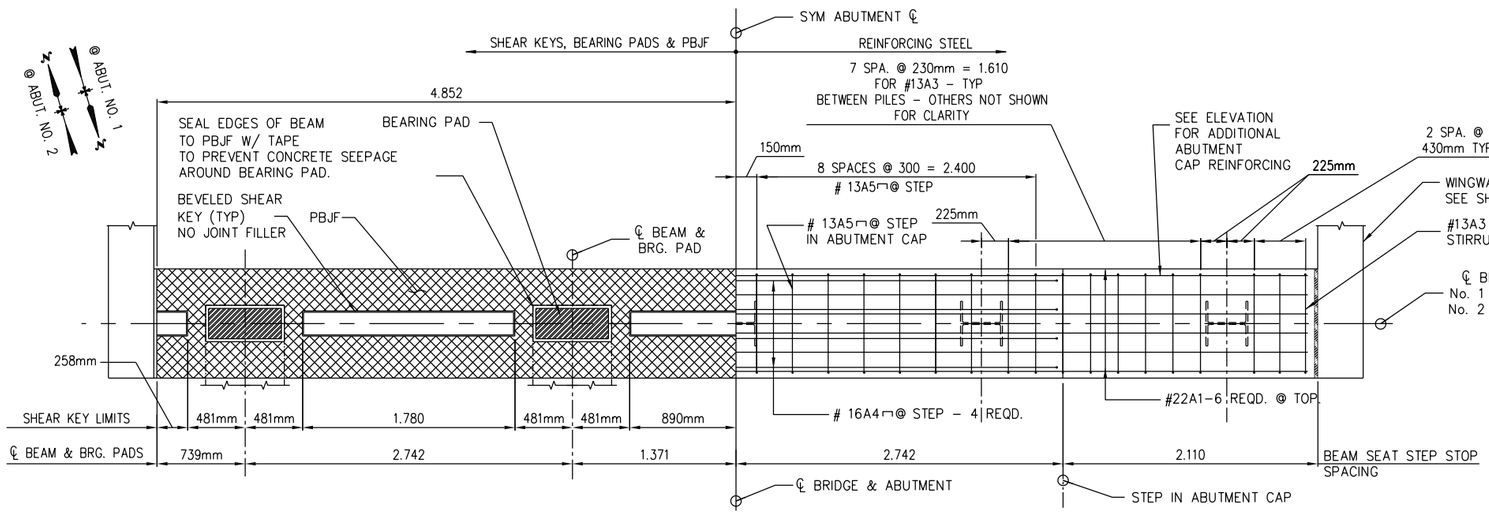
DEREK D. MEIER
NEW MEXICO
14504
REGISTERED PROFESSIONAL ENGINEER
4/14/20

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NAVAJO REGION OFFICE * DIVISION OF TRANSPORTATION

CHANNEL GRADING PLAN

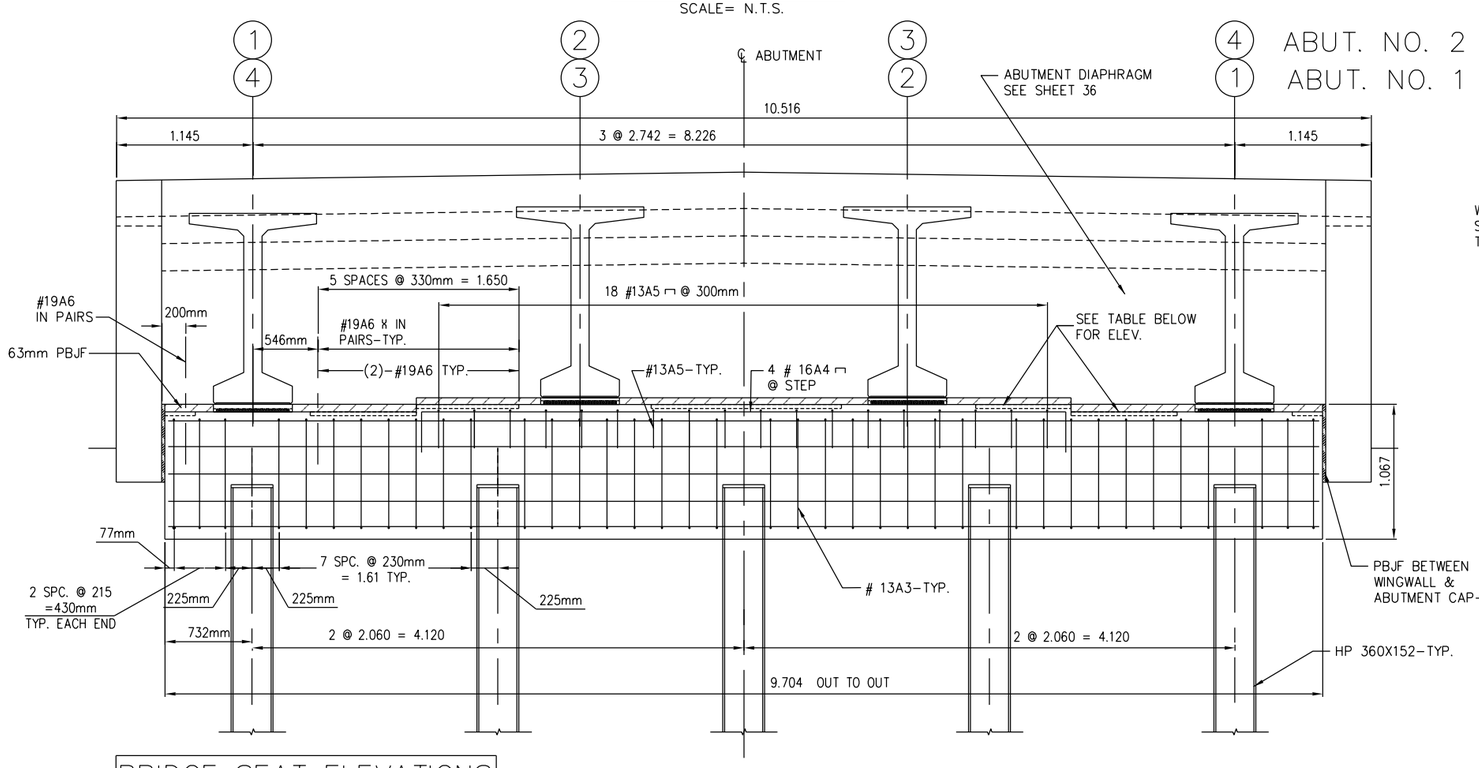
Designed by: WHPacific	**Date:** 5/10		
Drawn by: WHPacific	**Date:** 5/10		
Revised by: WHPacific	**Date:** 9/11		
File Name: N11(1A)-Bridge Grading sht 33			

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	34	82



ABUTMENT PLAN

SCALE= N.T.S.



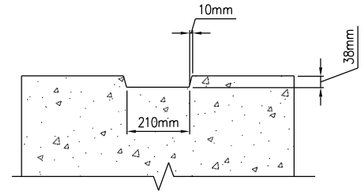
BRIDGE SEAT ELEVATIONS		
	BEAMS 1&4	BEAMS 2&3
ABUT. NO. 1	2165.310	2165.365
ABUT. NO. 2	2164.564	2164.619

ABUTMENT ELEVATION

SCALE= N.T.S.

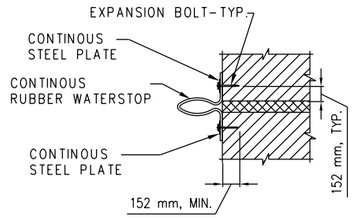
NOTE:

1. TOP OF ABUTMENT CAP TO BE LEVEL WITH SMOOTH TROWELED FINISH.



SHEAR KEY DETAIL

SCALE: N.T.S.



CONTINUOUS RUBBER WATERSTOP SHALL BE 457mm WIDE x 10mm THICK AND LONG ENOUGH TO PROVIDE A CONTINUOUS SEAL ACROSS THE ABUTMENT, AND SHALL CONFORM TO THE SUPPLEMENTAL SPECIFICATION 712.06.

THE RUBBER WATERSTOP SHALL BE SECURED WITH CONTINUOUS STEEL PLATES 102mm WIDE x 10mm THICK CONFORMING TO AASHTO M270M, GRADE 250 AT TOP AND BOTTOM (2 ea) AS SHOWN.

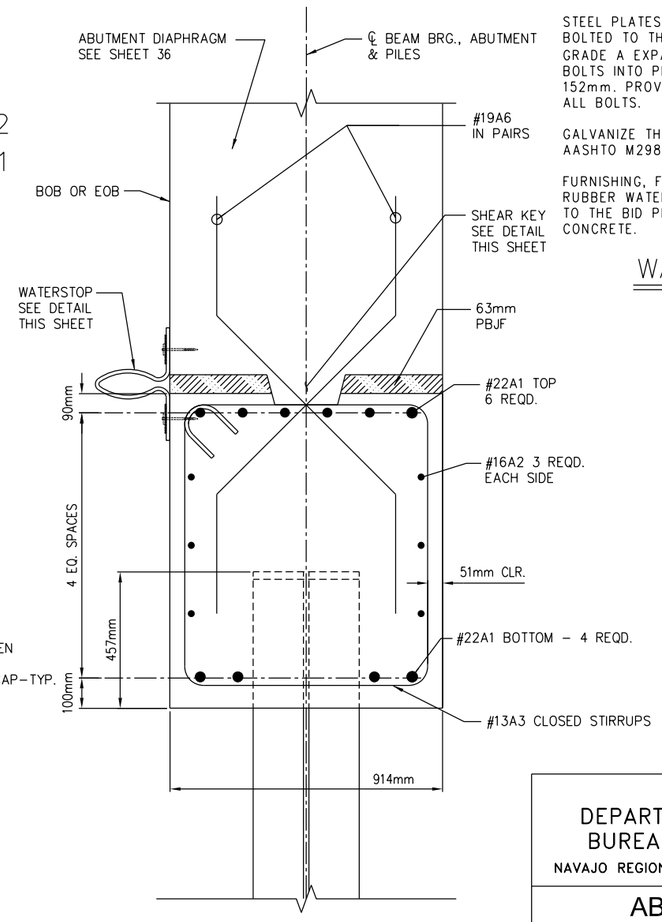
STEEL PLATES SECURING RUBBER WATERSTOP SHALL BE BOLTED TO THE CONCRETE WITH 13mm DIA., ASTM A307, GRADE A EXPANSION BOLTS AT 395mm c/c. EMBED THE BOLTS INTO PREDRILLED HOLES OF A MINIMUM DEPTH OF 152mm. PROVIDE STANDARD GALVANIZED WASHERS FOR ALL BOLTS.

GALVANIZE THE STEEL PLATES AND BOLTS ACCORDING TO AASHTO M298, CLASS 50 OR AASHTO M232.

FURNISHING, FABRICATING AND INSTALLATION OF THE RUBBER WATERSTOPS SHALL BE CONSIDERED INCIDENTAL TO THE BID PRICE FOR ITEM 55201–0200, STRUCTURAL CONCRETE.

WATERSTOP DETAIL

NTS



ABUTMENT SECTION

SCALE=N.T.S.

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4/14/2020

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BUREAU OF INDIAN AFFAIRS
NAVAJO REGION OFFICE * DIVISION OF TRANSPORTATION

ABUTMENT DETAILS

Designed by: MAZ	**Date:** 5/10
Drawn by: PAG	**Date:** 5/10
Revised by: WHPacific	**Date:** 9/10
File Name: N11(1A)–Abutment Details snt 34	

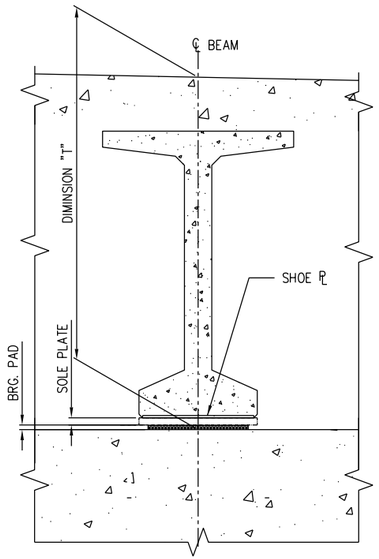
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	35	82

ELASTOMERIC BEARING PAD SCHEDULE
60 DUROMETER

LOCATION	DIMENSIONS			NUMBER OF SHIMS	INNER LAMINATION		OUTTER LAMINATION		DESIGN LOAD EACH PAD	NUMBER REQUIRED
	W	L	H		NUMBER	THICK	NUMBER	THICK		
ABUT No. 1 & 2	610 mm	254 mm	25 mm	2	1	9.52 mm	2	4.76 mm	DL= 672 kN LL= 343 kN	8

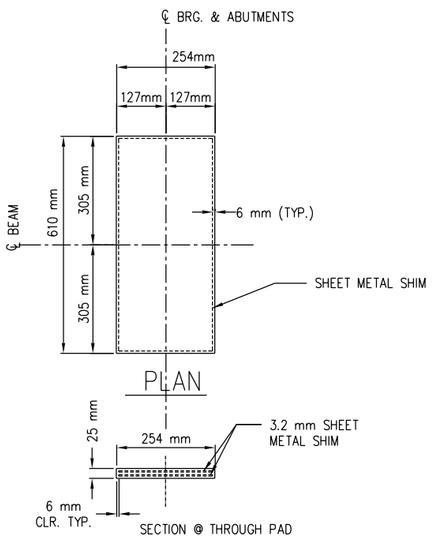
TABLE OF DIMENSION "T" @ ℄ BEAM BEARING

	ABUTMENT No. 1 & 2
SLAB	229 mm
HAUNCH THICKNESS AT CL BM	125 mm
BEAM	1.600
SOLE PLATE	38 mm
BEARING PAD COMPRESSED	25 mm
DIMENSION "T"	2.017



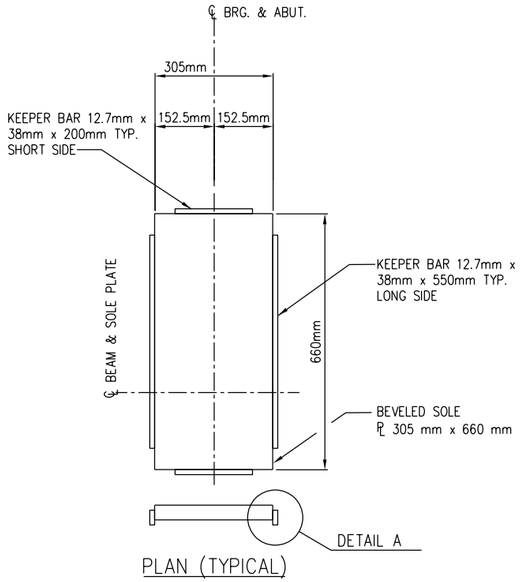
TYPICAL BEAM BEARING DETAIL AT ABUTMENTS

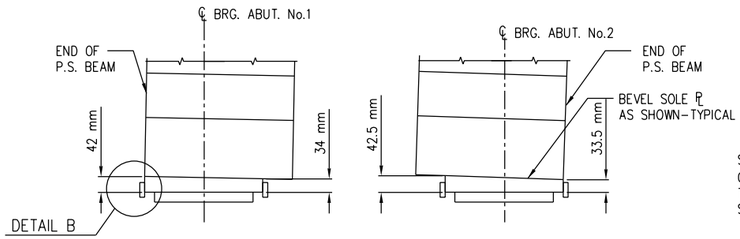
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ELASTOMERIC BEARING PAD DETAILS

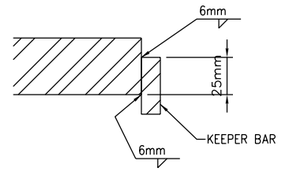
NTS



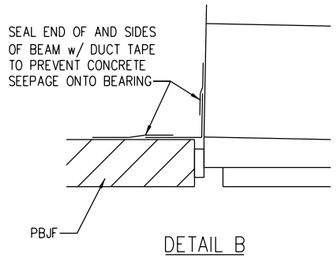


SOLE PLATE DETAILS

NTS



DETAIL A



DETAIL B

NOTES:

1: THE PLATE THICKNESS IS THE FINISHED THICKNESS.

2: IF MACHINING PROCESSES ARE USED TO ACHIEVE THE REQUIRED FLATNESS TOLERANCES OF THE SOLE PLATES, THE DIRECTION OF MACHINING ON THE SURFACE TO BE IN CONTACT WITH THE ELASTOMERIC PAD SHALL BE PERPENDICULAR TO THE LONGITUDINAL AXIS OF THE BEAM.

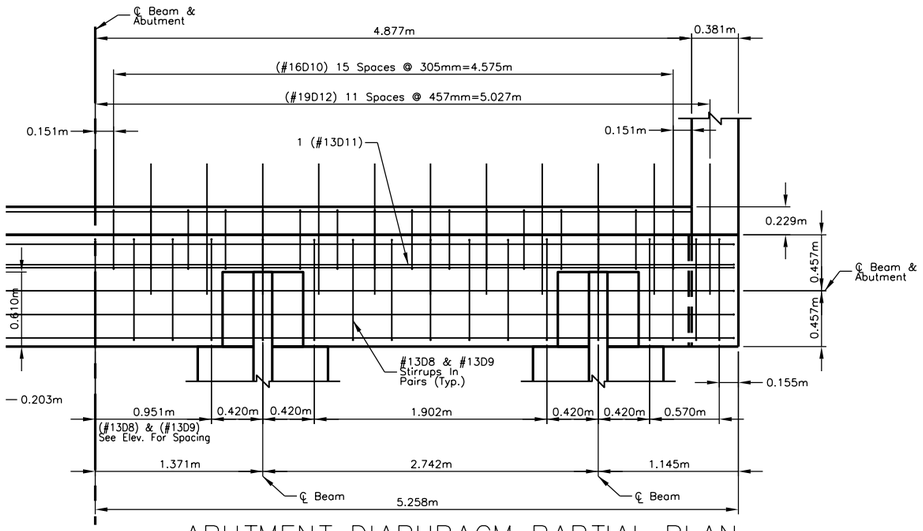
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NAVAJO REGION OFFICE * DIVISION OF TRANSPORTATION

BEAM SEAT AND BEARING PAD DETAILS

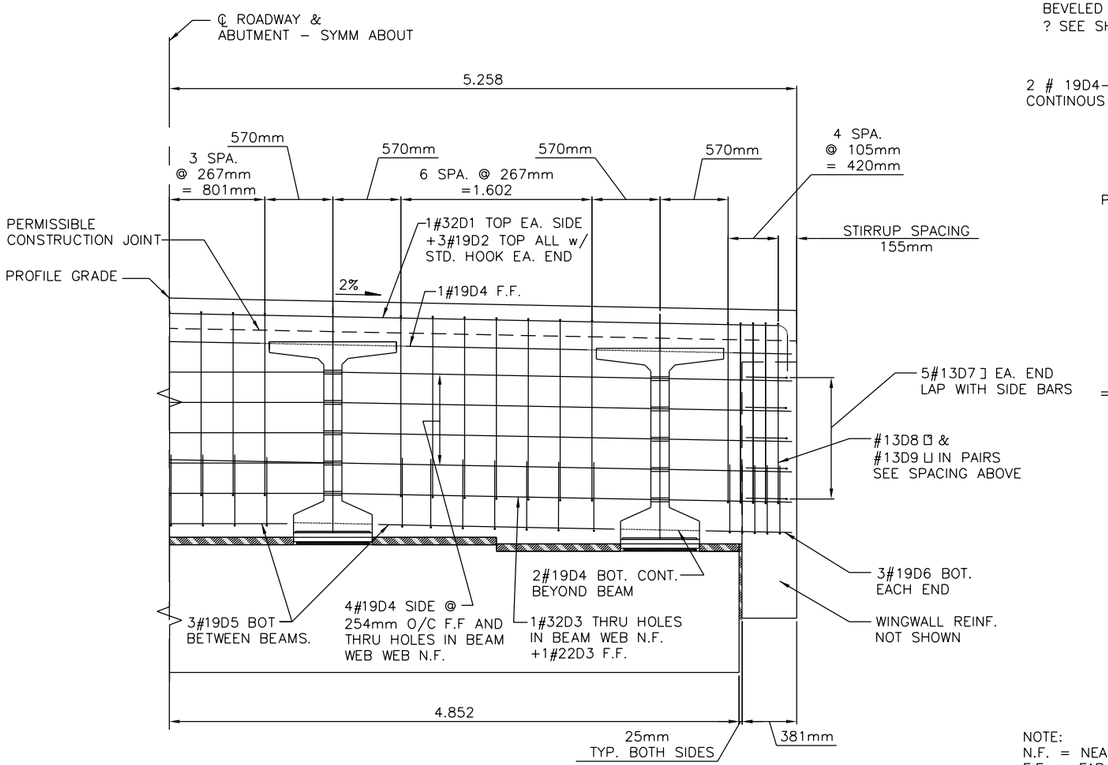
Designed by: MAZ	Date: 5/10
Drawn by: PAG	Date: 5/10
Revised by: WHPacific	Date: 9/11
File Name: N11(1A)-Beam Seat and Bearing Details sht 35	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	36	82



ABUTMENT DIAPHRAGM PARTIAL PLAN

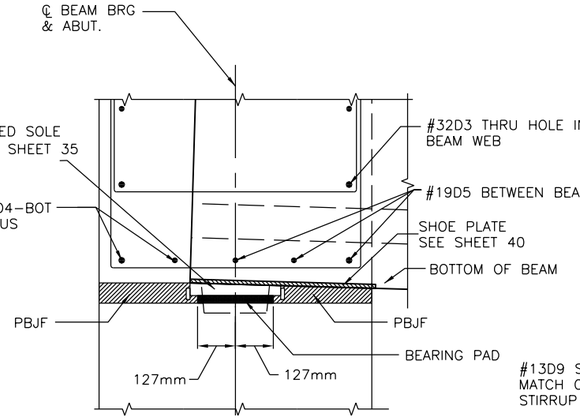
SCALE= N.T.S.



ABUTMENT DIAPHRAGM PARTIAL ELEVATION

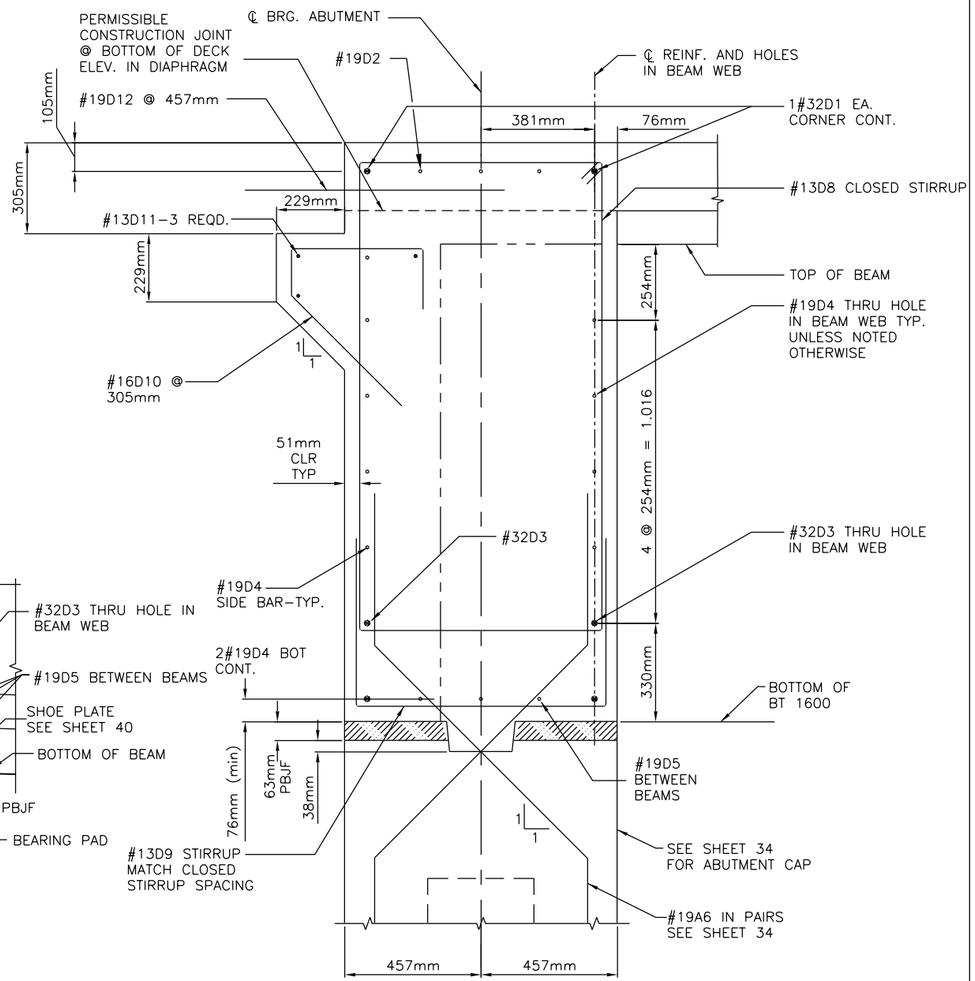
SCALE= N.T.S.

NOTE:
N.F. = NEAR FACE
F.F. = FAR FACE



PARTIAL SECTION @ BEAM BEARING.

SCALE= N.T.S.



SECTION THRU DIAPHRAGM

SCALE= N.T.S.

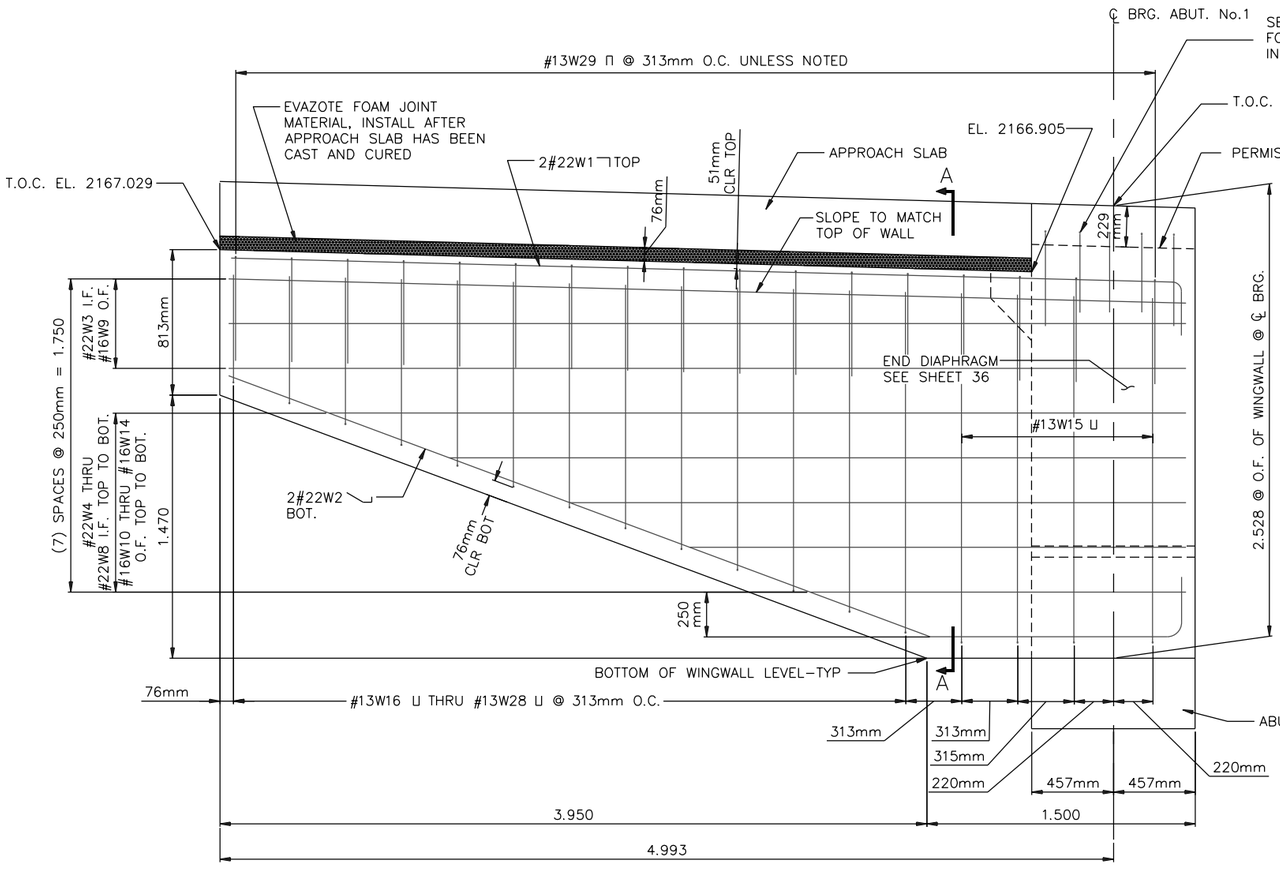
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ABUTMENT DIAPHRAGM DETAILS

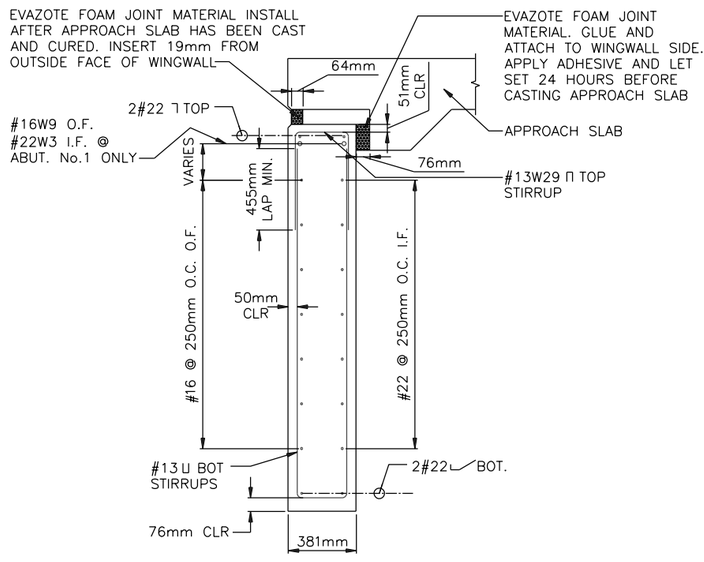
Designed by: MAZ	Date: 5/10
Drawn by: PAG	Date: 5/10
Revised by: HRILEY	Date: 12/10/17
File Name: Abutment Diaphragm Details sht 36	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	37	82



WINGWALL ELEVATION

SCALE=N.T.S.



SECTION A–A

SCALE= N.T.S.

WINGWALL ELEVATION

SCALE=N.T.S.

NOTE: EVAZOTE FLEX–FOAM JOINT MATERIAL SHALL CONFORM TO SECTION 570 SUPPLEMENTAL SPECIFICATIONS AND INSTALLED TO THE MANUFACTURERS RECOMMENDATIONS.

NOTES:

1. WINGWALLS SHOWN ARE AT THE RIGHT SIDE OF BRIDGE.
2. WINGWALLS @ LEFT SIDE ARE SYMMETRICAL TO ELEVATIONS SHOWN ABOUT THE ℄ OF ROADWAY.
3. DIMENSIONS SHOWN ARE AT THE OUTSIDE FACE OF WINGWALL UNLESS NOTED OTHERWISE.

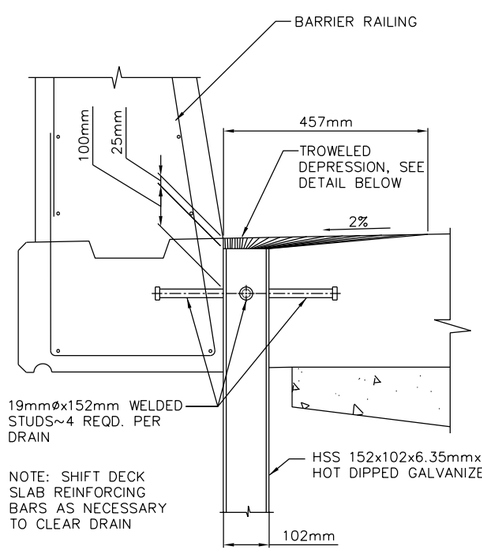
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WINGWALL DETAILS

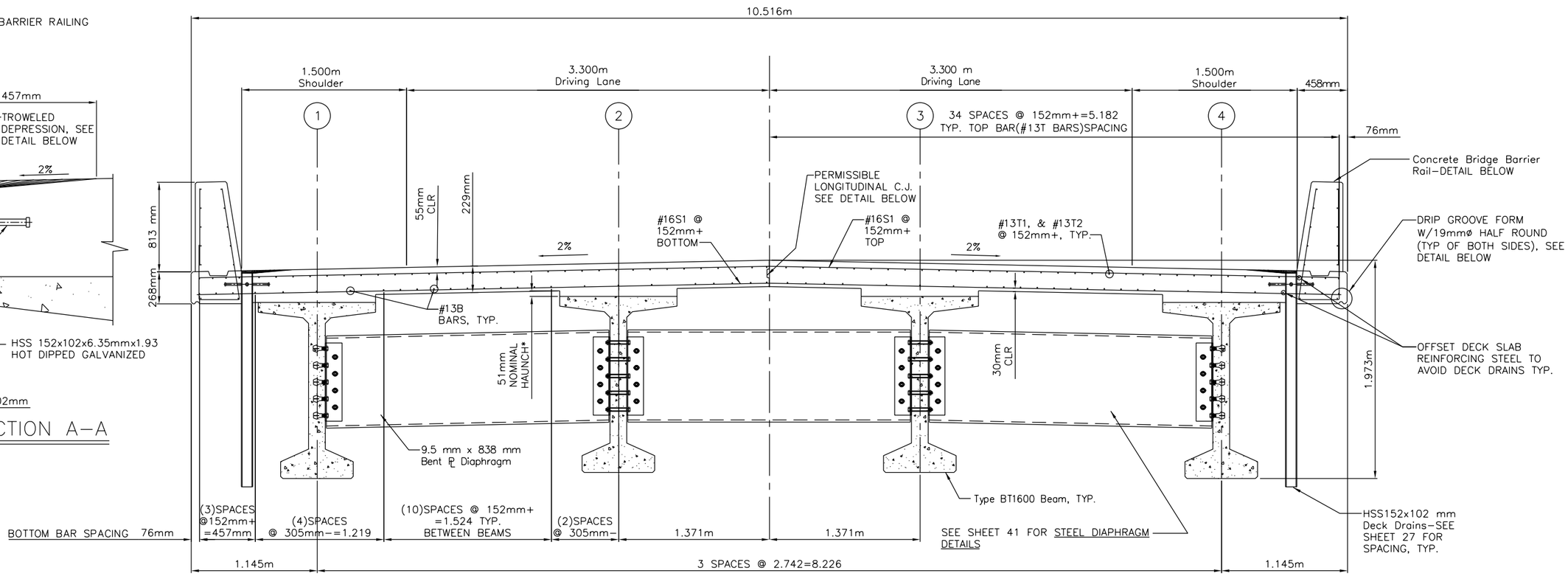
Designed by: MAZ	**Date:** 5/10
Drawn by: PAG	**Date:** 5/10
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)–Wingwall Details SHT	37

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	38	82



DECK DRAIN SECTION A–A

SCALE: NTS

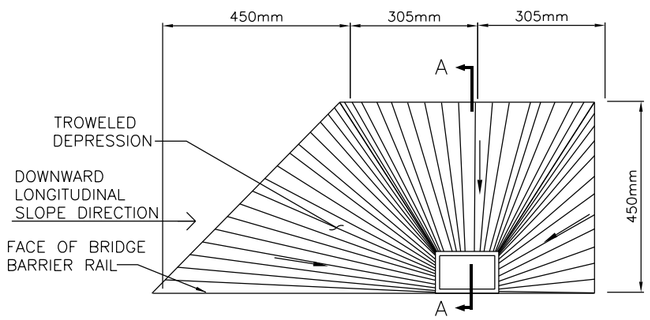


*ACTUAL HAUNCH TO BE BASED ON BEAM CAMBER.

SECTION AT INTERMEDIATE DIAPHRAGMS

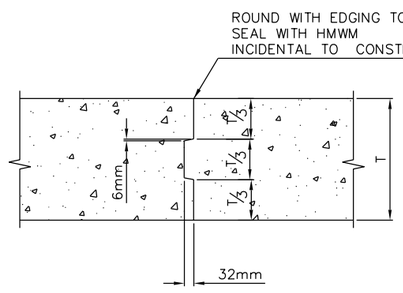
TYPICAL TRANSVERSE SECTION

NORMAL TO ROADWAY CENTERLINE
SCALE=NTS



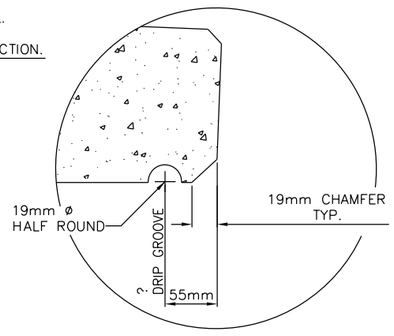
DECK DRAIN DETAIL

N.T.S.



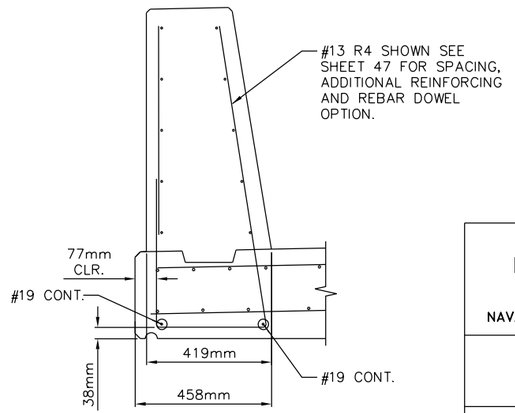
PERMISSIBLE LONGITUDINAL CONSTRUCTION JOINT

SCALE= NTS T = DECK THICKNESS



DRIP GROOVE DETAIL

SCALE: NTS



BRIDGE BARRIER RAILING DETAIL

SCALE: NTS

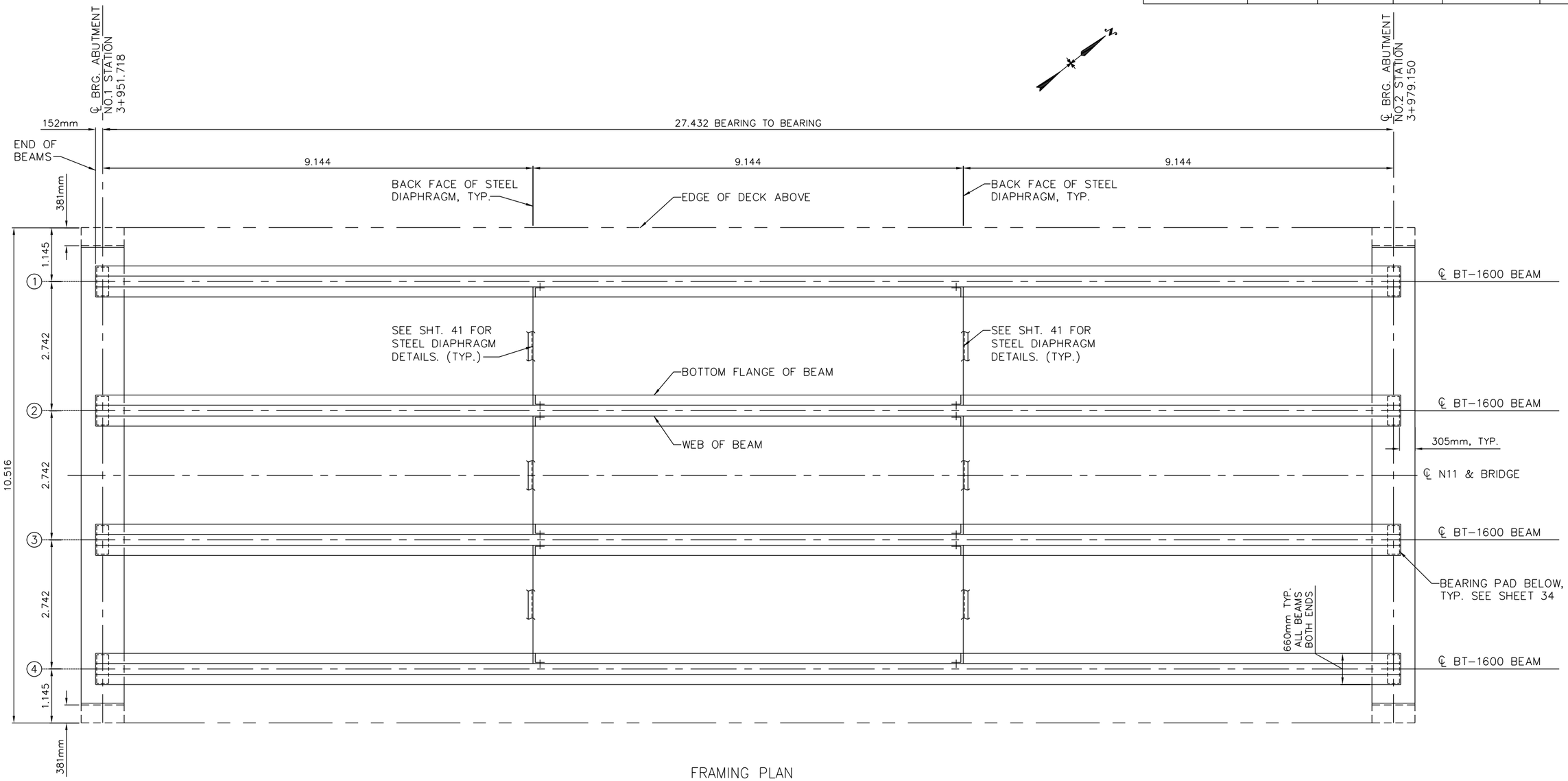
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TYPICAL TRANSVERSE SECTION

Designed by: MAZ	**Date:** 5/10
Drawn by: PAG	**Date:** 5/10
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)–Bridge Typical Section sht	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	39	82



FRAMING PLAN

N.T.S.

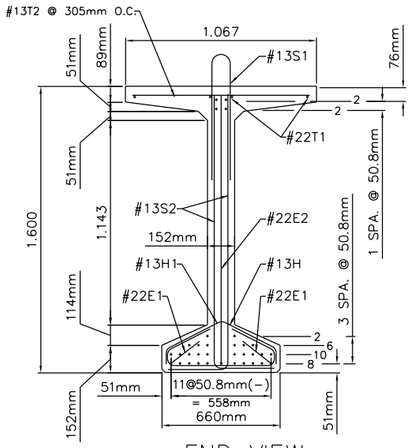
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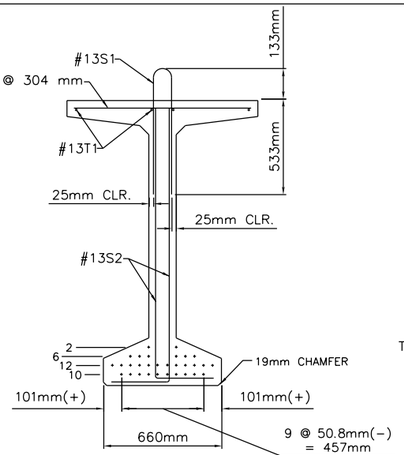
FRAMING PLAN

Designed by: MAZ	**Date:** 5/10
Drawn by: PAG	**Date:** 5/10
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)-FramingPlan sht 39	

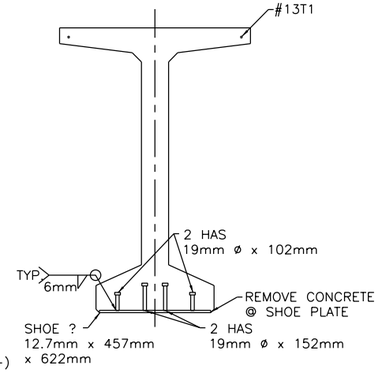
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	40	82



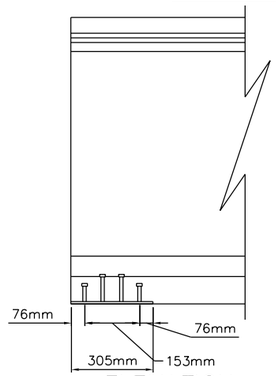
END VIEW



SECTION NEAR ℄ OF BEAM

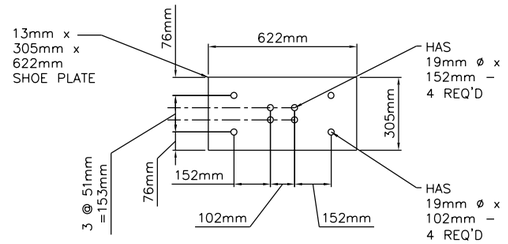


END VIEW



ELEVATION

HAS: ASTM A-108 STEEL GRADE 1010 THRU 1020.

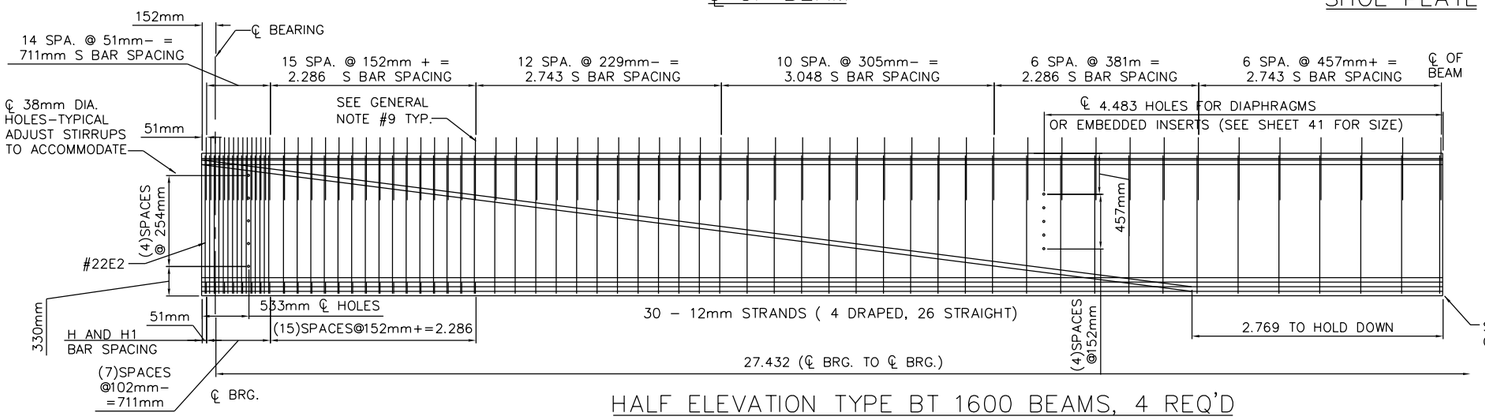


SHOE ℄ DETAIL

WEIGHT	CAMBER @ RELEASE	CAMBER @ ERECTION	DEAD LOAD* DEFLECTION
301 KN	47mm	84mm	24mm PER BEAM

*SEE CAMBER DIAGRAM ON SHEET 43.

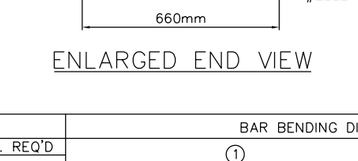
SHOE PLATE



HALF ELEVATION TYPE BT 1600 BEAMS, 4 REQ'D

(fpe =113.3 KN. PER STRAND; LOSSES = 24.5 KN. PER STRAND)

BEAM DATA

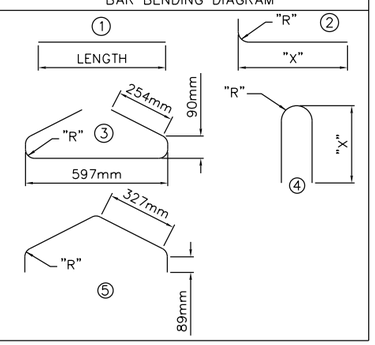


ENLARGED END VIEW

BARS REQUIRED FOR ONE BEAM						
BAR	TYPE	SIZE	"R"	"X"	LENGTH	NO. REQ'D
E1	2	#22	79mm	2.438	2.642	4
E2	2	#22	79mm	1.499	3.937	2
S1*	4	#13	44mm	686mm	1.524	127
S2	2	#13	38mm	1.499	1.803	254
H	3	#13	38mm		1.245	46
H1	5	#13	38mm		813mm	46
T1	1	#22			14.097	8
T2	1	#13			991mm	92

*EPOXY COATED

BAR BENDING DIAGRAM



GENERAL NOTES

1. COST OF REINFORCING BARS AND STRUCTURAL STEEL EMBEDDED IN BRIDGE BEAMS IS TO BE INCLUDED IN THE UNIT PRICE BID FOR PRECAST PRESTRESSED CONCRETE BRIDGE MEMBER TYPE BT–1600, BID ITEM NUMBER 55301–1900.
2. BEAMS TO BE LIFTED BY MEANS OF DEVICES DESIGNED BY THE FABRICATOR. BEAMS TO BE CAST, STORED, AND HAULED IN UPRIGHT POSITION. LIFTING DEVICE CALCULATIONS AND DETAILS MUST BE APPROVED BY THE AO/CO PRIOR TO USE.
3. THE TOP SURFACES OF THE BEAMS ARE TO BE THOROUGHLY WIRE BRUSHED AND SCORED TRANSVERSELY AFTER INITIAL SET (MIN. DEPTH = 6mm ACROSS ENTIRE FLANGE WIDTH). APPEARANCE OF TOP OF BEAM FINISH SHALL BE AGREED UPON PRIOR TO FABRICATION.
4. THE CAMBER AT ERECTION DIMENSION LISTED IS THE CALCULATED VALUE DUE TO THE EFFECT OF PRESTRESSING WITH THE WEIGHT OF THE BEAM ACTING, WITH AN ALLOWANCE FOR CAMBER GROWTH TO 90 DAYS. THE CONTRACTOR SHALL LIMIT THE CAMBER GROWTH TO A VALUE NOT TO EXCEED THE PREDICTED CAMBER AT ERECTION DIMENSION BY 25mm AT THE TIME OF DECK SLAB PLACEMENT. CAMBER GROWTH IS TO BE LIMITED BY WEIGHTING, FABRICATION SCHEDULING OR OTHER APPROVED MEANS.
5. DEAD LOAD DEFLECTION IS THE COMPUTED DEFLECTION DUE TO WEIGHT OF SLAB, DIAPHRAGMS, AND SUPERIMPOSED DEAD LOAD.
6. THE DESIGN SHOWN IS BASED ON THE USE OF 15.2mm DIAMETER LOW–RELAXATION STRANDS MEETING THE REQUIREMENTS OF AASHTO M–203 (GRADE 1860). INITIAL PRESTRESSING FORCE SHALL BE 164.9 KN PER STRAND. SLIGHT OVERSTRESSING UP TO 175.7 KN PER STRAND WILL BE ALLOWED TO OFFSET SEATING LOSSES.
7. TYPE III CEMENT MAY BE USED AT THE FABRICATOR'S OPTION.
8. SHOE PLATES MUST BE STRAIGHTENED AND SECURED IN AN ACCEPTABLE MANNER PRIOR TO CASTING INTO BEAM.
9. REINFORCING BARS PROJECTING FROM THE TOP OF THE GIRDER SHALL BE EPOXY COATED OR UNCOATED CORROSIVE RESISTANT STEEL.
10. THE LENGTH OF BEAMS SHOWN IS THE HORIZONTAL DISTANCE BASED ON PROJECT STATIONING. PRECASTER SHALL ACCOUNT FOR SLOPE OF BEAMS AND SHORTENING DUE TO PRETENSIONING TO DETERMINE THE ACTUAL FABRICATION LENGTH REQUIRED.

DESIGN DATA

DESIGN ACCORDING TO AASHTO LRFD SPECIFICATIONS DATED 2016 AND CURRENT INTERIMS.

BEAMS:
f'ci (MIN. COMPRESSIVE STRENGTH OF CONCRETE AT TIME OF INITIAL PRESTRESS)=48.2 MPa.
f'c = 65.5 MPa (ULTIMATE COMPRESSIVE STRENGTH)

PRESTRESSING STEEL:
15.2mm DIAMETER SEVEN WIRE LOW RELAXATION STRANDS.
fpu = 265.9 MPa PER STRAND
fpy = 153.2 MPa PER STRAND
CONVENTIONAL REINFORCING BARS:
fy = 414 MPa

COMPOSITE SLAB:
f'c = 27.6 MPa
ALLOWANCE FOR FUTURE WEARING SURFACE = 1.4 KPa
LIVE LOAD = HL–93
STAY–IN–PLACE DECK FORM = 0.7 KPa.

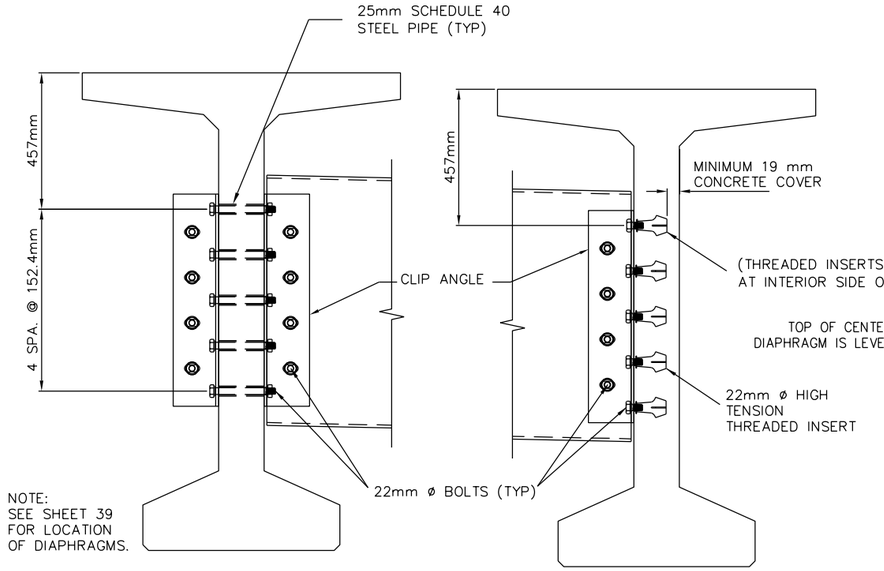


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NAVAJO REGION OFFICE * DIVISION OF TRANSPORTATION

PRESTRESSED CONCRETE BEAM DETAILS

Designed by: MAZ	Date: 5/10
Drawn by: PAG	Date: 5/10
Revised by: WHPacific	Date: 9/11
File Name: N11(1A)–Concrete Bridge Member	sht

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	41	82

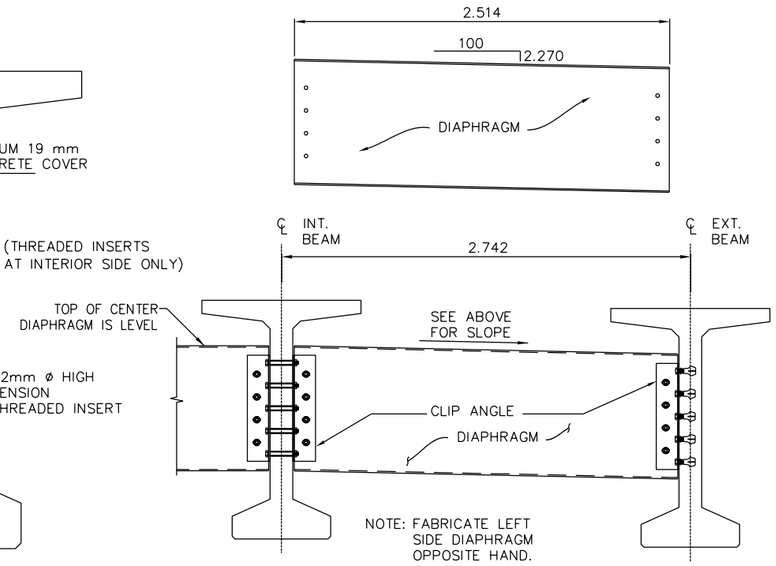


INTERIOR BEAM CONNECTION DETAIL

SCALE: 1:10

EXTERIOR BEAM CONNECTION DETAIL

SCALE: 1:10

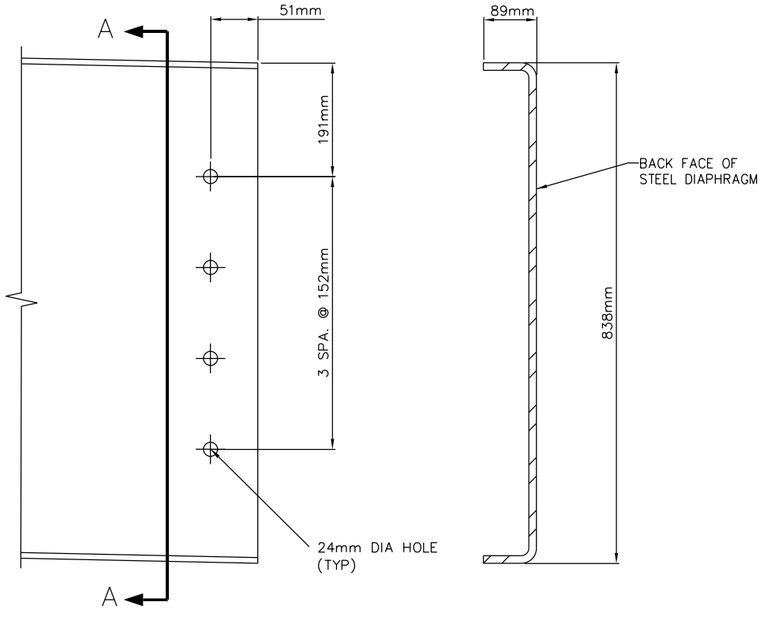


RIGHT SIDE BENT PLATE DIAPHRAGM

SCALE: 1:20

GENERAL NOTES

1. ALL STRUCTURAL STEEL ELEMENTS IN THIS DETAIL SHALL BE COMPOSED OF HOT-DIPPED GALVANIZED STEEL CONFORMING TO AASHTO M 270M, GRADE 250.
2. BOLTS SHALL MEET THE REQUIREMENTS OF AASHTO M 164M. BOLTS SHALL BE GALVANIZED AS PER AASHTO M 298.
3. THE VERTICAL DISTANCE BETWEEN ANY TWO HOLES OR INSERTS SHALL NOT VARY FROM THE SPECIFIED DISTANCE BY MORE THAN 2mm. ALSO, THE TOTAL LENGTH OF THE GROUP OF HOLES OR INSERTS SHALL NOT VARY FROM THE DESIGN LENGTH BY MORE THAN 2mm. THE PRESTRESSED BEAM FABRICATOR SHALL TAKE APPROPRIATE MEASURES TO ENSURE PROPER PLACEMENT OF INSERTS DURING THE BEAM FABRICATION PROCESS.
4. CLIP ANGLES SHALL BE ATTACHED TO THE PRESTRESSED BEAM AT THE BEAM FABRICATION SITE PRIOR TO TRANSPORT.
5. BENT PLATE DIAPHRAGMS AND CLIP ANGLES SHALL BE PAID FOR UNDER ITEM 55502-0000 STRUCTURAL STEEL. BOLTS, NUTS, AND WASHERS ARE INCIDENTAL TO ITEM 55502-0000 STRUCTURAL STEEL. THREADED INSERTS AND PIPE INSERTS ARE INCIDENTAL TO THE PRESTRESSED CONCRETE BEAMS.
6. AT LOCATION WHERE STEEL IS FASTENED TO CONCRETE, THE MAXIMUM INSTALLATION TENSION SHALL NOT EXCEED 44.5 kN (10 KIPS). TEST SHALL BE PERFORMED TO DETERMINE THE TORQUE NECESSARY TO ACHIEVE THE 44.5kN (10 KIPS) INSTALLATION TENSION.
7. BOLTED CONNECTION FOR STEEL TO STEEL SHALL BE IN ACCORDANCE WITH FP-14 SECTION 555.16.
8. SHOP DRAWINGS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL PRIOR TO FABRICATION. MATERIAL CERTIFICATION SHALL BE SUBMITTED FOR REVIEW AND APPROVAL FOR ALL MATERIALS.

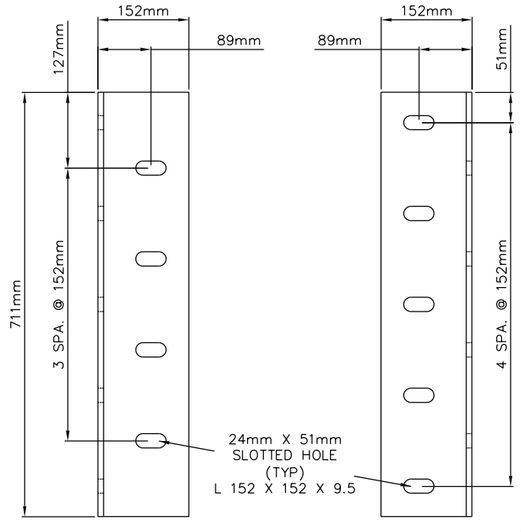


DIAPHRAGM END DETAIL

SECTION "A-A"

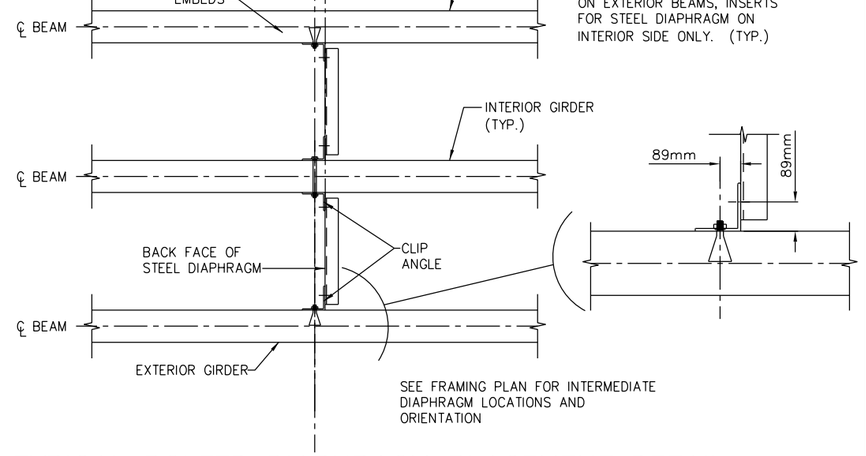
9.5mm BENT PLATE DIAPHRAGM

SCALE: 1:5



BOLTED DIAPHRAGM CLIP ANGLE DETAILS

SCALE: 1:5



TYPICAL BOLTED DIAPHRAGM PLACEMENT DETAIL

SCALE: N.T.S.

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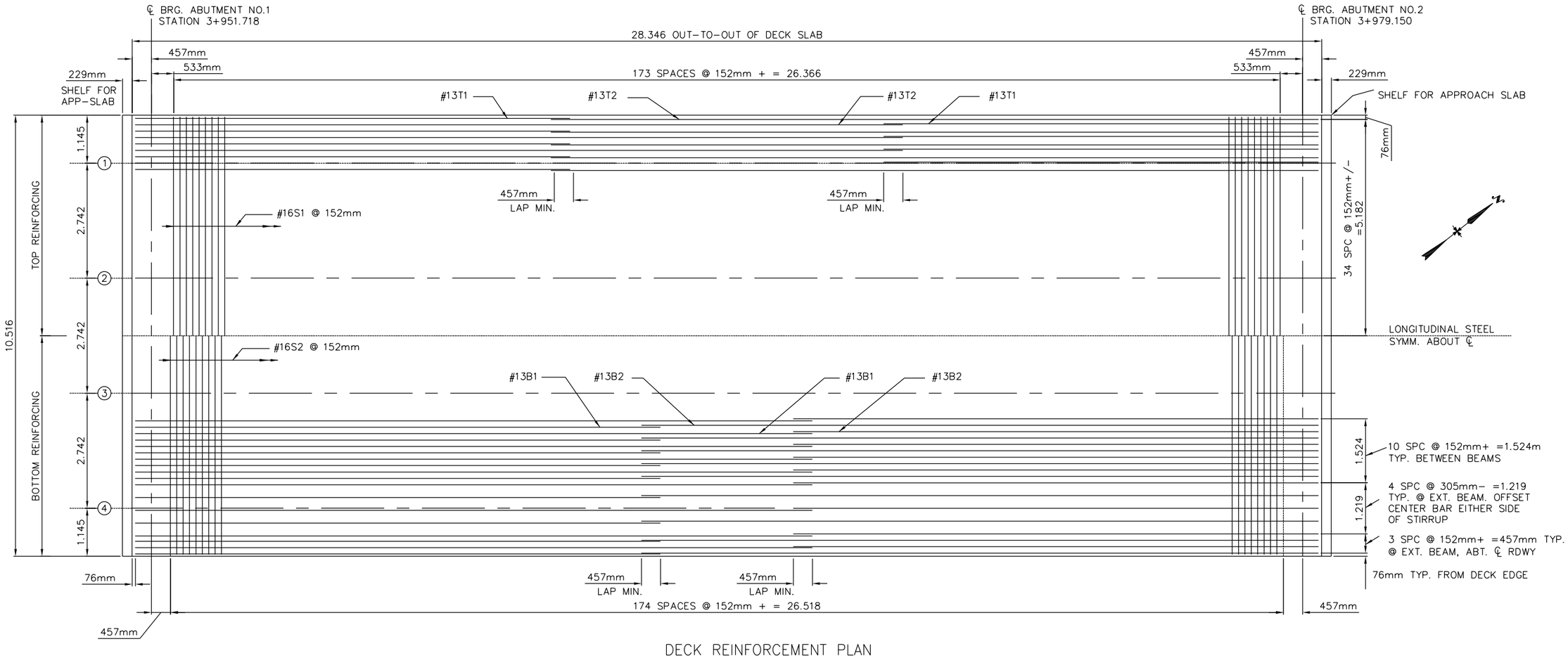
BEAM TYPE	DIAPHRAGM UNIT WEIGHT (kg/m)*	CLIP ANGLE WEIGHT (kg)	DIAPHRAGMS REQ'D	LENGTH (m)	CLIP ANGLES REQ'D	TOTAL STEEL (kg)
TYPE-BT-1600	75.9	15.9	6	2.515	12	1336

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STEEL DIAPHRAGM DETAILS

Designed by: MAZ	**Date:** 5/10
Drawn by: PAG	**Date:** 5/10
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)-Steel Diaphragm sht 41	

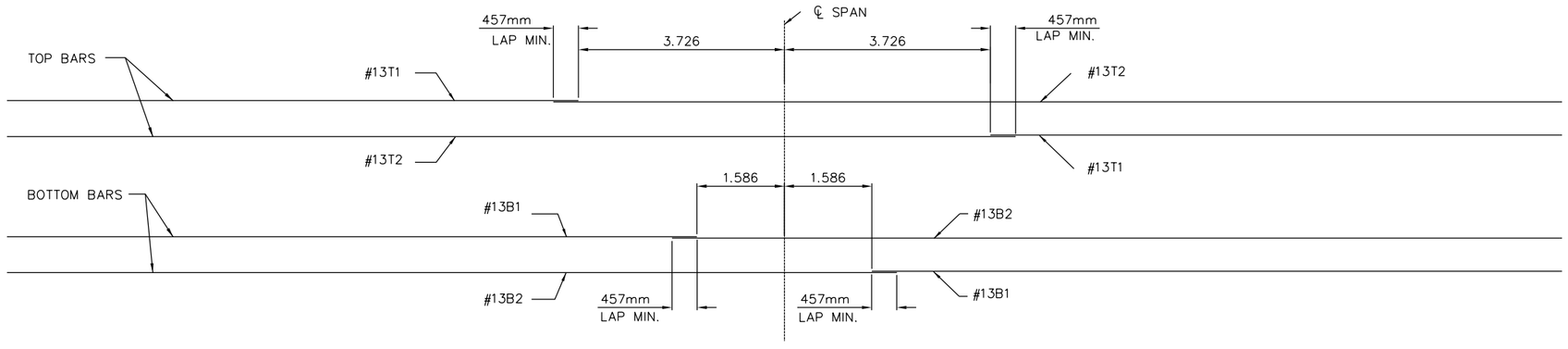
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	42	82



DECK REINFORCEMENT PLAN

SCALE 1:20

NOTE: SEE SHEET 47 FOR BRIDGE BARRIER RAILING REINFORCEMENT (NOT SHOWN)



BAR RUN LAYOUT

SCALE=1:20

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4/14/2020

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DECK REINFORCING PLAN

Designed by: MAZ	**Date:** 5/10
Drawn by: PAG	**Date:** 5/10
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)- Deck Reinforcing Plan sht	

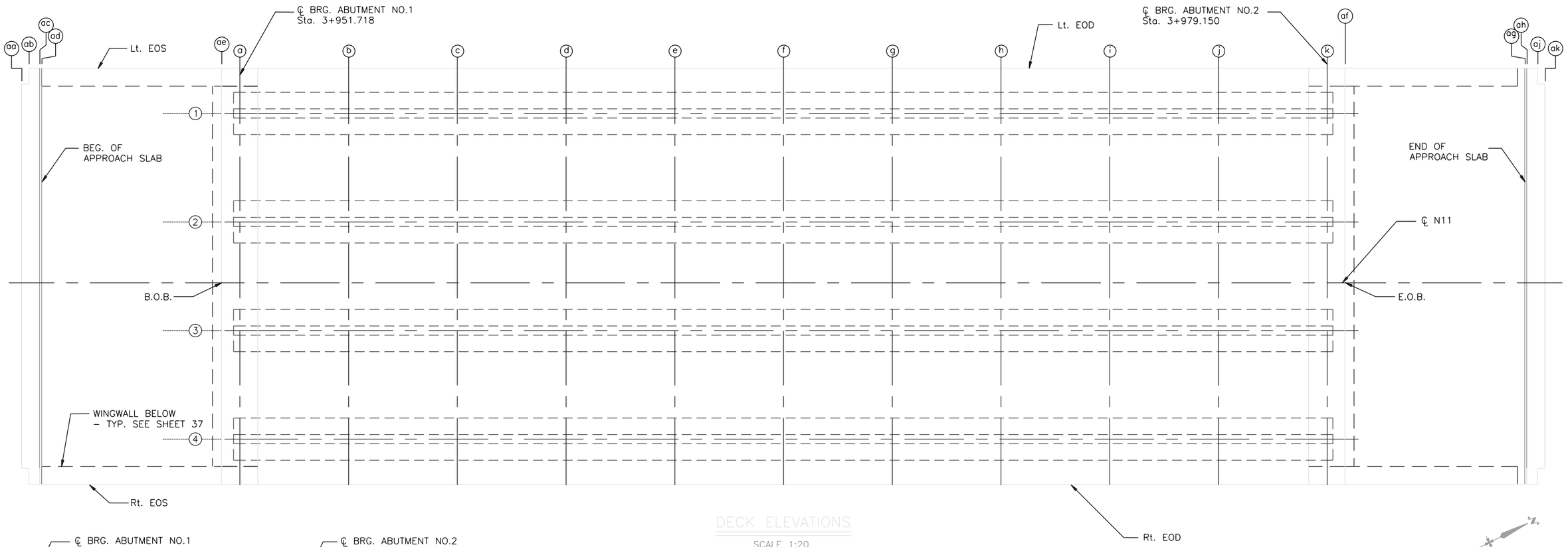
Location	Dist. From CL Rdwy	TOP OF SLAB ELEVATIONS AT 10TH POINTS										
		a	b	c	d	e	f	g	h	i	j	k
Lt EOD	5.258	2167.274	2167.199	2167.125	2167.050	2166.976	2166.901	2166.827	2166.752	2166.678	2166.603	2166.528
Bm 1	4.113	2167.297	2167.222	2167.148	2167.073	2166.999	2166.924	2166.849	2166.775	2166.700	2166.626	2166.551
Bm 2	1.371	2167.352	2167.277	2167.202	2167.128	2167.053	2166.979	2166.904	2166.830	2166.755	2166.681	2166.606
CL N11	0.000	2167.379	2167.304	2167.230	2167.155	2167.081	2167.006	2166.932	2166.857	2166.783	2166.708	2166.634
Bm 3	1.371	2167.352	2167.277	2167.202	2167.128	2167.053	2166.979	2166.904	2166.830	2166.755	2166.681	2166.606
Bm 4	4.113	2167.297	2167.222	2167.148	2167.073	2166.999	2166.924	2166.849	2166.775	2166.700	2166.626	2166.551
Rt EOD	5.258	2167.274	2167.199	2167.125	2167.050	2166.976	2166.901	2166.827	2166.752	2166.678	2166.603	2166.528

LTEOD = LEFT EDGE OF DECK
RTEOD = RIGHT EDGE OF DECK

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	43	82

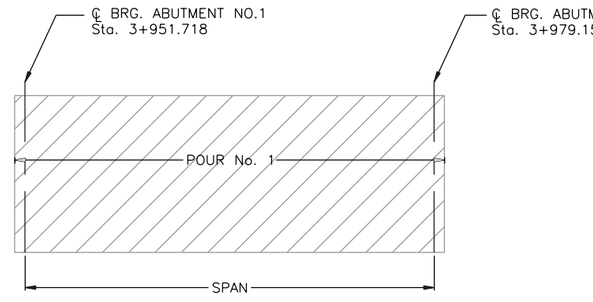
TOP OF APPROACH SLAB ELEVATIONS

		Approach Slab at Abutment No. 1					Approach Slab at Abutment No. 2				
Location	Dist. From CL Rdwy	aa	ab	ac	ad	ae	af	ag	ah	aj	ak
LF EOS	5.258	-	2167.418	2167.411	2167.410	2167.286	2166.516	2166.393	2166.391	2166.384	-
Notch in end dam - LF	4.852	2167.431	2167.426	-	-	-	-	-	-	2166.393	2166.387
CL Rdwy	0.000	2167.528	-	2167.516	2167.515	2167.391	2166.621	2166.498	2166.497	-	2166.484
Notch in end dam - RT	4.852	2167.431	2167.426	-	-	-	-	-	-	2166.393	2166.387
RT EOS	5.258	-	2167.418	2167.411	2167.410	2167.286	2166.516	2166.393	2166.391	2166.384	-



DECK ELEVATIONS

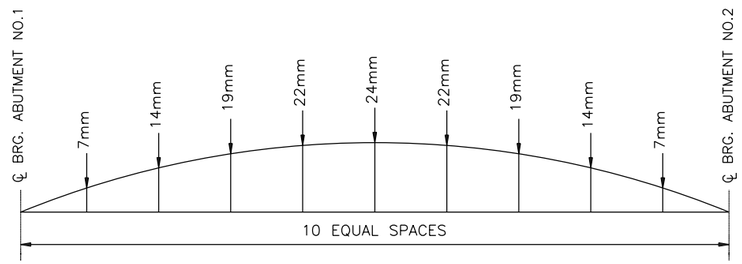
SCALE 1:20



CONCRETE DECK PLACEMENT DETAIL

NOTE:

CONCRETE SHALL BE PLACED THE FULL WIDTH OF THE DECK SLAB AT A FORWARD RATE OF PROGRESS OF NOT LESS THAN 10 METERS PER HOUR. SET RETARDANT SHALL NOT BE USED IF THE ATMOSPHERIC TEMPERATURE AT THE TIME OF PLACEMENT IS LESS THAN 16° C. PLACE CONCRETE FROM ABUT. No.2 TOWARD ABUT. No.1.



DEAD LOAD DEFLECTION DIAGRAM

NTS

NOTE:

TO COMPENSATE FOR DEAD LOAD DEFLECTIONS DUE TO WEIGHT OF SLAB AND SUPERIMPOSED DEAD LOADS, SET SCREEDS ABOVE FINISH GRADES BY DIMENSIONS (mm) SHOWN ABOVE.

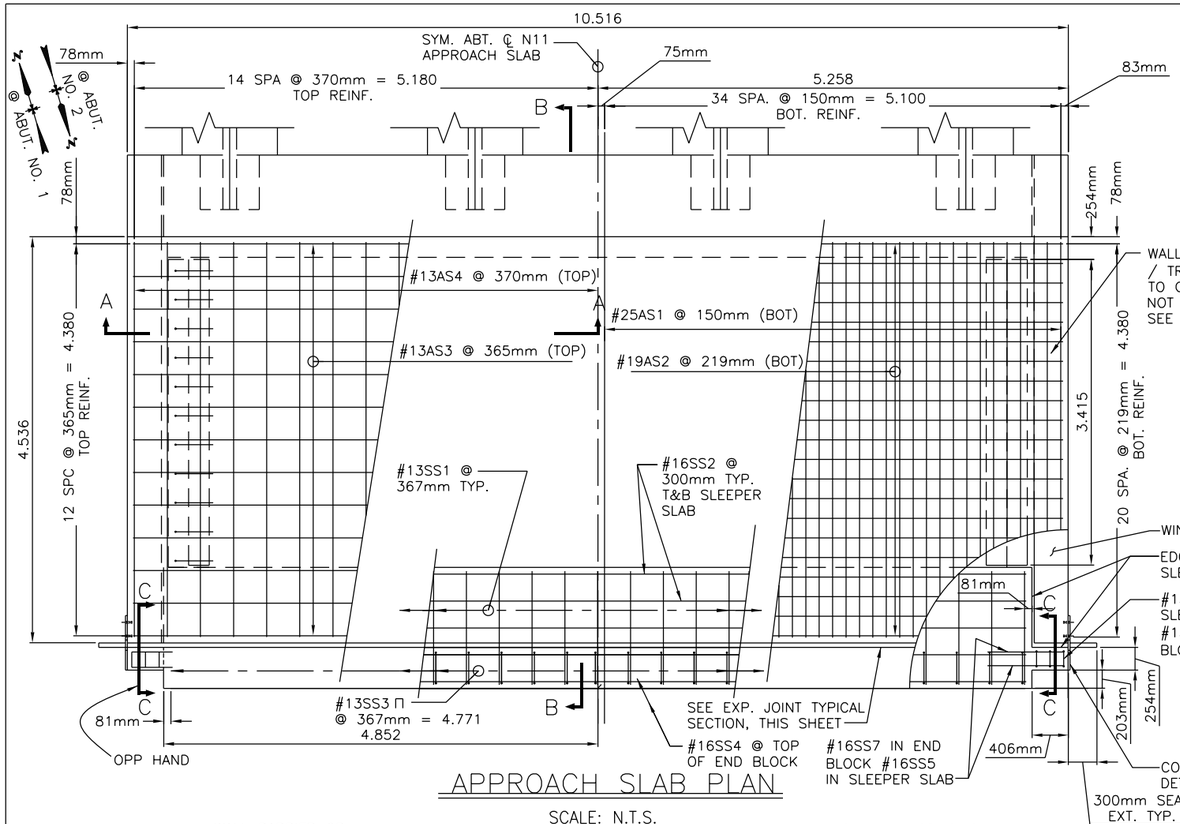


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DECK ELEVATIONS

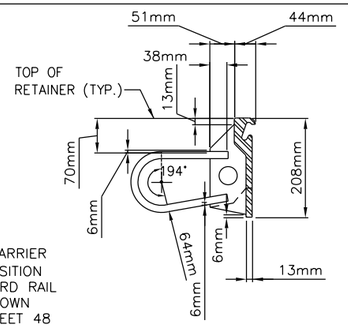
Designed by: MAZ	**Date:** 5/10
Drawn by: PAG	**Date:** 5/10
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)– Deck Elevations sht 43	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	44	82



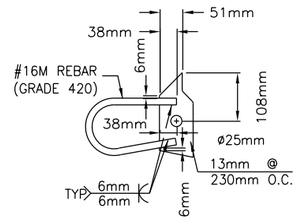
APPROACH SLAB PLAN

SCALE: N.T.S.



EXPANSION JOINT RAIL

NTS



ANCHOR DETAIL

NOTE: ALTERNATE ANCHOR DETAIL MAY BE SUBMITTED FOR REVIEW AND APPORVAL.

TYPICAL BRIDGE JOINT NOTES:

THE COST OF FURNISHING AND INSTALLING THESE JOINTS AND ALL MATERIALS SHALL BE CONSIDERED INCIDENTAL TO THE COST OF STRUCTURAL CONCRETE CLASS A(AE), ITEM NO. 55201-0200 AND NO DIRECT PAYMENT WILL BE MADE THEREFOR.

EXPANSION JOINT STRIP SEAL

1. JOINTS SHALL BE ONE OF THE FOLLOWING OR AN APPROVED EQUAL:

   a) WATSON, BOWMAN AND ACME CORP. JOINT WITH A TYPE SE STEEL EXTRUSION AND A SE-400 STRIP SEAL.
   b) E-POXY INDUSTRIES, INC. JOINT WITH A TYPE A STEEL EXTRUSION AND AEVA-SEAL BS 500 STRIP SEAL.

2. JOINTS OTHER THAN THOSE LISTED ABOVE MAY BE SUBMITTED FOR APPROVAL PROVIDED THEY ARE SIMILAR TO THAT SHOWN IN SECTION HEREIN AND CAN DEMONSTRATE BY TEST, THE DESIGN MOVEMENTS FROM AN INITIAL JOINT WIDTH SETTING OF 50mm AT MIDPOINT INSTALLATION TEMPERATURE OF 13° C (CENTIGRADE). JOINT MOVEMENT SHALL BE FOR A RANGE OF TEMPERATURES FROM -7° C TO 50° C. FOR INSTALLATION TEMPERATURES BELOW THE MIDPOINT TEMPERATURE, INCREASE THE WIDTH OF JOINT BY THE AMOUNT SHOWN BELOW. FOR INSTALLATION TEMPERATURE ABOVE THE MIDPOINT TEMPERATURE. DECREASE THE WIDTH OF THE JOINT BY THE AMOUNT SHOWN BELOW. ACTUAL OPENING DISTANCE WILL BE DETERMINED BY C.O. IN THE FIELD.

   CHANGE IN JOINT WIDTH = L(M) * 0.0000108(m/m) * CHANGE IN TEMPERATURE (°C), WHERE L=18.71

3. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR THE JOINTS SHOWING ALL FABRICATION DETAILS AND MATERIAL SPECIFICATIONS ACCORDING TO SPECIFICATION REQUIREMENTS. (SEE NOTE NO. 5)

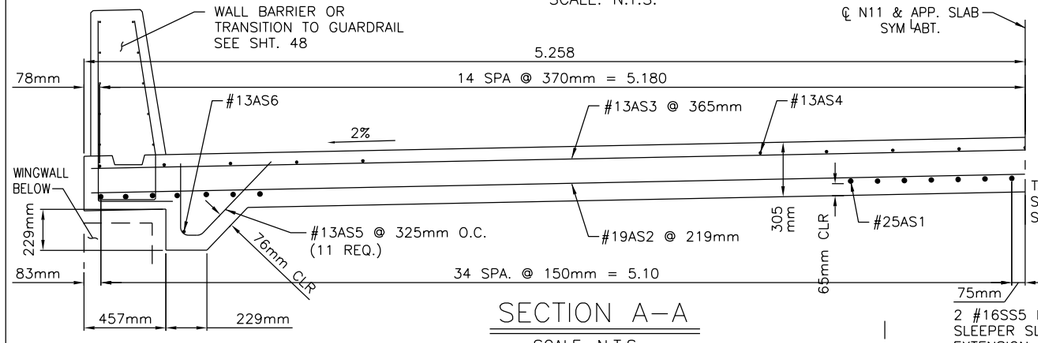
4. THE JOINTS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. A REPRESENTATIVE OF THE MANUFACTURER SHALL BE PRESENT AT THE SITE DURING INSTALLATION.

5. STEEL EXTRUSIONS RAIL, ANGLES AND COVER PLATES SHALL CONFORM TO AASHTO M 270M, GRADE 250, AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M298, CLASS 50 OR M232 AFTER FABRICATION. NEOPRENE STRIP SEAL SHALL CONFORM TO ASTM D5973.

6. STEEL EXTRUSION RAILS AND ANGLES SHALL BE FABRICATED TO CONFORM TO THE LONGITUDINAL GRADE AND ROADWAY CROWN AT APPROACH SLABS ON SLEEPER FOOTINGS.

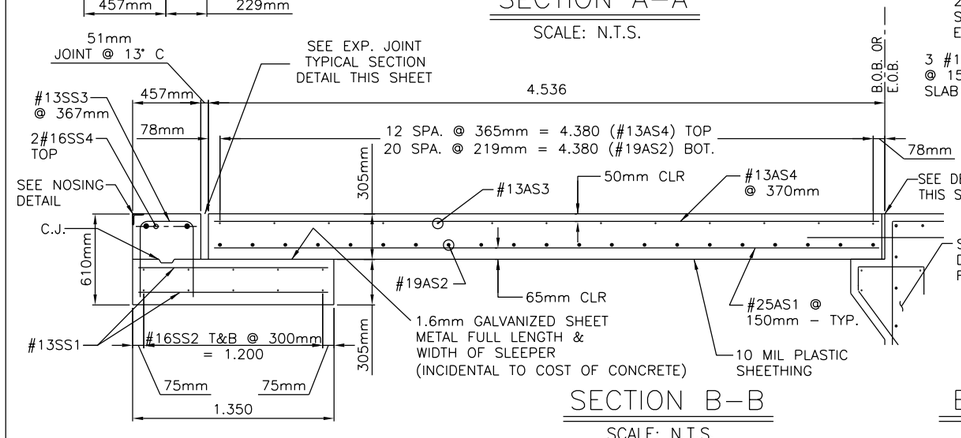
FIXED JOINT SEAL

7. MATERIAL AND CONSTRUCTION OF JOINT SEALANT SHALL CONFORM TO THE REQUIREMENTS OF SECTION 712.01 OF FP-14. THE CONCRETE JOINT-SEALER SHALL MEET ALL REQUIREMENTS OF AASHTO M173 AND THE BACKER ROD SHALL MEET THE REQUIREMENTS OF ASTM D 3204 TYPE 1.



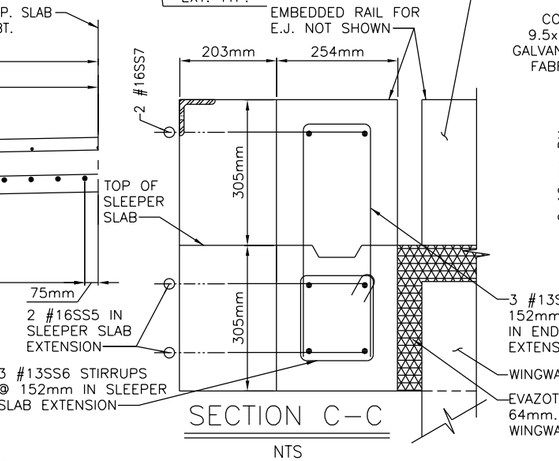
SECTION A-A

SCALE: N.T.S.



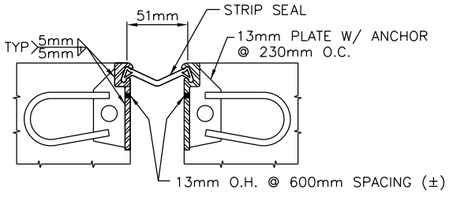
SECTION B-B

SCALE: N.T.S.



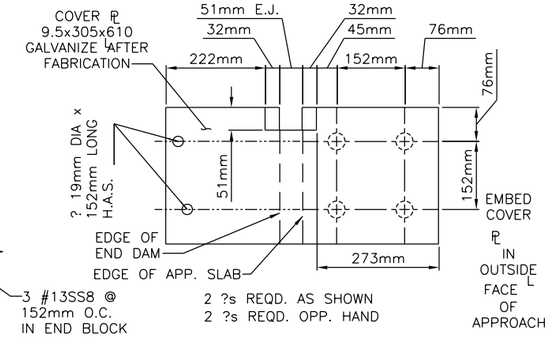
SECTION C-C

NTS



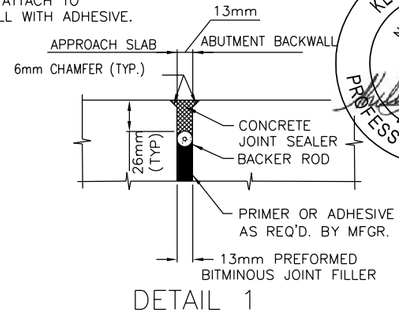
EXPANSION JOINT TYP. SECTION

NTS



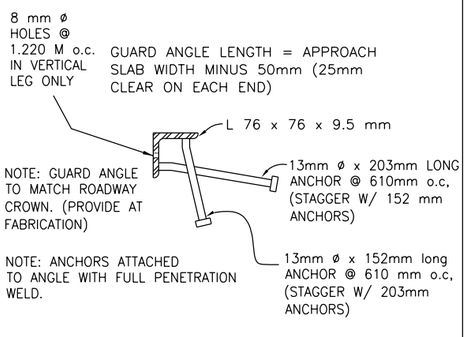
COVER PLATE DETAIL

NTS



DETAIL 1

NTS



NOSING PLATE DETAIL

NTS

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APPROACH SLAB DETAILS

Designed by: MAZ	**Date:** 5/10
Drawn by: PAG	**Date:** 5/10
Revised by: WHPacific	**Date:** 9/10
File Name: N11(1A) Approach Slab sht 44	

REINFORCING BAR SCHEDULE

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	45	82

--WINGWALLS--

@ Abutment No. 1

	MARK	SIZE	TYPE	NO. REQ'D	LENGTH	A	B	C	REMARKS
Wingwall, Top	#22W1	#22	3	4	5.675	5.350	380 mm		
Wingwall, Bot.	#22W2	#22	12	4	5.915	4.180	1.405	380 mm	
Wingwall, I.F. Horiz.	#22W3	#22	1	6	5.350	5.350			
Wingwall, I.F. Horiz.	#22W4	#22	1	2	4.790	4.790			
	TO								DECREASE LENGTH BY INCREMENTS OF 672 mm
Wingwall, I.F. Horiz.	#22W8	#22	1	2	2.102	2.102			
Wingwall, O.F. Horiz.	#16W9	#16	1	6	5.350	5.350			
Wingwall, O.F. Horiz.	#16W10	#16	1	2	4.790	4.790			
	TO								DECREASE LENGTH BY INCREMENTS OF 672 mm
Wingwall, O.F. Horiz.	#16W14	#16	1	2	2.102	2.102			
Bottom U Stirrups	#13W15	#13	8	8	4.050	280 mm	1.910		
Bottom U Stirrups	#13W16	#13	8	2	3.992	280 mm	1.881		
	TO								DECREASE "B" DIMENSION BY INCREMENTS OF 108 mm AND BAR LENGTH BY 216 mm
Bottom U Stirrups	#13W28	#13	8	2	1.400	280 mm	585 mm		
Top U Stirrups	#13W29	#13	8	34	1.400	280 mm	585 mm		

@ Abutment No. 2

	MARK	SIZE	TYPE	NO. REQ'D	LENGTH	A	B	C	REMARKS
Top U Stirrups	#13W29	#13	8	32	1.400	280 mm	585 mm		
Wingwall, Top.	#22W30	#22	3	4	5.360	5.035	380 mm		
Wingwall, Bot	#22W31	#22	13	4	5.545	3.815	1.405	380 mm	
Wingwall, I.F. Horiz.	#22W32	#22	1	6	5.060	5.060			
Wingwall, I.F. Horiz.	#22W33	#22	1	2	4.473	4.473			
	TO								DECREASE LENGTH BY INCREMENTS OF 759 mm
Wingwall, I.F. Horiz.	#22W36	#22	1	2	2.196	2.196			
Wingwall, O.F. Horiz.	#16W37	#16	1	6	5.060	5.060			
Wingwall, O.F. Horiz.	#16W38	#16	1	2	4.473	4.473			
	TO								DECREASE LENGTH BY INCREMENTS OF 759 mm
Wingwall, O.F. Horiz.	#16W41	#16	1	2	2.196	2.196			
Bottom U Stirrups	#13W42	#13	8	8	4.034	280 mm	1.902		
Bottom U Stirrups	#13W43	#13	8	2	3.886	280 mm	1.828		
	TO								DECREASE "B" DIMENSION BY INCREMENTS OF 113 mm AND BAR LENGTH BY 226 mm
Bottom U Stirrups	#13W54	#13	8	2	1.400	280 mm	585 mm		

-- APPROACH SLABS--

	MARK	SIZE	TYPE	NO. REQ'D	LENGTH	A	B	C	REMARKS
Bottom	25AS1	#25	1	140	4.435	4.435			EPOXY COATED
Bottom	19AS2	#19	1	42	10.435	10.435			EPOXY COATED
Top	13AS3	#13	1	26	10.435	10.435			EPOXY COATED
Top	13AS4	#13	1	58	4.435	4.435			EPOXY COATED
Bottom at key	13AS5	#13	4	44	1.060	402 mm	111 mm	572 mm	EPOXY COATED
Bottom at key	13AS6	#13	1	4	3.265	3.265			EPOXY COATED
Sleeper Slab -Ftg	13SS1	#13	1	108	1.270	1.270			
Sleeper Slab -Ftg	16SS2	#16	1	20	9.625	9.625			
End block	13SS3	#13	8	54	1.300	355 mm	500 mm		EPOXY COATED
End block	16SS4	#16	1	4	9.625	9.625			EPOXY COATED
Sleeper Slab Extension	16SS5	#16	1	16	1.000	1.000			
Stirrups at Sleeper Ext.	13SS6	#13	7	12	780 mm	152 mm	178 mm	100 mm	
End Block Extension	16SS7	#16	1	8	1.000				EPOXY COATED
Stirrups at End Block Ext.	13SS8	#13	7	12	1.390	152 mm	483 mm	100 mm	EPOXY COATED

--ABUTMENT CAPS--

	MARK	SIZE	TYPE	NO. REQ'D	LENGTH	A	B	C	REMARKS
Top & Bot.	#22A1	#22	1	20	9.620	9.620			
Sides	#16A2	#16	1	12	9.620	9.620			
Stirrups	#13A3	#13	7	76	3.680	813 mm	927 mm	100 mm	
Longitudinal at Step	#16A4	#16	8	8	5.990	5.380	305 mm		
Transverse at Step	#13A5	#13	8	36	1.420	813 mm	305 mm		
Diagonals	#19A6	#19	9	80	1.540	930 mm	305 mm		

--DECK SLAB

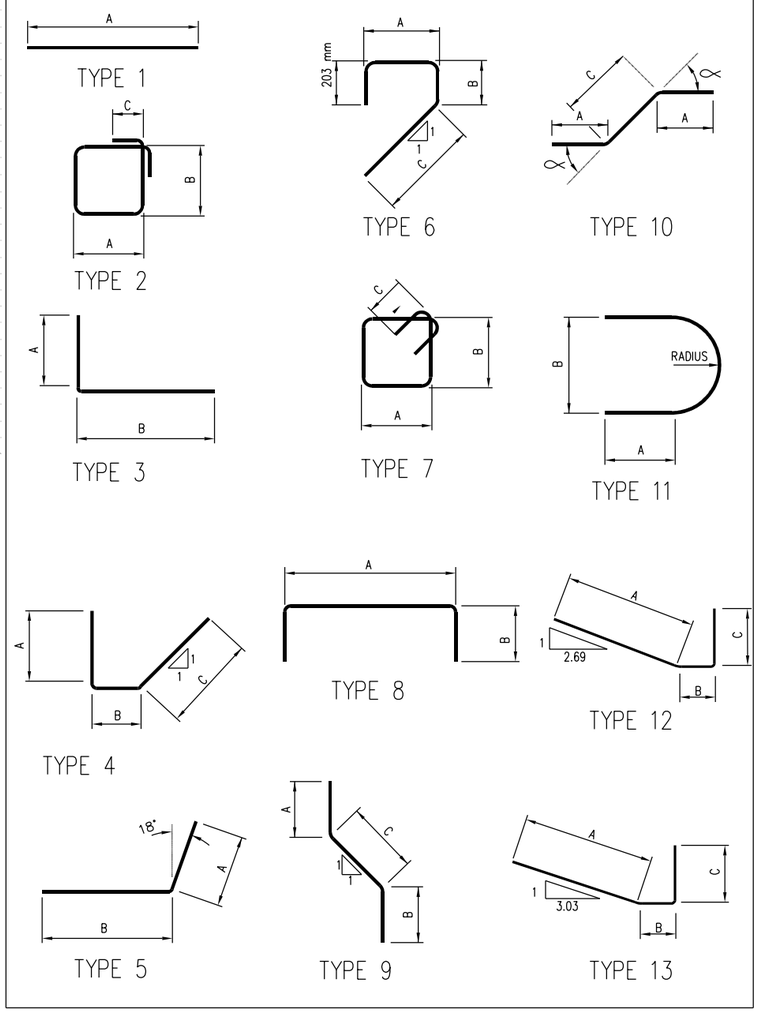
	MARK	SIZE	TYPE	NO. REQ'D	LENGTH	A	B	C	REMARKS
Top Transverse	16S1	#16	1	174	10.415	10.415			EPOXY COATED
Bot. Transverse	16S1	#16	1	175	10.415	10.415			EPOXY COATED
Bot. Longitudinal	13B1	#13	1	53	12.520	12.520			EPOXY COATED
Bot. Longitudinal	13B2	#13	1	53	16.140	16.140			EPOXY COATED
Top Longitudinal	13T1	#13	1	69	10.380	10.380			EPOXY COATED
Top Longitudinal	13T2	#13	1	69	18.280	18.280			EPOXY COATED

--ABUTMENT DIAPHRAGMS--

	MARK	SIZE	TYPE	NO. REQ'D	LENGTH	A	B	C	REMARKS
Top at Corners	#32D1	#32	8	4	11.280	10.364	550 mm		EPOXY COATED
Top	#19D2	#19	8	6	11.040	10.364	381 mm		EPOXY COATED
Side	#32D3	#32	1	4	10.415	10.415			
Side & Bottom	#19D4	#19	1	22	10.415	10.415			
Bot btwn Beams	#19D5	#19	1	18	1.980	1.980			
Bot at Ends	#19D6	#19	1	12	715 mm	715 mm			
End U Bars	#13D7	#13	8	20	1.385	775 mm	305 mm		
Stirrups	#13D8	#13	7	62	4.900	813 mm	1.565	100 mm	EPOXY COATED
Stirrups	#13D9	#13	8	62	1.935	813 mm	560 mm		
Shelf	#16D10	#16	6	64	1.250	441 mm	157 mm	525 mm	
Shelf - Longitudinal	#13D11	#13	1	6	9.650	9.650			

BENDING DIAGRAMS

ALL DIMENSIONS ARE OUT TO OUT



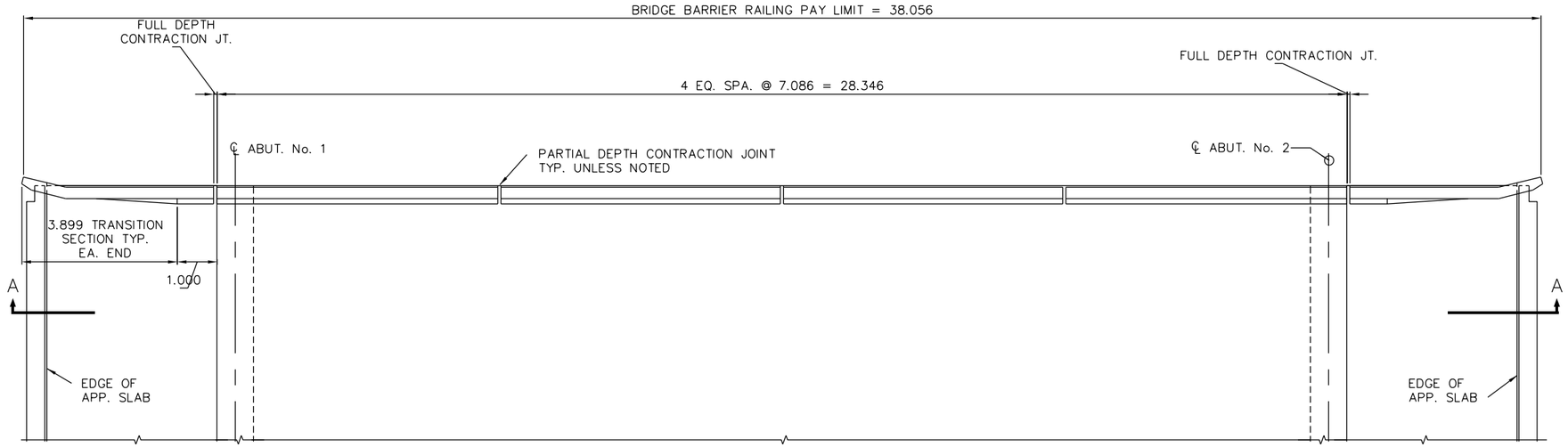
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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS
NAVAJO REGION OFFICE * DIVISION OF TRANSPORTATION

REINFORCING SCHEDULE

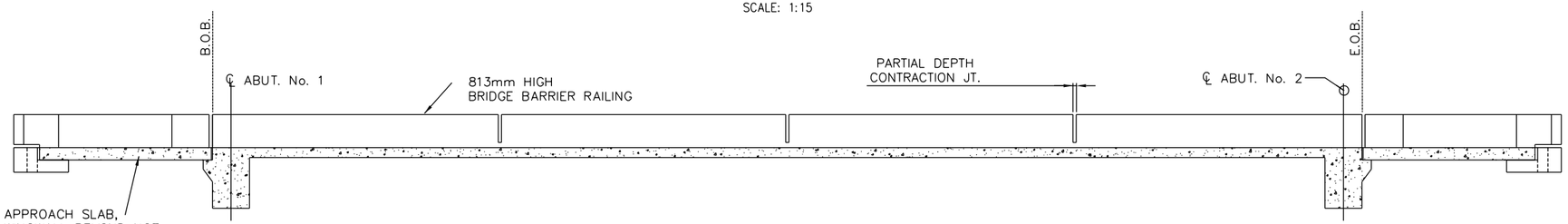
Designed by: MAZ	**Date:** 5/10		
Drawn by: PAG	**Date:** 5/10		
Revised by: WHPacific	**Date:** 9/11		
File Name: N11(1A)-Reinforcing Bar Schedule		sht	45

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	46	82



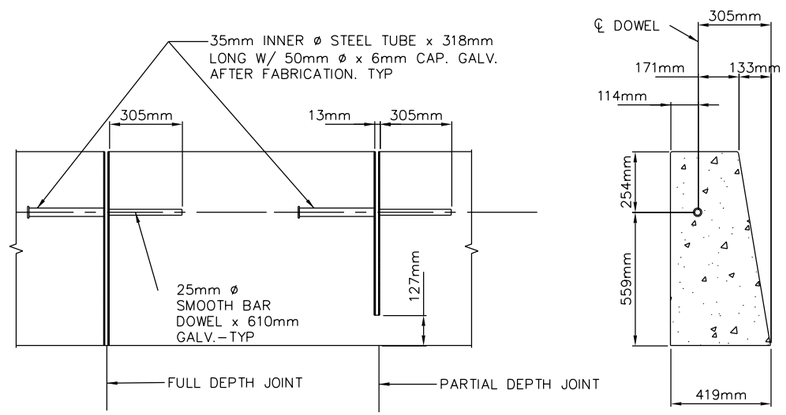
PARTAL PLAN

SCALE: 1:15



SECTION A–A

SCALE: 1:15



ELEVATION

SECTION

CONTRACTION JOINT DETAIL

CONTRACTION JOINTS AT EQUALLY SPACED INTERVALS.

GENERAL NOTES

1. CONCRETE FOR BRIDGE BARRIER RAILING SHALL BE CONCRETE CLASS A(AE). BARRIER RAILING SHALL BE PAID FOR AT THE UNIT PRICE PER LINEAR METER, BID ITEM 55601–0500, INCLUDING COMPLETELY EMBEDDED REINFORCING STEEL, DOWELS AND ANY OTHER COMPLETELY EMBEDDED OR APPURTENANT STEEL ITEMS.
2. REINFORCING BARS SHALL CONFORM TO THE REQUIREMENTS CONTAINED IN AASHTO M31M. REINFORCING BARS SHALL BE GRADE 420 UNLESS A DIFFERENT GRADE IS SPECIFIED ELSEWHERE IN THE PLANS. DIMENSIONS SHOWN REFER TO THE CENTERLINES OF BARS UNLESS NOTED OTHERWISE. ALL BARS SHALL BE EPOXY COATED.
3. BARRIER RAILINGS INSTALLATION ON DECK SLABS MAY BE TYPE 813A OR 813B AT THE OPTION OF THE CONTRACTOR. SEE SHEET 47 FOR DETAILS.
4. FOR DETAILS OF BRIDGE BARRIER RAILING CONNECTION TO THE APPROACH GUARDRAIL SEE SHEET 48.
5. REFLECTIVE BARRIER DELINEATORS SHALL BE MOUNTED ON TOP OF THE BARRIER RAILING IN CONFORMANCE WITH SHEET 8.
6. APPLY PENETRATING WATER REPELLENT TREATMENT TO ALL EXPOSED SURFACES OF THE BRIDGE BARRIER RAILING. SEE SUPPLEMENTAL SPECIFICATION SECTION 567. APPLY HIGH MOLECULAR WEIGHT METHACRYLATE (HMWM) TO DECK AT BASE OF BARRIER SEE SHEET 47.
7. DISCONTINUE HORIZONTAL REINFORCEMENT AT ALL CONSTRUCTION JOINT OPENINGS.
8. CONSTRUCTION JOINTS BETWEEN BARRIER RAILING AND BRIDGE DECK CONCRETE SHALL BE CLEANED AND ROUGHENED TO 6mm PROJECTION PRIOR TO PLACEMENT OF BARRIER RAILING CONCRETE.
9. CHAMFER EXPOSED EDGES OF STRUCTURES 19mm UNLESS NOTED OTHERWISE.
10. COVER TO REINFORCING BARS SHALL BE 50mm CLEAR UNLESS NOTED OTHERWISE.
11. STRUCTURAL STEEL SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M–270, GR 250. ALL STEEL SHALL BE GALVANIZED.

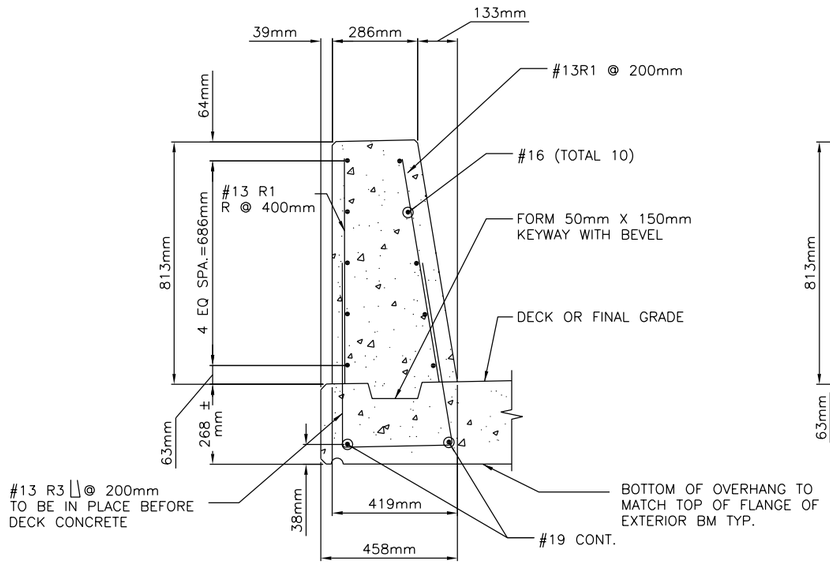
KELLY R. HEATH
NEW MEXICO
18915
PROFESSIONAL ENGINEER
4/14/2020

UNITED STATES
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BUREAU OF INDIAN AFFAIRS
NAVAJO REGION OFFICE * DIVISION OF TRANSPORTATION

BRIDGE BARRIER RAILING GENERAL DETAILS

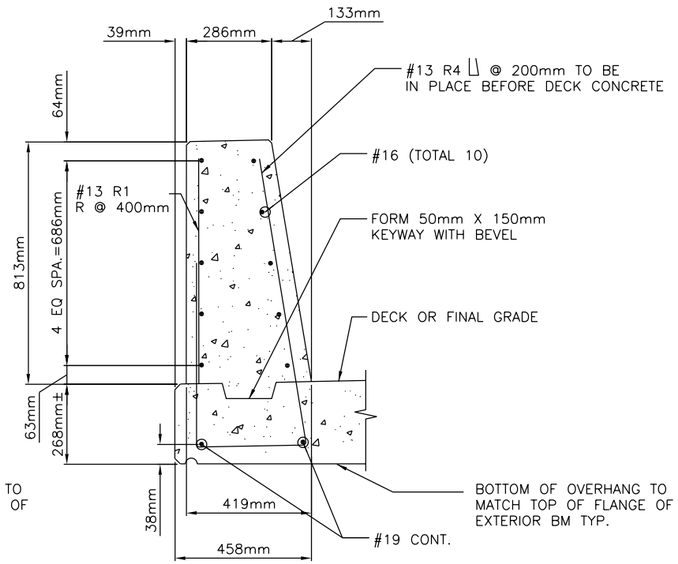
Designed by: MAZ	**Date:** 5/10
Drawn by: PAG	**Date:** 5/10
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)– Bridge Barrier Railing General Details sht 46	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	47	82



TYPE 813 A

SCALE: 1:100

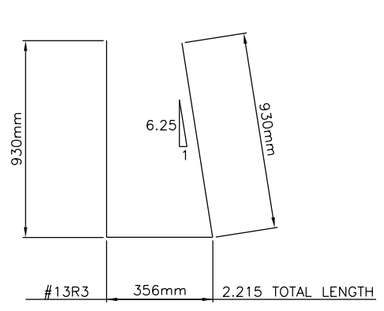


TYPE 813 B

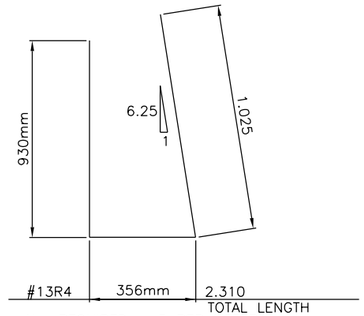
SCALE: 1:100

NOTE:

1. DOWELS FROM SLAB INTO BARRIER RAILING, #19 CONTINUOUS BARS AT CORNER OF DOWELS AND REINFORCING STEEL IN BARRIER ARE ALL INCIDENTAL TO BRIDGE RAILING, CONCRETE, BID ITEM 55601-0500.



No. REQUIRED = 5 PER METER



No. REQUIRED = 5 PER METER

ESTIMATED QUANTITIES

(FOR CONTRACTOR'S INFORMATION ONLY)

ITEM	UNIT	TOTAL
REINFORCING BARS, GR 420	kg/m	35.3 kg/m
SUPERSTRUCTURE CONCRETE	CU.m/m	0.276

THE QUANTITIES SHOWN IN THE ABOVE TABLE ARE BASED ON TYPE 813A WITH "T" = 254mm AND VARY WITH THE TYPE OF BARRIER RAIL SELECTED.

REBAR SCHEDULE

MARK	LENGTH	NO. REQD PER m
#13R1	715mm	2.5 O.F.
#13R1	715mm	5.0 I.F.

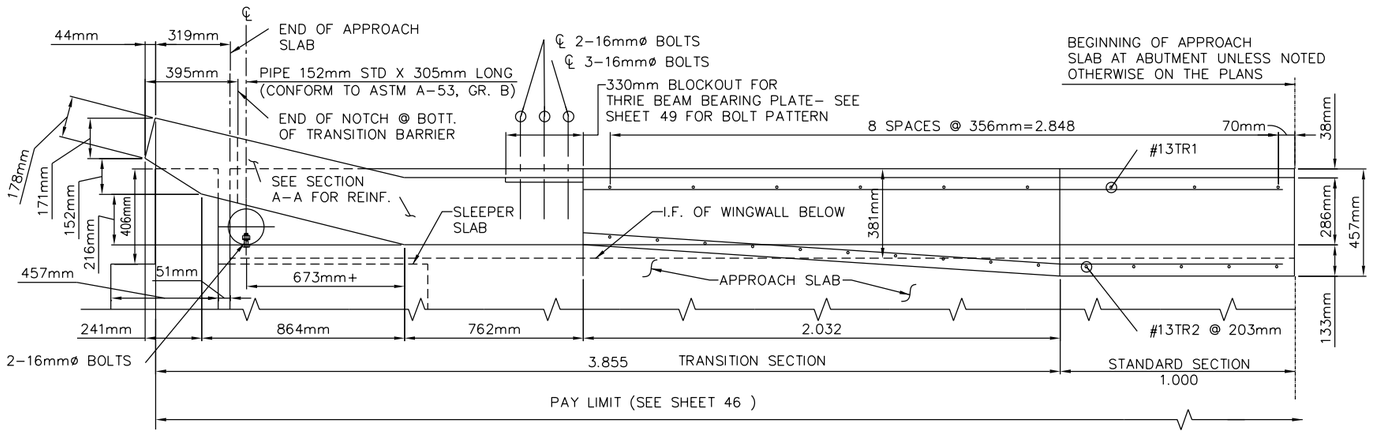


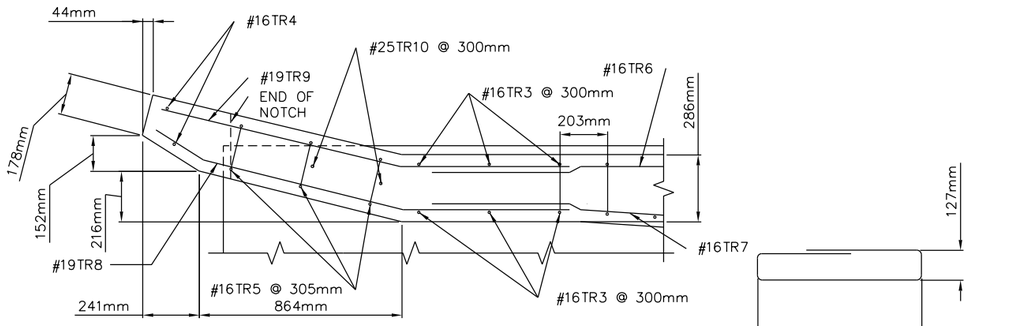
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS
NAVAJO REGION OFFICE * DIVISION OF TRANSPORTATION

BRIDGE BARRIER RAILING SECTIONS AND DETAILS

Designed by: MAZ	**Date:** 5/10
Drawn by: PAG	**Date:** 5/10
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)- Bridge Barrier Railing Sect. and Details sht 47	

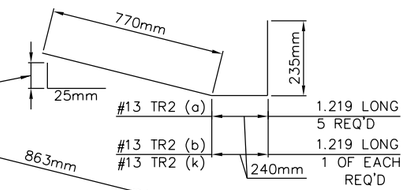
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	48	82

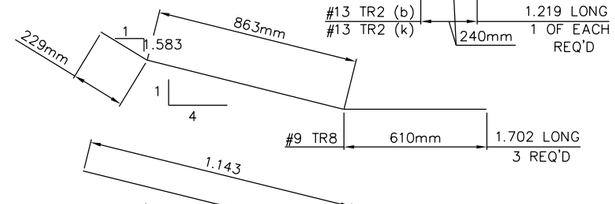




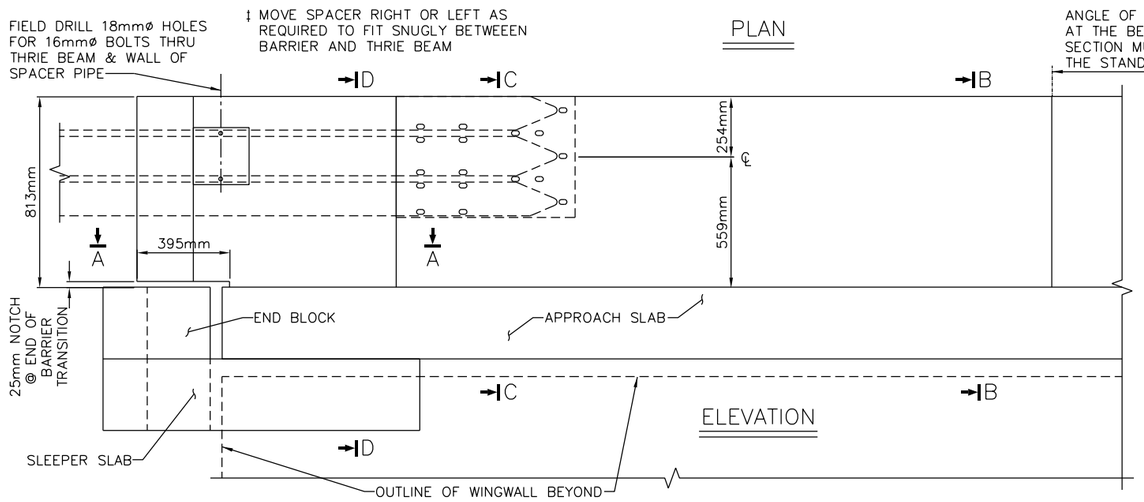
SECTION A-A

NOTE: BEVEL=133mm FOR #13TR2(a) IN STD. SECTION THEN VARIES FROM 128mm TO 8mm FOR #13TR2(b) THRU (k) IN 9 EQUAL INCREMENTS IN TRANSITION SECTION





PLAN

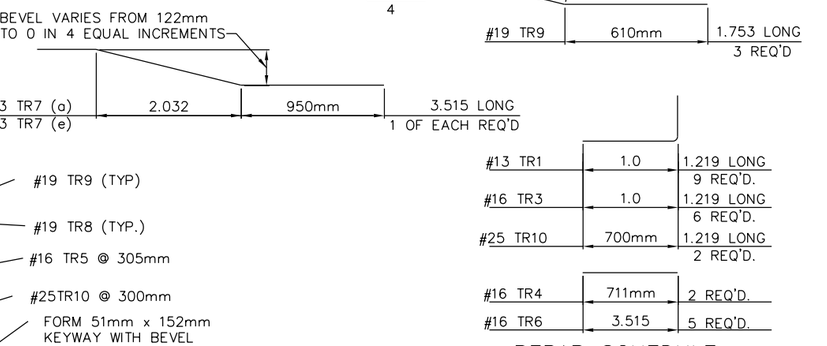


**ESTIMATED QUANTITIES

(FOR ONE TRANSITION & STD. SECTION ON APPROACH SLAB)

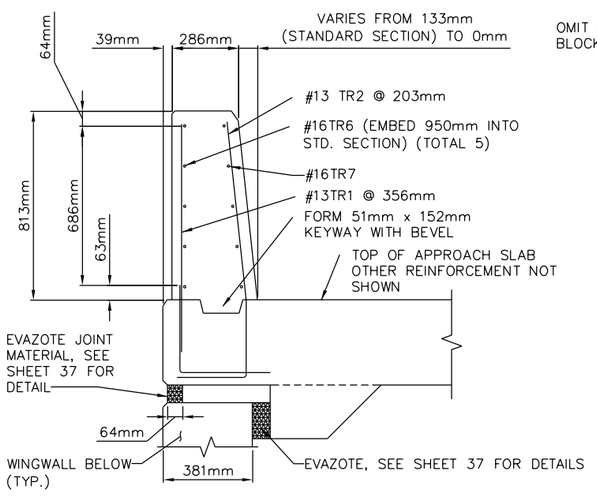
ITEM	UNIT	TOTAL
EPOXY COATED REINFORCING BARS, GRADE 60	kg	141.9
SUPERSTRUCTURE CONCRETE	m3	1.21

**FOR CONTRACTORS INFORMATION ONLY

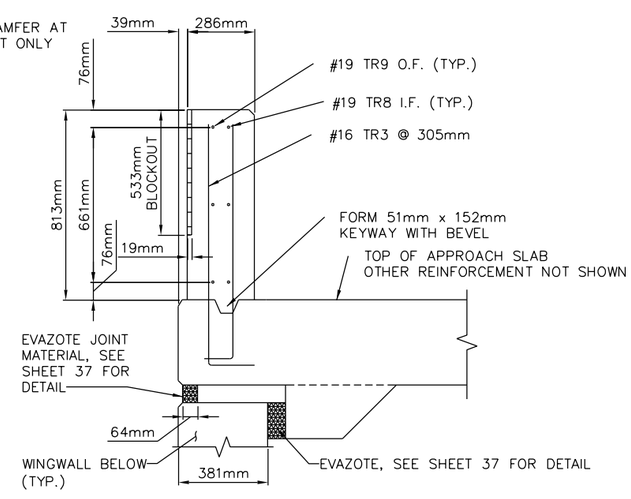


REBAR SCHEDULE

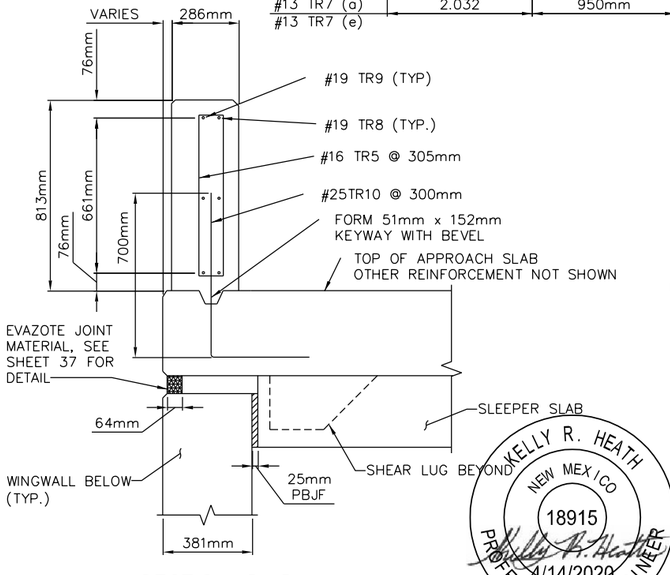
(FOR ONE TRANSITION & STD. SECTION ON APPROACH SLAB)



SECTION B-B



SECTION C-C



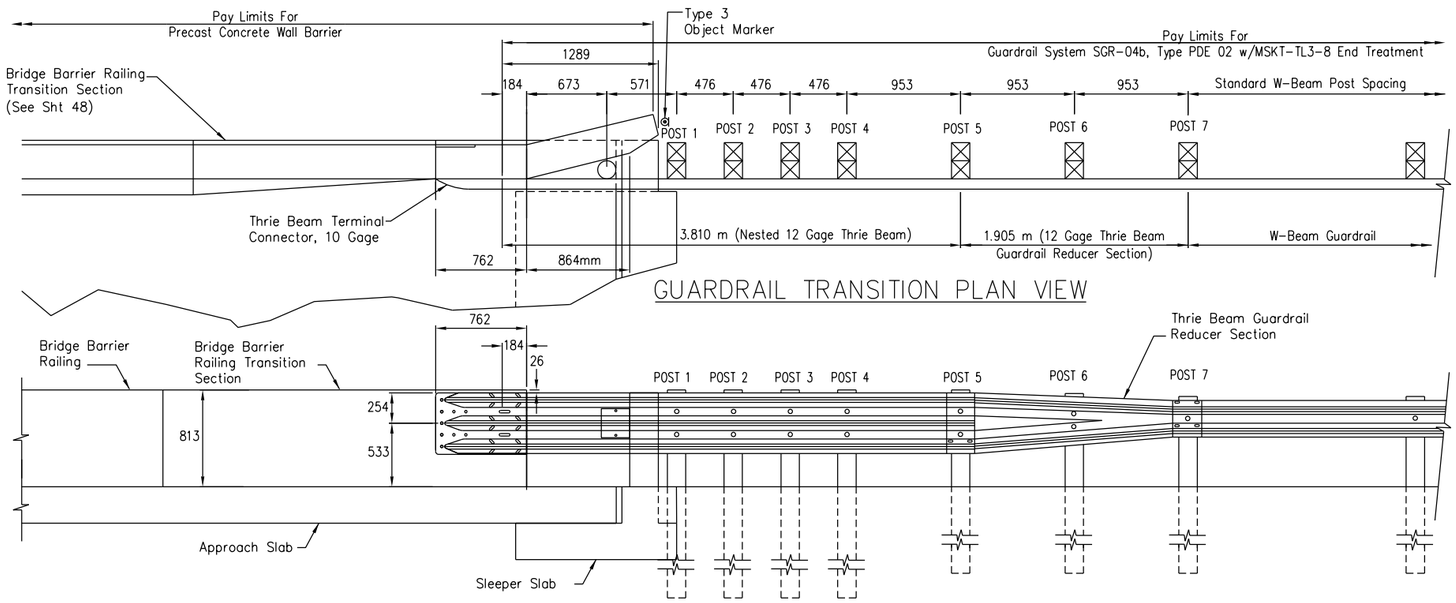
SECTION D-D

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

BRIDGE BARRIER RAILING TRANSITION SECTION DETAILS

Designed by: MAZ	Date: 5/10	
Drawn by: PAG	Date: 5/10	
Revised by: WHPacific	Date: 9/11	
File Name: N11(1A)- Bridge Barrier Railing		sht

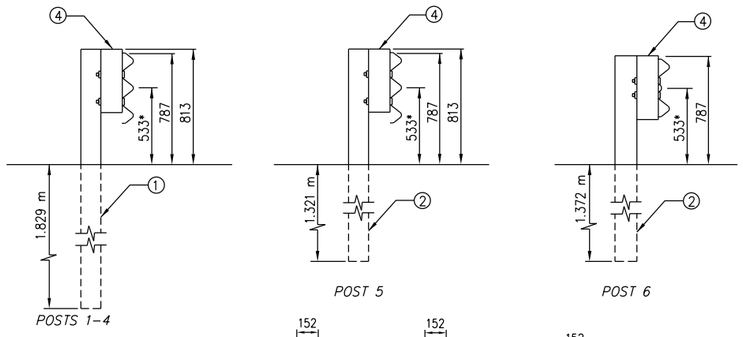
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	49	82

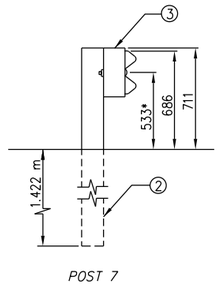


GUARDRAIL TRANSITION PLAN VIEW

GUARDRAIL TRANSITION ELEVATION VIEW

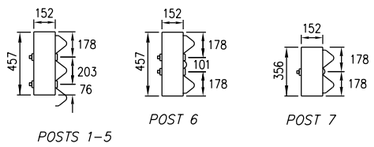
* Transition Center Height Of Thrie Beam Rail Element From 533 mm To 550 mm.



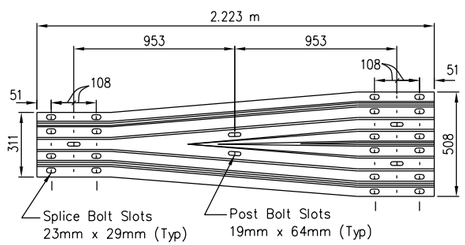


LEGEND

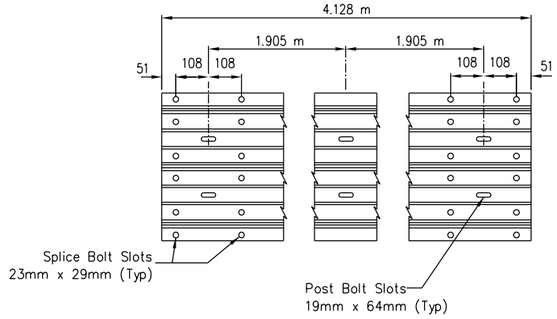
① *W152 x 635 x 2.591 m or W203 x 533 x 2.591 m Post*
② *W152 x 508 x 2.134 m or W203 x 457 x 2.134 m Post*
③ *152 x 203 x 356 Treated Timber Offset Block*
④ *152 x 203 x 457 Treated Timber Offset Block*
⑤ *152 x 152 x 203 Treated Timber Offset Block*



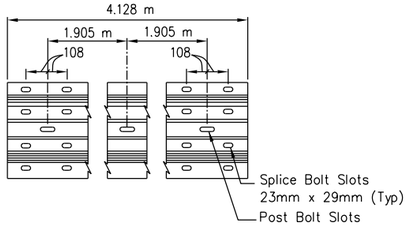
BLOCK DETAILS



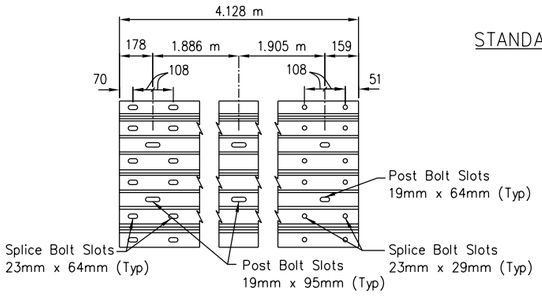
THRIE BEAM GUARDRAIL REDUCER SECTION



THRIE BEAM RAIL ELEMENT



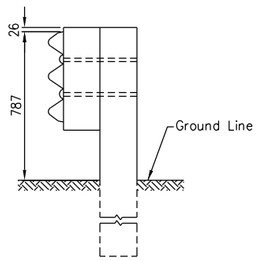
W-BEAM RAIL ELEMENT



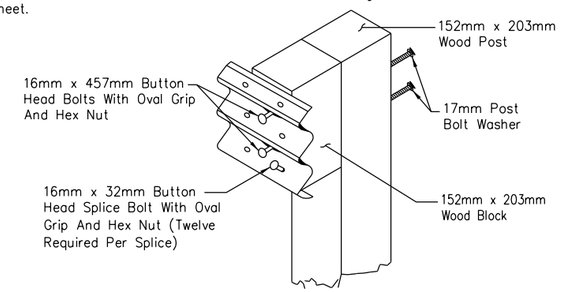
THRIE BEAM EXPANSION SECTION

GENERAL NOTES

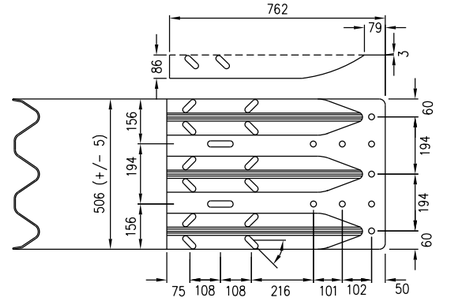
1. All Dimensions In Millimeters Unless Otherwise Shown.
2. All Materials and Workmanship Shall Conform To FP-14.
3. All Hardware Shall Meet FHWA Crash Worthiness Requirements As Per NCHRP 350 Guidelines.
4. Five 22 mm H.T. S. Bolts Are Required For The Attachment Of The Thrie Beam Terminal Connector To The Concrete Barrier, Length To Be Determined In The Field By The AOTR/COR Holes For Bolts Shall Be 25 mm Dia. And Shall Be Either Formed Or Core Drilled.
5. Furnishing And Placing Of Bolts, Washers, And Bearing Plate Shall Be Considered Incidental To The Cost Of Metal Barrier And No Direct Payment Will Be Made Therefor.
6. Install Thrie Beam Terminal Connector Between Nested Guardrail Elements On The Approach Section.
7. Install Thrie Beam Terminal Connector Outside Of The Nested Guardrail Elements On The Departure Section.
8. Bolts Are To Be Installed As Shown So That The Threaded End Of The Bolts And Nuts Are Placed Away From Traffic Side Of Rail.
9. Do Not Place Any Washers Under The Bolts On The Traffic Side Of The Barrier.
10. Reflector Tabs Shall Be Placed At 7.62 m Intervals On All Guardrail Installations.
11. The Color Of The Reflective Sheeting On The Reflector Tabs Shall Be The Same As The Color Of The Edgeline Pavement Marking In Front Of The Barrier.
12. Reflector Tabs Shall Have a Minimum Of 76 mm x 127 mm Reflective Sheeting On Both Sides And Shall Attach Securely To The Blockout.
13. Splices Shall Be Lapped So The Free End Does Not Face Traffic Flow.
14. Construction Tolerance For Height Of Guardrail Is 13 mm.
15. The Payment for Item 61701-5000 Includes Posts, Blocks, Rail, Thrie Beam & Concrete Transitition including All Other Materials and Labor to Construct Guardrail Transition as Shown on This Sheet.



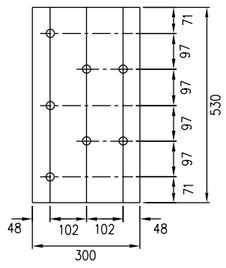
THRIE BEAM RAIL ASSEMBLY



THRIE BEAM POST ASSEMBLY



STANDARD THRIE BEAM TERMINAL CONNECTOR



16 mm BEARING PLATE

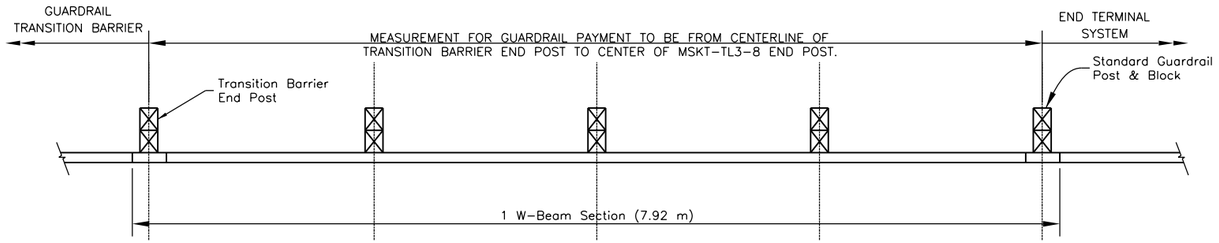
DEREK D. MEIER
NEW MEXICO
14504
REGISTERED PROFESSIONAL ENGINEER
4/14/20

UNITED STATES
DEPARTMENT OF THE INTERIOR
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NAVAJO REGION OFFICE * DIVISION OF TRANSPORTATION

GUARDRAIL TRANSITION AND THRIE BEAM DETAILS

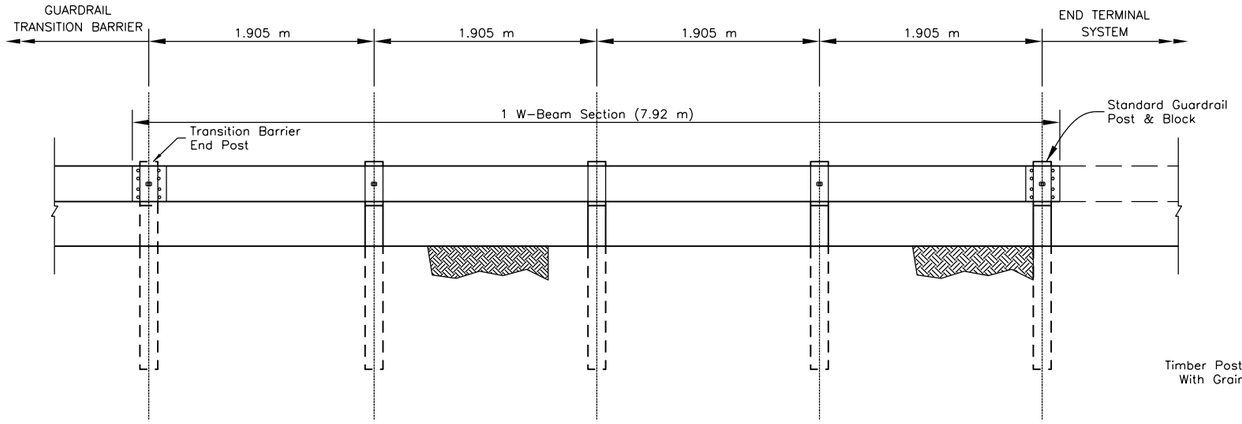
Designed by: WHPacific	**Date:** 6/07	
Drawn by: WHPacific	**Date:** 6/07	
Revised by: WHPacific	**Date:** 9/11	
File Name: N11(1A)-Guardrail Transition		Sht 49

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)	50	82

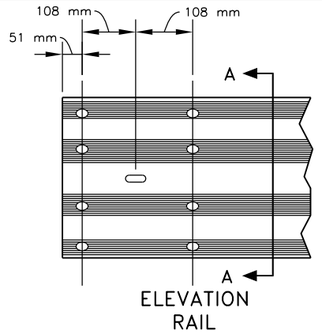


PLAN

TRAFFIC DIRECTION

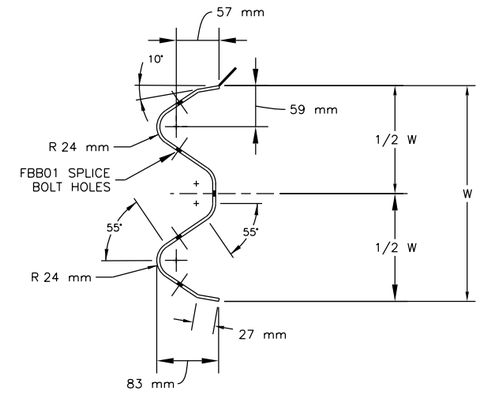


ELEVATION

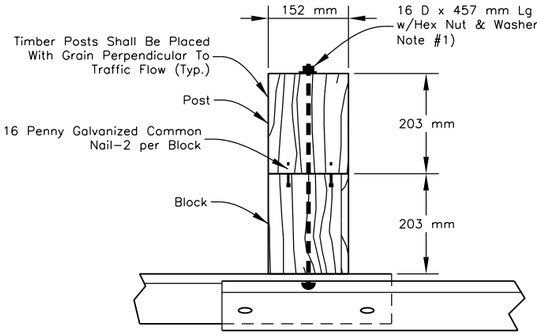


ELEVATION
RAIL

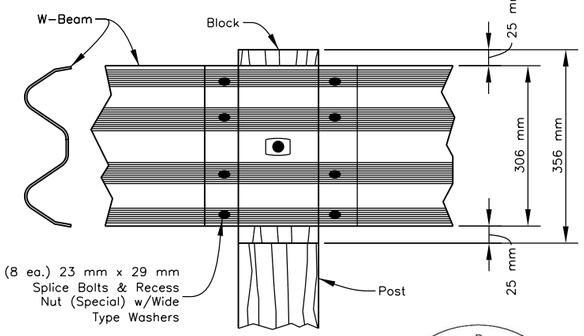
DESIGNATOR	COMPONENT	NUMBER
FBB01	Splice Bolt and Nut	2
FBB02	Guardrail-Post Bolt and Nut	2
FBB03	Guardrail-Post Bolt and Nut	2
FBB04	Guardrail-Post Bolt and Nut	2
FBX16a	Post Blockout Bolt (40 mm)	4
FWC16a	Round Washer	2
PDB01a	Timber Post Blockout	2
PDB01b	Timber Post Blockout	2
PDE02	Timber Post	2
PDE13	Timber Post	2
PWB01	Steel Post Blockout	2
PWE01	Steel Post	2
PWE02	Steel Post	2
RWB01a	W-Beam Backup Plate	1
RWM02a	W-Beam Rail	1



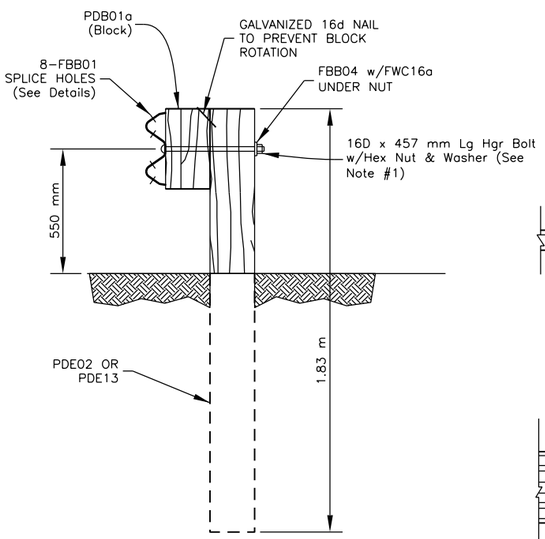
SECTION A-A
W-BEAM (RWM02A)



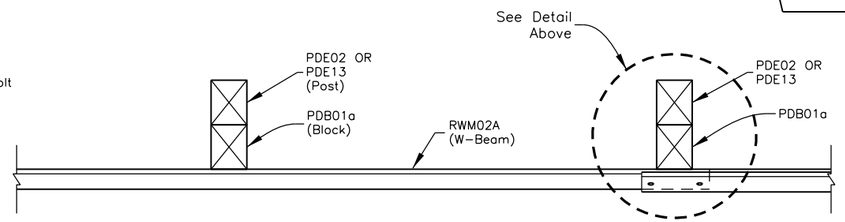
PLAN
POST/BLOCK &
SPLICE DETAIL



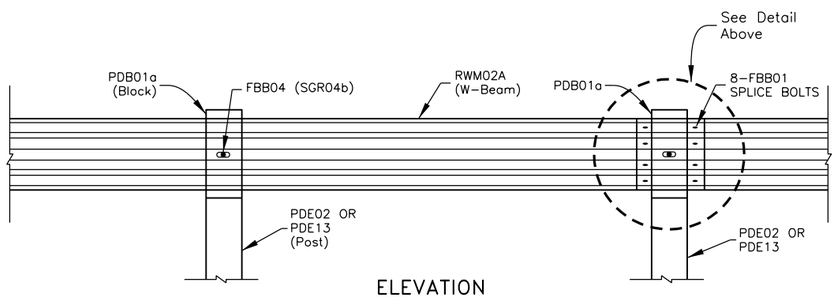
ELEVATION
POST/BLOCK
SPLICE DETAIL



ELEVATION
STRONG-POST W-BEAM



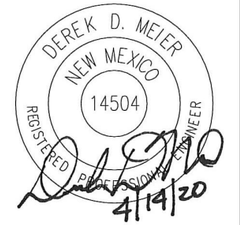
PLAN
W-BEAM/POST & BLOCK DETAILS



ELEVATION
W-BEAM/POST & BLOCK DETAILS

GENERAL NOTES

1. THE 16 D FLAT WASHER IS USED UNDER THE NUT, BEHIND THE POST ONLY. NO WASHER IS USED AT THE RAIL.
2. SEE SHEET 51 OF 82 FOR ADDITIONAL NOTES.
3. THE CONTRACTOR HAS THE OPTION TO USE ALL-STEEL POSTS W/WOODEN BLOCK ON STANDARD LINE POSTS, UNLESS OTEHERWISE NOTED ON THE DESIGN PLANS.
4. IF STEEL POSTS ARE APPROVED THEN RUBBER OR RECYCLED PLASTIC BLOCKS WILL BE REQUIRED AS SPECIFIED BY SUPPLIER.
5. BEGIN/END ASPHALT CURB AT POST #2.
6. BEGIN REFLECTIVE TABS ON THE W-BEAM AT EVERY FOURTH POST. THE COLOR OF THE TABS SHALL CONFORM TO THE COLOR OF THE ADJACENT EDGE LINE.
7. ANGLE STRUT MUST BE ATTACHED USING 19D HIGH STRENGTH BOLTS.



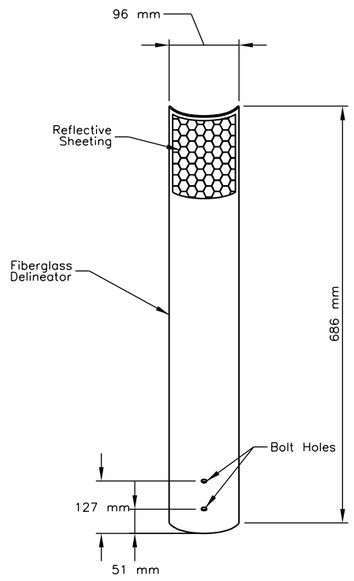
UNITED STATES
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BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

STANDARD GUARDRAIL DETAIL 1

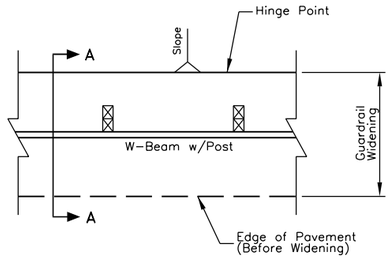
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DESIGNED BY: NRDOT	DATE: 7/5/2019
REVISED: 7/5/2019	BY: HRiley
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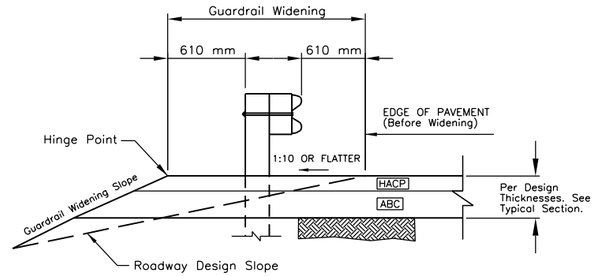
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A) 1,2&4	51	82



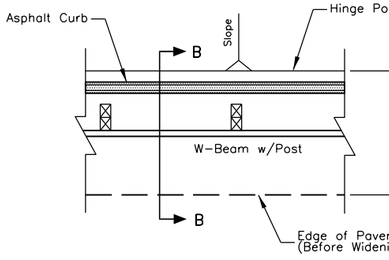
DELINEATOR DETAIL
(Reflective Sheeting Shall Face Traffic)



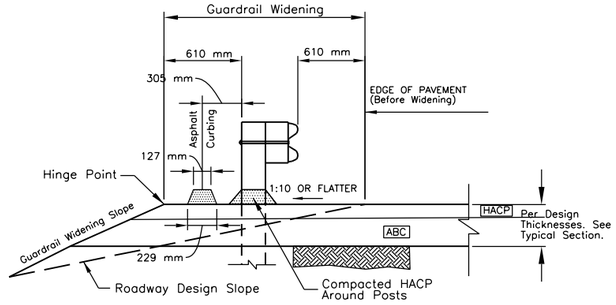
PLAN VIEW
w/NO CURBING



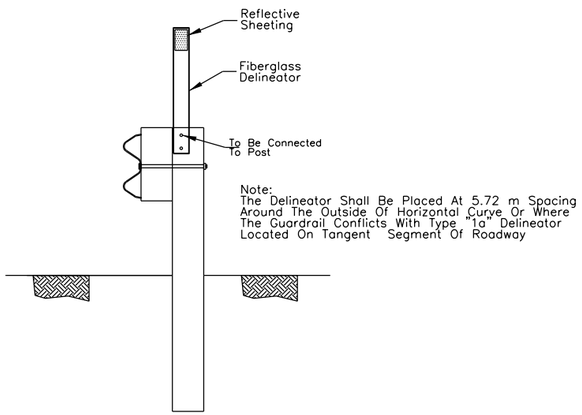
SECTION A–A
w/No Curbing



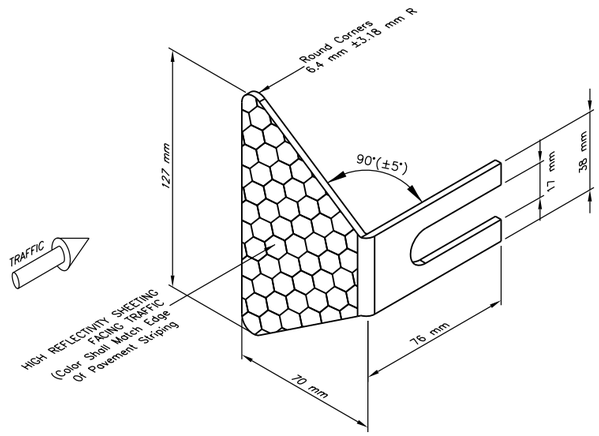
PLAN VIEW
w/CURBING



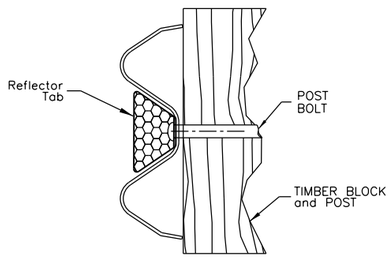
SECTION B–B
w/CURBING
Asphalt Curb Depth=102 mm



ELEVATION
GUARDRAIL/POST MOUNTED
DELINEATOR (TYP.)



ISOMETRIC VIEW
REFLECTOR TAB DETAIL



SECTION
REFLECTOR TAB
MOUNTING DETAIL
Install Tab on Every Fourth Post

GENERAL NOTES

1. ALL GUARDRAIL "W" BEAMS, SHALL BE GALVANIZED IN ACCORDANCE WITH (AASHTO M–180, CLASS A, TYPE 1) SPECIFICATION. ALL HARDWARE SHALL CONFORM TO (ASTM A–325) AND GALVANIZED IN ACCORDANCE WITH (ASTM A–153).
2. ALL STRUCTURAL STEEL ITEMS SHOWN SHALL CONFORM TO (AASHTO N183/ASTM A36) AND BE GALVANIZED IN ACCORDANCE WITH (AASHTO M–111) SPECIFICATION.
3. WIRE ROPE, FITTINGS AND HARDWARE SHALL CONFORM TO (ASSHTO M–30) SPECIFICATION TYPE II WITH A 19 mm DIAMETER AND A CLASS B ZINC COATING.
4. WOOD POSTS AND BLOCKS SHALL BE ROUGH SAWN LUMBER OR (S4S) HAVING MINIMUM BENDING STRENGTH OF 8.27 MPa (SINGLE MEMBER USE) AND MEETING AASHTO N168 (21TH EDITION), ALL POSTS SHALL BE TREATED IN ACCORDANCE WITH (AASHTO M–133) SPECIFICATION.
5. ASPHALT CONCRETE CURBING SHALL BE INSTALLED IN ACCORDANCE WITH SECTION B–B, AND CONSIDERED INCIDENTAL TO PAVING ITEMS AND NO DIRECT PAYMENT SHALL BE MADE.
6. ALL EMBANKMENT AND AGGREGATE BASE COURSE MATERIALS SHALL BE COMPACTED TO 95% OF MAXIMUM DRY DENSITY.
7. THE EMBANKMENT MATERIALS AND THE PLACING THEREOF SHALL BE INCLUDED IN CONTRACT BID ITEM 20401–0000 AND NO DIRECT PAYMENT SHALL BE MADE.
8. THE CONTRACTOR SHALL BE REQUIRED TO COMPACT THE BACKFILL AND THE ASPHALT ALL AROUND EACH GUARD RAIL POST WITH HAND TAMPERS TO INSURE INTEGRITY OF THE PAVEMENT AND GUARDRAIL AND TO PREVENT SEEPAGE OF WATER INTO THE PAVEMENT FROM THE GUARD RAIL POST HOLES. THIS WORK SHALL BE INCIDENTAL OBLIGATIONS OF THE WORK DESCRIBED HEREIN.
9. PLACEMENT OF HOT ASPHALT AND ABC MATERIAL FOR GUARDRAIL WIDENING SHALL BE INCLUDED IN BID ITEMS 30101–2000 AND 40201–0500.
10. FURNISHING & PLACEMENT OF 371 mm x 701 mm REFLECTIVE SHEETING AND REFLECTIVE TABS SHALL BE CONSIDERED INCIDENTAL TO ITEM 61701–5000 AND NO DIRECT PAYMENT SHALL BE MADE.
11. ANY RELATED PATENT RIGHTS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AS PER SECTION 107.01 OF THE FP–14.
12. THE CONTRACTOR HAS THE OPTION TO USE STEEL POSTS. IF STEEL POSTS ARE APPROVED, THEN RUBBER OR RECYCLED PLASTIC BLOCKS WILL BE REQUIRED.
13. PLACE REFLECTIVE TABS ON POSTS AT EVERY FOURTH POST. THE COLOR OF THE TABS SHALL CONFORM TO THE COLOR OF THE ADJACENT EDGE LINE

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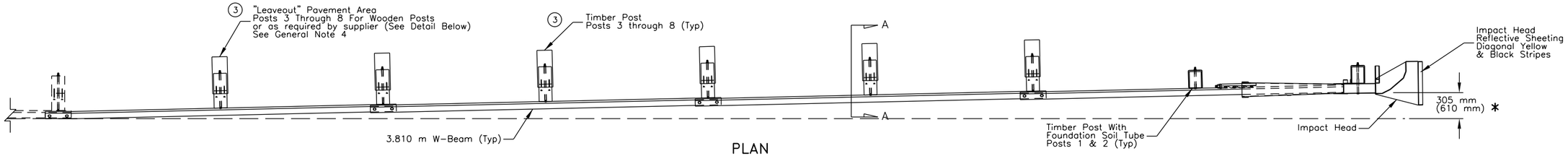
STANDARD GUARDRAIL
DETAIL 2

DRAWN BY: NRDOT	DATE: 7/5/2019
DESIGNED BY: NRDOT	DATE: 7/5/2019
REVISED: 5/52019	BY: HRiley
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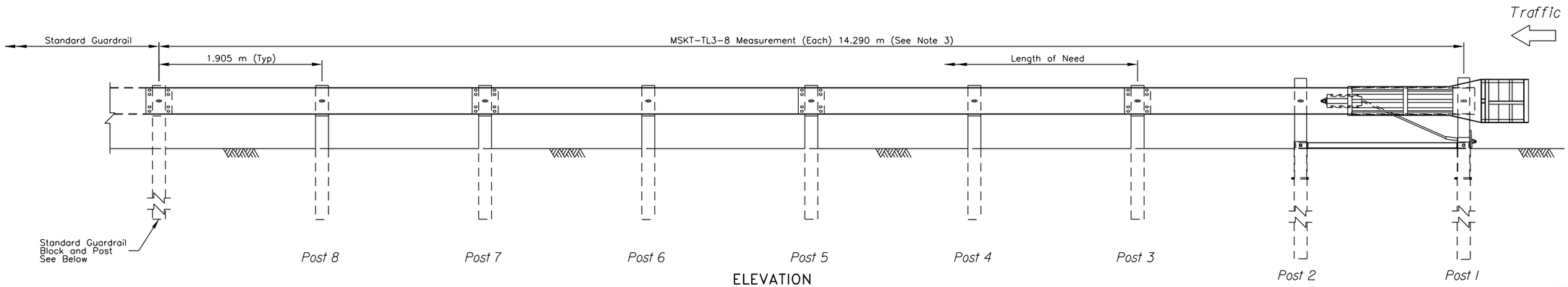
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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
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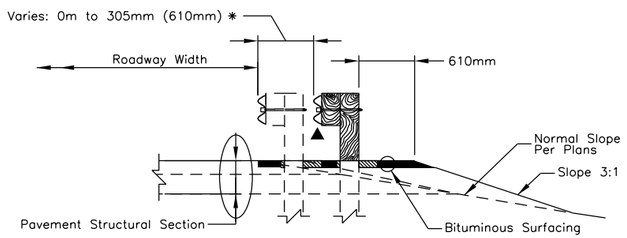
*FOR ELEVATIONS ABOVE (1,220 m) USE THE VALUES IN PARENTHESES



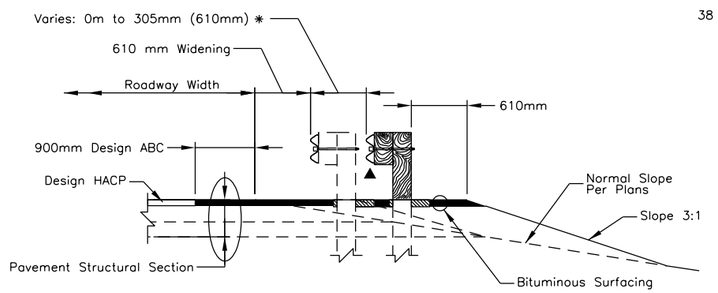
PLAN



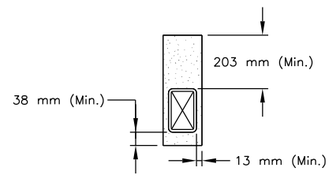
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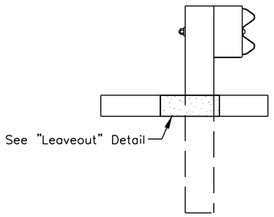
TYPE A SECTION



TYPE B SECTION



LEAVEOUT DETAIL

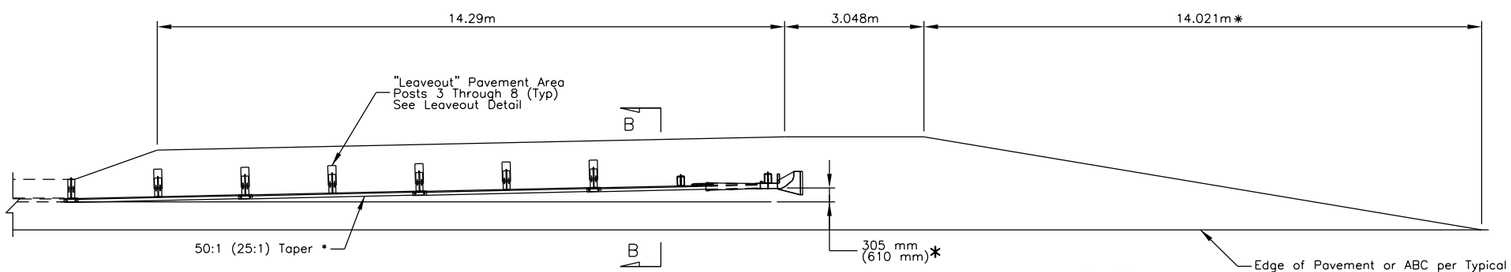


SECTION A-A
Typical At Post 3 Thru 8

GENERAL NOTES

1. THIS DETAIL IS FOR ROADWAY LAYOUT ONLY.
2. THE MSKT-TL3-8 SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND CURRENT APPROVED DRAWINGS INCLUDING ALL MATERIALS, HARDWARE, AND OTHER INFORMATION AS SHOWN IN THESE PLANS.
3. THE 14.290 m W-BEAM LENGTH SHALL CONSIST OF FOUR SECTIONS. THE END SECTION BEING A PROPRIETARY SPLIT RAIL.
4. IF SPECIFIED BY THE SUPPLIER, THE"LEAVEOUT" IN ASPHALTIC CONCRETE SHALL BE PROVIDED IN THE AC PAVEMENT AROUND THE GUARDRAIL POSTS AT THE LOCATIONS AND DIMENSIONS SPECIFIED BY SUPPLIER APPROVED SHOP DRAWING. "LEAVEOUT" MATERIAL SHALL CONSIST OF A 1-SACK GROUT MIX OR OTHER NON-COHESIVE MATERIAL AS APPROVED BY THE COR/COTR.

See Sheet 52B For General Notes.



TYPE B GUARDRAIL INSTALLATION
(FACE OF RAIL OFFSET 610mm FROM NORMAL EDGE OF PAVEMENT)

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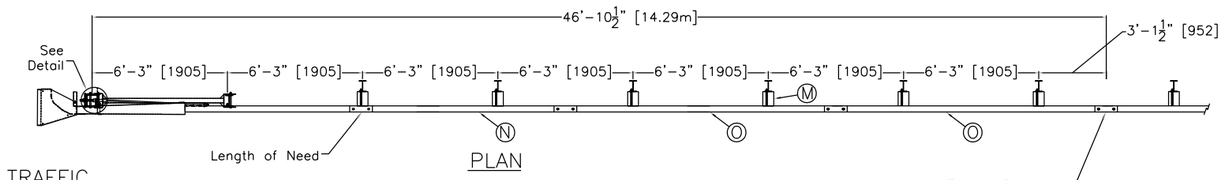
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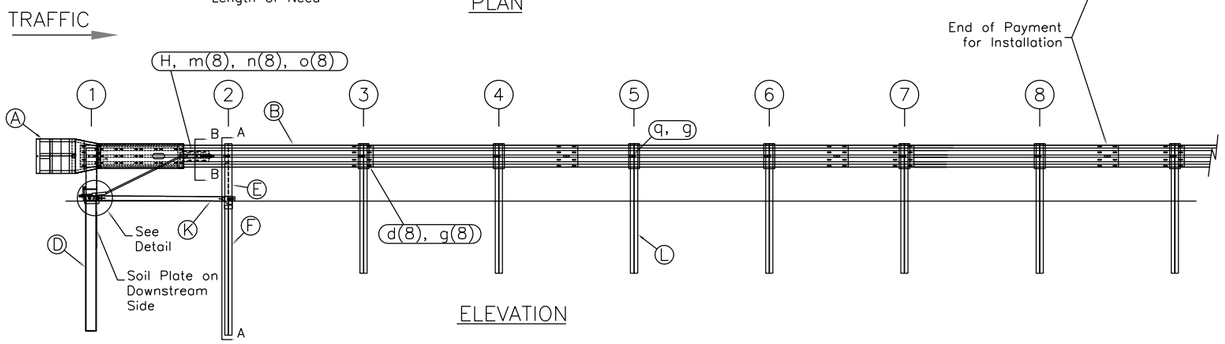
GUARDRAIL END TREATMENT
MSKT-TL3-8 LAYOUT; SHEET 1 of 2

DRAWN BY: NRDOT	DATE: 7/5/2019
DESIGNED BY: NRDOT	DATE: 7/05/2019
REVISED: 7/05/2019	BY: Mjmeyers
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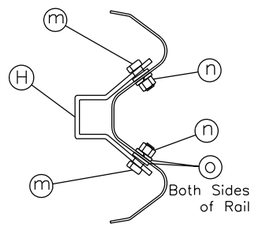
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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
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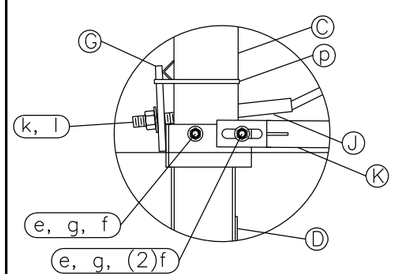




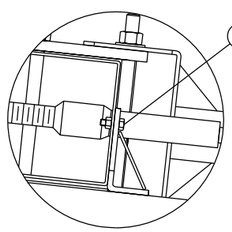
OPTIONAL FLARED INSTALLATION
25:1 maximum flare rate



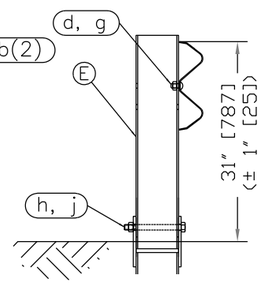
SECTION B–B
Anchor Bracket



Post #1 Connection Detail



Impact Head Connection Detail



SECTION A–A
Post #2

ITEM	QTY	BILL OF MATERIALS	ITEM NO.
A	1	IMPACT HEAD	MS3000
B	1	W–BEAM GUARDRAIL END SECTION, 12 Ga.	SF1303
C	1	FIRST POST TOP (6X6X$\frac{1}{8}$" Tube)	MTPHP1A
D	1	FIRST POST BOTTOM (6' W6X15)	MTPHP1B
E	1	SECOND POST ASSEMBLY TOP	UHP2A
F	1	SECOND POST ASSEMBLY BOTTOM	HP2B
G	1	BEARING PLATE	E750
H	1	CABLE ANCHOR BOX	S760
J	1	BCT CABLE ANCHOR ASSEMBLY	E770
K	1	STRUT	MS785
L	6	6x9 (6x8.5) STEEL POST	P621
M	6	RECYCLED PLASTIC BLOCK OR EQUIV.	CBSP–14
N	1	W–BEAM MGS RAIL SECTION (9'–4 1/2")	G12025
O	2	W–BEAM MGS RAIL SECTION (12'–6")	G1203A
		HARDWARE (ALL DIMENSIONS IN INCHES)	
a	2	5/16 x 1 HEX BOLT GRD 5	B5160104A
b	4	5/16 WASHER	W0516
c	2	5/16 HEX NUT	N0516
d	25	5/8 Dia. x 1 1/4 SPLICE BOLT (POST #2)	B580122
e	2	5/8 Dia. x 9 HEX BOLT A449	B580904A
f	3	5/8 WASHER	W050
g	33	5/8 Dia. H.G.R NUT	N050
h	1	3/4 Dia. x 8 1/2 HEX BOLT GRD A449	B340854A
j	1	3/4 Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	1/2 RSI SHOULDER BOLT W/WASHER	SB12A
n	8	1/2 STRUCTURAL NUT	N012A
o	8	1/2 STRUCTURAL WASHER	W012A
p	1	BEARING PLATE RETAINER TIE	CT–100ST
q	6	5/8" x 10" H.G.R. BOLT	B581002

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 MSKT–TL3–8 CAN BE FLARED AT A RATE OF 25:1 TO PREVENT THE IMPACT HEAD FROM ENCROACHING ON THE SHOULDER. THE FLARE IS NOT REQUIRED AND MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS.
4. THE SOIL TUBES SHALL NOT PROTRUDE MORE THAN 102 mm ABOVE GROUND (MEASURED ALONG A 1.5 m 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 308 mm DIA. POST HOLE, 508 mm INTO ROCK MAY BE USED IF APPROVED BY THE ENGINEER. GRANULAR MATERIAL WILL BE PLACED IN THE BOTTOM OF THE HOLE APPROX. 64 mm DEEP TO PROVIDE DRAINAGE. THE SOIL TUBES WILL BE FIELD CUT TO LENGTH, PLACED IN THE HOLE AND BACKFILLED WITH ADEQUATELY COMPACTED MATERIAL EXCAVATED FROM THE HOLE.
7. THE BREAKAWAY CABLE ASSEMBLY MUST BE TAUT. A LOCKING DEVICE, (VICE–GRIPS OR CHANNEL–LOCK PLIERS) SHOULD BE USED TO PREVENT THE CABLE FROM TWISTING WHEN TIGHTENING NUTS.
8. A SPECIAL SITE EVALUATION SHOULD BE CONSIDERED PRIOR TO USING THE MSKT–TL3–8 WHERE THERE IS LESS THAN 7.620 m BETWEEN THE OUTLET SIDE 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.
12. ALL BOLTS, NUTS, CABLES ASSEMBLIES, CABLE ANCHORS AND BEARING PLATES SHALL BE GALVANIZED.
13. THE LOWER SECTION OF THE POSTS 1 & 2 SHALL NOT PROTRUDE MORE 4 in [100mm] ABOVE THE GROUND (MEASURED ALONG A 5' [1.5M] CORD LONGITUDINAL TO THE SYSTEM). SITE GRADING MAY BE NECESSARY TO TO MEET THIS REQUIREMENT.
14. THE LOWER SECTION OF THE HINGED POST SHOULD NOT BE DRIVEN WITH THE UPPER POST ATTACHED. IF THE POST IS PLACED IN A DRILLED HOLE, THE BACKFILL MATERIAL MUST BE SATISFACTORILY COMPACTED TO PREVENT SETTLEMENT.
15. THE TERMINAL BREAK–AWAY SYSTEM SHALL MEET THE CRASH TEST AND EVALUATION CRITERIA ASSHTO MASH (TL3).
16. THE DETAILS PROVIDED ARE FROM ROAD SYSTEMS INC. THE CONTRACTOR SHALL PROVIDE THE MASH SKT IMPACT HEAD WITH 350 SKT TERMINALS OR EQUAL FROM ANY APPROVED VENDER.
17. DIMENSION IN BRAKETS [ ] ARE METRIC.
18. SEE THE CONTRACT SUPPLEMENTAL SPECIFICATION FOR SECTION 617 FOR ADDITIONAL REQUIREMENTS.

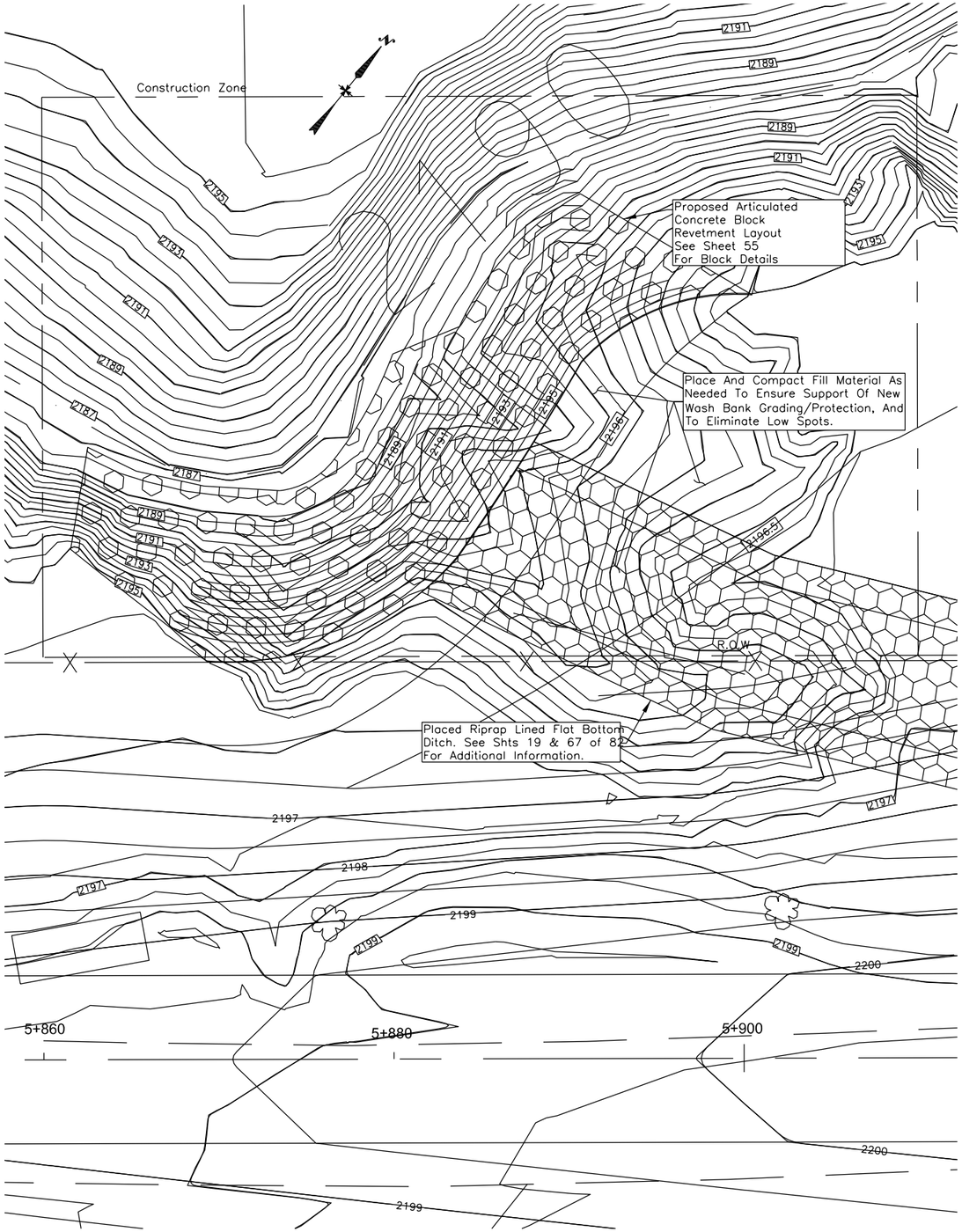


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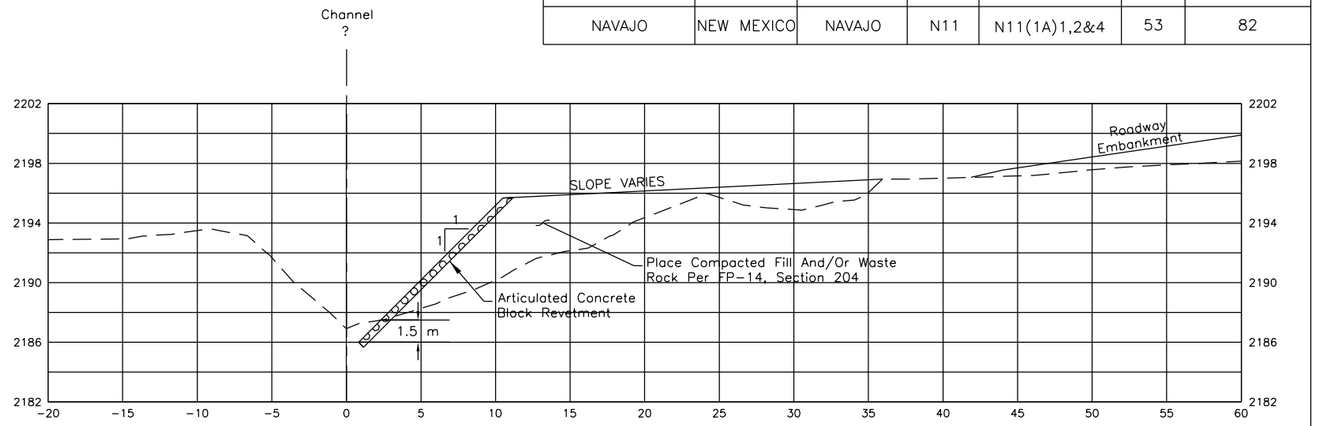
GUARDRAIL END TREATMENT
MSKT–TL3–8 LAYOUT; SHEET 2 of 2

DRAWN BY: NRDOT	DATE: 7/5/2019
DESIGNED BY: NRDOT	DATE: 7/05/2019
REVISED: 11/5/2019	BY: Mjmeyers
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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	53	82



CHANNEL GRADING PLAN
SCALE = 1:100



TYPICAL CHANNEL SECTION
5+862 to 5+900
SCALE = 1:200

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4/14/20

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DEPARTMENT OF THE INTERIOR
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CHANNEL GRADING PLAN

Designed by: WHPacific	**Date:** 5/10
Drawn by: WHPacific	**Date:** 5/10
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)-Channel Grading sht 53	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	54	82

Proposed Articulated Concrete Block Revetment Layout

Temporary Easement

Place And Compact Fill Material As Needed To Ensure Support Of New Wash Bank Grading/Protection, And To Eliminate Low Spots.

WORK REMOVED FROM PROJECT SCOPE

6+000 6+020 6+040 6+060 6+080

CHANNEL GRADING PLAN
SCALE = 1:100

GENERAL NOTES

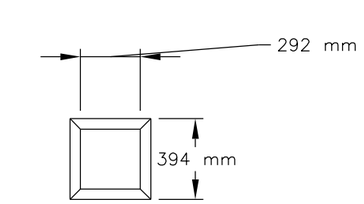
1. See Sheet 52 For Notes.

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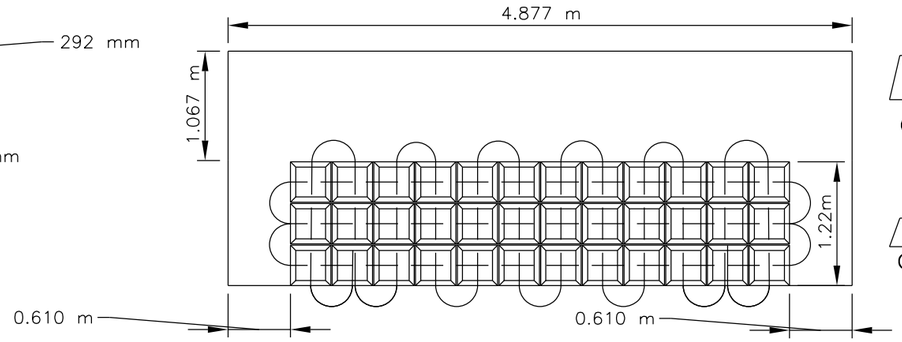
CHANNEL GRADING PLAN

Designed by: WHPacific	**Date:** 5/10
Drawn by: WHPacific	**Date:** 5/10
Revised by: WHPacific	**Date:** 9/11
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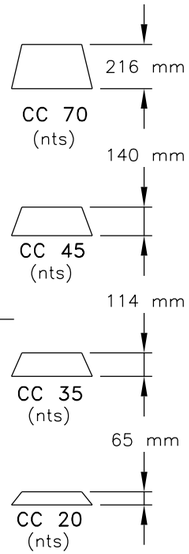
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
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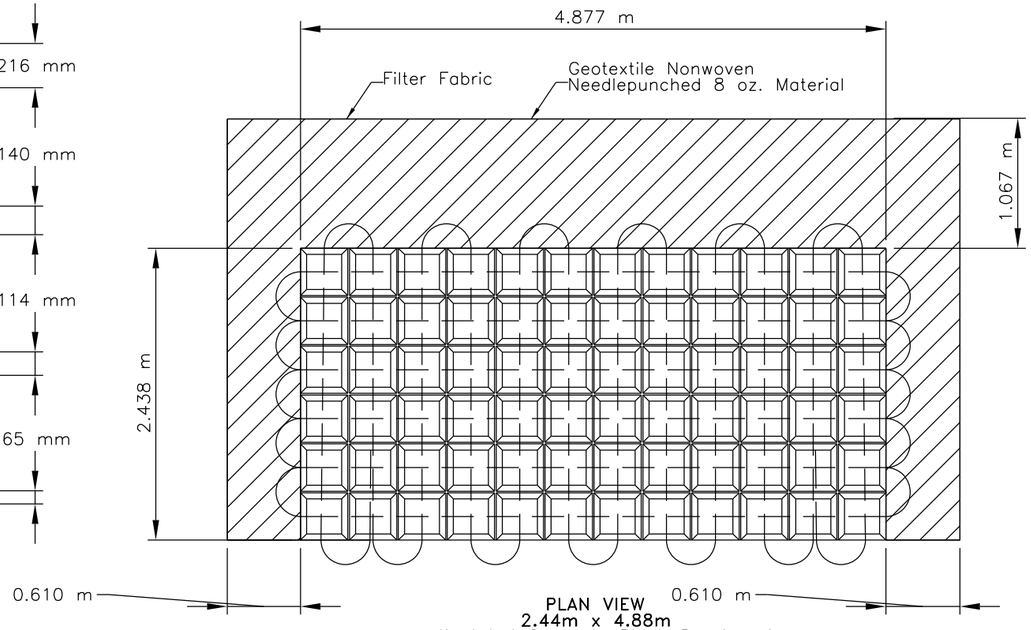


TOP VIEW
Concrete Block (Typ.)

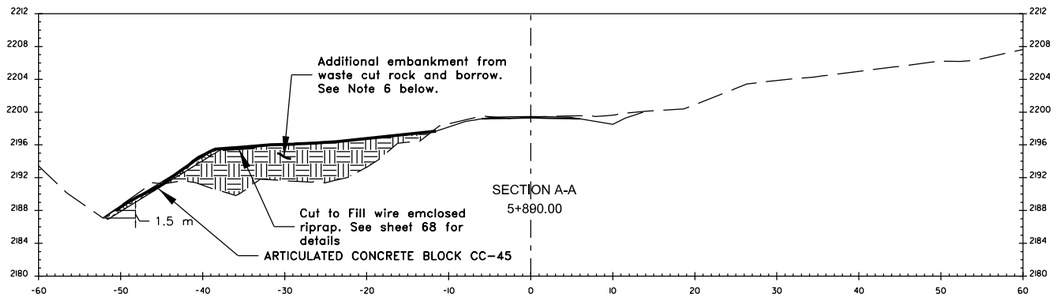


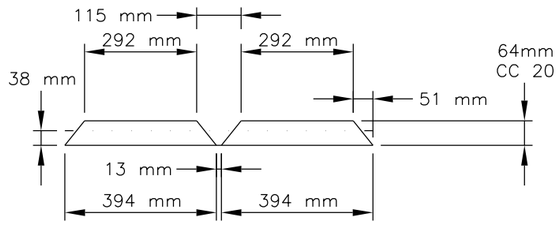
PLAN NEW
1.22m x 4.88m
Articulated Concrete Block Revetment





PLAN VIEW
2.44m x 4.88m
Articulated Concrete Block Revetment
(nts)





Detail "A"
(nts)

ITEM 25112-3000: ARTICULATED CONCRETE BLOCK REVETMENT

LOCATION	AREA (m²)
Sta. 5+862 to 5+900 Lt.	494
TOTAL	494

GENERAL NOTES

1. Workmanship and Materials Shall Conform to the Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects (FP-14), Along with All Supplemental Specifications for This Project.
2. The Quantities Shown are Only an Estimate. Actual Quantities Shall Be Determined in the Field. The Contractor Will Be Required to Make Adjustments to the Articulated Concrete Block Revetment (ACBR) as Necessary to Fit Actual Field Conditions. These Field Adjustments Will Be Incidental Obligations of the Contractor. See sheet 53 for layout details.
3. Channel Grading Shall Be Done in Accordance with the Plans and as Determined By the COTR/COR. All Grading Shall Be Considered Incidental to Completion of the ACBR Installation.
4. Embankment Below ACBR Shall Conform to Section 204 of FP-14. All Embankment For ACBR Above Natural Ground Is Included in the Quantity For Item 20401-0000, Roadway Excavation, and Shall Be Paid For Under That Item. All Excavation For ACBR Installation Shall Be Considered Incidental to Item 25112-3000, Articulated Concrete Block Revetment.
5. ACBR Shall Be Installed In Accordance With Manufacturer's Recommendations.
6. Waste Rock From Roadway Excavations May Be Placed with borrow In Fills Behind Bank Protection At Wash On Lt. Rock To Be Placed As Per FP-14, Section 204 And As Approved By CM. Waste Rock Placement To Be Incidental To Bid Item 20401-0000, Roadway Excavation.

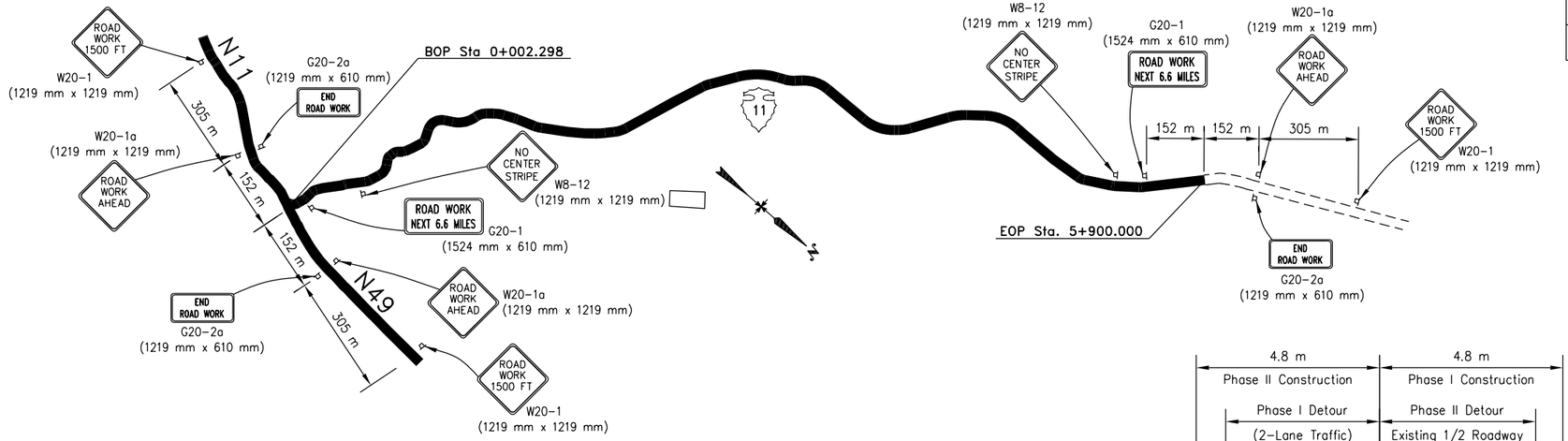


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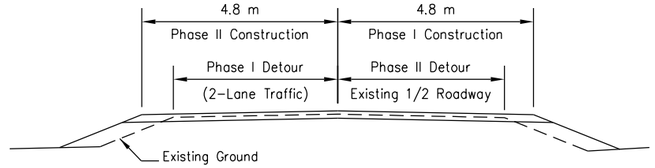
ARTICULATED CONCRETE BLOCK REVETMENT DETAILS

Designed by: NRDOT	Date:
Drawn by: NRDOT	Date:
Revised by: hjr	Date:
File Name: N11(1A)-ACBR detail sht 55.dgn	

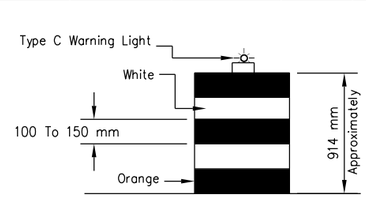
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	56	82



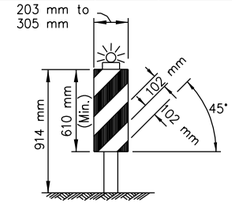
1. The Contractor May Construct Half The New Roadway (Under The Phase Construction Plan Shown) While Detouring Two-Way Traffic On The Other (Existing) Half. Once The First Half of The Roadway Is Built Up To The New Grades, Then Traffic Shall Be Directed To The New Half of Roadway While The Other (Existing) Half is Constructed.
2. All (New) Drainage Pipe Installations Shall Be In Accordance With The Phased Construction Plan Above, As Well As Removal Of Existing Pipes. All the Pipe Installation And Removal Shall Be Considered Incidental To Pipe Items Shown And No Additional Payment Will Be Made.
3. This Phased Construction Shall Be Considered Incidental To The TCP Shown And No Additional Payment Shall Be Made.
4. The Contractor's Construction Sequence Plan And Storm Water Pollution Prevention Plan Shall Reflect This Phased Construction.



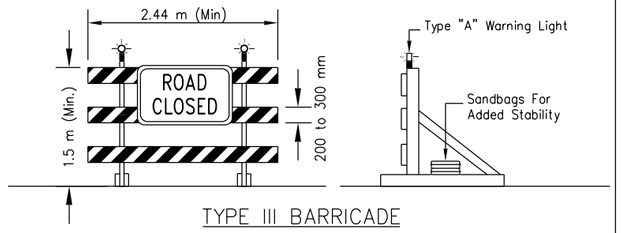
PHASED CONSTRUCTION



DRUM



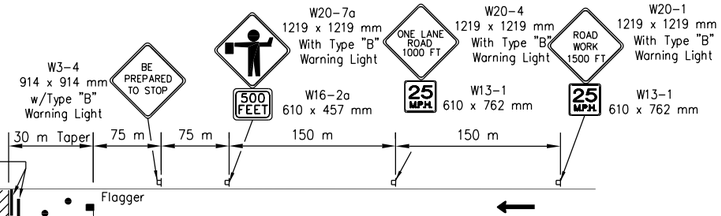
VERTICAL PANEL
(Alternate)

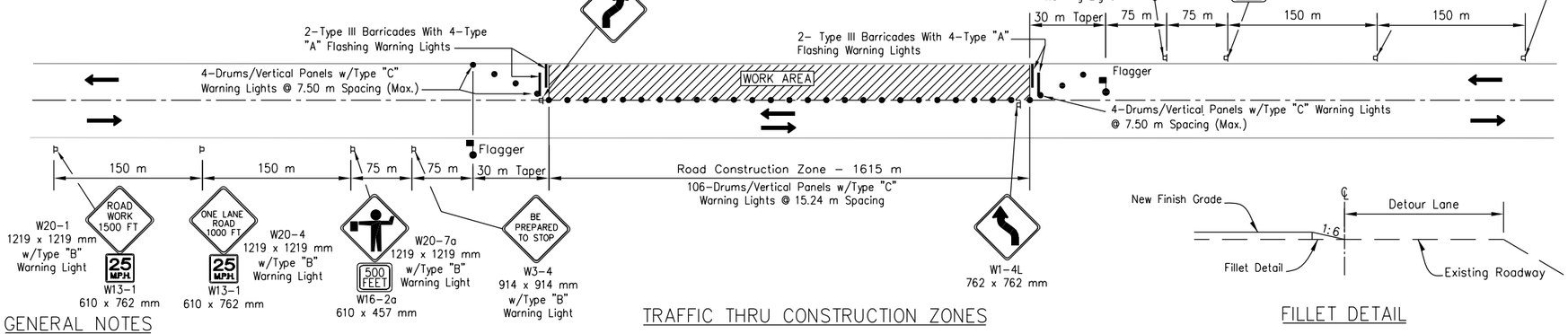


TYPE III BARRICADE

TEMPORARY TRAFFIC CONTROL DEVICES

DESIGNATION	DETAIL	MINIMUM SIZE (mm)	DESIGNATION	DETAIL	MINIMUM SIZE (mm)
W20-1	ROAD WORK 1500 FT	1219 x 1219	W1-4R W1-4L		762 x 762 762 x 762
W20-1a	ROAD WORK AHEAD	1219 x 1219	W16-2a	500 FEET	610 x 457
W20-4	ONE LANE ROAD 1000 FT	1219 x 1219	G20-2a	END ROAD WORK	1219 x 610
W20-7a		1219 x 1219	Type III Barricade		As Shown
W13-1	25 M.P.H.	610 x 762	R11-2	ROAD CLOSED	1219 x 762
Drums or Vertical Panels		As Shown	W8-12	NO CENTER STRIPE	1219 x 1219
Type A Warning Lights		N/A	G20-1	ROAD WORK NEXT 6.6 MILES	1524 x 610
Type C Warning Lights		N/A	W3-4	BE PREPARED TO STOP	914 x 914



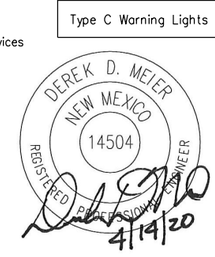


TRAFFIC THRU CONSTRUCTION ZONES

FILLET DETAIL

GENERAL NOTES

1. All Traffic Control Devices Shall Be in Accordance With the MUTCD (Latest Edition and Amendments) and the Supplemental Specifications for This Project.
2. 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-14, and the MUTCD Under Contract Item 63501-0000. Any Additional Traffic Control Devices Called For on the Contractor's TCP Will Not Be Measured For Payment But Shall Be Considered Incidental to the Bid Items For Traffic Control Shown in the Bid Schedule. See the Supplemental Specifications For Additional Requirements.
3. Signs W20-1a, G20-1 and G20-2a Shall Be Placed at the Project Limits and Remain in Place Through the Duration of the Project.
4. Flaggers Shall Be Stationed Left & Right As Shown When Equipment Is Crossing or Working Within the Existing Roadway Prism.
5. In Areas of Existing Roadway Widening And/Or Crossed By The General Public, the Contractor Shall Ensure That No Pavement Drop-Offs Are Left Exposed During Non-Working Hours. The Contractor Shall Initiate Corrective Means to Achieve a 1:6 Or Flatter Slope As Shown in the Fillet Detail.
6. At the End of Each Working Day, It Will Be the Contractor's Responsibility to Provide a Driving Surface Free of Obstructions. Access to All Adjoining Properties and BIA/County System Routes Shall Be Maintained at All Times (Day and Night).
7. All Traffic Control Devices (Except at Detour Road Locations and as Noted in Above Note #3) Such as Construction Signs, Drums, Barricades, etc., Shall Be Removed to a Location at Least Nine (9) Meters From the Edge of the Shoulder When Construction Is Not in Progress.
8. 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.
9. 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.
10. The Contractor Has the Option to Utilize Detour Roads in Accordance With the MUTCD in Conjunction With or in Lieu of Using the "Traffic Thru Construction Zones" Details Shown on this Plan and in Accordance With Section 107 and 204. The Cost of Any Detour Roads (Including All Detour Related Earthwork and Maintenance) Shall Be Considered Incidental to the Temporary Traffic Control Bid Items. The Contractor Is Responsible For All Necessary Permits and Clearances For Any Detour Roads.
11. It is the Responsibility of the Contractor to Maintain the Existing Roadway And/Or Detour in a Drivable Condition During Construction. This Work is Considered Incidental to Item 63501-0000.
12. At Locations Where New Road Construction Intersects Existing Roadways And At Tie-Ins With Existing Roads at The End of of The New Construction, Special Traffic Control Procedures Shall be Included as Needed in The Contractor's TCP. These Include But Are Not Necessarily Limited to The following: Type III Barricades With "Road Closed"/Detour Signs; Flaggers; Drums, Etc.
13. The Traffic Control on This Project Shall Be Coordinated With The Project Construction Schedule. The Contractor's TCP Shall Reflect This Coordination.



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TEMPORARY TRAFFIC CONTROL PLAN

Designed by: WHPacific **Date:** 12/09
Drawn by: WHPacific **Date:** 12/09
Revised by: WHPacific **Date:** 09/11
File Name: N11(1A)-Trafcntrl sht 56.dgn

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	57	82

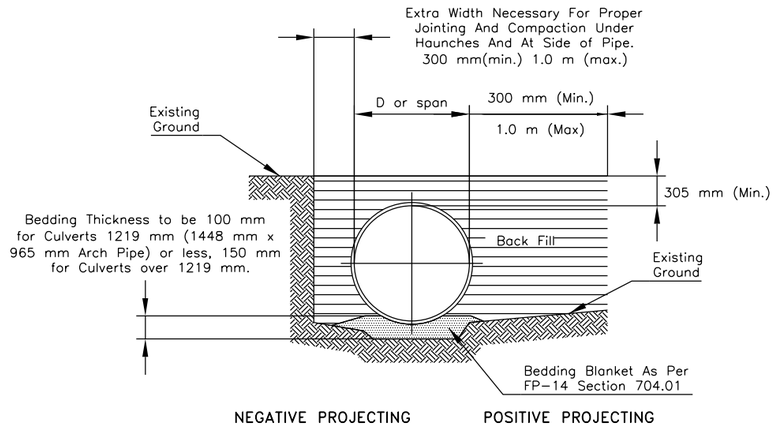


FIGURE A: BEDDING

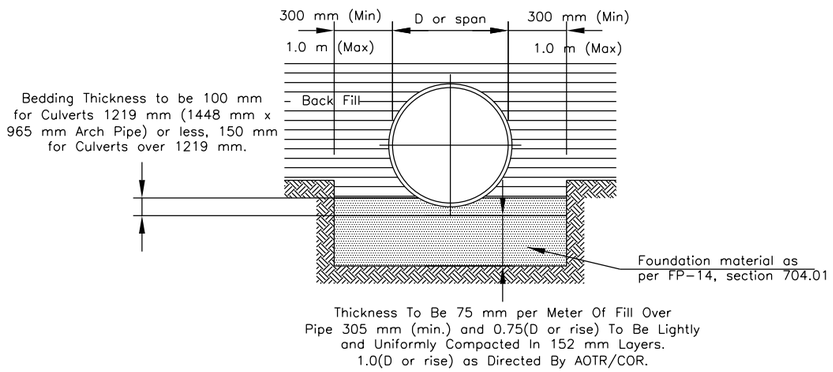


FIGURE B: ROCK BEDDING

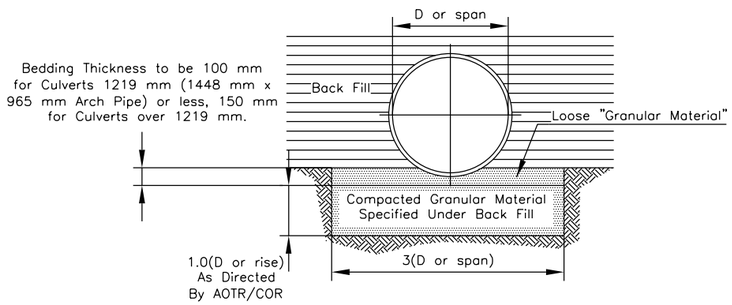
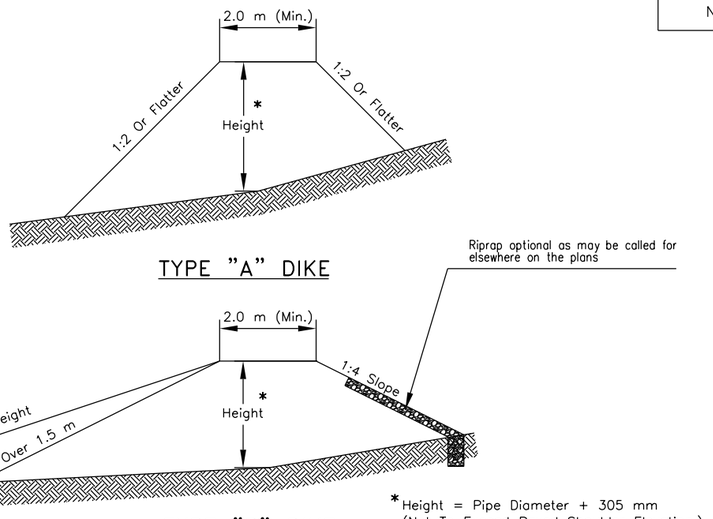


FIGURE C: FOUNDATION STABILIZATION BEDDING

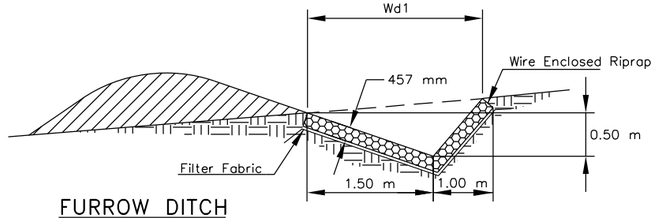


TYPE "A" DIKE

TYPE "B" DIKE

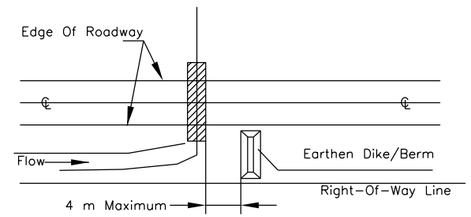
*Height = Pipe Diameter + 305 mm (Not To Exceed Paved Shoulder Elevation.)

EARTHEN DIKE/BERM DETAILS



FURROW DITCH

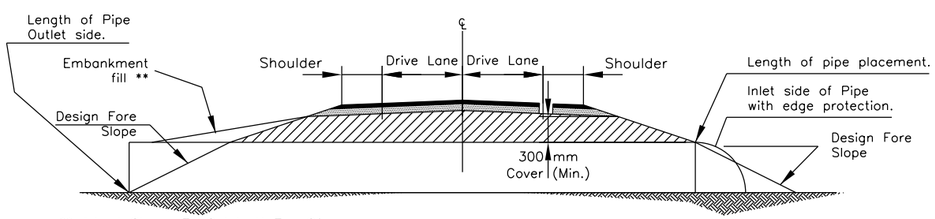
1. To Be Paid For By The Meter.
2. Furrow Ditch Sections As Shown Above Or An Approved Equivalent Shall Be Built As Directed By The CM.
3. Install Riprap in Furrow Ditch Only Where Directed in the Plans.
4. Payment Will Be Made Separately for the Furrow Ditch and the Riprap Lining Under Items 20425-2000 and 25112-2000 Respectively.
5. See Sheet 67 For Additional Riprap Notes.



EARTHEN DIKE/BERM INSTALLATION AT STRUCTURE

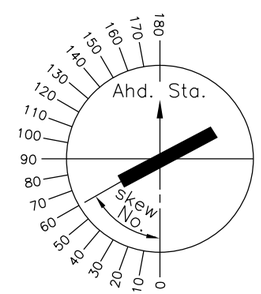
1. Earthen Dike/Berm At Structures To Be So Placed That They Create A Water Cushion. Elevation Top Of Earthen Dike/Berm Shall Be 305 mm Above Elevation Of Top Of Pipe Unless Otherwise Shown Or Directed by the CM.
2. Earthen Dike/Berm Shall Be Located A Distance Equal To The Largest Dimension Of Box Culvert Or Pipe from the Face of the Drainage Structure. In No Case Shall The Distance Exceed 4.0 m.

NOTE: Pipe Bedding And Backfill Material Shall Be Tested For Resistivity Each Pipe Location. The Minimum Acceptable Resistivity To Be 2000 Ohm-cm.



TYPICAL PIPE INSTALLATION- MAINLINE SHOWN

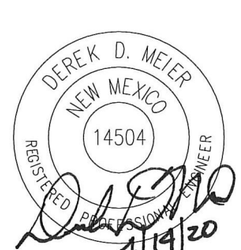
Turnout/Driveway, use 2-End Sections



STRUCTURE SKEW DIAGRAM

GENERAL NOTES

1. PLACE LOOSE BEDDING ROUGHLY SHAPED TO AT BOTTOM OF PIPE, THEN COMPACT UNDER HAUNCHES AFTER PIPE PLACEMENT.
2. SEE SECTION 204,209,602, AND 704 OF FP-14, INCLUDING THE SUPPLEMENTAL SPECIFICATION FOR ADDITIONAL NOTES.
3. ALL DRAINAGE STRUCTURE MATERIAL SHALL BE UNLOADED AND HANDLED WITH REASONABLE CARE. NO STRUCTURE SHALL BE DRAGGED OR ALLOWED TO STRIKE ANY HARD SURFACE DURING PLACEMENT. ANY DAMAGED STRUCTURE SHALL BE REPAIRED OR REPLACED, BY THE CONTRACTOR, AT NO ADDITIONAL COST TO THE GOVERNMENT.
4. ALL STRUCTURAL PLATE PIPE STRUCTURES SHALL BE ASSEMBLED AND INSTALLED IN ACCORDANCE WITH THE FABRICATORS RECOMMENDATION.
5. BACKFILL MATERIAL SHALL BE PLACED 300 mm (min) 1.0 m (max) PIPE DIAMETER WIDTH ON THE SIDES AND 0.30 m OVER THE PIPE. BACKFILL MATERIAL BEYOND THE 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.
6. PONDING OR JETTING PIPE BACKFILL SHALL NOT BE PERMITTED.
7. ALL PIPE EXCAVATION, BACKFILLING, DE-WATERING PUMPING OR COFFERDAMS REQUIRED TO PROPERLY INSTALL THE DRAINAGE PIPE SHALL BE CONSIDERED INCIDENTAL TO COMPLETION OF THE PROJECT AND NO ADDITIONAL PAYMENT SHALL BE MADE.
8. ALL PIPES SHALL BE PROTECTED BY A COVER OF NOT LESS THAN 0.91 m OF EMBANKMENT ABOVE PIPE BEFORE ANY HEAVY EQUIPMENT IS ALLOWED TO PASS OVER THE STRUCTURE(S) DURING CONSTRUCTION.
9. ALL CULVERTS 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 BE PLACED BELOW THE ORIGINAL GROUND ELEVATIONS.
10. ALL CULVERTS UNDER TURNOUT AND DRIVEWAYS SHALL BE PLACED AT THE PROPOSED DITCH FLOWLINE. THE CONTRACTOR SHALL BE REQUIRED TO FIELD ADJUST THE PROFILE GRADES OVER THE PIPE AS DIRECTED BY CM TO PROVIDE FOR THE MINIMUM COVER.
11. TYPE "B" DIKE SHALL BE USED ON THIS PROJECT UNLESS OTHERWISE NOTED ON THE PLANS. EMBANKMENT MATERIAL NEEDED TO BUILD EARTHEN DIKE SHALL BE CONSIDERED INCIDENTAL TO ITEM 20443-2000.



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STANDARD PIPE INSTALLATION AND DITCH DETAILS

Designed by: NRDOT	**Date:** 1/91
Drawn by: NRDOT	**Date:** 1/91
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)-PID sht 57	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	58	82

SINGLE POST REQUIREMENT CHART

K factor (B x A)	POST WEIGHT	B = Height To Bottom Of Traffic Sign + 1/2 Height Of Traffic Sign (Meter)										
		1.83	2.13	2.44	2.74	3.05	3.35	3.66	3.96	4.27	4.57	4.87
DOES NOT APPLY	2.976 kg/m	0.36	0.36	0.36	0.36	0.36	0.36	0.34	0.32	0.30	0.27	0.26
	3.348 kg/m	0.47	0.47	0.47	0.47	0.47	0.43	0.39	0.36	0.33	0.32	0.30
	4.092 kg/m	0.62	0.62	0.62	0.62	0.62	0.56	0.51	0.47	0.44	0.41	0.38
	4.464 kg/m	0.68	0.68	0.68	0.68	0.68	0.68	0.62	0.58	0.52	0.47	0.46
	5.952 kg/m	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.80	0.74	0.70	0.65

A (m^2) SIGN AREA (W x D)

DOUBLE POST REQUIREMENT CHART

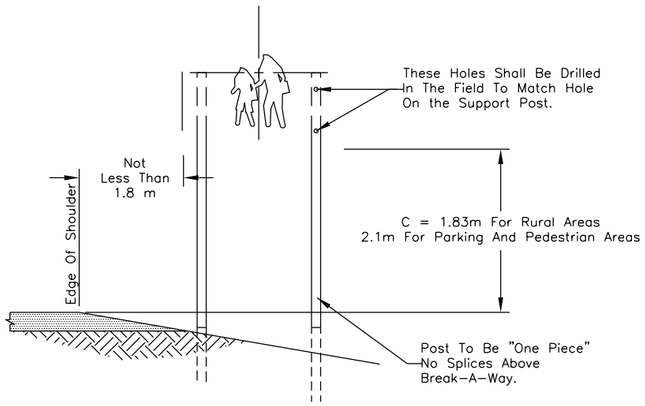
K factor (B x A)	POST WEIGHT	B = Height To Bottom Of Traffic Sign + 1/2 Height Of Traffic Sign (Meter)										
		1.83	2.13	2.44	2.74	3.05	3.35	3.66	3.96	4.27	4.57	4.87
2.74	2.976 kg/m	1.50	1.28	1.12	1.00	0.90	0.82	0.75	0.70	0.64	0.60	0.57
3.08	3.348 kg/m	1.69	1.45	1.27	1.13	1.01	0.92	0.85	0.78	0.72	0.68	0.63
4.03	4.092 kg/m	2.20	1.89	1.65	1.47	1.32	1.20	1.10	1.01	0.94	0.88	0.83
4.91	4.464 kg/m	2.69	2.31	2.03	1.79	1.62	1.47	1.35	1.24	1.15	1.08	1.01
6.83	5.952 kg/m	3.73	3.20	2.80	2.49	2.24	2.03	1.87	1.72	1.60	1.50	1.40

A (m^2) SIGN AREA (W x D)

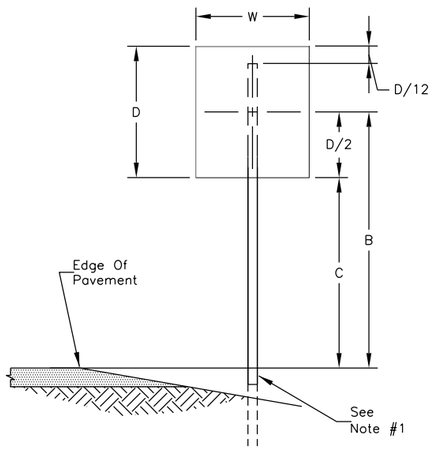
THREE POST REQUIREMENT CHART

K factor (B x A)	POST WEIGHT	B = Height To Bottom Of Traffic Sign + 1/2 Height Of Traffic Sign (Meter)										
		1.83	2.13	2.44	2.74	3.05	3.35	3.66	3.96	4.27	4.57	4.87
4.12	2.976 kg/m	2.25	1.92	1.68	1.50	1.35	1.23	1.12	1.04	0.97	0.90	0.85
4.65	3.348 kg/m	2.54	2.17	1.90	1.69	1.52	1.38	1.27	1.17	1.09	1.01	0.96
6.02	4.092 kg/m	3.30	2.82	2.47	2.19	1.98	1.79	1.64	1.52	1.41	1.32	1.24
7.40	4.464 kg/m	4.04	3.47	3.03	2.69	2.42	2.20	2.02	1.86	1.73	1.62	1.51
10.20	5.952 kg/m	5.58	4.78	4.19	3.73	3.35	3.05	2.79	2.57	2.40	2.23	2.09

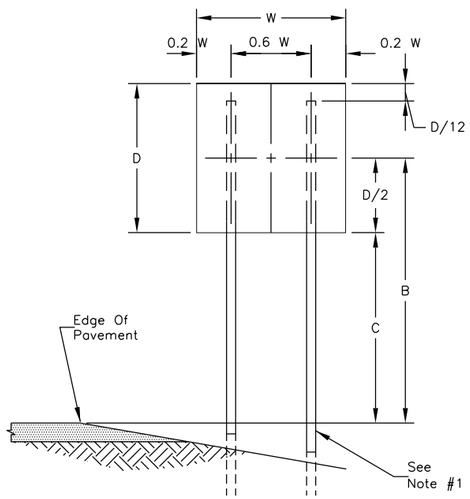
A (m^2) SIGN AREA (W x D)



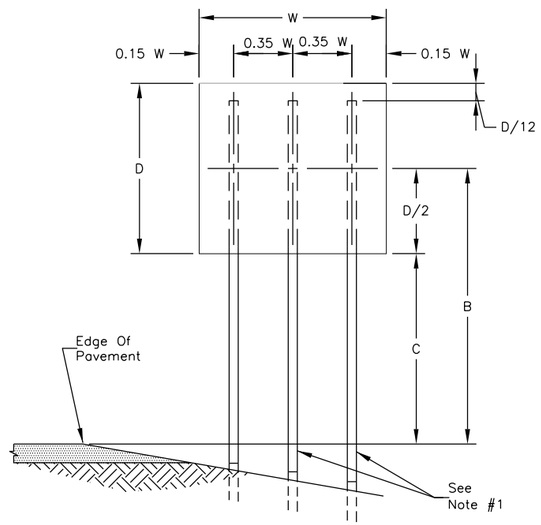
TYPICAL ROADSIDE SIGN LOCATION



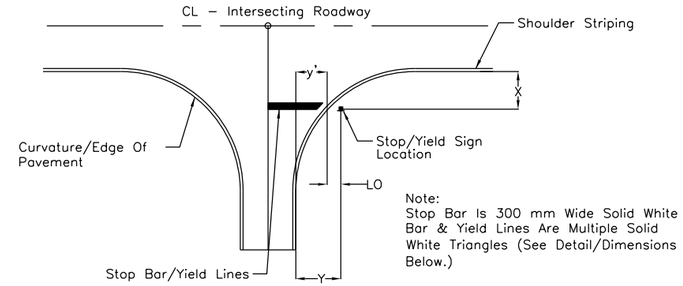
SINGLE POST SIZE (TYP.)



DOUBLE POST SIZE (TYP.)



THREE POST SIZE (TYP.)



y' = The Lateral Projection From Roadway EOP (Tangential) To Curvature\EOP.

Lateral Offset (LO) Is The Lateral Projection From Curvature\EOP To Sign Location = 1.80 m.

STOP\YIELD SIGN LOCATION TABLE

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 EXCESS OF 762 mm X 762 mm SIZE SHALL BE INSTALLED WITH A MINIMUM OF TWO (2) STEEL POSTS.

METHOD TO DETERMINE NUMBER OF POST(s) & POST WEIGHT REQUIREMENT:

For A 1.52 m Wide x 1.22 m High Traffic Sign.
Located On A Rural Highway.

GIVEN: W= 1.52 m
D= 1.22 m
C= 1.83 m For Rural Areas

SOLUTION: 1.) B = C + D/2
B= 1.83 + (1.22/2)
B= 2.44 m

2.) A = W x D
A= 1.52 x 1.22
A= 1.85 sq. m

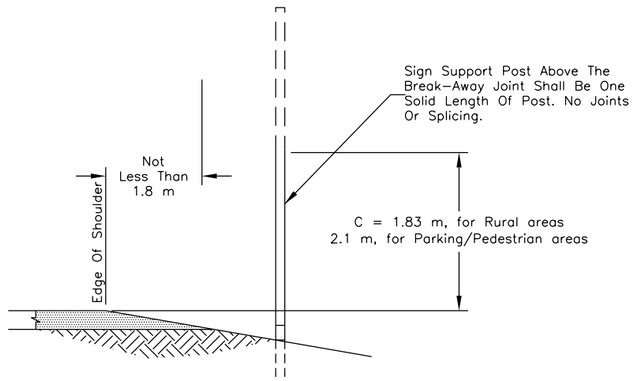
3.) K factor = A x B
K factor= 1.85 x 2.44
K factor= 4.51 cu. m

4.) Begin With The Single Post Chart For Column Of B= 2.44 m, And Continue Down Until The Area Of The Sign Equals Or Exceeds 1.85 sq. m, OR Down The K factor Column Until The Value Equals or Exceeds 4.51 cu. m. Both The Area & K factor Exceed The Single Post Chart So Go To The Double Post Chart.

Select Two (2) Posts Of 4.46 kg/m Yields A Factor Of 4.91 Which Is Optimum.

EXAMPLE:

K factor	POST WEIGHT	2.44
4.03	4.09 kg/m	1.65
4.51 -> 4.91	4.46 kg/m	2.03 <- 1.85
6.83	5.95 kg/m	2.80



TYPICAL ROADSIDE SIGN LOCATION

DEREK D. MEIER
NEW MEXICO
14504
REGISTERED PROFESSIONAL ENGINEER
4/14/20

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

PERMANENT SIGNING DETAILS

Designed by: NRDOT	**Date:** 1/05
Drawn by: NRDOT	**Date:** 1/05
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)-SGN1 sht 58	

Y (m)=

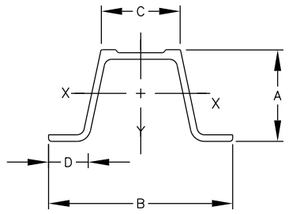
RADIUS OF TURNOUT (m) Y (m) rd (m) rd+LO (m) LENGTH OF STOP BAR

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	59	82

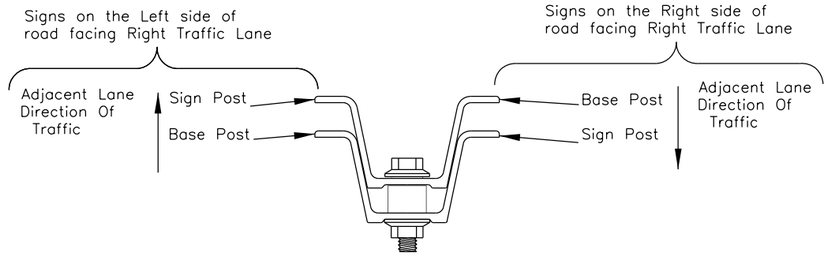
RIB–BAK U–CHANNEL SIGN SUPPORTS

WEIGHT	DIMENSIONS (mm)				AREA	X–X AXIS		Y–Y AXIS	
*kg/m	A	B	C	D	mm^2	$I(mm^4)$	$S(mm^3)$	$I(mm^4)$	$S(mm^3)$
2.97	38.30	76.91	33.12	16.10	54.83	81.99	42.27	195.62	50.96
3.71	38.68	79.35	33.15	18.33	51.28	103.22	51.29	249.73	62.92
4.08	39.47	78.77	32.72	16.94	55.74	112.38	54.89	278.04	70.62
4.45	48.34	85.85	33.73	18.42	62.45	188.65	73.24	374.60	87.34
5.94	50.27	85.78	34.04	19.10	80.77	260.14	97.99	476.58	111.10

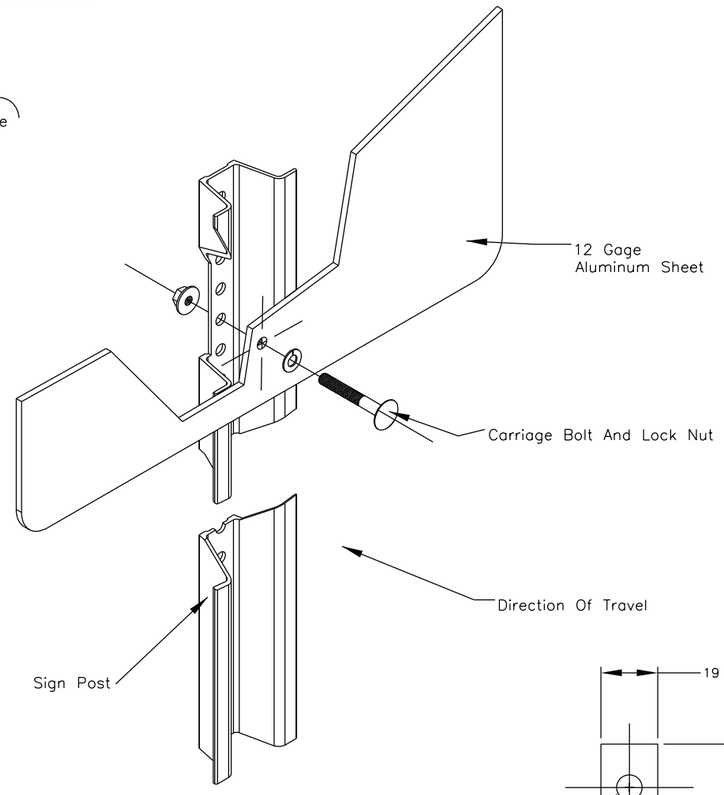
* ±5%

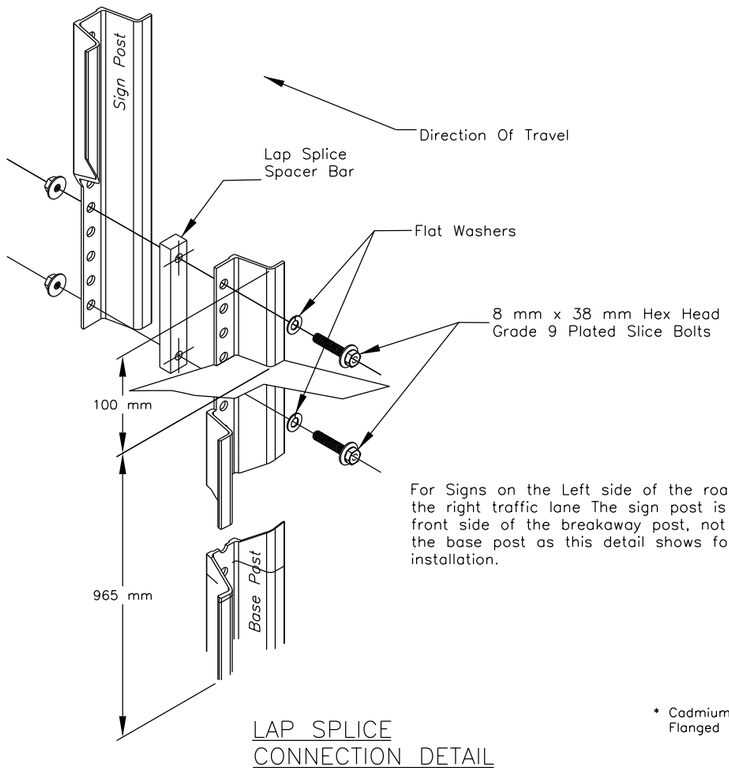


RIB–BAK U–CHANNEL



LAP SPLICE – TOP VIEW

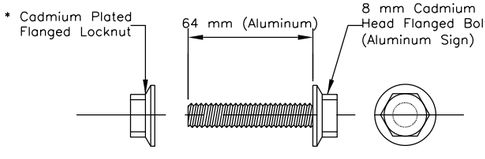




For Signs on the Left side of the road which face the right traffic lane The sign post is place on the front side of the breakaway post, not on the back of the base post as this detail shows for standard sign installation.

LAP SPLICE CONNECTION DETAIL

NOTE: After Final Installation and Tightening, All Posts and Sign Bolt Threads Shall Be "Jammed" To Help Prevent Loosening. Jamming Shall Not Be So Severe As To Prevent Nut Removal.

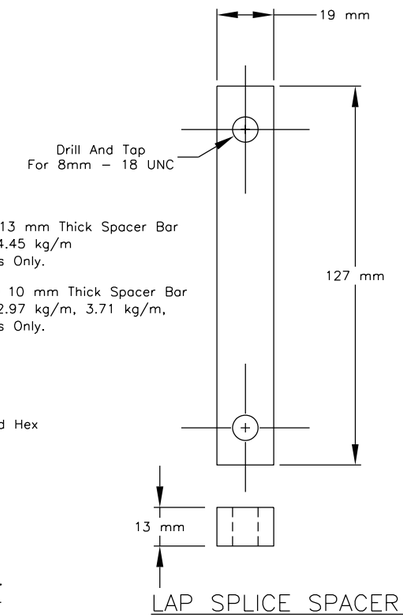


BOLTS AND LOCKNUT – SIGN ATTACHMENT

* Flanged Locknut Required For Carriage And Hex.

NOTE: The GOLD ANODIZED 13 mm Thick Spacer Bar Is To Be Used With 4.45 kg/m And 5.94 kg/m Posts Only.

The SILVER ANODIZED 10 mm Thick Spacer Bar Is To Be Used With 2.97 kg/m, 3.71 kg/m, And 4.08 kg/m Posts Only.



LAP SPLICE SPACER BAR

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 AND TENSILE STRENGTH OF STEEL SHALL BE 550 AND 689.47 MPa (MINIMUM), RESPECTIVELY.
2. STEEL POSTS SHALL BE UNIFORM, MODIFIED, FLANGED CHANNEL SECTION OF RIB–BAK DESIGN. WEIGHT OF THE STEEL SHALL BE AS SPECIFIED BY THE USER, ±5% BEFORE PUNCHING. THE POST SHALL BE PUNCHED WITH CONTINUOUS 9mmø HOLES ON 25mm INTERVAL ON CENTERS FOR THE ENTIRE LENGTH OF POST.
3. STEEL POSTS SHALL BE MACHINE STRAIGHTENED TO HAVE A SMOOTH UNIFORM FINISH, FREE FROM DEFECTS AFFECTING STRENGTH, DURABILITY, AND APPEARANCE. ALL HOLES AND EDGES SHALL BE FREE OF BURRS. THE PERMISSIBLE TOLERANCE FOR STRAIGHTNESS SHALL BE WITHIN 6.35mm IN 1.52 METER.
4. STEEL POSTS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM 123 BOLTS, NUTS, AND WASHERS SHALL BE CADMIUM PLATED IN ACCORDANCE WITH ASTM A–165 OR ZINC PLATED IN ACCORDANCE WITH ASTM B–633.
5. SPLICE HARDWARE SHALL CONSIST OF TWO FULLY THREADED, 8mm X 38mm GRADE–9 PLATED HEX HEAD BOLTS, FLAT WASHERS, AND SELF LOCKING HEX NUTS PER POST. IN ADDITION, ONE 19mm X 127mm PLATED SPACER BAR PER POST, TO STIFFEN THE SPLICE CONNECTION. EACH SPACER SHALL BE DRILLED AND TAPPED WITH 8mm–18 UNC THREADS. THE SPACER SHALL BE FABRICATED FROM HOT ROLLED CARBON STEEL BAR CONFORMING TO ASTM A–36 OR M–1020.
6. BOLTS AND LOCK NUT HARDWARE FOR SIGN ATTACHMENT SHALL BE CARRIAGE HEAD TYPE, 8mm–18 UNC, AND SHALL BE CADMIUM PLATED CONFORMING TO ASTM B–766.
7. AN APPROVED ALTERNATE BREAKAWAY SYSTEM AND SIGN SUPPORT POST ASSEMBLY MAY BE SUBMITTED TO THE COR/AOTR FOR REVIEW AND APPROVAL PRIOR TO IT'S USE.
8. THE CONTRACTOR HAS THE OPTION TO USE "ANTI–THEFT" NUTS IN LIEU OF JAMMING THE BOLT THREADS. NO ADDITIONAL PAYMENT WILL BE MADE IN RELATION TO USING ANTI–THEFT BOLTS.
9. SUPPLEMENTAL SIGNS ON THE OPPOSITE SIDE OF ROADWAY SHALL HAVE THE U–CHANNEL REVERSED SO THAT RIB–BAK IS FACING AWAY FROM THE OPPOSING TRAFFIC.

INSTALLATION PROCEDURE

STEP 1:
DRIVE BASE POST TO WITHIN APPROXIMATELY 300 mm 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 100 mm 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 50 mm 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.

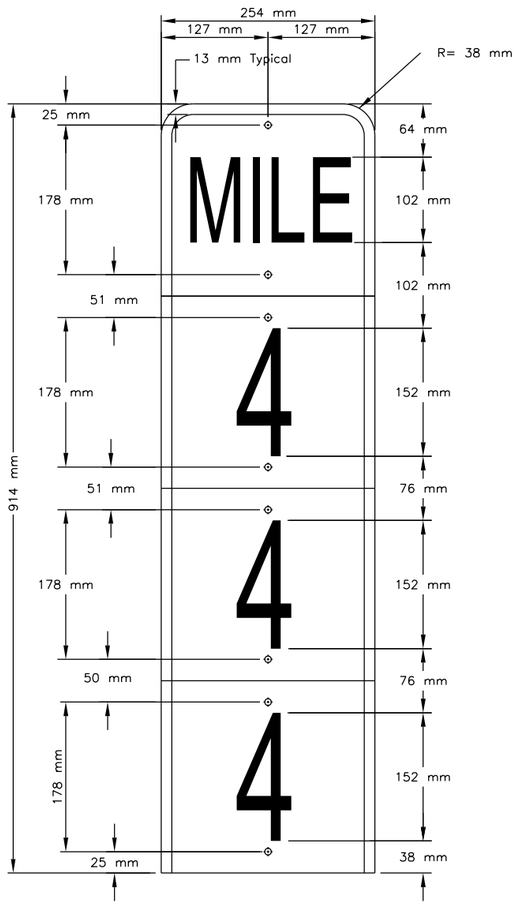


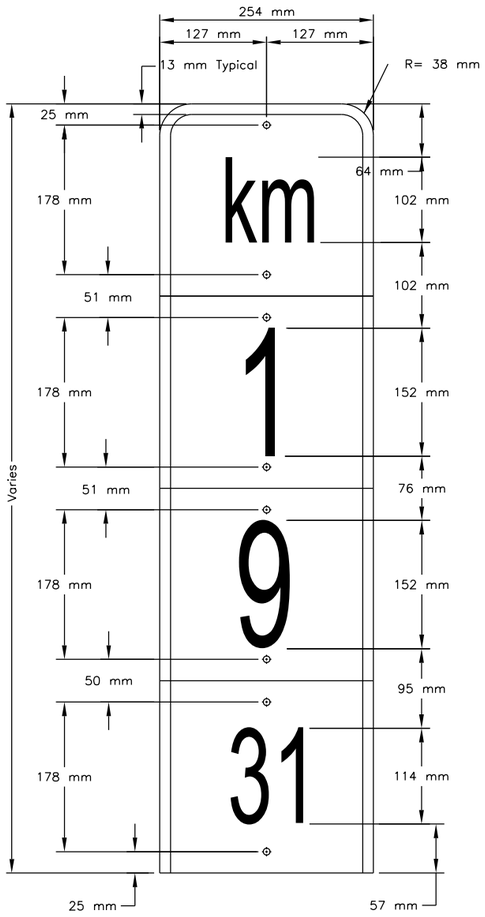
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS
NAVAJO REGION OFFICE * DIVISION OF TRANSPORTATION

LAP SPLICE U-CHANNEL BREAKAWAY SYSTEM POST & HARDWARE DETAILS

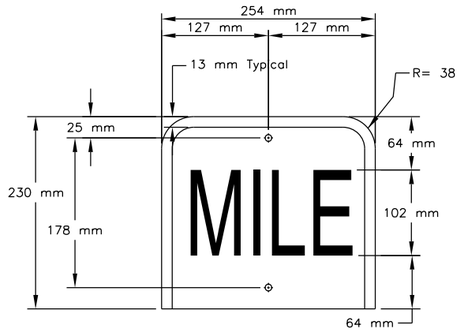
Designed by: NRDOT	**Date:** 7/00
Drawn by: NRDOT	**Date:** 7/00
Revised by: NRDOT	**Date:** 2/08
File Name: N11(1A)–SGN2 sht 59	

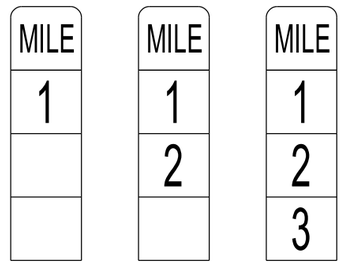
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	60	82





TYPICAL MILEPOST DETAIL

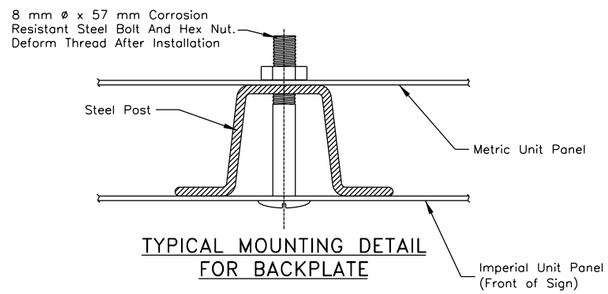




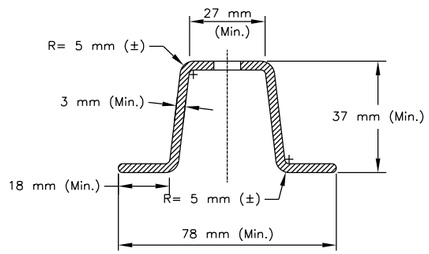
STANDARD NUMERAL POSITION

GENERAL NOTES

1. THE MILEPOST MARKER SHALL BE PLACED ON BOTH SIDES OF THE ROADWAY WITH IMPERIAL UNITS PANEL ON APPROACHING TRAFFIC SIDE, AND THE METRIC UNITS PANEL ON OPPOSING TRAFFIC SIDE.
2. MILEPOST PLATES SHALL BE FABRICATED FROM 16 GAGE MINIMUM THICKNESS 5052-H38 OR 6061-T6 ALUMINUM ALLOY.
3. ALL SURFACES TO BE COVERED WITH RETRO REFLECTIVE SHEETING, AND SHALL BE PREPARED IN ACCORDANCE WITH SUPPLEMENTAL SPECIFICATION SECTION 718.01, TABLE 633-1.
4. THE BORDER AND LEGEND SHALL BE STANDARD SILVER-WHITE COLOR. THE BACKGROUND COLOR SHALL BE STANDARD GREEN AND/OR REVERSE SILK-SCREENED.
5. THE BACK SIDE OF THE ALUMINUM SHEET SHALL BE ETCHED BY APPROVED METHOD TO REDUCE GLARE FROM REFLECTED LIGHT.
6. STEEL POSTS SHALL CONFORM TO ASTM A570 GRADE 30, 36 OR 40 AND SHALL NOT WEIGH LESS THAN 2.98 kg/m. AN APPROVED ALTERNATE BREAKAWAY ASSEMBLY MAY BE SUBMITTED TO THE CM FOR REVIEW AND APPROVAL PRIOR TO IT'S USE. THE POST SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A-123, OR PAINTED WITH A BAKED-ON ALKYD RESIN, OR PAINTED WITH A POLYESTER POWDER.
7. INSTALL MILEPOST MARKER 1.80 METER (MINIMUM) FROM ROADWAY SHOULDER. AT GUARDRAIL LOCATIONS, THE MILEPOST MARKER SHALL LINE UP WITH THE GUARDRAIL POSTS.
8. THE POST LENGTHS SHALL BE DETERMINED IN THE FIELD BASED ON FINISH GROUND ELEVATION WITH RESPECT TO EDGE OF PAVEMENT ELEVATION.
9. MILEPOSTS SHALL USE A BREAKAWAY POST DESIGN. FOR SIGN LAP SPLICE DETAILS SEE SHEET 59.



TYPICAL MOUNTING DETAIL FOR BACKPLATE

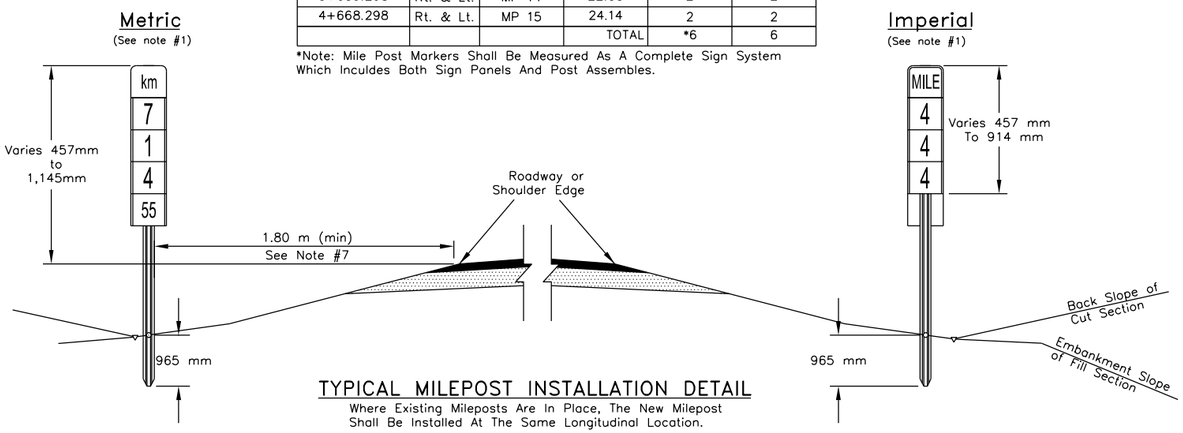


SECTION A-A

ITEM 63318-1000: MILEPOSTS, 1-POST & HARDWARE: 2.98 kg/m

STATION	LOCATION	DESCRIPTION		QUANTITY (Ea)	
		MILES	KILOMETERS	ENGLISH	METRIC
1+450.298	Rt. & Lt.	MP 13	20.92	2	2
3+059.298	Rt. & Lt.	MP 14	22.53	2	2
4+668.298	Rt. & Lt.	MP 15	24.14	2	2
			TOTAL	*6	6

*Note: Mile Post Markers Shall Be Measured As A Complete Sign System Which Inculdes Both Sign Panels And Post Assembles.



TYPICAL MILEPOST INSTALLATION DETAIL

Where Existing Mileposts Are In Place, The New Milepost Shall Be Installed At The Same Longitudinal Location.

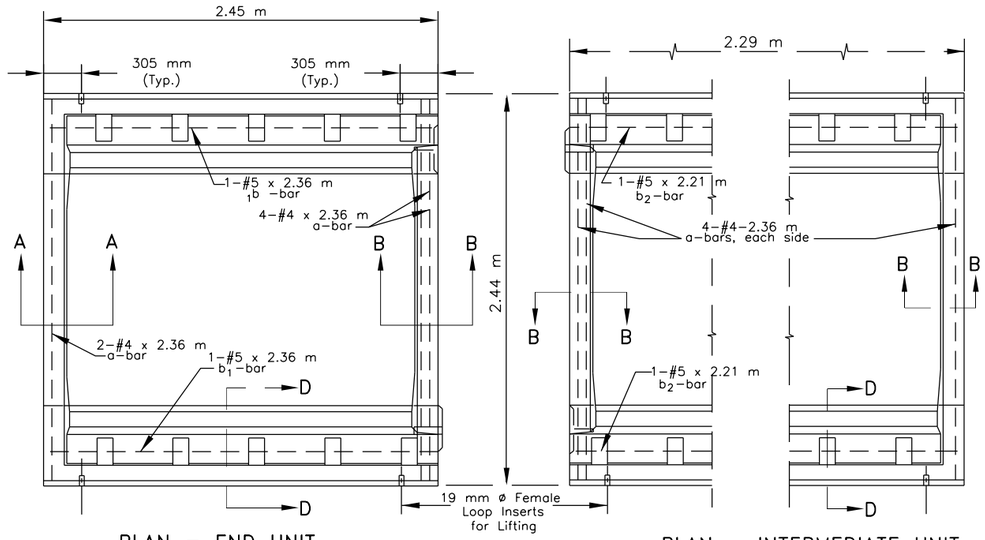


UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS
NAVAJO REGION OFFICE * DIVISION OF TRANSPORTATION

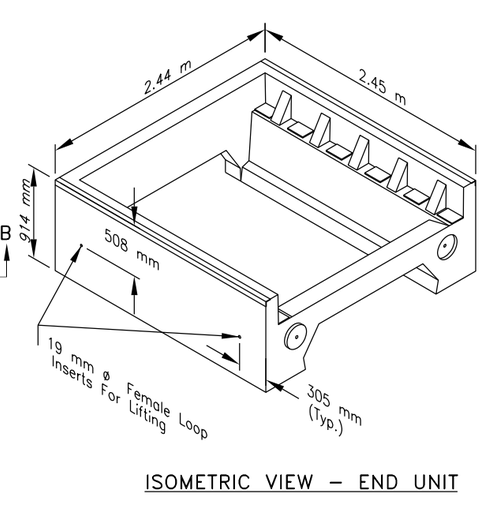
STANDARD MILEPOST DETAILS

Designed by: NRDOT	**Date:** 2/07
Drawn by: NRDOT	**Date:** 2/07
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)-MP sht 60	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	61	82



PLAN – END UNIT



PLAN – INTERMEDIATE UNIT

ISOMETRIC VIEW – END UNIT

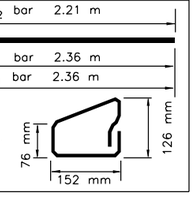
GENERAL NOTES

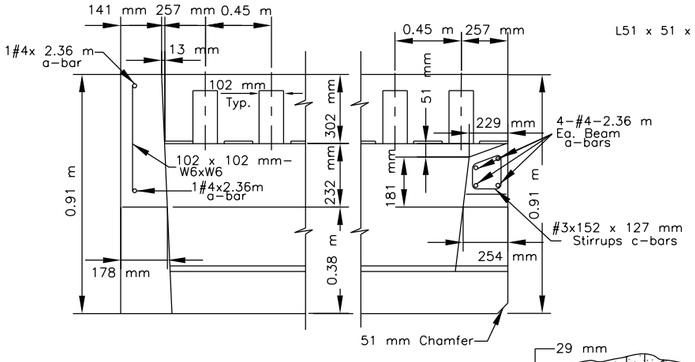
1. PRECAST CONCRETE SHALL ATTAIN 28-DAY COMPRESSIVE STRENGTH OF 27.62 MPa (minimum) IN ACCORDANCE WITH AASHTO T22 (ASTM C-39). THE CONCRETE SHALL BE CLASS A(AE) CONFORMING TO SECTION 552 OF FP-14.
2. REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 420. ALL STRUCTURAL STEEL SHALL CONFORM TO AASHTO M-183.
3. THE CONTRACTOR SHALL SLOPE THE BASES OF THE CATTLE GUARDS AS REQUIRED TO PROVIDE ROADWAY CROWNS OR SUPERELEVATION AS SHOWN ON THE PLANS.
4. BOLTS, WASHERS, AND NUTS SHALL BE GALVANIZED TO MEET THE REQUIREMENTS OF AASHTO M111 OR AASHTO M298.
5. ALL TRAFFIC GRILL UNITS, AND WING BRACE STRUCTURAL STEEL AND PIPE, INCLUDING THE STEEL ANGLES, SHALL RECEIVE ONE (1) PRIMER COAT, ONE (1) INTERMEDIATE COAT, AND ONE (1) FINISH COAT IN ACCORDANCE WITH SECTION 563, PAINT SYSTEM 2, OF FP-14.
6. WING BRACES SHALL BE CONSIDERED SUBSIDIARY ITEMS TO THE CATTLE GUARD UNIT.
7. THE CONTRACTOR HAS THE OPTION TO USE AN ALL STEEL FRAME CATTLE GUARD. IF THE CONTRACTOR ELECTS TO SUBSTITUTE FOR THE STEEL FRAME CATTLE GUARD, HE/SHE SHALL SHOW THEY ARE MORE COST EFFECTIVE WITH SUPPORTING DATA. THE CONTRACTOR IS RESPONSIBLE FOR ALL PATENT PROTECTION RIGHTS, SHOP DRAWINGS, MATERIAL CERTIFICATIONS, AND MILL TEST REPORTS. HOWEVER, NO STEEL FRAME CATTLE GUARD SHALL BE USED FOR CONCRETE DRAINAGE PAD CATTLE GUARD LOCATIONS.
8. ELASTOMERIC BEARING PADS SHALL BE SEALED WITH EPOXY ADHESIVE PRIOR TO THE INSTALLATION OF TRAFFIC GRILL UNIT.
9. DESIGN DATA: DESIGN ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, THIRD EDITION, 2004. DESIGN LOADS: HS20 AND DESIGN TANDEM WITH 33% IMPACT.

REINFORCING STEEL SCHEDULE

STRAIGHT BARS				BENT BARS			
MARK	NO.	SIZE	LENGTH	MARK	NO.	SIZE	LENGTH
END UNIT							
a	6	4	2.36 m				
b_1	2	5	2.36 m				
c					3	3	0.61 m
D_1	20	4	0.46 m				
INTERMEDIATE UNIT							
a	8	4	2.36 m				
b_2	2	5	2.21 m				
c					6	3	0.61 m
D_1	18	4	0.46 m				

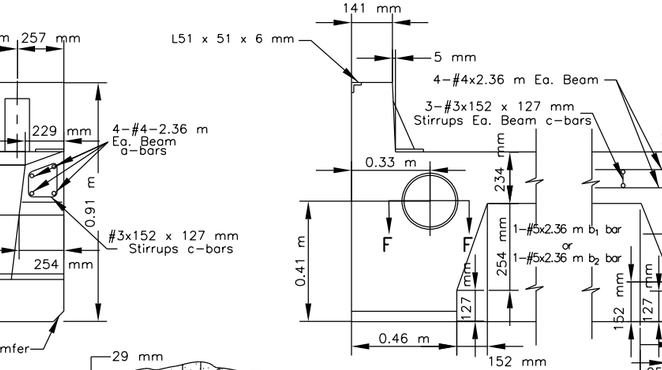
BENDING DIAGRAMS
ALL DIMENSIONS ARE OUT TO OUT



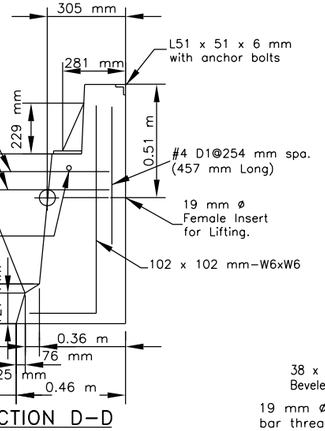


SECTION A–A

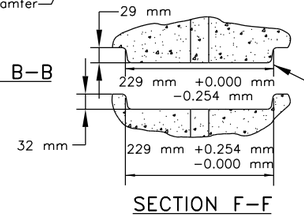
SECTION B–B



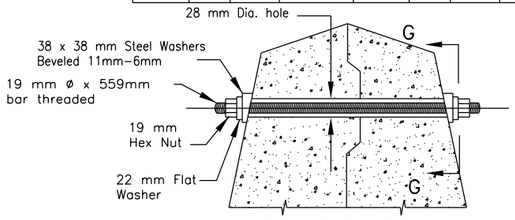
KEY LOCATION



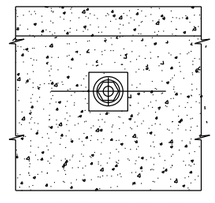
SECTION D–D



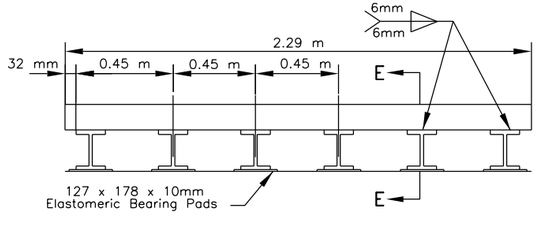
SECTION F–F



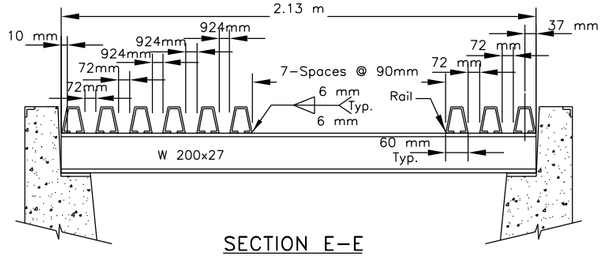
TIE BOLT DETAIL



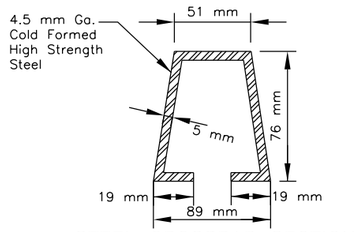
SECTION G–G



TRAFFIC GRILLE UNIT



SECTION E–E



STEEL CROSSBAR SECTION

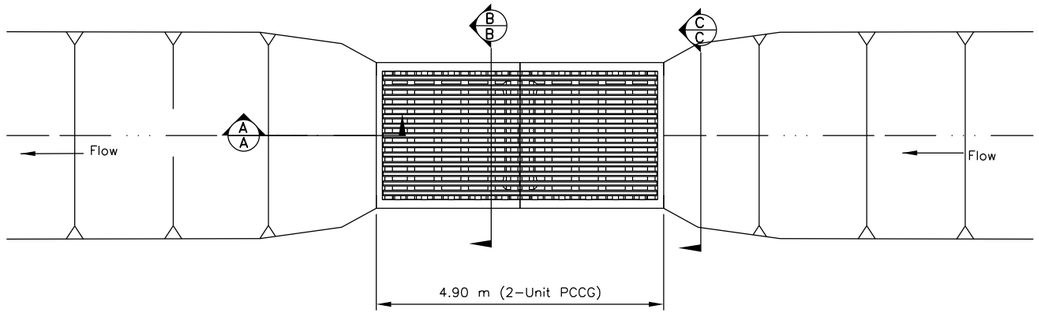


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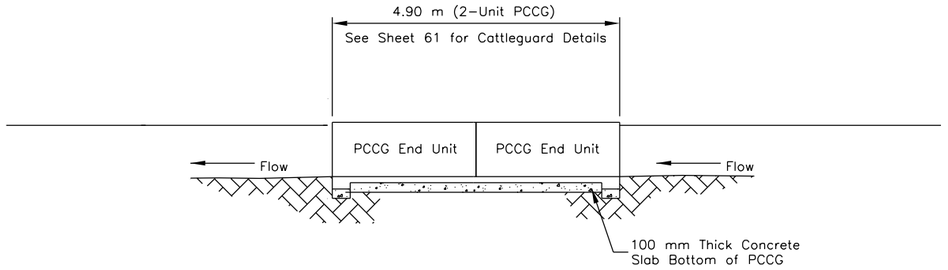
PRE-CAST CONCRETE CATTLE GUARD DETAILS

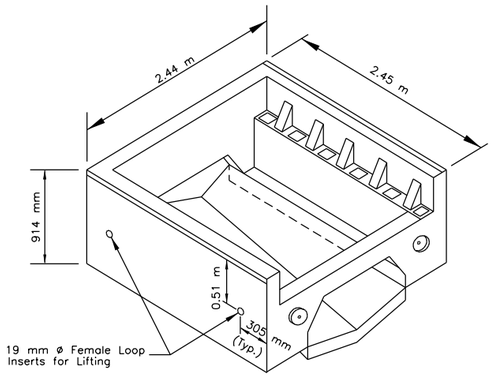
Designed by: NRDOT	**Date:** 1/91
Drawn by: NRDOT	**Date:** 1/91
Revised by: NRDOT	**Date:** 3/07
File Name: N11(1A)–PCCG sht 61	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	62	82



PLAN VIEW – PCCG WITH CONCRETE BOTTOM





ISOMETRIC VIEW – END UNIT

GENERAL NOTES

1. WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS (FP–14), ALONG WITH THE SUPPLEMENTAL SPECIFICATIONS FOR THIS PROJECT.

2. ALL CONCRETE SHALL BE CLASS A(AE) WITH CLASS 1 FINISH. CHAMFER ALL EXPOSED EDGES 19 mm. ALL CONCRETE SHALL CONFORM TO SECTION 552 & 601 OF THE FP–14. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF F'c = 20.7 MPa IN 28 DAYS.

3. REINFORCING STEEL SHALL CONFORM TO AASHTO SPECIFICATION M–31 ASTM A 615M, GRADE 40,AND SECTION 554 OF THE FP–14. ALL BEND DIMENSIONS FOR REINFORCING STEEL SHALL BE OUT TO OUT OF BARS. ALL REINFORCING STEEL SHALL HAVE 51 mm CLEARANCE COVER UNLESS OTHERWISE NOTED. ALL REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO COMPLETION OF STRUCTURE.

4. IN NO CASE SHALL ANY BACKFILL BE PLACED UNTIL THE CONCRETE HAS ATTAINED A COMPRESSIVE STRENGTH OF 17.2 MPa.

5. ALL STRUCTURE EXCAVATIONS SHALL BE DONE TO NEAT LINES AND WILL BE CONSIDERED INCIDENTAL TO COMPLETION OF THE STRUCTURE.

6. FOOTINGS SHALL BE PLACED TO THE ELEVATIONS SHOWN. IF UNSUITABLE MATERIAL IS FOUND AT THE FOOTING LOCATION AND ELEVATIONS, THE MATERIAL SHALL BE REMOVED AND REPLACED WITH APPROVED STRUCTURAL BACKFILL AS DETERMINED BY THE COR/COTR. ALL STRUCTURAL BACKFILL SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY AS DETERMINED BY AASHTO T99 METHOD C, BEFORE AND AFTER FOOTINGS ARE PLACED. THE STRUCTURAL BACKFILL MATERIAL SHALL CONFORM TO SECTIONS 208 AND 209 OF THE FP–14.

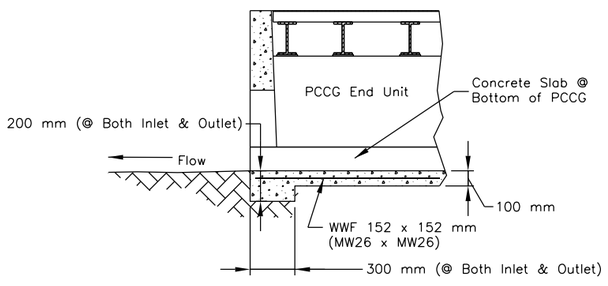
7. THE CONTRACTOR WILL BE REQUIRED TO MAKE FIELD ADJUSTMENTS AS DIRECTED BY THE CM TO MATCH FIELD CONDITIONS. THESE ADJUSTMENTS SHALL BE CONSIDERED INCIDENTAL TO COMPLETION OF THE PROJECT AND NO ADDITIONAL PAYMENT SHALL BE MADE.

8. SLOPE RESHAPING, CLEANING, AND EXCAVATION SHALL BE DONE IN ACCORDANCE WITH THE PLANS AND AS DETERMINED BY THE CM. ANY WASTE MATERIAL SHALL BE USED AS BORROW WHERE NEEDED AT OTHER PROJECT LOCATIONS AS DIRECTED AND APPROVED BY THE CM. ALL EXCAVATION, CLEANING, AND RESHAPING SHALL BE CONSIDERED INCIDENTAL TO COMPLETION OF THE STRUCTURE.

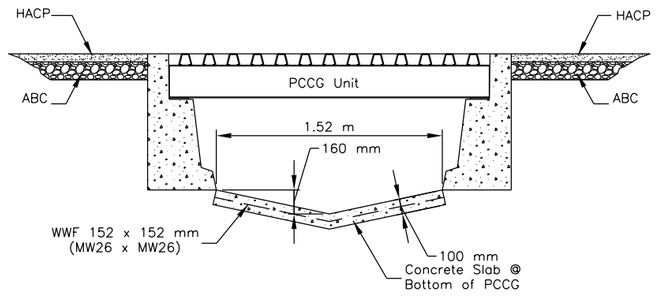
9. SEE SHEET 61 FOR THE CATTLEGUARD DETAILS AND DIMENSIONS.

10. THE TOP ELEVATION OF DRAIN THROUGH CATTLE GUARDS SHALL BE SET A MAXIMUM OF 500mm (AS APPROVED BY THE CM) ABOVE THE NATURAL GROUND IF REQUIRED TO ASSIST WITH DRAINAGE. THE TURNOUT GRADING, EARTHWORK, SURFACING, RIGHT OF WAY FENCING, ETC. SHALL BE ADJUSTED AS REQUIRED. THE COST OF THIS WORK SHALL BE INCLUDED IN THE RESPECTIVE BID ITEMS.

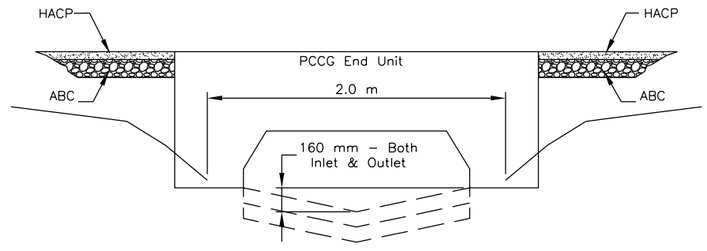
ELEVATION – PCCG WITH CONCRETE BOTTOM



SECTION A–A



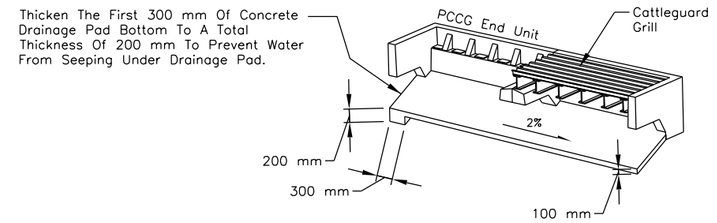
SECTION B–B



SECTION C–C

ITEM 60101-0000: MINOR CONCRETE CLASS A(AE)

LOCATION	NO. OF PCCG UNITS	LENGTH OF PAD (m)	TOTAL CONCRETE VOLUME (m^3)	TOTAL WT. OF WWF @ 2.83 kg/m^2
Turnout 0+080 Lt.	2	4.90	0.85	21.54
		TOTAL	0.85	21.54



DRAINAGE PAD



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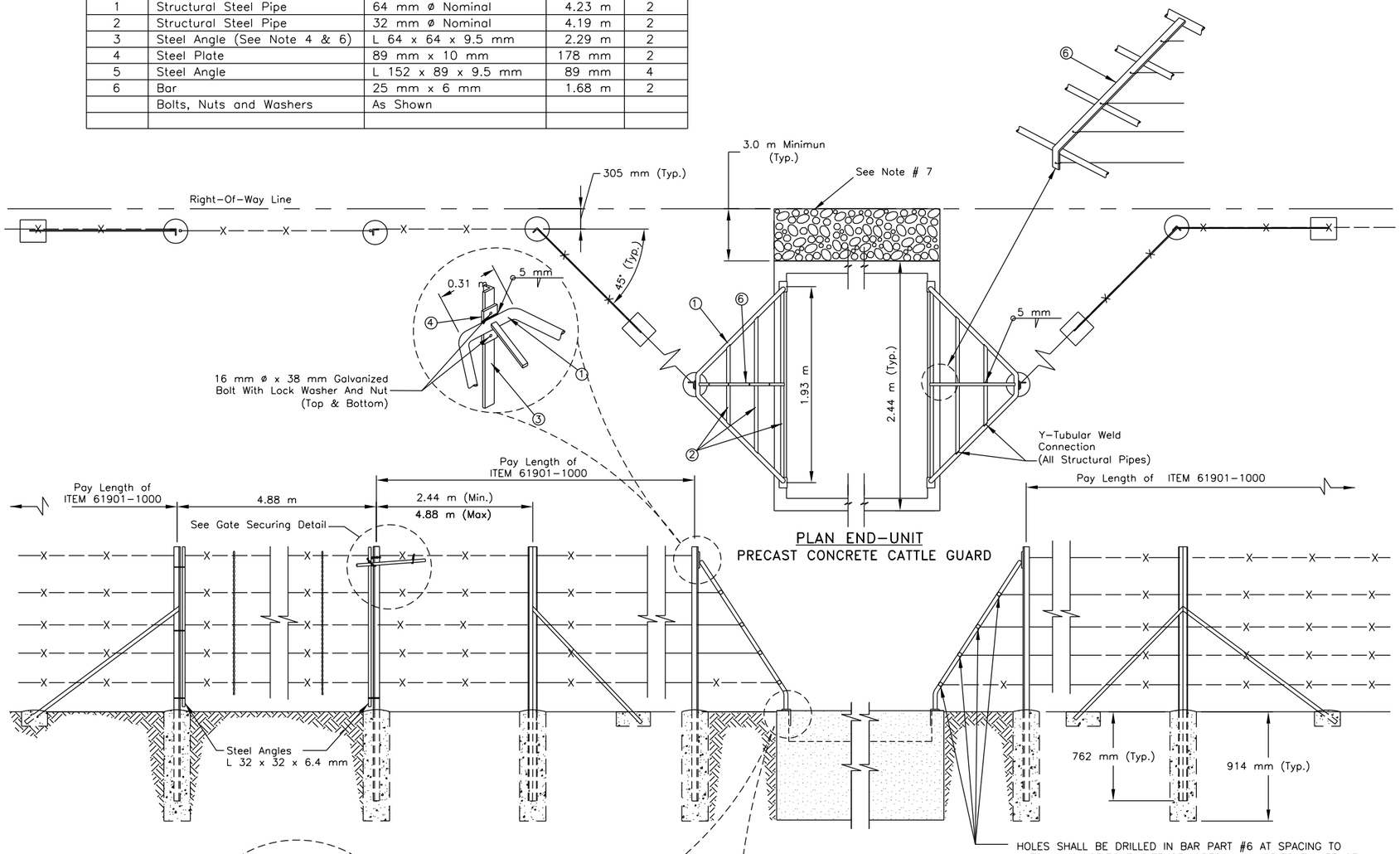
CONCRETE DRAINAGE PAD DETAIL FOR PRECAST CATTLE GUARD

Designed by: NRDOT	**Date:**
Drawn by: NRDOT	**Date:**
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)–PCCG_DRAIN sht 62	

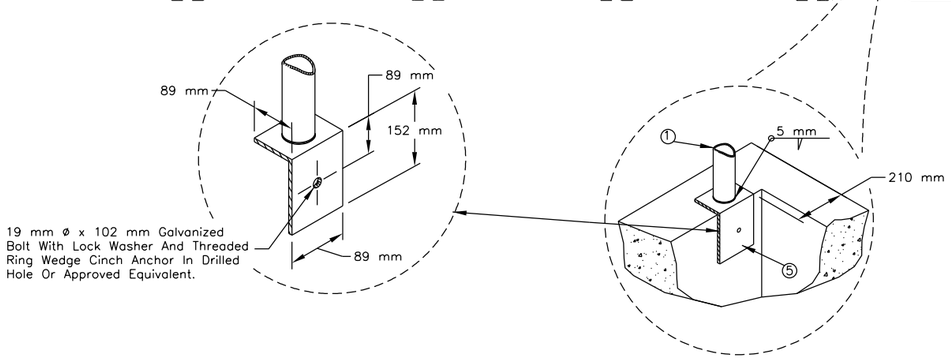
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	63	82

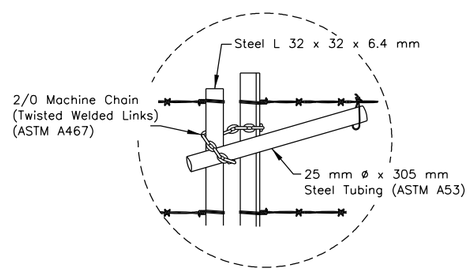
ESTIMATED MATERIAL LIST

PART NO.	MATERIAL	SIZE AND THICKNESS	LENGTH	QUANTITY
1	Structural Steel Pipe	64 mm ø Nominal	4.23 m	2
2	Structural Steel Pipe	32 mm ø Nominal	4.19 m	2
3	Steel Angle (See Note 4 & 6)	L 64 x 64 x 9.5 mm	2.29 m	2
4	Steel Plate	89 mm x 10 mm	178 mm	2
5	Steel Angle	L 152 x 89 x 9.5 mm	89 mm	4
6	Bar	25 mm x 6 mm	1.68 m	2
	Bolts, Nuts and Washers	As Shown		



PLAN END-UNIT
PRECAST CONCRETE CATTLE GUARD





GATE SECURING DETAIL

GENERAL NOTES

1. STRUCTURAL PIPE SHALL CONFORM TO ASTM A53-93a, GRADE B. ALL OTHER STRUCTURAL STEEL SHALL CONFORM TO ASTM-A36.
2. ALL STRUCTURAL PIPE JOINTS SHALL BE FABRICATED IN ACCORDANCE WITH AISC MANUAL OF STEEL CONSTRUCTION, LATEST EDITION.
3. WELDING SHALL MEET THE REQUIREMENTS OF AASHTO STANDARD SPECIFICATIONS FOR WELDING AT STRUCTURAL STEEL HIGHWAY BRIDGES, LATEST EDITION.
4. THE SUPPORTING WING BRACE POSTS (PART NO. 3) LENGTH SHALL BE SUFFICIENT TO ALLOW BRACE POSTS TO BE INSTALLED WITHIN CONCRETE FOUNDATIONS AS SHOWN ON THIS DETAIL SHEET. UNDER CERTAIN CONDITIONS (SUCH AS DRAIN THROUGH CATTLE GUARD, HIGH EMBANKMENT, ETC) THE LENGTH OF THE POST MAY VARY TO FULLY SUPPORT THE WING BRACES. THIS WORK SHALL BE INCIDENTAL TO THE CATTLE GUARD CONTRACT ITEMS. INSTALLATION OF GATE SHALL BE SUBSIDIARY ITEM TO THE CATTLE GUARD ITEM(S).
5. THE CM MAY ADJUST THE FINISHED CATTLE GUARD ELEVATION AS NEEDED TO FIT FIELD/DRAINAGE CONDITIONS. THE CONTRACTOR SHALL RE-GRADE THE ADJOINING TURNOUT APPROACHES AS REQUIRED. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE CATTLE GUARD CONTRACT ITEMS OF FP-14.
6. AT SKEWED TURNOUT LOCATIONS, THE CATTLE GUARD SHALL BE INSTALLED PERPENDICULAR TO TURNOUT.
7. THE LENGTH OF THE TURNOUT BETWEEN THE BACK EDGE OF THE CATTLE GUARD AND THE RIGHT-OF-WAY LIMIT SHALL BE SURFACED WITH A 100mm THICKNESS OF AGGREGATE BASE COURSE AT ALL 4.5 METER WIDE TURNOUTS. FOR TURNOUTS WIDER THAN 4.5 METERS, PLACE AGGREGATE BASE COURSE AND ASPHALT SURFACING TO MATCH THE TURNOUT STRUCTURAL SECTION, BETWEEN THE BACK OF THE CATTLE GUARD AND THE RIGHT-OF-WAY LINE. THE SURFACING MATERIAL AND WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE PAVING ITEMS SHOWN IN THE BID SCHEDULE.
8. AT CATTLE GUARD LOCATIONS WHERE THE DESIGN TYPICAL WIDTH IS WIDER ON ONE SIDE OF THE CATTLE GUARD THAN THE OTHER SIDE, THE NARROWER ROADWAY WIDTH SHALL BE FLARED OUT TO MATCH THE WIDER ROADWAY WIDTH USING AN 8:1 TAPER OR TO LENGTH ALLOWED BY THE RIGHT-OF-WAY WIDTH. THIS INCLUDES AT NARROW RIGHT-OF-WAY WIDTH WHERE THE TURNOUT RADIUS CANNOT BE COMPLETELY INSTALLED BETWEEN THE MAIN ROAD AND THE CATTLE GUARD. THIS WORK SHALL BE PAID UNDER THE EARTHWORK, BASE COURSE, AND PAVING ITEMS INCLUDED IN THE BID SCHEDULE.

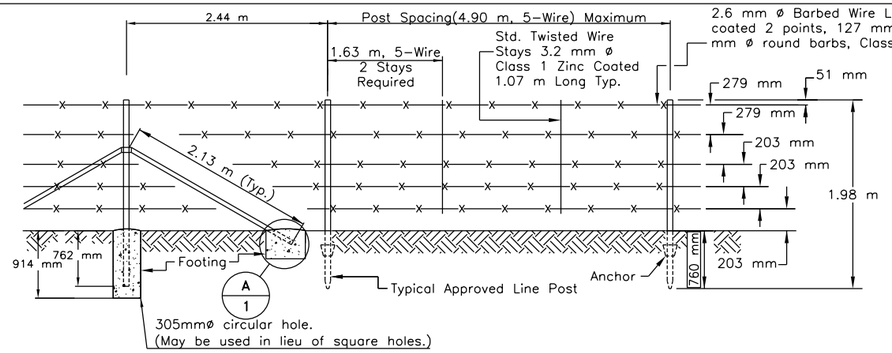
DEREK D. MEIER
NEW MEXICO
14504
REGISTERED PROFESSIONAL ENGINEER
4/14/20

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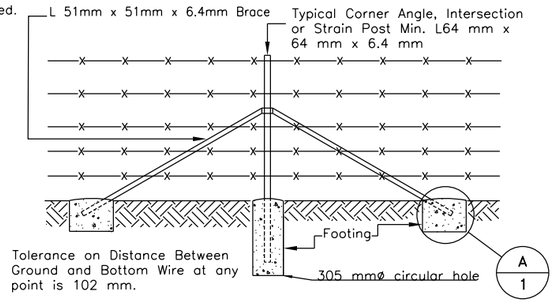
CATTLE GUARD AND WING BRACE DETAILS

Designed by: NRDOT	Date: 3/00
Drawn by: NRDOT	Date: 3/00
Revised by: WHPacific	Date: 9/11
File Name: N11(1A)-CGWB sht 63	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	64	82

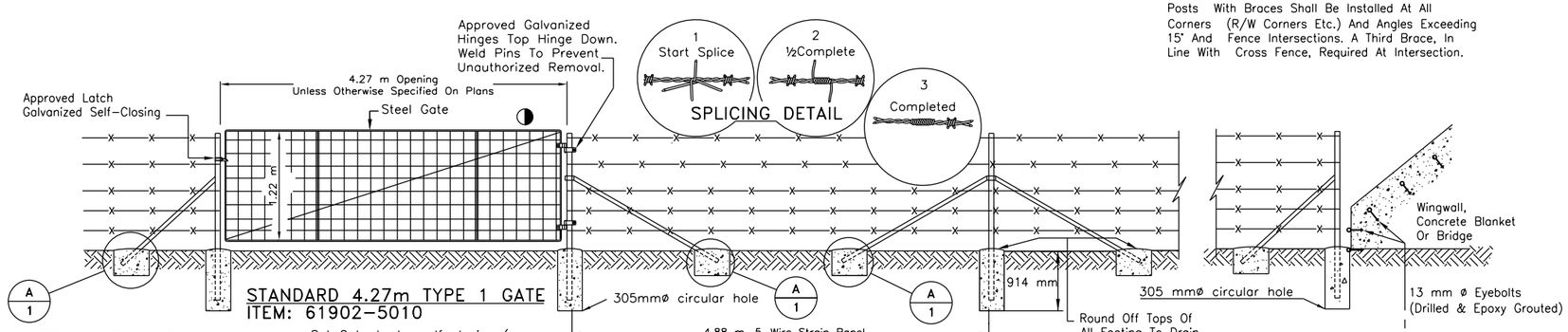


STANDARD 5 LINE GALVANIZED BARBED WIRE PANEL



STANDARD STRAIN POST

To Be Placed @ 198 m Max. Intervals. Strain Posts With Braces Shall Be Installed At All Corners (R/W Corners Etc.) And Angles Exceeding 15° And Fence Intersections. A Third Brace, In Line With Cross Fence, Required At Intersection.



STANDARD 4.27m TYPE 1 GATE ITEM: 61902-5010

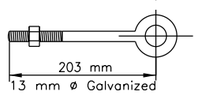
NOTES: When Tubular Post Hangers and/or Latches are used, It shall be drilled for a single 2.38 mm ø Min. drive pin to prevent rotation of the hangers and/or latches.

Set Gate to be self closing (use only when specified by special note in the plans)

For Gate Details at Cattle Guard location see standard cattle guard drawings.

◑ 35 mm ø Tubing 2 Vert. Braces Mesh □, △ , ◇ , 3.2 mm ø Line Wires 2.6 mm ø Crosswires. 1 Adjustable Diagonal Guy Fully Galvanized.

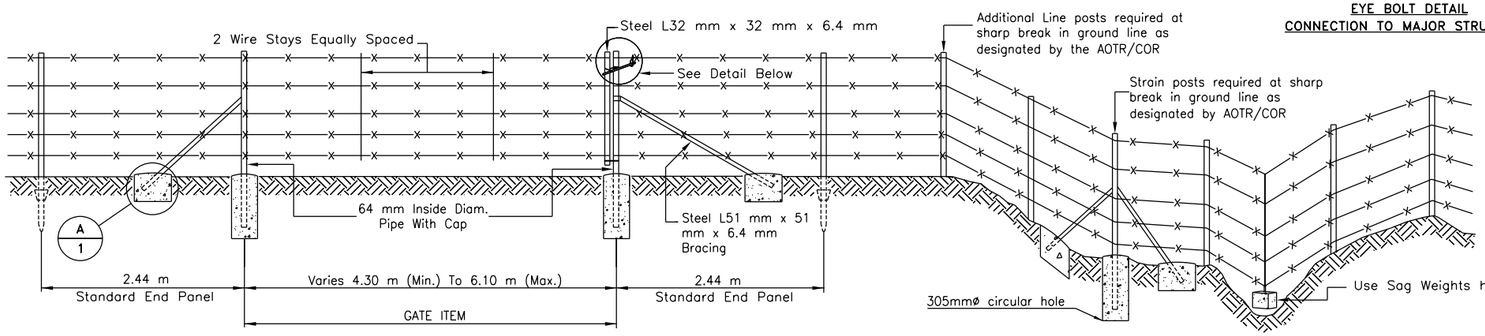
END POST



EYE BOLT DETAIL
CONNECTION TO MAJOR STRUCTURES

GENERAL NOTES

1. CORNER, GATE, INTERMEDIATE BRACE POSTS AND LINE POSTS SHALL BE EITHER GALVANIZED OR PAINTED IN ACCORDANCE WITH AASHTO M 281-96. METAL POST AND BRACES SHALL BE FABRICATED FROM RAIL, BILLET, OR COMMERCIAL GRADE STEEL CONFORMING WITH THE REQUIREMENT OF ASTM A 702.
2. LINE POSTS SHALL BE FABRICATED IN ACCORDANCE WITH AASHTO M 281-96, AND SHALL BE A NOMINAL WEIGHT OF 1.98 kg/m EXCLUSIVE OF ANCHOR PLATES. ANCHOR PLATES SHALL BE CLAMPED, WELDED OR RIVETED TO THE SECTION IN SUCH A MANNER AS TO PREVENT DISPLACEMENT WHEN THE POSTS ARE DRIVEN.
3. WHEN LINE POST ANCHORS ARE OMITTED, DUE TO CHANGE IN SOIL CONDITIONS SUCH AS ROCK, THEN THE POSTS SHALL BE SET IN CONCRETE. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO ITEM 61901-1000.
4. TIE WIRE, WIRE FASTENERS OR WIRE CLIPS FOR FASTENING BARBED AND WOVEN FABRIC FENCING TO THE STEEL POSTS SHALL BE 3.0 mm DIA. STEEL WIRE, CLASS 1 (ZINC COATED), SOFT TEMPER AND MEET THE REQUIREMENTS OF ASTM A 641. FURNISHING AND PLACEMENT OF FASTENERS SHALL BE INCLUDED WITH ITEM 61901-1000.
5. CONCRETE FOR ANCHORS, POST HOLES, ETC. SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 20.7 MPa IN 28 DAYS AND SHALL CONFORM TO SECTION 601 OF THE FP-14. FURNISHING AND PLACEMENT OF CONCRETE SHALL BE INCLUDED WITH ITEM 61901-1000.
6. TWO SPLICES ON THE SAME LINE BETWEEN THE STRAIN POST ASSEMBLIES SHALL NOT BE PERMITTED. NO SPLICES SHALL BE PLACED CLOSER THAN 30 METER OF ANY POST ASSEMBLIES.
7. UNLESS DIRECTED OTHERWISE BY THE CM, R.O.W. FENCING AT ALL CATTLE PASSES, CBC AND SIMILAR STRUCTURES, SHALL CROSS THE TOP OF THE STRUCTURE AT OR BEYOND THE CLEAR ZONE LIMIT OR DIRECTLY BEHIND THE GUARDRAIL. FENCE POST SPACING AND/OR DEPTH TO BE ADJUSTED TO CLEAR THE STRUCTURE. THIS WORK SHALL BE INCLUDED IN THE COST OF THE FENCING BID ITEM.
8. ANY CONFLICT IN PLACEMENT OF THE R/W FENCING AT DRAINAGE PIPE LOCATION, DUE TO NARROW R/W WIDTH OR OTHER CONSTRICTIONS, THE FENCE MAY BE PLACED OVER THE DRAINAGE STRUCTURE. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO ITEM 61901-1000.
9. CLEARING AND GRUBBING SHALL INCLUDE SHAPING AND/OR REMOVAL OF SMALL MOUNDS NECESSARY TO PRESENT A SMOOTH UNIFORM APPEARANCE OF BOTH GROUND AND FENCING LINE. THIS WORK SHALL BE INCIDENTAL TO THE INSTALLATION OF FENCING AND NO ADDITIONAL PAYMENT SHALL BE MADE.
10. ALL DRILLING INTO ROCK MATERIAL, ETC. SHALL BE INCIDENTAL TO THE INSTALLATION OF FENCING AND NO ADDITIONAL PAYMENT SHALL BE MADE.
11. GATE CLOSURE DEVICE SHALL BE STEEL PIPE, NPS 3/4 (26.7 mmø) SCHEDULE 40, CONFORMING TO THE REQUIREMENT OF ASTM A 53. THE GATE CLOSURE STEEL CHAIN SHALL BE WELDED TO THE STEEL PIPE AND ANGLE IRON FENCE POST. THIS WORK SHALL BE INCIDENTAL TO THE INSTALLATION OF FENCING AND NO ADDITIONAL PAYMENT SHALL BE MADE.
12. CONTRACTOR SHALL BE REQUIRED TO INSTALL SAG WEIGHTS WHERE VERTICAL CLEARANCE BETWEEN THE BOTTOM WIRE AND NATURAL GROUND IS 610 mm OR GREATER. THIS WORK SHALL BE INCIDENTAL TO THE INSTALLATION OF FENCING.

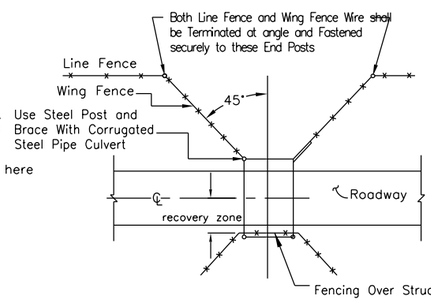


STANDARD TYPE-2 GATE

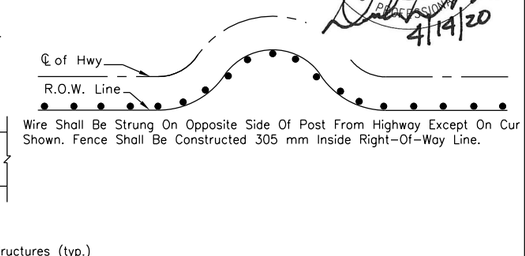
Use At Locations Noted On Plans

FENCE PROFILE IN ROUGH TERRAIN

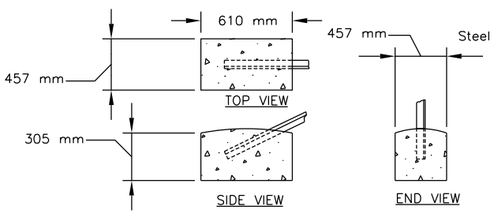
In Rough Terrain Post Spacing Shall Be Reduced Where Necessary To Maintain Required Spacing Below Bottom Wire Within The Tolerance Allowed.



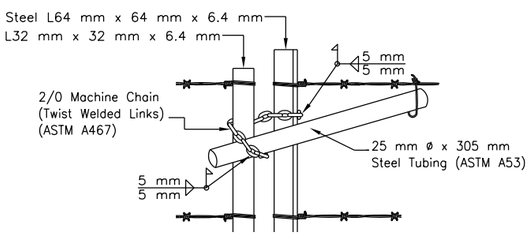
WING FENCE DETAIL



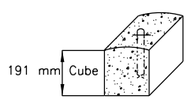
Wire Shall Be Strung On Opposite Side Of Post From Highway Except On Cur Shown. Fence Shall Be Constructed 305 mm Inside Right-Of-Way Line.



CONCRETE FOOTING FOR CORNER & STRAIN POST (A 1)



GATE SECURING DETAIL



38 mm x 127 mm Doubled and Twisted 3.8 mm(dia.) Wire Loop Centered in Block. 25.4 mm Projection Twisted Ends Down.

CONCRETE SAG WEIGHT DETAIL

Min. Weight Of Concrete Sag Shall Be 16 kg

TYPICAL STEEL POST SECTION

DEREK D. MEIER NEW MEXICO 14504 REGISTERED PROFESSIONAL ENGINEER
4/14/20

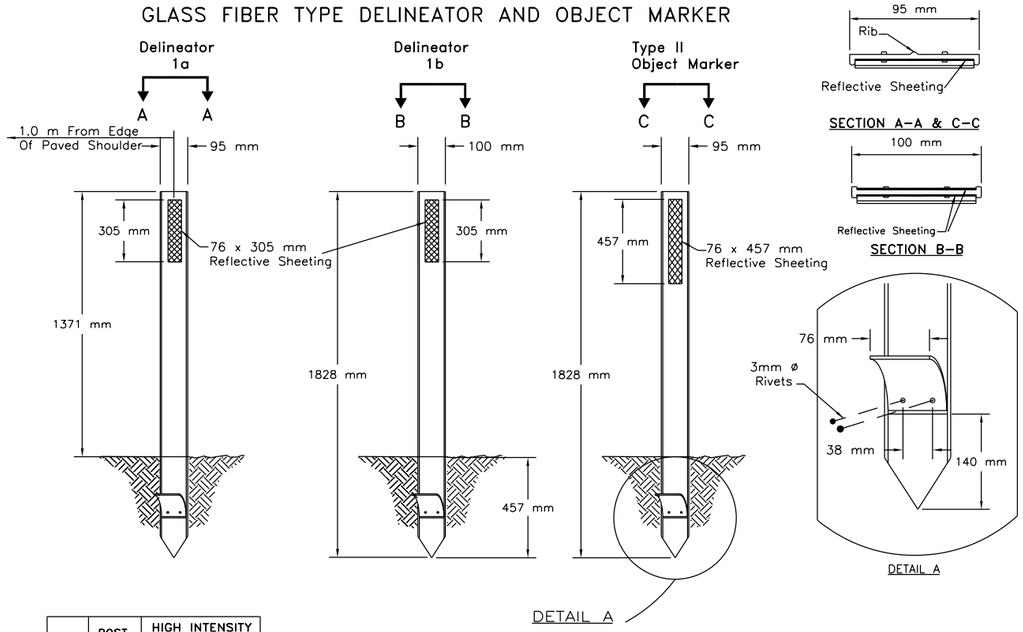
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STANDARD FENCING DETAILS

Designed by: NRDOT	**Date:** 1/01
Drawn by: NRDOT	**Date:** 1/01
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)-FEN sht 64	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	65	82

GLASS FIBER TYPE DELINEATOR AND OBJECT MARKER



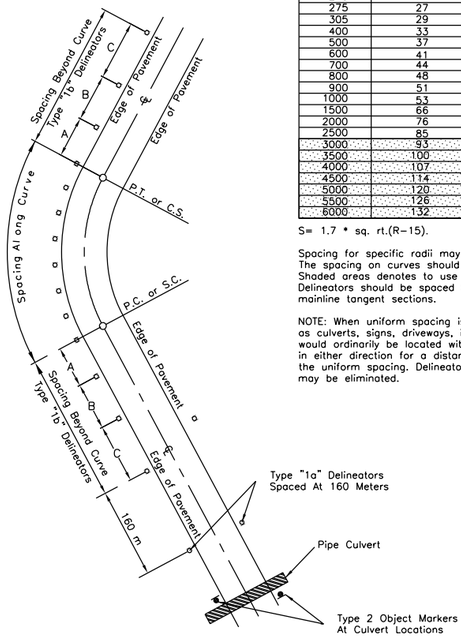
TYPE	POST COLOR	HIGH INTENSITY REFLECTIVE SHEETING
1a	WHITE	WHITE, ONE SIDE
1b	WHITE	WHITE, BOTH SIDES
2	YELLOW	AMBER, ONE SIDE

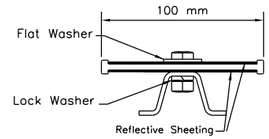
RADIUS OF CURVE (m)	APPROXIMATE SPACING (S) ON CURVE (m)	SPACING ON ADVANCE OF OR BEYOND A CURVE (m)		
		A (2S)	B (3S)	C (6S)
15	6	12	18	36
35	8	16	24	48
55	11	22	33	66
75	13	26	39	78
95	15	30	45	90
125	18	36	54	108
155	20	40	60	120
185	22	44	66	132
215	24	48	72	144
245	26	52	78	156
275	27	54	81	162
305	29	58	87	174
400	33	67	100	200
500	37	75	112	225
600	41	82	123	247
700	44	89	133	267
800	48	95	143	286
900	51	101	152	303
1000	53	107	160	320
1500	66	131	197	393
2000	76	151	227	454
2500	85	169	254	508
3000	93	186	279	557
3500	100	201	301	602
4000	107	215	322	644
4500	114	228	342	683
5000	120	240	360	720
5500	126	252	378	755
6000	132	263	395	789

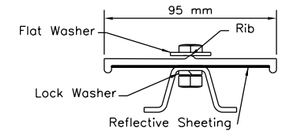
S= 1.7 * sq. rt.(R–15).

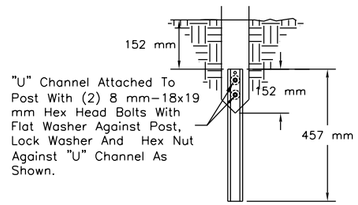
Spacing for specific radii may be interpolated from table.
The spacing on curves should not exceed 90 meters.
Shaded areas denotes to use 90 meter spacings.
Delineators should be spaced 60 to 160 meters apart on mainline tangent sections.

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.





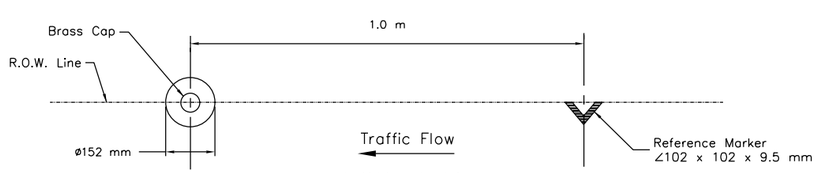




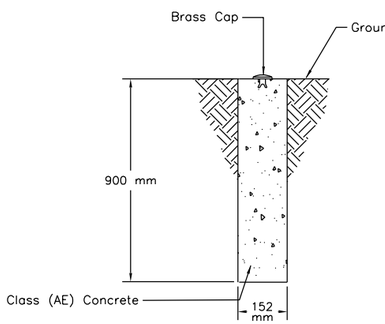
ALTERNATE DETAIL

GENERAL NOTES

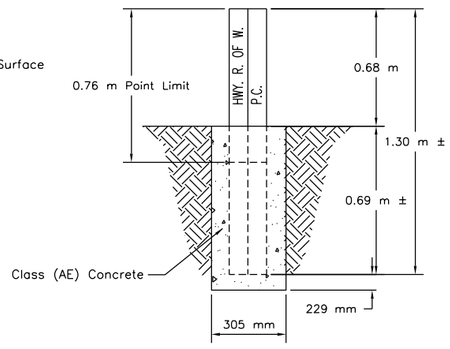
1. Survey monument and reference markers shall be placed as shown on the plans or as directed by the CM. The cost of supplying all materials and installation of Right–of–Way Monument and Markers shall be included in the unit price bid under Item 62101–0000 & 62102–0000.
2. If rock is encountered when installing the right–of–way monuments and reference markers, drill a 152mmø hole for R/W monument and 305mmø for reference marker in the rock to the depth required to install the monument and marker to full depth. All hole drilling into rock material, shall be considered incidental to the completion of the work and no additional payment shall be made therefor.
3. Brass caps for the survey monuments shall be supplied and installed by the Contractor conforming to the ASTM B–584 specification and shall be considered incidental to Item 62101–0000.
4. All concrete shall be class A(AE) and shall conform to Section 601 of the FP–14. Furnishing and placing of concrete and rebar shall be considered incidental to Items 62101–0000 & 62102–0000.
5. Roadway stationings and elevations shall be stamped on all brass caps by the Contractor after installation, unless otherwise directed in writing by the CM.
6. The Contractor shall be required to paint the reference markers per Section 719 and subsection 719.04 of FP–14:
   A. The primer coat shall conform to subsection 719.04(a) or (b) of FP–14.
   B. The white finish coat of paint shall conform to subsection 719.04(g), of FP–14.
   C. All letters, numerals, symbols, etc. shall be painted on the reference markers using the dimensions shown using Black Lamp paint conforming to ASTM D 209. The required information to place on the reference markers shall be furnished to the Contractor by the CM.
7. The Contractor has the option to use an approved State paint specification in lieu of that stated in Note (6) above. The Contractor shall submit (in writing) the paint specifications and request for use on the project at least 14 days in advance of the paint use for review and approval. The Contractor shall not be allowed to use any paint until the proper approval has been given by the CM. Any painting performed by the Contractor without the proper approval shall cause the work to be rejected.
8. The Contractor shall use glass fiber type highway delineators. The cost of supplying materials and installation of U–channel shall be included in the unit price bid under Items 63306–2000, 63309–0010, and 63309–0020.
9. Set Right–of–Way monument at station and offset to match the right–of–way plat. These locations may vary from the stations and offsets shown on the construction plan and profile sheets. Owner will provide a Plat with table of this information to the CM.



TOP VIEW

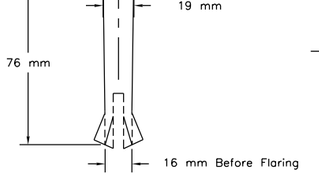


R/W MONUMENT



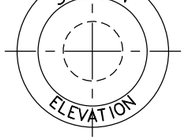
REFERENCE MARKER

R/W MONUMENT SYMBOL

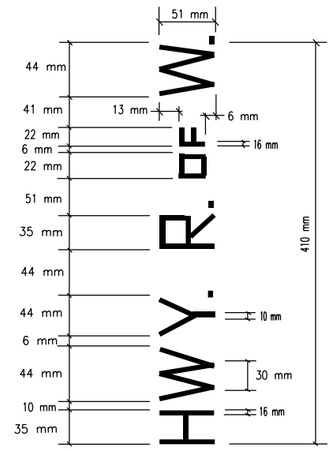


Similar to Berntsen Model C–1

BRASS CAP DETAIL



TOP VIEW



DETAIL OF LETTERS



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DELINEATOR & R.O.W. MARKER DETAILS

Designed by: NRDOT	**Date:** 12/07
Drawn by: NRDOT	**Date:** 12/07
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)–Dlntr–ROW sht 65	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	66	82

ITEM NO. 25101-2000: PLACED RIPRAP,CLASS 2

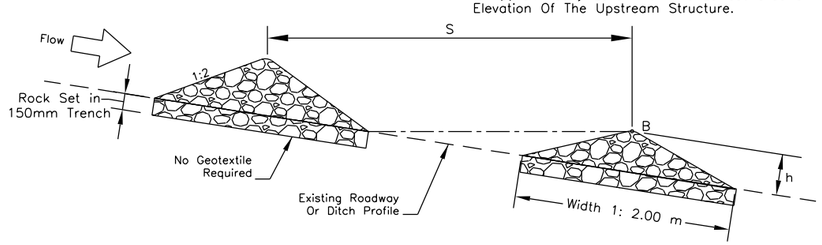
CHECK DAM LOCATION AND ESTIMATED QUANTITIES

STATION	LOC	WIDTH 1 (m)	HEIGHT (m)	WIDTH 2 (m)	VOLUME (m^2)	REMARKS
0+340	Rt.	2.00	0.50	5.20	2.85	V DITCH
0+380	Rt.	2.00	0.50	5.20	2.85	V DITCH
0+425	Rt.	2.00	0.50	5.20	2.85	V DITCH
0+465	Rt.	2.00	0.50	5.20	2.85	V DITCH
1+250	Rt.	2.00	0.50	5.85	3.24	V DITCH
1+290	Rt.	2.00	0.50	5.85	3.24	V DITCH
1+330	Rt.	2.00	0.50	5.85	3.24	V DITCH
1+370	Rt.	2.00	0.50	5.20	2.85	V DITCH
1+410	Rt.	2.00	0.50	5.20	2.85	V DITCH
1+450	Rt.	2.00	0.50	5.20	2.85	V DITCH
1+490	Rt.	2.00	0.50	5.85	3.24	V DITCH
1+330	Lt.	2.00	0.50	5.85	3.24	V DITCH
1+370	Lt.	2.00	0.50	5.85	3.24	V DITCH
1+410	Lt.	2.00	0.50	5.85	3.24	V DITCH
1+450	Lt.	2.00	0.50	5.20	2.85	V DITCH
1+490	Lt.	2.00	0.50	5.20	2.85	V DITCH
1+495	Lt.	2.00	0.50	5.20	2.85	V DITCH
1+520	Lt.	2.00	0.50	5.20	2.85	V DITCH
1+585	Lt.	2.00	0.50	5.20	2.85	V DITCH
1+620	Lt.	2.00	0.50	5.20	2.85	V DITCH
2+040	Rt.	2.00	0.50	5.20	2.85	V DITCH
2+080	Rt.	2.00	0.50	5.20	2.85	V DITCH
2+120	Rt.	2.00	0.50	5.20	2.85	V DITCH
2+160	Rt.	2.00	0.50	5.20	2.85	V DITCH
2+200	Rt.	2.00	0.50	5.20	2.85	V DITCH
2+240	Rt.	2.00	0.50	5.20	2.85	V DITCH
2+280	Rt.	2.00	0.50	5.20	2.85	V DITCH
2+320	Rt.	2.00	0.50	5.20	2.85	V DITCH
2+360	Rt.	2.00	0.50	5.85	3.24	V DITCH
2+040	Lt.	2.00	0.50	5.20	2.85	V DITCH
2+080	Lt.	2.00	0.50	5.20	2.85	V DITCH
2+120	Lt.	2.00	0.50	5.20	2.85	V DITCH
2+160	Lt.	2.00	0.50	5.20	2.85	V DITCH
2+200	Lt.	2.00	0.50	5.20	2.85	V DITCH
2+240	Lt.	2.00	0.50	5.20	2.85	V DITCH
2+280	Lt.	2.00	0.50	5.20	2.85	V DITCH
2+320	Lt.	2.00	0.50	5.85	3.24	V DITCH
2+360	Lt.	2.00	0.50	5.85	3.24	V DITCH
2+520	Rt.	2.00	0.50	5.20	2.85	V DITCH
2+560	Rt.	2.00	0.50	5.20	2.85	V DITCH
2+600	Rt.	2.00	0.50	5.20	2.85	V DITCH
2+640	Rt.	2.00	0.50	5.20	2.85	V DITCH
2+680	Rt.	2.00	0.50	5.20	2.85	V DITCH
2+720	Rt.	2.00	0.50	5.20	2.85	V DITCH
3+100	Lt.	2.00	0.50	5.20	2.85	V DITCH
3+140	Lt.	2.00	0.50	5.20	2.85	V DITCH
3+180	Lt.	2.00	0.50	5.20	2.85	V DITCH
3+220	Lt.	2.00	0.50	5.20	2.85	V DITCH
3+260	Lt.	2.00	0.50	5.20	2.85	V DITCH
3+300	Lt.	2.00	0.50	5.20	2.85	V DITCH
3+340	Lt.	2.00	0.50	5.20	2.85	V DITCH
3+380	Lt.	2.00	0.50	5.20	2.85	V DITCH
3+210	Rt.	2.00	0.50	5.20	2.85	V DITCH
3+250	Rt.	2.00	0.50	5.20	2.85	V DITCH
3+290	Rt.	2.00	0.50	5.20	2.85	V DITCH
3+330	Rt.	2.00	0.50	5.20	2.85	V DITCH
				TOTAL	163.50	

CHECK DAM NOTES

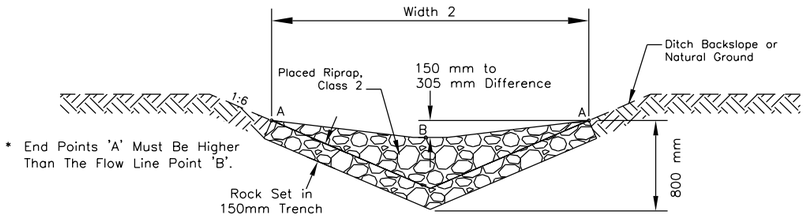
1. Workmanship And Materials Shall Conform To The Standard Specifications For Construction Of Roads And Bridges On Federal Highway Projects (FP-14) Along With All Supplemental Specifications For This Project.
2. Riprap Check Dams Shall Be Placed Prior To Cross Scarifying The Existing Road Bed To Prevent Recompacting The Road Bed During Check Dam Placement. The Check Dam Stations Given Are Approximate. The CM Shall Adjust As Necessary To Fit Field Conditions.
3. If In The Opinon Of The CM, The Existing Road Bed (During Scarfying) Is Rock Material And Not Prone To Erosion, The Check Dams May Be Deleted Or Relocated To More Erosive Sections Of The Existing Road Bed. All Riprap Field Adjustments Are Incidental Obligations Of The Contractor.
4. Check Dam Riprap Quantities Shown Are Approximate. Actual Quantities Shall Be Determined By Field Measurement.
5. Ditches And Backslope Reshaping, Cleaning, And Excavation Shall Be Done In Accordance With The Plans And As Determined By The CM. All Ditch Excavation, Cleaning, And Reshaping Shall Be Considered Incidental To Completion Of The Structure.
6. All Stone For Placed Riprap To Be Class 2 Meeting The Grading Requirements Of Table 705-1, And Section 251 Of The FP-14.

NOTE: Place Downstream Structure Such That Point 'B' Is Approximately Level With The Lowest Ground Elevation Of The Upstream Structure.



CHECK DAM SPACING GUIDELINES

S = 60 m For 2% & Less Grade,
S = 40 m For Greater Than 2% Grade.



CROSS SECTION DETAILS FOR V DITCH

* If required to maintain the 150mm minimum height of the top edge of the check dam (at back slopes) above the check dam flow line, the Contractor shall place embankment material as directed by the CM. This work shall be incidental to the riprap bid items and no additional payment will be made.

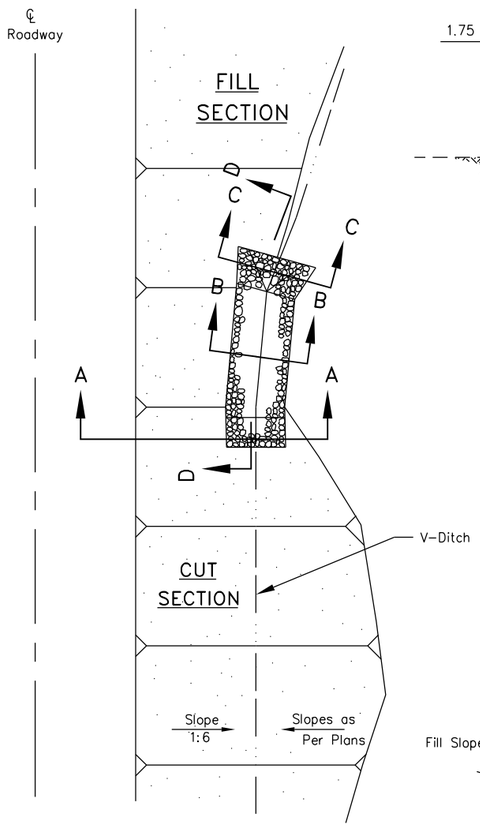


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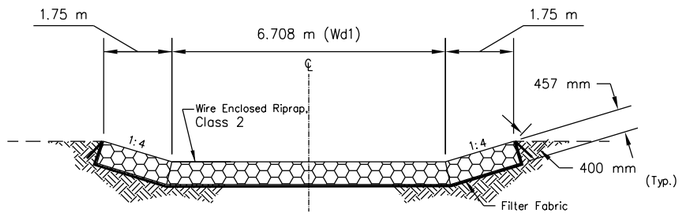
PLACED RIPRAP
CHECK DAM DETAILS

Designed by: NRDOT	**Date:** 7/03
Drawn by: NRDOT	**Date:** 7/03
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)-CKDAM SHT 66	

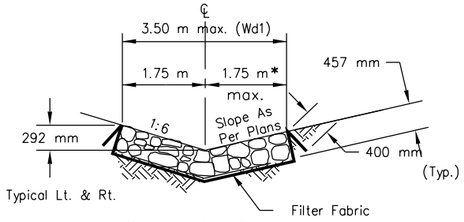
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	67	82



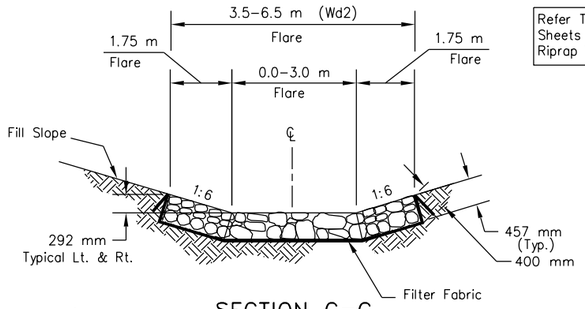
PLAN VIEW
CUT TO FILL TRANSITION
AT V-DITCH



FLAT BOTTOM DITCH
Sta. 5+597 to 5+624 Lt. & 5+885 to 5+937 Lt.

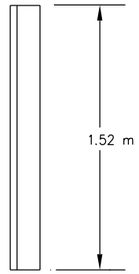


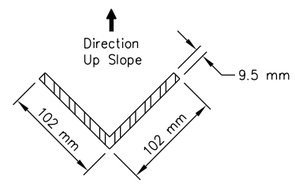
SECTION B-B
*Width=Depth Divided By Backslope(As Per Plans)



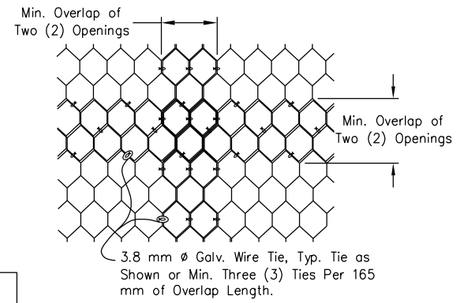
SECTION C-C

Refer To Notes On Plan & Profile Sheets For Location And Type of Riprap To Be Used.

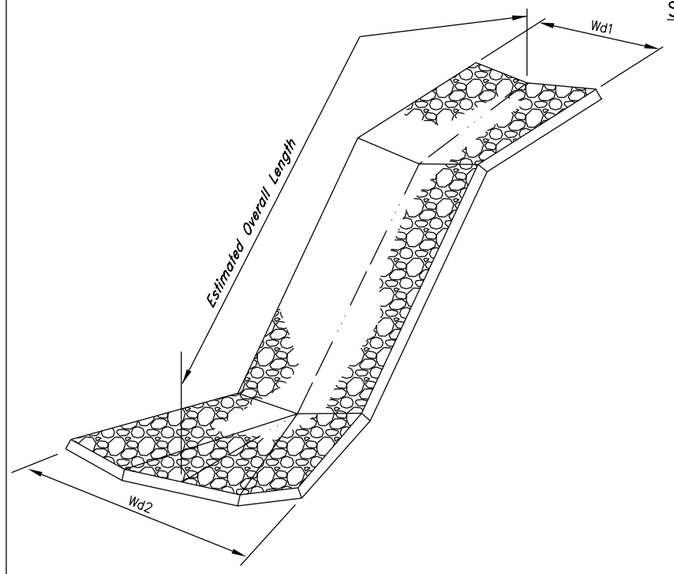




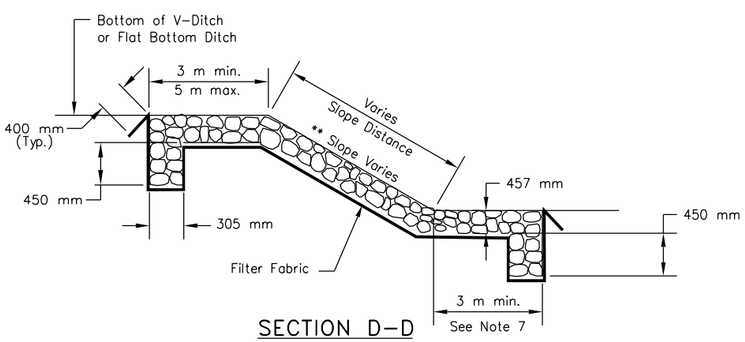
ANGLE IRON ANCHOR DETAIL
N.T.S.



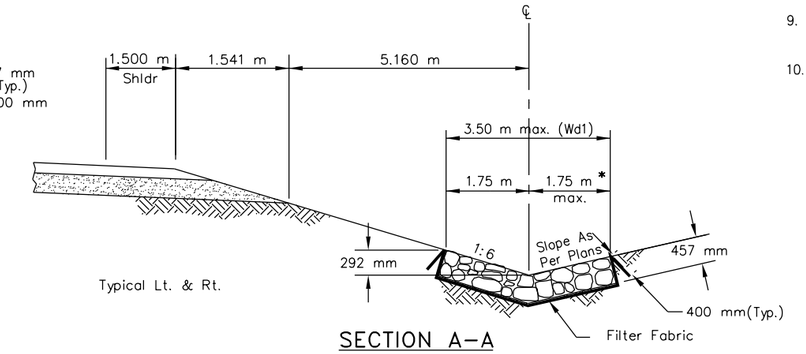
FABRIC SPLICING DETAIL
N.T.S.



PERSPECTIVE VIEW
PLACED RIPRAP DOWNDRAIN/CUT TO FILL TRANSITIONS
AT V-DITCHES & WASHES



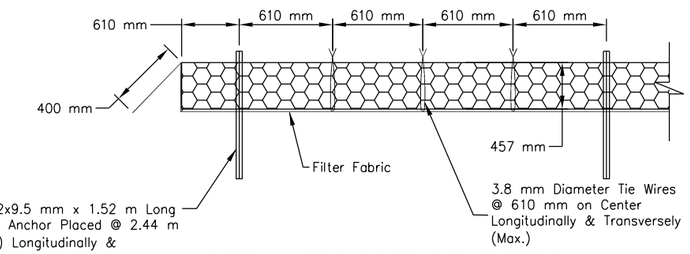
SECTION D-D
** See Note (7)



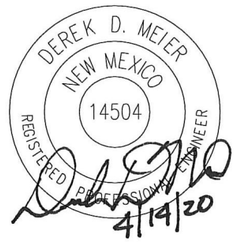
SECTION A-A
*Width=Depth Divided By Backslope (As Per Plans)

GENERAL NOTES

1. Workmanship and Materials Shall Conform to the Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects (FP-14), Along with All Supplemental Specifications for This Project.
2. The Quantities Shown are Only an Estimate. Actual Quantities Shall Be Determined in the Field. The CM, and Contractor Shall Review All Rock Cut Areas After the Construction of Vee and/or Flat Bottom Ditches Have Been "Roughed In". If in the Opinion of the CM the Rock Cut Is Stable, the CM May Elect to Delete Sections of the Riprap. The Contractor Will Be Required to Make Adjustments to the Riprap as Necessary to Fit Actual Field Conditions. These Field Adjustments Will Be Incidental Obligations of the Contractor.
3. Ditch and Back Slope Reshaping, Cleaning, and Excavation Shall Be Done in Accordance with the Plans and as Determined By the CM. All Ditch Excavation, Cleaning, and Reshaping Shall Be Considered Incidental to Completion of the Structure. Riprap Shall Conform to Section 251 of FP-14, the Supplemental Specifications, and the Details Shown in These Construction Plans.
4. The Wire Fabric Shall Be Galvanized And Be Of The Configuration Shown On This Sheet. An Alternate Wire Fabric May Be Submitted For Review And Approval. Any Wire Fabric Used Shall Have A Minimum Wire Diameter Of 2.8 mm, A Class 3 Zinc Coating (Galvanized), Shall Have A Maximum Opening Dimension Of 100 mm, And Shall Not Allow A 75 mmø Sphere To Pass Through Wire Fabric Opening.
5. Embankment Below Riprap Shall Conform to Section 204 of FP-14. Excavation For Riprap Foundations Shall Conform to Section 209 of FP-14. All Embankment For Riprap Above Natural Ground Is Included in the Quantity For Item 20401-0000, Roadway Excavation, and Shall Be Paid For Under That Item. All Excavation For Riprap Construction Shall Be Considered Incidental to Riprap Bid Item.
6. Rock Size Shall Conform to FP-14, Section 705, Table 705-1, Class 2.
7. Riprap Downdrains Shall Be Carried Down Slope to the Intersection of the Fill Slope and Extended Until a 2% or Lower Slope Is Achieved Before Termination or as Directed by the CM.
8. Wire Enclosed Riprap Shall Be Anchored As Shown With L 102 mm x 102 mm x 9.5 mm Steel Angles Spaced At 2.44 m Each Way. Steel Angles Shall Extend 75 mm Above The Top Of The Mesh. In Rocky Areas, Drive Angle Iron Anchors To Refusal (Min. Embedded 500 mm), Then Cut At 75 mm Above Riprap. Anchors Shall Be Saw Cut To Leave A Smooth Edge. Do Not Use A Cutting Torch. Furnishing And Placement Of Steel Angles Shall Be Considered Incidental To Completion Of The Structure.
9. The Finished Surface of All Riprap Shall Be Set 30 mm Below the Ground Surface Except at Riprap Discharge Ends, Which Shall Be Set 30 mm Above the Ground Surface.
10. Filter Fabric Shall Be Installed Under All Riprap (Except Grouted Riprap And Check Dams) And Shall Conform To Section 714, And Shall Be Considered Incidental To Riprap Bid Items. Round All Sharp Contours As Required To Fit The Soil Erosion Material Flush With The Existing Ground.



TYPICAL WIRE ENCLOSED RIPRAP SECTION
N.T.S.

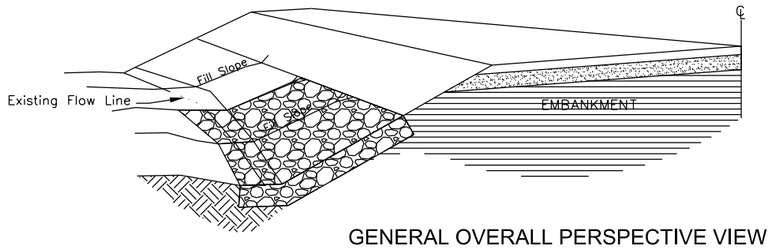


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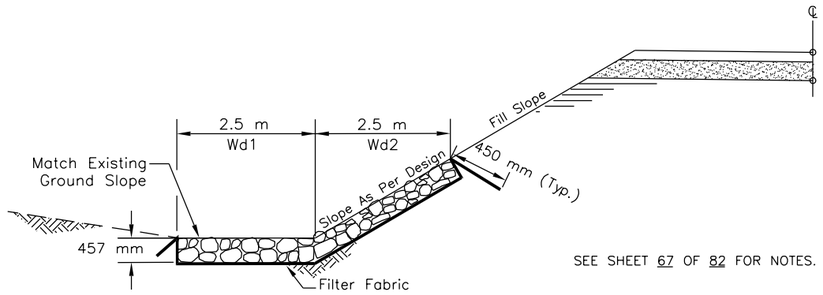
RIPRAP LINED DITCH, DOWNDRAIN & FLAT BOTTOM DITCH DETAILS

Designed by: NRDOT	**Date:**
Drawn by: NRDOT	**Date:**
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)-Riprap Downdrain SHT 67	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	68	82

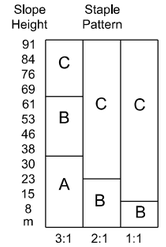


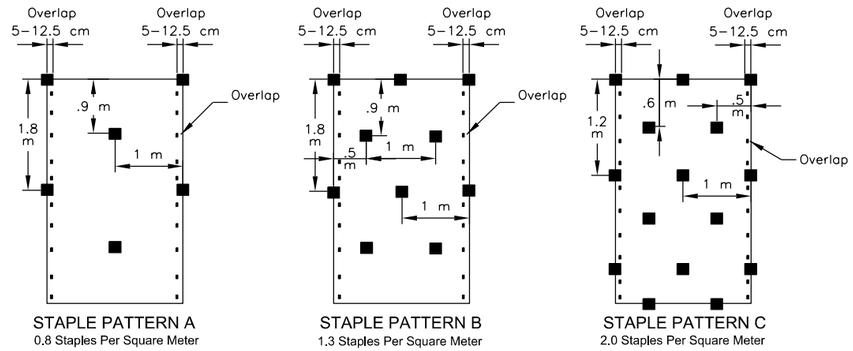
GENERAL OVERALL PERSPECTIVE VIEW
@ TOE OF EMBANKMENT



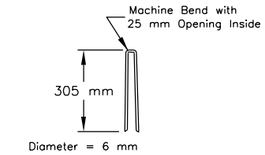
SEE SHEET 67 OF 82 FOR NOTES.

TOE OF SLOPE PROTECTION WITH PLACED RIPRAP, CLASS 2



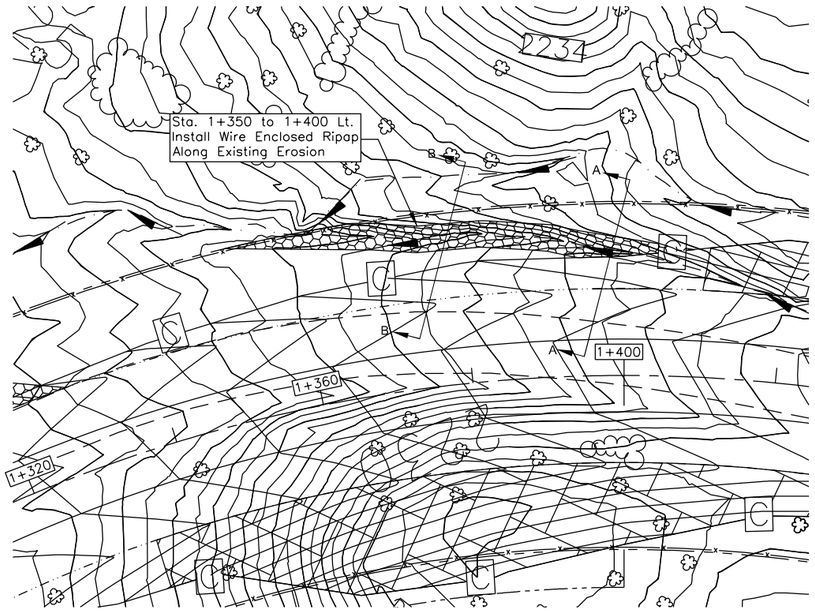


RECP STAPLE DETAILS

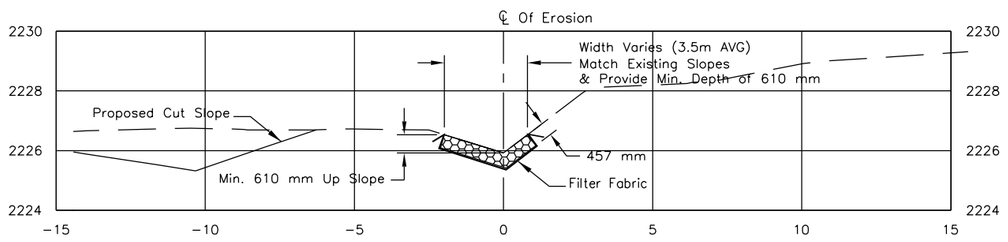


STAPLE, STEEL WIRE

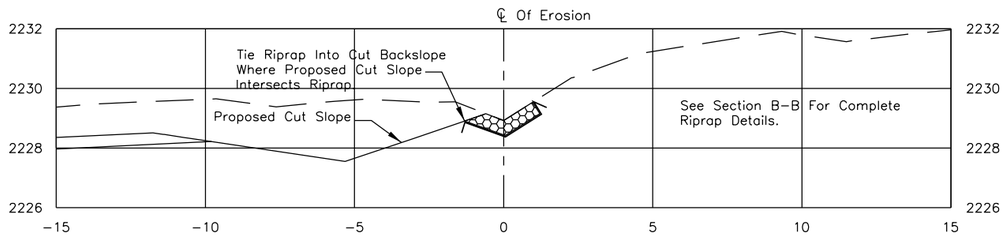




EROSION PROTECTION PLAN
1+350 to 1+400 Lt. NTS



SECTION B-B



SECTION A-A

See Sheet 67 For Additional Wire Enclosed Riprap Details & Notes.

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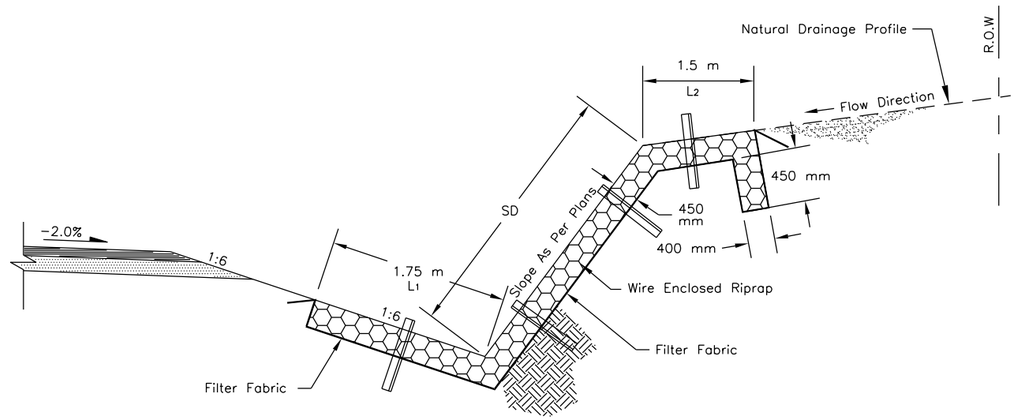
TOE OF SLOPE PROTECTION & RECP STAPLE DETAILS

Designed by: WHPacific	**Date:** 8/08
Drawn by: WHPacific	**Date:** 8/08
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)–EMB_PROT2 sht 68	

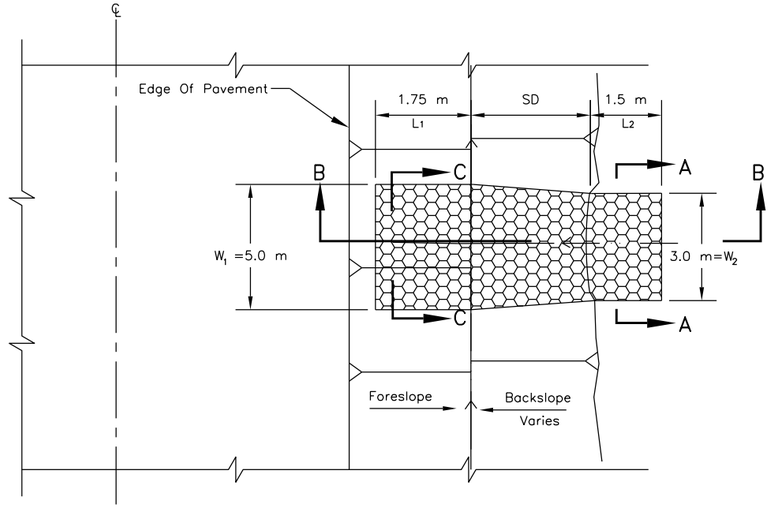
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	69	82

GENERAL NOTES

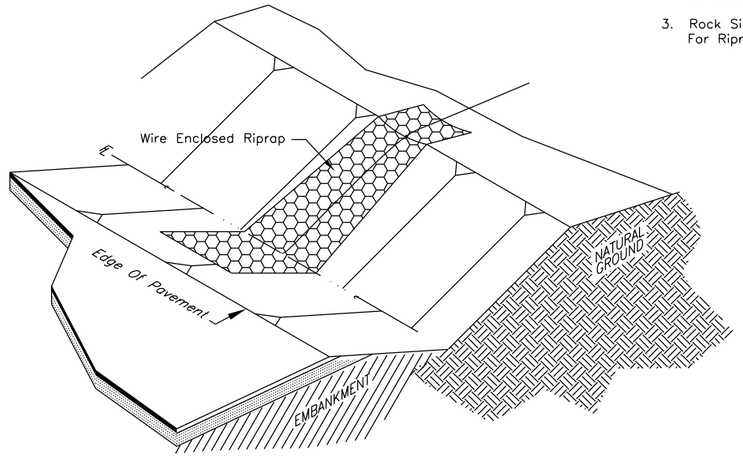
1. See Sheet 67 For Additional Notes & Riprap Details.
2. The Contractor Shall Be Required to Make Field Adjustments to Fit Field Conditions as Directed By The CM.
3. Rock Size Shall Conform to Table 705-1, Section 705, Rock For Riprap, Class 2.



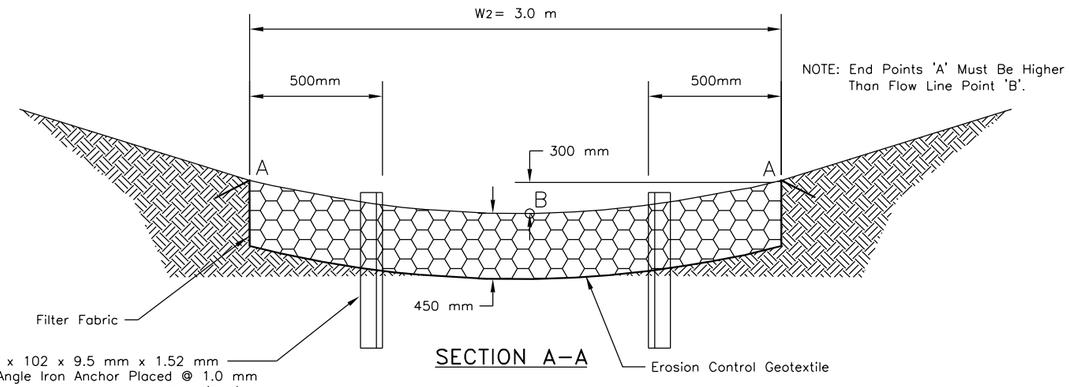
SECTION B-B



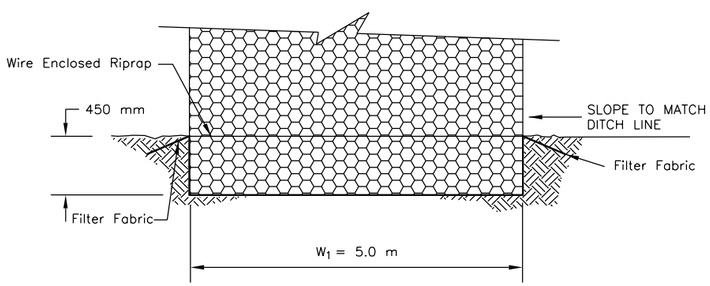
PLAN VIEW



ISOMETRIC VIEW



SECTION A-A



SECTION C-C

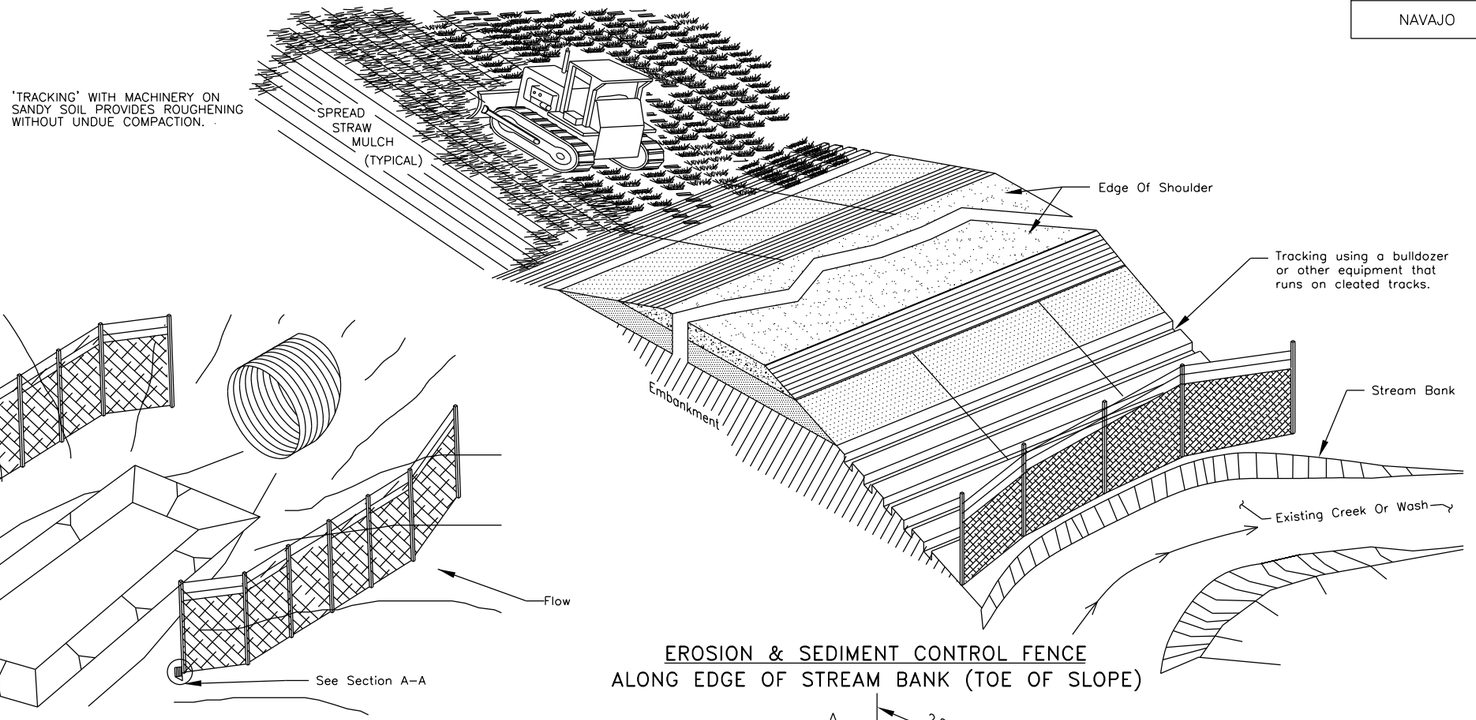


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NAVAJO REGION OFFICE * DIVISION OF TRANSPORTATION

WIRE ENCLOSED RIPRAP DETAIL FOR BACKSLOPE PROTECTION

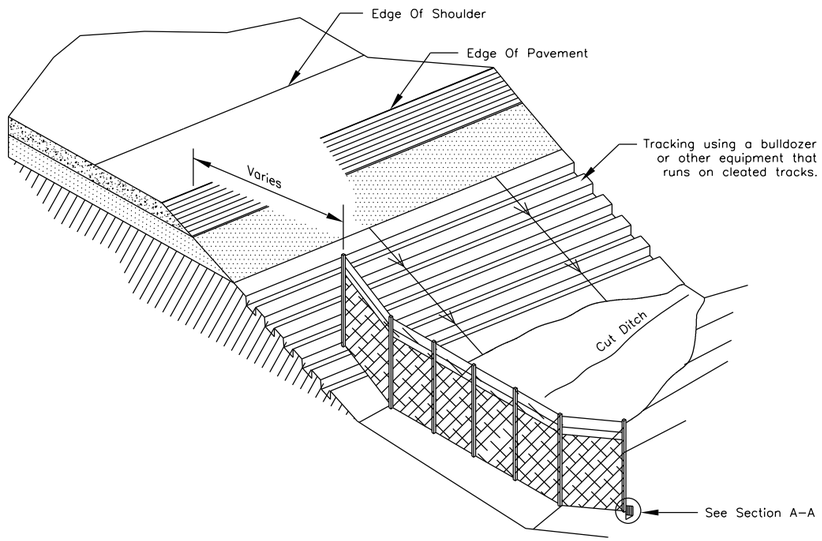
Designed by: NRDOT	**Date:** 6/08
Drawn by: LRT	**Date:** 6/08
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)-Backslope Protection sht	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	70	82

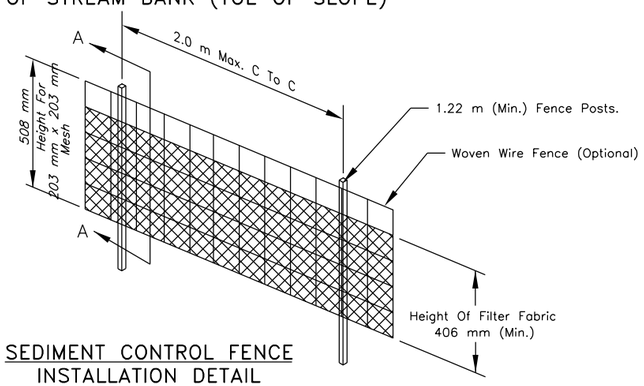


EROSION & SEDIMENT CONTROL FENCE ALONG EDGE OF STREAM BANK (TOE OF SLOPE)

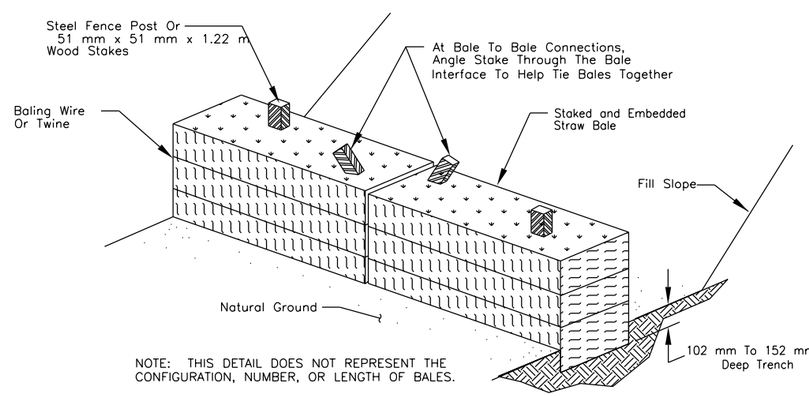
EROSION & SEDIMENT CONTROL FENCE AT DRAINAGE STRUCTURE



EROSION & SEDIMENT CONTROL FENCE IN MINOR SWALES OR CUT DITCHES (APPROX 60 m SPACING FOR FABRIC)



SEDIMENT CONTROL FENCE INSTALLATION DETAIL

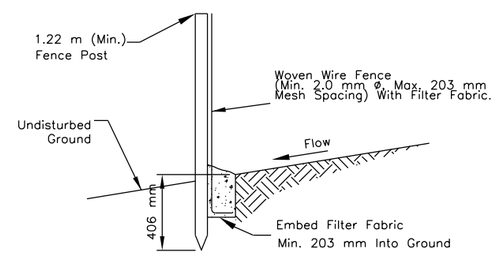


NOTE: THIS DETAIL DOES NOT REPRESENT THE CONFIGURATION, NUMBER, OR LENGTH OF BALES.

TYPICAL STRAW BALE STAKING AND TRENCHING DETAIL

GENERAL NOTES

1. THE CONTRACTOR SHALL PREPARE AND SUBMIT A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IN FULL DETAIL FOR ALL PHASES OF THE WORK FOR REVIEW AND APPROVAL AT LEAST 14 CALENDAR DAYS BEFORE IMPLEMENTATION. THE PLAN SHALL MEET THE REQUIREMENTS HEREIN AND SECTION 157 OF THE FP-14 AS MODIFIED IN THE SUPPLEMENTAL SPECIFICATION. SEE SPECIAL CONTRACT REQUIREMENTS FOR NPDES PERMIT REQUIREMENTS.
2. THE SILT FENCING CONSISTS OF 914 mm SEDIMENT CONTROL FABRIC CLOTH WITH BURIED-TOE, AND STEEL POSTS (TEE OR U TYPE) SPACED AT 2.00 m WITH 2 mm SIZE WELDED WIRE BACK-UP FENCE.
3. WOVEN WIRE FABRIC TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 610 mm AT THE TOP AND MID-SECTION. GEOTEXTILE MATERIAL FOR SILT FENCING SHALL BE IN ACCORDANCE WITH SUB-SECTION 713.16 OF FP-14.
4. WHEN TWO SECTION OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY 152 mm AND FOLDED. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.
5. SILT FENCE SHALL BE INSTALLED PARALLEL TO THE TOE OF ALL ROADWAY EMBANKMENT FILLS IN LOCATIONS WHERE THE TOE OF THE FILLS ARE WITHIN 2.0 m OF EXISTING STREAMS, CREEKS OR WASHES; IN AREAS WITH HIGHLY EROSIVE SOILS AND/OR WHERE EMBANKMENTS ARE AT A 1:3 OR STEEPER SLOPE. THE SILT FENCE SHALL BE PLACED 1 m TO 2 m DOWNHILL FROM THE TOE OF THE FILL AND IN ACCORDANCE WITH SECTION 157 OF THE FP-14 AND THE SUPPLEMENTAL SPECIFICATIONS.
6. STRAW BALES MAY BE USED AT THE TOP OF CUT BACKSLOPES AND FOR DIKES PROVIDED THEY ARE PROPERLY ANCHORED WITH STEEL FENCE POSTS OR 51 mm x 51 mm x 1.22 m WOOD STAKES (TWO PER BALE) ANCHORED 508 mm INTO THE NATURAL GROUND. STRAW BALES SHALL BE CERTIFIED 0.5% WEED FREE. DO NOT USE STRAW BALES IN AREAS OF CONCENTRATED FLOW AND CUT DITCHES.
7. FURNISHING AND PLACEMENT OF SILT FENCE MATERIAL AND OTHER EROSION CONTROL MEASURES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 15701-1000.
8. SEDIMENT/SILT FENCING SHALL BE PLACED AT ALL LOCATIONS WHERE EMBANKMENTS HAVE SLOPE DISTANCES OF 30.0 m OR GREATER. THE SEDIMENT FENCING WILL BE PLACED AT THE TOE OF SLOPES OFFSET 1-2 METERS.
9. THE CONTRACTOR SHALL INSPECT AND MAINTAIN ALL SWPPP MEASURES WEEKLY AND AFTER EACH SIGNIFICANT STORM EVENT (I.E. 25 mm OF MOISTURE IN 24 HOURS).
10. PRIOR TO FINAL ACCEPTANCE, ALL PROJECT AREAS(AS DETERMINED BY COTR/COR) SHOWING EROSION DAMAGE CAUSED BY THE CONTRACTOR'S FAILURE TO PROPERLY MAINTAIN HIS EROSION CONTROL STRUCTURES SHALL BE REPAIRED TO REMOVE SAID DAMAGE. ANY SPECIFIED EROSION CONTROL MATERIALS, STRUCTURES, OR DEVICES DAMAGED OR LOST DUE TO IMPROPER INSTALLATION, THE CONTRACTOR'S NEGLIGENCE OR IMPROPER MAINTENANCE, SHALL ALSO BE REPAIRED AND/OR REPLACED TO PROJECT REQUIREMENTS PRIOR TO FINAL ACCEPTANCE. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO BID ITEM 15701-0000, NO ADDITIONAL PAYMENT WILL BE MADE.



SECTION A-A

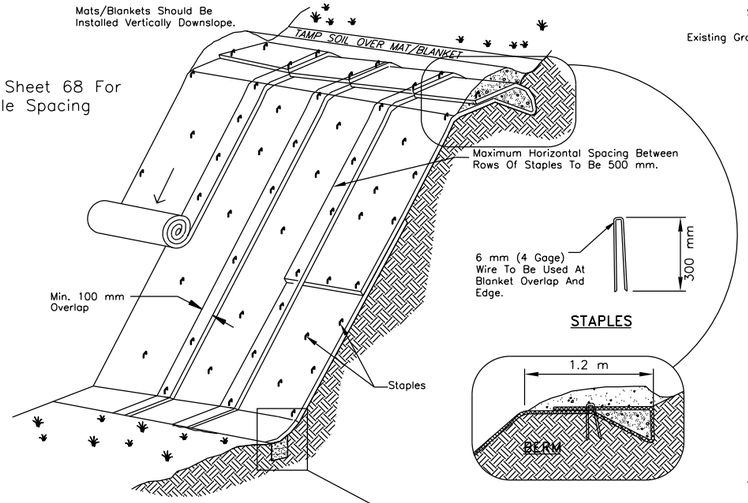
DEREK D. MEIER
NEW MEXICO
14504
REGISTERED PROFESSIONAL ENGINEER
4/14/20

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STORMWATER POLLUTION AND EROSION/SEDIMENT CONTROL

Designed by: NRDOT	**Date:** 8/07
Drawn by: NRDOT	**Date:** 8/07
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)-ER01 sht 70	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	71	82



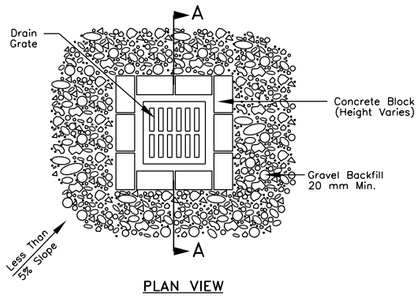
ISOMETRIC VIEW

EROSION BLANKETS & TURF REINFORCEMENT MATS SLOPE INSTALLATION

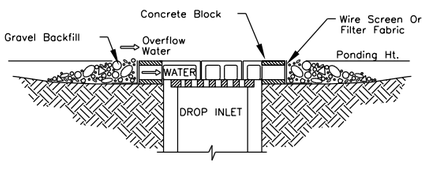
NOTES:
1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/BLANKETS SHALL HAVE GOOD SOIL CONTACT.

2. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.

3. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.



PLAN VIEW



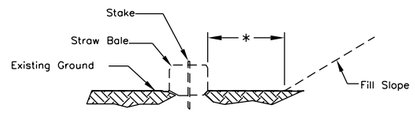
SECTION A–A

BLOCK AND GRAVEL DROP INLET SEDIMENT BARRIER

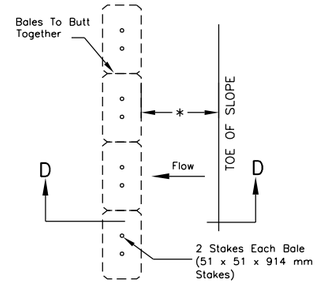
NOTES:
1. DROP INLET SEDIMENT BARRIERS ARE TO BE USED FOR SMALL, NEARLY LEVEL DRAINAGE AREAS. (LESS THAN 5%)

2. EXCAVATE A BASIN OF SUFFICIENT SIZE ADJACENT TO THE DROP INLET.

3. THE TOP OF THE STRUCTURE (PONDING HEIGHT) MUST BE WELL BELOW THE GROUND ELEVATION DOWNSLOPE TO PREVENT RUNOFF FROM BYPASSING THE INLET. A TEMPORARY DIKE MAY BE NECESSARY ON THE DOWNSLOPE SIDE OF THE STRUCTURE.



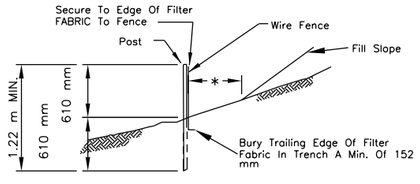
SECTION D–D
*SEE GENERAL NOTES.

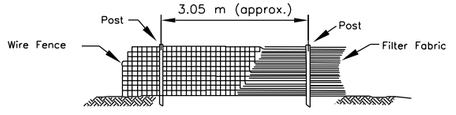


PLAN

STRAW BALE SILT BARRIER

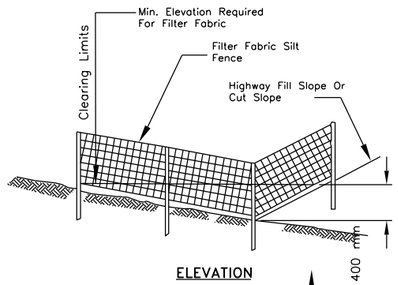
*SEE GENERAL NOTES



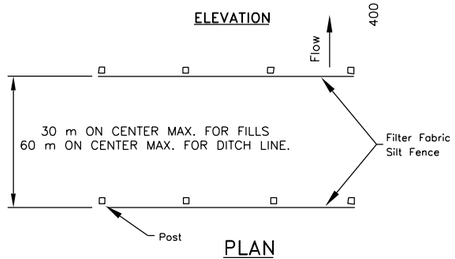


FILTER FABRIC SILT FENCE

* SEE GENERAL NOTES

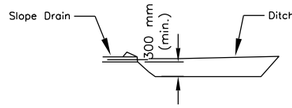


ELEVATION



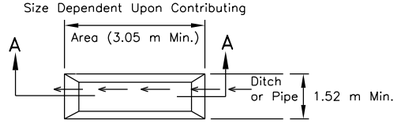
PLAN

SILT FENCE EROSION CHECK



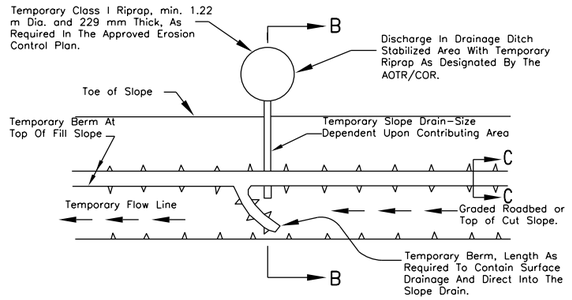
SECTION A–A

Size Dependent Upon Contributing

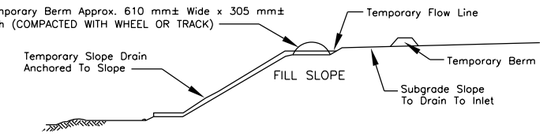


SEDIMENT TRAP

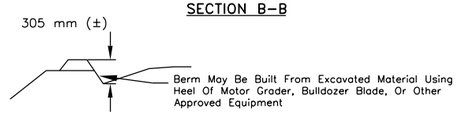
(Traps shall not fill to beyond one–half capacity prior to cleaning)



PLAN VIEW

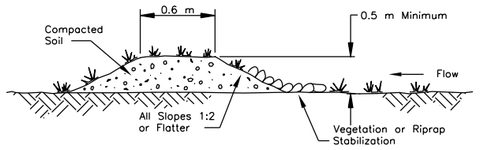


SECTION B–B

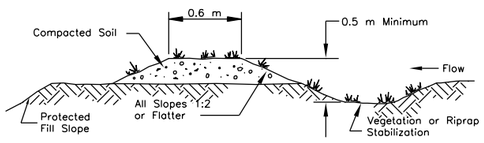


SECTION C–C

TEMPORARY SLOPE DRAIN, BERM. (FOR FILL AND CUT SLOPES) [NOTES: TEMPORARY BERMS MAY ALSO BE CONSTRUCTED OF STRAW BALES SET 104–152 mm INTO GROUND.]



TYPICAL TEMPORARY DIVERSION DIKE
(FOR TOP OF CUT BACK SLOPES.)



TYPICAL FILL DIVERSION

TEMPORARY DIVERSION DIKE

NOTES:
1. THE CHANNEL BEHIND THE DIKE SHALL HAVE POSITIVE GRADE TO A STABILIZED OUTLET.

2. THE DIKE SHALL BE ADEQATELY COMPACTED TO PREVENT FAILURE.

3. THE DIKE SHALL BE STABILIZED WITH TEMPORARY OR PERMANENT SEEDING OR RIPRAP.

4. THE DIVERSION DIKE SHALL EXTEND TO THE BOTTOM OF CUT BACK SLOPE AND INTERCEPT THE CUT DITCH.

GENERAL NOTES

1. SEE SHEET 70 OF 82 FOR ADDITIONAL NOTES AND DETAILS.

2. THE CONTRACTOR SHALL INSTALL GEOTEXTILE FABRIC, TYPE N, AROUND CONCRETE STRUCTURE, AS FOLLOWS:

   A. CONSTRUCT FINISH GRADING AROUND STRUCTURE TO BE PLACED.
   B. CUT TRENCHES FOR FOOTING OF SLAB.
   C. INSTALL 1.22m OF GEOTEXTILE FABRIC ANCHORED ON FLOOR AND TOP ALONG THE CUT FACE OF TRENCH AS SHOWN
   D. PLACE CONCRETE FORMS, REINFORCEMENTS,AND SUBSEQUENT CONCRETE.

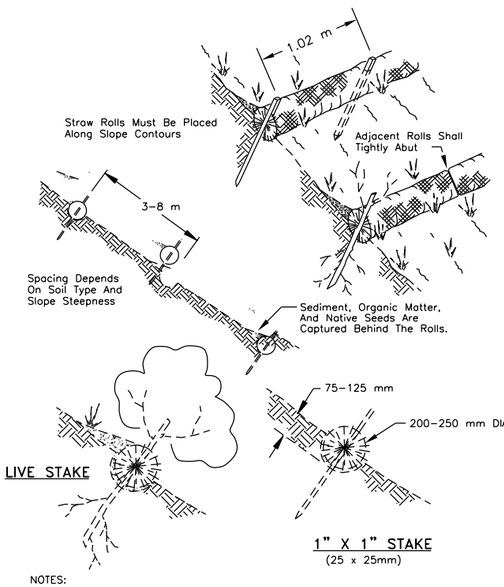
3. CONSTRUCT SEDIMENT BASINS AND TRAPS, EROSION CHECKS AND/OR FILTERS IN STRATEGIC LOCATIONS ON THE PROJECT TO FILTER STORM RUNOFF BEFORE IT LEAVES THE PROJECT CONSTRUCTION LIMITS OR ENTERS A STREAM AS SHOWN IN THE APPROVED SWPPP.

4. CLEAN ALL SEDIMENT BASINS AND TRAPS OF ACCUMULATED SEDIMENT WHEN HALF FULL OF SEDIMENT.

5. USE DRAIN PIPE, RIPRAP, GEOTEXTILE FABRIC, OR GRASS–LINED WATERWAY FOR TEMPORARY SLOPE DRAINS IT CHANNEL RUNOFF DOWN SLOPES, CHANNEL WATER INTO SLOPE DRAINS WITH STRAW BALES, WATTLES OR EARTH BERMS CONSTRUCTED AT THE TOP OF A CUT SLOPE. ANCHOR SLOPE DRAINS TO THE SLOPE.

6. THE CONTRACTOR SHALL ADJUST THE DIMENSIONS AND/OR LOCATIONS OF TEMPORARY SEDIMENT AND EROSION CONTROL DEVICES TO FIT ACTUAL FIELD CONDITIONS.

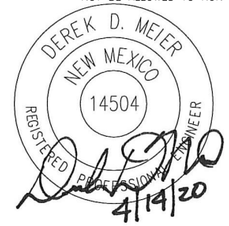
7. REMOVE AND DISPOSE OF EROSION CONTROL MEASURES WHEN THE PERMANENT EROSION CONTROL MEASURES ARE SATISFACTORILY ESTABLISHED AND DRAINAGE DITCHES AND CHANNELS ARE LINED AND STABILIZED, IN ACCORDANCE WITH SECTION 157 OF FP–14.



1" X 1" STAKE
(25 x 25mm)

NOTES:
1.STRAW ROLL INSTALLATION REQUIRED THE PLACEMENT AND SECURE STAKING OF THE ROLL IN A TRENCH, 75–125 mm DEEP, DUG ON CONTOUR. RUNOFF MUST NOT BE ALLOWED TO RUN UNDER OR AROUND ROLL.

STRAW ROLLS

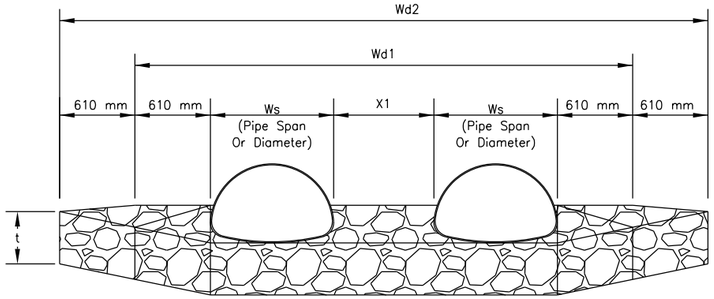


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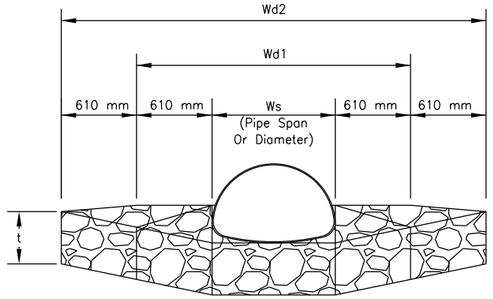
STORMWATER POLLUTION AND EROSION/SEDIMENT CONTROL

Designed by: NRDOT	**Date:** 1/05
Drawn by: NRDOT	**Date:** 1/05
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)–ER02 sht 71	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	72	82

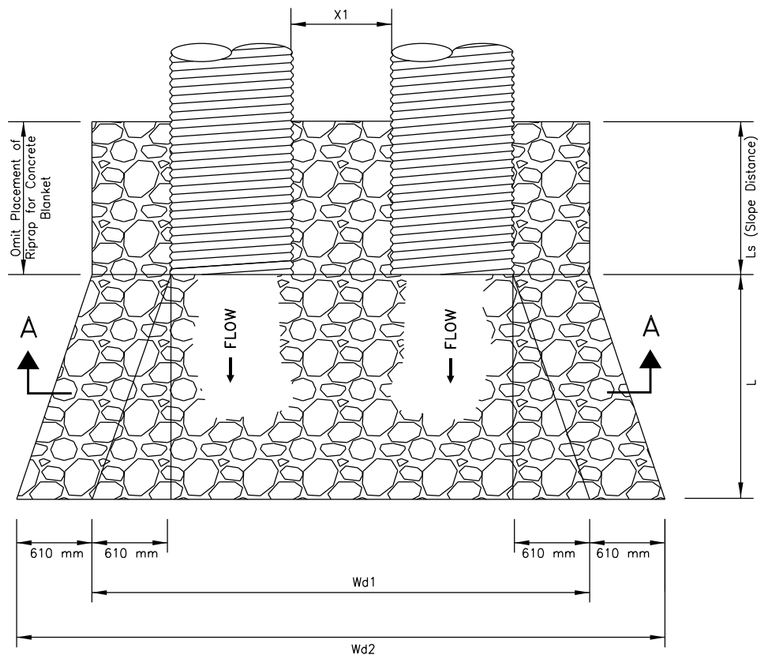


ELEVATION – MULTIPLE BARREL
SECTION A–A

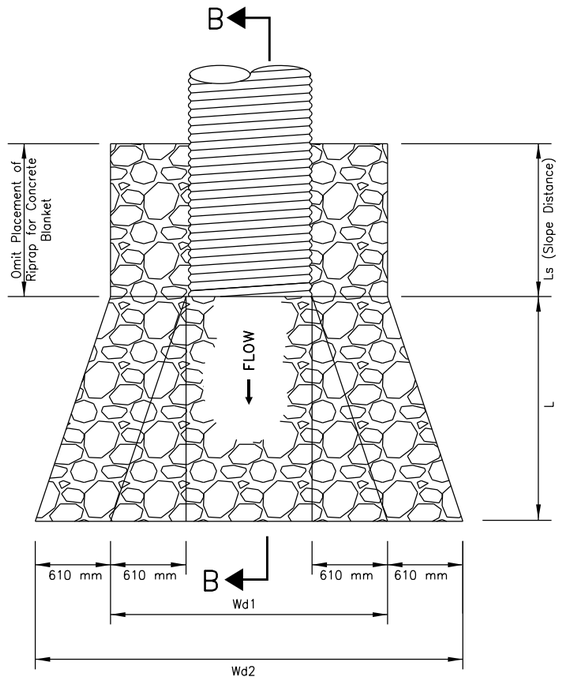


ELEVATION – SINGLE BARREL
SECTION A–A

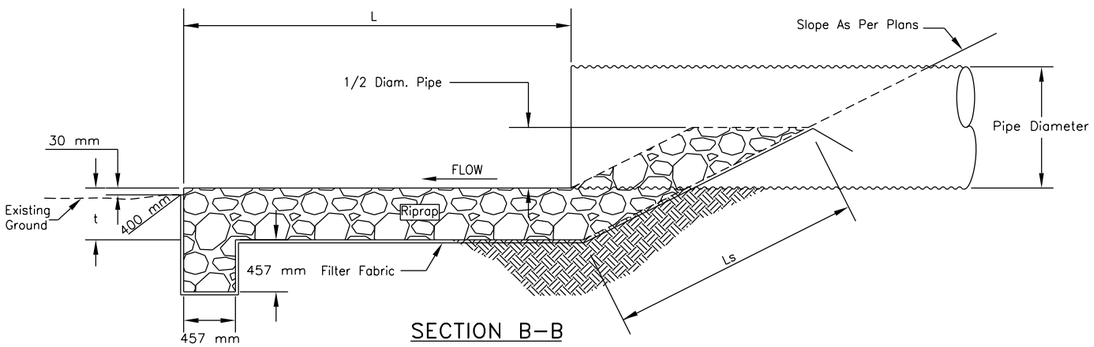
X1 = 1829 mm for 610 mm
X1 = 2083 mm for 762 mm



PLAN – MULTIPLE BARREL



PLAN – SINGLE BARREL



SECTION B–B

GENERAL NOTES

1. See Sheet 67 For Additional Notes and Details.
2. All Stone For Riprap Shall Be Class 2 Meeting The Grading Requirements Of Table 705–1 Of The FP–14. See Supplemental Specification Section 705 For Modification (No Minus 76 mm Rock) To Rock Specifications For Rock Used With Grouted Riprap.
3. All Excavations And Backfill Operations Shall Be Done To Neat Lines In Accordance With Section 209 Of The FP–14 And Will Be Incidental To Installation Of Riprap. See Supplemental Specifications For Additional Requirements.
4. Any Borrow Material Needed To Bring Existing Channels Up To Grade Shall Be Incidental To Riprap Pay Items.
5. See Sheet 75 For Grouted Riprap Details.

ITEM 25101-2000: PLACED RIPRAP, CLASS 2

STATION	STRUCTURE	LOCATION	Ws(m)	Wd1(m)	Wd2(m)	L(m)	Ls(m)	t(mm)	QUANTITY(m^3)
0+232.000	1–610 mm @ 132°	Outlet	0.610	1.830	3.050	3.66	5.06	457	7.54
								TOTAL	7.54

ITEM 25110-2000: GROUTED RIPRAP, CLASS 2

STATION	STRUCTURE	LOCATION	Ws(m)	Wd1(m)	Wd2(m)	L(m)	Ls(m)	t(mm)	QUANTITY(m^3)
1+920.000	2134 mm @ 90°	Outlet	2.134	3.354	4.574	3.66	3.53	457	9.55
								TOTAL	9.55

ITEM 25112-2000: WIRE ENCLOSED RIPRAP, CLASS 2

STATION	STRUCTURE	LOCATION	Ws(m)	Wd1(m)	Wd2(m)	L(m)	Ls(m)	t(mm)	QUANTITY(m^3)
5+635.000	3–610 mm @ 45°	Outlet	N/A	N/A	N/A	N/A	N/A	457	175.99
								TOTAL	175.99

Note: Skewed Wd1 & Wd2 = Wd1/cos? and Wd2/cos? Respectively.

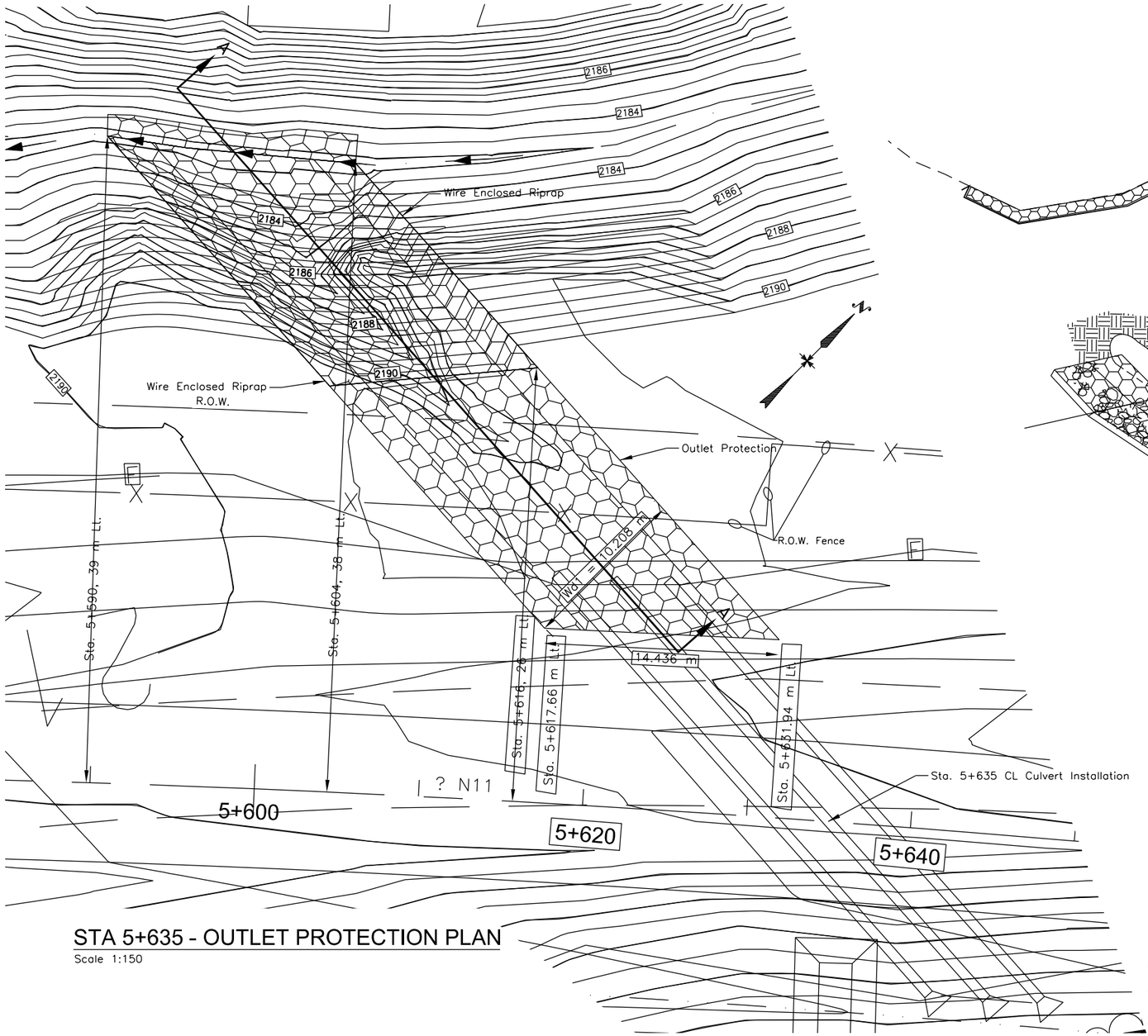
DEREK D. MEIER
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14504
REGISTERED PROFESSIONAL ENGINEER
4/14/20

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NAVAJO REGION OFFICE * DIVISION OF TRANSPORTATION

CULVERT RIPRAP APRON DETAILS

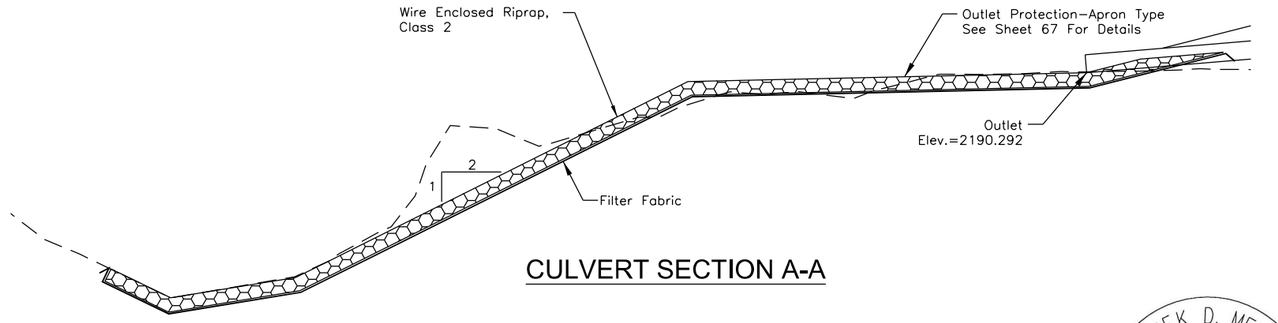
Designed by: NRDOT	**Date:**
Drawn by: NRDOT	**Date:**
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)–Culvert Riprap sht 72	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	73	82

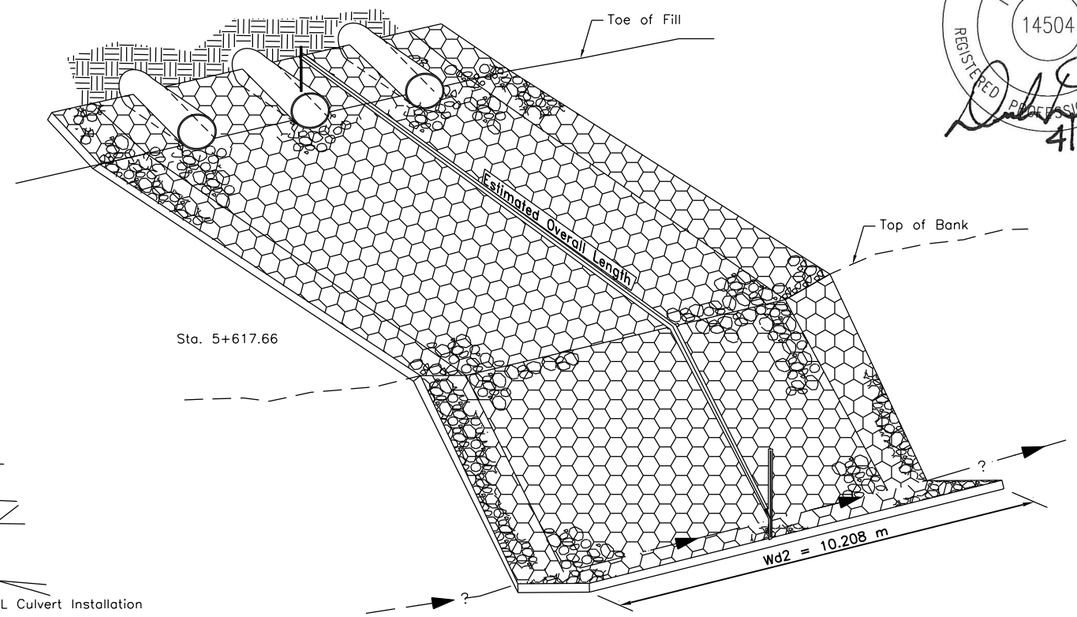


STA 5+635 - OUTLET PROTECTION PLAN

Scale 1:150



CULVERT SECTION A-A



ISOMETRIC VIEW

DEREK D. MEIER
NEW MEXICO
14504
REGISTERED PROFESSIONAL ENGINEER
4/14/20

GENERAL NOTES

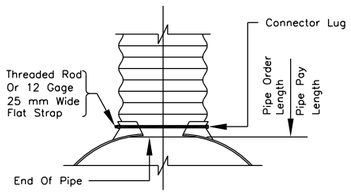
1. See Sheet 67 For Additional Notes, Riprap Details & Flat Bottom Ditch Details.
2. The Contractor Shall Be Required To Make Field Adjustments To Fit Field Conditions As Directed By The CM.
3. Rock Size Shall Conform To Table 705-1, Section 705, Rock For Riprap, Class 2.
4. See Plan Sheets & 77 of 82 For Information On The 3-610mm Pipe Installation.

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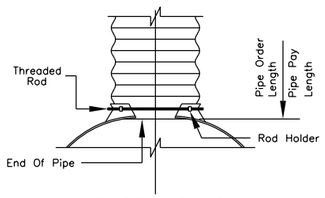
SPECIAL WIRE-ENCLOSED RIPRAP DOWNDRAIN

Designed by: WHPacific	**Date:** 6/10
Drawn by: WHPacific	**Date:** 6/10
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)-Special Downdrain sht	

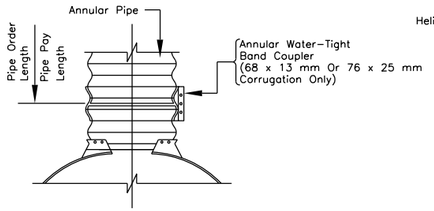
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	74	82



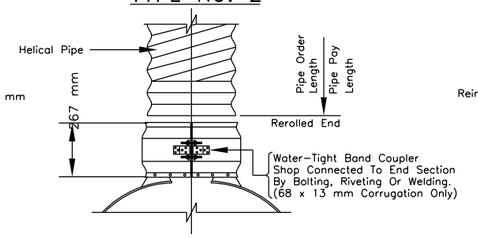
TYPE NO. 1



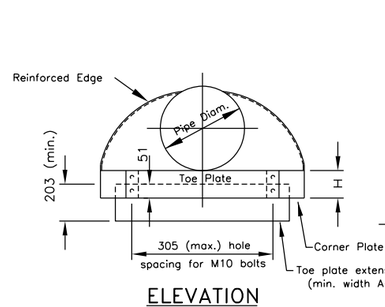
TYPE NO. 2



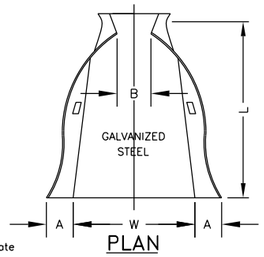
TYPE NO. 3



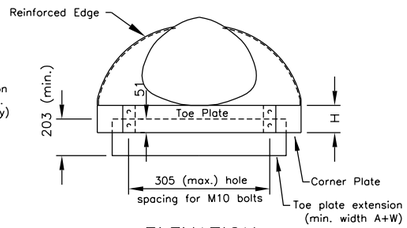
TYPE NO. 5
(See Note No.9)



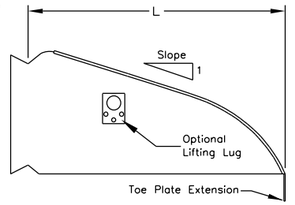
ELEVATION



PLAN



ELEVATION



TYPICAL CROSS SECTION

GENERAL NOTES

1. For Multiple Installation Of All Types, A Minimum Of A 610 mm 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 2.77 mm Thickness Sides And 3.5 mm 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 9.53 mmø Galvanized Rivets Or Bolts.
3. End Sections For Steel Pipe-Arches: For The 1956 mm x 1321 mm And 2108 mm X 1448 mm Sizes, Reinforced Edge To Be Supplemented By 51 mm x 51 mm x 6.35 mm Galvanized Angles. The Angles To Be Attached By 9.53 mm Dia. Galvanized Nuts And Bolts. Angle Reinforcement Will Be Placed Under The Center Panel Seams.
4. End Sections For Steel Circular Pipes: For 1524 mm Thru 2134 mm Sizes, Reinforced Edge To Be Supplemented With Galvanized Stiffener Angles. The Angles Will Be 51 mm x 51 mm x 6.35 mm For 1524 mm Thru 1829 mm, And 64 mm x 64 mm x 6.35 mm For 1981 mm And 2134 mm. The Angles To Be Attached By 9.53 mm 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 610 mm Pipe Only.
7. Type No. 2 Steel End Section: Connect End Section With Threaded Rod With Rod Holder, For 762 mm And 914 mm Round Pipe; And 432 mm x 330 mm Thru 1448 mm x 965 mm CSPA.
8. Type No. 3 Steel End Section: The Connection Includes 305 mm Of The Pipe Length As A Connector Section For Pipe Arch Sizes 1626 mm x 1092 mm Thru 2108 mm x 1448 mm And Round Pipe Sizes 1067 mm Thru 2134 mm. Gages Of Connector Section Shall Be The Same As The End Sections As Mentioned Above. The Connector Section Will Be Attached To The End Section By 9.5 mm Galvanized Rivets Or Bolts On Approximately 152 mm 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 9.5 mm Galvanized Steel Rivets Or Bolts Spaced At Approximately 152 mm 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.

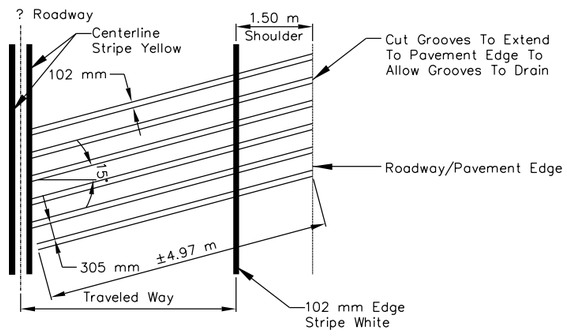
ROUND PIPE END SECTION

Pipe Diam (mm)	Thick ness (mm)	DIMEMSIONS A (25 mm=)	B (Max.)	H (25 mm±)	F (mm)	L (38 mm±)	W (51 mm±)	Approx. Slope	BODY
610	1.6	254	330	152	1168	1041	1219	2 1/2	1 Pc
762	2	311	318	203	1397	1229	1448	2 1/2	2 Pc
914	2	368	305	229	1778	1524	1829	2 1/2	2 Pc
1067	2.8	432	279	267	2082	1753	2134	2 1/2	2 Pc
1219	2.8	470	737	305	2235	2007	2286	2 1/4	3 Pc
1372	2.8	470	762	305	2540	2134	2591	2	3 Pc
1524	2.8 / 3.5	457	914	305	2845	2235	2896	1 3/4	3 Pc
1676	2.8 / 3.5	457	914	305	2997	2210	3048	1 1/2	3 Pc
1829	2.8 / 3.5	457	1118	305	3048	2248	3048	1 1/3	3 Pc
1981	2.8 / 3.5	457	168	305	3302	2223	3505	1 1/4	4 Pc
2134	2.8 / 3.5	457	1219	305	3454	2223	3658	1 1/6	4 Pc

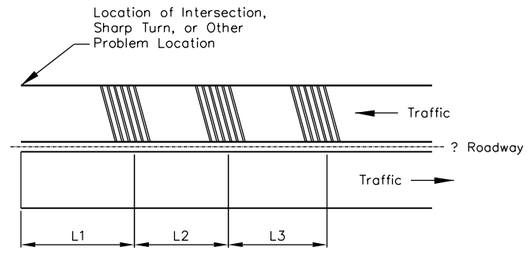
ARCH PIPE END SECTION

SPAN* *68 mm x 13 mm	RISE *76 mm x 25 mm	Thick ness (mm)	DIMEMSIONS A (25 mm±)	B (Max.)	H (25 mm±)	F (mm)	L (38 mm±)	W (51 mm±)	Approx. Slope	BODY
711 x 508		1.6	203	406	152	711	813	1219	2 1/2	1 Pc
889 x 610		2.0	254	406	152	863	991	1524	2 1/2	1 Pc
1067 x 737		2.0	305	305	191	1016	168	1905	2 1/2	2 Pc
1245 x 838		2.8	343	508	229	1168	1346	2134	2 1/2	2 Pc
1448 x 965		2.8	470	660	305	1473	1575	2286	2 1/4	3 Pc
1626 x 1092		2.8	457	737	305	1854	1753	2591	2 1/4	3 Pc
1803 x 1194		2.8 / 3.5	470	914	305	2540	1956	2896	2 1/4	3 Pc
	1854 x 1397	2.8	457	914	305	3149	1956	3200	2.0	3 Pc
	2057 x 1499	2.8	457	991	305	3454	1956	3505	2.0	3 Pc
	2210 x 1600	2.8	457	991	305	3454	1956	3505	2.00	3 Pc

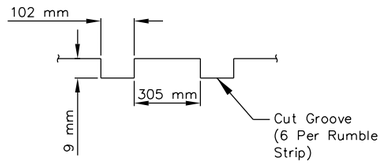
* CORRUGATION DIMENSION



CUT GROOVE RUMBLE STRIP



TYPICAL INSTALLATION



SECTION B-B

APPROACH SPEED	L1	L2	L3
≥ 90 km/h	USE TABLE 2C-4 SECTION 2C.05 IN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES	61 m	61 m
80 km/h		50 m	50 m
75 km/h		46 m	46 m
70 km/h		43 m	43 m
→ ≤ 60 km/h	68 m	38 m	38 m

ITEM 63313-0500: RUMBLE STRIP

STATION	LOCATION	QUANTITY
0+091	Lt.	1
0+129	Lt.	1
0+167	Lt.	1
	TOTAL	3

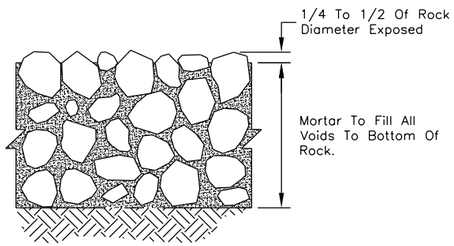


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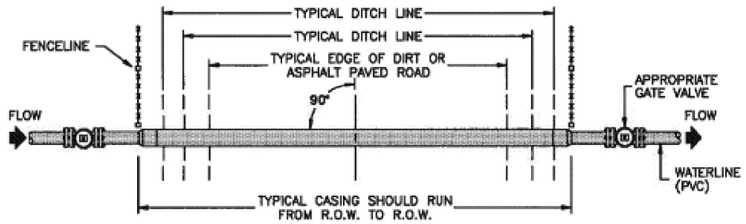
END SECTION AND RUMBLE STRIP DETAILS

Designed by: NRDOT	**Date:**
Drawn by: NRDOT	**Date:**
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)-STRUCT sht 74	

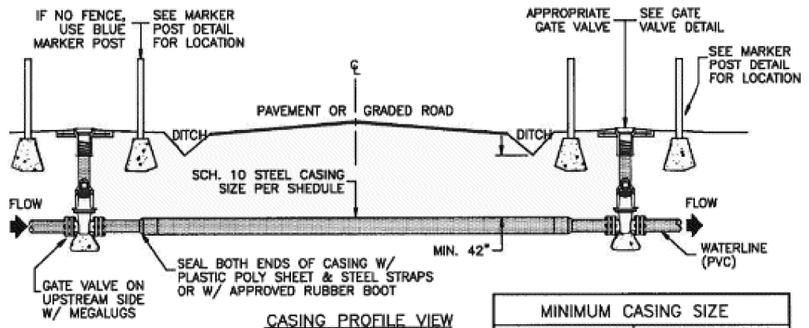
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	75	82



TYPICAL GROUTED RIPRAP DETAIL



CASING PLAN VIEW



CASING PROFILE VIEW

MINIMUM CASING SIZE	
PIPE SIZE (O.D.)	CASING SIZE (I.D.)
4"	12"
6"	14"
8"	16"
10"	18"
12"	20"
14"	22"

NOTES:

1. ALL CASINGS WILL TYPICALLY RUN FROM ROW TO ROW UNLESS OTHERWISE SPECIFIED.
2. BACKFILL SHALL BE 95% OF STANDARD PROCTOR DENSITY – TESTED IN 6" LIFTS.
3. ALL WOOD SKIDS ARE TO BE REDWOOD GRADE OR APPROVED EQUAL (OAE)
4. ALL SKIDS WILL BE SECURELY FASTENED TO PIPE WITH STAINLESS STEEL STRAPS.
5. ROAD SHALL BE BORED UNDER EXISTING PAVEMENT AND OPEN TRENCH ON REMAINDER, UNLESS OTHERWISE SPECIFIED.
6. IF SYSTEM IS LOOPED FOR A ROAD BORING APPLICATION, INSTALL GATE VALVE ON UPSTREAM AND DOWNSTREAM SIDES OF ROADWAY.
7. DUCTILE IRON SHALL BE CLASS 50.
8. DUCTILE IRON ROAD CROSSING IN B.I.A. RURAL AREAS SHALL BE FROM 10' BEYOND DITCH LINE UNLESS OTHERWISE SPECIFIED.

SHEET 1 OF 2

DESIGNED BY	NTUA
SURVEYED BY	
DRAWN BY	NTUA
APPROVED BY	NTUA
DATE	04/08
PROJECT NO.	
SCALE	NTS
ACAD FILENAME	Water Standard
DWG. NO.	WS-17a.DWG

NAVAJO TRIBAL UTILITY AUTHORITY

TYPICAL ROAD CROSSING FOR NTUA WATERLINES

FT. DEFIANCE, AZ

REVISIONS			
No.	Date	Brief	By
01	04/08	Revised	LJA
02			
03			
04			
05			
06			

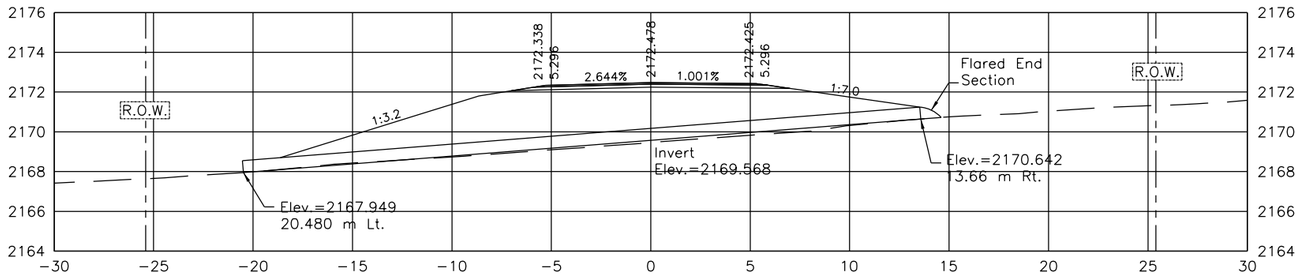


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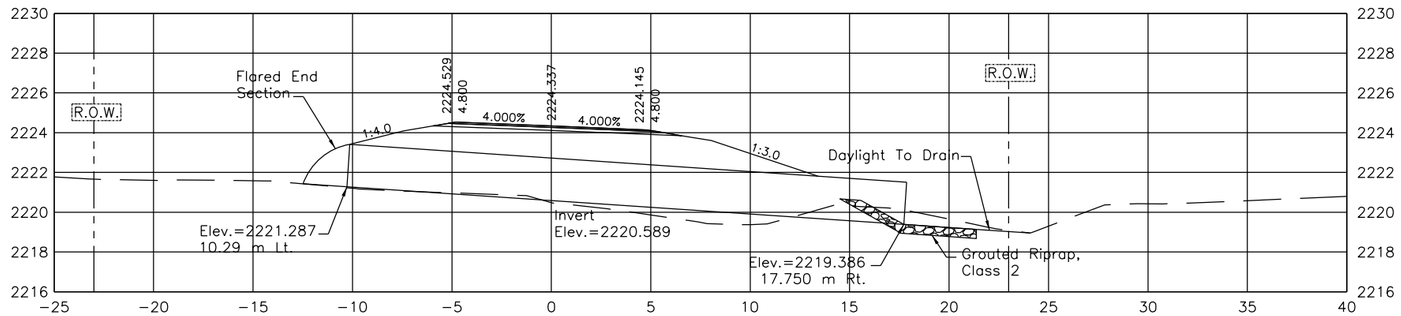
GROUTED RIPRAP AND NTUA CASING DETAILS

Designed by: NRDOT	Date: 3/00
Drawn by: NRDOT	Date: 3/00
Revised by: WHPacific	Date: 9/11
File Name: N11(1A)–Rock Berm sht 75	

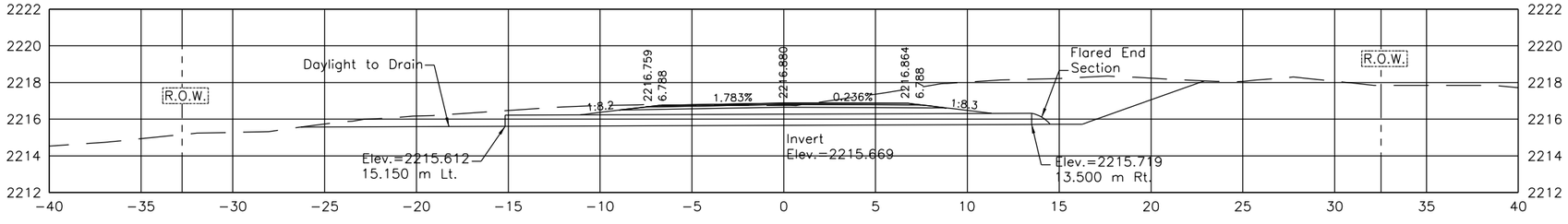
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	76	82



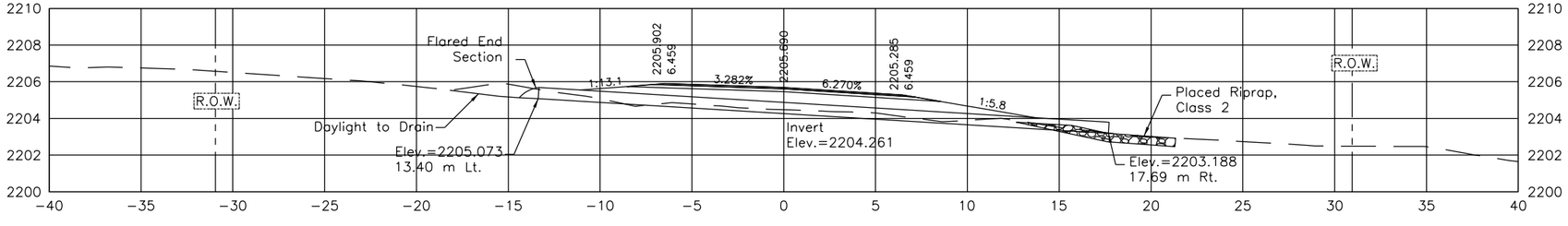
STA 3+750.000
1-610 mm x 34.14 m CSPC
115° Skew



STA 1+920.000
1-2134 mm x 28.04 m CSPC DUAL PURPOSE
90° Skew



STA 0+928.000
1-610 mm x 28.65 m CSPC
135° Skew



STA 0+232.000
1-610 mm x 31.09 m CSPC
132° Skew

GENERAL CULVERT NOTES

1. Refer to Plan & Profile Sheets and Culvert Cross Section Details for Type of Riprap at Culvert Outlets. See Sheet 72 For Riprap Details.
2. Outlet V-Ditches To Have 1:4 Side Slopes.
3. Drainage Pipe(s) Invert Elevations and Lengths are Approximate. Final Elevations and Lengths to be Field Determined By The Contractor as Part of the Revised Pipe List Submittal Package. Guidance on Developing a Revised Pipe List Will be Provided Upon Request of the Contractor.
4. At Pipe Cross Sections Drawn On Skew, The Right-Of-Way Line is no Longer Located at the Standard Right-Of-Way Offset, But is Shifted Away (Outward) From the Centerline a Distance Based on the Skew Angle.
5. Left and Right Distances Shown Are Measured Along the Pipe Centerline.
6. The Revised Pipe List Survey Data Shall be Verified by the Contractor's QCM Prior to Submittal to the CM for review and approval.



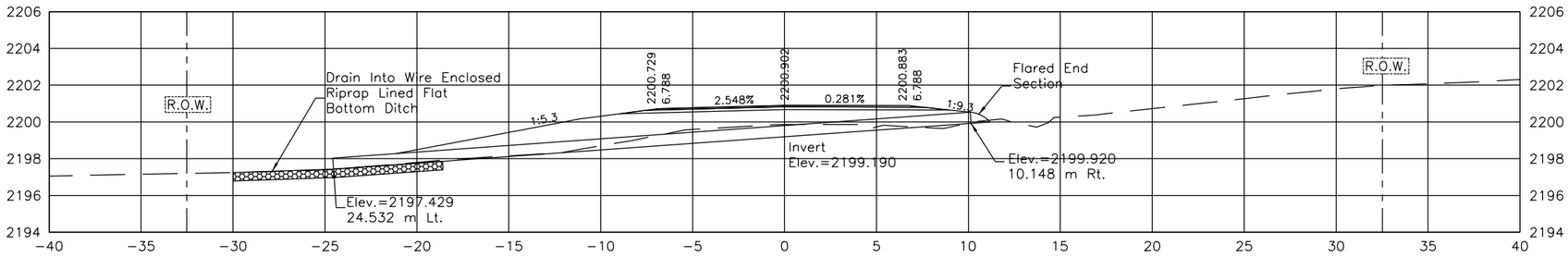
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NAVAJO REGION OFFICE * DIVISION OF TRANSPORTATION

CULVERT CROSS SECTIONS

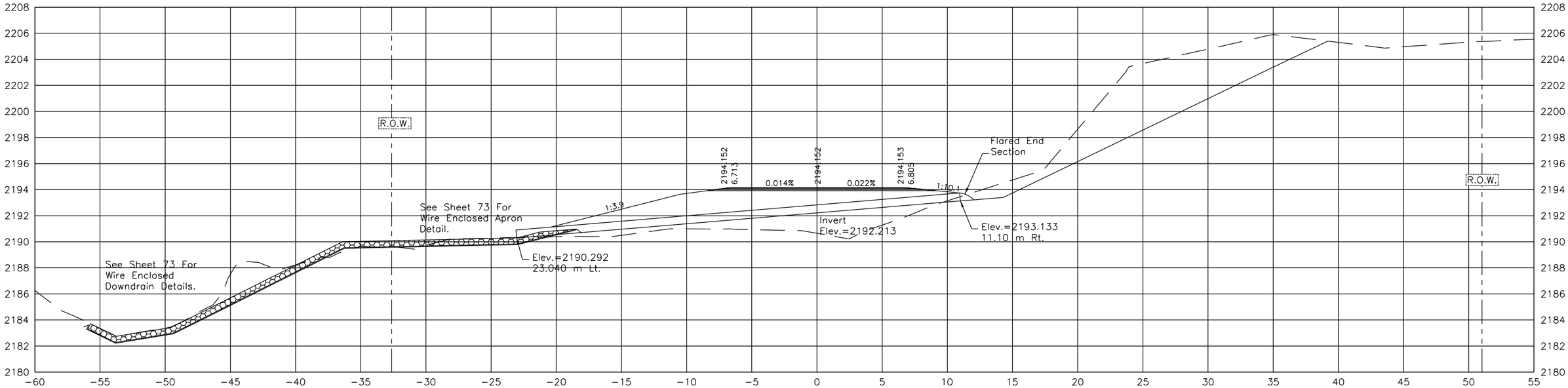
Designed by: WHPacific	**Date:** 12/09	
Drawn by: WHPacific	**Date:** 12/09	
Revised by: WHPacific	**Date:** 9/11	
File Name: N11(1A)-Culvert Sections sht		

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	77	82

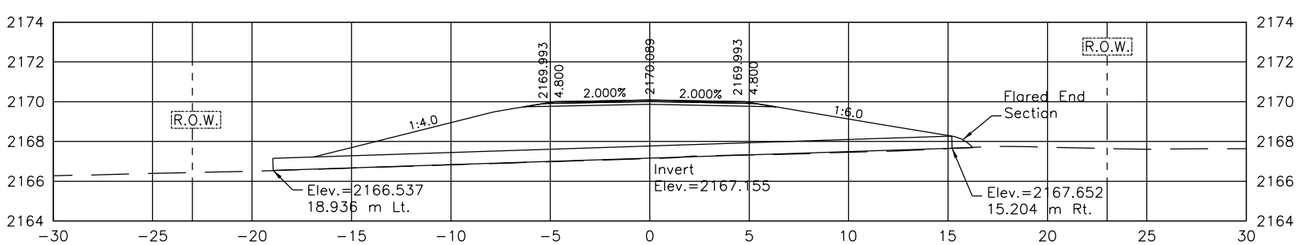
GENERAL CULVERT NOTES
1. See Sheet 76 For Additional Notes



STA 5+950.000
3-610 mm x 34.75 m CSPC
45° Skew



STA 5+635.000
3-610 mm x 34.14 m CSPC
45° Skew



STA 3+852.000
1-610 mm x 34.14 m CSPC
90° Skew

DEREK D. MEIER
NEW MEXICO
14504
REGISTERED PROFESSIONAL ENGINEER
4/14/20

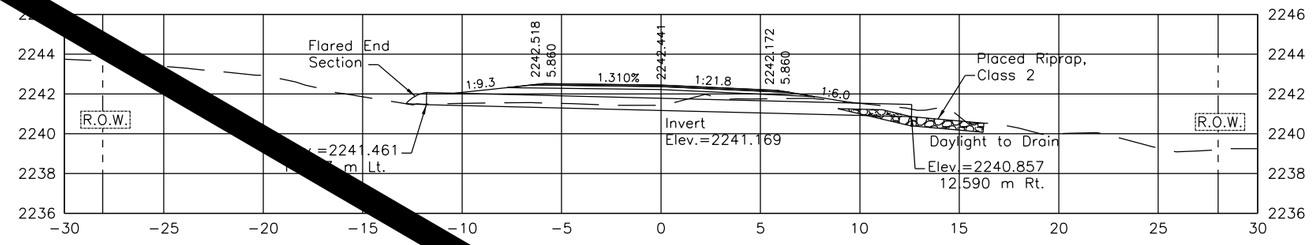
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CULVERT CROSS SECTIONS

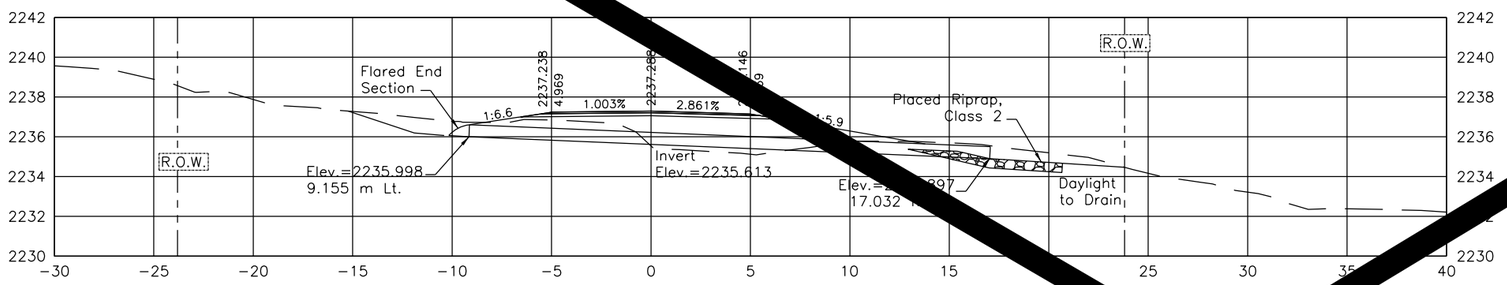
Designed by: WHPacific	**Date:** 12/09
Drawn by: WHPacific	**Date:** 12/09
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)-Culvert Sections sht	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)1,2&4	78-82	82

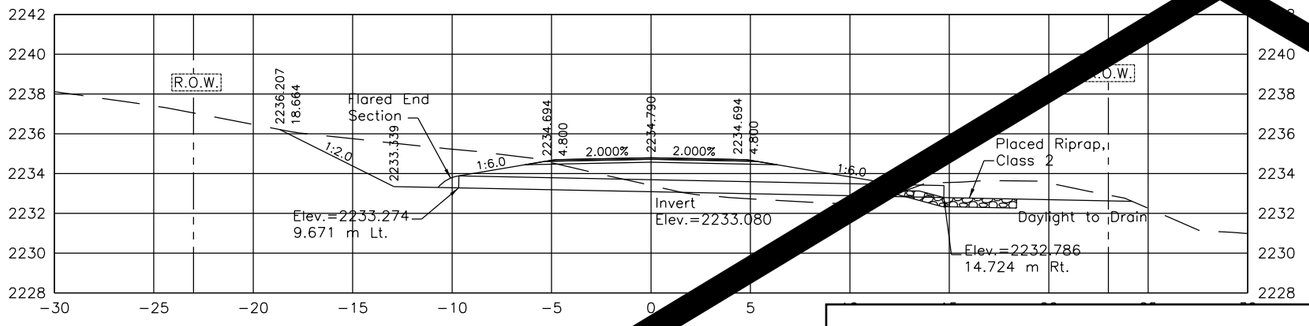
GENERAL CULVERT NOTES
1. See Sheet 76 For Additional Notes



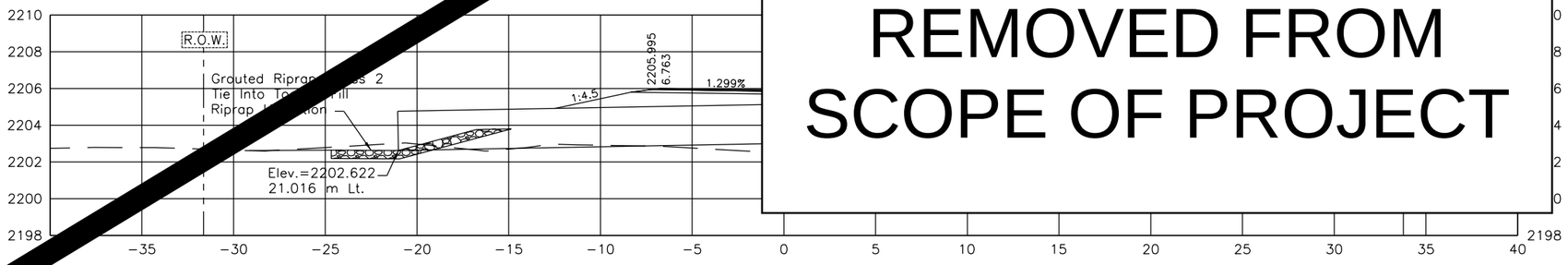
STA 7+523.000
2-610 mm x 24.38 m CSPC
125° Skew



STA 7+416.000
2-610 mm x 26.21 m CSPC
105° Skew



STA [illegible]93.000
1-61[illegible] x 24.38 m CSPC
90° Skew



STA 6+270.000
1-2134 mm x 39.01 m CSPC Dual Purpose
45° Skew

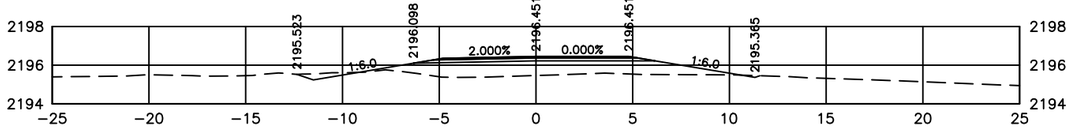
SHEETS 78-82 REMOVED FROM SCOPE OF PROJECT

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NAVAJO REGION OFFICE * DIVISION OF TRANSPORTATION

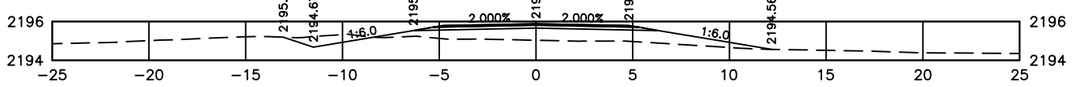
CULVERT CROSS SECTION

Designed by: WHPacific	**Date:** 12/09
Drawn by: WHPacific	**Date:** 12/09
Revised by: WHPacific	**Date:** 9/11
File Name: N11(1A)-Culvert Sections sht 76-82	

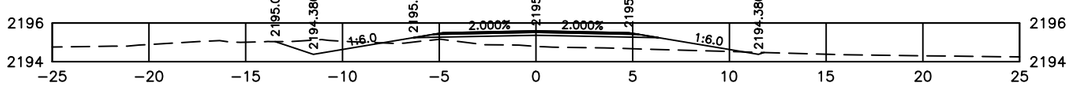
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)2&4	1	60



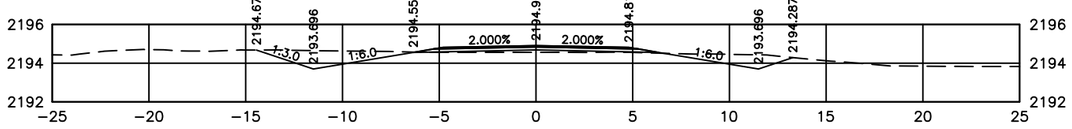
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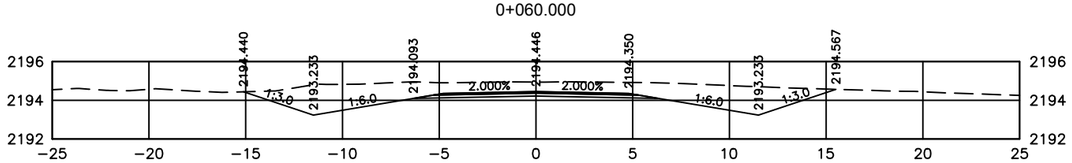
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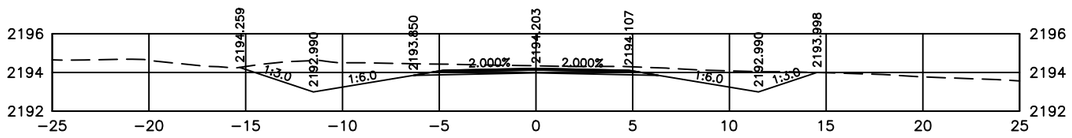
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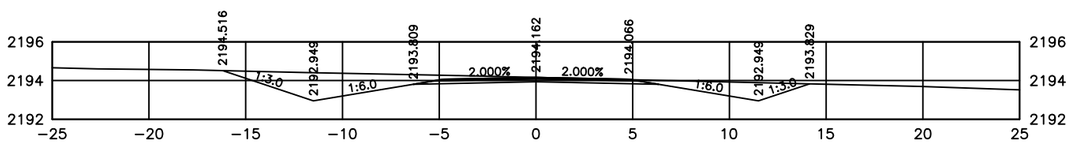
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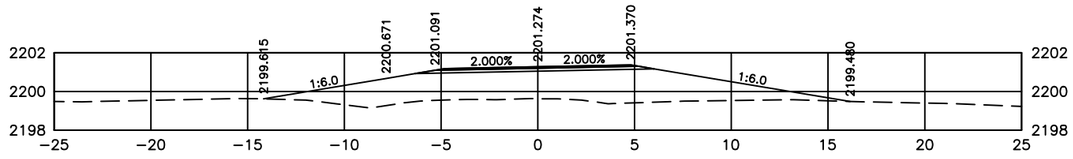
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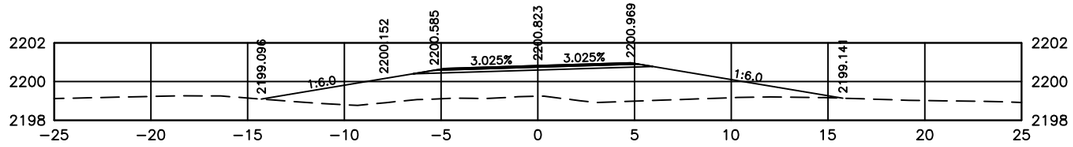
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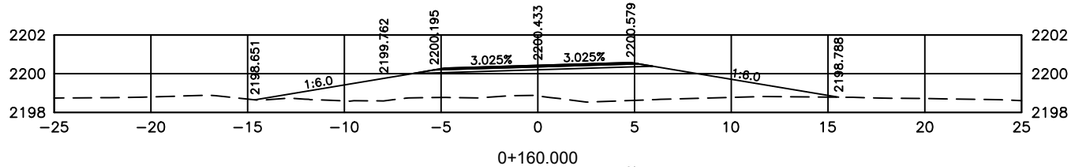
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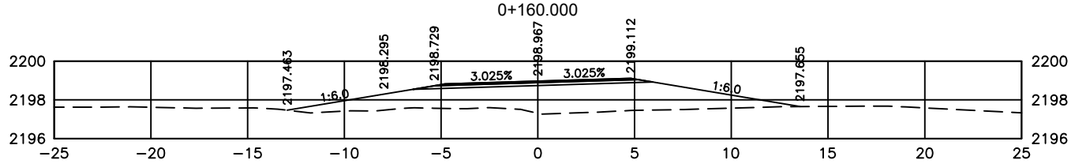
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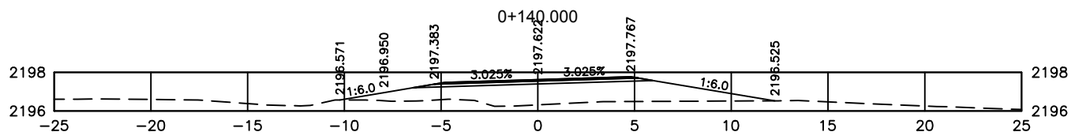
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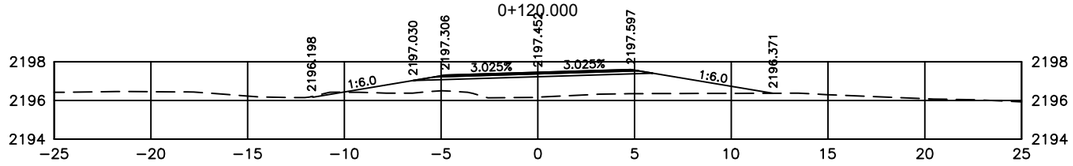
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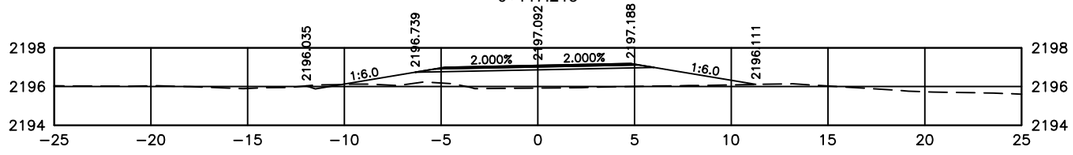
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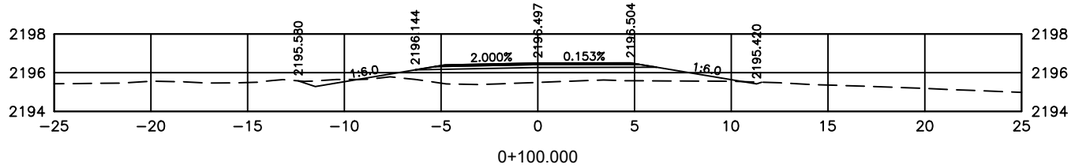
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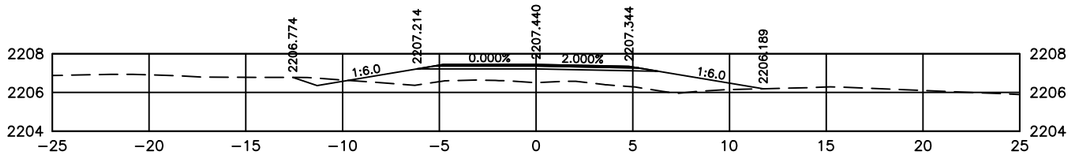
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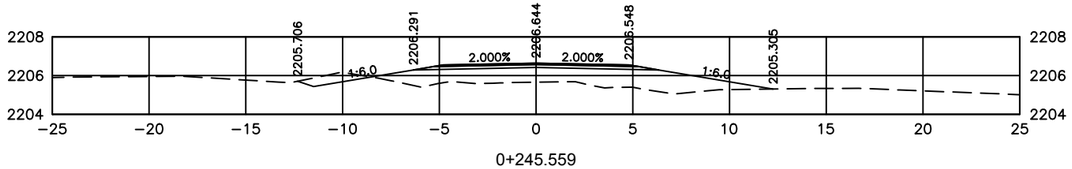
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Date: Nov. 05, 2019 - 4:51pm MJMeyers Drawing Name: M:\TRN\17-100-090-11\17-100-090-11\Plans\1_Sheets\N11(1A)-Cross Sections.dwg

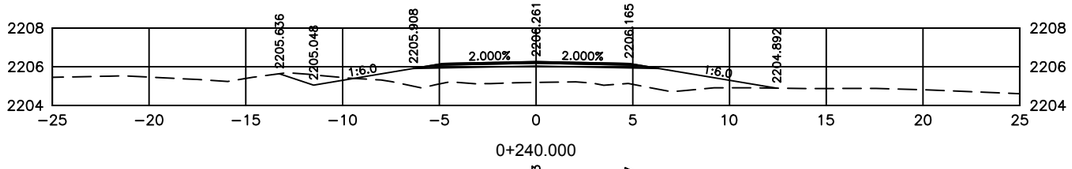
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)2&4	2	60



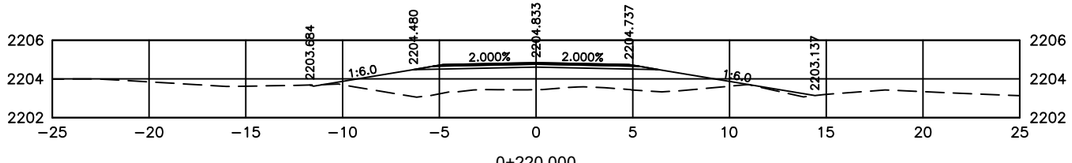
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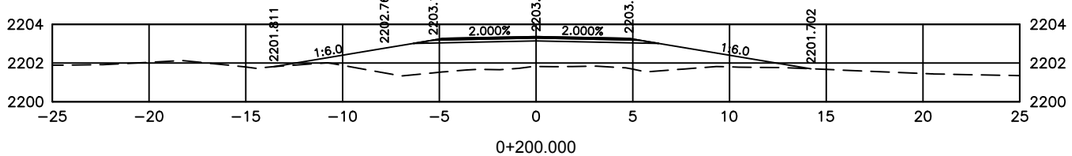
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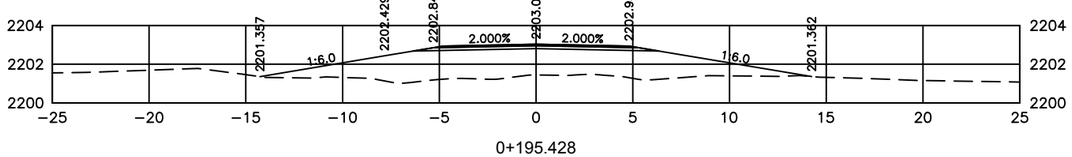
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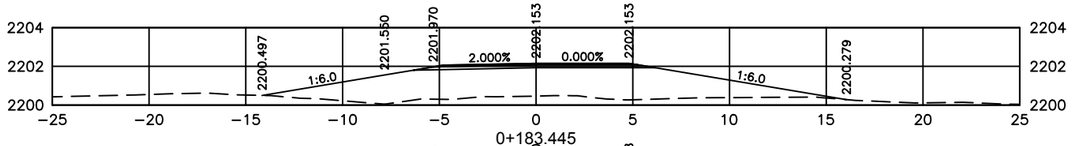
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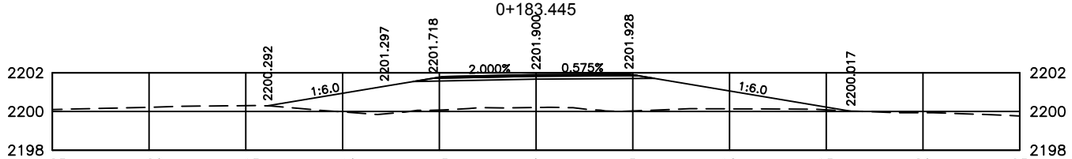
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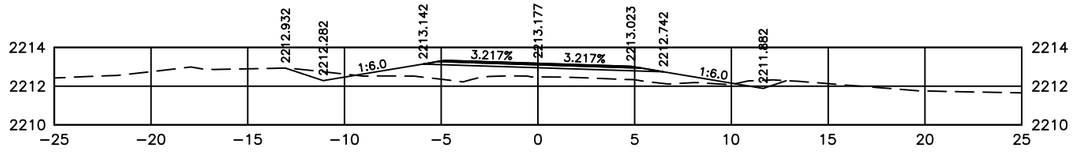
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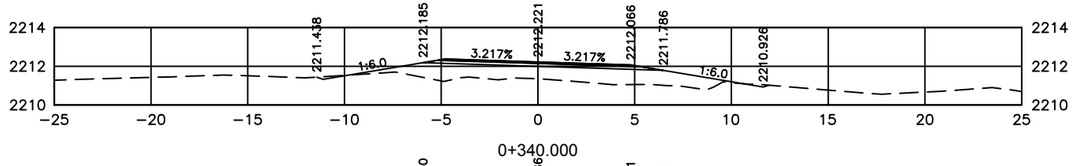
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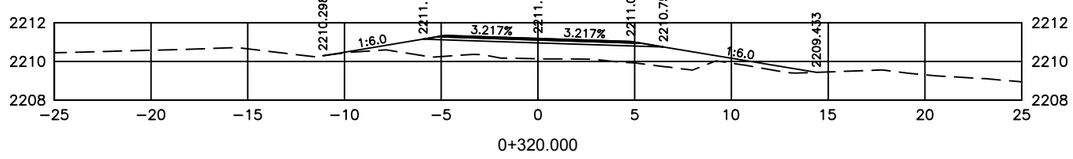
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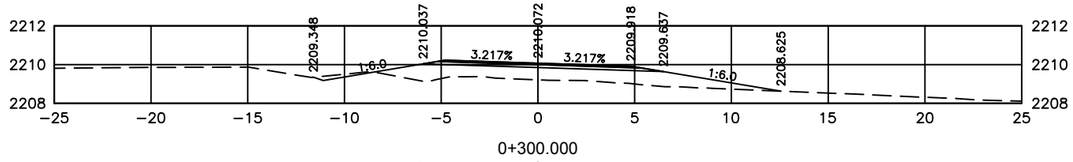
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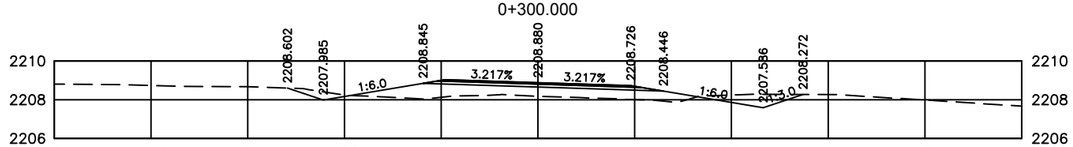
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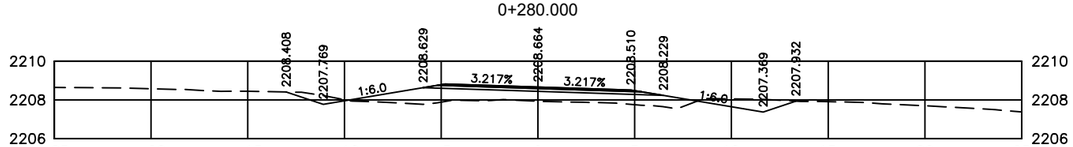
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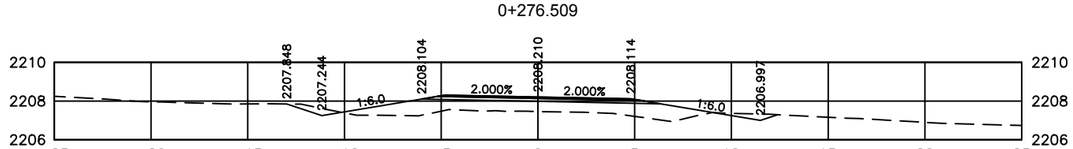
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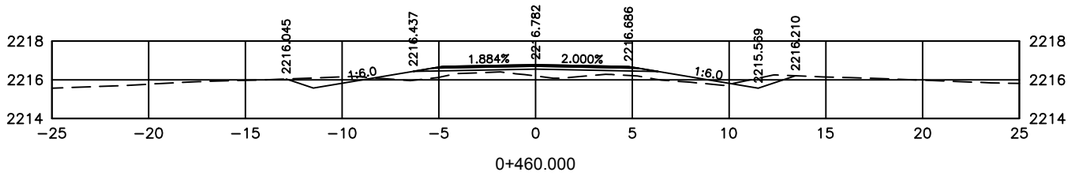
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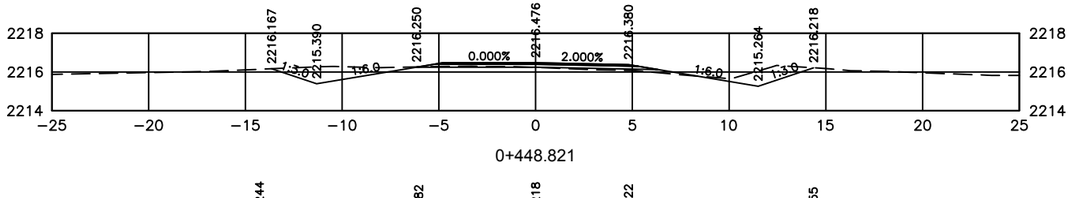


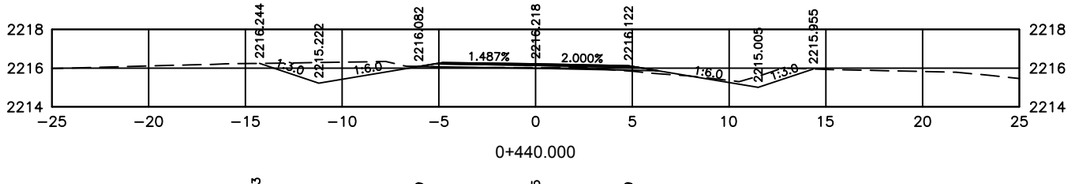
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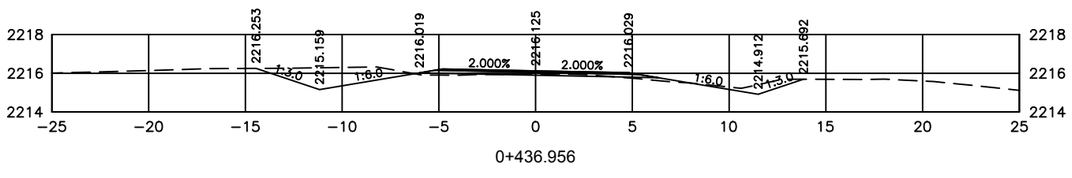
Date: Nov. 05, 2019 - 4:51pm MJMeyers Drawing Name: M:\TRN\17-100-090-11\17-100-090-11\Plans\1_Sheets\N11(1A)-Cross Sections.dwg

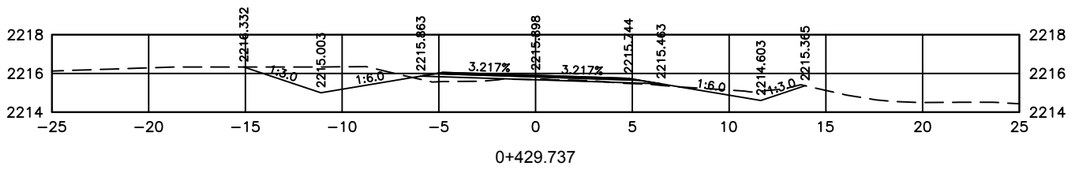
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)2&4	3	60

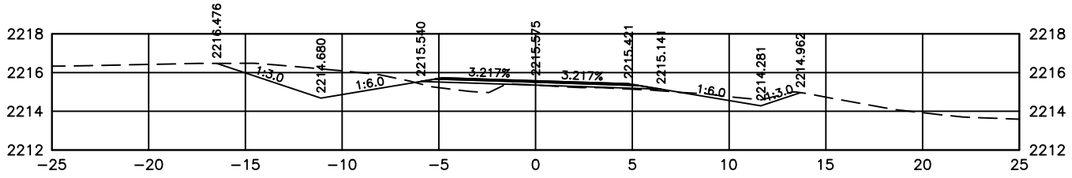


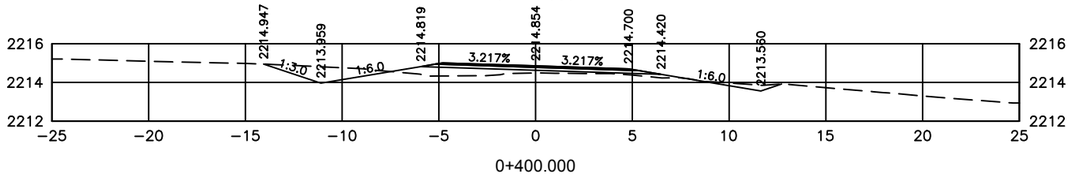


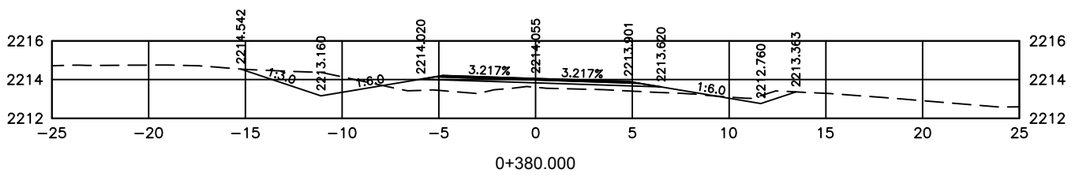


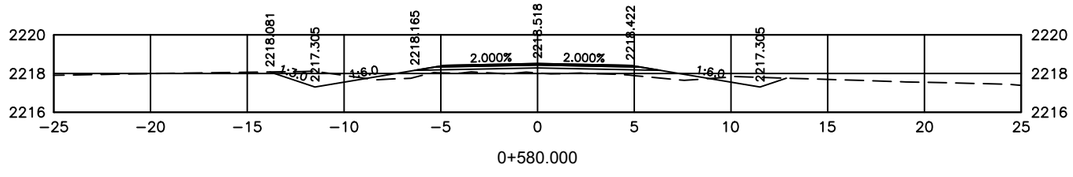


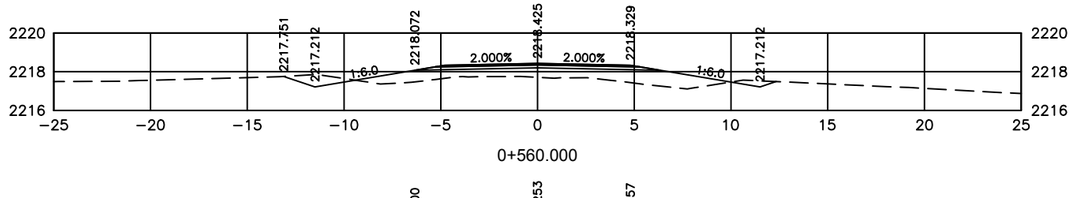


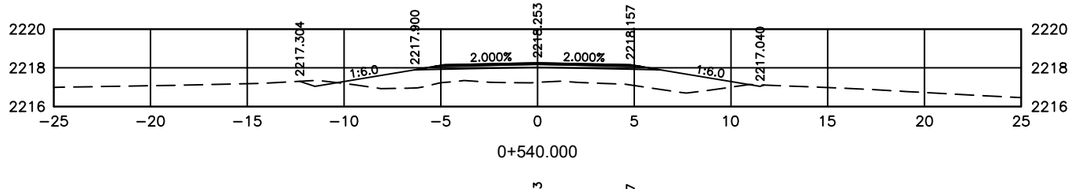


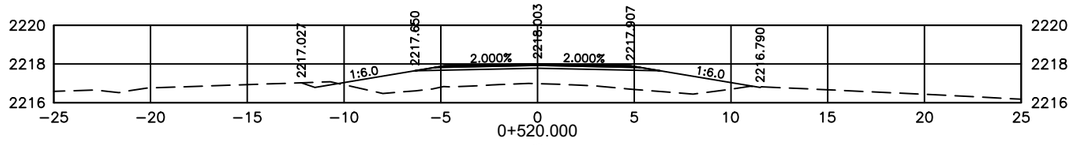


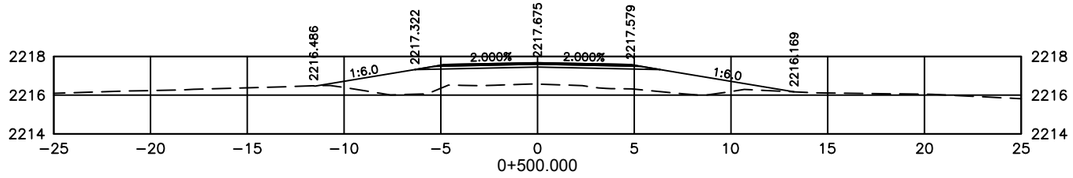


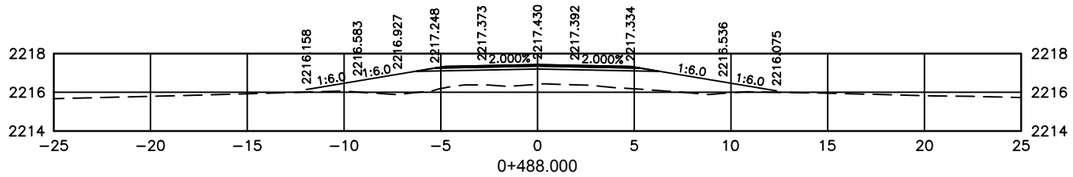


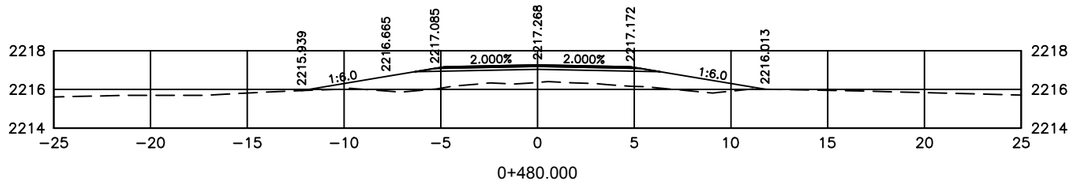


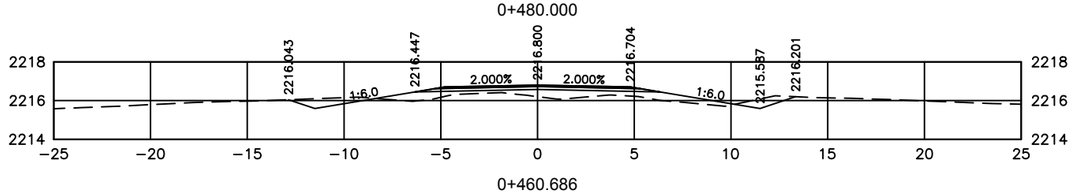






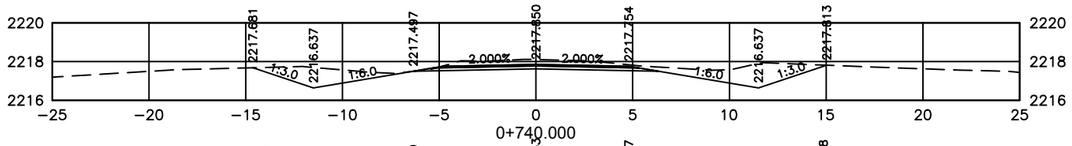




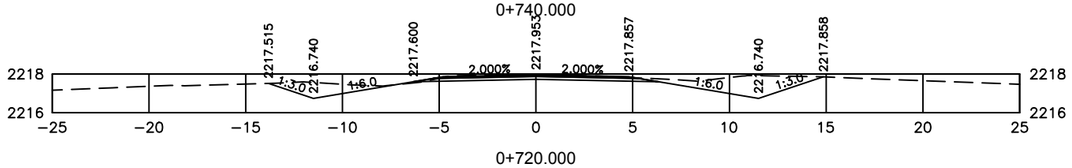


Date: Nov. 05, 2019 - 4:51pm MJMeyers Drawing Name: M:\TRN\17-100-090-11\17-100-090-11\Plans\1_Sheets\N11(1A)-Cross Sections.dwg

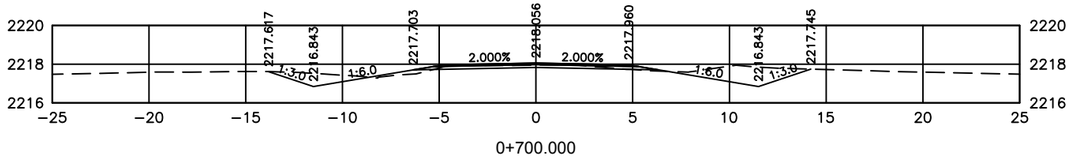
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)2&4	4	60



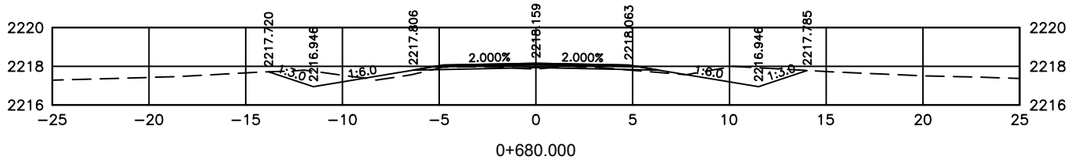
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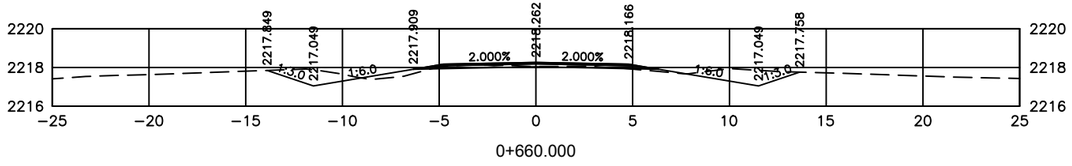
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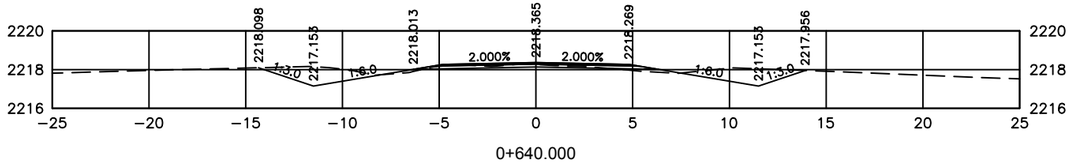
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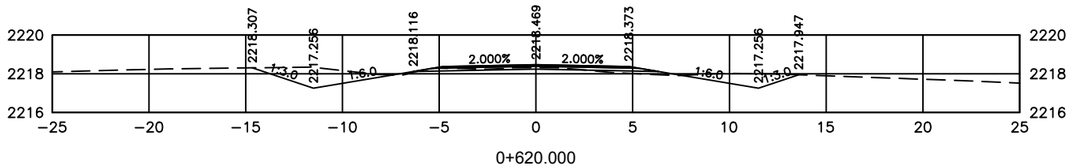
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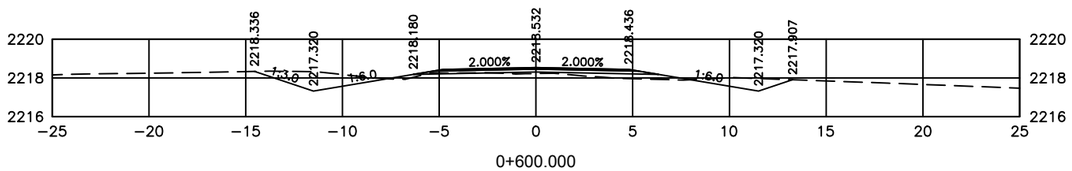
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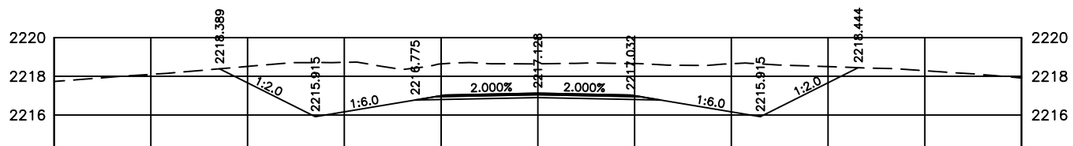
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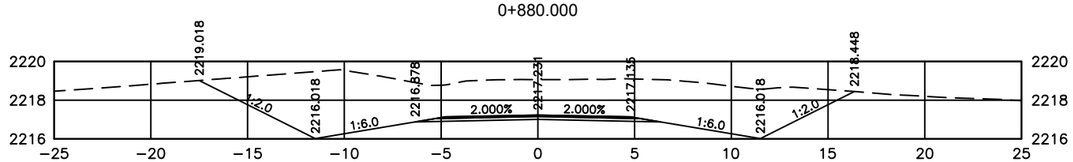
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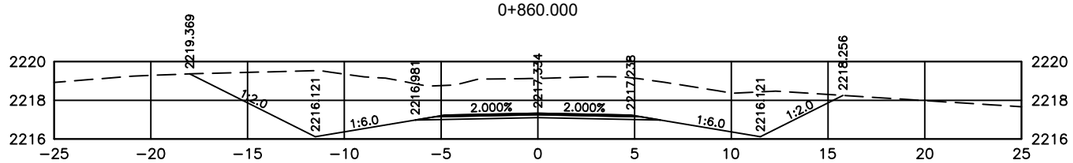
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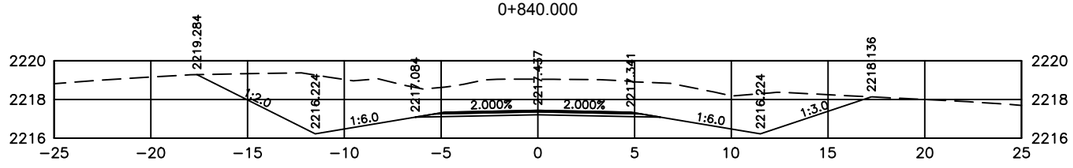
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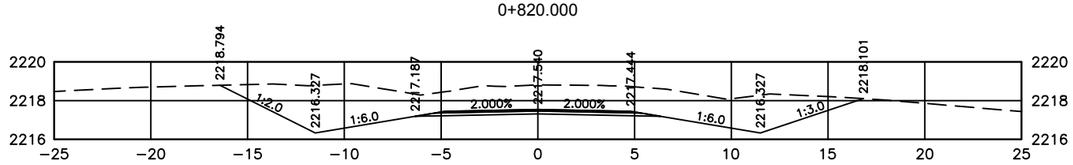
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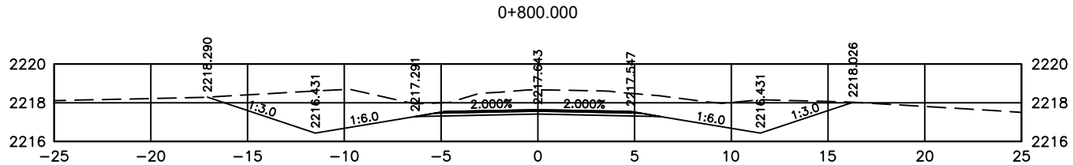
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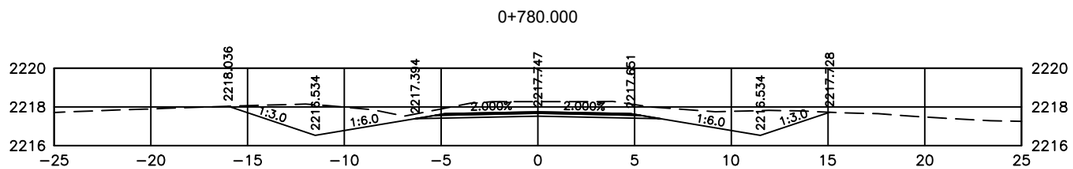
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0+800.000



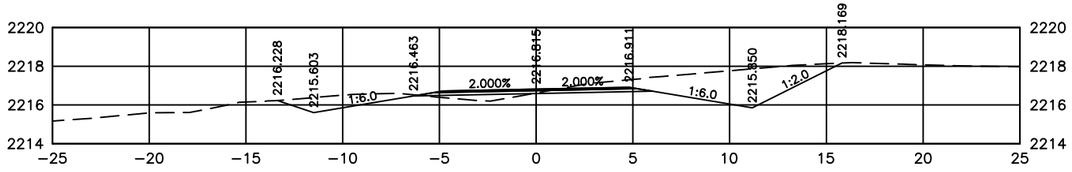
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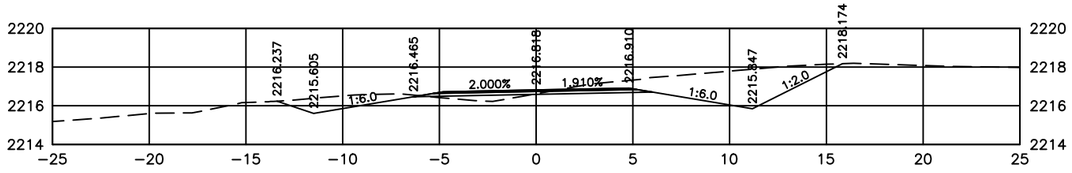
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Date: Nov. 05, 2019 - 4:51pm MJMeyers Drawing Name: M:\TRN\17-100-090-11\17-100-090-11\Plans\1_Sheets\N11(1A)-Cross Sections.dwg

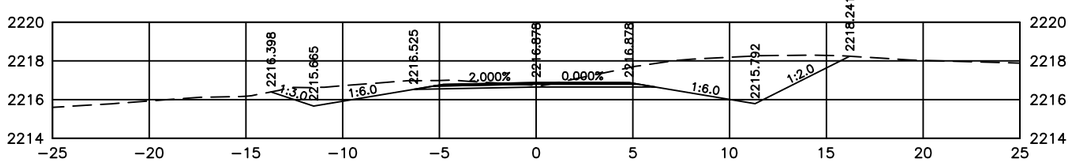
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)2&4	5	60



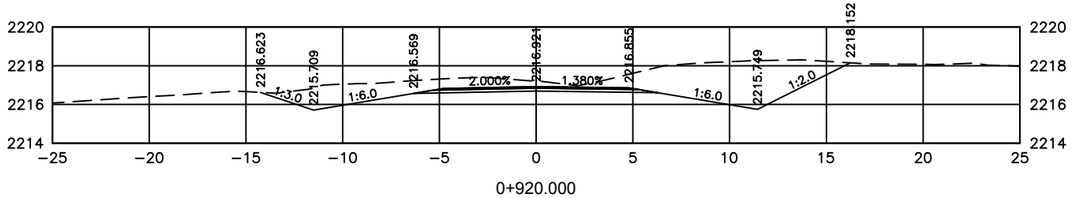
0+940.547



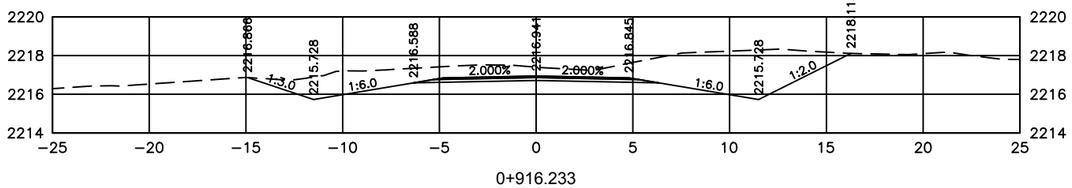
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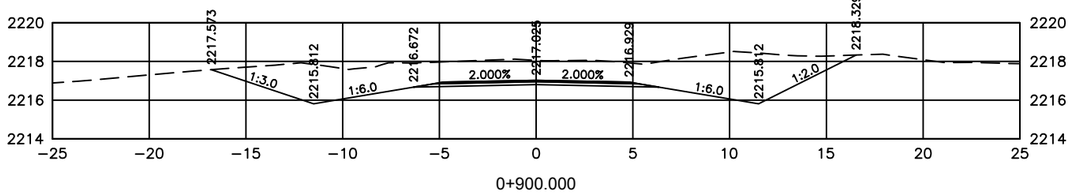
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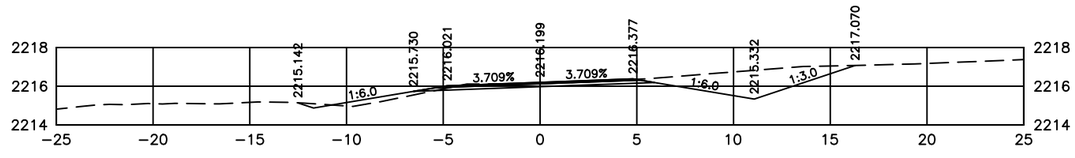
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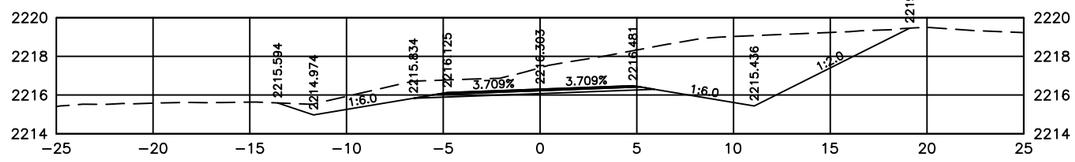
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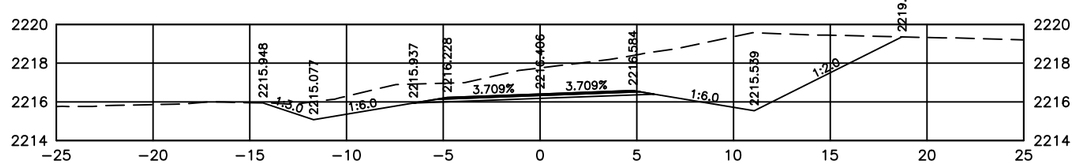
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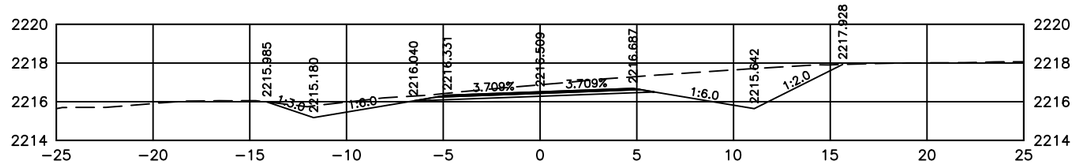
1+060.000



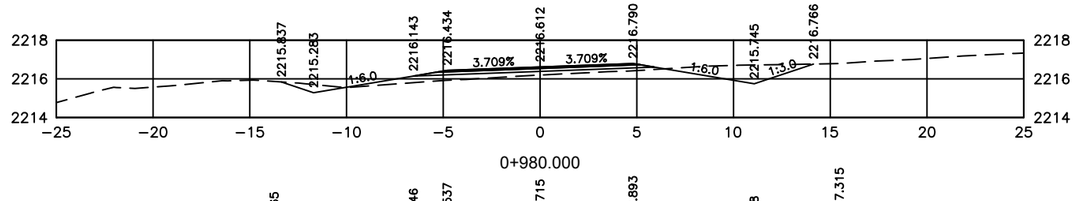
1+040.000



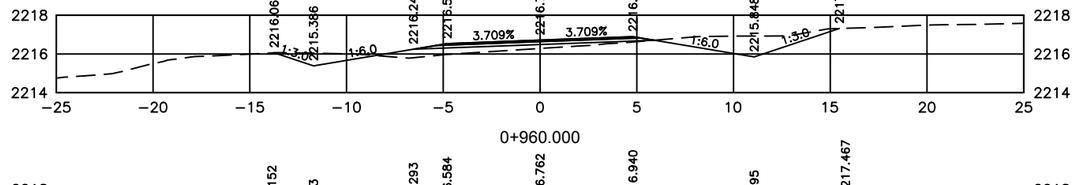
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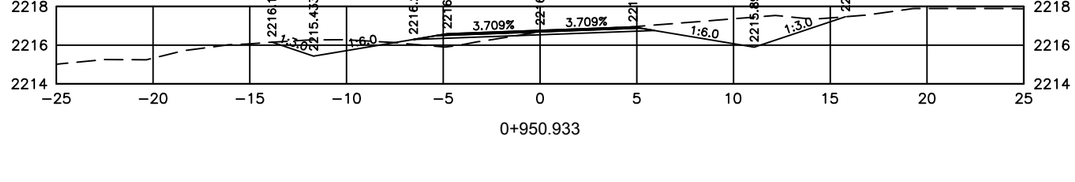
1+000.000



0+980.000



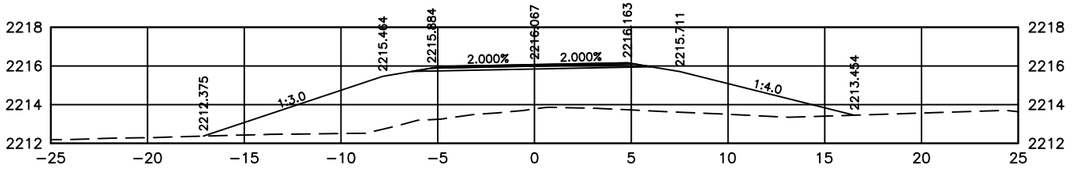
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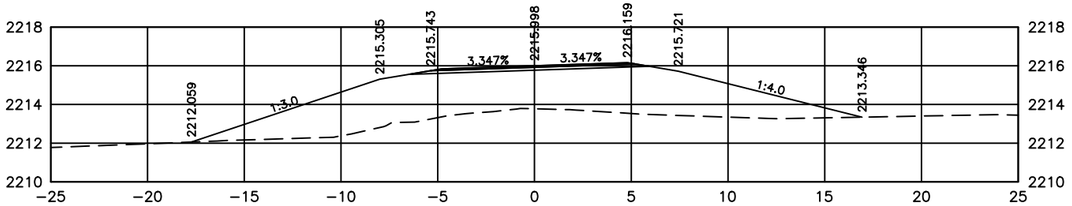
0+950.933

Date: Nov. 05, 2019 - 4:51pm MJMeyers Drawing Name: M:\TRN\17-100-090-11\17-100-090-11\Plans\1_Sheets\N11(1A)-Cross Sections.dwg

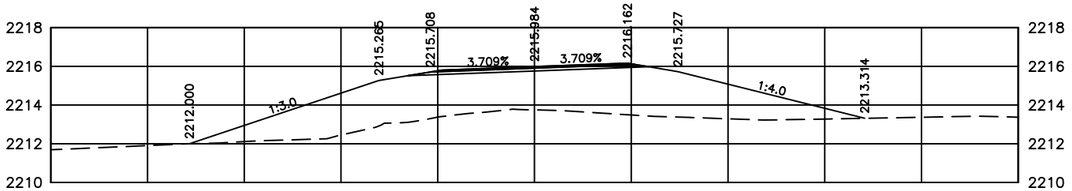
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)2&4	6	60



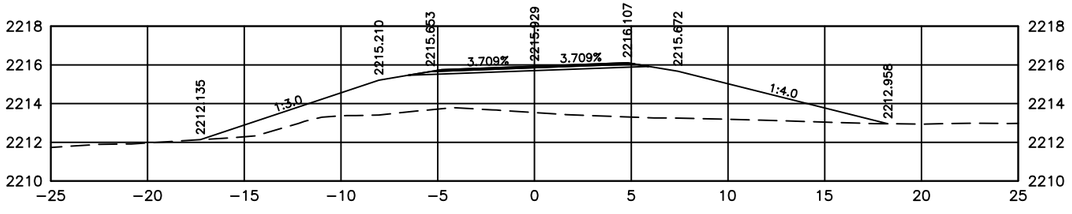
1+148.185



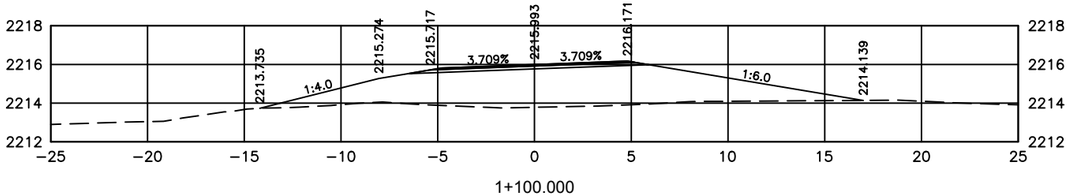
1+140.000



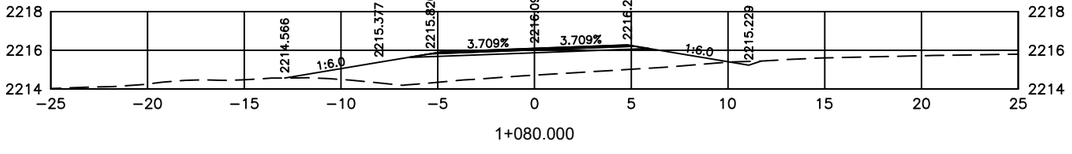
1+137.800



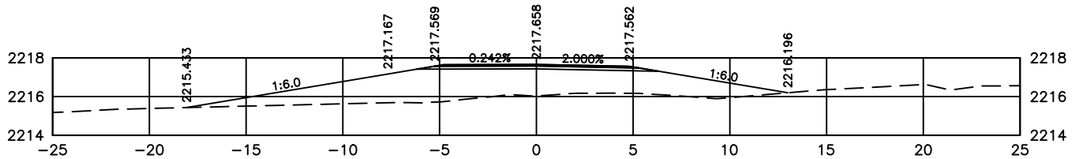
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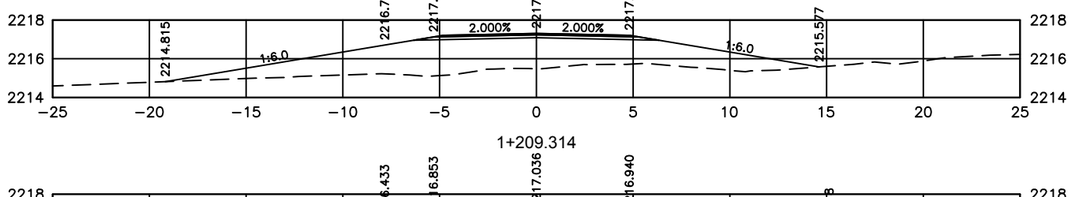
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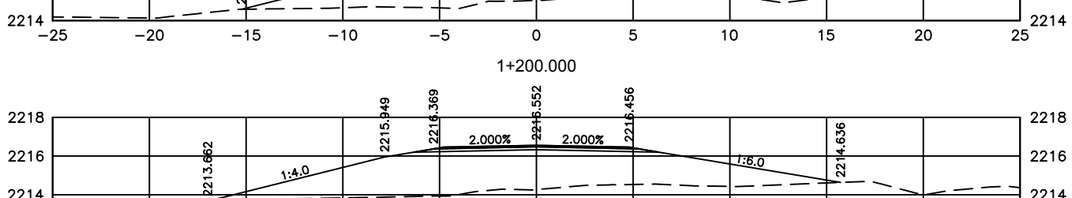
1+080.000



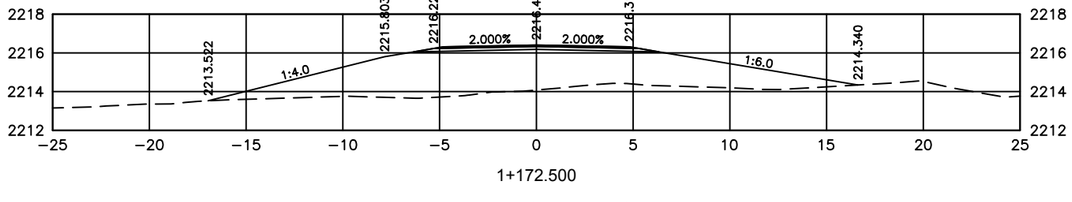
1+220.000



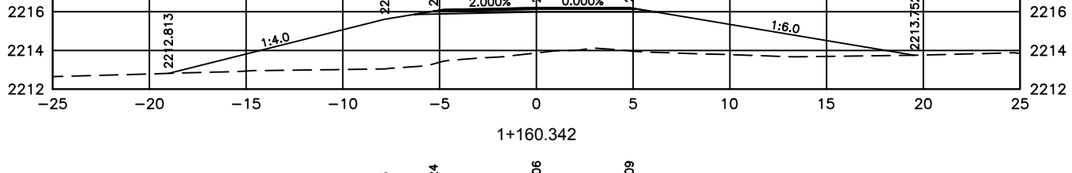
1+209.314



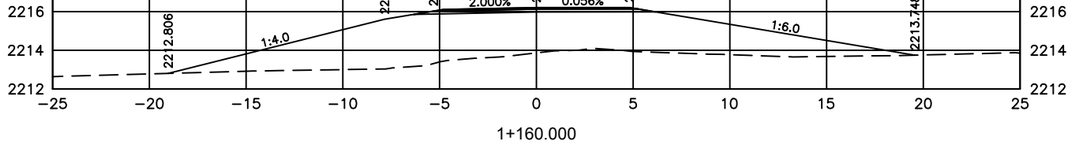
1+200.000



1+180.000



1+172.500

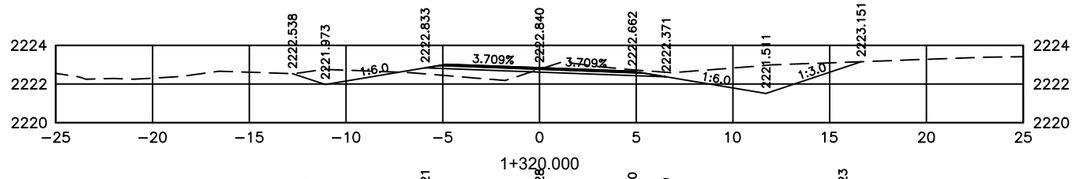


1+160.342

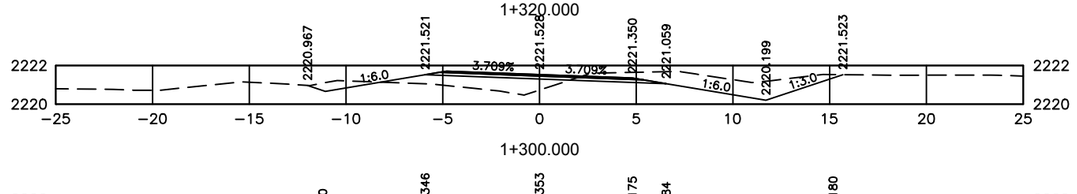
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Date: Nov. 05, 2019 - 4:51pm MJMeyers Drawing Name: M:\TRN\17-100-090-11\17-100-090-11\Plans\1_Sheets\N11(1A)-Cross Sections.dwg

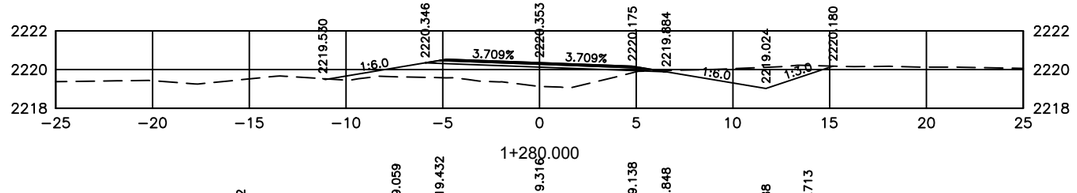
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)2&4	7	60



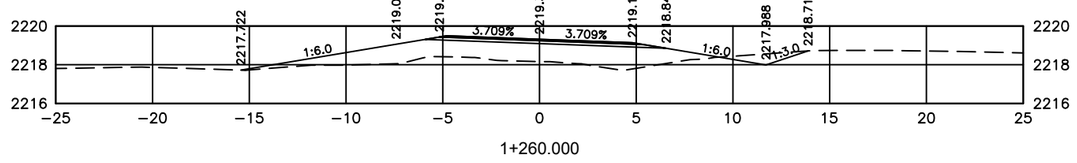
1+320.000



1+300.000



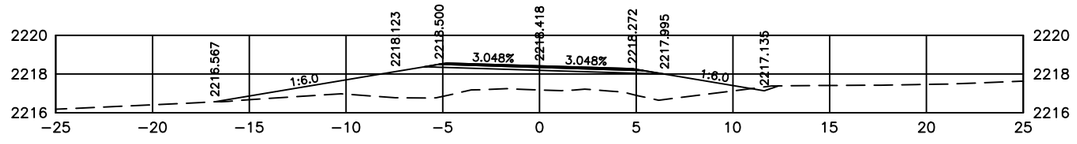
1+280.000



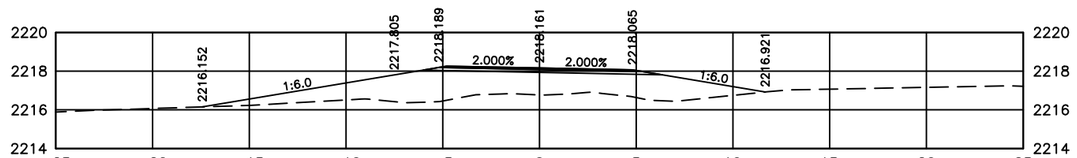
1+260.000



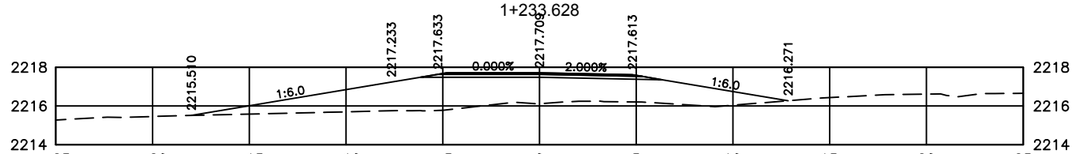
1+244.014



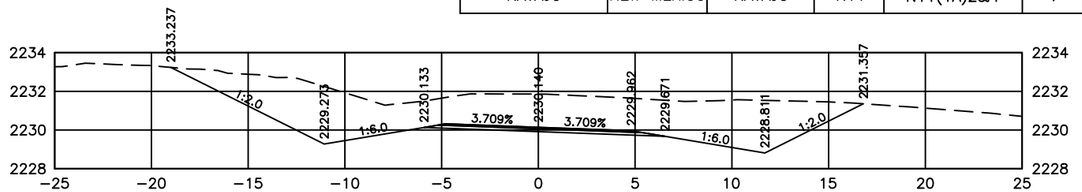
1+240.000



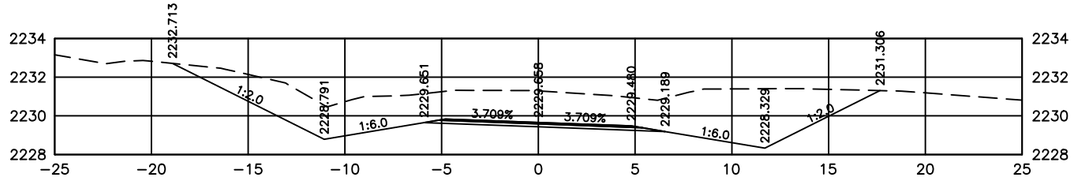
1+233.628



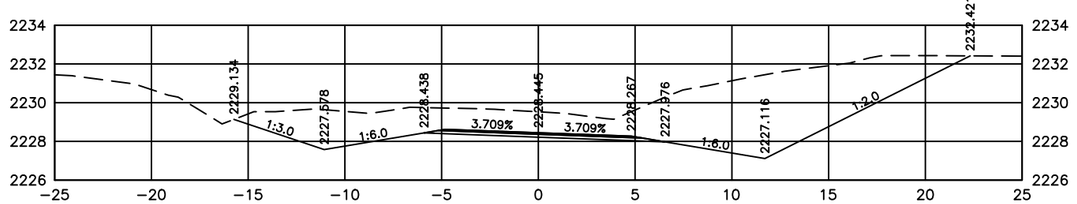
1+221.471



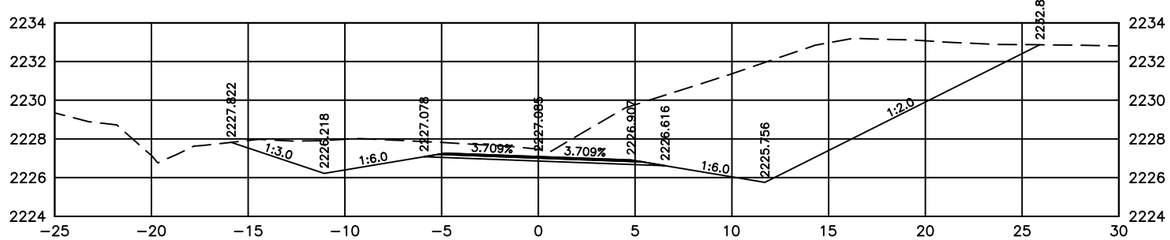
1+428.715



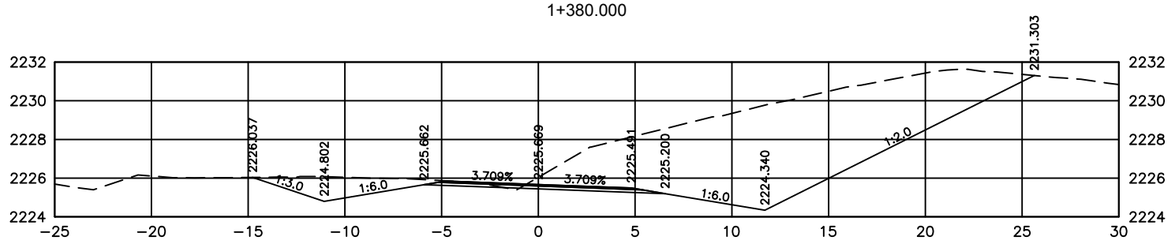
1+420.000



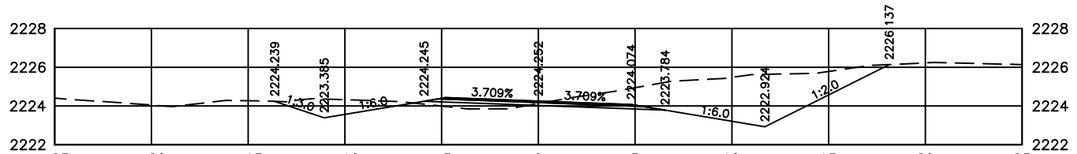
1+400.000



1+380.000



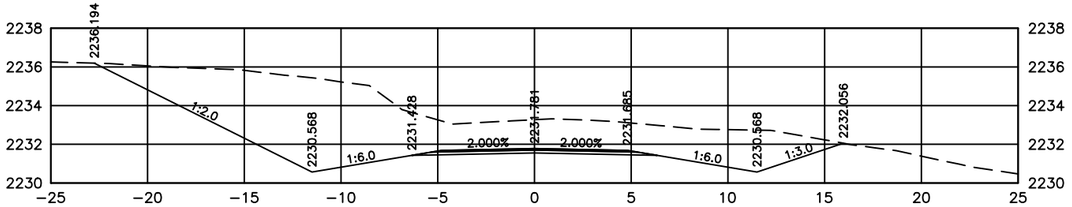
1+360.000



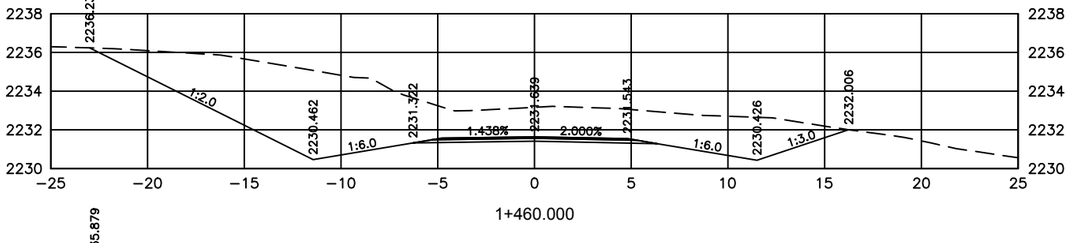
1+340.000

Date: Nov. 05, 2019 - 4:51pm MJMeyers Drawing Name: M:\TRN\17-100-090-11\17-100-090-11\Plans\1_Sheets\N11(1A)-Cross Sections.dwg

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)2&4	8	60

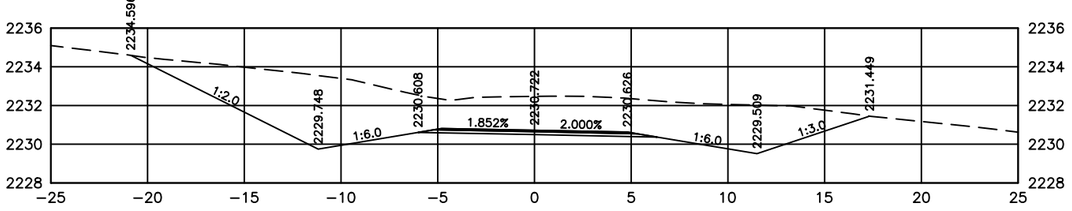


1+463.415

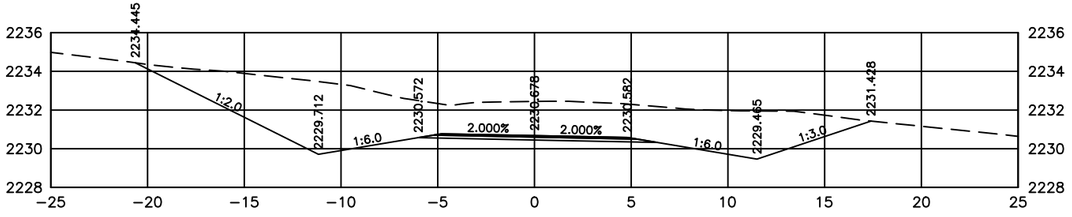


1+460.000

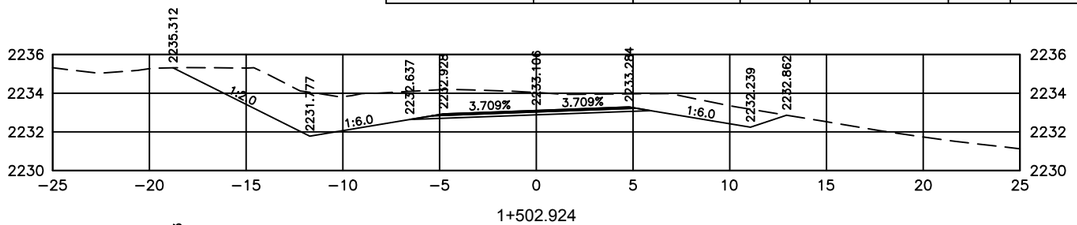
1+451.258



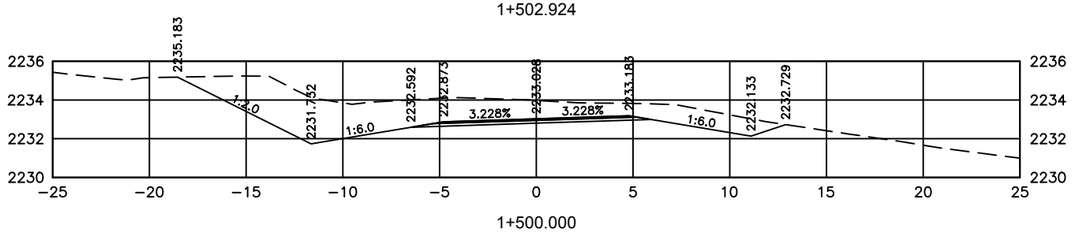
1+440.000



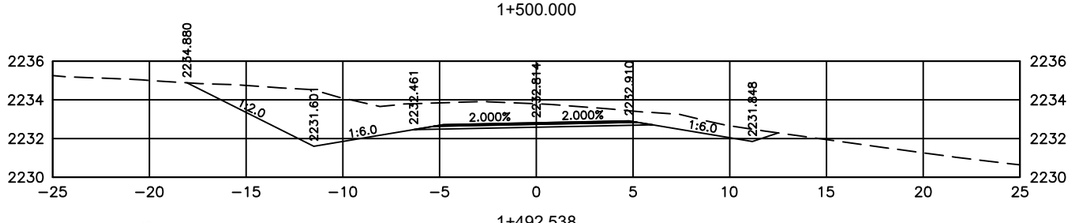
1+439.101



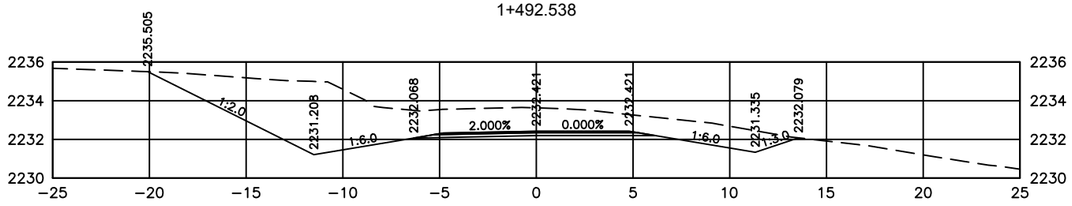
1+502.924



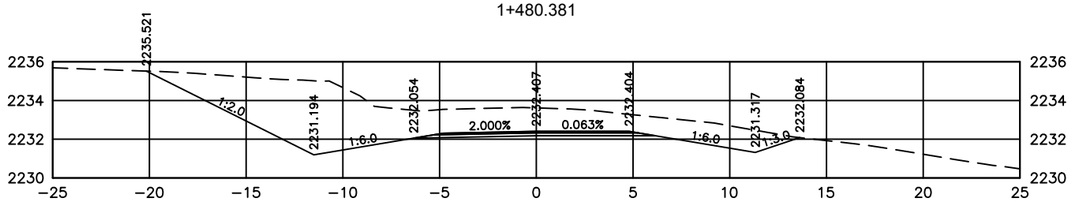
1+500.000



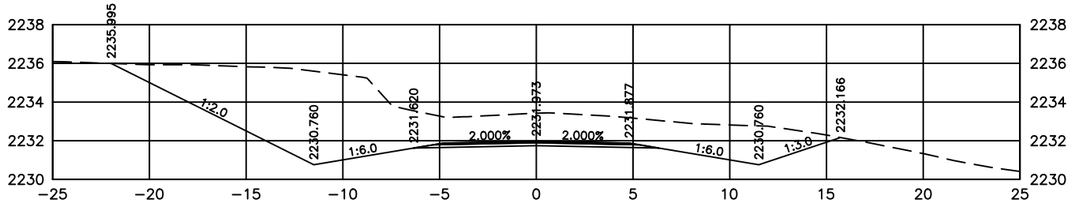
1+492.538



1+480.381



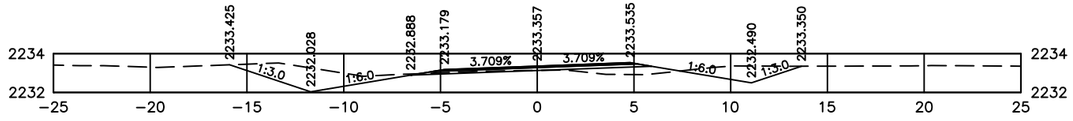
1+480.000



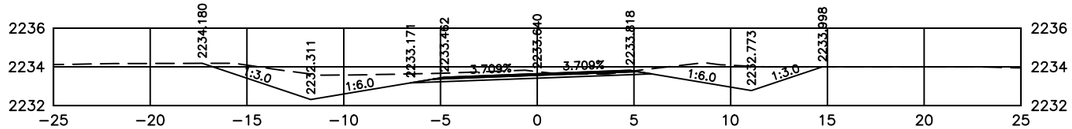
1+468.224

Date: Nov. 05, 2019 - 4:51pm MJMeyers Drawing Name: M:\TRN\17-100-090-11\17-100-090-11\Plans\1_Sheets\N11(1A)-Cross Sections.dwg

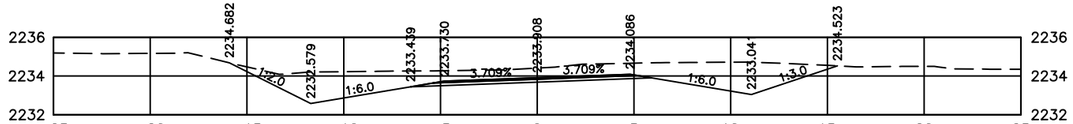
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)2&4	9	60



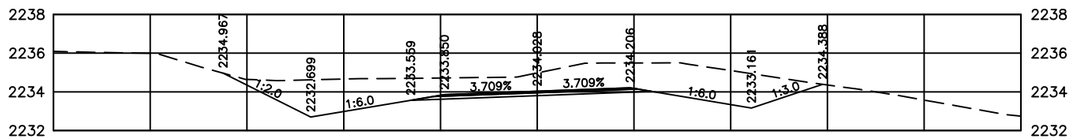
1+634.318



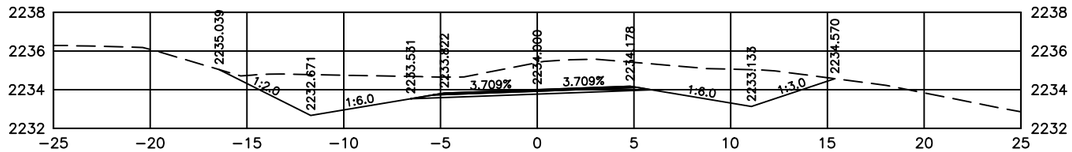
1+620.000



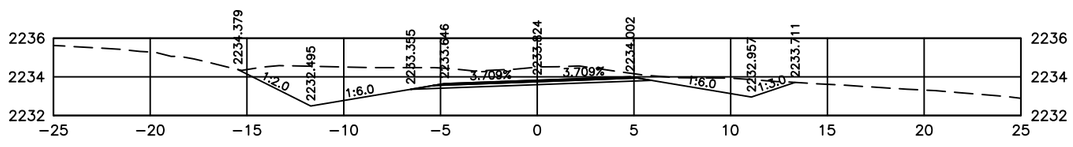
1+600.000



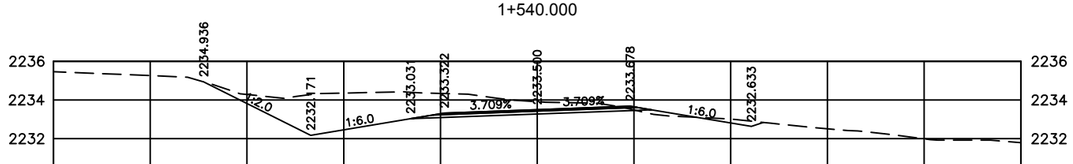
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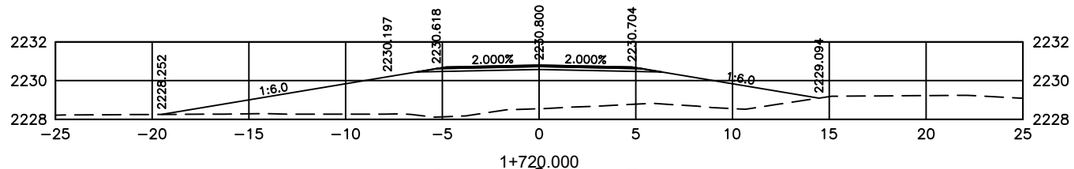
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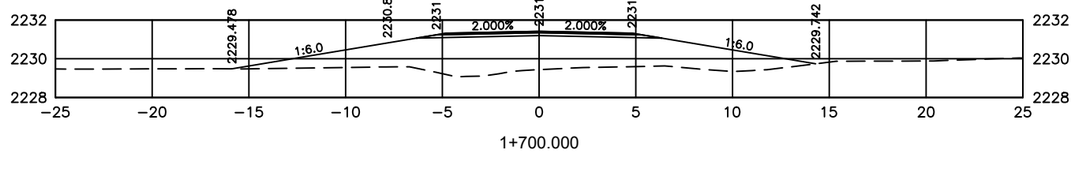
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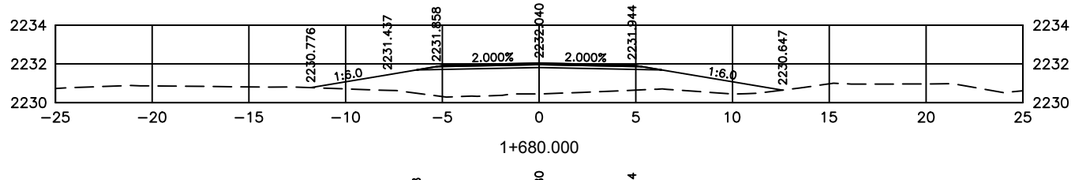
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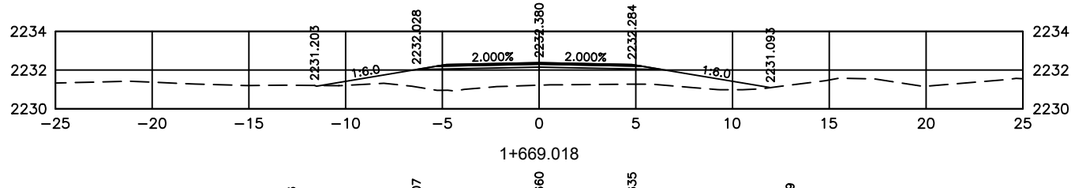
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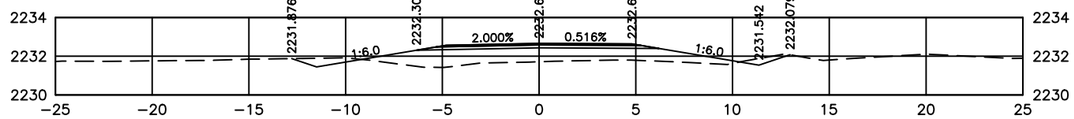
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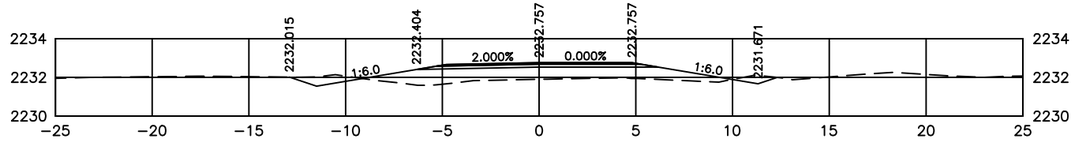
1+680.000



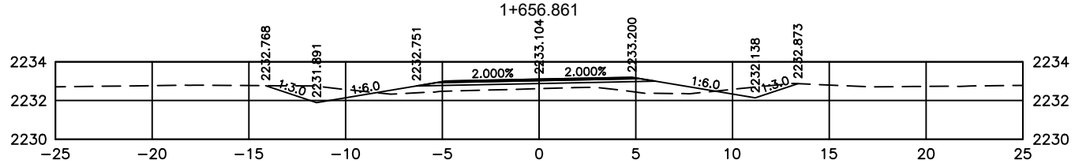
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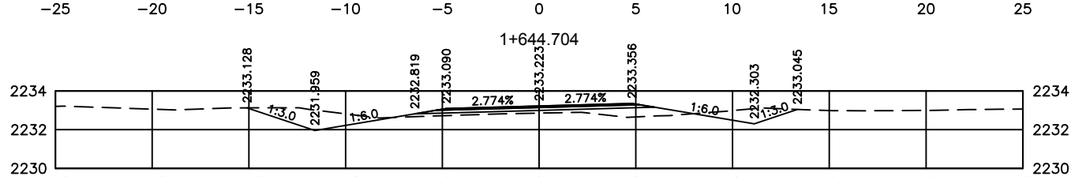
1+660.000



1+656.861



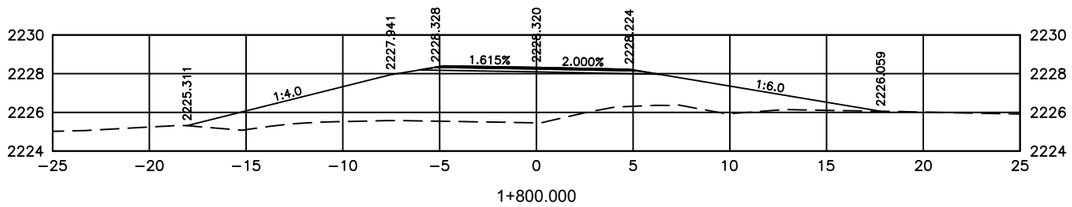
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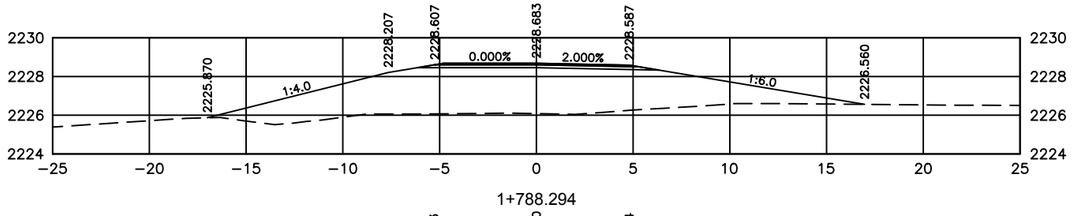
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Date: Nov. 05, 2019 - 4:51pm MJMeyers Drawing Name: M:\TRN\17-100-090-11\17-100-090-11\Plans\1_Sheets\N11(1A)-Cross Sections.dwg

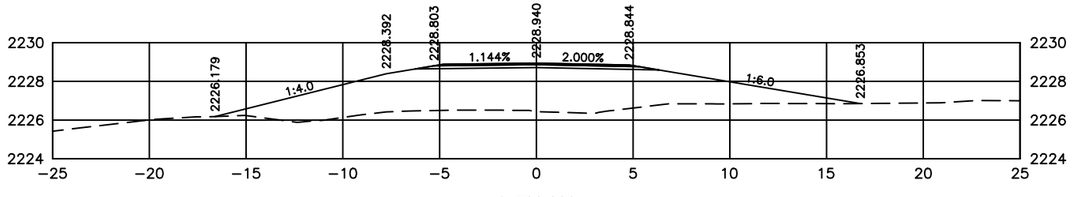
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)2&4	10	60



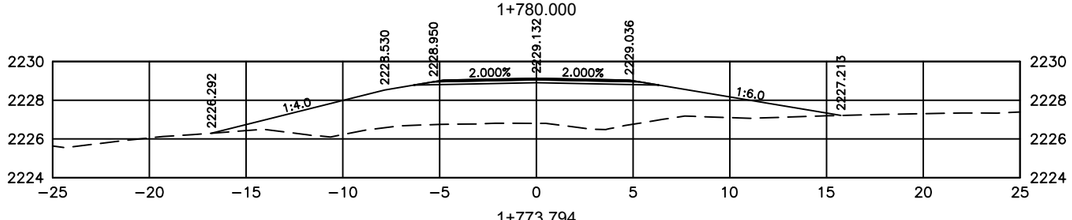
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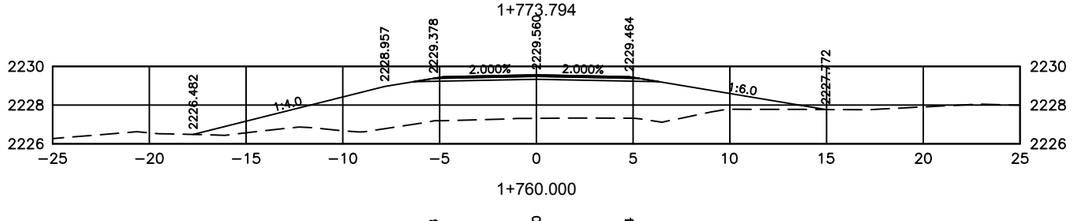
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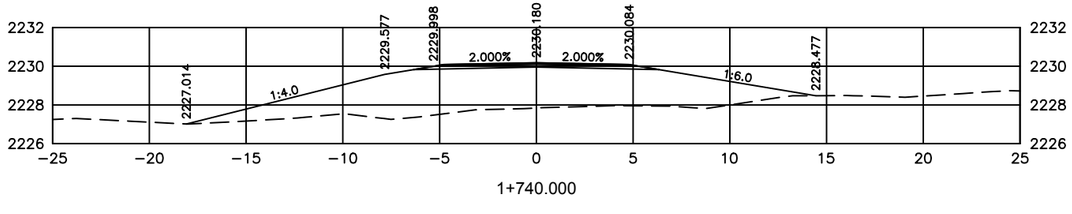
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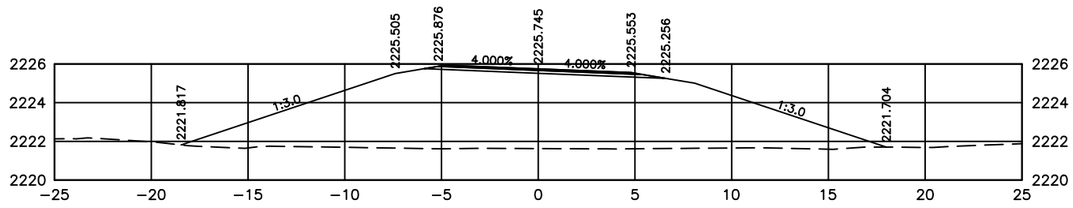
1+773.794



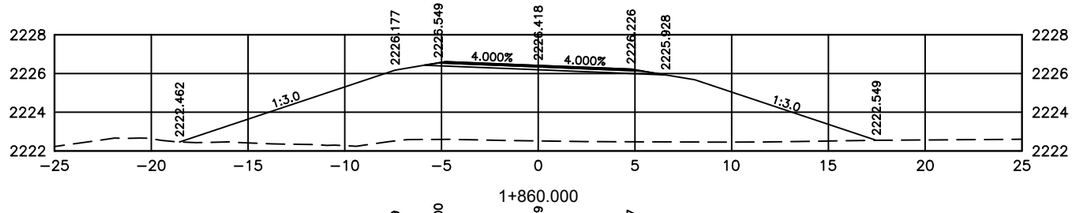
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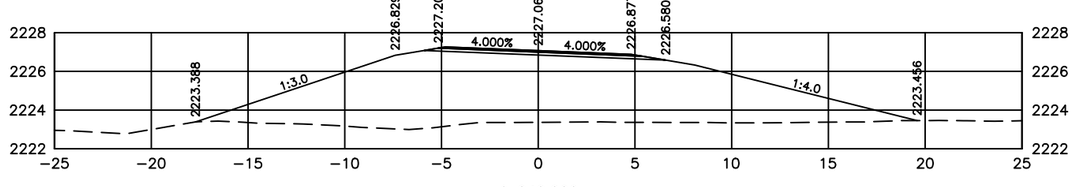
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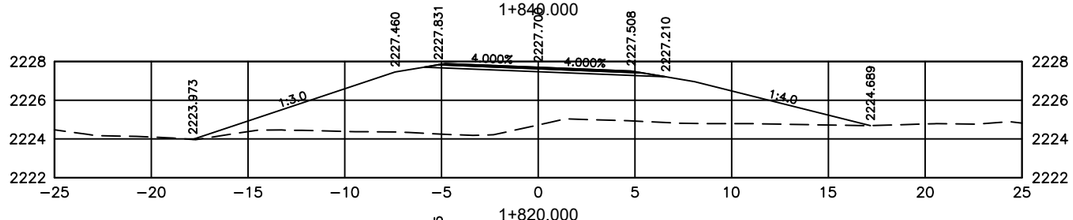
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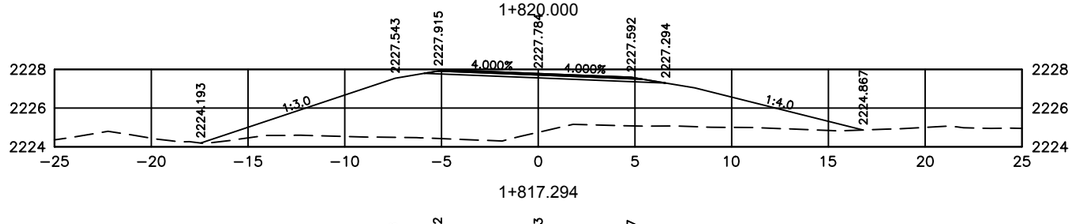
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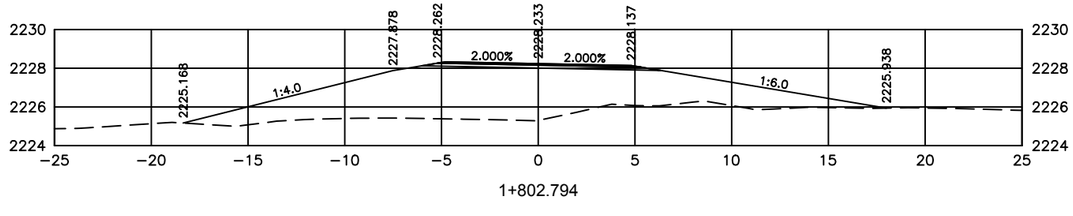
1+840.000



1+820.000



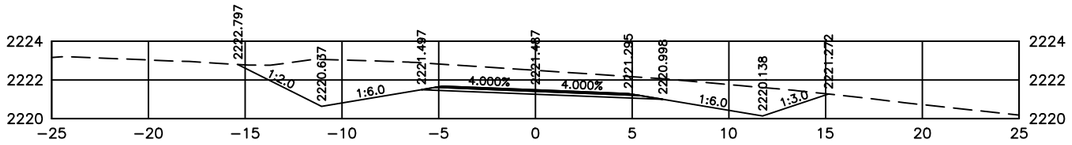
1+817.294



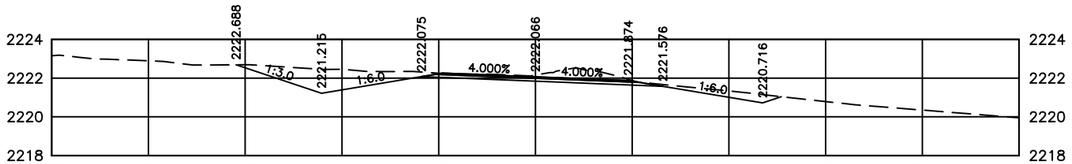
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Date: Nov. 05, 2019 - 4:51pm MJMeyers Drawing Name: M:\TRN\17-100-090-11\17-100-090-11\Plans\1_Sheets\N11(1A)-Cross Sections.dwg

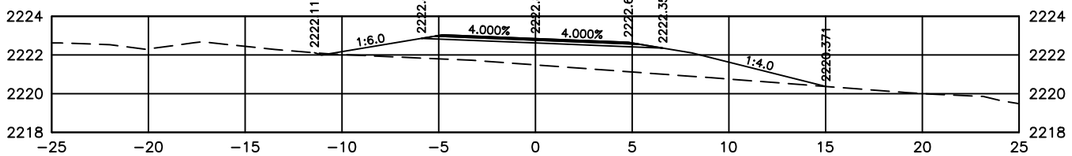
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)2&4	11	60



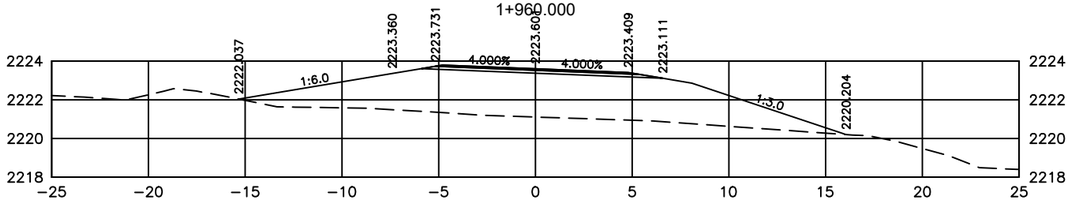
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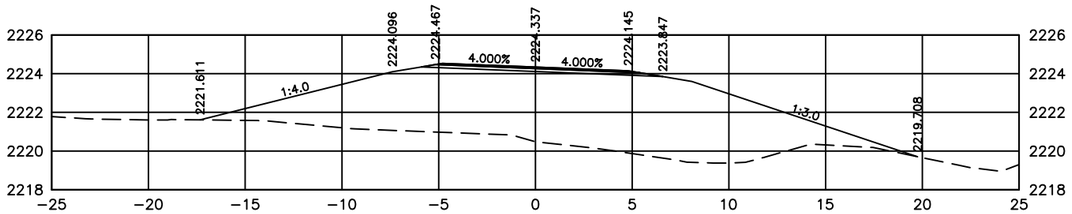
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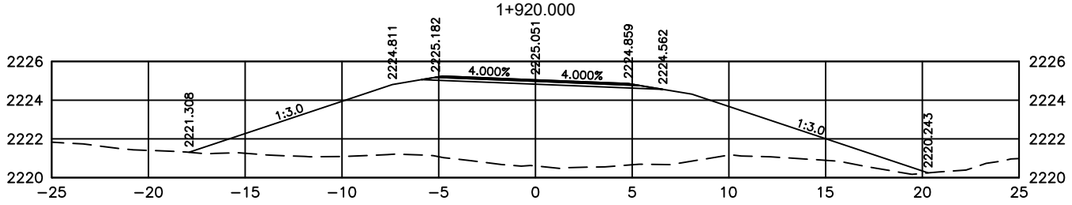
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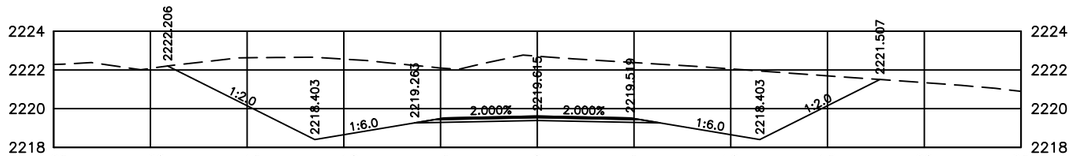
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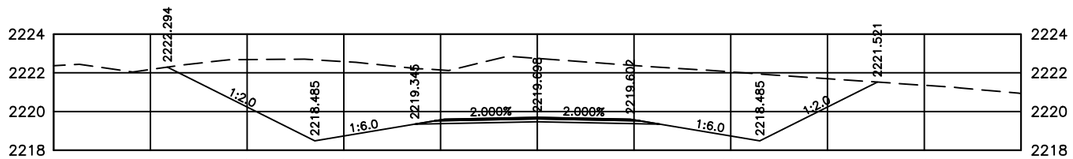
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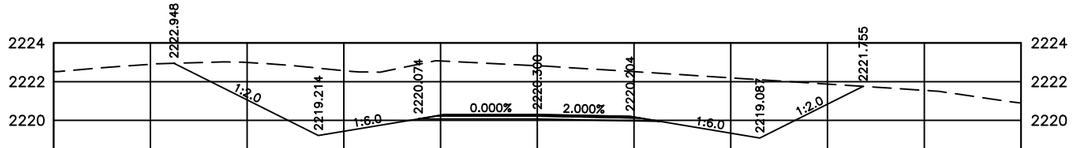
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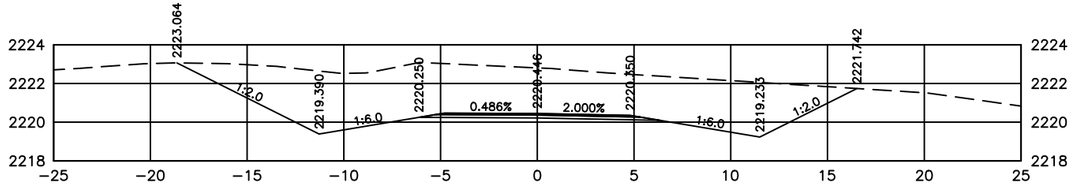
2+040.000



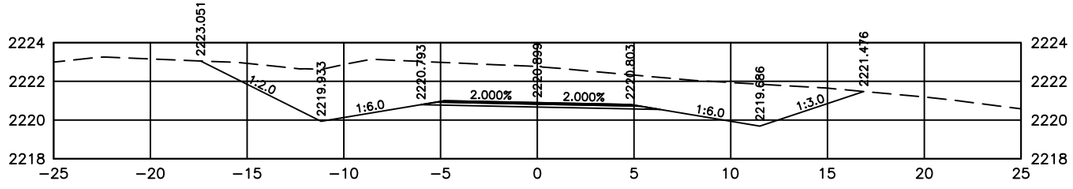
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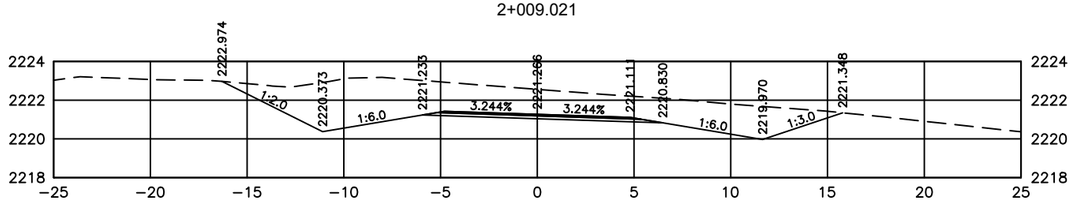
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2+020.000



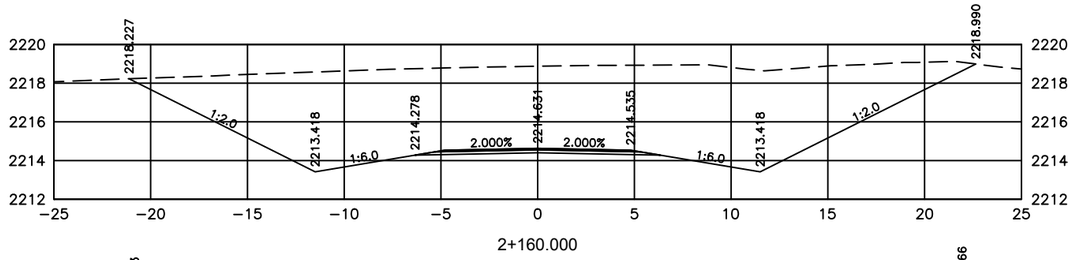
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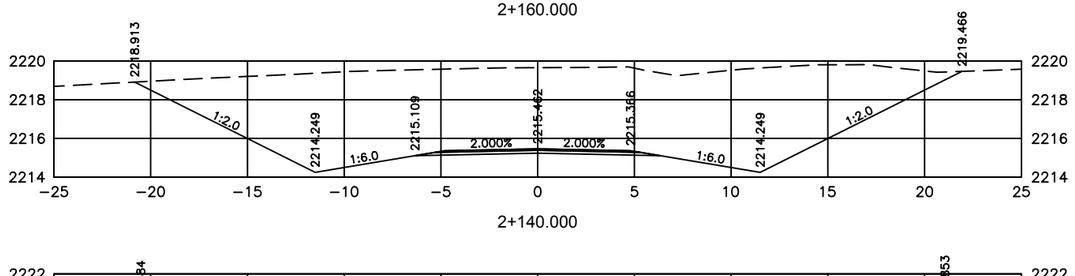
2+000.000

Date: Nov. 05, 2019 - 4:51pm MJMeyers Drawing Name: M:\TRN\17-100-090-11\17-100-090-11\Plans\1_Sheets\N11(1A)-Cross Sections.dwg

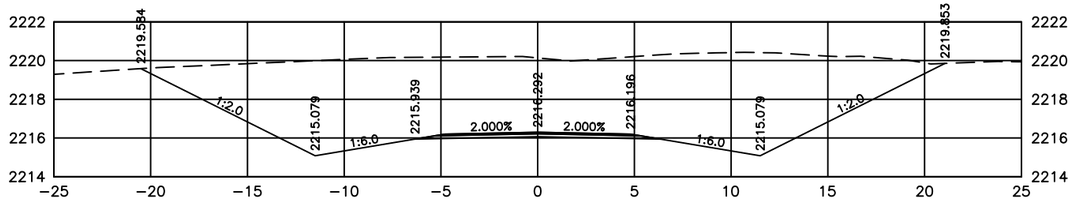
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)2&4	12	60



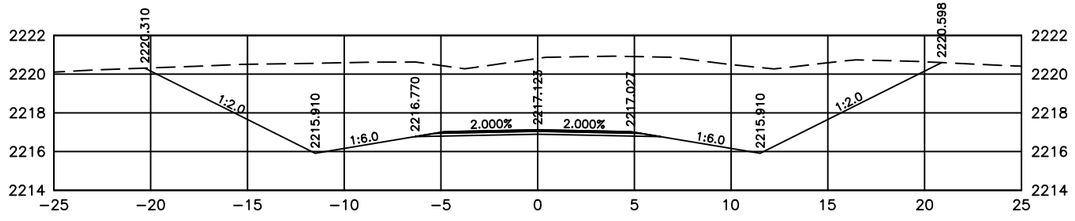
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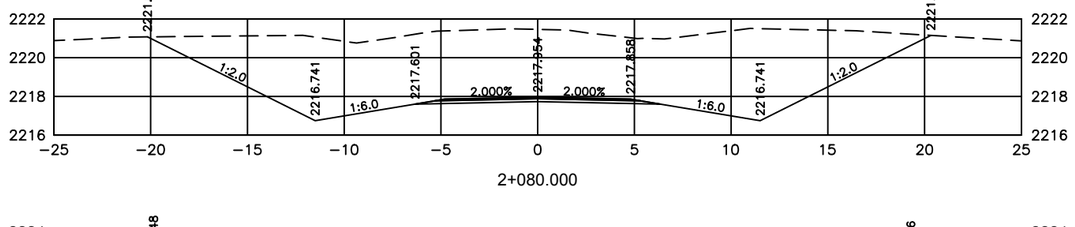
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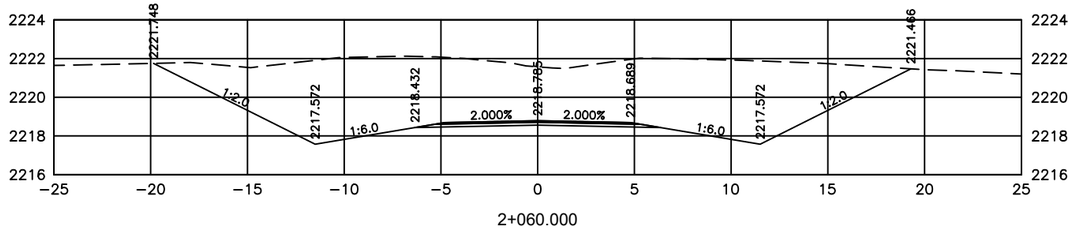
2+120.000



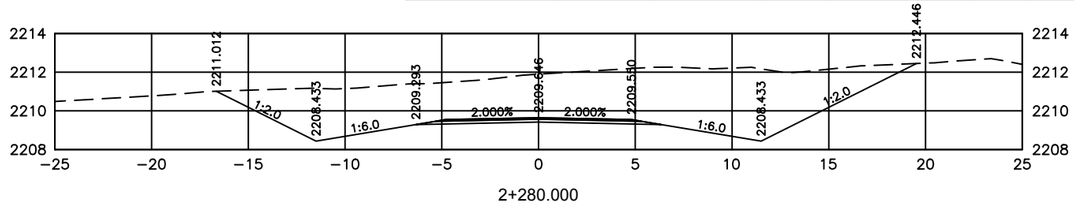
2+100.000



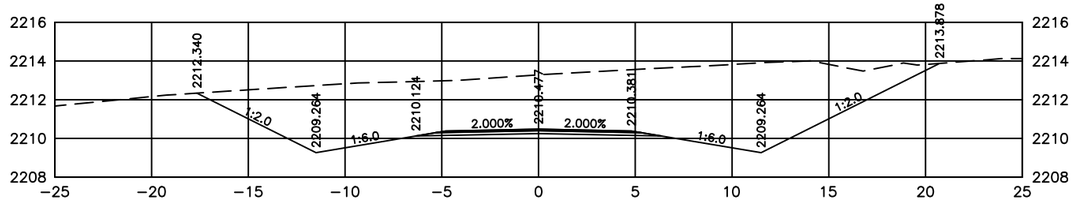
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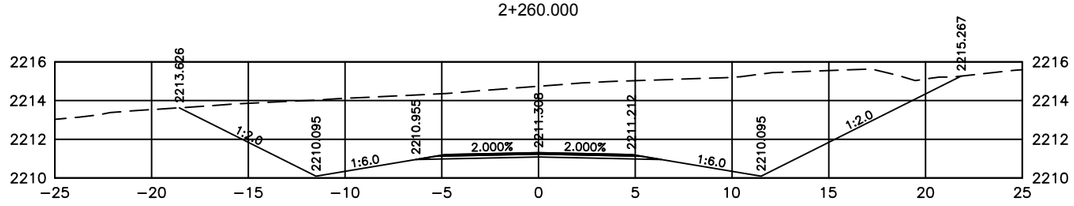
2+060.000



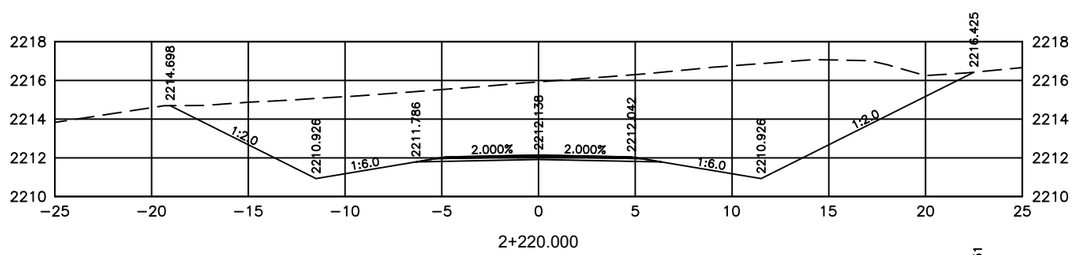
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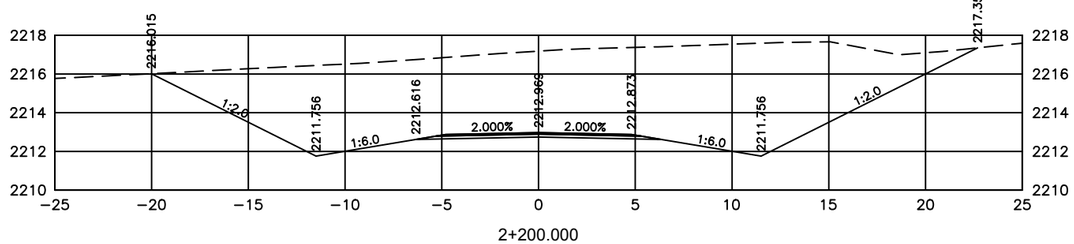
2+260.000



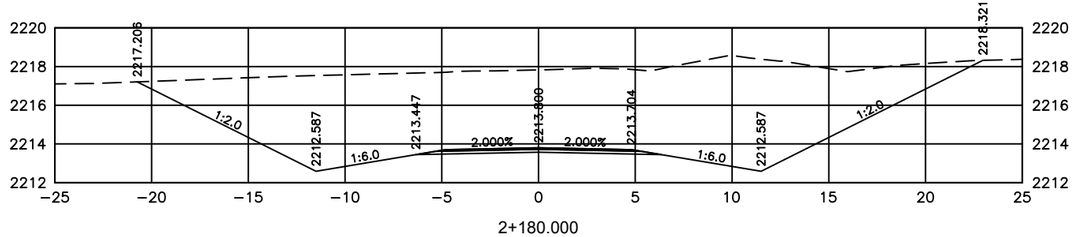
2+240.000



2+220.000



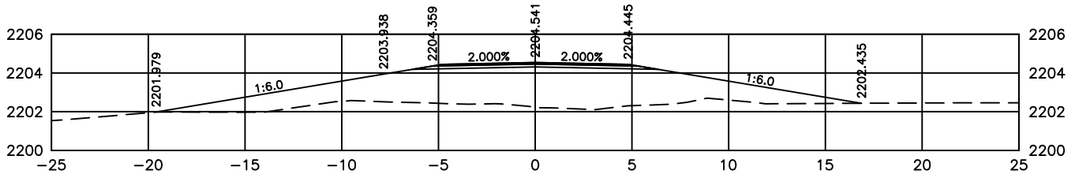
2+200.000

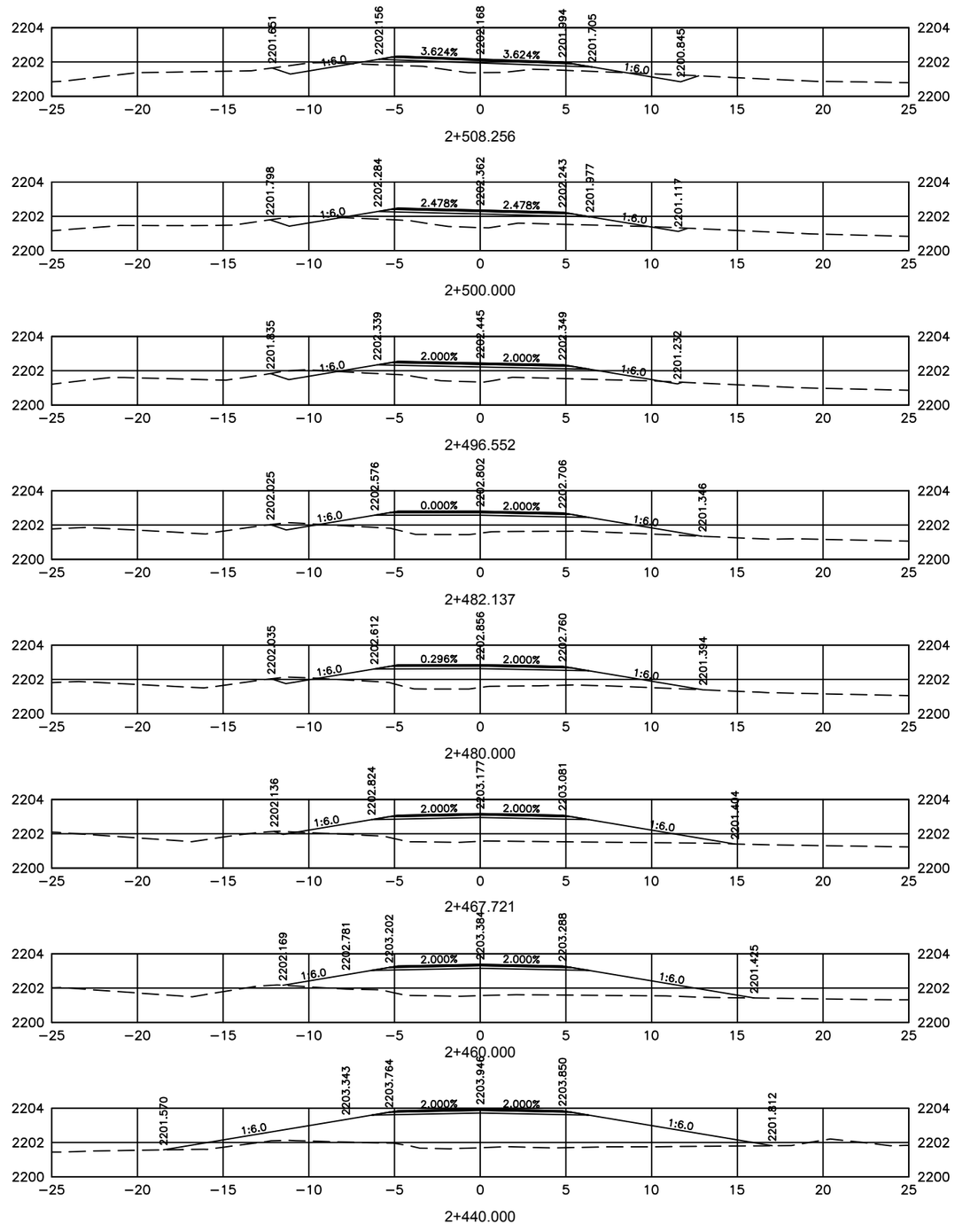


2+180.000

Date: Nov. 05, 2019 - 4:51pm MJMeyers Drawing Name: M:\TRN\17-100-090-11\17-100-090-11\Plans\1_Sheets\N11(1A)-Cross Sections.dwg

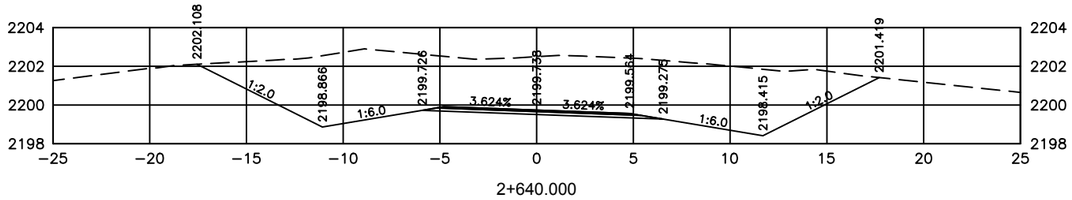
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)2&4	13	60



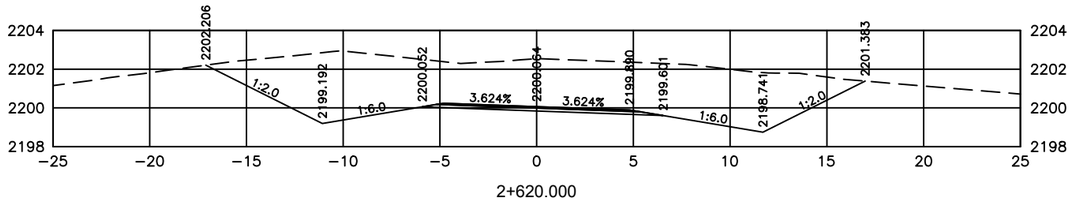


Date: Nov. 05, 2019 - 4:51pm MJMeyers Drawing Name: M:\TRN\17-100-090-11\17-100-090-11\Plans\1_Sheets\N11(1A)-Cross Sections.dwg

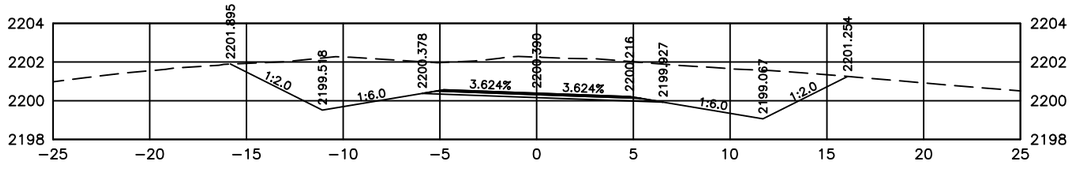
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)2&4	14	60



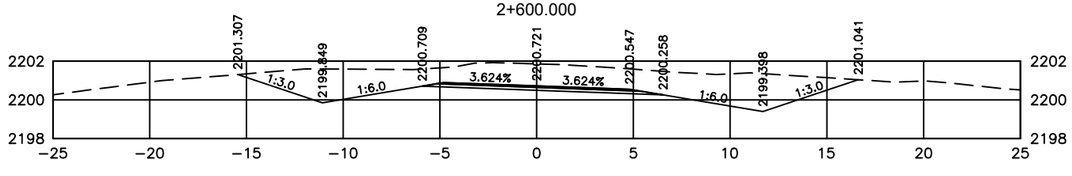
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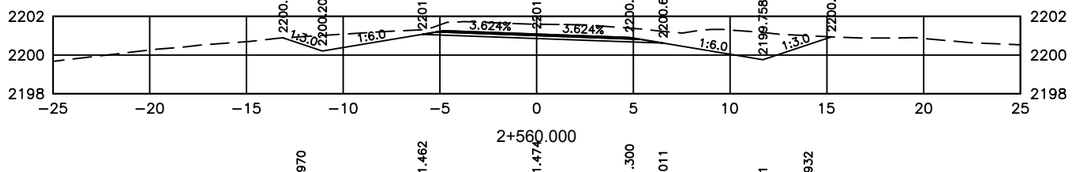
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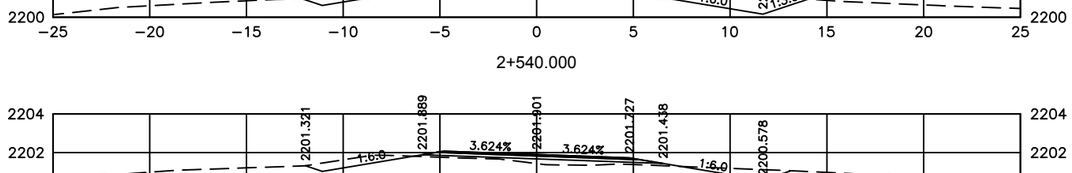
2+600.000



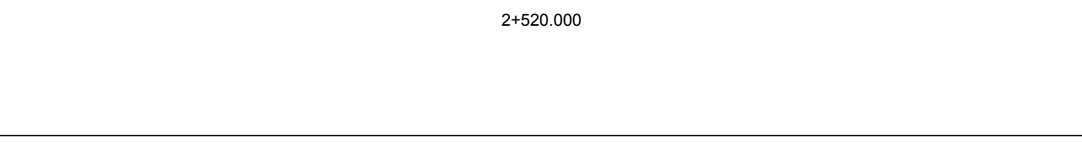
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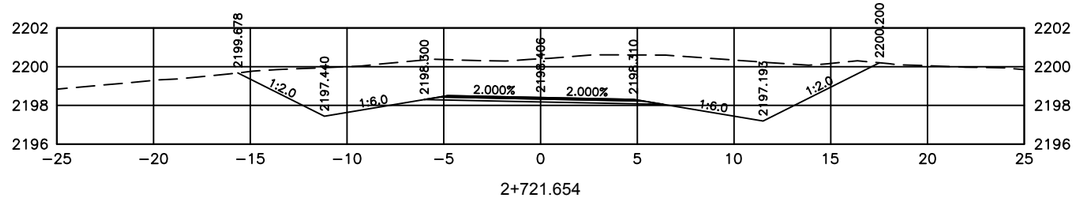
2+560.000



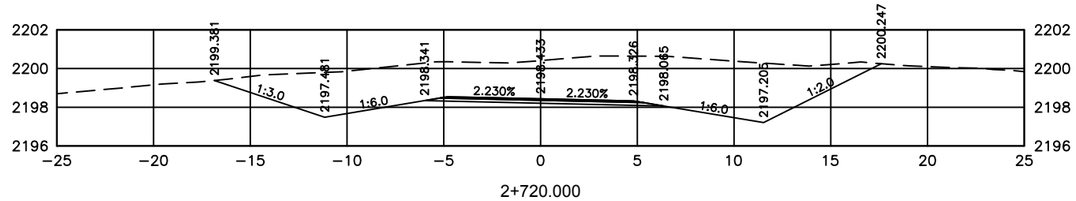
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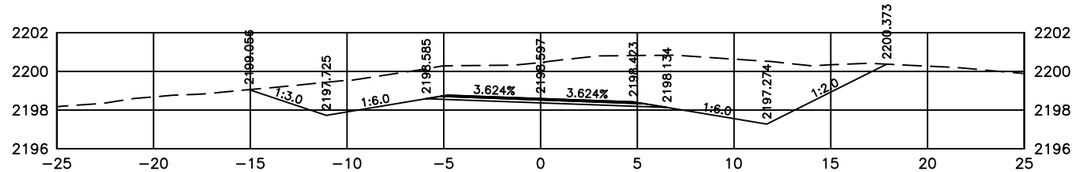
2+520.000



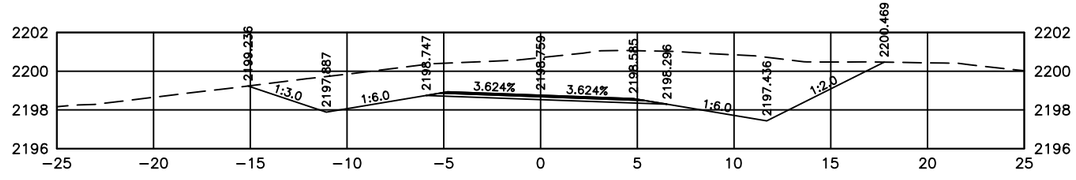
2+721.654



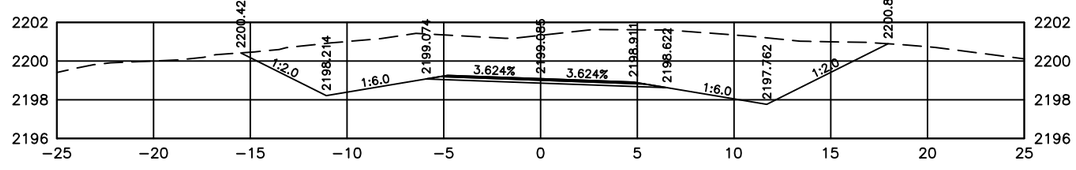
2+720.000



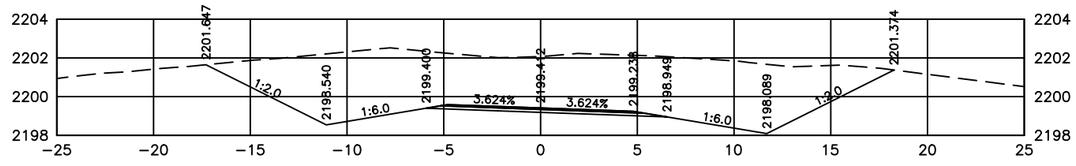
2+709.950



2+700.000



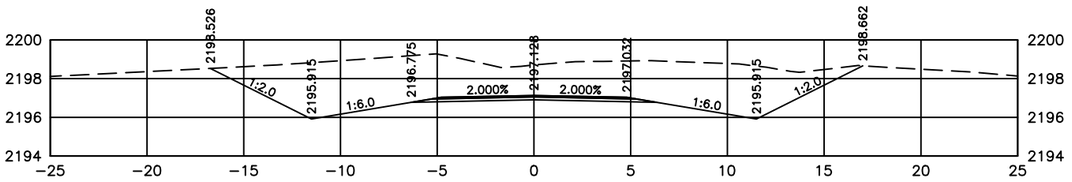
2+680.000



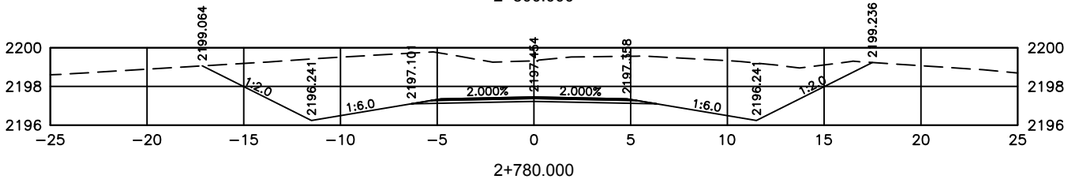
2+660.000

Date: Nov. 05, 2019 - 4:51pm MJMeyers Drawing Name: M:\TRN\17-100-090-11\17-100-090-11\Plans\1_Sheets\N11(1A)-Cross Sections.dwg

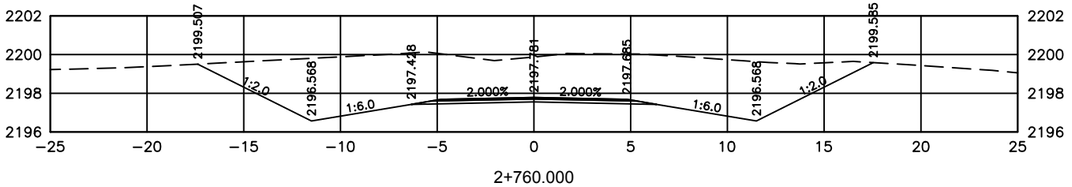
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)2&4	15	60



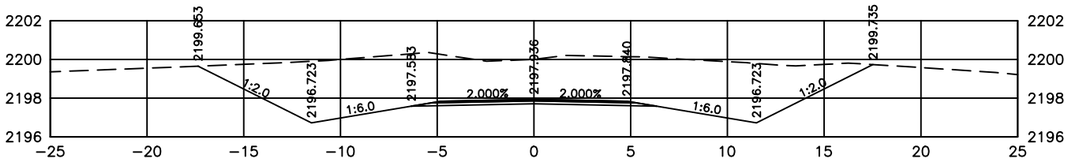
2+800.000



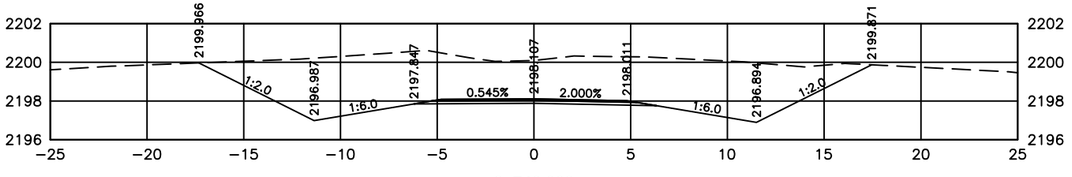
2+780.000



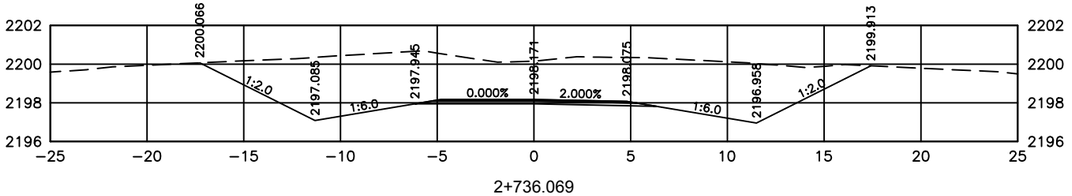
2+760.000



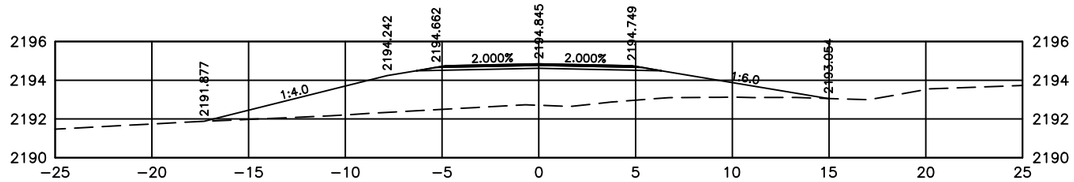
2+750.484



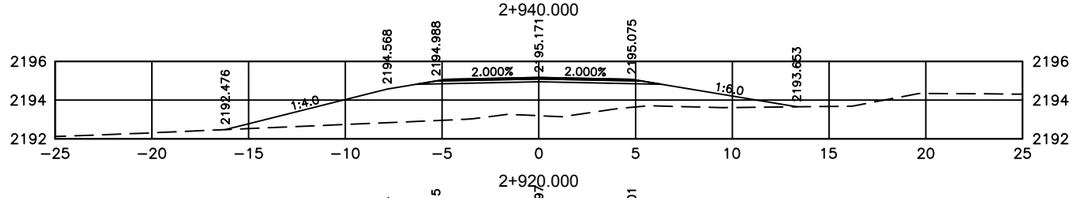
2+740.000



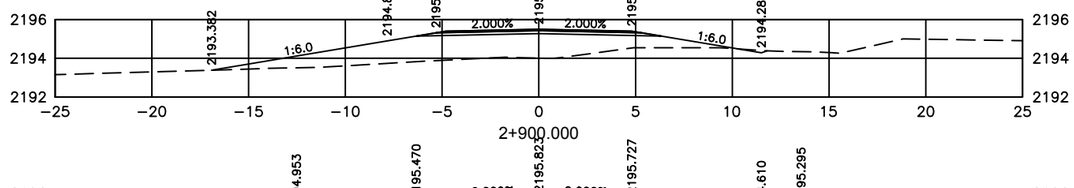
2+736.069



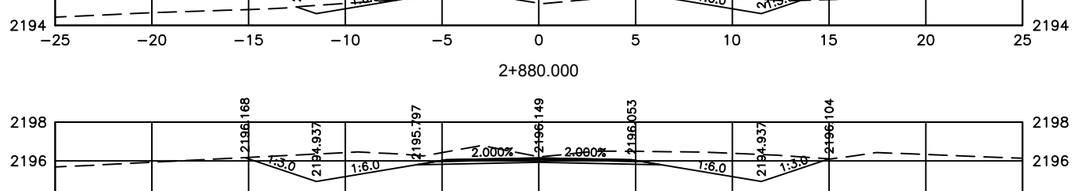
2+940.000



2+920.000

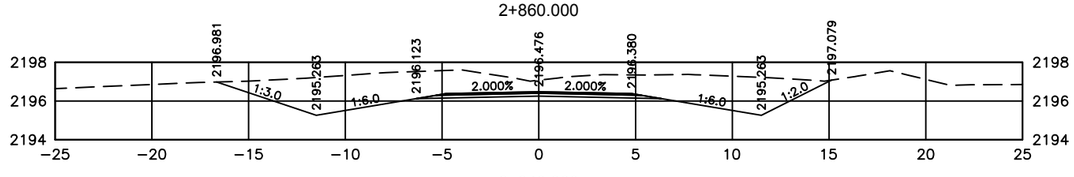


2+900.000

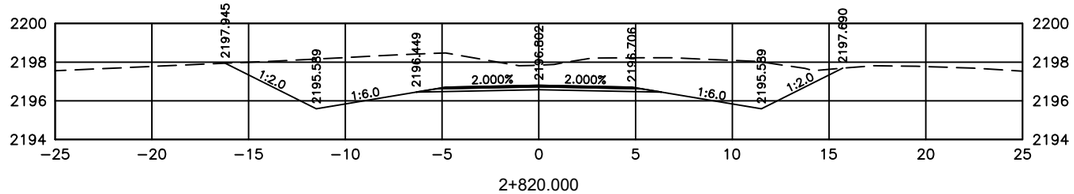


2+880.000

2+860.000



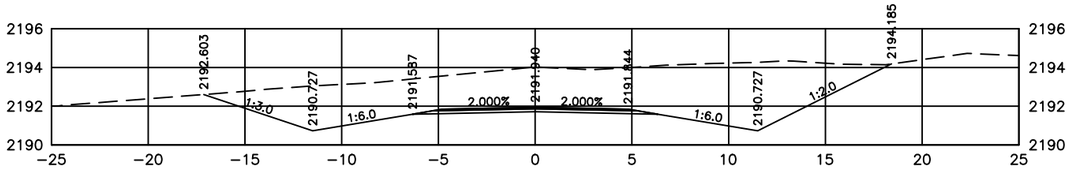
2+840.000



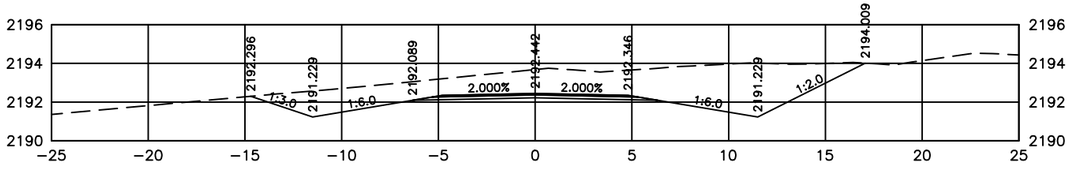
2+820.000

Date: Nov. 05, 2019 - 4:51pm MJMeyers Drawing Name: M:\TRN\17-100-090-11\17-100-090-11\Plans\1_Sheets\N11(1A)-Cross Sections.dwg

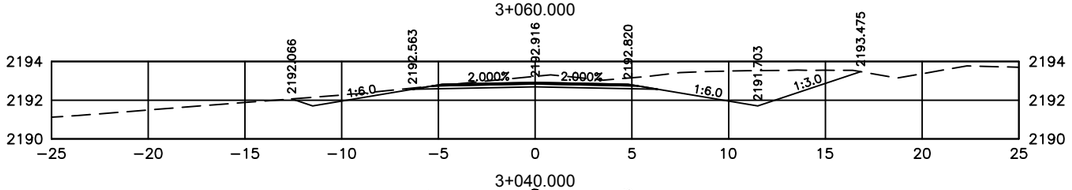
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)2&4	16	60



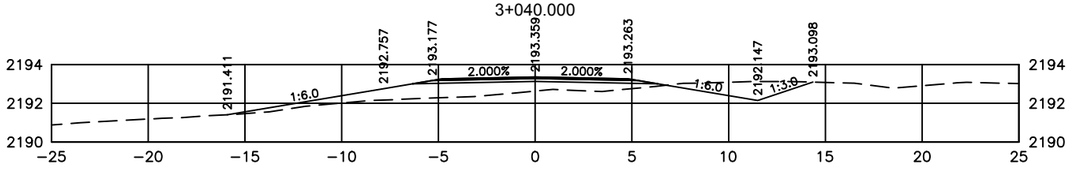
3+080.000



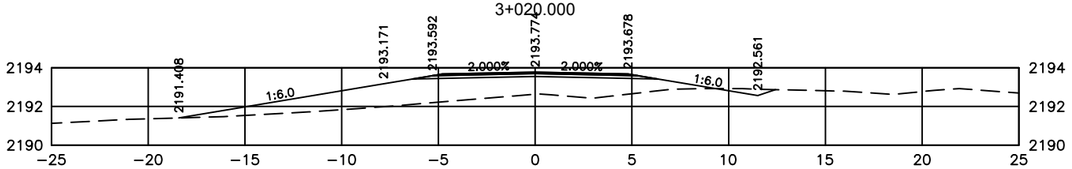
3+060.000



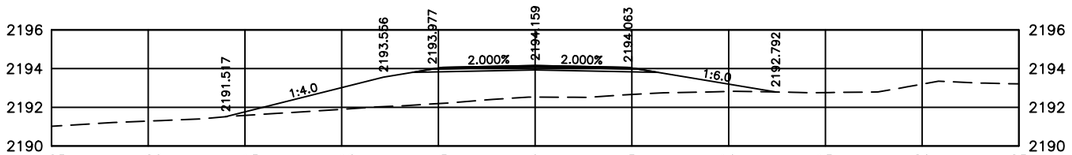
3+040.000



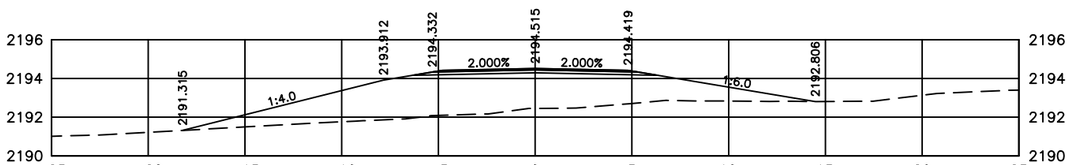
3+020.000



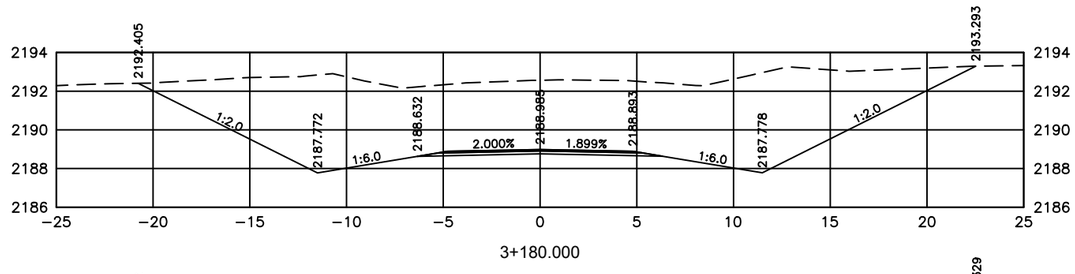
3+000.000



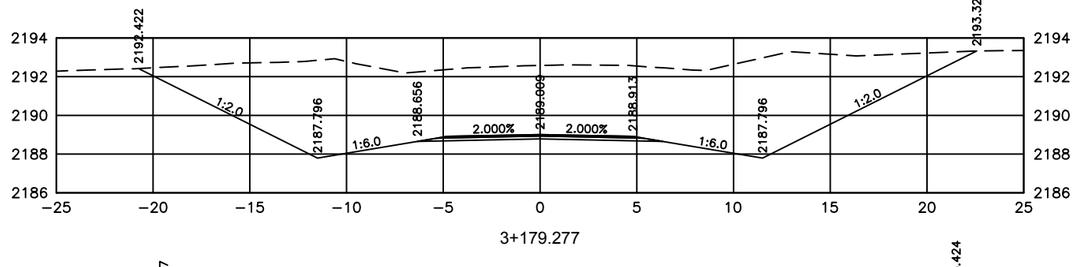
2+980.000



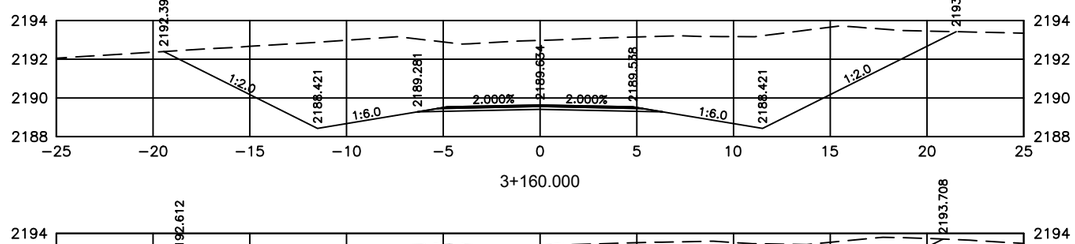
2+960.000



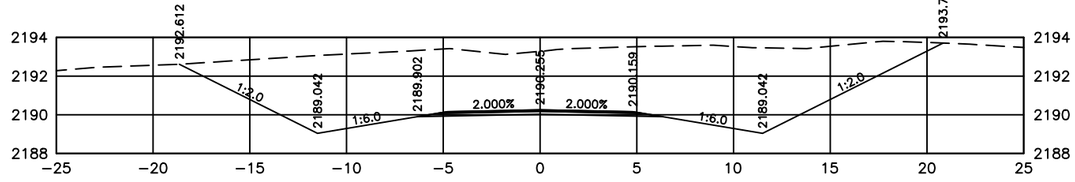
3+180.000



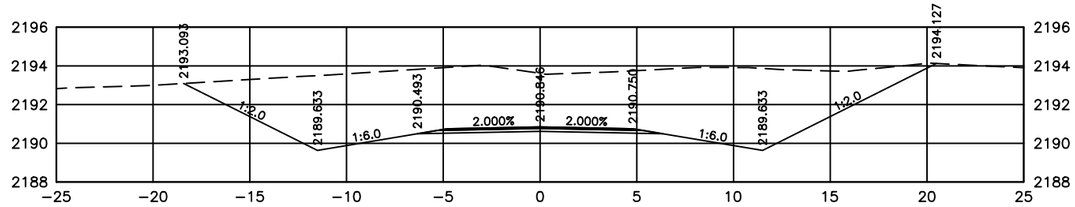
3+179.277



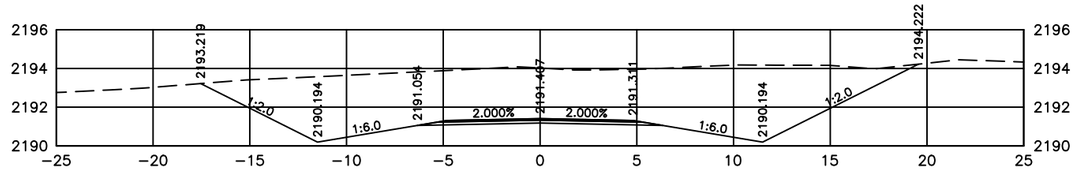
3+160.000



3+140.000



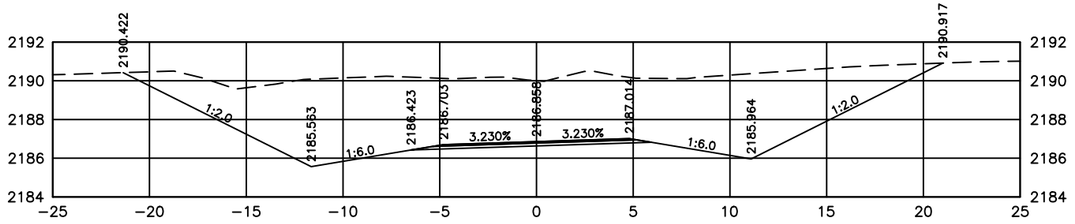
3+120.000



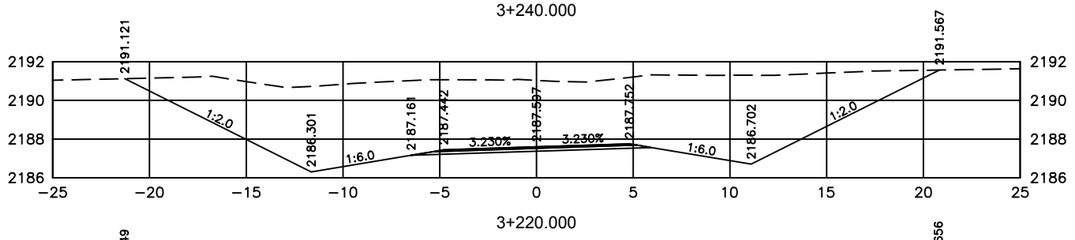
3+100.000

Date: Nov. 05, 2019 - 4:51pm MJMeyers Drawing Name: M:\TRN\17-100-090-11\17-100-090-11\1_Sheets\N11(1A)-Cross Sections.dwg

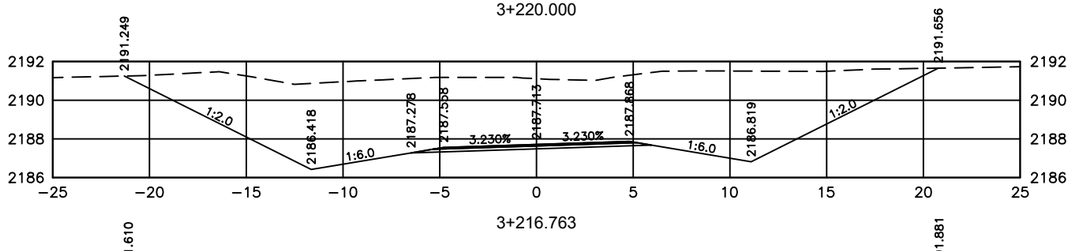
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)2&4	17	60



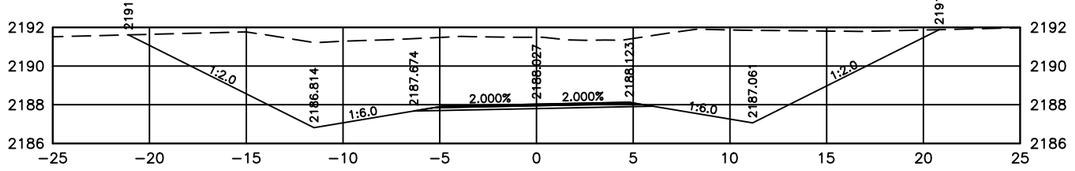
3+240.000



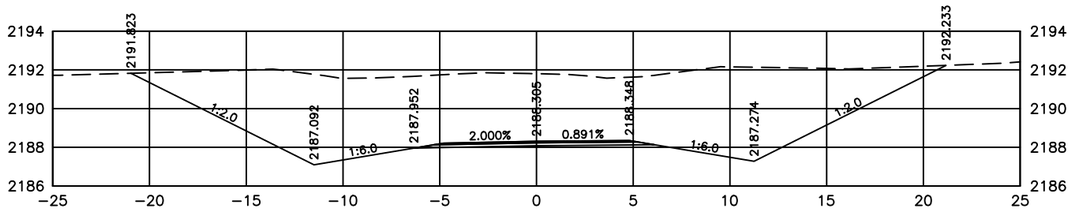
3+220.000



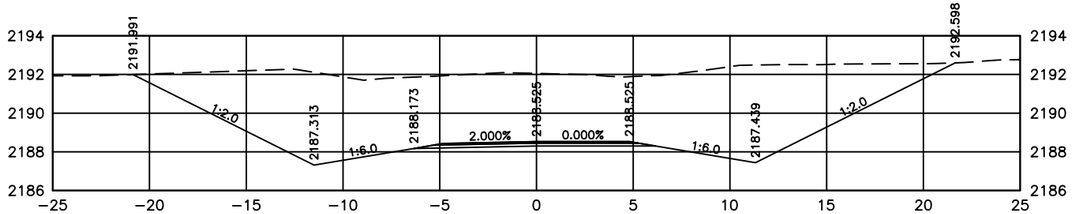
3+216.763



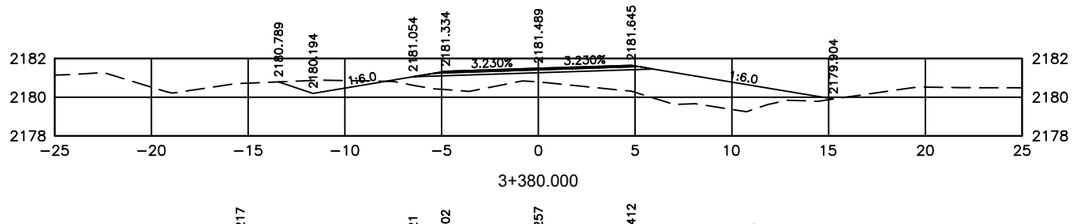
3+207.945



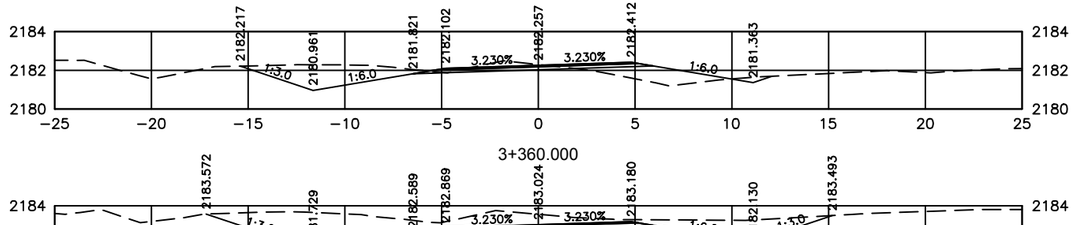
3+200.000



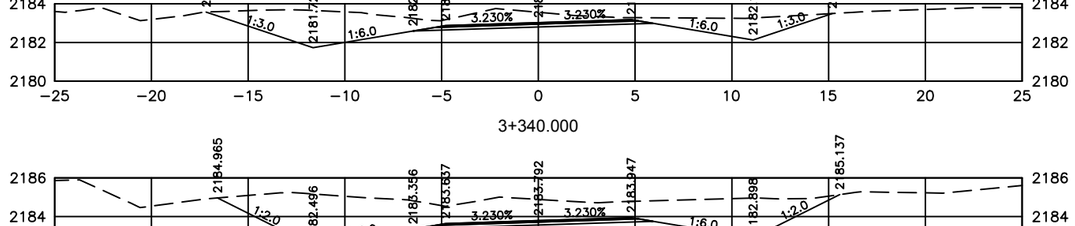
3+193.611



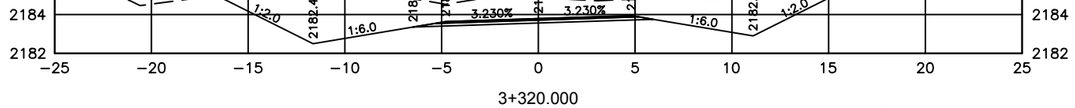
3+380.000



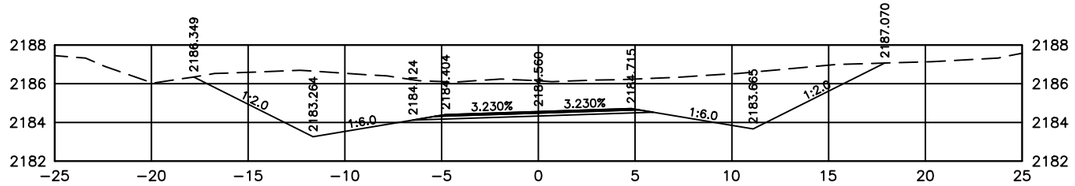
3+360.000



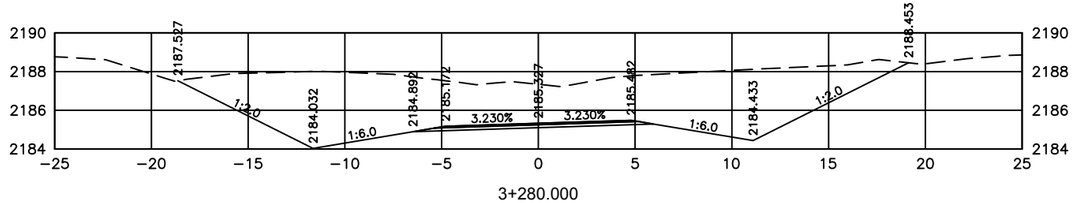
3+340.000



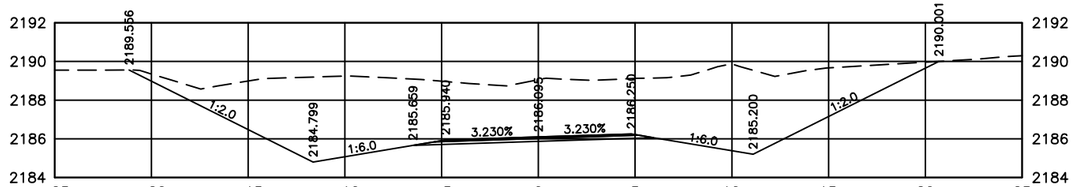
3+320.000



3+300.000



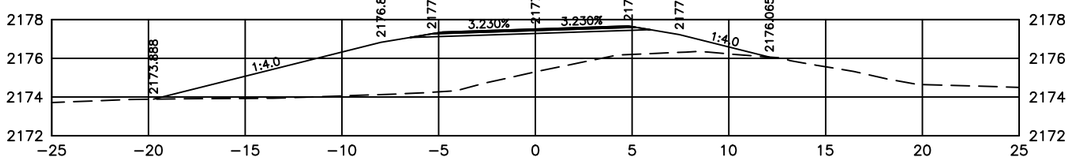
3+280.000



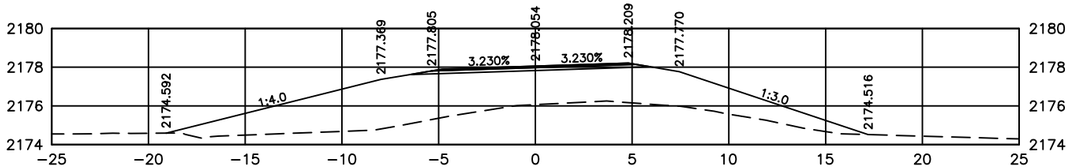
3+260.000

Date: Nov. 05, 2019 - 4:51pm MJMeyers Drawing Name: M:\TRN\17-100-090-11\17-100-090-11\Plans\1_Sheets\N11(1A)-Cross Sections.dwg

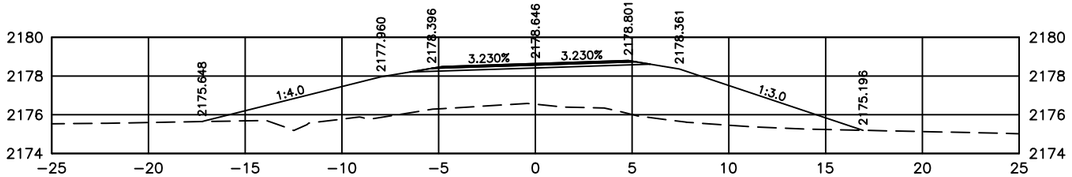
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)2&4	18	60



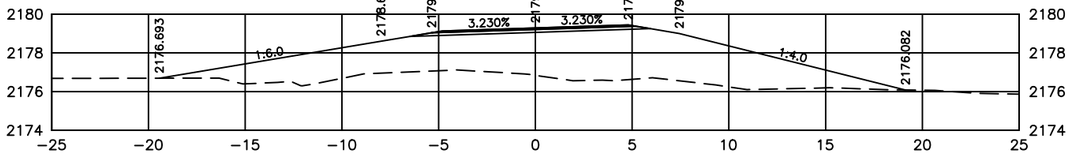
3+500.000



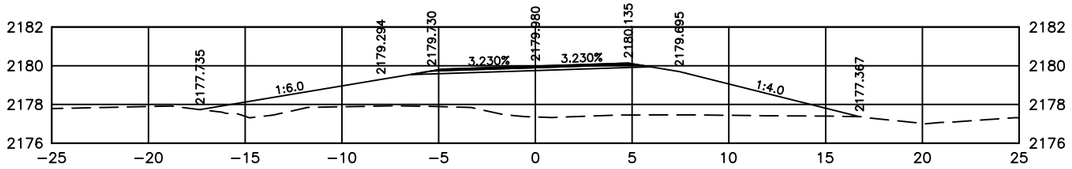
3+480.000



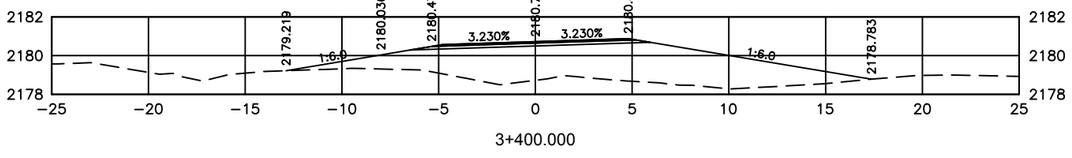
3+460.000



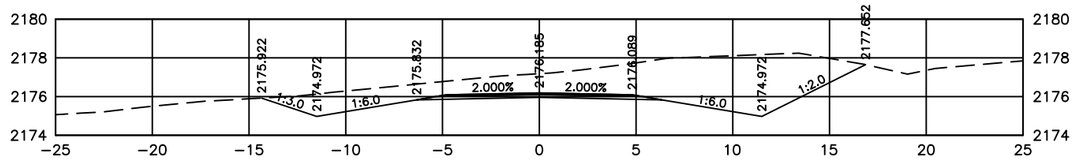
3+440.000



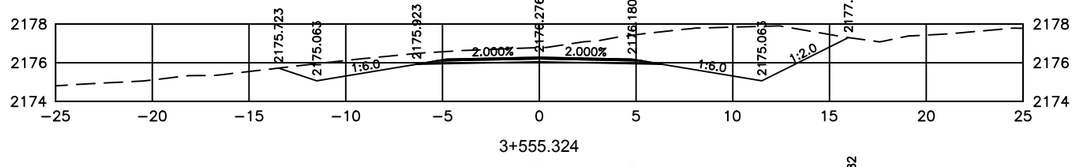
3+420.000



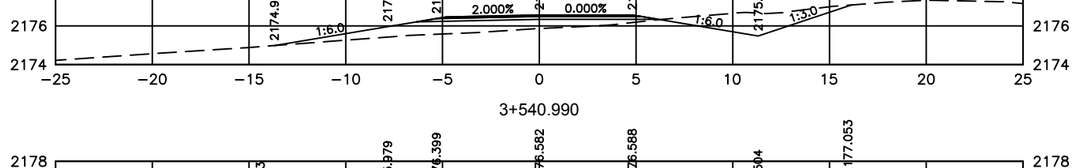
3+400.000



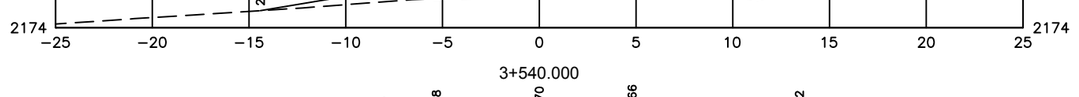
3+560.000



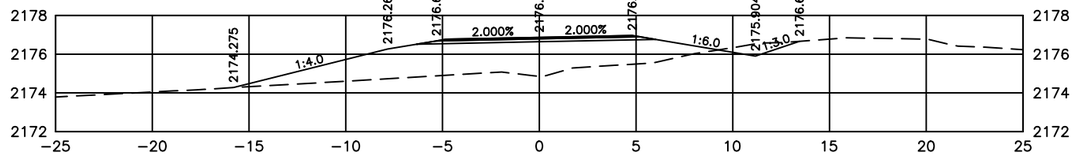
3+555.324



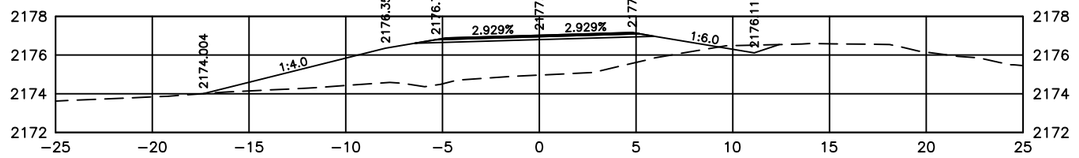
3+540.990



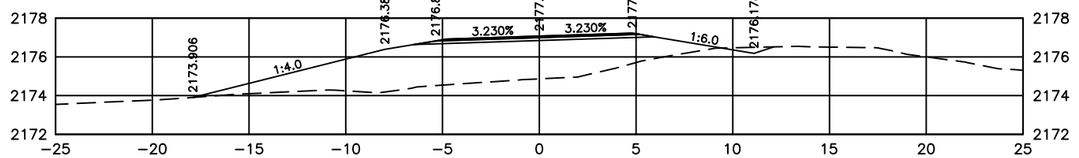
3+540.000



3+526.656



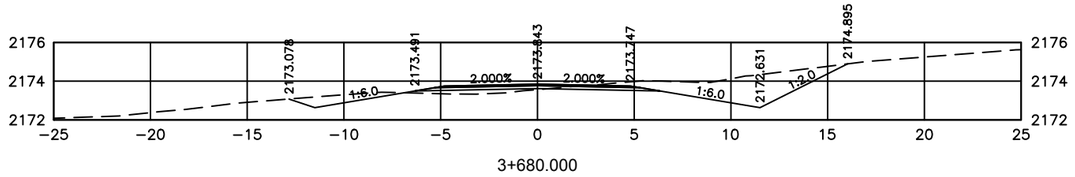
3+520.000



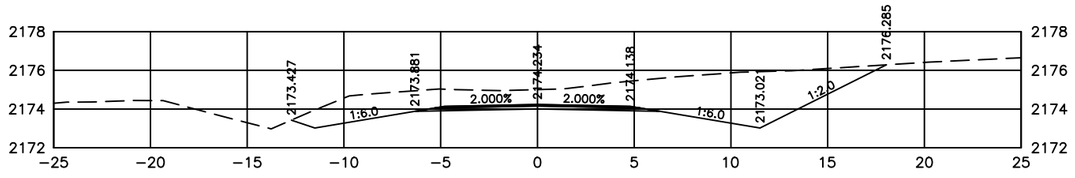
3+517.838

Date: Nov. 05, 2019 - 4:51pm MJMeyers Drawing Name: M:\TRN\17-100-090-11\17-100-090-11\1_Sheets\N11(1A)-Cross Sections.dwg

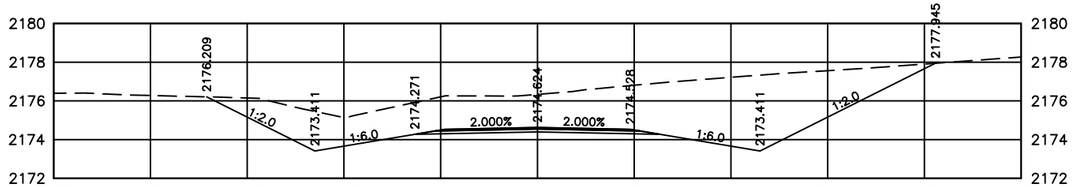
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)2&4	19	60



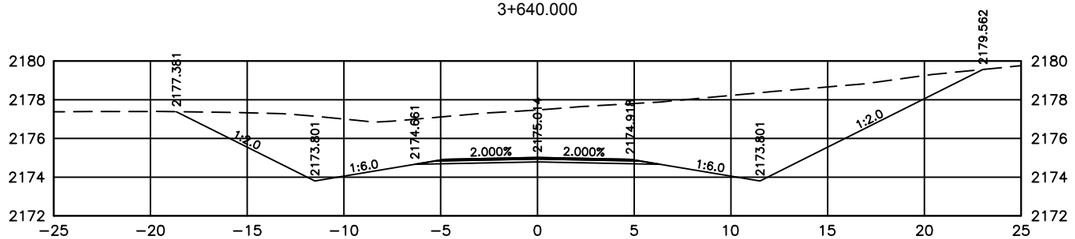
3+680.000



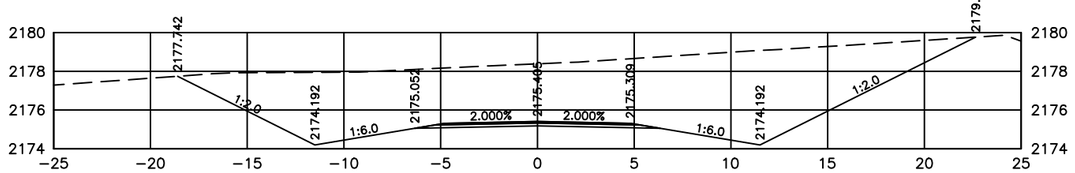
3+660.000



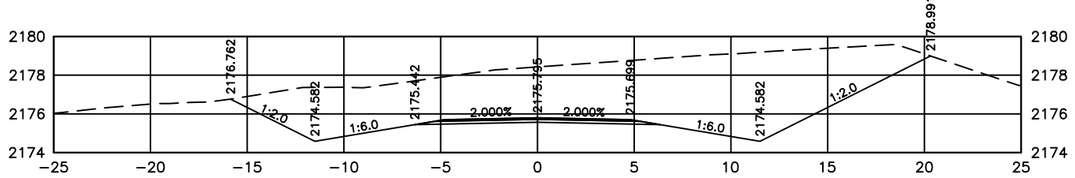
3+640.000



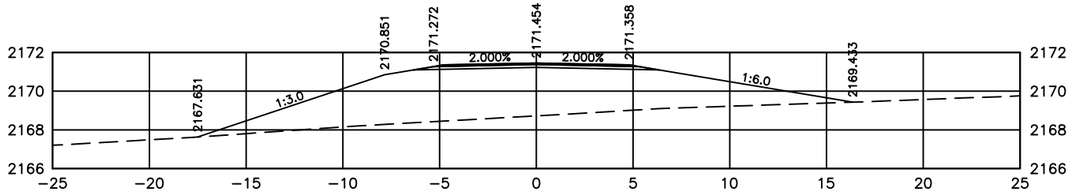
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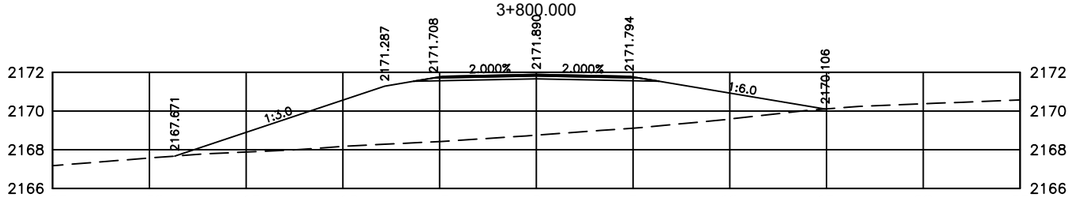
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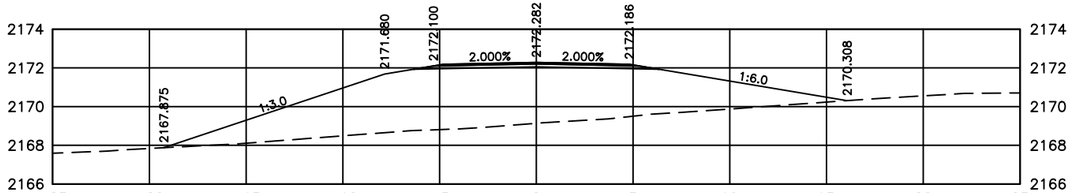
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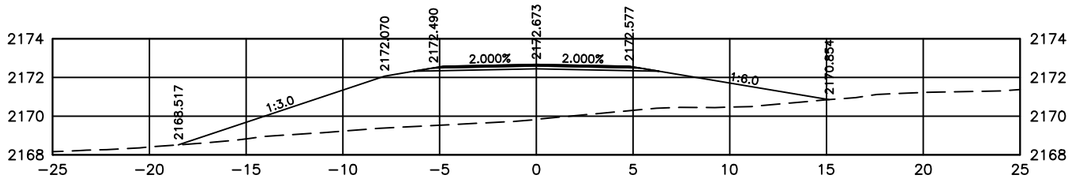
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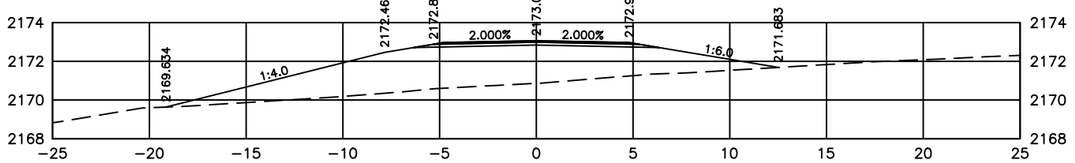
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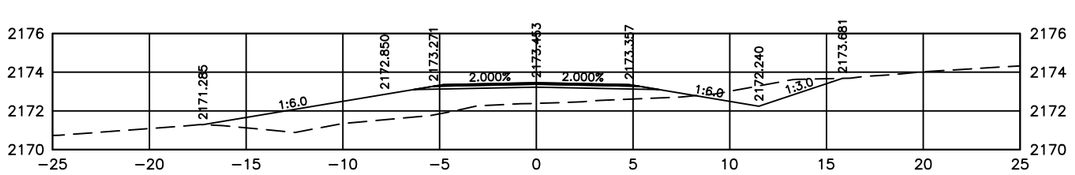
3+760.000



3+740.000



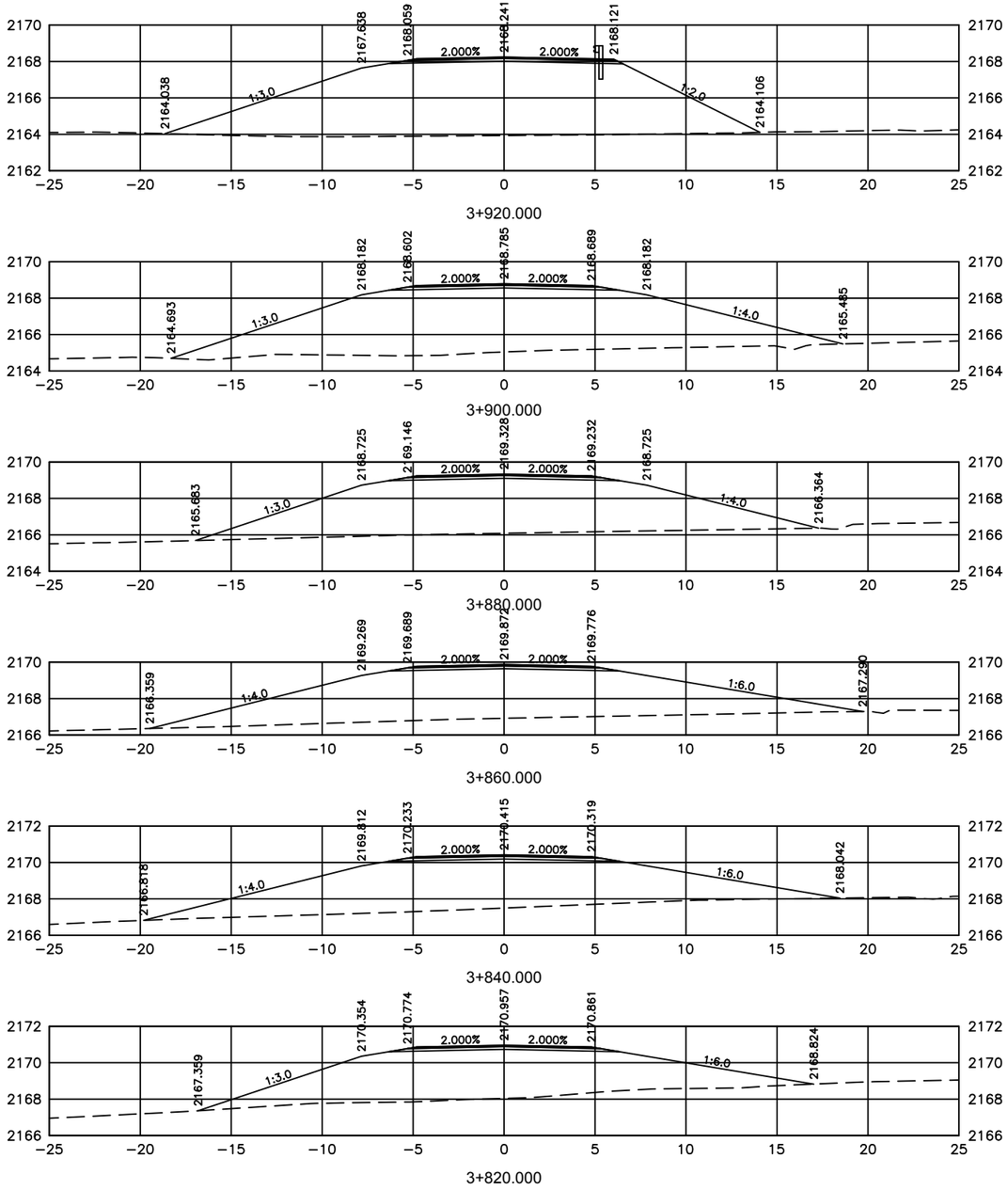
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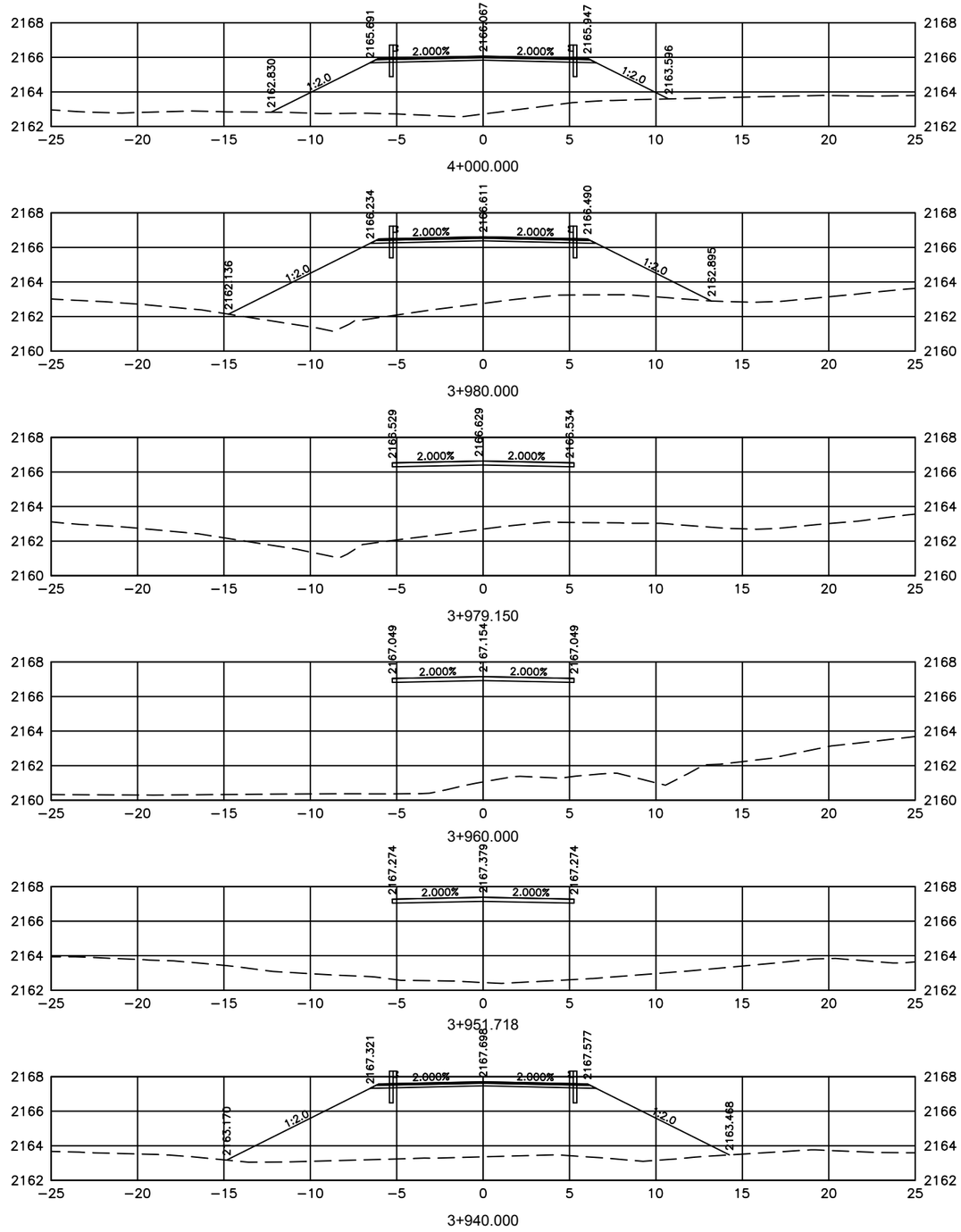


3+700.000

Date: Nov. 05, 2019 - 4:51pm MJMeyers Drawing Name: M:\TRN\17-100-090-11\17-100-090-11\Plans\1_Sheets\N11(1A)-Cross Sections.dwg

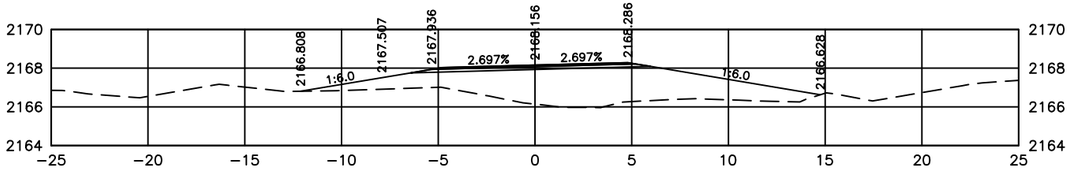
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)2&4	20	60



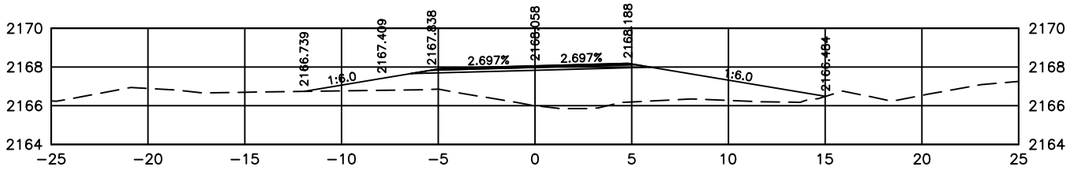


Date: Nov. 05, 2019 - 4:51pm MJMeyers Drawing Name: M:\TRN\17-100-090-11\17-100-090-11\Plans\1_Sheets\N11(1A)-Cross Sections.dwg

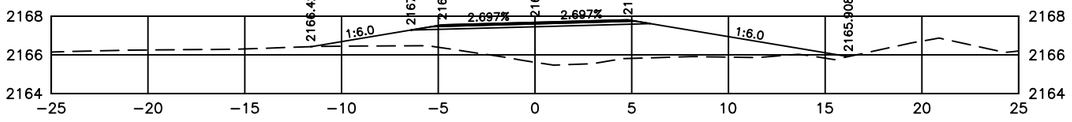
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)2&4	22	60



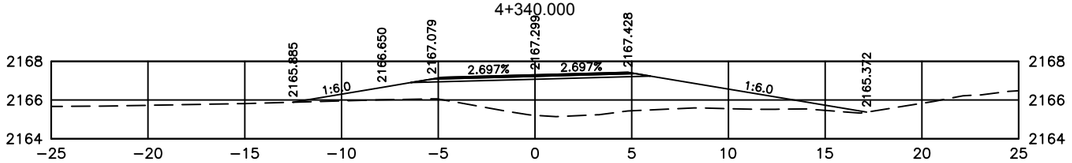
4+365.155



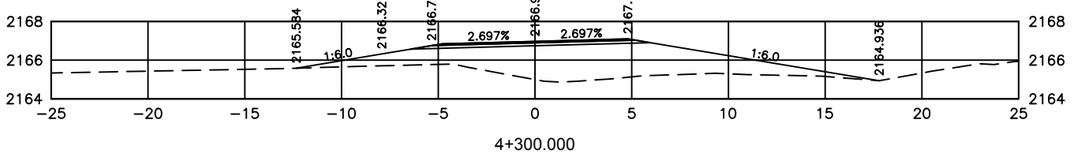
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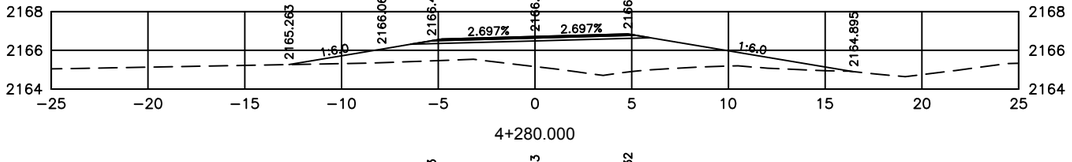
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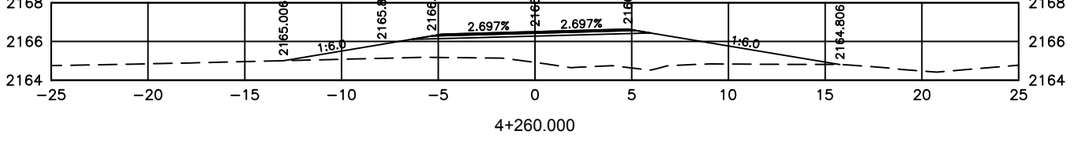
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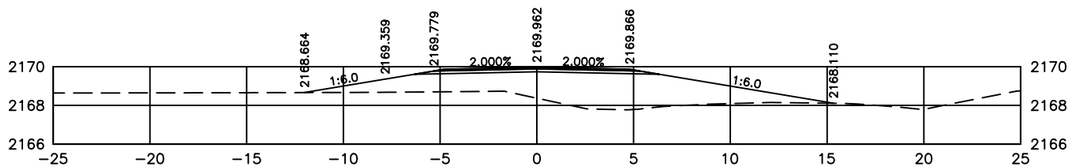
4+300.000



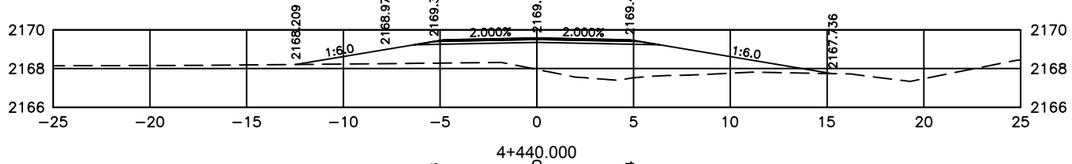
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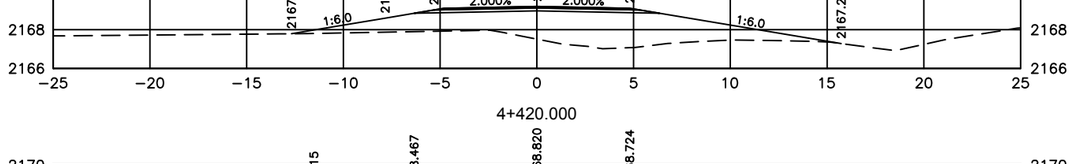
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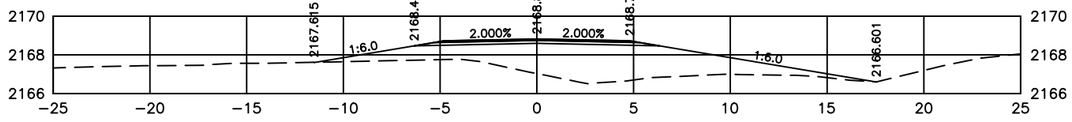
4+460.000



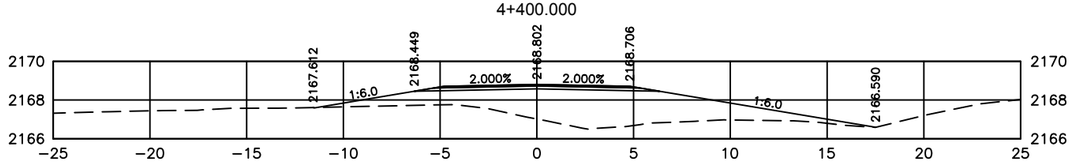
4+440.000



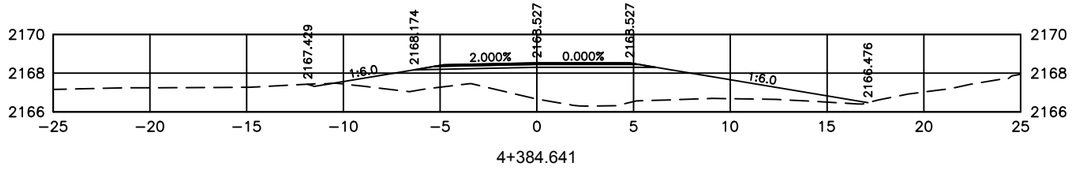
4+420.000



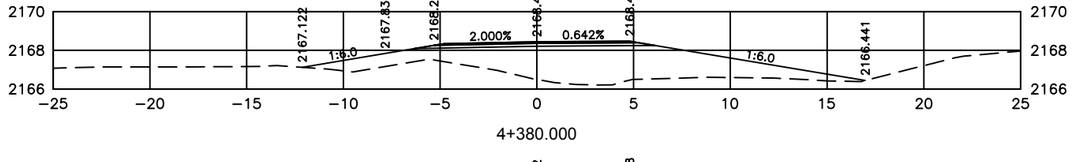
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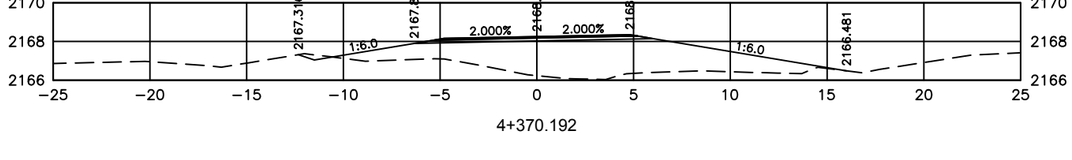
4+399.090



4+384.641



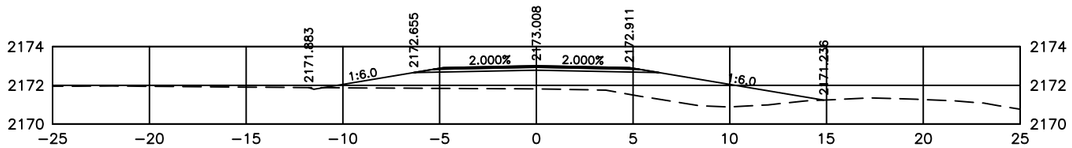
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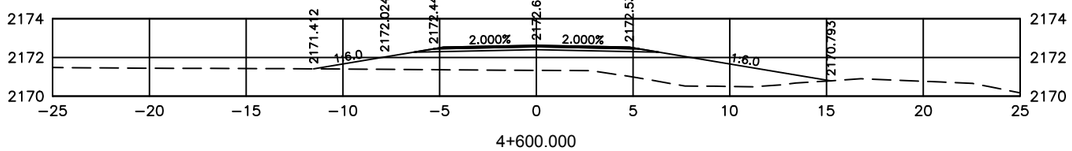


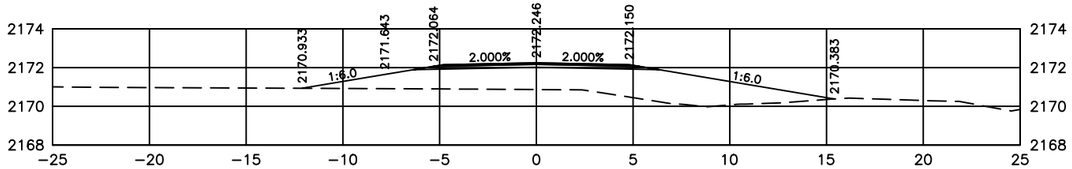
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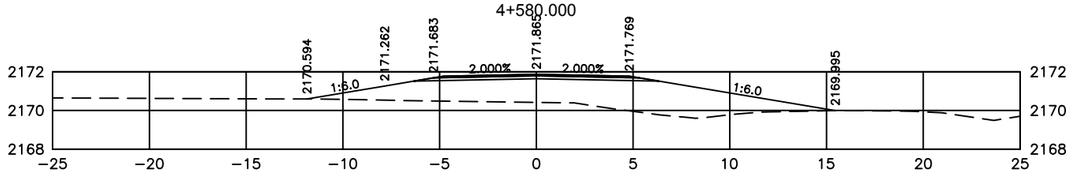
Date: Nov. 05, 2019 - 4:51pm MJMeyers Drawing Name: M:\TRN\17-100-090-11\17-100-090-11\Plans\1_Sheets\N11(1A)-Cross Sections.dwg

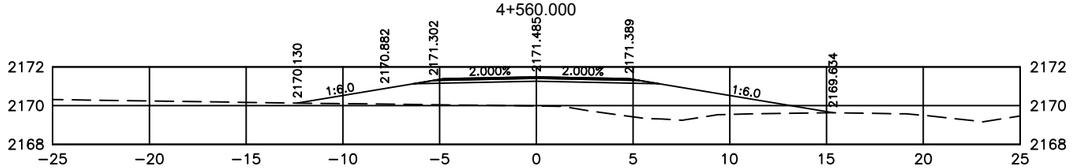
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)2&4	23	60

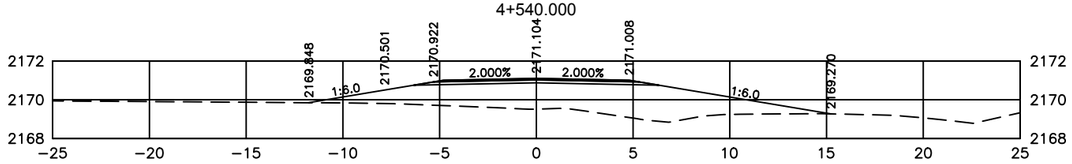


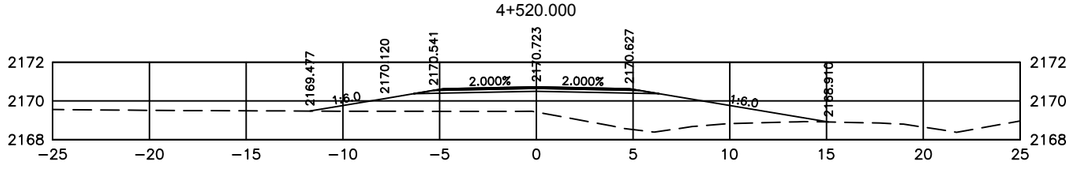


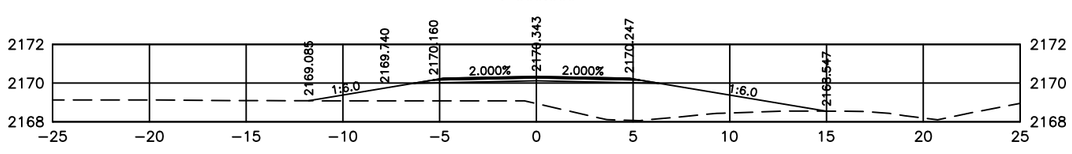


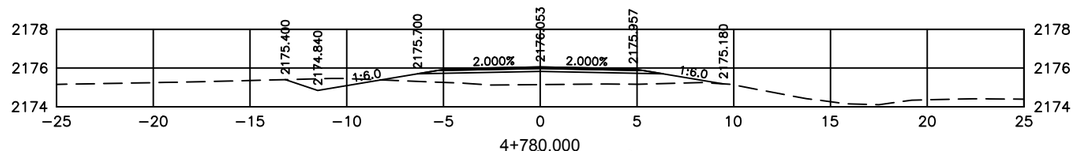


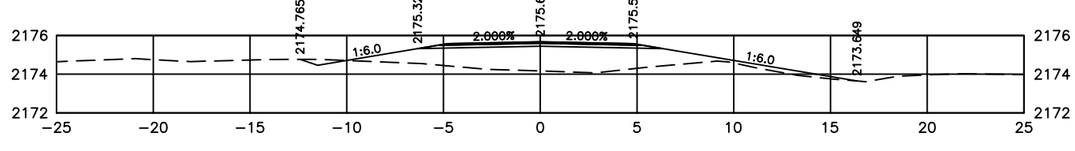


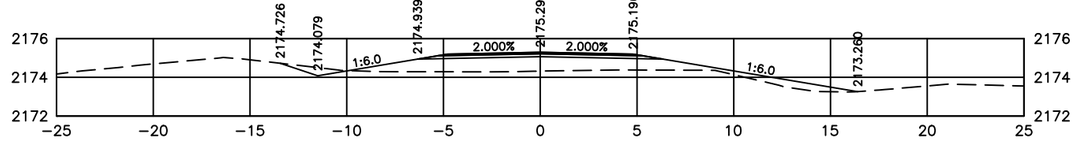


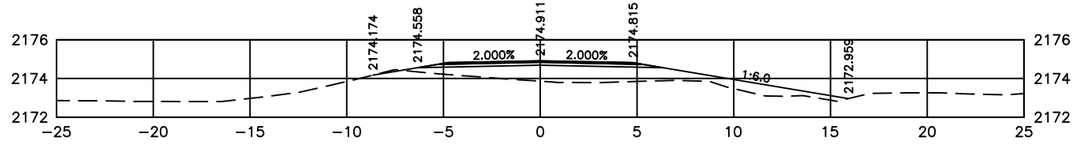


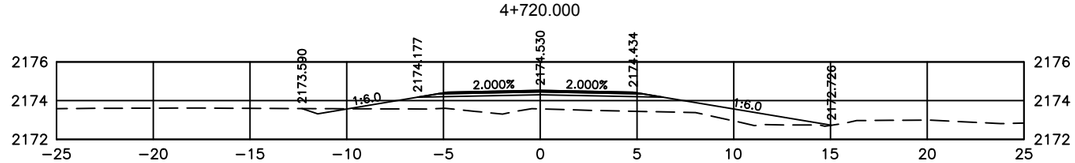


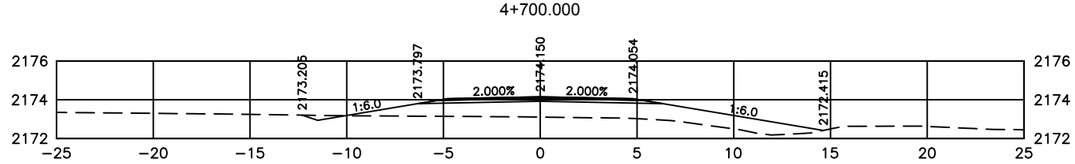


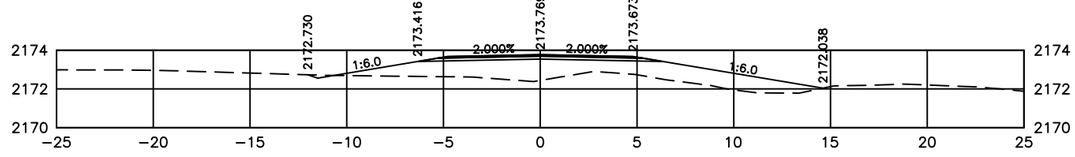


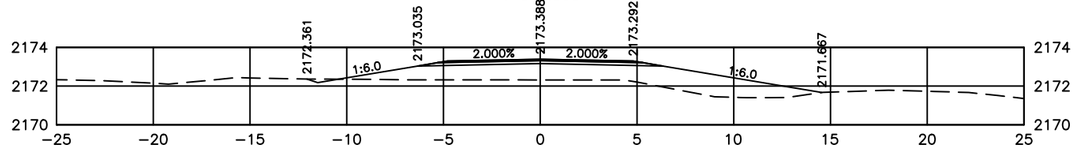






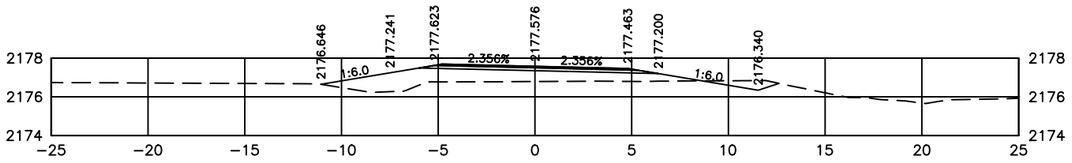




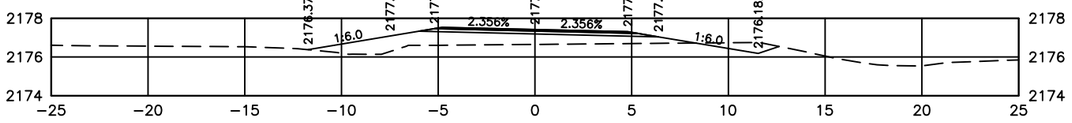


Date: Nov. 05, 2019 - 4:51pm MJMeyers Drawing Name: M:\TRN\17-100-090-11\17-100-090-11\Plans\1_Sheets\N11(1A)-Cross Sections.dwg

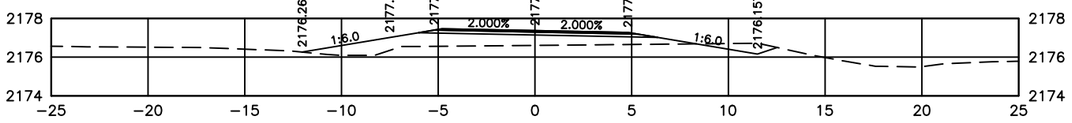
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)2&4	24	60



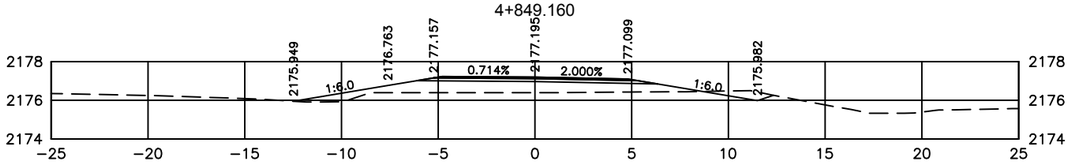
4+860.000



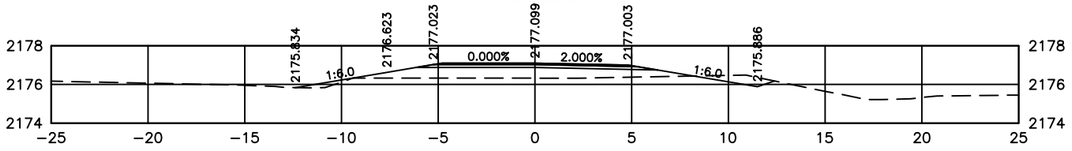
4+851.693



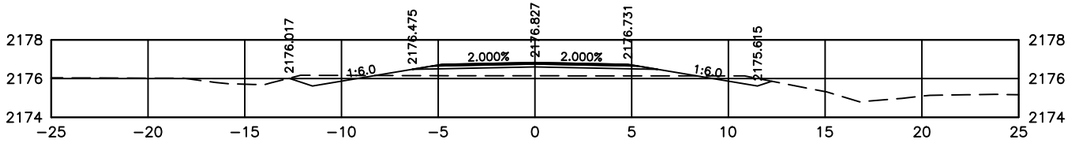
4+849.160



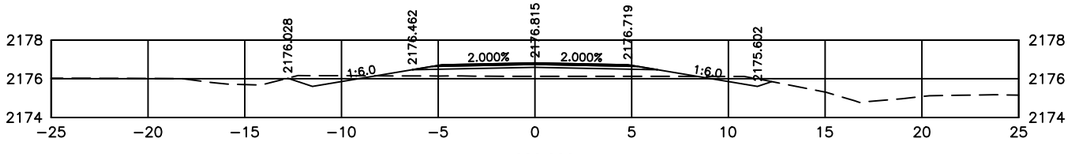
4+840.000



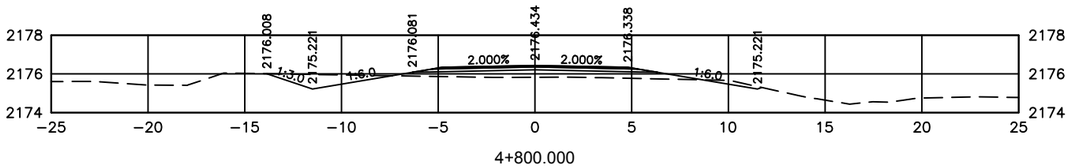
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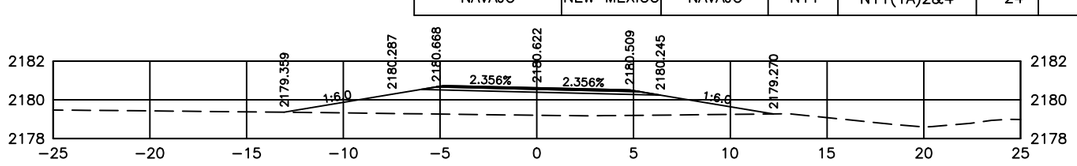
4+820.669



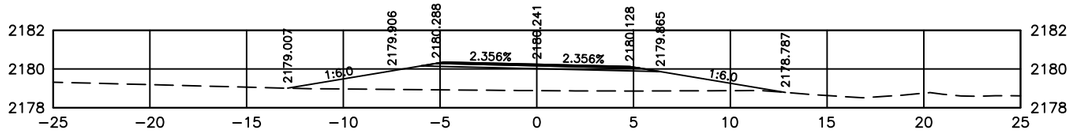
4+820.000



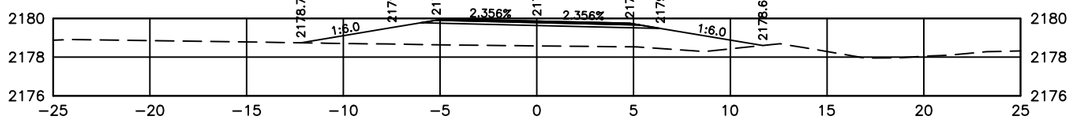
4+800.000



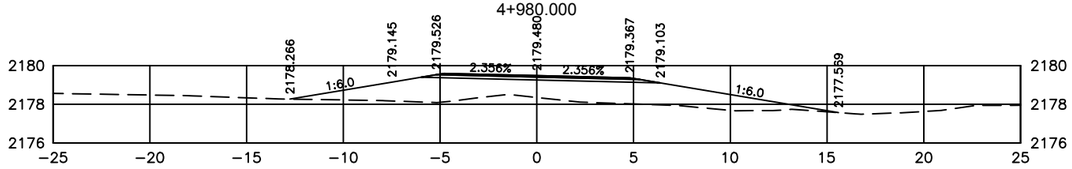
5+020.000



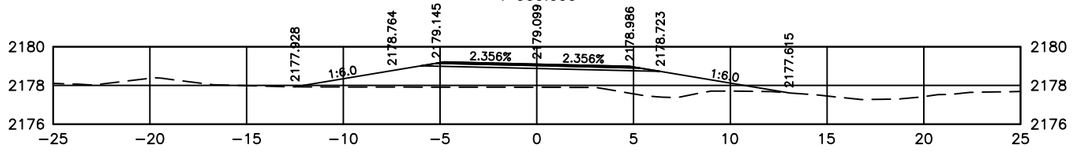
5+000.000



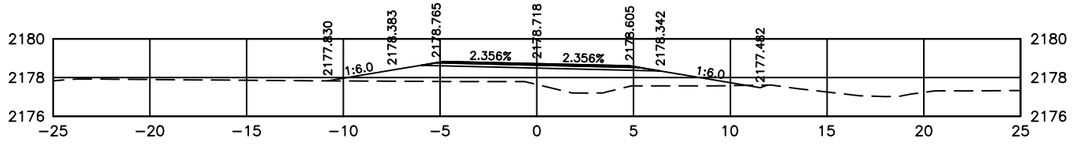
4+980.000



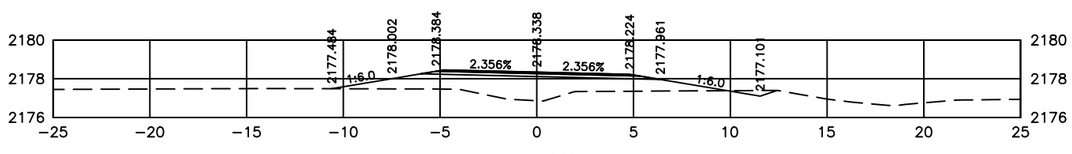
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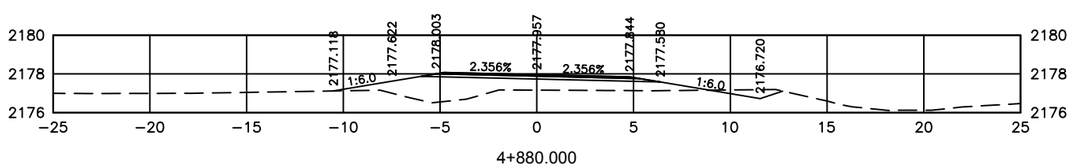
4+940.000



4+920.000



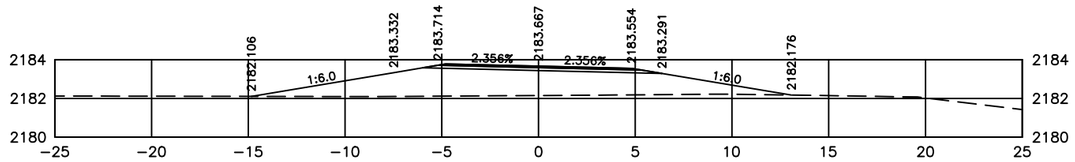
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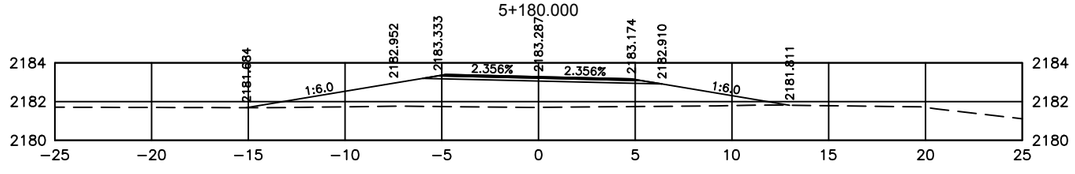
4+880.000

Date: Nov. 05, 2019 - 4:51pm MJMeyers Drawing Name: M:\TRN\17-100-090-11\17-100-090-11\Plans\1_Sheets\N11(1A)-Cross Sections.dwg

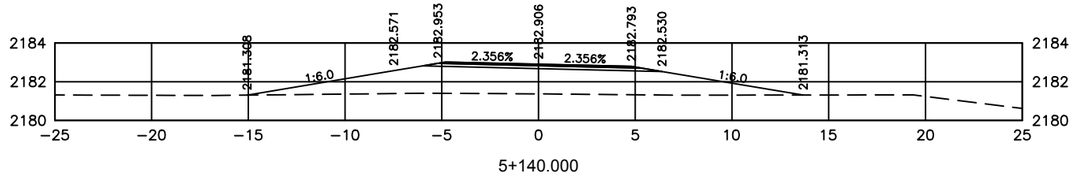
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)2&4	25	60



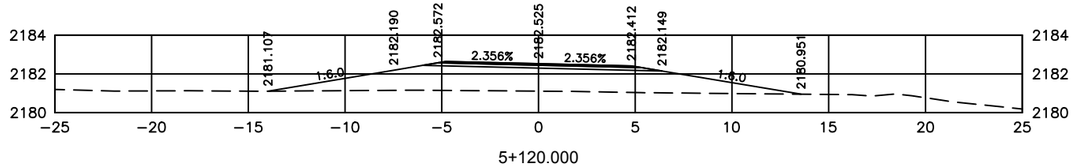
5+180.000



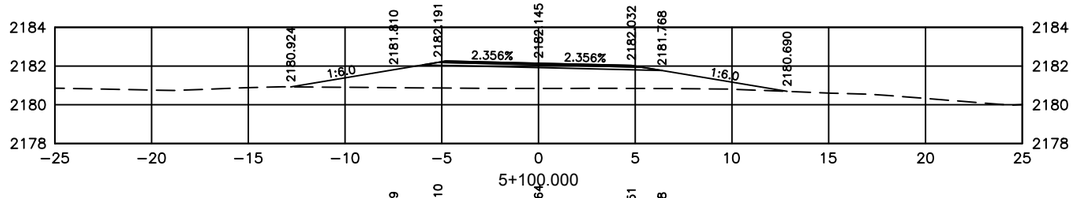
5+160.000



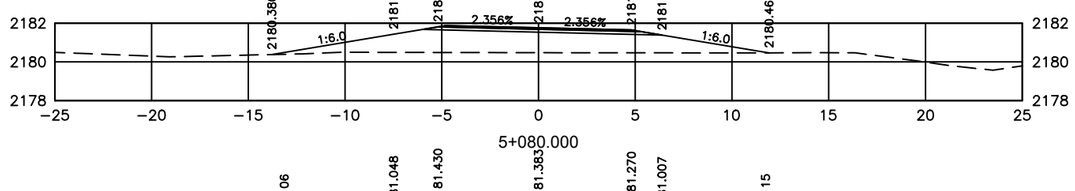
5+140.000



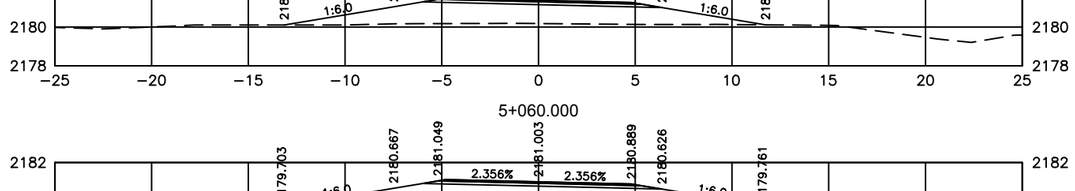
5+120.000



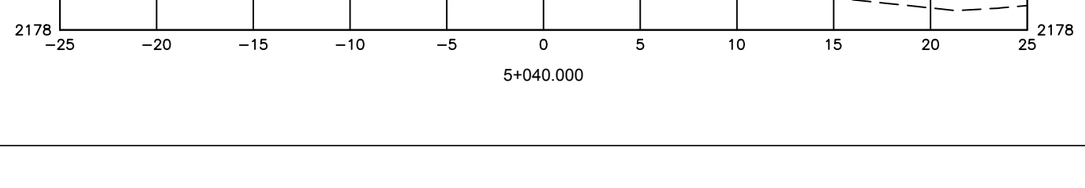
5+100.000



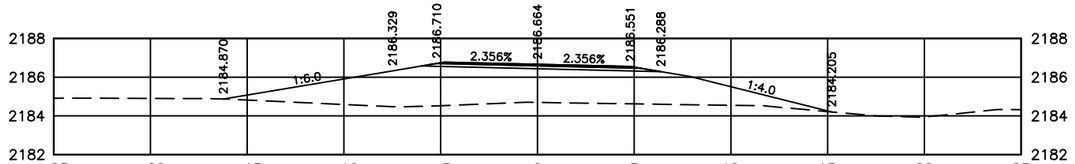
5+080.000



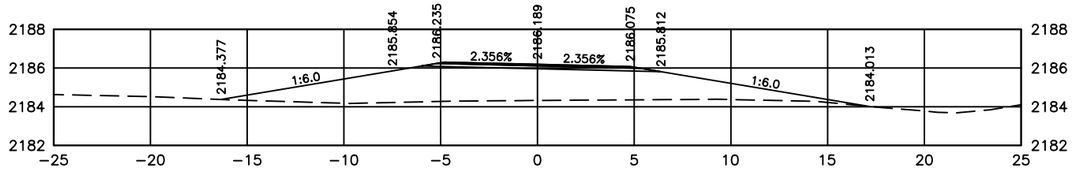
5+060.000



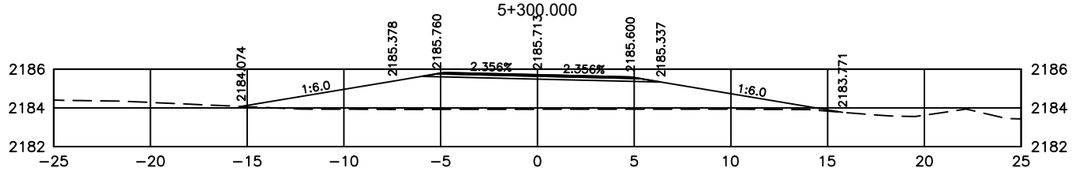
5+040.000



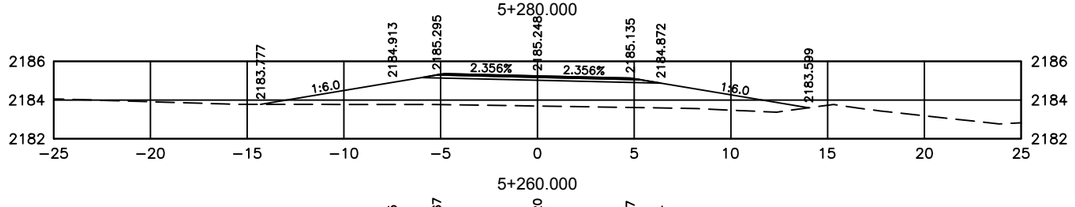
5+320.000



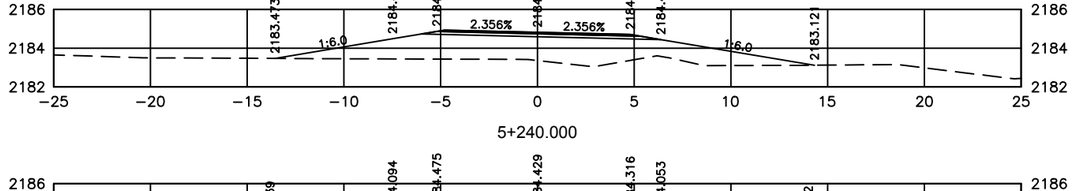
5+300.000



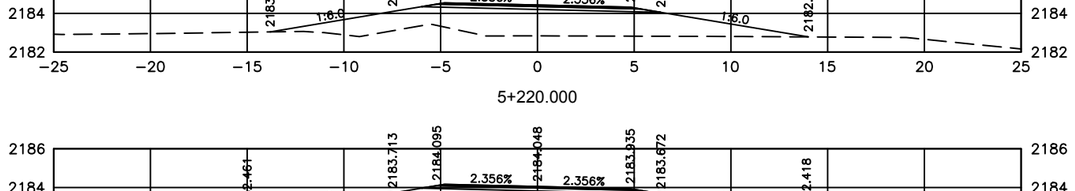
5+280.000



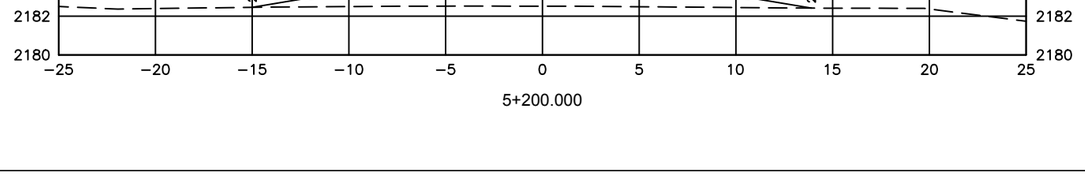
5+260.000



5+240.000



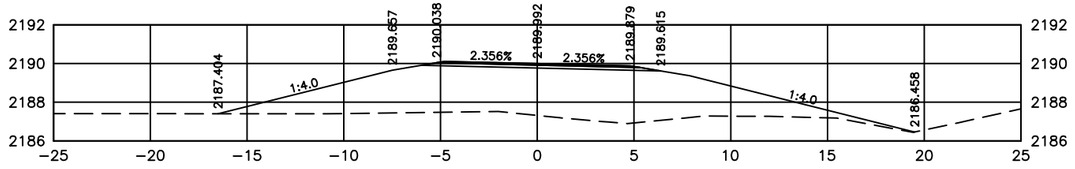
5+220.000



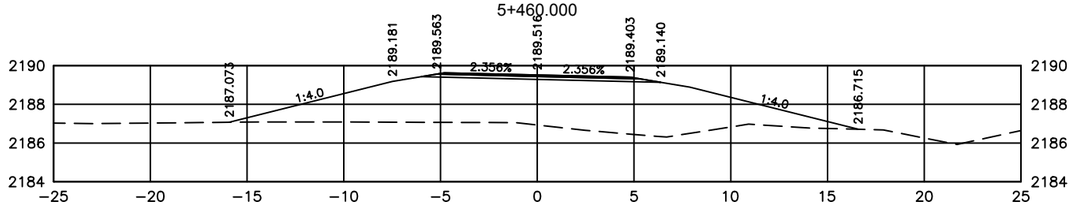
5+200.000

Date: Nov. 05, 2019 - 4:51pm MJMeyers Drawing Name: M:\TRN\17-100-090-11\17-100-090-11\Plans\1_Sheets\N11(1A)-Cross Sections.dwg

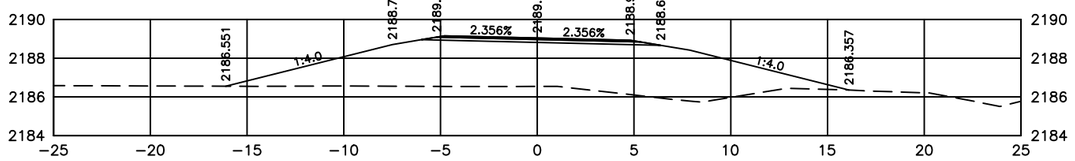
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)2&4	26	60



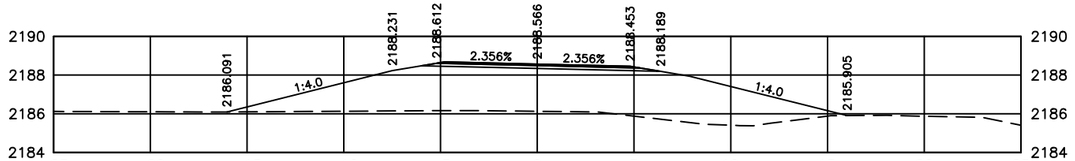
5+460.000



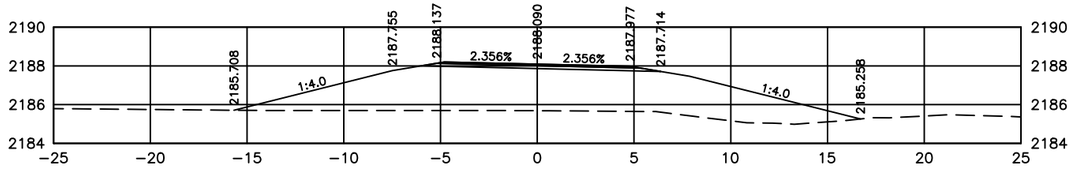
5+440.000



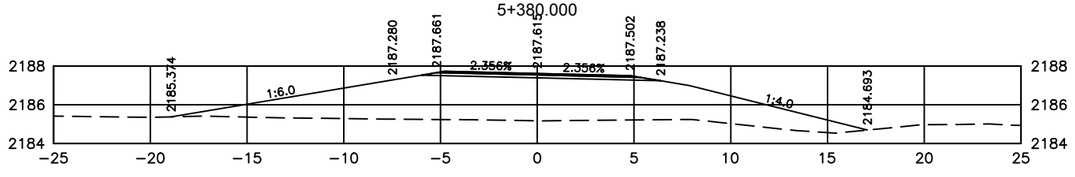
5+420.000



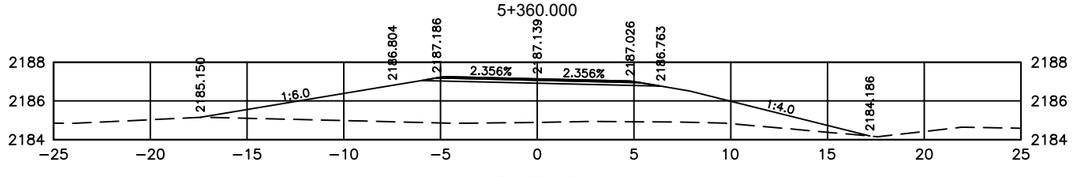
5+400.000



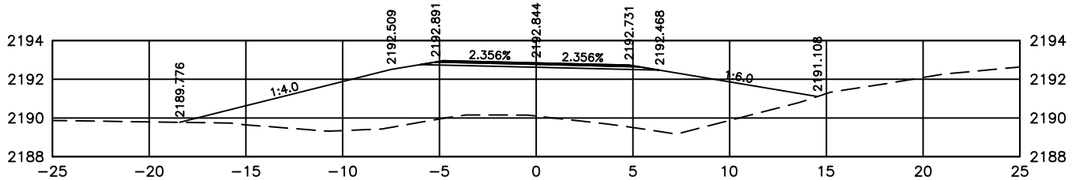
5+380.000



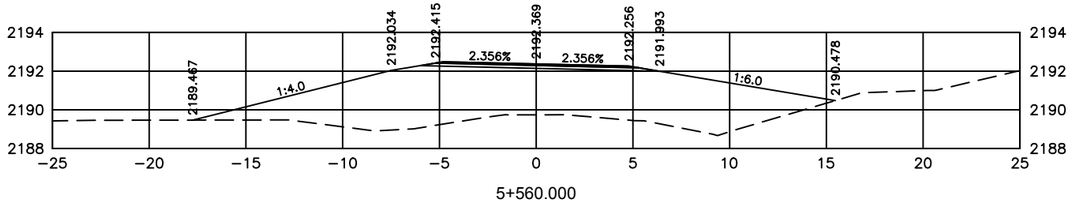
5+360.000



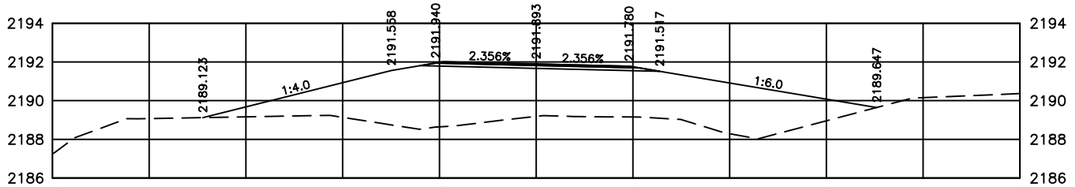
5+340.000



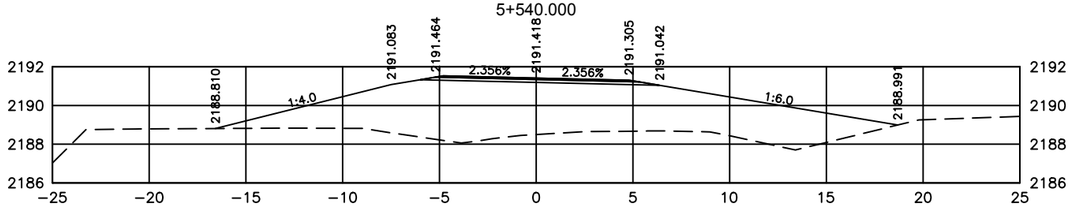
5+580.000



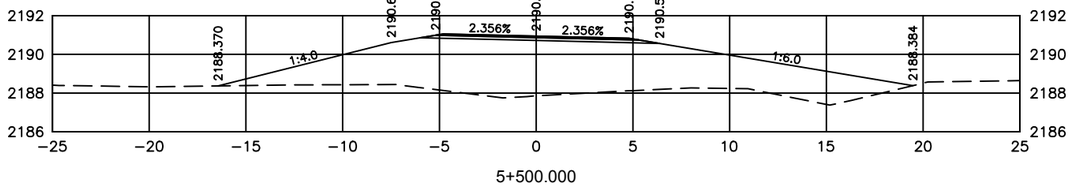
5+560.000



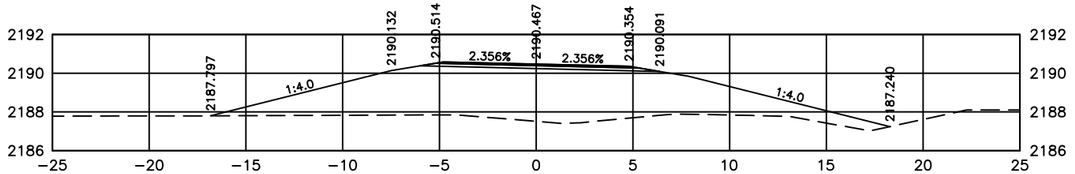
5+540.000



5+520.000



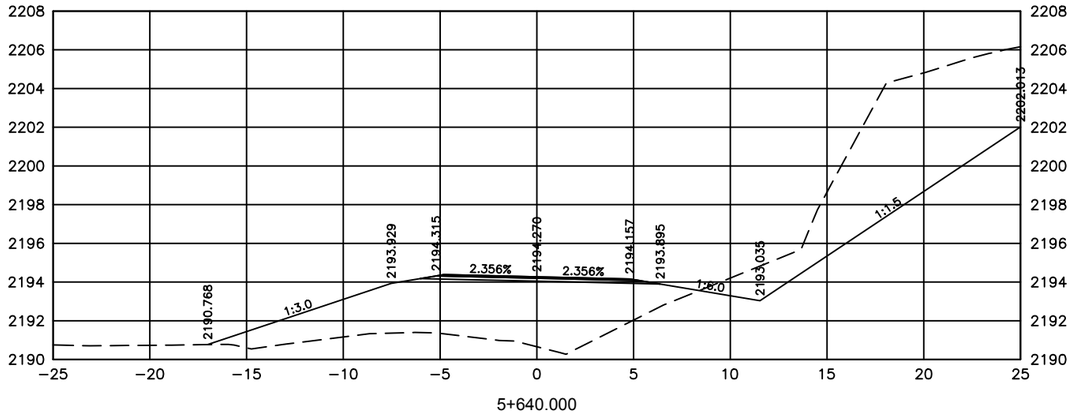
5+500.000



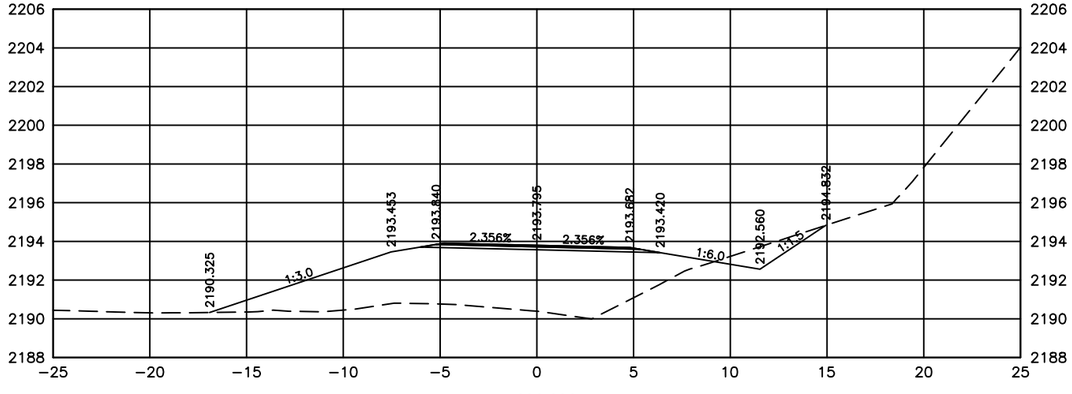
5+480.000

Date: Nov. 05, 2019 - 4:51pm MJMeyers Drawing Name: M:\TRN\17-100-090-11\17-100-090-11\1_Sheets\N11(1A)-Cross Sections.dwg

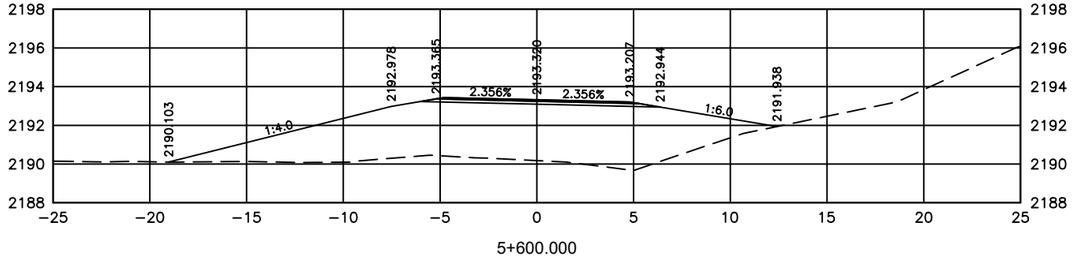
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)2&4	27	60



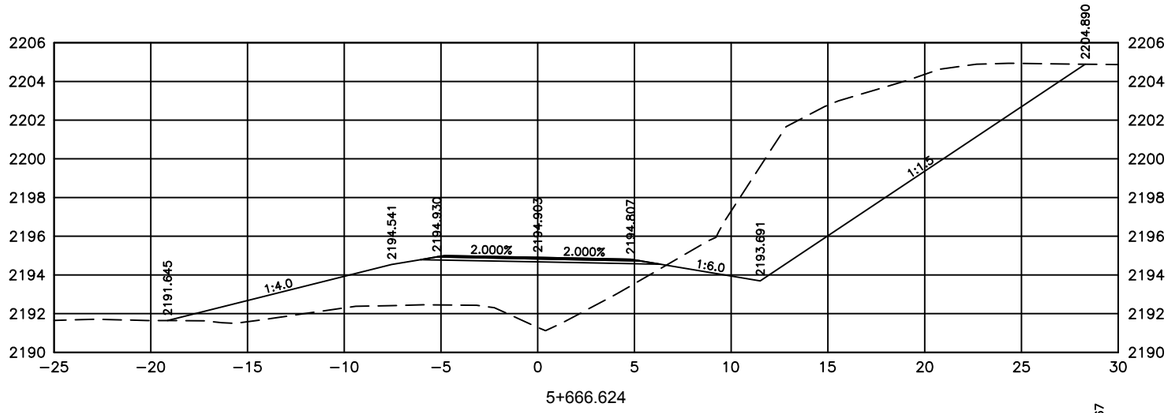
5+640.000



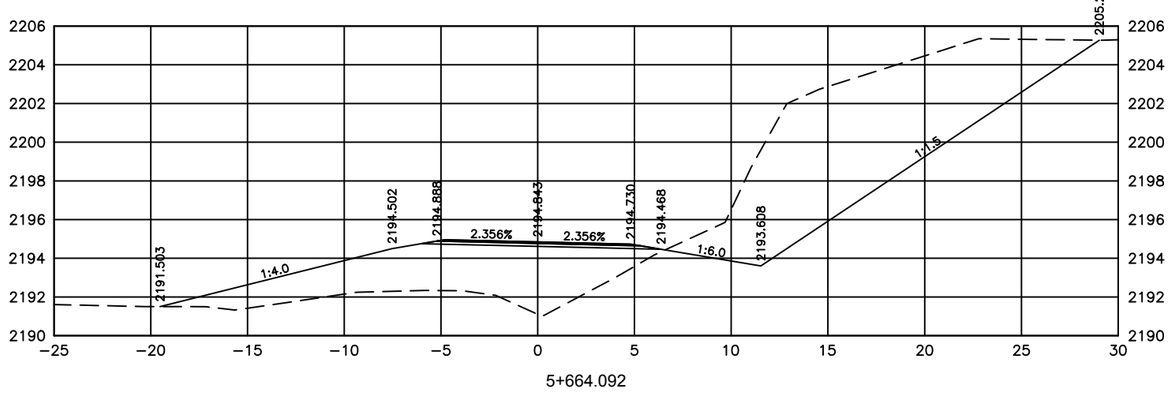
5+620.000



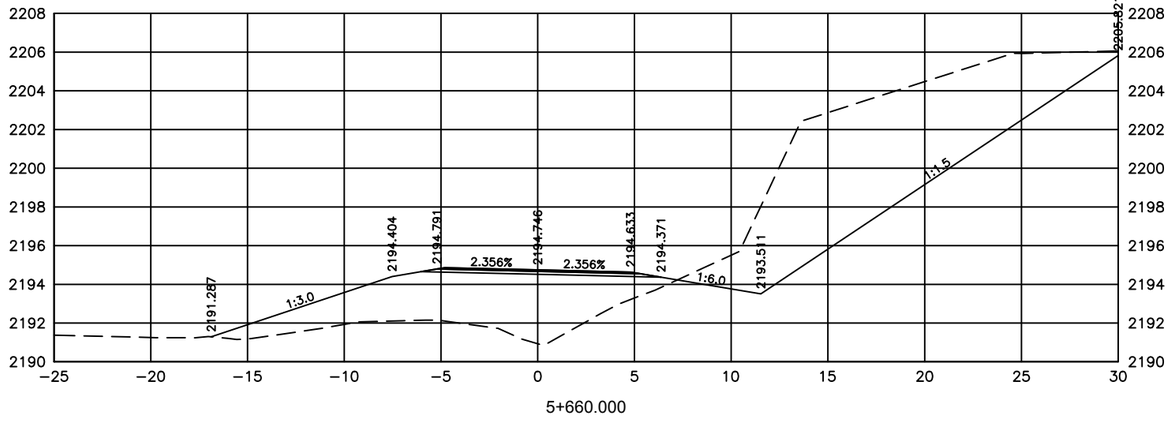
5+600.000



5+666.624



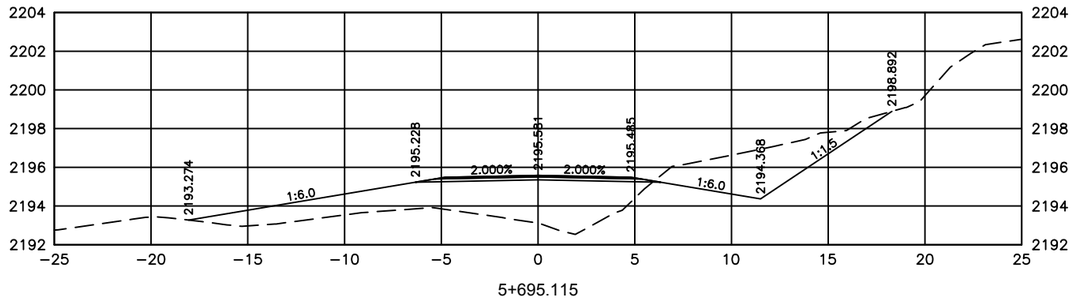
5+664.092



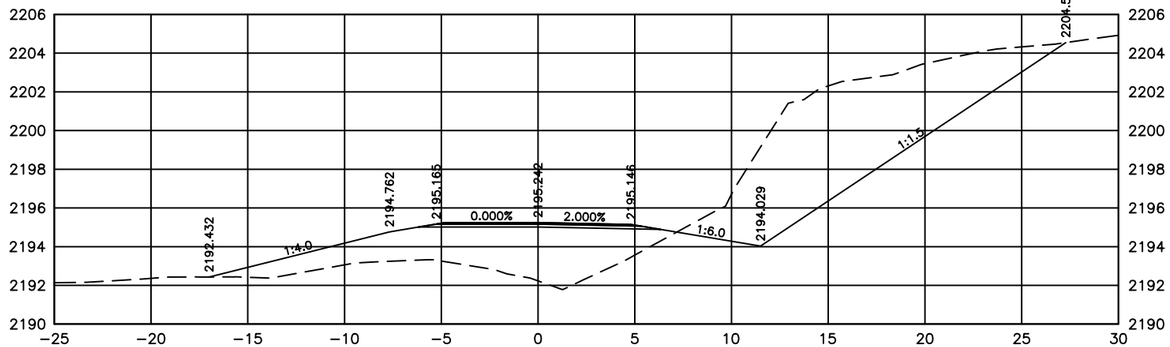
5+660.000

Date: Nov. 05, 2019 - 4:51pm MJMeyers Drawing Name: M:\TRN\17-100-090-11\17-100-090-11\Plans\1_Sheets\N11(1A)-Cross Sections.dwg

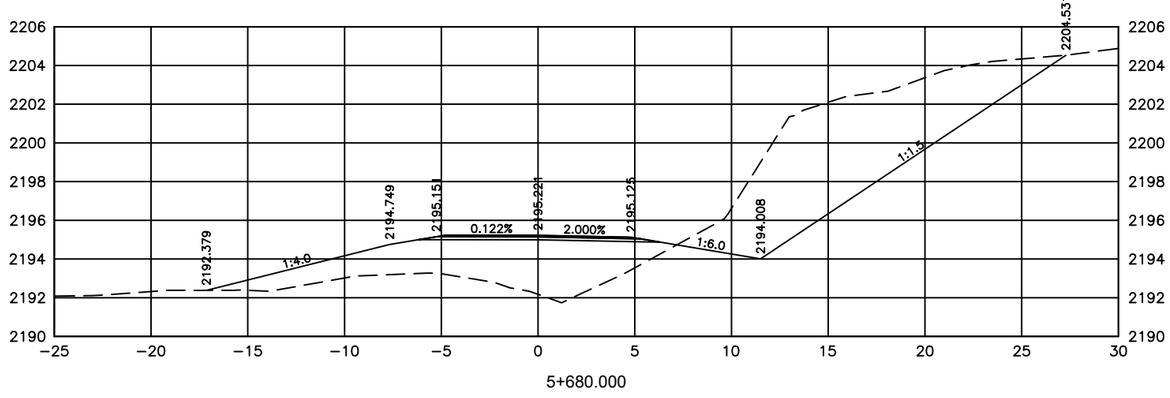
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)2&4	28	60



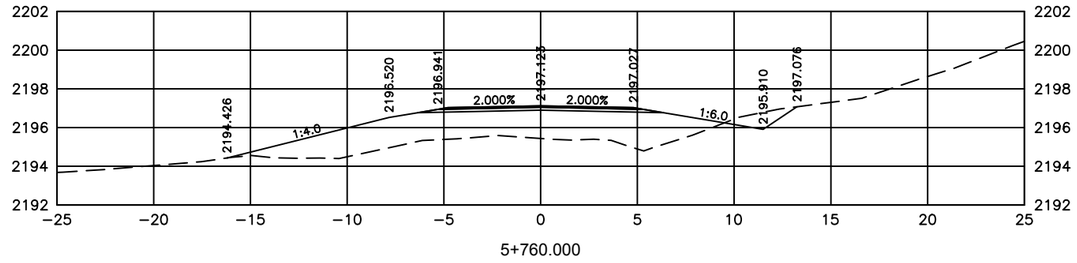
5+695.115



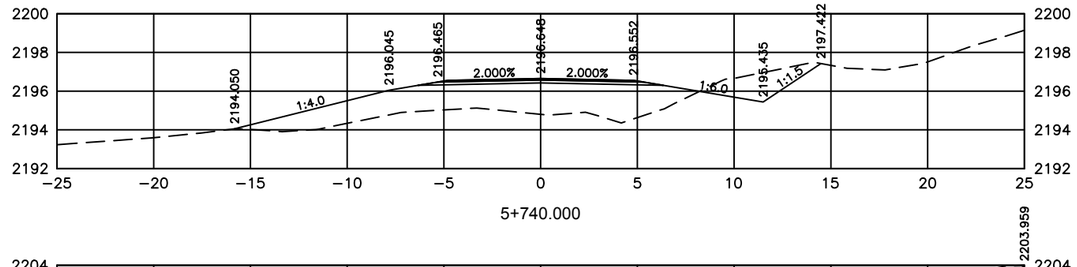
5+680.870



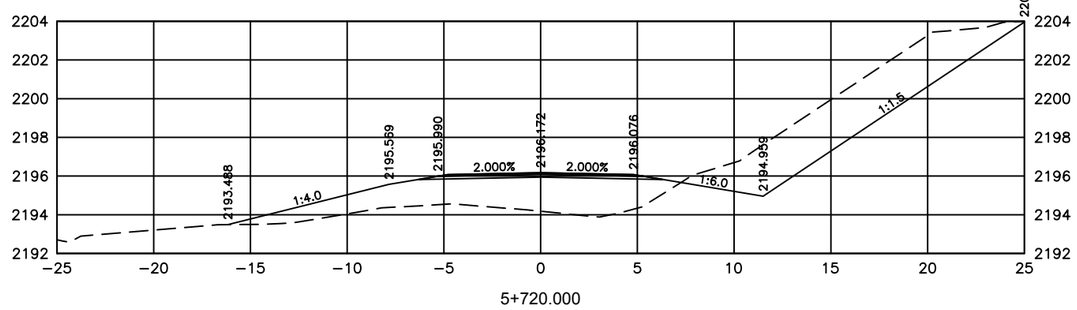
5+680.000



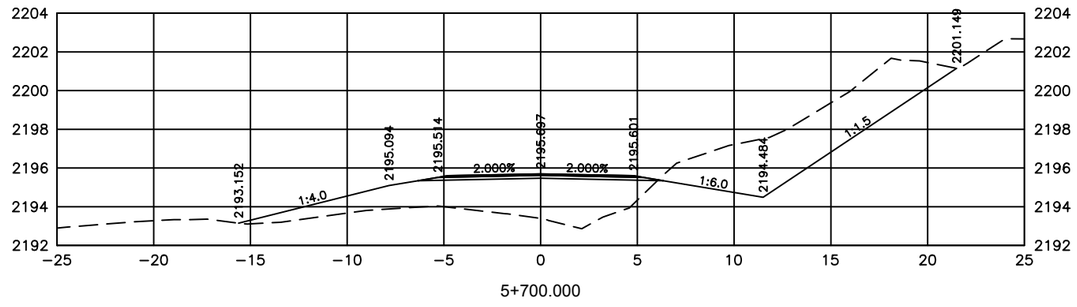
5+760.000



5+740.000



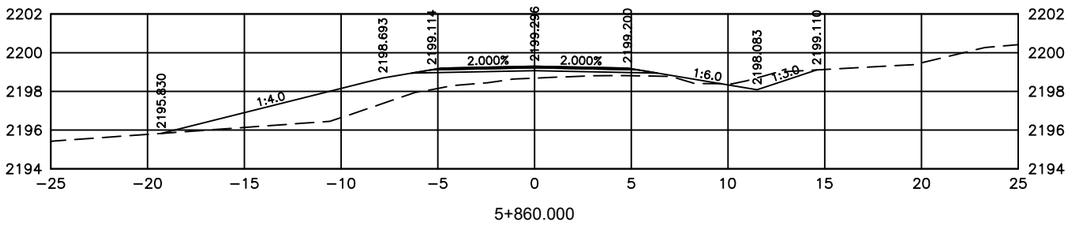
5+720.000



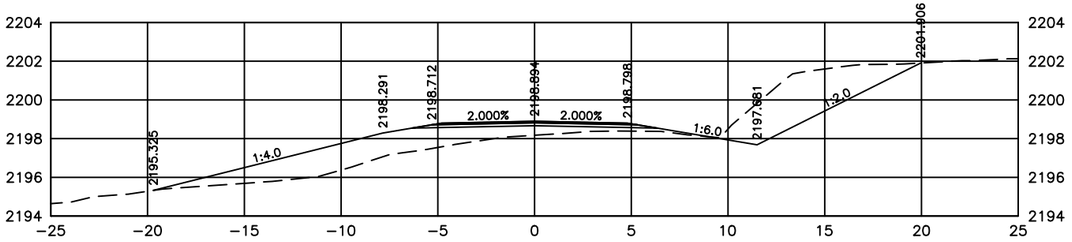
5+700.000

Date: Nov. 05, 2019 - 4:51pm MJMeyers Drawing Name: M:\TRN\17-100-090-11\17-100-090-11\Plans\1_Sheets\N11(1A)-Cross Sections.dwg

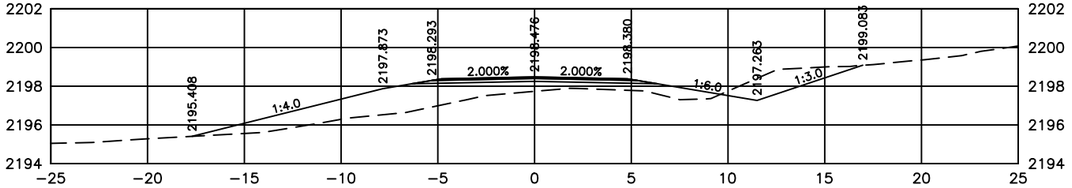
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N11	N11(1A)2&4	29	60



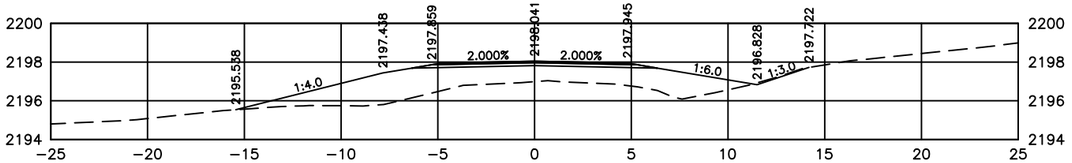
5+860.000



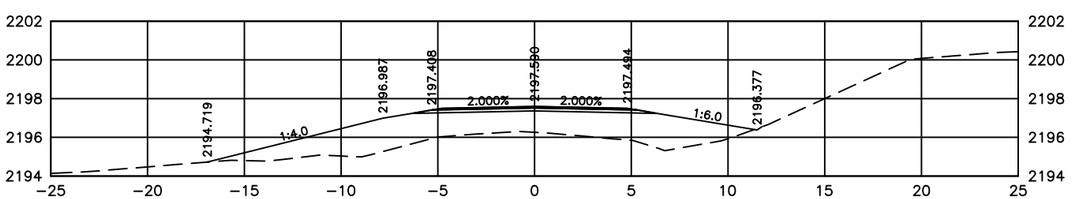
5+840.000



5+820.000

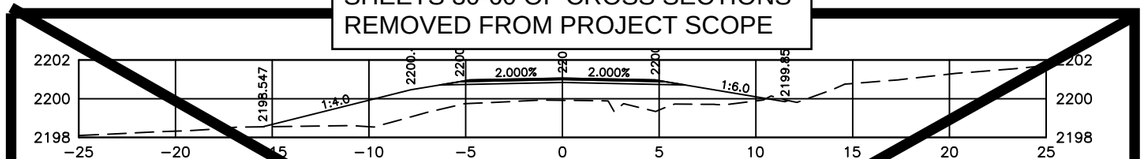


5+800.000

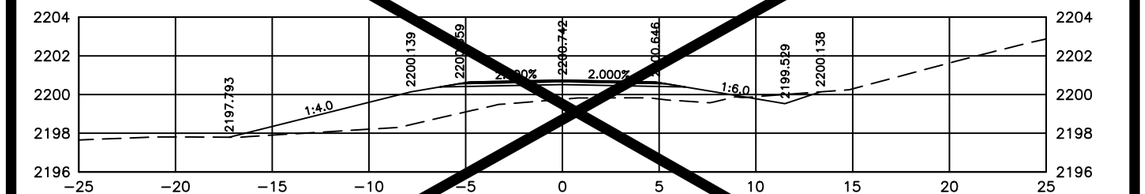


5+780.000

SHEETS 30-60 OF CROSS SECTIONS REMOVED FROM PROJECT SCOPE

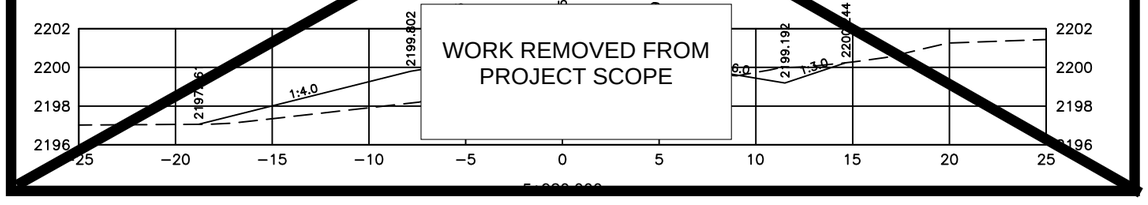


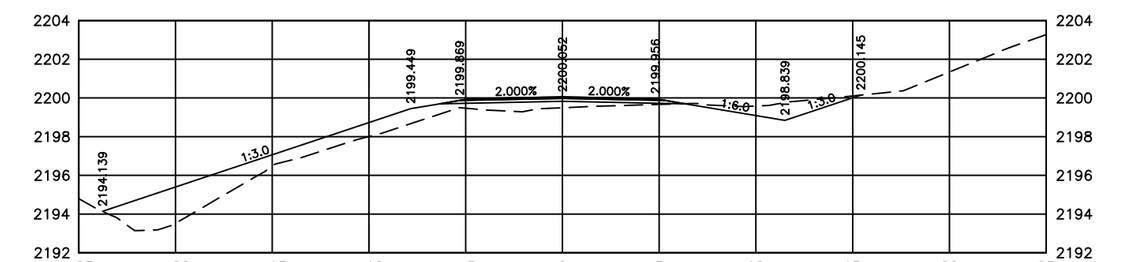
5+960.000



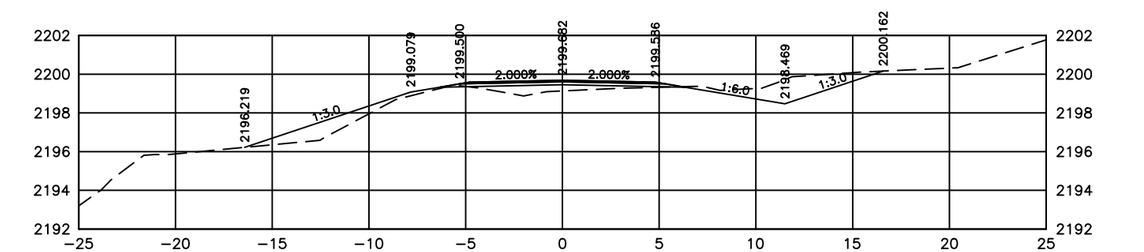
5+940.000

WORK REMOVED FROM PROJECT SCOPE





5+900.000



5+880.000

Date: Nov. 05, 2019 - 4:51pm MJMeyers Drawing Name: M:\TRN\17-100-090-11\17-100-090-11\Plans\1_Sheets\N11(1A)-Cross Sections.dwg