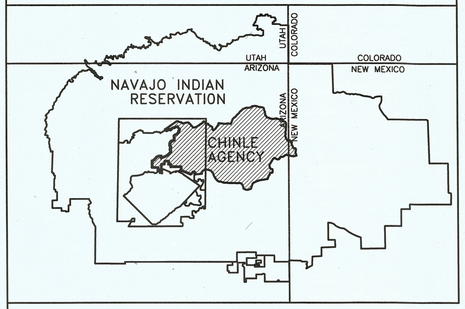
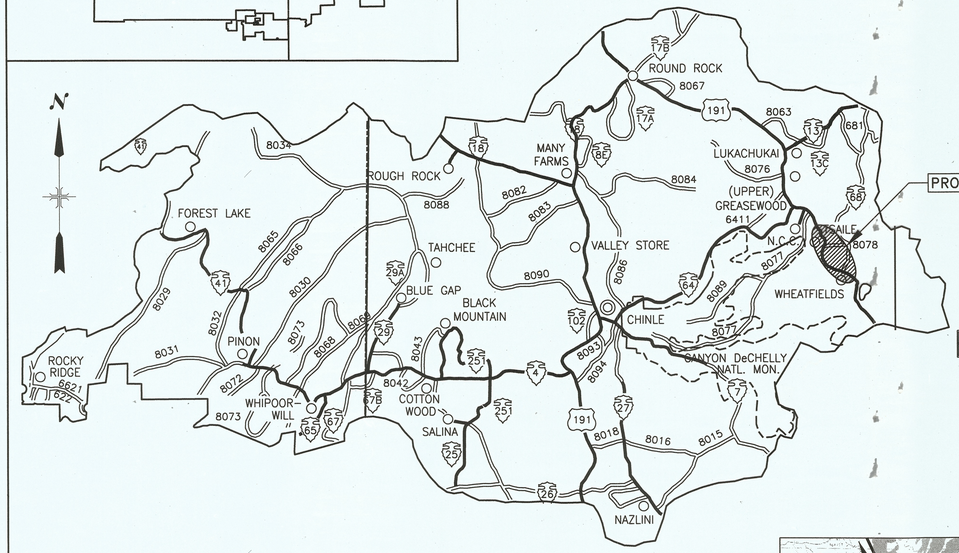
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS
NAVAJO REGION D.O.T.
ROUTE 12

APPROVED
By Harold J Riley-PE at 8:31 am, Apr 05, 2018

PROJECT N12(19-4)1,2&4
GRADE, DRAIN & AGGREGATE BASE COURSE, BRIDGE, HOT ASPHALTIC CONCRETE PAVEMENT AND MISCELLANEOUS CONSTRUCTION
17.20 km ID. NO. 35276

INDEX MAP





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ALIGNMENT TABLE

PROJECT: N12(19-4)1,2&4			
LOCATION	STATION	LENGTH (m)	LENGTH (km)
BOP	38+700.000		
		17,200.000	17.200
EOP	55+900.000		
	GRAND TOTAL:	17,200.000	17.200

DESIGN DATA - N12(19-4)1,2&4

DESIGN SPEED	100 km/h
MINIMUM RADIUS	394
MAXIMUM GRADIENT	3.12%
MINIMUM STOPPING SIGHT DISTANCE	185 m
MINIMUM PASSING SIGHT DISTANCE	670 m
AVERAGE DAILY TRAFFIC-ADT (2002)	1614 vpd
AVERAGE DAILY TRAFFIC-ADT (2033)	2648 vpd
DESIGN HOURLY VOLUME-DVH (2002)	242 vph
DESIGN HOURLY VOLUME-DVH (2033)	400 vph
MAXIMUM SUPERELEVATION (e max)	8.0%

RIGHT-OF-WAY TABLE

N12(19-4)1,2&4

STATION TO STATION			LEFT OFFSET (m)	RIGHT OFFSET (m)
38+700.00	To	39+621+32	22.86	22.86
39+621.32	To	39+725.88	30.48	30.48
39+725.88	To	49+600.00	22.86	22.86
49+600.00	To	49+700.00	30.48	30.48
49+700.00	To	55+900.00	22.86	22.86

LEGEND

STATE LINE
RESERVATION LINE
COUNTY LINE
TOWNSHIP or RANGE LINE
SECTION LINE
NATIONAL FOREST LINE
HIGHWAY RIGHT-OF-WAY LINE
UNFENCED PROPERTY
SECTION CORNER AND 1/4 CORNER
POWER LINE AND POLES
TELEPHONE LINE AND POLES
POLE GUY AND ANCHOR
TRAFFIC SIGN
GUARD RAIL
DELINEATORS
CHEVRON SIGN
BARBED WIRE FENCE
WOVEN WIRE FENCE
CATTLE GUARD
CULVERTS
CONCRETE BOX CULVERTS
GROUND LINE - EARTH
GROUND LINE - ROCK
EXISTING ROAD
SIDE ROAD TURNOUT
TREES and SHRUBS
CHANNEL or DITCH
EARTHEN DIKE and BERM
RIPRAP
DWELLING
RIGHT-OF-WAY MONUMENT
TELEPHONE PEDESTAL
IRRIGATION DITCH
FURROW DITCH
EROSION CONTROL TYPE IV FABRIC
OBLITERATION OF EXISTING ROAD

INDIAN SERVICE | COUNTY | STATE | FEDERAL

PROPOSED | PAVED | GRADED | UNIMPROVED

UNITED STATES
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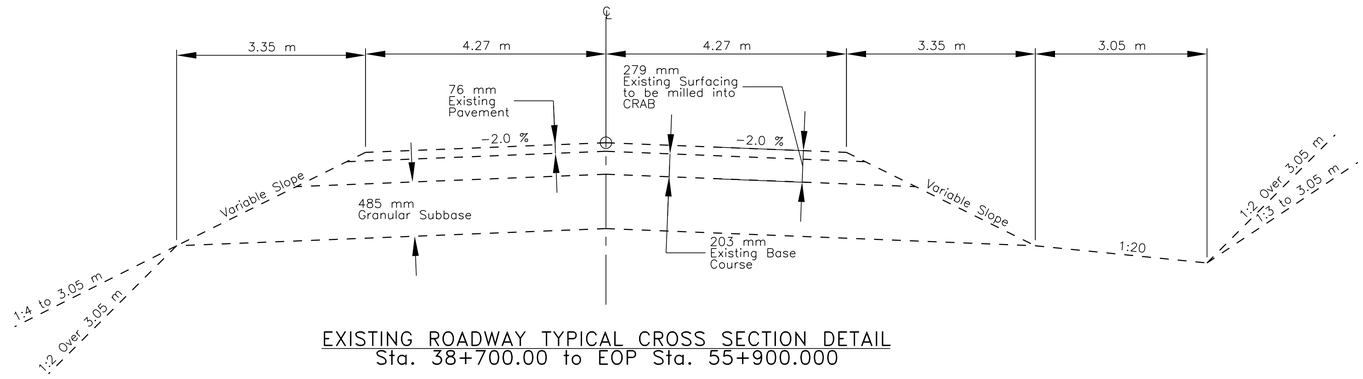
NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

RECOMMENDED APPROVAL	APPROVAL
AGENCY ROAD ENGINEER — DATE 3/21/18	
DIVISION MANAGER — DATE 3/21/18	
PLANNING & DESIGN BRANCH CHIEF — DATE	REGIONAL DIRECTOR — DATE 3/27/2018

PROJECT: N12(19-4) 2&4

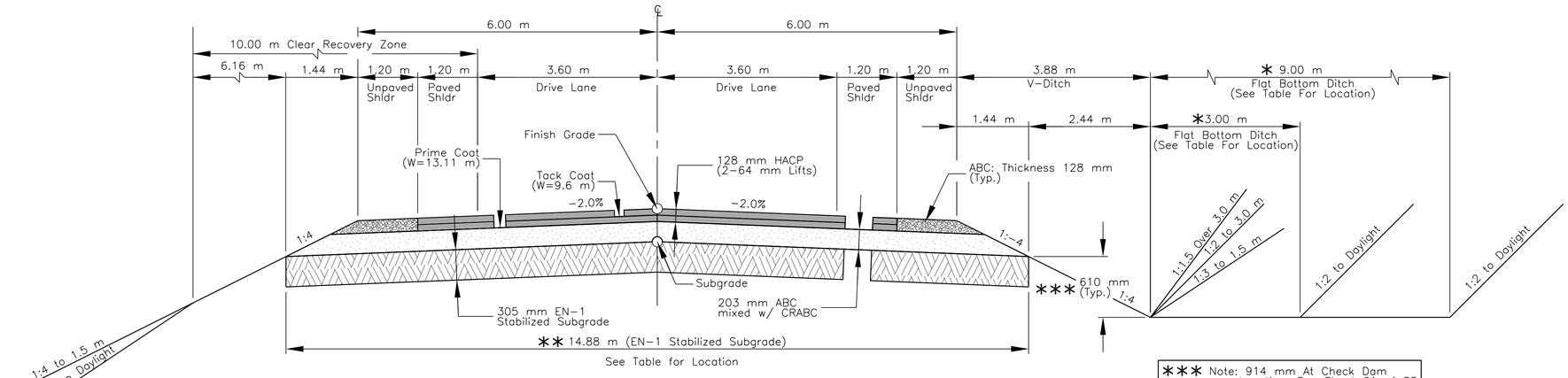
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	2	88



EXISTING ROADWAY TYPICAL CROSS SECTION DETAIL
Sta. 38+700.00 to EOP Sta. 55+900.000

SEQUENCE OF PAVEMENT RECONSTRUCTION:

1. THE CONTRACTOR SHALL TRANSVERSE SAW CUT (FULL DEPTH) THE EXISTING PAVEMENT AT THE EDGE OF PAVEMENT LINE AT BEGINNING AND ENDING OF PROJECT, AND MATCH THE NEW PAVEMENT WITH THE EXISTING TO PROVIDE A SMOOTH JOINT TRANSITION.
2. THE CONTRACTOR SHALL MILL AND PULVERIZE THE TOP 279mm OF EXISTING ASPHALT CONCRETE PAVEMENT AND BASE COURSE STRUCTURE, WHICH INCLUDES ALL MAINTENANCE PATCHES, TO MINUS 25mm SIEVE SIZE. THE CONTRACTOR HAS THE OPTION TO UTILIZE A SELF-PROPELLING PULVERIZING MACHINE OR OTHER CONSTRUCTION EQUIPMENT/METHODS CAPABLE OF MAINTAINING A UNIFORM GRADE AND CROSS SECTION.
3. AFTER PULVERIZING, THE CONTRACTOR SHALL STOCKPILE THE CRAB MATERIALS FOR USE ON THE NEW BASE COURSE. THEN BUILD UP THE EXISTING SUBGRADE AND SHOULDERS AS NEEDED WITH CUT MATERIALS WITHIN THE ROW.
4. THE CONTRACTOR SHALL BUILD THE TEMPORARY DETOUR ROADS AROUND THE WHEATFIELDS AND TSAILE WASH BRIDGES. INSTALL TEMPORARY DRAINAGE PIPES, BUILT UP GRADING, PLACE GRAVEL AND HOT MIX. REMOVE BOTH EXISTING STEEL BRIDGES. INSTALL NEW PRECAST CONCRETE ARCH BRIDGES.
5. THE CONTRACTOR SHALL FURNISH AND PLACE 205mm THICKNESS OF NEW AGGREGATE BASE COURSE MATERIAL MIXED WITH THE CRAB ON THE FINISHED AND APPROVED SUBGRADE USING A 50/50 RATIO MIX.
6. PLACE NEW 128 mm (2-64 mm lift) OF HOT ASPHALT CONCRETE PAVEMENT.
7. THE CONTRACTOR SHALL BREAKUP AND REMOVE (HOT MIX, GRAVEL, DIRT AND PIPES) FROM BOTH TEMPORARY DETOUR ROADS. HAUL THE PIPE MATERIALS TO THE CHINLE AGENCY MAINTENANCE YARD. USE THE GRAVEL AND EMBANKMENT MATERIAL ON THE MAIN ROADWAY CONSTRUCTION. UPON COMPLETION, THE CONTRACTOR SHALL SCARIFY THE DETOUR ROADBEDS, RE-ESTABLISH NATURAL DRAINAGE CHANNELS AND RE-SEED. THE OBLITERATION WORK SHALL BE PAID UNDER THE APPROPRIATE BID ITEMS.
8. THE CONTRACTOR SHALL PROVIDE FOR A SAFE AND RELATIVELY DUST FREE DRIVING SURFACE THROUGHOUT THE RE-CONSTRUCTION PROCESS FOR ALL SCHOOL, LOCAL BUSINESS, AND GENERAL TRAVELING PUBLIC TRAFFIC USE DAY AND NIGHT. THE CONTRACTOR'S TRAFFIC CONTROL AND CONSTRUCTION SEQUENCING PLAN SHALL INCLUDE THESE REQUIREMENTS AND BE SUBMITTED FOR REVIEW AND APPROVAL PRIOR TO ANY GROUND DISTURBING ACTIVITIES TAKING PLACE.



*** Note: 914 mm At Check Dam Location, See Sheet 61 of 88 For Check Dam Details

NEW TYPICAL CROSS SECTION DETAIL
Sta. 38+700.00 to EOP Sta. 55+900.00

* FLAT BOTTOM DITCH LOCATION

Station to Station			Location	Width (m)	Remarks
BOP 38+700.00	to	39+640.00	Left Side Only	3.00	Normal V-ditch on Right
55+100.00	to	54+500.00	Right Side Only	3.00	Normal V-ditch on Left
54+500.00	to	55+120.00	Right Side Only	9.00	Normal V-ditch on Left
55+120.00	to	55+900.00	Right Side Only	3.00	Normal V-ditch on Left

** EN-1 SUBGRADE STABILIZATION BOTTOM DITCH LOCATION

Station to Station			Width (m)	Area (sq/m)	Remarks
40+440.00	to	41+280.00	14.88	12,499.20	EN-1 Stabilized Subgrade to 305 mm Depth
44+540.00	to	45+000.00	14.88	6,844.80	EN-1 Stabilized Subgrade to 305 mm Depth
45+260.00	to	46+080.00	14.88	12,201.60	EN-1 Stabilized Subgrade to 305 mm Depth
			Total	31,545.60	

BASIS OF ESTIMATED QUANTITIES

ITEM No.	DESCRIPTION	GRADE	UNIT WT.	APPLICATION
21301-4000	Road Bond EN-1			Mix Ratio: 1:200, EN-1:Water
30103-2000	Untreated Aggregate Base Course	"Special"	2164 kg/m^3	Main Roadway: 128 mm or As Needed, Turnouts: 152 mm
40201-0500	Hot Asphaltic Concrete Pavement, Class "B"	"B"	2324 kg/m^3	Main Roadway and Turnouts: 128 mm (2-64 mm Lifts), Turnouts 51 mm
40502-0800	Asphalt Cement	PG 64-22		6.0% By Weight of Total Weight of Mixture
41101-5000	Prime Coat - Penetrating Emulsified Prime, Grade PEP	PEP	1056 L/t	Unit Weight: 1.36 L/sq m Apply on top of CRABC
41201-1000	Asphalt Emulsion Tack Coat	SS-1	1.001 L/kg	0.23 L/m^2 Application Rate

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TYPICAL CROSS SECTION DETAILS

DRAWN BY: NRDOT	DATE: 3/4/2015
DESIGNED BY: NRDOT	DATE: 3/4/2015
REVISED: 3/9/2018	BY: Leroy.Toledo
Sht 02 N12 Typical Sec.dgn	

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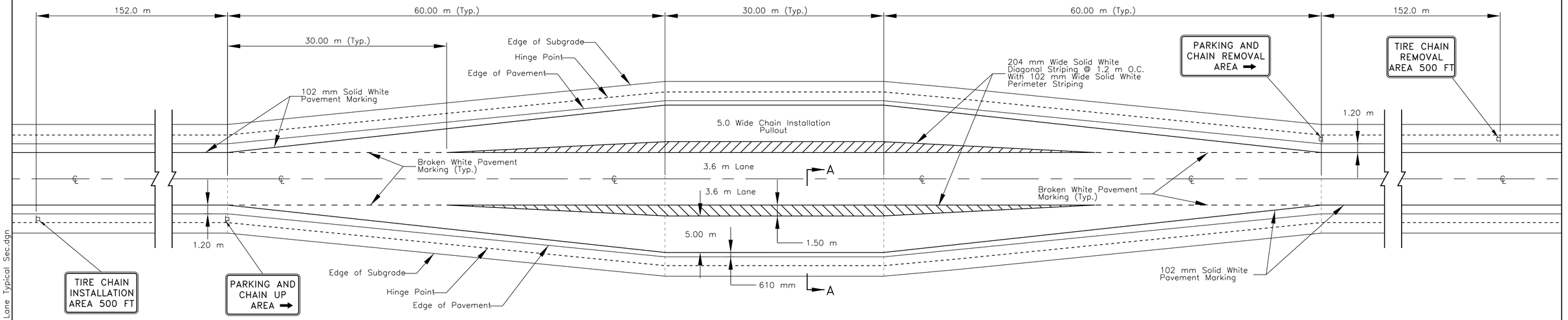
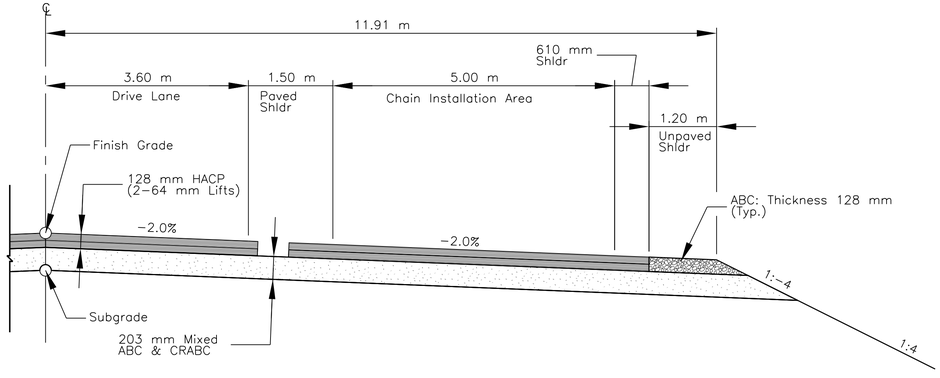
PROJECT: N12(19-4)1,2&4

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	3	88



TYPICAL CHAIN INSTALLATION PULLOUT PLAN



SECTION A-A
CHAIN INSTALLATION PULLOUT SECTION

CHAIN INSTALLATION PULLOUT LOCATION

Station to Station			Location	Remarks
42+720.000	to	42+870.000	Right Side	For North Bound Traffic-Chain Installation
42+530.000	to	42+680.000	Left Side	For South Bound Traffic-Chain Removal
45+940.000	to	46+090.000	Right Side	For North Bound Traffic-Chain Removal
45+940.000	to	46+090.000	Left Side	For South Bound Traffic-Chain Installation

ITEM 63401-1620: PAVEMENT MARKING, TYPE "H", BROKEN WHITE

Station to Station			Location	Length (m)	Remarks
42+360.000	to	42+390.000	Right Side	30.00	For North Bound Traffic-Chain Installation
42+480.000	to	42+510.000	Right Side	30.00	For North Bound Traffic-Chain Installation
42+530.000	to	42+560.000	Left Side	30.00	For South Bound Traffic-Chain Removal
42+650.000	to	42+680.000	Right Side	30.00	For South Bound Traffic-Chain Removal
45+940.000	to	45+970.000	Right Side	30.00	For North Bound Traffic-Chain Installation
46+060.000	to	45+090.000	Right Side	30.00	For North Bound Traffic-Chain Installation
45+940.000	to	45+970.000	Left Side	30.00	For South Bound Traffic-Chain Removal
46+060.000	to	45+090.000	Left Side	30.00	For South Bound Traffic-Chain Removal
			Total	240.00	

ITEM 63401-3290a: PAVEMENT MARKING, TYPE "H", DIAGONAL STRIPING

Station to Station			Location	EACH	Remarks
42+390.000	to	42+480.000	Right Side	1	For North Bound Traffic-Chain Installation, Solid White, 203mm Width
42+560.000	to	42+650.000	Left Side	1	For South Bound Traffic-Chain Removal, Solid White, 203mm Width
45+970.000	to	46+060.000	Right Side	1	For North Bound Traffic-Chain Installation, Solid White, 203mm Width
45+970.000	to	46+060.000	Left Side	1	For South Bound Traffic-Chain Installation, Solid White, 203mm Width
			Total	4	

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TIRE CHAIN INSTALLATION PULLOUT LAYOUT DETAIL

DRAWN BY: NRDOT	DATE: 4/19/2016
DESIGNED BY: NRDOT	DATE: 4/19/2016
REVISED: 3/9/2018	BY: Leroy.Toledo
Sht 03 N12 Pullout Lane Typical Sec.dgn	

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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	4	88

GENERAL NOTES

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 IN FULL METRIC UNITS.

2. ALL PERMANENT AND TEMPORARY ROADSIDE SIGNS, AND PAVEMENT MARKINGS SHALL BE PLACED IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS (LATEST EDITION) AND IN ACCORDANCE WITH THE DETAILS ON THESE PLANS. PLACEMENT OF "STOP" BAR, PERMANENT TRAFFIC SIGNS AND PAVEMENT MARKINGS SHALL BE FIELD ADJUSTED AS DIRECTED BY THE COR/COTR, AT NO ADDITIONAL COST TO THE GOVERNMENT.

3. THE TEMPORARY TRAFFIC CONTROL DETAILS SHOWN REFLECTS GENERAL REQUIREMENTS FOR THIS PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR PREPARING AND SUBMITTING A TRAFFIC CONTROL PLAN IN ACCORDANCE WITH THESE DETAILS, TAKING INTO ACCOUNT THE CONTRACTOR'S CONSTRUCTION SEQUENCING PLAN, MUTCD, AND THE SUPPLEMENTAL SPECIFICATIONS FOR SECTION 635.-TEMPORARY TRAFFIC CONTROL.

4. THE DESIGN FEATURES INCLUDING HORIZONTAL AND VERTICAL ALIGNMENTS, TYPICAL SECTIONS, AND OTHER DESIGN DETAILS SHOWN SHALL NOT BE ALTERED OR MODIFIED IN ANYWAY DURING CONSTRUCTION WITHOUT THE EXPRESSED WRITTEN DIRECTION AND WRITTEN APPROVAL OF THE NAVAJO REGION DIVISION OF TRANSPORTATION (NRDOT) DIVISION MANAGER THROUGH THE CONTRACTING OFFICER (CO), UNLESS OTHERWISE NOTED IN THESE PLANS OR SPECIFICATIONS. DRAINAGE STRUCTURES AND TURNOUTS SHALL BE INSTALLED AS SHOWN WITH ONLY MINOR CORRECTIONS IN LOCATION, SKEW, AND/OR INVERT ELEVATIONS AS NEEDED TO FIT FIELD CONDITIONS. TURNOUTS MAY NOT BE SHIFTED MORE THAN 5.0 METERS FROM THE LOCATIONS SHOWN ON THE PLANS WITHOUT THE WRITTEN APPROVAL OF THE NRDOT DIVISION MANAGER THROUGH THE CONTRACTING OFFICER (CO).

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 INCIDENTAL OBLIGATIONS OF THE CONTRACTOR.

6. THE BIDDER SHALL READ AND MAKE CAREFUL EXAMINATION OF THE PLANS, SPECIFICATIONS, QUANTITIES, MATERIAL, SURVEYING REQUIREMENTS, AND VISIT THE SITE OF THE PROPOSED CONSTRUCTION TO BECOME FAMILIAR WITH THE SITE CONDITIONS AND LIMITATIONS BEFORE MAKING A PROPOSAL. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY AND ALL ERRORS RESULTING FROM THE FAILURE TO MAKE SUCH AN EXAMINATION. ANY INFORMATION DERIVED FROM THE MAPS, PLANS, SPECIFICATIONS, PROFILES, DRAWINGS OR THE ENGINEER, SHALL NOT RELIEVE THE CONTRACTOR FROM ANY RISK OR FROM FULFILLING THE TERMS OF THE CONTRACT. THERE ARE SEVERAL AREAS WITH LIMITED WORKING ROOM WITHIN THE PROJECT RIGHT-OF-WAY, AND/OR WITH EXISTING FEATURES WITHIN OR NEAR THE PROJECT RIGHT-OF-WAY, THAT WILL REQUIRE "SPECIAL" CONSTRUCTION PROCEDURES.

7. THE CONTRACTOR IS REQUIRED TO SUBMIT A REVISED PIPE LIST TO THE COR/COTR, BASED ON THE FIELD STAKING IN ACCORDANCE WITH SECTION 152 OF THE CONTRACT SUPPLEMENTAL SPECIFICATION. THE APPROVAL OF ANY AND ALL REVISED PIPE LISTS WITH ACCOMPANYING DRAWINGS IS RENDERED AS A SERVICE ONLY AND IS NOT CONSIDERED A GUARANTEE OF MEASUREMENTS, QUANTITIES, INSTALLATION PROCEDURES, AND/OR DIMENSIONS, NOR SHALL IT BE CONSIDERED AS RELIEVING THE CONTRACTOR FROM COMPLYING WITH THE CONTRACT SPECIFICATIONS AND DESIGN PLANS. THE CONTRACTOR IS HEREBY NOTIFIED THAT UNDER NO CIRCUMSTANCE SHALL ANY DRAINAGE STRUCTURE(S) BE INSTALLED BELOW THE NATURAL FLOW LINE OF THE WASH, CHANNEL, ARROYO, OR DITCH LINE.

8. NO WORK SHALL BE PERFORMED OR GROUND DISTURBED OUTSIDE OF THE DESIGNATED CONSTRUCTION LIMITS IN ACCORDANCE WITH SECTION 107 OF THE FP-14 WITHOUT WRITTEN APPROVAL BY THE COR/COTR UNLESS OTHERWISE SHOWN AND LABELED ON THESE PLANS AS "CONSTRUCTION ZONE". IN NO CASE SHALL ANY WORK BE PERFORMED OUTSIDE THE DESIGNATED RIGHTS-OF-WAY LIMITS WITHOUT WRITTEN APPROVAL FROM THE NRDOT DIVISION MANAGER, UNLESS OTHERWISE SHOWN AND CALLED OUT ON THESE PLANS AS "WORK AREAS". THE CONSTRUCTION LIMIT IS THE CATCH POINT EARTHWORK LIMIT PLUS 3.0 METERS, NOT TO EXCEED THE RIGHT-OF-WAY LIMITS.

9. THE DETAILS SHOWN ON THE STORM WATER POLLUTION AND EROSION/SEDIMENT CONTROL DETAILS ARE GENERAL REQUIREMENTS TO BE USED BY THE CONTRACTOR IN PREPARING A STORM WATER POLLUTION PREVENTION PLAN ALONG WITH THE REQUIREMENTS IN SECTION 157 OF THE SUPPLEMENTAL SPECIFICATION AND SPECIAL CONTRACT REQUIREMENTS. THE SWPPP IS ONLY REQUIRED AT THE DRAINAGE PIPE REPLACEMENT LOCATIONS. THE CONTRACTOR IS REQUIRED TO SUBMIT A COURTESY COPY OF THE APPROVED SWPPP TO THE NAVAJO NATION WATER QUALITY EPA OFFICE.

10. THE QUANTITIES SHOWN ARE FOR ESTIMATING PURPOSES ONLY AND TO COMPARE AND CANVAS BIDS. ACTUAL PAY QUANTITIES WILL BE DETERMINED IN THE FIELD FOR AUTHORIZED CHANGES THAT AFFECT THE QUANTITIES. ANY OVER-RUN OR UNDER-RUN OF QUANTITIES SHALL BE SUBJECT TO THE SPECIAL CONTRACT REQUIREMENTS.

11. ALL TURNOUT/DRIVEWAYS, AS CALLED FOR ON THESE PLANS, SHALL EITHER BE CONSTRUCTED, REBUILT, RESHAPED AND/OR REMOVED UP TO THE RIGHT-OF-WAY LIMITS. ALL TURNOUTS SHALL BE PAVED TO THE CATTLEGUARD, THEN FROM THE BACK OF CATTLEGUARD TO THE R/W LINE, PLACE AGGREGATE BASE FOR ALL 4.5 METERS WIDE TURNOUTS; PLACE AGGREGATE AND HOT ASPHALTIC CONCRETE FOR TURNOUTS WIDER THAN 4.5 METERS TO MATCH THE AJOINING 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 COR/COTR 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 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, SECTION 211.01(b) METHOD 2. SCARIFICATION SHALL BE TO A DEPTH OF 300 MILLIMETERS. THE SCARIFIED SURFACE SHALL BE LEFT ROUGH, WITH 100 MILLIMETERS TO 300 MILLIMETERS HIGH RIDGES PERPENDICULAR TO THE EXISTING ROAD CENTERLINE. ROADWAY OBLITERATION INCLUDES GRADING DRAINAGE CHANNELS ACROSS THE OLD ROADBED, TO RE-ESTABLISH NATURAL DRAINAGE CHANNELS AND/OR TO OPEN CHANNELS FOR THE NEWLY INSTALLED (IN NEW ROADWAY) DRAINAGE STRUCTURES. THIS WORK TO BE INCLUDED IN THE BID ITEM 21102-2000. PERMANENT SEEDING AND STRAW MULCHING SHALL BE APPLIED TO ALL OBLITERATION AREAS, WITHIN THE CONSTRUCTION LIMITS. SEEDING AND MULCHING TO BE PAID UNDER ITEM 62510-1000.

13. STRUCTURAL EXCAVATION AND BEDDING/BACKFILL OF ALL DRAINAGE STRUCTURES (CULVERTS AND CONCRETE HEAD/WING WALLS) SHALL BE CONSIDERED INCIDENTAL TO THE 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 PLACED ALONG ROADWAY SHOULDERS AS EMBANKMENT IN AREAS ADJACENT TO THE REMOVAL AND AS DIRECTED BY THE COR/COTR.

14. ALL FURROW AND DRAINAGE DITCHES SHALL BE STAKED AND GRADED TO DRAIN UP TO THE RIGHT-OF-WAY LIMITS. EARTHEN DITCH BLOCKS, DIKES AND DITCHES SHALL BE CONSTRUCTED AS SHOWN ON THESE PLANS AND/OR ADDED AT LOCATIONS DESIGNATED BY THE COR/COTR. ALL DITCH BLOCKS, DIKES AND FURROW DITCHES SHALL BE PAID FOR UNDER THE APPROPRIATE BID ITEMS FOR THIS WORK AS SHOWN IN THE BID SCHEDULE. AT ALL DRAINAGE PIPE REPLACEMENTS, INSTALLATIONS, EXTENSIONS, AND IN-PLACE PIPE CLEANING LOCATIONS, THE CONTRACTOR SHALL CLEAN, REGRADE, AND RESHAPE THE INLET AND OUTLET CHANNELS TO THE RIGHT-OF-WAY LINE AS DIRECTED BY THE COR/COTR. THIS WORK SHALL BE INCIDENTAL TO BID ITEMS FOR SECTIONS 602, 603, AND/OR 607.

GENERAL NOTES

15. IMMEDIATELY PRIOR TO PLACING AGGREGATE BASE AND/OR RECYCLED MATERIAL, THE TOP 152 MILLMETERS OF THE FINISHED SUBGRADE (INCLUDING TURNOUTS) SHALL BE CHECKED FOR COMPACTION AND GRADE. IF COMPACTION DOES NOT MEET THE MINIMUM SPECIFIED COMPACTION AND TOLERANCE REQUIREMENTS, THE ORIGINAL GROUND AND/OR SUBGRADE SHALL BE RE-WATERED AND/OR SCARIFIED AS NEEDED AND RE-COMPACTED TO THE REQUIRED DENSITY AND TOLERANCE, AT THE CONTRACTOR'S EXPENSE. IN NO CASE SHALL ANY EMBANKMENT OR SURFACING MATERIAL BE PLACED ON FROZEN, MUDDY OR UNSTABLE NATURAL GROUND OR SUBGRADE. THIS WORK SHALL BE CONSIDERED AN INCIDENTAL OBLIGATION OF THE CONTRACTOR AND SHALL MEET THE REQUIREMENTS OF SECTION 704.03 OF THE FP-14 AS MODIFIED IN THE SPECIFICATIONS.

16. THE EARTHWORK TABLE SHOWN IS TO ASSIST THE CONTRACTOR IN ESTABLISHING A BID UNDER THE EARTHWORK ITEMS SHOWN IN THE BID SCHEDULE. ANY BORROW MATERIAL CALLED FOR ON THE PLANS SHALL BE TAKEN FROM CONTRACTOR IDENTIFIED SOURCES OUTSIDE THE RIGHT-OF-WAY LIMITS. IT IS THE SOLE RESPONSIBILITY AND EXPENSE OF THE CONTRACTOR TO PROVIDE ANY NECESSARY BORROW MATERIAL FOR THIS PROJECT INCLUDING ALL NECESSARY PERMITS. ALL EXCAVATION, BORROW, WASTE AND EMBANKMENT MATERIAL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEMS 20401-0000 AND 20403-0000. WASTE MATERIALS SHALL BE STOCKPILED LOCATIONS DESIGNATED BY THE COR BETWEEN STA 41+00 TO 55+900 LEFT & RIGHT OUTSIDE OF THE CONSTRUCTION STAKED LIMITS AND INSIDE THE ROW LINES WHERE THE MATERIAL WILL NOT BLOCK OFF DRAIANGE PATTERNS OR ACCESS TO HOME SITES. SEED AND MULCH THE STOCKPILES UNDER BID ITEM 62510-1000.

17. AT ALL TOP EDGES OF CUT SLOPES 3.0 METER OR HIGHER THAN THE DITCH FLOWLINE, THE CONTRACTOR SHALL REMOVE ALL LOOSE AND UNSTABLE ROCK OR ROCK THAT AS DETERMINED BY THE COR/COTR, 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 AS SHOWN IN THESE PLANS ARE APPROXIMATE AND ARE ONLY TO ASSIST THE CONTRACTOR IN COMPLETING THE WORK. THE CONTRACTOR SHALL CONTACT ALL UTILITY OWNERS PRIOR TO STARTING ANY CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL CONTACT THE NAVAJO TRIBAL UTILITY AUTHORITY (NTUA) AT (928)-729-5721 AND FRONTIER COMMUNICATION COMPANY AT (928)-871-3748, 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, FENCING MATERIALS, ETC, AS CALLED FOR ON THESE PLANS IN ACCORDANCE TO SECTIONS 203 AND 607 IN A DESIGNATED LOCATION ADJACENT TO THE REMOVAL LOCATION BUT OUTSIDE OF THE CONSTRUCTION STAKED LIMITS. THE COR/COTR SHALL OFFER THIS SALVAGED MATERIALS TO THE COMMUNITY MEMBERS AND/OR PROPERTY OWNERS. IF THEY ACCEPT, THE MATERIALS MUST BE PICKED UP THAT SAME DAY. ANY PIPE MATERIAL DETERMINED TO BE UNUSEABLE BY THE COR/COTR OR UNACCEPTABLE BY THE LAND OWNER/COMMUNITY MEMBERS SHALL BE DISPOSED OF BY THE CONTRACTOR IN ACCORDANCE WITH SECTIONS 107, AND 203. THE SALVAGE WORK SHALL BE INCLUDED IN THE APPROPRIATE UNIT PRICE BID ITEMS FOR SECTIONS 203 AND/OR 607.

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 SLOPES CANNOT BE CONSTRUCTED. IN THIS CASE, THE COR/COTR SHALL BE CONSULTED WITH THE OWNER FOR CHANGES IN THE TYPICAL SECTIONS, DESIGN SLOPES, AND/OR OTHER ADJUSTMENTS BEFORE PROCEEDING WITH THE WORK UNLESS NOTED OTHERWISE ON THE PLANS. THE FINAL CONSTRUCTED ROAD SECTION SHALL BE BASED ON THE GOVERNMENT/OWNER FURNISHED COMPUTERIZED STAKING REPORT AS ADJUSTED TO FIT FIELD CONDITIONS. THE CONTRACTOR SHALL STAY WITHIN THE LIMITS OF CONSTRUCTION, UNLESS OTHERWISE APPROVED. IN NO CASE SHALL THE CUT AND FILL BACK SLOPES BE BUILT STEEPER THAN THE MAXIMUM ALLOWED IN THE ROADWAY TYPICAL SECTION SHOWN.

21. THE CONTRACTOR SHALL SAW CUT (FULL DEPTH) THE EXISTING ASPHALT PAVEMENT WHERE NEW ASPHALT IS TO TIE INTO THE OLD ASPHALT PAVEMENT AT THE LOCATIONS NOTED ON THE PLANS. THE CONTRACTOR SHALL MATCH THE NEW ASPHALTIC CONCRETE PAVEMENT SURFACE TO EXISTING PAVEMENT SECTION AT TIE-IN POINTS AND TO PROVIDE FOR A SMOOTH TRANSITION AS DIRECTED BY THE COR/COTR. ALL SAWED PAVEMENT EDGES TO RECEIVE ASPHALT TACK COAT. THIS WORK SHALL BE INCIDENTAL TO BID ITEM 40201-0500 AS SHOWN IN THE BID SCHEDULE.

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

23. REMOVAL AND RE-ATTACHMENT OF FENCING REQUIRED TO COMPLETE SPECIFIED WORK AT DRAINAGE STRUCTURES, CATTLE GUARDS, GATES, TURNOUTS, RIPRAP, ETC, SHALL BE CONSIDERED INCIDENTAL TO THE BID ITEMS RELATED TO THE WORK REQUIRING SAID FENCE REMOVAL/RE-ATTACHMENT, FENCING REPAIRS, TEMPORARY FENCING AND/OR REMOVAL AND RE-ATTACHMENT OF FENCING, SHALL BE COMPLETED IN THE SAME WORK DAY SO AS NOT TO ALLOW LIVESTOCK ONTO THE PROJECT. IF WIRE TENSION IS LOST IN THE EXISTING FENCE, THE CONTRACTOR SHALL RE-TIGHTEN THE FENCE AS DIRECTED BY THE COR/COTR.

24. THE CONTRACTOR SHALL REMOVE BIA ROUTE N12 EXISTING ROADSIDE SIGNS THAT INTERFERE WITH ROAD CONSTRUCTION AND/OR CONTRADICT THE CONTRACTOR'S TEMPORARY TRAFFIC CONTROL PLAN, AT THE START OF THE CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE COR/COTR AT LEAST THREE (3) WORKING DAYS IN ADVANCE OF SUCH SIGN REMOVAL. THESE ROADSIDE SIGNS SHALL BE SALVAGED AND TAKEN TO THE CHINLE AGENCY MAINTENANCE YARD. SIGNS NEEDED FOR SAFETY/INFORMATION SHALL BE TEMPORARILY RESET AS DIRECTED BY THE COR/COTR ALL REMAINING SIGNS ALONG THE EXISTING N12 ROADWAY, NOT SPECIFICALLY DESIGNATED ON THE PLANS TO REMAIN, SHALL BE REMOVED. THIS WORK SHALL BE CONSIDERED AN INCIDENTAL OBLIGATION OF THE CONTRACTOR.

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

26. AT MAJOR DRAINAGE STRUCTURES AND LIVESTOCK PASS LOCATIONS, THE CONTRACTOR SHALL EITHER TIE THE WING FENCES TO STRUCTURES IN ACCORDANCE WITH THE DETAILS ON SHEET 44 OF 56 OR INSTALL FENCE OVER THE STRUCTURE AT THE CLEAR RECOVERY ZONE AS NOTED ON THE PLANS. 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 44 OF 56. ANY EXISTING CATTLE PASS CLOSURES ARE TO BE REMOVED. THIS WORK TO BE INCIDENTAL TO BID ITEM 61901-1000 AND NO ADDITIONAL PAYMENT SHALL BE MADE.

27. 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 ALIGNMENT STATIONING AND ELEVATIONS IN METRIC, UNLESS OTHERWISE NOTED UNDER SECTION 152 OF THE SUPPLEMENTAL SPECIFICATIONS. ANY EXISTING R/W MONUMENTS AND BRASS CAPS MISSING SHALL BE RE-SURVEYED IN TO THEIR ORIGINAL POSITION AND LABELED AND STAMPED ACCORDINGLY. ALL EXISTING REFERENCE MARKERS SHALL BE SAND BLASTED, CLEAN, AND REPAINTED WITH ENGLISH STATIONS ON ONE SIDE AND METRIC STATIONS ON THE OTHER. 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.

28. THERE MAY BE A NUMBER OF ARCHAEOLOGICAL SITE MITIGATIONS THAT ARE NOTED OR SHOWN ON THE PLANS. THE CONTRACTOR SHALL NOTIFY THE NAVAJO NATION DIVISION OF TRANSPORTATION (NNDOT) PROJECTS OFFICE (TAFT BLACKHORES) 505-371-8394 AS REQUIRED PRIOR TO STARTING CONSTRUCTION ACTIVITIES IN THESE LOCATIONS IF SHOWN ON THE PLANS. SEE THE SPECIAL CONTRACT REQUIREMENT SECTION OF THE CONTRACT FOR ADDITIONAL INFORMATION, AND REQUIREMENTS. THE CONTRACTOR SHALL PLACE TEMPORARY FLEXIBLE SAFETY FENCE AROUND THE ARCHAEOLOGY SITE(S) AS NOTED ON THE PLANS. THE FENCING MATERIAL SHALL BE SQUARE LINK (ORANGE COLOR) PLASTIC TYPE MADE OF HI-DENSITY HDPE, AS PER SECTION 710.11 OF THE FP-14. TEMPORARY ARCHAEOLOGY FENCING SHALL BE CONSIDERED INCIDENTAL OBLIGATIONS OF THE CONTRACTOR IF A SPECIFIC BID ITEM IS NOT SHOWN IN THE BID SCHEDULE.

GENERAL NOTES

29. AS-BUILTS PLAN AND PROFILE SHEETS [OF PROJECT N12(2-1)] SHALL BE PROVIDED UPON WRITTEN REQUEST TO THE COR/COTR ONLY FOR LOCATING EXISTING STRUCTURES AND APPRUNITENANCES TO BE REMOVED. HOWEVER, THE CONTRACTOR SHALL BE RESPONSIBLE FOR SURVEYING AND CHECKING THE NEW ROADWAY (HORIZONTAL AND VERTICAL) CENTERLINE ALIGNMENT TO INSURE THE PREVIOUS PROJECT ALIGNMENT MATCHES THE NEW ROADWAY ALIGNMENT AT THE BOP & EOP. REGRADE AND RESHAPE THE EXISTING ROADSIDE DITCHES AS NEEDED TO MATCH THE NEW DITCH LINES. THE CONTRACTOR IS ADVISED THAT MUCH OF THE INFORMATION FOUND ON THE AS-BUILT PLANS HAS BEEN REVISED/ UPDATED/CORRECTED FOR THE CURRENT PROJECT. THE AS-BUILT PLANS ARE PROVIDED FOR BACKGROUND INFORMATION ONLY. THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEMS 15201-0000, 20401-000, 30302-6000 AND 40201-0500.

30. THE GEO-TECHNICAL REPORT FOR THIS PROJECT SHALL BE PROVIDED UPON WRITTEN REQUEST FROM THE CONTRACTOR THRU COR/COTR.

31. ROADWAY END AREA AND PIPE CROSS SECTION DRAWINGS WILL BE PROVIDED IN EITHER HARD COPY OR ELECTRONIC FORMAT UPON WRITTEN REQUEST FROM THE CONTRACTOR THRU THE CONTRACTING OFFICER AT THE PRE-CONSTRUCITON MEETING.

32. ANY EXISTING MAIL BOXES, ADVERTISING BILLBOARDS, OR HOUSE ADDRESS SIGNS CALLED OUT ON THESE PLANS OR FOUND TO BE LOCATED ALONG THE ROADWAY PRISM SHALL BE REMOVED AND RE-INSTALLED OUTSIDE OF THE RIGHT-OF-WAY LIMIT OR AS DIRECTED BY THE COR/COTR. THE CONTRACTOR SHALL NOTIFY THE CHAPTER OFFICIALS AND ATTEMPT TO CONTACT ALL AFFECTED RESIDENTS TEN (10) WORKING DAYS PRIOR TO RESETTING MAIL BOXES. THIS WORK SHALL BE INCIDENTAL TO BID ITEM 20304-1000.

33. AT THE COMPLETION OF THE CONSTRUCTION, THE CONTRACTOR SHALL INSPECT THE INTERIOR OF ALL NEWLY INSTALLED CULVERTS, CATTLEGUARDS, AND/OR OTHER EXISTING DRAINAGE STRUCTURES. THESE STRUCTURES SHALL BE MAINTAINED IN A CLEAN CONDITION, FREE OF SILT AND OTHER DEBRIS UNTIL FINAL ACCEPTANCE OF THE PROJECT. THIS WORK SHALL BE CONSIDERED AN INCIDENTAL OBLIGATIONS OF THE CONTRACTOR UNDER THE APPROPRIATE BID ITEMS, FOR SECTIONS 602, 603, 607, AND 619.

34. THERE ARE NUMBER OF LOCATIONS WHERE RIPRAP, CHANNEL FLOWLINE GRADING, TURNOUTS, ETC., WILL REQUIRE WORK AND IMPROVEMENTS PLACED THROUGH AND BEYOND THE RIGHT-OF-WAY FENCING LOCATIONS. IN THESE LOCATIONS, THE RIGHT-OF-WAY FENCING SHALL BE ADJUSTED (POST SPACING, VERTICAL ALIGNMENT, POST INSTALLATIONS THROUGH RIPRAP, RIGHT-OF-WAY MONUMENT/MARKER ADJUSTMENT, ETC.) AS DIRECTED BY THE COR/COTR. THIS WORK TO BE INCIDENTAL TO BID ITEMS 61901-1000, 62101-0000, AND 62102-0000, AND NO ADDITIONAL PAYMENT WILL BE MADE.

35. IT IS EXPECTED A REVISED/ FINAL RIGHTS-OF-WAY GRANT OF EASEMENT BE DEVELOPED DURING THE CONSTRUCTION OF THE N12(19-4) PROJECT. THE CONTRACTOR SHALL NOT SURVEY FOR OR INSTALL R.O.W. MONUMENTS AND MARKERS OR FENCINGS UNTIL EXPRESSLY APPROVED BY THE OWNER THROUGH THE COR/COTR. FENCING CAN BE PLACED AT ALL ARCHAEOLOGICAL SITES IF SPECIFIED ON THE PLANS.

36. THE FINISHED SUBGRADE SOIL CLASSIFICATION AND PI'S WILL BE DETERMINED PRIOR TO SUBGRADE TREATMENT WITH ROADBOND EN-1. THE FINAL LOCATIONS (BY STATION) FOR SUBGRADE TREATMENT WILL BE DETERMINED BY THE GOVERNMENT/OWNER AND PROVIDED TO THE CONTRACTOR BEFORE THE WORK CAN PROCEED.

37. UNDER THE CLEARING AND GRUBING BID ITEM 20102-000, THE CONTRACTOR IS REQUIRED TO COMPLY WITH THE REQUIREMENTS STATED IN THE SUPPLEMENTAL SPECIFICATIONS AND PERMITS (IF REQUIRED) FOR THIS SECTION OF WORK CONCERNING TIMBER & BRUSH CUTTING & REMOVAL.

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

GENERAL NOTES

DRAWN BY: NRDOT	DATE: 12/19/2013
DESIGNED BY: NRDOT	DATE: 12/19/2013
REVISED: 10/5/2017	BY: Allen.Nakaidinae
Sht 04_N12 GenNotes.dgn	

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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	5	88

N12(19-4)1,2&4 HORIZONTAL ALIGNMENT TABLE

POINT	STATION (m)	ELEMENT	DIRECTION	NORTHING (m)	EASTING (m)
BOP	38+500.000			579,597.420	308,913.190
		Linear= 270.609 (m)	N 20°54'49" W		
PC	38+770.609			579,850.202	308,816.594
PI	38+985.651	CURVE 1		580,051.077	308,739.833
		Delta = 40°21'58" Lt.			
		Deg. = 2°59'07"			
		R = 585.000 (m)			
		L = 412.146 (m)			
		T = 215.042 (m)			
		e = 38.272 (m)			
PT	39+182.754			580,154.412	308,551.247
		Linear= 179.688 (m)	N 61°16'47" W		
PC	39+362.443			580,240.759	308,393.664
PI	39+494.062	CURVE 2		580,304.006	308,278.238
		Delta = 25°29'10" Rt.			
		Deg. = 3°00'02"			
		R = 582.000 (m)			
		L = 258.883 (m)			
		T = 131.619 (m)			
		e = 14.697 (m)			
PT	39+621.326			580,410.766	308,201.258
		Linear= 104.563 (m)	N 35°47'37" W		
PC	39+725.889			580,495.580	308,140.103
PI	39+851.672	CURVE 3		580,597.607	308,066.536
		Delta = 24°21'01" Lt.			
		Deg. = 2°59'44"			
		R = 583.000 (m)			
		L = 247.770 (m)			
		T = 125.784 (m)			
		e = 13.415 (m)			
PT	39+973.658			580,660.225	307,957.447
		Linear= 442.567 (m)	N 60°08'37" W		
PC	40+416.225			580,880.546	307,573.619
PI	40+538.173	CURVE 4		580,941.255	307,467.856
		Delta = 11°53'27" Rt.			
		Deg. = 1°29'29"			
		R = 1171.000 (m)			
		L = 243.020 (m)			
		T = 121.948 (m)			
		e = 6.333 (m)			
PT	40+659.245			581,022.453	307,376.871
		Linear= 349.942 (m)	N 48°15'11" W		
PC	41+009.187			581,255.459	307,115.782
PI	41+088.924	CURVE 5		581,308.551	307,056.291
		Delta = 15°29'50" Lt.			
		Deg. = 2°58'49"			
		R = 586.000 (m)			
		L = 158.500 (m)			
		T = 79.737 (m)			
		e = 5.400 (m)			
PT	41+167.687			581,343.817	306,984.777
		Linear= 41.141 (m)	N 63°45'01" W		
PC	41+208.829			581,362.014	306,947.879
PI	41+432.981	CURVE 6		581,461.153	306,746.841
		Delta = 28°46'08" Rt.			
		Deg. = 1°59'53"			
		R = 874.000 (m)			
		L = 438.847 (m)			
		T = 224.153 (m)			
		e = 28.286 (m)			
PT	41+647.676			581,644.810	306,618.332
		Linear= 162.631 (m)	N 34°58'53" W		
PC	41+810.307			581,778.060	306,525.094
PI	42+544.951	CURVE 7		582,379.982	306,103.916
		Delta = 55°30'40" Lt.			
		Deg. = 1°15'04"			
		R = 1396.000 (m)			
		L = 1352.517 (m)			
		T = 734.644 (m)			
		e = 181.504 (m)			
PT	43+162.824			582,373.669	305,369.299
		Linear= 921.851 (m)	S 89°30'27" W		
PC	44+084.674			582,365.746	304,447.483
PI	44+182.648	CURVE 8		582,364.904	304,349.512
		Delta = 12°49'16" Lt.			
		Deg. = 2°00'10"			
		R = 872.000 (m)			
		L = 195.130 (m)			
		T = 97.974 (m)			
		e = 5.487 (m)			
PT	44+279.804			582,342.342	304,254.171
		Linear= 387.695 (m)	S 76°41'11" W		
PC	44+667.499			582,253.063	303,876.896
PI	44+918.770	CURVE 9		582,195.200	303,632.379
		Delta = 59°47'49" Rt.			
		Deg. = 3°59'47"			
		R = 437.000 (m)			
		L = 456.077 (m)			
		T = 251.271 (m)			
		e = 67.089 (m)			
PT	45+123.576			582,377.415	303,459.362
		Linear= 1371.379 (m)	N 43°31'00" W		
PC	46+494.955			583,371.903	302,515.077
PI	47+492.512	CURVE 10		584,095.305	301,828.193
		Delta = 71°08'12" Rt.			
		Deg. = 1°15'07"			
		R = 1395.000 (m)			
		L = 1731.990 (m)			
		T = 997.557 (m)			
		e = 319.977 (m)			
PT	48+226.945			584,979.182	302,290.667

N12(19-4)1,2&4 HORIZONTAL ALIGNMENT TABLE

		Linear= 567.721 (m)	N 27°37'12" E		
PC	48+794.666			585,482.206	302,553.865
PI	49+266.024	CURVE 11		585,899.850	302,772.390
		Delta = 78°00'28" Lt.			
		Deg. = 3°00'02"			
		R = 582.000 (m)			
		L = 792.387 (m)			
		T = 471.359 (m)			
		e = 166.935 (m)			
PT	49+587.053			586,200.384	302,409.266
		Linear= 1212.060 (m)	N 50°23'15" W		
PC	50+799.113			586,973.181	301,475.525
PI	51+082.339	CURVE 12		587,153.763	301,257.335
		Delta = 51°53'56" Rt.			
		Deg. = 3°00'02"			
		R = 582.000 (m)			
		L = 527.181 (m)			
		T = 283.226 (m)			
		e = 65.256 (m)			
PT	51+326.293			587,436.891	301,264.805
		Linear= 70.276 (m)	N 1°30'41" E		
PC	51+396.570			587,507.142	301,266.659
PI	51+587.967	CURVE 13		587,698.473	301,271.707
		Delta = 47°24'05" Lt.			
		Deg. = 4°00'20"			
		R = 436.000 (m)			
		L = 360.707 (m)			
		T = 191.397 (m)			
		e = 40.160 (m)			
PT	51+757.277			587,831.692	301,134.284
		Linear= 493.549 (m)	N 45°53'24" W		
PC	52+250.826			588,175.221	300,779.913
PI	52+282.820	CURVE 14		588,197.491	300,756.941
		Delta = 2°05'50" Rt.			
		Deg. = 0°59'57"			
		R = 1748.000 (m)			
		L = 63.981 (m)			
		T = 31.994 (m)			
		e = 0.293 (m)			
PT	52+314.807			588,220.585	300,734.800
		Linear= 688.687 (m)	N 43°47'34" W		
PC	53+003.494			588,717.712	300,258.192
PI	53+172.332	CURVE 15		588,839.588	300,141.347
		Delta = 11°03'11" Lt.			
		Deg. = 1°00'03"			
		R = 1745.000 (m)			
		L = 336.629 (m)			
		T = 168.838 (m)			
		e = 8.149 (m)			
PT	53+340.123			588,936.802	300,003.304
		Linear= 654.433 (m)	N 54°50'45" W		
PC	53+994.556			589,313.611	299,468.237
PI	54+176.891	CURVE 16		589,418.596	299,319.159
		Delta = 34°47'26" Lt.			
		Deg. = 3°00'02"			
		R = 582.000 (m)			
		L = 353.395 (m)			
		T = 182.335 (m)			
		e = 27.893 (m)			
PT	54+347.951			589,419.753	299,136.828
		Linear= 45.879 (m)	N 89°38'10" W		
PC	54+393.830			589,420.045	299,090.950
PI	55+126.733	CURVE 17		589,424.698	298,358.062
		Delta = 64°23'33" Rt.			
		Deg. = 1°30'01"			
		R = 1164.000 (m)			
		L = 1308.172 (m)			
		T = 732.902 (m)			
		e = 211.515 (m)			
PT	55+702.003			590,087.609	298,045.501
		Linear= 197.997 (m)	N 25°14'38" W		
EOP	55+900.000			590,266.697	297,961.061

SUPERELEVATION TABLE

Station	Left Rate	Right Rate	Remarks
Curve 1			
38+720.518	−2.00%	−2.00%	Normal Crown
38+737.213	−2.00%	0.00%	Runoff
38+753.909	−2.00%	2.00%	Reverse Crown
38+797.317	−7.20%	7.20%	Full Super
39+159.911	−7.20%	7.20%	Full Super
39+202.522	−2.00%	2.00%	Reverse Crown
39+218.911	−2.00%	0.00%	Runoff
39+235.299	−2.00%	−2.00%	Normal Crown
Curve 2			
39+312.957	−2.00%	−2.00%	Normal Crown
39+329.346	0.00%	−2.00%	Runoff
39+345.735	2.00%	−2.00%	Reverse Crown
39+388.346	7.20%	−7.20%	Full Super
39+599.953	7.20%	−7.20%	Full Super
39+641.684	2.00%	−2.00%	Reverse Crown
39+657.734	0.00%	−2.00%	Runoff
39+673.785	−2.00%	−2.00%	Normal Crown
Curve 3			
39+674.139	−2.00%	−2.00%	Normal Crown
39+690.866	−2.00%	0.00%	Runoff
39+707.594	−2.00%	2.00%	Reverse Crown
39+751.085	−7.20%	7.20%	Full Super
39+951.577	−7.20%	7.20%	Full Super
39+993.307	−2.00%	2.00%	Reverse Crown
40+009.357	−2.00%	0.00%	Runoff
40+025.408	−2.00%	−2.00%	Normal Crown
Curve 4			
40+378.252	−2.00%	−2.00%	Normal Crown
40+395.103	0.00%	−2.00%	Runoff
40+411.953	2.00%	−2.00%	Reverse Crown
40+432.173	4.40%	−4.40%	Full Super
40+646.412	4.40%	−4.40%	Full Super
40+665.465	2.00%	−2.00%	Reverse Crown
40+681.341	0.00%	−2.00%	Runoff
40+697.218	−2.00%	−2.00%	Normal Crown
Curve 5			
40+957.425	−2.00%	−2.00%	Normal Crown
40+974.153	−2.00%	0.00%	Runoff
40+990.880	−2.00%	2.00%	Reverse Crown
41+034.372	−7.20%	7.20%	Full Super
41+114.459	−7.20%	7.20%	Full Super
41+157.070	−2.00%	2.00%	Reverse Crown
41+171.901	−2.00%	0.00%	Runoff
41+188.289	−2.00%	−2.00%	Normal Crown
Curve 6			
41+188.289	−2.00%	−2.00%	Normal Crown
41+204.586	0.00%	−2.00%	Runoff
41+222.440	2.00%	−2.00%	Reverse Crown
41+250.144	5.40%	−5.40%	Full Super
41+631.549	5.40%	−5.40%	Full Super
41+658.536	2.00%	−2.00%	Reverse Crown
41+674.410	0.00%	−2.00%	Runoff
41+690.284	−2.00%	−2.00%	Normal Crown
Curve 7			
41+775.274	−2.00%	−2.00%	Normal Crown
41+792.128	−2.00%	0.00%	Runoff
41+808.983	−2.00%	2.00%	Reverse Crown
41+824.151	−3.80%	3.80%	Full Super
43+152.084	−3.80%	3.80%	Full Super
43+166.290	−2.00%	2.00%	Reverse Crown
43+182.073	−2.00%	0.00%	Runoff
43+197.857	−2.00%	−2.00%	Normal Crown
Curve 8			
44+041.959	−2.00%	−2.00%	Normal Crown
44+058.673	−2.00%	0.00%	Runoff
44+075.386	−2.00%	2.00%	Reverse Crown
44+103.799	−5.40%	5.40%	Full Super
44+263.766	−5.40%	5.40%	Full Super
44+290.761	−2.00%	2.00%	Reverse Crown
44+306.640	−2.00%	0.00%	Runoff
44+322.519	−2.00%	−2.00%	Normal Crown
Curve 9			
44+612.431	−2.00%	−2.00%	Normal Crown
44+628.989	0.00%	−2.00%	Runoff
44+645.548	2.00%	−2.00%	Reverse Crown
44+695.224	8.00%	−8.00%	Full Super
45+098.971	8.00%	−8.00%	Full Super
45+146.775	2.00%	−2.00%	Reverse Crown
45+162.709	0.00%	−2.00%	Runoff
45+178.644	−2.00%	−2.00%	Normal Crown
Curve 10			
46+459.090	−2.00%	−2.00%	Normal Crown
46+475.950	0.00%	−2.00%	Runoff
46+492.809	2.00%	−2.00%	Reverse Crown
46+507.983	3.80%	−3.80%	Full Super
48+216.260	3.80%	−3.80%	Full Super
48+230.944	2.00%	−2.00%	Reverse Crown
48+247.260	0.00%	−2.00%	Runoff
48+263.576	−2.00%	−2.00%	Normal Crown
Curve 11			
48+744.131	−2.00%	−2.00%	Normal Crown
48+760.520	−2.00%	0.00%	Runoff
48+776.909	−2.00%	2.00%	Reverse Crown
48+819.520	−7.20%	7.20%	Full Super
49+564.495	−7.20%	7.20%	Full Super
49+606.270	−2.00%	2.00%	Reverse Crown
49+622.337	−2.00%	0.00%	Runoff
49+638.404	−2.00%	−2.00%	Normal Crown

SUPERELEVATION TABLE

Curve 12			
50+747.491	−2.00%	−2.00%	Normal Crown
50+764.202	0.00%	−2.00%	Runoff
50+780.913	2.00%	−2.00%	Reverse Crown
50+824.361	7.20%	−7.20%	Full Super
51+287.388	7.20%	−7.20%	Full Super
51+328.495	2.00%	−2.00%	Reverse Crown
51+344.884	0.00%	−2.00%	Runoff
51+361.273	−2.00%	−2.00%	Normal Crown
Curve 13			
51+361.273	−2.00%	−2.00%	Normal Crown
51+377.523	−2.00%	0.00%	Runoff
51+393.773	−2.00%	2.00%	Reverse Crown
51+444.028	−8.00%	8.00%	Full Super
51+732.913	−8.00%	8.00%	Full Super
51+780.771	−2.00%	2.00%	Reverse Crown
51+796.724	−2.00%	0.00%	Runoff
51+812.676	−2.00%	−2.00%	Normal Crown
Curve 14			
Normal Crown			
Curve 15			
Normal Crown			
Curve 16			
53+942.791	−2.00%	−2.00%	Normal Crown
53+959.503	−2.00%	0.00%	Runoff
53+976.215	−2.00%	2.00%	Reverse Crown
54+019.666	−7.20%	7.20%	Full Super
54+325.816	−7.20%	7.20%	Full Super
54+368.427	−2.00%	2.00%	Reverse Crown
54+384.816	−2.00%	0.00%	Runoff
54+401.205	−2.00%	−2.00%	Normal Crown
Curve 17			
Normal Crown			

VERTICAL ALIGNMENT TABLE

Point Type	Start Station	Element	Start Elevation	Start Gradient	Point Type	End Station	End Elevation	End Gradient	Length
POB	38+700.000	Linear	2,228.934	−1.6960%	PVC	39+132.000	2,221.607	−1.6960%	432.00
PVC	39+132.000	Parabola	2,221.607	−1.6960%	PVT	39+268.000	2,219.989	−0.6837%	136.00
PVT	39+268.000	Linear	2,219.989	−0.6837%	PVC	39+688.818	2,217.112	−0.6837%	420.82
PVC	39+688.818	Parabola	2,217.112	−0.6837%	PVT	39+774.818	2,217.340	1.2138%	86.00
PVT	39+774.818	Linear	2,217.340	1.2138%	PVC	40+425.681	2,225.240	1.2138%	650.86
PVC	40+425.681	Parabola	2,225.240	1.2138%	PVT	40+610.681	2,231.273	5.3084%	185.00
PVT	40+610.681	Linear	2,231.273	5.3084%	PVC	40+654.363	2,233.592	5.3084%	43.68
PVC	40+654.363	Parabola	2,233.592	5.3084%	PVT	41+178.363	2,235.003	−4.7699%	524.00
PVT	41+178.363	Linear	2,235.003	−4.7699%	PVC	41+302.500	2,229.082	−4.7699%	124.14
PVC	41+302.500	Parabola	2,229.082	−4.7699%	PVT	41+517.500	2,223.964	0.0096%	215.00
PVT	41+517.500	Linear	2,223.964	0.0096%	PVC	41+797.909	2,223.991	0.0096%	280.41
PVC	41+797.909	Parabola	2,223.991	0.0096%	PVT	41+983.909	2,227.846	4.1356%	186.00
PVT	41+983.909	Linear	2,227.846	4.1356%	PVC	42+232.727	2,238.136	4.1356%	248.82
PVC	42+232.727	Parabola	2,238.136	4.1356%	PVT	42+432.727	2,242.575	0.3025%	200.00
PVT	42+432.727	Linear	2,242.575	0.3025%	PVC	42+941.000	2,244.112	0.3025%	508.27
PVC	42+941.000	Parabola	2,244.112	0.3025%	PVT	43+055.000	2,245.922	2.8731%	114.00
PVT	43+055.000	Linear	2,245.922	2.8731%	PVC	43+637.136	2,262.648	2.8731%	582.14
PVC	43+637.136	Parabola	2,262.648	2.8731%	PVT	43+690.136	2,264.477	4.0285%	53.00
PVT	43+690.136	Linear	2,264.477	4.0285%	PVC	44+500.000	2,297.102	4.0285%	809.86
PVC	44+500.000	Parabola	2,297.102	4.0285%	PVT	45+020.000	2,291.871	−6.0405%	520.00
PVT	45+020.000	Linear	2,291.871	−6.0405%	PVC	45+650.000	2,253.816	−6.0405%	630.00
PVC	45+650.000	Parabola	2,253.816	−6.0405%	PVT	45+850.000	2,244.528	−3.2474%	200.00
PVT	45+850.000	Linear	2,244.528	−3.2474%	PVC	46+000.000	2,239.656	−3.2474%	150.00
PVC	46+000.000	Parabola	2,239.656	−3.2474%	PVT	46+200.000	2,236.835	0.4255%	200.00
PVT	46+200.000	Linear	2,236.835	0.4255%	PVC	46+654.636	2,238.769	0.4255%	454.64
PVC	46+654.636	Parabola	2,238.769	0.4255%	PVT	46+912.636	2,233.606	−4.4278%	258.00
PVT	46+912.636	Linear	2,233.606	−4.4278%	PVC	47+170.545	2,222.186	−4.4278%	257.91
PVC	47+170.545	Parabola	2,222.186	−4.4278%	PVT	47+238.545	2,219.685	−2.9301%	68.00
PVT	47+238.545	Linear	2,219.685	−2.9301%	PVC	47+716.909	2,205.668	−2.9301%	478.36
PVC	47+716.909	Parabola	2,205.668	−2.9301%	PVT	47+864.909	2,203.760	0.3515%	148.00
PVT	47+864.909	Linear	2,203.760	0.3515%	PVC	48+021.181	2,204.309	0.3515%	156.27
PVC	48+021.181	Parabola	2,204.309	0.3515%	PVT	48+155.181	2,203.063	−2.2122%	134.00
PVT	48+155.181	Linear	2,203.063	−2.2122%	PVC	48+259.636	2,200.752	−2.2122%	104.46
PVC	48+259.636	Parabola	2,200.752	−2.2122%	PVT	48+327.636	2,198.815	−3.4844%	68.00
PVT	48+327.636	Linear	2,198.815	−3.4844%	PVC	48+746.454	2,184.222	−3.4844%	418.82
PVC	48+746.454	Parabola	2,184.222	−3.4844%	PVT	48+884.454	2,181.524	−0.4263%	138.00
PVT	48+884.454	Linear	2,181.524	−0.4263%	PVC	49+198.454	2,180.185	−0.4263%	314.00
PVC	49+198.454	Parabola	2,180.185	−0.4263%	PVT	49+392.454	2,175.746	−4.1503%	194.00
PVT	49+392.454	Linear	2,175.746	−4.1503%	PVC	49+488.818	2,171.747	−4.1503%	96.36
PVC	49+488.818	Parabola	2,171.747	−4.1503%	PVT	49+754.818	2,168.575	1.7657%	266.00
PVT	49+754.818	Linear	2,168.575	1.7657%	PVC	50+052.500	2,173.832	1.7657%	297.68
PVC	50+052.500	Parabola	2,173.832	1.7657%	PVT	50+347.500	2,170.720	−3.8749%	295.00
PVT	50+347.500	Linear	2,170.720	−3.8749%	PVC	50+442.727	2,167.030	−3.8749%	95.23
PVC	50+442.727	Parabola	2,167.030	−3.8749%	PVT	50+582.727	2,163.930	−0.5538%	140.00
PVT	50+582.727	Linear	2,163.930	−0.5538%	PVC	50+703.000	2,163.264	−0.5538%	120.27
PVC	50+703.000	Parabola	2,163.264	−0.5538%	PVT	50+897.000	2,166.362	3.7478%	194.00
PVT	50+897.000	Linear	2,166.362	3.7478%	PVC	51+675.909	2,195.554	3.7478%	778.91
PVC	51+675.909	Parabola	2,195.554	3.7478%	PVT	51+985.909	2,197.984	−2.1802%	310.00
PVT	51+985.909	Linear	2,197.984	−2.1802%	PVC	52+118.636	2,195.090	−2.1802%	132.73
PVC	52+118.636	Parabola	2,195.090	−2.1802%	PVT	52+168.636	2,194.249	−1.1827%	50.00
PVT	52+168.636	Linear	2,194.249	−1.1827%	PVC	52+820.000	2,186.545	−1.1827%	651.36
PVC	52+820.000	Parabola	2,186.545	−1.1827%	PVT	52+920.000	2,184.538	−2.8321%	100.00
PVT	52+920.000	Linear	2,184.538	−2.8321%	PVC	53+837.500	2,158.553	−2.8321%	917.50
PVC	53+837.500	Parabola	2,158.553	−2.8321%	PVT	53+962.500	2,156.687	−0.1535%	125.00
PVT	53+962.500	Linear	2,156.687	−0.1535%	PVC	54+315.000	2,156.146	−0.1535%	352.50
PVC	54+315.000	Parabola	2,156.146	−0.1535%	PVT	54+365.000	2,155.838	−1.0797%	50.00
PVT	54+365.000	Linear	2,155.838	−1.0797%	PVC	54+846.136	2,150.643	−1.0797%	481.14
PVC	54+846.136	Parabola	2,150.643	−1.0797%	PVT	54+881.136	2,150.211	−1.3862%	35.00
PVT	54+881.136	Linear	2,150.211	−1.3862%	PVC	55+095.000	2,147.247	−1.3862%	213.86
PVC	55+095.000	Parabola	2,147.247	−1.3862%	PVT	55+125.000	2,146.895	−0.9590%	30.00
PVT	55+125.000	Linear	2,146.895	−0.9590%	PVC	55+367.500	2,144.570	−0.9590%	242.50
PVC	55+367.500	Parabola	2,144.570	−0.9590%	PVT	55+432.500	2,143.593	−2.0454%	65.00
PVT	55+432.500	Linear	2,143.593	−2.0454%	PVC	55+708.567	2,137.947	−2.0454%	276.07
PVC	55+708.567	Parabola	2,137.947	−2.0454%	PVT	55+801.433	2,137.006	0.0193%	92.87
PVT	55+801.433	Linear	2,137.006	0.0193%	POE	55+900.000	2,137.025	0.0193%	98.57

Note: Coordinates and Horizontal Distances Shown Are In Grid, Arizona State Plane Coordinates System, East Zone, NAD83, Meters

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

SUPERELEVATION, HORIZONTAL, AND VERTICAL ALIGNMENT TABLES

DRAWN BY: NRDOT DATE: 3/23/2015
DESIGNED BY: NRDOT DATE: 3/23/2015
REVISED: 3/9/2018 BY: Leroy.Toledo
Sht 05 N12 AlignTbl.dgn

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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	6	88

ESTIMATED QUANTITIES

ITEM	DESCRIPTION	QUANTITY	Units
10901-0000	Extra & Miscellaneous Work Authorized under Section 109.02(m)	All Req'd	Lump Sum
15101-0000	Mobilization	All Req'd	Lump Sum
15201-0000	Construction Survey and Staking	All Req'd	Lump Sum
15301-0020	Contractor Quality Control	13,750.00	Man Hrs.
15701-0000	Temporary Erosion Control	All Req'd	Lump Sum
15708-1000	Temporary Straw Mulching	20.61	ha
20102-0000	Clearing & Grubbing	All Req'd	Lump Sum
20304-1000	Removal of Structures & Obstructions with Bridge N504 & N505	All Req'd	Lump Sum
20401-0000	Roadway Excavation	126,350.00	m^3
20801-0000	Structure Excavation	1,383.00	m^3
20803-0000	Structure Backfill	603.00	m^3
20443-1000	Earthen Dike & Berm, Type A	171.00	m
20601-0000	Development of Water Supply	25.00	M-Liter
21301-4000	Subgrade Stabilization with Road Bond EN-1, 305 mm	31,545.60	m^2
25101-2000	Placed Riprap , Class-2	323.39	m^3
25110-2000	Grouted Riprap Class-2	195.80	m^3
25112-2000	Wire Enclosed Riprap, Class 2	1,694.53	m^3
30103-2000	Untreated Aggregate Base, Grading Special	6,332.00	t
40201-0500	Hot Asphaltic Concrete Pavement,Class B, Grade B, Type III Smoothness	53,924.00	t
40502-0800	Asphalt Cement, Grade PG-58-28	3,235.00	t
40802-0700	Cold Recycled Asphalt Base Course, 279 Depth	116,300	m^2
41101-5000	Prime Coat - Penetrating Emulsified Prime, Grade PEP	231.00	t
41201-1000	Asphalt Emulsion Tack Coat, Grade SS-1	38.00	t
55201-0200	Structural Concrete Class A(AE)	332.00	m^3
55401-1000	Reinforcing Steel , Grade 420 Epoxy Coated	22,886.70	kg
55101-2200	660mm ø Steel Pipe Pile, in place Bridge N504	355.00	m
55115-1000	Preboring of Piles	251.00	m
60101-1000	Minor Concrete, Class A(AE)	80.02	m^3
60201-0810	610 mm Corrugated Steel Pipe	1,132.58	m
60201-0910	762 mm Corrugated Steel Pipe	393.86	m
60201-1010	914 mm Corrugated Steel Pipe	82.91	m
60201-1110	1067 mm Corrugated Steel Pipe	52.43	m
60201-1210	1219 mm Corrugated Steel Pipe	199.95	m
60201-1410	1524 mm Corrugated Steel Pipe	109.73	m
60201-1810	2134 mm Corrugated Steel Pipe	42.06	m
60202-0610	889 mm Span x 610 mm Rise Corrugated Steel Pipe-Arch	96.32	m
60202-0710	1067 mm Span x 737 mm Rise Corrugated Steel Pipe-Arch	354.18	m
60202-0810	1245 mm Span x 838 mm Rise Corrugated Steel Pipe-Arch	331.01	m
60202-0910	1448 mm Span x 965 mm Rise Corrugated Steel Pipe-Arch	107.29	m
60202-1110	1803 mm Span x 1194 mm Rise Corrugated Steel Pipe-Arch	418.49	m
60210-0810	End Section 610 mm CSPC	101	Each
60210-0910	End Section 762 mm CSPC	14	Each
60210-1010	End Section 914 mm CSPC	6	Each
60210-1110	End Section 1067 mm CSPC	2	Each
60210-1210	End Section 1219 mm CSPC	6	Each
60211-1010	End Section 889 mm Span x 610 mm Rise CSPA	4	Each
60211-1110	End Section 1067 mm Span x 737 mm Rise CSPA	15	Each
60211-1210	End Section 1245 mm Span x 838 mm Rise CSPA	7	Each
60211-1310	End Section 1448 mm Span x 965 mm Rise CSPA	4	Each
60211-1510	End Section 1803 mm Span x 1194 mm Rise CSPA	6	Each
60301-0710	2448 mm Structural Plate Pipe Culvert, SPPC	87.78	m
60302-0910	2616 mm Span x 1803 mm Rise Structural Plate Pipe-Arch, SPPA	188.98	m
60304-0100	17.374 m Span x 3.249 m Rise Pre-Cast Arch Culvert Units with PC Wingwalls, Foundations- Bridge N504	23	Each
60304-0200	17.374 m Span x 3.249 m Rise Pre-Cast Arch Culvert with PC Wingwalls, Foundations- Bridge N505	21	Each
60701-1000	Remove, Clean and Stockpiling Pipe	1,369.56	m
61701-5000	Guardrail System, SGR04b, Type PDE02 with End Treatment SKT-350 & Thrie Beam, Type "A" Installation	944.88	m
61801-0000	Concrete Jersey Barrier, with transition barrier, Bridge N505	36.58	m
61901-3500	Wildlife Crossing Fence	35,104.00	m
61902-2310	Type 2 Gate only for 4.5 m wide Turnout	4	Each
61903-0310	Cattleguard (2-Unit) 4900 mm Width with Type 2 Gate	38	Each
61903-0710	Cattleguard (3-Unit) 7190 mm Width with Type 2 Gate	14	Each
61903-1010	Cattleguard (4-Unit) 9480 mm Width with Type 2 Gate	9	Each
61903-1110	Cattleguard (5-Unit) 11900 mm Width with Type 2 Gate	2	Each
61920-3000	Remove And Reset Cattleguard (At N12 & N64 Intersection)	1	Each
62101-0000	Right-Of-Way Monument	80	Each
62102-0000	Reference Marker	80	Each
62510-1000	Seeding, Dry Method	20.61	ha
62901-1100	Erosion Control Matting, Type IV	26,942	m^2
63302-2001	Sign Installation, 1-Post - 38 mm x 38 mm, Square Steel Post	39.83	m^2
63302-2002	Sign Installation, 1-Post - 44 mm x 44 mm, Square Steel Post	70.68	m^2
63302-2006	Sign Installation, 2-Post - 50 mm x 50 mm, Square Steel Post	23.35	m^2
63302-2007	Sign Installation, 2-Post - 57 mm x 57 mm, Square Steel Post	18.80	m^2
63302-2012	Sign Installation, 4-Post - 57 mm x 57 mm, Square Steel Post	1.90	m^2
63308-2000	Object Marker, Type 2, Square Steel Tube, 1- 38 mm x 38 mm	110	Each
63308-3010	Object Marker, Type 3, Square Steel Tube, 1- 38 mm x 38 mm	10	Each
63309-0040	Delineator, 1-38 mm x 38 mm Square Steel Tube, Type "1b"	115	Each
63318-1020	Milepost, 1- 38 mm x 38 mm square steel tube	26	Each
63401-1510	Pavement Markings, Type "H" Solid Yellow	11,620.53	m
63401-1520	Pavement Markings, Type "H" Solid White	34,313.94	m
63401-1610	Pavement Markings, Type "H" Broken Yellow	12,305.78	m
63401-1620	Pavement Markings, Type "H" Broken White	240.00	m
63405-2900	Pavement Marking, , Type "H", Turn Arrow	21	Each
63405-2950	Pavement Marking, Type "H", Straight Arrow	19	Each
63405-3000	Pavement Marking, Type "H", Straight/ Turn Arrow Combination	11	Each
63405-3050	Pavement Marking, Type "H", word " ONLY "	12	Each
63405-3260	Pavement Markings, Type "H" STOP bar	24	Each
63405-3290	Pavement Markings, Type "H", diagonal stripping, solid yellow	9	Each
63501-0000	Temporary Traffic Control Main Road Only	All Req'd	Lump Sum
63502-3000	Temporary Traffic Control, Raised Pavement Marker	7,644	Each
63509-1000	Flagger	12,655.00	Man Hrs.

ESTIMATED EARTHWORK VOLUME

STATION	TO	STATION	CUT (m^3)	FILL (m^3)	WASTE (m^3)	BORROW (m^3)
38+700.000	to	39+050.83	2,370.00	2,370.00	0.00	0.00
39+050.83	to	39+596.83	6,199.00	6,199.00	0.00	0.00
39+596.83	to	39+642.14	237.00	237.00	0.00	0.00
39+642.14	to	40+915.56	9,869.00	9,869.00	0.00	0.00
40+915.56	to	55+900.00	105,142.00	83,640.00	21,502.00	
		Sub-TOTAL	**123,817.00**	**102,315.00**	**21,502.00**	**0.00**
		Turnouts	2,533.00	9,208.00	0.00	6,675.00
		Milling	0.00	29,540.00	0.00	29,540.00
		Sub-TOTAL	**2,533.00**	**38,748.00**	**0.00**	**36,215.00**
		Waste From The Mainline	**0.00**	**0.00**	**21,502.00**	**0.00**
		Sub-TOTAL	**126,350.00**	**141,063.00**	**21,502.00**	**14,713.00**
		TOTAL	**126,350.00**	**141,063.00**	**6,789.00**	**0.00**

15% Shrinkage Factor Applied to Fill Volume

TURNOUT LOCATION, CATTLEGUARD & GATE QUANTITY TABLE

STATION	LOCATION	DESCRIPTION	REMARKS	61903-0310 2-Unit CG Each	61903-0710 3-Unit CG Each	61903-1010 4-Unit CG Each	61903-1110 5-Unit CG Each	61902-2310 Type 2 Gate Each	61920-3000 Remove & Reset Cattleguard
38+700.00	CL	1-5-Unit Cattleguard	Connect New Fencing to New Cattleguard on Both Left & Right				1		
38+898.00	Right	7.0 m TO w/ 3-Unit Cattleguard & Type 2 Gate	BIA Route N8080		1				
39+470.00	Left	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate		1					
39+765.57	Right	7.0 m TO w/ 3-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 20.12 m CSPC & End Sections		1				
40+280.00	Right	7.0 m TO w/ 3-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 18.90 m CSPC & End Sections		1				
40+370.00	Left	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 13.41 m CSPC & End Sections	1					
40+410.00	Right	7.0 m TO w/ 3-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 21.95 m CSPC & End Sections		1				
40+460.00	Left	7.0 m TO w/ 3-Unit Cattleguard & Type 2 Gate	BIA Bus route		1				
40+745.00	Left	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 10.97 m CSPC & End Sections	1					
41+075.00	Right	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 10.97 m CSPC & End Sections	1					
41+240.00	Right	7.0 m TO w/ 3-Unit Cattleguard & Type 2 Gate	C444		1				
41+535.00	Left	9.10 m TO w/ 4-Unit Cattleguard & Type 2 Gate	BIA Route N8079			1			
41+700.00	Right	9.10 m TO w/ 4-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 17.07 m CSPC & End Sections			1			
42+578.00	Right	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate		1					
42+770.00	Left	7.0 m TO w/ 3-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 21.34 m CSPC & End Sections		1				
43+020.00	Left	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 11.58 m CSPC & End Sections	1					
43+570.00	Right	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 12.19 m CSPC & End Sections	1					
43+575.00	Left	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate		1					
44+370.00	Right	4.5 m TO w/ Type 2 Gate Only	To Forestry lookout tower					1	
44+715.00	Left	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate		1					
45+505.00	Left	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate		1					
45+930.00	Right	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate		1					
46+160.00	Right	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 12.19 m CSPC & End Sections	1					
46+846.00	Left	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate		1					
47+235.00	Left	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate		1					
47+470.00	Left	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate		1					
48+240.00	Left	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate		1					
48+643.00	Right	4.5 m TO w/ Type 2 Gate Only	To Abandoned gravel pit area					1	
48+655.00	Left	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate		1					
49+211.00	Right	7.0 m TO w/ 3-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 19.51 m CSPC & End Sections		1				
49+330.00	Left	7.0 m TO w/ 3-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 20.12 m CSPC & End Sections		1				
49+440.00	Right	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 10.97 m CSPC & End Sections	1					
49+900.00	Left	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 10.97 m CSPC & End Sections	1					
49+970.00	Left	7.0 m TO w/ 3-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 19.51 m CSPC & End Sections		1				
50+000.00	Right	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate	1-610 mm x 8.53 m CSPC & End Sections	1					
50+580.00	Right	4.5 m TO w/ Type 2 Gate Only	To Field Area					1	
51+040.00	Left	7.0 m TO w/ 3-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 16.46 m CSPC & End Sections		1				
51+265.00	Left	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 12.19 m CSPC & End Sections	1					
51+473.00	Right	4.5 m TO w/ Type 2 Gate Only						1	
51+666.00	Left	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate		1					
51+698.00	Right	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate		1					
52+180.00	Left	9.10 m TO w/ 4-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 21.34 m CSPC & End Sections			1			
52+663.00	Left	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 12.19 m CSPC & End Sections	1					
52+663.00	Right	7.0 m TO w/ 3-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 20.73 m CSPC & End Sections		1				
52+813.00	Left	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate		1					
52+825.00	Right	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate		1					
53+015.00	Right	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 9.75 m CSPC & End Sections	1					
53+118.00	Left	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 9.14 m CSPC & End Sections	1					
53+256.00	Right	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 9.75 m CSPC & End Sections	1					
53+355.00	Left	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 10.97 m CSPC & End Sections	1					
53+470.00	Right	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 12.19 m CSPC & End Sections	1					
54+040.00	Right	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate	With 2-1803 mm S x 1193 mm R x 11.58 m CSPA & End Sections	1					
54+110.00	Left	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 17.07 m CSPC & End Sections	1					
54+224.00	Right	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate		1					
54+308.00	Right	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate		1					
54+400.00	Right	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate		1					
54+595.00	Left	9.10 m TO w/ 4-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 21.34 m CSPC & End Sections			1			
54+615.00	Right	7.0 m TO w/ 4-Unit Cattleguard & Type 2 Gate	With 4-1803 mm S x 1194 mm R x 17.68 m CSPA w/ Conc. Headwall &			1			
54+720.00	Right	7.0 m TO w/ 4-Unit Cattleguard & Type 2 Gate	With 4-1803 mm S x 1194 mm R x 15.85 m CSPA w/ Conc. Headwall &			1			
54+817.32	Right	7.0 m TO w/ 4-Unit Cattleguard & Type 2 Gate	With 4-1803 mm S x 1194 mm R x 15.85 m CSPA w/ Conc. Headwall &			1			
54+822.86	Left	Remove and Reset Existing 8-Unit Cattleguard	N12 and N64 Intersection						1
54+890.00	Left	7.0 m TO w/ 4-Unit Cattleguard & Type 2 Gate				1			
54+952.00	Right	7.0 m TO w/ 4-Unit Cattleguard & Type 2 Gate	With 4-1803 mm S x 1194 mm R x 15.24 m CSPA w/ Conc. Headwall &			1			
55+327.00	Right	7.0 m TO w/ 3-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 18.29 m CSPC & End Sections		1				
55+786.00	Right	7.0 m TO w/ 3-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 18.29 m CSPC & End Sections		1				
55+860.00	Left	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 11.58 m CSPC & End Sections	1					
55+860.00	Right	4.5 m TO w/ 2-Unit Cattleguard & Type 2 Gate	With 1-610 mm x 10.36 m CSPC & End Sections	1					
55+900.00	CL	1-5-Unit Cattleguard	Connect New Fencing to New Cattleguard on Both Left & Right				1		
			Total	38	14	9	2	4	1

ITEM: 61701-5000: Guardrail System SGR04b, TYPE PDE02 w/SKT-350 End Treatment & Thrie Beam

Station to Station	Location	7.62m Standard Guardrail Section (Each)	15.24m End Section (Each)	5.715m Trie-Beam Section (Each)	Total Length (m)	Remarks
39+575.51 - 39+735.85	Right	17	2		160.020	Bridge N504
39+599.85 - 39+759.97	Left	17	2		160.020	Bridge N504
44+959.11 - 45+284.68	Left	39	2		327.660	
49+582.35 - 49+582.86	Right	7	1		68.580	Bridge N505
49+582.35 - 49+582.86	Right	1	1		22.860	Bridge N505
49+582.86 - 49+656.39	Right			1	5.715	Guardrail to Jersey Barrier Transition Thrie Beam
49+674.69 - 49+680.22	Right			1	5.715	Guardrail to Jersey Barrier Transition Thrie Beam
49+680.22 - 49+733.55	Right	5	1		53.340	Bridge N505
49+602.14 - 49+647.85	Left	4	1		45.720	Bridge N505
49+647.85 - 49+653.38	Left			1	5.715	Guardrail to Jersey Barrier Transition Thrie Beam
49+671.68 - 49+677.21	Left			1	5.715	Guardrail to Jersey Barrier Transition Thrie Beam
49+677.21 - 49+761.02	Left	9	1		83.820	Bridge N505
				TOTAL	944.880	

ITEM No. 61801-0000: CONCRETE JERESY BARRIER WITH TRANSITION BARRIER-N505

Station to Station	Location	3.048m Transition Concrete Barrier (Each)	6.096m Concrete Jersey Barrier (Each)	Total Length (m)	Remarks
49+656.38 - 49+674.69	Right	2	2	18.288	Bridge N505
49+653.38 - 49+671.68	Left	2	2	18.288	Bridge N505
			TOTAL	36.576	

ITEM No. 61901-3500; WILDLIFE CROSSING FENCE QUANTITY

Description:	Location:	Offset:	Length (m):	Remark:
Mainline Sta. 37+700.00 to 55+900.00	centerline	22.86 m, left	17,200.00	tie-in fencing at EOP
4.5m wide Turnout with 2-unit cattleguard; (22)-3.70m	varies	left	-81.40	Type 2 gate included
7.0m wide Turnout with 3-unit catteguard; (5)- 6.20m	varies	left	-31.00	Type 1 gate included
9.1m wide Turnout with 4-unit catteguard; (4)- 8.3m	varies	left	-33.20	Type 1 gate included
Type 1 gate only; (0)- 4.27m	varies	left	0.00	Type 1 gate only
Mainline Sta. 37+700.00 to 55+900.00	centerline	22.86 m, right	17,200.00	tie-in fencing at EOP
4.5m wide Turnout with 2-unit cattleguard; (18)-3.70m	varies	right	-66.60	Type 2 gate included
7.0m wide Turnout with 3-unit catteguard; (13)- 6.20m	varies	right	-80.60	Type 2 gate included
9.1m wide Turnout with 4-unit catteguard; (1)- 8.3m	varies	right	-8.30	Type 1 gate included; Chapter House access
Type 1 gate only; (4)- 4.27m	varies	right	-17.08	Type 1 gate only
		sub-total:	34,081.82	m
		Total:	35,104.27	m (3% added to account for terrain slope)

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

ESTIMATED QUANTITY
TABLES-SHEET 1

DRAWN BY: NRDOT DATE: 3/23/2015
DESIGNED BY: NRDOT DATE: 3/23/2015
REVISED: 2/27/2018 BY: Leroy.Toledo
Sht 06 N12 QtyTbls_1.dgn

I:\DESIGN\Users\DESIGN3\CURRENT PROJECTS\N35_Chinle\N12(19-4)\DESIGN DATA_020315\CADD Files\Sht 06 N12 QtyTbls_1.dgn

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	7	88

ITEM 20304-1000: REMOVAL OF STRUCTURES AND OBSTRUCTIONS

Station	Location	Description	REMARKS
39+652.28 to 39+674.38	CL	Existing Bridge Structure	
39+755.00 to 40+269.00	Rt.	Existing Barb Wire Fence Along R/W	Portions of Fencing is Outside the Right-Of-Way
39+743.00 to 40+416.00	Lt.	Existing Barb Wire Fence Along R/W	Portion of Existing is Outside the Right-Of-Way
49+900.00 to 51+110.00	Rt.	Existing Barb Wire Fence Along R/W	Portion of Existing is Outside the Right-Of-Way
49+654.95 to 49+677.13	CL	Existing Bridge Structure	
50+620.00 to 50+724.00	Lt.	Existing Barb Wire Fence Along R/W	Portions of Fencing is Outside the Right-Of-Way
52+640.00 to 52+820.00	Lt.	Existing Barb Wire Fence Along R/W	Portions of Fencing is Outside the Right-Of-Way
54+796.00 to 55+160.00	Lt.	Existing Barb Wire Fence Along R/W	Portions of Fencing is Outside the Right-Of-Way
55+283.00 to 55+323.00	Rt.	Existing Barb Wire Fence Along R/W	Portions of Fencing is Outside the Right-Of-Way
55+333.50 to 55+520.00	Rt.	Existing Barb Wire Fence Along R/W	Portions of Fencing is Outside the Right-Of-Way
55+800.00 to 55+848.50	Rt.	Existing Barb Wire Fence Along R/W	Portions of Fencing is Outside the Right-Of-Way

TEMPORARY STRAW MULCHING AND SEEDING, DRY METHOD

Station	Location	ITEM 15708-1000 MULCHING (ha)	ITEM 6510-1000 SEEDING (ha)	Remarks
38+700.00 to 55+900.00	Lt.	9.422	9.422	Subgrade Hinge Point to Catchpoints
38+700.00 to 55+900.00	Rt.	9.493	9.493	Subgrade Hinge Point to Catchpoints
38+922.00 to 39+034.00	Rt.	0.039	0.039	Existing Dirt Road Inside R/W
39+768.00 to 40+274.00	Rt.	0.163	0.163	Existing Dirt Road Inside R/W
39+884.00 to 40+366.00	Lt.	0.157	0.157	Existing Dirt Road Inside R/W
40+372.00 to 40+455.00	Lt.	0.069	0.069	Existing Dirt Road Inside R/W
40+419.00 to 40+573.00	Rt.	0.064	0.064	Existing Dirt Road Inside R/W
40+747.00 to 40+885.00	Lt.	0.033	0.033	Existing Dirt Road Inside R/W
43+617.00 to 43+656.00	Lt.	0.017	0.017	Existing Dirt Road Inside R/W
43+638.00 to 43+969.00	Lt.	0.080	0.080	Existing Dirt Road Inside R/W
48+088.00 to 48+139.00	Lt.	0.019	0.019	Existing Dirt Road Inside R/W
48+162.00 to 48+233.00	Lt.	0.017	0.017	Existing Dirt Road Inside R/W
48+203.00 to48+297.00	Rt.	0.036	0.036	Existing Dirt Road Inside R/W
48+247.00 to 48+352.00	Lt.	0.036	0.036	Existing Dirt Road Inside R/W
48+996.00 to 49+264.00	Lt.	0.064	0.064	Existing Dirt Road Inside R/W
49+876.00 to 49+927.00	Rt.	0.022	0.022	Existing Dirt Road Inside R/W
49+929.00 to 49+963.00	Lt.	0.011	0.011	Existing Dirt Road Inside R/W
50+014.00 to 50+121.00	Lt.	0.024	0.024	Existing Dirt Road Inside R/W
50+130.00 to 50+146.00	Lt.	0.004	0.004	Existing Dirt Road Inside R/W
50+142.00 to 50+639.00	Lt.	0.131	0.131	Existing Dirt Road Inside R/W
50+583.00 to 51+108.00	Rt.	0.171	0.171	Existing Dirt Road Inside R/W
50+694.00 to 50+810.00	Lt.	0.033	0.033	Existing Dirt Road Inside R/W
51+578.00 to 51+662.00	Lt.	0.016	0.016	Existing Dirt Road Inside R/W
51+671.00 to 52+165.00	Lt.	0.123	0.123	Existing Dirt Road Inside R/W
52+171.00 to 52+228.00	Rt.	0.016	0.016	Existing Dirt Road Inside R/W
52+412.00 to 52+752.00	Lt.	0.050	0.050	Existing Dirt Road Inside R/W
52+432.00 to 52+512.00	Rt.	0.014	0.014	Existing Dirt Road Inside R/W
52+637.00 to 52+651.00	Rt.	0.005	0.005	Existing Dirt Road Inside R/W
52+817.00 to 52+894.00	Lt.	0.009	0.009	Existing Dirt Road Inside R/W
53+195.00 to 53+243.00	Rt.	0.026	0.026	Existing Dirt Road Inside R/W
53+219.00 to 53+579.00	Lt.	0.061	0.061	Existing Dirt Road Inside R/W
54+162.00 to 54+212.00	Rt.	0.013	0.013	Existing Dirt Road Inside R/W
55+125.00 to 55+615.00	Rt.	0.124	0.124	Existing Dirt Road Inside R/W
55+264.00 to 55+386.00	Lt.	0.028	0.028	Existing Dirt Road Inside R/W
55+592.00 to 55+653.00	Lt.	0.015	0.015	Existing Dirt Road Inside R/W
	Total	20.609	20.609	

ITEM 60701-1000: REMOVE, CLEAN & SALVAGE EXISTING PIPE

Station	Offset	Decription	Length (m)
38+802.306	CL	Existing 762 mm CMP	22.60
38+898.791	CL	Existing 762 mm CMP	28.05
39+026.525	CL	Existing 1067 mm CMP	16.30
39+308.431	CL	Existing 762 mm CMP	16.61
39+438.157	CL	Existing 762 mm CMP	17.12
39+693.990	55.116 m Rt.	Existing 1524 mm CMP Under TO Rt	8.81
40+275.277	9.229 m Lt.	Existing 457 mm CMP Under TO Lt	11.71
40+473.937	CL	Existing 610 mm CMP	24.96
40+576.145	CL	Existing 610 mm CMP	28.88
40+718.411	CL	Existing 610 mm CMP	23.49
41+213.402	CL	Existing 914 mm CMP	34.62
41+601.738	CL	Existing 610 mm CMP	22.96
41+692.610	14.355 m Rt.	Existing 610 mm CMP Under TO Rt	17.99
41+838.804	CL	Existing 1676 mm CMP	24.93
42+141.516	9.028 m Lt.	Existing 610 mm CMP Under TO Lt	11.95
42+518.876	CL	Existing 610 mm CMP	20.19
42+681.778	CL	Existing 610 mm CMP	18.97
42+926.570	CL	Existing 1219 mm CMP	19.27
43+019.798	8.756 m Lt.	Existing 610 mm CMP Under TO Lt	11.38
43+248.492	CL	Existing 610 mm CMP	26.09
43+458.876	CL	Existing 610 mm CMP	16.81
43+816.820	CL	Existing 610 mm CMP	16.95
44+176.118	CL	Existing 610 mm CMP	19.36
44+381.967	CL	Existing 610 mm CMP	19.13
45+137.747	CL	Existing 610 mm CMP	24.49
45+264.603	CL	Existing 610 mm CMP	24.34
45+530.057	CL	Existing 610 mm CMP	27.23
45+671.172	CL	Existing 610 mm CMP	22.48
45+756.745	CL	Existing 610 mm CMP	16.98
46+081.485	CL	Existing 1676 mm CMP	16.72
46+280.465	CL	Existing 762 mm CMP	20.03
46+416.656	CL	Existing 610 mm CMP	16.56
46+583.976	CL	Existing 610 mm CMP	18.00
46+657.076	CL	Existing 610 mm CMP	18.31
46+804.970	CL	Existing 610 mm CMP	18.31
46+897.930	CL	Existing 610 mm CMP	18.28
47+203.930	CL	Existing 610 mm CMP	18.31
47+413.797	CL	Existing 610 mm CMP	18.15
47+549.792	CL	Existing 610 mm CMP	17.48
47+909.648	CL	Existing 1219 mm CMP	20.08
48+494.564	CL	Existing 1067 mm CMP	18.15
48+627.390	CL	Existing 610 mm CMP	16.05
48+654.921	21.527 m Lt.	Existing 610 mm CMP Under TO Lt	8.56
48+698.673	CL	Existing 1676 mm CMP	18.26
48+982.238	CL	Existing 1676 mm CMP	29.92
49+272.989	CL	Existing 610 mm CMP	18.16
49+904.358	6.821 m Lt.	Existing 254 mm CMP Under TO Lt	8.34
50+324.037	CL	Existing 610 mm CMP	17.56
50+566.514	CL	Existing 610 mm CMP	19.91
50+644.117	CL	Existing 1829 mm CMP	17.22
50+987.012	CL	Existing 610 mm CMP	27.08
51+039.906	16.323 m Lt.	Existing 762 mm CMP Under TO Lt	18.37
51+672.015	CL	Existing 610 mm CMP	19.51
52+476.017	CL	Existing 610 mm CMP	16.83
52+784.253	CL	Existing 1524 mm CMP	34.04
53+014.454	10.444 m Rt.	Existing 762 mm CMP Under TO Rt	9.00
53+118.244	14.499 m Lt.	Existing 610 mm CMP Under TO Lt	7.86
53+175.601	CL	Existing 610 mm CMP	16.59
53+257.167	13.729 m Rt.	Existing 457 mm CMP Under TO Rt	10.40
53+354.502	8.794 m Lt.	Existing 457 mm CMP Under TO Lt	11.58
53+478.822	16.040 m Rt.	Existing 457 mm CMP Under TO Rt	12.12
54+105.681	CL	Existing 914 mm CMP	29.84
54+159.982	11.023 m Rt.	Existing 610 mm CMP Under TO Rt	7.49
54+261.890	CL	Existing 1219 mm CMP	20.05
54+387.299	CL	Existing 610 mm CMP	17.67
54+739.838	15.117 m Rt.	Existing 457 mm CMP Under TO Rt	20.76
54+817.943	15.256 m Rt.	Existing 610 mm CMP Under TO Rt	20.03
54+953.242	10.140 m Rt.	Existing 610 mm CMP Under TO Rt	24.93
55+115.299	CL	Existing 610 mm CMP	17.63
55+221.693	CL	Existing 1219 mm CMP	18.60
55+350.242	CL	Existing 610 mm CMP	17.89
55+737.138	CL	Existing 1676 mm CMP	24.31
		TOTAL	1,369.56

EXISTING UTILITY LINES

STATION	LOCATION	DESCRIPTION	REMARKS
39+511.96	CL	Existing Powerline X-ing	Protect-in-Place
39+512.13	CL	Existing Powerline X-ing	Protect-in-Place
39+512.23	CL	Existing Powerline X-ing	Protect-in-Place
39+514.40	CL	Existing Powerline X-ing	Protect-in-Place
39+514.40	CL	Existing Telephone Line X-ing	Notify Owner
40+298.26	CL	Existing Powerline X-ing	Protect-in-Place
40+298.38	CL	Existing Powerline X-ing	Protect-in-Place
40+299.14	CL	Existing Telephone Line X-ing	Notify Owner
41+361.58	CL	Exist Waterline Line X-ing, Depth 1.4 m	Notify Owner
41+361.78	CL	Existing Powerline X-ing	Protect-in-Place
41+447.51	CL	Existing Powerline X-ing	Protect-in-Place
41+447.74	CL	Existing Powerline X-ing	Protect-in-Place
42+996.74	CL	Existing Powerline X-ing	Protect-in-Place
42+996.99	CL	Existing Powerline X-ing	Protect-in-Place
43+004.43	CL	Existing Powerline X-ing	Protect-in-Place
43+004.43	CL	Existing Telephone Line X-ing	Notify Owner
48+811.82	CL	Existing Powerline X-ing	Protect-in-Place
48+811.96	CL	Existing Powerline X-ing	Protect-in-Place
48+812.26	CL	Existing Powerline X-ing	Protect-in-Place
49+255.23	CL	Existing Powerline X-ing	Protect-in-Place
49+255.28	CL	Existing Powerline X-ing	Protect-in-Place
49+308.56	CL	Existing Waterline X-ing	Protect-in-Place
49+394.03	CL	Existing Powerline X-ing	Protect-in-Place
49+394.16	CL	Existing Powerline X-ing	Protect-in-Place
49+870.69	CL	Existing Powerline X-ing	Protect-in-Place
49+870.69	CL	Existing Powerline X-ing	Protect-in-Place
49+870.71	CL	Existing Powerline X-ing	Protect-in-Place
50+015.52	CL	Existing Waterline X-ing	Protect-in-Place
50+083.49	CL	Existing Powerline X-ing	Protect-in-Place
50+084.72	CL	Existing Powerline X-ing	Protect-in-Place
51+528.33	CL	Existing Waterline X-ing	Protect-in-Place
52+224.12	CL	Existing Waterline X-ing	Protect-in-Place
52+398.27	CL	Existing Powerline X-ing	Protect-in-Place
52+399.27	CL	Existing Powerline X-ing	Protect-in-Place
52+650.00	CL	Existing Waterline X-ing, Depth 2.96 m	Protect-in-Place
52+833.55	CL	Existing Powerline X-ing	Protect-in-Place
52+833.61	CL	Existing Powerline X-ing	Protect-in-Place
53+084.89	CL	Existing Powerline X-ing	Protect-in-Place
53+086.55	CL	Existing Powerline X-ing	Protect-in-Place
53+268.13	CL	Existing Powerline X-ing	Protect-in-Place
53+269.80	CL	Existing Powerline X-ing	Protect-in-Place
53+540.00	CL	Existing Waterline X-ing, Depth 1.99 m	Protect-in-Place
53+996.89	CL	Existing Powerline X-ing	Protect-in-Place
53+998.14	CL	Existing Powerline X-ing	Protect-in-Place
54+377.38	CL	Existing Powerline X-ing	Protect-in-Place
54+856.77	CL	Existing Powerline X-ing	Protect-in-Place
55+561.93	CL	Existing Powerline X-ing	Protect-in-Place
55+773.38	CL	Existing Powerline X-ing	Protect-in-Place

NOTE: Protection/Relocate REMARKS are assumed and based on the Best The Actual Work Required/Performed By The Utility Owner May Vary.

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NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

ESTIMATED QUANTITY TABLES-SHEET 2

DRAWN BY: NRDOT DATE: 3/15/2017
DESIGNED BY: NRDOT DATE: 3/15/2017
REVISED: 11/7/2017 BY: Leroy.Toledo
Sht 07 N12 QtyTbls_2.dgn

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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	8	88

ESTIMATED DRAINAGE STRUCTURE QUANTITIES

			CIRCULAR							PIPE ARCH					CIRCULAR-END SECTION					PIPE ARCH-END SECTION					SPP	SPPA	PC-CBC	PC-CBC	
			60201-0810	60201-0910	60201-1010	60201-1110	60201-1210	60201-1410	60201-1810	60202-0610	60202-0710	60202-0810	60202-0910	60202-1110	60210-0810	60210-0910	60210-1010	60210-1110	60210-1210	60211-1010	60211-1110	60211-1210	60211-1310	60211-1510	60302-0710	60302-0910	60304-0100	60304-0200	
			610 mm CSPC 68 x 13 mm Corr. 2.77 mm Thickness	762 mm CSPC 68 x 13 mm Corr. 2.77 mm Thickness	914 mm CSPC 68 x 13 mm Corr. 2.77 mm Thickness	1067 mm CSPC 68 x 13 mm Corr. 2.77 mm Thickness	1219 mm CSPC 68 x 13 mm Corr. 2.77 mm Thickness	1524 mm CSPC 127 x 25 mm Corr. 2.77 mm Thickness	2134 mm CSPC 127 x 25 mm Corr. 2.77 mm Thickness	889 mm S x 610 mm R CSPA 68 x 13 mm Corr. 2.77 mm Thickness	1067 mm S x 737 mm R CSPA 68 x 13 mm Corr. 2.77 mm Thickness	1245 mm S x 858 mm R CSPA 68 x 13 mm Corr. 2.77 mm Thickness	1448 mm S x 965 mm R CSPA 68 x 13 mm Corr. 2.77 mm Thickness	1803 mm S x 1194 mm R CSPA 68 x 13 mm Corr. 2.77 mm Thickness	End Section 610 mm CSPC 2.77 mm Thickness	End Section 762 mm CSPC 2.77 mm Thickness	End Section 914 m CSPC 2.77 mm Thickness	End Section 1067 m CSPC 2.77 mm Thickness	End Section 1219 m CSPC 2.77 mm Thickness	889 mm S x 610 mm R CSPA 3.55 mm Thickness	End Section 1067 mm S x 737 mm R CSPA 3.55 mm Thickness	End Section 1245 mm S x 858 mm R CSPA 3.55 mm Thickness	End Section 1448 mm S x 965 mm R CSPA 3.55 mm Thickness	End Section 1803 mm S x 1194 mm R CSPA 3.55 mm Thickness	End Section 152 x 25 mm Corr. 3.55 mm Thickness	2440 mm SPP 25 mm Corr. 3.55 mm Thickness	2616mm S x 1752 x 25 mm R SPPA 3.55 mm Thickness	17.37m Span x 3.25m Rise Pre-Cast Concrete Box Culvert With Wingwalls & Footings	17.37m Span x 3.25m Rise Pre-Cast Concrete Box Culvert With Wingwalls & Footings	
Station	Recommended Structure	Skew No.	m	m	m	m	m	m	m	m	m	m	m	m	m	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	m	m	m	m	
38+802.300	1-889 mm S x 610 mm R x 31.699 m CSPA	46.50									31.70										1									
38+898.800	1-610 mm x 37.795 m CSPC	45.27	37.80													1														
39+026.520	1-762 mm x 28.042 m CSPC	87.0		28.04													1													
39+308.440	1-762 mm x 26.882 m CSPC	90.0		26.88													1													
39+438.150	1-762 mm x 29.261 m CSPC	90.0		29.26													1													
39+665.570	1-17.37 m S x 3.249 R m x 28.04 m PC CPA, Bridge N504	99.0																										28.04		
39+780.000	1-610 mm x 25.00 m CSPC & End Sections Under T.O. Rt.	90.0	25.00													2														
40+280.000	1-610 mm x 20.73 m CSPC & End Sections Under T.O. Rt.	90.0	20.93													2														
40+370.000	1-610 mm x 15.00 m CSPC & End Sections, Under T.O. Lt.	90.0	15.00													2														
40+410.000	1-610 mm x 20.73 m CSPC & End Sections Under T.O. Rt.	90.0	20.73													2														
40+474.000	1-610 mm x 27.432 m CSPC	90.0	27.43													1														
40+576.000	1-610 mm x 33.528 m CSPC	87.0	33.53													1														
40+718.000	1-610 mm x 23.165 m CSPC	90.0	23.17													1														
40+745.000	1-610 mm x 12.19 m CSPC	90.0	12.19													1														
41+075.000	1-610 mm x 12.19 m CSPC & End Sections Under T.O. Rt.	90.0	12.19													2														
41+213.400	2-1219 mm x 47.549 m CSPC	90.0						95.10												2										
41+601.740	2-1067 mm S x 737 mm R x 25.603 m CSPA	90.0										51.21										2								
41+838.800	5-2616 mm S x 1803 mm R x 37.795 m SPPA w/ Conc. Slope Paving at Inlet	60.0																								188.98			
42+518.880	1-914 mm x 25.603 m CSPC	90.0			25.60													1												
42+681.780	1-610 mm x 27.432 m CSPC	90.0	27.43													1														
42+785.000	1-610 mm x 20.73 m CSPC & End Sections, Under T.O. Lt. CR320	90.0	20.73													2														
42+926.570	2-1067 mm x 26.213 m CSPC	90.0				52.43													2											
43+020.000	1-610 mm x 12.19 m CSPC & End Sections, Under T.O. Lt.	90.0	12.19													2														
43+248.500	4-1448 mm S x 965 mm R x 26.822 m CSPA	123.71											107.29											4						
43+458.880	2-610 mm x 20.117 m CSPC	90.0	20.12													2														
43+570.000	2-610 mm x 12.19 m CSPC & End Sections Under T.O. Rt.	90.0	12.19													2														
43+575.000	1-610 mm x 12.19 m CSPC & End Sections, Under T.O. Lt.	90.0	12.19													2														
43+816.820	3-1067 mm S x 737 mm R x 20.117 m CSPA	90.0										60.35										3								
44+176.120	2-762 mm x 29.261 m CSPC	90.0		58.52													2													
44+381.970	1-762 mm x 29.261 m CSPC	90.0		29.26													1													
45+137.750	1-610 mm x 32.920 m CSPC	90.0	32.92													1														
45+264.600	1-610 mm x 26.822 m CSPC	90.0	26.82													1														
45+530.000	1-610 mm x 25.604 m CSPC	90.0	25.60													1														
45+671.170	1-610 mm x 29.261 m CSPC	90.0	29.26													1														
45+756.750	1-762 mm x 23.165 m CSPC	90.0		23.17													1													
45+930.000	1-610 mm x 12.80 m CSPC & End Sections Under T.O. Rt.	90.0	12.80													2														
46+081.500	2-1219 mm x 28.651 m CSPC	90.0						57.30												2										
46+160.000	1-610 mm x 12.19 m CSPC & End Sections Under T.O. Rt.	90.0	12.19													2														
46+280.460	1-914 mm x 28.042 m CSPC	90.0			28.04													1												
46+416.650	1-914 mm x 29.261 m CSPC	90.0			29.26													1												
46+584.000	1-610 mm x 28.042 m CSPC	90.0	28.04													1														
46+644.040	1-17.37 m S x 3.249 m x 25.60 m PC CPA, Bridge N505	75.0																											25.60	
46+657.000	1-610 mm x 23.774 m CSPC	90.0	23.77													1														
46+805.000	1-610 mm x 25.603 m CSPC	90.0	25.60													1														
46+897.940	1-762 mm x 25.603 m CSPC	90.0		25.60													1													
47+203.950	2-762 mm x 27.432 m CSPC	90.0		54.86													2													
47+413.760	2-889 mm S x 610 mm R x 21.946 m CSPA	90.0									43.89										2									
47+549.770	2-1067 mm S x 737 mm R x 22.555 m CSPA	90.0										45.11										2								
47+909.650	1-1067 mm S x 737 mm R x 29.870 m CSPA	90.0										29.87										1								
48+240.000	1-610 mm x 12.19 m CSPC & End Sections, Under T.O. Lt.	90.0	12.19													2														
48+494.550	1-762 mm x 23.774 m CSPC	90.0		23.77													1													
48+627.380	1-889 mm S x 610 mm R x 20.726 m CSPA	90.0									20.73										1									
48+640.000	1-610 mm x 12.19 m CSPC & End Sections Under T.O. Rt. To Gravel Pit	90.0	12.19													2														
48+655.000	1-610 mm x 12.19 m CSPC & End Sections, Under T.O. Lt.	90.0	12.19													2														
48+698.630	2-1219 mm x 23.774 m CSPC	90.0						47.55												2										
48+982.220	1-2134 mm x 42.062 m CSPC w/ Concrere Slope Paving at Inlet	90.0							42.06																					
49+215.000	1-610 mm x 19.51 m CSPC & End Sections Under T.O. Rt.	90.0	19.51													2														
49+272.980	1-610 mm x 27.432 m CSPC	60.0	27.43													1														
49+330.000	1-610 mm x 20.12 m CSPC & End Sections, Under T.O. Lt.	90.0	20.12													2														
49+440.000	1-610 mm x 12.19 m CSPC & End Sections Under T.O. Rt.	90.0	12.19													2														
49+900.000	1-610 mm x 12.19 m CSPC & End Sections, Under T.O. Lt.	90.0	12.19													2														
49+970.000	1-610 mm x 20.73 m CSPC & End Sections, Under T.O. Lt.	90.0	20.73													2														
50+000.000	1-610 mm x 12.19 m CSPC & End Sections Under T.O. Rt.	90.0	12.19													2														
50+324.030	1-1067 mm S x 737 mm R x 20.117 m CSPA	90.0										20.12										1								
50+566.500	1-762 mm x 23.165 m CSPC	90.0		23.17													1													
50+580.000	1-610 mm x 11.58 m CSPC & End Sections Under T.O. Rt. To Open Field	90.0	11.58													2														
50+644.110	4-1524 mm x 27.432 m CSPC w/ Concrete Slope Paving at Inlet	90.0							109.73																					
50+987.000	1-762 mm x 44.501 m CSPC	45.0		44.50													1													
51+040.000	1-610 mm x 25.60 m CSPC & End Sections, Under T.O. Lt., Bus Route	90.0	25.60													2														
51+265.000	1-610 mm x 12.19 m CSPC & End Sections, Under T.O. Lt.	90.0	12.19													2														
51+666.000	1-610 mm x 12.19 m CSPC & End Sections, Under T.O. Lt.	90.0	12.19													2														
		Sub-Total	772.32	367.04	82.91	52.43	199.95	109.73	42.06	96.32	206.65	0.00	107.29	0.00	64	13	3	2	6	4	9	0	4	0	0.00	188.98	28.04	25.60		

CONTINUED ON NEXT SHEET

UNITED STATES
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NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

DRAINAGE STRUCTURE
QUANTIY TABLE

DRAWN BY: NRDOT	DATE: 3/23/2015
DESIGNED BY: NRDOT	DATE: 3/23/2015
REVISED: 3/14/2018	BY: Leroy.Toledo
Sht 08 N12 PipeStruct.dgn	

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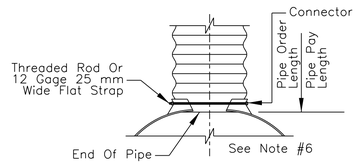
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	9	88

ESTIMATED DRAINAGE STRUCTURE QUANTITIES (Continued From Sheet 8)

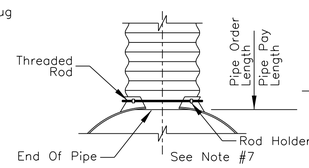
			CIRCULAR							PIPE ARCH					CIRCULAR-END SECTION					PIPE ARCH-END SECTION					SPP	SPPA	PC-CBC	PC-CBC	
			60201-0810	60201-0910	60201-1010	60201-1110	60201-1210	60201-1410	60201-1810	60202-0610	60202-0710	60202-0810	60202-0910	60202-1110	60210-0810	60210-0910	60210-1010	60210-1110	60210-210	60211-1010	60211-1110	60211-1210	60211-1310	60211-1510	60302-0710	60302-0910	60304-0100	60304-0200	
			610 mm x 2.77 mm Thickness	762 mm x 2.77 mm Thickness	914 mm x 2.77 mm Thickness	1067 mm x 2.77 mm Thickness	1219 mm x 2.77 mm Thickness	1524 mm x 2.77 mm Thickness	2134 mm x 2.77 mm Thickness	889 mm S x 610 mm R x 2.77 mm Thickness	1067 mm S x 737 mm R x 2.77 mm Thickness	1245 mm S x 838 mm R x 2.77 mm Thickness	1448 mm S x 965 mm R x 2.77 mm Thickness	1803 mm S x 1194 mm R x 2.77 mm Thickness	End Section 610 mm CSPC: 2.77 mm Thickness	End Section 762 mm CSPC: 2.77 mm Thickness	End Section 914 mm CSPC: 2.77 mm Thickness	End Section 1067 m CSPC: 2.77 mm Thickness	End Section 1219 m CSPC: 2.77 mm Thickness	889 mm S x 610 mm R CSPA 2.77 mm Thickness	1067 mm S x 737 mm R CSPA 2.77 mm Thickness	1245 mm S x 838 mm R CSPA 2.77 mm Thickness	1448 mm S x 965 mm R CSPA 3.55 mm Thickness	1803 mm S x 1194 mm R CSPA 3.55 mm Thickness	2440 mm SPP 3.55 mm Thickness	2616mm S x 1803mm R SPPA 3.55 mm Thickness	17.37m Span x 4.75m Rise Pre-Cast Concrete Box Culvert With Wingwalls & Footings	17.37m Span x 3.25m Rise Pre-Cast Concrete Box Culvert With Wingwalls & Footings	
Station	Recommended Structure	Skew No.	m	m	m	m	m	m	m	m	m	m	m	m	m	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	m	m	m	m	
51+672.000	1-610 mm x 26.822 m CSPC	90.0	26.82													1														
52+476.000	2-1067 mm S x 737 mm R x 20.117 m CSPA	90.0										40.23										2								
52+663.000	1-610 mm x 12.19 m CSPC & End Sections, Under T.O. Lt.	90.0	12.19													2														
52+663.000	1-610 mm x 20.72 m CSPC & End Sections Under T.O. Rt., Bus Rt. N8078	90.0	20.72													2														
52+780.000	2-2438 mm x 43.891 m SPP	90.0																									87.782			
53+015.000	1-610 mm x 12.19 m CSPC & End Sections Under T.O. Rt.	90.0	12.19													2														
53+118.000	1-610 mm x 12.19 m CSPC & End Sections, Under T.O. Lt.	90.0	12.19													2														
53+175.600	1-610 mm x 21.946 m CSPC	90.0	21.95													1														
53+256.000	1-610 mm x 12.19 m CSPC & End Sections Under T.O. Rt.	90.0	12.19													2														
53+355.000	1-610 mm x 12.19 m CSPC & End Sections, Under T.O. Lt.	90.0	12.19													2														
53+470.000	1-610 mm x 12.19 m CSPC & End Sections Under T.O. Rt.	90.0	12.19													2														
54+010.000	3-1245 mm S x 838 mm R x 39.624 CSPA	135.0											118.87										3							
54+040.000	2-1802 mm S x 1194 mm R x 11.58 m CSPA & End Sections, Under T.O. Rt.	90.0													23.16										2					
54+110.000	1-610 mm x 17.07 m CSPC & End Sections, Under T.O. Lt.	90.0	17.07													2														
54+105.680	4-1245 mm S x 838 mm R x 53.035 m CSPA	140.0											212.14										4							
54+262.000	1-610 mm x 34.138 m CSPC	140.0	34.14													1														
54+308.000	1-610 mm x 12.19 m CSPC & End Sections Under T.O. Rt.	90.0	12.19													2														
54+387.300	1-610 mm x 19.507 m CSPC	90.0	19.51													1														
54+400.000	1-610 mm x 12.19 m CSPC & End Sections Under T.O. Rt.	90.0	12.19													2														
54+595.000	1-610 mm x 22.56 m CSPC & End Sections, Under T.O. Lt., School Access	90.0	22.56													2														
54+615.000	4-1803 mm S x 1193 mm R x 17.680 m CSPA, T.O. Rt. w/ Conc. Headwall at Inlet	90.0													70.72															
54+720.000	4-1803mm S x 1194 mm R x 15.850 m CSPA, T.O. Rt. w/ Conc. Headwall at Inlet	90.0													63.40															
54+817.32	4-1803mm S x 1194 mm R x 15.850 m CSPA, T.O. Rt. w/ Conc. Headwall at Inlet	90.0													63.40															
54+890.000	1-610 mm x 12.19 m CSPC & End Sections, Under T.O. Lt.	90.0	12.19													2														
54+952.000	4-1803mm S x 1194 mm R x 15.850 m CSPA, T.O. Rt. w/ Conc. Headwall at Inlet	90.0													63.40															
54+952.000	1-610 mm x 12.19 m CSPC & End Sections, Under T.O. Lt.	90.0	12.19													2														
55+115.000	4-1803 mm S x 1194 mm R x 33.528 m CSPA	135.0													134.11										4					
55+221.690	1-762 mm x 26.822 m CSPC	90.0		26.82													1													
55+327.000	1-610 mm x 20.73 m CSPC & End Sections Under T.O. Rt. To NHA Housing	90.0	20.73													2														
55+350.240	1-610 mm x 21.945 m CSPC	90.0	21.95													1														
55+737.140	4-1067 mm S x 737 mm R x 26.822 m CSPA	90.0										107.29										4								
55+786.000	1-610 mm x 20.73 m CSPC & End Sections Under T.O. Rt. To Church	90.0	20.73													2														
55+860.000	1-610 mm x 12.19 m CSPC & End Sections Under T.O. Rt.	90.0	12.19													2														
	Sub-Total		360.26	26.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	147.52	331.01	0.00	418.19	37	1	0	0	0	0	6	7	0	6	87.78	0.00	0.00	0.00	
	Sub-Total from Sheet 8		772.32	367.04	82.91	52.43	199.95	109.73	42.06	96.32	206.65	0.00	107.29	0.00	64	13	3	2	6	4	9	0	4	0	0.00	188.98	28.04	26.82	
	Grand Total		1,132.58	393.86	82.91	52.43	199.95	109.73	42.06	96.32	354.18	331.01	107.29	418.19	101	14	3	2	6	4	15	7	4	6	87.78	188.98	28.04	26.82	

GENERAL NOTES

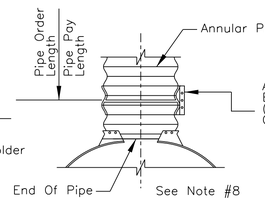
1. FOR MULTIPLE INSTALLATION OF ALL TYPES, A MINIMUM OF A 610 mm SPACING MEASURED ALONG THE HORIZONTAL BETWEEN FLARED END SECTIONS AT THEIR WIDEST CROSS SECTION SHALL BE USED.
2. ALL THREE (3) PIECE BODIES TO HAVE 2.77 mm THICKNESS SIDES AND 3.5 mm THICKNESS CENTER PANELS. WIDTH OF CENTER PANELS TO BE GREATER THAN 20% OF THE PIPE PERIPNERY. 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 mmø THRU 2134 mmø 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 mmø THRU 1829 mmø, AND 64 mm x 64 mm x 6.35 mm FOR 1981 mmø AND 2134 mmø. THE ANGLES TO BE ATTACHED BY 9.53 mmø 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 mmø ROUND PIPE & 711 mm x 308 mm CSPA.
7. TYPE NO. 2 STEEL END SECTION. CONNECT END SECTION WITH THREADED ROD WITH ROD HOLDER, FOR 762 mmø AND 914 mmø 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 mmø THRU 2134 mmø. GAGES OF CONNECTOR SECTION SHALL BE THE SAME AS THE END SECTIONS AS MENTION ABOVE. THE CONNECTOR SECTION WILL BE ATTACHED TO THE END SECTION BY 9.5 mmø GALVANIZED RIVETS OR BOLTS APPROXIMATELY 152mm 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 mmø GALVANIZED STEEL RIVETS OR BOLTS SPACED AT APPROXIMATELY 152mm 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



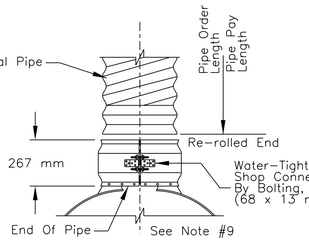
TYPE NO. 1



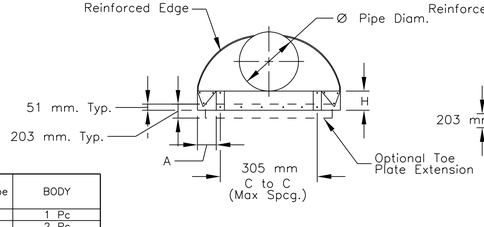
TYPE NO. 2



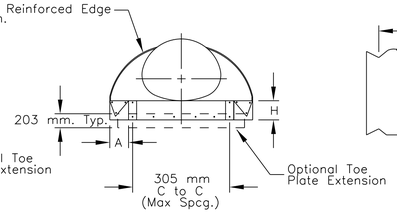
TYPE NO. 3



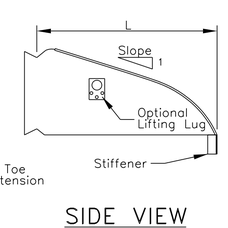
TYPE NO. 5



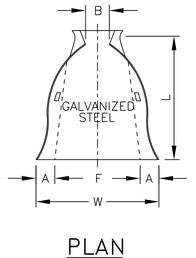
ELEVATION



ELEVATION



SIDE VIEW



PLAN

ROUND PIPE END SECTION - ALUMINUM COATED, TYPE 2

Pipe Diam (mm)	Thickness (mm)	DIMESIONS A (25 mm=)	B (Max.)	H (25 mm±)	F (mm)	L (38 mm±)	W Max Width	Approx. Slope	BODY
610	1.6	229	330	152	1168	1041	1829	2 1/2	1 Pc
762	2	279	406	203	1397	1295	2235	2 1/2	2 Pc
914	2	330	482	229	1778	1524	2665	2 1/2	2 Pc
1067	2.8	381	635	254	2083	1753	3098	2 1/2	2 Pc
1219	2.8	432	736	305	2235	1981	3327	2 1/4	3 Pc

ARCH PIPE END SECTION - ALUMINUM COATED, TYPE 2

SPAN* *68 mm 13 mm	RISE *76 mm 25 mm	Thick ness (mm)	DIMESIONS A (25 mm±)	B (Max.)	H (25 mm±)	F (mm)	L (38 mm±)	W Max Width	Approx. Slope	BODY
711 x 508		1.6	177	406	152	1168	813	1778	2 1/2	1 Pc
890 x 610		2.0	229	406	152	1473	991	2159	2 1/2	1 Pc
1067 x 737		2.0	279	457	178	1854	1168	2642	2 1/2	2 Pc

* CORRUGATION DIMENSION

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NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

CULVERT END SECTION DETAILS, GENERAL NOTES AND TABLES

DRAWN BY: NRDOT	DATE: 12/8/2009
DESIGNED BY: NRDOT	DATE: 12/8/2009
REVISED: 9/5/2013	BY: Leroy.Toledo
SHEET SIZE: Full Size (24x36) Plot Sheet	

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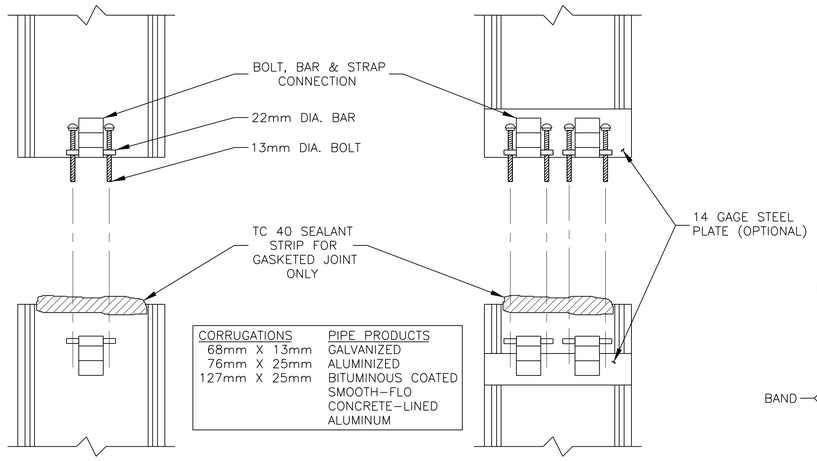
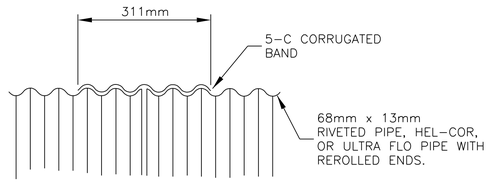
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	10	88



CONNECTION DETAIL
SINGLE BOLT, BAR & STRAP

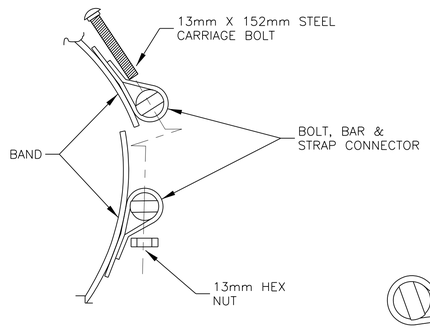
CONNECTION DETAIL
DOUBLE BOLT, BAR & STRAP

H-10 HUGGER BAND



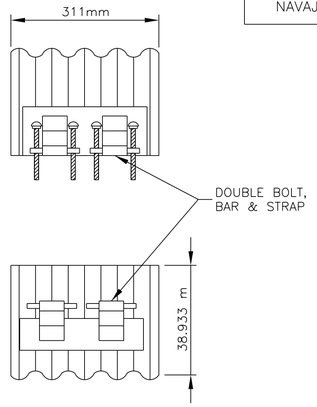
SECTION

CORRUGATIONS	PIPE PRODUCTS
68mm X 13mm ULTRA FLO	GALVANIZED ALUMINIZED BITUMINOUS COATED FIBER-BONDED

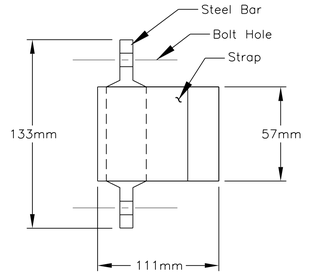


CONNECTION DETAIL
BOLT, BAR & STRAP

STRAP DETAIL



CONNECTION DETAIL



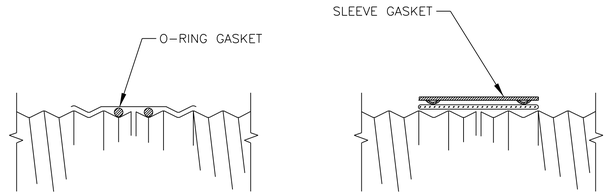
TOP VIEW
BAR & STRAP

GENERAL NOTES

1. CARE SHALL BE TAKEN THAT NO FOREIGN MATERIAL IS ALLOWED TO ENTER BETWEEN THE OUTER PIPE SURFACE AND THE INSIDE OF THE BAND.
2. TIGHTENING OF THE BOLTS MAY BE ACCOMPLISHED WITH THE USE OF SPANNER OR SOCKETHEAD DEEPWELL WRENCHES, EITHER MANUAL OR POWER. FASTENERS SHOULD BE TIGHTENED UNIFORMLY TO PREVENT UNEVEN COMPRESSION AGAINST THE PIPE WALL. FELTON BAND PULLER SHALL BE USED TO TIGHTEN BAND ON LARGER DIAMETER STRUCTURES, WHICH QUICKLY DRAWS THE BAND CONNECTORS TOGETHER TO FACILITATE BOLT AND NUT TIGHTENING. BOLTS SHOULD BE TIGHENED TO THE RECOMMENDED TORQUE OF 25-30 FT/LBS.
3. BANDS FOR PIPE-ARCH ARE THE SAME AS FOR EQUIVALENT DIAMETER ROUND PIPE.
4. BANDS ARE NORMALLY FURNISHED AS FOLLOWS:

   305mm THRU 1219mm; 1-PIECE
   1372mm THRU 2438mm; 2-PIECE
   2591mm THRU 3658mm; 3-PIECE

5. BAND FASTENERS ARE ATTACHED WITH SPOT WELDS, RIVETS OR HAND WELDS. ALL ALUMINUM BANDS ARE FURNISHED WITH A 14-GAGE ALUMINUM BACK-UP PLATE WELDED TO THE BAND AND THE STRAP.
6. THE GASKET AND BAND INSTALLATION SHALL BE ASSEMBLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. A REPRESENTATIVE OF THE MANUFACTURER MAY BE PRESENT AT THE SITE DURING INSTALLATION.
7. THE COST OF SUPPLYING ALL MATERIALS AND INSTALLATION OF THE GASKET AND BAND ASSEMBLY SHALL BE INCLUDED IN THE BID ITEMS 602, 603, AND 607.
8. ANY RELATED PATENT RIGHTS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AS PER SECTION 107.01 OF THE FP-14.



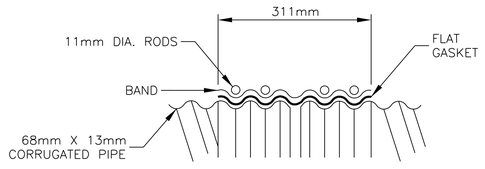
HUGGER TYPE

UNIVERSAL TYPE

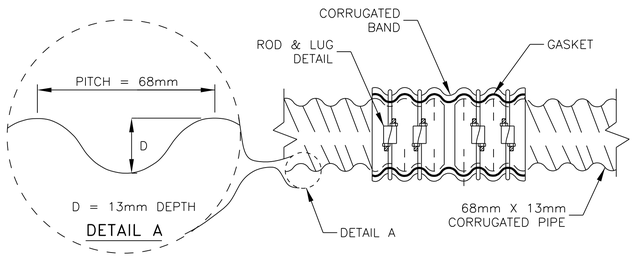
CORRUGATED

TYPICAL GASKET/BAND COUPLERS

5-C CORRUGATED BAND



SECTION



5-C CORRUGATED BAND
SIDE VIEW

FLAT GASKET INSTALLATION GUIDELINES

1. CLEAN THE PIPE EDGES.
2. APPLY LIBERAL AMOUNT OF LUBRICANT TO THE FIRST TWO ANNULAR CORRUGATIONS ON THE OUTSIDE OF THE PIPE.
3. SNAP THE FLAT GASKET INTO POSITION SUCH THAT THE GASKET COVERS THE FIRST ANNULAR CORRUGATION OR THE RECORRUGATED END. HALF OF THE GASKET WILL BE HANGING OVER THE END OF THE PIPE.
4. FOLD THE REMAINING HALF OF THE GASKET THAT IS EXTENDED OVER THE PIPE END BACK OVER THE SECTION OF THE GASKET POSITIONED ON THE END OF THE PIPE.
5. APPLY A LIBERAL AMOUNT OF LUBRICANT TO THE ENTIRE INNER SURFACE OF THE BAND.
6. PLACE THE BAND INTO POSITION ON THE INSTALLED LENGTH OF PIPE SO THAT THE NEXT LENGTH OF PIPE CAN BE INDEXED CORRECTLY AND THE FLAT GASKET ROLLED OVER THE SECOND PIPE END.
7. APPLY A LIBERAL AMOUNT OF LUBRICANT TO THE END OF THE SECOND LENGTH OF PIPE.
8. PLACE THE SECOND LENGTH OF PIPE INTO POSITION. THE TWO PIPE LENGTHS MUST BE POSITIONED PROPERLY FOR THE GASKET TO FIT OVER, AND THE BAND TO INDEX, ONTO THE SECOND PIPE END.
9. UNFOLD THE GASKET INTO POSITION OVER THE SECOND LENGTH OF PIPE. TAKE CARE TO INSURE THAT THE GASKET FITS OVER THE END OF THE SECOND PIPE SECTION. ALSO, THE BAND MUST BE INDEXED INTO THE PROPER ANNULAR CORRUGATION ON EACH LENGTH OF PIPE.
10. CHECK THE COMPLETE PERIPHERY OF THE PIPE TO INSURE THAT THE GASKET IS CENTERED EVENLY ON THE TWO LENGTHS OF PIPE.
11. SLIDE THE BAND INTO POSITION AND TIGHTEN THE BOLTS. FOR MAXIMUM COMPRESSION OF THE GASKET, THE BAND CORRUGATIONS MUST BE FULL SEATED INTO THE PROPER CORRUGATION ON EACH PIPE END. THIS WILL INSURE THAT THE PIPE LENGTHS ARE POSITIONED PROPERLY FOR THE GASKET.

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NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

GASKET/HUGGER BAND DETAILS

DRAWN BY: NRDOT	DATE: 3/12/2014
DESIGNED BY: NRDOT	DATE: 3/12/2014
REVISED: 7/16/2015	BY: Leroy.Toledo
Sht 10 N12 Gasket HBand Details_070815.dgn	

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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	11	88

Sta. 38+431.00, Lt. Turnout, Go West 0.125 Mile Right Side Of Dirt Road, Merchantable Timber Stockpile For Community Firewood. Contractor Shall Stay Within The Orange Flag Limits.

Sta. 38+898.791, CL, Existing 1-762 mm x 28.05 CSPC Remove, Cleaned, Salvage & Stockpile.

Sta. 38+802.306, CL, Existing 1-762 mm x 22.86 m CSPC Remove, Cleaned, Salvage & Stockpile.

Sta. 38+600.000 to Sta. 39+782.000, Lt. Mulch and Seed Existing Road.

Sta. 38+670.00 To 38+700.00 Taper Existing Roadway Section Into New Roadway Section. Transition Existing Ditch Into New Ditch.

Sta. 38+700.000, CL Install New 5-Unit Cattleguard As Shown. Connect New Right-Of-Way Fence To New Cattleguard On Left & Right As Shown.

C1
PI 38+985.651
A 40°21'58" Lt
R 585.000
L 412.146
T 215.042
E 38.272
N 580051.077
E 308739.833

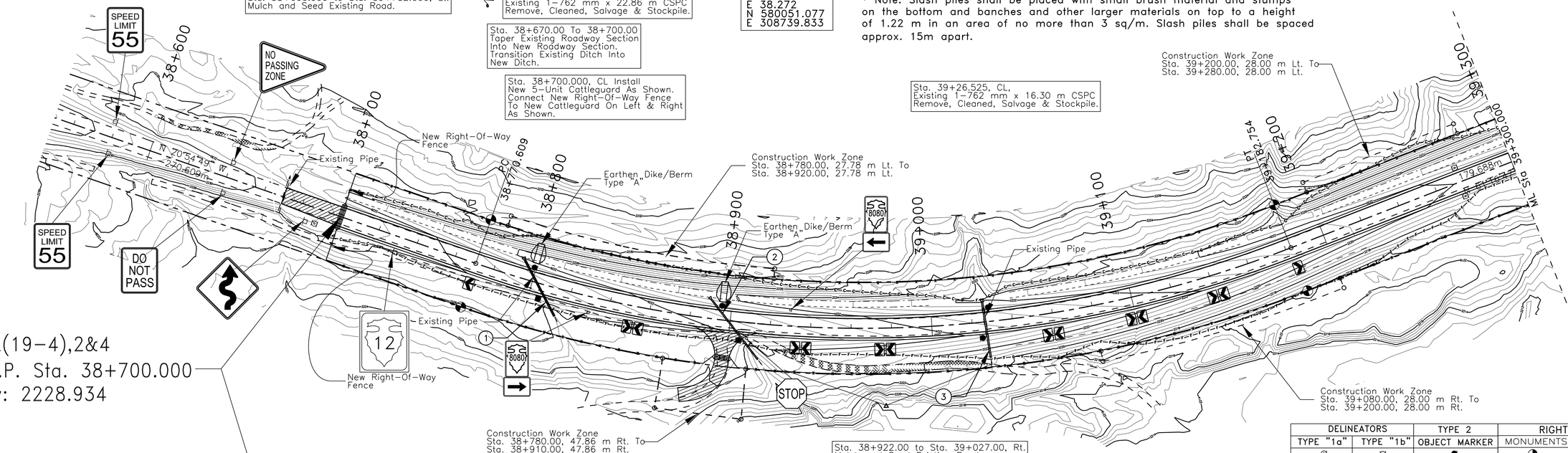
Legend *

Slash and/or Timber Stockpiling Locations

* Note: Slash piles shall be placed with small brush material and stumps on the bottom and banches and other larger materials on top to a height of 1.22 m in an area of no more than 3 sq/m. Slash piles shall be spaced approx. 15m apart.

Sta. 39+26.525, CL, Existing 1-762 mm x 16.30 m CSPC Remove, Cleaned, Salvage & Stockpile.

Construction Work Zone Sta. 39+200.00, 28.00 m Lt. To Sta. 39+280.00, 28.00 m Lt.



N12(19-4),2&4
B.O.P. Sta. 38+700.000
Elev: 2228.934

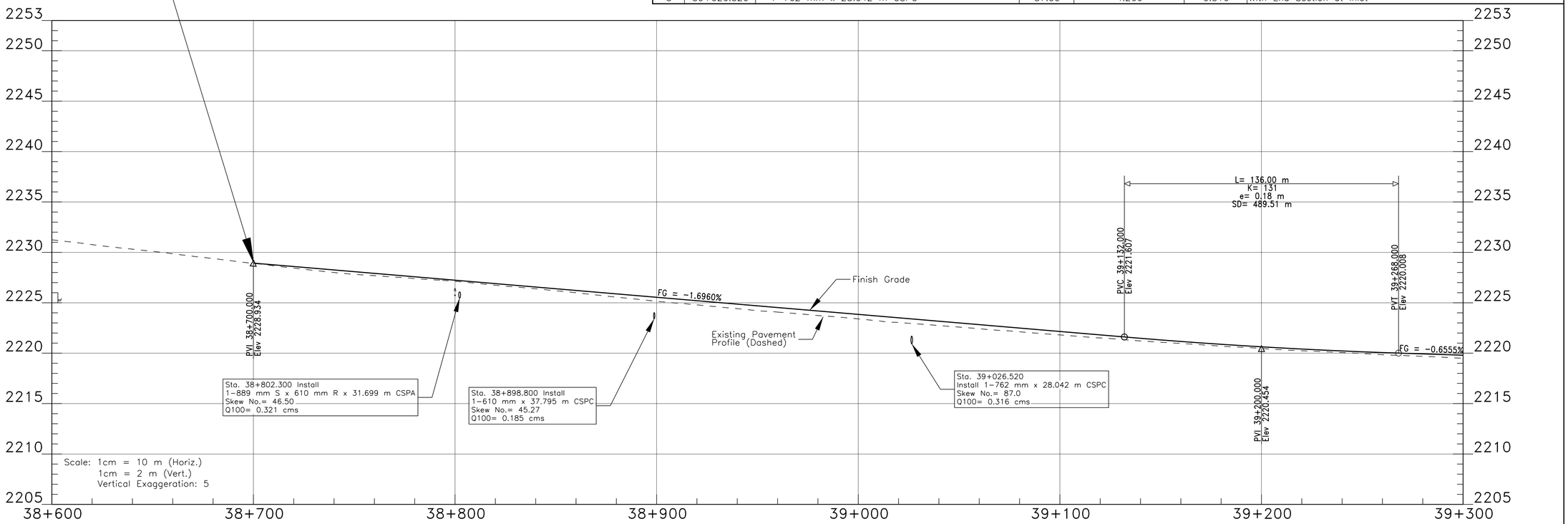
SCALE: Meters
0 20 40 60 80 100

Sta. 38+898.000, Rt. Construct Turnout 7.0 m Wide 3 Unit Cattle Guard With Type 2 Gate.

DELINEATORS		TYPE 2	RIGHT-OF-WAY	
TYPE "1a"	TYPE "1b"	OBJECT MARKER	MONUMENTS	MARKERS
⊠	⊠	●	◔	--NO SYMBOL--
0	3	6	4	4

DRAINAGE STRUCTURE TABLE

Mark	Station	Structure	Skew No.	Drainage Area (ha)	Q100 (cms)	Remarks
1	38+802.300	1-889 mm S x 610 mm R x 31.699 m CSPA	46.50	2.928	0.321	With End Section at Inlet & Type "A" Earthen Dike/Berm at Inlet
2	38+898.800	1-610 mm x 37.795 m CSPC	45.27	2.500	0.185	With End Section at Inlet & Type "A" Earthen Dike/Berm at Inlet
3	39+026.520	1-762 mm x 28.042 m CSPC	87.00	4.266	0.316	With End Section at Inlet



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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	12	88

Sta. 39+308.431, CL,
Existing 1-762 mm x 16.60 m CSPC
Removed, Cleaned, Salvage & Stockpiled.

Sta. 39+438.157, CL,
Existing 1-762 mm x 17.12 m CSPC
Removed, Cleaned, Salvage & Stockpiled.

Sta. 39+470.00, Lt. Construct
Turnout 4.5 m Wide 2 Unit
Cattle Guard With Type 2 Gate.

Sta. 39+512.226 m Existing Powerline
X-ing. Clearance: 10.627 m To Grade
The Contractor Shall Protect In-Place.

Sta. 39+665.54, CL, Construct
1-17.37 m S x 3.25 m R x 28.04 m Precast
Concrete Arch Pipe, Skew No. 99
See Sheet 75 to 88 For Arch Pipe Construction
Details. Existing Bridge To Be Demolished.
See Sheet 39 of 88 For Detour Plan.

Sta. 39+514.00 m Existing
Telephone X-ing.
Clearance: 13.92 m To Grade

Sta. 39+514.400, Existing Powerline
X-ing. Clearance: 14.53 m To Grade
The Contractor Shall Protect In-Place.

Sta. 39+512.127, Existing Powerline
X-ing. Clearance: 11.744 m To Grade
The Contractor Shall Protect In-Place.

Sta. 39+511.965 m Existing Powerline
X-ing. Clearance: 5.407 m To Grade
The Contractor Shall Protect In-Place.

Sta. 39+599.95 to 39+652.24, Lt.
Install Wire Enclosed Riprap In Cut-Fill
Transition As Shown. See Sheet 60 of 88
For Details.

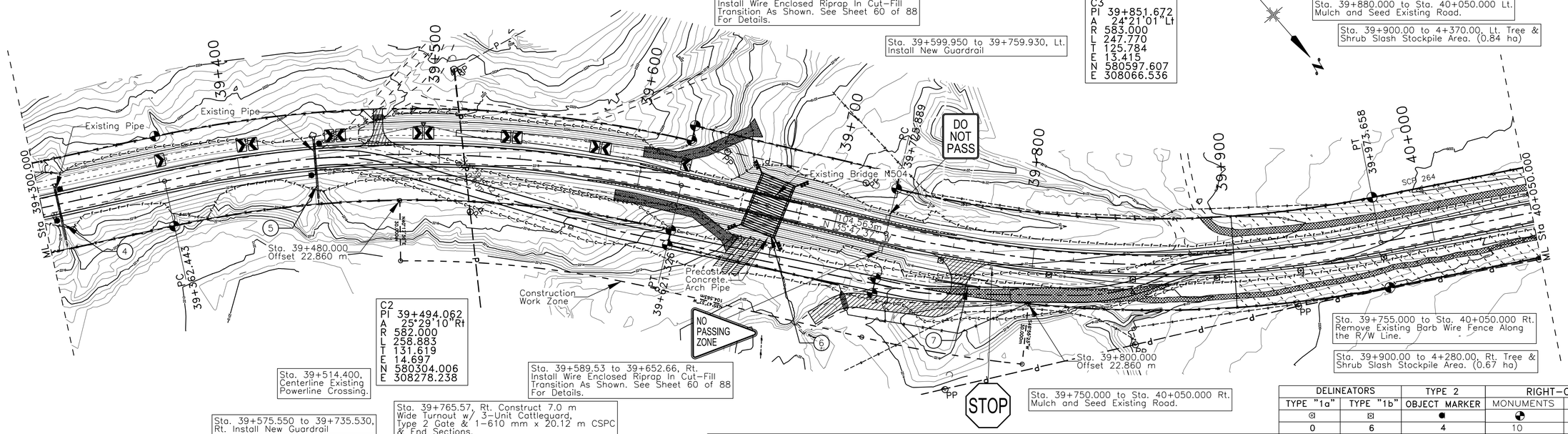
Sta. 39+599.950 to 39+759.930, Lt.
Install New Guardrail

C3
PI 39+851.672
A 24°21'01" Lt
R 583.000
L 247.770
T 125.784
E 13.415
N 580597.607
E 308066.536

Sta. 39+743.000 to Sta. 40+050.000 Lt.
Remove Existing Barb Wire Fence
Along the R/W Line.

Sta. 39+880.000 to Sta. 40+050.000 Lt.
Mulch and Seed Existing Road.

Sta. 39+900.00 to 4+370.00, Lt. Tree &
Shrub Slash Stockpile Area. (0.84 ha)



C2
PI 39+494.062
A 25°29'10" Rt
R 582.000
L 258.883
T 131.619
E 14.697
N 580304.006
E 308278.238

Sta. 39+514.400,
Centerline Existing
Powerline Crossing.

Sta. 39+589.53 to 39+652.66, Rt.
Install Wire Enclosed Riprap In Cut-Fill
Transition As Shown. See Sheet 60 of 88
For Details.

Sta. 39+575.550 to 39+735.530,
Rt. Install New Guardrail

Sta. 39+765.57, Rt. Construct 7.0 m
Wide Turnout w/ 3-Unit Cattleguard,
Type 2 Gate & 1-610 mm x 20.12 m CSPC
& End Sections.

Sta. 39+750.000 to Sta. 40+050.000 Rt.
Mulch and Seed Existing Road.

Sta. 39+755.000 to Sta. 40+050.000 Rt.
Remove Existing Barb Wire Fence Along
the R/W Line.

Sta. 39+900.00 to 4+280.00, Rt. Tree &
Shrub Slash Stockpile Area. (0.67 ha)

Sta. 39+440.00 to 39+500.00, Rt. Contractor Shall
Construct Temporary Detour Road With Temporary Drainage
Structures As Shown Prier To Existing Bridge Demolition And
Installation Of New Pre-Cast Pipe Arch.
See Sheet 39 of 88 For Details.

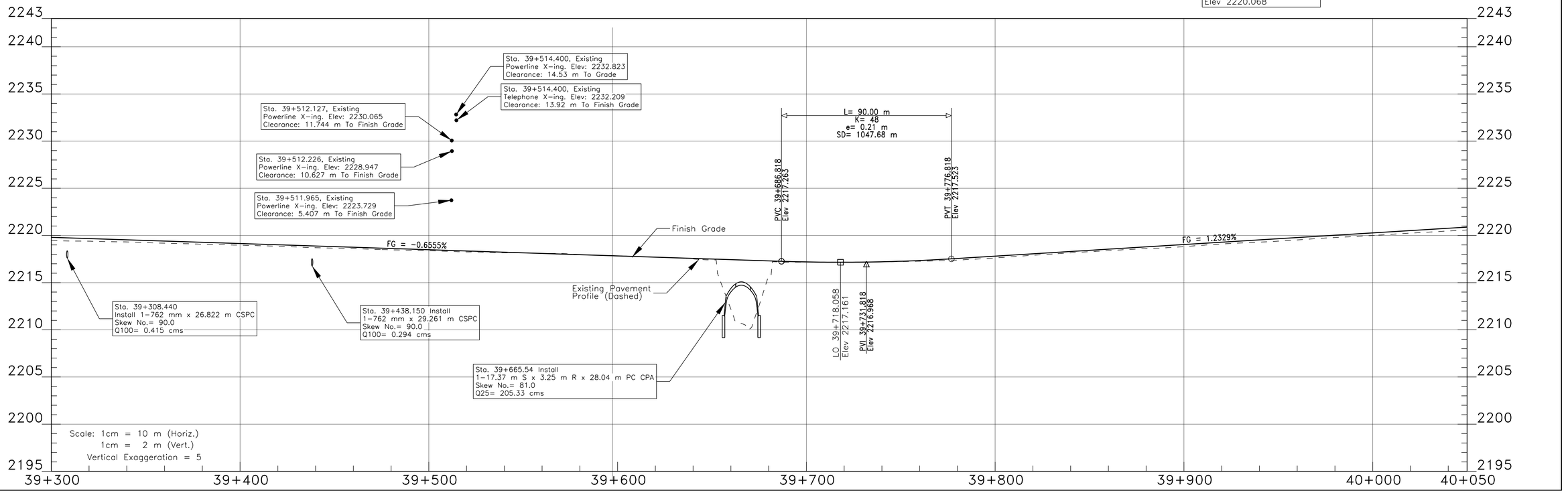
SCALE: Meters
0 20 40 60 80 100

DELINEATORS		TYPE 2	RIGHT-OF-WAY	
TYPE "1a"	TYPE "1b"	OBJECT MARKER	MONUMENTS	MARKERS
⊠	⊠	●	◒	--NO SYMBOL--
0	6	4	10	10

DRAINAGE STRUCTURE TABLE

Mark	Station	Structure	Skew No.	Drainage Area (ha)	Q25 (cms)	Q100 (cms)	Remarks
4	39+308.440	1-762 mm x 26.822 m CSPC	90.0	5.590		0.415	With End Section At Inlet
5	39+438.150	1-762 mm x 29.261 m CSPC	90.0	3.452		0.294	With End Section At Inlet
6	39+665.54	1-17.37 m S x 3.25 m R x 28.04 m PC CPA	99.0	13,136.000	205.326		With Pre-Cast Wingwall & Footing @ Inlet & Outlet
7	39+765.570	1-610 mm x 20.120 m CSPC	90.0	0.967		0.067	CSPC Under T/O w/2-End Sections

Sta. 39+998.00 SCP 264
Offset 21.749 m Lt.
Elev 2220.068



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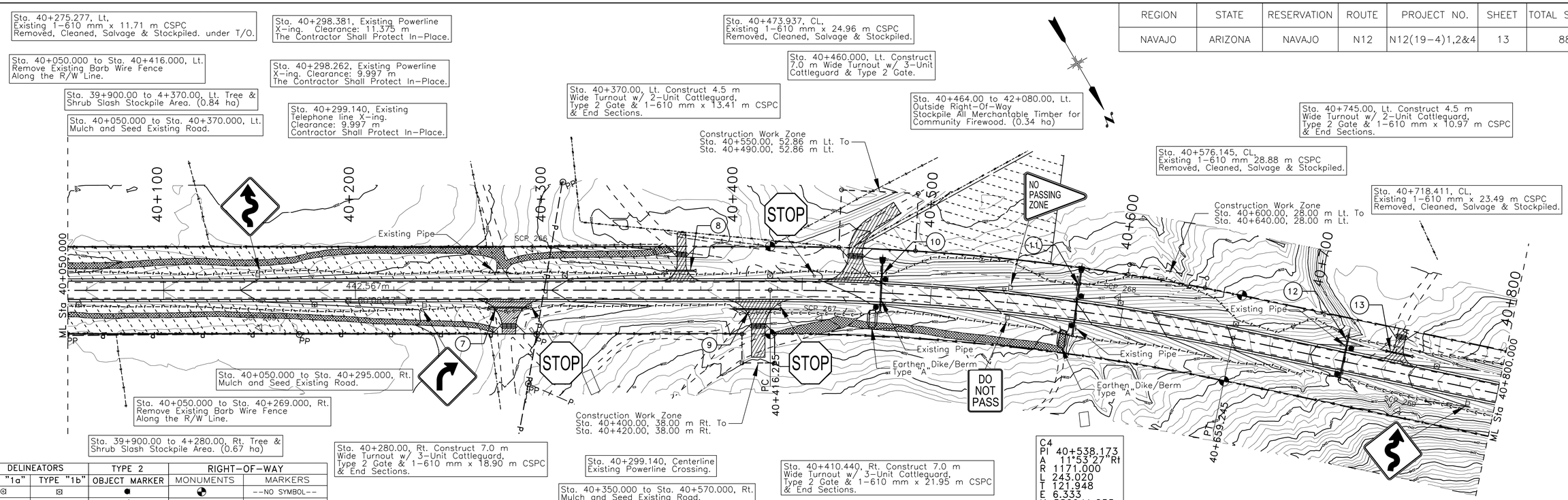
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	13	88

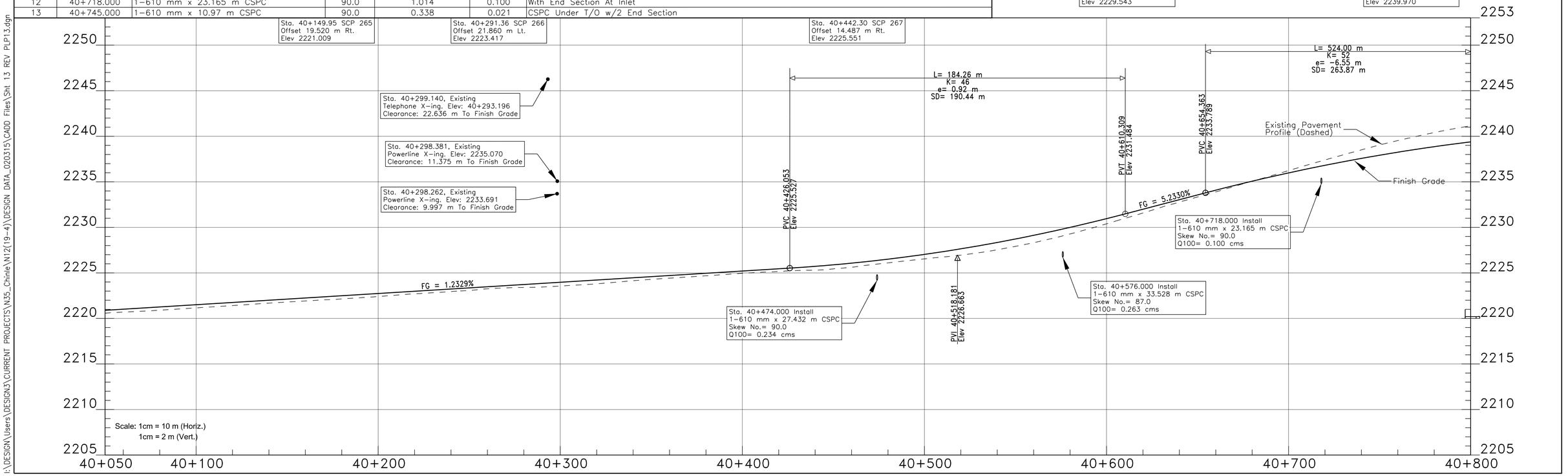


DELINEATORS		TYPE 2	RIGHT-OF-WAY	
TYPE "1a"	TYPE "1b"	OBJECT MARKER	MONUMENTS	MARKERS
⊙	⊡	●	◔	--NO SYMBOL--
0	7	6	4	4

DRAINAGE STRUCTURE TABLE

Mark	Station	Structure	Skew No.	Drainage Area (ha)	Q100 (cms)	Remarks
7	40+280.000	1-610 mm x 18.90 m CSPC	90.0	0.967	0.067	CSPC Under T/O w/2 End Section
8	40+370.000	1-610 mm x 13.41 m CSPC	90.0	0.132	0.008	CSPC Under T/O w/2 End Section
9	40+410.440	1-610 mm x 21.95 m CSPC	90.0	0.967	0.067	CSPC Under T/O w/2 End Section
10	40+474.000	1-610 mm x 27.432 m CSPC	90.0	2.211	0.234	With End Section At Inlet, Type "A" Earthen Dike/Berm at Inlet & Place Riprap Stilling Basing at Outlet
11	40+576.000	1-610 mm x 33.528 m CSPC	87.0	2.741	0.263	With End Section At Inlet, Type "A" Earthen Dike/Berm at Inlet & Place Riprap Stilling Basing at Outlet
12	40+718.000	1-610 mm x 23.165 m CSPC	90.0	1.014	0.100	With End Section At Inlet
13	40+745.000	1-610 mm x 10.97 m CSPC	90.0	0.338	0.021	CSPC Under T/O w/2 End Section

SCALE: Meters
0 20 40 60 80 100



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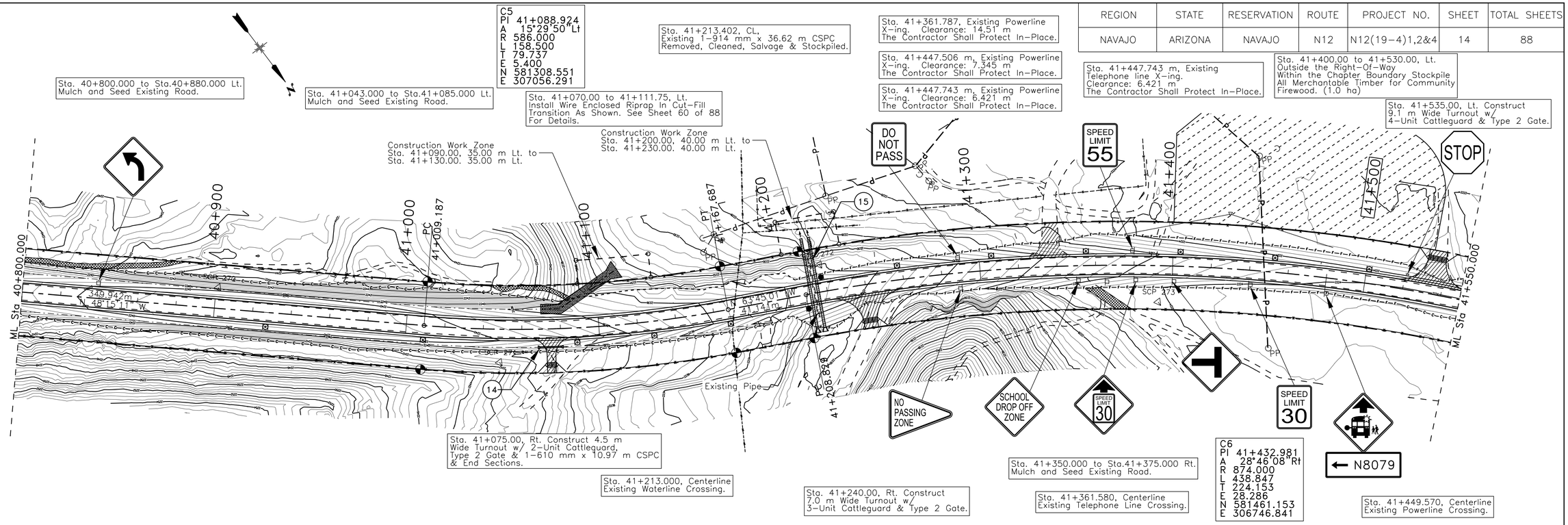
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	14	88



SCALE: Meters
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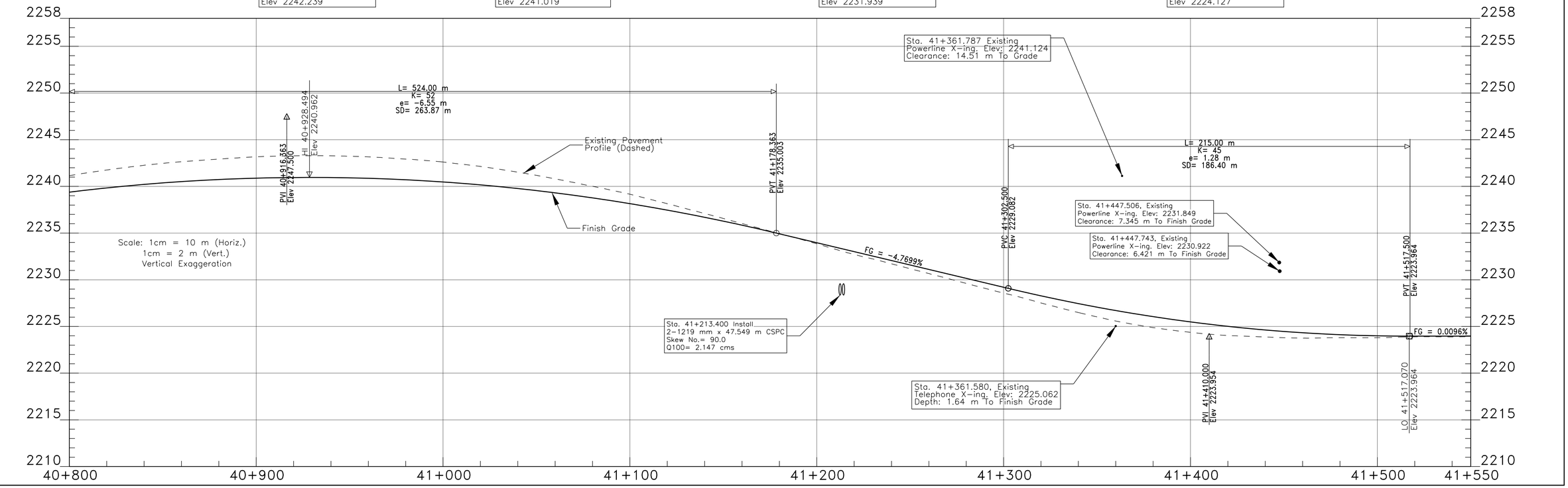
DELINEATORS		TYPE 2	RIGHT-OF-WAY	
TYPE "1a"	TYPE "1b"	OBJECT MARKER	MONUMENTS	MARKERS
				--NO SYMBOL--
0	11	2	6	6

DRAINAGE STRUCTURE TABLE

Mark	Station	Structure	Skew No.	Drainage Area (ha)	Q100 (cms)	Remarks
14	41+075.000	1-610 mm x 10.970 m CSPC	90.0	0.431	0.027	CSPC Under T/O w/ 2-End Section
15	41+213.400	2-1219 mm x 47.549 m CSPC	90.0	58.457	2.147	With End Section At Each Inlet



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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	15	88

Sta. 41+601.738, CL,
Existing 610 mm x 22.96 m CSPC
Removed, Cleaned, Salvage & Stockpiled.

Sta. 41+615.330 to Sta.41+660.000, Lt.
Mulch and Seed Existing Road.

Sta. 41+716.000 to Sta.41+740.000, Lt.
Mulch and Seed Existing Road.

Sta. 41+838.804, CL,
Existing 1678 mm x 24.93 CSPC
Removed, Cleaned, Salvage & Stockpiled.

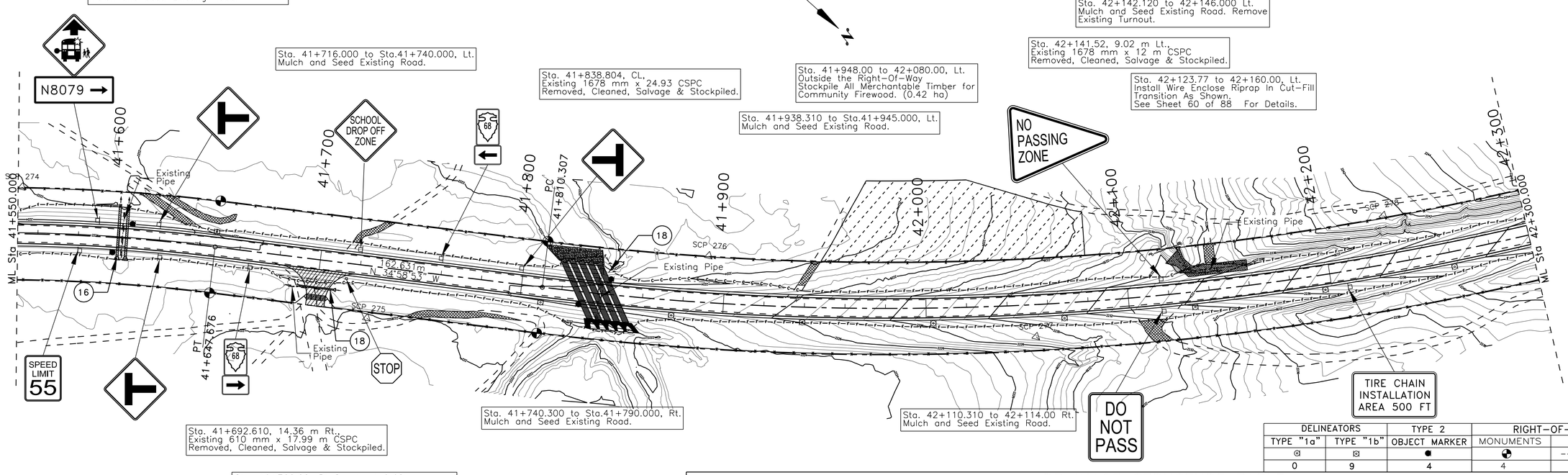
Sta. 41+948.00 to 42+080.00, Lt.
Outside the Right-Of-Way
Stockpile All Merchantable Timber for
Community Firewood. (0.42 ha)

Sta. 41+938.310 to Sta.41+945.000, Lt.
Mulch and Seed Existing Road.

Sta. 42+142.120 to 42+146.000 Lt.
Mulch and Seed Existing Road. Remove
Existing Turnout.

Sta. 42+141.52, 9.02 m Lt.,
Existing 1678 mm x 12 m CSPC
Removed, Cleaned, Salvage & Stockpiled.

Sta. 42+123.77 to 42+160.00, Lt.
Install Wire Enclose Riprap In Cut-Fill
Transition As Shown.
See Sheet 60 of 88 For Details.



Sta. 41+692.610, 14.36 m Rt.,
Existing 610 mm x 17.99 m CSPC
Removed, Cleaned, Salvage & Stockpiled.

Sta. 41+740.300 to Sta.41+790.000, Rt.
Mulch and Seed Existing Road.

Sta. 42+110.310 to 42+114.00 Rt.
Mulch and Seed Existing Road.

DELINEATORS		TYPE 2	RIGHT-OF-WAY	
TYPE "1a"	TYPE "1b"	OBJECT MARKER	MONUMENTS	MARKERS
⊠	⊠	●	◒	--NO SYMBOL--
0	9	4	4	4

Sta. 41+700.00, Rt Construct 9.10 m
Wide Turnout w/ 4-Unit Cattleguard,
Type 2 Gate & 1-610 mm x 17.07 m CSPC
& End Sections.

SCALE: Meters
0 20 40 60 80 100

DRAINAGE STRUCTURE TABLE

Mark	Station	Structure	Skew No.	Drainage Area (ha)	Q100 (cms)	Remarks
16	41+601.740	New 2-1067 mm S x 737 mm R x 25.603 m CSPA	90.0	20.660	1.226	With End Section at Each Inlet
17	41+700.000	New 1-610 mm x 17.070 m CSPC	90.0	n/a	n/a	CSPC Under T/O w/2-End Section For Relief Pipe Only
18	41+838.800	New 5-2616 mm S x 1803 mm R x 37.795 m SPPA	60.0	1,438.550	37.594	With Concrete Slope Paving Inlet w/ Grouted Riprap at Outlet

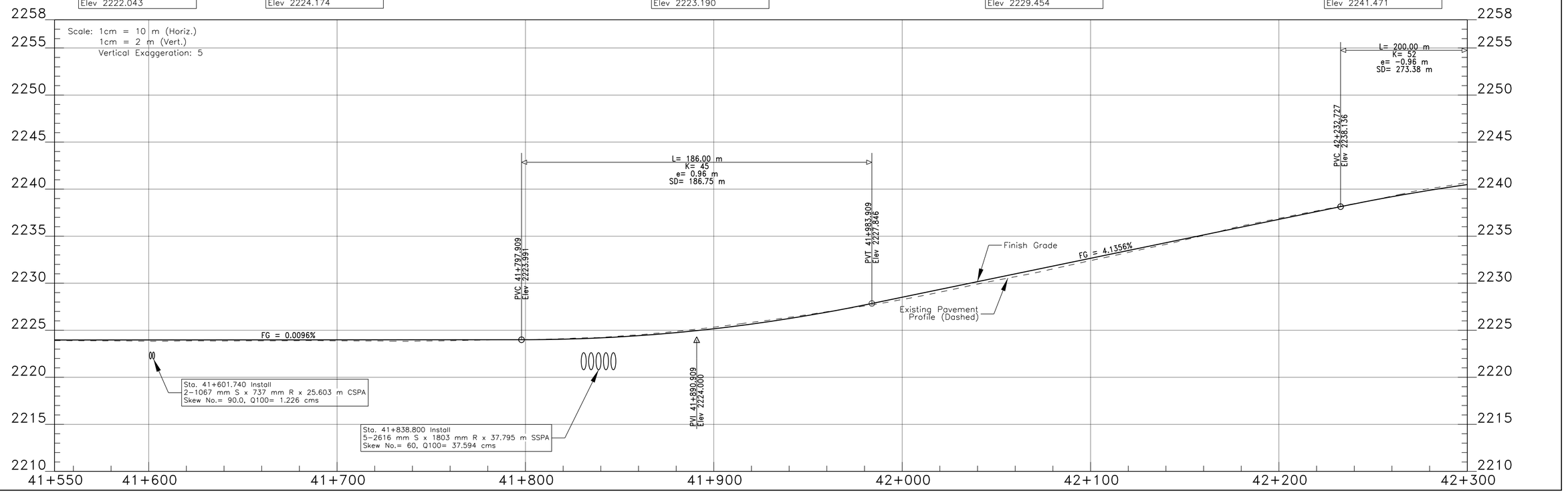
Sta. 41+551.79 SCP 274
Offset 23.014 m Lt.
Elev 2222.043

Sta. 41+726.24 SCP 275
Offset 25.676 m Rt.
Elev 2224.174

Sta. 41+891.27 SCP 276
Offset 23.051 m Lt.
Elev 2223.190

Sta. 42+053.57 SCP 277
Offset 15.894 m Rt.
Elev 2229.454

Sta. 42+231.19 SCP 278
Offset 23.823 m Lt.
Elev 2241.471



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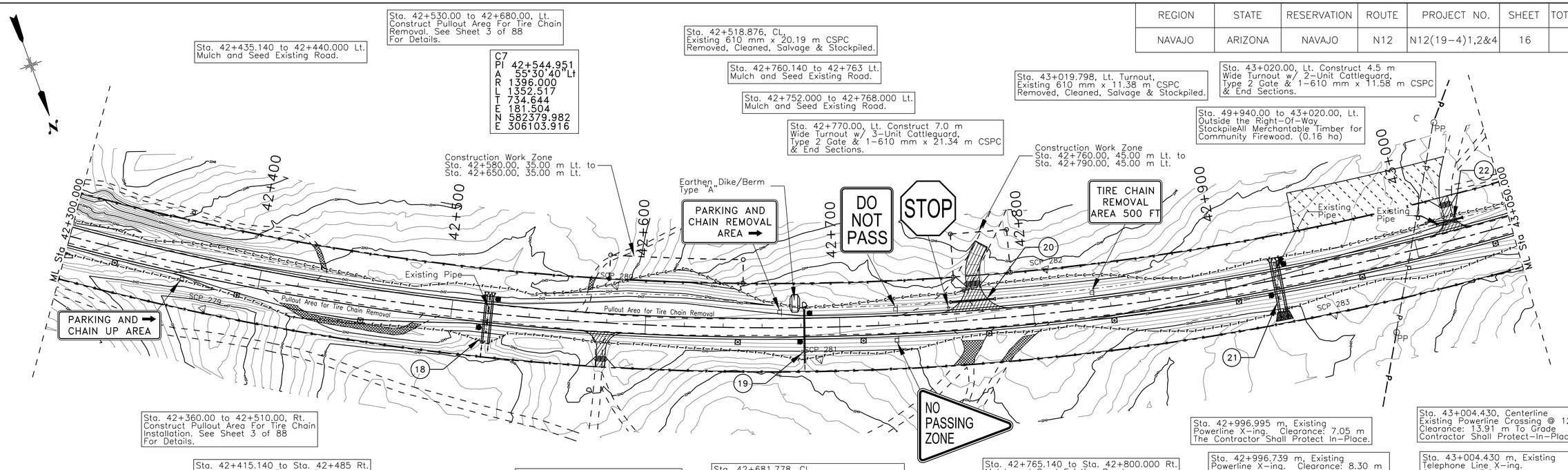
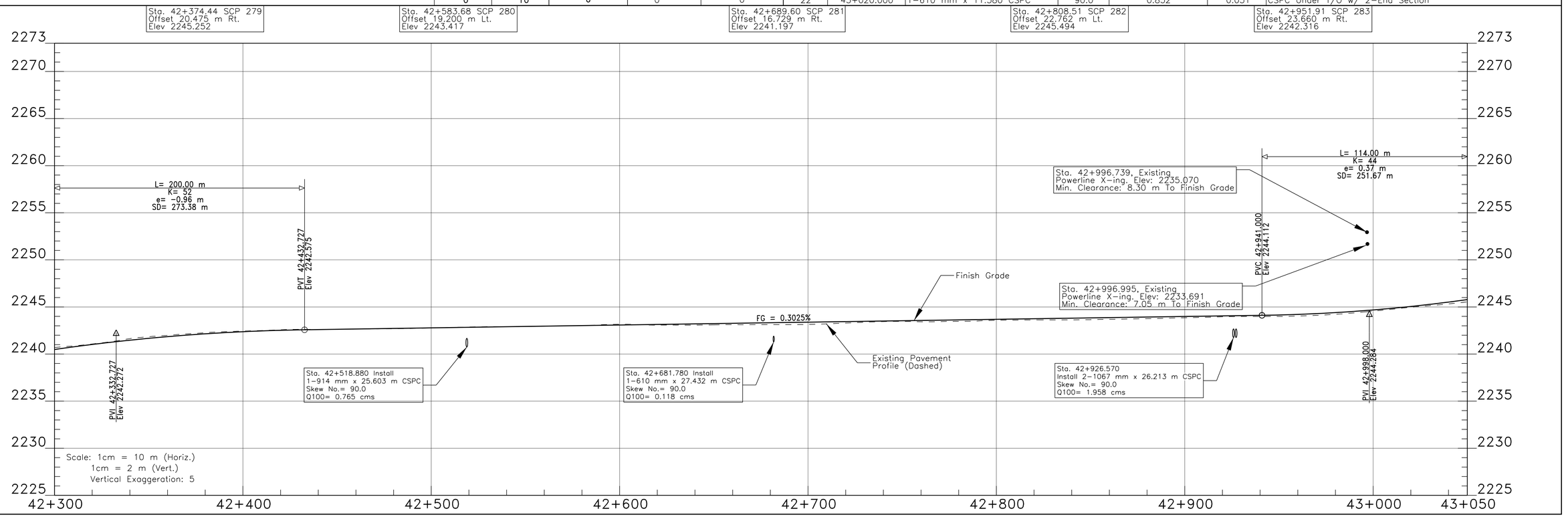
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	16	88



SCALE: Meters

0 20 40 60 80 100

DELINEATORS		TYPE 2	RIGHT-OF-WAY		DRAINAGE STRUCTURE TABLE					
TYPE "1a"	TYPE "1b"	OBJECT MARKER	MONUMENTS	MARKERS	Mark	Station	Structure	Skew No.	Drainage Area (ha)	Q100 (cms)	Remarks
⊡	⊡	●	⊕	--NO SYMBOL--	18	42+518.880	1-914 mm x 25.603 m CSPC	90.0	18.670	0.765	With End Section At Inlet
0	10	6	0	0	19	42+681.780	1-610 mm x 27.432 m CSPC	90.0	2.535	0.118	With End Section At Inlet & Type "A" Earthen Dike/Berm at Inlet
					20	42+770.000	1-610 mm x 21.340 m CSPC	90.0	0.202	0.013	CSPC Under T/O w/ 2-End Section
					21	42+926.570	2-1067 mm x 26.213 m CSPC	90.0	115.541	1.958	With End Section At Each Inlet & Placed Riprap Apron at Outlet
					22	43+020.000	1-610 mm x 11.580 CSPC	90.0	0.832	0.051	CSPC Under T/O w/ 2-End Section



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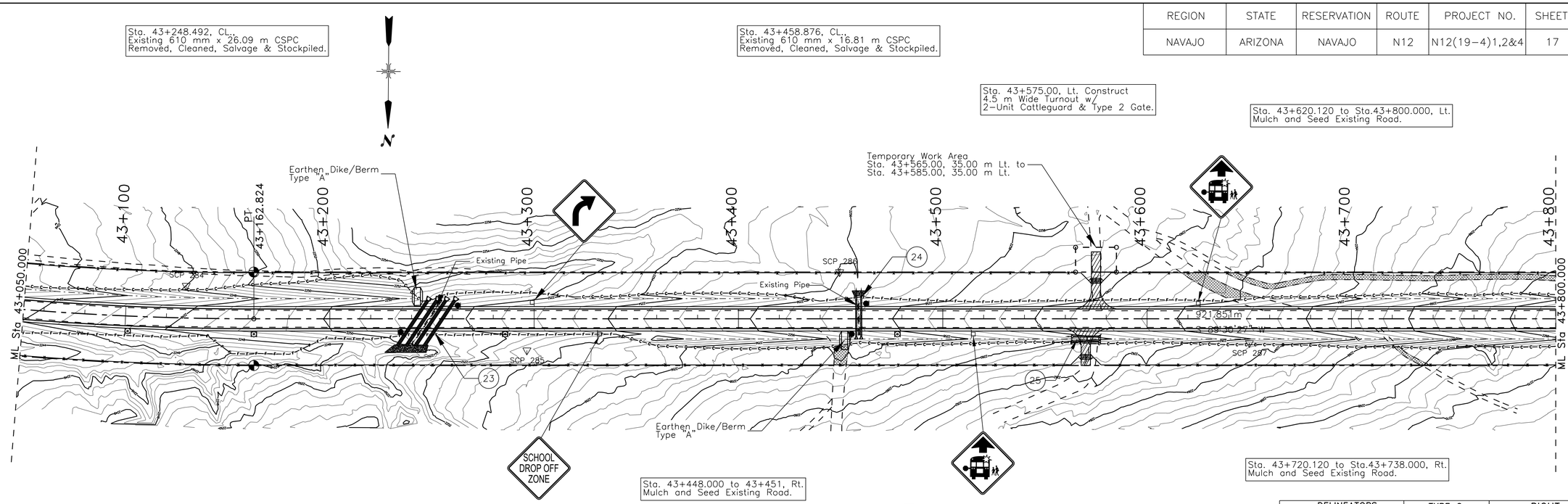
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	17	88



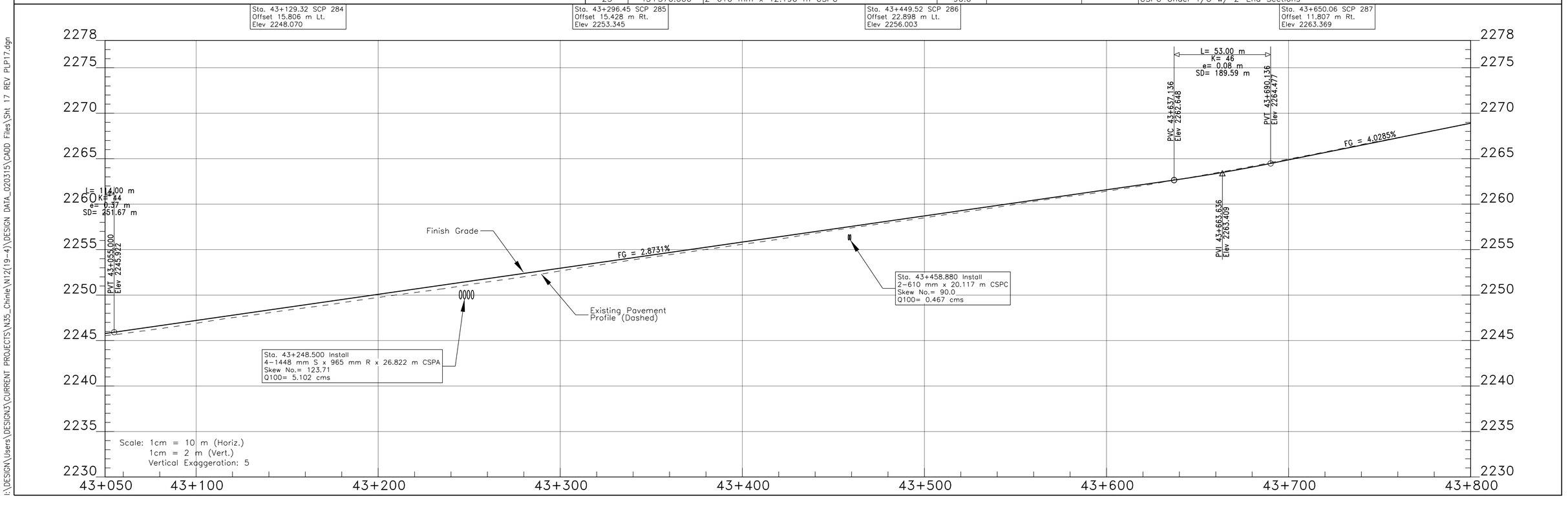
DELINEATORS		TYPE 2	RIGHT-OF-WAY	
TYPE "1a"	TYPE "1b"	OBJECT MARKER	MONUMENTS	MARKERS
⊠	⊠	●	⊕	--NO SYMBOL--
0	4	10	2	2

SCALE: Meters

0 20 40 60 80 100

DRAINAGE STRUCTURE TABLE

Mark	Station	Structure	Skew No.	Drainage Area (ha)	Q100 (cms)	Remarks
23	43+248.500	4-1448 mm S x 965 x mm R x 26.822 m CSPA	123.7	206.407	5.102	With End Sections At Inlet, Type "A" Earthen Dike/Berm at Inlet & Placed Riprap Apron at Oulet
24	43+458.880	2-610 mm x 20.117 m CSPC	90.0	10.018	0.467	With End Sections At Inlet, Type "A" Earthen Dike/Berm at Inlet & Placed Riprap Apron at Oulet
25	43+570.000	2-610 mm x 12.190 m CSPC	90.0			CSPC Under T/O w/ 2-End Sections



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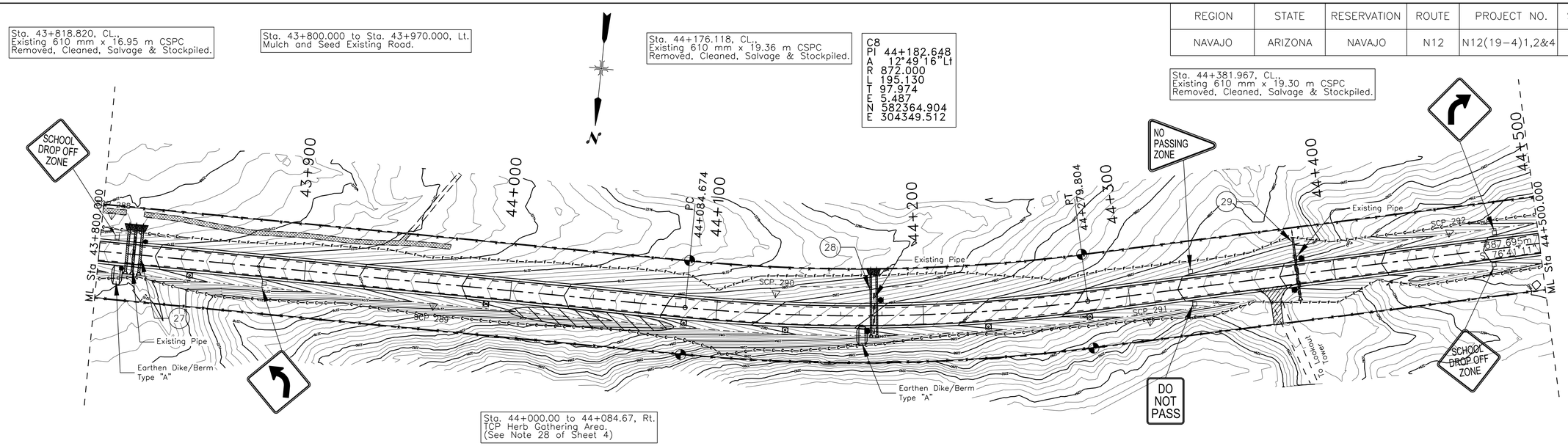
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	18	88



DELINEATORS		TYPE 2	RIGHT-OF-WAY	
TYPE "1a"	TYPE "1b"	OBJECT MARKER	MONUMENTS	MARKERS
⊠	⊠	●	◒	--NO SYMBOL--
0	6	6	4	4

DRAINAGE STRUCTURE TABLE

Mark	Station	Structure	Skew No.	Drainage Area (ha)	Q100 (cms)	Remarks
27	43+816.820	3-1067 mm S x 737 mm R x 20.117 m CSPA	90.0	39.482	1.785	With End Section At Inlet, Type "A" Earthen Dike/Berm at Inlet & Placed Riprap Apron at Oulet
28	44+176.120	2-762 mm x 29.261 m CSPC	90.0	18.434	0.833	With End Section At Inlet, Type "A" Earthen Dike/Berm at Inlet & Placed Riprap Stilling Basin at Oulet
29	44+381.970	1-762 mm x 29.261 m CSPC	90.0	5.438	0.307	With End Section At Inlet

SCALE: Meters
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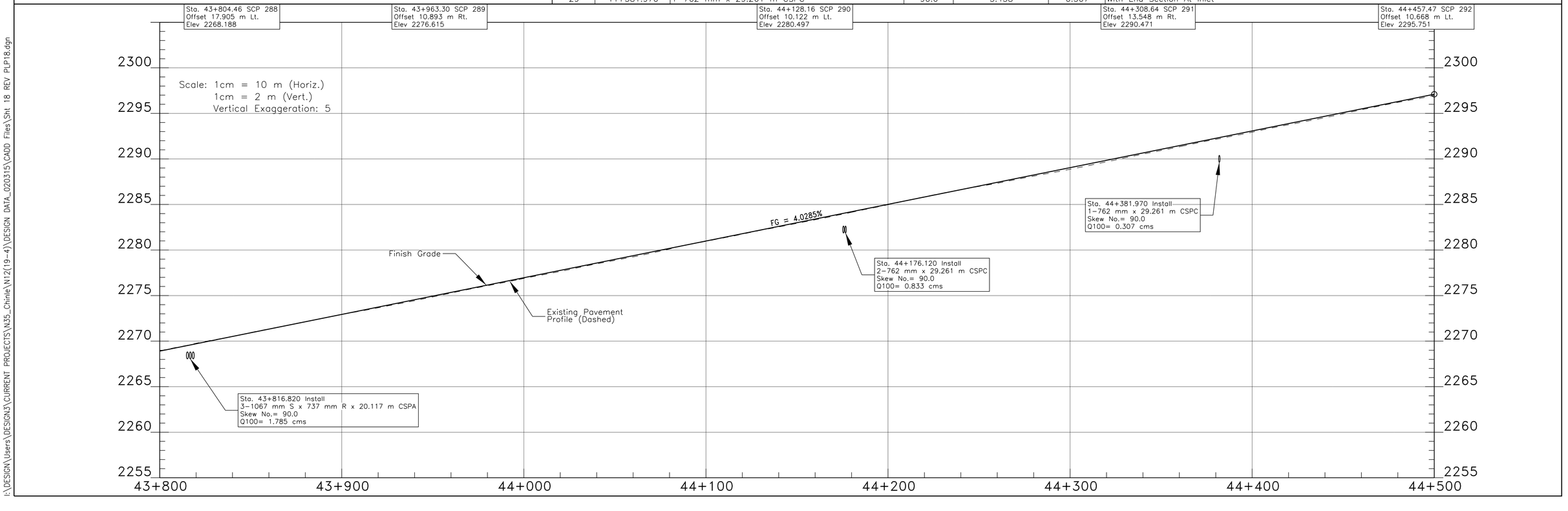

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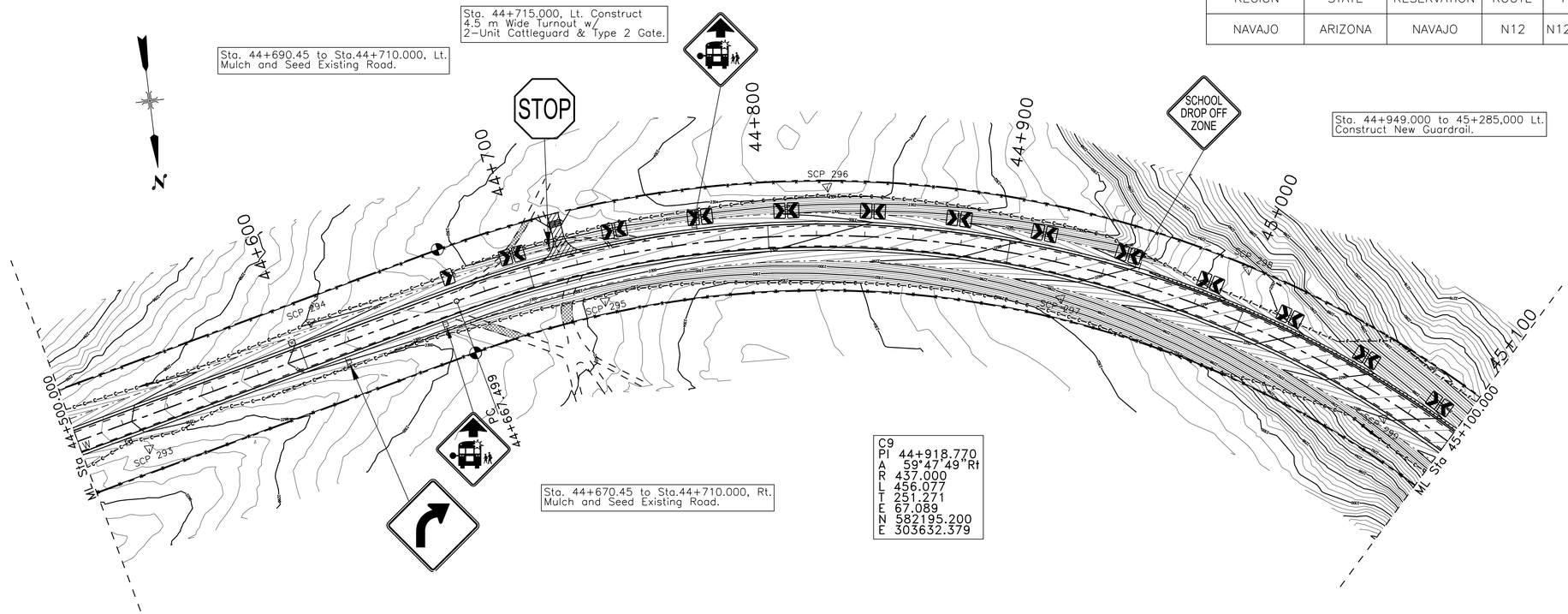
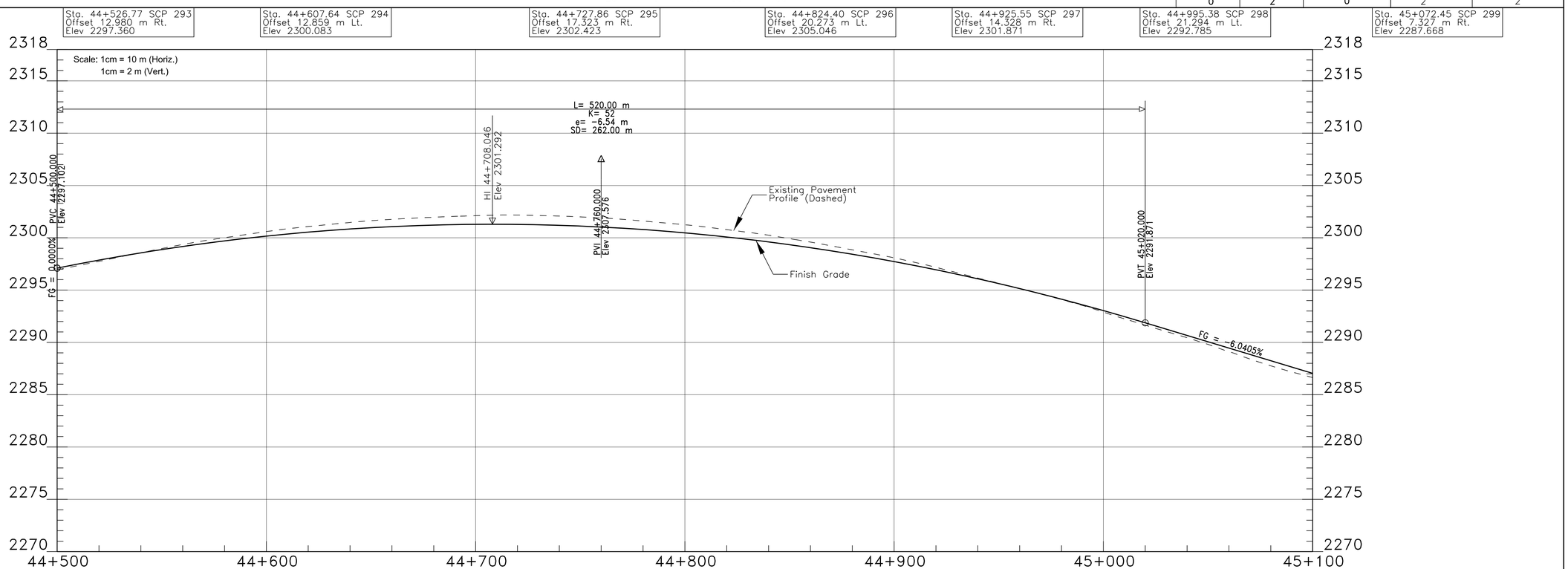
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	19	88



SCALE: Meters

0 20 40 60 80 100

DELINEATORS		TYPE 2	RIGHT-OF-WAY	
TYPE "1a"	TYPE "1b"	OBJECT MARKER	MONUMENTS	MARKERS
⊠	⊠	●	⊕	--NO SYMBOL--
0	2	0	2	2



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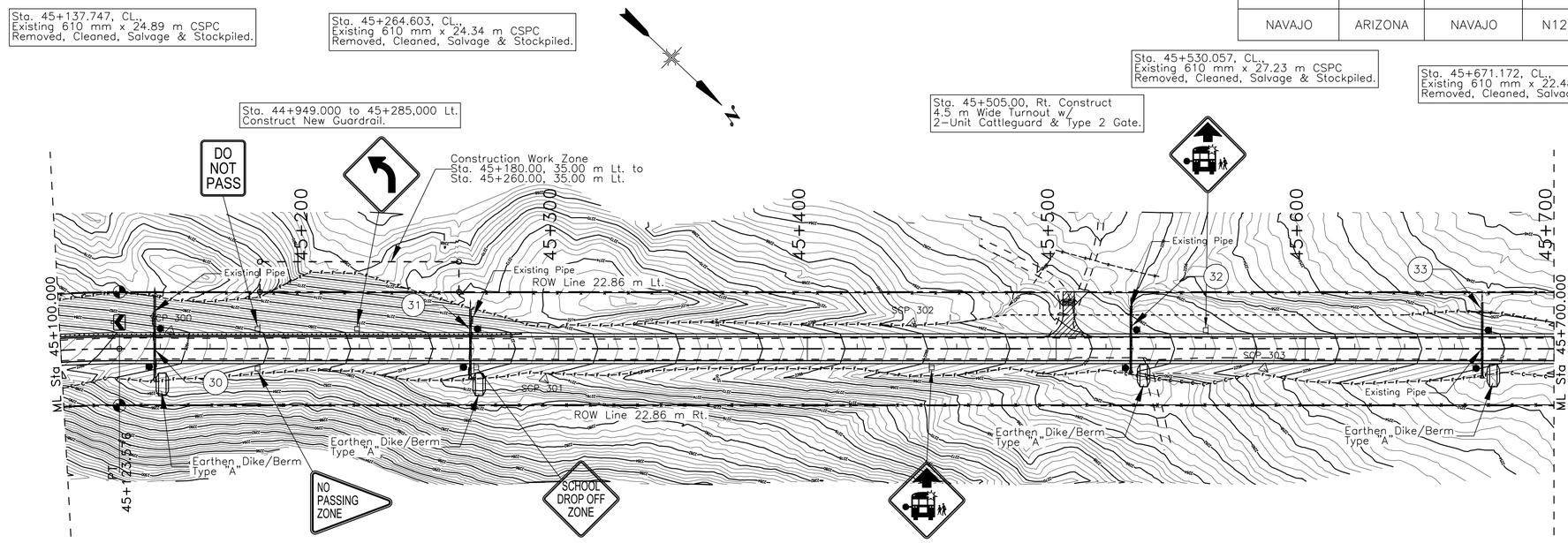
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	20	88



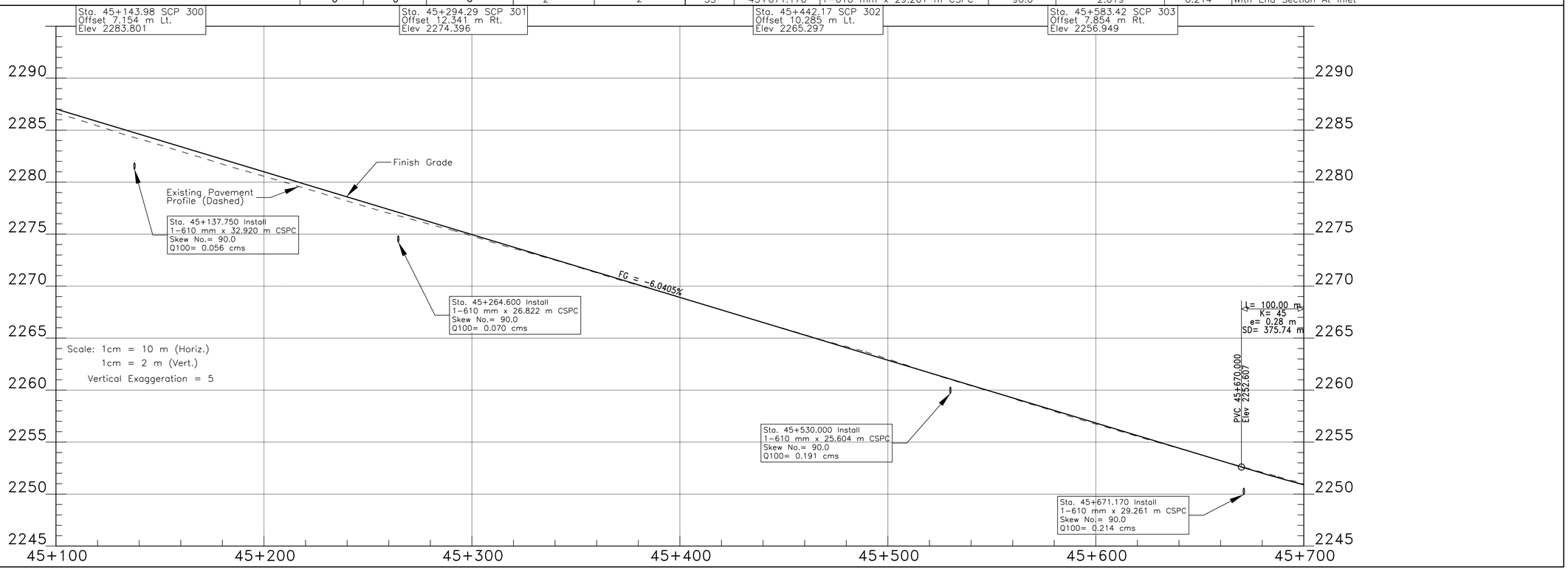
SCALE: Meters

0 20 40 60 80 100

DELINEATORS		TYPE 2	RIGHT-OF-WAY	
TYPE "1a"	TYPE "1b"	OBJECT MARKER	MONUMENTS	MARKERS
⊠	⊠	●	◒	--NO SYMBOL--
0	0	8	2	2

DRAINAGE STRUCTURE TABLE

Mark	Station	Structure	Skew No.	Drainage Area (ha)	Q100 (cms)	Remarks
30	45+137.750	1-610 mm x 32.92 m CSPC	90.0	0.707	0.056	With End Section At Inlet w/ Type "A" Earthen Dike/Berm at Inlet
31	45+264.600	1-610 mm x 26.822 mCSPC	90.0	0.622	0.070	With End Section At Inlet w/ Type "A" Earthen Dike/Berm at Inlet
32	45+530.000	1-610 mm x 25.604 m CSPC	90.0	2.007	0.191	With End Section At Inlet w/ Type "A" Earthen Dike/Berm at Inlet
33	45+671.170	1-610 mm x 29.261 m CSPC	90.0	2.019	0.214	With End Section At Inlet



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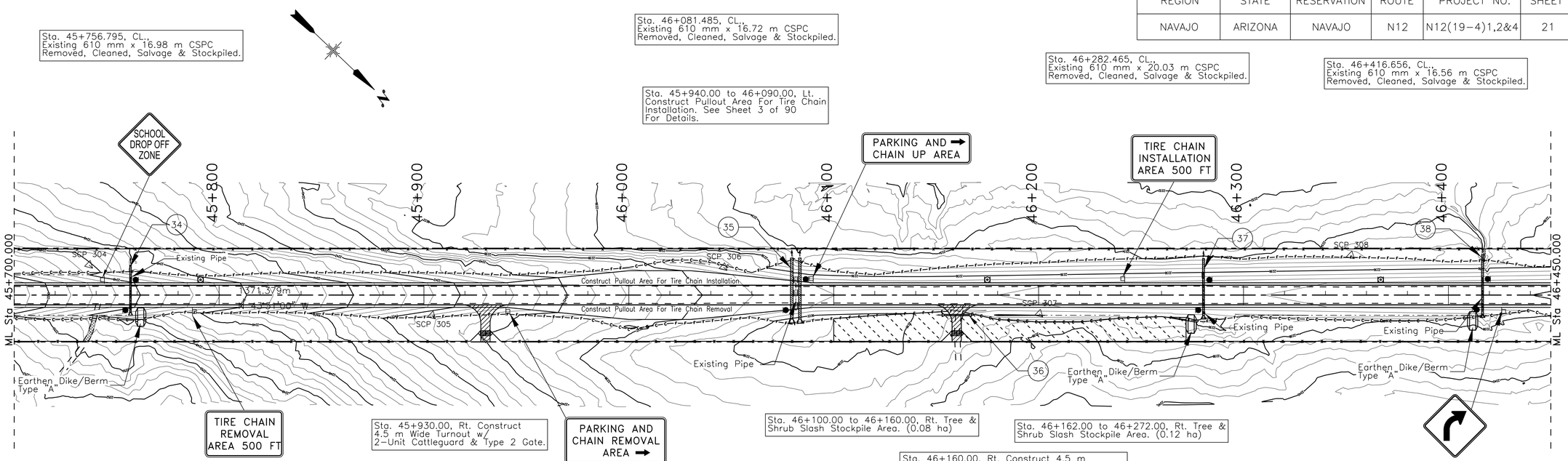
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	21	88

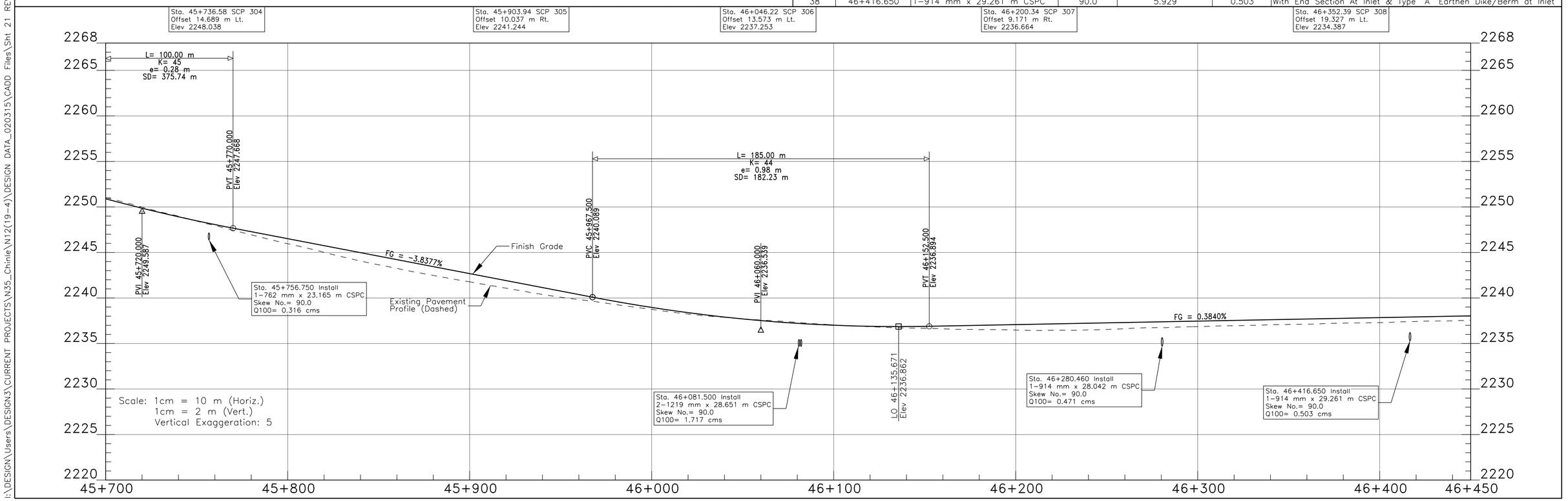


DELINEATORS		TYPE 2	RIGHT-OF-WAY	
TYPE "1a"	TYPE "1b"	OBJECT MARKER	MONUMENTS	MARKERS
⊡	⊡	●	◔	--NO SYMBOL--
0	3	8	0	0

SCALE: Meters
0 20 40 60 80 100

DRAINAGE STRUCTURE TABLE

Mark	Station	Structure	Skew No.	Drainage Area (ha)	Q100 (cms)	Remarks
34	45+756.750	1-762 mm x 23.165 m CSPC	90.0	3.584	0.316	With End Section At Inlet & Type "A" Earthen Dike/Berm at Inlet
35	46+081.500	2-1219 mm x 28.651 m CSPC	90.0	28.938	1.717	With End Section At Inlet
36	46+160.000	1-610 mm x 12.190 m CSPC	90.0	n/a	n/a	CSPC Under T/O w/ 2-End Sections For Relief Pipe Only
37	46+280.460	1-914 mm x 28.042 m CSPC	90.0	5.957	0.471	With End Section At Inlet & Type "A" Earthen Dike/Berm at Inlet
38	46+416.650	1-914 mm x 29.261 m CSPC	90.0	5.929	0.503	With End Section At Inlet & Type "A" Earthen Dike/Berm at Inlet



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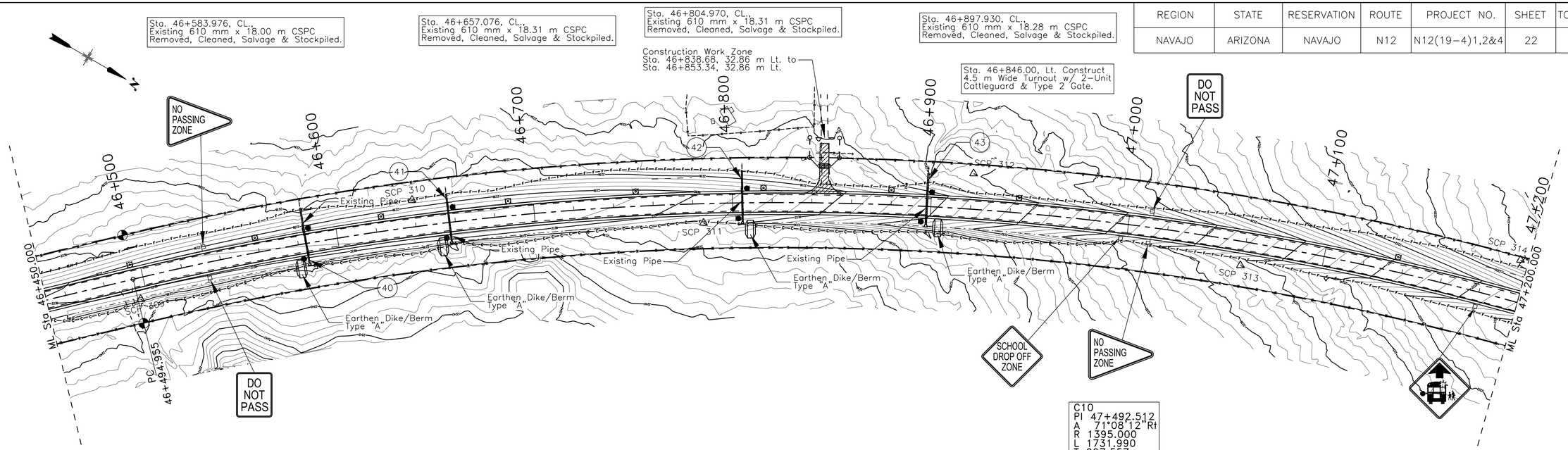
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	22	88



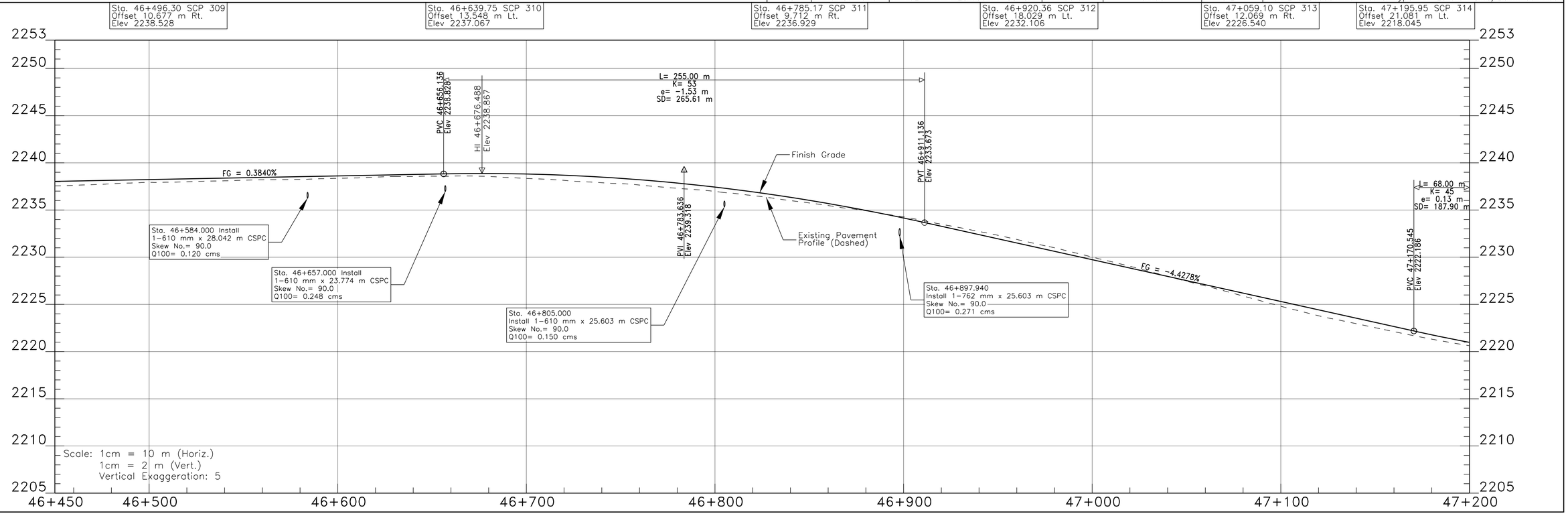
DELINEATORS		TYPE 2	RIGHT-OF-WAY	
TYPE "1a"	TYPE "1b"	OBJECT MARKER	MONUMENT	MARKER
⊡	⊡	●	◔	--NO SYMBOL--
0	9	8	2	2

SCALE: Meters

0 20 40 60 80 100

DRAINAGE STRUCTURE TABLE

Mark	Station	Structure	Skew No.	Drainage Area (ha)	Q100 (cms)	Remarks
40	46+584.000	1-610 mm x 28.042 m CSPC	90.0	1.185	0.120	With End Section At Inlet & Type "A" Earthen Dike/Berm at Inlet
41	46+657.000	1-610 mm x 23.774 m CSPC	90.0	2.420	0.248	With End Section At Inlet & Type "A" Earthen Dike/Berm at Inlet
42	46+805.000	1-610 mm x 25.603 m CSPC	90.0	1.570	0.150	With End Section At Inlet & Type "A" Earthen Dike/Berm at Inlet
43	46+897.940	1-762 mm x 25.603 m CSPC	90.0	3.193	0.271	With End Section At Inlet & Type "A" Earthen Dike/Berm at Inlet



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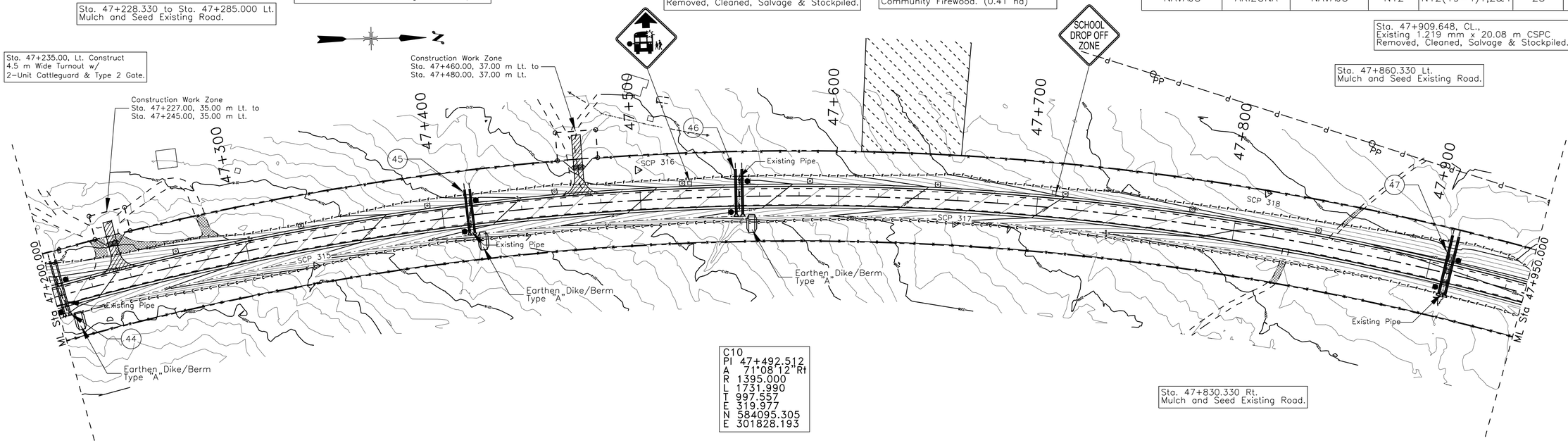
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	23	88



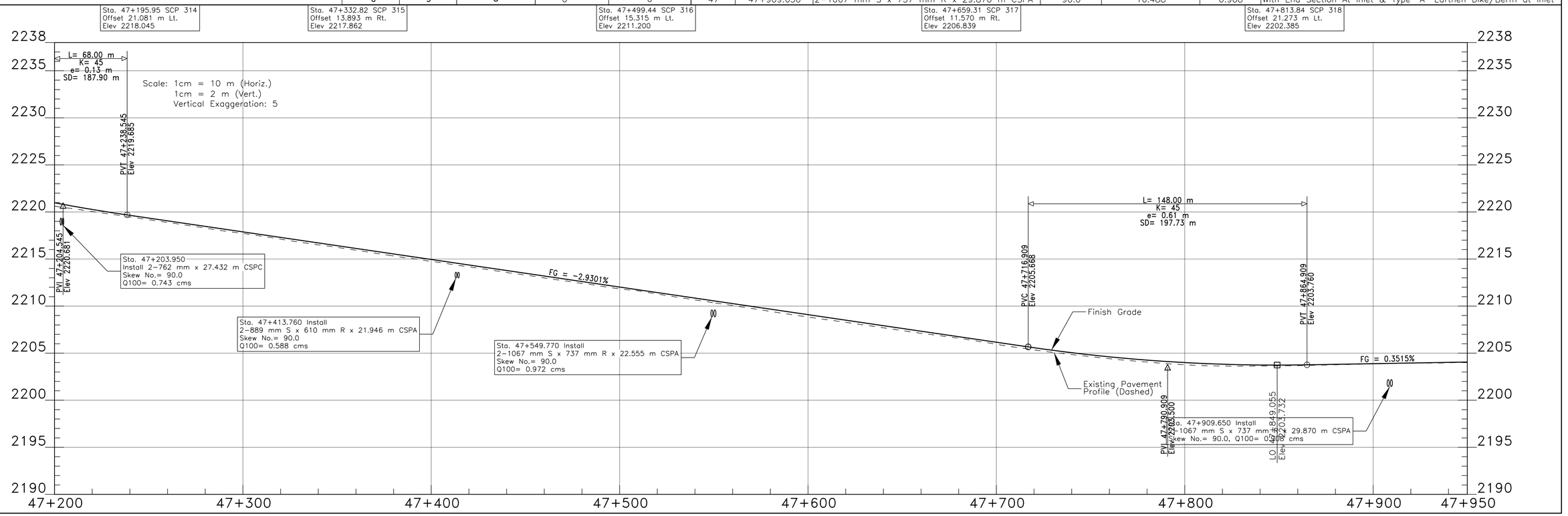
SCALE: Meters

0 20 40 60 80 100

DELINEATORS		TYPE 2	RIGHT-OF-WAY	
TYPE "1a"	TYPE "1b"	OBJECT MARKER	MONUMENTS	MARKERS
⊡	⊠	●	⊕	--NO SYMBOL--
0	9	8	0	0

DRAINAGE STRUCTURE TABLE

Mark	Station	Structure	Skew No.	Drainage Area (ha)	Q100 (cms)	Remarks
44	47+203.950	2-762 mm x 27.432 m CSPC	90.0	7.795	0.743	With End Section At Inlet & Type "A" Earthen Dike/Berm at Inlet
45	47+413.760	2-889 mm S x 610 mm R x 21.946 m CSPA	90.0	5.547	0.588	With End Section At Inlet & Type "A" Earthen Dike/Berm at Inlet
46	47+549.770	2-1067 mm S x 737 mm R x 22.555 m CSPA	90.0	9.171	0.972	With End Section At Inlet & Type "A" Earthen Dike/Berm at Inlet
47	47+909.650	2-1067 mm S x 737 mm R x 29.870 m CSPA	90.0	16.488	0.908	With End Section At Inlet & Type "A" Earthen Dike/Berm at Inlet



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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	24	88

Sta. 48+090.080 to Sta. 48+350.000, Lt.
Mulch and Seed Existing Road.

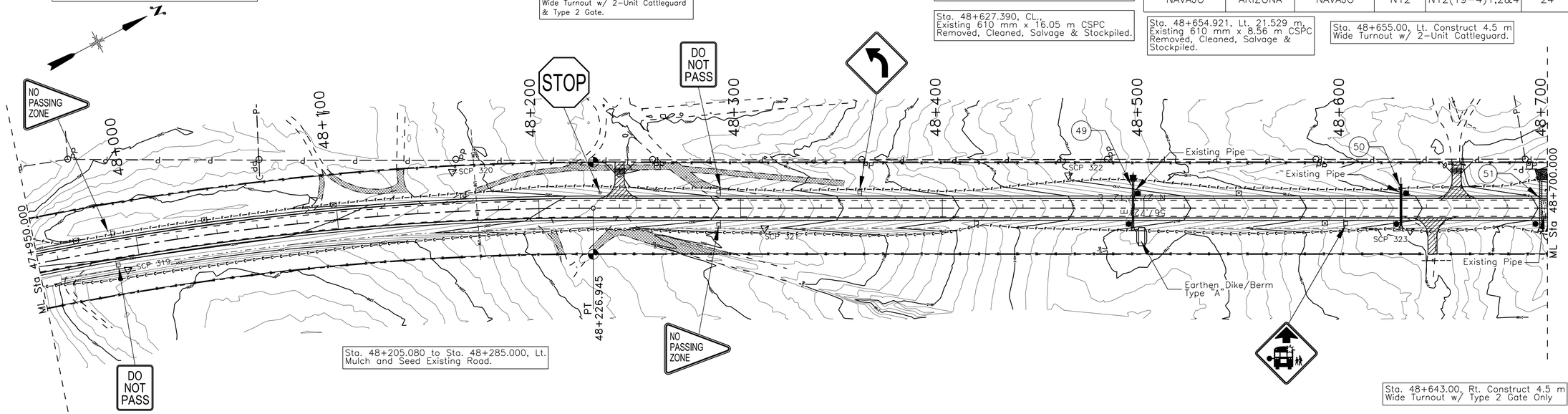
Sta. 48+240.00, Lt. Construct 4.5 m Wide Turnout w/ 2-Unit Cattleguard & Type 2 Gate.

Sta. 48+494.564, CL.,
Existing 1067 mm x 18.15 m CSPC
Removed, Cleaned, Salvage & Stockpiled.

Sta. 48+627.390, CL.,
Existing 610 mm x 16.05 m CSPC
Removed, Cleaned, Salvage & Stockpiled.

Sta. 48+654.921, Lt. 21.529 m,
Existing 610 mm x 8.56 m CSPC
Removed, Cleaned, Salvage & Stockpiled.

Sta. 48+655.00, Lt. Construct 4.5 m Wide Turnout w/ 2-Unit Cattleguard.



Sta. 48+205.080 to Sta. 48+285.000, Lt.
Mulch and Seed Existing Road.

Sta. 48+643.00, Rt. Construct 4.5 m Wide Turnout w/ Type 2 Gate Only

DELINEATORS		TYPE 2	RIGHT-OF-WAY	
TYPE "1a"	TYPE "1b"	OBJECT MARKER	MONUMENTS	MARKERS
⊠	⊠	●	⌖	--NO SYMBOL--
0	6	4	2	2

SCALE: Meters
0 20 40 60 80 100

DRAINAGE STRUCTURE TABLE

Mark	Station	Structure	Skew No.	Drainage Area (ha)	Q100 (cms)	Remarks
49	48+494.550	1-762 mm x 23.774 m CSPC	90.0	5.565	0.291	With End Section At Inlet, Type "A" Earthen Dike/Berm at Inlet & Placed Riprap Stilling Basin at Outlet
50	48+627.380	1-889 mm R x 610 mm x 20.726 m CSPA	90.0	0.551	0.058	With End Section At Inlet, Irrigation Pipe
51	48+698.630	2-1219 mm x 23.774 m CSPC	90.0	56.486	2.154	With End Section At Inlet & Wire Enclosed Riprap Apron at Outlet

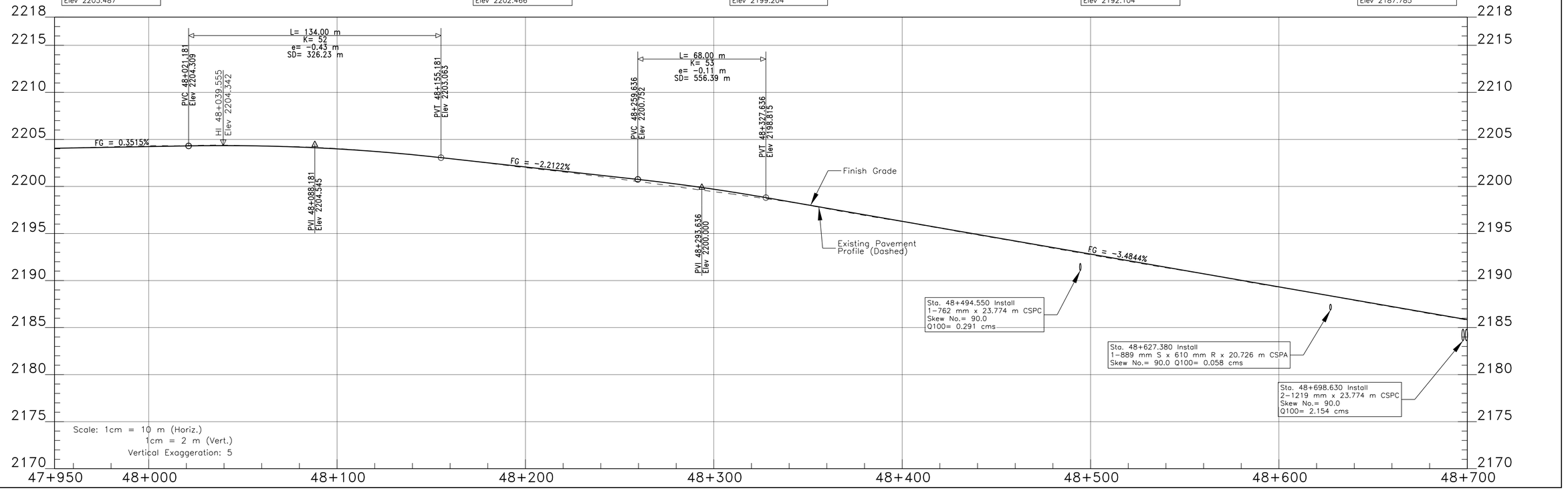
Sta. 47+993.32 SCP 319
Offset 11.159 m Rt.
Elev 2205.487

Sta. 48+157.99 SCP 320
Offset 19.735 m Lt.
Elev 2202.466

Sta. 48+311.93 SCP 321
Offset 9.948 m Rt.
Elev 2199.204

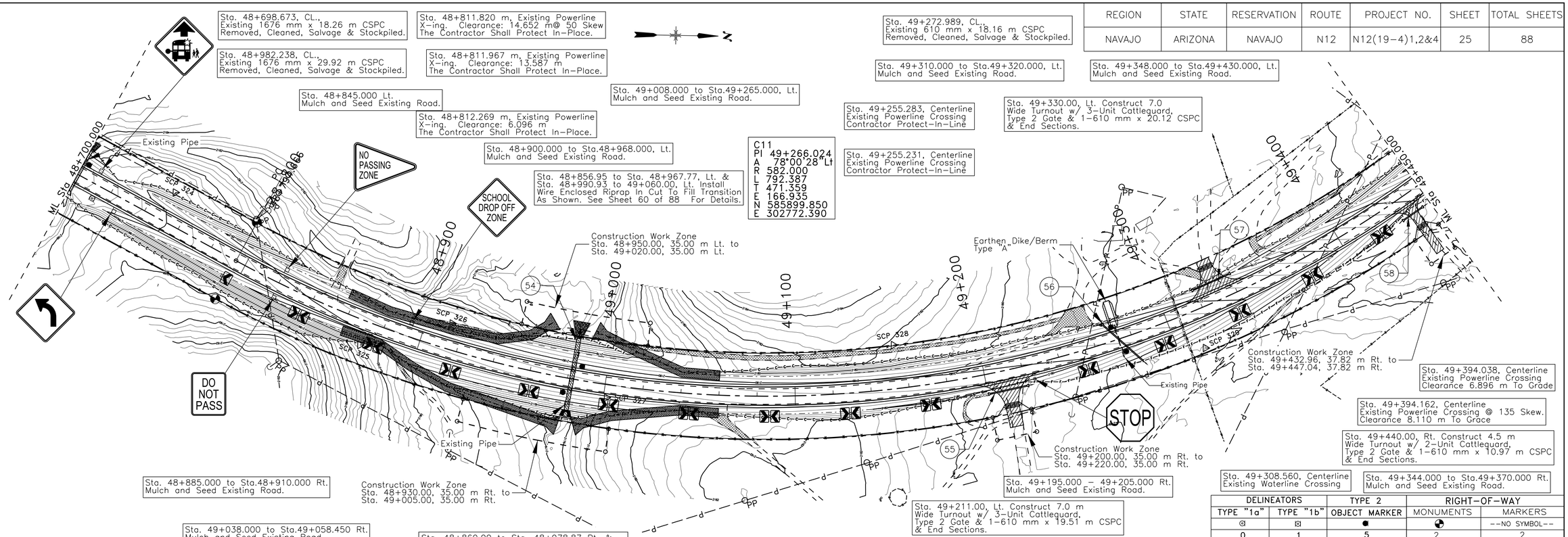
Sta. 48+462.51 SCP 322
Offset 16.275 m Lt.
Elev 2192.104

Sta. 48+631.98 SCP 323
Offset 11.179 m Rt.
Elev 2187.785



24 REV PLP24.dgn

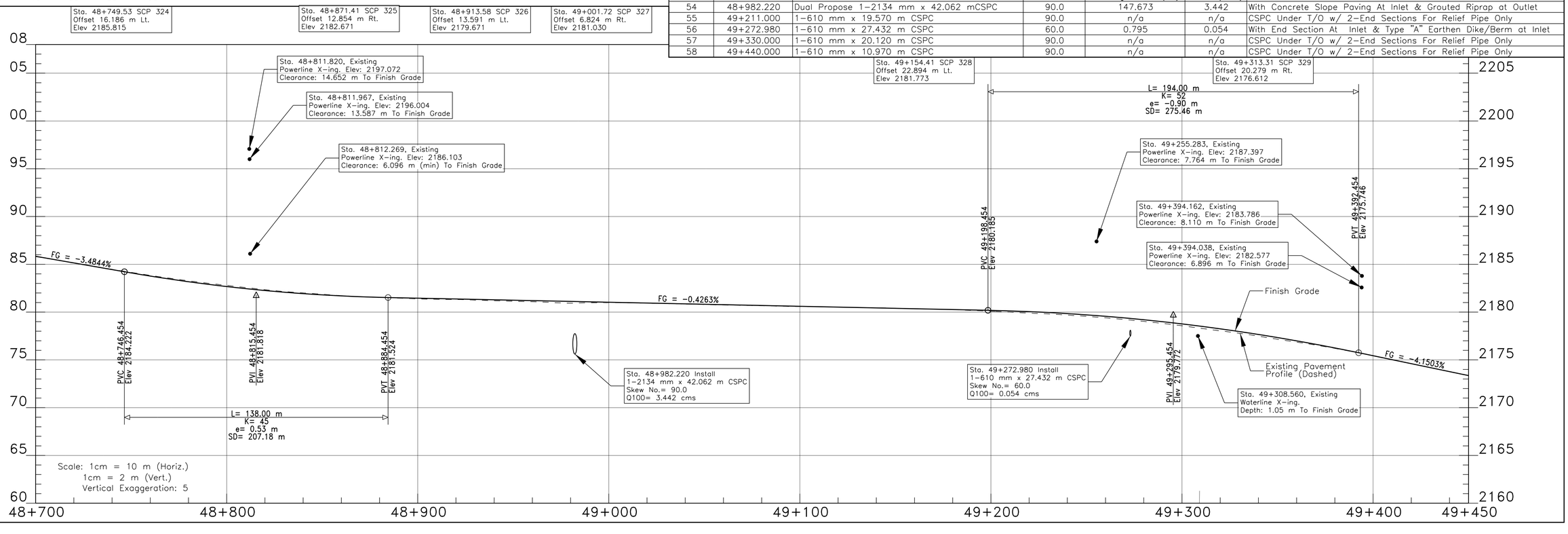
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	25	88



DELINEATORS		TYPE 2	RIGHT-OF-WAY	
TYPE "1a"	TYPE "1b"	OBJECT MARKER	MONUMENTS	MARKERS
⊠	⊠	●	◕	--NO SYMBOL--
0	1	5	2	2

DRAINAGE STRUCTURE TABLE

Mark	Station	Structure	Skew No.	Drainage Area (ha)	Q100 (cms)	Remarks
54	48+982.220	Dual Propose 1-2134 mm x 42.062 mCSPC	90.0	147.673	3.442	With Concrete Slope Paving At Inlet & Grouted Riprap at Outlet
55	49+211.000	1-610 mm x 19.570 m CSPC	90.0	n/a	n/a	CSPC Under T/O w/ 2-End Sections For Relief Pipe Only
56	49+272.980	1-610 mm x 27.432 m CSPC	60.0	0.795	0.054	With End Section At Inlet & Type "A" Earthen Dike/Berm at Inlet
57	49+330.000	1-610 mm x 20.120 m CSPC	90.0	n/a	n/a	CSPC Under T/O w/ 2-End Sections For Relief Pipe Only
58	49+440.000	1-610 mm x 10.970 m CSPC	90.0	n/a	n/a	CSPC Under T/O w/ 2-End Sections For Relief Pipe Only



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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	26	88

Sta. 49+494.00 To 49+534.00, Contractor Shall Install Temporary Fence At 17 m Left of Centerline To Protect Arch Site During Construction.

Sta. 49+644.04, CL Construct 1-17.37 m S x 3.25 m R x 26.82 m Precast Concrete Arch Pipe. Skew No. 75 See Sheet 75 to 88 For Arch Pipe Construction Details. Existing Bridge To Be Demolished. See Sheet 40 of 88 For Detour Plan.

Sta. 49+904.35, 6.82 m Lt. Existing 254 mm x 8.34 m CSPC Removed, Cleaned, Salvage & Stockpiled.

Sta. 49+470.000 to Sta. 49+520.000 Lt. Mulch and Seed Existing Road.

Sta. 49+599.850 to 49+759.830, Lt. Install New Guardrail

Sta. 49+900.00, Lt. Construct 4.5 m Wide Turnout w/ 2-Unit Cattleguard, Type 2 Gate & 1-610 mm x 10.97 m CSPC & End Sections.

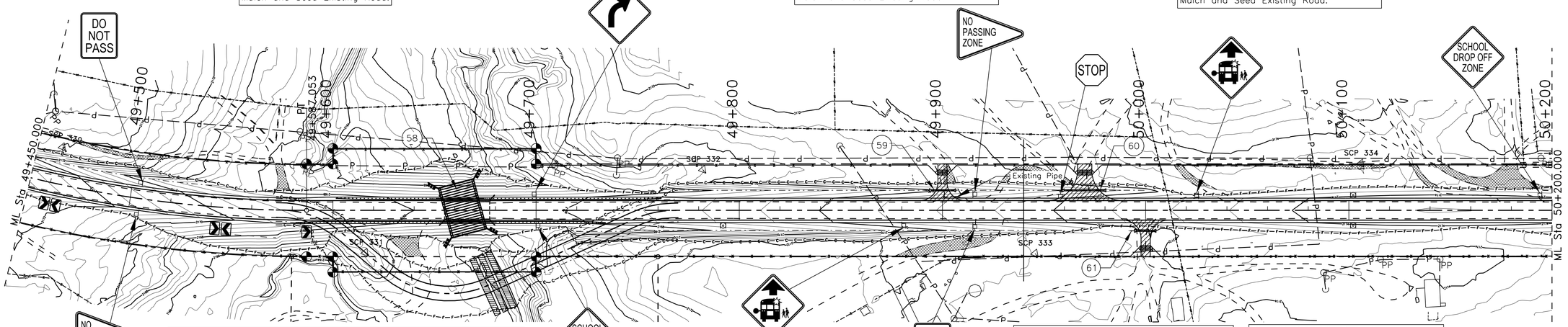
Sta. 49+970.00, Lt. Construct 7.0 m Wide Turnout w/ 3-Unit Cattleguard, Type 2 Gate & 1-610 mm x 19.51 m CSPC & End Sections.

Sta. 50+185.240 to Sta. 50+200.00, Lt. Remove and Relocate Existing Waterline by Owner.

Sta. 49+575.000 Lt. Mulch and Seed Existing Road.

Sta. 49+930.000 to Sta. 49+965.000 Lt. Mulch and Seed Existing Road.

Sta. 50+016.420 to Sta. 50+198.000 Lt. Mulch and Seed Existing Road.



Sta. 49+570.00 to 49+770.00, Rt. Contractor Shall Construct Temporary Detour Road With Temporary Drainage Structures As Shown Prier To Existing Bridge Demolition And Installation Of New Pre-Cast Pipe Arch. See Sheet 40 of 88 For Details.

Sta. 49+870.691, Centerline Existing Powerline Crossing @ 50 Skew. Contractor Protect-In-Place

Sta. 50+000.00, Rt. Construct 4.5 m Wide Turnout w/ 2-Unit Cattleguard, Type 2 Gate & 1-610 mm x 8.53 m CSPC & End Sections.

Sta. 50+084.721, Centerline Existing Powerline Crossing @ 85 Skew. Contractor Protect-In-Place

Sta. 50+083.494, Centerline Existing Powerline Crossing @ 85 Skew. Contractor Protect-In-Place

Sta. 49+878.280 to Sta. 49+920.250 Rt. Mulch and Seed Existing Road.

Sta. 49+870.699, Centerline Existing Powerline Crossing @ 50 Skew. Contractor Protect-In-Place

Sta. 49+870.714, Centerline Existing Powerline Crossing @ 50 Skew. Contractor Protect-In-Place

Sta. 50+015.520, Centerline Existing Waterline Crossing @ 80 Skew. Depth: 1.62 m To Grade Contractor Protect-In-Placew

Sta. 49+575.450 to 49+735.430, Rt. Install New Guard Rail.

Sta. 49+630.420 Rt. Mulch and Seed Existing Road.

Sta. 49+900.220 to Sta. 51+110.000 Rt. Remove Existing Barb Wire Fence Along the R/W Line.

SCALE: Meters

0 20 40 60 80 100

DELINEATORS		TYPE 2	RIGHT-OF-WAY	
TYPE "1a"	TYPE "1b"	OBJECT MARKER	MONUMENTS	MARKERS
⊡	⊠	●	⊕	--NO SYMBOL--
0	3	0	10	10

DRAINAGE STRUCTURE TABLE

Mark	Station	Structure	Skew No.	Drainage Area (ha)	Q25 (cms)	Q100 (cms)	Remarks
58	49+667.660	1-17.37 m S x 3.25 m x 26.82 m PC CPA	75.0	12,846.341	191.564		With Pre-Cast Wing Walls & Footing @ Inlet & Outlet
59	49+900.000	1-610 mm x 10.97 m CSPC	90.0	0.736		0.082	CSPC Under T/O w/ 2-End Sections
60	49+970.000	1-610 mm x 19.51 m CSPC	90.0				CSPC Under T/O w/ 2-End Sections
61	50+000.000	1-610 mm x 8.53 m CSPC	90.0	0.418		0.026	CSPC Under T/O w/ 2-End Sections

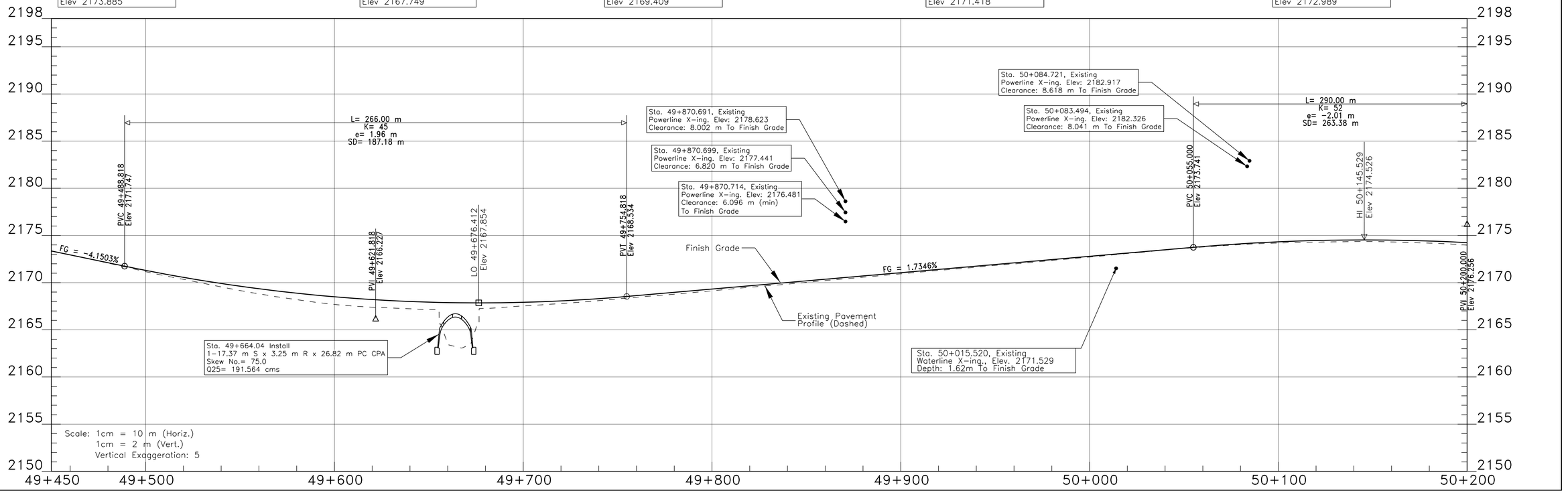
Sta. 49+462.14 SCP 330 Offset 18.261 m Lt. Elev 2173.885

Sta. 49+615.92 SCP 331 Offset 20.857 m Rt. Elev 2167.749

Sta. 49+782.13 SCP 332 Offset 20.027 m Lt. Elev 2169.409

Sta. 49+945.57 SCP 333 Offset 21.246 m Rt. Elev 2171.418

Sta. 50+105.94 SCP 334 Offset 23.144 m Lt. Elev 2172.989



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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	27	88

Sta. 50+324.037, CL.,
Existing 610 mm x 17.56 m CSPC
Removed, Cleaned, Salvage & Stockpiled.

Sta. 50+477.100 to Sta. 50+485,220 Lt.
Mulch and Seed Existing Road.

Sta. 50+566.514, CL.,
Existing 610 mm x 19.91 m CSPC
Removed, Cleaned, Salvage & Stockpiled.

Sta. 50+200.000 to Sta. 50+315,000 Lt.
Mulch and Seed Existing Road.

Sta. 50+336.100 to Sta. 50+350,000 Lt.
Mulch and Seed Existing Road.

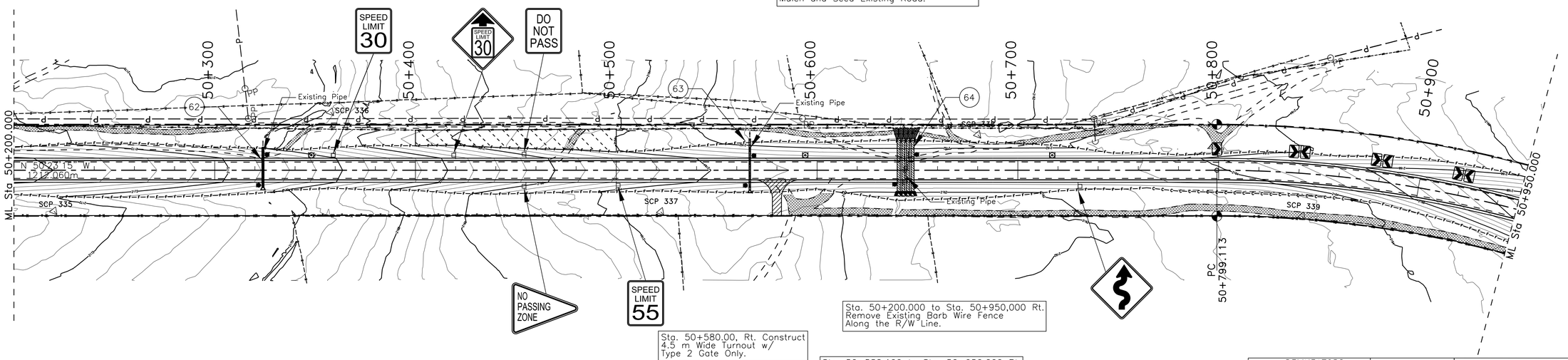
Sta. 50+200.100 to Sta. 50+742,220 Lt.
Remove and relocate Existing Waterline
by owner.

Sta. 50+644.117, CL.,
Existing 1829 mm x 17.22 m CSPC
Removed, Cleaned, Salvage & Stockpiled.

Sta. 50+620.000 to Sta. 50+724,000 Lt.
Remove Existing Barb Wire Fence
Along the R/W Line.

Sta. 50+400.00 to Sta. 50+500.00 Lt.
Tree & Shrub Slash Stockpile Area. (0.10 ha)

Sta. 50+562.100 to Sta. 50+810,220 Lt.
Mulch and Seed Existing Road.



Sta. 50+580.00, Rt. Construct
4.5 m Wide Turnout w/
Type 2 Gate Only.

Sta. 50+200.000 to Sta. 50+950,000 Rt.
Remove Existing Barb Wire Fence
Along the R/W Line.

Sta. 50+582.100 to Sta. 50+950,000 Rt.
Mulch and Seed Existing Road.

DELINEATORS		TYPE 2	RIGHT-OF-WAY	
TYPE "1a"	TYPE "1b"	OBJECT MARKER	MONUMENTS	MARKERS
⊙	⊙	●	◕	--NO SYMBOL--
0	3	6	2	2

DRAINAGE STRUCTURE TABLE

Mark	Station	Structure	Skew No.	Drainage Area (ha)	Q100 (cms)	Remarks
62	50+324.030	1-1067 mm S x 737 mm R x 20.117 m CSPA	90.0	n/a	n/a	With End Section At Inlet, Daylight with Irrigation Canal
63	50+566.500	1-762 mm x 23.165 m CSPC	90.0	n/a	n/a	With End Section At Inlet, For Relief Pipe Only
64	50+644.110	4-1524 mm x 27.432 m CSPC	90.0	322.476	9.566	With Concrete Slope Paving At Inlet & Wire Enclosed Riprap Apron at Outlet

SCALE: Meters
0 20 40 60 80 100

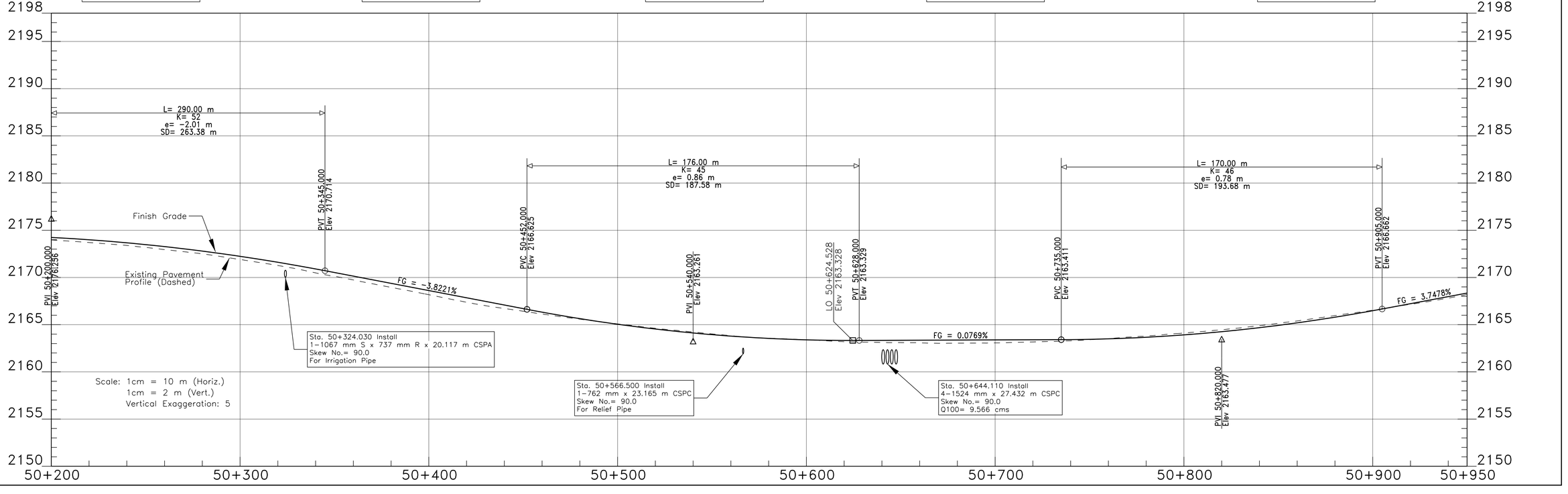
Sta. 50+219.96 SCP 335
Offset 20.386 m Rt.
Elev 2172.920

Sta. 50+357.75 SCP 336
Offset 28.958 m Lt.
Elev 2169.845

Sta. 50+522.20 SCP 337
Offset 20.696 m Rt.
Elev 2163.343

Sta. 50+680.10 SCP 338
Offset 17.688 m Lt.
Elev 2161.414

Sta. 50+843.27 SCP 339
Offset 21.321 m Rt.
Elev 2163.398



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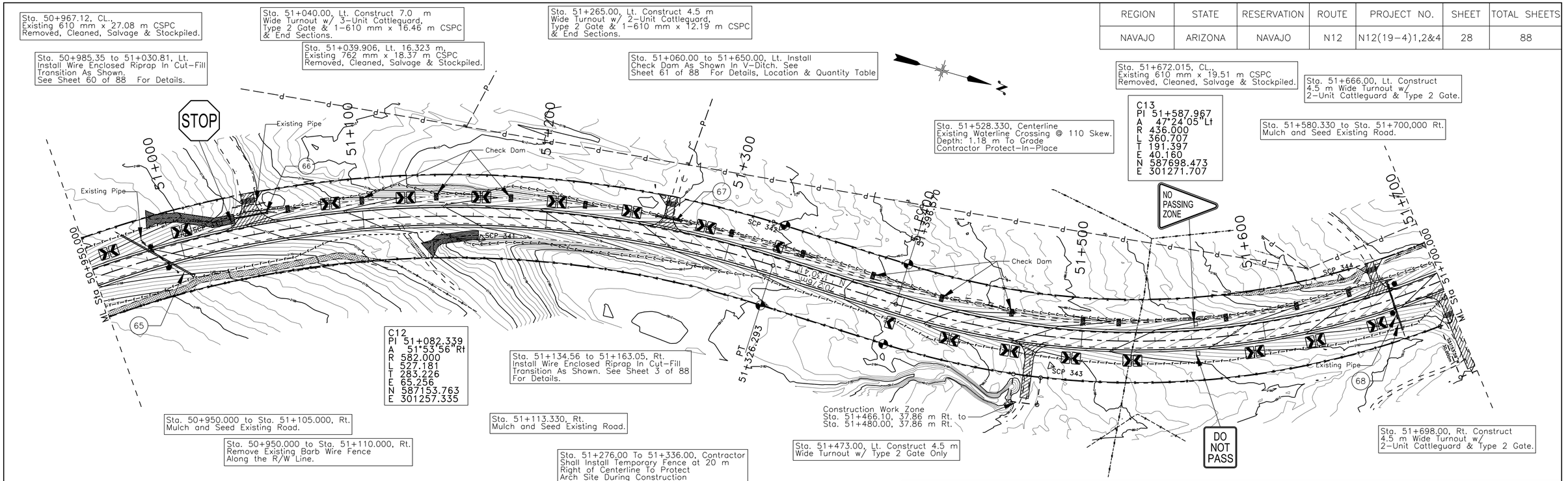
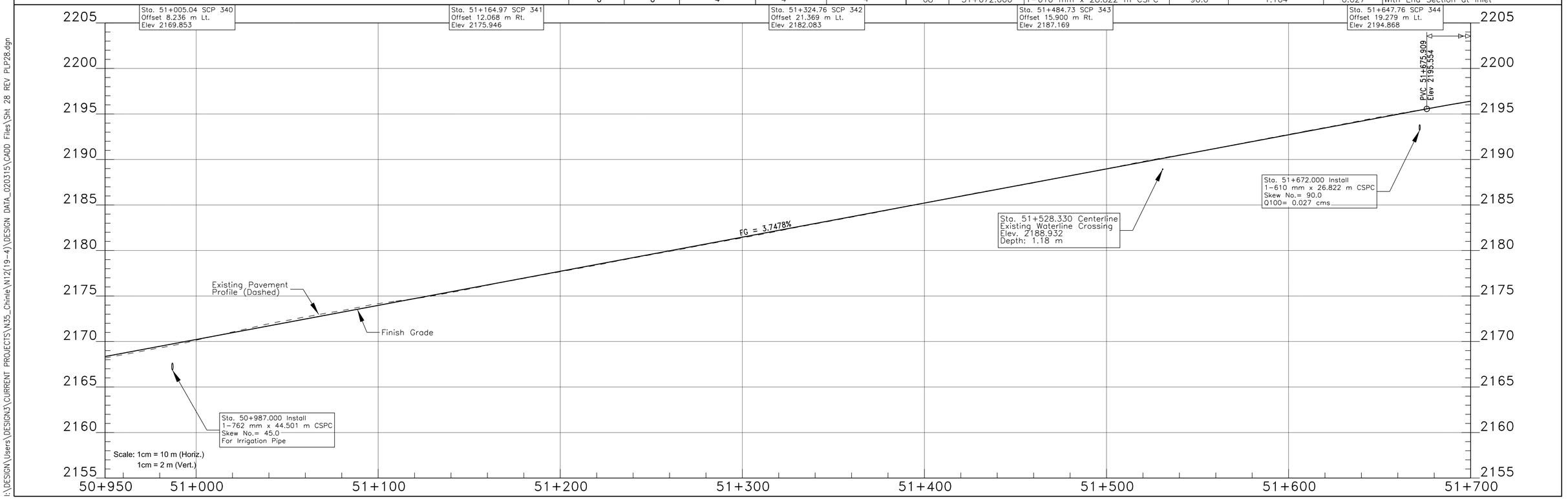
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	28	88



DELINEATORS		TYPE 2	RIGHT-OF-WAY	
TYPE "1a"	TYPE "1b"	OBJECT MARKER	MONUMENTS	MARKERS
⊡	⊡	●	⊕	--NO SYMBOL--
0	0	4	4	4

DRAINAGE STRUCTURE TABLE

Mark	Station	Structure	Skew No.	Drainage Area (ha)	Q100 (cms)	Remarks
65	50+987.000	1-762 mm x 44.501 m CSPC	45.0	n/a	n/a	With End Section at Inlet, Irrigation pipe
66	51+040.000	1-610 mm x 16.460 m CSPC	90.0	1.014	0.063	CSPC Under T/O w/ 2-End Sections
67	51+265.000	1-610 mm x 12.190 m CSPC	90.0	0.683	0.042	CSPC Under T/O w/ 2-End Sections
68	51+672.000	1-610 mm x 28.822 m CSPC	90.0	1.164	0.027	With End Section at Inlet



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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	29	88

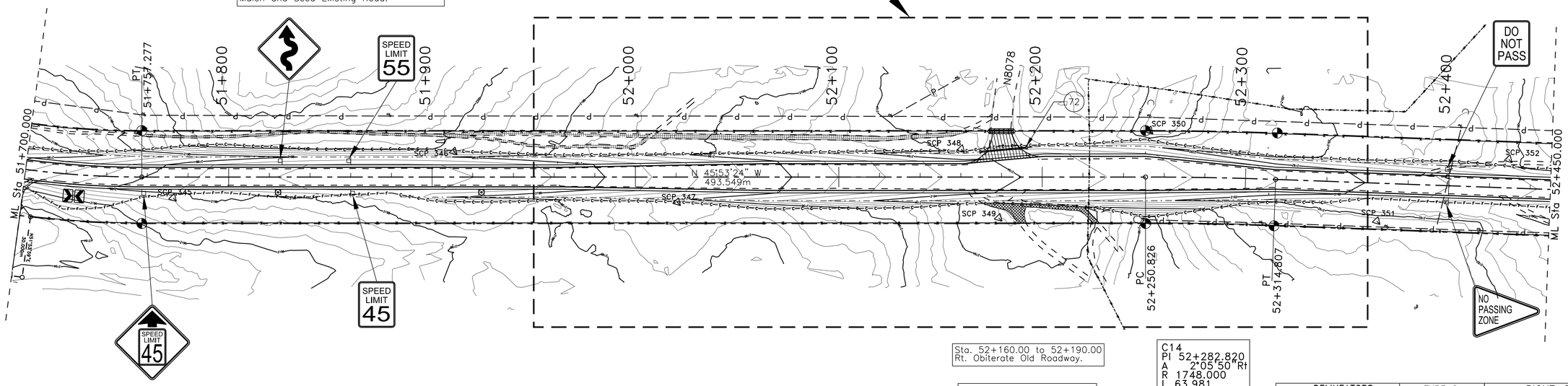
See Sheet 42 Of 88 For Permanent Traffic Control Sign Layout, Pavement Widening, Markings And Turning Lane Detail From Sta. 51+950.00 To 52+360.00

Sta. 52+180.00, Lt. (N8078-Dine College) Construct Turnout 9.10 m Wide w/4-Unit Cattleguard, w/ 1-610 mm x 21.34 m CSPC & End Sections.

Sta. 52+398.274, Centerline
Existing Powerline Crossing @ 109 Skew.
Contractor Protect-In-Place

Sta. 52+399.780, Centerline
Existing Powerline Crossing @ 109 Skew.
Contractor Protect-In-Place

Sta. 51+700.000 to Sta. 52+165.000, Lt.
Mulch and Seed Existing Road.



Sta. 52+160.00 to 52+190.00
Rt. Obiterate Old Roadway.

Sta. 52+224.124 Centerline
Existing Waterline Crossing.
Depth: 1.12 m To Grace
Contractor Protect-In-Place

C14
PI 52+282.820
A 2°05'50" Rt
R 1748.000
L 63.981
T 31.994
E 0.293
N 588197.491
E 300756.941

DELINEATORS		TYPE 2	RIGHT-OF-WAY	
TYPE "1a"	TYPE "1b"	OBJECT MARKER	MONUMENTS	MARKERS
⊠	⊠	●	◔	--NO SYMBOL--
0	2	0	6	6

SCALE: Meters
0 20 40 60 80 100

DRAINAGE STRUCTURE TABLE

Mark	Station	Structure	Skew No.	Drainage Area (ha)	Q100 (cms)	Remarks
72	52+180.000	1-610 mm x 21.34 m CSPC	90.0	0.519	0.032	CSPC Under T/O w/2-End Sections at Inlet & Outlet

Sta. 51+772.67 SCP 345
Offset 10.277 m Rt.
Elev 2197.671

Sta. 51+910.70 SCP 346
Offset 12.535 m Lt.
Elev 2199.548

Sta. 52+020.55 SCP 347
Offset 12.382 m Rt.
Elev 2196.656

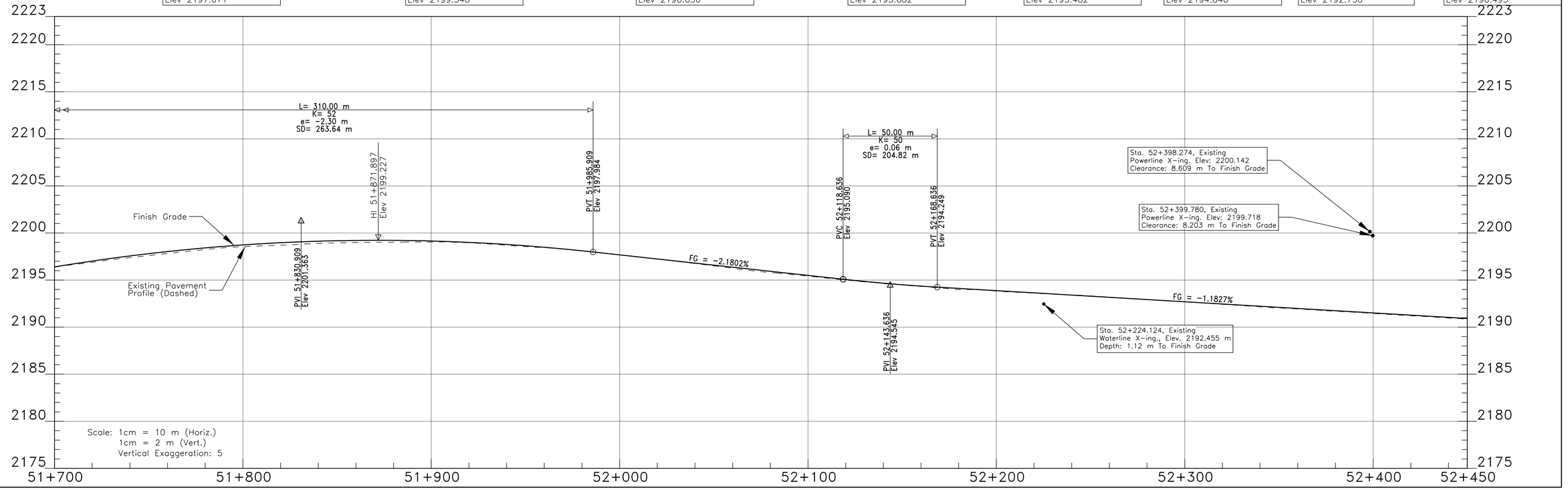
Sta. 52+160.20 SCP 348
Offset 13.759 m Lt.
Elev 2193.682

Sta. 52+178.65 SCP 349
Offset 20.127 m Rt.
Elev 2193.482

Sta. 52+252.83 SCP 350
Offset 22.850 m Lt.
Elev 2194.840

Sta. 52+365.23 SCP 351
Offset 18.655 m Rt.
Elev 2192.730

Sta. 52+429.01 SCP 352
Offset 14.102 m Lt.
Elev 2190.493



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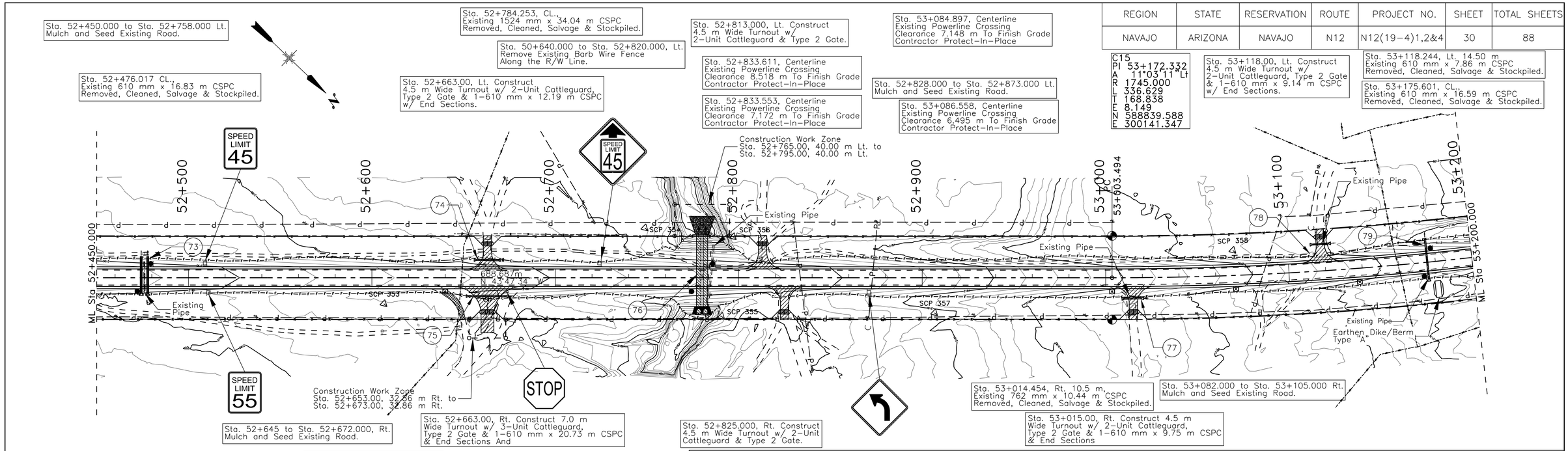
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	30	88



DRAINAGE STRUCTURE TABLE

Mark	Station	Structure	Skew No.	Drainage Area (ha)	Q100 (cms)	Remarks
73	52+476.000	2-1067 mm S x 737 mm R x 20.117 m CSPA	90.0	23.221	1.148	With End Section At Inlet
74	52+663.000	1-610 mm x 12.190 m CSPC	90.0	n/a	n/a	CSPC Under T/O w/ 2-End Section, For Relief Pipe Only
75	52+663.000	1-610 mm x 20.730 m CSPC	90.0	0.389	0.024	CSPC Under T/O w/ 2-End Section
76	52+780.000	2-2438 mm x 43.891 m Dual Propose SPP	90.0	953.687	14.818	With Concrete Slope Paving At Inlet Only & Grouted Riprap at Outlet
77	53+015.000	1-610 mm x 9.750 m CSPC	90.0	0.740	0.046	CSPC Under T/O w/ 2-End Section
78	53+118.000	1-610 mm x 9.140 m CSPC	90.0	0.648	0.040	CSPC Under T/O w/ 2-End Section
79	53+175.601	1-610 mm x 21.946 m CSPC	90.0	3.166	0.197	With End Section At Inlet & Type "A" Earthen Dike/Berm at Inlet

DELINEATORS		TYPE 2	RIGHT-OF-WAY	
TYPE "1a"	TYPE "1b"	OBJECT MARKER	MONUMENTS	MARKERS
⊙	⊙	●	◕	--NO SYMBOL--
0	4	6	2	2

Sta. 52+606.55 SCP 353
Offset 14.166 m Rt.
Elev 2188.634

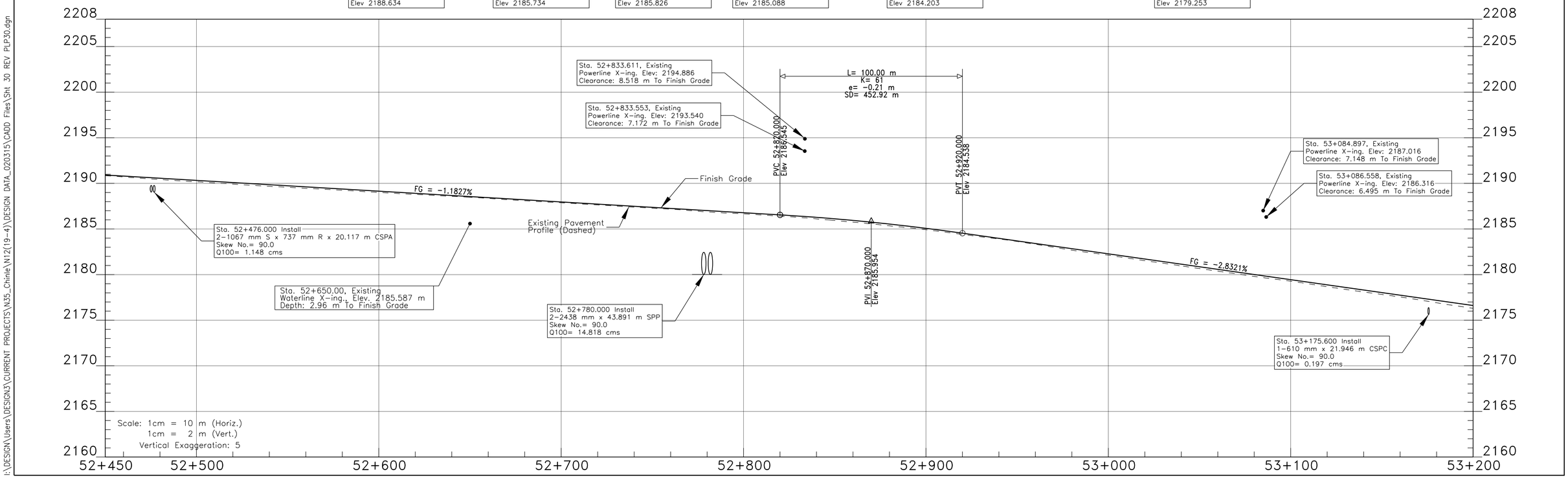
Sta. 52+748.78 SCP 354
Offset 27.197 m Lt.
Elev 2185.734

Sta. 52+796.98 SCP 356
Offset 22.358 m Lt.
Elev 2185.826

Sta. 52+790.60 SCP 355
Offset 21.027 m Rt.
Elev 2185.088

Sta. 52+906.73 SCP 357
Offset 19.166 m Rt.
Elev 2184.203

Sta. 53+069.86 SCP 358
Offset 13.686 m Lt.
Elev 2179.253



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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	31	88

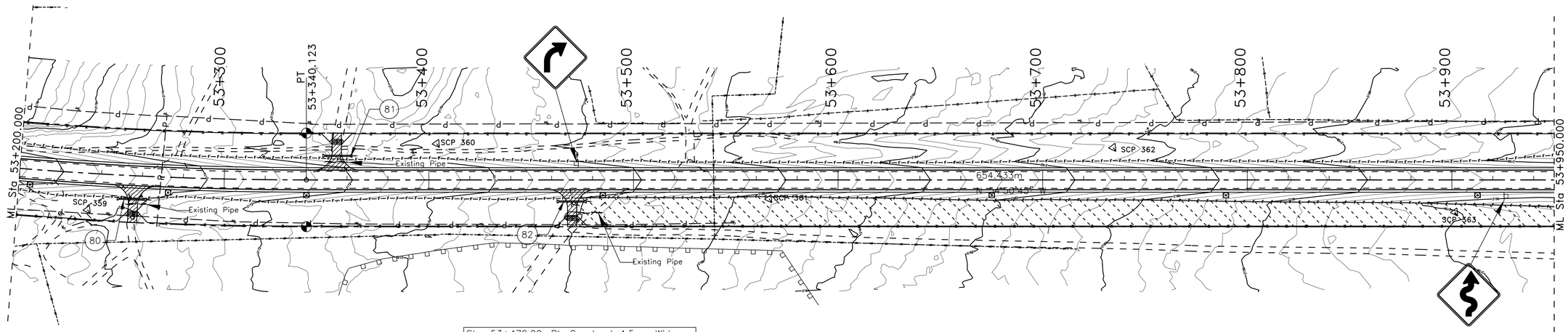
Sta. 53+268.130, Centerline
Existing Powerline Crossing
Clearance 6.074 m To Grade
Contractor Protect-In-Place

Sta. 53+269.803, Centerline
Existing Powerline Crossing
Clearance 6.096 m To Grade
Contractor Protect-In-Place

Sta. 53+354.502, Lt. 8.794 m
Existing 457 mm x 11.58 m CSPC
Removed, Cleaned, Salvage & Stockpiled.

Sta. 53+355.00, Lt. Construct 4.5 m Wide
Turnout w/2-Unit Cattleguard, Type 2 Gate,
1-610 mm x 10.97 m CSPC & End Sections.

Sta. 53+280.000 to Sta. 53+580.000 Lt.
Mulch and Seed Existing Road.



Sta. 53+256.00, Rt. Construct 4.5 m Wide
Turnout w/2-Unit Cattleguard, Type 2 Gate,
1-610 mm x 9.75 m CSPC & End Sections.

Sta. 53+470.00, Rt. Construct 4.5 m Wide
Turnout w/ 2-Unit Cattleguard, Type 2 Gate,
1-610 mm x 12.19 m CSPC & End Sections.

Sta. 53+478.822, Rt. 16.040 m
Existing 457 mm x 12.12 m CSPC
Removed, Cleaned, Salvage & Stockpiled.

Sta. 53+540.00, Centerline
Existing Waterline Crossing
Depth: 1.99 m To Finish Grade
Contractor Protect-In-Place

Sta. 53+472.00 to 54+000.00, Rt. Tree &
Shrub Slash Stockpile Area. (0.66 ha)

Sta. 53+257.167, 13.73 m Rt.
Existing 457 mm x 10.40 m CSPC
Removed, Cleaned, Salvage & Stockpiled.

SCALE: Meters
0 20 40 60 80 100

DELINEATORS		TYPE 2	RIGHT-OF-WAY	
TYPE "1a"	TYPE "1b"	OBJECT MARKER	MONUMENTS	MARKERS
⊙	⊡	●	⊕	--NO SYMBOL--
0	7	0	2	2

DRAINAGE STRUCTURE TABLE

Mark	Station	Structure	Skew No.	Drainage Area (ha)	Q100 (cms)	Remarks
80	53+256.000	1-610 mm x 9.750 m CSPC	90.0	1.018	0.063	CSPC Under T/O w/ 2-End Sections
81	53+355.000	1-610 mm x 10.970 m CSPC	90.0	2.864	0.178	CSPC Under T/O w/ 2-End Sections
82	53+470.000	1-610 mm x 12.190 m CSPC	90.0	1.018	0.063	CSPC Under T/O w/ 2-End Sections

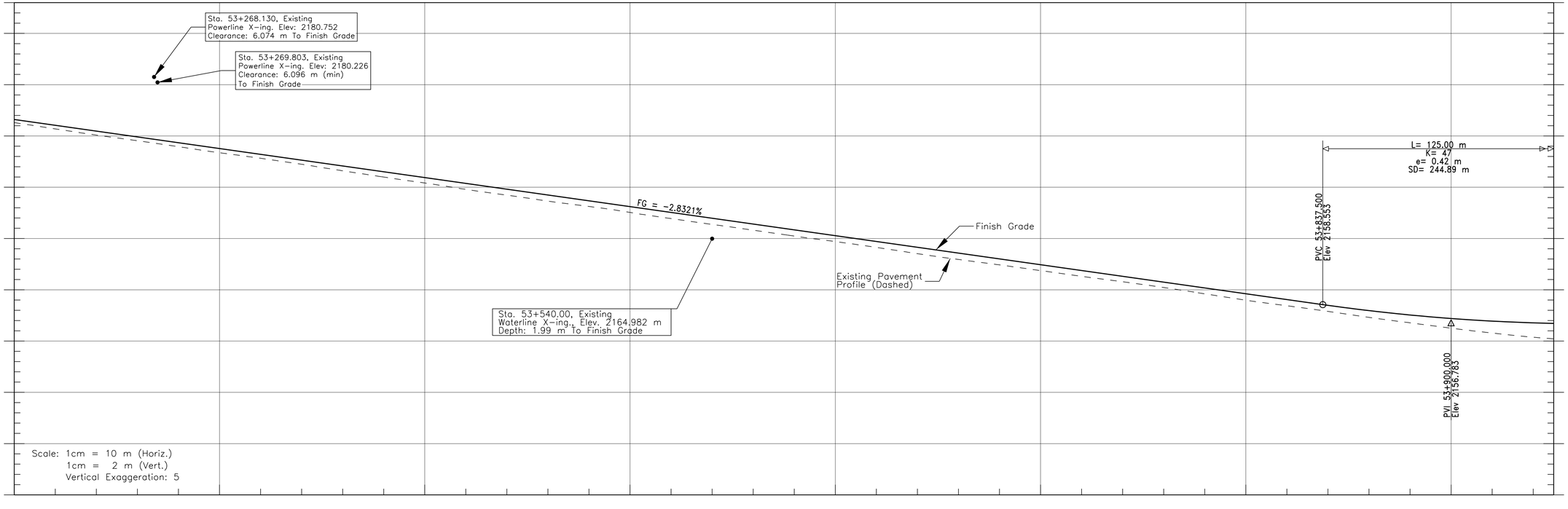
Sta. 53+234.16 SCP 359
Offset 17.840 m Rt.
Elev 2174.307

Sta. 53+403.80 SCP 360
Offset 17.736 m Lt.
Elev 2169.944

Sta. 53+566.30 SCP 361
Offset 9.270 m Rt.
Elev 2165.605

Sta. 53+734.43 SCP 362
Offset 15.797 m Lt.
Elev 2160.902

Sta. 53+901.51 SCP 363
Offset 15.772 m Rt.
Elev 2156.109



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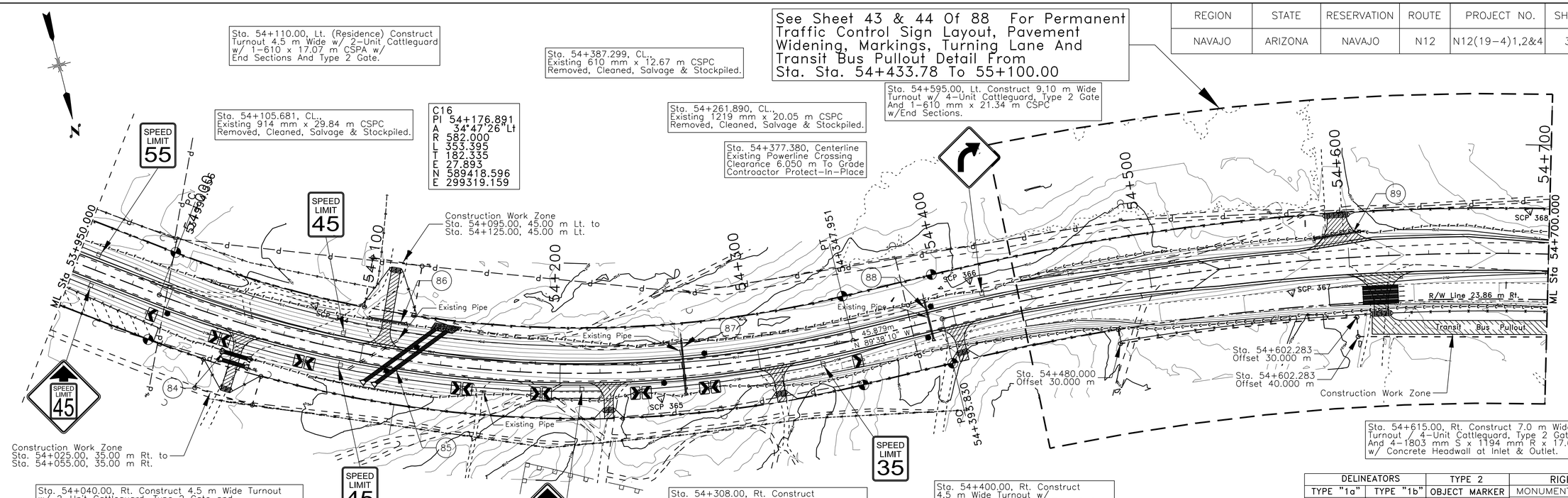
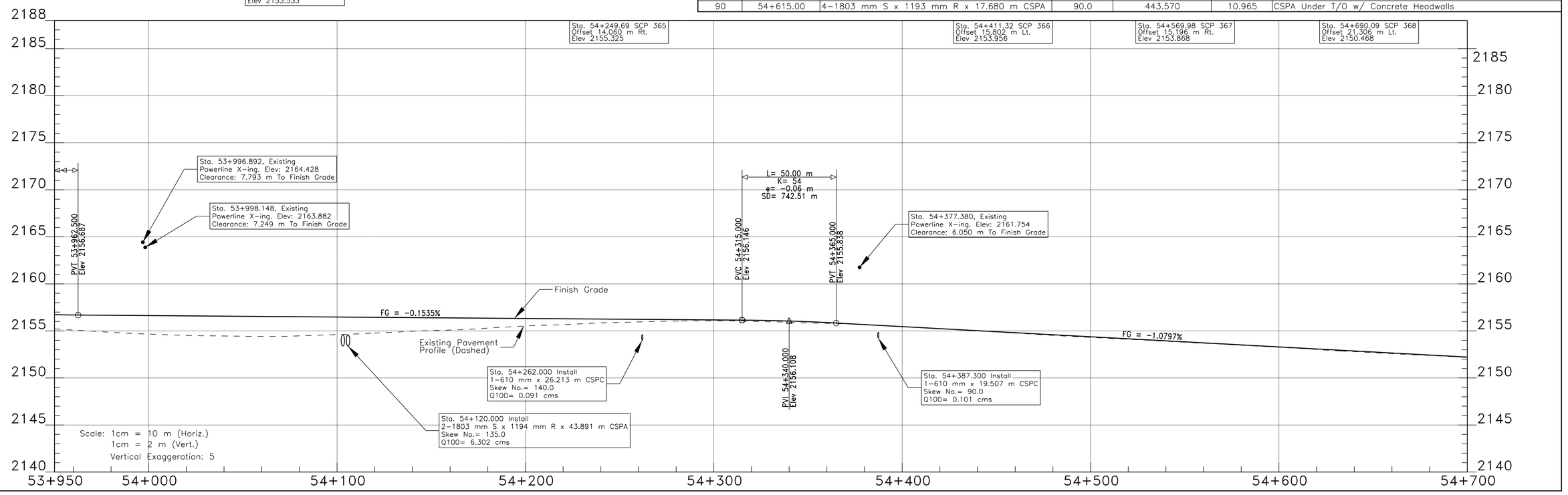
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	32	88



DELINEATORS		TYPE 2	RIGHT-OF-WAY	
TYPE "1a"	TYPE "1b"	OBJECT MARKER	MONUMENTS	MARKERS
⊠	⊠	●	◔	--NO SYMBOL--
0	0	24	6	6

DRAINAGE STRUCTURE TABLE

Mark	Station	Structure	Skew No.	Drainage Area (ha)	Q100 (cms)	Remarks
84	54+040.000	2-1803 mm S x 1193 mm R x 11.580 m CSPA	90.0	278.850	6.302	CSPA Under T/O w/ 2-End Sections
85	54+120.000	2-1803 mm S x 1193 mm R x 43.981 m CSPA	135.0			With End Section at Each Inlet & Place Riprap Apron at Outlet
86	54+110.000	1-610 mm x 17.070 m CSPC	90.0	2.822	0.199	CSPC Under T/O w/ 2-End Sections
87	54+262.000	1-610 mm x 26.213 m CSPC	140.0	0.919	0.091	With End Section at Inlet
88	54+387.300	1-610 mm x 19.507 m CSPC	90.0	1.019	0.101	With End Section at Inlet
89	54+595.00	1-610 mm x 24.340 m CSPC	90.0	0.258	0.016	CSPC Under T/O w/ 2-End Sections
90	54+615.00	4-1803 mm S x 1193 mm R x 17.680 m CSPA	90.0	443.570	10.965	CSPA Under T/O w/ Concrete Headwalls



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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	33	88

See Sheet 43 & 44 Of 88 For Permanent Traffic Control Sign Layout, Pavement Widening, Markings, Turning Lane And Transit Bus Pullout Detail From Sta. Sta. 54+433.78 To 55+100.00

Sta. 54+856.778, Centerline Existing Powerline Crossing Clearance 7.162 m To Grade Controactor Protect-In-Place

Sta. 54+890.00, Lt., Construct 7.0 Wide Turnout w/ 4-Unit Cattleguard & Type 2 Gate.

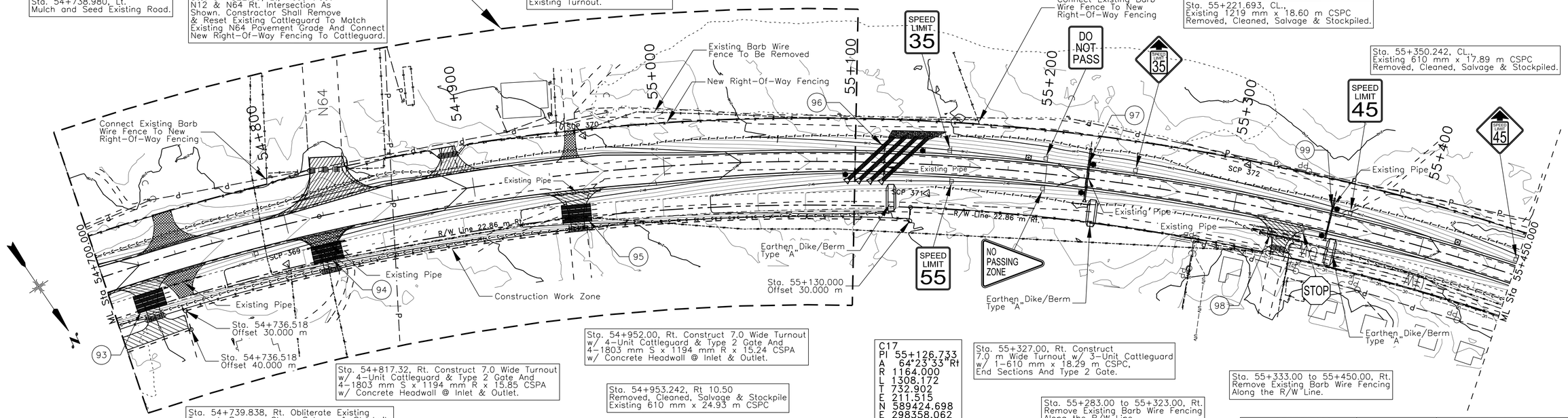
Sta. 54+795.00 to 55+162.00, Lt. Remove Existing Barb Wire Fencing Along the R/W Line.

Sta. 55+115.299, CL., Existing 610 mm x 17.63 m CSPC Removed, Cleaned, Salvage & Stockpiled.

Sta. 54+738.980, Lt. Mulch and Seed Existing Road.

Sta. 54+822.86, Lt, Recontruct N12 & N64 Rt. Intersection As Shown. Constractor Shall Remove & Reset Existing Cattleguard To Match Existing N64 Pavement Grade And Connect New Right-Of-Way Fencing To Cattleguard.

Sta. 54+953.060, Lt. Obliterate Existing Turnout.



Sta. 55+221.693, CL., Existing 1219 mm x 18.60 m CSPC Removed, Cleaned, Salvage & Stockpiled.

Sta. 55+350.242, CL., Existing 610 mm x 17.89 m CSPC Removed, Cleaned, Salvage & Stockpiled.

Sta. 54+739.838, Rt. Obliterate Existing Turnout. Remove, Clean, Salvage & Stockpile Existing 457 mm x 20.76 m CSPC

Sta. 54+817.32, Rt. Construct 7.0 Wide Turnout w/ 4-Unit Cattleguard & Type 2 Gate And 4-1803 mm S x 1194 mm R x 15.85 CSPA w/ Concrete Headwall @ Inlet & Outlet.

Sta. 54+952.00, Rt. Construct 7.0 Wide Turnout w/ 4-Unit Cattleguard & Type 2 Gate And 4-1803 mm S x 1194 mm R x 15.24 CSPA w/ Concrete Headwall @ Inlet & Outlet.

Sta. 54+953.242, Rt 10.50 Removed, Cleaned, Salvage & Stockpile Existing 610 mm x 24.93 m CSPC

Sta. 54+817.72, 15.00 m Rt. Remove, Clean, Salvage & Stockpile Existing 610 mm x 20.03 m CSPC

Sta. 54+720.00, Rt. Construct 7.0 Wide Turnout w/ 4-Unit Cattleguard & Type 2 Gate And 4-1803 mm S x 1194 mm R x 15.85 CSPA w/ Concrete Headwall @ Inlet & Outlet.

C17
PI 55+126.733
A 64°23'33" Rt
R 1164.000
L 1308.172
T 732.902
E 211.515
N 589424.698
E 298358.062

Sta. 55+327.00, Rt. Construct 7.0 m Wide Turnout w/ 3-Unit Cattleguard w/ 1-610 mm x 18.29 m CSPC, End Sections And Type 2 Gate.

Sta. 55+283.00 to 55+323.00, Rt. Remove Existing Barb Wire Fencing Along the R/W Line.

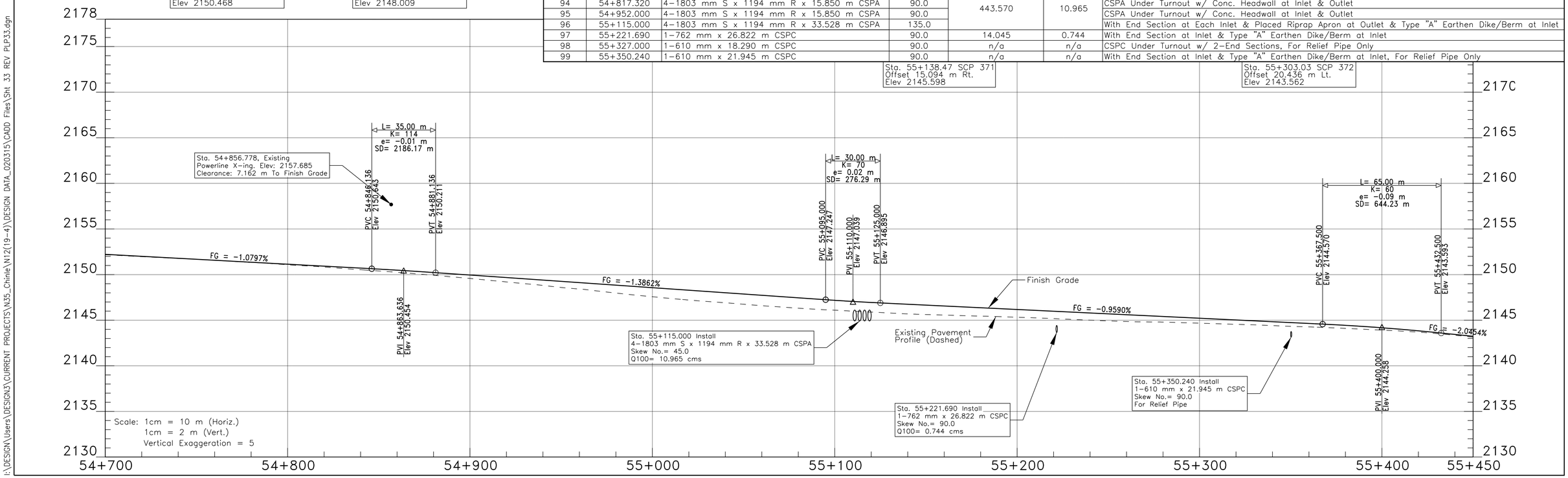
Sta. 55+333.00 to 55+450.00, Rt. Remove Existing Barb Wire Fencing Along the R/W Line.

SCALE: Meters
0 20 40 60 80 100

DELINEATORS		TYPE 2	RIGHT-OF-WAY	
TYPE "1a"	TYPE "1b"	OBJECT MARKER	MONUMENTS	MARKERS
⊡	⊡	●	⊕	--NO SYMBOL--
0	2	6	0	0

DRAINAGE STRUCTURE TABLE

Mark	Station	Structure	Skew No.	Drainage Area (ha)	Q100 (cms)	Remarks
93	54+720.000	4-1803 mm S x 1194 mm R x 15.850 m CSPA	90.0	443.570	10.965	CSPA Under Turnout w/ Conc. Headwall at Inlet & Outlet
94	54+817.320	4-1803 mm S x 1194 mm R x 15.850 m CSPA	90.0			CSPA Under Turnout w/ Conc. Headwall at Inlet & Outlet
95	54+952.000	4-1803 mm S x 1194 mm R x 15.850 m CSPA	90.0			CSPA Under Turnout w/ Conc. Headwall at Inlet & Outlet
96	55+115.000	4-1803 mm S x 1194 mm R x 33.528 m CSPA	135.0			With End Section at Each Inlet & Placed Riprap Apron at Outlet & Type "A" Earthen Dike/Berm at Inlet
97	55+221.690	1-762 mm x 26.822 m CSPC	90.0	14.045	0.744	With End Section at Inlet & Type "A" Earthen Dike/Berm at Inlet
98	55+327.000	1-610 mm x 18.290 m CSPC	90.0	n/a	n/a	CSPC Under Turnout w/ 2-End Sections, For Relief Pipe Only
99	55+350.240	1-610 mm x 21.945 m CSPC	90.0	n/a	n/a	With End Section at Inlet & Type "A" Earthen Dike/Berm at Inlet, For Relief Pipe Only



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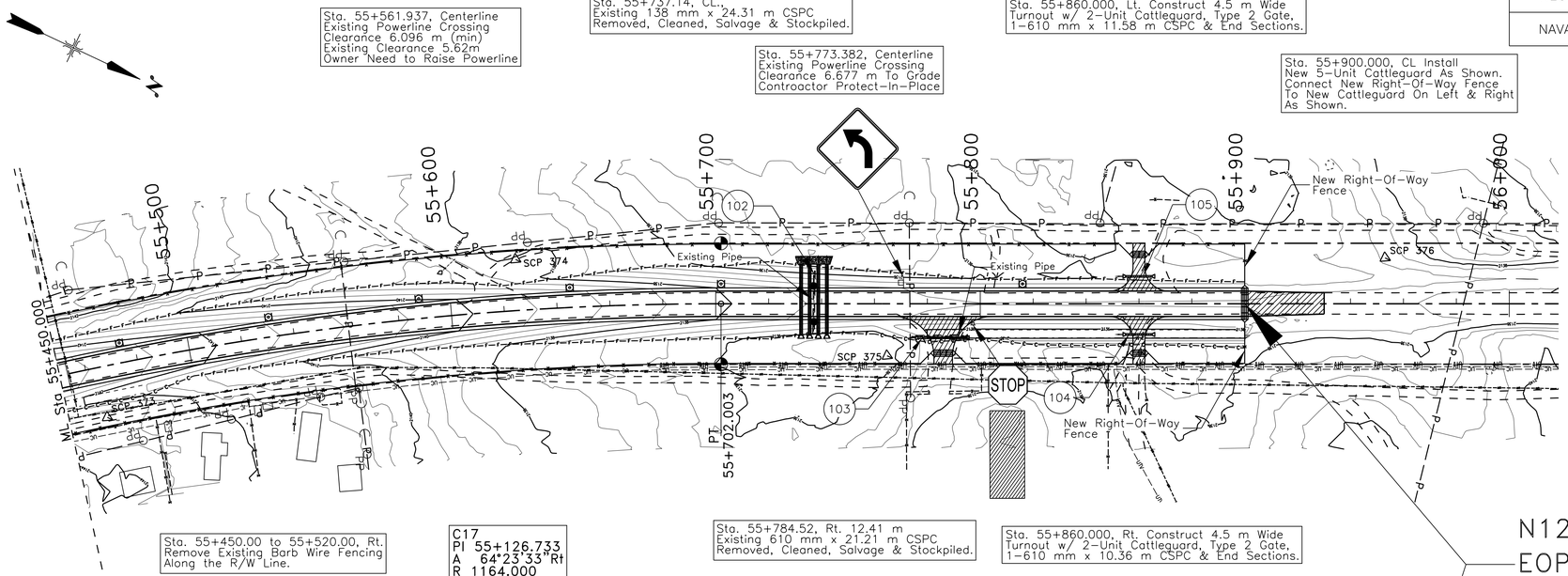
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	34	88



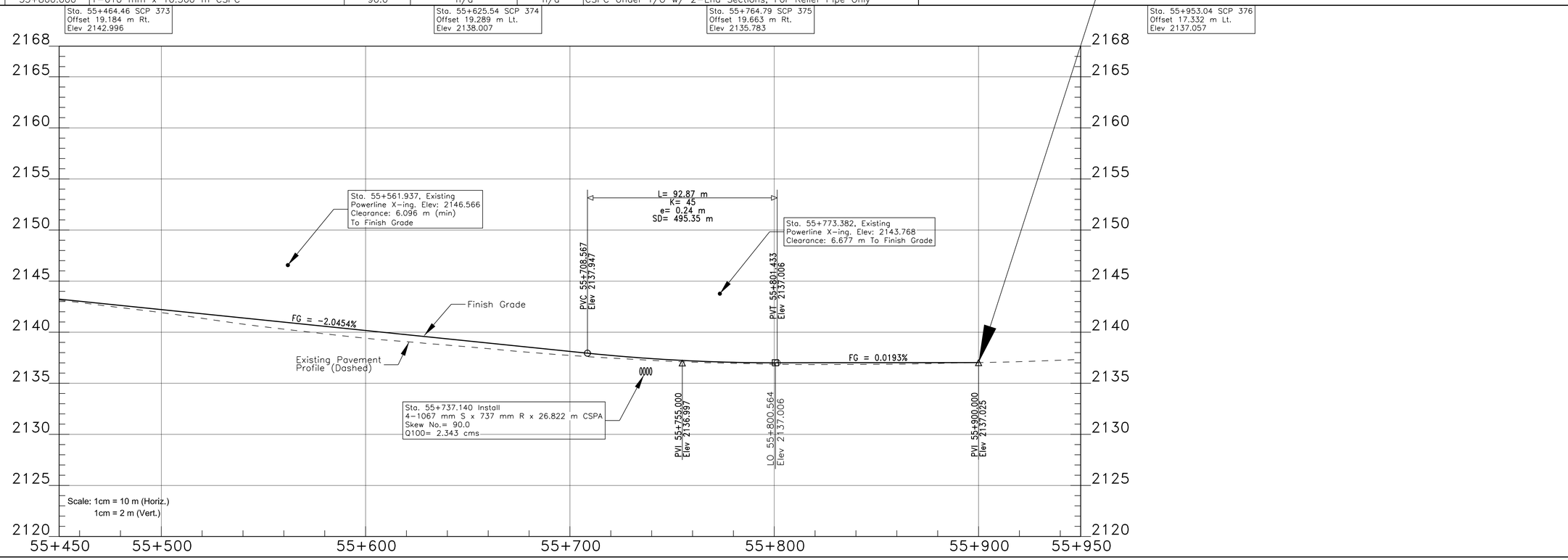
DELINEATORS		TYPE 2	RIGHT-OF-WAY	
TYPE "1a"	TYPE "1b"	OBJECT MARKER	MONUMENTS	MARKERS
⊙	⊡	◀	◔	--NO SYMBOL--
0	6	2	2	2

DRAINAGE STRUCTURE TABLE

Mark	Station	Structure	Skew No.	Drainage Area (ha)	Q100 (cms)	Remarks
102	55+737.140	4-1067 mm S x 737 mm R x 26.822 m CSPA	90.0	89.673	2.343	With End Section at Each Inlet & Placed Riprap Apron at Outlet
103	55+786.000	1-610 mm x 18.290 m CSPC	90.0	n/a	n/a	CSPC Under T/O w/ 2-End Sections, For Relief Pipe Only
104	55+860.000	1-610 mm x 11.580 m CSPC	90.0	n/a	n/a	CSPC Under T/O w/ 2-End Sections, For Relief Pipe Only
105	55+860.000	1-610 mm x 10.360 m CSPC	90.0	n/a	n/a	CSPC Under T/O w/ 2-End Sections, For Relief Pipe Only

N12(19-4)2&4
EOP Sta. 55+900.000
Elev: 2137.025

SCALE: Meters
0 20 40 60 80 100



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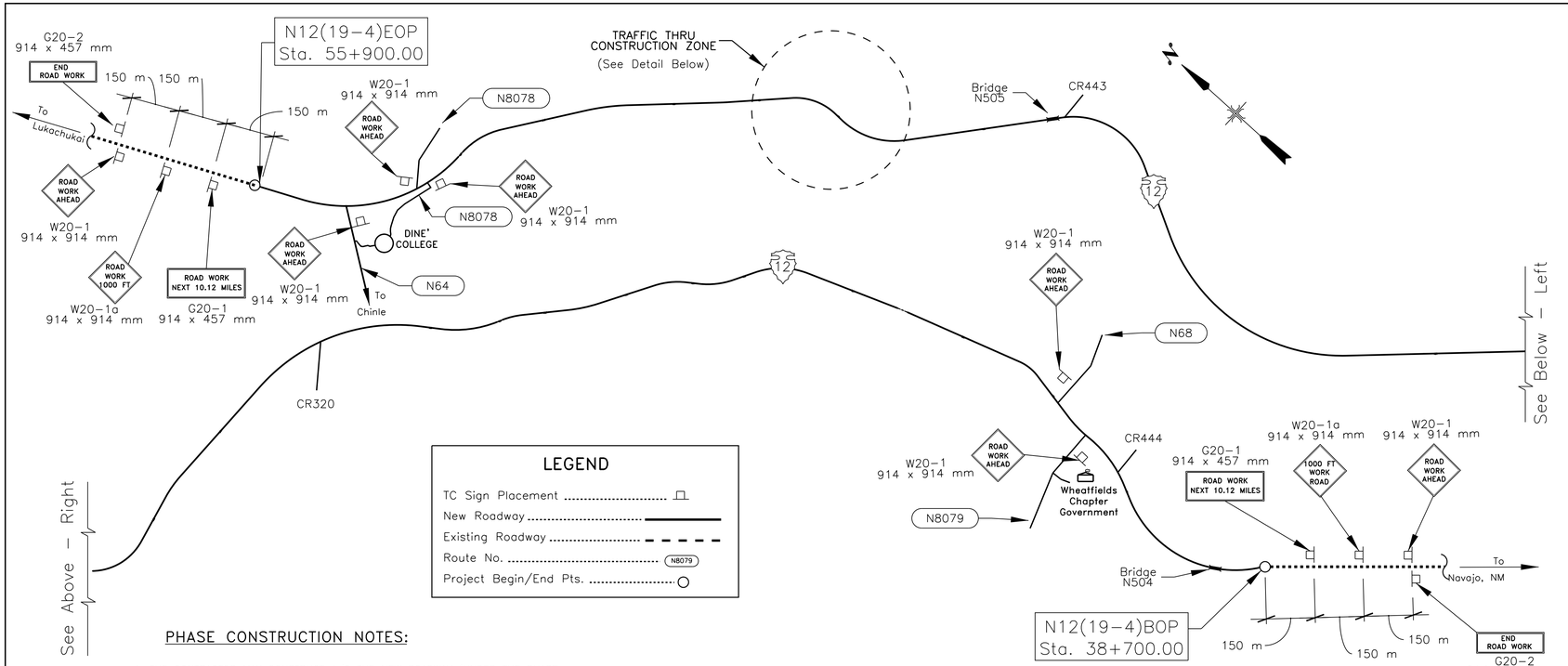
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	35	88

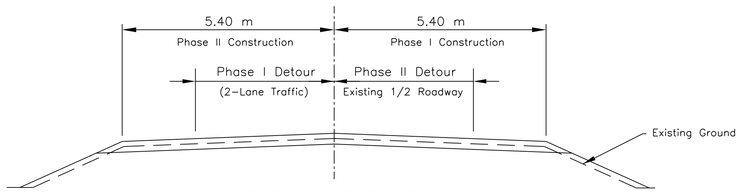


LEGEND

- TC Sign Placement
- New Roadway
- Existing Roadway
- Route No. (N8079)
- Project Begin/End Pts.

PHASE CONSTRUCTION NOTES:

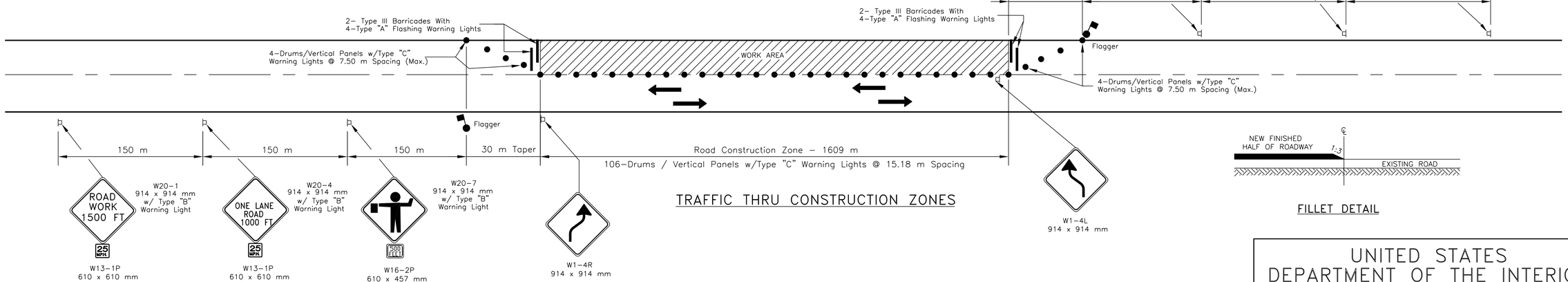
1. THE CONTRACTOR MAY CONSTRUCT 1/2 THE NEW ROADWAY (UNDER THE PHASE CONSTRUCTION PLAN SHOWN) WHILE DETOURING TWO-WAY TRAFFIC ON THE OTHER (EXISTING) HALF ONCE THE FIRST 1/2 OF ROADWAY IS BUILD UP TO THE NEW GRADES; THEN TRAFFIC SHALL BE DIRECTED TO THE NEW HALF OF ROADWAY WHILE THE OTHER (EXISTING) HALF IS CONSTRUCTED.
2. ALL (NEW) DRAINAGE PIPE INSTALLATION SHALL BE IN ACCORDANCE WITH THE PHASED CONSTRUCTION PLAN ABOVE AS WELL AS REMOVAL OF EXISTING PIPES. ALL THIS PIPE INSTALLATION & REMOVAL SHALL BE CONSIDERED INCIDENTAL TO PIPE ITEMS SHOWN AND NO ADDITIONAL PAYMENT SHALL BE MADE.
3. THIS PHASED CONSTRUCTION SHALL BE CONSIDERED INCIDENTAL TO THE TCP AND NO ADDITIONAL PAYMENT SHALL BE MADE.
4. THE CONTRACTOR'S CONSTRUCTION SCHEDULE, CONSTRUCTION SEQUENCING PLAN, AND STORM WATER POLLUTION PREVENTION PLAN SHALL REFLECT THIS PHASED CONSTRUCTION.



PHASED CONSTRUCTION

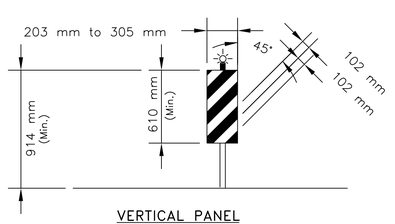
GENERAL NOTES

1. ALL TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH THE MUTCD MANUAL (LATEST EDITION AND AMENDMENTS) AND THE SUPPLEMENTAL SPECIFICATION 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, AND THE MUTCD UNDER CONTRACT ITEM 63501. 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 SUPPLEMENTAL SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
3. SIGNS (G20-1, W20-1, W20-1a, AND G20-2) 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 EXISTING ROADWAY PRISM.
5. IN AREAS OF EXISTING ROADWAY WIDENING, 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 MINIMUM 1:3 SLOPE AS SHOWN OF FILLET DETAIL.
6. AT THE END OF EACH WORKING DAY, IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIED A DRIVING SURFACE FREE OF OBSTRUCTIONS AS SHOWN ON THE PHASED AND FILLET CONSTRUCTION DETAILS AS APPLICABLE, ACCESS TO ALL ADJOINING PROPERTIES AND BIA 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 USE OF THE PILOT CARS AND 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 SHALL BE ALLOWED.
10. THE CONTRACTOR HAS THE OPTION TO UTILIZE DETOUR ROADS IN ACCORDANCE WITH THE MUTCD MANUAL IN CONJUNCTION WITH OR IN LIEU OF THE PHASE CONSTRUCTION DETAILS SHOWN 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 ITEM. THE CONTRACTOR IS RESPONSIBLE FOR ALL NECESSARY PERMITS AND CLEARANCES FOR ANY DETOUR ROADS.
11. AT LOCATIONS WHERE NEW ROAD CONSTRUCTION CROSSES EXISTING ROADWAY , AT TIE-INS WITH EXISTING ROADS, AND AT THE END OF THE NEW CONSTRUCTION DETAILS SHOWN AND IN ACCORDANCE WITH SECTION 107 AND 204, THE COST OF ANY DETOUR ROADS (INCLUDING ALL DETOUR RELATED EARTHWORK AND MAINTENANCE) SHALL BE CONSIDERED INCIDENTALTO THE TEMPORARY TRAFFIC CONTROL BID ITEMS. THE CONTRACTOR IS RESPONSIBLE FOR ALL NECESSARY PERMITS AND CLEARANCES FOR ANY DETOUR ROADS.
12. THE TRAFFIC CONTROL ON THIS PROJECT SHALL BE COORDINATED WITH THE PROJECT CONSTRUCTION SCHEDULE.

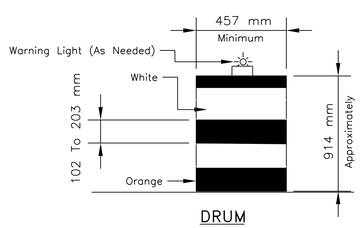


TRAFFIC THRU CONSTRUCTION ZONES

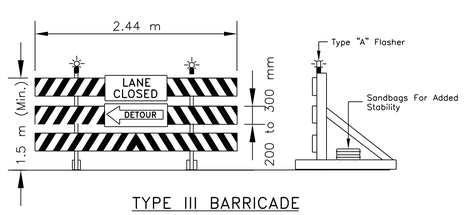
FILLET DETAIL



VERTICAL PANEL
(ALTERNATE)



DRUM



TYPE III BARRICADE

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS

NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

TEMPORARY TRAFFIC CONTROL PLAN

DRAWN BY: NRDOT	DATE: 3/19/2014
DESIGNED BY: NRDOT	DATE: 3/19/2014
REVISED: 3/19/2014	BY: Leroy.Toledo
Sht 35 N12 TCP.dgn	

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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	36	88

PERMANENT TRAFFIC CONTROL – SIGN, POST, & HARDWARE

Station	Location	Detail No.	Description	Sign Panel Size (mm)	Area of Sign (m^2)	Number of Square	Post Size (mm x mm)	No. of Panel	Total Area of Panel
38+730.000	Rt.	M1-23		457 x 762	0.35	1	38mm x 38mm	1	0.35
38+830.000	Rt.	M1-23		457 x 762	0.35	1	44mm x 44mm	2	1.12
38+930.000	Lt.	M6-1bR, M6-1bL Supplement Plate		553 x 381	0.21			2	
41+665.000	Rt.	M1-23		457 x 762	0.35	1	44mm x 44mm	2	1.12
41+760.000	Lt.	M6-1bR, M6-1bL Supplement Plate		553 x 381	0.21			2	
52+125.000	Rt.	M1-23		457 x 762	0.35	1	44mm x 44mm	2	1.12
52+240.000	Lt.	M6-1bR, M6-1bL Supplement Plate		553 x 381	0.21			2	
54+700.000	Rt.	M1-23		457 x 762	0.35	1	44mm x 44mm	2	1.12
54+920.000	Lt.	M6-1bR, M6-1bL Supplement Plate		553 x 381	0.21			2	
38+640.000 39+725.889 40+540.000 41+290.000 42+116.000 42+730.000 44+330.000 45+180.000 46+532.000 47+012.000 47+988.000 48+290.000 48+820.000 49+505.000 49+915.000 50+455.000 51+562.000 52+400.000 54+433.777 55+200.000	Rt. Lt. Rt. Lt. Rt. Lt. Rt. Lt. Rt. Lt. Rt. Lt. Rt. Lt. Rt. Lt. Rt. Lt. Rt. Lt.	R4-1		610 x 762	0.46	1	44mm x 44mm	20	9.20
38+640.000 39+725.889 40+540.000 41+290.000 42+116.000 42+730.000 44+330.000 45+180.000 46+532.000 47+012.000 47+988.000 48+290.000 48+820.000 49+505.000 49+915.000 50+455.000 51+562.000 52+400.000 54+433.777 55+200.000	Lt. Rt. Lt. Rt. Lt. Rt. Lt. Rt. Lt. Rt. Lt. Rt. Lt. Rt. Lt. Rt. Lt. Rt. Lt. Rt.	W14-3		914 x 1219 1219	0.52	2	50mm x 50mm	20	10.40
38+890.741 39+780.000 40+291.239 40+421.245 40+439.042 41+521.237 41+713.859 42+773.515 44+710.000 48+230.300 49+225.262 49+958.058 51+029.272 52+167.951 52+673.739 54+583.238 54+625.786 54+730.741 54+812.398 54+828.600 54+835.332 54+879.874 54+962.786 55+337.922 55+797.239	Rt. Rt. Rt. Rt. Lt. Lt. Rt. Lt. Lt. Lt. Rt. Lt. Lt. Lt. Rt. Lt. Rt. Rt. Lt. Rt. Rt. Lt. Rt. Rt. Rt.	R1-1		762 x 762	0.58	1	44mm x 44mm	25	14.50

PERMANENT TRAFFIC CONTROL – SIGN, POST, & HARDWARE

51+860.000 54+090.000 52+510.000 55+150.000 55+360.740 54+090.000	Rt. Lt. Lt. Rt. Lt. Rt.	R2-1		610 x 762	0.46	1	44mm x 44mm	7	3.22
38+580.000 38+580.000 41+380.000 41+580.000 50+500.000 51+860.000 52+510.000	Lt. Rt. Lt. Rt. Rt. Lt. Rt.	R2-1		610 x 762	0.46	1	44mm x 44mm	7	3.22
54+330.000 55+150.000	Rt. Lt.	R2-1		610 x 762	0.46	1	44mm x 44mm	2	0.92
41+440.000 50+360.000	Rt. Lt.	R2-1		610 x 762	0.46	1	44mm x 44mm	2	0.92
40+840.000 43+880.000 45+220.000 48+360.000 48+725.000 52+870.000 55+771.000	Lt. Rt. Lt. Lt. Rt. Rt. Lt.	W1-2L		762 x 762	0.58	1	44mm x 44mm	7	4.06
40+235.000 43+300.000 46+426.000 44+480.000 44+616.000 49+700.000 53+473.000	Rt. Lt. Rt. Lt. Rt. Lt. Lt.	W1-2R		762 x 762	0.58	1	44mm x 44mm	7	4.06
40+150.000 50+730.000 51+826.300	Lt. Rt. Lt.	W1-5L		762 x 762	0.58	1	44mm x 44mm	3	1.74
38+683.000 40+785.000 53+925.500 54+416.950	Rt. Rt. Rt. Lt.	W1-5R		762 x 762	0.58	1	44mm x 44mm	4	2.32
42+208.000 46+242.000	Rt. Lt.	D5-15		1658x1050	1.74	2	57mm x 57mm	2	3.48
42+360.000 46+090.000	Rt. Lt.	D5-17		1928x1050	2.02	2	57mm x 57mm	2	4.04
See Sheet 66 of 74 for Location & Quantity Table		W1-8L		457 x 610	0.28	1	38mm x 38mm	7	1.96
		W1-8L & W1-8R		457 x 610 457 x 610	0.28	1	38mm x 38mm	128	35.84
		W1-8R		457 x 610	0.28	1	38mm x 38mm	6	1.68

(CONTINUED ON NEXT SHEET)

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

PERMANENT & TEMPORARY TRAFFIC CONTROL DETAILS

DRAWN BY: NRDOT	DATE: 12/31/2013
DESIGNED BY: NRDOT	DATE: 12/31/2013
REVISED: 3/19/2014	BY: Leroy.Toledo
Sht 36 N12 Permanent Temp TCP.dgn	

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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	37	88

(CONTINUED FROM PREVIOUS SHEET)

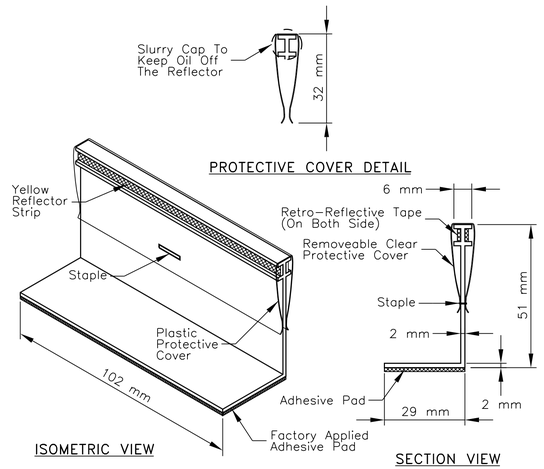
PERMANENT TRAFFIC CONTROL – SIGN, POST, & HARDWARE

42+670.000 45+940.000	Lt. Rt.	D5-17	PARKING AND CHAIN REMOVAL AREA →	1928x1050	2.02	2	57mm x 57mm	2	4.04
42+832.000 45+787.000	Lt. Rt.	D5-18	TIRE CHAIN REMOVAL AREA 500 FT	1658x1050	1.74	2	57mm x 57mm	2	3.48
51+757.277 52+725.000 53+960.000	Rt. Lt. Rt.	W3-5	SPEED LIMIT 45	762 x 762	0.58	1	44mm x 44mm	3	1.74
54+210.000 55+246.986 55+450.000	Rt. Lt. Lt.	W3-5	SPEED LIMIT 35	762 x 762	0.58	1	44mm x 44mm	3	1.74
41+380.00 50+420.00	Rt. Lt.	W3-5	SPEED LIMIT 30	762 x 762	0.58	1	44mm x 44mm	2	1.16
41+400.000 41+800.000	Rt. Lt.	W2-2L		762 x 762	0.58	1	44mm x 44mm	2	1.16
41+620.000 41+620.000	Lt. Rt.	W2-2R		762 x 762	0.58	1	44mm x 44mm	2	1.16
44+476.00 44+954.00 45+266.00 45+744.00 46+996.00 47+709.00 48+416.00 48+894.00 49+700.00 50+195.00 41+350.00 41+720.00 43+331.00 43+809.00	Rt. Lt. Rt. Lt. Rt. Lt. Rt. Lt. Rt. Lt. Rt. Lt. Rt. Lt.	S3-2a	SCHOOL DROP OFF ZONE	762 x 762	0.58	1	44mm x 44mm	14	8.12
43+514.00 43+626.00 44+659.00 44+771.00 45+449.00 45+561.00 47+179.00 47+526.00 48+599.00 48+711.00 49+880.00 50+026.00	Rt. Lt. Rt. Lt. Rt. Lt. Rt. Lt. Rt. Lt. Rt. Lt.	S3-1a		762 x 762	0.58	1	44mm x 44mm	12	6.96
41+480.00	Rt.	S3-1a D1-1L	← N8079	762 x 762 1328 x 450	0.58 0.60	2	50mm x 50mm	1 1	1.18
41+590.00	Lt.	S3-1a D1-1R	N8079 →	762 x 762 1328 x 450	0.58 0.60	2	50mm x 50mm	1 1	1.18
54+780.000 54+870.000	Rt. Lt.	D1-1L D1-1R	← CHINLE CHINLE →	1229 x 450	0.55	2	50mm x 50mm	2	1.10
54+780.000	Lt.	D2-2	LUKACHUKAI 7 ROUND ROCK 21	1851 x 750	1.39	2	50mm x 50mm	1	1.39
54+870.000	Rt.	D2-2	WHEATFIELDS 12 WINDOW ROCK 52	1995 x 750	1.50	2	50mm x 50mm	1	1.50

PERMANENT TRAFFIC CONTROL – SIGN, POST, & HARDWARE

54+900.000 55+020.000	Rt. Lt.	D1-1R D1-1L	SENIOR CENTER ← SENIOR CENTER	1373 x 750	1.03	2	50mm x 50mm	2	2.06
51+950.000 52+360.000	Rt. Lt.	D1-1L D1-1R	← DINE' COLLEGE DINE' → COLLEGE	1166 x 750	0.87	2	50mm x 50mm	2	1.74
54+530.000 54+650.000	Rt. Lt.	D1-1L D1-1R	TSAILE MIDDLE ← SCHOOL TSAILE MIDDLE SCHOOL →	1819 x 750	1.36	2	57mm x 57mm	2	2.72
52+064.680	Rt.	R3-8LA	ONLY	914 x 762	0.70	2	50mm x 50mm	1	0.70
52+280.000 54+970.000	Lt. Lt.	R3-8RA	ONLY	914 x 762	0.70	2	50mm x 50mm	2	1.40
54+543.707	Rt.	R3-8LR	ONLY	914 x 762	0.70	2	50mm x 50mm	1	0.70
54+681.466	Lt.	R3-8c	ONLY ONLY	1219 x 762	0.93	2	57mm x 57mm	1	0.93
52+180.000	Rt.	W1-7 WL-LB-WL-RB		914 x 457 1219 x 610	0.42 0.74	4	57mm x 57mm	1 2	1.90

63302-2001 – Sign Installation, 1 Post – 38 x 38 mm	Total	39.83 m²
63302-2002 – Sign Installation, 1 Post – 44 x 44 mm	Total	70.68 m²
63302-2006 – Sign Installation, 2 Post – 50 x 50 mm	Total	23.35 m²
63302-2007 – Sign Installation, 2 Post – 57 x 57 mm	Total	18.69 m²
63302-2012 – Sign Installation, 4 Post – 57 x 57 mm	Total	1.90 m²



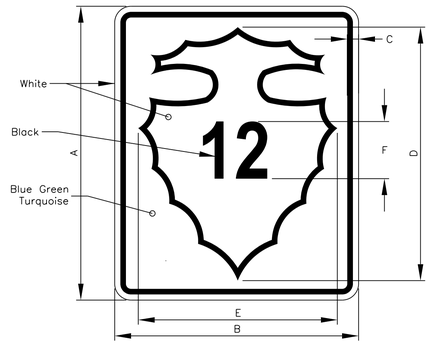
ITEM 63502-3000 TEMP. TRAFFIC CONTROL
RAISED PAVEMENT MARKER, YELLOW TYPE Y-2

GENERAL NOTES

1. SEE SHEETS 38 & 45-46 FOR SIGN DETAILS, DIMENSION PLACEMENT/LOCATION, MARKINGS, TURNOUT TYPICALS, STOP BARS, ETC.

TEMPORARY TRAFFIC CONTROL SIGNS

TYPE	DESCRIPTION	SIZE (mm)
W20-1a	ROAD WORK XXX FT	1219 x 1219
W20-4 W13-1P	ONE LANE ROAD XXX FT 25 MPH	1219 x 1219 610 x 610
W20-7 W16-2P	 500 FEET	914 x 914 457 x 610
G20-2	END ROAD WORK	914 x 457
W1-4L		914 x 914
W20-1	ROAD WORK AHEAD	914 x 914
G20-1	ROAD WORK NEXT 6 MILES	914 x 457
W8-12	NO CENTER LINE	914 x 914



SIGN	DIMENSION (mm)					F NUMERALS				
	A	B	C	D	E	DIGITS IN ROUTE	1	2	3	4
MIN.	610	457	13	495	343	SIZE & SERIES (mm)	254E	254D	203C	152B

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

PERMANENT & TEMPORARY TRAFFIC CONTROL DETAILS

DRAWN BY: NRDOT	DATE: 12/31/2013
DESIGNED BY: NRDOT	DATE: 12/31/2013
REVISED: 3/19/2014	BY: Leroy.Toledo
Sht 37 N12 Permanent Temp TCP.dgn	

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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	38	88

ITEM No. 63401-1510: PAVEMENT MARKING, TYPE "H", SOLID YELLOW

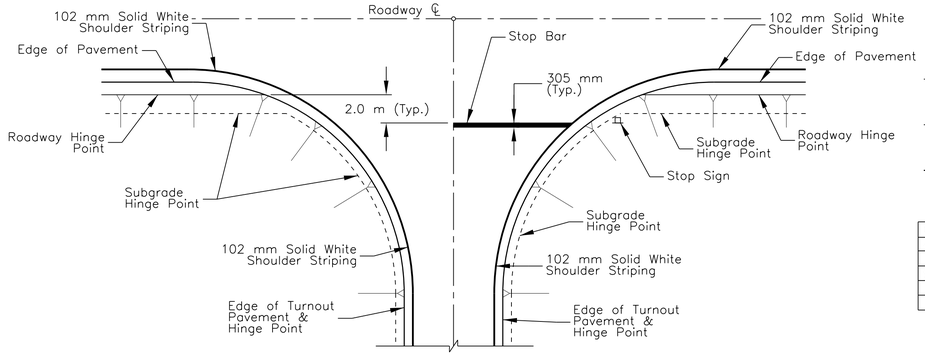
STATION TO STATION			LOCATION	DESCRIPTION	LENGTH (m)
38+640.00	To	39+725.00	CL	Double Solid Yellow	2,170.00
40+540.00	To	40+722.00	CL, Rt.	Solid Yellow	182.00
40+722.00	To	41+290.00	CL	Double Solid Yellow	1,136.00
41+290.00	To	41+320.00	CL, Rt.	Solid Yellow	30.00
42+116.00	To	42+280.00	CL, Rt.	Solid Yellow	164.00
42+280.00	To	42+730.00	CL	Double Solid Yellow	900.00
44+330.00	To	44+535.00	CL, Rt.	Solid Yellow	205.00
44+535.00	To	44+965.00	CL	Double Solid Yellow	860.00
44+965.00	To	45+180.00	CL, Lt.	Solid Yellow	215.00
46+532.00	To	46+677.00	CL, Rt.	Solid Yellow	145.00
46+677.00	To	46+862.00	CL	Double Solid Yellow	370.00
46+862.00	To	47+012.00	CL, Lt.	Solid Yellow	150.00
47+988.00	To	48+039.00	CL, Rt.	Solid Yellow	51.00
48+039.00	To	48+125.00	CL	Double Solid Yellow	172.00
48+125.00	To	48+289.00	CL, Lt.	Solid Yellow	164.00
48+820.00	To	49+340.00	CL	Double Solid Yellow	1,040.00
49+340.00	To	49+505.00	CL, Lt.	Solid Yellow	165.00
49+916.00	To	50+079.00	CL, Rt.	Solid Yellow	163.00
50+079.00	To	50+293.00	CL	Double Solid Yellow	428.00
50+293.00	To	50+455.00	CL, Lt.	Solid Yellow	162.00
51+562.00	To	51+720.00	CL, Rt.	Solid Yellow	158.00
51+720.00	To	51,964.02	CL	Double Solid Yellow	488.04
51+964.02	To	52+107.66	CL, Rt.	Solid Yellow - Around Diagonal Striping Island	144.11
51+964.02	To	52+107.66	CL, Lt.	Solid Yellow - Around Diagonal Striping Island	143.96
52+107.67	To	52+163.70	1.80 m Lt.	Double Solid Yellow	114.47
52+186.51	To	52+314.81	CL	Solid Yellow - Around Diagonal Striping Island	257.73
52,314.81	To	52+400.00	CL	Double Solid Yellow	170.39
54+443.78	To	54+548.71	Rt.	Solid Yellow - Around Diagonal Striping Island	115.26
54+433.78	To	54+548.71	CL, Lt.	Solid Yellow	114.93
54+548.71	To	54+578.71	CL	Double Solid Yellow	60.00
54+630.00	To	54+660.00	3.6 m Rt	Double Solid Yellow	60.00
54+660.00	To	54+707.54	Rt.	Solid Yellow - Around Diagonal Striping Island	96.30
54+735.00	To	54+765.00	3.6m Rt	Double Solid Yellow	60.00
54+765.00	To	54+780.00	Taper 3.6m Rt. To CL	Solid Yellow - Around Diagonal Striping Island	30.91
54+780.00	To	54+810.00	CL	Double Solid Yellow	60.00
54+822.81, Lt.			N12 & N64 Turnout CL	Double Solid Yellow	16.16
54+836.63	To	54+883.50	Rt.	Solid Yellow - Around Diagonal Striping Island	95.33
54+900.00	To	54+845.00	Rt.	Solid Yellow - Around Diagonal Striping Island	92.61
54+965.00	To	54+995.00	3.6m Rt.	Double Solid Yellow	60.00
54+995.00	To	55.095.00	Taper 3.6m Rt. To CL	Solid Yellow - Around Diagonal Striping Island	99.91
54+995.00	To	55+010.00	Taper 3.6m Rt. To CL	Solid Yellow - Around Diagonal Striping Island	15.42
55+010.00	To	55+095.00	CL, Lt.	Solid Yellow - Around Diagonal Striping Island	85.00
55+095.00	To	55+200.00	CL	Double Solid Yellow	210.00
				TOTAL	11,620.53

ITEM No. 63401-1610: PAVEMENT MARKING, TYPE "H", BROKEN YELLOW

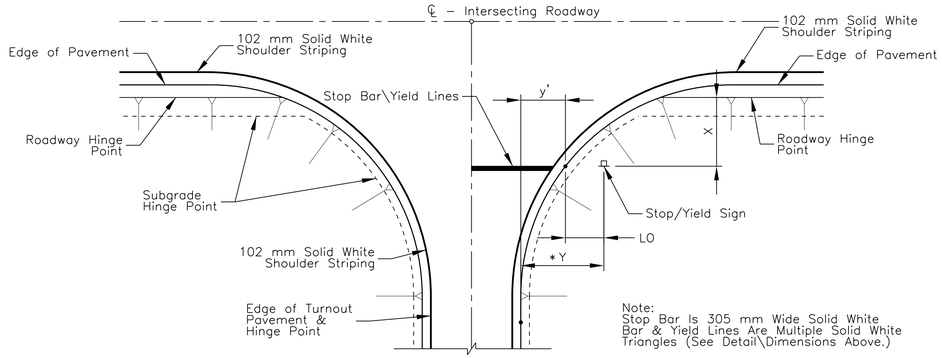
STATION TO STATION			LOCATION	DESCRIPTION	LENGTH (m)
39+725.00	To	40+540.00	CL	Broken Yellow	815.00
40+540.00	To	40+722.00	CL, Lt.	Broken Yellow	182.00
41+290.00	To	42+116.00	CL	Broken Yellow	826.00
42+116.00	To	42+280.00	CL, Lt.	Broken Yellow	164.00
42+730.00	To	44+330.00	CL	Broken Yellow	1,600.00
44+330.00	To	44+535.00	CL, Lt.	Broken Yellow	205.00
44+935.00	To	45+180.00	CL, Rt.	Broken Yellow	245.00
45+180.00	To	46+532.00	CL, Lt.	Broken Yellow	1,352.00
46+532.00	To	46+677.00	CL, Lt.	Broken Yellow	145.00
46+862.00	To	47+012.00	CL, Rt.	Broken Yellow	150.00
47+012.00	To	47+988.00	CL	Broken Yellow	976.00
47+988.00	To	48+039.00	CL, Lt.	Broken Yellow	51.00
48+125.00	To	48+289.00	CL, Rt.	Broken Yellow	164.00
48+289.00	To	48+820.00	CL	Broken Yellow	531.00
49+340.00	To	49+505.00	CL, Rt.	Broken Yellow	165.00
49+505.00	To	49+916.00	CL	Broken Yellow	411.00
49+916.00	To	50+079.00	CL, Lt.	Broken Yellow	163.00
50+293.00	To	50+455.00	CL, Rt.	Broken Yellow	162.00
50+455.00	To	51+562.00	CL	Broken Yellow	1,107.00
51+562.00	To	51+720.00	CL, Lt.	Broken Yellow	158.00
52+400.00	To	54+433.78	CL	Broken Yellow	2,033.78
55+200.00	To	55+900.00	CL	Broken Yellow	700.00
				TOTAL	12,305.78

ITEM No. 63401-1520: PAVEMENT MARKING, TYPE "H", SOLID WHITE

STATION TO STATION			LOCATION	DESCRIPTION	LENGTH (m)
38+700.00	To	51+964.02	Rt. Shoulder	Solid White	13,264.02
38+700.00	To	51+964.02	Lt. Shoulder	Solid White	13,264.02
52+314.81	To	54+433.78	Rt. Shoulder	Solid White	2,118.97
52+314.81	To	54+433.78	Lt. Shoulder	Solid White	2,118.97
55+095.00	To	55+900.00	Rt. Shoulder	Solid White	805.00
55+095.00	To	55+900.00	Lt. Shoulder	Solid White	805.00
Minus (21) 4.50m Turnout at Left: (-21 x 20.67) = -434.07					-434.07
Minus (21) 4.50m Turnout at Right: (-21 x 20.67) = -434.07					-434.07
Plus (5) 7.0m Turnout at Left: (-5 x 37.0) + (5 x (28.17 x 2)) = 96.70					96.70
Plus (9) 7.0m Turnout at Left: (-9 x 37.0) + (9 x (28.17 x 2)) = 174.06					174.06
Sta. 51+964.02 to Sta. 52+314.82 Pavement Widening Area					
51+964.02	To	52+177.60	Lt Shoulder	Solid White	222.58
52+186.51	To	52+250.83	5.4m Lt.	Solid White	64.31
52+185.35	To	52+314.81	Lt Shoulder	Solid White	135.73
51+964.02	To	52+314.82	Rt Shoulder	Solid White	350.66
52+107.97	To	52+163.70	1.8m Rt.	Solid White	55.74
Sta. 54+433.78 to Sta. 55+095.00 Pavement Widening Area					
54+433.78	To	54+591.13	3.6m Lt.	Solid White	168.06
54+599.03	To	54+818.98	Lt Shoulder	Solid White	239.74
54+837.21	To	54+883.50	3.6m Lt.	Solid White	46.43
54+835.41	To	54+887.16	Lt Shoulder	Solid White	68.82
54+892.84	To	55+095.00	Lt Shoulder	Solid White	212.14
54+900.00	To	54+968.27	3.6m Lt.	Solid White	68.48
54+548.71	To	54+590.00	3.6m Rt.	Solid White	41.16
54+612.80	To	54+660.00	CL	Solid White	47.20
54+780.00	To	54+810.00	3.6m Rt.	Solid White	30.00
54+960.00	To	54+995.00	CL	Solid White	35.00
54+433.78	To	54+612.00	Rt Shoulder	Solid White	190.92
54+617.95	To	54+716.93	Rt Shoulder	Solid White	125.52
54+722.88	To	54+814.65	Rt Shoulder	Solid White	113.62
54+820.60	To	54+948.99	Rt Shoulder	Solid White	150.00
54+954.94	To	55+095.00	Rt Shoulder	Solid White	153.07
N64 Turnout, West Bound Turn Lane			3.6m Rt.	Solid White	8.08
N64 Turnout, East Bound Turn Lane			3.6m Lt.	Solid White	8.08
				TOTAL	34,313.94



TYPICAL PAVEMENT MARKING LAYOUT & STOP BAR PLACEMENT TURNOUTS 7.0 m OR GREATER



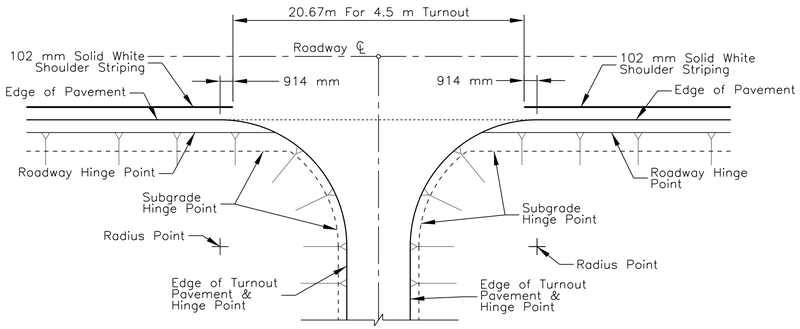
Note:
Stop Bar Is 305 mm Wide Solid White Bar & Yield Lines Are Multiple Solid White Triangles (See Detail\Dimensions Above.)

TYPICAL PAVEMENT MARKING LAYOUT AND STOP\YIELD SIGN PLACEMENT AT MAJOR INTERSECTION

STOP\YIELD SIGN LOCATION TABLE

RADIUS OF TURNOUT (m)	X (m)	y' (m)	*Y (m)	LENGTH of STOP BAR
3.00	1.80	0.25	2.05	1/2 Roadway width
6.00	3.00	0.80	2.60	1/2 Roadway width
9.00	4.50	1.21	3.01	1/2 Roadway width
12.00	6.00	1.61	3.41	1/2 Roadway width
15.00	7.50	2.01	3.81	1/2 Roadway width

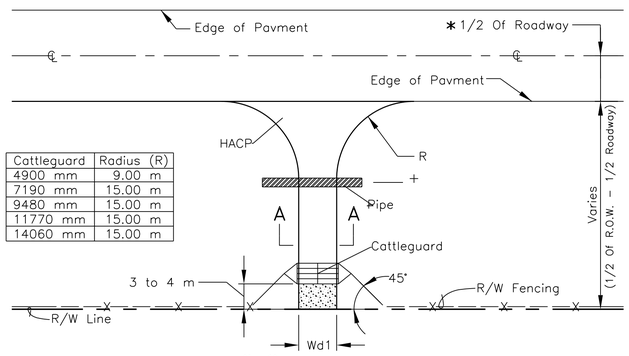
y'= Distance is the lateral projection from Roadway EOP (tangential) To Curvature\EOP.
Lateral Offset (LO) is the lateral projection from Curvature\EOP to sign location = 1.80 m.
*Y = y'+LO



TYPICAL PAVEMENT MARKING LAYOUT
At 4.5 m TURNOUTS

GENERAL NOTES

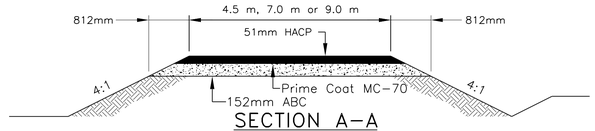
1. SEE SHEETS FOR SIGN DETAILS, DIMENSION, PLACEMENT/LOCATION, MARKINGS, TURNOUT TYPICALS, STOP BARS, ETC.



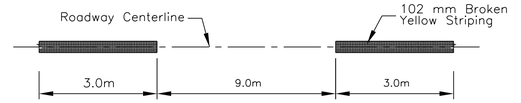
Cattleguard	Radius (R)
4900 mm	9.00 m
7190 mm	15.00 m
9480 mm	15.00 m
11770 mm	15.00 m
14060 mm	15.00 m

TYPICAL TYPE "A" TURNOUT LAYOUT DETAIL

*See Typical Section Detail For Roadway Width



SECTION A-A



TYPICAL PAVEMENT MARKING "BROKEN YELLOW"
Roadway Centerline Striping

ITEM No. 63405-3260: STOP BAR

STATION	LOCATION	EACH	REMARKS
38+898.00	Right	1	BIA Route N8080
39+765.57	Right	1	BIA Bus route
40+280.00	Right	1	BIA Bus route
40+410.00	Right	1	BIA Bus route
40+460.00	Left	1	BIA Bus route
41+240.00	Right	1	C444
41+535.00	Left	1	BIA Route N8079
41+700.00	Right	1	BIA Forest Road 7500/N68
42+770.00	Left	1	BIA Bus route
49+211.00	Right	1	C443
49+330.00	Left	1	Multiple Residence
49+970.00	Left	1	Multiple Residence
51+040.00	Left	1	BIA Bus route
52+180.00	Left	1	Dine' College East Entrance
52+663.00	Right	1	BIA Route N68
54+595.00	Left	1	Tsaile Middel School
54+615.00	Right	1	Transit Bus Pullout
54+720.00	Right	1	Transit Bus Pullout
54+817.32	Right	1	Store & Gas Station
54+822.86	Left	1	N12 & N64 Intersection
54+890.00	Left	1	
54+952.00	Right	1	Senior Center
55+327.00	Right	1	NHA Hpusing
55+786.00	Right	1	LDS Church
	TOTAL	24	

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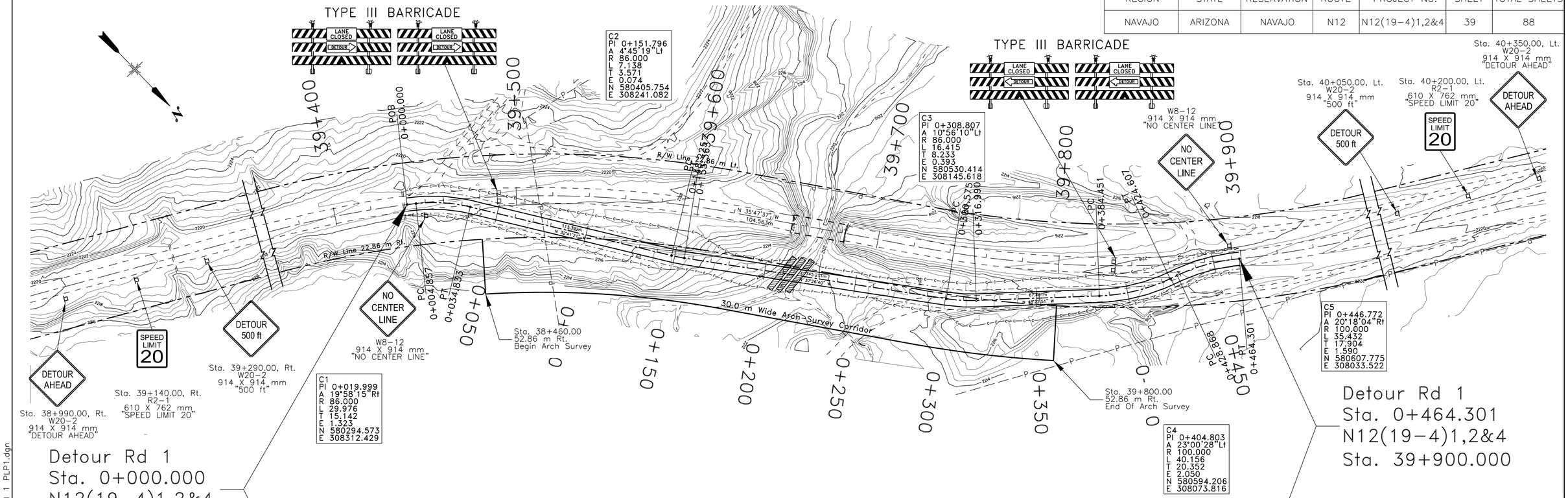
NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

PAVEMENT STRIPING, MARKING & TURNOUT LAYOUT DETAIL

DRAWN BY: NRDOT	DATE: 4/29/2015
DESIGNED BY: NRDOT	DATE: 4/29/2015
REVISED: 8/26/2015	BY: Leroy.Toledo
Sht 38 N12 Pvmt Mrkg TO Detail.dgn	

i:\DESIGN\Users\DESIGN3\CURRENT PROJECTS\N35_Chinle\N12(19-4)\DESIGN DATA_020315\CADD Files\Sht 38 N12 Pvmt Mrkg TO Detail.dgn

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	39	88

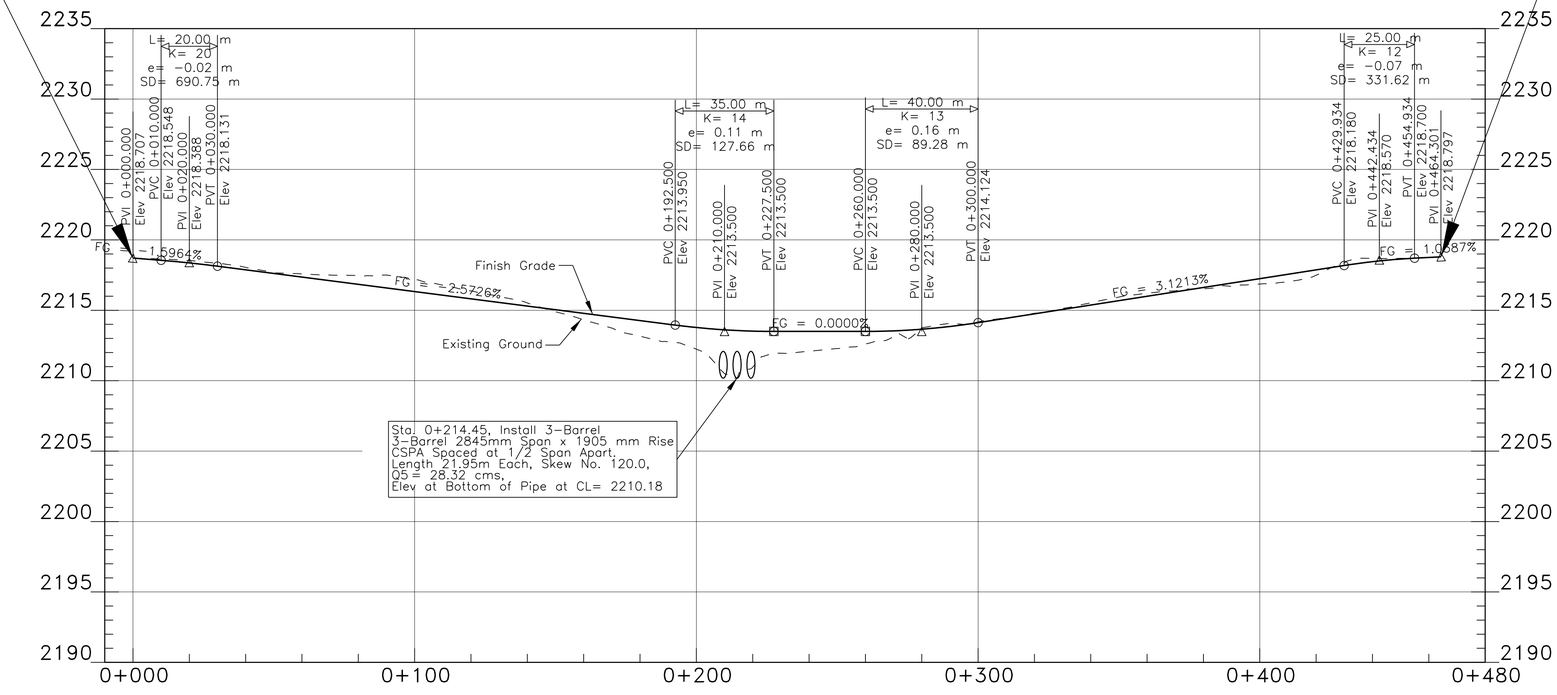


Detour Rd 1
Sta. 0+000.000
N12(19-4)1,2&4
Sta. 39+440.000

Detour Rd 1
Sta. 0+464.301
N12(19-4)1,2&4
Sta. 39+900.000

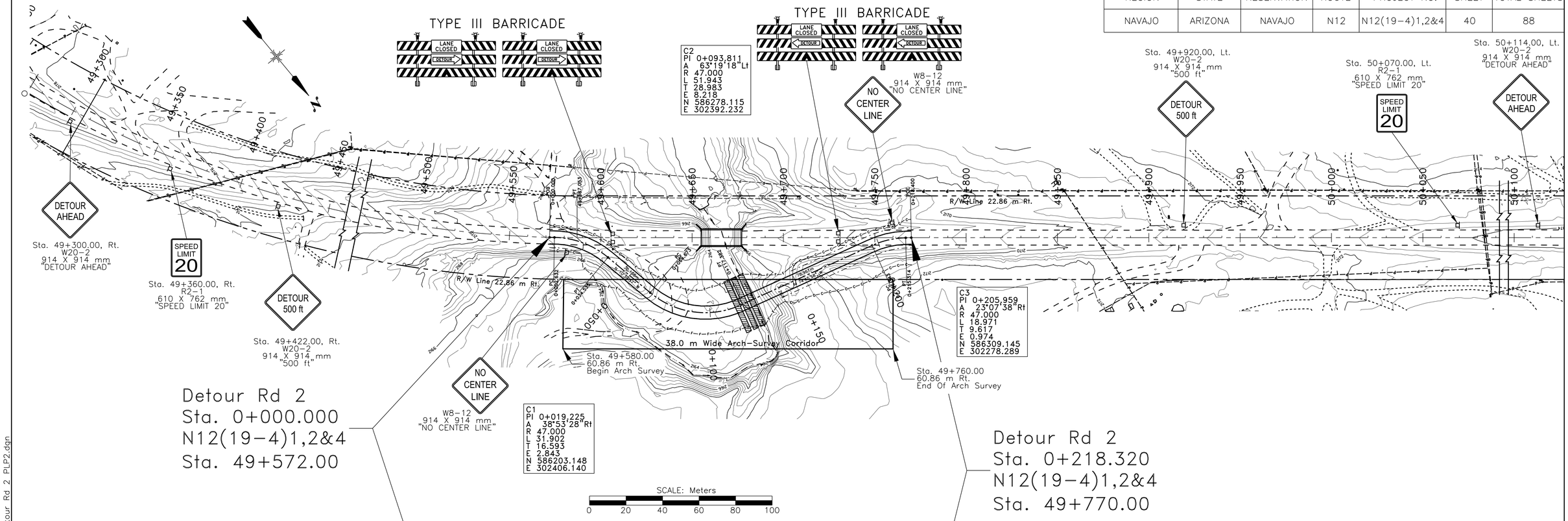
DRAINAGE STRUCTURES

MARK	STATION	STRUCTURE	SKEW No.	Q5 (cms)	REMARKS
1	0+214.45	3-2844 mm S x 1905 mm R x 21.95 m CSPA	120.0	28.32	New Corrugated Steel Pipe Culvert Arch



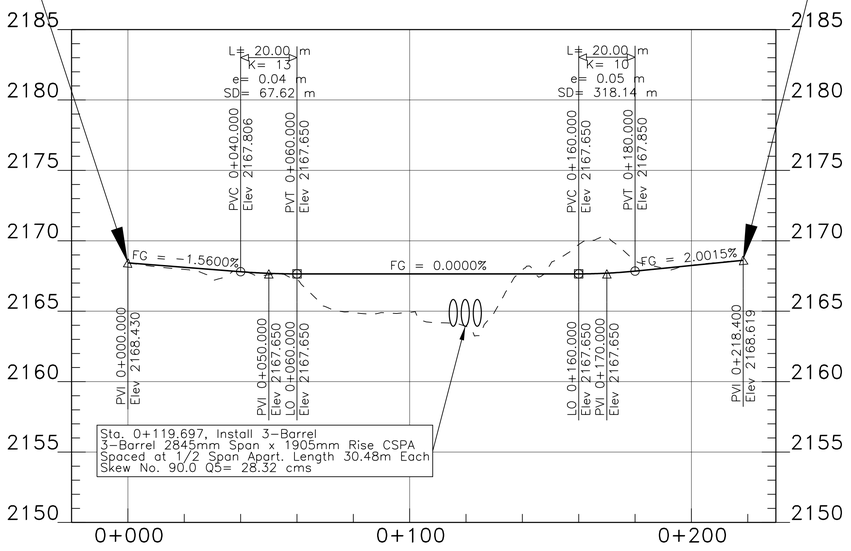
I:\DESIGN\Users\DESIGN3\CURRENT PROJECTS\N35_Chinle\N12(19-4)\DESIGN DATA_020315\CADD Files\Snt 39 Detour Rd 1 PLP1.dgn

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	40	88



Detour Rd 2
Sta. 0+000.000
N12(19-4)1,2&4
Sta. 49+572.00

Detour Rd 2
Sta. 0+218.320
N12(19-4)1,2&4
Sta. 49+770.00



DRAINAGE STRUCTURES

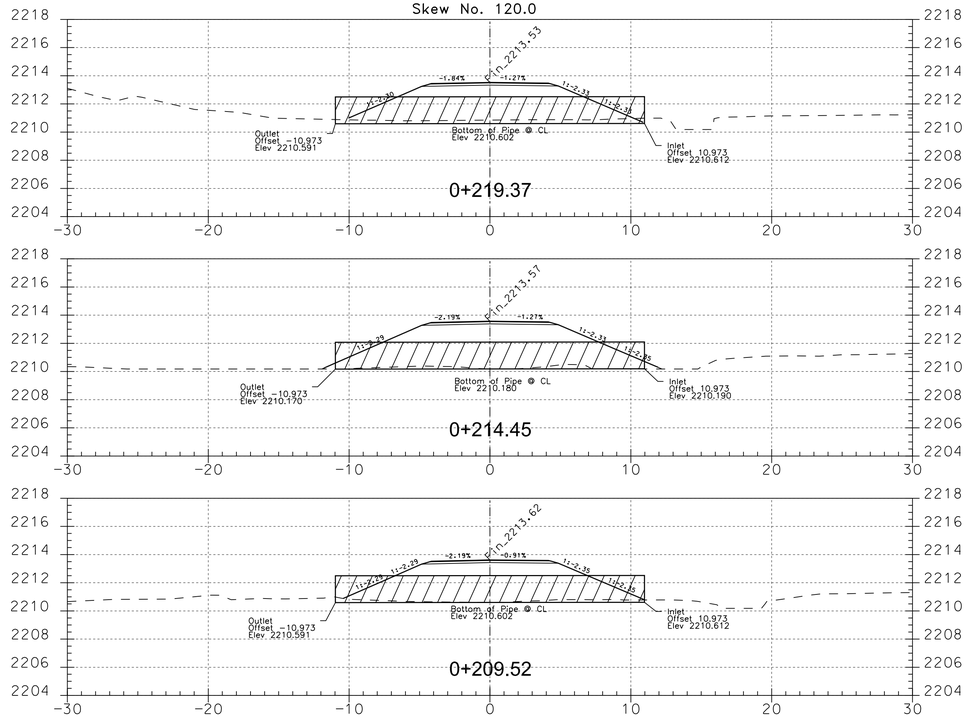
MARK	STATION	STRUCTURE	SKEW No.	Q5 (cms)	REMARKS
1	0+119.697	3-2844 mm S x 1905 mm R x 30.48 m CSPA	90.0	28.32	New Corrugated Steel Pipe Culvert Arch

I:\DESIGN\Users\DESIGN3\CURRENT PROJECTS\N35_Chinle\N12(19-4)\DESIGN DATA_020315\CADD Files\Sht 40 Detour Rd 2 PLP2.dgn

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	41	88

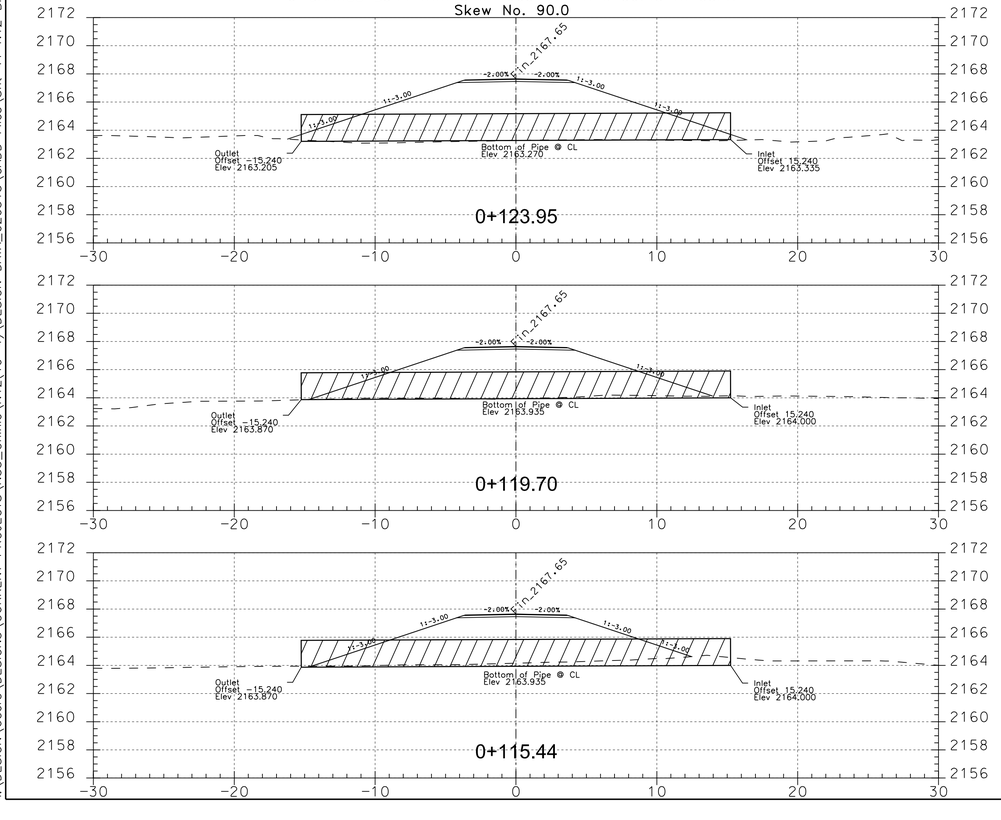
DETOUR ROAD No. 1

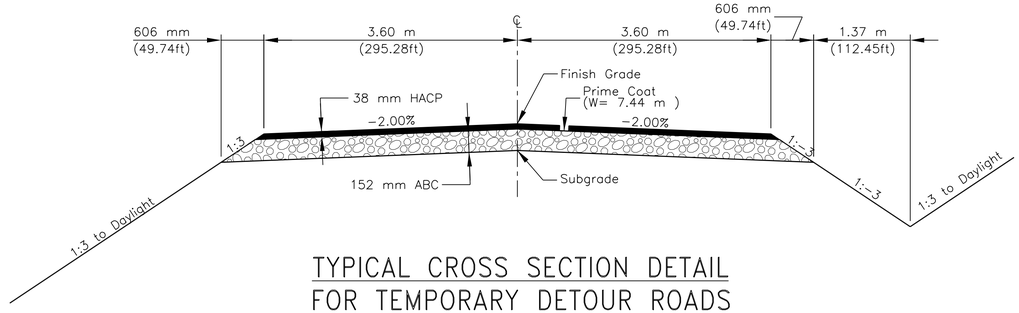
3-BARREL 2844 mm S x 1905 mm R x 21.946 m CSPA
Skew No. 120.0



DETOUR ROAD No. 2

3-BARREL 2844 mm S x 1905 mm R x 30.48 m CSPA
Skew No. 90.0





TYPICAL CROSS SECTION DETAIL FOR TEMPORARY DETOUR ROADS

EARTHWORK VOLUME-DETOUR ROAD 1

STATION	TO	STATION	CUT (m^3)	FILL (m^3)	WASTE (m^3)	BORROW (m^3)
0+000.000	to	0+115.269	253.00	253.00	0.00	0.00
0+115.269	to	0+151.754	120.00	120.00	0.00	0.00
0+151.754	to	0+464.347	888.00	3,503.00	0.00	2,615.00
		TOTAL	**1,261.00**	**3,876.00**	**0.00**	**2,615.00**

15% Shrinkage Factor Applied to Fill

EARTHWORK VOLUME-DETOUR ROAD 2

STATION	TO	STATION	CUT (m^3)	FILL (m^3)	WASTE (m^3)	BORROW (m^3)
0+000.000	to	0+030.034	58.00	58.00	58.00	0.00
0+030.034	to	0+218.320	1,870.00	3,938.00	0.00	2,068.00
		TOTAL	**1,928.00**	**3,996.00**	**0.00**	**2,068.00**

15% Shrinkage Factor Applied to Fill

ESTIMATED QUANTITIES

ITEM No.	DESCRIPTION	Detour Rd 1 (t)	Detour Rd 1 (t)	Total (t)
30103-2000	Untreated Aggregate Base Course, Special	1,210.84	539.31	1,750.15
40201-0500	Hot Asphaltic Concrete Pavement, Class "B". Grade "B"	300.24	141.16	441.40
40502-0800	Asphalt Cement, PG 64-22	18.01	8.47	26.48
41101-5000	Prime Coat, PEP	0.79	0.05	0.84

TEMPORARY DRAINAGE STRUCTURE

LOCATION	STATION	STRUCTURE	TOTAL LENGTH (m)	REMARKS
DETOUR ROAD 1	0+214.45	3-2844 mm S x 1905 mm R x 21.95 m CSPA	65.85	New Corrugated Steel Pipe Culvert Arch
DETOUR ROAD 2	0+119.69	3-2844 mm S x 1905 mm R x 30.48 m CSPA	91.44	New Corrugated Steel Pipe Culvert Arch
		TOTAL	**157.29**	

NOTES:

1. The construction of the detour roads for Bridges N504 & N504 shall be in accordance with the applicable sections of the FP-14, supplemental specifications, and the details provided in these design plans and contract documents.
2. The Contractor is responsible for maintaining the detour roads throughout the contract time period or until the main road can be opened back up to traffic.
3. Once the main N12 road is open to traffic, the Contractor shall remove the detour roads and restore the area back to its original condition to the fullest extent possible and re-seed and mulch all disturbed areas under bid item 62510-1000. The embankment, ABC, and asphalt materials shall be reused on the main roadway as embankment in the lower layers of the subgrade.
4. All temporary drainage structures shall be removed with care and stockpiled at a location for the government maintenance personnel to pick up. The Contractor shall coordinate the removal and stockpiling location with the COR.
5. The construction of the detour roads for bridges N504 & N504 shall be paid for under bid item 63510-1000.

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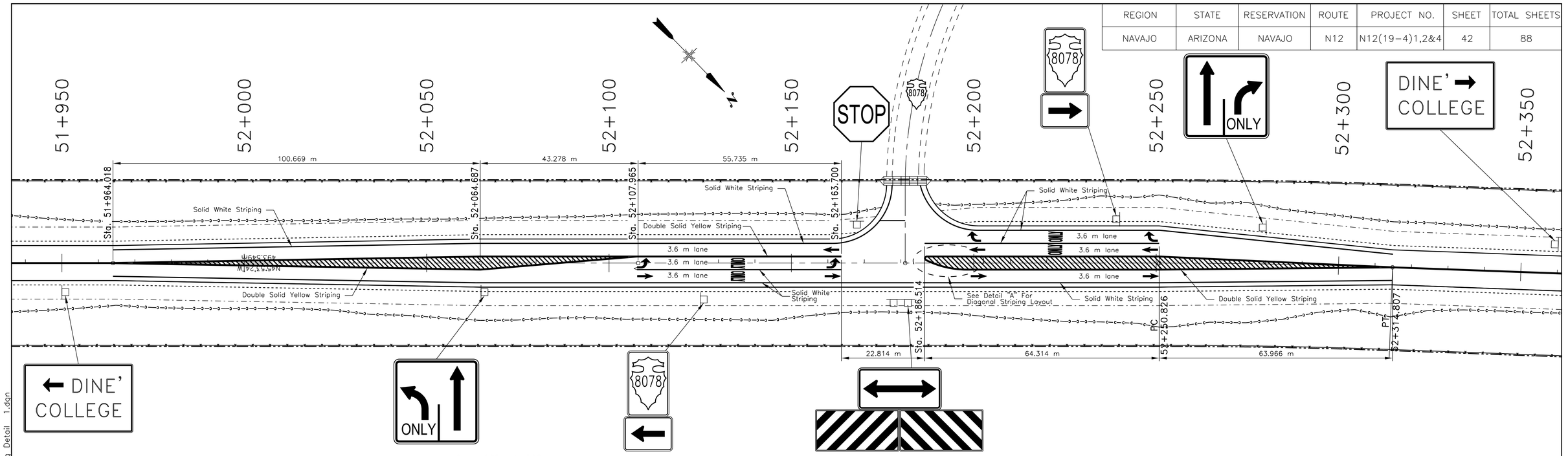
NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

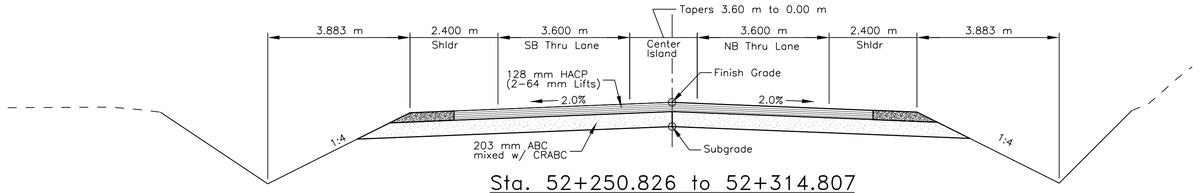
DETOUR ROAD TYPICAL
CROSS SECTIO DETAIL AND
PIPE CROSS SECTION DETAIL

DRAWN BY: NRDOT	DATE: 2/23/2016
DESIGNED BY: NRDOT	DATE: 2/23/2016
REVISED: 3/21/2018	BY: Harold.Riley
Sht 41 N12 Bridge Detour XS.dgn	

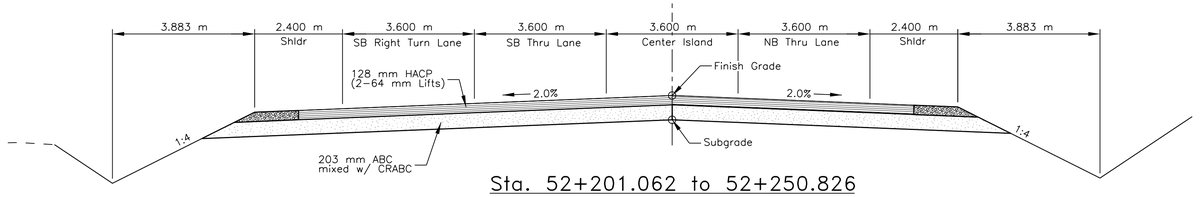
I:\DESIGN\Users\DESIGN3\CURRENT PROJECTS\N35_Chinle\N12(19-4)\DESIGN DATA_020315\CADD Files\Sht 41 N12 Bridge Detour XS.dgn

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	42	88



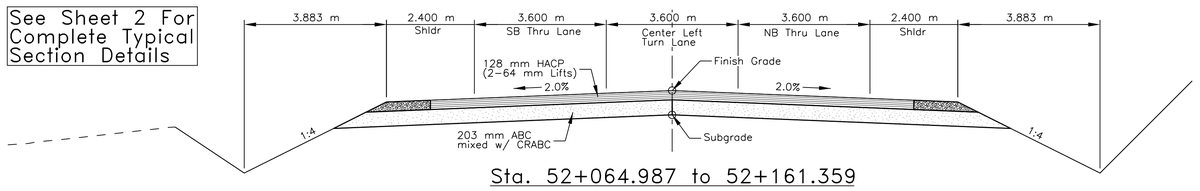


Sta. 52+250.826 to 52+314.807

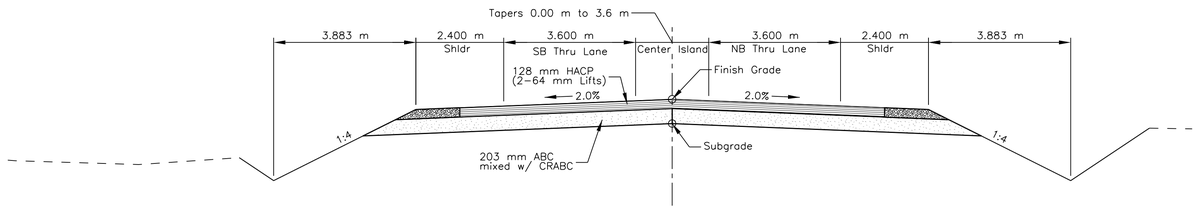


Sta. 52+201.062 to 52+250.826

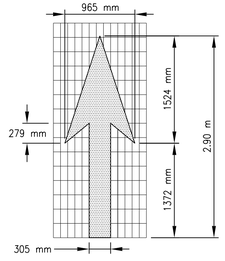
See Sheet 2 For Complete Typical Section Details



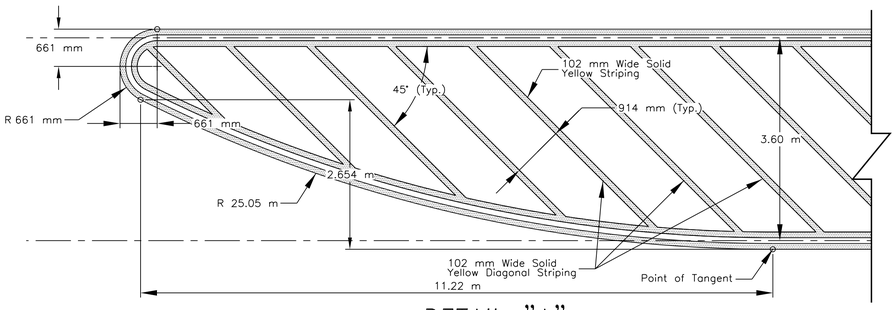
Sta. 52+064.987 to 52+161.359



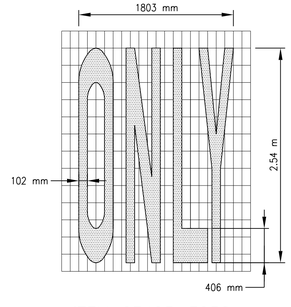
Sta. 51+964.018 to 52+064.687



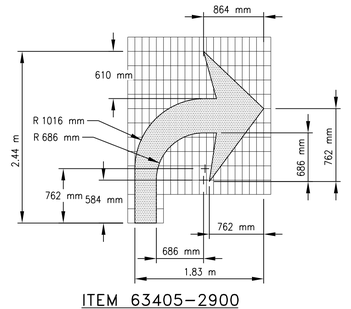
ITEM 63405-2950
Pavement Marking, Elongated Through Lane-Use Arrow, Type "H", Req'd 7 Each



DETAIL "A"



ITEM 63405-3050
Pavement Marking Word "ONLY", Type "H"
Req'd 4 Each



ITEM 63405-2900
Pavement Marking, Elongated Turn Lane-Use Arrow, Type "H", Req'd 4 Each

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

PAVEMENT WIDENING AND TURNING LANE DETAIL 1

DRAWN BY: NRDOT	DATE: 9/3/2015
DESIGNED BY: NRDOT	DATE: 9/3/2015
REVISED: 3/9/2018	BY: Leroy.Toledo
Sht 42 N12-N8078 Int Striping Detail 1.dgn	

I:\DESIGN\Users\DESIGN3\CURRENT PROJECTS\N35_Chinle\N12(19-4)\DESIGN DATA_020315\CADD Files\Sht 42 N12-N8078 Int Striping Detail 1.dgn

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	43	88

SCALE: Meters
0 10 20 30 40 50

N

54+350 54+400 54+450 54+500 54+550 54+600 54+650 54+700 54+750

99.93 m | 15.00 m | 41.29 m | 22.80 m | 47.20 m | 15.00 m | 32.34 m | 27.660 m

30.00 m | 30.00 m

PT Sta. 54+547.951

Sta. 54+433.777 | Sta. 54+533.707 | Sta. 54+548.707 | Sta. 54+578.707 | Sta. 54+590.000 | Sta. 54+612.800 | Sta. 54+630.000 | Sta. 54+660.000 | Sta. 54+675.000 | Sta. 54+707.340 | Sta. 54+735.000

N89°38'10"W 45.879m

PC Sta. 54+393.830

NO PASSING ZONE

STOP

TSAILE MIDDLE SCHOOL ←

TSAILE MIDDLE SCHOOL →

ONLY | ONLY

DO NOT PASS

Double Solid Yellow Striping

Solid White Striping

Diagonal Striping

3.60m Lane

See Detail "B" For Diagonal Striping Layout

R 6.00 m

83.56 m

7.00 m Transit Bus Pullout

8.94 m

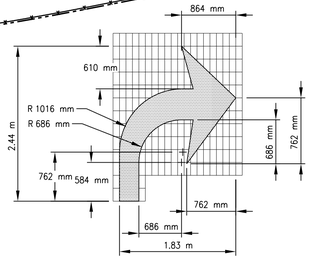
Sta. 54+609.633
Offset 38.909 m

121.37 m

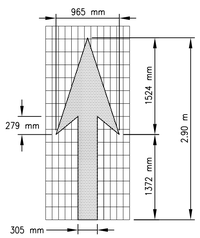
Sta. 54+735.270
Offset 39.000 m

Existing Parking Lot Pavement

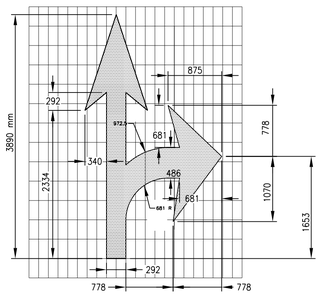
A



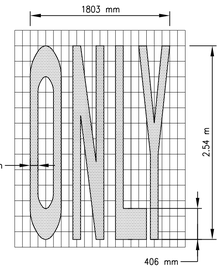
ITEM 63405-2900
Pavement Marking, Elongated Turn Lane-Use Arrow, Type "H", Req'd 7 Each



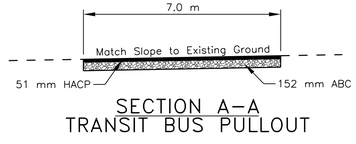
ITEM 63405-2950
Pavement Marking, Elongated Through Lane-Use Arrow, Type "H", Req'd 5 Each



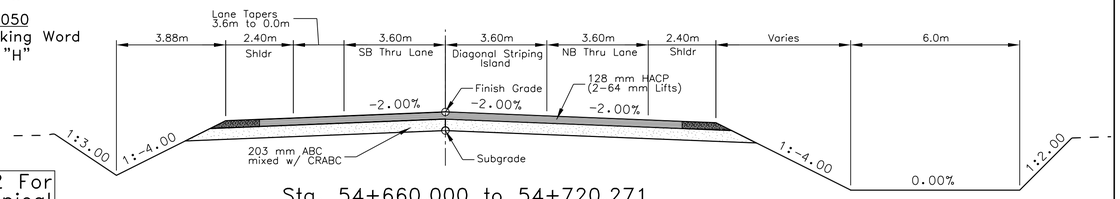
ITEM 63405-3000
Pavement Marking Turn & Through Lane-Use Arrow Type "H" Req'd 6 Each



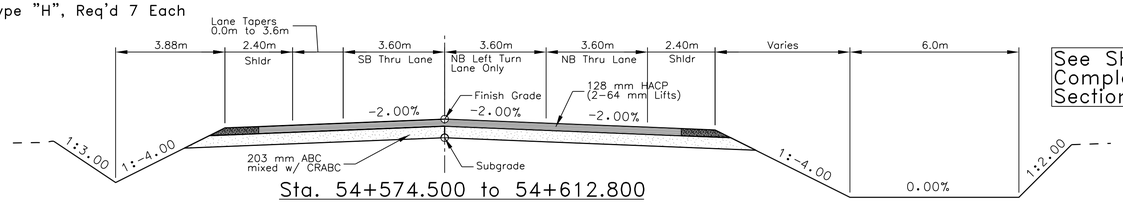
ITEM 63405-3050
Pavement Marking Word "ONLY", Type "H" Req'd 4 Each



SECTION A-A
TRANSIT BUS PULLOUT

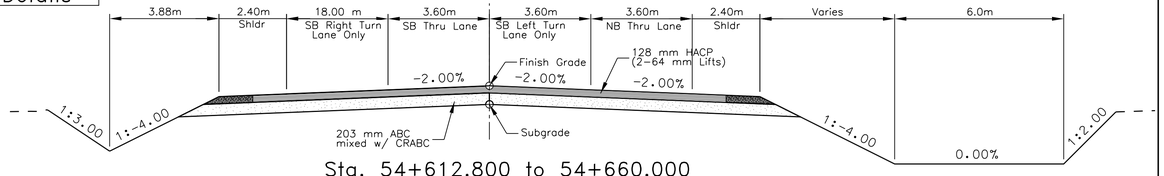


Sta. 54+660.000 to 54+720.271

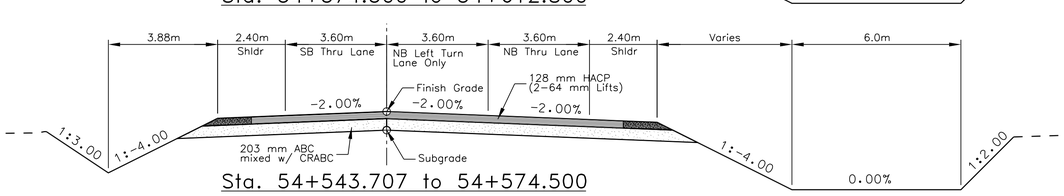


Sta. 54+574.500 to 54+612.800

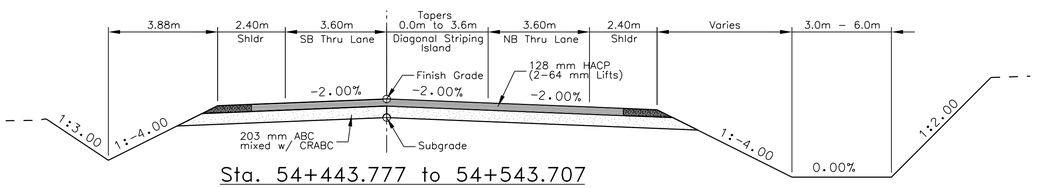
See Sheet 2 For Complete Typical Section Details



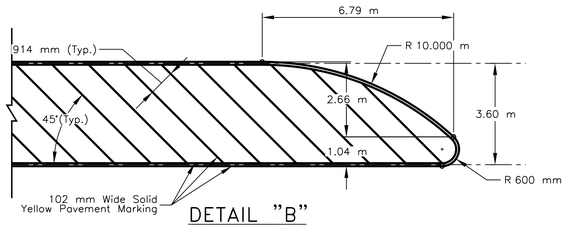
Sta. 54+612.800 to 54+660.000



Sta. 54+543.707 to 54+574.500



Sta. 54+443.777 to 54+543.707



DETAIL "B"
TYPICAL DIAGONAL STRIPING DETAIL

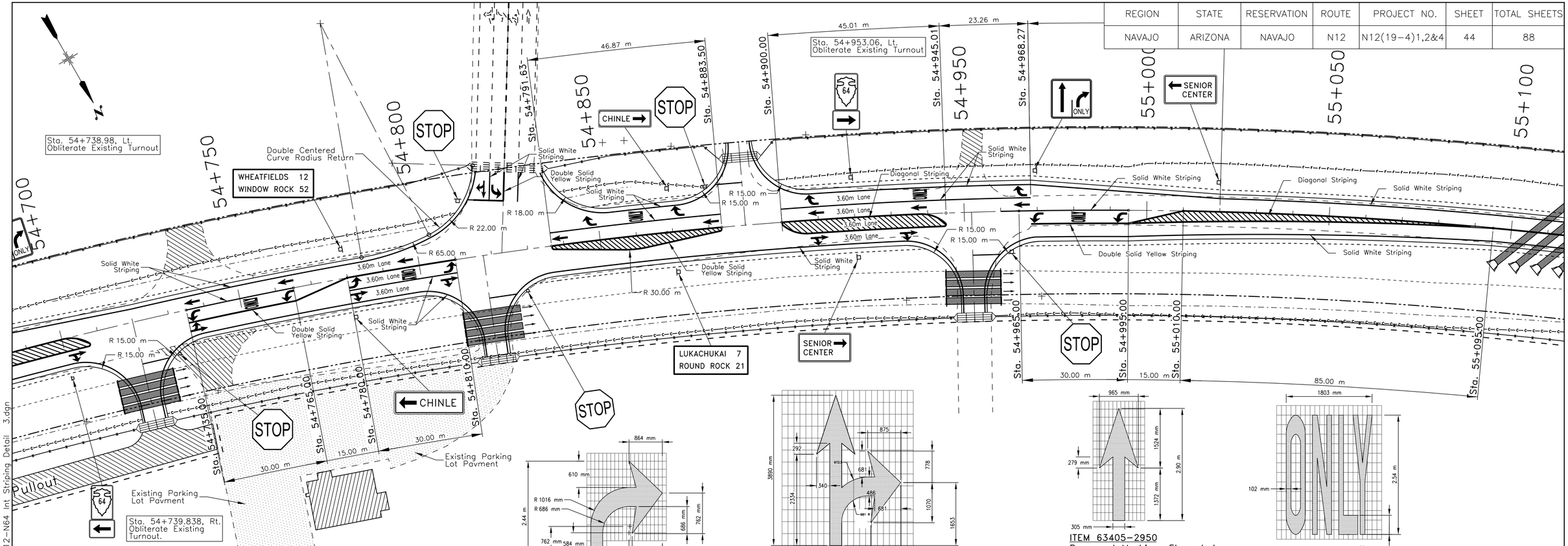
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

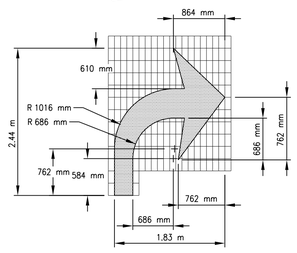
PAVEMENT WIDENING AND TURNING LANE DETAIL 2

DRAWN BY: NRDOT	DATE: 10/11/2017
DESIGNED BY: NRDOT	DATE: 10/11/2017
REVISED: 3/15/2018	BY: Leroy.Toledo
Sht 43 REV N12-Sch_Road Int Striping Detail 2 10-11-2017.dgn	

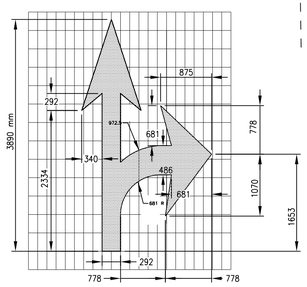
I:\DESIGN\Users\DESIGN3\CURRENT PROJECTS\N35_Chinle\N12(19-4)\DESIGN DATA_020315\CADD Files\Sht 43 REV N12-Sch_Road Int Striping Detail 2 10-11-2017.dgn

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	44	88





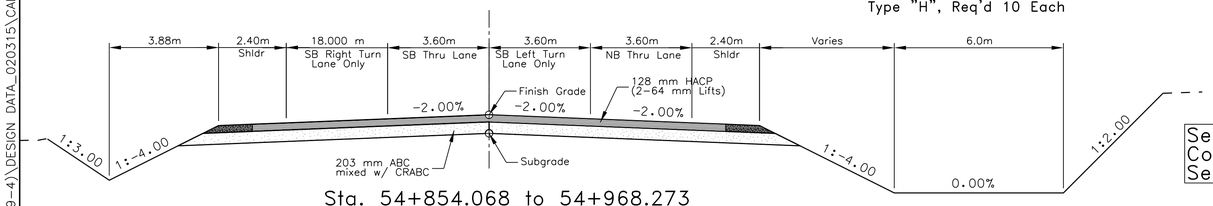
ITEM 63405-2900
Pavement Marking, Elongated
Turn Lane-Use Arrow,
Type "H", Req'd 10 Each



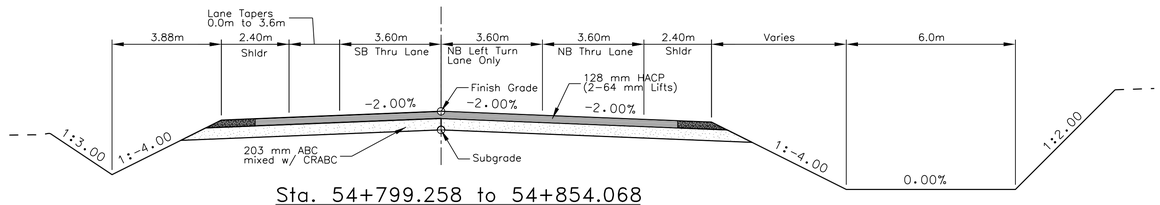
ITEM 63405-3000
Pavement Marking Turn & Through
Lane-Use Arrow Type "H"
Req'd 5 Each

ITEM 63405-2950
Pavement Marking, Elongated
Through Lane-Use Arrow,
Type "H", Req'd 7 Each

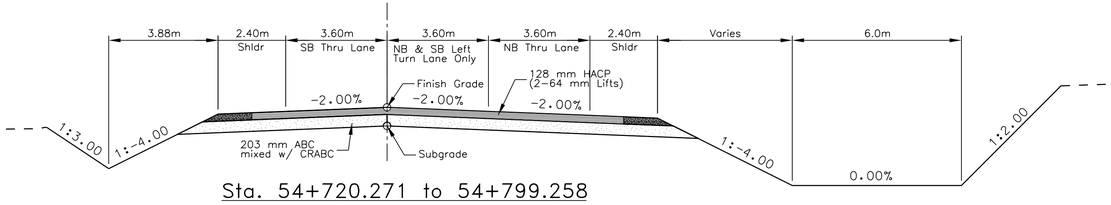
ITEM 63405-3050
Pavement Marking Word
"ONLY", Type "H"
Req'd 4 Each



Sta. 54+854.068 to 54+968.273

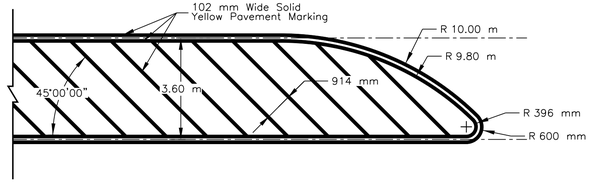


Sta. 54+799.258 to 54+854.068

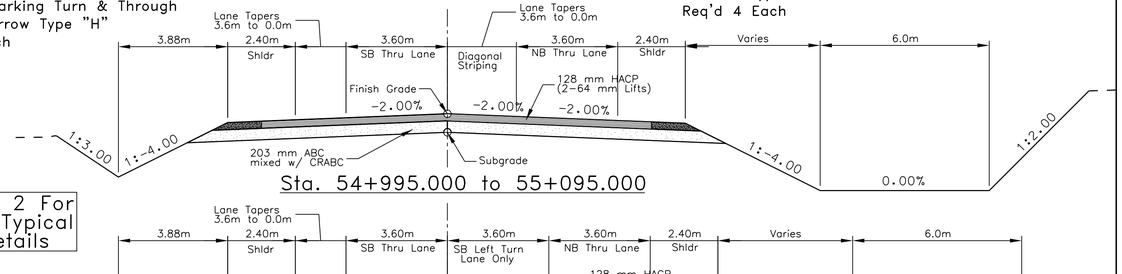


Sta. 54+720.271 to 54+799.258

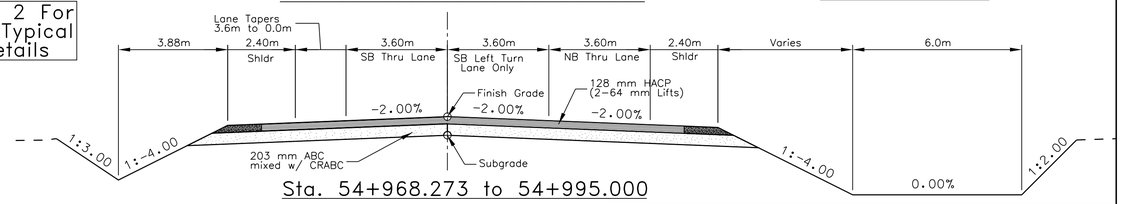
See Sheet 2 For
Complete Typical
Section Details



TYPICAL DIAGONAL STRIPING DETAIL



Sta. 54+995.000 to 55+095.000



Sta. 54+968.273 to 54+995.000

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

PAVEMENT WIDENING AND TURNING LANE DETAIL 4

DRAWN BY: NRDOT	DATE: 12/2/2016
DESIGNED BY: NRDOT	DATE: 12/2/2016
REVISED: 3/15/2018	BY: Leroy.Toledo
Sht 44 N12-N64 Int Striping Detail 3.dgn	

I:\DESIGN\Users\DESIGN3\CURRENT PROJECTS\N35_Chinle\N12(19-4)\DESIGN DATA_020315\CADD Files\Sht 44 N12-N64 Int Striping Detail 3.dgn

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	45	88

Square Tube Selection: Single Post – 2.80 mm thickness

Post Size	H = Panel Height To Bottom Of sign + 1/2 Height Of Traffic Sign (meter)					
	1.52	1.83	2.13	2.44	2.74	<--- H
38 mm x 38 mm	0.51	0.43	0.37	0.31	n/a	Maximum Sign Area (m^2)
44 mm x 44 mm	0.81	0.68	0.58	0.47	0.41	
50 mm x 50 mm	1.14	0.95	0.84	0.70	0.58	
57 mm x 57 mm	1.49	1.27	1.07	0.95	0.84	
64 mm x 64 mm	1.88	1.68	1.41	1.25	1.07	

Square Tube Selection: Double Post – 2.80 mm thickness

Post Size	H = Panel Height To Bottom Of sign + 1/2 Height Of Traffic Sign (meter)					
	1.52	1.83	2.13	2.44	2.74	<--- H
50 mm x 50 mm	n/a	n/a	1.49	0.84	0.58	Maximum Sign Area (m^2)
57 mm x 57 mm	n/a	n/a	2.15	1.97	1.81	
64 mm x 64 mm			2.68	2.46	2.26	

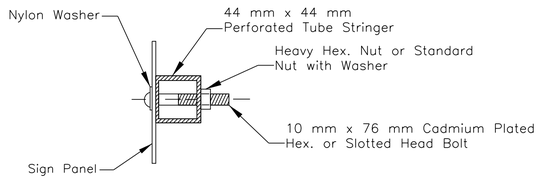
Square Tube Selection: Triple Post – 2.80 mm thickness

Post Size	H = Panel Height To Bottom Of sign + 1/2 Height Of Traffic Sign (meter)					
	1.52	1.83	2.13	2.44	2.74	<--- H
57 mm x 57 mm	n/a	n/a	3.08	2.83	2.61	Maximum Sign Area (m^2)
64 mm x 64 mm			3.82	3.52	3.26	

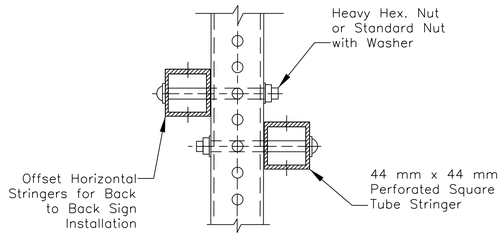
Guide Sign Post Dimensions

(Not for use with Warning, Regulatory or Marker Panels)

Panel Width	914 mm	1.22 m	1.52 m	1.83 m	2.13 m	2.44 m	2.74 m	3.05 m
two posts spacing (A)	559 mm	711 mm	914 mm	1.12 m	1.27 m	1.47 m	1.63 m	1.83m
bolts to panel (per stringer)			3	3	3	3	4	4
lenght of each stringer			1.22 m	1.42 m	1.57 m	1.78 m	1.93 m	2.13 m
two posts spacing (B)			533 mm	635 mm	737 mm	864 mm	965 mm	1.07 m
bolts to panel (per stringer)			3	3	4	4	4	4
length of each stringer			1.37 m	1.57 m	1.78 m	2.03 m	2.24 m	2.44 m



PANEL TO STRINGER OR POST



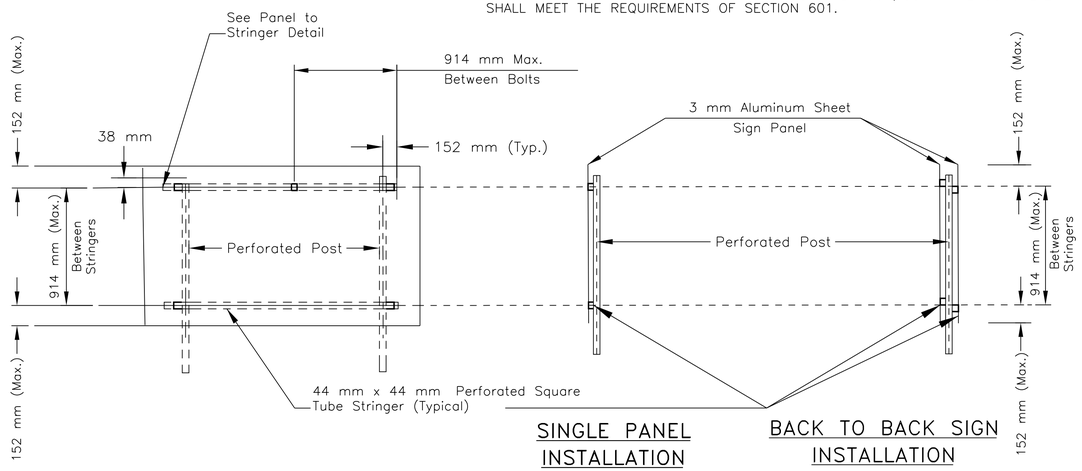
STRINGER TO POST

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. SIGNS GREATER THAN 762 mm IN WIDTH SHALL BE MOUNTED ON TWO OR MORE POSTS.

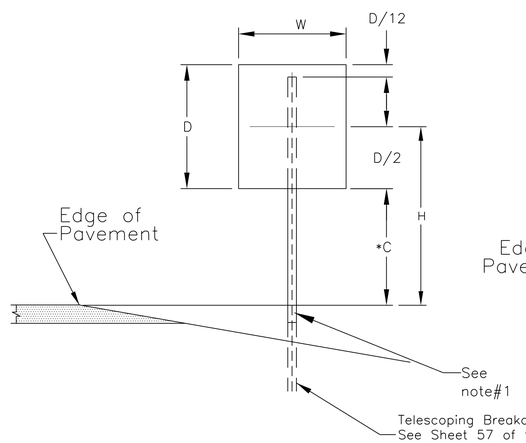
3. SIGN POST CONCRETE FOUNDATION SHALL BE USED IN LOOSE FINE GRAVITY SOILS THAT ARE HARD TO COMPACT AS DIRECTED BY COR/COTR. THE CONCRETE SHALL MEET THE REQUIREMENTS OF SECTION 601.



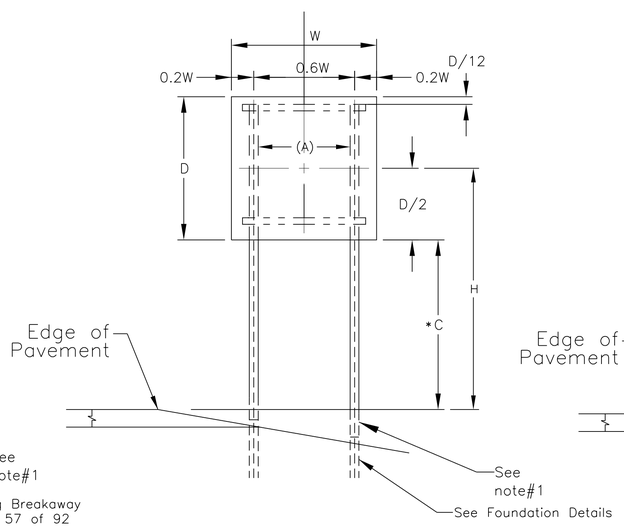
SINGLE PANEL INSTALLATION

BACK TO BACK SIGN INSTALLATION

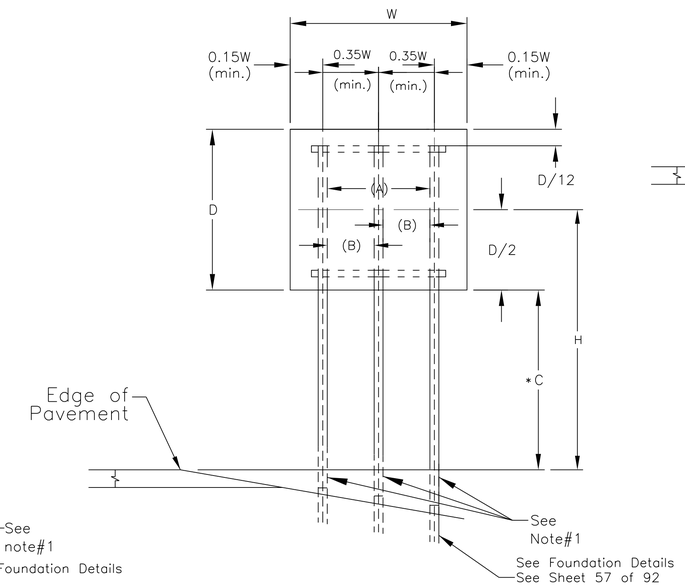
STRINGER DETAILS (FOR GUIDE SIGNS UP TO AND INCLUDING 3.05 mm WIDE)



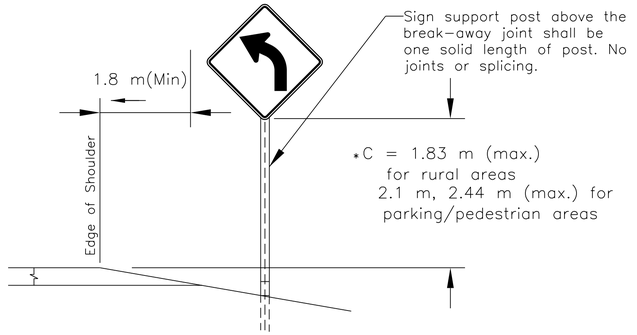
SINGLE POST SIZE (typ.)



DOUBLE POST SIZE (typ.)



THREE POST SIZE (typ.)



TYPICAL ROADSIDE SIGN LOCATION

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS

NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

POST SELECTION AND SIGN MOUNTING DETAILS

DRAWN BY: NRDOT	DATE: 7/29/2014
DESIGNED BY: NRDOT	DATE: 7/29/2014
REVISED: 1/26/2015	BY: Gerald.Hood
Sht 45 N12 Permament Sign Detail.dgn	

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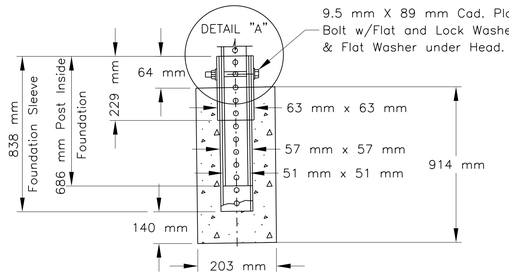
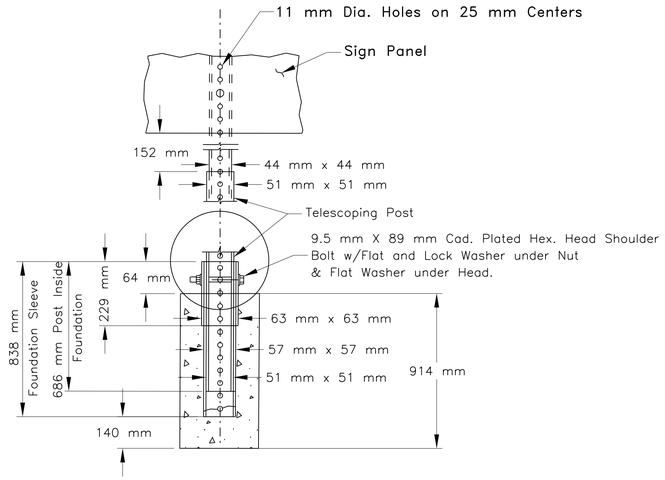
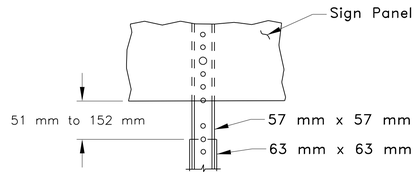
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	46	88



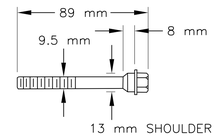
SINGLE POST FOUNDATION DETAIL



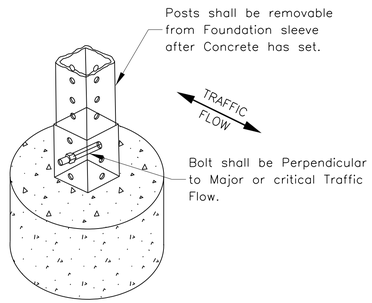
TELESCOPING POST DETAIL



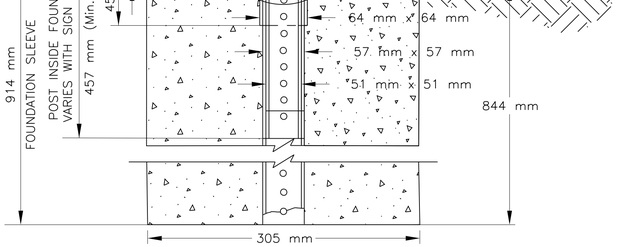
TELESCOPING POST INSTALLATION



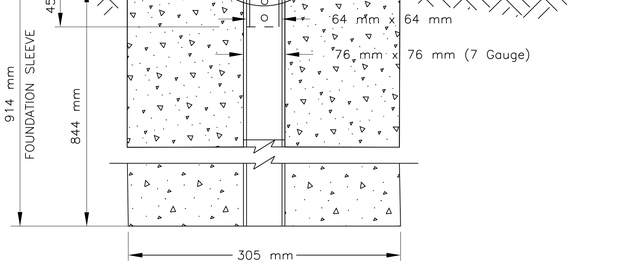
SHOULDER BOLT (HEAD)



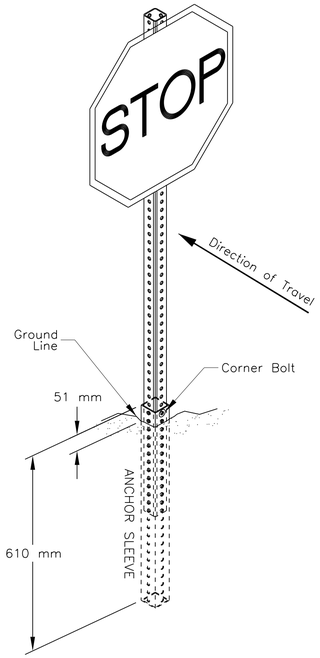
DETAIL "A"



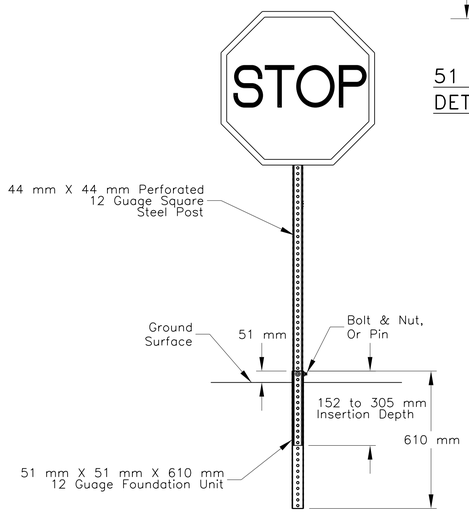
51 mm SINGLE POST CONCRETE FOUNDATION DETAIL (IN WEAK SOILS)



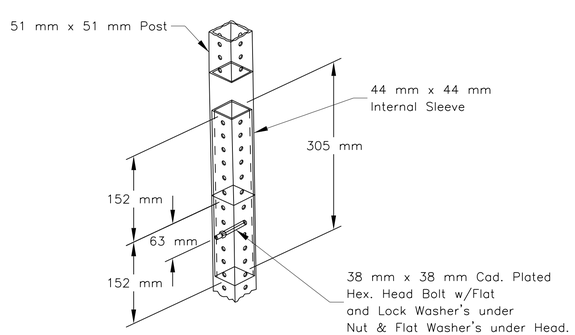
64 mm SINGLE POST CONCRETE FOUNDATION DETAIL (IN WEAK SOILS)



ISOMETRIC VIEW



TELESCOPING BREAKAWAY
(Single Post)



SINGLE POST PERMISSIBLE FIELD SPLICE
(Not allowed on Telescoping Post)

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

SQUARE POST AND SIGN MOUNTING DETAILS

DRAWN BY: NRDOT	DATE: 7/29/2014
DESIGNED BY: NRDOT	DATE: 7/29/2014
REVISED: 1/26/2015	BY: Gerald.Hood
Sht 46 N12 Post Select & Mounting Dtl.dgn	

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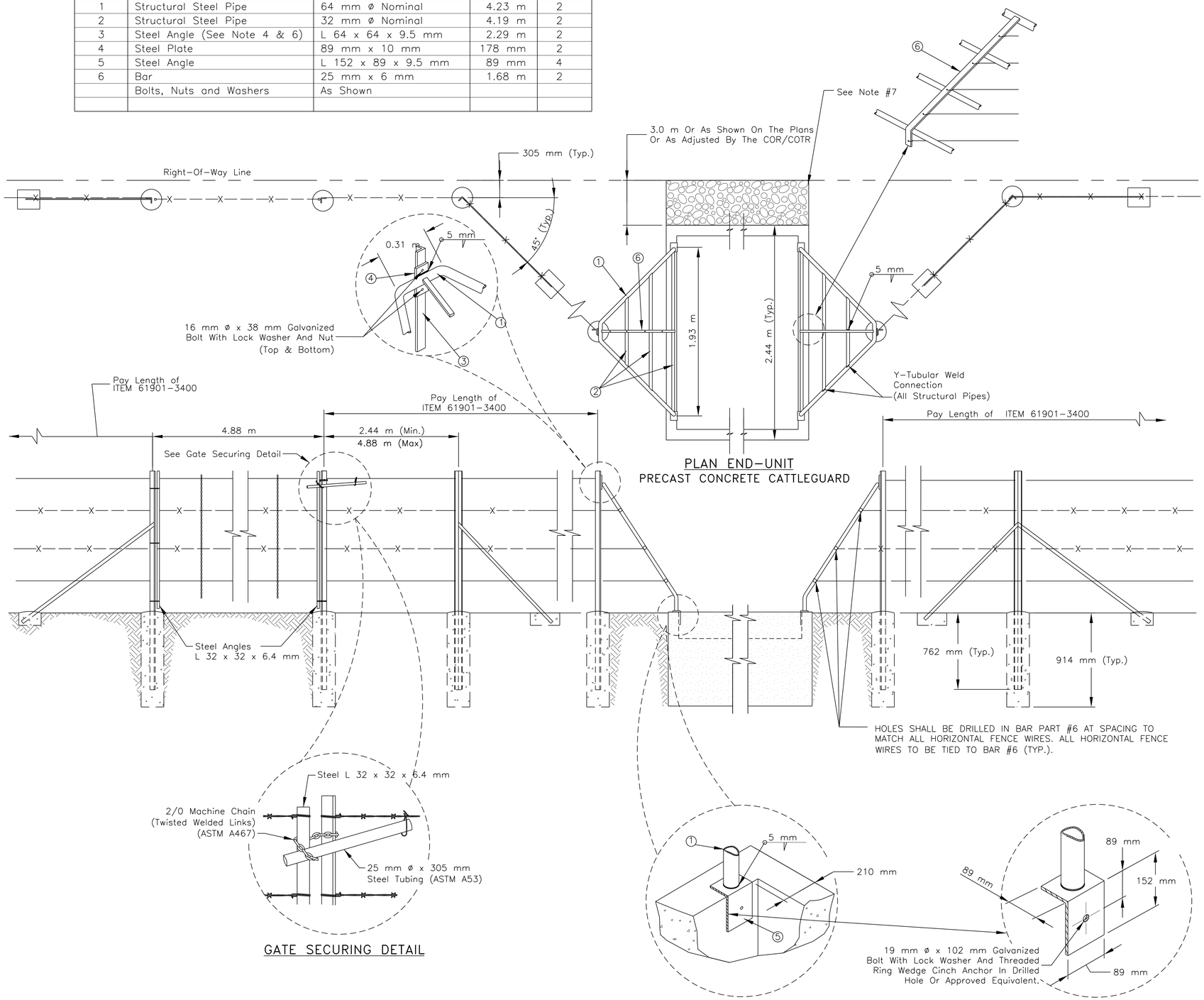
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	47	88

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 CATTLEGUARD

GATE SECURING DETAIL

GENERAL NOTES

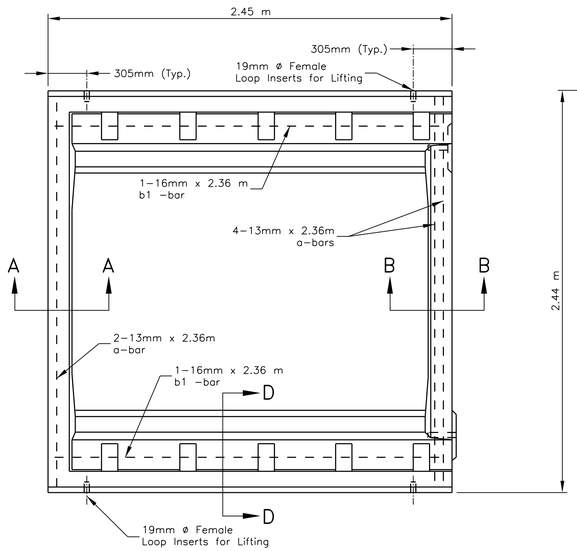
1. STRUCTURAL PIPE SHALL CONFORM TO ASTM A53-93A, GRADE B. ALL OTHER STRUCTURAL STEEL SHALL CONFORM TO ASTM-A36.
2. ALL STRUCTURAL PIPE JOINTS SHALL BE FABRICATED IN ACCORDANCE WITH AISC MANUAL OF STEEL CONSTRUCTION, LATEST EDITION.
3. WELDING SHALL MEET THE REQUIREMENTS OF AASHTO STANDARD SPECIFICATIONS FOR WELDING AT STRUCTURAL STEEL HIGHWAY BRIDGES, LATEST EDITION.
4. THE SUPPORTING WING BRACE POSTS LENGTH (PART 3) SHALL PROVIDE A MINIMUM OF 610mm OF SOIL PENETRATION. UNDER CERTAIN CONDITIONS (SUCH AS DRAIN THROUGH CATTLEGUARD, HIGH EMBANKMENT, ETC) THE LENGTH OF THE POST MAY VARY TO FULLY SUPPORT THE WING BRACES. THIS WORK SHALL BE INCIDENTAL TO CONTRACT ITEM 61903. INSTALLATION OF GATE SHALL BE SUBSIDIARY ITEM TO THE CATTLEGUARD ITEM(S).
5. THE COR/AOTR MAY ADJUST THE FINISHED CATTLEGUARD 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 CONTRACT ITEM 61903 OF FP-14. ANY MISTAKES MADE BY COR/AOTR IN DIRECTING ADJUSTMENTS TO THE FINISHED GRADE FOR THE CATTLE GUARDS AND APPROACH ROADWAY WILL BE CORRECTED UNDER SUBSECTION 109.02(M).
6. AT SKEWED TURNOUT LOCATIONS, THE CATTLEGUARD SHALL BE INSTALLED PERPENDICULAR TO TURNOUT.
7. THE LENGTH OF THE TURNOUT BETWEEN THE BACK EDGE OF THE CATTLEGUARD AND THE RIGHT-OF-WAY LIMIT SHALL BE SURFACED WITH A 100mm THICKNESS OF AGGREGATE BASE COURSE AT ALL 4.5m WIDE TURNOUTS. FOR TURNOUTS WIDER THAN 4.5m, PLACE AGGREGATE BASE COURSE AND ASPHALT SURFACING TO MATCH THE TURNOUT STRUCTURAL SECTION, BETWEEN THE BACK OF THE CATTLEGUARD 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 CATTLEGUARD LOCATIONS WHERE THE DESIGN TYPICAL WIDTH IS WIDER ON ONE SIDE OF THE CATTLEGUARD THAN THE OTHER SIDE, THE NARROWER ROADWAY WIDTH SHALL FLARED OUT TO MATCH THE WIDER ROADWAY WIDTH USING AN 8:1 TAPER OR TO THE LENGTH ALLOW BY THE RIGHT-OF-WAY WIDTH. THIS INCLUDES AT NARROW RIGHT-OF-WAY WIDTH WHERE THE TURNOUT RADIUS CANNOT BE COMPLETELY INSTALL BETWEEN THE MAIN ROAD AND THE CATTLEGUARD. THIS WORK SHALL BE PAID UNDER THE EARTHWORK, AGGREGATE BASE, AND PAVING ITEMS INCLUDED IN THE BID SCHEDULE.

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

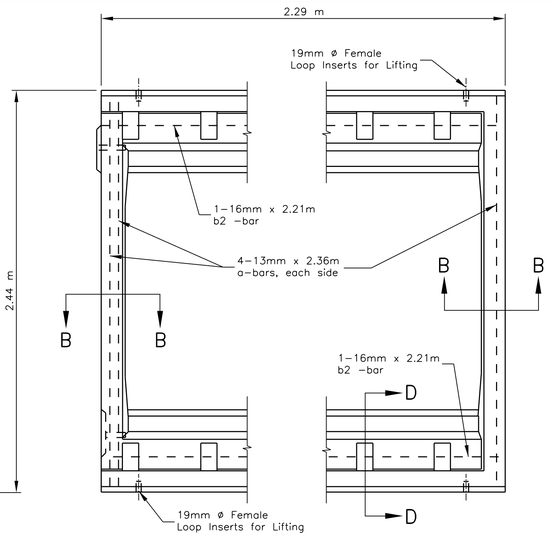
CATTLEGUARD AND WING BRACE DETAILS

DRAWN BY: NRDOT	DATE: 2/12/2014
DESIGNED BY: NRDOT	DATE: 2/12/2014
REVISED: 6/1/2015	BY: Leroy.Toledo
Sht 47 N12 CG WBRC.dgn	

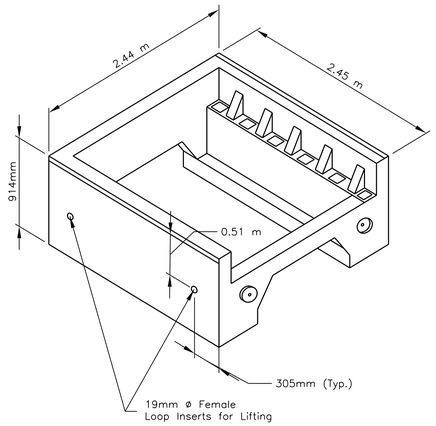
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	48	88



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.

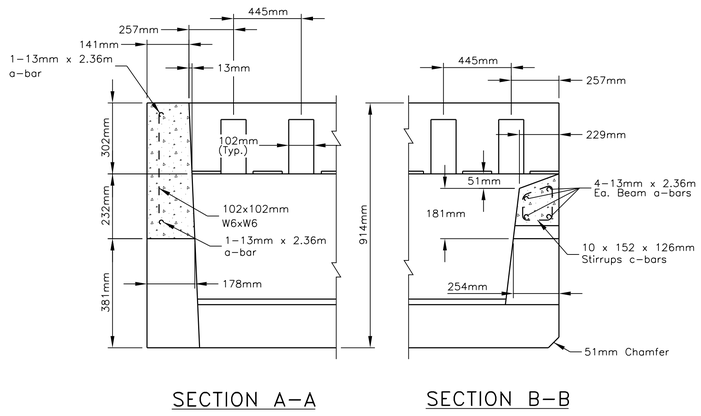
5. ALL TRAFFIC GRILL UNIT, AND WING BRACE STRUCTURAL STEEL AND PIPE, INCLUDING THE STEEL ANGLES SHALL RECEIVE ONE (1) PRIMER COAT, ONE (1) INTERMEDIATE COAT, AND ONE (1) FINISH COAT IN ACCORDANCE WITH SECTION 563, PAINT SYSTEM 2, OF FP-14.

6. WING BRACES SHALL BE CONSIDERED SUBSIDIARY ITEMS TO THE CATTLEGUARD UNIT.

7. THE CONTRACTOR HAS THE OPTION TO USE ALL STEEL FRAME CATTLEGUARD. IF THE CONTRACTOR ELECTS TO SUBSTITUTE FOR THE STEEL FRAME CATTLEGUARD, CONTRACTOR SHALL SHOW THEY ARE MORE COST EFFECTIVE WITH SUPPORTING DATA. THE CONTRACTOR IS RESPONSIBLE FOR ALL PATENT PROTECTION RIGHTS, SHOP DRAWINGS, MATERIAL CERTIFICATIONS, AND MILL TEST REPORTS. HOWEVER, NO STEEL FRAME CATTLEGUARD SHALL BE USED FOR CONCRETE DRAINAGE PAD CATTLEGUARD LOCATIONS.

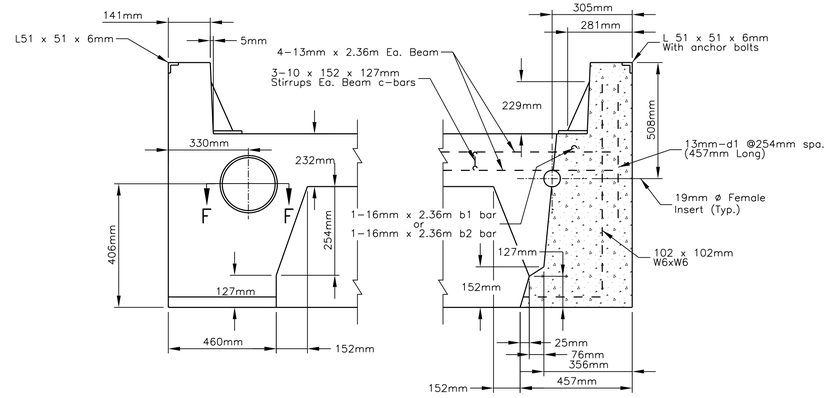
8. ELASTOMERIC BEARING PADS SHALL BE SEAL WITH EPOXY ADHESIVE PRIOR TO THE INSTALLATION OF TRAFFIC GRILL UNIT.

9. DESIGN DATA: DESIGN ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, THIRD EDITION. DESIGN LOADS: HS20 AND DESIGN TANDEM WITH 33% IMPACT.



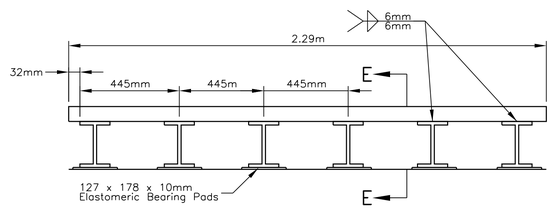
SECTION A-A

SECTION B-B

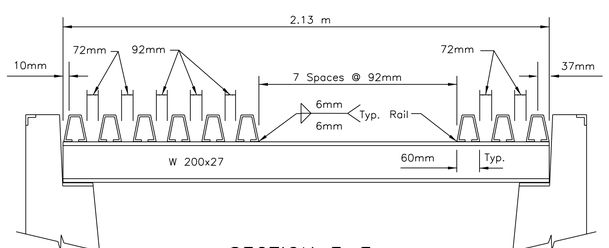


KEY LOCATION

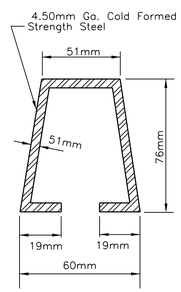
SECTION D-D



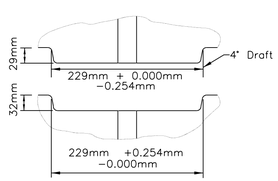
TRAFFIC GRILLE UNIT



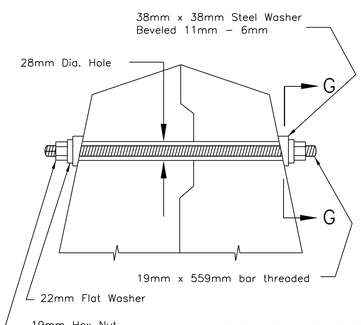
SECTION E-E



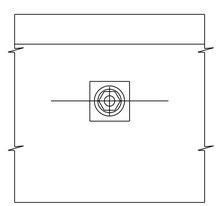
STEEL CROSSBAR SECTION
15 Req'd for 1 Grid



SECTION F-F



TIE BOLT DETAIL



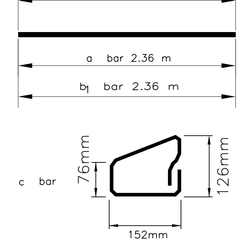
SECTION G-G

REINFORCING STEEL SCHEDULE

STRAIGHT BARS				BENT BARS			
MARK	NO.	SIZE	LENGTH	MARK	NO.	SIZE	LENGTH
END UNIT							
a	6	13	2.36 m				
b_1	2	16	2.36 m				
				c	3	10	0.61 m
D_1	20	13	0.46 m				
INTERMEDIATE UNIT							
a	8	13	2.36 m				
b_2	2	16	2.21 m				
				c	6	10	0.61 m
D_1	18	13	0.46 m				

BENDING DIAGRAMS

ALL DIMENSIONS ARE OUT TO OUT



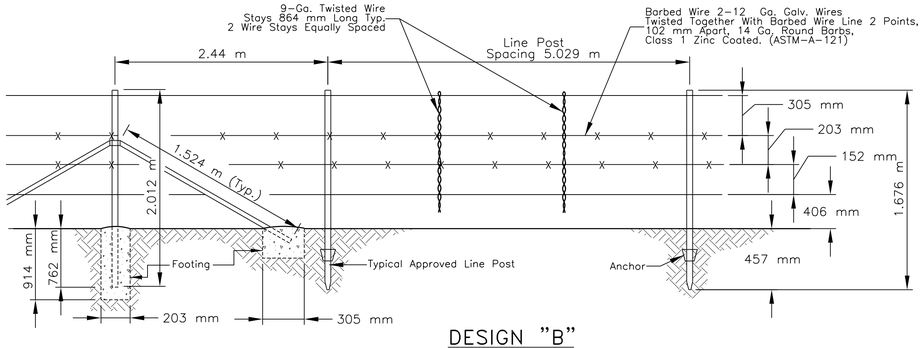
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

PRECAST CONCRETE CATTLEGUARD DETAILS

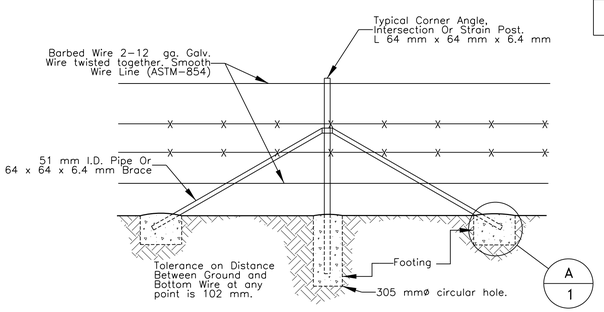
DRAWN BY: NRDOT	DATE: 2/12/2014
DESIGNED BY: NRDOT	DATE: 2/12/2014
REVISED: 6/1/2015	BY: Leroy.Toledo
Sht 48 N12 PCCG.dgn	

I:\DESIGN\Users\DESIGN3\CURRENT PROJECTS\N35_Chinle\N12(19-4)\DESIGN DATA_020315\CADD Files\Sht 48 N12 PCCG.dgn

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	49	88

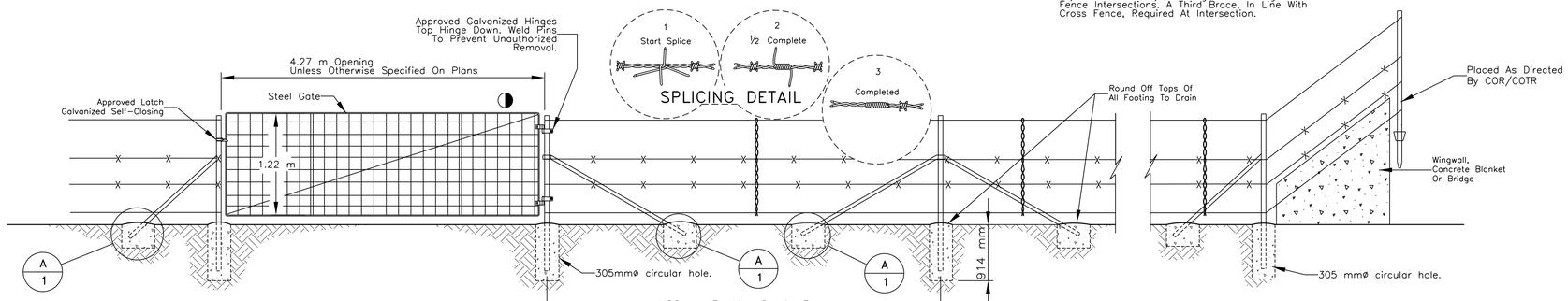


DESIGN "B"



STANDARD STRAIN POST

To Te 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.



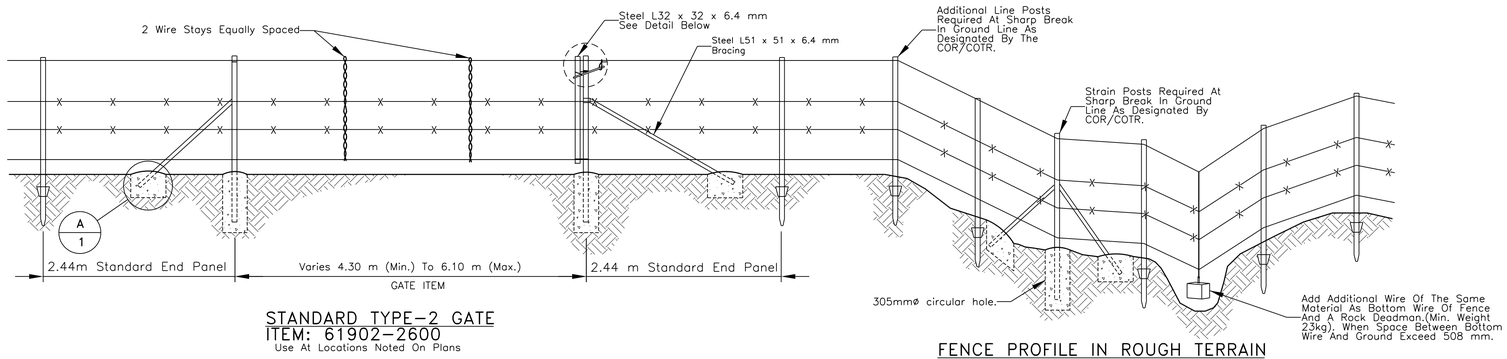
Notes: When Tubular Post Hangers And/Or Latches Are Used, It Shall Be Drilled For A Single 2.38 mm ø Min. Drive Pin To Prevent Rotation Of The Hangers And/Or Latches.

STANDARD 4.27m TYPE 1 GATE
ITEM: 61902-1300

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

END POST



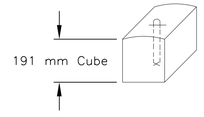
STANDARD TYPE-2 GATE
ITEM: 61902-2600

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.

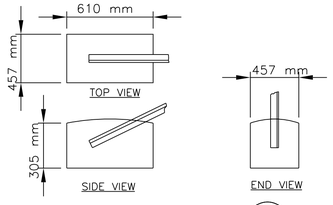
TYPICAL STEEL POST SECTION



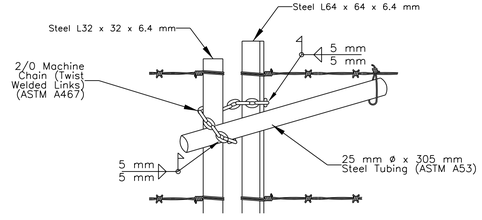
38 mm X 127 mm Doubled And Twisted 3.8 mm(Dia.) Wire Loop Centered In Block. 25.4 mm Projection Twisted Ends Down.

CONCRETE SAG WEIGHT DETAIL

Min. Weight Of Concrete Sag Shall Be 16 kg.



CONCRETE FOOTING FOR CORNER & STRAIN POST (A/1)



GATE SECURING DETAIL

GENERAL NOTES

1. CORNER, GATE, INTERMEDIATE BRACE POSTS AND LINE POSTS SHALL BE GALVANIZED 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. ALTERNATIVELY THE POSTS CAN BE PAINTED PER SECTION 710.04(C)(1).

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 61901-3400.

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 61901-3400.

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 61901-3400.

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 NOTED ON THE PLANS AS INSTALLING THE ROW FENCING OVER THE DRAINAGE STRUCTURE, CONNECT ALL R.O.W. FENCING TO CATTLE GUARDS, CULVERTS (GREATER THAN 1524 mm DIA.), AND CONCRETE STRUCTURES AS SHOWN ON THESE PLANS, AND/OR AS DIRECTED BY THE COR/COTR.

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 WITH FENCE POST SPACING BEING REDUCED WHERE NECESSARY, SO THAT POSTS ARE DRIVEN BETWEEN PIPES. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO ITEM 61901-3400.

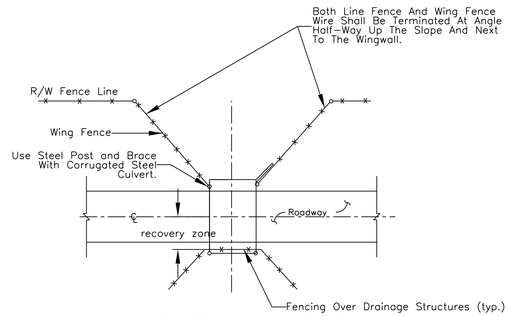
9. CLEARING AND GRUBBING SHALL INCLUDE SHAPING AND/OR REMOVAL OF SMALL MOUNDS NECESSARY TO PRESENT A SMOOTH UNIFORM APPEARANCE OF BOTH GROUND AND FENCING LINE. THIS WORK SHALL BE INCIDENTAL TO THE INSTALLATION OF FENCING AND NO ADDITIONAL PAYMENT SHALL BE MADE.

10. ALL DRILLING INTO ROCK MATERIAL, ETC. SHALL BE INCIDENTAL TO THE INSTALLATION OF FENCING AND NO ADDITIONAL PAYMENT SHALL BE MADE.

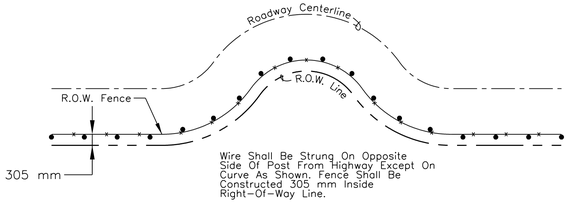
11. GATE CLOSURE DEVICE SHALL BE STEEL PIPE, NPS 3/4 (26.7 mmø) SCHEDULE 40, CONFORMING TO THE REQUIREMENT OF ASTM A 53. THE GATE CLOSURE STEEL CHAIN SHALL BE WELDED TO THE STEEL PIPE AND ANGLE IRON FENCE POST. THIS WORK SHALL BE INCIDENTAL TO THE INSTALLATION OF FENCING AND NO ADDITIONAL PAYMENT SHALL 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.

13. THE CONTRACTOR SHALL SUBMIT COMPLETE DETAILED SHOP DRAWINGS FOR PEDESTRIAN GATE, HINGES AND LATCH TO COR/COTR, FOR REVIEW AND APPROVAL. GATE POSTS AND BRACES, HINGES AND HATCH TO MATCH STANDARD TYPE 1 GATES. MINIMUM GATE FRAME TO BE CONSTRUCTED WITH 30 mm DIAMETER PIPE. GATE SHALL E SELF CLOSING.



WING FENCE @ STRUCTURE DETAIL

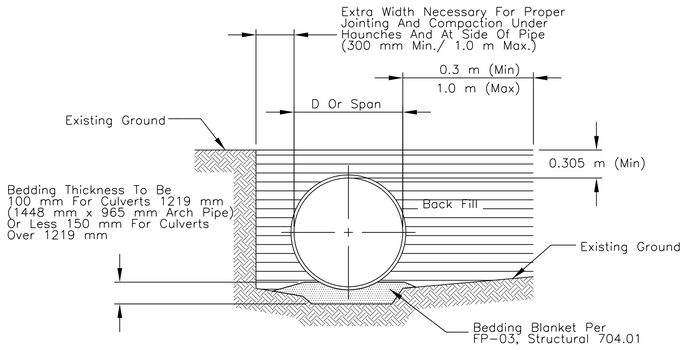


UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

STANDARD WILDLIFE FENCING DETAIL

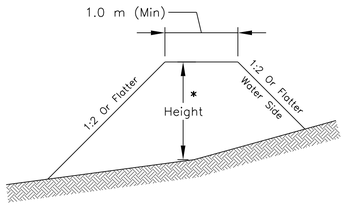
DRAWN BY: NRDOT	DATE: 1/14/2011
DESIGNED BY: NRDOT	DATE: 1/14/2011
REVISED: 2/4/2013	BY: Leroy.Toledo
SHEET SIZE: Full Size (24x36) Plot Sheet	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	50	88

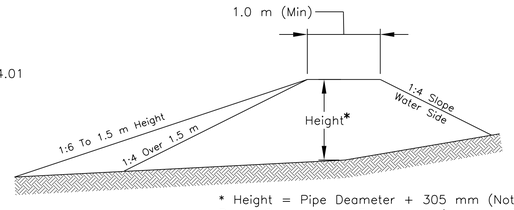


NEGATIVE PROJECTING POSITIVE PROJECTING

FIGURE A: BEDDING



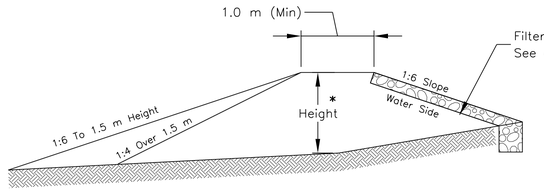
TYPE "A" DIKE/BERM



* Height = Pipe Deameter + 305 mm (Not To Exceed Paved Shoulder And Elevation Or/As Given On Plans)

TYPE "B" DIKE/BERM

EARTHEN DIKE/BERM DETAILS



TYPE "B" DIKE/BERM

NOTE: When Necessary The Slope May Be Flattened To 1:6 With 457 mm Thick Riprap Protection As Called For On Plans.

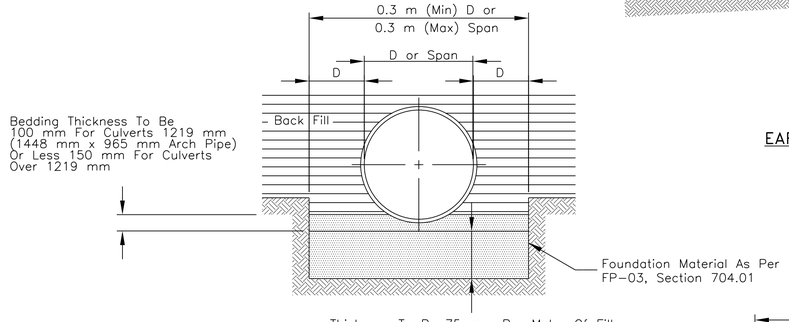
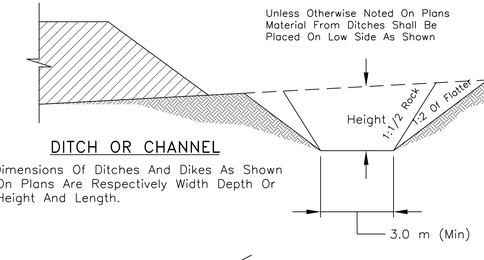
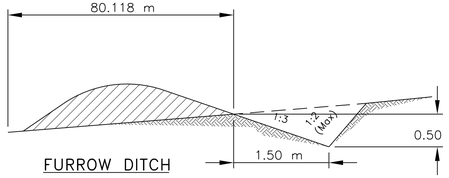


FIGURE B: ROCK BEDDING



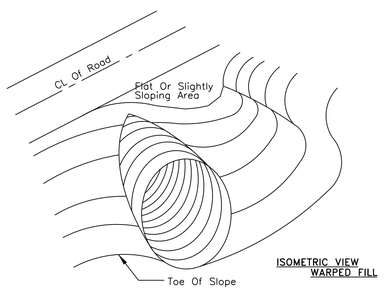
DITCH OR CHANNEL

Note: Dimensions Of Ditches And Dikes As Shown On Plans Are Respectively Width Depth Or Height And Length.



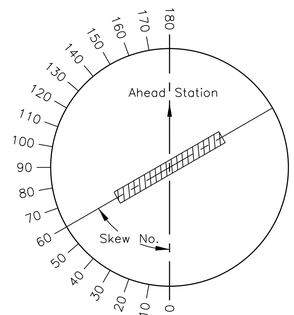
FURROW DITCH

1. To Be Paid For By The meter.
2. Furrow Ditch Sections As Shown Above And/Or Approved Equivalent Shall Be Built As Directed By The COR/COTR.



PIPE SKEWS TO THE EMBANKMENT (TYP.)

The Contractor Shall Be Required To Build The Warped Embankment Around The Skewed Drainage Pipe(s). This Work Shall Be Incidental To The Earthwork And Installation Of Drainage Pipe Items Shown.



STRUCTURE SKEW DIAGRAM

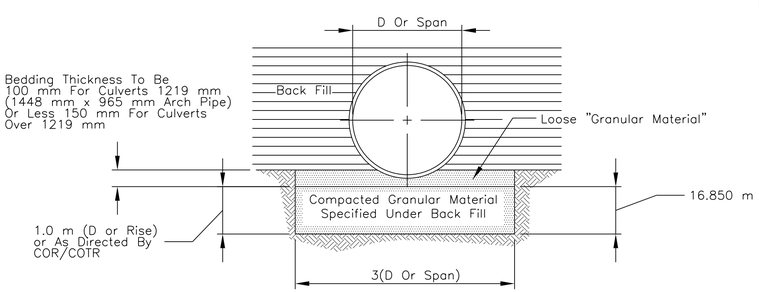
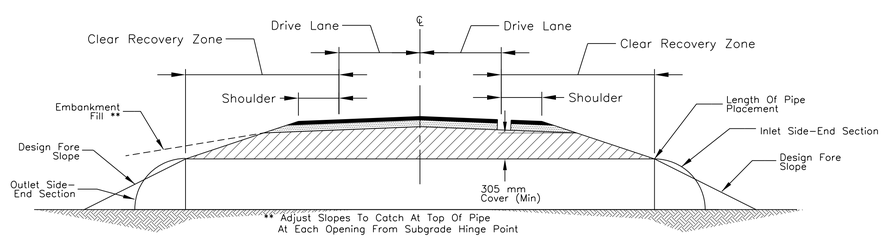
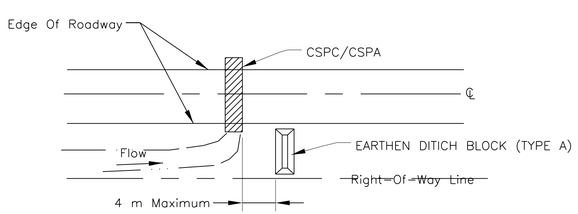


FIGURE C: FOUNDATION STABILIZATION BEDDING



TYPICAL PIPE INSTALLATION-(TURNOUT/DRIVEWAY AND MAIN ROADWAY.



EARTHEN DIKE/BERM INSTALLATION AT STRUCTURE

1. Earthen Dike/Berm At Structures To Be So Placed That They Create A Water Cushion. Elevation At Top Of Earthen Dike/Berm Shall Be 305 mm Above Elevation Of Top Of Pipe Unless Otherwise Shown Or Directed By The COR/COTR.
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.

GENERAL NOTES

1. PLACE LOOSE BEDDING ROUGHLY SHAPED TO 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 AND PRECAST BOX STRUCTURES SHALL BE ASSEMBLED AND INSTALLED IN ACCORDANCE WITH THE FABRICATORS RECOMMENDATIONS.
5. BACKFILL MATERIAL SHALL BE PLACED AT PIPE DIAMETER WIDE ON THE SIDES AND 300 mm (MIN)/ 1.0 m(MAX) OVER THE PIPE. BACKFILL MATERIAL BEYOND THE LIMITS SHALL BE REGULAR EARTHWORK EMBANKMENT MATERIAL, THE BACKFILL MATERIAL SHALL BE APPROVED BY THE COR/COTR. 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. MULTIPLE PIPE INSTALLATIONS SHALL BE PLACED 610 mm BETWEEN END SECTIONS UNLESS OTHERWISE DIRECTED BY THE COR/COTR.
9. ALL PIPE SHALL BE PROTECTED BY A COVER OR NOT LESS THAN 0.91 m OF EMBANKMENT ABOVE PIPE BEFORE ANY HEAVY EQUIPMENT IS ALLOWED TO PASS OVER THE STRUCTURE(S) DURING CONSTRUCTION.
10. ALL CULVERTS SHALL BE INSTALLED AT THE ORIGINAL FLOW LINE AND SLOPED TO ASSURE POSITIVE DRAINAGE UP TO THE R.O.W. LIMITS. IN NO CASE SHALL THE PIPE BE PLACED BELOW THE ORIGINAL FLOW ELEVATIONS, UNLESS OTHERWISE DIRECTED BY THE COR/COTR. THIS SHALL BE CONSIDERED INCIDENTAL TO COMPLETION OF THE PROJECT AND NO ADDITIONAL PAYMENT SHALL BE MADE.
11. AT DRAINAGE PIPE REPLACEMENTS, INSTALLATIONS, EXTENSIONS AND IN-PLACE PIPE CLEANING LOCATIONS, THE CONTRACTOR SHALL RESHAPE, REGRADE AND CLEAN THE INLET AND OUTLET CHANNELS TO THE RIGHT-OF-WAY LINE AND/OR EXISTING DRAINAGE CHANNEL, TO PRODUCE SMOOTH FLOWS AT CULVERT INTAKES AND DISCHARGES AS DIRECTED BY THE COR/COTR. THIS WORK SHALL BE INCIDENTAL TO THE BID ITEMS UNDER SECTIONS 602, 603 AND 607.
12. ALL CULVERTS UNDER TURNOUTS AND DRIVEWAYS SHALL BE PLACED AT THE PROPOSED DITCH FLOWLINE. THE CONTRACTOR SHALL BE REQUIRED TO FIELD ADJUST THE PROFILE GRADES OVER THE PIPE AS DIRECTED BY COR/COTR. TO PROVIDE FOR MINIMUN COVER.
13. TYPE "A" DIKE /BERM SHALL BE USED ON THE PROJECT UNLESS OTHERWISE NOTED ON THE PLANS. EMBANKMENT MATERIAL NEEDED TO BUILD EARTHEN DIKE/DERM SHALL BE CONSIDERED INCIDENTAL TO ITEM 20443-1000.
14. IF DIRECTED BY THE COR/COTR. TO BETTER FIT DRAINAGE FIELD CONDITIONS TO MORE SMOOTHLY DIRECT FLOW INTO THE PIPE AND/OR TO LESSEN THE WATERS IMPACT ON THE FACE OF THE EARTHEN DIKE/BERM. THIS WORK TO BE INCIDENTAL TO BID ITEM 20443-1000.

UNITED STATES
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NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

STANDARD PIPE INSTALLATION AND DITCH DETAILS

DRAWN BY: NRDOT	DATE: 2/4/2014
DESIGNED BY: NRDOT	DATE: 2/4/2014
REVISED: 3/19/2014	BY: Leroy.Toledo
Sht 50 N12 Std Pipe Install Details.8.19.2015.dgn	

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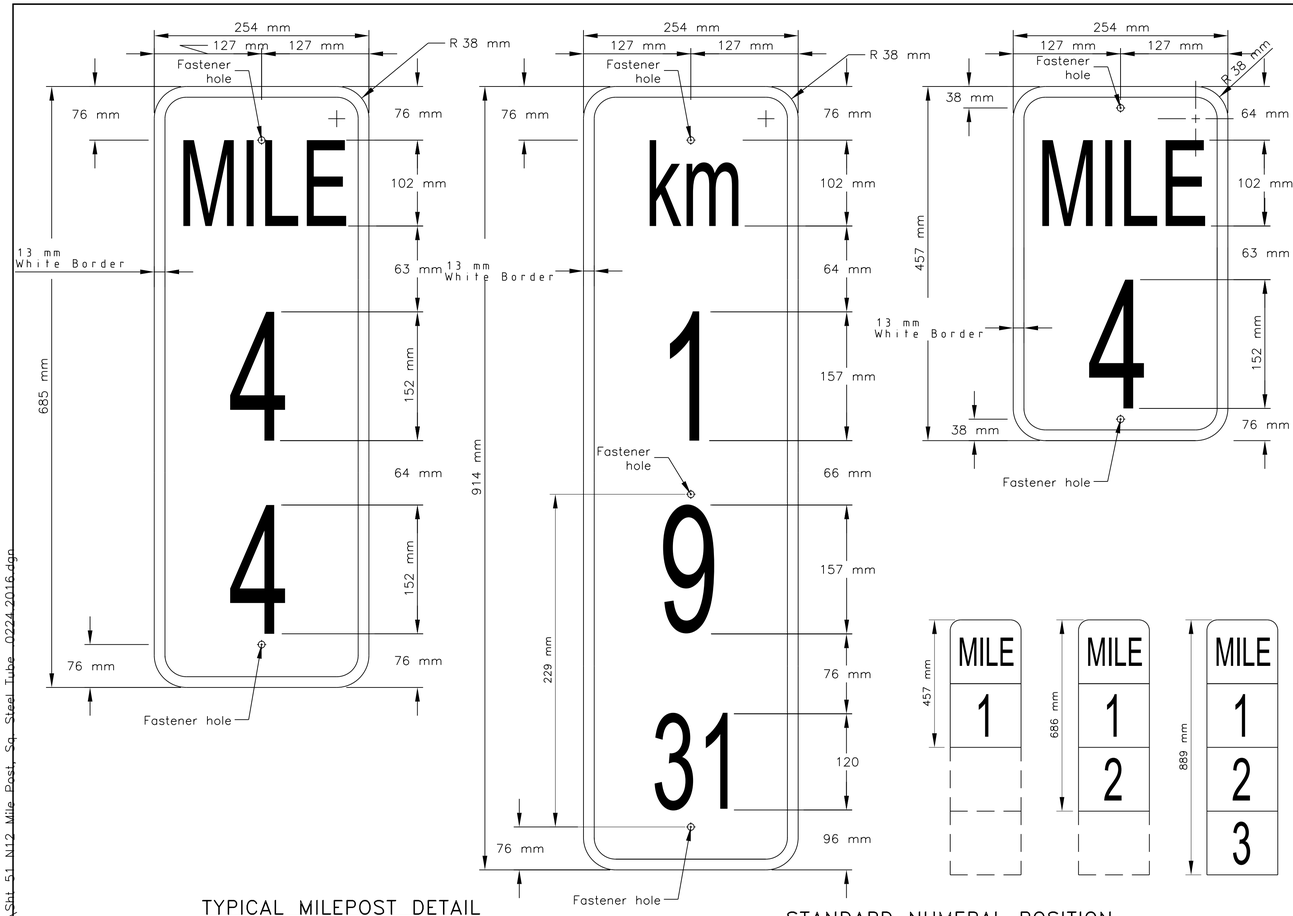
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	51	88

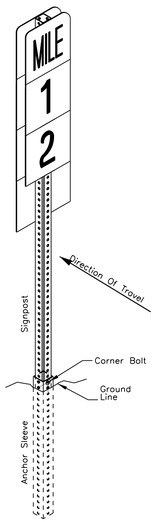


TYPICAL MILEPOST DETAIL

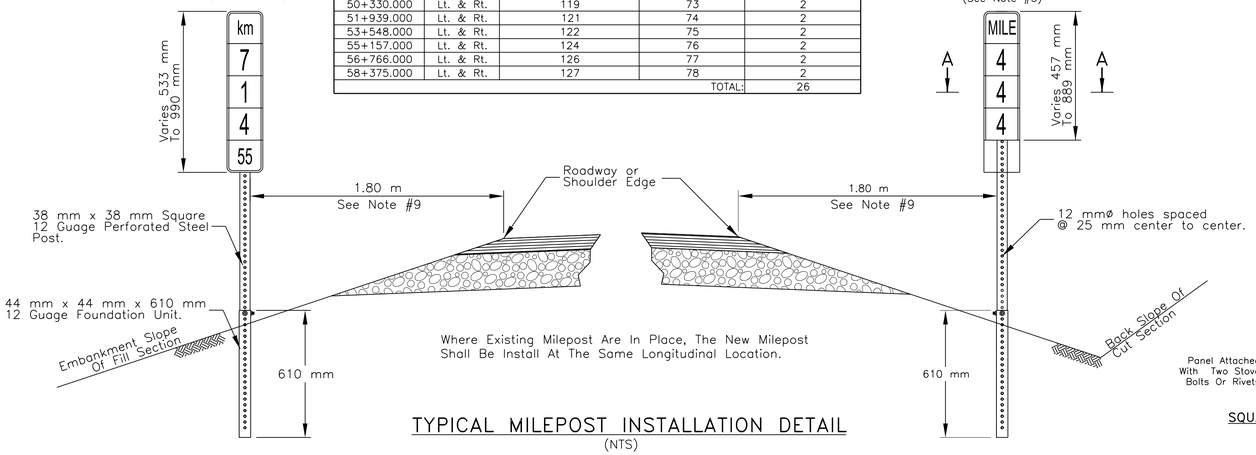
STANDARD NUMERAL POSITION

ITEM: 63318-1020 MILEPOST
38 mm x 38 mm STEEL SQUARE TUBE

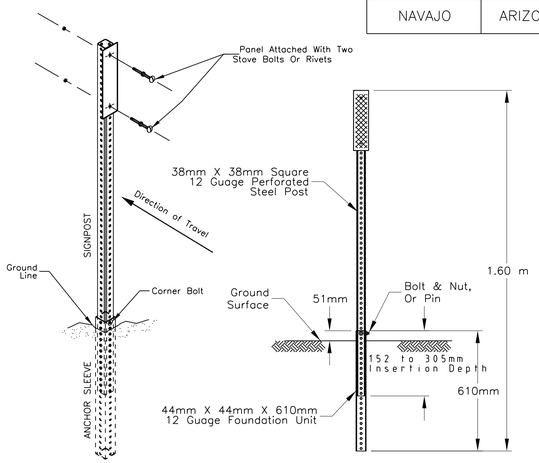
STATION (m)	LOCATION	Kilometers (Labels)	MILES (Labels)	QUANTITY (Each)
39+067.000	Lt. & Rt.	106	66	2
40+676.000	Lt. & Rt.	109	67	2
42+285.000	Lt. & Rt.	111	68	2
43+894.000	Lt. & Rt.	113	69	2
45+503.000	Lt. & Rt.	114	70	2
47+112.000	Lt. & Rt.	116	71	2
48+721.000	Lt. & Rt.	117	72	2
50+330.000	Lt. & Rt.	119	73	2
51+939.000	Lt. & Rt.	121	74	2
53+548.000	Lt. & Rt.	122	75	2
55+157.000	Lt. & Rt.	124	76	2
56+766.000	Lt. & Rt.	126	77	2
58+375.000	Lt. & Rt.	127	78	2
			TOTAL:	26



ISOMETRIC VIEW
NOTE: Square Tube Splice Connection Detail on Sheet 59

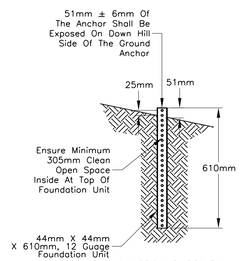


TYPICAL MILEPOST INSTALLATION DETAIL
(NTS)

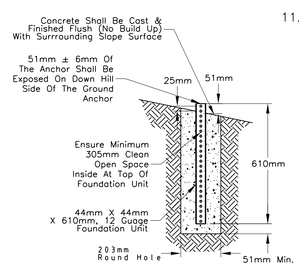


ISOMETRIC VIEW

ALTERNATE ASSEMBLY

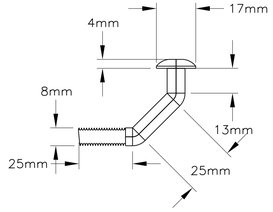


IN-GROUND DRIVEN

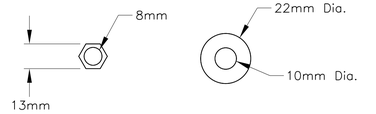


IN-GROUND CONCRETE

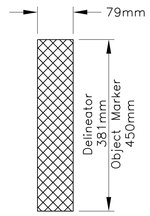
Use Chair Device To Ensure Minimum 51mm Clearance Above Bottom Of Hole



BREAK-AWAY BOLT

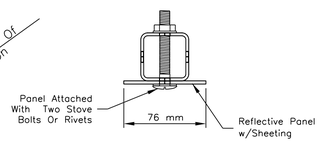


LOCK NUT FLAT WASHER

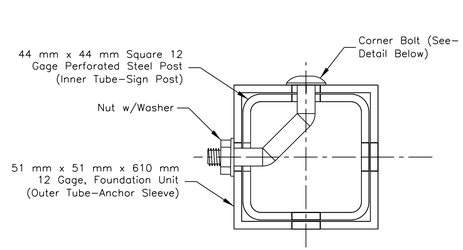


REFLECTIVE PANEL
(Pre-Drilled/Punched)

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



SQUARE TUBE POST AND PANEL



"BREAK-AWAY" DETAIL
SIGN POST/SLEEVE INTERFACE

GENERAL NOTES

1. ALL CONCRETE SHALL BE CLASS A(AE) AND SHALL CONFORM TO SECTION 601 OF THE FP-14. FURNISHING AND PLACING OF CONCRETE. WHEN REQUIRED, SHALL BE CONSIDERED INCIDENTAL TO ITEM 63309-0020.
2. THE CONTRACTOR SHALL USE 51mm X 51mm ALL STEEL SQUARE TUBE DELINEATORS. SEE SHEET 67 FOR POST SPACING.
3. THE MILE POSTS SHALL BE PLACED ON BOTH SIDE OF THE ROADWAY WITH ENGLISH UNITS PANEL ON APPROACHING TRAFFIC AND METRIC UNITS PANEL ON OPPOSING TRAFFIC.
4. MILE POST PLATES SHALL BE FABRICATED FROM 16 GAGE MINIMUM THICKNESS 5052-H38 OR 6061-T6 ALUMINUM ALLOY.
5. ALL SURFACE TO BE COVERED WITH REFLECTIVE SHEETING, AND SHALL BE PREPARED IN ACCORDANCE WITH SUPPLEMENTAL SPECIFICATION SECTION 718.11, TABLE 718-3.
6. THE BORDER AND LEGEND SHALL BE STANDARD REFLECTIVITY SILVER-WHITE. THE BACKGROUND SHALL BE STANDARD REFLECTIVITY GREEN AND MAY BE REVERSE SILK-SCREENED.
7. THE BACK SIDE OF THE ALUMINUM SHEETS SHALL BE ETCHED BY APPROVED METHODS TO REDUCE GLARE FROM REFLECTED SUNLIGHT.
8. STEEL POSTS SHALL CONFORM TO ASTM A499- YIELD POINT AND TENSILE STRENGTH OF STEEL SHALL BE 550 & 689 MPa (MINIMUM) RESPECTFULLY AND SHALL NOT WEIGHT LESS THAN 2.98 kg/m. AN APPROVED ALTERNATE BREAKAWAY ASSEMBLY MAY BE SUBMITTED TO THE COR/AOTR FOR REVIEW AND APPROVAL PRIOR TO IT'S USE. THE POSTS SHALL BE GALVANIZED AFTER FABICATION IN ACCORDANCE WITH ASTM A-123.
9. INSTALL MILE POST MARKER 1.80 METER (MAXIMUM) FROM ROADWAY SHOULDER. AT GUARDRAIL LOCATIONS, THE MILE POST MARKER SHALL LINE UP WITH THE GUARDRAIL POSTS.
10. THE POSTS LENGTH SHALL BE DETERMINED IN THE FIELD BASED ON FINISH GROUND ELEVATION WITH RESPECT TO EDGE OF PAVEMENT ELEVATION.
11. THE UNIT PRICE BID FOR FURNISHING AND INSTALLING MILE POSTS SHALL INCLUDE ALL MATERIALS INCLUDING TWO SIGNS PER POST.

UNITED STATES
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NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

STANDARD MILEPOST WITH U-CHANNEL STEEL POST AND PERFORATED SQUARE STEEL TUBE POST DETAILS

DRAWN BY: NRDOT	DATE: 2/12/2014
DESIGNED BY: NRDOT	DATE: 2/12/2014
REVISED: 6/1/2015	BY: Leroy.Toledo
Sht 51 N12 Mile Post, Sq. Steel Tube .0224.2016.dgn	

J:\DESIGN\Users\DESIGN3\CURRENT PROJECTS\N35_Chinle\N12(19-4)\DESIGN DATA .020315\CADD Files\Sht 51 N12 Mile Post, Sq. Steel Tube .0224.2016.dgn

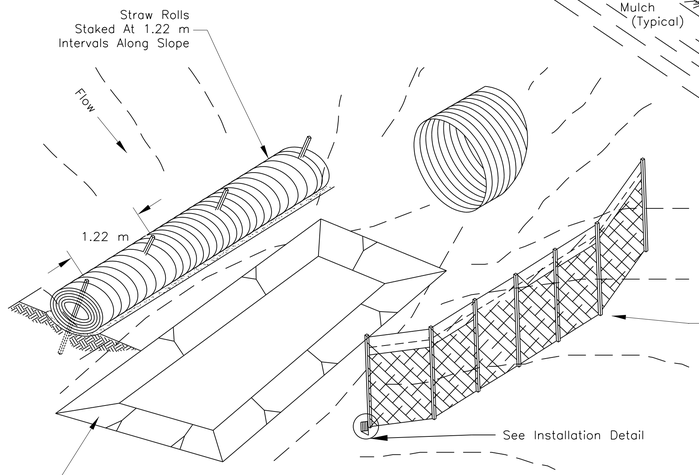
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	52	88

GENERAL NOTES

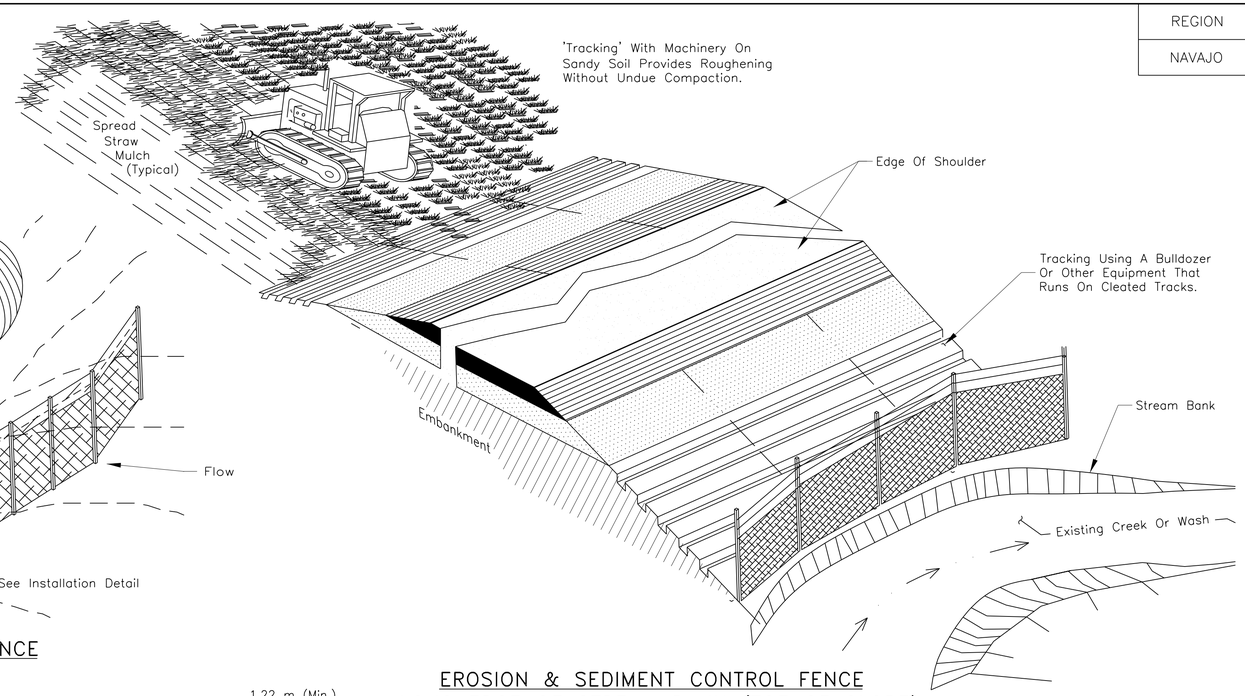
1. THE CONTRACTOR SHALL PREPARE AND SUBMIT A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IN FULL DETAIL FOR ALL PHASES OF THE WORK FOR REVIEW AND APPROVAL AT LEAST 14 CALANDER DAYS BEFORE IMPLEMENTATION. THE PLAN SHALL MEET THE REQUIREMENTS HEREIN AND SECTION 157 OF THE FP-14 AS MODIFIED IN THE SUPPLEMENTAL 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 2.0 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 TIP AND MID-SECTION. GEOTEXTILE MATERIAL FOR SILT FENCING SHALL BE TYPE-V UNDER SUB-SECTION 714.01 OF FP-14.
4. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY 152 mm AND FOLDED. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED BEFORE "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 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 15701-0000, AND/OR 15708-1000.
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).

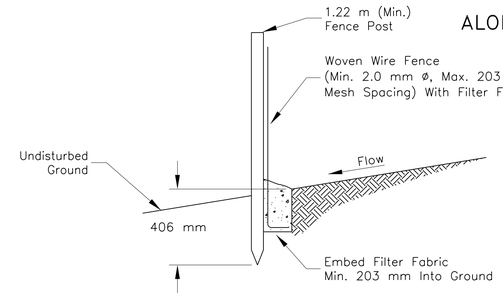
10. PRIOR TO ACCEPTANCE, ALL PROJECT AREAS (AS DETERMINED BY THE CORT) SHOWING EROSION DAMAGE CAUSED BY THE CONTRACTOR'S FAILURE TO PROPERLY MAINTAIN THIS EROSION CONTROL STRUCTURES SHALL BE REPAIRED TO REMOVE DAMAGE, ANY SPECIFIED EROSION CONTROL MATERIALS, STRUCTURES, OR DEVICES DAMAGE OR LOST DUE TO IMPROPER INSTALLATION. THE CONTRACTOR'S NEGLIGENCE OR IMPROPER MAINTENANCE, SHALL ALSO BE PEPAIRED AND/OR REPLACE PRIOR TO FINAL ACCEPTANCE AT THE CONTRACTOR'S ENTIRE EXPENSE.



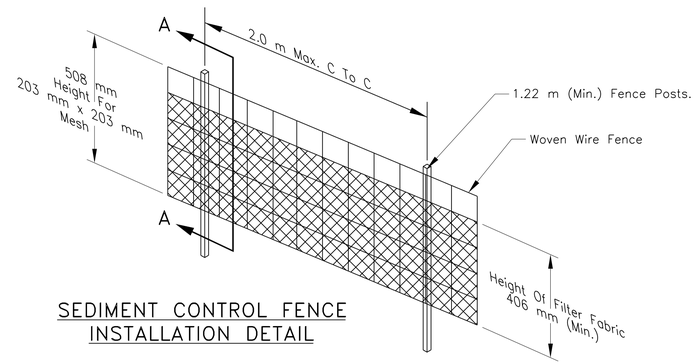
EROSION & SEDIMENT CONTROL FENCE
AT DRAINAGE STRUCTURE



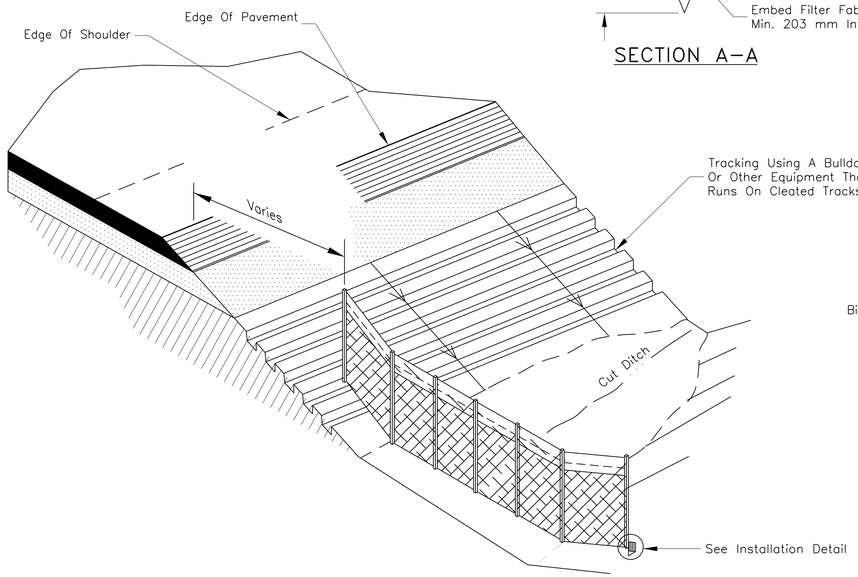
EROSION & SEDIMENT CONTROL FENCE
ALONG EDGE OF STREAM BANK (TOE OF SLOPE)



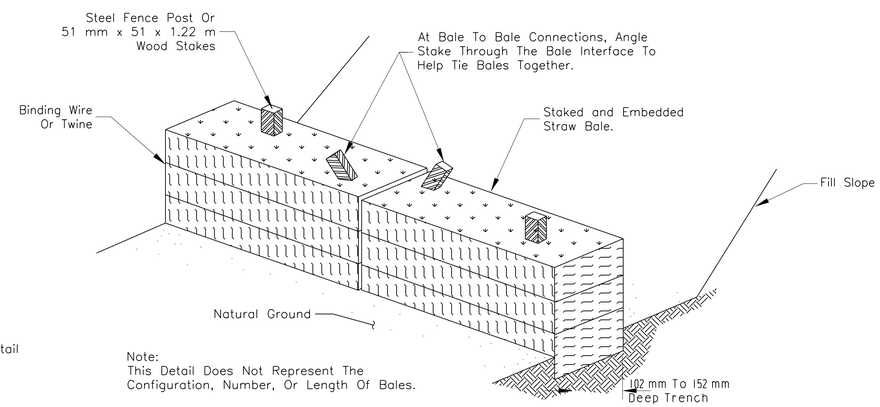
SECTION A-A



SEDIMENT CONTROL FENCE
INSTALLATION DETAIL



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



Note:
This Detail Does Not Represent The
Configuration, Number, Or Length Of Bales.

TYPICAL STRAW BALE STAKING
AND TRENCHING DETAIL

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

STORMWATER POLLUTION AND
EROSION/SEDIMENT
CONTROL DETAILS

DRAWN BY: NRDOT	DATE: 2/4/2014
DESIGNED BY: NRDOT	DATE: 2/4/2014
REVISED: 3/15/2014	BY: Paul.Manuelito
Sht 52 N12 ERO1 SWPPP.dgn	

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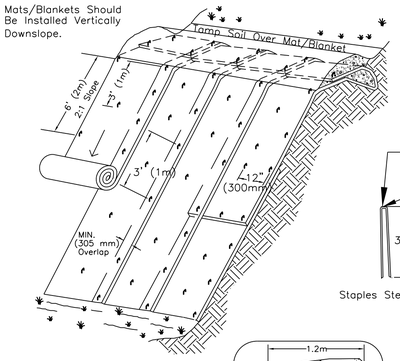
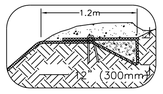
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	53	88

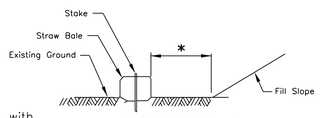


NOTES:
1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/ BLANKETS SHALL HAVE GOOD SOIL CONTACT.
2. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
3. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.



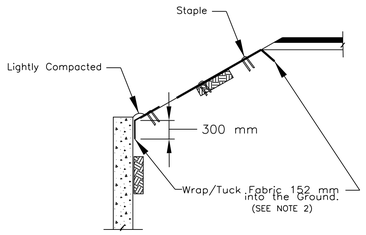
NOT TO SCALE

EROSION BLANKETS & TURF REINFORCEMENT MATS SLOPE INSTALLATION

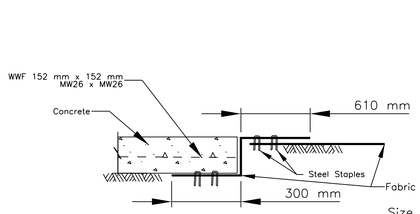


SECTION D–D

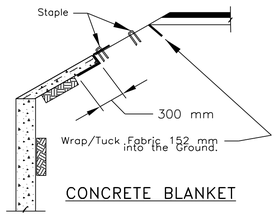
* See General Notes.



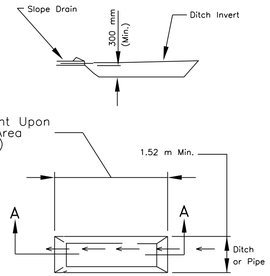
CONCRETE HEADWALL



TUCKING of FABRIC AROUND CONCRETE STRUCTURE DETAIL



CONCRETE BLANKET

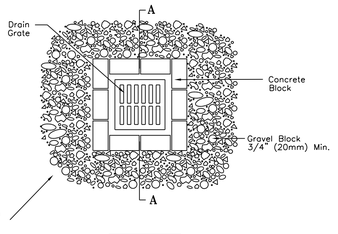


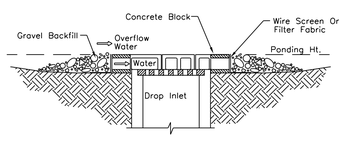
SEDIMENT TRAP

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

GENERAL NOTES

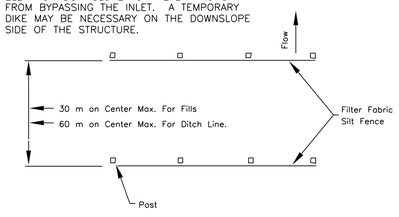
1. SEE SHEET 52 OF 88 FOR ADDITIONAL NOTES AND DETAILS.
2. THE CONTRACTOR SHALL INSTALL EROSION CONTROL BLANKETS, TYPE 4, PER SECTION 713.17(K) WITH 305 mm (min) OVERLAP.
   A. CONSTRUCT FINISH GRADING AROUND STRUCTURE TO BE PLACED.
   B. CUT TRENCHES FOR FOOTING OF SLAB.
   C. INSTALL 2.0 m OF EROSION CONTROL BLANKETS ANCHORED ON FLOOR AND TOP ALONG THE CUT FACE OF TRENCH AS SHOWN WITH COMPACTION CONTROL PER SECTION 204.11.
   D. PLACE CONCRETE FORMS, REINFORCEMENTS AND SUBSEQUENT CONCRETE.
3. CONSTRUCT SEDIMENT BASIN AND TRAPS, EROSION CHECKS AND/OR FILTERS IN STRATEGIC LOCATIONS ON THE PROJECT TO FILTER STORM RUNOFF BEFORE IT EXISTS THE PROJECT CONSTRUCTION LIMITS OR ENTERS A STREAM AS SHOWN IN THE APPROVED SWPPP.
4. CLEAN ALL SEDIMENTS BASIN 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 TO CHANNEL RUNOFF DOWN SLOPES, CHANNEL WATER INTO SLOPE DRAINS WITH STRAW BALES, WATTLES, OR EARTH BERMS CONSTRUCTED AT THE TOP OF A CUT SLOPE. ANCHOR SLOPE DRAINS TO THE SLOPE.
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 ARE SATISFACTORILY ESTABLISHED. DRAINAGE DITCHES AND CHANNELS ARE LINED AND STABILIZED, IN ACCORDANCE WITH SECTION 157 OF FP–14.
8. AT CUT SLOPES SPECIFIED IN THESE PLANS TO BE COVERED WITH EROSION MATTING PROTECTION, THE COR/COTR SHALL INSPECT THE SLOPES FOR EXISTING AND STABLE ROCK MATERIAL. IF IN THE OPINION OF THE CORT, THE CUT SLOPES ARE SUFFICIENTLY STABLE DUE TO THE NATURAL ROCK, THE CORT MAY DELETE THE MATTING IN THOSE AREAS.





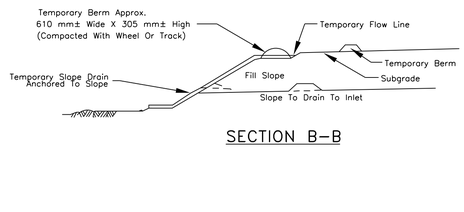
NOTES:
1. DROP INLET SEDIMENT BARRIERS ARE TO BE USED FOR SMALL, NEARLY LEVEL DRAINAGE AREAS. (LESS THAN 5%)
2. EXCAVATE A BASIN OF SUFFICIENT SIZE ADJACENT TO THE DROP INLET.
3. THE TOP OF THE STRUCTURE (PONDING HEIGHT) MUST BE WELL BELOW THE GROUND ELEVATION DOWNSLOPE TO PREVENT RUNOFF FROM BYPASSING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

BLOCK AND GRAVEL DROP INLET SEDIMENT BARRIER

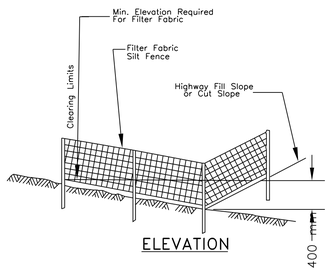


PLAN

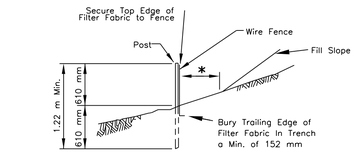
SILT FENCE EROSION CHECK

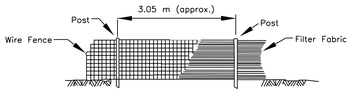


SECTION B–B



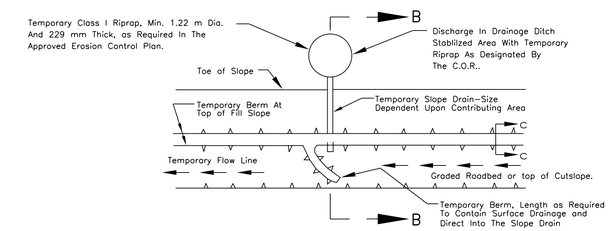
ELEVATION



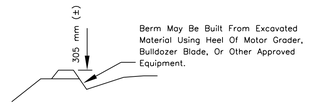


FILTER FABRIC SILT FENCE

* See General Notes.

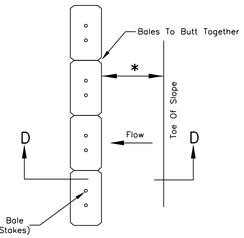


PLAN VIEW



SECTION C–C

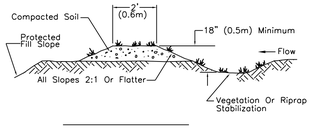
Temporary Slope Drain, Berm. (for fill and cutslopes)
[NOTE: Temporary berms may also be constructed of straw bales set 104–152mm into ground.]

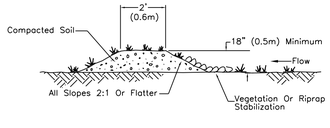


PLAN

STRAW BALE SILT BARRIER

* See general notes.

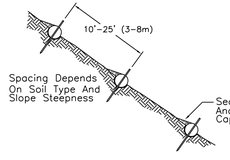


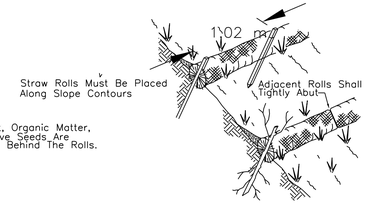


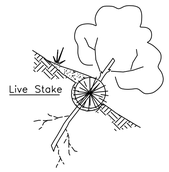
(For Top Of Cut Back Slopes.)

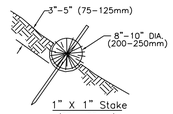
NOTES:
1. THE CHANNEL BEHIND THE DIKE SHALL HAVE POSITIVE GRADE TO A STABILIZED OUTLET.
2. THE DIKE SHALL BE ADEQUATELY COMPACTED TO PREVENT FAILURE.
3. THE DIKE SHALL BE STABILILIZED WITH TEMPORARY OR PERMANENT SEEDING OR RIPRAP.
4. THE DIVERSION DIKE SHALL EXTEND TO THE BOTTOM OF CUT BACK SLOPE AND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

TEMPORARY DIVERSION DIKE









Not To Scale

NOTE:
1. STRAW ROLL INSTALLATION REQUIRES THE PLACEMENT AND SECURE STAKING OF THE ROLL IN A TRENCH, 3"–5" (75–125mm) DEEP, DUG ON CONTOUR. RUNOFF MUST NOT BE ALLOWED TO RUN UNDER OR AROUND ROLL.

STRAW ROLLS

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

STORMWATER POLLUTION AND EROSION/SEDIMENT CONTROL DETAILS

DRAWN BY: NRDOT	DATE: 3/19/2014
DESIGNED BY: NRDOT	DATE: 3/19/2014
REVISED: 10/11/2017	BY: Leroy.Toledo
Sht 53 N12 ERO2 SWPPP.dgn	

I:\DESIGN\Users\DESIGN3\CURRENT PROJECTS\N35_Chinle\N12(19-4)\DESIGN DATA_020315\CADD Files\Sht 53 N12 ERO2 SWPPP.dgn

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
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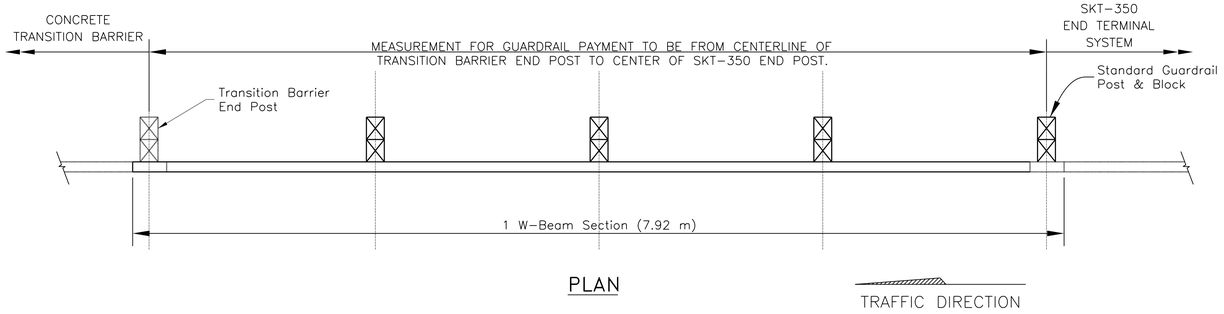
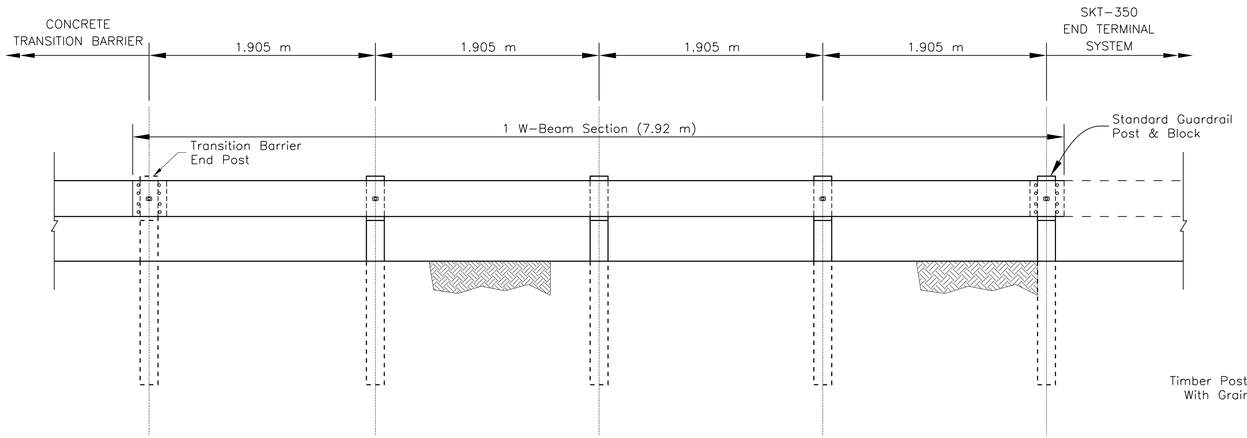
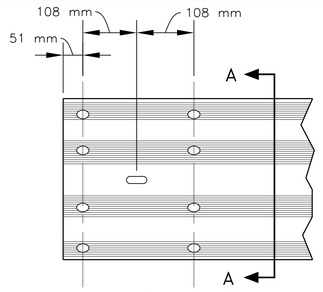


PLAN

TRAFFIC DIRECTION

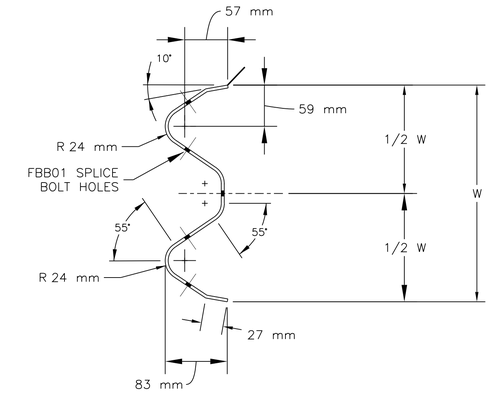


ELEVATION

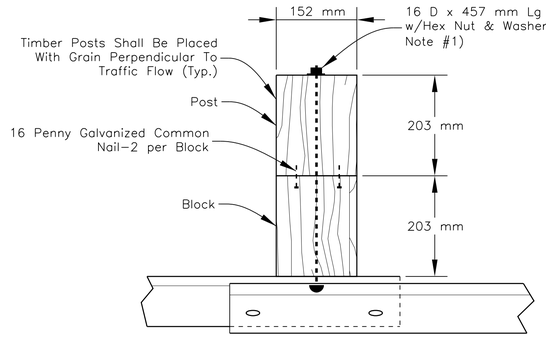


ELEVATION
RAIL

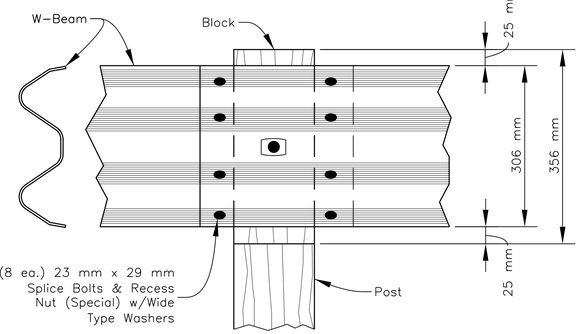
DESIGNATOR	COMPONENT	NUMBER
FBB01	Splice Bolt and Nut	2
FBB02	Guardrail-Post Bolt and Nut	2
FBB03	Guardrail-Post Bolt and Nut	2
FBB04	Guardrail-Post Bolt and Nut	2
FBX16a	Post Blockout Bolt (40 mm)	4
FWC16a	Round Washer	2
PDB01a	Timber Post Blockout	2
PDB01b	Timber Post Blockout	2
PDE02	Timber Post	2
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



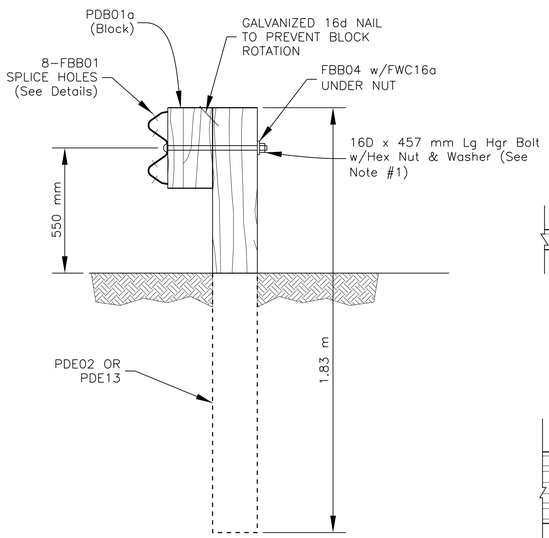
SECTION A-A
W-BEAM (RWM02A)



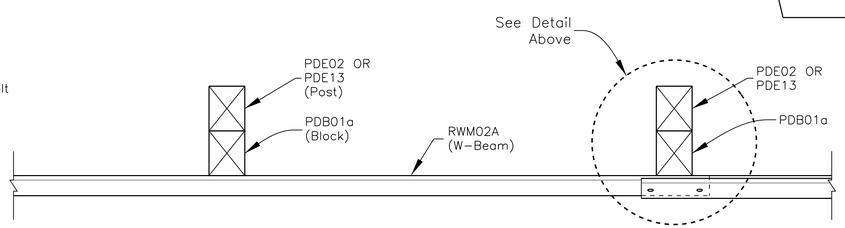
PLAN
POST/BLOCK &
SPLICE DETAIL



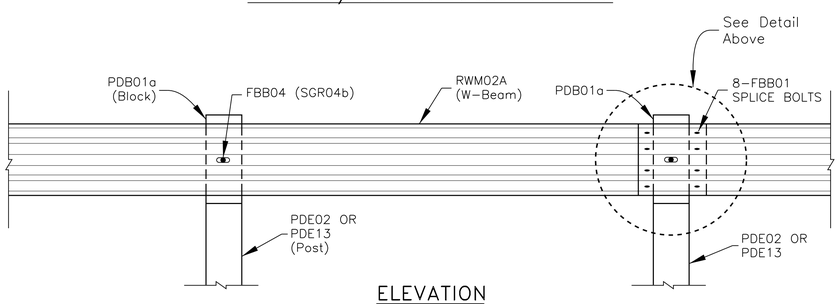
ELEVATION
POST/BLOCK
SPLICE DETAIL



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 55 OF 88 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 BLOCKS WILL BE REQUIRED.
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
DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

STANDARD GUARDRAIL DETAIL 1

DRAWN BY: NRDOT	DATE: 8/23/2017
DESIGNED BY: NRDOT	DATE: 8/23/2017
REVISED: 3/9/2018	BY: Leroy.Toledo

Sht 54 N12_SGR04 Std Gdrail Redesign1_rev 0823[illegible].dgn

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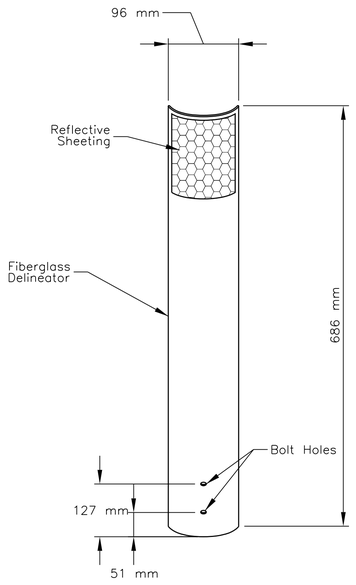
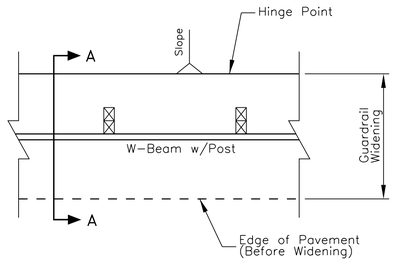
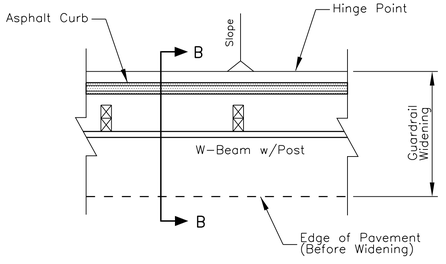
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	55	88



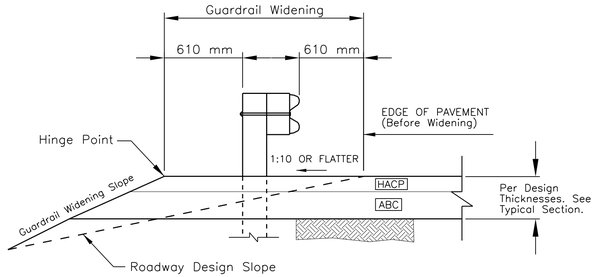
DELINEATOR DETAIL
(Reflective Sheeting Shall Face Traffic)



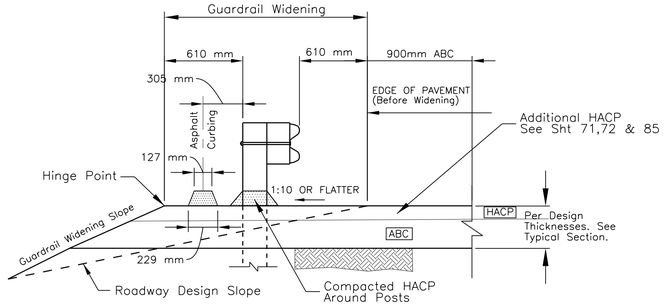
PLAN VIEW
w/NO CURBING



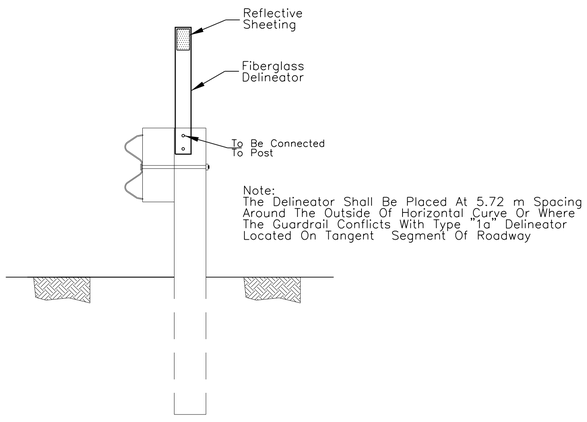
PLAN VIEW
w/CURBING



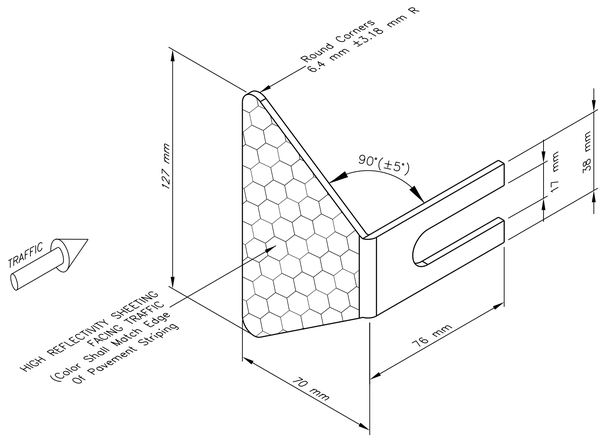
SECTION A-A
w/No Curbing



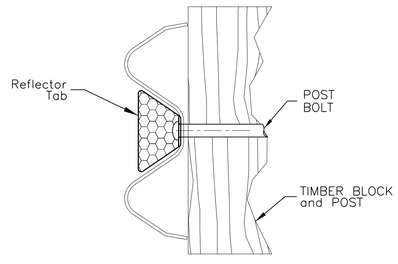
SECTION B-B
w/CURBING
Asphalt Curb Depth=102 mm



ELEVATION
GUARDRAIL/POST MOUNTED
DELINEATOR (TYP.)



ISOMETRIC VIEW
REFLECTOR TAB DETAIL



SECTION
REFLECTOR TAB
MOUNTING DETAIL
Install Tab on Every Second 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 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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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

STANDARD GUARDRAIL DETAIL 2

DRAWN BY: NRDOT	DATE: 8/23/2017
DESIGNED BY: NRDOT	DATE: 8/23/2017
REVISED: 3/9/2018	BY: Leroy.Toledo
Sht 55 N12_SGR04 Std Gdrail Redesign2_rev 082317.dgn	

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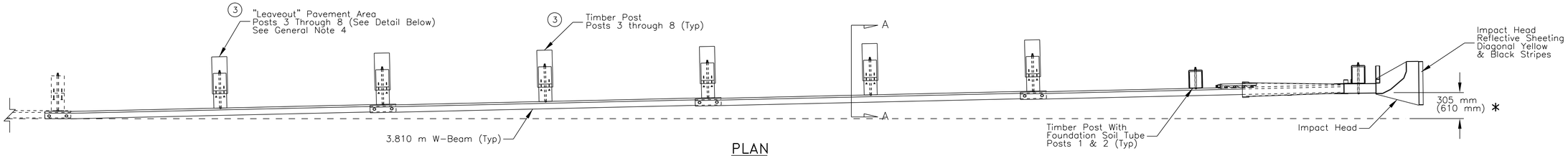
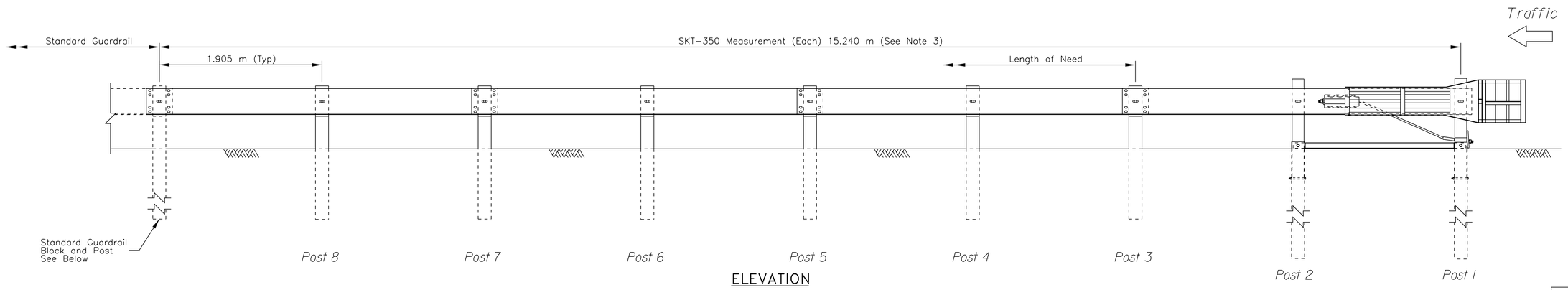
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	56	88

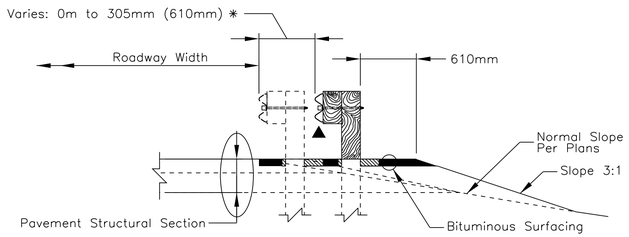
*FOR ELEVATIONS ABOVE (1,220 m) USE THE VALUES IN PARENTHESES



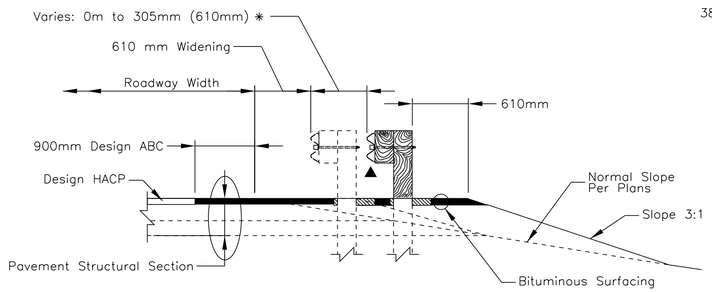
PLAN



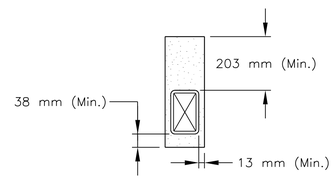
ELEVATION



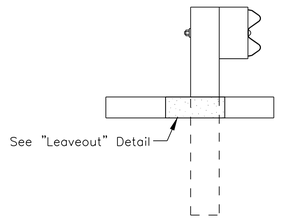
TYPE A SECTION



TYPE B SECTION



LEAVEOUT DETAIL

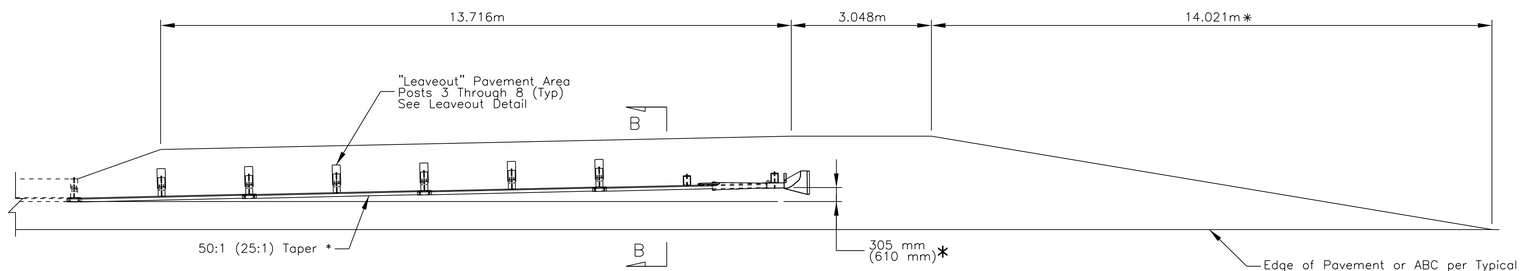


SECTION A-A
Typical At Post 3 Thru 8

GENERAL NOTES

1. THIS DETAIL IS FOR ROADWAY LAYOUT ONLY.
2. THE SKT-350 SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND CURRENT APPROVED DRAWINGS INCLUDING ALL DETAILS HARDWARE. HARDWARE QUANTITIES AND OTHER INFORMATION AS SHOWN IN THESE PLANS.
3. THE 15.240 m W-BEAM LENGTH SHALL CONSIST OF FOUR 4.0 m SECTIONS. THE END SECTION BEING A PROPRIETARY SPLIT RAIL.
4. "LEAVEOUT" IN ASPHALTIC CONCRETE SHALL BE PROVIDED IN THE AC PAVEMENT AROUND THE GUARDRAIL POSTS AT THE LOCATIONS AND DIMENSIONS SPECIFIED ON THE ROAD SYSTEMS INC. APPROVED DRAWING SHOWN IN THESE PLANS. "LEAVEOUT" MATERIAL SHALL CONSIST OF A 1-SACK GROUT MIX OR OTHER NON-COHESIVE MATERIAL AS APPROVED BY THE NRDOT MATERIALS UNIT.

See Sheet 87 For General Notes.



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

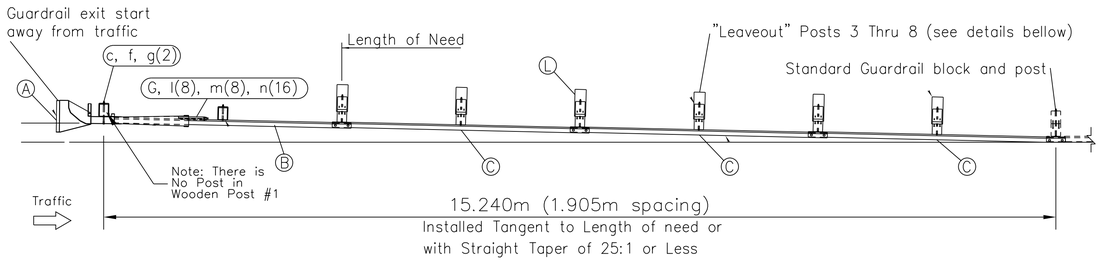
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

GUARDRAIL END TREATMENT
SKT-350 LAYOUT; SHEET 1 of 2

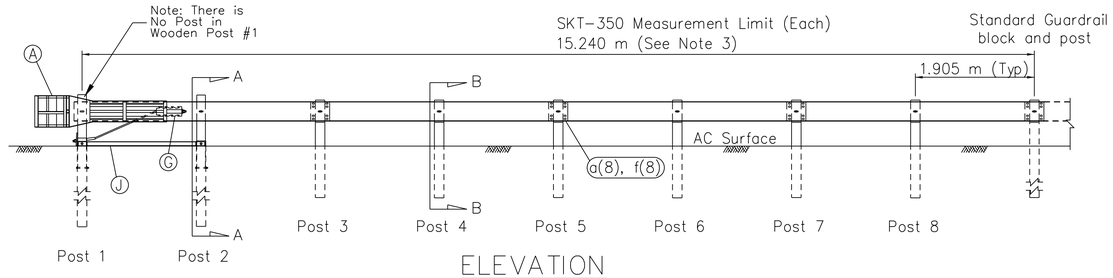
DRAWN BY: NRDOT	DATE: 9/19/2017
DESIGNED BY: NRDOT	DATE: 9/19/2017
REVISED: 3/9/2018	BY: Leroy.Toledo
Sht 56 N12 SKT-350_1of3_rev 091917.dgn	

I:\DESIGN\Users\DESIGN3\CURRENT PROJECTS\N35_Chinle\N12(19-4)\DESIGN DATA_020315\CADD Files\Sht 56 N12 SKT-350_1of3_rev 091917.dgn

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	57	88



PLAN



ELEVATION

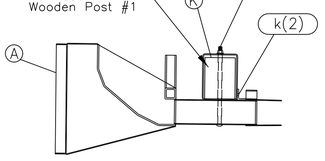
GENERAL NOTES

1. BREAKAWAY POSTS ARE REQUIRED WITH THE SEQUENTIAL KINKING TERMINAL.
2. ALL BOLTS, NUTS, CABLE ASSEMBLIES, CABLE ANCHORS AND BEARING PLATES SHALL BE GALVANIZED.
3. THE SKT-350 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 305 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 SKT-350 WHERE THERE IS LESS THAN 7.620 m BETWEEN THE OUTLET SIDE OF THE SKT-350 AND ANY ADJACENT DRVING 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.

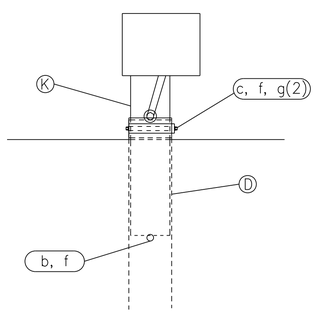
LEAVEOUT REQUIREMENTS

FOR POSTS 3 THROUGH 8, "LEAVEOUTS" IN TH3 ASPHALTIC CONCRETE PAVEMENT, AS SHOWN IN SECTION B-B AND BLOCKOUT DETAIL, AROUND GUARDRAIL POSTS SHALL BE PROVIDED WHERE ASPHALT THICKNESS EXCEEDS 39 mm NOMINAL (51 mm max) AND WHERE THE ASPHALT EXTENDS MORE THAN 457 mm BEHIND THE POSTS. THE "LEAVEOUT" SHALL BE USED AT THE POST LOCATIONS INDICATED AND THE "LEAVEOUT" MATERIAL TO BE PLACE IN THE VOID SHALL CONSIST OF A 1-SACK GROUT MIX OR OTHER NON-COHESIVE MATERIAL AS APPROVED BY THE NRDOT MATERIALS UNIT.

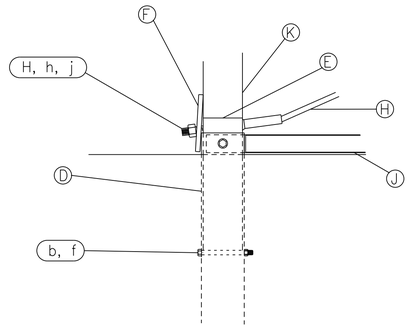
Code	QTY.	BILL OF MATERIALS	ITEM#
A	1	IMPACT HEAD	S3000
B	1	W-BEAM GUARDRAIL END SECTION, 12 GA., 3.810m	FS1303
C	3	W-BEAM GUARDRAIL, 12 GA., 3.810m RAIL ELEMENTS	G1203
D	2	FOUNDATION SOIL TUBE, 152mm x 203mm x 1.829m	E731
E	1	PIPE SLEEVE	E740
F	1	BEARING PLATE, 203mm x 203mm x 16mm	E750
G	1	CABLE ANCHOR BOX	S760
H	1	BCT CABLE ANCHOR ASSEMBLY	E770
J	1	GROUND STRUT	E780
K	2	140mm x 191mm x 1.143m WOOD POSTS	P650
L	6	152mm x 203mm x 1.829m WOOD CRT POST	P671
M	6	152mm x 203mm x 356mm TIMBER BLOCKOUT	P675
		HARDWARE	
a	32	16mm Dia. x 32mm SPLICE BOLT	B580122
b	2	16mm Dia. x 191mm HEX BOLT	B580754
c	2	16mm Dia. x 254mm HEX BOLT	B581004
d	1	16mm Dia. x 191mm H.G.R. BOLT (post 2 only)	B581002
e	6	16mm Dia. x 457mm H.G.R. BOLT (posts 3-8)	B581802
f	43	16mm Dia. H.G.R. NUT	N050
g	11	H.G.R. WASHER	W050
h	2	25mm ANCHOR CABLE HEX NUT	N100
j	2	25mm ANCHOR CABLE WASHER	W100
k	2	9.5mm X 76mm LAG SCREW	E350
l	8	CABLE ANCHOR BOX SHOULDER BOLTS	SB58A
m	8	12.7mm A325 STRUCTURAL NUTS	N055A
n	16	27mm OD x 14mm ID A325 STR. WASHER	W050A



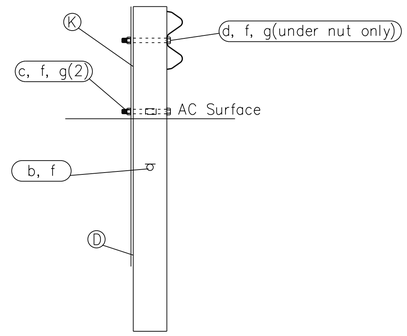
IMPACT HEAD
CONNECTING DETAIL



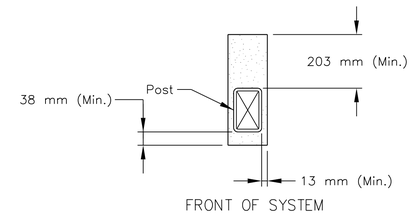
FRONT VIEW OF POST 1



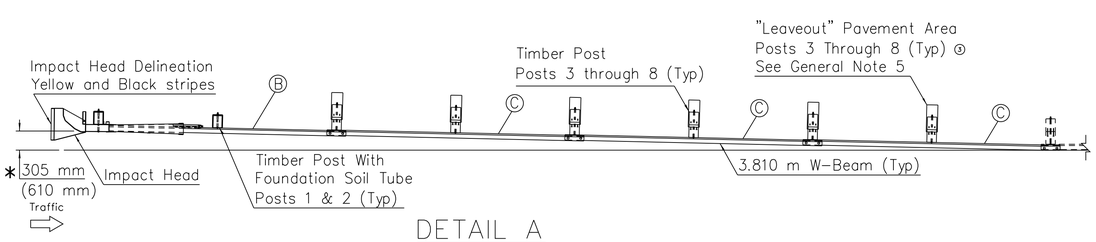
SIDE VIEW OF POST 1



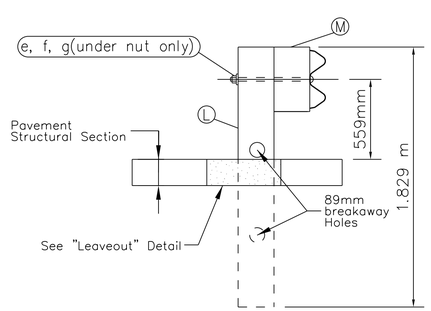
SECTION A-A



"LEAVEOUT" DETAIL



DETAIL A
optional flared installation, 25:1 maximum flare rate



SECTION B-B
typical at Post 3 thru 8

APPROVED AS NCHRP 350 T3 TERMINAL

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

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

DRAWN BY: NRDOT	DATE: 9/19/2017
DESIGNED BY: NRDOT	DATE: 9/19/2017
REVISED: 3/15/2018	BY: Leroy.Toledo
Sht 57 N12 SKT-350_2of2_rev 091917.dgn	

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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	58	88

ITEM No. 25101-2000: PLACED RIPRAP APRON, CLASS 2

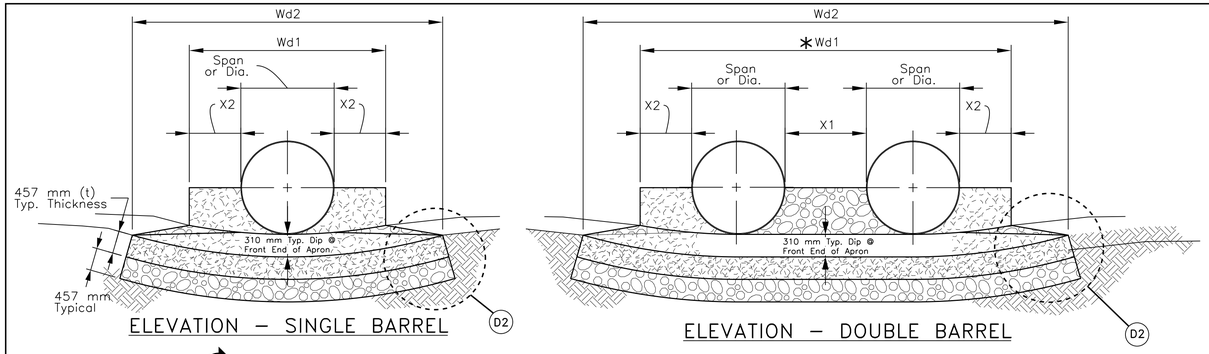
Station:	Structure:	Location	X_1 (m)	X_2 (m)	W_{d1} (m)*	W_{d2} (m)*	L (m)*	L_s (m)*	t (mm)	Estimated Qty (m)
42+926.570	2-1067 mm CSPC	Outlet	2.387	0.610	5.741	7.875	4.268	2.257	457	20.85
43+248.500	4-1448 mm S x 965 mm R CSPA	Outlet	2.840	0.733	16.947	19.816	3.860	2.046	457	52.41
43+458.880	2-610 mm CSPC	Outlet	1.625	0.610	4.065	5.285	2.440	1.314	457	8.76
43+816.820	3-1067 mm S x 737 mm R CSPA	Outlet	1.956	0.610	8.333	9.807	2.948	1.576	457	20.27
54+120.000	2-1803 mm S x 1194 mm R CSPA	Outlet	3.701	0.863	10.526	15.620	4.776	2.518	457	43.91
55+115.000	4-1803 mm S x 1194 mm CSPA	Outlet	3.701	0.863	23.028	28.122	4.776	2.518	457	88.19
55+734.140	4-1067 mm S x 737 mm R CSPA	Outlet	1.956	0.610	11.356	12.830	2.948	1.576	457	27.15
									TOTAL	261.53

ITEM No. 25112-2000: WIRE ENCLOSED RIPRAP APRON, CLASS 2

Station:	Structure:	Location	X_1 (m)	X_2 (m)	W_{d1} (m)*	W_{d2} (m)*	L (m)*	L_s (m)*	t (mm)	Estimated Qty (m)
48+698.630	2-1219 mm CSPC	Outlet	2.490	0.610	6.148	8.586	4.876	2.569	457	25.43
50+644.110	4-1524 mm CSPC	Outlet	0.762	0.610	9.602	12.650	6.096	1.858	457	41.79
									TOTAL	67.22

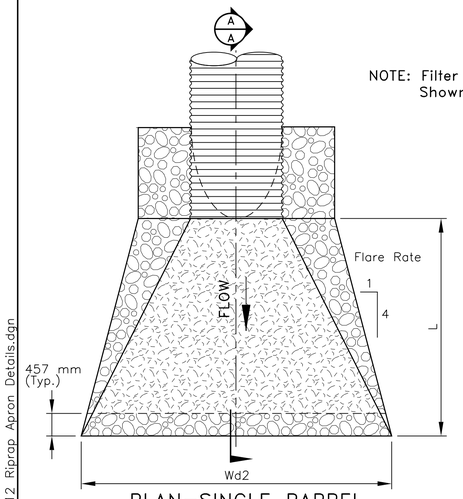
ITEM No. 25110-2000: GROUTED RIPRAP APRON, CLASS 2

Station:	Structure:	Location	X_1 (m)	X_2 (m)	W_{d1} (m)*	W_{d2} (m)*	L (m)*	L_s (m)*	t (mm)	Estimated Qty (m)
41+838.800	5-2616 mm S x 1803 mm R SPPA	Outlet	1.511	0.704	21.148	27.469	7.212	2.925	457	114.12
48+982.220	1-2134 mm CSPC	Outlet	---	0.610	3.354	7.622	8.536	2.494	457	26.82
52+780.000	2-2438 mm CSPC	Outlet	1.219	0.610	7.135	12.191	9.752	2.834	457	54.85
									TOTAL	195.80



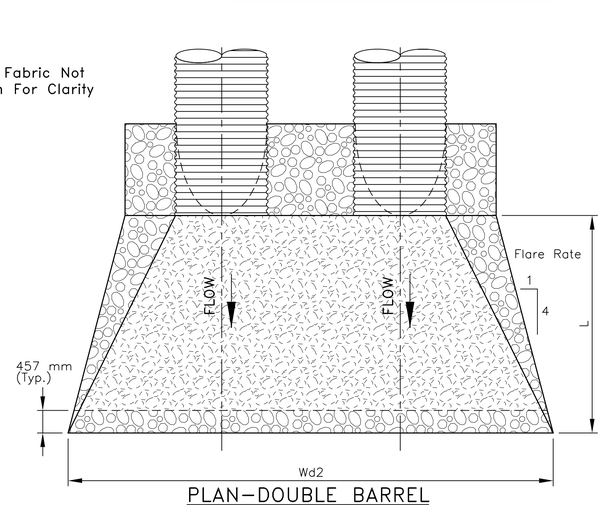
ELEVATION – SINGLE BARREL

ELEVATION – DOUBLE BARREL

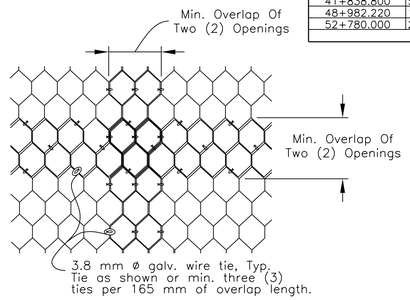


PLAN–SINGLE BARREL

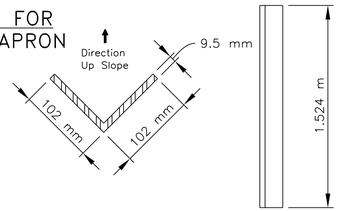
NOTE: Filter Fabric Not Shown For Clarity



PLAN–DOUBLE BARREL



FABRIC SPLICING DETAILS FOR WIRE ENCLOSED RIPRAP APRON



ANGLE IRON ANCHOR DETAIL

GENERAL NOTES

1. ALL STONE FOR RIPRAP SHALL BE CLASS 2 MEETING THE GRADING REQUIREMENTS OF TABLE 705-1OF THE FP-14.

2. ALL EXCAVATIONS AND BACKFILL OPERATIONS SHALL BE DONE TO NEAT LINES IN ACCORDANCE WITH SECTION 209 OF THE FP-14 AND SHALL BE INCIDENTAL TO THE INSTALLATION OF RIPRAP. SEE SUPPLEMENTAL SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

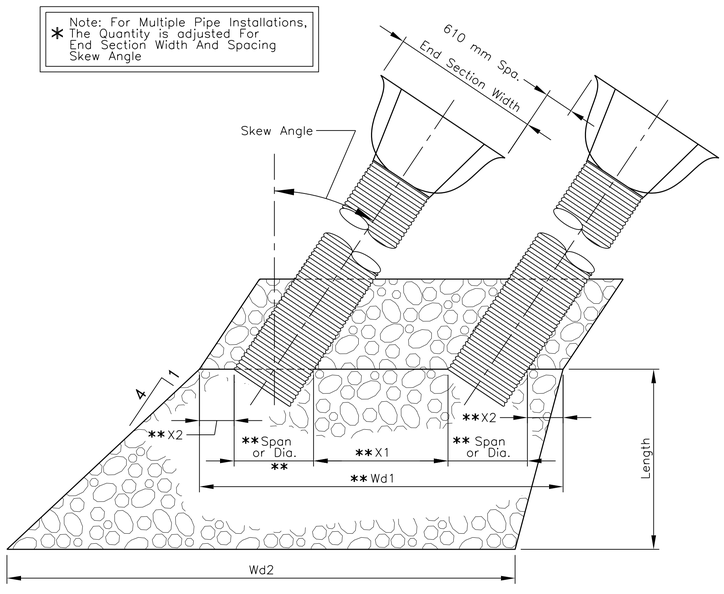
3. ANY BORROW MATERIAL NEEDED TO BRING EXISTING CHANNELS UP TO GRADE SHALLBE INCIDENTAL TO RIPRAP PAY ITEMS.

4. THE CONTRACTOR HAS THE OPTION TO USE ARTICULATED CONCRETE BLOCK REVETMENT.

5. THE WIRE FABRIC SHALL BE GALVANIZED AND BE OF THE CONFIGURATION SHOWN IN THIS SHEET. AN ALTERNATE WIRE FABRIC MAY BE SUBMITTED FOR REVIEW AND APPROVAL. ANY WIRE FABRIC USED SHALL HAVE A MINIMUM WIRE DIAMETER OF 3.0mm. A CLASS 3, ZINC COATING (GALVANIZED) SHALL HAVE A MAXIMUM OPENING DIMENSION OF 100 mm AND SHALL NOT ALLOW A 75 mm ø SPHERE TO PASS THROUGH THE WIRE FABRIC OPENING.

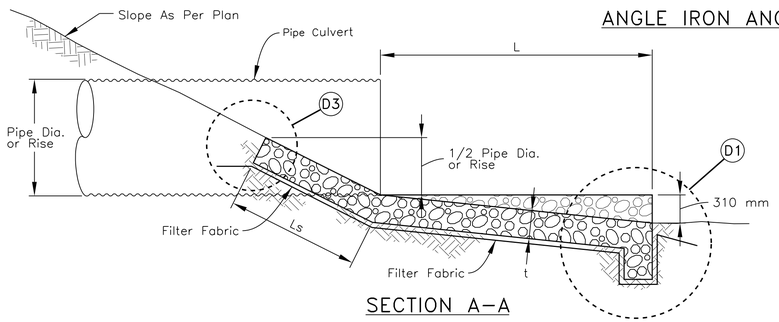
6. WIRE ENCLOSED RIPRAP SHALL BE ANCHORED AS SHOWN WITH L 102 mm x 9.5 mm STEEL ANGLES SPACED AT 2.44 m EACH WAY. STEEL ANGLES SHALL EXTEND 75 mm ABOVE THE TOP OF THE MESH. IN ROCKY AREAS DRIVE ANGLE IRON ANCHORS TO REFUSAL (MIN. EMBEDDED 500 mm), THEN CUT AT 75 mm ABOVE REPRAP. ANCHORS SHALL BE SAW-CUT TO LEAVE A SMOOTH EDGE, DO NOT USE A CUTTING TORCE. FURNISHING AND PLACEMENT OF ANGLE STEEL SHALL BE CONSIDERED INCIDENTAL TO COMPLETION OF THE STRUCTURE.

7. FOR ALL RIPRAP DOWNDRAIN AND CULVERT OUTLETS, PROVIDE CENTER OF RIPRAP 305 mm (MIN.) DIP BELOW OUTER EDGES AT OUTLET END. PLACE RIPRAP TO FIT CHANNEL BANKS WHERE POSSIBLE. ALL EXCAVATION AND APRON WARP RESHAPING SHALL BE CONSIDERED INCIDENTAL TO COMPLETION OF THE STRUCTURE.

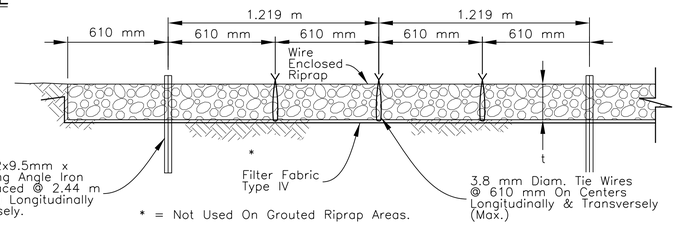


PLAN–SKEWED PIPES

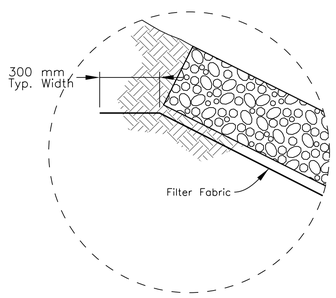
** Note: Divide X1, X2, Span or Diam. Wd1 & Wd2 Width by (1/ cos Skew Angel)



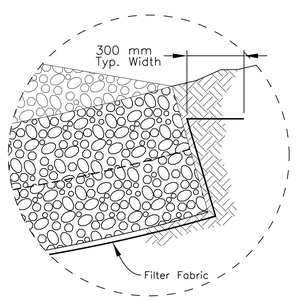
SECTION A–A



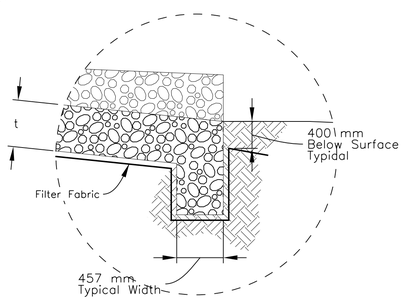
ANGLE IRON ANCHOR DETAILS
WIRE ENCLOSED RIPRAP APRON



DETAIL–D3



DETAIL–D2



DETAIL–D1

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

PLACED AND WIRE ENCLOSED RIPRAP APRON DETAIL

DRAWN BY: NRDOT	DATE: 1/28/2016
DESIGNED BY: NRDOT	DATE: 1/28/2016
REVISED: 3/15/2018	BY: Leroy.Toledo
Sht 58 N12 Riprap Apron Details.dgn	

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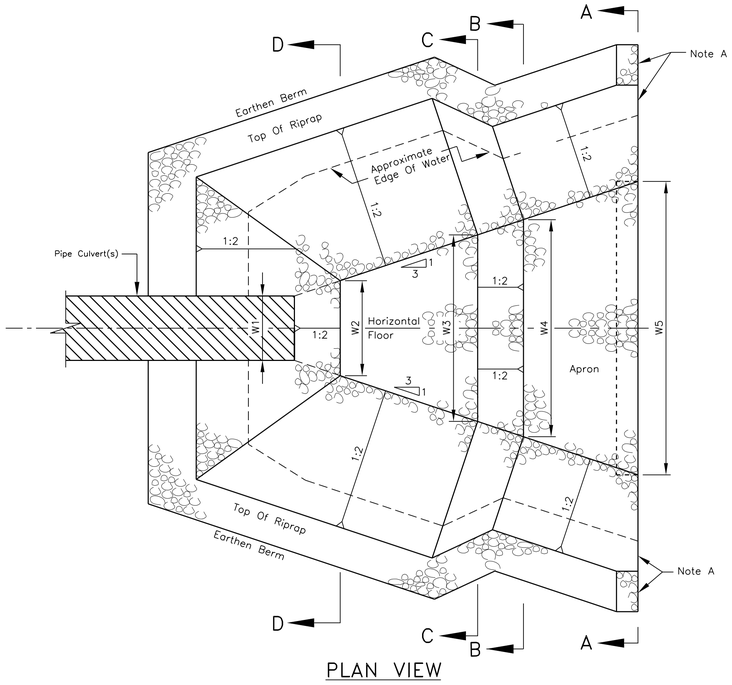
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	59	88



PLAN VIEW

NOTE:

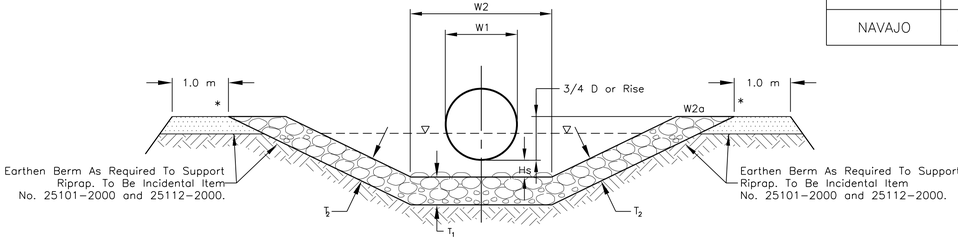
W_o = Diameter For Pipe Culvert(s) And Span Of Pipe-Arch Culvert(s) With Spacing(s) Between Barrel.

∇ = Water Surface Profile

$Y_o\nabla$ = Estimated Brink Depth

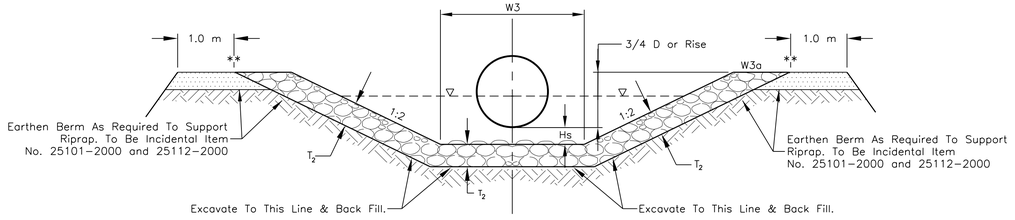
* = Dimension To Outside Riprap Edge = T_1 x 2.236

** = Dimension To Outside Riprap Edge = T_2 x 2.236



SECTION D-D

W2 =Bottom Width Of Hs, Begin Of Pool



SECTION C-C (W3 =Bottom Full Width @ End Of Pool.) (W3a =Top Edge of Riprap @ End Of Pool.)

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 PROJECT MANAGER, COR/COTR, 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 COR/COTR THE ROCK CUT IS STABLE, THE COR/COTR MAY ELECT TO DELETE SECTIONS OF THE PLACED RIPRAP. THE CONTRACTOR WILL BE REQUIRED TO MAKE ADJUSTMENTS TO THE PLACED 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 COR/COTR AND DITCH EXCAVATION, CLEANING, AND RESHAPING SHALL BE CONSIDERED INCIDENTAL TO COMPLETION OF THE STRUCTURE.

4. THE SIZE OF ALL STONE FOR RIPRAP IS TO BE CLASS 2, MEETING THE GRADING REQUIREMENTS OF TABLE 705-1, AND SECTION 251 OF FP-14.

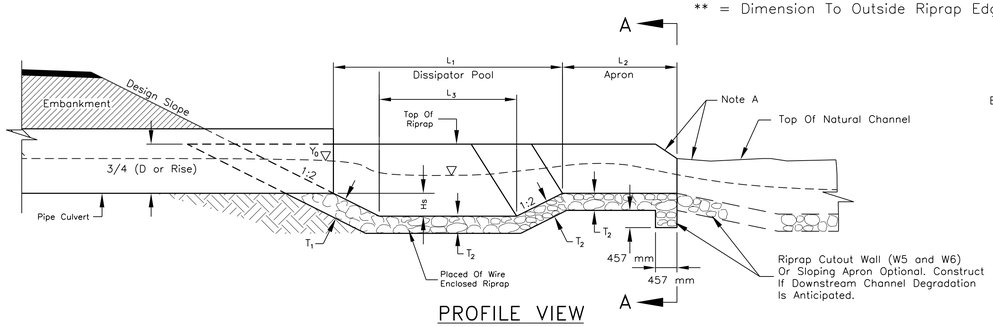
5. FILTER FABRIC SHALL BE INSTALLED UNDER ALL PLACED OR WIRE ENCLOSED RIPRAP AND SHALL CONFORM TO SECTION 714, TYPE IV-C, OF FP-96, AND SHALL BE CONSIDERED INCIDENTAL TO ITEM 25101. FILTER FABRIC SHALL BE TUCKED OR EMBEDDED 400mm INTO THE GROUND ALONG ALL EDGES AS SHOWN.

6. 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.

7. RIPRAP SHALL BE PLACED, OR WIRE ENCLOSED, AS SHOWN ON THE PLANS.

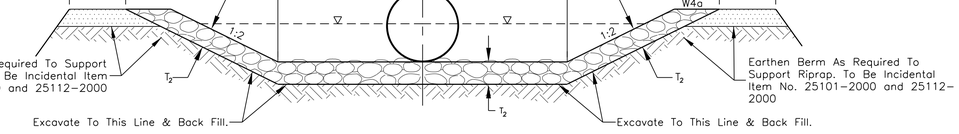
8. AT ALL LOCATIONS WHERE RIPRAP DITCH LINING CONNECTS TO CULVERTS OR CULVERT RIPRAP INLET/OUTLET STRUCTURES, THE CONTRACTOR SHALL SHAPE THE DITCH LINING TO CONNECT TO THE DRAINAGE STRUCTURE(S) AS DIRECTED BY THE COR/COTR. THIS WORK SHALL BE CONSIDERED INCIDENTAL OBLIGATIONS OF THE CONTRACTOR.

9. WIRE ENCLOSED CUT TO FILL TRANSITIONS AND DITCH LININGS SHALL BE CONSTRUCTED TO THE SAME GENERAL SHAPE AS THE PLACED RIPRAP OR WIRE ENCLOSED STRUCTURES SHOWN ON THIS SHEET.

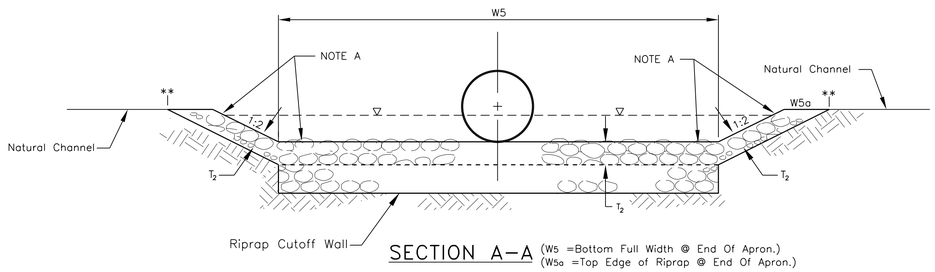


PROFILE VIEW

NOTE A: Warp Basin To Conform To Natural Stream Channel. Top Of Apron Riprap Should Be At The Same Elevation Or Lower Than Natural Channel Bottom At Section A-A.



SECTION B-B (W4 =Bottom Of Full Width @ Beginning Of Apron.) (W4a =Top Edge of Riprap @ Beginning Of Apron.)



SECTION A-A (W5 =Bottom Full Width @ End Of Apron.) (W5a =Top Edge of Riprap @ End Of Apron.)

ITEM No. 25101-2000: PLACED RIPRAP STILLING BASIN, CLASS 2

Station:	Structure:	L_1 (m)	L_2 (m)	L_3 (m)	hs (mm)	h_1 (mm)	t_2 (mm)	W_1 (m)	W_2 (m)	W_{2a}(m)	W_3 (m)	W_{3a} (m)	W_4 (m)	W_{4a} (m)	W_5 (m)	W_{5a} (m)	Estimated Qty (m^3)
40+576.00	1-610 CSPC	2.628	1.314	1.392	263	610	457	0.610	0.683	3.720	1.733	4.349	2.084	4.013	2.960	4.890	15,400
44+176.00	2-762 CSPC	2.677	1.339	1.605	268	610	457	3.240	3.762	7.301	4.832	7.521	5.189	7.599	6.082	8.491	27,850
48+494.00	1-762 CSPC	2.286	0.910	1.711	182	610	457	0.762	0.934	3.886	2.114	4.524	2.286	4.696	2.893	5.302	18,610
																TOTAL:	61,860

UNITED STATES
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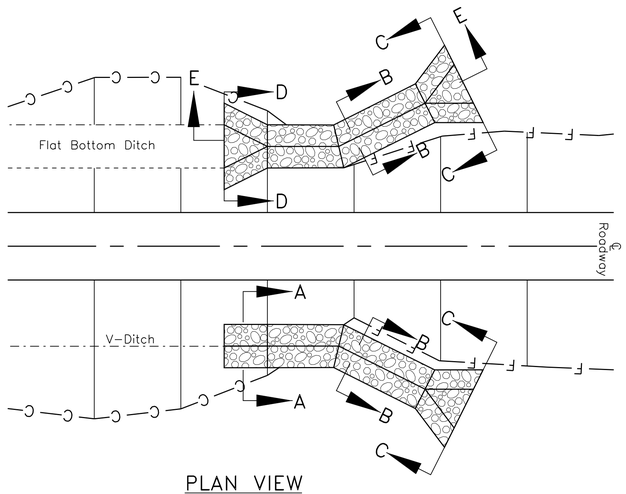
NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

RIPRAP STILLING BASIN DETAIL

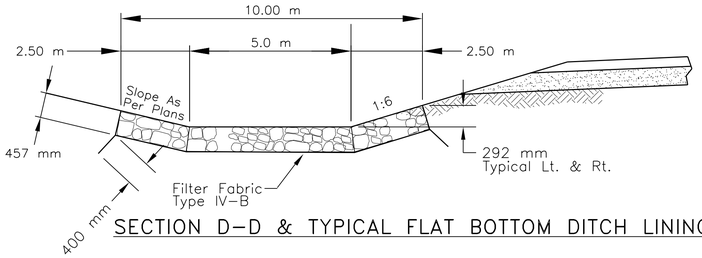
DRAWN BY: NRDOT	DATE: 8/19/2015
DESIGNED BY: NRDOT	DATE: 8/19/2015
REVISED: 3/9/2018	BY: NRDOT
Sht 59 N12 RR Stilling Basin Rev_7.09.2015.dgn	

I:\DESIGN\Users\DESIGN3\CURRENT PROJECTS\N35_Chinle\N12(19-4)\DESIGN DATA_020315\CADD Files\Sht 59 N12 RR Stilling Basin Rev_7.09.2015.dgn

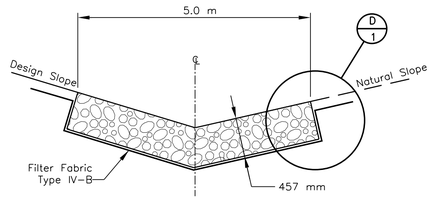
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19−2)1,2&4	60	88



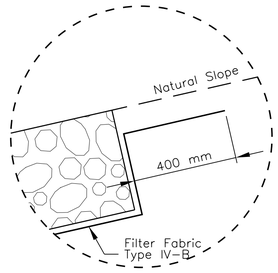
PLAN VIEW
Cut To Fill Transition



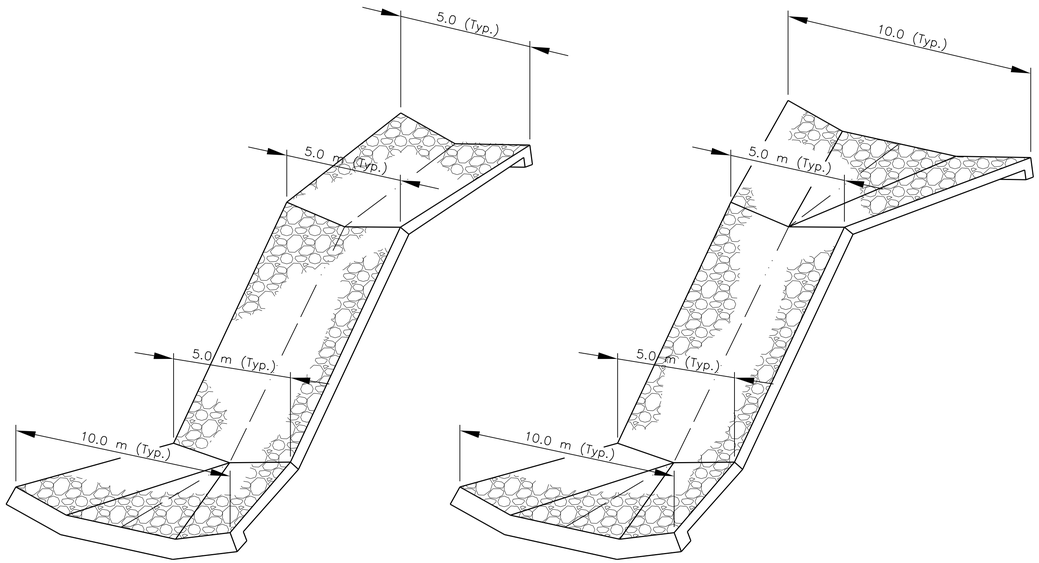
SECTION D−D & TYPICAL FLAT BOTTOM DITCH LINING DETAIL



SECTION A−A
&
SECTION B−B



DETAIL D/1

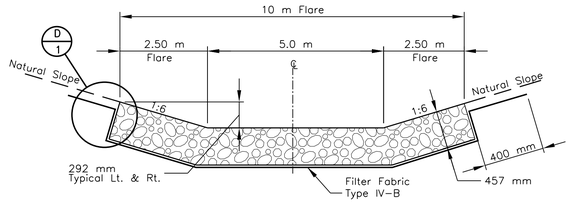


ISOMETRIC VIEW
Cut To Fill Transition & Down Drains
At V−Ditch

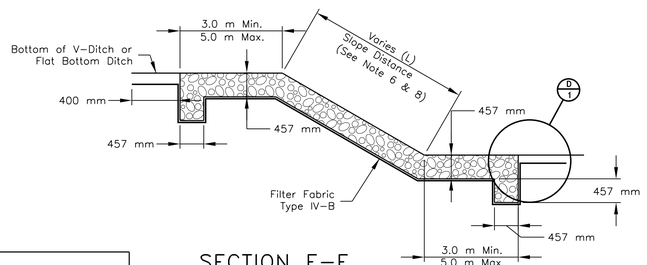
ISCMETRIC VIEW
Cut To Fill Transition & Down Drains
At Flat Bottom Ditch

GENERAL NOTES

1. ALL WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS (FP−14).
2. THE CONTRACTOR SHALL CLEAR AND GRUB ALL DEBRIS, BRUSH AND TREES THAT WILL INTERFERE WITH THE PLACEMENT OF DOWNDRAIN, EMBANKMENT PROTECTION. THIS WORK SHALL BE INCIDENTAL OBLIGATIONS OF THE CONTRACTOR UNDER ITEM 25101−2000.
3. THE CONTRACTOR SHALL BE REQUIRED TO MAKE ANY NECESSARY FIELD ADJUSTMENTS TO MATCH ACTUAL FIELD CONDITIONS. THESE FIELD ADJUSTMENTS ARE INCIDENTAL OBLIGATIONS OF THE CONTRACTOR.
4. IF UNSUITABLE MATERIAL IS FOUND AT THE FOOTING LOCATION AND ELEVATIONS, THE MATERIAL SHALL BE REMOVED AND REPLACED WITH APPROVED BACKFILL MATERIAL FROM ON−SITE AS DETERMINED BY THE COR/COTR. ALL BACKFILL MATERIAL SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY AS DETERMINED BY AASHTO T99 METHOD C. THE BACKFILL MATERIAL SHALL CONFORM TO SECTION 208 AND 209 OF THE FP−14. IF SUITABLE ON−SITE MATERIALS CANNOT BE FOUND, IMPORTED MATERIAL WILL BE NEGOTIATED IN ACCORDANCE WITH SECTION 109.02(m).
5. V−DITCH AND CHANNEL RESHAPING, CLEANING, AND EXCAVATION SHALL BE DONE IN ACCORDANCE WITH THE DETAILS SHOWN AND AS ADJUSTED BY THE COR/COTR. ANY WASTE MATERIAL SHALL BE USED AS BORROW WHERE NEEDED IN OTHER PROJECT LOCATION AS DETERMINED BY THE COR/COTR. ALL DITCH AND CHANNEL EXCAVATION, CLEANING, AND RESHAPING SHALL BE CONSIDERED INCIDENTAL TO COMPLETION OF THE STRUCTURE.
6. THE QUANTITIES SHOWN ARE ONLY AN ESTIMATE. ACTUAL QUANTITIES SHALL BE DETERMINED IN THE FIELD. THE COR/COTR, AND CONTRACTOR SHALL REVIEW ALL ROCK CUT AREAS AFTER THE CONSTRUCTION OF DITCHES, DOWNDRAINS, AND RIPRAP BASINS HAVE BEEN "ROUGH IN". IF IN THE OPINION OF THE COR/COTR, THE ROCK CUT IS STABLE, THE COR/COTR MAY ELECT TO DELETE SECTIONS OF THE RIPRAP PROTECTION.
7. STONE SIZE SHALL CONFORM TO TABLE 705−1, SECTION 705, STONE FOR RIPRAP, CLASS 2.
8. FILTER FABRIC SHALL BE INSTALLED UNDER ALL RIPRAP (EXCEPT GROUTED RIPRAP) AND SHALL CONFORM TO SECTION 714, TYPE IV−B, 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. EXTEND RIPRAP DOWN THE SHOULDER DITCH UNTIL A 2% SLOPE IS ACHIEVED, OR AS DIRECTED BY THE COR/COTR BEFORE PLACEMENT OF THE FLARE SECTION.
9. WIRE ENCLOSED RIPRAP SHALL CONFORM TO SECTION 251 OF THE FP−14 AND THE SUPPLEMENTAL SPECCIFICATIONS. WIRE MESH SHALL BE PLACED TO ENCLOSE THE STONE LAYER ON ALL SIDES AND FACES. THE WIRE MESH SHALL BE SPLICED ON ALL EDGES AND SHALL BE DRAWN TIGHTLY AGAINST THE STONE BY MEANS OF 3.8 mm WIRE TIES SPACED 0.61 m LONGITUDINALLY AND TRANSVERSELY.
10. 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 MINIMUM OPENING DIMENSION OR 100 mm, AND SHALL NOT ALLOW A 75 mm ø SPHERE TO PASS THROUGH WIRE FABRIC OPENING. SEE SHEET 58 OF 88 FOR WIRE ENCLOSED RIPRAP DETAILS.
11. RIPRAP SHALL BE ANCHORED AS SHOWN WITH L 102mm x 102mm x 9.5mm STEEL ANGLES SPACED AT 2.44 m EACH WAY. STEEL ANGLE SHALL EXTEND 75mm ABOVE THE TOP OF THE MESH. IN ROCKY AREAS, DRIVEANGLE IRON ANCHORS TO REFUSAL (MIN. EMBEDDED 500mm). THEN CUT AT 75mm 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.



SECTION C−C



SECTION E−E

ITEM No. 25112−2000: WIRE ENCLOSED, CLASS 2

STATION TO STATION	LOCATION	LENGTH (m)	VOLUME (m^3)	REMARKS
39+599.95 to 39+652.24	Lt.	59.87	145.65	Cut to Fill Transition & Downdrain
39+589.53 to 39+652.66	Rt.	65.00	157.37	Cut to Fill Transition & Downdrain
41+070.00 to 41+111.75	Lt.	45.67	113.20	Cut to Fill Transition & Downdrain
42+123.77 to 42+160.00	Lt.	39.76	99.70	Cut to Fill Transition & Downdrain
48+856.95 to 48+967.77	Lt.	113.32	267.78	Cut to Fill Transition & Downdrain
48+860.00 to 48+978.87	Rt.	124.00	292.19	Cut to Fill Transition & Downdrain
48+990.94 to 49+060.00	Lt.	69.79	168.32	Cut to Fill Transition & Downdrain
48+986.99 to 49+060.00	Rt.	77.05	184.90	Cut to Fill Transition & Downdrain
50+985.35 to 51+030.81	Lt.	48.89	120.56	Cut to Fill Transition & Downdrain
51+134.56 to 51+165.05	Rt.	30.11	77.65	Cut to Fill Transition & Downdrain
		TOTAL	1,627.31	

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NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

WIRE ENCLOSED RIPRAP
AT CUT−TO−FILL TRANSITIONS
AND DOWNDRAINS

DRAWN BY: NRDOT	DATE: 10/3/2017
DESIGNED BY: NRDOT	DATE: 10/3/2017
REVISED: 10/4/2017	BY: Leroy.Toledo
Sht 60 N12 Cut to Fill RR 100317.dgn	

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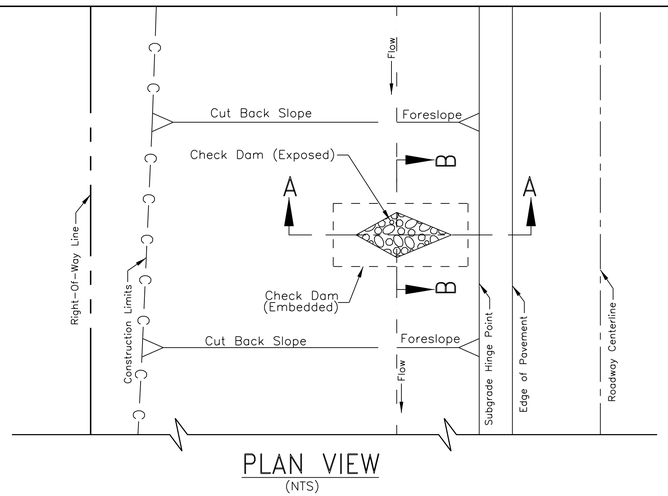
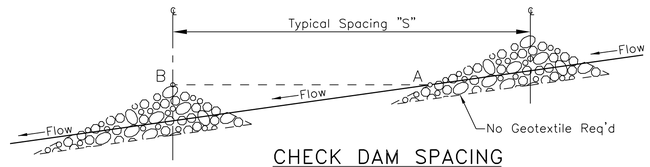
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	61	88



PLAN VIEW
(NTS)



CHECK DAM SPACING
S = 60 m For 2% & Less Grade.
S = 40 m For Greater That 2% Grade.
(NTS)

GENERAL NOTES

1. WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE STANDARD SPECIFICATION FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS [FP-14].

2. ROUND ALL SHARP CONTOURS AS REQUIRED TO FIT THE SOIL EROSION MATERIAL FLUSH WITH THE EXISTING GROUND.

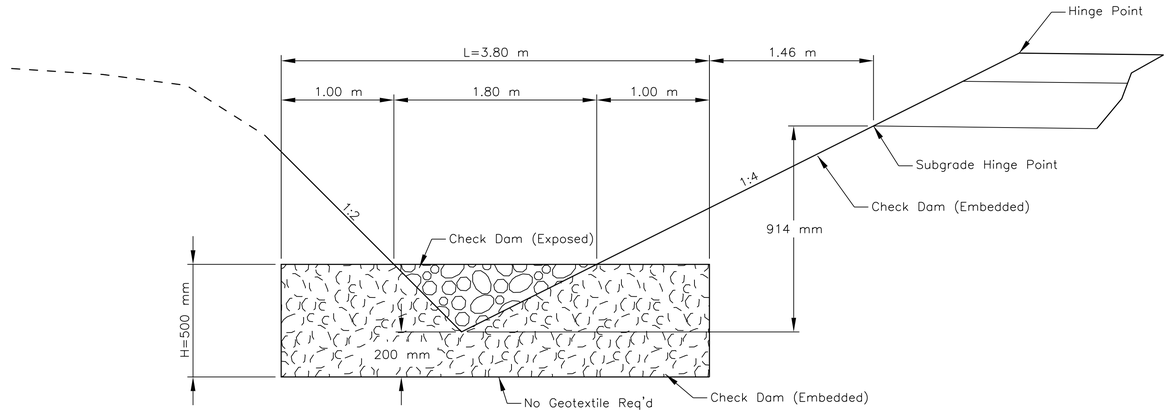
3. THE CONTRACTOR SHALL BE REQUIRED TO MAKE FIELD ADJUSTMENTS TO MATCH ACTUAL FIELD CONDITIONS AS DIRECTED BY THE REGIONAL ROAD ENGINEER. NO ADDITIONAL PAYMENT SHALL BE MADE FOR SUCH ADJUSTMENTS.

4. EMBANKMENT SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY AS DETERMINED BY AASHTO T-99, METHOD C AND CONFORM TO SECTION 204 OF FP-14.

5. EXCAVATION OF RIPRAP TOE TRENCH TO PLACE RIPRAP BELOW FLOW LINE AND OTHER EXCAVATION AND EMBANKMENT NECESSARY TO PLACE RIPRAP AS SHOWN SHALL BE INCIDENTAL TO ITEM 25101-2000.

6. STONE SIZE SHALL CONFORM TO TABLE 705-1, SECTION 705, STONE FOR RIPRAP, CLASS 2 & 3.

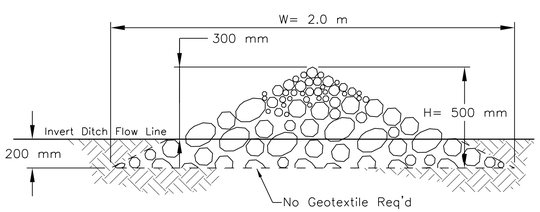
7. ROCK CHECK DAM SHALL BE INCLUDED IN BID ITEM 25101-2000.



SECTION A-A
V-DITCH WITH CLASS 2
RIPRAP CHECK DAM & 1:2 BACKSLOPE
Sta. 51+060.00 to 51+650.00 Left Only
(See Table Left)
(NTS)

ITEM No. 25101-2000: PLACED RIPRAP, CLASS 2
CHECK DAM LOCATION AND ESTIMATED QUANTITIES

STATION	LOCATION	L (m)	W (m)	H (mm)	CUT BACKLOPE	VOLUME (m^3)
51+060	Lt.	3.80	2.00	500	1:2	1.90
51+100	Lt.	3.80	2.00	500	1:2	1.90
51+140	Lt.	3.80	2.00	500	1:2	1.90
51+180	Lt.	3.80	2.00	500	1:2	1.90
51+220	Lt.	3.80	2.00	500	1:2	1.90
51+300	Lt.	3.80	2.00	500	1:2	1.90
51+340	Lt.	3.80	2.00	500	1:2	1.90
51+380	Lt.	3.80	2.00	500	1:2	1.90
51+420	Lt.	3.80	2.00	500	1:2	1.90
51+460	Lt.	3.80	2.00	500	1:2	1.90
51+500	Lt.	3.80	2.00	500	1:2	1.90
51+520	Lt.	3.80	2.00	500	1:2	1.90
51+580	Lt.	3.80	2.00	500	1:2	1.90
51+620	Lt.	3.80	2.00	500	1:2	1.90
51+650	Lt.	3.80	2.00	500	1:2	1.90
					TOTAL	28.50



SECTION B-B
(NTS)

Note: Place Downstream Structure Such That Point "B" Is Approximately Level With The Lowest Ground Elevation (Point "A") Of The Upstream Structure.

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

PLACED RIPRAP CHECK DAM
IN FLAT BOTTOM DITCH

DRAWN BY: NRDOT	DATE: 2/2/2012
DESIGNED BY: NRDOT	DATE: 2/2/2012
REVISED: 3/4/2015	BY: Leroy.Toledo
SHEET SIZE: Full Size (24x36) Plot Sheet	

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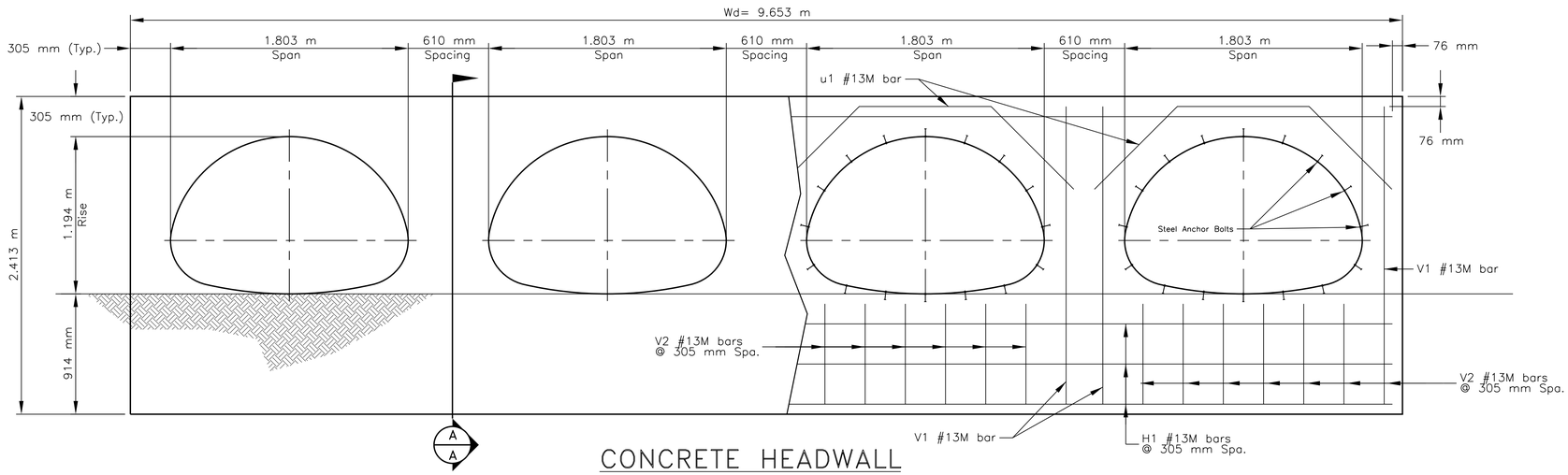
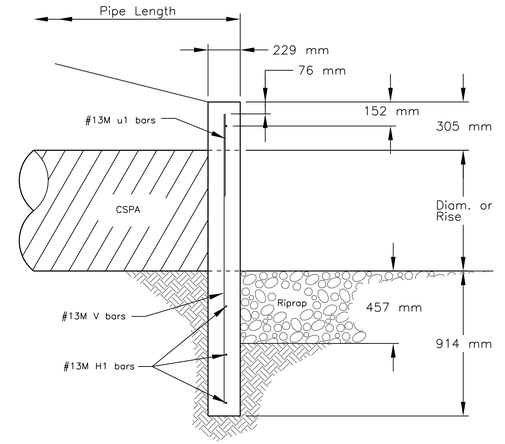
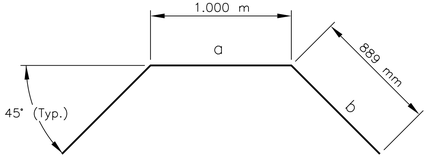
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	62	88



CONCRETE HEADWALL
ELEVATION VIEW
4-BARREL 1803 mm Span x 1194 m Rise CSPA



SECTION A-A



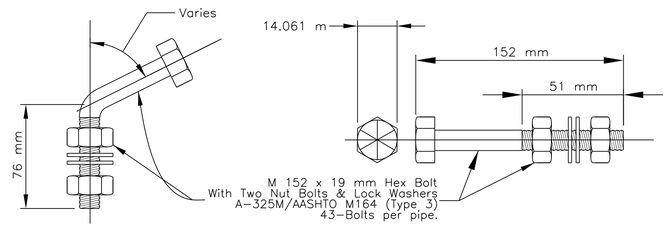
BAR BENDING DIAGRAM (u1 bars)

Project N12(19-4)1,2&4
ITEM No. 60101-0000: MINOR CONCRETE, CLASS A(AE), TYPE II

STATION	LOCATION	VOLUME		TOTAL	REMARKS
		INLET (m^3)	OUTLET (m^3)	VOLUME (m^3)	
54+615.00	Under TO Rt.	3.794	3.794	7.588	4-1803 mm S x 1194 mm R CSPA
54+720.00	Under TO Rt.	3.794	3.794	7.588	4-1803 mm S x 1194 mm R CSPA
54+720.00	Under TO Rt.	3.794	3.794	7.588	4-1803 mm S x 1194 mm R CSPA
54+952.00	Under TO Rt.	3.794	3.794	7.588	4-1803 mm S x 1194 mm R CSPA
			TOTAL	30.352	

REINFORCING BAR SCHEDULE

Station	Location	mark:	size:	No. req'd	length (m)	kg/m^3	Total wt (kg)	a*(mm)	b*(mm)	Remarks:
54+615.00	Under Turnout at Right	Straight reinforcing bars (Type 1)								Headwall With 4-barrel 1803 mm S x 1194 mm R CSPA
		V1	#13M	8	2.261	0.994	17.979			
		V2	#13M	24	0.762	0.994	18.178			
		H1	#13M	4	9.501	0.994	37.776			
		Bent reinforcing bars								
		u1	#13M	4	2.778	0.994	11.045	1000	889	
54+720.00	Under Turnout at Right	Straight reinforcing bars (Type 1)								Headwall With 4-barrel 1803 mm S x 1194 mm R CSPA
		V1	#13M	8	2.261	0.994	17.979			
		V2	#13M	24	0.762	0.994	18.178			
		H1	#13M	4	9.501	0.994	37.776			
		Bent reinforcing bars								
		u1	#13M	4	2.778	0.994	11.045	1000	889	
54+720.00	Under Turnout at Right	Straight reinforcing bars (Type 1)								Headwall With 4-barrel 1803 mm S x 1194 mm R CSPA
		V1	#13M	8	2.261	0.994	17.979			
		V2	#13M	24	0.762	0.994	18.178			
		H1	#13M	4	9.501	0.994	37.776			
		Bent reinforcing bars								
		u1	#13M	4	2.778	0.994	11.045	1000	889	
54+952.00	Under Turnout at Right	Straight reinforcing bars (Type 1)								Headwall With 4-barrel 1803 mm S x 1194 mm R CSPA
		V1	#13M	8	2.261	0.994	17.979			
		V2	#13M	24	0.762	0.994	18.178			
		H1	#13M	4	9.501	0.994	37.776			
		Bent reinforcing bars								
		u1	#13M	4	2.778	0.994	11.045	1000	889	
						Sub-Total	339.916	Per 1-Wall		
						Grand-Total	679.832	Both Walls @ Inlet & Outlet		



BENT AND STRAIGHT ANCHOR BOLT DETAIL
(nts)

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

CONCRETE HEADWALL
LAYOUT DETAIL FOR CSPA

DRAWN BY: NRDOT	DATE: 3/17/2017
DESIGNED BY: NRDOT	DATE: 3/17/2017
REVISED: 10/12/2017	BY: Leroy.Toledo
Sht 62 N12 TO Hdwlls Dtls.dgn	

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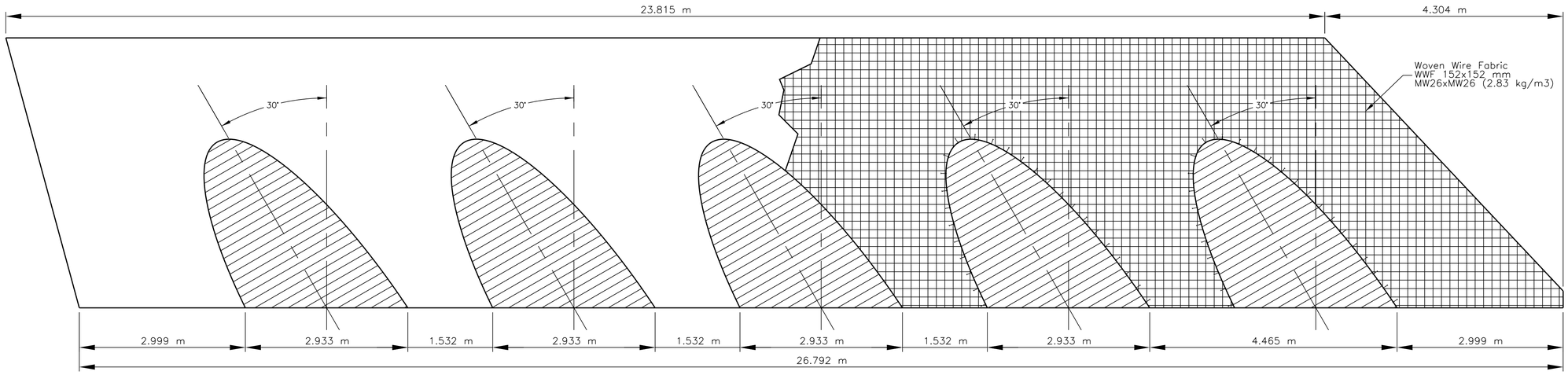
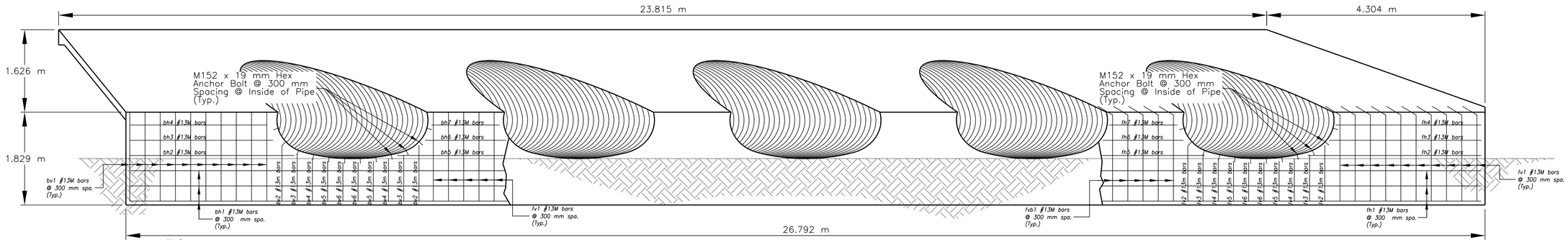
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	63	88

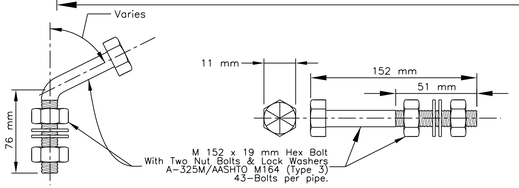
See Sheet 64 For General Notes



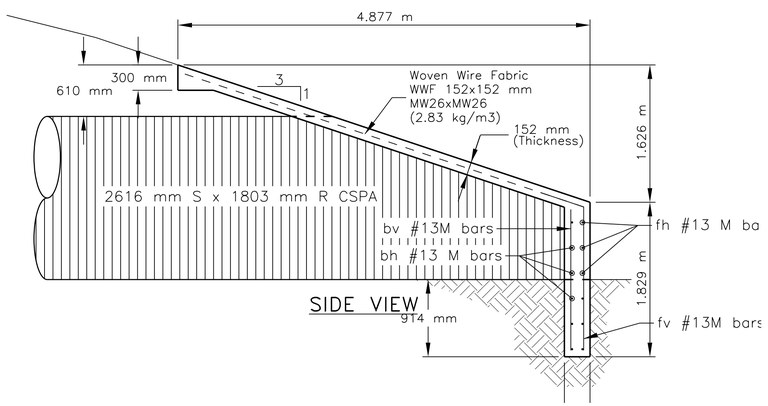
PLAN VIEW
Sta. 41+838.80 CSPC Inlet Only



ELEVATION
Sta. 41+836.70 CSPC Inlet Only



BENT AND STRAIGHT ANCHOR BOLT DETAIL
(nts)



SIDE VIEW

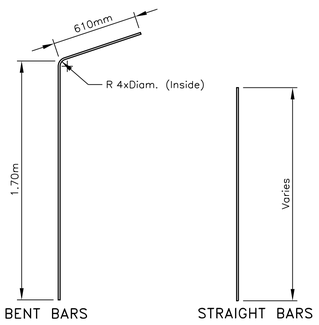
ITEM 60101-1000: MINOR CONCRETE (AE)

STATION	STRUCTURE	Vol. (m^3)	Area (m^2)	WWF (kg) **	Remarks
41+838.80	5-2616 mm S x 1803 mm R CSPA	25.62	95.65	270.69	
	TOTAL	25.62	95.65	270.69	

** WWF Unit Wt. 2.83 kg/m^2

REINFORCING BAR SCHEDULE

Mark	No. of Bars	Length (m)	Size	kg/m	Total Wt. (kg)	Remarks
Sta. 41+838.80 5-Barrel 2616 mm S x 1803 mm R CSPA Inlet						
fh1	3	26.400	#13M	0.994	78.725	Front Horizontal Straight Bars, Bottom of Pipes
fh2	2	3.420	#13M	0.994	6.799	Front Horizontal Straight Bars, Outside of Pipes
fh3	2	2.998	#13M	0.994	5.960	Front Horizontal Straight Bars, Outside of Pipes
fh4	2	2.876	#13M	0.994	5.717	Front Horizontal Straight Bars, Outside of Pipes
fh5	4	2.438	#13M	0.994	9.693	Front Horizontal Straight Bars, Between Pipes
fh6	4	1.595	#13M	0.994	6.342	Front Horizontal Straight Bars, Between Pipes
fh7	4	1.350	#13M	0.994	5.368	Front Horizontal Straight Bars, Between Pipes
fv1	40	2.308	#13M	0.994	91.766	Front Vertical Bent Bars, Left, Right & Between Pipes a= 610 mm b= 1700 mm
fv2	10	1.101	#13M	0.994	10.944	Front Vertical Straight Bars, Under Pipes
fv3	10	0.913	#13M	0.994	9.075	Front Vertical Straight Bars, Under Pipes
fv4	10	0.836	#13M	0.994	8.310	Front Vertical Straight Bars, Under Pipes
fv5	10	0.789	#13M	0.994	7.843	Front Vertical Straight Bars, Under Pipes
fv6	10	0.765	#13M	0.994	7.604	Front Vertical Straight Bars, Under Pipes
bh1	3	26.400	#13M	0.994	78.725	Back Horizontal Straight Bars, Bottom of Pipes
bh2	2	3.420	#13M	0.994	6.799	Back Horizontal Straight Bars, Bottom of Pipes
bh3	2	2.998	#13M	0.994	5.960	Back Horizontal Straight Bars, Bottom of Pipes
bh4	2	2.876	#13M	0.994	5.717	Back Horizontal Straight Bars, Bottom of Pipes
bh5	4	2.438	#13M	0.994	9.693	Back Horizontal Straight Bars, Between of Pipes
bh6	4	1.595	#13M	0.994	6.342	Back Horizontal Straight Bars, Between of Pipes
bh7	4	1.350	#13M	0.994	5.368	Back Horizontal Straight Bars, Between of Pipes
bv1	40	1.669	#13M	0.994	66.359	Back Vertical Straight Bars, Left, Right & Between Pipes
bv2	10	1.101	#13M	0.994	10.944	Back Vertical Straight Bars, Under Pipes
bv3	10	0.913	#13M	0.994	9.075	Back Vertical Straight Bars, Under Pipes
bv4	10	0.836	#13M	0.994	8.310	Back Vertical Straight Bars, Under Pipes
bv5	10	0.789	#13M	0.994	7.843	Back Vertical Straight Bars, Under Pipes
bv6	10	0.765	#13M	0.994	7.604	Back Vertical Straight Bars, Under Pipes
				Total?	482.885	



BENT BARS STRAIGHT BARS

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

STA 41+838.80 CONCRETE SLOPE PAVING DETAIL

DRAWN BY: NRDOT	DATE: 4/9/2014
DESIGNED BY: NRDOT	DATE: 4/9/2014
REVISED: 3/9/2018	BY: Leroy.Toledo
Sht 63 REV Slope Paving 1.dgn	

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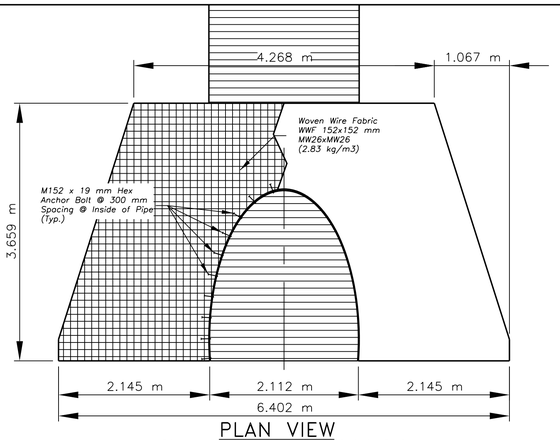
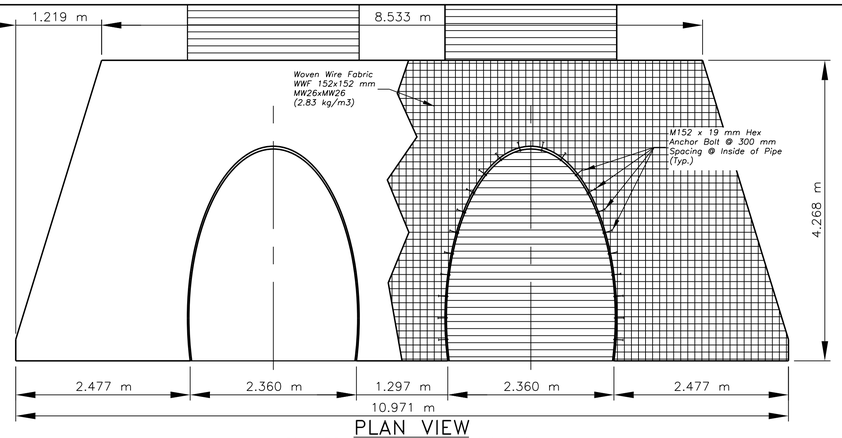
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	64	88

GENERAL NOTES

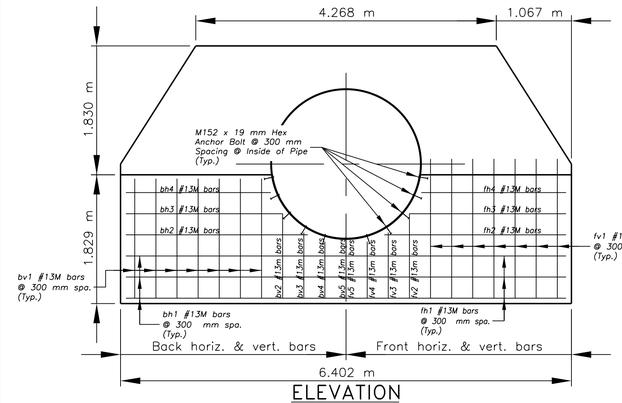
1. ALL WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS (FP-14).
2. ALL CONCRETE SHALL BE CLASS A(AE) WITH CLASS 1 FINISH. CHAMFER ALL EXPOSED EDGES 19 mm. THE CONCRETE SHALL CONFORM TO SECTION 601 "MINOR CONCRETE" OF FP-14. F'c = 20.68 MPa.
3. REINFORCING STEEL SHALL CONFORM TO AASHTO SPECIFICATION M-31 (ASTM A 615M), GRADE 420, AND SECTION 554 OF FP-14. FURNISHING AND PLACEMENT OF REBARS, ANCHOR BOLT, AND WELDED WIRE FABRIC SHALL BE CONSIDERED INCIDENTAL TO CONTRACT BID ITEM 60101-0000.
4. ALL STRUCTURE EXCAVATION AND EMBANKMENT AROUND THE CONCRETE BLANKET SHALL BE DONE TO NEAT LINES AND WILL BE CONSIDERED INCIDENTAL TO COMPLETION OF THE STRUCTURE.
5. THE CONTRACTOR SHALL BE REQUIRED TO MAKE ANY NECESSARY FIELD ADJUSTMENTS TO FIT EXISTING FIELD CONDITIONS, AS DIRECTED BY THE COR/COTR. NO ADDITIONAL PAYMENT SHALL BE MADE FOR SUCH ADJUSTMENTS.
6. IF UNSUITABLE MATERIAL IS FOUND AT THE FOOTING LOCATION AND ELEVATIONS, THE MATERIAL SHALL BE REMOVED AND REPLACED WITH APPROVED UNCLASSIFIED BACKFILL AS DETERMINED BY THE COR/COTR. ALL UNCLASSIFIED BACKFILL SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY AS DETERMINED BY AASHTO T99 METHOD C, BEFORE AND AFTER FOOTINGS ARE PLACED. THE UNCLASSIFIED BACKFILL MATERIAL SHALL CONFORM TO SECTION 208 AND 209 OF FP-14. FURNISHING AND PLACEMENT OF UNCLASSIFIED BACKFILL SHALL BE ACCORDANCE WITH SECTION 109.02(m), 204 & 209.
7. ALL FOOTING EXCAVATIONS SHALL BE INSPECTED AND APPROVED BY THE COR/COTR PRIOR TO PLACEMENT OF FORMS, REINFORCING STEEL, AND SUBSEQUENT CONCRETE.
8. CHANNEL RESHAPING, CLEANING, AND EXCAVATION SHALL BE DONE IN ACCORDANCE WITH THE PLANS AND AS DETERMINED BY THE COR/COTR. ANY WASTE MATERIAL SHALL BE USED AS BORROW WHERE NEEDED IN OTHER PROJECT LOCATION AS DESIGNATED AND APPROVAL BY THE COR/COTR. ALL CHANNEL EXCAVATION, CLEANING, AND RESHAPING SHALL BE CONSIDERED INCIDENTAL TO COMPLETION OF THE STRUCTURE.
9. IN NO CASE SHALL ANY BACKFILL BE PLACED UNTIL THE CONCRETE HAS ATTAINED A COMPRESSIVE STRENGTH OF 17.24 MPa.
10. ESTIMATED QUANTITIES OF TABULATED CONCRETE, WELDED WIRE FABRIC, AND REINFORCING STEEL AND NOTED SIZE OF STRUCTURE(S) ARE FOR ONE (1) SLOPE BLANKET AT A GIVEN STATION. CONCRETE BLANKETS ARE REQUIRED AT INLET SIDE OF THE DRAINAGE STRUCTURE(S) ONLY, UNLESS OTHERWISE NOTED.
11. AT LOCATIONS WHERE THE TOP EDGE OF THE CONCRETE BLANKET EXTENDS BEYOND/NEAR THE HINGE POINT OR CANNOT BE INSTALLED DUE TO INSUFFICIENT COVER OVER THE PIPES, THE CONTRACTOR SHALL BE REQUIRED TO ADJUST THE VERTICAL HEIGHT ABOVE THE PIPE(S) TO 305 mm AND INSTALL TWO (2) ADDITIONAL #13M REBARS SET VERTICALLY ±152 mm APART W/76 mm MINIMUM COVER ALL AROUND ACROSS THE ENTIRE WIDTH OF THE STRUCTURE AND WILL BE CONSIDERED INCIDENTAL TO COMPLETION OF THE STRUCTURE.
12. EROSION CONTROL MATTING SHALL CONFORM TO SECTION 629 AND 713.17(k) OF THE FP-14 FOR TYPE IV-B MATERIAL, AND SHALL BE INCIDENTAL TO THE UNIT PRICE FOR ITEM 60101-0000. MATTINGS SHALL BE TUCKED OR EMBEDDED INTO EMBANKMENT ALONG ALL EDGES AS SHOWN. SEE SHEET 53 OF 88 FOR EROSION CONTROL MATTING INSTALLATION DETAILS.



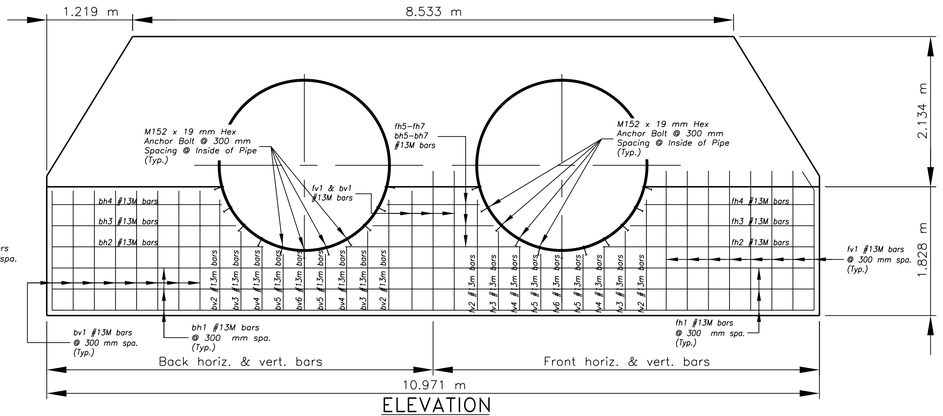
PLAN VIEW
Sta. 48+982.22 CSPC Inlet Only



PLAN VIEW
Sta. 52+780.00 CSPC Inlet Only



ELEVATION
Sta. 48+982.22 CSPC Inlet Only



ELEVATION
Sta. 52+780.00 CSPC Inlet Only

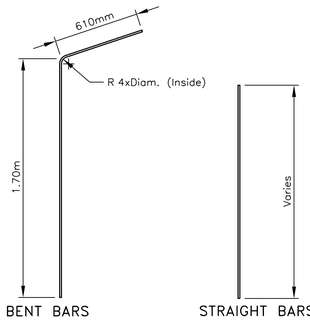
REINFORCING BAR SCHEDULE

Mark	No. of Bars	Length (m)	Size	kg/m	Total Wt. (kg)	Remarks
Sta. 48+982.22 1-2134 mm ø CSPC @ Inlet Only						
fh1	3	6.250	#13M	0.994	18.638	Front Horizontal Straight Bars, Bottom of Pipes
fh2	2	2.580	#13M	0.994	5.129	Front Horizontal Straight Bars, Outside of Pipes
fh3	2	2.230	#13M	0.994	4.433	Front Horizontal Straight Bars, Outside of Pipes
fh4	2	2.060	#13M	0.994	4.095	Front Horizontal Straight Bars, Outside of Pipes
fv1	14	2.320	#13M	0.994	32.285	Front Vertical Bent Bars, Left, Right & Between Pipes a= 610 mm b= 1700 mm
fv2	2	1.201	#13M	0.994	2.388	Front Vertical Straight Bars, Under Pipes
fv3	2	0.933	#13M	0.994	1.855	Front Vertical Straight Bars, Under Pipes
fv4	2	0.802	#13M	0.994	1.594	Front Vertical Straight Bars, Under Pipes
fv5	1	0.762	#13M	0.994	0.757	Front Vertical Straight Bars, Under Pipes
bh1	3	6.250	#13M	0.994	18.638	Back Horizontal Straight Bars, Bottom of Pipes
bh2	2	2.580	#13M	0.994	5.129	Back Horizontal Straight Bars, Bottom of Pipes
bh3	2	2.230	#13M	0.994	4.433	Back Horizontal Straight Bars, Bottom of Pipes
bh4	2	2.060	#13M	0.994	4.095	Back Horizontal Straight Bars, Bottom of Pipes
bv1	14	1.700	#13M	0.994	23.657	Back Vertical Straight Bars, Left, Right & Between Pipes
bv2	2	1.201	#13M	0.994	2.388	Back Vertical Straight Bars, Under Pipes
bv3	2	0.933	#13M	0.994	1.855	Back Vertical Straight Bars, Under Pipes
bv4	2	0.802	#13M	0.994	1.594	Back Vertical Straight Bars, Under Pipes
bv5	1	0.762	#13M	0.994	0.757	Back Vertical Straight Bars, Under Pipes
				Total?	133.721	
Sta. 52+780.00 2-2438 mm ø SPP @ Inlet Only						
vh1	3	10.819	#13M	0.994	32.262	Front Horizontal Straight Bars, Bottom of Pipes
vh2	2	2.999	#13M	0.994	5.962	Front Horizontal Straight Bars, Outside of Pipes
vh3	2	2.610	#13M	0.994	5.189	Front Horizontal Straight Bars, Outside of Pipes
vh4	2	2.412	#13M	0.994	4.795	Front Horizontal Straight Bars, Outside of Pipes
vh5	1	2.494	#13M	0.994	2.479	Front Horizontal Straight Bars, Between Pipes
vh6	1	1.715	#13M	0.994	1.705	Front Horizontal Straight Bars, Between Pipes
vh7	1	1.319	#13M	0.994	1.311	Front Horizontal Straight Bars, Between Pipes
fv1	19	2.320	#13M	0.994	43.816	Front Vertical Bent Bars, Left, Right & Between Pipes a= 610 mm b= 1700 mm
fv2	4	1.570	#13M	0.994	6.242	Front Vertical Straight Bars, Under Pipes
fv3	4	1.126	#13M	0.994	4.477	Front Vertical Straight Bars, Under Pipes
fv4	4	0.909	#13M	0.994	3.614	Front Vertical Straight Bars, Under Pipes
fv5	4	0.800	#13M	0.994	3.181	Front Vertical Straight Bars, Under Pipes
fv6	2	0.762	#13M	0.994	1.515	Front Vertical Straight Bars, Under Pipes
bh1	3	10.819	#13M	0.994	32.262	Back Horizontal Straight Bars, Bottom of Pipes
bh2	2	2.999	#13M	0.994	5.962	Back Horizontal Straight Bars, Bottom of Pipes
bh3	2	2.610	#13M	0.994	5.189	Back Horizontal Straight Bars, Bottom of Pipes
bh4	2	2.412	#13M	0.994	4.795	Back Horizontal Straight Bars, Bottom of Pipes
bh5	1	2.494	#13M	0.994	2.479	Back Horizontal Straight Bars, Between Pipes
bh6	1	1.715	#13M	0.994	1.705	Back Horizontal Straight Bars, Between Pipes
bh7	1	1.319	#13M	0.994	1.311	Back Horizontal Straight Bars, Between Pipes
bv1	19	1.700	#13M	0.994	32.106	Back Vertical Straight Bars, Left, Right & Between Pipes
bv2	4	1.570	#13M	0.994	6.242	Back Vertical Straight Bars, Under Pipes
bv3	4	1.126	#13M	0.994	4.477	Back Vertical Straight Bars, Under Pipes
bv4	4	0.909	#13M	0.994	3.614	Back Vertical Straight Bars, Under Pipes
bv5	4	0.800	#13M	0.994	3.181	Back Vertical Straight Bars, Under Pipes
bv6	2	0.762	#13M	0.994	1.515	Back Vertical Straight Bars, Under Pipes
				Total?	219.871	

ITEM 60101-1000: MINOR CONCRETE (AE)

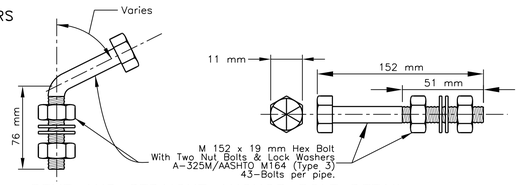
STATION	STRUCTURE	Vol. (m^3)	Area (m^3)	WWF (kg) **	Remarks
48+982.22	1-2134 mm ø CSPC	5.67	17.47	49.43	
52+780.00	2-2438 mm ø SPP	10.02	33.22	94.02	
	TOTAL	15.69	50.69	143.44	

** WWF Unit Wt. 2.83 kg/m^2

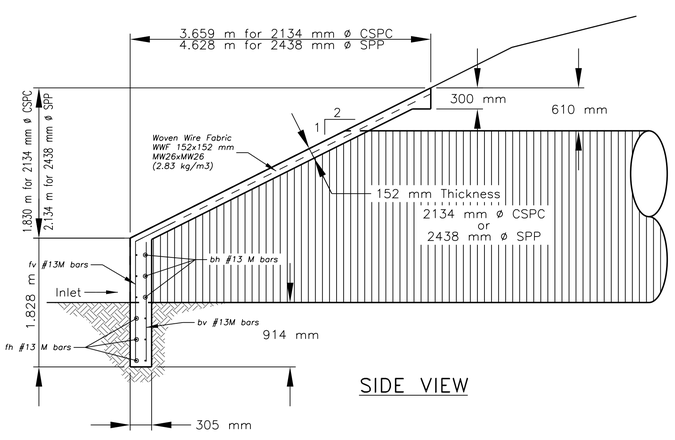


BENT BARS STRAIGHT BARS

REBARS



BENT AND STRAIGHT ANCHOR BOLT DETAIL
(nts)



SIDE VIEW

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS

NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

CONCRETE SLOPE PAVING DETAIL Sta. 48+982.22 & Sta. 52+780.00

DRAWN BY: NRDOT	DATE: 5/3/2016
DESIGNED BY: NRDOT	DATE: 5/3/2016
REVISED: 3/15/2018	BY: Leroy.Toledo
Sht 64 REV Slope Paving 2.dgn	

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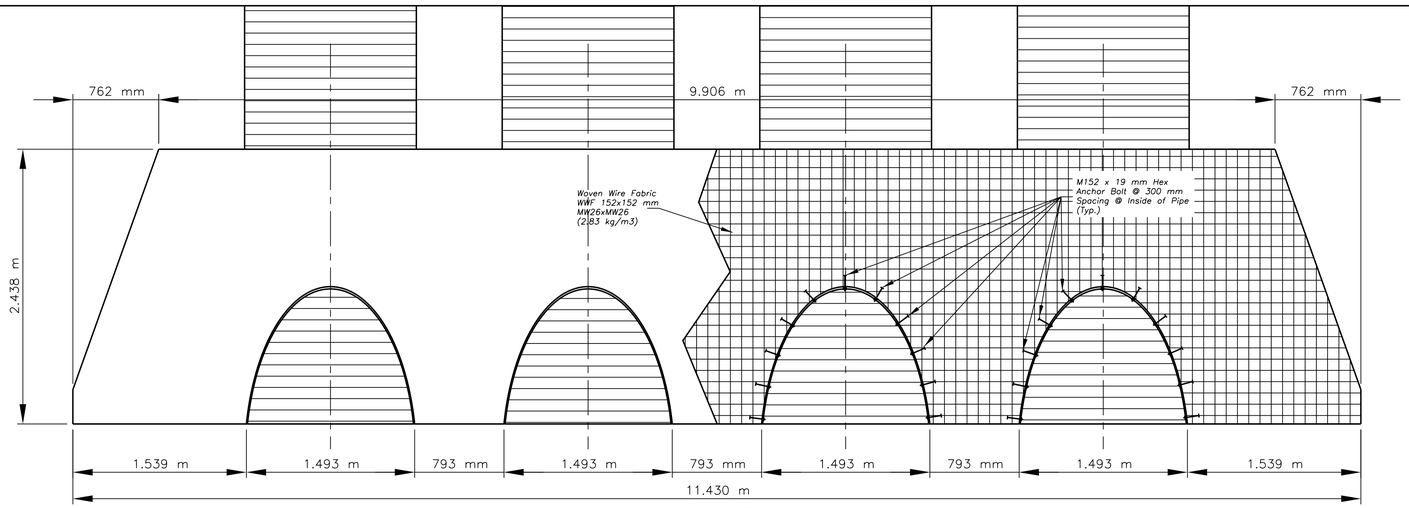
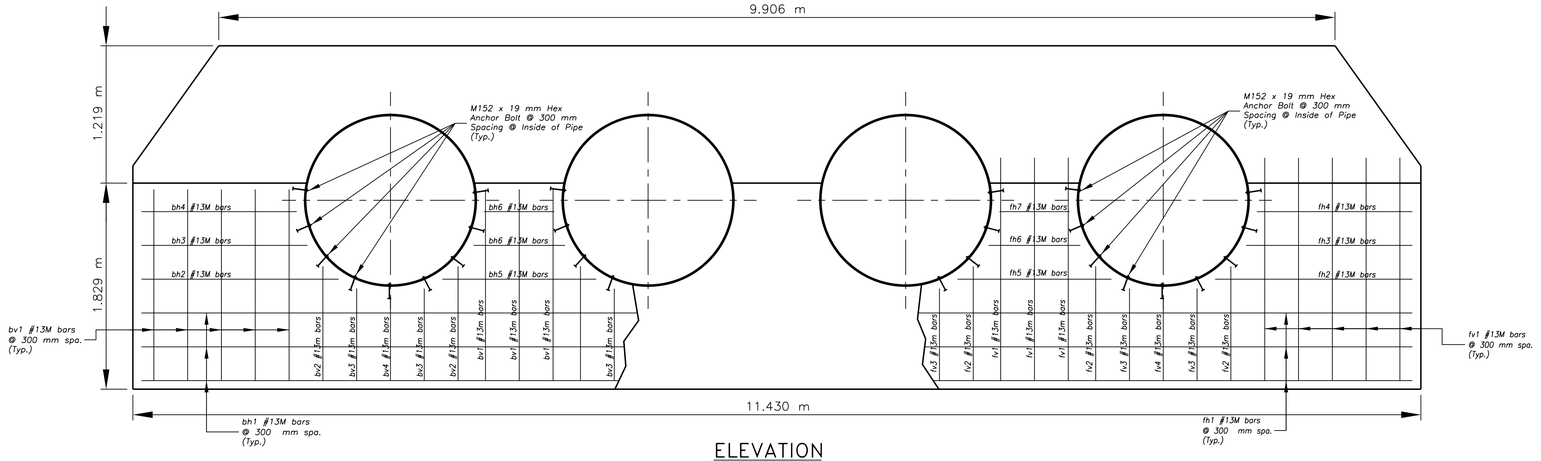
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	65	88



PLAN VIEW
Sta. 56+644.11 CSPC Inlet Only



ELEVATION
Sta. 56+644.11 CSPC Inlet Only

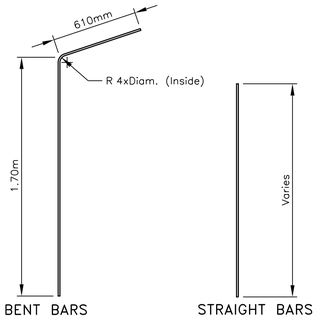
ITEM 60101-1000: MINOR CONCRETE (AE)

STATION	STRUCTURE	Vol. (m^3)	Area (m^2)	WWF (kg) **	Remarks
50+644.11	4-1524 mm ø CSPC	8.36	23.25	65.81	
	TOTAL	8.36	23.25	65.81	

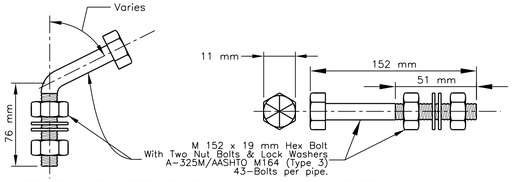
** WWF Unit Wt. 2.83 kg/m^2

REINFORCING BAR SCHEDULE

Mark	No. of Bars	Length (m)	Size	kg/m	Total Wt. (kg)	Remarks
Sta. 50+644.11 4-1524 mm ø CSPA @ Inlet Only						
fh1	3	11.278	#13M	0.994	33.631	Front Horizontal Straight Bars, Bottom of Pipes
fh2	2	1.749	#13M	0.994	3.477	Front Horizontal Straight Bars, Outside of Pipes
fh3	2	1.474	#13M	0.994	2.930	Front Horizontal Straight Bars, Outside of Pipes
fh4	2	1.378	#13M	0.994	2.739	Front Horizontal Straight Bars, Outside of Pipes
fh5	3	1.365	#13M	0.994	4.070	Front Horizontal Straight Bars, Between Pipes
fh6	3	0.813	#13M	0.994	2.424	Front Horizontal Straight Bars, Between Pipes
fh7	3	0.622	#13M	0.994	1.855	Front Horizontal Straight Bars, Between Pipes
fv1	19	2.320	#13M	0.994	43.816	Front Vertical Bent Bars, Left, Right & Between Pipes a= 610 mm b= 1700 mm
fv2	8	1.015	#13M	0.994	8.071	Front Vertical Straight Bars, Under Pipes
fv3	8	0.818	#13M	0.994	6.505	Front Vertical Straight Bars, Under Pipes
fv4	4	0.762	#13M	0.994	3.030	Front Vertical Straight Bars, Under Pipes
bh1	3	11.278	#13M	0.994	33.631	Back Horizontal Straight Bars, Bottom of Pipes
bh2	2	1.749	#13M	0.994	3.477	Back Horizontal Straight Bars, Bottom of Pipes
bh3	2	1.474	#13M	0.994	2.930	Back Horizontal Straight Bars, Bottom of Pipes
bh4	2	1.378	#13M	0.994	2.739	Back Horizontal Straight Bars, Bottom of Pipes
bh5	3	1.365	#13M	0.994	4.070	Back Horizontal Straight Bars, Between Pipes
bh6	3	0.813	#13M	0.994	2.424	Back Horizontal Straight Bars, Between Pipes
bh7	3	0.622	#13M	0.994	1.855	Back Horizontal Straight Bars, Between Pipes
bv1	19	1.700	#13M	0.994	32.106	Back Vertical Straight Bars, Left, Right & Between Pipes
bv2	8	1.015	#13M	0.994	8.071	Back Vertical Straight Bars, Under Pipes
bv3	8	0.818	#13M	0.994	6.505	Back Vertical Straight Bars, Under Pipes
bv4	4	0.762	#13M	0.994	3.030	Back Vertical Straight Bars, Under Pipes
				Total	213.388	



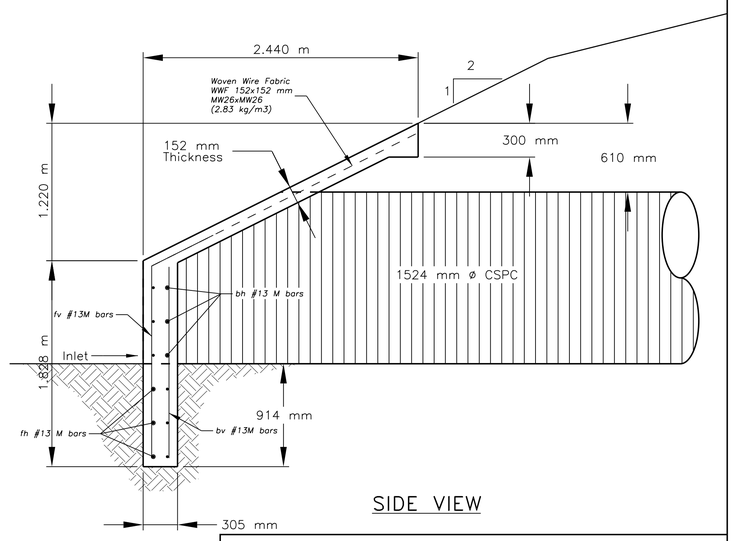
REBARS



BENT AND STRAIGHT ANCHOR BOLT DETAIL
(nts)

GENERAL NOTES

1. ALL WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS (FP-14).
2. ALL CONCRETE SHALL BE CLASS A(AE) WITH CLASS 1 FINISH. CHAMFER ALL EXPOSED EDGES 19 mm. THE CONCRETE SHALL CONFORM TO SECTION 601 "MINOR CONCRETE" OF FP-14. F'c = 20.68 MPa.
3. REINFORCING STEEL SHALL CONFORM TO AASHTO SPECIFICATION M-31 (ASTM A 615M), GRADE 420, AND SECTION 554 OF FP-14. FURNISHING AND PLACEMENT OF REBARS, ANCHOR BOLT, AND WELDED WIRE FABRIC SHALL BE CONSIDERED INCIDENTAL TO CONTRACT BID ITEM 60101-0000.
4. ALL STRUCTURE EXCAVATION AND EMBANKMENT AROUND THE CONCRETE BLANKET SHALL BE DONE TO NEAT LINES AND WILL BE CONSIDERED INCIDENTAL TO COMPLETION OF THE STRUCTURE.
5. THE CONTRACTOR SHALL BE REQUIRED TO MAKE ANY NECESSARY FIELD ADJUSTMENTS TO FIT EXISTING FIELD CONDITIONS, AS DIRECTED BY THE COR/COTR. NO ADDITIONAL PAYMENT SHALL BE MADE FOR SUCH ADJUSTMENTS.
6. IF UNSUITABLE MATERIAL IS FOUND AT THE FOOTING LOCATION AND ELEVATIONS, THE MATERIAL SHALL BE REMOVED AND REPLACED WITH APPROVED UNCLASSIFIED BACKFILL AS DETERMINED BY THE COR/COTR. ALL UNCLASSIFIED BACKFILL SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY AS DETERMINED BY AASHTO T99 METHOD C, BEFORE AND AFTER FOOTINGS ARE PLACED. THE UNCLASSIFIED BACKFILL MATERIAL SHALL CONFORM TO SECTION 208 AND 209 OF FP-14. FURNISHING AND PLACEMENT OF UNCLASSIFIED BACKFILL SHALL BE ACCORDANCE WITH SECTION 109.02(m), 204 & 209.
7. ALL FOOTING EXCAVATIONS SHALL BE INSPECTED AND APPROVED BY THE COR/COTR PRIOR TO PLACEMENT OF FORMS, REINFORCING STEEL, AND SUBSEQUENT CONCRETE.
8. CHANNEL RESHAPING, CLEANING, AND EXCAVATION SHALL BE DONE IN ACCORDANCE WITH THE PLANS AND AS DETERMINED BY THE COR/COTR. ANY WASTE MATERIAL SHALL BE USED AS BORROW WHERE NEEDED IN OTHER PROJECT LOCATION AS DESIGNATED AND APPROVAL BY THE COR/COTR. ALL CHANNEL EXCAVATION, CLEANING, AND RESHAPING SHALL BE CONSIDERED INCIDENTAL TO COMPLETION OF THE STRUCTURE.
9. IN NO CASE SHALL ANY BACKFILL BE PLACED UNTIL THE CONCRETE HAS ATTAINED A COMPRESSIVE STRENGTH OF 17.24 MPa.
10. ESTIMATED QUANTITIES OF TABULATED CONCRETE, WELDED WIRE FABRIC, AND REINFORCING STEEL AND NOTED SIZE OF STRUCTURE(S) ARE FOR ONE (1) SLOPE BLANKET AT A GIVEN STATION. CONCRETE BLANKETS ARE REQUIRED AT INLET SIDE OF THE DRAINAGE STRUCTURE(S) ONLY, UNLESS OTHERWISE NOTED.
11. AT LOCATIONS WHERE THE TOP EDGE OF THE CONCRETE BLANKET EXTENDS BEYOND/NEAR THE HINGE POINT OR CANNOT BE INSTALLED DUE TO INSUFFICIENT COVER OVER THE PIPES, THE CONTRACTOR SHALL BE REQUIRED TO ADJUST THE VERTICAL HEIGHT ABOVE THE PIPE(S) TO 305 mm AND INSTALL TWO (2) ADDITIONAL #13M REBARS SET VERTICALLY ±152 mm APART W/76 mm MINIMUM COVER ALL AROUND ACROSS THE ENTIRE WIDTH OF THE STRUCTURE AND WILL BE CONSIDERED INCIDENTAL TO COMPLETION OF THE STRUCTURE.
12. EROSION CONTROL MATTING SHALL CONFORM TO SECTION 629 AND 713.17(k) OF THE FP-14 FOR TYPE IV-B MATERIAL, AND SHALL BE INCIDENTAL TO THE UNIT PRICE FOR ITEM 60101-0000. MATTINGS SHALL BE TUCKED OR EMBEDDED INTO EMBANKMENT ALONG ALL EDGES AS SHOWN. SEE SHEET 52 & 53 FOR EROSION CONTROL MATTING INSTALLATION DETAILS.



SIDE VIEW

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS

NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

CONCRETE SLOPE PAVING DETAIL At Sta. 50+644.11

DRAWN BY: NRDOT	DATE: 5/5/2016
DESIGNED BY: NRDOT	DATE: 5/5/2016
REVISED: 3/9/2018	BY: Leroy.Toledo
Sht 65 REV Slope Paving 3.dgn	

I:\DESIGN\Users\DESIGN3\CURRENT PROJECTS\N35_Chinle\N12(19-4)\DESIGN DATA_020315\CADD Files\Sht 65 REV Slope Paving 3.dgn

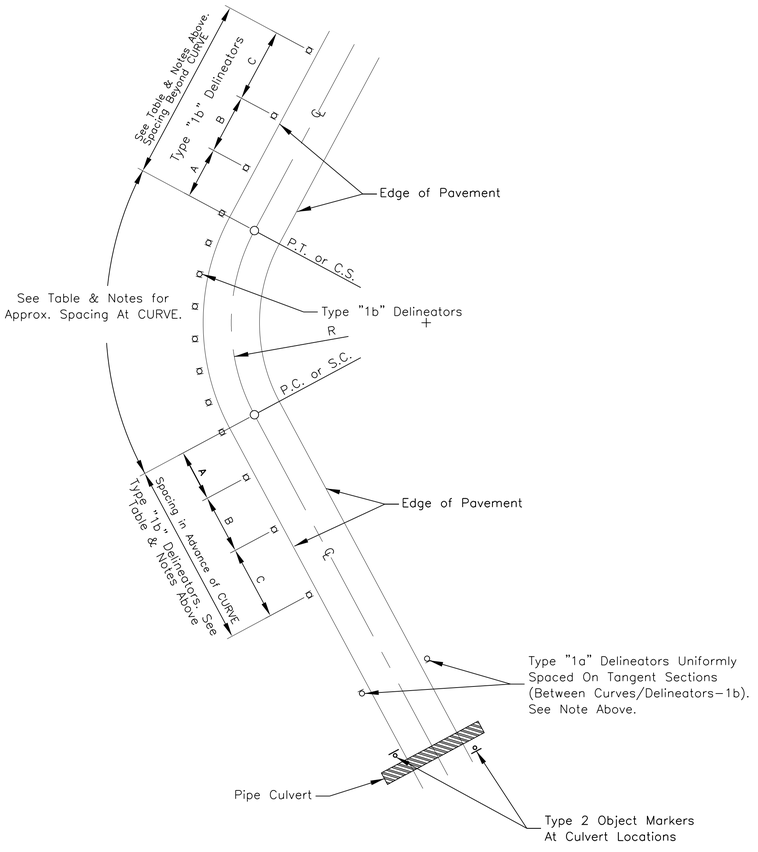
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	66	88

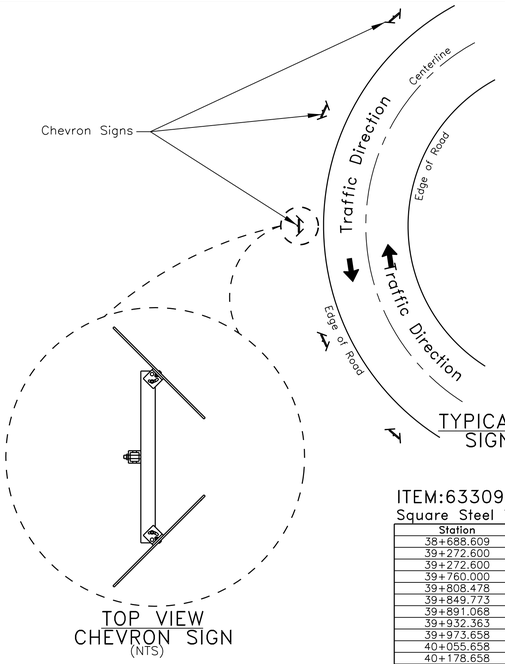
RADIUS OF CURVE (m)	APPROXIMATE SPACING (S) ON CURVE (m)	SPACING ON ADVANCE OF OR BEYOND A CURVE (m)		
		A (2S)	B (3S)	C (6S)
15	6	12	18	36
35	8	16	24	48
55	11	22	33	66
75	13	26	39	78
95	15	30	45	90
125	18	36	54	108
155	20	40	60	120
185	22	44	66	132
215	24	48	72	144
245	26	52	78	156
275	27	54	81	162
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 Roadway 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.

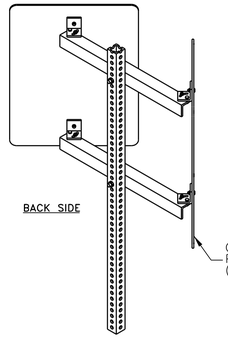
NOTE: Delineator and Object Markers shall be installed 610 mm (min) or 1219 mm (normal), or in-line with the guardrail posts, measured from Roadway or shoulder edge.

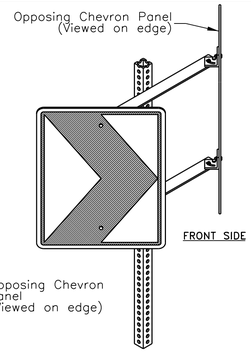




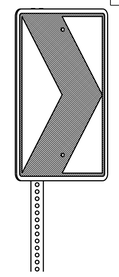
TYPICAL CHEVRON SIGN LAYOUT
(NTS)

TOP VIEW
CHEVRON SIGN
(NTS)





ISOMETRIC VIEW
CHEVRON DETAILS
(NTS)



SIDE VIEW
CHEVRON SIGN
(NTS)

Note: Each Chevron Symbol/Panel (2 ea.) Shall Face On-Coming Traffic And Shall Follow The Direction Of Curvature.

ITEM:63309-0040 DELINEATORS, Type 1b
Square Steel Tube, 1-38 mm x 38 mm

Station	Loction	Description	Each
38+688.609	Rt.	Delin Type 1b	1
39+272.600	Rt.	Delin Type 1b	1
39+272.600	Lt.	Delin Type 1b	1
39+760.000	Rt.	Delin Type 1b	1
39+808.478	Rt.	Delin Type 1b	1
39+849.773	Rt.	Delin Type 1b	1
39+891.068	Rt.	Delin Type 1b	1
39+932.363	Rt.	Delin Type 1b	1
39+973.658	Rt.	Delin Type 1b	1
40+055.658	Rt.	Delin Type 1b	1
40+178.658	Rt.	Delin Type 1b	1
40+309.225	Lt.	Delin Type 1b	1
40+416.225	Lt.	Delin Type 1b	1
40+598.490	Lt.	Delin Type 1b	1
40+659.245	Lt.	Delin Type 1b	1
40+766.245	Lt.	Delin Type 1b	1
40+927.187	Rt.	Delin Type 1b	1
41+009.187	Rt.	Delin Type 1b	1
41+048.812	Rt.	Delin Type 1b	1
41+088.437	Rt.	Delin Type 1b	1
41+128.062	Rt.	Delin Type 1b	1
41+167.687	Rt.	Delin Type 1b	1
41+257.589	Lt.	Delin Type 1b	1
41+306.350	Lt.	Delin Type 1b	1
41+355.111	Lt.	Delin Type 1b	1
41+403.872	Lt.	Delin Type 1b	1
41+452.632	Lt.	Delin Type 1b	1
41+501.393	Lt.	Delin Type 1b	1
41+647.676	Lt.	Delin Type 1b	1
41+810.307	Rt.	Delin Type 1b	1
41+874.713	Rt.	Delin Type 1b	1
41+939.118	Rt.	Delin Type 1b	1
42+003.524	Rt.	Delin Type 1b	1
42+067.929	Rt.	Delin Type 1b	1
42+132.335	Rt.	Delin Type 1b	1
42+196.740	Rt.	Delin Type 1b	1
42+261.146	Rt.	Delin Type 1b	1
42+325.552	Rt.	Delin Type 1b	1
42+389.957	Rt.	Delin Type 1b	1
42+454.363	Rt.	Delin Type 1b	1
42+647.579	Rt.	Delin Type 1b	1
42+711.985	Rt.	Delin Type 1b	1
42+776.390	Rt.	Delin Type 1b	1
42+840.796	Rt.	Delin Type 1b	1
42+905.202	Rt.	Delin Type 1b	1
42+969.607	Rt.	Delin Type 1b	1
43+034.013	Rt.	Delin Type 1b	1
43+098.418	Rt.	Delin Type 1b	1
43+162.824	Rt.	Delin Type 1b	1
43+285.824	Rt.	Delin Type 1b	1
43+477.824	Rt.	Delin Type 1b	1
43+844.674	Rt.	Delin Type 1b	1
43+988.674	Rt.	Delin Type 1b	1
44+084.674	Rt.	Delin Type 1b	1
44+133.457	Rt.	Delin Type 1b	1
44+231.022	Rt.	Delin Type 1b	1
44+279.804	Rt.	Delin Type 1b	1
44+519.804	Rt.	Delin Type 1b	1
44+597.500	Lt.	Delin Type 1b	1
45+790.955	Lt.	Delin Type 1b	1
46+174.955	Lt.	Delin Type 1b	1
46+366.955	Lt.	Delin Type 1b	1
46+494.955	Lt.	Delin Type 1b	1
46+559.102	Lt.	Delin Type 1b	1
46+623.250	Lt.	Delin Type 1b	1
46+687.398	Lt.	Delin Type 1b	1
46+751.546	Lt.	Delin Type 1b	1
46+815.694	Lt.	Delin Type 1b	1
46+879.841	Lt.	Delin Type 1b	1
46+943.989	Lt.	Delin Type 1b	1
47+072.285	Lt.	Delin Type 1b	1
47+136.433	Lt.	Delin Type 1b	1
47+264.728	Lt.	Delin Type 1b	1
47+328.876	Lt.	Delin Type 1b	1
47+393.024	Lt.	Delin Type 1b	1
47+457.171	Lt.	Delin Type 1b	1
47+521.319	Lt.	Delin Type 1b	1
47+585.467	Lt.	Delin Type 1b	1
47+713.763	Lt.	Delin Type 1b	1
47+777.910	Lt.	Delin Type 1b	1
47+842.058	Lt.	Delin Type 1b	1
47+970.354	Lt.	Delin Type 1b	1
48+034.502	Lt.	Delin Type 1b	1
48+098.649	Lt.	Delin Type 1b	1
48+162.797	Lt.	Delin Type 1b	1
48+546.945	Lt.	Delin Type 1b	1
48+589.670	Rt.	Delin Type 1b	1
48+712.670	Rt.	Delin Type 1b	1
49+792.050	Rt.	Delin Type 1b	1
50+102.113	Rt.	Delin Type 1b	1

ITEM:63309-0040 DELINEATORS, Type 1b
Square Steel Tube, 1-38 mm x 38 mm

50+102.113	Lt.	Delin Type 1b	1
50+348.113	Lt.	Delin Type 1b	1
50+594.113	Lt.	Delin Type 1b	1
50+717.113	Lt.	Delin Type 1b	1
51+824.277	Rt.	Delin Type 1b	1
51+924.277	Rt.	Delin Type 1b	1
52+640.000	Rt.	Delin Type 1b	1
53+003.494	Rt.	Delin Type 1b	1
53+070.820	Rt.	Delin Type 1b	1
53+138.146	Rt.	Delin Type 1b	1
53+205.471	Rt.	Delin Type 1b	1
53+272.797	Rt.	Delin Type 1b	1
53+340.123	Rt.	Delin Type 1b	1
53+485.000	Rt.	Delin Type 1b	1
53+675.123	Rt.	Delin Type 1b	1
53+789.556	Rt.	Delin Type 1b	1
53+912.556	Rt.	Delin Type 1b	1
55+190.109	Lt.	Delin Type 1b	1
55+417.617	Lt.	Delin Type 1b	1
55+474.495	Lt.	Delin Type 1b	1
55+531.372	Lt.	Delin Type 1b	1
55+588.249	Lt.	Delin Type 1b	1
55+645.126	Lt.	Delin Type 1b	1
55+702.003	Lt.	Delin Type 1b	1
55+816.003	Lt.	Delin Type 1b	1
		TOTAL	115

ITEM: 63308-2000, OBJECT MARKER, TYPE 2
Square Steel Tube, 1-38 mm x 38 mm

STATION	LOCATION	TYPE 2
38+802.300	Lt. & Rt.	2
38+898.800	Lt. & Rt.	2
39+026.520	Lt. & Rt.	2
39+308.440	Lt. & Rt.	2
39+438.150	Lt. & Rt.	2
40+474.000	Lt. & Rt.	2
40+576.000	Lt. & Rt.	2
40+718.000	Lt. & Rt.	2
41+213.400	Lt. & Rt.	2
41+601.740	Lt. & Rt.	2
42+518.880	Lt. & Rt.	2
42+681.780	Lt. & Rt.	2
42+926.570	Lt. & Rt.	2
43+248.500	Lt. & Rt.	2
43+458.880	Lt. & Rt.	2
43+816.820	Lt. & Rt.	2
44+176.120	Lt. & Rt.	2
44+381.970	Lt. & Rt.	2
45+137.750	Lt. & Rt.	2
45+264.600	Lt. & Rt.	2
45+530.000	Lt. & Rt.	2
45+671.170	Lt. & Rt.	2
45+756.750	Lt. & Rt.	2
46+081.500	Lt. & Rt.	2
46+280.460	Lt. & Rt.	2
46+416.650	Lt. & Rt.	2
46+584.000	Lt. & Rt.	2
46+657.000	Lt. & Rt.	2
46+805.000	Lt. & Rt.	2
46+897.940	Lt. & Rt.	2
47+203.950	Lt. & Rt.	2
47+413.760	Lt. & Rt.	2
47+549.770	Lt. & Rt.	2
47+909.650	Lt. & Rt.	2
48+494.550	Lt. & Rt.	2
48+627.380	Lt. & Rt.	2
48+698.630	Lt. & Rt.	2
48+982.220	Lt. & Rt.	2
49+272.980	Lt. & Rt.	2
50+324.030	Lt. & Rt.	2
50+566.500	Lt. & Rt.	2
50+644.110	Lt. & Rt.	2
50+987.000	Lt. & Rt.	2
51+672.000	Lt. & Rt.	2
52+476.000	Lt. & Rt.	2
52+780.000	Lt. & Rt.	2
53+175.600	Lt. & Rt.	2
54+010.000	Lt. & Rt.	2
54+120.000	Lt. & Rt.	2
54+262.000	Lt. & Rt.	2
54+387.300	Lt. & Rt.	2
55+115.000	Lt. & Rt.	2
55+221.690	Lt. & Rt.	2
55+350.240	Lt. & Rt.	2
55+737.140	Lt. & Rt.	2
	TOTAL	110

ITEM 63302-2001, CHEVRON SIGN
1-POST, 38 x 38 mm SQUARE STEEL TUBE

Station	Location	Description	TOTAL AREA (sq/m)
PC 38+770.609	Rt.	W1-8L	0.28
38+853.038	Rt.	W1-8L & W1-8R	0.56
38+935.467	Rt.	W1-8L & W1-8R	0.56
38+976.682	Rt.	W1-8L & W1-8R	0.56
39+059.111	Rt.	W1-8L & W1-8R	0.56
39+100.325	Rt.	W1-8L & W1-8R	0.56
39+141.540	Rt.	W1-8L & W1-8R	0.56
PT 39+182.754	Rt.	W1-8R	0.28
PC 39+362.443	Lt.	W1-8R	0.28
39+405.590	Lt.	W1-8L & W1-8R	0.56
39+448.737	Lt.	W1-8L & W1-8R	0.56
39+491.885	Lt.	W1-8L & W1-8R	0.56
39+535.032	Lt.	W1-8L & W1-8R	0.56
39+578.735	Lt.	W1-8L & W1-8R	0.56
PT 39+621.326	Lt.	W1-8L	0.28
PC 44+667.499	Lt.	W1-8R	0.28
44+695.000	Lt.	W1-8L & W1-8R	0.56
44+737.665	Lt.	W1-8L & W1-8R	0.56
44+772.748	Lt.	W1-8L & W1-8R	0.56
44+807.830	Lt.	W1-8L & W1-8R	0.56
44+842.913	Lt.	W1-8L & W1-8R	0.56
44+877.996	Lt.	W1-8L & W1-8R	0.56
44+913.079	Lt.	W1-8L & W1-8R	0.56
44+948.162	Lt.	W1-8L & W1-8R	0.56
44+983.244	Lt.	W1-8L & W1-8R	0.56
45+018.327	Lt.	W1-8L & W1-8R	0.56
45+053.410	Lt.	W1-8L & W1-8R	0.56
45+088.493	Lt.	W1-8L & W1-8R	0.56
PT 45+123.576	Lt.	W1-8L	0.28
PC 48+794.666	Rt.	W1-8L	0.28
48+836.370	Rt.	W1-8L & W1-8R	0.56
48+878.075	Rt.	W1-8L & W1-8R	0.56
48+919.779	Rt.	W1-8L & W1-8R	0.56
48+961.484	Rt.	W1-8L & W1-8R	0.56
49+003.189	Rt.	W1-8L & W1-8R	0.56
49+044.893	Rt.	W1-8L & W1-8R	0.56
49+086.598	Rt.	W1-8L & W1-8R	0.56
49+128.302	Rt.	W1-8L & W1-8R	0.56
49+170.007	Rt.	W1-8L & W1-8R	0.56
49+253.416	Rt.	W1-8L & W1-8R	0.56
49+295.121	Rt.	W1-8L & W1-8R	0.56
49+336.825	Rt.	W1-8L & W1-8R	0.56
49+378.530	Rt.	W1-8L & W1-8R	0.56
49+420.235	Rt.	W1-8L & W1-8R	0.56
49+461.939	Rt.	W1-8L & W1-8R	0.56
49+545.348	Rt.	W1-8L & W1-8R	0.56
PT 49+587.053	Rt.	W1-8R	0.28
PC 50+799.113	Lt.	W1-8R	0.28
50+839.665	Lt.	W1-8L & W1-8R	0.56
50+880.218	Lt.	W1-8L & W1-8R	0.56
50+920.770	Lt.	W1-8L & W1-8R	0.56
50+961.322	Lt.	W1-8L & W1-8R	0.56
51+001.875	Lt.	W1-8L & W1-8R	0.56
51+082.979	Lt.	W1-8L & W1-8R	0.56
51+123.532	Lt.	W1-8L & W1-8R	0.56
51+164.084	Lt.	W1-8L & W1-8R	0.56
51+204.636	Lt.	W1-8L & W1-8R	0.56
51+245.189	Lt.	W1-8L & W1-8R	0.56
51+285.741	Lt.	W1-8L & W1-8R	0.56
PT 51+326.293	Lt.	W1-8L	0.28
PC 51+396.570	Rt.	W1-8L	0.28
51+429.361	Rt.	W1-8L & W1-8R	0.56
51+462.153	Rt.	W1-8L & W1-8R	0.56
51+494.944	Rt.	W1-8L & W1-8R	0.56
51+527.736	Rt.	W1-8L & W1-8R	0.56
51+593.319	Rt.	W1-8L & W1-8R	0.56
51+626.111	Rt.	W1-8L & W1-8R	0.56
51+660.000	Rt.	W1-8L & W1-8R	0.56
51+724.485	Rt.	W1-8L & W1-8R	0.56
PC 53+994.556	Rt.	W1-8L	0.28
54+030.000	Rt.	W1-8L & W1-8R	0.56
54+073.088	Rt.	W1-8L & W1-8R	0.56
54+151.621	Rt.	W1-8L & W1-8R	0.56
54+190.887	Rt.	W1-8L & W1-8R	0.56
54+240.000	Rt.	W1-8L & W1-8R	0.56
54+274.000	Rt.	W1-8L & W1-8R	0.56
PT 54+347.951	Rt.	W1-8R	0.28
		TOTAL	39.48

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

DELINEATORS & OBJECT MARKER LAYOUT DETAIL & QUANTITY TABLES

DRAWN BY: NRDOT	DATE: 1/24/2013
DESIGNED BY: NRDOT	DATE: 1/24/2013
REVISED: 5/28/2013	BY: Leroy.Toledo
Sht 66 N12 DelinObjMkr Table.dgn	

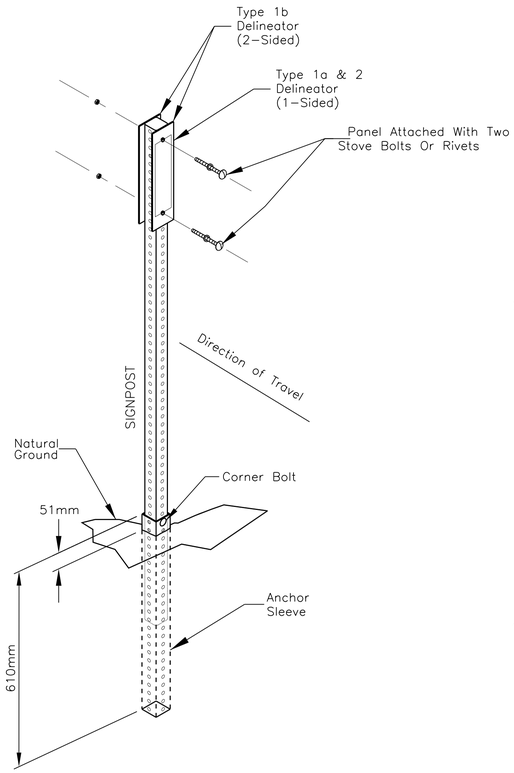
I:\DESIGN\Users\DESIGN3\CURRENT PROJECTS\N35_Chinle\N12(19-4)\DESIGN DATA_020315\CADD Files\Sht 66 N12 DelinObjMkr Table.dgn

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	67	88

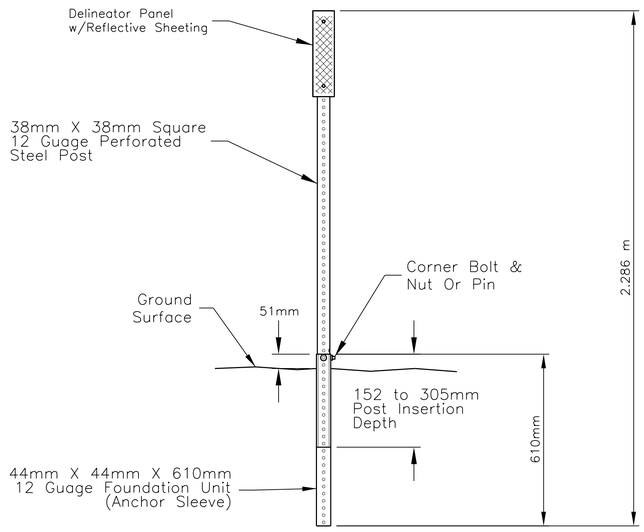
GENERAL NOTES

1. ALL CONCRETE SHALL BE CLASS A(AE) AND SHALL CONFORM TO SECTION 601 OF THE FP-14. FURNISHING AND PLACING OF CONCRETE, WHEN REQUIRED, SHALL BE CONSIDERED INCIDENTAL TO ITEMS 63308-2000, 63309-0010, AND 63309-0020.

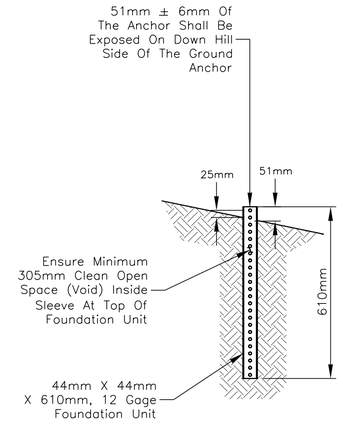
2. THE CONTRACTOR SHALL USE SQUARE STEEL TUBE HIGHWAY DELINEATORS. THE COST OF SUPPLYING MATERIALS AND INSTALLATION SHALL BE INCLUDED IN THE UNIT PRICE BID UNDER ITEMS 63308-2000, 63309-0010, AND 63309-0020. SEE SHEET 63 FOR POST SPACING.



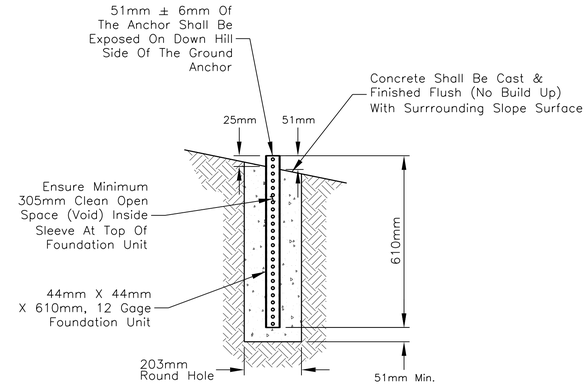
ISOMETRIC VIEW



ALTERNATE ASSEMBLY

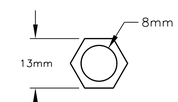


IN-GROUND DRIVEN

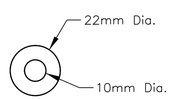


IN-GROUND CONCRETE

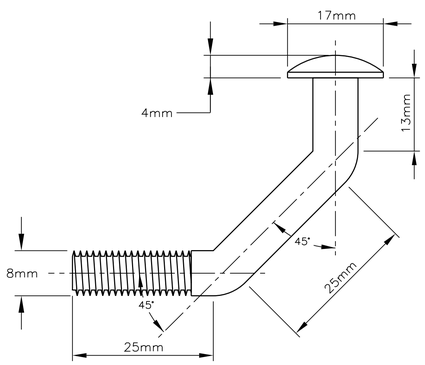
Note: Use Chair Device To Ensure
Minimum 51mm Clearance
Above Bottom Of Hole



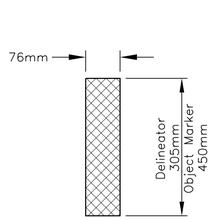
LOCK NUT



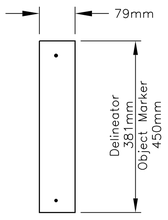
FLAT WASHER



BREAK-AWAY BOLT

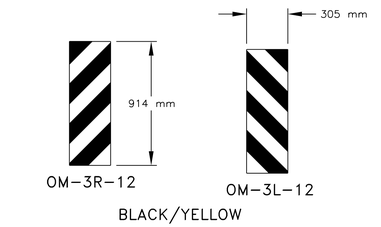


REFLECTIVE SHEETING

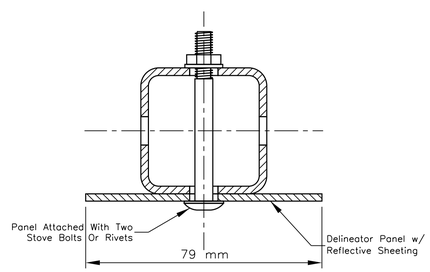


DELINEATOR PANEL
(Pre-Drilled/Punched)

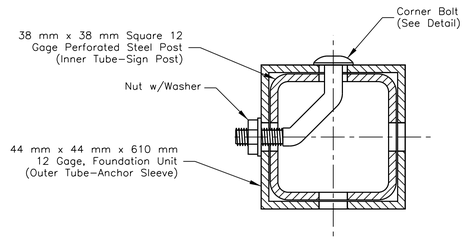
TYPE	POST	HIGH INTENSITY REFLECTIVE SHEETING
1a	SQ. TUBE	WHITE, ONE SIDE
1b	SQ. TUBE	WHITE, BOTH SIDES
2	SQ. TUBE	AMBER, ONE SIDE



TYPE-3 OBJECT MARKER



SQUARE TUBE POST AND PANEL



"BREAK-AWAY" DETAIL
SIGN POST/SLEEVE INTERFACE

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

SQUARE TUBE STEEL POST
REFLECTIVE PANEL
DELINEATOR DETAILS

DRAWN BY: NRDOT	DATE: 1/31/2013
DESIGNED BY: NRDOT	DATE: 1/31/2013
REVISED: 5/28/2013	BY: Leroy.Toledo
Sht 67 N12 DelinObjMkr detail.dgn	

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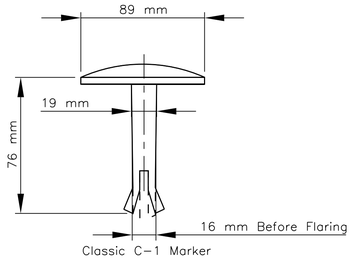
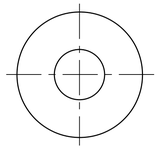
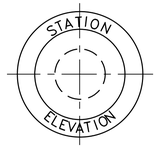
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	68	88



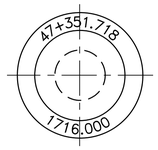
BRASS CAP DETAIL



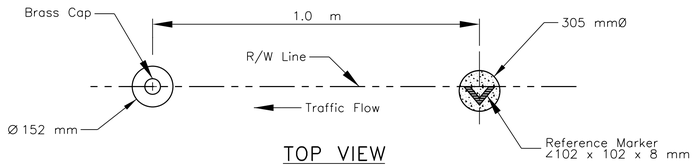
BOTTOM VIEW



TOP VIEW



EXAMPLE



TOP VIEW

ITEM 62101-0000; RIGHT-OF-WAY MONUMENT
ITEM 62102-0000; REFERENCE MARKER

Station	Description	Location		ROW Monument	Reference Marker
		Right	Left		
38+770.609	PC 1	22.86 m	22.86 m	2	2
39+182.754	PT 1	22.86 m	22.86 m	2	2
39+362.443	PC 2	22.86 m	22.86 m	2	2
39+621.326	PT 2	22.86 m	22.86 m	2	2
39+621.326	PT 2	30.48 m	30.48 m	2	2
39+725.889	PC 3	30.48 m	30.48 m	2	2
39+725.889	PC 3	22.86 m	22.86 m	2	2
39+973.658	PT 3	22.86 m	22.86 m	2	2
40+416.225	PC 4	22.86 m	22.86 m	2	2
40+659.245	PT 4	22.86 m	22.86 m	2	2
41+009.187	PC 5	22.86 m	22.86 m	2	2
41+167.687	PT 5	22.86 m	22.86 m	2	2
41+208.829	PC 6	22.86 m	22.86 m	2	2
41+647.676	PT 6	22.86 m	22.86 m	2	2
41+810.307	PC 7	22.86 m	22.86 m	2	2
43+162.824	PT 7	22.86 m	22.86 m	2	2
44+084.674	PC 8	22.86 m	22.86 m	2	2
44+279.804	PT 8	22.86 m	22.86 m	2	2
44+667.499	PC 9	22.86 m	22.86 m	2	2
45+123.576	PT 9	22.86 m	22.86 m	2	2
46+494.955	PC 10	22.86 m	22.86 m	2	2
48+226.945	PT 10	22.86 m	22.86 m	2	2
48+794.666	PC 11	22.86 m	22.86 m	2	2
49+587.000	PT 11	22.86 m	22.86 m	2	2
49+600.000	POT	22.86 m	22.86 m	2	2
49+600.000	POT	30.48 m	30.48 m	2	2
49+700.000	POT	30.48 m	30.48 m	2	2
49+700.000	POT	22.86 m	22.86 m	2	2
50+799.113	PC 12	22.86 m	22.86 m	2	2
51+326.293	PT 12	22.86 m	22.86 m	2	2
51+396.570	PC 13	22.86 m	22.86 m	2	2
51+757.277	PT 13	22.86 m	22.86 m	2	2
52+250.826	PC 14	22.86 m	22.86 m	2	2
52+314.807	PT 14	22.86 m	22.86 m	2	2
53+003.494	PC 15	22.86 m	22.86 m	2	2
53+340.123	PT 15	22.86 m	22.86 m	2	2
53+994.556	PC 16	22.86 m	22.86 m	2	2
54+347.951	PT 16	22.86 m	22.86 m	2	2
54+393.830	PC 17	22.86 m	22.86 m	2	2
55+702.003	PT 17	22.86 m	22.86 m	2	2
			Total?	80	80

GENERAL NOTES

1.. Survey monuments and reference markers shall be placed as shown on the plans or as director by COR/COTR. 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 Monument and reference Marker, drill a 152 mm Ø for survey monument and 305 mm Ø for reference marker hole in the rock to the depth required to install the monument and marker to full depth. All holes drilled into rock material shall be considered incidental to the completion of the work and no additional payment shall be made thereof.

3. Brass caps for the survey monument 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. Furnishings and placement of concrete shall be considered incidental to Items 62101-0000 & 62102-0000.

5. Roadway stationing and elevations shall be stamped on all brass caps by the Contractor after installation, unless otherwise directed in writing by the COR/COTR.

6. The Contractor shall be required to paint the reference markers per Section 708 and subsection 708.04 of FP-14:

   a) Prime coat entire steel material and shall conform to subsection 708.04(a) or (b) of FP-14.

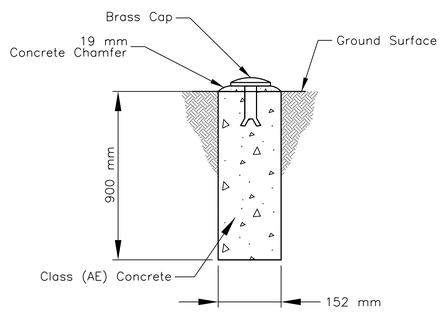
   b) Coat white finish of paint the tip 762 mm and shall conform to subsection 708.04(c), (d), or (e) of FP-14.

   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 COR/COTR.

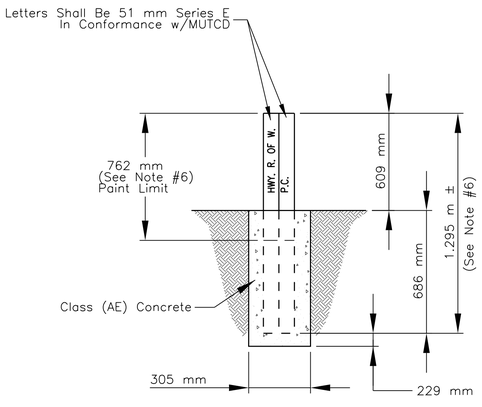
7. The Contractor has the option to use an approved State Highway paint specifications in lieu of that stated in Note (6) above. The Contractor shall submit (in writing) the paint specifications and request for use on the project at least 14 days in advance of the paint use for review and approval. The contractor shall not be allowed to use any paint until the proper approval has been given by the COR/COTR. 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 steel U-channel shall be included in the unit price bid under Items 63308-2000, 63309-0010, and 63309-0020.

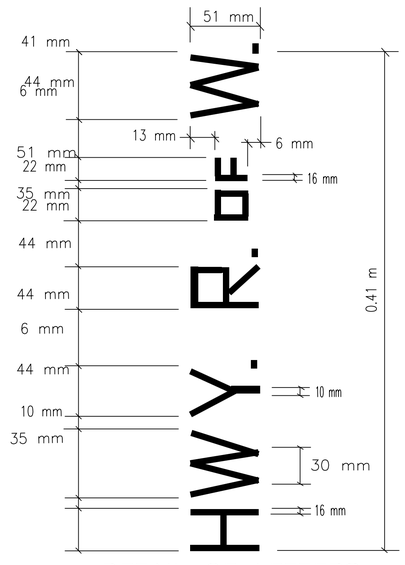
9. Set Right-Of-Way monument at station and offset to match the Right-Of-Way plat. These locations may vary from the stations and offsets shown on the construction plan and profile sheets



SURVEY MONUMENT
NTS



REFERENCE MARKER
NTS



DETAIL OF LETTERS

R/W MONUMENT SYMBOL

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

RIGHT-OF-WAY & REFERENCE MARKERS DETAIL

DRAWN BY: NRDOT	DATE: 2/3/2014
DESIGNED BY: NRDOT	DATE: 2/3/2014
REVISED: 6/1/2015	BY: Leroy.Toledo
Sht 68 N12 ROW Mkr.dgn	

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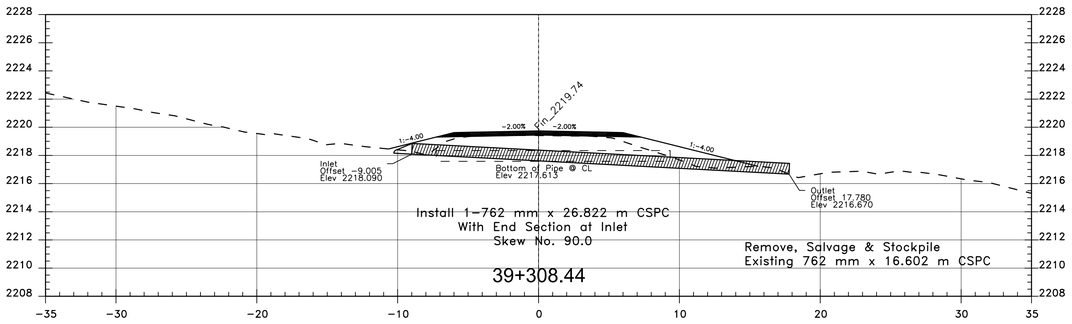
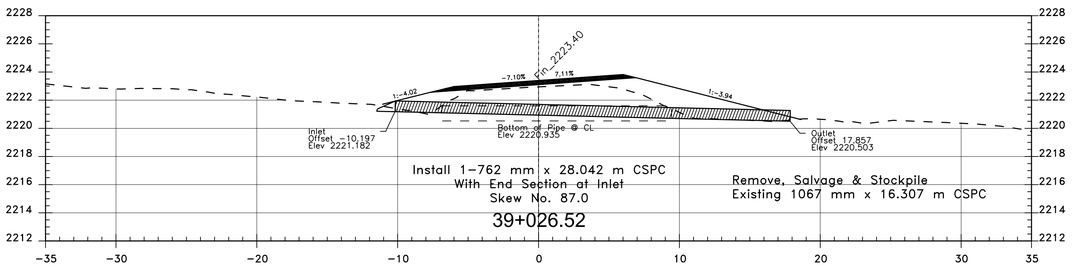
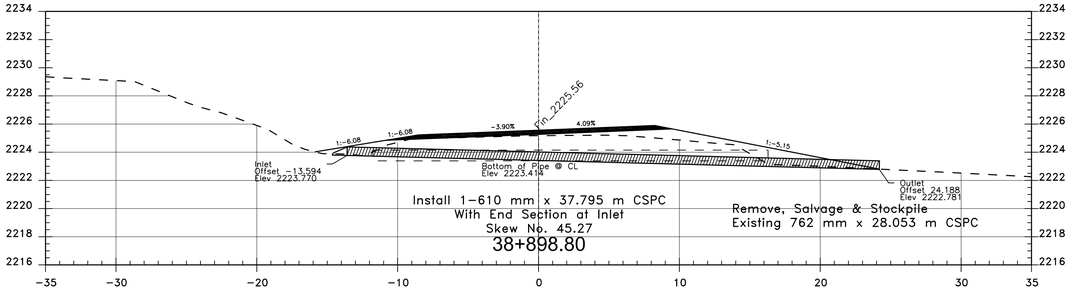
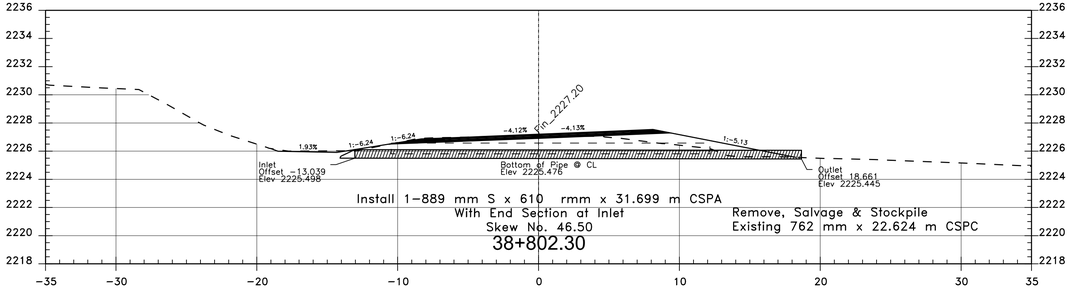
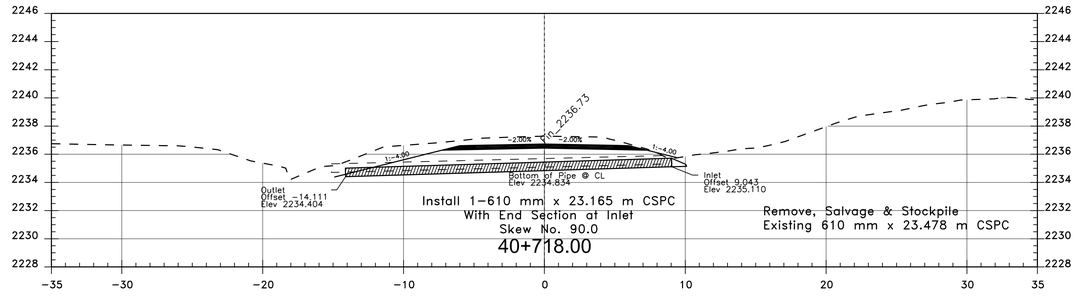
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	69	88

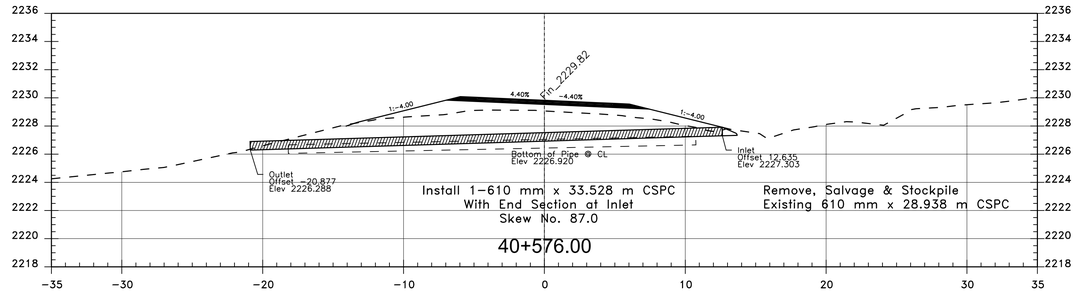


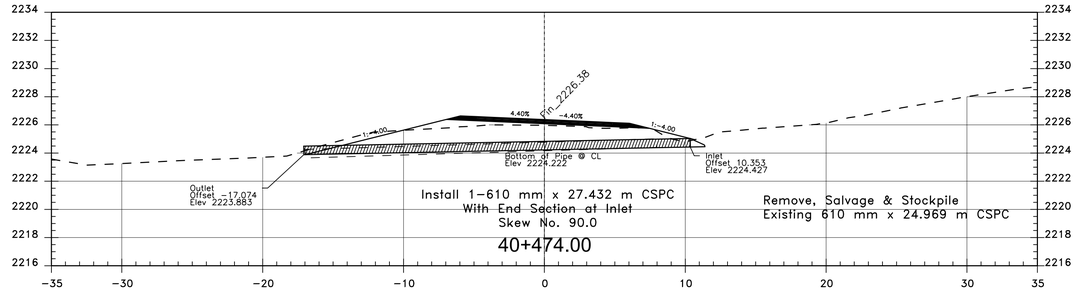


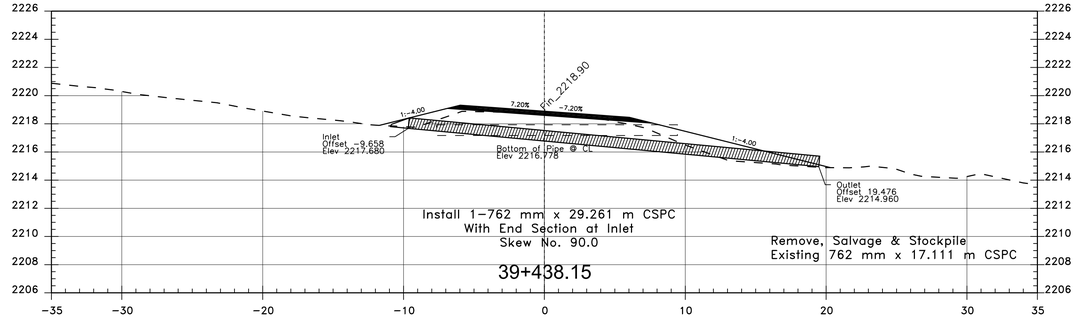




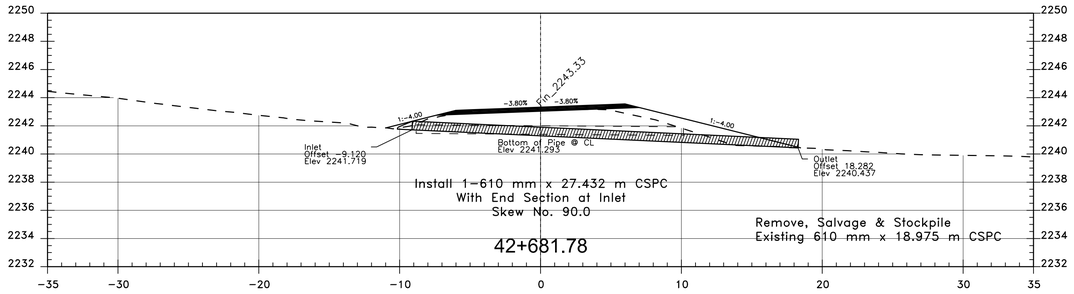


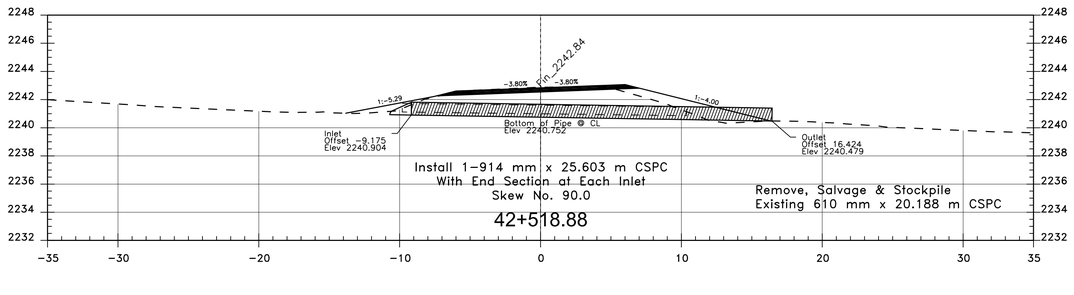


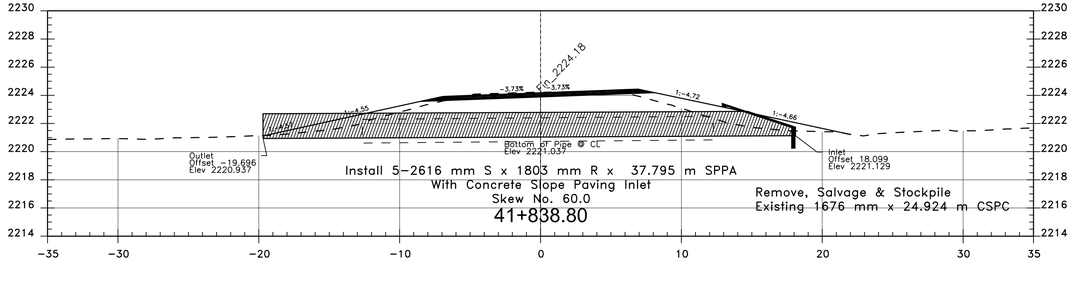


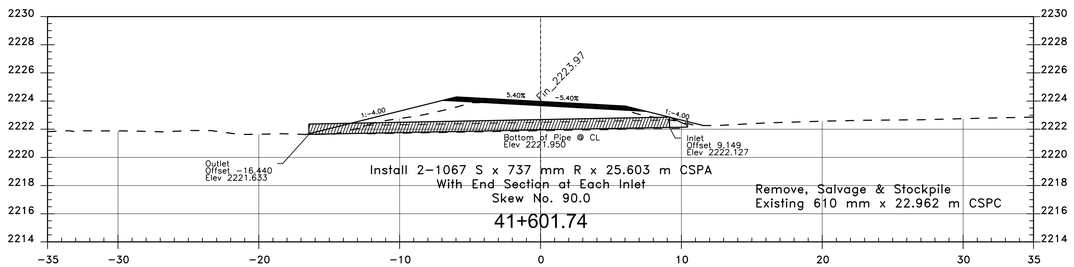


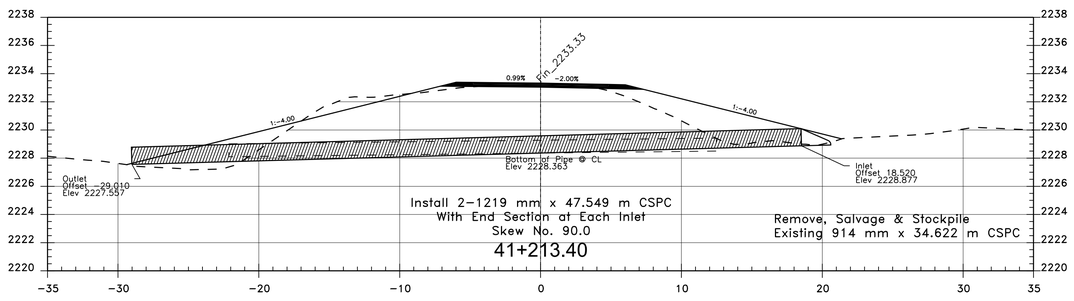
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	70	88

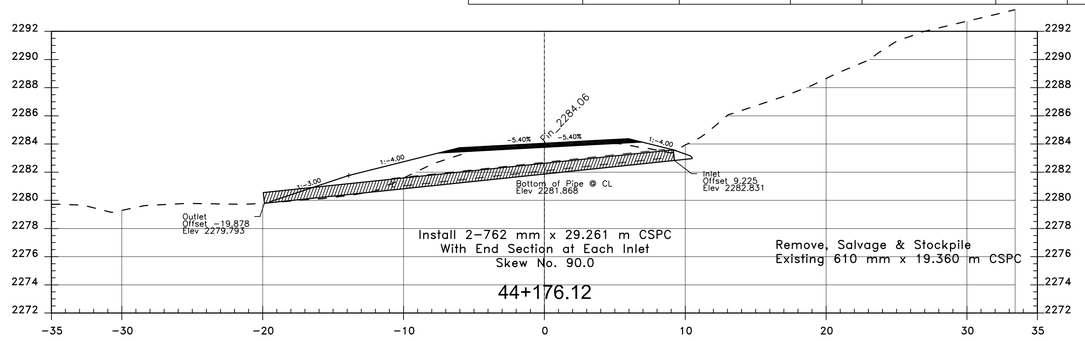


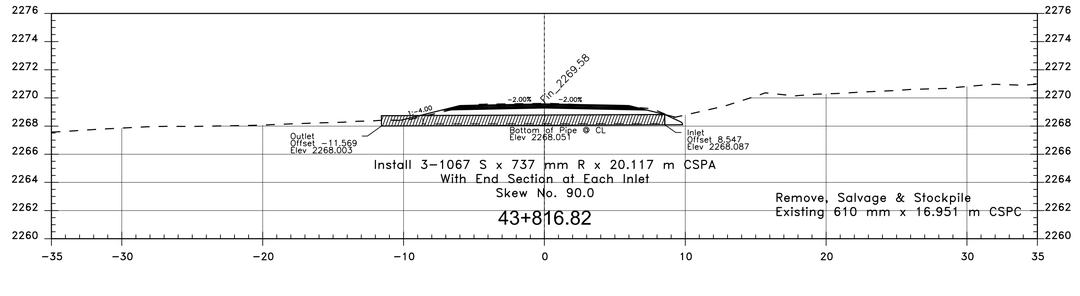


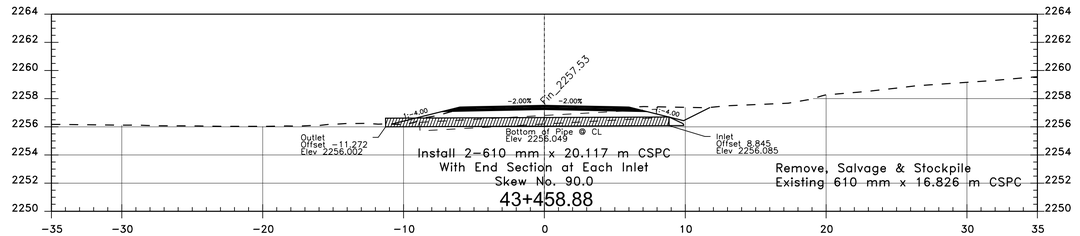


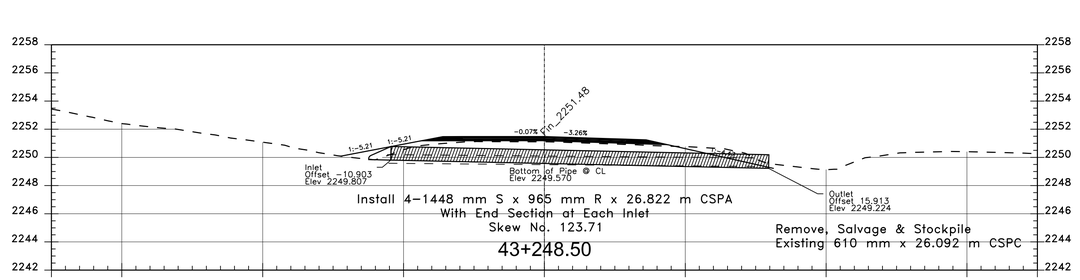


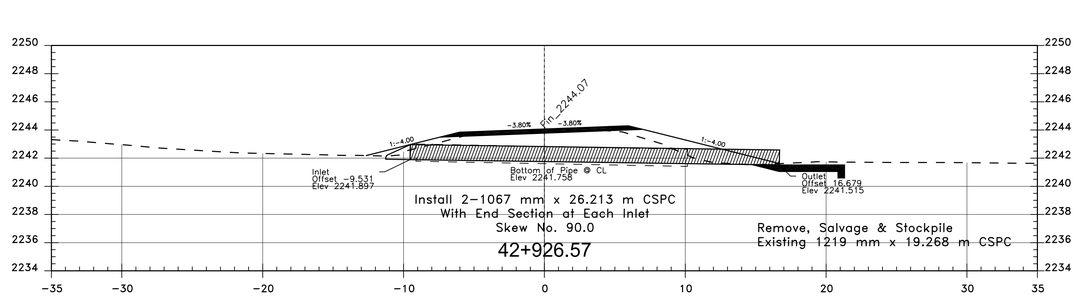




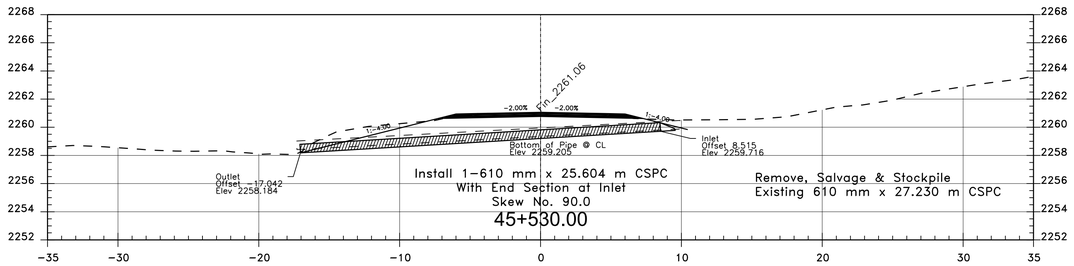


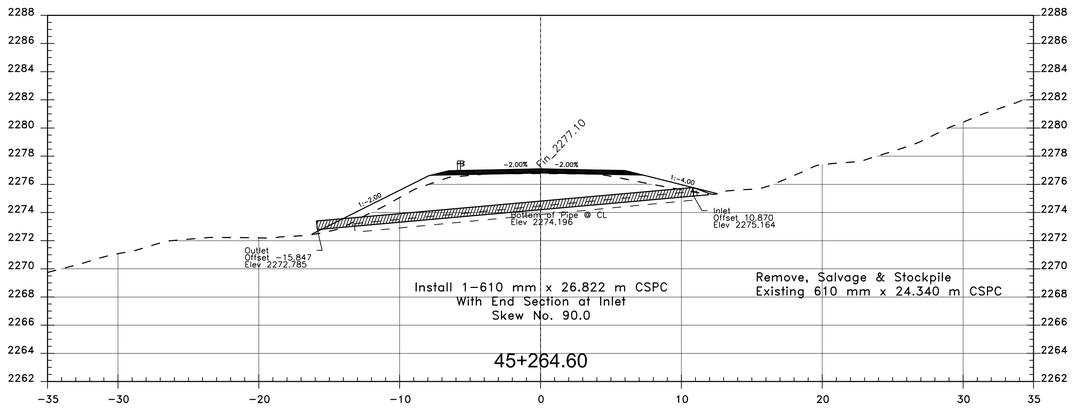


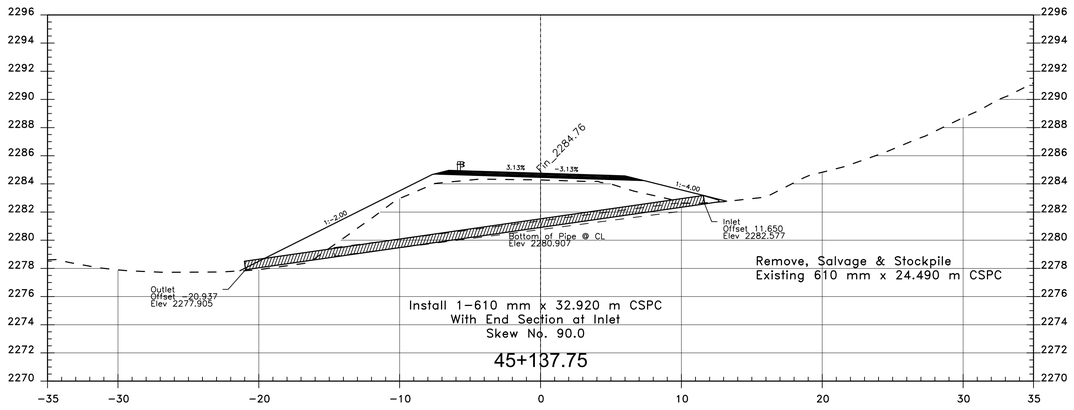


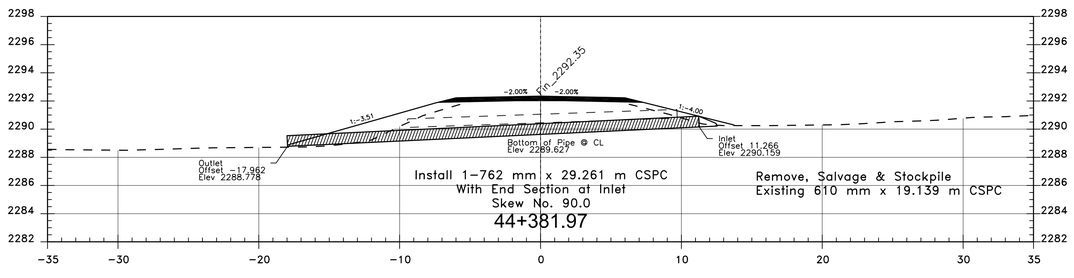


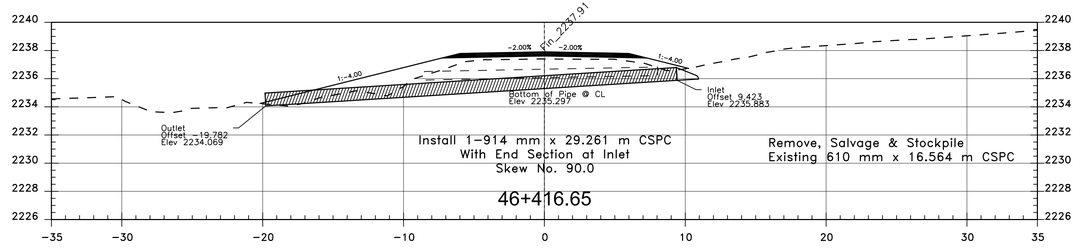
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	71	88

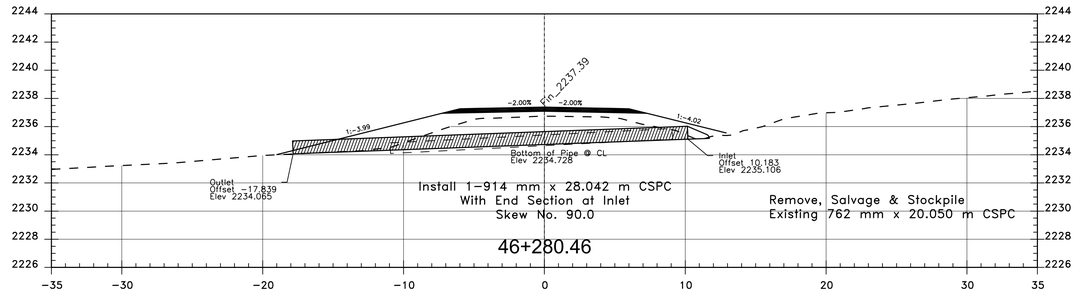


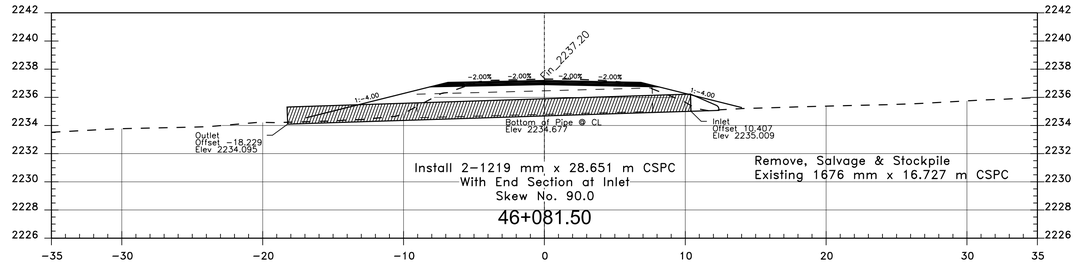


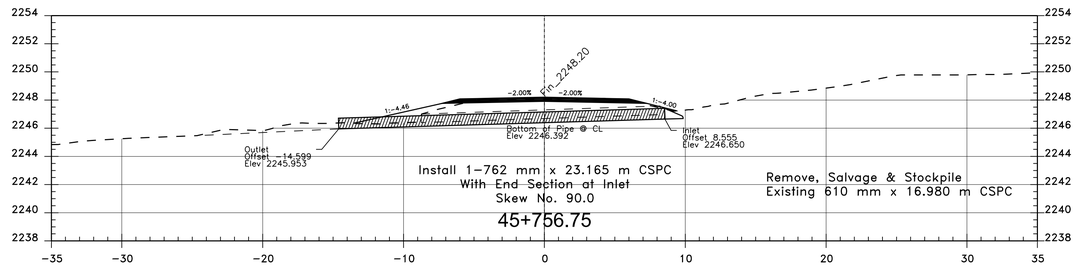


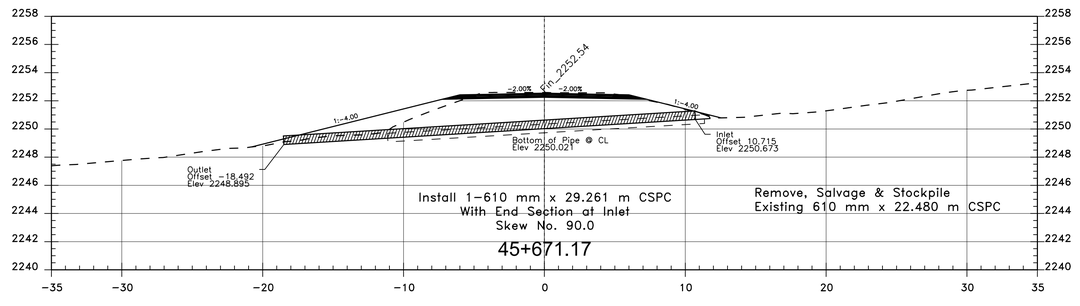












REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
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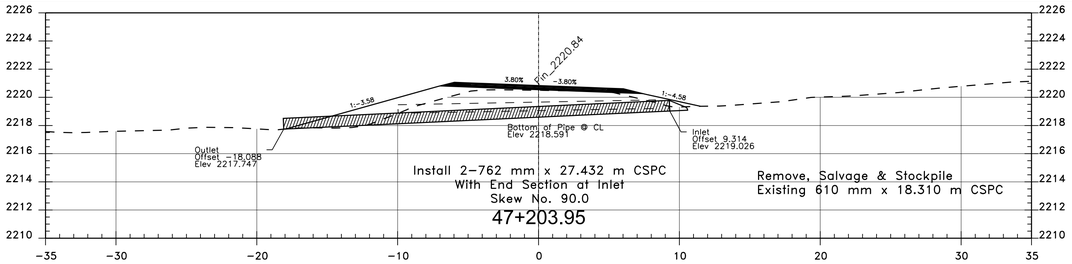
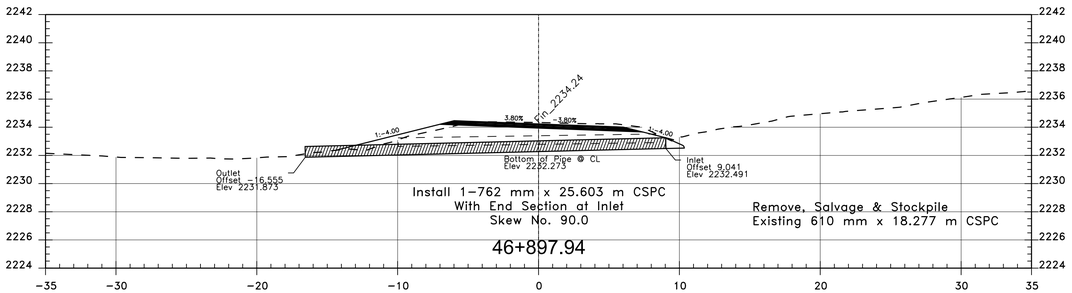
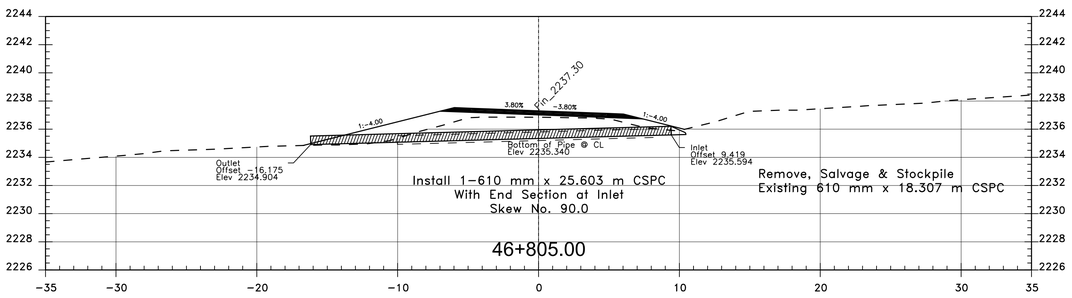
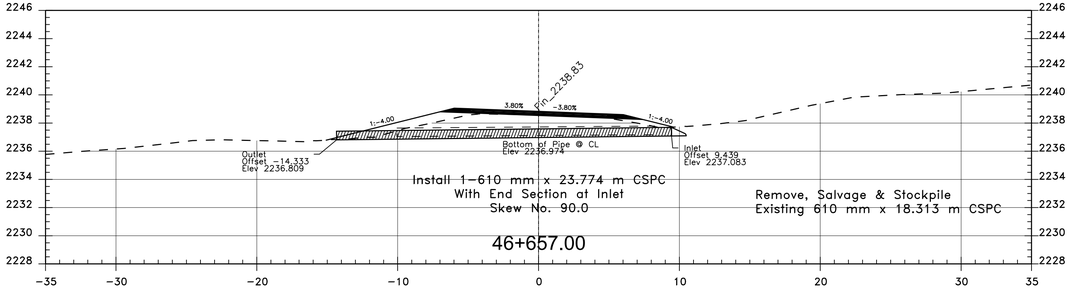
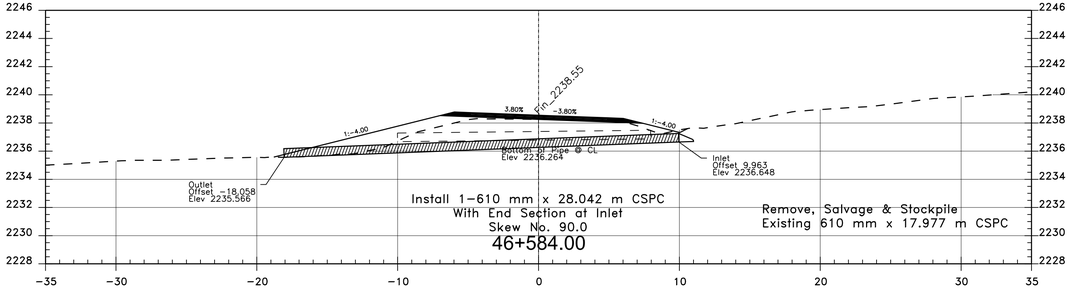
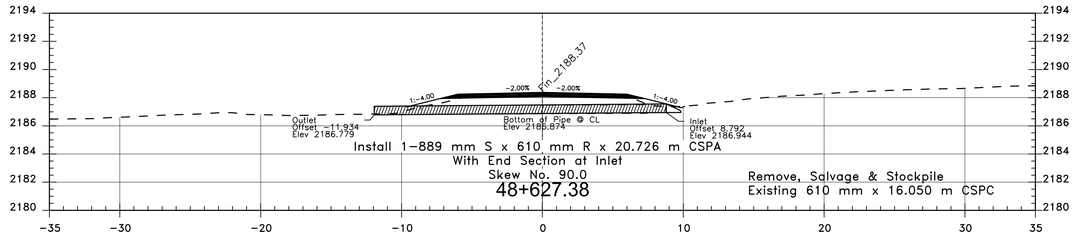


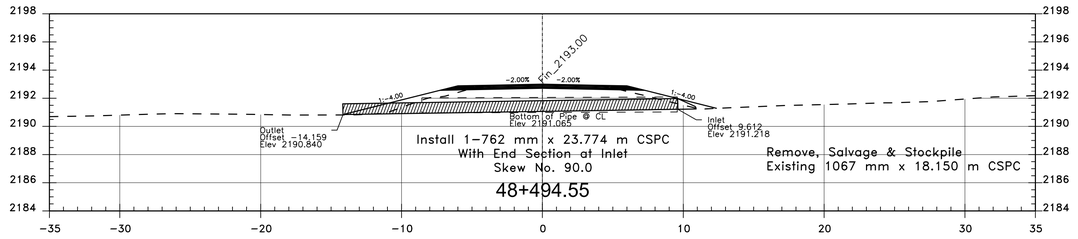


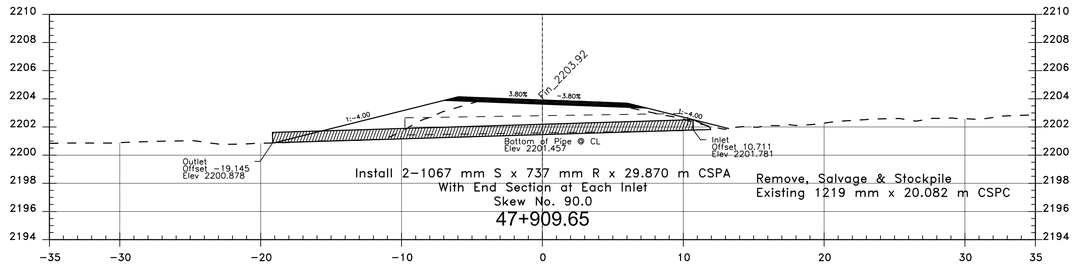


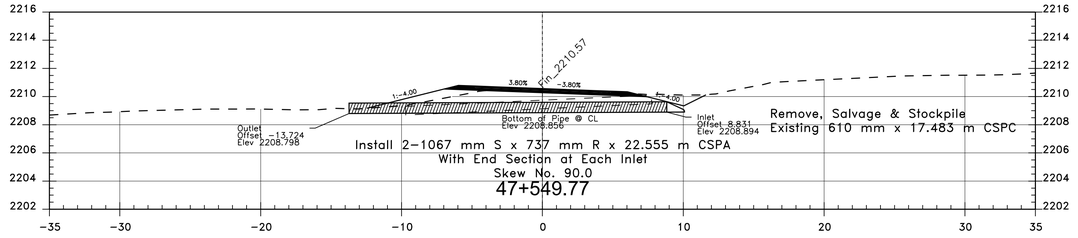


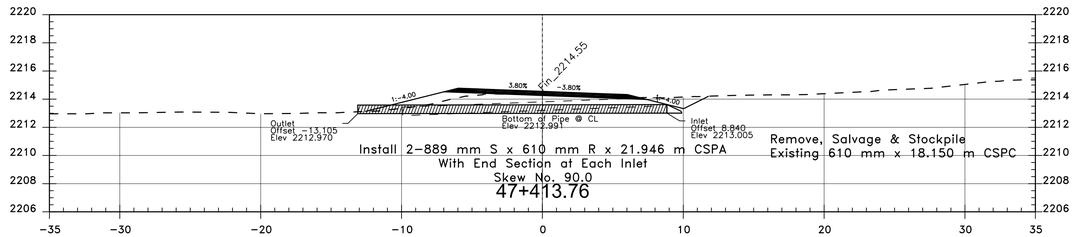




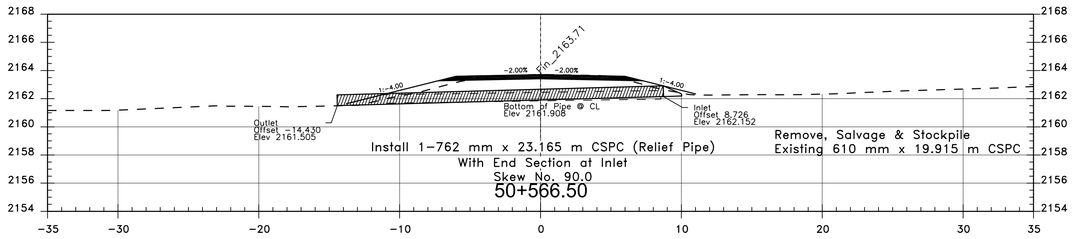


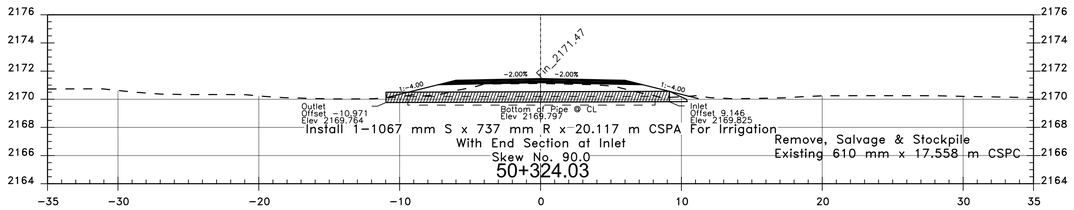


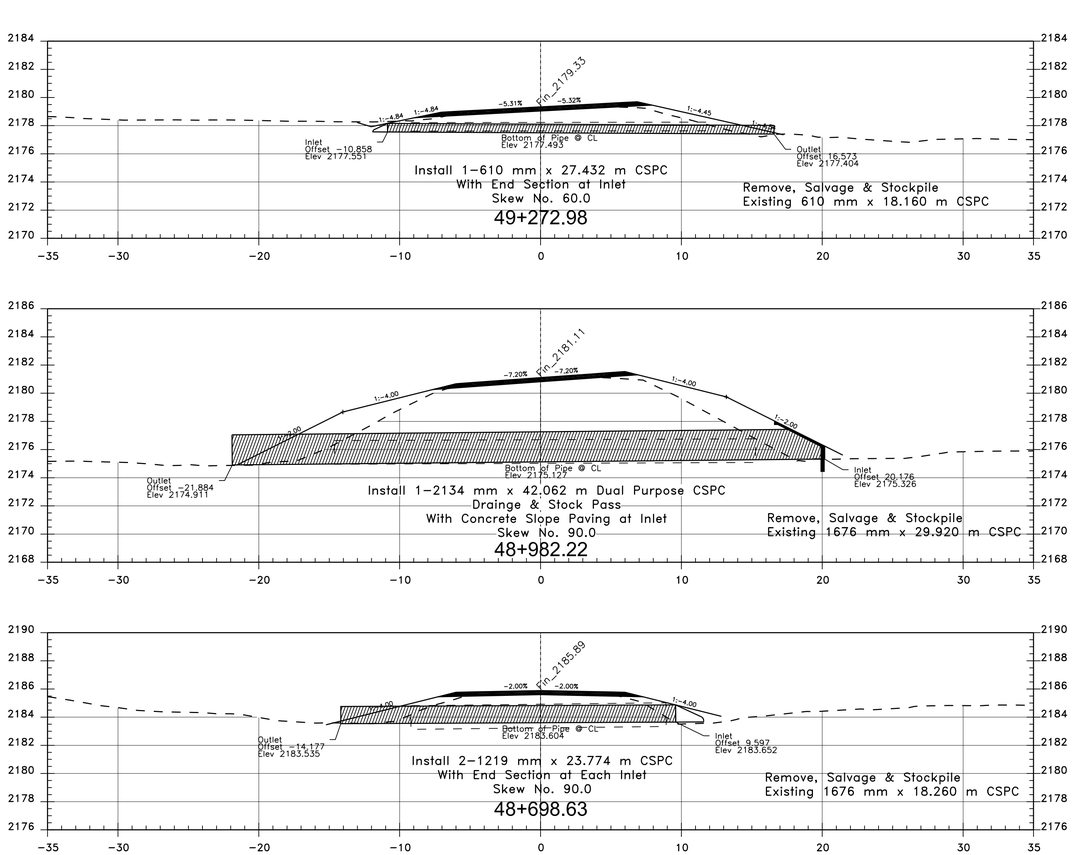


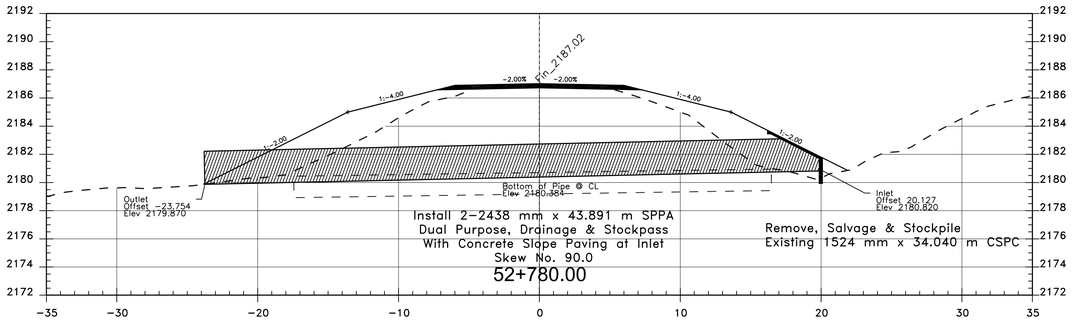


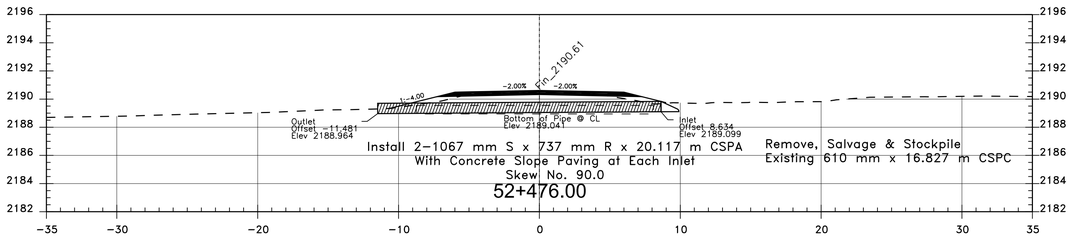
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	73	88

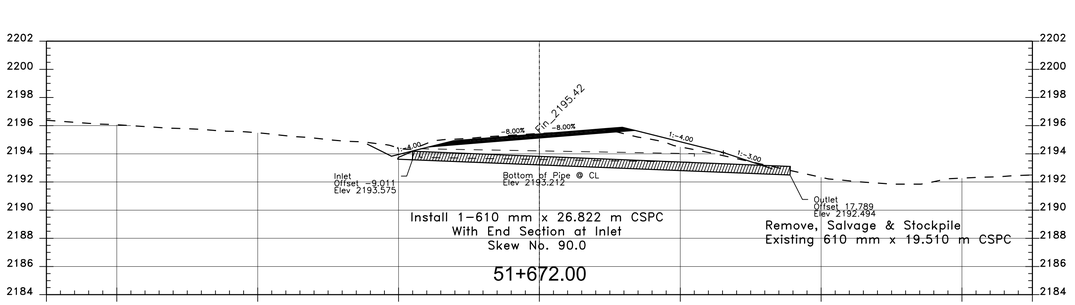


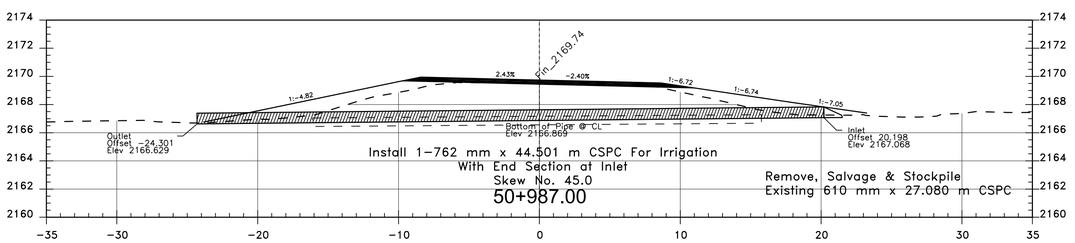


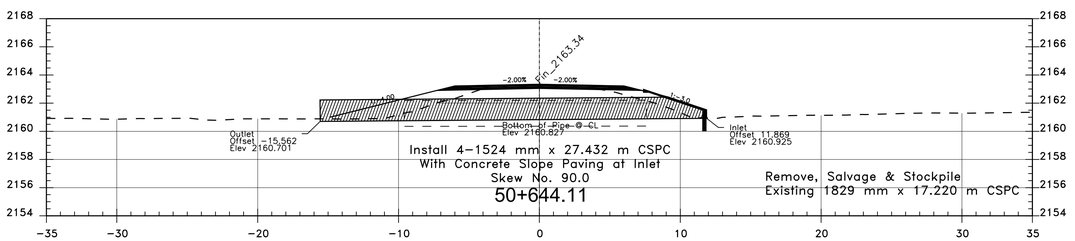




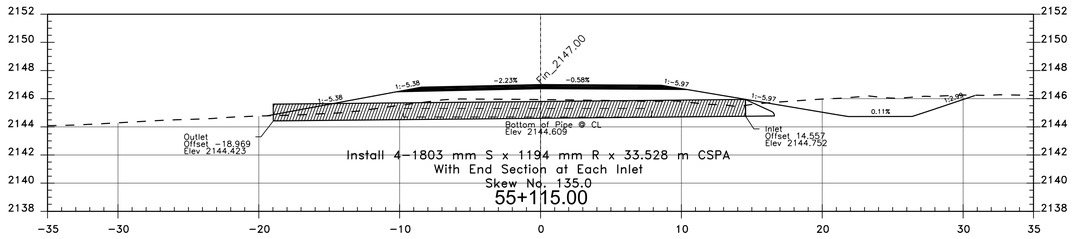


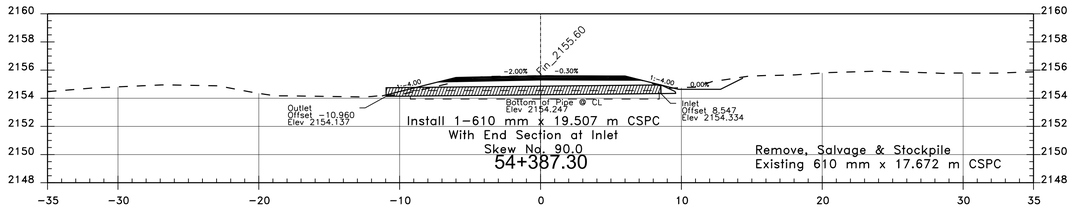


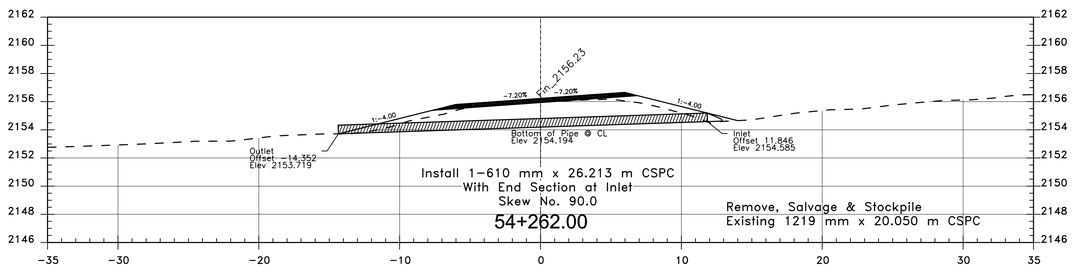


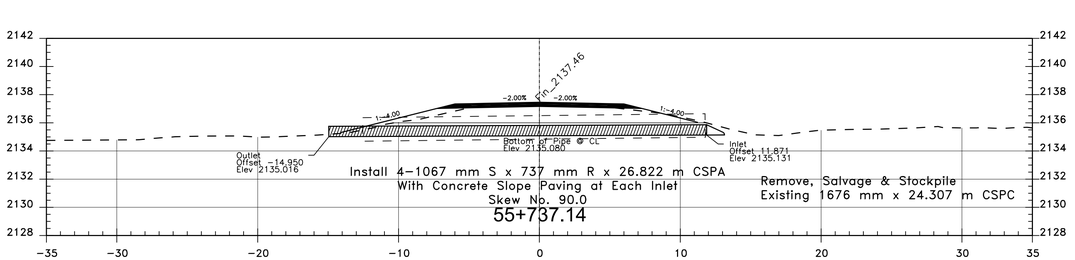


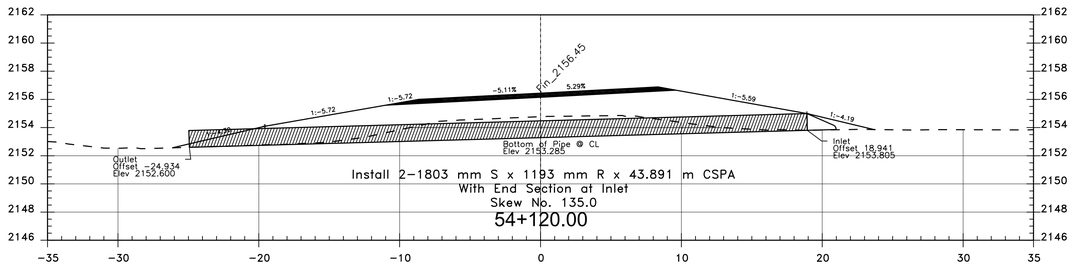
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	74	88

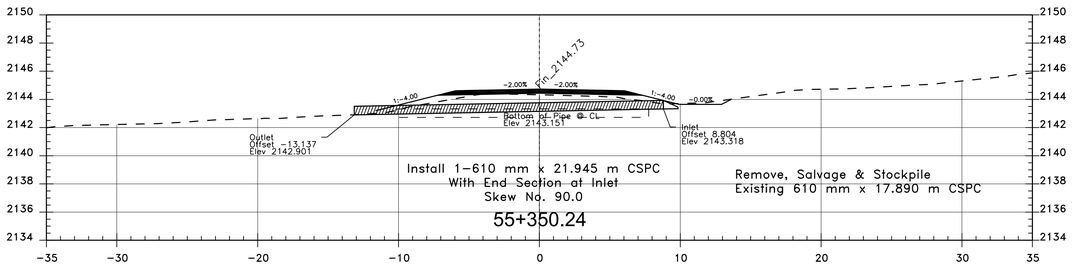


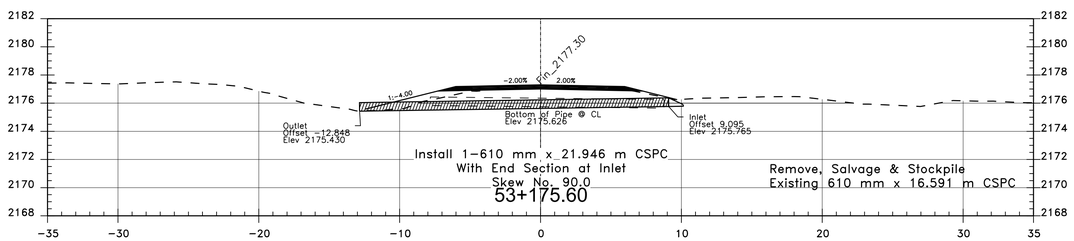


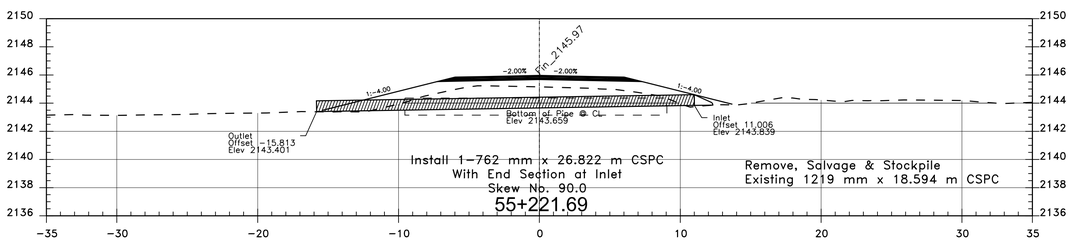












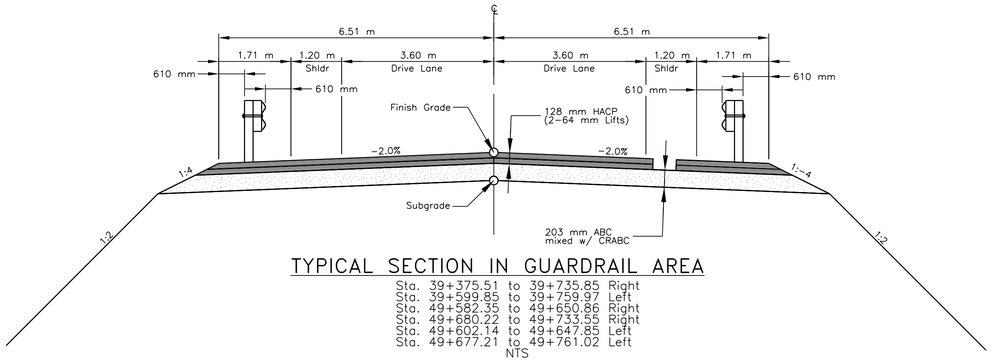
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	B-01	88

BRIDGE N504 REPLACEMENT
BRIDGE AND ROADWAY ESTIMATED QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
20304-1000	Removal of Structures and Obstructions	All Req'd	L.S.
20801-0000	Structure Excavation	832.00	cu/m
20803-0000	Structure Backfill	386.00	cu/m
55101-2200	660mm ø Steel Pipe Pile, in place Bridge N504	355.00	m
55115-1000	Preboring of Piles	251.00	m
55201-0200	Structural Concrete, Class A(AE)	231.00	cu/m
55401-1000	Reinforcing Steel	10,530.00	kg
60225-1000	17.374 m Span, 3.249 m Rise, 28.042 m Long Precast Conc. Arch	23	each
63308-3000	Object Marker, Type 3, Square Steel Tube, 1- 38 mm x 38 mm	4	ea.

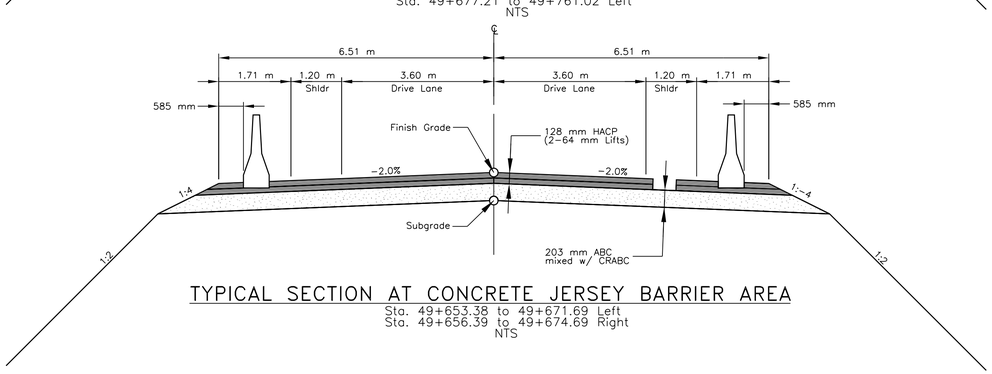
BRIDGE N505 REPLACEMENT
BRIDGE AND ROADWAY ESTIMATED QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
20304-1000	Removal of Structures and Obstructions	All Req'd	L.S.
20801-0000	Structure Excavation	551.00	cu/m
20803-0000	Structure Backfill	217.00	cu/m
55201-0200	Structural Concrete, Class A(AE)	101.00	cu/m
55401-1000	Reinforcing Steel	12,357.00	kg
60225-1000	17.374 m Span, 3.249 m Rise, 25.603 m Long Precast Conc. Arch	21	each
61801-0000	Concrete Jersey Barrier, with transition barrier, Bridge N505	36.58	m
63308-3000	Object Marker, Type 3, Square Steel Tube, 1- 38 mm x 38 mm	4	ea.



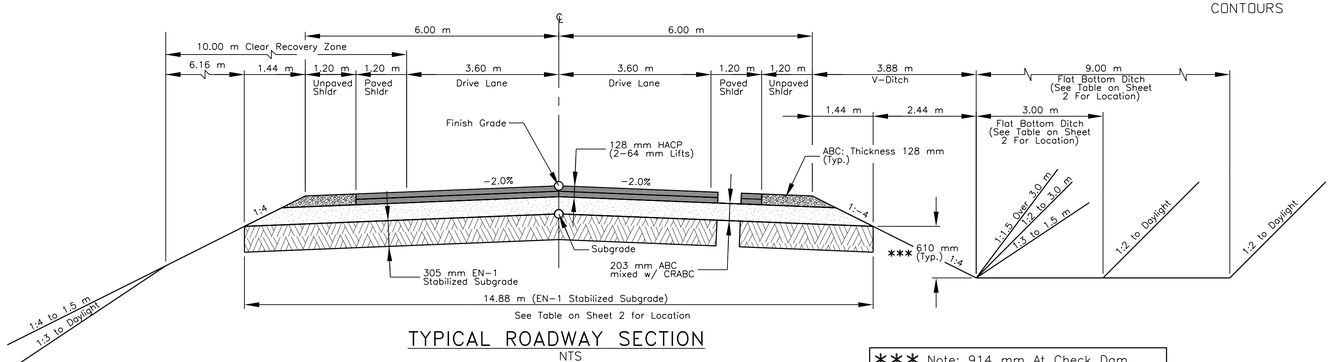
TYPICAL SECTION IN GUARDRAIL AREA

Sta. 39+375.51 to 39+735.85 Right
Sta. 39+599.85 to 39+759.97 Left
Sta. 49+582.35 to 49+650.86 Right
Sta. 49+680.22 to 49+733.55 Right
Sta. 49+602.14 to 49+647.85 Left
Sta. 49+677.21 to 49+761.02 Left
NTS



TYPICAL SECTION AT CONCRETE JERSEY BARRIER AREA

Sta. 49+653.38 to 49+671.69 Left
Sta. 49+656.39 to 49+674.69 Right
NTS



TYPICAL ROADWAY SECTION
NTS

*** Note: 914 mm At Check Dam Location. See Sheet 61 of 86 For Check Dam Details

GENERAL NOTES

SPECIFICATIONS: Design: AASHTO LRFD Bridge Design Specifications, 5th Ed., 2010 Construction: Standard Specifications For Construction Of Roads and Bridges on Federal Highway Projects, FP-14 and Supplemental Specifications.

UNITS: This project has been designed and drawn using the SI (metric) system of units. Unless otherwise noted, all values are given in their respective metric units.

DESIGN LOADS: Dead Loads: Concrete = 23.56 kN/m^3, Backfill Earth Pressure = 9.42 kN/m^3. Live Loads: HS 20-44 plus impact. Impact = 15/(L+38) where L=Span length in meters. Maximum Impact factor = 0.30.

DESIGN & CONSTRUCTION: Material strengths are F'c=27.6 MPa for reinforced concrete, Fy=413.7 MPa for reinforcing steel.

REINFORCING STEEL: All reinforcing steel shall conform to AASHTO M31M, Grade 420. The minimum cover of any reinforcing steel shall be 50 mm unless otherwise specified. Unless otherwise specified, exposed concrete edges shall have a 20 mm chamfer.

SIGNING: All permanent, temporary signs and coding shall be placed in accordance with the Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways 1988 Edition and amendments, and in accordance with these plans where applicable.

TEMPORARY TRAFFIC CONTROL: The Contractor will be required to submit a Temporary Traffic Control Plan (TCP) to the COR for review and approval prior to performance of the Contract. This plan shall be in accordance with the Supplemental Specifications and details shown on these plans and the MUTCD with amendments. The quantities shown for the TCP may vary depending upon the plan submitted by the Contractor, at his own option, and in accordance with Supplemental Specifications for Section 635, Temporary Traffic Control. The TCP shown on these plans is considered as a guide only.

TRASH/CONST. DEBRIS: The Contractor shall assume full responsibility and expense for all disposal and/or construction debris in accordance with Section 107 of the FP-14.

SITE FAMILIARIZATION: The contractor shall read and make careful examination of the plans, specifications, quantities, materials, and visit the site proposed construction to become familiar with the site conditions and limitations before making a proposal. The bidder 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.

ESTIMATED QUANTITIES: The quantities shown are for estimating purposes only and to compare and canvas bids. Actual quantities will be determined in the field during construction.

UTILITIES: The Contractor shall take all necessary precautions during construction to prevent damage to any utilities whether shown on the plans or not. The Contractor shall be required to contact the utility owners to establish the exact locations of any utilities in relation to the project prior to beginning of construction.

REMOVAL OF EXISTING The Contractor shall stock pile salvageable material within the project limits for removal by the Agency Road Engineer. All other material shall be removed from the project site in accordance with project specifications. Remove existing piling to 1.00 m below flowline elevation.

DRAINAGE CHANNELS: BRIDGE: All drainage channels, including shoulder ditch lines, shall be graded to drain as directed by the COR. This work shall be considered a subsidiary obligation of the Contractor, and no additional payment will be made.

MAINTAINING ACCESS: The Contractor shall be required to maintain access to adjoining property at all times day or night, where access is already present.

EXCAVATION AND: PREPARATION Excavation and preparation for foundation bed shall be paid for under item 20801, Structure Excavation. Backfilling of structure shall be considered incidental to item 20801.

Foundation bed shall be on bedrock (sandstone) per Section 208.09 of the FP-14. If unsuitable bedrock or soil exists at the elevations of the bottom of footing, remove unsuitable material at the direction of the COR and place seal concrete in conformance with Section 552 of the FP-14 to the required elevation of the bottom of footing.

SEAL CONCRETE: Seal concrete, if necessary shall be paid for under item 55204, Seal Concrete. If suitable bed rock is encountered for ALL foundation bedding, seal concrete will not be required.

FOUNDATION: CONSTRUCTION Foundation construction to the tops of the raised seat, including concrete, reinforcing steel, forming and other work as specified in Section 601 of the FP-14 shall be paid for under item 60101, Minor Concrete. Concrete for foundations, including raised seat, shall be air entrained with 28 day compressivestrength of 27.6 MPa.

EXISTING GROUND: CONTOURS Existing ground contours upstream, downstream and within precast reinforcing concrete arch (PRCA) culvert shall be maintained throughout construction to the maximum extent possible. Excavation plan-area limits shall be kept to the smallest area possible while maintaining applicable excavation work area requirements for the safety of workers. Any disturbance of existing ground contours upstream, downstream and within PRCA culvert shall be re-graded to preconstruction conditions and seeded prior to project completion.

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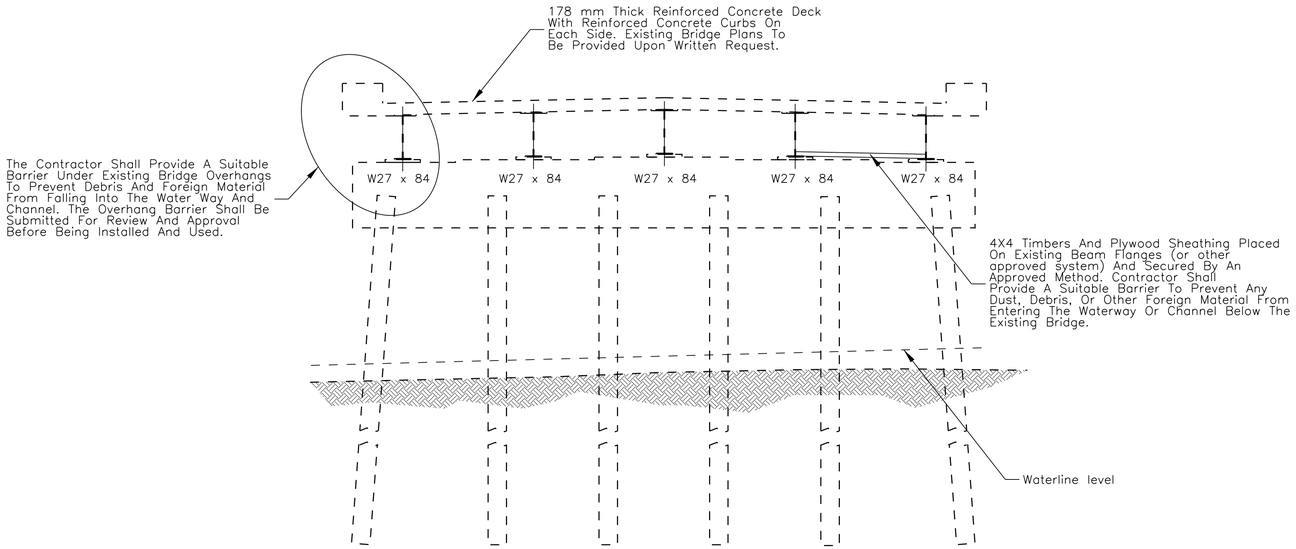
NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

GENERAL NOTES
ESTIMATED QUANTITIES

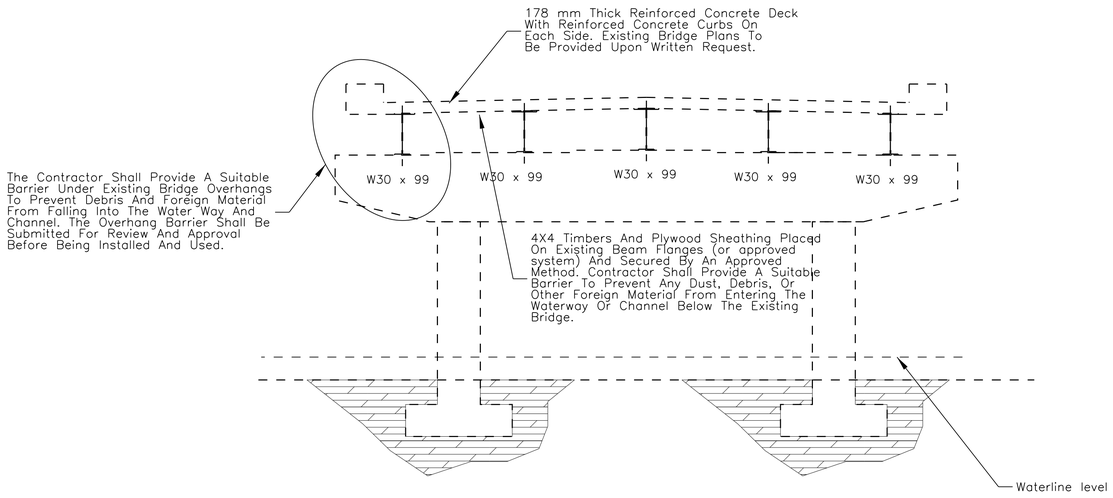
DRAWN BY: NRDOT	DATE: 2/23/2018
DESIGNED BY: NRDOT	DATE: 2/23/2018
REVISED: 3/15/2018	BY: Leroy.Toledo

Sht 75_B-01 N504 n N505 GENOTES n QTYS 2018-02-15.dgn

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	B-02	88



EXISTING BRIDGE N504 - STA. 39+667.00



EXISTING BRIDGE N505 - STA. 49+665.69

GENERAL NOTES

1. EXISTING BRIDGE CONCRETE DECK TO BE REMOVED FROM THE TOP OF THE BRIDGE IN SECTIONS. THE CONTRACTOR SHALL CONSTRUCT A DUST AND PARTICAL BARRIER BELOW THE EXISTING CONCRETE DECK TO PREVENT ANY MATERIAL FROM ENTERING THE STREAM AREA. 4X4 TIMBERS AND PLYWOOD DECKING IS SHOWN FOR EXAMPLE. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING, DESIGNING AND CONTRUCTING AN ACCEPTABLE TEMPORARY BARRIER FOR REMOVAL OF THE CONCRETE BRIDGE DECK.

2. NO EXISTING BRIDGE MATERIALS TO BE ALLOWED TO FALL ON OR INTO STREAM OR CHANNEL BED BELOW THE BRIDGE. ALL WORK SHALL BE PERFORMED FROM ABOVE THE CHANNEL BED AND ALSO REMOVED FROM THE PROJECT AREA FROM THE TOP OF THE BRIDGE SUPERSTRUCTURE OR FROM THE APPROACH ROADWAYS ADJACENT TO THE BRIDGE. THE CONTRACTOR'S SWPPP SHALL PROVIDE SPECIFIC DETAILS AND MITIGATION MEASURE TO PROTECT THE CREEK AT BOTH THE N504 & N505 BRIDGES.

3. THE CONTRACTOR WILL CUT THE H-PILES DOWN TO A 50mm ABOVE THE EXISTING WATERLINE ELEVATION FOR BRIDGE N504 AND THE PIER COLUMS FOR THE N505 BRIDGE. ANY DEBRIS THAT SHOULD FALL INTO EITHER CREEK MUST IMMEDIATELY BE REMOVED TO AVOID FINES BY THE REGULATORY OFFICES.

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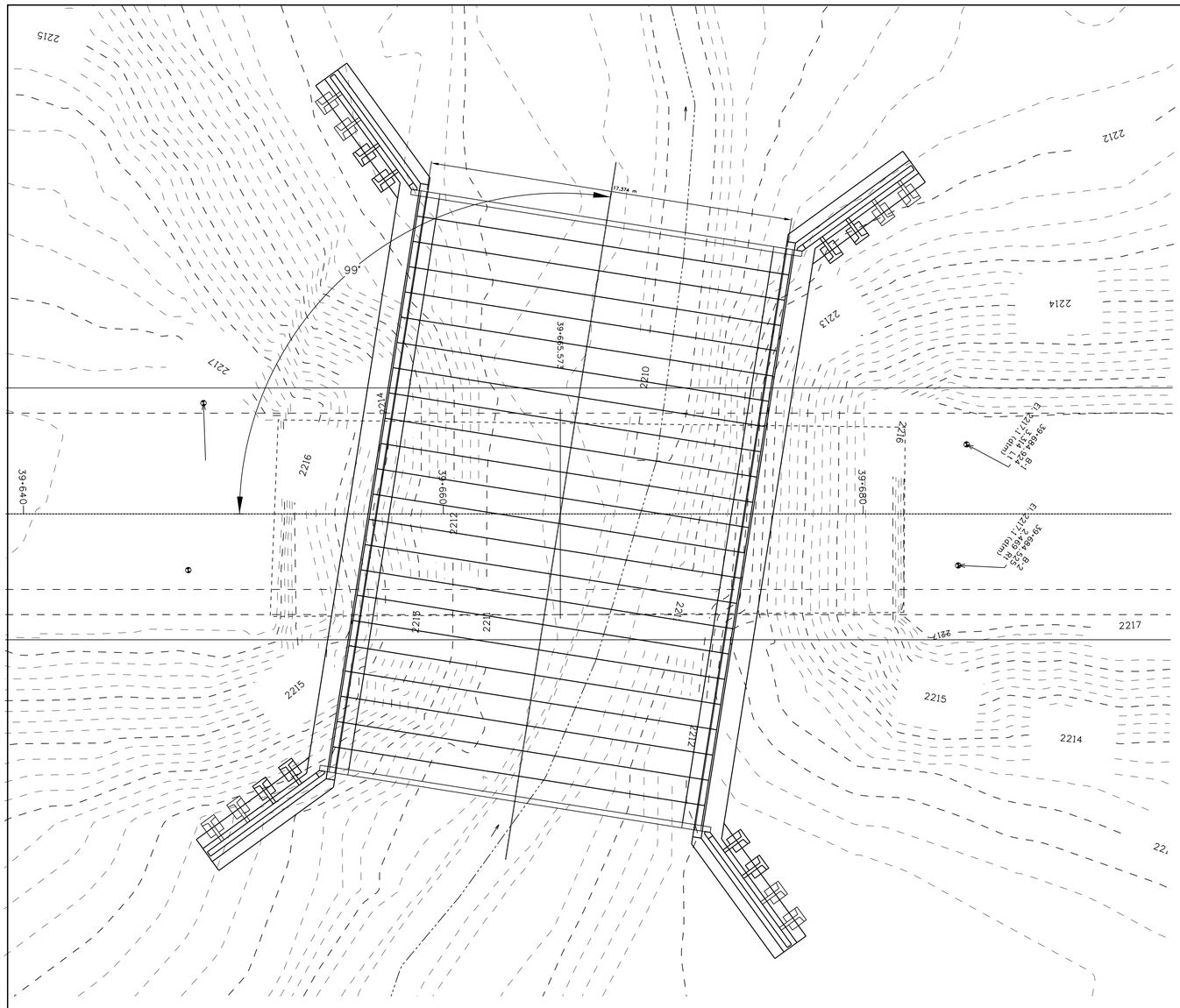
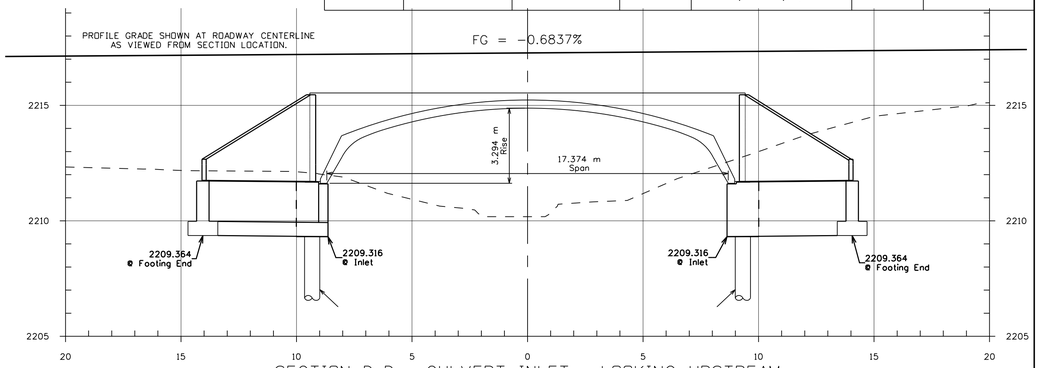
NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

N504 & 505 EXISTING BRIDGE REMOVAL DETAILS

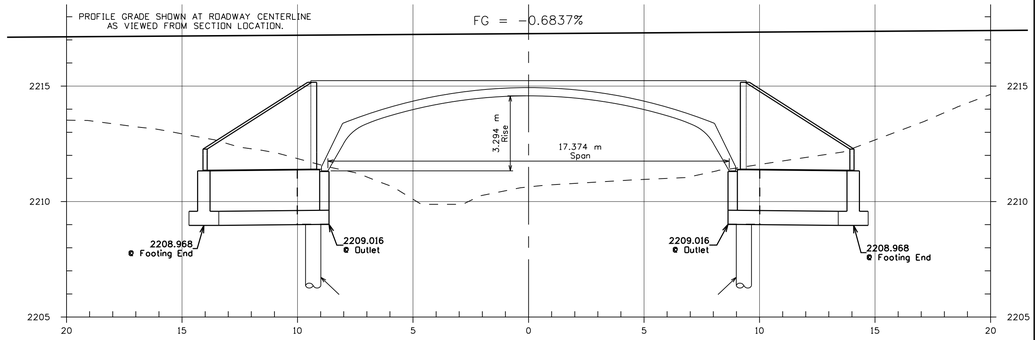
DRAWN BY: NRDOT	DATE: 2/23/2018	
DESIGNED BY: NRDOT	DATE: 2/23/2018	
REVISED: 3/21/2018	BY: Leroy.Toledo	
Sht 76_B-02 Exist Bridge Removal Details		2018.dgn

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	B-03	88

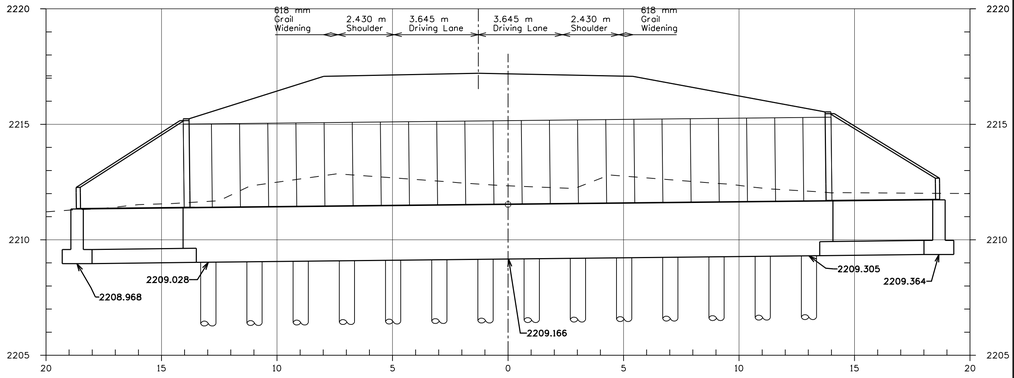




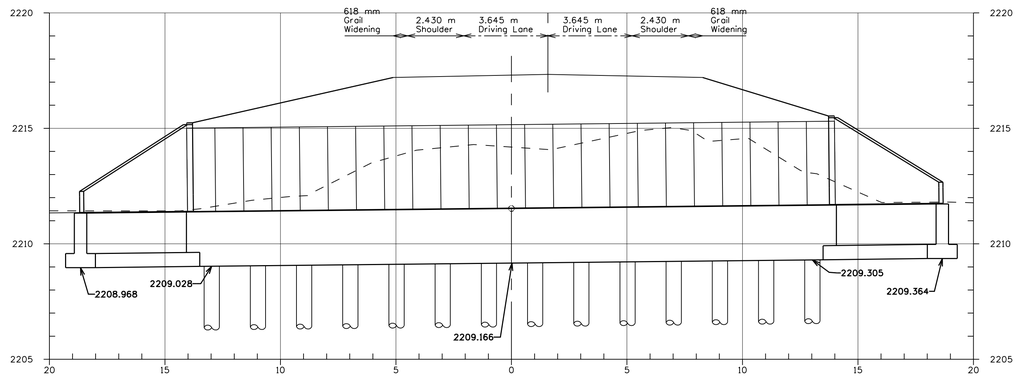
SECTION D-D - CULVERT INLET - LOOKING UPSTREAM



SECTION C-C - CULVERT OUTLET - LOOKING UPSTREAM



SECTION B-B - STATION 39+674.728 - 9° SKEW
NORTH FOOTING - LOOKING AHEAD STATION



SECTION A-A - STATION 39+656.418 - 9° SKEW
SOUTH FOOTING - LOOKING AHEAD STATION

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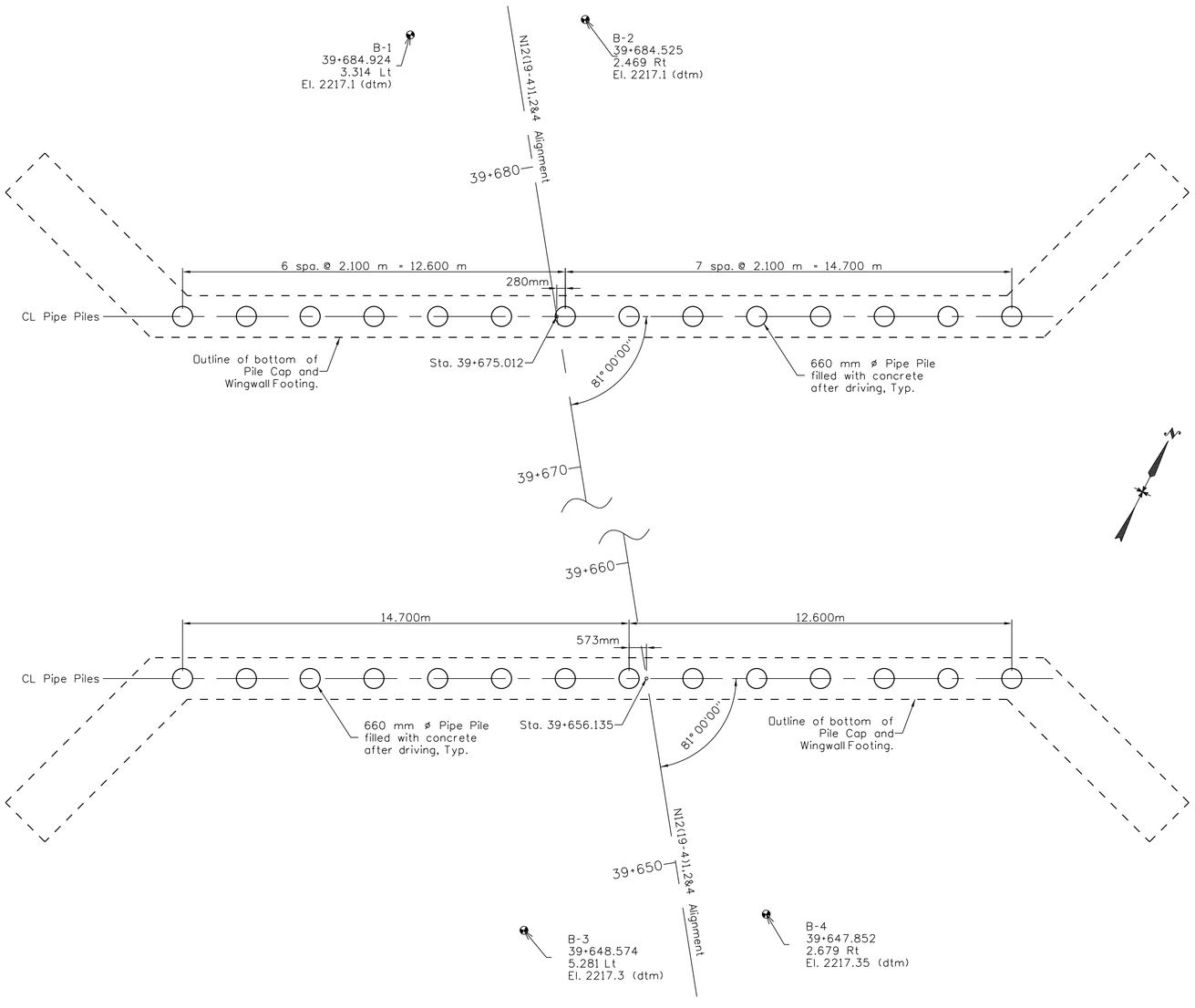
NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

BRIDGE N504 –STRUCTURE LAYOUT AND ELEVATION VIEWS

DRAWN BY: NRDOT	DATE: 2/15/2018
DESIGNED BY: NRDOT	DATE: 2/15/2018
REVISED: 3/15/2018	BY: Leroy.Toledo
Filename: N504 Struct Layout and Elev Views	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	B-04	88



PILE LAYOUT PLAN VIEW

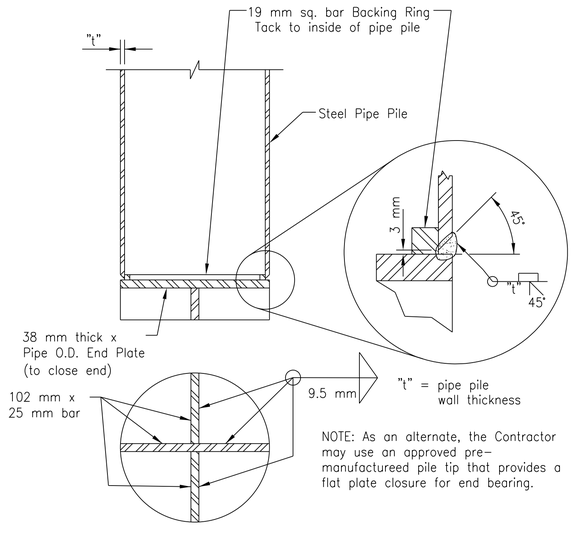
PIPE PILE COORDINATES		
PILE	NORTHING	EASTING
ABUTMENT NO.1		
1	580432.115	308167.266
2	580433.062	308169.141
3	580434.008	308171.015
4	580434.955	308172.890
5	580435.902	308174.764
6	580436.848	308176.639
7	580437.795	308178.513
8	580438.742	308180.388
9	580439.688	308182.262
10	580440.635	308184.137
11	580441.582	308186.011
12	580442.528	308187.886
13	580443.475	308189.760
14	580444.421	308191.635
ABUTMENT NO. 2		
15	580448.758	308158.861
16	580449.705	308160.736
17	580450.652	308162.610
18	580451.598	308164.485
19	580452.545	308166.359
20	580453.491	308168.234
21	580454.438	308170.109
22	580455.385	308171.983
23	580456.331	308173.858
24	580457.278	308175.732
25	580458.225	308177.607
26	580459.171	308179.481
27	580460.118	308181.356
28	580461.064	308183.230

LEGEND

BORE HOLE LOCATION

PILING NOTES

1. FOR ADDITIONAL FOUNDATION NOTES: SEE BRIDGE GENERAL NOTE SHEET.
2. PILE TIPS FOR PIPE PILING SHALL BE AS SHOWN ON THESE PLANS.
3. THIS BRIDGE PROJECT INCLUDES TEST PILES. SEE SUPPLEMENTAL SPECIFICATIONS SECTION 551 FOR ADDITIONAL INFORMATION, INCLUDING DETERMINATION OF PILE QUANTITIES REQUIRED FOR PROJECT.
4. APPROVED TEST PILES SHALL BECOME PERMANENT PILES. TEST PILES WILL BE PAID UNDER BID ITEM 55120-0000.
5. PREBORING SHALL BE PERFORMED TO THE SPECIFIED PREBORE ELEVATION. PILES SHALL BE PLACED INTO PREBORE HOLES AND DRIVEN TO THE ULTIMATE LOAD SPECIFIED. PILES SHALL BE SUPPORTED LATERALLY TO ASSURE A VERTICAL POSITION.
6. ANY VOID OR ANNULAR SPACE SURROUNDING THE PILE RESULTING FROM THE PREBORED HOLE SHALL BE FILLED WITH A LEAN CONCRETE FLOWABLE FILL AFTER DRIVING. LEAN CONCRETE FLOWABLE FILL SHALL BE CONSIDERED INCIDENTAL TO THE ITEMS 55101-0200 AND ITEM 55120-0000



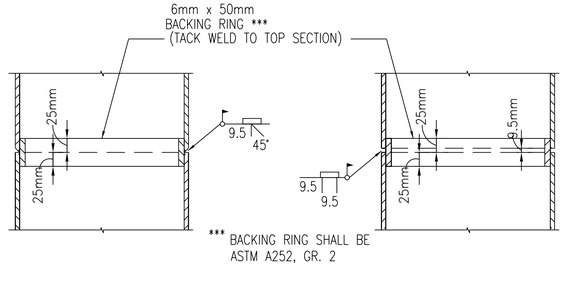
NOTE: As an alternate, the Contractor may use an approved pre-manufactureed pile tip that provides a flat plate closure for end bearing.

FLAT PLATE PILE TIP

PILE REQUIREMENTS

LOCATION	PILE TYPE	NO. OF TEST PILES	NO. OF PRODUCTION PILES	ESTIMATED LENGTH PER PILE *	TOTAL ESTIMATED LENGTH	ESTIMATED CONCRETE VOLUME NSIDE EACH PIPE	TOTAL CONCRETE VOLUME INSIDE PIPES	ESTIMATED PREBORE LENGTH PER PILE *	ESTIMATED PILE TIP ELEVATION	APPLIED STRUCT. LOAD (PILE DESIGN) (kN)	ULTIMATE CAPACITY (kN)
ABUTMENT NO. 1 CL PILES STA. 39+656.135	STEEL PIPE PILE 660mmø x 16mm FILLED WITH CONCRETE	1	13	10.8	179.4	3.69	48.03	9.3	2199.5	1428	3570
ABUTMENT NO. 2 CL PILES STA. 39+675.012	STEEL PIPE PILE 660mmø x 16mm FILLED WITH CONCRETE	1	13	11.5	175.5	3.93	51.15	10.0	2198.8	1428	3570
				TOTAL	354.9	TOTAL	99.18				

* – ESTIMATED PILE LENGTH and ESTIMATED PREBORE LENGTH base on longest pile in foundation. Information is provided for estimating purposes only. ACTUAL PILE LENGTH AND PREBORE LENGTH SHALL BE DETERMINED IN THE FIELD BASED ON TEST PILE INSTALLATION AND ADJUSTMENTS FOR DRIVING TO GAIN REQUIRED PILE CAPACITY AS DETERMINED BY CONSTRUCTION INSPECTION OF DRIVING OPERATIONS.



SHOWING ALTERNATE PERMISSIBLE FIELD WELDS

STEEL PIPE PILE SPLICE DETAIL (TYP)

UNITED STATES
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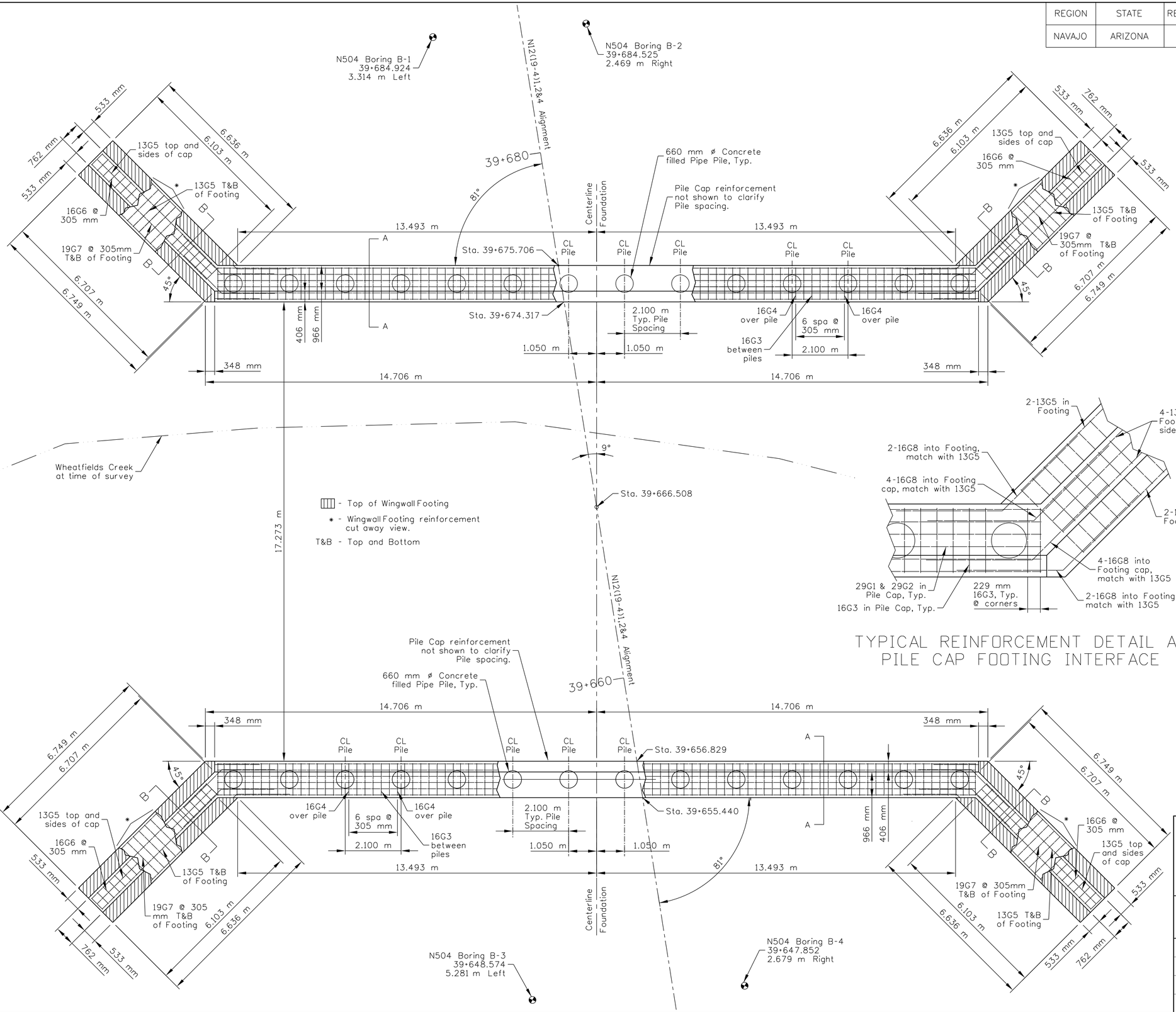
NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

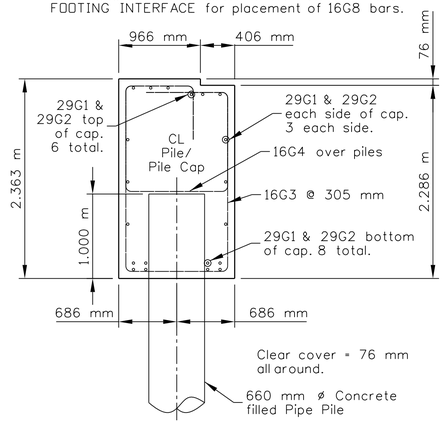
BRIDGE N504 PIPE LAYOUT AND NOTES

DRAWN BY: NRDOT	DATE: 2/23/2018
DESIGNED BY: NRDOT	DATE: 2/23/2018
REVISED: 3/19/2018	BY: Leroy.Toledo
Sht 78_B-04 N504 Pipe Pile Details 2018-02-12.dgn	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	B-05	88



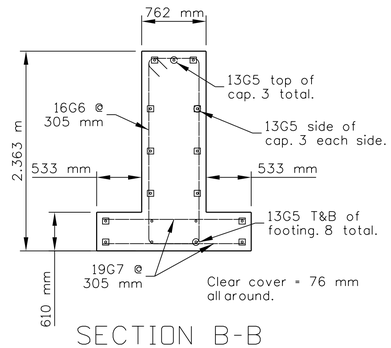
NOTE: See REINFORCEMENT DETAIL AT PILE CAP FOOTING INTERFACE for placement of 16G8 bars.



SECTION A-A (THROUGH PILE CAP)

TYPICAL REINFORCEMENT DETAIL AT PILE CAP FOOTING INTERFACE

⊡ - 13G5 bars to be matched with 16G8 bars extended out from Pile Cap. 12 total.



SECTION B-B (THROUGH WINGWALL FOOTING)

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS

NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

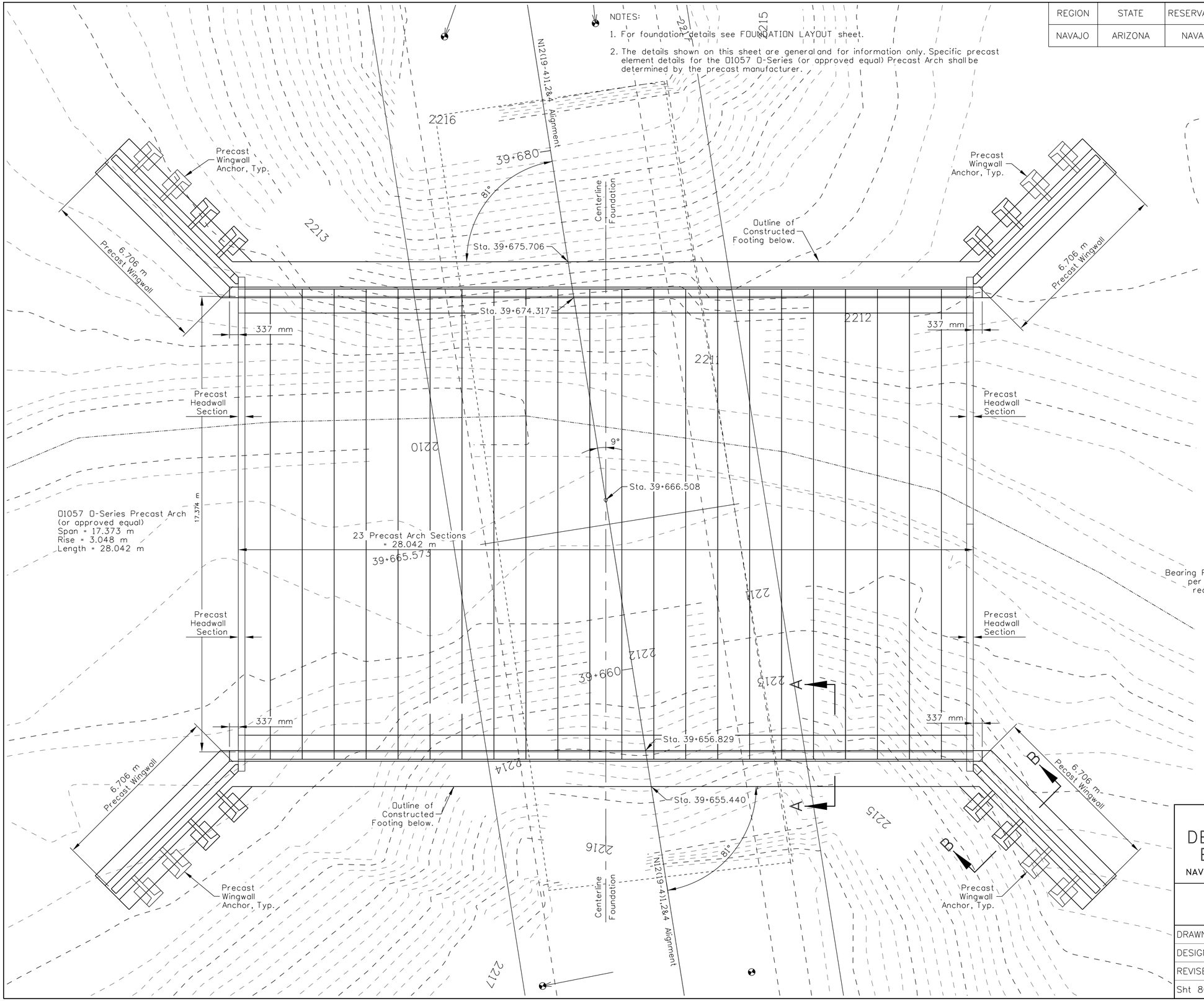
BRIDGE N504 REPLACEMENT FOUNDATION LAYOUT

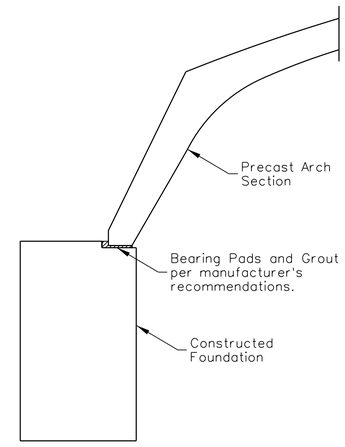
DRAWN BY: cdh	DATE: 2018/02/12
DESIGNED BY: Struct Unit	DATE: 2018/02/12
REVISED: -/-/-	BY: - -
Filename: N504 Foundation Layout	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	B-06	88

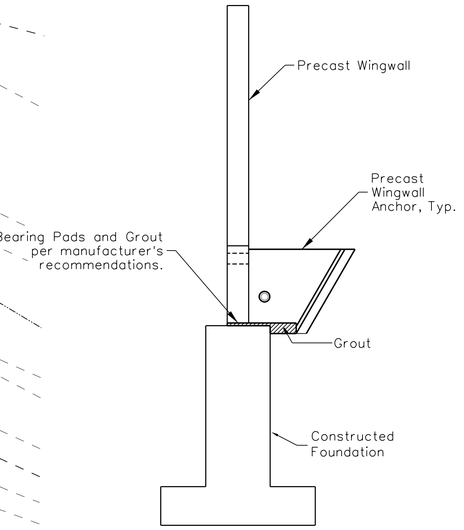
NOTES:

1. For foundation details see FOUNDATION LAYOUT sheet.
2. The details shown on this sheet are general and for information only. Specific precast element details for the 01057 O-Series (or approved equal) Precast Arch shall be determined by the precast manufacturer.





SECTION A-A



SECTION B-B

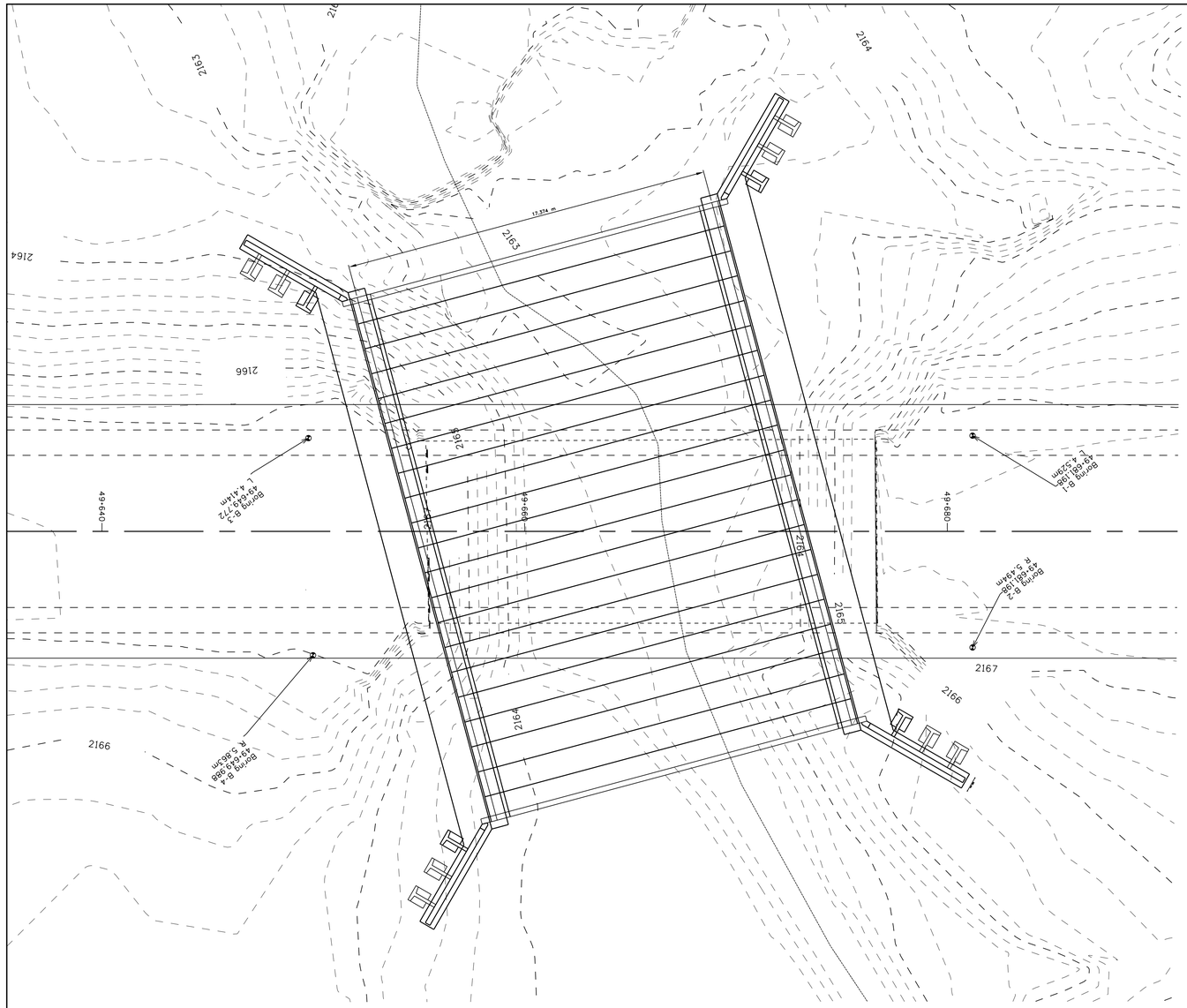
UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS

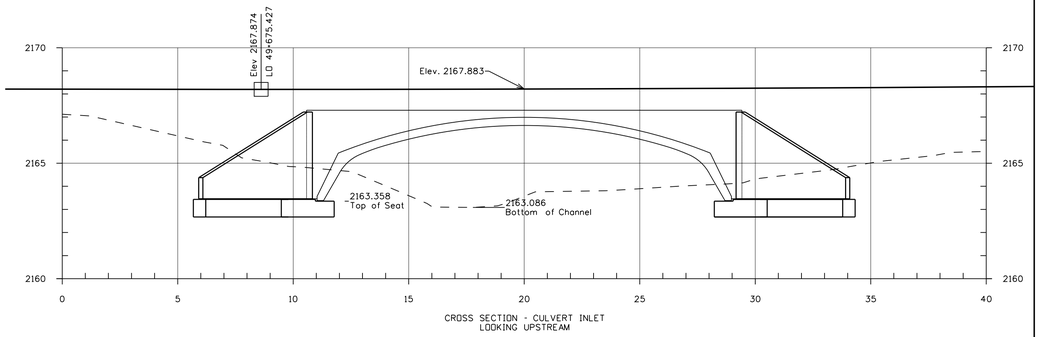
NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

BRIDGE N504 REPLACEMENT PRECAST ARCH LAYOUT

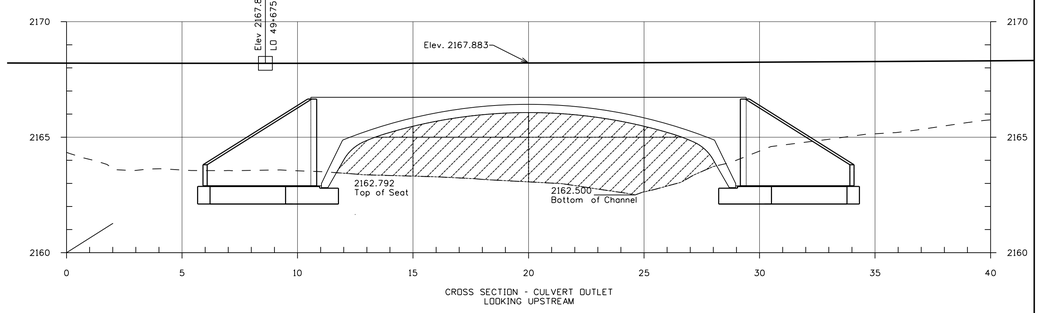
DRAWN BY: NRDOT	DATE: 2/13/2018
DESIGNED BY: NRDOT	DATE: 2/13/2018
REVISED: 3/16/2018	BY: Leroy.Toledo
Sht 80_B-06 N504 Precast Arch Layout 2018-02-15.dgn	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	B-07	88

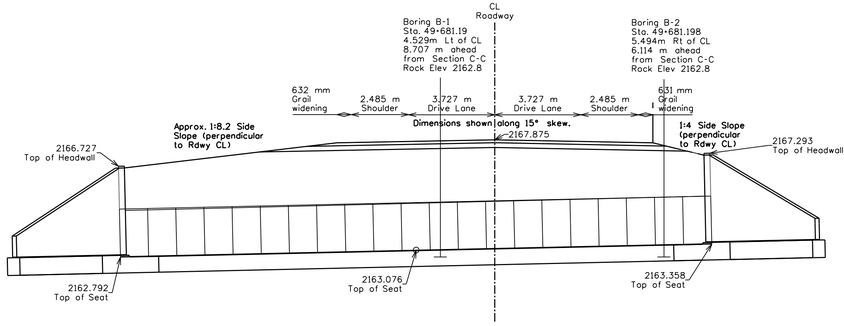




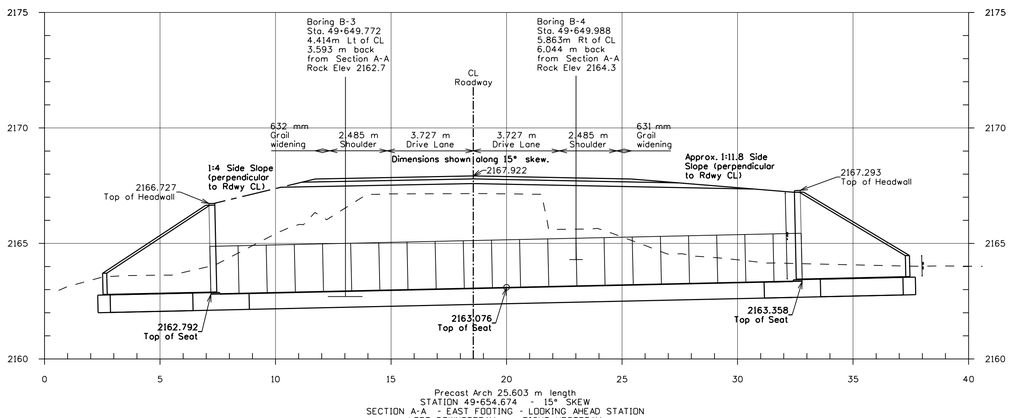
CROSS SECTION - CULVERT INLET
LOOKING UPSTREAM



CROSS SECTION - CULVERT OUTLET
LOOKING UPSTREAM



Precast Arch 25.603 m length
STATION 49+673.397 - 15° SKEW
SECTION C-C - WEST FOOTING OF CULVERT - LOOKING AHEAD STATION
LEFT: DOWNSTREAM - RIGHT: UPSTREAM



Precast Arch 25.603 m length
STATION 49+654.674 - 15° SKEW
SECTION A-A - EAST FOOTING - LOOKING AHEAD STATION
LEFT: DOWNSTREAM - RIGHT: UPSTREAM

NOTES:

1. REFER TO SHEET 76 FOR PROTECTIVE MEASURES DURING REMOVAL OF THE EXISTING BRIDGE SUPERSTRUCTURE AND FOUNDATIONS FOR BOTH BRIDGES.
2. THE CONTRACTOR SHALL INCLUDE MITIGATION MEASURES IN THE SWPPP TO PROTECT THE CREEK AT BOTH BRIDGES FROM CONTAMINATION DURING THE INSTALLATION OF THE FOUNDATIONS, WINDWALLS, AND ARCH UNITS.
3. CUT AND REMOVE THE OLD STEEL PILES TO BE WITHIN 75MM FROM THE TOP OF THE EXISTING WATER FLOW OR ELEVATION?? THE PILES SHALL BECOME THE PROTERTY OF THE CONTRACTOR AS SALVAGE MATERIAL.
4. REMOVE THE CONCRETE COLUMNS TO WITH 305MM OF THE TOP OF THE SPREAD FOOTING OR ELEVATION?? . REMOVE ALL CONCRETE AND OTHER DEBRIS IMMEDIATLEY FROM THE CREEK AND DISPOSE OF OFFSITE IN APPROVED LANDFILL PER SECTION 203.

UNITED STATES
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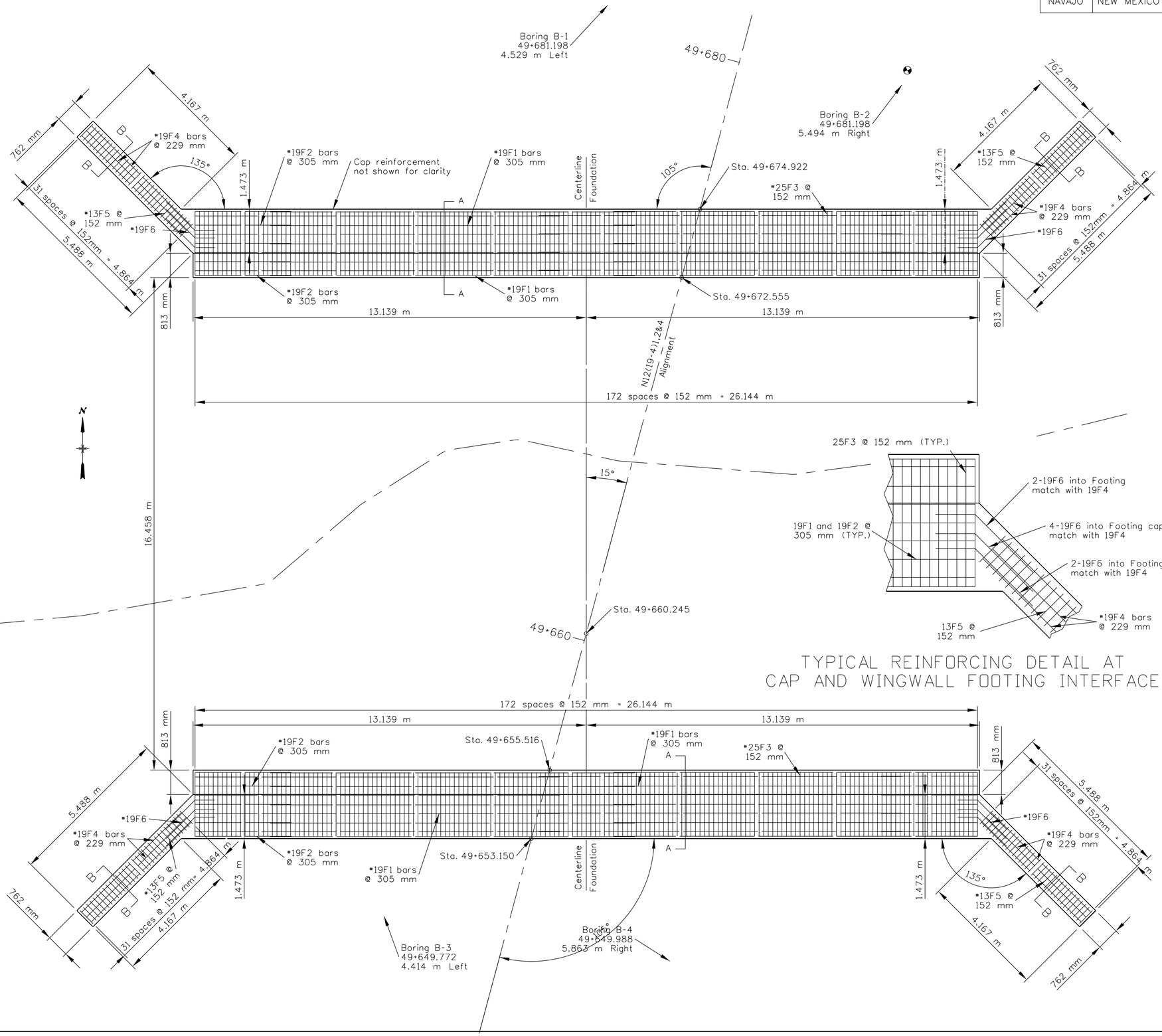
NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

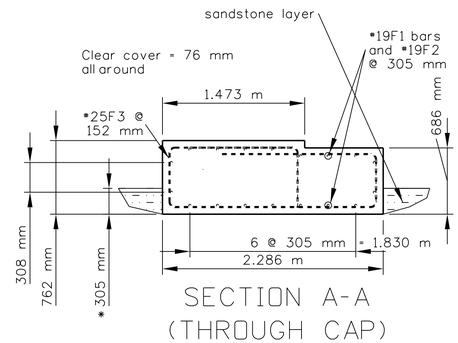
BRIDGE N505 STRUCTURE LAYOUT AND ELEVATION VIEWS

DRAWN BY: NRDOT	DATE: 2/12/2018
DESIGNED BY: NRDOT	DATE: 2/12/2018
REVISED: 3/16/2018	BY: Leroy.Toledo
Filename: N504 Struct Layout and Elev Views	

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N12	N12(19-4)1,2&4	B-08	88



TYPICAL REINFORCING DETAIL AT
CAP AND WINGWALL FOOTING INTERFACE



SECTION A-A
(THROUGH CAP)

NOTES:

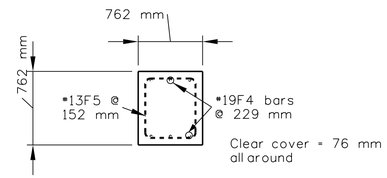
1. Minimum embedment of precast arch foundation into sandstone is 305 mm, except for wingwall foundations.

2. The Contractor shall neatly carve out the required socket for each foundation to the lines and grades shown.

3. The COR/COTR shall inspect the excavation before laying the reinforcement and formwork.

4. if unstable sandstone is found, immediatley notify the COR.

5. Should it be necessary to install reinforcement into the sanestone, this work will be considered under section 109.02(s) of the FP-14



SECTION B-B
(THROUGH WINGWALL FOOTING)

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

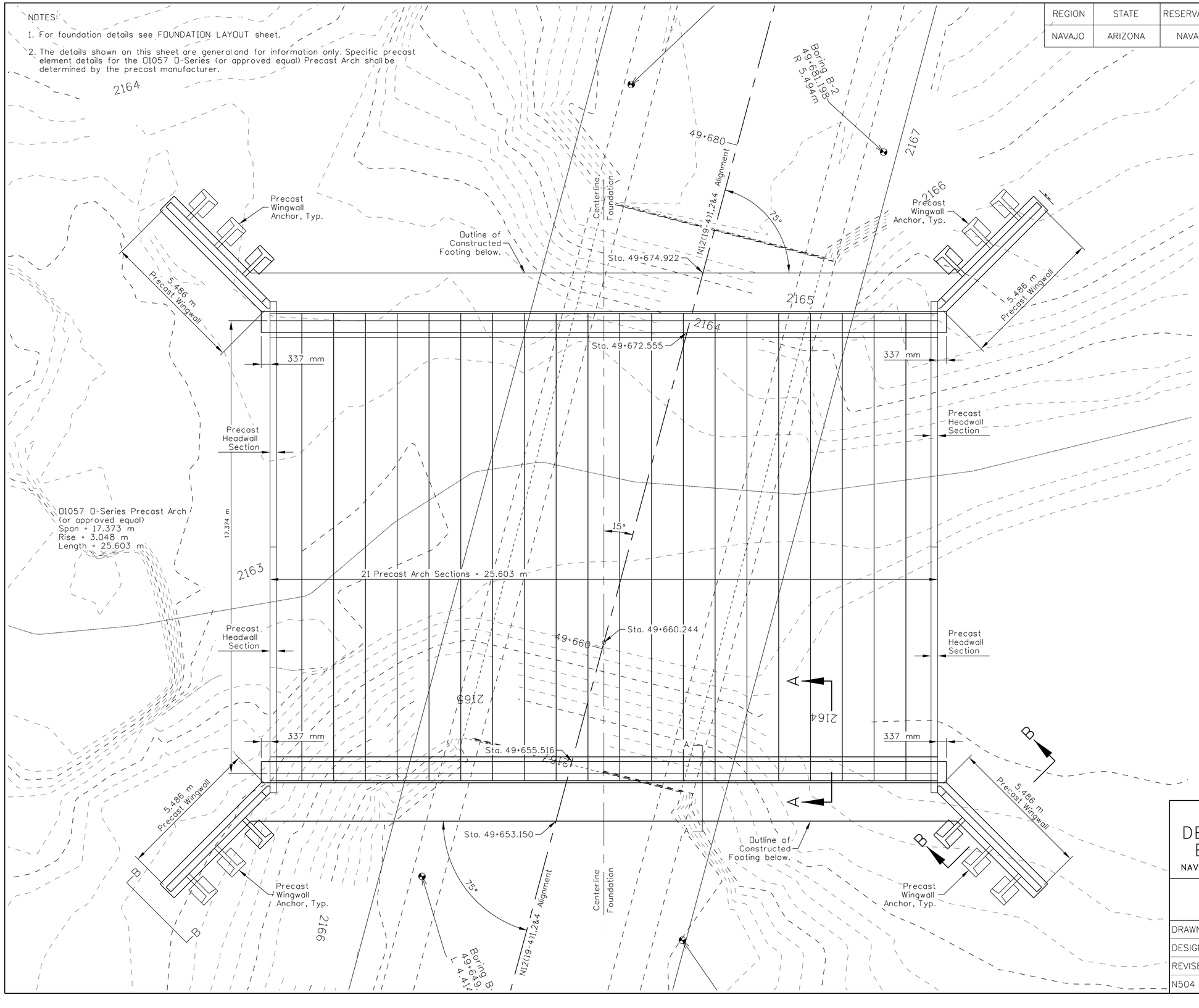
BRIDGE N505 FOUNDATION LAYOUT DETAIL

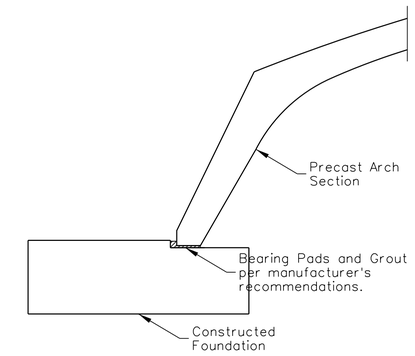
DRAWN BY: NRDOT	DATE: 2/13/2018
DESIGNED BY: NRDOT	DATE: 2/13/2018
REVISED: 2/13/2018	BY: rsh
Filename: 08_N505 Foundation Layout	

NOTES:

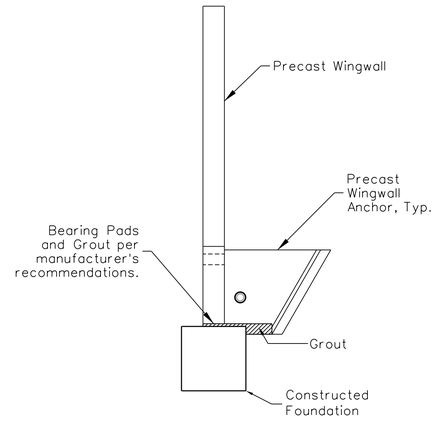
1. For foundation details see FOUNDATION LAYOUT sheet.
2. The details shown on this sheet are general and for information only. Specific precast element details for the 01057 D-Series (or approved equal) Precast Arch shall be determined by the precast manufacturer.

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	B-09	88





SECTION A-A



SECTION B-B

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

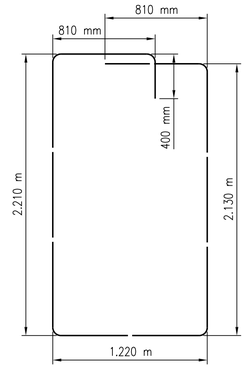
BRIDGE N505 REPLACEMENT
PRECAST ARCH LAYOUT

DRAWN BY: cdh	DATE: 2018/02/13
DESIGNED BY: Struct Unit	DATE: 2018/02/13
REVISED: -/-/-	BY: - -
N504 Precast Arch Layout	

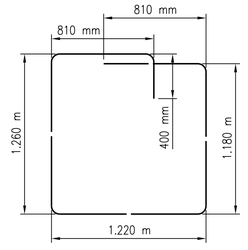
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	B-10	88

LOCATION	STRAIGHT BARS MARK	QTY.	SIZE	LENGTH	BENT BARS MARK	QTY.	SIZE	LENGTH	SPACING
NOTES: TB = Top and Bottom. TBS = Top, Bottom and Sides. Stations shown are at backside of foundation.									
ARCH FOOTING; Abutment 1, Sta. 39+655.440									
Longitudinal, TBS	29G1	40	29	12.190 m	#29 splice length = 1.420 m				As Shown
Longitudinal, TBS	29G2	20	29	6.980 m					As Shown
Stirrups					16G3	69	16	7.580 m	305 mm
					16G4	27	16	5.680 m	As Shown
WINGWALL FOOTINGS (2 EACH); Abutment 1, Sta. 39+655.440									
Longitudinal, TBS	13G5	34	34	6.100 m					As Shown
Stirrups					16G6	42	16	5.950 m	305 mm
	19G7	80	19	1.670 m					305 mm
					16G8	24	16	4.000 m	As Shown
ARCH FOOTING; Abutment 2, Sta. 39+675.706									
Longitudinal, TBS	29G1	40	29	12.190 m	#29 splice length = 1.420 m				As Shown
Longitudinal, TBS	29G2	20	29	6.980 m					As Shown
Stirrups					16G3	69	16	7.580 m	305 mm
					16G4	27	16	5.680 m	As Shown
WINGWALL FOOTINGS (2 EACH); Abutment 2, Sta. 39+675.706									
Longitudinal, TBS	13G5	34	34	6.100 m					As Shown
Stirrups					16G6	42	16	5.950 m	305 mm
	19G7	80	19	1.670 m					305 mm
					16G8	24	16	4.000 m	As Shown

BENDING DIAGRAMS
ALL DIMENSIONS ARE OUT TO OUT



16G3



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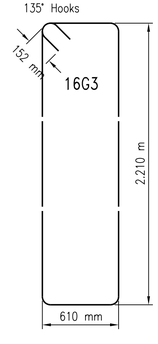

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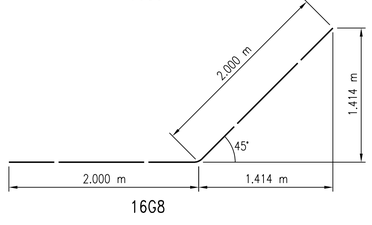
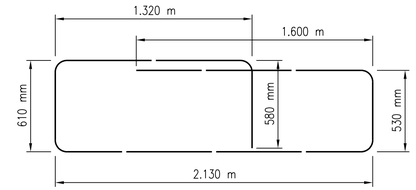


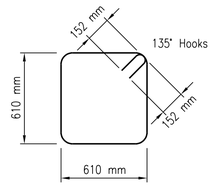
16G8

LOCATION	STRAIGHT BARS MARK	QTY.	SIZE	LENGTH	BENT BARS MARK	QTY.	SIZE	LENGTH	SPACING
ARCH FOOTING; Abutment 1, Sta. 49+653.150									
Longitudinal, TBS	19F1	36	19	12.190 m	#19 splice length = 710 mm				As Shown
Longitudinal, TBS	19F2	18	19	3.190 m					As Shown
Stirrups					25F3	173	25	6.770 m	152 mm
WINGWALL FOOTINGS (2 EACH); Abutment 1, Sta. 49+653.150									
Longitudinal, TBS	19F4	16	19	4.710 m					As Shown
Stirrups					13F5	64	13	2.750 m	152 mm
					19F6	16	19	2.030 m	As Shown
ARCH FOOTING; Abutment 2, Sta. 49+674.922 #19 bar splice length = 710 mm									
Longitudinal, TBS	19F1	36	19	12.190 m					As Shown
Longitudinal, TBS	19F2	18	19	3.190 m					As Shown
Stirrups					25F3	173	25	6.770 m	152 mm
WINGWALL FOOTINGS (2 EACH); Abutment 2, Sta. 49+674.922									
Longitudinal, TBS	19F4	16	19	4.710 m					As Shown
Stirrups					13F5	64	13	2.750 m	152 mm
					19F6	16	19	2.030 m	As Shown

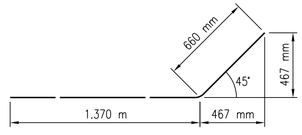
BENDING DIAGRAMS
ALL DIMENSIONS ARE OUT TO OUT



25F3



13F5



19F6

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

BRIDGES N504 & N505 REPLACEMENT
REINFORCING STEEL SCHEDULE

DRAWN BY: NRDOT	DATE: 2/23/2018
DESIGNED BY: NRDOT	DATE: 2/23/2018
REVISED: 3/9/2018	BY: Leroy.Toledo
Sht 84_B-10 N504 n 505 Reinforcing Steel	Sheet 2018.dgn

REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	B-11	88

SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN BRIDGE SYSTEMS

1. DESCRIPTION

This work shall consist of constructing a CON/SPAN bridge in accordance with these specifications and in reasonably close conformity with the lines, grades, design and dimensions shown on the plans or as established by the COR. In situations where two or more specifications apply to this work, the most stringent requirements shall govern.

2. TYPES

Precast reinforced concrete CON/SPAN bridge units manufactured in accordance with this specification shall be designated by span and rise. Precast reinforced concrete CON/SPAN wingwalls and headwalls manufactured in accordance with this specification shall be designated by length, height, and deflection angle.

3. MATERIALS – CONCRETE

The concrete for the precast elements shall be air-entrained, composed of Portland cement, fine and coarse aggregates, admixtures, and water. Air-entrained concrete shall contain 6 ± 2 percent air, and the air entraining admixture shall conform to AASHTO M154.

3.1 Portland Cement – Shall conform to the requirements of ASTM Specifications C150-Type I, Type II, or Type III cement.

3.2 Coarse Aggregate – Shall consist of stone having a maximum size of 25 mm. Aggregate shall meet requirements for ASTM C33.

3.3 Water Reducing Admixture – The manufacturer may submit, for approval by the COR, a water-reducing admixture for the purpose of increasing workability and reducing the water requirement for the concrete.

3.4 Calcium Chloride – The addition to the mix of calcium chloride or admixtures containing calcium chloride will not be permitted.

4. MATERIALS – STEEL REINFORCEMENT AND HARDWARE

All reinforcing steel and hardware for the precast elements shall be fabricated and placed in accordance with the detailed shop drawings submitted by the manufacturer.

4.1 Steel Reinforcement – Reinforcement shall consist of welded wire fabric conforming to AASHTO M 55M (ASTM A 185M) or AASHTO M 221M (ASTM A 497M), or deformed billet steel bars conforming to AASHTO M 31M (ASTM A 615M) Grade 420. Longitudinal distribution reinforcement may consist of welded wire fabric or deformed billet-steel bars.

4.2 Hardware:

Bolts and threaded rods for wingwall connections shall conform to ASTM A 307. Nuts shall conform to AASHTO M 292M (ASTM A 194M) Grade 2H. All bolts, threaded rods and nuts used in wingwall connections shall be mechanically zinc coated in accordance with ASTM B 695M Class 50.

Structural Steel for wingwall connection plates and plate washers shall conform to AASHTO M 270M (ASTM A 709M) Grade 250 and shall be hot dip galvanized as per AASHTO M 111M (ASTM A 153M).

Inserts for wingwalls shall be 25 mm diameter Two-Bolt Preset Wingwall Anchors as manufactured by Dayton/Richmond Concrete Accessories, Miamisburg, Ohio, (800) 745-3700, or approved equal.

Ferrule Loop Inserts shall be F-64 Ferrule Loop Inserts as manufactured by Dayton/Richmond Concrete Accessories, Miamisburg, Ohio, (800) 745-3700, or approved equal.

Hook Bolts used in attached headwall connections shall be ASTM A 307.

Inserts for detached headwall connections shall be AISI Type 304 stainless steel, F-58 Expanded Coil inserts as manufactured by Dayton/Richmond Concrete Accessories, Miamisburg, Ohio, (800) 745-3700, or approved equal. Coil rods and nuts used in headwall connections shall be AISI Type 304 stainless steel. Washers used in headwall connections shall be either AISI Type 304 stainless steel plate washers or AASHTO M 270M (ASTM A 709M) Grade 250 plate washers hot dip galvanized as per AASHTO M 111M (ASTM A 153M).

Reinforcing bar splices for precast conrete elements only, shall be made using the Dowel Bar Splicer System as manufactured by Dayton/Richmond Concrete Accessories, Miamisburg, Ohio, (800) 745-3700, or approved equal, and shall consist of the Dowel Bar Splicer (DB-SAE) and Dowel-In (DI).

5. MANUFACTURE

5.1 Mixture – The aggregates, cement and water shall be proportioned and mixed in a batch mixer to produce a homogeneous concrete meeting the strength requirements of this specification. The proportion of Portland cement in the mixture shall not be less than 360 kilograms per cubic meter of concrete.

5.2 Curing – The precast concrete elements shall be cured for a sufficient length of time so that the concrete will develop the specified compressive strength in 28 days or less. Any one of the following methods of curing or combinations thereof shall be used:

5.2.1. Steam Curing – The precast elements may be low pressure, steam cured by a system that will maintain a moist atmosphere.

5.2.2. Water Curing – The precast elements may be water cured by any method that will keep the sections moist.

5.2.3. Membrane Curing – A sealing membrane conforming to the requirements of ASTM Specification C 309 may be applied and shall be left intact until the required concrete compressive strength is attained. The concrete temperature at the time of application shall be within + 5 degrees C of the atmospheric temperature. All surfaces shall be kept moist prior to the application of the compounds and shall be damp when the compound is applied.

5.3 Forms – the forms used in manufacture shall be sufficiently rigid and accurate to maintain the bridge unit, wingwall, and headwall dimensions within the permissible variations given in Section 7 of these Specifications. All casting surfaces shall be of a smooth nonporous material.

5.4 Handling – Handling devices or holes shall be permitted in each precast element for the purpose of handling and installation.

5.5 Storage – The precast elements shall be stored in such a manner to prevent cracking or damage. The units shall not be moved until the concrete compressive strength has reached a minimum of 17.2 MPa, and they shall not be stored in an upright position until the concrete compressive strength is a minimum of 27.6 MPa.

6. DESIGN

6.1 The precast element dimension and reinforcement details shall be as prescribed in the plan and the shop drawings provided by the manufacturer, subject to the provisions of Section 7, below. The minimum concrete compressive strength shall be as shown on the shop drawings. The minimum steel yield strength shall be 414 MPa, unless otherwise noted on the shop drawings.

6.2 The precast elements are designed in accordance with the "Standard Specifications for Highway Bridges" 16th Edition, adopted by the American Association of State Highway and Transportation Officials, 1996, as amended by the 1997, 1998, 1999, and 2000 Interim Revisions. A minimum of 305 mm of cover above the crown of the bridge units is required in the installed condition. (Unless noted otherwise on the shop drawings and designed accordingly.)

6.3 Placement of Reinforcement in Precast Bridge Units – The cover of concrete over the outside circumferential reinforcement shall be 50 mm minimum. The cover of concrete over the inside circumferential reinforcement shall be 40 mm minimum, unless otherwise noted on the shop drawings. The clear distance of the end circumferential wires shall not be less than 25 mm nor more than 50 mm from the ends of each section. Reinforcement shall be assembled utilizing single or multiple layers of welded wire fabric (not to exceed 3 layers), supplemented with a single layer of deformed billet-steel bars, when necessary. Welded wire fabric shall be composed of circumferential and longitudinal wires meeting the spacing requirements of 6.6, below, and shall contain sufficient longitudinal wires extending through the bridge unit to maintain the shape and position of the reinforcement. Longitudinal distribution reinforcement may be welded wire fabric or deformed billet-steel bars and shall meet the spacing requirements of 6.6, below. The ends of the longitudinal distribution reinforcement shall be not more than 75 mm and not less than 40 mm from the ends of the bridge unit.

6.4 Placement of Reinforcement for Precast Wingwalls and Headwalls – The cover of concrete over the longitudinal and transverse reinforcement shall be 50 mm minimum. The clear distance from the end of each precast element to the end transverse reinforcing steel shall not be less than 25 mm nor more than 50 mm. Reinforcement shall be assembled utilizing a single layer of welded wire fabric, or a single layer of deformed billet-steel bars. Welded wire fabric shall be composed of transverse and longitudinal wires meeting the spacing requirements of 6.7, below, and shall contain sufficient longitudinal wires extending through the element to maintain the shape and position of the reinforcement. Longitudinal reinforcement may be welded wire fabric or deformed billet-steel bars and shall meet the spacing requirements of 6.7, below. The ends of the longitudinal reinforcement shall be not more than 75 mm and not less than 40 mm from the ends of the walls.

6.5 Bending of Reinforcement for Precast Bridge Units – The outside and inside circumferential reinforcing steel for the corners of the bridge shall be bent to such an angle that is approximately equal to the configuration of the bridge's outside corner.

6.6 Laps, Welds, and Spacing for Precast Bridge Units – Tension splices in the circumferential reinforcement shall be made by lapping. Laps may be tack welded together for assembly purposes. For smooth welded wire fabric, the overlap shall meet the requirements of AASHTO 8.30.2 and 8.32.6. For deformed welded wire fabric, the overlap shall meet the requirements of AASHTO 8.30.1 and 8.32.5. The overlap of welded wire fabric shall be measured between the outer most longitudinal wires of each fabric sheet. For deformed billet-steel bars, the overlap shall meet the requirements of AASHTO 8.25. For splices other than tension splices, the overlap shall be a minimum of 305 mm for welded wire fabric or deformed billet-steel bars. The spacing center to center of the circumferential wires in a wire fabric sheet shall be not less than 50 mm nor more than 100 mm. The spacing center to center of the longitudinal wires shall not be more than 200 mm. The spacing center to center of the longitudinal distribution steel for either line of reinforcing in the top slab shall be not more than 405 mm.

6.7 Laps, Welds, and Spacing for Precast Wingwalls and Headwalls – Splices in the reinforcement shall be made by lapping. Laps may be tack welded together for assembly purposes. For smooth welded wire fabric, the overlap shall meet the requirements of AASHTO 8.30.2 and 8.32.6. For deformed welded wire fabric, the overlap shall meet the requirements of AASHTO 8.30.1 and 8.32.5. For deformed billet-steel bars, the overlap shall meet the requirements of AASHTO 8.25. The spacing center-to-center of the wires in a wire fabric sheet shall be not less than 50 mm nor more than 200 mm.

7. PERMISSIBLE VARIATIONS

7.1 Bridge Units

7.1.1. Internal Dimensions – The internal dimension shall vary not more than 1% from the design dimensions nor more than 40 mm whichever is less. The haunch dimensions shall vary not more than 20 mm from the design dimension.

7.1.2. Slab and Wall Thickness – The slab and wall thickness shall not be less than that shown in the design by more than 5 mm. A thickness more than that required in the design shall not be cause for rejection.

7.1.3. Length of Opposite Surfaces – Variations in laying lengths of two opposite surfaces of the bridge unit shall not be more than 15 mm in any section, except where beveled ends for laying of curves are specified by the purchaser.

7.1.4. Length of Section – The underrun in length of a section shall not be more than 15 mm in any bridge unit.

7.1.5. Position of Reinforcement – The maximum variation in position of the reinforcement shall be + 15 mm. In no case shall the cover over the reinforcement be less than 40 mm for the outside circumferential steel or be less than 25 mm for the inside circumferential steel as measured to the external or internal surface of the bridge. These tolerances or cover requirements do not apply to mating surfaces of the joints.

7.1.6. Area of Reinforcement – The areas of steel reinforcement shall be the design steel areas as shown in the manufacturer's shop drawings. Steel areas greater than those required shall not be cause for rejection. The permissible variation in diameter of any reinforcement shall conform to the tolerances prescribed in the ASTM Specification for that type of reinforcement.

7.2 Wingwalls and Headwalls

7.2.1. Wall Thickness – The wall thickness shall not vary from that shown in the design by more than 15 mm.

7.2.2. Length/ Height of Wall sections – The length and height of the wall shall not vary from that shown in the design by more than 15 mm.

7.2.3. Position of Reinforcement – The maximum variation in the position of the reinforcement shall be + 15 mm. In no case shall the cover over the reinforcement be less than 40 mm.

7.2.4. Size of Reinforcement – The permissible variation in diameter of any reinforcing shall conform to the tolerances prescribed in the ASTM Specification for that type of reinforcing. Steel area greater than that required shall not be cause for rejection.

8. TESTING AND INSPECTION

8.1 Type of Test Specimen – Concrete compressive strength shall be determined from compression tests made on cylinders or cores. For cylinder testing, a minimum of 4 cylinders shall be taken during each production run. For core testing, one core shall be cut from each of 3 precast elements selected at random from each production group. A production group shall be defined as 15 or fewer bridge units (of a particular size), wingwalls or headwalls in a continuous production run. For each continuous production run, each production group or fraction thereof shall be considered separately for the purpose of testing and acceptance. A production run shall be considered continuous if not interrupted for more than 3 consecutive days.

8.2 Compression Testing – Cylinders shall be made and tested as prescribed by the ASTM C 39 Specification. Cores shall be obtained and tested for compressive strength in accordance with the provisions of the ASTM C 497 Specification.

8.3 Acceptability of Cylinder Tests – When the average compressive strength of all cylinders tested is equal to or greater than the design compressive strength, and not more than 10% of the cylinders tested have a compressive strength less than the design concrete strength, and no cylinder tested has a compressive strength less than 80% of the design compressive strength, then the lot shall be accepted. When the compressive strength of the cylinders tested does not conform to this acceptance criteria, the acceptability of the lot may be determined as described in section 8.4, below. Failure of any of the 28-day test cylinders to meet 90 percent of the minimum compressive strength requirement can be cause for rejection.

8.4 Acceptability of Core Tests – The compressive strength of the concrete in each production group as defined in 8.1 is acceptable when the average core test strength is equal to or greater than the design concrete strength. When the compressive strength of the core tested is less than the design concrete strength, the precast element from which that core was taken may be re-cored. When the compressive strength of the re-core is equal to or greater than the design concrete strength, the compressive strength of the concrete in that production group is acceptable.

8.4.1. When the compressive strength of any recore is less than the design concrete strength, the precast element from which that core was taken shall be rejected. Two precast elements from the remainder of the group shall be selected at random and one core shall be taken from each. If the compressive strength of both cores is equal to or greater than the design concrete strength, the compressive strength of the remainder of that group is acceptable. If the compressive strength of either of the two cores tested is less than the design concrete strength, the remainder of the group shall be rejected or, at the option of the manufacturer, each precast element of the remainder of the group shall be cored and accepted individually, and any of these elements that have cores with less than the design concrete strength shall be rejected.

8.4.2 Plugging Core Holes – The core holes shall be plugged and sealed by the manufacturer in a manner such that the elements will meet all of the test requirements of this specification. Precast elements so sealed shall be considered satisfactory for use.

8.5 Test Equipment – Every manufacturer furnishing culverts under this specification shall furnish all facilities and personnel necessary to carryout the test required.

9. JOINTS

The bridge units shall be produced with flat butt ends. The ends of the bridge units shall be such that when the sections are laid together they will make a continuous line of with a smooth interior free of appreciable irregularities, all compatible with the permissible variations in Section 7, above. The joint width shall not exceed 20 mm.

10. WORKMANSHIP AND FINISH

The bridge units, wingwalls, and headwalls shall be substantially free of fractures. The ends of the bridge units shall be normal to the walls and centerline of the bridge section, within the limits of the variations given in section 7, above, except where beveled ends are specified. The faces of the wingwalls and headwalls shall be parallel to each other, within the limits of variations given in section 7, above. The surface of the precast elements shall be a smooth steel form or troweled surface. Trapped air pockets causing surface defects shall be considered as part of a smooth, steel form finish.

11. REPAIRS

Precast elements may be repaired, if necessary, because of imperfections in manufacture or handling damage and will be acceptable if, in the opinion of the purchaser, the repairs are sound, properly finished and cured, and the repaired section conforms to the requirements of this Specification.

12. INSPECTION

The quality of materials, the process of manufacture, and the finished precast elements shall be subject to inspection by the purchaser.

13. REJECTION

The precast elements shall be subject to rejection because of any of the specification requirements. Individual precast elements may be rejected because of any of the following:

13.1 Fractures or cracks passing through the wall, except for a single end crack that does not exceed one half the thickness of the wall.

13.2 Defects that indicate proportioning, mixing, and molding not in compliance with Section 5, of these Specifications.

13.3 Honeycombed or open texture.

13.4 Damaged ends, where such damage would prevent making a satisfactory joint.

14. MARKING

Each bridge unit shall be clearly marked by waterproof paint. The following shall be shown on the inside of the vertical leg of the bridge section:

Bridge Span X Bridge Rise

Date of Manufacture

Name or trademark of the manufacturer

15. CONSTRUCTION REQUIREMENTS

15.1 Footings – The bridge units and wingwalls shall be installed on cast-in-place concrete footings. The design size and elevation of the footings shall be as determined on these plans. A 75 mm deep keyway shall be formed in the top surface of the bridge footing 75 mm clear of the inside and outside faces of the bridge units, unless specified otherwise on the plans. No keyway is required in the wingwall footings, unless otherwise specified on the plans. The footings shall be given a smooth float finish and shall reach a compressive strength of 20.7 MPa before placement of the bridge and wingwall elements. The completed footing surface shall be constructed in accordance with grades shown on the plans. When tested with a 3-meter straight edge, the surface shall not vary more than 5 mm in 3 meters.

15.2 Placement of the Bridge Units, Wingwalls, and Headwalls – The bridge units, wingwalls, and headwalls shall be placed as shown on these plans. Special care shall be taken in setting the elements to the true line and grade. The bridge units and wingwalls shall be set on 150 X 150 mm masonite or steel shims. A minimum of 15 mm gap shall be provided between the footing and the bottom of the bridge's vertical legs or the wingwall. The gap shall be filled with cement grout (Portland cement and water or cement mortar composed of one part Portland cement and three parts of sand, by volume, and water.)

15.3 External Protection of Joints – The butt joint made by two adjoining bridge units shall be covered with a 22 mm x 35 mm preformed bituminous joint sealant and a minimum of a 230 mm wide joint wrap. The surface shall be free of dirt before applying the joint material. A primer compatible with the joint wrap to be used shall be applied for a minimum width of 230 mm on each side of the joint. The external wrap shall be either EZ-WRAP RUBBER by PRESS-SEAL GASKET CORPORATION, SEAL WRAP by MAR MAC MANUFACTURING CO. INC. or approved equal. The joint shall be covered continuously from the bottom of one bridge section leg, across the top of the arch and to the opposite bridge section leg. Any laps that result in the joint wrap shall be a minimum of 150 mm long with the overlap running downhill.

In addition to the joints between bridge units, the joint between the end bridge unit and the headwall shall also be sealed as described above. If precast wingwalls are used, the joint between the end bridge unit and the wingwall shall be sealed with a 610 mm strip of filter fabric. Also, if lift holes are formed in the arch units, they shall be primed and covered with a 230 x 230 mm square of joint wrap.

During the backfilling operation, care shall be taken to keep the joint wrap in its proper location over the joint.

15.4 Backfill – Backfill shall be considered as all replaced excavation and new embankment adjacent to the CON/SPAN bridge units, wingwalls, and headwalls. The project construction and material specifications which include the specifications for excavation for structures and roadway excavation and embankment construction, shall apply except as modified in this section.

No backfill shall be placed against any structural elements until they have been approved by the Engineer.

Backfill against a waterproofed surface shall be placed carefully to avoid damage to the waterproofing material.

Mechanical tampers or approved compacting equipment shall be used to compact all backfill and embankment immediately adjacent to each side and over the top of each bridge unit until it is covered to a minimum depth of 305 mm, unless the design fill height is less than 305 mm. The backfill within the Critical Backfill Zone (C.B.Z.) (shown in the diagrams below) shall be placed in lifts of 205 mm or less (loose depth). Heavy compaction equipment shall not be operated in this area or over the bridge until it is covered to a depth of 305 mm, unless the design fill height is less than 305 mm.

Lightweight dozers and graders may be operated over bridge units having 305 mm of compacted cover, but heavy earth moving equipment (larger than a D-4 Dozer weighing in excess of 10.9 Tonnes and having track pressures of 33kPa or greater) shall require 610 mm of cover unless the design cover is less than two feet. In no case shall equipment operating in excess of the design load (MS18 or MS22.5) be permitted over the bridge units unless approved by CON/SPAN.

Any additional fill and subsequent excavation required to provide this minimum cover shall be made at no additional cost to the project.

As a precaution against introducing unbalanced stresses in the bridge, when placing backfill at no time shall the difference between the heights of fill on opposite sides of the bridge exceed 610 mm.

Backfill in front of wingwalls shall be carried to ground lines shown in the plans.

For fill heights over 3.7 meters, no backfilling may begin until a backfill compaction testing plan has been coordinated with and approved by CON/SPAN Bridge Systems. Cost of the backfill compaction testing shall be included in the cost of the precast units. This included cost applies only to projects with fill heights over 3.7 meters (as measured from top crown of arch to finished grade).

16. QUALITY ASSURANCE

The Precaster shall demonstrate adherence to the standards set forth in the NPCA Quality Control Manual. The Precaster shall meet either Section 16.1 or 16.2.

16.1. Certification: The Precaster shall be certified by the Precast/Prestressed Concrete Institute Plant Certification Program or the National Precast Concrete Association's Plant Certification Program prior to and during production of the products covered by this specification.

16.2. Qualifications, Testing and Inspection

16.2.1. The Precaster shall have been in the business of producing precast concrete products similar to those specified for a minimum of three years. He shall maintain a permanent quality control department or retain an independent testing agency on a continuing basis. The agency shall issue a report, certified by a licensed engineer, detailing the ability of the Precaster to produce quality products consistent with industry standards.

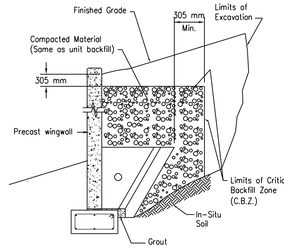
16.2.2. The Precaster shall show that the following tests are performed in accordance with the ASTM standards indicated. Tests shall be performed for each 115 cubic meters of concrete placed, but not less frequently than once per production run, as defined in §8 of these specifications.

16.2.2.1. Air Content: C231 or C173

16.2.2.2. Compressive Strength: C39, C497

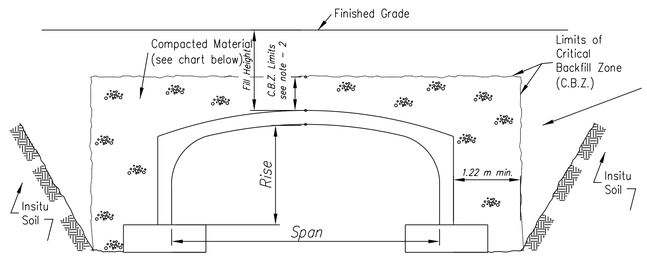
16.2.3. The Precaster shall provide documentation demonstrating compliance with this section to CON/SPAN Bridge Systems at regular intervals or upon request.

16.2.4. The Owner may place an inspector in the plant when the products covered by this specification are being manufactured.



WINGWALL BACKFILL REQUIREMENTS

BACKFILL DESCRIPTION								
Group Classification	A-1		A-3	A-2				A-4
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7	
Sieve Analysis, Percent Passing								
No. 10	50 max.							
No. 40	30 max.	50 max.	51 min.					
No. 200	15 max.	25 max.	10 max.	35 max.	35 max.	35 max.	35 max.	36 min.
Characteristics of Fraction Passing								
No. 40								
Liquid Limit				40 max.	41 min.	40 max.	41 min.	40 max.
Plasticity Index	6 max.		N.P.	10 max.	10 max.	11 min.	11 min.	10 max.
Usual Types of Significant Constituent Materials	Stone Fragments, Gravel & Sand		Fine Sand	Silty or Clayey Gravel and Sand				Silty Soils
General Rating as Subgrade	Excellent to Good							Fair to Poor



ELEVATION

NOTES
1. SEE CON/SPAN SPECIFICATIONS SECTION 15.4 FOR BACKFILL SPECIFICATIONS.
2. FOR FILL HEIGHTS GREATER THAN 610 mm, C.B.Z. LIMIT SHALL BE 610 mm ABOVE ARCH CROWN. FOR FILL HEIGHTS LESS THAN 610 mm, THE FINISHED GRADE SHALL BE THE BOUNDARY LINE FOR THE C.B.Z.
3. BACKFILLING OPERATIONS WITHIN THE C.B.Z. SHALL BE PERFORMED IN LIFTS OF 205 mm OR LESS (LOOSE DEPTH).
4. MAXIMUM DRY DENSITY SHALL BE DETERMINED BY AASHTO T-99 OR OTHER APPROVED METHODS.
5. BACKFILL SHALL BE COMPACTED IN LAYERS UNTIL THE DENSITY IS NOT LESS THAN 95% OF THE MAXIMUM DRY DENSITY.

SPAN	FILL HEIGHT	ACCEPTABLE MATERIAL INSIDE C.B.Z.	ACCEPTABLE MATERIAL OUTSIDE C.B.Z.
≤ 7.3 m	≥ 3.7 m	A1, A3	**
≤ 7.3 m	< 3.7 m	A1, A2, A3, A4	**
> 7.3 m	ALL	A1, A3	**

** EMBANKMENT MATERIAL PER PROJECT SPECIFICATIONS

BACKFILL REQUIREMENTS

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

BRIDGES N504 & N505 REPLACEMENT
PRECAST ARCH GENERAL NOTES

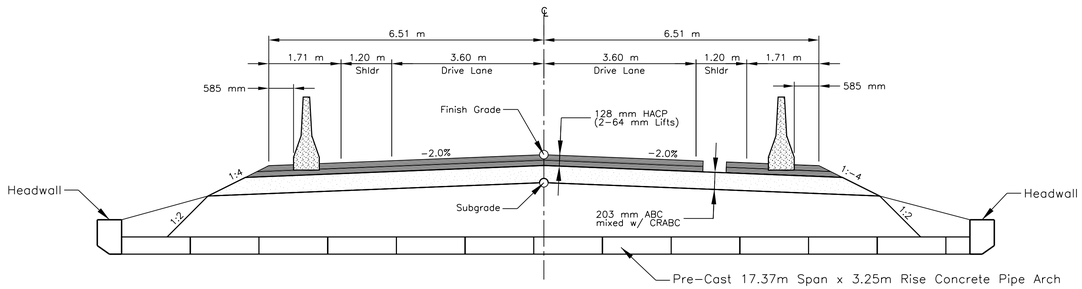
DRAWN BY: NRDOT DATE: 2/23/2018

DESIGNED BY: NRDOT DATE: 2/23/2018

REVISED: 3/15/2018 BY: Leroy.Toledo

Sht 85_B-11 N504 n N505 CONSPAN det notes 2018.dgn

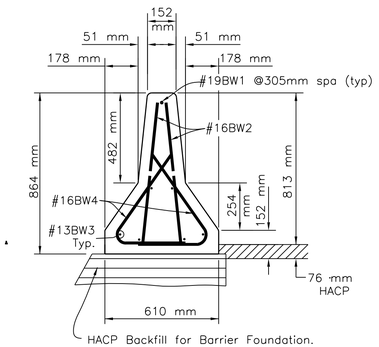
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	B-12	88



TYPICAL SECTION AT CONCRETE JERSEY BARRIER AREA

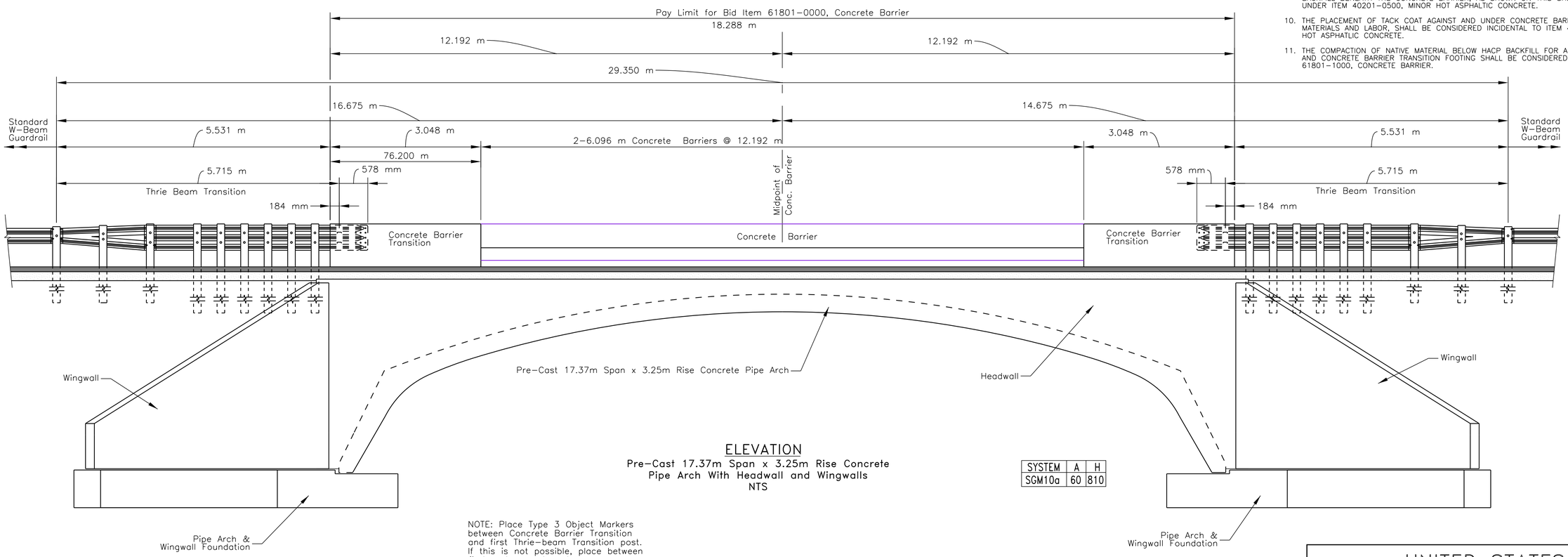
Sta. 49+653.38 to 49+671.69 Left
Sta. 49+656.39 to 49+674.69 Right
NTS

SEE SHEET 6 FOR ESTIMATED QUANTITY TABLE



GENERAL NOTES

1. AT NO TIME DURING THE PLACEMENT OF THE PC ARCH GUARDRAILS SHALL THE ROADWAY EDGE AT ACTIVE TRAFFIC LANES BE LEFT WITHOUT CONTROL BARRIERS OR FLAGMEN.
2. PLACMENT OF PRECAST CONCRETE BARRIER SECTIONS SHALL BE BASED ON THE MIDPOINT OF CBC. MIDPOINT OF CBC SHALL BE DETEMINED IN THE FIELD BY MEASURMENT OF INLET AND OUTLET OF EACH CBC, AND SHALL BE CONCURRED BY THE COR/COTR.
3. AT THE CONTRACTOR'S OPTION, THE CONCRETE BARRIER MAY BE CAST IN PLACE IN LIEU OF PROVIDING PRECAST SECTIONS.
4. THE EXISTING ASPHALT AT THE NEW W-BEAM GUARDRAIL (INCLUDING THE 6 METER SHOULDER WIDENING TAPER AT GUARDRAIL ENDS) AND CONCRETE BARRIER TRANSITION (NOT THE PRECAST BARRIER SECTIONS) LOCATIONS, SHALL BE FULL DEPTH SAW CUT AT THE SHOULDER LINE AND ALL ASPHALT BEYOND SAW CUT SHALL BE REMOVED. THE EXISTING ASPHALT AT THE PRECAST BARRIER SECTIONS SHALL BE SAW CUT AND REMOVED TO THE LIMITS SHOWN ON THIS SHEET. THE WORK SHALL BE CONSIDERED INCIDENTAL TO ITEM 20304-1000, REMOVAL OF STRUCTURES AND OBSTRUCTIONS.
5. THE PRECAST CONCRETE BARRIER SECTIONS AND THE CONCRETE BARRIER TRANSITIONS WITH FOOTING SHALL BE SET AS PER FP-14, SECTION 618 AND AS DETAILED ON SHEETS B-13 AND B-14.
6. GUARDRAIL WIDENING AND THE AREA IN FRONT OF THE TRANSITION FOOTING SHALL BE SURFACED WITH 152 mm OF ABC AND 76 mm OF ASPHALT SURFACING AND SHALL BE PLACED TO THE DIMENSIONS SHOWN ON SHEET 18 OF 95. AGGREGATE BASE COURSE AND HOT ASPHALTIC CONCRETE FOR GUARDRAIL WIDENING SHALL BE PAID UNDER ITEM 30301-2000, UNTREATED AGGREGATE BASE COURSE, GRADING D, AND ITEM 40401-0000, MINOR HOT ASPHALTIC CONCRETE, RESPECTIVELY. THE FINISH ELEVATION OF THE GUARDRAIL WIDENING ASPHALT SHALL MATCH THE FINISHED RECYCLED ASPHALT COURSE ELEVATION.
7. THE NEW GUARDRAIL AND THRIE BEAM TRANSITION STRUCTURES SHALL BE INSTALLED AS PER FP-14, SECTION 617 AND AS DETAILED ON SHEETS B-13 AND B-14.
8. ALL WORK, MATERIALS AND LABOR REQUIRED FOR THE EXISTING MATERIAL REMOVAL ABOVE THE EXISTING GUARDRAIL ATTACHMENT BLOCKS, AS SHOWN ON THIS SHEET, SHALL BE CONSIDERED INCIDENTAL ITEM 20304-1000, REMOVAL STRUCTURES AN OBSTRUCTIONS.
9. ALL WORK, MATERIALS AND LABOR REQUIRED FOR THE CONSTRUCTION OF THE HACP BACKFILL BENEATH THE CONCRETE BARRIER, AS SHOWN ON THIS SHEET, SHALL BE PAID UNDER ITEM 40201-0500, MINOR HOT ASPHALTIC CONCRETE.
10. THE PLACEMENT OF TACK COAT AGAINST AND UNDER CONCRETE BARRIER, INCLUDING ALL MATERIALS AND LABOR, SHALL BE CONSIDERED INCIDENTAL TO ITEM 40201-0500, MINOR HOT ASPHATLIC CONCRETE.
11. THE COMPACTION OF NATIVE MATERIAL BELOW HACP BACKFILL FOR AREAS BETWEEN ARCH AND CONCRETE BARRIER TRANSITION FOOTING SHALL BE CONSIDERED INCIDENTAL TO ITEM 61801-1000, CONCRETE BARRIER.

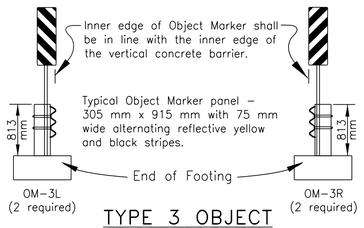


ELEVATION

Pre-Cast 17.37m Span x 3.25m Rise Concrete Pipe Arch With Headwall and Wingwalls
NTS

SYSTEM	A	H
SGM10a	60	810

NOTE: Place Type 3 Object Markers between Concrete Barrier Transition and first Thrie-beam Transition post. If this is not possible, place between first and second post.



TYPE 3 OBJECT MARKER INSTALLATION

NOTE:

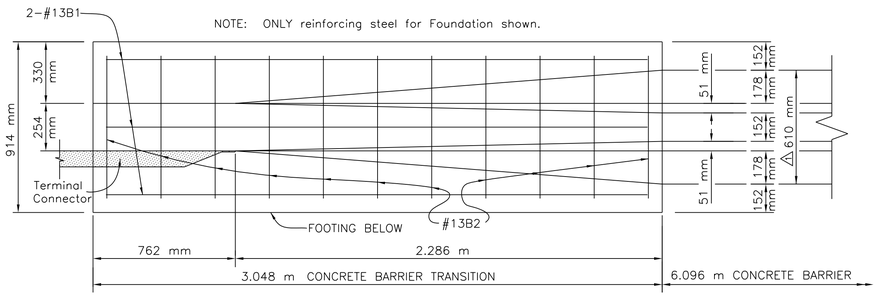
1. Concrete Barrier Transition sections shall be cast in place.
2. At Skewed Box Locations, guardrailing are off center relative to the Centerline

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

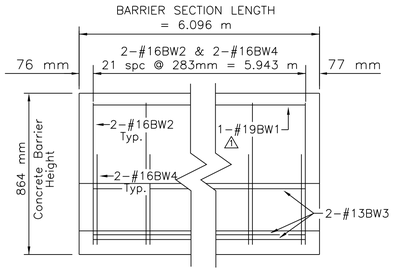
CONCRETE JERSEY BARRIER DETAILS AT N505 BRIDGE LOCATION

DRAWN BY: NRDOT	DATE: 8/23/2017
DESIGNED BY: NRDOT	DATE: 8/23/2017
REVISED: 3/15/2018	BY: Leroy.Toledo
Sht 86 B-12 Conc Barrier 1 rev 2018.dgn	

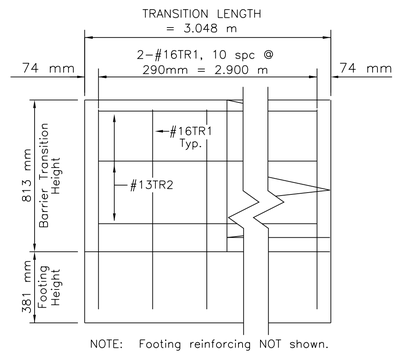
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19−4)1,2&4	B−13	88



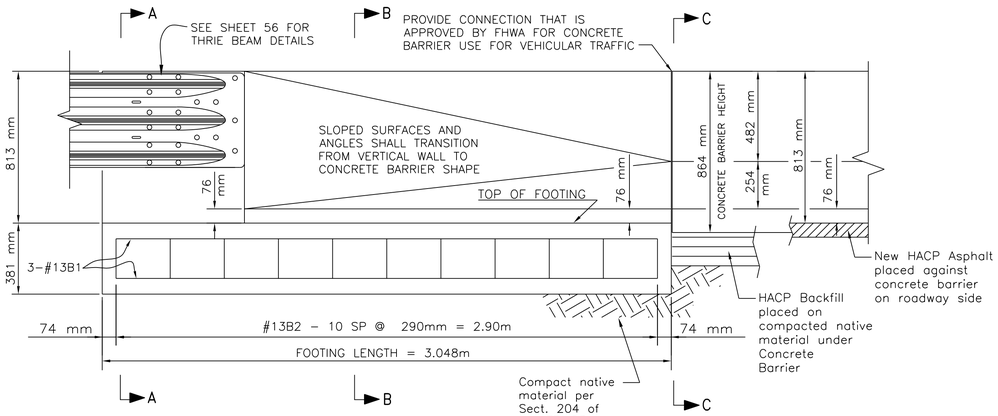
PLAN



CONCRETE BARRIER
REINFORCING DETAILS − ELEVATION



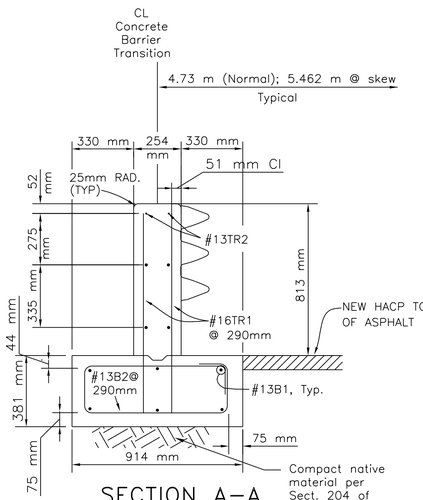
CONCRETE BARRIER TRANSTION
REINFORCING DETAILS − ELEVATION



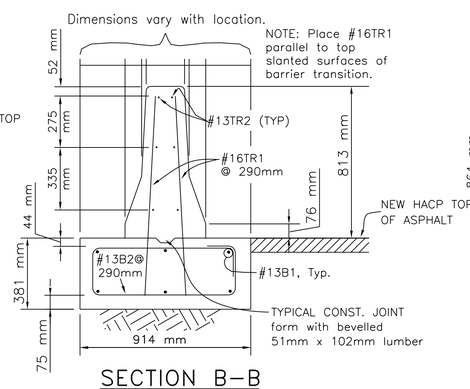
ELEVATION

GENERAL NOTES

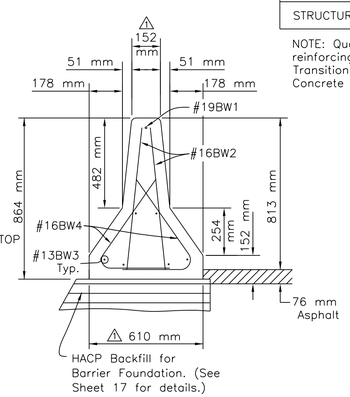
1. SPECIFICATIONS: DESIGN: AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGES, SEVENTEENTH EDITION, 2002 AND SUBSEQUENT INTERIM SPECS. CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS, FP−14, AND ALL SUBSEQUENT REVISIONS.
2. UNITS: ALL DIMENSIONS ARE IN SI (METRIC) UNITS.
3. CONCRETE: CAST IN PLACE CONCRETE SHALL BE CLASS A(AE) WITH A 28 DAY MINIMUM STRENGTH OF 20.7 MPa. THE AIR CONTENT FOR CLASS A(AE) CONCRETE SHALL NOT BE LESS THAN SPECIFIED IN THE FP−14. CHAMFER EXPOSED CORNERS OF ALL CONCRETE 20mm UNLESS OTHERWISE SHOWN. ALL CONCRETE SHALL CONTAIN TYPE II PORTLAND CEMENT. THE TIME LIMITS SPECIFIED IN THE FP−14 SHALL APPLY. IF THE CONCRETE CANNOT BE DISCHARGED WITHIN THE SPECIFIED LIMIT, AN ALTERNATE METHOD OF DELIVERY, SUCH AS DRY BATCHING SHALL BE USED OR A SITE BATCHING PLANT CONFORMING TO THE SPECIFICATIONS SHALL BE USED. ALL CONCRETE FOR BARRIERS AND BARRIER TRANSTIONS AND ALL EXPANSION JOINTS INCLUDING ANY FILLER MATERIAL, SHALL BE CONSIDERED INCIDENTAL TO ITEM 61801−0000, CONCRETE JERSEY BARRIER.
4. FINISHING CONCRETE SURFACES: ALL CONCRETE SURFACES ABOVE GROUND LEVEL SHALL BE GIVEN A CLASS 1 ORDINARY FINISH.
5. REINFORCING STEEL: ALL REINFORCING STEEL SHALL CONFORM TO AASHTO M 31M, GRADE 420 UNLESS A DIFFERENT GRADE IS SPECIFIED. THE MINIMUM COVER OF ANY REINFORCING STEEL SHALL BE 50mm UNLESS OTHERWISE SPECIFIED. DIMENSIONS SHOWN REFER TO THE CENTERLINE OR BARS UNLESS NOTED OTHERWISE. LENGTHS OF REINFORCING STEEL BARS SHOWN INCLUDE REQUIRED SPLICE LENGTHS FOR SPLICES SHOWN. ALL REINFORCING STEEL FOR PRECAST CONCRETE JERSEY BARRIER AND CAST−IN−PLACE CONCRETE JERSEY BARRIER TRANSITIONS SHALL BE CONSIDERED INCIDENTAL TO ITEM 61801−0000, CONCRETE JERSEY BARRIER.
6. CONTRACTOR SHALL VERIFY: IN THE FIELD ALL DIMENSIONS, ELEVATIONS, AND DETAILS WHICH WILL BE INVOLVED IN THE NEW CONSTRUCTION BEFORE PROCEEDING WITH NEW WORK.
7. PRECAST CONCRETE JERSEY BARRIERS: FABRICATE (PRE−CAST) OR CAST IN PLACE. CONTRACTOR SHALL SUBMIT A PROPOSED CONCRETE JERSEY BARRIER (JERSEY BARRIER) DESIGN AND LAYOUT TO THE NAVAJO REGIONAL PLANNING AND DESIGN SECTION THROUGH THE COR/AOTR PRIOR TO FABRICATION OR ORDERING OF MATERIAL. SEE THIS SHEET FOR SAMPLE DESIGN/LAYOUT. THE CONTRACTOR HAS THE OPTION TO SUBMIT ALTERNATE DESIGNS FOR REVIEW AND APPROVAL AND SHALL INCLUDE DESIGN OF BARRIER SECTION CONNECTIONS CAPABLE OF RESISTING TRAFFIC IMPACTS CONFORMING TO FEDERAL STANDARDS, LIFTING ANCHORS, ANY ADDITIONAL REINFORCING STEEL NECESSARY TO SUIT LIFTING AND HANDLING OF THE PRECAST BARRIERS. ALTERNATE DESIGNS SHALL BE OF EQUAL OR GREATER CAPACITY FOR TRAFFIC IMPACT. PAYMENT FOR PRECAST CONCRETE JERSEY BARRIERS, CAST−IN−PLACE CONCRETE JERSEY BARRIER TRANSITIONS AND ALL NECESSARY LABOR, HARDWARE AND MATERIALS SHALL BE PAID BY THE LINEAR METER. UNDER BID ITEM 61801−0000. THE COST OF ALL REINFORCING STEEL, INSERTS AND CONNECTIONS ASSOCIATED WITH THESE ITEM ARE CONSIDERED INCIDENTAL TO ITEM 61801−0000.
8. FOUNDATION BELOW CONCRETE BARREIR TRANSITION FOOTING SHALL BE COMPACTED NATIVE MATERIAL COMPACTED PER SECTION 204 OF THE FP−14. ALL WORK, MATERIALS AND LABOR NECESSARY FOR THE COMPACTION OF THE FOOTING BED SHALL BE CONSIDERED INCIDENTAL TO ITEM 61801−0000, CONCRETE JERSEY BARRIER.



SECTION A−A



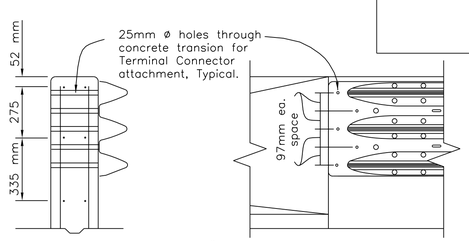
SECTION B−B



SECTION C−C

ESTIMATED QUANTITIES		
ONE 3.048 m TRANSITION W/ FOOTING		
REINFORCING BAR GRADE 420	96	kg
STRUCTURAL CONCRETE CLASS "AE"	1.81	m^3
ONE 6.096m CONCRETE BARRIER		
REINFORCING BAR GRADE 420	161	kg
STRUCTURAL CONCRETE CLASS "AE"	1.74	m^3

NOTE: Quantities shown for information only. Concrete and reinforcing steel for Concrete Barrier and Concrete Barrier Transition is considered incidental to Item 61801−0000, Concrete Barrier.



NOTE: See Note #8 above for details regarding the 25mm ø attachment holes.

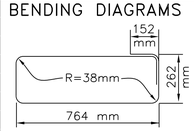
TERMINAL CONNECTOR
ATTACHMENT DETAIL

REINFORCING BAR SCHEDULE

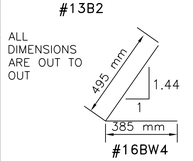
LOCATION	MARK	QTY.	SIZE	LENGTH	SPACING
Footing, Longitudinal	13B1	6	13	2.900 m	
Footing, Stirrup (bent)	13B2	11	13	2.360 m	290 mm
Transition, Vertical	16TR1	22	16	1.070 m	290 mm
Transition, Horizontal	13TR2	6	13	2.900 m	
Barrier, Top Horizontal	19BW1	1	19	5.900 m	
Barrier, Vertical	16BW2	44	16	760 mm	283 mm
Barrier, Lower Horizontal	13BW3	6	13	5.900 m	
Barrier, Stirrup (bent)	16BW4	44	16	880 mm	283 mm

NOTE: Quantities shown above are for ONE 3.048 m long Concrete Barrier Transition with Footing, and for ONE 6.096 m long Concrete Barrier Section.

BENDING DIAGRAMS



#13B2



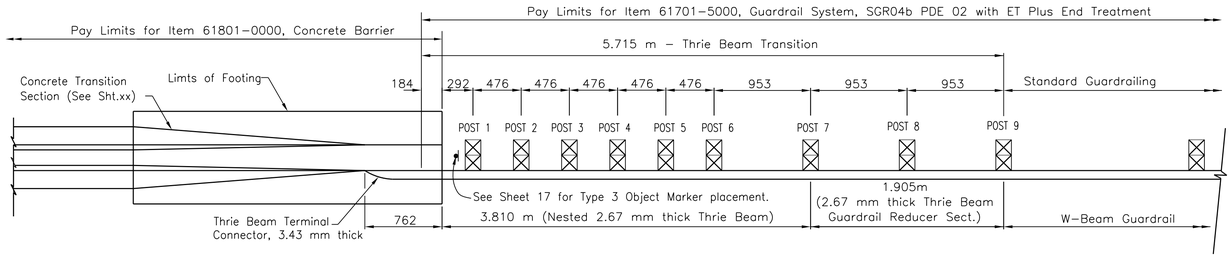
#16BW4

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

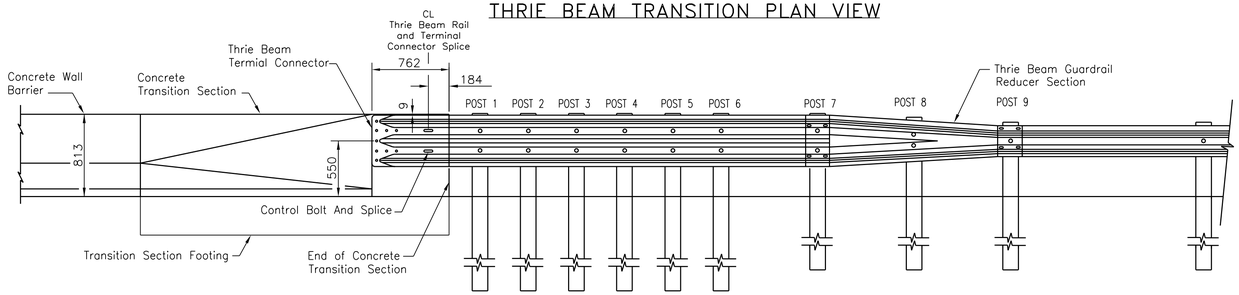
CONCRETE BARRIER TRANSITION TO THRIE BEAM DETAILS

DRAWN BY: NRDOT	DATE: 9/19/2017
DESIGNED BY: NRDOT	DATE: 9/19/2017
REVISED: 9/19/2017	BY: Leroy.Toledo
Sht 87 B−13 Conc Barrier 2 rev 2018.dgn	

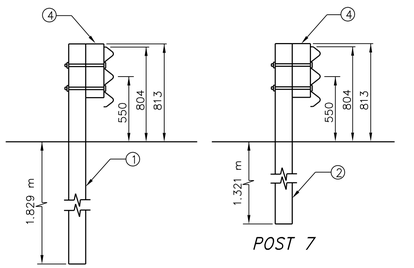
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N12	N12(19-4)1,2&4	B-14	88

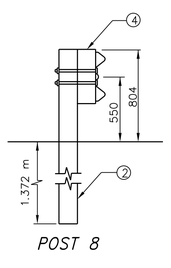


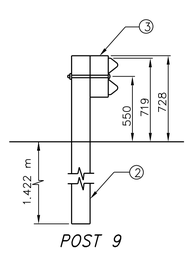
THRIE BEAM TRANSITION PLAN VIEW

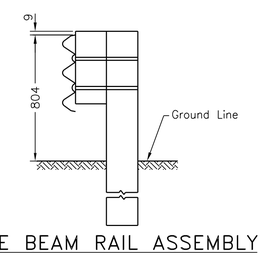


THRIE BEAM TRANSITION ELEVATION VIEW

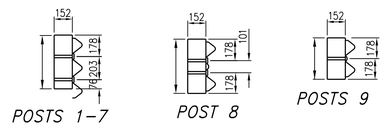




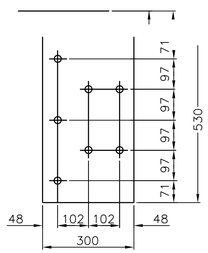




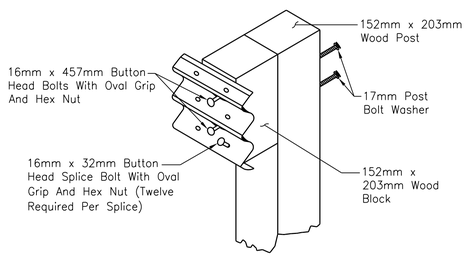
THRIE BEAM RAIL ASSEMBLY



BLOCK DETAILS



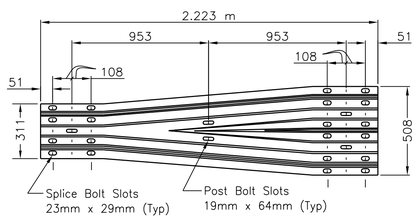
16 mm BEARING PLATE



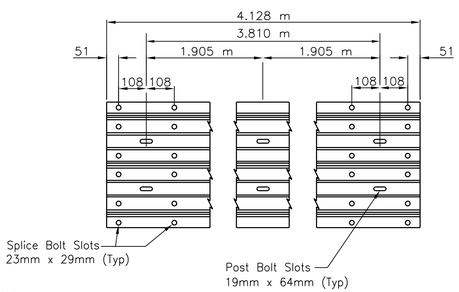
THRIE BEAM POST ASSEMBLY

LEGEND

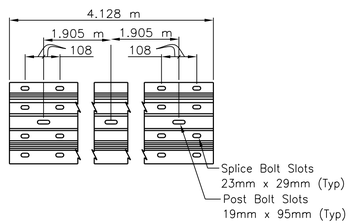
① 152 x 635 x 2.591 m or W203 x 533 x 2.591 m Post
② W152 x 508 x 2.134 m or W203 x 457 x 2.134 m Post
③ 152 x 203 x 356 Treated Timber Offset Block
④ 152 x 203 x 457 Treated Timber Offset Block



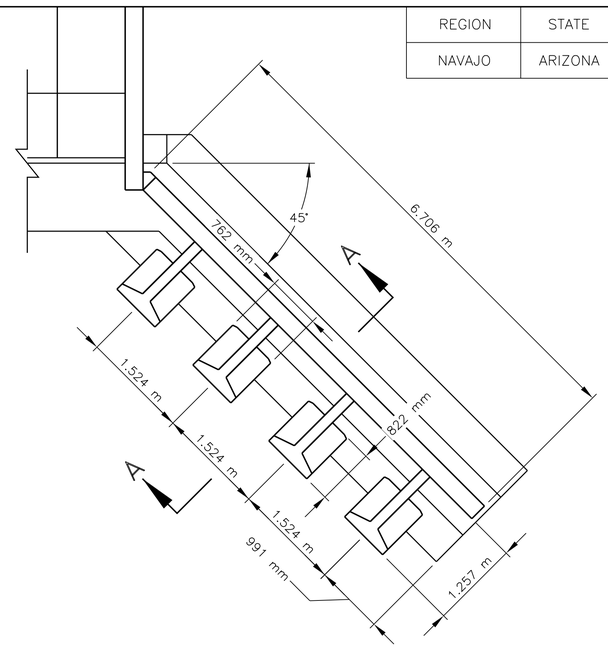
THRIE BEAM GUARDRAIL REDUCER SECTION



THRIE BEAM RAIL ELEMENT



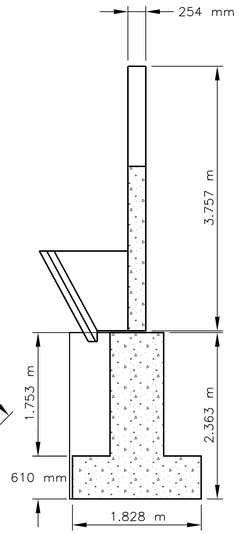
W-BEAM RAIL ELEMENT



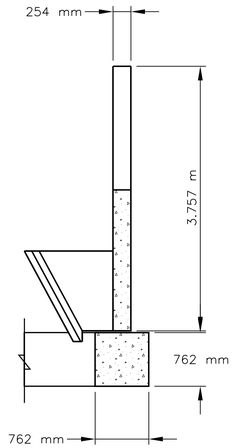
PLAN VIEW-N504 BRIDGE WINGWALL

STANDARD THRIE BEAM TERMINAL CONNECTOR

PLAN VIEW-N505 BRIDGE WINGWALL



SECTION A-A



SECTION B-B

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 DIAMETER GALVANIZED AASHTO M164 BOLTS ARE REQUIRED FOR THE ATTACHMENT OF THE THRIE BEAM TERMINAL CONNECTOR
5. TO THE CONCRETE BARRIER, LENGTH TO BE DETERMINED IN THE FIELD BY THE COR/COTR. HOLES FOR BOLTS SHALL BE 25 mm DIA. AND SHALL BE EITHER FORMED OR CORE DRILLED.
6. 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.
7. INSTALL THRIE BEAM TERMINAL CONNECTOR BETWEEN NESTED GUARDRAIL ELEMENTS ON THE APPROACH SECTION.
8. INSTALL THRIE BEAM TERMINAL CONNECTOR OUTSIDE OF THE NESTED GUARDRAIL ELEMENTS ON THE DEPARTURE SECTION.
9. 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.
10. DO NOT PLACE ANY WASHERS UNDER THE BOLTS ON THE TRAFFIC SIDE OF THE BARRIER.
11. PLACE REFLECTOR TABS ON POSTS 1, 6 AND 9.
12. THE COLOR OF THE REFLECTIVE SHEETING ON THE REFLECTOR TABS SHALL BE THE SAME AS THE COLOR OF THE EDGELINE PAVEMENT MARKING IN FRONTOF THE BARRIER.
13. REFLECTOR TABS SHALL HAVE A MINIMUM OF 76 x 127 mm REFLECTIVE SHEETING ON BOTH SIDES AND SHALL ATTACH SECURELY TO THE BLOCKOUT.
14. SPLICES SHALL BE LAPPED SO THE FREE END DOES NOT FACE TRAFFIC FLOW.
15. CONSTRUCTION TOLERANCE FOR HEIGHT OF GUARDRAIL IS 13 mm.
16. TERMINAL CONNECTOR, THRIE BEAM BEARING PLATE AND ASSOCIATED HARDWARE SHALL BE INCLUDED IN THE UNIT PRICE FOR BID ITEM 61701-5000.

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

GUARDRAIL TRANSITION
THRIE BEAM AND
WING WALL DETAILS

DRAWN BY: NRDOT	DATE: 8/23/2017
DESIGNED BY: NRDOT	DATE: 8/23/2017
REVISED: 3/20/2018	BY: Harold.Riley
Sht 88 B-14 ThrieBeamTransition_rev 2018.dgn	