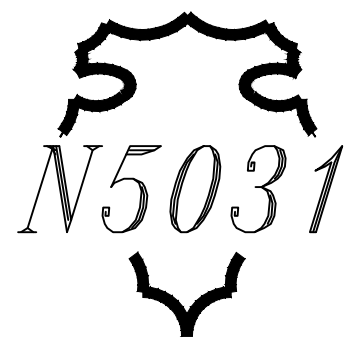


UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS
NAVAJO REGION D.O.T.
ROUTE



PROJ. N5031(1)1,2&4
HOGBACK IRRIGATION CANAL
I.D. NO. N32704

**APPROVED
CONSTRUCTION
DRAWINGS**

November 09, 2011

Changes per NECA Proposal
Response dated December 19, 2011

INDEX TO SHEETS	
SHT. NO.	DESCRIPTION
1	TITLE SHEET
2	TYPICAL ROADWAY SECTION & GENERAL NOTES
3	BRIDGE GENERAL NOTES, QUANTITIES AND TABLES
4	ROADWAY PLAN AND PROFILE
5	TEMPORARY TRAFFIC CONTROL & SUGGESTED DETOUR LAYOUT
6	BRIDGE PLAN AND PROFILE
7	SOIL PROFILE AND BORING PLAN (1 OF 2)
8	SOIL PROFILE AND BORING PLAN (2 OF 2)
9	ABUTMENT DETAILS
10	WINGWALL DETAILS AND TOP OF CONCRETE ELEVATIONS
11	PRESTRESSED CONCRETE SLAB DETAILS - TYPE S III-48 (1 OF 2)
12	PRESTRESSED CONCRETE SLAB DETAILS - TYPE S III-48 (2 OF 2)
13	DECK PLAN AND SECTION
14	REINFORCING BAR SCHEDULE AND APPROACH SLAB DETAILS
15	BRIDGE RAIL DETAILS
16	APPROACH GUARDRAIL DETAILS
17	STANDARD GUARDRAIL DETAILS - CRT
18-19	STANDARD GUARDRAIL DETAILS - ET-PLUS
20	PERMANENT SIGNING DETAILS
21	POST AND HARDWARE DETAILS
22	STANDARD PIPE INSTALLATION TURNOUT & ROUTE SIGN DETAILS
23	PIPE CULVERT DETAILS
24	DELINEATOR AND ROW MARKER DETAILS
25	CHAIN LINK FENCING DETAILS
26	BARB WIRE FENCING DETAILS
27	PRECAST CONCRETE CATTLEGUARD DETAILS
28	CATTLEGUARD WING-BRACE DETAILS
29	CONCRETE DRAINAGE PAD DETAILS FOR PCCG
30-31	STORMWATER POLLUTION EROSION/SEDIMENT CONTROL DETAILS
32	TEMPORARY TRAFFIC CONTROL & ALTERNATE DETOUR LAYOUT

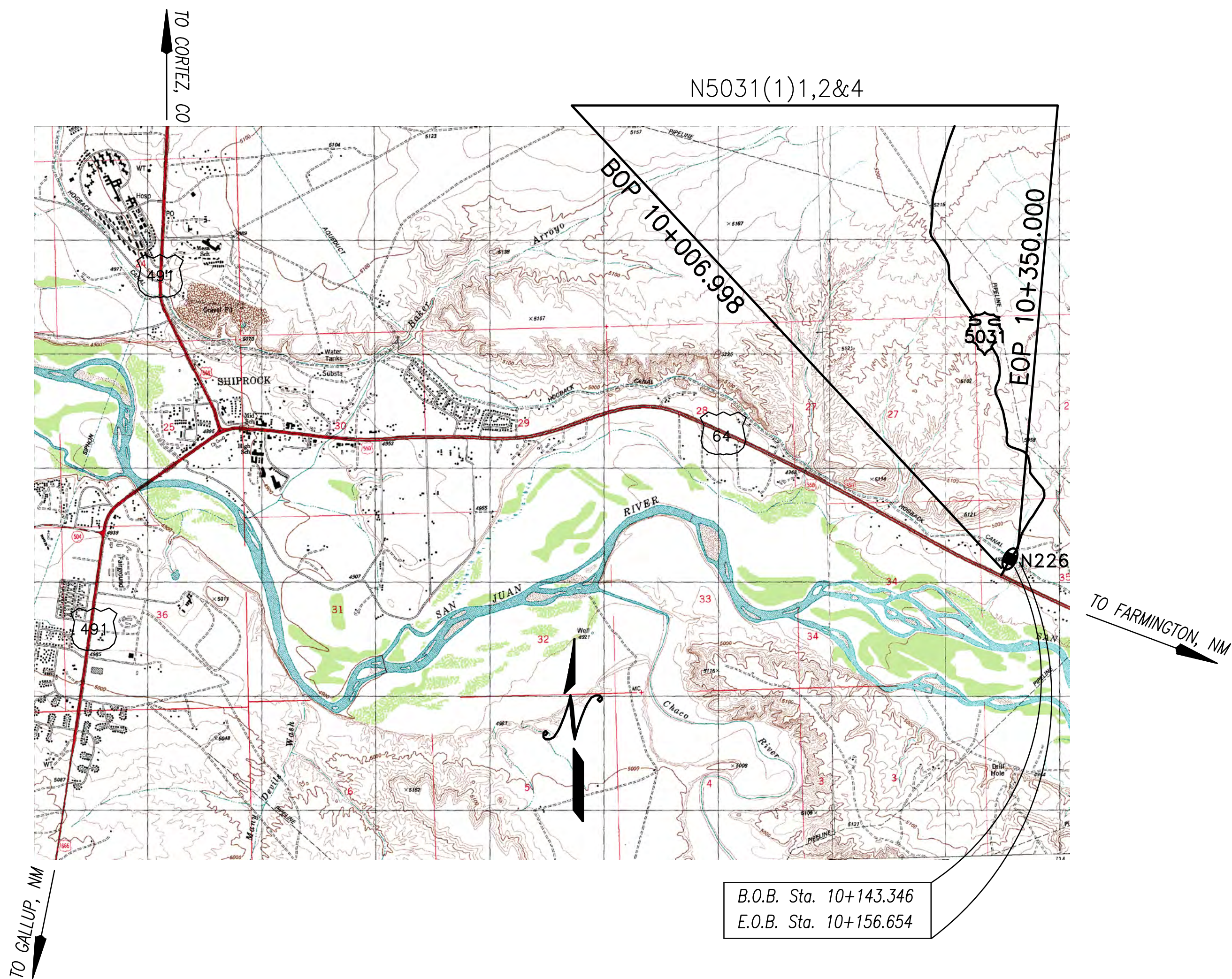
LEGEND

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

DESIGN	DATA
Design Speed	50 km/h
Min. Radius of Curve	140 m
Max. Gradient	4.3%
Min. Stopping Sight Dist.	65m
Min. Passing Sight Dist.	345m
2001 ADT	483 VPD
2021 ADT	718 VPD
Design Hourly Volume	20 VPD
Max. Super Elevation	4%

RIGHT OF WAY		
Left Corridor Width	STA 10+005.657 TO STA 10+133.492	7.000 m
	STA 10+133.492 TO STA 10+182.668	23.000 m
	STA 10+182.668 TO STA 10+181.105	13.690 m
	STA 10+181.105 TAPER FROM	13.690 m
	TO STA 10+350.000	17.027 m
Right Corridor Width	STA 10+005.657 TAPER FROM	8.617 m
	TO STA 10+129.867	6.452 m
	STA 10+129.867 TO STA 10+350.000	23.000 m

LENGTH OF PROJECT		
STATION TO STATION	LIN. METERS	KILOMETERS
B.O.P. Station 10+006.969		
B.O.B. Station 10+143.346	136.377	0.136
E.O.B. Station 10+156.654	13.308	0.014
E.O.P. Station 10+350.000	193.346	0.193
TOTAL	343.031	0.343

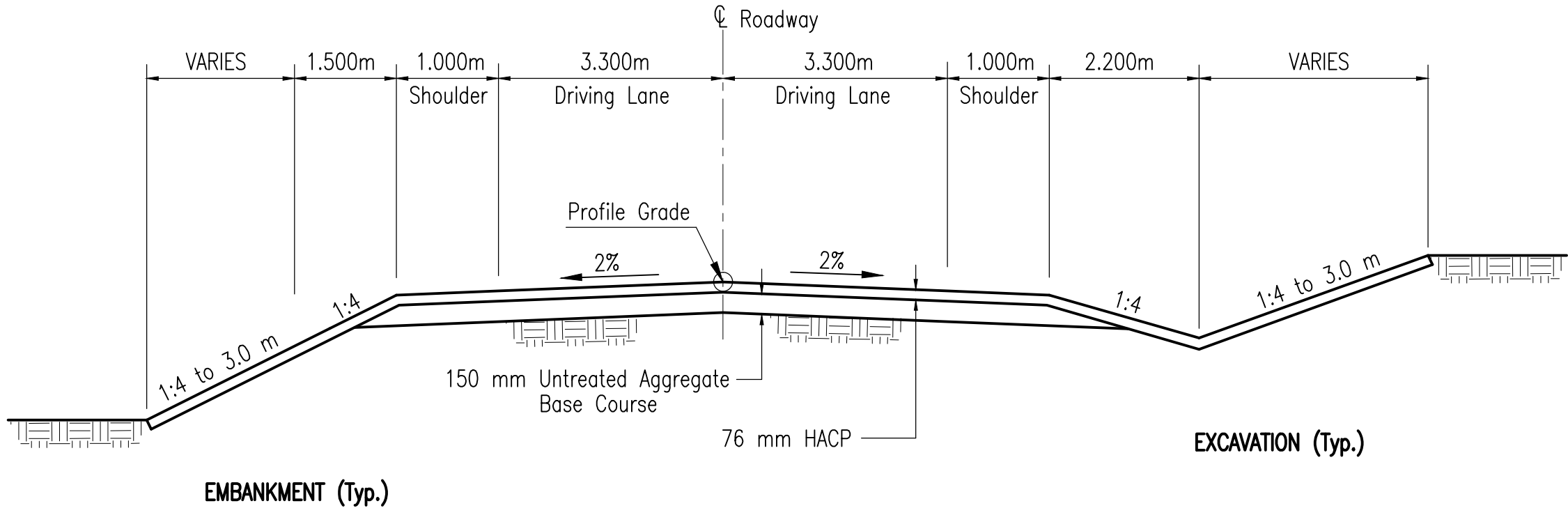


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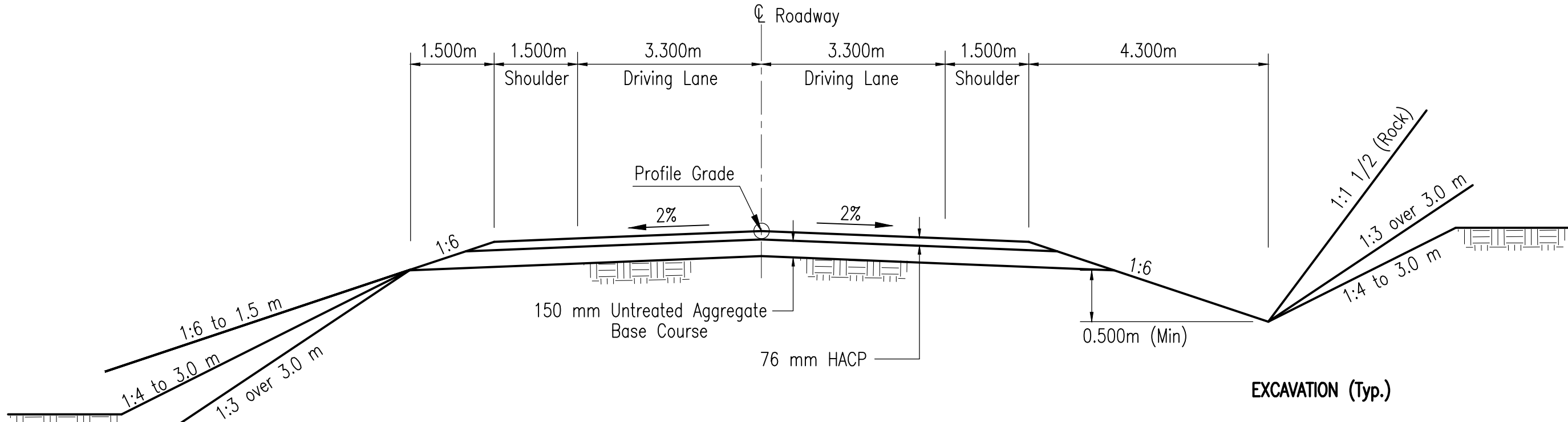
RECOMMENDED APPROVAL	APPROVAL
Agency Road Engineer	DATE
Division Manager	DATE
Planning and Design Chief	DATE
Regional Director	DATE

REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	NM	Navajo	N5031	N5031(1)1,2&4	2	32

TYPICAL ROAD SECTIONS
Project N5031(1)1,2&4 Hogback Irrigation Canal Bridge



MAIN SECTION
Station 10+006.998 to Station 10+143.041



MAIN SECTION
Station 10+156.959 to Station 10+350.000

STRIPING DETAILS

- 102mm STRIPE WIDTH
TWO WAY PASSING
- 102mm STRIPE WIDTH
76mm BETWEEN STRIPES
ONE WAY NO PASSING
- 102mm STRIPE WIDTH
76mm BETWEEN STRIPES
TWO WAY NO PASSING
- 102mm STRIPE WIDTH
- 102mm STRIPE WIDTH
SHOULDER STRIPE DISTANCE FROM CL
AS INDICATED ON TYPICAL SECTION

STRIPING NOTES

- Details (1) thru (4) are yellow, detail (5) is white.
- Payment will be made for meters only.
- Striping shall conform to the current edition of the manual on Uniform Traffic Control Devices for Streets and Highways and Section 634, Traffic Markings of FP-03.
- The 1:3 striping segment to gap ratio (3.048m segment, 9.144m gap) is recommended.

GENERAL NOTES

- ALL WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS (FP-03), AND THE SUPPLEMENTAL SPECIFICATIONS FOR THIS PROJECT.
- ALL PERMANENT AND TEMPORARY ROADSIDE SIGNS SHALL BE PLACED IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS (LATEST EDITION AND AMENDMENTS) AND IN ACCORDANCE WITH THE DETAILS ON THESE PLANS.
- THE DETAILS SHOWN FOR TEMPORARY TRAFFIC CONTROL REFLECTS GENERAL REQUIREMENTS FOR THIS PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR PREPARING AND SUBMITTING A TRAFFIC CONTROL PLAN (TCP) IN ACCORDANCE WITH THESE DETAILS, THE CONTRACTOR'S CONSTRUCTION SEQUENCING PLAN, MUTCD, AND THE SUPPLEMENTAL SPECIFICATIONS FOR SECTION 635, TEMPORARY TRAFFIC CONTROL. THE CONTRACTOR SHALL SUBMIT A SEPARATE TRAFFIC CONTROL PLAN, FOR REVIEW AND APPROVAL TO THE APPROPRIATE STATE HIGHWAY AGENCY(WITH A COPY SENT TO THE COR) FOR WORK WITHIN THE STATE HIGHWAY RIGHT OF WAY.
- THE DESIGN FEATURES INCLUDING HORIZONTAL AND VERTICAL ALIGNMENTS, TYPICAL SECTIONS, TURNOUTS, AND OTHER DESIGN DETAILS SHOWN ON THESE DESIGN PLANS SHALL NOT BE ALTERED OR MODIFIED IN ANYWAY DURING CONSTRUCTION WITHOUT THE EXPRESSED WRITTEN DIRECTION AND APPROVAL OF THE REGIONAL ROAD ENGINEER AND/OR CONTRACTING OFFICER. DRAINAGE STRUCTURES SHALL BE INSTALLED AS SHOWN ON THE PLANS WITH ONLY MINOR CORRECTIONS IN LOCATION, SKEW AND/OR ELEVATIONS AS NEEDED TO FIT FIELD CONDITIONS.
- THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY AND EXPENSE FOR DISPOSAL OF TRASH AND/OR CONSTRUCTION DEBRIS IN ACCORDANCE WITH SECTIONS 107 AND 203 OF THE FP-03. THIS WORK SHALL BE INCIDENTAL OBLIGATIONS OF THE CONTRACTOR.
- THE CONTRACTOR SHALL READ AND MAKE CAREFUL EXAMINATION OF THE PLANS, SPECIFICATION, QUANTITIES, MATERIALS AND VISIT THE SITE OF THE PROPOSED CONSTRUCTION TO BECOME FAMILIAR WITH THE SITE CONDITIONS AND LIMITATIONS BEFORE MAKING A PROPOSAL. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY AND ALL ERRORS RESULTING FROM THE FAILURE TO MAKE SUCH AN EXAMINATION. ANY INFORMATION DERIVED FROM THE MAPS, PLANS, SPECIFICATIONS, PROFILES, DRAWINGS OR THE ENGINEER, WILL NOT RELIEVE THE CONTRACTOR FROM ANY RISK OR FROM FULFILLING THE TERMS OF THE CONTRACT.
- NO WORK SHALL BE PERFORMED OUTSIDE OF THE DESIGNATED CONSTRUCTION LIMITS WITHOUT APPROVAL. IN NO CASE SHALL ANY WORK BE PERFORMED OUTSIDE THE DESIGNATED RIGHT-OF-WAY LIMITS WITHOUT WRITTEN APPROVAL FROM THE REGIONAL DIVISION MANAGER.
- 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. EARTHWORK QUANTITIES SHALL BE BASED ON THE "AS STAKED" CROSS SECTIONS. FINAL EARTHWORK QUANTITIES SHALL BE BASED ON FINAL CROSS SECTION SURVEY DATA SUBMITTED TO THE AOTR/COR IN AN APPROVED FORMAT. ANY OVER-RUN OR UNDER-RUN OF QUANTITIES SHALL BE SUBJECT TO FAR 52.211-18.
- ALL TURNOUTS AND DRIVEWAYS SHALL EITHER BE CONSTRUCTED, REBUILT AND/OR RESHAPED OR REMOVED UP TO THE R/W LIMITS AS SHOWN ON THESE PLANS AND PAVED TO THE R/W LIMITS AS REQUIRED. THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE APPROPRIATE EARTHWORK AND PAVING BID ITEMS SHOWN IN THE BID SCHEDULE.
- STRUCTURAL EXCAVATION AND BACKFILL OF CULVERTS AND OTHER DRAINAGE STRUCTURES SHALL BE CONSIDERED INCIDENTAL TO INSTALLATION OF THE STRUCTURE. EXCESS MATERIAL REMOVED MAY BE USED TO REBUILD TURNOUTS OR PLACED ALONG ROADWAY SHOULDERS IN AREAS DESIGNATED AND AS DIRECTED BY THE COR/AOTR.
- ALL FURROW DITCHES AND DRAINAGE DITCHES SHALL BE STAKED AND GRADED TO DRAIN UP TO THE RIGHT-OF-WAY LIMITS. DITCH BLOCKS, DIKES AND DITCHES MAY BE ADDED AT LOCATIONS DESIGNATED BY THE COR/AOTR AND/OR AS SHOWN ON THESE PLANS. 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.
- IMMEDIATELY PRIOR TO PLACING AGGREGATE BASE COURSE, THE TOP 150 mm OF FINISHED SUBGRADE SHALL BE CHECKED FOR COMPACTION AND GRADE. IF COMPACTION DOES NOT MEET THE MINIMUM SPECIFIED COMPACTION REQUIREMENTS, THE SUBGRADE SHALL BE WATERED AND/OR SCARIFIED AS NEEDED AND RE-COMPACTED TO THE REQUIRED DENSITY. IN NO CASE SHALL ANY EMBANKMENT OR SURFACING MATERIAL BE PLACED ON FROZEN, MUDDY OR UNSTABLE NATURAL GROUND. THIS WORK SHALL BE CONSIDERED AN INCIDENTAL OBLIGATION OF THE CONTRACTOR.
- 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, WASTE AND EMBANKMENT MATERIAL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE EARTHWORK BID ITEMS SHOWN. ANY WASTE MATERIAL SHOWN ON THESE PLANS SHALL BE USED AS NECESSARY TO CONSTRUCT TURNOUTS AND DITCH BLOCKS AND BE PLACED AS EMBANKMENT ALONG THE SHOULDERS IN AREAS AS DIRECTED BY THE COR/AOTR.
- THE LOCATION OF UTILITIES SHOWN ON SHEET 3 & 4 ARE APPROXIMATE AND ARE ONLY TO ASSIST THE CONTRACTOR IN COMPLETING THE WORK. THE CONTRACTOR SHALL VERIFY ALL UTILITIES WITH THE OWNERS PRIOR TO CONSTRUCTION. ANY DAMAGE TO ANY UTILITIES THROUGH THE NEGLIGENCE OF THE CONTRACTOR SHALL BE RESTORED TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
- THE CONTRACTOR SHALL REMOVE AND CLEAN AND STOCKPILE ALL EXISTING CULVERTS, CATTLEGUARD AND FENCING MATERIALS AS CALLED FOR ON THESE PLANS AND SECTIONS 203 AND 607. ALL SALVAGEABLE MATERIALS AS DETERMINED BY THE COR/AOTR SHALL BE TAKEN TO THE SHIPROCK AGENCY MAINTENANCE YARD AND STOCKPILED. ANY MATERIALS DETERMINED TO BE UNUSABLE BY THE COR/AOTR SHALL BE DISPOSED OF BY THE CONTRACTOR IN ACCORDANCE WITH SECTIONS 107 AND 203. THIS WORK SHALL BE INCLUDED IN THE APPROPRIATE UNIT PRICE BID ITEMS FOR SECTIONS 203 AND/OR 607 (WHERE APPLICABLE).

- THE CONTRACTOR SHALL BE REQUIRED TO REPAIR ALL DENTED, BENT OR OTHERWISE DAMAGED PIPE ENDS OR PIPE END SECTIONS. THIS WORK SHALL MEET THE APPROVAL OF THE CONTRACTING OFFICER, AND IS EXPECTED TO INCLUDE STRAIGHTENING OF DENTED/BENT CULVERT ENDS, WELDING OF CUTS/TEARS IN THE EXISTING CULVERTS, ETC. NO SEPARATE PAYMENT FOR THIS WORK WILL BE MADE. THE CONTRACTOR SHALL CONSIDER THESE REPAIRS INCIDENTAL TO THE CONTRACT.
- THE ROADWAY TYPICAL SECTION SHOWN IS THE BASIC TEMPLATE TO WHICH THE PROJECT IS TO BE STAKED AND BUILT. THERE WILL HOWEVER, BE LOCATIONS WHERE, DUE TO EXISTING GROUND CONDITIONS, TURNOUTS, CULVERTS OR OTHER STRUCTURES, ETC., THE SHOWN TYPICAL SECTION CAN NOT BE CONSTRUCTED. THE FINAL CONSTRUCTED ROAD SECTION SHALL BE BASED ON THE COMPUTERIZED STAKING NOTES AS ADJUSTED TO FIT FIELD CONDITIONS.
- THE CONTRACTOR SHALL BE REQUIRED TO SAW CUT THE EXISTING ASPHALT PAVEMENT WHERE OLD ASPHALT IS TO TIE INTO THE NEW ASPHALT PAVEMENT. THE CONTRACTOR SHALL BE REQUIRED TO TAPER THE NEW ASPHALTIC CONCRETE SURFACING TO MATCH EXISTING PAVEMENT SECTION AT TIE-IN POINTS AND TO PROVIDE FOR A SMOOTH TRANSITION AS DIRECTED BY THE COR/AOTR THIS WORK SHALL BE INCIDENTAL TO THE PAVING ITEMS SHOWN.
- AT THE COMPLETION OF THIS PROJECT, THE CONTRACTOR SHALL RESHAPE THE IRRIGATION CHANNEL TO MATCH ADJACENT CHANNEL SHAPE. THE COR/AOTR SHALL INVITE THE NAVAJO NATION DEPARTMENT OF WATER RESOURCES & SHIPROCK IRRIGATION OFFICE TO THE FINAL INSPECTION
- IN NO CASE SHALL ANY CALLED FOR DRAINAGE STRUCTURE(S) BE INSTALLED BELOW THE NATURAL FLOW LINE OF THE WASH OR DITCH. THE CONTRACTOR AND COR/AOTR SHALL ADJUST THE LENGTH OF PIPE(S) TO MATCH FIELD CONDITIONS AND SUBMIT A REVISED PIPE LIST TO THE PLANNING & DESIGN BRANCH CHIEF FOR REVIEW AND APPROVAL BEFORE THE CONTRACTOR ORDERS THE MATERIAL.
- EXISTING CATTLE GUARDS, CULVERTS, AND ROADSIDE SIGNS, OR OTHER IMPROVEMENTS NEGLIGENTLY DAMAGED BY THE CONTRACTOR, DURING CONSTRUCTION, SHALL BE RESTORED IN EQUAL OR BETTER CONDITION AT THE CONTRACTOR'S EXPENSE.
- REMOVAL AND REATTACHMENT OF BARBED-WIRE FENCING AT ALL MAJOR DRAINAGE PIPES AND CATTLEGUARDS SHALL BE CONSIDERED INCIDENTAL OBLIGATIONS OF THE CONTRACTOR, FOR WORK REQUIRING REMOVAL AND/OR EXTENSION OF EXISTING STRUCTURES.
- THE CONTRACTOR SHALL REMOVE ALL EXISTING ROADSIDE SIGNS AT THE TIME NEW PERMANENT ROADSIDE SIGNS ARE INSTALLED OR IF THEY ARE IN THE WAY OF CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE COR/AOTR AT LEAST THREE (3) WORKING DAYS IN ADVANCE OF SUCH SIGN REMOVAL.
- CONSTRUCTION SURVEY STAKING SHALL BE IN ACCORDANCE WITH SECTION 152 OF THE FP-03. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE GOVERNMENT FURNISHED REFERENCE AND CONTROL POINTS DURING CONSTRUCTION. THE COST OF ANY GOVERNMENT RE-STAKING DUE TO THE NEGLIGENCE OF THE CONTRACTOR SHALL BE DEDUCTED FROM THE CONTRACTOR'S PROGRESS PAYMENTS.
- AT ALL DRAINAGE PIPE REPLACEMENTS AND IN-PLACE PIPE CLEANING LOCATIONS, THE CONTRACTOR SHALL CLEAN AND REGRADE, RESHAPE THE INLET AND OUTLET CHANNELS TO THE RIGHT-OF-WAY LINE AS DIRECTED BY THE CONTRACTING OFFICER. THIS WORK SHALL BE INCIDENTAL TO BID ITEM 60202-0510.
- ALL RIGHT-OF-WAY REFERENCE MARKERS SHALL BE LABELED IN THE METRIC AND ENGLISH UNITS OF MEASURE.
- DUE TO NARROW RIGHT-OF-WAY WIDTHS, THE COMPLETE TURNOUT RADIUS CAN NOT BE CONSTRUCTED AT NUMEROUS TURNOUTS. AT THESE LOCATIONS THE CONTRACTOR SHALL CONSTRUCT THE PLANNED RADIUS, BUT END THE RADIUS AT THE RIGHT-OF-WAY LIMIT. THE ACTUAL TURNOUT WIDTH (AT THE RIGHT-OF-WAY LINE) WILL BE WIDER THAN THE WIDTH GIVEN ON THE PLANS.
- THE EXISTING MAIL BOXES LOCATED ALONG THE ROADWAY PRISM SHALL BE REMOVE AND REINSTALLED OUTSIDE OF THE RIGHT-OF-WAY LIMIT. THIS WORK SHALL BE INCIDENTAL TO BID ITEM 20304-0000.
- AT THE COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL INSPECT THE INTERIOR OF ALL NEWLY INSTALLED CULVERTS AND EXISTING DRAINAGE PIPES SPECIFIED IN THE PLANS TO BE CLEANED. THESE CULVERTS SHALL BE FREE OF SILT AND OTHER DEBRIS PRIOR TO THE FINAL PROJECT INSPECTION. THE CULVERTS SHALL BE MAINTAINED IN A "CLEAN" CONDITION UNTIL THE PROJECT IS ACCEPTED BY THE CONTRACTING OFFICER.
- PER LETTER DATED MAY 26, 2011 FROM BUREAU OF RECLAMATION. SUBJECT: EASEMENT ENCROACHMENT AGREEMENT NO. 11-LM-40-03480, PERMISSION TO CROSS THE NAVAJO NATION MUNICIPAL PIPELINE FOR THE CONSTRUCTION OF A BRIDGE AND APPROACH ROAD TO THE HOGBACK CHAPTER HOUSE AND CASINO, NAVAJO ROUTE N5031. A 1.52 M MINIMUM COVER OVER THE CASING IS REQUIRED, THE ROAD TYPICAL SECTION AT STATION 10+169,534 MUST PROVIDE A MINIMUM ELEVATION OF 4993.5 ft. (1522.019 m) AT ALL LOCATIONS. CONTRACTOR SHALL CONSTRUCT THE ROADWAY SUBGRADE NORTH OF THE BRIDGE LOCATION TO THE DESIGN SUBGRADE BEFORE THE BEGINNING OF BRIDGE CONSTRUCTION. THE SUBGRADE NORTH OF THE BRIDGE SHALL BE INSPECTED AND APPROVED BY AO/CO PRIOR TO BEGINNING OF BRIDGE CONSTRUCTION. THIS INCLUDES ANY PART OF THE DETOUR SELECTED BY THE CONTRACTOR WHICH SHALL TIE IN TO THE NORTH ROADWAY SUBGRADE PROFILE. THE ROADWAY.


Revised: 12-21-2011

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS NAVAJO REGIONAL OFFICE – DIVISION OF TRANSPORTATION	
TYPICAL ROADWAY SECTION AND GENERAL NOTES	
Designed by: HRC	
Drawn by: TAY, cdh Date: 08/08/11	
Checked by: EV, cdh Date: 11/09/11	
File Name: 02_Rdtyp	

NOTE: THE BRIDGE SHALL BE CONSTRUCTED DURING THE WINTER MONTHS WHEN THE CANAL IS SHUT OFF. THE CANAL SHUT OFF DATES VARY DEPENDING ON THE WEATHER BUT ARE APPROXIMATELY FROM NOVEMBER 15 TO MARCH 31, EACH YEAR. BRIDGE CONSTRUCTION SHALL BE COMPLETED IN ONE SHUT OFF SEASON. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY WEATHER PROTECTION THAT MAY BE NECESSARY TO COMPLETE CONSTRUCTION DURING THE WINTER, INCLUDING EARTHWORK AND COMPACTION. THIS INCLUDES PROTECTION FROM FREEZING AND MOISTURE.

BASIS OF ESTIMATED QUANTITIES				
ITEM NUMBER	DESCRIPTION	GRADE	UNIT WT.	APPLICATION
30101-2000	Aggregate Base Grading D	D	2,244 kg/m ³	150 mm-Mainline 102 mm Turnouts
40201-0500	Hot Asphaltic Conc. Pymt. Marshall Test Class B Grading B	B	2,404 kg/m ³	Two 38 mm lifts – Mainline, One 51 mm lift – Turnouts.
A40930-0600	Asphalt Cement Grade PG 58-28	PG 58-28	0.9806 L/kg	5.5% by wt. of total weight of mixture
41101-5000	Prime Coat Grade PEP	MC-70	1.056 L/m ²	1.36 L/m ²
41201-1000	Asphalt Emulsion Tack Coat Grade SS-1	SS-1	1.000 L/m ²	0.23 L/m ²

BRIDGE AND ROADWAY ESTIMATED QUANTITIES

ITEM	DESCRIPTION	QUANTITY	UNIT	AS BUILT
10901-0000	Extra and 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	4800	Man-Hour	
15701-0000	Soil Erosion Control	All Req'd	Lump Sum	
15708-1000	Soil Erosion Control, Temporary Straw Mulch	0.72	Hectare	
20102-0000	Clearing and Grubbing	All Req'd	Lump Sum	
20304-1000	Removal of Structures and Obstructions	All Req'd	Lump Sum	
20401-0000	Roadway Excavation	222	Cubic Meter	
20403-0000	Unclassified Borrow	1505	Cubic Meter	
20601-0000	Development of Water Supply	0.58	Mega Liter	
20801-0000	Structure Excavation	46	Cubic Meter	
20803-0000	Structure Backfill	21	Cubic Meter	
30101-2000	Aggregate Base Grading D	1254	Metric Ton	
40201-0500	Hot Asphalt Concrete Pavement Marshall Test Class B , Grading B	623	Metric Ton	
40930-0600	Asphalt-Cement Grade, PC-58-28-	-32-	Metric Ton	
41101-5000	Prime Coat, Grade PEP 	7.63	Metric Ton	
41201-1000	Asphalt Emulsion, Tack Coat, Grade SS-1	0.76	Metric Ton	
55101-1200	HP 250 x 62 Steel Piles, In Place	140	Meter	
55115-1000	Preboring	130	Meter	
55201-0200	Structural Concrete Class A(AE)	59	Cubic Meter	
55301-0500	Precast, Prestressed Concrete Members, Voided Slab (SIII-48)	9	Each	
55401-1000	Reinforcing Steel	3255	Kilogram	
55401-2000	Reinforcing Steel, Epoxy Coated	4032	Kilogram	
55601-0900	Bridge Rail, Steel	26.7	Meter	
60202-0510	711 mm Span, 508 mm Rise Corrugated Steel Pipe Arch	65	Meter	
60211-0910	End Section for 711 mm Span, 508 mm Rise Corrugated Steel Pipe Arch	8	Each	
61701-4100	Guardrail System SGR04b, Type PDE02 w/ CRT End Treatment	74	Meter	
61701-5000	Guardrail System SGR04b, Type PDE02 w/ ET-PLUS End Treatment	99	Meter	
61902-1300	Swing Gates, Double 1.829m x 2.438m Chain Link Gate	4	Each	
61903-0310	Cattle Guard, 4900 mm with Type II Gate	2	Each	
61903-0711	Cattle Guard, 7190 mm with Type II Gate	2	Each	
61903-1011	Cattle Guard, 9480 mm without gate	1	Each	
61921-2000	Remove and Replace Fence With 1.22m Chain Link or 5-Strand Barbed Wire	607	Meter	
62101-0000	Right of Way Monument	16	Each	
62102-0000	Reference Marker	16	Each	
62510-1000	Seeding, Dry Method	0.72	Hectare	
63302-0003	Sign Installation, 1 Post and Hardware: 4.10 kg/m	1.20	Square Meter	
63302-0010	Sign Installation, 2 Posts and Hardware: 2.98 kg/m	1.74	Square Meter	
63308-2000	Object Marker, Glass Fiber, Type 2	2	Each	
63308-3000	Object Marker, Type 3 w/1 Post and Hardware 2.98 kg/m	4	Each	
63309-0020	Delineators, Glass Fiber, Type 1b	11	Each	
63401-1510	Pavement Markings, Type H, Solid Yellow	686	Meter	
63401-1520	Pavement Markings, Type H, Solid White	556	Meter	
63501-0000	Temporary Traffic Control	All Req'd	Lump Sum	
63506-0500	Temporary Traffic Control, Flagger	320	Man-Hour	

ITEM 20401-0000: EARTHWORK QUANTITIES

STATION - STATION	CUT (m³)	* FILL (m³)	BORROW (m³)	WASTE (m³)
10+006.998 to 10+143.346	65.65	271.56	205.91	----
10+156.654 to 10+350.000	155.47	1409.29	1253.82	----
TOTAL	221.12	1680.85	1459.73	----

* Assumed 25% fill factor

ITEM 61903-0310: 2-UNIT CATTLE GUARD AND TURNOUT PAVING LOCATIONS

STATION	LOCATION	TURNOUT SIZE (m)	REMARKS
10+219.328	Rt.	4.50 x 18.2m	Construct New Turn Out to R/W W/Type 2 Gate
10+282.429	Rt.	4.50 x 21.0m	Construct New Turn Out @ 20' Skew to R/W W/Type 2 Gate

ITEM 61903-0710: 3-UNIT CATTLE GUARD W/ TYPE II GATE AND TURNOUT PAVING LOCATIONS

STATION	LOCATION	TURNOUT SIZE (m)	REMARKS
10+336.969	Lt.	7.00 x 18.2m	Construct New Turn Out to R/W, W/Type 2 Gate

ITEM 61903-1011: 4-UNIT CATTLE GUARD

STATION	LOCATION	REMARKS
10+350.000	CL	Without Gate

TURNOUT LOCATIONS: GRADE AND PAVE ONLY

STATION	LOCATION	SIZE (m)	REMARKS
10+049.127	Rt.	4.50 x 8.000m	Construct New Turn Out to R/W W/1-Swing Gate
10+108.824	Rt.	4.50 x 8.000m	Construct New Turn Out to R/W W/1-Swing Gate
10+083.212	Lt.	4.50 x 8.000m	Construct New Turn Out to R/W W/1-Swing Gate
10+098.967	Lt.	4.50 x 8.000m	Construct New Turn Out to R/W W/1-Swing Gate
10+134.661	Rt.	4.50 x 23.000m	Construct New Turn Out to R/W
10+137.912	Lt.	4.50 x 23.000m	Construct New Turn Out to R/W
10+161.991	Rt.	4.50 x 23.000m	Construct New Turn Out to R/W
10+163.508	Lt.	4.50 x 23.000m	Construct New Turn Out to R/W

EXISTING UTILITY CROSSING

STATION	LOC.	OWNER	DESCRIPTION	SKEW	REMARKS
10+000 - 10+128.009	Left	NTUA	Over Head Power	----	To Remain in Place
10+06.515	℄	NTUA	Over Head Power	90°	To Remain in Place
10+010.935	℄	NTUA	Over Head Power	59°	To Remain in Place
10+023.506	℄	NTUA	Over Head Power	76°	To Remain in Place
10+070.566	℄	NTUA	Over Head Power	90°	To Remain in Place

ITEM 63401-1510: Pavement Markings, Type "H", Solid Yellow

Station	Location	Length	Unit
10+006.969-10+350.000	Centerline, Rt.	343.031	m
10+006.969-10+350.000	Centerline, Lt.	343.031	m
TOTAL		686.062	m

ITEM 63401-1520: Pavement Markings, Type "H", Solid White

Station	Location	Length	Unit
10+006.969-10+350.000	Lt. Shoulder	343	m
10+006.969-10+350.000	Rt. Shoulder	343	m
	2- 7.00m TO	-30	m
	10- 4.50m TO's	-100	m
TOTAL		556	m

ITEM 61921-2000: Remove and Replace Fence, 1.22m Chainlink

STATION TO STATION	LOCATION	LENGTH (m)	REMARKS
10+005.750 to 10+136.300	Lt. R.O.W.	130.55	Lt. Right-Of-Way
10+080.698 to 10+085.726	Lt. R.O.W.	-5.028	minus double gate at driveway 10+083.212
10+096.453 to 10+101.481	Lt. R.O.W.	-5.028	minus double gate at driveway 10+098.967
	subtotal:	120.494	
10+005.750 to 10+129.708	Rt. R.O.W.	123.958	Rt. Right-Of-Way
10+046.613 to 10+051.641	Rt. R.O.W.	-5.028	minus double gate at driveway 10+049.127
10+106.310 to 10+111.338	Rt. R.O.W.	-5.028	minus double gate at driveway 10+108.824
	subtotal:	113.902	
	TOTAL:	234.396	

ITEM 61921-2000: Remove and Replace, 5-strand barbed wire

10+170.600 to 10+350.000	Lt. R.O.W.	179.400	Lt. Right-Of-Way, Tie into existing Fence
10+263.875 to 10+271.065	Lt. R.O.W.	-7.190	minus 3-unit cattleguard at T.O. 10+267.470
10+333.374 to 10+340.564	Lt. R.O.W.	-7.190	minus 3-unit cattleguard at T.O. 10+336.969
10+350.000 to 10+350.000	Lt. R.O.W.	12.287	Tie-in from ROW to cattleguard at EOP
	subtotal:	177.307	
10+163.126 to 10+350.000	Right	186.874	Rt. Right-Of-Way, Tie into existing Fence
10+216.878 to 10+221.778	Right	-4.900	minus 2-Unit Cattleguard at T.O. 10+219.328
10+279.979 to 10+284.879	Right	-4.900	minus 2-Unit Cattleguard at T.O. 10+282.429
10+350.000 to 10+350.000	Right	18.260	Tie-in from ROW to cattleguard at EOP
	subtotal:	195.334	
	TOTAL:	372.641	
GRAND TOTAL:		607.037	CHAIN LINK AND 5-STRAND BARBED WIRE

ITEM 61701-4100: GUARDRAIL SYSTEM SGR04(b), Type PDE02 with CRT END TREATMENT

STATION	LOCATION	LENGTH (m)
10+130.458 to 10+131.241	RT.	11.688
10+132.302 to 10+134.969	LT.	11.688
10+138.816 to 10+142.159	RT.	12.642
10+140.763 to 10+144.105	LT.	12.642
10+155.895 to 10+159.237	RT.	12.642
10+157.841 to 10+161.184	LT.	12.642
TOTAL		73.944

ITEM 61701-5000: GUARDRAIL SYSTEM SGR04(b), Type PDE02 with ET-PLUS END TREATMENT

STATION	LOCATION	LENGTH (m)
10+115.217 to 10+130.458	RT.	15.240
10+117.061 to 10+132.302	LT.	15.240
10+168.847 to 10+203.139	LT.	34.290
10+168.847 to 10+203.139	RT.	34.290
TOTAL		99.060

ITEM 60202-0510: STEEL PIPE ARCH

STATION	SIZE	REMARKS
10+210.000, CL	1-711 mm x 508mm x 22.82m	150° SKEW
10+219.328, Rt.	1-711 mm x 508mm x 11.73m	TURNOUT
10+282.429, Rt.	1-711 mm x 508mm x 16.12m	TURNOUT
10+336.969, Lt.	1-711 mm x 508mm x 13.55m	TURNOUT
SUBTOTAL (m) :	64.22m	

REGION

STATE

RESERVATION

ROUTE

PROJECT

SHEET

TOTAL SHEETS

Navajo

NM

Navajo

N5031

N5031(1)2&4

3

32

BRIDGE GENERAL NOTES

1. SPECIFICATIONS: Design; AASHTO Standard Specifications for Highway Bridges, 1996, 16th Ed. w/ Interims thru 2000 Construction; Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects, FP-03 and Supplemental Specifications.

2. UNITS: This project has been designed and drawn using the SI (metric) system of units.

3. DESIGN LOADS: Dead Loads; Concrete = 23.56 kN/m³, Steel = 76.97 kN/m³ , Paving Allowance = 1.20 kPa of roadway Surface, Backfill Earth Pressure = 4.7 kPa/m LIVE LOADS; MS 18 plus impact. Impact = 15/L + 38 where L = span length in meters. Maximum Impact factor = 0.30.

4. RATINGS: Inventory Rating = MS 19.1. Operating Rating = MS 31.9.

5. DESIGN & CONSTRUCTION: Superstructure designed using AASHTO Load Factor Design (LFD) and substructure (including Bearings) using Service Design. Material strengths are f'c = 27.6 MPa for reinforced concrete, Fy = 413.7 MPa for reinforcing steel and Fy = 248.2 MPa for H-piling. Prestressed beams designed in accordance with current AASHTO design criteria. Material strengths are f'c = 41.4 MPa for prestressed concrete and Fs = 1861.6 MPa for prestressing steel. The slabs are "fixed" to the Abutments, but the abutment piles are free to flex, in order to take any temperature movement.

6. HOT ASPHALTIC CONCRETE PAVEMENT (HACP) OVERLAY: HACP shall conform to Section 402 of the FP-03. Water proofing membrane shall be the Polyguard 665 membrane manufactured by Polyguard Products, Inc., the GeoTac Membrane manufactured by Contech Construction Products, Inc., or an approved equal. A primer or adhesive shall be applied prior to water proof membrane as recommended by the manufacturer. See Deck Plan and Section for overlay placement details. Quantities for bridge overlay HACP shall be included in Item 40201-0500. Water proofing membrane, adhesive and sand blasting shall be considered incidental to Item 40201-0500.

7. CONCRETE: Concrete in precast, prestressed concrete voided slabs (S III-48) shall be Class P and shall have a F'ci = 34.50 MPa at release of prestressing strands and the minimum design strength indicated above at 28 days. Cast in place concrete in superstructure and substructure shall be Class A(AE) with the minimum design strength indicated above at 28 days. Cast in place concrete shall be made with Type II Cement. The air content for Class A(AE) concrete shall not be less than that specified in the FP-03. Chamfer exposed corners of all concrete 19 mm unless otherwise shown. The time limits specified in the FP-03 shall apply. If concrete cannot be discharged within the specified time limit, alternatives such as dry batching, a site batching plant conforming to the specifications or retardant admixtures shall be used. If required, such alternatives shall be discussed at pre-construction meeting. Approval of alternative methods shall be based on review of historical data for identical strength concrete placed at similarly remote locations. Historical data shall indicate conformance to the required specifications. The approach slab shall be given a sidewalk finish in accordance with Sections 552.14(2) of the FP-03. Exposed surfaces of the substructure down to 300 mm below the ground line shall be given a Class 2 rubbed finish as specified in Section 552.16 of the FP-03. All other surfaces of concrete shall be given a Class 1 ordinary finish.

8. REINFORCING STEEL: All plain reinforcing steel shall conform to AASHTO M31M, Grade 420, and epoxy coated reinforcing steel conform to ASHTO M284M and AASHTO M31M, Grade 420. All reinforcement in deck, or protruding into the deck shall be epoxy coated. The minimum cover of any reinforcing steel shall be 50 mm unless otherwise specified. Lengths of reinforcing steel bars shown include required splice lengths for splices shown. Any additional splices not shown in the plans shall be requested for approval by the Contractor and shall not be utilized until written approval is granted by the CO. Additional reinforcing steel quantities required for additional splices not shown in the plans shall not be paid for. Reinforcing steel sizes shown in these plans are in accordance with AASHTO M31M.

9. PRESTRESSING STEEL: Prestressing steel shall be 12.7 mm Ø, seven wire, low relaxation prestressing steel strands conforming to AASHTO M203M, Grade 1860.

10. PRESTRESSED SLABS: Prestressed slabs shall be manufactured as detailed in these plans. All concrete, reinforcing steel, prestressing steel, lifting devices, inserts, bearing plates, elastomeric bearing pads, and any other materials necessary for the fabrication of the prestressed beams shall be considered incidental to Item 55301-0500, Precast, Prestressed Concrete Structural Members, Voided Slabs (SIII-48). Apply a sidewalk finish to the top of the slabs as per Section 552.14(2) of the FP-03. Elastomeric bearing pads shall conform to AASHTO M251M and shall be 60 Durometer hardness.

11. STRUCTURAL STEEL: Diaphragm anchor bolts shall conform to AASHTO M164M.

12. STEEL PILES: Steel piles shall be HP 250 x 62 for abutments w/ heavy duty pile tips. Piles shall conform to AASHTO M270M, Grade 250. Pile shall be driven to three times the Applied Structural Load shown in the plans. Piles shall be driven utilizing the dynamic formula given in Section 551.06 (b) of the FP-03. The ultimate pile capacity (RU) shall be the Applied Structural Load multiplied by a factor of safety of 3. Piles shall be driven to at least minimum tip elevation required for lateral stability or to penetrate unsuitable strata or deeper to gain the required ultimate pile capacity (RU). Splicing shall be in accordance with Sections 551.08 and 551.09 of the FP-03 except that splice details shall be as shown in the plans. Piles shall be driven to the tolerances given in Section 551.08 of the FP-03. Axial alignment deviations shall be measured starting from the planned pile location at the cutoff elevation and shall not exceed the tolerance given in Section 551.08 of the FP-03. Assure correct pile placement and alignment (within applicable tolerances) by providing horizontal bracing between the crane and pile driving leads. The abutments are integral and designed to flex. Preboring for all abutment piles shall conform to Section 551.07 of the FP-03. Backfill with Select Granular Backfill (FP-03 704.10) after placement of piles.

13. The Contractor shall remove, clean (if so directed) and stockpile all existing salvageable material, as indicated by the AOTR/COR and as called for on these plans under Item 203. Salvageable material shall be transported by the contractor to the Shiprock Agency maintenance yard and stockpiled. Any existing materials determined to be unsalvageable by the AOTR/COR shall be disposed of by the contractor in accordance with Sections 107 and 203 of the FP-03 and supplemental specifications. Any existing piling shall be removed to one meter below planned flowline, or lower, to accommodate new construction. All work involving salvageable and unsalvageable material shall be included in the appropriate unit price for Item 203, as applicable.

Revised: 12-21-2011

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BRIDGE GENERAL NOTES,
QUANTITIES AND TABLES

Designed by: HRC

Drawn by: cdh HRC, rsh Date: 12/01/11

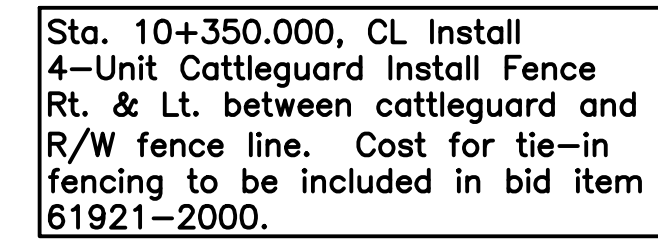
Checked by: cdh EV Date: 10/25/11

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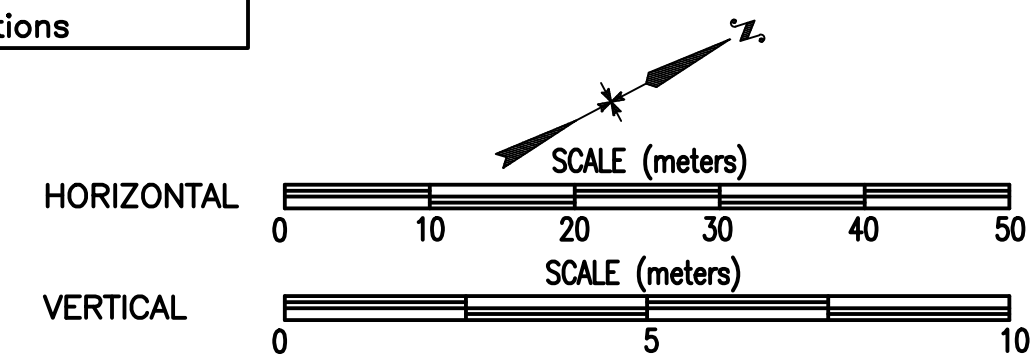


1. TURNOUTS FOR THE IRRIGATION CANAL MAINTENANCE ROAD SHALL HAVE A RADIUS OF 3.048m.

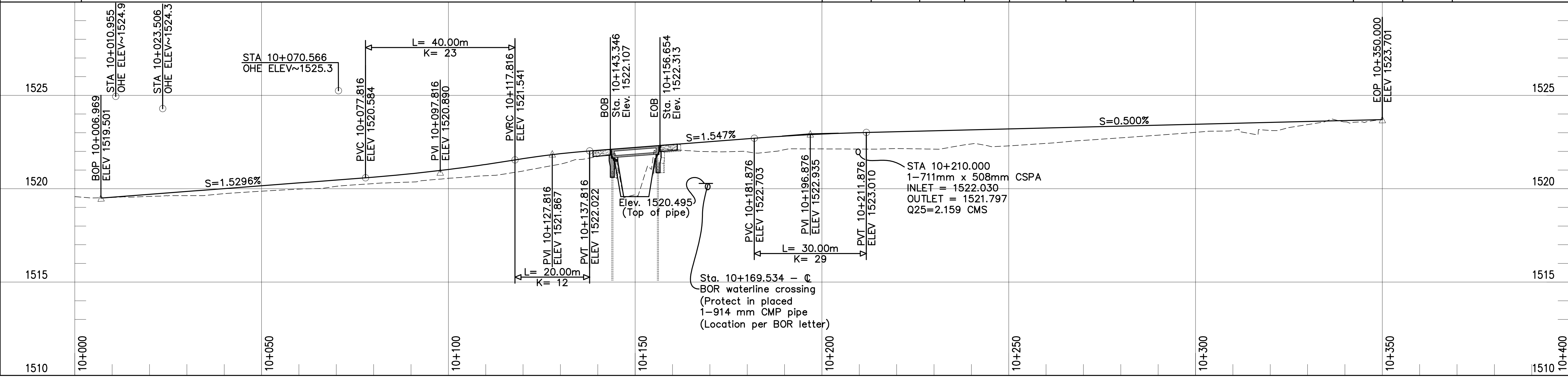
STA. 10+330.000 to STA. 10+350.000 Taper proposed roadway width to match existing roadway.



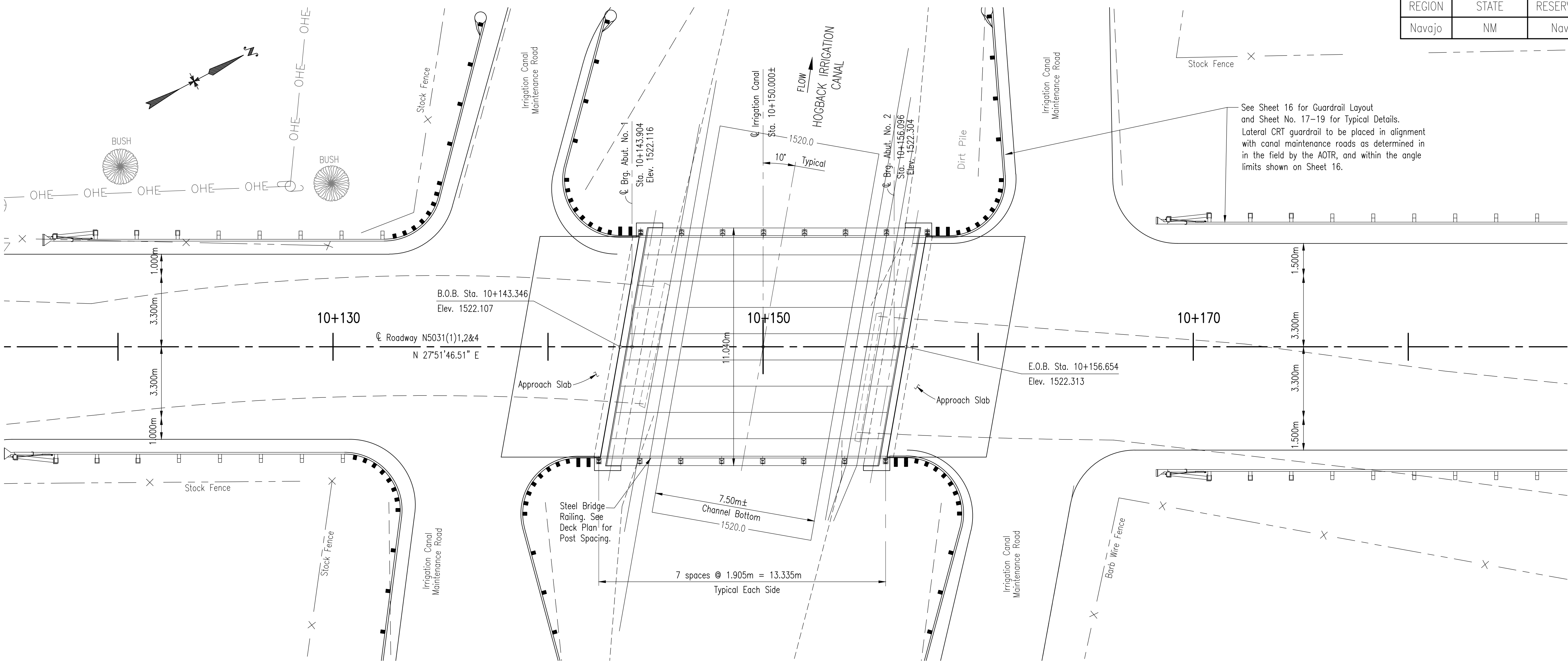
Sta. 10+005.930 to Sta. 10+129.708, Rt.
Remove existing fence and Replace
w/ chain link fence at R/W line



DELINEATORS		OBJECT MARKER		MONUMENTS AND REFERENCE MARKERS
㊦	㊧	㊨		
Type "1a"	Type "1b"	Type 2	Type 3	
0	11	2	4	16

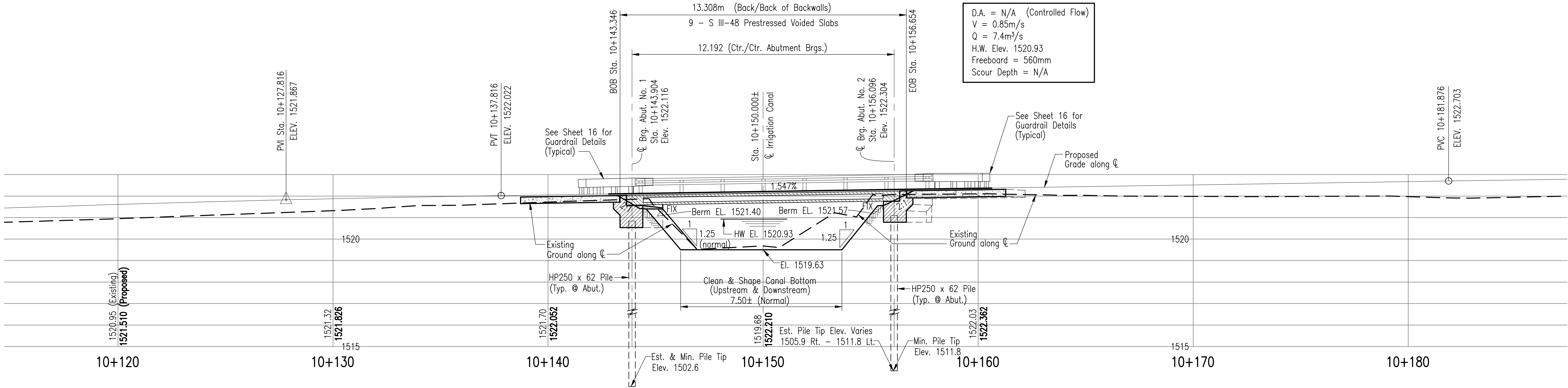


REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	NM	Navajo	N5031	N5031(1)1,2&4	6	32



STRUCTURE LOCATION PLAN

Not to Scale



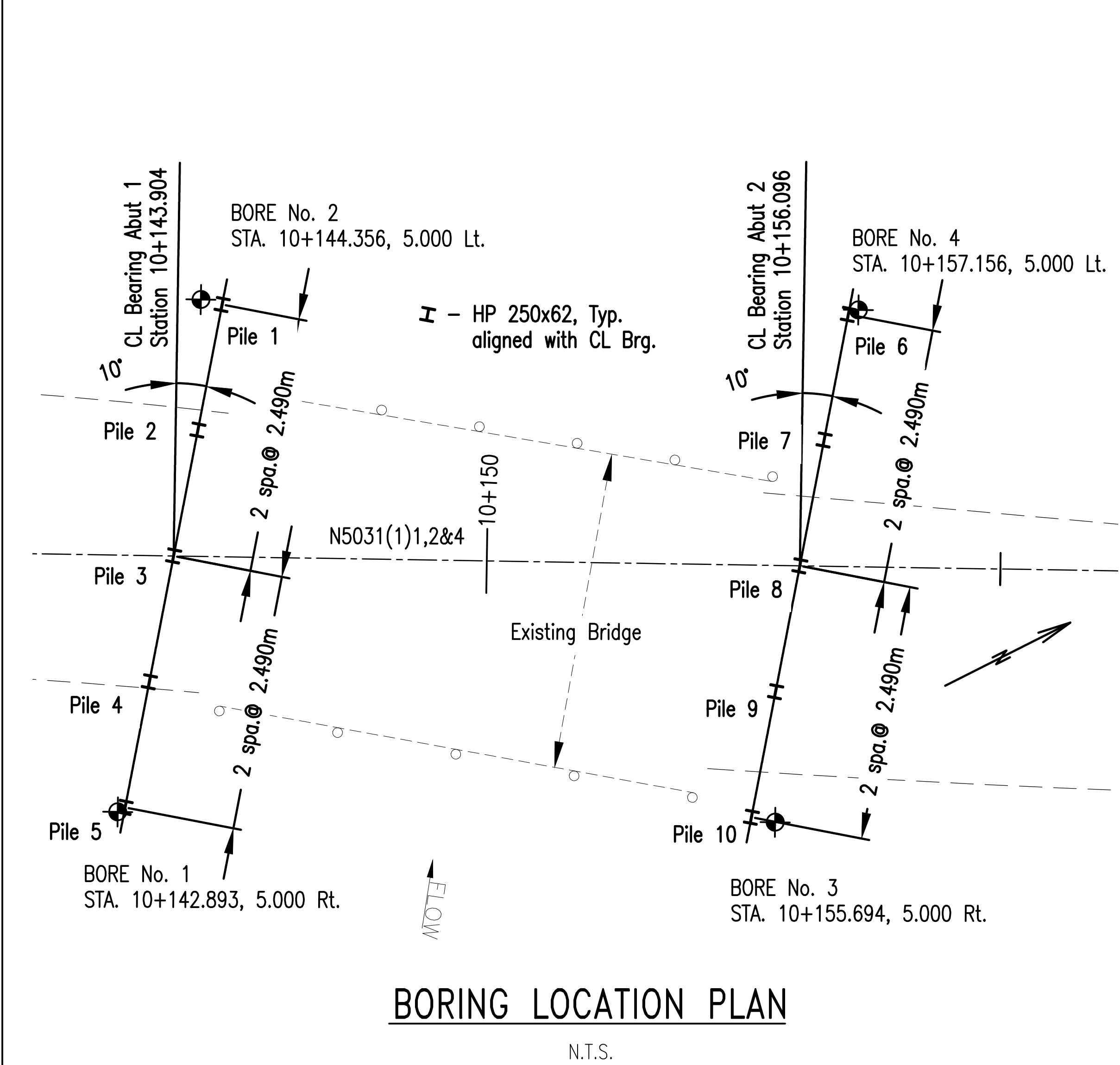
STRUCTURE SECTION ALONG C ROADWAY

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BRIDGE PLAN AND PROFILE

Designed by: MAZ
Drawn by: TAY, cdh Date: 10/27/11
Checked by: MAZ Date: 06-03
File Name: Struloc.dwg

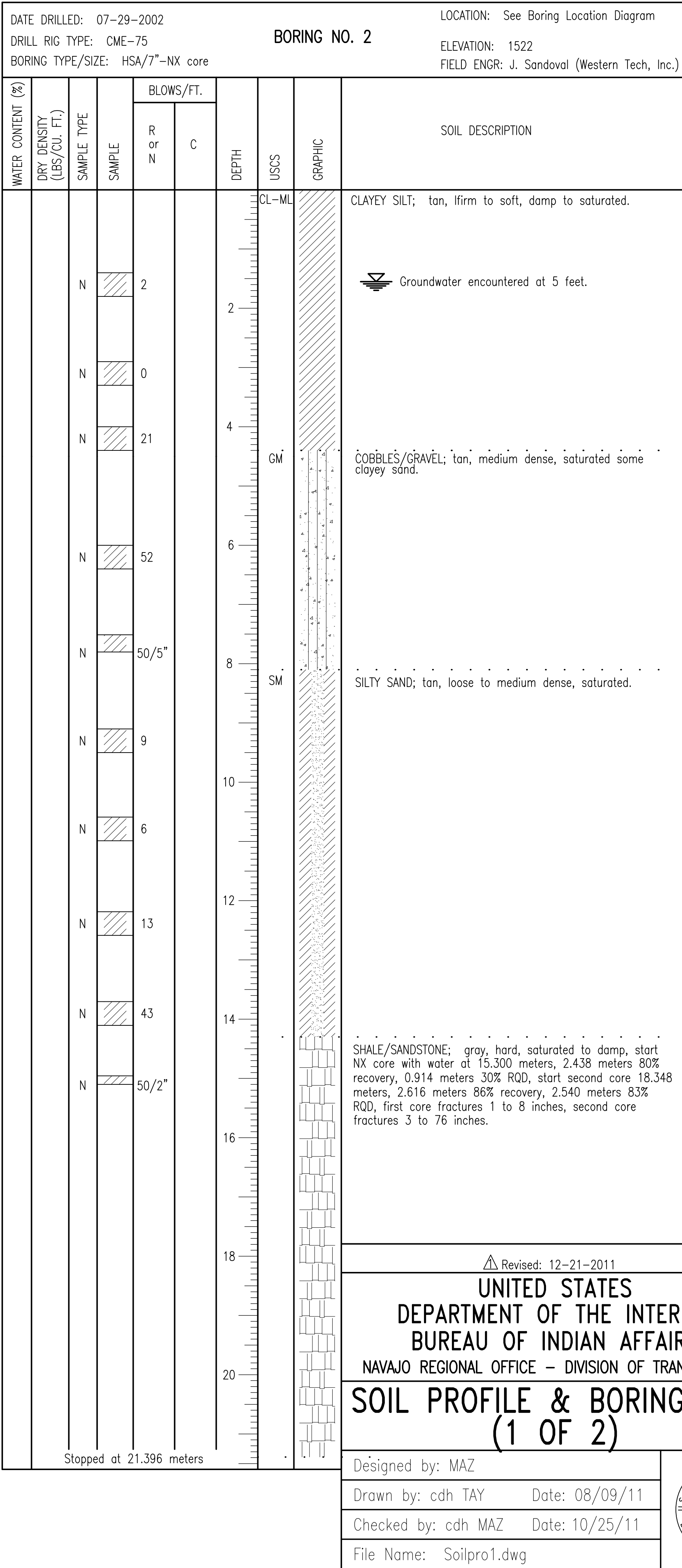
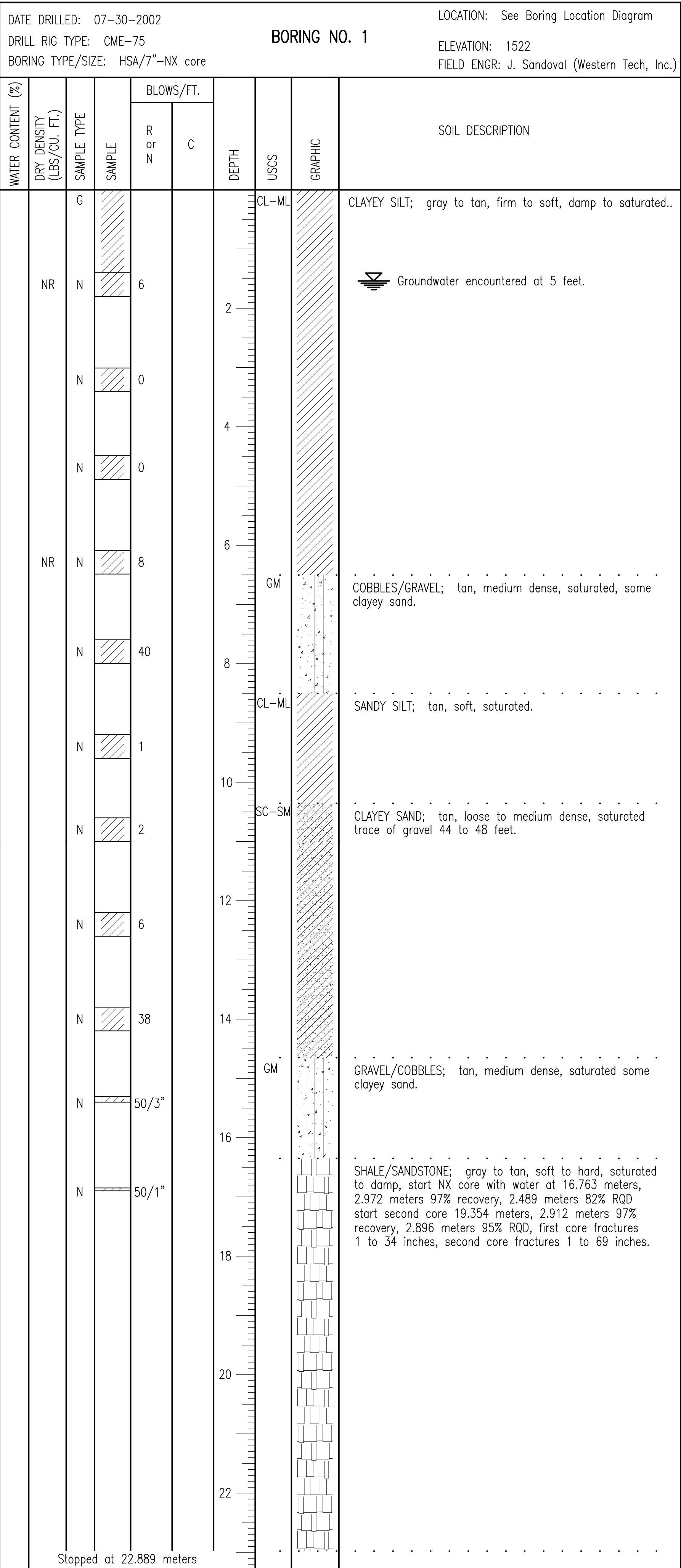


BORING LOCATION PLAN

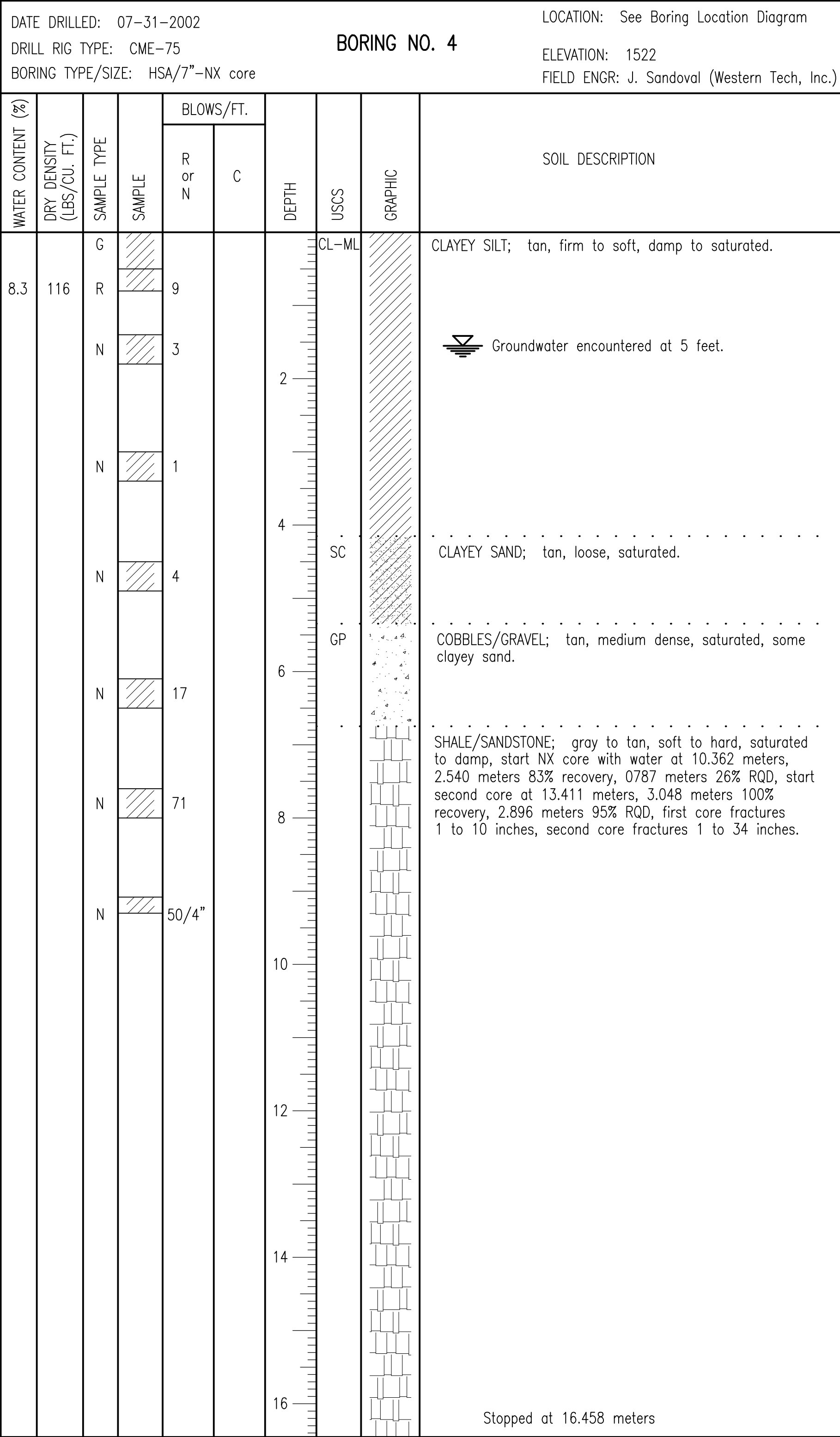
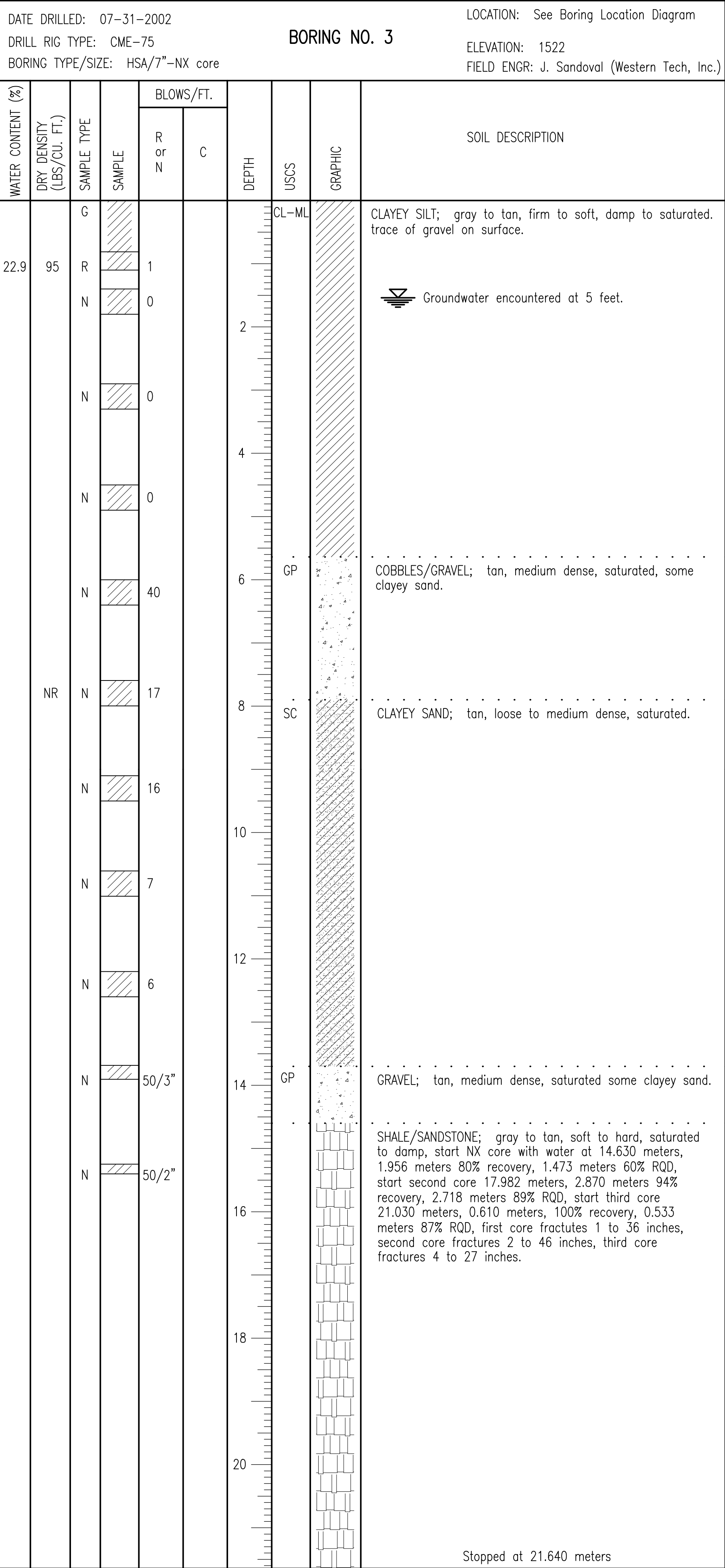
N.T.S.

FOUNDATION INFORMATION					
		ABUTMENT 1		ABUTMENT 2	
PILE TYPE		HP 250x62		HP 250x62	
NO. OF PILES		5		5	
APPLIED LOAD/PILE		438 kN		438 kN	
ULTIMATE CAP./PILE		1314 kN		1314 kN	
ABUTMENT 1:	PILE 1	PILE 2	PILE 3	PILE 4	PILE 5
PREBORE ELEV.	1506.2	1505.7	1505.2	1504.7	1504.2
MIN. TIP ELEV.	1505.7	1505.2	1504.7	1504.2	1503.7
ABUTMENT 2:	PILE 6	PILE 7	PILE 8	PILE 9	PILE 10
PREBORE ELEV.	1514.0	1512.1	1510.2	1508.3	1506.4
MIN. TIP ELEV.	1513.5	1511.6	1509.7	1507.8	△ 1505.9

NOTE: See Sheet No. 8 for Boring No. 3, No. 4 and Boring Notes and Graphic Symbols.



REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	NM	Navajo	N5031	N5031(1)1,2&4	8	31



UNIFIED SOIL CLASSIFICATION SYSTEM							
Soils are visually classified by the Unified Soil Classification system on the boring logs presented in this report. Grain-size analysis and Atterberg Limits Tests are often performed on selected samples to aid in classification. The classification system is briefly outlined in this chart. For a more detailed description of the system, see "The Unified Soil Classification System", Corp of Engineers, U.S. Army Technical Memorandum No. 3-357 (Revised April 1960) or ASTM Designation: D2487-66T.							
MAJOR DIVISIONS				GRAPHIC SYMBOL	GROUP SYMBOL	TYPICAL NAMES	
COARSE-GRAINED SOILS (Less than 50% passes No. 200 sieve)	GRAVELS (50% or less of coarse fraction passes No. 4 sieve)	CLEAN GRAVELS (Less than 5% passes No. 200 sieve)			GW	Well graded gravel, gravel-sand mixtures, or sand-gravel-cobble mixtures.	
					GP	Poorly graded gravels, gravel-sand mixtures, or sand-gravel-cobble mixtures.	
		GRAVEL WITH FINES (More than 12% passes No. 200 sieve)	"A" Limits plot below line and hatched zone on plasticity chart.		GM	Silty gravel, gravel-sand-silt mixtures.	
			"A" Limits plot above line and hatched zone on plasticity chart.		GC	Clayey gravels, gravel-sand-clay mixtures.	
	SANDS (More than 50% of coarse fraction passes No. 4 sieve)	CLEAN SANDS (Less than 5% passes No. 200 sieve)			SW	Well graded sands, gravelly sands.	
					SP	Poorly graded sands, gravelly sands.	
FINE-GRAINED SOILS (50% or more passes No. 200 sieve)	SANDS WITH FINES (More than 12% passes No. 200 sieve)		Limits plot above line and hatched zone on plasticity chart.		SM	Silty sands, sand-silt mixtures.	
			"A" line and hatched zone on plasticity chart.		SC	Clayey sands, sand-clay mixtures.	
	SILTS (Liquid Limit less than 50)	SILTS OF LOW PLASTICITY (Liquid Limit less than 50)			ML	Inorganic silts, clayey silts with slight plasticity.	
					NH	Inorganic silts, micaceous or diatomaceous silty soils, elastic silts.	
		CLAYS (Liquid Limit more than 50)	CLAYS OF LOW PLASTICITY (Liquid Limit less than 50)			CL	Inorganic clays of low to medium plasticity, gravelly, sandy, silty and/or lean clays.
						CH	Inorganic clays of high plasticity, fat clays, sandy clays of high plasticity.
NOTE: Coarse grained soils with between 5% and 12% passing the No. 200 sieve and fine grained soils with limits plotting in the hatched zone on the plasticity chart are to be denoted by double symbols.							

NOTE: Limited data is shown from the Geotechnical Investigation performed for this project. Upon request, a copy of the original Geotechnical Investigation report will be furnished. Use of the data contained here or in the original report is at the discretion of the user who is responsible for all interpretations or assumptions based on this data.

NOTE: HSA = Hollow Stem Auger (CME-75)
SS = Split Spoon Sampler with SPT value
T = Thin Walled Tube Sampler
B = Bulk Sample
N = SPT value
SPT = Standard Penetration Test (616 N hammer free falling 762 mm)

SAMPLE TYPE: G = Grab Sample
R = Ring Sample
N = Split-barrel Sample

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SOIL PROFILE & BORING PLAN
(2 OF 2)

Designed by: MAZ

Drawn by: cdh TAY Date: 08/11/11

Checked by: cdh MAZ Date: 08/11/11

File Name: Soilpro2.dwg

REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	NM	Navajo	N5031	N5031(1)1,2&4	9	31

NOTES:

Reinforcing shown in Abutment Plan and Abutment Elevation details are symmetrical about \varnothing Roadway. Not all reinforcing steel shown. See Reinforcing Steel Schedule for quantities.

Reinforcing bars may be adjusted no more than 50mm to miss inserts, anchor assemblies, and holes.

See Sheet No. 10 for Wingwall Elevations B-B, C-C and Wingwall Reinforcing.

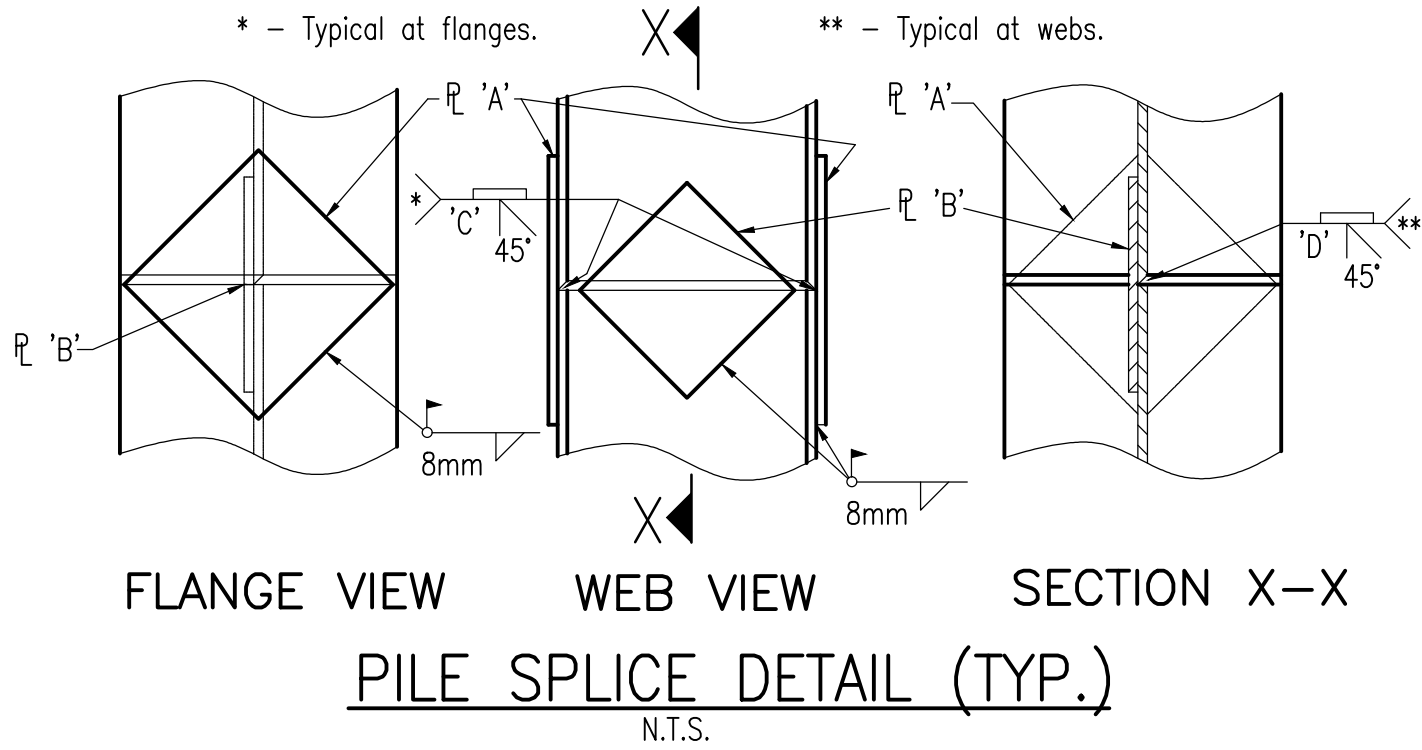
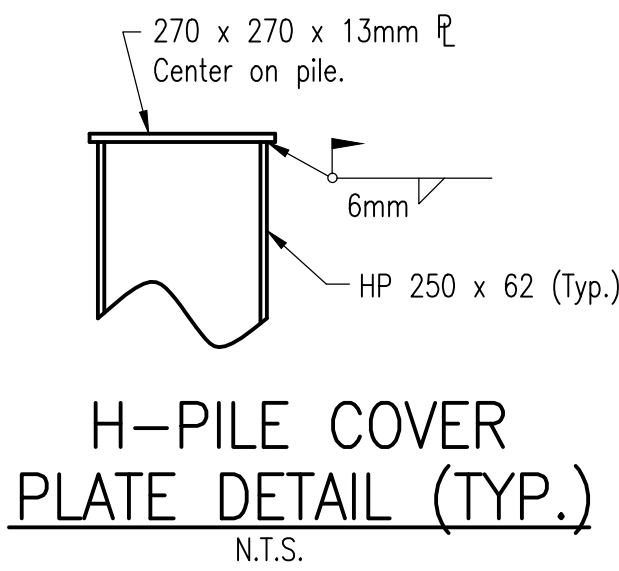
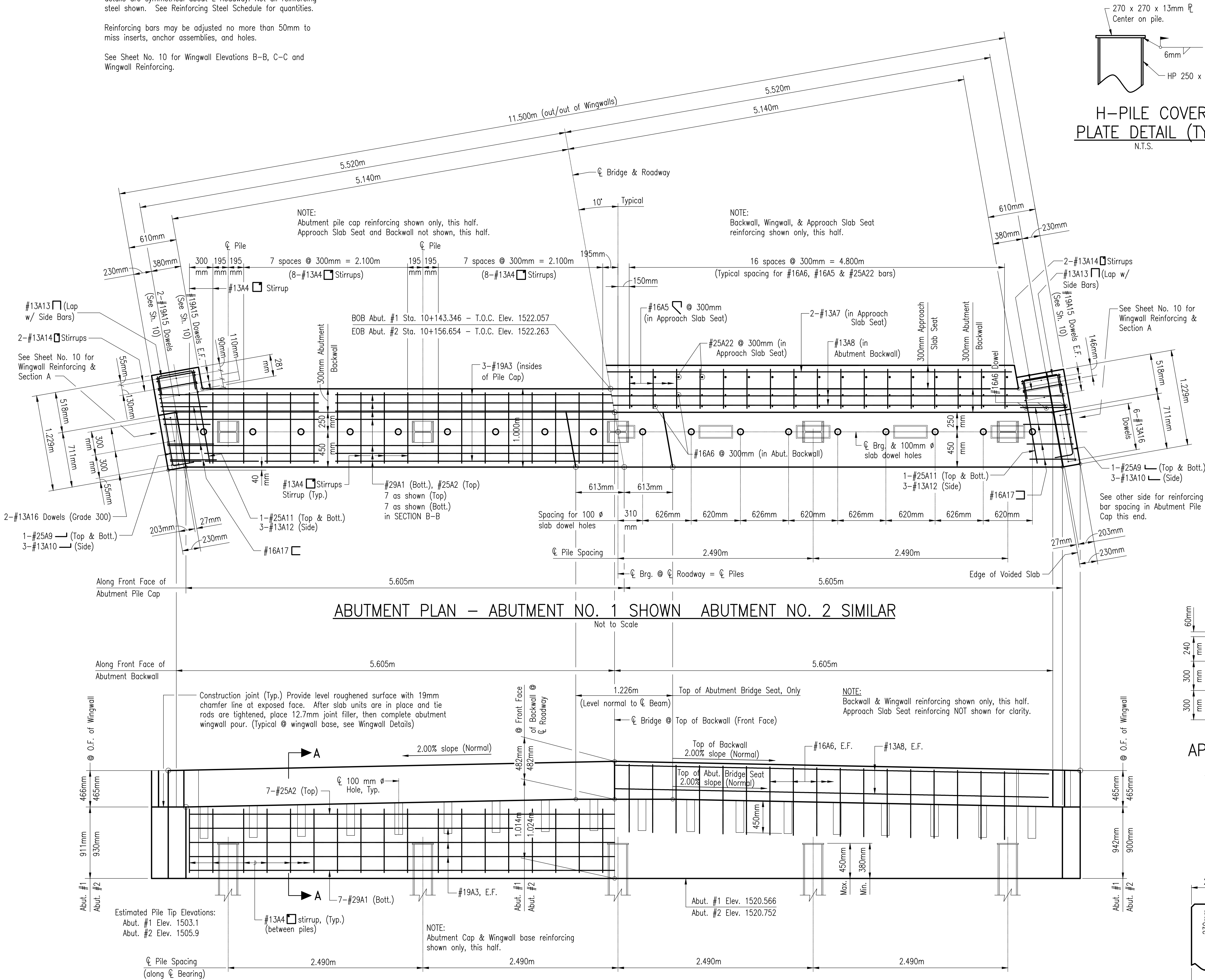
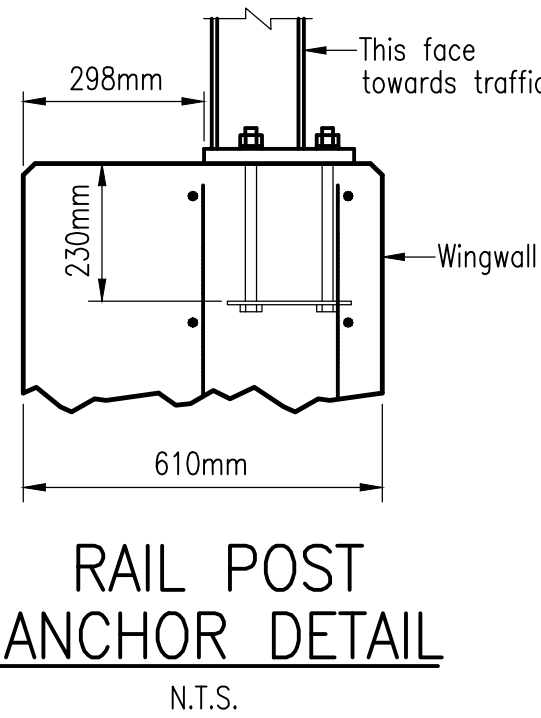
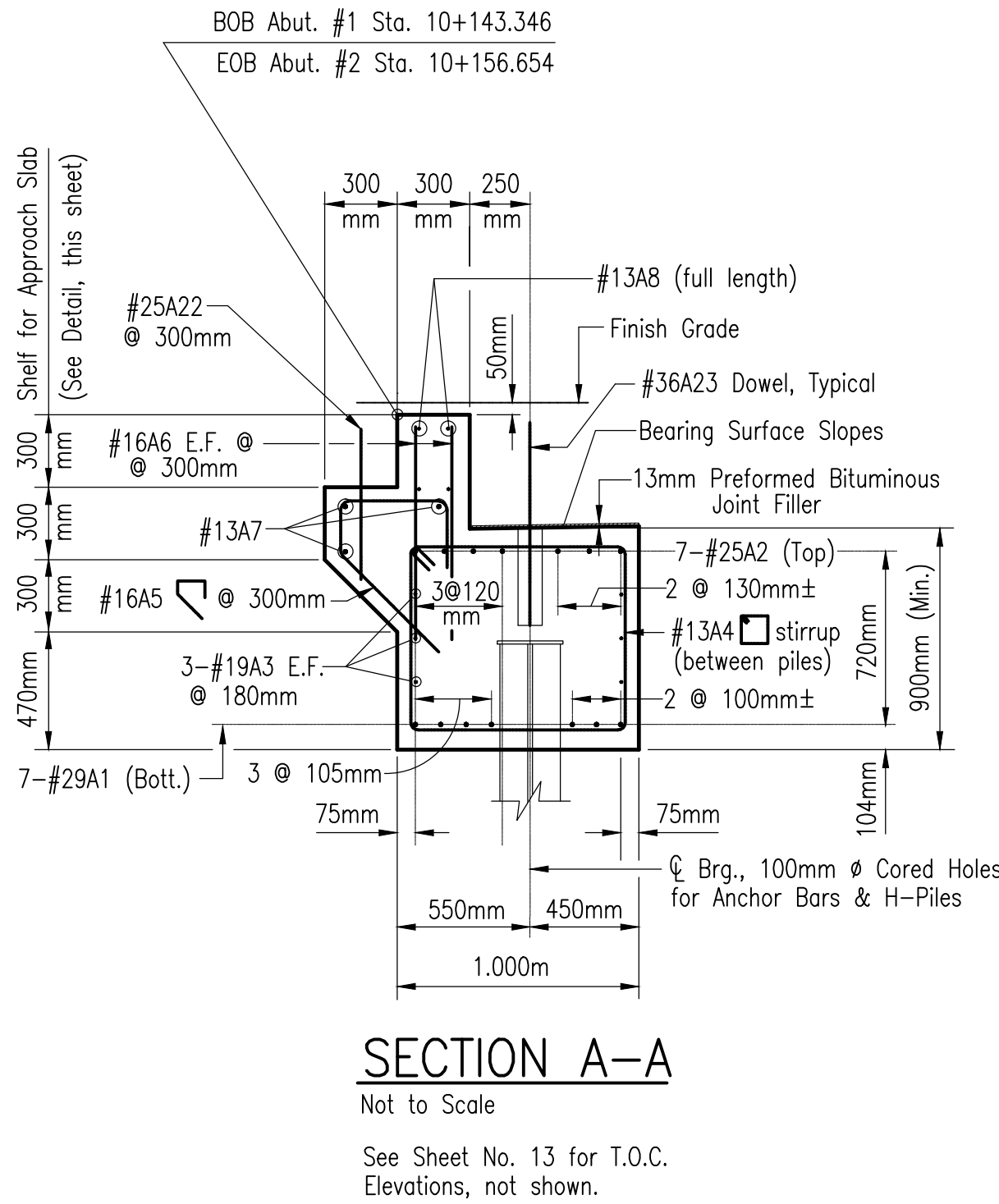
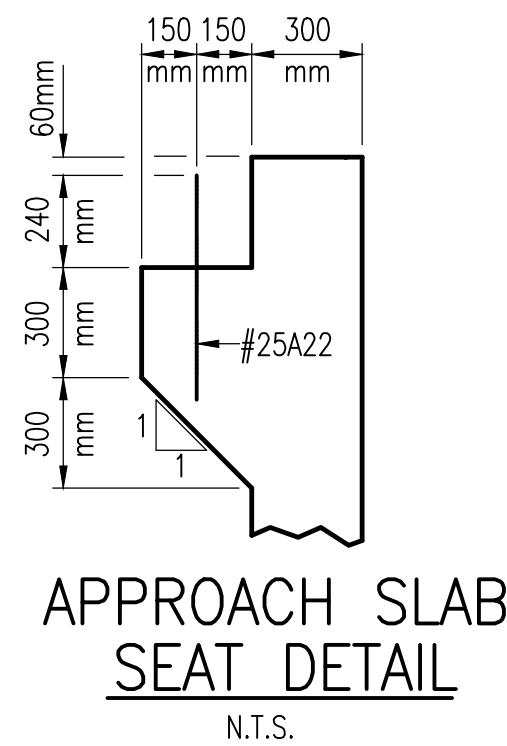


TABLE OF SPLICE PLATE DIMENSIONS AND WELD SIZES				
mm x kg/m	\varnothing 'A' (mm)	\varnothing 'B' (mm)	Weld Size 'C'	Weld Size 'D'
HP 250 x 62	170 x 170 x 13	135 x 135 x 13	14mm	14mm

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



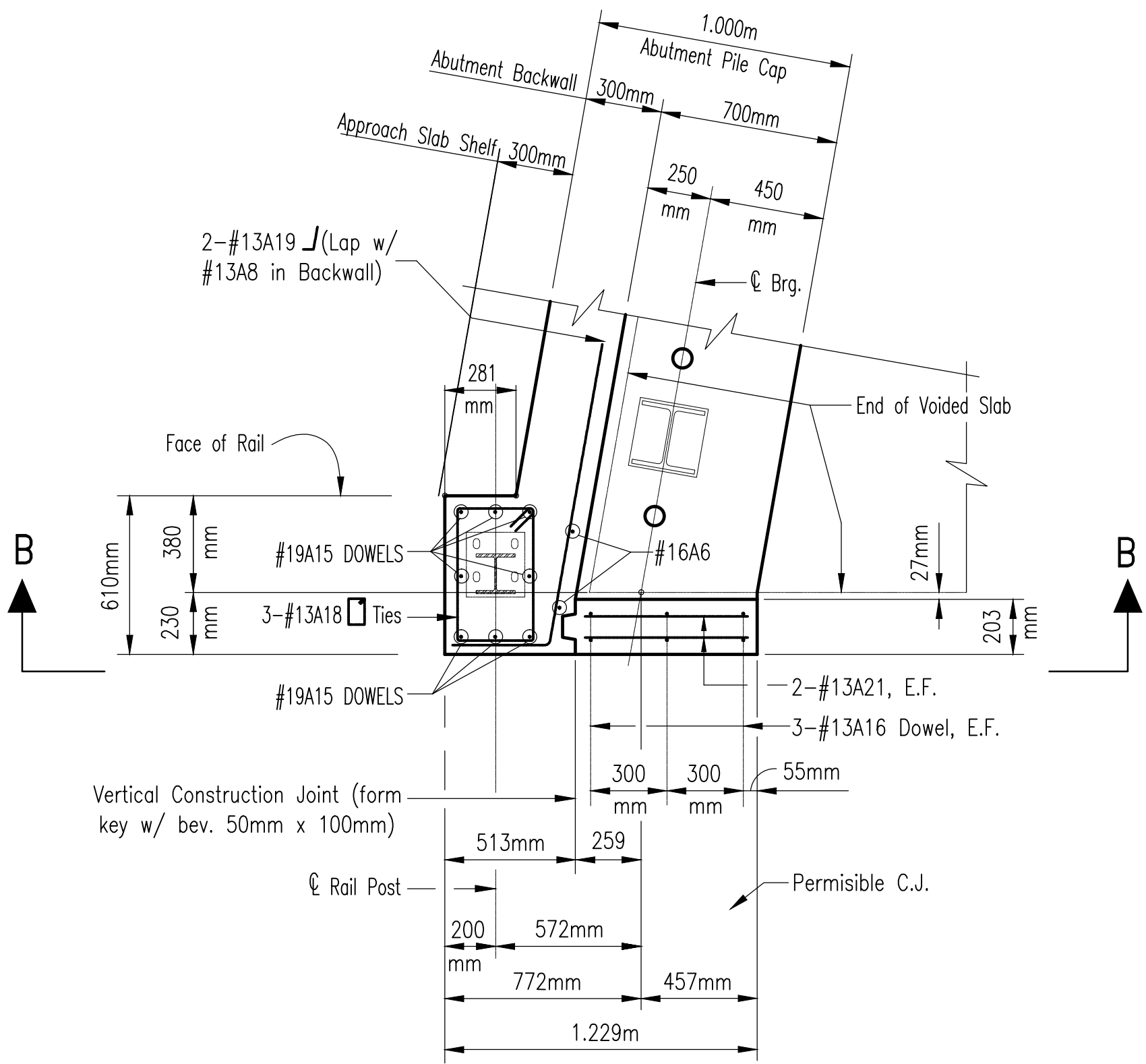
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ABUTMENT DETAILS

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Drawn by: TAY
Checked by: MAZ
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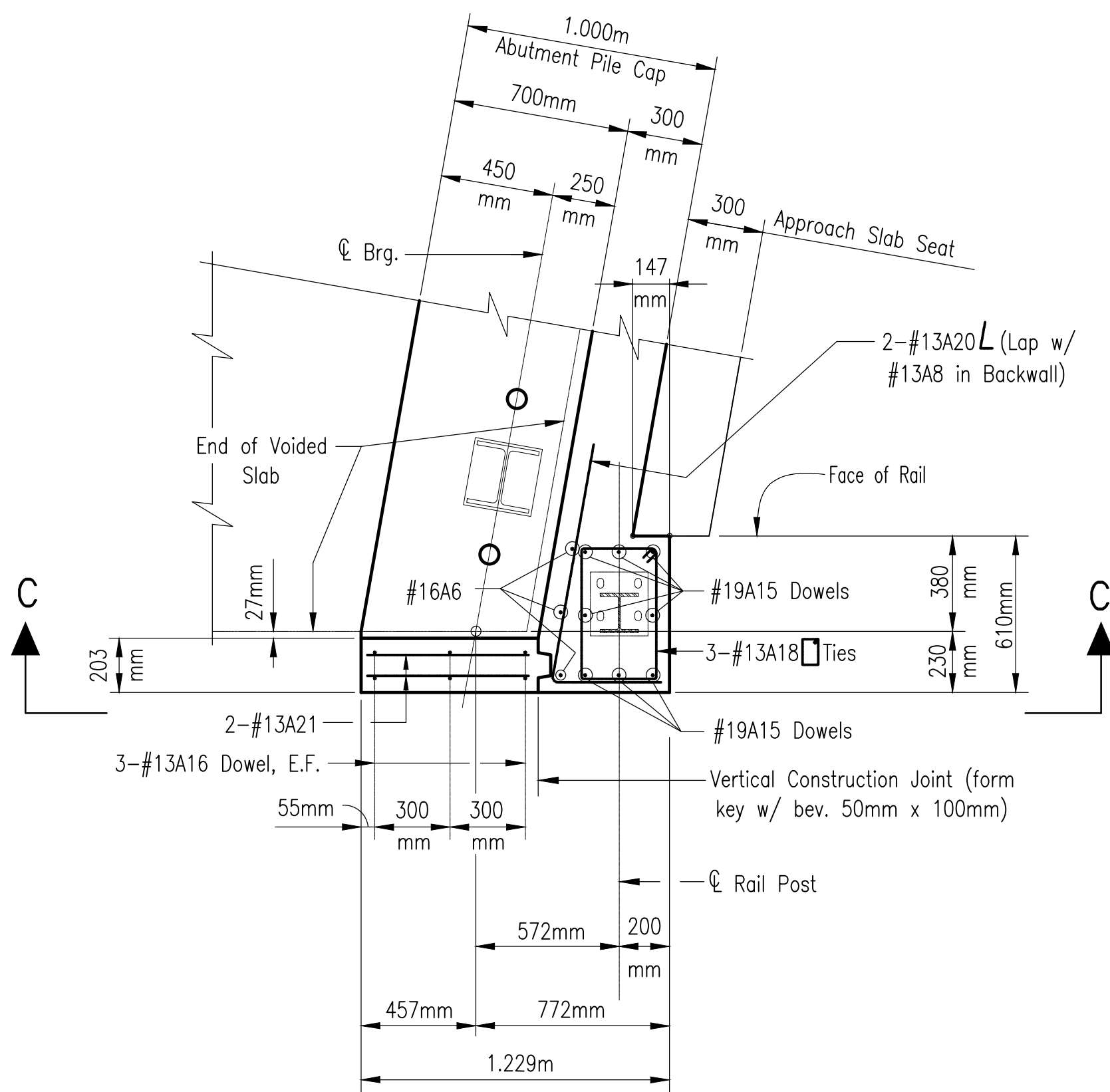
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REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	NM	Navajo	N5031	N5031(1)1,2&4	10	31



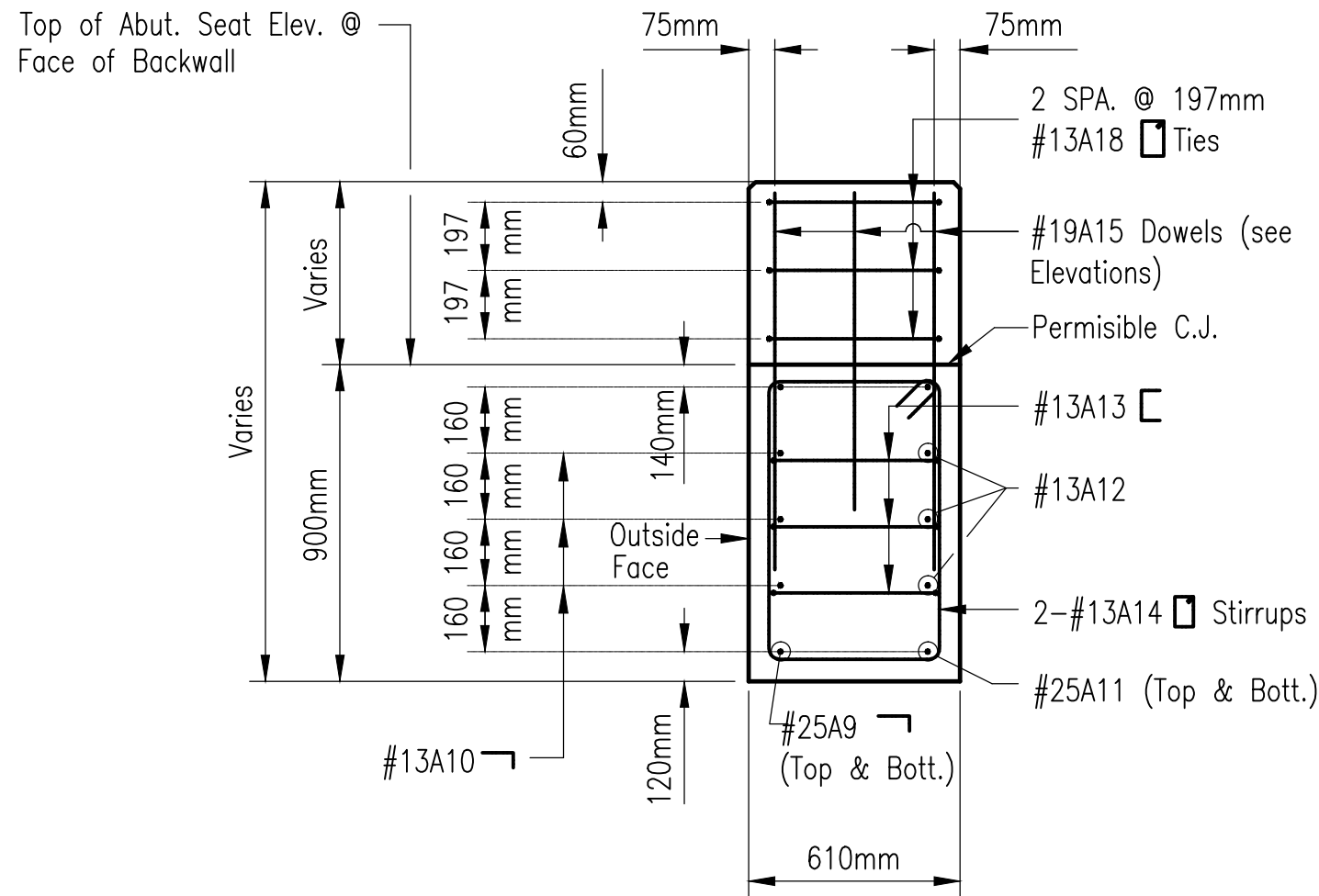
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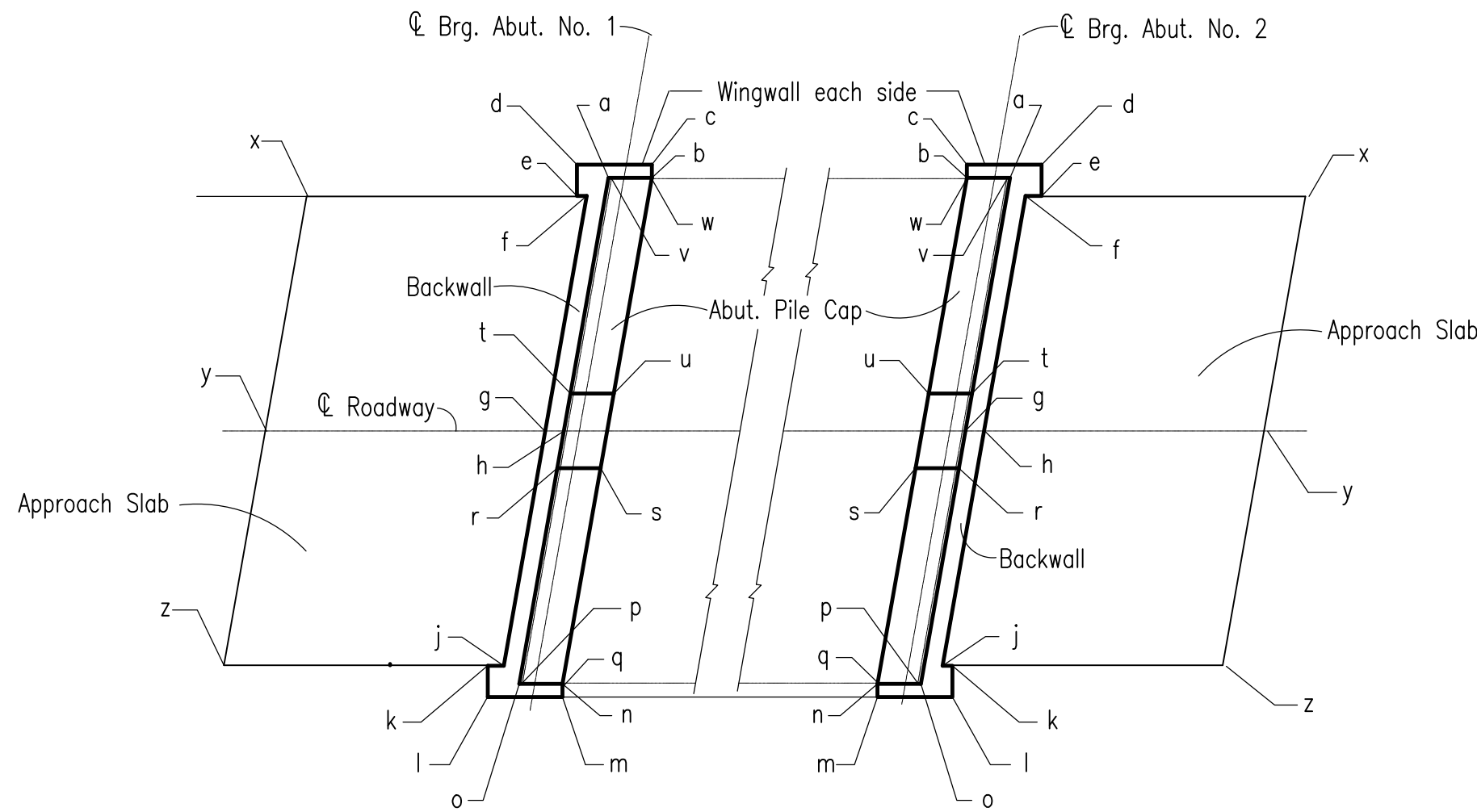
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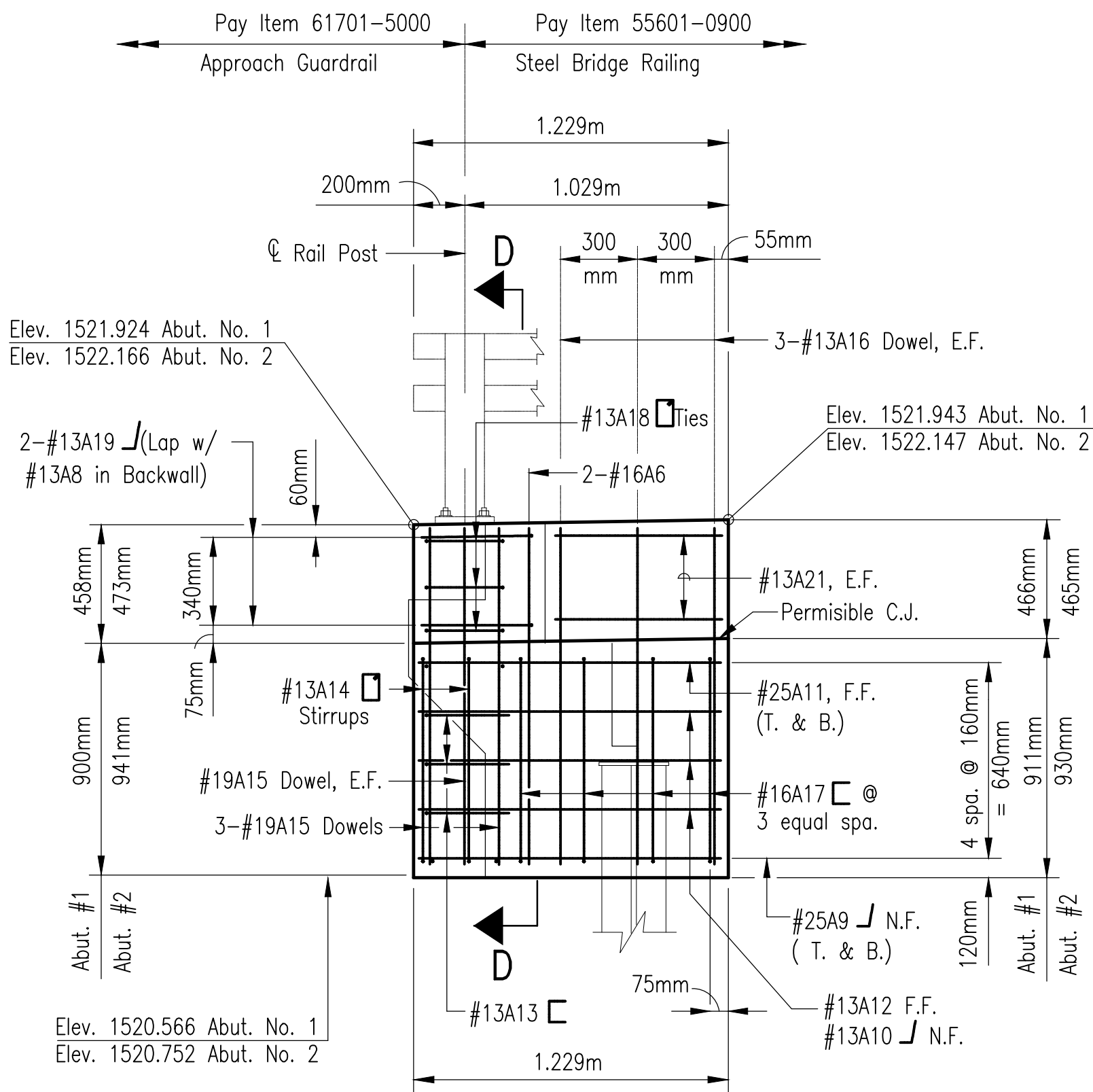
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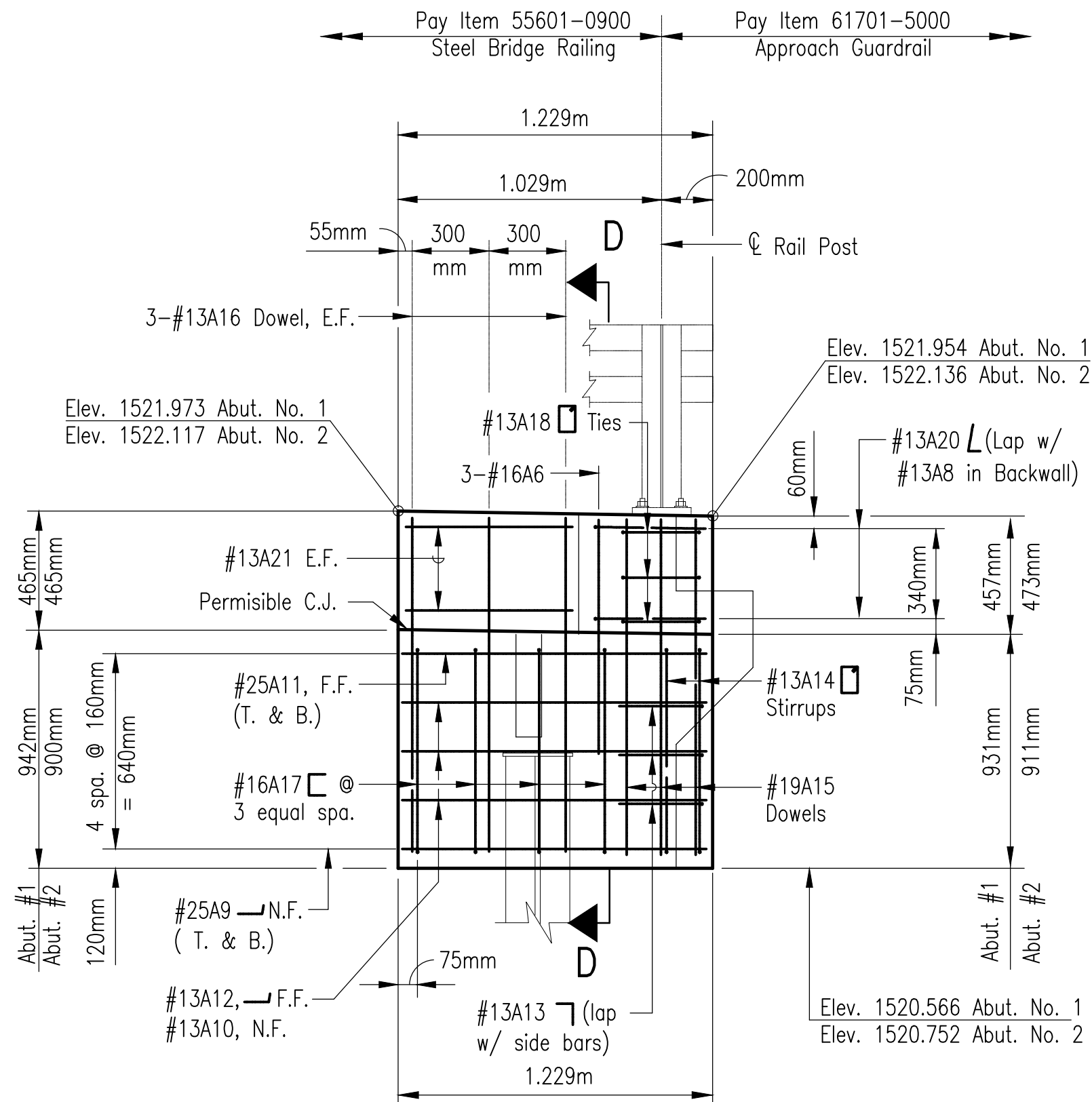
SKETCH SHOWING TOP OF CONCRETE ELEVATION POINTS

Not to Scale



ELEVATION B-B

Not to Scale



ELEVATION C-C

Not to Scale

TOP OF CONCRETE ELEVATIONS			
LOCATION	POINT	ABUTMENT NO. 1	ABUTMENT NO. 2
TOP OF WINGWALL & BACKWALL	a	1521.966	1522.163
	b	1521.977	1522.151
	c	1521.973	1522.147
	d	1521.954	1522.166
	e	1521.966	1522.179
	f	1521.968	1522.174
	g	1522.057	1522.258
	h	1522.062	1522.263
	j	1521.940	1522.146
	k	1521.936	1522.148
	l	1521.924	1522.136
	m	1521.943	1522.117
	n	1521.947	1522.121
	o	1521.936	1522.132
TOP OF ABUTMENT PILE CAP	p	1521.466	1521.663
	q	1521.477	1521.652
	r	1521.578	1521.774
	s	1521.589	1521.763
	t	1521.581	1521.778
	u	1521.592	1521.767
	v	1521.497	1521.693
TOP OF APPROACH SLAB	w	1521.508	1521.682
	x	1521.893	1522.243
	y	1521.979	1522.332
	z	1521.858	1522.217

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WINGWALL DETAILS AND TOP
OF CONCRETE ELEVATIONS

Designed by: MAZ

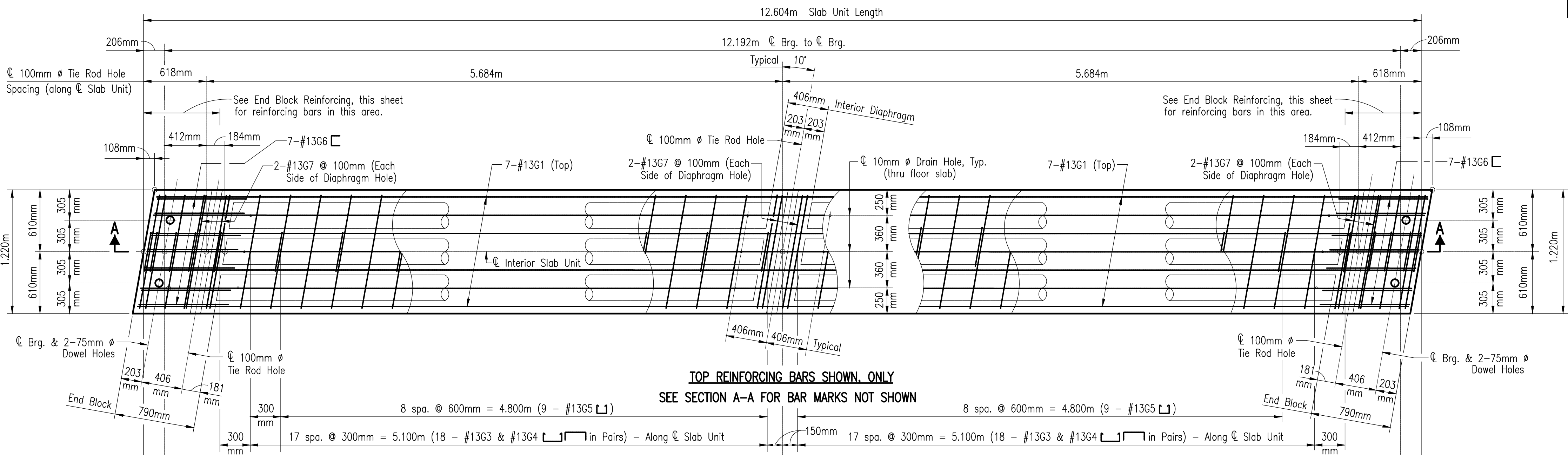
Drawn by: TAY Date: 07-03

Checked by: MAZ Date: 07-03

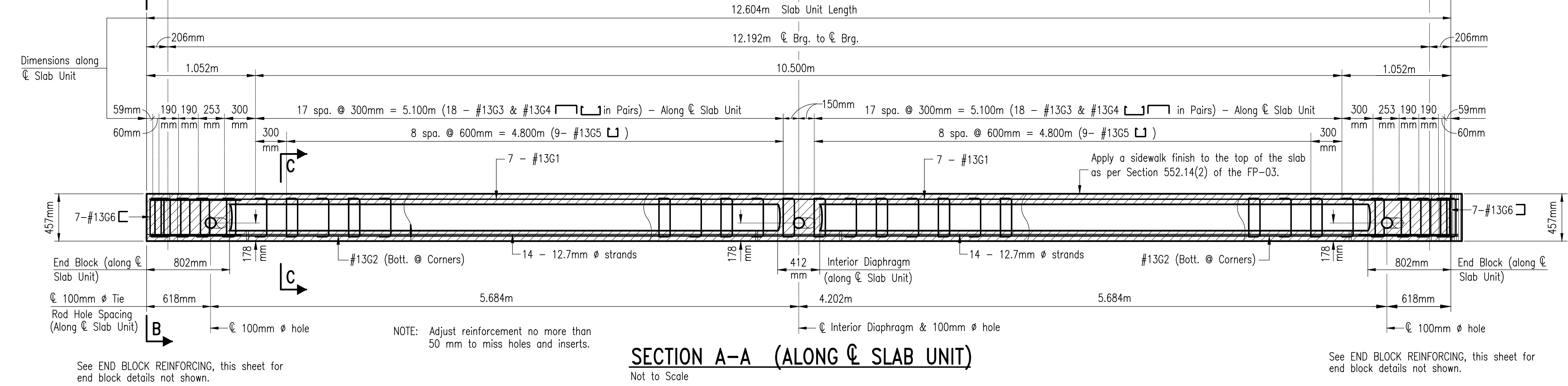
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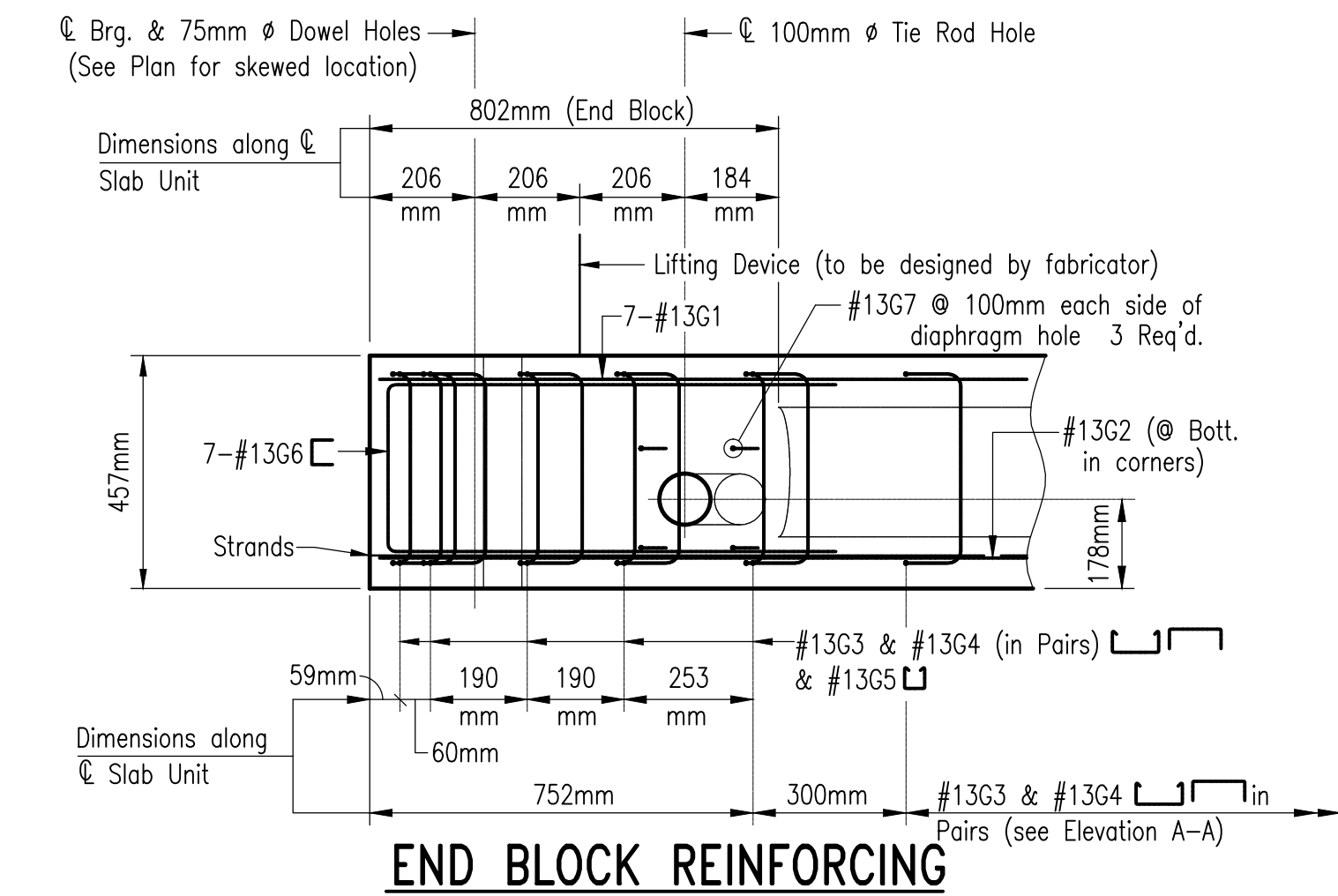
REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	NM	Navajo	N5031	N5031(1)1,2&4	11	31



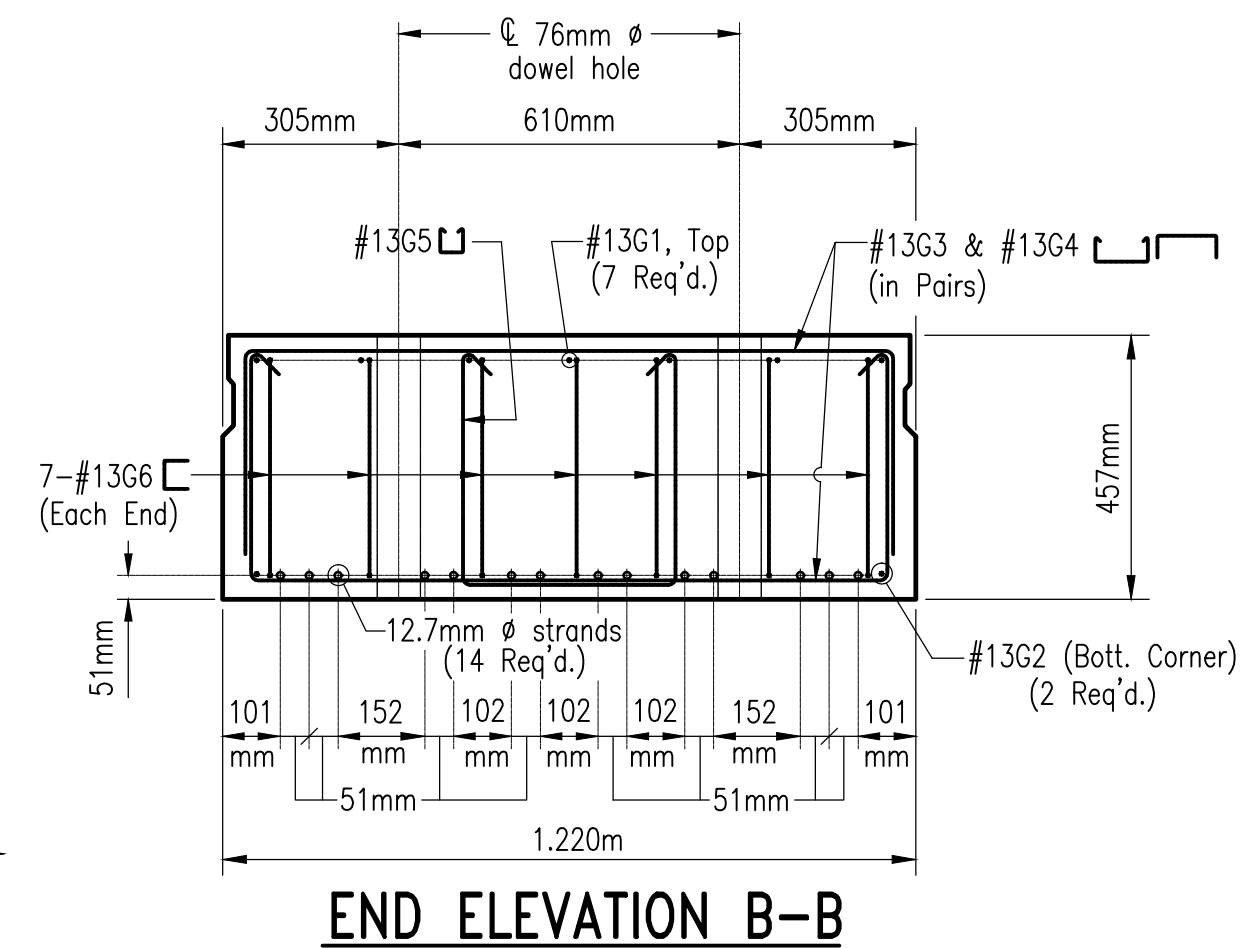
PLAN – PRESTRESSED CONCRETE VOIDED SLAB S III-48
Interior Slab Unit – 7 Req'd.
SEE SHEET NO. 12 FOR EXTERIOR UNIT



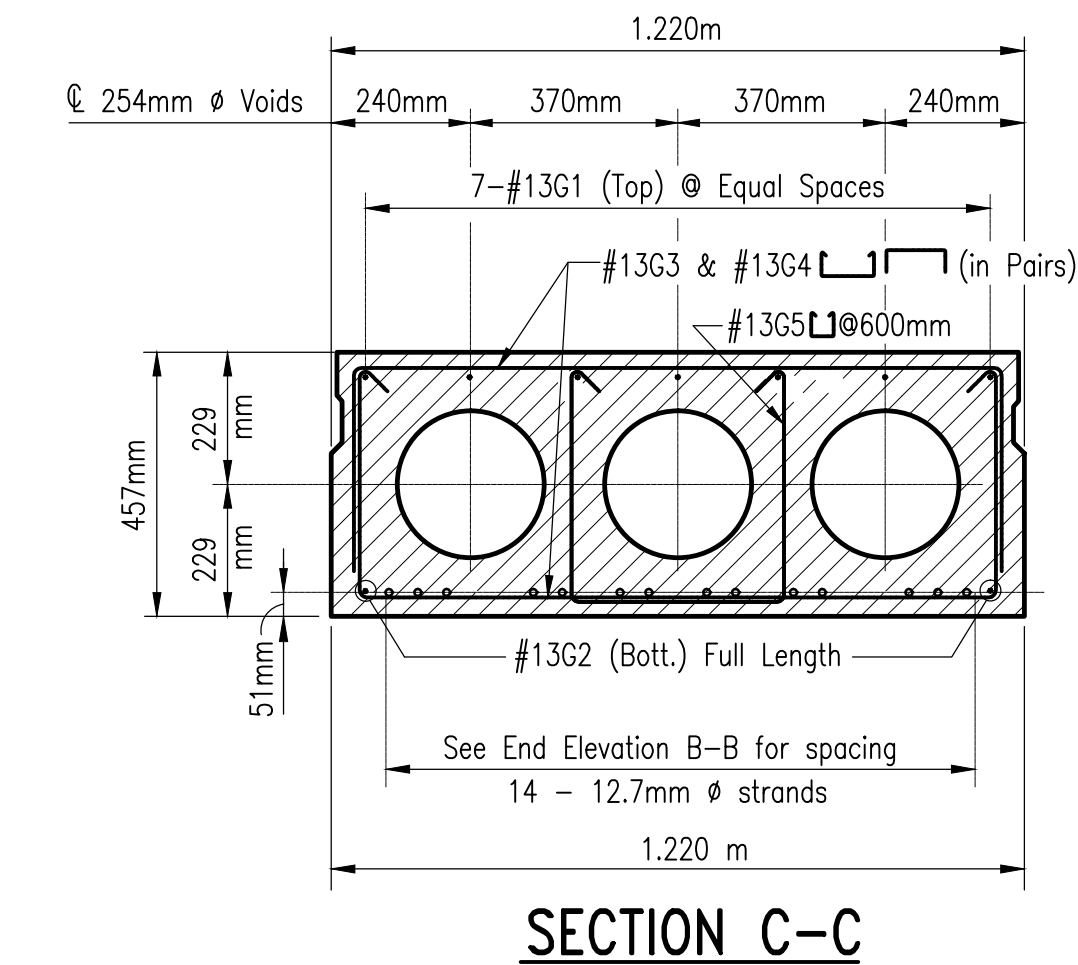
SECTION A-A (ALONG SLAB UNIT)
Not to Scale



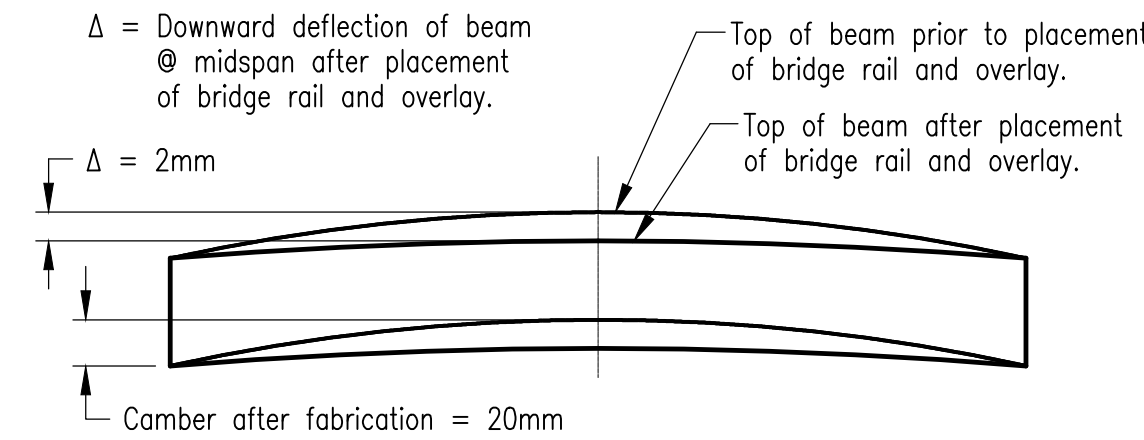
END BLOCK REINFORCING



END ELEVATION B-B

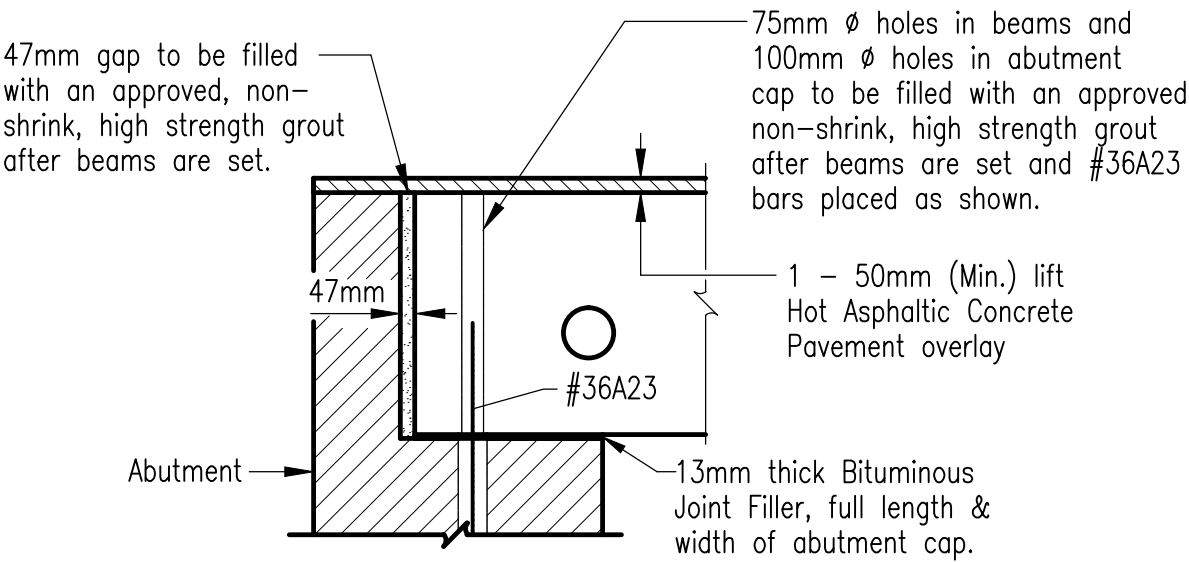


SECTION C-C



CAMBER AND DEFLECTION DIAGRAM

NOTE: Cambers and deflections shown are theoretical based on design calculations. Actual cambers and deflections shall be determined in the field and adjustments made if necessary.



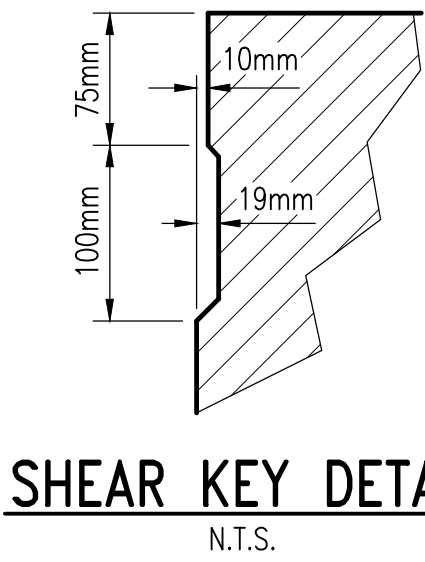
GROUT DETAIL AT ABUTMENT

ESTIMATED QUANTITIES (one S III-48 slab)

CONCRETE	5.41 m ³
REINFORCEMENT	25 kg
EPOXY COATED REINF.	341 kg
12.7 mm Ø STRAND	176.5 m

VOIDED SLAB CONCRETE COVER TABLE

Top of top slab	40mm
Sides of web	50mm
All other surfaces	25mm



SHEAR KEY DETAIL
N.T.S.

NOTE:
See Reinforcing Bar Schedule Sheet for Details

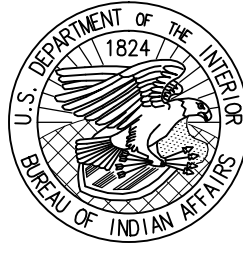
PRESTRESSED CONCRETE VOIDED SLAB INFORMATION TABLE – S III-48

SPAN	L, TOTAL LENGTH	L1, C to C BEARING	12.7 mm Ø PRESTRESSING STRAND TOTAL NUMBER	CONCRETE		NUMBER OF SLABS
				MIN. COMPRESSIVE STRENGTH @ 28 DAYS	MIN. COMPRESSIVE STRENGTH @ RELEASE	
1	12.604m	12.192m	14	41.37 MPa	34.47 MPa	7

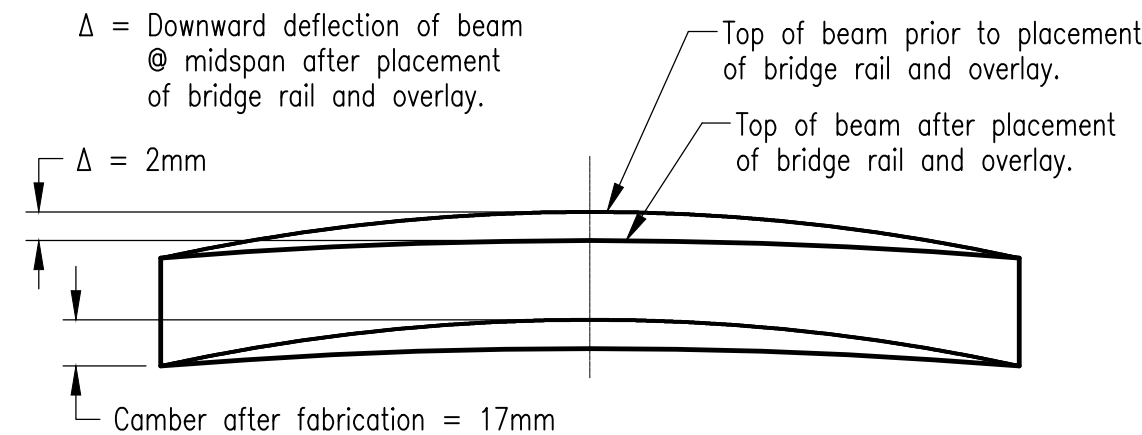
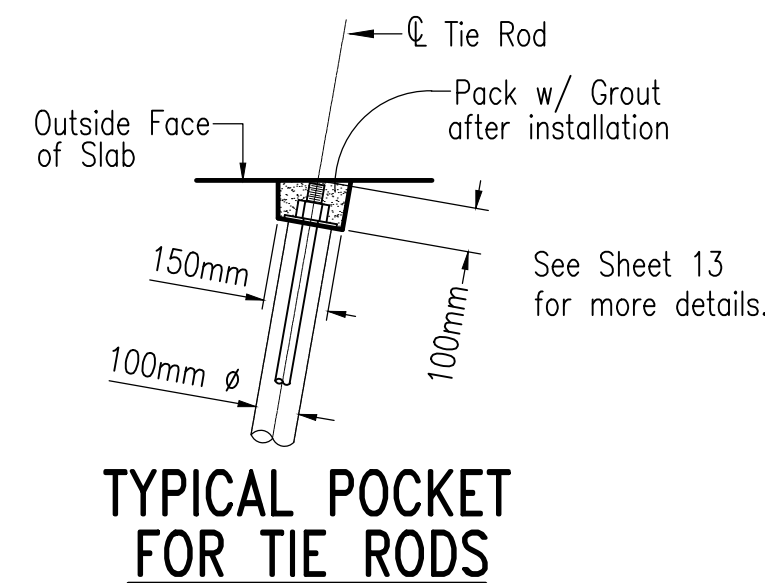
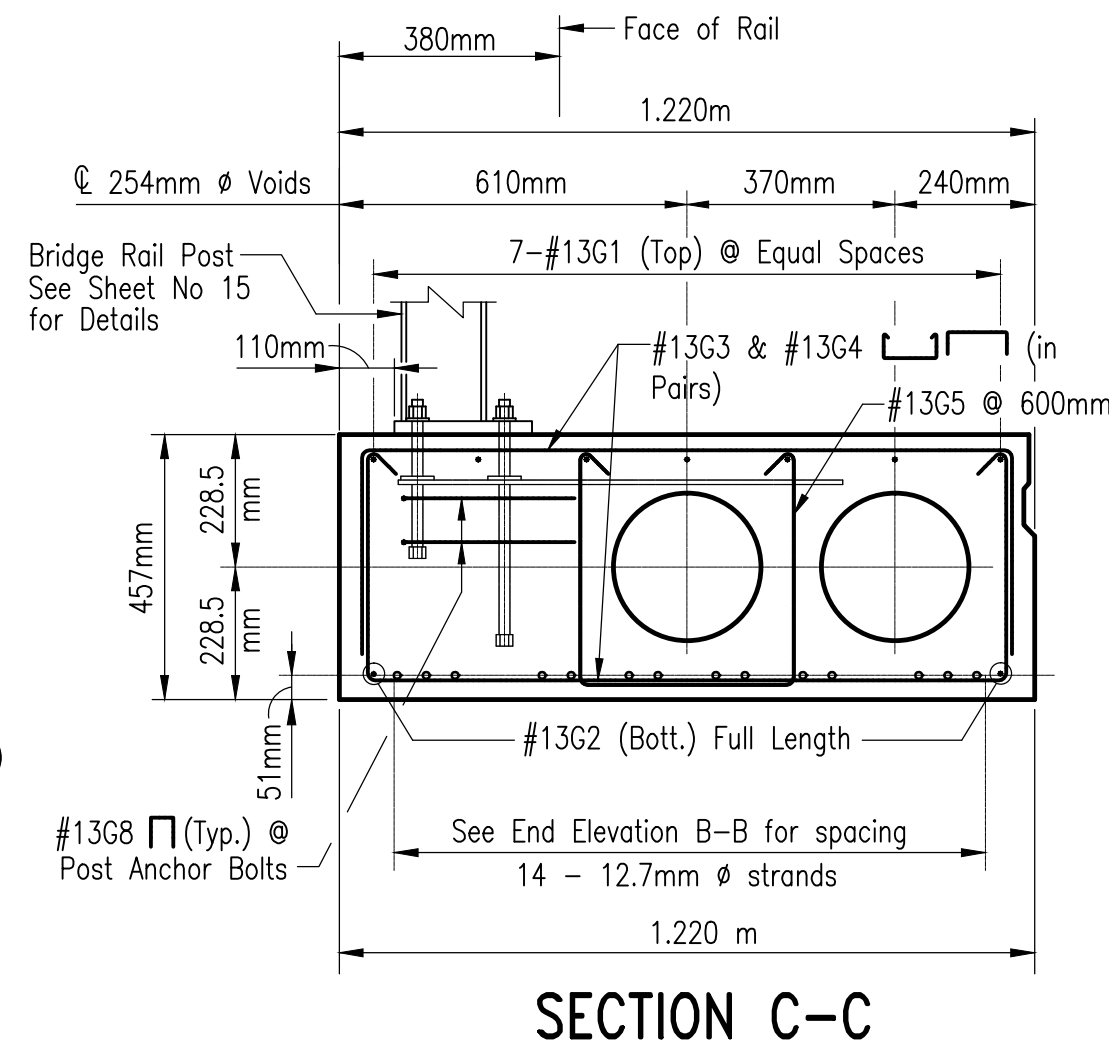
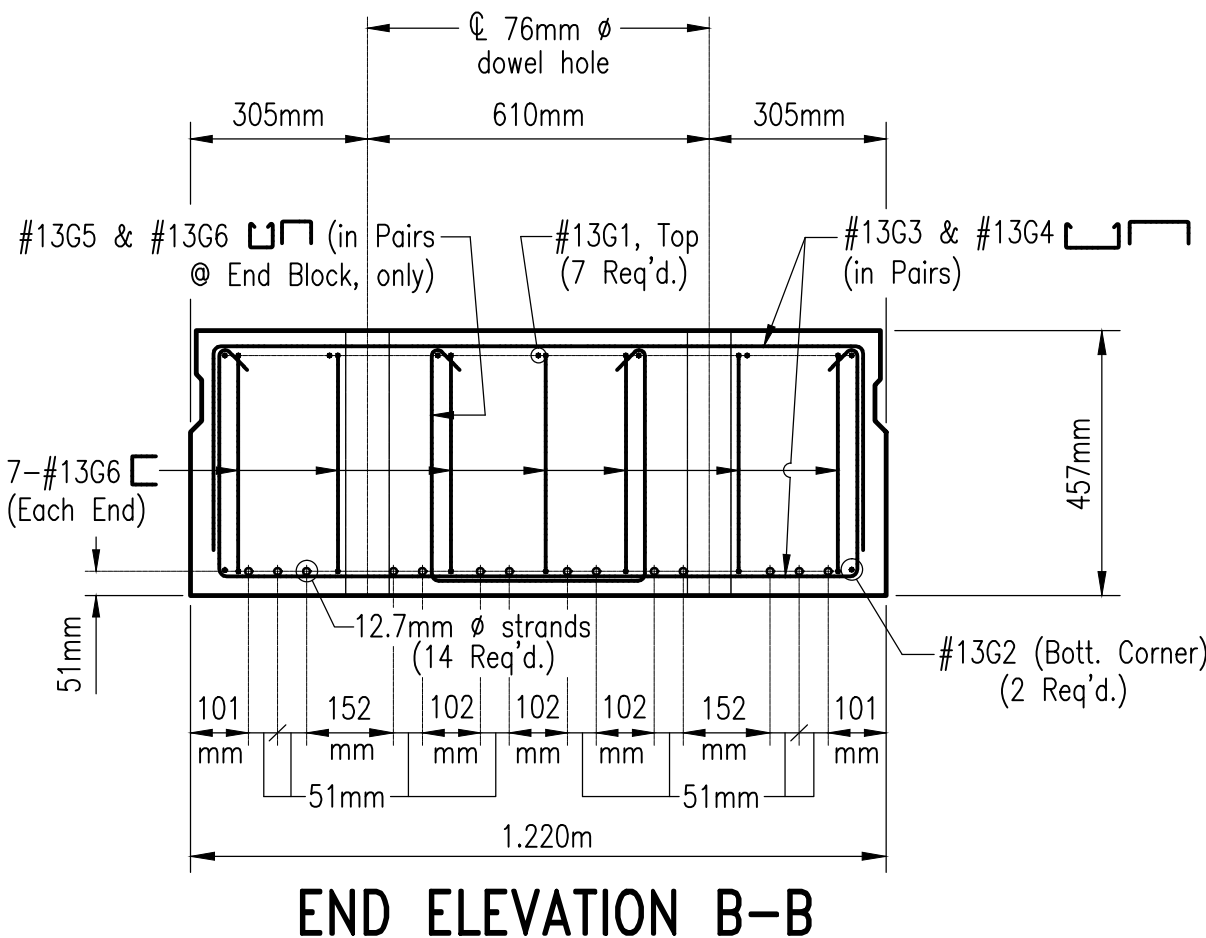
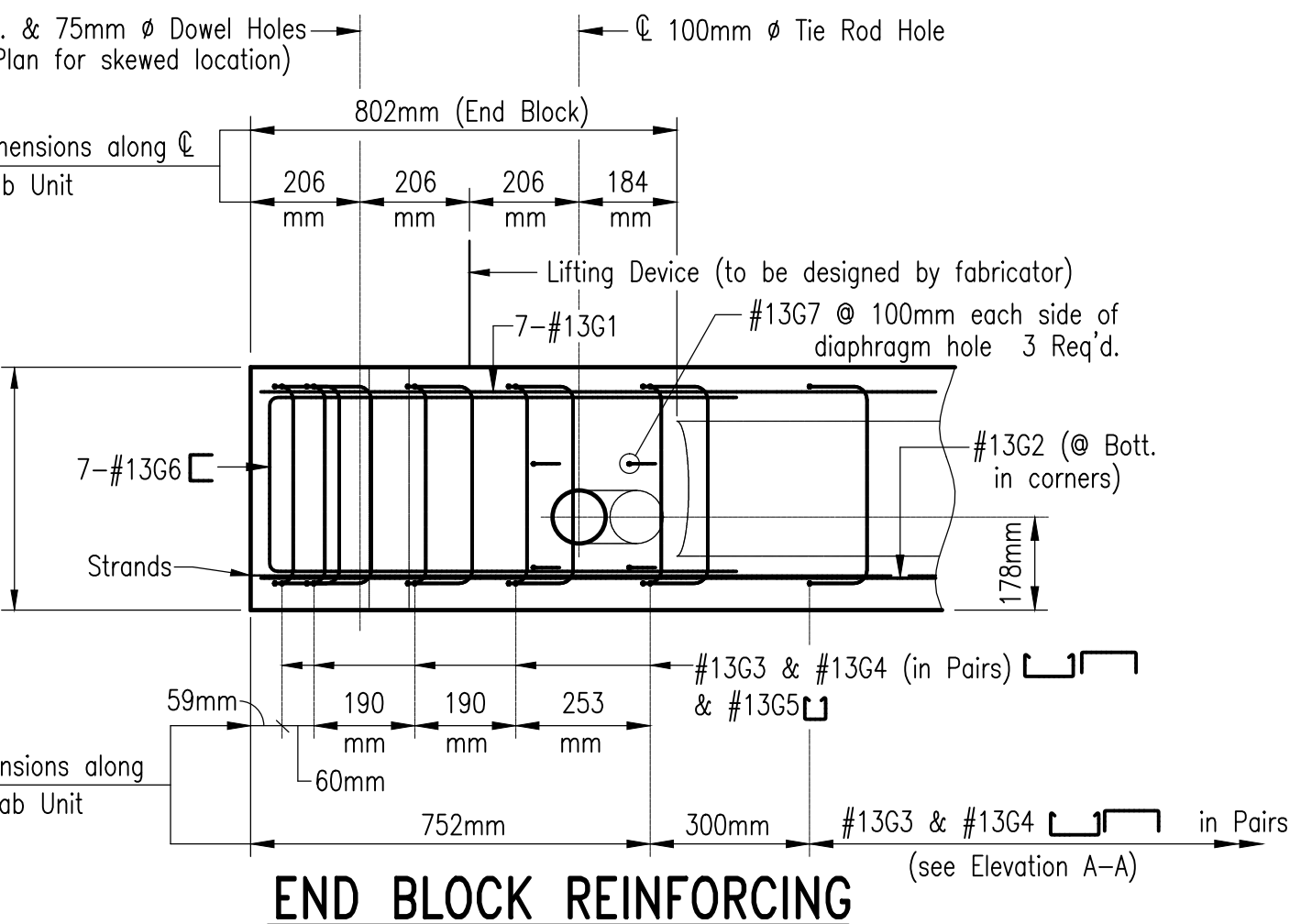
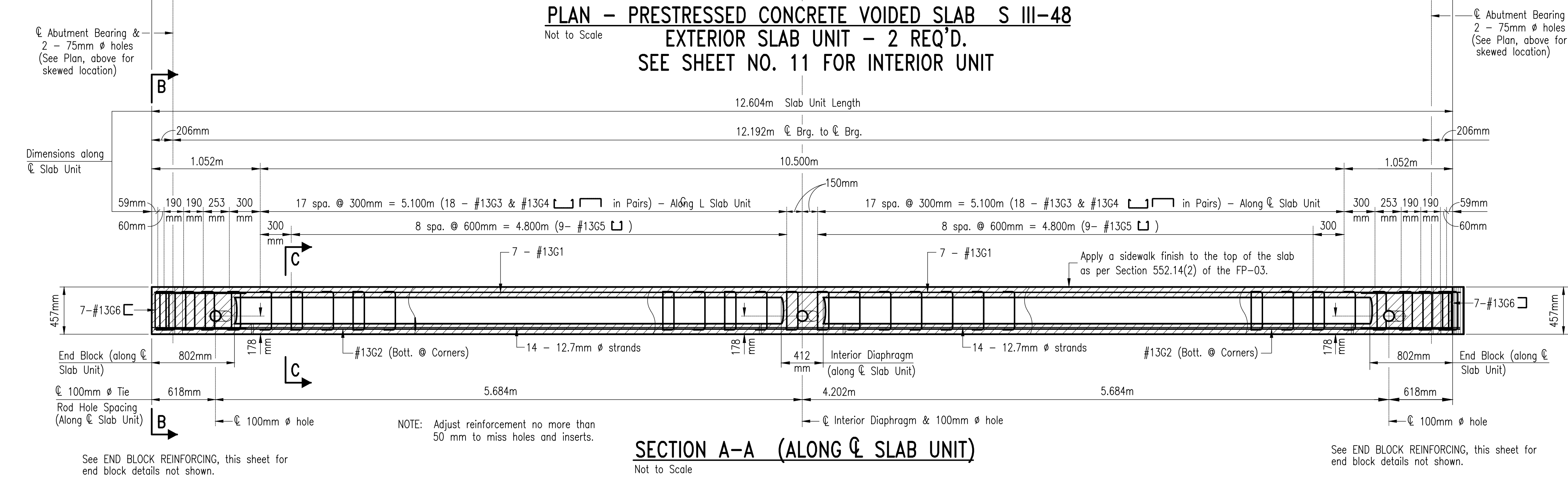
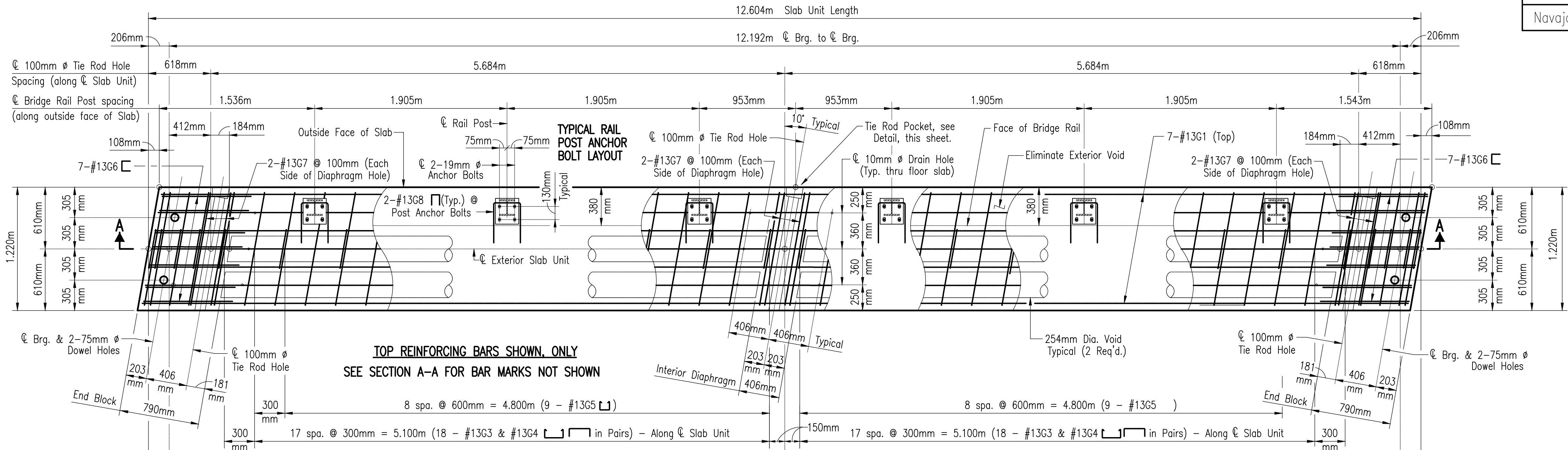
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL OFFICE – DIVISION OF TRANSPORTATION

PRESTRESSED CONCRETE SLAB DETAILS – TYPE S III-48 (1 OF 2)

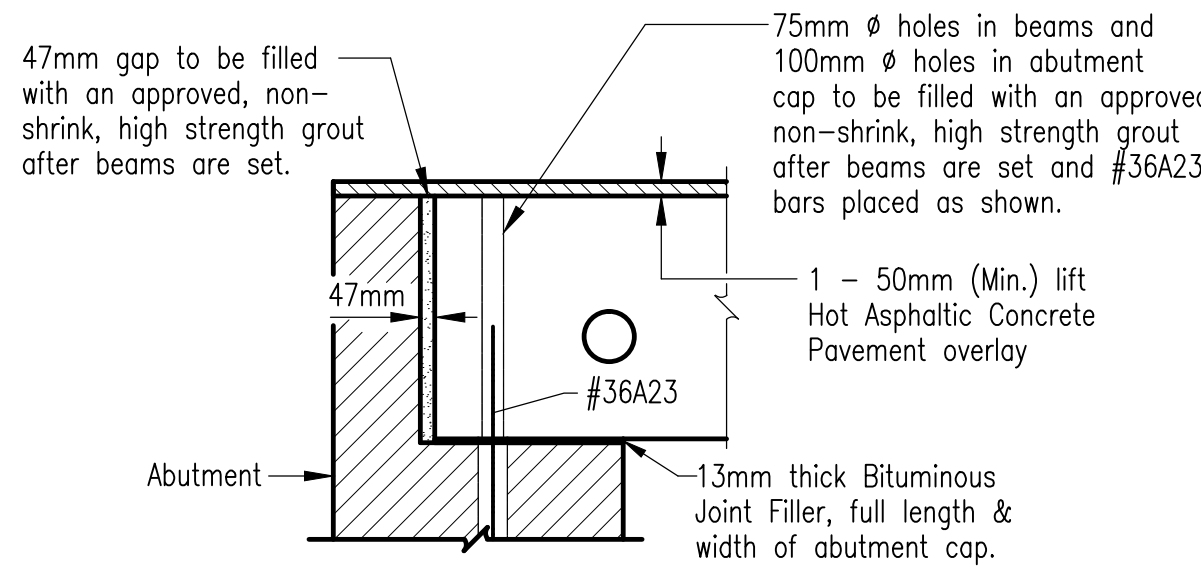
Designed by: MAZ
Drawn by: TAY Date: 06-03
Checked by: MAZ Date: 06-03
File Name: Slabdet1.dwg



REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	NM	Navajo	N5031	N5031(1)1,2&4	12	31



NOTE: Cambers and deflections shown are theoretical based on design calculations. Actual cambers and deflections shall be determined in the field and adjustments made if necessary.

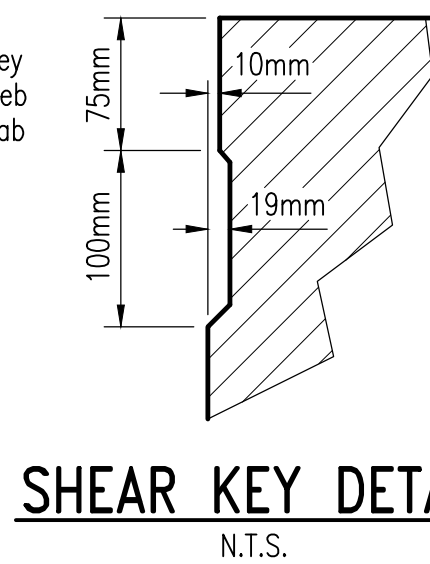


ESTIMATED QUANTITIES (one S III-48 slab)

CONCRETE	5.95 m ³
REINFORCEMENT	37 kg
EPOXY COATED REINF.	339 kg
12.7 mm \varnothing STRAND	176.5 m

VOIDED SLAB CONCRETE COVER TABLE

Top of top slab	40mm
Sides of web	50mm
All other surfaces	25mm



NOTE: Omit shear key on exterior web of exterior slab unit, only.

NOTE: See Sheet No. 14 for Reinforcing Steel Details.

PRESTRESSED CONCRETE VOIDED SLAB INFORMATION TABLE - S III-48

SPAN	L, TOTAL LENGTH	L1, \varnothing to \varnothing BEARING	12.7 mm \varnothing PRESTRESSING STRAND	CONCRETE		NUMBER OF SLABS
			TOTAL NUMBER	MIN. COMPRESSIVE STRENGTH \varnothing 28 DAYS	MIN. COMPRESSIVE STRENGTH \varnothing RELEASE	
1	12.604m	12.192m	14	41.37 MPa	34.47 MPa	2

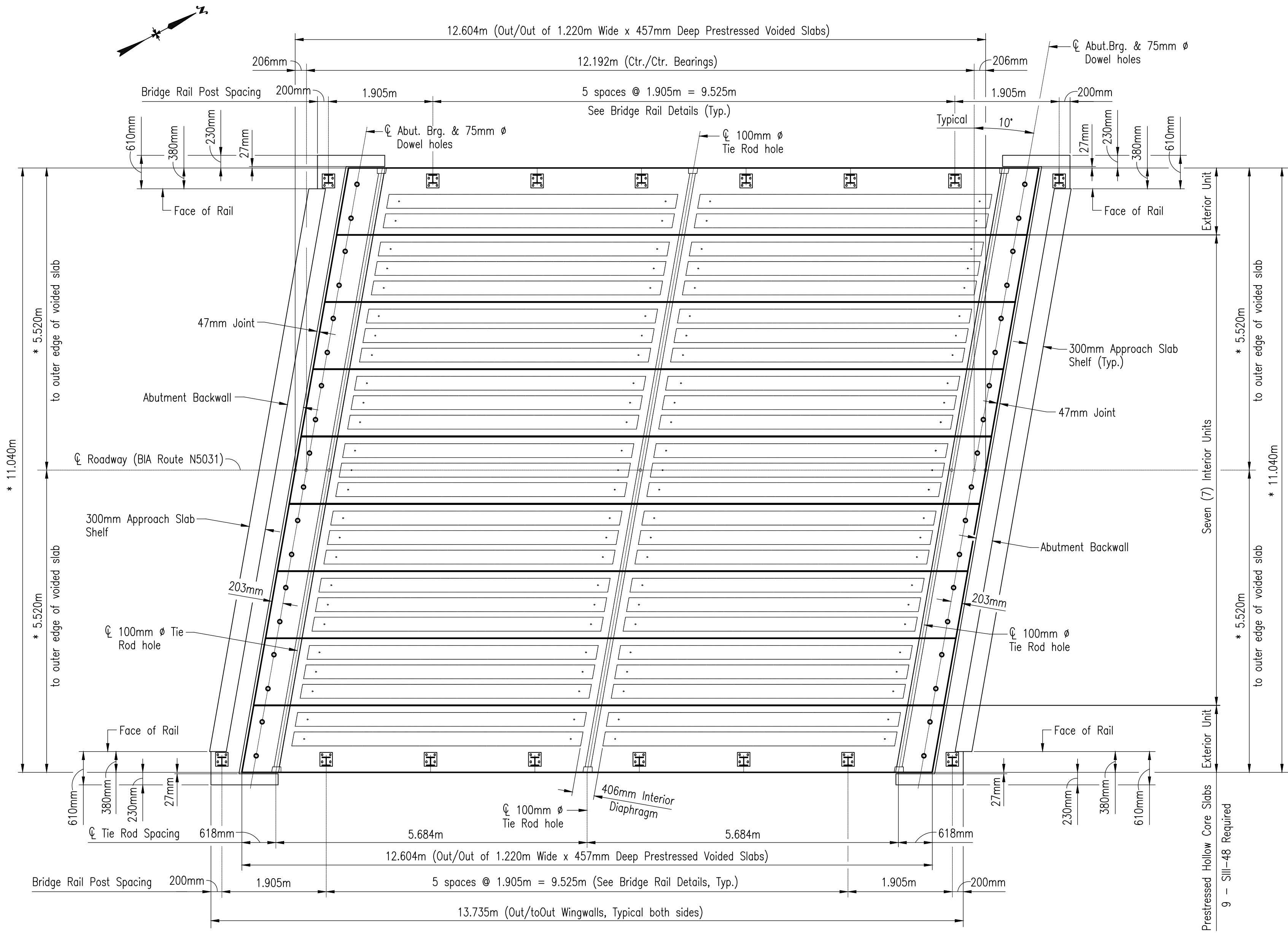
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

PRESTRESSED CONCRETE SLAB DETAILS - TYPE S III-48 (2 OF 2)

Designed by: MAZ
Drawn by: TAY Date: 07-03
Checked by: MAZ Date: 07-03
File Name: Slabdet2.dwg

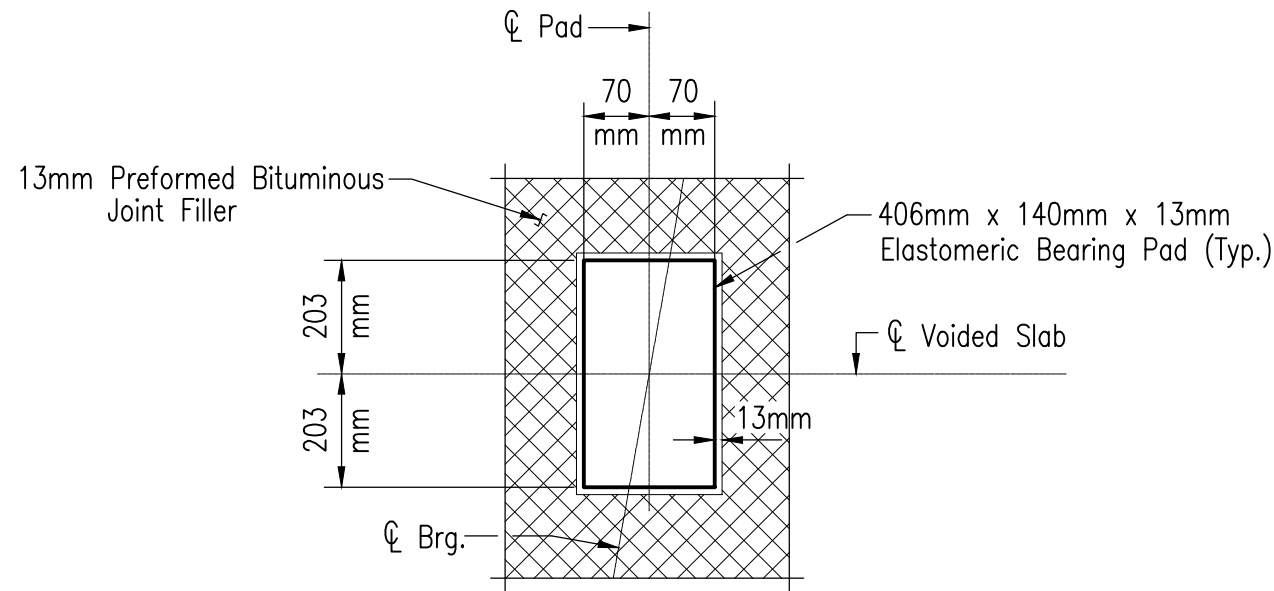


REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	NM	Navajo	N5031	N5031(1)1,2&4	13	31



DECK PLAN – PRESTRESSED VOIDED SLABS

Not to Scale



BEARING PAD DETAIL

Not to Scale

HACP OVERLAY NOTES

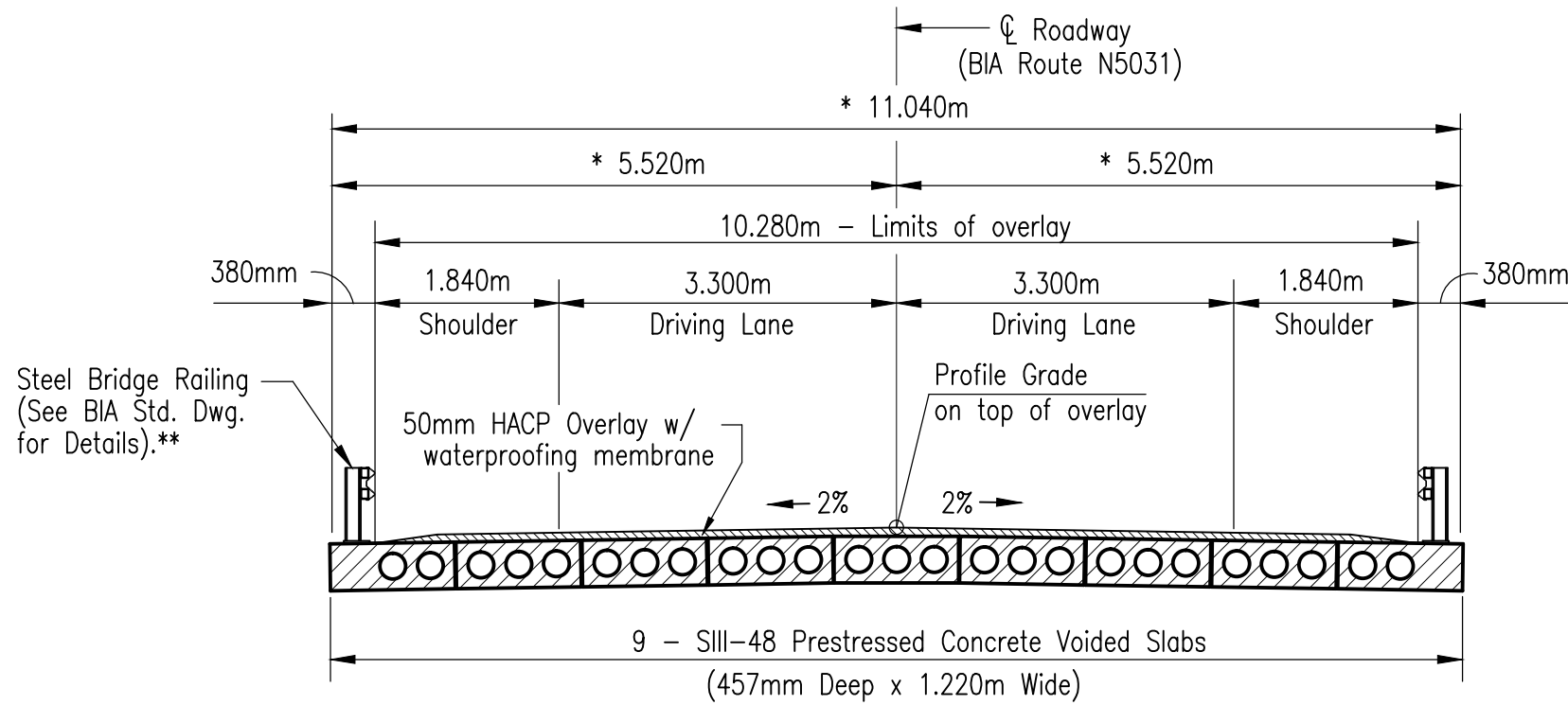
- A Water Proofing Membrane and Hot Asphaltic Concrete Pavement overlay shall be placed over the slabs and approach slabs as follows:
 - Lightly sand blast top surfaces of slabs and approach slabs to clean any loose or foreign material.
 - Place primer or adhesive as recommended by the membrane manufacturer over clean surfaces of box beams and approach slabs within limits of overlay shown in on this sheet.
 - Place water proofing membrane per manufacturer's recommendations. All joints shall be overlapped a minimum of 150 mm.
 - Place 50 mm of Hot Asphaltic Concrete Pavement over water proofing membrane within limits shown.
- Do not place Hot Asphaltic Concrete Pavement until the non-shrink grout in shear keys has cured for 21 days.
- See note about HACP in Bridge General Notes for additional details.
- The water proofing membrane, adhesive and sand blasting are incidental Item 40201-0500.

TIE ROD NOTES

- Tie Rods shall be either 32mm ϕ AASHTO M270M, Grade 250, steel rods or AASHTO M 203M, Grade 1860, prestressing strands tensioned to a load of 135 kN. Tie rod threads shall be cut to the coarse thread Series 2A. At the Contractor's option, equivalent rods with rolled threads may be substituted. Tie Rods shall be galvanized after fabrication.
- After tie rods have been placed and tensioned, longitudinal shear keys shall be filled with an approved non-shrink, high strength grout.
- If prestressing strands are used, the Contractor shall submit a detail showing method of anchorage for approval prior to use.
- Tie Rods and related hardware shall be incidental to Item 55301-0500, Precast Prestressed Concrete Structural Members, Voided Slab (S III-48), Class P.

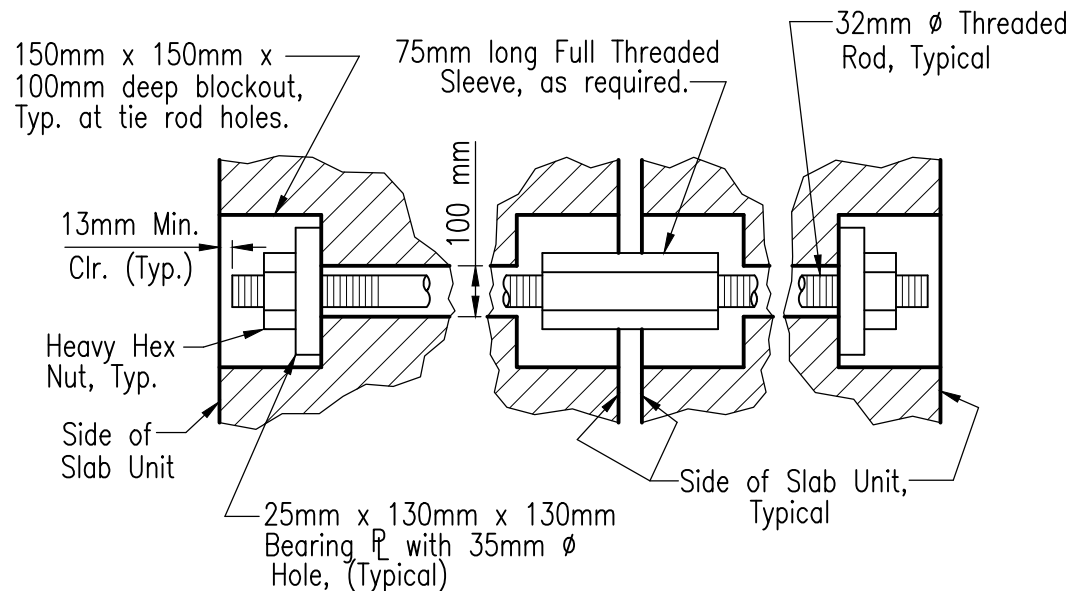
ITEM 40101-0500 – BRIDGE OVERLAY
HACP QUANTITIES

STATION TO STATION	WIDTH	THICKNESS	VOLUME
10+138.829 to 10+161.171	10.280m	50mm	11.58m ³
(Ends of Approach Slabs) @ ϕ			
TOTAL:			11.58m ³
UNIT WEIGHT = 2324 kg/m ³ = 2.324 t/m ³			
TOTAL:			26.9 t



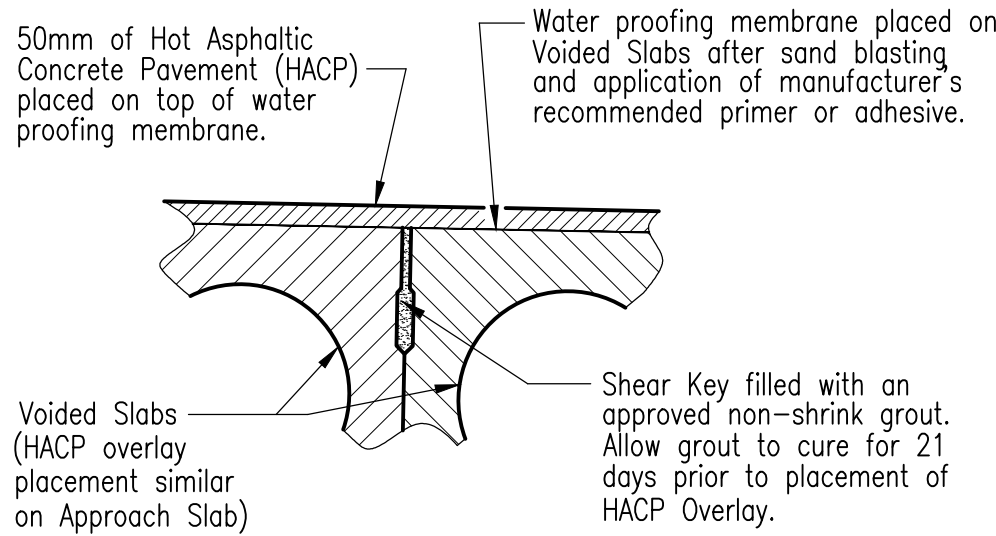
TYPICAL BRIDGE DECK SECTION

N.T.S.



TIE ROD AND TIE ROD HOLE DETAIL

- N.T.S.
- NOTES: Fill blockouts at tie rod holes with an approved, non-shrink, high strength grout after tensioning tie rods to the specified load.
- See Detail on Sheet No. 12 for Typical Tie Rod Pocket @ skewed end.



HOT ASPHALTIC CONCRETE
PAVEMENT PLACEMENT DETAILS

N.T.S.

UNITED STATES
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DECK PLAN AND SECTION

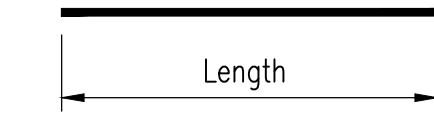
Designed by: MAZ	
Drawn by: TAY	Date: 07-03
Checked by: MAZ	Date: 07-03
File Name: Deckplan.dwg	



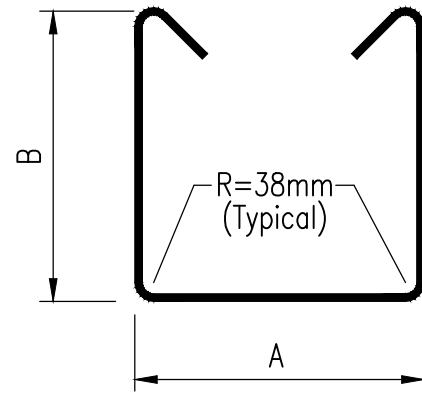
	LOCATION	STRAIGHT BARS					BENT BARS							SPACING
		MARK	TYPE	QTY.	SIZE	LENGTH	MARK	TYPE	QTY.	SIZE	A	B	LENGTH	
ABUTMENTS														
	Bottom	A1	1	14	#29	11.600m								100mm
	Top	A2	1	14	#25	11.600m								120,130mm
	Sides	A3	1	12	#19	11.600m								180mm
	Stirrups						A4	7	72	#13	900mm	780mm	3.460m	300mm
	Shelf						A5	8	68	#16	500mm		1.430m	300mm
	Backwall, Vertical	A6	1	146	#16	914mm								300mm
	Backwall Shelf, Horiz.	A7	1	6	#13	10.360m								As Shown
	Backwall, Horiz.	A8	1	8	#13	11.600m								As Show
	End, Outside Face, Top & Bott.						A9	2	8	#25	1.090m	305mm	1.333m	As Shown
	End, Outside Face, Side						A10	2	12	#13	1.090m	305mm	1.362m	As Shown
	End, Inside Face, Top & Bott.	A11	1	8	#25	1.090m								As Shown
	End, Inside Face, Side	A12	1	12	#13	1.090m								As Shown
	End, Horiz.						A13	4	12	#13	460mm	320mm	1.100mm	As Shown
	End, Stirrups						A14	7	8	#13	490mm	800mm	2.800m	As Shown
	Dowel @ Rail Post	A15	1	32	#19	1.070m								
	Dowel @ Wingwall	A16	1	24	#13	910mm								300mm
	End, Vertical						A17	4	16	#16	740mm	680mm	2.020m	As Shown
	Ties @ Rail Post						A18	7	12	#13	300mm	510mm	1.737m	As Shown
	End, Backwall						A19	5	4	#13	700mm		1.010m	As Shown
	End, Backwall						A20	6	4	#13	700mm		981mm	As Shown
	Wingwall, Horiz.	A21	1	16	#13	650mm								350mm
	Shelf, Dowel	A22	1	68	#25	550mm								300mm
	Beam, Dowel	A23	1	36	#36	840mm								
	APPROACH SLABS													
*	Longitudinal, bottom	S1	1	142	#25	4.485m								145mm
*	Transverse, bottom	S2	1	42	#19	10.310m								220mm
*	Transverse, top	S3	1	26	#13	10.310m								367mm
*	Longitudinal, top	S4	1	60	#13	4.485m								350mm
Reinforcing steel bars for Prestressed Voided Slab Units, S III-48, are NOT included in Item 55401, Reinforcing Steel. Furnishing, fabricating, installing, and any other related work shall be considered incidental to Item 55301a and 55301b, Precast, Prestressed Concrete Member.														
	B III-48 HOLLOW-CORE SLAB (1-INTERIOR SLAB)													
*	Longitudinal, top slab	G1	1	7	#13	12.500m								As Shown
	Longitudinal, bottom slab	G2	1	2	#13	12.500m								As Shown
*	Stirrups						G3	3	46	#13	1.135m	385mm	2.049m	As Shown
*	Stirrups						G4	4	46	#13	1.135m	385mm	1.841m	As Shown
*	Stirrups						G5	3	28	#13	387mm	385mm	1.299m	As Shown
*	Stirrups, end block						G6	4	14	#13	330mm	880mm	2.050m	As Shown
*	Longitudinal, around Diaph. Hole	G7	1	12	#13	962mm								As Shown
	B III-48 HOLLOW-CORE SLAB (1-EXTERIOR SLAB)													
*	Longitudinal, top slab	G1	1	7	#13	12.500m								As Shown
	Longitudinal, bottom slab	G2	1	2	#13	12.500m								As Shown
*	Stirrups						G3	3	46	#13	1.135m	385mm	2.049m	As Shown
*	Stirrups						G4	4	46	#13	1.135m	385mm	1.841m	As Shown
*	Stirrups						G5	3	28	#13	387mm	385mm	1.299m	As Shown
*	Stirrups, end block						G6	4	14	#13	330mm	880mm	2.050m	As Shown
	Longitudinal, around Diaph. Hole	G7	1	12	#13	962mm								As Shown
*	Longitudinal, around Anchor Bolts						G8	4	12	#13	216mm	305mm	762mm	As Shown

* - Epoxy Coated

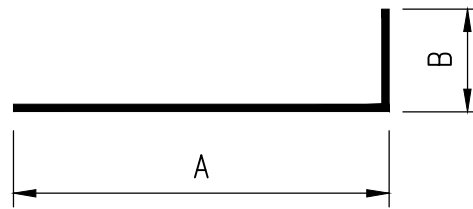
BENDING DIAGRAMS
ALL DIMENSIONS ARE OUT TO OUT



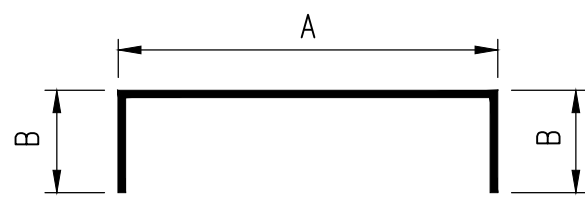
TYPE 1



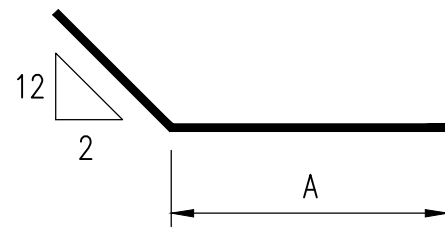
TYPE 3



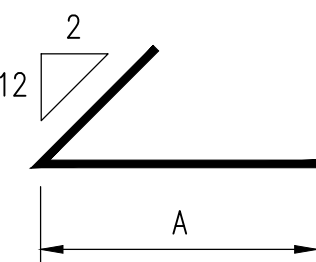
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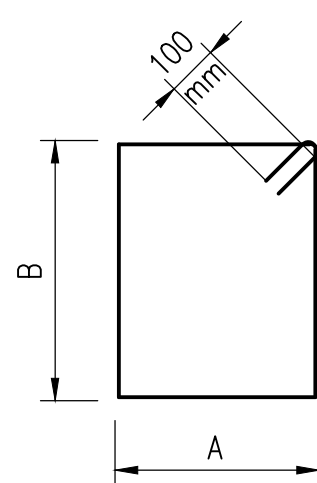
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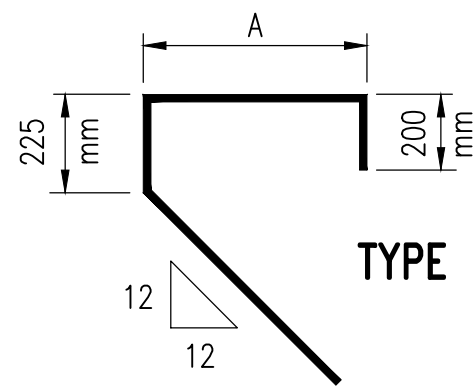
TYPE 5



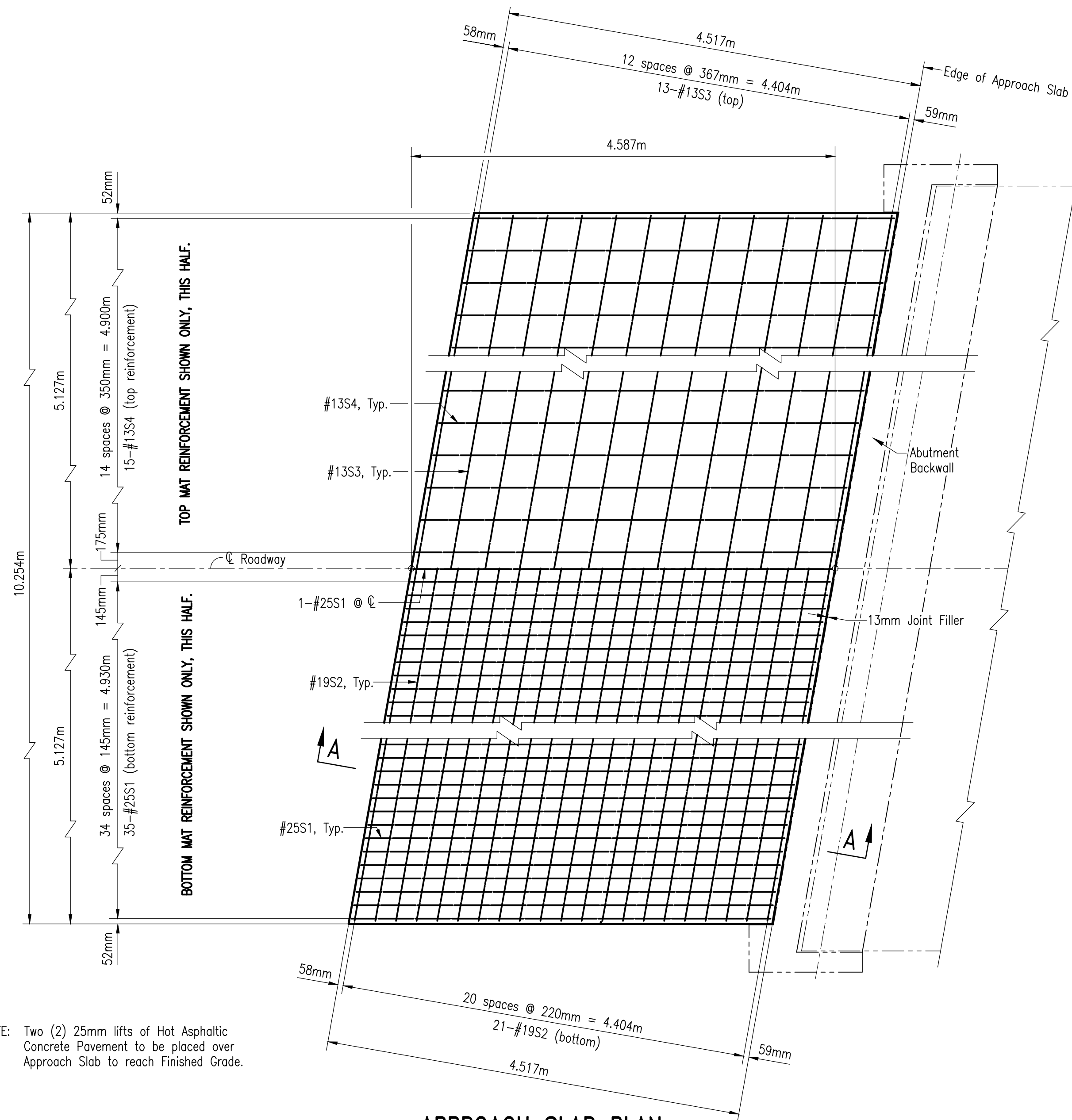
TYPE 6



TYPE 7

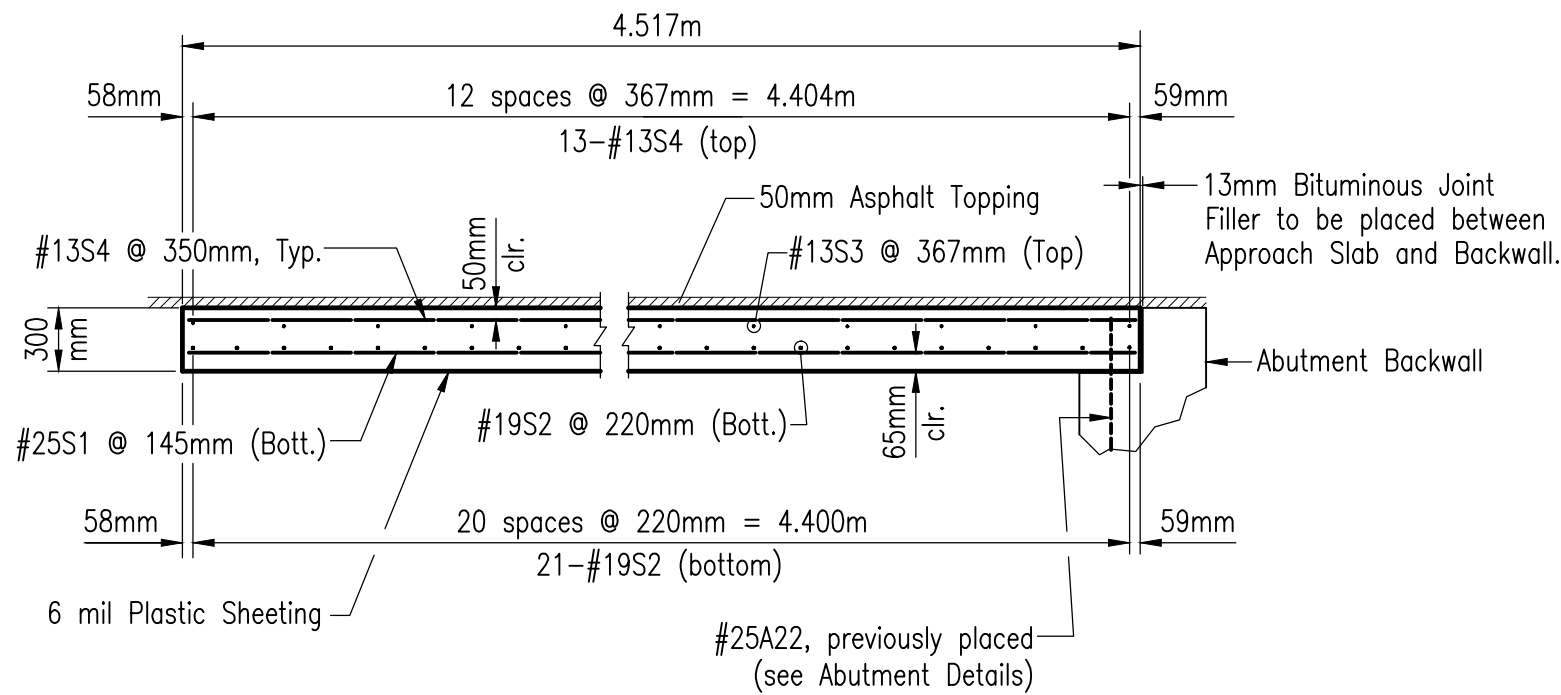


TYPE 8



NOTE: Two (2) 25mm lifts of Hot Asphaltic Concrete Pavement to be placed over Approach Slab to reach Finished Grade.

APPROACH SLAB PLAN
Not to Scale

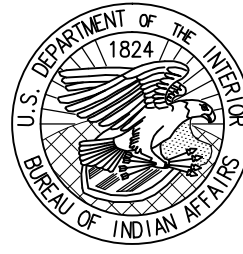


SECTION A-A
Not to scale

UNITED STATES
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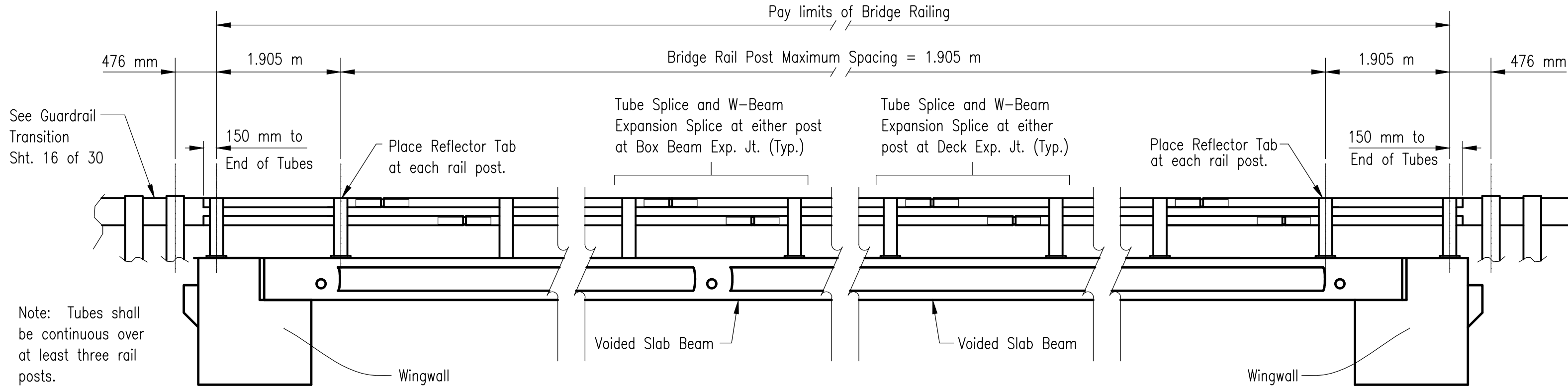
REINFORCING BAR SCHEDULE
& APPROACH SLAB DETAILS

Designed by: MAZ
Drawn by: TAY Date: 07-03
Checked by: MAZ Date: 07-03
File Name: Rnfschd.dwg

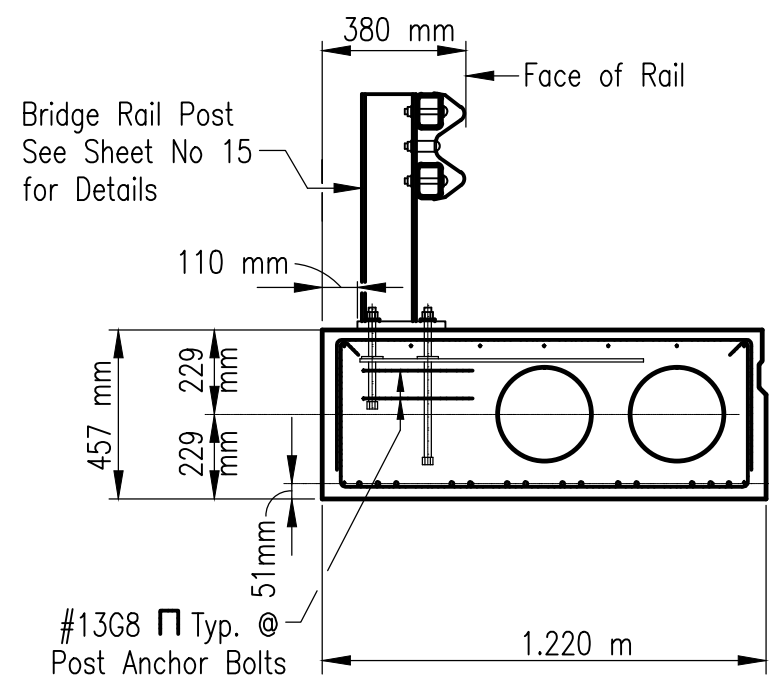


GENERAL NOTES

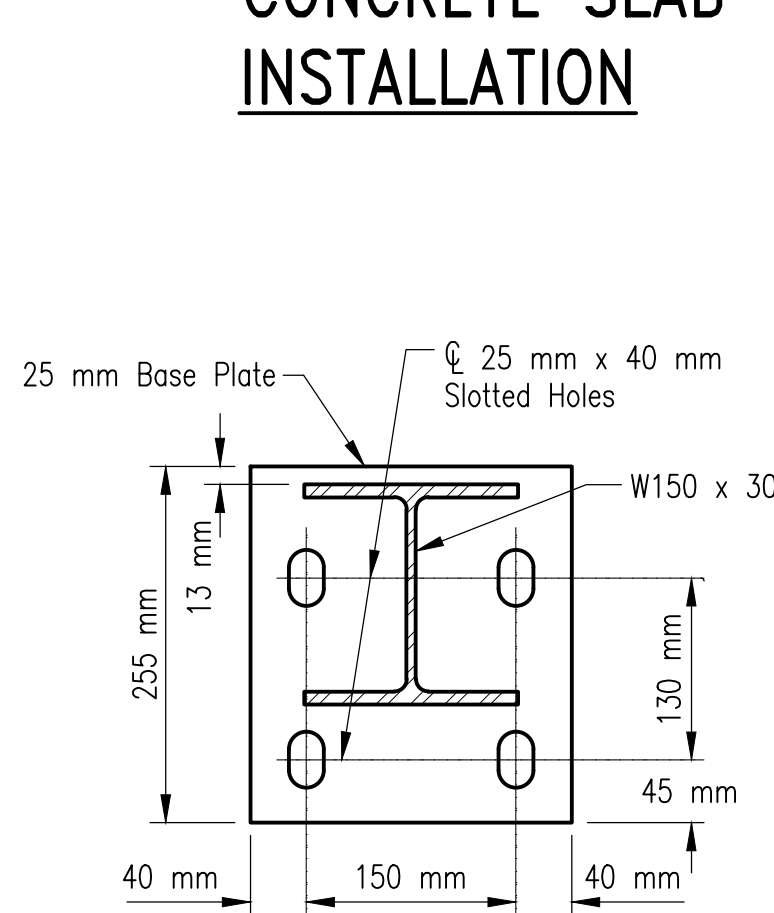
- Panel lengths of tube members shall be attached continuously to a minimum of three posts (except at abutments with expansion joints). Tube splice assemblies shall be provided at a 15 m maximum spacing throughout the bridge railing.
- Dimensions and specified hardware is given in SI (metric) units. For hardware specified in SI (metric) units, English unit hardware may be substituted provided that they are equal or greater in strength.
- Rail posts shall be placed as shown and perpendicular to the adjacent roadway grade. They may be vertical to normal roadway cross slopes, and shall be perpendicular to super elevated roadway cross slopes. The face of railing shall have a smooth transition between normal and super elevated positions. Metal shims shall be used where necessary.
- All nuts, bolts, washers, anchorage plates, bottom plates and necessary hardware are considered as parts of the rail for payment.
- All steel components except reinforcing steel and bolt anchorage plates shall be galvanized unless otherwise shown in plans.
- Anchor bolts shall be M20 x 2.5 AASHTO M164, Type 1, galvanized bolts. Each bolt shall have a hardened steel washer and a 50 mm plain steel washer. Nuts shall conform to AASHTO M291, Class 10S, Class 2A or 2B fit tolerances and be heavy hex, galvanized nuts.
- All tubes and tube sleeve dimensions shall be as shown in the Tube Sleeve Table. All posts, plates and shims shall conform to AASHTO M270M.
- All W-Beam and W-Beam connection hardware shall conform to the requirements of AASHTO M 180.
- Shop drawings shall be submitted and approved at least 14 days prior to the fabrication of the bridge rail components.
- Dimensions noted by asterisk (*) shall be increased by 50 mm when a 50 mm HACF overlay is specified for the bridge deck.



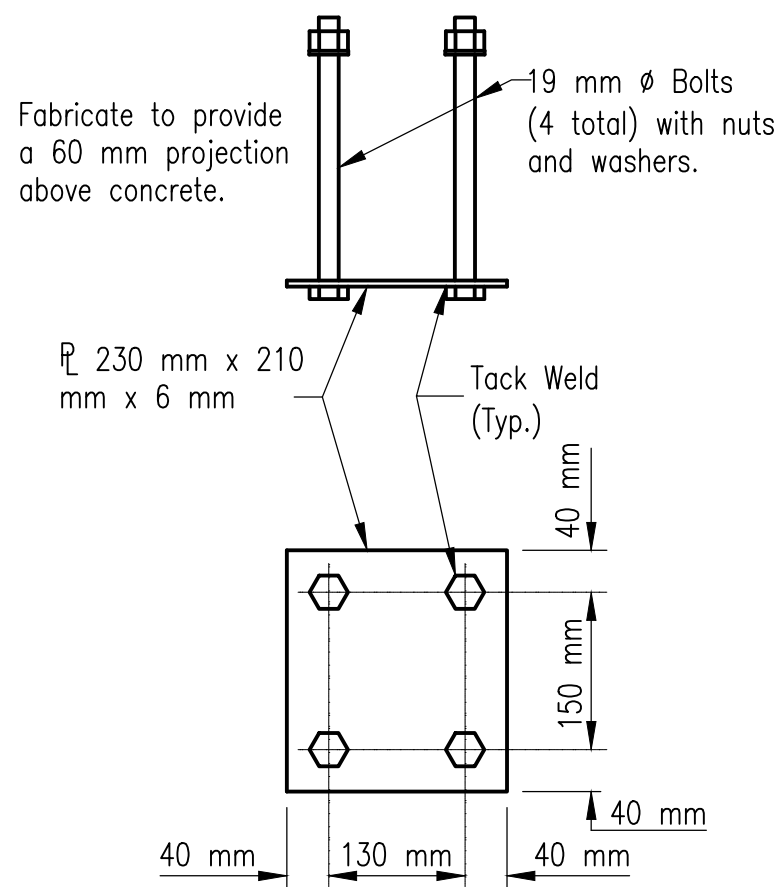
BRIDGE RAIL ELEVATION



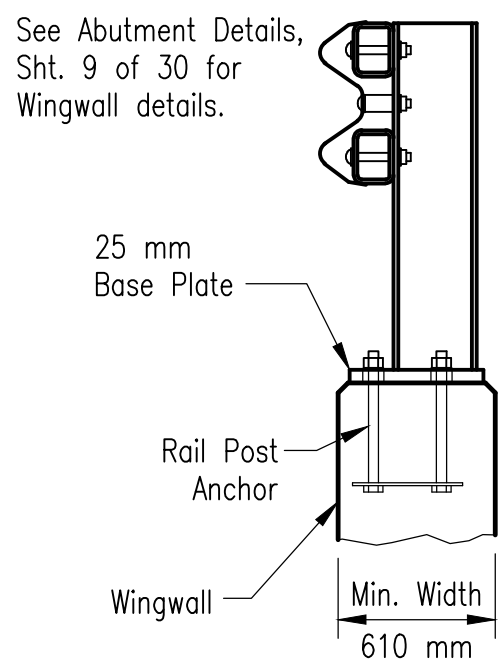
CONCRETE SLAB INSTALLATION



BASEPLATE DETAIL



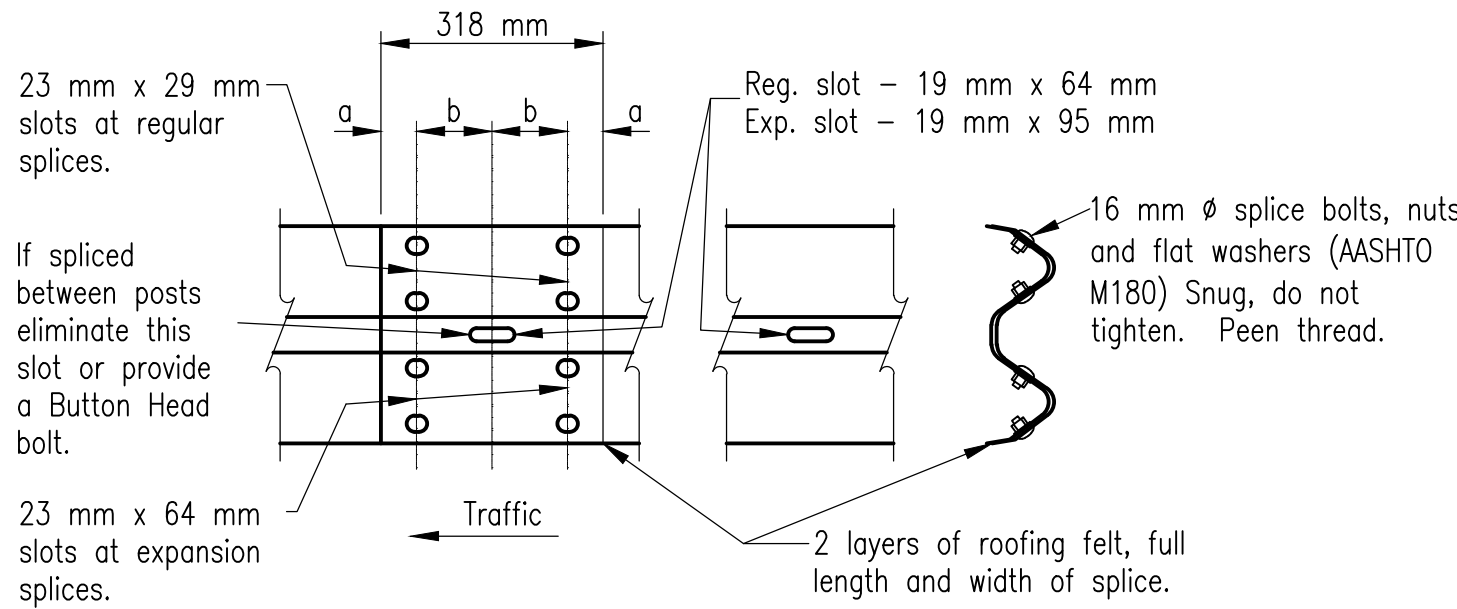
RAIL POST ANCHOR



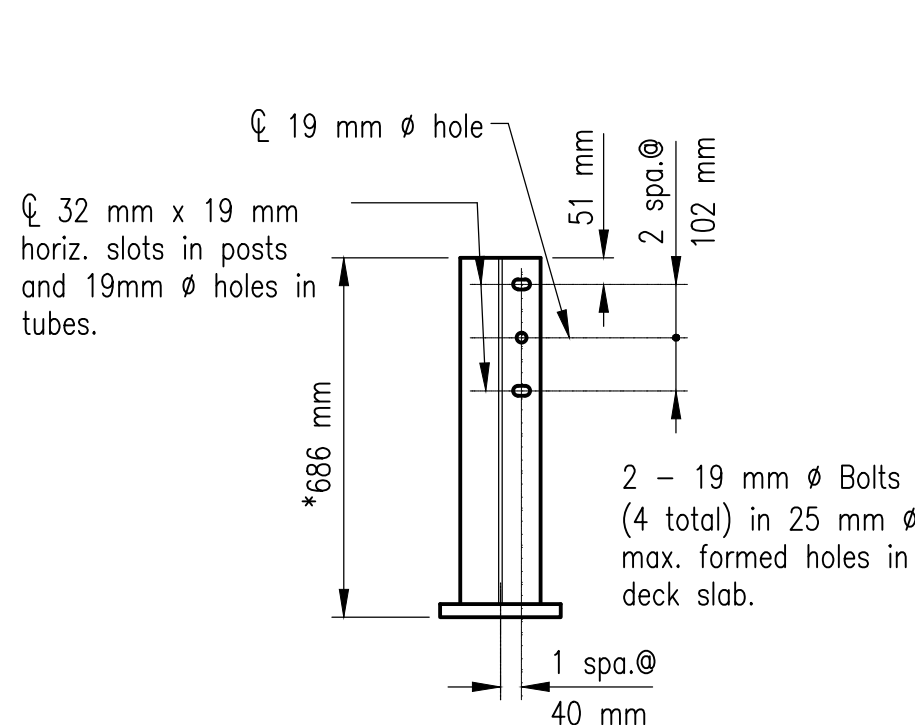
WINGWALL INSTALLATION

SPLICE	a	b
Regular	51 mm	108 mm
Expansion	70 mm	89 mm

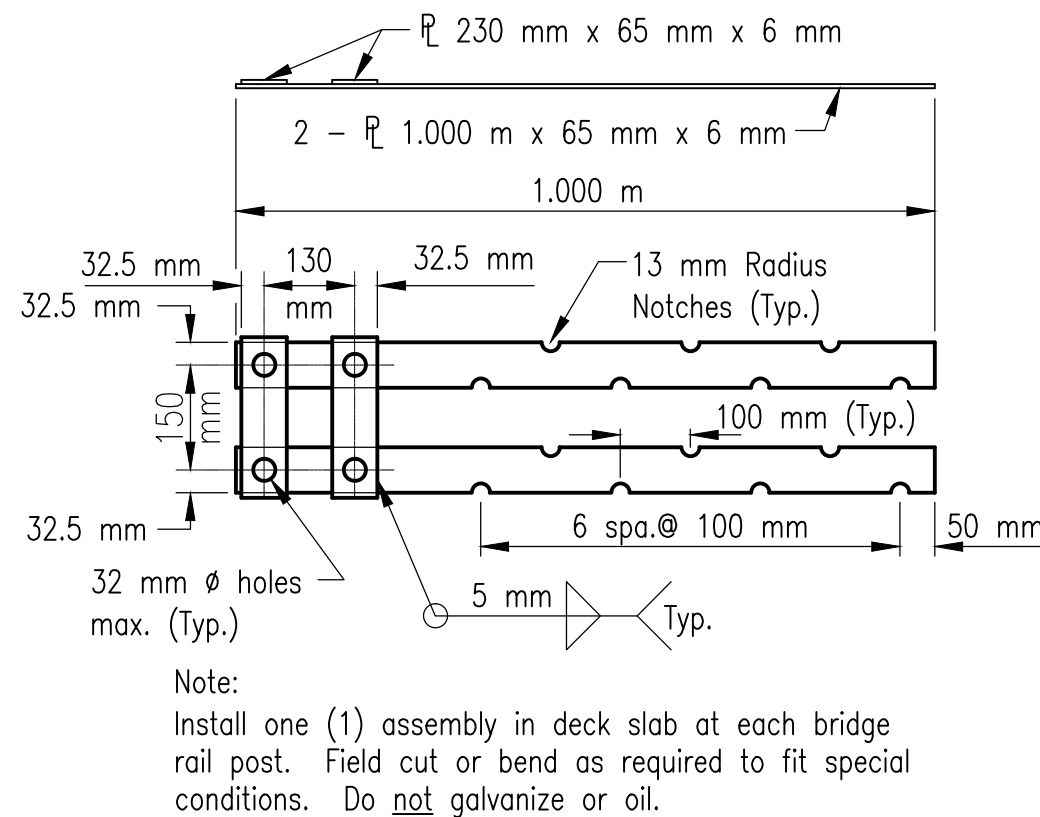
Note:
W-Beam shall conform to
AASHTO M180, Class A, Type I.



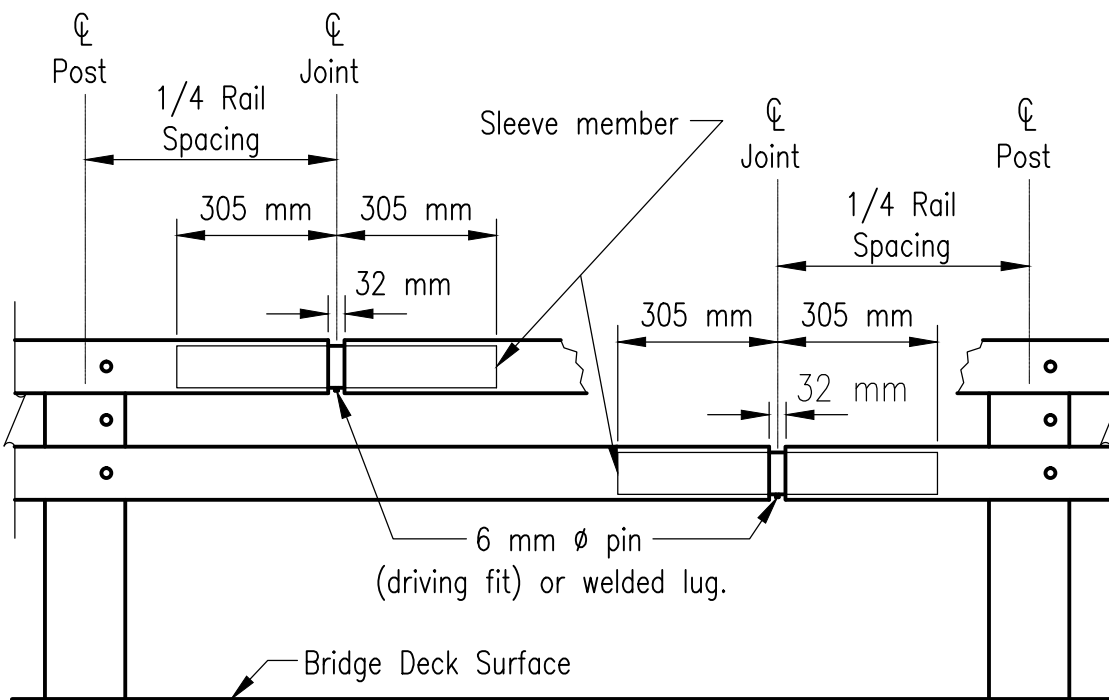
W-BEAM RAIL DETAILS



BRIDGE RAIL POST FOR CONCRETE DECK AND WINGWALL

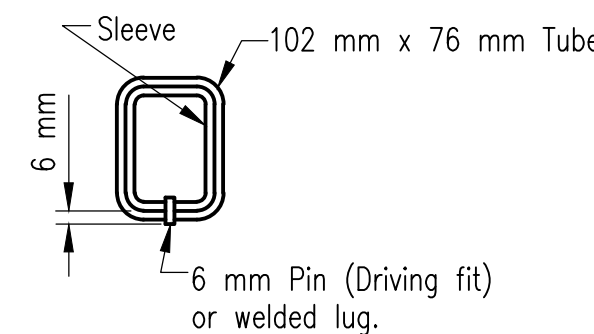


BOLT ANCHORAGE PLATES



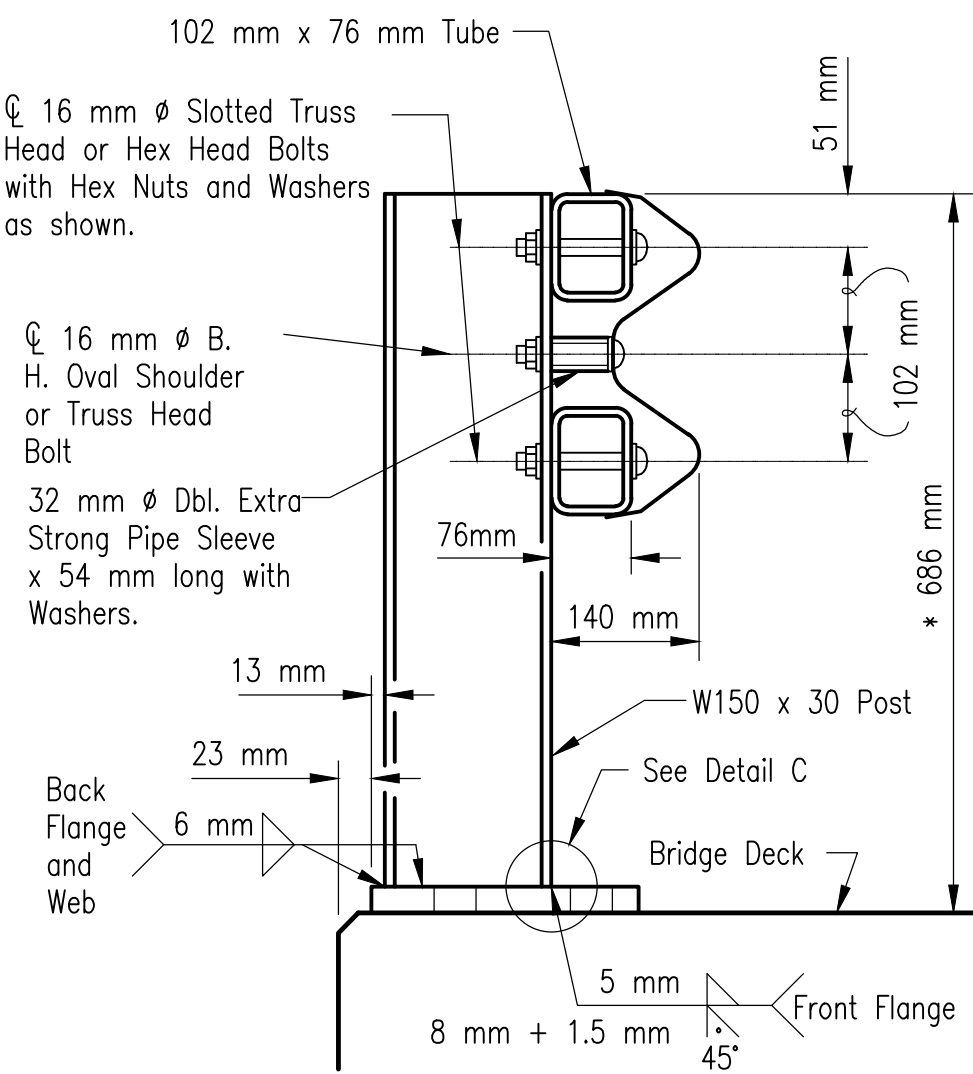
Note: W-Beam Rail not shown.

TUBE SPLICE DETAILS



Note:
The difference between the outside dimensions of the sleeve and the inside dimensions of the rail shall not exceed 3 mm along either axis.

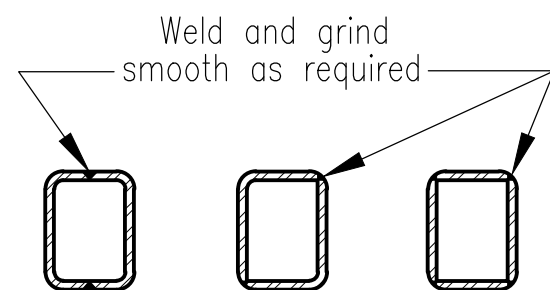
TUBE SPLICE SECTION



Note: In lieu of Front Flange Weld shown, a 9.5 mm fillet weld all around including edges of flange may be used.

Note: Details shown are similar for Box Beam installation except for items pertaining to 25 mm Base Plate.

ELEVATION OF RAIL POST



SLEEVE FABRICATION OPTIONS

TUBE & SLEEVE MEMBERS		
Rail Member		Sleeve Thickness
Material	Thickness	Material: A36
A500 Gr.C	4.8 mm	4.7 mm
A500 Gr.B	6.4 mm	6.4 mm
A500 Gr.A	7.9 mm	6.4 mm

Note: Other sections of equal or greater strength are acceptable for sleeves.

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

BRIDGE RAIL DETAILS

Designed by: BOR – Structural Unit

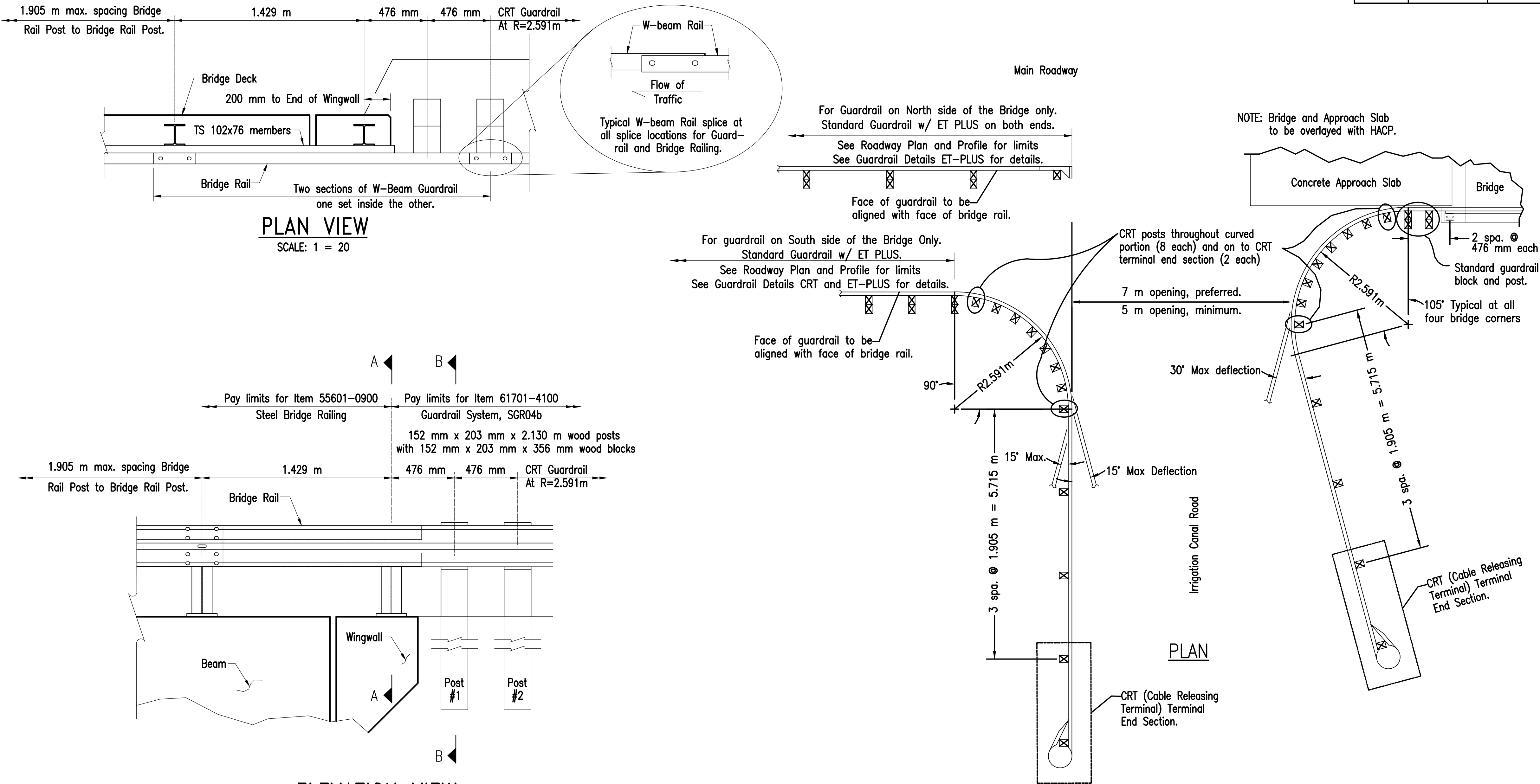
Drawn by: TAY Date: 07-03

Checked by: HRC Date: 07-03

File Name: Brdgrail.dwg

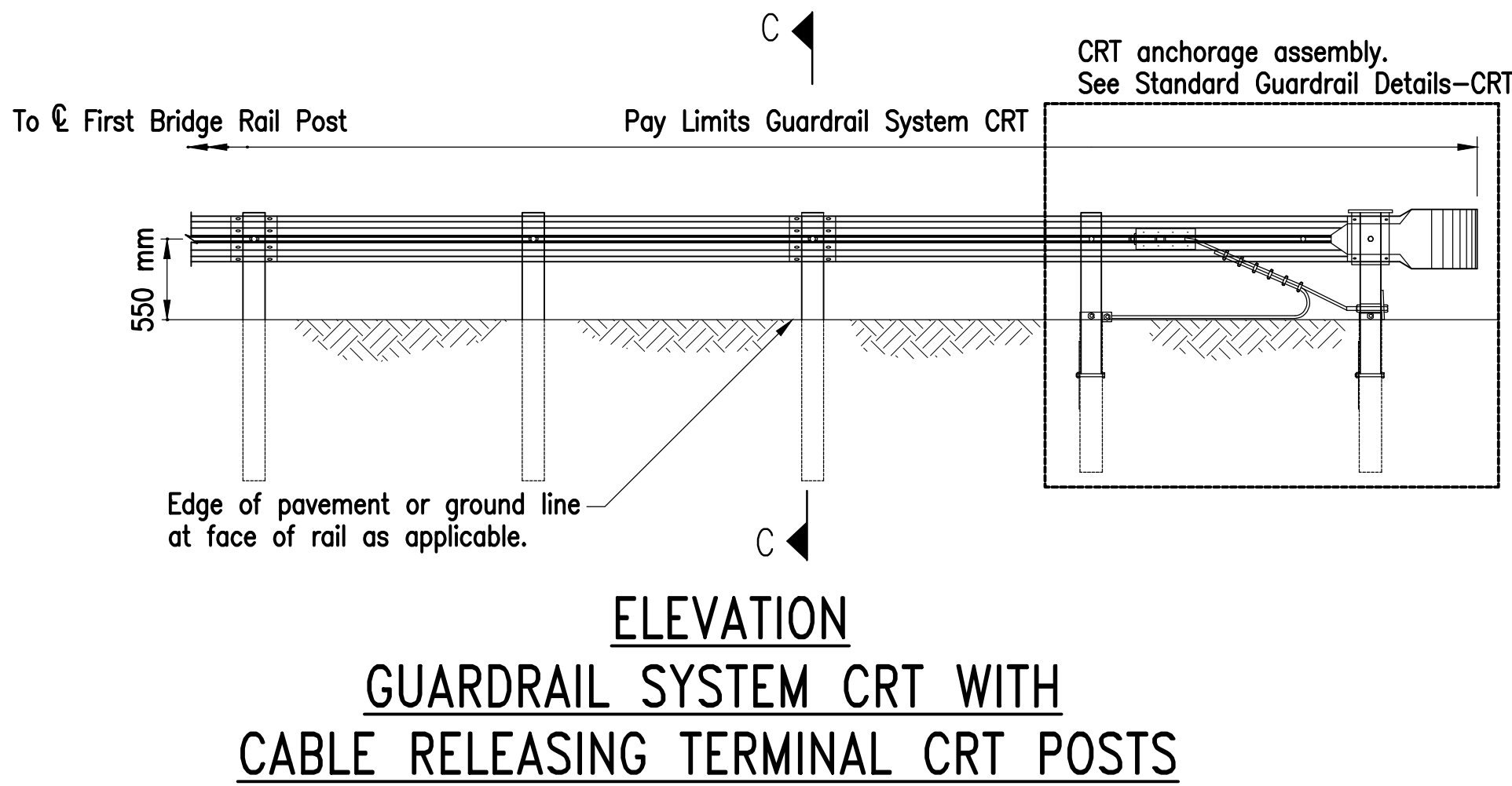


REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	NM	Navajo	N5031	N5031(1)1,2&4	16	31



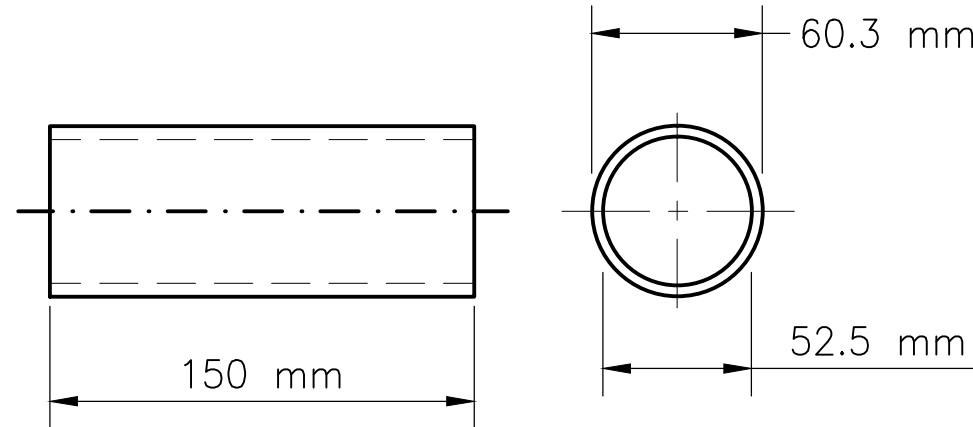
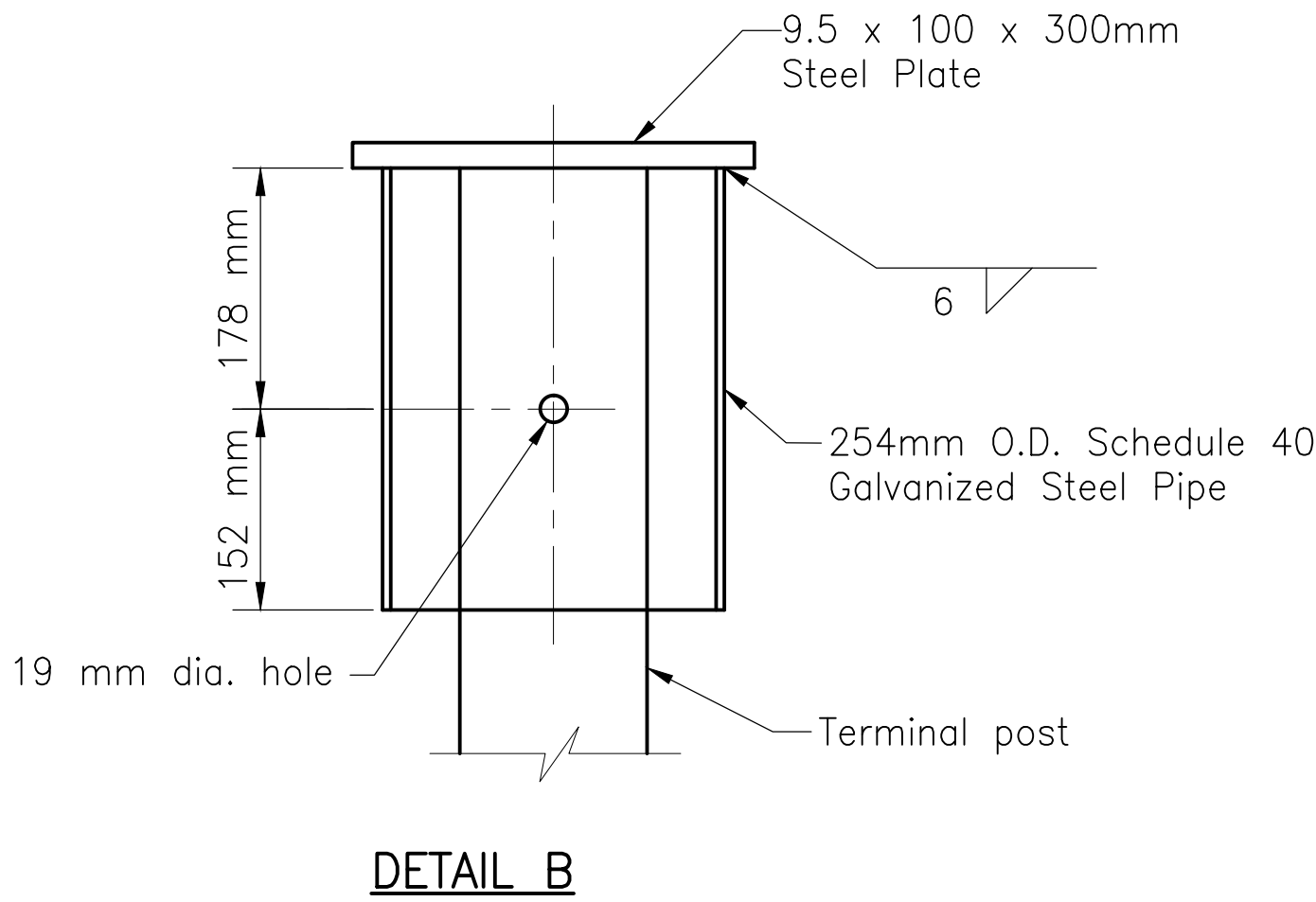
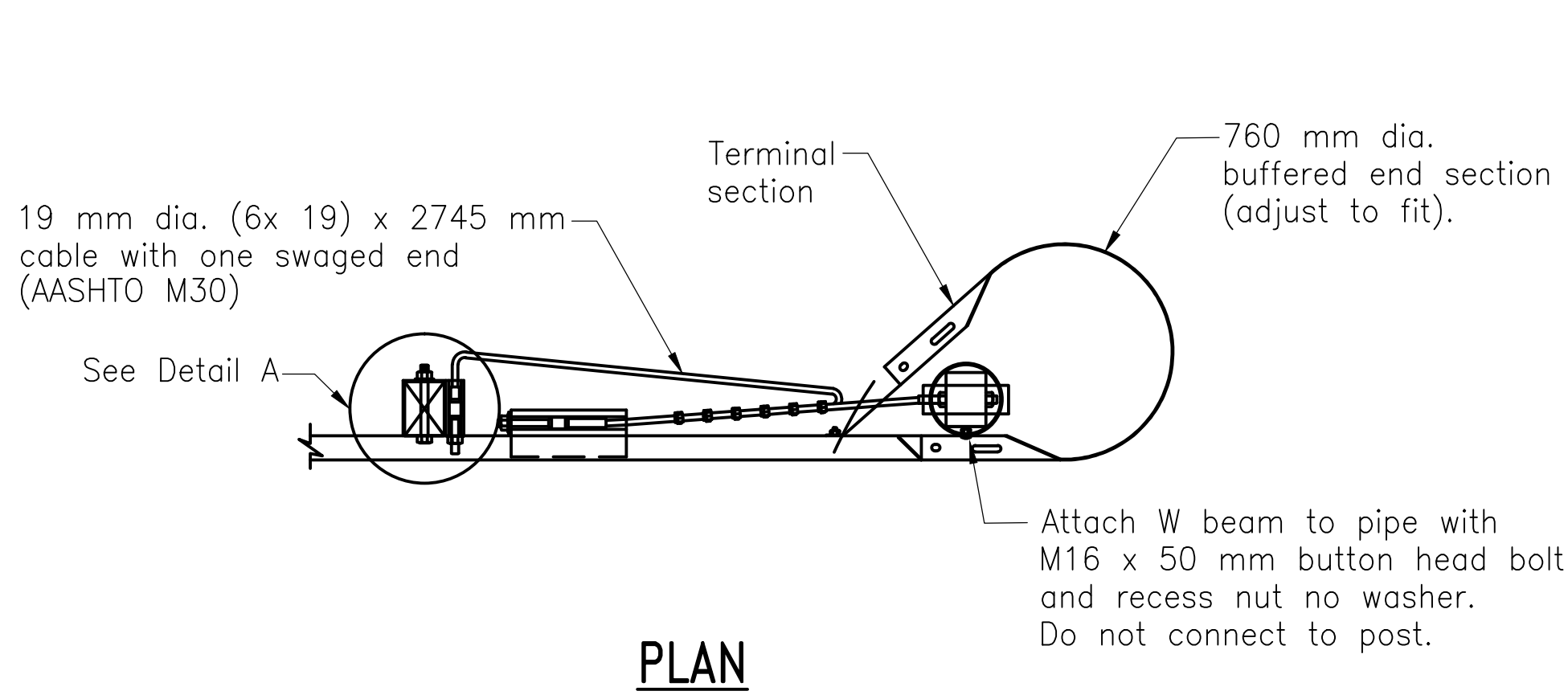
GENERAL NOTES

- Standard barrier hardware has been used to develop this guardrail transition. Designations provided in brackets relate to standard elements detailed in "A Guide to Standardized Highway Barrier Rail Hardware", 1979, AASHTO- AGC- ARTBA Joint Cooperative Committee and modified standard elements as detailed on this sheet.
- Dimensions and specified hardware are given in SI (metric) units. For hardware specified in SI (metric) units, English unit hardware may be substituted provided they are of equal or greater strength.
- All W-beams shall be galvanized in accordance with AASHTO M111M ASTM A123M and furnishing, fabricating and installing these items shall be considered incidental to Item 61701-4100.
- All high strength hex bolts and carriage bolts AASHTO M164M, Type I, galv. shall be galvanized in accordance with AASHTO M232M and furnishing, fabricating and installing these items shall be considered incidental to Item 61701-4100.
- W-beam shall conform to AASHTO M180, Class A, Type 1.
- Wood blocks and posts shall be rough sawn lumber or surfaced on four sides (S4S) having a minimum bending strength of 8.27 MPa. All posts and blocks shall be treated in accordance with AASHTO M133.
- All embankment and aggregate base course materials for widening shall be compacted to 95% of maximum density. Embankment and aggregate base course materials, and the placing thereof, shall be considered incidental to Item 61701-4100.
- Asphaltic concrete widening and curbing shall be considered incidental to Item 61701-4100. The Contractor shall be required to backfill and compact hot asphaltic concrete mixture around the guardrail posts to the satisfaction of the COR/AOTR.
- Certificates of Compliance shall be required for all guardrail and wood post materials and associated hardware prior to installation of any material under Item 61701-4100.



UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION	
APPROACH GUARDRAIL DETAILS	
Designed by: HC	
Drawn by: TAY, rsh Date: 06/03/11	
Checked by: EV Date: 07-03	
File Name: guardrail.dwg	

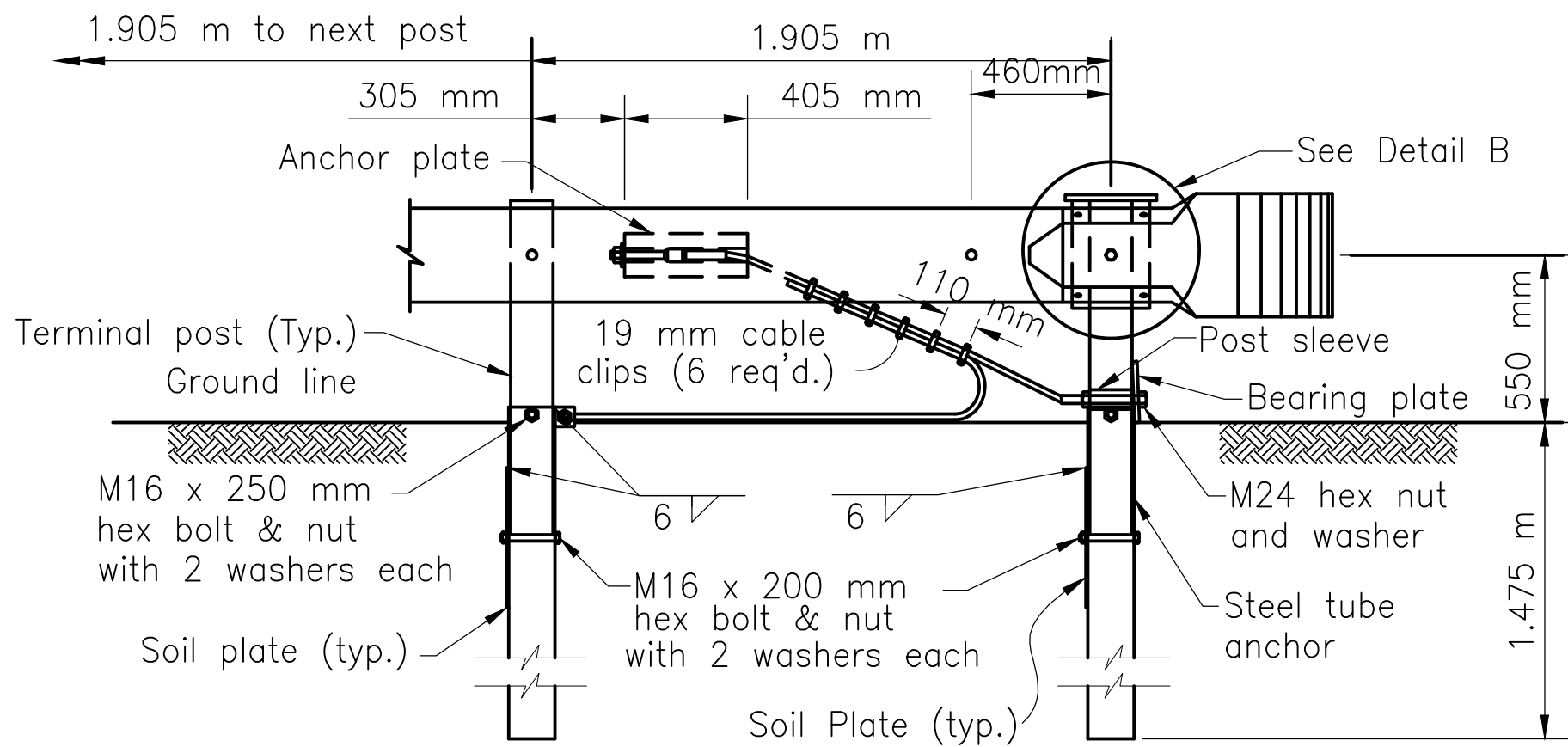
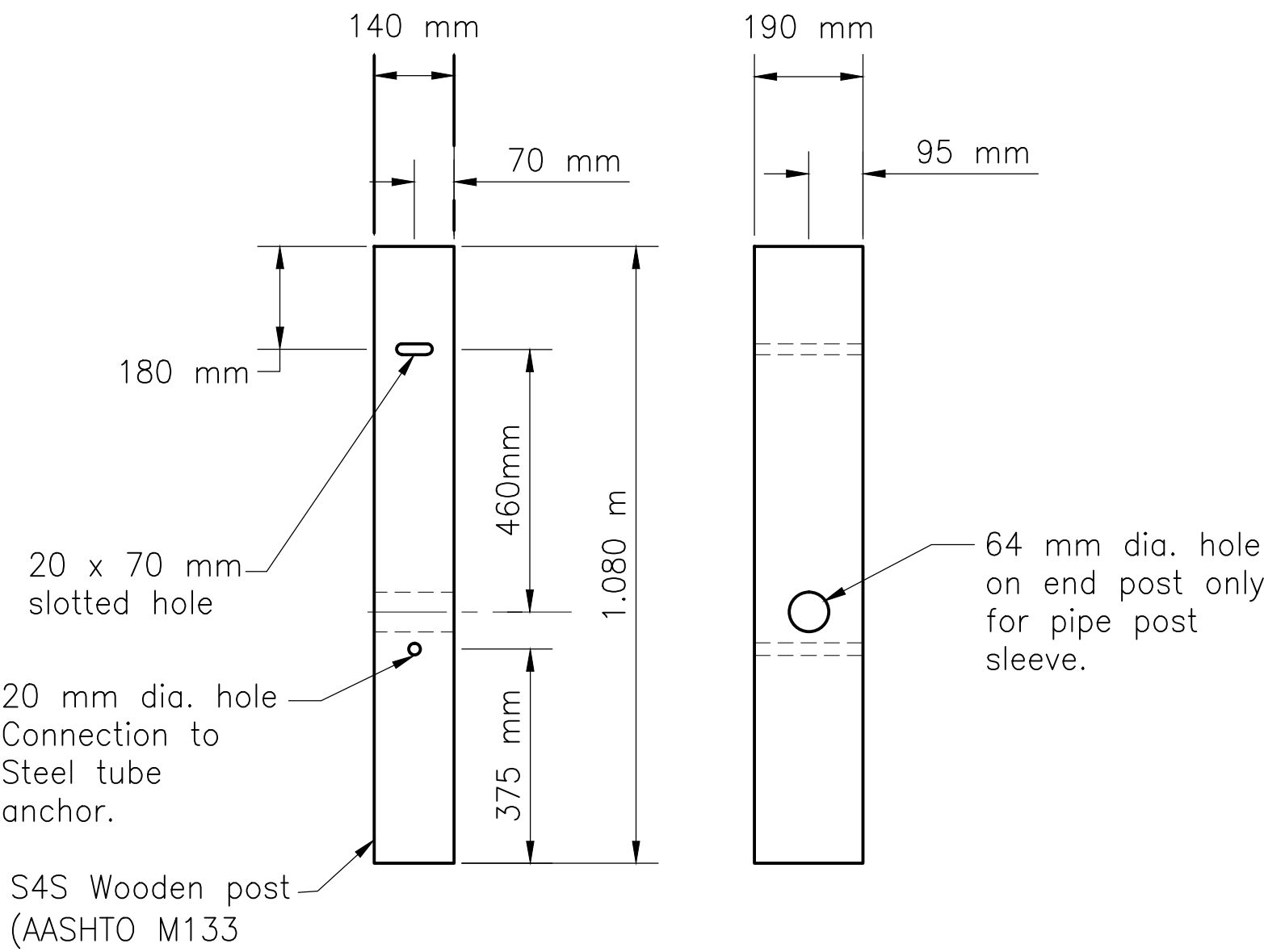
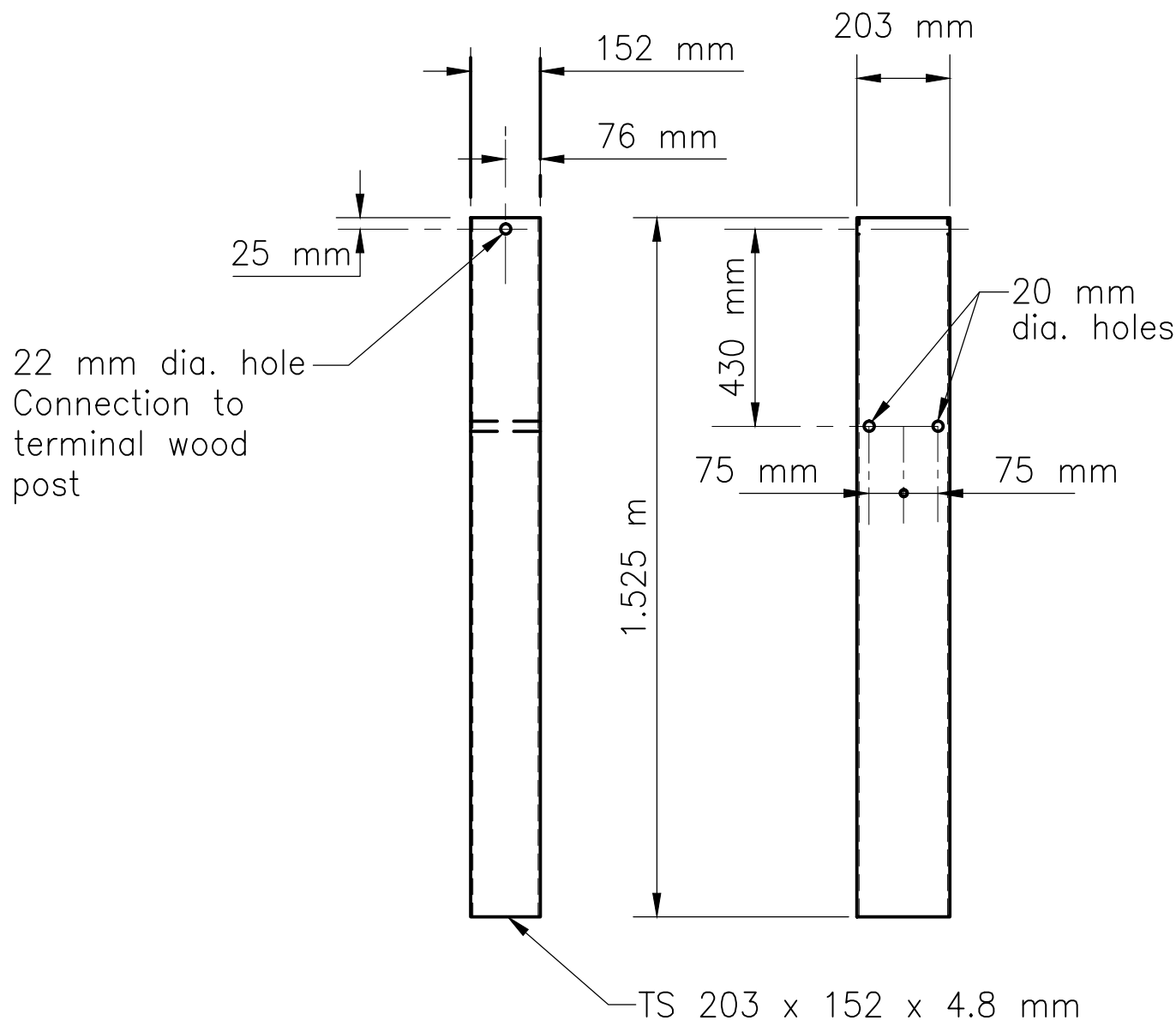
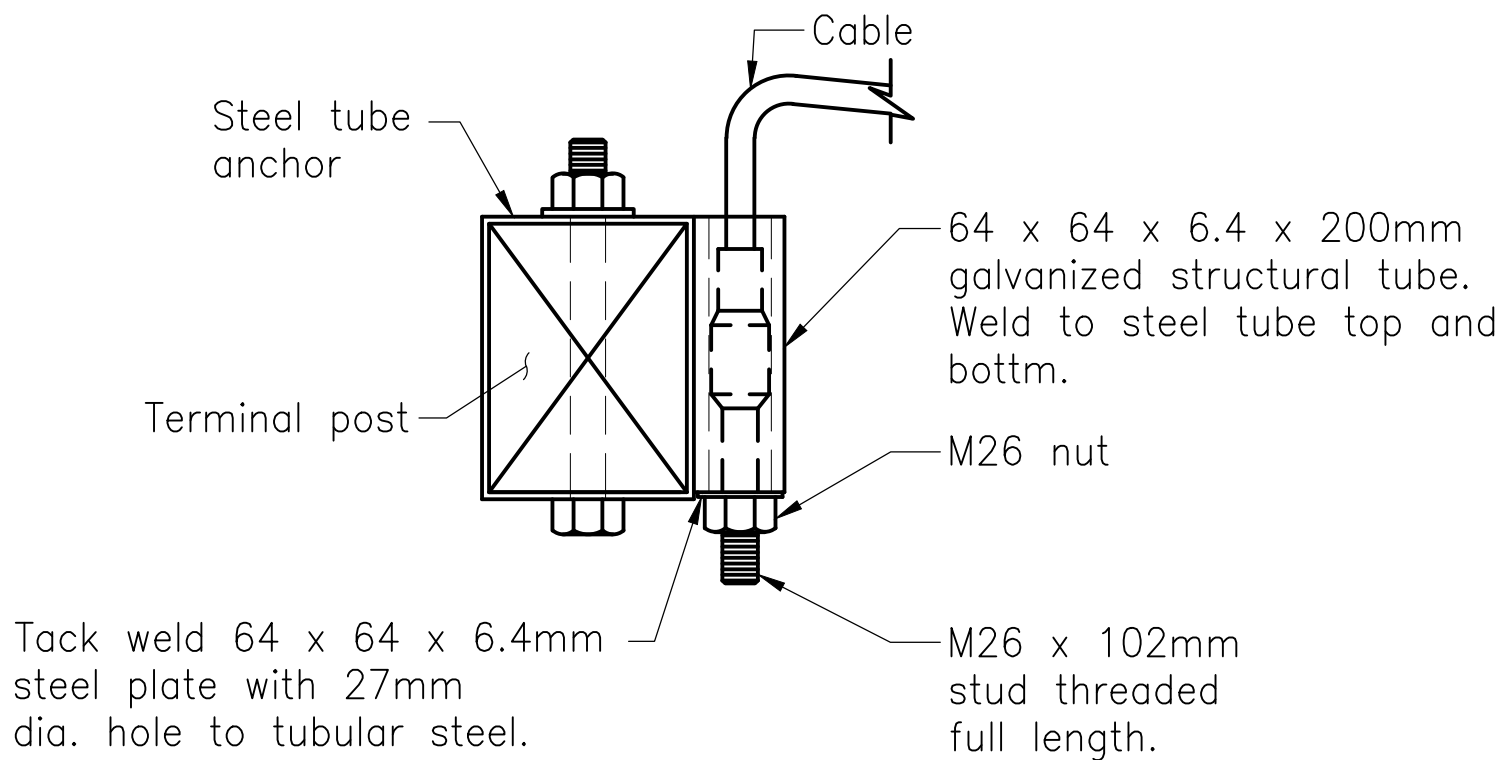
REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	NM	Navajo	N5031	N5031(1)1,2&4	17	31



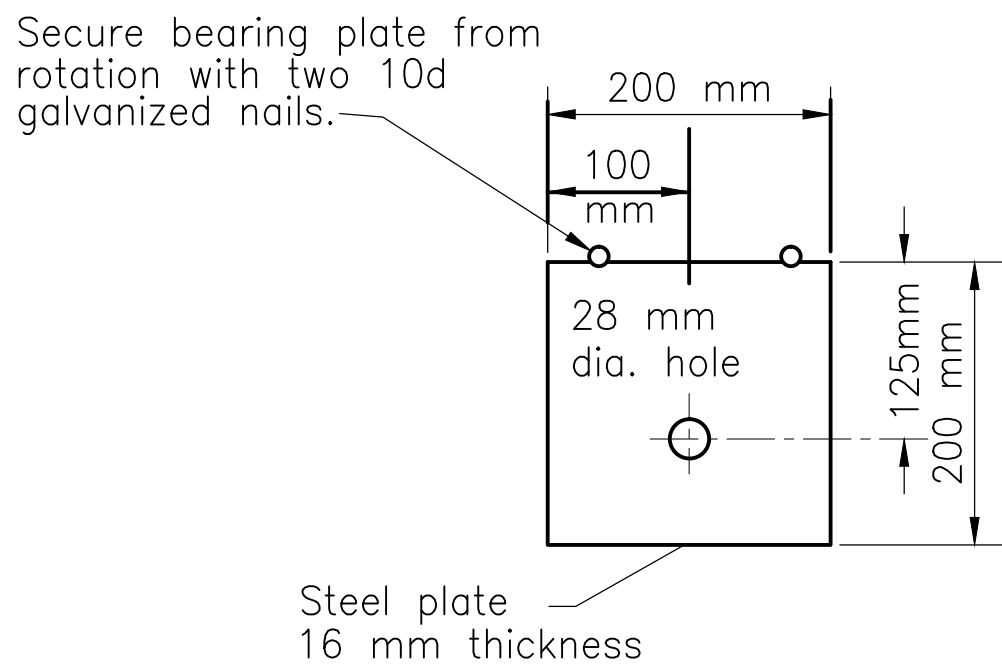
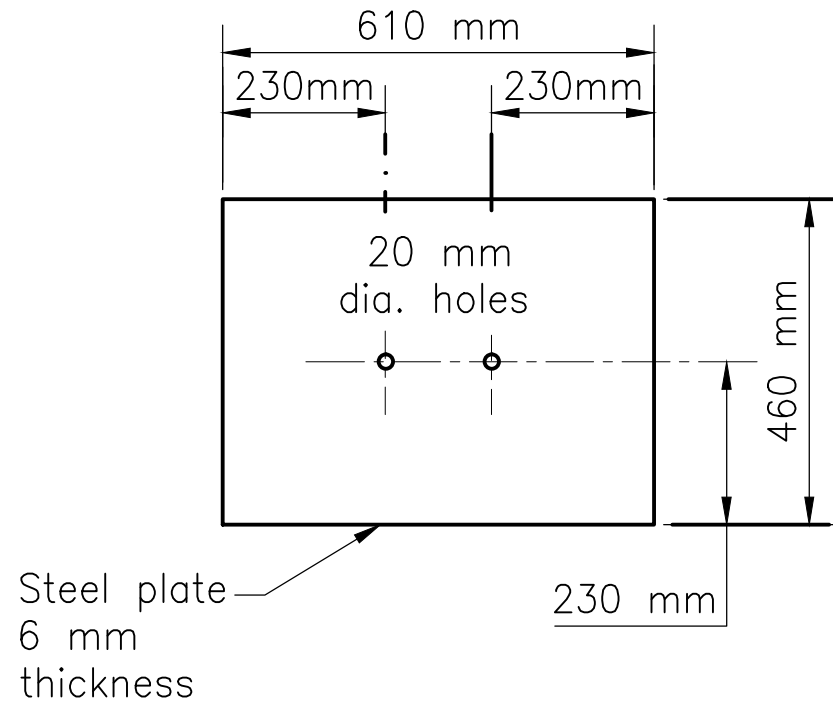
GALVANIZED STANDARD PIPE POST SLEEVE
(See Wood Terminal Post Detail)


NOTE:

1. All material and workmanship shall conform to the standard specifications for construction of roads and bridges on federal highway projects(FP-03) and the supplemental specifications for this project.
2. All hardware shall meet FHWA crash worthiness requirements. As per NCHRP 350 Guidelines.
3. Dimensions not labeled are in millimeters.
4. Dimensional tolerances not shown or implied are intended to be those consistent with the proper functioning of the part, including its appearance, and accepted manufacturing practices.
5. Furnish hardware in the metric sizes shown. Equivalent imperial sizes may be used when metric sizes are not available.

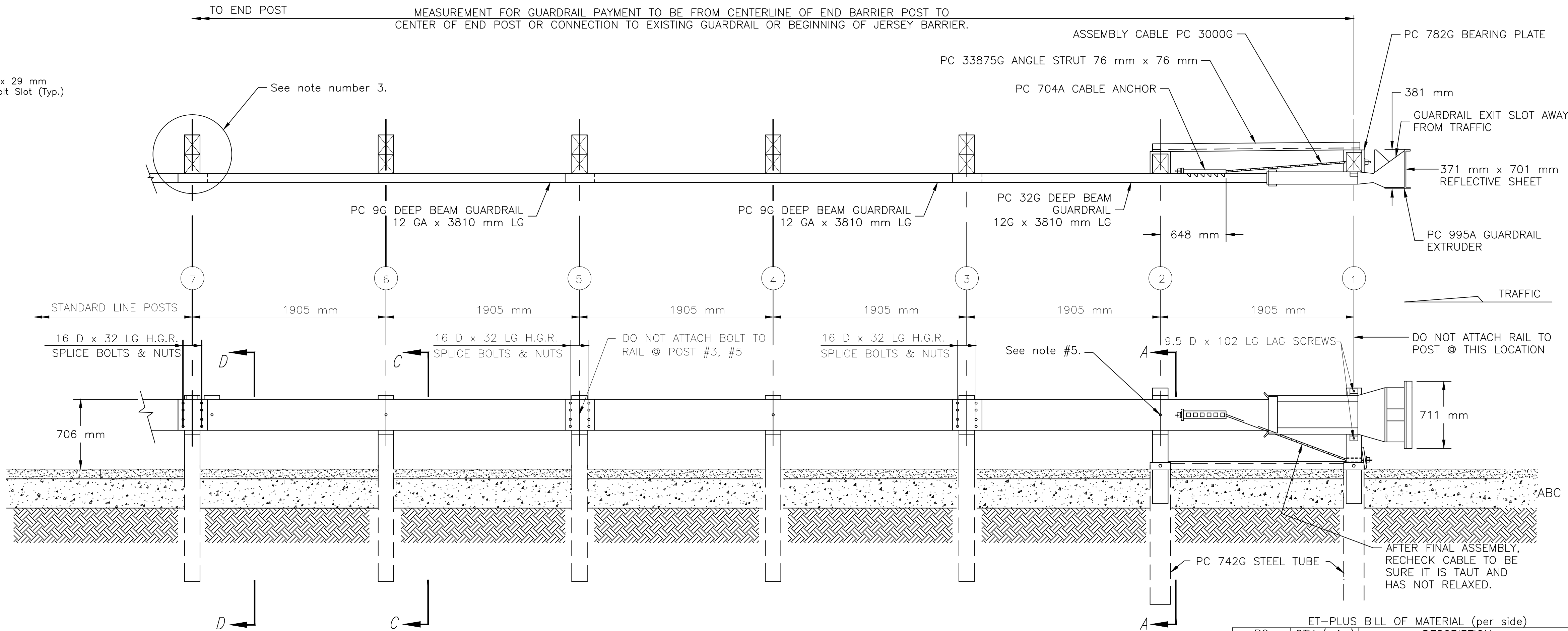
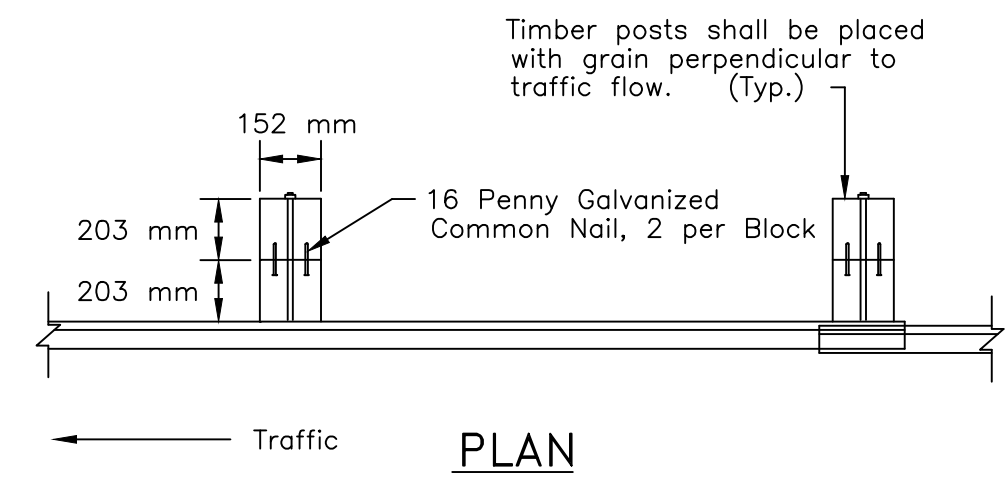
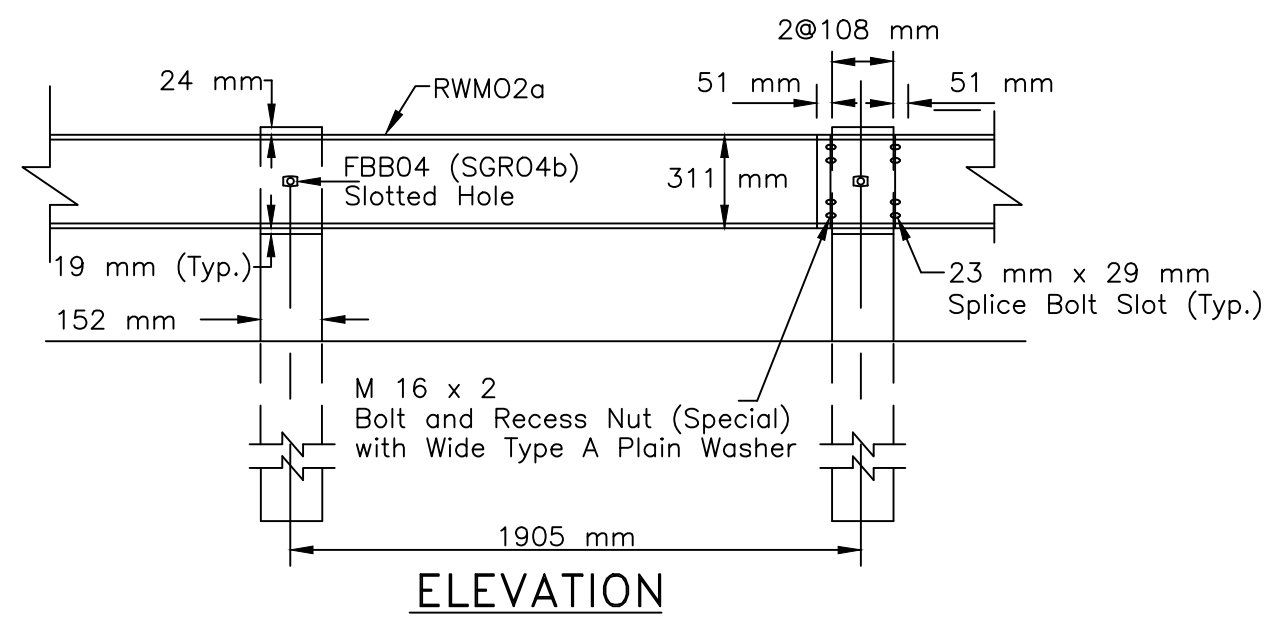


ANCHORAGE ASSEMBLY



UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION	
STANDARD GUARDRAIL DETAILS CRT	
Designed by: HC	
Drawn by: TAY	
Checked by: EV	
File Name: crt.dwg	
Date: 07-03	
Date: 07-03	

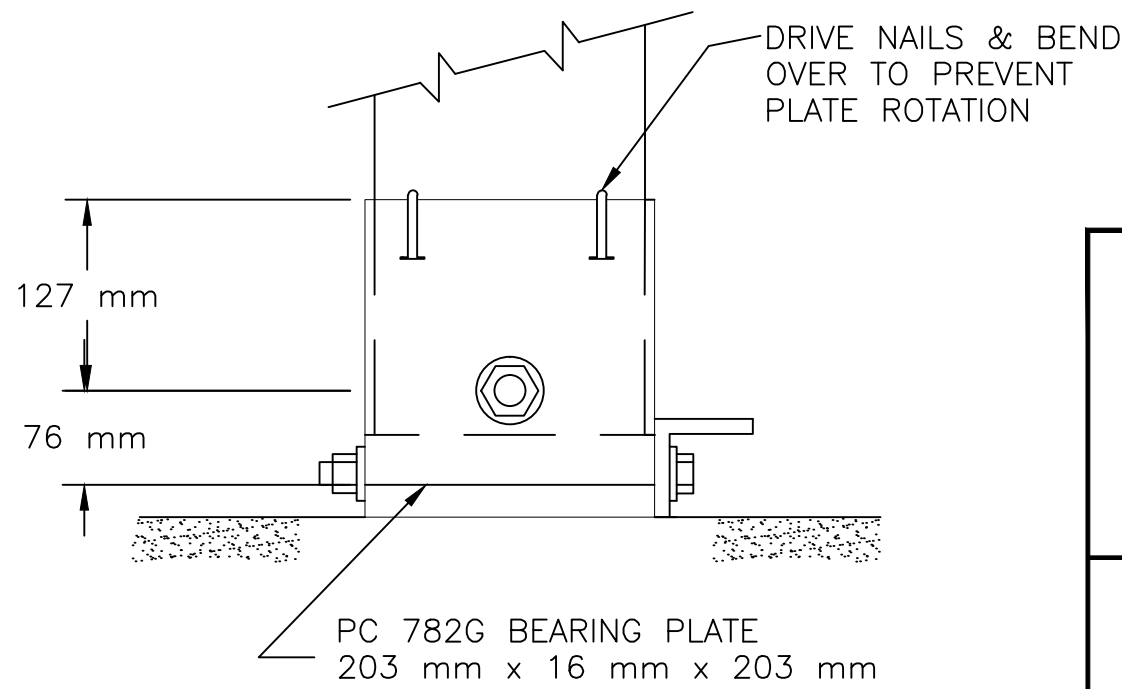
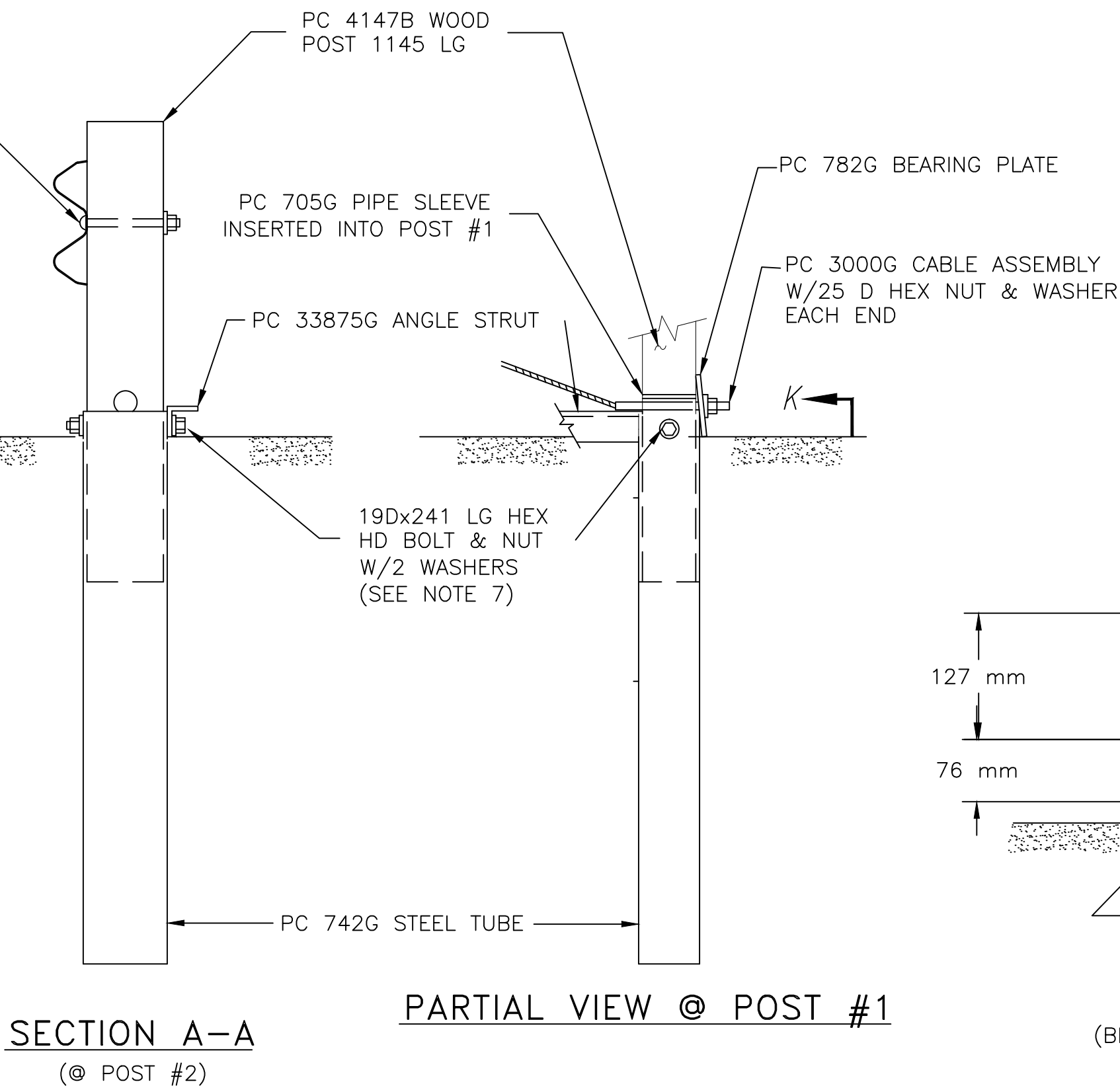
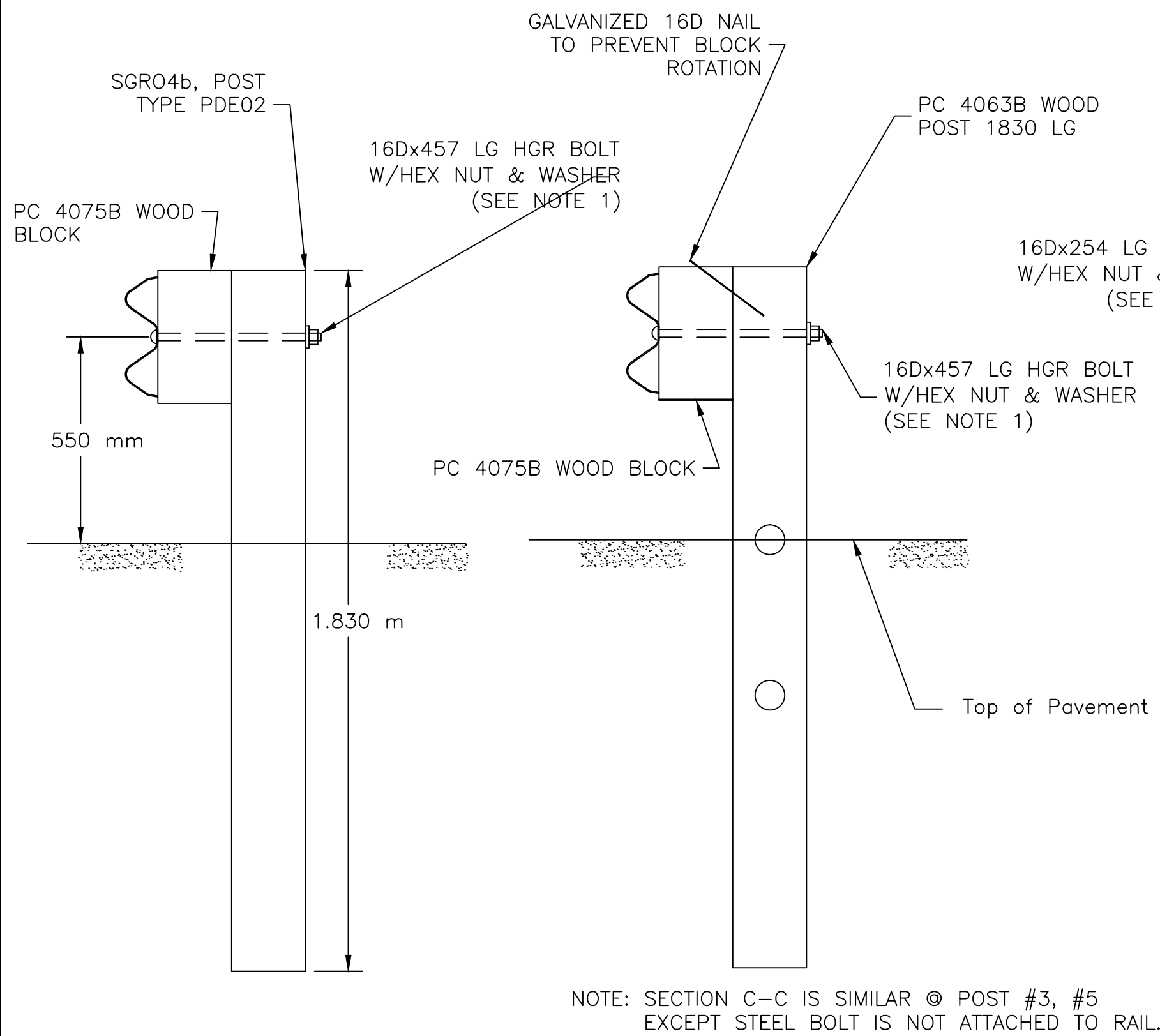
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NM	NAVAJO	N5031	N5031(1),2&4	18	32



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 19 OF 32 FOR ADDITIONAL NOTES.
3. THE CONTRACTOR HAS THE OPTION TO USE ALL-STEEL POSTS W/WOODEN BLOCK AFTER POST #7 ON STANDARD LINE POSTS, UNLESS OTHERWISE NOTED ON THE DESIGN PLANS.
4. BEGIN/END ASPHALT CURB (IF SPECIFIED) AT POST #6.
5. BEGIN REFLECTIVE TAB ON POST #2.
6. PLACE TABS ON THE W-BEAM AT EVERY FOURTH POST. THE COLOR OF THE TABS SHALL CONFIRM TO THE COLOR OF THE ADJACENT EDGE LINE.
7. ANGLE STRUT MUST BE ATTACHED USING 19D HIGH STRENGTH BOLTS.
8. BOLT MUST BE HIGH STRENGTH. INSTALL SO NUT & WASHER ARE ON TRAFFIC SIDE OF POST. (SEE VIEW K)

ET-PLUS BILL OF MATERIAL (per side)		
PC	QTY (min.)	DESCRIPTION
9G	2	2.67/3.81/1.905/s (GUARDRAIL)
32G	1	2.67/3.81/1.905/s ANC(GUARDRAIL)
60G	1	2.67/3.81/1.905/s (GUARDRAIL)
62G	1	2.67/3.81/1.905/s ANC(GUARDRAIL)
704A	1	CABLE ANCHOR BRACKET
705G	1	PIPE SLEEVE-60mmSTD.PIPEx140mm
705G*	2	152x203x1375x4.8mm TUBE SLEEVE
705G	2	152x203x1830x4.8mm TUBE SLEEVE
705G*	1	460mmx610mmx6mm SOIL PLATE
705G	1	200x200x16mm BEARING PLATE
995A	1	GUARDRAIL EXTRUDER
3000G	1	CABLE ASSEMBLY 19mm x 1981mm
3300G	6	16mm WASHER
3340G	30	16mm HGR NUT
3360G	24	16mmdia.x35mm HGR SPLICE BOLTS
3478G	1	16mmdia.x190mm HEX HD BOLT
3497G**	1	16mmdia.x240mm HEX HD BOLT
3500G	1	16mmdia.x255mm HGR POST BOLT
3580G	5	16mmdia.x460mm HGR POST BOLT
3700G	2	16mm HGR NUT
3704G	4	19mm WASHER
3900G	2	25mm WASHER
3910G	2	25mm HEX NUT
4063G	5	WOOD POST-150x200x1830mm
4075G	5	WOOD BLOCK-150x200x350mm DR
4147G	2	WOOD POST-140x190x1145mm
4228B	2	10mmx100mm LAG SCREW
5148B	2	19mmdia.x240mm HS HEX HD BOLT
9852A**	1	STRUT
33875G	1	1980mm ANGLE STRUT
6206G	1	325x700REFLECTIVE SHEETING-Rt.side
6207B	1	325x700REFLECTIVE SHEETING-Lt.side
*Option to the 1830mm Post Sleeve Tube		
**Option to PC-33875G		



UNITED STATES
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NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

STANDARD GUARDRAIL BARRIER END
TREATMENT ET-PLUS
FOR DESIGN SPEED <100km/h

DRAWN BY: ALEE DATE: 4/12/02

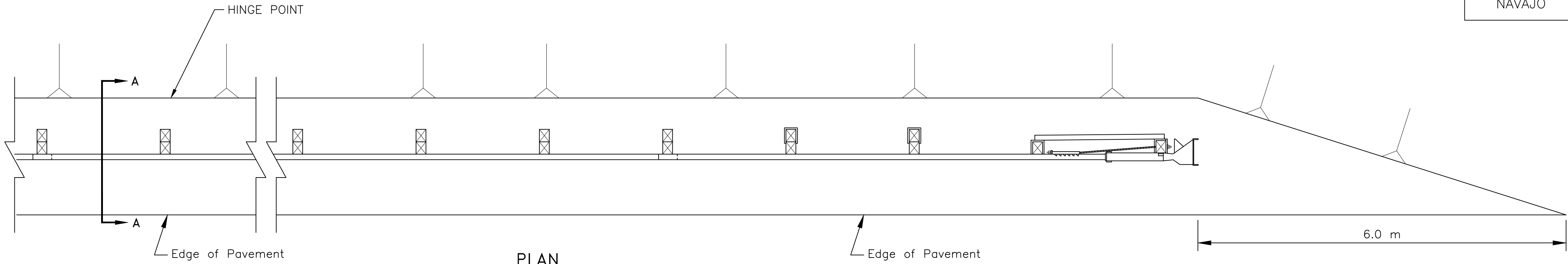
DESIGNED BY: B.O.R. DATE: 4/12/02

REVISED: 10/26/11 FILENAME: 18_ETPLUS2

BY: STRUCT SCALE: NTS

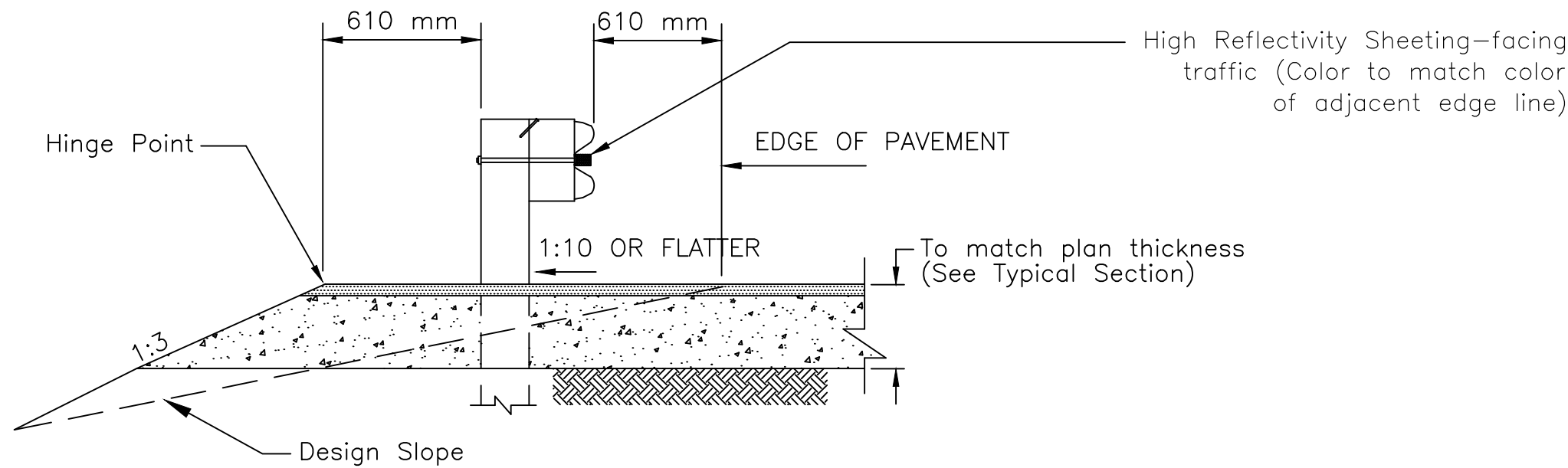


REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NM	NAVAJO	N5031	N5031(1)1,2&4	19	31

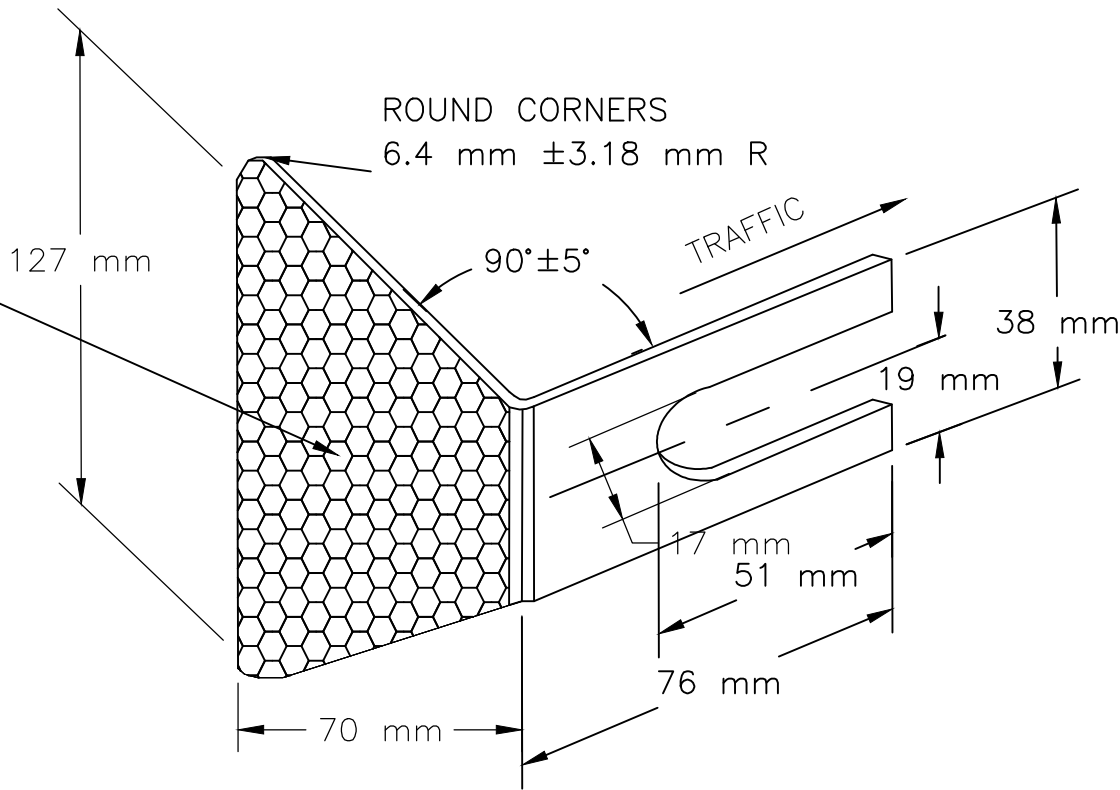


GENERAL NOTES

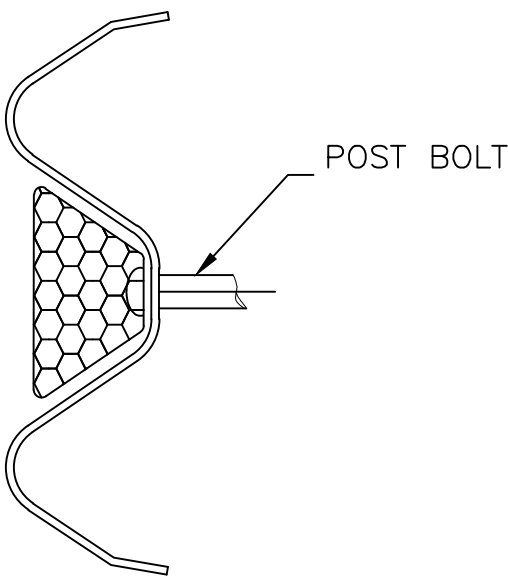
1. ALL GUARDRAIL "W" BEAMS, END TREATMENT, AND TERMINAL CONNECTORS SHALL BE GALVANIZED IN ACCORDANCE WITH (AASHTO M180, CLASS A, TYPE 1 SPECIFICATION. ALL HARDWARE SHALL CONFORM TO (ASTM A325) AND GALVANIZED IN ACCORDANCE WITH (ASTM A153).
2. ALL STRUCTURAL STEEL ITEMS SHOWN SHALL CONFORM TO (AASHTO M270M, Grade 250) AND BE GALVANIZED IN ACCORDANCE WITH (AASHTO M111) SPECIFICATION.
3. WIRE ROPE, FITTINGS AND HARDWARE SHALL CONFORM TO (AASHTO M30) 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 M168 (21th EDITION). ALL POSTS SHALL BE TREATED IN ACCORDANCE WITH (AASHTO M133) SPECIFICATION.
5. ALL EMBANKMENT AND AGGREGATE BASE COURSE MATERIALS SHALL BE COMPACTED TO 95% OF MAXIMUM DRY DENSITY.
6. THE EMBANKMENT MATERIALS AND THE PLACING THEREOF SHALL BE INCIDENTAL TO ITEMS 20401-0000 AND 61701-5000 AND NO DIRECT PAYMENT SHALL BE MADE.
7. 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.
8. THE COST OF THE ET-PLUS ASSEMBLY AND THE PLACING THEREOF SHALL BE CONSIDERED INCIDENTAL TO ITEM 61701-5000, WHICH INCLUDES BREAKAWAY POSTS, STEEL TUBE ASSEMBLIES AND HARDWARE.
9. PLACEMENT OF HOT ASPHALT AND ABC MATERIAL FOR GUARDRAIL WIDENING SHALL BE INCLUDED WITH ITEMS 30101-2000 AND 40201-0500.
10. FURNISHING & PLACEMENT OF REFLECTIVE SHEETING AND REFLECTIVE TAPS 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-03.
12. POSTS TO BE INSTALLED PER SECTION 617.03 WITH THE PROPER HOLE TOLERANCE OF 15 mm. FAILURE OF THE CONTRACTOR TO INSTALL THE GUARDRAIL POST CORRECTLY SHALL RESULT IN THE GUARDRAIL BEING REJECTED AND REINSTALLED AT THE CONTRACTOR'S ENTIRE EXPENSE.



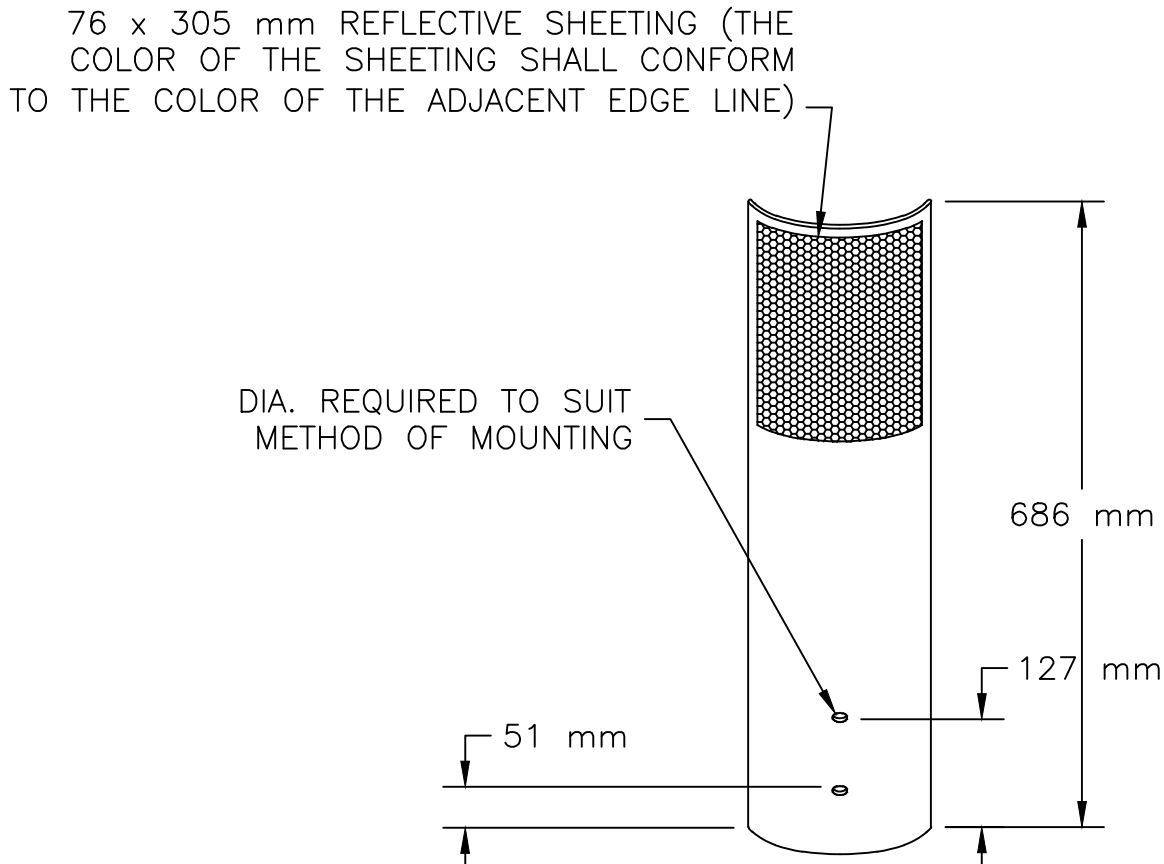
SECTION A-A
Without Asphalt Curb



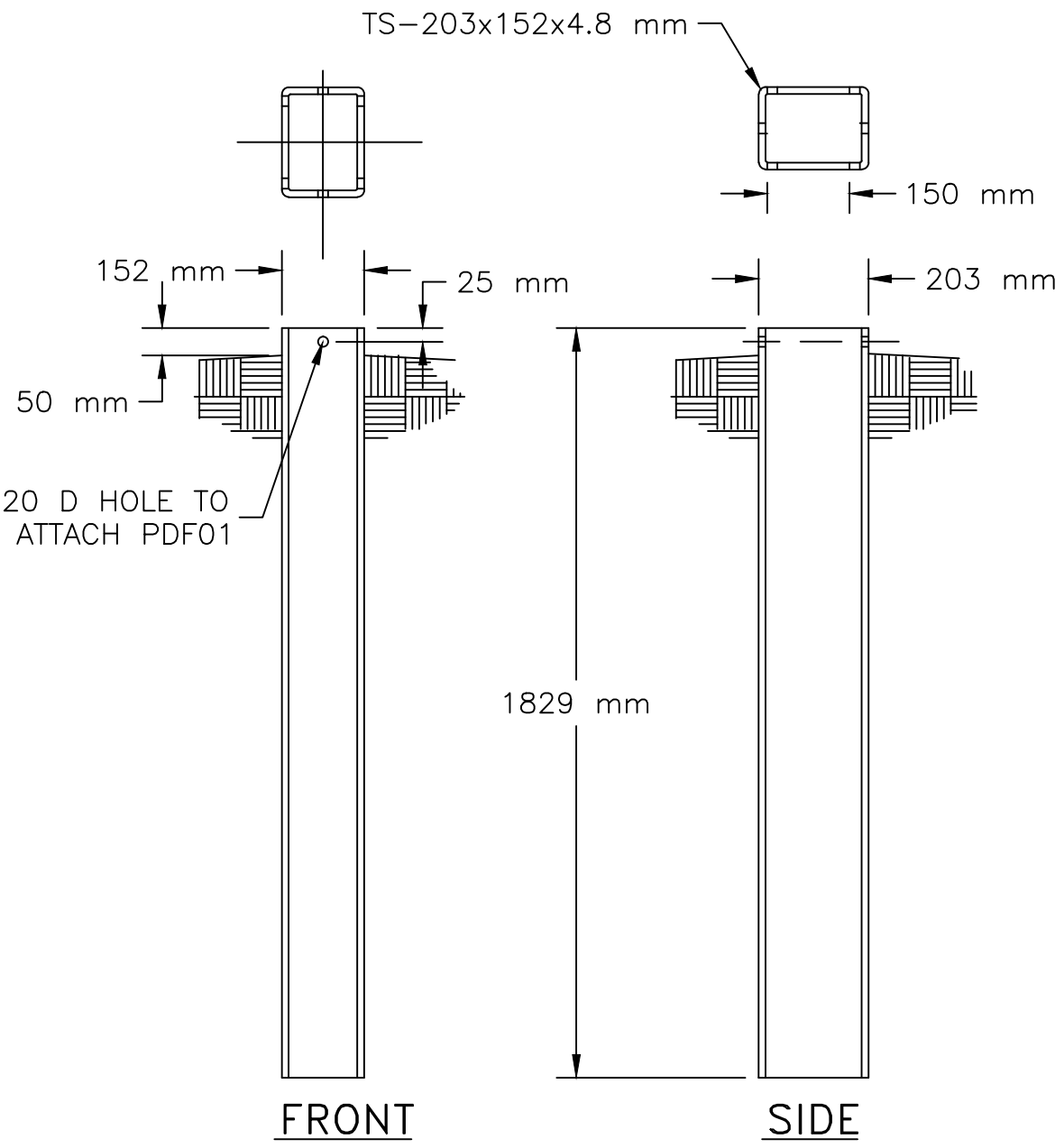
REFLECTOR TAB
(Install on every Fourth post, starting on post#2)



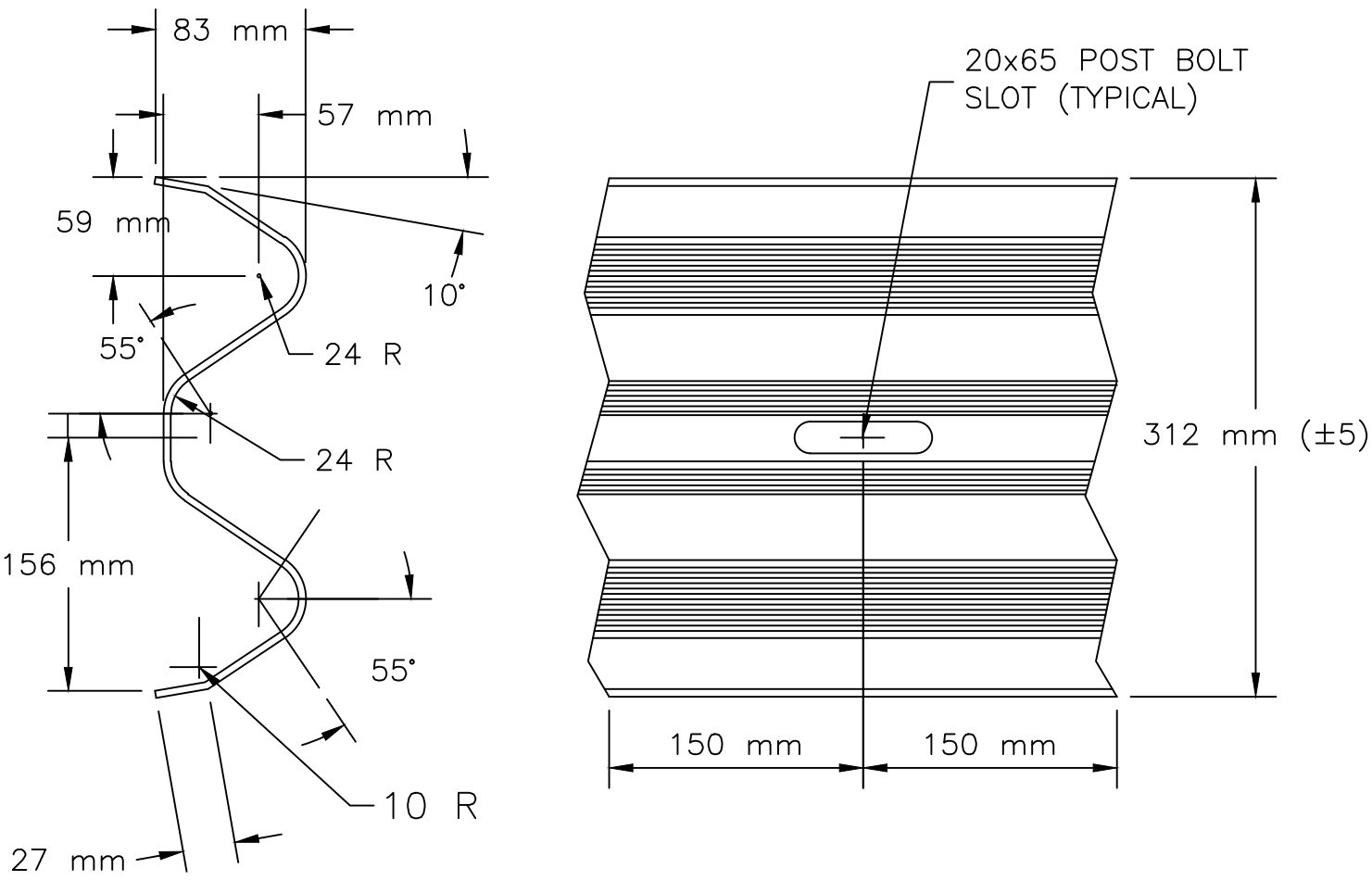
MOUNTING POSITION ON
GUARD RAIL TYPE 3



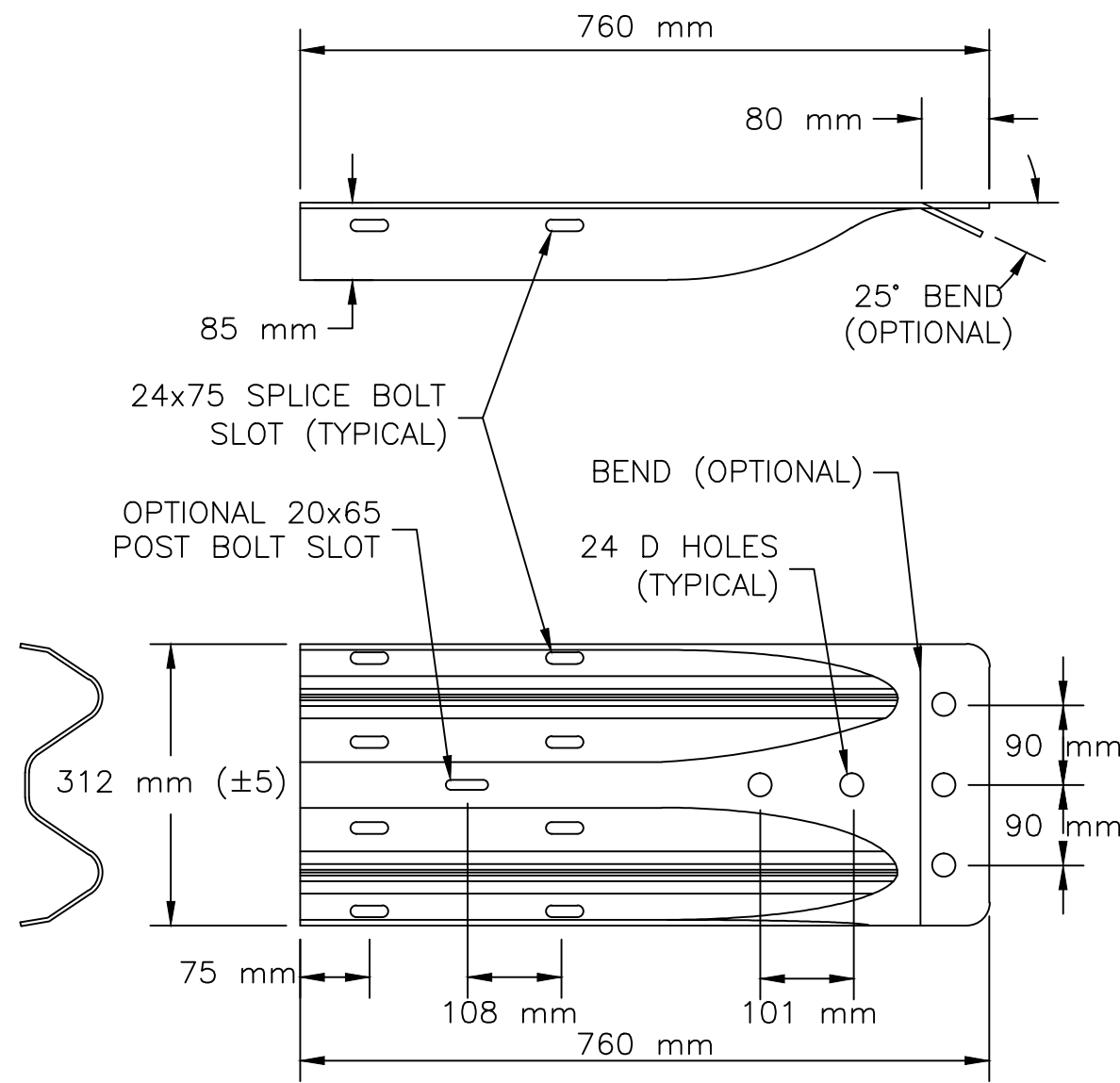
DELINEATOR DETAIL
(Reflective sheeting facing traffic)



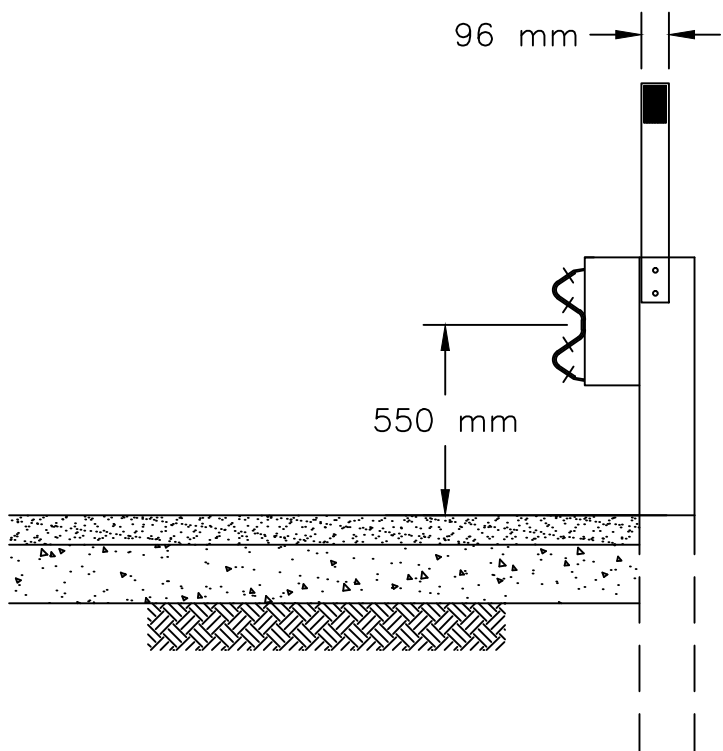
FOUNDATION TUBE



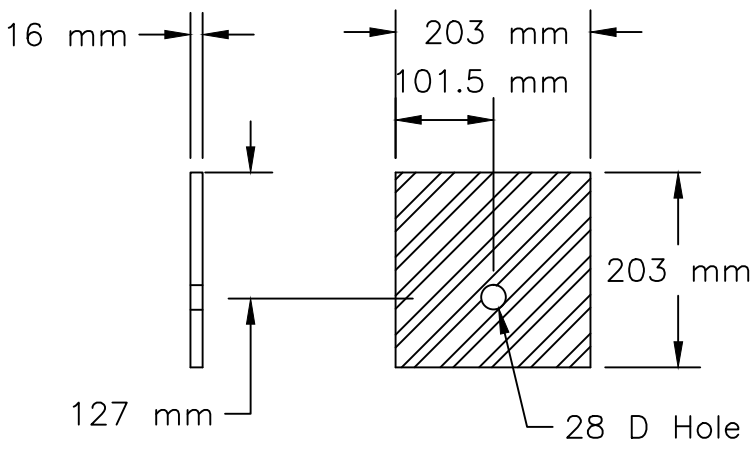
SECTION THRU GUARDRAIL ELEMENT



TERMINAL CONNECTOR



GUARDRAIL MOUNTED DELINEATOR (TYPICAL)
(The delineator shall be placed at 5.72 meter spacing, around the outside of horizontal curve, or where the guardrail conflicts with Type "1a" delineator located on tangent segment of roadway.



BEARING PLATE

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

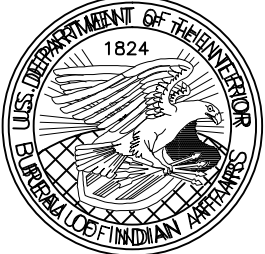
STANDARD GUARDRAIL DETAIL
ET-PLUS

DRAWN BY: ALEE DATE: 7/29/02

DESIGNED BY: D.O.T. DATE: 7/29/02

REVISED: 6/03/11 FILENAME: ETPLUS3

BY: STRUCT SCALE: NTS



REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N5031	N5031(1)2&4	20	32

CHART TO DETERMINE SINGLE POST SIZE													
POST WEIGHT	K FACTOR (B x A)	B DIMENSION (Meter)											
		1.52	1.83	2.13	2.44	2.74	3.05	3.35	3.66	3.96	4.27	4.57	4.87
2.976 kg/m	DOES NOT APPLY	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.34	0.32	0.30	0.27	0.26
3.348 kg/m		0.47	0.47	0.47	0.47	0.47	0.47	0.43	0.39	0.36	0.33	0.32	0.30
4.092 kg/m		0.62	0.62	0.62	0.62	0.62	0.62	0.56	0.51	0.47	0.44	0.41	0.38
4.464 kg/m		0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.62	0.58	0.52	0.47	0.46
5.952 kg/m		0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.80	0.74	0.70	0.65

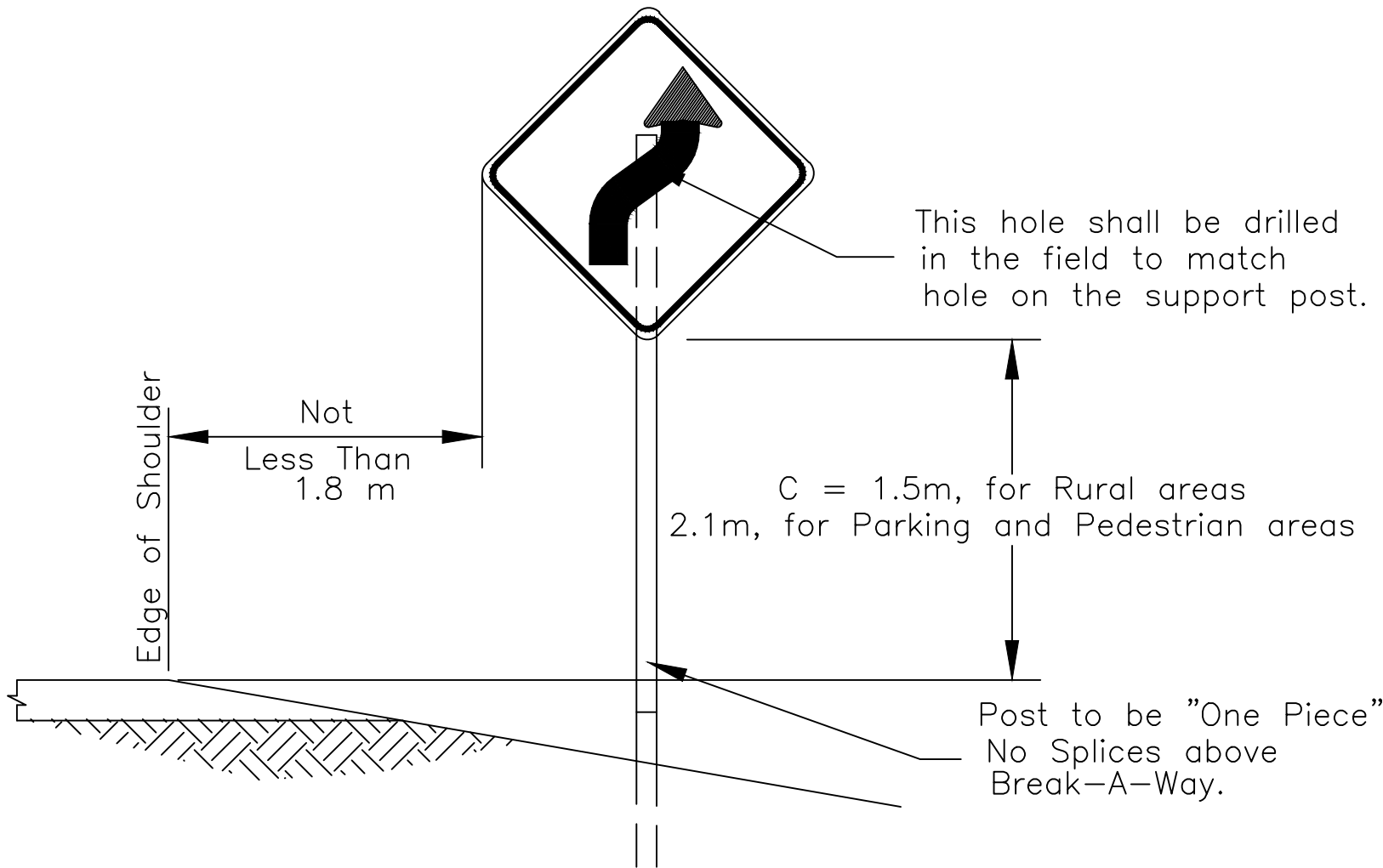
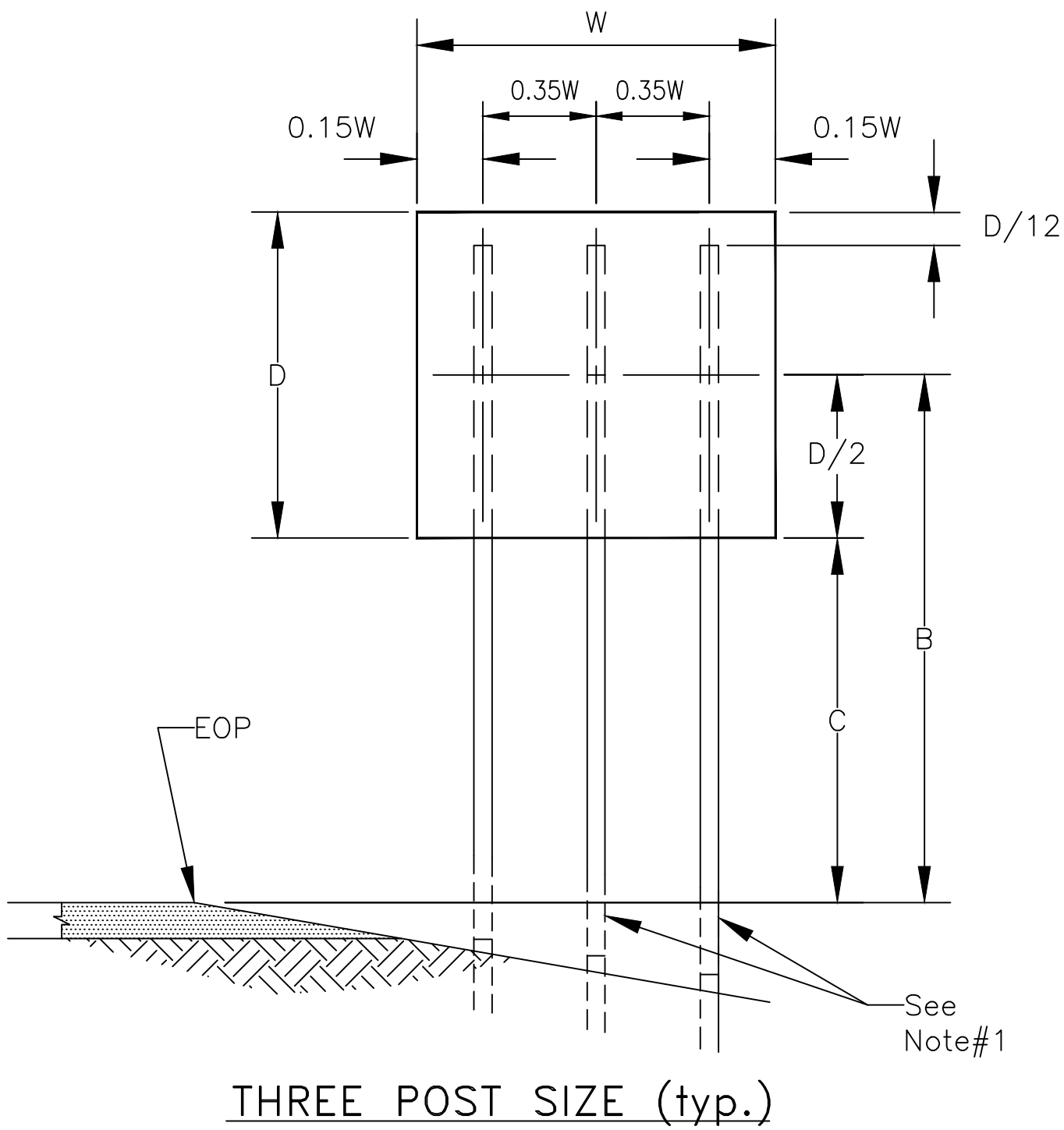
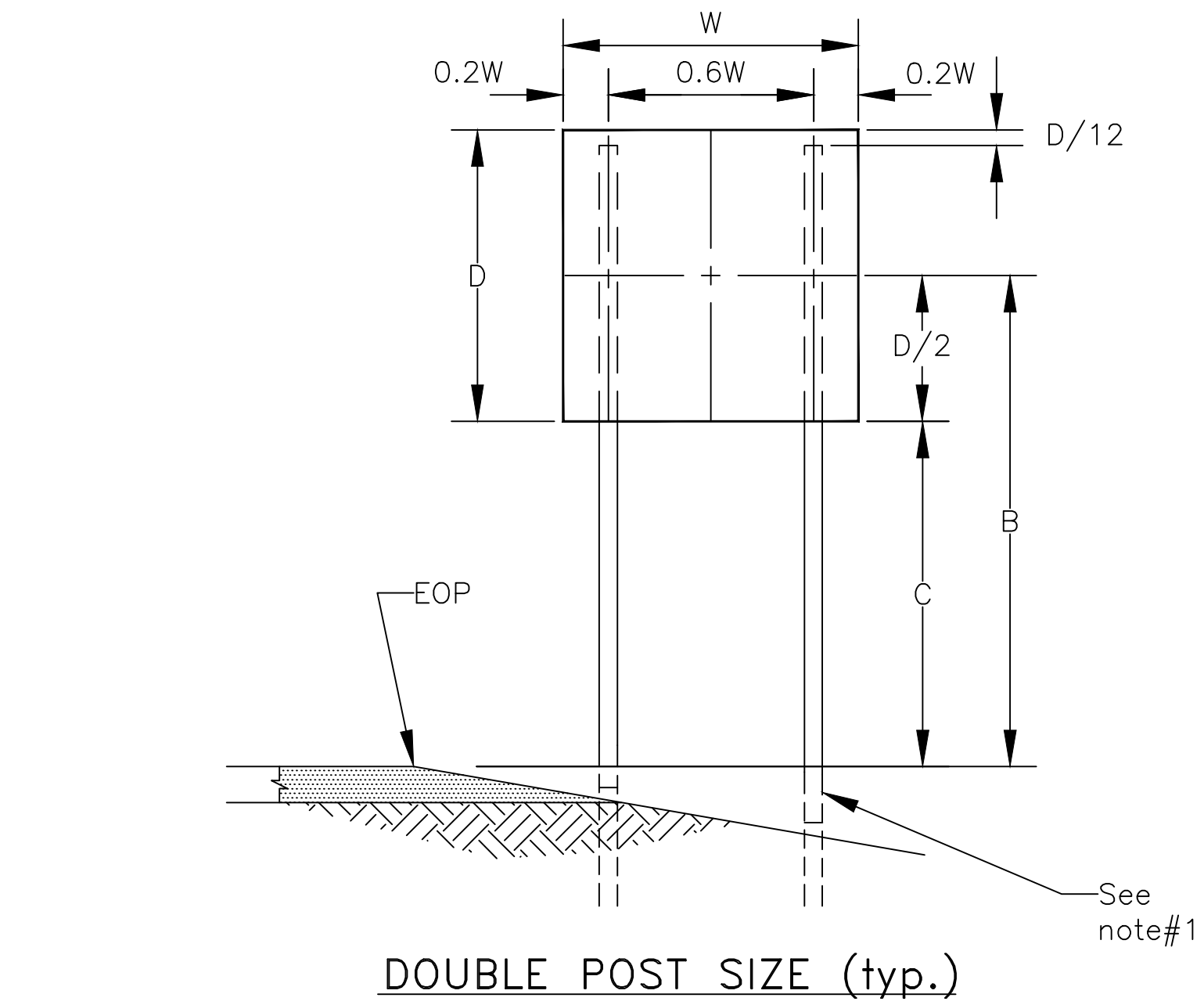
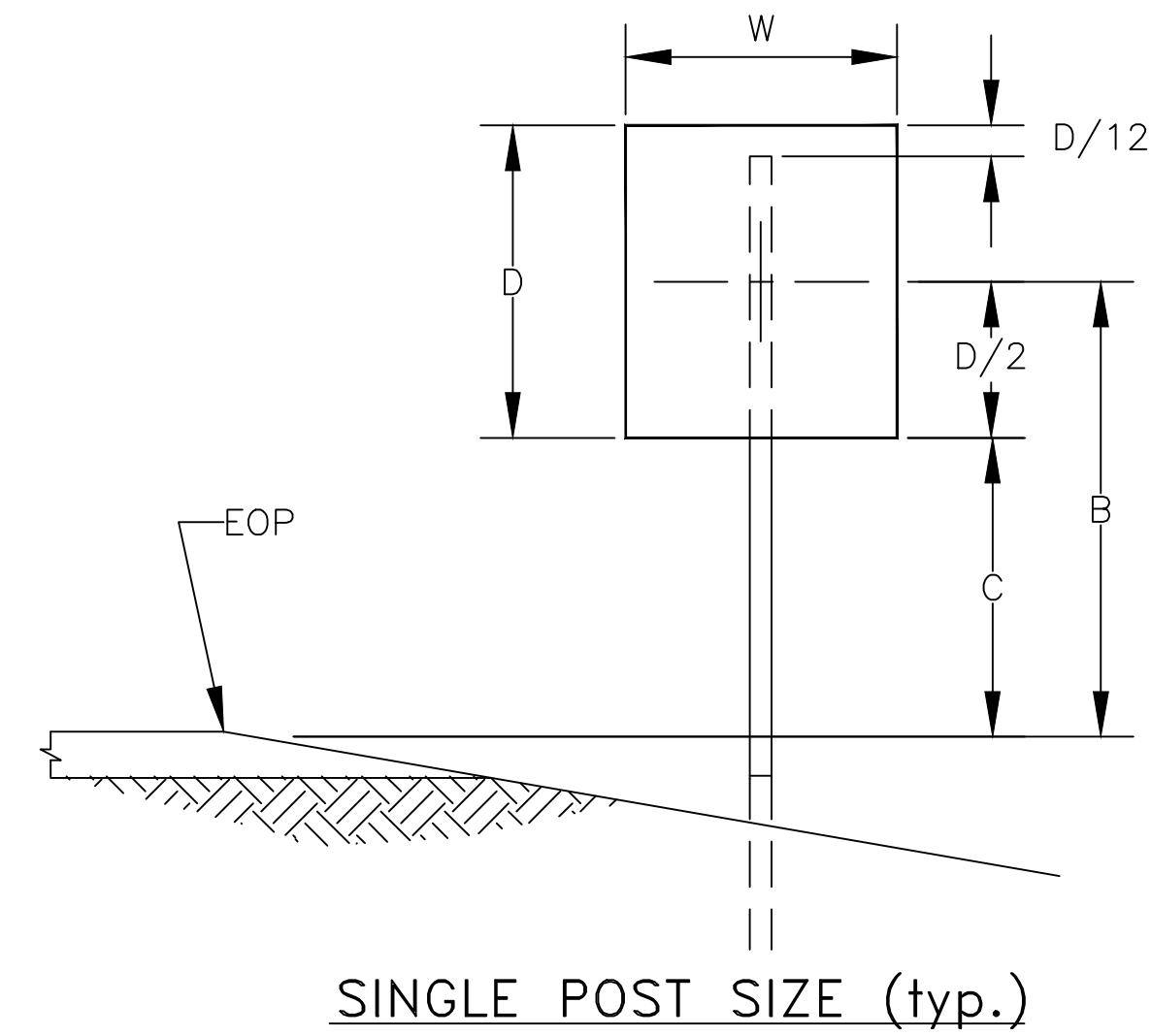
A(m²)
SIGN AREA

CHART TO DETERMINE DOUBLE POST SIZE													
POST WEIGHT	K FACTOR (B x A)	B DIMENSION (Meter)											
		1.52	1.83	2.13	2.44	2.74	3.05	3.35	3.66	3.96	4.27	4.57	4.87
2.976 kg/m	2.74	1.80	1.50	1.28	1.12	1.00	0.90	0.82	0.75	0.70	0.64	0.60	0.57
3.348 kg/m	3.08	2.03	1.69	1.45	1.27	1.13	1.01	0.92	0.85	0.78	0.72	0.68	0.63
4.092 kg/m	4.03	2.64	2.20	1.89	1.65	1.47	1.32	1.20	1.10	1.01	0.94	0.88	0.83
4.464 kg/m	4.91	3.23	2.69	2.31	2.03	1.79	1.62	1.47	1.35	1.24	1.15	1.08	1.01
5.952 kg/m	6.83	4.48	3.73	3.20	2.80	2.49	2.24	2.03	1.87	1.72	1.60	1.50	1.40

A(m²)
SIGN AREA

CHART TO DETERMINE THREE POST SIZE													
POST WEIGHT	K FACTOR (B x A)	B DIMENSION (Meter)											
		1.52	1.83	2.13	2.44	2.74	3.05	3.35	3.66	3.96	4.27	4.57	4.87
2.976 kg/m	4.12	2.69	2.25	1.92	1.68	1.50	1.35	1.23	1.12	1.04	0.97	0.90	0.85
3.348 kg/m	4.65	3.05	2.54	2.17	1.90	1.69	1.52	1.38	1.27	1.17	1.09	1.01	0.96
4.092 kg/m	6.02	3.96	3.30	2.82	2.47	2.19	1.98	1.79	1.64	1.52	1.41	1.32	1.24
4.464 kg/m	7.40	4.85	4.04	3.47	3.03	2.69	2.42	2.20	2.02	1.86	1.73	1.62	1.51
5.952 kg/m	10.20	6.71	5.58	4.78	4.19	3.73	3.35	3.05	2.79	2.57	2.40	2.23	2.09

A(m²)
SIGN AREA



TYPICAL ROADSIDE SIGN LOCATION

GENERAL NOTES

- The contractor shall be required to adjust the length of sign support posts. This work shall be included in the unit price for the appropriate bid items shown in the bid schedule.
- Sign dimension equal to or in excess of 762mm x 762mm size shall be install with a minimum of two (2) steel posts.

Illustration of posts/weight determination:

REQUIRED: Determine Post Requirement
For 1.52 m wide x 1.22 m high Sign.
Located On A Rural Highway.

GIVEN:
W=1.52 m
D=1.22 m
C = 1.5 m for Rural areas

SOLUTION: 1. D/2 = 0.61m; K factor = 3.90
2. B=C+D/2=1.5 + 0.61; B=2.11 m
3. A=WxD=1.52 x 0.61 = 1.85 sq. m.
4. Begin with single post chart for column of B=2.13 m, and continue down until area of sign equal or exceed 1.85 sq. m. The area exceeds the single post chart, so go to the double post table.

Select two (2) Posts of 4.09 kg/m
Yields a factor of 4.03
Which Is Optimum.

POST	B=2.13
4.09 kg/m	1.89 ←
4.46 kg/m	2.31
5.95 kg/m	3.20

PERMANENT ROADSIDE SIGNS

STATION	LOC.	SIZE DETAIL NO.	DESCRIPTION	SIGN PANEL SIZE (mm)	AREA OF SIGN (Sq. m.)	NO. Of POSTS	kg/m	TOTAL SIGN PANELS
10+250.000	Rt.	W5-1	ROAD NARROWS	762 x 762	0.58	2	2.98	1
10+260.47 10+329.969	Lt. Lt.	R1-1 R1-1	STOP	762 x 762 762 x 762	0.58 0.58	2 2	2.98 2.98	1 1
10+030.000 10+300.000	Rt. Lt.	R2-1 R2-1	SPEED LIMIT 25	610 x 762 610 x 762	0.46 0.46	1 1	4.09 4.09	1 1
10+020.000	Rt.	M-1	5031	460 x 610	0.28	1	4.09	1

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

PERMANENT SIGNING DETAIL

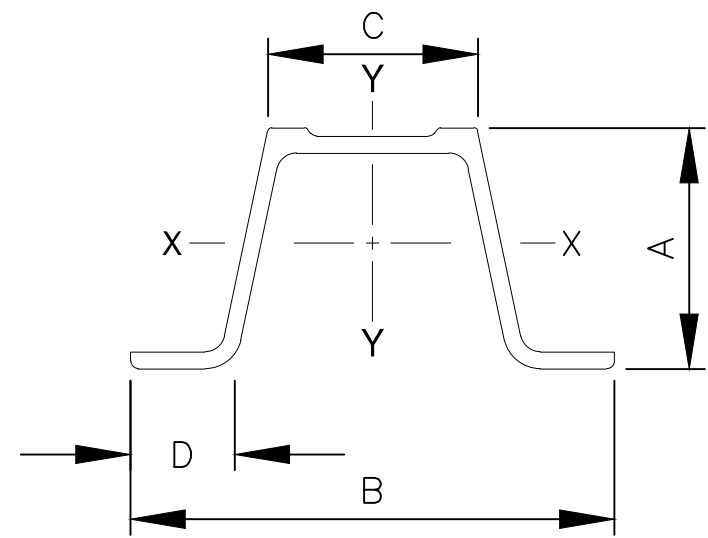
DRAWN BY: B.O.R.	DATE: 11/97
DESIGNED BY: B.O.R.	DATE: 11/97
REVISED: 11/11	FILENAME: 20_Permsign
BY: STRUCT	SCALE: NTS



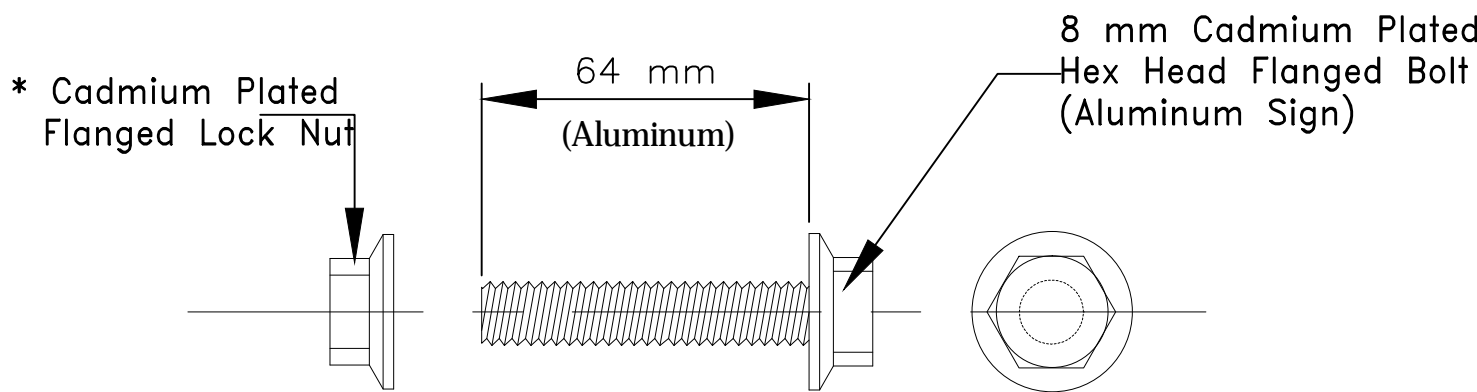
RIB-BAK U-CHANNEL SIGN SUPPORTS

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

* ±5%

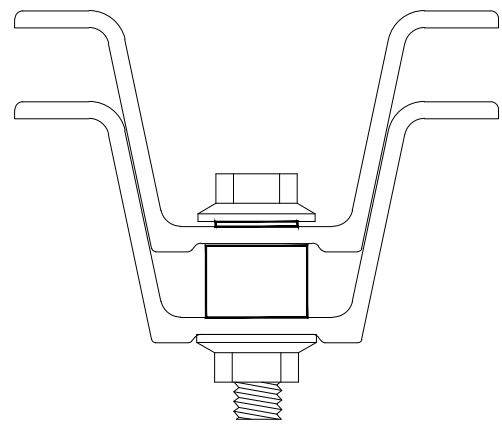


RIB-BAK U-CHANNEL

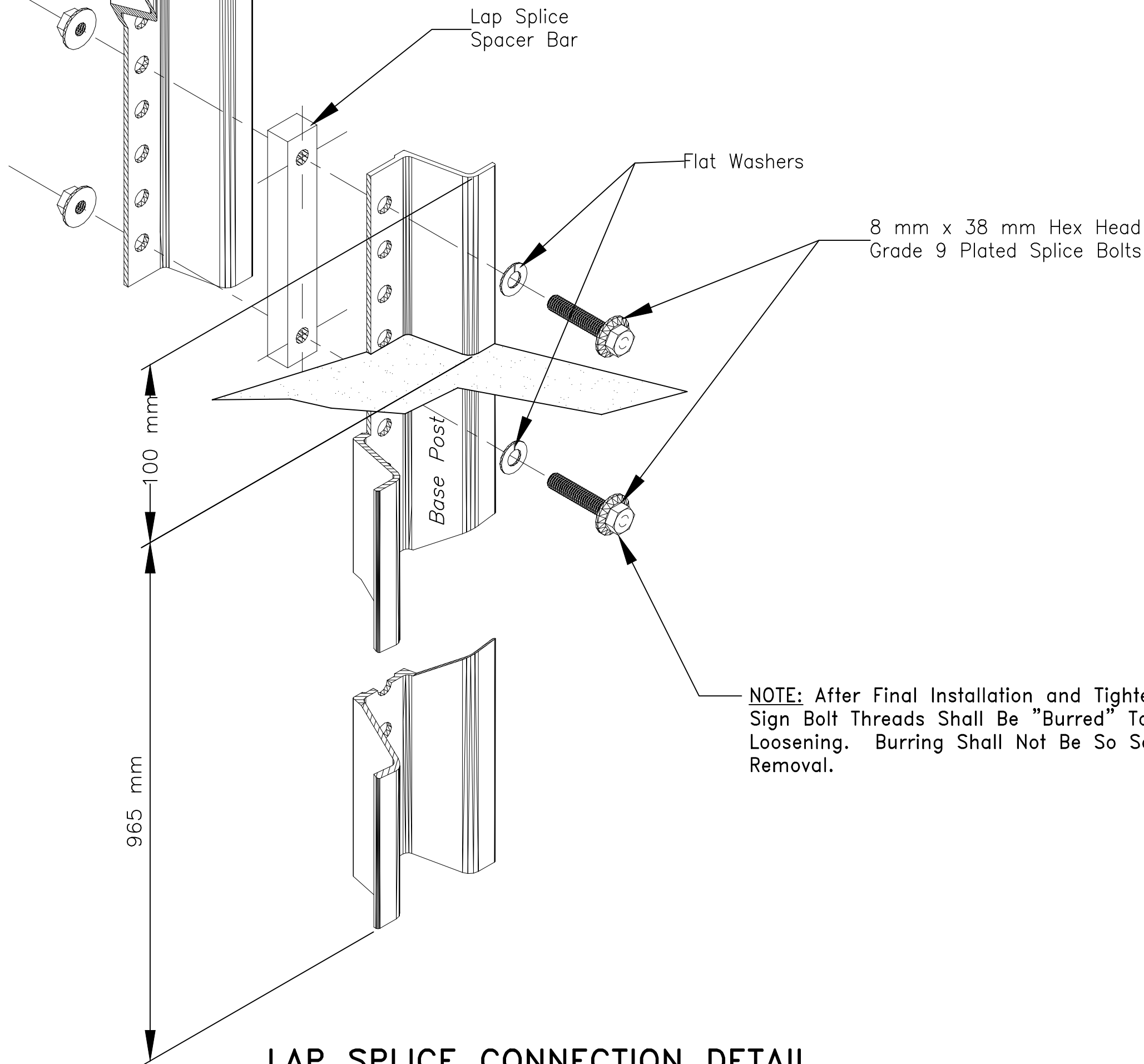


BOLTS AND LOCK NUT – SIGN ATTACHMENT

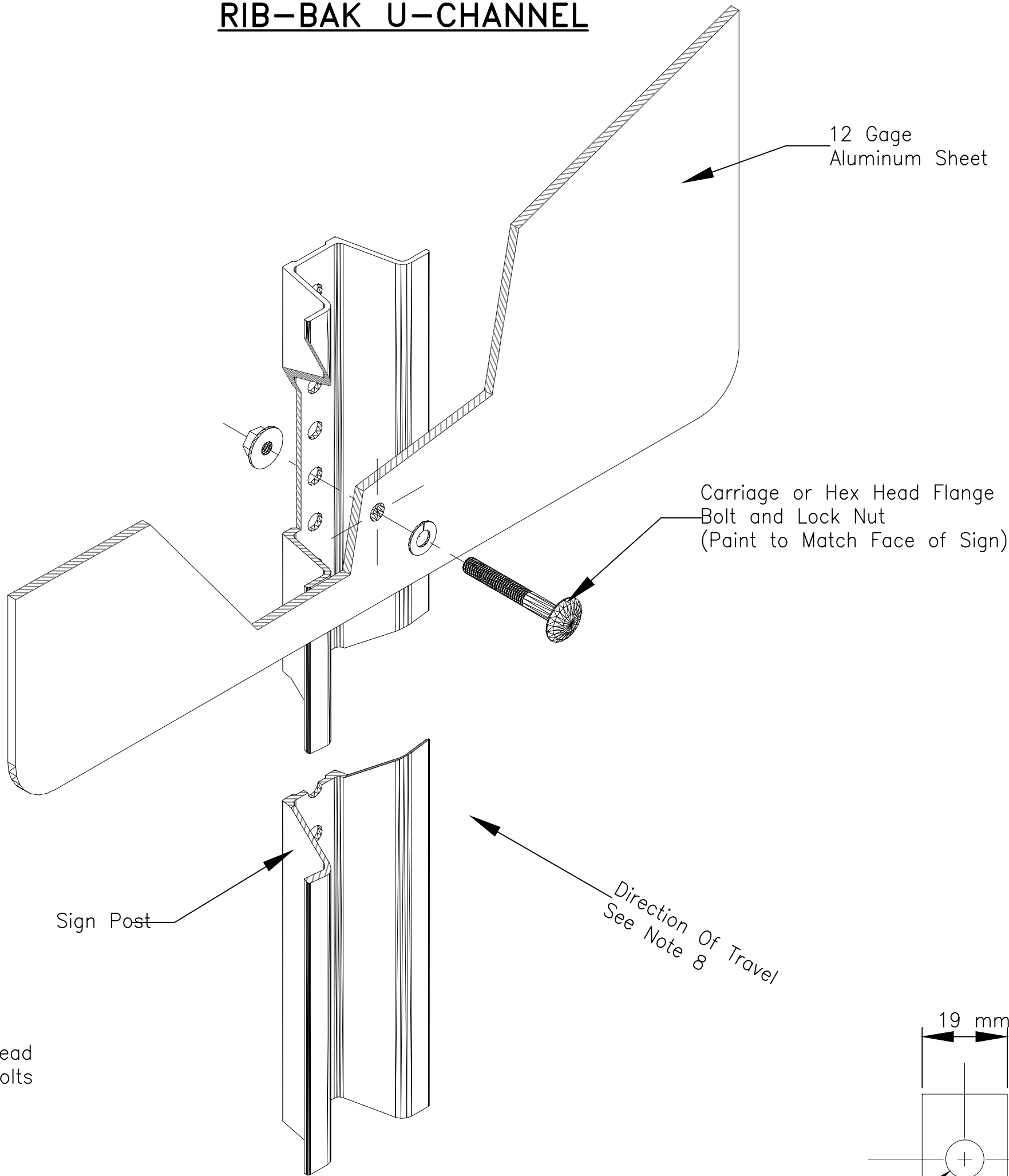
* Flanged Lock Nut Required For Carriage And Hex



LAP SPLICE – TOP VIEW



LAP SPLICE CONNECTION DETAIL

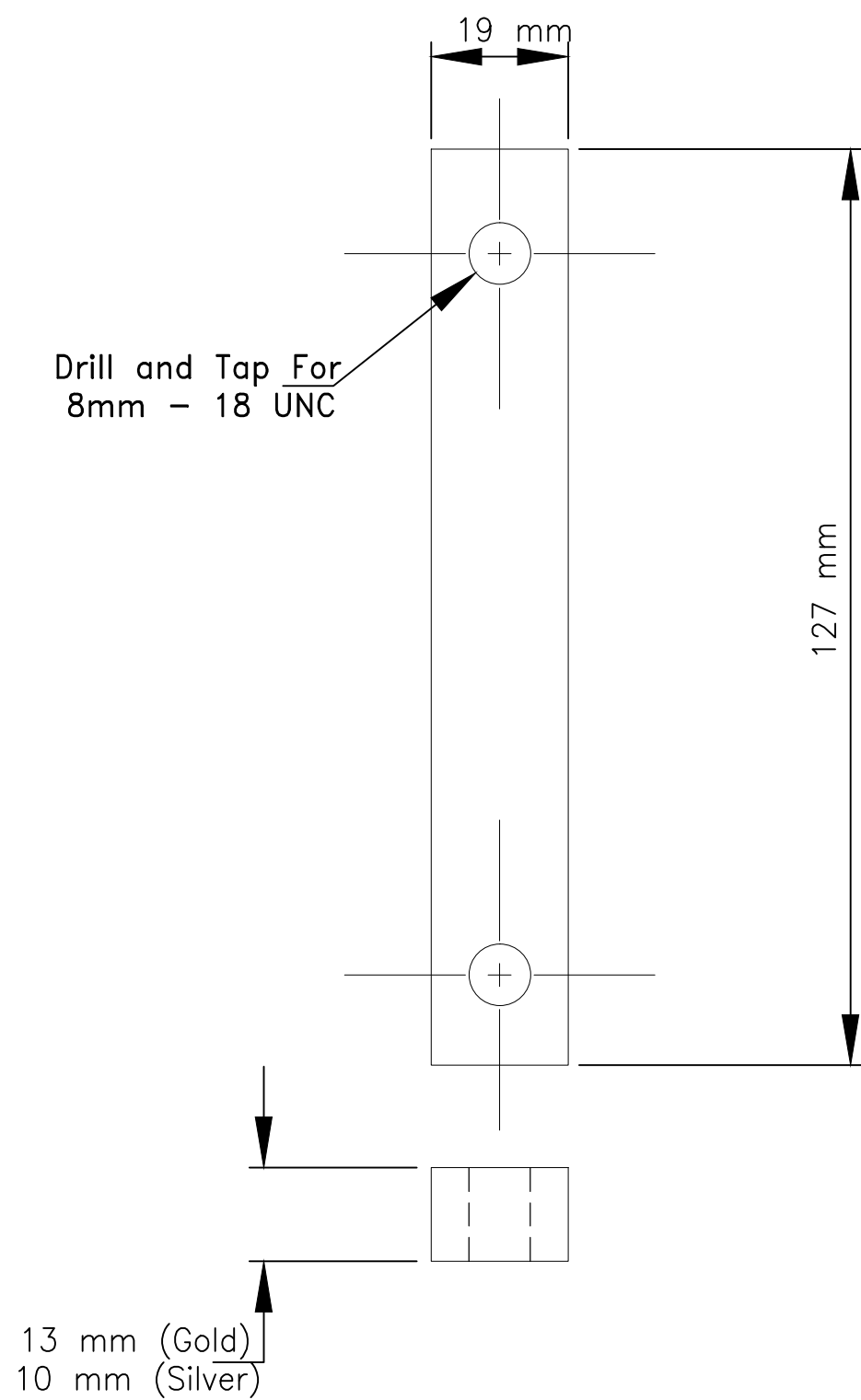


NOTE: The Gold Anodized 13 mm Thick Spacer Bar Is to Be Used With 4.45 kg/m and 5.94 kg/m Posts Only.

NOTE: After Final Installation and Tightening, ALL Posts and Sign Bolt Threads Shall Be "Burred" To Help Prevent Loosening. Burring Shall Not Be So Severe As to Prevent Nut Removal.

The Silver Anodized 10 mm Thick Spacer Bar Is to Be Used With 2.97 kg/m, 3.71 kg/m, and 4.08 kg/m Posts Only.

Direction Of Travel
See Note 8



LAP SPLICE SPACER BAR

General Notes

- Base Post and Sign Post Shall Be Rib-Bak U-Channel Fabricated From Hot Rolled Carbon Steel Bars Conforming to the Requirements of ASTM A499. Yield Point of the Steel Shall Be 550 MPa (Minimum). Tensile Shall Be 689.47 MPa (Minimum).
- Posts Shall Be a Uniform, Modified, Flanged Channel Section of the Rib-Bak Design. Weight of the Posts Shall Be as Specified By the User, ±5% Before Punching. The Posts Shall Be Punched With Continuous 9 mm Holes on 25 mm Centers For the Entire Length of the Post.
- The Posts Shall Be Machine Straightened to Have a Smooth, Uniform Finish Free From Defects Affecting Their Strength, Durability, or Appearance. All Holes and Rough Edges Shall Be Free From Burrs. The Permissible Tolerance for Straightness Shall Be Within 6.35 mm in 1.52 Meter.
- Posts Shall Be Galvanized After Fabrication in Accordance With the Requirements of ASTM A123. Bolts, Nuts, Washers and Spacer Shall Be Cadmium Plated in Accordance With the Requirements of ASTM A165 or Zinc Plated in Accordance With the Requirements of ASTM B633.
- Splice Hardware Shall Consist of Two Fully Threaded, 8 mm X 38 mm Grade 9 Plated, Hex Head Bolts, With Flat Washers, and Self Locking Hex Nuts Per Post. In Addition, One Shall Be Galvanized After Fabrication in Accordance With the Requirements of ASTM A123. Bolts, Nuts, Washers and Spacers Shall Be Cadmium Plated in Accordance With ASTM B766. One 19 mm X 127 mm Plated Spacer Bar Shall Be Used, Per Post, To Stiffen the Splice Connection. Each Spacer Bar Shall Be Drilled and Tapped With 8 mm-18 UNC Threads. The Spacer Shall Be Fabricated From Hot Rolled Carbon Steel Bars Conforming to ASTM A36 or M1020. Bolts Shall Be Red in Color With the Head Marking "M180".
- Bolts and Lock Nut Hardware For Sign Attachment Shall Be Hex Head Flange Type. Size Shall Be 8 mm-18 UNC. Bolts and Nuts Shall Be Cadmium Plated to ASTM B766 Specification.
- An Alternate Breakaway and Support Post Assembly May Be Submitted to the NRDOT Division Manager for Review and Approval.
- Supplemental Signs on the Opposite Side of Road Shall Have the Post Reversed So That Rib-Bak Is Facing Away From the Opposing Traffic.
- The Post Shall Be Coated With a Baked on Green Alkyd Resin, Paint, Painted With a Polyester Powder or Galvanized Per Note 4 Above.

INSTALLATION PROCEDURE

- STEP 1:
Drive Base Post to Within Approximately 300 mm Above Ground Level. Place One Bolt and Cut Washer in Fifth Hole From the Top and Securely Tighten Threaded Spacer Onto Bolt.
- STEP 2:
Drive Base Post to 100 mm Above Ground Level. Place Remaining Bolt and Cut Washer in First Hole From the End and Securely Tighten Threaded Spacer Onto Bolt.
- STEP 3:
Dig Out Approximately 50 mm From Around Back of Ground Post to Allow Room For Top Post to Be Attached.
- STEP 4:
Nest Top Post Onto Protruding Base Post Bolts, Through the First and Fifth Holes of the Top Post.
- STEP 5:
Place a Self-Locking Flange Nut on Each Bolt. Tighten Nuts and Tamp Earth Around Post Firmly.

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

SIGN POST AND
HARDWARE DETAILS

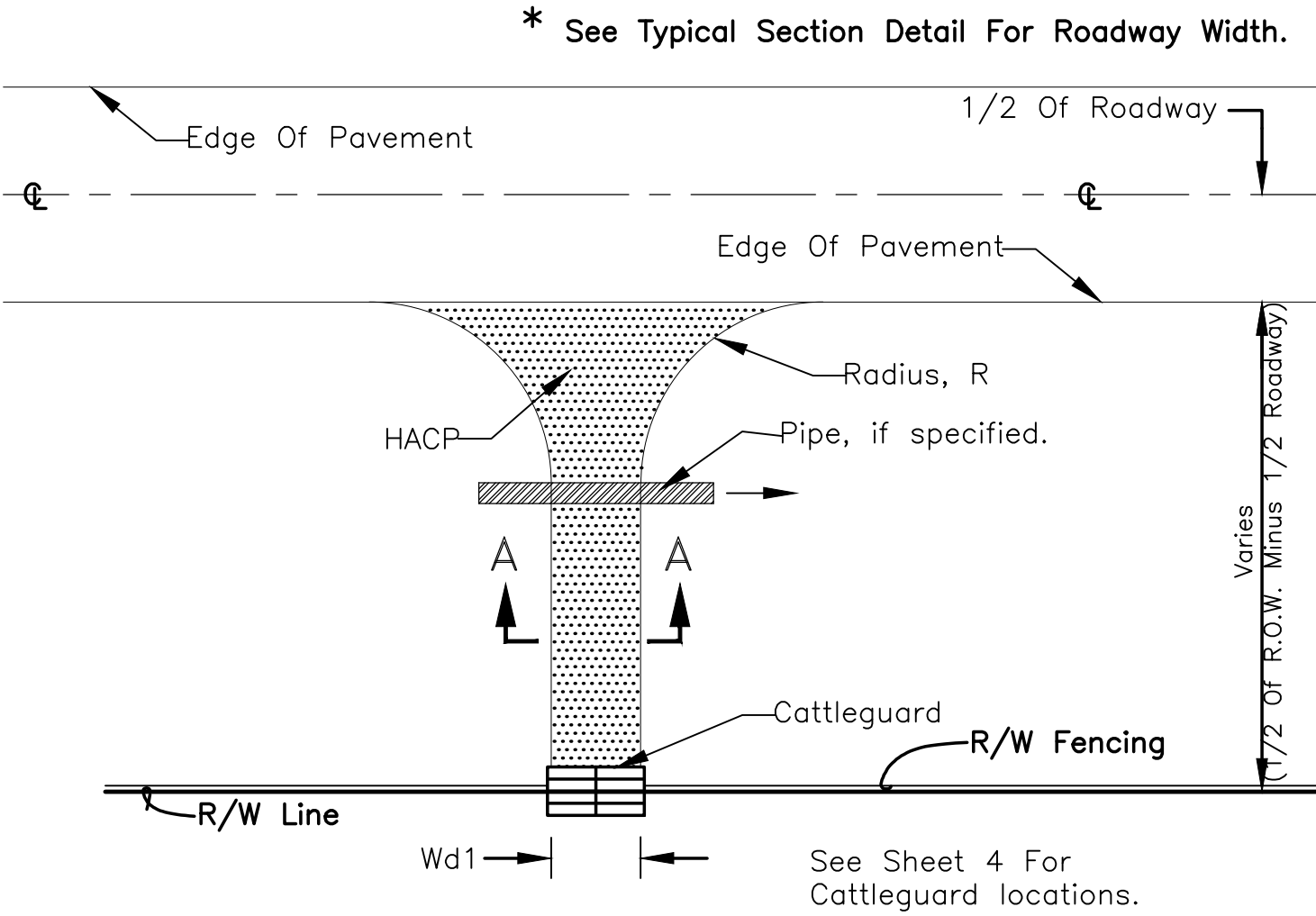
Designed by: NRO-DOT
Drawn by: NRO-DOT Date: 06/03/11
Revised by: Date:
File Name: 21_Permsig2



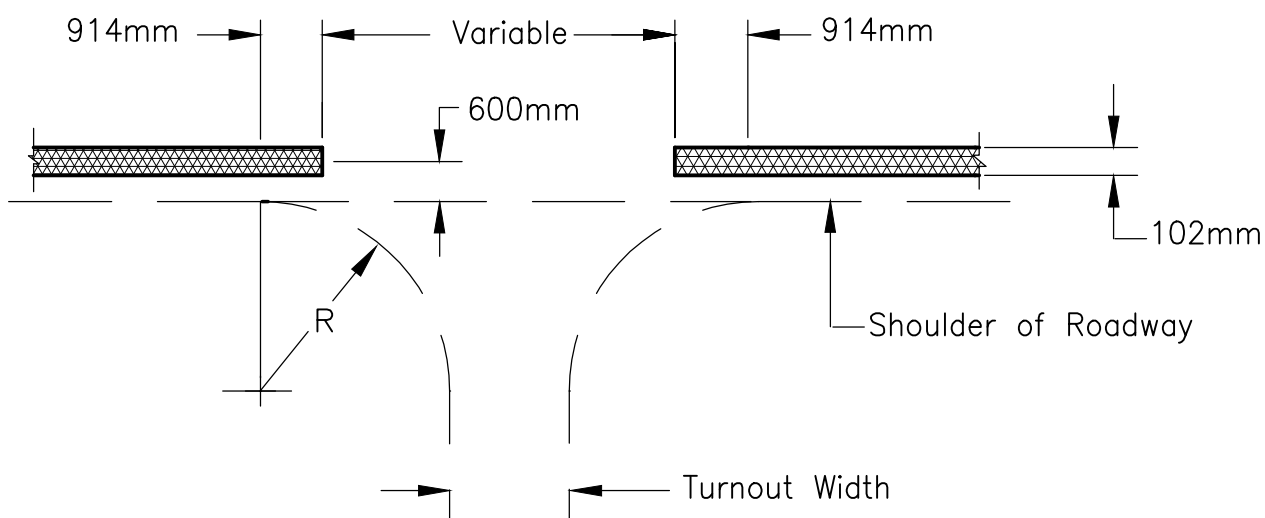
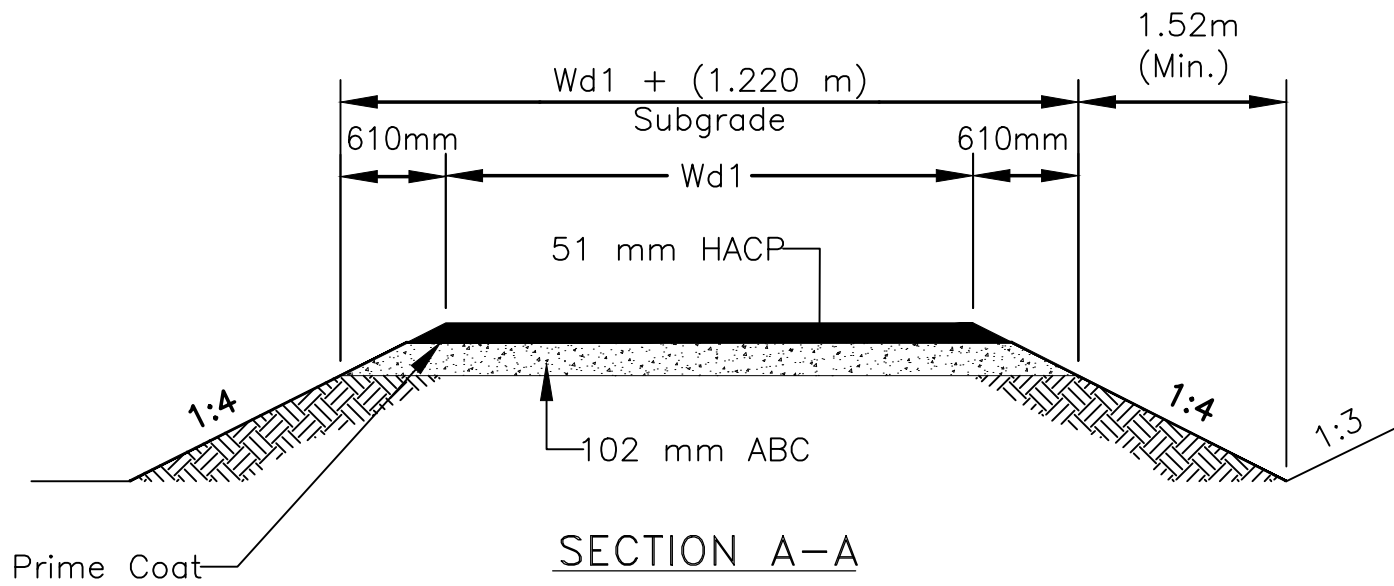
REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	NM	Navajo	N5031	N5031(1)1,2&4	22	32

TYPE "A" TURNOUT	Wd1	Cattleguard	R
	4.50 m	2-UNIT	9.00 m
	7.00 m	3-UNIT	9.00 m
	9.10 m	4-UNIT	15.00 m
	11.50 m	5-UNIT	15.00 m
	14.00 m	6-UNIT	15.00 m

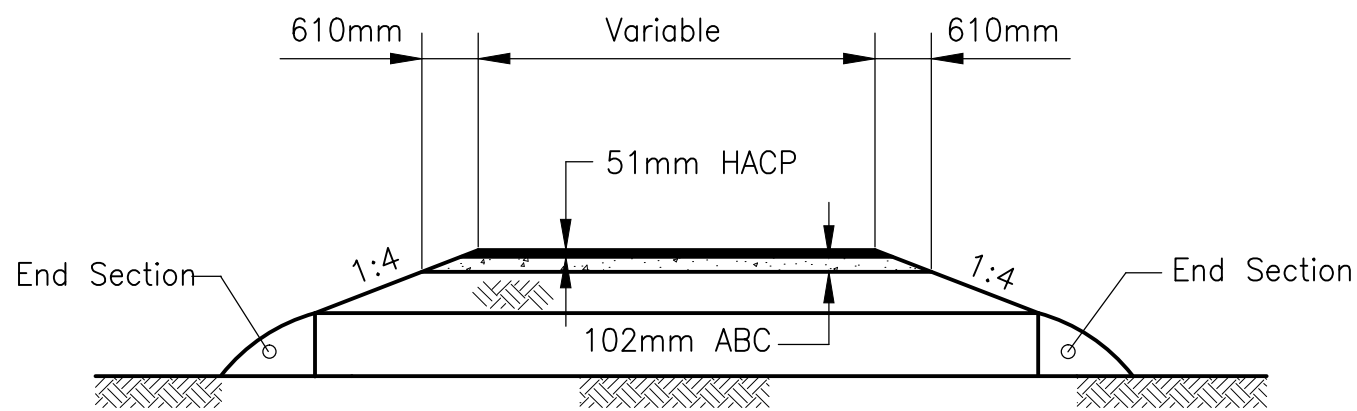
Special Note: 4.5 m Turnouts at irrigation canal (4 total) shall have radius (R) of 3.0 m.



TYPICAL TYPE "A" TURNOUT



TYPICAL TURNOUT TRAFFIC MARKING



TYPICAL TURNOUTS WITH CSPC INSTALLATION

Minimum width necessary for proper jointing and compaction under haunches and at side of pipe (Max. pay width=457 mm)

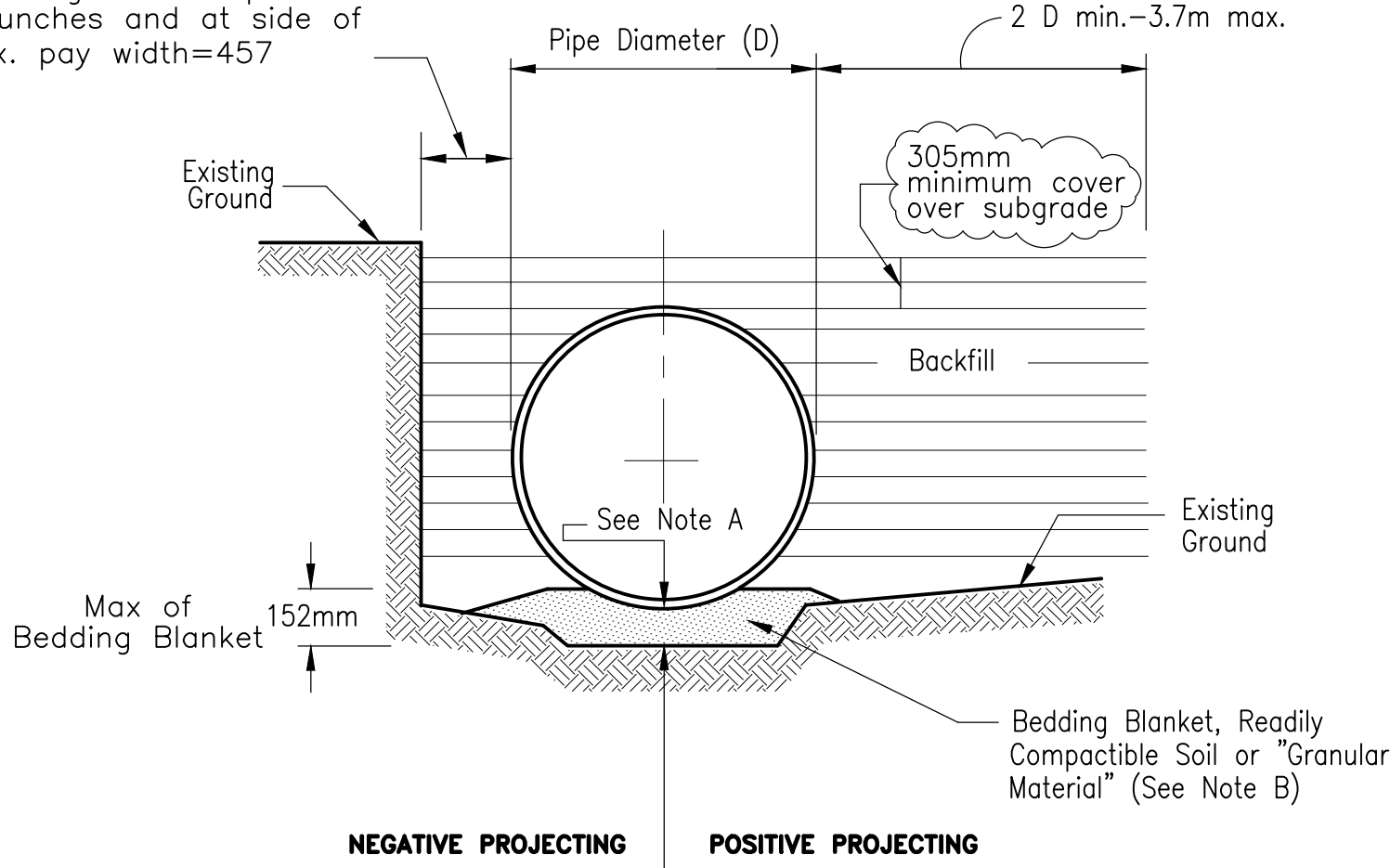


FIG. A. CLASS C BEDDING

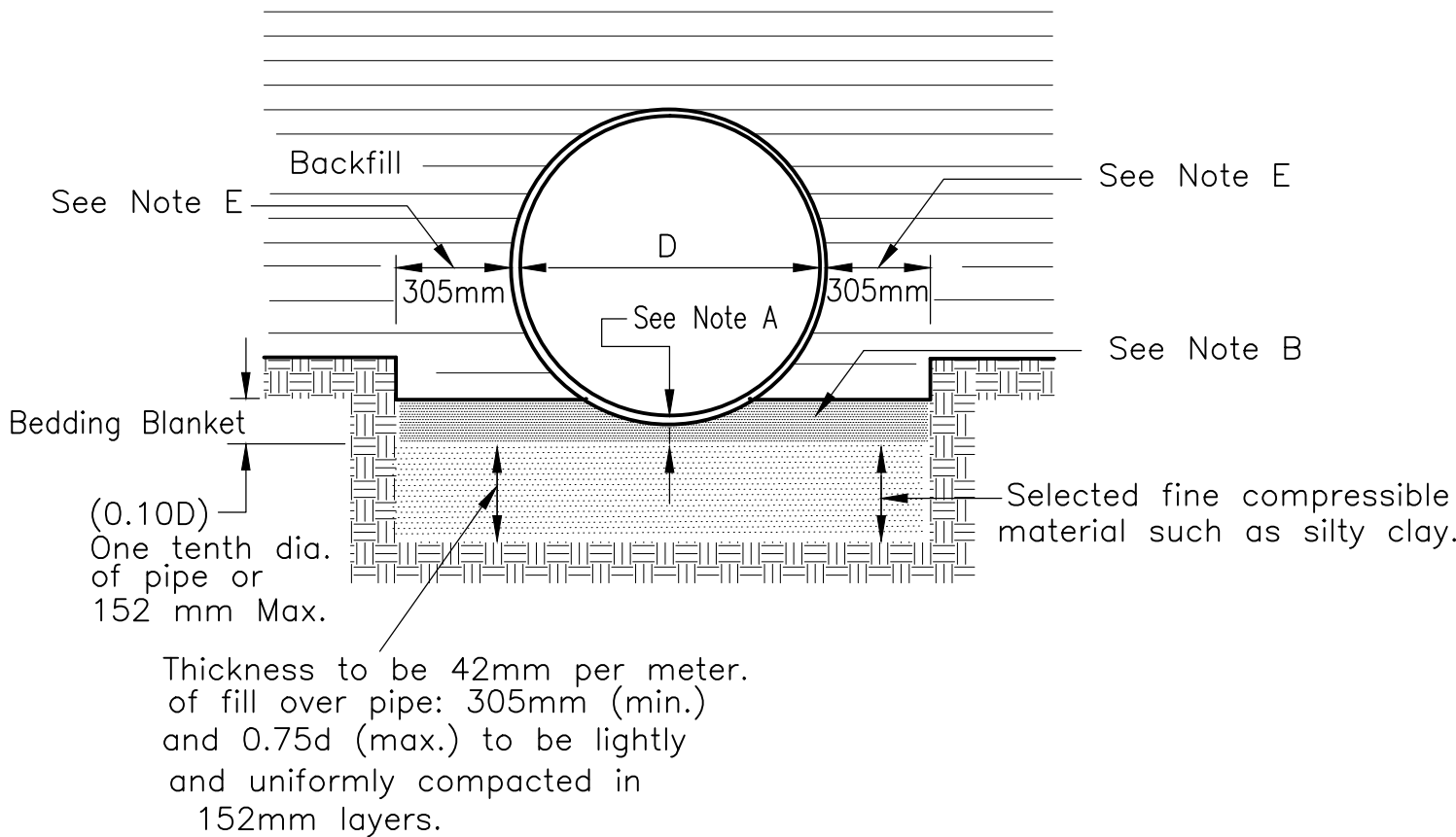


FIG. B ROCK BEDDING

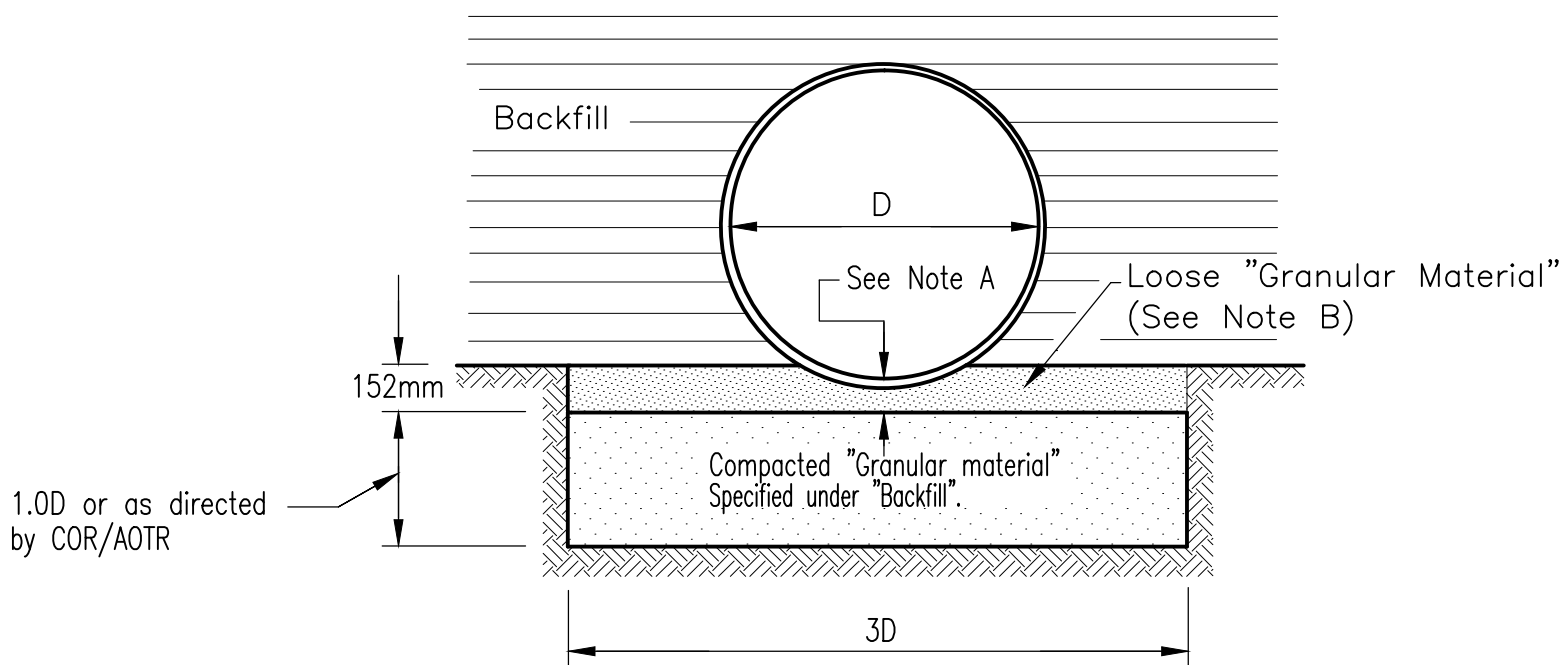
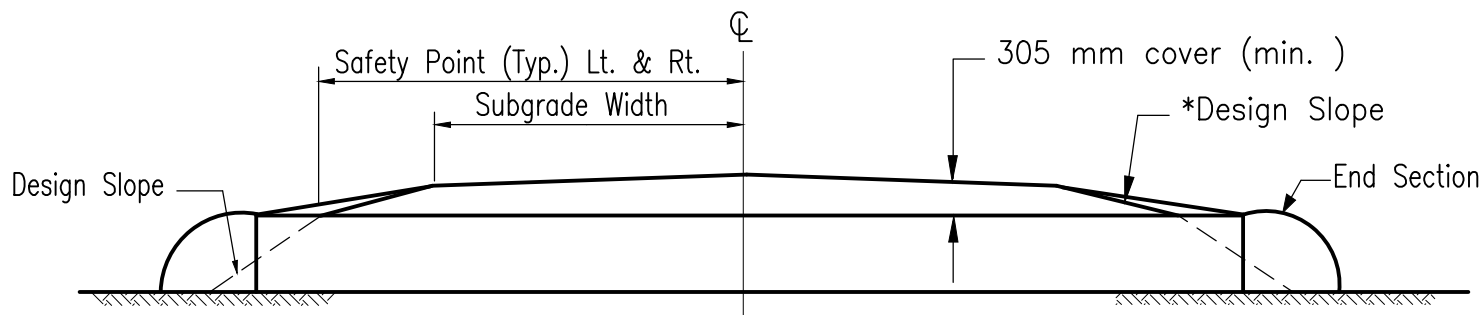


FIG. C. FOUNDATION STABILIZATION BEDDING

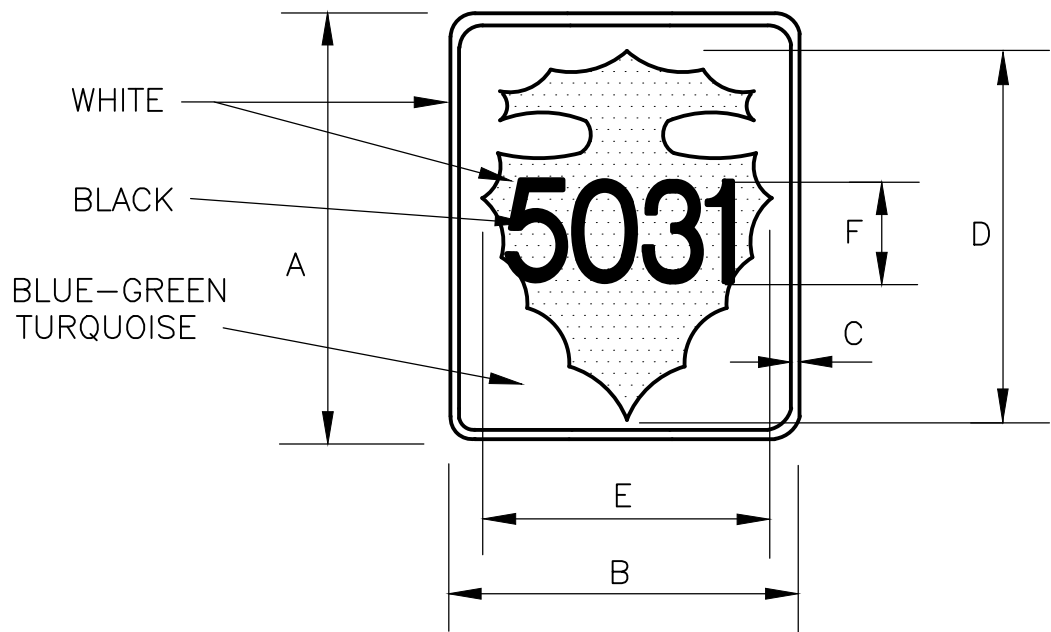


* - Adjust slopes to catch at top of pipe at each opening

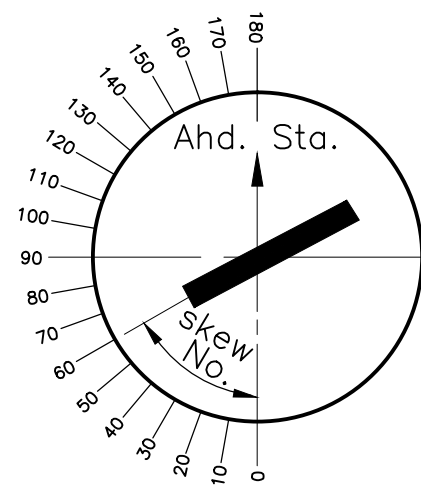
TYPICAL PIPE INSTALLATION

GENERAL NOTES:

- Place loose bedding roughly shaped to fit bottom of pipe, then compact under haunches after pipe placement.
- See sections 204, 209, 602, and 704 of FP-03, including the supplemental specification for additional notes.
- 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 Contractor, at no additional cost to the government.
- All structural plate pipes, arches, and super span structure shall be assembled and installed in accordance with the fabricators recommendation.
- Backfill material shall be placed minimum 305 mm up to (D/2) pipe diameter width on the sides. Backfill material beyond the limits shall be regular earthwork embankment material. The backfill material shall be approved by the COR/AOTR prior to it's use and shall be placed in accordance with the plans and specifications.
- Pounding or jetting pipe backfill shall not be permitted.
- All pipe excavation, backfill, de-watering, pumping or cofferdams required to properly install the drainage pipe shall be considered incidental to completion of the project and additional payment shall be made.
- Multiple pipe installations shall be placed 457 mm between end sections unless otherwise directed by the COR/AOTR or as shown on the plans.
- All pipes shall be protected by a cover of not less than 914 mm of embankment above pipe before any heavy equipment is allowed to pass over the structure(s) during construction.
- All culverts shall be installed at the original ground line and slope to assure positive drainage up to the R.O.W. limits. In no case shall the pipe be placed below the original ground elevations, unless as directed by the COR/AOTR. This work shall be considered incidental to completion of project and no additional payment shall be made.
- All culverts under turnouts and driveways shall be placed at the proposed ditch flowline and contractor shall adjust turnout profile grades to provide for 305 mm cover (To Subgrade) over pipe. The Contractor shall be required to make field adjustments in grades as directed by the COR/AOTR.



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)	E 254	D 254	C 208 B 152



STRUCTURE SKEW DIAGRAM

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

STANDARD PIPE INSTALLATION,
TURNOUT & ROUTE SIGN DETAILS

Designed by: B.O.R.

Drawn by: TAY

Date: 07-03

Checked by: HRC

Date: 10-26-11

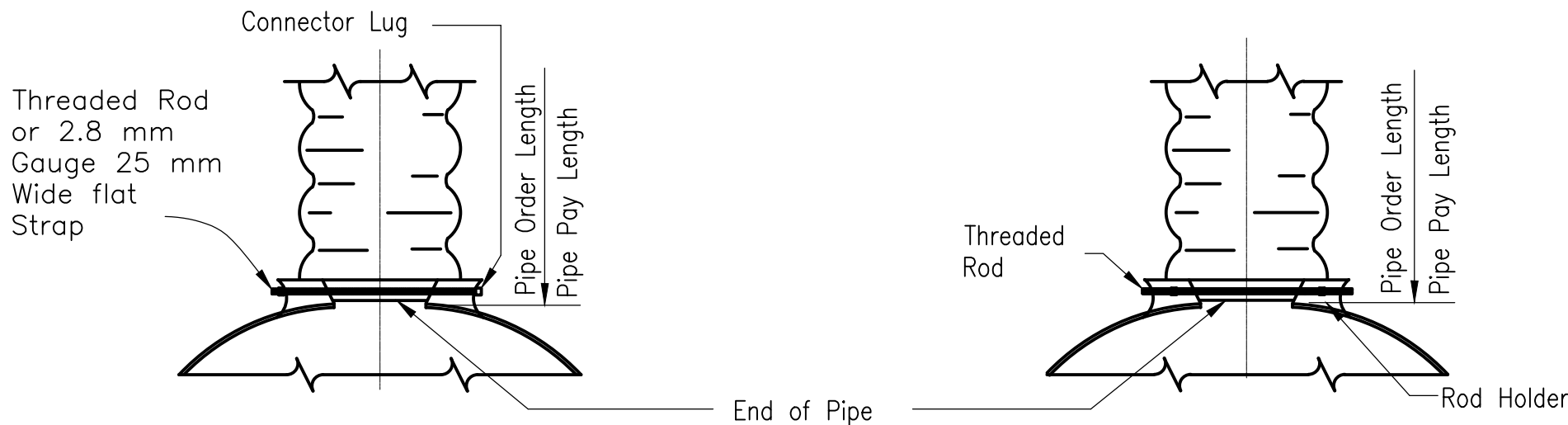
File Name: 22_Stdpipe



<div>ESTIMATED STRUCTURE QUANTITIES</div>				ITEM NO.		
				60202-0510		
				711 mm x 508 mm CSPA-Gauge No. 16		
				67.7 mm x 12.7 mm Corrugation End Section For 711 mm x 508 mm CSPA Gauge No. 16		
STATION	Ha	STRUCTURE DESCRIPTION	SKEW NO.	L.m	Ea.	
10+210.000, CL	NA	1-711 mm x 508 mm x 22.82 m CSPA	150°	22.82	2	
10+219.328, Rt.	NA	1-711 mm x 508 mm x 11.73 m CSPA	N/A	11.73	2	
10+282.429, Rt.	NA	1-711 mm x 508 mm x 16.12 m CSPA	N/A	16.12	2	
10+336.969, Lt.	NA	1-711 mm x 508 mm x 13.55 m CSPA	N/A	13.55	2	
SUBTOTAL :				64.22	8	

GENERAL NOTES

- All 3 piece bodies to have 2.77 mm thick sides and 3.51 mm thick center panels. Multiple panel bodies shall have lap seams tightly joined together by galvanized rivets or bolts.
- Types No. 1 & No. 2 for pipes with annular ends only.
- Type No. 3 connections is allowed and available for all CSPC's and CSPA's (except for the pipes with 76 mm by 25 mm corrugations). The stub section shall have the same gage thickness as the end section, and shall be included in the unit bid price for the end section.
- Type No. 5 connections are allowed and available for all CSPC's and CSPA's (except those pipes having 76 mm by 25 mm corrugations).
- All helical pipe joints shall be rerolled to allow for watertight band coupler.

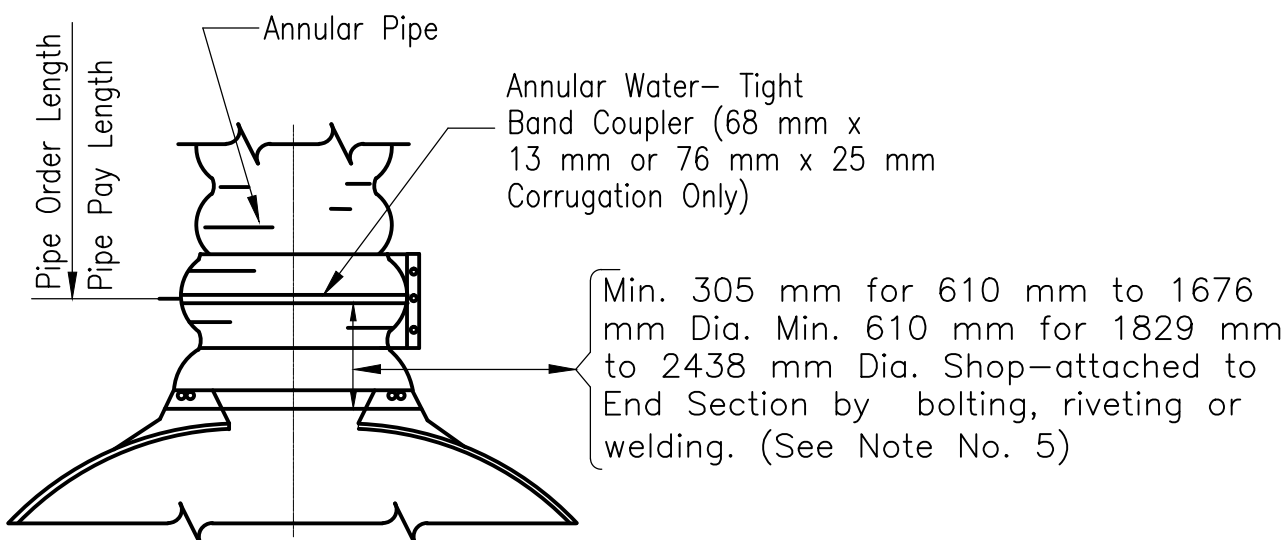


TYPE NO. 1

For 305 mm thru 610 mm C.S.P. & 711 mm x 508 mm C.S.P.A. (See Note No. 4)

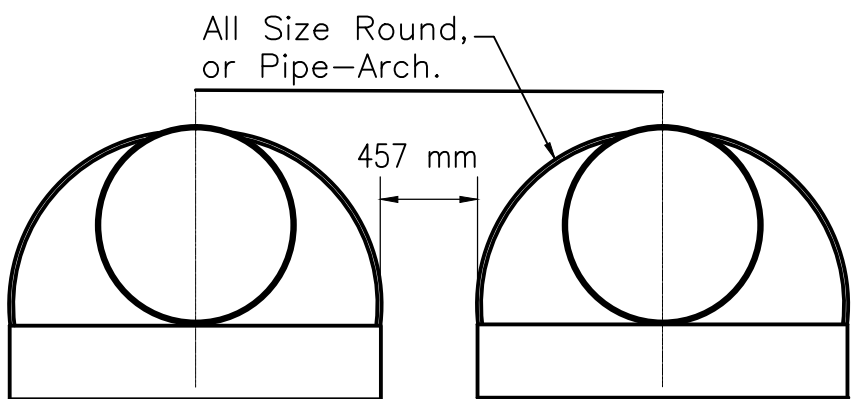
TYPE NO. 2

For 762 mm & 914 mm, and for 178 mm x 330 mm thru 1448 mm x 965 mm only (See Note No. 4)



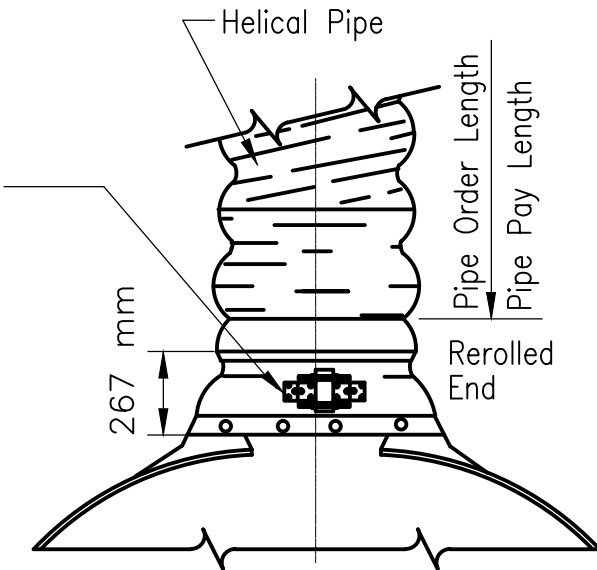
TYPE NO. 3

Min. 305 mm for 610 mm to 1676 mm Dia. Min. 610 mm for 1829 mm to 2438 mm Dia. Shop-attached to End Section by bolting, riveting or welding. (See Note No. 5)



MULTIPLE INSTALLATION SPACING

Water-tight Band Coupler, Shop connected to end section by bolting, riveting or welding. (68 mm x 13 mm Corrugation Only)



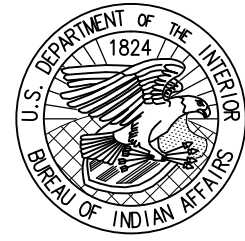
TYPE NO. 5

(SEE NOTE No. 6)

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

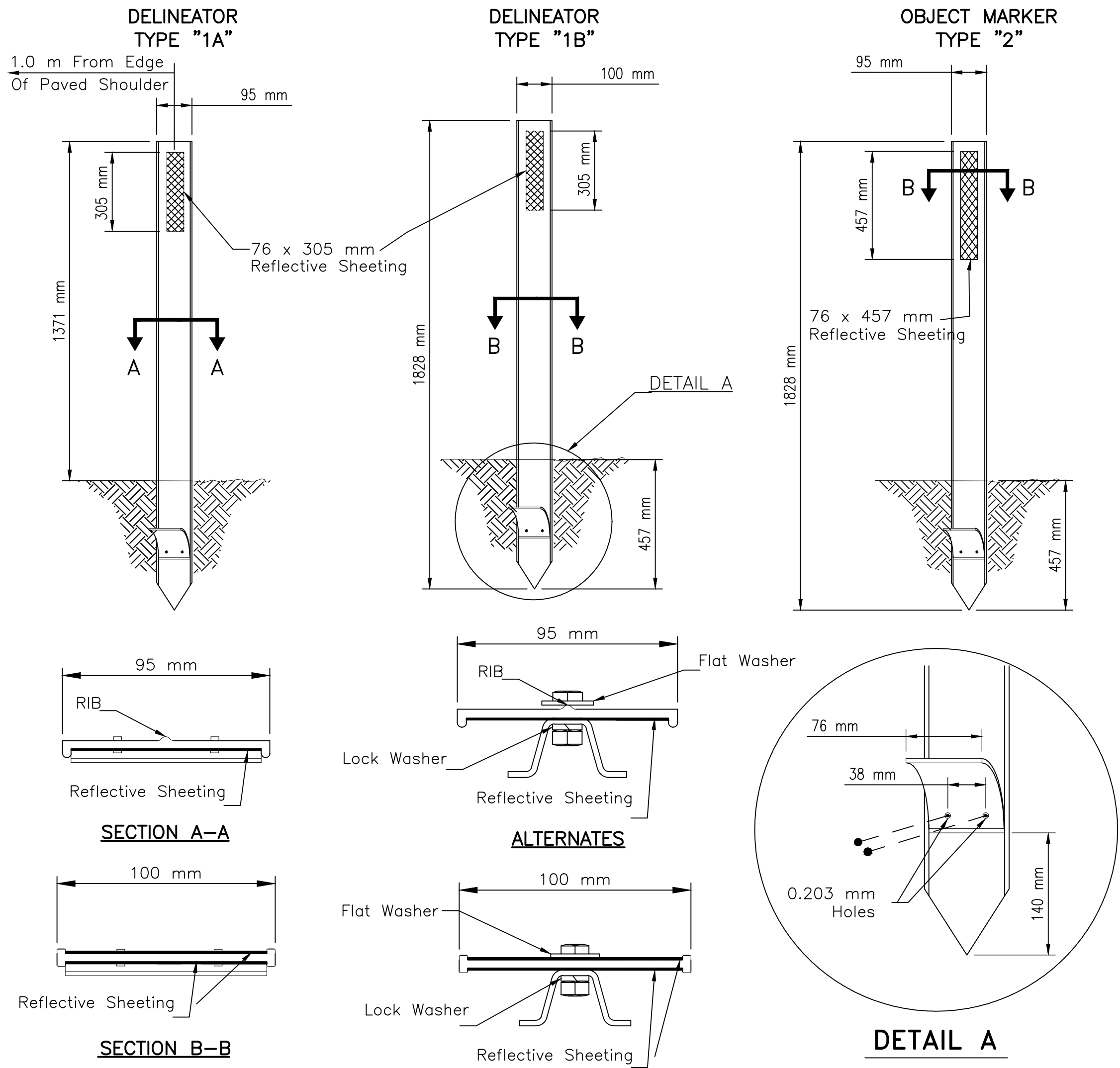
PIPE CULVERT DETAILS

Designed by: BOR - Structural Unit
Drawn by: TAY Date: 07-03
Checked by: dc, HRC Date: 12-01-11
File Name: 23_Culvpipe



REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	NM	Navajo	N5031	N5031(1)1,2&4	24	31

GLASS FIBER TYPE DELINEATOR



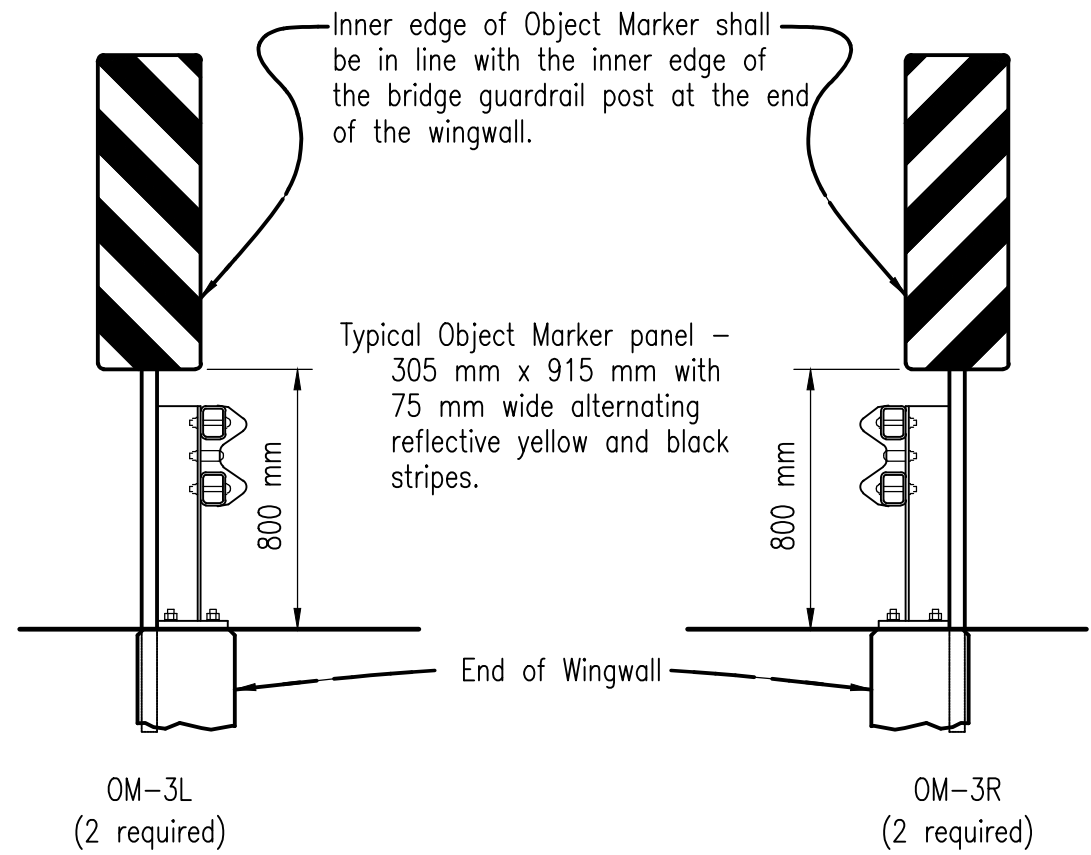
TYPE	POST COLOR	HIGH INTENSITY REFLECTIVE SHEETING
1a	WHITE	WHITE, ONE SIDE
1b	WHITE	WHITE, BOTH SIDES
2	YELLOW	AMBER, ONE SIDE

ITEM 63308-2000
TYPE 2 OBJECT MARKER

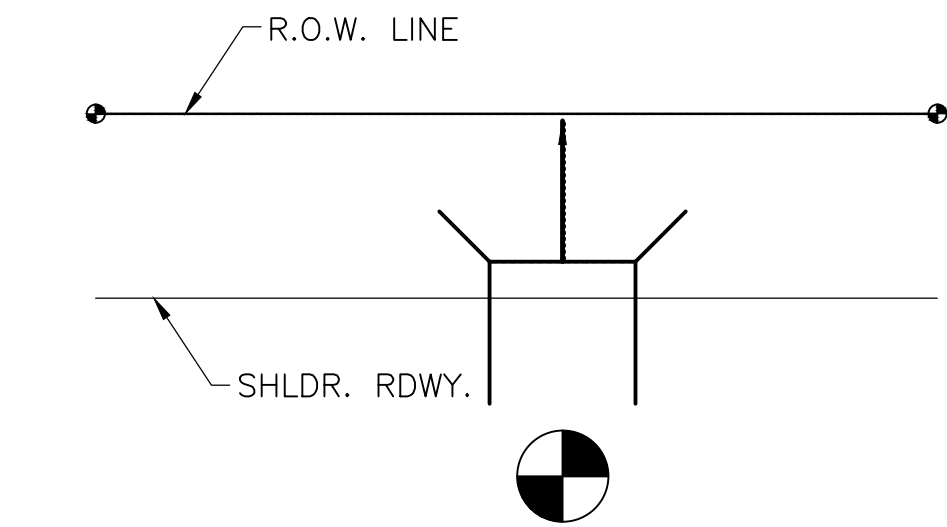
STATION	LOCATION	QTY.
10+195.290	Rt.	1
10+223.721	Lt.	1
TOTAL		2

ITEM 63309-0020
TYPE 1b DELINEATOR

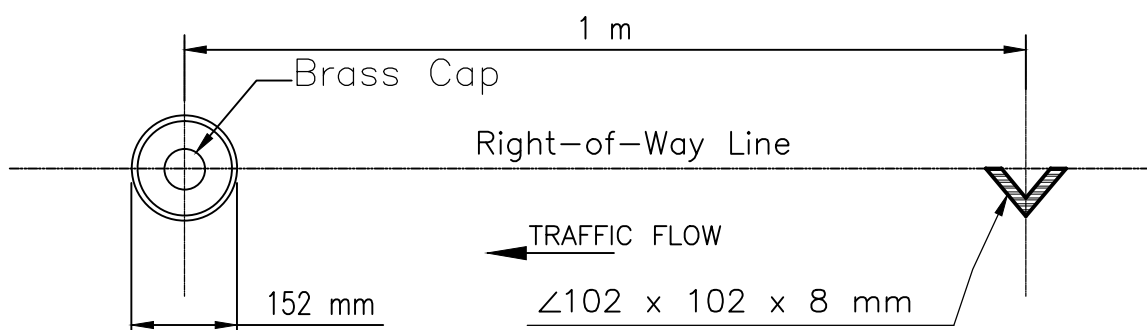
STATION	LOCATION	QTY.
10+040.000	Lt. & Rt.	2
10+090.560	Lt. & Rt.	2
10+102.203	Rt.	1
10+109.441	Lt.	1
10+115.430	Rt.	1
10+240.000	Lt. & Rt.	2
10+350.000	Lt. & Rt.	2
TOTAL		11



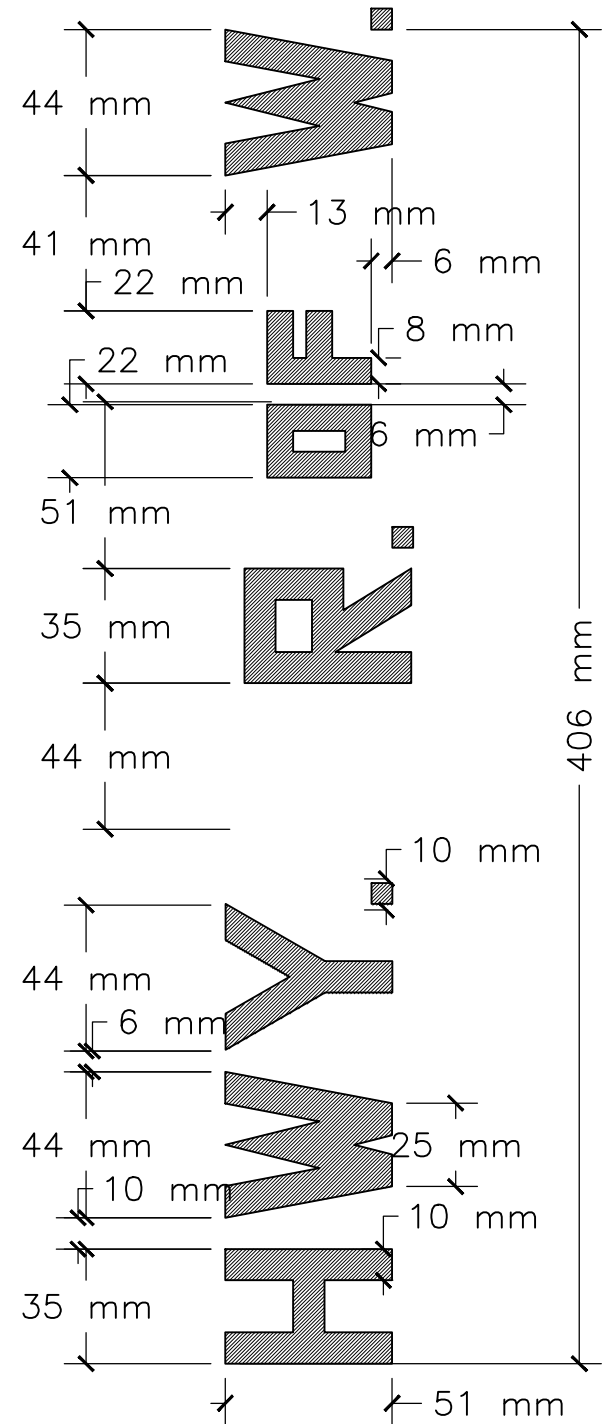
TYPE 3 OBJECT MARKER
STEEL BRIDGE RAIL INSTALLATION



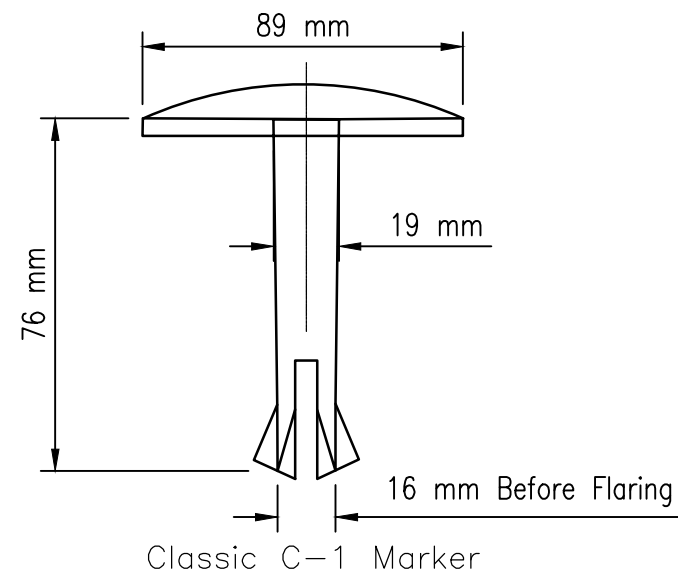
R/W MONUMENT SYMBOL



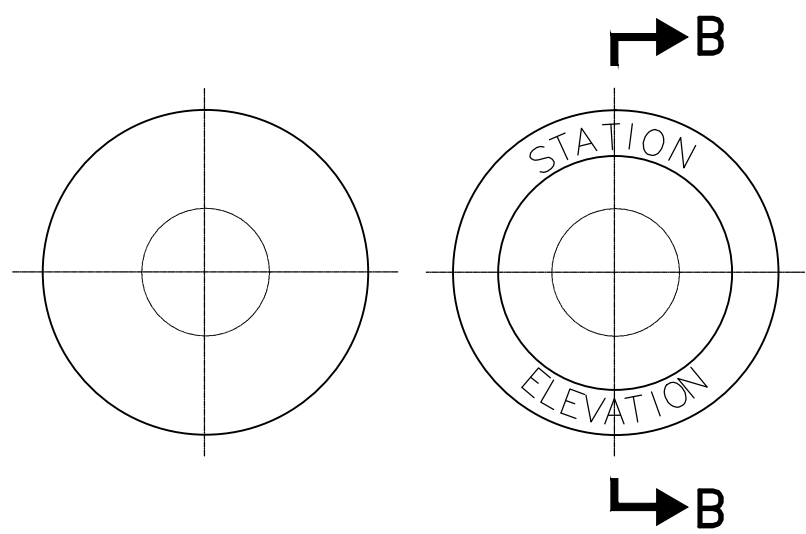
PLAN VIEW



TYPICAL LETTERING DETAIL



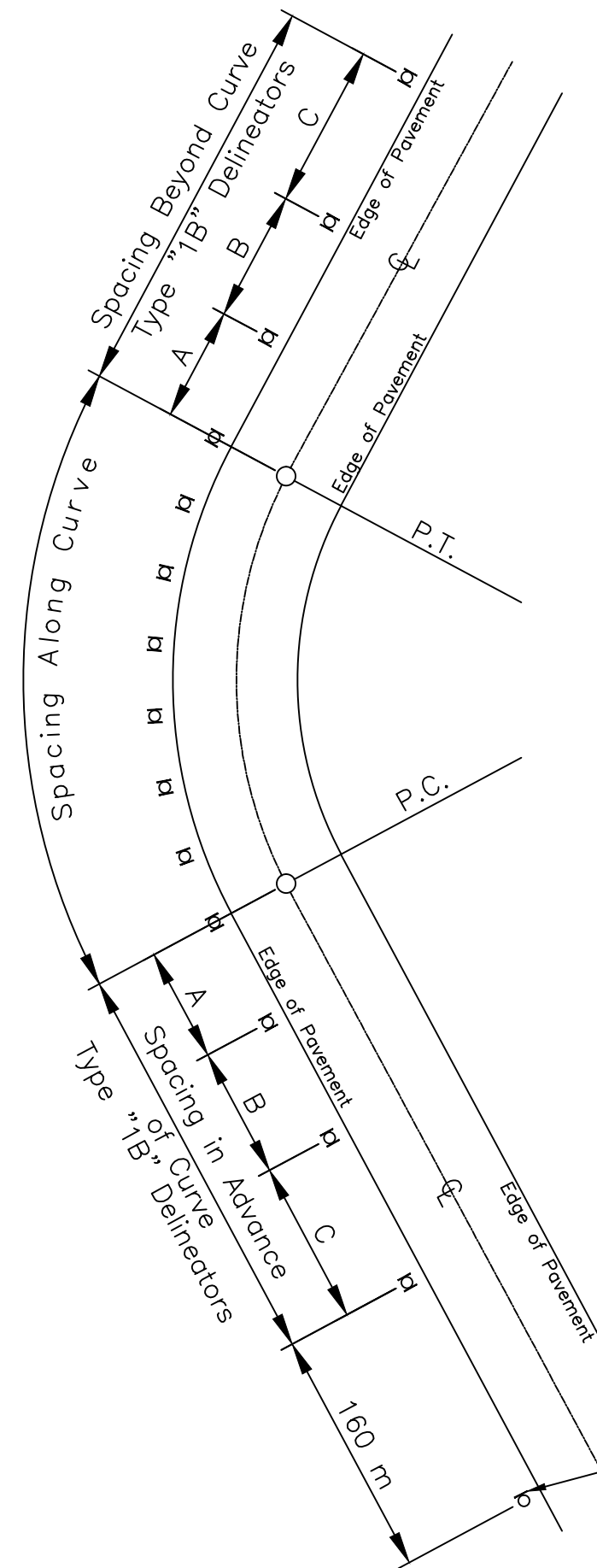
SECTION B-B



BOTTOM VIEW

TOP VIEW

STANDARD BRASS CAP DETAIL
(OR APPROVED EQUAL)

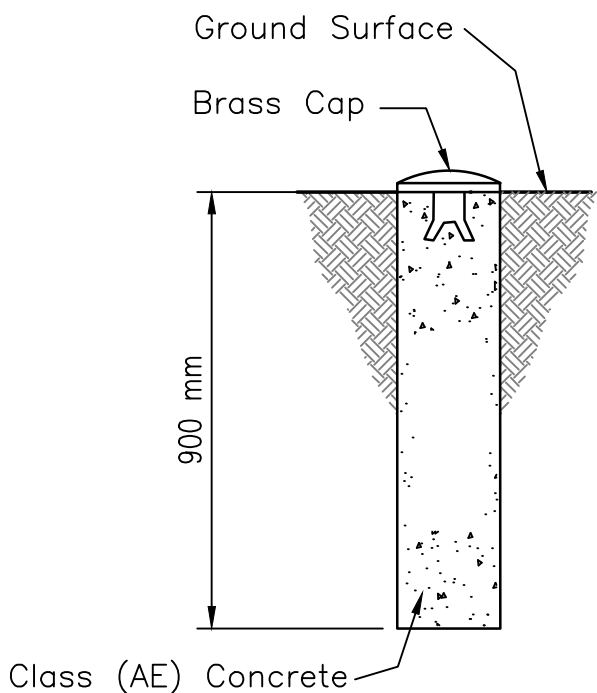


RADIUS OF CURVE (m)	APPROXIMATE SPACING (S) ON CURVE (m)	SPACING ON ADVANCE OF OR BEYOND A CURVE (m)		
		A (2S)	B (3S)	C (6S)
15	6	12	18	36
35	8	16	24	48
55	11	22	33	66
75	13	26	39	78
95	15	30	45	90
125	18	36	54	108
155	20	40	60	120
185	22	44	66	132
215	24	48	72	144
245	26	52	78	156
275	27	54	81	162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

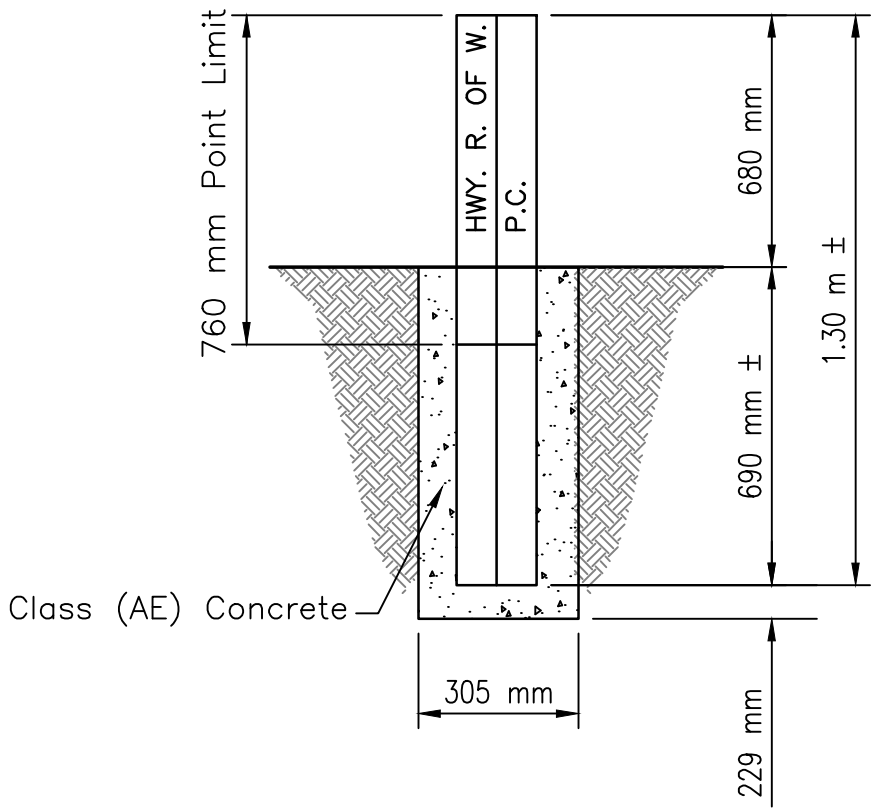
$S = 1.7 \times \sqrt{R-15}$
Spacing For Specific Radii May Be Interpolated From Table. The Spacing On Curves Should Not Exceed 90 Meters. Shaded Areas Denotes To Use 90 Meter Spacings. Delineators Should Be Spaced 60 To 160 Meters Apart On Mainline Tangent Sections.

NOTE: When Uniform Spacing Is Interrupted By Such Features As Culverts, Signs, Driveways, Intersections, Delineators Which Would Ordinarily Be Located Within The Features May Be Relocated In Either Direction For A Distance Not Exceeding One Quarter Of The Uniform Spacing. Delineators Still Falling Within Such Features May Be Eliminated.

Type "1A" Delineators
Spaced At 60 To 160 Meters



R.O.W. MONUMENT



REFERENCE MARKER

ITEM 63308-3000
TYPE 3 OBJECT MARKER

STATION	LOCATION	QTY.
10+142.159	Rt.	1
10+144.105	Lt.	1
10+155.895	Rt.	1
10+157.841	Lt.	1
TOTAL		4

GENERAL NOTES

- Survey Monument and Reference Markers Shall Be Placed As Shown on the Plans or As Directed By the AOTR/COR. The Cost of Supplying All Materials and Installation of Right-of-Way Monuments & Markers Shall Be Included in the Unit Prices Bid Under Items 62101-0000 & 62102-0000.
- Brass Caps For the Survey Monuments Shall Be Supplied By the Contractor Conforming to ASTM B584 and Shall Be Considered Incidental to Item 62101-0000.
- All Concrete Shall Be Class A(AE) and Shall Conform to Section 601 of FP-03. Furnishing and Placing of Concrete and Rebar Shall Be Considered Incidental to Items 62101-0000 & 62102-0000.
- Roadway Stationing & Elevations Shall Be Stamped on All Brass Caps By the AOTR/COR After Installation.
- The Contractor Shall Be Required to Paint the Reference Markers Per Section 708 and Subsection 708.04 of FP-03:
 - The Primer Coat Shall Conform to Subsection 708.04(A) or (B) of FP-03.
 - The White Finish Coat of Paint Shall Conform to Subsections 708.04 (C), (D), or (E) of FP-03.
 - All Letters, Numerals, Symbols, Etc. Shall Be Painted on the Reference markers Using the Dimensions Shown Using Lamp Black Paint Conforming to ASTM D 209. The Required Information to Be Placed on the Reference Markers Shall Be Furnished to the Contractor By the AOTR/COR.
- The Contractor Has the Option to Use An Approved State Paint Specification in Lieu of That Stated in Note 5 Above. The Contractor Shall Submit the Paint Specifications (in Writing) 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 Contracting Officer. Any Painting Performed by the Contractor Without the Proper Approval Shall Be Cause For the Work to Be Rejected.
- The Contractor Shall Use Glass Fiber Highway Delineators only. The Cost of Supplying Materials and Installation of U-Channel Shall Be Included in the Unit Price Bid Under Items 63308-2000, 63308-3000 & 63309-0020.
- Set R.O.W. Monuments at Stations and Offsets to Match the Right-Of-Way Plat. These Locations May Vary From the Stations and Offsets Shown on the Construction Plan and Profile Sheets.
- All Hole Drilling into Rock Material Shall Be Incidental to the Installation of R.O.W. Monuments and Reference Markers.

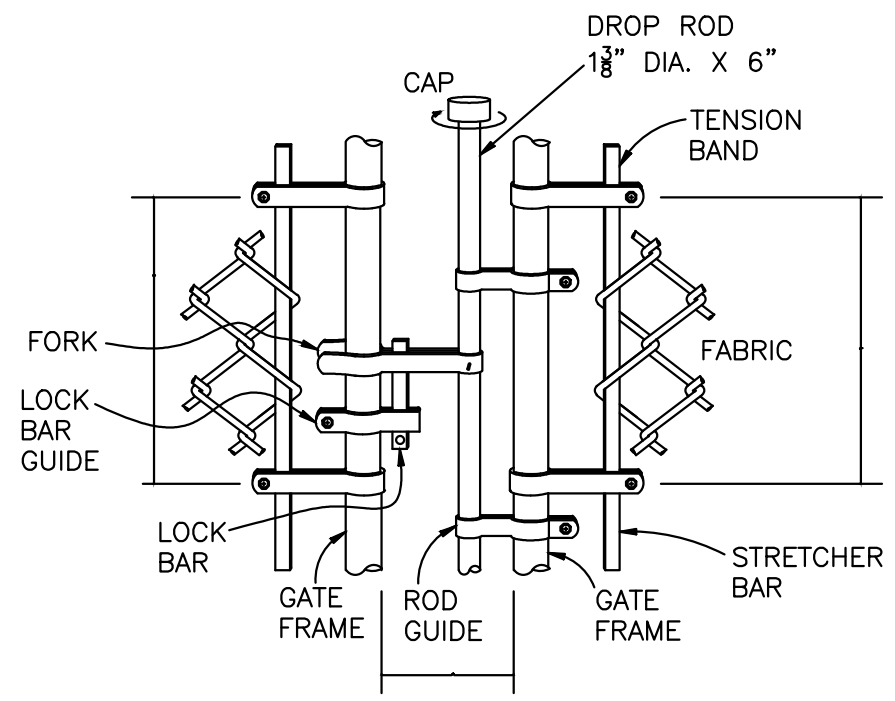
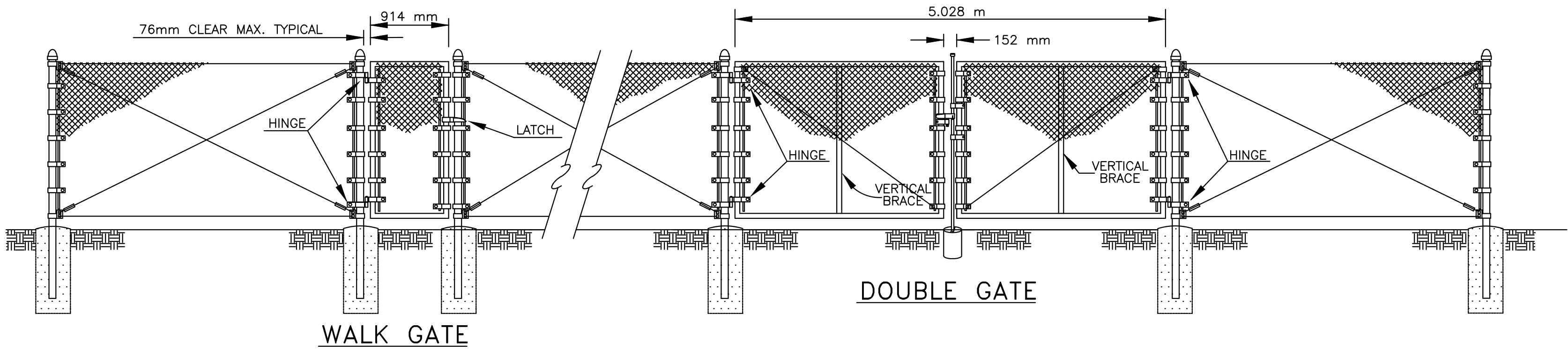
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

DELINEATOR AND ROW
MARKER DETAILS

Designed by: B.O.R.
Drawn by: TAY, rsh Date: 06/06/11
Checked by: HRC Date: 07-03
File Name: 24_Delindet



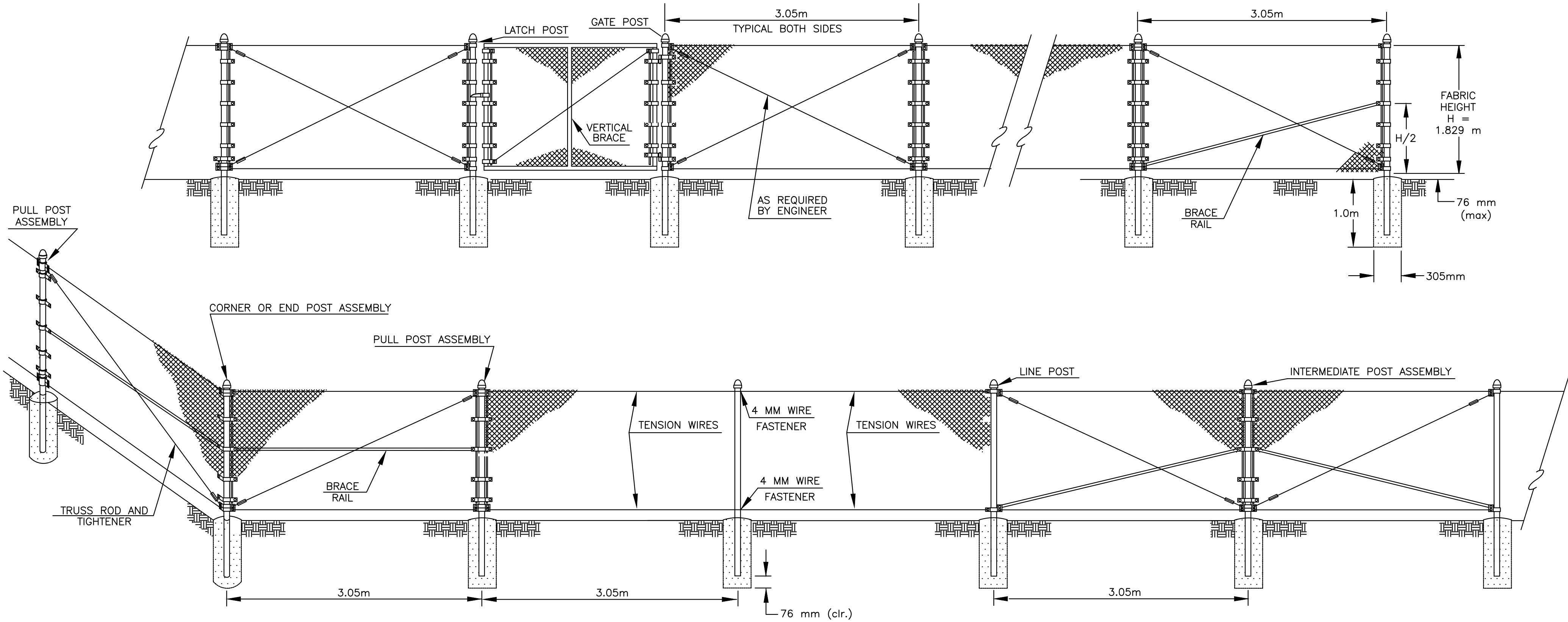
AREA	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NM	NAVAJO	N5031	N5031(1)1,2&4	25	32



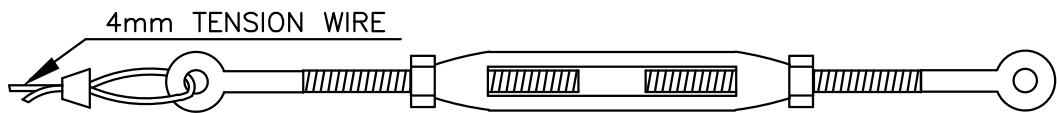
TYPICAL DROP ROD ASSEMBLY

GENERAL NOTES

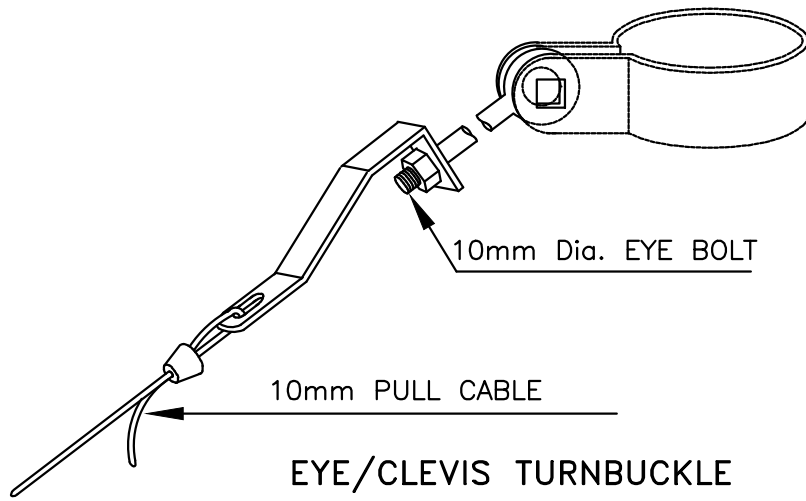
- POSTS SHALL BE ROUND PIPE, H-SECTION OR ROLL-FORMED AND SHALL CONFORM TO THE NOMINAL DIMENSIONAL REQUIREMENTS SHOWN ON THE PLANS. IN ADDITION, THE MATERIAL OF WHICH POSTS ARE FABRICATED SHALL HAVE A NOMINAL THICKNESS, BEFORE GALVANIZING, OF NOT LESS THAN 3mm.
- CHAIN LINK FABRIC SHALL BE EITHER ZINC-COATED OR ALUMINUM-COATED STEEL WIRE FENCE FABRIC. ZINC-COATED STEEL FABRIC SHALL CONFORM TO THE REQUIREMENTS OF ASTM A392, CLASS 1 COATING. ALUMINUM-COATED STEEL FABRIC SHALL CONFORM TO THE REQUIREMENTS OF ASTM A491, WITH A MINIMUM WEIGHT OF COATING OF 122 GRAMS PER SQUARE METER OF WIRE SURFACE AREA. THE FABRIC SHALL BE 3.05mm (Dia.) FOR ALL FENCE FABRIC 1829mm OR LESS IN HEIGHT AND SHALL BE 3.76mm (Dia.) FABRICS GREATER THAN 1829mm IN HEIGHT.
- TENSION WIRES SHALL BE 4.50mm (Dia.) COIL SPRING STEEL WIRE WITH A MINIMUM TENSILE STRENGTH OF 517.12 MPa, AND SHALL BE ZINC-COATED OF ALUMINUM-COATED. TENSION AND BRACE BANDS TO BE INSTALLED ON MAXIMUM OF 40mm CENTERS.
- TRUSS RODS SHALL BE 10mm DIAMETER ADJUSTABLE RODS. TRUSS TIGHTENERS SHALL HAVE A STRAP THICKNESS OF NOT LESS THAN 13mm.
- STRETCHER BARS SHALL BE 5mm BY 19mm STEEL FLAT BARS. STRETCHER BAR BANDS SHALL BE 3mm BY 25mm PREFORMED STEEL BANDS.
- BOTTOM TENSION WIRE SHALL BE 127mm FROM TOP OF CROWN ON CONCRETE FOOTINGS.
- INTERMEDIATE POST ASSEMBLIES SHALL BE SPACED AT 154m INTERVALS OR MIDWAY BETWEEN PULL POSTS WHEN THE DISTANCE BETWEEN SUCH POSTS IS LESS THAN 308m AND MORE THAN 154m.
- CHAIN LINK FENCE POST DIAMETERS SHALL BE AS FOLLOWS:
LINK POST (O.D.) = 60mm
CORNER, END, GATE, INTERMEDIATE = 73mm
LATCH, PULL POST
- NEW DOUBLE GATE ASSEMBLIES SHALL INCLUDE ALL MATERIALS AND LABOR BETWEEN AND INCLUDING THE OUTER GATE POSTS. WHEN NEW GATE ASSEMBLIES ARE A PART OF EXISTING FENCE RELOCATION, THE RESET (EXISTING) MATERIAL SHALL STOP AT AND CONNECT TO THE OUTER GATE POST. IF THE ADJOINING FENCE IS EQUIPPED WITH A BARBED WIRE TOP, INSTALL A MATCHING BARBED WIRE TOP ON THE GATE ASSEMBLY FROM OUTER GATE POST TO OUTER GATE POST INCLUDING THE GATE LEAFS. ON THE GATE LEAFS, INSTALL BARBED WIRE SUPPORTS AT BOTH GATE ENDS AND AT EACH VERTICAL BRACE. FENCING BETWEEN GATE POSTS SHALL INCLUDE TOP AND/OR BOTTOM TENSION WIRES OR TOP RAIL AS NEED TO MATCH ADJOINING FENCING.



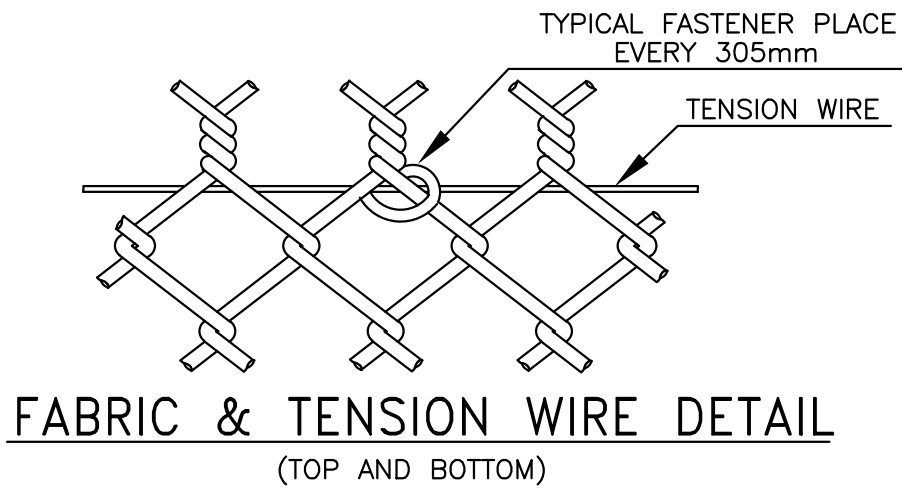
TYPICAL CHAIN LINK FENCE INSTALLATION



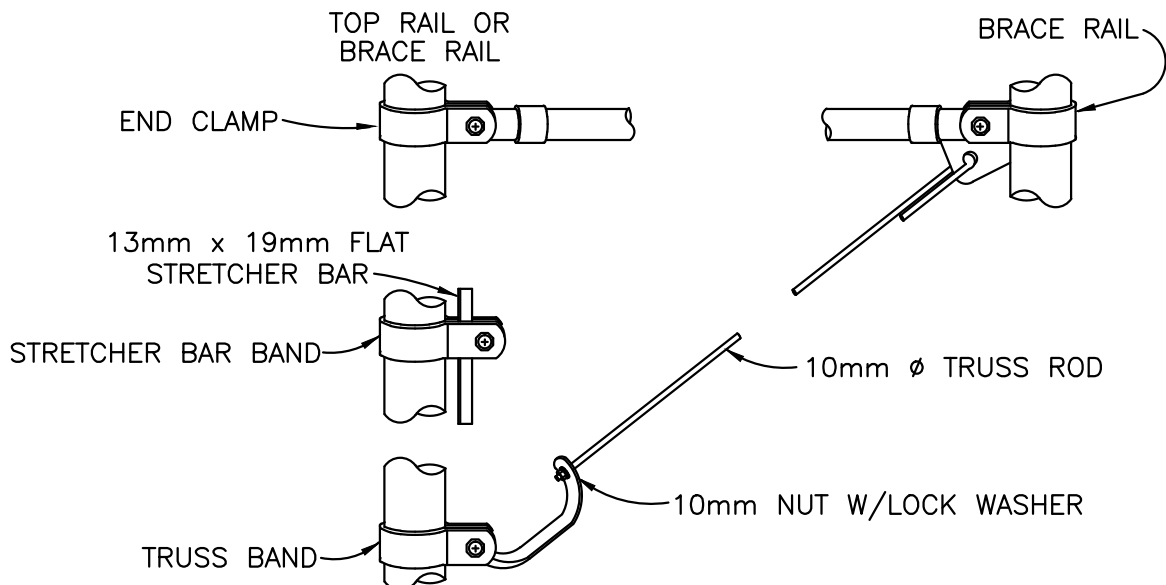
10mm EYE & EYE/TURNBUCKLE



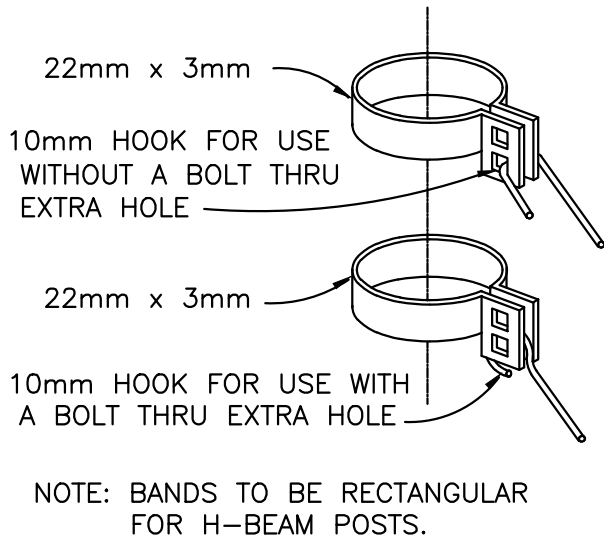
TYPICAL TENSION DEVICES



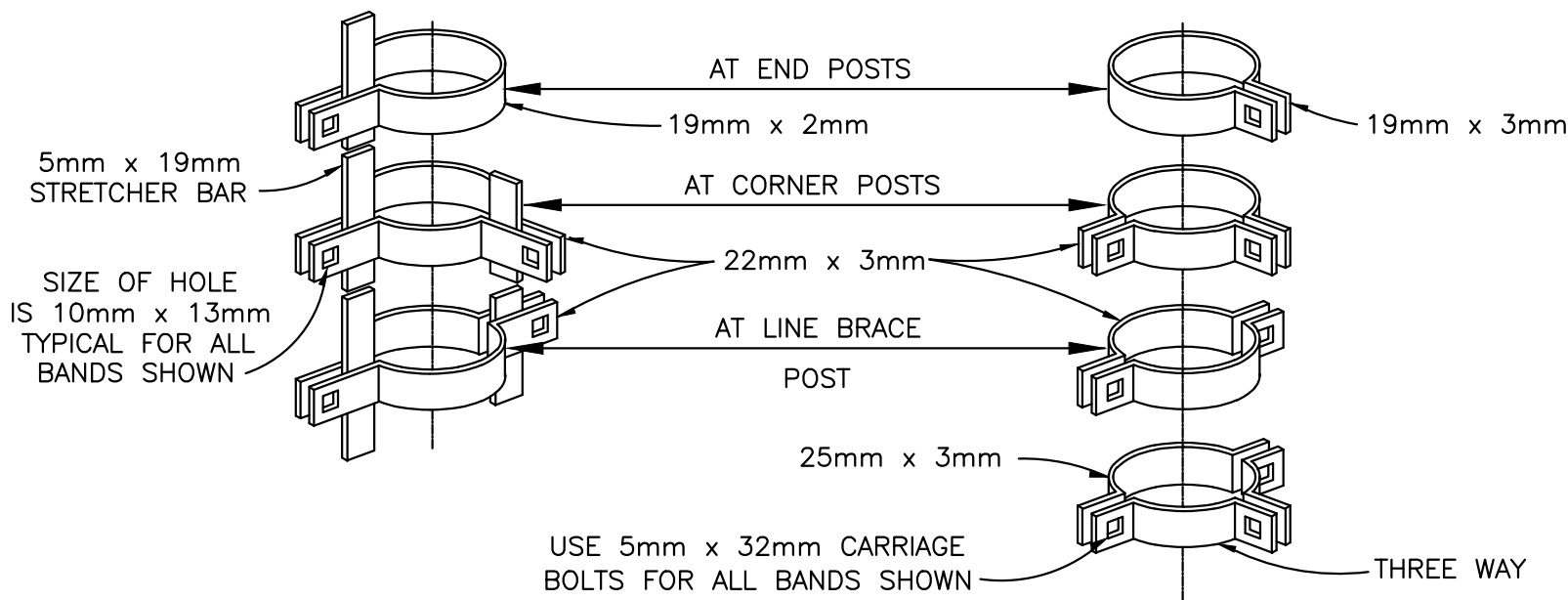
4mm WIRE FASTENER
(TOP AND BOTTOM OF POST)



GATE DETAIL



BRACE & TRUSS BANDS



TENSION BANDS

BRACE BANDS

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CHAIN LINK FENCING DETAILS

DRAWN BY: BOR DATE: 1991

DESIGNED BY: BOR DATE: 1991

REVISED: 11/11 FILENAME: 25_chain_link_fence

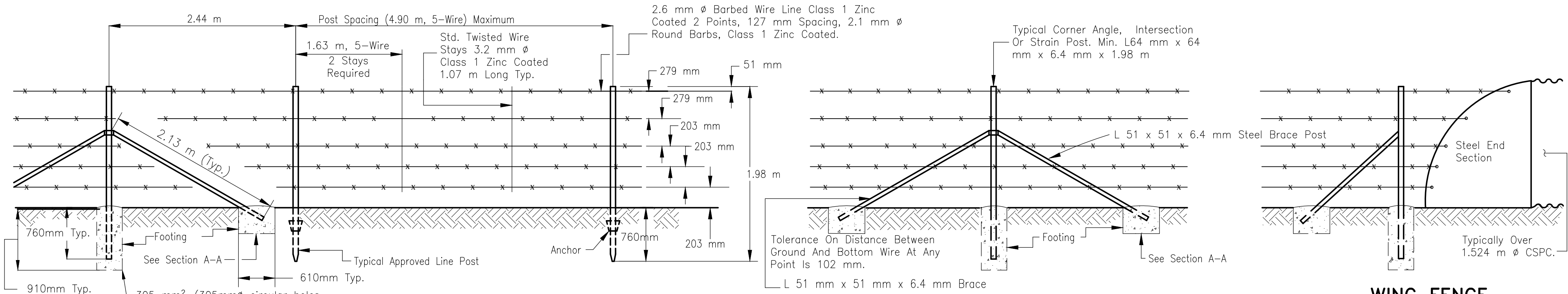
BY: STRUCT



REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	NM	Navajo	N5031	N5031(1)1,2&4	26	31

GENERAL NOTES

- CORNER, GATE, INTERMEDIATE BRACE POSTS AND LINE POSTS SHALL BE EITHER GALVANIZED OR PAINTED IN ACCORDANCE WITH AASHTO M281. METAL POST AND BRACES SHALL BE FABRICATED FROM RAIL, BILLET, OR COMMERCIAL GRADE STEEL CONFORMING WITH THE REQUIREMENT OF ASTM A702.
- LINE POSTS SHALL BE FABRICATED IN ACCORDANCE WITH AASHTO M281, AND SHALL HAVE 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.
- 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 61921-1000.
- 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-03. FURNISHING AND PLACEMENT OF CONCRETE SHALL BE INCLUDED WITH ITEM 61921-1000.
- 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.
- CONNECT ALL R.O.W. FENCING TO CATTLE GUARDS, CULVERTS (GREATER THAN 1.524m DIA.), AND CONCRETE STRUCTURES AS SHOWN ON THESE PLANS, AND/OR AS DIRECTED BY THE COR/AOTR.
- ANY CONFLICT IN PLACEMENT OF THE R/W FENCING AT DRAINAGE PIPE LOCATION, DUE TO NARROW R/W WIDTH OR OTHER CONSTRICTIONS, THE FENCE MAY BE PLACED OVER THE DRAINAGE STRUCTURE. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO ITEM 61921-1000.
- CLEARING AND GRUBBING SHALL INCLUDE SHAPING AND/OR REMOVAL OF SMALL MOUNDS NECESSARY TO PRESENT A SMOOTH UNIFORM APPEARANCE OF BOTH GROUND AND FENCING LINE. THIS WORK SHALL BE INCIDENTAL TO THE INSTALLATION OF FENCING AND NO ADDITIONAL PAYMENT SHALL BE MADE.
- ALL DRILLING INTO ROCK MATERIAL, ETC. SHALL BE INCIDENTAL TO THE INSTALLATION OF FENCING AND NO ADDITIONAL PAYMENT SHALL BE MADE.
- GATE CLOSURE DEVICE SHALL BE STEEL PIPE, NPS 3/4 (26.7 mm ϕ) SCHEDULE 40, CONFORMING TO THE REQUIREMENT OF ASTM A53. THE GATE CLOSURE STEEL CHAIN SHALL BE WELDED TO THE STEEL PIPE AND ANGLE IRON FENCE POST. THIS WORK SHALL BE INCIDENTAL TO THE INSTALLATION OF FENCING AND NO ADDITIONAL PAYMENT SHALL BE MADE.
- CONTRACTOR SHALL BE REQUIRED TO INSTALL SAG WEIGHTS WHERE VERTICAL CLEARANCE BETWEEN THE BOTTOM WIRE AND NATURAL GROUND IS 610mm OR GREATER. THIS WORK SHALL BE INCIDENTAL TO THE INSTALLATION OF FENCING.
- TIE WIRE, WIRE FASTENERS OR WIRE CLIPS FOR FASTENING BARBED AND WOVEN FABRIC FENCING TO THE STEEL POSTS SHALL BE 3.0mm DIA. STEEL WIRE, CLASS 1 (ZINC COATED), SOFT TEMPER AND MEET THE REQUIREMENTS OF ASTM A641. FURNISHING AND PLACEMENT OF FASTENERS SHALL BE INCLUDED WITH ITEM 61921-1000.

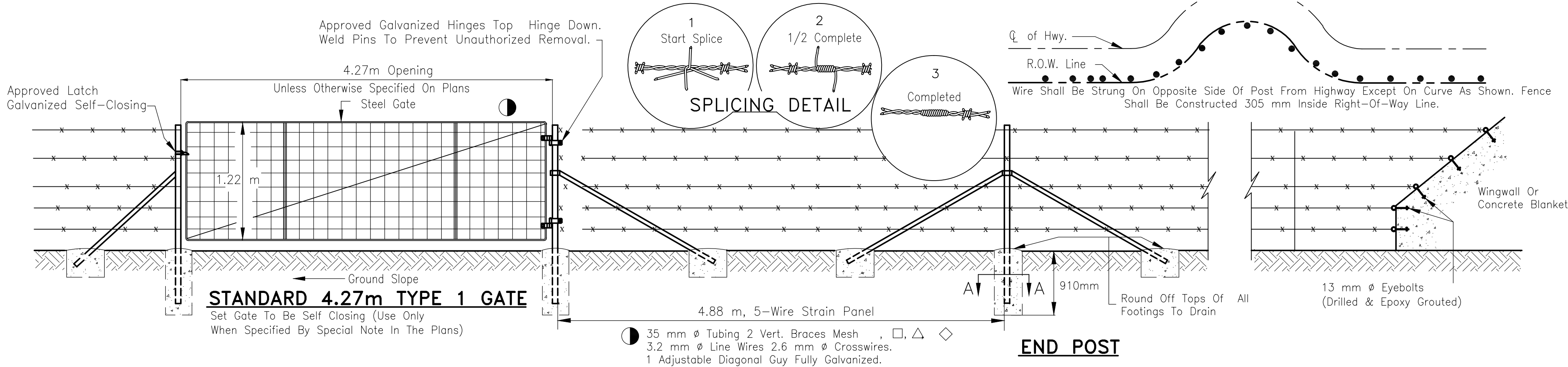


STANDARD 5 LINE GALVANIZED BARBED WIRE PANEL

STANDARD STRAIN POST

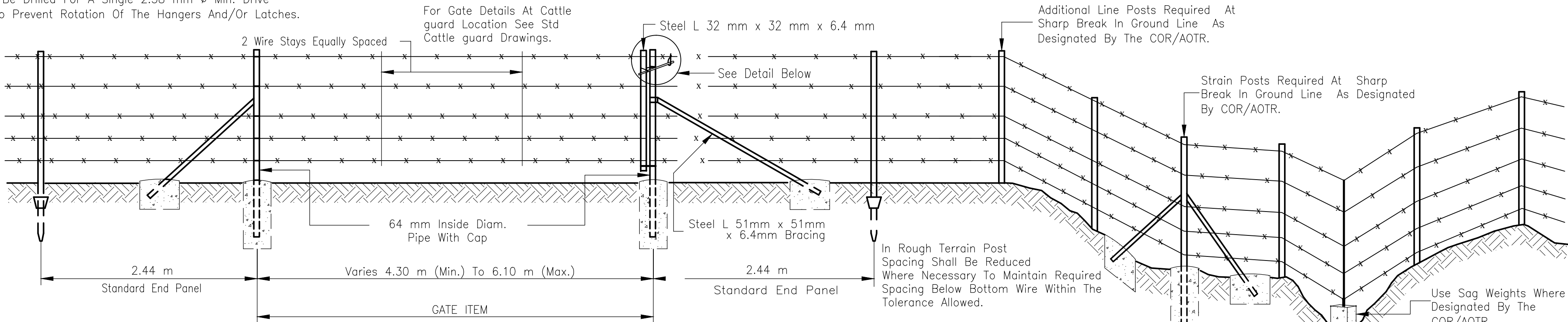
WING FENCE

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



END POST

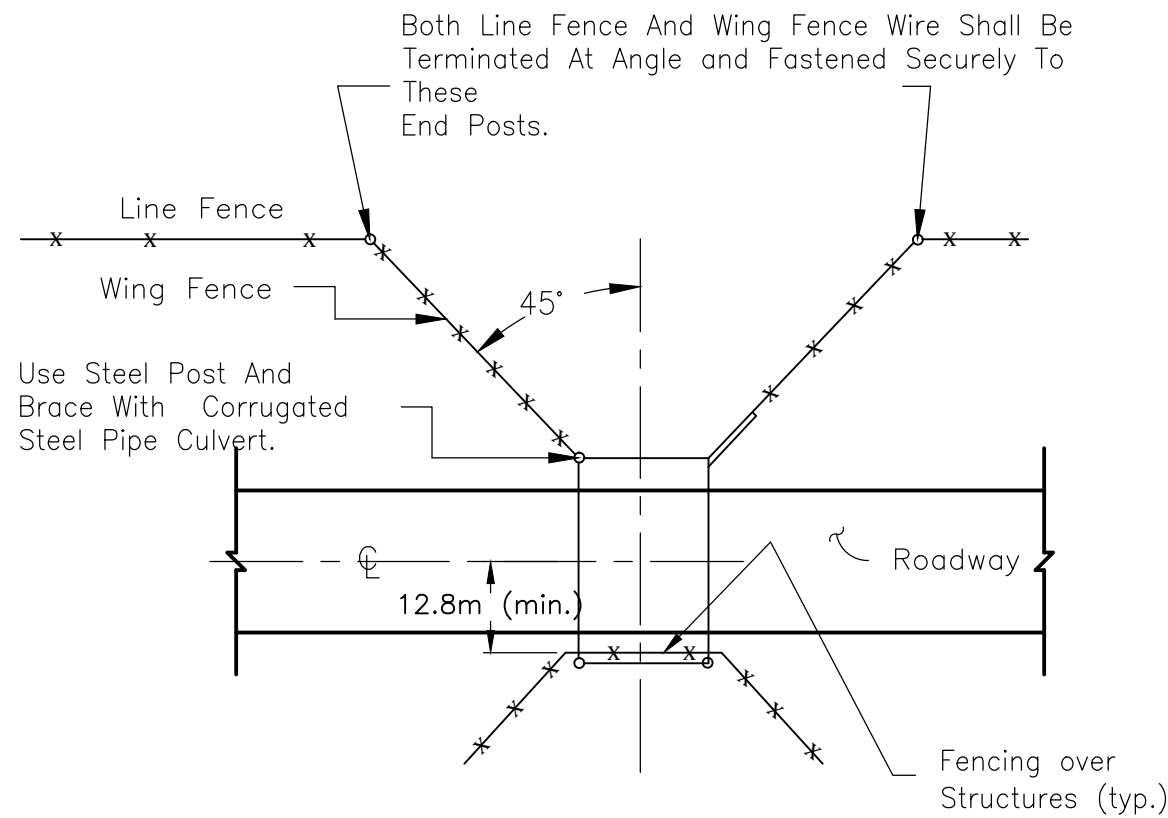
NOTE: When Tubular Post Hangers And/Or Latches Are Used, It Shall Be Drilled For A Single 2.38 mm ϕ Min. Drive Pin To Prevent Rotation Of The Hangers And/Or Latches.



STANDARD TYPE-2 GATE

Use At Locations Noted On Plans

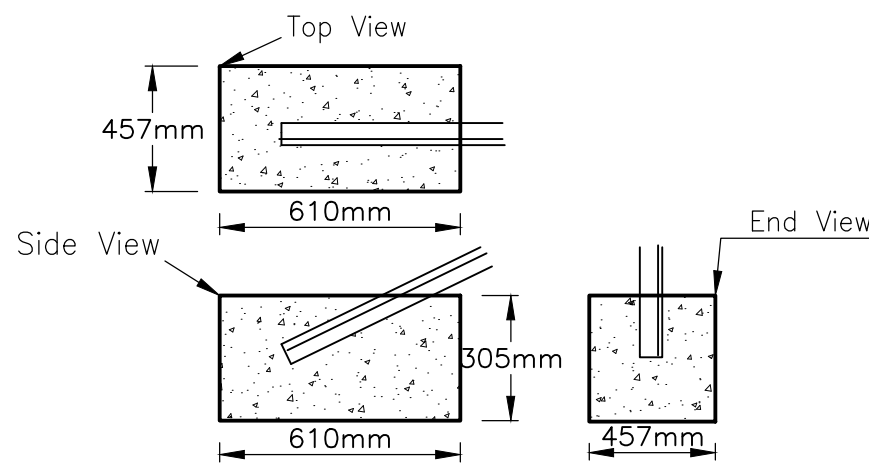
FENCE PROFILE IN ROUGH TERRAIN



WING FENCE DETAIL

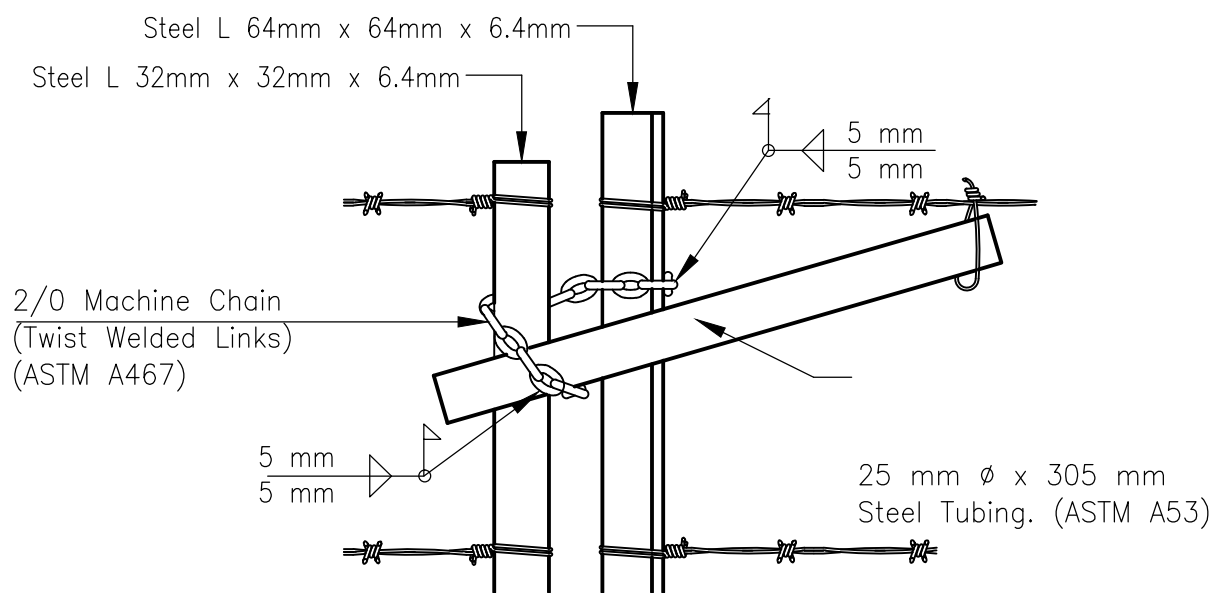


TYPICAL STEEL POST SECTION

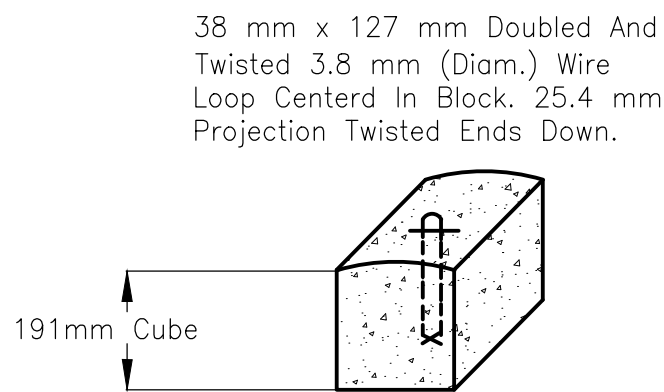


SECTION A-A

Concrete Footing of Corner Metal Posts with Bracing

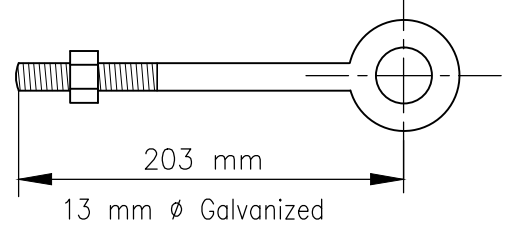


GATE SECURING DETAIL



CONCRETE SAG WEIGHT DETAIL

Min. Weight Of Concrete Sag Shall Be 16 kg.



EYE BOLT DETAIL

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NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

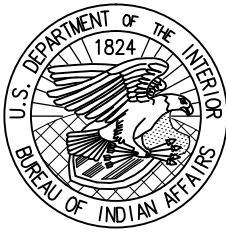
FENCING DETAILS

Designed by: NRDOT

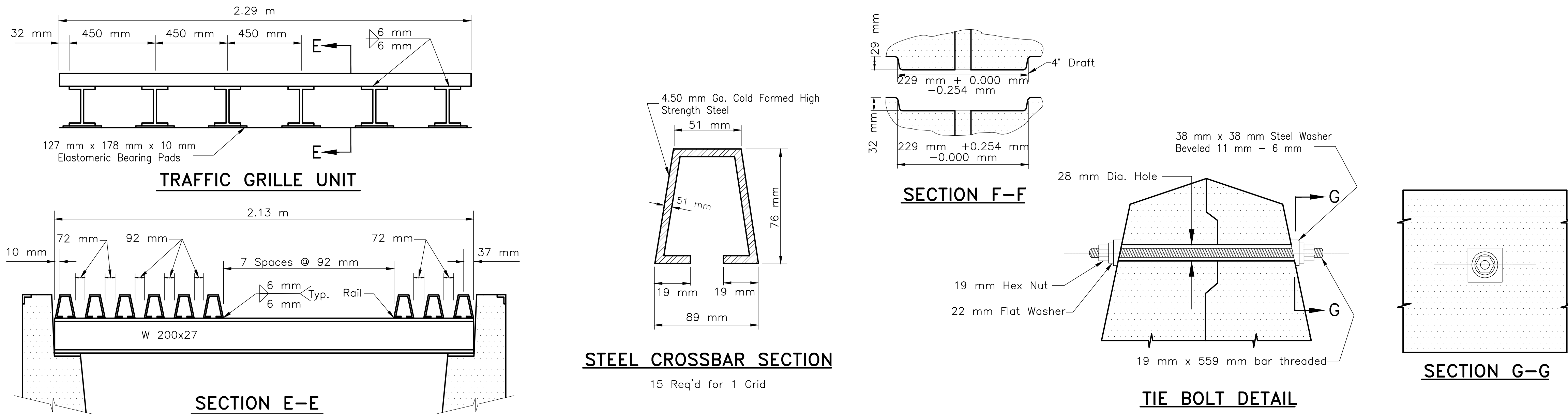
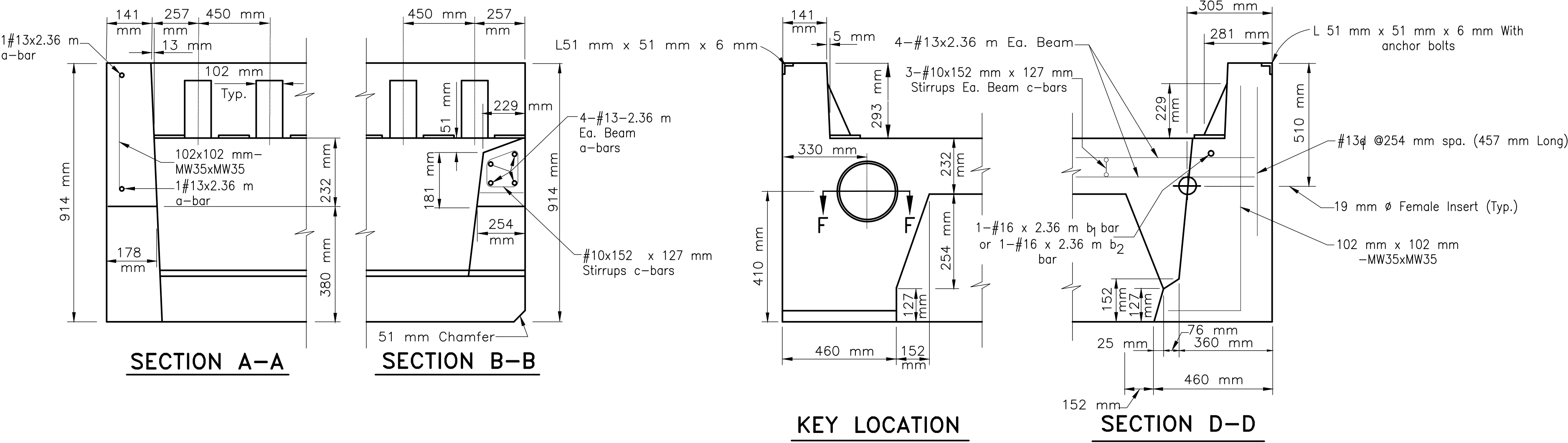
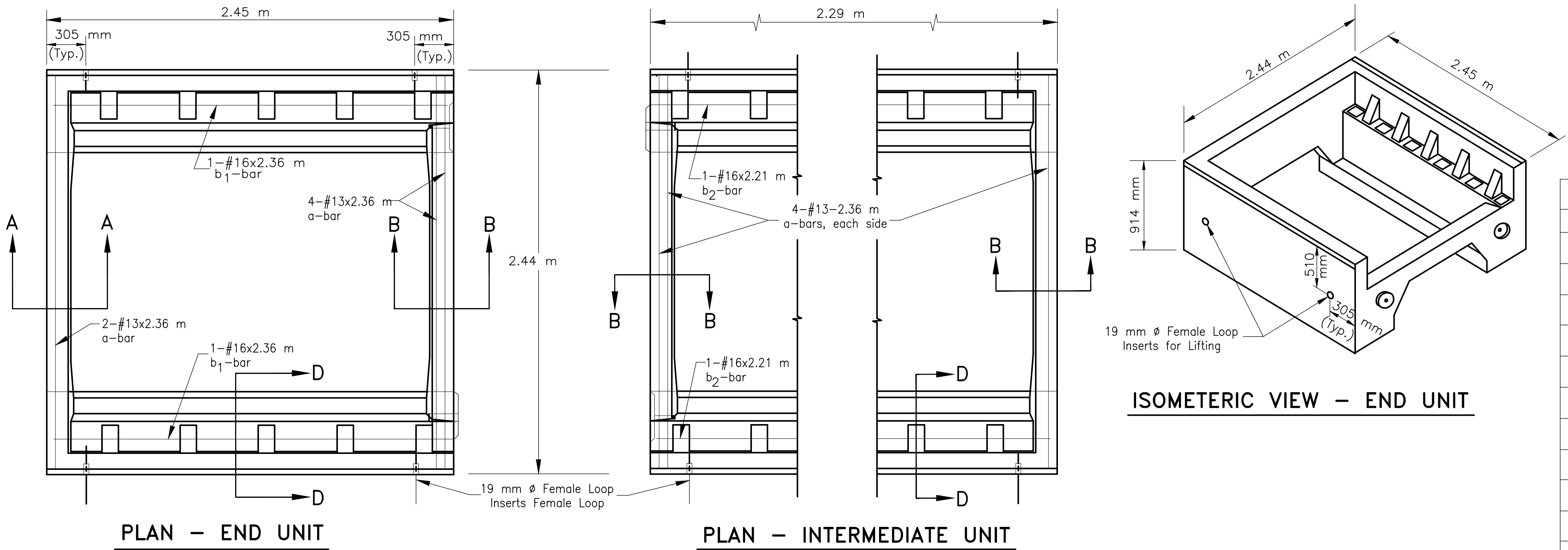
Drawn by: DESIGN2 Date: 01/01

Checked by: HRC Date: 07-03

File Name: 26_BARBWIREfence



REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	NM	Navajo	N5031	N5031(1)1,2&4	27	31



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PRECAST CONCRETE
CATTLEGUARD DETAILS

Designed by: BOR – Structural Unit
Drawn by: TAY Date: 07-03
Checked by: HRC Date: 07-03
File Name: 27_CTGRD1

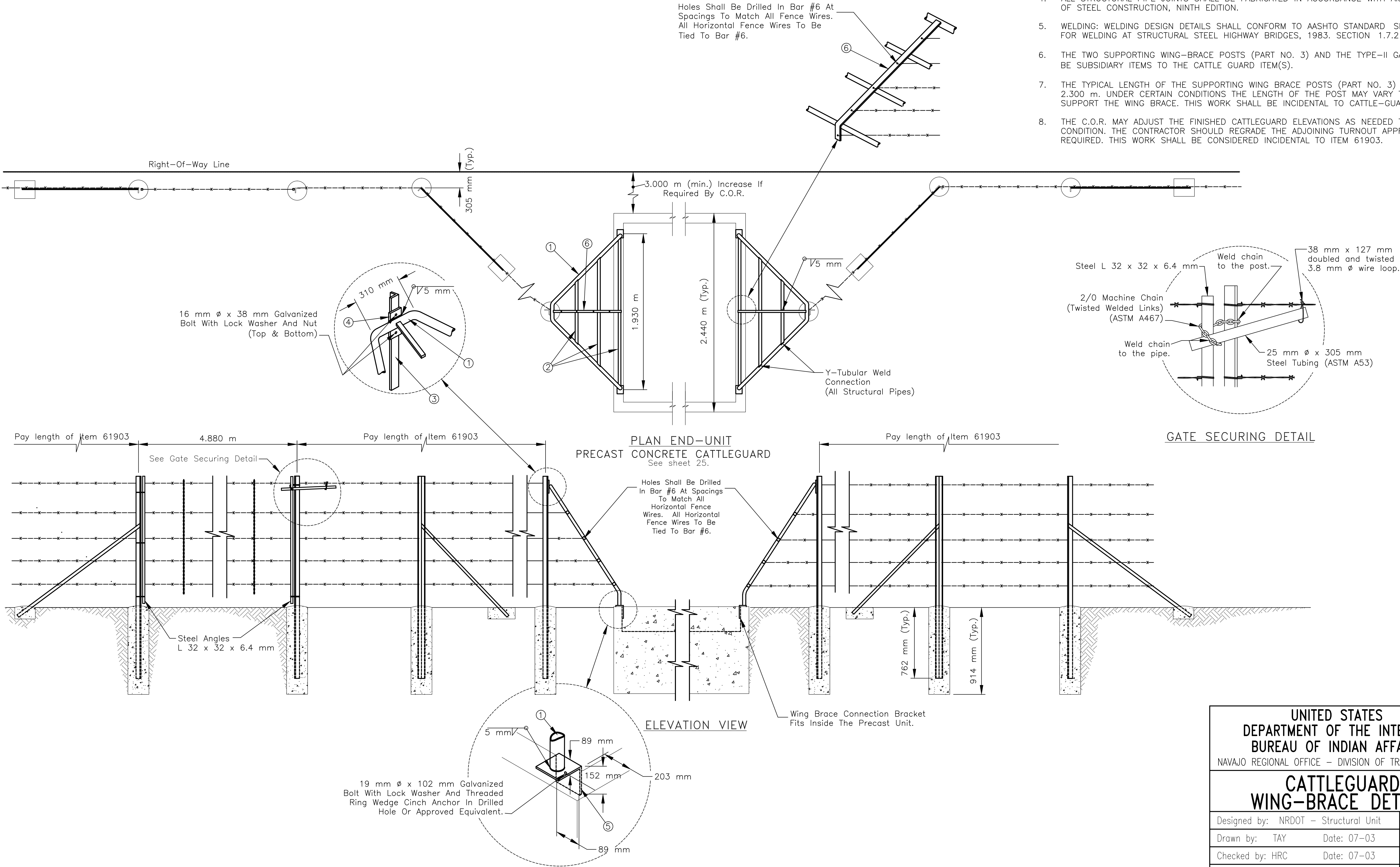
REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	NM	Navajo	N5031	N5031(1)1,2&4	28	31

ESTIMATED MATERIAL LIST

PART NO.	MATERIAL	SIZE AND THICKNESS	LENGTH	QUANTITY
1	Structural Steel Pipe (sch 40)	64 mm Ø Nominal	4.23 m	2
2	Structural Steel Pipe (sch 40)	32 mm Ø Nominal	4.19 m	2
3	Steel Angle (See Note 6 & 7)	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		

GENERAL NOTES

- STRUCTURAL PIPE SHALL CONFORM TO ASTM A53 – 93A, GRADE B. ALL OTHER STRUCTURAL STEEL SHALL CONFORM TO ASTM-A36.
- BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111 (ASTM A123).
- ALL WING-BRACE STRUCTURAL STEEL PIPE SHALL RECEIVE ONE (1) PRIMER COAT, ONE (1) INTERMEDIATE COAT AND ONE (1) FINISH COAT IN ACCORDANCE WITH SECTION 563, PAINT SYSTEM 2, OF THE FP-03.
- ALL STRUCTURAL PIPE JOINTS SHALL BE FABRICATED IN ACCORDANCE WITH AISC MANUAL OF STEEL CONSTRUCTION, NINTH EDITION.
- WELDING: WELDING DESIGN DETAILS SHALL CONFORM TO AASHTO STANDARD SPECIFICATIONS FOR WELDING AT STRUCTURAL STEEL HIGHWAY BRIDGES, 1983. SECTION 1.7.21.
- THE TWO SUPPORTING WING-BRACE POSTS (PART NO. 3) AND THE TYPE-II GATE SHALL BE SUBSIDIARY ITEMS TO THE CATTLE GUARD ITEM(S).
- THE TYPICAL LENGTH OF THE SUPPORTING WING BRACE POSTS (PART NO. 3) SHALL BE 2.300 m. UNDER CERTAIN CONDITIONS THE LENGTH OF THE POST MAY VARY TO FULLY SUPPORT THE WING BRACE. THIS WORK SHALL BE INCIDENTAL TO CATTLE-GUARD ITEM.
- THE C.O.R. MAY ADJUST THE FINISHED CATTLEGUARD ELEVATIONS AS NEEDED TO FIT FIELD CONDITION. THE CONTRACTOR SHOULD REGRADE THE ADJOINING TURNOUT APPROACHES AS REQUIRED. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO ITEM 61903.



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CATTLEGUARD
WING-BRACE DETAILS

Designed by: NRDOT – Structural Unit

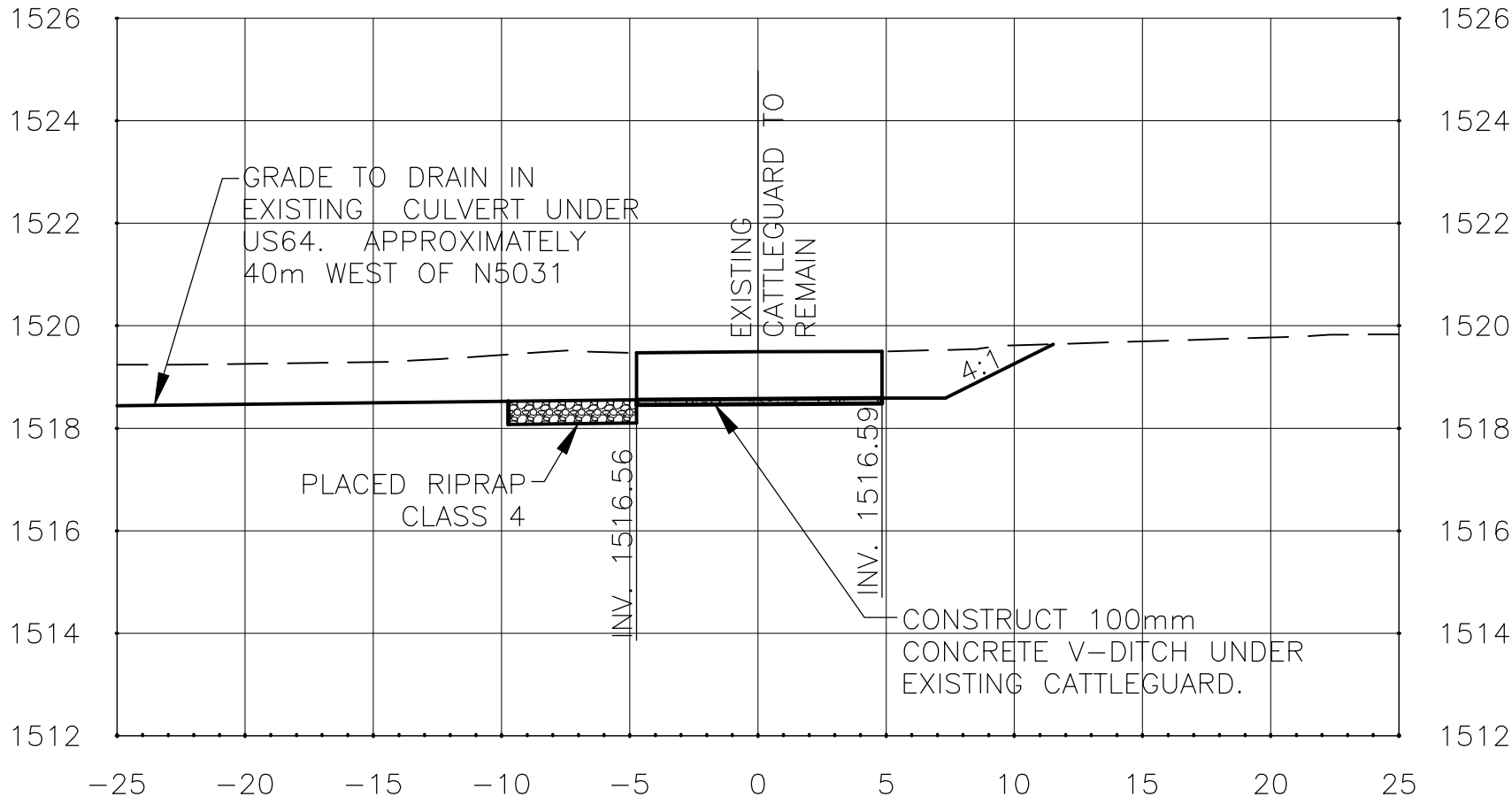
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Checked by: HRC Date: 07-03

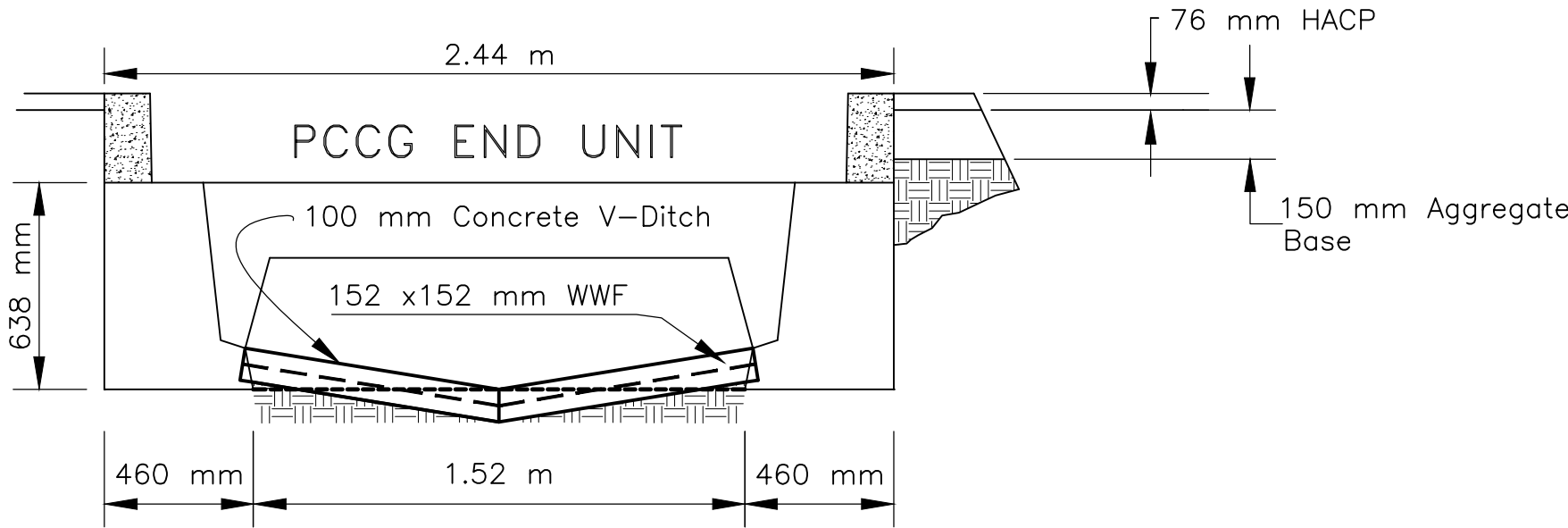
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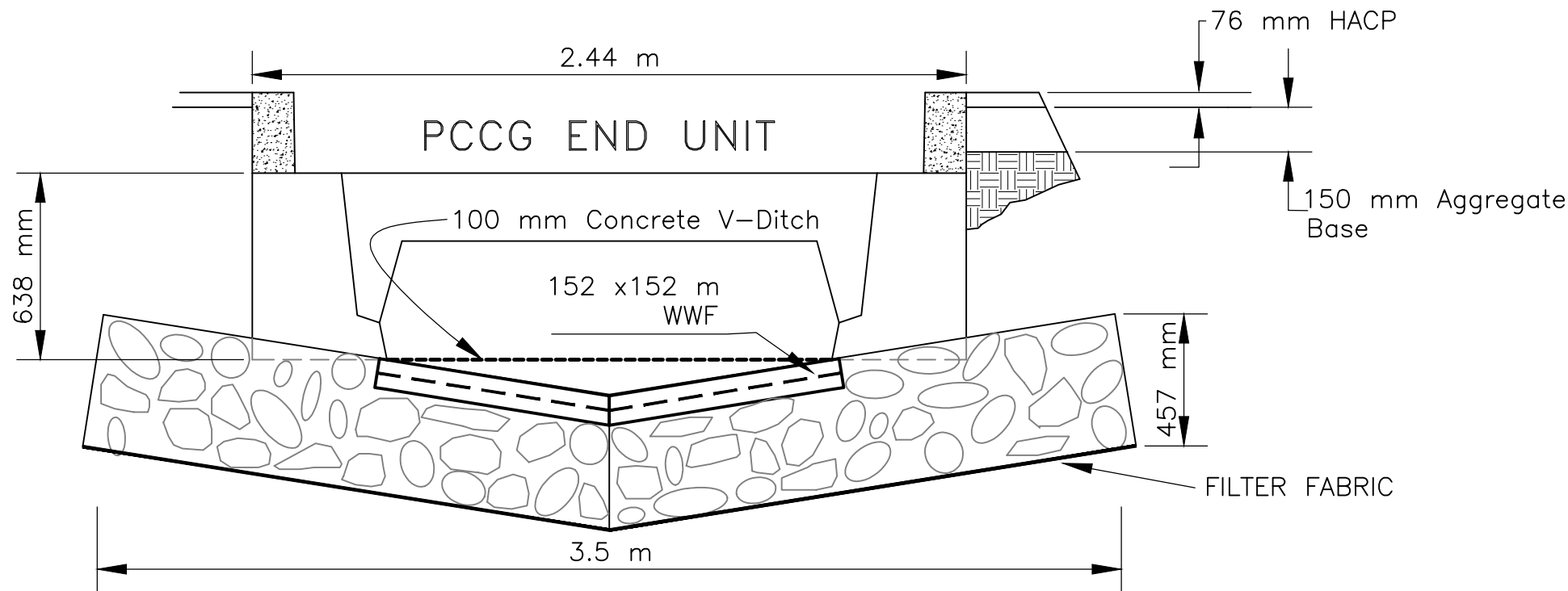
REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	NM	Navajo	N5031	N5031(1)1,2&4	29	31



CATTLEGUARD CROSS SECTION DETAILS
10+006.969



SIDE VIEW – INLET



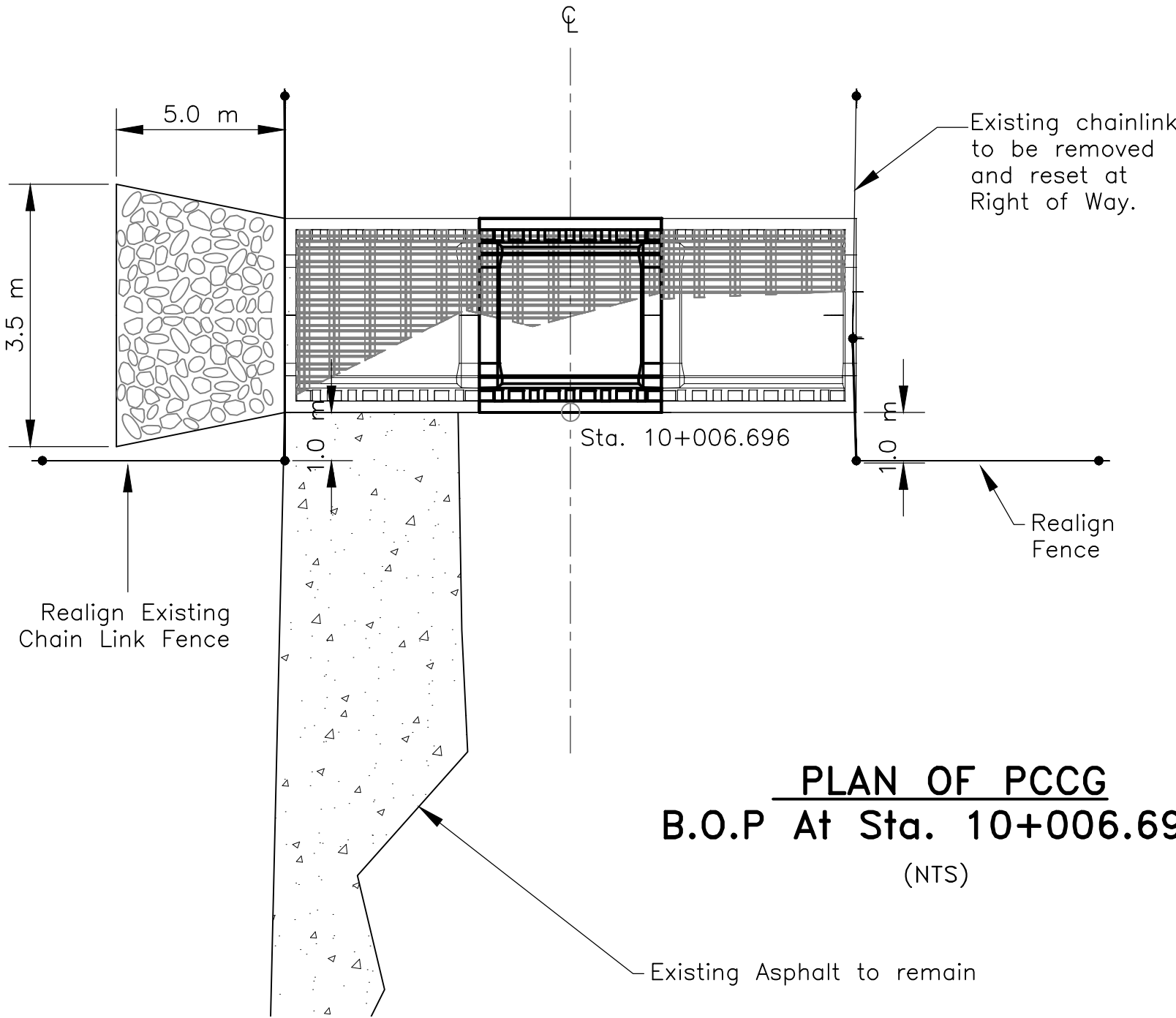
SIDE VIEW – OUTLET

ITEM 60101-0000: CONCRETE

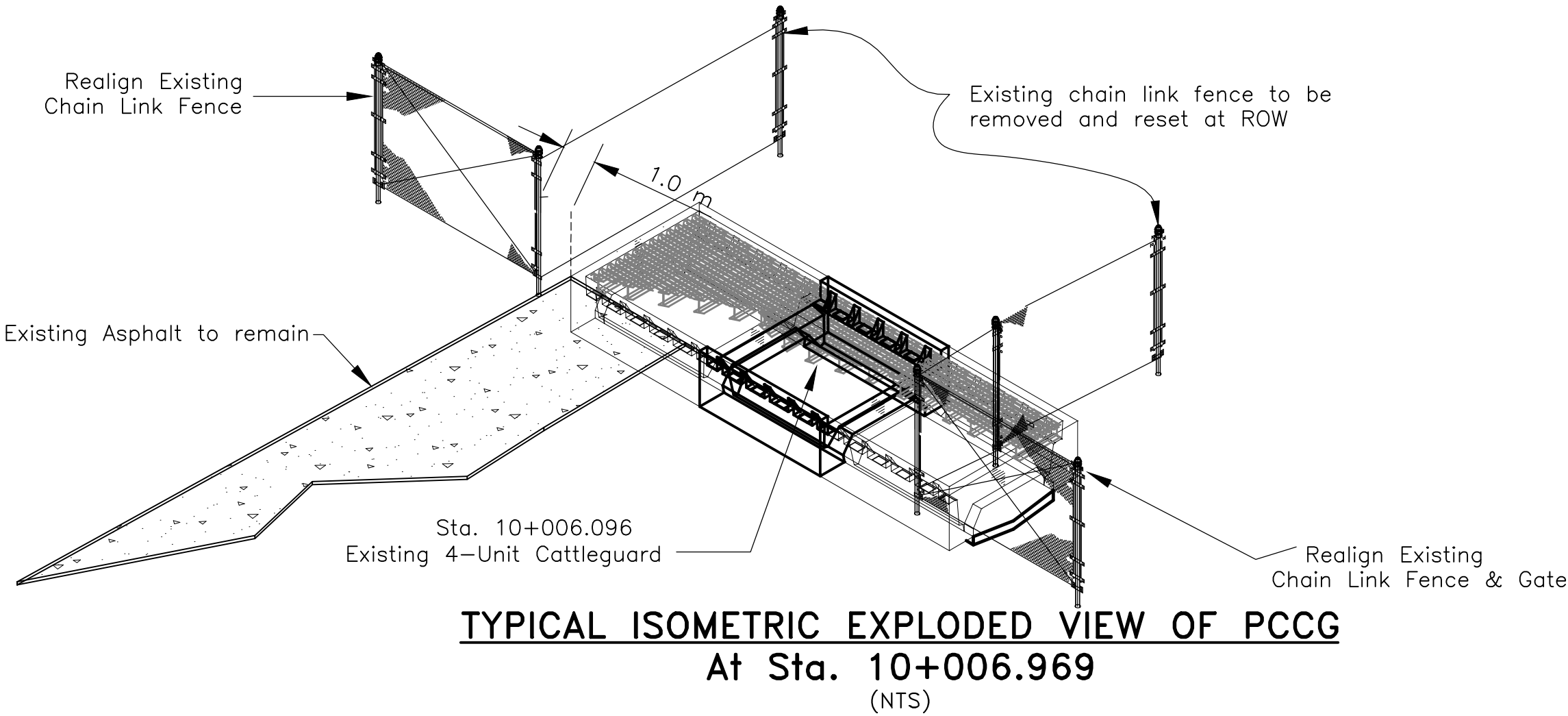
LOCATION	No. OF PCCG UNITS	LENGTH OF PAD (m)	TOTAL CONCRETE VOLUME (m³)	TOTAL Wt. of WWF @ 2 kg/m² (kg)
0+839.50 – Mainline	4	9.573	1.45	29.10
TOTAL...			1.45	29.10

ITEM 25101-4000: PLACED RIPRAP, CLASS 4

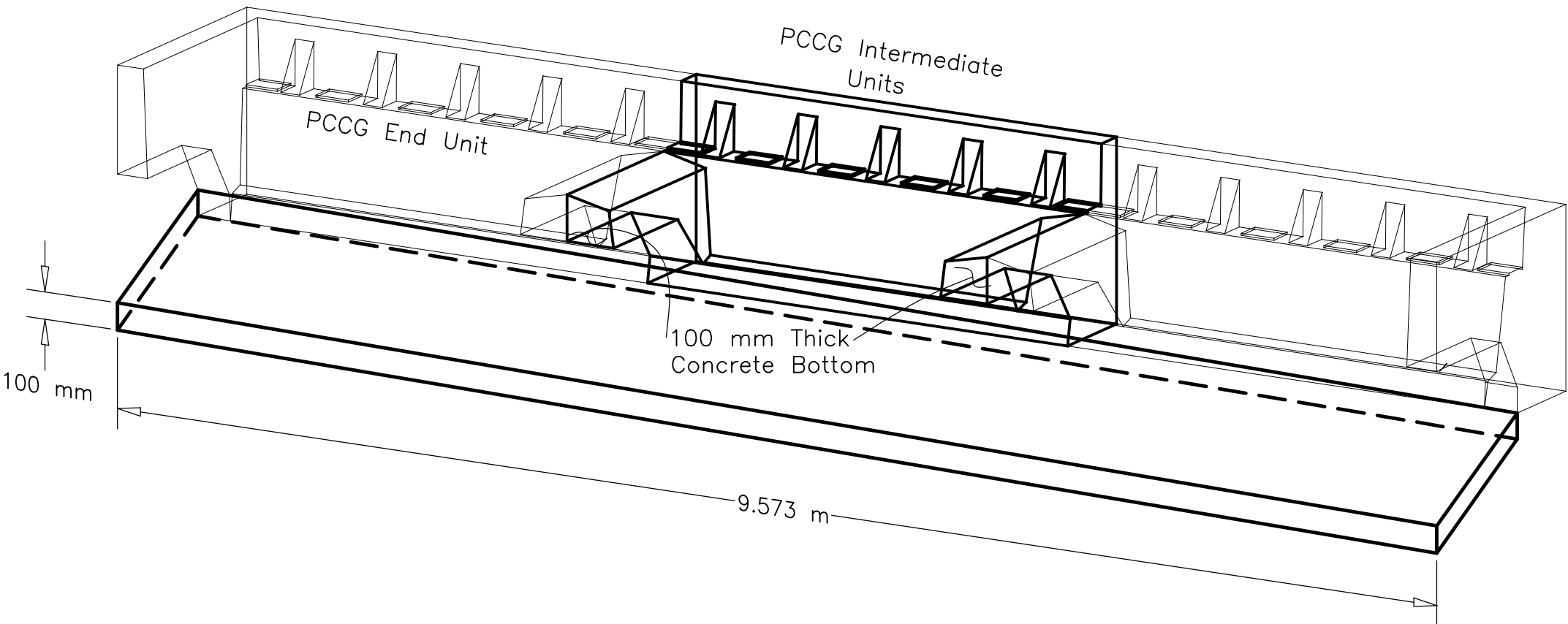
LOCATION	LENGTH (m)	WIDTH (m)	THICKNESS (m)	TOTAL VOLUME (m³)
0+839.50 – Rt.	5.00	3.5	0.457	7.99
TOTAL...				7.99



PLAN OF PCCG
B.O.P At Sta. 10+006.696
(NTS)



TYPICAL ISOMETRIC EXPLODED VIEW OF PCCG
At Sta. 10+006.969
(NTS)



TYPICAL ISOMETRIC SECTION VIEW
PCCG & CONCRETE BOTTOM
(NTS)

GENERAL NOTES

- WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS (FP-03), ALONG WITH THE SUPPLEMENTAL SPECIFICATIONS FOR THIS PROJECT.
- ALL CONCRETE SHALL BE CLASS A(AE) WITH CLASS 1 FINISH. CHAMFER ALL EXPOSED EDGES 19 mm. ALL CONCRETE SHALL CONFORM TO SECTION 552 & 601 OF THE FP-03. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF $F'_c = 20.7 \text{ MPa}$ IN 28 DAYS.
- REINFORCING STEEL SHALL CONFORM TO AASHTO SPECIFICATION M31M ASTM A 615M, GRADE 280, AND SECTION 554 OF FP-03. ALL BEND DIMENSIONS FOR REINFORCING STEEL SHALL BE OUT TO OUT OF BARS. ALL REINFORCING STEEL SHALL HAVE 51 mm CLEARANCE COVER UNLESS OTHERWISE NOTED. ALL REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO COMPLETION OF STRUCTURE.
- IN NO CASE SHALL ANY BACKFILL BE PLACED UNTIL THE CONCRETE HAS ATTAINED A COMPRESSIVE STRENGTH OF 17.2 MPa.
- ALL STRUCTURE EXCAVATIONS SHALL BE DONE TO NEAT LINES AND WILL BE CONSIDERED INCIDENTAL TO COMPLETION OF THE STRUCTURE.
- FOOTINGS SHALL BE PLACED TO THE ELEVATIONS SHOWN. IF UNSUITABLE MATERIAL IS FOUND AT THE FOOTING LOCATION AND ELEVATIONS, THE MATERIAL SHALL BE REMOVED AND REPLACED WITH APPROVED STRUCTURAL BACKFILL AS DETERMINED BY THE COR/AOTR ALL STRUCTURAL BACKFILL SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY AS DETERMINED BY AASHTO T99 METHOD C, BEFORE AND AFTER FOOTINGS ARE PLACED. THE STRUCTURAL BACKFILL MATERIAL SHALL CONFORM TO SECTION 208 AND 209 OF THE FP-03.
- THE CONTRACTOR WILL BE REQUIRED TO MAKE FIELD ADJUSTMENTS AS DIRECTED BY THE COR/AOTR TO MATCH FIELD CONDITIONS. THESE ADJUSTMENTS SHALL BE CONSIDERED INCIDENTAL TO COMPLETION OF PROJECT AND NO ADDITIONAL PAYMENT SHALL BE MADE.
- SLOPES RESHAPING, CLEANING, AND EXCAVATION SHALL BE DONE IN ACCORDANCE WITH THE PLANS AND AS DETERMINED BY THE COR/AOTR ANY WASTE MATERIAL SHALL BE USED AS BORROW WHERE NEEDED IN OTHER PROJECT LOCATION AS DESIGNATED AND APPROVAL BY THE COR/AOTR ALL EXCAVATION, CLEANING, AND RESHAPING SHALL BE CONSIDERED INCIDENTAL TO COMPLETION OF THE STRUCTURE.

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CONCRETE DRAINAGE PAD
DETAILS FOR PCCG

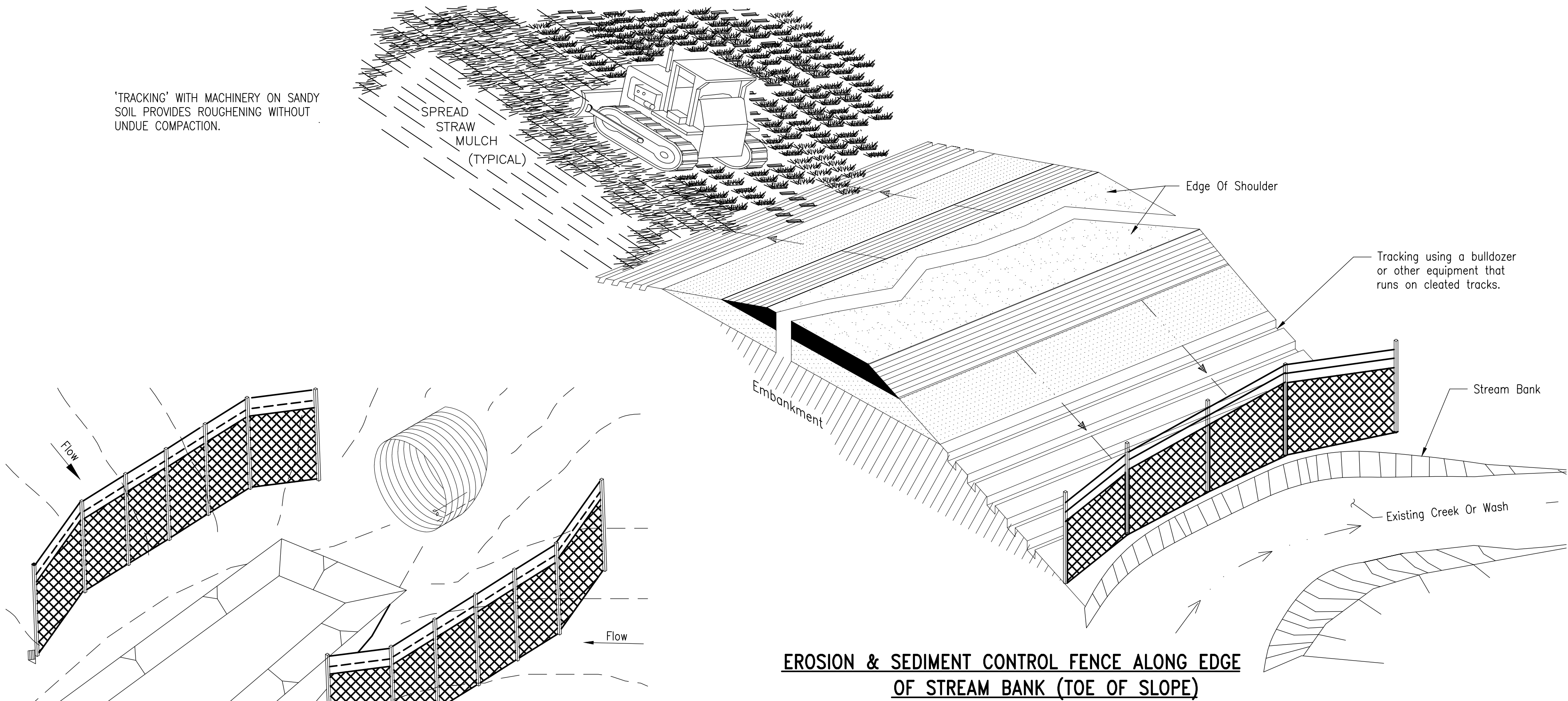
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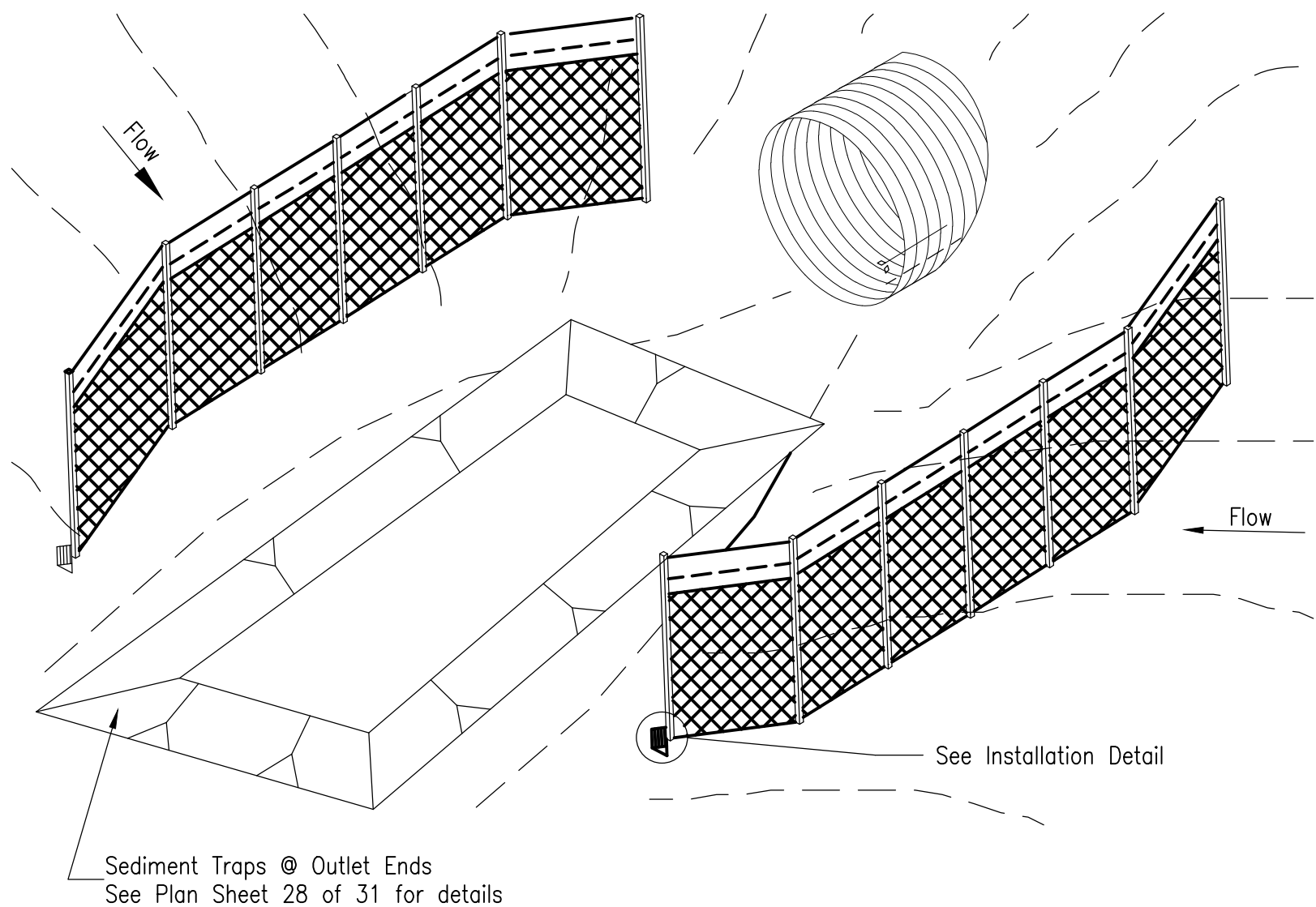
REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	NM	Navajo	N5031	N5031(1)1,2&4	30	31

GENERAL NOTES

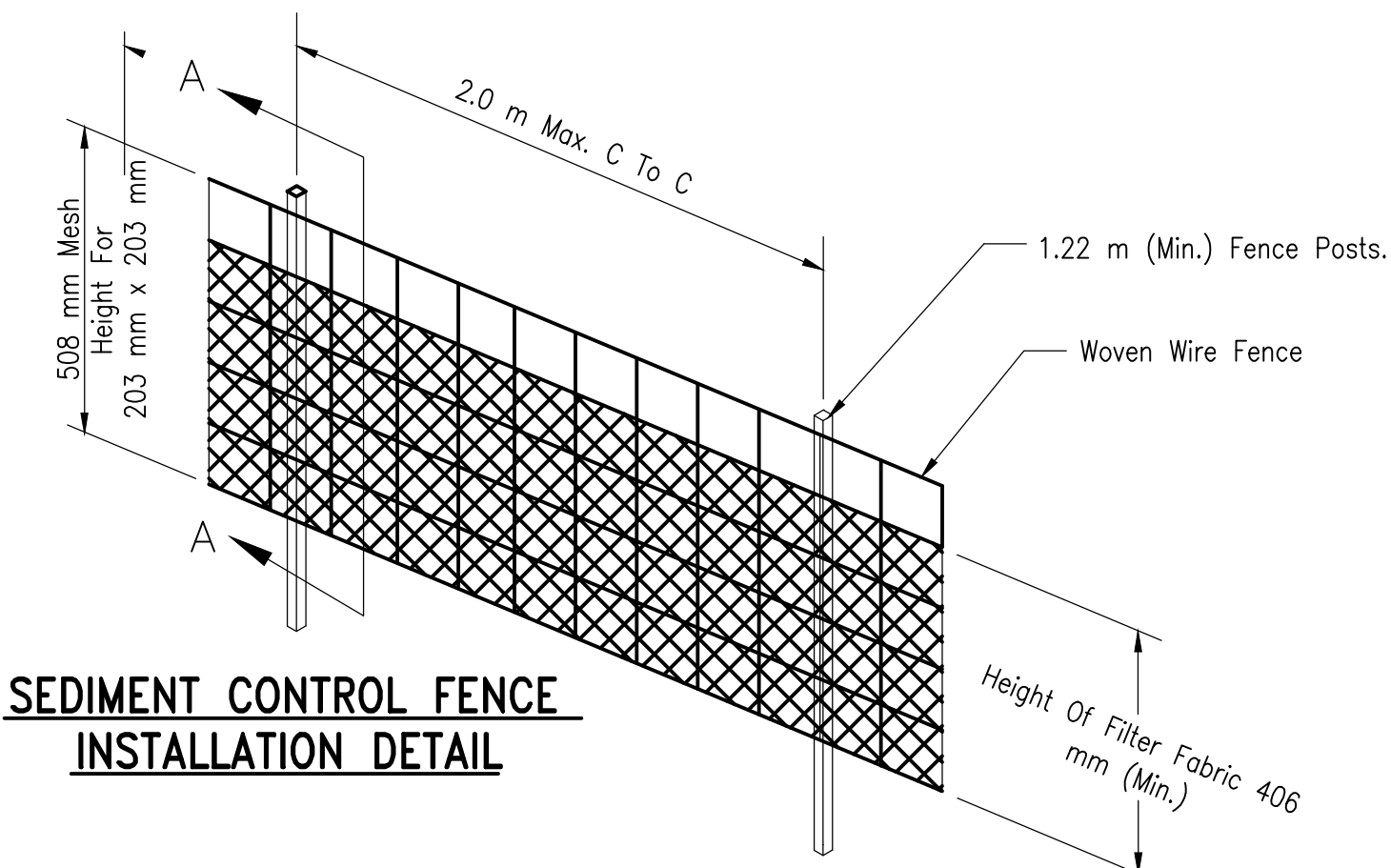
1. THE CONTRACTOR SHALL PREPARE AND SUBMIT A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IN FULL DETAIL FOR ALL PHASES OF THE WORK FOR REVIEW AND APPROVAL AT LEAST 14 CALENDAR DAYS BEFORE IMPLEMENTATION. THE PLAN SHALL MEET THE REQUIREMENTS HEREIN AND SECTION 157 OF THE FP-03 AS MODIFIED IN THE SUPPLEMENTAL SPECIFICATION. SEE SPECIAL CONTRACT REQUIREMENTS FOR NPDES PERMIT REQUIREMENTS.
2. THE SILT FENCING CONSISTS OF 914mm SEDIMENT CONTROL FABRIC CLOTH WITH BURIED-TOE, AND STEEL POSTS (TEE OR U TYPE) SPACED AT 2.00 m WITH 2mm 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 610mm AT THE TOP AND MID-SECTION. GEOTEXTILE MATERIAL FOR SILT FENCING SHALL BE TYPE-V UNDER SUB-SECTION 714.01 OF FP-03.
4. WHEN TWO SECTION OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY 152mm AND FOLDED. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOPING IN THE SILT FENCE.
5. THE SILT FENCE SHALL BE INSTALLED ALONG THE ROADWAY DITCHES, ALONG THE BOTTOM OF ALL EMBANKMENT FILLS THAT ARE WITH 2.0 M OF EXISTING STREAMS, CREEKS, OR WASHES, AND IN AREAS WITH HIGHLY EROSION SOILS. SILT FENCES TO BE PLACED 1-2 METERS TOWARD THE R/W LINES FROM THE BASE OF FILL SLOPES 1:3 OR STEEPER IN ACCORDANCE WITH SECTION 157 OF FP-03 AND THE SUPPLEMENTAL SPECIFICATION.
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 51mm X 51mm X 1.22 M. WOOD STAKES (TWO PER BALE) ANCHORED 508mm 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. 25mm OF MOISTURE IN 24 HOURS).
10. PRIOR TO ACCEPTANCE, ALL PROJECT AREAS (AS DETERMINED BY THE P&D BRANCH CHIEF) SHOWING EROSION DAMAGE CAUSED BY THE CONTRACTOR'S FAILURE TO PROPERLY MAINTAIN THE EROSION CONTROL STRUCTURES SHALL BE REPAIRED. ANY SPECIFIED EROSION CONTROL MATERIALS, STRUCTURES, OR DEVICES DAMAGED OR LOST DUE TO IMPROPER MAINTENANCE, SHALL ALSO BE REPAIRED AND/OR REPLACED PRIOR TO FINAL ACCEPTANCE AT THE CONTRACTOR'S ENTIRE EXPENSE.



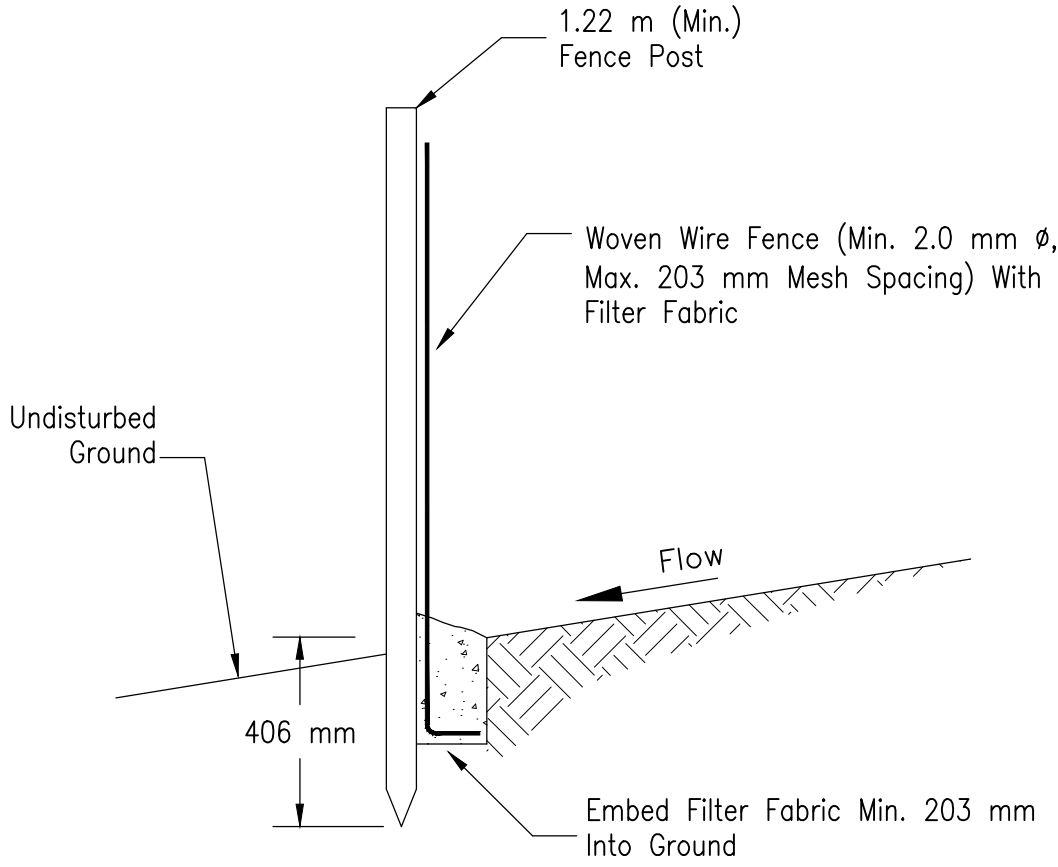
EROSION & SEDIMENT CONTROL FENCE ALONG EDGE OF STREAM BANK (TOE OF SLOPE)



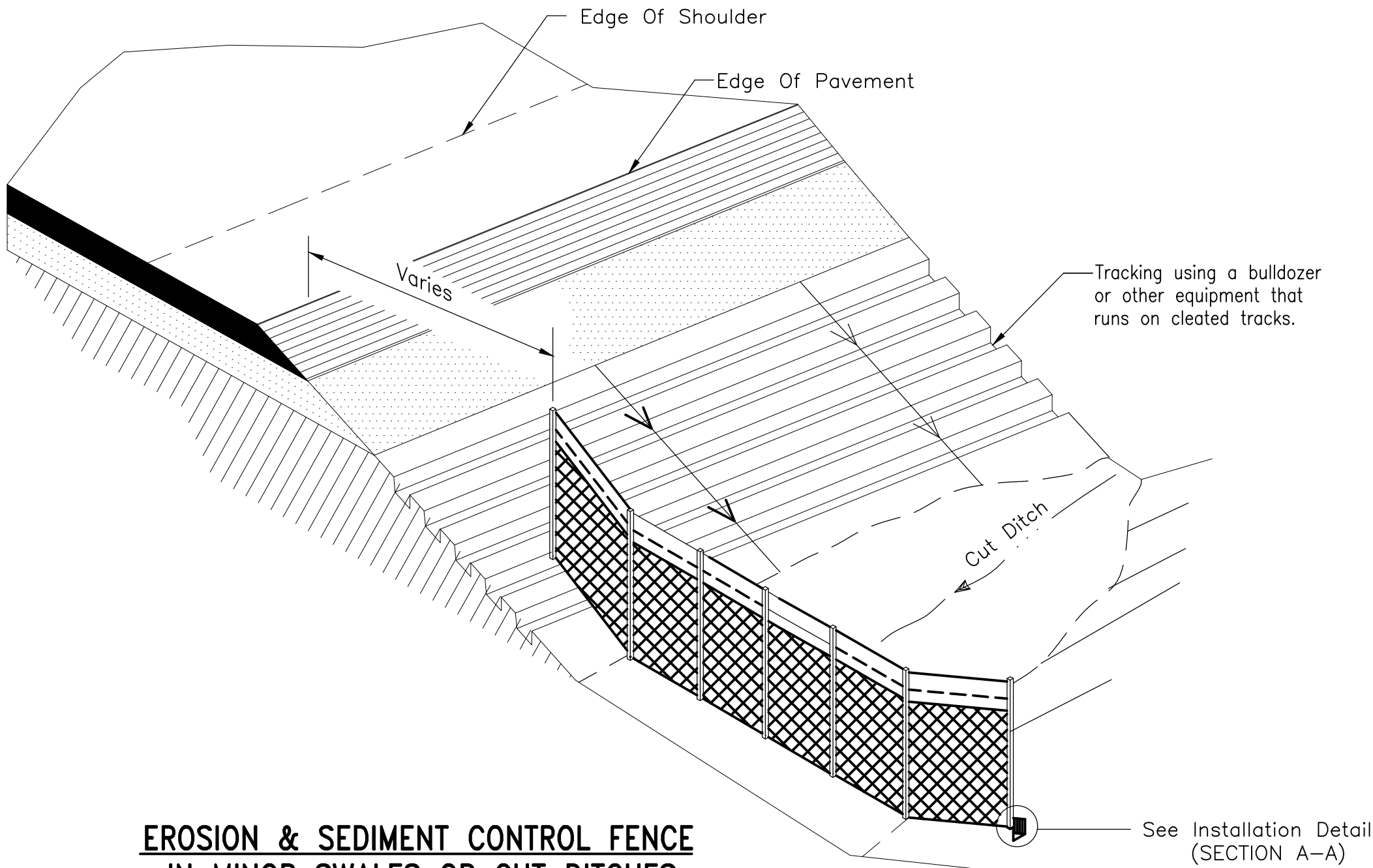
EROSION & SEDIMENT CONTROL FENCE AT DRAINAGE STRUCTURE



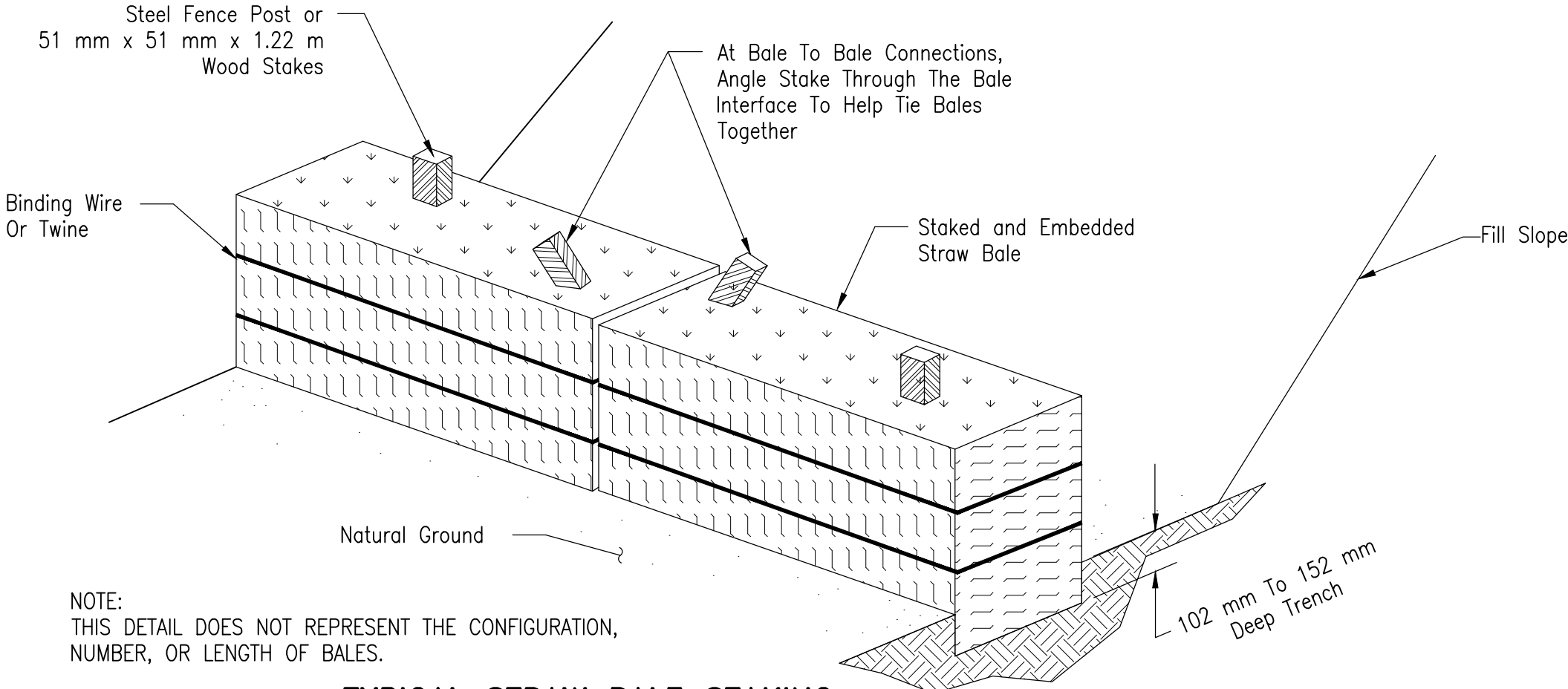
SEDIMENT CONTROL FENCE INSTALLATION DETAIL



SECTION A-A



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 TRENCHING DETAIL

UNITED STATES
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NAVAJO REGIONAL OFFICE – DIVISION OF TRANSPORTATION

STORMWATER POLLUTION
EROSION/SEDIMENT CONTROL DETAILS

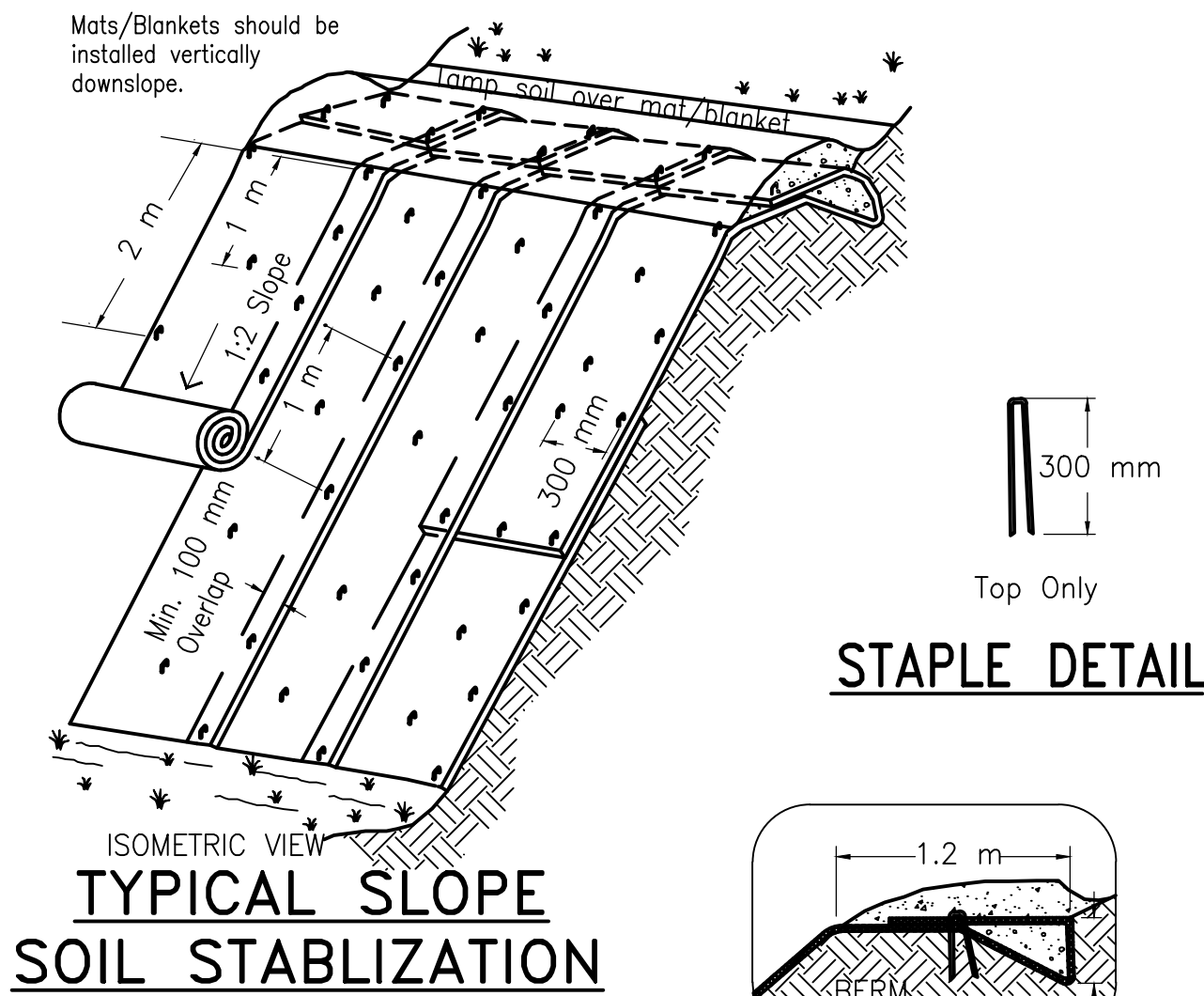
Designed by: B.O.R.
Drawn by: TAY Date: 07-03
Checked by: HRC Date: 07-03
File Name: 30_SPESC1



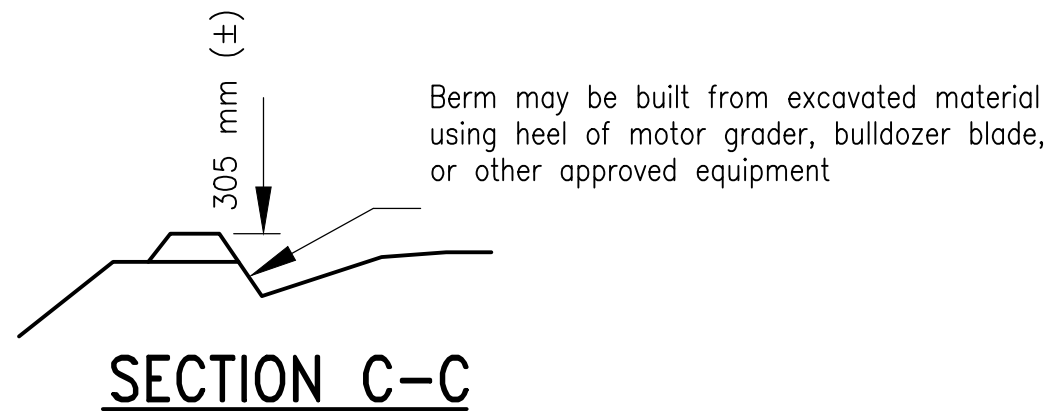
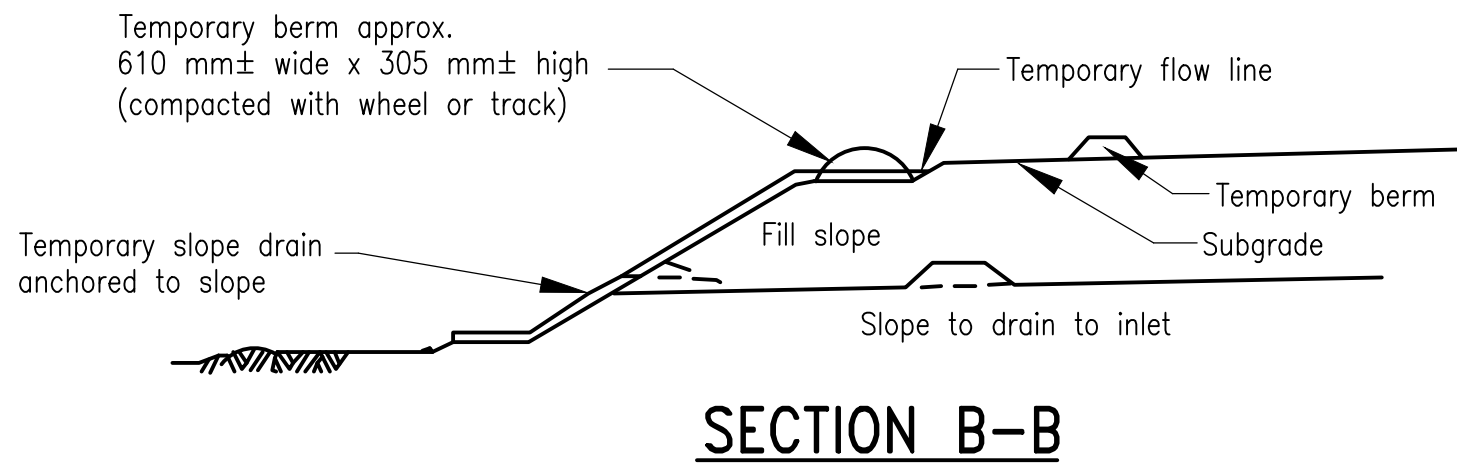
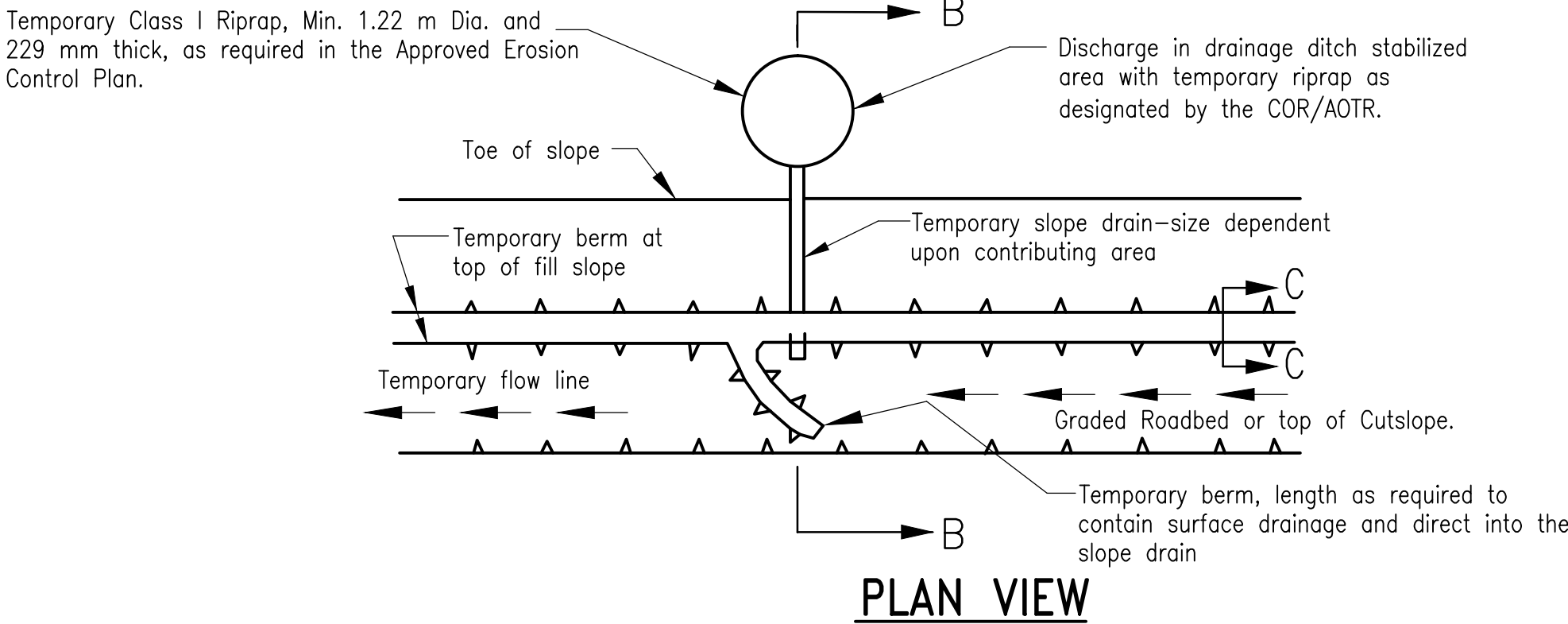
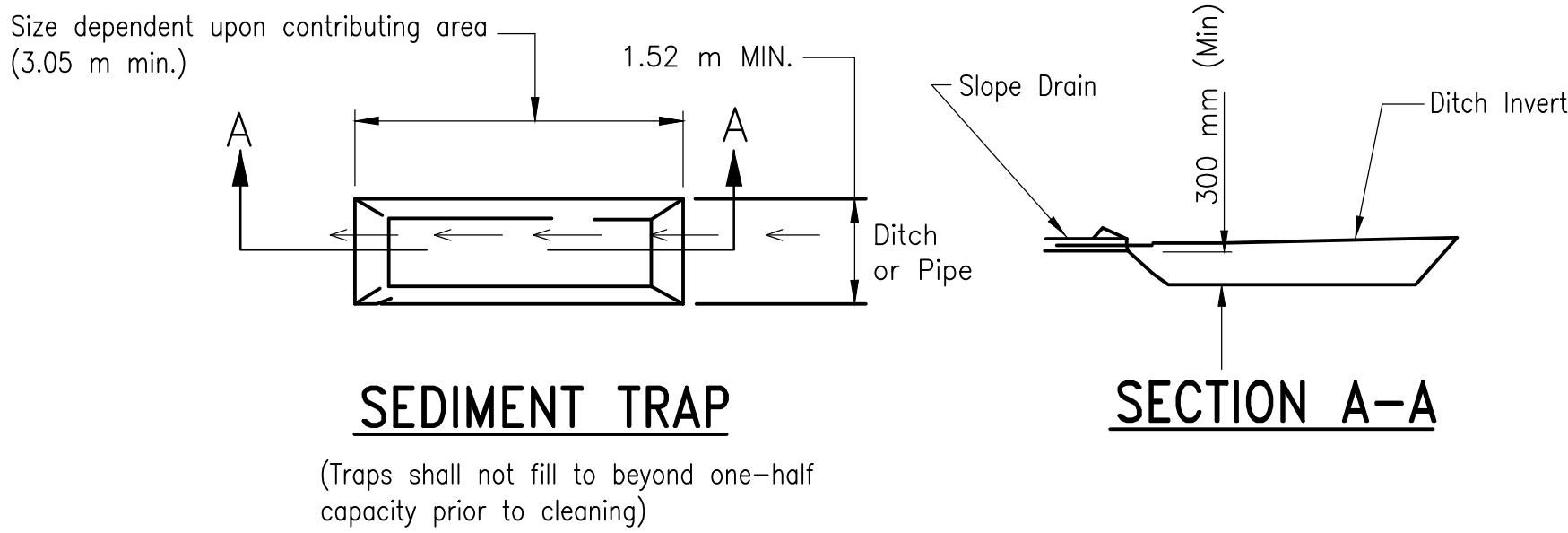
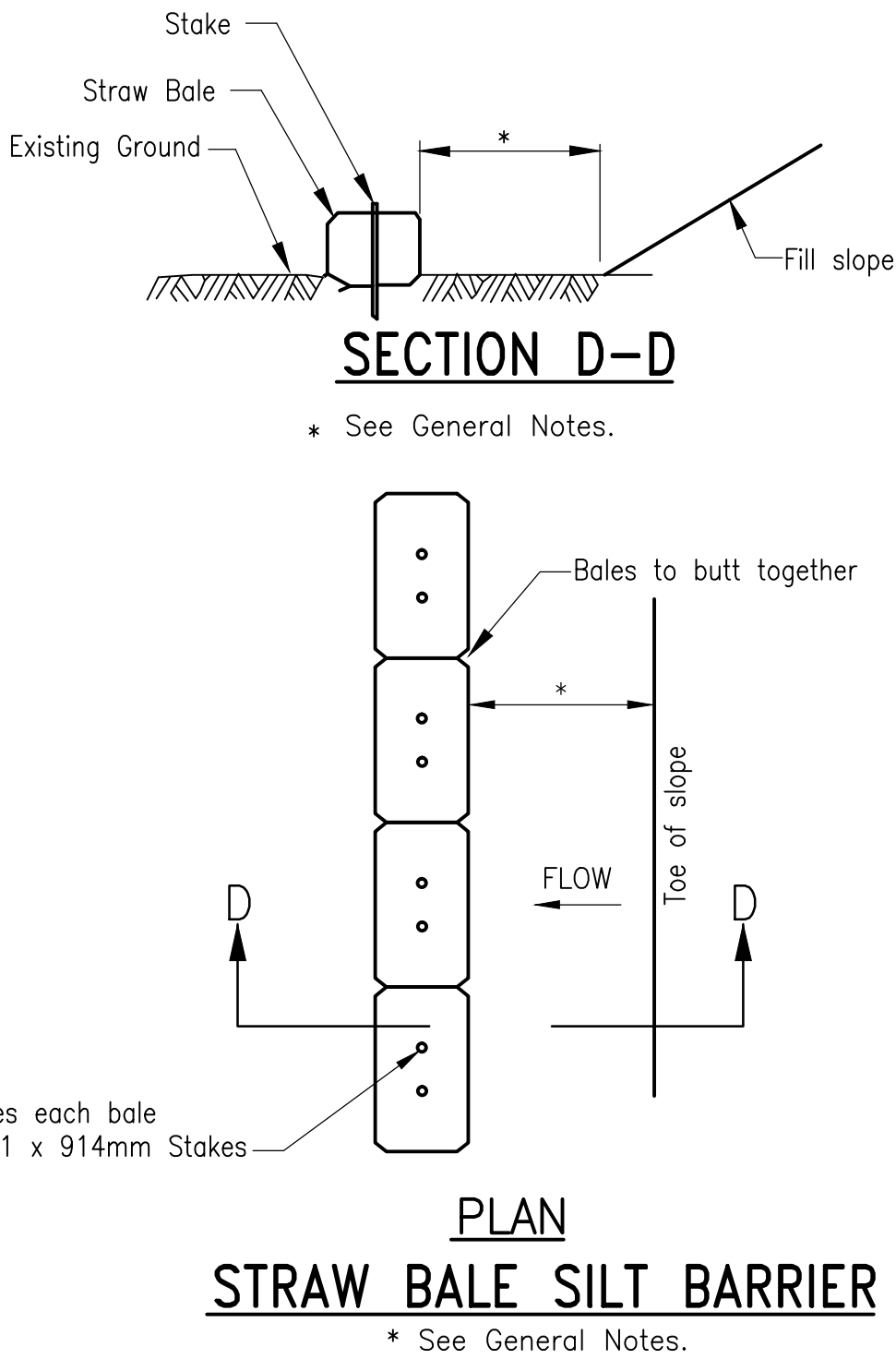
REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	TOTAL SHEETS
Navajo	NM	Navajo	N5031	N5031(1)1,2&3	31	31

GENERAL NOTES

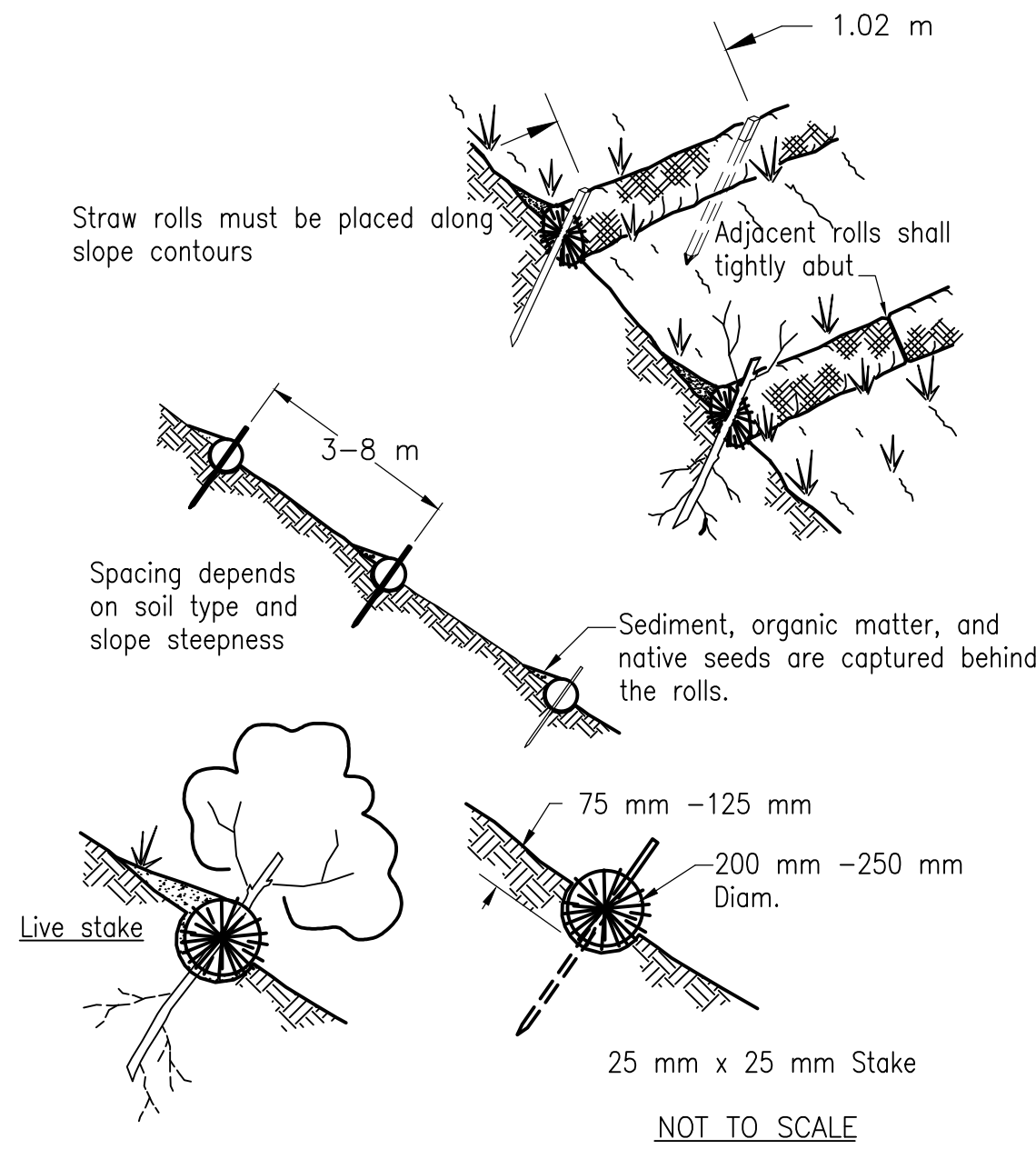
- SEE SHEET 30 FOR ADDITIONAL NOTES AND DETAILS.
- CONSTRUCT SEDIMENT BASIN AND TRAPS, EROSION CHECKS AND/OR FILTERS IN STRATEGIC LOCATIONS ON THE PROJECT TO FILTER STORM RUNOFF BEFORE IT LEAVES THE PROJECT CONSTRUCTION LIMITS OR ENTERS A STREAM AS SHOWN IN THE APPROVED SWPPP.
- CLEAN ALL SEDIMENT BASIN AND TRAPS OF ACCUMULATED SEDIMENT WHEN HALF FULL OF SEDIMENT.
- USE DRAIN PIPE, RIPRAP, GEOTEXTILE FABRIC, OR GRASS-LINED WATERWAY FOR TEMPORARY SLOPE DRAINS TO CHANNEL RUNOFF DOWN SLOPES. CHANNEL WATER INTO SLOPE DRAINS WITH STRAW BALES, WATTLES OR EARTH BERMS CONSTRUCTED AT THE TOP OF A CUT SLOPE. ANCHOR SLOPE DRAINS TO THE SLOPE.
- THE CONTRACTOR SHALL ADJUST THE DIMENSIONS AND LOCATIONS OF TEMPORARY SEDIMENT AND EROSION CONTROL DEVICES TO FIT ACTUAL FIELD CONDITIONS.
- REMOVE AND DISPOSE OF EROSION CONTROL MEASURES WHEN THE PERMANENT EROSION CONTROL MEASURES ARE SATISFACTORILY ESTABLISHED AND DRAINAGE DITCHES AND CHANNELS ARE LINED AND STABILIZED, IN ACCORDANCE WITH SECTION 157 OF FP-03.



- NOTES:
- Slope surface shall be free of rocks, clods, sticks and grass. mats/blankets shall have good soil contact.
 - Apply permanent seeding before placing blankets.
 - Lay blankets loosely and stake or staple to maintain direct contact with the soil. Do not stretch.



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



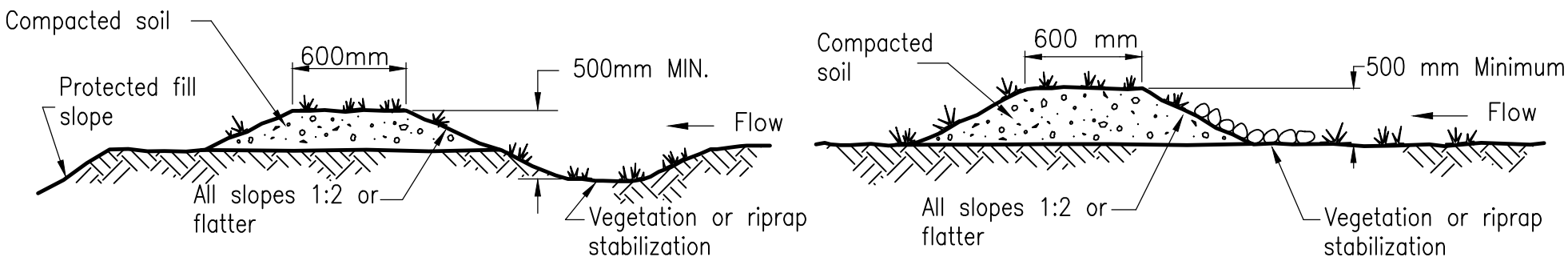
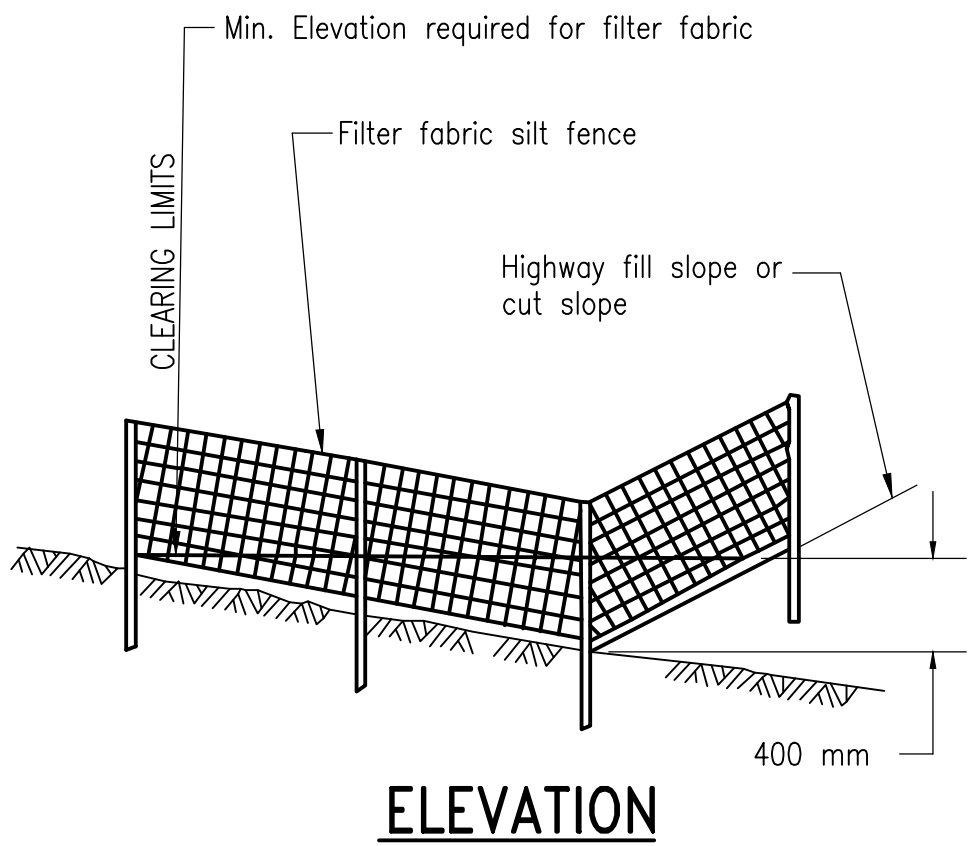
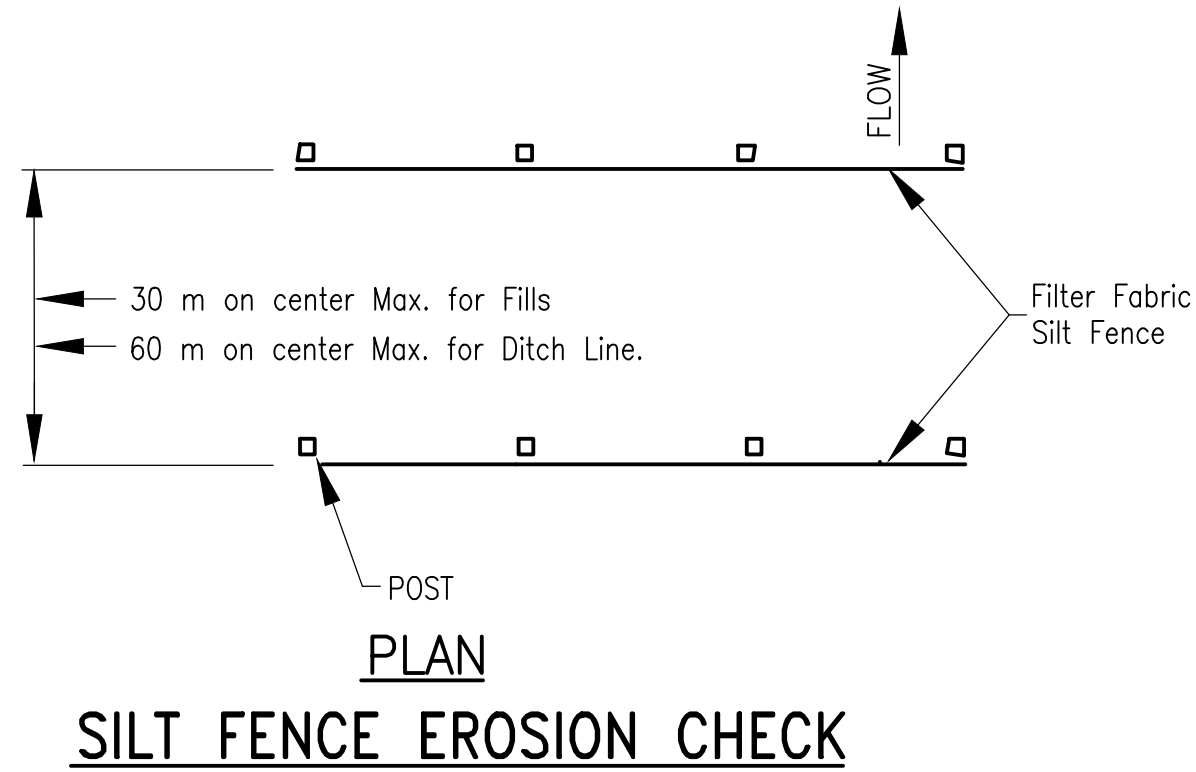
NOTE:

Straw roll installation requires the placement and secure staking of the roll in a trench, 75-125 mm deep, dug on contour. Runoff must not be allowed to run under or around roll.

STRAW ROLLS

- NOTES:
- Drop inlet sediment barriers are to be used for small, nearly level drainage areas. (less than 5%)
 - Excavate a basin of sufficient size adjacent to the drop inlet.
 - The top of the structure (ponding height) must be well below the ground elevation downslope to prevent runoff from bypassing the inlet. A temporary dike may be necessary on the downslope side of the structure.

BLOCK AND GRAVEL DROP INLET SEDIMENT BARRIER



NOTES:

- The channel behind the dike shall have positive grade to a stabilized outlet.
- The dike shall be adequately compacted to prevent failure.
- The dike shall be stabilized with temporary or permanent seeding or riprap. The diversion dike shall extend to the bottom of cut back slope and intercept the cut ditch.

TEMPORARY DIVERSION DIKE

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NAVAJO REGIONAL OFFICE - DIVISION OF TRANSPORTATION

STORMWATER POLLUTION EROSION/SEDIMENT CONTROL DETAILS

Designed by: NRDOT
Drawn by: TAY Date: 07-03
Checked by: HRC Date: 07-03
File Name: 31_SPESC2



REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	NEW MEXICO	NAVAJO	N5031	N5031(1)2&4	32	32

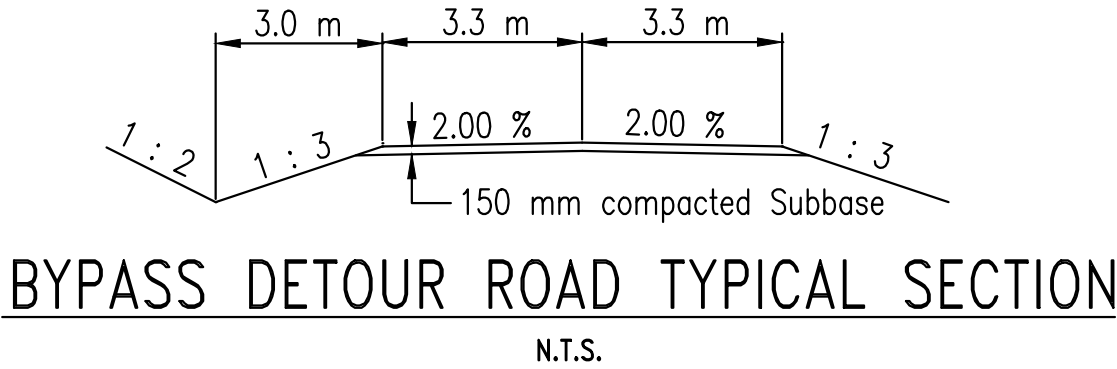
GENERAL NOTES

- ALL TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH THE MUTCD MANUAL (LATEST EDITION AND AMENDMENTS) AND THE SUPPLEMENTAL SPECIFICATIONS FOR THIS PROJECT.
- THE TRAFFIC CONTROL DETAILS SHOWN ARE ONLY A GUIDE. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PREPARING AND IMPLEMENTING A TRAFFIC CONTROL PLAN (TCP) IN ACCORDANCE WITH THESE DETAILS, SECTION 635, 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.
- SIGNS G20-1, W20-1A, AND G20-2A SHALL BE PLACED AT THE PROJECT LIMITS AND REMAIN IN PLACE THROUGH THE DURATION OF THE PROJECT.
- FLAGGERS SHALL BE STATIONED LEFT & RIGHT AS SHOWN WHEN EQUIPMENT IS CROSSING OR WORKING WITHIN EXISTING ROADWAY PRISM OR AT DETOURS.
- AT THE END OF EACH WORKING DAY, IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE 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.
- 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 MOVED TO A LOCATION AT LEAST NINE (9) METERS FROM THE EDGE OF THE SHOULDER WHEN CONSTRUCTION IS NOT IN PROGRESS.
- DURING CONSTRUCTION OPERATIONS, TRAFFIC SHALL BE MOVED THROUGH THE WORK ZONE USING PILOT CARS (AS REQUIRED), APPLICABLE SIGNS AND OTHER ITEMS (TWO-WAY RADIO CONTACT) RELATED TO THE USE OF THE PILOT CARS SHALL BE USED AND SHALL BE CONSIDERED INCIDENTAL OBLIGATIONS OF THE CONTRACTOR.
- THE CONTRACTOR HAS THE OPTION TO EITHER USE DRUMS OR VERTICAL PANELS; BUT SHALL NOT USE A COMBINATION OF BOTH. NO TRAFFIC CONES SHALL BE ALLOWED.
- 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 ITEMS. THE CONTRACTOR IS RESPONSIBLE FOR ALL NECESSARY PERMITS AND CLEARANCES FOR ANY DETOUR ROADS.

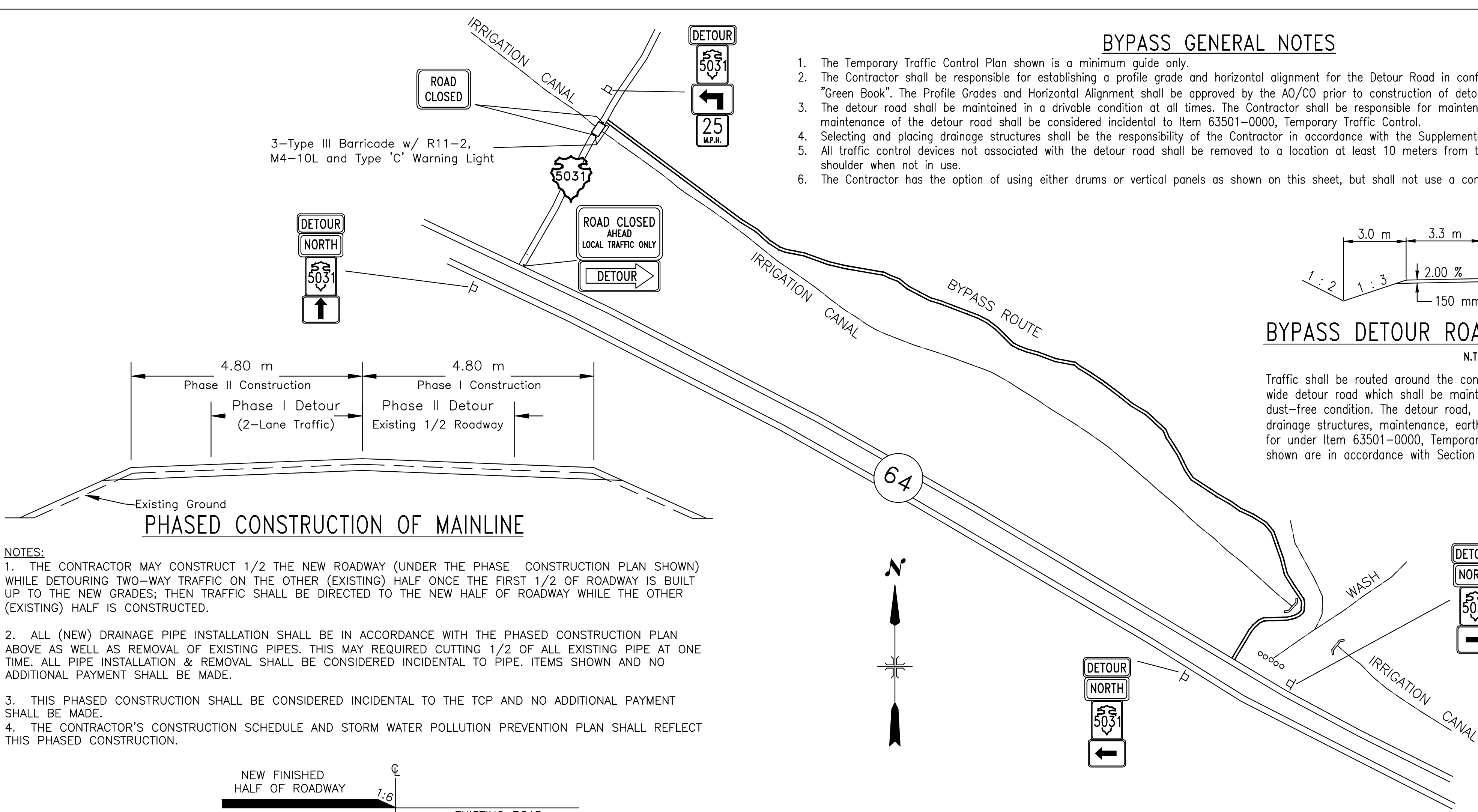
[NOTES #10 AND # 11 DELETED.]

BYPASS GENERAL NOTES

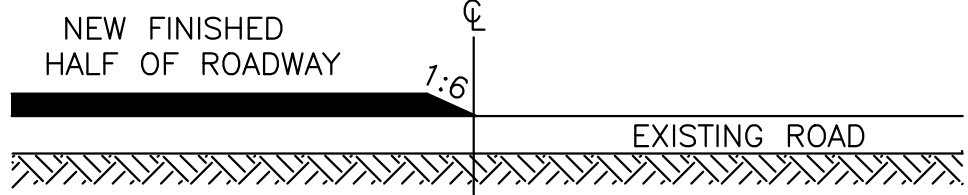
- The Temporary Traffic Control Plan shown is a minimum guide only.
- The Contractor shall be responsible for establishing a profile grade and horizontal alignment for the Detour Road in conformance with the AASHTO "Green Book". The Profile Grades and Horizontal Alignment shall be approved by the AO/CO prior to construction of detour.
- The detour road shall be maintained in a drivable condition at all times. The Contractor shall be responsible for maintenance of the detour road. The maintenance of the detour road shall be considered incidental to Item 63501-0000, Temporary Traffic Control.
- Selecting and placing drainage structures shall be the responsibility of the Contractor in accordance with the Supplemental Specifications.
- All traffic control devices not associated with the detour road shall be removed to a location at least 10 meters from the edge of the roadway shoulder when not in use.
- The Contractor has the option of using either drums or vertical panels as shown on this sheet, but shall not use a combination of both.



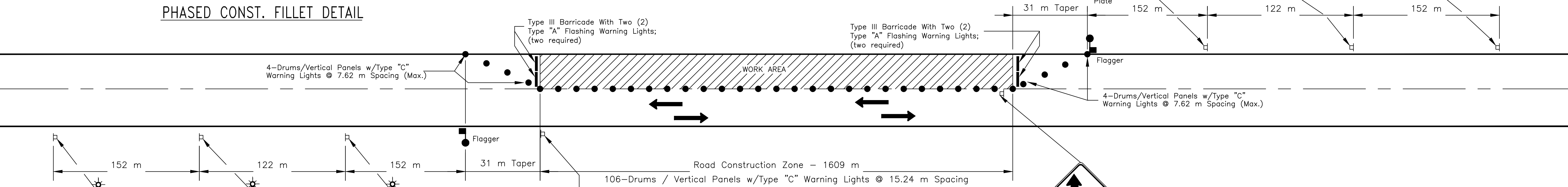
Traffic shall be routed around the construction area on a two-lane 6.6 m wide detour road which shall be maintained at all times in a smooth dust-free condition. The detour road, including all traffic control, drainage structures, maintenance, earthwork and obliteration shall be paid for under Item 63501-0000, Temporary Traffic Control. Slope designations shown are in accordance with Section 101.03 (d) of the FP-03.



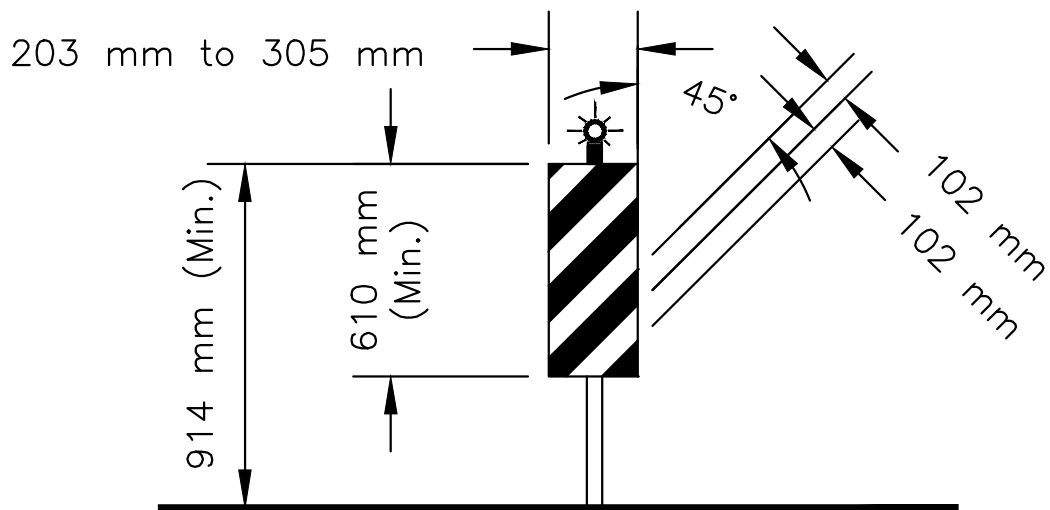
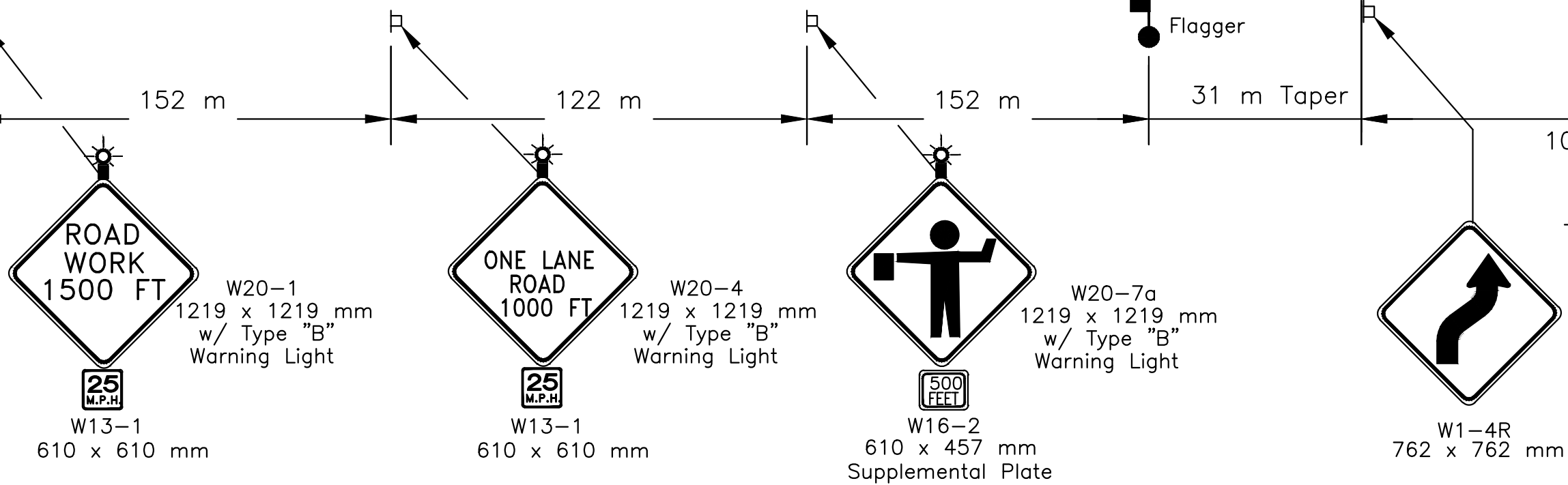
- NOTES:**
- THE CONTRACTOR MAY CONSTRUCT 1/2 THE NEW ROADWAY (UNDER THE PHASE CONSTRUCTION PLAN SHOWN) WHILE DETOURING TWO-WAY TRAFFIC ON THE OTHER (EXISTING) HALF ONCE THE FIRST 1/2 OF ROADWAY IS BUILT UP TO THE NEW GRADES; THEN TRAFFIC SHALL BE DIRECTED TO THE NEW HALF OF ROADWAY WHILE THE OTHER (EXISTING)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



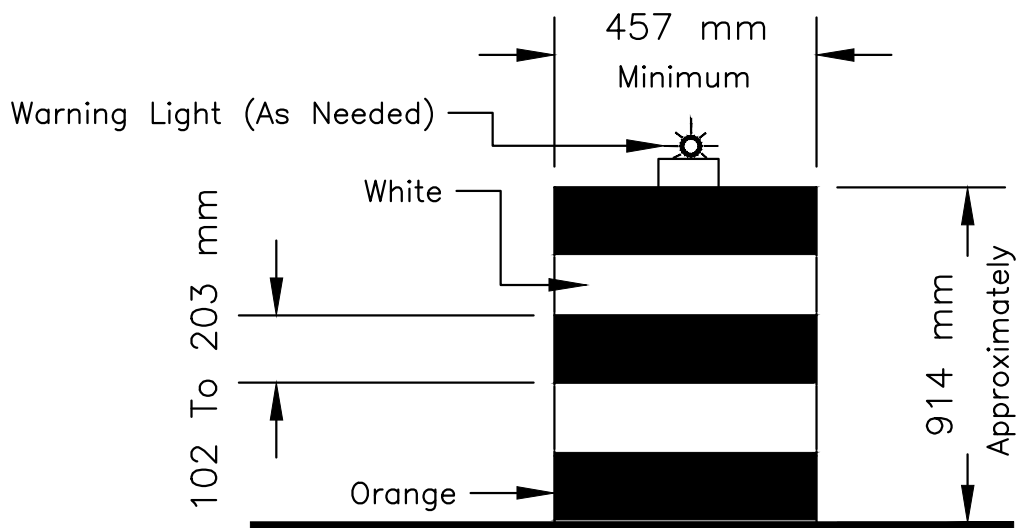
PHASED CONST. FILLET DETAIL



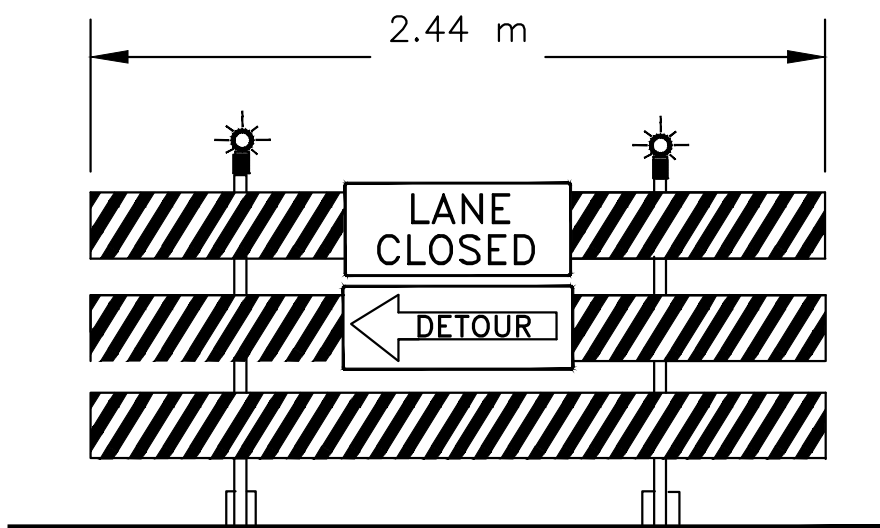
TRAFFIC THRU CONSTRUCTION ZONES OF MAINLINE



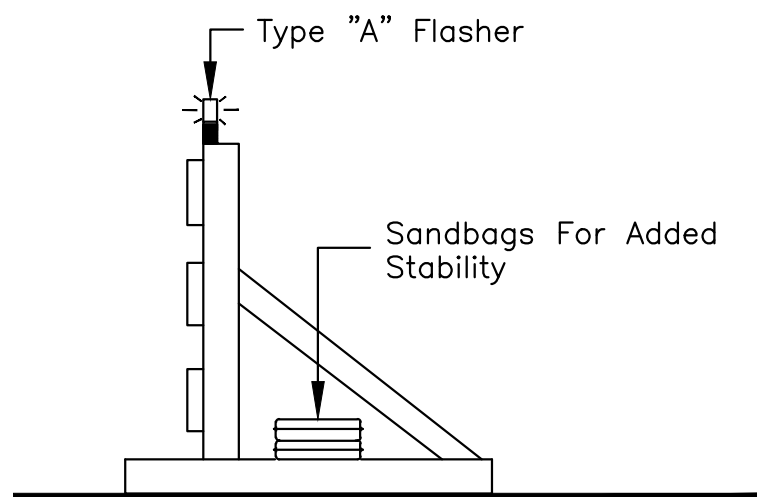
VERTICAL PANEL (ALTERNATE)



DRUM



TYPE III BARRICADE



Revised: 12-21-2011

UNITED STATES
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TEMPORARY TRAFFIC CONTROL
& ALTERNATE DETOUR LAYOUT

DRAWN BY: NRO-DOT	DATE: 9/28/09
DESIGNED BY: NRO-DOT	DATE: 9/28/09
REVISED: 12/21/11	FILENAME: 32_TCP
BY: NRO-DOT Struct	SCALE: NTS

