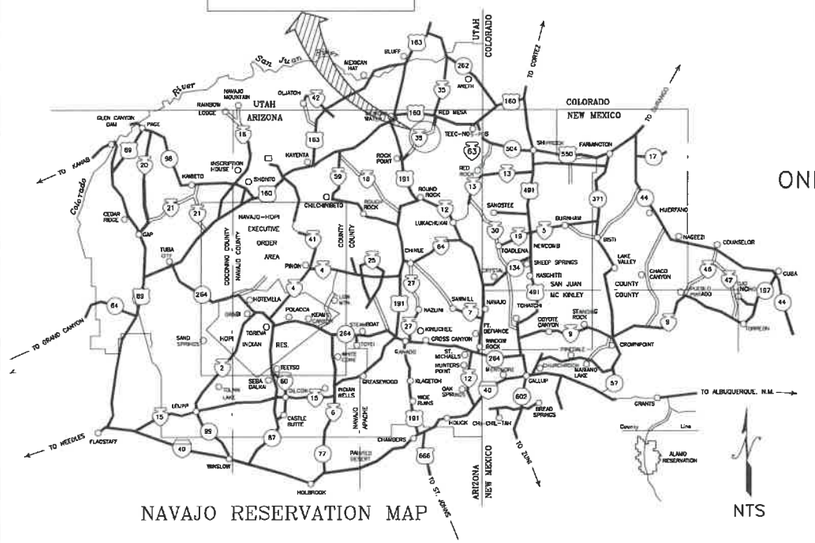
NAVAJO DIVISION OF TRANSPORTATION

PROJ.N35(8)1,2&4



PROJ. N35(8)1, 2 & 4
SWEETWATER

GRADE & DRAINAGE PLACEMENT OF AGGREGATE
BASE COURSE, DOUBLE CHIP SEAL,
ONE (1) STRUCTURE AND MISCELLANEOUS CONSTRUCTION

35

10.307 km

I.D. No. N3243100

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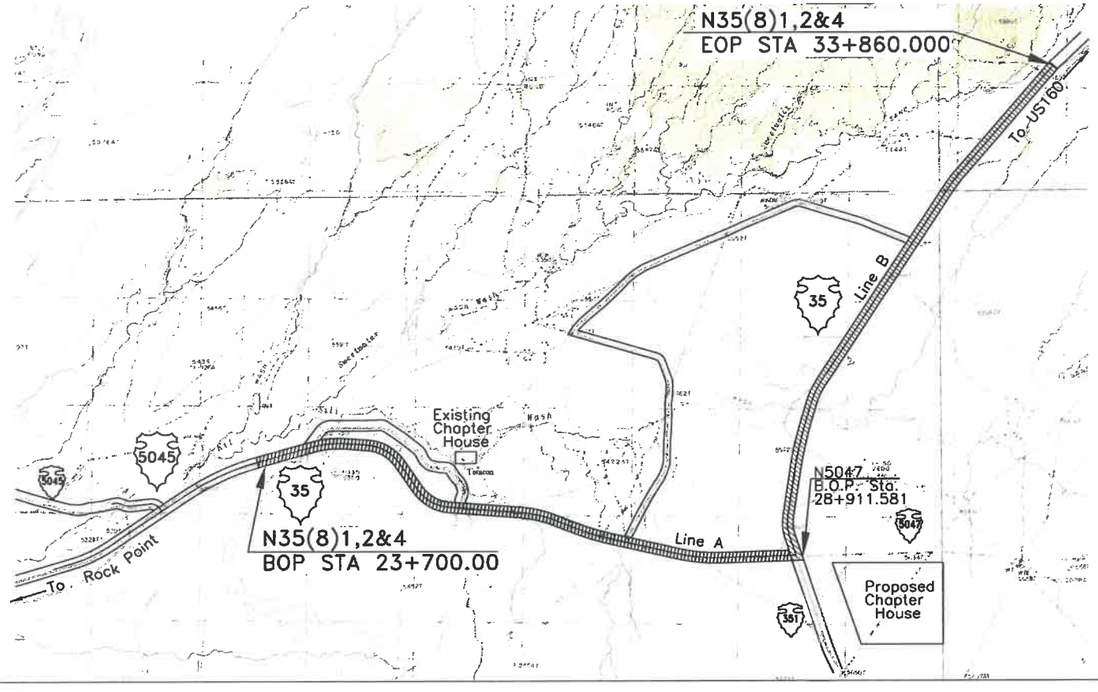
LEGEND

STATE LINE
RESERVATION LINE
COUNTY LINE
TOWNSHIP or RANGE LINE
SECTION LINE
NATIONAL FOREST LINE
HIGHWAY RIGHT-OF-WAY LINE
UNFENCED PROPERTY
SECTION CORNER AND 1/4 CORNER
POWER LINE AND POLES
TELEPHONE LINE AND POLES
POLE GUY AND ANCHOR
TRAFFIC SIGN
GUARD RAIL
DELINEATORS
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 — CONSTRUCTION
COUNTY — PAVED
STATE — GRADED
FEDERAL — UNIMPROVED

PROJECT LENGTH		
STATION TO STATION	METER	KILOMETER
Mainline N35(8) B.O.P. STA. 23+700.000 E.O.P. STA. 33+860.000	10160.000	10.160
N5047(1) B.O.P. STA. 28+913.066 E.O.P. STA. 28+960.000	146.934	0.147
TOTAL:	10,306.934	10.307

N35(8) RIGHT OF WAY		
N35(8)	LOCATION	
	LEFT	RIGHT
STA. 23+700.000 to STA. 30+195.120	30.00m	30.00m
STA. 30+195.120 to STA. 30+364.203	55.00m	45.00m
STA. 30+364.203 to STA. 33+860.000	30.00m	30.00m



DESIGN DATA–MAINLINE	
Design Speed	100 km/h
Maximum Radius of Curve	394 m
Maximum Gradient	8%
Minimum Stopping Sight Distance	185 m
Minimum Passing Sight Distance	320 m
Average Daily Traffic (2011)	238 vpd
Estimated ADT (2031)	377 vpd
Maximum Super Elev. (e max.)	8 %
Design Hourly Volume (DHV)	48 vph

RECOMMENDED:

PRINCIPAL ENGINEER
NAVAJO DIVISION OF TRANSPORTATION

5/17/22
DATE

APPROVED:

DIRECTOR
NAVAJO DIVISION OF TRANSPORTATION

DATE

Registered Professional Engineer
CERTIFICATE
25015
ANDREW JOHN SPEAR
STATE OF NEW MEXICO

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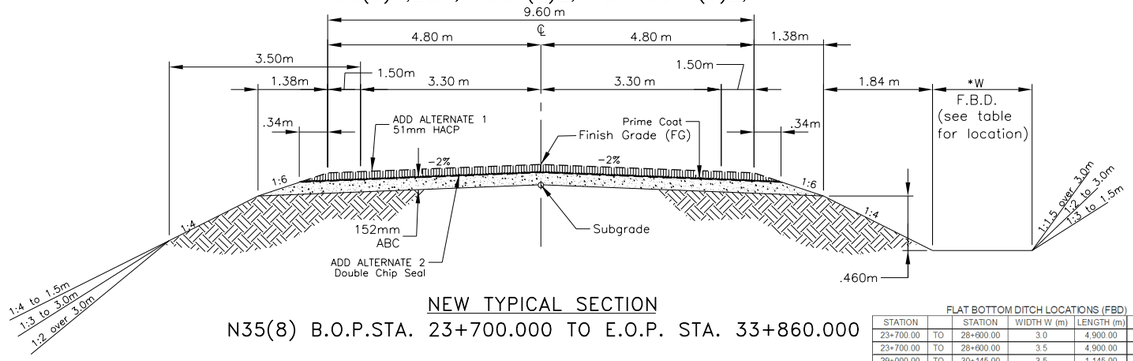
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	2	66

TYPICAL CROSS SECTION
N35(8)1,2&4, N351(1)2,4 & N5047(1)2,4



NEW TYPICAL SECTION
N35(8) B.O.P.STA. 23+700.000 TO E.O.P. STA. 33+860.000

FLAT BOTTOM DITCH LOCATIONS (FBD)

STATION		STATION	WIDTH W (m)	LENGTH (m)	REMARKS
23+700.00	TO	28+600.00	3.0	4,900.00	Rt.
23+700.00	TO	28+600.00	3.5	4,900.00	Lt.
29+000.00	TO	30+145.00	3.5	1,145.00	Lt. & Rt.
		TOTAL:		6,045.00	

General Note:

1. ALL WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS (FP-14), AND THE SUPPLEMENTAL SPECIFICATIONS FOR THIS PROJECT.
2. ALL PERMANENT AND TEMPORARY ROADSIDE SIGNS, AND PAVEMENT MARKINGS SHALL BE PLACED IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS (LATEST EDITION) AND IN ACCORDANCE WITH THE DETAILS ON THESE PLANS. PLACEMENT OF "STOP" BAR, PERMANENT TRAFFIC SIGNS AND PAVEMENT MARKINGS SHALL BE FIELD ADJUSTED AS DIRECTED BY THE COR/COTR, AT NO ADDITIONAL COST TO THE GOVERNMENT.
3. THE TEMPORARY TRAFFIC CONTROL DETAILS SHOWN REFLECTS GENERAL REQUIREMENTS FOR THIS PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR PREPARING AND SUBMITTING A TRAFFIC CONTROL PLAN IN ACCORDANCE WITH THESE DETAILS, TAKING INTO ACCOUNT THE CONTRACTOR'S CONSTRUCTION SEQUENCING PLAN, MUTCD, AND THE SUPPLEMENTAL SPECIFICATIONS FOR SECTION 635.-TEMPORARY TRAFFIC CONTROL.
4. THE DESIGN FEATURES INCLUDING HORIZONTAL AND VERTICAL ALIGNMENTS, TYPICAL SECTIONS, AND OTHER DESIGN DETAILS SHOWN SHALL NOT BE ALTERED OR MODIFIED IN ANYWAY DURING CONSTRUCTION WITHOUT THE EXPRESSED WRITTEN DIRECTION AND WRITTEN APPROVAL OF THE NAVAJO REGION OFFICE-DIVISION OF TRANSPORTATION (NR-DOT) DIVISION MANAGER THROUGH THE CONTRACTING OFFICIAL (CO), UNLESS OTHERWISE NOTED IN THESE PLANS OR SPECIFICATIONS. DRAINAGE STRUCTURES AND TURNOUTS SHALL BE INSTALLED AS SHOWN WITH ONLY MINOR CORRECTIONS IN LOCATION, SKEW, AND/OR INVERT ELEVATIONS AS NEEDED TO FIT FIELD CONDITIONS. TURNOUTS MAY NOT BE SHIFTED MORE THAN 5.0 METERS FROM THE LOCATIONS SHOWN ON THE PLANS WITHOUT THE WRITTEN APPROVAL OF THE NRDOT DIVISION MANAGER THROUGH THE CONTRACTING OFFICIAL.
5. THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY AND EXPENSE FOR DISPOSAL OF TRASH AND/OR CONSTRUCTION DEBRIS IN ACCORDANCE WITH SECTIONS 107 AND 203 OF THE FP-14 AS WELL AS ANY AND ALL PERMIT REQUIREMENTS. THIS WORK SHALL BE INCIDENTAL OBLIGATIONS OF THE CONTRACTOR.
6. THE BIDDER SHALL READ AND MAKE CAREFUL EXAMINATION OF THE PLANS, SPECIFICATIONS, QUANTITIES, MATERIAL, SURVEYING REQUIREMENTS, AND VISIT THE SITE OF THE PROPOSED CONSTRUCTION TO BECOME FAMILIAR WITH THE SITE CONDITIONS AND LIMITATIONS BEFORE MAKING A PROPOSAL. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY AND ALL ERRORS RESULTING FROM THE FAILURE TO MAKE SUCH AN EXAMINATION. ANY INFORMATION DERIVED FROM THE MAPS, PLANS, SPECIFICATIONS, PROFILES, DRAWINGS OR THE ENGINEER, SHALL NOT RELIEVE THE CONTRACTOR FROM ANY RISK OR FROM FULFILLING THE TERMS OF THE CONTRACT. THERE ARE SEVERAL AREAS WITH LIMITED WORKING ROOM WITHIN THE PROJECT RIGHT-OF-WAY, AND/OR WITH EXISTING FEATURES WITHIN OR NEAR THE PROJECT RIGHT-OF-WAY, THAT WILL REQUIRE "SPECIAL" CONSTRUCTION PROCEDURES.
7. THE CONTRACTOR IS REQUIRED TO SUBMIT A REVISED PIPE LIST TO THE NRDOT, PLANNING & DESIGN BRANCH CHIEF THROUGH THE COR/COTR, BASED ON THE FIELD STAKING IN ACCORDANCE WITH SECTION 152 OF THE CONTRACT SUPPLEMENTAL SPECIFICATION. THE APPROVAL OF ANY AND ALL REVISED PIPE LISTS WITH ACCOMPANYING DRAWINGS IS RENDERED AS A SERVICE ONLY AND IS NOT CONSIDERED A GUARANTEE OF MEASUREMENTS, QUANTITIES, INSTALLATION PROCEDURES, AND/OR DIMENSIONS, NOR SHALL IT BE CONSIDERED AS RELIEVING THE CONTRACTOR FROM COMPLYING WITH THE CONTRACT SPECIFICATIONS AND DESIGN PLANS. THE CONTRACTOR IS HEREBY NOTIFIED THAT UNDER NO CIRCUMSTANCE SHALL ANY DRAINAGE STRUCTURE(S) BE INSTALLED BELOW THE NATURAL FLOW LINE OF THE WASH, CHANNEL, ARROYO, OR DITCH LINE.
8. NO WORK SHALL BE PERFORMED OR GROUND DISTURBED OUTSIDE OF THE DESIGNATED CONSTRUCTION LIMITS IN ACCORDANCE WITH SECTION 107 OF THE FP-14 WITHOUT WRITTEN APPROVAL BY THE NRDOT MANAGER UNLESS OTHERWISE SHOWN AND LABELED ON THESE PLANS AS "CONSTRUCTION ZONE" IN NO CASE SHALL ANY WORK BE PERFORMED OUTSIDE THE DESIGNATED RIGHT LIMITS WITHOUT WRITTEN APPROVAL FROM THE NRDOT DIVISION MANAGER, UNLESS OTHERWISE SHOWN AND CALLED OUT ON THESE PLANS AS "CONSTRUCTION ZONE". THE CONSTRUCTION LIMIT IS THE CATCH POINT EARTHWORK LIMIT PLUS 3.0 METERS, NOT TO EXCEED THE RIGHT-OF-WAY LIMITS.

Cont. General Note

9. THE DETAILS SHOWN ON THE STORM WATER POLLUTION AND EROSION/SEDIMENT CONTROL DETAILS ARE GENERAL REQUIREMENTS TO BE USED BY THE CONTRACTOR IN PREPARING A STORM WATER POLLUTION PREVENTION PLAN ALONG WITH THE REQUIREMENTS IN SECTION 157 OF THE SUPPLEMENTAL SPECIFICATION AND SPECIAL CONTRACT REQUIREMENTS. THE SWPPP IS ONLY REQUIRED AT THE DRAINAGE PIPE REPLACEMENT LOCATIONS.THE CONTRACTOR IS REQUIRED TO SUBMIT COURTESY COPY OF THE APPROVED SWPPP TO THE NAVAJO NATION WATER QUALITY EPA OFFICE.
10. THE QUANTITIES SHOWN ARE FOR ESTIMATING PURPOSES ONLY AND TO COMPARE AND CANVAS BIDS. ACTUAL PAY QUANTITIES WILL BE DETERMINED IN THE FIELD FOR AUTHORIZED CHANGES THAT AFFECT THE QUANTITIES. ANY OVER-RUN OR UNDER-RUN OF QUANTITIES SHALL BE SUBJECT TO FAR 52.211-18, VARIATION IN ESTIMATED QUANTITY.
11. ALL TURNOUT/DRIVEWAYS, AS CALLED FOR ON THESE PLANS, SHALL EITHER BE CONSTRUCTED, REBUILT, RESHAPED AND/OR REMOVED UP TO THE RIGHT-OF-WAY LIMITS. ALL TURNOUTS SHALL BE PAVED TO THE CATTLEGUARD, THEN FROM THE BACK OF CATTLEGUARD TO THE R/W LINE, PLACE AGGREGATE BASE FOR ALL 4.5m WIDE TURNOUTS; PLACE AGGREGATE AND HOT ASPHALTIC CONCRETE FOR TURNOUTS WIDER THAN 4.5m TO MATCH THE STRUCTURAL SECTION. REQUIRED GRADING, SHAPING, AND EARTH COMPACTION OUTSIDE OF THE RIGHT-OF-WAY, TO CONNECT NEW TURNOUTS TO THE EXISTING ROADWAY/DRIVEWAY (AS SHOWN ON THE PLANS OR AS DIRECTED BY THE COR/COTR) SHALL BE INCIDENTAL TO BID ITEM 20401-0000. ANY REQUIRED AGGREGATE BASE AND/OR ASPHALT MATERIAL SHALL BE PAID FOR UNDER THE APPROPRIATE BID ITEMS FOR THIS WORK AS SHOWN IN THE BID SCHEDULE.
12. THE CONTRACTOR SHALL BE REQUIRED TO OBLITERATE ALL EXISTING ABANDONED TURNOUTS AND ROADWAY WITHIN THE RIGHT-OF-WAY LIMITS, AND ANY EXISTING TURNOUTS/ROADWAY OUTSIDE OF THE RIGHT-OF-WAY THAT ARE DESIGNATED ON THE PLANS FOR OBLITERATION. OBLITERATION SHALL BE AS PER FP-14, METHOD 2. SCARIFICATION SHALL BE TO A DEPTH OF 300mm. THE SCARIFIED SURFACE SHALL BE LEFT ROUGH, WITH 100mm TO 300mm HIGH RIDGES PERPENDICULAR TO THE EXISTING ROAD CENTERLINE. ROADWAY OBLITERATION INCLUDES GRADING DRAINAGE CHANNELS ACROSS THE OLD ROADBED, TO RE-ESTABLISH NATURAL DRAINAGE CHANNELS AND/OR TO OPEN CHANNELS FOR THE NEWLY INSTALLED (IN NEW ROADWAY) DRAINAGE STRUCTURES. THIS WORK TO BE INCLUDED IN THE BID ITEM 21102-2000. PERMANENT SEEDING AND STRAW MULCHING SHALL BE APPLIED TO ALL OBLITERATION AREAS, WITHIN THE CONSTRUCTION LIMITS. SEEDING AND MULCHING TO BE PAID UNDER ITEM 62510-1000.
13. STRUCTURAL EXCAVATION AND BEDDING/BACKFILL OF ALL DRAINAGE STRUCTURES (CULVERTS AND CONCRETE HEAD/WING WALLS) SHALL BE CONSIDERED INCIDENTAL TO THE INSTALLATION OF STRUCTURES. BEDDING AND BACKFILL MATERIAL SHALL MEET ALL REQUIREMENTS OF FP-14, SECTIONS 209 AND 704. APPROVED EXCESS EXCAVATION MATERIAL MAY BE USED TO REBUILD TURNOUTS, EARTHEN DITCH BLOCKS, AND/OR PLACED ALONG ROADWAY SHOULDERS AS EMBANKMENT IN AREAS ADJACENT TO THE REMOVAL AND AS DIRECTED BY THE COR/COTR.
14. ALL FURROW AND DRAINAGE DITCHES SHALL BE STAKED AND GRADED TO DRAIN UP TO THE RIGHT-OF-WAY LIMITS. EARTHEN DITCH BLOCKS, DIKES AND DITCHES SHALL BE CONSTRUCTED AS SHOWN ON THESE PLANS AND/OR ADDED AT LOCATIONS DESIGNATED BY THE COR/COTR. ALL DITCH BLOCKS, DIKES AND FURROW DITCHES SHALL BE PAID FOR UNDER THE APPROPRIATE BID ITEMS FOR THIS WORK AS SHOWN IN THE BID SCHEDULE. AT ALL DRAINAGE PIPE REPLACEMENTS, INSTALLATIONS, EXTENSIONS, AND IN-PLACE PIPE CLEANING LOCATIONS, THE CONTRACTOR SHALL CLEAN, REGRADE, AND RESHAPE THE INLET AND OUTLET CHANNELS TO THE RIGHT-OF-WAY LINE AS DIRECTED BY THE COR/COTR. THIS WORK SHALL BE INCIDENTAL TO BID ITEMS FOR SECTIONS 602, 603, AND/OR 607.

Cont. General Note

15. IMMEDIATELY PRIOR TO PLACING EMBANKMENT, AGGREGATE BASE AND/OR RECYCLED MATERIAL, THE TOP 152 mm OF THE ORIGINAL GROUND, OR FINISHED SUBGRADE (INCLUDING TURNOUTS) SHALL BE CHECKED FOR COMPACTION AND GRADE. IF COMPACTION DOES NOT MEET THE MINIMUM SPECIFIED COMPACTION AND TOLERANCE REQUIREMENTS, THE ORIGINAL GROUND AND/OR SUBGRADE SHALL BE RE-WATERED AND/OR SCARIFIED AS NEEDED AND RE-COMPACTED TO THE REQUIRED DENSITY AND TOLERANCE, AT THE CONTRACTOR'S EXPENSE. IN NO CASE SHALL ANY EMBANKMENT OR SURFACING MATERIAL BE PLACED ON FROZEN, MUDDY OR UNSTABLE NATURAL GROUND OR SUBGRADE. THIS WORK SHALL BE CONSIDERED AN INCIDENTAL OBLIGATION OF THE CONTRACTOR.
16. THE EARTHWORK TABLE SHOWN IS TO ASSIST THE CONTRACTOR IN ESTABLISHING A BID UNDER THE EARTHWORK ITEMS SHOWN IN THE BID SCHEDULE. ANY BORROW MATERIAL CALLED FOR ON THE PLANS SHALL BE TAKEN FROM CONTRACTOR IDENTIFIED SOURCES OUTSIDE THE RIGHT-OF-WAY LIMITS. IT IS THE SOLE RESPONSIBILITY AND EXPENSE OF THE CONTRACTOR TO PROVIDE ANY NECESSARY BORROW MATERIAL FOR THIS PROJECT INCLUDING ALL NECESSARY PERMITS. ALL EXCAVATION, BORROW, WASTE AND EMBANKMENT MATERIAL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEMS 20401-0000 AND 20403-0000. IF MATERIAL IS APPROVED, THE WASTE MATERIAL SHOWN ON THESE PLANS SHALL BE USED AS NECESSARY TO CONSTRUCT TURNOUTS, DITCH BLOCKS, AND/OR BE PLACED AS EMBANKMENT ALONG THE SHOULDERS IN AREAS AS DIRECTED BY THE COR/COTR. WASTE MATERIAL NOT USED WITHIN THE PROJECT LIMITS, SHALL BE DISPOSED OF AS PER FP-14, SECTION 204.14.
17. AT ALL TOP EDGES OF CUT SLOPES 3.0 METER OR HIGHER THAN THE DITCH FLOWLINE, THE CONTRACTOR SHALL REMOVE ALL LOOSE AND UNSTABLE ROCK OR ROCK THAT AS DETERMINED BY THE COR/COTR, MAY BECOME LOOSE WITHIN 5.0 METER OF THE TOP CUT SLOPE. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO BID ITEM 20401-0000, AND NO ADDITIONAL PAYMENT WILL BE MADE.
18. THE LOCATION OF UTILITIES AS SHOWN IN THESE PLANS ARE APPROXIMATE AND ARE ONLY TO ASSIST THE CONTRACTOR IN COMPLETING THE WORK. THE CONTRACTOR SHALL CONTACT ALL UTILITY OWNERS PRIOR TO STARTING ANY CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL CONTACT THE ARIZONA BLUE STAKE AT 811, NAVAJO TRIBAL UTILITY AUTHORITY (NTUA) AT (928)-729-5721, FRONTIER COMMUNICATION COMPANY AT (928)-871-3748, AND NAVAJO NATION DIVISION OF NATURAL RESOURCES AT (928)-729-4003, PRIOR TO STARTING ANY CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL VERIFY ALL UTILITIES AND THEIR LOCATIONS WITH THE UTILITY OWNERS PRIOR TO CONSTRUCTION. ANY UTILITIES DAMAGED DUE TO NEGLIGENCE OF THE CONTRACTOR SHALL BE RESTORED TO CODE REQUIREMENTS AT THE CONTRACTOR'S EXPENSE.
19. THE CONTRACTOR SHALL REMOVE, CLEAN, AND STOCKPILE ALL SALVAGEABLE EXISTING CULVERTS, GUARDRAIL, CATTLE GUARDS, FENCING MATERIALS, ETC, AS CALLED FOR ON THESE PLANS AND/OR SECTIONS 203 AND 607 IN A DESIGNATED LOCATION ADJACENT TO THE REMOVAL LOCATION BUT OUTSIDE OF THE RIGHT-OF-WAY. THE COR/COTR SHALL OFFER THIS SALVAGED MATERIALS TO THE COMMUNITY MEMBERS AND/OR PROPERTY OWNERS. IF THEY ACCEPT, THE MATERIALS MUST BE PICKED UP THAT SAME DAY. ANY PIPE MATERIALS DETERMINED TO BE UNUSEABLE BY THE COR/COTR OR UNACCEPTABLE BY THE LAND OWNER/ COMMUNITY MEMBERS SHALL BE DISPOSED OF BY THE CONTRACTOR IN ACCORDANCE WITH SECTIONS 107, AND 203. THE SALVAGE WORK SHALL BE INCLUDED IN THE APPROPRIATE UNIT PRICE BID ITEMS FOR SECTIONS 203 AND/OR 607.
20. THE ROADWAY TYPICAL SECTION SHOWN IS THE BASIC TEMPLATE TO WHICH THE PROJECT IS TO BE STAKED AND BUILT. HOWEVER, THERE WILL BE LOCATIONS WHERE, DUE TO EXISTING GROUND CONDITIONS, TURNOUTS, CULVERTS OR OTHER STRUCTURES, ETC., THE SHOWN TYPICAL SLOPES CANNOT BE CONSTRUCTED. IN THIS CASE, THE NRDOT PLANNING & DESIGN BRANCH CHIEF, THROUGH THE COR/COTR, SHALL BE CONSULTED FOR CHANGES IN THE TYPICAL SECTIONS, DESIGN SLOPES, AND/OR OTHER ADJUSTMENTS BEFORE PROCEEDING WITH THE WORK UNLESS NOTED OTHERWISE ON THE PLANS. THE FINAL CONSTRUCTED ROAD SECTION SHALL BE BASED ON THE GOVERNMENT FURNISHED COMPUTERIZED STAKING REPORT AS ADJUSTED TO FIT FIELD CONDITIONS, UNLESS OTHERWISE APPROVED. IN NO CASE SHALL THE CUT AND FILL BACK SLOPES BE BUILT STEEPER THAN THE MAXIMUM ALLOWED IN THE ROADWAY TYPICAL SECTION SHOWN.
21. THE CONTRACTOR SHALL SAW CUT (FULL DEPTH) THE EXISTING ASPHALT PAVEMENT (INCLUDING TURNOUTS) WHERE NEW ASPHALT IS TO TIE INTO THE OLD ASPHALT PAVEMENT AT THE LOCATIONS NOTED ON THE PLANS. THE CONTRACTOR SHALL MATCH THE NEW ASPHALTIC CONCRETE PAVEMENT SURFACE TO EXISTING PAVEMENT SECTION AT TIE-IN POINTS AND TO PROVIDE FOR A SMOOTH TRANSITION AS DIRECTED BY THE COR/COTR. ALL SAWED PAVEMENT EDGES TO RECEIVE ASPHALT TACK COAT. THIS WORK SHALL BE INCIDENTAL TO BID ITEM 40201-0500 AS SHOWN IN THE BID SCHEDULE.
22. ANY EXISTING OR NEW ROADSIDE FEATURES OR OTHER IMPROVEMENTS NEGLIGENTLY DAMAGED BY THE CONTRACTOR, DURING CONSTRUCTION, SHALL BE RESTORED/REPLACED IN EQUAL OR BETTER CONDITION AT THE CONTRACTOR'S EXPENSE.
23. REMOVAL AND RE-ATTACHMENT OF FENCING REQUIRED TO COMPLETE SPECIFIED WORK AT DRAINAGE STRUCTURES, CATTLE GUARDS, GATES, TURNOUTS, RIPRAP, ETC, SHALL BE CONSIDERED INCIDENTAL TO THE BID ITEMS RELATED TO THE WORK REQUIRING SAID FENCE REMOVAL/RE-ATTACHMENT. FENCING REPAIRS, TEMPORARY FENCING AND/OR REMOVAL AND RE-ATTACHMENT OF FENCING, SHALL BE COMPLETED IN THE SAME WORK DAY SO AS NOT TO ALLOW LIVESTOCK ONTO THE PROJECT. IF WIRE TENSION IS LOST IN THE EXISTING FENCE, THE CONTRACTOR SHALL RE-TIGHTEN THE FENCE AS DIRECTED BY THE COR/COTR.
24. THE CONTRACTOR SHALL REMOVE BIA ROUTE N35 EXISTING ROADSIDE SIGNS THAT INTERFERE WITH ROAD CONSTRUCTION AND/OR CONTRADICT THE CONTRACTOR'S TEMPORARY TRAFFIC CONTROL PLAN, AT THE START OF THE CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE COR/COTR AT LEAST THREE (3) WORKING DAYS IN ADVANCE OF SUCH SIGN REMOVAL. THESE ROADSIDE SIGNS SHALL BE SALVAGED AND TAKEN TO THE SHIPROCK MAINTENANCE YARD. SIGNS NEEDED FOR SAFETY/INFORMATION SHALL BE TEMPORARILY RESET AS DIRECTED BY THE COR/COTR. ALL REMAINING SIGNS ALONG THE EXISTING N31 ROADWAY, NOT SPECIFICALLY DESIGNATED ON THE PLANS TO REMAIN, SHALL BE REMOVED. THIS WORK SHALL BE CONSIDERED AN INCIDENTAL OBLIGATION OF THE CONTRACTOR.
25. GRADE AND SHAPE THE SHOULDER AND DITCHES (AS DIRECTED BY COR/COTR) FROM THE SUBGRADE HINGE POINTS TO AND INCLUDING THE EXISTING DITCH LINE AREAS FOR THE CONSTRUCTION OF RIPRAP DITCH LININGS, SLOPE PROTECTION, AND RUNDOWNS. THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE RIPRAP ITEMS SHOWN IN THE BID SCHEDULE.
26. AT MAJOR DRAINAGE STRUCTURES AND LIVESTOCK PASS LOCATIONS, THE CONTRACTOR SHALL EITHER TIE THE WING FENCES TO STRUCTURES IN ACCORDANCE WITH THE DETAILS ON SHEET 18 OF 61 OR INSTALL FENCE OVER THE STRUCTURE AT THE CLEAR RECOVERY ZONE AS NOTED ON THE PLANS. IF NO CORNER FENCE POST/BRACE/STRAIN EXISTS AT TIE-IN TO RIGHT-OF-WAY FENCE, THE CONTRACTOR SHALL INSTALL A STRAIN POST ASSEMBLY AS PER PLAN SHEET 60 OF 83. ANY EXISTING CATTLE PASS CLOSURES ARE TO BE REMOVED. THIS WORK TO BE INCIDENTAL TO BID ITEM 61901-3400 AND NO ADDITIONAL PAYMENT SHALL BE MADE.

Cont. General Note

27. ALL RIGHT-OF-WAY REFERENCE MARKERS SHALL BE LABELED IN THE METRIC UNITS OF MEASURE. ALL EXISTING AND NEW BRASS CAPS SHALL BE STAMPED WITH BOTH ALIGNMENT STATIONING AND ELEVATIONS IN METRIC, UNLESS OTHERWISE NOTED UNDER SECTION 152 OF THE SUPPLEMENTAL SPECIFICATIONS. ANY EXISTING R/W MONUMENTS AND BRASS CAPS MISSING SHALL BE RE-SURVEYED IN TO THEIR ORIGINAL POSITION AND LABELED AND STAMPED ACCORDINGLY. ALL EXISTING REFERENCE MARKERS SHALL BE SAND BLASTED, CLEAN, AND REPAINTED WITH ENGLISH STATIONS ON ONE SIDE AND METRIC STATIONS ON THE OTHER. ANY MISSING OR DAMAGED MARKERS SHALL BE RE-SURVEYED AND REPLACED. THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEMS 62101-0000 AND 62102-0000.
28. THERE MAY BE A NUMBER OF ARCHAEOLOGICAL SITE MITIGATIONS THAT ARE NOTED ON THE PLANS. THE CONTRACTOR SHALL NOTIFY THE NAVAJO NATION DEPARTMENT OF TRANSPORTATION (NNDOT) ROAD CULTURAL RESOURCE MANAGEMENT (RCRM) AS REQUIRED PRIOR TO STARTING CONSTRUCTION ACTIVITIES IN THESE LOCATIONS. SEE THE SPECIAL CONTRACT REQUIREMENT SECTION OF THE CONTRACT FOR ADDITIONAL INFORMATION, AND REQUIREMENTS. THE CONTRACTOR SHALL PLACE TEMPORARY FLEXIBLE SAFETY FENCE AROUND THE ARCHAEOLOGY SITE(S) AS NOTED ON THE PLANS. THE FENCING MATERIAL SHALL BE SQUARE LINK (ORANGE COLOR) PLASTIC TYPE MADE OF HI-DENSITY HDPE, AS PER SECTION 710.11 OF FP-14. TEMPORARY ARCHAEOLOGY FENCING SHALL BE CONSIDERED INCIDENTAL OBLIGATIONS OF THE CONTRACTOR IF A SPECIFIC BID ITEM IS NOT SHOWN IN THE BID SCHEDULE.
29. AS-BUILTS GRADE AND DRAINAGE CONSTRUCTION PLANS [OF PROJECT ___N35(9)2___] MAY BE PROVIDED UPON WRITTEN REQUEST FROM THE CONTRACTOR THRU COR/COTR.
30. ROADWAY END AREA AND PIPE CROSS SECTION DRAWINGS WILL BE PROVIDED IN EITHER HARD COPY OR ELECTRONIC FORMAT UPON WRITTEN REQUEST FROM THE CONTRACTOR THRU CO.
31. ANY EXISTING MAIL BOXES, ADVERTISING BILLBOARDS, OR HOUSE ADDRESS SIGNS CALLED OUT ON THESE PLANS OR FOUND TO BE LOCATED ALONG THE ROADWAY PRISM SHALL BE REMOVED AND RE-INSTALLED OUTSIDE OF THE RIGHT-OF-WAY LIMIT OR AS DIRECTED BY THE COR/COTR. THE CONTRACTOR SHALL NOTIFY THE US-POSTAL SERVICE AND ATTEMPT TO CONTACT ALL AFFECTED RESIDENTS TEN (10) WORKING DAYS PRIOR TO RESETTING MAIL BOX (ES). THIS WORK SHALL BE INCIDENTAL TO BID ITEM 20304-1000.
32. AT THE COMPLETION OF THE CONSTRUCTION, THE CONTRACTOR SHALL INSPECT THE INTERIOR OF ALL NEWLY INSTALLED OR EXTENDED/CLEANED CULVERTS, CATTLEGUARDS, AND/OR OTHER EXISTING DRAINAGE STRUCTURES. THESE STRUCTURES SHALL BE MAINTAINED IN A CLEAN CONDITION, FREE OF SILT AND OTHER DEBRIS UNTIL FINAL ACCEPTANCE OF THE PROJECT. THIS WORK SHALL BE CONSIDERED AN INCIDENTAL OBLIGATIONS OF THE CONTRACTOR UNDER THE APPROPRIATE BID ITEMS, FOR SECTIONS 602, 603, 607, AND 619.
33. THERE ARE NUMBER OF LOCATIONS WHERE RIPRAP, CHANNEL FLOWLINE GRADING, TURNOUTS, ETC., WILL REQUIRE WORK AND IMPROVEMENTS PLACED THROUGH AND BEYOND THE RIGHT-OF-WAY FENCING LOCATIONS. IN THESE LOCATIONS, THE RIGHT-OF-WAY FENCING SHALL BE ADJUSTED (POST SPACING, VERTICAL ALIGNMENT, POST INSTALLATIONS THROUGH RIPRAP, RIGHT-OF-WAY MONUMENT/MARKER ADJUSTMENT, ETC.) AS DIRECTED BY THE COR/COTR. THIS WORK TO BE INCIDENTAL TO BID ITEMS 61901-3400, 62101-0000, AND 62102-0000, AND NO ADDITIONAL PAYMENT WILL BE MADE.
34. THE CONTRACTOR HAS THE OPTION TO USE (IF APPROVED) ARTICULATED CONCRETE BLOCK REVETMENT IN LIEU OF PLACED, WIRE ENCLOSED AND/OR GROUTED RIPRAP. THE CONTRACTOR IS RESPONSIBLE FOR SUPPLYING ALL DESIGNS, DETAILS, AND SHOP DRAWINGS REQUIRED FOR USING THE CABLE CONCRETE.
35. IT IS EXPECTED A REVISED/ FINAL RIGHTS-OF-WAY GRANT OF EASEMENT BE DEVELOPED DURING THE CONSTRUCTION OF THE N35(8) PROJECT. THE CONTRACTOR SHALL NOT SURVEY FOR OR INSTALL R.O.W. MONUMENTS AND MARKERS OR FENCINGS UNTIL EXPRESSLY APPROVED BY THE NRDOT DIVISION MANAGER THROUGH THE COR/COTR. FENCING CAN BE PLACED AT ALL ARCHAEOLOGICAL SITES IF SPECIFIED ON THE PLANS.
36. THE FINISHED SUBGRADE SOIL CLASSIFICATION AND PI'S WILL BE DETERMINED PRIOR TO SUBGRADE TREATMENT WITH ROADBOND EN-1. THE FINAL LOCATIONS (BY STATION) FOR SUBGRADE TREATMENT WILL BE DETERMINED BY THE BIA-NRDOT MATERIALS UNIT AND PROVIDED TO THE CONTRACTOR BEFORE THE WORK CAN PROCEED.

BASIS OF ESTIMATED QUANTITIES

ITEM No.	DESCRIPTION	GRADE	UNIT	APPLICATION
30101-2000	UNTREATED AGGREGATE BASE COURSE	Special	2,244 kg/m³	152 mm-Mainline, 152 mm-Turnouts
40201-0500	HOT ASPHALTIC CONC. PVMT. CALSS "B"	"B"	2,404 kg/m³	1-51 mm Lift Mainline and Turnouts
40502-0800	ASPHALT BINDER		0.9806 l/kg	6% by weight of total mixture
40701-1300	CHIP SEAL TYPE 2C		m²	
41101-1000	CUT BACK ASPHALT, PRIME COAT	MC-70	1.056 L/kg	1.36 L/m²

NAVAJO D.O.T.

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

TYPICAL CROSS SECTION & GENERAL NOTES

DESIGNED BY: AJS	REVISED:	25015 ANDREW JOHN SPEAR, Registered Professional Engineer, Certificate No., State of Arizona, Arizona, U.S.A.
DRAWN BY: DBB	BY:	
DATE: 5/16/2022	DIBBLE	
DWG: G2		

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ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	3	66

SUMMARY OF QUANTITIES

FP-14	DESCRIPTION	QUANTITY	UNITS	AS-BUILT
10901-0000	Extra & Miscellaneous Work - Authorized under Section 109.02(s) for FP-14	All Required	Lump Sum	
15101-0000	Mobilization	1	Lump Sum	
15201-0000	Construction Survey & Staking	1	Lump Sum	
15301-0020	Contractor Quality Control	1	Lump Sum	
15701-0000	Soil Erosion Control, Temporary	1	Lump Sum	
15703-1000	Soil Erosion Control, Soil Stabilization	30.2	ha	
20102-0000	Clearing and Grubbing	35.3	ha	
20302-2600	Removal of Pavement Markings	620	m	
20304-1000	Removal of Structures and Obstructions	1	Lump Sum	
20401-0000	Roadway Excavation	191,507	m^3	
21101-2000	Roadway Obliteraton, Method 2	20,070	m^2	
21301-0000	Subgrade Stablilization	25,000	m^2	
25101-2200	Placed Riprap, Method B, Class 2	740	m^3	
25110-2200	Grouted Riprap, Method B, Class 2	36.0	m^4	
25302-1200	Wire Enclosed Riprap, Class 1	2,934	m^3	
30101-2000	Untreated Aggregate Base, Grading "Special"	40,462	t	
40201-0500	Hot Asphaltic Concrete Pavement, Class "B", Grade "B", Type III Smoothness	20,422	t	
40501-0800	Asphalt Binder, PG-58-28	1,226	t	
40701-1300	Chip Seal, Type 2C	215,908	m^2	
41101-1000	Prime Coat, Method 1	141	t	
55401-1000	Reinforcing Steel	2,231	kg	
60101-1000	Minor Concrete A(AE)	70.3	m^3	
60201-0810	610 mm Corrugated Steel Pipe Culvert	215.2	m	
60201-0910	762 mm Corrugated Steel Pipe Culvert	162.2	m	
60201-1010	914 mm Corrugated Steel Pipe Culvert	135.3	m	
60201-1110	1067 mm Corrugated Steel Pipe Culvert	118.9	m	
60201-1810	2134 mm Corrugated Steel Pipe Culvert	99.4	m	
60202-0510	889 mm x 610 mm Corrugated Steel Pipe Arch	56.7	m	
60202-0810	1448 mm x 965 mm Corrugarted Steel Pipe Arch	211.4	m	
60210-0810	End Section for 610 mm Pipe Culvert	20	Each	
60210-0910	End Section for 762 mm Pipe Culvert	4	Each	
60210-1010	End Section for 914 mm Pipe Culvert	4	Each	
60210-1110	End Section for 1067mm Pipe Culvert	2	Each	
60222-3250	3.05m Span x 3.05m Rise Double Barrel Concrete Precast Box Culvert with	51.2	m	
60701-1000	Remove, Clean & Stockpiling Culvert	54.4	m	
60802-0400	Paved Waterway, Type 4	53.0	m	
60901-0400	Curb, Concrete, 150mm Depth	636.6	m	
60902-0400	Curb and Gutter, Concrete, 150mm Depth	13.4	m	
61701-4700	Guardrail System, MGS, Type 2, Class B, Wood Posts	480	m	
61702-1520	Terminal Section, Type MGS tangent, MSKT-TL3-8, SGR04b, Type PDE02	4	Each	
61901-1000	Barbed Wire Fence, 5 Strand	23,198	m	
61902-2600	Gate, Barbed Wire, Type 2, 4880 mm Width	1	Each	
61902-2601	Gate, Woven Wire, Type 1, 4270 mm Width	6	Each	
61903-0310	Cattleguard, 2 Unit 4900 mm	4	Each	
61903-0710	Cattleguard, 3 Unit 7190 mm	3	Each	
61903-1010	Cattleguard, 4 Unit 9480 mm	2	Each	
61920-3000	Remove and Relocate Cattle Guard	1	Each	
62101-0000	ROW Monument	50	Each	
62102-0000	Reference Marker	50	Each	
62102-2000	Install Waterline Marker, (Utility Furnished)	4	Each	
62510-1000	Seeding, Dry Method	30.2	ha	
62901-1100	Rolled Erosion Control Product, Type 4	116	m^2	
63301-0100	Sign System, Milepost, 38 mm x 38 mm Steel square tube	14	Each	
63303-1200	Signs, Aluminum Panel, Type 9 Sheeting	44	m^2	
63305-0400	Posts, Steel, 50mm x 50mm	392	m	
63308-2000	Object Marker, Type 2, 38 mm x 38 mm Steel Square Tube	36	Each	
63309-0030	Delineators, Type "1a", 38 mm x 38 mm Steel Square Tube	36	Each	
63309-0040	Delineators, Type "1b", 38 mm x 38 mm Steel Square Tube	106	Each	
63401-1500	Pavement Markings, Type H, Solid	42,839	m	
63401-1600	Pavement Markings, Type H, Broken	10,734	m	
63501-0000	Temporary Traffic Control	All Required	Lump Sum	

ITEM 20304-1000: REMOVAL OF STRUCTURES & OBSTRUCTIONS

STATION	LOCATION	REMARKS
32+140.00	Left	Remove Tolikan church sign and set aside for pickup by owner
33+866.22	centerline	ITEM 61920-3000: Remove the 4-unit cattleguard, wing braces and reinstall @ CL BOP of N351(1)

N35(8) TURNOUT LOCATIONS W/ CATTLEGUARDS AND GATES

STATION	LOCATION	TURNOUT SIZE	CATTLEGUARD			ITEM 61902-2600 TYPE GATE (EA)	ITEM 61902-2601 TYPE 2 GATE (EA)	REMARKS:
			2-UNIT CG ITEM 61903-0310	3-UNIT CG ITEM 61903-0710	4-UNIT CG ITEM 61903-1010			
N35 STATIONING								
23+700.00	CL	n/a			1	X		N35 Terminus
25+346.00	Rt.	n/a				1		Maintenance Access
25+715.00	Rt.	4.5m Turnout	1			X		To Residents
25+744.99	Lt.	n/a		1		X		To Chapter House
25+818.00	Rt.	n/a				1		Maintenance Access
26+745.00	Lt.	4.5m Turnout	1			X		To Residents
27+160.00	Rt.	n/a				1		Maintenance Access
27+306.00	Lt.	7.0m Turnout		1		X		CR534
29+410.00	Rt.	4.5m Turnout	1			X		To Residents
30+322.00	Lt.	n/a				1		Maintenance Access
30+331.00	Rt.	n/a				1		Maintenance Access
32+135.00	Lt.	7.0m Turnout		1		X		To Tolikan Christian Church
32+140.00	Rt.	n/a					1	Community Cemetery
33+294.00	Lt.	4.5m Turnout	1			X		To Residents
N5047								
28+945.00	CL	n/a			1	X		To Residents
N351								
28+882.00	CL	n/a			Note 1	1		To Residents
CHAPTER ACCESS ROAD TURNOUT LOCATIONS W/ CATTLEGUARDS & NO PIPES								
0+013.42	Lt.	4.5m Turnout						45-Deg Skew Lt
0+049.00	Rt.	7.0m Turnout						
		TOTAL:	4	3	2	6	1	

Note 1 - Install salvaged CG from N35(9) Sta. 33+866.22, New gate is quatified with Type 1 Gates.
Note 2 - Gates associated with Cattleguards (X) are paid for as part of the Cattleguard line item.

ITEM 21101-2000 ROADWAY OBLITERATION - METHOD 2

STATION TO STATION			Length	Area (m^2)	LOCATION	REMARKS:
23+750.	to	23+835.	85.0	1550.0	Right	Existing dirt road
23+890.	to	23+910.	20.0	60.0	Right	Existing dirt road
24+035.	to	24+070.	35.0	150.0	Right	Existing dirt road
24+090.	to	24+120.	1640.0	8200.0	Left	Existing dirt road
24+170.	to	24+190.	20.0	60.0	Left	Existing dirt road
24+610.	to	24+650.	40.0	100.0	Left	Existing dirt road
24+775.	to	24+910.	135.0	600.0	Left	Existing dirt road
24+925.	to	24+940.	15.0	40.0	Right	Existing dirt road
24+970.	to	25+010.	40.0	70.0	Right	Existing dirt road
25+285.	to	25+315.	30.0	50.0	Left	Existing dirt road
25+345.	to	25+420.	75.0	110.0	Left	Existing dirt road
25+465.	to	25+490.	25.0	50.0	Right	Existing dirt road
25+695.	to	25+715.	20.0	25.0	Right	Existing dirt road
25+730.	to	25+740.	10.0	25.0	Left	Existing dirt road
25+750.	to	25+780.	30.0	220.0	Left	Existing dirt road
25+865.	to	25+895.	30.0	60.0	Left	Existing dirt road
25+860.	to	26+080.	220.0	1100.0	Left	Existing dirt road
26+130.	to	26+150.	20.0	50.0	Left	Existing dirt road
26+150.	to	26+155.	5.0	30.0	Right	Existing dirt road
26+185.	to	26+200.	15.0	50.0	Right	Existing dirt road
26+310.	to	26+350.	40.0	70.0	Left	Existing dirt road
26+730.	to	26+735.	5.0	50.0	Right	Existing dirt road
27+810.	to	27+815.	5.0	30.0	Right	Existing dirt road
27+945.	to	27+955.	10.0	50.0	Left	Existing dirt road
28+015.	to	28+020.	5.0	40.0	Right	Existing dirt road
28+025.	to	28+065.	40.0	80.0	Right	Existing dirt road
29+280.	to	29+290.	10.0	40.0	Left	Existing dirt road
29+310.	to	29+575.	265.0	1340.0	Right	Existing dirt road
29+380.	to	29+390.	10.0	25.0	Left	Existing dirt road
29+925.	to	29+960.	35.0	230.0	Left	Existing dirt road
29+925.	to	29+930.	5.0	30.0	Right	Existing dirt road
30+020.	to	30+065.	45.0	120.0	Right	Existing dirt road
30+575.	to	30+595.	20.0	40.0	Left	Existing dirt road
30+585.	to	30+690.	105.0	530.0	Left	Existing dirt road
30+660.	to	30+695.	35.0	60.0	Right	Existing dirt road
30+725.	to	30+750.	25.0	50.0	Right	Existing dirt road
30+925.	to	30+935.	10.0	30.0	Right	Existing dirt road
31+770.	to	31+780.	10.0	70.0	Left	Existing dirt road
31+765.	to	31+775.	10.0	60.0	Right	Existing dirt road
32+145.	to	32+150.	5.0	70.0	Right	Existing dirt road
32+360.	to	33+290.	930.0	4400.0	Left	Existing dirt road
33+310.	to	33+320.	10.0	55.0	Right	Existing dirt road
		TOTAL:	4145.0	20070.0		

ESTIMATED EARTHWORK VOLUME

STATION	TO	STATION	CUT (m^3)	FILL (m^3)	WASTE (m^3)
N35(8) Line A and N5045					
21+441.45	to	24+524.66	53,976.00	53,976.00	0.00
24+524.66	to	24+842.31	18,516.00	18,516.00	0.00
24+842.31	to	24+928.31	3,914.00	3,914.00	0.00
24+928.31	to	25+712.44	30,487.00	30,487.00	0.00
25+712.44	to	25+788.96	1,864.00	1,864.00	0.00
25+788.96	to	26+775.62	10,429.00	10,429.00	0.00
26+775.62	to	27+116.50	2,242.00	2,242.00	0.00
27+116.50	to	28+913.07	5,664.00	32,949.00	0.00
		Sub-Total	**127,092.00**	**154,377.00**	**0.00**
N35(8) Line B					
28+920.00	to	29+502.58	7,893.00	7,893.00	0.00
29+502.58	to	30+280.28	27,594.00	27,594.00	0.00
30+280.28	to	33+860.00	21,479.00	82,202.00	0.00
		Sub-Total	**56,966.00**	**117,689.00**	**0.00**
N5047(1)					
28+913.07	to	29+145.70	1,850.00	1,850.00	0.00
29+145.70	to	29+398.06	4,383.00	38.00	4,345.00
		Sub-Total	**6,233.00**	**1,888.00**	**4,345.00**
N351(1)					
28+613.07	to	28+908.00	5,264.00	1,087.00	4,177.00
		Sub-Total	**5,264.00**	**1,087.00**	**4,177.00**
N5045(1)					
0+004.80	to	0+023.66	308.00	308.00	0.00
0+023.66	to	0+503.03	9,773.00	1,002.00	8,771.00
		Sub-Total	**10,081.00**	**1,310.00**	**8,771.00**
		Grand-Total	**205,636.00**	**276,351.00**	**0.00**

12% Shrinkage Factor Applied to Fill Volume

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

ESTIMATED QUANTITIES

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: G3	

Registered Professional Engineer (Civil) CERTIFICATE NO. 25015 ANDREW JOHN SPEAR Date Signed 5/16/22 ARIZONA U.S.A.

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ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	4	66

N35(8) ALIGNMENT

POINT	STATION (m)	ELEMENT	DIRECTION	NORTHING (m)	EASTING (m)
POB	21+441.450			648384.2	275667.022
		Linear= 199.958 (m)	N 73°04'32" E		
PC	21+641.409			648442.41	275858.32
PI	21+812.756	CURVE DATA		648492.291	276022.246
		Delta = 16°44'59" Lt.			
		Deg. = 4°55'22"			
		R = 1163.899 (m)			
		L = 340.250 (m)			
		T = 171.347 (m)			
		e = 12.545 (m)			
PT	21+981.658			648587.298	276164.841
		Linear= 871.936 (m)	N 56°19'33" E		
PC	22+853.594			649070.759	276890.47
PI	23+226.470	CURVE DATA		649277.507	277200.779
		Delta = 18°12'04" Rt.			
		Deg. = 2°27'41"			
		R = 2327.797 (m)			
		L = 739.470 (m)			
		T = 372.876 (m)			
		e = 29.675 (m)			
PT	23+593.064			649376.985	277560.14
		Linear= 538.277 (m)	N 74°31'37" E		
PC	24+131.341			649520.59	278078.908
PI	24+280.265	CURVE DATA		649560.32	278222.434
		Delta = 19°21'48" Rt.			
		Deg. = 6°33'49"			
		R = 872.924 (m)			
		L = 295.007 (m)			
		T = 148.924 (m)			
		e = 12.612 (m)			
PT	24+426.348			649550.216	278371.015
		Linear= 214.628 (m)	S 86°06'35" E		
PC	24+640.976			649535.655	278585.148
PI	24+831.932	CURVE DATA		649522.7	278775.664
		Delta = 51°36'04" Rt.			
		Deg. = 14°30'19"			
		R = 395.000 (m)			
		L = 355.741 (m)			
		T = 190.956 (m)			
		e = 43.736 (m)			
PT	24+996.718			649365.344	278883.846
		Linear= 291.146 (m)	S 34°30'31" E		
PC	25+287.864			649125.428	279048.789
PI	25+477.027	CURVE DATA		648969.549	279155.955
		Delta = 51°10'45" Lt.			
		Deg. = 14°30'19"			
		R = 395.000 (m)			
		L = 352.831 (m)			
		T = 189.164 (m)			
		e = 42.959 (m)			
PT	25+640.695			648955.325	279344.584
		Linear= 638.871 (m)	S 85°41'16" E		
PC	26+279.566			648907.286	279981.646
PI	26+457.493	CURVE DATA		648893.907	280159.07
		Delta = 17°23'00" Rt.			
		Deg. = 4°55'22"			
		R = 1163.899 (m)			
		L = 353.120 (m)			
		T = 177.927 (m)			
		e = 13.521 (m)			
PT	26+632.687			648828.132	280324.393
		Linear= 163.416 (m)	S 68°18'16" E		
PC	26+796.102			648767.722	280476.232
PI	26+978.046	CURVE DATA		648700.462	280645.288
		Delta = 8°56'18" Lt.			
		Deg. = 2°27'41"			
		R = 2327.797 (m)			
		L = 363.150 (m)			
		T = 181.944 (m)			
		e = 7.100 (m)			
PT	27+159.252			648660.285	280822.74
		Linear= 617.851 (m)	S 77°14'35" E		
PC	27+777.103			648523.852	281425.34
PI	27+998.652	CURVE DATA		648474.931	281641.42
		Delta = 14°27'52" Lt.			
		Deg. = 3°16'55"			
		R = 1745.848 (m)			
		L = 440.742 (m)			
		T = 221.549 (m)			
		e = 14.001 (m)			
PT	28+217.845			648481.531	281862.87
		Linear= 695.221 (m)	N 88°17'34" E		

CONTINUE ON N35(8) ALIGNMENT

PI	28+913.066			648502.245	282557.783
		Linear= 184.140 (m)	N 18°54'03" W		
PC	29+097.206			648676.456	282498.134
PI	29+193.355	CURVE DATA		648767.42	282466.988
		Delta = 27°21'40" Rt.			
		Deg. = 14°30'19"			
		R = 395.000 (m)			
		L = 188.629 (m)			
		T = 96.149 (m)			
		e = 11.534 (m)			
PT	29+285.835			648862.523	282481.133
		Linear= 424.198 (m)	N 8°27'37" E		
PC	29+710.033			649282.104	282543.542
PI	29+952.967	CURVE DATA		649522.395	282579.284
		Delta = 7°57'36" Rt.			
		Deg. = 1°38'27"			
		R = 3491.695 (m)			
		L = 485.087 (m)			
		T = 242.935 (m)			
		e = 8.441 (m)			
PT	30+195.120			649755.422	282647.956
		Linear= 169.083 (m)	N 16°25'12" E		
PC	30+364.203			649917.609	282695.752
PI	30+466.719	CURVE DATA		650015.944	282724.731
		Delta = 16°42'10" Rt.			
		Deg. = 8°12'16"			
		R = 698.339 (m)			
		L = 203.578 (m)			
		T = 102.516 (m)			
		e = 7.485 (m)			
PT	30+567.781			650101.801	282780.749
		Linear= 2126.501 (m)	N 33°07'22" E		
PC	32+694.282			651882.748	283942.745
PI	32+811.969	CURVE DATA		651981.311	284007.053
		Delta = 7°42'46" Rt.			
		Deg. = 3°16'55"			
		R = 1745.848 (m)			
		L = 235.017 (m)			
		T = 117.687 (m)			
		e = 3.962 (m)			
PT	32+929.300			652070.351	284084.007
		Linear= 1299.033 (m)	N 40°50'08" E		
POE	34+228.333			653053.184	284933.435

N5047(1) ALIGNMENT

POINT	STATION (m)	ELEMENT	DIRECTION	NORTHING (m)	EASTING (m)
POB	28+918.091			648502.395	282562.805
		Linear= 486.485 (m)	N 88°17'34" E		
EOP	29+398.066			648516.694	283042.567

N351(1) ALIGNMENT

POINT	STATION (m)	ELEMENT	DIRECTION	NORTHING (m)	EASTING (m)
POB	28+613.066			648218.421	282654.962
		Linear= 294.975 (m)	N 18°54'03" w		
EOP	28+908.041			648497.491	282559.410

All alignments and models are shown in Arizona State Plane East Zone GRID

NAVAJO D.O.T.

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

ALIGNMENT TABLE & QUANTITY TABLE

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: G4	

Registered Professional Engineer CERTIFICATE NO. 25015 ANDREW JOHN SPEAR State of Arizona

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ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	5	66

N35(8) - EXISTING UTILITY CROSSINGS

STATION	DESCIPTION	LOCATION	ELEVATION	SKEW NO.	OWNER	REMARKS
24+082.00	Existing Fiber Optic in Conduit	Centerline	unk	135	Frontier	Protect in Place
25+799.00	Exsiting OH Fiber Optic, Pole, Guy Wire and Pullbox	Lt.	unk	n/a	Frontier	Remove and Relocate Pole, Guy Wire, Pullbox and Fiber line by Frontier
26+278.00	Existing 102 mm PVC Waterline in 305 mm Steel Casing	Centerline	Depth 0.610mm	90	NTUA	Protect in Place, Install new Marker Posts from NTUA
26+332.00	Existing Overhead Power Line	Centerline	1659.210	135	NTUA	6.77 m Clearance, Protect in Place
28+926.00	Existing Fiber Optic in Conduit	Centerline	unk	80	Frontier	Relocate by Frontier Communications
29+382.00	Existing Overhead Power Line	Centerline	1709.870	115	NTUA	12.06m Clearance, Protect in Place
29+659.00	Existing 102 mm PVC Waterline in 305 mm Steel Casing	Centerline	Depth 0.610mm	95	NTUA	Protect in Place, Install new Marker Posts from NTUA
N5047(1) - EXISTING UTILITY CROSSING						
29+042.00	Existing Overhead Power Line	Centerline	1711.200	75	NTUA	10.3m Clearance, Protect in Place
CHAPTER HOUSE ACCESS ROAD - EXISTING UTILITY CROSSING						
0+254.00	Existing OH Fiber Optic	Centerline	unk	90	Frontier	Protect in Place

N35(8), N351(1), N5045(1) and N5047(1) ESTIMATED PAVEMENT QUANTITIES

ITEM 30101-2000: UNTREATED AGGREGATE BASE COURSE, GRADE SPECIAL

PROJECT	Sta. to Sta.			ABC Vol. (m3)	Unit wt. (kg/cu m)	t
N35(8) Line A & N5047	23+700.00	to	28+960.00	8,884.27	2,244.00	19,936.29
N35(8) Line B	28+918.00	to	33+860.00	8,347.16	2,244.00	18,731.02
Access Road	0+000.00	to	0+306.34	396.35	2,244.00	889.42
Transitions				190.00	2,244.00	426.36
Turnouts and Driveways				213.00	2,244.00	477.97
					TOTAL	40,461.06

ITEM 40701-1300: CHIP SEAL, TYPE 2C

PROJECT	Sta. to Sta.			Chip Seal Area. (sq m)	Applications	sq m
N35(8) Line A & N5047	23+700.00	to	28+960.00	53,652.00	2.00	107,304.00
N35(8) Line B	28+918.00	to	33+860.00	50,408.40	2.00	100,817.00
Access Road	0+000.00	to	0+306.34	2,607.59	2.00	5,215.00
Turnout and Driveways				1286.00	2.00	2,572.00
					TOTAL	215,908.00

ITEM 41101-1000: PRIME COAT, MC-70

PROJECT	Sta. to Sta.			Prime Coat Area (sq m)	1.36 L/sq m (L)	1.056 L/kg (kg)	t
N35(8) Line A & N5047	23+700.00	to	28+960.00	53,652.00	72,966.72	69,097.27	69.10
N35(8) Line B	28+918.00	to	33+860.00	50,408.40	68,555.42	64,919.91	64.92
Access Road	0+000.00	to	0+306.34	2,607.59	3,546.32	3,358.26	3.36
Transitions				1,248.00	1,697.28	1,607.27	1.61
Turnout and Driveways				1,286.00	1,748.96	1,656.21	1.66
						TOTAL	140.64

ITEM 40201-0500: HOT ASPHALTIC CONCRETE PAVEMENT, CLASS "B", GRADE "B"

PROJECT	Sta. to Sta.			HACP Vol. (c.y/m)	Unit wt. (kg/cu m)	t
N35(8) Line A & N5047	21+441.45	to	28+960.00	4,985.00	2,404.00	11,983.94
N35(8) Line B	28+918.00	to	33+860.00	3,277.00	2,404.00	7,877.91
Access Road	0+000.00	to	0+306.34	162.00	2,404.00	389.45
Turnout and Driveways				71.00	2,404.00	170.68
					TOTAL	20,421.98

ITEM 40501-0800: ASPHALT BINDER, PG-58-28

PROJECT	Sta. to Sta.			Application	t
N35(8) Line A & N5047	21+441.45	to	28+960.00	6% by Weight of Total Mix	719.04
N35(8) Line B	28+918.00	to	33+860.00	6% by Weight of Total Mix	472.67
Access Road	0+000.00	to	0+306.34	6% by Weight of Total Mix	23.37
Turnout and Driveways					10.24
				TOTAL	1,225.32

ITEM 15703-1000: SOIL EROSION CONTROL, TEMPORARY

Total Disturbed Area (from InRoads) =	329,798.0 m^2
- Area of New Roadway =	71,540.0 m^2
+ Staging Areas =	23,409.0 m^2
+ Areas of Existing Roadway Obliteration =	20,070.0 m^2
Total Area to Seed	301,737.0 m^2
Total Area to Seed	**30.2 ha**

ITEM 62510-1000: SEEDING, DRY METHOD

Total Disturbed Area (from InRoads)	329,798 m^2
-Area of New Roadway	71,540 m^2
+ Staging Areas	23,409 m^2
+ Areas of Existing Roadway Obliteration	20,070 m^2
Total Area to Seed	301,737 m^2
Total Area to Seed	**30.2 ha**

ITEM No. 61901-1000; FENCING, BARBED WIRE, 5 STRAND QUANTITY

Description:	Location:	Offset:	Length (m):	Remark:
Mainline, Station 23+700.000 to 28+882.586	centerline	30.480m, left	5182.59	tie-in new fencing to N5047 & N351 north.
Mainline, Station 28+943.546 to EOP 33+860.000	centerline	30.480m, left	4916.45	tie-in new fencing to N351 north & N35(9)
4.5m wide Turnout with 2-unit cattleguard; (5)-3.70m	varies	left	-18.50	
7.0m wide Turnout with 3-unit catteguard; (0)- 6.20m	varies	left	0.00	
Type 1 gate only; (2)- 4.27m	varies	left	-8.54	
Mainline, Station 23+700.000 to 28+882.586	centerline	30.480m, right	7441.14	tie-in new fencing BOP and N351 south
Mainline, Station 28+943.546 to EOP 33+860.000	centerline	30.480m, right	4936.45	tie-in new fencing to N351 north & N35(9)
4.5m wide Turnout with 2-unit cattleguard; (3)-3.70m	varies	right	-11.10	
7.0m wide Turnout with 3-unit catteguard; (4)- 6.20m	varies	right	-24.80	
Type 1 gate only; (1)- 4.27m	varies	right	-4.27	
Mainline; N351	south	30.480, right	25.74	
Mainline; N5047	east	30.480, right	25.74	
Mainline; N35(8)	BOP	centerline	60.96	perpendicular fencing to new cattleguard
		sub-total:	22521.86	m
		Total:	23197.52	m (3% added to account for terrain slope)

ITEM 62101-0000: R/W MONUMENTS & MARKERS

N35(8) LINE A				
Station	**Location**	**Monument (Each)**	**Markers (Each)**	**Remarks**
23+700.00	30.0m Lt. & Rt.	2	2	
24+131.34	30.0m Lt. & Rt.	2	2	
24+426.35	30.0m Lt. & Rt.	2	2	
24+640.98	30.0m Lt. & Rt.	2	2	
24+640.98	40.0m Rt.	1	1	
24+996.72	40.0m Rt.	1	1	
24+996.72	30.0m Lt. & Rt.	2	2	
25+287.86	30.0m Lt. & Rt.	2	2	
25+640.69	30.0m Lt. & Rt.	2	2	
26+279.57	30.0m Lt. & Rt.	2	2	
26+632.69	30.0m Lt. & Rt.	2	2	
26+796.10	30.0m Lt. & Rt.	2	2	
27+159.25	30.0m Lt. & Rt.	2	2	
27+777.10	30.0m Lt. & Rt.	2	2	
28+217.85	30.0m Lt. & Rt.	2	2	
28+872.38	30.0m Lt.	1	1	
28+890.95	30.0m Rt.	1	1	
	TOTAL	**30**	**30**	
N35(8) LINE B				
Station	**Location**	**Monument (Each)**	**Markers (Each)**	**Remarks**
28+872.38	30.0m Rt.	1	1	
28+935.19	30.0m Rt.	1	1	
29+097.21	30.0m Lt. & Rt.	2	2	
29+285.84	30.0m Lt. & Rt.	2	2	
29+710.03	30.0m Lt. & Rt.	2	2	
30+195.12	55.0m Lt. & 45.0m Rt.	2	2	
30+364.20	55.0m Lt. & 45.0m Rt.	2	2	
30+567.78	30.0m Lt. & Rt.	2	2	
32+694.28	30.0m Lt. & Rt.	2	2	
32+929.30	30.0m Lt. & Rt.	2	2	
33+860.00	30.0m Lt. & Rt.	2	2	
	TOTAL	**20**	**20**	

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

ALIGNMENT TABLE & QUANTITY TABLE

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/17/2022	DIBBLE
DWG: G5	

Registered Professional Engineer CERTIFICATE NO. 25015 ANDREW JOHN SPEAR STATE OF NEW MEXICO NATIONAL SURVEYING

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ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	6	66

N35(8) SECONDARY CONTROL POINTS

PT No.	NORTHING	EASTING	ELEVATION	STYLE	DECRIPTION
100	648364.993	275686.289	1577.575	Control Point	SCP 1
101	648466.494	275851.369	1580.488	Control Point	SCP 2
102	648528.327	276015.592	1590.318	Control Point	SCP 3
103	648655.933	276226.301	1587.110	Control Point	SCP 4
104	648717.671	276406.986	1588.348	Control Point	SCP 5
105	648893.380	276588.065	1588.279	Control Point	SCP 6
106	648993.945	276818.276	1590.642	Control Point	SCP 7
107	649168.837	277005.641	1589.495	Control Point	SCP 8
108	649302.592	277404.805	1599.867	Control Point	SCP 10
109	649419.736	277639.206	1601.801	Control Point	SCP 11
110	649421.975	277827.127	1604.968	Control Point	SCP 12
111	649502.851	277928.192	1612.600	Control Point	SCP 13
112	649509.329	278120.580	1613.750	Control Point	SCP 14
113	649573.147	278234.736	1614.127	Control Point	SCP 15
114	649524.707	278393.517	1618.066	Control Point	SCP 16
115	649557.386	278602.830	1619.918	Control Point	SCP 17
116	649507.752	278788.413	1621.746	Control Point	SCP 18
117	649312.118	278949.490	1619.752	Control Point	SCP 19
118	649106.637	279032.659	1625.609	Control Point	SCP 20
119	649007.524	279218.418	1632.971	Control Point	SCP 21
120	648926.546	279409.223	1638.106	Control Point	SCP 22
121	648958.396	279663.303	1643.492	Control Point	SCP 23
122	648891.978	279882.286	1651.229	Control Point	SCP 24
123	648902.601	280154.747	1659.279	Control Point	SCP 25
124	648776.252	280390.243	1665.975	Control Point	SCP 26
125	648730.664	280656.438	1668.131	Control Point	SCP 27
126	648614.792	280906.010	1673.100	Control Point	SCP 28
127	648606.762	281162.865	1677.291	Control Point	SCP 29
128	648511.574	281374.852	1683.401	Control Point	SCP 30
129	648521.978	281658.503	1690 .677	Control Point	SCP 31
130	648458.977	281895.995	1692.161	Control Point	SCP 32
131	648518.514	282134.959	1694.766	Control Point	SCP 33
132	648467.840	282376.601	1698.633	Control Point	SCP 34
133	648604.079	282553.169	1699.605	Control Point	SCP 35
134	648834.744	282449.334	1697.545	Control Point	SCP 36
135	649061.204	282540.000	1697.127	Control Point	SCP 37
136	649327.670	282521.213	1690.862	Control Point	SCP 38
137	649528.070	282618.614	1692.745	Control Point	SCP 39
138	649686.164	282658.253	1684.343	Control Point	SCP 40
139	649833.644	282739.959	1674.924	Control Point	SCP 41
140	649920.150	282647.908	1672.745	Control Point	SCP 42
141	650031.420	282767.152	1683.745	Control Point	SCP 43
142	650237.643	282834.867	1684.050	Control Point	SCP 44
143	650414.567	283013.098	1688.774	Control Point	SCP 45
144	650623.664	283090.234	1691.082	Control Point	SCP 46
145	650808.390	283276.317	1695.453	Control Point	SCP 47
146	651039.857	283360.616	1700.962	Control Point	SCP 48
147	651258.663	283501.014	1708.436	Control Point	SCP 49
148	651428.200	283680.222	1714.000	Control Point	SCP 50
149	651609.211	283732.120	1720.632	Control Point	SCP 51
150	651819.374	283867.441	1726.674	Control Point	SCP 52
151	651991.507	284055.952	1732.327	Control Point	SCP 53
152	652180.284	284217.351	1738.759	Control Point	SCP 54
153	652406.281	284338.335	1747.472	Control Point	SCP 55
154	652557.517	284545.300	1752.182	Control Point	SCP 56
155	652785.407	284664.428	1756.128	Control Point	SCP 57
156	648992.820	276649.633	1589.383	Control Point	SCP 1 N5045
157	648961.665	276484.298	1589.931	Control Point	SCP 2 N5045
158	648999.944	276343.191	1583.759	Control Point	SCP 3 N5045
159	649015.744	276195.447	1584.289	Control Point	SCP 4 N5045

N35(8)1,2&4 Bench Mark TABLE

STATION	OFFSET	Elevation	Desciption
23+680.669	20.108	1,601.801	TBM 11
23+862.377	27.869	1604.968	TBM 12
23+981.355	23.113	1,612.600	TBM 13
24+169.434	21.159	1,613.750	TBM 14
24+292.013	24.234	1,614.127	TBM 15
24+450.529	23.924	1,618.066	TBM 16
24+656.250	23.193	1,619.918	TBM 17
24+835.730	37.46	1,621.746	TBM 18
24+077.768	23.939	1,619.752	TBM 19
25+293.847	23.985	1,625.609	TBM 20
25+501.374	19.445	1,632.971	TBM 21
25+707.315	23.837	1,638.106	TBM 22
25+958.281	27.028	1,643.492	TBM 23
26+181.638	22.736	1,651.229	TBM 24
26+450.068	21.036	1,659.279	TBM 25
26+713.051	23.862	1,665.975	TBM 26
26+979.402	25.05	1,668.131	TBM 27
27+250.512	25.983	1,673.100	TBM 28
27+502.800	-22.904	1,677.291	TBM 29
27+730.573	23.124	1,683.401	TBM 30
28+010.199	-34.427	1,690.000	TBM 31
28+250.283	24.531	1,692.161	TBM 32
28+490.915	-28.86	1,694.766	TBM 33
28+730.940	28.991	1,698.633	TBM 34
29+010.904	28.623	1,699.605	TBM 35
29+255.821	-28.589	1,697.545	TBM 36
29+491.015	28.995	1,697.127	TBM 37
29+751.474	-29.038	1,690.862	TBM 38
29+996.706	28.715	1,692.745	TBM 39
30+131.064	28.872	1,684.343	TBM 40
30+296.159	66.139	1,674.924	TBM 41
30+353.116	-46.611	1,672.745	TBM 42
30+498.954	23.797	1,683.745	TBM 43
30+711.121	-28.905	1,684.050	TBM 44
30+956.687	23.686	1,688.774	TBM 45
31+173.955	-25.971	1,691.082	TBM 46
31+430.346	28.933	1,695.453	TBM 47
31+670.264	-26.948	1,700.962	TBM 48
30+930.233	-28.928	1,708.436	TBM 49
32+170.146	28.518	1,714.000	TBM 50
32+350.101	-26.928	1,720.632	TBM 51
32+600.057	-28.437	1,726.674	TBM 52
32+849.978	281.557	1,732.327	TBM 53
33+099.666	29.002	1,738.759	TBM 54
33+349.763	-27.241	1,747.472	TBM 55
33+599.519	30.455	1,752.182	TBM 56
33+849.835	28.430	1,756.128	TBM 57
TOTAL:			

ITEM 63309-0030: DELINEATERS, TYPE 1a

Station	Location	Each
25+958.00	Lt. & Rt.	2
27+458.00	Lt. & Rt.	2
28+549.00	Lt. & Rt.	2
28+687.00	Lt. & Rt.	2
30+897.00	Lt. & Rt.	2
31+057.00	Lt. & Rt.	2
31+218.00	Lt. & Rt.	2
31+379.00	Lt. & Rt.	2
31+550.00	Lt. & Rt.	2
31+710.00	Lt. & Rt.	2
31+884.00	Lt. & Rt.	2
32+045.00	Lt. & Rt.	2
32+205.00	Lt. & Rt.	2
32+366.00	Lt. & Rt.	2
33+355.00	Lt. & Rt.	2
33+515.00	Lt. & Rt.	2
33+676.00	Lt. & Rt.	2
33+836.00	Lt. & Rt.	2
	TOTAL	36

ITEM 63309-0040: DELINEATERS, TYPE 1b

Station	Location	Each
23+746.39	Lt.	1
23+977.98	Lt.	1
24+063.30	Lt.	1
24+131.39	Lt.	1
24+182.00	Lt.	1
24+230.29	Lt.	1
24+278.05	Lt.	1
24+328.51	Lt.	1
24+426.22	Lt.	1
24+500.28	Lt.	1
24+640.44	Lt.	1
24+675.35	Lt.	1
24+720.97	Lt.	1
24+769.46	Lt.	1
24+799.37	Lt.	1
24+831.90	Lt.	1
24+864.19	Lt.	1
24+897.65	Lt.	1
24+930.72	Lt.	1
24+963.88	Lt.	1
24+996.68	Lt.	1
25+063.25	Lt.	1
25+141.33	Lt.	1
25+199.95	Rt.	1
25+287.48	Rt.	1
25+331.11	Rt.	1
25+387.82	Rt.	1
25+421.36	Rt.	1
25+458.17	Rt.	1
25+491.09	Rt.	1
25+522.92	Rt.	1
25+564.99	Rt.	1
25+600.83	Rt.	1
25+640.33	Rt.	1
25+728.99	Rt.	1
25+809.40	Rt.	1
26+112.32	Lt.	1
26+190.45	Lt.	1
26+279.38	Lt.	1
26+327.88	Lt.	1
26+373.12	Lt.	1
26+416.18	Lt.	1
26+454.99	Lt.	1
26+507.45	Lt.	1
26+551.80	Lt.	1
26+595.93	Lt.	1
26+632.53	Lt.	1
26+707.22	Lt.	1
26+721.53	Rt.	1
26+796.05	Rt.	1
26+881.25	Rt.	1
26+976.40	Rt.	1
27+074.46	Rt.	1
27+159.29	Rt.	1
27+248.76	Rt.	1
27+328.12	Rt.	1
27+612.50	Rt.	1
27+688.66	Rt.	1
27+777.17	Rt.	1
27+842.40	Rt.	1
27+899.67	Rt.	1
27+950.13	Rt.	1
28+002.37	Rt.	1
28+045.67	Rt.	1
28+100.00	Rt.	1
28+151.32	Rt.	1
28+218.11	Rt.	1
28+306.66	Rt.	1
28+387.39	Rt.	1
29+030.61	Lt.	1
29+097.55	Lt.	1
29+128.78	Lt.	1
29+161.18	Lt.	1

ITEM 63309-0040: DELINEATERS, TYPE 1b

29+192.25	Lt.	1
29+222.45	Lt.	1
29+255.10	Lt.	1
29+285.84	Lt.	1
29+353.53	Lt.	1
29+440.19	Lt.	1
29+538.09	Lt.	1
29+625.70	Lt.	1
29+709.47	Lt.	1
29+781.95	Lt.	1
29+868.12	Lt.	1
29+942.41	Lt.	1
30+026.38	Lt.	1
30+110.80	Lt.	1
30+194.75	Lt.	1
30+279.50	Lt.	1
30+364.20	Lt.	1
30+412.79	Lt.	1
30+462.75	Lt.	1
30+514.76	Lt.	1
30+567.59	Lt.	1
30+657.08	Lt.	1
30+734.56	Lt.	1
32+526.83	Lt.	1
32+606.52	Lt.	1
32+693.32	Lt.	1
32+751.71	Lt.	1
32+812.33	Lt.	1
32+870.03	Lt.	1
32+929.18	Lt.	1
33+018.48	Lt.	1
33+105.59	Lt.	1
33+192.68	Lt.	1
	TOTAL	106

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

CONTROL POINT, BENCH MARK & R/W MONUMENT DELINEATORS

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: G6	

Arizona Professional Engineer CERTIFICATE NO. 25015 ANDREW JOHN SPEAR Date Signing Expires 09/30/2022

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ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	7	66

NOTE: SEE DWG D19 FOR GENERAL NOTES AND ADDITIONAL DETAILS

ESTIMATED DRAINAGE STRUCTURE QUANTITIES

Station	Structure	Skew No.	25101-2000 Placed Riprap, Class 2 Length(m)	60201-0810 610mm CSPC Aluminum Alloy 68mm x 13mm Corr. 2.77mm Thickness Length(m)	60201-0910 762mm CSPC Aluminum Alloy 68mm x 13mm Corr. 2.77mm Thickness Length(m)	60201-1010 914mm CSPC Aluminum Alloy 68mm x 13mm Corr. 2.77mm Thickness Length(m)	60201-1110 1067mm CSPC Aluminum Alloy 68mm x 12mm Corr. 2.77mm Thickness Length(m)	60201-1810 2134mm CSPC Aluminum Alloy 127mm x 25mm Corr. 3.5mm Thickness Length(m)	60202-0510 889 mm x 610 mm CSPA Aluminum Alloy 68mm x 12mm Corr. 2.77mm Thickness Length(m)	60202-0810 1448mm x 965mm CSPA Aluminum Alloy 68mm x 12mm Corr. 2.77mm Thickness Length(m)	60222-3250 3.05 Span x 3.05 x Rise Double-Barrel RCBC Length(m)	60210-0810 End Section 610mm CSPC 2.77mm Thickness Each	60210-0910 End Section 762mm CSPC 2.77mm Thickness Each	60210-1010 End Section 914mm CSPC 2.77mm Thickness Each	60210-1110 End Section 1067mm CSPC 2.77mm Thickness Each	60211-0910 End Section 889mm x 610mm CSPC 2.77mm Thickness Each
24 + 080.00	1 - 762 mm x 56.083 m CSPC	140			56.083							1				
24 + 101.00	1 - 610 mm x 24.384 m CSPC	90		24.384							1					
24 + 139.50	1 - 610 mm x 29.261 m CSPC	98		29.261							1					
24 + 375.00	1 - 1067 mm x 60.960 m CSPC	106					60.960								1	
24 + 560.00	1 - 1067 mm x 57.912 m CSPC	108					57.912								1	
24 + 950.00	1 - 762 mm x 45.110 m CSPC	90			45.110							1				
25 + 110.00	1 - 762 mm x 26.213 m CSPC	82			26.213							1				
25 + 180.00	1 - 610 mm x 35.966 m CSPC	82		35.966							1					
25 + 250.00	1 - 762 mm x 34.747 m CSPC	66			34.747							1				
25 + 350.00	1 - 2134 mm x 42.672 m CSPC	57						42.672								
25 + 550.00	1 - 914 mm x 33.572 m CSPC	101				33.527								1		
25 + 794.00	1 - 2134 mm x 31.699 m CSPC	82						31.699								
26 + 225.00	1 - 610 mm x 21.337 m CSPC	83				21.337								1		
26 + 250.00	3 - 914 mm x 26.822 m CSPC	46				80.466								3		
26 + 745.00	1 - 610 mm x 15.240m CSPC (Under Turnout) Lt.	0		15.240							2					
27 + 050.00	2 - 610 mm x 20.117 m CSPC	66		40.234							2					
27 + 180.00	1 - 2134 mm x 24.995 m CSPC	95						24.995								
27 + 306.00	1 - 610 mm x 15.240 m CSPC (Under Turnout) Lt.	0		15.240							2					
28 + 264.00	3 - 889 mm x 610 mm x 18.898 m CSPA	90							56.694							3
28 + 911.91	4 - 1448 mm x 965 mm x 52.96 m CSPA	36								211.840						
29 + 410.00	1 - 610 mm x 18.288 m CSPC (Under Turnout) Rt.	0		18.288							2					
30 + 310.00	2 - Barrel 3.05m Span x 3.05m x Rise x 51.204m CBC, w/wingwalls on both sides.	80									51.204					
32 + 135.00	1 - 610 mm x 18.288 m CSPC (Under Turnout) Lt.	0		18.288							2					
33 + 294.00	1 - 610 mm x 18.288 m CSPC (Under Turnout) Lt.	0		18.288							2					
			TOTAL:	215.2	162.2	135.3	118.9	99.4	56.7	211.8	51.2	15	4	5	2	3

ITEM 60701-1000 REMOVE, CLEAN & STOCKPILE CULVERT

STATION	LOCATION	LENGTH (m)	REMARKS
23+850.00	Centerline	12.80	1- 610 mm CSPC
25+794.00	Centerline	14.80	1- 914 mm CSPC
26+226.00	Centerline	14.80	1- 914 mm CSPC
27+180.00	Centerline	12.00	1- 1524 mm CSPC
TOTAL:		54.40	

NAVAJO D.O.T.

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

DRAINAGE STRUCTURE QUANTITIES

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: G7	

Registered Professional Engineer CERTIFICATE NO. 25015 ANDREW JOHN SPEAR ARIZONA U.S.A.

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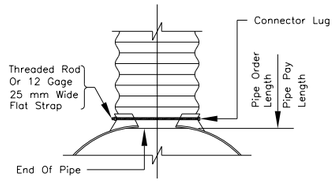
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	8	66



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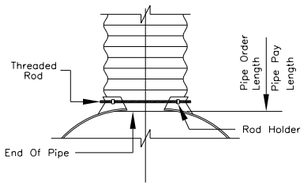

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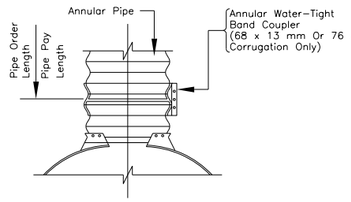

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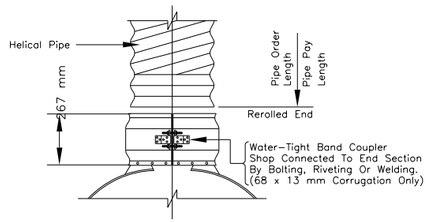

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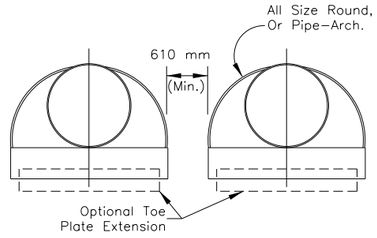
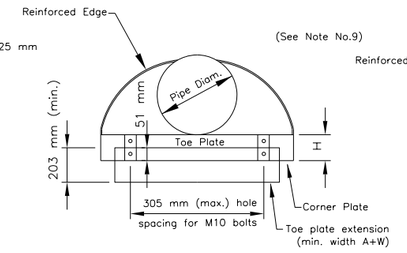
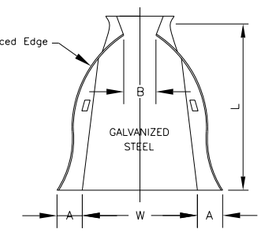


MULTIPLE INSTALLATION SPACING

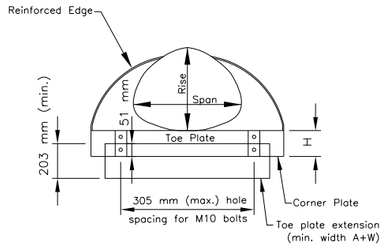
NOTE: At Roadway Culverts Place End Sections On Inlet End Only. At Driveway Culverts Place End Sections On Both Ends.



ELEVATION



PLAN



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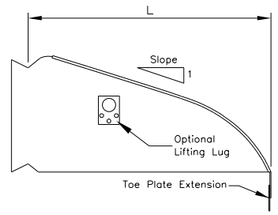


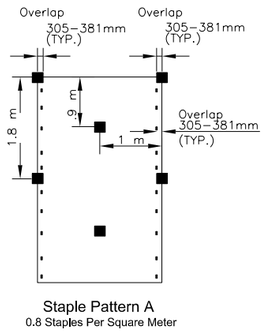
TYPICAL CROSS SECTION

GENERAL NOTES

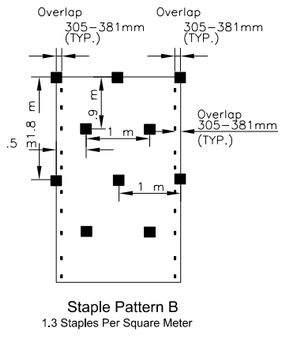
1. For Multiple Installation Of All Types, A Minimum Of A 610mm Spacing Measured Along The Horizontal Between Flared End Sections At Their Widest Cross Section Shall Be Used.
2. All Three (3) Piece Bodies To Have 2.77mm Thickness Sides And 3.5mm Thickness Center Panels. Width Of Center Panels To Be Greater Than 20% Of The Pipe Periphery. Multiple Panel Bodies To Have Lap Seams Which Are To Be Tightly Joined By 9.53mmø Galvanized Rivets Or Bolts.
3. End Sections For Steel Pipe-Arches: For The 1956mm x 1321mm And 2108mm X 1448mm Sizes, Reinforced Edge To Be Supplemented By 51mm x 51mm x 6.35mm Galvanized Angles. The Angles To Be Attached By 9.53mm Dia. Galvanized Nuts And Bolts. Angle Reinforcement Will Be Placed Under The Center Panel Seams.
4. End Sections For Steel Circular Pipes: For 1524mm Thru 2134mm Sizes, Reinforced Edge To Be Supplemented With Galvanized Stiffener Angles. The Angles Will Be 51mm x 51mm x 6.35mm For 1524mm Thru 1829mm, And 64mm x 64mm x 6.35mm For 1981mm And 2134mm. The Angles To Be Attached By 9.53mm Galvanized Nuts And Bolts.
5. Welding Shall Not Be Permitted In Connecting End Sections To Connector Sections Or Connector Sections To Pipe.
6. Type No. 1 Steel End Section: Connect End Section With Threaded Rod With Connector Lug, For 610mm Pipe Only.
7. Type No. 2 Steel End Section: Connect End Section With Threaded Rod With Rod Holder, For 762mm And 914mm Round Pipe; And 432mm x 330mm Thru 1448mm x 965mm CSPA.
8. Type No. 3 Steel End Section: The Connection Includes 305mm Of The Pipe Length As A Connector Section For Pipe Arch Sizes 1626mm x 1092mm Thru 2108mm x 1448mm And Round Pipe Sizes 1067mm Thru 2134mm. Gages Of Connector Section Shall Be The Same As The End Sections As Mentioned Above. The Connector Section Will Be Attached To The End Section By 9.5mm Galvanized Rivets Or Bolts On Approximately 152mm Centers.
9. Helically Corrugated Pipe: For Type No. 5 And Type No. 3 The Dimple Band Or Corrugated Pipe Connector Section Shall Be Attached To The End Section By 9.5mm Galvanized Steel Rivets Or Bolts Spaced At Approximately 152mm Centers.
10. Type No. 1, Type No. 2, And Type No. 3 Connections May Be Used With Welded Seams Helically Corrugated Pipe With Re-Rolled Ends. Re-Rolled Ends Shall Include A Minimum Of Two (2) Annular Corrugations Of The Same Size As The Pipe Corrugations.

RECP STAPLE TABLE

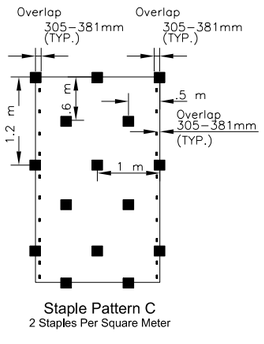
Slope Ht. (m)	Staple Pattern		
91 84 76 69 61 53 46 38 30 23 15 8	C	C	C
	B		
	A	B	B
Grade	1:3	1:2	1:1



Staple Pattern A
0.8 Staples Per Square Meter



Staple Pattern B
1.3 Staples Per Square Meter



Staple Pattern C
2 Staples Per Square Meter

RECP STAPLE DETAILS
SEE SHEET 00 FOR ADDITIONAL REQUIREMENTS

STAPLE NOTES

1. To Determine The Staple Pattern To Use For Erosion Blankets/Mats Refer To The Rolled Erosion Control Products (RECP) Staple Table. Choose Staple Pattern A, B Or C Based On The Grade And Slope Height.
2. Begin Stapling At Top Of Slope.
3. Staple Overlap Areas With Staggered Pattern With Staples.
4. Staple Patterns Shown Are For 2.44 m Wide Blankets.
5. Follow All The Manufacturer's Recommendations For Installing Blankets & Staples.

NOTE: PIPE BEDDING AND BACKFILL MATERIAL SHALL BE TESTED FOR RESISTIVITY AT EACH PIPE LOCATION AND SOURCE PER SECTION 153. THE MINIMUM ACCEPTABLE RESISTIVITY TO BE PER SECTION 704 OF THE SUPPLEMENTAL SPECIFICATIONS.

ROUND PIPE END SECTION

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

ARCH PIPE END SECTION

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

* CORRUGATION DIMENSION

NAVAJO D.O.T.

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

DRAINAGE STRUCTURE & END SECTION DETAIL

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: G8	

Professional Engineer CERTIFICATE NO. 25015 ANDREW JOHN SPEAR Date Signed 5/16/22 ARIZONA U.S.A.

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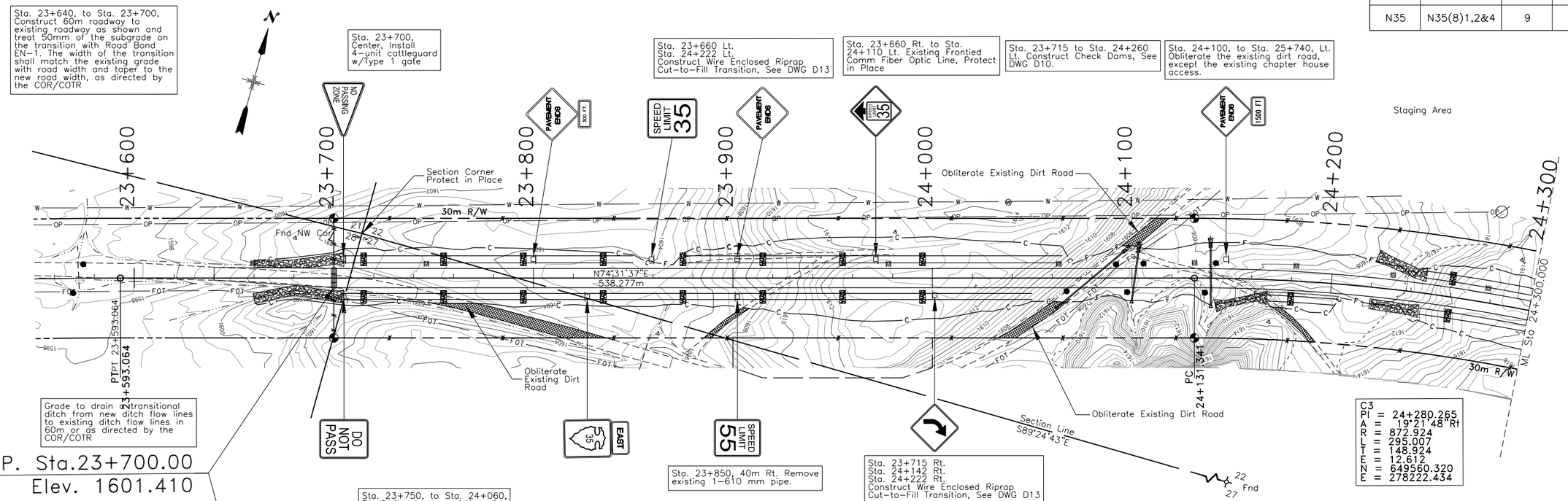
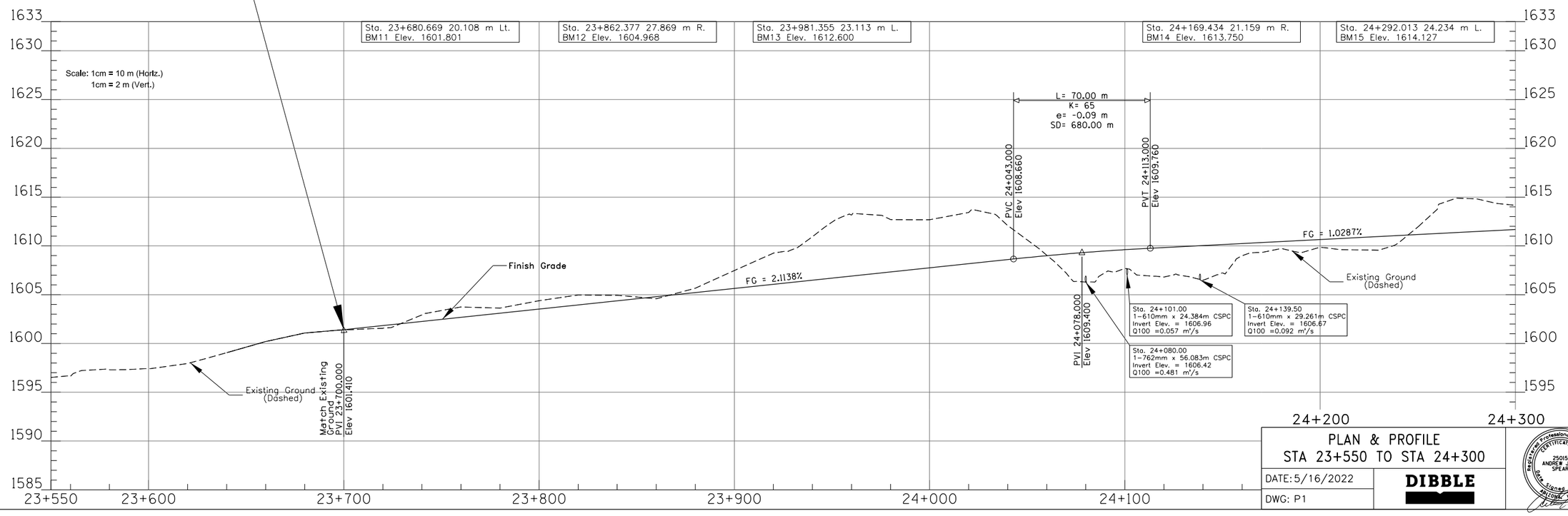
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	9	66



DELINEATORS		TYPE 2	RIGHT-OF-WAY MARKER
TYPE "1a"	TYPE "1b"	OBJECT MARKER	
⊡	⊡	●	◕
0	8	6	4

DRAINAGE STRUCTURES

MARK	STATION	STRUCTURE	SKEW No.	D.A. (Ha.)	REMARKS
	24+080	1-762 mm x 56.083 m CSPC	140°	6.07	New Corrugated Steel Pipe Culvert with End Section at Inlet
	24+101	1-610 mm x 24.384 m CSPC	90°	0.20	New Corrugated Steel Pipe Culvert with End Section at Inlet
	24+139.5	1-610 mm x 29.261 m CSPC	98°	1.54	New Corrugated Steel Pipe Culvert with End Section at Inlet



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PLAN & PROFILE
STA 23+550 TO STA 24+300

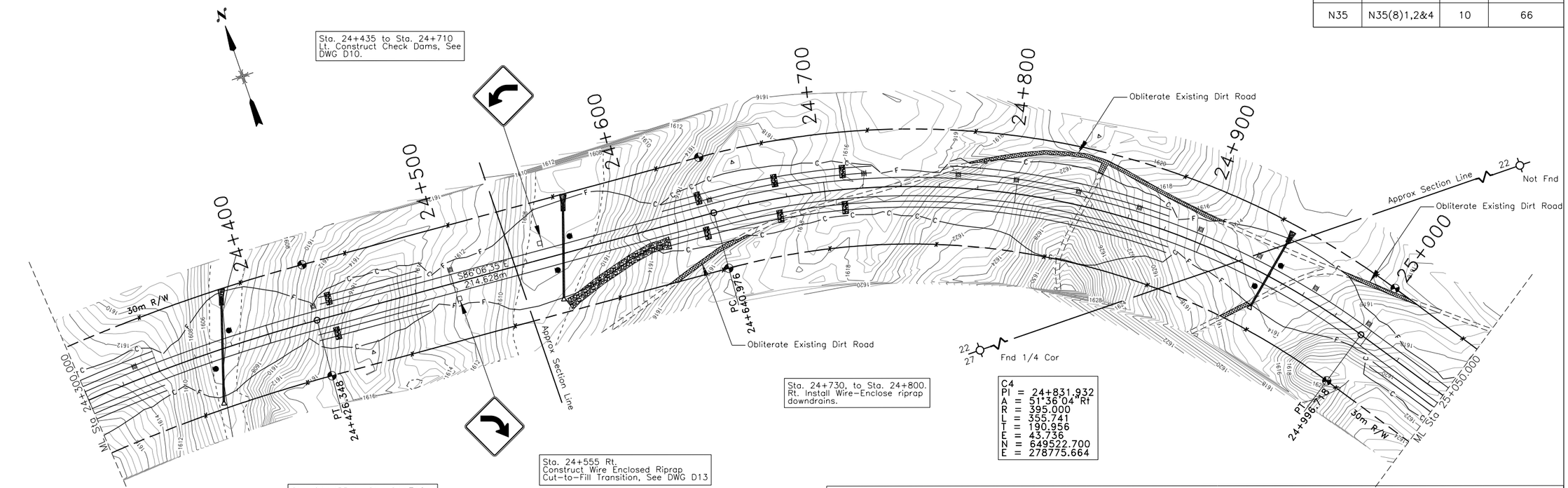
DATE: 5/16/2022

DWG: P1

DIBBLE

Registered Professional Engineer CERTIFICATE NO. 25015 ANDREW JOHN SPEAR

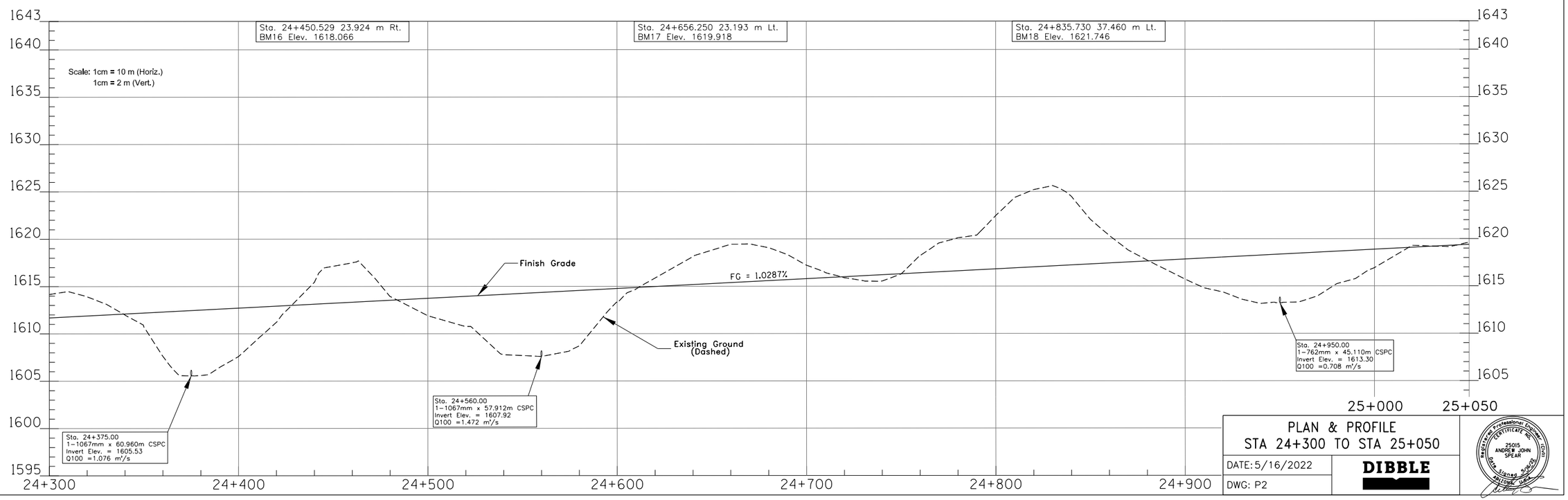
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	10	66



DELINEATORS		TYPE 2	RIGHT-OF-WAY MARKER
TYPE "1a"	TYPE "1b"	OBJECT MARKER	
⊡	⊡	●	◕
0	14	6	6

DRAINAGE STRUCTURES

MARK	STATION	STRUCTURE	SKEW No.	D.A. (Ha.)	REMARKS
	24+375.00	1-1067 mm x 60.960 m CSPC	106°	14.973	New Corrugated Steel Pipe Culvert With End Section At Inlet
	24+560.00	1-1067 mm x 57.912 m CSPC	108°	13.354	New Corrugated Steel Pipe Culvert With End Section At Inlet
	24+950.00	1-762 mm x 45.110 m CSPC	90°	9.712	New Corrugated Steel Pipe Culvert With End Section At Inlet



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PLAN & PROFILE
STA 24+300 TO STA 25+050

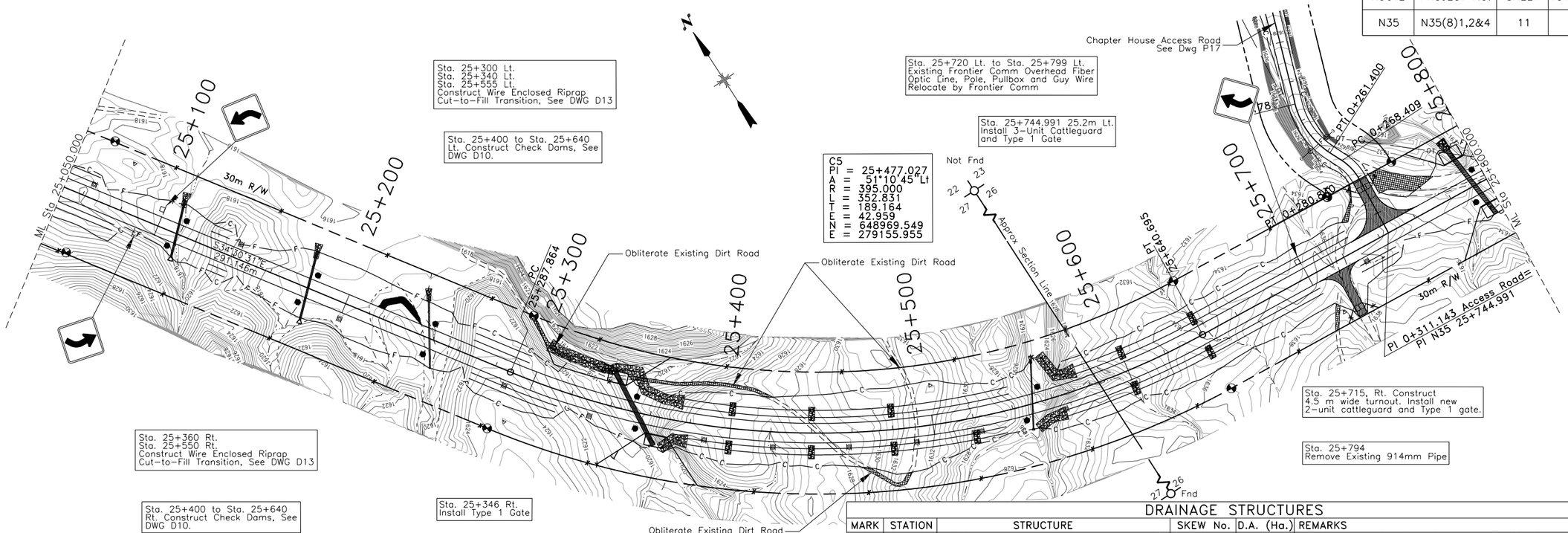
DATE: 5/16/2022

DWG: P2

DIBBLE

Registered Professional Engineer
CERTIFICATE NO.
25015
ANDREW JOHN SPEAR
Date Signed 5/16/22
ARIZONA, U.S.A.

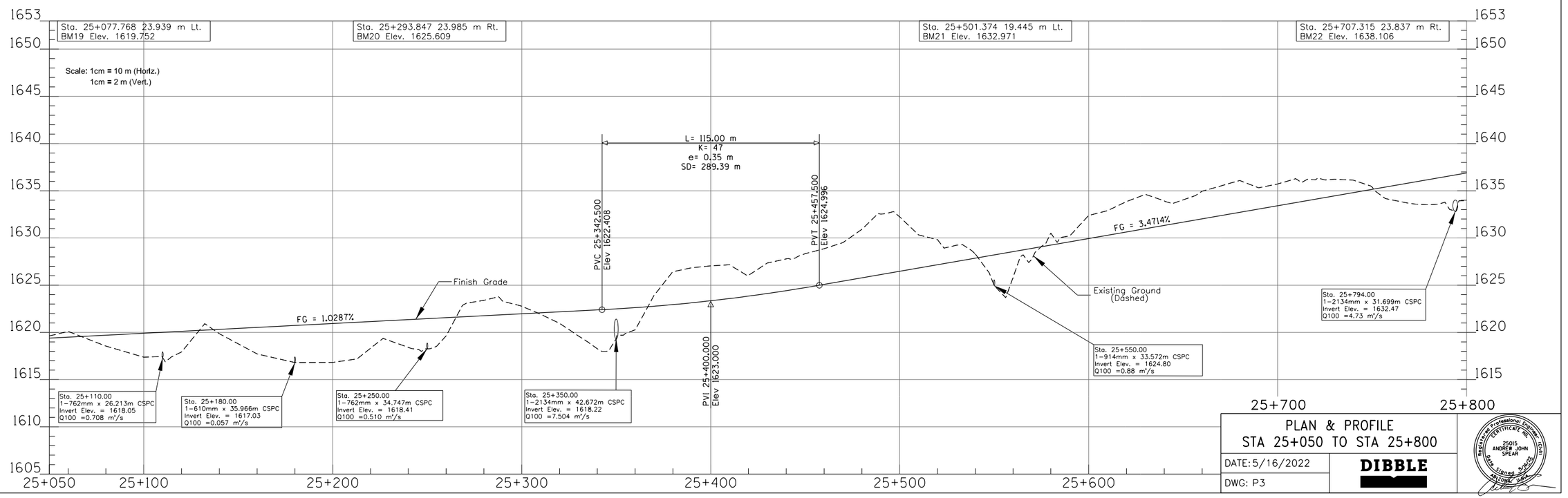
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	11	66



DELINEATORS		TYPE 2	RIGHT-OF-WAY MARKER
TYPE "1a"	TYPE "1b"	OBJECT MARKER	
⊡	⊡	●	◔
0	14	12	6

DRAINAGE STRUCTURES

MARK	STATION	STRUCTURE	SKEW No.	D.A. (Ha.)	REMARKS
7	25+110.00	1-762 mm x 26.213 m CSPC	82°	6.47	New Corrugated Steel Pipe Culvert with End Section at Inlet
8	25+180.00	1-610 mm x 35.966 m CSPC	82°	0.809	New Corrugated Steel Pipe Culvert with End Section at Inlet
9	25+250.00	1-762 mm x 34.747 m CSPC	66°	6.48	New Corrugated Steel Pipe Culvert with End Section at Inlet
10	25+350.00	1-2134 mm x 42.672 m CSPC	50°	53.823	New Corrugated Steel Pipe Culvert w/Conc Blanket at Inlets/Outlets
11	25+550.00	1-914 mm x 33.572 m CSPC	101°	16.87	New Corrugated Steel Pipe Culvert with End Section at Inlet
12	25+794.00	1-2134 mm x 31.699 m CSPC	80°	238.36	New Corrugated Steel Pipe Culvert w/Conc Blanket at Inlets/Outlets



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PLAN & PROFILE
STA 25+050 TO STA 25+800

DATE: 5/16/2022

DWG: P3

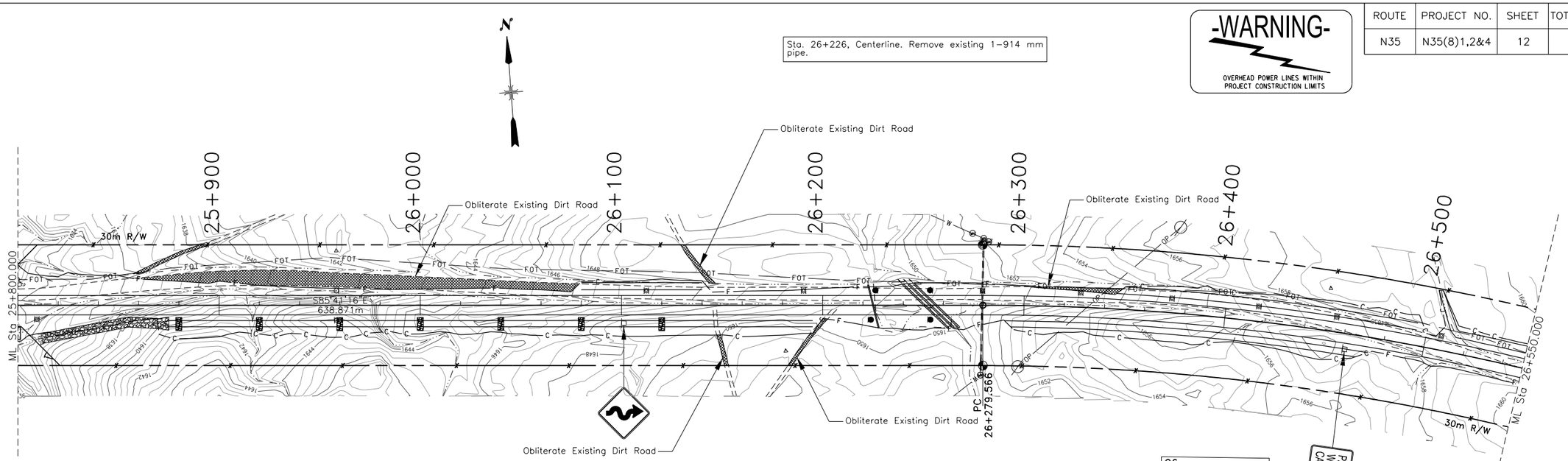
DIBBLE

Nevada Professional Engineer CERTIFICATE NO. 25015 ANDREW JOHN SPEAR

-WARNING-

OVERHEAD POWER LINES WITHIN PROJECT CONSTRUCTION LIMITS

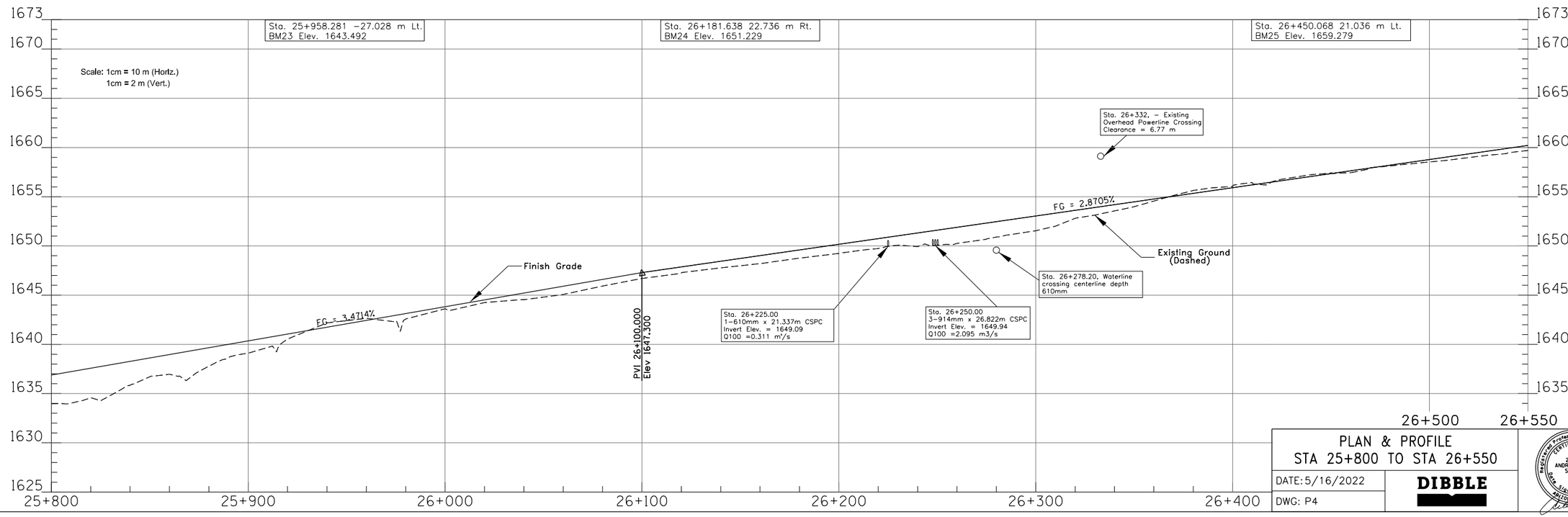
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	12	66



DELINEATORS		TYPE 2	RIGHT–OF–WAY MARKER
TYPE "1a"	TYPE "1b"	OBJECT MARKER	
⊡	⊡	●	◔
2	9	4	2

DRAINAGE STRUCTURES

MARK	STATION	STRUCTURE	SKEW No.	D.A. (Ha.)	REMARKS
	26+225.00	1–610 mm x 21.337 m CSPC	83°	8.498	New Corrugated Steel Pipe Culvert with End Section at Inlet
	26+250.00	3–914 mm x 26.822 m CSPC	46°	80.128	New Corrugated Steel Pipe Culvert with End Sections at Inlet



PLAN & PROFILE
STA 25+800 TO STA 26+550

DATE: 5/16/2022

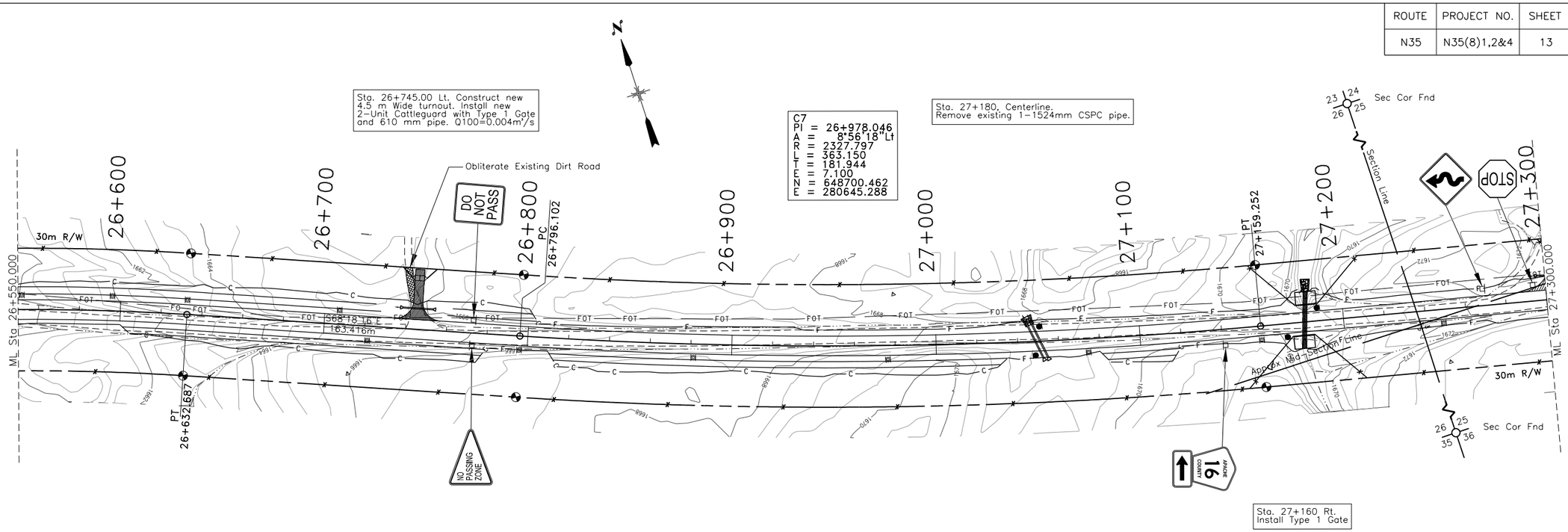
DWG: P4

DIBBLE

Registered Professional Engineer CERTIFICATE NO. 25015 ANDREW JOHN SPEAR

J:\2017\1017064.15 NDOT, N35 Sweetwater\CAD\N35–P04.dgn

ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	13	66

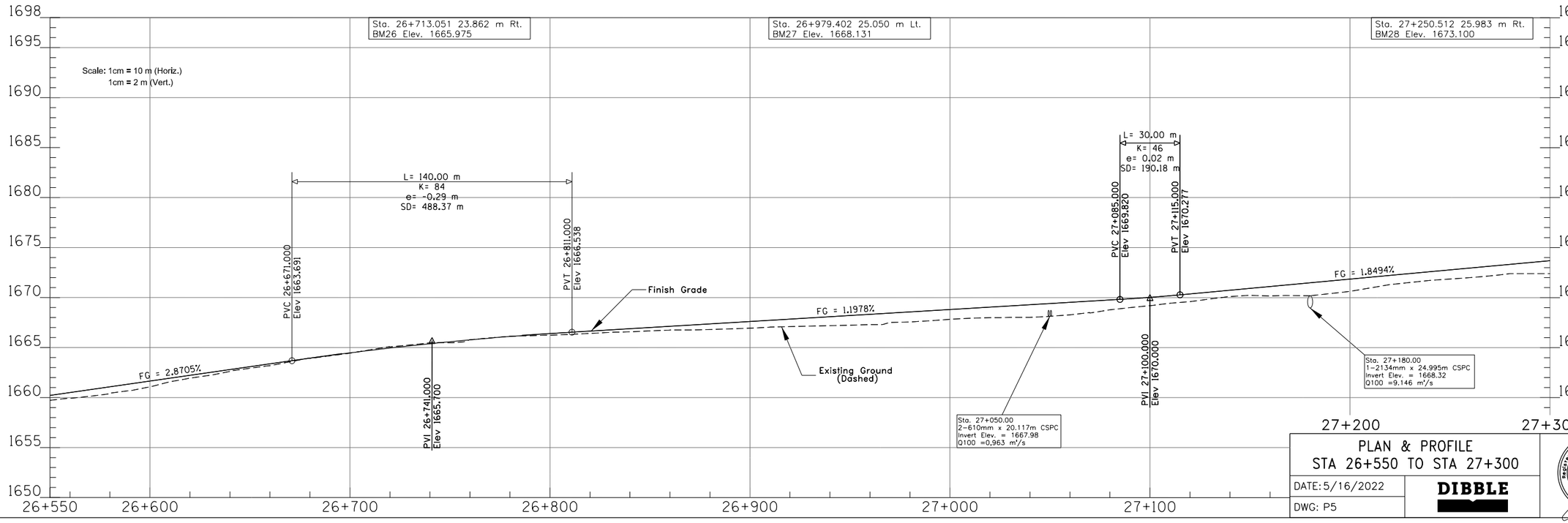


SCALE: Meters
0 20 40 60 80 100

DELINEATORS		TYPE 2	RIGHT-OF-WAY MARKER
TYPE "1a"	TYPE "1b"	OBJECT MARKER	
⊡	⊠	●	◔
0	11	4	6

DRAINAGE STRUCTURES

MARK	STATION	STRUCTURE	SKEW No.	D.A. (Ha.)	REMARKS
14	26+745.00	1-610 mm x 15.240 m CSPC	0	0.109	New Corrugated Steel Pipe under turnout with End Sections
15	27+050.00	2-610 mm x 20.117 m CSPC	66°	23.472	New Corrugated Steel Pipe Culvert With End Section At Inlets
16	27+180.00	1-2134 m x 24.995 m CSPC	95°	347.62	New Corrugated Steel Pipe Culvert w/Conc Blanket at Inlets/Outlets



PLAN & PROFILE
STA 26+550 TO STA 27+300

DATE: 5/16/2022

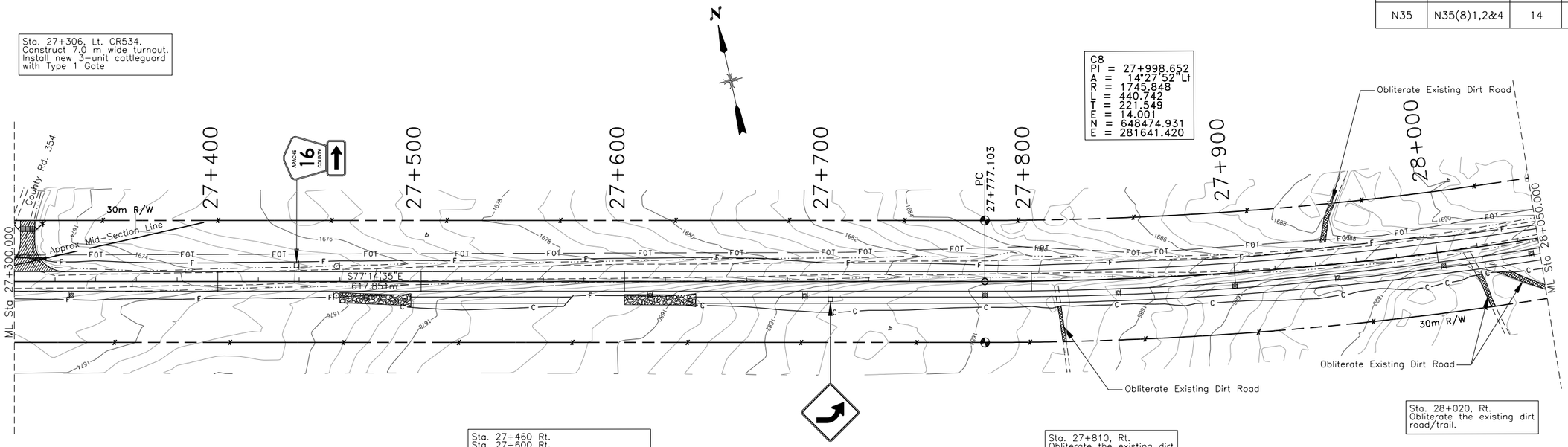
DWG: P5

DIBBLE

Registered Professional Engineer CERTIFICATE NO. 25015 ANDREW JOHN SPEAR Nevada U.S.A.

J:\2017\1017064.15 NDOT, N35 Sweetwater\CAD\N35-P05.dgn

ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	14	66



SCALE: Meters
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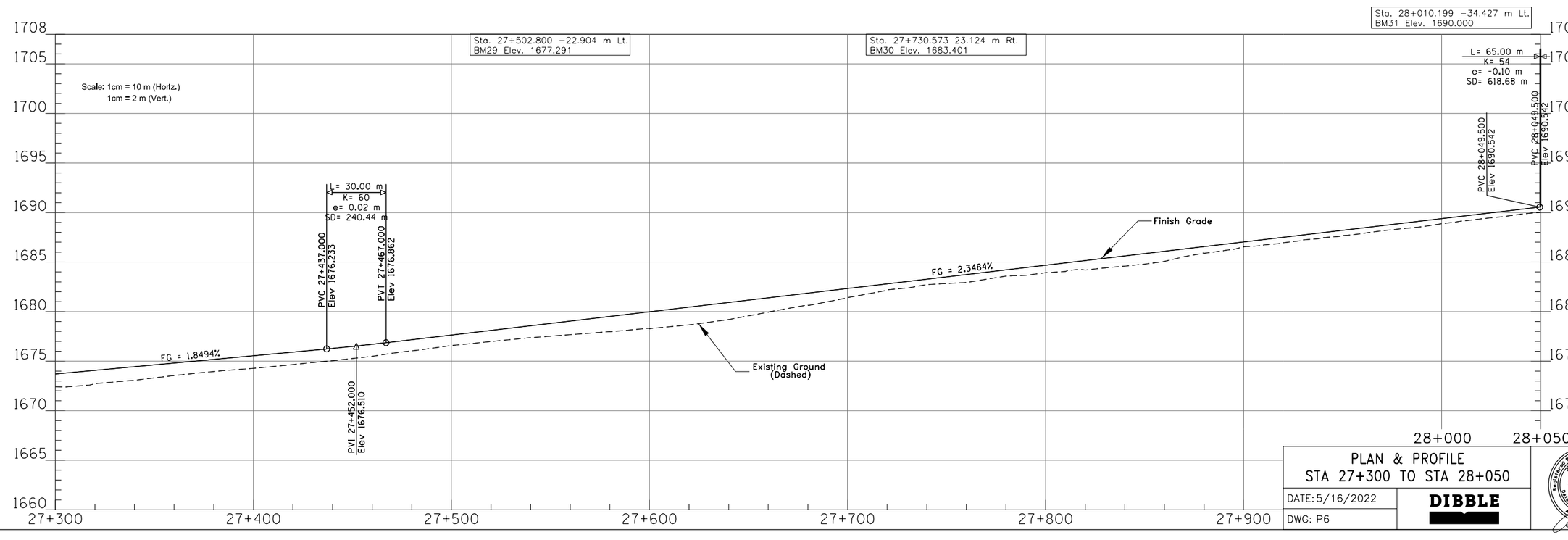
DRAINAGE STRUCTURES

MARK	STATION	STRUCTURE	SKEW No.	D.A. (Ha.)	REMARKS
1	27+306.00	1-610 mm x 15.240 m CSPC	0	0.361	New Corruagated Steel Pipe under the turnout.

DELINEATORS		RIGHT-OF-WAY MARKER
TYPE "1a"	TYPE "1b"	
2	9	2



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PLAN & PROFILE
STA 27+300 TO STA 28+050

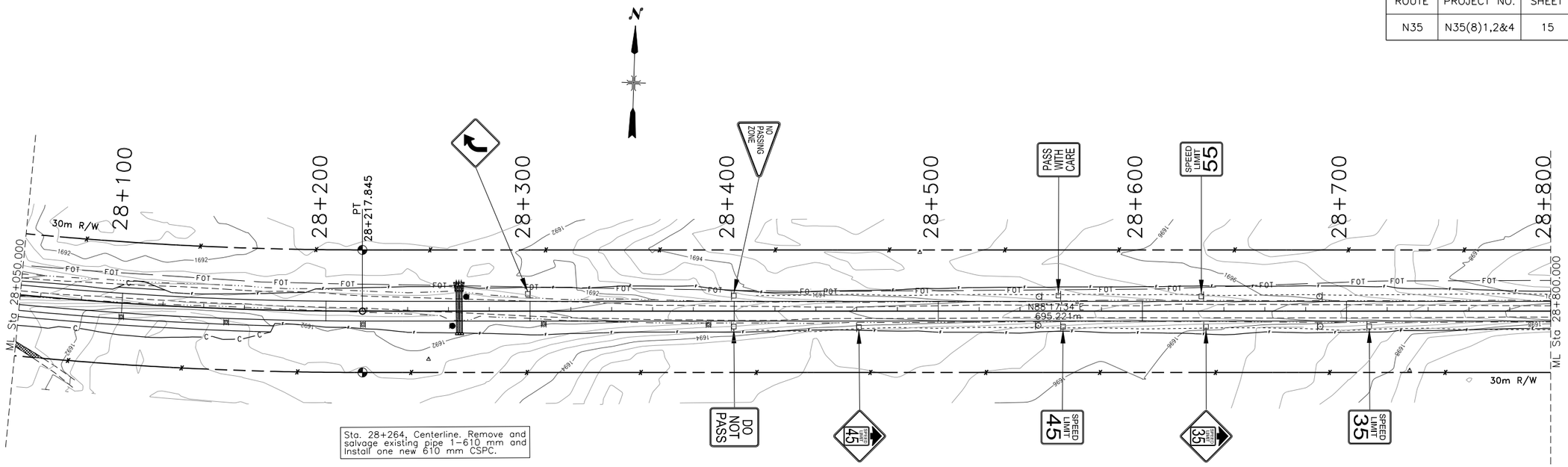
DATE: 5/16/2022

DWG: P6

DIBBLE

Registered Professional Engineer State of Arizona
CERTIFICATE NO.
25015
ANDREW JOHN SPEAR
This item has been electronically signed and sealed using a SHA1 authentication code

ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	15	66



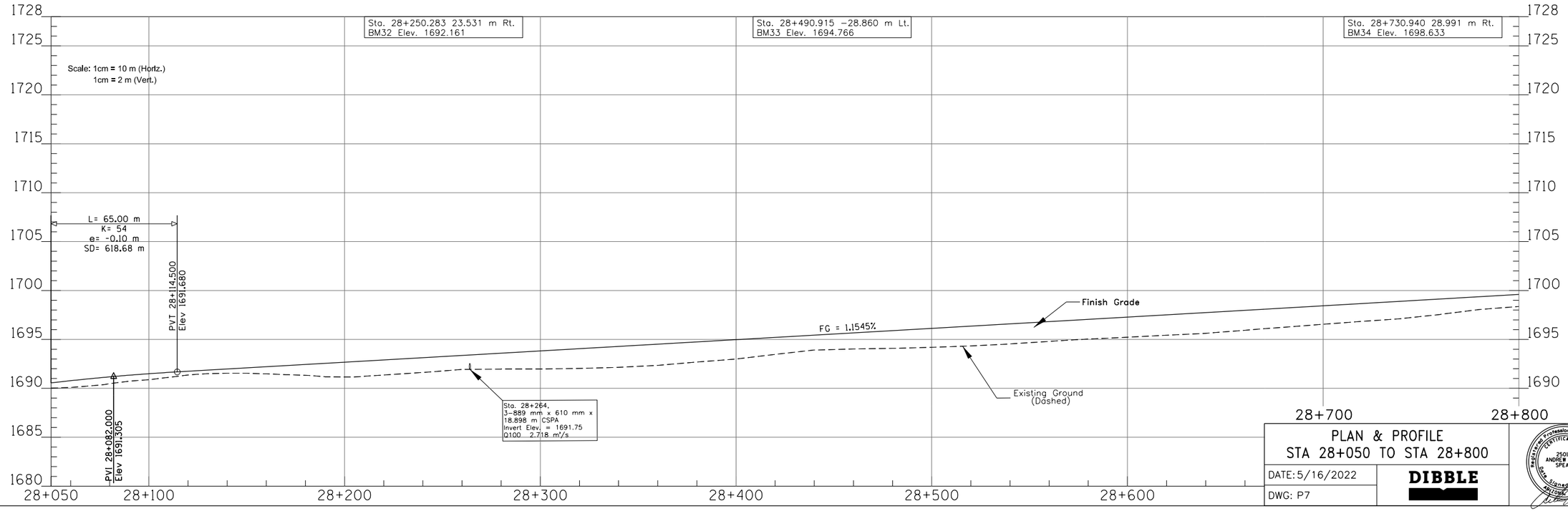
SCALE: Meters

0 20 40 60 80 100

DELINEATORS		TYPE 2	RIGHT-OF-WAY MARKER
TYPE "1a"	TYPE "1b"	OBJECT MARKER	
4	5	2	2

DRAINAGE STRUCTURES

MARK	STATION	STRUCTURE	SKEW No.	D.A. (Ha.)	REMARKS
	28+264.00	3-889 mm x 610 mm x 18.898 m CSPA	90°	133.95	New Corrugated Steel Pipe Culvert with End Section at Inlet



PLAN & PROFILE
STA 28+050 TO STA 28+800

DATE: 5/16/2022

DWG: P7

DIBBLE

Registered Professional Engineer CERTIFICATE NO. 25015 ANDREW JOHN SPEAR STATE OF NEW MEXICO

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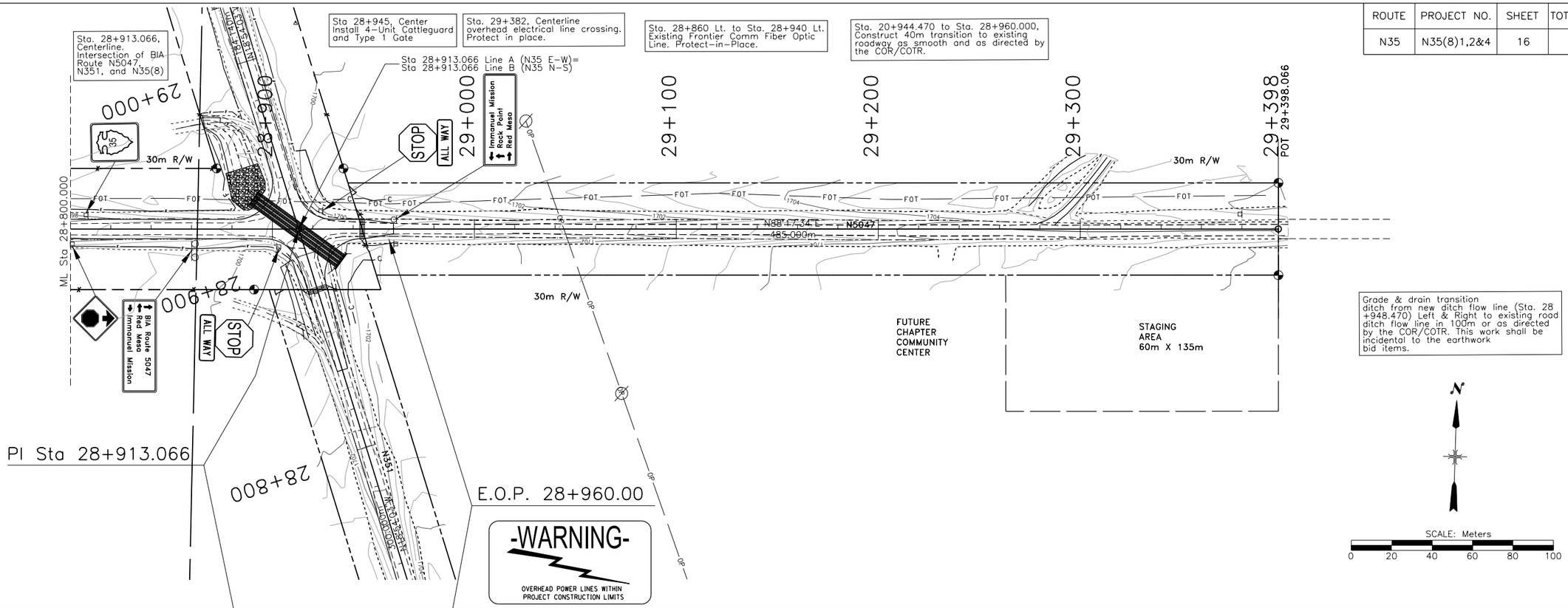
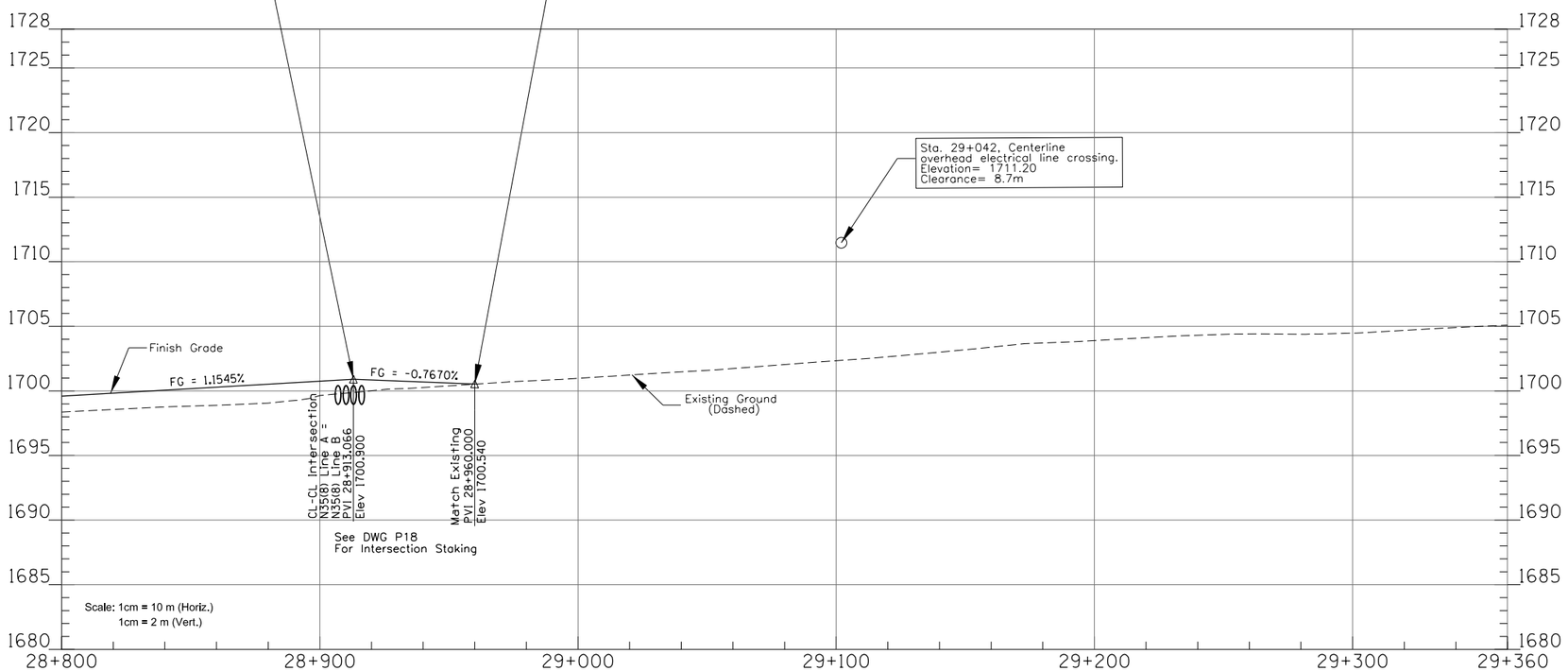
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	16	66





PLAN & PROFILE
STA 28+860 TO STA 29+500

DATE: 5/16/2022

DWG: P08

DIBBLE

25015 ANDREW JOHN SPEAR

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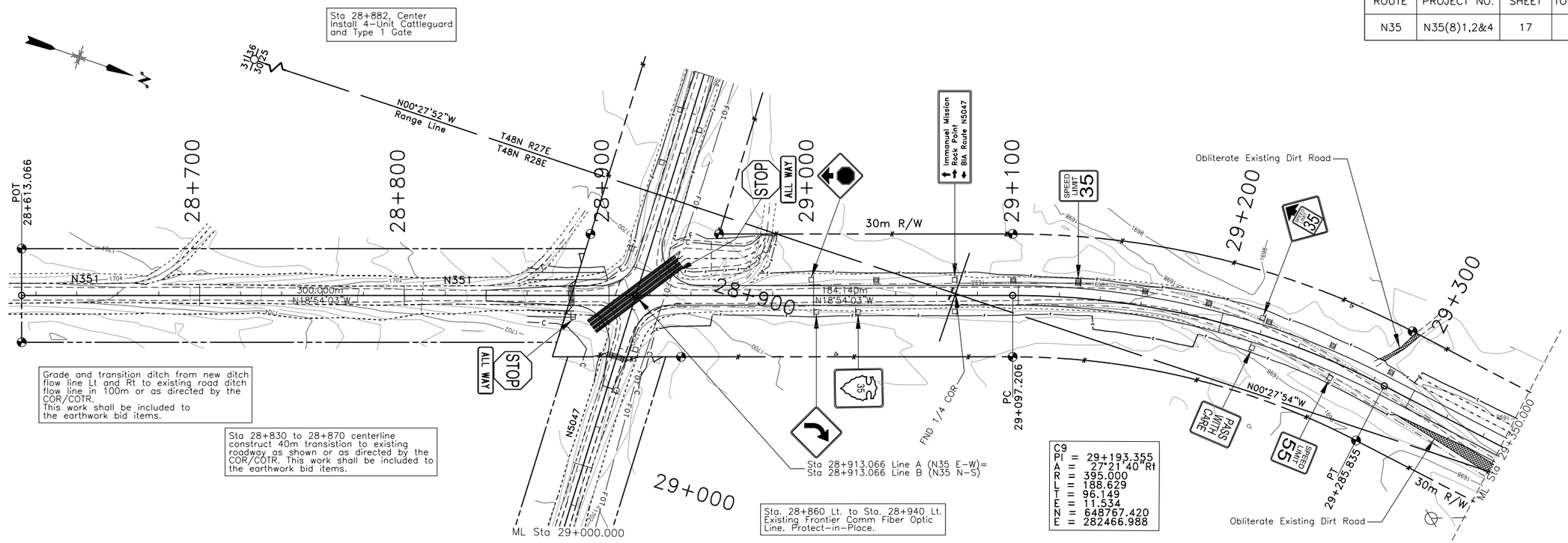
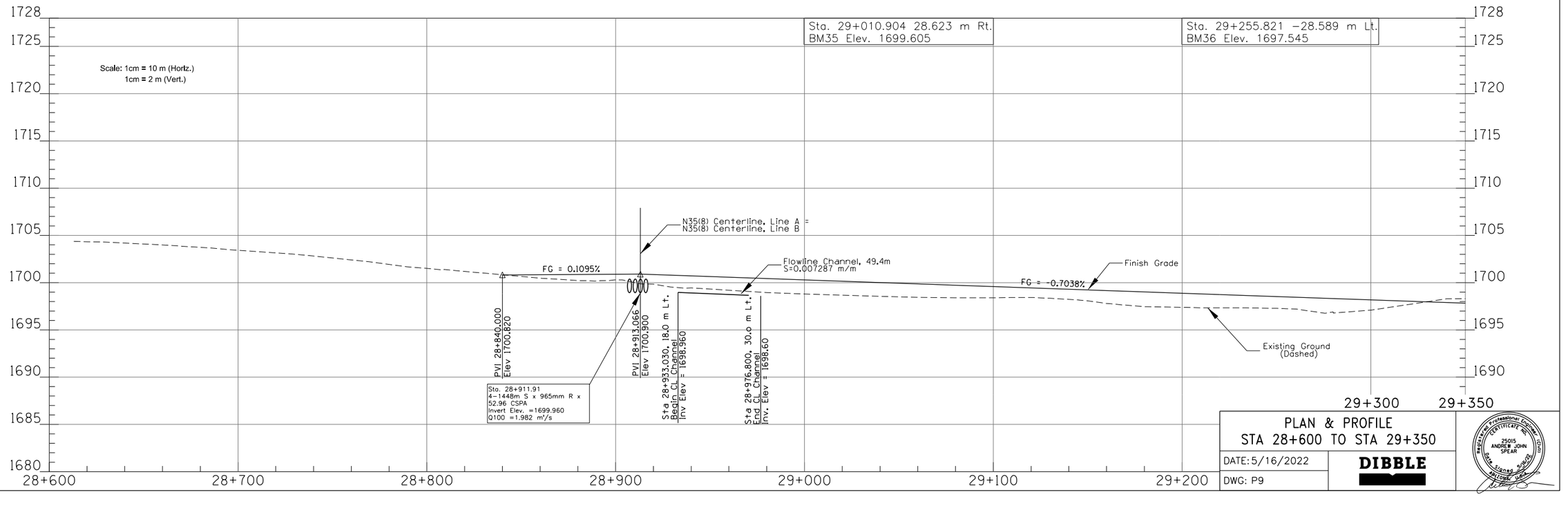
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	17	66



DELINEATORS		TYPE 2	RIGHT-OF-WAY MARKER
TYPE "1a"	TYPE "1b"	OBJECT MARKER	
⊙	⊡	●	◒
0	9	0	8

DRAINAGE STRUCTURES

MARK	STATION	STRUCTURE	SKEW No.	D.A. (Ha.)	REMARKS
	28+911.91	4-1448mm S x 965mm R x 52.96 m CSPA	36°	38.85	New Conc Headwall Lt./Rt. See DWG D13



PLAN & PROFILE
STA 28+600 TO STA 29+350

DATE: 5/16/2022

DWG: P9

DIBBLE

Registered Professional Engineer CERTIFICATE NO. 25015 ANDREW JOHN SPEAR STATE OF NEVADA

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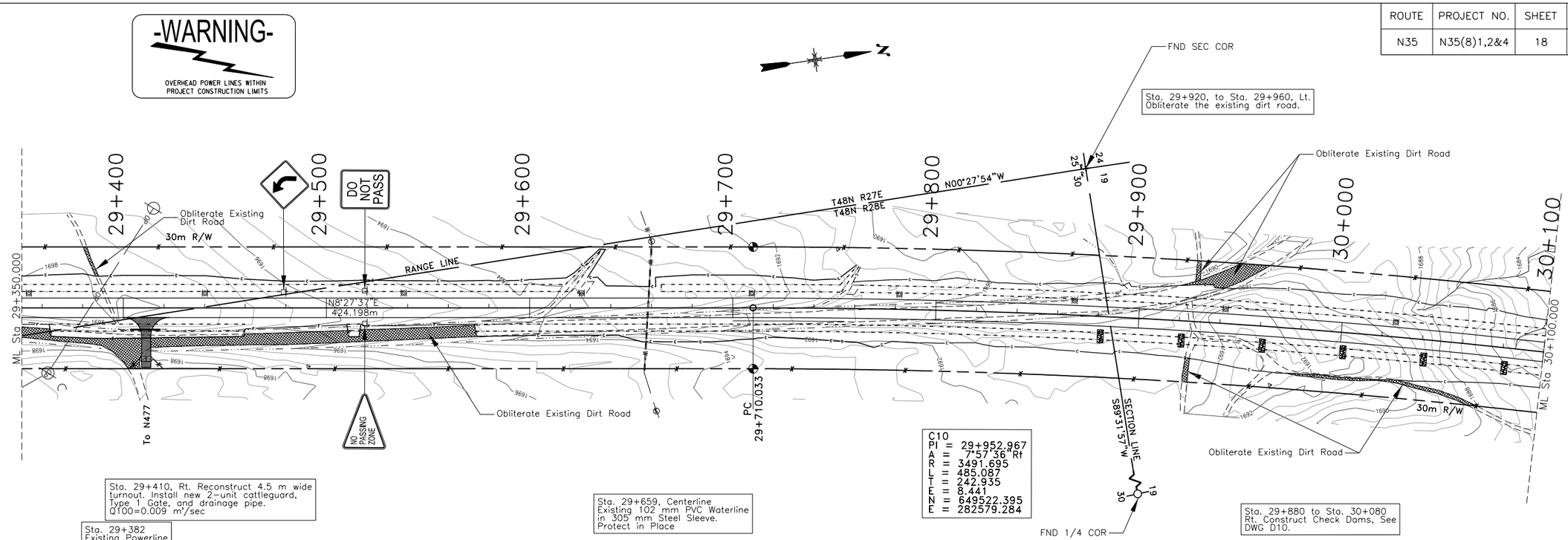
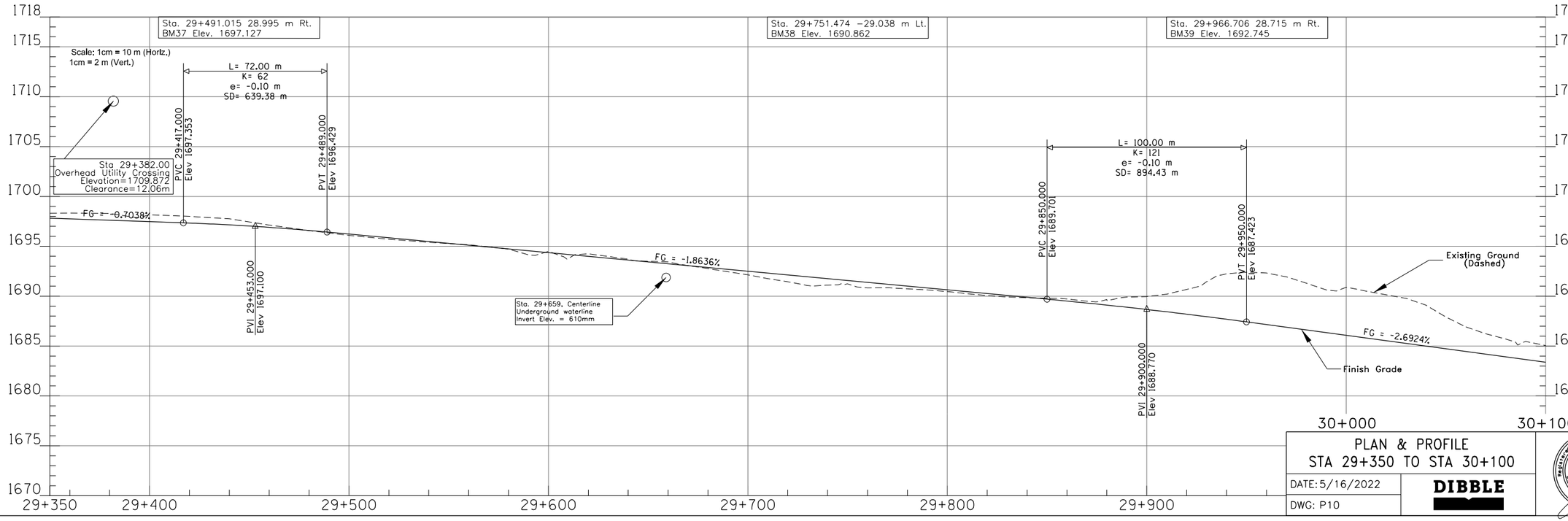
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	18	66



DELINEATORS		TYPE 2	RIGHT-OF-WAY MARKER
TYPE "1a"	TYPE "1b"	OBJECT MARKER	
⊙	⊡	●	◔
0	9	0	2

DRAINAGE STRUCTURES

MARK	STATION	STRUCTURE	SKEW No.	D.A. (Ha.)	REMARKS
1	29+410.00	1-610 mm x 18.288 m CSPC	0	0.361	New Corrugated Steel Pipe under the turnout.



PLAN & PROFILE
STA 29+350 TO STA 30+100

DATE: 5/16/2022

DWG: P10

DIBBLE

Registered Professional Engineer CERTIFICATE NO. 25015 ANDREW JOHN SPEAR STATE OF NEVADA

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ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	19	66

Sta. 30+136 to Sta. 30+300 Lt.
Construct Wire Enclosed Riprap at Cut/Fill Transition, See DWG D11

Sta. 30+116 to 30+385, 5.41m Lt.
Install MGS Guardrail, Type 2, Class B, Wood 240m
Install Terminal Section, MGS Tangent Type, 2 Each

Sta. 29+920, to Sta. 30+660, Lt.
Obliterate the existing dirt road.

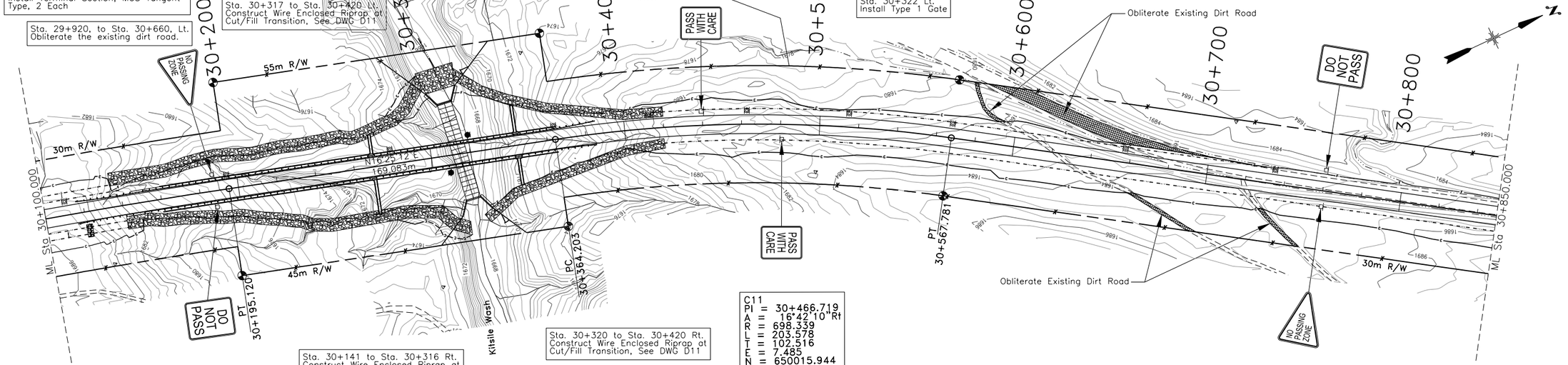
Sta. 30+160 to 30+270, 6.21m Lt
Sta. 30+110 to 30+228.32
Sta. 30+271.68 to 30+342.62
sta. 30+345.98 to 30+365
New concrete curb, 150mm depth

Sta. 30+270, 6.21m Lt
Construct concrete curb and gutter, 150mm depth, 3.36m
Construct paved waterway, Type 4, L=10m Lt

Sta. 30+317 to Sta. 30+420 Lt.
Construct Wire Enclosed Riprap at Cut/Fill Transition, See DWG D11

Sta. 30+344.3, 6.21m Lt
Construct concrete curb and gutter, 150mm depth, 3.36m
Construct paved waterway, Type 4, L=14m Lt

Sta. 30+322 Lt.
Install Type 1 Gate



Sta. 30+116 to 30+385, 5.41m Rt.
Install MGS Guardrail, Type 2, Class B, Wood 240m
Install Terminal Section, MGS Tangent Type, 2 Each

Sta. 30+120 Rt. Construct Check Dam, See DWG D10.

Sta. 30+141 to Sta. 30+316 Rt.
Construct Wire Enclosed Riprap at Cut/Fill Transition, See DWG D11

Sta. 30+160 to 30+270, 6.21m Rt
Sta. 30+110 to 30+268.32
Sta. 30+271.68 to 30+342.62
Sta. 30+345.98 to 30+365
New concrete curb, 150mm depth

Sta. 30+270, 6.21m Rt
Construct concrete curb and gutter, 150mm depth, 3.36m
Construct paved waterway, Type 4, L=15m Rt

Sta. 30+320 to Sta. 30+420 Rt.
Construct Wire Enclosed Riprap at Cut/Fill Transition, See DWG D11

Sta. 30+344.3, 6.21m Rt
Construct concrete curb, 150mm depth, 3.36m
Construct paved waterway, Type 4, L=14m Rt

C11
PI = 30+466.719
A = 16°42'10" Rt
R = 698.339
L = 203.578
T = 102.516
E = 7.485
N = 650015.944
E = 282724.731

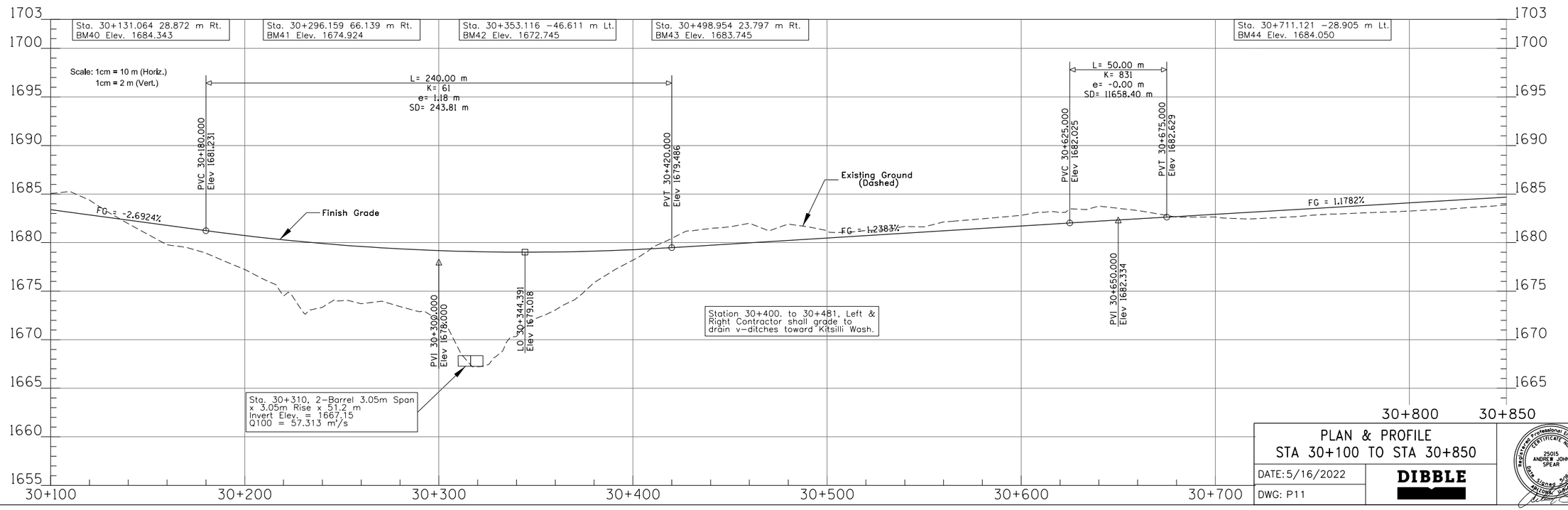
Sta. 30+331 Rt.
Install Type 1 Gate

SCALE: Meters
0 20 40 60 80 100

DELINEATORS		TYPE 2	RIGHT-OF-WAY
TYPE "1a"	TYPE "1b"	OBJECT MARKER	MARKER
⊙	⊠	●	◔
0	9	2	6

DRAINAGE STRUCTURES

MARK	STATION	STRUCTURE	SKEW No.	D.A. (Ha.)	REMARKS
1	30+310.00	2-3.05m Span x 3.05 Rise x 51.2m CBC	80	4606	With Wingwalls on Both Sides & Wire-closed Riprap at outlet.



PLAN & PROFILE
STA 30+100 TO STA 30+850

DATE: 5/16/2022

DWG: P11

DIBBLE

Registered Professional Engineer
CERTIFICATE NO.
25015
ANDREW JOHN SPEAR
STATE OF NEVADA

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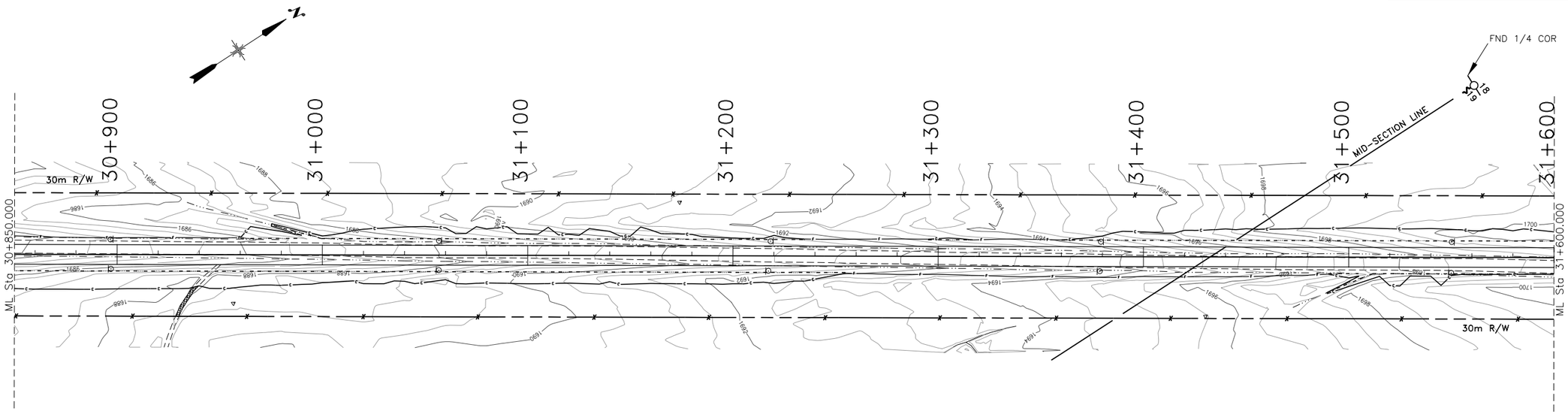
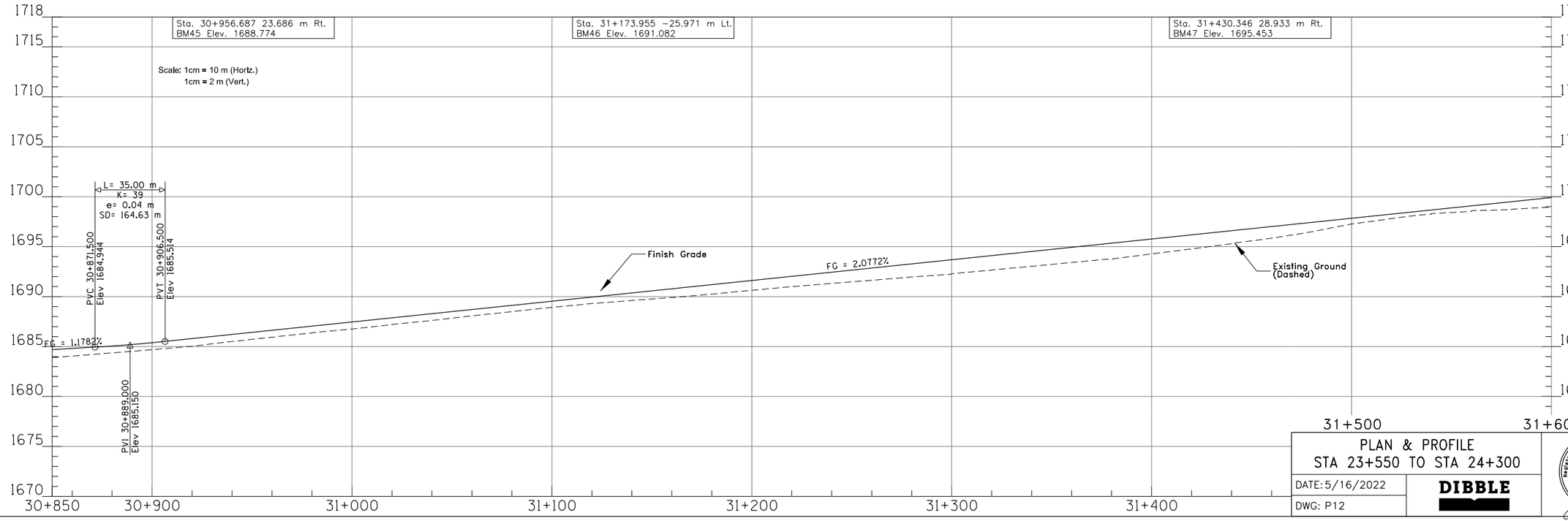
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	20	66



DELINEATORS		TYPE 2	RIGHT-OF-WAY MARKER
TYPE "1a"	TYPE "1b"	OBJECT MARKER	
⊙	⊠	●	◒
8	0	0	0



PLAN & PROFILE
STA 23+550 TO STA 24+300

DATE: 5/16/2022

DWG: P12

DIBBLE

Registered Professional Engineer
CERTIFICATE NO.
25015
ANDREW JOHN SPEAR
COLORADO

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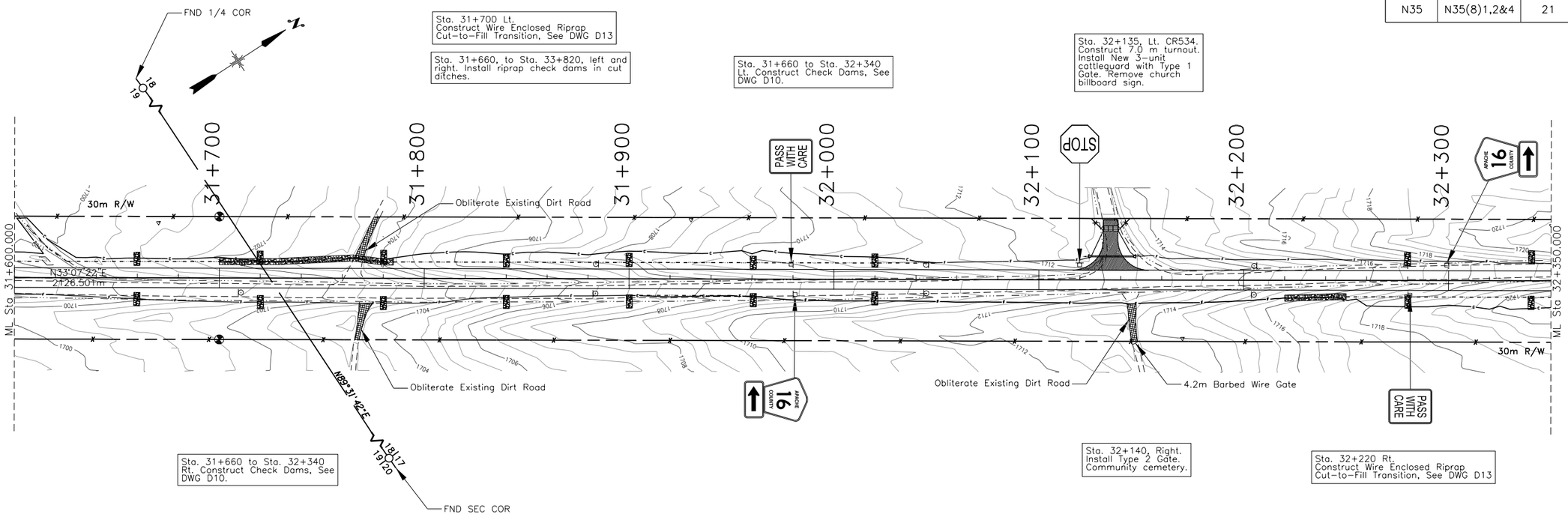
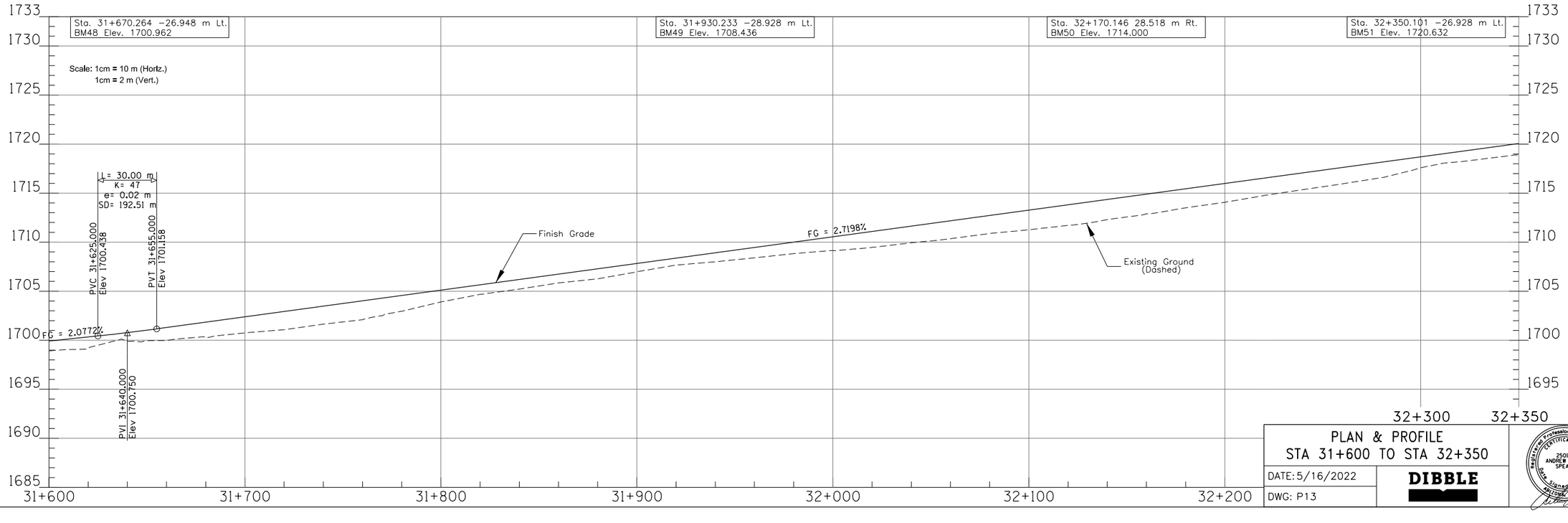
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	21	66



DELINEATORS		TYPE 2	RIGHT-OF-WAY MARKER
TYPE "1a"	TYPE "1b"	OBJECT MARKER	
⊙	⊡	●	◕
10	0	0	0

DRAINAGE STRUCTURES

MARK	STATION	STRUCTURE	SKEW No.	D.A. (Ha.)	REMARKS
1	32+135.00	1-610 mm x 18.288 m CSPC	0	n/a	New Corrugated Steel Pipe under the turnout.



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PLAN & PROFILE STA 31+600 TO STA 32+350

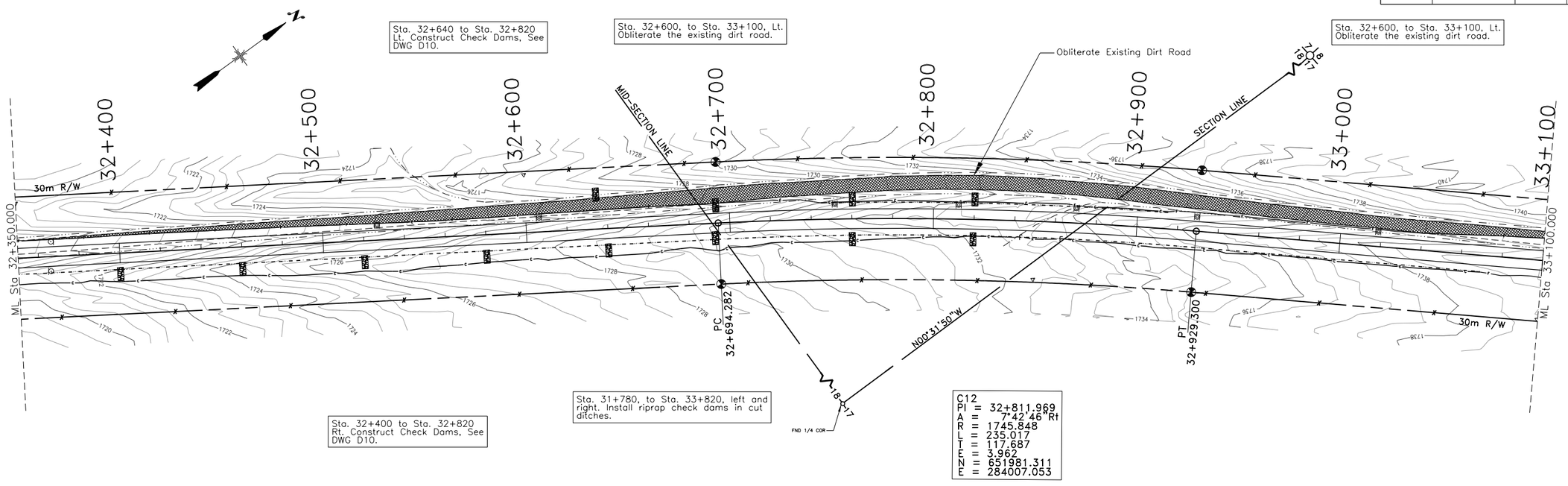
DATE: 5/16/2022

DWG: P13

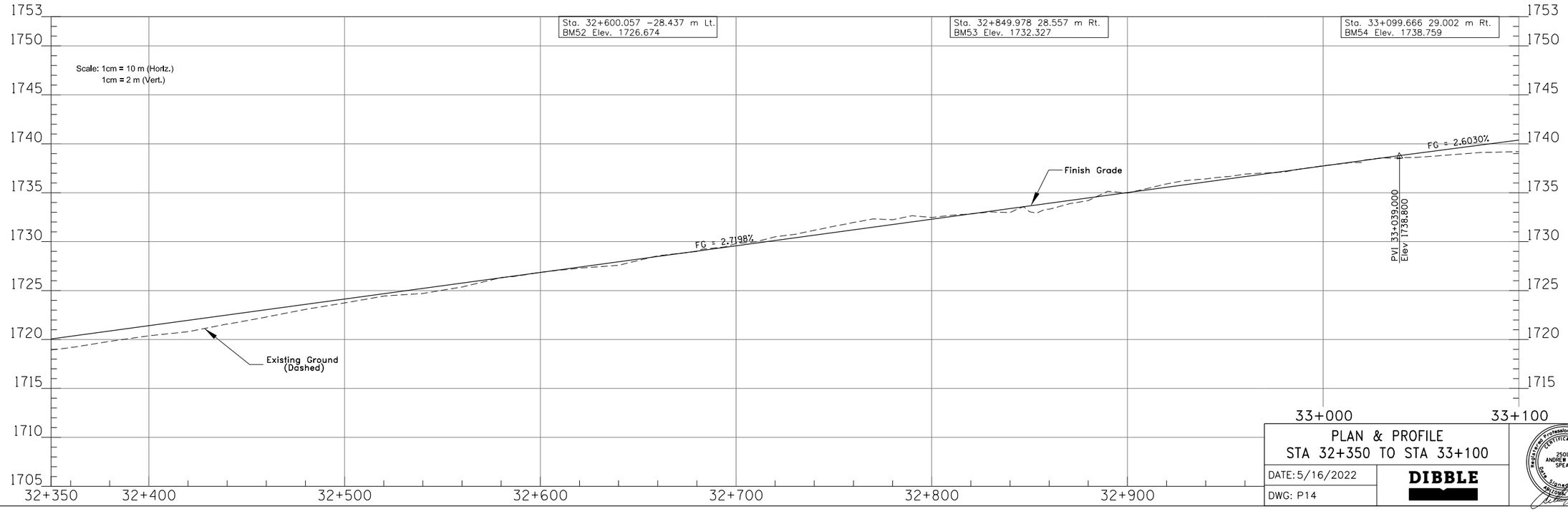
DIBBLE

Registered Professional Engineer CERTIFICATE NO. 25015 ANDREW JOHN SPEAR STATE OF NEVADA

ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	22	66



DELINEATORS		TYPE 2	RIGHT-OF-WAY MARKER
TYPE "1a"	TYPE "1b"	OBJECT MARKER	
⊙	⊠	●	◒
0	9	0	4



PLAN & PROFILE
STA 32+350 TO STA 33+100

DATE: 5/16/2022

DWG: P14

DIBBLE

Registered Professional Engineer CERTIFICATE NO. 25015 ANDREW JOHN SPEAR STATE OF NEVADA

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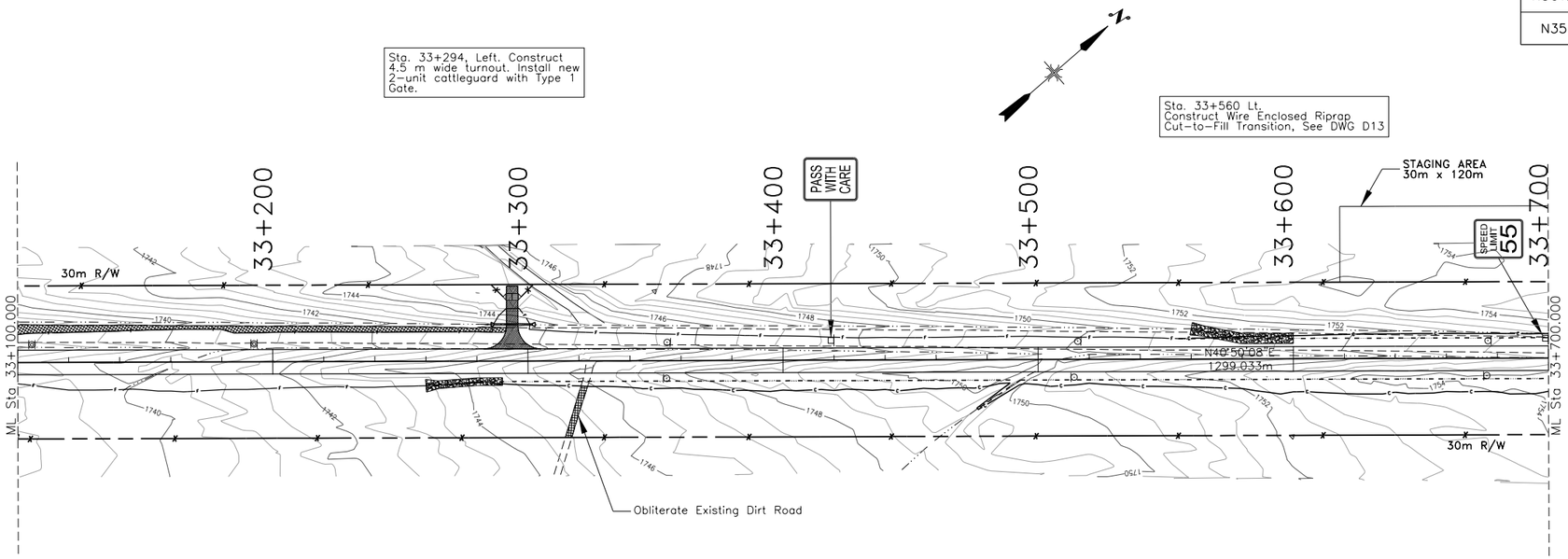
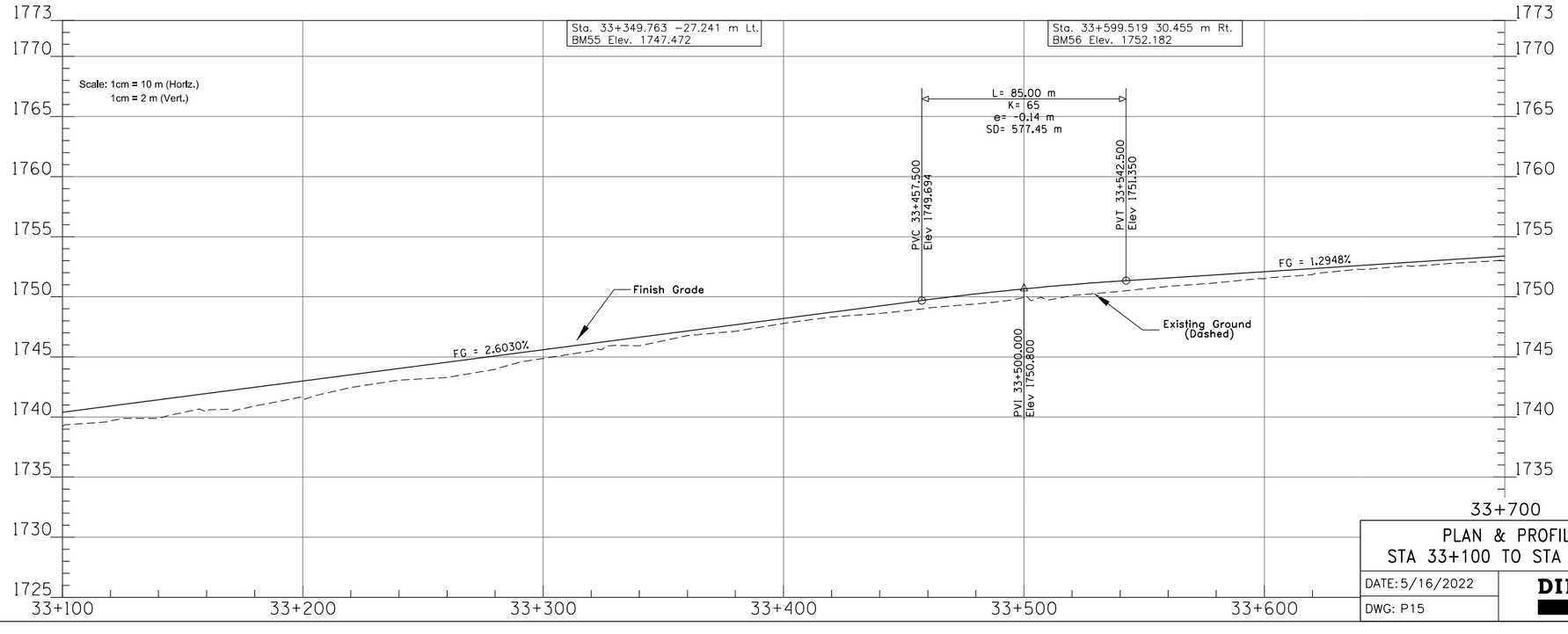
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	23	66



DRAINAGE STRUCTURES

MARK	STATION	STRUCTURE	SKEW No.	D.A. (Ha.)	REMARKS
1	33+294.00	1-610 mm x 18.288 m CSPC	0	0.361	New Corruagated Steel Pipe under the turnout.

DELINEATORS		TYPE 2	RIGHT-OF-WAY MARKER
TYPE "1a"	TYPE "1b"	OBJECT MARKER	
⊙	⊠	●	◒
8	1	0	2



PLAN & PROFILE
STA 33+100 TO STA 33+700

DATE: 5/16/2022

DWG: P15

DIBBLE

Registered Professional Engineer CERTIFICATE NO. 25015 ANDREW JOHN SPEAR STATE OF NEVADA

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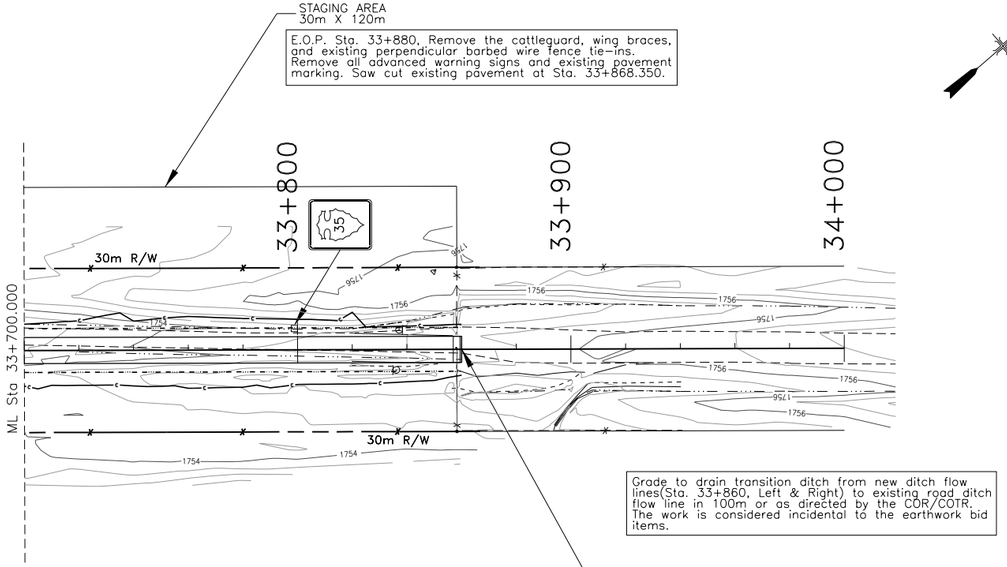
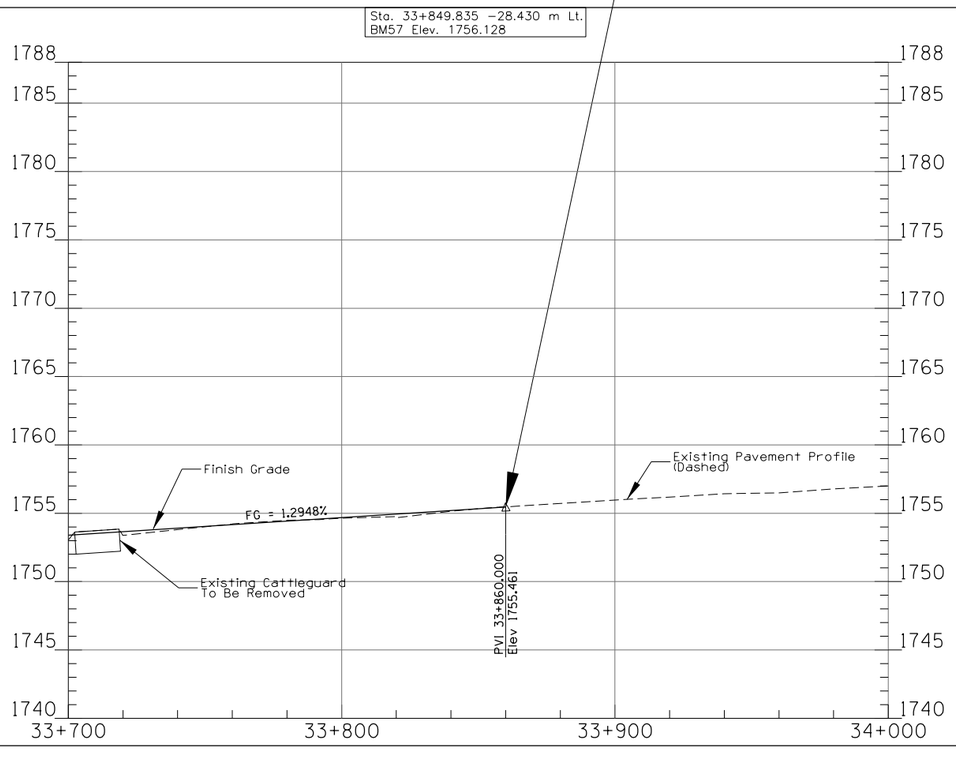
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	24	66



DELINEATORS		TYPE 2	RIGHT-OF-WAY MARKER
TYPE "1a"	TYPE "1b"	OBJECT MARKER	
⊙	⊠	●	
8	1	0	2



PLAN & PROFILE
STA 33+700 TO STA 34+000

DATE: 5/16/2022

DWG: P16

DIBBLE

Registered Professional Engineer
CERTIFICATE NO.
25015
ANDREW JOHN SPEAR
STATE OF WYOMING

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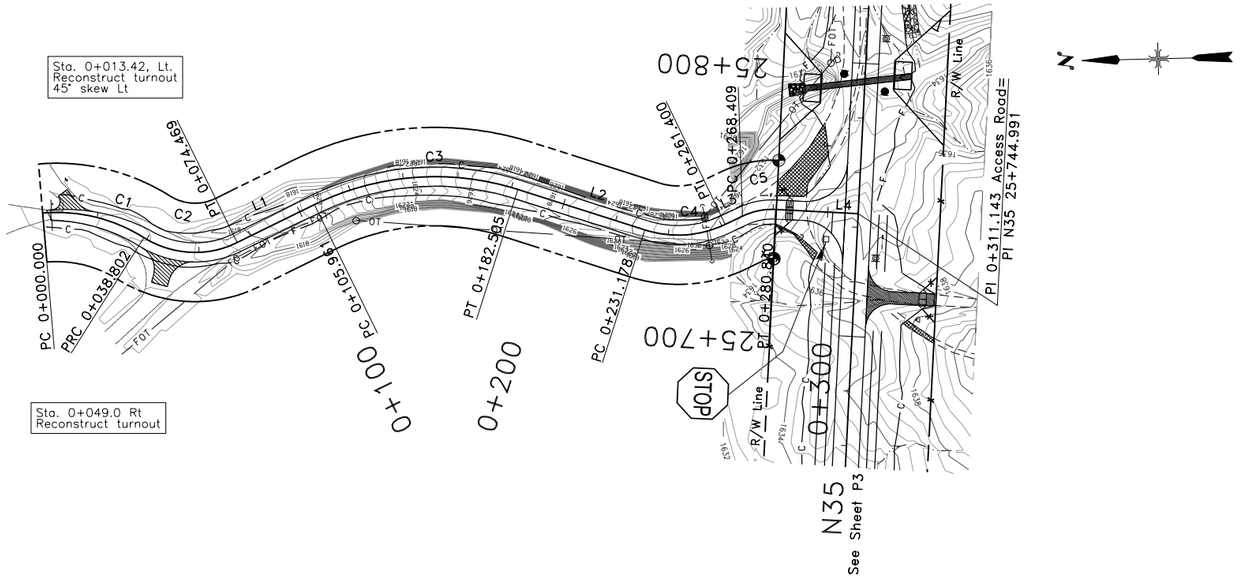
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	25	66

CURVE DATA

No.	Radius	Tangent	Length	Delta
1	60.000	20.107	38.802	37^03'13" Right
2	35.000	19.556	35.666	58^23'12" Left
3	100.000	40.257	76.544	43^51'23" Right
4	40.000	15.873	30.222	43^17'23" Left
5	25.000	6.347	12.431	28^29'19" Right

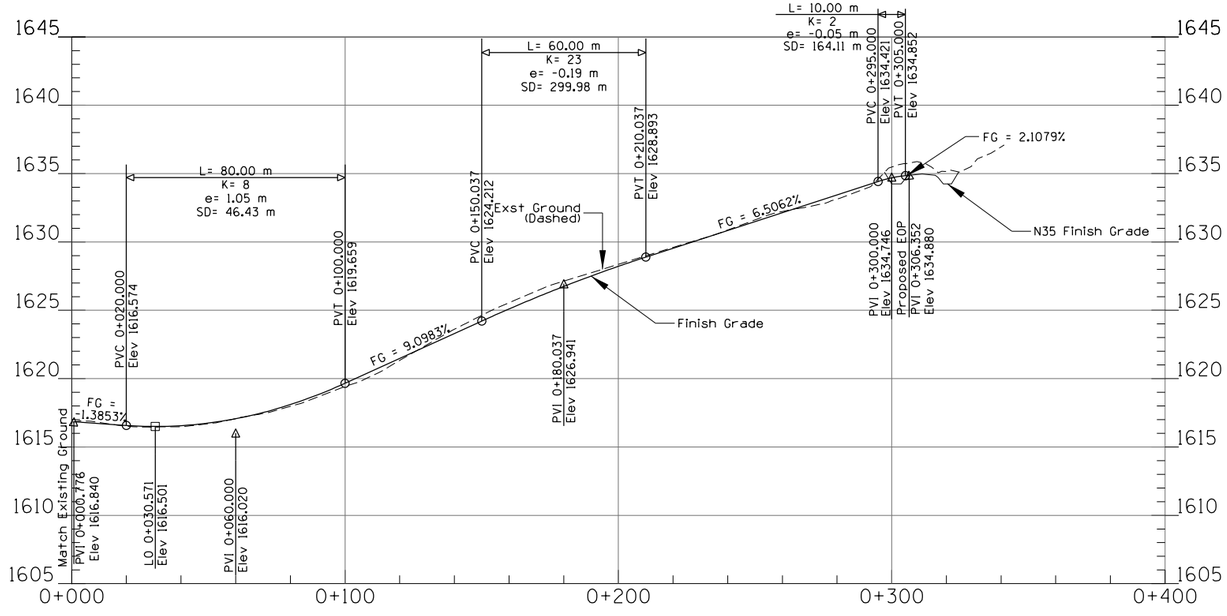
LINE DATA

No.	Bearing	Length
1	S 3^24'35" E	
2	S 33^38'38" W	
3	S 24^44'34" E	31.492
4	S 19^06'49" W	48.673
5	S 24^10'35" E	7.009
6	S 4^18'44" W	30.304



SCALE: Meters

0 20 40 60 80 100

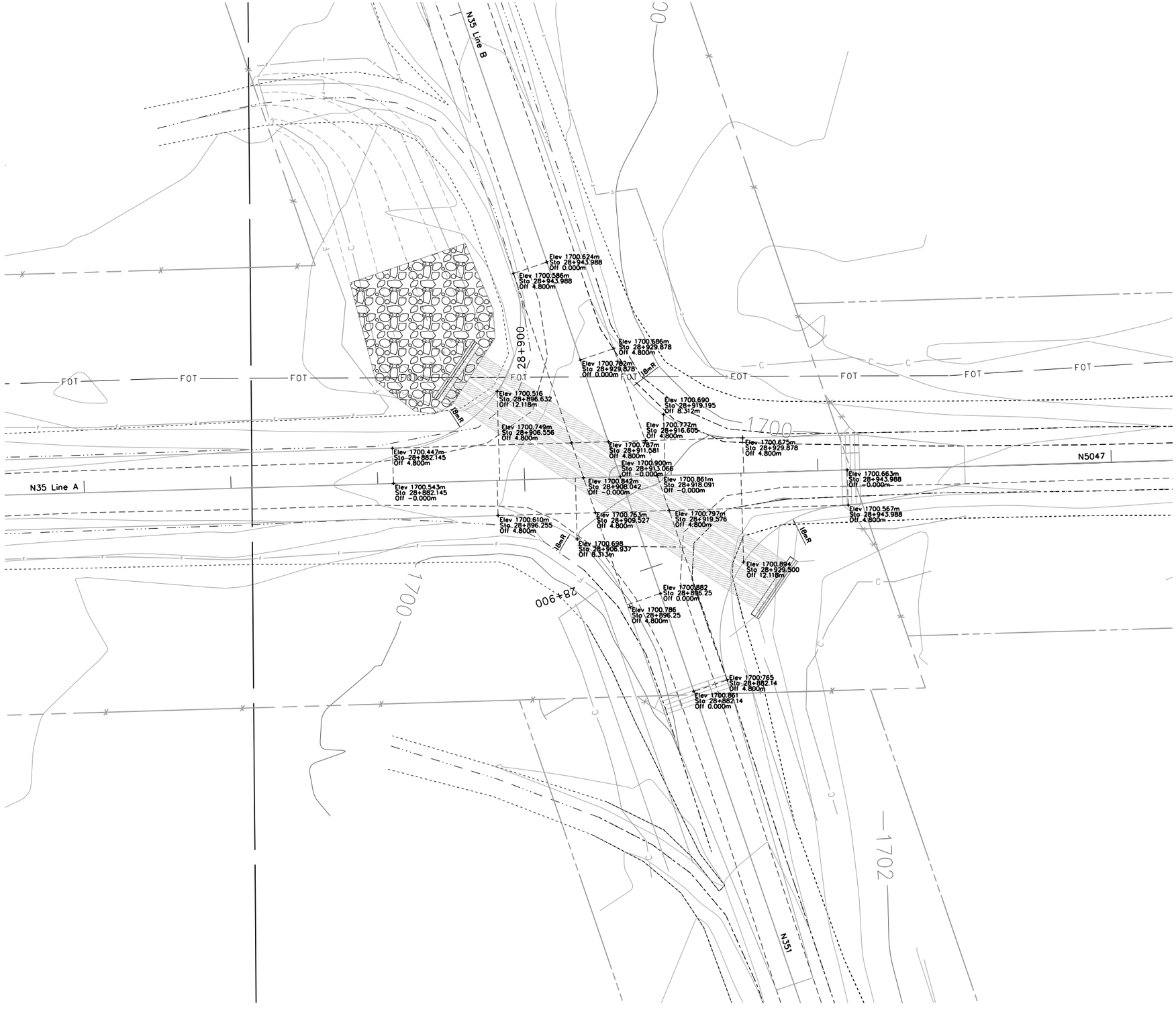


PLAN & PROFILE CHAPTER HOUSE ACCESS ROAD	
DATE: 5/16/2022	DIBBLE
DWG: P17	

Registered Professional Engineer
CERTIFICATE NO.
25015
ANDREW JOHN
SPEAR
STATE OF OHIO

J:\2017\1017064.15_NDOT_N35_Sweetwater\CAD\N35-P17.dgn

ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	26	66



Note:
All grades are finished AC pavement grades.
Subtract 51mm for top of AB and another
152mm for subgrade elevations.

NAVAJO D.O.T.

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

INTERSECTION STAKING DIAGRAM

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: P18	

J:\2017\1017064.15_NDOT_N35_Sweetwater\CAD\N35-P18.dgn

ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	27	66

GENERAL NOTES

1. ALL TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH THE MUTCD MANUAL (LATEST EDITION AND AMENDMENTS) AND THE SUPPLEMENTAL SPECIFICATIONS FOR THIS PROJECT.

2. THE TRAFFIC CONTROL DETAILS SHOWN ARE ONLY A GUIDE AND REFLECTS GENERAL REQUIREMENTS. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR IMPLEMENTING HIS TCP IN ACCORDANCE WITH THIS PLAN AND THE MUTCD UNDER CONTRACT ITEM 63501-0000. ANY ADDITIONAL TRAFFIC CONTROL DEVICES CALLED FOR ON THE CONTRACTOR'S TCP WILL NOT BE MEASURED FOR PAYMENT BUT SHALL BE CONSIDERED INCIDENTAL TO CONTRACT ITEM 63501-0000. SEE SUPPLEMENTAL SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

3. SIGNS (G20-1, W20-1A & B, AND G20-2A) SHALL BE PLACED AT THE PROJECT LIMITS AND REMAIN IN PLACE THROUGH THE DURATION OF THE PROJECT.

4. FLAGGERS SHALL BE STATIONED LEFT & RIGHT AS SHOWN WHEN EQUIPMENT IS CROSSING OR WORKING WITHIN EXISTING ROADWAY PRISM OR AT DETOURS.

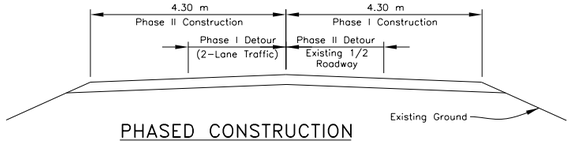
5. AT THE END OF EACH WORKING DAY, IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE A DRIVING SURFACE FREE OF OBSTRUCTIONS AS SHOWN ON THE PHASED CONSTRUCTION DETAIL. ACCESS TO ALL ADJOINING PROPERTIES AND BIA/COUNTY SYSTEM ROUTES SHALL BE MAINTAINED AT ALL TIMES DAY AND NIGHT.

6. ALL TRAFFIC CONTROL DEVICES (EXCEPT AT DETOUR ROAD LOCATIONS AND AS NOTED IN ABOVE NOTE #3) SUCH AS CONSTRUCTION SIGNS, DRUMS, BARRICADES, ETC., SHALL BE REMOVED TO A LOCATION AT LEAST NINE (9) METERS FROM EDGE OF THE SHOULDER WHEN CONSTRUCTION IS NOT IN PROGRESS.

7. 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 CONSIDERED INCIDENTAL TO CONSTRUCTION AND NO PAYMENT OR MEASUREMENT SHALL BE MADE.

8. THE CONTRACTOR HAS THE OPTION TO EITHER USE DRUMS OR VERTICAL PANELS, BUT SHALL NOT USE A COMBINATION OF BOTH. NO TRAFFIC CONES ARE ALLOWED.

9. 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 PLAN 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.

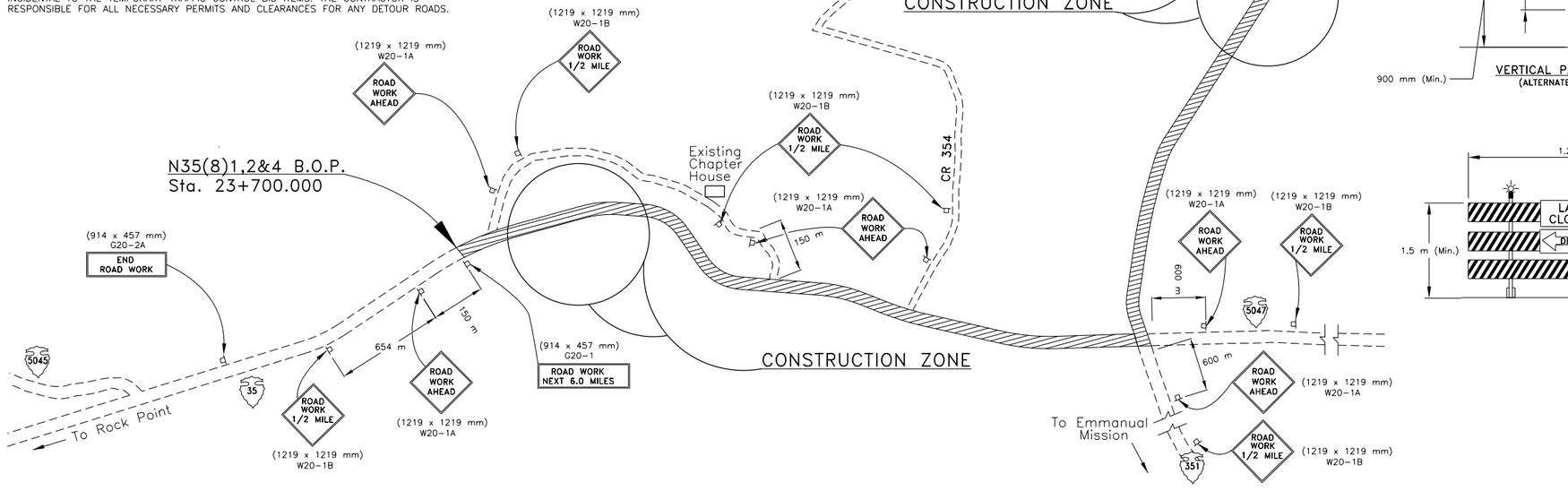


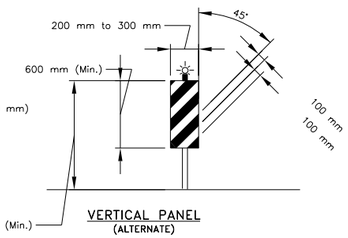
PHASED CONSTRUCTION

1. THE CONTRACTOR MAY ELECT TO CONSTRUCT 1/2 THE NEW ROADWAY (UNDER PHASED CONSTRUCTION PLAN SHOWN) WHILE DETOURING TWO-WAY TRAFFIC ON THE OTHER (EXISTING) HALF, ONCE THE FIRST ½ 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.

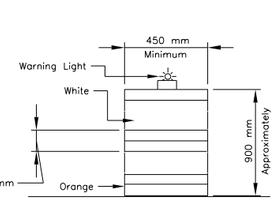
2. THIS PHASED CONSTRUCTION SHALL BE CONSIDERED INCIDENTAL TO THE T.C.P. SHOWN AND NO ADDITIONAL PAYMENT SHALL BE MADE.

3. THE CONTRACTOR'S CONSTRUCTION SCHEDULE, CONSTRUCTION SEQUENCING PLAN, AND STORM WATER POLLUTION PREVENTION PLAN SHALL REFLECT THIS PHASED CONSTRUCTION.

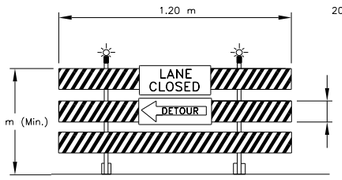




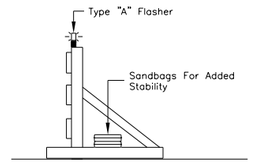
VERTICAL PANEL (ALTERNATE)

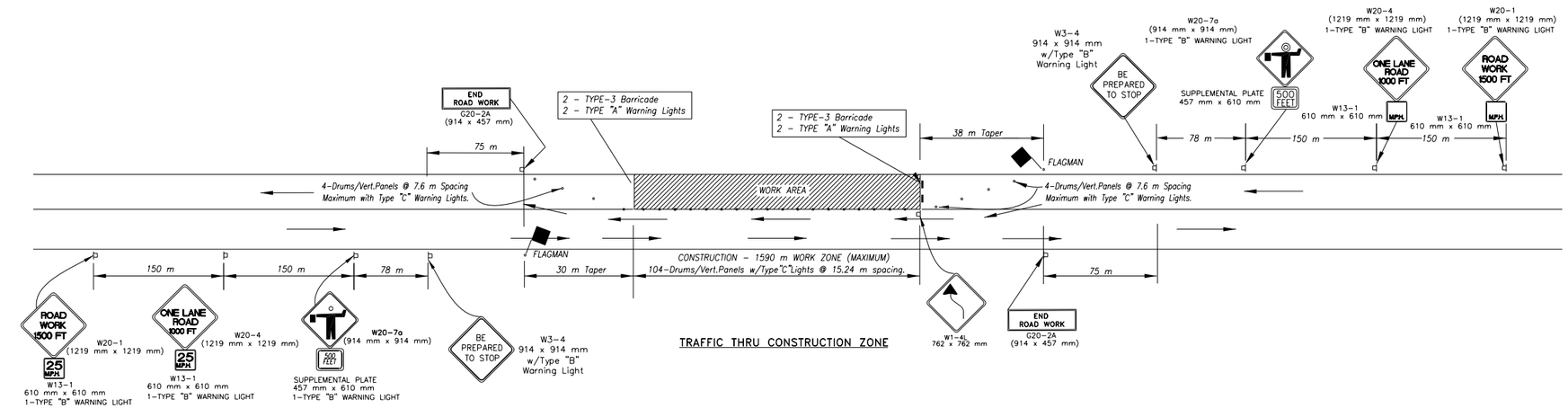


DRUM



TYPE III BARRICADE





TRAFFIC THRU CONSTRUCTION ZONE

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

TEMPORARY TRAFFIC CONTROL DETAIL

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: D1	

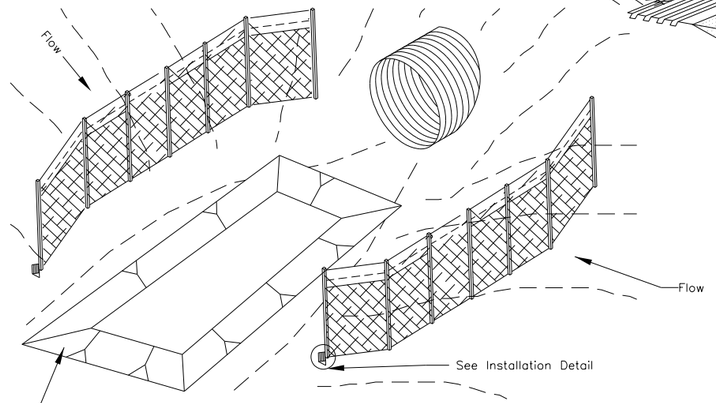
Registered Professional Engineer CERTIFICATE NO. 25015 ANDREW JOHN SPEAR Date Signed 5/16/22 Arizona U.S.A.

J:\2017\1017064.15_NDOT_N35_Sweetwater\CAD\N35-DT01.dgn

ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	28	66

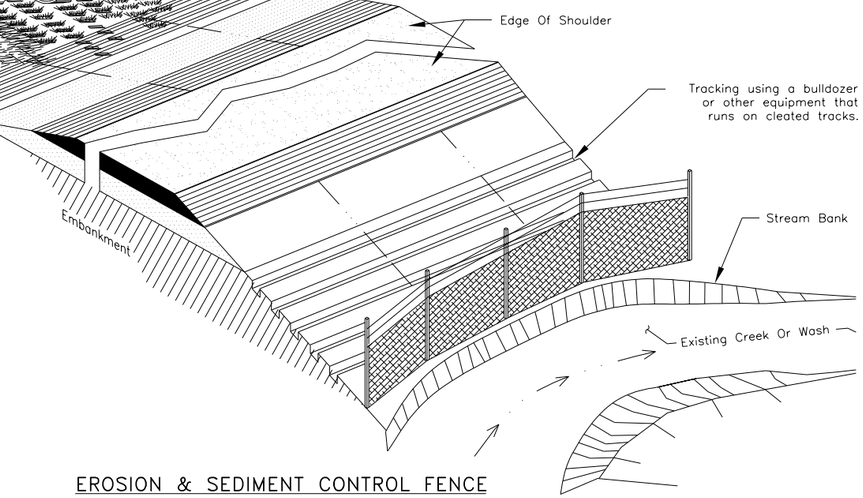
'TRACKING' WITH MACHINERY ON SANDY SOIL PROVIDES ROUGHENING WITHOUT UNDUE COMPACTION.

SPREAD STRAW MULCH (TYPICAL)

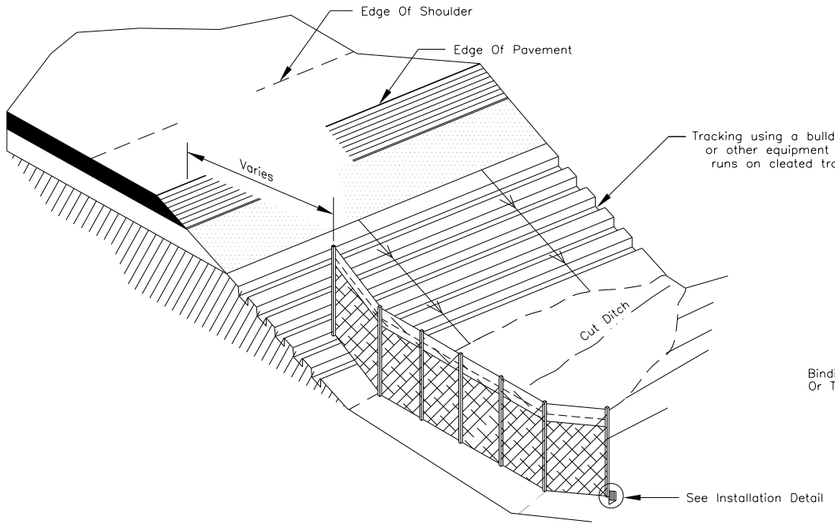


EROSION & SEDIMENT CONTROL FENCE
AT DRAINAGE STRUCTURE

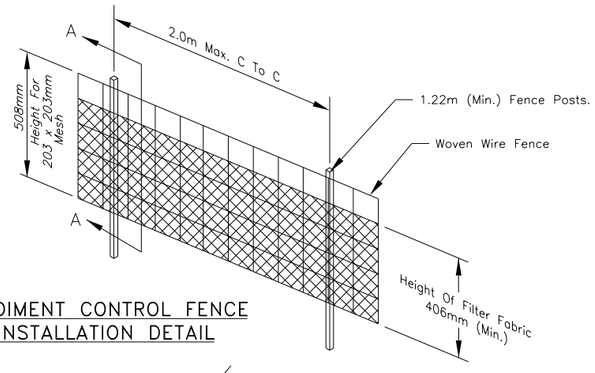
Sediment Traps @ Outlet Ends
See Plan Sheet 00 of 00 for details



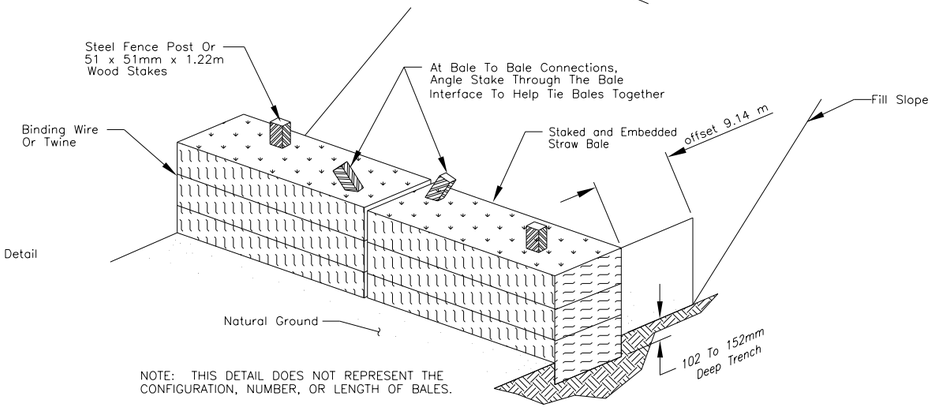
EROSION & SEDIMENT CONTROL FENCE
ALONG EDGE OF STREAM BANK (TOE OF SLOPE)



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



SEDIMENT CONTROL FENCE
INSTALLATION DETAIL



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

TYPICAL STRAW BALE STAKING
AND TRENCHING DETAIL

GENERAL NOTES

1. THE CONTRACTOR SHALL PREPARE AND SUBMIT A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IN FULL DETAILS FOR ALL PHASES OF THE WORK FOR REVIEW AND APPROVAL AT LEAST 14 CALENDAR DAYS BEFORE IMPLEMENTATION. THE PLAN SHALL MEET THE REQUIREMENTS HEREIN AND SECTION 157 OF THE FP-14 AS MODIFIED IN THE SUPPLEMENTAL SPECIFICATION. SEE SPECIAL CONTRACT REQUIREMENTS FOR NPDES PERMIT REQUIREMENTS.

2. THE SILT FENCING CONSISTS OF 914mm SEDIMENT CONTROL FABRIC CLOTH WITH BURIED-TOE, AND STEEL POSTS (TEE OR U TYPE) SPACED AT 3.00m WITH 2mm SIZE WELDED WIRE BACK-UP FENCE.

3. WOVEN WIRE FABRIC TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STABLES. 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-14.

4. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY 152mm AND FOLDED. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED TO PREVENT "BULGES" DEVELOPING IN THE SILT FENCE.

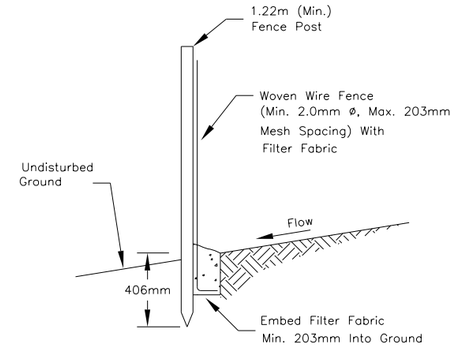
5. THE SILT FENCE SHALL BE INSTALLED ALONG THE ROADWAY DITCHES, ALONG THE BOTTOM OF ALL EMBANKMENT FILLS THAT ARE WITHIN 2.0m OF EXISTING STREAMS, CREEKS, OR WASHES, AND IN AREAS WITH HIGHLY EROSIVE SOILS. SILT FENCES TO BE PLACED 1-2 METERS TOWARD THE R/W LINES FROM THE BASE OF FILL SLOPES 1:3 OR STEEPER IN ACCORDANCE WITH SECTION 157 OF FP-14 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 51x 51mm x 1.22m 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 15708-1000 AND/OR 15714-0000.

8. SEDIMENT/SILT FENCING SHALL BE PLACED AT ALL LOCATIONS WHERE EMBANKMENTS HAVE SLOPE DISTANCES OF 30.0m 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). RECORD AS PER CLEAN WATER 402 REQUIREMENT.



SECTION A-A

NAVAJO D.O.T.

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

STORMWATER POLLUTION PREVENTION & SEDIMENT CONTROL DETAILS

DESIGNED BY: AJS	REVISED:	Registered Professional Engineer (Civil) CERTIFICATE NO. 25015 ANDREW JOHN SPEAR Date Signed 5/16/22 ARIZONA U.S.A.
DRAWN BY: DBB	BY:	
DATE: 5/16/2022	DIBBLE	
DWG: D2		

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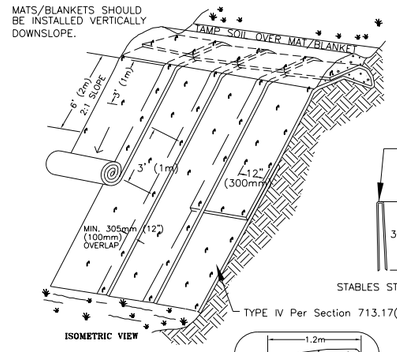
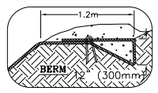
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	29	66



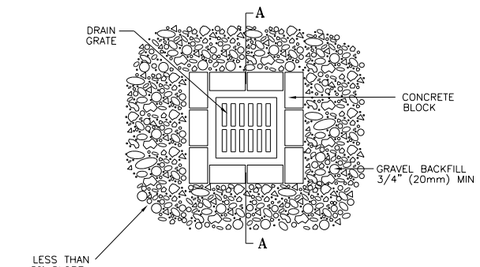
TYPICAL SLOPE SOIL STABLIZATION



NOT TO SCALE

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

EROSION BLANKETS & TURF REINFORCEMENT MATS SLOPE INSTALLATION

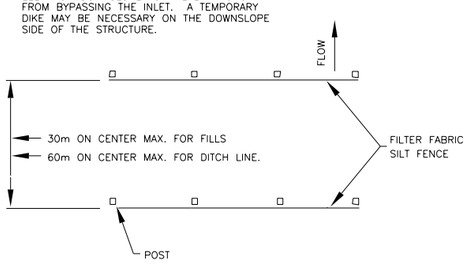


PLAN VIEW

SECTION A – A

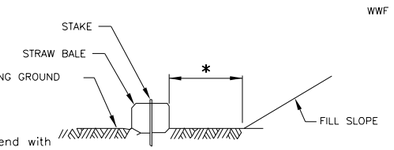
NOTES:
1. DROP INLET SEDIMENT BARRIERS ARE TO BE USED FOR SMALL, NEARLY LEVEL DRAINAGE AREAS. (LESS THAN 5%)
2. EXCAVATE A BASIN OF SUFFICIENT SIZE ADJACENT TO THE DROP INLET.
3. THE TOP OF THE STRUCTURE (PONDING HEIGHT) MUST BE WELL BELOW THE GROUND ELEVATION DOWNSLOPE TO PREVENT RUNOFF FROM BYPASSING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

BLOCK AND GRAVEL DROP INLET SEDIMENT BARRIER



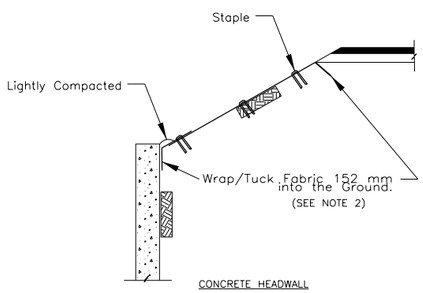
PLAN

SILT FENCE EROSION CHECK

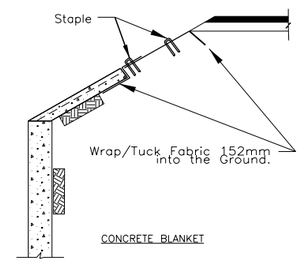


SECTION D–D

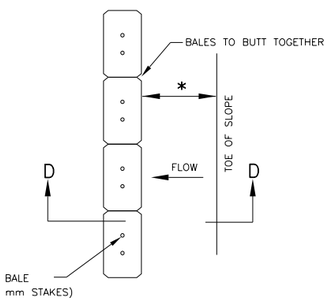
* See General Notes.



CONCRETE HEADWALL



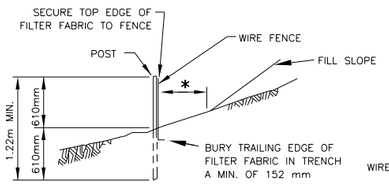
CONCRETE BLANKET

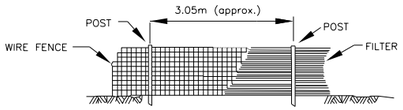


PLAN

STRAW BALE SILT BARRIER

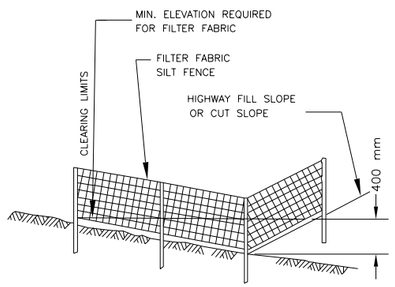
* See general notes.



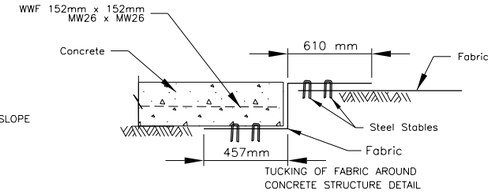


FILTER FABRIC SILT FENCE

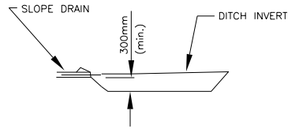
* See General Notes.



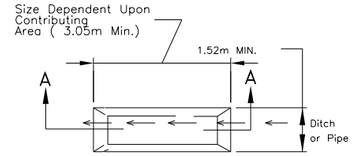
ELEVATION



TUCKING OF FABRIC AROUND CONCRETE STRUCTURE DETAIL

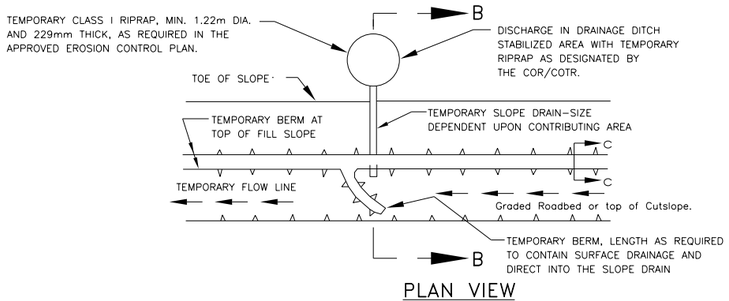


SECTION A–A

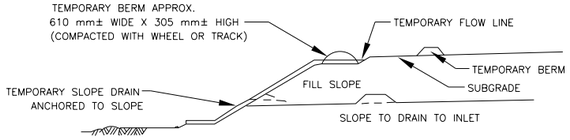


SEDIMENT TRAP

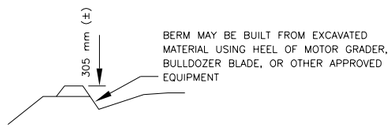
(Traps shall not fill to beyond one–half capacity prior to cleaning)



PLAN VIEW

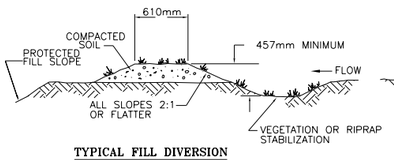


SECTION B–B

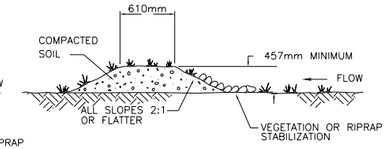


SECTION C–C

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



TYPICAL FILL DIVERSION

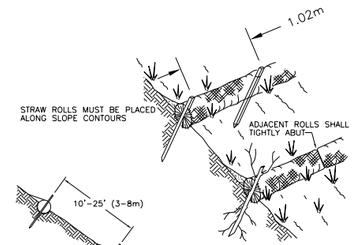


TYPICAL TEMPORARY DIVERSION DIKE

(FOR TOP OF CUT BACK SLOPES.)

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

TEMPORARY DIVERSION DIKE



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

NOT TO SCALE

STRAW ROLLS

GENERAL NOTES

1. SEE SHEET 28 OF 80 FOR ADDITIONAL NOTES AND DETAILS.
2. THE CONTRACTOR SHALL INSTALL GEOTEXTILE FABRIC, TYPE IV, AROUND CONCRETE STRUCTURE, AS FOLLOWS:
   a) CONSTRUCT FINISH GRADING AROUND STRUCTURE TO BE PLACED.
   b) CUT TRENCHES FOR FOOTING OF SLAB.
   c) INSTALL 1.22 m OF GEOTEXTILE FABRIC ANCHORED ON FLOOR AND TOP ALONG THE CUT FACE OF REACH AS SHOWN.
   d) PLACE CONCRETE FORMS, REINFORCEMENTS, AND SEQUENT CONCRETE.
3. 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.
4. CLEAN ALL SEDIMENT BASIN AND TRAPS OF ACCUMULATED SEDIMENT WHEN HALF FULL OF SEDIMENT.
5. USE DRAIN PIPE, RIPRAP, GEOTEXTILE FABRIC, OR GRASS–LINED WATERWAY FOR TEMPORARY SLOPE DRAINS TO CHANNEL RUNOFF DOWN SLOPES. CHANNEL WATER INTO SLOPE DRAINS WITH STRAW BALES, WATTLES, OR EARTH BERMS CONSTRUCTED AT THE TOP OF A CUT SLOPE. ANCHOR SLOPE DRAINS TO THE SLOPE.
6. THE CONTRACTOR SHALL ADJUST THE DIMENSIONS AND/OR LOCATIONS OF TEMPORARY SEDIMENT AND EROSION CONTROL DEVICES TO FIT ACTUAL FIELD CONDITIONS.
7. REMOVE AND DISPOSE OF EROSION CONTROL MEASURES WHEN THE PERMANENT EROSION CONTROL MEASURES ARE SATISFACTORILY ESTABLISHED, DRAINAGE DITCHES, AND CHANNELS, ARE LINED AND STABILIZED, IN ACCORDANCE WITH SECTION 157 OF FP–14.

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

STORMWATER POLLUTION PREVENTION & SEDMENT CONTROL DETAILS

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: D3	

Registered Professional Engineer CERTIFICATE NO. 25015 ANDREW JOHN SPEAR New Mexico U.S.A.

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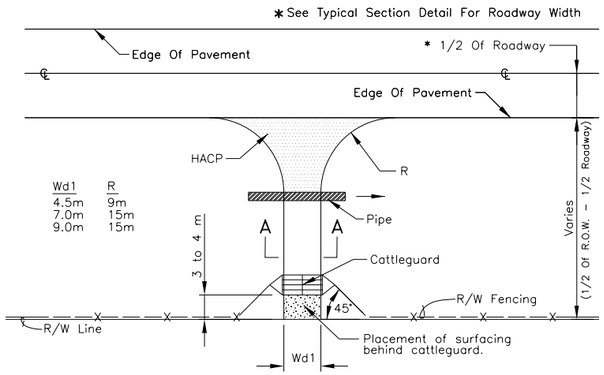
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	30	66

N35(8) Line A & Line B: PERMANENT SIGNS & HARDWARE

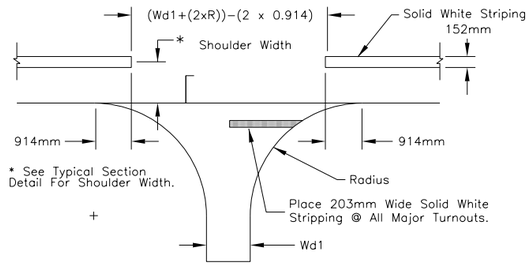
Station	Location	Detail No.	Description	Sign Panel Size (mm)	Area of Sign (m²)	Number of Square Post	Post Size (mm x mm)	No. of Panel	Total Area of Panel (m²)
28+900.64 28+925.70 28+888.30 28+934.85	Rt. Lt. Rt. Lt.	R1-1 R3-1P	STOP ALL WAY	914 x 914 457 x 152	0.90	2	50 x 50	4	3.60
27+290.00 32+120.00 0+300.00	Lt. Rt. Lt.	R1-1	STOP	914 x 914	0.84	2	50 x 50	3	2.52
28+800.00 29+000.00	Rt. Lt.	W3-1		762 x 762	0.58	1	50 x 50	2	1.16
28+800.00 29+020.00 33+800.00	Lt. Lt. Lt.	M1-23(BIA)	35	610 x 762	0.46	1	50 x 50	3	1.38
23+830.00	Rt.	M3-2 M1-23	EAST 35	610 x 305 610 x 762	0.19 0.46	1	50 x 50	1	0.65
26+460.00 28+760.00 29+180.00 30+440.00 30+480.00 31+980.00 32+280.00 33+420.00	Rt. Lt. Rt. Lt. Rt. Lt. Rt. Lt.	R4-2	PASS WITH CARE	610 x 762	0.46	1	50 x 50	8	3.68
27+140.00 31+980.00	Rt. Rt.	M6-1L M1-23(-24 BIA)	APACHE 16 COUNTY	610 x 610 533 x 381	0.37 0.20	1	50 x 50	2	1.14
27+440.00	Rt.	M6-1L M1-23(-24 BIA)	APACHE 16 COUNTY	610 x 610 533 x 381	0.37 0.20	1	50 x 50	2	1.14
		R2-1	SPEED LIMIT 45	610 x 762	0.46	1	50 x 50	1	0.46
23+860.00 28+710.00 29+130.00	Lt. Rt. Lt.	R2-1	SPEED LIMIT 35	610 x 762	0.46	1	50 x 50	3	1.38
23+900.00 28+630.00 29+260.00 33+700.00	Rt. Lt. Rt. Lt.	R2-1	SPEED LIMIT 55	610 x 762	0.46	1	50 x 50	4	1.84
23+705.00 26+774.00 28+400.00 29+480.00 30+190.00 30+760.00 31+980.00 32+280.00	Rt. Lt. Rt. Lt. Rt. Lt. Lt. Rt.	R4-1	DO NOT PASS	610 x 762	0.46	1	50 x 50	8	3.68

N35(8) Line A & Line B: PERMANENT SIGNS & HARDWARE

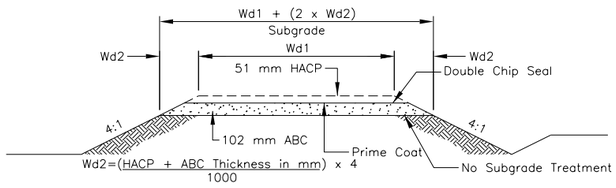
Station	Location	Detail No.	Description	Sign Panel Size (mm)	Area of Sign (m²)	Number of Square Post	Post Size (mm x mm)	No. of Panel	Total Area of Panel (m²)
23+705.00 26+774.00 28+400.00 29+480.00 30+190.00 30+760.00	Lt. Rt. Lt. Rt. Lt. Rt.	W14-3	NO PASSING ZONE	914 x 1219 x 1219	0.52	2	50 x 50	8	4.16
24+550.00 25+090.00 25+100.00 27+700.00 29+480.00	Lt. Rt. Lt. Rt. Lt.	W1-2L		762 x 762	0.58	1	50 x 50	5	2.90
24+000.00 24+500.00 25+700.00 28+300.00 29+000.00	Rt. Rt. Lt. Lt. Rt.	W1-2R		762 x 762	0.58	1	50 x 50	5	2.90
26+100.00 27+270.00	Rt. Lt.	W1-5L		762 x 762	0.58	1	50 x 50	2	1.16
28+460.00	Rt.	W3-5	SPEED LIMIT 45	914 x 914	0.84	2	50 x 50	3	2.52
23+980.00 28+630.00 29+220.00	Lt. Rt. Lt.	W3-5	SPEED LIMIT 35	914 x 914	0.84	2	50 x 50	1	0.84
23+800.00	Lt.	W8-3 W16-2aP	PAVEMENT ENDS 300 FT.	914 x 914 610 x 305	0.84 0.19	2	50 x 50	1	1.03
23+900.00	Lt.	W8-3	PAVEMENT ENDS	914 x 914	0.84	1	50 x 50	1	0.84
24+150.00	Lt.	W8-3 W16-2a Supplemental Plate	PAVEMENT ENDS 1500 FT	914 x 914 610 x 305	0.84 0.19	1	50 x 50	1	1.03
29+860.00	Rt.	D1-3	BIA Route 5047 Red Mesa US160 Immanual Mission	1371 x 910	1.25	3	50 x 50	1	1.25
29+070.00	Lt.	D1-3	Immanual Mission Rock Point BIA Route N5047	1371 x 910	1.25	3	50 x 50	1	1.25
29+000.00	Lt.	D1-3	Emmanual Mission Rock Point Red Mesa	1371 x 910	1.25	3	50 x 50	1	1.25
63302-1200	Signs, Aluminum Panel, Type IX Sheeting								43.76sq/m
63305-0400	Posts, Steel, 50mm x 50mm								391.4m



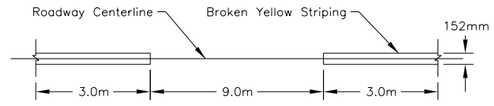
TYPICAL TYPE "A" TURNOUT



TYPICAL PAVEMENT MARKING @ TURNOUT



SECTION A-A



TYPICAL PAVEMENT MARKING "BROKEN YELLOW"

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

N35(8) SIGNING AND MARKING QUANTITIES & DETAILS

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: D4	

Registered Professional Engineer (Civil) CERTIFICATE NO. 25015 ANDREW JOHN SPEAR Date Signed 5/16/22 ARIZONA U.S.A.

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ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	31	66

63401-1500 PAVEMENT MARKINGS, TYPE H, SOLID, YELLOW

STATION TO STATION			LOCATION	DESCRIPTION	LENGTH (m)	102mm EQUIV QUANTITY (m)
23+700.00	To	26+460.00	C. Lt. & Rt.	No Passing Lt. & Rt.	2,760.00	8,280.00
26+460.00	To	26+774.00	C. Lt.	No Passing Lt.	314.00	471.00
28+400.00	To	28+760.00	C. Rt.	No Passing Rt.	360.00	540.00
28+760.00	To	28+902.00	C. Lt. & Rt.	No Passing Lt. & Rt.	142.00	426.00
28+933.00	To	29+220.00	C. Lt. & Rt.	No Passing Lt. & Rt.	287.00	861.00
29+220.00	To	29+520.00	C. Lt.	No Passing Lt.	300.00	450.00
30+190.00	To	30+440.00	C. Rt.	No Passing Rt.	250.00	375.00
30+440.00	To	30+480.00	C. Lt. & Rt.	No Passing Lt. & Rt.	40.00	120.00
30+480.00	To	30+760.00	C. Lt.	No Passing Lt.	280.00	420.00
N5047						
28,924.00	To	28,960.00	C. Lt. & Rt.	No Passing Lt. & Rt.	36.00	108.00
N351						
28,840.00	To	28,893.00	C. Lt. & Rt.	No Passing Lt. & Rt.	53.00	159.00
				TOTAL:	4,822.00	12,210.00

63401-1600 PAVEMENT MARKINGS, TYPE H, BROKEN, YELLOW

STATION TO STATION			LOCATION	DESCRIPTION	LENGTH (m)	102mm EQUIV QUANTITY (m)
26+460.00	To	26+720.00	C. Rt.	Passing Allowed Rt.	260.00	390.00
26+774.00	To	28,400.00	C. Lt. & Rt.	Passing Allowed Lt. & Rt.	1,626.00	2,439.00
28+400.00	To	28,760.00	C. Lt.	Passing Allowed Lt.	360.00	540.00
29+220.00	To	29+520.00	C. Rt.	Passing Allowed Rt.	300.00	450.00
29+520.00	To	30+190.00	C. Lt. & Rt.	Passing Allowed Lt. & Rt.	670.00	1,005.00
30+190.00	To	30+440.00	C. Lt.	Passing Allowed Lt.	250.00	375.00
30+480.00	To	30+760.00	C. Rt.	Passing Allowed Rt.	280.00	420.00
30+760.00	To	33+860.00	C. Lt. & Rt.	Passing Allowed L. & Rt.	3,100.00	4,650.00
33+860.00	To	34+170.00	C. Lt. & Rt.	Passing Allowed L. & Rt.	310.00	465.00
				TOTAL:	7,156.00	10,734.00

63401-1500 PAVEMENT MARKINGS, TYPE H, SOLID, WHITE

STATION TO STATION			LOCATION	DESCRIPTION	LENGTH(m)	102mm EQUIV QUANTITY (m)
N35; 23+700	To	EOP; 33+860	Left	Solid White	10,160.00	15,240.00
Minus (3) - 4.5m wide T.O. @ 20.672m					-62.02	-93.02
Minus (4) - 7.00m wide T.O. @ 23.172m					-92.69	-139.03
Main; 23+700	To	EOP; 33+880	Right	Solid White	10180.00	15270.00
Minus (3) - 4.5m wide T.O. @ 20.672m					-62.02	-93.02
Minus (0) - 7.0m wide T.O. @ 23.172m					0.00	0.00
N5047						
28,925.00	To	28,960.00	Lt. & Rt.		35.90	107.70
N351						
28,840.00	To	28,902.00	Lt. & Rt.		53.10	159.30
				TOTAL:	20,212.28	30,451.92

63401-1500 PAVEMENT MARKINGS, TYPE H, SOLID, STOP BAR

STATION	LINE		LOCATION	DESCRIPTION	LENGTH (m)	102mm EQUIV QUANTITY (m)
25+715.00	A		Rt.	305mm STOP BAR	3.46	10.38
25+744.99	A		Lt.	305mm STOP BAR	5.51	16.53
26+745.00	A		Lt.	305mm STOP BAR	3.46	10.38
27+306.00	A		Lt.	305mm STOP BAR	5.51	16.53
28+902.10	A		Rt.	305mm STOP BAR	5.75	17.25
28+924.10	A		Lt.	305mm STOP BAR	5.75	17.25
28+893.10	B		Rt.	305mm STOP BAR	8.50	25.50
29+033.10	B		Lt.	305mm STOP BAR	8.50	25.50
29+410.00	B		Rt.	305mm STOP BAR	3.46	10.38
32+135.00	B		Lt.	305mm STOP BAR	5.51	16.53
33+945.00	B		Lt.	305mm STOP BAR	3.46	10.38
				TOTAL:	3.46	176.61

63401-1610 PAVEMENT MARKINGS OBLITERATION

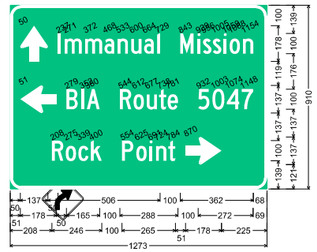
STATION TO STATION			LOCATION	DESCRIPTION	LENGTH (m)	QUANTITY (m)
33+860.00	To	34+170.00	C. Lt. & Rt.	Double Yellow	310.00	620.00
				TOTAL:	310.00	620.00

N351: PERMANENT SIGNS & HARDWARE

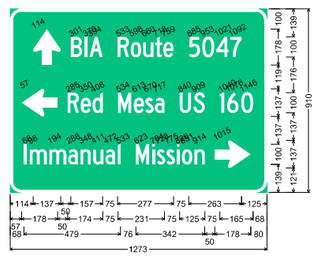
Station	Location	Detail No.	Description	Sign Panel Size (mm)	Area of Sign (m²)	Number of Square Post	Post Size (mm x mm)	No. of Panel	Total Area of Panel (m²)
28+900.00	Rt.	R1-1	STOP	914 x 914	0.84	1	50 x 50	1	0.84
63302-2002	Sign Installation, 1-Post 44 mm x 44 mm, Square Steel Tube								1.96 sq/m
63302-2006	Sign Installation, 2-Post 50 mm x 50 mm, Square Steel Tube								0.84 sq/m
63302-2009	Sign Installation, 3-Post 50 mm x 50 mm, Square Steel Tube								1.16 sq/m

N5047: PERMANENT SIGNS & HARDWARE

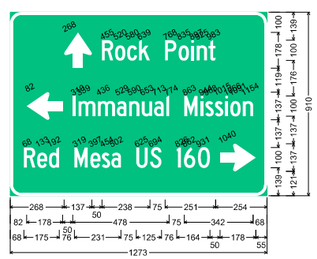
Station	Location	Detail No.	Description	Sign Panel Size (mm)	Area of Sign (m²)	Number of Square Post	Post Size (mm x mm)	No. of Panel	Total Area of Panel (m²)
28+925.00	Lt.	R1-1	STOP	914 x 914	0.84	2	50 x 50	1	0.84
63302-2002	Sign Installation, 1-Post 44 mm x 44 mm, Square Steel Tube								1.16 sq/m
63302-2006	Sign Installation, 2-Post 50 mm x 50 mm, Square Steel Tube								0.84 sq/m



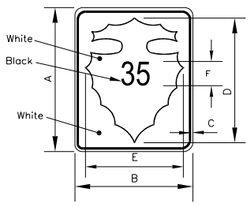
55mm Radius, 14mm Border, White on, Green;
Arrow Custom - 178mm 90°; "Immanual Mission", C 2K;
Arrow Custom - 178mm 180°; "BIA Route 5047", C 2K;
"Rock Point", C 2K; Arrow Custom - 178mm 0°;

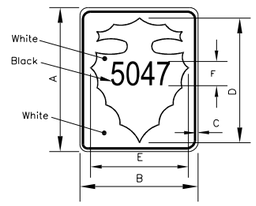


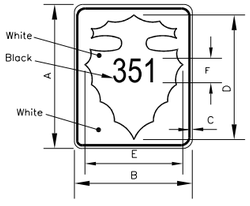
55mm Radius, 14mm Border, White on, Green;
Arrow Custom - 178mm 90°;
"BIA Route 5047", C 2K 75% spacing;
Arrow Custom - 178mm 180°;
"Red Mesa US 160", C 2K 75% spacing;
"Immanual Mission", C 2K 75% spacing;
Arrow Custom - 178mm 0°;



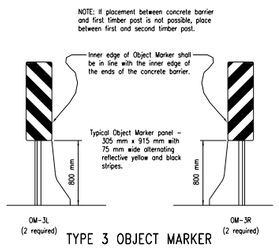
55mm Radius, 14mm Border, White on, Green;
Arrow Custom - 178mm 90°;
"Rock Point", C 2K 75% spacing;
Arrow Custom - 178mm 180°;
"Immanual Mission", C 2K 75% spacing;
"Red Mesa US 160", C 2K 75% spacing;
Arrow Custom - 178mm 0°;



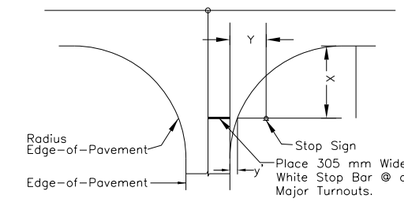




SIGN	DIMENSION (mm)					F NUMERALS				
	A	B	C	D	E	DIGITS IN ROUTE	1	2	3	4
MIN.	610	457	13	495	343	SIZE & SERIES (mm)	370	296	237	198



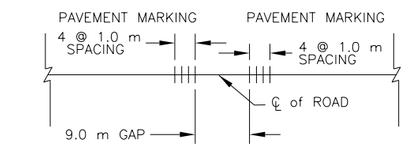
TYPE 3 OBJECT MARKER
CONCRETE BARRIER INSTALLATION
STATION 0+000.00 Lt. & Rt.
STATION 0+000.00 Lt. & Rt.



STOP SIGN LOCATION AT INTERSECTION

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

y'= Distance of Roadway Turnout EOP to Radius EOP
Lateral Offset (LO) From EOP =1.80 m



ITEM 63502-3000 TEMP. TRAFFIC CONTROL
RAISED PAVEMENT MARKER, YELLOW-5,493 Ea.

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

N5047 SIGNING AND MARKING DETAILS & QUANTITIES

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: D5	

25015 ANDRE' JOHN SPEAR — Registered Professional Engineer — CERTIFICATE NO. — Date Signed 6/30/22 — ARIZONA U.S.A.

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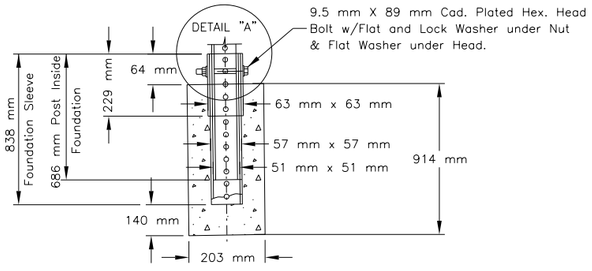
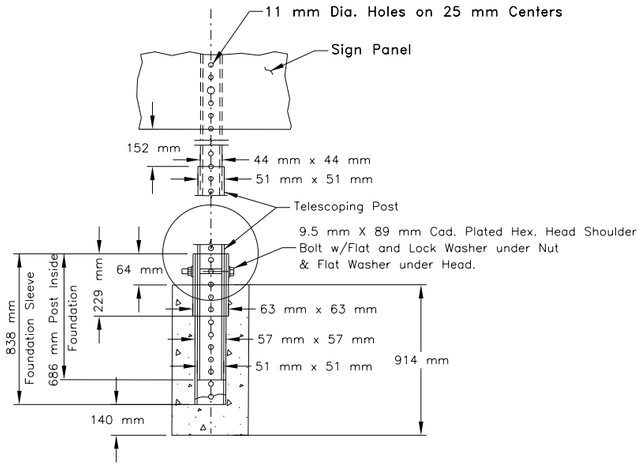
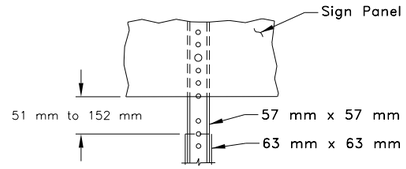
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	32	66



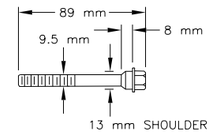
SINGLE POST FOUNDATION DETAIL



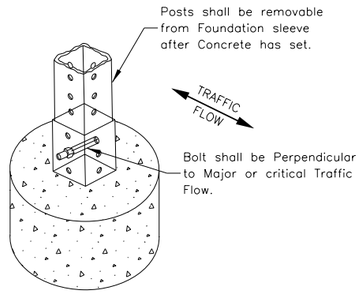
TELESCOPING POST DETAIL



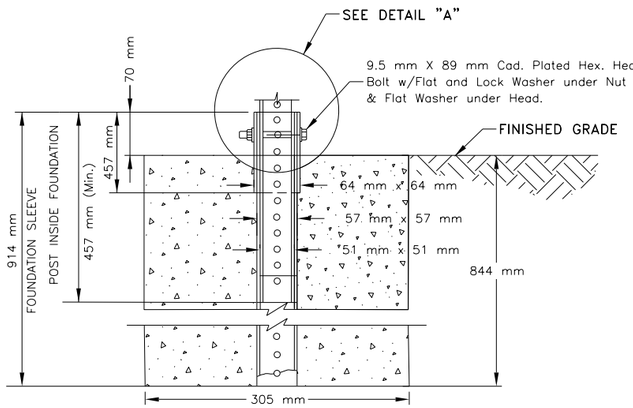
TELESCOPING POST INSTALLATION



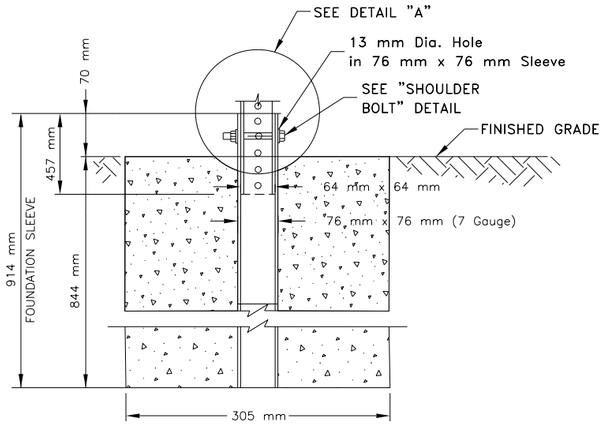
SHOULDER BOLT (HEAD)



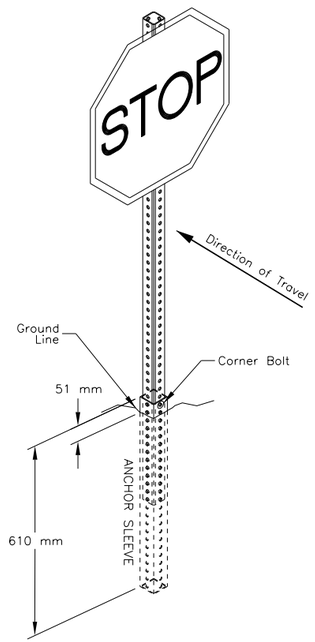
DETAIL "A"



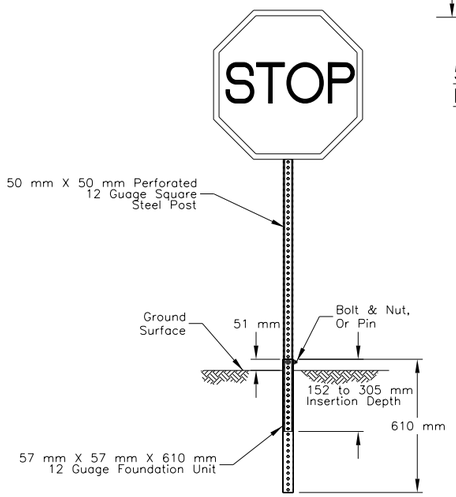
51 mm SINGLE POST CONCRETE FOUNDATION DETAIL (IN WEAK SOILS OR SANDSTONE)



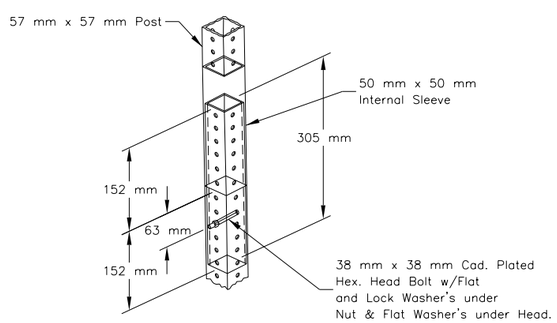
64 mm SINGLE POST CONCRETE FOUNDATION DETAIL (IN WEAK SOILS OR SANDSTONE)



ISOMETRIC VIEW



TELESCOPING BREAKAWAY
(Single Post)
For all other soils



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

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

SQUARE TUBE POST BREAK-A-WAY AND SIGN MOUNTING DETAILS

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: D6	

Registered Professional Engineer CERTIFICATE NO. 25015 ANDREW JOHN SPEAR

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ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	33	66

Galvanized Square Tube Selection; Single post - 2.80 mm thickness (12gage)

Post Size	H = C+(D/2) (meter)					
	1.52	1.83	2.13	2.44	2.74	<— H (m)
38 mm x 38 mm	0.51	0.43	0.37	0.31	n/a	<=Maximum Sign Area (m^2)
44 mm x 44 mm	0.81	0.68	0.58	0.47	0.41	
50 mm x 50 mm	1.14	0.95	0.84	0.70	0.58	
57 mm x 57 mm	1.49	1.27	1.07	0.95	0.84	
64 mm x 64 mm	1.88	1.68	1.41	1.25	1.07	
	5.00	6.00	7.00	8.00	9.00	<— H (ft)

Galvanized Square Tube Selection; Double post - 2.80 mm thickness (12 gage)

Post Size	H = C+(D/2) (meter)					
	1.52	1.83	2.13	2.44	2.74	<— H (m)
57 mm x 57 mm	n/a	2.97	2.23	2.04	1.95	<=Maximum Sign Area (m^2)
64 mm x 64 mm	n/a	4.09	3.53	3.16	2.60	
	5.00	6.00	7.00	8.00	9.00	<— H (ft)

Galvanized Square Tube Selection; Triple post - 2.80 mm thickness (12 gage)

Post Size	H = C+(D/2) (meter)					
	1.52	1.83	2.13	2.44	2.74	<— H (m)
57 mm x 57 mm	4.74	4.74	3.85	2.83	2.61	<=Maximum Sign Area (m^2)
64 mm x 64 mm	6.13	6.13	5.30	4.46	3.90	
	5.00	6.00	7.00	8.00	9.00	<— H (ft)

Guide Sign Post Dimensions
(Not for use with Warning, Regulatory or Marker Panels)

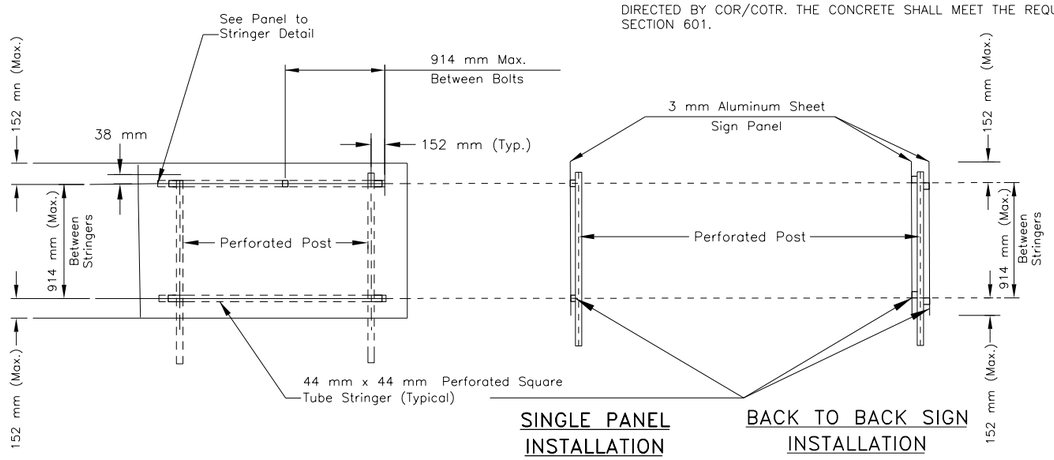
Panel Width	914 mm	1.22 m	1.52 m	1.83 m	2.13 m	2.44 m	2.74 m	3.05 m
two posts spacing (A)	559 mm	711mm	914 mm	1.12 m	1.27 m	1.47 m	1.63 m	1.83 m
bolts to panel (per stringer)	-	-	3	3	3	3	4	4
length of each stringer	-	-	1.22 m	1.42 m	1.57 m	1.78 m	1.93 m	2.13 m
three posts spacing (B)	-	-	533 mm	635 mm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

GENERAL NOTES:

1. THE CONTRACTOR SHALL BE REQUIRED TO ADJUST THE LENGTH OF SIGN SUPPORT POSTS. THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE FOR THE APPROPRIATE BID ITEMS SHOWN IN THE BID SCHEDULE.

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

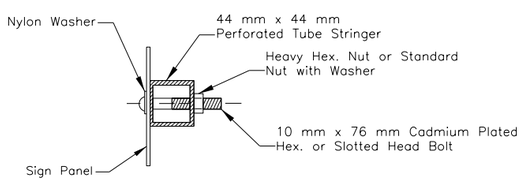
3. SIGN POST CONCRETE FOUNDATION SHALL BE USED IN LOOSE FINE GRAVELLY SOILS THAT ARE HARD TO COMPACT OR FOR INSTALLATION IN SANDSTONE AS DIRECTED BY COR/COTR. THE CONCRETE SHALL MEET THE REQUIREMENTS OF SECTION 601.



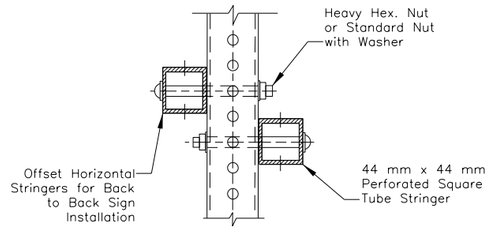
SINGLE PANEL INSTALLATION

BACK TO BACK SIGN INSTALLATION

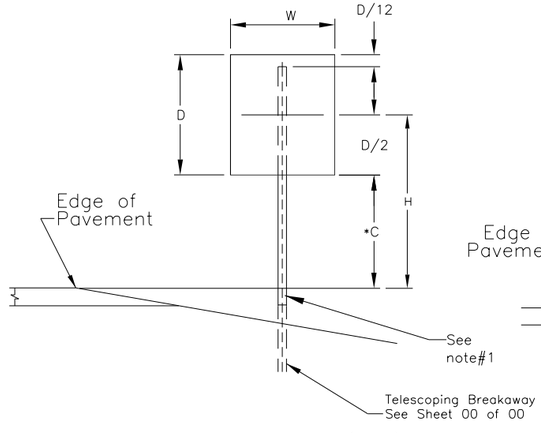
STRINGER DETAILS (FOR GUIDE SIGNS UP TO AND INCLUDING 3.05 mm WIDE)



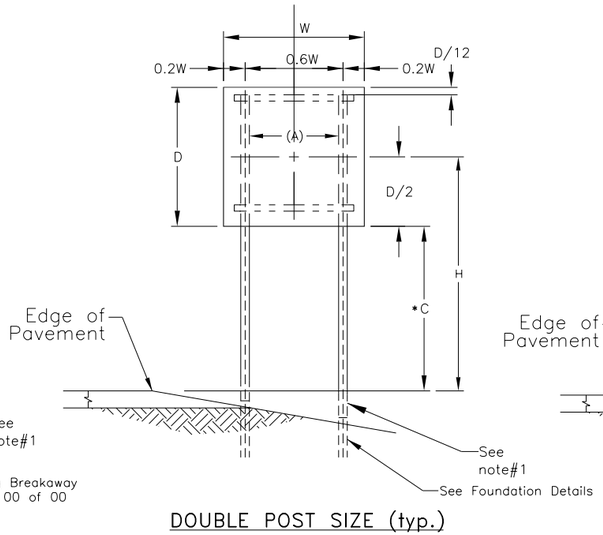
PANEL TO STRINGER OR POST



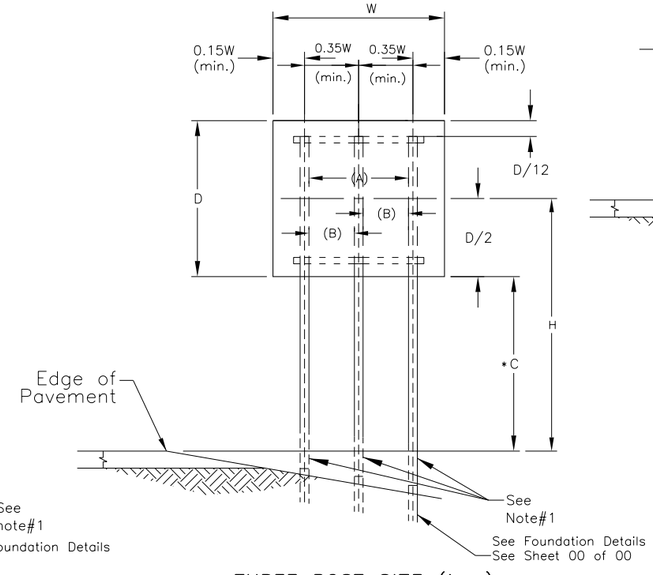
STRINGER TO POST



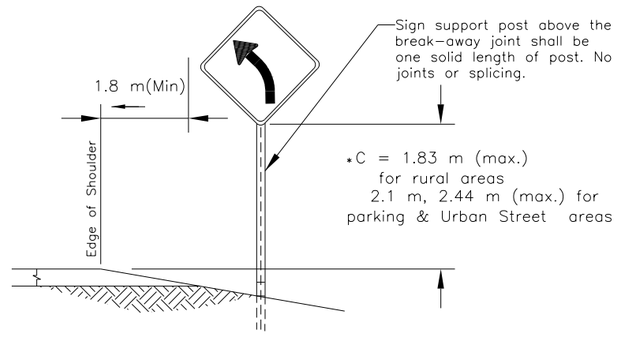
SINGLE POST SIZE (typ.)



DOUBLE POST SIZE (typ.)



THREE POST SIZE (typ.)



TYPICAL ROADSIDE SIGN LOCATION

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

SQUARE TUBE POST SELECTION AND SIGN MOUNTING DETAILS

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: D7	

Registered Professional Engineer (Civil) CERTIFICATE NO. 25015 ANDREW JOHN SPEAR Date Signed 5/16/22 ARIZONA U.S.A.

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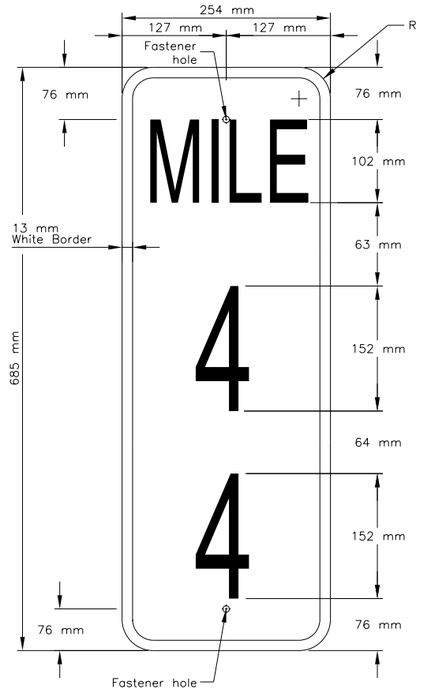
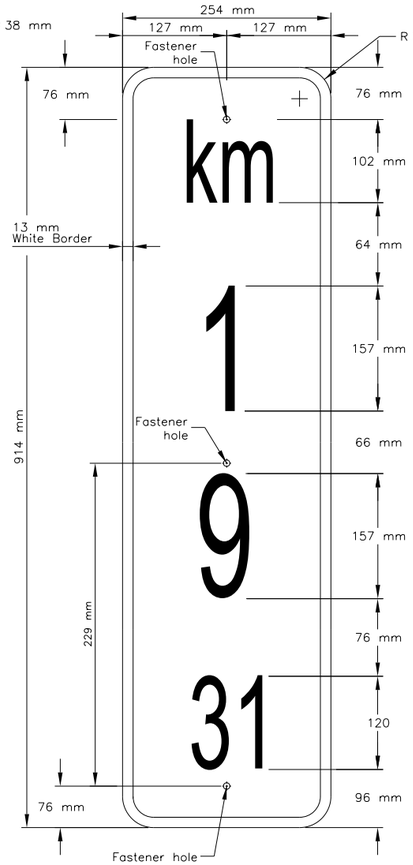
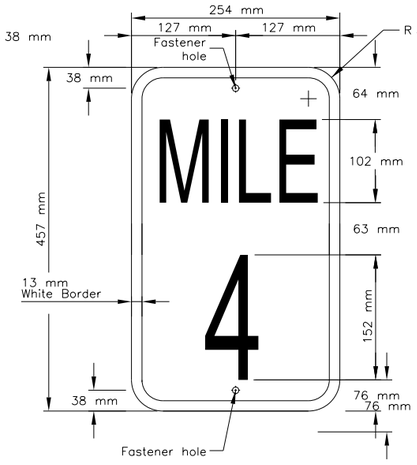
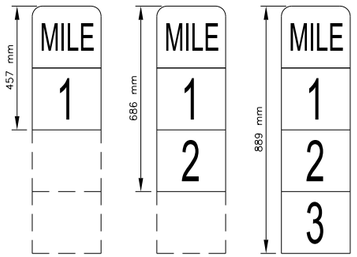
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	34	66

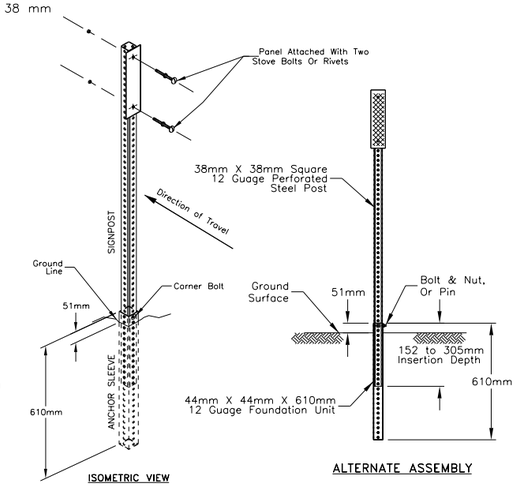






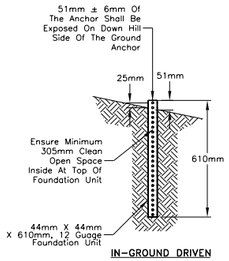
STANDARD NUMERAL POSITION



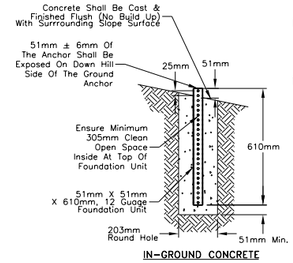


ISOMETRIC VIEW

ALTERNATE ASSEMBLY

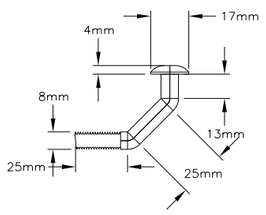


IN-GROUND DRIVEN

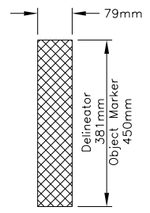


IN-GROUND CONCRETE

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

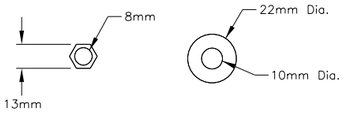


BREAK-AWAY BOLT

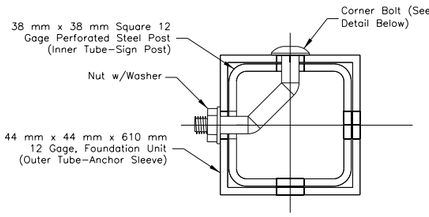


REFLECTIVE PANEL
(Pre-Drilled/Punched)

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



LOCK NUT FLAT WASHER

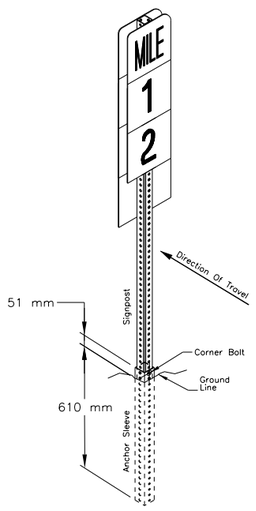


"BREAK-AWAY" DETAIL
SIGN POST/SLEEVE INTERFACE

GENERAL NOTES

1. ALL CONCRETE SHALL BE CLASS A(AE) AND SHALL CONFORM TO SECTION 601 OF THE FP-14. FURNISHING AND PLACING OF CONCRETE, WHEN REQUIRED, SHALL BE CONSIDERED INCIDENTAL TO ITEM 63309-0020.
2. THE CONTRACTOR SHALL USE 51mm X 51mm ALL STEEL SQUARE TUBE DELINEATORS. SEE SHEET 38 of 80 FOR POST SPACING.
3. THE MILE POSTS SHALL BE PLACED ON BOTH SIDE OF THE ROADWAY WITH ENGLISH UNITS PANEL ON APPROACHING TRAFFIC AND METRIC UNITS PANEL ON OPPOSING TRAFFIC.
4. MILE POST PLATES SHALL BE FABRICATED FROM 16 GAGE MINIMUM THICKNESS 5052-H38 OR 6061-T6 ALUMINUM ALLOY.
5. ALL SURFACE TO BE COVERED WITH REFLECTIVE SHEETING, AND SHALL BE PREPARED IN ACCORDANCE WITH SUPPLEMENTAL SPECIFICATION SECTION 718.11, TABLE 718-3.
6. THE BORDER AND LEGEND SHALL BE STANDARD REFLECTIVITY SILVER-WHITE. THE BACKGROUND SHALL BE STANDARD REFLECTIVITY GREEN AND MAY BE REVERSE SILK-SCREENED.
7. THE BACK SIDE OF THE ALUMINUM SHEETS SHALL BE ETCHED BY APPROVED METHODS TO REDUCE GLARE FROM REFLECTED SUNLIGHT.
8. STEEL POSTS SHALL CONFORM TO ASTM A499- YIELD POINT AND TENSILE STRENGTH OF STEEL SHALL BE 550 & 689 MPa (MINIMUM) RESPECTFULLY AND SHALL NOT WEIGHT LESS THAN 2.98 kg/m. AN APPROVED ALTERNATE BREAKAWAY ASSEMBLY MAY BE SUBMITTED TO THE COR/COTR FOR REVIEW AND APPROVAL PRIOR TO IT'S USE. THE POSTS SHALL BE GALVANIZED AFTER FABICATION IN ACCORDANCE WITH ASTM A-123.
9. INSTALL MILE POST MARKER 1.80 METER (MAXIMUM) FROM ROADWAY SHOULDER. AT GUARDRAIL LOCATIONS, THE MILE POST MARKER SHALL LINE UP WITH THE GUARDRAIL POSTS.
10. THE POSTS LENGTH SHALL BE DETERMINED IN THE FIELD BASED ON FINISH GROUND ELEVATION WITH RESPECT TO EDGE OF PAVEMENT ELEVATION.
11. THE UNIT PRICE BID FOR FURNISHING AND INSTALLING MILE POSTS SHALL INCLUDE ALL MATERIALS INCLUDING TWO SIGNS PER POST.

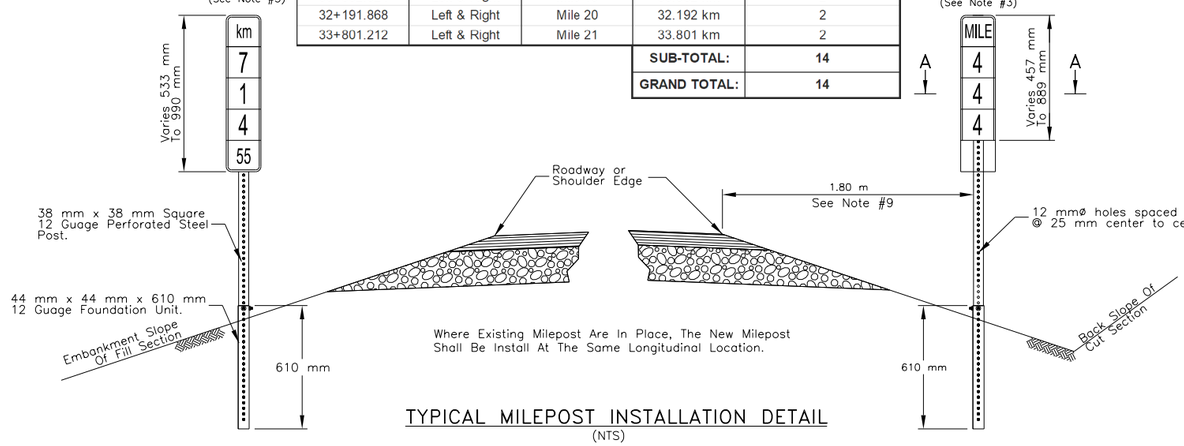
TYPICAL MILEPOST DETAIL



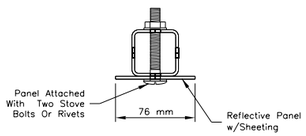
ISOMETRIC VIEW
NOTE: Square Tube Splice Connection Detail on Sheet 00

ITEM 63301-0100; MILEPOST, 35mm X 35mm SQUARE STEEL POST

STATION	LOCATION	DESCRIPTION		QUANTITY (EACH)
		ENGLISH	METRIC	ENGLISH/METRIC
24+145.148	Left & Right	Mile 15	24.145 km	2
25+754.492	Left & Right	Mile 16	25.754 km	2
27+363.836	Left & Right	Mile 17	27.364 km	2
28+973.180	Left & Right	Mile 18	28.973 km	2
30+582.524	Left & Right	Mile 19	30.582 km	2
32+191.868	Left & Right	Mile 20	32.192 km	2
33+801.212	Left & Right	Mile 21	33.801 km	2
		SUB-TOTAL:		14
		GRAND TOTAL:		14



TYPICAL MILEPOST INSTALLATION DETAIL
(NTS)



SQUARE TUBE POST AND PANEL

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

SQUARE TUBE STEEL POST & MILE POST MARKER DETAILS

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: D8	

Registered Professional Engineer CERTIFICATE NO. 25015 ANDREW JOHN SPEAR State of Arizona

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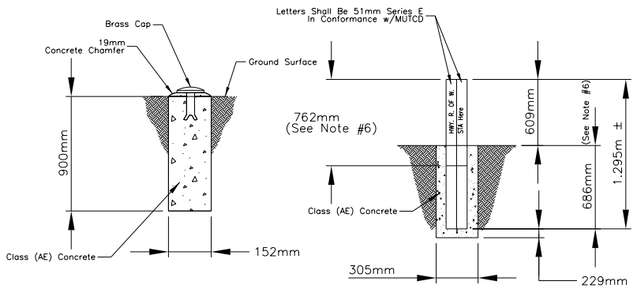
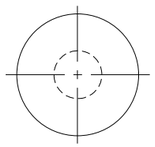
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	35	66



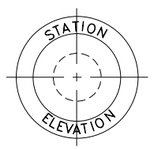
SURVEY MONUMENT
NTS

REFERENCE MARKER
NTS

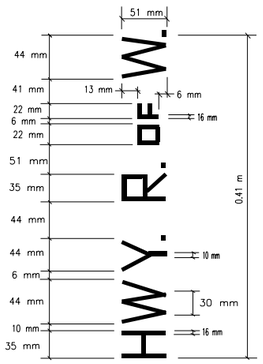
R/W MONUMENT SYMBOL



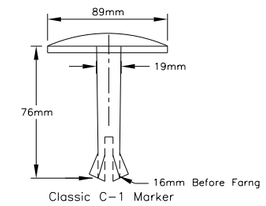
BOTTOM VIEW



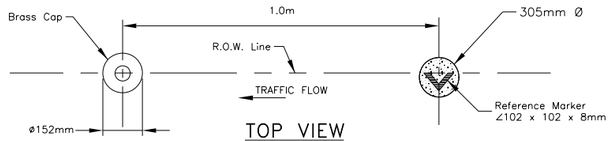
TOP VIEW



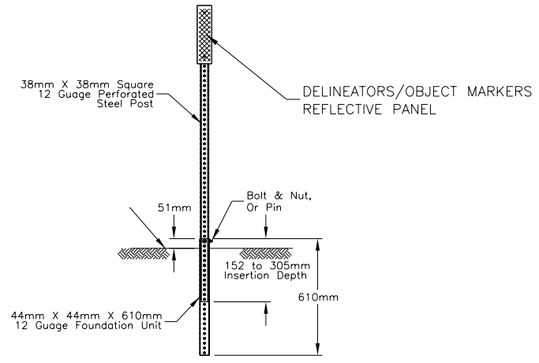
DETAIL OF LETTERS



BRASS CAP DETAIL

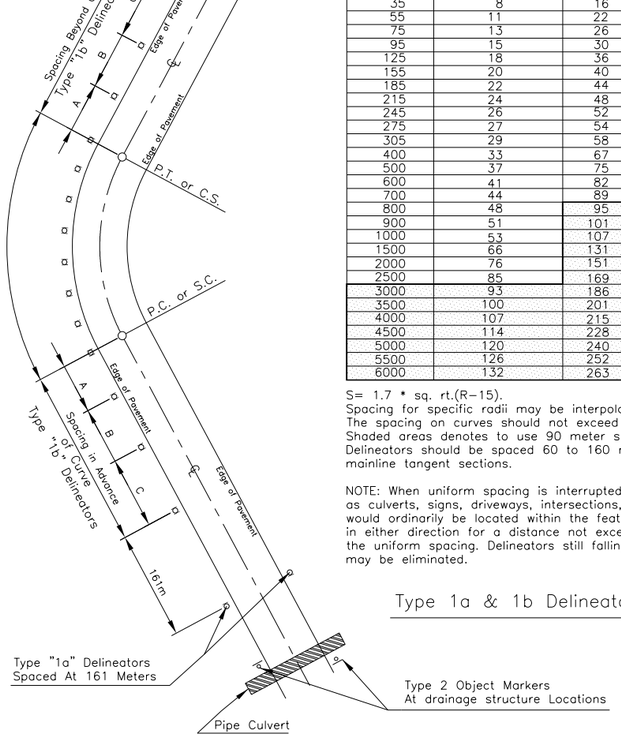


TOP VIEW



DELINEATORS & OBJECT MARKERS ASSEMBLY

TYPE	POST COLOR	HIGH INTENSITY REFLECTIVE SHEETING
1a	White	White, One Side
1b	White	White, Both Sides
2	Yellow	Amber, One Side

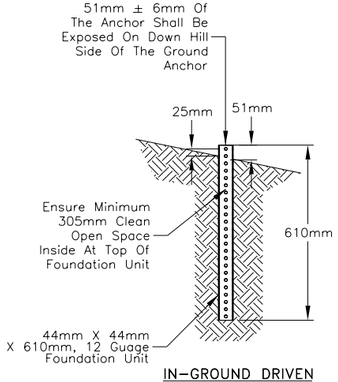


RADIUS OF CURVE (m)	APPROXIMATE SPACING (S) ON CURVE (m)	SPACING ON ADVANCE OF OR BEYOND A CURVE (m)		
		A (2S)	B (3S)	C (6S)
15	6	12	18	36
35	8	16	24	48
55	11	22	33	66
75	13	26	39	78
95	15	30	45	90
125	18	36	54	108
155	20	40	60	120
185	22	44	66	132
215	24	48	72	144
245	26	52	78	156
275	27	54	81	162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

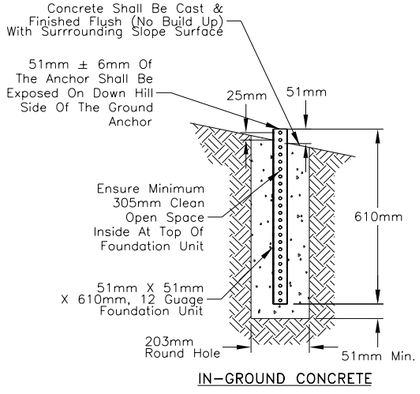
S= 1.7 * sq. rt.(R-15).
Spacing for specific radii may be interpolated from table.
The spacing on curves should not exceed 90 meters.
Shaded areas denotes to use 90 meter spacings.
Delineators should be spaced 60 to 160 meters apart on mainline tangent sections.

NOTE: When uniform spacing is interrupted by such features as culverts, signs, driveways, intersections, delineators which would ordinarily be located within the features may be relocated in either direction for a distance not exceeding one quarter of the uniform spacing. Delineators still falling within such features may be eliminated.

Type 1a & 1b Delineator Detail



IN-GROUND DRIVEN



IN-GROUND CONCRETE

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

GENERAL NOTES

1. Survey monument and reference markers shall be placed as shown on the plans or as directed by COR/COTR. The cost of supplying all materials and installation of Right-of-Way Monument and Markers shall be included in the unit price bid under Item 62101-0000 & 62102-0000. See sheet 5 for table.
2. If rock is encountered when installing the right-of-way monument and reference maker, drill a 152mm ø for survey monument and 305mmø for reference marker hole in the rock to the depth required to install the monument and marker to full depth. All hole drilling into rock material, shall be considered incidental to the completion of the work and no additional payment shall be made thereof.
3. Brass caps for the survey monument shall be supplied and installed by the Contractor conforming to the ASTM B-584 specification and shall be considered incidental to Item 62101-0000.
4. All concrete shall be Class A(AE) and shall conform to Section 601 of the FP-14. Furnishing and placing of concrete shall be considered incidental to Items 62101-0000 & 62102-0000.
5. Roadway stationing and elevations shall be stamped on all brass caps by the Contractor after installation, unless otherwise directed in writing by the COR/COTR.
6. The Contractor shall be required to paint the reference markers per Section 708 and subsection 708.04 of FP-14.
   a) Prime coat entire steel material and shall conform to subsection 708.04(a) or (b) of FP-14.
   b) Coat white finish of paint the top 762mm and shall conform to subsection 708.04(c), (d), or (e) of FP-14.
   c) All letters, numerals, symbols, etc. shall be painted on the reference markers using the dimensions shown using Black Lamp paint conforming to ASTM D 209. The required information to place on the reference markers shall be furnished to the Contractor by the COR/COTR.
7. The Contractor has the option to use an approved State Highway paint specifications in lieu of that stated in Note (6) above. The Contractor shall submit (in writing) the paint specifications and request for use on the project at least 14 days in advance of the paint use for review and approval. The Contractor shall not be allowed to use any paint until the proper approval has been given by the COR/COTR. Any painting performed by the Contractor without the proper approval shall cause the work to be rejected.
8. The Contractor shall use steel post type highway delineators. The cost of supplying materials and installation of galvanized steel square tube delineators shall be included in the unit price bid under Items 63308-2000, 63309-0010, and 63309-0020.
9. Set Right-of-Way monument at station and offset to match the right-of-way plat. These locations may vary from the stations and offsets shown on the construction plan and profile sheets.
10. THE CONTRACTOR SHALL USE 38mm x 38mm ALL STEEL SQUARE TUBE HIGHWAY DELINEATORS. DELINEATORS TYPE 1a and type 1b SHALL BE INSTALLED 610mm (min) OR 1219mm (NORMAL), OR IN-LINE WITH GUARDRAIL POSTS. MEASURED FROM ROADWAY OR SHOULDER EDGE. DELINEATOR TYPE 1c (i.e. DRAINAGE STRUCTURE) AND OBJECT MARKER SHALL BE USED TO MARK OBSTRUCTIONS THAT ARE LOCATED WITHIN 610mm (min) OR 1219mm (NORMAL) OF THE PAVEMENT EDGE AND SHALL BE MOUNTED ON OR IMMEDIATELY IN FRONT OF THE OBSTRUCTION.

NAVAJO D.O.T.

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

R/W MONUMENTS & DELINEATOR/ OBJECT MARKER LAYOUT DETAILS

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: D9	

Registered Professional Engineer — CERTIFICATE NO. 25015 — ANDREW JOHN SPEAR — New Mexico — 5/16/22

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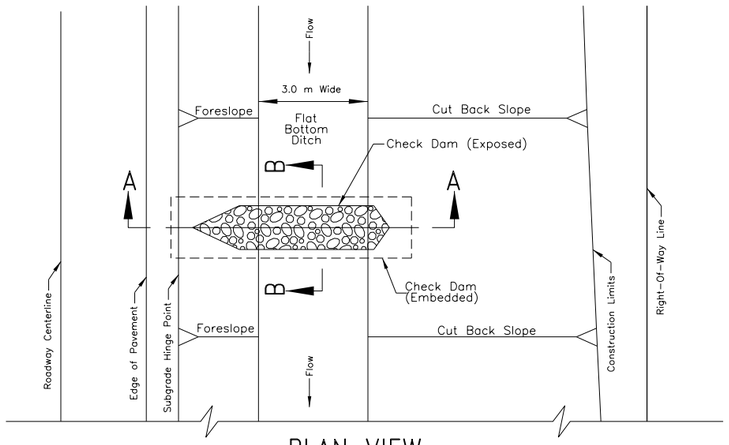
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	36	66

ITEM NO. 25101-2200: PLACED RIPRAP, CLASS 2 (CHECK DAM)
CHECK DAM LOCATION AND ESTIMATED QUANTITIES

STATION	LOCATIONS	L1	L2	L3	BACKSLOPE	VOLUME (m^3)	REMARKS
23+715	Left	3.00	3.50	2.50	1:3	8.82	Flat Bottom Ditch
23+715	Right	3.00	3.00	2.50	1:3	8.33	Flat Bottom Ditch
23+755	Left	3.00	3.50	2.50	1:3	8.82	Flat Bottom Ditch
23+755	Right	3.00	3.00	2.50	1:3	8.33	Flat Bottom Ditch
23+795	Left	3.00	3.50	2.50	1:3	8.82	Flat Bottom Ditch
23+795	Right	3.00	3.00	2.50	1:3	8.33	Flat Bottom Ditch
23+835	Left	3.00	3.50	2.50	1:3	8.82	Flat Bottom Ditch
23+835	Right	3.00	3.00	2.50	1:3	8.33	Flat Bottom Ditch
23+875	Left	3.00	3.50	2.50	1:3	8.82	Flat Bottom Ditch
23+875	Right	3.00	3.00	2.50	1:3	8.33	Flat Bottom Ditch
23+915	Left	3.00	3.50	2.50	1:3	8.82	Flat Bottom Ditch
23+915	Right	3.00	3.00	2.50	1:3	8.33	Flat Bottom Ditch
23+955	Left	3.00	3.50	2.50	1:3	8.82	Flat Bottom Ditch
23+955	Right	3.00	3.00	2.50	1:3	8.33	Flat Bottom Ditch
23+995	Left	3.00	3.50	2.50	1:3	8.82	Flat Bottom Ditch
23+995	Right	3.00	3.00	2.50	1:3	8.33	Flat Bottom Ditch
24+180	Right	3.00	3.00	2.50	1:3	8.33	Flat Bottom Ditch
24+260	Left	3.00	3.50	2.50	1:3	8.82	Flat Bottom Ditch
24+260	Right	3.00	3.00	2.50	1:3	8.33	Flat Bottom Ditch
24+435	Left	3.00	3.50	2.50	1:3	8.82	Flat Bottom Ditch
24+435	Right	3.00	3.00	2.50	1:3	8.33	Flat Bottom Ditch
24+635	Left & Right	2.76	3.05	2.50	1:3	16.29	Flat Bottom Ditch
24+675	Left & Right	2.76	3.05	2.50	1:3	16.29	Flat Bottom Ditch
24+710	Left & Right	2.76	3.05	2.50	1:3	16.29	Flat Bottom Ditch
25+400	Left & Right	2.76	3.05	2.50	1:3	16.29	Flat Bottom Ditch
25+440	Left & Right	2.76	3.05	2.50	1:3	16.29	Flat Bottom Ditch
25+480	Left & Right	2.76	3.05	2.50	1:3	16.29	Flat Bottom Ditch
25+520	Right	2.76	3.05	2.50	1:3	8.14	Flat Bottom Ditch
25+560	Right	2.76	3.05	2.50	1:3	8.14	Flat Bottom Ditch
25+600	Right	2.76	3.05	2.50	1:3	8.14	Flat Bottom Ditch
25+640	Left & Right	2.76	3.05	2.50	1:3	16.29	Flat Bottom Ditch
25+880	Right	2.76	3.05	2.50	1:3	8.14	Flat Bottom Ditch
25+920	Right	2.76	3.05	2.50	1:3	8.14	Flat Bottom Ditch
25+960	Right	2.76	3.05	2.50	1:3	8.14	Flat Bottom Ditch
26+000	Right	2.76	3.05	2.50	1:3	8.14	Flat Bottom Ditch
26+040	Right	2.76	3.05	2.50	1:3	8.14	Flat Bottom Ditch
26+080	Right	2.76	3.05	2.50	1:3	8.14	Flat Bottom Ditch
26+120	Right	2.76	3.05	2.50	1:3	8.14	Flat Bottom Ditch
29+880	Right	2.76	3.05	2.50	1:3	8.14	Flat Bottom Ditch
29+920	Right	2.76	3.05	2.50	1:3	8.14	Flat Bottom Ditch
29+960	Right	2.76	3.05	2.50	1:3	8.14	Flat Bottom Ditch
30+000	Right	2.76	3.05	2.50	1:3	8.14	Flat Bottom Ditch
30+040	Right	2.76	3.05	2.50	1:3	8.14	Flat Bottom Ditch
30+080	Right	2.76	3.05	2.50	1:3	8.14	Flat Bottom Ditch
30+120	Right	2.76	3.05	2.50	1:3	8.14	Flat Bottom Ditch
31+660	Left & Right	2.76	0.00	2.50	1:3	10.31	V-Bottom Ditch
31+720	Left & Right	2.76	0.00	2.50	1:3	10.31	V-Bottom Ditch
31+780	Left & Right	2.76	0.00	2.50	1:3	10.31	V-Bottom Ditch
31+840	Left & Right	2.76	0.00	2.50	1:3	10.31	V-Bottom Ditch
31+900	Left & Right	2.76	0.00	2.50	1:3	10.31	V-Bottom Ditch
31+960	Left & Right	2.76	0.00	2.50	1:3	10.31	V-Bottom Ditch
32+020	Left & Right	2.76	0.00	2.50	1:3	10.31	V-Bottom Ditch
32+280	Left & Right	2.76	0.00	2.50	1:3	10.31	V-Bottom Ditch
32+340	Left & Right	2.76	0.00	2.50	1:3	10.31	V-Bottom Ditch
32+400	Right	2.76	0.00	2.50	1:3	5.15	V-Bottom Ditch
32+460	Right	2.76	0.00	2.50	1:3	5.15	V-Bottom Ditch
32+520	Right	2.76	0.00	2.50	1:3	5.15	V-Bottom Ditch
32+580	Right	2.76	0.00	2.50	1:3	5.15	V-Bottom Ditch
32+640	Right	2.76	0.00	2.50	1:3	5.15	V-Bottom Ditch
32+700	Right	2.76	0.00	2.50	1:3	5.15	V-Bottom Ditch
32+760	Right	2.76	0.00	2.50	1:3	5.15	V-Bottom Ditch
33+340	Left & Right	2.76	0.00	2.50	1:3	10.31	V-Bottom Ditch
33+400	Right	2.76	0.00	2.50	1:3	5.15	V-Bottom Ditch
33+460	Right	2.76	0.00	2.50	1:3	5.15	V-Bottom Ditch
33+520	Right	2.76	0.00	2.50	1:3	5.15	V-Bottom Ditch
33+580	Right	2.76	0.00	2.50	1:3	5.15	V-Bottom Ditch
33+640	Left & Right	2.76	0.00	2.50	1:3	10.31	V-Bottom Ditch
33+700	Left & Right	2.76	0.00	2.50	1:3	10.31	V-Bottom Ditch
33+760	Left & Right	2.76	0.00	2.50	1:3	10.31	V-Bottom Ditch
33+820	Left & Right	2.76	0.00	2.50	1:3	10.31	V-Bottom Ditch
					TOTAL:	633.33	



PLAN VIEW

GENERAL NOTES

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

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

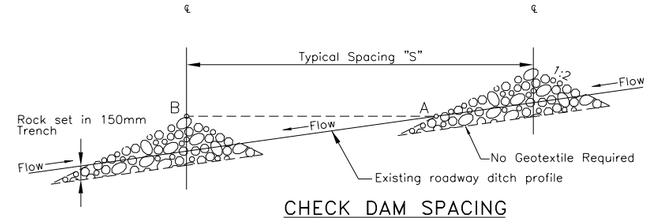
3. THE CONTRACTOR SHALL BE REQUIRED TO MAKE FIELD ADJUSTMENTS TO MATCH ACTUAL FIELD CONDITIONS AS DIRECTED BY THE COR/COTR. NO ADDITIONAL PAYMENT SHALL BE MADE FOR SUCH ADJUSTMENTS.

4. EMBANKMENT SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY AS DETERMINED BY AASHTO T-99, METHOD C AND CONFORM TO SECTION 204 OF FP-03.

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

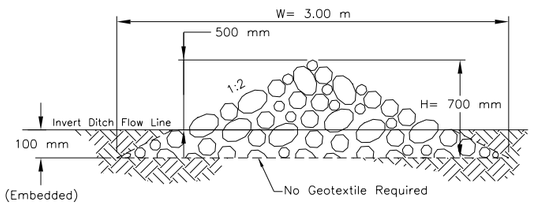
6. STONE SIZE SHALL CONFORM TO TABLE 705-1, SECTION 705, STONE FOR RIPRAP, CLASS 2 & 3.

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

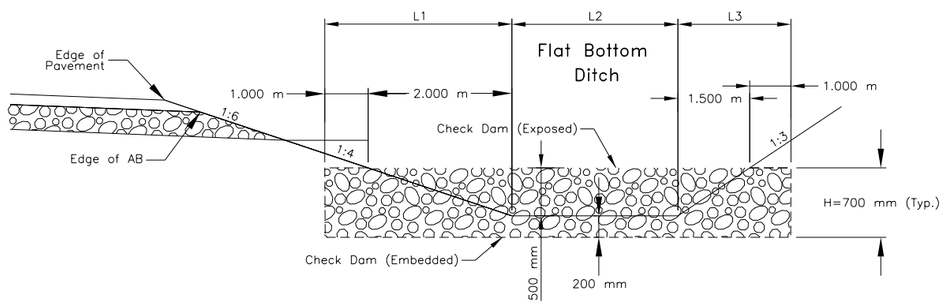


CHECK DAM SPACING
S = 60 m For 2% & Less Grade.
S = 40 m For Greater That 2% Grade.

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



SECTION B-B : Riprap Check Dam



SECTION A-A
3.05 m WIDE FLAT BOTTOM DITCH
WITH CLASS 2 RIPRAP CHECK DAM
(See Table Above for Location)

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

PLACED RIPRAP CHECK DAM DETAILS

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: D10	

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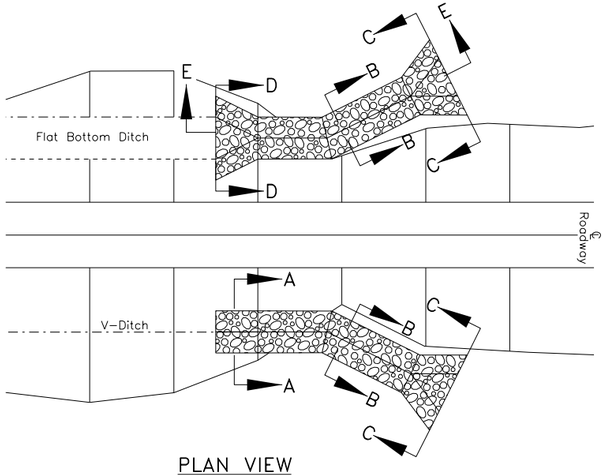
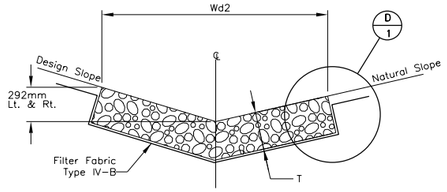
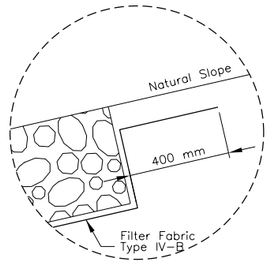
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	37	66



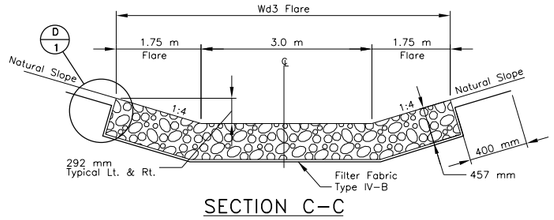
PLAN VIEW
Cut To Fill Transition



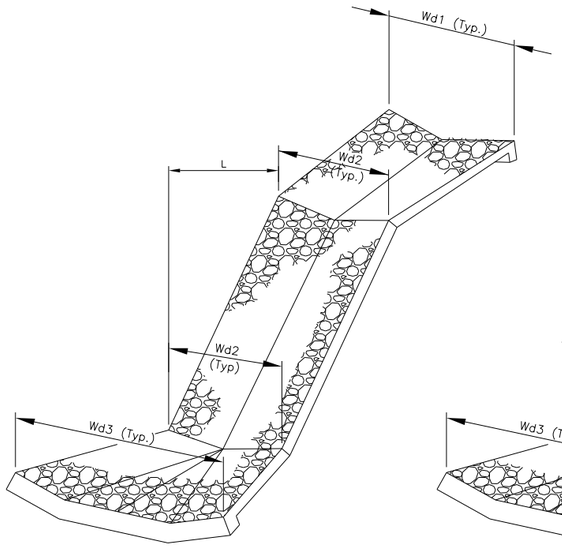
SECTION A-A
&
SECTION B-B



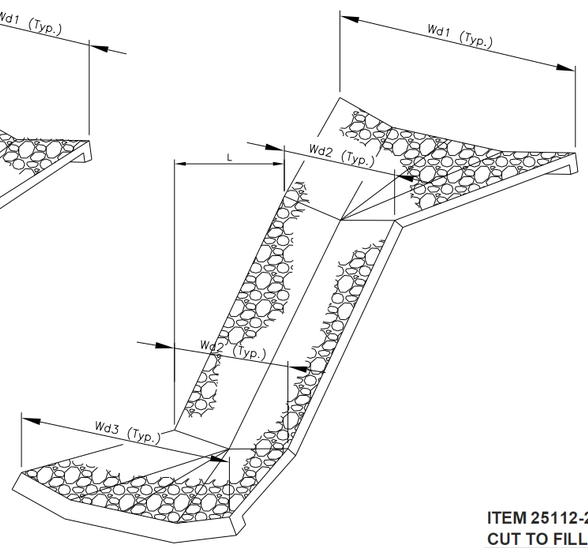
DETAIL D 1



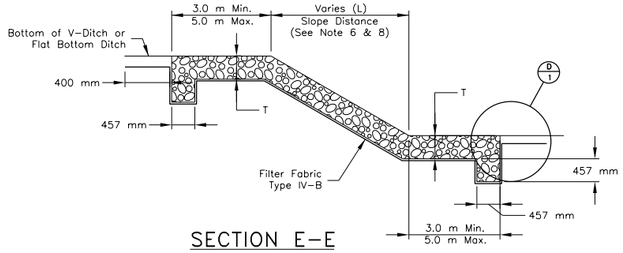
SECTION C-C



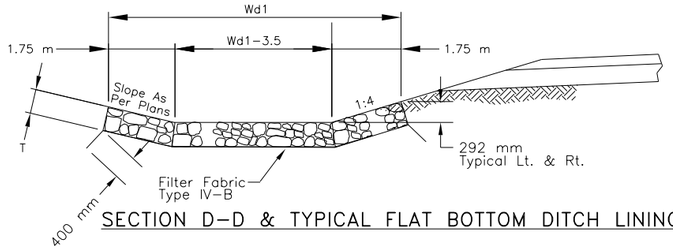
ISOMETRIC VIEW
Cut To Fill Transition & Down Drains
At V-Ditch



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



SECTION E-E



SECTION D-D & TYPICAL FLAT BOTTOM DITCH LINING DETAIL

ITEM 25112-2000: WIRE ENCLOSED RIPRAP, CLASS 1
CUT TO FILL TRANSITIONS

LOCATION	Wd1 (m)	Wd2 (m)	Wd3 (m)	THICKNESS (mm)	LENGTH-Wd2 (m)	UPPER FLARE VOLUME (m^3)	LOWER FLARE VOLUME (m^3)	CUTOFF VOLUME (m^3)	DITCH CHANNEL VOLUME (m^3)	TOTAL VOLUME (m^3)
23+660 to 23+705, Left	7.00	5.00	5.00	457	35	13.71	11.43	1.92	79.98	107.03
23+660 to 23+705, Right	6.50	5.00	5.00	457	35	13.14	11.43	1.78	79.98	106.32
24+142 to 24+168, Right	6.50	3.50	6.50	457	16	11.43	11.43	1.78	25.59	50.23
24+220 to 24+245, Right	6.50	5.00	5.00	457	15	13.14	11.43	1.78	34.28	60.62
24+222 to 24+247, Left	7.00	5.00	6.50	457	15	13.71	13.14	1.92	34.28	63.05
24+555 to 24+615, Right	6.50	5.00	6.50	457	50	13.14	13.14	1.78	114.25	142.31
25+300 to 25+335 Left	5.00	5.00	6.50	457	25	11.43	13.14	1.37	57.13	83.06
25+340 to 25+375, Left	7.00	5.00	5.00	457	30	13.71	11.43	1.92	68.55	95.61
25+360 to 25+380, Right	6.50	5.00	5.00	457	15	13.14	11.43	1.78	34.28	60.62
25+555 to 25+575, Left	7.00	5.00	5.00	457	20	13.71	11.43	1.92	45.70	72.76
25+550 to 25+565, Right	6.50	5.00	5.00	457	30	13.14	11.43	1.78	68.55	94.90
25+812 to 25+874 Right	6.50	5.00	6.50	457	58	13.14	13.14	1.78	132.53	160.59
27+460 to 27+495 Right	6.50	5.00		457	30	13.14		1.78	68.55	83.47
27+600 to 27+630 Right	6.50	5.00		457	25	13.14		1.78	57.13	72.05
30+136 to 30+300, Left	6.50	3.50	6.50	457	220	11.43	11.43	1.78	351.89	376.52
30+141 to 30+316, Right	6.50	3.50	6.50	457	220	11.43	11.43	1.78	351.89	376.52
30+317 to 30+420, Left	6.50	3.50	6.50	457	120	11.43	11.43	1.78	191.94	216.57
30+320 to 30+420, Right	6.50	3.50	6.50	457	120	11.43	11.43	1.78	191.94	216.57
31+700 to 31+785, Left		3.00	3.00	457	80		6.86	0.00	109.68	116.54
32+220 to 32+250, Right		3.00	3.00	457	25		6.86	0.00	34.28	41.13
33+260 to 33+290, Right		3.00	5.00	457	25		9.14	0.00	34.28	43.42
33+560 to 33+600, Left		4.00	5.00	457	35		10.28	0.00	63.98	74.26
									TOTAL:	2714.16

GENERAL NOTES

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

2. THE CONTRACTOR SHALL CLEAR AND GRUB ALL DEBRIS, BRUSH AND TREES THAT WILL INTERFERE WITH THE PLACEMENT OF DOWNDRAIN, EMBANKMENT PROTECTION. THIS WORK SHALL BE INCIDENTAL OBLIGATIONS OF THE CONTRACTOR UNDER ITEM 25101-2000.

3. THE CONTRACTOR SHALL BE REQUIRED TO MAKE ANY NECESSARY FIELD ADJUSTMENTS TO MATCH ACTUAL FIELD CONDITIONS. THESE FIELD ADJUSTMENTS ARE INCIDENTAL OBLIGATIONS OF THE CONTRACTOR.

4. IF UNSUITABLE MATERIAL IS FOUND AT THE FOOTING LOCATION AND ELEVATIONS, THE MATERIAL SHALL BE REMOVED AND REPLACED WITH APPROVED BACKFILL MATERIAL FROMON-SITE AS DETERMINED BY THE COR/COTR. ALL BACKFILL MATERIAL SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY AS DETERMINED BY AASHTO T99 METHOD C. THE BACKFILL MATERIAL SHALL CONFORM TO SECTION 208 AND 209 OF THE FP-03. IF SUITABLE ON-SITE MATERIALS CANNOT BE FOUND, IMPORTED MATERIAL WILL BE NEGOTIATED IN ACCORDANCE WITH SECTION 109.02(s).

5. V-DITCH AND CHANNEL RESHAPING, CLEANING, AND EXCAVATION SHALL BE DONE IN ACCORDANCE WITH THE DETAILS SHOWN AND AS ADJUSTED BY THE COR/COTR. ANY WASTE MATERIAL SHALL BE USED AS BORROW WHERE NEEDED IN OTHER PROJECT LOCATION AS DETERMINED BY THE COR/COTR. ALL DITCH AND CHANNEL EXCAVATION, CLEANING, AND RESHAPING SHALL BE CONSIDERED INCIDENTAL TO COMPLETION OF THE STRUCTURE.

6. THE QUANTITIES SHOWN ARE ONLY AN ESTIMATE. ACTUAL QUANTITIES SHALL BE DETERMINED IN THE FIELD. THE COR/COTR, AND CONTRACTOR SHALL REVIEW ALL ROCKCUT AREAS AFTER THE CONSTRUCTION OF DITCHES, DOWNDRAINS, AND RIPRAP BASINS HAVE BEEN "ROUGH IN". IF IN THE OPINION OF THE COR/COTR, THE ROCK CUT IS STABLE, THE COR/COTR MAY ELECT TO DELETE SECTIONS OF THE RIPRAP PROTECTION.

7. STONE SIZE SHALL CONFORM TO TABLE 705-1, SECTION 705, CLASS 2.

8. FILTER FABRIC SHALL BE INSTALLED UNDER ALL RIPRAP (EXCEPT GROUTED RIPRAP) AND SHALL CONFORM TO SECTION 714, TYPE IV-B, AND SHALL BE CONSIDERED INCIDENTAL TO RIPRAP BID ITEMS. ROUND ALL SHARP CONTOURS AS REQUIRED TO FIT THE SOIL EROSION MATERIAL FLUSH WITH THE EXISTING GROUND. EXTEND RIPRAP DOWN THE SHOULDER DITCH UNTIL A 2% SLOPE IS ACHIEVED, OR AS DIRECTED BY THE COR/COTRBEFORE PLACEMENT OF THE FL ARE SECTION.

9. WIRE ENCLOSED RIPRAP SHALL CONFORM TO SECTION 251 OF THE FP-03 AND THE SUPPLEMENTAL SPECIFICATIONS. WIRE MESH SHALL BE PLACED TO ENCLOSE THE STONE LAYER ON ALL SIDES AND FACES. THE WIRE MESH SHALL BE SPLICED ON ALL EDGE SAND SHALL BE DRAWN TIGHTLY AGAINST THE STONE BY MEANS OF 3.8 mm WIRE TIESSPACED 0.61m LONGITUDINALLY AND TRANSVERSELY.

10. THE WIRE FABRIC SHALL BE GALVANIZED AND BE OF THE CONFIGURATION SHOWN ON THIS SHEET. AN ALTERNATE WIRE FABRIC MAY BE SUBMITTED FOR REVIEW AND APPROVAL. ANY WIRE FABRIC USED SHALL HAVE A MINIMUM WIRE DIAMETER OF 2.8 mm, A CLASS 3 ZINC COATING (GALVANIZED), SHALL HAVE A MINIMUM OPENING DIMENSION OR 100 mm, AND SHALL NOT ALLOW A 75 mm ø SPHERE TO PASS THROUGH WIRE FABRIC OPENING. SEE SHEET 42 OF 80 FOR WIRE ENCLOSED RIPRAP DETAILS.

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

NAVAJO D.O.T.

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

CUT TO FILL TRANSITION AND SPILLWAY DETAILS

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: D11	

Registered Professional Engineer
CERTIFICATE NO.
25015
ANDREW JOHN SPEAR
State of Arizona
ARIZONA, U.S.A.

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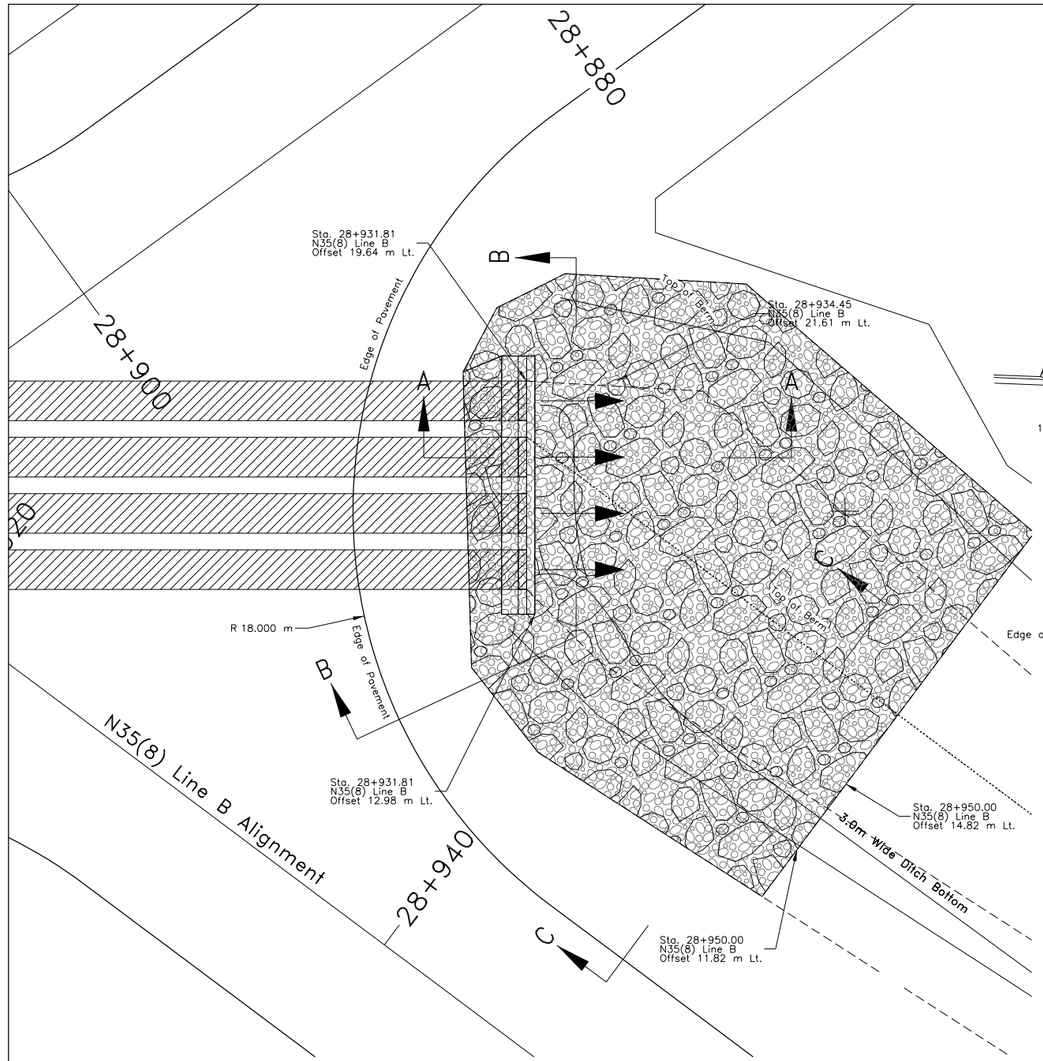
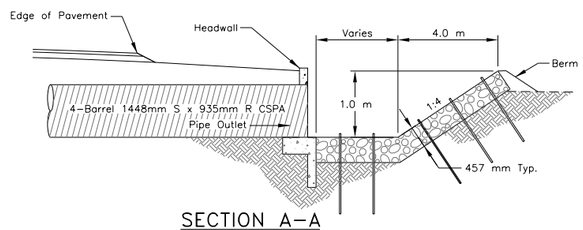
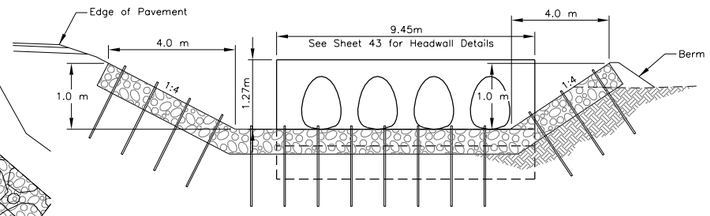
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	38	66



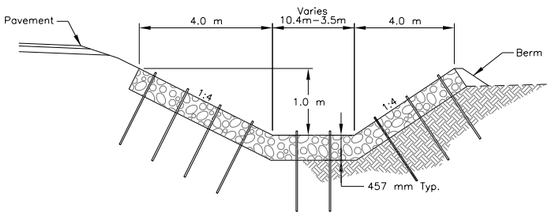
PLAN VIEW



SECTION A–A

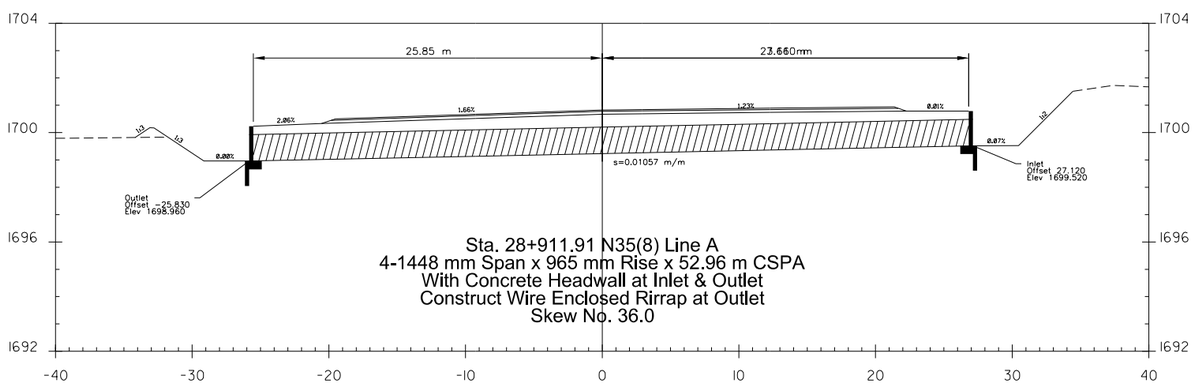


SECTION B–B



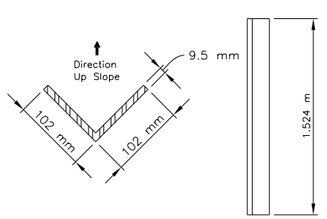
SECTION C–C

ITEM: 25302–1200 WIRE ENCLOSED RIPRAP
ESTIMATED QUANTITY= 141.4 cu/m



Sta. 28+911.91 N35(8) Line A
4-1448 mm Span x 965 mm Rise x 52.96 m CSPA
With Concrete Headwall at Inlet & Outlet
Construct Wire Enclosed Rirrap at Outlet
Skew No. 36.0

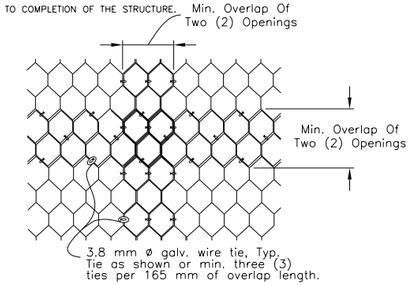
PIPE CROSS SECTION



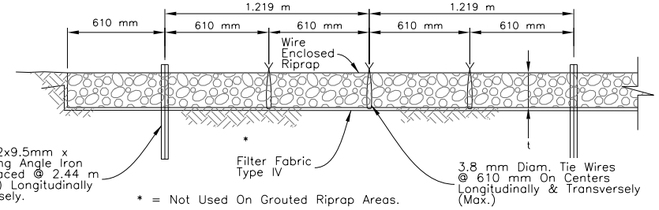
ANGLE IRON ANCHOR DETAIL

GENERAL NOTES

1. ALL STONE FOR RIPRAP SHALL BE CLASS 2 MEETING THE GRADING REQUIREMENTS OF TABLE 705–1OF THE FP–14.
2. ALL EXCAVATIONS AND BACKFILL OPERATIONS SHALL BE DONE TO NEAT LINES IN ACCORDANCE WITH SECTION 209 OF THE FP–14 AND SHALL BE INCIDENTAL TO THE INSTALLATION OF RIPRAP. SEE SUPPLEMENTAL SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
3. ANY BORROW MATERIAL NEEDED TO BRING EXISTING CHANNELS UP TO GRADE SHALLBE INCIDENTAL TO RIPRAP PAY ITEMS.
4. THE WIRE FABRIC SHALL BE GALVANIZED AND BE OF THE CONFIGURATION SHOWN IN THIS SHEET. AN ALTERNATE WIRE FABRIC MAY BE SUBMITTED FOR REVIEW AND APPROVAL. ANY WIRE FABRIC USED SHALL HAVE A MINIMUM WIRE DIAMETER OF 3.0mm. A CLASS 3, ZINC COATING (GALVANIZED) SHALL HAVE A MAXIMUM OPENING DIMENSION OF 100 mm AND SHALL NOT ALLOW A 75 mm ø SPHERE TO PASS THROUGH THE WIRE FABRIC OPENING.
5. WIRE ENCLOSED RIPRAP SHALL BE ANCHORED AS SHOWN WITH L 102 mm x 9.5 mm STEEL ANGLES SPACED AT 2.44 m EACH WAY. STEEL ANGLES SHALL EXTEND 75 mm ABOVE THE TOP OF THE MESH. IN ROCKY AREAS DRIVE ANGLE IRON ANCHORS TO REFUSAL (MIN. EMBEDDED 500 mm). THEN CUT AT 75 mm ABOVE REPRAP. ANCHORS SHALL BE SAW–CUT TO LEAVE A SMOOTH EDGE. DO NOT USE A CUTTING TORCE. FURNISHING AND PLACEMENT OF ANGLE STEEL SHALL BE CONSIDERED INCIDENTAL TO COMPLETION OF THE STRUCTURE.
6. FOR ALL RIPRAP DOWNDRAIN AND CULVERT OUTLETS, PROVIDE CENTER OF RIPRAP 305 mm (MIN.) DIP BELOW OUTER EDGES AT OUTLET END. PLACE RIPRAP TO FIT CHANNEL BANKS WHERE POSSIBLE. ALL EXCAVATION AND APRON WARP RESHAPING SHALL BE CONSIDERED INCIDENTAL TO COMPLETION OF THE STRUCTURE.



FABRIC SPLICING DETAILS FOR
WIRE ENCLOSED RIPRAP APRON



ANGLE IRON ANCHOR DETAILS
WIRE ENCLOSED RIPRAP APRON

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

WIRE ENCLOSED RIPRAP DETAILS AT PIPE OUTLET

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: D12	

25015 ANDREW JOHN SPEAR — Registered Professional Engineer — CERTIFICATE NO. — State of Arizona

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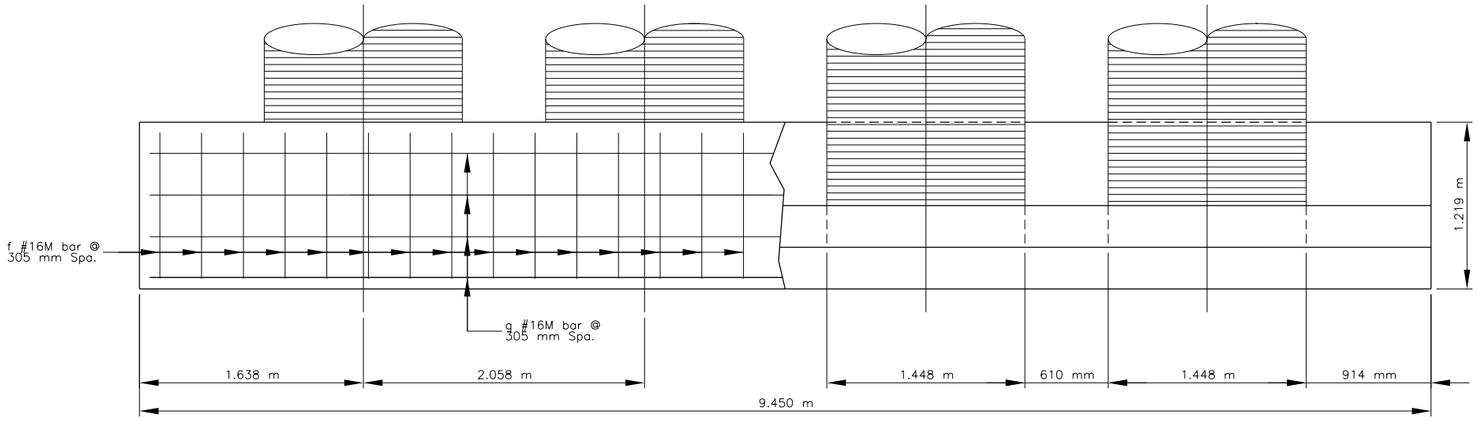
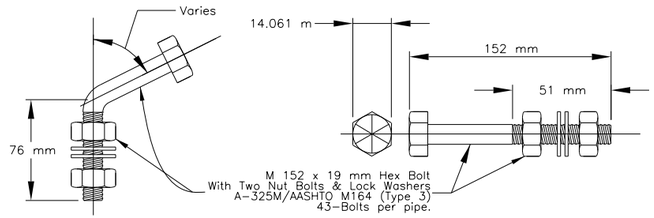
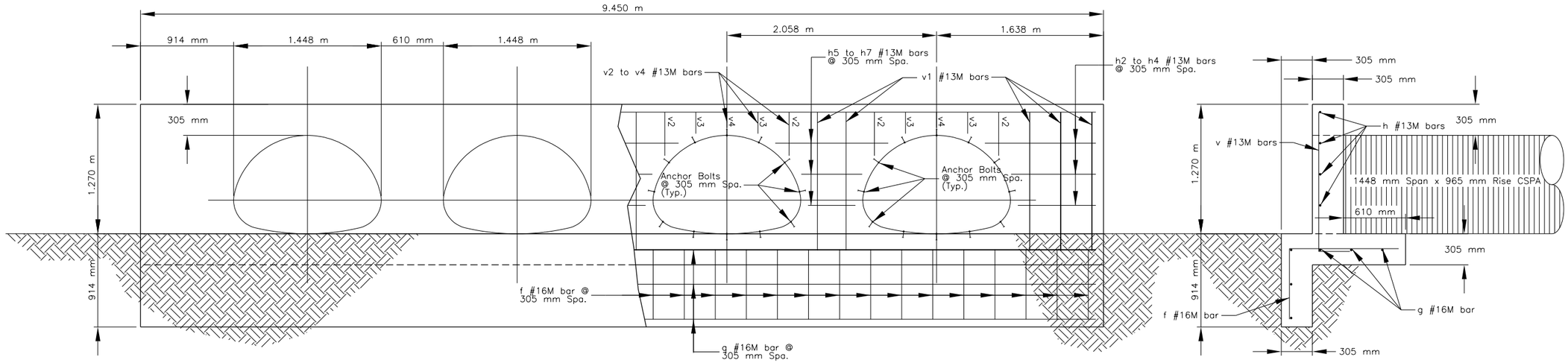
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	39	66



PLAN VIEW – INLET & OUTLET



BENT AND STRAIGHT ANCHOR BOLT DETAIL
(nts)



ELEVATION VIEW – INLET & OUTLET

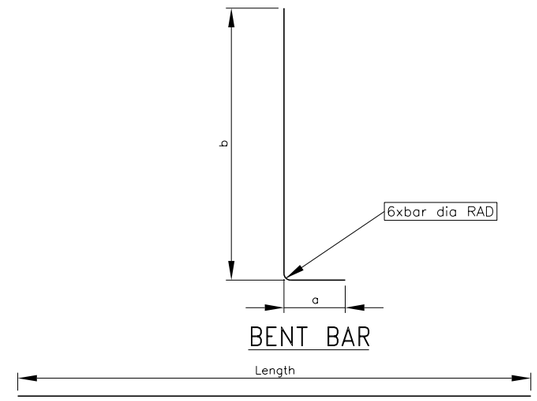
SIDE VIEW

BID ITEM: 60101-1000 MINOR CONCRETE A(AE)

Station	Structure	Location	Volume (cu/m)
28+913.00	4-1448 mm S x 965 mm R x 54.255 m CSPA	Inlet	7.595
		Outlet	7.595
		Total	15.190

GRADE 60 REINFORCING BAR SCHEDULE FOR HEADWALL

MARK	No.	SIZE	TYPE	LENGTH Each (m)	kg/m	TOTAL Wt. (kg)	REMARK
v1	12	#13M	2	1.665	0.994	19.860	Vertical bent bars in Headwall
v2	8	#13M	1	0.428	0.994	3.403	Vertical Straight bars in Headwall
v3	8	#13M	2	0.212	0.994	1.686	Vertical Straight bars in Headwall
v4	4	#13M	2	0.153	0.994	0.608	Vertical Straight bars in Headwall
h1	1	#13M	1	9.298	0.994	9.242	Horizontal straight bars in Headwall
h2	2	#13M	1	1.088	0.994	2.163	Horizontal straight bars in Headwall
h3	2	#13M	1	0.831	0.994	1.652	Horizontal straight bars in Headwall
h4	2	#13M	1	0.765	0.994	1.521	Horizontal straight bars in Headwall
h5	3	#13M	1	1.110	0.994	3.310	Horizontal straight bars in Headwall
h6	3	#13M	1	0.597	0.994	1.780	Horizontal straight bars in Headwall
h7	3	#13M	1	0.465	0.994	1.387	Horizontal straight bars in Headwall
g	6	#16M	1	9.298	1.552	86.583	Longitudinal straight bars in Footing
f	31	#16M	1	1.750	1.552	84.196	Lateral bent bars in Footing
					Sub-Total	217.392	For Each Headwall
					Grand Total	434.783	For Both Headwall



BENT BAR

STRAIGHT BARS
(nts)

NAVAJO D.O.T.

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

CONCRETE HEADWALL DETAIL FOR REINFORCED CONCRETE PIPE ARCH

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: D13	

Registered Professional Engineer CERTIFICATE NO. 25015 ANDREW JOHN SPEAR Date Signed 5/16/22 ARIZONA U.S.A.

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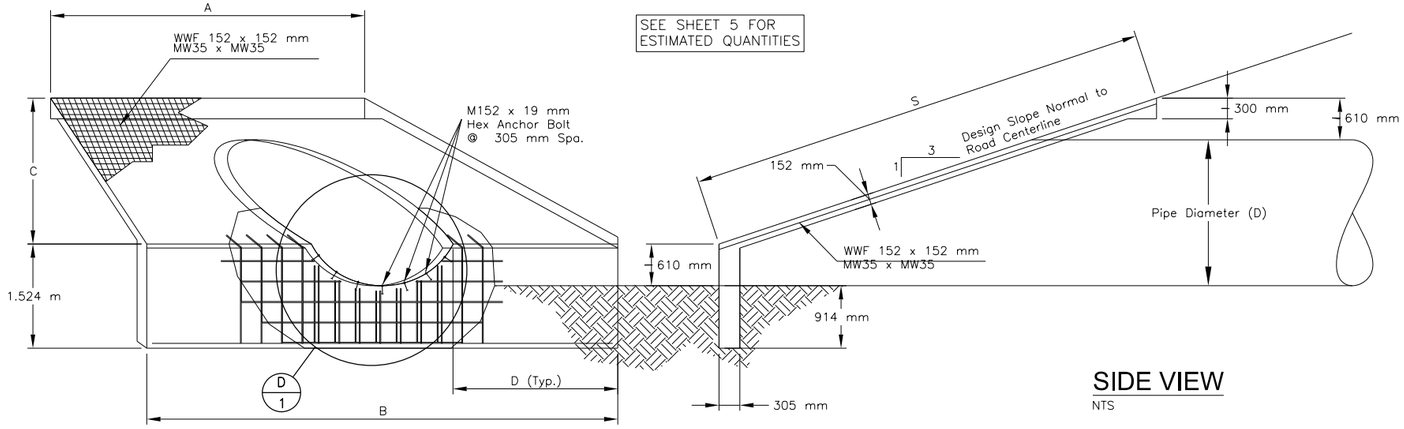
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	40	66



SEE SHEET 5 FOR ESTIMATED QUANTITIES

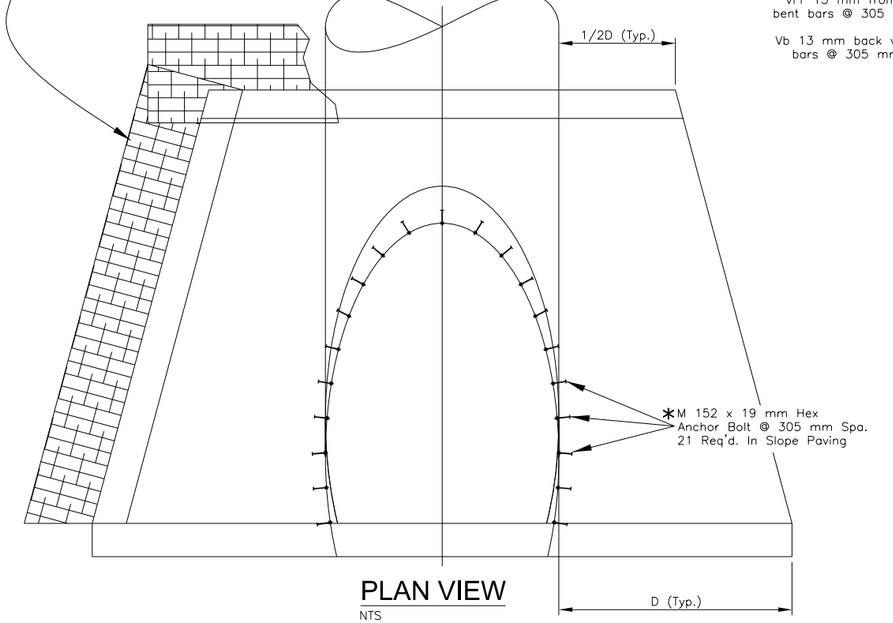
FRONT ELEVATION
NTS

SIDE VIEW
NTS

GENERAL NOTES

1. ALL WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS (FP-14).
2. ALL CONCRETE SHALL BE CLASS A(AE) WITH CLASS 1 FINISH. CHAMFER ALL EXPOSED EDGES 19 mm. THE CONCRETE SHALL CONFORM TO SECTION 552 "STRUCTURAL CONCRETE" OF FP-14. F'c = 20.68 MPa.
3. REINFORCING STEEL SHALL CONFORM TO AASHTO SPECIFICATION M-31 (ASTM A 615M), GRADE 420, AND SECTION 554 OF FP-14. FURNISHING AND PLACEMENT OF REBARS, ANCHOR BOLT, AND WELDED WIRE FABRIC SHALL BE CONSIDERED INCIDENTAL TO CONTRACT BID ITEM 60101-0000.
4. ALL STRUCTURE EXCAVATION AND EMBANKMENT AROUND THE CONCRETE BLANKET SHALL BE DONE TO NEAT LINES AND WILL BE CONSIDERED INCIDENTAL TO COMPLETION OF THE STRUCTURE.
5. THE CONTRACTOR SHALL BE REQUIRED TO MAKE ANY NECESSARY FIELD ADJUSTMENTS TO FIT EXISTING FIELD CONDITIONS, AS DIRECTED BY THE COR/COTR. NO ADDITIONAL PAYMENT SHALL BE MADE FOR SUCH ADJUSTMENTS.
6. IF UNSUITABLE MATERIAL IS FOUND AT THE FOOTING LOCATION AND ELEVATIONS, THE MATERIAL SHALL BE REMOVED AND REPLACED WITH APPROVED UNCLASSIFIED BACKFILL AS DETERMINED BY THE COR/COTR. ALL UNCLASSIFIED BACKFILL SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY AS DETERMINED BY AASHTO T99 METHOD C, BEFORE AND AFTER FOOTINGS ARE PLACED. THE UNCLASSIFIED BACKFILL MATERIAL SHALL CONFORM TO SECTION 208 AND 209 OF FP-14. FURNISHING AND PLACEMENT OF UNCLASSIFIED BACKFILL SHALL BE ACCORDANCE WITH SECTION 109.02(s).
7. ALL FOOTING EXCAVATIONS SHALL BE INSPECTED AND APPROVED BY THE COR/COTR PRIOR TO PLACEMENT OF FORMS, REINFORCING STEEL AND SUBSEQUENT CONCRETE.
8. CHANNEL RESHAPING, CLEANING, AND EXCAVATION SHALL BE DONE IN ACCORDANCE WITH THE PLANS AND AS DETERMINED BY THE COR/COTR. ANY WASTE MATERIAL SHALL BE USED AS BORROW WHERE NEEDED IN OTHER PROJECT LOCATIONS AS DESIGNATED AND APPROVED BY THE COR/COTR. ALL CHANNEL EXCAVATION, CLEANING AND RESHAPING SHALL BE CONSIDERED INCIDENTAL TO COMPLETION OF THE STRUCTURE.
9. IN NO CASE SHALL ANY BACKFILL BE PLACED UNTIL THE CONCRETE HAS ATTAINED A COMPRESSIVE STRENGTH OF 17.24 MPa.
10. TABULATED CONCRETE, WELDED WIRE FABRIC, AND REINFORCING STEEL ESTIMATED QUANTITIES ARE FOR ONE (1) SIDED BLANKET AT A GIVEN STATION AND SIZE OF STRUCTURE(S).
11. WHERE THE CONCRETE BLANKET CANNOT BE INSTALLED DUE TO SHALLOW DEPTH OF COVER OVER THE PIPE(S), AND/OR THE PARAPET HEIGHT IS ABOVE THE AGGREGATE BASE HINGE POINT, THE CONTRACTOR SHALL BE REQUIRED TO ADJUST THE PARAPET WALL HEIGHT TO 305 mm, AND INSTALL ADDITIONAL TWO (2) - #13M REBAR ON THE TOP WALL ACROSS THE ENTIRE LENGTH OF STRUCTURE. THIS WORK WILL BE CONSIDERED INCIDENTAL TO COMPLETION OF THE STRUCTURE.
12. EROSION CONTROL MATTING SHALL CONFORM TO SECTION 629 AND 713.17(k) OF THE FP-14 FOR TYPE IV-B MATERIAL, AND SHALL BE INCIDENTAL TO THE UNIT PRICE FOR ITEM 60101-0000. MATS SHALL BE TUCKED OR EMBEDDED INTO EMBANKMENT ALONG ALL EDGES AS SHOWN. SEE SHEET OF FOR EROSION CONTROL MAT INSTALLATION DETAILS.

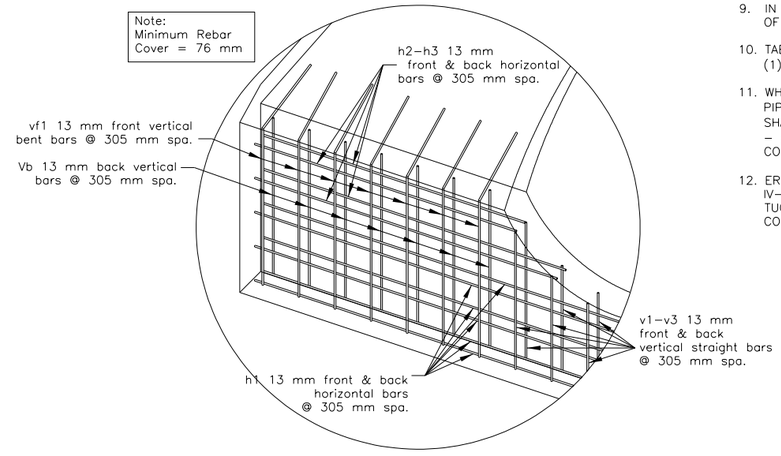
At All Edges Of The Concrete Blankets, A 900 mm Strip Of Type IV Matting Shall Be Laid So That 300 mm Is Under The Blanket Edges. After The Concrete Is Set, The Remaining Material Shall Be Folded Around The Edge Of The Concrete, The Edge Backfilled And The Matting Unfolded On Top Of The Finished Surface. The Main Matting Installation Shall Overlap The Exposed Portion Of The 900 mm Wide Strip.



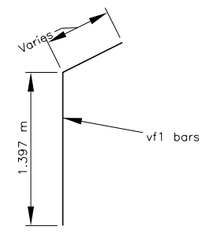
PLAN VIEW
NTS

*NOTE: Anchor Bolts Shall Be Bent/Fabricated As Needed to Align With The Concrete Slope Blanket Prior To Bolting To The Culvert. The Culvert Wall Shall Not Be Deformed/Bent To Align Bolts

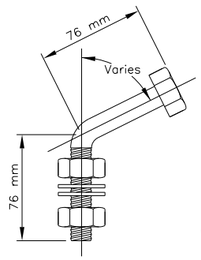
Note:
Minimum Rebar
Cover = 76 mm

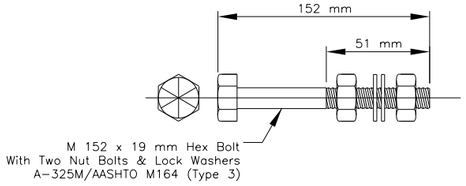


DETAIL D/1
NTS



BENT BAR DETAIL
NTS





BENT AND STRAIGHT ANCHOR BOLT DETAIL

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

SINGLE BARREL PIPE CONCRETE SLOPE BLANKET DETAILS

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: D14	

Registered Professional Engineer (Civil) CERTIFICATE NO. 25015 ANDREW JOHN SPEAR Date Signed 5/16/22 ARIZONA U.S.A.

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ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	41	66

ITEM 60101-1000: MINOR CONCRETE CLASS A(AE)*
CONCRETE SLOPE BLANKET LOCATIONS

LOCATION	PIPE DIAMETER D (mm)	NUMBER OF PIPES	SKEW NO.	A (m)	B (m)	C (m)	S (m)	VOLUME OF CONCRETE	WEIGHT OF REINFORCING BARS (kg)	WEIGHT OF WWF @ 2 kg/m2 (KG)	AREA OF ROLLED EROSION CONTROL PRODUCT, TYPE 4 (m2)
N35											
25+350.000 (Inlet)	2134	1	82	1:3.3	4.709	7.064	2.134	7.877	133.43	56.636	19.334
25+350.000 (Outlet)	2134	1	82	1:3.3	4.709	7.064	2.134	7.877	133.43	56.636	19.334
25+794.000 (Inlet)	2134	1	57	1:3.3	4.709	7.064	2.134	7.877	133.43	56.636	19.334
25+794.000 (Outlet)	2134	1	57	1:3.3	4.709	7.064	2.134	7.877	133.43	56.636	19.334
27+180.000 (Inlet)	2134	1	95	1:3.3	4.709	7.064	2.134	7.877	133.43	56.636	19.334
27+180.000 (Outlet)	2134	1	95	1:3.3	4.709	7.064	2.134	7.877	133.43	56.636	19.334
							TOTAL:	47.262	800.58	339.816	116.004

See DWG D14 for Details

REBAR SCHEDULE
CONCRETE SLOPE BLANKET LOCATIONS

STATION	MARK	NO. OF BARS	LENGTH EACH (m)	SIZE	kg/m	TOTAL WT. (kg)	REMARKS
N35							
25+350.000 (Inlet)	h1	6	6.912	13 mm	0.994	41.22	Front & Back Horizontal Straight Bars
	h2	4	2.487	13 mm	0.994	9.89	Front & Back Horizontal Straight Bars
	h3	4	2.856	13 mm	0.994	11.36	Front & Back Horizontal Straight Bars
	vf1	18	2.007	13 mm	0.994	35.91	Front Vertical Bent Bars
	v1	4	0.771	13 mm	0.994	3.07	Front & Back Vertical Straight Bars
	v2	4	0.848	13 mm	0.994	3.37	Front & Back Vertical Straight Bars
	v3	4	1.021	13 mm	0.994	4.06	Front & Back Vertical Straight Bars
	vb	18	1.372	13 mm	0.994	24.55	Back Vertical Straight Bars
SUBTOTAL						133.43	
25+350.000 (Outlet)	h1	6	6.912	13 mm	0.994	41.22	Front & Back Horizontal Straight Bars
	h2	4	2.487	13 mm	0.994	9.89	Front & Back Horizontal Straight Bars
	h3	4	2.856	13 mm	0.994	11.36	Front & Back Horizontal Straight Bars
	vf1	18	2.007	13 mm	0.994	35.91	Front Vertical Bent Bars
	v1	4	0.771	13 mm	0.994	3.07	Front & Back Vertical Straight Bars
	v2	4	0.848	13 mm	0.994	3.37	Front & Back Vertical Straight Bars
	v3	4	1.021	13 mm	0.994	4.06	Front & Back Vertical Straight Bars
	vb	18	1.372	13 mm	0.994	24.55	Back Vertical Straight Bars
SUBTOTAL						133.43	
25+794.000 (Inlet)	h1	6	6.912	13 mm	0.994	41.22	Front & Back Horizontal Straight Bars
	h2	4	2.487	13 mm	0.994	9.89	Front & Back Horizontal Straight Bars
	h3	4	2.856	13 mm	0.994	11.36	Front & Back Horizontal Straight Bars
	vf1	18	2.007	13 mm	0.994	35.91	Front Vertical Bent Bars
	v1	4	0.771	13 mm	0.994	3.07	Front & Back Vertical Straight Bars
	v2	4	0.848	13 mm	0.994	3.37	Front & Back Vertical Straight Bars
	v3	4	1.021	13 mm	0.994	4.06	Front & Back Vertical Straight Bars
	vb	18	1.372	13 mm	0.994	24.55	Back Vertical Straight Bars
SUBTOTAL						133.43	
25+794.000 (Outlet)	h1	6	6.912	13 mm	0.994	41.22	Front & Back Horizontal Straight Bars
	h2	4	2.487	13 mm	0.994	9.89	Front & Back Horizontal Straight Bars
	h3	4	2.856	13 mm	0.994	11.36	Front & Back Horizontal Straight Bars
	vf1	18	2.007	13 mm	0.994	35.91	Front Vertical Bent Bars
	v1	4	0.771	13 mm	0.994	3.07	Front & Back Vertical Straight Bars
	v2	4	0.848	13 mm	0.994	3.37	Front & Back Vertical Straight Bars
	v3	4	1.021	13 mm	0.994	4.06	Front & Back Vertical Straight Bars
	vb	18	1.372	13 mm	0.994	24.55	Back Vertical Straight Bars
SUBTOTAL						133.43	
27+180.000 (Inlet)	h1	6	6.912	13 mm	0.994	41.22	Front & Back Horizontal Straight Bars
	h2	4	2.487	13 mm	0.994	9.89	Front & Back Horizontal Straight Bars
	h3	4	2.856	13 mm	0.994	11.36	Front & Back Horizontal Straight Bars
	vf1	18	2.007	13 mm	0.994	35.91	Front Vertical Bent Bars
	v1	4	0.771	13 mm	0.994	3.07	Front & Back Vertical Straight Bars
	v2	4	0.848	13 mm	0.994	3.37	Front & Back Vertical Straight Bars
	v3	4	1.021	13 mm	0.994	4.06	Front & Back Vertical Straight Bars
	vb	18	1.372	13 mm	0.994	24.55	Back Vertical Straight Bars
SUBTOTAL						133.43	
27+180.000 (Outlet)	h1	6	6.912	13 mm	0.994	41.22	Front & Back Horizontal Straight Bars
	h2	4	2.487	13 mm	0.994	9.89	Front & Back Horizontal Straight Bars
	h3	4	2.856	13 mm	0.994	11.36	Front & Back Horizontal Straight Bars
	vf1	18	2.007	13 mm	0.994	35.91	Front Vertical Bent Bars
	v1	4	0.771	13 mm	0.994	3.07	Front & Back Vertical Straight Bars
	v2	4	0.848	13 mm	0.994	3.37	Front & Back Vertical Straight Bars
	v3	4	1.021	13 mm	0.994	4.06	Front & Back Vertical Straight Bars
	vb	18	1.372	13 mm	0.994	24.55	Back Vertical Straight Bars
SUBTOTAL						133.43	

NAVAJO D.O.T.

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

SLOPE BLANKET QUANTITIES

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: D14B	

Registered Professional Engineer — CERTIFICATE NO. 25015 — ANDREW JOHN SPEAR — Date Signed 5/16/22 — ARIZONA U.S.A.

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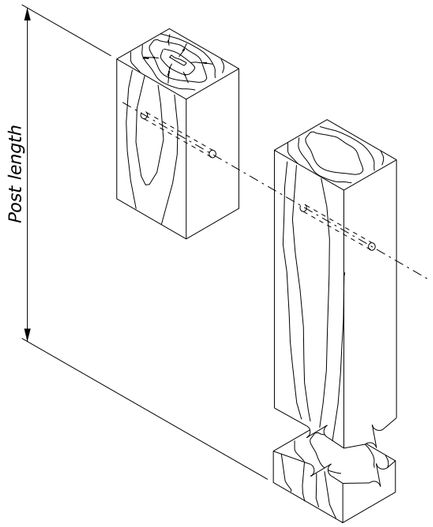
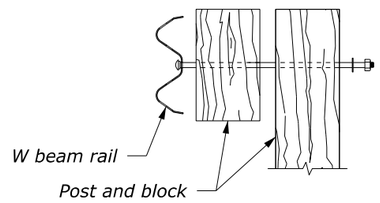
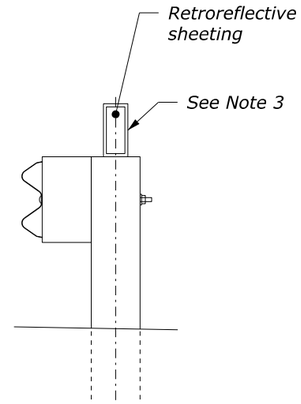
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	42	66



POST AND BLOCK



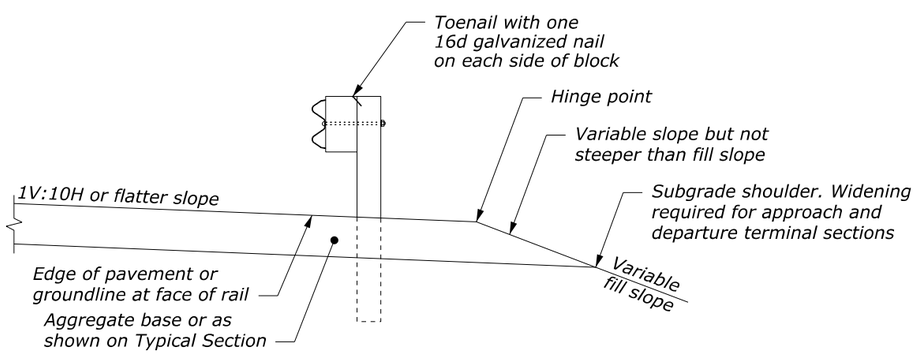
POST BOLT ASSEMBLY



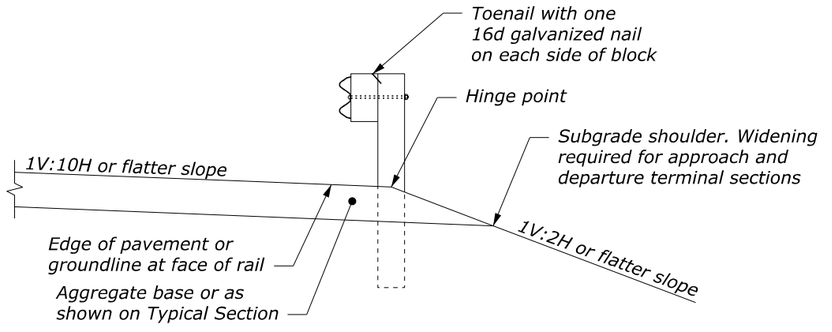
FLEXIBLE DELINEATOR GUARDRAIL MOUNT

NOTE:

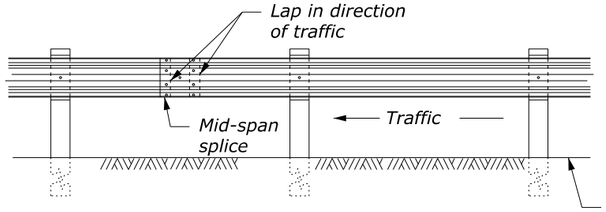
1. When encountering impenetrable material, one post may be omitted in locations where the typical guardrail cross section and the hinge point. For all other locations, see Section 617 and Details C617-13 or C617-37.
2. Size of block shown elsewhere on the plans. Use a single block or combination of blocks (no more than two) to achieve the with anti-rotation nails. If combination blocks are used, toenail the adjacent blocks with two 16d galvanized nails to prevent block rotation.
3. Install a flexible hinged delineator every fourth post. Fasten delineator to the top of the wood post using either an adhesive or mechanical means according to the manufacturer's recommendations. Match the color of the reflective element with the edge line. Other types of delineators may be used as approved by the CO.
4. In erodible or uncompacted soils, increase post length to 7'-6".
5. 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.



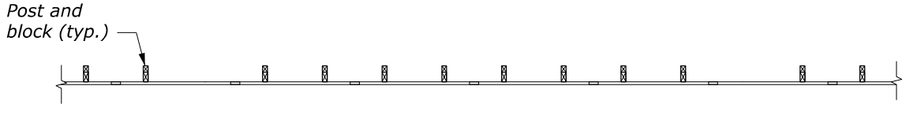
TYPICAL GUARDRAIL CROSS SECTION



TYPICAL GUARDRAIL CROSS SECTION



TYPICAL GUARDRAIL ELEVATION



PLAN VIEW

OMITTED POST DETAIL

See Note 1

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

MGS W-BEAM GUARDRAIL, WOOD POSTS

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: D15	

Registered Professional Engineer (Civil) CERTIFICATE NO. 25015 ANDREW JOHN SPEAR Date Signed 5/16/22 ARIZONA U.S.A.

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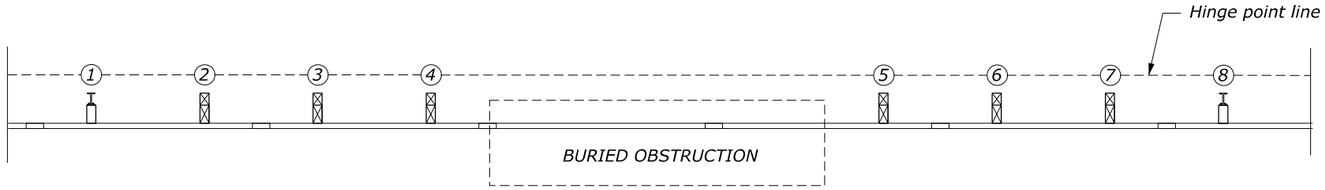
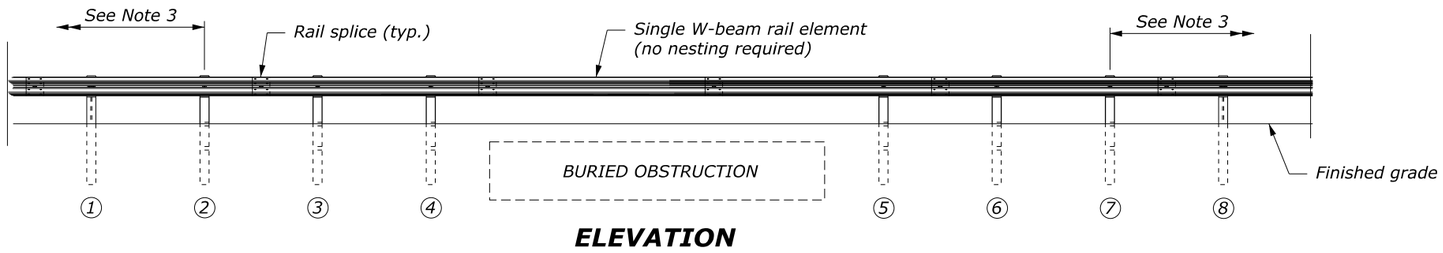
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	43	66



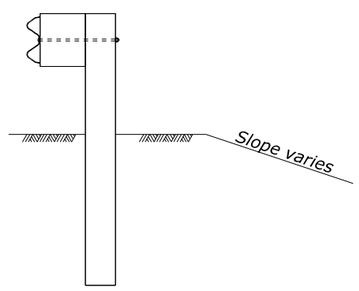
PLAN



ELEVATION

NOTE:

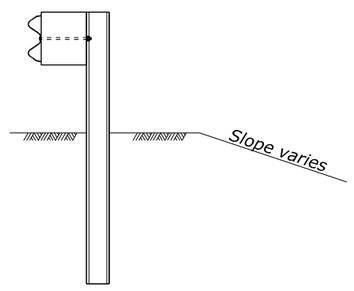
1. Posts ① and ⑧ may be wood or steel.
2. Use wood posts for CRT posts.
3. The minimum length of guardrail, including the end terminals, upstream and downstream of posts ② and ⑦ is
4. In locations where the culvert headwall extends above the finished grade to act as a vertical roadway curb, the maximum height of the culvert headwall above the
5. See Details C617-31 or C617-32 for other assembly details.



WOOD POST DETAIL

POST ① AND ⑧

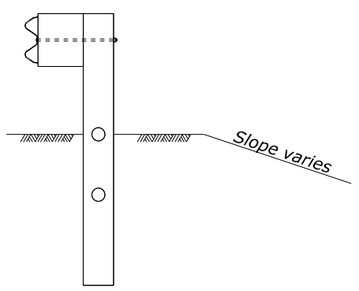
See Note 1



STEEL POST DETAIL

POST ① AND ⑧

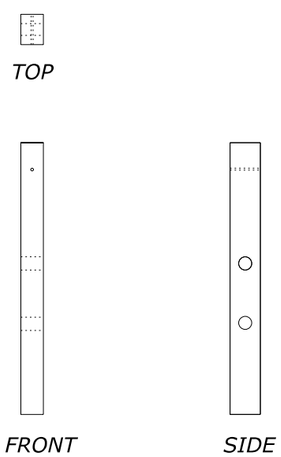
See Note 1



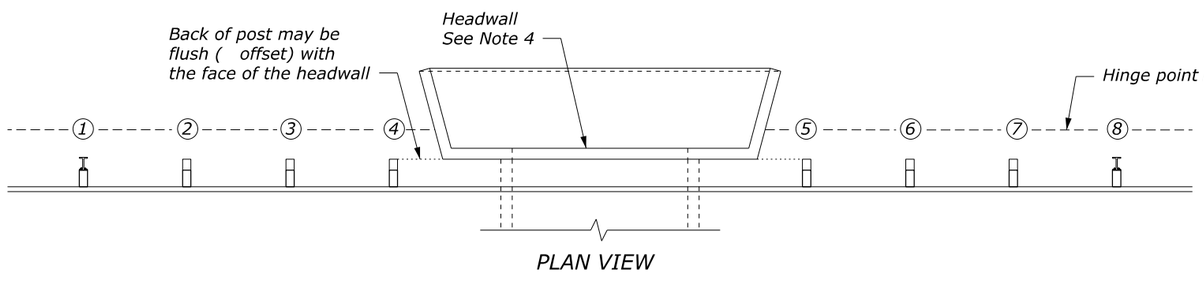
CRT POST DETAIL

POST ② THRU ⑦

See Note 2



CRT WOOD POST



PLAN VIEW

SPAN WITH HEADWALL DETAIL

NO SCALE

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

MGS W-BEAM GUARDRAIL
LONG-SPAN SYSTEM

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: D15B	

Registered Professional Engineer
CERTIFICATE NO.
25015
ANDREW JOHN SPEAR
State of Arizona

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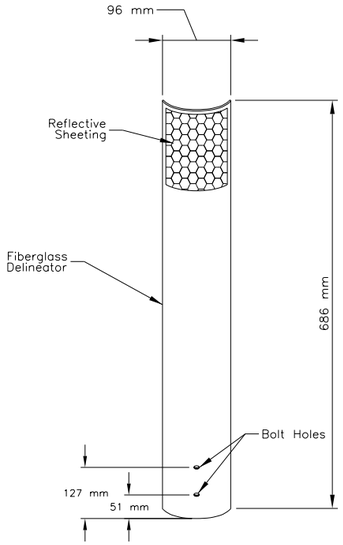
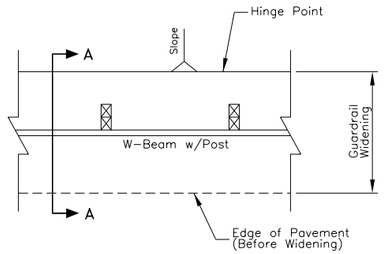
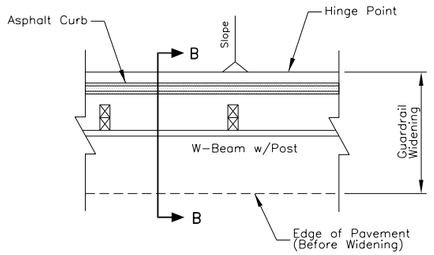
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	44	66



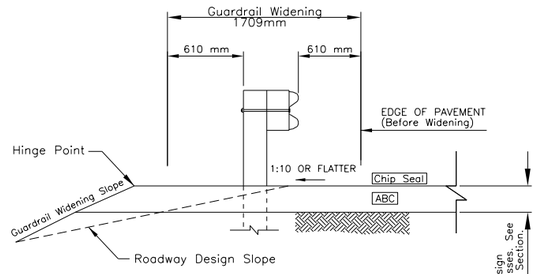
DELINEATOR DETAIL BRIDGE LOCATIONS
(Reflective Sheeting Shall Face Traffic)



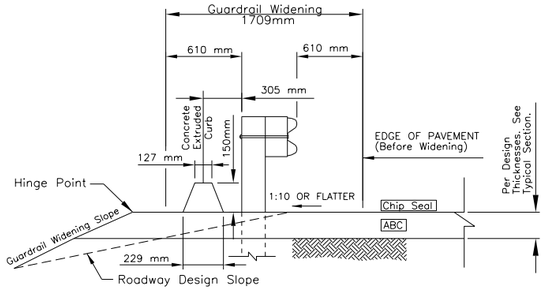
PLAN VIEW
w/NO CURBING



PLAN VIEW
w/CURBING



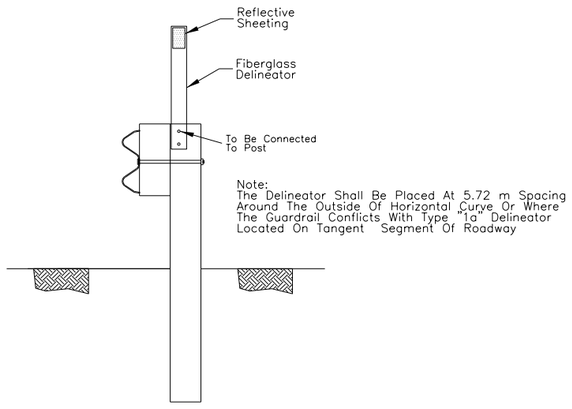
SECTION A-A
w/No Curbing



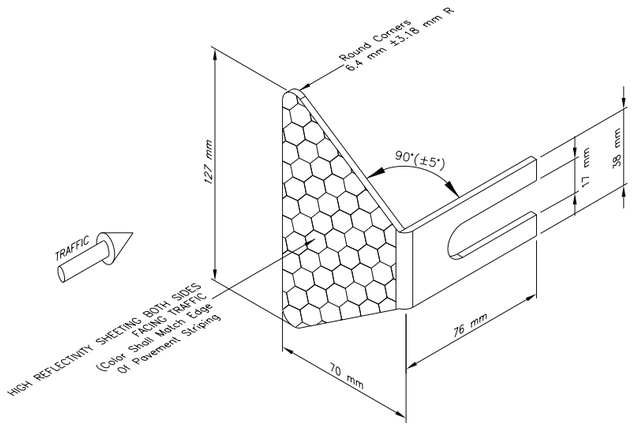
SECTION B-B
w/CURBING
Asphalt Curb Depth=102 mm

GENERAL NOTES

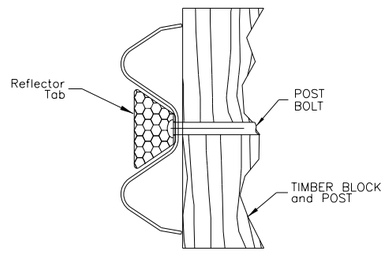
1. ALL GUARDRAIL "W" BEAMS, SHALL BE GALVANIZED IN ACCORDANCE WITH (AASHTO M-180, CLASS A, TYPE 1) SPECIFICATION. ALL HARDWARE SHALL CONFORM TO (ASTM A-325) AND GALVANIZED IN ACCORDANCE WITH (ASTM A-153).
2. ALL STRUCTURAL STEEL ITEMS SHOWN SHALL CONFORM TO (AASHTO N183/ASTM A36) AND BE GALVANIZED IN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



ELEVATION
GUARDRAIL/POST MOUNTED
DELINEATOR (TYP.)



ISOMETRIC VIEW
REFLECTOR TAB DETAIL



SECTION
REFLECTOR TAB
MOUNTING DETAIL
Install Tab on Every Fourth Post

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

SGR04 STANDARD GUARDRAIL CURBING AND REFLECTOR TAB DETAIL

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: D16	

Registered Professional Engineer CERTIFICATE NO. 25015 ANDREW JOHN SPEAR ARIZONA U.S.A.

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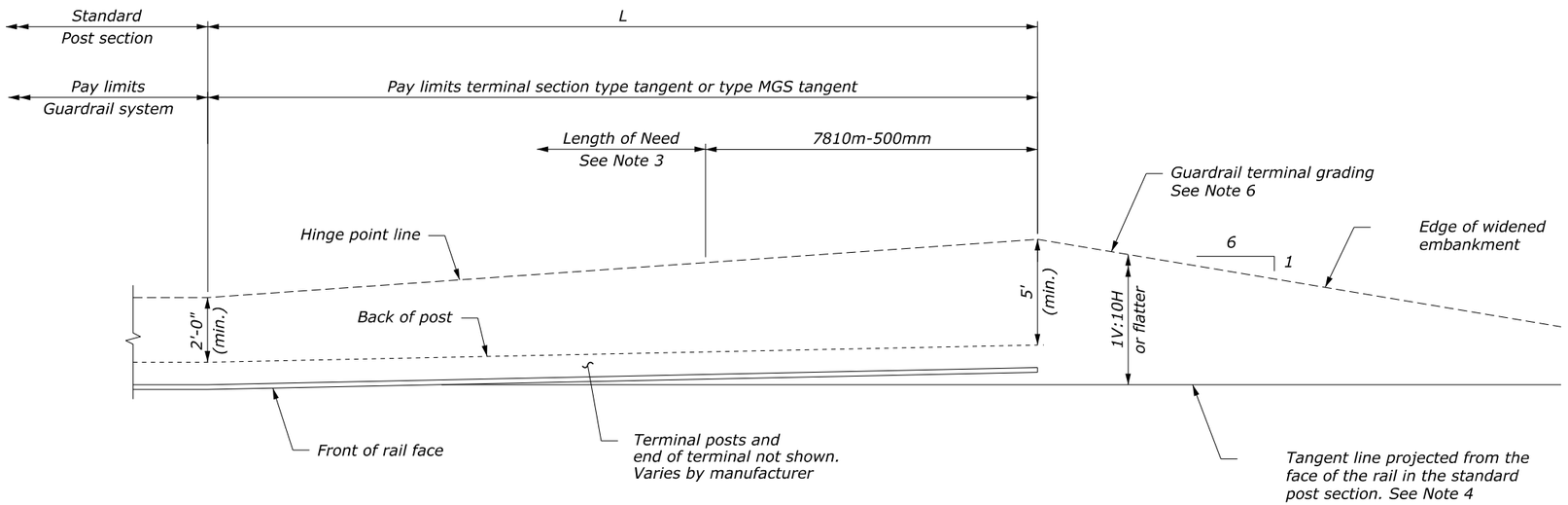
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	45	66



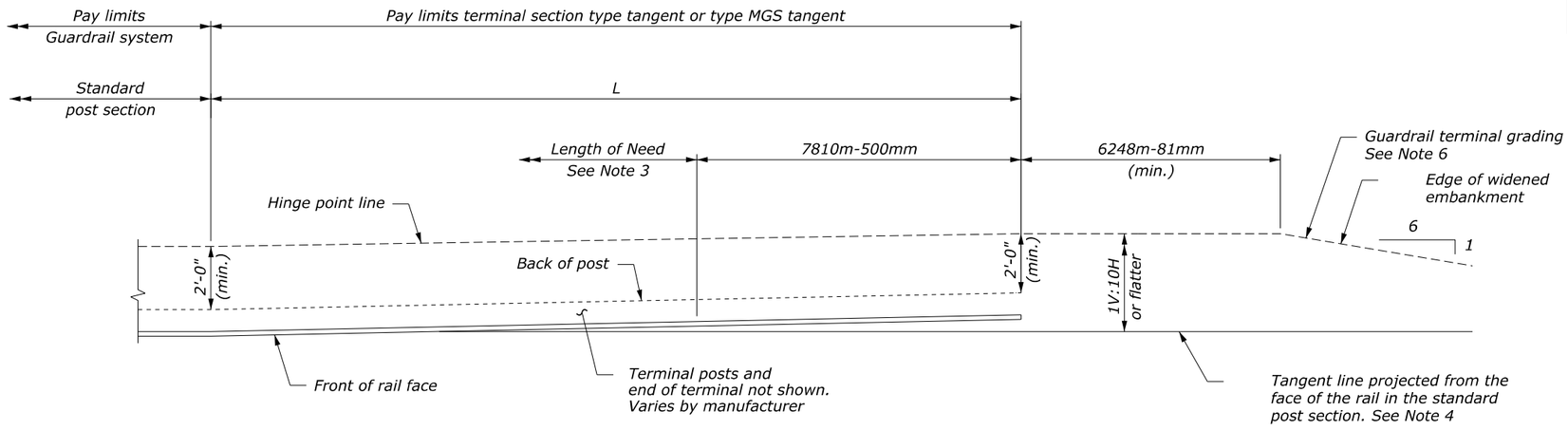
PLAN

PREFERRED GRADING

NOTE:

1. *Install tangent terminal according to the manufacturer's recommendations. See manufacturer's drawings for other details.*
2. *Construct the terminal grading layout as shown in the staking notes or model. If no staking notes or model are provided, use the preferred grading layout as much as practical within site constraints. If necessary because of site limitations, use the alternative grading layout.*
3. *For design purposes, the length of need is assumed to begin at post 3. Verify the length of need with the manufacturer for a specific product. Adjust grading as necessary to install the tangent terminal according to the manufacturer's recommendations.*
4. *Install terminal at a 1:25 taper or flatter, to position the end farther away from the edge of the shoulder, or use a taper according to manufacturer's recommendations.*
5. *Install a reflectorized object marker on the end of the terminal.*
6. *Construct a 1V:4H slope outside of the guardrail terminal grading extents where practical.*

TEST LEVEL	L (FT)
2 (≤ 45 mph)	25
3 (> 45 mph)	37.5 or 50 (for G4)
	50 (for MGS)



PLAN

ALTERNATIVE GRADING

NO SCALE

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

MGS AND G4 W-BEAM GUARDRAIL TYPE TANGENT TERMINAL AND GRADING

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: D17	

Registered Professional Engineer
CERTIFICATE NO. 25015
ANDREW JOHN SPEAR
State of Arizona

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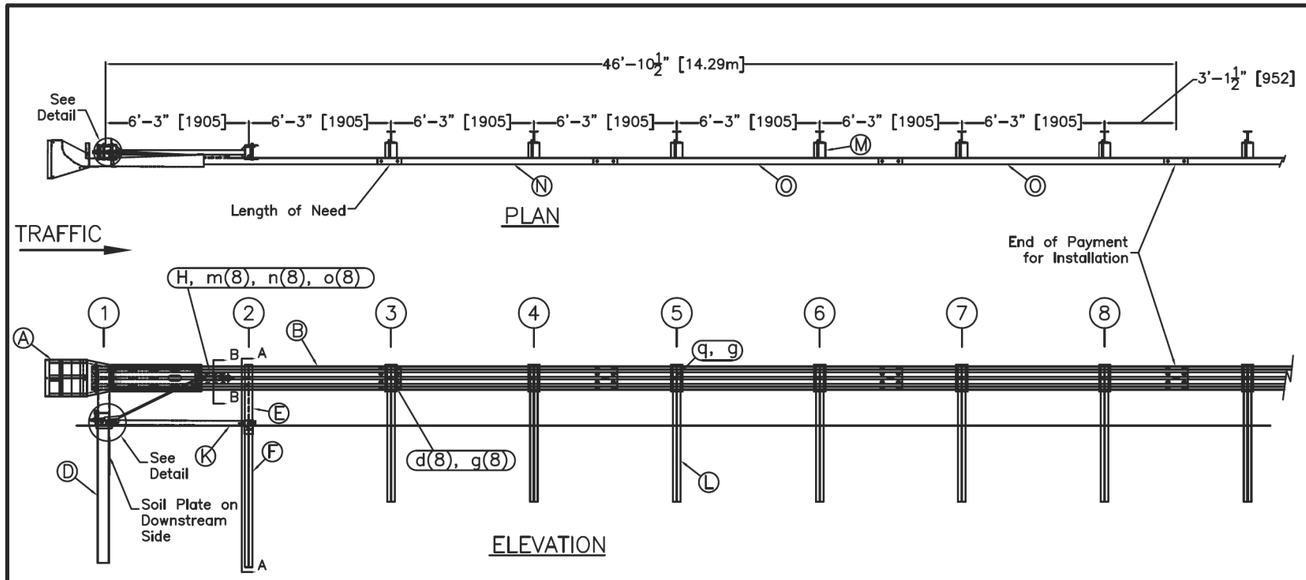
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	46	66



ITEM	QTY	BILL OF MATERIALS	ITEM NO.
A	1	IMPACT HEAD	MS3000
B	1	W–BEAM GUARDRAIL END SECTION, 12 Ga.	SF1303
C	1	FIRST POST TOP (6X6X⅛" Tube)	MTPHP1A
D	1	FIRST POST BOTTOM (6' W6X15)	MTPHP1B
E	1	SECOND POST ASSEMBLY TOP	UHP2A
F	1	SECOND POST ASSEMBLY BOTTOM	HP2B
G	1	BEARING PLATE	E750
H	1	CABLE ANCHOR BOX	S760
J	1	BCT CABLE ANCHOR ASSEMBLY	E770
K	1	STRUT	MS785
L	6	6x9 (6x8.5) STEEL POST	P621
M	6	RECYCLED PLASTIC BLOCK OR EQUIV.	CBSP–14
N	1	W–BEAM MGS RAIL SECTION (9'–4 1/2")	G12025
O	2	W–BEAM MGS RAIL SECTION (12'–6")	G1203A
		HARDWARE (ALL DIMENSIONS IN INCHES)	
a	2	5/16 x 1 HEX BOLT GRD 5	B5160104A
b	4	5/16 WASHER	W0516
c	2	5/16 HEX NUT	N0516
d	25	5/8 Dia. x 1 1/4 SPLICE BOLT (POST #2)	B580122
e	2	5/8 Dia. x 9 HEX BOLT A449	B580904A
f	3	5/8 WASHER	W050
g	33	5/8 Dia. H.G.R NUT	N050
h	1	3/4 Dia. x 8 1/2 HEX BOLT GRD A449	B340854A
j	1	3/4 Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	1/2 RSI SHOULDER BOLT W/WASHER	SB12A
n	8	1/2 STRUCTURAL NUT	N012A
o	8	1/2 STRUCTURAL WASHER	W012A
p	1	BEARING PLATE RETAINER TIE	CT–100ST
q	6	5/8" x 10" H.G.R. BOLT	B581002

GENERAL NOTES:

1. All bolts, nuts, cable assemblies, cable anchors and bearing plates shall be galvanized.
2. The lower sections of the Posts 1&2 shall not protrude more than 4 in [100] above the ground (measured along a 5' [1.5m] cord longitudinal to the system). Site grading may be necessary to meet this requirement.
3. The lower section of the hinged post should not be driven with the upper post attached. If the post is placed in a drilled hole, the backfill material must be satisfactorily compacted to prevent settlement.
4. When competent rock is encountered, a 12" [300] Ø post hole, 20 in. [500] deep cored into the rock surface may be used if approved by the engineer for Posts 1 and/or 2. Granular material will be placed in the bottom of the hole, approximately 2.5" [60] deep to provide drainage. The first and/or second post can be field cut to length, placed in the hole and backfilled with suitable backfill. The soil plate may be trimmed if required.
5. The breakaway cable assembly must be taut. A locking device (vice grips or channel lock pliers) should be used to prevent the cable from twisting when tightening nuts.

RSI
Road Systems, Inc.
Big Spring, TX
Phone: 432–263–2435
or Phone: 330–346–0721

MSKT-SP-MGS
Terminal (8" Blocks)
Test Level 3

Drawing Name: MSKT-SP-MGS8
Scale: None
Sheet: 1
Date: 05/20/17
By: JRR
Rev: 0

NAVAJO D.O.T.

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

MSKT–SP–MGS TERMINAL
(8" BLOCKS) TEST LEVEL 3

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: D18	

Registered Professional Engineer (Civil) CERTIFICATE NO. 25015 ANDREW JOHN SPEAR Date Signed 5/16/22 ARIZONA U.S.A.

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ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	47	66

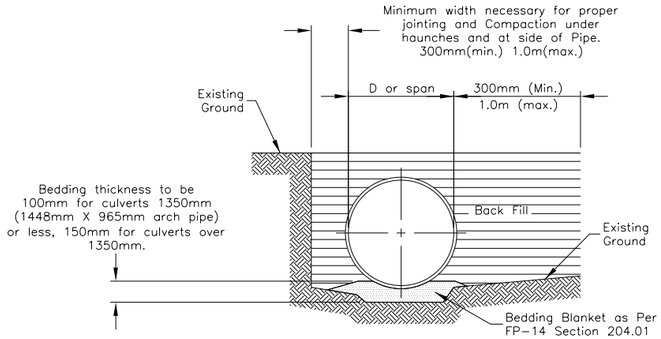


FIGURE A: BEDDING

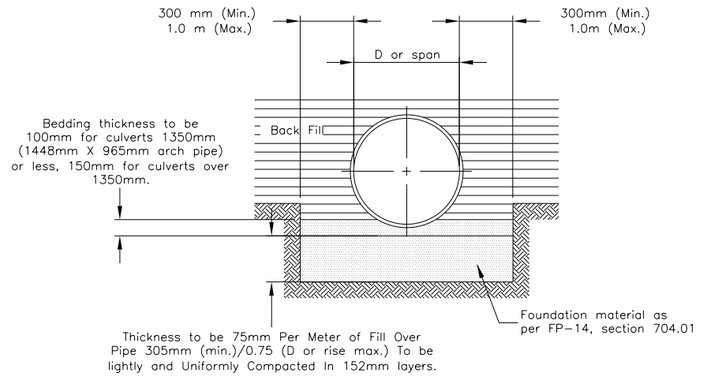


FIGURE B: ROCK BEDDING

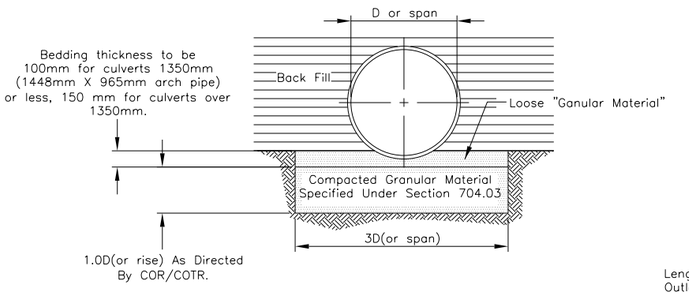
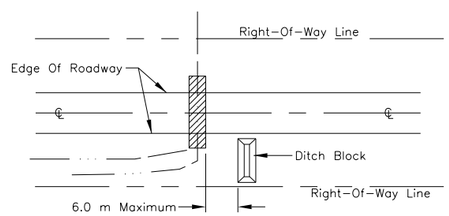


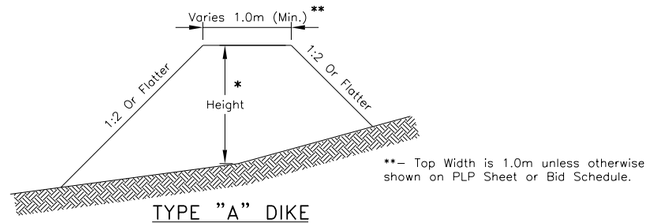
FIGURE C: FOUNDATION STABILIZATION BEDDING



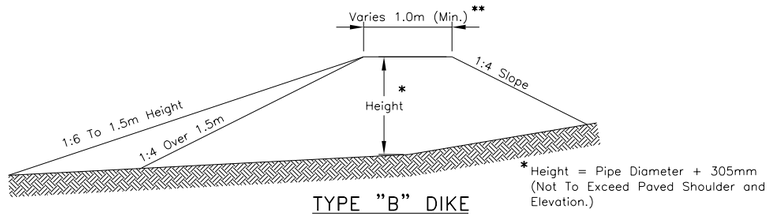
DITCH BLOCK INSTALLATION AT STRUCTURE

1. Ditch Blocks at Structures Shall Be Placed Such That The Water is Diverted Into Structure. The Elevation at Top of Ditch Block Shall Be 305mm Above Elevation of Top of Pipe Unless Otherwise Shown or Directed by the COR/COTR. SEE NOTE 14 THIS SHEET.

2. Ditch Block Shall Be Located A Distance Equal To The Largest Dimension of Box Culvert or Pipe from the Face of the Drainage Structure. In No Case Shall The Distance Exceed 3.0m.



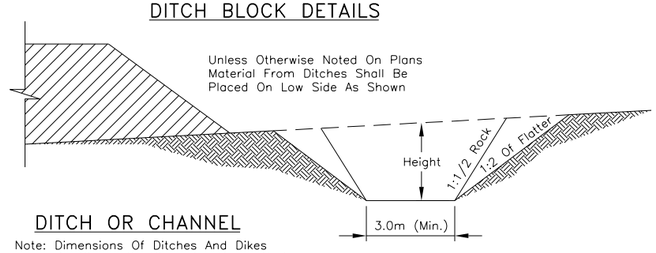
TYPE "A" DIKE



TYPE "B" DIKE

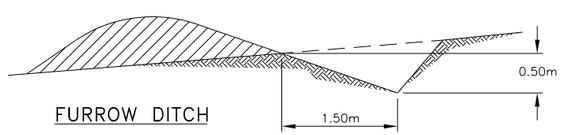
NOTE: When Necessary The Slope May Be Flattened To 1:6 With Rip Rap Protection As Called For On Plans.

DITCH BLOCK DETAILS



DITCH OR CHANNEL

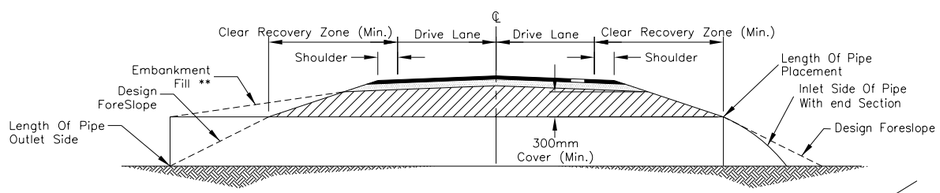
Note: Dimensions Of Ditches And Dikes As Shown On Plans Are Respectively Width Depth Or Height And Length.



FURROW DITCH

1. To Be Paid For By The Meter.

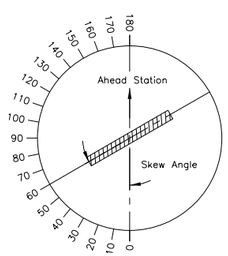
2. Furrow Ditch Sections As Shown Above Or And Approved Equivalent Shall Be Built As Directed By The COR/COTR UNDER BID ITEM 20410-2000.



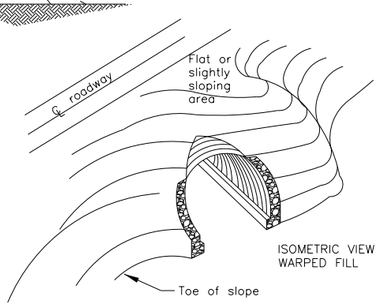
** Adjust Slopes To Catch At Top Of Pipe At Each Opening

TYPICAL PIPE INSTALLATION- MAINLINE SHOWN

Turnout/Driveway, use 2-End Sections



STRUCTURE SKEW DIAGRAM



PIPE SKEWS TO THE EMBANKMENT WARPING (TYP.)

1. The Contractor shall be required to built the warped embankment around the skewed drainage pipe(s). This work shall be incidental to the earthwork and installation of drainage pipe items shown.

1. PLACE LOOSE BEDDING ROUGHLY SHAPED TO BOTTOM OF PIPE, THEN COMPACTED UNDER HAUNCHES AFTER PIPE PLACEMENT.

2. SEE SECTIONS 204, 209, 602, AND 704 OF FP-14, INCLUDING THE SUPPLEMENTAL SPECIFICATION FOR ADDITIONAL NOTES.

3. ALL DRAINAGE STRUCTURE MATERIAL SHALL BE UNLOADED AND HANDLED WITH REASONABLE CARE. NO STRUCTURE SHALL BE DRAGGED OR ALLOWED TO STRIKE ANY HARD SURFACE DURING PLACEMENT. ANY DAMAGED STRUCTURE SHALL BE REPAIRED OR REPLACED, BY THE CONTRACTOR, AT NO ADDITIONAL COST TO THE GOVERNMENT.

4. ALL STRUCTURAL PLATE PIPE & BOX STRUCTURES SHALL BE ASSEMBLED AND INSTALLED IN ACCORDANCE WITH THE FABRICATOR'S RECOMMENDATIONS AND DETAILS ELSE WHERE ON THESE PLANS.

5. BACKFILL MATERIAL SHALL BE PLACED 305mm(min.) 1.0m(max) PIPE DIAMETER WIDTH ON THE SIDES AND 305mm OVER THE PIPE. BACKFILL MATERIAL BEYOND THESE LIMITS SHALL BE REGULAR EARTHWORK EMBANKMENT MATERIAL. THE BACKFILL MATERIAL SHALL BE APPROVED BY THE COR/COTR PRIOR TO IT'S USE AND SHALL BE PLACED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.

6. POUNDING OR JETTING PIPE BACKFILL SHALL NOT BE PERMITTED.

7. ALL PIPE EXCAVATION, BACKFILLING, DE-WATERING, PUMPING OR COFFERDAMS REQUIRED TO PROPERLY INSTALL THE DRAINAGE PIPE SHALL BE CONSIDERED INCIDENTAL TO COMPLETION OF THE PROJECT AND NO ADDITIONAL PAYMENT SHALL BE MADE.

8. MULTIPLE PIPE INSTALLATIONS SHALL BE PLACED 610mm MINIMUM BETWEEN END SECTIONS UNLESS OTHERWISE DIRECTED BY THE COR/COTR OR AS SHOWN ON THE PLANS.

9. ALL PIPES SHALL BE PROTECTED BY A COVER OF NOT LESS THAN 914mm OF EMBANKMENT ABOVE PIPE BEFORE AND HEAVY EQUIPMENT IS ALLOWED TO PASS OVER THE STRUCTURE(S) DURING CONSTRUCTION.

10. ALL DRAINAGE STRUCTURES SHALL BE INSTALLED AT THE ORIGINAL GROUND LINE AND SLOPE TO ASSURE POSITIVE DRAINAGE UP TO THE R.O.W. LIMITS. IN NO CASE SHALL THE PIPE(S) BE PLACED BELOW THE ORIGINAL GROUND ELEVATIONS. THIS WORK SHALL BE CONSIDERED INCIDIDENTAL TO COMPLETION OF PROJECT AND NO ADDITIONAL PAYMENT SHALL BE MADE.

11. AT DRAINAGE PIPE REPLACEMENTS, INSTALLATION, EXTENSIONS, AND IN-PLACE PIPE CLEANING LOCATIONS, THE CONTRACTOR SHALL RESHAPE, REGRADE AND CLEAN THE INLET AND OUTLET CHANNELS TO THE RIGHT-OF-WAY LINE AND/OR EXISTING DRAINAGE CHANNEL, TO PRODUCE SMOOTH FLOWS AT CULVERT INTAKES AND DISCHARGES AS DIRECTED BY THE COR/COTR. THIS WORK SHALL BE INCIDENTAL TO THE BID ITEMS UNDER SECTIONS 602, 603, AND 607.

12. ALL CULVERTS UNDER TURNOUTS AND DRIVEWAYS SHALL BE PLACED AT THE PROPOSED DITCH FLOWLINE. THE CONTRACTOR SHALL BE REQUIRED TO FIELD ADJUST THE PROFILE GRADES OVER PIPE AS DIRECTED BY THE COR/COTR TO PROVIDE FOR THE MINIMUM COVE.

13. TYPE "B" DIKE SHALL BE USED ON THIS PROJECT UNLESS OTHERWISE NOTED ON THE PLANS. EMBANKMENT MATERIAL NEEDED TO BUILD EARTHEN DIKES SHALL BE CONSIDERED INCIDENTAL TO THE BID ITEMS FOR DITCH BLOCKS AS SHOWN IN THE BID SCHEDULE.

14. ADJUST THE DITCH BLOCKS WITH A CURVE TO FIT FIELD CONDITIONS AS DIRECTED BY THE COR/COTR. THESE ADJUSTMENTS SHALL BE CONSIDERED INCIDENTAL TO BID ITEMS FOR DITCH BLOCKS SHOWN IN THE BID SCHEDULE.

15. BACKFILL AND BEDDING MATERIAL INSTALLATION FOR PRECAST BOX, STRUCTURES SHALL BE INACCORDANCE WITH THE FABRICATORS RECOMMENDATIONS AND APPROVED SHOP PLANS

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

STANDARD PIPE INSTALLATION AND DITCH-DIKE DETAILS

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: D19	

Registered Professional Engineer CERTIFICATE NO. 25015 ANDREW JOHN SPEAR State of Arizona

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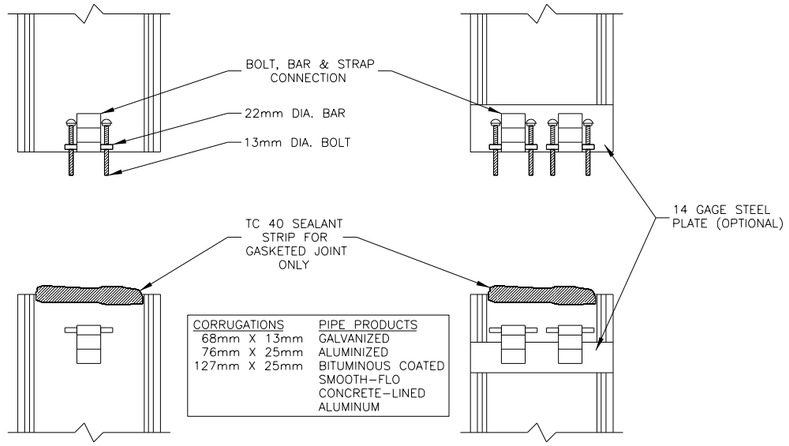
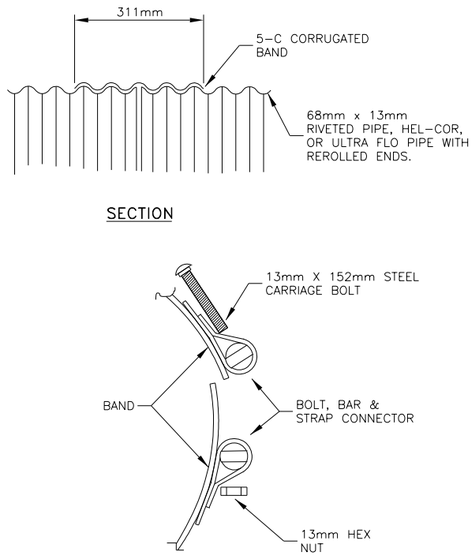
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	48	66



CONNECTION DETAIL
SINGLE
BOLT, BAR & STRAP

CONNECTION DETAIL
DOUBLE
BOLT, BAR & STRAP

H-10 HUGGER BAND

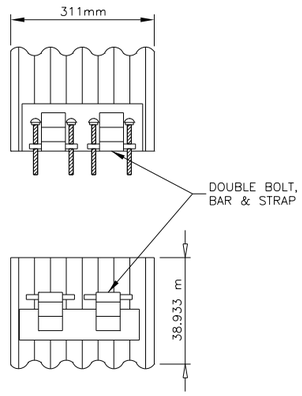


SECTION

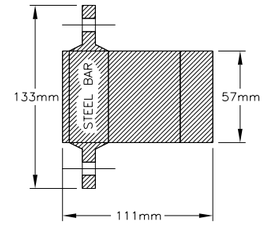
BOLT, BAR & STRAP
CONNECTION DETAIL

STRAP DETAIL

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



CONNECTION DETAIL

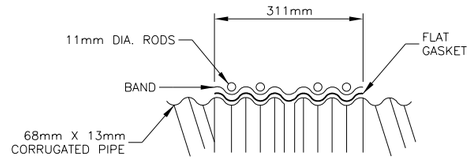


TOP VIEW

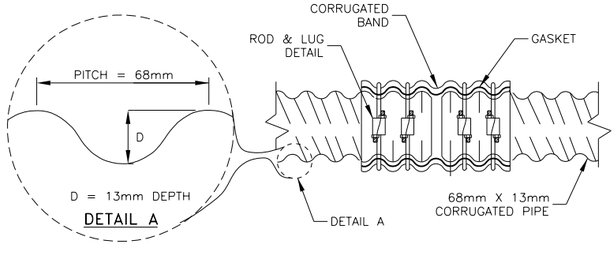
5-C CORRUGATED BAND

FLAT GASKET INSTALLATION GUIDELINES

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



SECTION



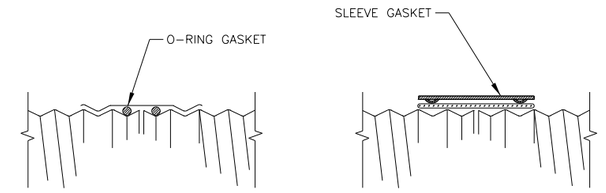
5-C CORRUGATED BAND
SIDE VIEW

GENERAL NOTES

1. CARE SHALL BE TAKEN TO INSURE THAT NO FOREIGN MATERIAL GETS INTO OR ENTER BETWEEN THE OUTER PIPE SURFACE AND THE INNER SURFACE OF THE BAND.
2. TIGHTENING OF THE BOLTS MAY BE ACCOMPLISHED WITH THE USE OF SPANNER OR SOCKETHEAD DEEPWELL WRENCHES, EITHER MANUAL OR POWER. FASTENERS SHOULD BE TIGHTENED UNIFORMLY TO PREVENT UNEVEN COMPRESSION AGAINST THE PIPE WALL. FELTON BAND PULLER SHALL BE USED TO TIGHTEN BAND ON LARGER DIAMETER STRUCTURES, WHICH QUICKLY DRAWS THE BAND CONNECTORS TOGETHER TO FACILITATE BOLT AND NUT TIGHTENING. BOLTS SHOULD BE TIGHENED TO THE RECOMMENDED TORQUE OF 40 N m
3. BANDS FOR PIPE-ARCH ARE THE SAME AS FOR EQUIVALENT DIAMETER ROUND PIPE.
4. BANDS ARE NORMALLY FURNISHED AS FOLLOWS:

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

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



TYPICAL GASKET/BAND COUPLERS

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

PIPE GASKET/HUGGER BAND DETAILS

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: D20	

Registered Professional Engineer CERTIFICATE NO. 25015 ANDRE' JOHN SPEAR Date Signed 5/16/22 ARIZONA U.S.A.

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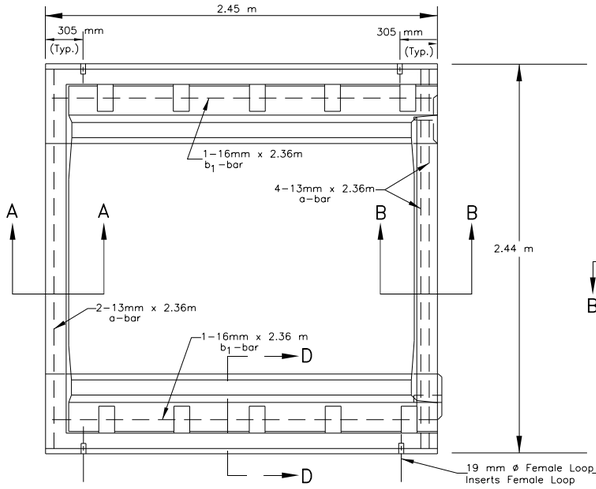
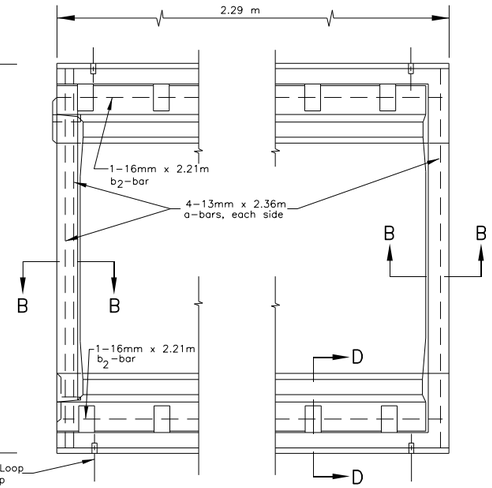
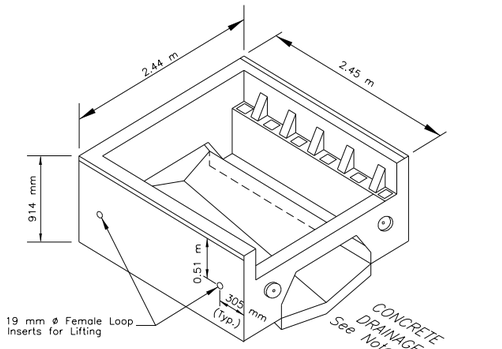
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	49	66



PLAN – END UNIT



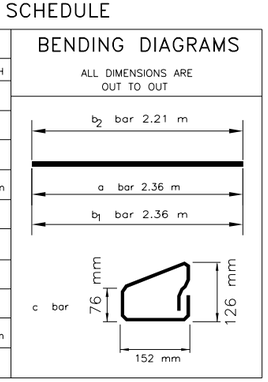
PLAN – INTERMEDIATE UNIT

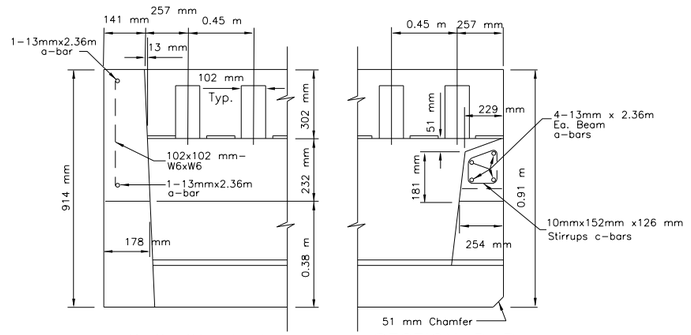


ISOMETRIC VIEW – END UNIT

REINFORCING STEEL SCHEDULE

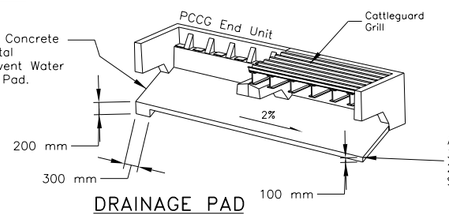
STRAIGHT BARS				BENT BARS				BENDING DIAGRAMS
MARK	NO.	SIZE	LENGTH	MARK	NO.	SIZE	LENGTH	ALL DIMENSIONS ARE OUT TO OUT
END UNIT								
a	6	13	2.36 m					
b_1	2	16	2.36 m					
				c	3	10	0.61 m	
D_1	20	13	0.46 m					
INTERMEDIATE UNIT								
a	8	13	2.36 m					
b_2	2	16	2.21 m					
				c	6	10	0.61 m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



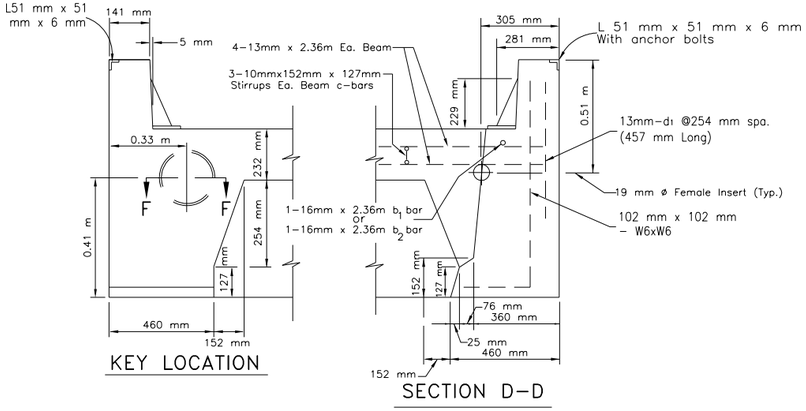


SECTION A–A

SECTION B–B

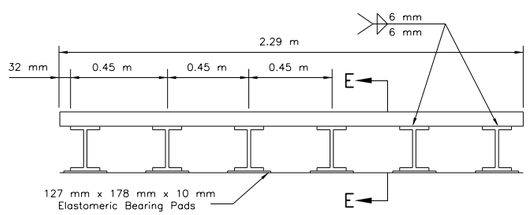


DRAINAGE PAD

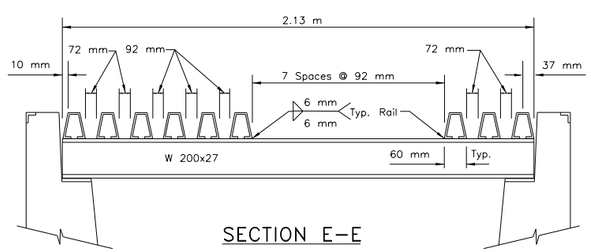


KEY LOCATION

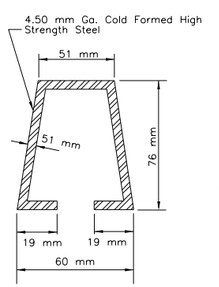
SECTION D–D



TRAFFIC GRILLE UNIT

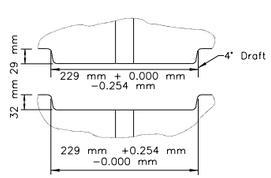


SECTION E–E

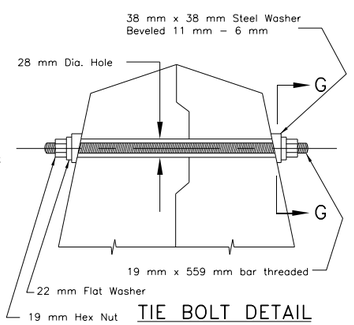


STEEL CROSSBAR SECTION

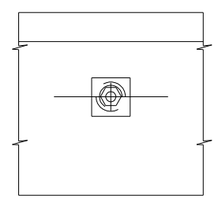
15 Req'd for 1 Grid



SECTION F–F



TIE BOLT DETAIL



SECTION G–G

GENERAL NOTES

1. PRECAST CONCRETE SHALL ATTAIN A MINIMUM 28–DAY COMPRESSIVE STRENGTH OF 27.6 MPa, IN ACCORDANCE WITH AASHTO T22 (ASTM C–39). THE CONCRETE SHALL BE CLASS A(ABE) CONFORMING TO SECTION 552 OF THE FP–14.
2. REINFORCING STEEL SHALL CONFORM TO ASTM SPECIFICATION A615, GRADE 300. ALL STRUCTURAL STEEL SHALL CONFORM TO AASHTO M270M, GRADE 250.
3. EACH UNIT SHALL CONFORM TO THE AASHTO MS–18 HIGHWAY LOADING REQUIREMENTS.
4. EACH UNIT SHALL BE FABRICATED TO CONFORM TO THE ROADWAY CROWN AS SHOWN ON THE PLANS, OR AS DESIGNATED BY THE COR/COTR.
5. BOLTS, WASHER, AND NUTS, SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M–111.
6. ALL TRAFFIC GRILL UNIT, INCLUDING STEEL ANGLES SHALL BE SHOP PAINTED WITH ONE (1) PRIMER COAT, ONE (1) INTERMEDIATE COAT, AND ONE (1) FINISH COAT IN ACCORDANCE WITH SECTION 563, PAINT SYSTEM 2 OF FP–14.
7. WING BRACES SHALL BE CONSIDERED SUBSIDIARY ITEMS TO THE CATTLEGUARD UNIT.
8. SEE SHEET 50 FOR REINFORCING STEEL TO BE USE AT PCC DRAINAGE PAD.
9. SEE DETAIL ON THIS SHEET AND SHEET 50 FOR CONCRETE DRAINAGE PAD LOCATIONS AND NOTES.

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

PRECAST CONCRETE CATTLEGUARD DETAILS

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: D21	

Registered Professional Engineer – CERTIFICATE NO. 25015 – ANDRE B. JOHN SPEAR – Date Signed 4/30/22 – ARIZONA U.S.A.

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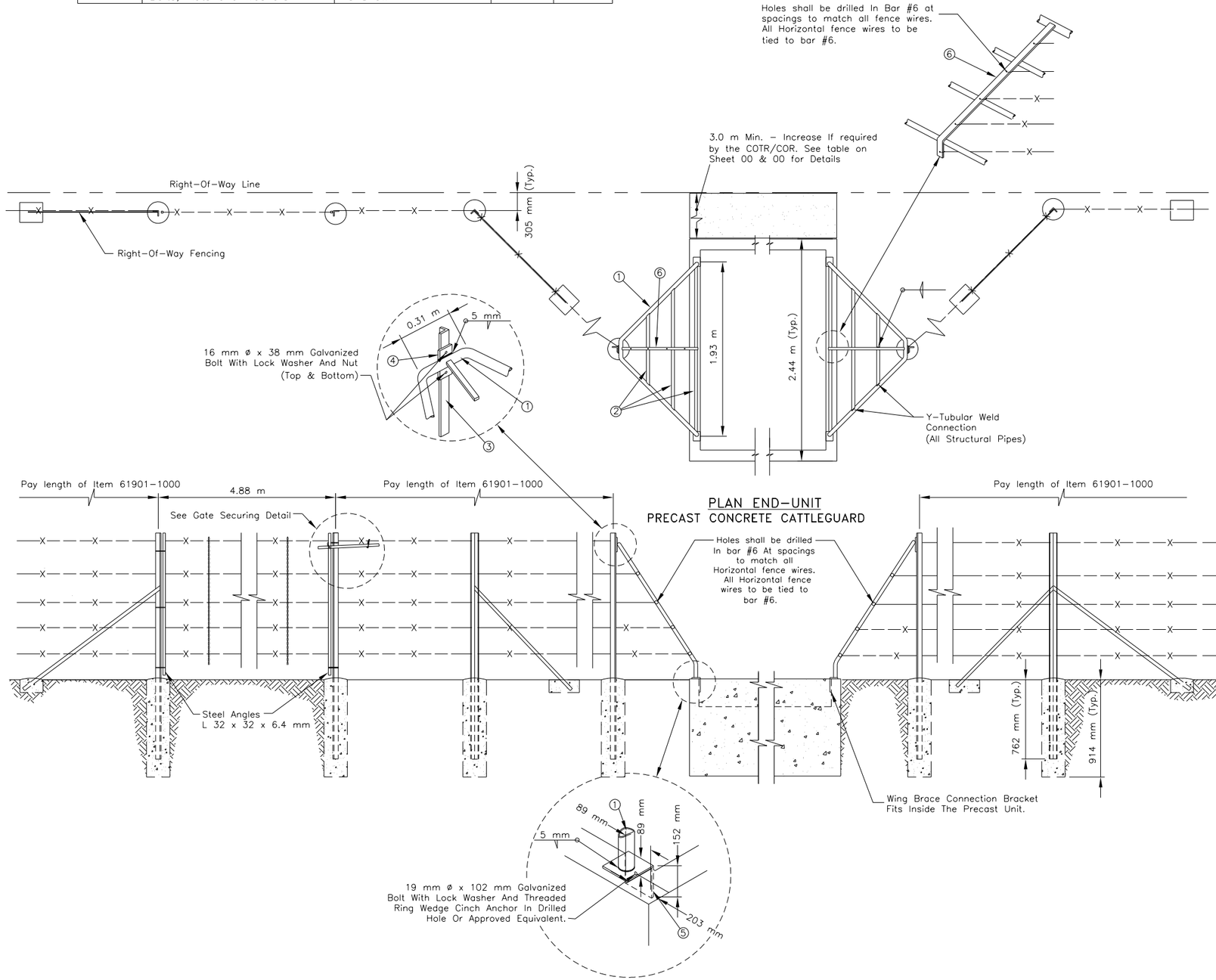
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	50	66

ESTIMATED MATERIAL LIST

PART NO.	MATERIAL	SIZE AND THICKNESS	LENGTH	QUANTITY
1	Structural Steel Pipe	64 mm ø Nominal	4.23 m	2
2	Structural Steel Pipe	32 mm ø Nominal	4.19 m	2
3	Steel Angle (See Note 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		



PLAN END–UNIT
PRECAST CONCRETE CATTLEGUARD

GENERAL NOTES

1. Structural pipe shall conform to ASTM A53–93a, Grade B. All other structural steel shall conform to ASTM–A36.

2. Bolts, nuts, and washers shall be galvanized in accordance with AASHTO M111 (ASTM A123).

3. All wing brace structural steel and pipe shall receive one (1) primer coat, one (1) intermediate coat, and one (1) finish coat in accordance with Section 563, Paint System 2 of FP–14.

4. All structural pipe joints shall be fabricated in accordance with AISC Manual of Steel Construction, Latest Edition.

5. Welding design details shall conform to the AASHTO Standard Specifications for welding at Structural Steel Highway Bridges, Latest Edition.

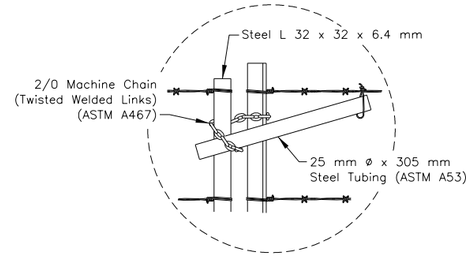
6. The supporting wing brace posts length (part 3) shall be 2.3 meter (minimum). Under certain conditions (such as drain through cattleguard, high embankment, etc) the length of the post may vary to fully support the wing braces. This work shall be incidental to the bid items for cattleguard under section 619. Installation of Gates at cattleguard locations shall be included in the unit price bid for the cattleguard bid item(s) shown in the bid schedule.

7. The COR/COTR may adjust the finished cattleguard elevation as needed to fit field/drainage conditions. The Contractor shall re–grade the adjoining turnout approaches as required. This work shall be considered incidental to item 61903–1000 of FP–14. Any mistakes made by COR/COTR in directing adjustments to the finished grade for the cattleguards and approach roadway will be corrected under a negotiated modification under subsection 109.02(s).

8. At skewed turnout locations, the cattleguard shall be installed perpendicular to turnout.

9. The length of the turnout between the back edge of the cattleguard and the right–of–way limit shall be surfaced with a 100 mm thickness of aggregate base course. The surfacing material and work shall be included in the unit price bid for the aggregate item shown in the bid schedule.

10. At cattleguard locations where the design typical width is wider on one side of the cattleguard than the other side, the narrower roadway width shall flared out to match the wider roadway width using an 8:1 taper or to the length allow by the right–of–way width. This includes at narrow right–of–way with where the turnout radius cannot be completely install between the main road and the cattleguard. This work shall be paid under the earthwork, base course, and paving items included in the bid schedule.



GATE SECURING DETAIL

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

CATTLEGUARD LOCATION WING BRACE DETAILS

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: D23	

Registered Professional Engineer (Civil) CERTIFICATE NO. 25015 ANDREW JOHN SPEAR Date Signed 5/16/22 ARIZONA U.S.A.

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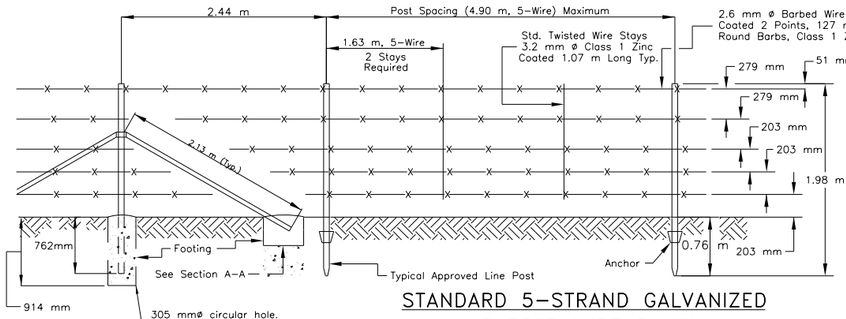
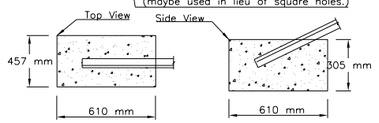
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	51	66

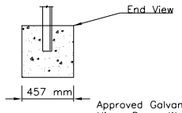


STANDARD 5-STRAND GALVANIZED BARBED WIRE PANEL

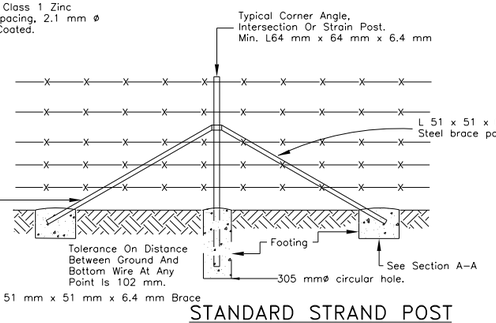


SECTION A-A

Concrete Footing for Corner and Strain Posts.

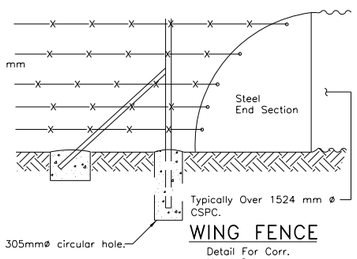


Approved Galvanized Hinges Top Hinge Down. Weld Pins To Prevent Unauthorized Removal.



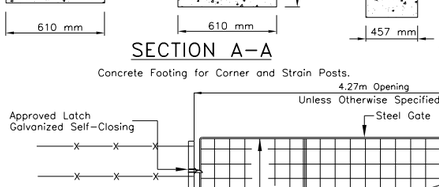
STANDARD STRAND POST

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



WING FENCE

Detail For Corr. Metal Culvert



SPLICING DETAIL

STANDARD 4.27m TYPE 1 GATE

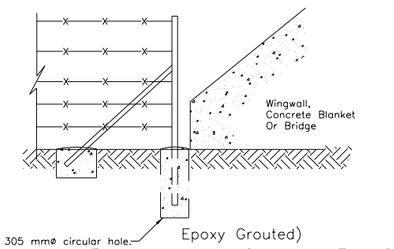
Set Gate To Be Self Closing (Use Only When Specified By Special Note In The Plans)

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

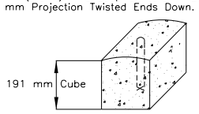
For Gate Details At Cattle guard Location See Standard Cattle guard Drawings.

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

END POST



Fence to Wingwall Connection Type 2



CONCRETE SAG WEIGHT DETAIL

Min. Weight Of Concrete Sag Shall Be 16 kg.

38 mm x 127 mm Doubled And Twisted 3.8 mm (Diam.) Wire Loop Centerd In Block. 25.4 mm Projection Twisted Ends Down.

GENERAL NOTES

1. CORNER, GATE, INTERMEDIATE BRACE POSTS AND LINE POSTS SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M 281-96. METAL POST AND BRACES SHALL BE FABRICATED FROM RAIL, BILLET, OR COMMERCIAL GRADE STEEL CONFORMING WITH THE REQUIREMENT OF ASTM A 702.

2. LINE POSTS 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.

3. WHEN LINE POST ANCHORS ARE OMITTED, DUE TO CHANGE IN SOIL CONDITIONS SUCH AS ROCK, THEN THE POSTS SHALL BE SET IN CONCRETE. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO ITEM 61901-1000.

4. TIE WIRE, WIRE FASTENERS OR WIRE CLIPS FOR FASTENING BARBED AND WOVEN FABRIC FENCING TO THE STEEL POSTS SHALL BE 3.0 mm DIA. STEEL WIRE, CLASS 1 (ZINC COATED), SOFT TEMPER AND MEET THE REQUIREMENTS OF ASTM A 641. FURNISHING AND PLACEMENT OF FASTENERS SHALL BE INCLUDED WITH ITEM 61901-1000.

5. CONCRETE FOR ANCHORS, POST HOLES, ETC. SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 20.7 MPa IN 28 DAYS AND SHALL CONFORM TO SECTION 601 OF THE FP-14. FURNISHING AND PLACEMENT OF CONCRETE SHALL BE INCLUDED IN THE UNIT BID PRICE FOR BID ITEM 61901-1000.

6. TWO SPLICES ON THE SAME LINE BETWEEN THE STRAIN POST ASSEMBLIES SHALL NOT BE PERMITTED. NO SPLICES SHALL BE PLACED CLOSER THAN 30 METER OF ANY STRAIN POST ASSEMBLIES.

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

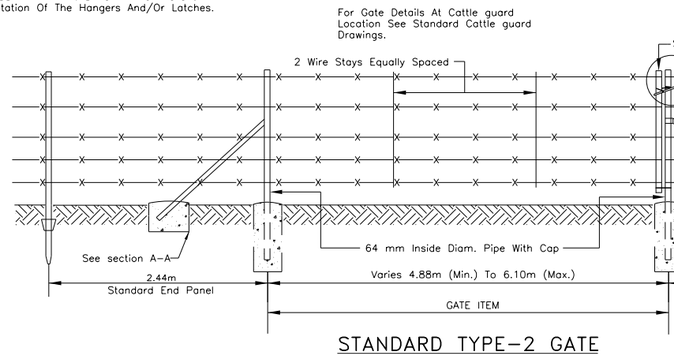
8. ANY CONFLICT IN PLACEMENT OF THE R/W FENCING AT DRAINAGE PIPE LOCATION, DUE TO NARROW R/W WIDTH OR OTHER CONSTRICTIONS, THE FENCE MAY BE PLACED OVER THE DRAINAGE STRUCTURE. THIS WORK AND ADJUSTED LENGTH INSTALLED SHALL BE PAID FOR UNDER BID ITEM 61901-1000.

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

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

11. TYPE 2 GATE CLOSURE DEVICE SHALL BE STEEL PIPE, NPS 26.7 mm ø SCHEDULE 40, CONFORMING TO THE REQUIREMENT OF ASTM A 53. THE GATE CLOSURE STEEL CHAIN SHALL BE WELDED TO THE STEEL PIPE AND ANGLE IRON FENCE POST. THIS WORK SHALL BE INCIDENTAL TO THE INSTALLATION OF FENCING AND NO ADDITIONAL PAYMENT SHALL BE MADE.

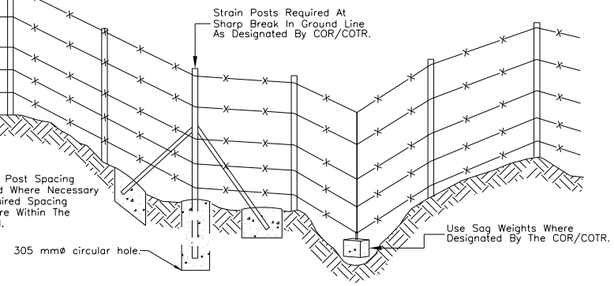
12. CONTRACTOR SHALL BE REQUIRED TO INSTALL SAG WEIGHTS WHERE VERTICAL CLEARANCE BETWEEN THE BOTTOM WIRE AND NATURAL GROUND IS 610 mm OR GREATER. THIS WORK SHALL BE INCIDENTAL TO THE INSTALLATION OF FENCING.



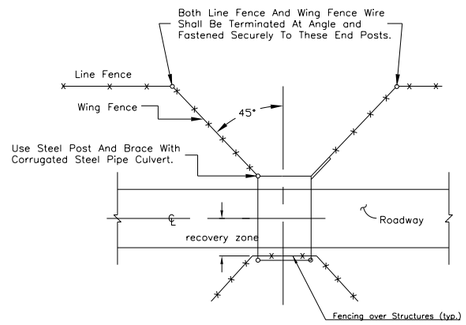
STANDARD TYPE-2 GATE

Use At Locations Noted On Plans

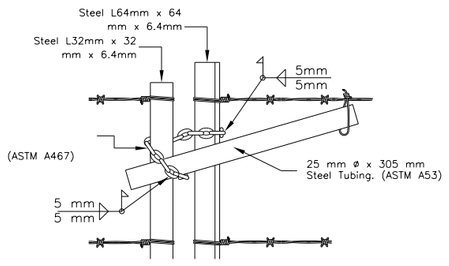
CONNECTION TO MAJOR STRUCTURES



FENCE PROFILE IN ROUGH TERRAIN

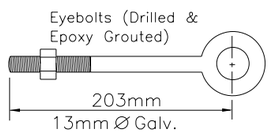


WING FENCE DETAIL

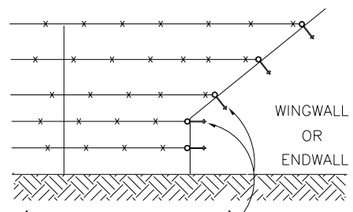


GATE SECURING DETAIL

TYPICAL STEEL POST SECTION



EYE BOLT DETAIL



Eyebolts (Drilled & Epoxy Grouted)
Fence to Wingwall Connection Type 1

NAVAJO D.O.T.

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

STANDARD FENCING DETAILS

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: D24	

Registered Professional Engineer CERTIFICATE NO. 25015 ANDREW JOHN SPEAR State of Arizona

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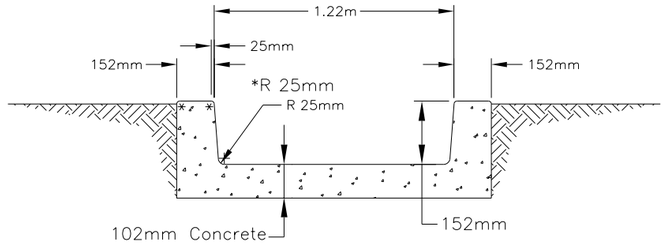
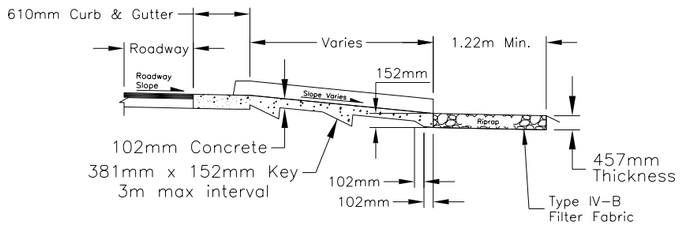
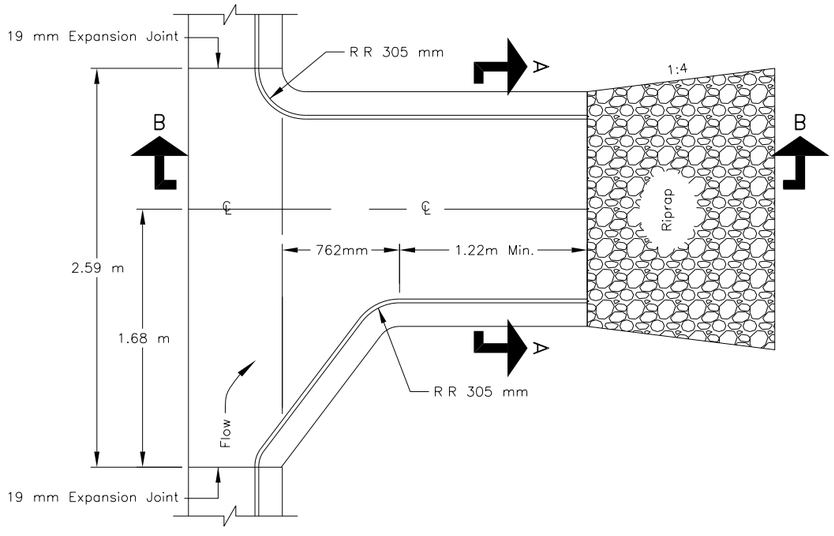
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	52	66



SECTION A–A



SECTION B–B



TYPE IV–2
SPILLWAY DETAIL

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

SPILLWAY DETAILS

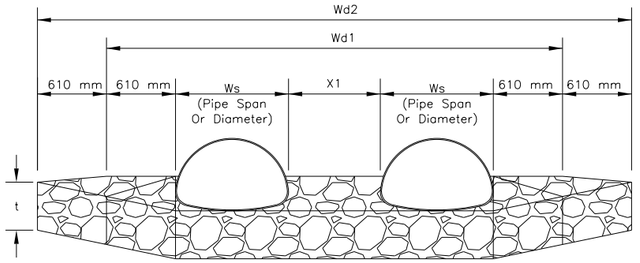
DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	
DWG: D25	

DIBBLE

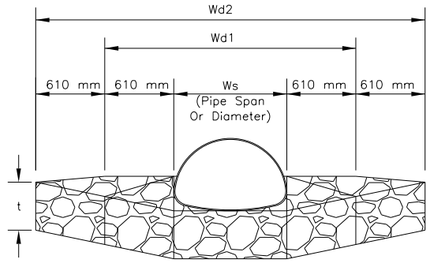
Registered Professional Engineer
CERTIFICATE NO.
25015
ANDREW JOHN SPEAR
State of Arizona

J:\2017\1017064.15_NDOT_N35_Sweetwater\CAD\N35-D725.dgn

ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	53	66

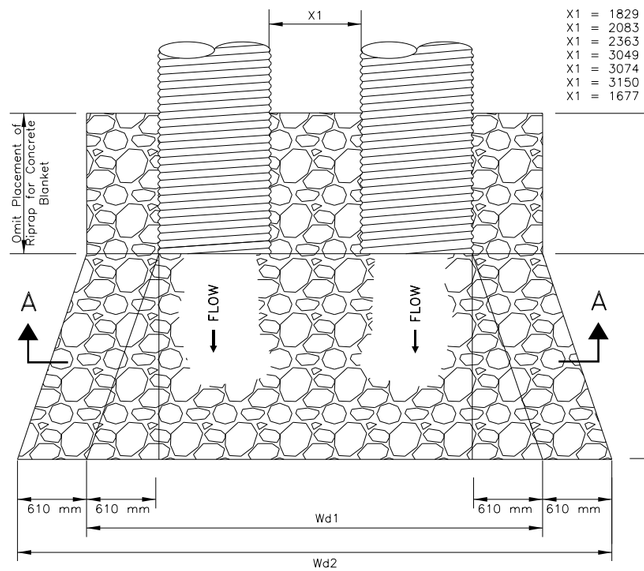


ELEVATION – MULTIPLE BARREL
SECTION A–A

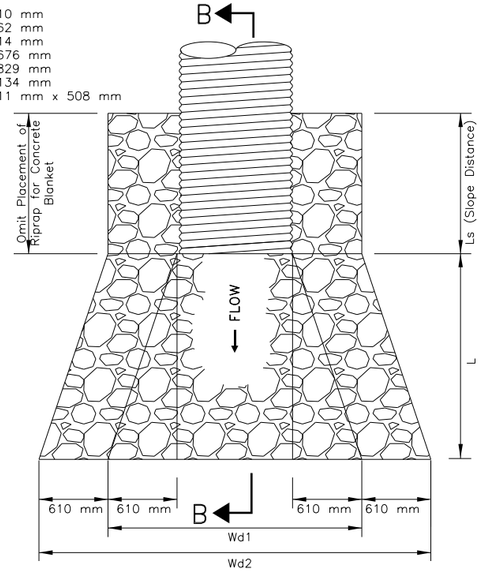


ELEVATION – SINGLE BARREL
SECTION A–A

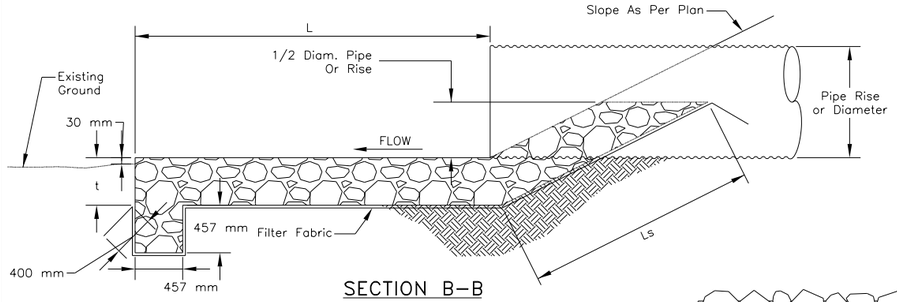
X1 = 1829 mm for 610 mm
X1 = 2083 mm for 762 mm
X1 = 2363 mm for 914 mm
X1 = 3049 mm for 1676 mm
X1 = 3074 mm for 1829 mm
X1 = 3150 mm for 2134 mm
X1 = 1677 mm for 711 mm x 508 mm



PLAN – MULTIPLE BARREL



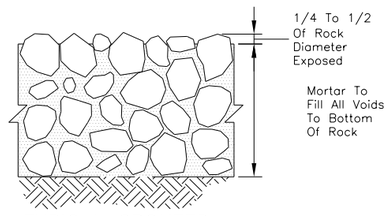
PLAN – SINGLE BARREL



SECTION B–B

GENERAL NOTES:

1. See Dwg D11 and D12 For Additional Notes and Details on Wire Enclosed Riprap.
2. All Stone For Riprap Shall Be Class 2 Meeting The Grading Requirements Of Table 705 -1 Of The FP-14. See Supplemental Specification Section 705 For Modification (No Minus 76 mm Rock) To Rock Specifications For Rock Used With Grouted Riprap.
3. All Excavations And Backfill Operations Shall Be Done To Neat Lines In Accordance With Section 209 Of The FP-14 And Will Be Incidental To Installation Of Riprap. See Supplemental Specifications For Additional Requirements.
4. Any Borrow Material Needed To Bring Existing Channels Up To Grade Shall Be Incidental To Riprap Pay Items.
5. Fill Rock Voids In Grouted Riprap With Mortar Per Section 251 & 712.05. Leave Rock On Surface Exposed 1/4 To 1/2 Rock Diameter. See Typical Grouted Riprap Detail At Right.



TYPICAL GROUTED
RIPRAP DETAIL

ITEM 25110-2200: GROUTED RIPRAP, METHOD B, CLASS 2
CULVERT OUTLETS

CULVERT OUTLETS

STATION	STRUCTURE	LOCATION	Ws (m)	X1 (m)	Wd1 (m)	Wd2 (m)	L (m)	VOLUME ON SIDESLOPE Ls (m)	VOLUME ON SIDESLOPE t (mm)	QUANTITY (m^3)
25+350	1-2134 mm	Outlet	2.134	0.000	3.354	4.574	6.00	0.00	457	11.82
25+794	1-2134 mm	Outlet	2.134	0.000	3.354	4.574	6.25	0.00	457	12.28
27+180	1-2134 mm	Outlet	2.134	0.000	3.354	4.574	6.00	0.00	457	11.82
									TOTAL:	35.93

N8031(3)
ITEM 25101-2200: PLACED RIPRAP, METHOD B, CLASS 2
CULVERT OUTLETS

CULVERT OUTLETS

STATION	STRUCTURE	LOCATION	No. of Pipes	Pipe Size (mm) Dia /Span	Pipe Size (mm) Rise	Ws (m)	X1 (m)	Wd1 (m)	Wd2 (m)	L (m)	VOLUME ON SIDESLOPE Ls (m)	VOLUME ON SIDESLOPE t (mm)	QUANTITY (m^3)
24+080.000	1-762 mm	Outlet	1	762		0.762		1.982	3.202	3.00	3.05	457	5.35
24+101.000	1-610 mm	Outlet	1	610		0.610		1.830	3.050	2.00	2.44	457	3.99
24+139.500	1-610 mm	Outlet	1	610		0.610		1.830	3.050	2.00	2.44	457	3.99
24+375.000	1-1067 mm	Outlet	1	1067		1.067		2.287	3.507	4.00	4.27	457	7.75
24+560.000	1-1067 mm	Outlet	1	1067		1.067		2.287	3.507	4.00	4.27	457	7.75
24+950.000	1-762 mm	Outlet	1	762		0.762		1.982	3.202	3.00	3.05	457	5.45
25+110.000	1-762 mm	Outlet	1	762		0.762		1.982	3.202	3.00	3.05	457	5.35
25+180.000	1-610 mm	Outlet	1	610		0.610		1.830	3.050	2.00	2.44	457	3.99
25+250.000	1-762 mm	Outlet	1	762		0.762		1.982	3.202	3.00	3.05	457	5.35
25+550.000	1-914 mm	Outlet	1	914		0.914		2.134	3.354	3.00	3.66	457	5.76
26+225.000	1-610 mm	Outlet	1	610		0.610		1.830	3.050	2.00	2.44	457	3.99
26+250.000	3-914 mm	Outlet	3	914		0.914		3.962	5.182	3.00	3.66	457	7.35
26+745.000	1-610 mm	Outlet	1	610		0.610		1.830	3.050	2.00	2.44	457	3.99
27+050.000	2-610 mm	Outlet	2	610		0.610	0.610	3.050	4.270	2.00	2.44	457	5.92
27+306.000	1-610 mm	Outlet	1	610		0.610		1.830	3.050	2.00	2.44	457	3.99
28+264.000	3-889x610 mm	Outlet	3	889		0.889	0.610	5.107	6.327	2.00	3.56	457	10.07
29+410.000	1-610 mm	Outlet	1	610		0.610		1.830	3.050	2.00	2.44	457	3.99
30+310.000	1-610 mm	Outlet	1	610		0.610		1.830	3.050	2.00	2.44	457	3.99
32+135.000	3-610 mm	Outlet	3	610		0.610	0.610	4.270	5.490	2.00	2.44	457	8.51
												TOTAL:	106.53

NAVAJO D.O.T.

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

CULVERT RIPRAP APRON DETAILS

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: D26	

Registered Professional Engineer
CERTIFICATE NO.
25015
ANDREW JOHN SPEAR
State of Arizona

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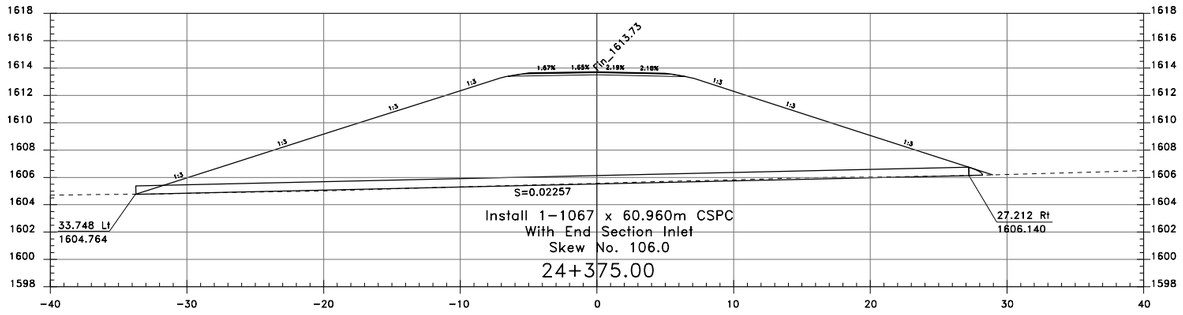
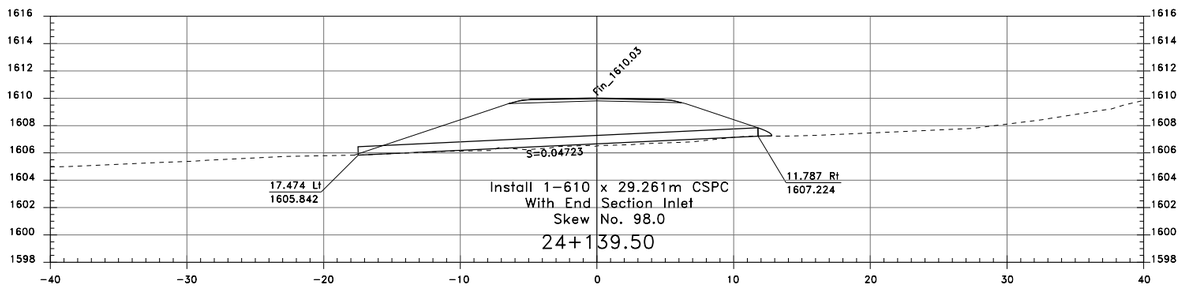
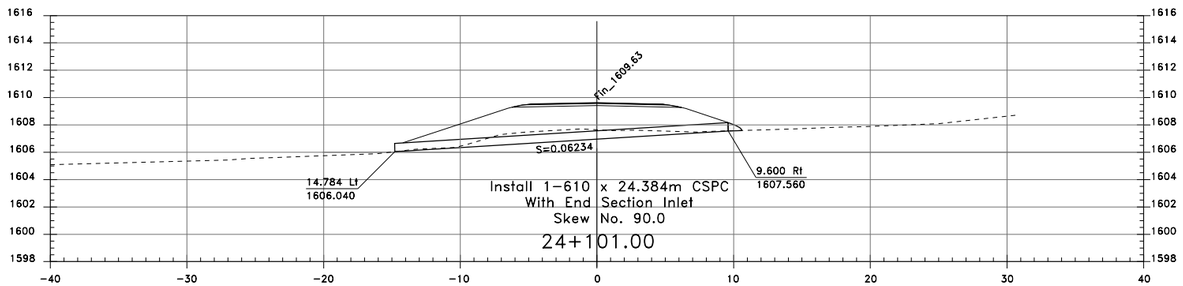
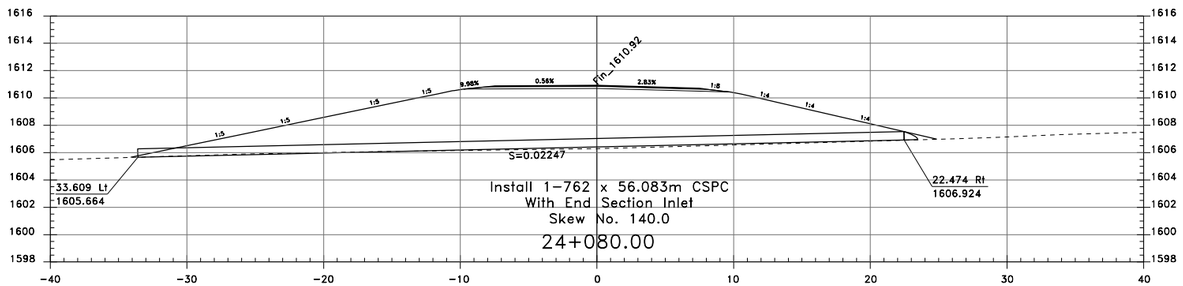
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	54	66









NOTE: SEE DWG D19 & SECTION 152 OF THE SUPPLIMENTAL SPECIFICATION FOR ADDITIONAL REQUIREMENTS

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

CULVERT CROSS SECTION

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: X1	

Registered Professional Engineer
CERTIFICATE NO.
25015
ANDREW JOHN SPEAR
State of Arizona

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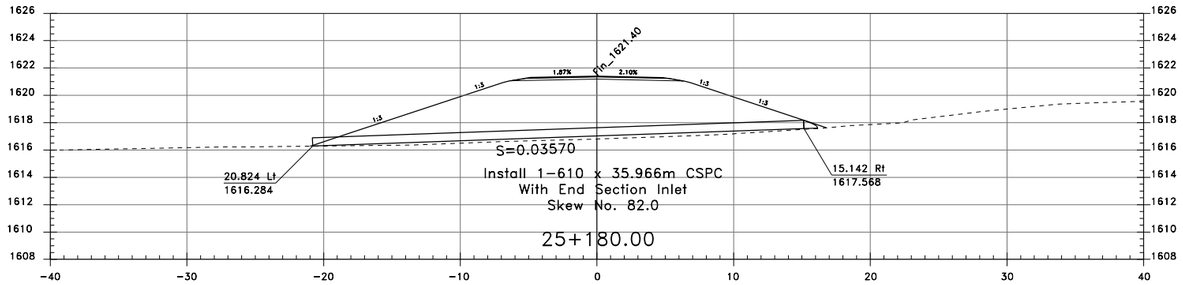
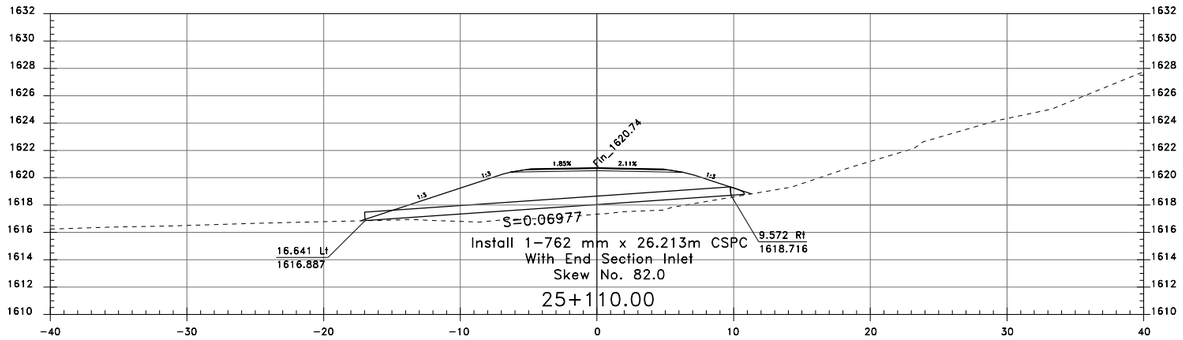
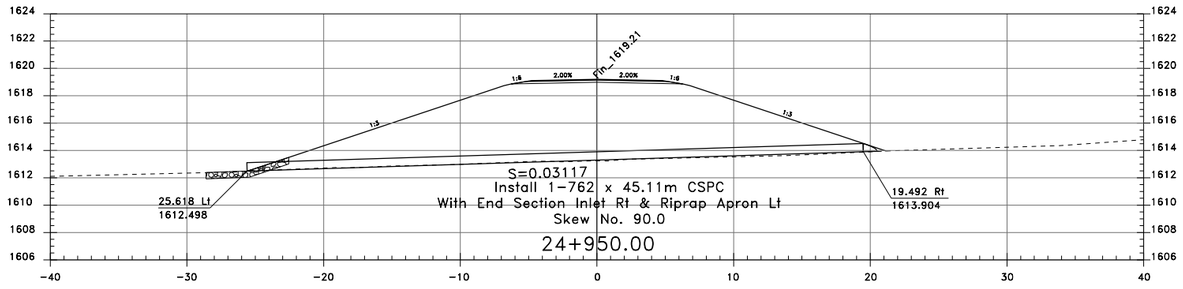
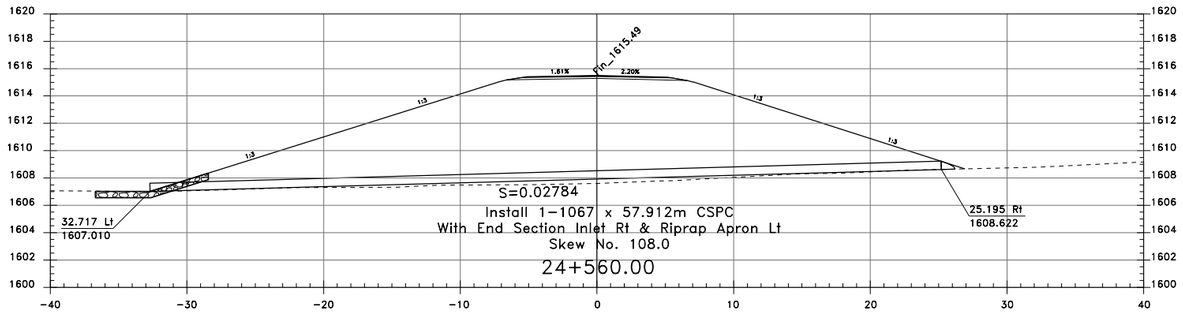
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	55	66









NOTE: SEE DWG D19 & SECTION 152 OF THE SUPPLIMENTAL SPECIFICATION FOR ADDITIONAL REQUIREMENTS

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

CULVERT CROSS SECTION

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: X2	

Registered Professional Engineer
CERTIFICATE NO.
25015
ANDREW JOHN SPEAR
Date Signed 5/16/22
ARIZONA U.S.A.

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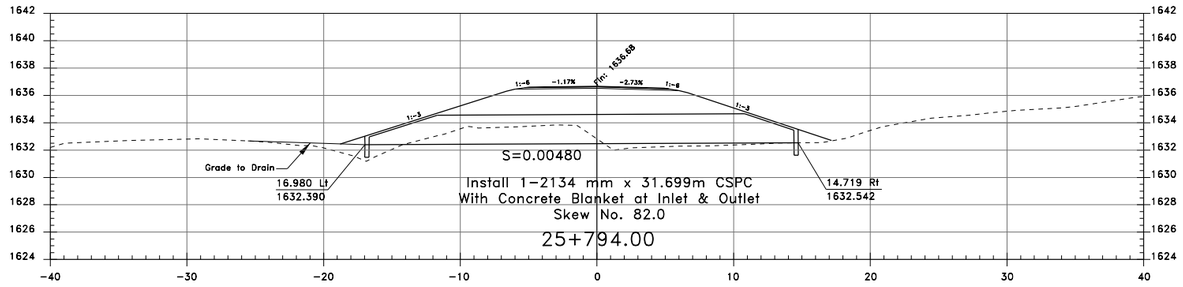
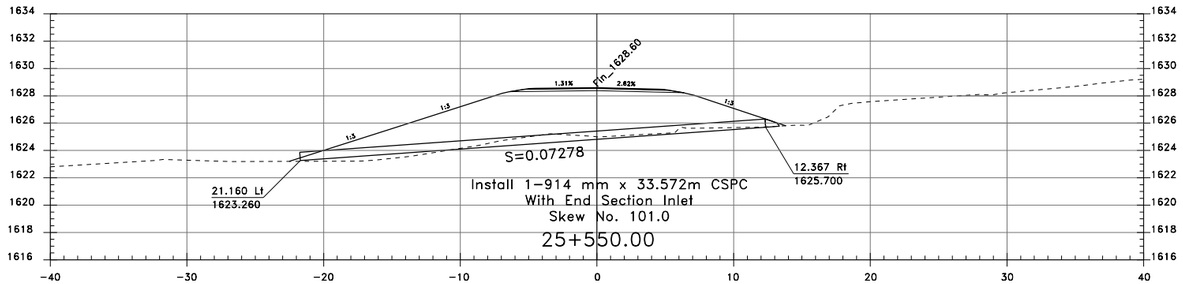
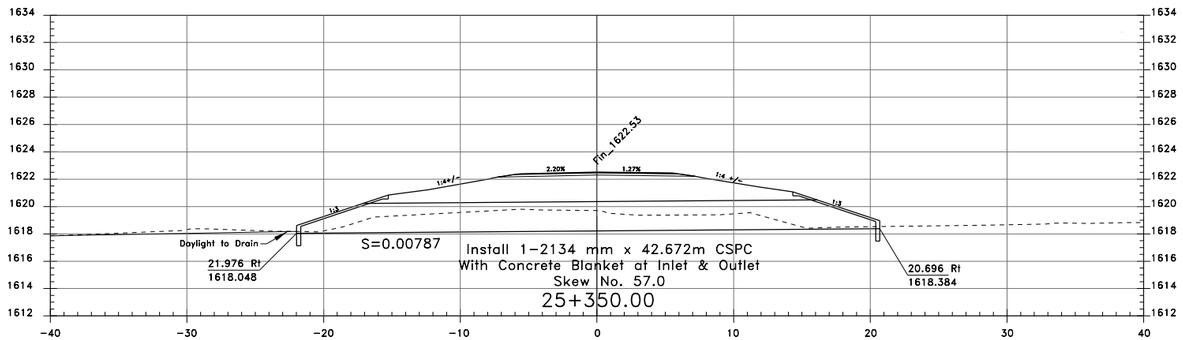
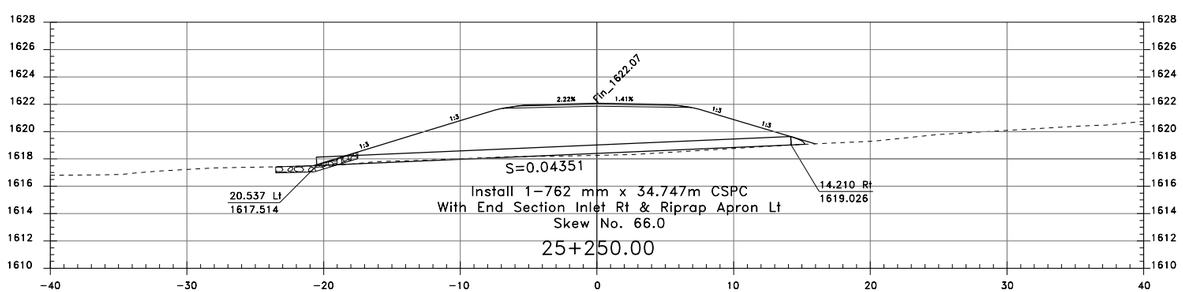
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	56	66

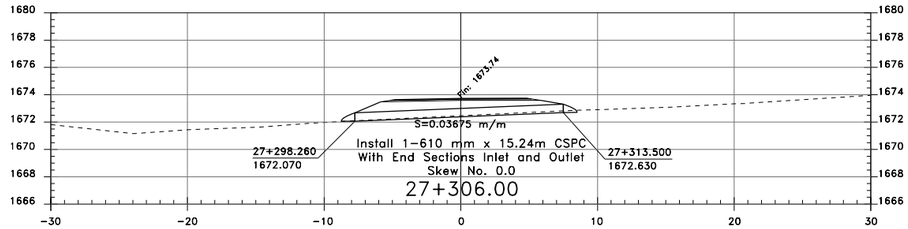
NOTE: SEE DWG D19 & SECTION 152 OF THE SUPPLIMENTAL SPECIFICATION FOR ADDITIONAL REQUIREMENTS

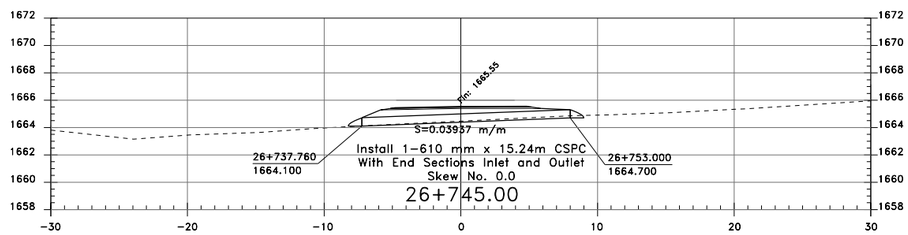












NAVAJO D.O.T.

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

CULVERT CROSS SECTION

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: X3	

Arizona Professional Engineer CERTIFICATE NO. 25015 ANDREW JOHN SPEAR Date Signed 5/16/22

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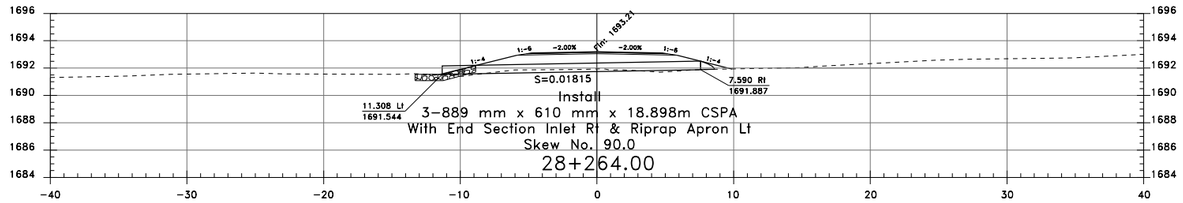
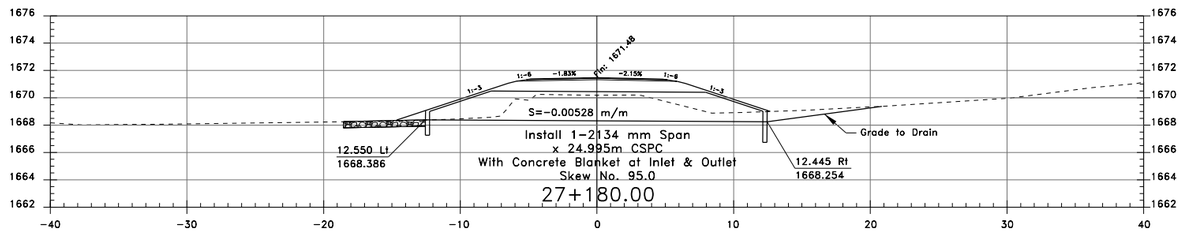
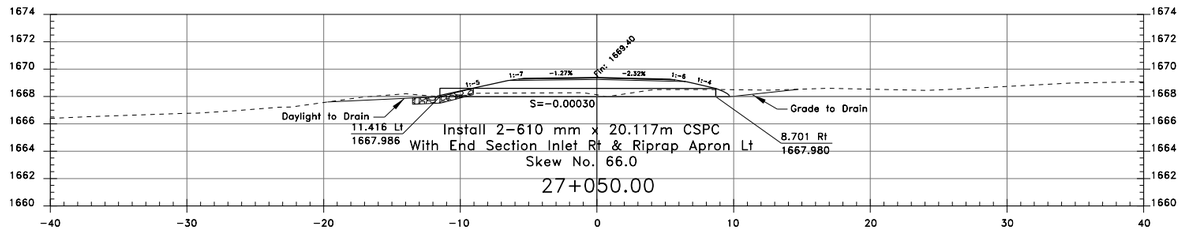
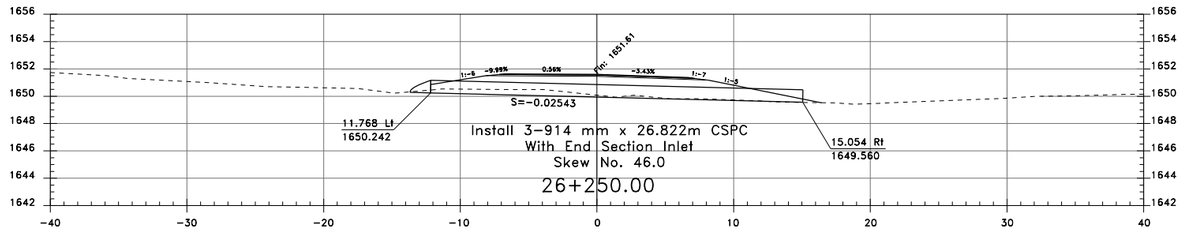
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	57	66

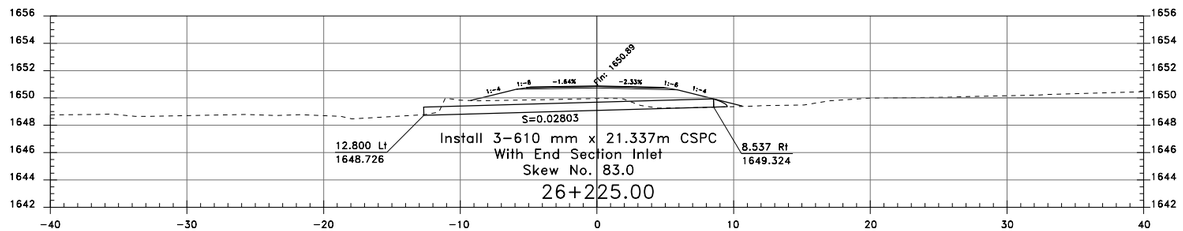
NOTE: SEE DWG D19 & SECTION 152 OF THE SUPPLIMENTAL SPECIFICATION FOR ADDITIONAL REQUIREMENTS

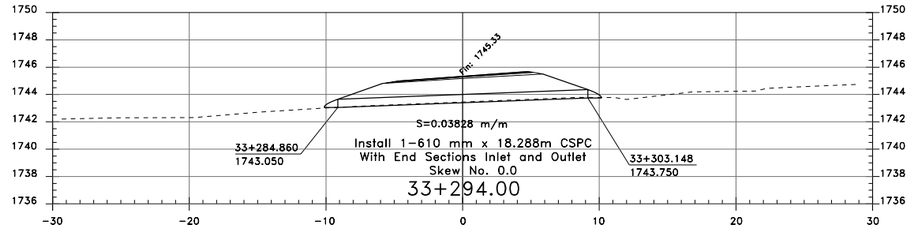


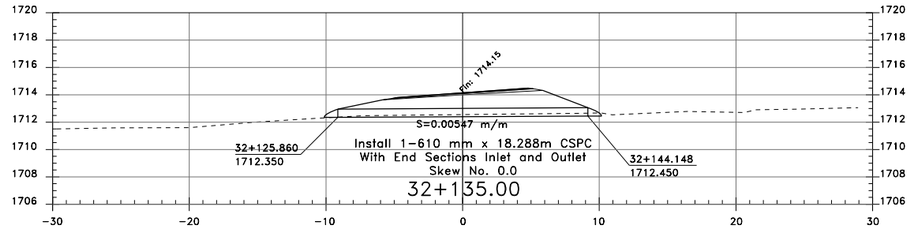


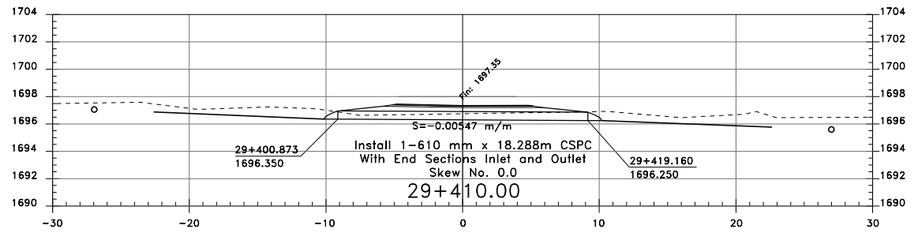












NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

CULVERT CROSS SECTION

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: X4	

25015 ANDREW JOHN SPEAR — Registered Professional Engineer (Civil) — Date Signed 5/16/22 — Arizona, U.S.A.

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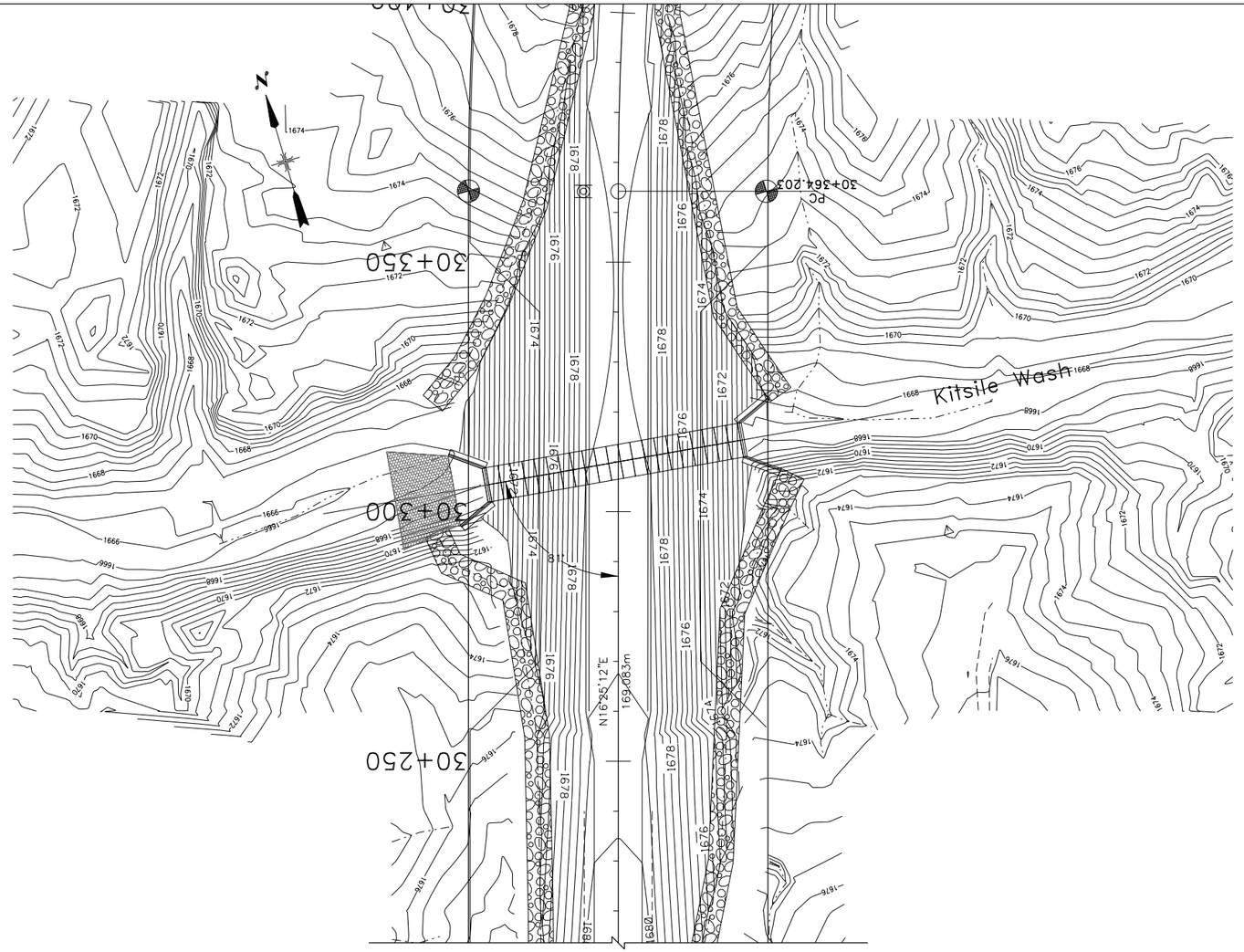
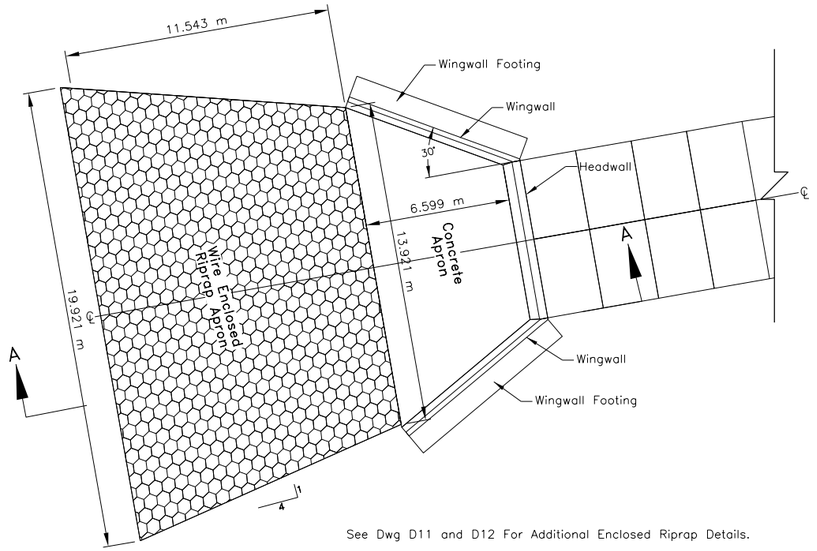
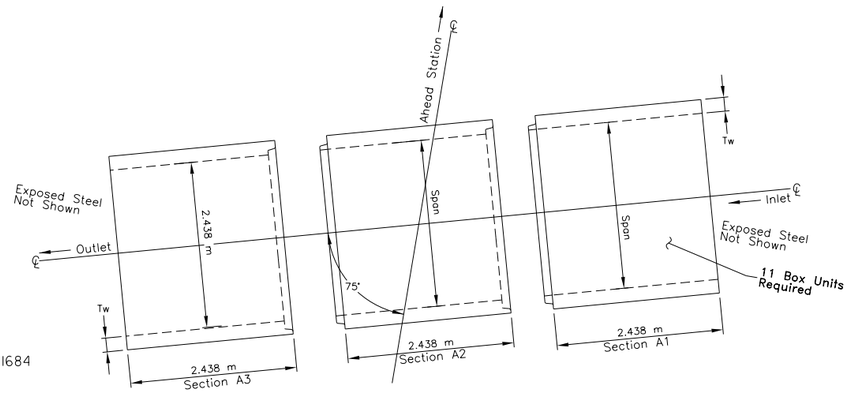
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	58	66



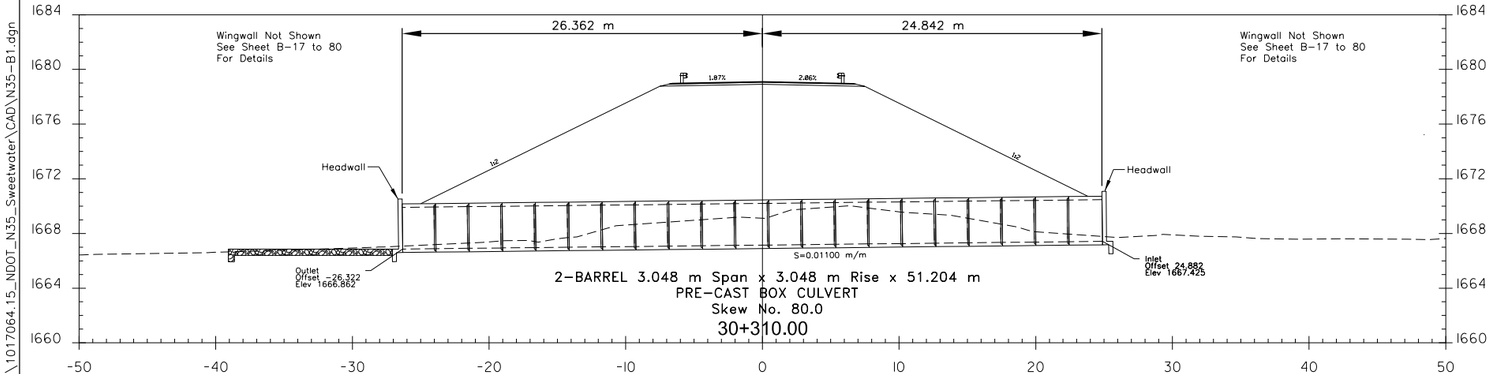


See Dwg D11 and D12 For Additional Enclosed Riprap Details.

DETAIL "A"
WIRE ENCLOSED RIPRAP APRON
Est. Qty.= 78.0 m³



PRE-CAST BOX CULVERT (NTS)
LAYOUT DETAIL



2-BARREL 3.048 m Span x 3.048 m Rise x 51.204 m
PRE-CAST BOX CULVERT
Skew No. 80.0
30+310.00

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

STA. 30+310.00 DRAINAGE STRUCTURE CROSS SECTION DETAIL

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: B1	

Registered Professional Engineer — CERTIFICATE NO. 25015 — ANDREW JOHN SPEAR — State of Arizona

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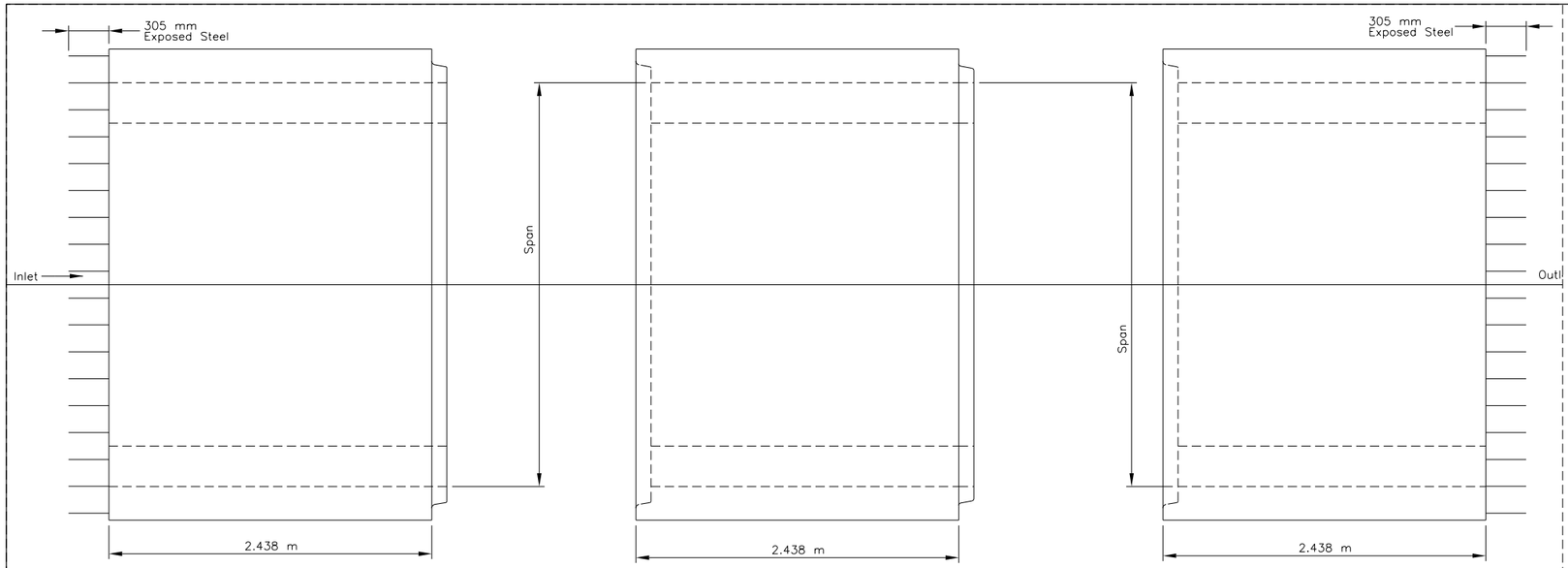
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	59	66



PLAN VIEW–BOX CULVERT
SECTION A 1

PLAN VIEW–BOX CULVERT
SECTION A 2

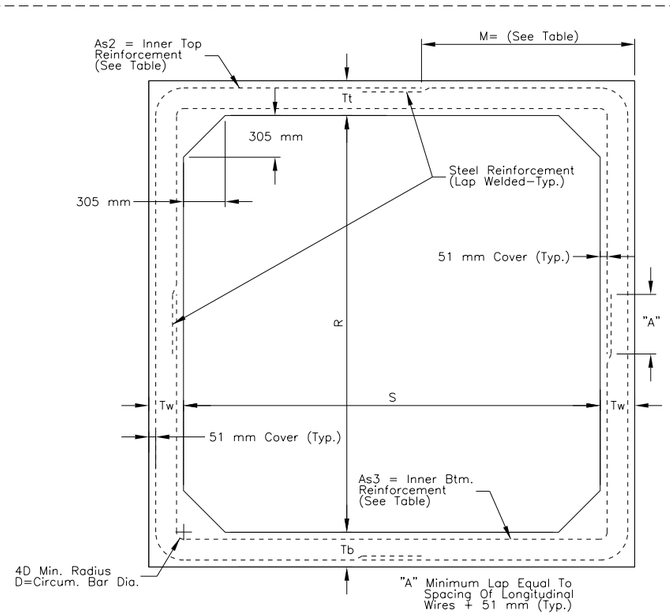
PLAN VIEW–BOX CULVERT
SECTION A 3

Note: Protect Exposed Steel From Damage Or Accidentally Deformed or Bent In Fabrication Yard And During Transport To Project Site.

STANDARD PRECAST BOX CULVERT DESIGNS (51 mm COVER) – 2.438 m, 3.048 m & 3.658 m SPANS

STATION	SPAN X RISE	SLAB/WALL THICKNESS				DESIGN EARTH COVER ABOVE TOP SLAB (mm)	REINFORCEMENT AREA (cm2/per meter)								As1 EXT. LENGTH (M)
	S x R	TOP (Tt)	BOTTOM (Tb)	SIDE (Tw)	HAUNCH (H)		As1	As2	As3	As4	As5	As6	As7	As8	
	(m)	(mm)	(mm)	(mm)	(mm)										(mm)
30+310.00	3.05 x 3.05	254	254	254	102 – 305	610 to < 914	9.313	15.028	13.547	3.598	5.080	8.043	9.313	*	2007

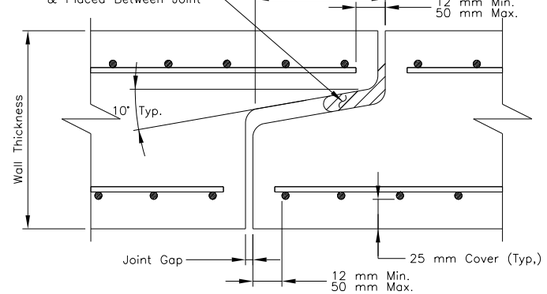
* See General Note No. 5



SIDE VIEW–SINGE BARREL

GENERAL NOTES

1. ONLY ONE DESIGN OF PRECAST BOX CULVERT IS TO BE USED FOR ANY INSTALLATION.
2. REINFORCING STEEL MUST CONSIST OF SMOOTH OR DEFORMED WELDED WIRE REINFORCEMENT (WWR) MEETING THE REQUIREMENTS OF SPECIFICATION SECTION 931. LONGITUDINAL REINFORCEMENT MAY CONSIST OF REINFORCING BARS MEETING THE REQUIREMENTS OF SPECIFICATION SECTION 931. MINIMUM COVER MUST BE 51 mm FOR SLIGHTLY AGGRESSIVE ENVIRONMENTS OR 76 mm FOR MODERATELY TO EXTREMELY AGGRESSIVE ENVIRONMENTS, UNLESS OTHERWISE SHOWN. THE SPACING OF CIRCUMFERENTIAL WIRES MUST NOT BE LESS THAN 51 mm NOR MORE THAN 102 mm. THE SPACING OF LONGITUDINAL WIRES OR BARS MUST NOT BE MORE THAN 203 mm.
3. AS9 LONGITUDINAL WIRES MUST HAVE A MINIMUM CROSS–SECTIONAL AREA OF 40% OF THE CIRCUMFERENTIAL WIRES, BUT NOT LESS THAN A W2.5 OR D2.5 FOR WWR, OR #3 BARS FOR DEFORMED BARS.
4. WELDING OF REINFORCEMENT MUST BE LIMITED TO THE LOCATIONS SHOWN IN ASTM C1577 AND IN ACCORDANCE WITH ANSI/AWS D1.4 "STRUCTURAL WELDING CODE – REINFORCING STEEL".
5. FOR ALTERNATE REINFORCING CONFIGURATION OPTIONS 2 AND 3 SHOWN IN DETAIL "A" AND "B" (SHEET 1), AS1 MAY BE EXTENDED TO THE MIDDLE OF EITHER SLAB AND LAP SPLICED WITH AS7 AND AS8. AS4 MAY BE LAP SPLICED AT ANY LOCATION OR CONNECTED TO AS2 OR AS3 AT CORNERS BY WELDING.
6. HAUNCH DIMENSIONS MAY VARY BETWEEN THE MINIMUM AND MAXIMUM DIMENSIONS SHOWN IN THE DESIGN TABLES BUT ONLY ONE HAUNCH DIMENSION MUST BE USED WITHIN THE FULL LENGTH OF THE BOX CULVERT INSTALLATION.
7. SUBMITTAL OF REDESIGN CALCULATIONS ARE NOT REQUIRED FOR ANY INCREASE TO THE SLAB AND/OR WALL THICKNESS WHEN THE MINIMUM REINFORCEMENT AREAS SHOWN IN THE DESIGN TABLES ARE PROVIDED.
8. FOR DESIGN EARTH COVER GREATER THAN 3 m, THE CONTRACTOR MAY INTERPOLATE THE REQUIRED AREAS OF REINFORCEMENT AND SLAB OR WALL THICKNESS. INTERPOLATED AREAS OF REINFORCEMENT SLAB OR WALL THICKNESS MUST BE APPROVED BY THE ENGINEER.
9. MINIMUM LENGTH OF PRECAST BOX SEGMENTS IS 1.22 m AND MAXIMUM LENGTH IS 4.88 m.
10. SEE INDEX NO. 291 FOR CONNECTIONS TO WING WALLS, HEADWALLS AND OTHER GENERAL DETAIL



BOX CULVERT
JOINT DETAIL

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

2–BARREL PRE–CAST CONCRETE BOX SEGMENT DETAILS

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: B2	

Registered Professional Engineer – CERTIFICATE NO. 25015 – ANDRE B. JOHN SPEAR – STATE OF ARIZONA

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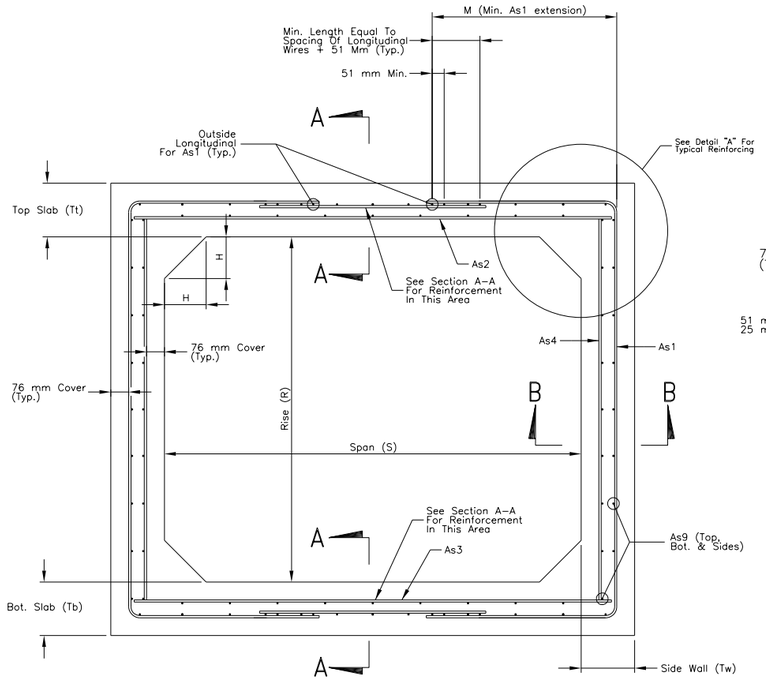
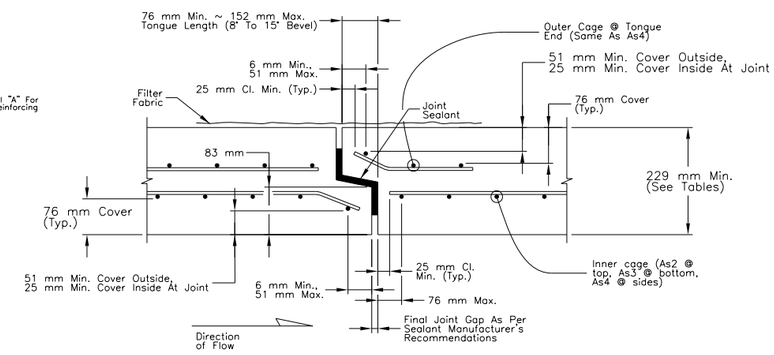
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	60	66

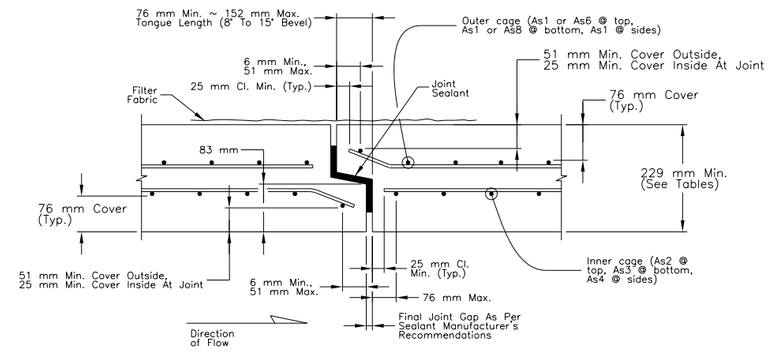


TYPICAL BOX SECTION (TYPE 2)

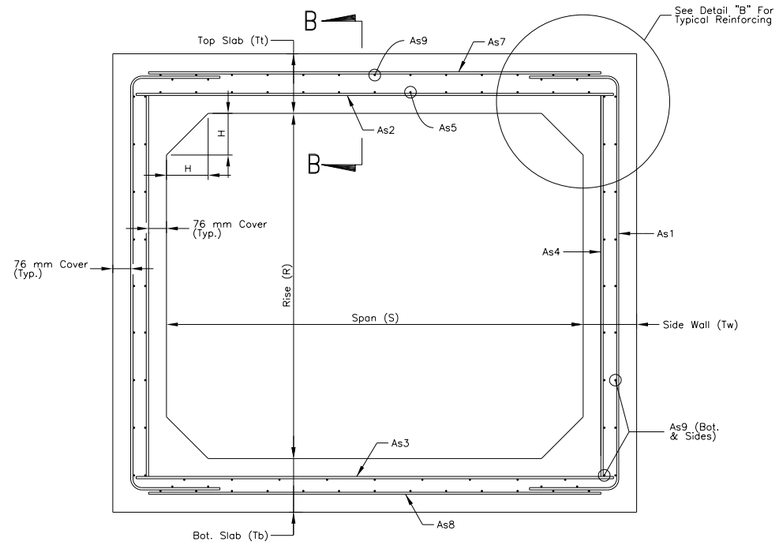
DESIGN EARTH COVER 51 mm OR GREATER
(Option 1 Reinforcing Configuration Shown)



SECTION A–A

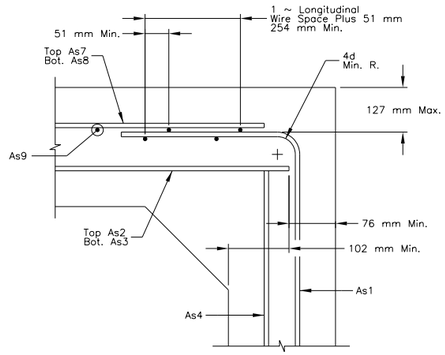


SECTION B–B
TYPICAL SECTION THRU JOINT

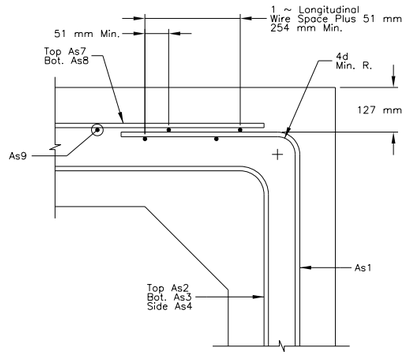


TYPICAL BOX SECTION (TYPE 1)

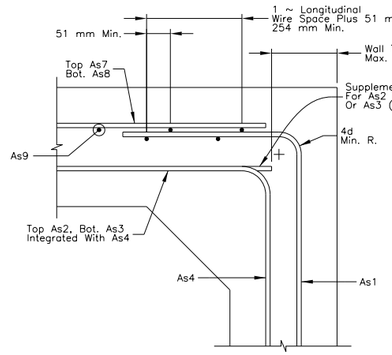
DESIGN EARTH COVER LESS THAN 51 mm
(Option 1 Reinforcing Configuration Shown)



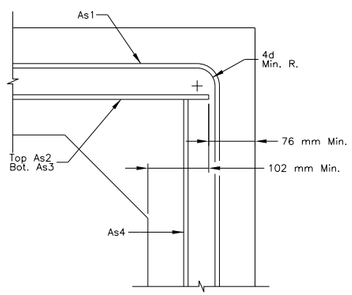
DETAIL "B" (OPTION 1)



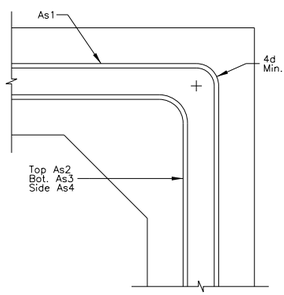
DETAIL "B" (OPTION 2)



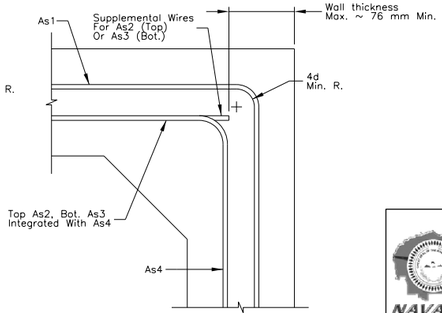
DETAIL "B" (OPTION 3)



DETAIL "A" (OPTION 1)



DETAIL "A" (OPTION 2)



DETAIL "A" (OPTION 3)

NOTES:

1. Work this Index with Index No. 291.
2. See Sheet 29 for dimensions and areas of reinforcement.

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

PRECAST BOX CULVERT REINFORCEMENT DETAILS

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: B3	

Registered Professional Engineer (Civil) CERTIFICATE NO. 25015 ANDREW JOHN SPEAR Date Signed 5/16/22 ARIZONA U.S.A.

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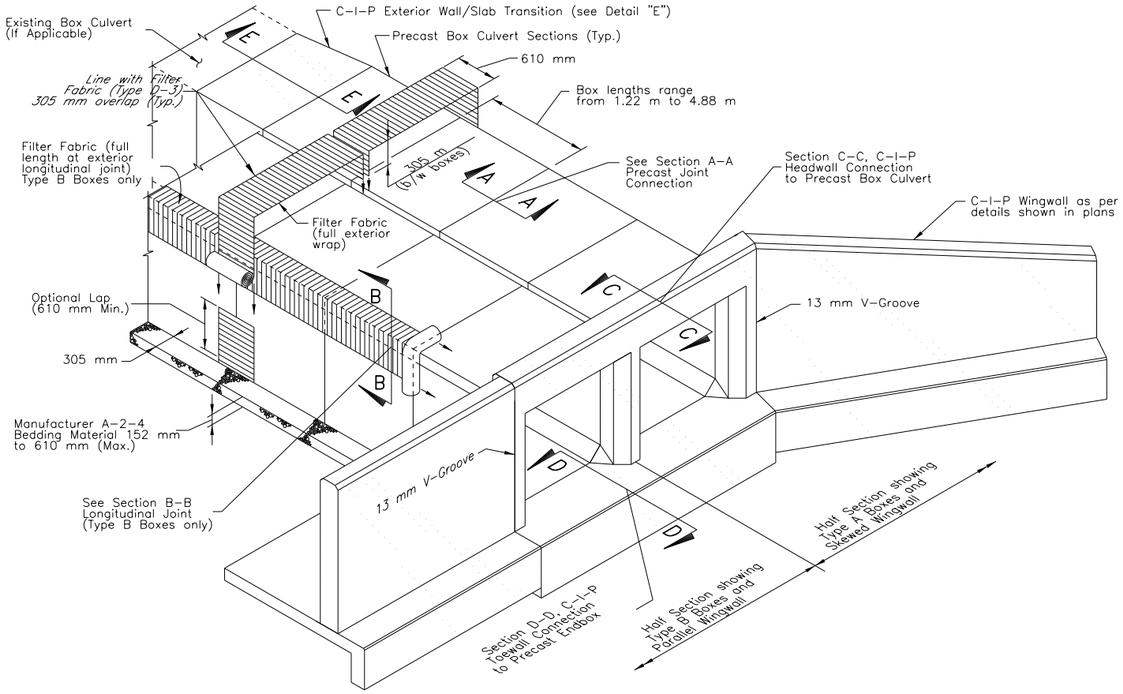
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	61	66



ISOMETRIC VIEW OF PRECAST CONCRETE BOX CULVERT

ISOMETRIC VIEW OF PRECAST CONCRETE BOX CULVERT
(Double Barrel Culvert shown,
Single or Multiple Barrel Culvert similar)

GENERAL NOTES

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

2. THE CONTRACTOR SHALL DESIGN, MANUFACTURER, AND CONSTRUCT A FOUR BARREL PRE-CAST CONCRETE BOX CULVERT STRUCTURES WITH WINGWALLS IN ACCORDANCE WITH ASTM C-1501-04 AND DESIGN CRITERIA BELOW. THE DESIGN SHALL INCLUDE DETAILS OF THE CULVERT BARREL, HEADWALLS, APRONS, WINGWALLS AND FOUNDATIONS INCLUDING DRAINAGE AND BACKFILL REQUIREMENTS. THE NORMAL OPENING WIDTH AND HEIGHT OF THE CBC SHALL BE 3.048m BY 3.048m. THE REQUIRED MINIMUM LENGTH OF STRUCTURE AND ORIENTATION OF WINGWALLS IS SHOWN ON THE DRAWINGS. JOINTS IN THE BOX SHALL BE SEALED TO PREVENT WATER LEAKAGE USING AN APPROVED JOINT COMPOUND CONFORMING TO ASTM C 990 AS REFLECTED IN THE SHOP DRAWINGS.

3. PRE-CASTER QUALIFICATIONS:
   - A. SUPPLIERS MUST HAVE A MINIMUM OF 5-YEARS EXPERIENCE DESIGNING AND MANUFACTURING PRECAST CONCRETE BOX STRUCTURES.
   - B. PRECASTER SHALL BE CERTIFIED BY THE PRECAST/PRESTRESSED CONCRETE INSTITUTE PLANT CERTIFICATION PROGRAM OR THE NATIONAL PRECAST CONCRETE ASSOCIATION'S PLANT CERTIFICATION PROGRAM PRIOR TO AND DURING PRODUCTION OF THE PRODUCTS COVERED UNDER THIS CONTRACT.
   - C. PRECAST BOX CULVERT SUPPLIER MUST BE PRESENT AT PRE-CONSTRUCTION MEETING, IF ONE IS HELD.

4. SUBMITTAL REQUIREMENTS: SUBMIT PRECASTER QUALIFICATIONS. SUBMIT A COMPLETE SET OF STRUCTURAL CALCULATIONS, SHOP DRAWINGS, PERTINENT STANDARD DETAILS AND PRODUCT DATA OF ALL MATERIALS TO BE USED IN THE MANUFACTURER OF PRECAST UNITS AND COMPONENTS. IF CALCULATIONS ARE BASED ON COMPUTER PROGRAMS, COMPLETE INPUT FILES OF GEOMETRY, MATERIALS PROPERTIES, MEMBER SIZES AND DESIGN ANALYSIS AND CALCULATION OF REINFORCING STEEL SHALL BE SUBMITTED. CALCULATIONS AND ALL DRAWINGS SHALL BE SIGNED AND SEALED BY A LICENSED PROFESSIONAL ENGINEER LICENSED IN THE STATE WHERE THE PROJECT RESIDES AND WHO IS RESPONSIBLE FOR THEIR PREPARATION. THE DIMENSIONS SHOWN ON THE SHOP DRAWINGS SHALL BE PREPARED IN METRIC UNITS.

5. SUBSTITUTION: PRECAST MANUFACTURER MAY SUBMIT A DIFFERENT TYPE OF BOX CULVERT THAN THE ONE DEPICTED ON THE DRAWINGS, PROVIDED THAT THE MINIMUM OPENING AREA OF BOX UNITS IS PROVIDED AND OTHER MINIMUM AND MAXIMUM DIMENSIONS ARE MAINTAINED. THE NET OPENING AREA SHALL NOT BE LESS THAN THAT SHOWN IN THESE DESIGN PLANS. ANY PROPOSED CHANGES IN LENGTH OR HEIGHT OF STRUCTURE OR IN GRADING SHALL BE INCLUDED IN THE DESIGN CALCULATIONS AND DETAILS.

6. DESIGN CRITERIA:
   - A. DESIGN CODE: LATEST EDITION OF THE AASHTO LRFD DESIGN SPECIFICATIONS.
   - B. LIVE LOAD: HL-93 FOR BOX UNITS ONLY.

7. MATERIAL PROPERTIES:
   - A. PRECAST CONCRETE COMPRESSIVE STRENGTH: 34.5 MPa (5,000 psi) AT 28-DAYS.
   - B. CAST-IN-PLACE CONCRETE: FP-03, f'c = 20.7 MPa (3,000 psi) MIN AT 28-DAYS.
   - C. ALL CONCRETE SHALL BE AIR ENTRAINED.
   - D. REINFORCING STEEL: ASTM A615, fy=413.7 MPa (60,000 psi) EPOXY COATED
   - E. STEEL HARDWARE: ASTM A36, GALVANIZED IN ACCORDANCE WITH ASTM-123.
   - F. ALLOWABLE BEARING PRESURE: 143kPa/sm (1.33t/SF).
   - G. HEIGHT OF FILL OVER BOX: 0.972m or 2045kg/cm.
   - H. ANGLE OF INTERNAL FRICTION Ø: 34 degrees

8. A GEOTECHNICAL DATA IS AVAILABLE FOR BIDDER'S INSPECTION UPON WRITTEN REQUEST TO THE CONTRACTING OFFICER (CO). THE CONTRACTOR MAY CONDUCT HIS OWN GEOTECHNICAL INVESTIGATIONS AND PROPOSE A DIFFERENT FOUNDATION CONCEPT SUBJECT TO REVIEW AND APPROVAL BY THE BIA-NRDOT. THE FOLLOWING IS A PARTIAL LIST OF DESIGN INFORMATION TO BE USED:
   - A. CANTILEVERED WINGWALLS:
     1. LEVEL BACKFILL: SOIL PRESSURE EQUIVALENT TO FLUID WITH UNIT WEIGHT OF 560 kg PER CUBIC METER (115 pcf), HORIZONTAL PRESSURE DUE TO A SURCHARGE LOAD: 342kg/sm UNIFORM PRESSURE EQUAL TO 0.33 TIMES THE SURCHARGE LOAD.
     2. SLOPING BACKFILL: SOIL PRESSURE EQUIVALENT TO FLUID WITH UNIT WEIGHT OF 342kg PER CUBIC METER (115 pcf), HORIZONTAL PRESSURE DUE TO A SURCHARGE LOAD: UNIFORM PRESSURE EQUAL TO 0.40 TIMES THE SURCHARGE LOAD.
   - B. BELOW GRADE REINFORCED CONCRETE BOX: NON-YIELDING BELOW GRADE WALLS WHICH CANNOT DEFLECT TO MOBILIZE THE ACTIVE SOIL PRESSURE SHOULD BE DESIGN FOR THE AT-REST LATERAL EARTH PRESSURE STATE EQUAL TO AN EQUIVALENT FLUID LATERAL EARTH PRESSURE OF 8.5 kN PER CUBIC METER (178 pcf).
   - C. FACTOR OF SAFETY AGAINST SLIDING: 1.5 MINIMUM. FACTOR OF SAFETY AGAINST OVERTURNING: 1.5 MINIMUM FOR FOOTINGS ON ROCK AND 2.0 FOR ALL OTHER SOILS.
   - D. ALLOWABLE BEARING PRESSURE: 143 kPa (1.33 Ton per ft^2), TO SUPPORT ON SPREAD FOOTINGS PLACED ON THE UNDISTURBED SANDY-SILT SOILS.
   - E. COEFFICENT OF BASE FRICTION = 0.37 FOR FOUNDATIONS FOUNDED ON SANDY-SILT SOILS.

9. THE TOP LAYER OF UNSUITABLE SOIL UNDER BOX UNITS AND WINGWALLS SHALL BE REMOVED TO A MAX DEPTH OF 610mm AND MANUFACTURER RECOMMENDED (A-2-4) BACKFILL PLACED PRIOR TO CONSTRUCTING CONCRETE FOUNDATION FOR PRECAST UNITS AND ANY WINGWALLS.

10. ALL DIMENSIONS ARE IN METRIC UNITS.

11. MANUFACTURER: MANUFACTURING OF PRECAST UNITS SHALL NOT BE STARTED UNTIL THE DESIGN CALCULATIONS AND SHOP DRAWINGS HAVE BEEN APPROVED BY THE BIA-NRDOT. MANUFACTURE PRECAST UNITS AT THE PRECASTER'S PLANT ONLY.

12. CONSTRUCTION: CONTRACTOR SHALL COORDINATE INSTALLATION OF THE PRECAST STRUCTURE TO PREVENT DAMAGE. PROVIDE CRANES WITH SUFFICIENT CAPACITY TO ALLOW SAFE INSTALLATION OF THE STRUCTURE. IF ANY PRECAST UNIT IS CRACKED OR DAMAGED, THE PRECAST UNITS SHALL BE REPLACED AT NO ADDITIONAL COST TO THE GOVERNMENT. THE CONTRACTOR SHALL SUBMIT A PROCEDURE FOR REPAIR OF MINOR SPALLS FOR THE CO'S APPROVAL.

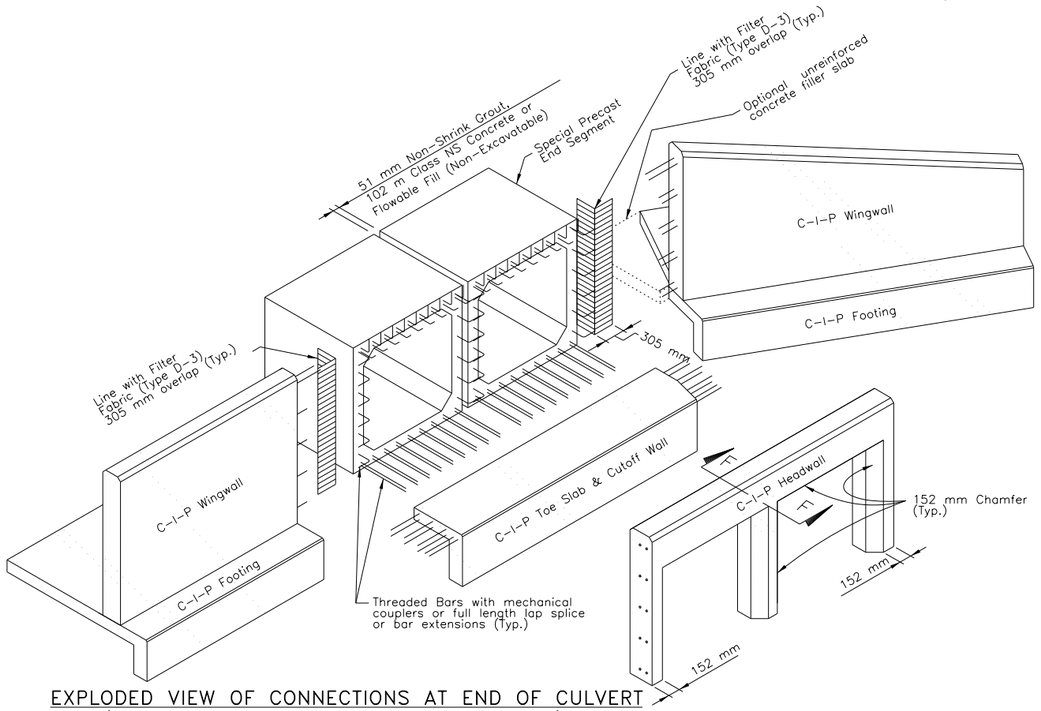
13. EACH PRECAST UNIT SHALL BE JOINED TOGETHER BY A METHOD RECOMMENDED BY THE MANUFACTURER THAT DOES NOT CAUSE ANY DAMAGE TO THE SECTIONS. DO NOT DRIVE OR RAM SECTIONS TOGETHER WITH MACHINERY OR HAND TOOLS.

14. BASIS OF PAYMENT: PAYMENT FOR DESIGN, MANUFACTURER, AND ERECTION OF THE COMPLETE STRUCTURE, INCLUDING THE BOX BARREL(S), CONCRETE APRONS, WINGWALLS, HEADWALLS, CAST-IN-PLACE FOUNDATIONS, ROCK REMOVAL FOR WINGWALL FOOTINGS, AND DRAINAGE SYSTEM SHALL BE PAID FOR BY LUMP SUM OR LINEAR METER AS REFLECTED IN THE BID SCHEDULE.

15. ANY RELATED PATENT RIGHTS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AS PER SECTION 107.01 OF THE FP14.

STANDARD CRITERA

CLASS	TYPE (1)	APPLOCATION DESCRIPTION	INDEX No.	PERMITTIVITY SEC^{-1}	AOS SIEVE #	Min. GRAB TENSILE STRENGTH kg	Min. SEWN STRENGTH kg/cm	Min. PUNCTURE kg	Min. TRAPEZODIAL TEAR kg	UV RESISTANCE (Min. Allowed) %	UV RESISTANCE (Min. Allowed) Time (Hrs.)	REMARKS
DRAINAGE (D)	D-3	Underdrain ***	286	% SOIL PASSING	% SOIL PASSING	Elongation	Elongation	Elongation	Elongation	50	500	No woven slit film fabrics allowed.50 sieve. * For cohesive soils with plasticity index >7, maximum average role value AOS is number ** Required Trapezoidal tear for woven monofilament is 250. *** See Index No. 286 for the permittivity and AOS values of the
		French Drain	285	No. 200 SIEVE	No. 200 SIEVE							
		Sheet Piling Filter		<15% 0.5	<15% 40							
		Filter Fabric Jacket (Culvert)	280	15% to 50% 0.2	15% to 50% 60	<50% 248 ≥ 50% 128	<50% 5.7 ≥50% 3.6	<50% 90 ≥ 50% 57	<50% 90** ≥ 50% 57			
		Concrete Pavement Subdrainage	287	>50% 0.1	>50% 70*							



EXPLODED VIEW OF CONNECTIONS AT END OF CULVERT

(Double Barrel Culvert shown, Single or Multiple Barrel Culvert similar)

PERMITTED PRECAST ALTERNATE BOX SECTIONS

TYPE	DESCRIPTION	SINGLE BARREL	MULTIPLE BARRELS	DESIGN NOTES
A	Single Cell Monolithic (Four Sided)			Contractor Design
B	Single Cell Two-Piece (Four Sided)	Three sided bottom section; Top slab section		Contractor Design
C	Multicell Monolithic	Not Applicable		Contractor Design

TABLE 1

Test	Unit	Test Method
Permittivity	sec^{-1}	ASTM-D-4491
AOS	US Sieve No.	ASTM-D-4751
Elongation	%	ASTM-D-4632
Grab Tensile Strength	kg	ASTM-D-4595
Wide With Tensile Strength	kg/cm	See Note Below
Maximum Design Velocity	m/sec	ASTM-D-4884
Sewn Strength	kg/cm	ASTM-D-4833
Puncture	kg	ASTM-D-4533
Tranapezoidial Tear	kg	ASTM-D-4355
Ultraviolet Resistance	% Retained In Strength	
Filtration Efficiency	%	ASTM-D-5141
Flow Rate	L^3/ min.	ASTM-D-5141

*Note: Shear stress limits for plastic erosion mats determined by 30 minutes susutained flow in unvegatated state as determined by tests performed by Utah State University, Texas Transportation Institute or and independent testing approved

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

PRECAST CONCRETE BOX CULVERTS ISOMETRIC DETAILS

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: B4	

Registered Professional Engineer (Civil) CERTIFICATE NO. 25015 ANDREW JOHN SPEAR State of Arizona

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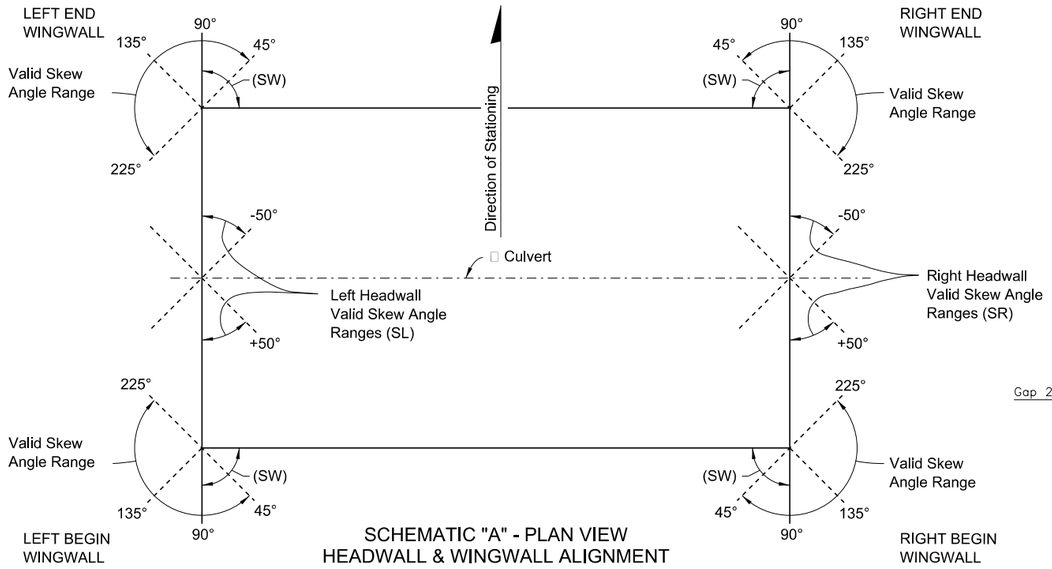
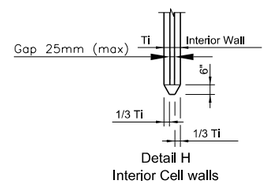
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	62	66

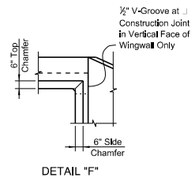


SCHEMATIC "A" - PLAN VIEW
HEADWALL & WINGWALL ALIGNMENT

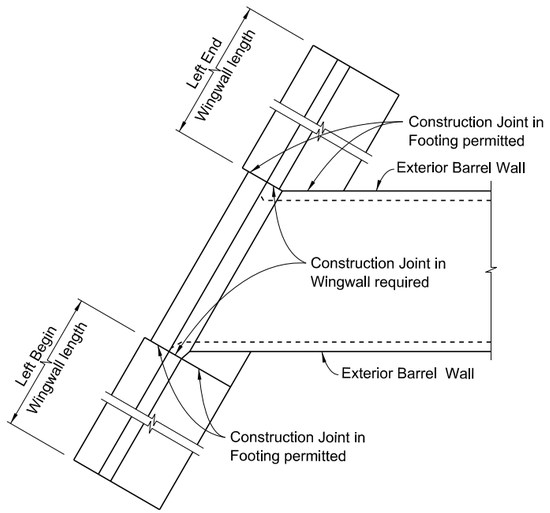
NOTE: All headwall and culvert skew angles are measured in degrees from a line perpendicular to the centerline of culvert (counter-clockwise positive), see Schematic "B".



Detail H
Interior Cell walls

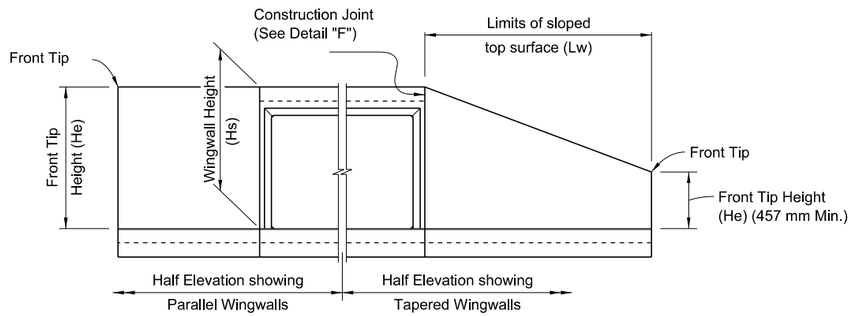


DETAIL "F"



PART PLAN SHOWING PARALLEL WINGWALLS
AND LOCATION OF CONSTRUCTION JOINTS

NOTE:
Construction Joints in wingwalls and footings are located as follows: For non-skewed wingwalls they are located adjacent to the exterior face of the exterior barrel wall; when the CL of wingwall and CL of exterior barrel wall results in an acute angle see Left End Wingwall above, and when the angle is obtuse see Left Begin Wingwall above and Detail C.



END ELEVATION
OF CULVERT

1. For small angles, the Contractor may elect to fill the area between the box and the wingwall footing with unreinforced concrete. For wingwall skew angles less then 90 degrees, field bend wingwall reinforcement as necessary while maintaining cover. No additional payment will be made for this work.

GENERAL NOTES:

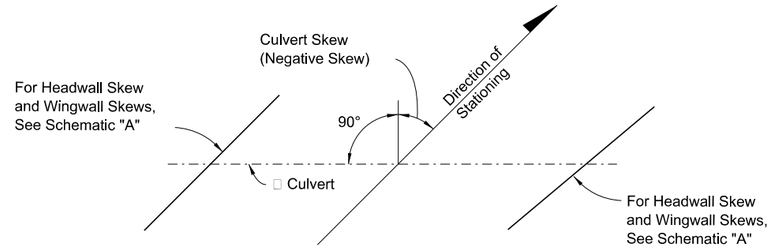
LIVE LOAD: HL-93.

CONSTRUCTION LOADING: It is the construction Contractor's responsibility to provide for supporting construction loads that exceed AASHTO HL-93, and any construction load applied prior to 610 mm of compacted fill placed above the top slab.

SURFACE FINISH: All concrete surfaces shall receive a Class I finish per Section 552.16(a)

SKEWED CONSTRUCTION JOINTS: Construction joints in barrels of culverts with skewed wingwalls may be placed parallel to the headwalls and the reinforcing steel, and the slabs may be cut provided that the cut reinforcing steel extends beyond the construction joint enough for splices to be made in accordance with Table 1 on this sheet. The cost of construction joints and additional reinforcing shall be at the expense of the Contractor.

REINFORCING STEEL: See Sheet 14 for type, size, number, and reinforcing per meter requirements for wingwall and sheet 16 for precast box units.



SCHEMATIC "B" - PLAN VIEW
CULVERT ALIGNMENT

NOTE: For Culvert Skew see Contract Plans.

TABLE 1 - MINIMUM BAR SPLICE LENGTHS FOR LONGITUDINAL REINFORCING

BAR SIZE	SPLICE (CLASS A/AE) CLASS A(AE) (2344 mPa)	SPLICE (CLASS A/AE) CLASS A(AE) (3792 mPa)	BAR SIZE	SPLICE (CLASS B) CLASS A(AE) (2344 mPa)	SPLICE (CLASS B) CLASS A(AE) (3792 mPa)
#10M	305 mm	305 mm	#25M	1.067 m	838 mm
#13M	406 mm	406 mm	#29M	1.346 m	1.067 m
#16M	508 mm	508 mm	#32M	2,006 m	1,346 m
#19M	584 mm	584 mm	#36M	2.388 m	1.956 m
#22M	813 mm	686 mm			

TABLE 1 NOTE: Splice lengths are based on an AASHTO Class B tension lap splice for the Specification Section 552 concrete class shown.

NAVAJO D.O.T.

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

PRECAST CONCRETE BOX WINGWALL PLAN DETAILS

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: B5	

Registered Professional Engineer (Civil) CERTIFICATE NO. 25015 ANDREW JOHN SPEAR Date Signed 5/16/22 ARIZONA U.S.A.

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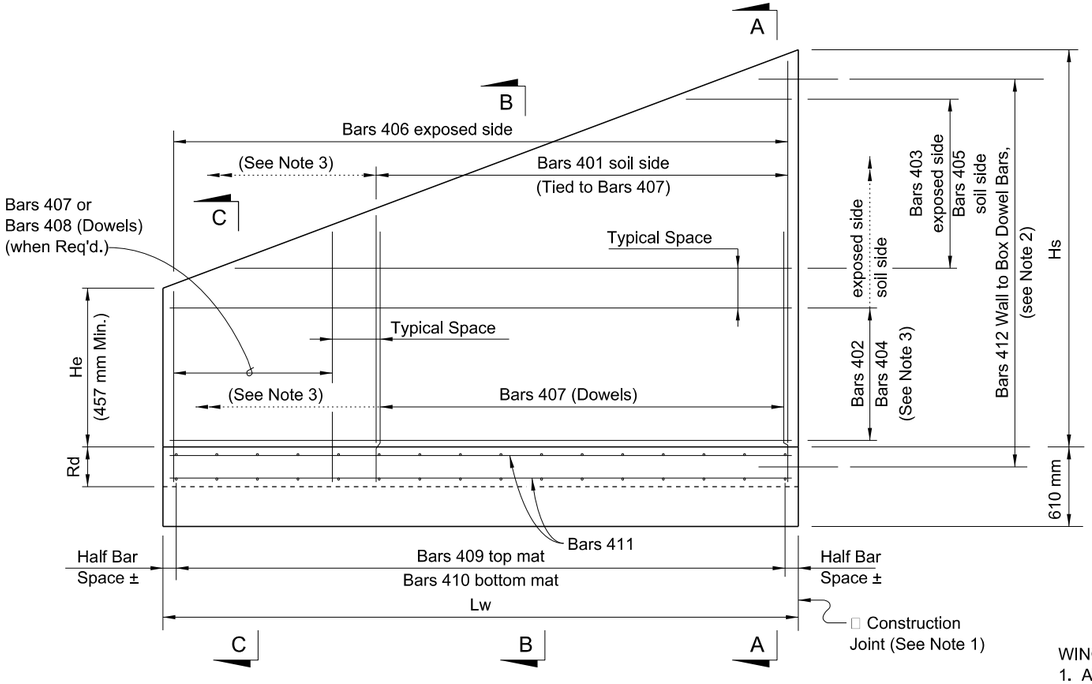
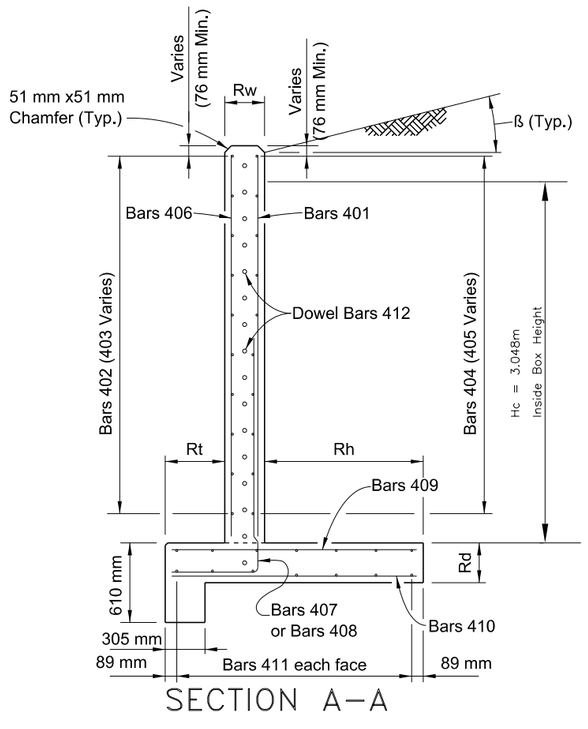
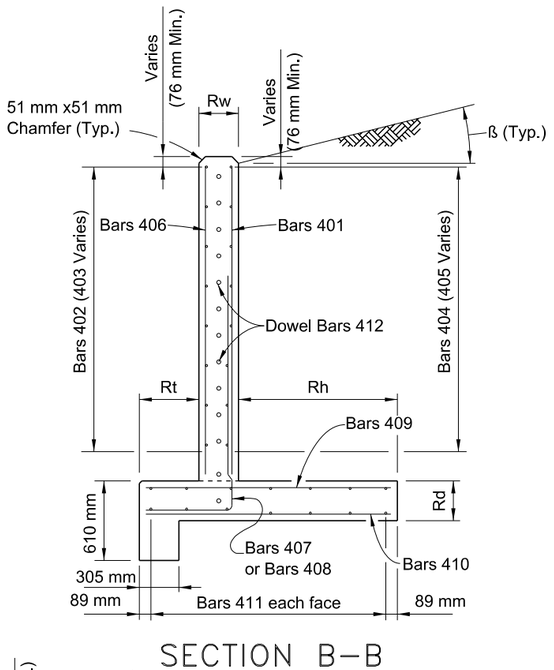
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	63	66



WINGWALL ELEVATION - Variable Height
(Left End shown - other corners similar)



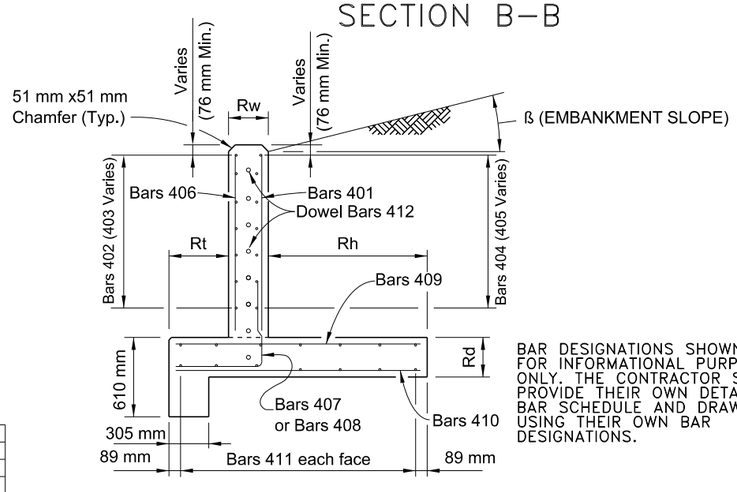
SECTION A–A



SECTION B–B

WINGWALL NOTES:

1. Align construction joint perpendicular to wingwall.
2. In the vicinity of the construction joint, field bend reinforcement as necessary to maintain minimum reinforcement cover.
3. For constant height wingwalls, variable length Bars 403, 405 & 408 are not required, and as such the limits of Bars 401 & 407 extend the full length of the wingwall, and the limits of Bars 402 & 404 extend to the full height of the wingwall.
4. Contractor is resonsible for determiming all bar lengths dimensions for the barrel, wingwall and concrete apron reinforcement in accordance with table on drawing, using the bar designations shown and provide shop plans for review.



SECTION C–C

BAR DESIGNATIONS SHOWN ARE FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR SHALL PROVIDE THEIR OWN DETAIL BAR SCHEDULE AND DRAWINGS USING THEIR OWN BAR DESIGNATIONS.

BOX, HEADWALL AND CUTOFF WALL DATA TABLE (mm unless shown otherwise) — Table date: 4–17–14

LOCATION:	STRUCTURE / BRIDGE NUMBER	BOX									HEADWALL AND CUTOFF WALL									
		Wc (m)	Hc (m)	Tt	Tw	Tb	Ti	#cells	Lc (m)	Cover	Blhw	Hlhw	Brhw	Hrhw	Blcw	Hlcw	Brcw	Hrcw	SL(deg)	SR(deg)
30+310.00		3.048	3.048	254	254	254	229	44	26.822	51	305	356	305	356	356	914	305	914	30	30

LEFT SIDE WINGWALLS DATA TABLE (mm unless shown otherwise) — Table date: 4–17–14

STRUCTURE / BRIDGE NUMBER	LEFT END WINGWALL									LEFT BEGIN WINGWALL								
	Rt	Rw	Rh	Rd	SW (deg)	B (deg)	He (m)	Hs (m)	Lw (m)	Rt	Rw	Rh	Rd	SW (deg)	B (deg)	He (m)	Hs (m)	Lw (m)
	548	254	1105	292	30	18.43	0.152	3.658	10.420	548	254	1105	292	30	18.43	0.152	3.658	5.867

RIGHT SIDE WINGWALLS DATA TABLE (mm unless shown otherwise) — Table date: 4–17–14

STRUCTURE / BRIDGE NUMBER	RIGHT END WINGWALL									RIGHT BEGIN WINGWALL								
	Rt	Rw	Rh	Rd	SW (deg)	B (deg)	He (m)	Hs (m)	Lw (m)	Rt	Rw	Rh	Rd	SW (deg)	B (deg)	He (m)	Hs (m)	Lw (m)
	548	254	1105	292	30	18.43	0.152	3.658	5.867	548	254	1105	292	30	18.43	0.152	3.658	13.006

WINGWALL REINFORCEMENT AREA (mm2 per linear meter) — Table date: 4–17–14

Wall Height (m)	Stem Wall (back face)	Stem Wall T&S (back face)	Stem Wall (front face)	Stem Wall T&S (front face)	Footing (top mat)	Footing T&S (top mat)	Footing (bottom mat)	Footing T&S (bottom mat)
4.267	1968	423	423	423	1968	423	423	423
3.048	1312	423	423	423	1312	423	423	423
2.134	847	423	423	423	847	423	423	423
1.219	423	423	423	423	423	423	423	423
0.610	423	423	423	423	423	423	423	423

Wingwall Note: Bar designations in "( )" are only required for variable height wingwalls.

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

CONCRETE BOX CULVERT WINGWALLS DETAIL

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: B6	

Registered Professional Engineer — CERTIFICATE NO. 25015 — ANDREW JOHN SPEAR — New Mexico — 5/16/22 — Navajo Nation

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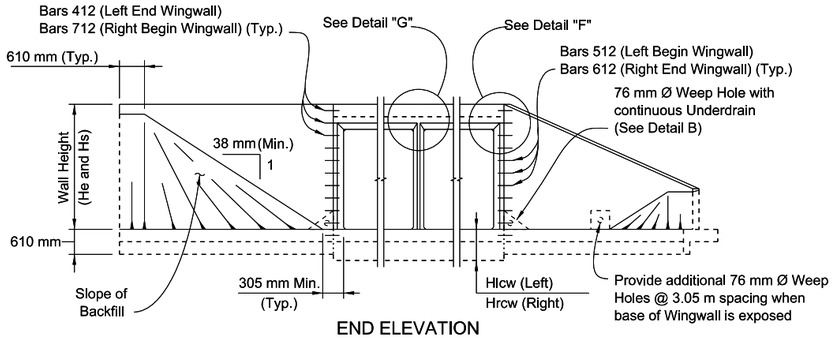
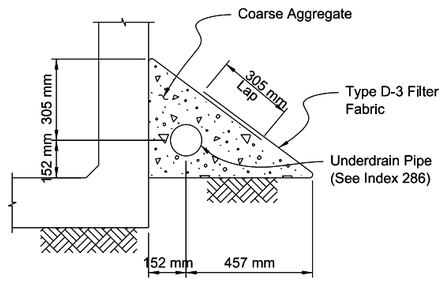
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	64	66



END ELEVATION
(Showing Constant Height And
Variable Height Wingwalls)



DETAIL "B"
UNDERDRAIN DETAIL
(Similar to Type II)

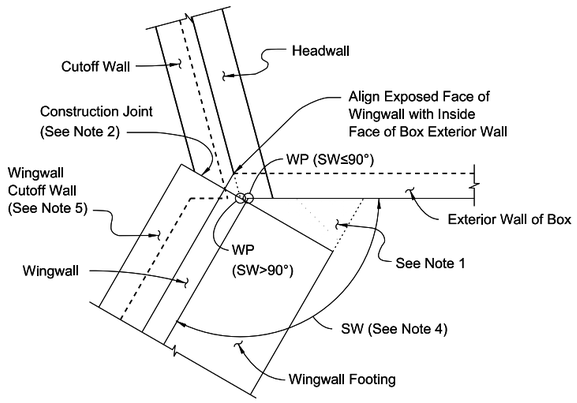
NOTES:
1. For small angles, the Contractor may elect to fill the area between the box and the wingwall footing with unreinforced concrete. For wingwall skew angles less then 90 degrees, field bend wingwall reinforcement as necessary while maintaining cover. No additional payment will be made for this work.

2. Location of Construction Joint determined by WP at theoretical intersection of: - Soil side face of Headwall and outside face of Box Exterior Wall, for SW≤90°; - Outside face of Wingwall and outside face of Box Exterior Wall, for SW>90°.

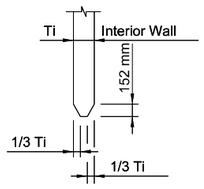
3. Provide 152 mm chamfer when angle 'A' is greater than 45°. Maintain minimum wall thickness. Field adjust reinforcing to maintain cover.

4. Wingwall Skew Angles (SW) are measured from the adjacent box exterior wall to the wingwall.
5. Turn or extend Wingwall Cutoff Wall as necessary to meet Box Cutoff Wall.

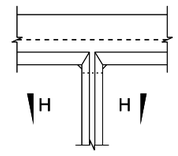
6. Provide additional reinforcement in the top of the top slab below traffic railings to ensure a minimum area of 0.80 sq. in./ft. transverse reinforcing.



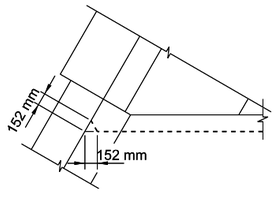
DETAIL "C" - PLAN VIEW
WINGWALL TO BOX CONNECTION
(Left Begin Corner Shown, Other Corners Similar)



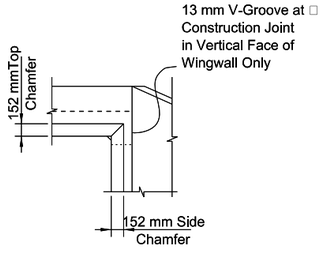
SECTION H-H
Ti = 229 mm



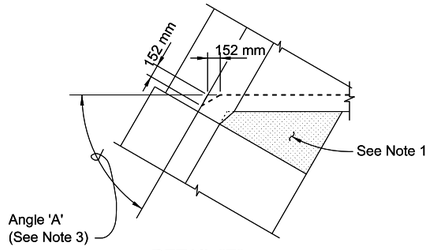
DETAIL "G"



DETAIL "D"



DETAIL "F"



DETAIL "E"

CROSS REFERENCE:
See Sheet 53 for locations of Details "D", "E", "J" & "K".
See Sheet 54 for locations of Detail "C".

NAVAJO D.O.T.

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

WINGWALL TO BOX CONNECTION DETAIL

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: B7	

Registered Professional Engineer
CERTIFICATE NO.
25015
ANDREW JOHN
SPEAR
New Mexico
NAVAJO NATION

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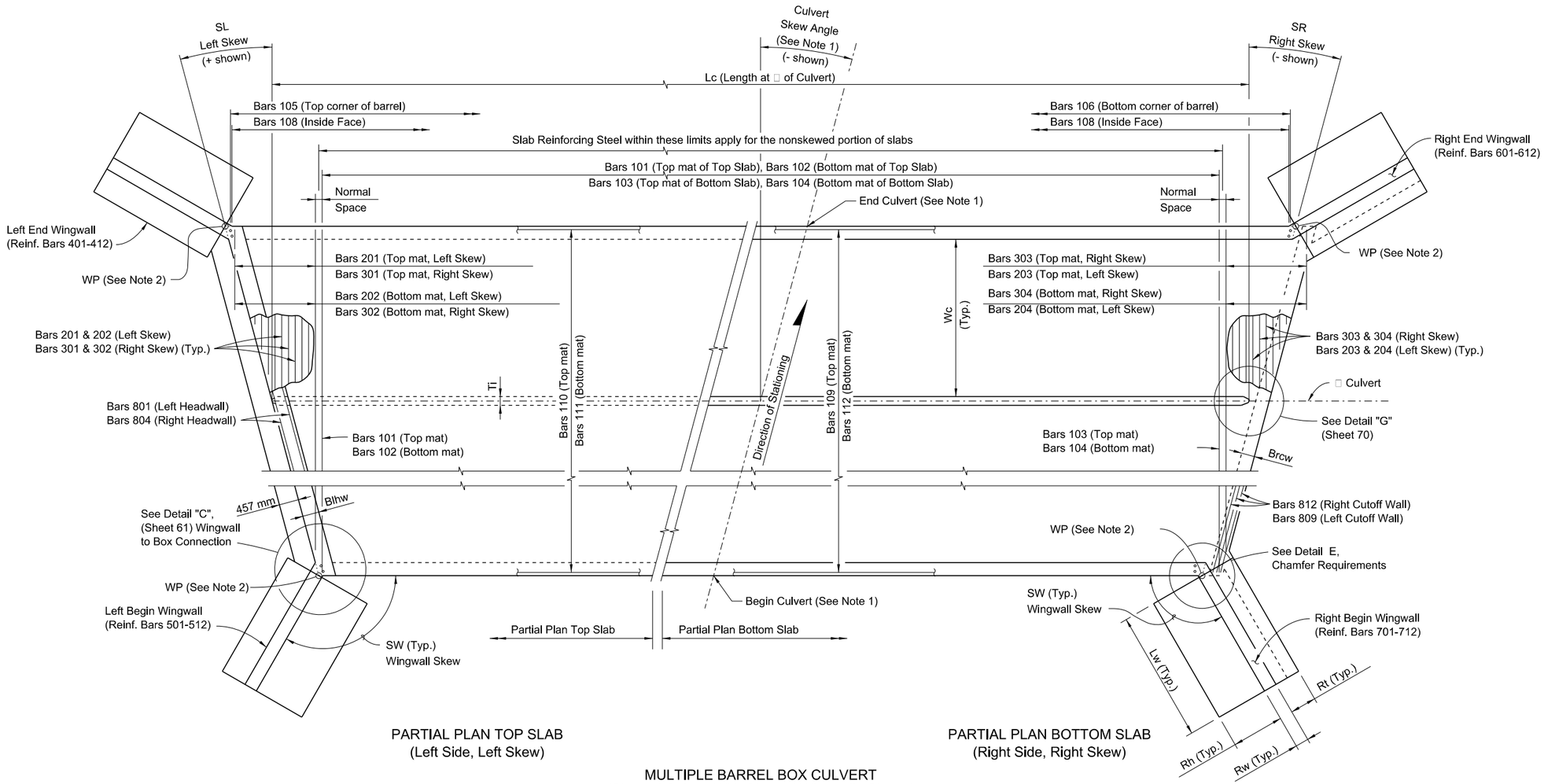
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	65	66



PARTIAL PLAN TOP SLAB
(Left Side, Left Skew)

PARTIAL PLAN BOTTOM SLAB
(Right Side, Right Skew)

MULTIPLE BARREL BOX CULVERT
(Skewed Culvert With Skewed Wingwalls Shown)

NOTES:
1. See Contract Plans Sht 7 & 80 for Culvert Location, Culvert Skew Angle and Roadway Cross Section.
2. WP = Working Point, used for wingwall layout and location of construction joint. See Detail C (Sheet 61).

NAVAJO D.O.T.

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

MULTIPLE BARREL BOX CULVERT LAYOUT DETAILS

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: B8	

Registered Professional Engineer
CERTIFICATE NO.
25015
ANDREW JOHN
SPEAR
STATE OF NEW MEXICO
NATIONAL ENGINEER

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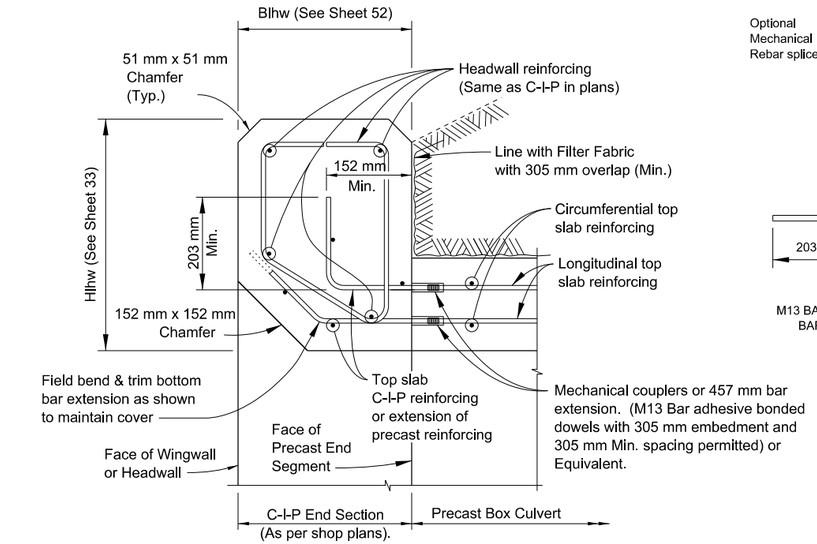
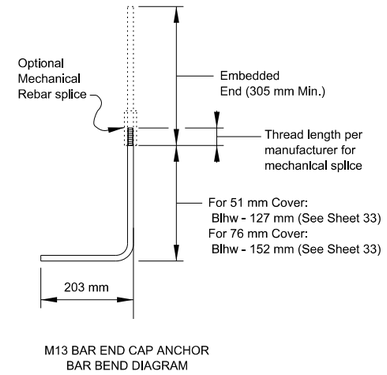
ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
N35	N35(8)1,2&4	66	66

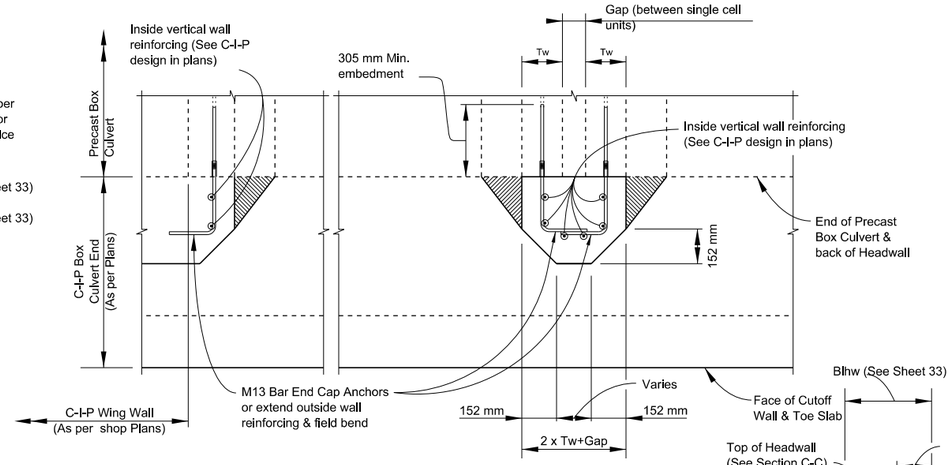


SECTION C-C

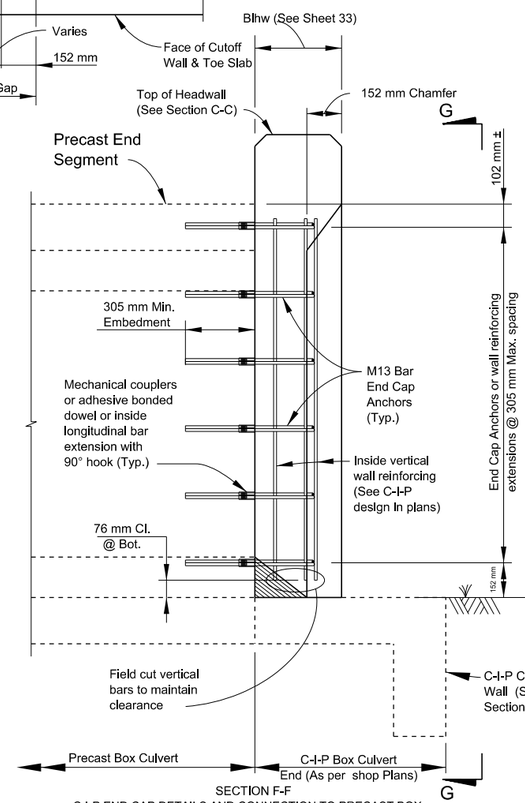
C-I-P HEADWALL DETAILS AND CONNECTION TO PRECAST BOX



M13 BAR END CAP ANCHOR BAR BEND DIAGRAM

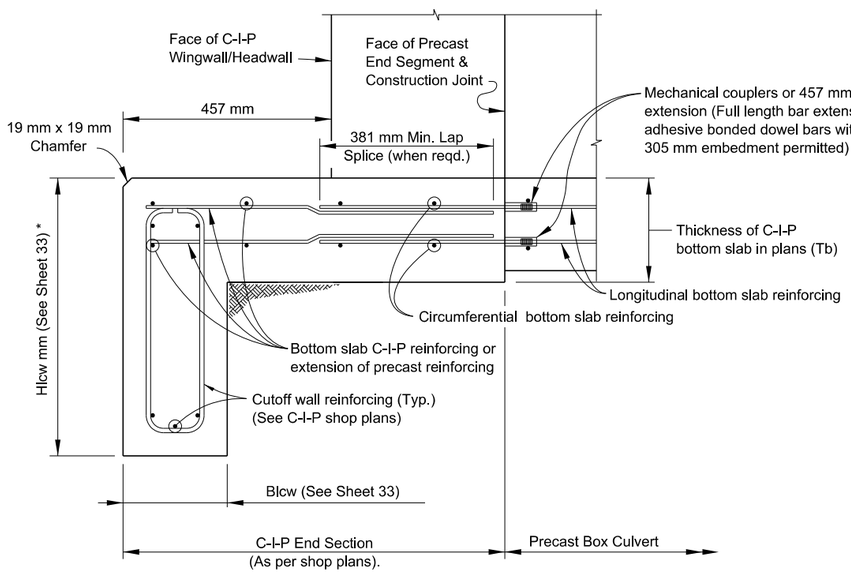


SECTION H-H



SECTION F-F

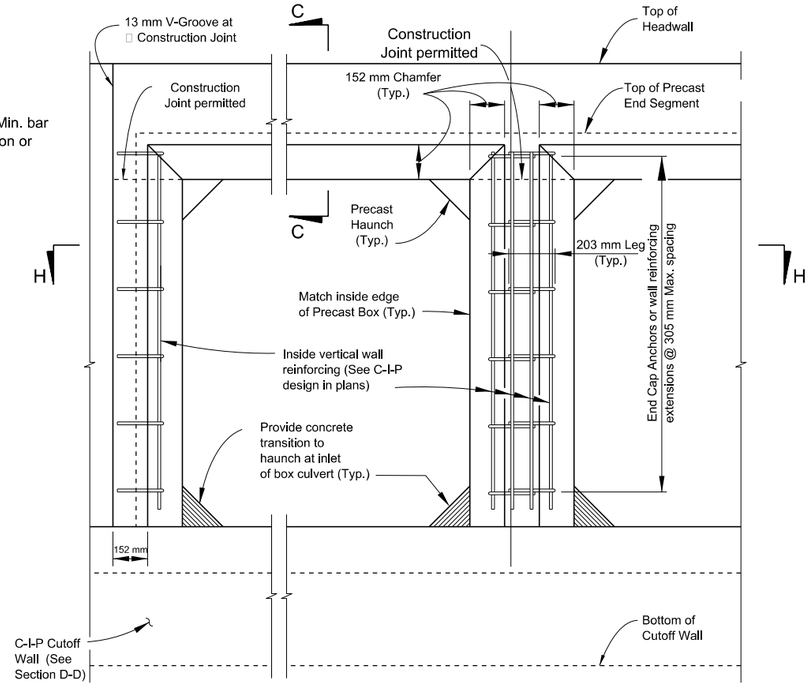
C-I-P END CAP DETAILS AND CONNECTION TO PRECAST BOX



SECTION D-D

C-I-P TOE SLAB & CUTOFF WALL DETAILS AND CONNECTION TO PRECAST BOX

* Provide additional 152 mm depth of cutoff wall at no additional cost.



VIEW G-G

(Headwall, Toe Slab and Cutoff Wall Reinforcing not shown for clarity)

ELEVATION VIEW

BOX BLOCKOUT DETAILS

NAVAJO DIVISION OF TRANSPORTATION
DEPARTMENT OF ROADS

N35 SWEETWATER

BOX HEADWALL, CAP & CUTOFF WALL DETAILS

DESIGNED BY: AJS	REVISED:
DRAWN BY: DBB	BY:
DATE: 5/16/2022	DIBBLE
DWG: B9	

Registered Professional Engineer (Civil) CERTIFICATE NO. 25015 ANDREW JOHN SPEAR Date Signed 4/30/22 Arizona U.S.A.

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