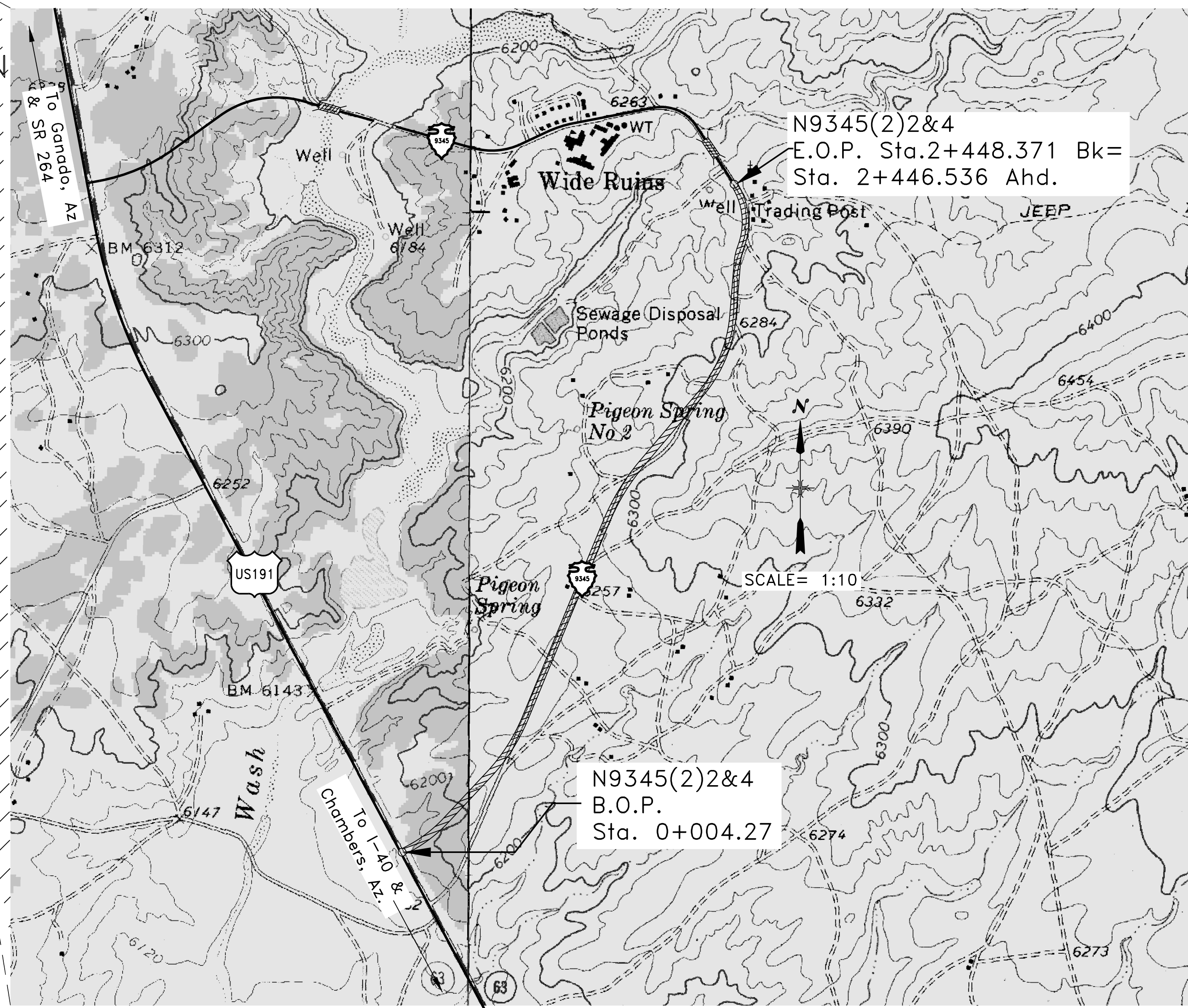




PROJECT N9345(2)2&4

PROJECT LOCATION

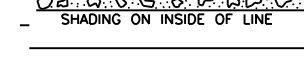
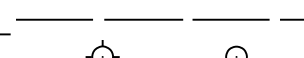
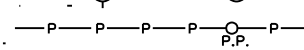
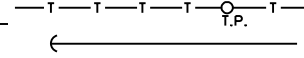
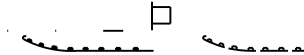
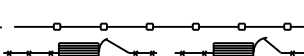
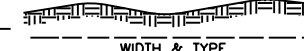
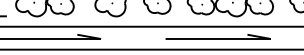
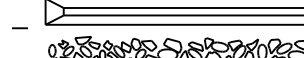
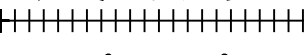
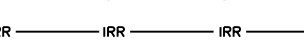
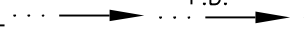
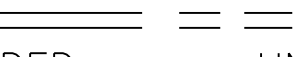
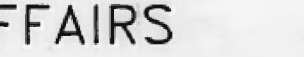
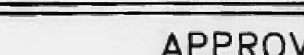


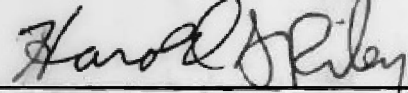
| LENGTH OF PROJECT         |          |           |
|---------------------------|----------|-----------|
| N9345(2)2&4 South         |          |           |
| STATION                   | METER    | KILOMETER |
| B.O.P. STA. 0+004.27      |          |           |
| STA. 2+448.371 Bk =       | 2444.101 | 2.44      |
| E.O.P. STA. 2+446.536 Ahd |          |           |
| TOTAL:                    | 2444.101 | 2.44      |

| DESIGN DATA                                 |                   |
|---------------------------------------------|-------------------|
| DESIGN SPEED . . . . .                      | 70 km/h           |
| MINIMUM RADIUS . . . . .                    | 203 m             |
| MAXIMUM GRADIENT . . . . .                  | -6.79 %           |
| MINIMUM STOPPING SIGHT DISTANCE . . . . .   | 105 m             |
| MINIMUM PASSING SIGHT DISTANCE . . . . .    | 485 m             |
| AVERAGE DAILY TRAFFIC (2002) . . . . .      | 284 vpd           |
| EST. AVERAGE DAILY TRAFFIC (2023) . . . . . | 431 vpd           |
| DESIGN HOURLY VOLUME (DHV) . . . . .        | 15 vph            |
| MAXIMUM SUPERELEVATION (e max.) . . . . .   | Normal Crown      |
| RIGHT-OF-WAY WIDTH . . . . .                | VARIABLE AS SHOWN |
| STA. 0+031.016 - STA. 0+800.00 . . . . .    | 30 m Lt.          |
| STA. 0+031.016 - STA. 1+752.54 . . . . .    | 30 m Rt.          |
| STA. 0+800.00 - STA. 1+140.00 . . . . .     | 15 m Lt.          |
| STA. 1+140.00 - STA. 1+752.54 . . . . .     | 30 m Lt.          |
| STA. 1+752.54 - E.O.P. . . . .              | VARIES LT.        |
| STA. 1+752.54 - E.O.P. . . . .              | VARIES LT.        |

| INDEX OF SHEETS |                                                            |
|-----------------|------------------------------------------------------------|
| SHEET No.       | DESCRIPTION                                                |
| 1               | TITLE SHEET                                                |
| 2               | TYPICAL CROSS SECTION & GENERAL NOTES                      |
| 3               | ESTIMATED QUANTITIES TABLES                                |
| 4               | DRAINAGE STRUCTURE QUANTITIES                              |
| 5 – 8           | PLAN & PROFILE SHEETS                                      |
| 9 – 16          | CONCRETE RETAINING WALL PLAN, PROFILES & DETAILS           |
| 17              | CONCRETE PANEL & COPING REINFORCING BAR LAYOUT DETAIL      |
| 18              | TEMPORARY TRAFFIC CONTROL                                  |
| 19              | TEMPORARY & PERMANENT TRAFFIC CONTROL DETAILS              |
| 20              | PERMANENT SIGNING DETAIL                                   |
| 21              | LAB SPLICE U-CHANNEL BREAKAWAY, POSTS AND HARDWARE DETAILS |
| 22              | STANDARD PIPE INSTALLATION AND DITCH DETAILS               |
| 23              | PIPE-ARCH INSTALLATION AND ELBOW DETAILS                   |
| 24              | STANDARD FLEXIBLE PIPE INSTALLATION DETAILS                |
| 25              | TURNOUTS AND GROUTED RIPRAP DETAILS                        |
| 26              | OLD ROADWAY OBLITERATION PLAN/CHECK DAM DETAILS            |
| 27– 30          | CATCH BASIN AND GROUTED RIPRAP DETAILS                     |
| 31 – 32         | STORMWATER POLLUTION & EROSION/SEDIMENT CONTRIL            |
| 33              | STANDARD FENCING DETAILS                                   |
| 34              | CATTLEGUARD AND WING BRACE DETAILS                         |
| 35              | PRE-CAST CONCRETE CATTLEGUARD DETAILS                      |
| 36              | MISCELLANEOUS DETAILS                                      |
| 37 – 39         | PIPE CROSS SECTION SHEETS                                  |

## 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              |  |
| TEMPORARY SAFTY 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         |  |
| TELEPHONE PEDESTAL            |  |
| FURROW DITCH                  |  |

| UNITED STATES<br>DEPARTMENT OF THE INTERIOR<br>BUREAU OF INDIAN AFFAIRS<br>NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION |                                                                                                            |
|--------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| <u>RECOMMENDED APPROVAL</u>                                                                                                    | <u>APPROVAL</u>                                                                                            |
| <br>AGENCY ROAD ENGINEER                  |                       |
| 8/17/2011<br>DATE                                                                                                              |                                                                                                            |
| <br>DIVISION MANAGER                      |                                                                                                            |
| 8/5/11<br>DATE                                                                                                                 |                                                                                                            |
| <br>PLANNING & DESIGN BRANCH CHIEF        |                                                                                                            |
| 8/11/2011<br>DATE                                                                                                              |                                                                                                            |
|                                                                                                                                | <br>REGIONAL DIRECTOR |

\\CURRENT\_PROJECTS\N36\_Ft\_Defiance\N9345(2)2&4\_092908\DESIGN\_DATA\_082908\CADD\_FILES\_082908\Microstation\_09282010\SHt\_2\_9345typ.dgn

|        |         |             |       |             |       |              |
|--------|---------|-------------|-------|-------------|-------|--------------|
| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 2     | 39           |

PROJECT: N9345(2)2&4

CONSTRUCTION PLANS APPROVED  
08/16/2011

RETAINING WALL LOCATION

| STATION TO STATION     | LOCATION | REMARKS                                 |
|------------------------|----------|-----------------------------------------|
| 0+277.707 to 0+523.357 | Lt.      | See 9 of 39 For Typical Section Detail  |
| 2+177.647 to 2+339.970 | Rt.      | See 12 of 39 For Typical Section Detail |
| 2+275.147 to 2+317.243 | Lt.      | See 12 of 39 For Typical Section Detail |

GENERAL NOTES--CONTINUATION

23. THE CONTRACTOR SHALL REMOVE EXISTING ROADSIDE SIGNS THAT INTERFERE WITH ROAD CONSTRUCTION AND/OR CONTRADICT THE CONTRACTOR'S TEMPORARY TRAFFIC CONTROL PLAN, AT THE START OF THE CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE COR/AOTR AT LEAST THREE (3) WORKING DAYS IN ADVANCE OF SUCH SIGN REMOVAL. THESE ROADSIDE SIGNS SHALL BE SALVAGED AND TAKEN TO THE FORT DEFIANCE MAINTENANCE YARD. SIGNS NEEDED FOR SAFETY/INFORMATION SHALL BE TEMPORARILY RESET AS DIRECTED BY THE COR/AOTR. THIS WORK SHALL BE CONSIDERED AN INCIDENTAL OBLIGATION OF THE CONTRACTOR.

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

25. 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. ANY EXISTING R/W MONUMENTS AND BRASS CAPS MISSING SHALL BE RE-SURVEYED IN TO AS CLOSE TO THEIR ORIGINAL POSITION AS POSSIBLE 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.

26. DUE TO NARROW RIGHT-OF-WAY WIDTHS, THE COMPLETE TURNOUT RADIUS CAN NOT BE CONSTRUCTED AT NUMEROUS TURNOUTS. AT THESE LOCATIONS THE CONTRACTOR SHALL CONSTRUCT THE PLANNED RADIUS, BUT END THE RADIUS AT THE RIGHT-OF-WAY LIMIT. THE ACTUAL TURNOUT WIDTH (AT THE RIGHT-OF-WAY LINE) WILL BE WIDER THAN THE WIDTH GIVEN ON THE PLANS.

27. THERE ARE A NUMBER OF ARCHAEOLOGICAL SITE MITIGATIONS THAT ARE NOTED ON THE PLANS. THE CONTRACTOR SHALL NOTIFY THE NAVAJO NATION HISTORIC PRESERVATION DEPARTMENT (NNHPD) AS REQUIRED PRIOR TO STARTING CONSTRUCTION ACTIVITY. SEE THE SPECIAL CONTRACT REQUIREMENT SECTION OF THE CONTRACT FOR ADDITIONAL INFORMATION, AND REQUIREMENTS. THE CONTRACTOR SHALL PLACE TEMPORARY FLEXIBLE SAFETY FENCE SYSTEMS AROUND THE ARCHAEOLOGY SITE(S) AS SHOWN ON THE PLANS. THE FENCING MATERIAL SHALL BE SQUARE LINK (ORANGE COLOR) PLASTIC TYPE MADE OF HI-DENSITY HDPE. ALL THE RETAINING WALLS MUST BE CONSTRUCTED BEFORE ANY FURTHER GRADING WORK CAN TAKE PLACE. SEE NOTE 34 BELOW FOR ADDITIONAL REQUIREMENTS.

28. THE GEO-TECHNICAL REPORT FOR THIS PROJECT SHALL BE PROVIDED UPON WRITTEN REQUEST TO THE CONTRACTING OFFICER.

29. ROADWAY AND PIPE CROSS SECTION DRAWINGS WILL BE PROVIDED IN EITHER HARD COPY OR ELECTRONIC FORMAT UPON WRITTEN REQUEST TO THE CONTRACTING OFFICER.

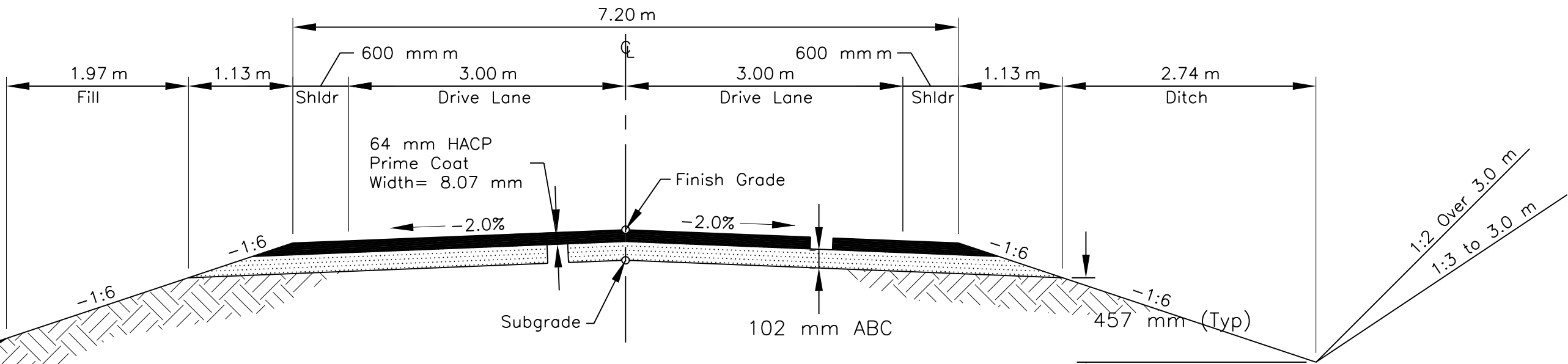
30. ANY EXISTING MAIL BOXES, ADVERTISING BILLBOARDS, OR HOUSE ADDRESS SIGNS LOCATED ALONG THE ROADWAY PRISM SHALL BE REMOVED AND RE-INSTALLED OUTSIDE OF THE RIGHT-OF-WAY LIMIT OR AS DIRECTED BY THE COR/AOTR. THE CONTRACTOR SHALL NOTIFY THE US-POSTAL SERVICE AND ATTEMPT TO CONTACT ALL AFFECTED RESIDENTS TEN (10) WORKING DAYS PRIOR TO RESETING MAIL BOX(ES). THIS WORK SHALL BE INCIDENTAL TO BID ITEM 20304-1000.

31. AT THE COMPLETION OF THE CONSTRUCTION, THE CONTRACTOR SHALL INSPECT THE INTERIOR OF ALL NEWLY INSTALLED OR EXTENDED/CLEANED CULVERTS, CATTLEGUARDS, AND/OR OTHER 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, AND 607.

32. A NUMBER OF EXISTING TURNOUT RECONSTRUCTION REQUIRE EXISTING METAL GATES TO BE RELOCATED. THE CONTRACTOR IS ADVISED TO FIELD REVIEW EACH GATE RELOCATION PRIOR TO SUBMITTING A BID. GATE RELOCATIONS TO INCLUDE REMOVAL OF EXISTING GATE, SUPPORT POSTS, AND RESETING GATE POSTS IN LOCATION SELECTED BY THE COR. ALL GATE/SUPPORT POSTS TO BE SET IN CONCRETE (SEE R/W FENCING DETAILS FOR CONCRETE DIMENSIONS). ALL COST TO RELOCATE GATES AND POSTS SHALL BE INCIDENTAL TO THE ASSOCIATE CATTLEGUARD INSTALLATION AND NO ADDITIONAL PAYMENT SHALL BE MADE.

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/AOTR. THIS WORK TO BE INCIDENTAL TO BID ITEM 61901-1000, 62101-0000 AND 62102-0000, AND NO ADDITIONAL PAYMENT WILL BE MADE.

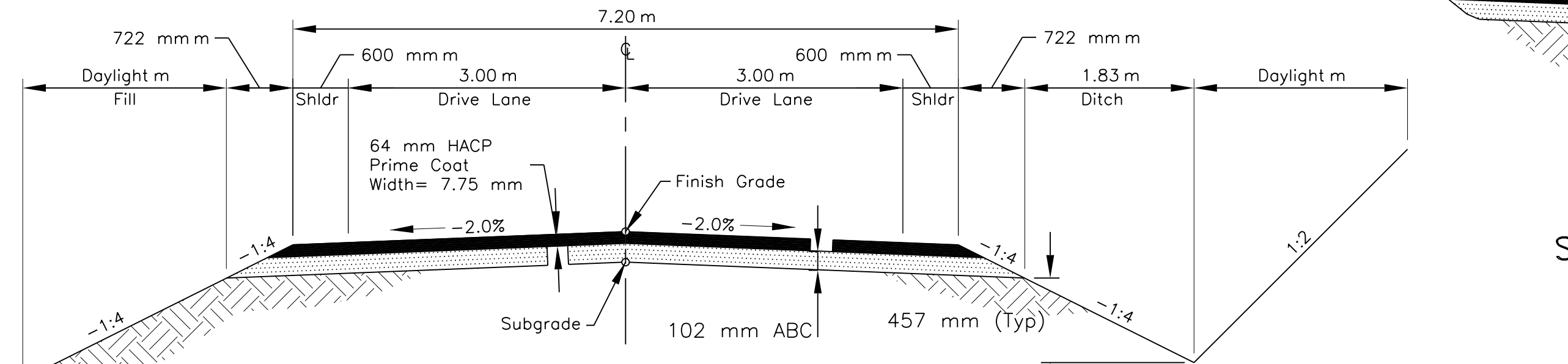
34. THE CONTRACTOR SHALL INSTALL ALL RETAINING WALLS ON THIS PROJECT BEFORE FULL EARTHWORK OPERATION CAN COMMENCE. THE RETAINING WALL CONSTRUCTION UNDER BID ITEMS 25701-0000 SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS INCLUDING CONCRETE, H-PILES, CONCRETE PANELS, HARDWARE, AND OTHER MATERIALS CALLED FOR IN THESE DESIGN PLANS.



TYPICAL CROSS SECTION

Sta. 0+004.27 to 2+317.243, Lt.

Sta. 0+004.27 to 2+340.000, Rt.



TYPICAL CROSS SECTION

Sta. 2+317.243 to 2+448.371 Bk.= 2+446.536 Ahd. Lt.

Sta. 2+340.000 to 2+448.371 Bk.= 2+446.536 Ahd. Rt.

SPECIAL DITCH SECTION

Sta. 2+070.00 to 2+177.647

Right Side Only

\*Note: Width Tapers From 3.87 m @ Sta. 2+070.00 To 2.74 m @ 2+177.647, Rt. This Special Ditch Is To Drain Runoff Away From The Retaining Wall Into New Pipe @ Station 2+070.79.

GENERAL NOTES--CONTINUATION

12. THE CONTRACTOR SHALL BE REQUIRED TO OBLITERATE ALL EXISTING ABANDONED TURNOUTS AND ROADWAYS WITHIN THE RIGHT-OF-WAY LIMITS. ALSO, OBLITERATE THE EXISTING N9345 DIRT ROAD FROM US191 TOWARDS THE NEW ALIGNMENT. THE CONTRACTOR SHALL BE REQUIRED TO OBLITERATE ALL EXISTING/ABANDONED ROADS WITHIN THE RIGHT-OF-WAY LIMITS AS FOLLOWS: SCARIFY THE EXISTING ROAD TO A DEPTH OF 300 mm AND LEAVING THE SURFACE ROUGH (100 mm TO 150 mm HIGH RIDGES PERPENDICULAR TO THE EXISTING ROAD CENTERLINE). ROADWAY OBLITERATION INCLUDES GRADING DRAINAGE CHANNELS ACROSS THE OLD ROADBED AND/OR DRAINAGE PIPE OPENINGS, AS MAY BE REQUIRED BY THE COR. THIS APPLIES TO ALL EXISTING ROADS LOCATED BETWEEN THE CONSTRUCTION CATCH POINTS AND THE RIGHT-OF-WAY LIMITS. SEEDING AND STRAW MULCH SHALL BE APPLIED TO ALL DISTURBED AREAS OUTSIDE OF THE PAVED AREA. STRAW MULCHING TO BE PAID UNDER ITEM 15708-1000.

13. STRUCTURAL EXCAVATION AND BACKFILL OF DRAINAGE STRUCTURES SHALL BE CONSIDERED INCIDENTAL TO INSTALLATION OF STRUCTURES. EXCESS MATERIAL REMOVED MAY BE USED TO REBUILD TURNOUTS, EARTHERN DIKES/BERMS, AND/OR PLACED ALONG ROADWAY SHOULDERS AS EMBANKMENT IN AREAS DESIGNATED BY THE COR/AOTR.

14. ALL FURROW DITCHES AND DRAINAGE DITCHES SHALL BE STAKED AND GRADED TO DRAIN UP TO THE RIGHT-OF-WAY LIMITS. EARTHEN DIKES AND DITCHES SHALL BE CONSTRUCTED AS SHOWN ON THESE PLANS AND/OR ADDED AT LOCATIONS DESIGNATED BY THE COR/AOTR. ALL EARTHEN 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, 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. THIS WORK SHALL BE INCIDENTAL TO BID ITEMS 602, 603, AND 607.

15. IMMEDIATELY PRIOR TO PLACING EMBANKMENT, AGGREGATE BASE AND/OR RECYCLED MATERIAL, THE TOP 152 mm OF FINISHED SUBGRADE (INCLUDING TURNOUTS) SHALL BE CHECKED FOR COMPACTION AND GRADE. IF COMPACTION DOES NOT MEET THE MINIMUM SPECIFIED COMPACTION REQUIREMENTS, THE SUBGRADE SHALL BE WATERED AND/OR SCARIFIED AS NEEDED AND RE-COMPACTED TO THE REQUIRED DENSITY. IN NO CASE SHALL ANY EMBANKMENT OR SURFACING MATERIAL BE PLACED ON FROZEN, MUDDY OR UNSTABLE NATURAL GROUND 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. ANY WASTE MATERIAL SHOWN ON THESE PLANS SHALL BE USED AS NECESSARY TO CONSTRUCT TURNOUTS, BACKFILL OLD N9345 DIRT ROAD, AND EARTHERN DIKES/BERMS AND/OR BE PLACED AS EMBANKMENT ALONG THE SHOULDERS IN AREAS AS DIRECTED BY THE C.O.R. WASTE MATERIAL NOT USED WITHIN THE PROJECT LIMITS, SHALL BE DISPOSED OF AS PER FP-03, SECTION 204.14.

17. THE LOCATION OF UTILITIES SHOWN IN THESE PLANS ARE APPROXIMATE AND ARE ONLY TO ASSIST THE CONTRACTOR IN COMPLETING THE WORK. THE CONTRACTOR SHALL CONTACT ALL UTILITY OWNERS PRIOR TO STARTING ANY CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL CONTACT THE ARIZONA BLUE STAKES-CALL AT (800)-782-5348 #17 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.

18. THE CONTRACTOR SHALL REMOVE, CLEAN, AND STOCKPILE ALL SALVAGEABLE EXISTING CULVERTS, CATTLE GUARDS AND FENCING MATERIALS, ETC., AS CALLED FOR ON THESE PLANS AND SECTIONS 203 AND 607. ALL SALVAGEABLE MATERIALS AS DETERMINED BY THE COR/AOTR SHALL BE TAKEN TO THE FORT DEFIANCE MAINTENANCE YARD (LOCATED 100 km NORTHEAST OF THE BOP). ANY MATERIALS DETERMINED TO BE UNUSABLE BY THE COR/AOTR SHALL BE DISPOSED OF BY THE CONTRACTOR IN ACCORDANCE WITH SECTIONS 107, AND 203. THE SALVAGE WORK SHALL BE INCLUDED IN THE APPROPRIATE UNIT PRICE BID ITEMS FOR SECTIONS 203 AND/OR 607.

19. THE ROADWAY TYPICAL SECTION SHOWN IS THE BASIC TEMPLATE TO WHICH THE PROJECT IS TO BE STAKED AND BUILT. HOWEVER, THERE WILL BE LOCATIONS WHERE, DUE TO EXISTING GROUND CONDITIONS, TURNOUTS, CULVERTS OR OTHER STRUCTURES, ETC., THE SHOWN TYPICAL SECTION BACK AND FORE SLOPES CANNOT BE CONSTRUCTED. IN THIS CASE THE NRO-DOT DIVISION MANAGER, THROUGH THE COR/AOTR, SHALL BE CONSULTED FOR CHANGES IN THE TYPICAL SECTIONS AND/OR APPROVED PROFILES BEFORE PROCEEDING WITH THE WORK UNLESS NOTED OTHERWISE ON THE PLANS. THE FINAL CONSTRUCTED ROAD SECTION SHALL BE BASED ON THE GOVERNMENT FURNISHED COMPUTERIZED STAKING REPORT AS ADJUSTED TO FIT FIELD CONDITIONS. THE CONTRACTOR SHALL STAY WITHIN THE LIMITS OF CONSTRUCTION, UNLESS OTHERWISE APPROVED. IN NO CASE SHALL THE CUT AND FILL BACK SLOPES BE BUILT STEEPER THAN THE MAXIMUM ALLOWED IN THE ROADWAY TYPICAL SECTION SHOWN.

20. THE CONTRACTOR SHALL SAW CUT (FULL DEPTH) THE EXISTING ASPHALT PAVEMENT WHERE OLD ASPHALT IS TO TIE INTO THE NEW ASPHALT PAVEMENT AT THE BOP, EOP, AND STATIONS 26+600 TO 26+680, LEFT, AND MISCELLANEOUS TURNOUTS. THE CONTRACTOR SHALL MATCH THE NEW ASPHALTIC CONCRETE PAVEMENT SURFACE TO EXISTING PAVEMENT SECTION AT TIE-IN POINTS AND TO PROVIDE FOR A SMOOTH TRANSITION AS DIRECTED BY THE COR/AOTR ALL SAWN PAVEMENT EDGES TO RECEIVE ASPHALT TACK COAT. THIS WORK SHALL BE INCIDENTAL TO THE PAVING ITEMS SHOWN IN THE BID SCHEDULE.

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

22. REMOVAL AND RE-ATTACHMENTS OF FENCING AT ALL MAJOR DRAINAGE STRUCTURE, CATTLE GUARDS, GATES, ETC. SHALL BE CONSIDERED INCIDENTAL OBLIGATIONS OF THE CONTRACTOR UNDER ITEM 619 FOR WORK REQUIRING REMOVAL, REPLACEMENT, AND/OR MODIFICATION OF EXISTING STRUCTURES, INSTALLATION OF NEW GATES AND/OR TIE-INS TO EXISTING FENCES. ALL FENCING REPAIRS, TEMPORARY FENCING AND/OR REPLACEMENT SHALL BE COMPLETED IMMEDIATELY IN THE SAME WORK DAY SO AS NOT TO ALLOW LIVESTOCK ONTO THE PROJECT.

BASIS OF ESTIMATED QUANTITIES

| ITEM NO.   | DESCRIPTION                           | GRADE    | UNITS                   | APPLICATION                                  |
|------------|---------------------------------------|----------|-------------------------|----------------------------------------------|
| 30101-2000 | Untreated Aggregate Base Course       | "D"      | 2 244 kg/m <sup>3</sup> | 102 mm - Mainline; 102 mm - Turnouts         |
| 40201-0500 | Hot Asphalt Conc. Pavement, Class "B" | "B"      | 2 404 kg/m <sup>3</sup> | 64 mm - Mainline; 51 mm - Turnouts           |
| 40502-0800 | Asphalt Binder                        | PG 58-28 | 0.98 L/kg               | 5.5% by Weight of Material Mix               |
| 41101-5000 | Asphalt Prime Coat                    | MC-70    | 1.06 L/kg               | 1.36 L/m <sup>2</sup> , Apply on top of ABC. |

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

TYPICAL CROSS SECTION  
AND GENERAL NOTES

|                              |             |
|------------------------------|-------------|
| DRAWN BY: NRDOT              | DATE: 02/97 |
| DESIGNED BY: NRDOT           | DATE: 02/97 |
| REVISED: 09/2010             | BY: LRT     |
| SCALE: n/a                   |             |
| FILENAME: Sh2_2_9345typ.dgn  |             |
| SHEET MODEL NAME: PLOT SHEET |             |



I:\CURRENT PROJECTS\N36\_Ft Defiance\N9345(2)2&4\_092908\CADD FILES\_092908\Microstation\_09282010\Sht 3\_9345qnt.dgn

|  |        |         |             |       |             |       |              |
|--|--------|---------|-------------|-------|-------------|-------|--------------|
|  | REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
|  | NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 3     | 39           |

ESTIMATED QUANTITIES

| ITEM No.     | DESCRIPTION                                            | QUANTITY   | UNITS    |
|--------------|--------------------------------------------------------|------------|----------|
| 10901 – 0000 | EXTRA & MISCELLANEOUS WORK AUTHORIZED UNDER 109.2(m)   | All Req'd. | Lump Sum |
| 15101 – 0000 | MOBILIZATION                                           | All Req'd. | Lump Sum |
| 15201 – 0000 | CONSTRUCTION SURVEY AND STAKING                        | All Req'd. | Lump Sum |
| 15301 – 0020 | CONTRACTOR QUALITY CONTROL                             | 3,658      | MAN HR   |
| 15701 – 0000 | TEMPORARY EROSION CONTROL                              | All Req'd. | Lump Sum |
| 15708 – 1000 | TEMPORARY STRAW MULCHING                               | 3.06       | Ha       |
| 20102 – 0000 | CLEARING AND GRUBBING                                  | All Req'd. | Lump Sum |
| 20304 – 1000 | REMOVAL OF STRUCTURES AND OBSTRUCTIONS                 | All Req'd. | Lump Sum |
| 20401 – 0000 | ROADWAY EXCAVATION                                     | 31,948.00  | m        |
| 20443 – 1000 | EARTHEN DIKES/BERMS                                    | 105        | m        |
| 20601 – 0000 | DEVELOPMENT OF WATER SUPPLY                            | 7.57       | m–Liter  |
| 21102 – 1000 | ROADWAY AND TURNOUT OBLITERATION, METHOD 1             | All Req'd. | Lump Sum |
| 25101 – 2000 | PLACED RIPRAP (CHECK DAM) CLASS – 2                    | 44.80      | m        |
| 25110 – 2000 | GROUTED RIPRAP, CLASS – 2                              | 2,915.79   | m        |
| 25701 – 0000 | H–PILE/CONCRETE RETAINING WALL (927.0 m <sup>2</sup> ) | All Req'd. | Lump Sum |
| 30101 – 2000 | UNTREATED AGGREGATE COURSE GRADING "D"                 | 5,799      | t        |
| 40201 – 0500 | HOT ASPHALTIC CONC. PAVEMENT, CLASS "B", GRADE "B"     | 3,098      | t        |
| 40502 – 0800 | ASPHALT BINDER PG – 58 – 28                            | 186        | t        |
| 41101 – 5000 | PRIME COAT, GRADE MC–70                                | 28.20      | t        |
| 60101 – 0000 | MINOR CONCRETE, CLASS A (AE)                           | 2.78       | m        |
| 60201 – 0000 | 457 mm PLASTIC FLEXIBLE PIPE                           | 6.71       | m        |
| 60201 – 0810 | 610 mm CORRUGATED STEEL PIPE CULVERT                   | 39.41      | m        |
| 60201 – 0910 | 762 mm CORRUGATED STEEL PIPE CULVERT                   | 154.22     | m        |
| 60201 – 1010 | 914 mm CORRUGATED STEEL PIPE CULVERT                   | 54.86      | m        |
| 60202 – 0510 | 711 mm SPAN x 508 mm RISE CORRUGATED STEEL PIPE ARCH   | 107.28     | m        |
| 60202 – 0810 | 1245 mm SPAN x 838 mm RISE CORRUGATED STEEL PIPE ARCH  | 66.25      | m        |
| 60210 – 0810 | END SECTION FOR 610 mm CORRUGATED STEEL PIPE CULVERT   | 2          | Each     |
| 60210 – 0910 | END SECTION FOR 762 mm CORRUGATED STEEL PIPE CULVERT   | 6          | Each     |
| 60210 – 1010 | END SECTION FOR 914 mm CORRUGATED STEEL PIPE CULVERT   | 2          | Each     |
| 60211 – 0910 | END SECTION FOR 711 mm x 508 mm, PIPE ARCH             | 14         | Each     |
| 60212 – 1200 | ELBOW, 1245 mm SPAN x 838 mm RISE, PIPE ARCH           | 2          | Each     |
| 60404 – 0000 | INLET, CONCRETE CATCH BASIN                            | 1          | Each     |
| 60701 – 1000 | REMOVING, CLEANING, AND STOCKPILING CULVERT            | 76.20      | m        |
| 60801 – 0100 | PAVED WATERWAY, TYPE ASPHALT                           | 1,189.83   | m        |
| 61901 – 1000 | FENCE, 5–STRAND, BARBED WIRE                           | 824.03     | m        |
| 61901 – 3400 | TEMPORARY SAFTY FENCE, PLASTIC, HDPE–Type              | 694        | m        |
| 61903 – 1011 | CATTLEGUARD, 4–UNIT, 9.48m WIDE W\ FENCE–NO GATE       | 1          | Each     |
| 62101 – 0000 | RIGHT–OF WAY MONUMENT                                  | 22         | Each     |
| 62102 – 0000 | REFERENCE MARKER                                       | 22         | Each     |
| 62510 – 1000 | SEEDING, DRY METHOD                                    | 3.97       | Ha       |
| 62901 – 1100 | EROSION CONTROL MATTING, TYPE IV                       | 1,868.22   | m        |
| 63302 – 0002 | SIGN INSTALLATION, 1–POST & HARDWARE, 3.35 Kg/m        | 2.35       | m        |
| 63302 – 0003 | SIGN INSTALLATION, 1–POST & HARDWARE, 4.10 Kg/m        | 3.87       | m        |
| 63302 – 0010 | SIGN INSTALLATION, 2–POST & HARDWARE, 2.98 Kg/m        | 12.15      | m        |
| 63302 – 0012 | SIGN INSTALLATION, 2–POST & HARDWARE, 4.10 Kg/m        | 3.24       | m        |
| 63308 – 2000 | OBJECT MARKER FLEXIBLE, TYPE 2                         | 18         | Each     |
| 63309 – 0020 | FLEXIBLE DELINEATORS, TYPE " 1b"                       | 38         | Each     |
| 63401 – 1510 | PAVEMENT MARKINGS, TYPE "H", SOLID YELLOW              | 3,822.20   | m        |
| 63401 – 1520 | PAVEMENT MARKINGS, TYPE "H", SOLID WHITE               | 4,622.90   | m        |
| 63401 – 1610 | PAVEMENT MARKINGS, TYPE "H", BROKEN YELLOW             | 960        | m        |
| 63405 – 3260 | PAVEMENT MARKINGS, TYPE "H", STOP BAR, SOLID WHITE     | 1          | Each     |
| 63501 – 0000 | TEMPORARY TRAFFIC CONTROL                              | All Req'd. | Lump Sum |
| 63506 – 0500 | FLAGGER                                                | 5,518      | MAN HR   |

ITEM No. 21102–1000  
ROADWAY AND TURNOUT OBLITERATION

| STATION  | TO | STATION  | LOCATION | DESCRIPTION             |
|----------|----|----------|----------|-------------------------|
| 0+004.32 | –  | 0+461.32 | Rt./Lt.  | Old N9345 Rdwy.         |
| 0+578.00 |    |          | Rt.      | Existing Turnout @ Skew |
| 0+940.00 |    |          | Lt.      | Existing Turnout @ Skew |
| 0+960.00 |    |          | Rt.      | Existing Turnout @ Skew |
| 1+007.00 |    |          | Rt.      | Existing Turnout @ Skew |
| 1+105.00 |    |          | Rt.      | Existing Turnout @ Skew |
| 1+167.00 |    |          | Lt.      | Existing Turnout        |
| 1+183.00 |    |          | Rt.      | Existing Turnout @ Skew |
| 1+212.00 |    |          | Lt.      | Existing Turnout @ Skew |
| 1+307.00 |    |          | Lt.      | Existing Turnout @ Skew |
| 1+400.00 |    |          | Lt.      | Existing Turnout @ Skew |
| 1+621.50 |    |          | Lt.      | Existing Turnout        |
| 1+785.00 |    |          | Lt.      | Existing Turnout        |
| 1+800.00 |    |          | Rt.      | Existing Turnout @ Skew |
| 2+005.00 |    |          | Rt.      | Existing Turnout @ Skew |
| 2+260.00 |    |          | Lt.      | Existing Turnout @ Skew |
| 2+375.00 |    |          | Rt.      | Existing Turnout @ Skew |
| 2+405.00 |    |          | Rt.      | Existing Turnout @ Skew |

CONSTRUCTION PLANS APPROVED  
08/16/2011

ITEM No. 20304–1000  
REMOVAL OF STRUCTURE AND OBSTRUCTIONS

| STATION TO STATION     | LOCATION | DESCRIPTION                                                      |
|------------------------|----------|------------------------------------------------------------------|
| US 191 HWY             |          |                                                                  |
| 35+509.96              | RT.      | EXISTING CATTLEGUARD AT US–191 TURNOUT AND STOP SIGN             |
| 35+298.31 to 35+358.31 | RT.      | EXISTING R.O.W. FENCE TO BE SALVAGE/STOCKPILED                   |
| N9345(2)2&4            |          |                                                                  |
| 0+937.00 to 0+969.00   | RT.      | EXISTING FENCE TO BE SALVAGED AND STOCKPILED                     |
| 1+90.00 to 1+137.00    | LT.      | EXISTING FENCE TO BE SALVAGED AND STOCKPILED                     |
| 2+448.00               | Lt/Rt.   | EXISTING SIGNS, 'NO PASS ZONE' & 'DO NOT PASS, SALVAGE/STOCKPILE |
| 2+540.00               | LT.      | EXISTING SIGNS, 'PAVEMENTS ENDS' & '25 MPH', SALVAGE/STOCKPILE   |

NEW TURNOUT LOCATIONS

| STATION  | LOC | SIZE             | TYPE | REMARKS                                       |
|----------|-----|------------------|------|-----------------------------------------------|
| 0+552.00 | Rt. | 7.00 m x 26.40 m | A    | Turnout Only                                  |
| 0+780.00 | Rt. | 4.50 m x 26.40 m | A    | Turnout With 1–711 mm x 508 mm x 10.97 m CSPA |
| 0+990.00 | Rt. | 7.00 m x 26.40 m | A    | Turnout With 1–711 mm x 508 mm x 20.73 m CSPA |
| 1+018.00 | Lt. | 4.50 m x 11.40 m | A    | Turnout With 1–711 mm x 508 mm x 9.14 m CSPA  |
| 1+155.75 | Rt. | 7.00 m x 26.40 m | A    | Turnout With 1–711 mm x 508 mm x 21.34 m CSPA |
| 1+270.00 | Lt. | 4.50 m x 26.40 m | A    | Turnout With 1–711 mm x 508 mm x 10.97 m CSPA |
| 1+643.00 | Lt. | 4.50 m x 26.40 m | A    | Turnout With 1–711 mm x 508 mm x 10.97 m CSPA |
| 1+943.00 | Rt. | 7.00 m x 26.40 m | A    | Turnout With 1–711 mm x 508 mm x 23.16 m CSPA |
| 2+389.00 | Rt. | 7.00 m x 11.05 m | A    | Turnout Only                                  |

EXISTING UTILITIES

| STATION  | LOCATION | REMARKS                    | OWNER      | REMARKS                        |
|----------|----------|----------------------------|------------|--------------------------------|
| 0+985.70 | CL       | Existing Power Line X–ing. | FCC & NTUA | Height To Be Adjusted By Owner |
| 1+048.62 | CL       | Existing Power Line X–ing. | FCC & NTUA | Height To Be Adjusted By Owner |
| 1+058.34 | CL       | Existing Waterline.        | NTUA       | Protect in Place.              |
| 2+196.68 | CL       | Existing Power Line X–ing. | NTUA       | Protect in Place.              |
| 2+396.09 | Rt.      | Existing Power Pole        | NTUA       | Protect in Place.              |
| 2+412.00 | Rt.      | Existing Power Pole        | NTUA       | Protect in Place.              |
| 2+440.39 | Lt.      | Existing Power Line X–ing. | NTUA       | Protect in Place.              |

61901–1000; 5–STRAND, BARBED WIRE

| STATION   | TO | STATION   | LOC. | DESCRIPTION                                                           | LENGTH (m) |
|-----------|----|-----------|------|-----------------------------------------------------------------------|------------|
| 35+298.31 | To | 35+520.00 | Lt.  | Install New Fence On US 191 R/W between New And Old N9345 Turnouts    | 221.69     |
| 0+031.01  | To | 0+277.71  | Lt.  | Install New Fence @R/W to Retaining Wall                              | 246.70     |
| 0+532.36  | To | 0+800.00  | Lt.  | Install New Fence @R/W From Retaining Wall To Existing Property Fence | 276.64     |
| 0+937.00  | To | 0+969.00  | Rt.  | Install New Fence @ R/W                                               | 32.00      |
| 1+090.00  | To | 1+137.00  | Lt.  | Install New Fence @ R/W                                               | 47.00      |
| TOTAL:    |    |           |      |                                                                       | 824.03     |

61901–3400; TEMPORARY SAFETY FENCING, PLASTIC, HDPE

| STATION  | to | STATION  | LOCATION     | DESCRIPTION           | LENGTH (m) |
|----------|----|----------|--------------|-----------------------|------------|
| 0+040.00 | to | 0+094.00 | 22 m Rt.     | Arch–Site, AZ–P–36–81 | 54.00      |
| 0+260.00 | to | 0+520.00 | 15 m Lt./Rt. | Arch–Site, AZ–P–37–42 | 520.00     |
| 0+790.00 | to | 0+910.00 | 15 m Rt.     | Arch–Site, AZ–P–37–15 | 120.00     |
| TOTAL:   |    |          |              |                       | 694.00     |

N9345(2) EARTHWORK

| N9345–STATION TO STATION |              | CUT       | FILL       | BORROW | WASTE    |
|--------------------------|--------------|-----------|------------|--------|----------|
| 0+004.270                | TO 2+448.370 | 31,948.00 | –24,484.00 | 0.00   | 7,464.00 |
| TOTAL                    |              | 31,948.00 | –24,484.00 | 0.00   | 7,464.00 |

61903–1011: 9480 mm CATTLEGUARD WITHOUT GATE

| STATION  | LOC. | DESCRIPTION                                                         |
|----------|------|---------------------------------------------------------------------|
| 0+038.26 | CL   | 4–Unit Cattleguard w/Fence – No Gate (3.52 m Outside US 191 R.O.W.) |

62510–1000; SEEDING, DRY METHOD

| STATION  | TO | STATION                        | AREA(Lt) m          | AREA(Rt) m | TOTAL AREA (ha) |
|----------|----|--------------------------------|---------------------|------------|-----------------|
| 0+004.27 | To | 2+448.371 Bk.<br>2+446.536 Ahd | 14,121.95           | 16,436.28  | 3.06 ha.        |
| 0+004.32 | To | 0+461.320                      | * Old N9345 Roadway |            | 0.91 ha.        |
| TOTAL:   |    |                                |                     |            | 3.97 ha         |

\* See Roadway Obliteration & Seeding Table Sheet 27 of 39 for Details.

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

ESTIMATED QUANTITIES

DRAWN BY: NRODOT      DATE: 2/93  
DESIGNED BY: NRODOT      DATE: 10/92  
REVISED: 06/07      BY: NRODOT  
SCALE: NTS  
FILENAME: 9345QNT  
SHEET MODEL NAME: PLOT SHEET



pharman.cheel\CURRENT PROJECTS\N36\_FI\_Defiance\N9345(2)2&4\_092908\DESIGN DATA\_082908\CADD FILES\_092908\Microstation\_09282010\Sht\_4\_9345sr.dgn

|        |         |             |       |             |       |              |
|--------|---------|-------------|-------|-------------|-------|--------------|
| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 4     | 39           |

| ESTIMATED<br>STRUCTURE<br>QUANTITIES |                                                               | ITEM NO. | 60201-<br>0000                  | 60201-<br>0810                                               | 60201-<br>0910                                            | 60201-<br>1010                                            | 60202-<br>0510                                            | 60202-<br>0810                                            | 60210-<br>0810                                            | 60210-<br>0910                                             | 60210-<br>1010                                             | 60211-<br>0910                                             | 60212-<br>1200                                             |                                               |
|--------------------------------------|---------------------------------------------------------------|----------|---------------------------------|--------------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------|-----------------------------------------------|
|                                      |                                                               |          | 457 mm<br>Plastic Flexible Pipe | 610 mm<br>68 mm x 13 mm Corrugation<br>Plastic Flexible Pipe | 762 mm<br>68 mm x 13 mm Corrugation<br>Steel Pipe Culvert | 814 mm<br>68 mm x 13 mm Corrugation<br>Steel Pipe Culvert | 868 mm<br>68 mm x 13 mm Corrugation<br>Steel Pipe Culvert | 914 mm<br>68 mm x 13 mm Corrugation<br>Steel Pipe Culvert | 968 mm<br>68 mm x 13 mm Corrugation<br>Steel Pipe Culvert | 1022 mm<br>68 mm x 13 mm Corrugation<br>Steel Pipe Culvert | 1076 mm<br>68 mm x 13 mm Corrugation<br>Steel Pipe Culvert | 1130 mm<br>68 mm x 13 mm Corrugation<br>Steel Pipe Culvert | 1184 mm<br>68 mm x 13 mm Corrugation<br>Steel Pipe Culvert | Estimated Area Of<br>Construction Disturbance |
| STATION                              | STRUCTURE SIZE                                                | SKEW NO. | m                               | m                                                            | m                                                         | m                                                         | m                                                         | m                                                         | m                                                         | m                                                          | Ea.                                                        | Ea.                                                        | Ea.                                                        | ha                                            |
| 0+192.00                             | 1+762 mm x 20.12 m CSPC                                       | 80.00    |                                 |                                                              | 20.12                                                     |                                                           |                                                           |                                                           |                                                           |                                                            |                                                            | 1                                                          |                                                            | 0.0068                                        |
| 0+628.66                             | 2-762 mm x 23.16 m CSPC                                       | 90.00    |                                 |                                                              | 46.32                                                     |                                                           |                                                           |                                                           |                                                           |                                                            |                                                            | 2                                                          |                                                            | 0.0127                                        |
| 0+780.00                             | 1 - 711 mm Span x 508 mm Rise x 10.97 m CSPA Under T.O. , Rt. | N/A      |                                 |                                                              |                                                           |                                                           |                                                           | 10.97                                                     |                                                           |                                                            |                                                            |                                                            | 2                                                          | N/A                                           |
| 0+990.00                             | 1 - 711 mm Span x 508 mm Rise x 20.73 m CSPA Under T.O. , Rt. | N/A      |                                 |                                                              |                                                           |                                                           |                                                           | 20.73                                                     |                                                           |                                                            |                                                            |                                                            | 2                                                          | N/A                                           |
| 1+018.00                             | 1 - 711 mm Span x 508 mm Rise x 9.14 m CSPA Under T.O. , Lt.  | N/A      |                                 |                                                              |                                                           |                                                           |                                                           | 9.14                                                      |                                                           |                                                            |                                                            |                                                            | 2                                                          | N/A                                           |
| 1+155.75                             | 1 - 711 mm Span x 508 mm Rise x 21.34 m CSPA Under T.O. , Rt. | N/A      |                                 |                                                              |                                                           |                                                           |                                                           | 21.34                                                     |                                                           |                                                            |                                                            |                                                            | 2                                                          | N/A                                           |
| 1+270.00                             | 1 - 711 mm Span x 508 mm Rise x 10.97 m CSPA Under T.O. , Lt. | N/A      |                                 |                                                              |                                                           |                                                           |                                                           | 10.97                                                     |                                                           |                                                            |                                                            |                                                            | 2                                                          | N/A                                           |
| 1+520.00                             | 1+762 mm x 34.14 m CSCP                                       | 90.00    |                                 |                                                              | 34.14                                                     |                                                           |                                                           |                                                           |                                                           |                                                            |                                                            | 1                                                          |                                                            | 0.0064                                        |
| 1+571.00                             | 1+762 mm x 24.99 m CSCP                                       | 90.00    |                                 |                                                              | 24.99                                                     |                                                           |                                                           |                                                           |                                                           |                                                            |                                                            | 1                                                          |                                                            | 0.0047                                        |
| 1+631.00                             | 1+762 mm x 28.65 m CSCP                                       | 45.00    |                                 |                                                              | 28.65                                                     |                                                           |                                                           |                                                           |                                                           |                                                            |                                                            | 1                                                          |                                                            | 0.0077                                        |
| 1+643.00                             | 1 - 711 mm Span x 508 mm Rise x 10.97 m CSPA Under T.O. , Lt. | N/A      |                                 |                                                              |                                                           |                                                           |                                                           | 10.97                                                     |                                                           |                                                            |                                                            |                                                            | 2                                                          | N/A                                           |
| 1+943.00                             | 1 - 711 mm Span x 508 mm Rise x 23.16 m CSPA Under T.O. , Rt. | N/A      |                                 |                                                              |                                                           |                                                           |                                                           | 23.16                                                     |                                                           |                                                            |                                                            |                                                            | 2                                                          | N/A                                           |
| 1+968.73                             | 1 - 610 mm x 21.73 m CSCP                                     | 134.54   |                                 | 21.73                                                        |                                                           |                                                           |                                                           |                                                           |                                                           |                                                            | 1                                                          |                                                            |                                                            | N/A                                           |
| 2+070.79                             | 2 - 914 mm x 27.43 m CSCP                                     | 116.15   |                                 |                                                              |                                                           |                                                           | 54.86                                                     |                                                           |                                                           |                                                            |                                                            |                                                            | 2                                                          | 0.0167                                        |
| 2+267.00                             | 1 - 610 mm x 6.71 m Flex Plastic Pipe, Thru Retaining Wall    | N/A      | 6.71                            |                                                              |                                                           |                                                           |                                                           |                                                           |                                                           |                                                            |                                                            |                                                            |                                                            |                                               |
| 2+322.88                             | 1-1245 mm Span x 838 mm Rise x 16.20 m CSPA                   | **       |                                 |                                                              |                                                           |                                                           |                                                           |                                                           |                                                           | 16.20                                                      |                                                            |                                                            |                                                            | 1 0.0202                                      |
| 2+322.88                             | 1-1245 mm Span x 838 mm Rise x 17.48 m CSPA                   | **       |                                 |                                                              |                                                           |                                                           |                                                           |                                                           |                                                           | 17.48                                                      |                                                            |                                                            |                                                            |                                               |
| 2+325.32                             | 1-1245 mm Span x 838 mm Rise x 14.12 m CSPA                   | **       |                                 |                                                              |                                                           |                                                           |                                                           |                                                           |                                                           | 14.12                                                      |                                                            |                                                            |                                                            | 1 0.0202                                      |
| 2+325.32                             | 1-1245 mm Span x 838 mm Rise x 18.45 m CSPA                   | **       |                                 |                                                              |                                                           |                                                           |                                                           |                                                           |                                                           | 18.45                                                      |                                                            |                                                            |                                                            |                                               |
| 2+372.00                             | 1 - 610 mm x 17.68 m CSCP                                     | 90.00    |                                 | 17.68                                                        |                                                           |                                                           |                                                           |                                                           |                                                           |                                                            | 1                                                          |                                                            |                                                            | N/A                                           |
| TOTAL                                |                                                               |          | 6.71                            | 39.41                                                        | 154.22                                                    | 54.86                                                     | 107.28                                                    | 66.25                                                     | 2                                                         | 6                                                          | 2                                                          | 14                                                         | 2                                                          |                                               |

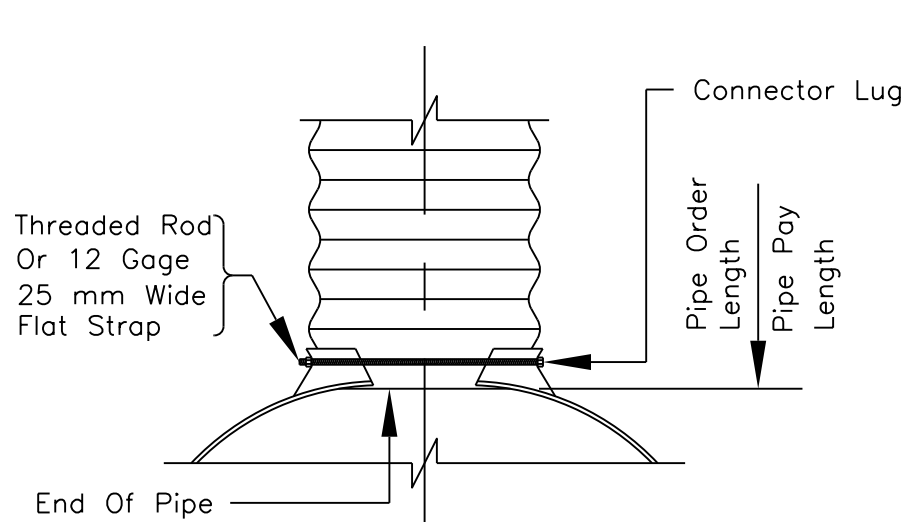
CONSTRUCTION PLANS APPROVED  
08/16/2011

### GENERAL NOTES

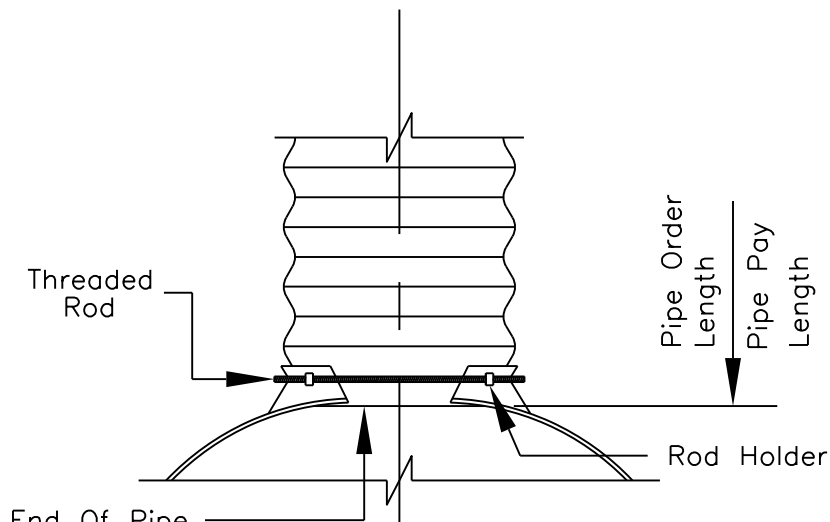
- FOR MULTIPLE INSTALLATION OF ALL TYPES, A MINIMUM OF A 610 mm SPACING MEASURED ALONG THE HORIZONTAL BETWEEN FLARED END SECTIONS AT THEIR WIDEST CROSS SECTION SHALL BE USED.
- ALL THREE (3) PIECE BODIES TO HAVE 2.77 mm THICKNESS SIDES AND 3.5 mm THICKNESS CENTER PANELS. WIDTH OF CENTER PANELS TO BE GREATER THAN 20% OF THE PIPE PERIPHERY. MULTIPLE PANEL BODIES TO HAVE LAP SEAMS WHICH ARE TO BE TIGHTLY JOINED BY 9.53 mmØ GALVANIZED RIVETS OR BOLTS.
- END SECTIONS FOR STEEL PIPE-ARCHES: FOR THE 1956 mm x 1321 mm AND 2108 mm x 1448 mm SIZES, REINFORCED EDGE TO BE SUPPLEMENTED BY 51 mm x 51 mm x 6.35 mm GALVANIZED ANGLES. THE ANGLES TO BE ATTACHED BY 9.53 mm dia. GALVANIZED NUTS AND BOLTS. ANGLE REINFORCEMENT WILL BE PLACED UNDER THE CENTER PANEL SEAMS.
- END SECTIONS FOR STEEL CIRCULAR PIPES: FOR 1524 mmØ THRU 2134 mmØ SIZES, REINFORCED EDGE TO BE SUPPLEMENTED WITH GALVANIZED STIFFENER ANGLES. THE ANGLES WILL BE 51 mm x 51 mm x 6.35 mm FOR 1524 mmØ THRU 1829 mmØ, AND 64 mm x 64 mm x 6.35 mm FOR 1981 mmØ AND 2134 mmØ. THE ANGLES TO BE ATTACHED BY 9.53 mmØ GALVANIZED NUTS AND BOLTS.
- WELDING SHALL NOT BE PERMITTED IN CONNECTING END SECTIONS TO CONNECTOR SECTIONS OR CONNECTOR SECTIONS TO PIPE.
- TYPE NO. 1 STEEL END SECTION. CONNECT END SECTION WITH THREADED ROD WITH CONNECTOR LUG, FOR 610 mmØ ROUND PIPE & 711 mm x 308 mm CSPA.
- TYPE NO. 2 STEEL END SECTION. CONNECT END SECTION WITH THREADED ROD WITH ROD HOLDER, FOR 762 mmØ AND 914 mmØ ROUND PIPE; AND 432 mm x 330 mm THRU 1448 mm x 965 mm CSPA.
- TYPE NO. 3 STEEL END SECTION. THE CONNECTION INCLUDES 305 mm OF THE PIPE LENGTH AS A CONNECTOR SECTION FOR PIPE ARCH SIZES 1626 mm x 1092 mm THRU 2108 mm x 1448 mm AND ROUND PIPE SIZES 1067 mmØ THRU 2134 mmØ. GAGES OF CONNECTOR SECTION SHALL BE THE SAME AS THE END SECTIONS AS MENTION ABOVE. THE CONNECTOR SECTION WILL BE ATTACHED TO THE END SECTION BY 9.5 mmØ GALVANIZED RIVETS OR BOLTS APPROXIMATELY 152mm CENTERS.
- HELICALLY-CORRUGATED PIPE FOR TYPE NO 5 AND TYPE NO.3 THE DIMPLE BAND OR CORRUGATED PIPE CONNECTOR SECTION SHALL BE ATTACHED TO THE END SECTION BY 9.5 mmØ GALVANIZED STEEL RIVETS OR BOLTS SPACED AT APPROXIMATELY 152mm CENTERS.
- TYPE NO. 1, TYPE NO. 2 AND TYPE NO. 3 CONNECTIONS MAY BE USED WITH WELDED SEAMS HELICALLY CORRUGATED PIPE WITH RE-ROLLED ENDS. RE-ROLLED ENDS SHALL INCLUDE A MINIMUM OF TWO (2) ANNULAR CORRUGATIONS OF THE SAME SIZE AS THE PIPE CORRUGATIONS

| ROUND PIPE<br>END SECTION - GALVANIZED STEEL |                       |            |             |            |            |               |            |                  |      |
|----------------------------------------------|-----------------------|------------|-------------|------------|------------|---------------|------------|------------------|------|
| PIPE<br>DIAM.<br>(mm)                        | THICK<br>NESS<br>(mm) | DIMENSIONS |             |            |            |               |            | APPROX.<br>SLOPE | BODY |
|                                              |                       | A<br>(Min) | B<br>(Max.) | H<br>(Min) | F<br>(Min) | L<br>(51 mm±) | W<br>(Max) |                  |      |
| 610                                          | 1.6                   | 229        | 330         | 152        | 1168       | 1041          | 1829       | 2 1/8            | 1 Pc |
| 762                                          | 2                     | 279        | 406         | 203        | 1397       | 1295          | 2235       | 2 1/8            | 2 Pc |
| 914                                          | 2                     | 330        | 483         | 229        | 1778       | 1524          | 2267       | 2                | 2 Pc |

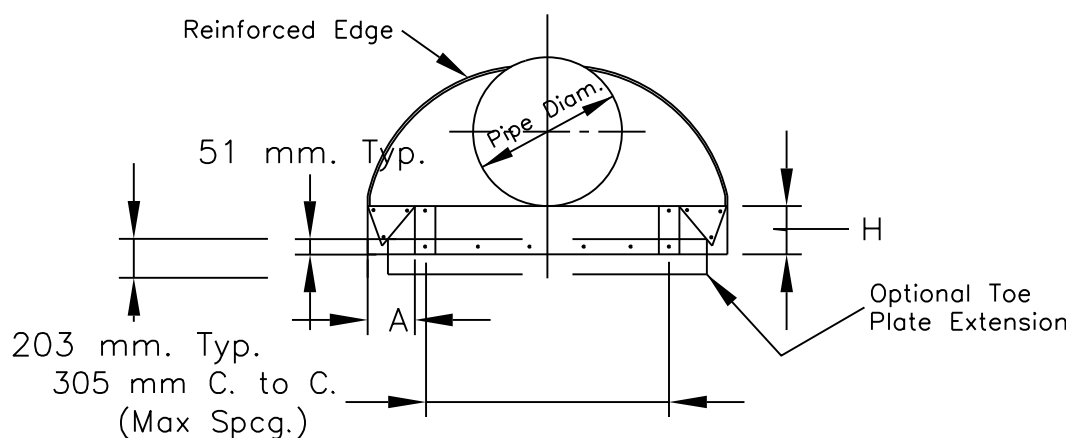
| ARCH PIPE<br>END SECTION – GALVANIZED STEEL |      |                       |            |             |            |            |               |            |                  |      |
|---------------------------------------------|------|-----------------------|------------|-------------|------------|------------|---------------|------------|------------------|------|
| PIPE<br>DIAM.                               |      | THICK<br>NESS<br>(mm) | DIMENSIONS |             |            |            |               |            | APPROX.<br>SLOPE | BODY |
| SPAN                                        | RISE |                       | A<br>(Min) | B<br>(Max.) | H<br>(Min) | F<br>(Min) | L<br>(51 mm±) | W<br>(Max) |                  |      |
| 711 x 508                                   |      | 1.6                   | 178        | 406         | 152        | 1168       | 813           | 4778       | 2                | 1 Pc |
| 1245 x 838                                  |      | 2.8                   | 343        | 508         | 229        | 1168       | 1346          | 2134       | 2 1/2            | 2 Pc |



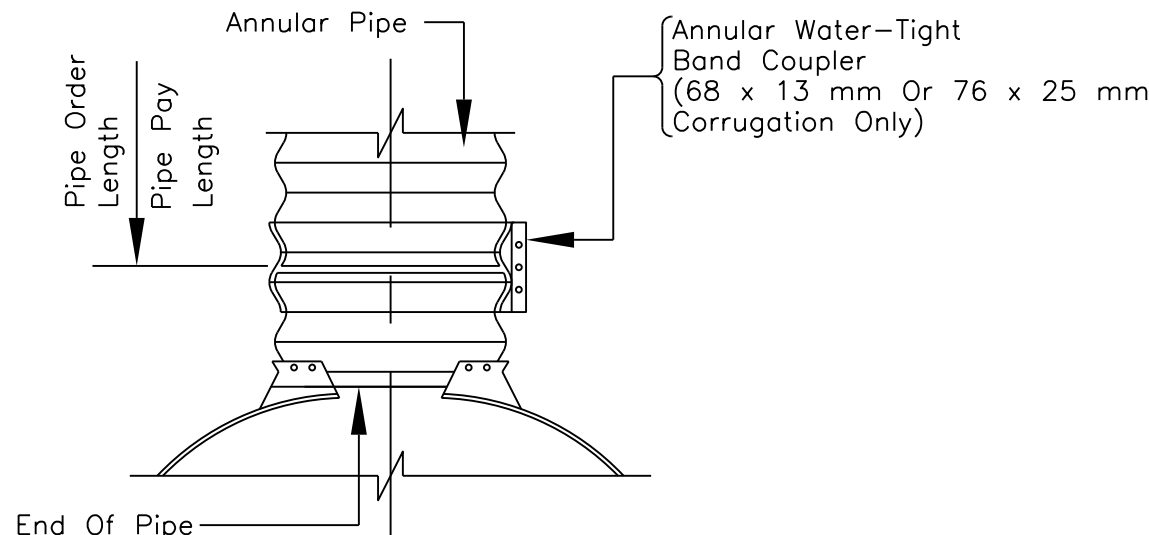
TYPE NO. 1



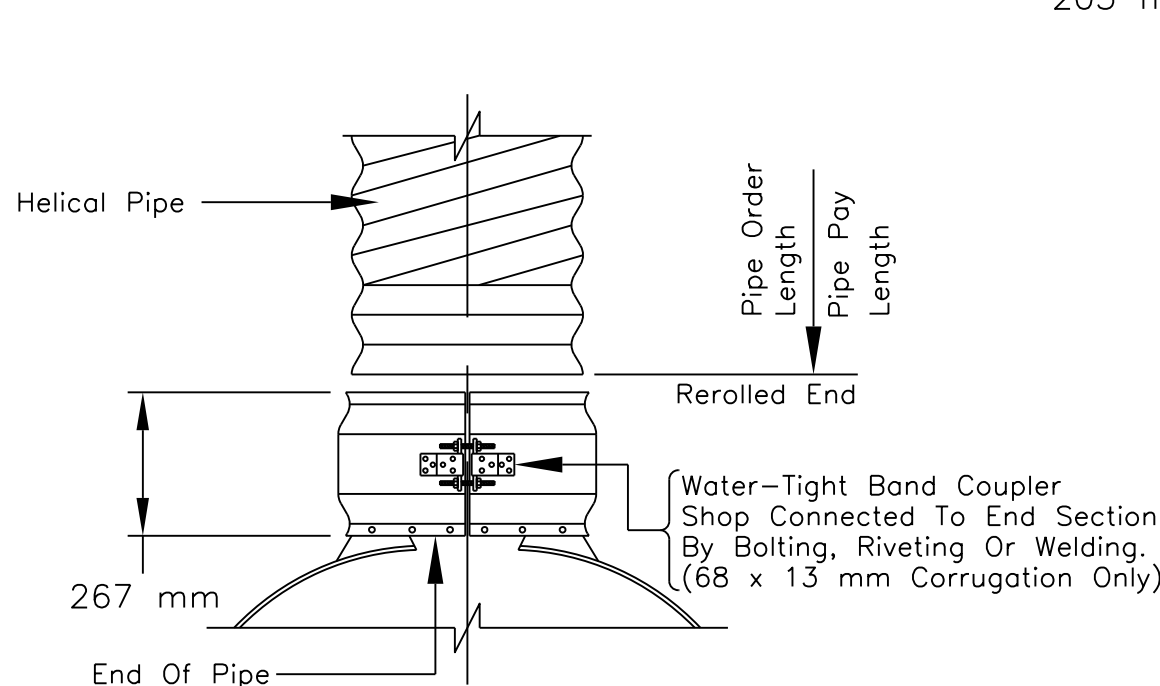
TYPE NO. 2



ELEVATION

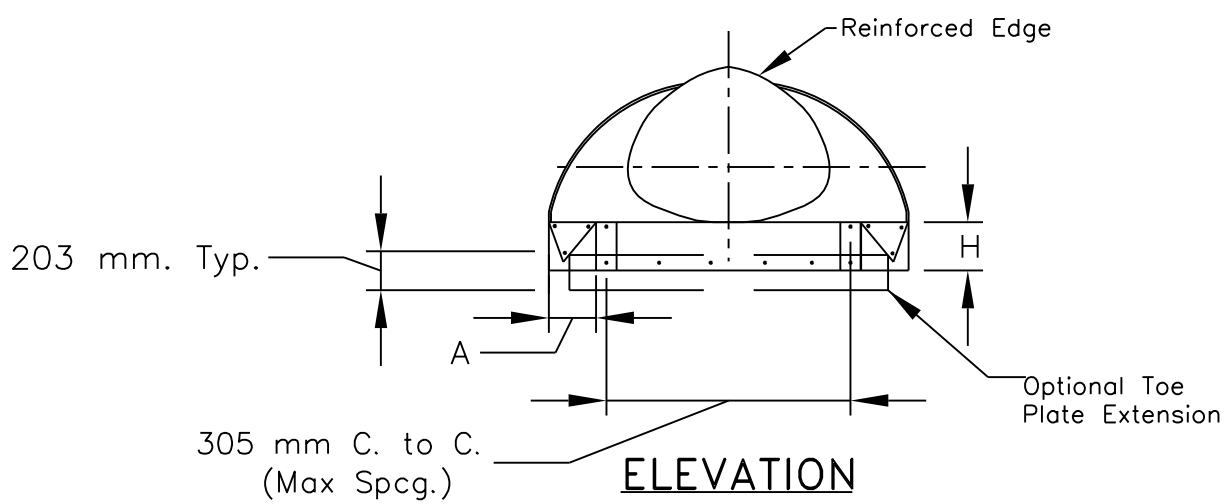


TYPE NO. 3

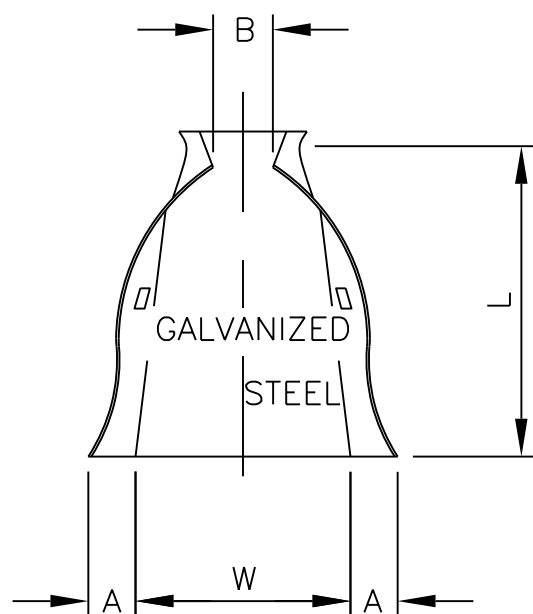


TYPE NO. 5

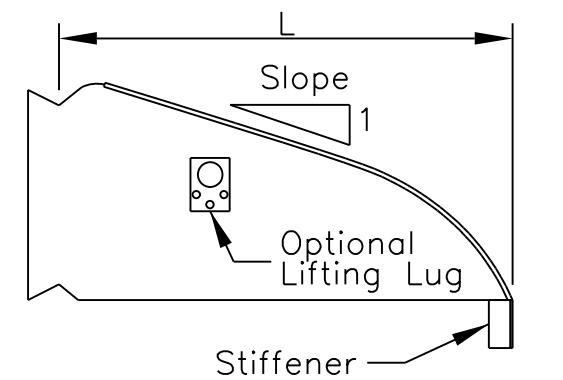
(See Note No.9)



ELEVATION



PLAN



TYPICAL CROSS SECTION

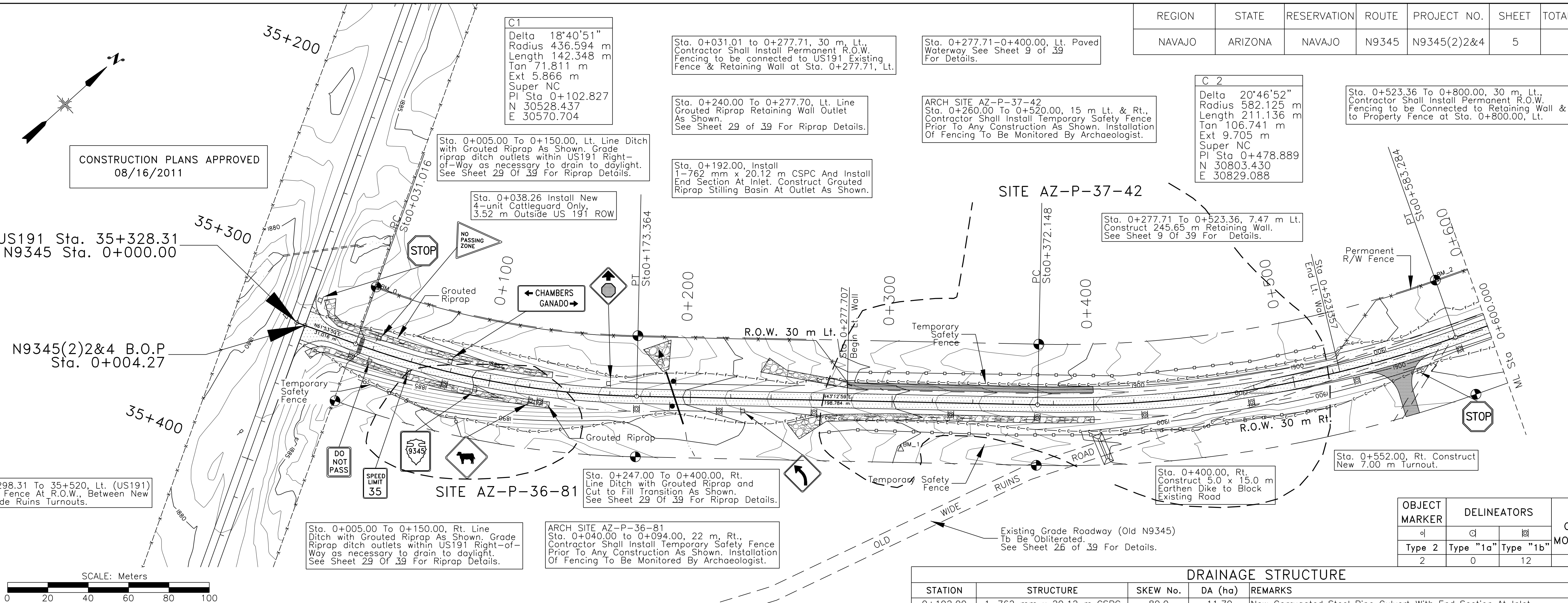
UNITED STATES  
DEPARTMENT OF THE INTERIOR  
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NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

### DRAINAGE STRUCTURE QUANTITIES

DRAWN BY: NRO DOT DATE: 10/92  
DESIGNED BY: NRO DOT DATE: 10/92  
REVISED: 01/06 BY: SC  
SCALE: NTS  
FILENAME: 9345STR  
SHEET MODEL NAME: PLOT SHEET



| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
|--------|---------|-------------|-------|-------------|-------|--------------|
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 5     | 39           |



| OBJECT MARKER | DELINEATORS         | RIGHT OF-WAY MONUMENTS |
|---------------|---------------------|------------------------|
| Type 2        | Type "1a" Type "1b" |                        |
| 2             | 0 12                | 8                      |

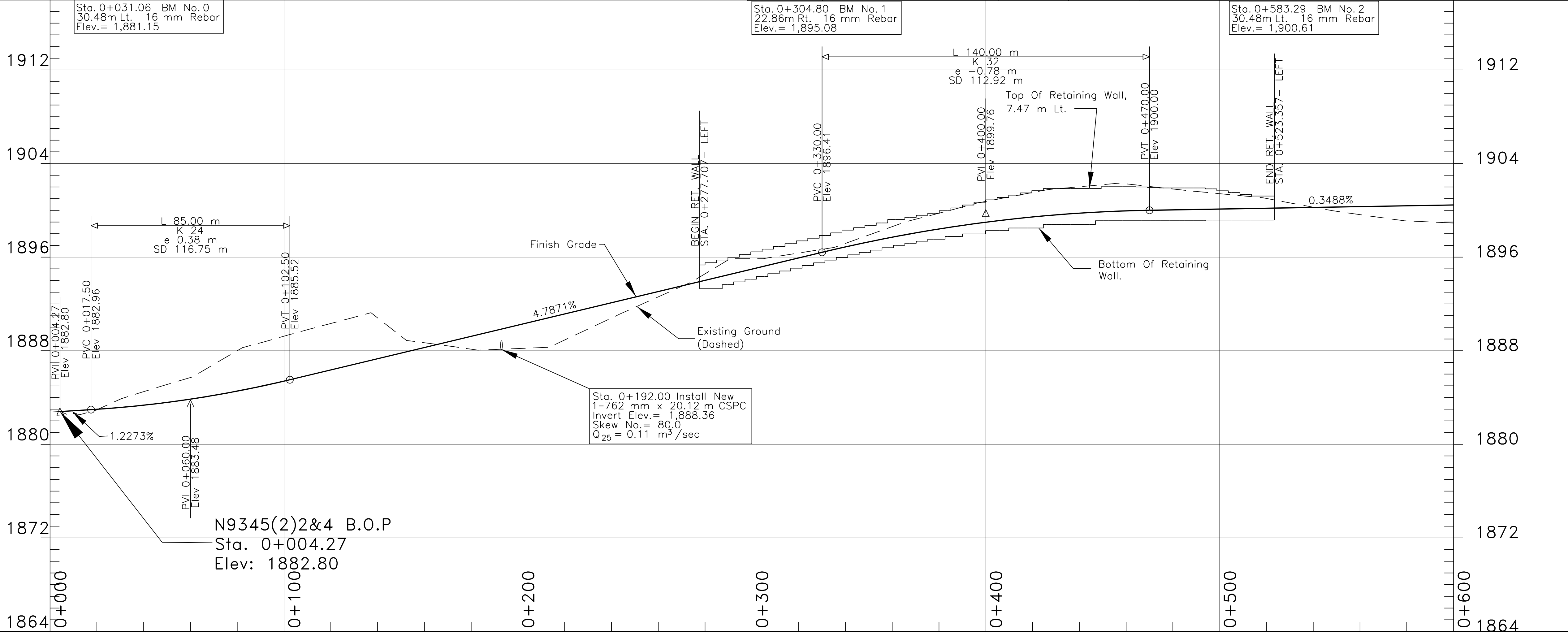
DRAINAGE STRUCTURE

| STATION  | STRUCTURE               | SKEW No. | DA (ha) | REMARKS                                                     |
|----------|-------------------------|----------|---------|-------------------------------------------------------------|
| 0+192.00 | 1-762 mm x 20.12 m CSPP | 80.0     | 11.70   | New Corrugated Steel Pipe Culvert With End Section At Inlet |

|                                                                      |                                                                      |                                                                      |
|----------------------------------------------------------------------|----------------------------------------------------------------------|----------------------------------------------------------------------|
| Sta. 0+192.00 BM No. 1<br>22.86m Rt. 16 mm Rebar<br>Elev. = 1,895.08 | Sta. 0+304.80 BM No. 1<br>22.86m Rt. 16 mm Rebar<br>Elev. = 1,895.08 | Sta. 0+583.29 BM No. 2<br>30.48m Lt. 16 mm Rebar<br>Elev. = 1,900.61 |
|----------------------------------------------------------------------|----------------------------------------------------------------------|----------------------------------------------------------------------|

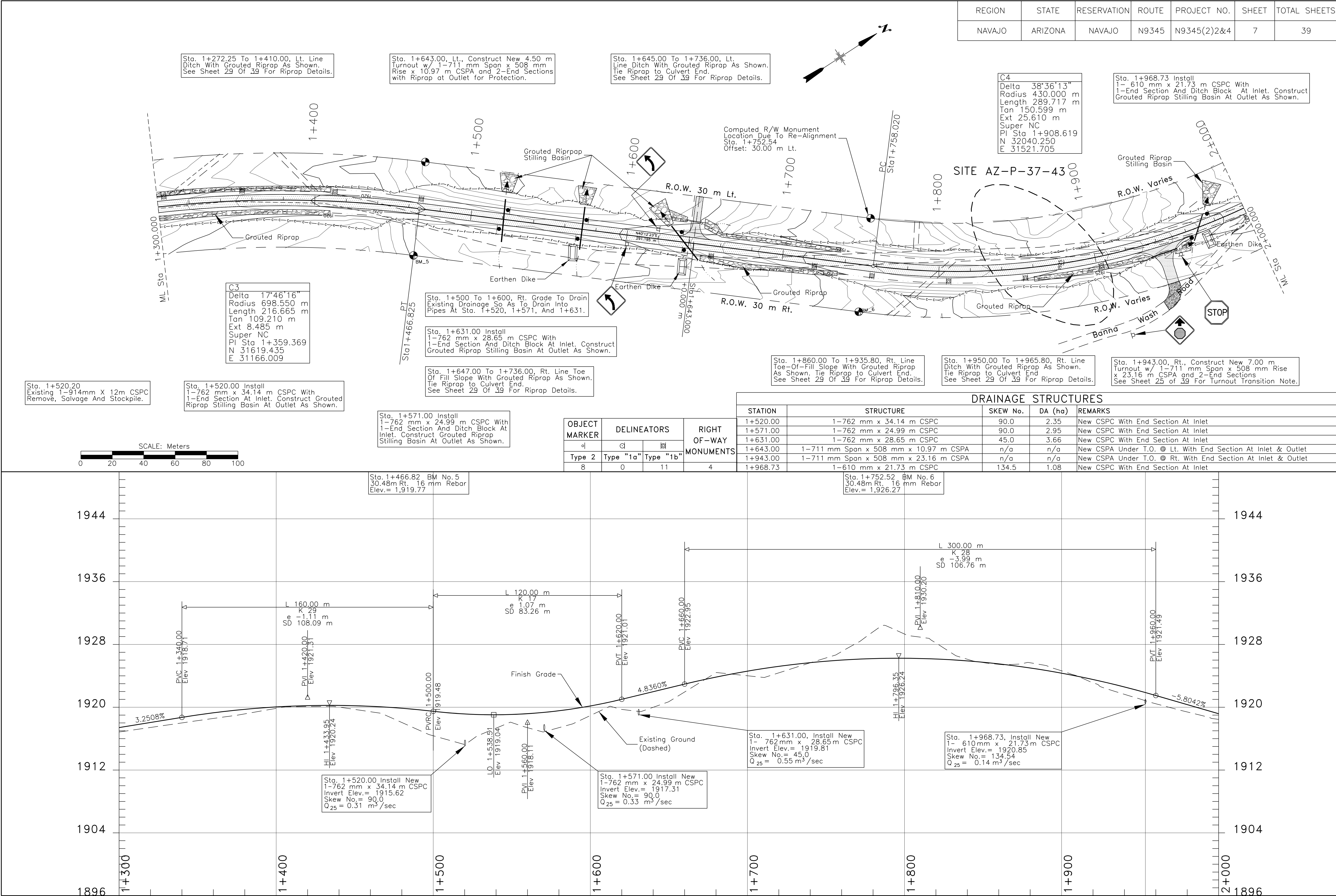
N9345(2) ALIGNMENT TABLE

| POINT | STATION(m) | ELEMENT                                                                                                        | DIRECTION     | NORTHING(m) | EASTING(m) |
|-------|------------|----------------------------------------------------------------------------------------------------------------|---------------|-------------|------------|
| POB   | 0+000.000  | Begin Alignment                                                                                                |               | 30,480.000  | 30,480.000 |
| BOP   | 0+004.270  | Lineal= 4.270 (m)                                                                                              | N 61°53'50" E | 30,482.011  | 30,483.767 |
| PC    | 0+031.016  | Lineal= 26.746 (m)                                                                                             | N 61°53'50" E | 30,482.011  | 30,483.767 |
| PI    | 0+102.827  | CURVE DATA<br>Delta = 18°40'51" Lt.<br>R = 436.594 (m)<br>L = 142.348 (m)<br>T = 71.811 (m)<br>e = 5.866 (m)   |               | 30,494.610  | 30,507.359 |
| PT    | 0+173.364  | Lineal= 198.784 (m)                                                                                            | N 43°12'59" E | 30,580.771  | 30,619.878 |
| PC    | 0+372.148  | CURVE DATA<br>Delta = 20°46'52" Lt.<br>R = 582.125 (m)<br>L = 211.136 (m)<br>T = 106.741 (m)<br>e = 9.705 (m)  |               | 30,725.640  | 30,755.996 |
| PI    | 0+478.889  | Lineal= 666.875 (m)                                                                                            | N 22°26'07" E | 30,803.430  | 30,829.088 |
| PT    | 0+583.284  | Lineal= 291.195 (m)                                                                                            | N 40°12'23" E | 31,702.842  | 31,236.508 |
| PC    | 1+250.160  | CURVE DATA<br>Delta = 17°46'16" Rt.<br>R = 698.550 (m)<br>L = 216.865 (m)<br>T = 109.210 (m)<br>e = 8.485 (m)  |               | 31,518.492  | 31,124.330 |
| PI    | 1+359.369  | Lineal= 107.915 (m)                                                                                            | N 1°36'10" E  | 31,619.435  | 31,166.009 |
| PT    | 1+466.825  | Lineal= 75.997 (m)                                                                                             | N 15°02'14" E | 32,298.663  | 31,528.936 |
| PC    | 1+758.020  | CURVE DATA<br>Delta = 38°36'13" Lt.<br>R = 430.000 (m)<br>L = 289.717 (m)<br>T = 150.599 (m)<br>e = 25.610 (m) |               | 32,323.975  | 31,529.644 |
| PI    | 1+908.619  | Lineal= 10.845 (m)                                                                                             | N 33°06'41" E | 32,348.430  | 31,536.214 |
| PT    | 2+047.737  | Lineal= 10.845 (m)                                                                                             | N 33°06'41" E | 32,421.825  | 31,555.931 |
| PC    | 2+155.652  | CURVE DATA<br>Delta = 13°26'04" Rt.<br>R = 215.000 (m)<br>L = 50.412 (m)<br>T = 25.322 (m)<br>e = 1.486 (m)    |               | 32,501.650  | 31,577.376 |
| PI    | 2+180.974  | Lineal= 75.997 (m)                                                                                             | N 15°02'14" E | 32,348.430  | 31,536.214 |
| PT    | 2+206.064  | Lineal= 75.997 (m)                                                                                             | N 15°02'14" E | 32,421.825  | 31,555.931 |
| PC    | 2+282.061  | CURVE DATA<br>Delta = 48°08'55" Lt.<br>R = 185.000 (m)<br>L = 155.465 (m)<br>T = 82.655 (m)<br>e = 17.625 (m)  |               | 32,570.883  | 31,532.224 |
| PI    | 2+364.716  | Lineal= 10.845 (m)                                                                                             | N 33°06'41" E | 32,570.883  | 31,532.224 |
| PT    | 2+437.526  | Lineal= 10.845 (m)                                                                                             | N 33°06'41" E | 32,570.883  | 31,532.224 |
| EOP   | 2+448.371  | EOP Eq. Bk =                                                                                                   |               | 32,579.966  | 31,526.300 |
| EOP   | 2+446.536  | EOP Eq. Ahd =                                                                                                  |               | 32,579.966  | 31,526.300 |





| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
|--------|---------|-------------|-------|-------------|-------|--------------|
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 7     | 39           |



C4  
Delta 38°36'13"  
Radius 430.000 m  
Length 289.717 m  
Tan 150.599 m  
Ext 25.610 m  
Super NC  
PI Sta 1+908.619  
N 32040.250  
E 31521.705

Sta. 1+968.73 Install  
1- 610 mm x 21.73 m CSPC With  
1-End Section And Ditch Block At Inlet. Construct  
Grouted Riprap Stilling Basin At Outlet As Shown.

C3  
Delta 17°46'16"  
Radius 698.550 m  
Length 216.665 m  
Tan 109.210 m  
Ext 8.485 m  
Super NC  
PI Sta 1+359.369  
N 31619.435  
E 31166.009

Sta. 1+500 To 1+600, Rt. Grade To Drain  
Existing Drainage So As To Drain Into  
Pipes At Sta. 1+520, 1+571, And 1+631.

Sta. 1+631.00 Install  
1-762 mm x 28.65 m CSPC With  
1-End Section And Ditch Block At Inlet. Construct  
Grouted Riprap Stilling Basin At Outlet As Shown.

Sta. 1+647.00 To 1+736.00, Rt. Line Toe  
Of Fill Slope With Grouted Riprap As Shown.  
Tie Riprap to Culvert End.  
See Sheet 29 Of 39 For Riprap Details.

Sta. 1+860.00 To 1+935.80, Rt. Line  
Toe-Of-Fill Slope With Grouted Riprap  
As Shown. Tie Riprap to Culvert End.  
See Sheet 29 Of 39 For Riprap Details.

Sta. 1+950.00 To 1+965.80, Rt. Line  
Ditch With Grouted Riprap As Shown.  
Tie Riprap to Culvert End.  
See Sheet 29 Of 39 For Riprap Details.

Sta. 1+943.00, Rt., Construct New 7.00 m  
Turnout w/ 1-711 mm Span x 508 mm Rise  
x 23.16 m CSPA and 2-End Sections  
See Sheet 25 of 39 For Turnout Transition Note.

DRAINAGE STRUCTURES

| STATION  | STRUCTURE                             | SKIEW No. | DA (ha) | REMARKS                                                      |
|----------|---------------------------------------|-----------|---------|--------------------------------------------------------------|
| 1+520.00 | 1-762 mm x 34.14 m CSPC               | 90.0      | 2.35    | New CSPC With End Section At Inlet                           |
| 1+571.00 | 1-762 mm x 24.99 m CSPC               | 90.0      | 2.95    | New CSPC With End Section At Inlet                           |
| 1+631.00 | 1-762 mm x 28.65 m CSPC               | 45.0      | 3.66    | New CSPC With End Section At Inlet                           |
| 1+643.00 | 1-711 mm Span x 508 mm x 10.97 m CSPA | n/a       | n/a     | New CSPA Under T.O. @ Lt. With End Section At Inlet & Outlet |
| 1+943.00 | 1-711 mm Span x 508 mm x 23.16 m CSPA | n/a       | n/a     | New CSPA Under T.O. @ Rt. With End Section At Inlet & Outlet |
| 1+968.73 | 1-610 mm x 21.73 m CSPC               | 134.5     | 1.08    | New CSPC With End Section At Inlet                           |

| OBJECT<br>MARKER | DELINEATORS |           |   | RIGHT<br>OF-WAY<br>MONUMENTS |
|------------------|-------------|-----------|---|------------------------------|
|                  | o           | q         | u |                              |
| Type 2           | Type "1a"   | Type "1b" |   |                              |
| 8                | 0           | 11        |   | 4                            |

Sta. 1+466.82 BM No. 5  
30.48m Rt. 16 mm Rebar  
Elev.= 1,919.77

Sta. 1+752.52 BM No. 6  
30.48m Rt. 16 mm Rebar  
Elev.= 1,926.27

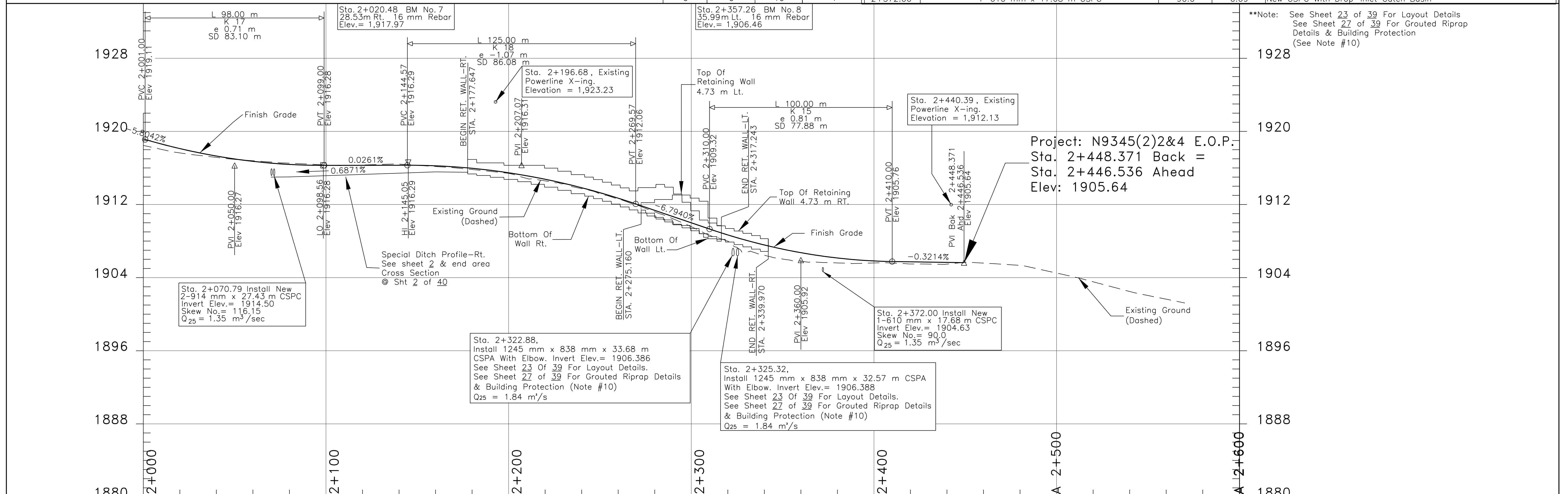
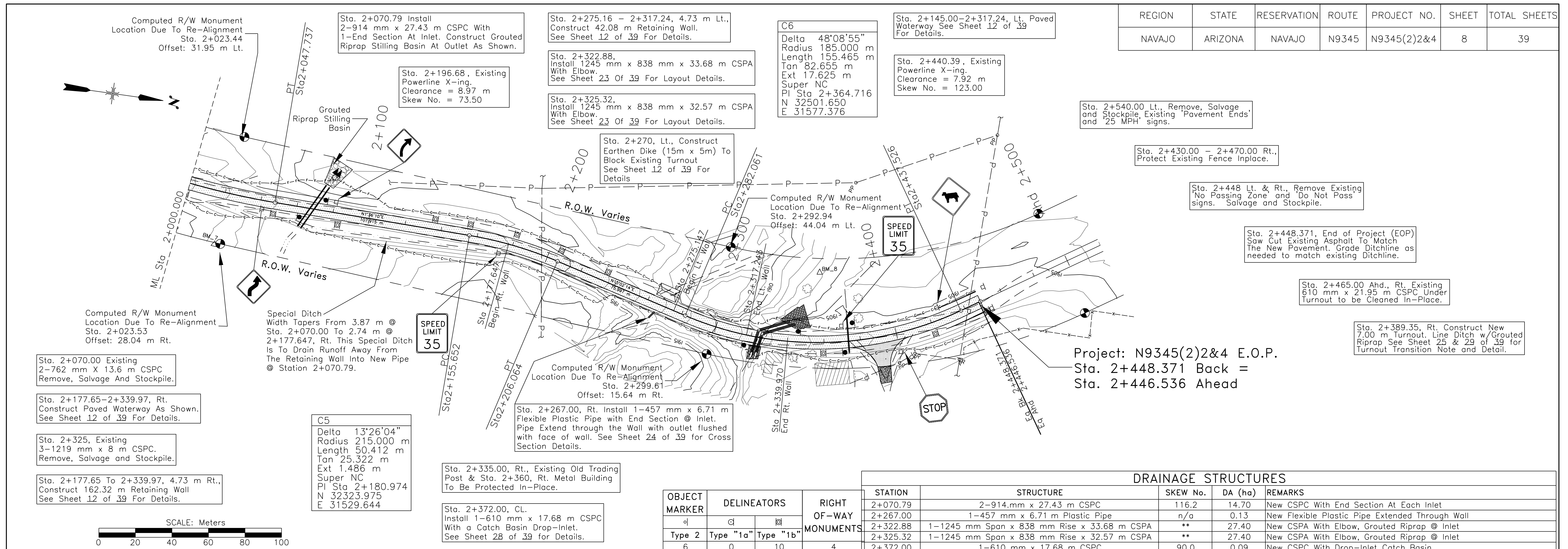
Sta. 1+520.00 Install New  
1-762 mm x 34.14 m CSPC  
Invert Elev.= 1915.62  
Skew No.= 90.0  
Q<sub>25</sub> = 0.31 m<sup>3</sup>/sec

Sta. 1+571.00 Install New  
1-762 mm x 24.99 m CSPC  
Invert Elev.= 1917.31  
Skew No.= 90.0  
Q<sub>25</sub> = 0.33 m<sup>3</sup>/sec

Sta. 1+631.00, Install New  
1- 762mm x 28.65m CSPC  
Invert Elev.= 1919.81  
Skew No.= 45.0  
Q<sub>25</sub> = 0.55 m<sup>3</sup>/sec

Sta. 1+968.73, Install New  
1- 610mm x 21.73m CSPC  
Invert Elev.= 1920.85  
Skew No.= 134.54  
Q<sub>25</sub> = 0.14 m<sup>3</sup>/sec

| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
|--------|---------|-------------|-------|-------------|-------|--------------|
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 8     | 39           |



I:\CURRENT PROJECTS\N36\_FL Defiance\N9345(2)2&4\_092908\DESIGN DATA\_082908\CADD FILES\_082908\Microstation\_09282010\Sht\_9\_Lt\_Wall1\_Plan.dgn

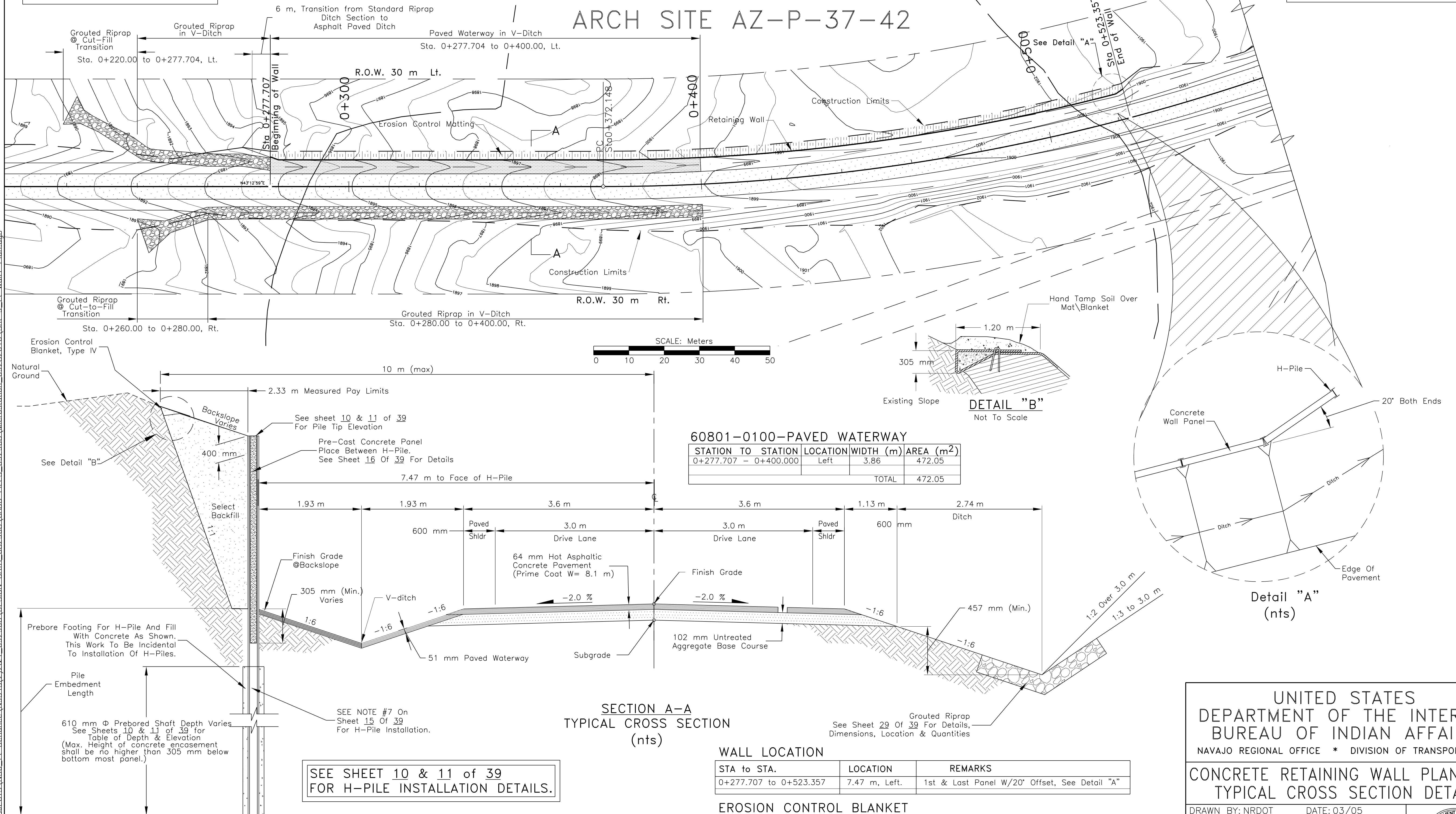
| Legend            |         |
|-------------------|---------|
| Existing Road     | ----    |
| Cut               | - - - - |
| Fill              | ----    |
| Existing Drainage | ----    |
| Right-Of-Way Line | ----    |
| V-Ditch Bottom    | ----    |

## PLAN VIEW

## ARCH SITE AZ-P-37-42

| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
|--------|---------|-------------|-------|-------------|-------|--------------|
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 9     | 39           |

CONSTRUCTION PLANS APPROVED  
08/16/2011



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

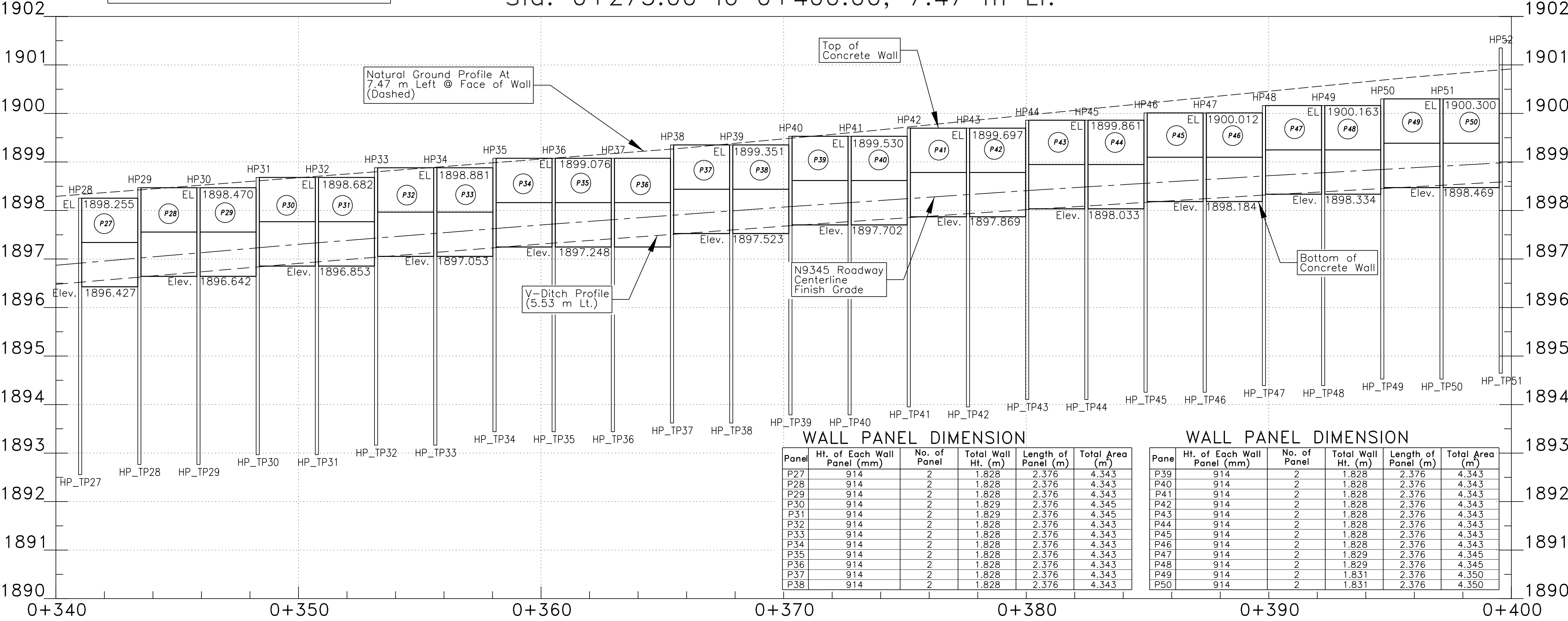
CONCRETE RETAINING WALL PLAN AND  
TYPICAL CROSS SECTION DETAIL

|                               |             |
|-------------------------------|-------------|
| DRAWN BY: NRDOT               | DATE: 03/05 |
| DESIGNED BY: NRDOT            | DATE: 03/05 |
| REVISED: 09/10                | BY: LRT     |
| SCALE: n/a                    |             |
| FILENAME: Sht_9_Lt_Wall1_Plan |             |
| SHEET MODEL NAME: PLOT SHEET  |             |

CONSTRUCTION PLANS APPROVED  
08/16/2011

RETAINING WALL PROFILE  
Sta. 0+275.00 to 0+400.00, 7.47 m Lt.

| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
|--------|---------|-------------|-------|-------------|-------|--------------|
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 10    | 39           |



WALL PANEL DIMENSION

| Panel | Ht. of Each Wall Panel (mm) | No. of Panel | Total Wall Ht. (m) | Length of Panel (m) | Total Area (m <sup>2</sup> ) |
|-------|-----------------------------|--------------|--------------------|---------------------|------------------------------|
| P27   | 914                         | 2            | 1.828              | 2.376               | 4.343                        |
| P28   | 914                         | 2            | 1.828              | 2.376               | 4.343                        |
| P29   | 914                         | 2            | 1.828              | 2.376               | 4.343                        |
| P30   | 914                         | 2            | 1.829              | 2.376               | 4.345                        |
| P31   | 914                         | 2            | 1.829              | 2.376               | 4.345                        |
| P32   | 914                         | 2            | 1.828              | 2.376               | 4.343                        |
| P33   | 914                         | 2            | 1.828              | 2.376               | 4.343                        |
| P34   | 914                         | 2            | 1.828              | 2.376               | 4.343                        |
| P35   | 914                         | 2            | 1.828              | 2.376               | 4.343                        |
| P36   | 914                         | 2            | 1.828              | 2.376               | 4.343                        |
| P37   | 914                         | 2            | 1.828              | 2.376               | 4.343                        |
| P38   | 914                         | 2            | 1.828              | 2.376               | 4.343                        |

WALL PANEL DIMENSION

| Panel | Ht. of Each Wall Panel (mm) | No. of Panel | Total Wall Ht. (m) | Length of Panel (m) | Total Area (m <sup>2</sup> ) |
|-------|-----------------------------|--------------|--------------------|---------------------|------------------------------|
| P39   | 914                         | 2            | 1.828              | 2.376               | 4.343                        |
| P40   | 914                         | 2            | 1.828              | 2.376               | 4.343                        |
| P41   | 914                         | 2            | 1.828              | 2.376               | 4.343                        |
| P42   | 914                         | 2            | 1.828              | 2.376               | 4.343                        |
| P43   | 914                         | 2            | 1.828              | 2.376               | 4.343                        |
| P44   | 914                         | 2            | 1.828              | 2.376               | 4.343                        |
| P45   | 914                         | 2            | 1.828              | 2.376               | 4.343                        |
| P46   | 914                         | 2            | 1.828              | 2.376               | 4.343                        |
| P47   | 914                         | 2            | 1.829              | 2.376               | 4.345                        |
| P48   | 914                         | 2            | 1.829              | 2.376               | 4.345                        |
| P49   | 914                         | 2            | 1.831              | 2.376               | 4.350                        |
| P50   | 914                         | 2            | 1.831              | 2.376               | 4.350                        |

SCALE: 1:100 Horiz.  
1:50 Vert.

LEFT WALL 1 H-PILE INSTALLATION DATA

| Station   | Offset (m) | Mark | Top Pile Tip Elevation | Mark  | Bottom Pile Tip Elevation | Pile Length (m) |
|-----------|------------|------|------------------------|-------|---------------------------|-----------------|
| 0+277.707 | -8.300     | HP2  | 1,895.223              | HPT1  | 1,889.550                 | 5.673           |
| 0+280.000 | -7.470     | HP3  | 1,895.461              | HPT2  | 1,889.550                 | 5.911           |
| 0+282.440 | -7.470     | HP4  | 1,895.461              | HPT3  | 1,889.780                 | 5.681           |
| 0+284.880 | -7.470     | HP5  | 1,895.699              | HPT4  | 1,890.010                 | 5.689           |
| 0+287.320 | -7.470     | HP6  | 1,895.699              | HPT5  | 1,890.010                 | 5.689           |
| 0+289.760 | -7.470     | HP7  | 1,895.933              | HPT6  | 1,890.250                 | 5.683           |
| 0+292.200 | -7.470     | HP8  | 1,895.933              | HPT7  | 1,890.250                 | 5.683           |
| 0+294.640 | -7.470     | HP9  | 1,896.166              | HPT8  | 1,890.480                 | 5.686           |
| 0+297.080 | -7.470     | HP10 | 1,896.166              | HPT9  | 1,890.480                 | 5.686           |
| 0+299.520 | -7.470     | HP11 | 1,896.402              | HPT10 | 1,890.720                 | 5.682           |
| 0+301.960 | -7.470     | HP12 | 1,896.402              | HPT11 | 1,890.720                 | 5.692           |
| 0+304.400 | -7.470     | HP13 | 1,896.633              | HPT12 | 1,890.950                 | 5.683           |
| 0+306.840 | -7.470     | HP14 | 1,896.633              | HPT13 | 1,890.950                 | 5.683           |
| 0+309.280 | -7.470     | HP15 | 1,896.687              | HPT14 | 1,891.180                 | 5.507           |
| 0+311.720 | -7.470     | HP16 | 1,896.867              | HPT15 | 1,891.180                 | 5.687           |
| 0+314.160 | -7.470     | HP17 | 1,897.100              | HPT16 | 1,891.420                 | 5.680           |
| 0+316.600 | -7.470     | HP18 | 1,897.100              | HPT17 | 1,891.420                 | 5.680           |
| 0+319.040 | -7.470     | HP19 | 1,897.334              | HPT18 | 1,891.650                 | 5.684           |
| 0+321.480 | -7.470     | HP20 | 1,897.334              | HPT19 | 1,891.650                 | 5.684           |
| 0+323.920 | -7.470     | HP21 | 1,897.568              | HPT20 | 1,891.880                 | 5.688           |
| 0+326.360 | -7.470     | HP22 | 1,897.568              | HPT21 | 1,891.880                 | 5.688           |
| 0+328.800 | -7.470     | HP23 | 1,897.801              | HPT22 | 1,892.110                 | 5.691           |
| 0+331.240 | -7.470     | HP24 | 1,897.801              | HPT23 | 1,892.110                 | 5.691           |
| 0+333.680 | -7.470     | HP25 | 1,898.029              | HPT24 | 1,892.340                 | 5.689           |
| 0+336.120 | -7.470     | HP26 | 1,898.029              | HPT25 | 1,892.340                 | 5.689           |
| 0+338.560 | -7.470     | HP27 | 1,898.255              | HPT26 | 1,892.550                 | 5.705           |
| 0+341.000 | -7.470     | HP28 | 1,898.255              | HPT27 | 1,892.550                 | 5.705           |
| 0+343.440 | -7.470     | HP29 | 1,898.470              | HPT28 | 1,892.770                 | 5.700           |
| 0+345.880 | -7.470     | HP30 | 1,898.470              | HPT29 | 1,892.770                 | 5.700           |
| 0+348.320 | -7.470     | HP31 | 1,898.682              | HPT30 | 1,892.970                 | 5.712           |
| 0+350.760 | -7.470     | HP32 | 1,898.682              | HPT31 | 1,892.970                 | 5.712           |
| 0+353.200 | -7.470     | HP33 | 1,898.881              | HPT32 | 1,893.160                 | 5.721           |
| 0+355.640 | -7.470     | HP34 | 1,898.881              | HPT33 | 1,893.160                 | 5.721           |
| 0+358.080 | -7.470     | HP35 | 1,899.076              | HPT34 | 1,893.440                 | 5.636           |
| 0+360.520 | -7.470     | HP36 | 1,899.076              | HPT35 | 1,893.440                 | 5.636           |
| 0+362.960 | -7.470     | HP37 | 1,899.076              | HPT36 | 1,893.440                 | 5.636           |
| 0+365.400 | -7.470     | HP38 | 1,899.351              | HPT37 | 1,893.620                 | 5.731           |
| 0+367.840 | -7.470     | HP39 | 1,899.351              | HPT38 | 1,893.620                 | 5.731           |
| 0+370.280 | -7.470     | HP40 | 1,899.530              | HPT39 | 1,893.790                 | 5.740           |
| 0+372.728 | -7.470     | HP41 | 1,899.530              | HPT40 | 1,893.790                 | 5.740           |
| 0+375.199 | -7.470     | HP42 | 1,899.697              | HPT41 | 1,893.950                 | 5.747           |
| 0+377.671 | -7.470     | HP43 | 1,899.697              | HPT42 | 1,893.950                 | 5.747           |
| 0+380.143 | -7.470     | HP44 | 1,899.861              | HPT43 | 1,894.100                 | 5.761           |
| 0+382.614 | -7.470     | HP45 | 1,899.861              | HPT44 | 1,894.100                 | 5.761           |
| 0+385.086 | -7.470     | HP46 | 1,900.012              | HPT45 | 1,894.250                 | 5.762           |
| 0+387.558 | -7.470     | HP47 | 1,900.012              | HPT46 | 1,894.250                 | 5.762           |
| 0+390.030 | -7.470     | HP48 | 1,900.163              | HPT47 | 1,894.390                 | 5.773           |
| 0+392.501 | -7.470     | HP49 | 1,900.163              | HPT48 | 1,894.390                 | 5.773           |
| 0+394.973 | -7.470     | HP50 | 1,900.300              | HPT49 | 1,894.530                 | 5.770           |
| 0+397.445 | -7.470     | HP51 | 1,900.300              | HPT50 | 1,894.530                 | 5.770           |
| 0+399.916 | -7.470     | HP52 | 1,901.350              | HPT51 | 1,894.650                 | 6.700           |

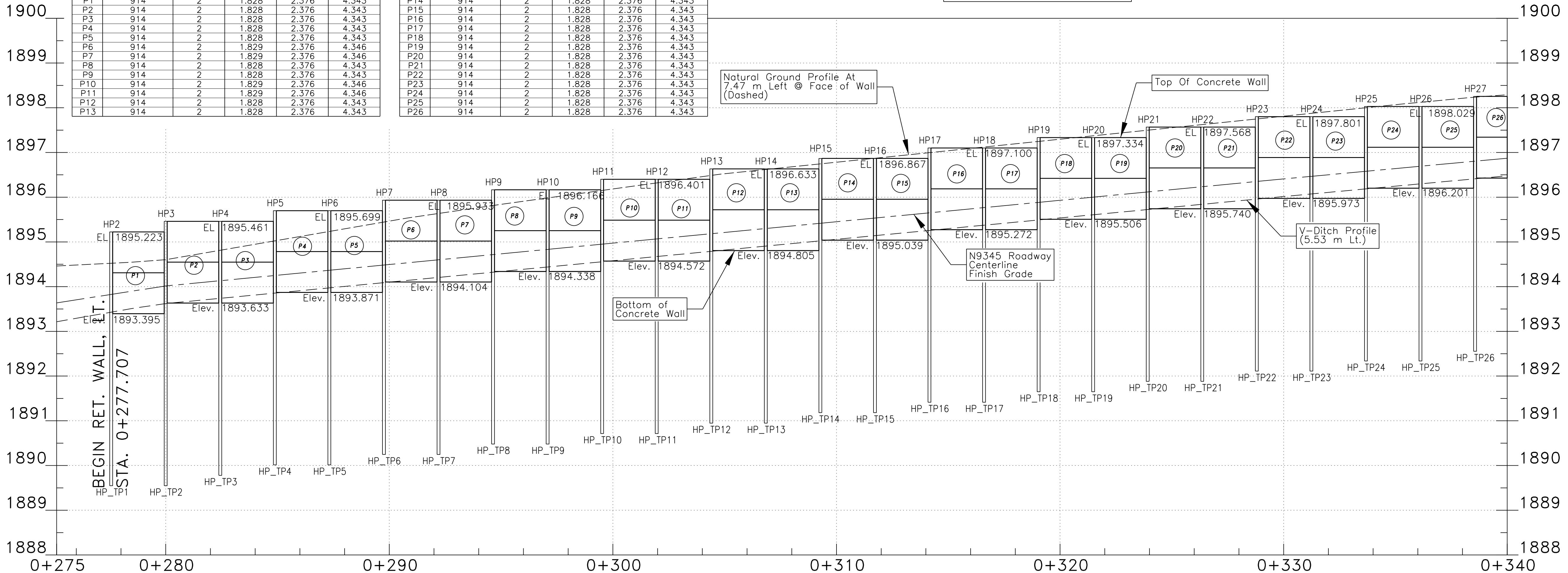
PILE DATA CONTINUES ON NEXT SHEET

WALL PANEL DIMENSION

| Panel | Ht. of Each Wall Panel (m) | No. of Panel | Total Wall Ht. (m) | Length of Panel (m) | Total Area (m <sup>2</sup> ) |
|-------|----------------------------|--------------|--------------------|---------------------|------------------------------|
| P1    | 914                        | 2            | 1.828              | 2.376               | 4.343                        |
| P2    | 914                        | 2            | 1.828              | 2.376               | 4.343                        |
| P3    | 914                        | 2            | 1.828              | 2.376               | 4.343                        |
| P4    | 914                        | 2            | 1.828              | 2.376               | 4.343                        |
| P5    | 914                        | 2            | 1.828              | 2.376               | 4.343                        |
| P6    | 914                        | 2            | 1.829              | 2.376               | 4.346                        |
| P7    | 914                        | 2            | 1.829              | 2.376               | 4.346                        |
| P8    | 914                        | 2            | 1.828              | 2.376               | 4.343                        |
| P9    | 914                        | 2            | 1.828              | 2.376               | 4.343                        |
| P10   | 914                        | 2            | 1.829              | 2.376               | 4.346                        |
| P11   | 914                        | 2            | 1.829              | 2.376               | 4.346                        |
| P12   | 914                        | 2            | 1.828              | 2.376               | 4.343                        |
| P13   | 914                        | 2            | 1.828              | 2.376               | 4.343                        |

WALL PANEL DIMENSION

| Panel | Ht. of Each Wall Panel (m) | No. of Panel | Total Wall Ht. (m) | Length of Panel (m) | Total Area (m <sup>2</sup> ) |
|-------|----------------------------|--------------|--------------------|---------------------|------------------------------|
| P14   | 914                        | 2            | 1.828              | 2.376               | 4.343                        |
| P15   | 914                        | 2            | 1.828              | 2.376               | 4.343                        |
| P16   | 914                        | 2            | 1.828              | 2.376               | 4.343                        |
| P17   | 914                        | 2            | 1.828              | 2.376               | 4.343                        |
| P18   | 914                        | 2            | 1.828              | 2.376               | 4.343                        |
| P19   | 914                        | 2            | 1.828              | 2.376               | 4.343                        |
| P20   | 914                        | 2            | 1.828              | 2.376               | 4.343                        |
| P21   | 914                        | 2            | 1.828              | 2.376               | 4.343                        |
| P22   | 914                        | 2            | 1.828              | 2.376               | 4.343                        |
| P23   | 914                        | 2            | 1.828              | 2.376               | 4.343                        |
| P24   | 914                        | 2            | 1.828              | 2.376               | 4.343                        |
| P25   | 914                        | 2            | 1.828              | 2.376               | 4.343                        |
| P26   | 914                        | 2            | 1.828              | 2.376               | 4.343                        |



PROFILE CONT'D ABOVE

NOTE:  
Concrete for H-Pile  
Encasement not shown.

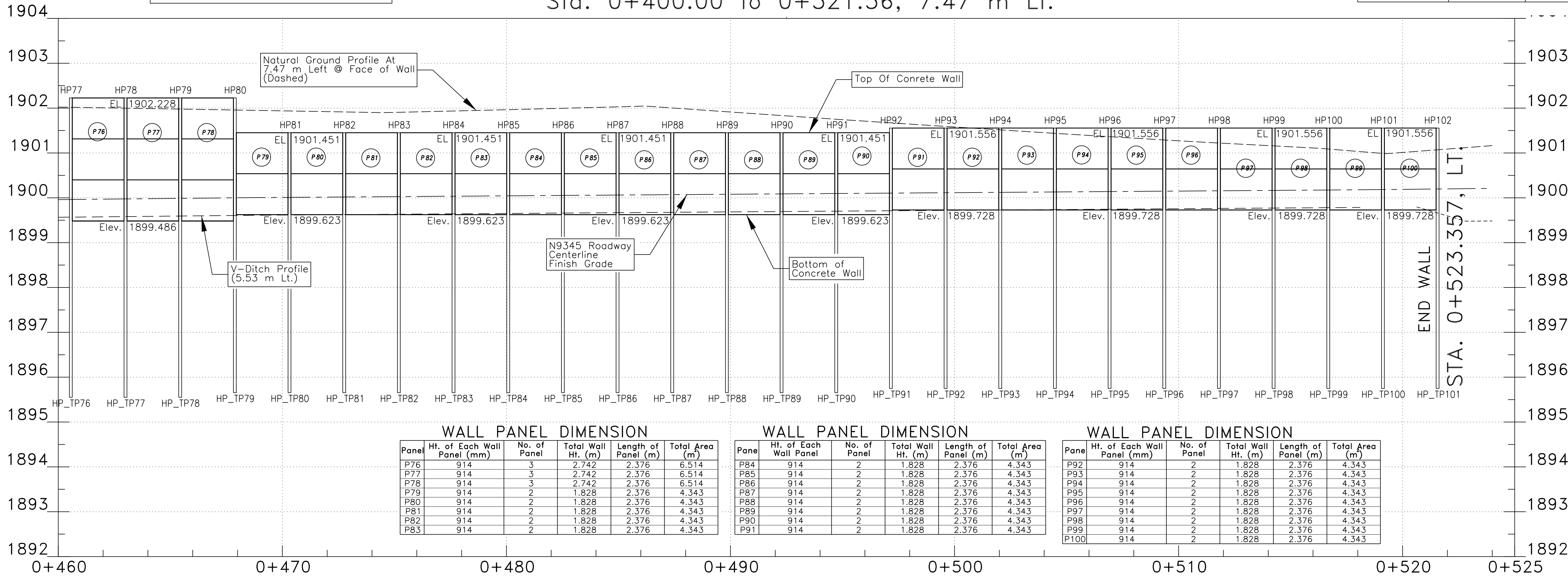
H-PILE INSTALLATION DATA  
CONTINUES ON NEXT SHEET

I:\CURRENT PROJECTS\N36-Ft Defiance\N9345(2)&4\_092908\DESIGN DATA\_082908\CADD FILES\_092908\Microstation\_09282010\Sht 11\_Lt Wall 1\_profile.dgn

CONSTRUCTION PLANS APPROVED  
08/16/2011

RETAINING WALL PROFILE  
Sta. 0+400.00 to 0+521.56, 7.47 m Lt.

| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
|--------|---------|-------------|-------|-------------|-------|--------------|
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 11    | 39           |



WALL PANEL DIMENSION

| Panel | Ht. of Each Wall Panel (mm) | No. of Panel | Total Wall Ht. (m) | Length of Panel (m) | Total Area (m²) |
|-------|-----------------------------|--------------|--------------------|---------------------|-----------------|
| P76   | 914                         | 3            | 2.742              | 2.376               | 6.514           |
| P77   | 914                         | 3            | 2.742              | 2.376               | 6.514           |
| P78   | 914                         | 3            | 2.742              | 2.376               | 6.514           |
| P79   | 914                         | 2            | 1.828              | 2.376               | 4.343           |
| P80   | 914                         | 2            | 1.828              | 2.376               | 4.343           |
| P81   | 914                         | 2            | 1.828              | 2.376               | 4.343           |
| P82   | 914                         | 2            | 1.828              | 2.376               | 4.343           |
| P83   | 914                         | 2            | 1.828              | 2.376               | 4.343           |

WALL PANEL DIMENSION

| Pane | Ht. of Each Wall Panel (mm) | No. of Panel | Total Wall Ht. (m) | Length of Panel (m) | Total Area (m²) |
|------|-----------------------------|--------------|--------------------|---------------------|-----------------|
| P84  | 914                         | 2            | 1.828              | 2.376               | 4.343           |
| P85  | 914                         | 2            | 1.828              | 2.376               | 4.343           |
| P86  | 914                         | 2            | 1.828              | 2.376               | 4.343           |
| P87  | 914                         | 2            | 1.828              | 2.376               | 4.343           |
| P88  | 914                         | 2            | 1.828              | 2.376               | 4.343           |
| P89  | 914                         | 2            | 1.828              | 2.376               | 4.343           |
| P90  | 914                         | 2            | 1.828              | 2.376               | 4.343           |
| P91  | 914                         | 2            | 1.828              | 2.376               | 4.343           |

WALL PANEL DIMENSION

| Pane | Ht. of Each Wall Panel (mm) | No. of Panel | Total Wall Ht. (m) | Length of Panel (m) | Total Area (m²) |
|------|-----------------------------|--------------|--------------------|---------------------|-----------------|
| P92  | 914                         | 2            | 1.828              | 2.376               | 4.343           |
| P93  | 914                         | 2            | 1.828              | 2.376               | 4.343           |
| P94  | 914                         | 2            | 1.828              | 2.376               | 4.343           |
| P95  | 914                         | 2            | 1.828              | 2.376               | 4.343           |
| P96  | 914                         | 2            | 1.828              | 2.376               | 4.343           |
| P97  | 914                         | 2            | 1.828              | 2.376               | 4.343           |
| P98  | 914                         | 2            | 1.828              | 2.376               | 4.343           |
| P99  | 914                         | 2            | 1.828              | 2.376               | 4.343           |
| P100 | 914                         | 2            | 1.828              | 2.376               | 4.343           |

Note:  
Concrete For H-Pile  
Encasement not shown.

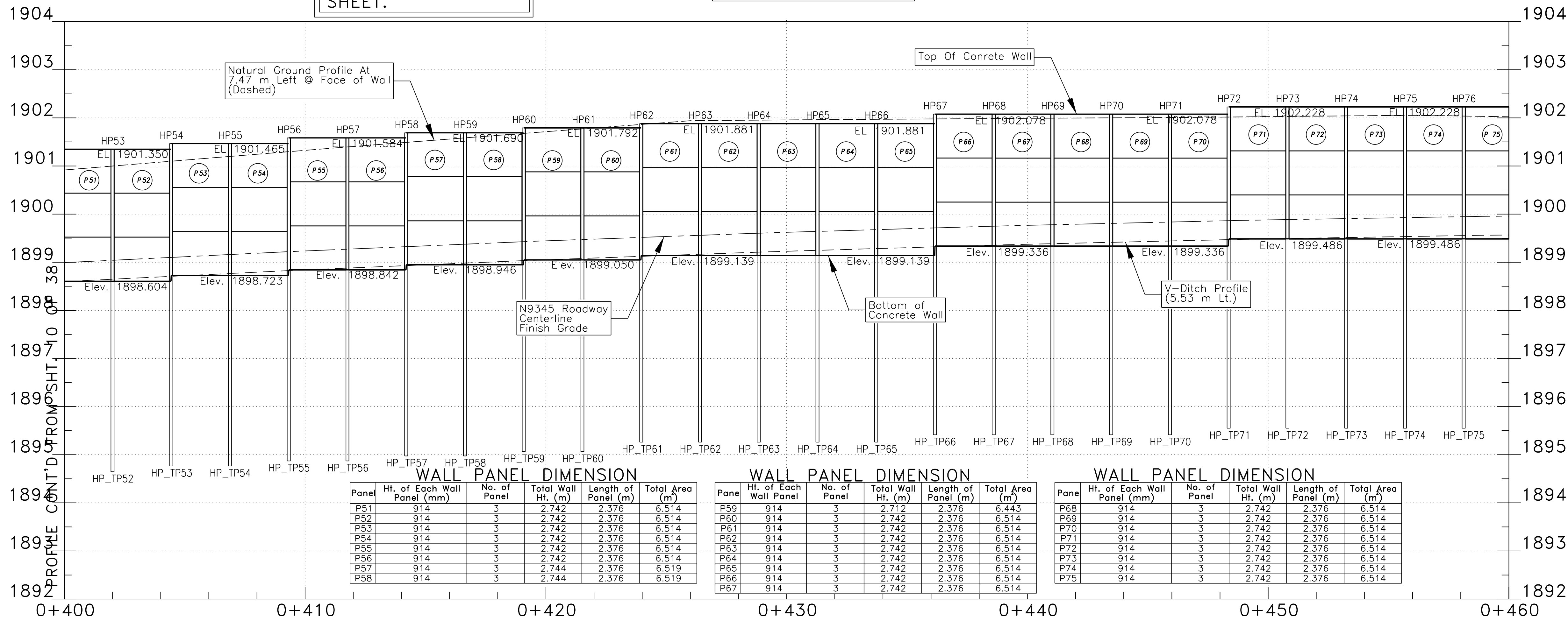
H-PILE INSTALLATION  
BEGINS ON PREVIOUS  
SHEET.

SCALE: 1:100 Horiz.  
1:50 Vert.

H-PILE INSTALLATION DATA-LEFT

| Station   | Offset (m) | Mark  | Top Pipe Tip Elevation | Mark   | Bottom Pipe Tip Elevation | Pile Length (m) |
|-----------|------------|-------|------------------------|--------|---------------------------|-----------------|
| 0+399.916 | -7.470     | HP52  | 1,901.350              | HPT51  | 1,894.650                 | 6.700           |
| 0+402.388 | -7.470     | HP53  | 1,901.350              | HPT52  | 1,894.650                 | 6.700           |
| 0+404.860 | -7.470     | HP54  | 1,901.465              | HPT53  | 1,894.770                 | 6.695           |
| 0+407.332 | -7.470     | HP55  | 1,901.465              | HPT54  | 1,894.770                 | 6.695           |
| 0+409.803 | -7.470     | HP56  | 1,901.584              | HPT55  | 1,894.870                 | 6.714           |
| 0+412.275 | -7.470     | HP57  | 1,901.584              | HPT56  | 1,894.870                 | 6.714           |
| 0+414.747 | -7.470     | HP58  | 1,901.690              | HPT57  | 1,894.970                 | 6.720           |
| 0+417.219 | -7.470     | HP59  | 1,901.690              | HPT58  | 1,894.970                 | 6.720           |
| 0+419.690 | -7.470     | HP60  | 1,901.792              | HPT59  | 1,895.060                 | 6.732           |
| 0+422.162 | -7.470     | HP61  | 1,901.792              | HPT60  | 1,895.060                 | 6.732           |
| 0+424.634 | -7.470     | HP62  | 1,901.881              | HPT61  | 1,895.260                 | 6.621           |
| 0+427.105 | -7.470     | HP63  | 1,901.881              | HPT62  | 1,895.260                 | 6.621           |
| 0+429.577 | -7.470     | HP64  | 1,901.881              | HPT63  | 1,895.260                 | 6.621           |
| 0+432.049 | -7.470     | HP65  | 1,901.881              | HPT64  | 1,895.260                 | 6.621           |
| 0+434.521 | -7.470     | HP66  | 1,901.881              | HPT65  | 1,895.260                 | 6.621           |
| 0+436.992 | -7.470     | HP67  | 1,902.078              | HPT66  | 1,895.410                 | 6.668           |
| 0+439.464 | -7.470     | HP68  | 1,902.078              | HPT67  | 1,895.410                 | 6.668           |
| 0+441.936 | -7.470     | HP69  | 1,902.078              | HPT68  | 1,895.410                 | 6.668           |
| 0+444.407 | -7.470     | HP70  | 1,902.078              | HPT69  | 1,895.410                 | 6.668           |
| 0+446.879 | -7.470     | HP71  | 1,902.078              | HPT70  | 1,895.410                 | 6.668           |
| 0+449.351 | -7.470     | HP72  | 1,902.228              | HPT71  | 1,895.550                 | 6.678           |
| 0+451.823 | -7.470     | HP73  | 1,902.228              | HPT72  | 1,895.550                 | 6.678           |
| 0+454.294 | -7.470     | HP74  | 1,902.228              | HPT73  | 1,895.550                 | 6.678           |
| 0+456.766 | -7.470     | HP75  | 1,902.228              | HPT74  | 1,895.550                 | 6.678           |
| 0+459.238 | -7.470     | HP76  | 1,902.228              | HPT75  | 1,895.550                 | 6.678           |
| 0+461.710 | -7.470     | HP77  | 1,902.228              | HPT76  | 1,895.550                 | 6.678           |
| 0+464.181 | -7.470     | HP78  | 1,902.228              | HPT77  | 1,895.550                 | 6.678           |
| 0+466.653 | -7.470     | HP79  | 1,902.228              | HPT78  | 1,895.550                 | 6.678           |
| 0+469.125 | -7.470     | HP80  | 1,902.228              | HPT79  | 1,895.660                 | 6.568           |
| 0+471.596 | -7.470     | HP81  | 1,901.451              | HPT80  | 1,895.660                 | 5.791           |
| 0+474.068 | -7.470     | HP82  | 1,901.451              | HPT81  | 1,895.660                 | 5.791           |
| 0+476.540 | -7.470     | HP83  | 1,901.451              | HPT82  | 1,895.660                 | 5.791           |
| 0+479.012 | -7.470     | HP84  | 1,901.451              | HPT83  | 1,895.660                 | 5.791           |
| 0+481.483 | -7.470     | HP85  | 1,901.451              | HPT84  | 1,895.660                 | 5.791           |
| 0+483.955 | -7.470     | HP86  | 1,901.451              | HPT85  | 1,895.660                 | 5.791           |
| 0+486.427 | -7.470     | HP87  | 1,901.451              | HPT86  | 1,895.660                 | 5.791           |
| 0+488.898 | -7.470     | HP88  | 1,901.451              | HPT87  | 1,895.660                 | 5.791           |
| 0+491.370 | -7.470     | HP89  | 1,901.451              | HPT88  | 1,895.660                 | 5.791           |
| 0+493.842 | -7.470     | HP90  | 1,901.451              | HPT89  | 1,895.660                 | 5.791           |
| 0+496.314 | -7.470     | HP91  | 1,901.451              | HPT90  | 1,895.660                 | 5.791           |
| 0+498.785 | -7.470     | HP92  | 1,901.556              | HPT91  | 1,895.750                 | 5.806           |
| 0+501.257 | -7.470     | HP93  | 1,901.556              | HPT92  | 1,895.750                 | 5.806           |
| 0+503.729 | -7.470     | HP94  | 1,901.556              | HPT93  | 1,895.750                 | 5.806           |
| 0+506.200 | -7.470     | HP95  | 1,901.556              | HPT94  | 1,895.750                 | 5.806           |
| 0+508.672 | -7.470     | HP96  | 1,901.556              | HPT95  | 1,895.750                 | 5.806           |
| 0+511.144 | -7.470     | HP97  | 1,901.556              | HPT96  | 1,895.750                 | 5.806           |
| 0+513.616 | -7.470     | HP98  | 1,901.556              | HPT97  | 1,895.750                 | 5.806           |
| 0+516.087 | -7.470     | HP99  | 1,901.556              | HPT98  | 1,895.750                 | 5.806           |
| 0+518.559 | -7.470     | HP100 | 1,901.556              | HPT99  | 1,895.750                 | 5.806           |
| 0+521.031 | -7.470     | HP101 | 1,901.556              | HPT100 | 1,895.750                 | 5.806           |
| 0+523.357 | -8.300     | HP102 | 1,901.556              | HPT101 | 1,895.750                 | 5.806           |

PROFILE CONT'D ABOVE



WALL PANEL DIMENSION

| Panel | Ht. of Each Wall Panel (mm) | No. of Panel | Total Wall Ht. (m) | Length of Panel (m) | Total Area (m²) |
|-------|-----------------------------|--------------|--------------------|---------------------|-----------------|
| P51   | 914                         | 3            | 2.742              | 2.376               | 6.514           |
| P52   | 914                         | 3            | 2.742              | 2.376               | 6.514           |
| P53   | 914                         | 3            | 2.742              | 2.376               | 6.514           |
| P54   | 914                         | 3            | 2.742              | 2.376               | 6.514           |
| P55   | 914                         | 3            | 2.742              | 2.376               | 6.514           |
| P56   | 914                         | 3            | 2.742              | 2.376               | 6.514           |
| P57   | 914                         | 3            | 2.744              | 2.376               | 6.519           |
| P58   | 914                         | 3            | 2.744              | 2.376               | 6.519           |

WALL PANEL DIMENSION

| Pane | Ht. of Each Wall Panel (mm) | No. of Panel | Total Wall Ht. (m) | Length of Panel (m) | Total Area (m²) |
|------|-----------------------------|--------------|--------------------|---------------------|-----------------|
| P59  | 914                         | 3            | 2.712              | 2.376               | 6.443           |
| P60  | 914                         | 3            | 2.742              | 2.376               | 6.514           |
| P61  | 914                         | 3            | 2.742              | 2.376               | 6.514           |
| P62  | 914                         | 3            | 2.742              | 2.376               | 6.514           |
| P63  | 914                         | 3            | 2.742              | 2.376               | 6.514           |
| P64  | 914                         | 3            | 2.742              | 2.376               | 6.514           |
| P65  | 914                         | 3            | 2.742              | 2.376               | 6.514           |
| P66  | 914                         | 3            | 2.742              | 2.376               | 6.514           |
| P67  | 914                         | 3            | 2.742              | 2.376               | 6.514           |

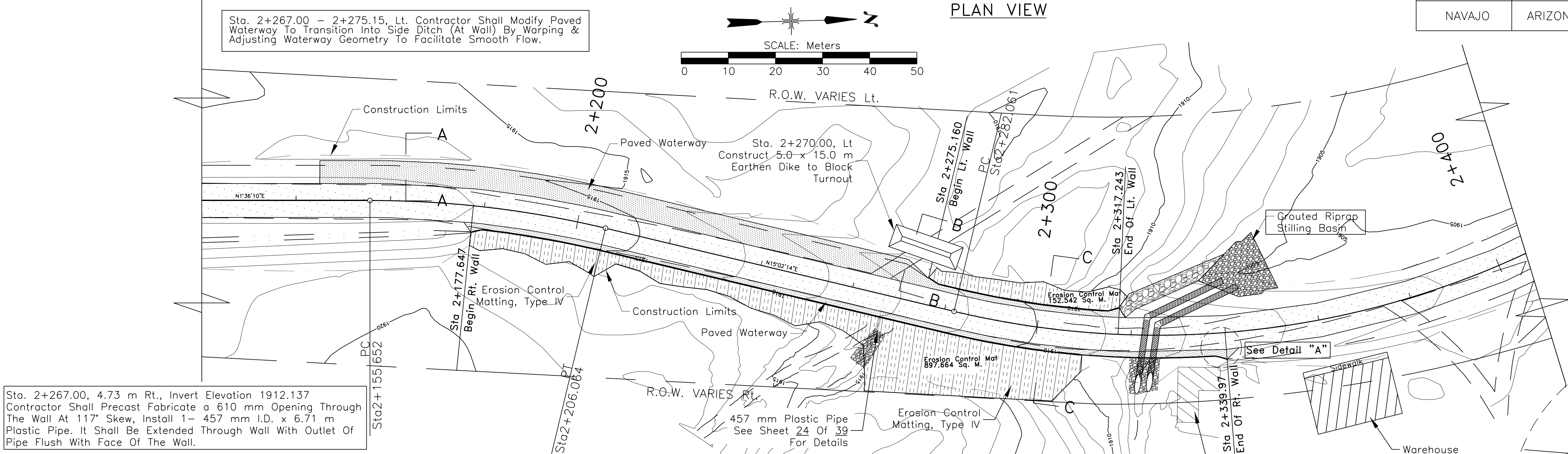
WALL PANEL DIMENSION

| Pane | Ht. of Each Wall Panel (mm) | No. of Panel | Total Wall Ht. (m) | Length of Panel (m) | Total Area (m²) |
|------|-----------------------------|--------------|--------------------|---------------------|-----------------|
| P68  | 914                         | 3            | 2.742              | 2.376               | 6.514           |
| P69  | 914                         | 3            | 2.742              | 2.376               | 6.514           |
| P70  | 914                         | 3            | 2.742              | 2.376               | 6.514           |
| P71  | 914                         | 3            | 2.742              | 2.376               | 6.514           |
| P72  | 914                         | 3            | 2.742              | 2.376               | 6.514           |
| P73  | 914                         | 3            | 2.742              | 2.376               | 6.514           |
| P74  | 914                         | 3            | 2.742              | 2.376               | 6.514           |
| P75  | 914                         | 3            | 2.742              | 2.376               | 6.514           |

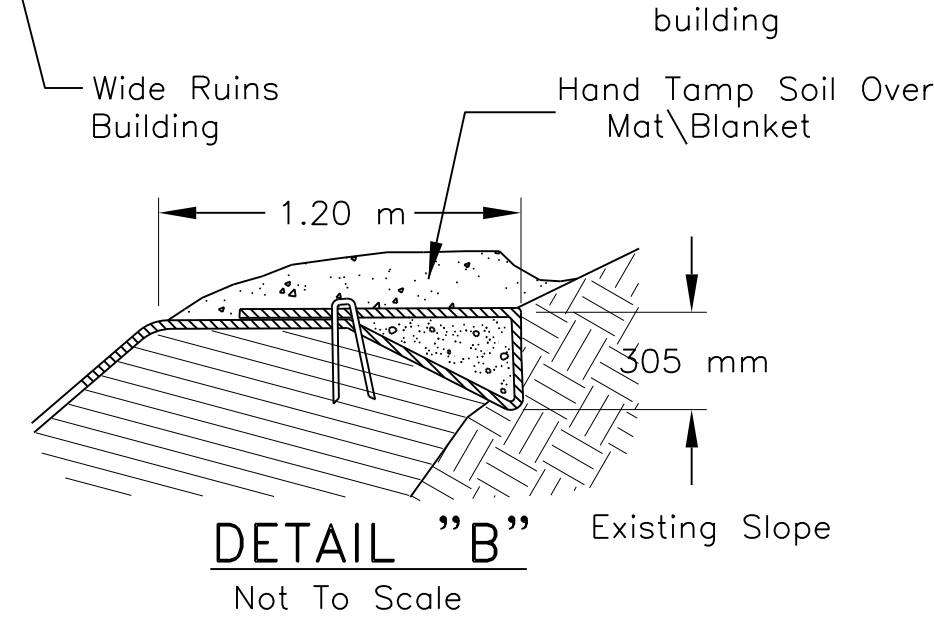
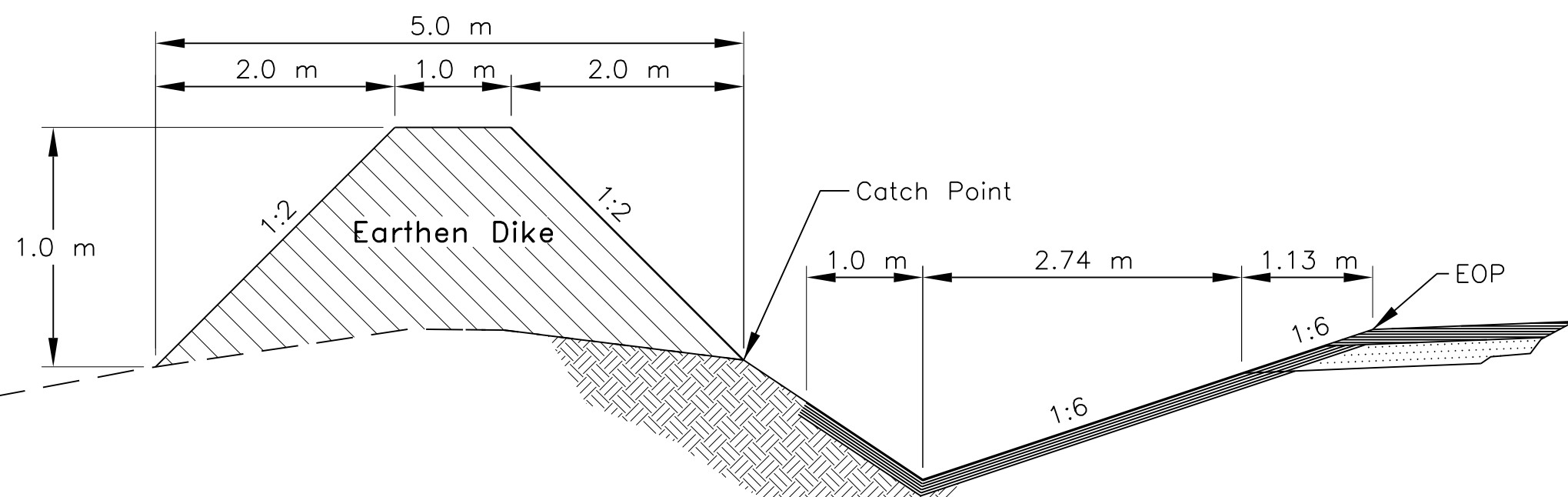
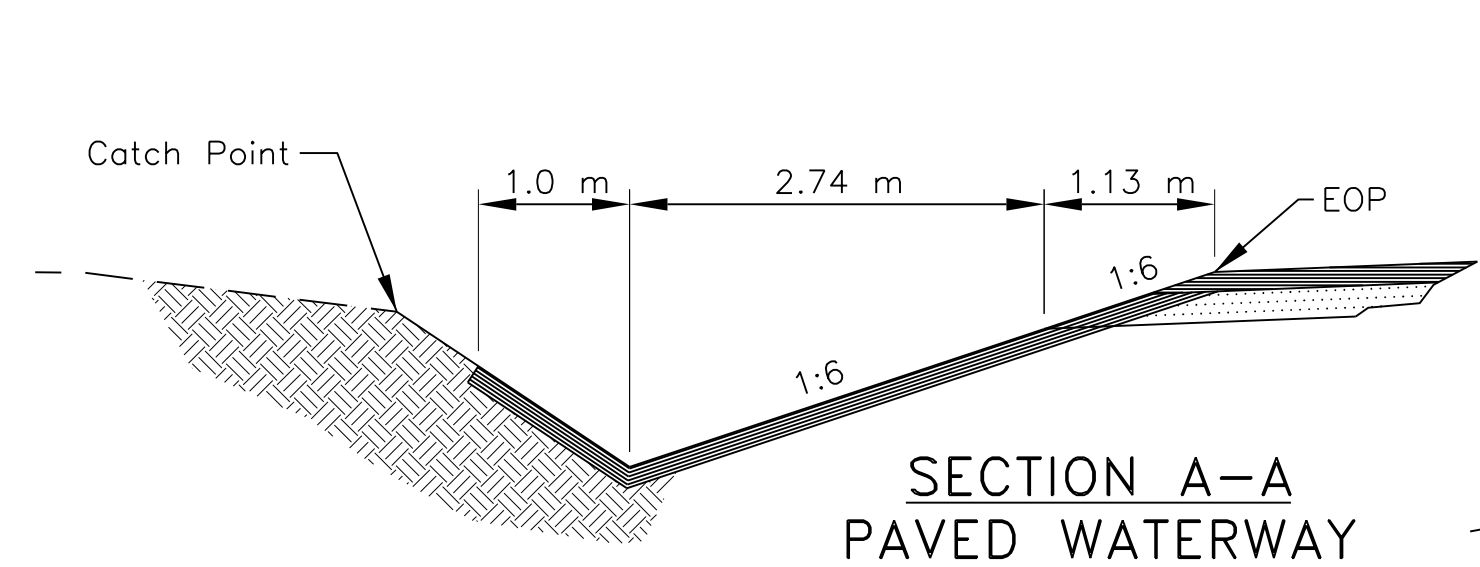
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| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
|--------|---------|-------------|-------|-------------|-------|--------------|
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 12    | 39           |

PLAN VIEW



| Legend            |     |
|-------------------|-----|
| Existing Road     | --- |
| Cut               | --- |
| Fill              | --- |
| Existing Drainage | --- |
| Right-Of-Way Line | --- |
| V-Ditch Bottom    | --- |



SEE SHEET 13 & 14 of 39  
FOR H-PILE INSTALLATION DETAILS.

60801 - 0100 - PAVED WATERWAYS

| STATION-STATION     | LOCATION | WIDTH(m) | AREA(m <sup>2</sup> ) |
|---------------------|----------|----------|-----------------------|
| 0+277.71 - 0+400.00 | Lt.      | 3.91     | 478.17                |
| 2+177.65 - 2+339.97 | Rt.      | 1.13     | 183.43                |
| 2+145.00 - 2+275.16 | Lt.      | 3.74     | 486.80                |
| 2+275.16 - 2+317.24 | Lt.      | 1.13     | 47.55                 |
| TOTAL:              |          |          | 1189.83               |

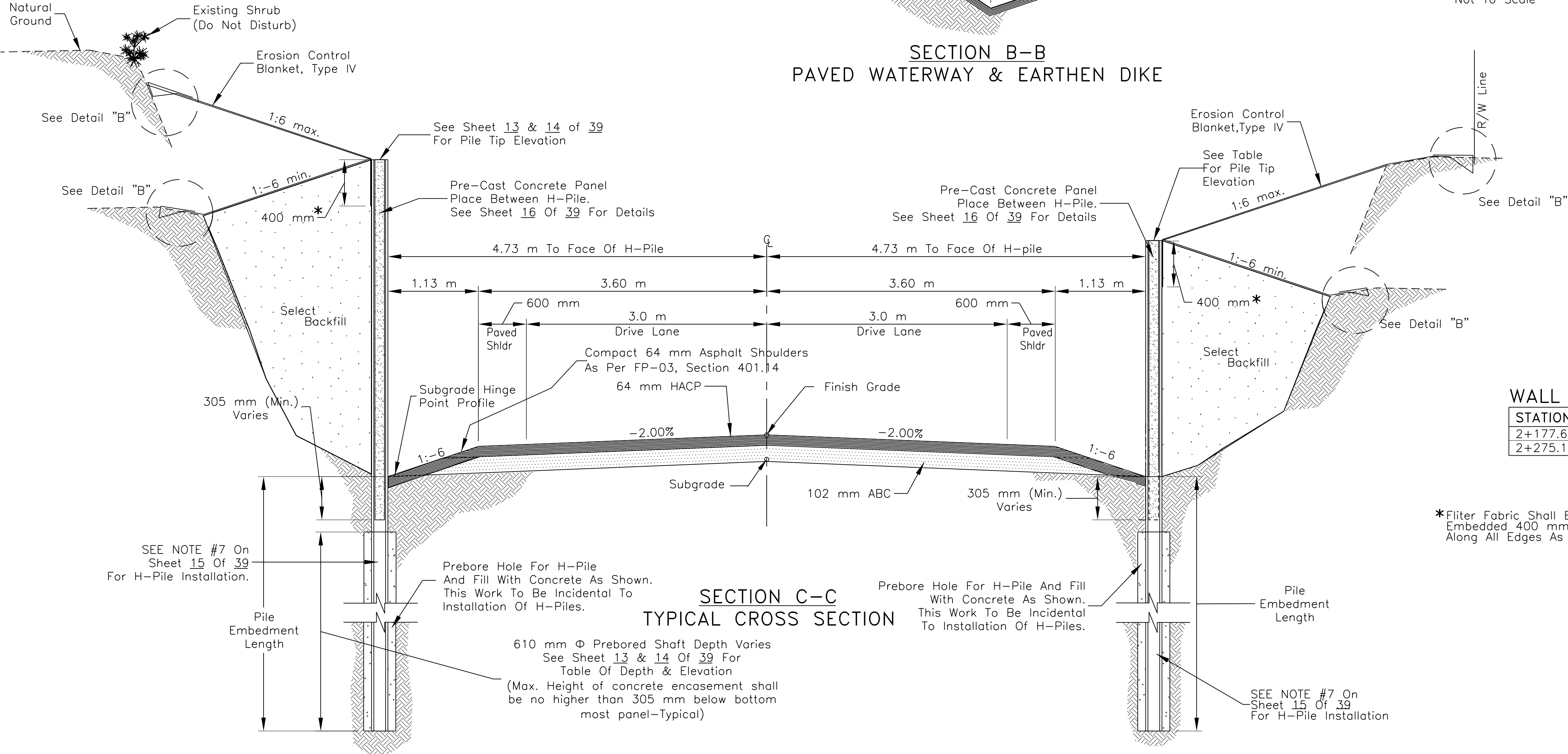
EROSION CONTROL BLANKET  
62901 - 1100 - MATTING, TYPE IV

| STATION  | TO | STATION  | LOCATION | WIDTH(M) | AREA(m <sup>2</sup> ) |
|----------|----|----------|----------|----------|-----------------------|
| 0+277.71 | -  | 0+523.36 | Lt.      | 3.33     | 818.02                |
| 2+177.65 | -  | 2+310.00 | Rt.      | 3.33     | 897.66                |
| 2+275.16 | -  | 2+318.84 | Lt.      | 3.33     | 152.54                |
|          |    |          | TOTAL:   |          | 1868.22               |

WALL LOCATION

| STATION   | TO | STATION   | LOCATION   | REMARKS                                               |
|-----------|----|-----------|------------|-------------------------------------------------------|
| 2+177.647 | -  | 2+339.970 | 4.73 m Rt. | First & Last Wall Panel w/ 20" Offset, See Detail "A" |
| 2+275.147 | -  | 2+317.243 | 4.73 m Lt. | First & Last Wall Panel w/ 20" Offset, See Detail "A" |

\*Filter Fabric Shall Be Tucked Or Embedded 400 mm Into Embankment Along All Edges As Shown.



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

TYPICAL CROSS SECTION DETAIL  
AND RETAINING WALL PLAN

DRAWN BY: NRDOT DATE: 03/05  
DESIGNED BY: NRDOT DATE: 03/05  
REVISED: 09/10 BY: LRT  
SCALE: n/a  
FILENAME: Sht 12\_Wall Plan2  
SHEET MODEL NAME: PLOT SHEET



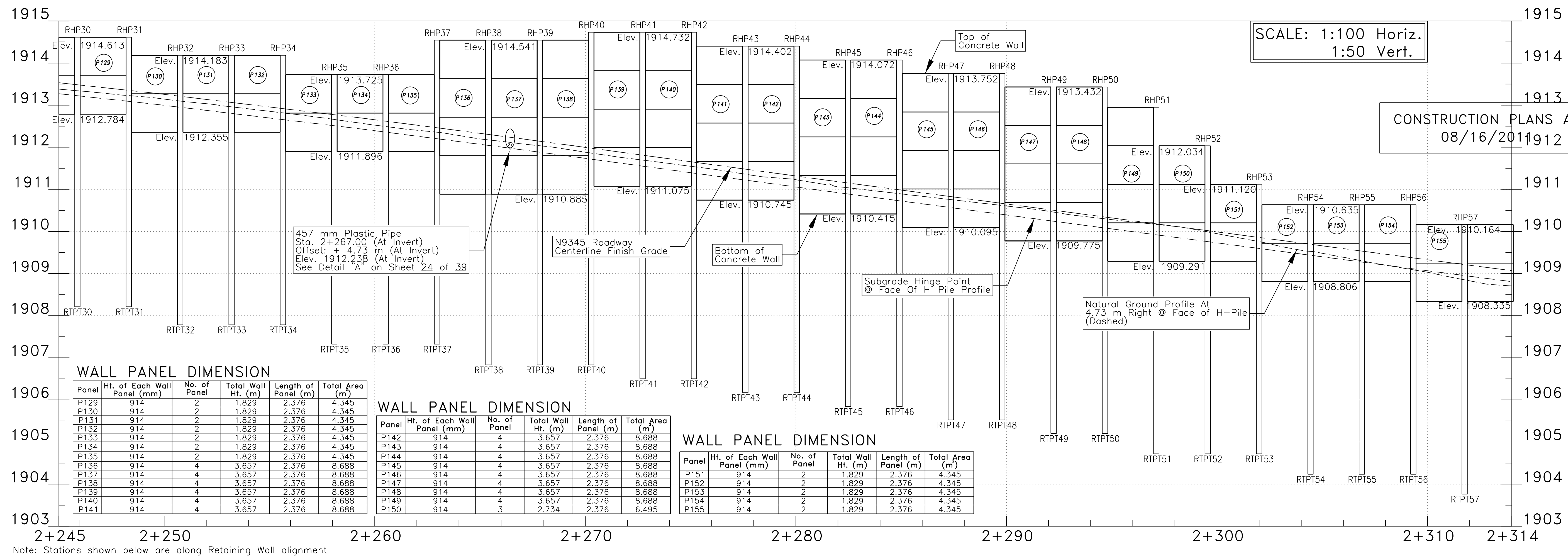
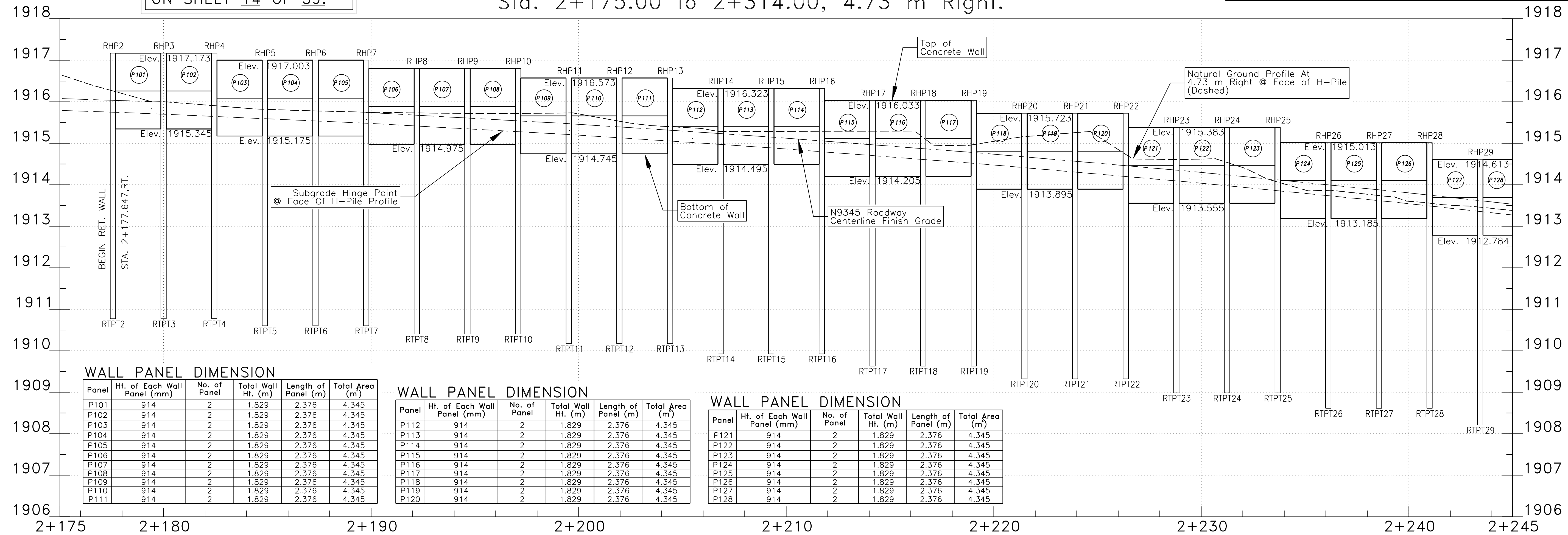
I:\CURRENT PROJECTS\N36\_Ft Defiance\N9345(2)2&4\_092908\DESIGN DATA\_082908\CADD FILES\_09282010\Sht 13 Rt Wall profile.dgn

See H-PILE DATA TABLE  
ON SHEET 14 OF 39.

# RETAINING WALL PROFILE

Sta. 2+175.00 to 2+314.00, 4.73 m Right.

| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
|--------|---------|-------------|-------|-------------|-------|--------------|
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 13    | 39           |



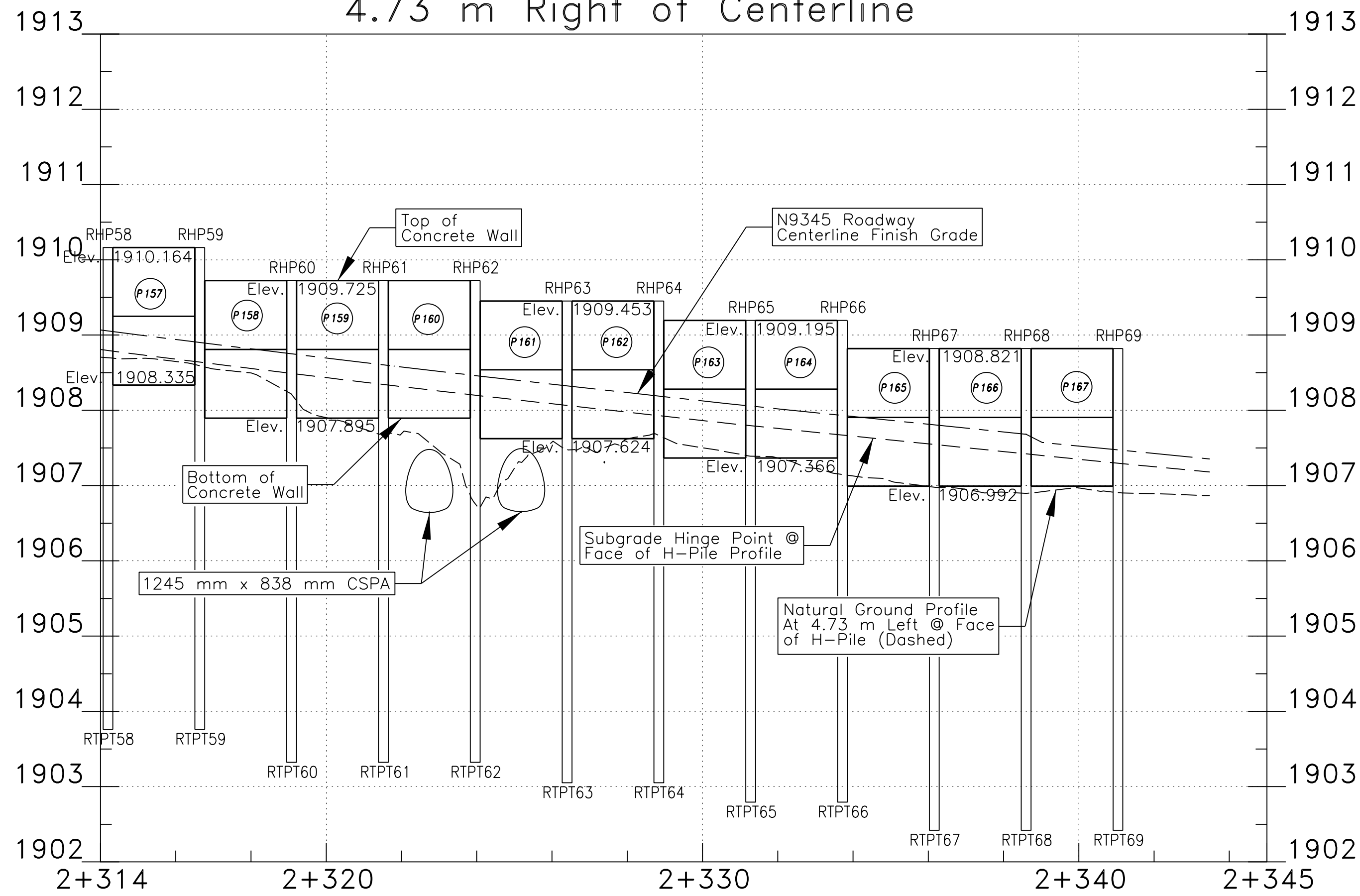
SCALE: 1:100 Horiz.  
1:50 Vert.

CONSTRUCTION PLANS APPROVED  
08/16/2011

I:\CURRENT PROJECTS\N36\_Ft Defiance\N9345(2)2&4\_092908\DESIGN DATA\_082908\CADD FILES\_09282010\Sht 14\_Lt Wall2\_profile.dgn

## RETAINING WALL PROFILE (Cont.)

4.73 m Right of Centerline



CONSTRUCTION PLANS APPROVED  
08/16/2011

## WALL PANEL DIMENSION (Right Wall Continued)

| Panel | Ht. of Each Wall Panel (mm) | No. of Panel | Total Wall Ht. (m) | Length of Panel (m) | Total Area (m <sup>2</sup> ) |
|-------|-----------------------------|--------------|--------------------|---------------------|------------------------------|
| P157  | 914                         | 2            | 1.829              | 2.376               | 4.345                        |
| P158  | 914                         | 2            | 1.829              | 2.376               | 4.345                        |
| P159  | 914                         | 2            | 1.829              | 2.376               | 4.345                        |
| P160  | 914                         | 2            | 1.829              | 2.376               | 4.345                        |
| P161  | 914                         | 2            | 1.829              | 2.376               | 4.345                        |
| P162  | 914                         | 2            | 1.829              | 2.376               | 4.345                        |
| P163  | 914                         | 2            | 1.829              | 2.376               | 4.345                        |
| P164  | 914                         | 2            | 1.829              | 2.376               | 4.345                        |
| P165  | 914                         | 2            | 1.829              | 2.376               | 4.345                        |
| P166  | 914                         | 2            | 1.829              | 2.376               | 4.345                        |
| P167  | 914                         | 2            | 1.829              | 2.376               | 4.345                        |

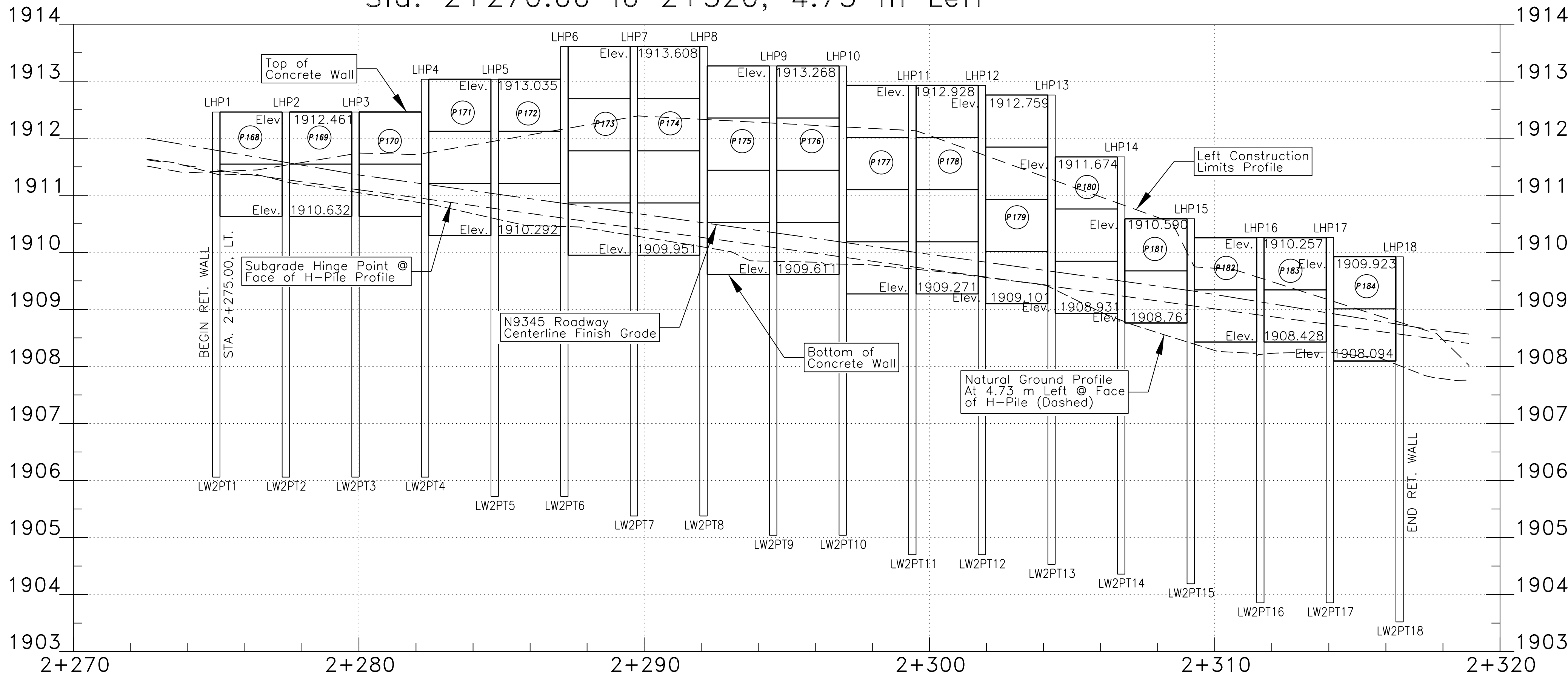
Note:

Concrete for H-Pile  
Encasement not shown.

## Lt. WALL PANEL DIMENSION

| Panel | Ht. of Each Wall Panel (mm) | No. of Panel | Total Wall Ht. (m) | Length of Panel (m) | Total Area (m <sup>2</sup> ) |
|-------|-----------------------------|--------------|--------------------|---------------------|------------------------------|
| P168  | 914                         | 2            | 1.829              | 2.376               | 4.345                        |
| P169  | 914                         | 2            | 1.829              | 2.376               | 4.345                        |
| P170  | 914                         | 2            | 1.829              | 2.376               | 4.345                        |
| P171  | 914                         | 3            | 2.743              | 2.376               | 6.516                        |
| P172  | 914                         | 3            | 2.743              | 2.376               | 6.516                        |
| P173  | 914                         | 4            | 3.657              | 2.376               | 8.688                        |
| P174  | 914                         | 4            | 3.657              | 2.376               | 8.688                        |
| P175  | 914                         | 4            | 3.657              | 2.376               | 8.688                        |
| P176  | 914                         | 4            | 3.657              | 2.376               | 8.688                        |
| P177  | 914                         | 4            | 3.657              | 2.376               | 8.688                        |
| P178  | 914                         | 4            | 3.657              | 2.376               | 8.688                        |
| P179  | 914                         | 4            | 3.658              | 2.376               | 8.690                        |
| P180  | 914                         | 3            | 2.743              | 2.376               | 6.516                        |
| P181  | 914                         | 2            | 1.829              | 2.376               | 4.345                        |
| P182  | 914                         | 2            | 1.829              | 2.376               | 4.345                        |
| P183  | 914                         | 2            | 1.829              | 2.376               | 4.345                        |
| P184  | 914                         | 2            | 1.829              | 2.376               | 4.345                        |

## RETAINING WALL PROFILE Sta. 2+270.00 to 2+320, 4.73 m Left



SCALE: 1:100 Horiz.  
1:50 Vert.

| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
|--------|---------|-------------|-------|-------------|-------|--------------|
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 14    | 39           |

## H-PILE INSTALLATION DATA-RIGHT (See Previous Sheet)

| Station   | Mark  | *Offset (m) | Top Pile Tip Elevation | Mark   | Bottom Pile Tip Elevation | H-pile Length (m) |
|-----------|-------|-------------|------------------------|--------|---------------------------|-------------------|
| 2+177.647 | RHP2  | 5.550       | 1,917.173              | RTPT2  | 1,910.773                 | 6.400             |
| 2+180.000 | RHP3  | 4.730       | 1,917.173              | RTPT3  | 1,910.773                 | 6.400             |
| 2+182.495 | RHP4  | 4.730       | 1,917.173              | RTPT4  | 1,910.773                 | 6.400             |
| 2+184.990 | RHP5  | 4.730       | 1,917.003              | RTPT5  | 1,910.603                 | 6.400             |
| 2+187.485 | RHP6  | 4.730       | 1,917.003              | RTPT6  | 1,910.603                 | 6.400             |
| 2+189.980 | RHP7  | 4.730       | 1,917.003              | RTPT7  | 1,910.603                 | 6.400             |
| 2+192.475 | RHP8  | 4.730       | 1,916.803              | RTPT8  | 1,910.403                 | 6.400             |
| 2+194.970 | RHP9  | 4.730       | 1,916.803              | RTPT9  | 1,910.403                 | 6.400             |
| 2+197.464 | RHP10 | 4.730       | 1,916.803              | RTPT10 | 1,910.403                 | 6.400             |
| 2+199.959 | RHP11 | 4.730       | 1,916.573              | RTPT11 | 1,910.173                 | 6.400             |
| 2+202.454 | RHP12 | 4.730       | 1,916.573              | RTPT12 | 1,910.173                 | 6.400             |
| 2+204.949 | RHP13 | 4.730       | 1,916.573              | RTPT13 | 1,910.173                 | 6.400             |
| 2+207.414 | RHP14 | 4.730       | 1,916.323              | RTPT14 | 1,909.923                 | 6.400             |
| 2+209.854 | RHP15 | 4.730       | 1,916.323              | RTPT15 | 1,909.923                 | 6.400             |
| 2+212.294 | RHP16 | 4.730       | 1,916.323              | RTPT16 | 1,909.923                 | 6.400             |
| 2+214.734 | RHP17 | 4.730       | 1,916.033              | RTPT17 | 1,909.633                 | 6.400             |
| 2+217.174 | RHP18 | 4.730       | 1,916.033              | RTPT18 | 1,909.633                 | 6.400             |
| 2+219.614 | RHP19 | 4.730       | 1,916.033              | RTPT19 | 1,909.633                 | 6.400             |
| 2+222.053 | RHP20 | 4.730       | 1,915.723              | RTPT20 | 1,909.323                 | 6.400             |
| 2+224.493 | RHP21 | 4.730       | 1,915.723              | RTPT21 | 1,909.323                 | 6.400             |
| 2+226.933 | RHP22 | 4.730       | 1,915.723              | RTPT22 | 1,909.323                 | 6.400             |
| 2+229.373 | RHP23 | 4.730       | 1,915.383              | RTPT23 | 1,908.983                 | 6.400             |
| 2+231.813 | RHP24 | 4.730       | 1,915.383              | RTPT24 | 1,908.983                 | 6.400             |
| 2+234.253 | RHP25 | 4.730       | 1,915.383              | RTPT25 | 1,908.983                 | 6.400             |
| 2+236.693 | RHP26 | 4.730       | 1,915.013              | RTPT26 | 1,908.613                 | 6.400             |
| 2+239.133 | RHP27 | 4.730       | 1,915.013              | RTPT27 | 1,908.613                 | 6.400             |
| 2+241.573 | RHP28 | 4.730       | 1,915.013              | RTPT28 | 1,908.613                 | 6.400             |
| 2+244.013 | RHP29 | 4.730       | 1,914.613              | RTPT29 | 1,908.212                 | 6.401             |
| 2+246.453 | RHP30 | 4.730       | 1,914.613              | RTPT30 | 1,908.212                 | 6.401             |
| 2+248.893 | RHP31 | 4.730       | 1,914.613              | RTPT31 | 1,908.212                 | 6.401             |
| 2+251.333 | RHP32 | 4.730       | 1,914.183              | RTPT32 | 1,907.783                 | 6.400             |
| 2+253.773 | RHP33 | 4.730       | 1,914.183              | RTPT33 | 1,907.783                 | 6.400             |
| 2+256.213 | RHP34 | 4.730       | 1,914.183              | RTPT34 | 1,907.783                 | 6.400             |
| 2+258.653 | RHP35 | 4.730       | 1,913.725              | RTPT35 | 1,907.324                 | 6.401             |
| 2+261.093 | RHP36 | 4.730       | 1,913.725              | RTPT36 | 1,907.324                 | 6.401             |
| 2+263.533 | RHP37 | 4.730       | 1,914.541              | RTPT37 | 1,907.324                 | 7.217             |
| 2+265.973 | RHP38 | 4.730       | 1,914.541              | RTPT38 | 1,906.833                 | 7.708             |
| 2+268.413 | RHP39 | 4.730       | 1,914.541              | RTPT39 | 1,906.833                 | 7.708             |
| 2+270.853 | RHP40 | 4.730       | 1,914.732              | RTPT40 | 1,906.833                 | 7.899             |
| 2+273.293 | RHP41 | 4.730       | 1,914.732              | RTPT41 | 1,906.503                 | 8.229             |
| 2+275.733 | RHP42 | 4.730       | 1,914.732              | RTPT42 | 1,906.503                 | 8.229             |
| 2+278.173 | RHP43 | 4.730       | 1,914.402              | RTPT43 | 1,906.173                 | 8.229             |
| 2+280.613 | RHP44 | 4.730       | 1,914.402              | RTPT44 | 1,906.173                 | 8.229             |
| 2+283.029 | RHP45 | 4.730       | 1,914.072              | RTPT45 | 1,905.843                 | 8.229             |
| 2+285.408 | RHP46 | 4.730       | 1,914.072              | RTPT46 | 1,905.843                 | 8.229             |
| 2+287.787 | RHP47 | 4.730       | 1,913.752              | RTPT47 | 1,905.523                 | 8.229             |
| 2+290.166 | RHP48 | 4.730       | 1,913.752              | RTPT48 | 1,905.523                 | 8.229             |
| 2+292.545 | RHP49 | 4.730       | 1,913.432              | RTPT49 | 1,905.203                 | 8.229             |
| 2+294.924 | RHP50 | 4.730       | 1,913.432              | RTPT50 | 1,905.203                 | 8.229             |
| 2+297.304 | RHP51 | 4.730       | 1,912.949              | RTPT51 | 1,904.719                 | 8.230             |
| 2+299.683 | RHP52 | 4.730       | 1,912.034              | RTPT52 | 1,904.719                 | 7.315             |
| 2+302.062 | RHP53 | 4.730       | 1,911.120              | RTPT53 | 1,904.719                 | 6.401             |
| 2+304.441 | RHP54 | 4.730       | 1,910.635              | RTPT54 | 1,904.234                 | 6.401             |
| 2+306.820 | RHP55 | 4.730       | 1,910.635              | RTPT55 | 1,904.234                 | 6.401             |
| 2+309.199 | RHP56 | 4.730       | 1,910.635              | RTPT56 | 1,904.234                 | 6.401             |
| 2+311.578 | RHP57 | 4.730       | 1,910.164              | RTPT57 | 1,903.763                 | 6.401             |
| 2+313.958 | RHP58 | 4.730       | 1,910.164              | RTPT58 | 1,903.763                 | 6.401             |
| 2+316.337 | RHP59 | 4.730       | 1,910.164              | RTPT59 | 1,903.763                 | 6.401             |
| 2+318.716 | RHP60 | 4.730       | 1,909.725              | RTPT60 | 1,903.323                 | 6.402             |
| 2+321.095 | RHP61 | 4.730       | 1,909.725              | RTPT61 | 1,903.323                 | 6.402             |
| 2+323.474 | RHP62 | 4.730       | 1,909.725              | RTPT62 | 1,903.323                 | 6.402             |
| 2+325.853 | RHP63 | 4.730       | 1,909.453              | RTPT63 | 1,903.052                 | 6.401             |
| 2+328.233 | RHP64 | 4.730       | 1,909.453              | RTPT64 | 1,903.052                 | 6.401             |
| 2+330.612 | RHP65 | 4.730       | 1,909.195              | RTPT65 | 1,902.794                 | 6.401             |
| 2+332.991 | RHP66 | 4.730       | 1,909.195              | RTPT66 | 1,902.794                 | 6.401             |
| 2+335.370 | RHP67 | 4.730       | 1,908.821              | RTPT67 | 1,902.420                 | 6.401             |
| 2+337.749 | RHP68 | 4.730       | 1,908.821              | RTPT68 | 1,902.420                 | 6.401             |
| 2+339.970 | RHP69 | 5.590       | 1,908.821              | RTPT69 | 1,902.420                 | 6.401             |

\* Offset Is To Face Of H-Pile.

\*\* Note: Station shown are N9345 Centerline Alignment Stations

## H-PILE INSTALLATION DATA-LEFT

| Station   | Mark  | *Offset (m) | Top Pile Tip | Mark    | Bottom Pile Tip | H-pile Length (m) |
|-----------|-------|-------------|--------------|---------|-----------------|-------------------|
| 2+275.147 | LHP1  | -5.560      | 1,912.461    | LW2PT1  | 1,906.060       | 6.401             |
| 2+277.440 | LHP2  | -4.730      | 1,912.461    | LW2PT2  | 1,906.060       | 6.401             |
| 2+279.880 | LHP3  | -4.730      | 1,912.461    | LW2PT3  | 1,906.060       | 6.401             |
| 2+282.327 | LHP4  | -4.730      | 1,913.035    | LW2PT4  | 1,906.060       | 6.975             |
| 2+284.831 | LHP5  | -4.730      | 1,913.035    | LW2PT5  | 1,905.720       | 7.315             |
| 2+287.335 | LHP6  | -4.730      | 1,913.608    | LW2PT6  | 1,905.720       | 7.888             |
| 2+289.839 | LHP7  | -4.730      | 1,913.608    | LW2PT7  | 1,905.379       | 8.229             |
| 2+292.343 | LHP8  | -4.730      | 1,913.608    | LW2PT8  | 1,905.379       | 8.229             |
| 2+294.847 | LHP9  | -4.730      | 1,913.268    | LW2PT9  | 1,905.039       | 8.229             |
| 2+297.351 | LHP10 | -4.730      | 1,913.268    | LW2PT10 | 1,905.039       | 8.229             |
| 2+299.855 | LHP11 | -4.730      | 1,912.928    | LW2PT11 | 1,904.699       | 8.229             |
| 2+302.359 | LHP12 | -4.730      | 1,912.928    | LW2PT12 | 1,904.699       | 8.229             |
| 2+304.863 | LHP13 | -4.730      | 1,912.759    | LW2PT13 | 1,904.529       | 8.230             |
| 2+307.367 | LHP14 | -4.730      | 1,911.674    | LW2PT14 | 1,904.359       | 7.315             |
| 2+309.871 | LHP15 | -4.730      | 1,910.590    | LW2PT15 | 1,904.189       | 6.401             |
| 2+312.375 | LHP16 | -4.730      | 1,910.257    | LW2PT16 | 1,903.856       | 6.401             |
| 2+314.879 | LHP17 | -4.730      | 1,910.257    | LW2PT17 | 1,903.856       | 6.401             |
| 2+317.243 | LHP18 | -5.550      | 1,909.923    | LW2PT18 | 1,903.522       | 6.401             |

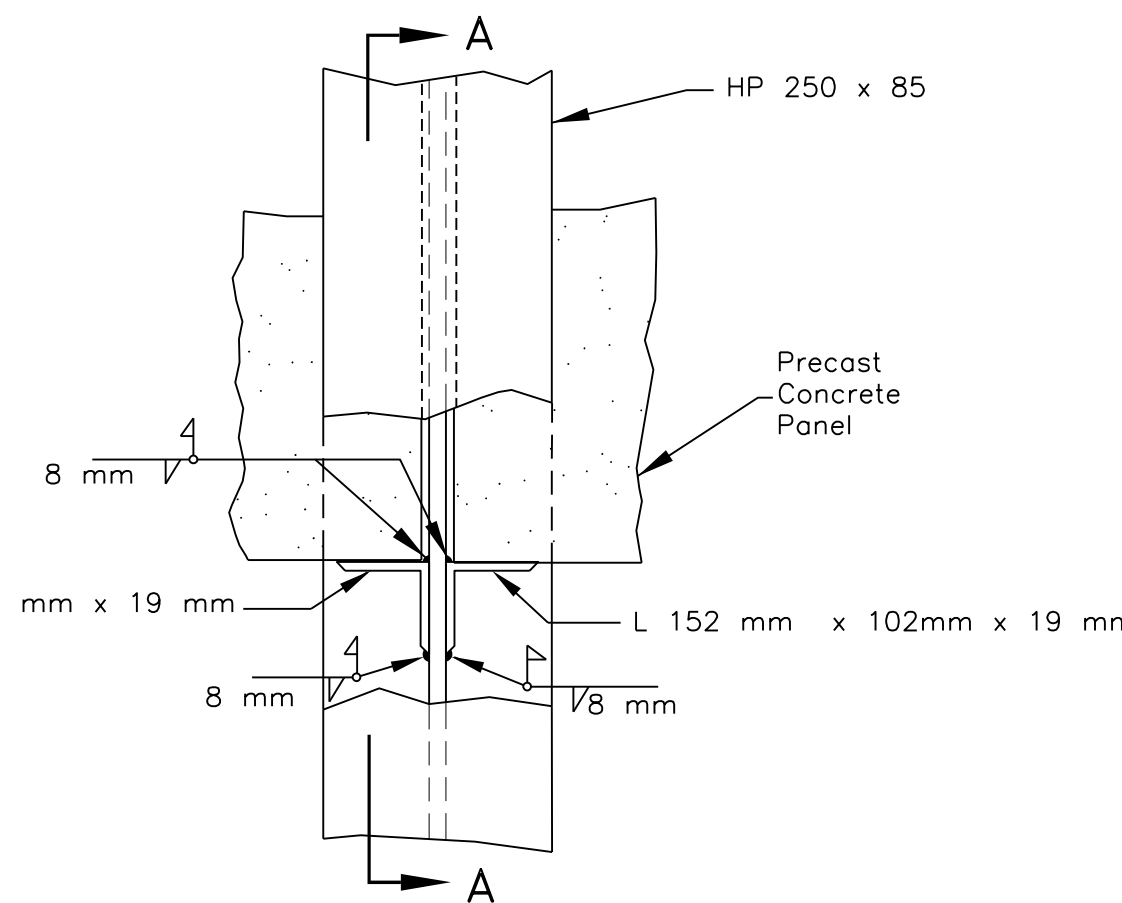
\* Offset Is To Face Of H-Pile.

\*\* Note: Station shown are N9345 Centerline Alignment Stations

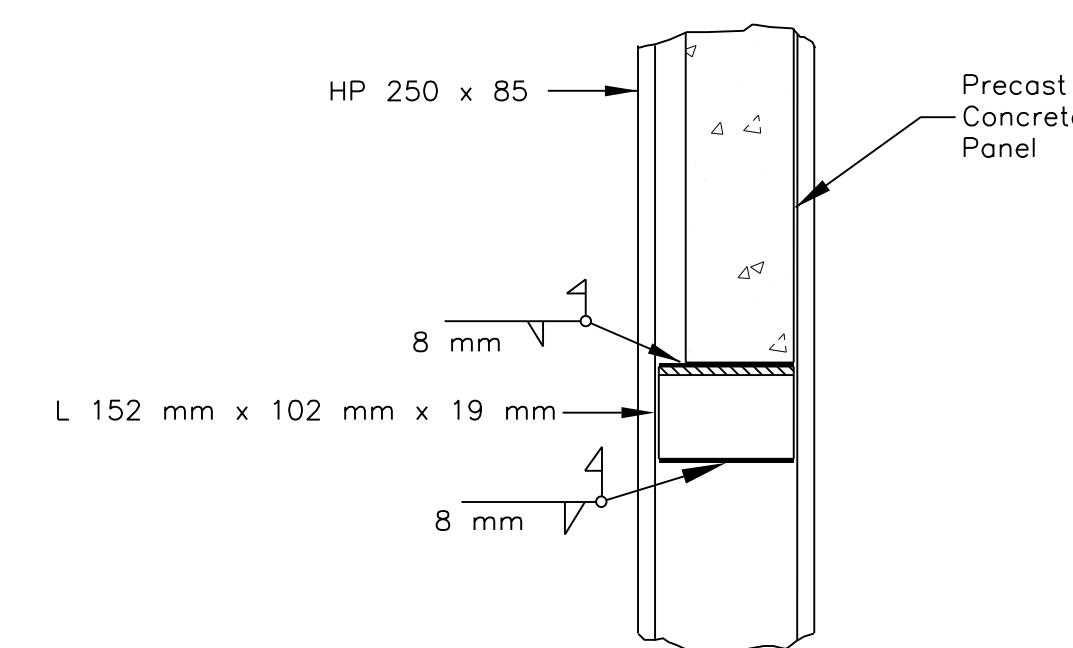
| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
|--------|---------|-------------|-------|-------------|-------|--------------|
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 15    | 39           |

## GENERAL NOTES

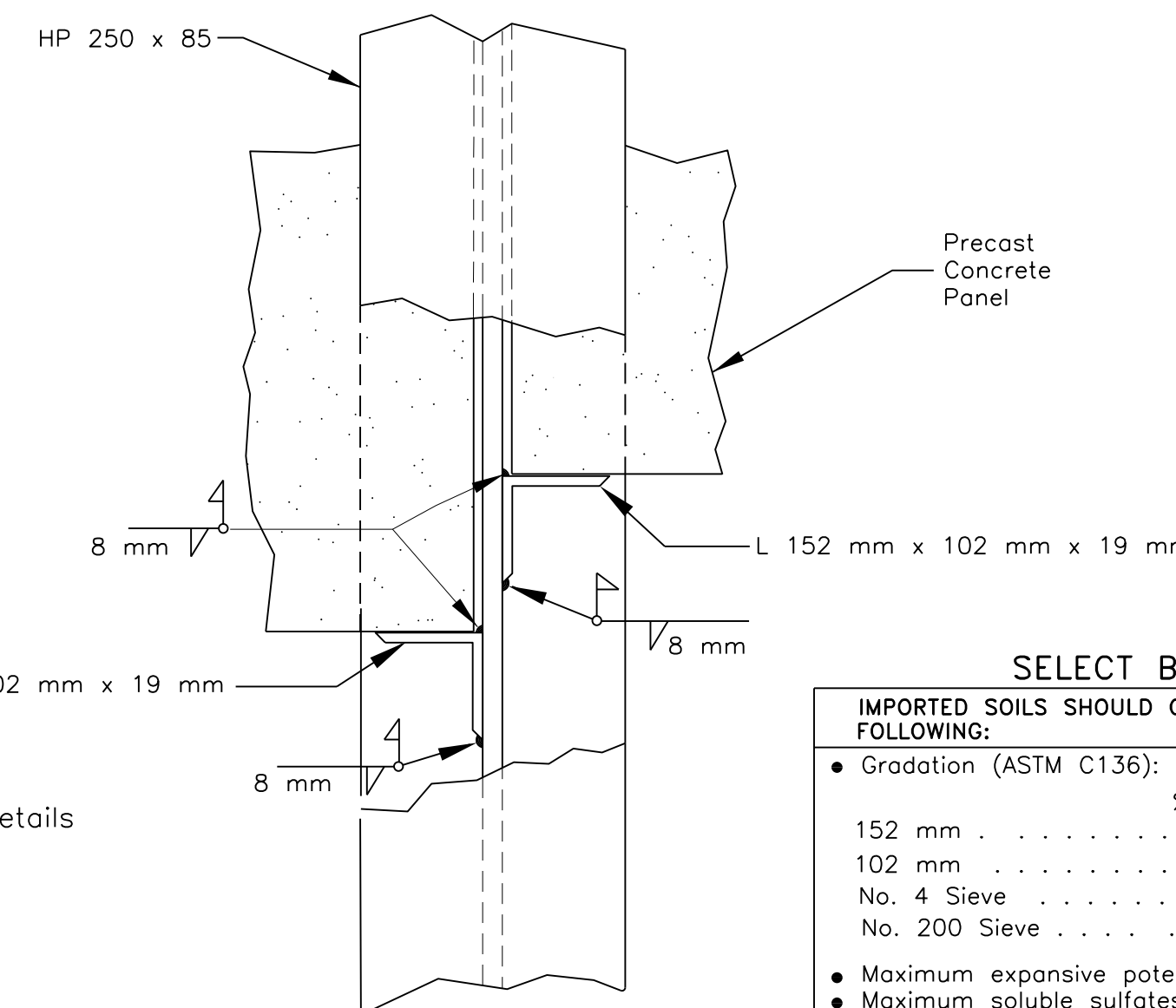
1. SPECIFICATION: AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, 1996, SIXTEENTH EDITION; FEDERAL HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS, FP-03; SPECIAL PROVISIONS AS INCLUDED IN THE SUPPLEMENTAL SPECIFICATIONS.
2. DEAD LOADS-STEEL: 67.8 kg/m'  
EARTH BACKFILL MATERIAL: 1,925 kg/m'=28'  
BEARING CAPACITY AT DITCHLINE: 34.47 MPa (Compacted)  
DEAD LOAD-CONCRETE: 1,977 kg/m'  
CONCRETE:  $F_c=20.7$  MPa@ 28 Days
3. STEEL HP-PILE: ALL STEEL H-PILES SHALL CONFORM TO ASTM A-36. FURNISHING, BORING, AND NECESSARY SPlicing OF PILING (AS REQUIRED), SUPPORT ANGLE IRON AND ALL WORK INVOLVED SHALL BE CONSIDERED INCIDENTAL TO ITEM 25701-0000. ALL PILES SHALL BE INSTALLED TO THE ESTIMATED PILE TIP ELEVATION OR LOWER. PAINT ALL STEEL PILES AND STEEL HARDWARE ABOVE A POINT OF 600 mm BELOW DITCHLINE IN ACCORDANCE WITH SECTION 563, PAINT SYSTEM 3. THE FINAL COAT COLOR TO MATCH THE EXISTING WIDE RUINS STONE WALLS BLOCK COLOR WILL BE SAMPLED AND PROVIDED FOR APPROVAL. INSTALLATION OF H-PILES SHALL BE DONE BY PREBORING, ENCASING AND CAST IN PLACE CONCRETE. THIS WORK SHALL BE INCLUDED AND PAID FOR UNDER ITEM 25701-0000. THE CONCRETE SHALL MEET THE REQUIREMENTS OF SECTION 661.
4. 'TINTED' CONCRETE: PRECAST CONCRETE PANELS FOR RETAINING WALLS. ALL 'TINTED' CONCRETE SHALL BE CLASS A(AE) WITH ARCHITECTURAL FACE TEXTURING THAT MATCHES THE WIDE RUINS BLOCK WALLS. ALL 'TINTED' CONCRETE SHALL CONFORM TO SECTION 552 OF THE FP-03. ALL 'TINTED' CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF  $F'_c = 20.7$  MPa IN 28 DAYS. THE FINAL COAT COLOR TO MATCH THE EXISTING WIDE RUINS BLOCK WALLS COLOR. PAINT COLOR CHIPS SHALL BE SUBMITTED TO THE NRDOT DIVISION MANAGER FOR APPROVAL.
5. REINFORCING STEEL: SHALL CONFORM TO AASHTO SPECIFICATION M-31 (ASTM A 615M), GRADE 40, AND SECTION 554 OF FP-03. FURNISHING AND PLACEMENT OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO CONCRETE PANEL.
6. MISCELLANEOUS STEEL AND BOLTS: ALL MISCELLANEOUS STEEL SHALL CONFORM TO AASHTO M-183 (ASTM A36). ALL BOLTS SHALL CONFORM TO AASHTO M164 (ASTM A325), TYPE 1. ITEMS TO BE GALVANIZED SHALL BE IN ACCORDANCE WITH AASHTO M 111 (ASTM A123). ALL WORK REQUIRED TO FURNISH, FABRICATE AND PLACEMENT OF ALL MISCELLANEOUS STEEL AND BOLTS TO BE EMBEDDED OR INSERTED INTO THE CONCRETE PANEL AND H-PILES SHALL BE CONSIDERED INCIDENTAL TO ITEM 25701-0000. WELDING SHALL CONFORM TO AWS D-1.1 FOR ASTM A36 BASE METAL.
7. ALL STRUCTURE EXCAVATIONS AND BACKFILLING OPERATIONS SHALL BE DONE TO NEAT LINES AND SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 204 AND 209 OF FP-03, AND SHALL BE CONSIDERED INCIDENTAL TO COMPLETION OF STRUCTURE.
8. THE CONTRACTOR SHALL BE REQUIRED TO MAKE FIELD ADJUSTMENTS AS DIRECTED BY THE C.O.R. TO MATCH FIELD CONDITIONS. THESE ADJUSTMENTS SHALL BE CONSIDERED INCIDENTAL TO COMPLETION OF PROJECT AND NO ADDITIONAL PAYMENT SHALL BE MADE.
9. RETAINING WALLS SHALL CONFORM TO HORIZONTAL CURVE BY MAINTAINING A DISTANCE OF 4.73 m FOR STATION SHOWN ON SHT 12 OF 40 AND 7.47 m FROM THE CENTERLINE OF ROADWAY AT STATIONS SHOWN ON SHT 9 OF 40.
10. THE CONTRACTOR SHALL RE-SHAPE THE BACK SLOPES IN ACCORDANCE WITH SECTION 625 OF FP-03, PRIOR TO PLACEMENT OF THE EROSION CONTROL MATTING AND SEEDING.
11. BACKFILL MATERIAL SHALL CONFORM TO AASHTO A-2-4 SOIL CLASSIFICATION OR BETTER. ALL APPROVED SELECT BACKFILL SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY AS DETERMINED BY AASHTO T-99, METHOD C. FURNISHING AND PLACEMENT OF SELECT BACKFILL SHALL BE INCIDENTAL TO INSTALLATION OF THE RETAINING WALL.
12. ALL BACKFILLING BEHIND WALLS SHALL BE DONE BY HAND W/HAND TAMPERS. THE PLACEMENT OF BACKFILL LIFTS SHALL BE BY FRONT END LOADED USED ONLY ON THE ROADWAY SIDE OF RETAINING WALL. A QUALIFIED ARCHEOLOGIST IS REQUIRED DURING THE RETAINING WALL CONSTRUCTION AND PLACEMENT OF EROSION CONTROL FABRIC.



### MAIN PANEL DETAIL

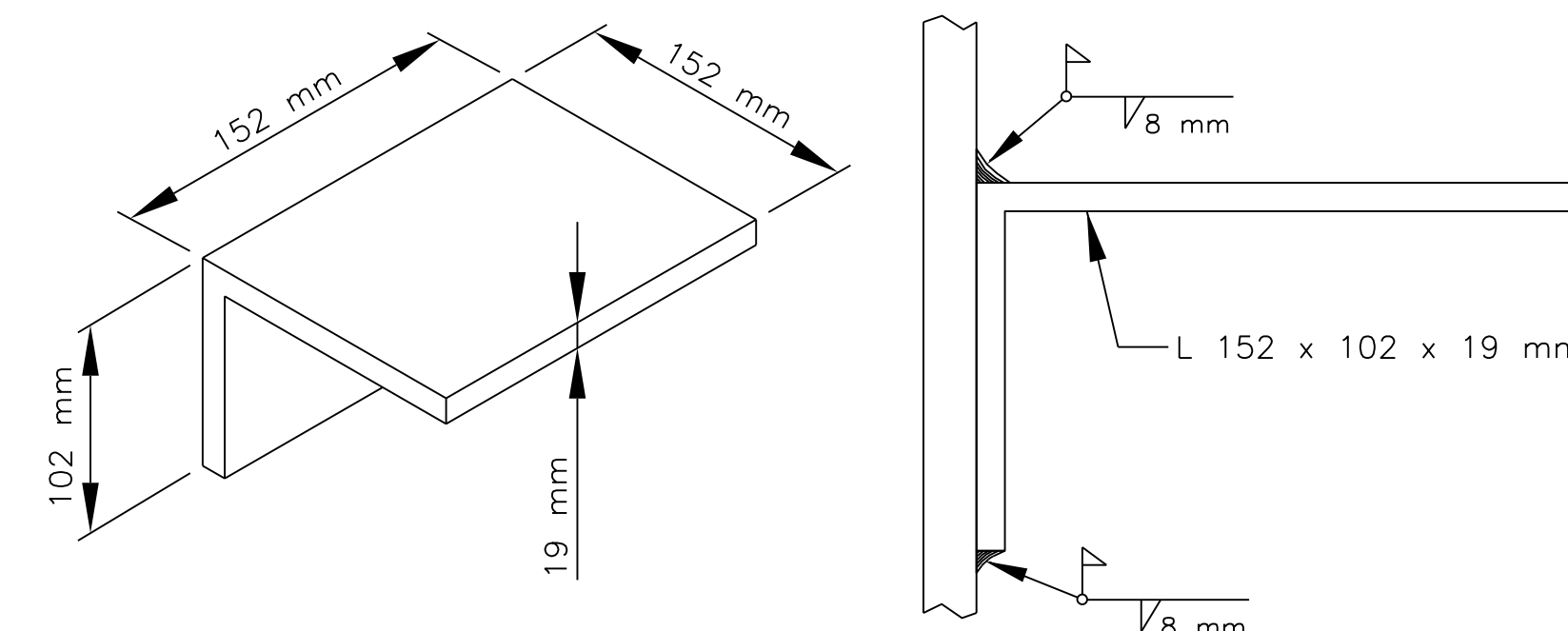


SECTION A-A



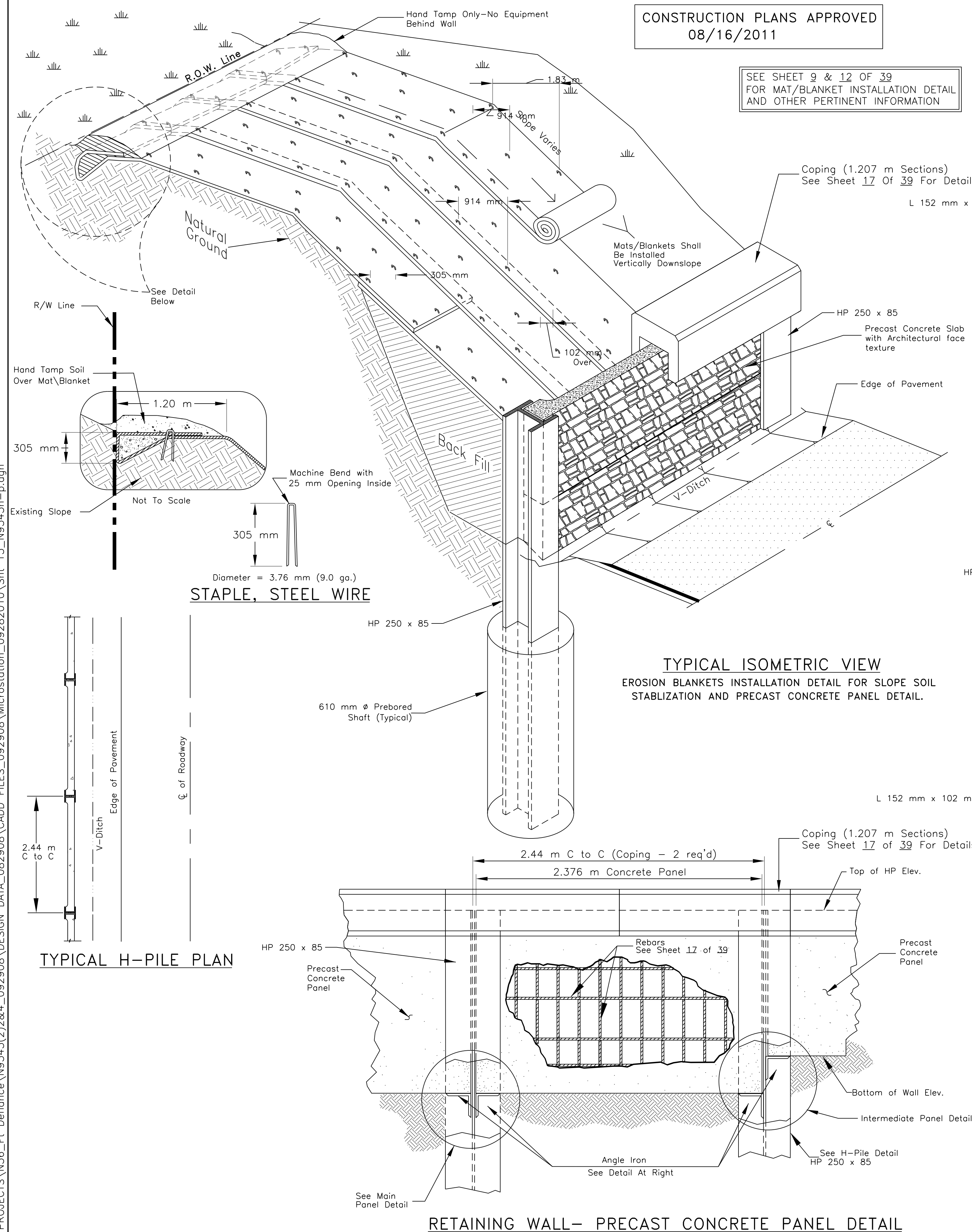
INTERMEDIATE PANEL DETAIL

| SELECT BACKFILL                                                                                                                          |                   |
|------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| IMPORTED SOILS SHOULD CONFORM TO THE FOLLOWING:                                                                                          |                   |
| <ul style="list-style-type: none"> <li>Gradation (ASTM C136):</li> </ul>                                                                 |                   |
|                                                                                                                                          | % finer by weight |
| 152 mm . . . . .                                                                                                                         | 100               |
| 102 mm . . . . .                                                                                                                         | 70 - 100          |
| No. 4 Sieve . . . . .                                                                                                                    | 50 - 100          |
| No. 200 Sieve . . . . .                                                                                                                  | 50 (max.)         |
| <ul style="list-style-type: none"> <li>Maximum expansive potent (%) . . . . .</li> <li>Maximum soluble sulfates (%) . . . . .</li> </ul> | 1.5<br>0.10       |



### ANGLE IRON DETAIL

WELD DETAIL

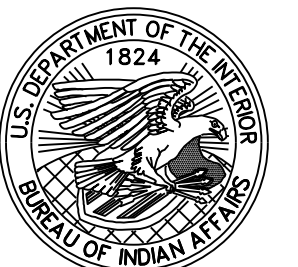


NOTE: Architectural Face Texturing Not Shown on Details above for Clarity.

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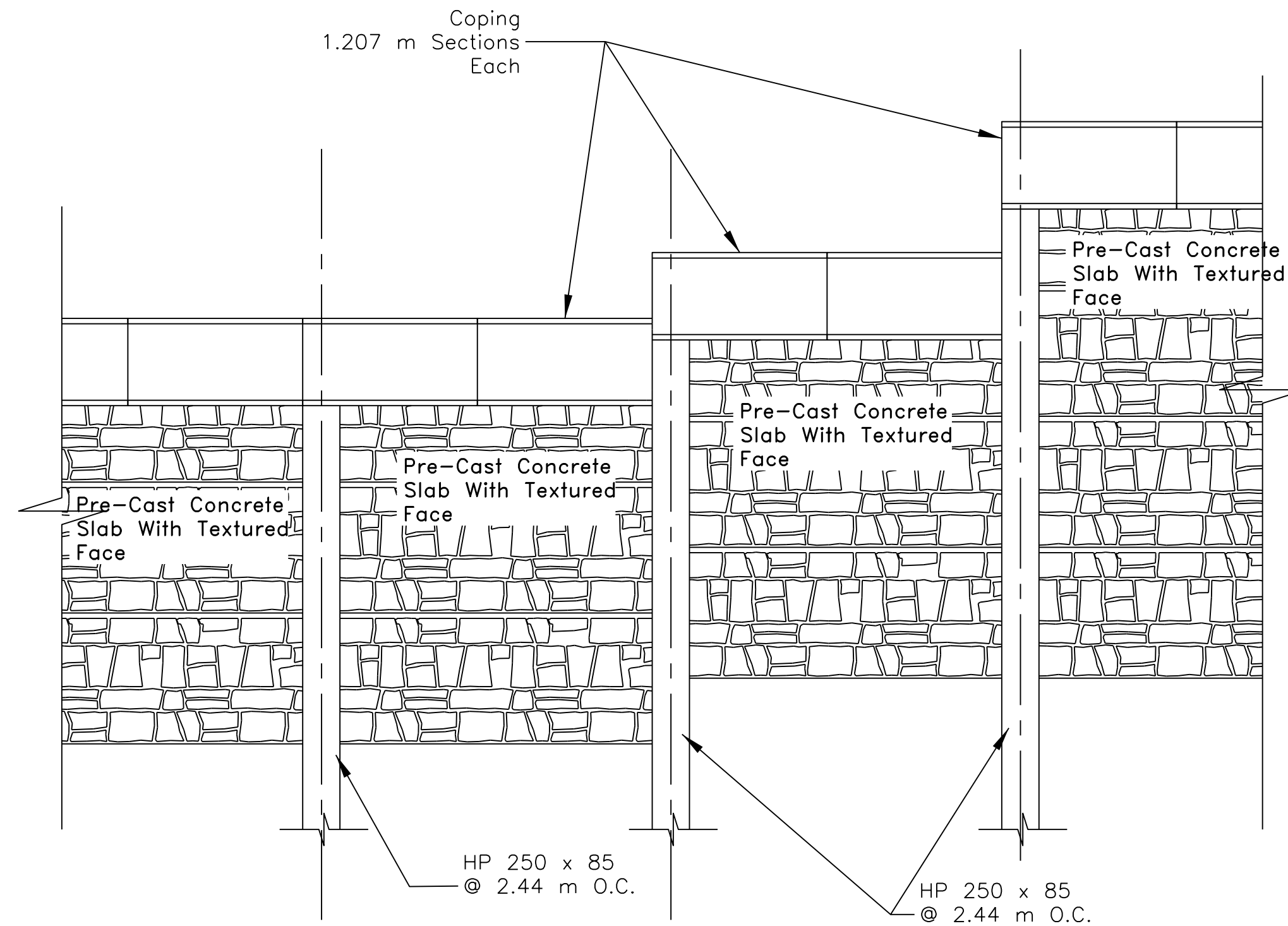
H-PILE AND CONCRETE  
RETAINING WALL DETAILS

|                              |             |
|------------------------------|-------------|
| DRAWN BY: NRDOT              | DATE: 10/97 |
| DESIGNED BY: NRDOT           | DATE: 10/97 |
| REVISED: 09/10               | BY: LRT     |
| SCALE: n/a                   |             |
| FILENAME: Sht 15_N9345h-p    |             |
| SHEET MODEL NAME: PLOT SHEET |             |

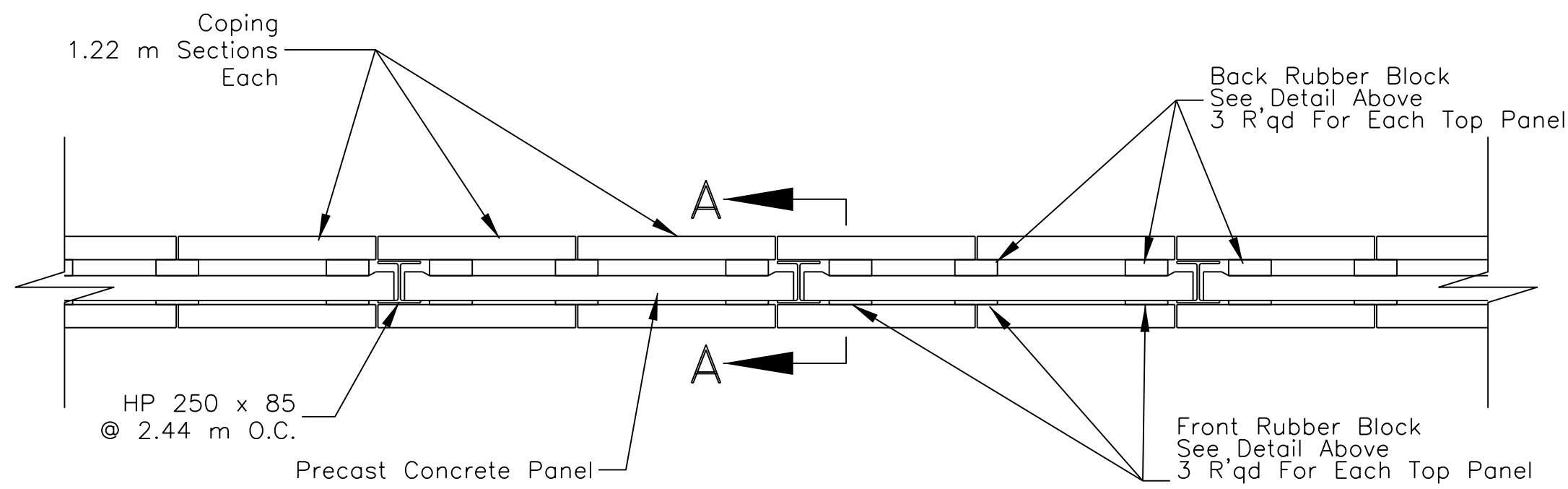


I:\CURRENT PROJECTS\N36\_Ft Defiance\N9345(2)&4\_092908\DESIGN DATA\_082908\Microstation\_09282010\Sht 16\_Panel InstallationAN2.14.11.dgn

CONSTRUCTION PLANS APPROVED  
08/16/2011

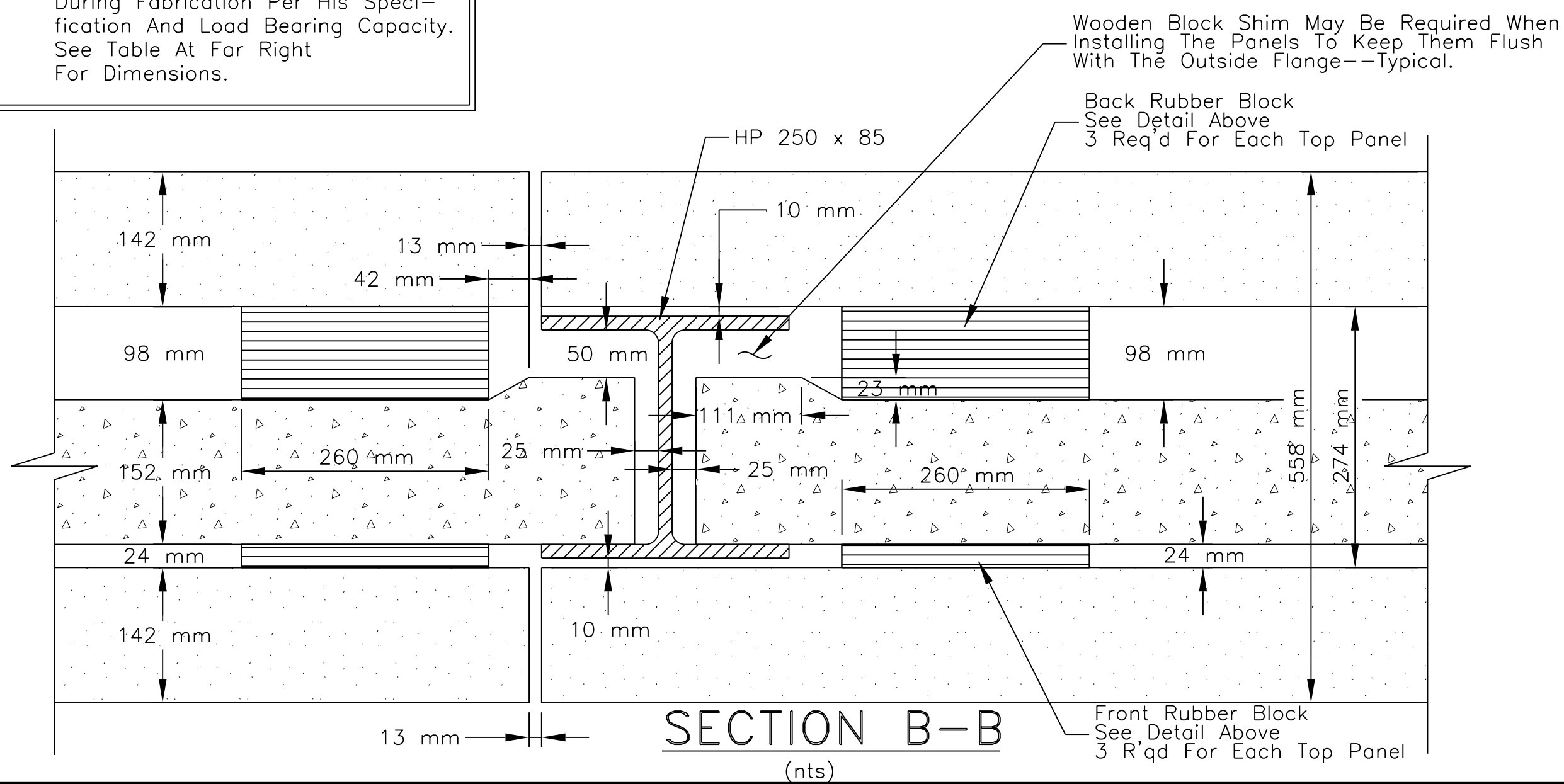


FRONT ELEVATION  
(nts)

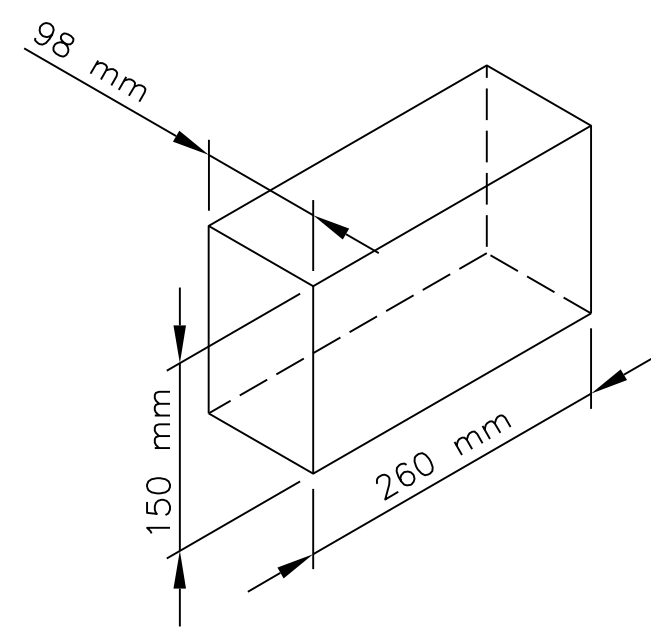


PLAN VIEW  
(nts)

Note: Placement of P-52 SL Anchor To Be Determined By Manufacturer During Fabrication Per His Specification And Load Bearing Capacity. See Table At Far Right For Dimensions.

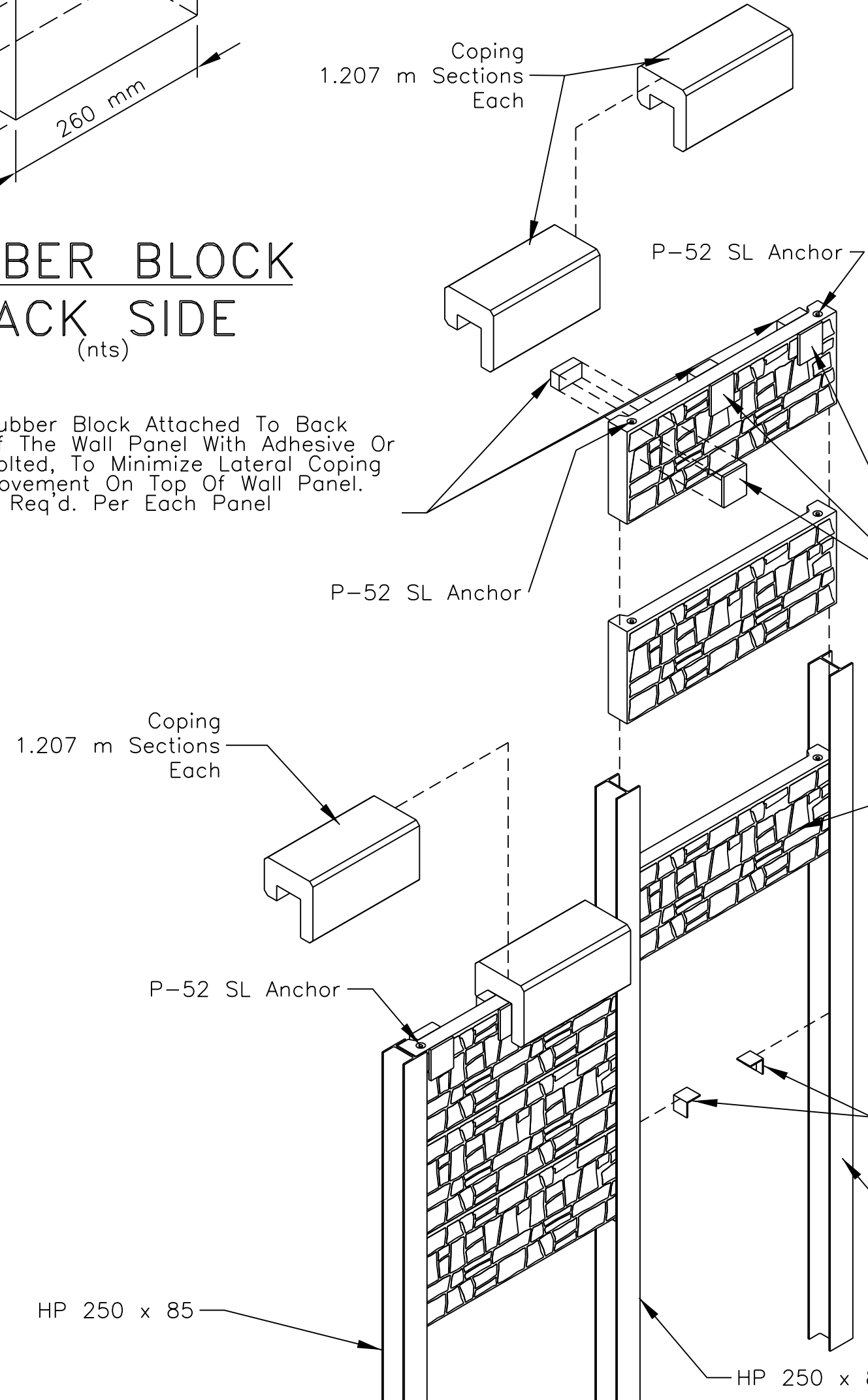


SECTION B-B  
(nts)

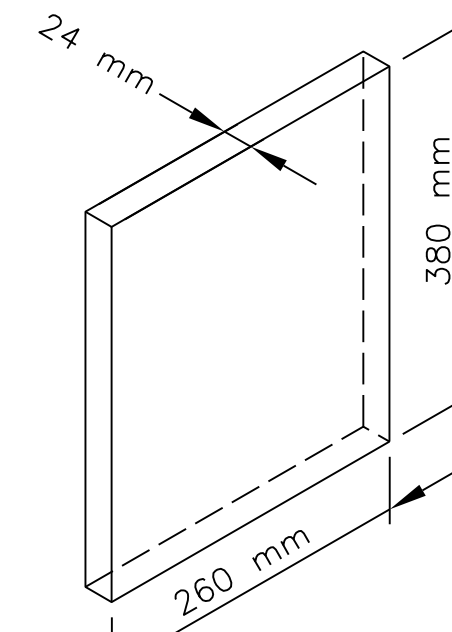


RUBBER BLOCK  
BACK SIDE  
(nts)

Rubber Block Attached To Back Of The Wall Panel With Adhesive Or Bolted, To Minimize Lateral Coping Movement On Top Of Wall Panel. 3 Req'd. Per Each Panel

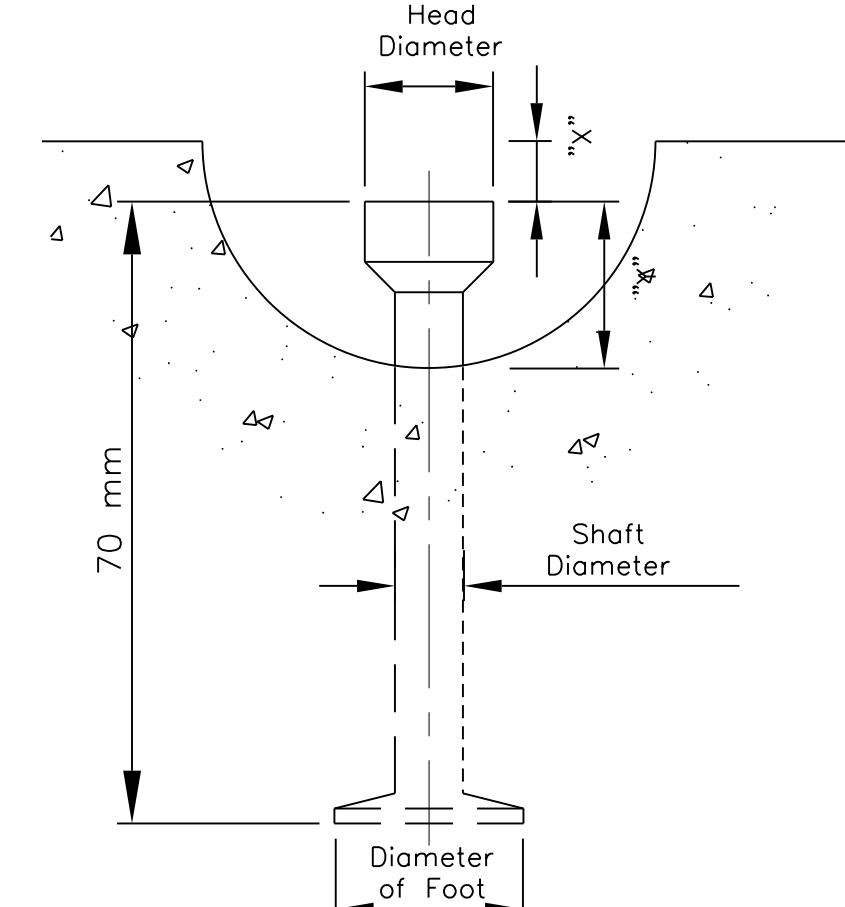


ISOMETRIC EXPLODED VIEW  
(nts)

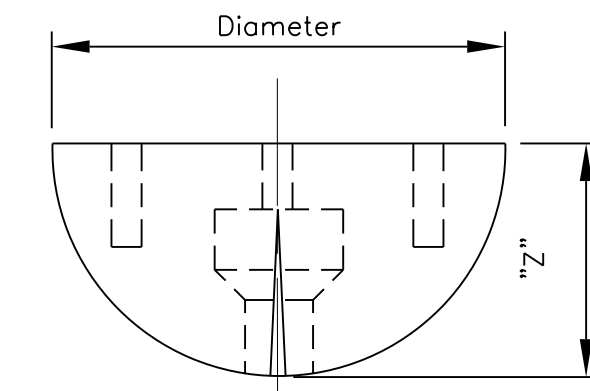


RUBBER BLOCK  
FRONT SIDE  
(nts)

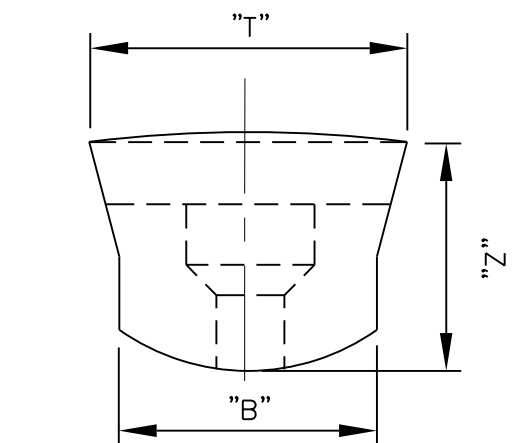
Rubber Block Attached To Back Of The Wall Panel With Adhesive Or Bolted, To Minimize Lateral Coping Movement On Top Of Wall Panel. 3 Req'd. Per Each Panel



P-52 SL ANCHOR



SL ROUND  
RECESS PLUG



SL NARROW  
RECESS PLUG

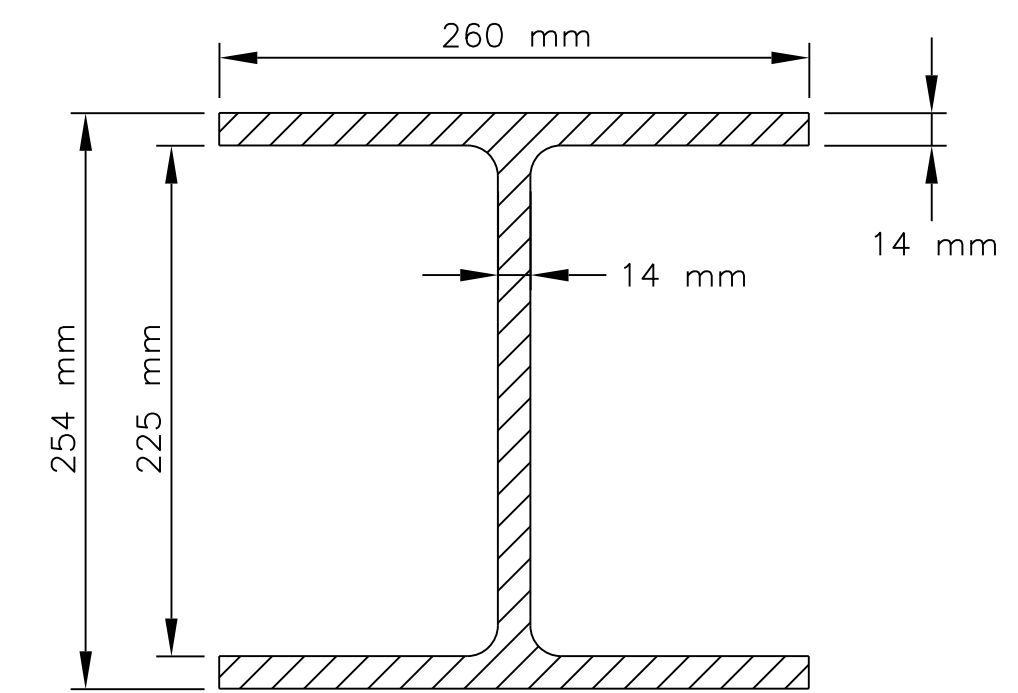
P-52 SL ANCHOR DIMENSIONS

| Swift Lift anchor | Dimension "X" | Dimensions "Y" | Shaft Diameter | Foot Diameter | Head Diameter |
|-------------------|---------------|----------------|----------------|---------------|---------------|
| 1 or 1.3 Tons     | 8 mm          | 22 mm          | 9 mm           | 25 mm         | 17 mm         |
| 2 or 2.5 Tons     | 11 mm         | 27 mm          | 14 mm          | 35 mm         | 24 mm         |

SL RECESS PLUG DIMENSIONS

| Swift Lift anchor | Dimension of Recess Plug | Dimension "Z" | Dimension "T" | Dimension "B" |
|-------------------|--------------------------|---------------|---------------|---------------|
| 2 or 2.5 Tons     | 76 mm                    | 37 mm         | 52 mm         | 44 mm         |

Note: The length of the narrow recess plug is the same as the diameter of the round recess plug.

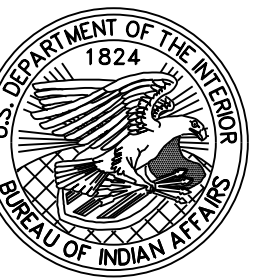


H-PILE  
HP 250 x 85  
(nts)

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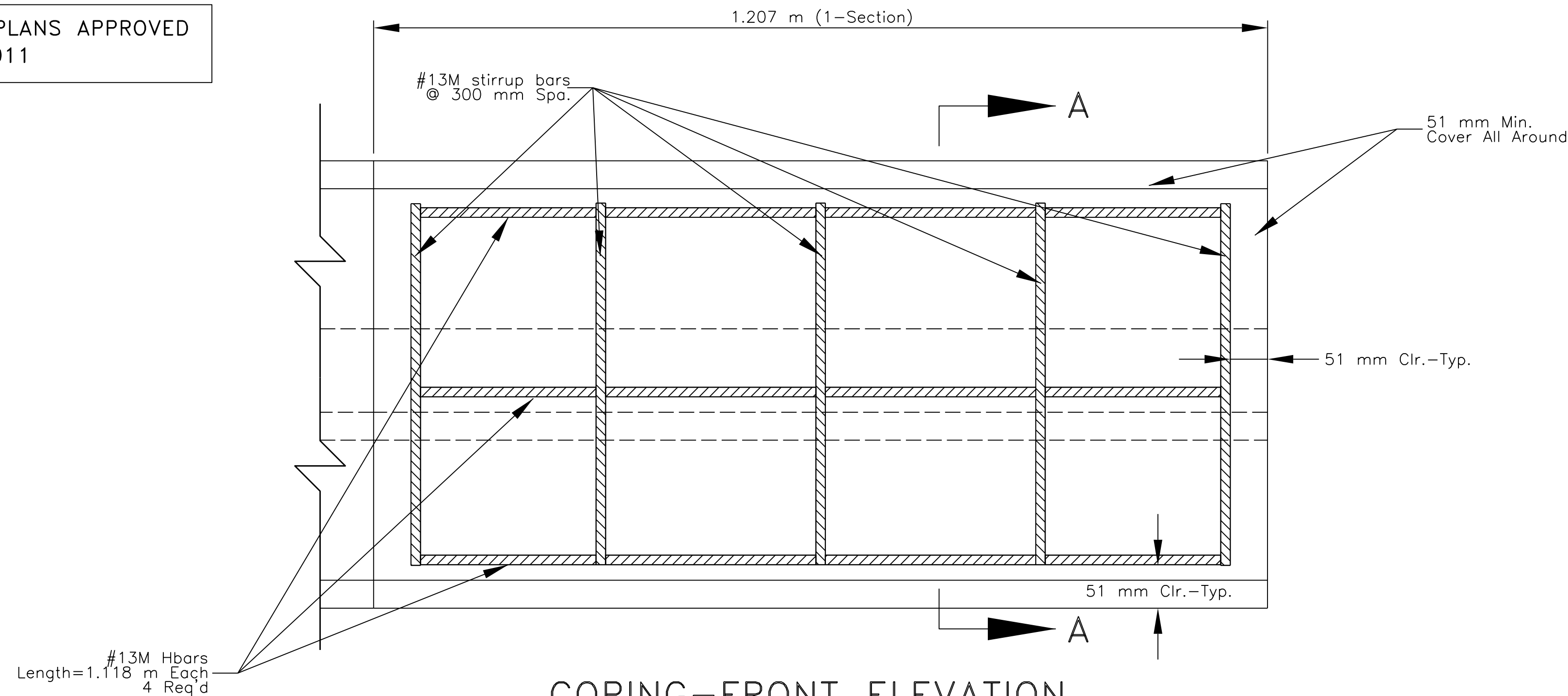
CONCRETE PANEL INSTALLATION  
AND COPING DETAILS

DRAWN BY: NRDOT DATE: 05/06  
DESIGNED BY: NRDOT DATE: 05/06  
REVISED: 09/10 BY: LRT  
SCALE: NTS  
FILENAME: Sht 16\_Panel Installation  
SHEET MODEL NAME: PLOT SHEET

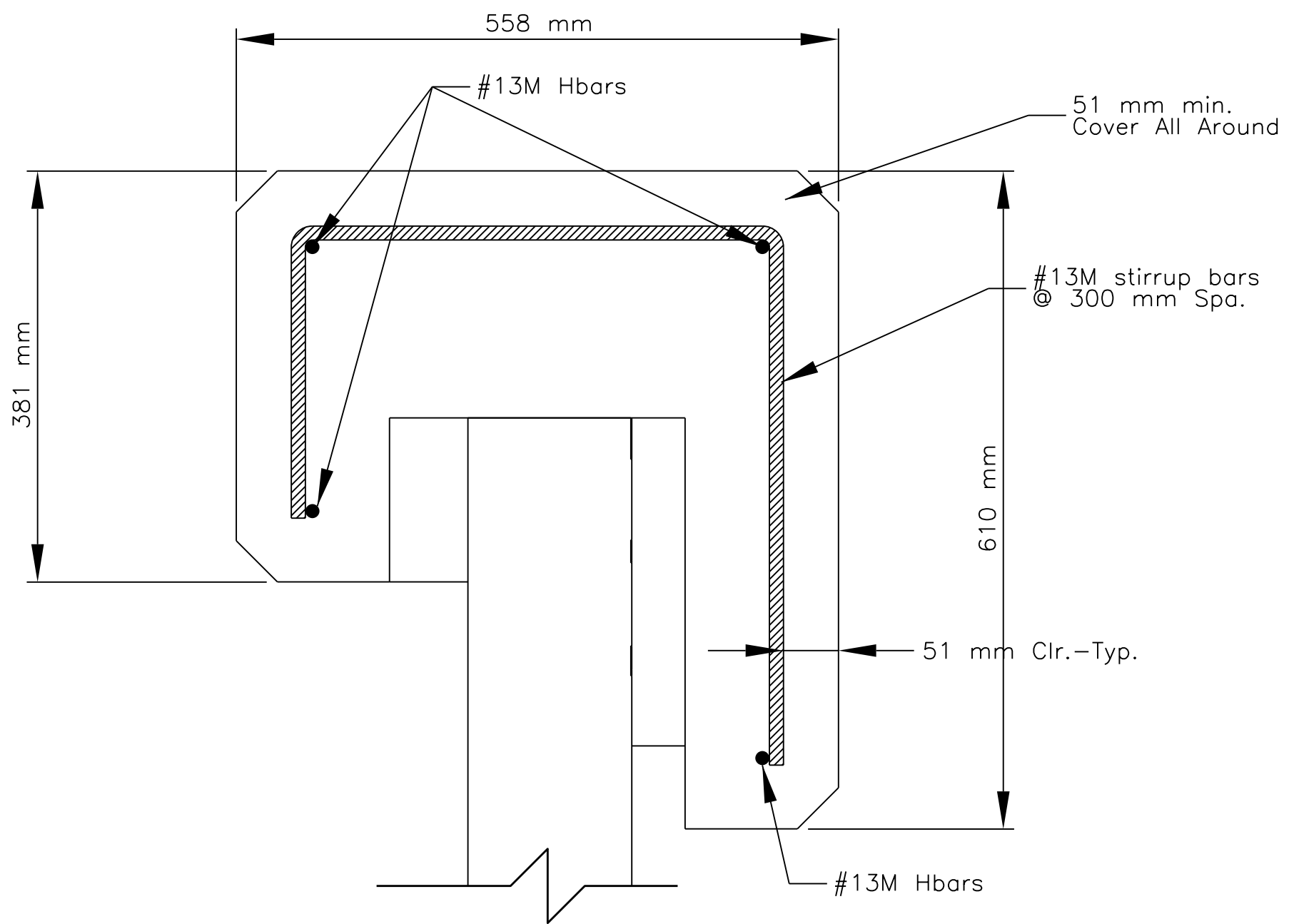


I:\CURRENT PROJECTS\N36\_Ft. Defiance\N9345(2)2&4\_092908\DESIGN DATA\_082908\CADD FILES\_092908\Microstation\_09282010\Sht 17\_Panel and Coping Detail.dgn

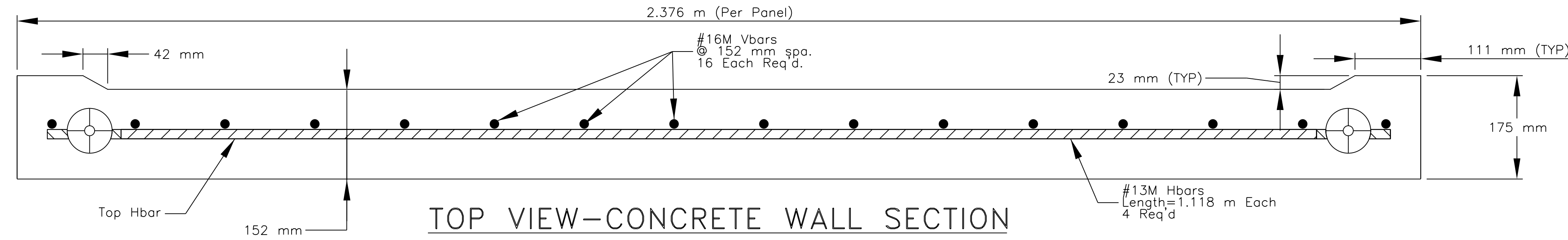
CONSTRUCTION PLANS APPROVED  
08/16/2011



COPING-FRONT ELEVATION



SECTION A-A



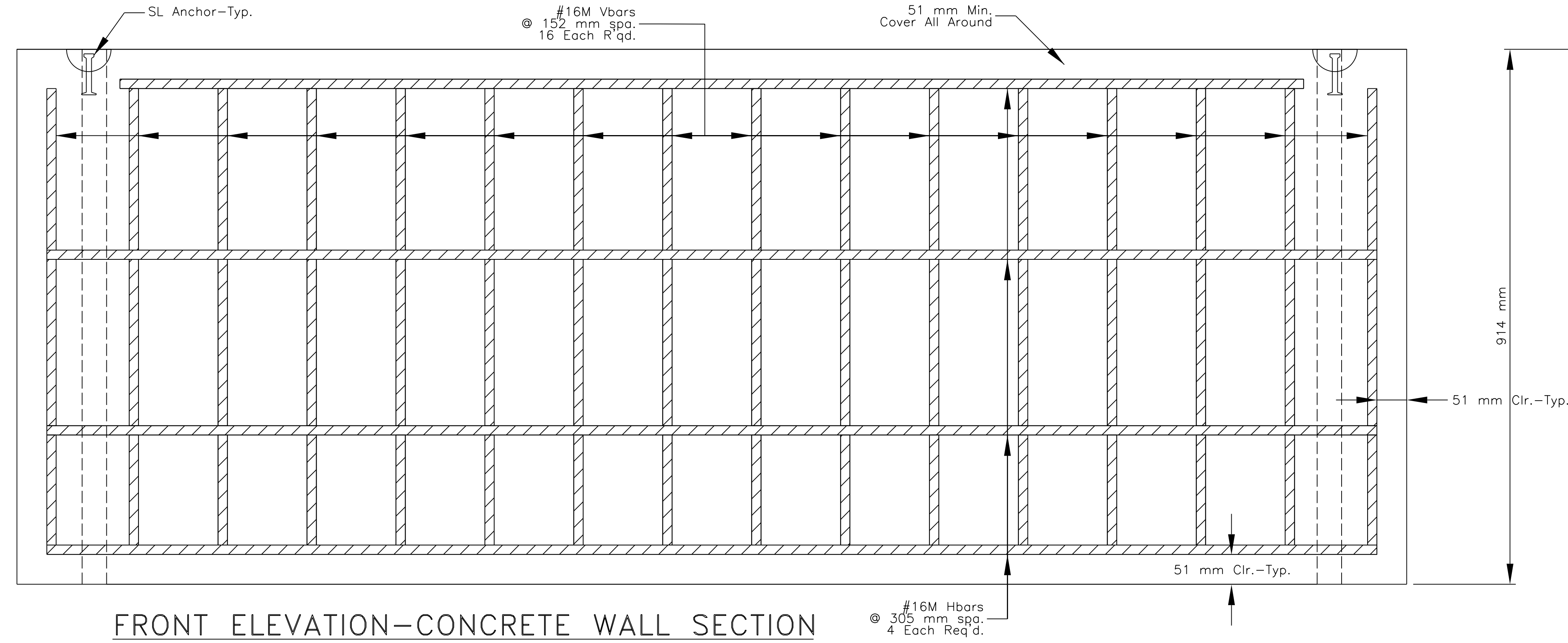
TOP VIEW-CONCRETE WALL SECTION

REINFORCING BAR SCHEDULE FOR COPING (per 1 coping)

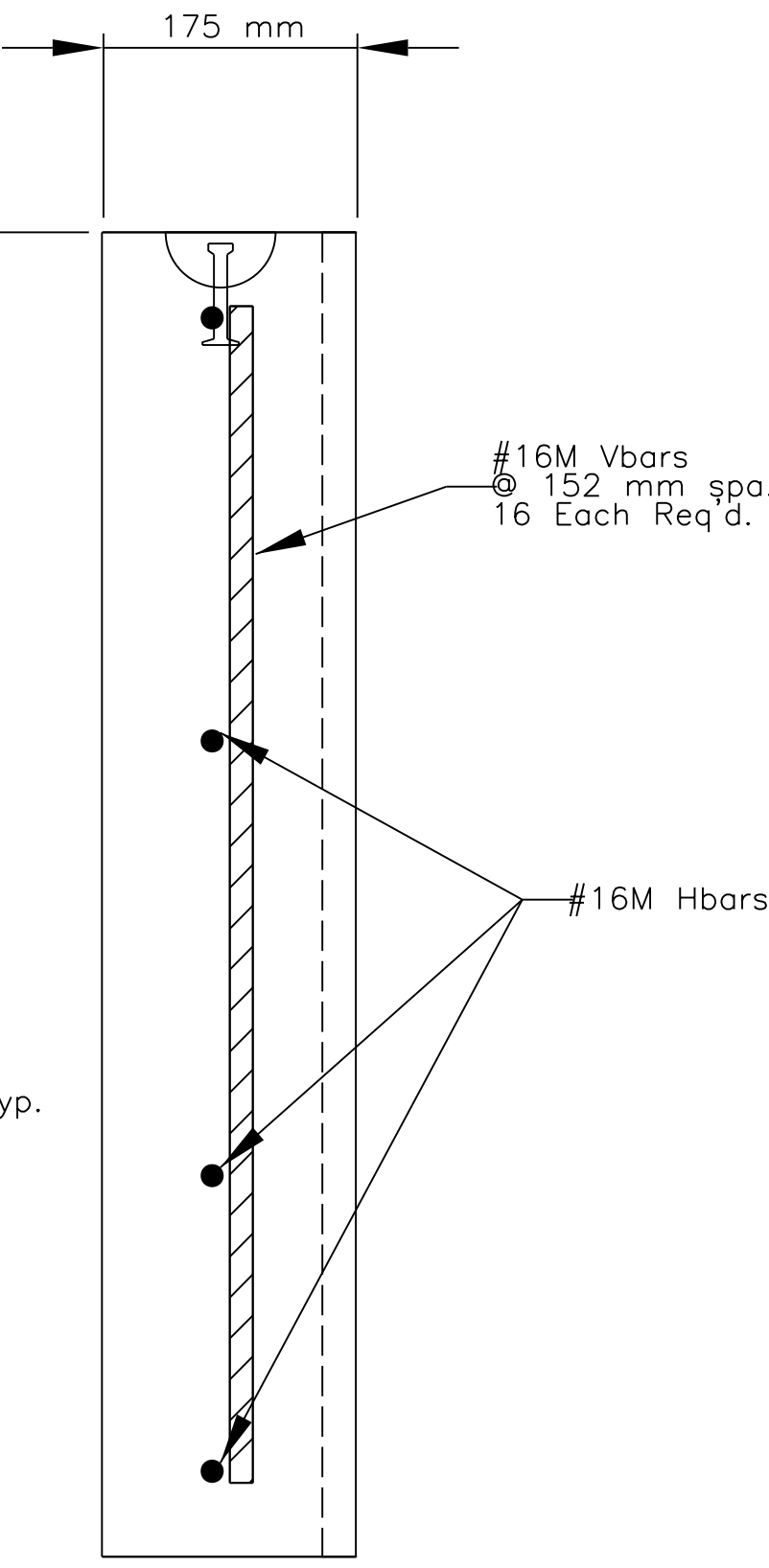
| MARK              | No. EACH | TYPE | SIZE | LENGTH (m) | kg/m  | TOTAL Wt (kg) | Conc. Vol. (m <sup>3</sup> ) |
|-------------------|----------|------|------|------------|-------|---------------|------------------------------|
| #13M Hbars        | 4        | 1    | 13M  | 1.105      | 0.994 | 4.394         | 0.245                        |
| #13M Stirrup bars | 5        | n/a  | 13M  | 1.189      | 0.994 | 5.911         | 0.245                        |
| TOTAL             |          |      |      |            |       | 10.305        | 0.245                        |

REINFORCING BAR SCHEDULE FOR WALL PANEL (per section)

| MARK       | No. EACH | TYPE | SIZE | LENGTH (m) | kg/m  | TOTAL Wt (kg) | Conc. Vol. (m <sup>3</sup> ) |
|------------|----------|------|------|------------|-------|---------------|------------------------------|
| #16M Vbars | 16       | 1    | 16M  | 0.812      | 1.552 | 20.164        | 0.336                        |
| #16M Hbars | 4        | 1    | 16M  | 2.274      | 1.552 | 14.117        | 0.336                        |
| TOTAL      |          |      |      |            |       | 34.281        | 0.336                        |



FRONT ELEVATION-CONCRETE WALL SECTION



SIDE VIEW

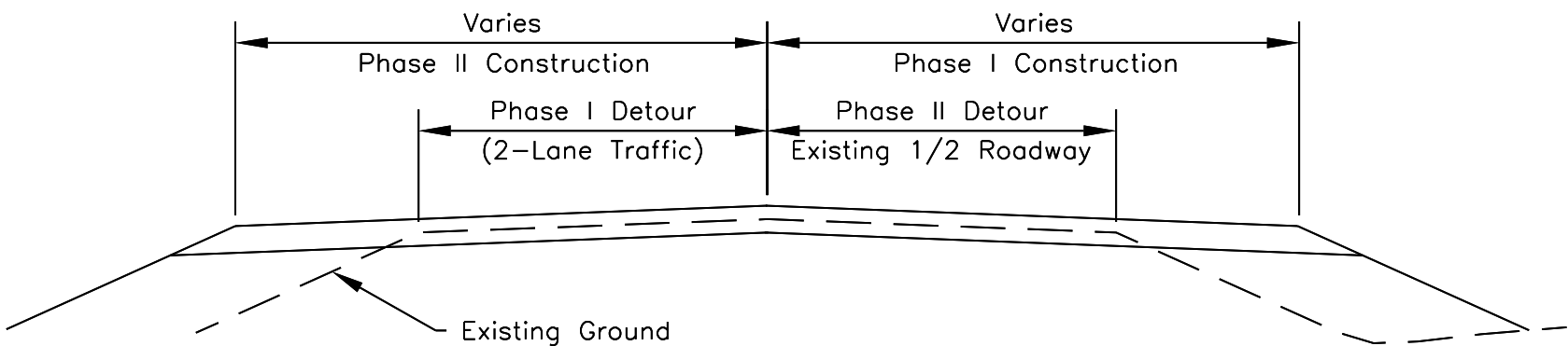
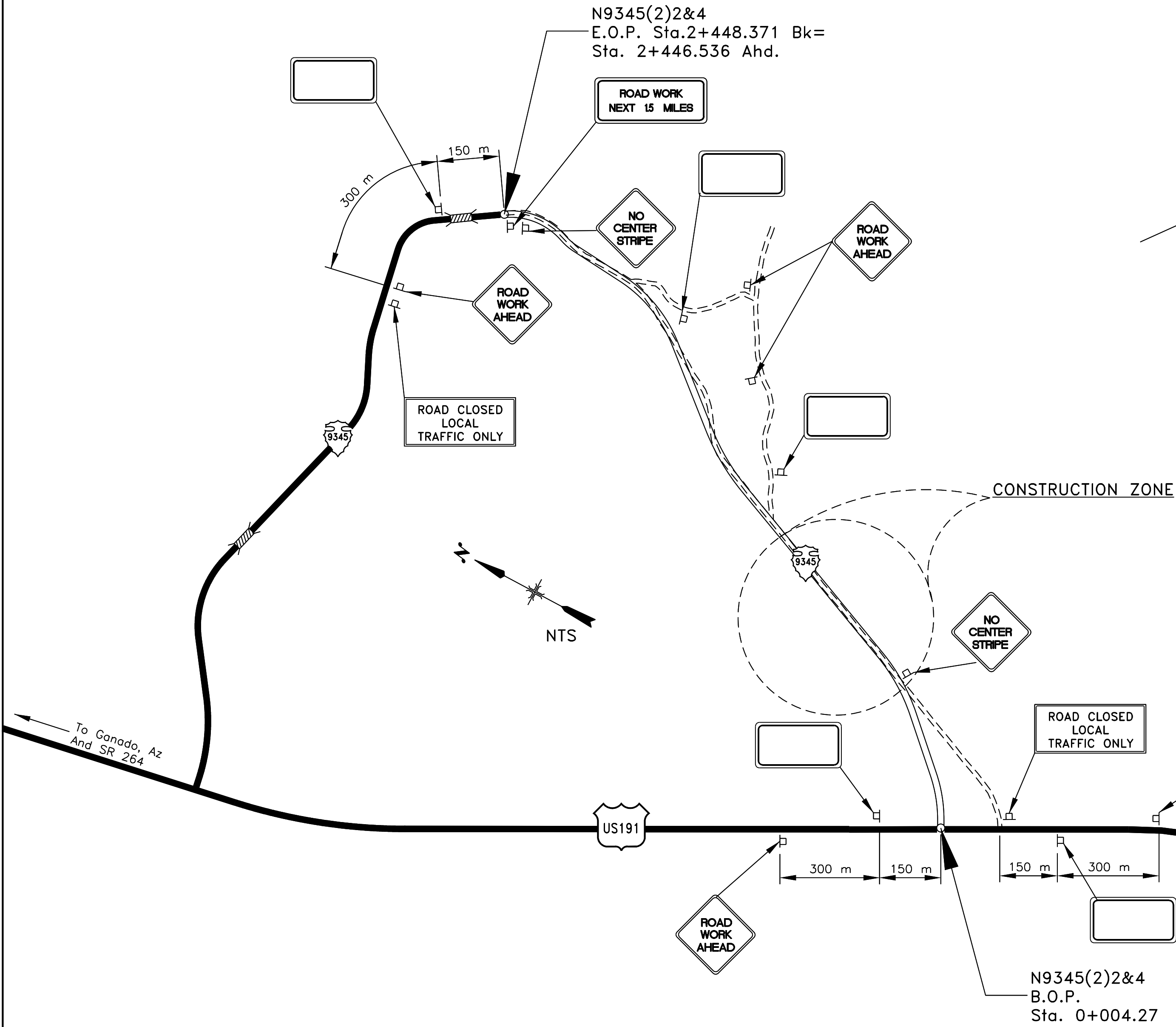
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NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

CONCRETE PANEL & COPING  
REINFORCING BAR LAYOUT DETAIL

DRAWN BY: NRDOT DATE: 04/11  
DESIGNED BY: NRDOT DATE: 04/11  
REVISED: BY:  
SCALE: 1:200  
FILENAME: Sht 17\_Panel and Coping Detail  
SHEET MODEL NAME: PLOT SHEET



| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
|--------|---------|-------------|-------|-------------|-------|--------------|
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 18    | 39           |

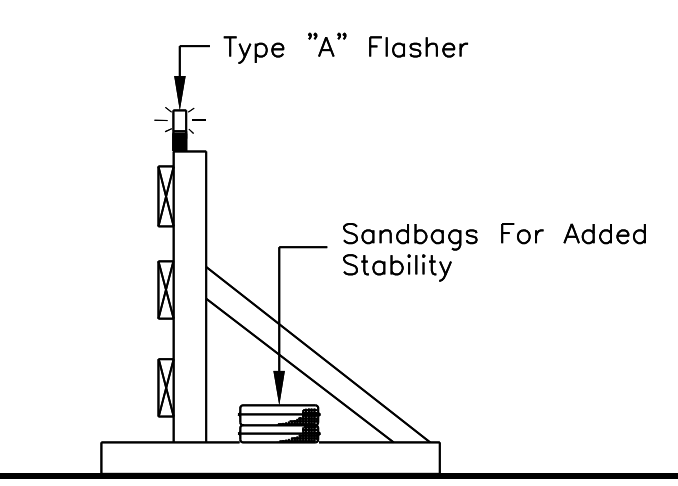
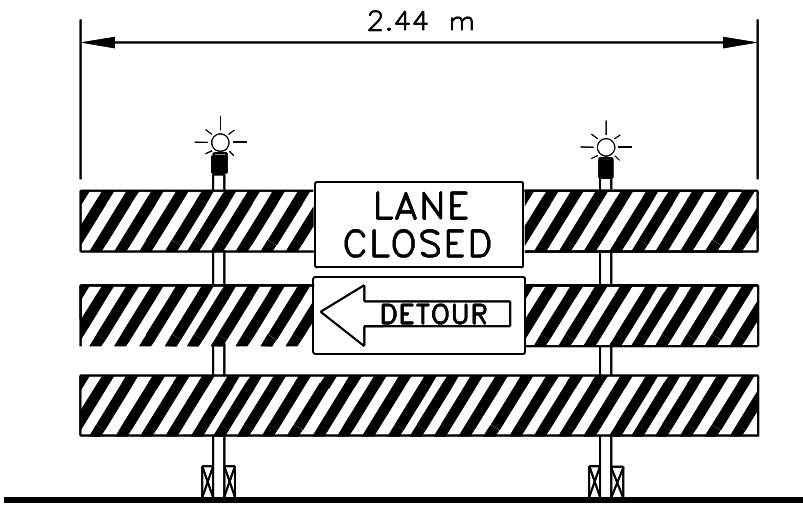
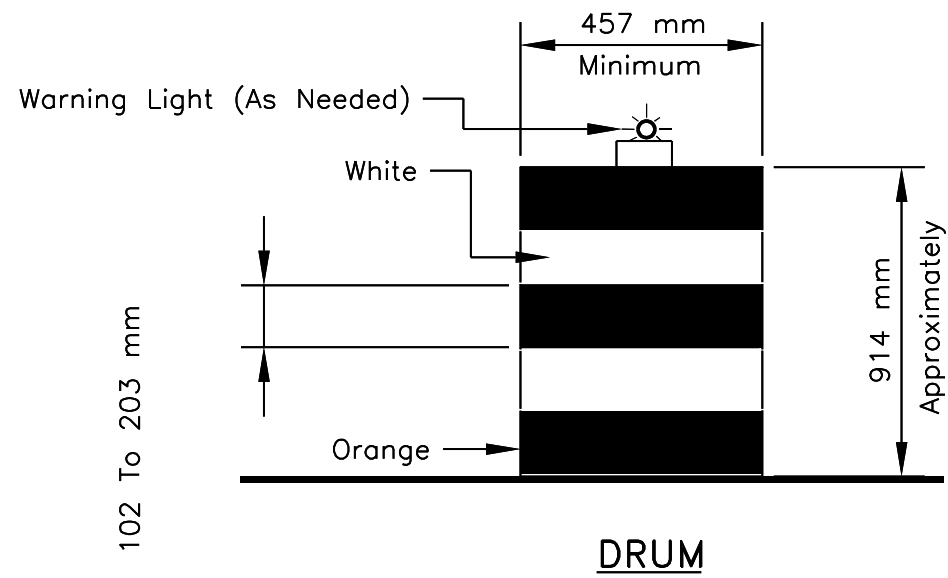
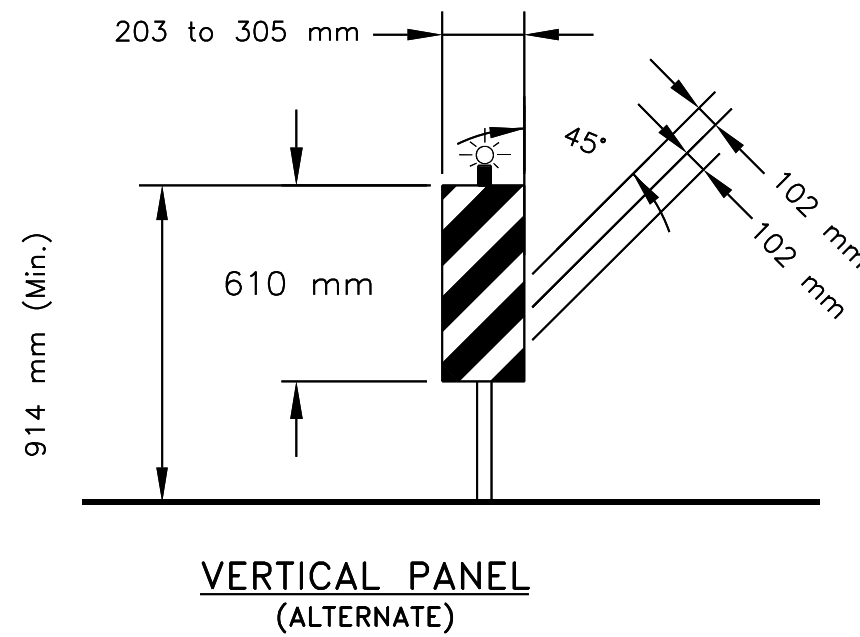
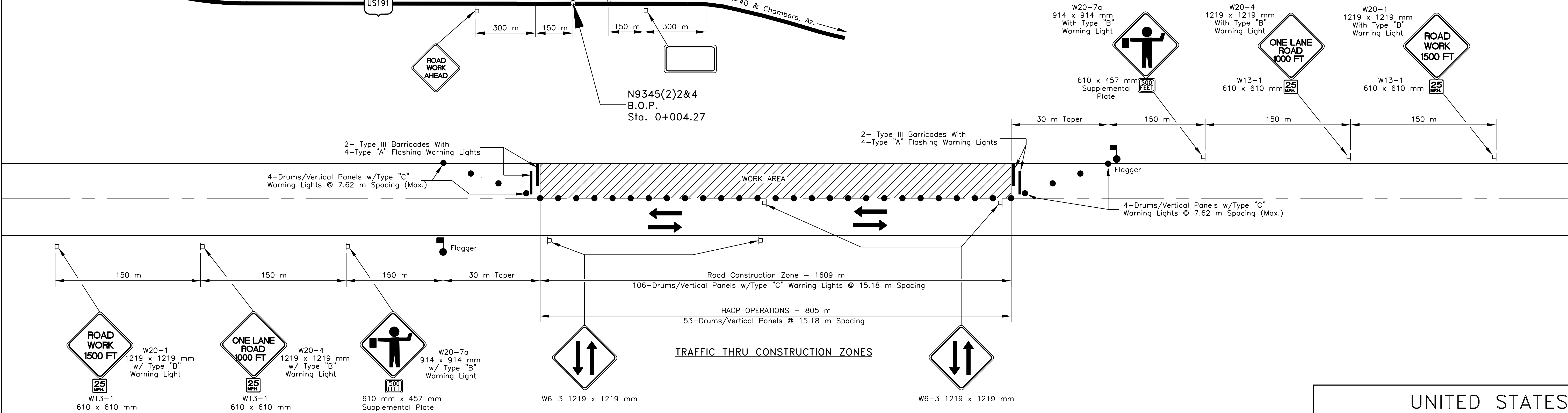


#### PHASED CONSTRUCTION

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

#### 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 PLAN (TCP) SHOWN IS ONLY A GUIDE. 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. THE CONTRACTOR SHALL ALSO SUBMIT A COPY OF HIS TRAFFIC CONTROL PLAN, RELATED TO US191 TO THE ARIZONA DEPARTMENT OF TRANSPORTATION (ADOT) 2-WEEKS PRIOR TO START OF CONSTRUCTION. SEE SUPPLEMENTAL SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
3. SIGNS (G20-1, W20-1A, G20-2A AND W8-12) 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 BUSINESS AND B.I.A. SYSTEM ROUTES SHALL BE MAINTAINED AT ALL TIMES DAY OR NIGHT.
6. ALL TRAFFIC CONTROL DEVICES (EXCEPT AT DETOUR ROAD LOCATIONS) 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 CONSTRUCTIONS 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 OBLIGATION OF THE CONTRACTOR.
8. THE CONTRACTOR HAS THE OPTION TO EITHER USE DRUMS OR VERTICAL PANELS; BUT SHALL NOT USE A COMBINATION OF BOTH.
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. THE COST OF ANY DETOUR ROADS SHALL BE CONSIDERED INCIDENTAL TO CONTRACT ITEM 63501-0000.
10. THE CONTRACTOR HAS THE OPTION TO UTILIZE EXISTING ROADS AS DETOUR ROAD AS SHOWN. THE COST OF MAINTAINING EXISTING ROADS SHALL BE CONSIDERED INCIDENTAL TO ITEM 63501-0000.
11. AT LOCATIONS WHERE NEW ROAD CONSTRUCTION CROSSES EXISTING ROADWAYS AND AT TIE-INS WITH EXISTING ROADS AT END THE OF THE NEW CONSTRUCTIONS, SPECIAL TRAFFIC CONTROL PROCEDURES SHALL BE NEEDED AT VARIOUS TIMES THROUGH OUT THE CONSTRUCTION. THESE INCLUDE BUT ARE NOT NECESSARILY LIMITED TO THE FOLLOWING, TYPE 3 BARRICADES WITH "ROAD CLOSE", DETOUR SIGNS, FLAGMAN, DRUMS, AND/OR DETOURS, ETC.. THE CONTRACTOR SHALL SUBMIT TO THE C.O.R. (FOR APPROVAL) HIS TRAFFIC CONTROL PLAN(S) FOR THIS WORK PRIOR TO THE BEGINNING THE VARIOUS CONSTRUCTION PHASE IN THESE AREAS. THIS TRAFFIC CONTROL WORK IS TO BE INCLUDED IN THE CONTRACTOR'S BID PRICE FOR ITEM 63501-0000, TEMPORARY TRAFFIC CONTROL.



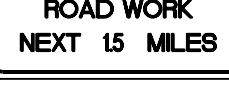
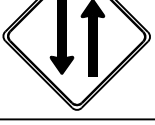
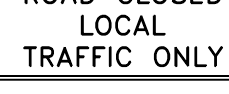
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#### TEMPORARY TRAFFIC CONTROL

DRAWN BY: NRO DOT DATE: 10/96  
DESIGNED BY: NRO DOT DATE: 10/96  
REVISED: 10/10 BY: SC  
SCALE: NTS  
FILENAME: 9345TCP  
SHEET MODEL NAME: PLOT SHEET



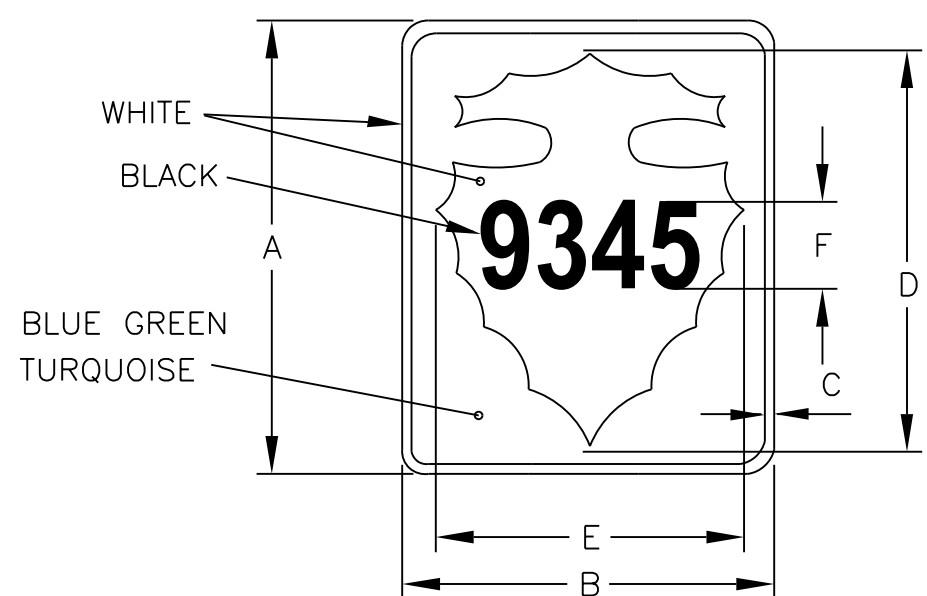
TEMPORARY TRAFFIC CONTROL SIGNS (MINIMUM)

| TYPE               | DESCRIPTION                                                                       | SIZE (mm)   |
|--------------------|-----------------------------------------------------------------------------------|-------------|
| W20-1              |  | 1219 x 1219 |
| W20-4              |  | 1219 x 1219 |
| W13-1              |  | 610 x 610   |
| W20-7a             |  | 914 x 914   |
| Supplemental Plate |  | 457 x 610   |
| G20-2              |  | 457 x 914   |
| W8-12              |  | 914 x 914   |
| W20-1              |  | 1219 x 1219 |
| G20-1              |  | 1524 x 610  |
| W6-3               |  | 1219 x 1219 |
| R11-4a             |  | 1524 x 762  |

| 63401-1510: PAVEMENT MARKINGS, SOLID YELLOW |          |           |
|---------------------------------------------|----------|-----------|
| STATION TO STATION                          | LOCATION | LENGTH(m) |
| 0+007.27 - 0+850.00                         | Lt. CL   | 842.73    |
| 0+007.27 - 0+460.00                         | Rt. CL   | 452.73    |
| 0+950.00 - 2+448.371 Bk.                    | Rt. CL   | 1,498.37  |
| 2+446.536 Ahd                               |          |           |
| 1+420.00 - 2+448.371 Bk.                    | Lt. CL   | 1,028.37  |
| 2+446.536 Ahd                               |          |           |
| GRAND TOTAL:                                |          | 3,822.20  |

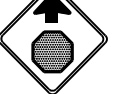
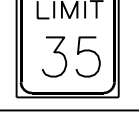
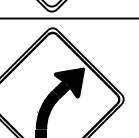
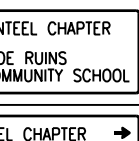
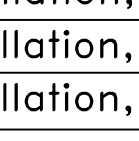
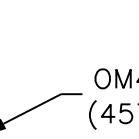
| 63401-1520: PAVEMENT MARKINGS, SOLID WHITE |                         |           |
|--------------------------------------------|-------------------------|-----------|
| STATION TO STATION                         | LOCATION                | LENGTH(m) |
| 0+007.27 - 2+448.371 Bk.                   | Lt. Shldr.              | 2,441.10  |
| 2+446.536 Ahd.                             | 3-4.50 m T.O. @ 20.45 m | -61.35    |
| SUB-TOTAL:                                 |                         | 2,379.75  |
| 0+007.27 - 2+448.371 Bk.                   | Rt. Shldr.              | 2,441.10  |
| 2+446.536 Ahd.                             | 1-4.50 m T.O. @ 20.45 m | -20.45    |
|                                            | 5-7.0 m T.O. @ 35.50 m  | -177.50   |
| SUB-TOTAL:                                 |                         | 2,243.15  |
| GRAND-TOTAL:                               |                         | 4,622.90  |

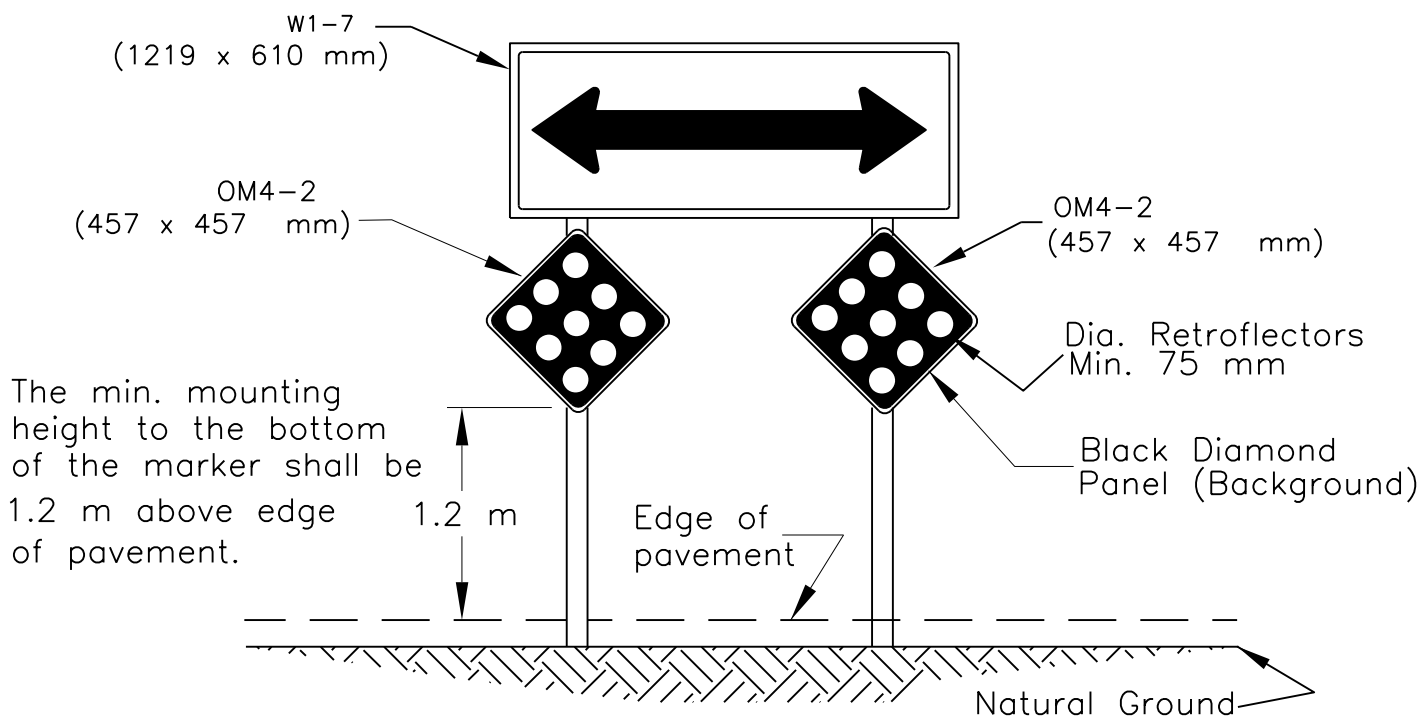
| 63401-1510: PAVEMENT MARKINGS, SOLID YELLOW |          |           |
|---------------------------------------------|----------|-----------|
| STATION TO STATION                          | LOCATION | LENGTH(m) |
| 0+007.27 - 0+850.00                         | Lt. Cl   | 842.73    |
| 0+007.27 - 0+460.00                         | Rt. Cl   | 452.73    |



| 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<br>( mm ) | 254E | 254D | 203C | 152B |

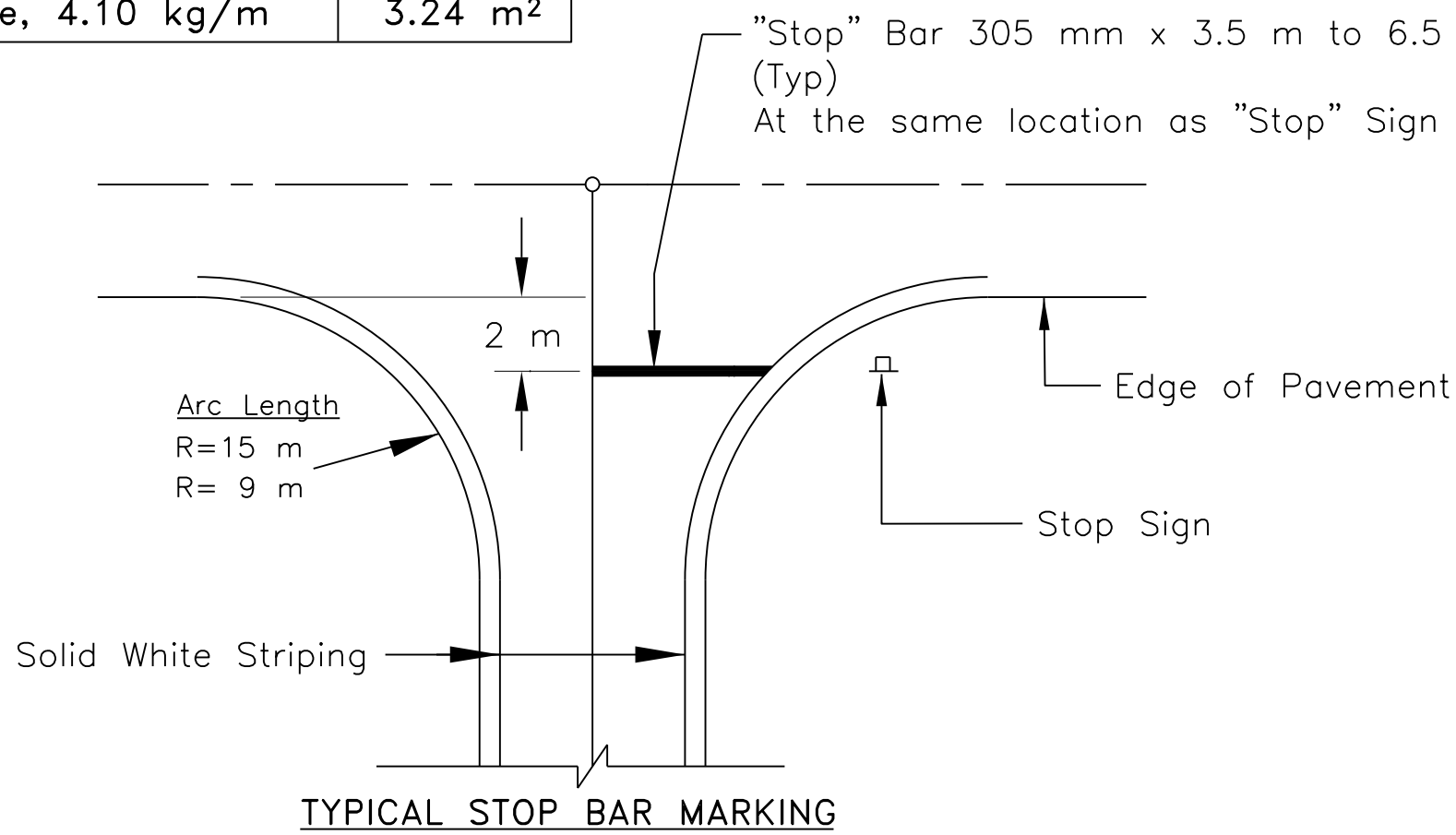
PERMANENT ROADSIDE SIGN, POSTS & HARDWARE

| STATION                                                    | LOC.                            | SIZE DETAIL No. | DESCRIPTION                                                                           | PANEL SIZE (mm) | PANEL AREA(m <sup>2</sup> ) | NO. Of POSTS | POST SIZE kg/m | TOTAL SIGN PANELS    |
|------------------------------------------------------------|---------------------------------|-----------------|---------------------------------------------------------------------------------------|-----------------|-----------------------------|--------------|----------------|----------------------|
| 0+007.27                                                   | Lt.                             | R1-1            |    | 914 x 914       | 0.67                        | 2            | 2.98           | 1                    |
| 0+560.00<br>1+003.00<br>1+165.00<br>1+958.00<br>2+400.00   | Rt.<br>Rt.<br>Rt.<br>Rt.<br>Rt. | R1-1            |    | 762 x 762       | 0.47                        | 1            | 3.35           | 5                    |
| 0+160.00<br>BANANA RD.<br>BANANA RD.                       | Lt.<br>Rt.<br>Rt.               | W3-1A           |    | 762x 762        | 0.56                        | 2            | 2.98           | 3                    |
| 0+090.00                                                   | Rt.                             | SEE DETAIL      |    | 457 x 610       | 0.28                        | 1            | 4.10           | 1                    |
| 0+060.00<br>2+173.00<br>2+370.00<br>2+540.00               | Rt.<br>Lt.<br>Lt.<br>Lt.        | R2-1            |    | 610 x 762       | 0.46                        | 1            | 4.10           | 4                    |
| 0+040.00<br>0+850.00<br>0+950.00<br>2+488.00               | Lt.<br>Rt.<br>Lt.<br>Rt.        | W14-3           |    | 1219 x1219x 914 | 0.52                        | 2            | 2.98           | 4                    |
| 0+040.00<br>0+850.00<br>0+950.00<br>2+488.00               | Rt.<br>Lt.<br>Rt.<br>Lt.        | R4-1            |    | 610 x 762       | 0.46                        | 1            | 4.10           | 4                    |
| 0+080.00                                                   | Lt.                             | D2-1            |    | 1219 x 610      | 0.72                        | 2            | 2.98           | 1                    |
| 0+120.00<br>2+428.00                                       | Rt.<br>Lt.                      | W11-4           |    | 762 x 762       | 0.56                        | 2            | 2.98           | 2                    |
| 0+638.00<br>1+090.00<br>2+078.00                           | Lt.<br>Rt.<br>Lt.               | W1-2R           |    | 762 x 762       | 0.56                        | 2            | 2.98           | 3                    |
| 0+222.00<br>1+600.00<br>1+620.00                           | Rt.<br>Rt.<br>Lt.               | W1-2L           |   | 762 x 762       | 0.56                        | 2            | 2.98           | 3                    |
| 2+040.00                                                   | Rt.                             | W1-4R           |  | 762 x 762       | 0.56                        | 2            | 2.98           | 1                    |
| HWY. U.S.191                                               |                                 |                 |                                                                                       |                 |                             |              |                |                      |
| 35+135.00                                                  | Lt.                             | D1-1L           |  | 1842 x 914      | 1.62                        | 2            | 4.10           | 1                    |
| 35+518.00                                                  | Rt.                             | D1-1R           |  | 1842 x 914      | 1.62                        | 2            | 4.10           | 1                    |
| 35+328.31                                                  | Rt.                             | W1-7            |  | 1219 x 610      | 0.72                        |              |                | 1                    |
|                                                            |                                 | OM4-2           |  | 457 x 457       | 0.20                        | 2            | 2.98           | 2                    |
|                                                            |                                 |                 | See Details Below                                                                     |                 |                             |              |                |                      |
| 35+296.00 (Lt. Arrow)                                      | Rt.                             | SEE DETAIL      |  | 610 X 457       | 0.27                        | 2            | 2.98           | 2                    |
| 35+375.00 (Rt. Arrow)                                      | Lt.                             | M6-1            |  | 357 x 510       | 0.18                        |              |                | 2                    |
| 63302-0002 Sign Installation, 1-Post & hardware, 3.35 kg/m |                                 |                 |                                                                                       |                 |                             |              |                | 2.35 m <sup>2</sup>  |
| 63302-0003 Sign Installation, 1-Post & hardware, 4.10 kg/m |                                 |                 |                                                                                       |                 |                             |              |                | 3.87 m <sup>2</sup>  |
| 63302-0010 Sign Installation, 2-Post & Hardware, 2.98 kg/m |                                 |                 |                                                                                       |                 |                             |              |                | 12.15 m <sup>2</sup> |
| 63302-0012 Sign Installation, 2-Post & Hardware, 4.10 kg/m |                                 |                 |                                                                                       |                 |                             |              |                | 3.24 m <sup>2</sup>  |



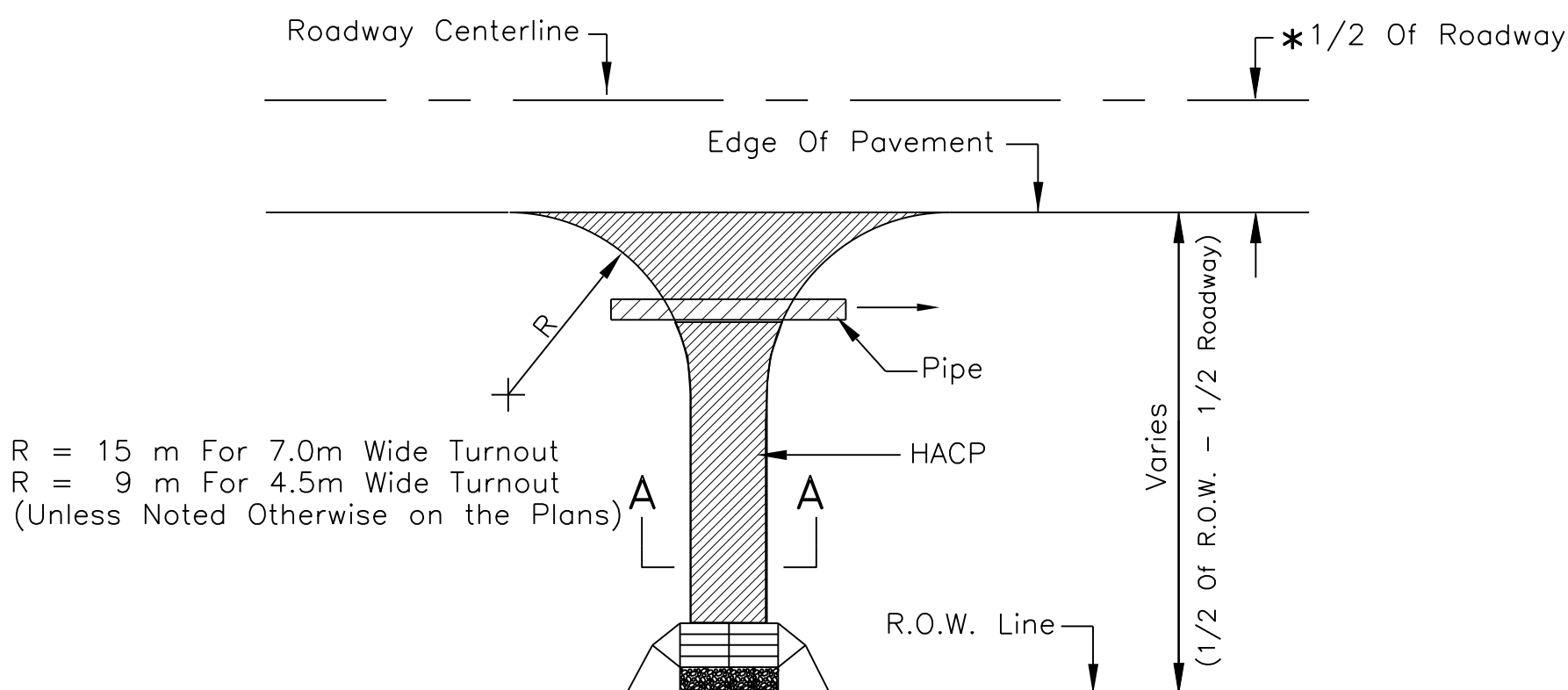
Note: Type 4 Object Marker consists of nine (9) red retroreflectors, each with a min. dia. of 75 mm, mounted symmetrically on a black diamond panel.

PERMANENT BARRICADE  
STA. 35+328.31, Rt.  
(US191)

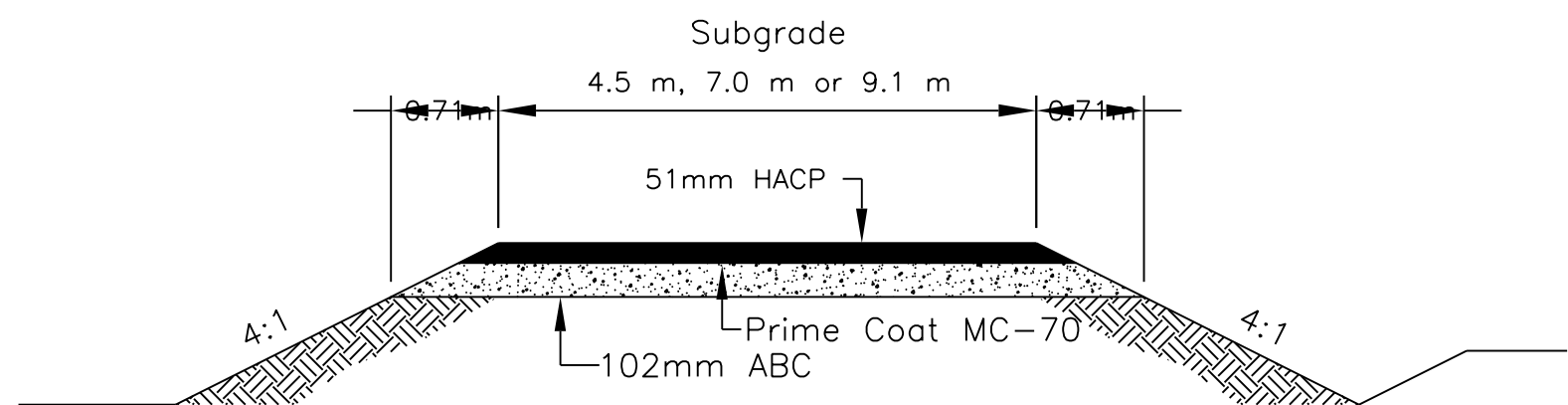


| 63405-3260: PAVEMENT MARKINGS, STOP BAR |          |               |
|-----------------------------------------|----------|---------------|
| STATION                                 | LOCATION | REMARKS       |
| 0+007.27                                | Lt.      | Jct. w/US 191 |

NOTE: Placement of Stop Sign according to MUTCD will vary from 3 m to 15 m and field adjusted as directed by C.O.R..



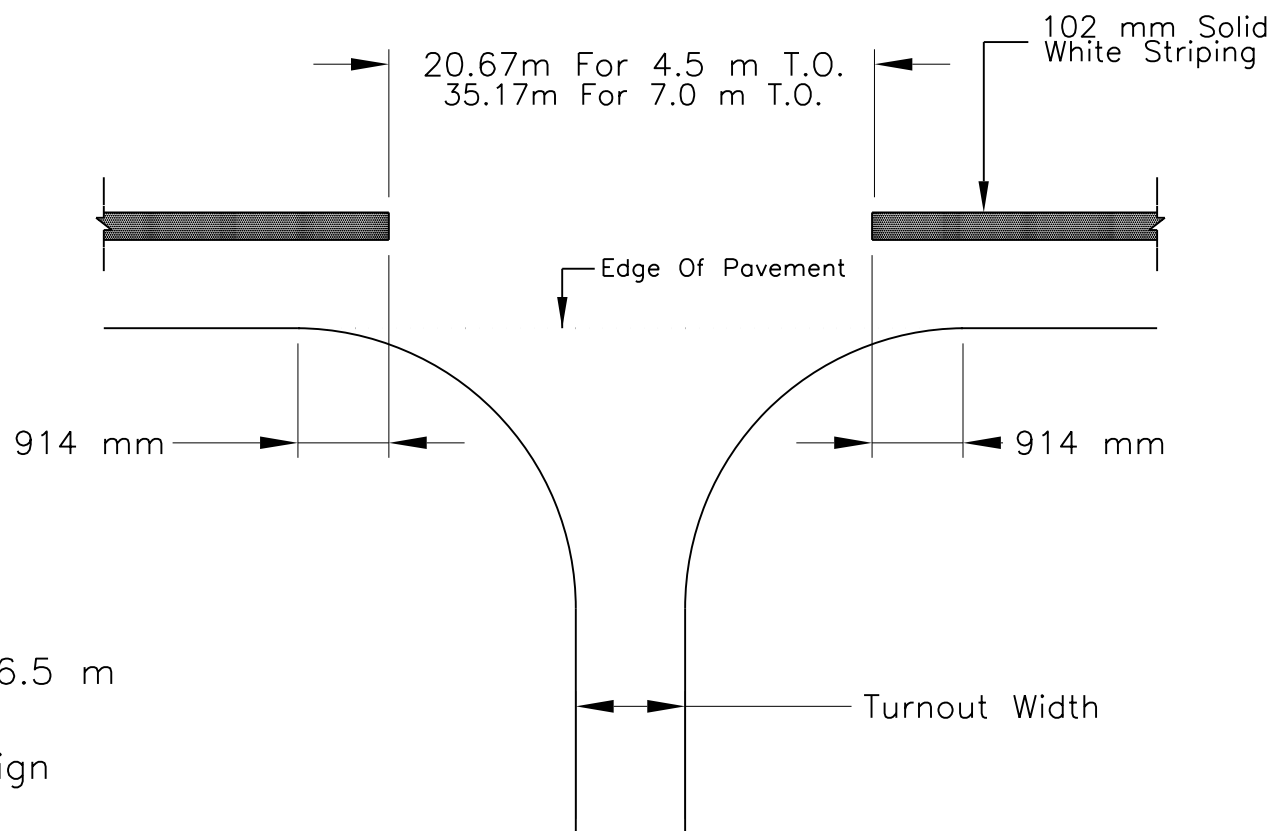
\*See Typical Section On Sheet 2 Of 39  
TYPICAL TYPE "A" TURNOUT



SECTION A-A



TYPICAL PAVEMENT MARKING "BROKEN YELLOW"  
(See Table For Location)



TYPICAL PAVEMENT MARKING @ TURNOUT  
ROADWAY SHOULDER STRIPING

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

TEMPORARY AND  
PERMANENT ROADSIDE  
TRAFFIC CONTROL DETAILS

DRAWN BY: NRO DOT DATE: 02/97  
DESIGNED BY: NRO DOT DATE: 02/97  
REVISED: 10/10 BY: SC  
SCALE: NTS  
FILENAME: 9345tfs  
SHEET MODEL NAME: PLOT SHEET



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

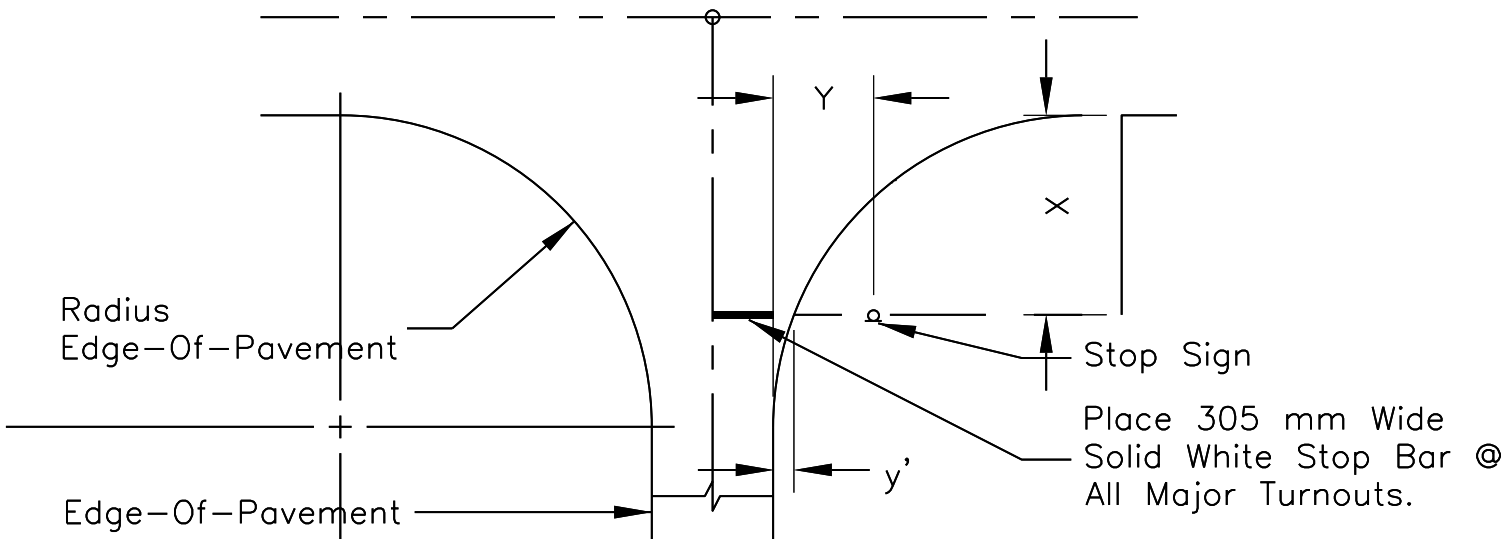
| DOUBLE POST REQUIREMENT CHART |                |                                                                           |      |      |      |      |      |      |      |      |      |      |                                                |
|-------------------------------|----------------|--------------------------------------------------------------------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

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

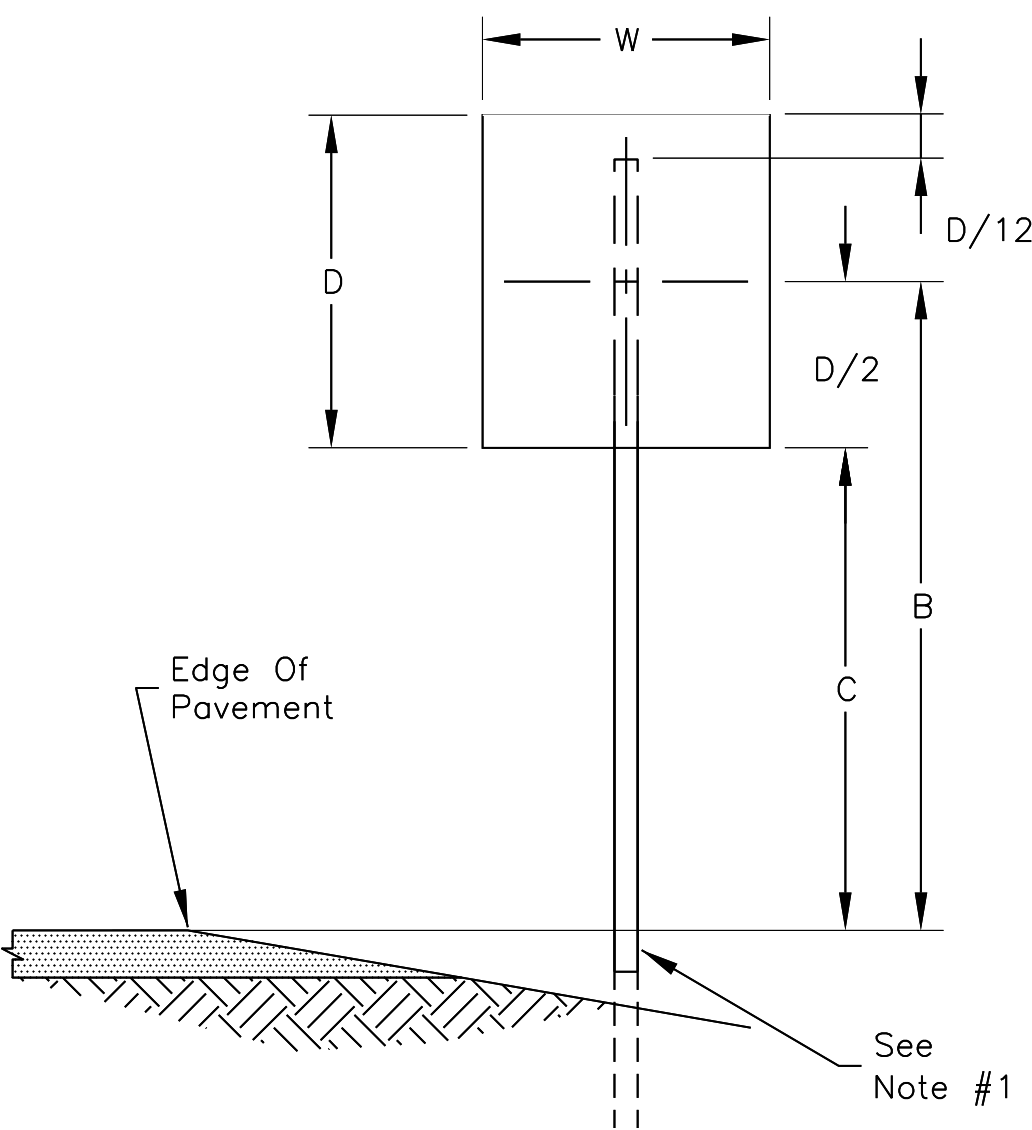
STOP SIGN AND LINE LOCATION TABLE

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

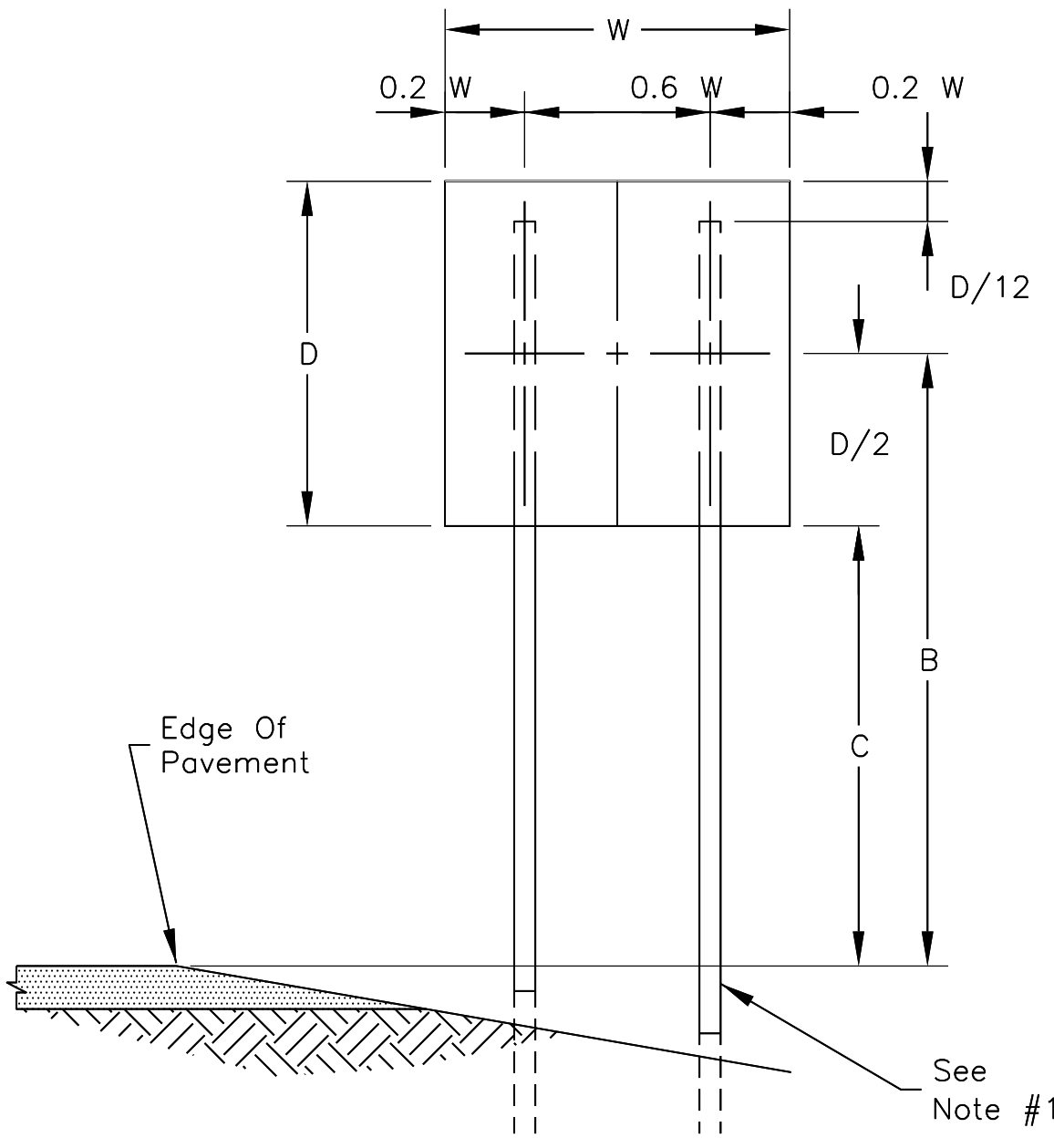
y' = Distance From Roadway EOP To Radius EOP  
Lateral Offset(LO) From EOP (m)=1.80



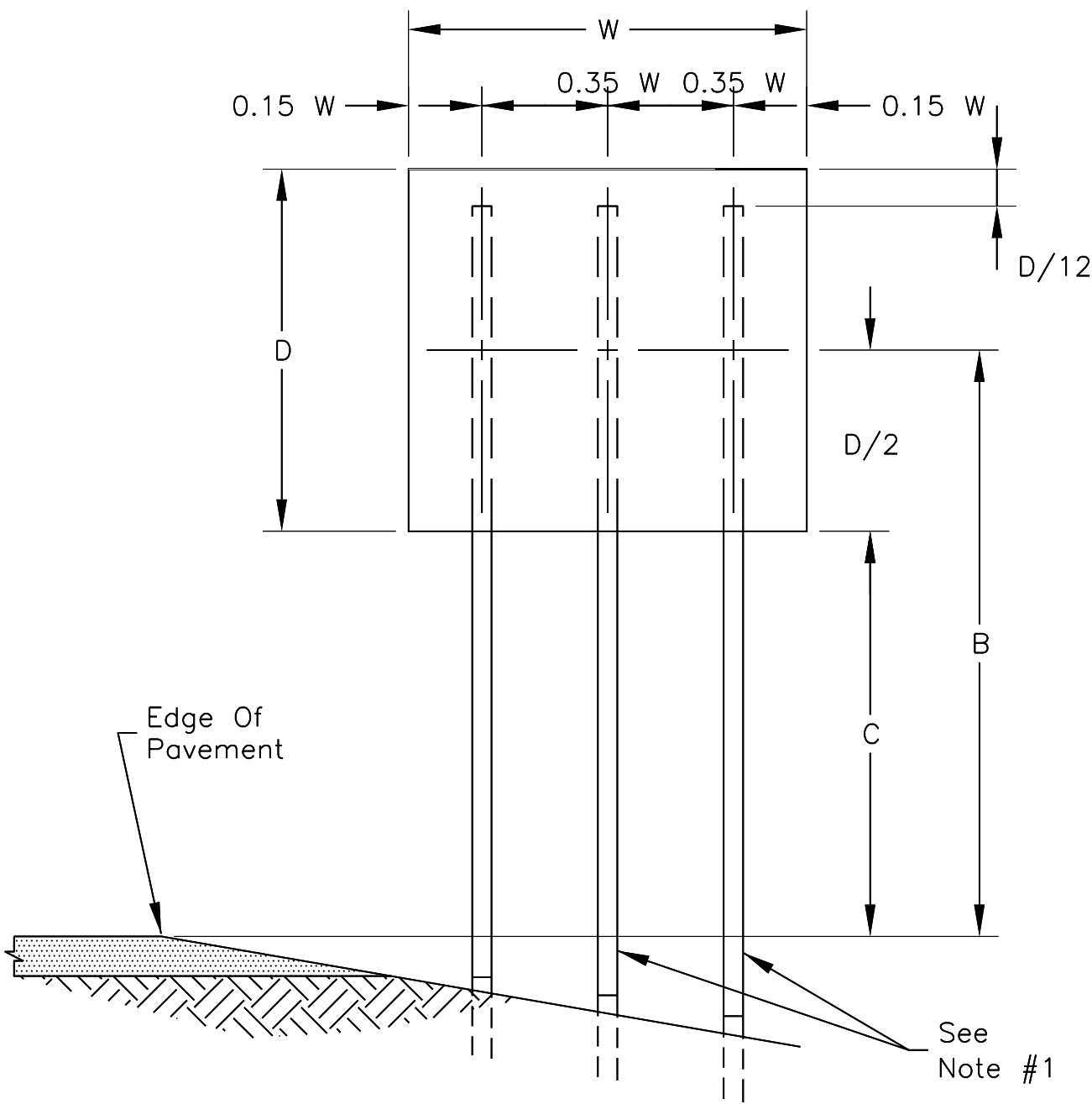
STOP SIGN LOCATION AT INTERSECTION



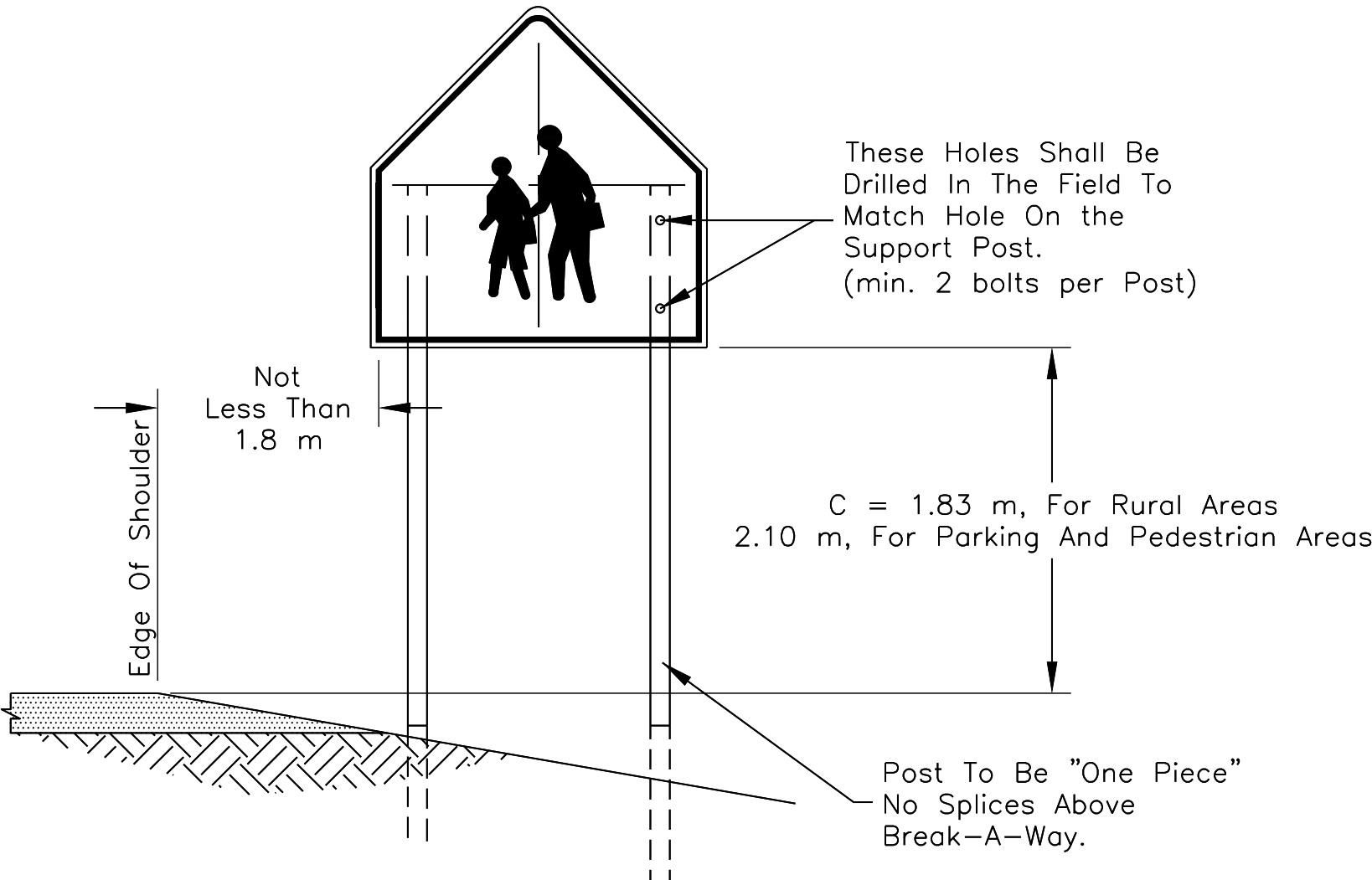
SINGLE POST SIZE (TYP.)



DOUBLE POST SIZE (TYP.)



THREE POST SIZE (TYP.)



TYPICAL ROADSIDE SIGN LOCATION

GENERAL NOTES:

1. THE CONTRACTOR SHALL BE REQUIRED TO ADJUST THE LENGTH OF SIGN SUPPORT POSTS. THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE FOR THE APPROPRIATE BID ITEMS SHOWN IN THE BID SCHEDULE.
2. SIGN DIMENSION EQUAL TO OR IN EXCESS OF 762 MM X 762 MM SIZE SHALL BE INSTALLED WITH A MINIMUM OF TWO (2) STEEL POSTS.

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

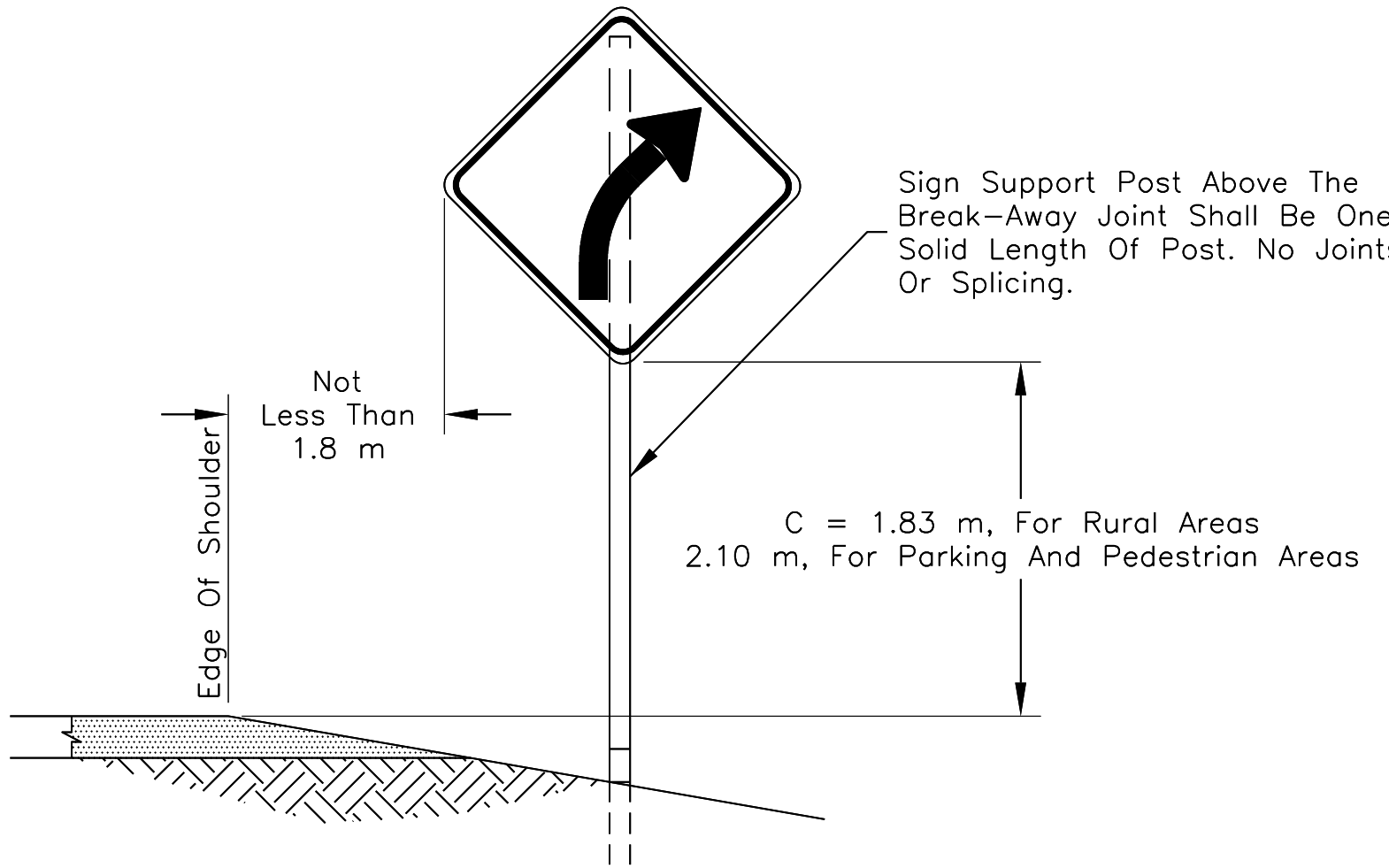
For A 1.52 m Wide x 1.22 m High Traffic Sign.  
Located On A Rural Highway.  
GIVEN: W= 1.52 m  
D= 1.22 m  
C= 1.83 m For Rural Areas

SOLUTION: 1.)  $B = C + D/2$   
 $B = 1.83 + (1.22/2)$   
 $B = 2.44$  m  
2.)  $A = W \times D$   
 $A = 1.52 \times 1.22$   
 $A = 1.85$  sq. m  
3.) K factor =  $A \times B$   
K factor=  $1.85 \times 2.44$   
K factor= 4.51 cu. m  
4.) Begin With The Single Post Chart For Column Of B= 2.44 m, And Continue Down Until The Area Of The Sign Equals Or Exceeds 1.85 sq. m, OR Down The K factor Column Until The Value Equals or Exceeds 4.51 cu. m. Both The Area & K factor Exceed The Single Post Chart So Go To The Double Post Chart.

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

| K factor | POST WEIGHT | 2.44 |
|----------|-------------|------|
| 4.03     | 4.09 kg/m   | 1.65 |
| 4.91     | 4.46 kg/m   | 2.03 |
| 6.83     | 5.95 kg/m   | 2.80 |

4.51 -> 1.85



TYPICAL ROADSIDE SIGN LOCATION

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

PERMANENT SIGNING DETAIL

DRAWN BY: NRODOT DATE: 11/97  
DESIGNED BY: NRODOT DATE: 11/97  
REVISED: 10/10 BY: SC  
SCALE: NTS  
FILENAME: 9345sn1  
SHEET MODEL NAME: PLOT SHEET

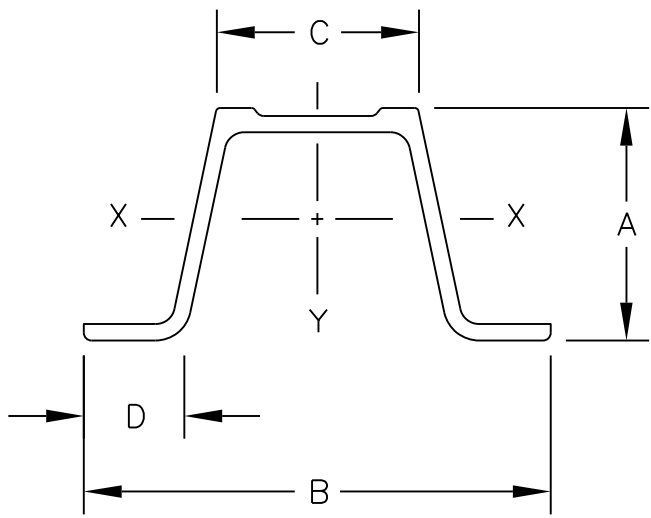


| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
|--------|---------|-------------|-------|-------------|-------|--------------|
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 21    | 39           |

RIB-BAK U-CHANNEL SIGN SUPPORTS

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

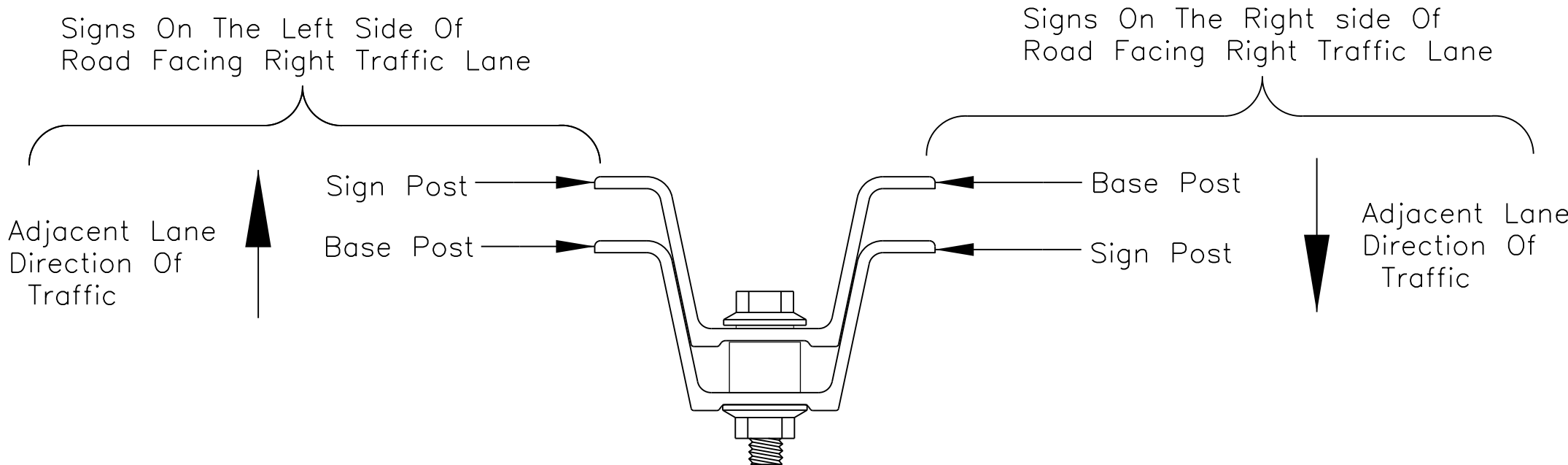
\* ±5%



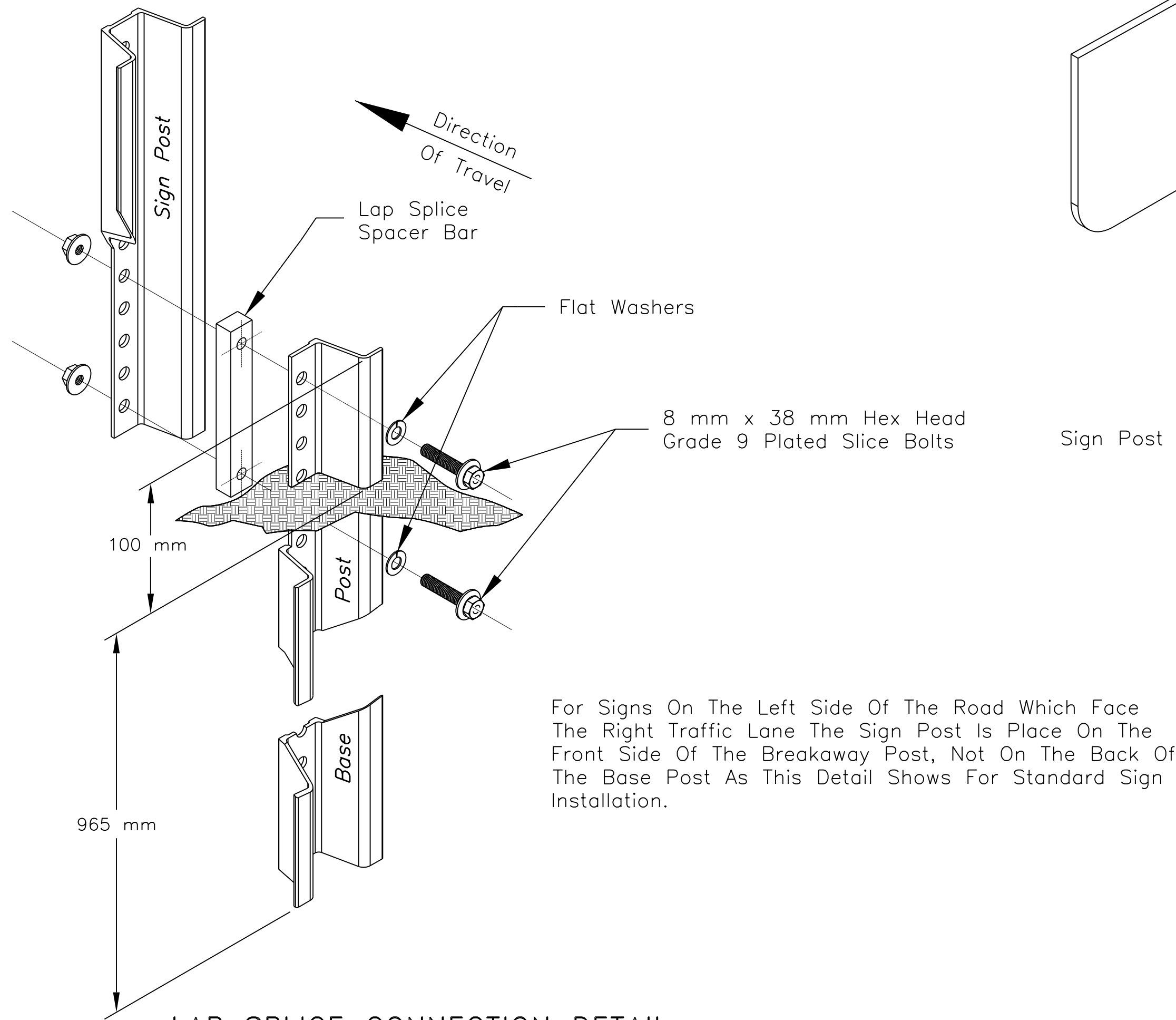
RIB-BAK U-CHANNEL

GENERAL NOTES

- STEEL BASE POST AND SIGN POST SHALL BE RIB-BAK U-CHANNEL FABRICATED FROM HOT ROLLED CARBON STEEL BARS CONFORMING TO THE REQUIREMENTS OF ASTM A499. YIELD POINT AND TENSILE STRENGTH OF STEEL SHALL BE 550 AND 689.47 MPa (MINIMUM), RESPECTIVELY.
- STEEL POSTS SHALL BE UNIFORM, MODIFIED, FLANGED CHANNEL SECTION OF RIB-BAK DESIGN. WEIGHT OF THE STEEL POSTS SHALL BE AS SPECIFIED BY THE USER, ±5% BEFORE PUNCHING. THE POST SHALL BE PUNCHED WITH CONTINUOUS 9mmØ HOLES ON 25mm INTERVAL ON CENTERS FOR THE ENTIRE LENGTH OF POST.
- STEEL POSTS SHALL BE MACHINE STRAIGHTENED TO HAVE A SMOOTH UNIFORM FINISH, FREE FROM DEFECTS AFFECTING STRENGTH, DURABILITY, AND APPEARANCE. ALL HOLES AND EDGES SHALL BE FREE OF BURRS. THE PERMISSIBLE TOLERANCE FOR STRAIGHTNESS SHALL BE WITHIN 6.35mm IN 1.52 METER.
- STEEL POSTS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM 123. BOLTS, NUTS, AND WASHERS SHALL BE CADMIUM PLATED IN ACCORDANCE WITH ASTM A-165 OR ZINC PLATED IN ACCORDANCE WITH ASTM B-633.
- SPLICE HARDWARE SHALL CONSIST OF TWO FULLY THREADED, 8mm X 38mm GRADE-9 PLATED HEX HEAD BOLTS, FLAT WASHERS, AND SELF LOCKING HEX NUTS PER POST. IN ADDITION, ONE 19mm X 127mm PLATED SPACER BAR PER POST, TO STIFFEN THE SPLICE CONNECTION. EACH SPACER SHALL BE DRILLED AND TAPPED WITH 8mm-18 UNC THREADS. THE SPACER SHALL BE FABRICATED FROM HOT ROLLED CARBON STEEL BAR CONFORMING TO ASTM A-36 OR M-1020.
- BOLTS AND LOCK NUT HARDWARE FOR SIGN ATTACHMENT SHALL BE CARRIAGE HEAD TYPE, 8mm-18 UNC, AND SHALL BE CADMIUM PLATED CONFORMING TO ASTM B-766.
- AN APPROVED ALTERNATE BREAKAWAY SYSTEM AND SIGN SUPPORT POST ASSEMBLY MAY BE SUBMITTED TO THE COR/AOTR FOR REVIEW AND APPROVAL PRIOR TO IT'S USE.
- THE CONTRACTOR HAS THE OPTION TO USE "ANTI-THIEF" NUTS IN LIEU OF JAMMING THE BOLT THREADS. NO ADDITIONAL PAYMENT WILL BE MADE IN RELATION TO USING ANTI-THIEF BOLTS.
- SUPPLEMENTAL SIGNS ON THE OPPOSITE SIDE OF ROADWAY SHALL HAVE THE U-CHANNEL REVERSED SO THAT RIB-BAK IS FACING AWAY FROM THE OPPOSING TRAFFIC.

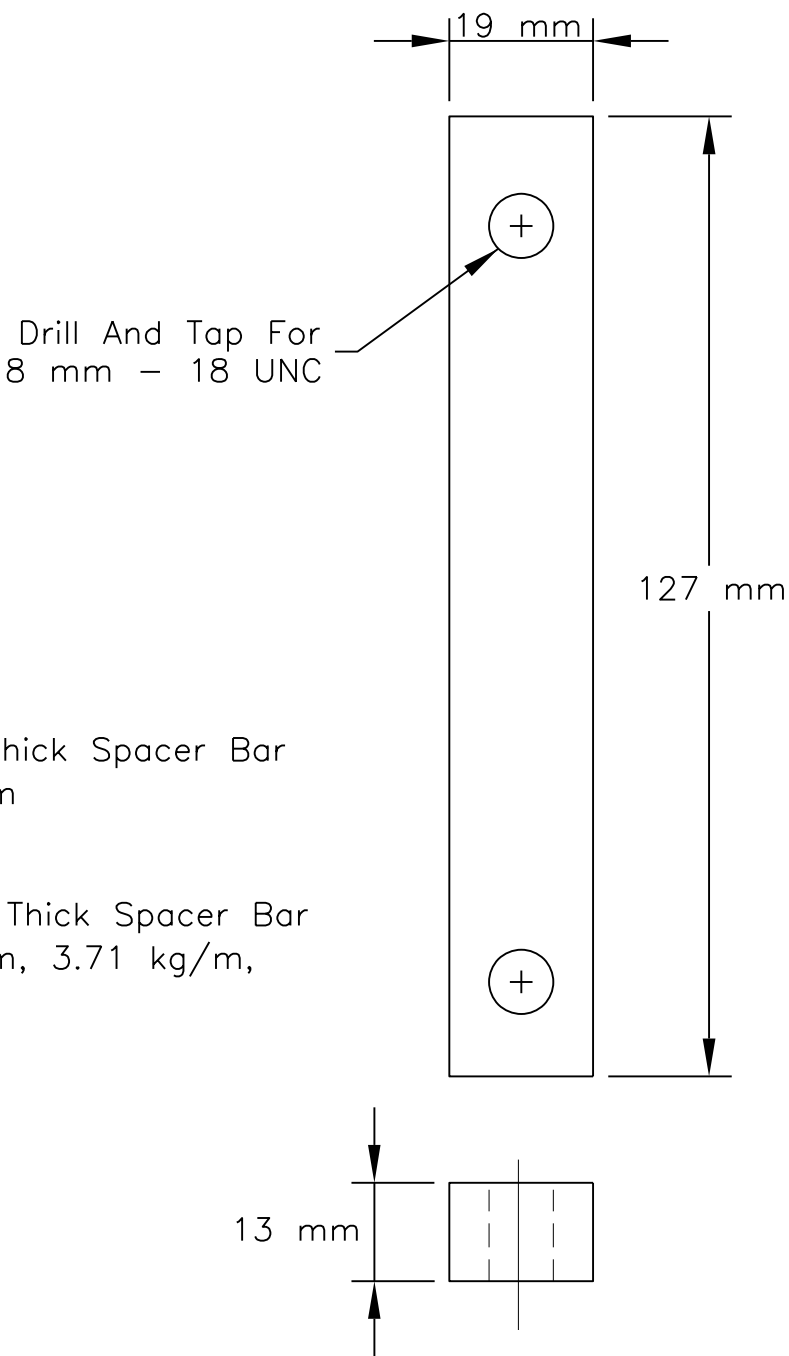
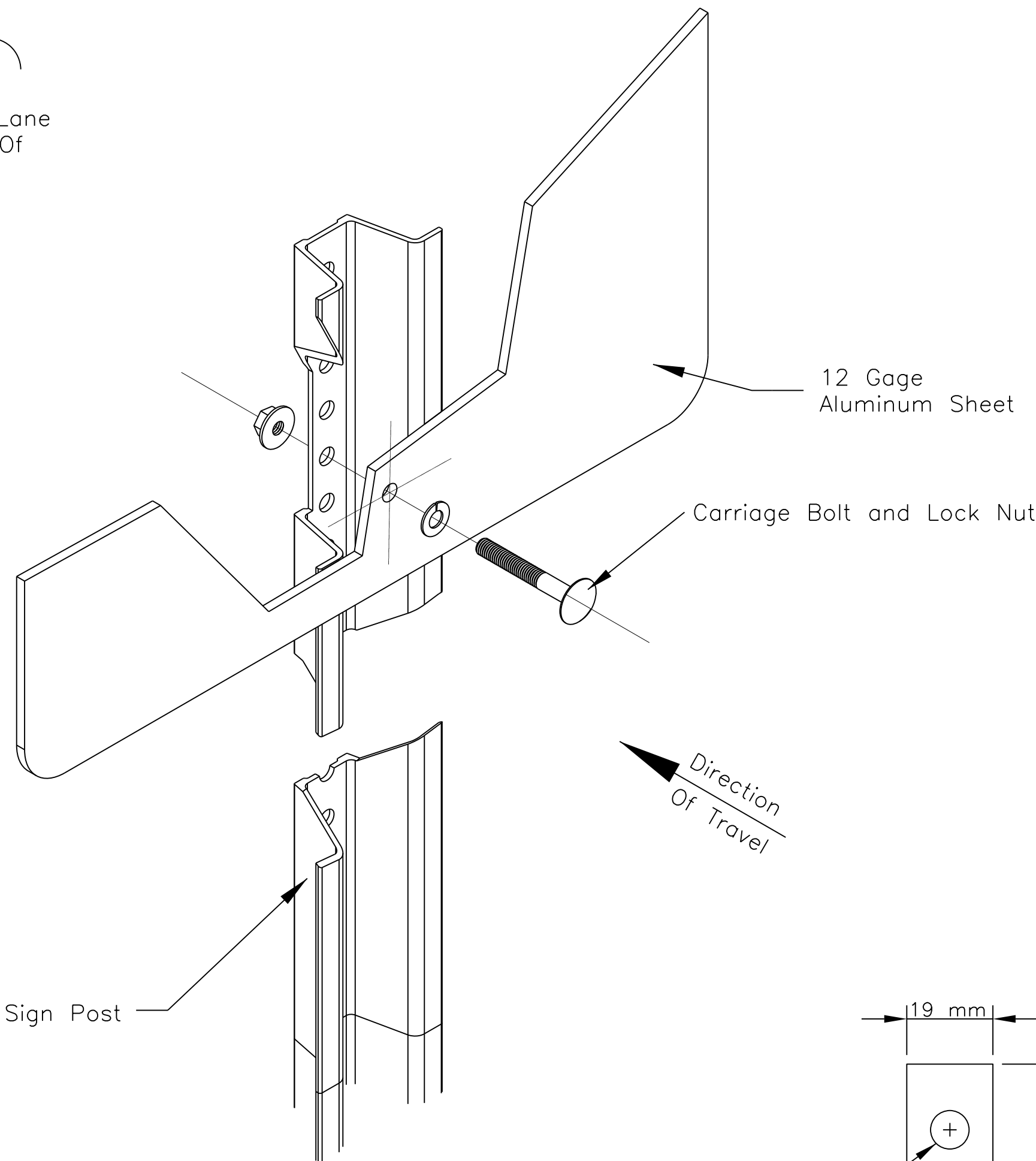


LAP SPLICE – TOP VIEW



LAP SPLICE CONNECTION DETAIL

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



LAP SPLICE SPACER BAR

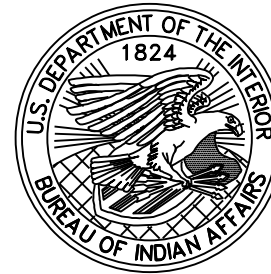
NOTE: The GOLD ANODIZED 13 mm Thick Spacer Bar Is To Be Used With 4.45 kg/m And 5.94 kg/m Posts Only.

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

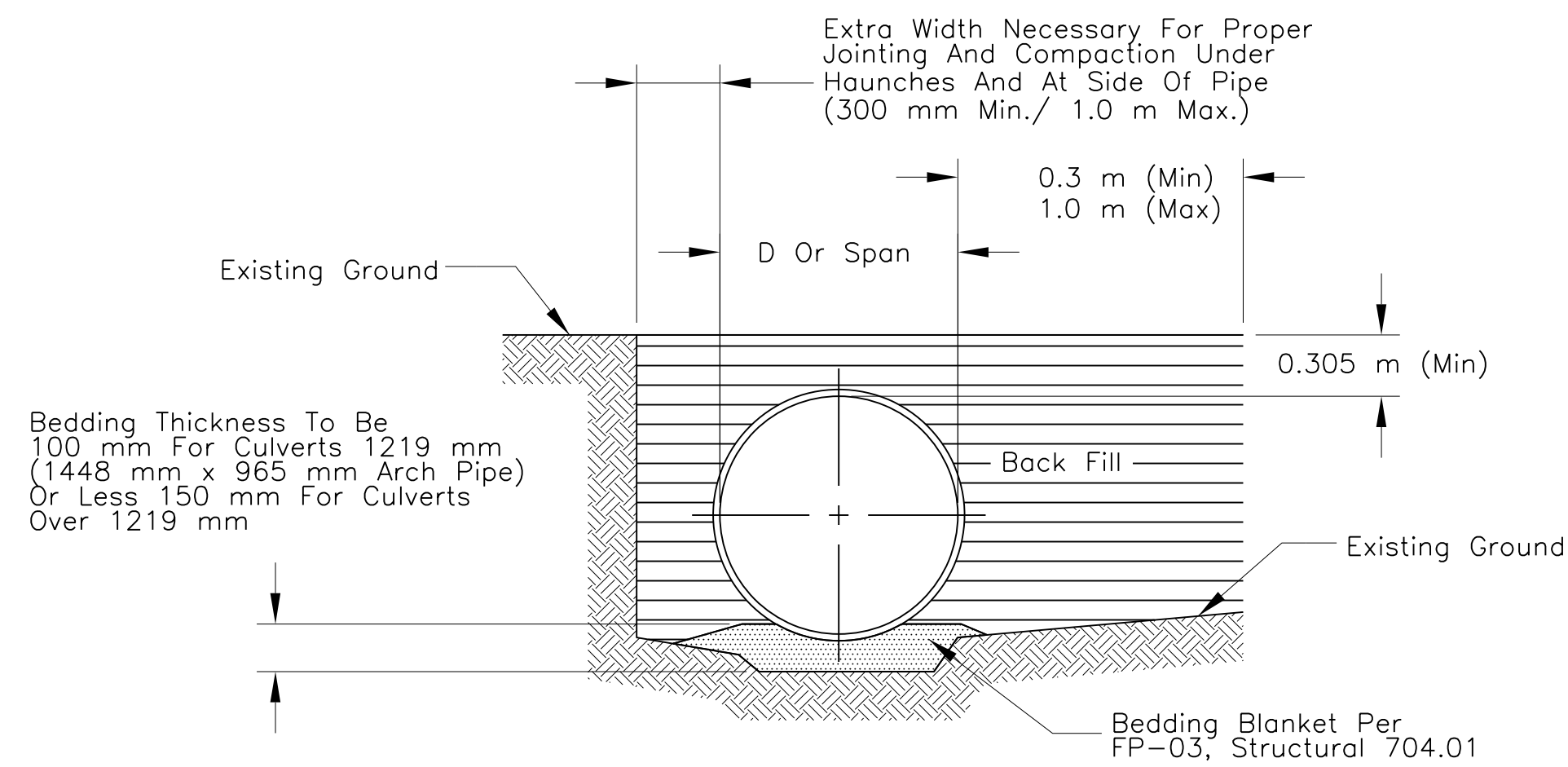
UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF INDIAN AFFAIRS  
NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

LAB SPLICE U-CHANNEL  
BREAKAWAY SYSTEM  
POST & HARDWARE DETAILS

DRAWN BY: NRDOT DATE: 07/2000  
DESIGNED BY: NRDOT DATE: 07/2000  
REVISED: 10/12/2010 BY: LRT  
SCALE: n/a  
FILENAME: Sht\_20\_9345sign2  
SHEET MODEL NAME: PLOT SHEET



| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
|--------|---------|-------------|-------|-------------|-------|--------------|
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 22    | 39           |



NEGATIVE PROJECTING POSITIVE PROJECTING  
FIGURE A: BEDDING

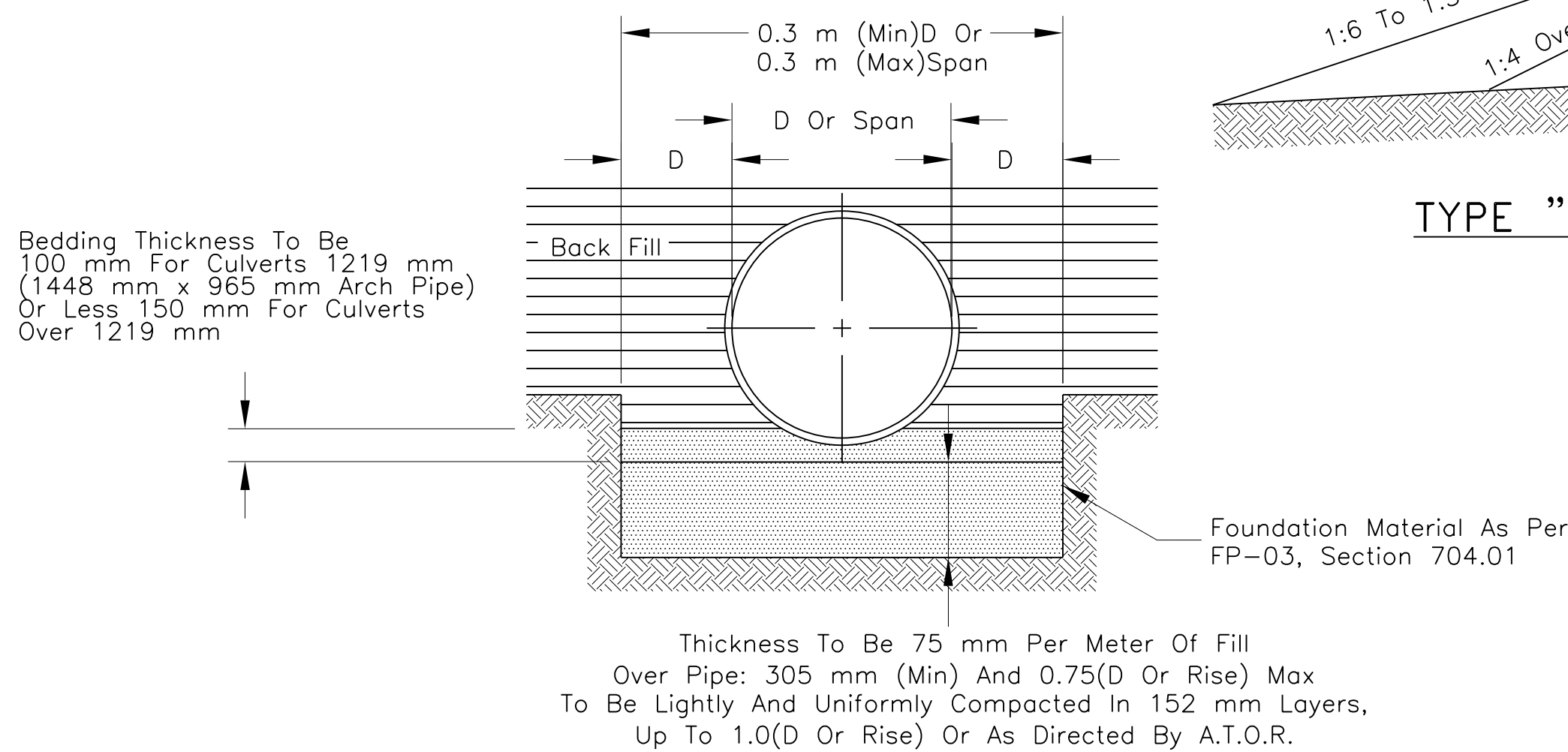


FIGURE B: ROCK BEDDING

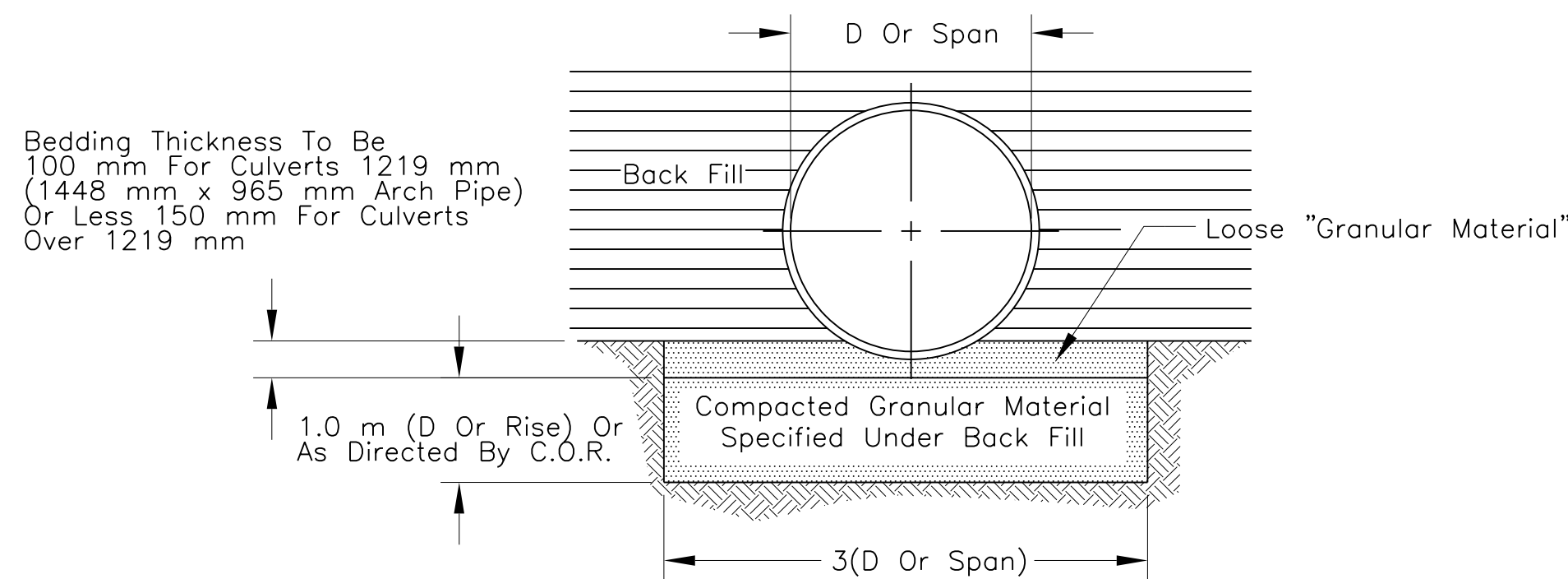
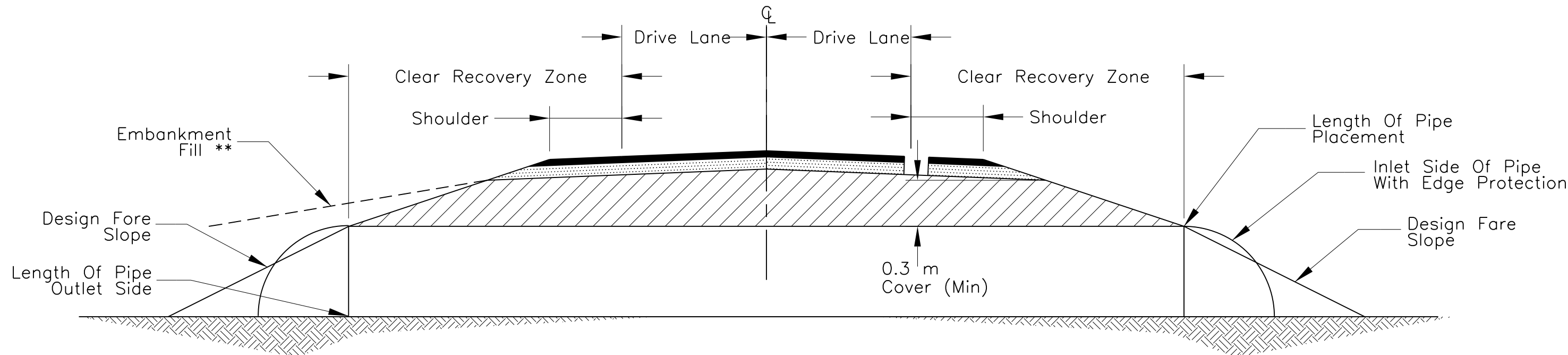
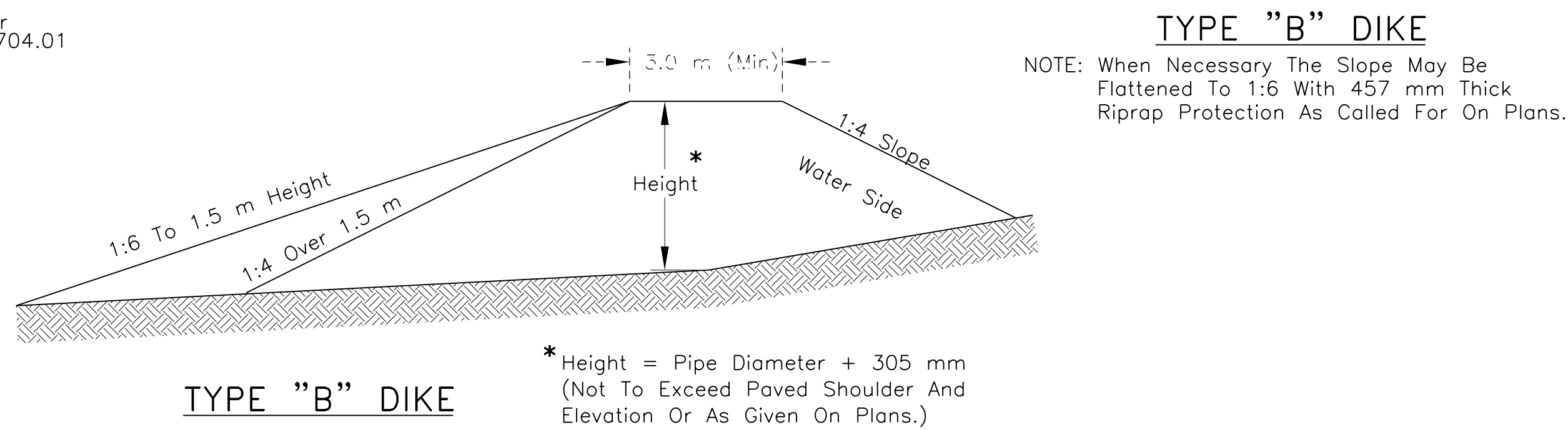
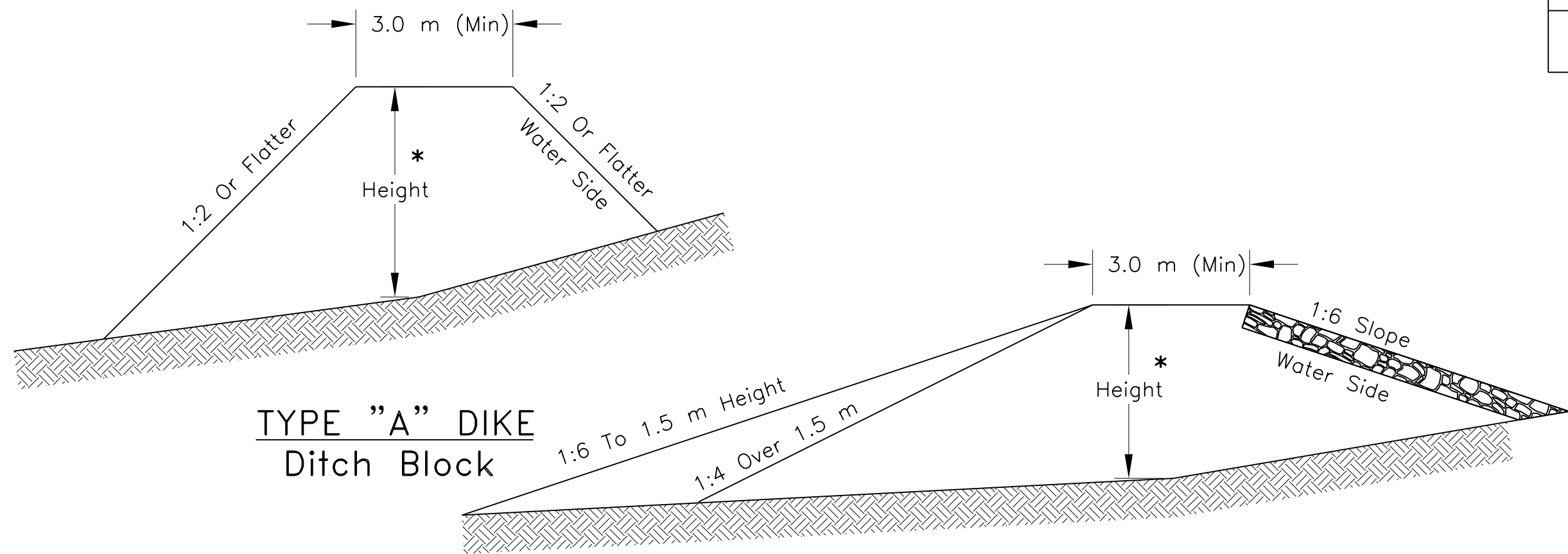


FIGURE C: FOUNDATION STABILIZATION BEDDING



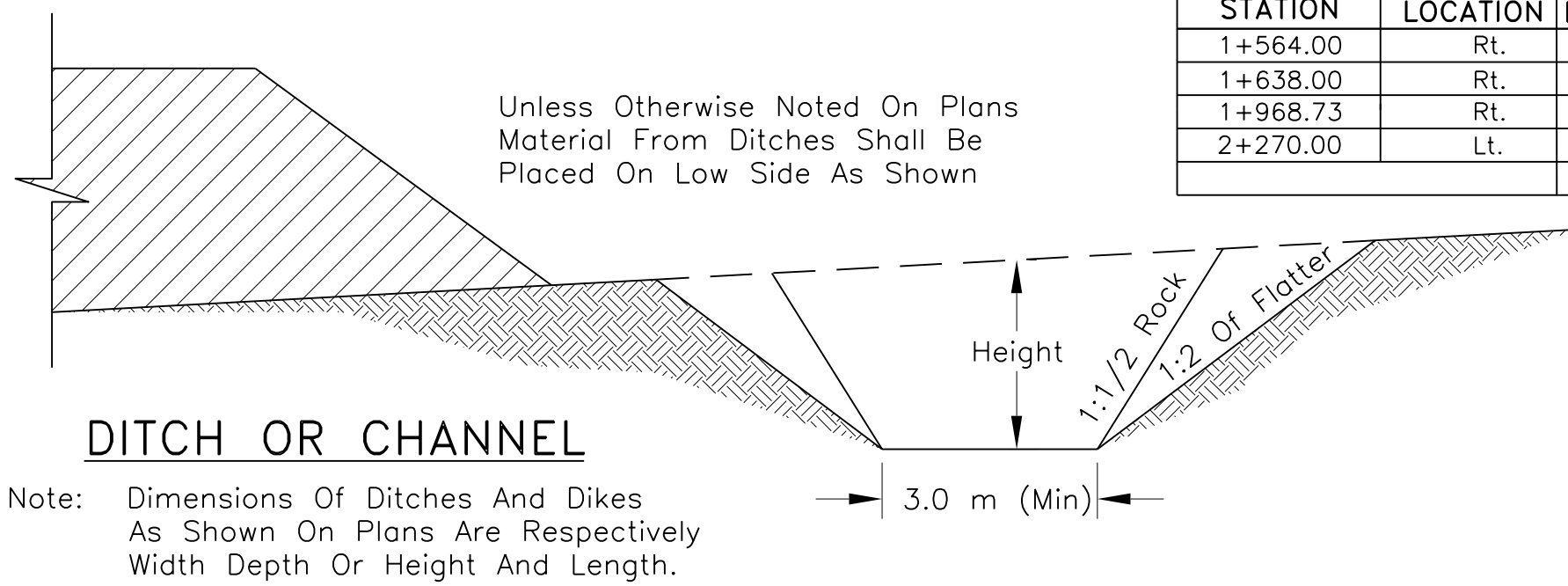
\*\* Adjust Slopes To Catch At Top Of Pipe At Each Opening

TYPICAL PIPE INSTALLATION-(TURNOUT/DRIVEWAY, USE 2-END SECTIONS)

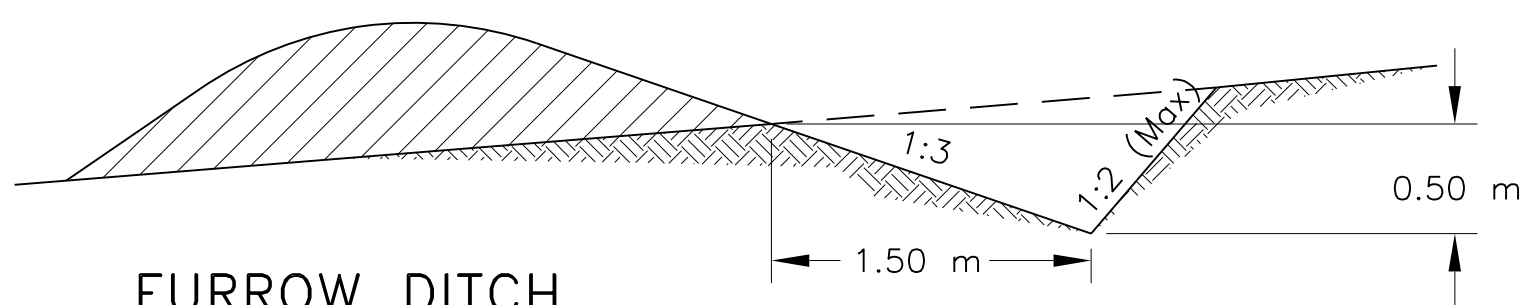


\* Height = Pipe Diameter + 305 mm  
(Not To Exceed Paved Shoulder And Elevation Or As Given On Plans.)

DITCH BLOCK DETAILS

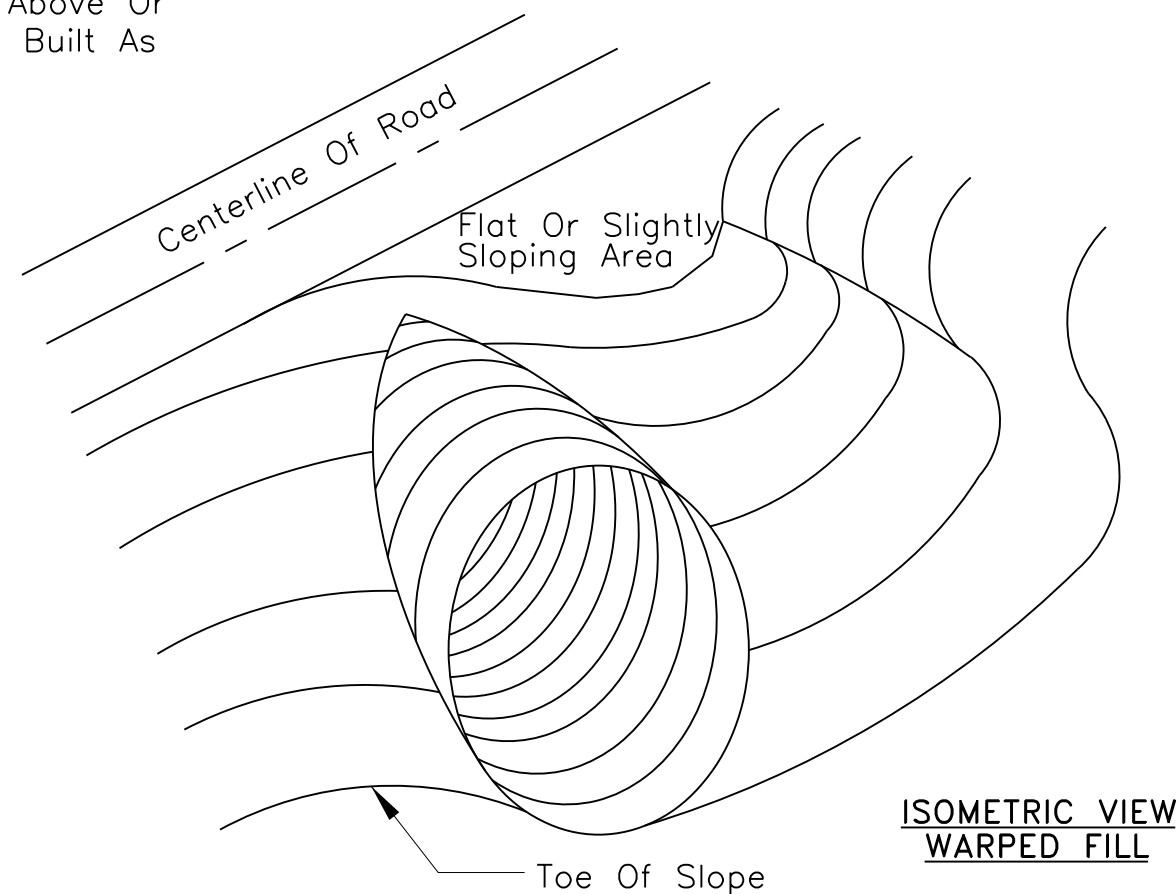


DITCH OR CHANNEL



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 C.O.R..
3. See Sheet 20 For Riprap Lined Furrow Ditch Dimensions.



PIPE SKEWS TO THE EMBANKMENT (TYP.)

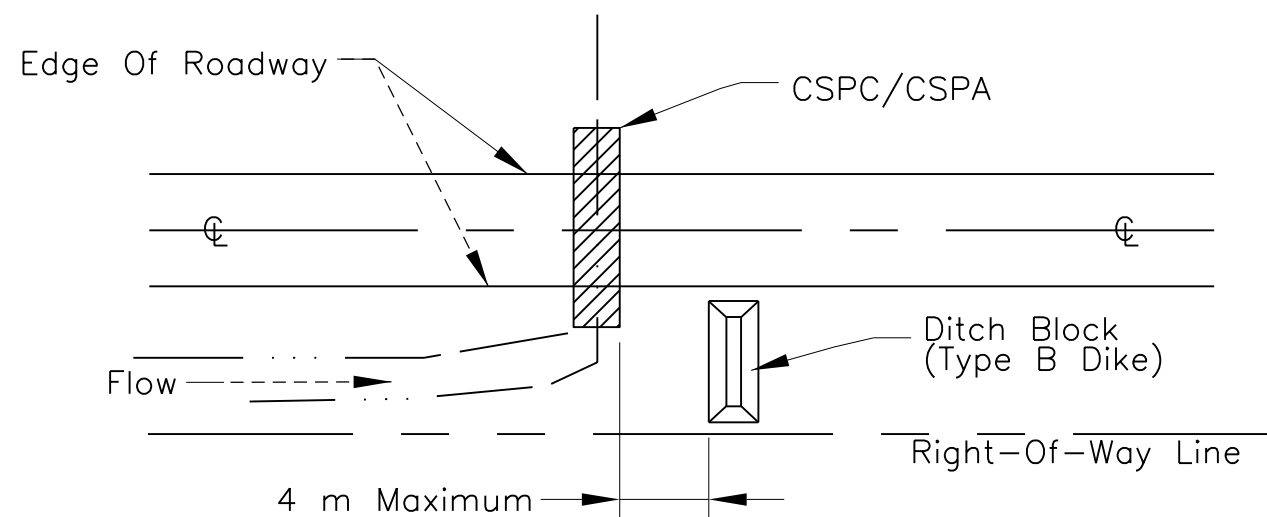
The Contractor Shall Be Required To Build The Warped Embankment Around The Skewed Drainage Pipe(s). This Work Shall Be Incidental To The Earthwork And Installation Of Drainage Pipe Items Shown.

## GENERAL NOTES

1. PLACE LOOSE BEDDING ROUGHLY SHAPED TO AT BOTTOM OF PIPE, THEN COMPACT UNDER HAUNCHES AFTER PIPE PLACEMENT.
2. SEE SECTION 204,209,602, AND 704 OF FP-03, INCLUDING THE SUPPLEMENTAL SPECIFICATION FOR ADDITIONAL NOTES.
3. ALL DRAINAGE STRUCTURE MATERIAL SHALL BE UNLOADED AND HANDLED WITH REASONABLE CARE. NO STRUCTURE SHALL BE DRAGGED OR ALLOWED TO STRIKE ANY HARD SURFACE DURING PLACEMENT. ANY DAMAGED STRUCTURE SHALL BE REPAIRED OR REPLACED, BY THE CONTRACTOR, AT NO ADDITIONAL COST TO THE GOVERNMENT.
4. ALL STRUCTURAL PLATE PIPE STRUCTURES SHALL BE ASSEMBLED AND INSTALLED IN ACCORDANCE WITH THE FABRICATORS RECOMMENDATION.
5. BACKFILL MATERIAL SHALL BE PLACED 300 mm (min) 1.0 m (max) PIPE DIAMETER WIDTH ON THE SIDES AND 300 mm COVER ABOVE THE PIPE. BACKFILL MATERIAL BEYOND THE LIMITS SHALL BE REGULAR EARTHWORK EMBANKMENT MATERIAL, THE BACKFILL MATERIAL SHALL BE APPROVED BY THE COR/AOTR PRIOR TO IT'S USE AND SHALL BE PLACED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.
6. PONDING OR JETTING PIPE BACKFILL SHALL NOT BE PERMITTED.
7. ALL PIPE EXCAVATION, BACKFILLING, DE-WATERING PUMPING OR COFFERDAMS REQUIRED TO PROPERLY INSTALL THE DRAINAGE PIPE SHALL BE CONSIDERED INCIDENTAL TO COMPLETION OF THE PROJECT AND NO ADDITIONAL PAYMENT SHALL BE MADE.
8. ALL PIPES SHALL BE PROTECTED BY A COVER OF NOT LESS THAN 0.91 m OF EMBANKMENT ABOVE PIPE BEFORE ANY HEAVY EQUIPMENT IS ALLOWED TO PASS OVER THE STRUCTURE(S) DURING CONSTRUCTION.
9. ALL CULVERTS SHALL BE INSTALLED AT THE ORIGINAL GROUND LINE AND SLOPE TO ASSURE POSITIVE DRAINAGE UP TO THE R.O.W. LIMITS. IN NO CASE SHALL THE PIPE BE PLACED BELOW THE ORIGINAL GROUND ELEVATIONS, UNLESS AS DIRECTED BY THE REGIONAL ROAD MANAGER. THIS SHALL BE CONSIDERED INCIDENTAL TO COMPLETION OF PROJECT AND NO ADDITIONAL PAYMENT SHALL BE MADE.
10. ALL CULVERTS UNDER TURNOUT AND DRIVEWAYS SHALL BE PLACED AT THE PROPOSED DITCH FLOWLINE. THE CONTRACTOR SHALL BE REQUIRED TO FIELD ADJUST THE PROFILE GRADES OVER THE PIPE AS DIRECTED BY COR/AOTR TO PROVIDE FOR THE MINIMUM COVER.
11. TYPE "A" EARTHEN DIKE SHALL BE USED ON THIS PROJECT UNLESS OTHERWISE NOTED ON THE PLANS. EMBANKMENT MATERIAL NEEDED TO BUILD EARTHEN DIKE SHALL BE CONSIDERED INCIDENTAL TO ITEM 20443-1000.

## 20443-1000 EARTHEN DIKE/BERM, Type-A

| STATION  | LOCATION | ESTIMATED QUANTITY (m) | REMARKS    |
|----------|----------|------------------------|------------|
| 1+564.00 | Rt.      | 30.00 m                | Inlet Side |
| 1+638.00 | Rt.      | 30.00 m                | Inlet Side |
| 1+968.73 | Rt.      | 30.00 m                | Inlet Side |
| 2+270.00 | Lt.      | 15.00 m                | Road Block |
|          |          | TOTAL                  | 105.00 m   |



## DITCH BLOCK INSTALLATION AT STRUCTURE

1. Ditch Block At Structures To Be So Placed That They Create A Water Cushion. Elevation At Top Of Ditch Block Shall Be 305 mm Above Elevation Of Top Of Pipe Unless Otherwise Shown Or Directed By The C.O.R..
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 4.0 m.

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## STANDARD PIPE INSTALLATION AND DITCH DETAILS

DRAWN BY: NRO DOT DATE: 05/04  
DESIGNED BY: NRO DOT DATE: 05/04  
REVISED: 10/10 BY: SC  
SCALE: NTS  
FILENAME: 9345pid  
SHEET MODEL NAME: PLOT SHEET

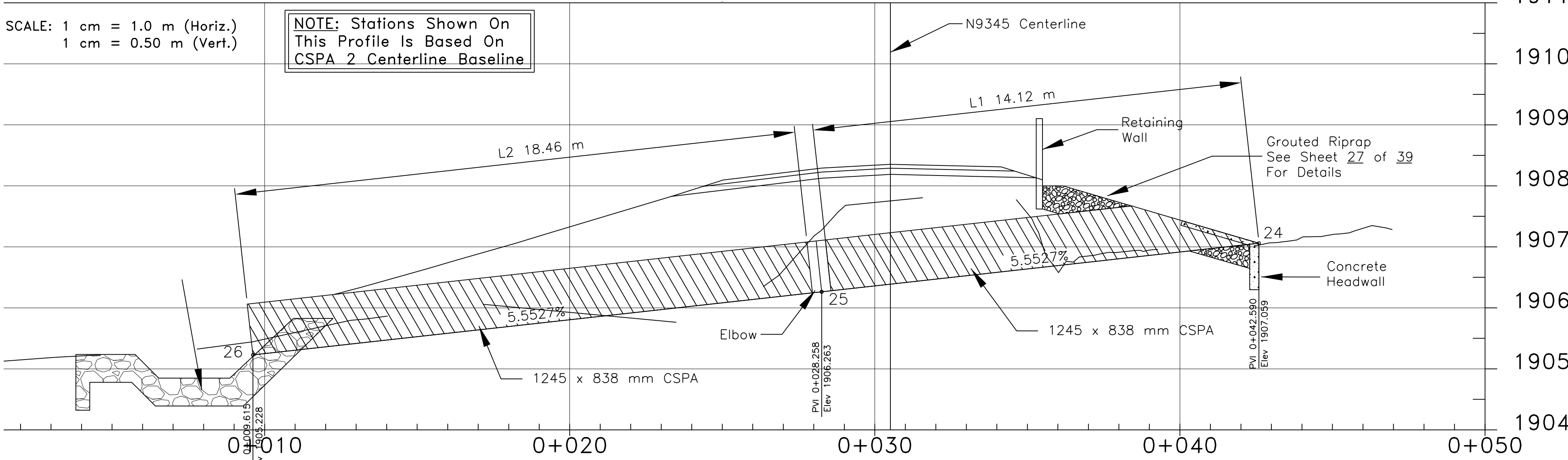


| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
|--------|---------|-------------|-------|-------------|-------|--------------|
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 23    | 39           |

### CSPA 2 CENTERLINE PROFILE-STA. 2+325.32

SCALE: 1 cm = 1.0 m (Horiz.)  
1 cm = 0.50 m (Vert.)

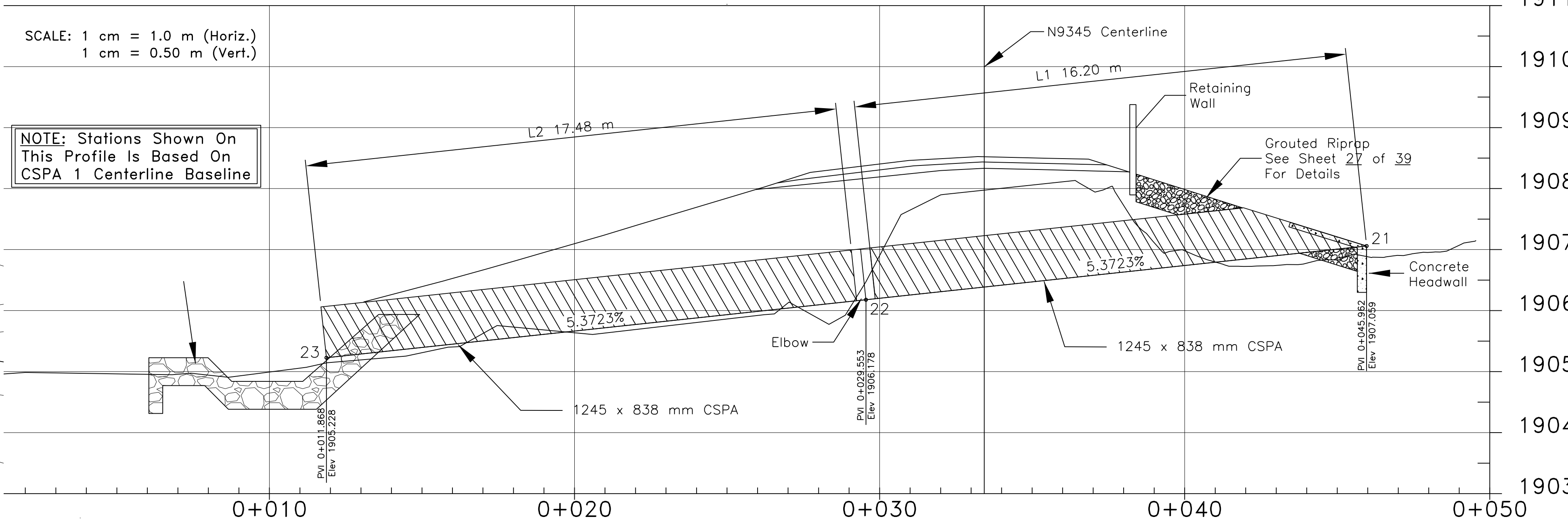
NOTE: Stations Shown On  
This Profile Is Based On  
CSPA 2 Centerline Baseline



### CSPA 1 CENTERLINE PROFILE-STA. 2+322.88

SCALE: 1 cm = 1.0 m (Horiz.)  
1 cm = 0.50 m (Vert.)

NOTE: Stations Shown On  
This Profile Is Based On  
CSPA 1 Centerline Baseline

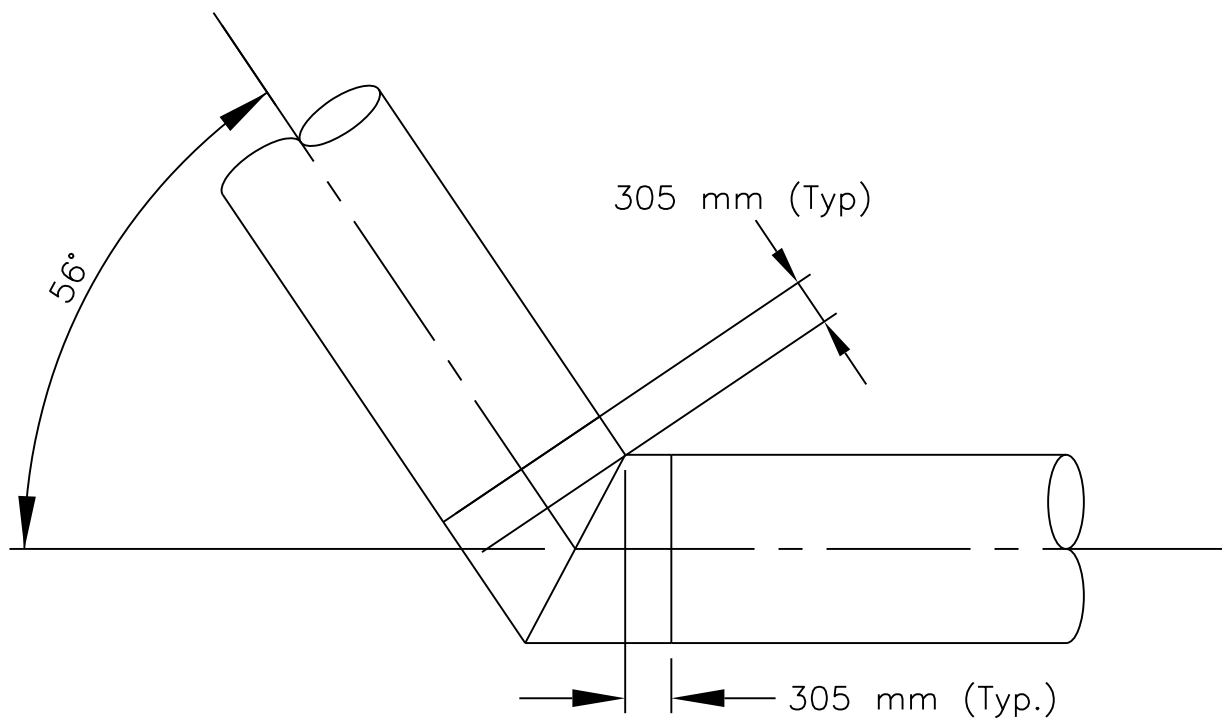


#### ESTIMATED STRUCTURE QUANTITY

| STATION - N9345 | STRUCTURE                       | LENGTH (m) |       | TOTAL LENGTH (m) | ELBOW (Each) |
|-----------------|---------------------------------|------------|-------|------------------|--------------|
|                 |                                 | L1         | L2    |                  |              |
| 2+322.88        | 1245 mm Span x 838 mm Rise CSPA | 16.20      | 17.48 | 33.68            | 1            |
| 2+325.32        | 1245 mm Span x 838 mm Rise CSPA | 14.12      | 18.45 | 32.57            | 1            |
|                 |                                 | TOTAL      |       | 66.25            | 2            |

#### CSPA PIPE INVERT DATA

| MARK | STATION - N9345 | OFFSET (m) | ELEVATION | REMARKS              |
|------|-----------------|------------|-----------|----------------------|
| 21   | 2+321.373       | 12.43      | 1,906.059 | CSPA 1 Inlet Invert  |
| 22   | 2+323.391       | -3.85      | 1,906.178 | CSPA 1 Elbow Invert  |
| 23   | 2+340.249       | 11.00      | 1,905.228 | CSPA 1 Outlet Invert |
| 24   | 2+323.716       | 11.96      | 1,906.059 | CSPA 2 Inlet Invert  |
| 25   | 2+325.646       | -2.23      | 1,906.263 | CSPA 2 Elbow Invert  |
| 26   | 2+343.376       | -9.53      | 1,905.228 | CSPA 2 Outlet Invert |



TYPICAL ELBOW DETAIL  
(nts)

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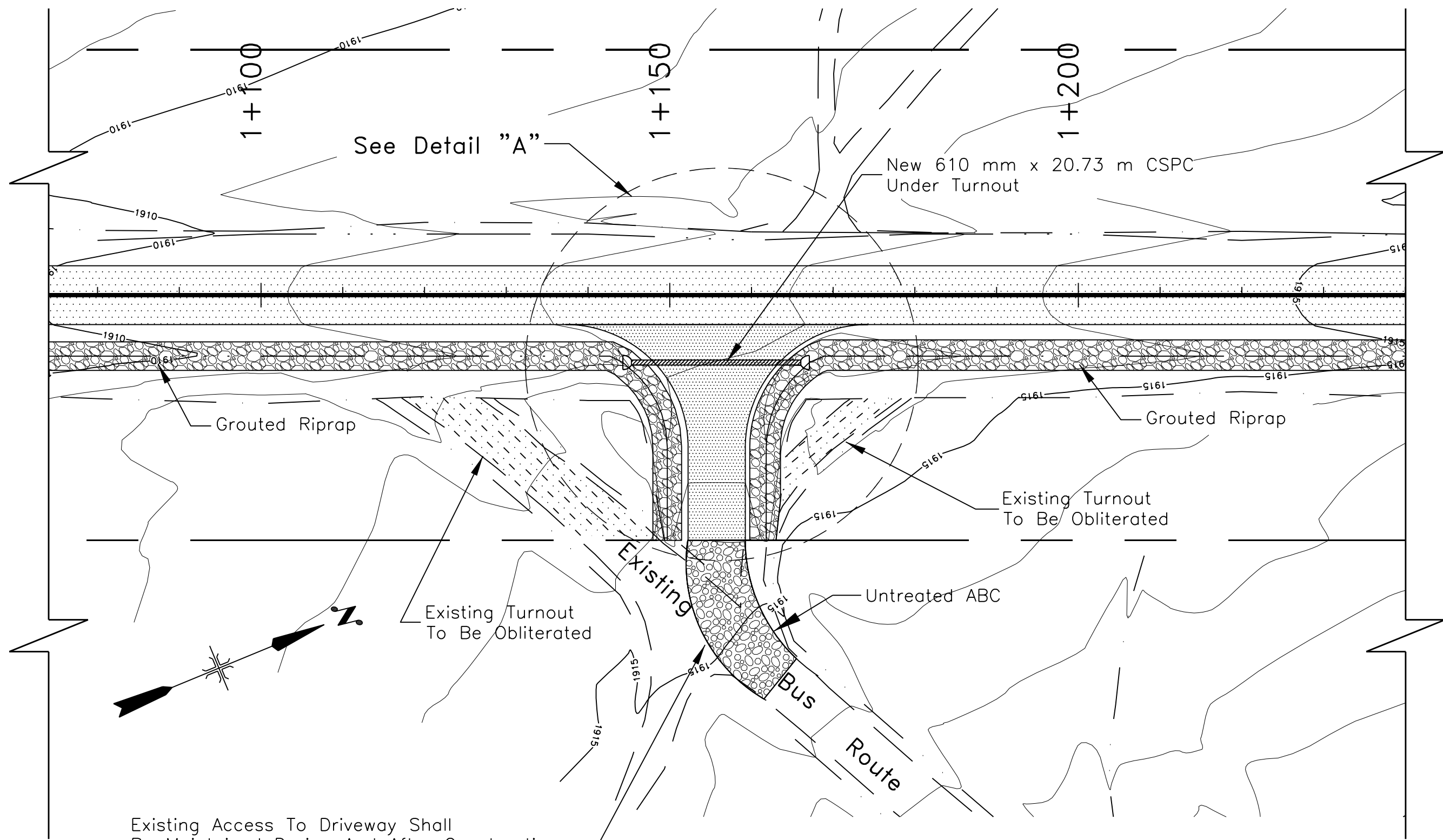
#### PIPE-ARCH INSTALLATION AND ELBOW DERAIL

DRAWN BY: NRDOT DATE: 00/05  
DESIGNED BY: NRDOT DATE: 11/05  
REVISED: 10/10 BY: LRT  
SCALE: See Plan  
FILENAME: Sht\_22\_Pipe\_Elbow  
SHEET MODEL NAME: PLOT SHEET



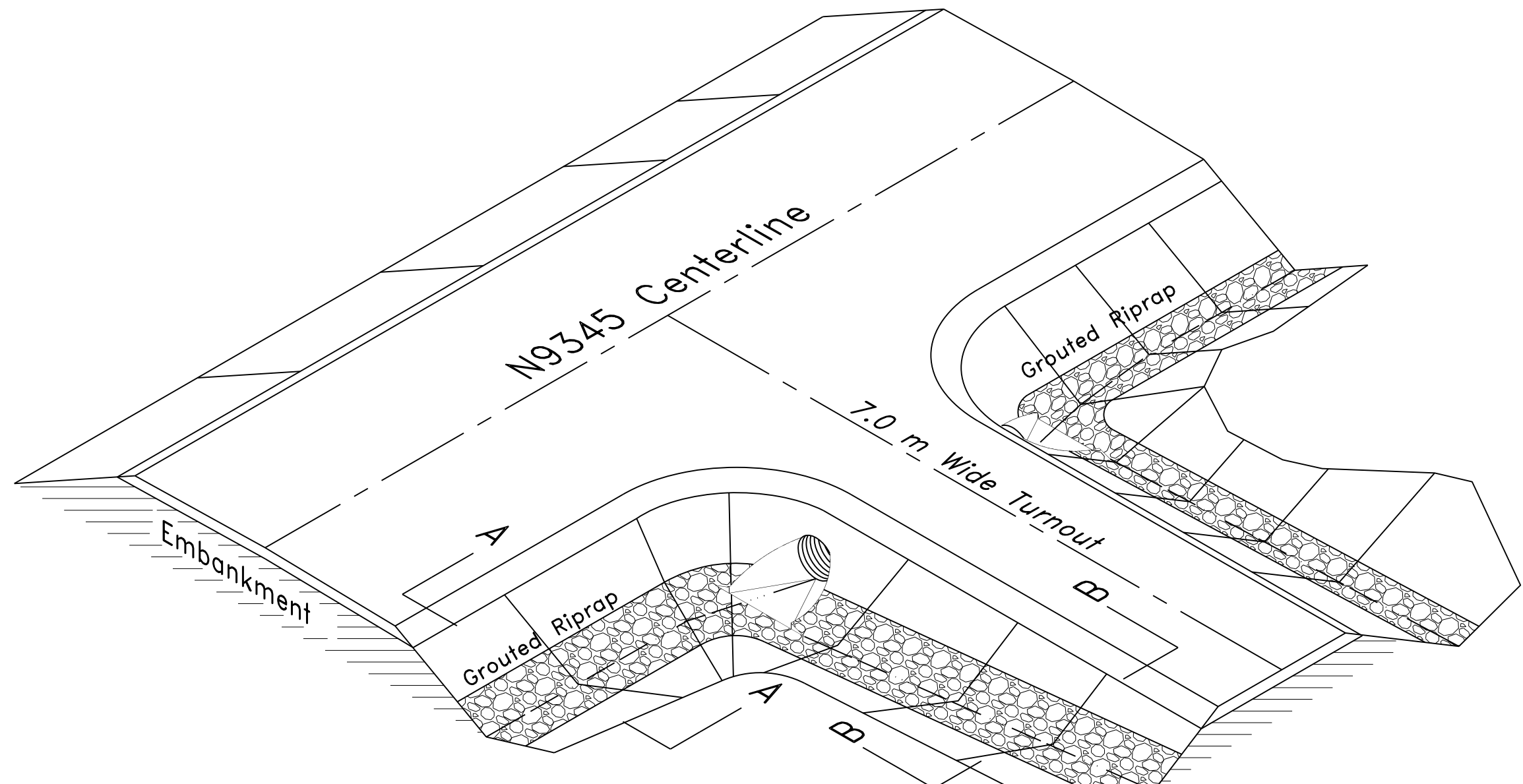
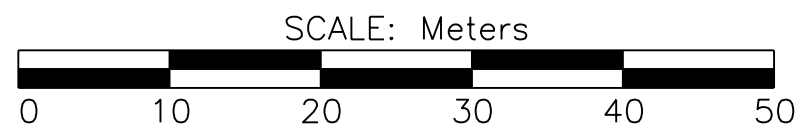


| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
|--------|---------|-------------|-------|-------------|-------|--------------|
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 25    | 39           |



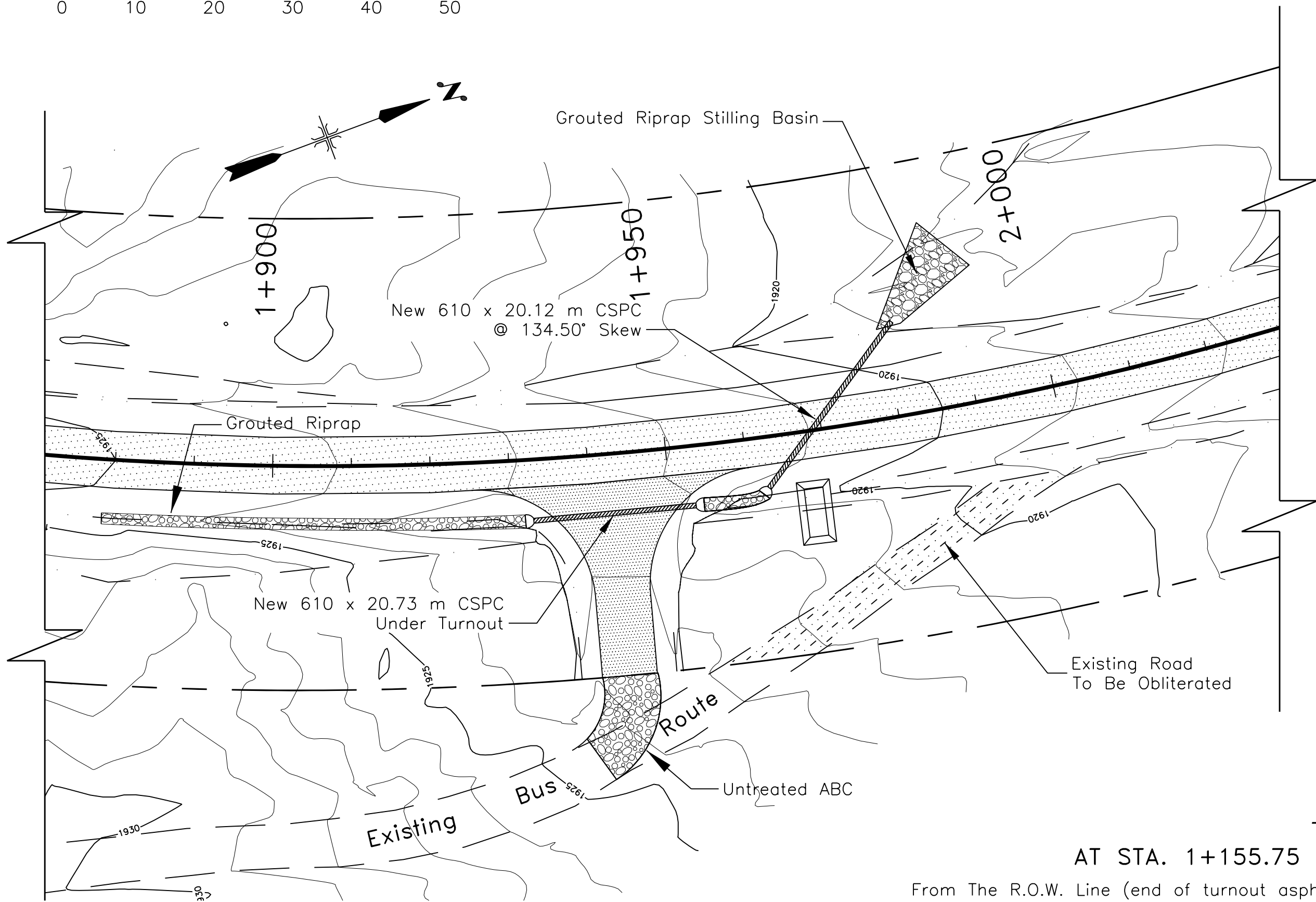
Existing Access To Driveway Shall Be Maintained During And After Construction.

PLAN VIEW  
7.0 m WIDE TURNOUT  
@ Sta. 1+155.75, Rt.

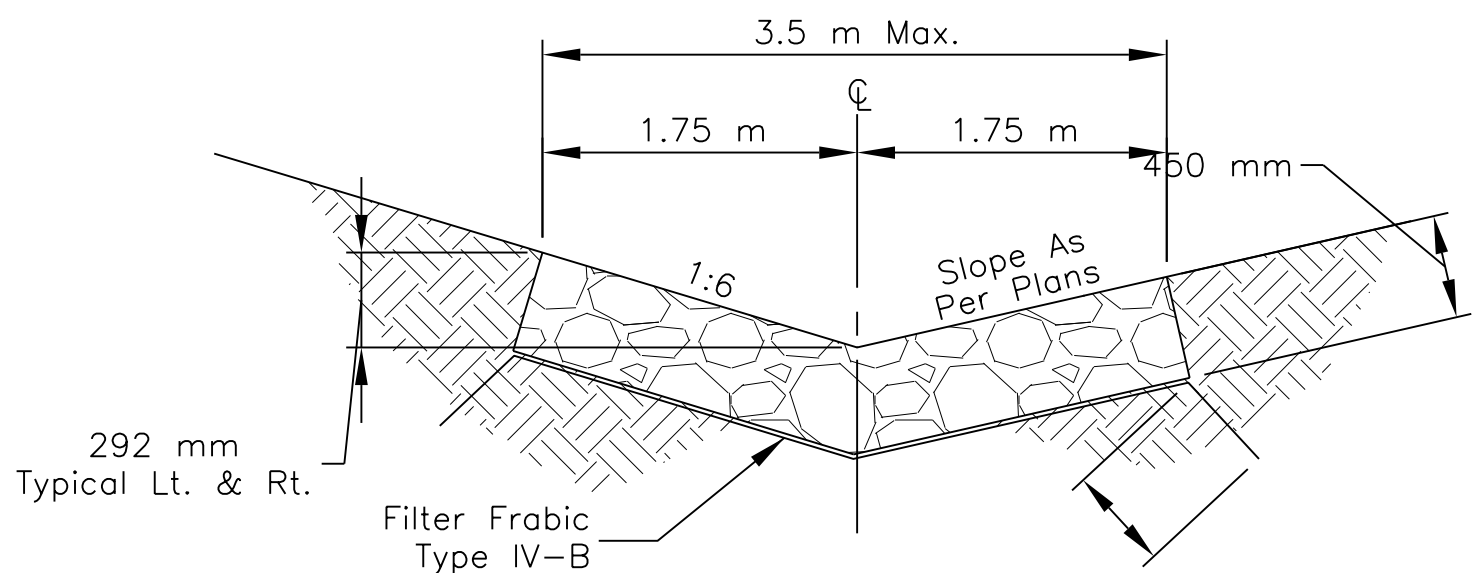


DETAIL "A"  
(nts)

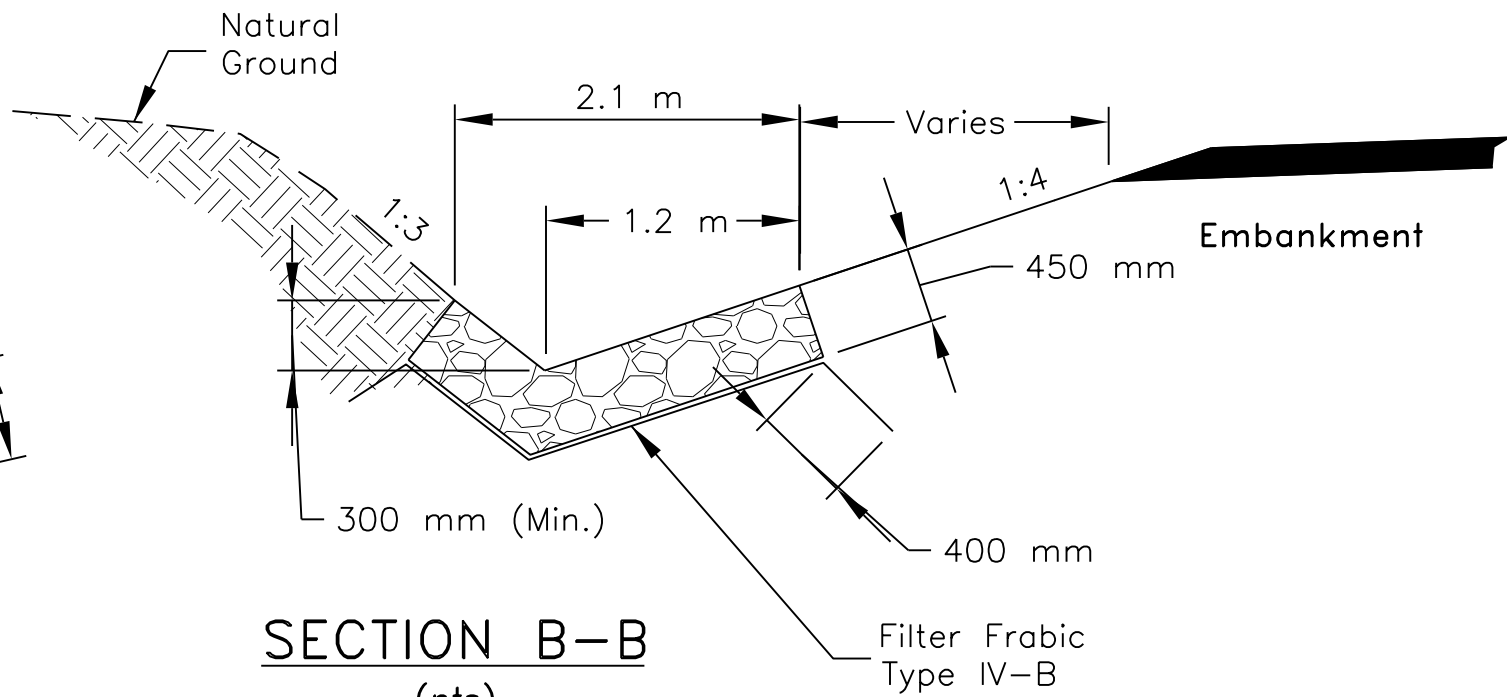
See Sheet 29 of 39 For Grouted Riprap Quantity Table And General Notes.



PLAN VIEW  
7.0 m WIDE TURNOUT  
@ Sta. 1+943.00, Rt.



SECTION A-A  
(nts)



SECTION B-B  
(nts)

TURNOUT TRANSITIONS  
AT STA. 1+155.75 RT, STA. 1+943 RT & STA. 2+389.35 RT.

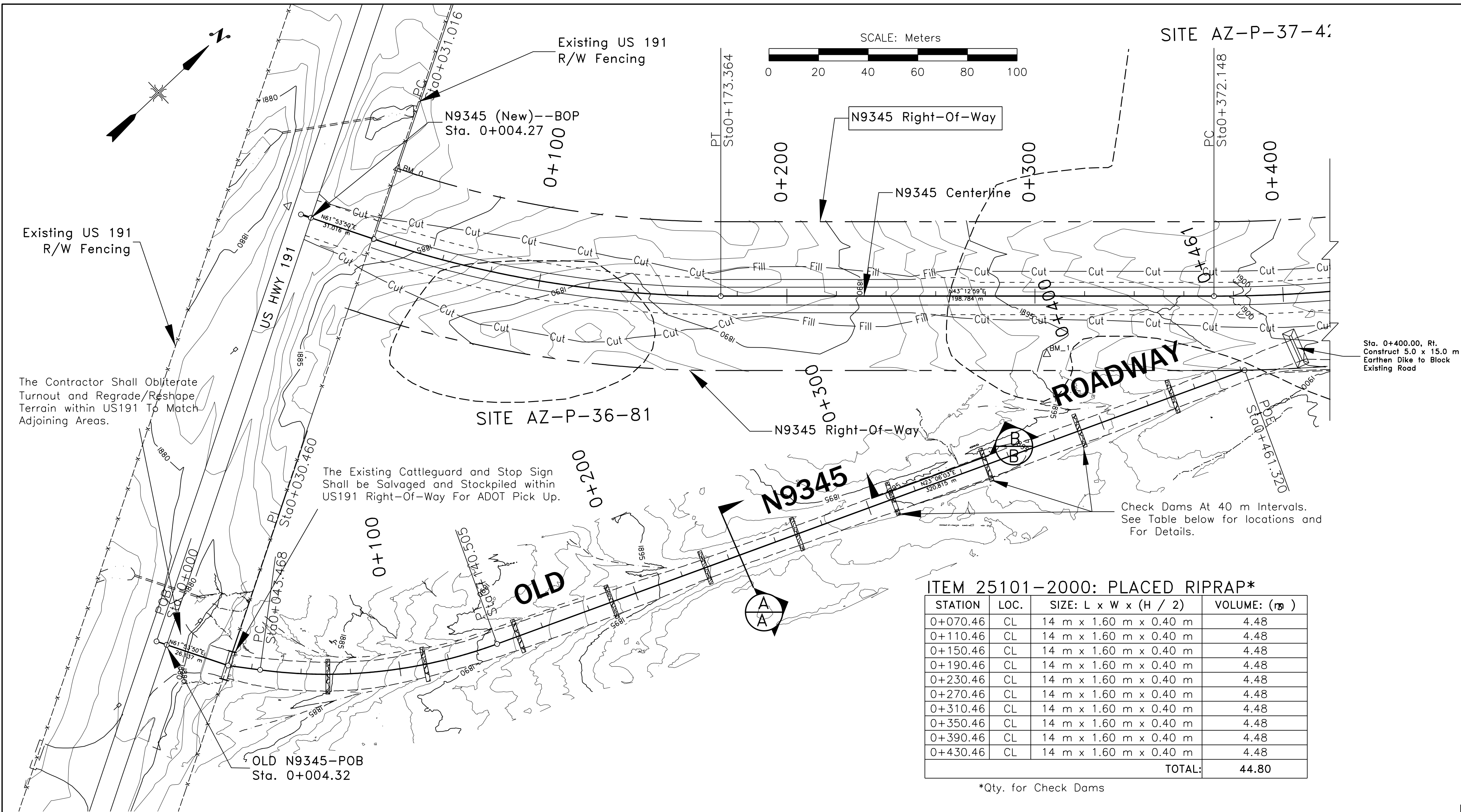
From The R.O.W. Line (end of turnout asphalt) The Contractor Shall Construct A Smooth Transition To The Existing Road Including Any Excavation, Fill, Compaction, Ditch Grading, etc. Place 100 mm Of Compacted ABC For A Distance Of 20 m From The R.O.W. line And To A Width As Needed To Cover The Transition Driving Surface. The ABC Shall Be Paid Under Bid Item 30101-2000, All Other Turnout Transition Related Work Shall Be Considered Incidental To The Project And No Other Payments Will Be Made. The Turnout Transition Construction Shall Be As Directed And As Approved By The C.O.R.

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TURNOUT & GROUTED  
RIPRAP DETAIL

DRAWN BY: NRDOT DATE: 09/05  
DESIGNED BY: NRDOT DATE: 09/05  
REVISED: 09/10 BY: LRT  
SCALE: Varies  
FILENAME: Sht 24\_Turnout Plan  
SHEET MODEL NAME: PLOT SHEET





| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
|--------|---------|-------------|-------|-------------|-------|--------------|
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 26    | 39           |

GENERAL NOTES

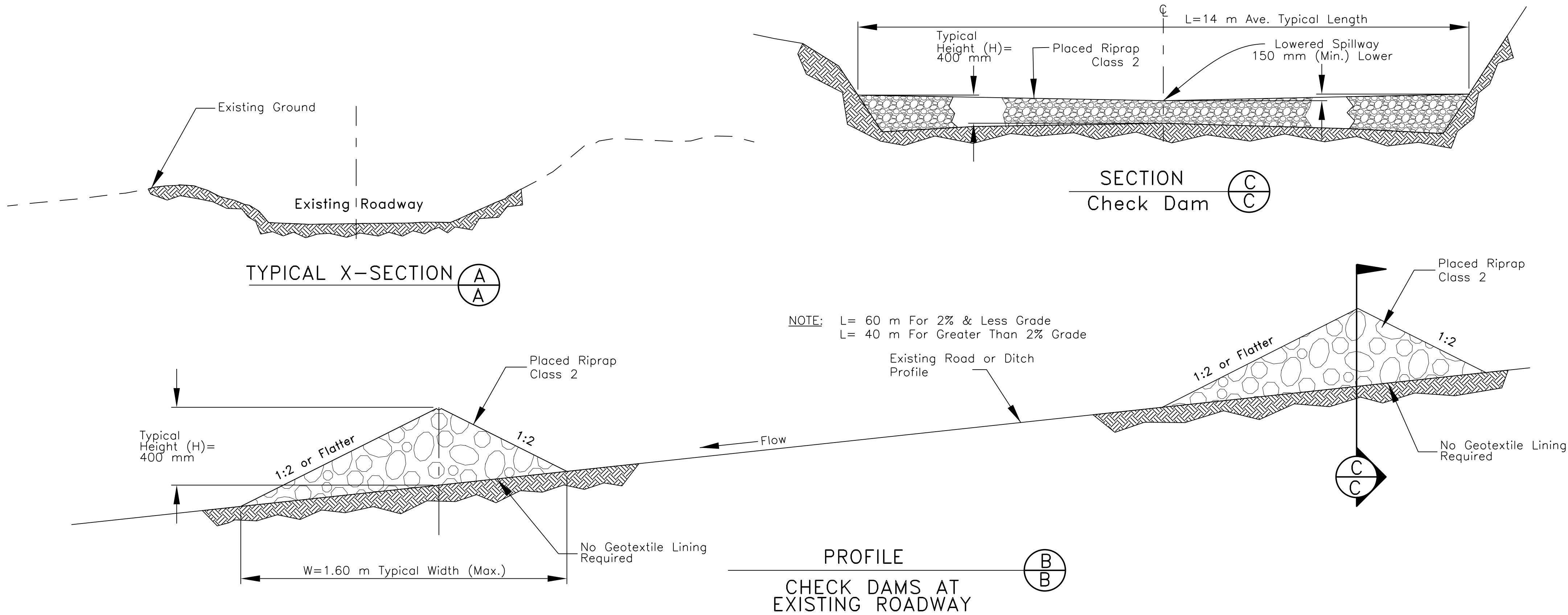
- AS PART OF THE N9345(2)2&4 PROJECT, THE CONTRACTOR SHALL OBLITERATE THE OLD N9345 WITH US191 (LOCATED 180 m SOUTH OF THE NEW N9345 INTERSECTION). THIS WORK SHALL INCLUDE ALL EXCAVATION AND GRADING WORK REQUIRED TO RESHAPE THE US191 RIGHT-OF-WAY TO MATCH THE ADJOINING AREAS. THE CATTLEGUARD AND STOP SIGN SHALL BE SALVAGED AND STOCKPILED WITHIN THE US191 RIGHT-OF-WAY FOR ADOT TO PICK UP. THIS WORK SHALL BE INCLUDED IN BID ITEM 21102-1000. ALL DISTURBED AREAS SHALL BE SEEDED UNDER BID ITEM 62510-1000.
- SEE SHEET 2 OF 39, NOTE #12 FOR ROADWAY SCARIFYING.
- WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE STANDARD SPECIFICATION FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECT(FP-03).
- ALL STONE FOR RIPRAP SHALL BE CLASS 2 MEETING THE GRADING REQUIREMENTS OF TABLE 705-1 OF THE FP-03.
- THE QUANTITIES SHOWN ARE ONLY AN ESTIMATE. ACTUAL QUANTITIES SHALL BE DETERMINED IN THE FIELD. THE CONTRACTOR WILL BE REQUIRED TO MAKE ANY NECESSARY ADJUSTMENTS IN THE FIELD TO MATCH EXISTING FIELD CONDITIONS AS DIRECTED BY THE COR/AOTR. THESE FIELD ADJUSTMENTS ARE INCIDENTAL OBLIGATIONS OF THE CONTRACTOR AND NO ADDITIONAL PAYMENT SHALL BE MADE.
- ALL EXCAVATIONS SHALL BE DONE TO NEAT LINES IN ACCORDANCE WITH SECTION 209 OF THE FP-03.

OLD ROADWAY ALIGNMENT

| POINT                 | STATION (m) | ELEMENT             | DIRECTION     | NORTHING (m) | EASTING (m) |
|-----------------------|-------------|---------------------|---------------|--------------|-------------|
| POB                   | 0+000.000   |                     |               | 30319.752    | 30565.575   |
| PI                    | 0+004.323   | Linear= 4.323 (m)   | N 61°53'50" E | 30321.788    | 30569.388   |
| PI                    | 0+030.460   | Linear= 26.137 (m)  | N 61°53'50" E | 30334.1      | 30592.443   |
| PC                    | 0+043.468   | Linear= 13.008 (m)  | N 50°51'34" E | 30342.311    | 30602.532   |
| PI                    | 0+092.958   |                     |               | 30373.55     | 30640.917   |
| CURVE DATA            |             |                     |               |              |             |
| Delta = 27°45'31" Lt. |             |                     |               |              |             |
| Deg. = 8°43'09"       |             |                     |               |              |             |
| R = 200.292 (m)       |             |                     |               |              |             |
| L = 97.037 (m)        |             |                     |               |              |             |
| T = 49.490 (m)        |             |                     |               |              |             |
| e = 6.024 (m)         |             |                     |               |              |             |
| PT                    | 0+140.505   |                     |               | 30419.072    | 30660.335   |
| POE                   | 0+461.320   | Linear= 320.815 (m) | N 23°06'03" E | 30714.163    | 30786.207   |

ITEM 62510-1000: SEEDING and  
ITEM 21102-1000: ROADWAY AND TURNOUT OBLITERATION

| STA to STA           | LENGTH | WIDTH | AREA (ha) | REMARKS                                  |
|----------------------|--------|-------|-----------|------------------------------------------|
| 0+004.32 to 0+030.46 | 26.14  | 20.00 | 0.05      | Within The US191 Right-Of-Way            |
| 0+030.46 to 0+461.32 | 430.86 | 20.00 | 0.86      | Outside The US191 & N9345 Rights-Of-Way. |
| TOTAL:               |        |       |           | 0.91                                     |

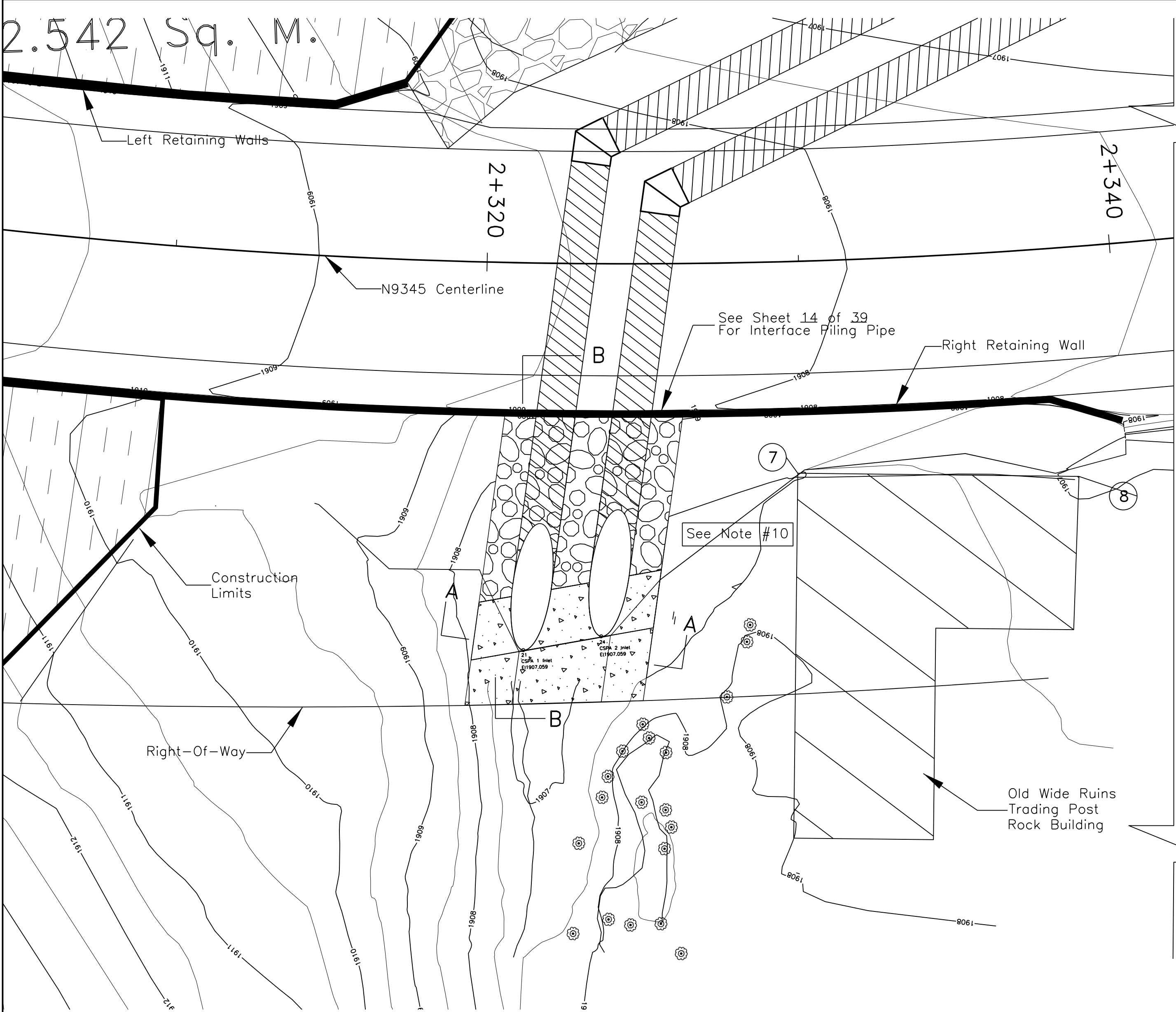


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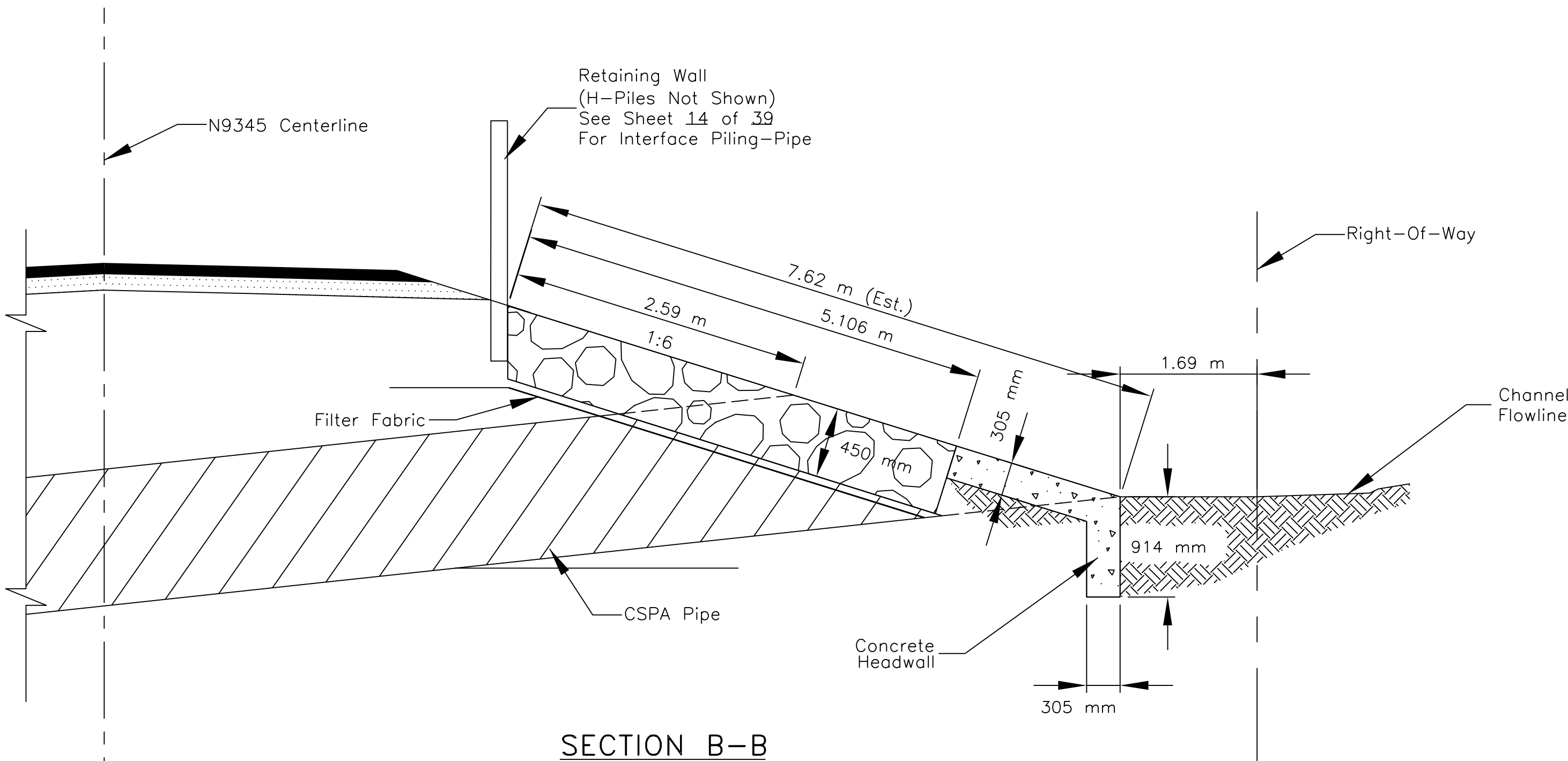
OLD ROADWAY OBLITERATION  
PLAN/CHECK DAM DETAILS

DRAWN BY: LRT DATE: 12/05  
DESIGNED BY: NRODOT DATE: 12/05  
REVISED: 01/26/06 BY: DUY  
SCALE: NTS  
FILENAME: 9345 RW-OB  
SHEET MODEL NAME: PLOT SHEET





PLAN VIEW  
SCALE: 1:100



SECTION B-B  
GROUTED RIPRAP @ INLET  
(nts)

APPROXIMATE  
WIDE RUINS BUILDING LOCATION

| MARK | STATION  | OFFSET (m) | REMARKS                           |
|------|----------|------------|-----------------------------------|
| 7    | 2+329.79 | 6.80 Rt.   | To be avoided during construction |
| 8    | 2+338.47 | 7.37 Rt.   | To be avoided during construction |

ESTIMATED GROUTED RIPRAP VOLUME

TOTAL: 12.70 m<sup>3</sup>

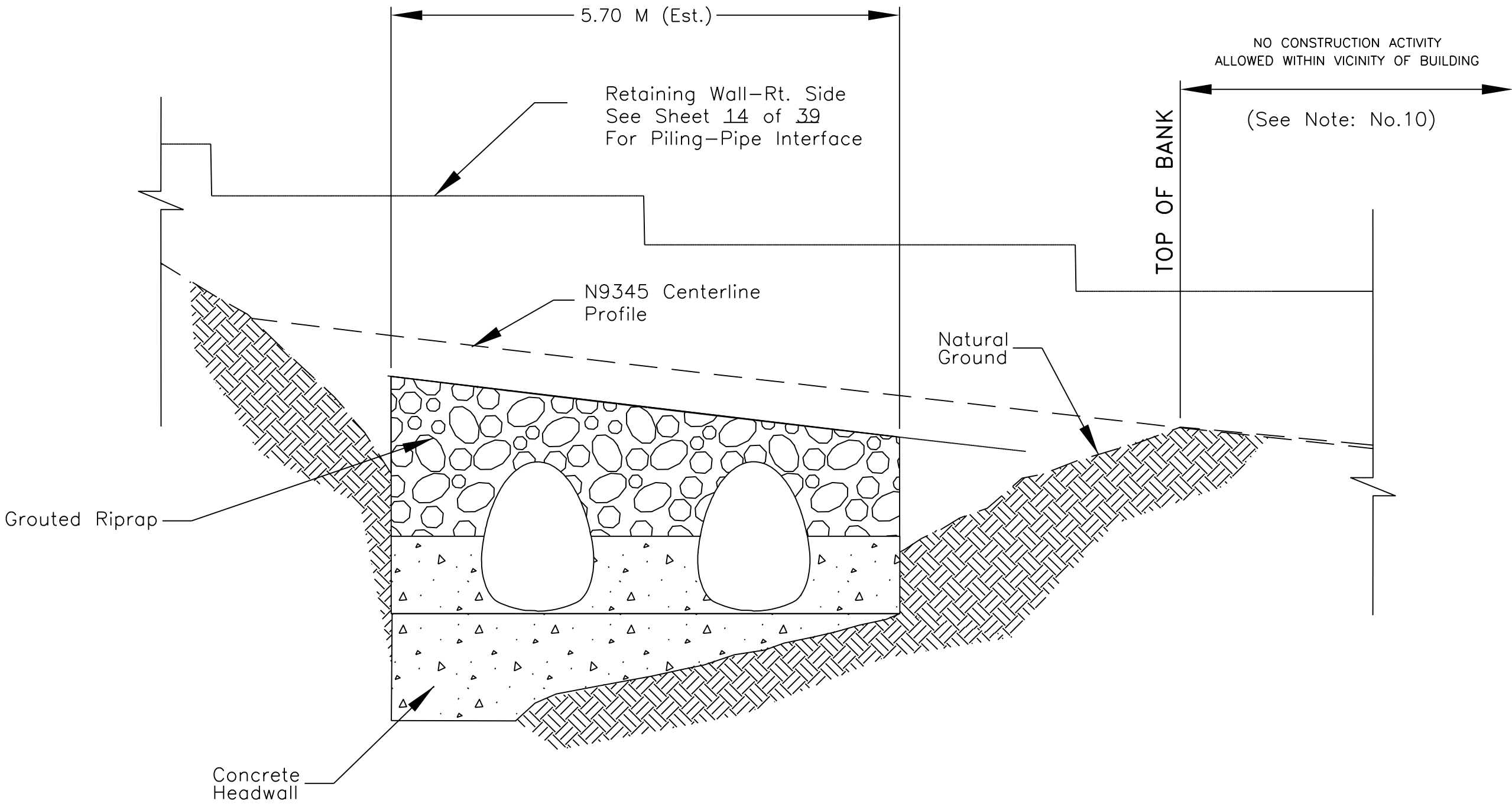
60101-0000 Minor Concrete, Class A(AE)

| STATION  | LOCATION | VOLUME              | REMARKS |
|----------|----------|---------------------|---------|
| 2+324.10 | Right    | 2.78 m <sup>3</sup> | Inlet   |

| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
|--------|---------|-------------|-------|-------------|-------|--------------|
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 27    | 39           |

GENERAL NOTES

1. SPECIFICATION: STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS, FP-03; SPECIAL PROVISIONS AS INCLUDED IN THE SUPPLEMENTAL SPECIFICATIONS.
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 FIELD CONDITIONS AS DIRECTED BY THE C.O.R..
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 FOR RIPRAP FOUNDATION BELOW THE FLOW LINE AND INTO EMBANKMENT AS SHOWN SHALL BE INCIDENTAL TO ITEM 25110-2000.
6. STONE SIZE SHALL CONFORM TO TABLE 705-1, SECTION 705, STONE FOR RIPRAP, CLASS 2.
7. LEAVE SURFACE ROCK EXPOSED 1/4 TO 1/2 OF ROCK DEPTH.
8. GEOTEXTILE FABRIC SHALL BE INSTALLED UNDER ALL RIPRAP AS SHOWN AND SHALL CONFORM TO SECTION 714, TABLE 714-4, TYPE IV, AND SHALL BE CONSIDERED INCIDENTAL TO BID ITEM 25110-2000.
9. GEOTEXTILE FABRIC SHALL BE TUCKED OR EMBEDDED 400 mm INTO EMBANKMENT ALONG ALL EDGES AS SHOWN.
10. THE CONTRACTOR SHALL USE DUE CARE TO PROTECT AND PRESERVE THE AREA BETWEEN THE EXISTING WASH BANK AND THE OLD WIDE RUINS TRADING POST ROCK BUILDING. THE BUILDING STRUCTURE IS TO BE PROTECTED IN-PLACE DURING THE INSTALLATION OF CULVERTS AND INLET PROTECTION STRUCTURE(S). ALL EQUIPMENT RELATED WORK REQUIRED TO EXCAVATE AND BACKFILL WITHIN THE "PRESERVATION ZONE" SHALL BE PERFORMED FROM THE WASH SIDE (SOUTH SIDE). ABSOLUTELY, NO WHEEL TRACK TRAFFIC ON THE WASH EMBANKMENT ALLOWED.
11. AFTER THE INSTALLATION OF CULVERTS AND INLET PROTECTION STRUCTURE(S) ARE COMPLETED, THE WASH FLOW LINE AND BANKS SHALL BE REGRADED AS DIRECTED BY COR/AOTR. THIS WORK SHALL BE INCIDENTAL TO THE INSTALLATION OF THE CULVERTS AND INLET PROTECTION.



SECTION A-A

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GROUTED RIPRAP  
AT PIPE INLET

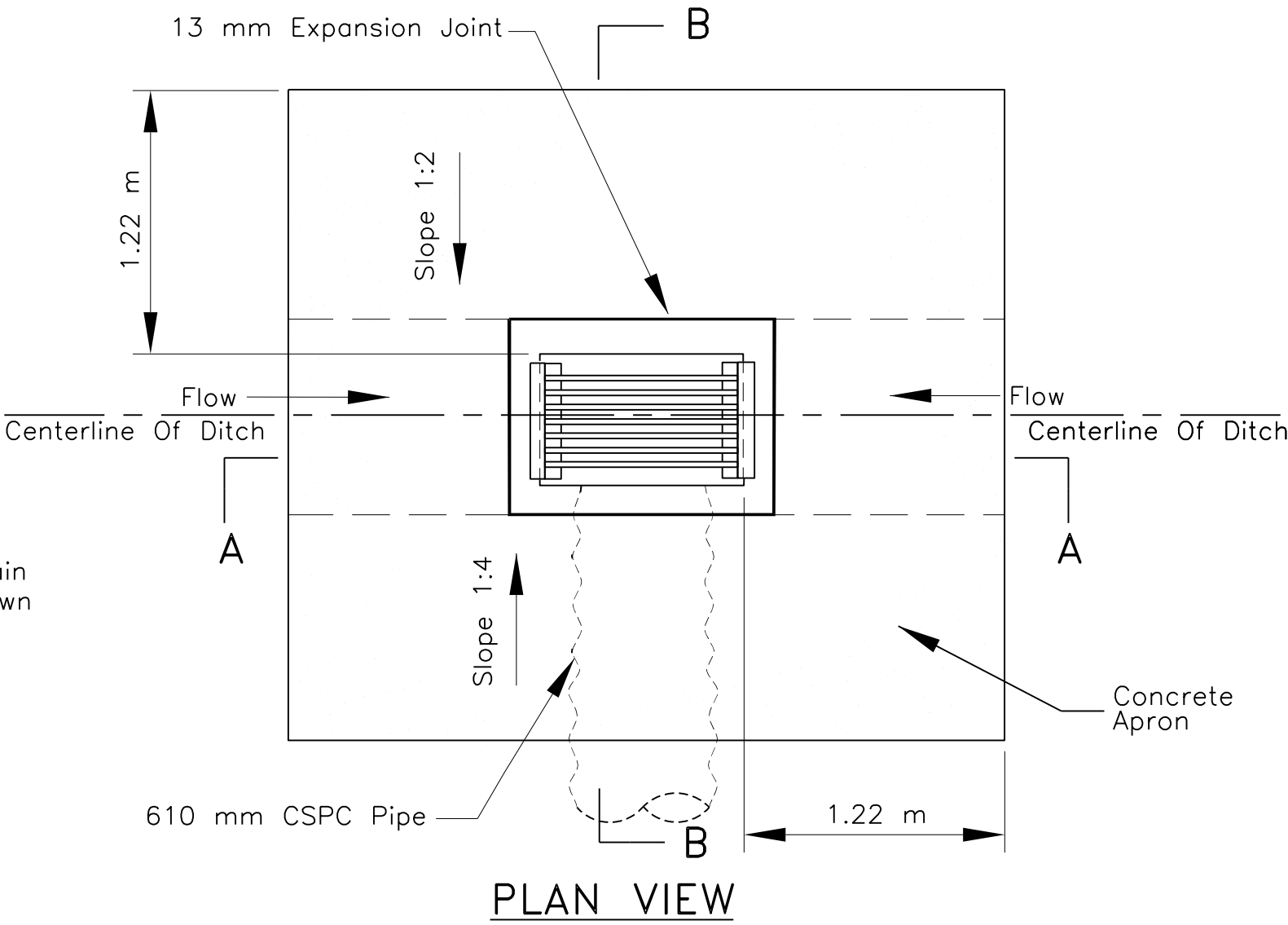
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DESIGNED BY: NRDOT DATE: 08/05  
REVISED: 01/26/06 BY: DESIGN 3  
SCALE: NTS  
FILENAME: 9345GROUT\_RR  
SHEET MODEL NAME: PLOT SHEET



| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
|--------|---------|-------------|-------|-------------|-------|--------------|
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 28    | 39           |

GENERAL NOTES

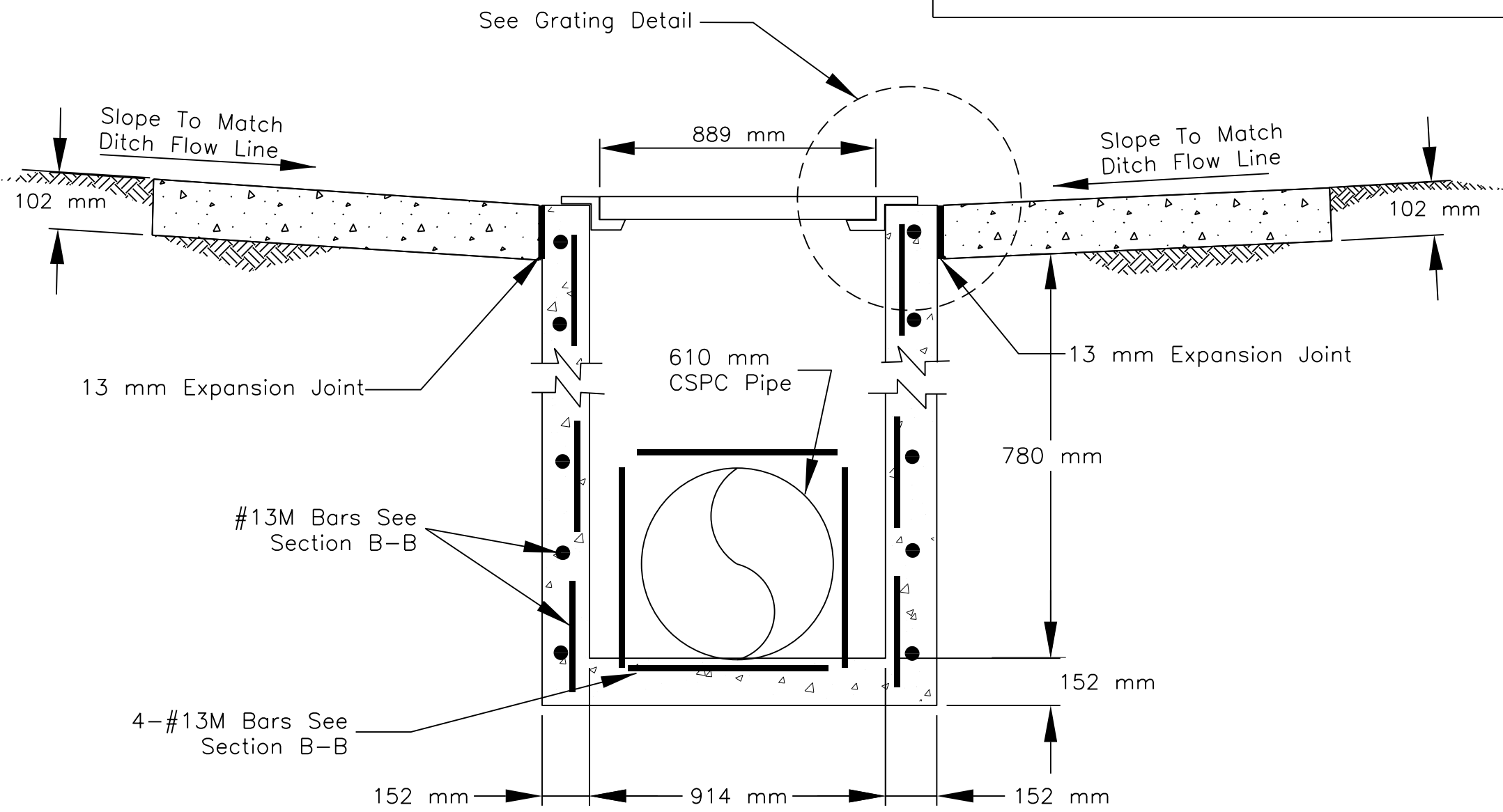
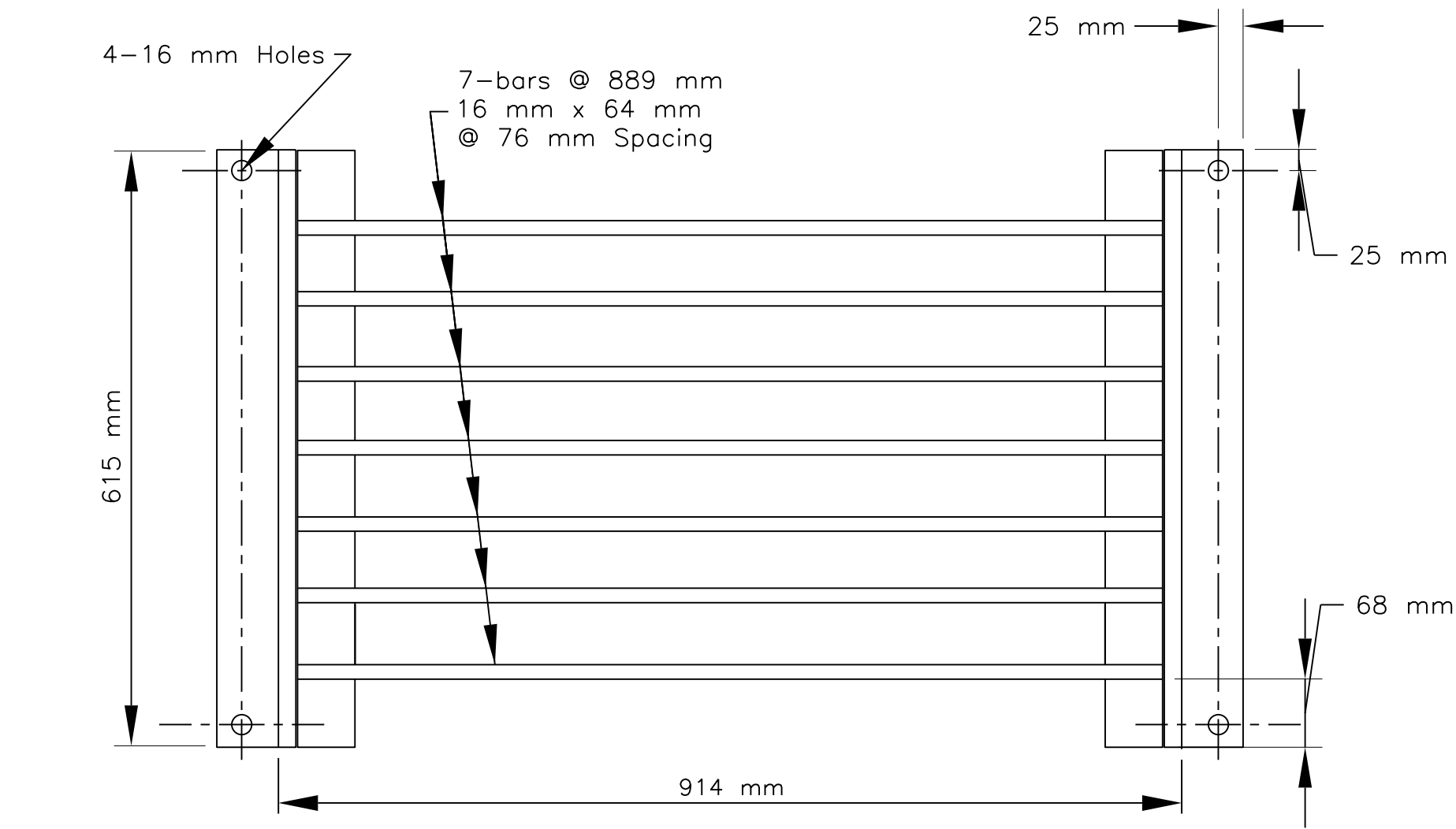
1. AT STATION 2+372, 6.60 m RT; INSTALL 610 mm x 914 mm CATCH BASIN WITH GRATE. CONSTRUCT CONCRETE BASIN, INCLUDING APRON, AS PER FP-03, SECTION 604. CONSTRUCT GRATE AND FRAME WITH STRUCTURE STEEL CONFORMING TO AASHTO M 183M AND AS PER FP-96, SECTION 725. WELDING SHALL CONFORM TO FP-03, SECTION 555.18.
2. THE CONCRETE CATCH BASIN AND APRON SHALL BE CONSTRUCTED TO THE DIMENSIONS SHOWN ON THE PLANS. PLACE REINFORCING STEEL AND WIRE FABRIC AT LOCATIONS AND SPACING SHOWN. PREFORMED EXPANSION JOINT FILLERS SHALL MEET AASTO M 33.
3. GRATE AND FRAME SHALL BE FACTORY ASSEMBLED AND WELDED. GRATE AND FRAME SHALL BE PAINTED AS PER FP-03, SECTION 563, PAINT SYSTEM #4. ALL PAINTING TO BE SHOP APPLIED AFTER WELDING AND ASSEMBLY. TOP COAT TO BE BLACK IN COLOR. ANCHOR BOLTS AND NUTS SHALL BE CADMIUM PLATED AS PER ASTM B 766, CLASS 12, TYPE III.
4. 610 mm PIPE SHALL BE INSTALLED FLUSH WITH INSIDE WALL OF CATCH BASIN, WITH FLOW LINE MATCHING BASIN BOTTOM.
5. STATION 2+355 TO STATION 2+385 RT., CONSTRUCT AND GRADE NEW ROADWAY DITCHES TO DRAIN TO CATCH BASIN. WARP DITCH BACK SLOPE AS NEEDED AT CATCH BASIN TO MAINTAIN 1:2 SLOPE. STATION 2+394 TO STATION 2+415 RT., CONSTRUCT AND GRADE NEW ROADWAY DITCHES TO DRAIN TO THE NORTH. INSTALL GROUTED RIPRAP DITCH LINING AS SHOWN AND AS PER DETAILS ON SHEET 30 OF 39.
6. ALL LABOR AND MATERIALS RELATED TO THE CONSTRUCTION AND INSTALLATION OF THE CATCH BASIN AND APRON, INCLUDING BUT NOT NECESSARY LIMITED TO, EXCAVATION, CONCRETE FORMS/FORMING, REINFORCING STEEL/WIRE, CONCRETE, CONNECTION TO OUTLET PIPE, GRATE AND FRAME, BACKFILL, ETC., SHALL BE INCLUDED IN BID ITEM 60404-0000.



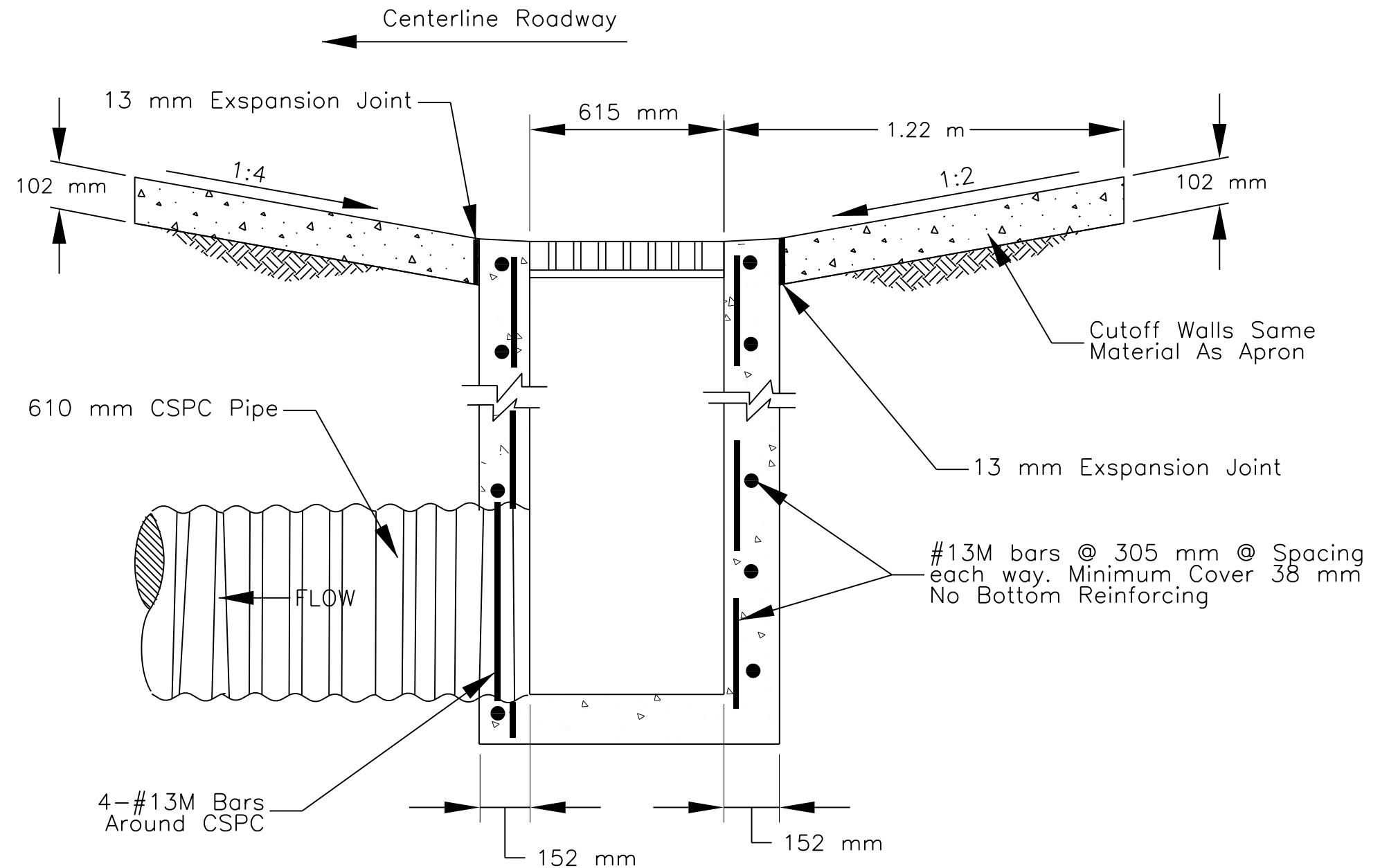
TYPICAL ISOMETRIC VIEW  
© Sta. 2+389.35 Rt. Turnout Location

ESTIMATED QUANTITY: ITEM 25110-2000 - GROUTED RIPRAP, CLASS 2

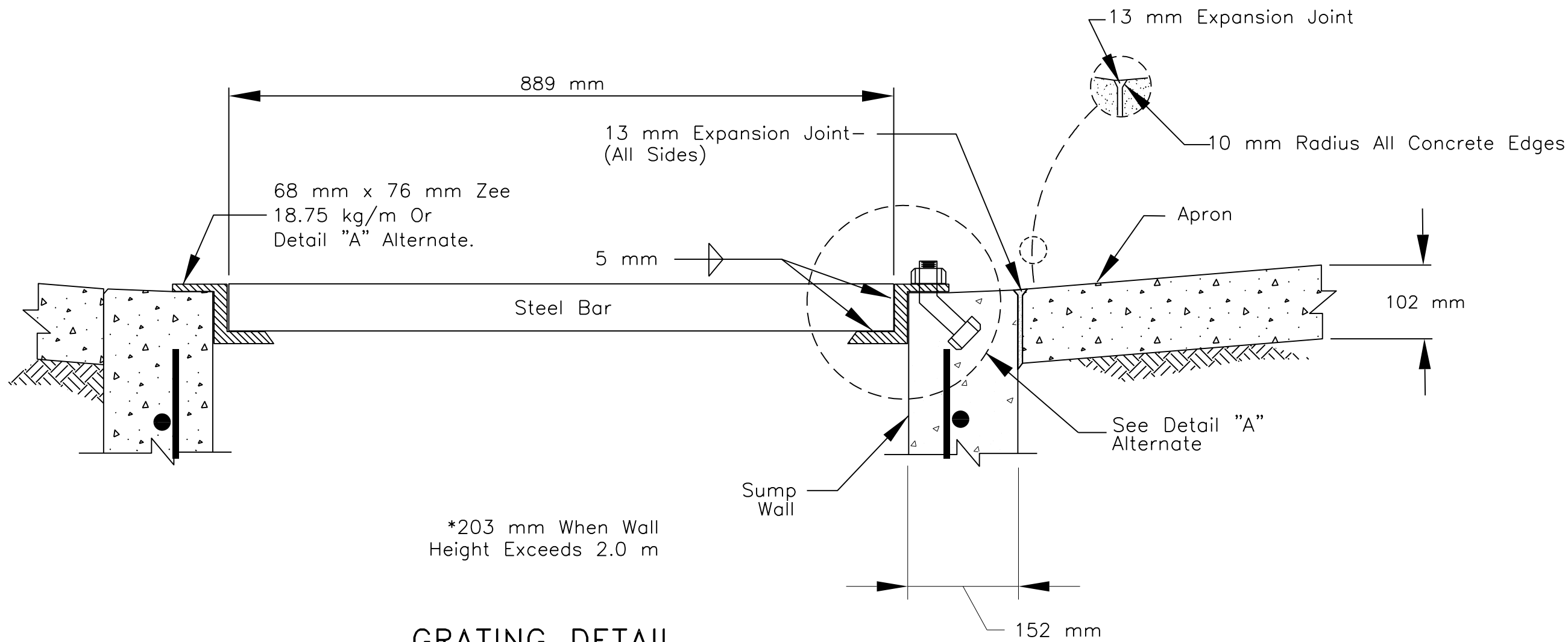
| STATION TO STATION   | LOCATION | ESTIMATED LENGTH (m) | WIDTH (m) | THICKNESS (mm) | VOLUME (m <sup>3</sup> ) | REMARKS                         |
|----------------------|----------|----------------------|-----------|----------------|--------------------------|---------------------------------|
| 2+370.00 to 2+385.00 | Rt.      | 15.00                | 3.50      | 450            | 24.00                    | Riprap Lined in Turnout V-Ditch |
| 2+393.00 to 2+420.00 | Rt.      | 27.00                | 3.50      | 450            | 43.00                    | Riprap Lined in Turnout V-Ditch |
| TOTAL:               |          |                      |           |                | 67.00                    |                                 |



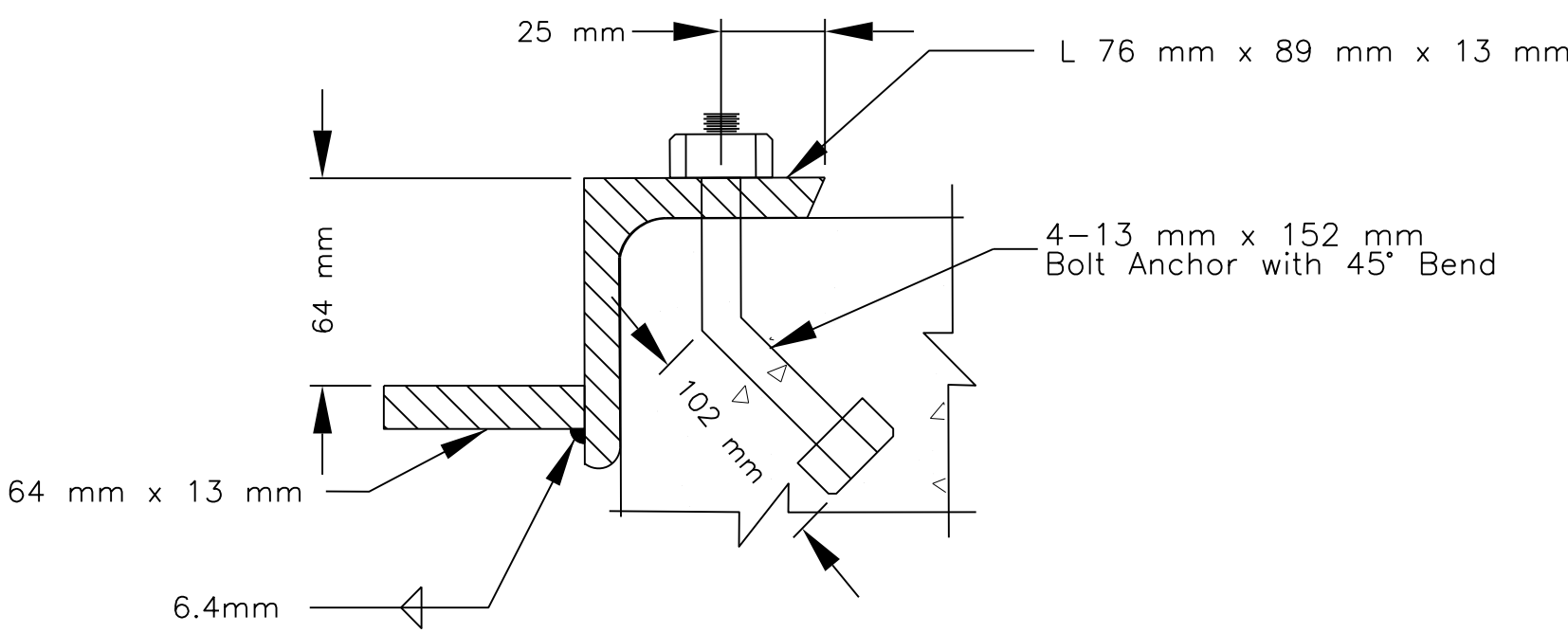
SECTION A-A



SECTION B-B



GRATING DETAIL



DETAIL "A" ALTERNATE

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CATCH BASIN DETAILS  
STA. 2+372.00-RT. SIDE

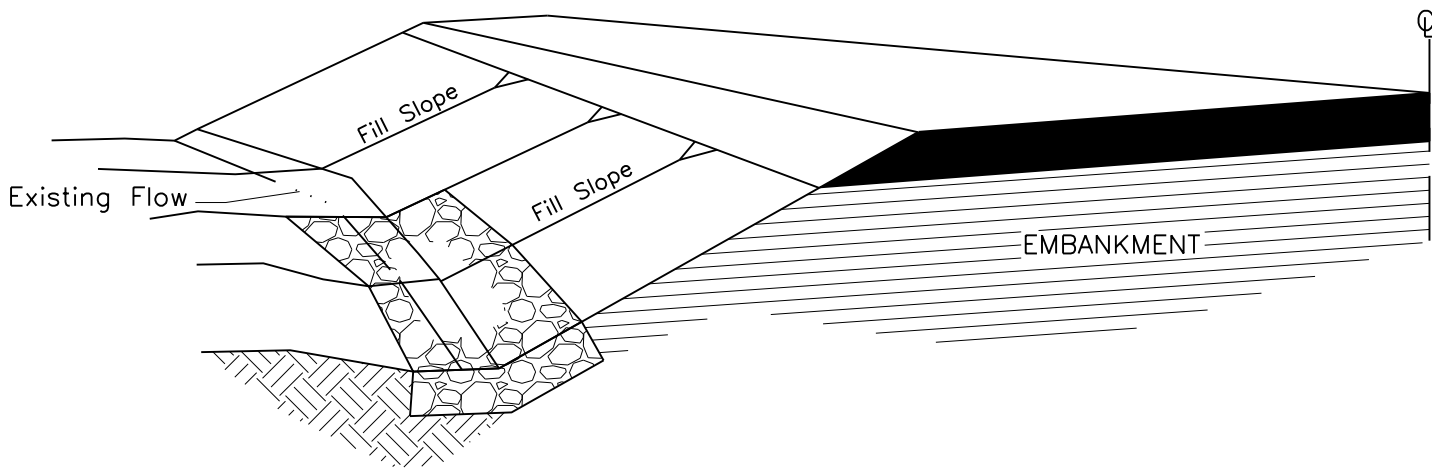
DRAWN BY: NRODOT DATE: 05/04  
DESIGNED BY: NRODOT DATE: 05/04  
REVISED: 09/06 BY: DESIGN 3  
SCALE: NTS  
FILENAME: Catchbasin  
SHEET MODEL NAME: PLOT SHEET



| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
|--------|---------|-------------|-------|-------------|-------|--------------|
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 29    | 39           |

GENERAL NOTES

- 1.ALL WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS (FP-03).
- 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 25110-2000.
- 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 AS DETERMINED BY THE COR/AOTR. ALL BACKFILL MATERIAL SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY AS DETERMINED BY AASHTO T99 METHOD C, BEFORE AND AFTER FOOTINGS ARE PLACED. THE BACKFILL MATERIAL SHALL CONFORM TO SECTION 208 AND 209 OF THE FP-03. THIS WORK SHALL BE INCIDENTAL OBLIGATIONS OF THE CONTRACTOR UNDER ITEM 25110-2000.
- 5.VEE DITCH AND CHANNEL RESHAPING, CLEANING, AND EXCAVATION SHALL BE DONE IN ACCORDANCE WITH THE DETAILS SHOWN AND AS ADJUSTED BY THE COR/AOTR. ANY WASTE MATERIAL SHALL BE USED AS BORROW WHERE NEEDED IN OTHER PROJECT LOCATIONS AS DETERMINED BY THE COR/AOTR. 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/AOTR, AND CONTRACTOR SHALL REVIEW ALL ROCK CUT AREAS AFTER THE CONSTRUCTION OF DITCHES, DOWNDRAINS, AND RIPRAP BASINS HAVE BEEN "ROUGH IN". IF IN THE OPINION OF THE COR/AOTR, THAT THE ROCK CUT IS STABLE, THE COR/AOTR MAY ELECT TO DELETE SECTIONS OF THE RIPRAP PROTECTION.
- 7.STONE SIZE SHALL CONFORM TO TABLE 705-1, SECTION 705, STONE FOR RIPRAP, CLASS 2.
- 8.FILTER FABRIC SHALL BE INSTALLED UNDER ALL RIPRAP (EXCEPT GROUTED RIPRAP) AND SHALL CONFORM TO SECTION 714, TYPE IV-B, AND SHALL BE CONSIDERED INCIDENTAL TO RIPRAP BID ITEMS. ROUND ALL SHARP CONTOURS AS REQUIRED TO FIT THE SOIL EROSION MATERIAL FLUSH WITH THE EXISTING GROUND. EXTEND RIPRAP DOWN SLOPE UNTIL A 2% SLOPE IS ACHIEVED.

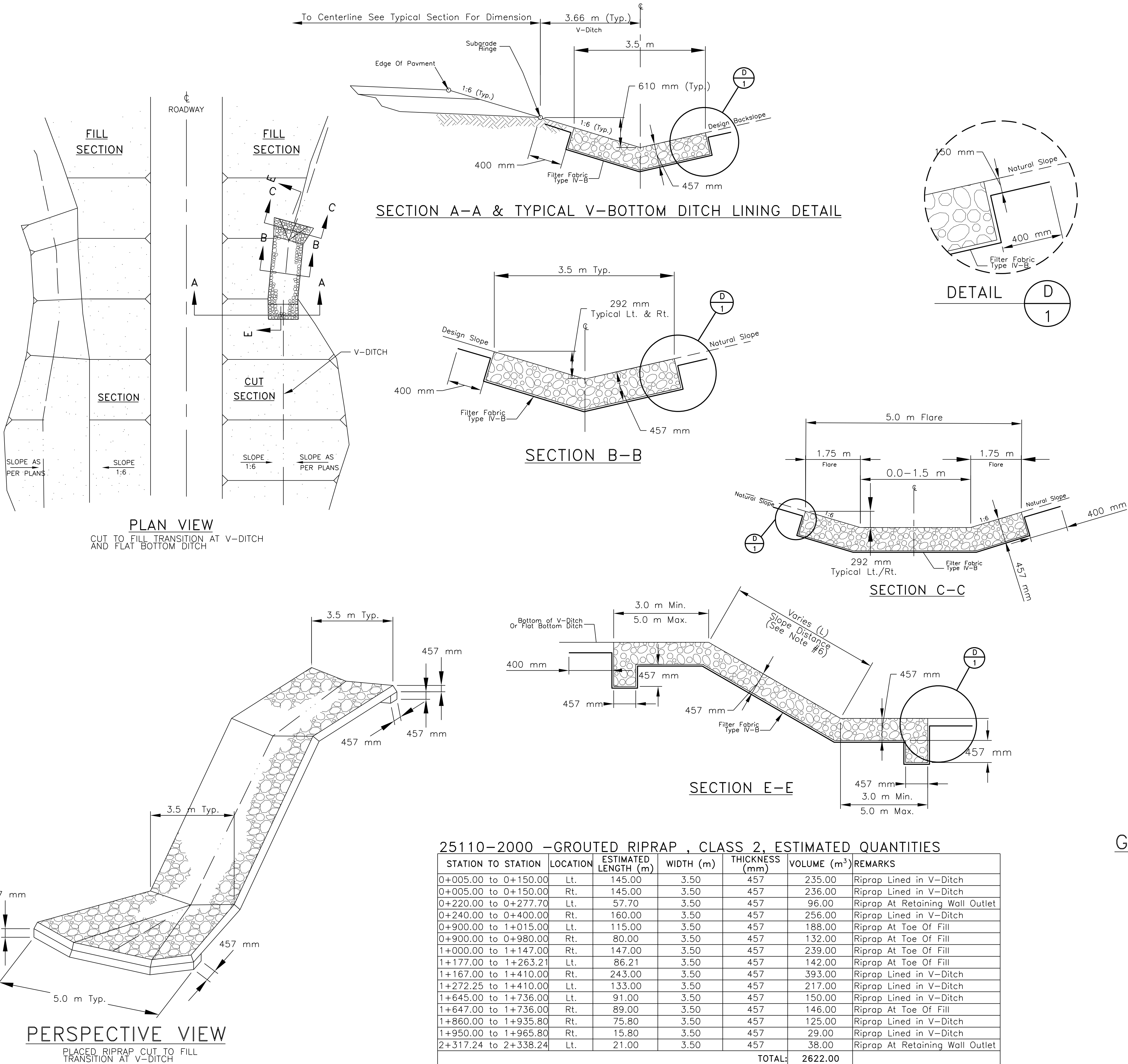


GENERAL OVERALL PERSPECTIVE VIEW  
@ TOE OF EMBANKMENT

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

GROUTED RIPRAP DETAILS  
FOR CUT-TO-FILL TRANSITION  
AND DITCH LINING

DRAWN BY: NRODOT DATE: 7/03  
DESIGNED BY: NRODOT DATE: 7/03  
REVISED: 01/26/06 BY: DESIGN 3  
SCALE: NTS  
FILENAME: 9345RIP\_DN  
SHEET MODEL NAME: PLOT SHEET



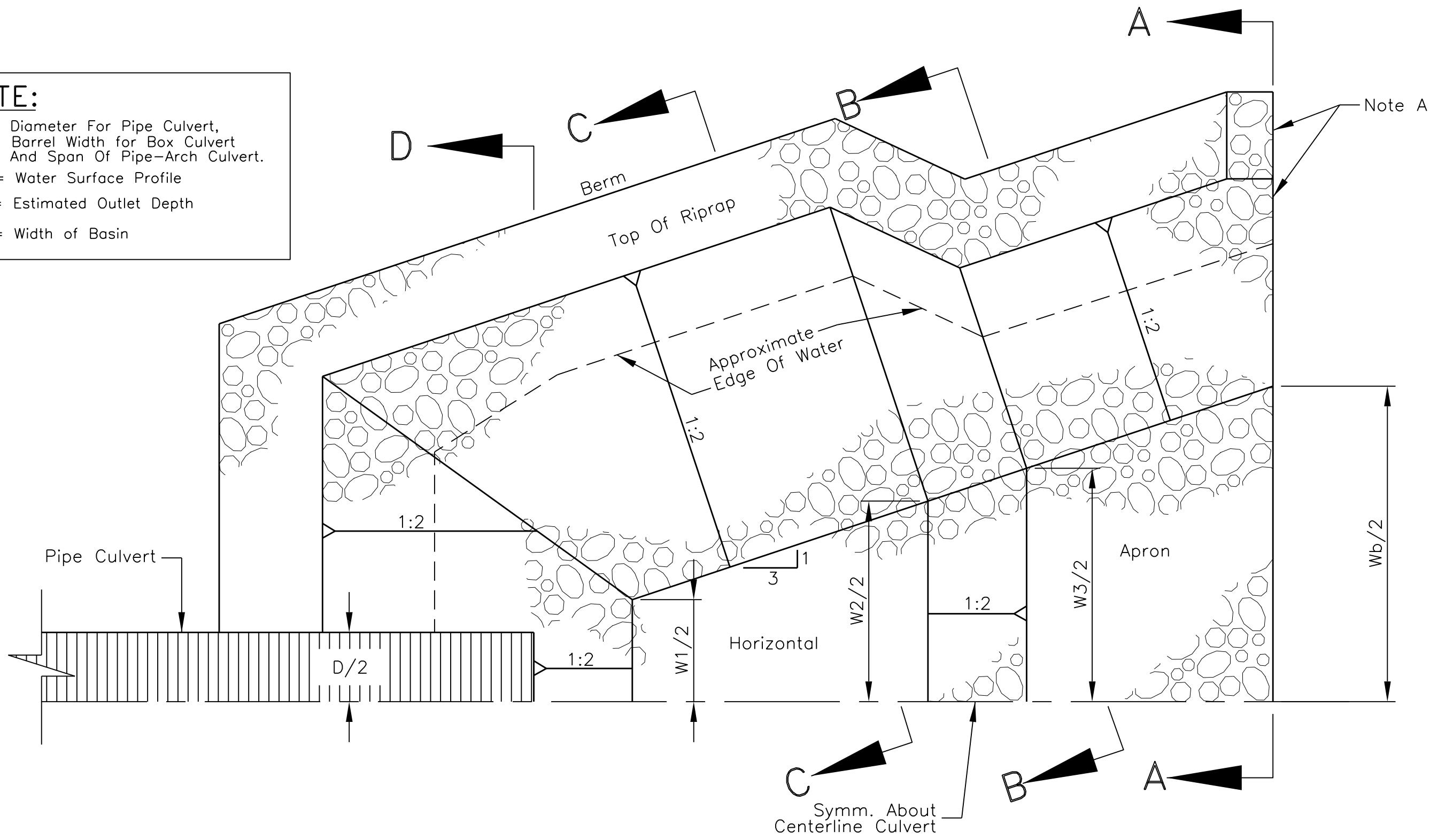
25110-2000 -GROUTED RIPRAP, CLASS 2, ESTIMATED QUANTITIES

| STATION TO STATION   | LOCATION | ESTIMATED LENGTH (m) | WIDTH (m) | THICKNESS (mm) | VOLUME (m³) | REMARKS                         |
|----------------------|----------|----------------------|-----------|----------------|-------------|---------------------------------|
| 0+005.00 to 0+150.00 | Lt.      | 145.00               | 3.50      | 457            | 235.00      | Riprap Lined in V-Ditch         |
| 0+005.00 to 0+150.00 | Rt.      | 145.00               | 3.50      | 457            | 236.00      | Riprap Lined in V-Ditch         |
| 0+220.00 to 0+277.70 | Lt.      | 57.70                | 3.50      | 457            | 96.00       | Riprap At Retaining Wall Outlet |
| 0+240.00 to 0+400.00 | Rt.      | 160.00               | 3.50      | 457            | 256.00      | Riprap Lined in V-Ditch         |
| 0+900.00 to 1+015.00 | Lt.      | 115.00               | 3.50      | 457            | 188.00      | Riprap At Toe Of Fill           |
| 0+900.00 to 0+980.00 | Rt.      | 80.00                | 3.50      | 457            | 132.00      | Riprap At Toe Of Fill           |
| 1+000.00 to 1+147.00 | Rt.      | 147.00               | 3.50      | 457            | 239.00      | Riprap At Toe Of Fill           |
| 1+177.00 to 1+263.21 | Lt.      | 86.21                | 3.50      | 457            | 142.00      | Riprap At Toe Of Fill           |
| 1+167.00 to 1+410.00 | Rt.      | 243.00               | 3.50      | 457            | 393.00      | Riprap Lined in V-Ditch         |
| 1+272.25 to 1+410.00 | Lt.      | 133.00               | 3.50      | 457            | 217.00      | Riprap Lined in V-Ditch         |
| 1+645.00 to 1+736.00 | Lt.      | 91.00                | 3.50      | 457            | 150.00      | Riprap Lined in V-Ditch         |
| 1+647.00 to 1+736.00 | Rt.      | 89.00                | 3.50      | 457            | 146.00      | Riprap At Toe Of Fill           |
| 1+860.00 to 1+935.80 | Rt.      | 75.80                | 3.50      | 457            | 125.00      | Riprap Lined in V-Ditch         |
| 1+950.00 to 1+965.80 | Rt.      | 15.80                | 3.50      | 457            | 29.00       | Riprap Lined in V-Ditch         |
| 2+317.24 to 2+338.24 | Lt.      | 21.00                | 3.50      | 457            | 38.00       | Riprap At Retaining Wall Outlet |
| TOTAL:               |          |                      |           |                | 2622.00     |                                 |

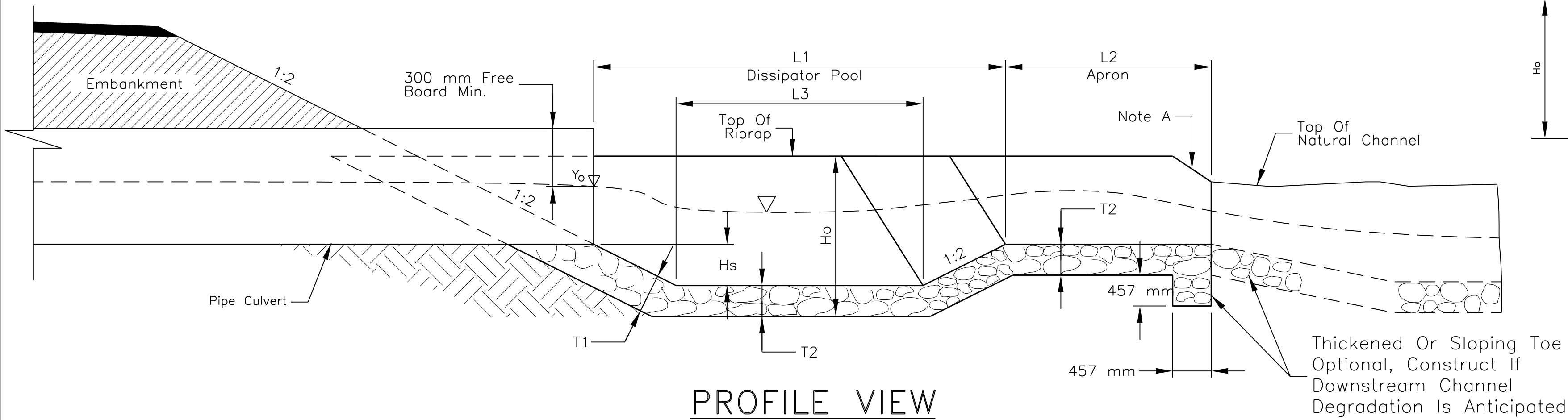
| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
|--------|---------|-------------|-------|-------------|-------|--------------|
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 30    | 39           |

**NOTE:**

D = Diameter For Pipe Culvert,  
Barrel Width for Box Culvert  
And Span Of Pipe-Arch Culvert.  
▽ = Water Surface Profile  
Y<sub>o</sub>▽ = Estimated Outlet Depth  
W<sub>b</sub> = Width of Basin



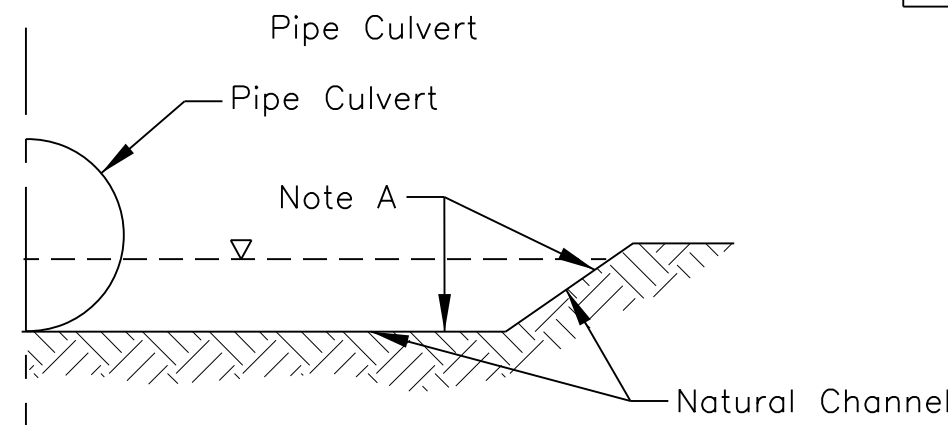
**PLAN VIEW**



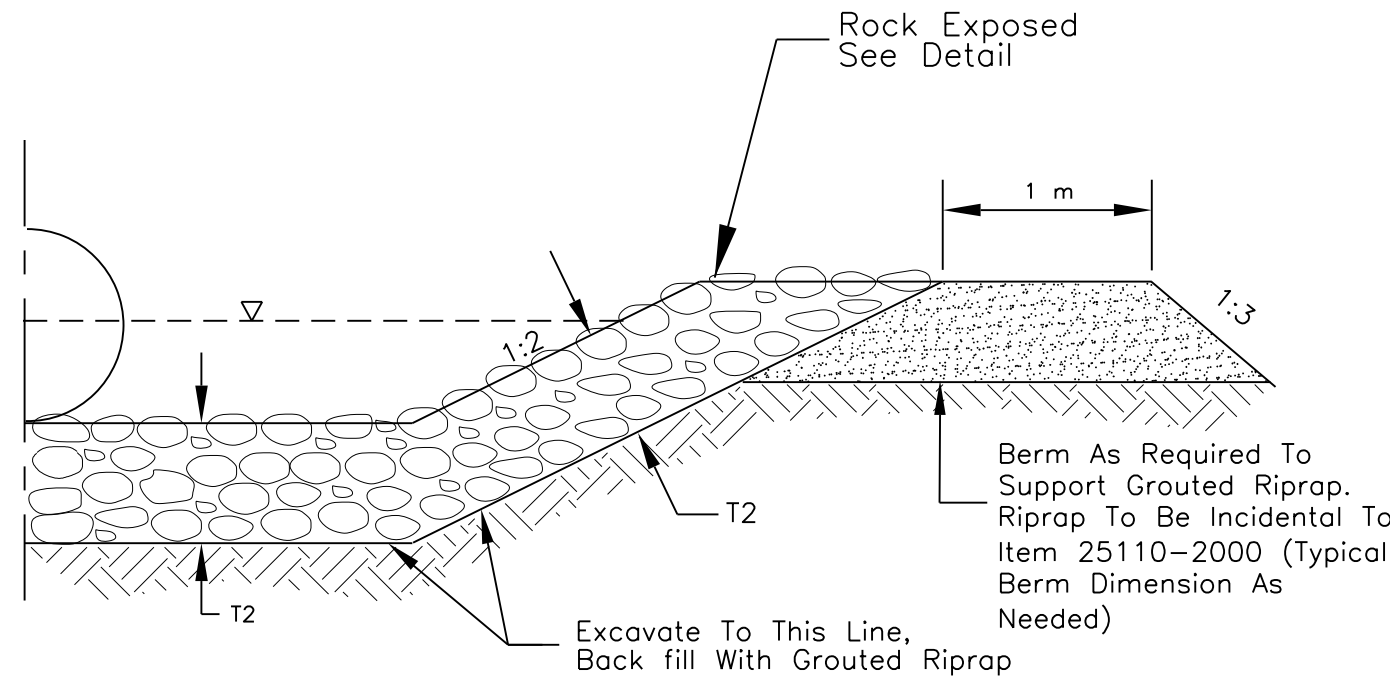
**PROFILE VIEW**

**NOTE A:** WARP THE HORIZONTAL ALIGNMENT IF REQUIRED TO FIT THE EXISTING CHANNEL. IF THE ELEVATION OF THE RIPRAP IS HIGHER THEN THE EXISTING STREAM BOTTOM AT SECTION A, INSTALL A SLOPING GROUTED RIPRAP APRON AT A SLOPE 1.5 TIMES THE PERCENT SLOPE OF THE EXISTING STREAM. LENGTH AS NEEDED TO REACH THE STREAM BOTTOM.

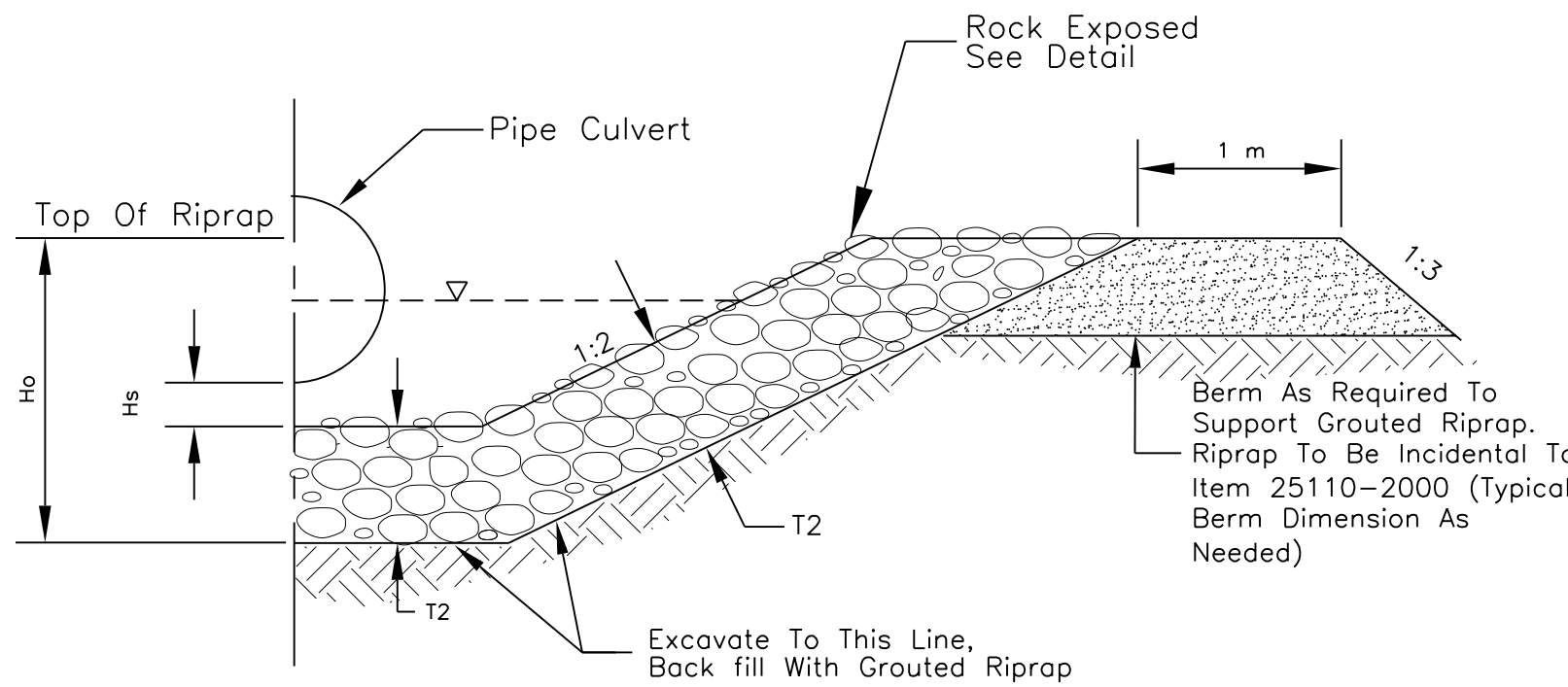
**NOTE B:** FOR MULTIPLE PIPES OR CULVERTS, (D)=SUM OF EACH PIPE (D)+ SPACING BETWEEN EACH PIPE OR CULVERT.



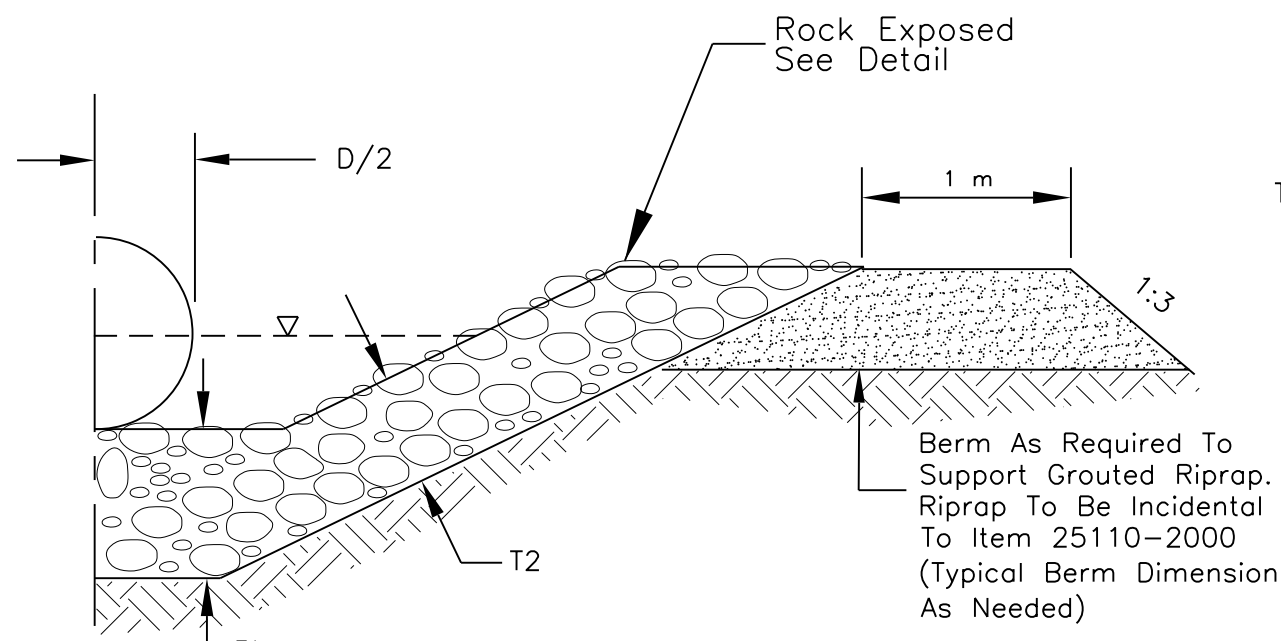
**SECTION A-A**



**SECTION B-B**



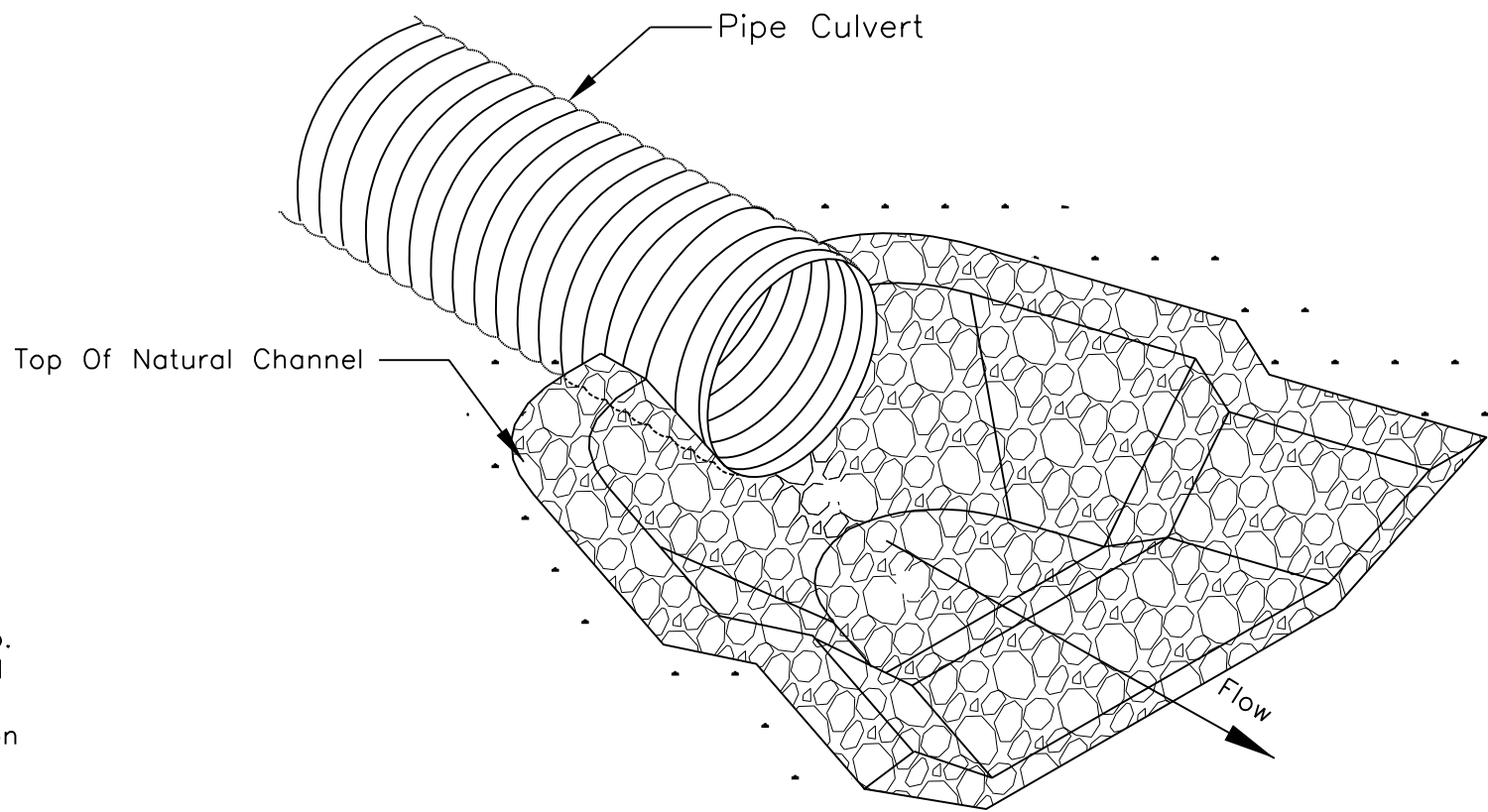
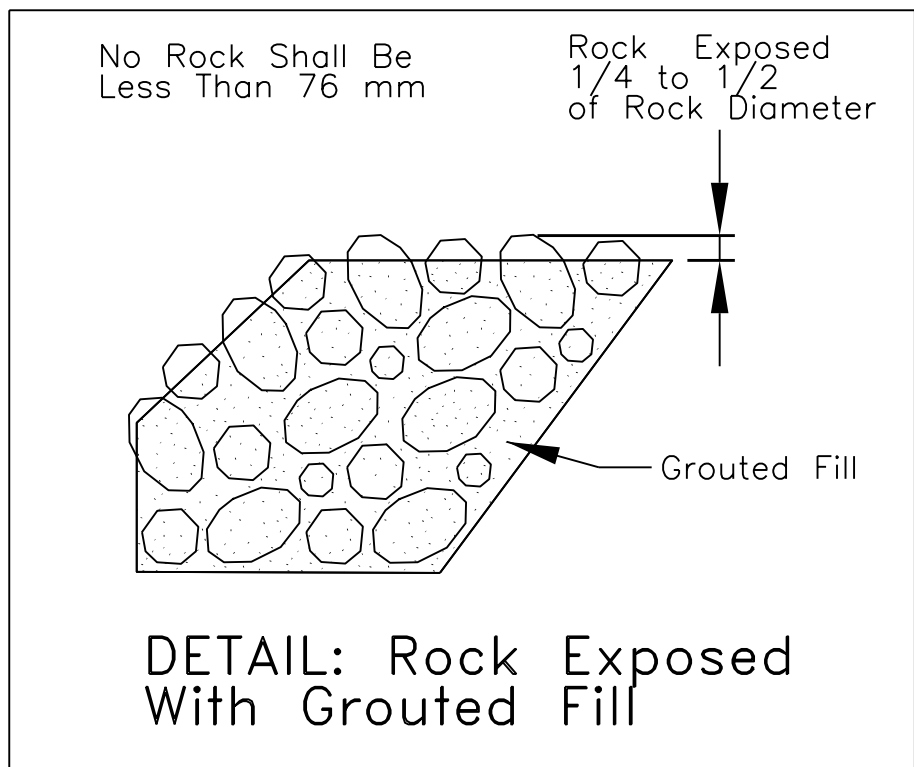
**SECTION C-C**



**SECTION D-D**

**GENERAL NOTES**

- WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS (FP-03).
- THE QUANTITIES SHOWN ARE ONLY AN ESTIMATE. ACTUAL QUANTITIES SHALL BE DETERMINED IN THE FIELD. THE CONTRACTOR WILL BE REQUIRED TO MAKE ANY NECESSARY ADJUSTMENTS IN THE FIELD TO MATCH EXISTING FIELD CONDITIONS. THESE FIELD ADJUSTMENTS ARE INCIDENTAL OBLIGATIONS OF THE CONTRACTOR.
- EXCAVATE, CLEAN, AND RESHAPE INLET TO INSTALL ROCK BERM AS SHOWN. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO ITEM 25110-2000.
- STONE SIZE SHALL CONFORM TO FP-03, TABLE 705-1, CLASS 2, EXCEPT NO ROCK LESS THAN 76 MM SHALL BE USED.
- FILL ROCK VOIDS WITH MORTAR PER SECTION 251 & 712.05. LEAVE ROCK ON SURFACE EXPOSED 1/4 TO 1/2 ROCK DIAMETER. SEE DETAIL BELOW.
- ALL EXCAVATIONS AROUND THE ROCK BERM INLET STRUCTURES SHALL BE BACKFILLED WITH COMPACTED MATERIAL AS PER FP-03 SECTION 204.10.
- THE CONTRACTOR SHALL BE REQUIRED TO MAKE ANY NECESSARY FIELD ADJUSTMENTS AS DIRECTED BY THE COR/ AOTR. THIS WORK SHALL BE INCIDENTAL TO ITEM 25110-2000.
- ALL GROUND RIPRAP ROCK SHALL BE CLASS 2.



**ISOMETRIC VIEW**

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

| Station: | Structure:                  | L1 (m) | L2 (m) | L3 (m) | Ho (m) | Hs (mm) | T1 (mm) | T2 (mm) | D (m) | W1 (m) | W2 (m) | W3 (m) | Wb (m) | Vol. (m <sup>3</sup> ) |
|----------|-----------------------------|--------|--------|--------|--------|---------|---------|---------|-------|--------|--------|--------|--------|------------------------|
| 0+192.00 | 1-762 mm CSPC               | 2.290  | 0.930  | 1.530  | 1.057  | 190     | 610     | 457     | 0.762 | 1.015  | 2.035  | 2.289  | 2.909  | 13.00                  |
| 0+628.66 | 2-762 mm CSPC               | 2.290  | 0.762  | 1.070  | 1.486  | 315     | 610     | 457     | 3.506 | 3.913  | 4.626  | 5.033  | 5.541  | 26.47                  |
| 1+520.20 | 1-762 mm CSPC               | 2.290  | 0.762  | 1.070  | 1.294  | 305     | 610     | 457     | 0.762 | 1.169  | 1.882  | 2.289  | 2.797  | 15.16                  |
| 1+571.00 | 1-762 mm CSPC               | 2.290  | 0.762  | 1.070  | 1.303  | 305     | 610     | 457     | 0.762 | 1.169  | 1.882  | 2.289  | 2.797  | 15.30                  |
| 1+631.00 | 1-762 mm CSPC               | 2.760  | 1.380  | 1.540  | 1.373  | 305     | 610     | 457     | 0.762 | 1.169  | 2.195  | 2.602  | 3.522  | 20.50                  |
| 1+963.68 | 1-610 mm CSPC               | 2.720  | 1.070  | 1.500  | 1.212  | 305     | 610     | 457     | 0.610 | 1.169  | 2.169  | 2.575  | 3.289  | 16.50                  |
| 2+070.79 | 2-914 mm CSPC               | 5.030  | 2.510  | 3.030  | 1.522  | 500     | 610     | 457     | 4.064 | 4.731  | 6.751  | 7.417  | 9.091  | 53.79                  |
| 2+326.16 | 2-1245 mm S x 838 mm R CSPA | 3.880  | 1.940  | 2.328  | 1.410  | 388     | 610     | 457     | 4.680 | 5.192  | 6.744  | 7.261  | 8.554  | 43.12                  |
| TOTAL:   |                             |        |        |        |        |         |         |         |       |        |        |        |        | 203.84                 |

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

**GROUTED RIPRAP  
STILLING BASIN**

DRAWN BY: NRDOT DATE: 07/97  
DESIGNED BY: NRDOT DATE: 07/98  
REVISED: 09/10 BY: LRT  
SCALE: n/a  
FILENAME: Sht\_29\_9345\_rrb  
SHEET MODEL NAME: PLOT SHEET

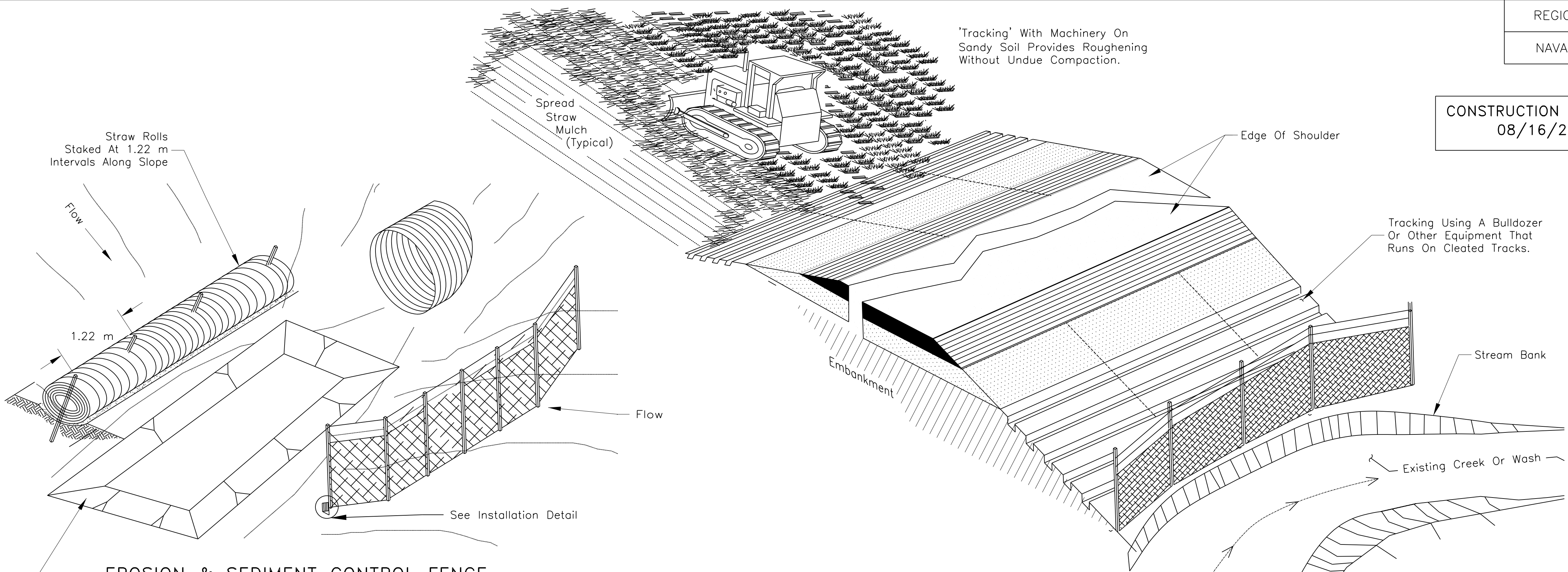


| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
|--------|---------|-------------|-------|-------------|-------|--------------|
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 31    | 39           |

CONSTRUCTION PLANS APPROVED  
08/16/2011

GENERAL NOTES

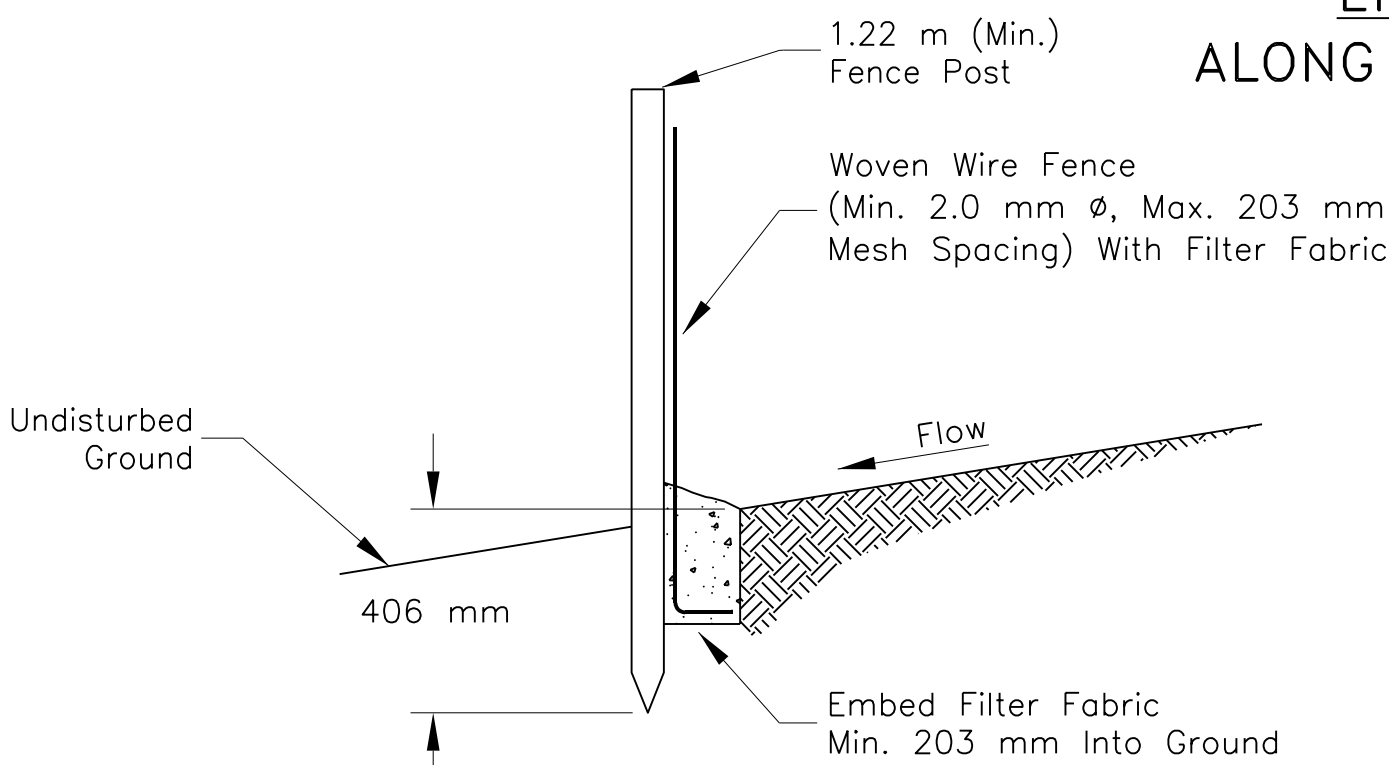
1. THE CONTRACTOR SHALL PREPARE AND SUBMIT A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IN FULL DETAIL FOR ALL PHASES OF THE WORK FOR REVIEW AND APPROVAL AT LEAST 14 CALANDER DAYS BEFORE IMPLEMENTATION. THE PLAN SHALL MEET THE REQUIREMENTS HEREIN AND SECTION 157 OF THE FP-03 AS MODIFIED IN THE SUPPLEMENTAL SPECIFICATION. SEE SPECIAL CONTRACT REQUIREMENTS FOR NPDES PERMIT REQUIREMENTS.
2. THE SILT FENCING CONSISTS OF 914 mm SEDIMENT CONTROL FABRIC CLOTH WITH BURIED-TOE, AND STEEL POSTS (TEE OR U TYPE) SPACED AT 2.00 m WITH 2 mm SIZE WELDED WIRE BACK-UP FENCE.
3. WOVEN WIRE FABRIC TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 610 mm AT THE TOP AND MID-SECTION. GEOTEXTILE MATERIAL FOR SILT FENCING SHALL BE TYPE-V UNDER SUB-SECTION 714.01 OF FP-03.
4. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY 152 mm AND FOLDED. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED BEFORE "BULGES" DEVELOP IN THE SILT FENCE.
5. SILT FENCE SHALL BE INSTALLED PARALLEL TO THE TOE OF ALL ROADWAY EMBANKMENT FILLS IN LOCATIONS WHERE THE TOE OF THE FILLS ARE WITHIN 2.0 m OF EXISTING STREAMS, CREEKS OR WASHES; IN AREAS WITH HIGHLY EROSION SOILS AND/OR WHERE EMBANKMENTS ARE AT A 1:3 OR STEEPER SLOPE. THE SILT FENCE SHALL BE PLACED 1 m TO 2 m DOWNHILL FROM THE TOE OF FILL AND IN ACCORDANCE WITH SECTION 157 OF THE FP-03 AND THE SUPPLEMENTAL SPECIFICATIONS.
6. STRAW BALES MAY BE USED AT THE TOP OF CUT BACKSLOPES AND FOR DIKES PROVIDED THEY ARE PROPERLY ANCHORED WITH STEEL FENCE POSTS OR 51 mm X 51 mm X 1.22 m WOOD STAKES (TWO PER BALE) ANCHORED 508 mm INTO THE NATURAL GROUND. STRAW BALES SHALL BE CERTIFIED 0.5% WEED FREE. DO NOT USE STRAW BALES IN AREAS OF CONCENTRATED FLOW AND CUT DITCHES.
7. FURNISHING AND PLACEMENT OF SILT FENCE MATERIAL AND OTHER EROSION CONTROL MEASURES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 15701-0000, AND/OR 15708-1000.
8. SEDIMENT/SILT FENCING SHALL BE PLACED AT ALL LOCATIONS WHERE EMBANKMENTS HAVE SLOPE DISTANCES OF 30.0 m OR GREATER. THE SEDIMENT FENCING WILL BE PLACED AT THE TOE OF SLOPES OFFSET 1-2 METERS.
9. THE CONTRACTOR SHALL INSPECT AND MAINTAIN ALL SWPPP MEASURES WEEKLY AND AFTER EACH SIGNIFICANT STORM EVENT (I.E. 25 mm OF MOISTURE IN 24 HOURS).
10. PRIOR TO ACCEPTANCE, ALL PROJECT AREAS (AS DETERMINED BY THE AO/AOTR) SHOWING EROSION DAMAGE CAUSED BY THE CONTRACTOR'S FAILURE TO PROPERLY MAINTAIN HIS EROSION CONTROL STRUCTURES SHALL BE REPAIRED TO REMOVE DAMAGE, ANY SPECIFIED EROSION CONTROL MATERIALS, STRUCTURES, OR DEVICES DAMAGE OR LOST DUE TO IMPROPER INSTALLATION, THE CONTRACTOR'S NEGLIGENCE OR IMPROPER MAINTENANCE, SHALL ALSO BE REPAIRED AND/OR REPLACE PRIOR TO FINAL ACCEPTANCE AT THE CONTRACTOR'S ENTIRE EXPENSE.



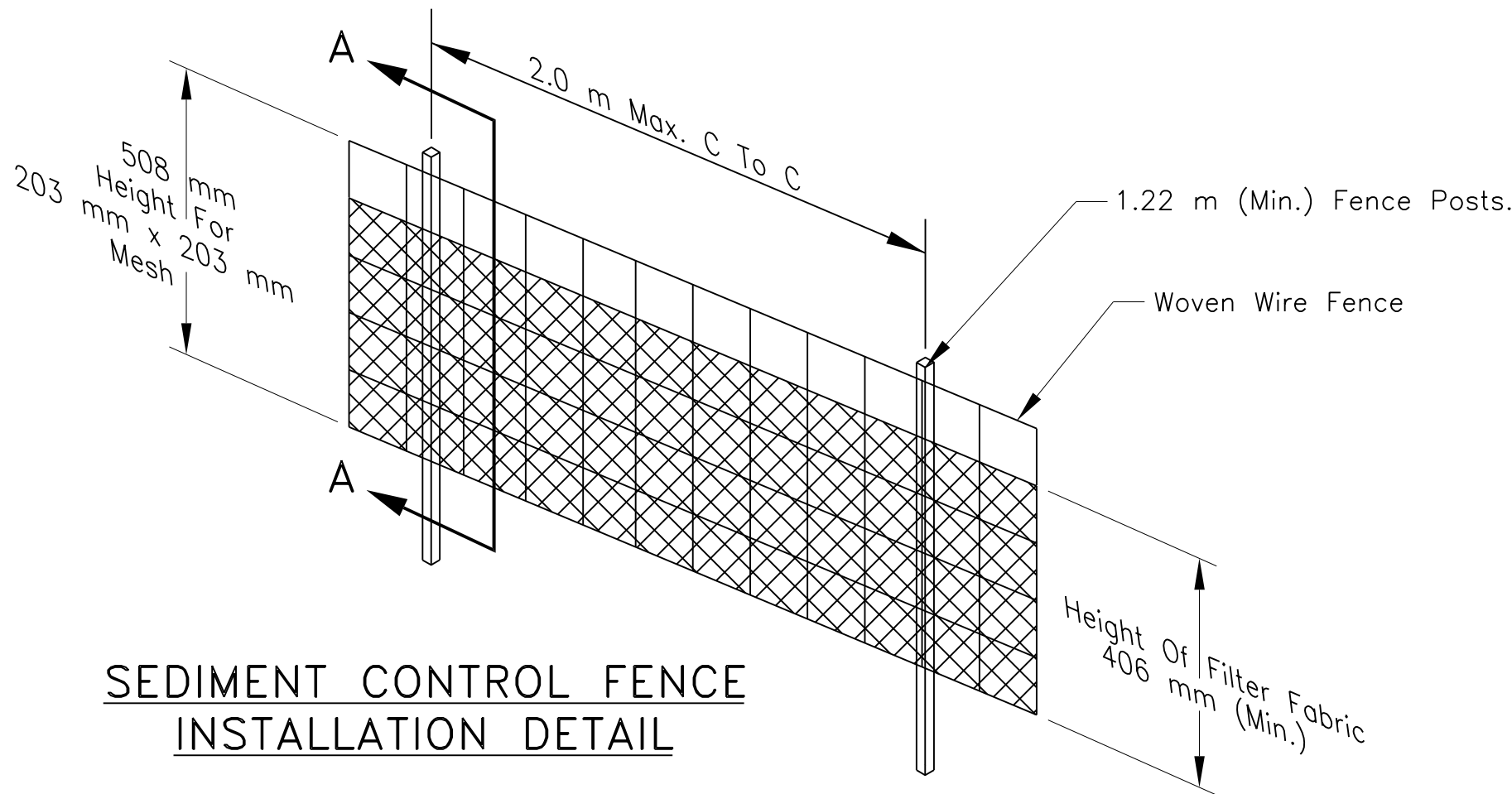
EROSION & SEDIMENT CONTROL FENCE  
AT DRAINAGE STRUCTURE

Sediment Traps @ Outlet Ends  
See Section A-A, See  
Following Sheet For Details.

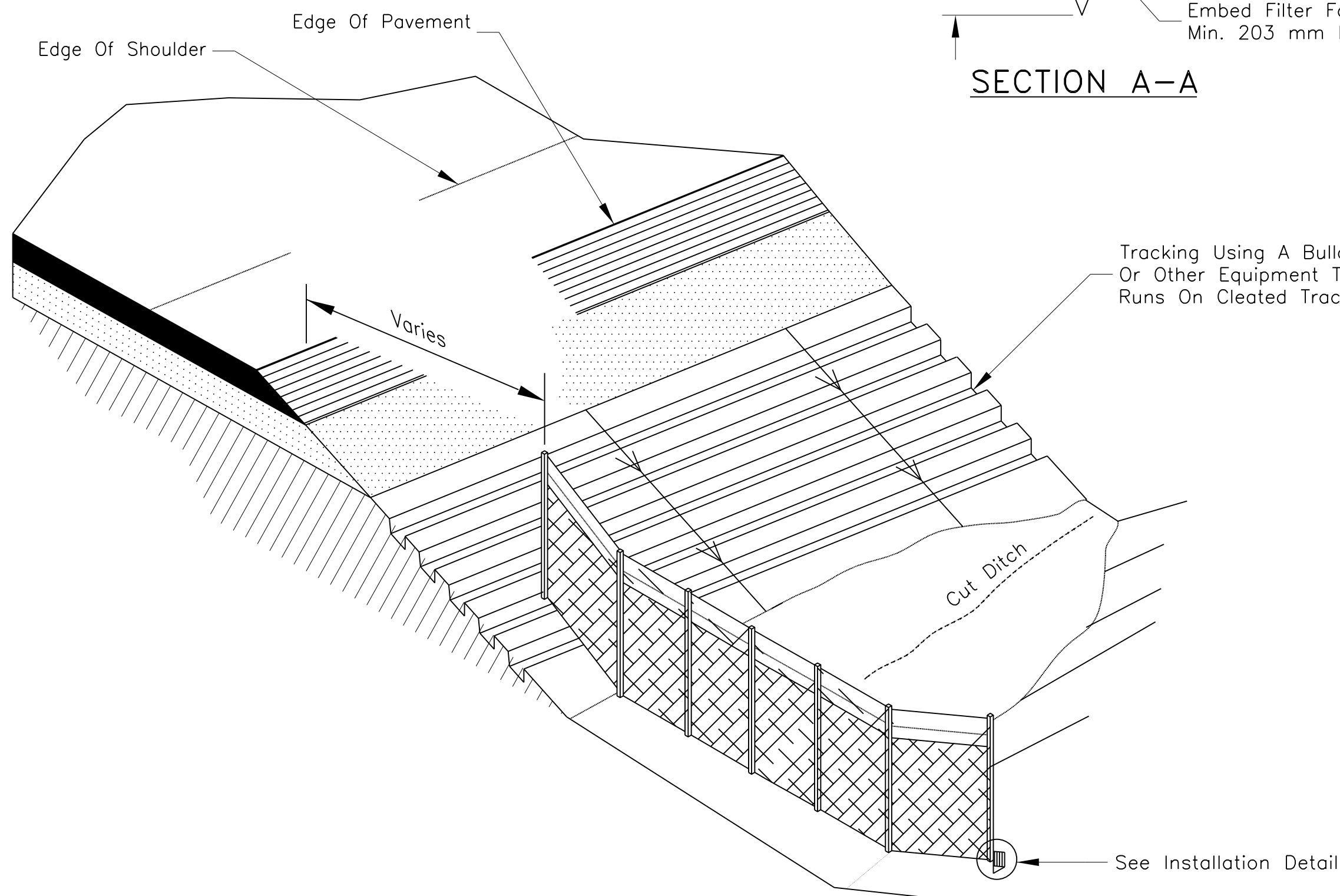
EROSION & SEDIMENT CONTROL FENCE  
ALONG EDGE OF STREAM BANK (TOE OF SLOPE)



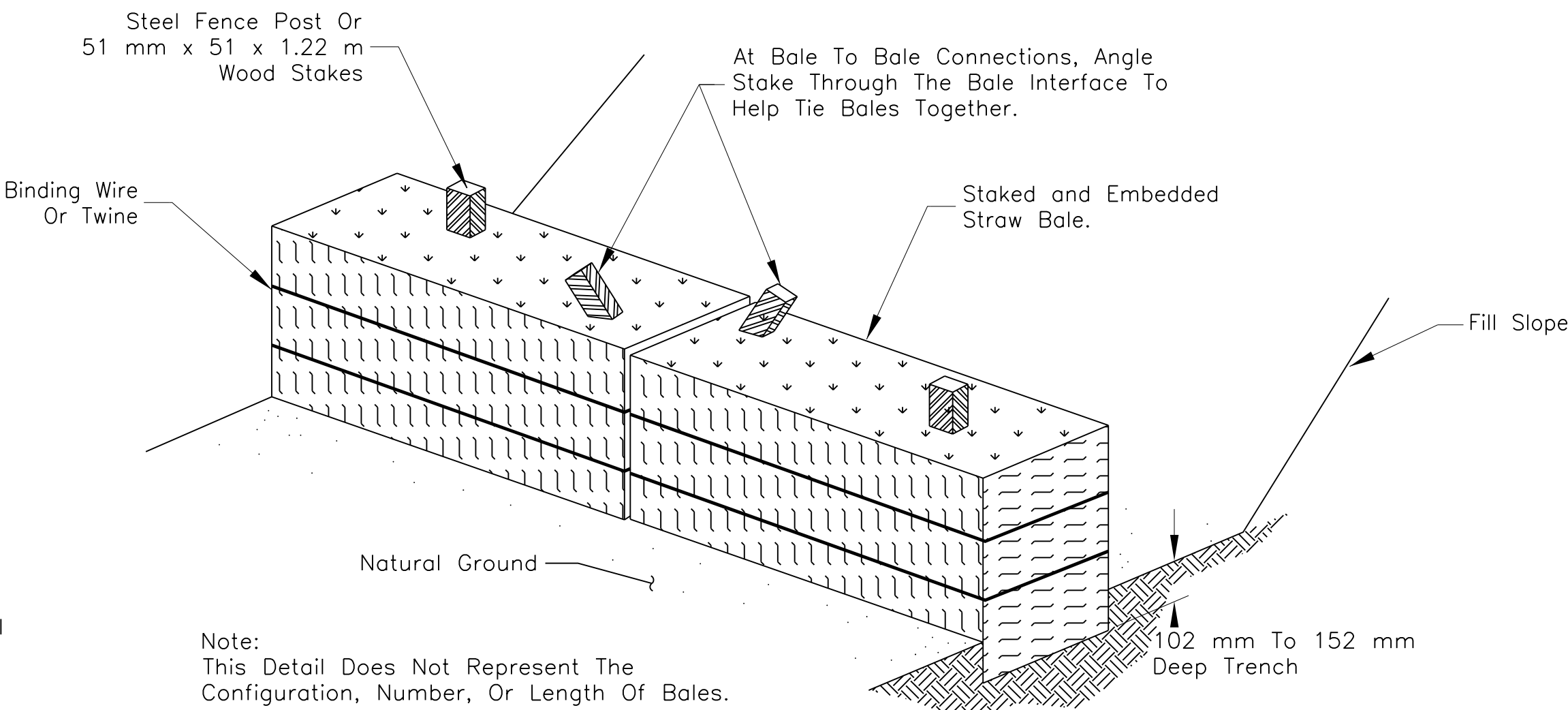
SECTION A-A



SEDIMENT CONTROL FENCE  
INSTALLATION DETAIL



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



TYPICAL STRAW BALE STAKING  
AND TRENCHING DETAIL

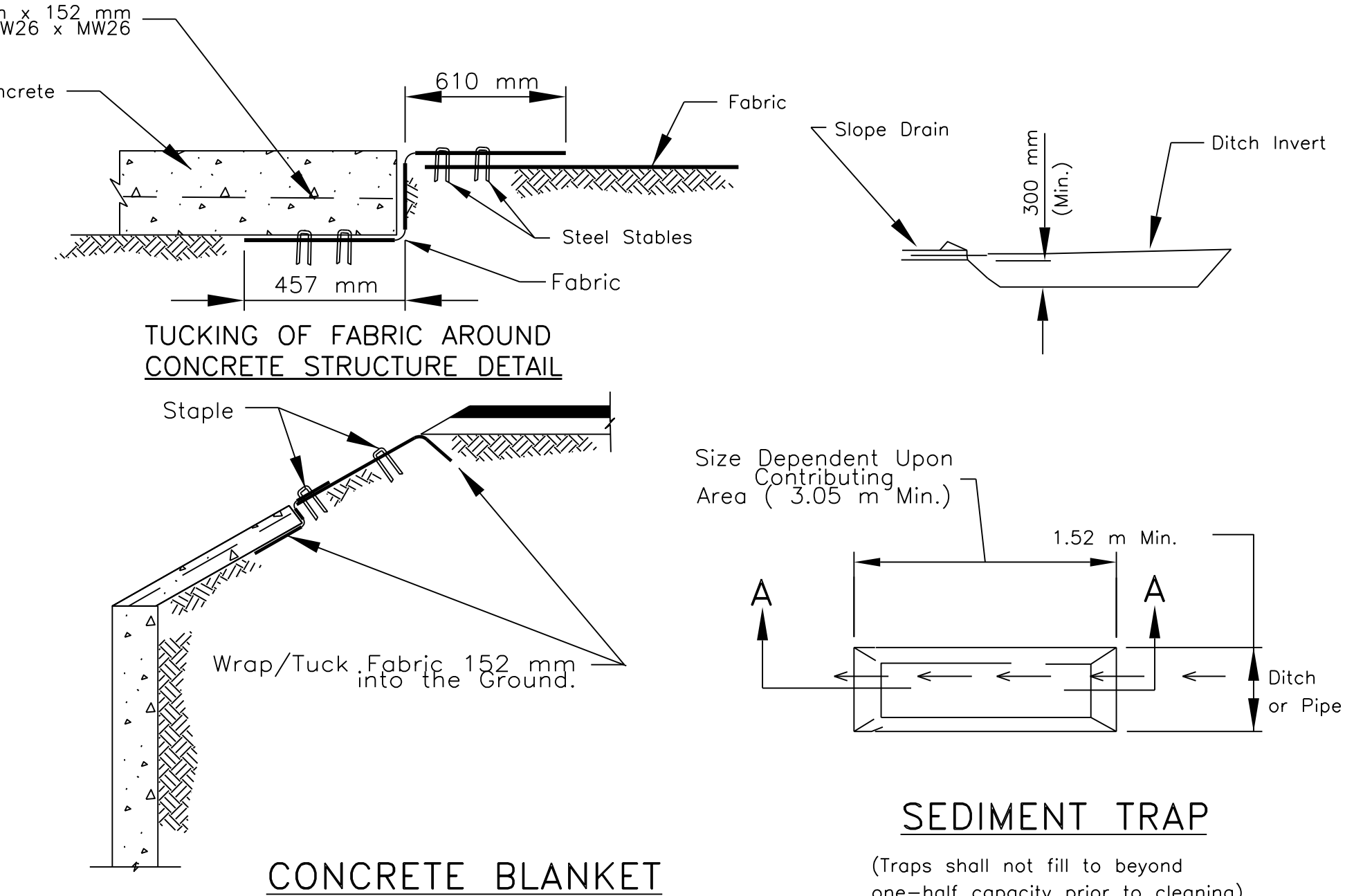
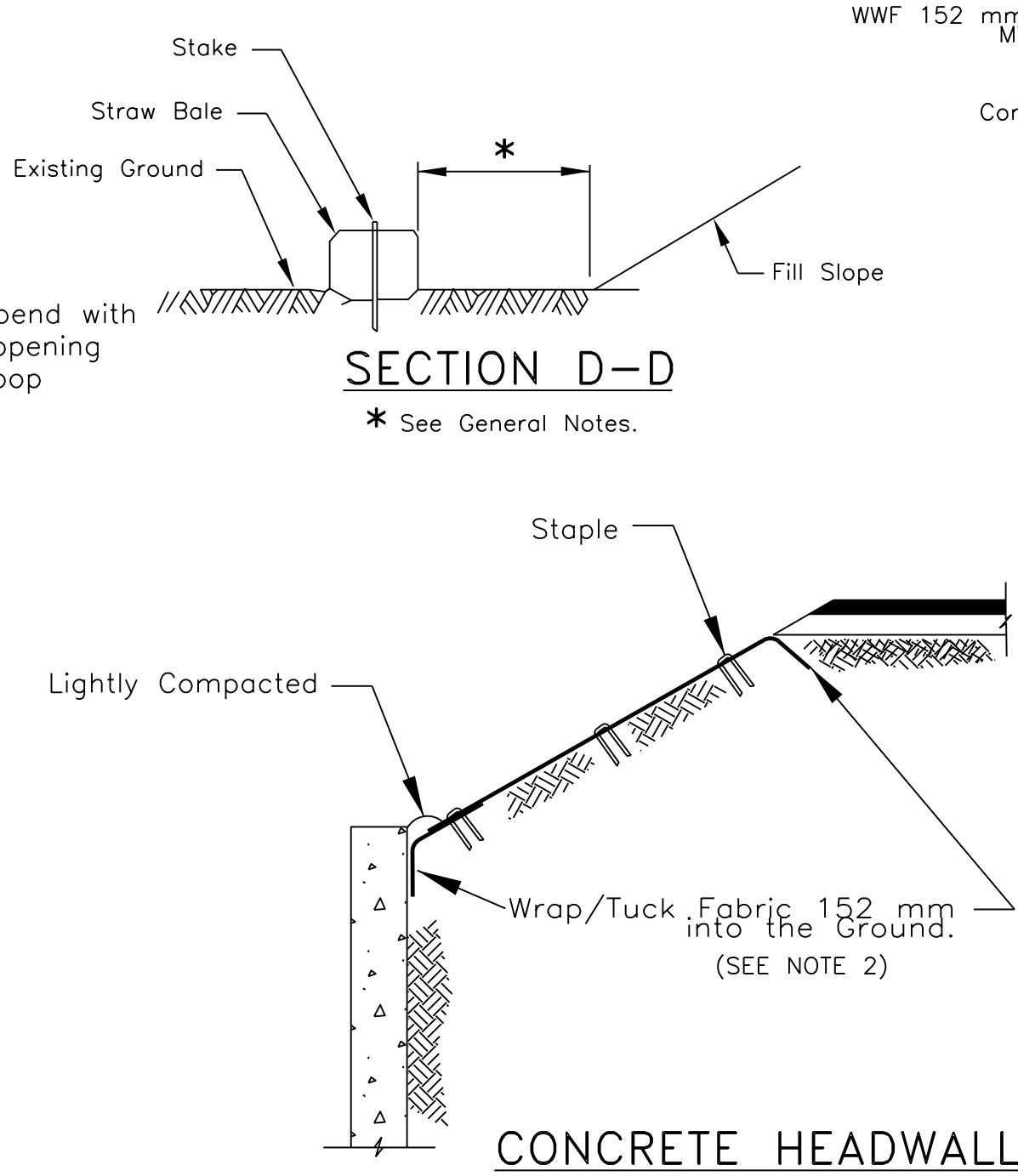
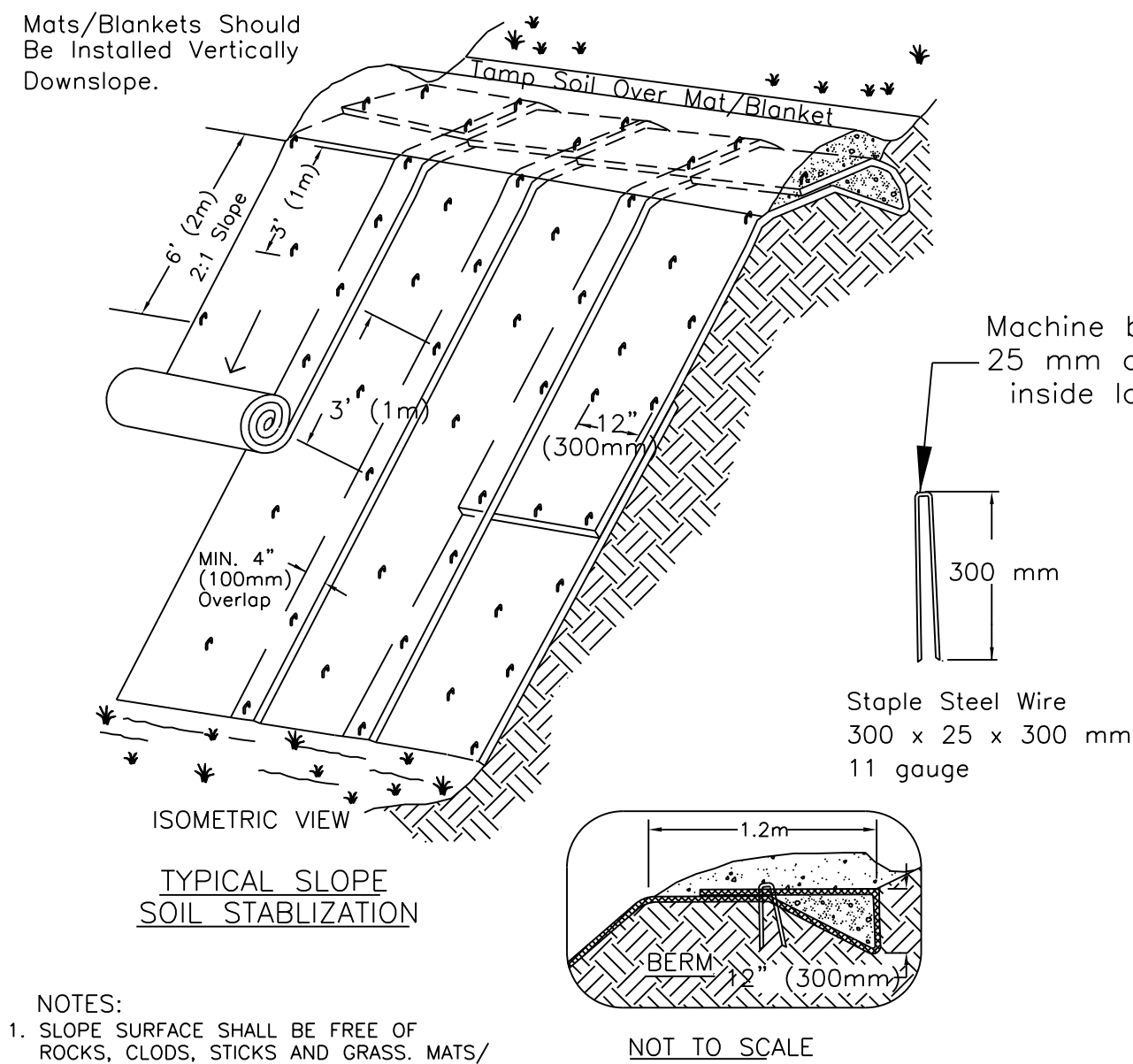
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NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

STORMWATER POLLUTION  
AND EROSION/SEDIMENT  
CONTROL DETAILS

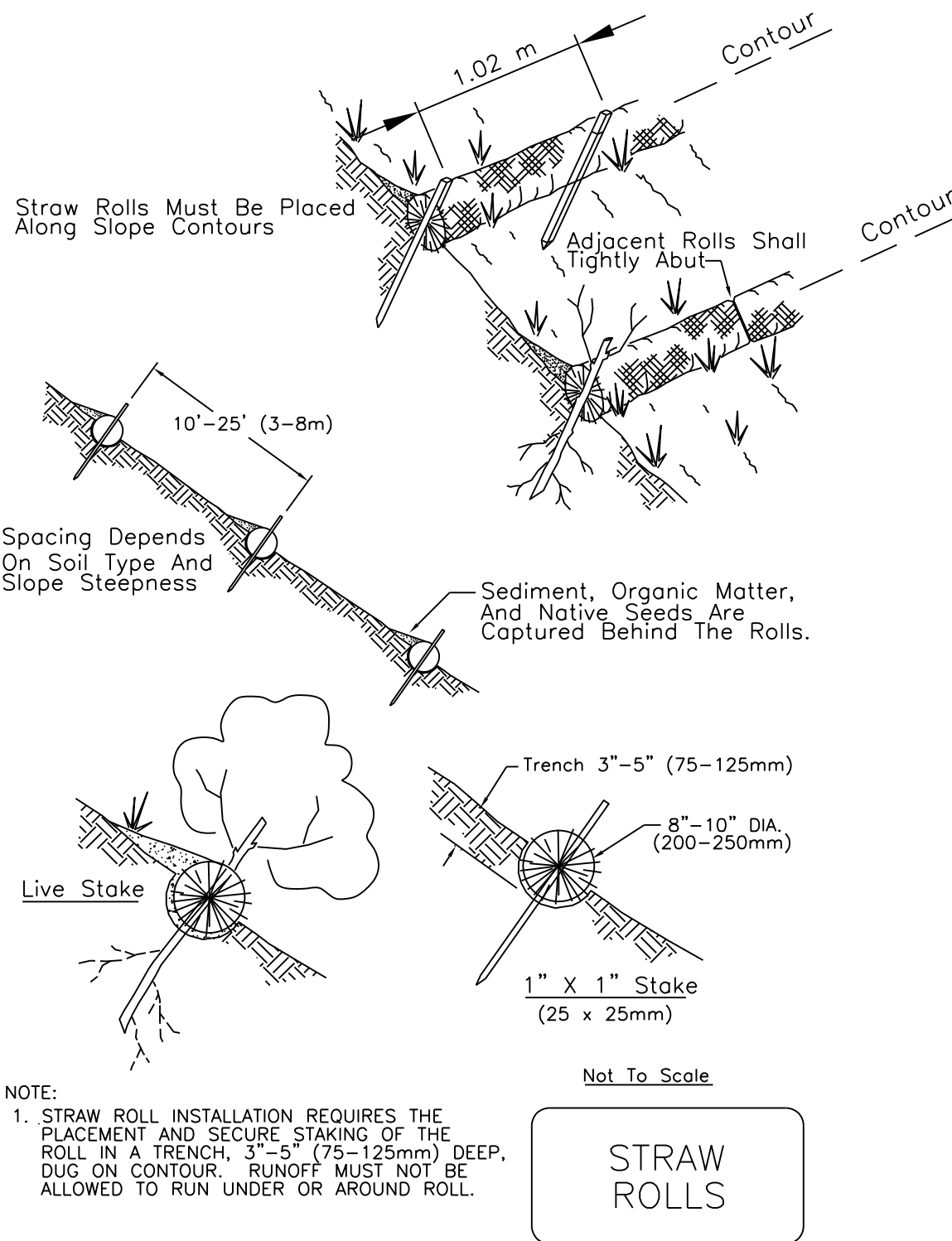
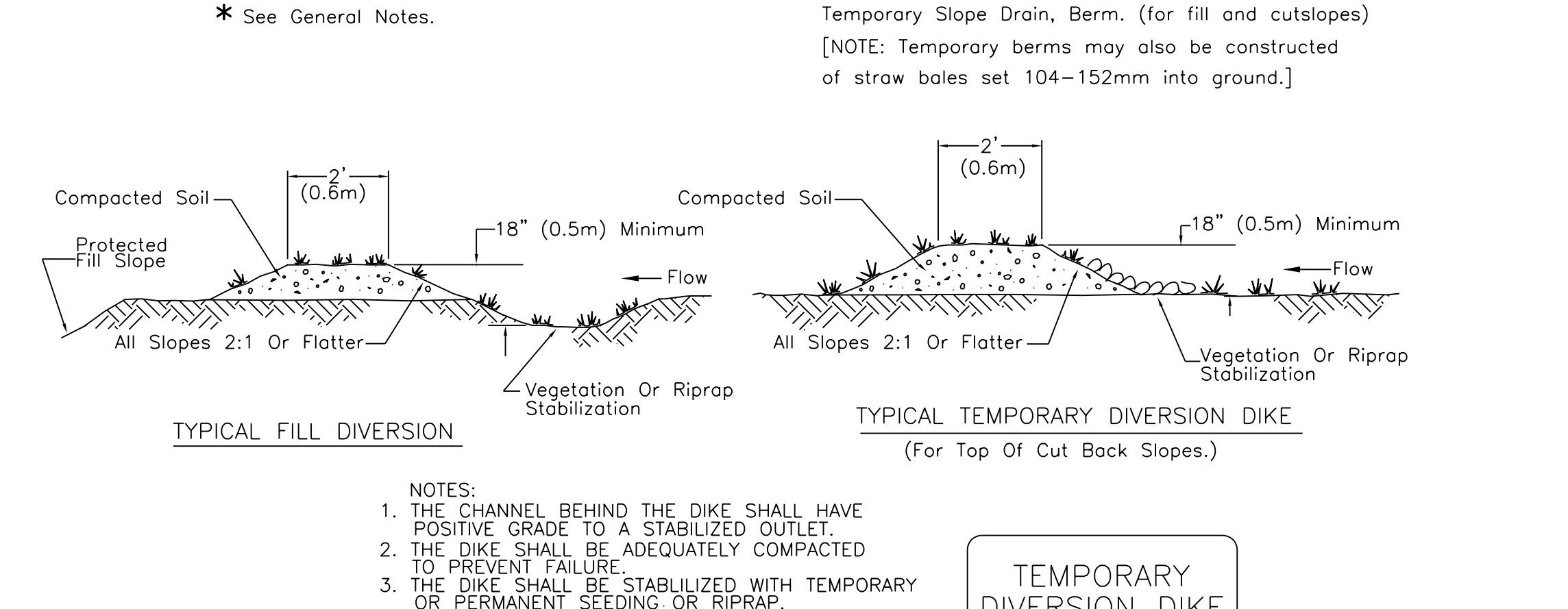
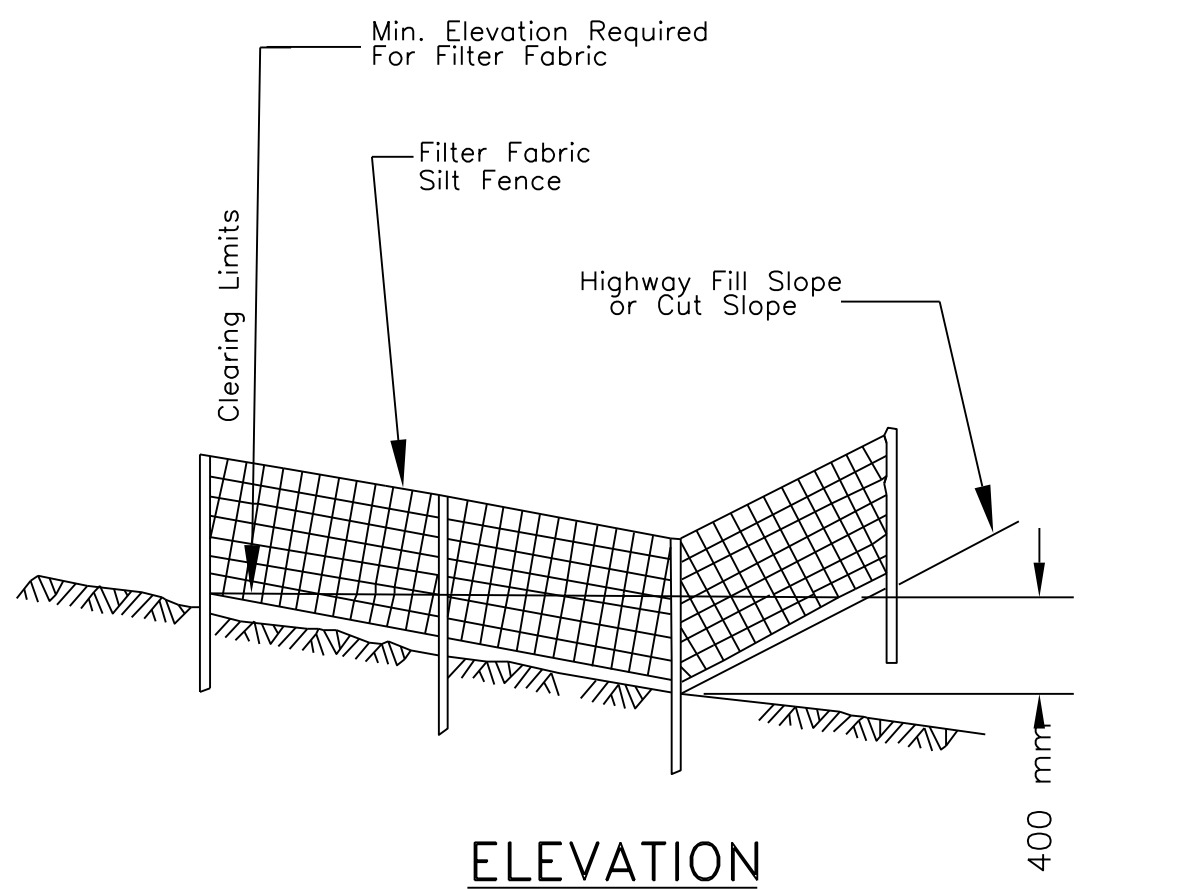
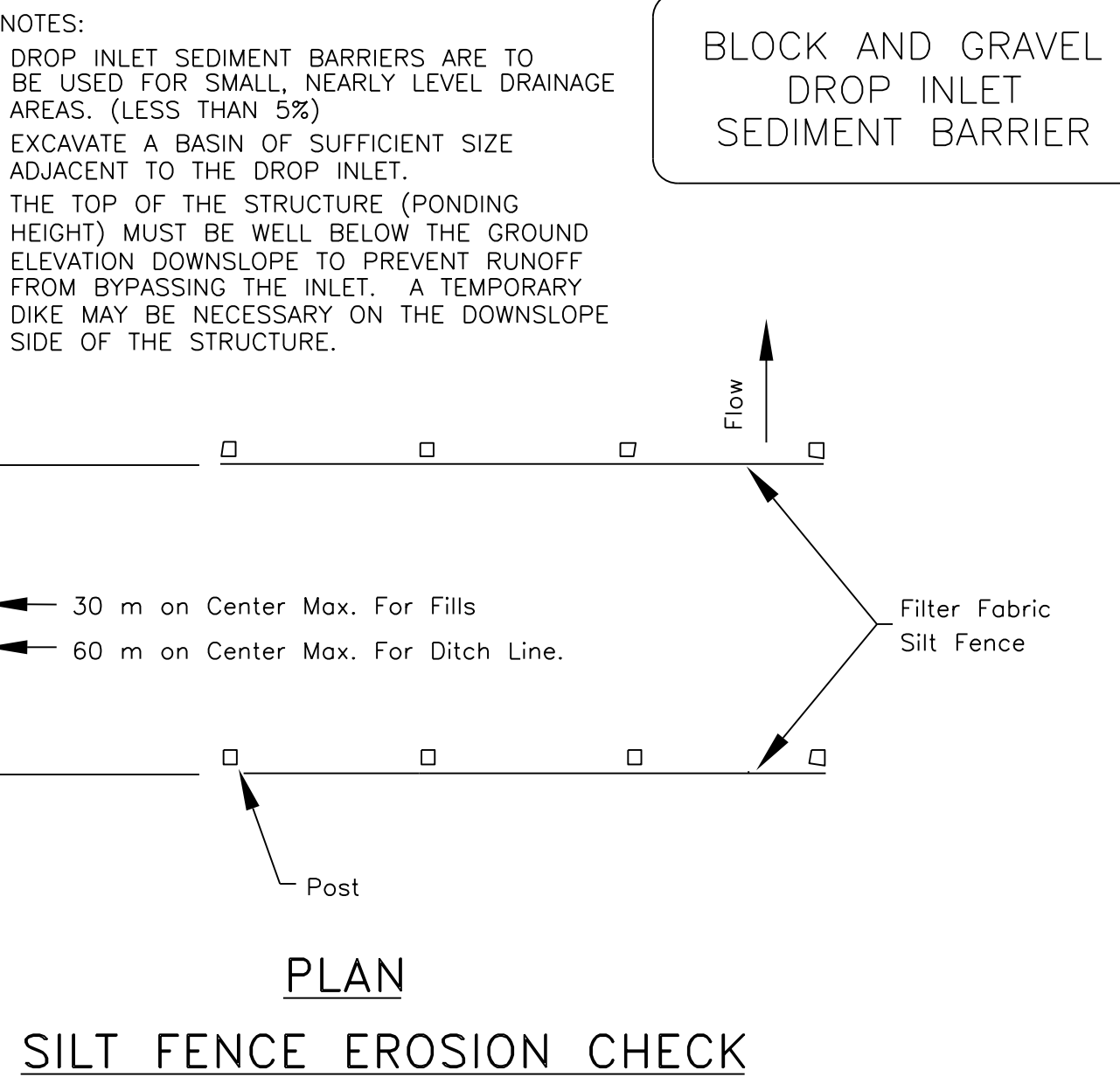
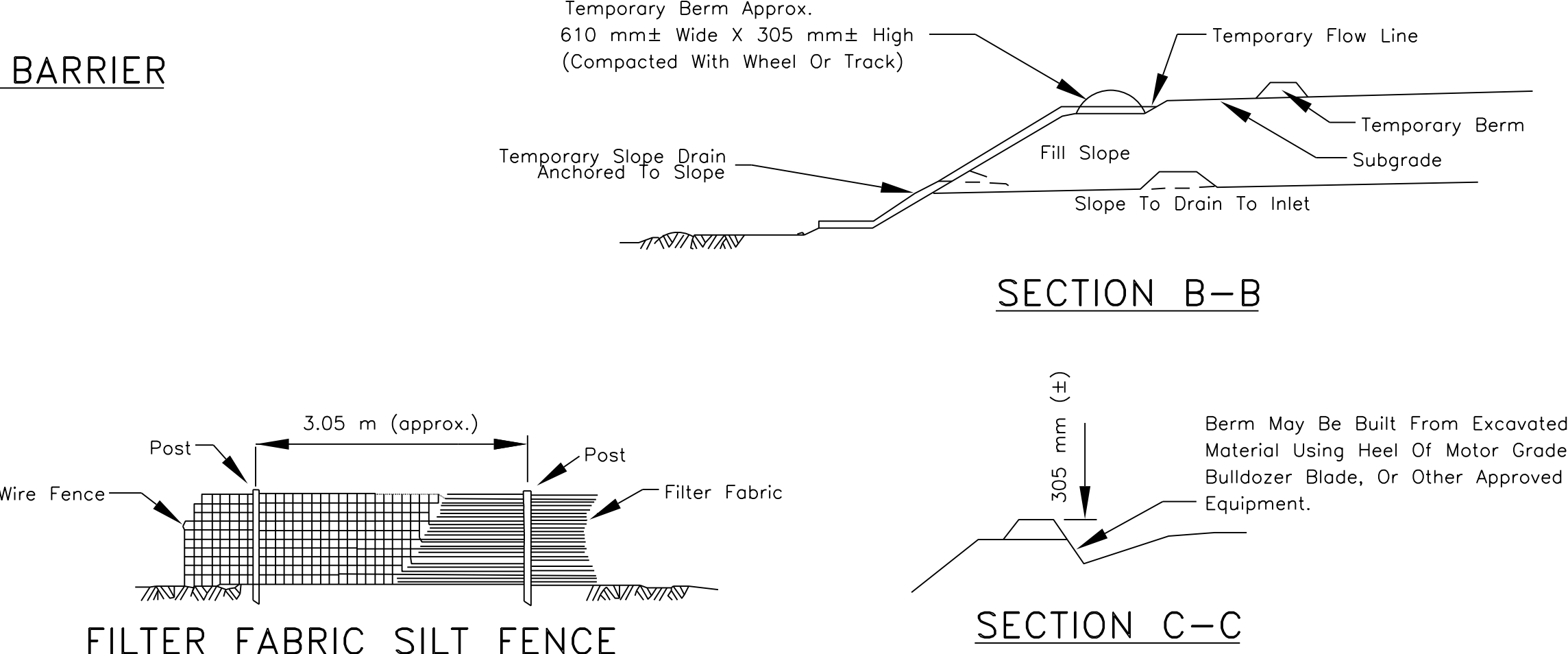
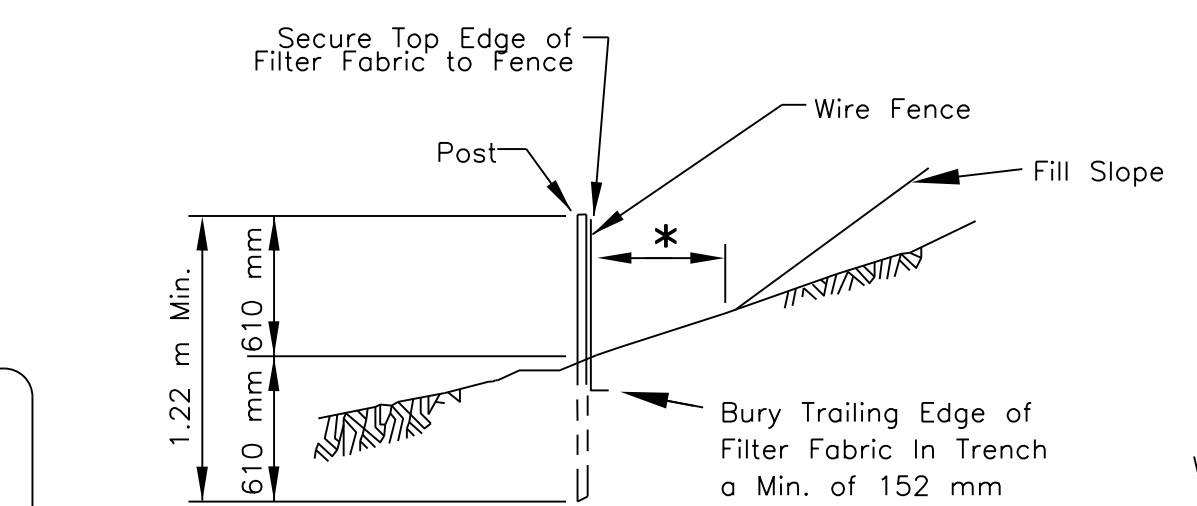
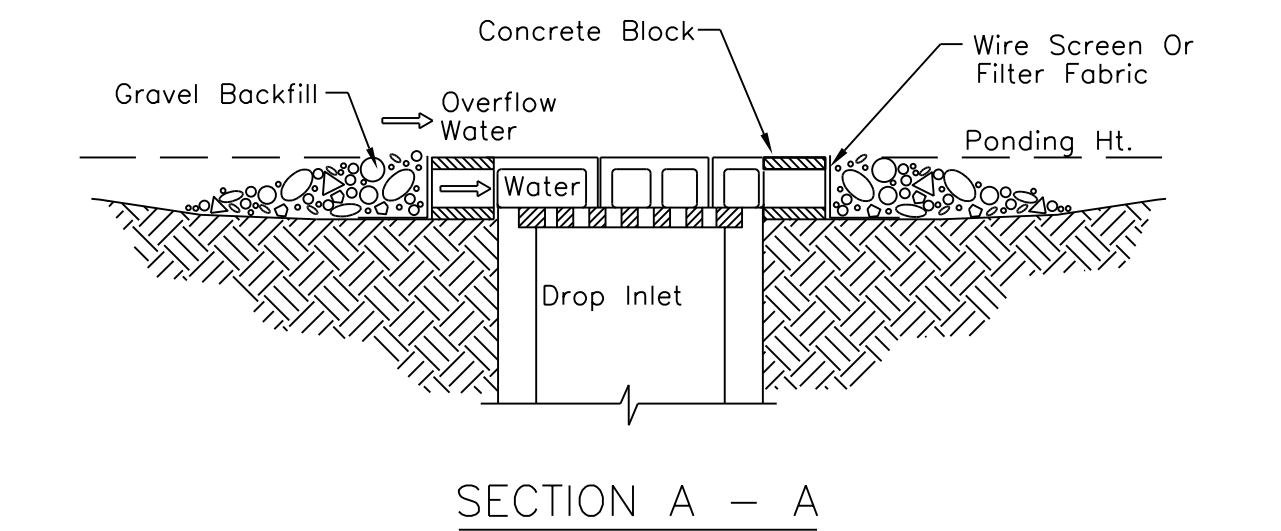
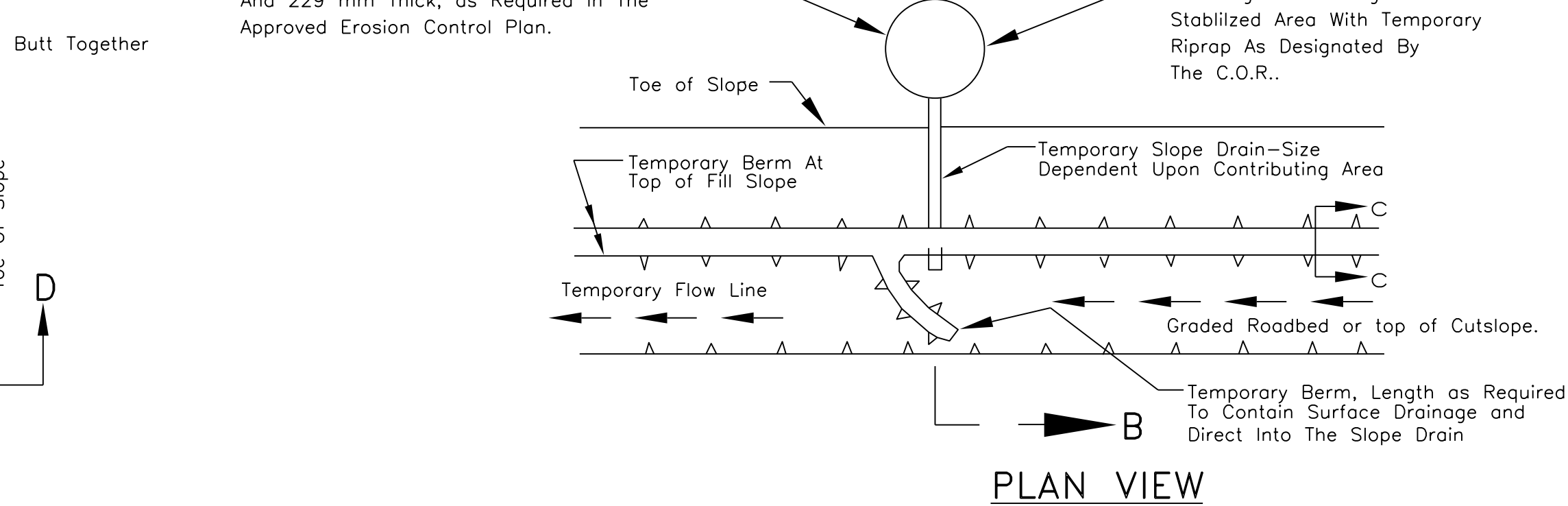
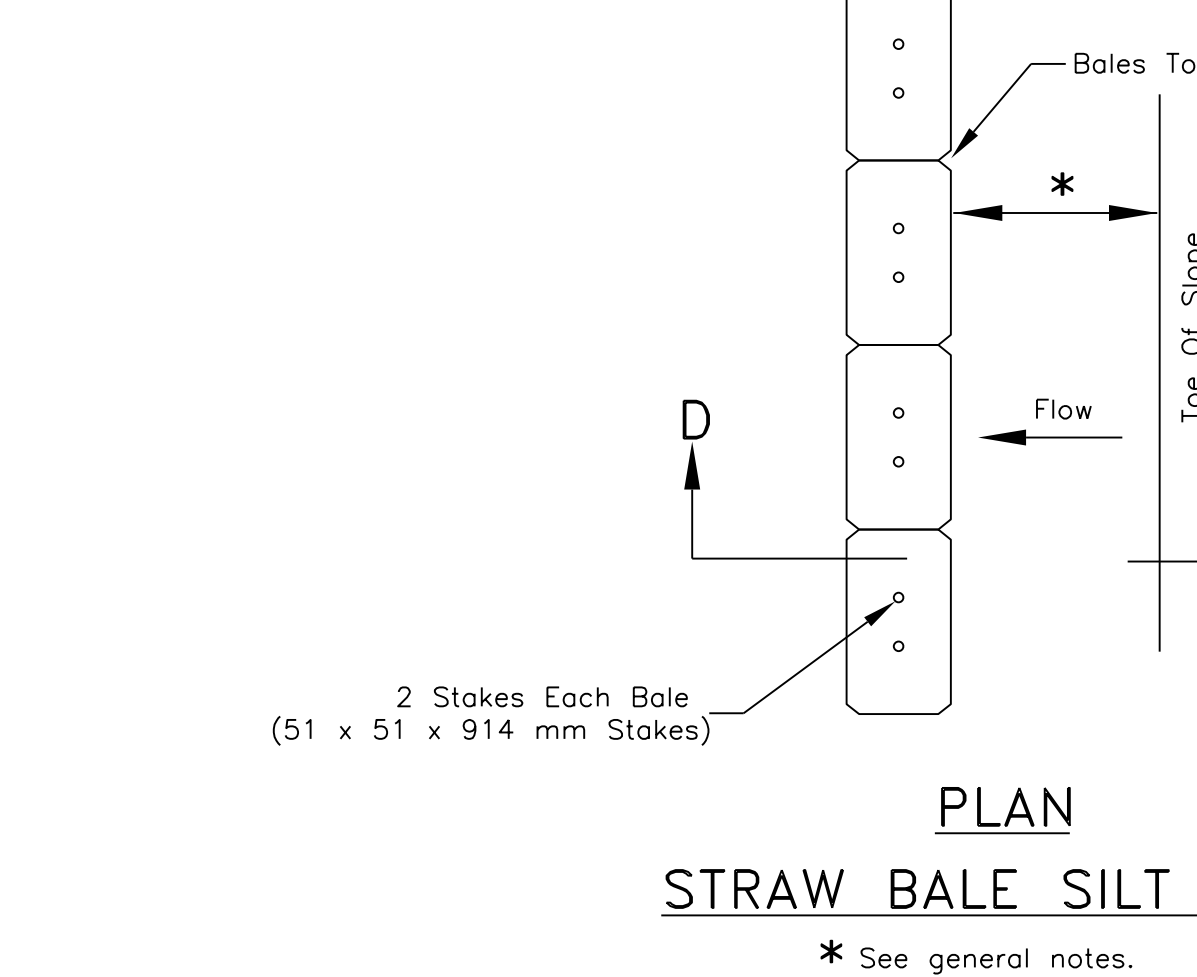
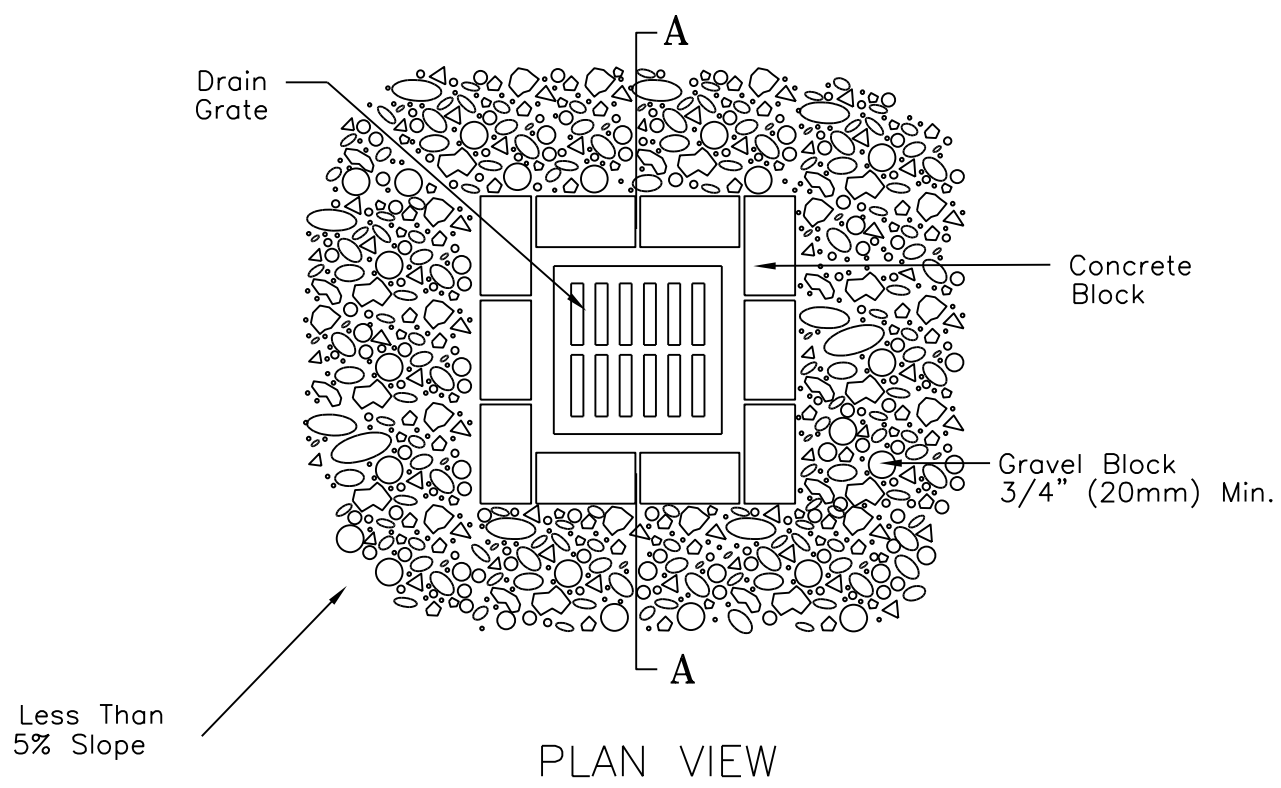
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SHEET MODEL NAME: PLOT SHEET



| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
|--------|---------|-------------|-------|-------------|-------|--------------|
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 32    | 39           |



- ### GENERAL NOTES
- SEE SHEET 31 OF 39 FOR ADDITIONAL NOTES AND DETAILS.
  - THE CONTRACTOR SHALL INSTALL GEOTEXTILE FABRIC, TYPE 4,
    - CONSTRUCT FINISH GRADING AROUND STRUCTURE TO BE PLACED.
    - CUT TRENCHES FOR FOOTING OF SLAB.
    - INSTALL 1.22m OF GEOTEXTILE FABRIC ANCHORED ON FLOOR AND TOP ALONG THE CUT FACE OF TRENCH AS SHOWN.
    - PLACE CONCRETE FORMS, REINFORCEMENTS AND SUBSEQUENT CONCRETE.
  - CONSTRUCT SEDIMENT BASIN AND TRAPS, EROSION CHECKS AND/OR FILTERS IN STRATEGIC LOCATIONS ON THE PROJECT TO FILTER STORM RUNOFF BEFORE IT LEAVES THE PROJECT CONSTRUCTION LIMITS OR ENTERS A STREAM AS SHOWN IN THE APPROVED SWPPP.
  - CLEAN ALL SEDIMENTS BASIN AND TRAPS OF ACCUMULATED SEDIMENT WHEN HALF FULL OF SEDIMENT.
  - USE DRAIN PIPE, RIPRAP, GEOTEXTILE FABRIC, OR GRASS-LINED WATERWAY FOR TEMPORARY SLOPE DRAINS TO CHANNEL RUNOFF DOWN SLOPES, CHANNEL WATER INTO SLOPE DRAINS WITH STRAW BALES, WATTLE, OR EARTH BERMS CONSTRUCTED AT THE TOP OF A CUT SLOPE. ANCHOR SLOPE DRAINS TO THE SLOPE.
  - THE CONTRACTOR SHALL ADJUST THE DIMENSIONS AND/OR LOCATIONS OF TEMPORARY SEDIMENT AND EROSION CONTROL DEVICES TO FIT ACTUAL FIELD CONDITIONS.
  - REMOVE AND DISPOSE OF EROSION CONTROL MEASURES ARE SATISFACTORILY ESTABLISHED DRAINAGE DITCHES AND CHANNELS ARE LINED AND STABILIZED, IN ACCORDANCE WITH SECTION 157 OF FP-03.
  - AT CUT SLOPES SPECIFIED IN THESE PLANS TO BE COVERED WITH EROSION MATTING PROTECTION, THE COR/AOTR SHALL INSPECT THE SLOPES FOR EXISTING AND STABLE ROCK MATERIAL. IF IN THE OPINION OF THE COR/AOTR, THE CUT SLOPES ARE SUFFICIENTLY STABLE DUE TO THE NATURAL ROCK, THE COR/AOTR MAY DELETE THE MATTING IN THOSE AREAS.



REVISED  
3-30-09

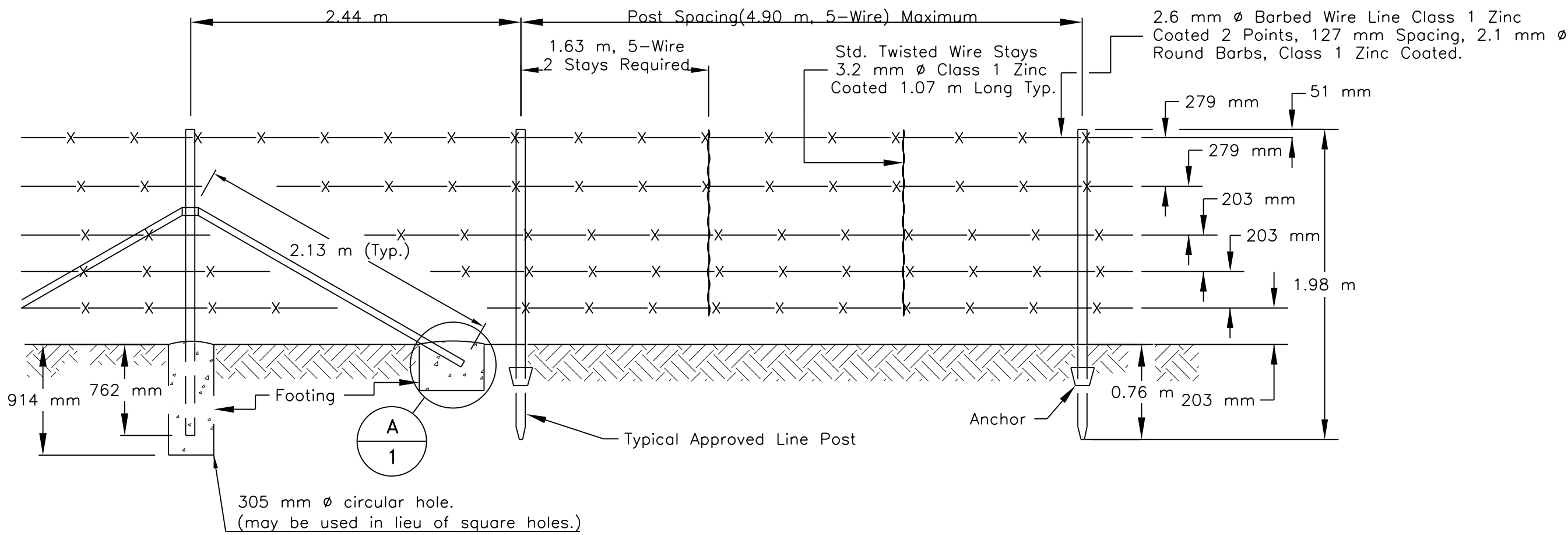
UNITED STATES  
DEPARTMENT OF THE INTERIOR  
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STORMWATER POLLUTION AND  
EROSION/SEDIMENT CONTROL DETAILS

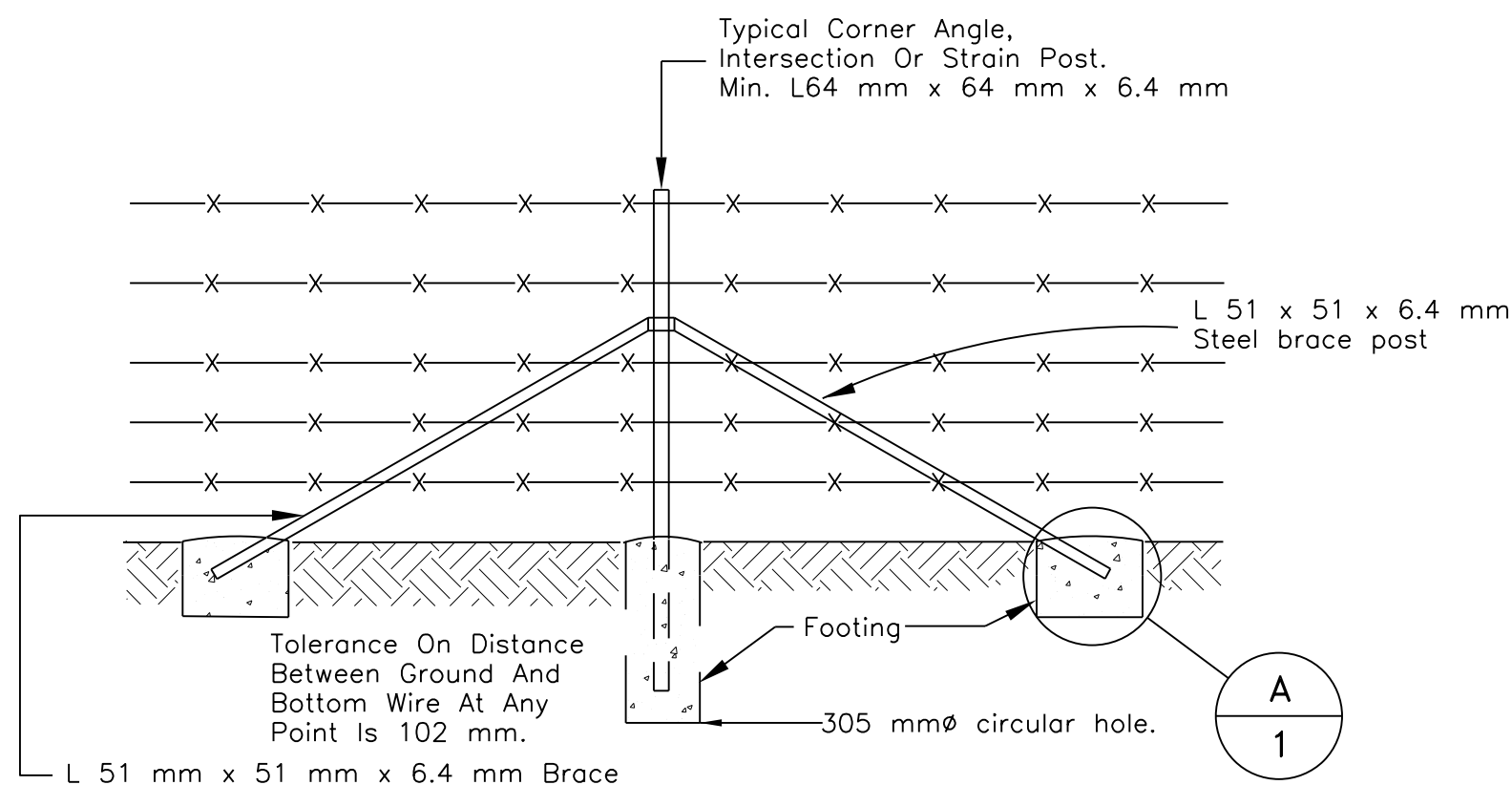
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| SCALE: NTS              |             |
| FILENAME: 9345ero2      |             |
| SHEET MODEL NAME: Model |             |



| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
|--------|---------|-------------|-------|-------------|-------|--------------|
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 33    | 39           |

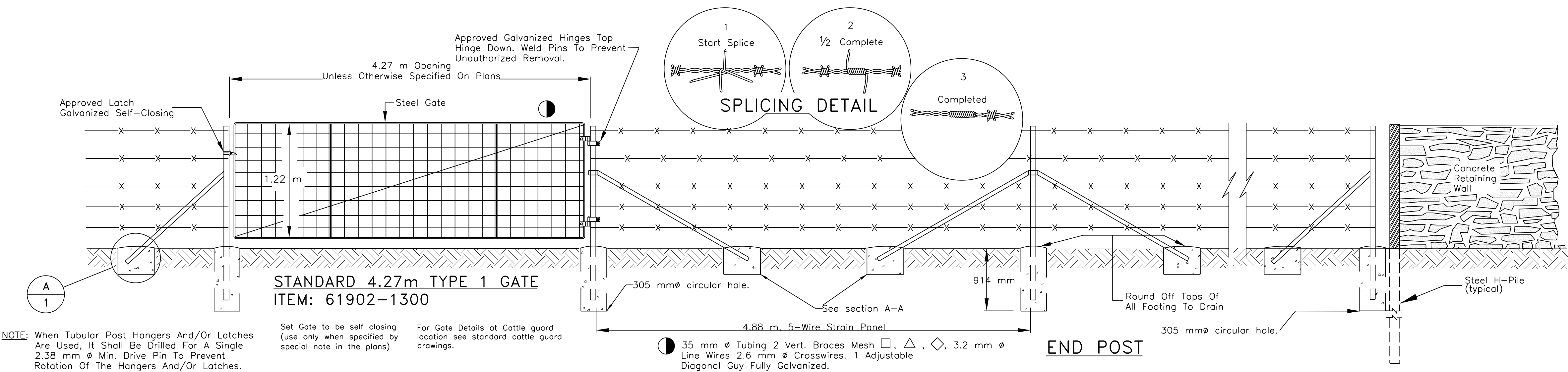


STANDARD 5 LINE GALVANIZED BARBED WIRE PANEL



STANDARD STRAIN POST

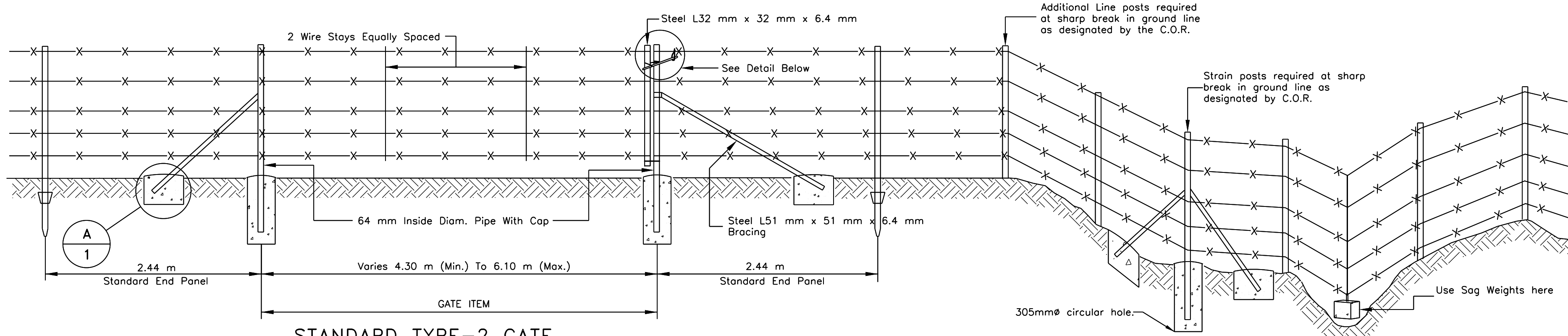
To Be Placed @ 198 m Max. Intervals. Strain Posts With Braces Shall Be Installed At All Corners (R/W Corners Etc.) And Angles Exceeding 15° And Fence Intersections. A Third Brace, In Line With Cross Fence, Required At Intersection.



STANDARD 4.27m TYPE 1 GATE  
ITEM: 61902-1300

END POST

CONNECTION TO CONCRETE RETAINING WALL

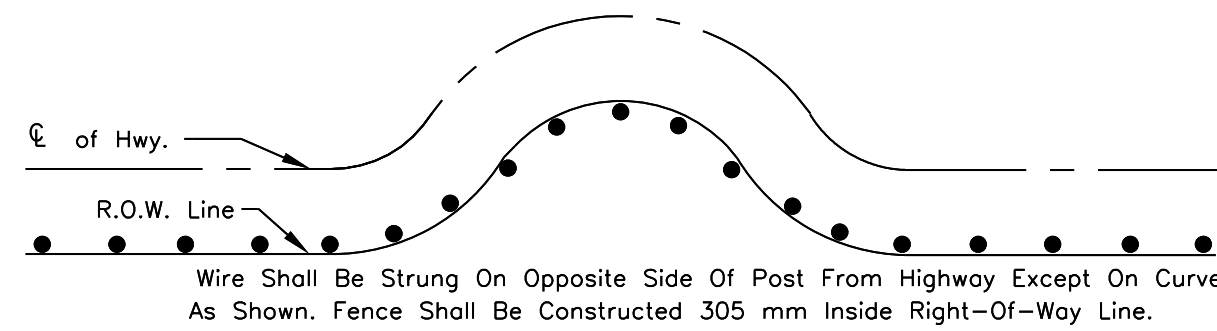


STANDARD TYPE-2 GATE  
ITEM: 61902-2600

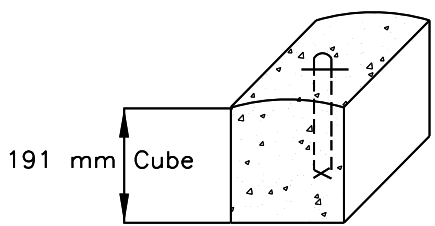
Use At Locations Noted On Plans

FENCE PROFILE IN ROUGH TERRAIN

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

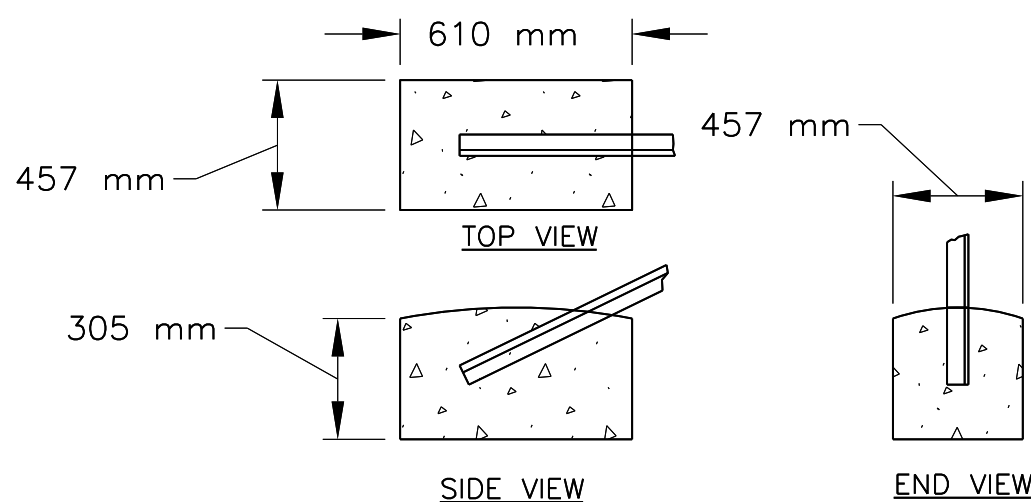


TYPICAL STEEL POST SECTION

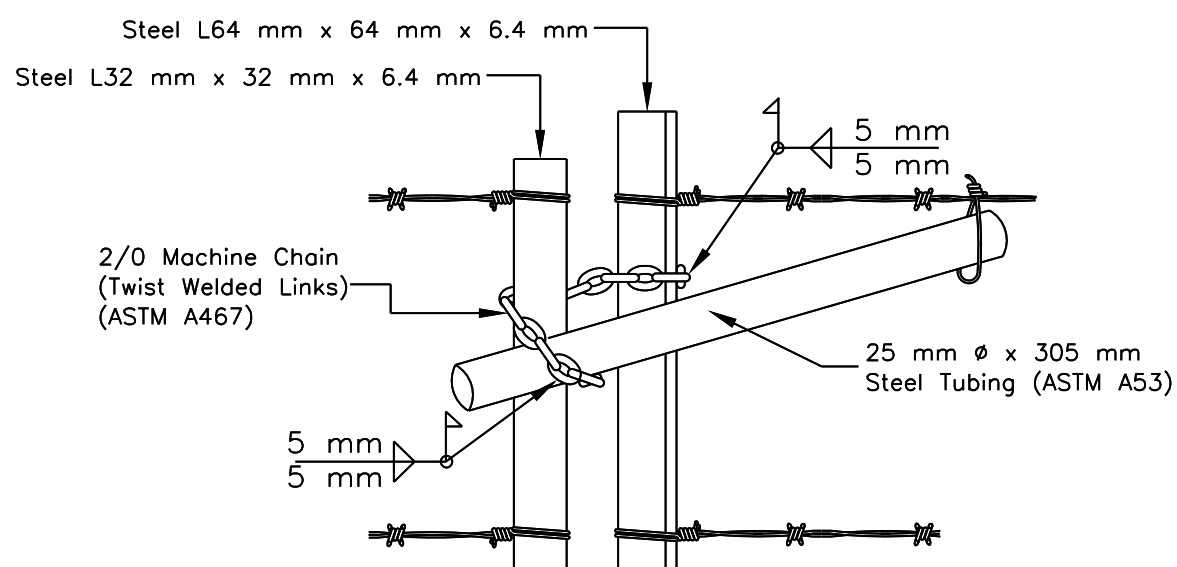


CONCRETE SAG WEIGHT DETAIL

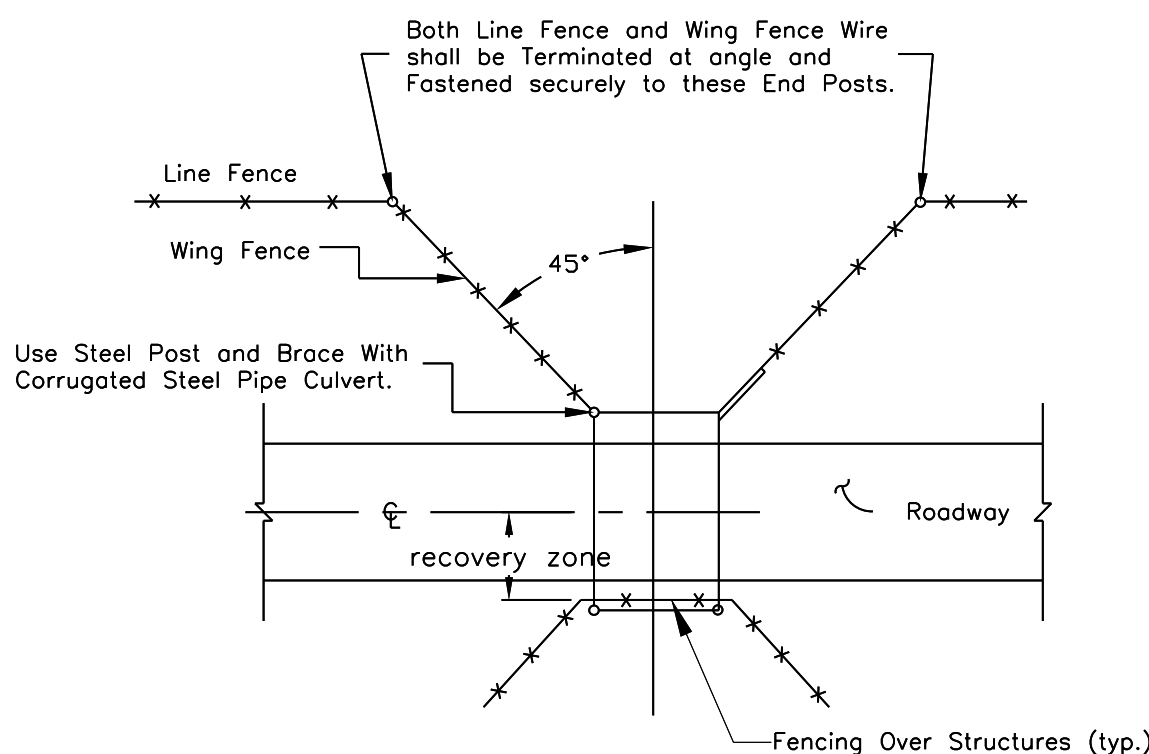
Min. Weight Of Concrete  
Sag Shall Be 16 kg.



CONCRETE FOOTING FOR  
CORNER & STRAIN POST



GATE SECURING DETAIL



WING FENCE DETAIL

## GENERAL NOTES

- CORNER, GATE, INTERMEDIATED 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.
- LINE POSTS SHALL BE FABRICATED IN ACCORDANCE WITH AASHTO M 281-96, AND SHALL BE A NOMINAL WEIGHT OF 1.98 kg/m EXCLUSIVE OF ANCHOR PLATES. ANCHOR PLATES SHALL BE CLAMPED, WELDED OR RIVETED TO THE SECTION IN SUCH A MANNER AS TO PREVENT DISPLACEMENT WHEN THE POSTS ARE DRIVEN.
- 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.
- THE WIRE, WIRE FASTENERS, OR WIRE CLIPS FOR FASTENING BARBED AND WOVEN 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.
- CONCRETE FOR ANCHORS, POST HOLES, ETC. SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 20.7 MPa AT 28 DAYS AND SHALL CONFORM TO SECTION 601 OF THE FP-03. FURNISHING AND PLACEMENT OF CONCRETE SHALL BE INCLUDED WITH ITEM 61901-1000.
- TWO SPLICES ON THE SAME LINE BETWEEN THE STRAIN ASSEMBLES SHALL NOT BE PERMITTED. NO SPLICES SHALL BE PLACED CLOSER THAN 30m OF ANY POST ASSEMBLES.
- CONNECT ALL R.O.W. FENCING TO CATTLEGUARDS CULVERTS (GREATER THAN 1524 mm DIA.) AND CONCRETE STRUCTURES AS SHOWN ON THESE PLANS, AND/OR AS DIRECTED BY THE COR/AOTR.
- ANY CONFLICT IN PLACEMENT OF THE R/W FENCING AT DRAINAGE PIPE LOCATION, DUE TO NARROW R/W WIDTH OR OTHER CONSTRUCTIONS. THE FENCE MAY BE PLACED OVER THE DRAINAGE STRUCTURE. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO ITEM 61901-1000.
- CLEARING/GRUBBING SHALL INCLUDE SHAPING AND/OR REMOVAL OF SMALL MOUNDS NECESSARY TO PRESENT A SMOOTH UNIFORM APPEARANCE OF BOTH GROUND AND FENCING LINE. THIS WORK SHALL BE INCIDENTAL TO THE INSTALLATION OF FENCING AND NO ADDITIONAL PAYMENT SHALL BE MADE.
- ALL DRILLING INTO ROCK MATERIAL, ETC. SHALL BE INCIDENTAL TO THE INSTALLATION OF FENCING AND NO ADDITIONAL PAYMENT SHALL BE MADE.
- GATE, CLOSURE DEVICE SHALL BE STEEL PIPE, NPS ? (26.7mm 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.
- 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.
- THE CONTRACTOR SHALL SUBMIT COMPLETE DETAILED SHOP DRAWINGS FOR PEDESTRIAN GATE, HINGES AND LATCH TO PLANNING AND DESIGN CHIEF, THROUGH THE C.O. FOR REVIEW AND APPROVAL. GATE POSTS AND BRACES, HINGES AND LATCH TO MATCH STANDARD TYPE-1 GATES. MINIMUM GATE FRAME TO BE CONSTRUCTED WITH 30 mm DIAMETER PIPE, AND SHALL BE SELF CLOSING.

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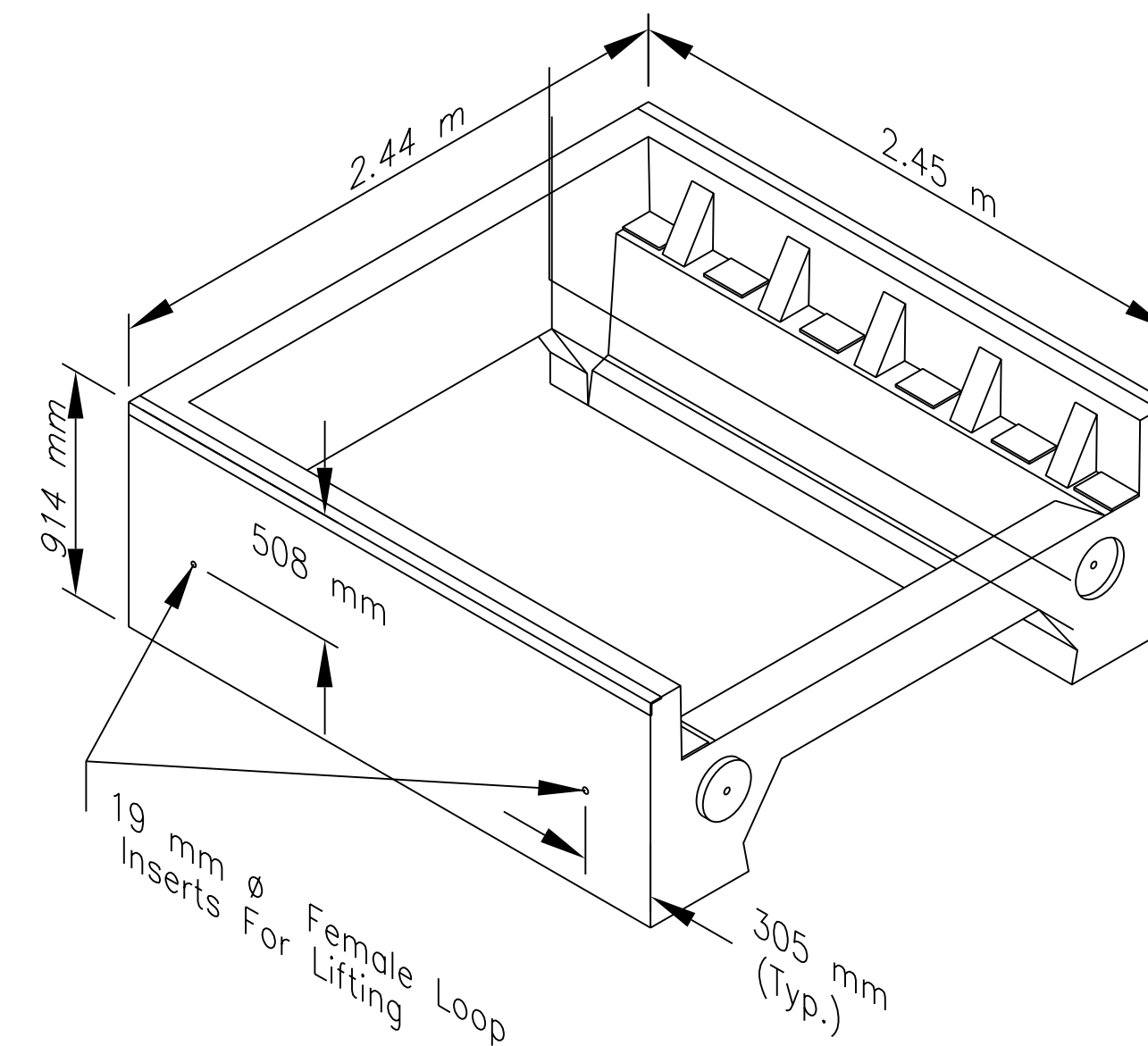
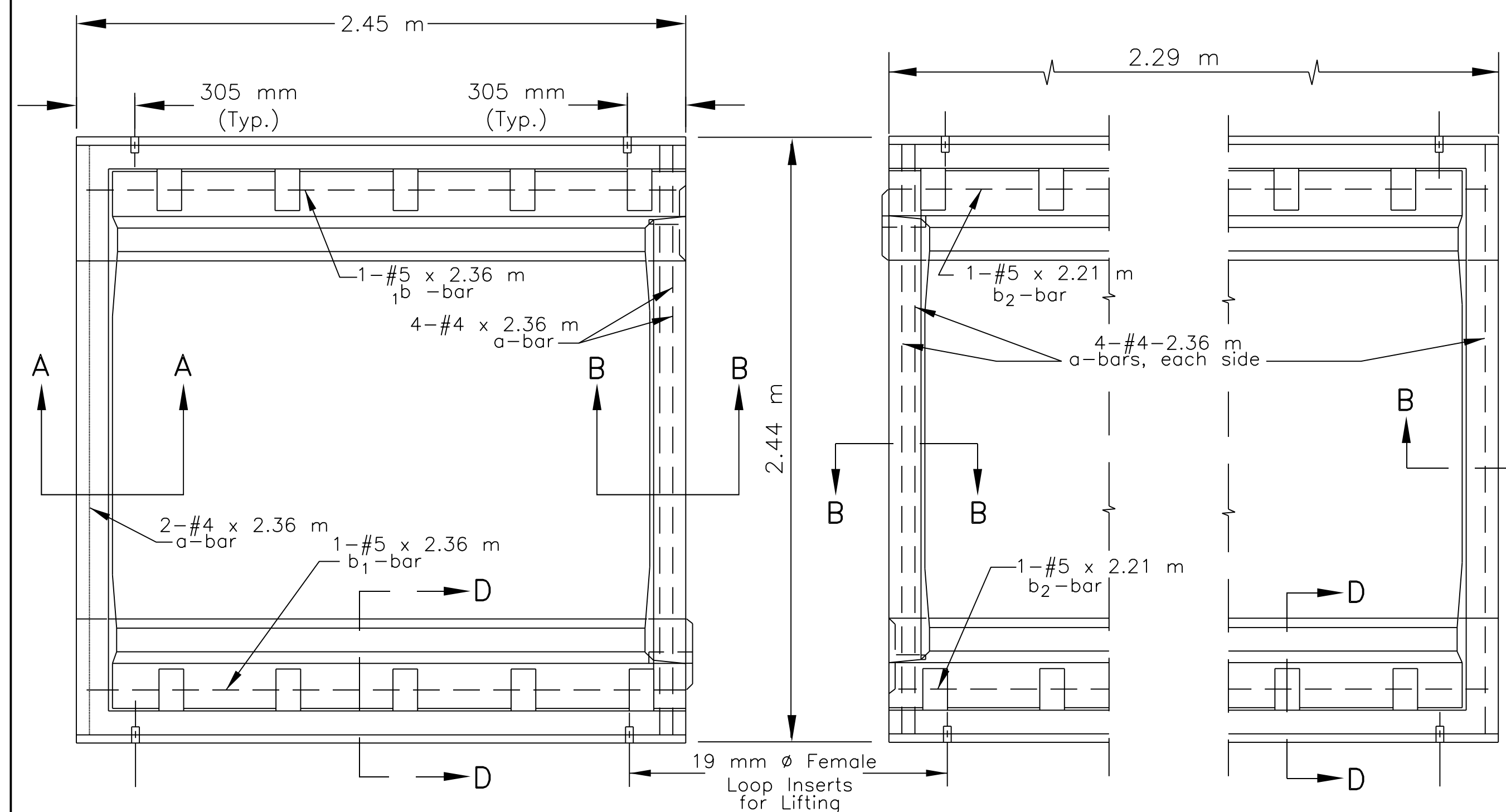
## STANDARD FENCING DETAILS

DRAWN BY: NRODOT DATE: 01/01  
DESIGNED BY: NRODOT DATE: 01/01  
REVISED: 10/10 BY: SC  
SCALE: NTS  
FILENAME: 9345sfd  
SHEET MODEL NAME: Model

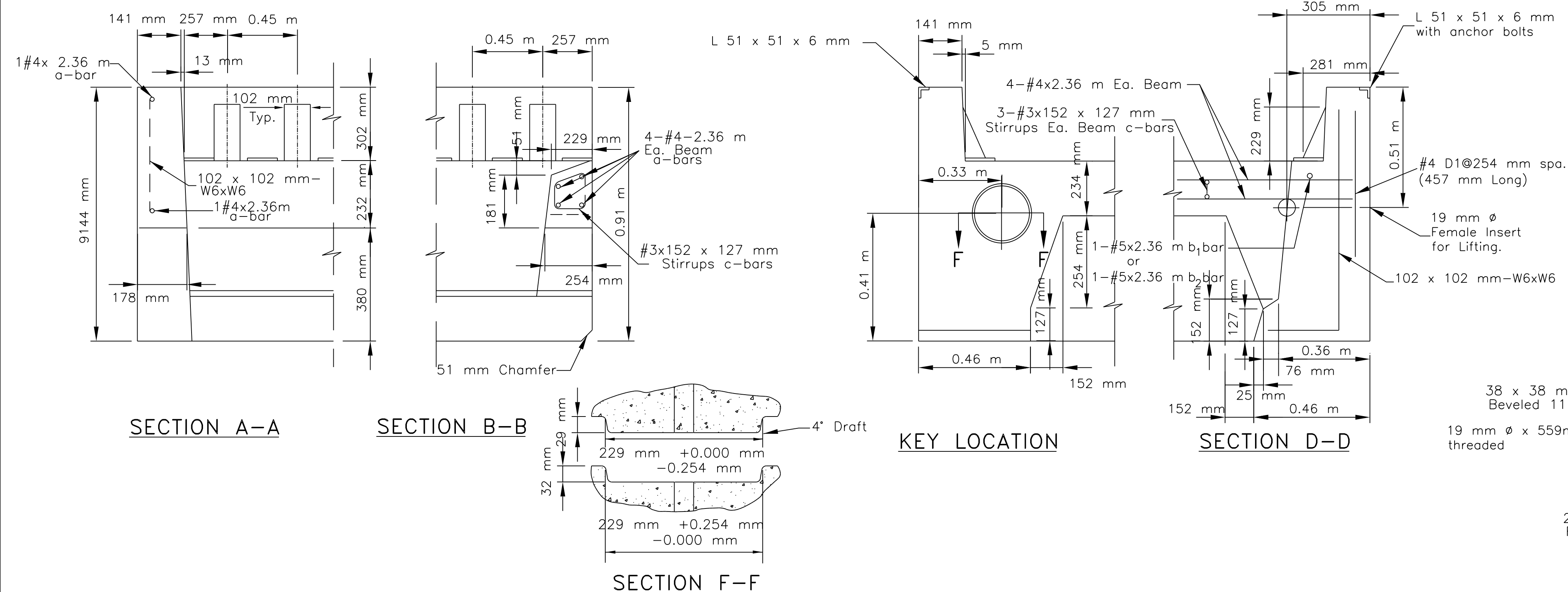




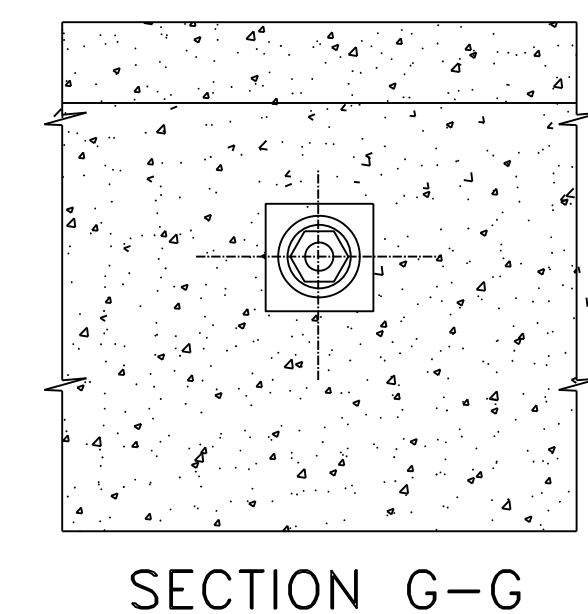
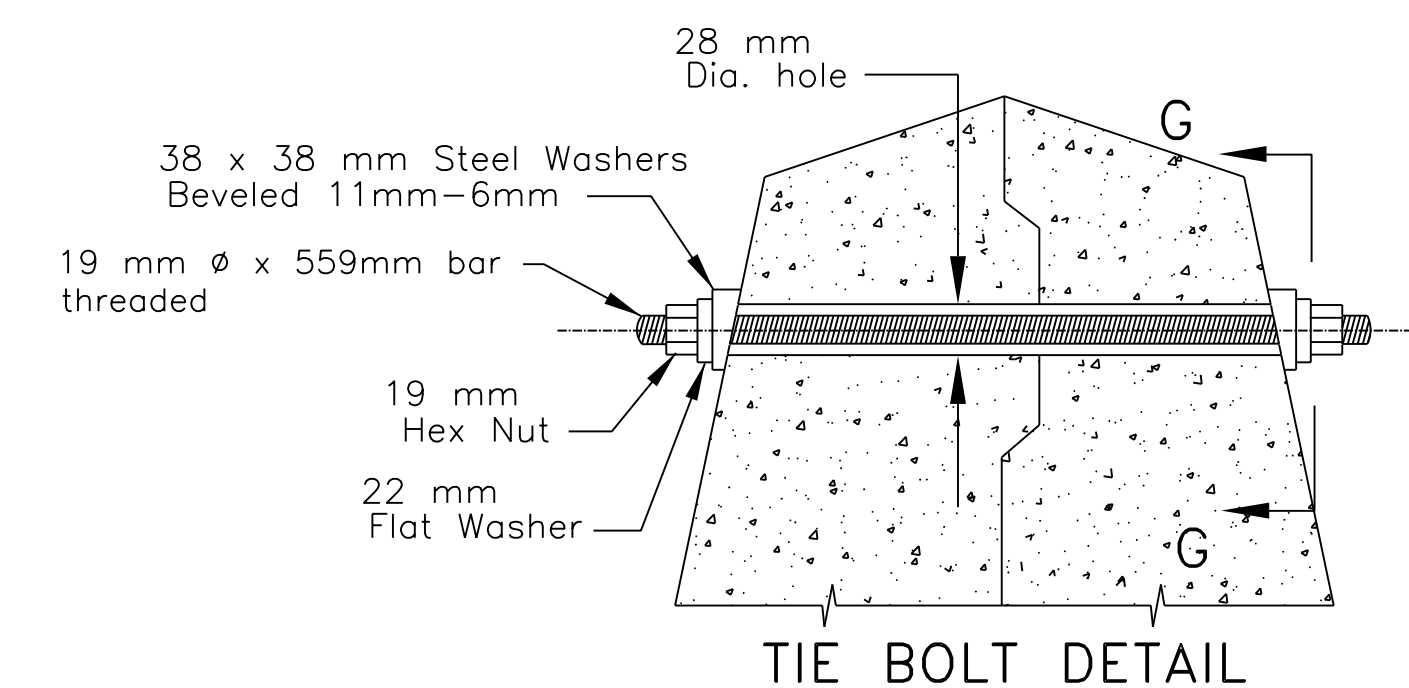
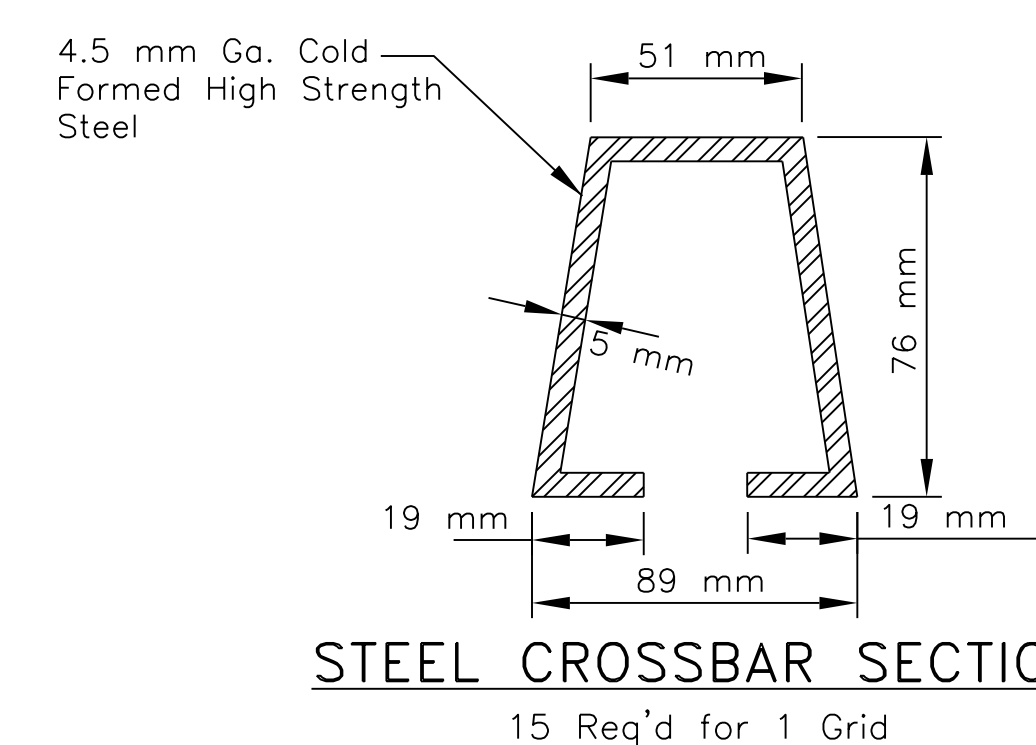
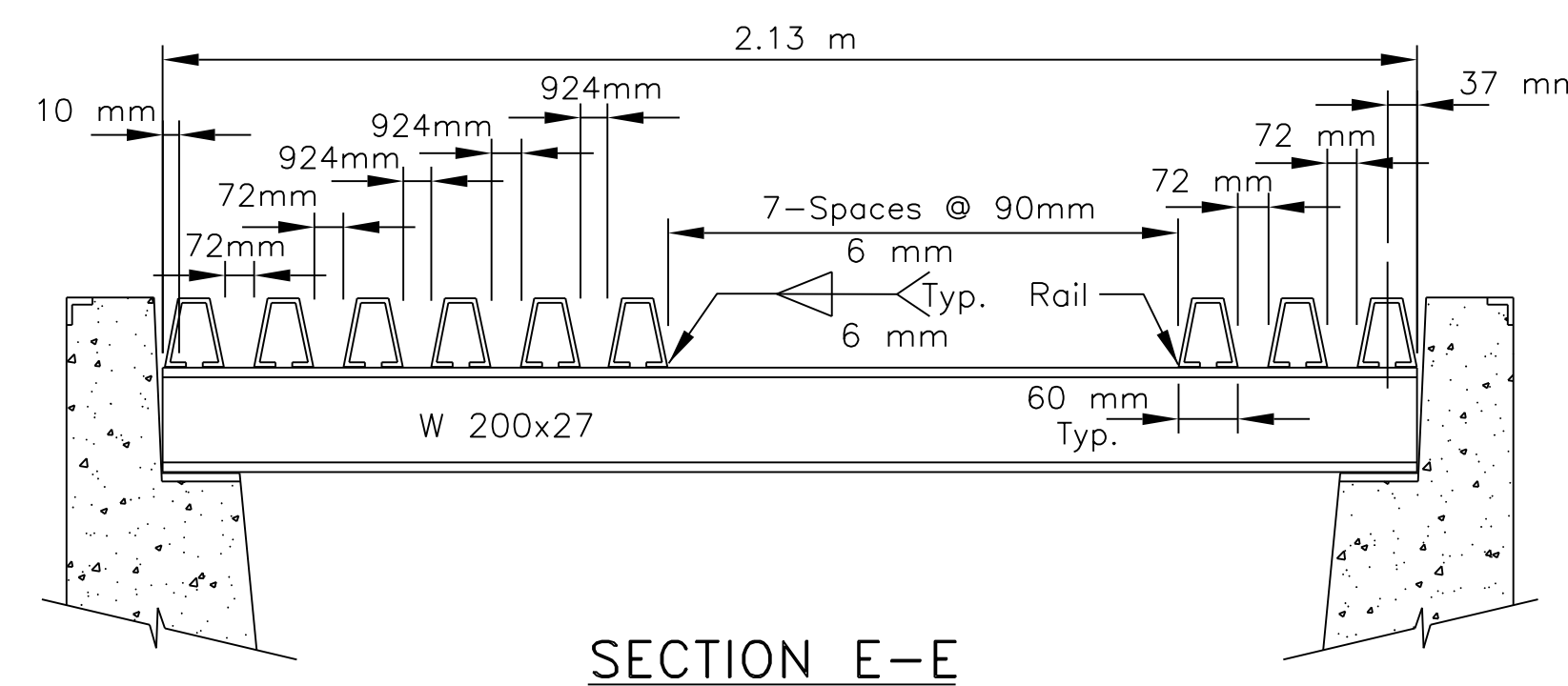
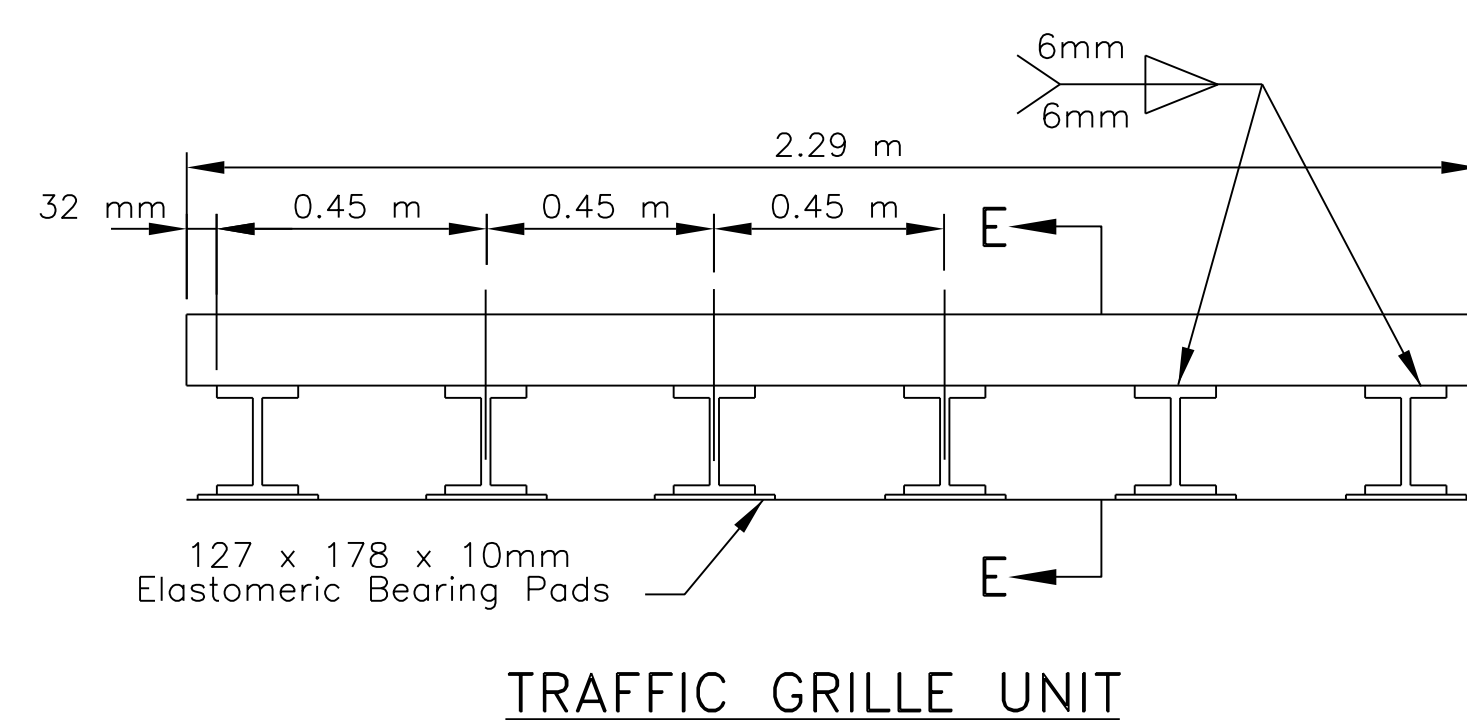
| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
|--------|---------|-------------|-------|-------------|-------|--------------|
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 35    | 39           |



- ## GENERAL NOTE:
1. Precast concrete shall attain 28-day compressive strength of 27.62 MPa (minimum) in accordance with AASHTO T22 (ASTM C-39). The concrete shall be Class A(AE) conforming to Section 552 of FP-03.
  2. Reinforcing steel shall conform to ASTM A615, Grade 420. All structural steel shall conform to AASHTO M-183.
  3. The Contractor shall slope the bases of the cattle guards as required to provide roadway crowns or super-elevation as shown on the plans.
  4. Bolts, washers, and nuts shall be galvanized to meet the requirements of AASHTO M 111 or AASHTO M298.
  5. All traffic grill unit, and wing brace structural steel and pipe, including the steel angles shall receive one (1) primer coat, one (1) intermediate coat, and one (1) finish coat in accordance with Section 563, Paint System 2, of FP-03.
  6. Wing braces shall be considered subsidiary items to the cattleguard unit.
  7. The Contractor has the option to use all steel frame cattleguard. If the Contractor elects to substitute for the steel frame cattleguard, he/her shall show they are more cost effective with supporting data. The Contractor is responsible for all patent protection rights, shop drawings, material certifications, and mill test reports. However, no steel frame cattleguard shall be used for concrete drainage pad cattleguard locations.
  8. Elastomeric bearing pads shall be seal with epoxy adhesive prior to the installation of traffic grill unit.
  9. Design Data: Design according to AASHTO LRFD Bridge Design Specifications, third edition, 2004.
- Design Loads: HS20 and Design Tandem with 33% impact.

REINFORCING STEEL SCHEDULE

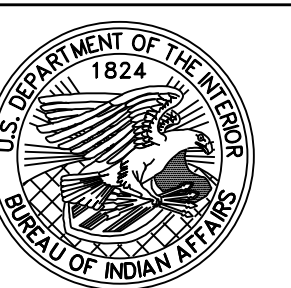
| STRAIGHT BARS     |     |      |        | BENT BARS |     |        |        | BENDING DIAGRAMS              |  |
|-------------------|-----|------|--------|-----------|-----|--------|--------|-------------------------------|--|
| MARK              | NO. | SIZE | LENGTH | MARK      | NO. | SIZE   | LENGTH | ALL DIMENSIONS ARE OUT TO OUT |  |
| END UNIT          |     |      |        |           |     |        |        |                               |  |
| a                 | 6   | 4    | 2.36 m |           |     |        |        |                               |  |
| b <sub>1</sub>    | 2   | 5    | 2.36 m |           |     |        |        |                               |  |
| c                 |     |      |        | 3         | 3   | 0.61 m |        |                               |  |
| D <sub>1</sub>    | 20  | 4    | 0.46 m |           |     |        |        |                               |  |
| INTERMEDIATE UNIT |     |      |        |           |     |        |        |                               |  |
| a                 | 8   | 4    | 2.36 m |           |     |        |        |                               |  |
| b <sub>2</sub>    | 2   | 5    | 2.21 m |           |     |        |        |                               |  |
| c                 |     |      |        | 6         | 3   | 0.61 m |        |                               |  |
| D <sub>1</sub>    | 18  | 4    | 0.46 m |           |     |        |        |                               |  |



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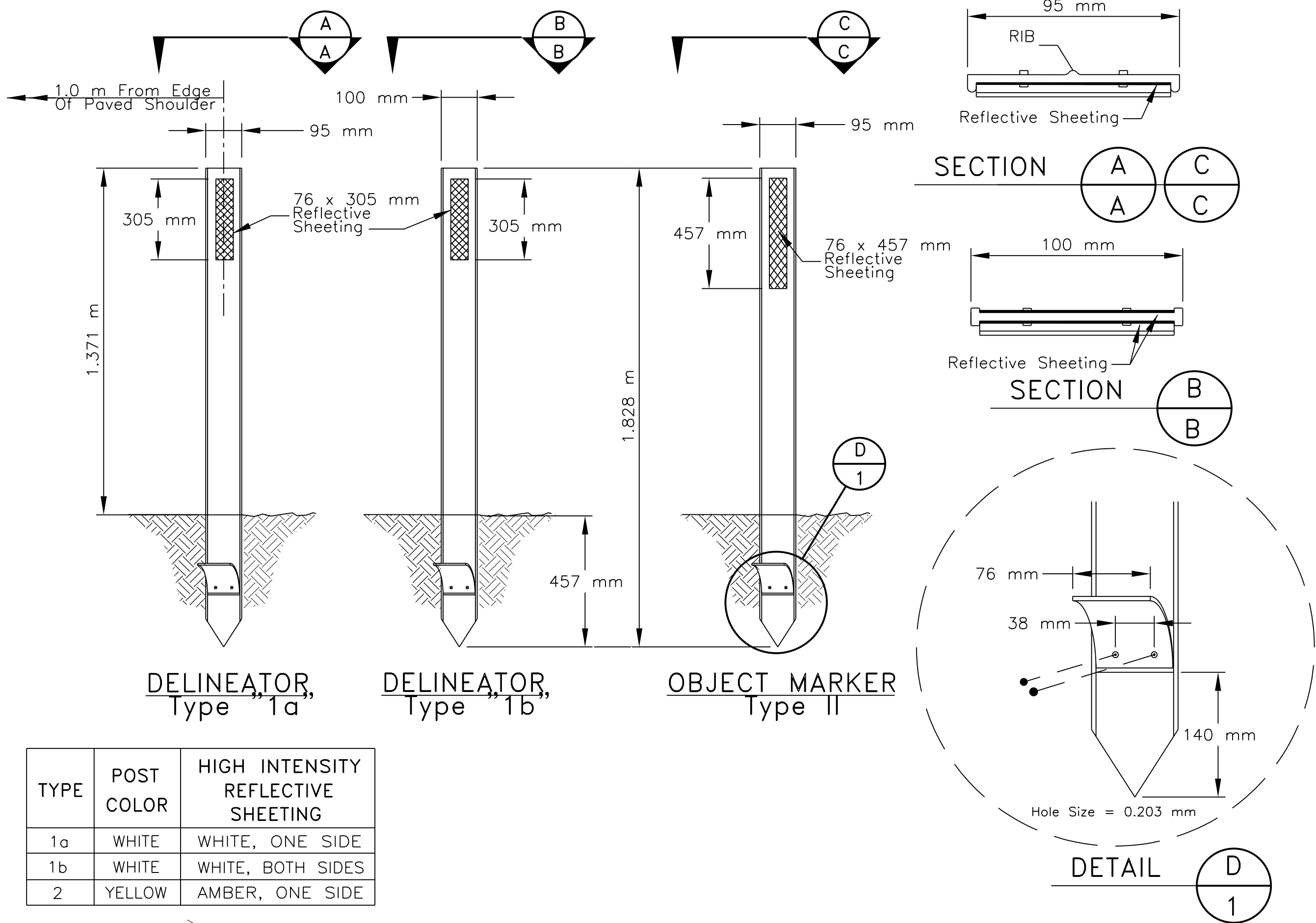
## PRE-CAST CONCRETE CATTLEGUARD DETAILS

|                         |             |
|-------------------------|-------------|
| DRAWN BY: NRO DOT       | DATE: 01/91 |
| DESIGNED BY: NRO DOT    | DATE: 01/91 |
| REVISED: 10/10          | BY: SC      |
| SCALE: NTS              |             |
| FILENAME: 9345PCCG      |             |
| SHEET MODEL NAME: mODEL |             |



| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
|--------|---------|-------------|-------|-------------|-------|--------------|
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 36    | 39           |

GLASS FIBER TYPE DELINEATOR AND OBJECT MARKER



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

| R.O.W. MONUMENT |          |      |  |
|-----------------|----------|------|--|
| Station         | Location | Each |  |
| 0+031.02        | Lt.      | 1    |  |
| 0+173.36        | Lt.      | 1    |  |
| 0+372.12        | Lt.      | 1    |  |
| 0+583.25        | Lt.      | 1    |  |
| 0+790.00        | Lt.      | 2    |  |
| 1+140.00        | Lt.      | 2    |  |
| 1+250.16        | Lt.      | 1    |  |
| 1+466.83        | Lt.      | 1    |  |
| 1+752.54        | Lt.      | 1    |  |
| 2+023.44        | Lt.      | 1    |  |
| 2+292.94        | Lt.      | 1    |  |
| TOTAL           |          | 13   |  |

| REFERENCE MARKERS |          |      |  |
|-------------------|----------|------|--|
| Station           | Location | Each |  |
| 0+031.02          | Lt.      | 1    |  |
| 0+173.36          | Lt.      | 1    |  |
| 0+372.12          | Lt.      | 1    |  |
| 0+583.25          | Lt.      | 1    |  |
| 0+790.00          | Lt.      | 2    |  |
| 1+140.00          | Lt.      | 2    |  |
| 1+250.16          | Lt.      | 1    |  |
| 1+466.83          | Lt.      | 1    |  |
| 1+752.54          | Lt.      | 1    |  |
| 2+023.44          | Lt.      | 1    |  |
| 2+292.94          | Lt.      | 1    |  |
| TOTAL             |          | 13   |  |

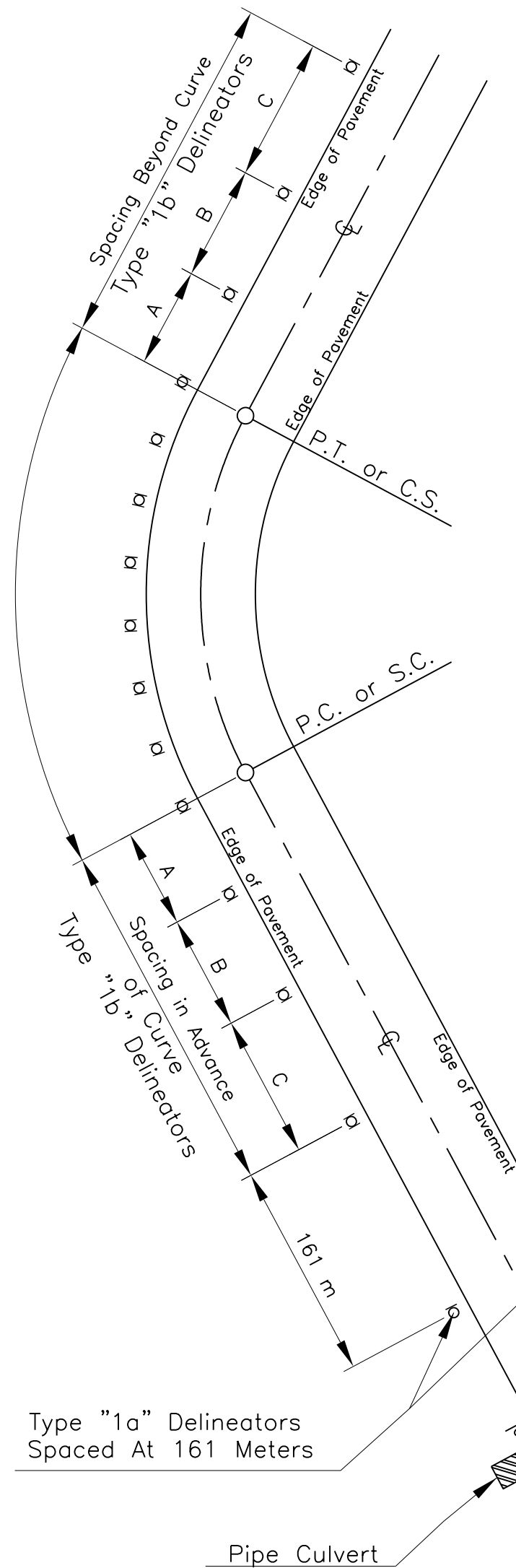
| ROW MONUMENTS |          |      |  |
|---------------|----------|------|--|
| Station       | Location | Each |  |
| 0+031.02      | Rt.      | 1    |  |
| 0+173.36      | Rt.      | 1    |  |
| 0+372.12      | Rt.      | 1    |  |
| 0+583.25      | Rt.      | 1    |  |
| 1+250.11      | Rt.      | 1    |  |
| 1+467.18      | Rt.      | 1    |  |
| 1+758.02      | Rt.      | 1    |  |
| 2+047.74      | Rt.      | 1    |  |
| 2+299.03      | Rt.      | 1    |  |
| TOTAL         |          | 9    |  |

| REFERENCE MARKERS |          |      |  |
|-------------------|----------|------|--|
| Station           | Location | Each |  |
| 0+031.02          | Rt.      | 1    |  |
| 0+173.36          | Rt.      | 1    |  |
| 0+372.15          | Rt.      | 1    |  |
| 0+583.29          | Rt.      | 1    |  |
| 1+250.16          | Rt.      | 1    |  |
| 1+466.83          | Rt.      | 1    |  |
| 1+752.54          | Rt.      | 1    |  |
| 2+023.53          | Rt.      | 1    |  |
| 2+299.61          | Rt.      | 1    |  |
| TOTAL             |          | 9    |  |

| DELINEATORS -TYPE 1b |          |      |        |  |
|----------------------|----------|------|--------|--|
| Station              | Location | Each | Offset |  |
| 0+031.02             | Rt.      | 1    | 6.3    |  |
| 0+078.47             | Rt.      | 1    | 6.3    |  |
| 0+125.91             | Rt.      | 1    | 6.3    |  |
| 0+173.36             | Rt.      | 1    | 6.3    |  |
| 0+212.00             | Rt.      | 1    | 6.24   |  |
| 0+261.37             | Rt.      | 1    | 6.24   |  |
| 0+332.00             | Rt.      | 1    | 6.24   |  |
| 0+372.12             | Rt.      | 1    | 6.24   |  |
| 0+424.90             | Rt.      | 1    | 6.24   |  |
| 0+477.69             | Rt.      | 1    | 6.24   |  |
| 0+530.47             | Rt.      | 1    | 6.24   |  |
| 0+583.25             | Rt.      | 1    | 6.24   |  |
| 0+708.00             | Rt.      | 1    | 6.24   |  |
| 0+835.00             | Rt.      | 1    | 6.24   |  |
| 1+128.00             | Lt.      | 1    | -7.12  |  |
| 1+208.00             | Lt.      | 1    | -7.12  |  |
| 1+250.11             | Lt.      | 1    | -6.49  |  |
| 1+304.29             | Lt.      | 1    | -6.16  |  |
| 1+353.80             | Lt.      | 1    | -6.44  |  |
| 1+412.54             | Lt.      | 1    | -6.22  |  |
| 1+467.18             | Lt.      | 1    | -6.34  |  |
| 1+655.00             | Rt.      | 1    | 6.74   |  |
| 1+722.00             | Rt.      | 1    | 6.74   |  |
| 1+758.02             | Rt.      | 1    | 6.3    |  |
| 1+806.31             | Rt.      | 1    | 6.3    |  |
| 1+854.59             | Rt.      | 1    | 6.3    |  |
| 1+902.88             | Rt.      | 1    | 6.3    |  |
| 1+999.45             | Rt.      | 1    | 6.3    |  |
| 2+047.74             | Rt.      | 1    | 6.3    |  |
| 2+086.00             | Rt.      | 1    | 6.3    |  |
| 2+135.00             | Lt.      | 1    | -6.31  |  |
| 2+155.59             | Lt.      | 1    | -6.31  |  |
| 2+180.80             | Lt.      | 1    | -6.31  |  |
| 2+206.00             | Lt.      | 1    | -6.31  |  |
| 2+232.00             | Lt.      | 1    | -6.31  |  |
| 2+359.64             | Rt.      | 1    | 3.45   |  |
| 2+420.25             | Rt.      | 1    | 4.94   |  |
| 2+450.43             | Rt.      | 1    | 6.31   |  |
| TOTAL                |          | 38   |        |  |

GENERAL NOTES

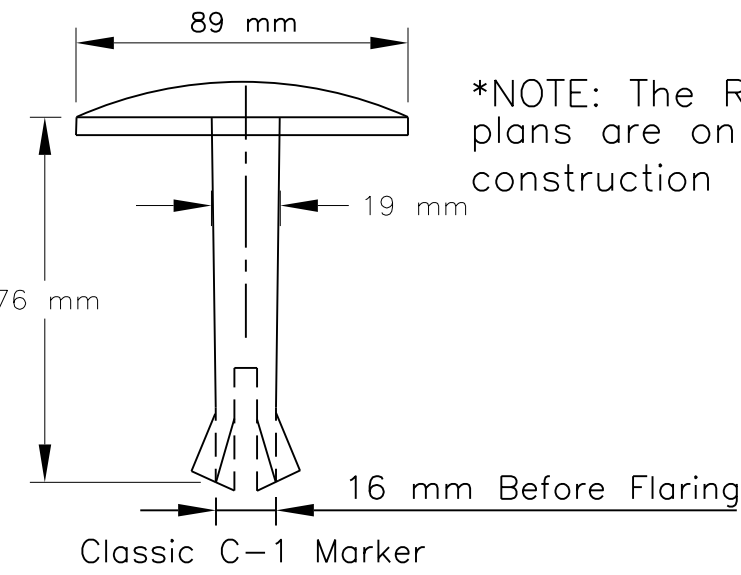
- SURVEY MONUMENT AND REFERENCE MARKERS SHALL BE PLACED AS SHOWN ON THE PLANS OR AS DIRECTED BY COR/AOTR. THE COST OF SUPPLYING ALL MATERIALS AND INSTALLATION OF RIGHT-OF-WAY MONUMENT AND MARKERS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 62101-0000 & 62102-0000.
- IF ROCK IS ENCOUNTERED WHEN INSTALLING THE RIGHT-OF-WAY MONUMENTS AND REFERENCE MARKERS, DRILL A 152mm  $\phi$  FOR R/W MONUMENT AND 305mm  $\phi$  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.
- BRASS CAPS FOR THE SURVEY MONUMENTS SHALL BE SUPPLIED AND INSTALLED BY THE CONTRACTOR. THE BRASS CAPS SHALL CONFORM TO THE ASTM B-584 SPECIFICATION AND SHALL BE CONSIDERED INCIDENTAL TO ITEM 62101-0000. SEE SUPPLEMENTAL SPECIFICATION UNDER SECTION 152 FOR FURTHER REQUIREMENTS.
- ALL CONCRETE SHALL BE CLASS A(AE) AND SHALL CONFORM TO SECTION 601 OF THE FP-03. FURNISHING AND PLACING OF CONCRETE AND REBAR SHALL BE CONSIDERED INCIDENTAL TO ITEMS 62101-0000 & 62102-0000.
- ROADWAY STATIONINGS AND ELEVATIONS SHALL BE STAMPED ON ALL BRASS CAPS BY THE CONTRACTOR AFTER INSTALLATION, UNLESS OTHERWISE DIRECTED IN WRITING BY THE COR/AOTR.
- THE CONTRACTOR SHALL BE REQUIRED TO PAINT THE REFERENCE MARKERS PER SECTION 708 AND SUBSECTION 708.04 OF FP-03:
  - THE PRIMER COAT SHALL CONFORM TO SUBSECTION 708.04(A) OR (B) OF FP-03.
  - THE WHITE FINISH COAT OF PAINT SHALL CONFORM TO SUBSECTION 708.04(C), (D), OR (E) OF FP-03.
  - ALL LETTERS, NUMERALS, SYMBOLS, ETC. SHALL BE PAINTED ON THE REFERENCE MARKERS USING THE DIMENSIONS SHOWN USING 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/AOTR TO MATCH THE RIGHT-OF-WAY PLAT.
- THE CONTRACTOR HAS THE OPTION TO USE AN APPROVED STATE 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. ANY PAINTING PERFORMED BY THE CONTRACTOR WITHOUT THE PROPER APPROVAL SHALL CAUSE THE WORK TO BE REJECTED.



| 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    |

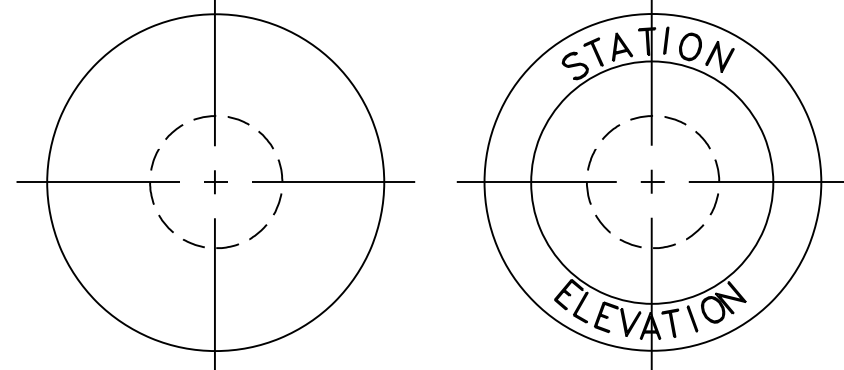
$S = 1.7 * \text{sq. rt.}(R-15)$   
Spacing for specific radii may be interpolated from table.  
The spacing on curves should not exceed 90 meters.  
Shaded areas denotes to use 90 meter spacings.  
Delineators should be spaced 60 to 160 meters apart on mainline tangent sections.

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.

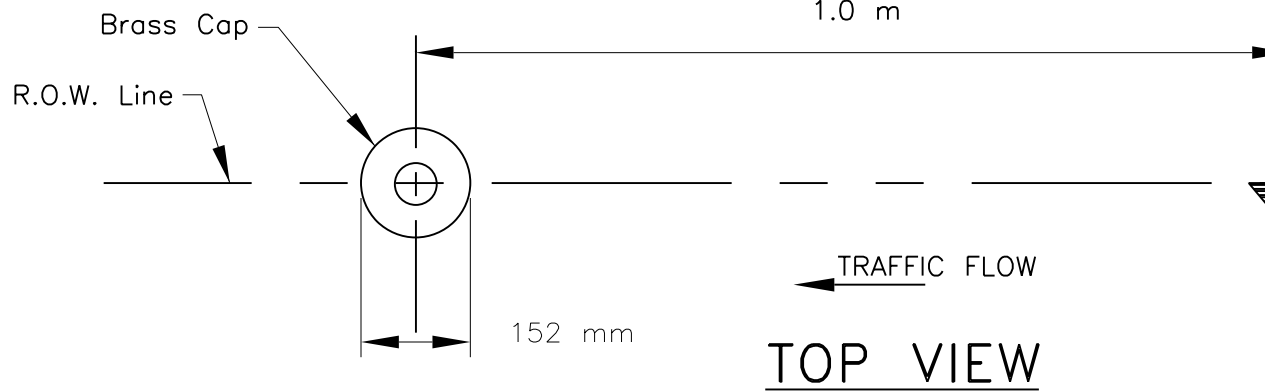


BRASS CAP DETAIL

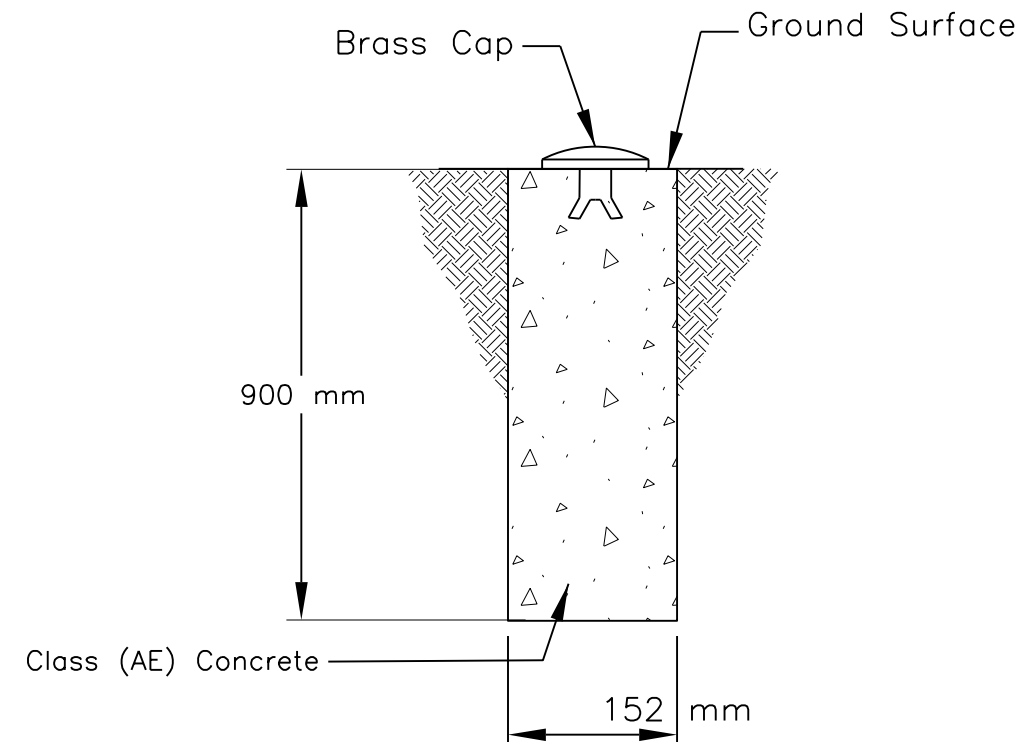
\*NOTE: The R.O.W. monument locations given on these plans are only approximate and are based on the N9345 construction centerline, NOT on the R.O.W. centerline.



BOTTOM VIEW TOP VIEW



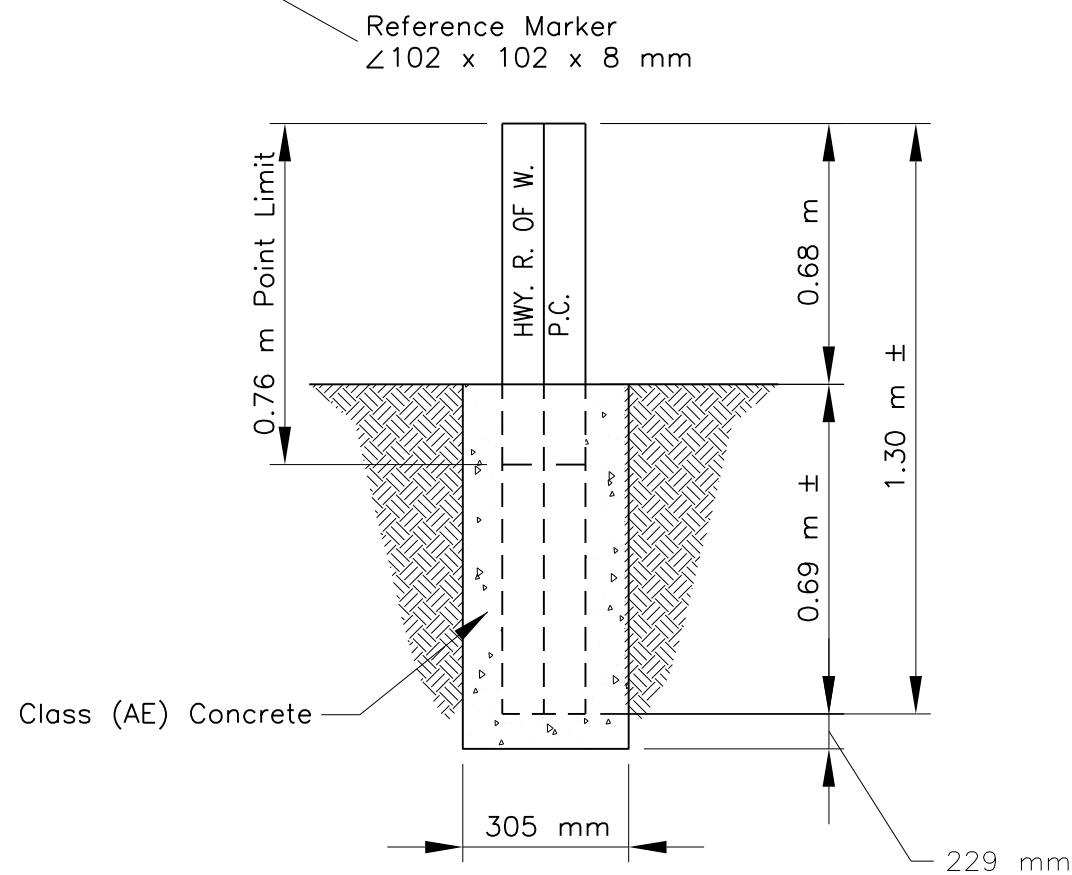
TOP VIEW



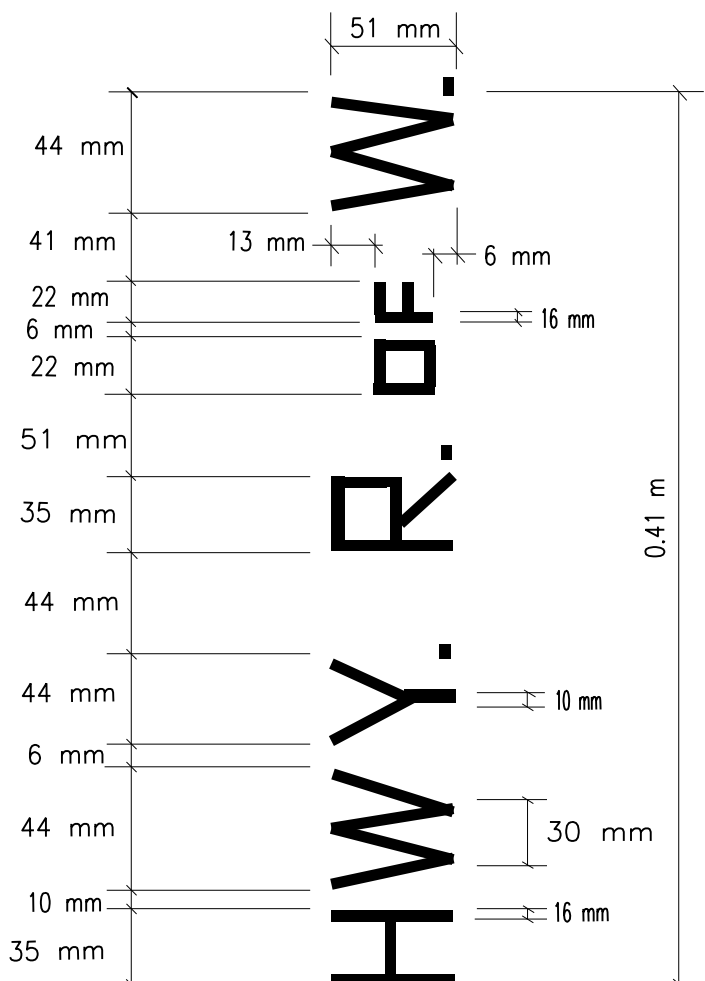
R/W MONUMENT

| OBJECT MARKERS |          |      |
|----------------|----------|------|
| STATION        | Location | Each |
| 0+192.00       | Rt./Lt.  | 2    |
| 0+628.66       | Rt./Lt.  | 2    |
| 1+520.20       | Rt./Lt.  | 2    |
| 1+571.00       | Rt./Lt.  | 2    |
| 1+631.00       | Rt./Lt.  | 2    |
| 1+968.73       | Rt./Lt.  | 2    |
| 2+070.79       | Rt./Lt.  | 2    |
| 2+322.88       | Rt.      | 1    |
| 2+325.32       | Lt.      | 1    |
| 2+372.00       | Rt./Lt.  | 2    |
| TOTAL          |          | 18   |

R/W MONUMENT SYMBOL



REFERENCE MARKER



DETAIL OF LETTERS

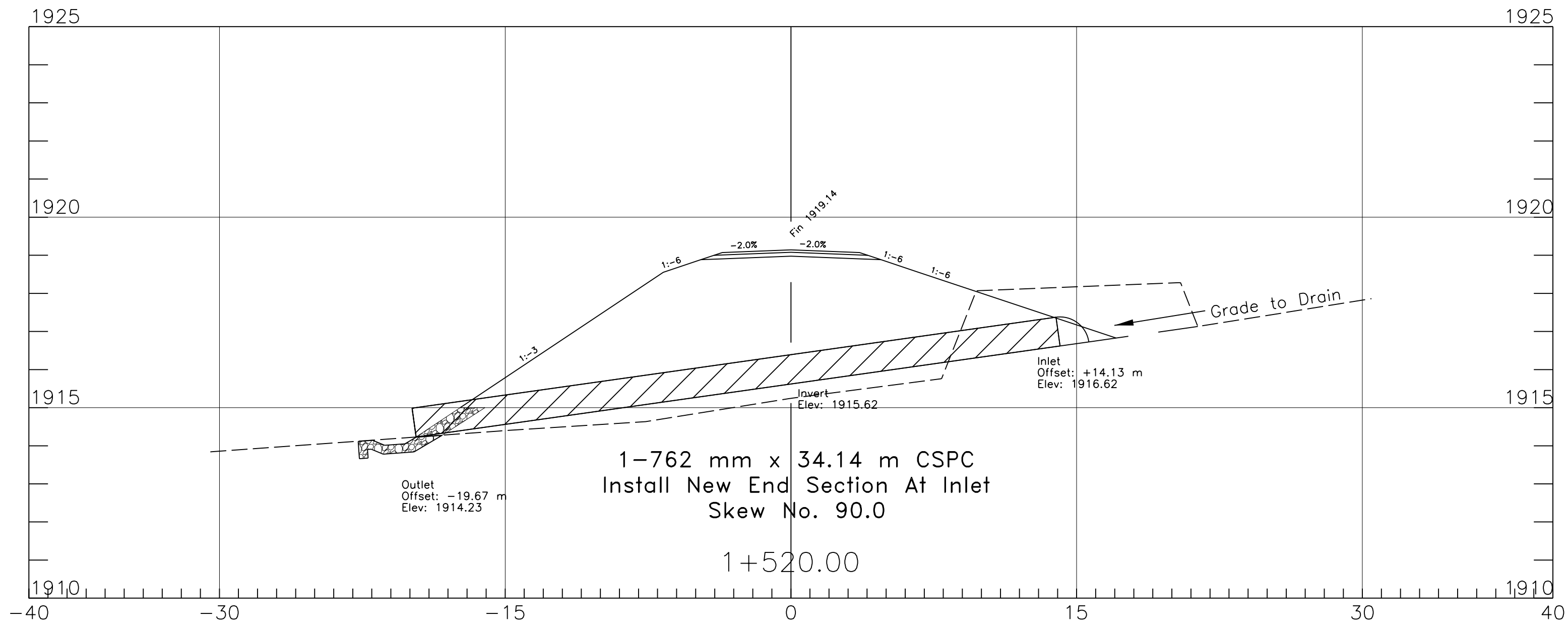
UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF INDIAN AFFAIRS  
NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

MISCELLANEOUS

DRAWN BY: NRODOT DATE: 11/93  
DESIGNED BY: NRODOT DATE: 11/93  
REVISED: 10/05 BY: SC  
SCALE: NTS  
FILENAME: 9345MIS  
SHEET MODEL NAME: MODEL



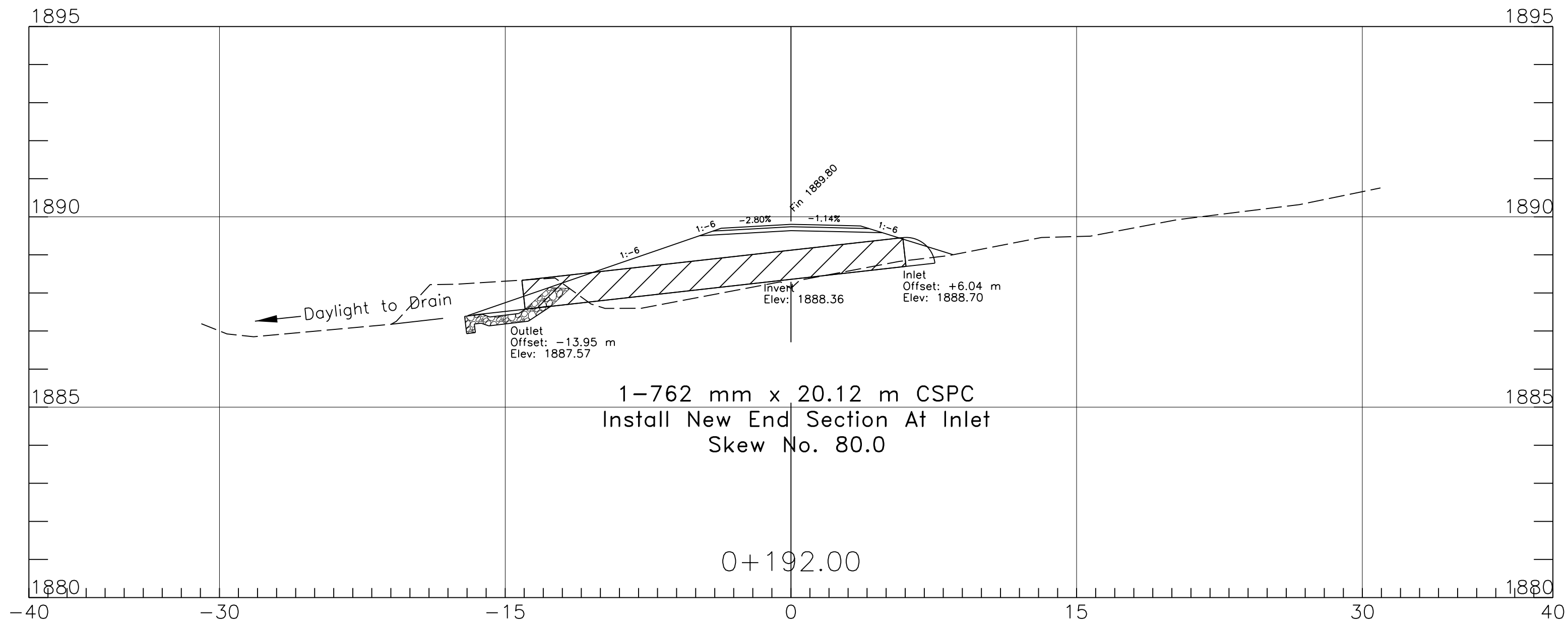
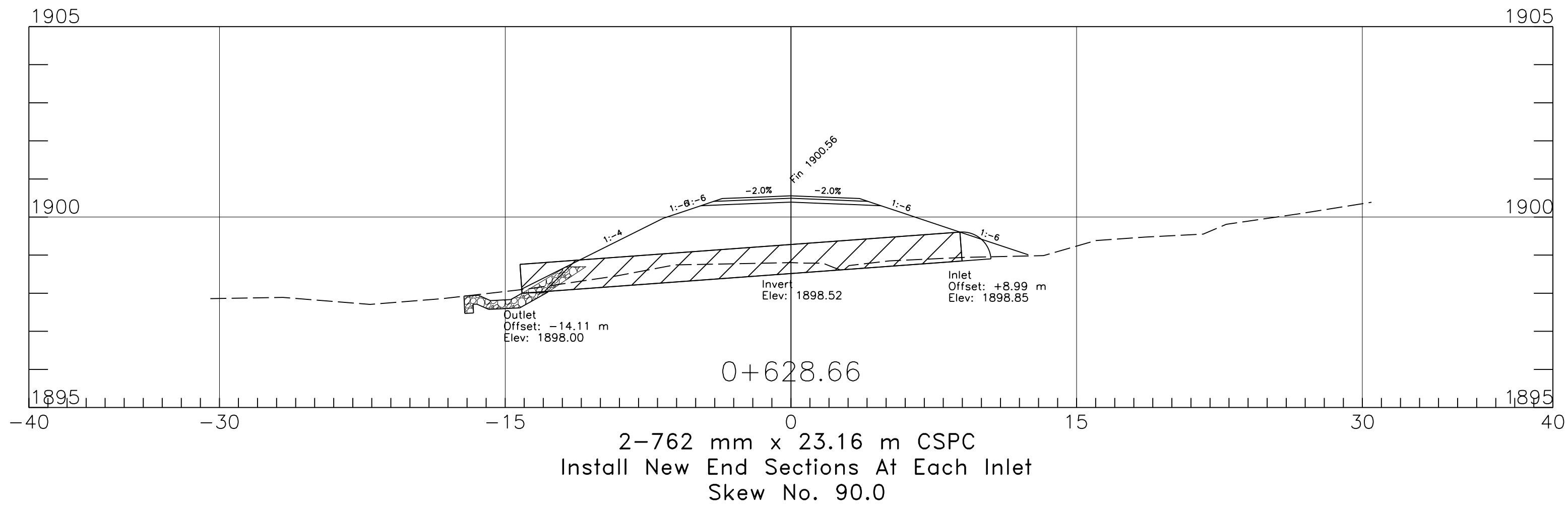
| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
|--------|---------|-------------|-------|-------------|-------|--------------|
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 37    | 39           |



GENERAL NOTES

1. DRAINAGE PIPE(S) INVERT ELEVATION AND LENGTHS ARE APPROXIMATE. FINAL ELEVATIONS AND LENGTHS TO BE FIELD DETERMINED BY THE CONTRACTOR AS PART OF THE REVISED PIPE LIST SUBMITTAL PACKAGE. GUIDANCE ON DEVELOPING A REVISED PIPE LIST CAN BE PROVIDED UPON REQUEST TO THE CONTRACTOR.
2. THE REVISED PIPE LIST SURVEY DATA SHALL BE VERIFIED BY THE COR/AOTR AND THE CONTRACTOR'S QCM PRIOR TO SUBMITTAL TO THE REGIONAL DIVISION OF TRANSPORTATION.
3. DO NOT INSTALL PIPE CULVERT(S) BELOW EXISTING CHANNEL BOTTOM
4. THE PIPE X-SECTIONS ARE SHOWN PARALLEL TO PIPE SKEW.

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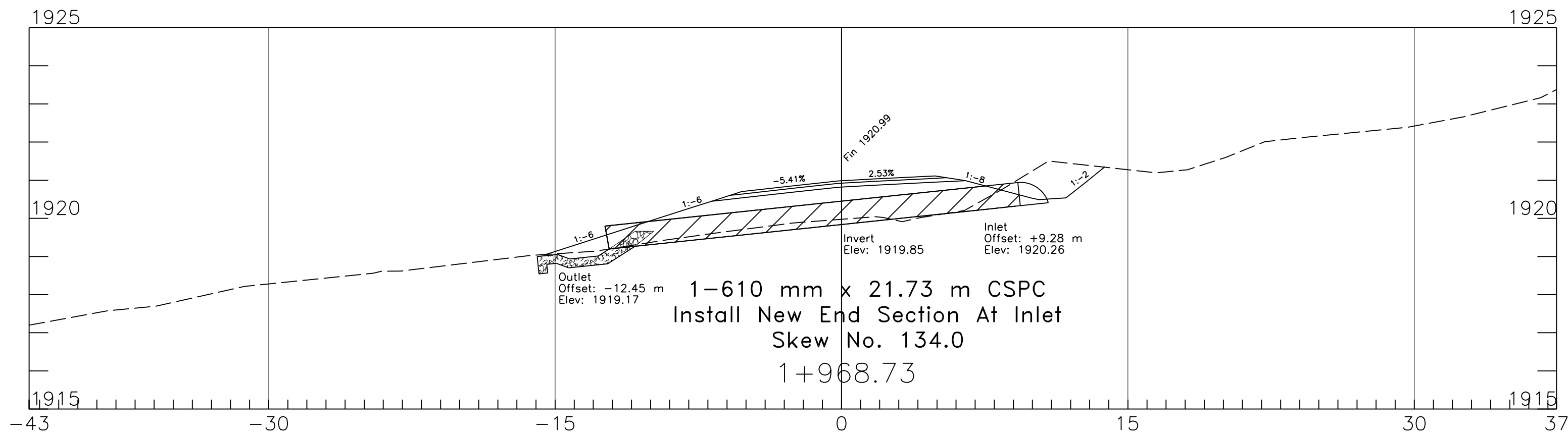
UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF INDIAN AFFAIRS  
NAVAJO REGIONAL OFFICE \* DIVISION OF TRANSPORTATION

PIPE CROSS SECTION

DRAWN BY: NRODOT DATE: 10/2002  
DESIGNED BY: NRODOT DATE: 10/2002  
REVISED: 10/2010 BY: NRODOT  
SCALE: n/a  
FILENAME: Sht\_36\_PIPE\_XS  
SHEET MODEL NAME: PLOT SHEET

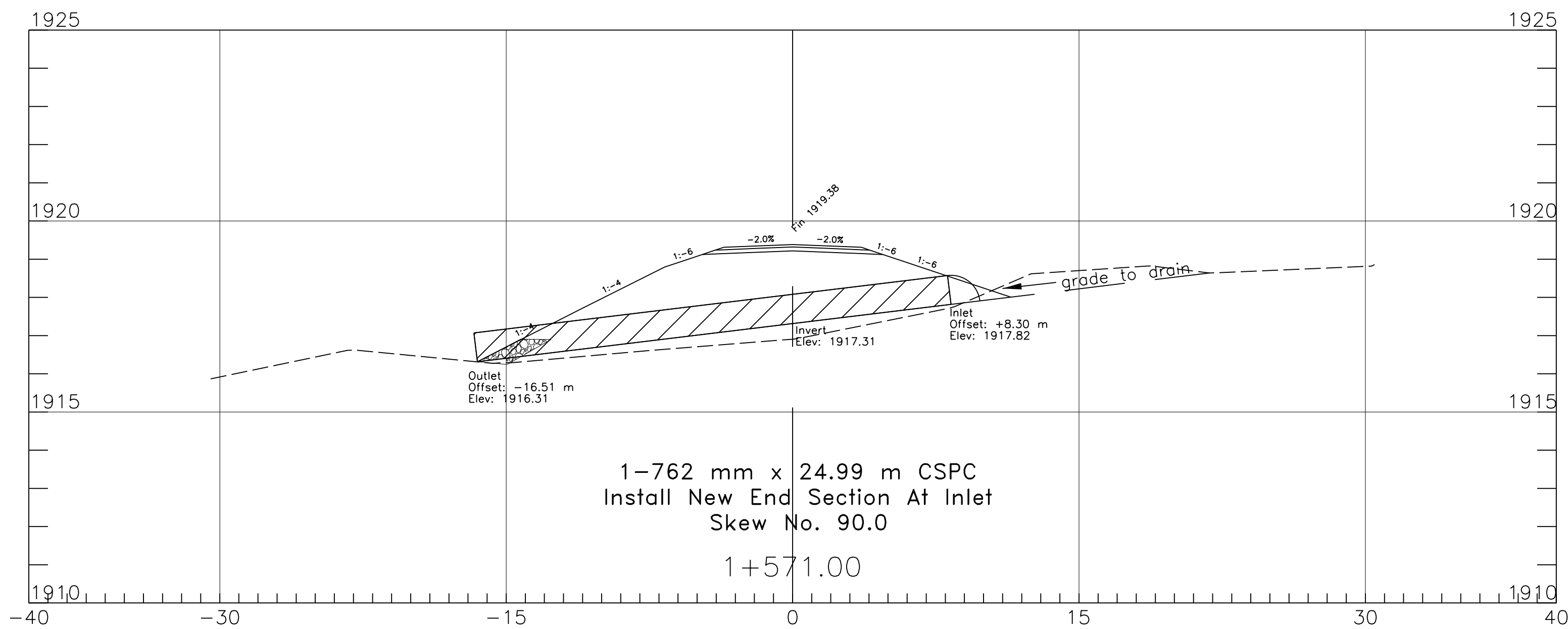
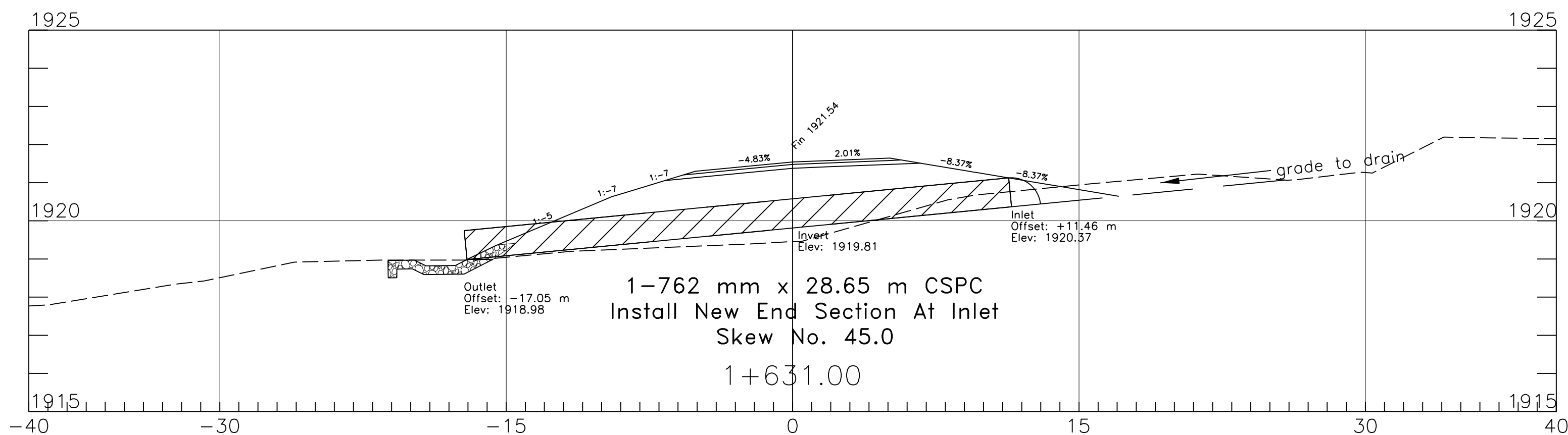


| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
|--------|---------|-------------|-------|-------------|-------|--------------|
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 38    | 39           |



GENERAL NOTES:  
See Sheet 37 of 39 for Additional Notes.

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## PIPE CROSS SECTION

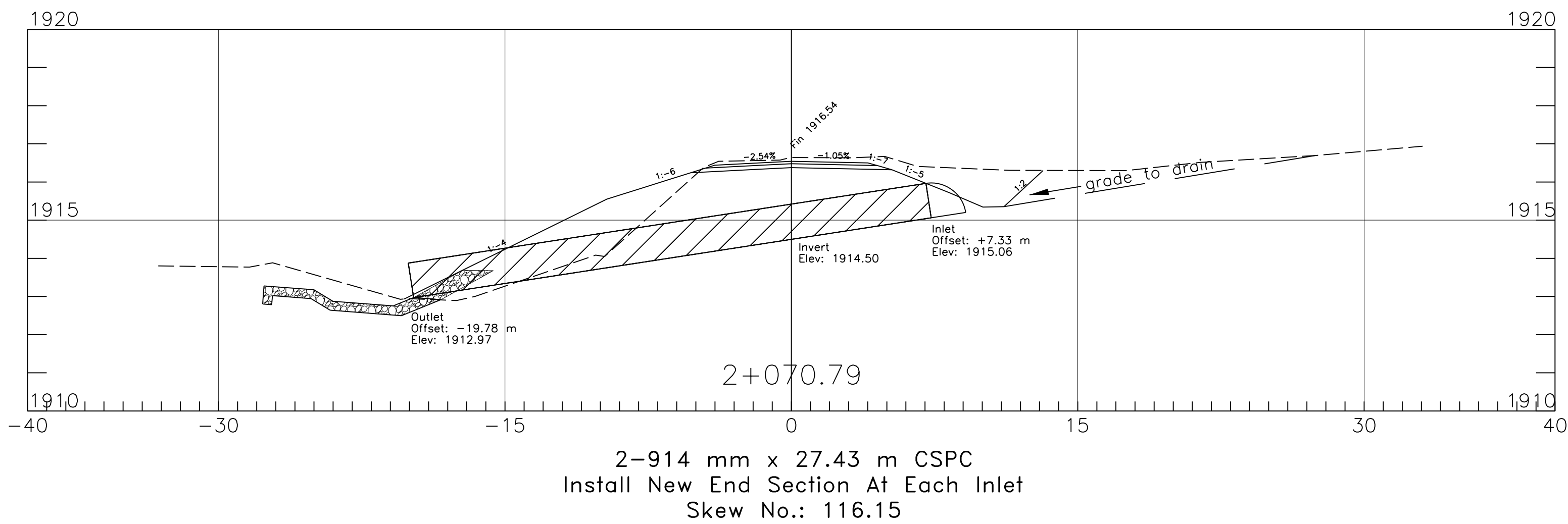
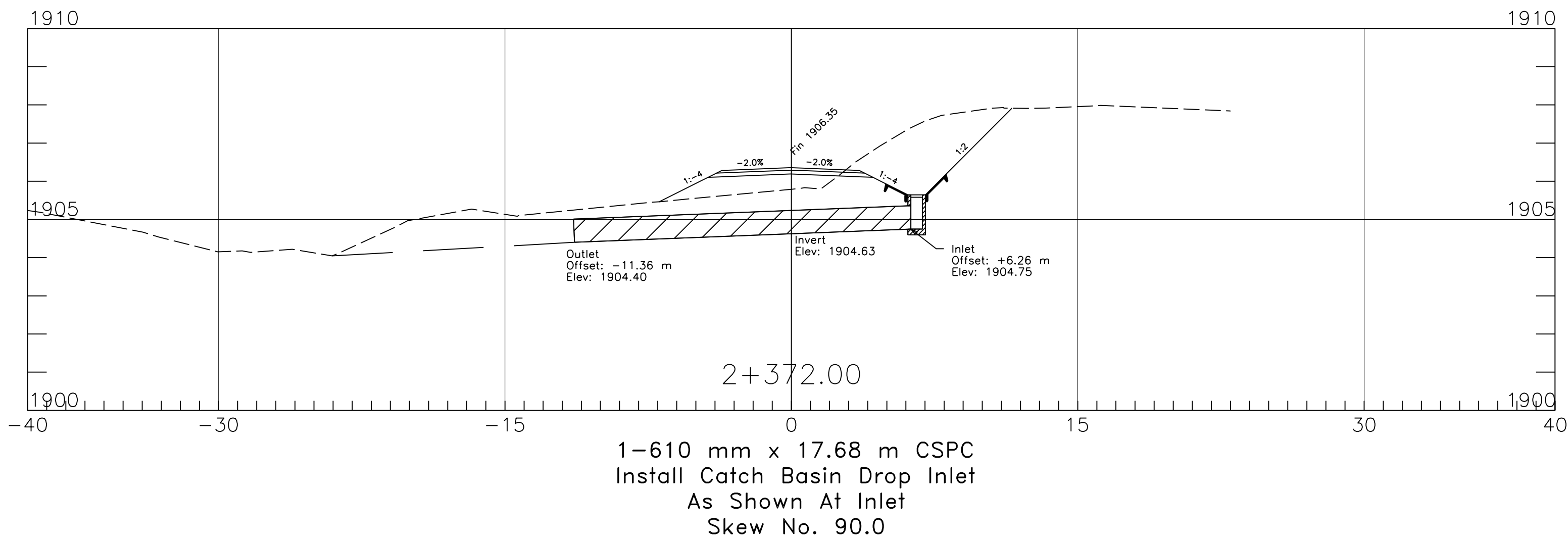
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SCALE: n/a  
FILENAME: Sht\_37\_PIPE.XS  
SHEET MODEL NAME: PLOT SHEET



| REGION | STATE   | RESERVATION | ROUTE | PROJECT NO. | SHEET | TOTAL SHEETS |
|--------|---------|-------------|-------|-------------|-------|--------------|
| NAVAJO | ARIZONA | NAVAJO      | N9345 | N9345(2)2&4 | 39    | 39           |

\* See Sheet 37 Of 39 For General Notes.

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PIPE CROSS SECTION

|                              |               |
|------------------------------|---------------|
| DRAWN BY: NRODOT             | DATE: 10/2002 |
| DESIGNED BY: NRODOT          | DATE: 10/2002 |
| REVISED: 10/2010             | BY: NRODOT    |
| SCALE: n/a                   |               |
| FILENAME: Sht_38_PIPE_XS     |               |
| SHEET MODEL NAME: PLOT SHEET |               |