

Navajo Nation Division of Transportation

Request for Proposal (RFP)

Bid No. 20-05-2317LE

The Navajo Division of Transportation (Navajo DOT) is soliciting proposals to construct "N9402(2)1,2&3 Bridge N656 Replacement Project in Lupton, AZ". The proposed work consists of grading, subgrade, placement of aggregate base course with stabilization, installation of drainage structures, bridge replacement with abutment protection, traffic signs, and other miscellaneous work as called for in the design plans and specifications for this 0.390 km (0.242 miles) bridge replacement project over the Rio Puerco River in Lupton, AZ, Apache County, Navajo Nation.

Proposals will be subject to all requirements specified in RFP No. 20-05-2317LE. The RFP package will be available for download from the Navajo DOT website (www.navajodot.org), beginning June 25, 2020 at 10:00 AM.

A MANDATORY Virtual Pre-Proposal Meeting will be held on Thursday, July 2, 2020 at 10:00 AM (local Window Rock, AZ time). The Pre-Proposal Meeting will consist of a brief presentation explaining the Project Scope and the necessary items required to be submitted as part of the RFP. Contractors are encouraged to conduct a field review of the project site located 0.25 miles south of I-40 in Lupton, AZ on their own.

The link for the web meeting and conference call number are as follows:

<https://global.gotomeeting.com/join/963957325>

1-877-568-4106, Access Code 963-957-325

Proposal and bid package must be physically submitted to the following address by July 23, 2020, no later than 4:00 PM (local Window Rock, AZ time):

Navajo Division of Transportation
Attention: Ardanial Begay
Navajo Transportation Complex
#16 Old Coal Mine Road
Mentmore, NM 87319
(505) 371-8351

The Navajo Nation Business Opportunity Act and Navajo Preference Act shall apply to this project. Prospective bidders are encouraged to familiarize themselves with these provisions. Having preference does not guarantee the award of the project. Competitive Sealed Proposals under the Navajo Nation Business Opportunity Act shall be utilized in the selection of the Contractor. Refer to 12 N.N.C. §332 Competitive Sealed Proposals.

The Navajo Nation reserves the right to waive any formalities or irregularities in the Request for Proposals and/or to reject any or all bids; to be the sole judge of the suitability of the materials offered and to award a contract for the furnishing of services it deems to be in the best interest of the Navajo Nation.

PROPOSAL SUBMITTAL



All proposals MUST have the Prospective Respondent's name and contact information on the outside of the Sealed Proposal and Proposal Cost (envelopes). If not included, it will be considered "Non-Responsive."

All proposals are to be submitted to:

Navajo Division of Transportation
Attention: Ardaniel Begay
Navajo Transportation Complex
#16 Old Coal Mine Road
Mentmore, NM 87319
Phone: (505) 371-8351

All proposals and bid schedule shall be sent in sealed envelope, clearly marked with the following information:

Respondent's Contact Information

RFP Bid Number:	20-05-2317LE
Project Name:	N9402(2)1,2&3
Contact Person:	Ardaniel Begay Navajo Division of Transportation Work Phone: (505) 371-8351 Email: abegay@navajodot.org

Please submit one (1) original and five (5) copies of proposals.

PART I

INFORMATION ONLY – NO RESPONSE TO THIS SECTION IS REQUIRED

- A. This Request for Proposal (RFP) provides the prospective respondents with sufficient information that will enable them to prepare and submit a proposal for consideration.
- B. This RFP contains the instructions governing the proposals to be submitted and the materials to be included. These are mandatory requirements which must be met to be eligible for consideration. Failure to adhere will result in a “Non-Responsive” Status.
- C. SCHEDULE OF ACTIVITIES AND TIMELINES:

Schedule of Activities	Timelines
Mandatory Pre-Proposal Meeting	Thursday, July 2, 2020 at 10:00 a.m.
Prospective respondents “Inquiry Timeline.” Questions regarding this RFP must be submitted in writing, by fax or email prior to this date. No questions accepted after this date.	Friday, July 10, 2020, by 4:00 p.m.
Written responses to written questions will be distributed in writing through an Addendum issued on this date.	Thursday, July 16, 2020, by 10:00 a.m.
Due date for all proposals	Thursday, July 23, 2020, by 4:00 p.m.
Opening of proposals and evaluations by the Review Panel	Between July 27, 2020 to July 31, 2020
Selection of Contractor	Tuesday, August 4, 2020

- D. INQUIRIES: Questions regarding this RFP must be submitted in writing, by fax or email to the Project Contact listed below. Written questions as to the intent or clarity of this RFP can be submitted to the Project Contact until the inquiring date listed in Section C. Written responses to written questions and any RFP amendments will be distributed in writing through an Addendum issued on the date listed in Section C. No further questions, in any form, will be entertained after the date listed in Section C.

Project Contact: Ardaniel Begay, Principal Contract Analyst, Navajo Division of Transportation, Telephone: (505) 371-8351, Fax: (505) 371-8399, and Email: abegay@navajodot.org

- E. ADDENDUM OR SUPPLEMENT TO THIS REQUEST FOR PROPOSALS: In the event it becomes necessary to revise any part of this RFP, an addendum will be issued. **The addendum(s) will be available for download from the Navajo Division of Transportation (Navajo DOT) website (www.navajodot.org).** It is important that respondents check the Navajo DOT website for addendum(s). Any respondents that already submitted a proposal will be notified.

- F. PROPOSALS SUBMISSION: Proposal must be received by Thursday, July 23, 2020, at 4:00 p.m. (local Window Rock, AZ time). Respondents who are mailing their proposals should allow sufficient time for mail delivery to ensure receipt by the time specified. If mailed, it is recommended that proposals be sent by certified mail to the address indicated on Page 2 of this RFP.
- G. NUMBER OF PROPOSALS TO BE SUBMITTED: In the submission of a proposal, one original and five (5) copies must be enclosed in **one sealed envelope**. A separately sealed Bid Schedule envelope should be contained within this overall proposal envelope as described in Part III, Section G. The outside of the proposal envelope should be clearly marked with: 1) Respondent's Contact information; 2) the RFP Bid Number; 3) the Project Name; and 4) the NDOT Contact Person.
- H. LATE RECEIPT OF PROPOSALS: Late proposals will not be accepted. It is the responsibility of the respondent to ensure that the proposal arrives at the Navajo DOT on or before the date/time specified.
- I. REJECTION OF PROPOSALS: The Navajo DOT reserves the right to reject any or all proposals and to waive informalities and minor irregularities in the proposals received.
- J. PROPRIETARY INFORMATION: Any restriction on the use of the information, data, contents contained within the proposals must be clearly stated in the proposal itself. Each and every page of the propriety material must be labeled or identified with the word "Proprietary." Proprietary information submitted in response to this RFP will be handled in accordance with applicable procurement regulations.
- K. PROPOSAL MATERIAL OWNERSHIP: All material submitted in reference to this RFP shall become the property of the Navajo Nation and will not be returned to the respondent. Responses received will be retained by the Navajo DOT and may be reviewed by any person(s) after the final selection has been made, subject to Section J. The Navajo DOT has the right to use any or all systems, ideas presented in this RFP, subject to limitations in Section J. Disqualification or non-selection of a respondent does not eliminate this right.
- L. INCURRING COSTS: The Navajo DOT is not liable for any cost incurred by the Respondent prior to issuance of signed contract award for services.
- M. ACCEPTANCE OF PROPOSAL CONTENT: The contents of the proposal of the successful respondent will become contractual obligation, if acquisition action ensues. Failure of the successful respondents to accept this obligation may result in cancellation of the award and such respondent may be removed from consideration for future solicitation.
- N. ACCEPTANCE TIME: The Navajo DOT, in coordination with the Navajo Nation Business Regulatory Department and the Navajo Nation Office of the Controller, intends to select the successful Respondent in the time specified in Section C, after the closing date of receipt of proposals.

- O. AWARD OF ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE (EJCDC) CONSTRUCTION CONTRACT: Upon selection, Navajo DOT will establish a construction contract using the C-520, C-700 and Navajo Nation Supplemental General Conditions, reviewed and approved by the Navajo Nation Department of Justice in the name of the successful respondent; and the contents of the proposal submitted by the respondent will become part of the contract. See attached sample EJCDC Construction Contract Documents.
- P. TAXES: All performance under this Contract within the territorial jurisdiction of the Navajo Nation is subject to the six percent (6%) Navajo Sales Tax (24 N.N.C. 601 et seq.).
- Q. JOINT PROPOSALS: Nothing in this RFP shall be construed to prohibit respondents from entering into a consortium for the purpose of offering a proposal in response to this RFP. Parties to a consortium will not be permitted to submit independent proposals in response to this RFP.
- R. EVALUATION PROCEDURE AND CRITERIA:
- a. Review Panel: A Review Panel, with specific related technical background, will be selected and evaluate the proposals received in accordance with general criteria used herein. The review panel may request for a meeting for purposes of proposal clarification and the respondent should be prepared to provide any additional information the Review Panel feels necessary for a fair evaluation of the proposals.
 - b. Failure of a respondent to provide any information, requested in this RFP, may result in the proposal being disqualified. All proposals must be endorsed with the signature of a responsible official having the authority to bind the respondent in the execution of a contract.
 - c. The sole objective of the review panel is to select the respondent most responsive to the needs of the Navajo Nation and the Navajo DOT. The specification in this RFP represent the minimum performance necessary for a response. On the basis of the evaluation criteria established in this RFP, the Review Panel will select and recommend the respondent who best meets the objective in the Scope of Work in Part II.
 - d. Each RFP will be evaluated and points will be awarded for each criteria item as noted. Descriptions of the components are provided in Part III - Outline of Request for Proposal.
 - Qualifications and Capability.....25 points
 - Experience with Similar Work.....25 points
 - Project Understanding and Approach.....30 points
 - Litigations, Judgments and Surety Company Claims.....10 points
 - Certified Navajo Business.....0 – 10 points

- S. RETURN PROPOSAL: The Navajo Nation and Navajo DOT has no obligation in returning any of the proposals received in response to this RFP.
- T. COMPLIANCE WITH THE NAVAJO NATION BUSINESS OPPORTUNITY ACT: Proposal will be opened and evaluated in compliance with the Navajo Nation's Business Opportunity Act, 5 N.N.C., Chapter 2, Subsection 201 – 215 and the Navajo Nation Procurement Code Rules and Regulations. Refer to 12 N.N.C §332 Competitive Sealed Proposals.
- U. COMPLIANCE WITH THE NAVAJO NATION BUSINESS OPPORTUNITY ACT SUBCONTRACTING REQUIREMENTS: The Prime Contractor shall comply with the Navajo Nation Business Opportunity Act, 5 N.N.C., Chapter 2, Subsection 201 - 215 in the purchase of materials, special trades, subcontractors, or professional services. It is the intent of this Act to grant first opportunity and contracting preference to qualified Navajo-owned or Indian-owned businesses for all contracts, subcontracts, grants and subgrants issued by public and private entities within the Navajo Nation.
- i. For further information on the Navajo Business Opportunity Act is available at: <http://www.navajobusiness.com/pdf/DngBus/BusRegultry/Opportunity%20Act.pdf>
 - ii. For further information on the Source List- Certified Navajo Businesses is available at: http://navajobusiness.com/pdf/SourceList/Source_List.pdf

PART II

PURPOSE:

The purpose of this Request for Proposal (RFP) is to select a Contractor that will complete grading, drainage, aggregate base course, 5-span bridge and miscellaneous construction for a length of 0.390 km (0.242 miles) of roadway located in Lupton, AZ, Apache County, Navajo Nation.

The Navajo DOT will complete the following:

- Provide construction management/oversight during construction.
- Provide independent assurance materials testing as necessary.

SCOPE OF WORK

- Project N9402(2)1,2&3 includes: grading, subgrade, placement of aggregate base course with stabilization, installation of drainage structures, bridge replacement with abutment protection, traffic signs, and other miscellaneous work along approximately 0.390 km (0.242 miles) of BIA Route N9402 in Lupton, AZ.
- All work shall be completed in accordance with the Plans, "Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects FP-14" and Special Contract Requirements to FP-14 as provided.

- This project will utilize Tribal Transportation Program funding administered through the Federal Highway Administration and will need to comply with Federal Regulations and Requirements.
- See the attached EJCDC Construction Contract, Standard General Conditions, Navajo Nation Supplemental General Conditions, Special Contract Requirements, FP-14 Supplemental Specifications, Project Design Plans, Davis-Bacon Wage Determinations, Environmental Requirements & Permits and related documentation.

PROPOSAL FORMAT: Appearance of the proposal is important and professionalism in the proposal presentation should not be neglected. The proposal standards are as follows:

- The proposal shall not exceed 20 single-sided pages (maximum 8-1/2" x 11") with a minimum of 10 pt. type. If Proposer chooses to utilize 11" x 17" size sheets, this shall count as 2 pages. Submissions exceeding the 20 page limit will be considered non-responsive and will be un-rated. All pages in the proposal, including photos, charts, graphs, exhibits, letter of interest, etc. are counted toward the 20 pages. The following items do not count towards the 20 page proposal limit and shall be placed in an appendix to the proposal:
 - SF 1442 – Solicitation, Offer and Award
 - SF 24 - Bid Bond/Guarantee
 - SF 28 - Affidavit of Individual Surety
 - Affidavit of Non-Collusion
 - Proof of Certificate of Insurance
 - Statement from bonding agency
 - Statement from Insurance Carrier
 - Proof of Navajo Nation Certification
 - Acknowledgment of Addendums
- Submit one (1) original (unbound) and five (5) copies (plastic comb or wire spiral bound) of the proposal.

Part III

OUTLINE OF REQUEST FOR PROPOSAL

Prospective Respondent's interested in providing construction services shall submit a RFP that addresses the following evaluation criteria. The RFP shall be concise and fully self-contained; shall display clearly and accurately the capability, knowledge, experience and capacity of the Prospective Respondent to meet the requirements of this RFP; and must address the following specific criteria in the order and format indicated.

A. LETTER OF INTEREST:

Provide a Letter of Interest on the Prospective Respondent's company letterhead identifying the Prime Proposer and their subcontractors. Briefly summarize the Team's background and any distinguishing qualities or capabilities that uniquely qualify the Team for this project. This letter is to be signed by the president, executive director or owner of the company/organization with authority

to bind the Prospective Respondent contractually. In addition, Respondent should acknowledge receipt and review of the addendum(s).

B. QUALIFICATIONS AND CAPABILITY:

- a. Provide a graphic organizational structure chart, clearly describing who the Prime Contractor and individuals are, as well as the roles and responsible individuals of proposed subcontractors if any. Clarify who has decision-making authority.
 - Please reference Special Contract Requirements, Section 18, Contract Clause NN-236-1, Performance of Work by the Contractor in Exhibit C of Contract Book, as to the percent of the total dollar amount of work to be performed by the Prime Contractor under the contract.
- b. Describe how your management structure will facilitate completion of all construction work. Identify how this will result in an integrated and cohesive team for managing the project. Describe your commitment to ensure the work will be performed by the experienced personnel listed in this proposal.
- c. List the key individuals to be assigned to the project together with the job descriptions, qualifications, certifications, experience and length of time with company. Provide supporting resumes and two references for each position listed below:
 - Project Manager
 - Construction Manager / Superintendent
 - Lead Cost Estimator
 - Chief Scheduler
 - Quality Control Supervisor
 - Key Sub-contractors used for construction services. Key Subcontractors can be defined as ones completing any major work categories (earthwork, drainage, paving, signing/stripping, fencing, erosion control, traffic control, etc.) or total costs for their services add up to at least 5% of the total bid amount.
- d. Describe specifically the procedures the Prime Proposer and each of the Team members will employ to ensure that the project and the Owner are thoroughly supported from the earliest planning stages of construction through the completion of the warranty period. Describe the current workload and availability of staff to handle the project, for the Prime Proposer and each of the Team members.
- e. Document that each individual and/or firm that is proposing to perform material testing, general contracting and construction, and sub-contracting services, is properly licensed or registered to perform such services in the State of Arizona. Material testing consultants must be sufficiently covered by Professional Liability Insurance and contractors must be fully bonded and insured. Provide proof of your company's Certificate of Insurance and other insurances related to this project.

- f. Provide information regarding the financial capability of the Proposed Responder to successfully undertake projects of this type. Provide statements from bonding agencies and insurance carriers. The following bonds are required for the project:
- Bid Bond/Guarantee. Contractor shall provide to the Navajo Nation a Bid Bond/Guarantee as required by Special Contract Requirement, Section 18, Contract Clause NN-228-1 Bid Guarantee. The amount of the bid guarantee shall be ten (10) percent of the bid price per 12 N.N.C. §341 Bid Security.
 - Performance Bond. The successful Contractor shall provide to the Navajo Nation a Performance Bond as required in Article 11.1 of the Navajo Nation Supplemental General Conditions, Exhibit B of Contract Book, as attached under the EJCDC Construction Contract Documents. For the Proposal, provide affidavit from surety indicating Contractor's ability to provide said bond.
 - Payment Bond. The successful Contractor shall provide to the Navajo Nation a Payment Bond as required in Article 11.2 of the Navajo Nation Supplemental General Conditions, Exhibit B of Contract Book. For the Proposal, provide affidavit from surety indicating Contractor's ability to provide said bond.
 - Lesser Bond amounts. Contractor shall refer to Article 11.3 of the Navajo Nation Supplemental General Conditions, Exhibit B of Contract Book for requirements regarding Lesser Bond amounts.
 - Bonding documentation required. The Navajo Nation's Representative must receive written documentation of all required bonds prior to the issuance of a Notice to Proceed for the Project, and Contractor shall not commence any work or services under this Contract until such documentation is received by the Navajo Nation.
- g. Prime Contractor shall submit a Subcontracting Plan that complies with the Navajo Nation Business Opportunity Act listing the following:
- Subcontractors and suppliers to be used by the Prime Contractor;
 - Procedures used in selecting subcontractors and suppliers; and
 - Subcontracts or lease agreements for equipment to be used in performance of the contract.
 - For further information on the Navajo Business Opportunity Act is available at: <http://www.navajobusiness.com/pdf/DngBus/BusRegultry/Opportunity%20Act.pdf>
 - For further information on the Source List- Certified Navajo Businesses is available at: http://navajobusiness.com/pdf/SourceList/Source_List.pdf

C. EXPERIENCE WITH SIMILAR WORK:

Prospective Respondent shall demonstrate experience and quality of service rendered on road and bridge replacement construction projects with similar scope, size and characteristics, especially if completed on the Navajo Nation, other Indian Reservations and rural communities. List and describe in detail at least three (3) completed projects which establish the Prospective Respondent and Team members' experience with relevant transportation projects of similar size and scope completed in the last ten years. Provide the following information for each completed project:

- Project Name and Location
- Project Owner's Name and Address; Contact Name, Email Address, and Telephone Number
- Project Scope of Work Performed
- Original Contract Award / Final Contract Award
- Project Begin Date / Original Project End Date / Final Project End Date
- Number of Contract Modification(s), descriptions, and disposition.

Navajo DOT may contact references for performance appraisal of Prospective Respondent. Failure to provide examples of related projects may result in disqualification or considered as "non-responsive."

D. PROJECT UNDERSTANDING AND APPROACH:

Describe your understanding of the project and approach for delivering construction services for the project. Discuss the major issues your team has identified on this project and your proposed approach to address these issues.

The Owner seeks the best solutions to accelerate construction and deliver the project under budget while enhancing value and quality. Describe in detail the proposed innovations your team recommends.

Construction Management – Describe your approach to deliver this project including the following sub-factors:

- Costs – Describe your cost modeling process for the overall project including your strategy relating to a "no change order" philosophy to eliminate cost growth during construction.
- Schedule – Describe your construction scheduling methods to collaboratively optimize the project schedule and to address late project decisions and 3rd party constraints, such as utility relocations. Provide a proposed construction schedule/work plan using a Gantt chart, or other methods, to demonstrate when each major task or phase of construction will be completed for this project.
- Constructability Review – Describe your constructability review process that incorporates a collaborative team approach. Identify specific constructability issues for this project and your proposed solutions.

Manpower - Explain the availability of personnel to complete the project. This project has the potential to be of social and economic benefit to the community. The Owner desires maximum practical local participation in the project. Describe your Team's approach, if any, to actively promote utilization of local resources and labor.

Equipment - Provide a list of equipment needed to complete the project.

Communication Plan – Describe how Respondent will communicate with the Navajo DOT, Navajo Nation Lupton Chapter, and impacted residents on the progress of the project. Face-to-Face meeting is preferred when 30%, 60%, 90%, and 100% of the project is completed.

Describe your familiarity of constructing projects on the Navajo Nation. Emphasis is placed on the Respondent's ability to demonstrate sensitivity to Navajo cultural values, and the ability to work with the Navajo Nation government and its constituents at the local Lupton Chapter.

E. LITIGATIONS, JUDGMENTS & SURETY COMPANY CLAIMS:

Have any members of the Team been involved in any litigation with a project owner, municipality or other public agency in the last ten (10) years? If so, explain the circumstances, resolution, and current status.

Have primary members of the Team (i.e. Prime Respondent, Engineer, or Contractor) been involved in any construction-related litigation with any project owners in the last ten (10) years? If so, explain the circumstances, resolution, and current status.

Has a surety company finished a project of or paid a claim relative to any constructor identified in the RFP within the last ten (10) years? If so, explain the circumstances, resolution, and current status.

F. CERTIFIED NAVAJO BUSINESS:

Provide proof that business is currently certified by the Navajo Nation - Business Regulatory Department and prioritized under Navajo Nation Council Resolution CAP-37-02 and also under the Section 204 (A) (1) and (2) of the revised Navajo Nation Business Opportunity Act.

G. BID SCHEDULE / PROPOSAL COST:

In **a separate sealed envelope clearly marked** as "BID SCHEDULE – RFP #20-05-2317LE Project N9402(2)1,2&3", and with Respondent's information. The sealed envelope should be included in the overall proposal envelope, but will not be opened by the Review Team until after the proposals have been reviewed and ranked.

End of RFP.

Attachments

- 1) Bid Schedule
- 2) Addendum Acknowledgement

Other Documents

- 1) Plans - A set of the design plans can be obtained from the Navajo Division of Transportation website below during the Request for Proposal process.
<http://www.navajodot.org/RFP.aspx>
- 2) Contract Book
- 3) Geotechnical Report



**BID SCHEDULE
NAVAJO NATION DIVISION OF TRANSPORTATION**

PROJECT: N9402(2)1,2&3

Date: June 08, 2020

LENGTH: 0.390 km (0.242 miles)

ITEM	DESCRIPTION	Quantity	Units	Unit Bid Price	Total Price
10901-0000	Extra & Miscellaneous Work - Authorized under Suppl. Spec. 109.02(s) of Exhibit F	All Required	Lump Sum	\$60,000.00	\$60,000.00
15101-0000	Mobilization	All Required	Lump Sum	\$	\$
15201-0000	Construction Survey & Staking	All Required	Lump Sum	\$	\$
15301-0000	Contractor Quality Control	7,300	Man Hr	\$	\$
15701-0000	Soil Erosion Control	All Required	Lump Sum	\$	\$
20102-0000	Clearing and Grubbing	All Required	Lump Sum	\$	\$
20304-1000	Removal of Structures and Obstructions	All Required	Lump Sum	\$	\$
20401-0000	Roadway Excavation	744	m ³	\$	\$
20403-0000	Unclassified Borrow	3,604	m ³	\$	\$
20601-0000	Development of Water Supply	1.39	M-liter	\$	\$
25101-3000	Placed Riprap , Class-3 (Ditches)	1,025	m ³	\$	\$
25112-2000	Wire Enclosed Riprap, Class 2 (Abutment Protection)	833	m ³	\$	\$
30101-2000	Aggregate Base, Grading Special	154	t	\$	\$
30401-0000	Aggregate Stabilization with Roadbond EN 1-Road Bond, Imported Surface Course Aggregate Grading D, 152 mm Depth	2,731	m ²	\$	\$
55101-0200	Concrete Filled Steel Pipe Piles, PP 610 x 9.53, In Place	269	m	\$	\$
55120-0000	Test Piles	100	m	\$	\$
55201-0200	Structural Concrete Class A(AE)	500	m ³	\$	\$
55301-1700	Precast, Prestressed Concrete Bulb Tee Girders, BT-1370	20	Each	\$	\$
55401-1000	Reinforcing Steel, Grade 420	9,114	kg	\$	\$
55401-2000	Reinforcing Steel Epoxy Coated, Grade 420	58,288	kg	\$	\$
55502-0000	Structural Steel, Furnished, Fabricated, and Erected (Diaphragms)	3,738	kg	\$	\$
55502-0010	Structural Steel, Furnished, Fabricated, and Erected (Girt and Sway)	7,121	kg	\$	\$
55601-0900	Bridge Railing, Steel	269	m	\$	\$
56301-2000	Painting, Steel Structure (Pipe Piles)	All Required	Lump Sum	\$	\$
60201-0810	610 mm Corrugated Steel Pipe Culvert	30.4	m	\$	\$
60210-0810	End Section for 610 mm Corrugated Steel Pipe Culvert	1	Each	\$	\$
61701-5000	Guardrail System, SGR04b, Type PDE02 with MSKT TL3-8 End Treatment, Type "A" Installation	164	m	\$	\$
62101-0000	Monument (Right-Of-Way)	16	Each	\$	\$
62102-0000	Marker (Reference)	16	Each	\$	\$
62510-1000	Seeding, Dry Method	0.64	ha	\$	\$
62515-1000	Mulching, Dry Method	0.47	ha	\$	\$
62901-1100	Rolled Erosion Control Product, Type IV	1,664	m ²	\$	\$
63302-2002	Sign Installation, 1 Post and Hardware: 44mm x 44mm Square Tube	0.92	m ²	\$	\$



BID SCHEDULE
NAVAJO NATION DIVISION OF TRANSPORTATION

PROJECT: N9402(2)1,2&3

Date: June 08, 2020

LENGTH: 0.390 km (0.242 miles)

ITEM	DESCRIPTION	Quantity	Units	Unit Bid Price	Total Price
63302-2006	Sign Installation, 2 Post and Hardware: 50mm x 50mm Square Tube	1.13	m ²	\$	\$
63308-3000	Object Marker, Type 3, with 1-Post and Hardware: 2.98 kg/m	4	Each	\$	\$
63309-0020	Delineator, Type Glass Fiber, Type "1b"	7	Each	\$	\$
63501-0000	Temporary Traffic Control	All Req'd	Lump Sum	\$	\$
				Subtotal:	\$
				Navajo Nation Tax (6%):	\$
				Total Bid Price:	\$

Contractor Name

SCOPE-OF-WORK

The proposed work consists of furnishing all labor, material, equipment and incidentals necessary for construction of 0.390 km of grading and subgrade, placement of aggregate base course and treatment, removal of existing bridge and construction of 5-span bridge, installation of drainage structure and rip rap, guardrail, signs, and other miscellaneous construction in accordance with the specification and design drawings for this Project. The quantities listed for each item is estimated and the Unit Price is applicable to each as given in the Bid Schedule above. The final pay quantity measurements shall be rounded to the significant figures given in this bid schedule for the final pay estimate. Payment for work performed on Items furnished will be made in accordance with Sub-Section 109.05, Scope of Payment of FP-14. **The Unit Bid Price must include all overhead, profit, and bonding.**

Addendum Acknowledgement

Addendum:

In submitting this Bid, Respondent represents that: *Respondent has examined and carefully studied the RFP and attachments, and any data and reference items identified in the RFP documents, and hereby acknowledges receipt of the following Addenda:*

Addendum No:

Addendum Date:

Respondent's Acknowledgement Signature:

Name and Title

Company Name

Signature

CONTRACT BOOK FOR

N9402(2)1,2&3

**GRADE, DRAINAGE, AGGREGATE BASE COURSE,
5 SPAN BRIDGE and MISCELLANEOUS CONSTRUCTION
FOR LENGTH OF 0.390 km (0.242 miles) OF ROADWAY
LOCATED IN LUPTON, AZ,
APACHE COUNTY, NAVAJO NATION**

JUNE 2020



**Navajo Division of Transportation
Navajo Transportation Complex
#16 Old Coal Mine Road
Mentmore, NM 87319
Phone (505) 371-8300**

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Exhibit A - EJCDC C-700 Standard General Conditions

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Exhibit B - Navajo Nation Supplemental General Conditions (NNSGC)

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Contract Number: _____

**AGREEMENT BETWEEN GOVERNMENT AND CONTRACTOR
FOR CONSTRUCTION CONTRACT (FIXED PRICE)**

BUSINESS UNIT #'S & AMOUNTS: _____ \$ _____

_____ \$ _____

CONTRACT NOT TO EXCEED: _____ \$ _____

BEGINNING DATE OF CONTRACT: Date of Notice to Proceed

ENDING DATE OF CONTRACT: 534 calendar days after Date of Notice to Proceed

THIS AGREEMENT is by and between NAVAJO NATION (“Government”) and
_____ (“Contractor”)

ARTICLE 1 – WORK

1.1 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

GRADE, DRAINAGE, AGGREGATE BASE COURSE, 5 SPAN BRIDGE and MISCELLANEOUS CONSTRUCTION FOR LENGTH OF 0.390 km (0.242 miles) OF ROADWAY LOCATED IN LUPTON, AZ, APACHE COUNTY, NAVAJO NATION.

ARTICLE 2 – THE PROJECT

2.1 The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows: Project **N9402(2)1,2&3** Includes:

Grading and subgrade, placement of aggregate base course and treatment, removal of existing bridge and construction of 5-span bridge, installation of drainage structure and rip rap, guardrail, signs, and other miscellaneous work as called for in the design plans and specifications for this project.

ARTICLE 3 – ENGINEER; GOVERNMENT AND CONTRACTOR’S REPRESENTATIVE

- 3.1 The Project has been designed by the BIA Navajo Regional Division of Transportation, herein referred to as “Engineer of Record”.
- 3.2 The Government’s representative [Contracting Officer (CO)] is Jonathan Nez (whose phone number is 928-871-7915) and will assume all duties and responsibilities, and have the rights and authority assigned to insure the completion of the Work in accordance with the Contract Documents.
- 3.3 The Contractor’s representative is _____ whose phone number is (XXX) XXX-XXXX.

ARTICLE 4 – CONTRACT TIMES

4.1 *Time of the Essence*

- A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.2 *Dates for Substantial Completion and Final Payment*

- A. The Work will be substantially completed on or before _____, and completed and ready for final payment in accordance with Paragraph 14.7 of the General Conditions on or before.

4.3 *Days to Achieve Substantial Completion and Final Payment*

The Work will be substantially completed within 504 calendar days after the date when the Contract Time commence (Notice to Proceed) to run as provided in Paragraph 2.3 of the General Conditions, and completed and ready for final acceptance in accordance with Paragraph 14.7 of the General Conditions within 534 calendar days after the date when the Contract Time commences.

Please note that the above durations take into consideration non-working days for weather conditions normal to the project area and provides adequate time for shutdowns during winter suspension(s) and holidays. See Article 12.3 of Standard General Conditions, Exhibit A for requirements related to Delay claims.

4.4 *Liquidated Damages*

- A. Contractor and Government recognize that time is of the essence as stated in Paragraph 4.1 above and that Government will suffer financial loss if the Work is not completed within the times specified in Paragraph 4.2 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. The contractor shall pay Government the amounts, as reflected in Table 108-1 of Section 108 in the FP-2014 for each day that expires after the time specified in Paragraph 4.2 above until the Work is substantially complete. After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by Government, Contractor shall continue to pay damages for each day that expires after the time specified in Paragraph 4.2 above for completion and readiness for final payment until the Work is completed and ready for final payment.

ARTICLE 5 – CONTRACT PRICE

5.1 Government shall pay Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined pursuant to Paragraphs 5.1.A, 5.1.B, or 5.1.C below as applicable:

- A. For all work other than Unit Price Work, a total sum of: \$0 in accordance with the Contractor's Schedule of Values, attached as Exhibit D.
- B. For all Unit Price Work, an amount equal to the sum of the established unit price for each separately identified item of Unit Price Work times the actual quantity of that bid item attached as Exhibit D.

The Bid prices for Unit Price Work set forth as of the Effective Date of the Agreement are based on estimated quantities. As provided in Paragraph 11.3 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by the Construction Manager.

- C. For all Work, at the prices stated in Contractor's Bid, attached hereto as Exhibit "D".

ARTICLE 6 – PAYMENT PROCEDURES

6.1 *Submittal and Processing of Payments*

- A. Contractor shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by Construction Manager as provided in the General Conditions.

6.2 *Progress Payments; Retainage*

As provided for in Articles 16 of Exhibit B.

6.3 *Final Payment*

- A. Upon final completion and acceptance of the Work in accordance with Paragraph 14.7 of the General Conditions, Government shall pay the remainder of the Contract Price as recommended by Construction Manager as provided in said Paragraph 14.7.

ARTICLE 7 – INTEREST

7.1 All moneys not paid when due as provided in Article 14 of the General Conditions shall bear interest at the rate of 5% percent per annum.

ARTICLE 8 – CONTRACTOR’S REPRESENTATIONS

- 8.1 In order to induce Government to enter into this Agreement, Contractor makes the following representations:
- A. Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.
 - B. Contractor has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
 - C. Contractor is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.
 - D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities), if any, that have been identified in Paragraph 4.2 of the Standard General Conditions as containing reliable "technical data," and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in Paragraph 4.6 of the Standard General Conditions as containing reliable "technical data."
 - E. Contractor has considered the information known to Contractor; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Contract Documents; and (3) Contractor’s safety precautions and programs.
 - F. Based on the information and observations referred to in Paragraph 8.1.E above, Contractor does not consider that further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.
 - G. Contractor is aware of the general nature of work to be performed by Government and others at the Site that relates to the Work as indicated in the Contract Documents.
 - H. Contractor has given Government written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
 - I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

ARTICLE 9 – CONTRACT DOCUMENTS

9.1 *Contents*

The Contract Documents are as shown in Article 2 of Exhibit B.

ARTICLE 10 – MISCELLANEOUS

10.1 *Terms*

A. Terms used in this Agreement will have the meanings stated in the General Conditions and the Supplementary Conditions.

10.2 *Assignment of Contract*

A. Assignment of this Contract is prohibited under Article 26 of Exhibit B.

10.3 *Successors and Assigns*

A. As provided for in Article 27 of Exhibit B.

10.4 *Severability*

A. As provided for in Article 30 of Exhibit B.

10.5 *Contractor's Certifications*

A. Contractor agrees to submit an “Affidavit of Non-Collusion” prior to the Government’s execution of this Contract. The Contractor shall certify (see forms in Exhibit E) that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 10.5:

1. “corrupt practice” means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;
2. “fraudulent practice” means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Government, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Government of the benefits of free and open competition;
3. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Government, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
4. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

IN WITNESS WHEREOF, Government and Contractor have signed this Agreement. Counterparts have been delivered to Government and Contractor. All portions of the Contract Documents have been signed or have been identified by Government and Contractor or on their behalf.

This Agreement will be effective on _____ which is the Effective Date of the Agreement.

**Notice To Proceed Date, will be given once contract is fully reviewed (in accordance with the 164 Review Process), encumbered, and assigned a contract number by Navajo Nation Division of Finance.*

NOTE TO CONTRACTOR

The Effective Date of the Agreement and the dates of any Construction Performance Bond and Construction Payment Bond (Exhibit E) should be the same, if possible. In no case may the date of any bonds be earlier than the Effective Date of the Agreement.

GOVERNMENT:

The Navajo Nation

By: Jonathan Nez

Title: President

(If Contractor is a corporation, a partnership, or a joint venture, attaches evidence of authority to sign.)

Attest: _____

Title: _____

Address for giving notices:

P.O. Box # 7440

Window Rock, Az. 86515

(If Government is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)

Contract has been reviewed and determined to

be in Accordance with Navajo Nation Law.

CONTRACTOR:

By: _____

Title: _____

Attest: _____

Title: _____

Address for giving notices:

License No.: _____

(Where applicable)

Agent for service of process:

EXHIBIT A

EJCDC STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

AS MODIFIED FOR THE N9402(2)1,2&3 PROJECT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.1 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agreement*—The written instrument which is evidence of the agreement between Government and Contractor covering the Work.
 3. *Application for Payment*—The form acceptable to Construction Manager which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *Asbestos*—Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.
 5. *Bid*—The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 6. *Bidder*—The individual or entity who submits a Bid directly to Government.
 7. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).
 8. *Bidding Requirements*—The advertisement or request for proposals, Instructions to Bidders, Bid security of acceptable form, if any, and the Bid Form with any supplements.
 9. *Change Order*—A document recommended by Construction Manager which is signed by Contractor and Government and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement. See paragraph 2 of Exhibit C.
 10. *Claim*—A demand or assertion by Government or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.
 11. *Construction Manager (CM)*—The Government’s field project representative (as further defined in Supplemental Specification Section 101.04).

12. *Contract*—The entire and integrated written agreement between the Government and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.
13. *Contract Documents*—Those items so designated in Article 9 of the Agreement.
14. *Original Contract Amount*—The moneys payable by Government to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement.
15. *Contract Times*—See Article 4 of the Agreement.
16. *Contractor*—The individual or entity with whom Government has entered into the Agreement.
17. *Cost of the Work*— See Paragraph 11.1 for definition.
18. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.
19. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective.
20. *Engineer of Record (or Engineer)*—The Government’s representative who is responsible for the project designs/plans/Drawings (as further defined in Supplemental Specification Section 101.04).
21. *Field Order*—A written order issued by the Construction Manager which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.
22. *General Requirements*—Various Articles of these Standard General Conditions of the Construction Contract.
23. *Government*—The Navajo Nation acting through the Contracting Officer (CO), the person designated from the Navajo Nation with the authority to enter into, administer, and/or terminate contracts and make related determinations and findings (as further defined in Supplemental Specification Section 101.04).
24. *Hazardous Environmental Condition*—The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto.
25. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.
26. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
27. *Liens*—Charges, security interests, or encumbrances upon Project funds, real property, or

personal property.

28. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.
29. *Notice of Award*—The written notice by Government to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Government will sign and deliver the Agreement.
30. *Notice to Proceed*—A written notice given by Government (CO) to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents. See Article 8 of Exhibit B.
31. *Owner*—The entity/agency who holds the easement for which the project is being constructed on.
32. *PCBs*—Polychlorinated biphenyls.
33. *Petroleum*—Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-hazardous waste and crude oils.
34. *Progress Schedule*—A construction schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.
35. *Project*—The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.
36. *Project Manual*—The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.
37. *Radioactive Material*—Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.
38. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
39. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.
40. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.
41. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or

information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

42. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Government which are designated for the use of Contractor.
43. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.
44. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.
45. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Construction Manager, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.
46. *Successful Bidder*—The Bidder submitting a responsive Bid to whom Government makes an award.
47. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements these General Conditions, including the Navajo Nation Supplemental General Conditions (NNSGC), Exhibit B.
48. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or Subcontractor.
49. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
50. *Unit Price Work*—Work to be paid for on the basis of unit prices.
51. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents. See Article 1 of the Agreement.
52. *Work Change Directive*—A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Government and recommended by Engineer of Record

ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.2 Terminology

A. The words and terms discussed in Paragraph 1.2.B through F are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives:*

1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.9 or any other provision of the Contract Documents.

C. *Day:*

1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective:*

1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - a. does not conform to the Contract Documents; or
 - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - c. has been damaged prior to Construction Manager’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Government at Substantial Completion in accordance with Paragraph 14.4 or 14.5).

E. *Furnish, Install, Perform, Provide:*

1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
 2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
 3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
 4. When “furnish,” “install,” “perform,” or “provide” is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, “provide” is implied.
- F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.1 *Delivery of Bonds and Evidence of Insurance*

- A. *Bonding Requirement:* See Article 11 of Exhibit B.
- B. *Evidence of Insurance:* See Article 9 of Exhibit B.

2.2 *Copies of Documents*

- A. Due to excessive costs incurred by the Government in printing, the Government will no longer be providing plans and specifications for its projects to the Contractor, suppliers and/or subcontractors. The Government shall furnish electronic media in Acrobat (*.PDF) format from which the Contractor may produce hard copy drawings.

Any Prime Contractor bidding on Government contracts is responsible for providing its Subcontractors and Suppliers with information relating to their respective disciplines for cost proposals. Any misinterpretation or incorrect bids made to the Prime Contractor by the Subcontractor or Suppliers will not relieve the prime Contractor of his obligation to honor the contract and bid proposal submitted.

2.3 *Commencement of Contract Times; Notice to Proceed*

- A. **EFFECTIVE DATE; TERM, NOTICE TO PROCEED REQUIRED.** The effective beginning and ending date of this Contract are as shown on the first page of the Agreement. The Contractor shall not commence any work until the Government issues a formal "Notice to Proceed" for the Project;

notwithstanding, the Contractor shall not commence any work until the effective date of all insurance required by Article 9 of Exhibit B. This Contract shall expire on the date shown unless earlier terminated or extended by modification in accordance with Article 12 herein.

2.4 *Starting the Work*

- A. The Contractor shall be required to (a) commence work under this contract within **ten** [10] calendar days after the date the Contractor receives the notice to proceed, (b) prosecute the work diligently, and (c) complete the entire work ready for use not later than the final date shown on the Contract Agreement. The time stated for completion shall include final cleanup of the premises.

2.5 *Before Starting Construction*

- A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in Paragraph 2.6), Contractor shall submit to Construction Manager for timely review:
1. a preliminary Construction Schedule (including each bid item of work) indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents (the performance time allowed under this contract is based on a forty-hour workweek);
 2. a preliminary Schedule of various Submittals including shop drawings, materials certifications, etc; and
 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit, bonding, and direct unit costs applicable to each item of Work.

2.6 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Government, Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.5.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.
- B. At this conference Government and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit instructions, receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party. The Authorized Representatives shall be listed in Article 3 of the Agreement.
- C. The Contractor shall furnish the following documents at this conference to the Government for review and approval prior to giving the notice to proceed:
1. Temporary Traffic Control Plan (TTCP)

2. Safety Plan
3. Quality Control Plan (QCP)
4. Storm Water Pollution Prevention Plan (SWPPP)
5. Construction Schedule

2.7 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Construction Manager, and others as appropriate will be held to review for acceptability to Construction Manager as provided below the revised construction schedules submitted in accordance with Paragraph 2.5.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Construction Manager.
 1. The Progress Schedule will be acceptable to Construction Manager if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Construction Manager responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
 2. Contractor's Schedule of Submittals will be acceptable to Construction Manager if it provides a workable arrangement for reviewing and processing the required submittals.
 3. Contractor's Schedule of Values will be acceptable to Construction Manager as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.1 *Intent*

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all; except see Article 3 of Exhibit B.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that reasonably may be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the indicated result will be provided whether or not specifically called for, at no additional cost to Government.
- C. Clarifications and interpretations of the Contract Documents shall be issued by Construction Manager or Engineer as provided in Article 9.

3.2 *Reference Standards*

- A. Standards, Specifications, Codes, Laws, and Regulations
 1. Reference to standards, specifications, manuals, or codes of any technical society,

organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard, specification, manual, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Government, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Government, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.3 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies:*

1. *Contractor's Review of Contract Documents Before Starting Work:* Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Construction Manager any conflict, error, ambiguity, or discrepancy which Contractor discovers, or has actual knowledge of, and shall obtain a written interpretation or clarification from Construction Manager before proceeding with any Work affected thereby.
2. *Contractor's Review of Contract Documents During Performance of Work:* If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) any standard, specification, manual, or code, or (c) any instruction of any Supplier, then Contractor shall promptly report it to Construction Manager in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.4.
3. The Government assumes no responsibility for any conclusions or interpretations made by the Contractor based on the information made available by the Government. Nor does the Government assume responsibility for any understanding reached or representation made concerning conditions which can affect the work by any of its officers or agents before the execution of this contract, unless that understanding or representation is expressly stated in this contract.

B. *Resolving Discrepancies:*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:

- a. the provisions of any standard, specification, manual, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference in the Contract Documents); or
- b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.4 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.
- B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways, provided that any such additions, deletions, revisions or modifications shall be duly approved in accordance with Article 32 of the NNSGC, Exhibit B:
 1. A Field Order;
 2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 6.17.D.3); or
 3. Engineer's written interpretation or clarification.

3.5 *Reuse of Documents*

- A. Contractor and any Subcontractor or Supplier shall not:
 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions; or
 2. reuse of any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Government and Engineer and specific written verification or adaptation by Engineer.
- B. The prohibitions of this Paragraph 3.5 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.6 *Electronic Data*

- A. Unless otherwise stated in the Supplementary Conditions, the data furnished by Government or Engineer to Contractor, or by Contractor to Government or Engineer, that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's

sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.

- B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.
- C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.1 *Availability of Lands*

- A. Owner shall furnish the Site. Government shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities as required. If Contractor and Government are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Government's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.5.
- B. Upon reasonable written request, Government shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Government's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.2 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
 - 1. those reports known to Government of explorations and tests of subsurface conditions at or contiguous to the Site; and
 - 2. those drawings known to Government of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, and response to questions, but such reports and drawings are not Contract Documents. Such "technical data"

is identified in the Supplementary Conditions. Except for such reliance on such “technical data,” Contractor may not rely upon or make any claim against Government or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor’s purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
3. any Contractor interpretation of or conclusion drawn from any “technical data” or any such other data, interpretations, opinions, or information.

4.3 *Differing Subsurface or Physical Conditions*

A. *Notice:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed either:

1. is of such a nature as to establish that any “technical data” on which Contractor is entitled to rely as provided in Paragraph 4.2 is materially inaccurate; or
2. is of such a nature as to require a change in the Contract Documents; or
3. differs materially from that shown or indicated in the Contract Documents; or
4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents; then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Government and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *Engineer’s Review:* After receipt of written notice as required by Paragraph 4.3.A, Engineer will promptly review the pertinent condition, determine the necessity of Government’s obtaining additional exploration or tests with respect thereto, and advise Government in writing (with a copy to Contractor) of Engineer’s findings and conclusions.

C. *Possible Price and Times Adjustments:*

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor’s cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. such condition must meet any one or more of the categories described in Paragraph

4.3.A; and

- b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.7 and 11.3.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:
 - a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Government with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or
 - b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or
 - c. Contractor failed to give the written notice as required by Paragraph 4.3.A.
 3. If Government and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.5. However, neither Government or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.4 *Underground Facilities*

- A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Government or Engineer by the owners of such Underground Facilities, including Government, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:
 1. Government and Engineer shall not be responsible for the accuracy or completeness of any such information or data provided by others; and
 2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
 - a. reviewing and checking all such information and data;
 - b. locating all Underground Facilities shown or indicated in the Contract Documents;
 - c. coordination of the Work with the owners of such Underground Facilities, including Government, during construction; and
 - d. the safety and protection of all such Underground Facilities and repairing any damage

thereto resulting from the Work.

B. Not Shown or Indicated:

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Government and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
2. If Engineer and Construction Manager concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Government and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Government or Contractor may make a Claim therefor as provided in Paragraph 10.5.

4.5 Reference Points

- A. Government shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Government. Contractor shall report to Construction Manager whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.6 Hazardous Environmental Condition at Site

- A. *Reports and Drawings:* The Supplementary Conditions identify those reports and drawings known to Government relating to Hazardous Environmental Conditions that have been identified at the Site.
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Government or Engineer, or any of their officers, directors, members,

partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
 2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.
- D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Government and Engineer (and promptly thereafter confirm such notice in writing). Government shall promptly consult with Engineer concerning the necessity for Government to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Government shall take such actions as are necessary to permit Government to timely obtain required permits and provide Contractor the written notice required by Paragraph 4.6.E.
- E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Government has obtained any required permits related thereto and delivered written notice to Contractor: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Government and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.5.
- F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Government may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Government and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.5. Government may have such deleted portion of the Work performed by Government's own forces or others in accordance with Article 7.

- G. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Government and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.6.G shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- H. The provisions of Paragraphs 4.2, 4.3, and 4.4 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 – BONDS AND INSURANCE

5.1 *Performance, Payment, and Other Bonds*

- A. As provided for in Article 11 of Exhibit B.

5.2 *Licensed Sureties and Insurers*

- A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Government and/or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions, Special Contract Requirements (Exhibit C) and Exhibit E.

5.3 *Certificates of Insurance*

- A. As provided for in Articles 9 and 10 of Exhibit B.

5.4 *Contractor's Insurance*

- A. As provided for in Articles 9 and 10 of Exhibit B.

5.5 *Government's Liability Insurance*

- A. Government, at Government's option, may purchase and maintain at Government's expense Government's own liability insurance as will protect Government against claims which may arise from operations under the Contract Documents.

5.6 *Property Insurance*

- A. The government is not responsible for insurable property interest losses of the contractor and subcontractors on this contract.

5.7 *Waiver of Rights*

- A. Contractor waives all rights against the Government and their respective officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) under such policies for losses and damages so caused.

5.8 *Receipt and Application of Insurance Proceeds*

- A. Any insured loss under the policies of insurance required by Paragraph 5.6 will be adjusted with Government and made payable to Government as fiduciary for the loss payees, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.8.B. Government shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order.
- B. Government as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Government's exercise of this power. If such objection be made, Government as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Government as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Government as fiduciary shall give bond for the proper performance of such duties.

5.9 *Acceptance of Bonds and Insurance; Option to Replace*

- A. If either Government or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.1.B. Government and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds or insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

- A. If Government finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.5, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.6 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 – CONTRACTOR’S RESPONSIBILITIES

6.1 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Government or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Government and Engineer except under extraordinary circumstances.
- C. See also Article 14 of Exhibit B.

6.2 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site. The Contracting Officer (CO) may require, in writing, that the Contractor remove from the Work any employee the Government deems incompetent, careless, or otherwise objectionable.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Government’s written consent (which will not be unreasonably withheld) given after prior written notice to Construction Manager. Any costs associated with Government inspections/oversight on weekends, holidays or in excess of the normal 40-hour work week as a result of contractor induced delays or mistakes in the work, shall be deducted from the next progress payment. Contractor shall also comply with Navajo Nation laws in connection with hiring and subcontracting. See Article 33 of Exhibit B.

6.3 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment

and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

- B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Government. If required by Construction Manager, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.4 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.7 as it may be adjusted from time to time as provided below.
 - 1. Contractor shall submit to Construction Manager for acceptance (to the extent indicated in Paragraph 2.7) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.
 - 2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.5 *Substitutes and "Or-Equals"*

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Construction Manager for review under the circumstances described below.
 - 1. *"Or-Equal" Items:* If in Construction Manager's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Construction Manager as an "or-equal" item, in which case review and approval of the proposed item may, in Construction Manager's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.5.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

- a. in the exercise of reasonable judgment Construction Manager determines that:
 - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
 - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole; and
 - 3) it has a proven record of performance and availability of responsive service.
- b. Contractor certifies that, if approved and incorporated into the Work:
 - 1) there will be no increase in cost to the Government or increase in Contract Times; and
 - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. *Substitute Items:*

- a. If in Construction Manager's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.5.A.1, it will be considered a proposed substitute item.
- b. Contractor shall submit sufficient information as provided below to allow Construction Manager to determine if the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Construction Manager from anyone other than Contractor.
- c. The requirements for review by Construction Manager will be as set forth in Paragraph 6.5.A.2.d, as supplemented by the General Requirements, and as Construction Manager may decide is appropriate under the circumstances.
- d. Contractor shall make written application to Construction Manager for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
 - 1) shall certify that the proposed substitute item will:
 - a) perform adequately the functions and achieve the results called for by the general design,
 - b) be similar in substance to that specified, and
 - c) be suited to the same use as that specified;
 - 2) will state:
 - a) the extent, if any, to which the use of the proposed substitute item will prejudice

Contractor's achievement of Substantial Completion on time,

- b) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Government for other work on the Project) to adapt the design to the proposed substitute item, and
 - c) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;
- 3) will identify:
- a) all variations of the proposed substitute item from that specified, and
 - b) available engineering, sales, maintenance, repair, and replacement services; and
- 4) shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.

- B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Construction Manager. Contractor shall submit sufficient information to allow Construction Manager, in Construction Manager's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Construction Manager will be similar to those provided in Paragraph 6.5.A.2.
- C. *Government's Evaluation:* Construction Manager will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.5.A and 6.5.B. Construction Manager may require Contractor to furnish additional data about the proposed substitute item. Construction Manager will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Construction Manager's review is complete, which will be evidenced by a Change Order in the case of a substitute and an approved Shop Drawing for an "or equal." Construction Manager will advise Contractor in writing of any negative determination.
- D. *Special Guarantee:* Government may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- E. *Government's Cost Reimbursement:* Construction Manager will record Government's costs in evaluating a substitute proposal as submitted by Contractor pursuant to Paragraphs 6.5.A.2 and 6.5.B. Whether or not Construction Manager approves a substitute so proposed or submitted by Contractor; Contractor may be required to reimburse Government for the reasonable charges of evaluating each such proposed substitute. Contractor shall also reimburse Government for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Government) resulting from the acceptance of each proposed substitute.

- F. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.6 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Government as indicated in Paragraph 6.6.B), whether initially or as a replacement, against whom Government may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.
- B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Government in advance for acceptance by Government by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Government's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Government of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Government or Engineer to reject defective Work.
- C. Contractor shall be fully responsible to Government and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:
1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Government or Engineer and any such Subcontractor, Supplier or other individual or entity; nor
 2. shall create any obligation on the part of Government or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.
- D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.
- E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Construction Manager through Contractor.
- F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the

Work to be performed by any specific trade.

- G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Government and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as a loss payee on the property insurance provided in Paragraph 5.6, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Government, Contractor, Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same. See also Article 27 of Exhibit B and Section 108.02 of the FP-14 Specifications.

6.7 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Government or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Government in the Contract Documents.
- B. Contractor shall indemnify and hold harmless Government and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.8 *Permits*

- A. Unless otherwise provided in Exhibit I, Contractor shall obtain and pay for all construction permits and licenses. Government shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Contractor shall pay all charges of utility owners for connections for providing permanent service to the Work. See also Article 4.0 of Exhibit B.

6.9 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Government nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, and terms of the contract, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.3.
- C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times, in accordance with Article 32 of Exhibit B.

6.10 *Taxes*

- A. As provided for in Article 15 of Exhibit B.

6.11 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas:*

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.
2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.
3. Contractor shall indemnify and hold harmless Government and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Government, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

- B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other

debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

- C. *Cleaning*: Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Government. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading Structures*: Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 *Record Documents*

- A. The Contractor and Construction Manager shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Construction Manager for Government.

6.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:
 - 1. all persons on the Site or who may be affected by the Work;
 - 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 - 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

- C. Contractor shall comply with the applicable requirements of Government's safety programs, if any. The Supplementary Conditions identify any Government's safety programs that are applicable to the Work.
- D. Contractor shall inform Government and Engineer of the specific requirements of Contractor's safety program with which Government's and Engineer's employees and representatives must comply with while at the Site.
- E. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Government or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
- F. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Government and Contractor in accordance with Paragraph 14.7.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

- A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Construction Manager prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Construction Manager determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a modification may be entered into in accordance with Article 32 of Exhibit B.

6.17 *Shop Drawings and Samples*

- A. Contractor shall submit Shop Drawings and Samples to Construction Manager for review and

approval in accordance with the accepted Schedule of Submittals (as required by Paragraph 2.7). Each submittal will be identified as Construction Manager may require.

1. *Shop Drawings:*

- a. Submit number of copies specified in the General Requirements.
- b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Construction Manager the services, materials, and equipment Contractor proposes to provide and to enable Construction Manager to review the information for the limited purposes required by Paragraph 6.17.D.

2. *Samples:*

- a. Submit number of Samples specified in the Specifications.
- b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Construction Manager may require to enable Construction Manager to review the submittal for the limited purposes required by Paragraph 6.17.D.

B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Construction Manager's review and approval of the pertinent submittals will be at the sole expense and responsibility of Contractor.

C. *Submittal Procedures:*

1. Before submitting each Shop Drawing or Sample, Contractor shall have:

- a. reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
- b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
- c. determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
- d. determine and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.

3. With each submittal, Contractor shall give Construction Manager specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Construction Manager for review and approval of each such variation.

D. Engineer's Review:

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Construction Manager. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Construction Manager has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. Resubmittal Procedures:

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.18 Continuing the Work

- A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Government. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.4 or as Government and Contractor may otherwise agree in writing.

6.19 Contractor's General Warranty and Guarantee

- A. Contractor warrants and guarantees to Owner/Government, **for up to 1 year** from the date of final acceptance, that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants,

and subcontractors shall be entitled to rely on representation of Contractor's warranty and guarantee.

B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
2. normal wear and tear under normal usage.

C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. observations by Engineer;
2. recommendation by Construction Manager or payment by Government of any progress or final payment;
3. the issuance of a certificate of Substantial Completion by Construction Manager or any payment related thereto by Government;
4. use or occupancy of the Work or any part thereof by Government;
5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;
6. any inspection, test, or approval by others; or
7. any correction of defective Work by Government.

6.20 *Indemnification*

A. See Article 31 of Exhibit B.

6.21 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.
- B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Government and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly

licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

- C. Government and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Government and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 7 – OTHER WORK AT THE SITE

7.1 *Related Work at Site*

- A. Government may perform other work related to the Project at the Site with Government's employees or through other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:
 - 1. written notice thereof will be given to Contractor prior to starting any such other work; and
 - 2. if Government and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.5.
- B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and Government, if Government is performing other work with Government's employees, proper and safe access to the Site, provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Construction Manager and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Government and such utility owners and other contractors.
- C. If the proper execution or results of any part of Contractor's Work depends upon work performed

by others under this Article 7, Contractor shall inspect such other work and promptly report to Construction Manager in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

7.2 *Coordination*

- A. If Government intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:
 - 1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;
 - 2. the specific matters to be covered by such authority and responsibility will be itemized; and
 - 3. the extent of such authority and responsibilities will be provided.
- B. Unless otherwise provided in the Supplementary Conditions, Government shall have sole authority and responsibility for such coordination.

7.3 *Legal Relationships*

- A. Paragraphs 7.1.A and 7.2 are not applicable for utilities not under the control of Government.
- B. Each other direct contract of Government under Paragraph 7.1.A shall provide that the other contractor is liable to Government and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's wrongful actions or inactions.
- C. Contractor shall be liable to Government and any other contractor under direct contract to Government for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's wrongful action or inactions.

ARTICLE 8 – GOVERNMENT'S RESPONSIBILITIES

8.1 *Communications to Contractor*

- A. Except as otherwise provided in these General Conditions, Government shall issue all communications to Contractor through Construction Manager.

8.2 *Replacement of Construction Manager*

- A. In case of termination of the employment of Construction Manager, Government shall appoint a Construction Manager to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Construction Manager.

8.3 *Furnish Data*

- A. Government shall promptly furnish the data required of Government under the Contract Documents.

8.4 *Pay When Due*

- A. Government shall make payments to Contractor when they are due as provided in Paragraphs 14.2.C and 14.7.C.

8.5 *Lands and Easements; Reports and Tests*

- A. Government's duties with respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.1 and 4.5. Paragraph 4.2 refers to Government's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

8.6 *Insurance*

- A. See Article 9 of Exhibit B.

8.7 *Change Orders*

- A. Government is obligated to execute Change Orders as indicated in Paragraph 10.3.

8.8 *Inspections, Tests, and Approvals*

- A. Government's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 13.3.B.

8.9 *Limitations on Government's Responsibilities*

- A. The Government shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Government will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

- A. Government's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.6.

8.11 *Evidence of Financial Arrangements*

- A. Upon request of Contractor, Government shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Government's obligations under the Contract Documents.

8.12 *Compliance with Safety Program*

- A. While at the Site, Government's employees and representatives shall comply with the specific

applicable requirements of Contractor's safety programs of which Government has been informed pursuant to Paragraph 6.13.D.

ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.1 *Government's Representative*

- A. Engineer will be Government's technical representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Government's representative during construction are set forth in the Contract Documents.

9.2 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Government, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Government a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Government informed of the progress of the Work and will endeavor to guard Government against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.9. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

9.3 *Project Representative*

- A. If Government and Engineer agree, Engineer will furnish additional staff to assist Construction Manager in providing more extensive observation of the Work. The authority and responsibilities of any such staff and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.9. If Government designates another representative or agent to represent Government at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions, and specifications.

9.4 *Authorized Variations in Work*

- A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as

indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Government and also on Contractor, who shall perform the Work involved promptly. If Government or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, that adjustment will be made in accordance with Article 32 of Exhibit B.

9.5 *Rejecting Defective Work*

- A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.4, whether or not the Work is fabricated, installed, or completed.

9.6 *Shop Drawings, Change Orders and Payments*

- A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.
- B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.
- C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.
- D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.7 *Determinations for Unit Price Work*

- A. Construction Manager will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Construction Manager's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Construction Manager's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Government and Contractor, subject to the provisions of Paragraph 10.5.

9.8 *Decisions on Requirements of Contract Documents and Acceptability of Work*

- A. Construction Manager will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Government and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.
- B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If

Government or Contractor believes that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a modification shall be pursued in accordance with Article 32 of Exhibit B.

- C. Engineer's written decision on the issue referred will be final and binding on Government and Contractor.
- D. When functioning as interpreter and judge under this Paragraph 9.8, Engineer will not show partiality to Government or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.9 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.
- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.7, will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 9.9 shall also apply to additional staff, if any, and assistants, if any.

9.10 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Engineer has been informed pursuant to Paragraph 6.13.D.

ARTICLE 10 – CHANGES IN THE WORK; CLAIMS

10.1 *Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Government may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).
- B. If Government and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, they shall follow the procedures of Article 36 of Exhibit B.

10.2 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.4, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.4.D.

10.3 *Execution of Change Orders*

- A. Government and Contractor shall execute appropriate Change Orders in accordance with Article 32 of Exhibit B.
 - 1. changes in the Work which are: (i) ordered by Government pursuant to Paragraph 10.1.A, (ii) required because of acceptance of defective Work under Paragraph 13.8.A or Government's correction of defective Work under Paragraph 13.9, or (iii) agreed to by the parties;
 - 2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive.

10.4 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.5 *Claims*

- A. As provided for in Article 36 of Exhibit B.

ARTICLE 11 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.1 *Cost of the Work*

- A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in

Paragraph 11.1.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Government, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 11.1.B, and shall include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Government and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Government.
2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Government deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Government. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Government, and Contractor shall make provisions so that they may be obtained.
3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Government, Contractor shall obtain competitive bids from Subcontractors acceptable to Government and Contractor and shall deliver such bids to Government, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.1.
4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not

owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

- c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Government with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
- d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
- e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
- f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.6.A), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Government. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.
- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The cost of premiums for all bonds and insurance, Contractor is required by the Contract Documents to purchase and maintain.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

- 1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.1.A.1 or specifically covered by Paragraph 11.1.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.1.A.
- C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.1.A.
- D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.1.A and 11.1.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Construction Manager an itemized cost breakdown together with supporting data.

11.2 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Government and Engineer.
- B. *Contingency Allowance:*
1. Contractor agrees that a contingency allowance, if any, is for the sole use of Government to cover unanticipated costs.
- C. Prior to final payment, an appropriate Change Order will be issued as recommended by Construction Manager to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.3 Unit Price Work

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the

actual quantities and classifications of Unit Price Work performed by Contractor will be made by Construction Manager subject to the provisions of Paragraph 9.7.

- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead, profit, bonding, labor, materials and incidentals for each separately identified item.
- D. Government or Contractor may seek to adjust the Contract Price in accordance with Article 32 of Exhibit B, if: :
 - 1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
 - 2. there is no corresponding adjustment with respect to any other item of Work; and
 - 3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Government believes that Government is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.1 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order in accordance with Article 32 of Exhibit B. Any Claim for an adjustment in the Contract Price shall be made in accordance with Article 36 of Exhibit B.

12.2 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any adjustment in the Contract Times shall be made in accordance with Article 32 of Exhibit B.
- B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.3 *Delays*

- A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.2.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Government, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.
- B. If Government, Engineer, or other contractors or utility owners performing other work for Government as contemplated by Article 7, or anyone for whom Government is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's

entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

- C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Government, or other causes not the fault of and beyond control of Government and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Time extensions because of weather conditions shall not be granted except in cases of unusually severe/abnormal weather unanticipated by this contract. The Contractor shall be required to obtain and submit, to the Government, climatological data for the area of the project, covering at least a ten year period, to receive consideration for any contention of unusually severe/abnormal weather and time extension. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.3.C.
- D. Government, Engineer, and their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.
- E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.1 *Notice of Defects*

- A. Prompt notice of all defective Work of which Government or Engineer has actual knowledge will be given to Contractor. Defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.2 *Access to Work*

- A. Government, Engineer, their consultants and other representatives and personnel of Government, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

13.3 *Tests and Inspections*

- A. Contractor shall give Construction Manager timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

- B. Government shall employ and pay for the services of an independent testing laboratory to perform all Quality Assurance inspections, tests, or approvals required by the Contract Documents except:
 - 1. for inspections, tests, or approvals covered by Paragraphs 13.3.C and 13.3.D below;
 - 2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.4.B shall be paid as provided in Paragraph 13.4.C; and
 - 3. as otherwise specifically provided in the Contract Documents.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Construction Manager the required certificates of inspection or approval.
- D. Contractor shall be responsible for all Quality Control of the work by arranging and obtaining and shall pay all costs in connection with any and all inspections, tests, or approvals required for Government's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Government and Engineer.
- E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Construction Manager, Contractor shall, if requested by Construction Manager, uncover such Work for observation.
- F. Uncovering Work as provided in Paragraph 13.3.E shall be at Contractor's expense unless Contractor has given Construction Manager timely notice of Contractor's intention to cover the same and Construction Manager has not acted with reasonable promptness in response to such notice.

13.4 *Uncovering Work*

- A. If any Work is covered contrary to the written request of Construction Manager, it must, if requested by Construction Manager, be uncovered for Construction Manager's observation and replaced at Contractor's expense.
- B. If Construction Manager considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Construction Manager's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.
- C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of

work of others); and Government shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Government may make a Claim therefor as provided in Paragraph 10.5.

- D. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.5.

13.5 *Government May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Government may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Government to stop the Work shall not give rise to any duty on the part of Government to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.6 *Correction or Removal of Defective Work*

- A. Promptly after receipt of written notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Construction Manager, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).
- B. When correcting defective Work under the terms of this Paragraph 13.6 or Paragraph 13.7, Contractor shall take no action that would void or otherwise impair Government's special warranty and guarantee, if any, on said Work.

13.7 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Government or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Government and in accordance with Government's written instructions:
 - 1. repair such defective land or areas; or
 - 2. correct such defective Work; or

3. if the defective Work has been rejected by Government, remove it from the Project and replace it with Work that is not defective, and
 4. Satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Government's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Government may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.
- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.7, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.
- E. Contractor's obligations under this Paragraph 13.7 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.7 shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

13.8 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Government (and, prior to Construction Manager's recommendation of final payment, Construction Manager) prefers to accept it, Government may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Government's evaluation of and determination to accept such defective Work (such costs to be approved by Construction Manager as to reasonableness) and for the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Construction Manager's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Government shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Government may make a Claim as provided in Article 36 of Exhibit B. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Government.

13.9 *Government May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Construction Manager to correct defective Work, or to remove and replace rejected Work as required by Construction Manager in accordance with Paragraph 13.6.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Government may, after seven days written notice to Contractor, correct, or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 13.9, Government shall proceed expeditiously. In connection with such corrective or remedial action, Government may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Government has paid Contractor but which are stored elsewhere. Contractor shall allow Government, Government's representatives, agents and employees, Government's other contractors, and Engineer and Engineer's consultants access to the Site to enable Government to exercise the rights and remedies under this Paragraph.
- C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Government in exercising the rights and remedies under this Paragraph 13.9 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Government shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Government may make a Claim therefor as provided in Article 36 of Exhibit B. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Government of Government's rights and remedies under this Paragraph 13.9.

ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

14.1 *Schedule of Values-*

- A. The Schedule of Values established as provided in Paragraph 2.7.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Construction Manager. Progress payments on account of Unit Price Work will be based on the number of units completed in place and accepted.

14.2 *Progress Payments*

A. *Applications for Payments:*

- 1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Construction Manager for review an Application for Payment filled out and signed by Contractor covering the Work

completed as of the date of the Application and accompanied by such supporting documentation (i.e. the Government's receiving reports per FP Section 109.08(d)) as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Government has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Government's interest therein, all of which must be satisfactory to Government.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement and Article 16 of Exhibit B.
4. The Taxes applied with respect to progress payments will be as stipulated in the Article 15 of Exhibit B.

B. Review of Applications:

1. Construction Manager will, within 14 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Government (CO) or return the Application to Contractor indicating in writing Construction Manager's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Construction Manager's recommendation of any payment requested in an Application for Payment will constitute a representation by Government, based on Engineer's/ Construction Manager's observations of the executed Work as experienced and qualified design professionals, and on Construction Manager's review of the Application for Payment and the accompanying data and schedules, that to the best of Construction Manager's knowledge, information and belief:
 - a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 9.7, and any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Construction Manager's responsibility to observe the Work.
3. By recommending any such payment Construction Manager will not thereby be deemed to

have represented that:

- a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Construction Manager in the Contract Documents; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Government or entitle Government to withhold payment to Contractor.
4. Neither Construction Manager's review of Contractor's Work for the purposes of recommending payments nor Construction Manager's recommendation of any payment, including final payment, will impose responsibility on Construction Manager:
- a. to supervise, direct, or control the Work, or
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
 - d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Government free and clear of any Liens.
5. Construction Manager may refuse to recommend the whole or any part of any payment if, in Construction Manager's opinion, it would be incorrect to make the representations stated in Paragraph 14.2.B.2. Construction Manager may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Construction Manager's opinion to protect Government from loss because:
- a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Government has been required to correct defective Work or complete Work in accordance with Paragraph 13.9; or
 - d. Construction Manager has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.2.A.

C. Payment Becomes Due:

1. Thirty (30) calendar days after presentation of the Application for Payment to Government with Construction Manager's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.2.D) become due, and when due will be paid by Government to Contractor.

D. Reduction in Payment:

1. Government may refuse to make payment of the full amount recommended by Construction Manager because:
 - a. claims have been made against Government on account of Contractor's performance or furnishing of the Work;
 - b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Government to secure the satisfaction and discharge of such Liens;
 - c. there are other items entitling Government to a set-off against the amount recommended; or
 - d. Government has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.2.B.5.a through 14.2.B.5.c or Paragraph 15.2.A.
2. If Government refuses to make payment of the full amount recommended by Construction Manager, Government will give Contractor immediate written notice stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Government shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Government and Contractor, when Contractor remedies the reasons for such action.
3. Upon a subsequent determination that Government's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.2.C.1 and subject to interest as provided in the Agreement.

14.3 Contractor's Warranty of Title

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Government no later than the time of payment free and clear of all Liens.

14.4 Substantial Completion

- A. When Contractor considers the entire Work ready for its intended use, Contractor shall notify Construction Manager in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Construction Manager issue a certificate of Substantial Completion.
- B. Promptly after Contractor's notification, Construction Manager, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. Substantial Completion

will ONLY be given by the Government when the project is complete such that it can be safely and effectively used by the public without further delays, disruption, or other impediments as recommended by the Construction Manager and Engineer during a substantial completion inspection. For conventional bridge and highway work, this is the point at which all road grading, pavement structure, shoulder, drainage, permanent signing and markings, traffic barrier, safety appurtenance, utility work is complete and meets all the contract requirements. If Construction Manager does not consider the Work substantially complete, Construction Manager will notify Contractor in writing giving the reasons therefor.

- C. If Construction Manager considers the Work substantially complete, Construction Manager will deliver to Engineer and Contractor a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Engineer shall have seven days after receipt of the tentative certificate during which to make written objection to Construction Manager as to any provisions of the certificate or attached list. If, after considering such objections, Construction Manager concludes that the Work is not substantially complete, Construction Manager will, within 14 days after submission of the tentative certificate, notify Contractor in writing, stating the reasons therefor. If, after consideration of Engineer's objections, Construction Manager considers the Work substantially complete, Construction Manager will, within said 14 days, execute and deliver to Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Construction Manager believes justified after consideration of any objections from Engineer.
- D. At the time of delivery of the tentative certificate of Substantial Completion, Construction Manager will deliver to Engineer and Contractor a written recommendation as to division of responsibilities pending final payment between Government and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Engineer and Contractor agree otherwise in writing and so inform Construction Manager in writing prior to issuing the definitive certificate of Substantial Completion, Construction Manager aforesaid recommendation will be binding on Government and Contractor until final payment.
- E. Government shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the tentative list.

14.5 *Partial Utilization*

- A. Prior to Substantial Completion of all the Work, Government may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Government, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Government for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
 - 1. Government at any time may request Contractor in writing to permit Government to use or occupy any such part of the Work which Government believes to be ready for its intended use

and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Government, and Engineer will follow the procedures of Paragraph 14.4.A through D for that part of the Work.

2. Contractor at any time may notify Construction Manager in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Construction Manager to issue a certificate of Substantial Completion for that part of the Work.
3. Within a reasonable time after either such request, Construction Manager, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Construction Manager does not consider that part of the Work to be substantially complete, Construction Manager will notify Contractor in writing giving the reasons therefor. If Construction Manager considers that part of the Work to be substantially complete, the provisions of Paragraph 14.4 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

14.6 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Construction Manager will promptly make a final inspection with Engineer and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.7 *Final Payment*

A. *Application for Payment:*

1. After Contractor has, in the opinion of Construction Manager, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.
2. The final Application for Payment shall be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Articles 9 and 10 of Exhibit B.
 - b. consent of the surety, if any, to final payment;
 - c. a list of all Claims against Government that Contractor believes are unsettled; and
 - d. complete and legally effective releases or waivers (satisfactory to Government) of all

Lien rights arising out of or Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 14.7.A.2 and as approved by Government, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Government might in any way be responsible, or which might in any way result in liens or other burdens on Government's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Government to indemnify Government against any Lien.

B. Construction Manager's Review of Application and Acceptance:

1. If, on the basis of Construction Manager's observation of the Work during construction and final inspection, and Construction Manager's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Construction Manager is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Construction Manager will, within ten days after receipt of the final Application for Payment, indicate in writing Construction Manager's recommendation of payment and present the Application for Payment to Government for payment. At the same time Construction Manager will also give written notice to Engineer and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.9. Otherwise, Construction Manager will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. Payment Becomes Due:

1. Thirty days after the presentation to Government of the Application for Payment and accompanying documentation, the amount recommended by Construction Manager, less any sum Government is entitled to set off against Construction Manager's recommendation, including but not limited to liquidated damages, will become due and will be paid by Government to Contractor.

14.8 *Final Completion Delayed-*

- A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Construction Manager so confirms, Government shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Construction Manager, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Government for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.1, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Construction Manager with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment,

except that it shall not constitute a waiver of Claims.

14.9 *Waiver of Claims*

A. The making and acceptance of final payment will constitute:

1. a waiver of all Claims by Government against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.6, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and
2. a waiver of all Claims by Contractor against Government other than those previously made in accordance with the requirements herein and expressly acknowledged by Government in writing as still unsettled.

ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

See Article 29 of Exhibit B.

15.1 *Government May Suspend Work*

A. At any time and without cause, Government may suspend the Work or any portion thereof for a period of not more than 120 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Article 36 of Exhibit B. See paragraph 8 of Exhibit C for further information.

15.2 *Government May Terminate for Cause*

A. The occurrence of any one or more of the following events will justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.7 as adjusted from time to time pursuant to Paragraph 6.4);
2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;
3. Contractor's repeated disregard of the authority of Construction Manager; or
4. Contractor's violation in any substantial way of any provisions of the Contract Documents.

B. If one or more of the events identified in Paragraph 15.2.A occur, Government may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:

1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the

full extent they could be used by Contractor (without liability to Contractor for trespass or conversion);

2. incorporate in the Work all materials and equipment stored at the Site or for which Government has paid Contractor but which are stored elsewhere; and
 3. Complete the Work as Government may deem expedient.
- C. If Government proceeds as provided in Paragraph 15.2.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Government arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Government. Such claims, costs, losses, and damages incurred by Government will be reviewed by Construction Manager as to their reasonableness and, when so approved by Construction Manager, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph, Government shall not be required to obtain the lowest price for the Work performed.
- D. Notwithstanding Paragraphs 15.2.B and 15.2.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.
- E. Where Contractor's services have been so terminated by Government, the termination will not affect any rights or remedies of Government against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Government will not release Contractor from liability.
- F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.1.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.2.B and 15.2.C.

15.3 *Government May Terminate For Convenience*

- A. Upon seven days written notice to Contractor, Government may, without cause and without prejudice to any other right or remedy of Government, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and
 4. reasonable expenses directly attributable to termination.
- B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.4 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 120 consecutive days by Government or under an order of court or other public authority, or (ii) Construction Manager fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Government fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Government, and provided Government does not remedy such suspension or failure within that time, terminate the Contract and recover from Government payment on the same terms as provided in Paragraph 15.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Construction Manager has failed to act on an Application for Payment within 30 days after it is submitted, or Government has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Government, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.4 are not intended to preclude Contractor from making a Claim under Article 36 of Exhibit B for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

ARTICLE 16 – DISPUTE RESOLUTION

16.1 *Methods and Procedures*

- A. As provided for in Article 36 of Exhibit B.

ARTICLE 17 – MISCELLANEOUS

17.1 *Giving Notice*

- A. As provided for in Article 20 of Exhibit B. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended; or
 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.2 *Computation of Times*

- A. When any period of time is referred to in the Contract Documents by calendar days, it will be computed to include the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.3 *Cumulative Remedies- N/A*

17.4 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.5 *Controlling Law*

- A. As provided for in Articles 33 and 36 of Exhibit B.

17.6 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

EXHIBIT B

NAVAJO NATION SUPPLEMENTAL GENERAL CONDITIONS

NAVAJO NATION SUPPLEMENTAL GENERAL CONDITIONS

1.0 IDENTIFICATION OF THE PARTIES; PROJECT. This Contract is entered into by and between the Navajo Nation and _____, who is hereinafter referred to as "Contractor." The Navajo Nation and Contractor are herein jointly referred to as "Parties." The authorized representatives for both Parties are named in the Primary Contract. The Project that is the subject of this Contract is the "N9402(2)1,2&3 Road Project" located in Lupton, Arizona hereinafter referred to as "the Project."

2.0 DOCUMENTS CONSTITUTING THE CONTRACT. The following:

- 2.1 the EJCDC C-520 ©2007 Form of agreement between Government and Contractor for construction contract (Fixed Price), as modified;
- 2.2 Exhibit A - the EJCDC C-700 ©2007 - Standard General Conditions of the Construction Contract (Fixed Price);
- 2.3 Exhibit B - NNSGC "Navajo Nation Supplemental General Conditions";
- 2.4 Exhibit C - Special Contract Requirements;
- 2.5 Exhibit D - Bid Schedule;
- 2.6 Exhibit E - Required Contract Forms;
- 2.7 Exhibit F - Standard Specification for Construction of Roads & Bridges - FP-2014 & Supplemental Specifications;
- 2.8 Exhibit G - Project Design Plans;
- 2.9 Exhibit H- Davis Bacon Wage Determination - AZ20200009 01/03/2020;
- 2.10 Exhibit I - Environmental Requirements & Permits

The above are to be considered collectively as one agreement/contract and the term "Contract" whenever used herein shall be deemed to include all such documents.

3.0 CONTRACT DOCUMENTS & NNSGC GOVERN. The Parties hereby acknowledge and agree that the written provisions contained in the documents listed in Article 2.0 herein constitute the complete understanding of the Parties with respect to the subject matter of this Contract, and that there are no promises or representations between the Parties other than those set forth herein. Any conflict between any provision(s) contained in the Contract documents shall be resolved by reference to and interpretation of the provision(s) contained in this Navajo Nation Supplemental General Conditions.

4.0 ORIGINAL CONTRACT AMOUNT: [\$_____) which amount is the Original Contract Amount. Any modification of this amount shall comply with Article 32 herein. The Contractor hereby acknowledges and agrees that said payment constitutes the full and adequate consideration for all work fully and satisfactorily performed, for all applicable taxes, permit fees, licensing fees, registration fees, bonding and surety costs, insurance or any other expenses necessary or convenient for the Contractor to perform under this Contract.

5.0 PRIMARY WORK LOCATION. In the performance of work or provision of services pursuant to this Contract the Contractor is authorized to travel at Contractor's sole expense. The work to be performed and/or services to be provided shall be primarily in Lupton Chapter area of the Navajo Nation, state of Arizona.

6.0 AVAILABILITY OF FUNDS.

6.1 Appropriations required. Pursuant to 2 N.N.C. §223 A, the obligation of the Government to pay Contractor the entire Original Contract Amount, or any portion thereof as invoiced, or any amounts under any and all change orders, amendments, or modifications to this Contract, shall be contingent upon the availability of funds, from whatever source, for the Project which is the subject of this Contract.

6.2 Subsequent fiscal periods. Pursuant to 12 N.N.C. §350 D, if funds adequate to support continuation of performance under this Contract are not appropriated or otherwise become unavailable during any fiscal period(s) subsequent to that period in which this Contract is entered into, then this Contract may, at the sole discretion of the Government, be cancelled and Contractor shall be reimbursed only for the reasonable value of any non-recurring costs incurred as a direct result of work performed under this Contract.

7.0 CONTRACT NUMBER. Upon contract execution, the Government shall assign a Contract Number which shall be shown on the first page of the Primary Contract. All invoices submitted by Contractor for payment shall reference said Contract Number, including the Project Name and Business Unit Number.

8.0 EFFECTIVE DATE; TERM, NOTICE TO PROCEED REQUIRED. The effective beginning and ending date of this Contract are as shown on the first page of the Primary Contract. The Contractor shall not commence any work until the Government issues a formal "Notice to Proceed" for the Project; notwithstanding, the Contractor shall not commence any work until the effective date of all insurance required by Article 9 herein. This Contract shall expire on the date shown unless earlier terminated or extended by modification in accordance with Article 32 herein.

9.0 INSURANCE REQUIREMENTS.

The Contractor shall, at its sole expense, procure and maintain adequate and sufficient insurance for all of Contractor's potential liabilities, in accordance with this Article, relating to any claims by any party for any injury to persons or damage to property arising out of or connected with any work performed or services provided under this Contract by the Contractor.

9.1 Minimum Insurance Coverages. The Contractor shall obtain and maintain for the duration of performance under this Contract, the minimum insurance coverages shown below:

- (a) Commercial General Liability - ISO CG 0001 Form or equivalent. Coverages shall include:
 - Premises and Operations
 - Personal/Advertising Injury
 - Products/Completed Operations
 - Liability assumed under an Insured Contract (including defense costs assumed under contract)
 - Broad Form Property Damage
 - Independent Contractors/Consultants

- (b) Automobile Liability including all:
 - Contractor-Owned Vehicles
 - Non-owned Vehicles
 - Rented/Hired Vehicles
 - Personal injury Protection (where applicable)
- (c) Workers' Compensation:
 - Statutory Benefits (Coverage A)
 - Employers Liability (Coverage B)

9.2 Limits required. Contractor shall carry the limits of liability as required below (where "State Law" is indicated, such limits shall be in accordance with the laws and regulations of the State wherein this Contract shall be primarily performed):

COMMERCIAL GENERAL LIABILITY	
GENERAL AGGREGATE	\$ 2,000,000
PRODUCTS/COMPLETED OPERATIONS AGGREGATE	\$ 2,000,000
OCCURRENCE BASIS/ PER EACH OCCURRENCE	\$ 1,000,000
PERSONAL/ADVERTISING INJURY	\$ 1,000,000
FIRE DAMAGE (ANY ONE FIRE)	\$ 50,000
MEDICAL PAYMENTS (ANY ONE PERSON)	\$ 5,000
AUTOMOBILE LIABILITY	
BODILY INJURY/PROPERTY DAMAGE (EACH	\$ 1,000,000
PERSONAL INJURY PROTECTION (IF APPLICABLE)	BY STATE LAW
WORKERS' COMPENSATION	
COVERAGE A (WORKERS' COMPENSATION)	BY STATE LAW
COVERAGE B (EMPLOYERS LIABILITY)	\$ 500,000

9.3 All policies must be written on a "per-occurrence" basis, unless otherwise approved by the Navajo Nation Risk Management Program.

9.4 Claims-made basis. In the event that Contractor's liability insurance required by this Contract is written on a claims-made basis, the Contractor shall warrant that any retroactive date under the policy shall precede the effective date of this Contract, and that either continuous coverage will be maintained or an extended discovery period will be exercised for a period of two (2) years beginning as of the date that performance under this Contract is completed.

9.5 Primary coverage basis. For payment of any claims, Contractor's insurance coverage shall be on a primary, non-contributory basis with any other insurance coverages and/or self-insurance carried by the Navajo Nation or all other available sources.

9.6 Required language. The Contractor's General Liability and Umbrella Liability policy shall be endorsed to include the following language: "The Navajo Nation, its elected officials, employees, agents, and volunteers are named as an Additional Insured with respect to liability arising out of the activities performed by the Insured [the Contractor] pursuant to a Contract with the Navajo Nation." (ISO Forms CG 2010 and CG 20 37 "Additional Insured- Government s, Lessees or Contractors-Completed Operations, 2004 Editions or equivalent).

9.7 Waiver of subrogation. All Contractor's policies shall contain a waiver of subrogation in favor of the Government, its divisions, departments, offices, agencies, boards, commissions,

committees, enterprises and its employees, officers, officials, and agents for losses arising from work performed or services provided by the Contractor pursuant to a Contract with the Government.

- 9.8 **Separation of Insureds.** The Contractor's policy shall include a "Separation of Insureds" clause (Cross Liability).
- 9.9 **Insurer rating.** The Contractor's insurance policy shall be issued by a licensed or approved insurer with an "A.M. Best" rating of not less than A- VII. The Government in no way warrants that the above-required minimum insurer rating is sufficient to protect the Contractor from potential insurer insolvency.
- 9.10 **Certificates of insurance.** The Contractor shall provide to the Government certificates of insurance as required by this Contract. The certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. Each insurance policy required by this Contract must be in effect upon, or prior to, commencement of performance under this Contract and shall remain in effect until such time as all of its obligations under this Contract or any subsequent modifications have been fully and satisfactorily completed. Insurance certificates shall be sent to the Navajo Nation Department of Risk Management, P.O. Box 1690, Window Rock, Arizona, 86515. The Contract Number and a description of the work performed or services provided thereunder shall be indicated on such certificates.
- 9.11 **Subcontractors.** The Contractor's subcontractors, if any, shall be included as insureds under the Contractor's policy, or the Contractor shall provide to the Government separate certificates and endorsements for each of its subcontractors holding separate policies. All coverages for subcontractors shall be subject to the minimum policy amounts shown herein.
- 9.12 **Notification of change required.** The insurance policy required herein shall provide the required coverage and shall not be suspended, voided, canceled, or reduced in coverage or in limits except after thirty (30) calendar days prior written notice has been given to the Government. Such notice shall be sent in accordance with Article 20.0 herein.
- 9.13 **Approval of modifications.** Any modification of the insurance requirements set forth herein shall be approved by the Navajo Nation Risk Management Program, whose decision shall be final. Such modification shall not require a formal Contract modification, but may be approved by administrative action of the Risk Management Program. The Contractor may request, for itself or its subcontractors, that the insurance requirements shown herein be modified, provided that such request be delivered in writing to the Risk Management Program at least ten days prior to the solicitation due date or, if not a solicitation, prior to contract execution or modification. The Contractor shall include with such request a justification for the modification with supporting documentation. Any modifications approved shall on a case-by-case basis and shall not affect the insurance requirements of other subcontractors for whom modifications have not been approved. Any deviations from the standard types and coverages set forth herein shall be approved by the Navajo Nation Risk Management Program prior to the issuance of a Notice to Proceed.
- 9.14 **Government disclaimers.** The insurance requirements and coverages set forth herein are

minimum requirements only and in no way limit the indemnity covenants contained in this Contract. The Government in no way warrants that the minimum limits herein are sufficient to protect the Contractor or its' subcontractors from any liabilities that might arise from the work performed or services provided under this contract, and the Contractor and its subcontractors are free to purchase additional insurance. By requiring such minimum insurance, the Government shall not be deemed to have assessed the risk that may be applicable to the Contractor under the Contract. The Contractor shall assess its own risks and if it deems appropriate and/or prudent, it may maintain higher limits and/or broader coverages. The Contractor is not relieved of any liability or other obligations assumed or pursuant to this Contract by reason of its failure to obtain or maintain insurance in sufficient amounts, duration, or types.

9.15 **No sovereign immunity waiver.** The Parties acknowledge and agree that the Government is relying on, and does not waive or intend to waive by any provision of this Contract, the monetary limitations and other rights, immunities, and protections provided under 1 N.N.C. §§551 et seq., as from time to time amended, or otherwise available to the Government or its elected officials, employees, agents, and volunteers.

9.16 **Mutual cooperation.** The Government and Contractor shall cooperate in good faith in the collection of any insurance proceeds which may be payable in the event of any loss, including the execution and delivery of any proof of loss or other actions required to effect recovery.

9.17 **Insurance documentation required.** The Government's representative must receive written documentation of all required insurance prior to the issuance of a Notice to Proceed for the Project, and the Contractor shall not commence any work to be performed or services to be provided under this Contract unless and until such documentation has been submitted to the Government. If the Contractor is able to furnish such documentation prior to the Government's execution of this Contract, such documentation shall be made an Attachment to the Primary Contract. The Government may terminate this Contract for breach if the Government's representative determines that the Contractor has failed to submit the required documentation in a timely manner and that the Government is unable to issue a Notice to Proceed in a timely manner.

10.0 BUILDER'S RISK INSURANCE. The Contractor shall obtain, on behalf of the Government, a "Builder's Risk" insurance policy for all aspects of the Project; such insurance coverage shall be in amount adequate to cover any potential loss, relating to the Project or any portion thereof, that may occur prior to the effective date and time of the Government's property insurance coverage for the Project.

11.0 BONDING REQUIREMENTS.

11.1 **Performance Bond.** The Contractor shall provide to the Government a Performance Bond underwritten and executed by a surety company that guarantees the Contractor's complete and satisfactory performance under the Contract. The Performance Bond shall be equal to one-hundred percent (100%) of the Original Contract Amount, unless otherwise provided in Article 11.3 herein.

11.2 **Payment Bond.** The Contractor shall provide to the Government a Payment Bond

underwritten and executed by a surety company that will protect all persons, subcontractors, or other entities supplying labor and material to the Contractor or its subcontractors for the performance under this Contract. The Payment Bond shall be in an amount equal to one-hundred percent (100%) of the Original Contract Amount, unless otherwise provided in Article 11.3 herein. The Payment Bond must be provided in addition to the Performance Bond required in Article 11.1 herein.

11.3 Lesser Bond amounts. The Government, with the concurrence of the Government Controller or his/her designee, may allow the Contractor to provide a Performance Bond or a Payment Bond, or both, in an amount equal to fifty percent (50%) of the Original Contract Amount, so long as either (1) the Government withholds, as retainage, fifty percent (50%) of each invoiced amount; or, (2) the Contractor provides an irrevocable Letter of Credit in amount equal to fifty percent (50%) of the Original Contract Amount. In no case shall a Performance Bond or Payment Bond be in an amount less than fifty percent (50%) of the Original Contract Amount.

12.0 LICENSING & REGISTRATION REQUIREMENTS.

12.1 State license required. The Contractor shall hold a current and valid license from an appropriate State Licensing Board or Agency for the type of work to be performed under this Contract, which license is customarily maintained in the industry. Said License must be maintained as active and current for the entire duration of performance under this Contract. The Contractor shall indicate its business name, business address, "Qualifying Party," and state license number in the Primary Contract. Regardless of who the "qualifying party" is, the Contractor agrees to immediately notify the Government if such license is suspended, revoked, expired, or otherwise not in effect.

12.2 Business registration required. The Contractor shall be registered to do business with the State in which the Project is located. All documents regarding such registration shall be provided to the Government prior to the execution of this Contract, and must be active and valid for the effective duration of this Contract. The Contractor shall immediately notify the Government if such registration is suspended, revoked, expired, or otherwise not in effect.

12.3 Documentation required. The Contractor shall submit written documentation of all required licenses and registrations to the Government's representative. The Government may terminate this Contract for material breach if the Government's representative determines that the Contractor has failed to timely submit the required documentation.

12.4 Licensed subcontractors required. All subcontractors used by the Contractor in its performance under this Contract shall be duly registered and licensed to practice their professions in the Navajo Nation and/or the State in which the Project is located. Use of unregistered or unlicensed subcontractors shall constitute a material breach and the Government may terminate this Contract.

13.0 RIGHT TO REFUSE CONTRACT. The Government reserves its right to refuse to execute this Contract upon a written determination that any of the following has occurred prior to the Nation's execution of this Contract:

- 13.1 **faulty procurement;** a document, procedure, decision, action, or other event pertaining to the procurement of this Contract, or to any related pre-procurement activities, is in violation of any applicable Government, federal, or state laws or regulations governing said procurement; or
- 13.2 **ancillary firm(s);** an ancillary firm is ineligible for the award of this Contract or is unavailable to perform on the Project, for any reason; in such case, the Government may, in its discretion, either (1) reject the selected Proposal containing the ancillary firm's qualifications and refuse to execute this Contract; or (2) decide not to reject the Proposal and consider only the license and relevant qualifications of the Contractor standing alone; or (3) decide not to reject the Proposal and permit another equally/more qualified firm to perform those Contract services that would have been performed by the ineligible or unavailable firm; or
- 13.3 **lack of funding availability;** when funding for the Scope of Work has become wholly or partially unavailable; or
- 13.4 **change to SOW or other requirements;** the Scope of Work or any other mandatory requirement is required to be changed significantly; or
- 13.5 **change to Budget/MFP;** there has been a revision (whether increase or decrease) of the budget or Maximum Feasible Price that was originally established by the Government prior to the initiation of the procurement process for this Contract; or
- 13.6 **protest filed;** a protest has been timely filed in accordance with 12 N.N.C. §360(A), unless a determination has been made to proceed with a Contract award pursuant to 12 N.N.C. §360(F); or
- 13.7 **other reasons cited in Regulations;** any of the following pertains to this procurement:
- 13.7.1 inadequate or ambiguous specifications were cited in the RFP/RSQ;
 - 13.7.2 the services contemplated under this Contract are no longer required;
 - 13.7.3 the RFP/RSQ did not provide for consideration of all factors of cost to the Government
 - 13.7.4 all Proposals received indicate that the needs of the Government can be satisfied by a less expensive service differing from that described in the RFP/RSQ;
 - 13.7.5 all fee Proposals received exceed the Maximum Feasible Price after opportunity for negotiation pursuant to 12 N.N.C. §346(D);
 - 13.7.6 the selected Proposal was collusive, contained fraudulent statements or information, contained any material misrepresentation, or was submitted in bad faith; and
 - 13.7.7 Cancellation of proposed Contract serves in the best interest of the Government.

14.0 PROJECT SUPERVISION; AUTHORIZATION OF PAYMENTS.

- 14.1 **Government's Representative.** In the performance of work or provision of services under this Contract, the Contractor shall at all times be under the supervision and direction of the Government's representative named in the Primary Contract, or his/her successor or designee.
- 14.2 **Payment approval required.** No payment shall be authorized or remitted to the Contractor unless and until the Government's representative, or his/her successor or designee, approves in writing in advance the work performed or services provided under this Contract, and has given prior written approval of invoice(s), billing(s), or payment application(s) submitted to

the Government. All invoices must be supported by adequate verification, documentation, and itemization of all required Project deliverables received by the Government.

14.3 Joint supervision and approval. Any cooperative or joint supervision, or joint approval authority involving person(s) other than the Government's representative, whether Government staff or other person(s), shall be conducted through a duly approved and executed cooperative agreement that sets forth the extent of decision-making, supervision, and approval authority of the Government's representative and such other person(s).

14.4 Subcontractor Expenses. The Contractor shall be solely responsible for all consideration, compensation, taxes, fees or any other expenses whatsoever, related to the Contractor's use of any subcontractors, agents, representatives, employees or consultants in the performance of Contractor's obligation under this Contract.

15.0 TAXES. Contractor acknowledges and agrees that all work performed and services provided within the territorial jurisdiction of the Navajo Nation is subject to the **six** percent (6%) Navajo Sales Tax (24 N.N.C. §601 et seq.).

15.1 Identification of taxable activity. The Contractor shall separately indicate, on each invoice or payment application submitted to the Government, any and all of its work performed or services provided within the Navajo Nation pursuant to this Contract, and shall itemize the Navajo Sales Tax.

15.2 Withholding. The Contractor acknowledges and agrees that the Government shall withhold from each payment **six** percent (6%) of the amount associated with work performed or services provided within the Navajo Nation under this Contract, and shall transfer such **six** percent (6%) amount to the Office of the Navajo Tax Commission (ONTC) on behalf of the Contractor. The Contractor shall indicate on its quarterly tax return filed with the ONTC that the Navajo Sales Tax has been withheld and paid.

15.3 Filing and other payments. The Contractor acknowledges that the Government's withholding of tax in no way removes Contractor's responsibility for timely filing of tax returns and payment of interest, penalties, or any other amounts relating to Contractor's tax obligations under the Government's or any other jurisdiction.

16.0 RETAINAGE

16.1 Percentage withheld. Contractor agrees that the Government shall withhold ten percent (10%) of the payment due under each invoice submitted to the Government, as Retainage. If Article 11.3 applies, the retainage shall be fifty percent (50%).

16.2 Release of Partial Retainage. Upon receipt of a Certificate of Substantial Completion and a request by the Contractor for a release of partial retainage, the Nation shall obtain consent of the Surety (if any) and shall make payment of partial retainage for the invoiced Work required to obtain the Certificate of Substantial Completion. Any invoiced Work which did not contribute to the Certificate of Substantial Completion shall be released until the Final Payment as described in Articles 16.3 and 17.0 herein.

16.3 Legal release required. Any remaining portion of the retainage balance shall not be released until the Contractor submits a "Release of All Claims and Liens" which is notarized and signed by the Contractor, and also submits all similar legal releases of subcontractors.

17.0 SUBMITTAL OF FINAL INVOICES & WORK PRODUCT. Copies of all work product documents, reports, photographs, drawings, schematics, related correspondence, invoices, and other information or documents regarding the Project shall be provided to the Nation's Representative no later than thirty (30) calendar days following the expiration or termination of this Contract. Final invoice(s) shall be due no later than thirty (30) calendar days following the expiration or termination of this Contract.

18.0 DEBTS OWED; RIGHT TO OFFSET. The Contractor acknowledges that pursuant to the Navajo Business and Procurement Act, 12 N.N.C. §§ 1501 et seq., the Contractor, in its present form or in any other identifiable capacity as an individual, business, corporation, partnership, or other entity, is eligible to do business with the "Navajo Nation" as defined in 12 N.N.C. §1503(A). Contractor further acknowledges that if the Contractor has an outstanding money judgment against it in favor of the Government, or there exists a delinquent accounts receivable debt which is due and owing to the Government by Contractor, then the Government may, upon due notice to the Contractor, offset its money claim against any amount owed for work performed or services provided under this Contract.

19.0 PRIVATE CONTRACTOR. The Contractor shall perform and conduct all activities under this Contract as a private independent Contractor and shall not be considered an employee of the Government or receive any benefits to which the Government's employees are entitled.

20.0 ISSUANCE OF NOTICES; MAILINGS. Any notices or correspondence relating to this Contract sent by either Party to the other shall be mailed to the address shown on the front page of the Primary Contract, shall be mailed via certified U.S.P.O. mailing with return receipt requested, and shall be deemed issued or submitted to the receiving Party as of the date of such certified mailing.

21.0 REQUESTS FOR INFORMATION. When requested by the Government, Contractor shall submit proper verification of invoices, pay applications, reports, documents or any other information related to this Contract within fourteen (14) calendar days of the date of the request.

22.0 RECORDS; AUDITS. Pursuant to 12 N.N.C. §352, Contractor shall keep and maintain books, records, documents or other materials related to performance under this Contract for a period of five (5) calendar years from the date of issuance of final payment under this Contract. Upon issuance of a Notice of Audit to Contractor, the Government may audit such documents and records any time during the effective period of this Contract, up to the five (5) calendar year period following final payment. Contractor agrees to have an authorized individual execute and have notarized a release authorizing the Government to release the Contractor's ledgers, books, records, documents or other materials related to performance under this Contract, as such information may be required by a governmental agency under an agreement with the Government for purposes of an audit by such agency of such documents and records. Contractor agrees that said executed release shall constitute permission for disclosure of information pursuant to 2 N.N.C. §85 (A)(5)(d) and 2 N.N.C. §86(C).

23.0 GOVERNMENT OWNERSHIP OF WORK PRODUCT. All intangible and intellectual property or work product that is produced by the Contractor or any of its subcontractors, which work product is embodied in any tangible medium such as notes, plans, or drawings, including the overall form as well as the arrangement and composition of spaces and elements in the medium, and is produced for purposes of fulfilling any duties under this Contract, shall be and remain the property of the Government at all times, whether or not such product is completed or certified, and may be used by the Government, except as follows:

23.1 Limited disclosure. Said property shall not be distributed or disclosed to any party other than the Government or its divisions, departments, offices, agencies, boards, commissions, committees, enterprises, employees, officers, officials, and agents, except (1) upon prior written consent of the Contractor; or (2) pursuant to a duly authorized and executed contract between the Government and any other tribal, county, state or federal agency; or (3) pursuant to any applicable law requiring disclosure.

23.2 Right of reuse. The Contractor acknowledges and agrees that the Government may use said property, or any portion thereof, in connection with the Project that is the subject of this Contract, for purposes of completion, modification, restoration, or renovation of such Project, at the sole discretion of the Government. Contractor agrees that such reuse shall be without any consideration, compensation or consent of Contractor, and Contractor expressly waives any claims with respect to such reuse. With regard to reuse of said property for any purpose not reasonably related to the Project, said property shall be considered Instruments of Service as provided for in the Primary Contract, and shall be subject to the restrictions on reuse as provided for therein.

24.0 WARRANTY.

24.1 Materials and Labor. Contractor warrants to the Government that all labor, materials, equipment and furnishings used in, or incorporated into, the Project will be of good quality, new, that the Work will be free from defects in design, materials and workmanship, and that all Work will conform with the requirements of the Construction Documents. If required by the Government's Representative, the Contractor shall furnish satisfactory evidence of compliance with this warranty. The type, quality and quantum of such evidence, and whether such evidence is satisfactory, shall be within the sole discretion of the Government's Representative. Any portion of the Work not conforming to these requirements, including substitutions not properly approved and authorized by the Government, and including non-conformance relating to any materials, equipment, furnishings, labor, installation, or workmanship, may be considered defective.

24.2 Repair or replacement. Contractor agrees to repair, replace, or re-perform, or pay the Government the reasonable cost of such repair, replacement, or re-performance, any portion of the Work that the Government deems in its sole discretion to be defective, so long as Government submits to the Contractor a written notice of any defect within one (1) calendar year following the issuance of a Certificate of Occupancy for the Project. The choice among repair, replacement, re-performance, or payment shall be the Contractor's. Any steps taken by the Contractor to correct defects shall not act to extend the term of this warranty. All repairs, replacement, or re-performance by the Contractor shall be at no

charge to the Government and shall be performed within 60 calendar days of the Contractor's receipt of notification of the defect, which period shall be extended for delays outside the Contractor's control.

24.3 **Maintenance.** Failure of the Government to perform reasonable regular maintenance and proper care of the finished Project shall void this warranty.

24.4 **Access to the Project.** Government must provide access to the Contractor during its normal business hours, Monday through Friday, 8 a.m. to 5 p.m., to inspect the defect reported and, if necessary, to take corrective action.

24.5 **No liens.** Contractor guarantees that, as of the conclusion of this Contract, all work will be free of liens, claims and security interests of any third parties.

25.0 NO THIRD PARTY BENEFICIARIES. Notwithstanding any provision of Navajo Nation law, codified or uncoded, or any Navajo Nation common or fundamental law, no provision of this Contract shall be construed as conferring any rights to, and may not be invoked by or for the benefit of, any other person or entity that is not one of the signatory Parties hereto.

26.0 ASSIGNMENT RESTRICTED. The Contractor shall not in any manner whatsoever assign, convey, transfer, or sublet any rights to this Contract or any interest therein including any amendments or modifications thereto, any work product resulting from the work performed or services provided under this Contract including any amendments or modifications thereto, or any monetary claims against the Government relating to this Contract or any amendments or modifications thereto, without the prior written consent of the Government. Any attempted assignment without such prior consent shall be void; said consent may be granted, granted upon conditions, or withheld, at the Government's sole discretion.

27.0 PARTNERS, SUCCESSORS, SUBCONTRACTORS. All provisions, conditions and covenants contained in the Contract Documents shall extend to and be binding upon each of the Contractor's owners, partners, team members, successors, heirs, assigns, executors, administrators, employees, officials and agents, including all of the Contractor's subcontractors, and the Contractor expressly agrees that the term "Contractor" whenever used herein, or in any other Contract document, shall be deemed to include all such owners, partners, team members, successors, heirs, assigns, executors, administrators, employees, designees, consultants, officials, agents, and subcontractors.

28.0 RIGHT TO ASSURANCE. If at any time prior to the completion of services, the Government has reason to believe that the Contractor does not intend to or is unable to complete the contracted services, the Government may demand in writing that the Contractor submit written assurance of intent to complete performance. Failure to provide such assurance within fourteen (14) calendar days shall be deemed as a response that the Contractor will not complete services which will allow the Government to terminate this Contract.

29.0 RIGHT TO SUSPEND OR TERMINATE.

29.1 Generally. The rights of the Parties to suspend or terminate this Contract shall be as provided for in the Primary Contract and Exhibit A. In addition, upon prior written notice to the Contractor of not less than thirty (30) calendar days, the Government may unilaterally order a temporary stoppage of work. If the Contractor is not at fault for stoppage, any additional payment to the Contractor for such stoppage shall be in accordance with Article 32 herein.

29.2 Non-compliance or violation of laws. In addition to the Government's right of suspension and termination provided for in the Primary Contract, the Government may terminate this Contract for Breach if the Government's representative determines in writing that the Contractor or any of its' subcontractors has violated any applicable law or regulation in the procurement or performance of this Contract.

29.3 Falsification, lack of documentation. The Government may terminate this Contract for breach if:

- (a) any statement or documentation regarding any licensing, business registration, insurance coverage, or debts owed, is determined to be false; or
- (b) Contractor has failed to submit in a timely manner any requested documentation pertaining to any licensing, business registration, insurance coverage, or debts owed, and the Government's representative determines that the Government is unable to issue a Notice to Proceed, or to otherwise proceed with the Project, in a timely manner.

29.4 Financial responsibility, solvency. The Government may terminate this Contract for breach if:

- (a) the Contractor becomes insolvent or its insolvency is imminent, or the Contractor files for bankruptcy under any chapter of federal law; or
- (b) the provider of the Contractor's insurance is not solvent or its insolvency is imminent; or
- (c) the Nation receives notice that the Contractor has failed to pay its subcontractors, employees, suppliers or other ancillary firm(s) for any work on this Project.

29.5 Debarment, suspension. The Government may terminate this Contract if the Government or any of its political subdivisions, enterprises, or other related entities, or if any federal or state governmental entity, has for any reason debarred or suspended the Contractor or any of its subcontractors. Such debarment or suspension shall be considered effective notwithstanding any appeal, and shall be effective unless and until conclusively resolved in favor of the Contractor or subcontractor.

29.6 Termination for Convenience. Pursuant to 12 N.N.C. §344 and §350, the Government shall have the right to terminate this Contract for the convenience of the Government.

30.0 SEVERABILITY. If any provision of this Contract is determined, by a court of competent jurisdiction arbitration decision, to be invalid, illegal or incapable of being enforced under any rule of law, all other conditions and provisions of this Contract shall nevertheless remain in full force and effect.

31.0 INDEMNIFICATION. Contractor agrees to hold harmless and indemnify the Government and its divisions, departments, offices, agencies, boards, commissions, committees, enterprises, employees, officers, officials, and agents against any and all losses, costs, damages, claims, expenses, attorney's fees, or other liabilities whatsoever, for any injury, illness, disease or death to persons and for any damage to Nation property arising from the negligent acts or omissions by the Contractor, as defined in Article 27.0 herein, regardless of whether or not any liability is caused in part by an indemnified party.

32.0 AMENDMENTS; CHANGE ORDERS, MODIFICATIONS.

32.1 Written modification required. Any revisions, amendments, addendums, alterations, change orders, modifications, increases in payment over and above the Original Contract Amount, or changes whatsoever to any provision of the Contract shall be made only by a duly approved written agreement, deemed a modification signed by the signatories of the Contract or their authorized designee.

32.2 Prior approval required. The Government's authorized representative shall determine that the modification is reasonably related to the scope of work for the project; all modifications must be approved in writing by the Nation's Representative prior to consideration and execution by the Government signatory.

32.3 20% Limitation if Bid used. If the Original Contract Amount is based on a "Bid" submitted by the Contractor and accepted by the Government, pursuant to 2 N.N.C. §223(F), such modifications shall not exceed, in the aggregate, twenty percent (20%) of the accepted Bid.

33.0 GOVERNING LAW; COMPLIANCE WITH NAVAJO NATION LAWS.

33.1 Navajo Nation Law Governs. Navajo Nation law governs the interpretation of the Contract Documents.

33.2 Navajo Preference in Hiring. In the hiring of any employees (under an employer-employee relationship) who will perform primarily at the Project site, the Contractor shall comply with all provisions of the Navajo Preference in Employment Act, at 15 N.N.C. §601 *et seq.*

33.3 Navajo Preference in subcontracting. Contractor expressly acknowledges and agrees that it is deemed a "Prime Contractor" under 5 N.N.C. §202 K, and as such must comply with all applicable provisions of the Navajo Business Opportunity Act, at 5 N.N.C. §201 *et seq.*, and with all rules and regulations promulgated thereto. In accordance with 5 N.N.C. §205 F, the Navajo Nation Business Regulatory Department shall have the authority to require the Contractor to comply with current minimum percentages for procurement and subcontract awards to Navajo-owned and controlled entities, firms and organizations, based upon availability and upon the qualifications of such entities to provide specific products and services necessary or appropriate for the Project.

33.4 Other laws. The Contractor shall comply with all other Navajo Nation laws and regulations and of the United States, now in force and effect or as hereafter may come into force and effect that pertain to the work to be performed or services to be provided under this Contract.

34.0 NAVAJO NATION JURISDICTION. By voluntarily entering into and executing this Contract, the Contractor expressly consents to the full territorial, administrative, legislative, executive and judicial jurisdiction of the Government, including but not limited to, the jurisdiction to regulate, adjudicate disputes, and to levy fines or enter judgments for injunctive relief and/or compensatory and punitive damages, in connection with all activities conducted by the Contractor within the Navajo Nation or which have a proximate (legal) effect on persons or property within the Navajo Nation. The Contractor hereby acknowledges and agrees that this Contract constitutes a voluntary consensual relationship between the Contractor and the Government.

35.0 SOVEREIGN IMMUNITY. Nothing herein shall be considered a waiver, express or implied, of the sovereign immunity of the Government, except to the limited extent provided for in the Navajo Sovereign Immunity Act, as amended, at 1 N.N.C. §§551 et seq.

36.0 DISPUTE RESOLUTION. Any claim, dispute, or other matter in question arising out of or relating to this Contract shall be resolved by the negotiation and arbitration procedures set forth as follows:

36.1 Negotiation. The Parties shall endeavor to resolve claims or disputes between them by informal good faith negotiation, which negotiation period shall not exceed thirty (30) calendar days, commencing as of the receipt by either Party of the other Party's written "Notice to Invoke Dispute Resolution Procedures."

36.2 Arbitration. If the negotiation provided for in Article 36.1 herein does not result in resolution of the Parties' dispute within thirty (30) calendar days of commencement of negotiation, then, unless the Parties agree in writing to extend the time for negotiation, either Party may invoke arbitration by sending Notice of Intent to Commence Arbitration. Any Arbitration invoked against the Navajo Nation shall be in accordance with the procedures referenced in the Navajo Sovereign Immunity Act, as amended, at 1 N.N.C. §554(J) and §554(K), and as set forth in the Navajo Nation Arbitration Act, as amended, at 7 N.N.C. §§ 1101 et seq. Any procedure not expressly provided for under Navajo law may be conducted in accordance with the Commercial Arbitration Rules of the American Arbitration Association, except to the extent that any rules are modified by the following:

- a. unless otherwise agreed to in writing by the Parties, all arbitration procedures shall be held in Window Rock, Arizona; and
- b. the arbitration shall be conducted by a single arbitrator selected by the Navajo Nation, unless one of the Parties' claims exceeds \$1,000,000.00, exclusive of interest, costs, and fees; in such case the arbitration shall be conducted by a panel consisting of three (3) arbitrators, one of which shall be chosen by each Party, with the two arbitrators choosing the third; at least one arbitrator shall possess at least ten (10) years of experience in Indian Law; and
- c. if the Contractor seeks to enforce an arbitration award against the Government, a notice of intent to invoke arbitration shall be filed in strict compliance with the notice requirements of the Navajo Sovereign Immunity

Act, at 1 N.N.C. § 555; and

- d. whether as a result of an arbitration provided for herein or of any judicial action to enforce an arbitration award resulting from such arbitration, any award against the Government shall be in strict conformance with the provisions of 1 N.N.C. §554(K) 1-6; and
- e. whether in the context of an arbitration provided for herein or any judicial action to enforce an arbitration award resulting from arbitration, Navajo Nation laws and regulations shall exclusively govern the interpretation of this Contract, the arbitration provisions herein, the arbitration procedures conducted pursuant thereto, and the application of all provisions of the Contract to the Contractor; and
- f. pursuant to 1 N.N.C. § 554(K) and 7 N.N.C. §1102, the appropriate Navajo Nation district court shall have **exclusive jurisdiction** to compel the Government's participation in on arbitration, and shall have exclusive jurisdiction to enforce, modify, or vacate on arbitration award resulting from such arbitration; Contractor understands and agrees that domestication of an arbitration judgment against the Government in any other court will violate the Navajo Nation Sovereign Immunity Act such that the Government will be able to assert the defense of sovereign immunity in any other foreign (federal, state, tribal) court; and
- g. neither Party can be awarded any attorney's fees and costs.

36.3 Exclusive Remedy. The negotiation and arbitration provisions provided herein shall constitute the sole and exclusive remedy to any dispute or controversy arising from this Contract. This dispute resolution agreement shall be a complete defense to any suit, claim, action or proceeding in any federal, state, or tribal judicial or administrative tribunal; and

36.4 Post-termination; post-expiration. Regarding any dispute arising from this Contract, the dispute resolution procedures set forth herein shall survive the termination or expiration of this Contract.

36.5 Challenges limited. By entering into this Contract, the Contractor expressly covenants and agrees that it shall not contest or challenge the territorial, administrative, legislative, executive or judicial jurisdiction of the Government on the basis that such jurisdiction is inconsistent with the status of the Navajo Nation as an Indian tribal Nation, or that the Navajo Nation government is not a government of general jurisdiction, or that the Navajo Nation government does not possess full police power (i.e. the power to legislate and regulate for the public's general health and welfare) over all lands, persons, activities, transactions, or occurrences within its territorial boundaries, or on any other basis not generally applicable in a similar challenge to the jurisdiction of a state government.

37.0 DEPARTMENT OF JUSTICE APPROVAL. Pursuant to 1 N.N.C. §554(J)(2) and (K)(2), Navajo Nation Department of Justice approval is required for all agreements that include a limited waiver of sovereign immunity to compel or enforce arbitration under the Navajo Nation Arbitration Act, as amended, 7 N.N.C. §1101 et seq.

Navajo Nation Department of Justice

*******END OF DOCUMENT*******

EXHIBIT C
SPECIAL CONTRACT REQUIREMENTS

EXHIBIT C - SPECIAL CONTRACT REQUIREMENTS

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EXHIBIT C

SPECIAL CONTRACT REQUIREMENTS

1. Requirements for Execution of Surety Bonds

Each surety company bond (performance and payment) which purports to have been executed by an agent or attorney-in-fact, for the corporate surety, is required to have submitted with it a power of attorney to the signatory agent or attorney-in-fact, and executed by the corporate surety upon a date reasonably approximate to the date to the bond. Such power of attorney shall in each instance be retained with the bond. See Article 2 of (**Exhibit A**) for further information on bonding requirements for this contract.

2. Modification Proposal - Cost Breakdown

The Contractor, in connection with any proposal he makes for a contract modification, shall upon request furnish a price breakdown, itemized as required by the Contracting Officer (CO) along with a complete breakdown of the original unit bid price as requested by the Construction Manager. Unless otherwise directed, the breakdown shall be in sufficient detail to permit an analysis of all material, labor, equipment, subcontract, and overhead costs, as well as profit, and shall cover all work involved in the modification, whether such work was deleted, added, or changed. Any amount claimed for subcontractors shall be supported by a similar price breakdown. In addition, if the proposal includes a time extension, a justification thereof shall also be furnished. The proposal, together with the price breakdown and time extension justification, shall be furnished by the date specified by the Construction Manager.

3. Contractor Safety Program Requirements

Article 6.13, Exhibit A, General Conditions of the Contract is supplemented with the following:

The Contractor shall establish a safety program, which shall include at a minimum the following requirements:

A) Safety Program Submittal:

Within 30 days following the awarding of a contract, the Contractor shall submit in writing to the Government a proposed comprehensive safety program in accordance with the following:

(a) The Contractor shall provide and maintain work environments and procedures which will (1) safeguard the public and Government personnel, property, materials, supplies, and equipment exposed to Contractor operations and activities; (2) avoid interruptions of Government operations and delays in project completion dates; and (3) control costs in the performance of this contract.

(b) For these purposes on contracts for construction or dismantling, demolition, or removal of improvements, the Contractor shall -

(1) Provide appropriate safety barricades, signs, and signal lights;

(2) Comply with the standards issued by the Secretary of Labor at 29 CFR part 1926 and 29 CFR part 1910; and

(3) Ensure that any additional measures the Contracting Officer determines to be reasonably necessary for the purposes are taken.

(c) Whenever the Government becomes aware of any noncompliance with these requirements or any condition which poses a serious or imminent danger to the health or safety of the public or Government personnel, the Government shall notify the Contractor orally, with written confirmation, and request immediate initiation of corrective action. This notice, when delivered to the Contractor or the Contractor's representative at the work site, shall be deemed sufficient notice of the noncompliance and that corrective action is required. After receiving the notice, the Contractor shall immediately take corrective action. If the Contractor fails or refuses to promptly take corrective action, the Government may issue an order stopping all or part of the work until satisfactory corrective action has been taken. The Contractor shall not be entitled to any equitable adjustment of the contract price or extension of the performance schedule on any stop work order issued under this clause.

(d) The Contractor shall insert paragraphs (a) thru (d), with appropriate changes in the designation of the parties, in subcontracts.

B) Pre-Construction Safety Meeting:

A representative of the Contractor shall meet with Construction Manager and staff prior to the start of construction, and throughout the term of the contract to review the safety program and discuss implementation of health and safety provisions pertinent to the work under contract. The Contractor should be prepared to discuss, in detail, the measures to be taken to control the hazards associated with the major phases of the work under contract. The initial meeting shall be devoted mainly to a discussion of the manner in which the Contractor intends to administer the health and safety program, delegation of responsibility for implementing the program, and a determination of what shall be presented in the written safety program.

C) Contractor Housekeeping Requirement:

Good housekeeping, including provision and facilities for routine scrap removal, shall be maintained in all areas within the Contractor's scope of operation. Any and all garbage shall be stored and removed to a certified landfill off the reservation.

D) Contractor Contamination Requirement:

Article 6.13, Exhibit A, General Conditions of the Contract is supplemented with the following:

Handling, storage, and disposal of hazardous materials of any nature shall be carried out in a manner so as not to contaminate or pollute public and/or private property, water supplies, rivers, lakes, reservoirs, streams, or the atmosphere. Disposal of all materials, including waste, garbage, and sewage, shall comply with all local, tribal, state, and federal regulations including but not limited to the Clean Water Act, 33 U.S.C. §§1251 *et seq.* and the Clean Air Act, 42 U.S.C. §§7401 *et seq.*

4. Buy America Requirements

Article 6.3 of Exhibit A, is supplemented with the following:

The following clarifies the Government's "Buy America Requirements" which requires the Contractor to provide materials that comply with the Buy America requirements in 23 CFR § 635.410. Previous interpretations of the Buy America requirements allowed exclusions for certain steel and iron manufactured products that contained less than 90% steel or iron components. Previous interpretations also allowed exclusions for miscellaneous steel and iron components, subcomponents and hardware. These exclusions no longer apply.

Since these exclusions no longer apply, the Contractor shall provide certification proving that all steel or iron materials were manufactured in the United States before performing Work that uses steel or iron materials. Additionally, the Contractor shall provide certification that all coatings on the steel or iron materials were applied in the United States. If these certifications are not provided, the Government may take any remedies available under the Contract.

Other exclusions to the Buy America requirements remain in effect, including but not limited to, minimal use of foreign steel and iron materials. The exclusion allows the Contractor to use foreign steel or iron material that does not exceed one-tenth of one percent (0.1%) of the Total Bid Amount or that does not exceed \$2,500.00 whichever is greater. To comply with the minimal use exclusion, the Contractor shall provide to the Construction Manager invoices showing the cost of the foreign steel or iron material that cannot be certified as delivered to the Project.

5. Water

Water sources used for this project shall be subject to the laws and regulations imposed by the permitting agency. Any costs associated with obtaining such permits shall be borne by the Contractor. A copy of this permit shall be furnished to the Construction Manager prior to construction. In no case may sewer lagoon water be used until the Contractor can show that the water will comply with the requirements of the Navajo EPA and the Clean Water Act and that a testing procedure to follow is outlined in the overall safety plan to insure compliance.

6. Borrow and Aggregate Materials

Contractor Furnished Source:

Article 4 of Exhibit A is supplemented as follows: The Contractor shall be solely responsible for the location, surveying, permits, and associated costs for all borrow and aggregate material sources either within or outside of the Navajo Indian Reservation. The Contractor shall provide copies of all permits to the Government for their records. The Government may provide suggested borrow sources information to the Contractor (if available) but gives no guarantees of the volumes available, suitability of the borrow material meeting the contract requirements, responsibility for the lack of material within the source to complete the items of work in this contract nor does the government waive any permit requirements through the Tribal processes. All activities associated with borrow and aggregate material sources on the

Navajo Reservation, state, and federal lands shall be subject to applicable Federal, State, and Tribal laws. All expenses associated with obtaining necessary permits shall be the contractor's responsibility. The contract time shall only be extended (under a negotiated written modification) if the Contractor in obtaining permits requiring Federal Government review and/or approval, which delays the Contractor. A delay caused by Tribal or other State or local permitting processes is the responsibility of the Contractor. Written proof is required to substantiate any delays as a result in obtaining any material sources for the project.

The Contractor shall perform aggregate quality tests on three (3) representative samples (i.e. 3 samples for the Contractor and 3 for the Government) for each proposed aggregate and borrow source and for each change in source. A source is defined as the land area from which material will be removed and represented by the aggregate quality samples. The selection of samples representing the source shall be the entire responsibility of the Contractor including cost, all associated equipment, and labor. The Contractor shall notify the Government before opening the test hole within the source so that the Government or his elected representative will have the opportunity to observe the test hole opening and subsequent sampling. The Government may perform verification testing on the Government's split samples, the costs of which shall be the responsibility of the Government. The Contractor shall not use the Materials Lab hired under this contract for the sampling and test or charge the costs to the Quality Control bid items.

The material sampled shall be tested by an AASHTO certified testing laboratory. The Contractor shall submit the test results to the Government immediately. The cost of all sampling and testing shall be considered an incidental obligation of the Contractor. The Government may direct the contractor to re-test the material source based on government test results. The costs of any re-testing shall be borne by the Contractor, unless such tests substantiate the Contractor's original results, in which case the Government will reimburse the Contractor for the costs of re-testing in accordance with section 109.02(m).

The Contractor shall be responsible for all testing during the crushing and screening operations. Should the source contain insufficient material to meet the contract needs or should it become necessary for the Contractor, to change and/or select a new source, the Contractor shall be solely responsible for all costs and delays to the contract, unless such change is due to negligent actions of the Government.

The Contractor shall be solely responsible for obtaining archeological and environmental clearances for his haul roads, material sources, staging areas, and construction yard including all permits and associated costs. The Contractor shall be responsible for providing adequate traffic control on all haul roads in accordance with the MUTCD latest edition. The Contractor shall construct and/or maintain all haul roads into and from the source to the project as required by the land owner. Any existing Government owned roads damaged by the Contractor's negligence or failure to abide by load restrictions shall be restored to original condition at the Contractor's expense. All haul road construction, maintenance (including dust control), traffic control including flaggers, and improvements will not be measured for payment but shall be considered a subsidiary obligation of the Contractor under the contract items requiring borrow and/or

aggregate material. Copies of such clearances and permits shall be furnished immediately to the Government.

Commercial and/or other Material Source:

Article 4 of Exhibit A is supplemented as follows: The Contractor shall adhere to the requirements under these “Special Contract Requirements” with the following stipulations applied:

- A. The Contractor shall advise the Government (at least 5 working days in advance) of materials to be furnished from commercial sources.
- B. The Contractor shall, upon request, furnish aggregate quality test results from the proposed commercial source with split samples for the government. This requirement will be considered fulfilled if the submittals for the product supplied contain the required information that meets the contract requirements. The Government has the right to test the split samples as necessary and provide the results to the Contractor if there is an issue with the contractor’s test results is found.

7. *-- Deleted --*

8. *-- Deleted --*

9. **Certifications and Shop Drawings**

Article 6.17, Exhibit A, General Conditions of the Contract is supplemented with the following:

Certifications: The Contractor will be required to furnish certificate(s) of compliance (i.e. production certification) along with valid test reports, for all cements, fly ash, precast products, PVC pipe, corrugated steel, structural steel and hardware, reinforcing steel, asphaltic materials, wood posts and hardware for guardrails, all permanent timber materials, aluminum signing materials, pavement markings and paints, traffic sign paint, paints and coatings for structural steel, high strength bolts, seed, piling, and other materials calling for painted surfaces, any other materials which require fabrication or materials taken from outside of the project limits, and for materials specifically requiring certificates of compliances by the construction plans or specifications. The Contractor shall be responsible to assure that the certificates of compliance have the following minimum requirements prior to submittal:

- the name and address of the manufacturer and/or supplier,
- the material production date,
- the project number (may be indicated on Contractor’s cover letter),
- the contract number (may be indicated on Contractor’s cover letter),
- a printed or written description of the end product or end use (as shown in the Construction plans, specifications, or approved shop drawings),
- applicable sizes or dimensions of materials,
- printed or written statements as to what Contract specification the material is in conformance to (as specified in the FP-14, Contract plans and specifications, and/or approved shop drawings) with proper AASHTO or equivalent ASTM test results, heat numbers, and specified limits.

Certificates of compliance for material that do not conform to the specified AASHTO or equivalent ASTM specification shall not be submitted under the Submittal Transmittal Review and Approval Form, but shall be submitted by the Contractor under a Letter of Request for Substitution with justification to include a comparison of the proposed substitute material specification to the specified material specification showing equal to or better performance. The materials may not be used on the project until such time as the submission has been reviewed and accepted, in writing, by the Government as an equivalent substitution. The certificates of compliance shall be submitted directly from the supplier, through the Prime Contractor, to the Construction Manager for review and approval prior to the materials being incorporated into the work. Certificates of compliance not containing all of the minimum requirements listed above, or certificates of compliance not conforming to the specified material specifications (ie; substitutions) which are submitted under the Submittal Transmittal Review and Approval Form, will not be reviewed by the Government and will be returned to the Contractor as DISAPPROVED. Full payment will not be made for work incorporating materials that require certificates of compliance until the material supplied on the project is matched by heat number or other identifying number to approved certificates of compliance by Quality Control subcontractor and Construction Manager. Materials supplied on the project that cannot be matched by heat number or other identifying number to approved certificates of compliance, or that are incorporated into the work prior to certificate of compliance approval, shall not be paid for.

The Contractor shall furnish product certifications for all other small quantity items which include fencing items, sign posts, delineators, object markers, reflective tabs, pavement markers, air entraining agents, concrete additives, joint materials, fertilizer, erosion control items, geotextiles, and any other products purchased off the shelf from a supplier. The certificates of compliance shall clearly identify the AASHTO/ASTM/or other specified standard test each product meets (as called for in the contract) as issued by the manufacturer.

Electrical items meeting UL approval, and underground utility materials meeting ASTM or AWWA specifications and so certified or stamped on the product, will require no further certificates of compliance.

The Contractor may furnish material purchased in bulk or left over from previous projects by submitting a product certification or certificate of compliance for the current project as outlined above.

The Contractor shall be responsible for verifying that material furnished and/or installed on the project site, or contained in items fabricated off site and shipped to the project site, are the same materials that are shown on the approved certifications and/or drawings. Verification shall be made by heat number, lot number, traceable paperwork, markings or other industry standard methods of material identification showing that the material is the same material shown on the approved certifications. Work containing material that is not verifiable as being covered by approved certifications may be disapproved and/or may be subject to non-payment. Verification shall be documented in the project record files.

Shop Drawings: The Contractor shall submit three (3) paper copies and an electronic copy for review. The Contractor shall provide Architectural D size shop drawings and electronic files in **AutoCAD 2019** compatible format on a jump drive for all bridge structural members and hardware, guardrail and barriers, cattleguards and hardware, wing bracing, retained earth walls, and any pre-cast or fabricated concrete or steel materials called for in the contract for review and approval prior to fabrication. The Contractor shall allow up to **three (3)** weeks, from the time the shop drawings are received, for review and approval. The Government shall reply to the Contractor's shop plans either as "**Approved for Fabrication**," "**Approved as Marked**," or "**Resubmit/Disapproved**".

Approval of any and all concrete reinforcement lists, shop plans, or drawings is rendered as a service only and is not considered a guarantee of measurements, quantities, and/or dimensions, nor shall it be considered as relieving the Contractor from complying with the contract requirements.

10. Furnishing of Contractor Field Testing Laboratory

Article 6 of Exhibit A is supplemented with the following: The Contractor shall furnish, at a location convenient and close to the project site, a certified field laboratory equipped with all necessary test equipment with accessories and all incidentals including utilities and sanitary facilities to satisfy the testing and inspection services required by this contract.

Use equipment that has been calibrated within the last 6 months of issuance of this contract, and that is applicable to the contract requirements. Tag all necessary equipment indicating the date of last inspection, inspector, and calibration number.

The laboratory, utilities (including all associated monthly costs), accessories, and all equipment required by the contract requirements including furnishing of a laboratory site shall be included in the unit price bid for mobilization or applicable bid item for quality control sampling, testing, and inspection as reflected in the bid schedule.

No work requiring testing shall be permitted until the Contractor has furnished the above and the laboratory is ready to accept samples for testing by furnishing the following:

1. Description of the calibrated equipment including calibration number, model number, serial number and/or other acceptable identification.
2. Identification of the individual(s) who performed the calibration of the equipment.
3. Description of the procedure used to calibrate all the equipment to be used on this contract.

11. Furnishing of Field Office & Sanitary Facilities

Article 4 of Exhibit A is supplemented as follows: The Contractor shall furnish, at locations convenient and close to the project site, one weatherproof building for the exclusive use of Government personnel for use as a field office. The building shall have, as a minimum, outside dimensions of 2.4m (8 feet) in width

by 9.14m (30 feet) in length having a minimum ceiling height of 2.13m (7 feet), at least two operable windows and two lockable doors, and adequate supply of 110 volt, 60 cycle electricity capability for lighting, operating of office and computer equipment, and shall be heated and air-conditioned; a phone service line provided with internet and fax capability; portable toilet facilities, serviced at least weekly, shall be furnished by the Contractor and removed when no longer required. In addition to the above general requirements for the building, the Contractor shall furnish a water supply for drinking, which shall be delivered either in a continuous pressurized system or an elevated gravity flow system of adequate capacity to fully support the facility being provided for the duration of the project. The furnishing (i.e. two work desks, drafting table, 4 drawer file cabinet, and table for conducting meetings with up to eight people), of the above facility (including all utilities furnished and paid for (except phone service) shall be included in the unit price bid for mobilization. See section 637.03 of the FP-2014 for additional requirements.

12. Asphalt Shipments

Article 6 of Exhibit A is supplemented with the following: All asphalt shipments to the project shall be in sealed tankers and this seal shall **only** be removed by an authorized representative of the Quality Control Manager. Any tanker with a broken seal or no seal shall be rejected and removed from the project.

When the bid schedule calls for payment of bituminous materials by the ton, the quantity used shall be determined by certified weight tickets accompanying each load subject to correction when bituminous material has been lost, wasted, or otherwise not incorporated into the work. Asphalt shipments shall be weighed across the project scales before and after unloading when requested. Should the project scales determine a weight less than the certified weight tickets show, the lesser quantity will be the pay quantity. Each weight ticket shall be clearly referenced to accompanying bill of lading and certified laboratory analysis report.

13. Load Restrictions

The total gross vehicle weight imposed on this project under this contract or any other Navajo Reservation route by any vehicle or combination of vehicles shall be as follows:

The Navajo Tribe has adopted vehicle weight limits that are more restrictive than those in the states of New Mexico, Utah, and Arizona. The weight limits of the Navajo Tribe shall apply to all BIA owned Navajo Regional roads and bridges within the Navajo Reservation unless a lesser limit is posted; then the lesser limit shall apply regardless of when the lesser limit was posted. Under certain circumstances, these limits may be exceeded, but only when the Contractor has applied for and received an approved permit to do so issued by the BIA Navajo Regional Office, Division of Transportation. The Contractor may make application for a permit to exceed weight limits from the Regional Road Maintenance Engineer.

The State and Counties respective laws set the weight limits for roads under the jurisdiction of the counties and states. The Contractor is required to haul within these limits unless he has a permit from the applicable jurisdiction to haul above those limits. The Contractor shall be solely responsible for all damages to roads and bridges caused by hauling above the legal limits including any Subcontractors under

this contract. All damages, regardless of jurisdiction, shall be repaired at the Contractor's expense to the satisfaction of the owner's standards and/or directives.

14 N.N.C. §§607 - 608 of the Navajo Nation Code as it relates to vehicle load limits is referenced (in metric) herein for the Contractor's convenience when hauling over BIA or tribal routes.

Section 607.Load limits on Single-axles, wheels and tires

- a) The gross weight imposed on the highway by the wheels of any one (1) axle of any one (1) axle of a vehicle shall not exceed 9809 kg, nor shall any one (1) wheel carry a load in excess of 4995 kg. A tandem axle **cannot** carry load in excess of 15,585 kg.
- b) No wheel equipped with pneumatic, solid rubber, or cushion tires shall carry a load in excess of 272 kg for every 25mm of tire width. The width of pneumatic tires shall be taken at the manufacturer's rating. The width of solid rubber and cushion tires shall be measured at the flange of the rim.

Section 608.Gross weight of vehicles and loads

- (a) Subject to the weight limits imposed in section 607, the total gross weight with load of a vehicle or combination of vehicles with two or more consecutive axles shall not exceed the gross weight given for the respective distance between the first and last axles of measured longitudinally to the nearest 0.3 meters, as set forth in the following table:

<u>Distance (D)</u>	<u>Load (L)</u>	<u>Distance (D)</u>	<u>Load (L)</u>	<u>Distance (D)</u>	<u>Load (L)</u>
1.2	14,512	2.7	15,419	4.3	19,592
1.5	14,512	3.0	15,873	4.6	19,955
1.8	14,512	3.3	16,190	4.9	20,317
2.1	14,512	3.7	16,508	5.2	20,680
2.4	14,966	4.0	16,825	5.5	21,043

D = Distance in meters (m) between first and last axles of group of axles.

L = Allowable load in kilograms (kg) on group of axles.

- (b) The total gross weight with load imposed on the highway by any vehicle or combination of vehicles where the distance between the first and last axles is more than 5.45 meters shall not exceed that given for the respective distance given in the following table:

<u>Distance (D)</u>	<u>Load (L)</u>	<u>Distance (D)</u>	<u>Load (L)</u>	<u>Distance (D)</u>	<u>Load (L)</u>

5.8	21,406	8.8	26,599	11.9	30,839
6.1	21,769	9.1	26,984	12.2	31,746
6.4	22,131	9.4	27,370	12.5	32,653
6.7	22,494	9.7	27,755	12.8 – 15.5	32,780
7.0	22,857	10.0	28,140	15.8	33,379
7.3	23,220	10.4	28,526	16.1	33,741
7.6	25,057	10.7	28,911	16.4	34,104
7.9	25,442	11.0	29,297	16.8	34,467
8.2	25,828	11.3	29,682	17.0 & over	34,830
8.5	26,213	11.6	30,068		

D = Distance in meters (m) between first and last axles of vehicle.

L = Allowable load in kilograms (kg) of vehicle.

- (c) The distance between axles shall be measured to the nearest (0.3m). When a fraction is exactly one-half foot (152mm) the next larger whole number shall be used.

The Contractor shall be responsible for all damages caused by his or her supplier's hauling units on any State, Tribal, and Bureau owned highway. All damages shall be repaired at the Contractor's expense to the facilities original condition.

14. -- Deleted --

15. Archeological Requirements

Article 6.9 of Exhibit A is supplemented with the following: The Contractor shall be responsible for all environmental and archaeological requirements as outlined in Navajo Nation Historic Preservation (HPD) Office archeological discovery procedures, and NEPA regulations as may be described in this contract and/or shown on the design plans. Archeological sites shown on the plans are not to be disturbed by any construction equipment unless otherwise directed by the Government. The Contractor shall insure that no equipment comes within 5 meters of any known sites identified on the plans. Any mitigation measures that may be called for in this contract (excluding hiring of an archeologist for construction oversight) to protect archeological sites and/or environmental concerns during construction shall be paid for under the appropriate bid items shown. For those archaeological sites that are within the roadway right-of-way (i.e. refer to design plans) the Contractor may have to conduct the grading operations ONLY with an archeologist present. The Contractor shall coordinate such work with the Government so that an archeologist can be present during construction if the construction plans call for such. If any unknown

arch sites or environmental concerns are discovered during construction, it will be the responsibility of the Government to mitigate in accordance with section 106 of the NHPA and/or section 107.02 of the FP-2014. The Contractor is then required to coordinate and accommodate the necessary archeological/environmental work while constructing the roadway in other locations.

In the event that **all project work** has to be suspended, for a short period of time (i.e. up to 4 weeks) to address any issues with archaeology or environmental mitigation mentioned above, the Contractor may request for a time extension equal to the delay of the mitigation to the Government in writing. See Article 15 of Exhibit A for SUSPENSION OF WORK in the contract documents for further information.

16. **Construction Requirements:**

Article 6 of Exhibit A is supplemented with the following:

- A. The Contractor is not permitted to park heavy equipment within 15 meters of existing drainage washes to prevent the leakage of oils or other toxic materials from entering the waters of the United States. The Contractor is required to inspect all heavy construction equipment each day to insure all equipment is free of leaks and have a mitigation plan in place in case a toxic spill does occur. Any inadvertent discharge of toxic materials by the Contractor's equipment and operations shall result in an immediate halt of work until the Contractor cleans up all spills and/or leaks in accordance with the EPA regulations at his entire expense. The Contractor shall also be required to immediately notify the Government and Navajo Regional Environmental Scientist when such spills or leaks occur.
- B. All pipe installations shall be performed during low to no flow periods of runoff to minimize water quality impacts to the fullest extent possible.
- C. In no case shall any grading or pipe installation or other ground disturbing work begin until the contractor's Storm Water Pollution Prevention Plan has been reviewed, accepted by the Government and implemented by the Contractor. The Contractor is required to file a Notice of Intent with USEPA on the forms provided by the USEPA. See paragraph (17) below. The Contractor shall provide copies of the approved SWPPP to the Navajo Nation Environmental Protection Agency (NNEPA).
- D. Waste concrete and/or hot mix shall be disposed of in accordance with EPA regulations off the project site. In no case shall any wasting or stockpiling of concrete and/or hot mix be allowed within the project limits. Temporary washout traps or containment vessels are allowed provided these traps or vessels are properly engineered and located in the proper locations before use. At completion, the traps and vessels shall be removed from the project in accordance with these contract requirements, USEPA, Navajo EPA, and State regulations.
- E. The Contractor shall provide a parking area for employee's private vehicles. Private vehicles are not to be parked within the road right-of-way that is open to public traffic nor shall they be parked within 15 meters of drainage washes or known archeological sites. Vehicles may be parked

outside the right-of-way limits provided the Contractor is given permission by the land user or tribe or may park the vehicles within the Contractor's construction yard.

- F. No work involving testing and inspection may take place until the Contractor's Quality Control Plan is reviewed and accepted by the Government in writing.
- G. The Contractor shall coordinate all work and cooperate with the utility companies and adjoining land users who have buried or overhead water, gas, electric, and phone lines within or just outside the right-of-way in accordance with Section 107.02 as incidental obligations under this contract.
- H. The Contractor shall stockpile the existing top soil for use in re-vegetation of borrow pits and roadway slopes to the fullest extent possible **when required in the bid schedule** or other permit requirements issued under the permitting office. Do not carry out clearing and grubbing until the Contractor's surveyor has cross sectioned the original ground on the roadway and has submitted the data for review and the Contractor has been given approval in writing. For borrow pits, the overburden top soil must be removed first before cross sections can be taken. See section 204.08 & 204.16(a)(2)(a) of the FP-14.
- I. The Contractor's camp site and construction yard shall be kept clean and free of litter at all times to prevent debris and litter from entering bodies of water. All trash will be disposed of in accordance with State and USEPA regulations and all camp sites and construction yards shall be restored to their pre-construction condition or better at project completion in conformance with the permit requirements and applicable tribal, state, and federal laws.
- J. Oils, lubricant, fuel, and hydraulic fluids shall be stored in sealed containers or in facilities that meet EPA regulations for prevention of environmental contamination.
- K. Any welding called for (except tack welding) on any structural member (member designed to carry or resist traffic or pedestrian loads) shall be subject to visual inspection and magnetic particle testing by an AWS Certified Welding Inspector, and shall pass such testing prior to acceptance of the work unless otherwise directed by the Government. All inspection, equipment, materials and incidentals required for the testing, inspection, and reporting by an AWS Certified Welding Inspector shall be included in the unit price bid for Bid Item 15301-0000.
- L. Other requirements as outlined in Exhibit (I) of this contract.
- M. **-- Deleted --**
- N. **-- Deleted --**

17. Environmental NOI Requirements:

Certain environmental clearances, Best Management Practices, and Clean Water Act permits are attached in Exhibit (I) of these contract documents as reflected in the design plans in accordance with section 107.01 of the FP-2014. The Government/owner of the project shall be responsible for those mitigation

measures required by the NEPA documents that are not covered in this contract. The Contractor is responsible for all environmental permits associated with the Contractor's construction operations.

Both the Contractor and Owner/Government are jointly responsible for filing **Notice of Intent** (unless otherwise directed by the Government or as defined elsewhere in this contract) to begin construction under the National Pollution Discharge Elimination System (NPDES) permit requirements to USEPA. Under this permit process the Contractor is required to and shall:

- A. Prepare for review and approval a Storm Water Pollution Prevention Plan (SWPPP) per section 157 and the requirements in Exhibit I.
- B. When the SWPPP is approved, the Government will have the project Owner file **Notice of Intent** and a copy of the notice shall be provided to the Contractor to file with his Notice.
- C. Once the Contractor receives notice that his SWPPP is approved, he shall prepare the Contractor NPDES Permit **Notice of Intent** form in Exhibit I and submit an NOI to the USEPA no later than the 14 day waiting period prior to actual ground disturbance per the 2017 CGP. The USEPA will mail back a copy of the permit for the project and a copy shall be furnished to the Government to insure compliance.
- D. At completion of the project and final inspection has been performed, the Contractor shall then prepare and submit to the USEPA a **Notice of Termination** with a copy submitted to the Government to insure compliance.

Note: The above forms can also be found on the following USEPA page:

<https://www.epa.gov/npdes/submitting-notice-intent-noi-notice-termination-not-or-low-erosivity-waiver-lew-under>

18. Contract Clauses:

The following Clauses are applicable to this Construction Contract. Each Bidder shall include the following requirements in their bid proposals:

Clause NN-214-18 Preparation of Bids:

(a) Bids must be (1) submitted on the forms furnished by the Contracting Agency or on copies of those forms, and (2) manually signed. The person signing a bid must initial each erasure or change appearing on any bid form.

(b) The bid form may require bidders to submit bid prices for one or more items on various bases, including -

- (1) Lump sum bidding;
- (2) Alternate prices (as called for);
- (3) Units of construction; or
- (4) Any combination of subparagraphs (1) through (3) above.

(c) If the solicitation requires bidding on all items, failure to do so will disqualify the bid. If bidding on all items is not required, bidders should insert the words no bid in the space provided for any item on which no price is submitted.

(d) Alternate bids will not be considered unless this solicitation authorizes their submission.

Execute and submit all required standard forms, bid schedules, and solicitation provisions contained in the solicitation as part of the bid.

Complete NN-1442, Solicitation, Offer, and Award, and sign as follows:

(a) Individuals. Sign your individual signature. For individuals doing business as a firm, follow the individual signature with the individual's typed, stamped, or printed name and the words, "an individual doing business as (name of firm) ."

(b) Partnerships. Submit a list of all partners having authority to bind the partnership. One of the listed partners must sign on behalf of the partnership.

(c) Corporations. Sign in the corporate name, followed by the word "by" and the signature and title of the person authorized to sign. Submit evidence from the corporation that the person signing has authority to bind the corporation.

(d) Joint ventures. Submit a copy of the Joint Venture agreement. Sign the EJCDC C-520 Contract Agreement and NN-1442 according to the Joint Venture agreement.

(e) Limited liability company. Sign in the company name, followed by the word "by" and the signature of the person authorized to sign. Submit evidence that the individual executing the document has authority to bind the company.

(f) Agents. When an agent signs, other than as stated in (a) through (e) above, furnish satisfactory evidence that the agent has authority to bind the bidder.

Bid Schedule: Insert a unit bid price, in figures, for each pay item for which a quantity appears in the bid schedule. Multiply the unit bid price by the quantity for each pay item and show the amount bid. Should any mathematical check made by the Government show a mistake in the amount bid, the corrected unit price extension shall govern.

When the words "lump sum" appear as a unit bid price, insert an amount bid for each lump sum pay item.

When the words "contingent sum" or a fixed rate appears as a unit bid price, include the Government inserted amount bid for the item in the total bid amount if not already filled in.

Total all of the amounts bid for each pay item and show the total bid amount.

The quantities shown in the bid schedule are approximate, unless designated as a contract quantity, and are used for the comparison of bids. Payment will be made for the actual quantities of work performed and accepted or material furnished according to the contract. The scheduled quantities may be increased, decreased, or deleted. Bid schedule quantities are considered the original contract quantities.

Clause NN-228-1 Bid Guarantee:

Submit the bid guarantee in accordance with the following requirements and on NN-24, Bid Bond form. (see Exhibit E for forms):

(a) Failure to furnish a bid guarantee in the proper form and amount, by the time set for opening of bids, will be cause for rejection of the bid.

(b) The bidder shall furnish a bid guarantee in the form of a firm commitment, e.g., bid bond supported by good and sufficient surety or sureties acceptable to the Government, postal money order, certified check, cashier's check, irrevocable letter of credit, or, under Treasury Department regulations, certain bonds or notes of the United States. The Government will return bid guarantees, other than bid bonds.

(1) To unsuccessful bidders as soon as practicable after the opening of bids; and

(2) To the successful bidder upon execution of contractual documents and bonds (including any necessary coinsurance or reinsurance agreements), as required by the bid as accepted.

(c) The amount of the bid guarantee shall be **ten (10)** percent of the bid price per Navajo Nation Procurement Code 12 N.N.C. §341 Bid Security.

(d) If the successful bidder, upon acceptance of its bid by the Government within the period specified for acceptance, fails to execute all contractual documents or furnish executed bond(s) within 10 days after receipt of the forms by the bidder, the Government may terminate the contract for default.

(e) In the event the contract is terminated for default, the bidder is liable for any cost of acquiring the work that exceeds the amount of its bid, and the bid guarantee is available to offset the difference.

(f) If the bid guarantee is other than a corporate or individual surety, sign the SF 24 as the principal and make a statement on the form pledging the security. Make checks or money orders payable to the agency issuing the solicitation.

(g) **Power of attorney.** A corporate surety shall submit a current power of attorney for the signing agent or attorney-in-fact with each bid bond.

(h) **Evidence of guarantee assistance.** A surety that has a guarantee of assistance from the Small Business Administration shall submit a copy of its *"Surety Bond Guarantee Agreement"* with each bid bond. In addition, submit a power of attorney for the surety representative identified in the agreement.

Clause NN-228-11: Individual Surety:

See Exhibit E for forms to use under this clause.

(a) Offerors shall obtain from each person acting as an individual surety on a bid guarantee, a performance bond, or a payment bond -

(1) Pledge of assets; and

(2) Standard Affidavit of Individual Surety.

(b) Pledges of assets from each person acting as an individual surety shall be in the form of -

(1) Evidence of an escrow account containing cash, certificates of deposit, commercial or Government securities, or other assets with respect to Government securities held in book entry form; and/or

(2) A recorded lien on real estate. The offeror will be required to provide -

(i) A mortgagee title insurance policy, in an insurance amount equal to the amount of the lien, or other evidence of title that is consistent with the requirements of Section 2 of the United States Department of Justice Title Standards at http://www.justice.gov/enrd/ENRD_Assets/Title_Standards_2001.pdf. This title evidence must show fee simple title vested in the surety along with any concurrent owners; whether any real estate taxes are due and payable; and any recorded encumbrances against the property, including the lien filed in favor of the Government.

(ii) Evidence of the amount due under any encumbrance shown in the evidence of title;

(iii) A copy of the current real estate tax assessment of the property or a current appraisal dated no earlier than 6 months prior to the date of the bond, prepared by a professional appraiser who certifies that the appraisal has been conducted in accordance with the generally accepted appraisal standards as reflected in the Uniform Standards of Professional Appraisal Practice, as promulgated by the Appraisal Foundation.

Complete and date the Affidavit of Individual Surety, after the solicitation date. The individual surety shall personally sign this Affidavit. Execution by power of attorney is not acceptable. Bidders cannot serve as their own surety. Assets named shall be committed to the project with a bank designated to serve as trustee.

After reviewing the Affidavit of Individual Surety, the surety may be requested to provide further documentation with respect to any of its assets, debts, or encumbrances. The information may be required to be furnished under oath. Failure of the surety to respond with the requested documentation within 7 days of receipt of the request is cause for rejection of the surety.

Any material misstatement by the surety, overstatement of assets (either as to ownership or value) or understatement of liabilities is cause for rejection of the surety. Substitution of individual sureties to support a bid bond after the bid opening will not be permitted.

Clause NN-228-15: Performance and Payment Bonds:

(a) The successful offeror shall furnish performance and payment bonds to the Government as detailed in Article 11 of Exhibit B.

(b) See Exhibit E for forms to use under this clause.

(c) Furnishing executed bonds. The Contractor shall furnish all executed bonds, including any necessary reinsurance agreements, to the Government, within the time period specified in the Bid Guarantee provision of the solicitation, or otherwise specified by the Government, but in any event, before starting work.

(d) Surety or other security for bonds. The bonds shall be in the form of firm commitment, supported by corporate sureties whose names appear on the list contained in Treasury Department Circular 570, individual sureties, or by other acceptable security such as postal money order, certified check, cashier's check, irrevocable letter of credit, or, in accordance with Treasury Department regulations, certain bonds or notes of the United States. Treasury Circular 570 is published in the Federal Register or at <http://www.fms.treas.gov/c570/>.

(e) The requirements contained in Subsections 102.03 and 102.04 of the FP-2014 relating to power of attorney, evidence of guarantee assistance, and individual sureties also apply to performance and payment bonds.

Clause NN-214-10: Sealed Bidding and Submission of Bids:

(a) The Government will evaluate bids in response to this solicitation as described in the Request for Proposals and will award a contract to the responsible bidder following the Navajo Nation Procurement Act and Regulations. Refer to 12 N.N.C. §332 Competitive Sealed Proposals.

(b) The Government may (1) reject any or all bids, (2) accept other than the lowest bid, and (3) waive informalities or minor irregularities in bids received.

(c) The Government may accept any item or group of items of a bid, unless the bidder qualifies the bid by specific limitations. The Government reserves the right to make an award on any item for a quantity less than the quantity offered, at the unit prices offered, unless the bidder specifies otherwise in the bid.

(d) The Government may reject a bid as nonresponsive if the prices bid are materially unbalanced between line items or subline items. A bid is materially unbalanced when it is based on prices significantly less than cost for some work and prices which are significantly overstated in relation to cost for other work, and if there is a reasonable doubt that the bid will result in the lowest overall cost to the Government even though it may be the low evaluated bid, or if it is so unbalanced as to be tantamount to allowing an advance payment.

(e) Bids and bid modifications shall be submitted in sealed envelopes or packages (unless Government allows submissions by electronic means) (1) addressed to the office specified in the solicitation, and (2) showing the time and date specified for receipt, the solicitation number, and the name and address of the bidder.

(f) Bidders using commercial carrier services shall ensure that the bid is addressed and marked on the outermost envelope or wrapper as prescribed in subparagraphs (e) (1) and (2) of this provision when delivered to the office specified in the solicitation.

(g) Facsimile bids, modifications, or withdrawals, will not be considered unless authorized by the solicitation.

(h) Bids submitted by electronic commerce shall be considered only if the electronic commerce method was specifically stipulated or permitted by the solicitation.

Clause NN-236-1: Performance of Work by the Contractor:

The Prime Contractor shall perform on the site, and with its own organization, work equivalent to at least **50%** percent of the total dollar amount of work to be performed under the contract. This percentage may be reduced by a supplemental agreement to this contract if, during performing the work, the Contractor requests a reduction and the Government determines that the reduction would be to the advantage of the Government.

Clause NN-222-6 Construction Wage Rate Requirements (Davis Bacon Act):

See Exhibit H for the Wage determination for this construction contract.

(a) Definition - Site of the work –

(1) Means -

(i) The primary site of the work. The physical place or places where the construction called for in the contract will remain when work on it is completed; and

(ii) The secondary site of the work, if any. Any other site where a significant portion of the building or work is constructed, provided that such site is -

(A) Located in the United States; and

(B) Established specifically for the performance of the contract or project;

(2) Except as provided in paragraph (3) of this definition, includes any fabrication plants, mobile factories, batch plants, borrow pits, job headquarters, tool yards, etc., provided -

(i) They are dedicated exclusively, or nearly so, to performance of the contract or project; and

(ii) They are adjacent or virtually adjacent to the “primary site of the work” as defined in paragraph (a)(1)(i), or the “secondary site of the work” as defined in paragraph (a)(1)(ii) of this definition;

(3) Does not include permanent home offices, branch plant establishments, fabrication plants, or tool yards of a Contractor or subcontractor whose locations and continuance in operation are determined wholly without regard to a particular Federal contract or project. In addition, fabrication plants, batch plants, borrow pits, job headquarters, yards, etc., of a commercial or material supplier which are established by a supplier of materials for the project before opening of bids and not on the Project site, are not included in the “site of the work.” Such permanent, previously established facilities are not a part of the “site of the work” even if the operations for a period of time may be dedicated exclusively or nearly so, to the performance of a contract.

(b)

(1) All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment

computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, or as may be incorporated for a secondary site of the work, regardless of any contractual relationship which may be alleged to exist between the Contractor and such laborers and mechanics. Any wage determination incorporated for a secondary site of the work shall be effective from the first day on which work under the contract was performed at that site and shall be incorporated without any adjustment in contract price or estimated cost. Laborers employed by the construction Contractor or construction subcontractor that are transporting portions of the building or work between the secondary site of the work and the primary site of the work shall be paid in accordance with the wage determination applicable to the primary site of the work.

(2) Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Construction Wage Rate Requirements statute on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (e) of this clause; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such period.

(3) Such laborers and mechanics shall be paid not less than the appropriate wage rate and fringe benefits in the wage determination for the classification of work actually performed, without regard to skill, except as provided in the clause entitled Apprentices and Trainees. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein; provided that the employer's payroll records accurately set forth the time spent in each classification in which work is performed.

(4) The wage determination (including any additional classifications and wage rates conformed under paragraph (c) of this clause) and the Construction Wage Rate Requirements (Davis-Bacon Act) poster (WH-1321) shall be posted at all times by the Contractor and its subcontractors at the primary site of the work and the secondary site of the work, if any, in a prominent and accessible place where it can be easily seen by the workers.

(c)

(1) The Government shall require that any class of laborers or mechanics, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The Government shall approve an additional classification and wage rate and fringe benefits therefor only when all the following criteria have been met:

- (i) The work to be performed by the classification requested is not performed by a classification in the wage determination.
- (ii) The classification is utilized in the area by the construction industry.
- (iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(iv) With respect to helpers, such a classification prevails in the area in which the work is performed.

(2) If the Contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the Government agree on the classification and wage rate (including the amount designated for fringe benefits, where appropriate), a report of the action taken shall be sent by the Government to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator or an authorized representative will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the Government or will notify the Government within the 30-day period that additional time is necessary.

(3) In the event the Contractor, the laborers or mechanics to be employed in the classification, or their representatives, and the Government do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the Government shall refer the questions, including the views of all interested parties and the recommendation of the Government, to the Administrator of the Wage and Hour Division for Determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the Government or will notify the Government within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits, where appropriate) determined pursuant to subparagraphs (c)(2) and (c)(3) of this clause shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(d) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the Contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(e) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program; provided, that the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Construction Wage Rate Requirements statute have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

Clause NN-219-14: Limitations on Subcontracting:

(a) This clause does not apply to the unrestricted portion of a partial set-aside.

(b) Applicability. This clause applies only to -

(1) Contracts that have been set aside or reserved for small business concerns or 8(a) participants;

- (2) Part or parts of a multiple-award contract that have been set aside for small business concerns or 8(a) participants; and
 - (3) Orders set aside for small business or 8(a) participants under multiple-award contracts as described in 8.405-5 and 16.505(b)(2)(i)(F).
- (c) By submission of an offer and execution of a contract, the Offeror/Contractor agrees that in performance of the contract in the case of a contract for -
- (1) Services (except construction). At least 50 percent of the cost of contract performance incurred for personnel shall be expended for employees of the concern.
 - (2) Supplies (other than procurement from a non-manufacturer of such supplies). The concern shall perform work for at least 50 percent of the cost of manufacturing the supplies, not including the cost of materials.
 - (3) General construction. The concern will perform at least 15 percent of the cost of the contract, not including the cost of materials, with its own employees.
 - (4) Construction by special trade contractors. The concern will perform at least 25 percent of the cost of the contract, not including the cost of materials, with its own employees.

Clause NN-236-3: Site Investigation and Conditions Affecting the Work:

(a) The Contractor acknowledges that it has taken steps reasonably necessary to ascertain the nature and location of the work, and that it has investigated and satisfied itself as to the general and local conditions which can affect the work or its cost, including but not limited to (1) conditions bearing upon transportation, disposal, handling, and storage of materials; (2) the availability of labor, water, electric power, and roads; (3) uncertainties of weather, river stages, tides, or similar physical conditions at the site; (4) the conformation and conditions of the ground; and (5) the character of equipment and facilities needed preliminary to and during work performance. The Contractor also acknowledges that it has satisfied itself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by the Government, as well as from the drawings and specifications made a part of this contract. Any failure of the Contractor to take the actions described and acknowledged in this paragraph will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the work without additional expense to the Government.

(b) The Government assumes no responsibility for any conclusions or interpretations made by the Contractor based on the information made available by the Government. Nor does the Government assume responsibility for any understanding reached or representation made concerning conditions which can affect the work by any of its Engineer, officers, or agents before the execution of this contract, unless that understanding or representation is expressly stated in this contract.

Clause NN-236-5: Material and Workmanship:

(a) All equipment, material, and articles incorporated into the work covered by this contract shall be new and of the most suitable grade for the purpose intended, unless otherwise specifically provided

in this contract. References in the specifications to equipment, material, articles, or patented processes by trade name, make, or catalog number, shall be regarded as establishing a standard of quality and shall not be construed as limiting competition. The Contractor may, at its option, use any equipment, material, article, or process that, in the judgment of the Government, is equal to that named in the specifications, unless otherwise specifically provided in this contract.

(b) All work under this contract shall be performed in a skillful and workmanlike manner. The Contracting Officer may require, in writing, that the Contractor remove from the work any employee the Government deems incompetent, careless, or otherwise objectionable.

Clause NN-236-9: Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements:

(a) The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which is not to be removed and which does not unreasonably interfere with the work required under this contract. The Contractor shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during contract performance, or by the careless operation of equipment, or by workmen, the Contractor shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the Contracting Officer.

(b) The Contractor shall protect from damage all existing improvements and utilities (1) at or near the work site and (2) on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. The Contractor shall repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refuses to repair the damage promptly, the Government may have the necessary work performed and charge the cost to the Contractor.

Clause NN-236-13: Accident Prevention:

(a) The Contractor shall provide and maintain work environments and procedures which will (1) safeguard the public and Government personnel, property, materials, supplies, and equipment exposed to Contractor operations and activities; (2) avoid interruptions of Government operations and delays in project completion dates; and (3) control costs in the performance of this contract.

(b) For these purposes on contracts for construction or dismantling, demolition, or removal of improvements, the Contractor shall -

- (1) Provide appropriate safety barricades, signs, and signal lights;
- (2) Comply with the standards issued by the Secretary of Labor at 29 CFR part 1926 and 29 CFR part 1910; and
- (3) Ensure that any additional measures the Contracting Officer determines to be reasonably necessary for the purposes are taken.

(c) If this contract is for construction or dismantling, demolition or removal of improvements with any Department of Defense agency or component, the Contractor shall comply with all pertinent

provisions of the latest version of U.S. Army Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1, in effect on the date of the solicitation.

(d) Whenever the Contracting Officer becomes aware of any noncompliance with these requirements or any condition which poses a serious or imminent danger to the health or safety of the public or Government personnel, the Contracting Officer shall notify the Contractor orally, with written confirmation, and request immediate initiation of corrective action. This notice, when delivered to the Contractor or the Contractor's representative at the work site, shall be deemed sufficient notice of the noncompliance and that corrective action is required. After receiving the notice, the Contractor shall immediately take corrective action. If the Contractor fails or refuses to promptly take corrective action, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. The Contractor shall not be entitled to any equitable adjustment of the contract price or extension of the performance schedule on any stop work order issued under this clause.

(e) The Contractor shall insert this clause, including this paragraph (e), with appropriate changes in the designation of the parties, in subcontracts.

Clause NN-236-21: Specifications and Drawings for Construction:

(a) The Contractor shall keep on the work site a copy of the drawings and specifications and shall at all times give the Contracting Officer access thereto. Anything mentioned in the specifications and not shown on the drawings, or shown on the drawings and not mentioned in the specifications, shall be of like effect as if shown or mentioned in both. In case of difference between drawings and specifications, the specifications shall govern. In case of discrepancy in the figures, in the drawings, or in the specifications, the matter shall be promptly submitted to the Contracting Officer, who shall promptly make a determination in writing. Any adjustment by the Contractor without such a determination shall be at its own risk and expense. The Contracting Officer shall furnish from time to time such detailed drawings and other information as considered necessary, unless otherwise provided.

(b) Wherever in the specifications or upon the drawings the words directed, required, ordered, designated, prescribed, or words of like import are used, it shall be understood that the direction, requirement, order, designation, or prescription, of the Contracting Officer is intended and similarly the words approved, acceptable, satisfactory, or words of like import shall mean approved by, or acceptable to, or satisfactory to the Contracting Officer, unless otherwise expressly stated.

(c) Where as shown, as indicated, as detailed, or words of similar import are used, it shall be understood that the reference is made to the drawings accompanying this contract unless stated otherwise. The word provided as used herein shall be understood to mean provide complete in place that is furnished and installed.

(d) Shop drawings means drawings, submitted to the Government by the Contractor, subcontractor, or any lower tier subcontractor pursuant to a construction contract, showing in detail (1) the proposed fabrication and assembly of structural elements and (2) the installation (i.e., form, fit, and attachment details) of materials or equipment. It includes drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, and similar materials furnished by the contractor to explain in detail specific portions of the work required by the contract. The Government

may duplicate, use, and disclose in any manner and for any purpose shop drawings delivered under this contract.

(e) If this contract requires shop drawings, the Contractor shall coordinate all such drawings, and review them for accuracy, completeness, and compliance with contract requirements and shall indicate its approval thereon as evidence of such coordination and review. Shop drawings submitted to the Contracting Officer without evidence of the Contractor's approval may be returned for resubmission. The Contracting Officer will indicate an approval or disapproval of the shop drawings and if not approved as submitted shall indicate the Government's reasons therefor. Any work done before such approval shall be at the Contractor's risk. Approval by the Contracting Officer shall not relieve the Contractor from responsibility for any errors or omissions in such drawings, nor from responsibility for complying with the requirements of this contract, except with respect to variations described and approved in accordance with (f) below.

(f) If shop drawings show variations from the contract requirements, the Contractor shall describe such variations in writing, separate from the drawings, at the time of submission. If the Contracting Officer approves any such variation, the Contracting Officer shall issue an appropriate contract modification, except that, if the variation is minor or does not involve a change in price or in time of performance, a modification need not be issued.

(g) The Contractor shall submit to the Contracting Officer for approval four copies (unless otherwise indicated) of all shop drawings as called for under the various headings of these specifications. Three sets (unless otherwise indicated) of all shop drawings, will be retained by the Contracting Officer and one set will be returned to the Contractor.

Clause NN-243-1: Changes Fixed-Price:

(a) The Contracting Officer may at any time, by written order, and without notice to the sureties, if any, make changes within the general scope of this contract in any one or more of the following:

- (1) Drawings, designs, or specifications when the supplies to be furnished are to be specially manufactured for the Government in accordance with the drawings, designs, or specifications.
- (2) Method of shipment or packing.
- (3) Place of delivery.

(b) If any such change causes an increase or decrease in the cost of, or the time required for, performance of any part of the work under this contract, whether or not changed by the order, the Government shall make an equitable adjustment in the contract price, the delivery schedule, or both, and shall modify the contract.

(c) The Contractor must assert its right to an adjustment under this clause within 30 days from the date of receipt of the written order. However, if the Government decides that the facts justify it, the Government may receive and act upon a proposal submitted before final payment of the contract.

(d) If the Contractor's proposal includes the cost of property made obsolete or excess by the change, the Government shall have the right to prescribe the manner of the disposition of the property.

(e) Failure to agree to any adjustment shall be a dispute under the Disputes clause (Exhibit B) of this contract. However, nothing in this clause shall excuse the Contractor from proceeding with the contract as changed.

Clause NN-236-17: Layout of Work:

The Contractor shall lay out its work from Government-established base lines and bench marks indicated on the drawings, and shall be responsible for all measurements in connection with the layout. The Contractor shall furnish, at its own expense, all stakes, templates, platforms, equipment, tools, materials, and labor required to lay out any part of the work. The Contractor shall be responsible for executing the work to the lines and grades that may be established or indicated by the Government. The Contractor shall also be responsible for maintaining and preserving all stakes and other marks established by the Government until authorized to remove them. If such marks are destroyed by the Contractor or through its negligence before their removal is authorized, the Contractor shall replace them promptly before any further work continues. The Government may replace them and deduct the expense of the replacement from any amounts due or to become due to the Contractor.

Clause NN-248-3: Value Engineering Construction:

(a) General. The Contractor is encouraged to develop, prepare, and submit a value engineering change proposals (VECP's) voluntarily. The Contractor shall share in any instant contract savings realized from accepted VECP's, in accordance with paragraph (f) below.

(b) Definitions. Collateral costs, as used in this clause, means agency costs of operation, maintenance, logistic support, or Government-furnished property.

Collateral savings, as used in this clause, means those measurable net reductions resulting from a VECP in the agency's overall projected collateral costs, exclusive of acquisition savings, whether or not the acquisition cost changes.

Contractor's development and implementation costs, as used in this clause, means those costs the Contractor incurs on a VECP specifically in developing, testing, preparing, and submitting the VECP, as well as those costs the Contractor incurs to make the contractual changes required by Government acceptance of a VECP.

Government costs, as used in this clause, means those agency costs that result directly from developing and implementing the VECP, such as any net increases in the cost of testing, operations, maintenance, and logistic support. The term does not include the normal administrative costs of processing the VECP.

Instant contract savings, as used in this clause, means the estimated reduction in Contractor cost of performance resulting from acceptance of the VECP, minus allowable Contractor's development and implementation costs, including subcontractors' development and implementation costs (see paragraph (h) below).

Value engineering change proposal (VECP) means a proposal that -

- (1) Requires a change to this, the instant contract, to implement; and

(2) Results in reducing the contract price or estimated cost without impairing essential functions or characteristics; provided, that it does not involve a change -

(i) In deliverable end item quantities only; or

(ii) To the contract type only.

(c) VECP preparation. As a minimum, the Contractor shall include in each VECP the information described in subparagraphs (1) through (7) below. If the proposed change is affected by contractually required configuration management or similar procedures, the instructions in those procedures relating to format, identification, and priority assignment shall govern VECP preparation. The VECP shall include the following:

(1) A description of the difference between the existing contract requirement and that proposed; the comparative advantages and disadvantages of each, a justification when an item's function or characteristics are being altered, and the effect of the change on the end item's performance.

(2) A list and analysis of the contract requirements that must be changed if the VECP is accepted, including any suggested specification revisions.

(3) A separate, detailed cost estimate for (i) the affected portions of the existing contract requirement and (ii) the VECP. The cost reduction associated with the VECP shall take into account the Contractor's allowable development and implementation costs, including any amount attributable to subcontracts under paragraph (h) below.

(4) A description and estimate of costs the Government may incur in implementing the VECP, such as test and evaluation and operating and support costs.

(5) A prediction of any effects the proposed change would have on collateral costs to the agency.

(6) A statement of the time by which a contract modification accepting the VECP must be issued in order to achieve the maximum cost reduction, noting any effect on the contract completion time or delivery schedule.

(7) Identification of any previous submissions of the VECP, including the dates submitted, the agencies and contract numbers involved, and previous Government actions, if known.

(d) Submission. The Contractor shall submit VECP's to the Construction Manager at the worksite, providing a copy for the Contracting Officer.

(e) Government action.

(1) The Contracting Officer will notify the Contractor of the status of the VECP within 45 calendar days after the contracting office receives it. If additional time is required, the Contracting Officer will notify the Contractor within the 45-day period and provide the reason for the delay and the expected date of the decision. The Government will process VECP's expeditiously; however, it will not be liable for any delay in acting upon a VECP.

(2) If the VECP is not accepted, the Contracting Officer will notify the Contractor in writing, explaining the reasons for rejection. The Contractor may withdraw any VECP, in whole or in part, at any time before it is accepted by the Government. The Contracting Officer may

require that the Contractor provide written notification before undertaking significant expenditures for VECP effort.

(3) Any VECP may be accepted, in whole or in part, by the Contracting Officer's award of a modification to this contract citing this clause. The Contracting Officer may accept the VECP, even though an agreement on price reduction has not been reached, by issuing the Contractor a notice to proceed with the change. Until a notice to proceed is issued or a contract modification applies a VECP to this contract, the Contractor shall perform in accordance with the existing contract. The decision to accept or reject all or part of any VECP is a unilateral decision made solely at the discretion of the Contracting Officer.

(f) Sharing.

(1) Rates. The Government's share of savings is determined by subtracting Government costs from instant contract savings and multiplying the result by (i) 45 percent for fixed-price contracts or (ii) 75 percent for cost-reimbursement contracts.

(2) Payment. Payment of any share due the Contractor for use of a VECP on this contract shall be authorized by a modification to this contract to -

(i) Accept the VECP;

(ii) Reduce the contract price or estimated cost by the amount of instant contract savings; and

(iii) Provide the Contractor's share of savings by adding the amount calculated to the contract price or fee.

(g) Collateral savings. If a VECP is accepted, the Contracting Officer will increase the instant contract amount by 20 percent of any projected collateral savings determined to be realized in a typical year of use after subtracting any Government costs not previously offset. However, the Contractor's share of collateral savings will not exceed the contract's firm-fixed-price or estimated cost, at the time the VECP is accepted, or \$100,000, whichever is greater. The Contracting Officer is the sole determiner of the amount of collateral savings.

(h) Subcontracts. The Contractor shall include an appropriate value engineering clause in any subcontract of \$70,000 or more and may include one in subcontracts of lesser value. In computing any adjustment in this contract's price under paragraph (f) above, the Contractor's allowable development and implementation costs shall include any subcontractor's allowable development and implementation costs clearly resulting from a VECP accepted by the Government under this contract, but shall exclude any value engineering incentive payments to a subcontractor. The Contractor may choose any arrangement for subcontractor value engineering incentive payments; provided that these payments shall not reduce the Government's share of the savings resulting from the VECP.

(i) Data. The Contractor may restrict the Government's right to use any part of a VECP or the supporting data by marking the following legend on the affected parts:

“These data, furnished under the Value Engineering proposal, shall not be disclosed outside the Government or duplicated, used, or disclosed, in whole or in part, for any purpose other than to evaluate a value engineering change proposal submitted under the clause. This restriction does not limit the Government's right to use information contained in these data if it has been obtained or is otherwise available from the Contractor or from another source without limitations.”

If a VECP is accepted, the Contractor hereby grants the Government unlimited rights in the VECP and supporting data, except that, with respect to data qualifying and submitted as limited rights technical data, the Government shall have the rights specified in the contract modification implementing the VECP and shall appropriately mark the data. (The terms unlimited rights and limited rights are defined in part 27 of the Federal Acquisition Regulation.)

Before undertaking significant expenditures, provide the CO with a written description of the value engineering change proposal (VECP) concept. Within 14 days, the CO will inform the Contractor as to whether the concept appears to be viable or if the concept is unacceptable. If the CO indicates (in writing) that the concept appears to be viable, prepare and submit the formal VECP proposal. Off the shelf product substitutions that are widely available to the local industry are not considered a VECP. This includes, but not limited to, drainage pipe coatings or change in type or size; erosion control mats of various types; products made and available in both steel or concrete such as cattle guards; fencing post coatings or types; sign posts or types; traffic control signs or types; other traffic control devices readily available; and products made from commonly used materials that are available in the industry as a substitute for the product call for in the contract.

EXHIBIT D

BID SCHEDULE

NOTICE TO BIDDER:

- **See Section 102.02 of the FP-2014 (Exhibit F), Section 18 - Contract Clauses of Exhibit C and below for Preparation of Bids instructions**
- Please reference Clause NN-236-1, Performance of Work by the Contractor in Exhibit C as to the percent of the total dollar amount of work to be performed by the Prime Contractor under the contract.
- All bonding, overhead, and profit are to be included in each unit bid price.
- Navajo Nation Tribal Taxes and/or Local Taxes for construction work on the Navajo Indian Reservation shall be shown separately on the bid and withheld from payment as described in Section 6.10 of Exhibit A. Bidders are responsible to inquire of any and all Tribal Taxes that may be applicable to this solicitation. For more information regarding Tribal Taxes contact:
The Navajo Nation
Office of the Navajo Tax Commission
P.O. Box 1903
Window Rock, Arizona, 86515
(928) 871-6681 or 6683
- The following items shall be submitted as part of the Contractor's response. Please refer to the Request for Proposal for complete instructions.
 - Letter of Interest
 - Certificates of Insurance
 - Bonds
 - Scope of Work including: roles and responsibilities, manpower, proposed construction schedule, listing of equipment and products.
 - Communication Protocol
 - References
 - Certification of Navajo Business
 - Addendum Acknowledgement
 - Bid Form
 - Required Contract Forms



**BID SCHEDULE
NAVAJO NATION DIVISION OF TRANSPORTATION**

PROJECT: N9402(2)1,2&3

Date: June 08, 2020

LENGTH: 0.390 km (0.242 miles)

ITEM	DESCRIPTION	Quantity	Units	Unit Bid Price	Total Price
10901-0000	Extra & Miscellaneous Work - Authorized under Suppl. Spec. 109.02(s) of Exhibit F	All Required	Lump Sum	\$60,000.00	\$60,000.00
15101-0000	Mobilization	All Required	Lump Sum	\$	\$
15201-0000	Construction Survey & Staking	All Required	Lump Sum	\$	\$
15301-0000	Contractor Quality Control	7,300	Man Hr	\$	\$
15701-0000	Soil Erosion Control	All Required	Lump Sum	\$	\$
20102-0000	Clearing and Grubbing	All Required	Lump Sum	\$	\$
20304-1000	Removal of Structures and Obstructions	All Required	Lump Sum	\$	\$
20401-0000	Roadway Excavation	744	m ³	\$	\$
20403-0000	Unclassified Borrow	3,604	m ³	\$	\$
20601-0000	Development of Water Supply	1.39	M-liter	\$	\$
25101-3000	Placed Riprap , Class-3 (Ditches)	1,025	m ³	\$	\$
25112-2000	Wire Enclosed Riprap, Class 2 (Abutment Protection)	833	m ³	\$	\$
30101-2000	Aggregate Base, Grading Special	154	t	\$	\$
30401-0000	Aggregate Stabilization with Roadbond EN 1-Road Bond, Imported Surface Course Aggregate Grading D, 152 mm Depth	2,731	m ²	\$	\$
55101-0200	Concrete Filled Steel Pipe Piles, PP 610 x 9.53, In Place	269	m	\$	\$
55120-0000	Test Piles	100	m	\$	\$
55201-0200	Structural Concrete Class A(AE)	500	m ³	\$	\$
55301-1700	Precast, Prestressed Concrete Bulb Tee Girders, BT-1370	20	Each	\$	\$
55401-1000	Reinforcing Steel, Grade 420	9,114	kg	\$	\$
55401-2000	Reinforcing Steel Epoxy Coated, Grade 420	58,288	kg	\$	\$
55502-0000	Structural Steel, Furnished, Fabricated, and Erected (Diaphragms)	3,738	kg	\$	\$
55502-0010	Structural Steel, Furnished, Fabricated, and Erected (Girt and Sway)	7,121	kg	\$	\$
55601-0900	Bridge Railing, Steel	269	m	\$	\$
56301-2000	Painting, Steel Structure (Pipe Piles)	All Required	Lump Sum	\$	\$
60201-0810	610 mm Corrugated Steel Pipe Culvert	30.4	m	\$	\$
60210-0810	End Section for 610 mm Corrugated Steel Pipe Culvert	1	Each	\$	\$
61701-5000	Guardrail System, SGR04b, Type PDE02 with MSKT TL3-8 End Treatment, Type "A" Installation	164	m	\$	\$
62101-0000	Monument (Right-Of-Way)	16	Each	\$	\$
62102-0000	Marker (Reference)	16	Each	\$	\$
62510-1000	Seeding, Dry Method	0.64	ha	\$	\$
62515-1000	Mulching, Dry Method	0.47	ha	\$	\$
62901-1100	Rolled Erosion Control Product, Type IV	1,664	m ²	\$	\$
63302-2002	Sign Installation, 1 Post and Hardware: 44mm x 44mm Square Tube	0.92	m ²	\$	\$



**BID SCHEDULE
NAVAJO NATION DIVISION OF TRANSPORTATION**

PROJECT: N9402(2)1,2&3

Date: June 08, 2020

LENGTH: 0.390 km (0.242 miles)

ITEM	DESCRIPTION	Quantity	Units	Unit Bid Price	Total Price
63302-2006	Sign Installation, 2 Post and Hardware: 50mm x 50mm Square Tube	1.13	m ²	\$	\$
63308-3000	Object Marker, Type 3, with 1-Post and Hardware: 2.98 kg/m	4	Each	\$	\$
63309-0020	Delineator, Type Glass Fiber, Type "1b"	7	Each	\$	\$
63501-0000	Temporary Traffic Control	All Req'd	Lump Sum	\$	\$
				Subtotal:	\$
				Navajo Nation Tax (6%):	\$
				Total Bid Price:	\$

Contractor Name

SCOPE-OF-WORK

The proposed work consists of furnishing all labor, material, equipment and incidentals necessary for construction of 0.390 km of grading and subgrade, placement of aggregate base course and treatment, removal of existing bridge and construction of 5-span bridge, installation of drainage structure and rip rap, guardrail, signs, and other miscellaneous construction in accordance with the specification and design drawings for this Project. The quantities listed for each item is estimated and the Unit Price is applicable to each as given in the Bid Schedule above. The final pay quantity measurements shall be rounded to the significant figures given in this bid schedule for the final pay estimate. Payment for work performed on Items furnished will be made in accordance with Sub-Section 109.05, Scope of Payment of FP-14. **The Unit Bid Price must include all overhead, profit, and bonding.**

EXHIBIT E

REQUIRED CONTRACT FORMS

The Bidder's shall file out the forms herein and submit with their bids.

SOLICITATION, OFFER, AND AWARD (Construction, Alteration, or Repair)	1. SOLICITATION NUMBER	2. TYPE OF SOLICITATION <input type="checkbox"/> SEALED BID (IFB) <input type="checkbox"/> NEGOTIATED (RFP)	3. DATE ISSUED	PAGE OF PAGES

IMPORTANT - The "offer" section on the reverse must be fully completed by offeror.

4. CONTRACT NUMBER	5. REQUISITION/PURCHASE REQUEST NUMBER	6. PROJECT NUMBER
7. ISSUED BY	CODE	8. ADDRESS OFFER TO
9. FOR INFORMATION CALL:	a. NAME	b. TELEPHONE NUMBER (Include area code) (NO COLLECT CALLS)

SOLICITATION

NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid and "bidder".

10. THE GOVERNMENT REQUIRES PERFORMANCE OF THE WORK DESCRIBED IN THESE DOCUMENTS (Title, identifying number, date)

11. The contractor shall begin performance within _____ calendar days and complete it within _____ calendar days after receiving <input type="checkbox"/> award, <input type="checkbox"/> notice to proceed. This performance period is <input type="checkbox"/> mandatory <input type="checkbox"/> negotiable. (See _____).	
12a. THE CONTRACTOR MUST FURNISH ANY REQUIRED PERFORMANCE AND PAYMENT BONDS? (If "YES", indicate within how many calendar days after award in Item 12b.) <input type="checkbox"/> YES <input type="checkbox"/> NO	12b. CALENDAR DAYS

13. ADDITIONAL SOLICITATION REQUIREMENTS:

- a. Sealed offers in original and _____ copies to perform the work required are due at the place specified in Item 8 by _____ (hour) local time _____ (date). If this is a sealed bid solicitation, offers will be publicly opened at that time. Sealed envelopes containing offers shall be marked to show the offeror's name and address, the solicitation number, and the date and time offers are due.
- b. An offer guarantee ☐ is, ☐ is not required.
- c. All offers are subject to the (1) work requirements, and (2) other provisions and clauses incorporated in the solicitation in full text or by reference.
- d. Offers providing less than _____ calendar days for Government acceptance after the date offers are due will not be considered and will be rejected.

OFFER (Must be fully completed by offeror)

14. NAME AND ADDRESS OF OFFEROR (Include ZIP Code)		15. TELEPHONE NUMBER (Include area code)
		16. REMITTANCE ADDRESS (Include only if different than Item 14.)
CODE	FACILITY CODE	

17. The offeror agrees to perform the work required at the prices specified below in strict accordance with the terms of this solicitation, if this offer is accepted by the Government in writing within _____ calendar days after the date offers are due. (Insert any number equal to or greater than the minimum requirement stated in Item 13d. Failure to insert any number means the offeror accepts the minimum in Item 13d.)

AMOUNTS



See the Bid Schedule for Offeror's proposed bid amount.

18. The offeror agrees to furnish any required performance and payment bonds.

19. ACKNOWLEDGMENT OF AMENDMENTS

(The offeror acknowledges receipt of amendments to the solicitation -- give number and date of each)

AMENDMENT NUMBER										
DATE.										

20a. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER (Type or print)	20b. SIGNATURE	20c. OFFER DATE
--	----------------	-----------------

AWARD (To be completed by Government)

21. ITEMS ACCEPTED:

22. AMOUNT See the Bid Schedule for Contract Award Amount		23. ACCOUNTING AND APPROPRIATION DATA	
24. SUBMIT INVOICES TO ADDRESS SHOWN IN (4 copies unless otherwise specified)	ITEM	25. OTHER THAN FULL AND OPEN COMPETITION PURSUANT TO <input type="checkbox"/> 10 U.S.C. 2304(c) () <input type="checkbox"/> 41 U.S.C. 3304(a) ()	
26. ADMINISTERED BY		27. PAYMENT WILL BE MADE BY	

CONTRACTING OFFICER WILL COMPLETE ITEM 28 OR 29 AS APPLICABLE

<input type="checkbox"/> 28. NEGOTIATED AGREEMENT (Contractor is required to sign this document and return _____ copies to issuing office.) Contractor agrees to furnish and deliver all items or perform all work requirements identified on this form and any continuation sheets for the consideration stated in this contract. The rights and obligations of the parties to this contract shall be governed by (a) this contract award, (b) the solicitation, and (c) the clauses, representations, certifications, and specifications incorporated by reference in or attached to this contract.		<input type="checkbox"/> 29. AWARD (Contractor is not required to sign this document.) Your offer on this solicitation is hereby accepted as to the items listed. This award consummates the contract, which consists of (a) the Government solicitation and your offer, and (b) this contract award. No further contractual document is necessary.	
30a. NAME AND TITLE OF CONTRACTOR OR PERSON AUTHORIZED TO SIGN (Type or print)		31a. NAME OF CONTRACTING OFFICER (Type or print)	
30b. SIGNATURE	30c. DATE	31b. UNITED STATES OF AMERICA BY	31c. DATE

BID BOND <i>(See instructions on reverse)</i>	DATE BOND EXECUTED <i>(Must not be later than bid opening date)</i>	OMB Control Number: 9000-0045 Expiration Date: 8/31/2022
Paperwork Reduction Act Statement - This information collection meets the requirements of 44 USC § 3507, as amended by section 2 of the Paperwork Reduction Act of 1995. You do not need to answer these questions unless we display a valid Office of Management and Budget (OMB) control number. The OMB control number for this collection is 9000-0045. We estimate that it will take 1 hour to read the instructions, gather the facts, and answer the questions. Send only comments relating to our time estimate, including suggestions for reducing this burden, or any other aspects of this collection of information to: General Services Administration, Regulatory Secretariat Division (M1V1CB), 1800 F Street, NW, Washington, DC 20405.		
PRINCIPAL <i>(Legal name and business address)</i>	TYPE OF ORGANIZATION <i>("X" one)</i> <input type="checkbox"/> INDIVIDUAL <input type="checkbox"/> PARTNERSHIP <input type="checkbox"/> JOINT VENTURE <input type="checkbox"/> CORPORATION <input type="checkbox"/> OTHER <i>(Specify)</i>	
		STATE OF INCORPORATION
SURETY(IES) <i>(Name and business address)</i>		

PENAL SUM OF BOND					BID IDENTIFICATION	
PERCENT OF BID PRICE	AMOUNT NOT TO EXCEED				BID DATE	INVITATION NUMBER
	MILLION(S)	THOUSAND(S)	HUNDRED(S)	CENTS	FOR <i>(Construction, Supplies or Services)</i>	

OBLIGATION:

We, the Principal and Surety(ies) are firmly bound to the **Navajo Nation** (hereinafter called the Government) in the above penal sum. For payment of the penal sum, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally. However, where the Sureties are corporations acting as co-sureties, we, the Sureties, bind ourselves in such sum "jointly and severally" as well as "severally" only for the purpose of allowing a joint action or actions against any or all of us. For all other purposes, each Surety binds itself, jointly and severally with the Principal, for the payment of the sum shown opposite the name of the Surety. If no limit of liability is indicated, the limit of liability is the full amount of the penal sum.

CONDITIONS:

The Principal has submitted the bid identified above.

THEREFORE:

The above obligation is void if the Principal - (a) upon acceptance by the Government of the bid identified above, within the period specified therein for acceptance (sixty (60) days if no period is specified), executes the further contractual documents and gives the bond(s) required by the terms of the bid as accepted within the time specified (ten (10) days if no period is specified) after receipt of the forms by the principal; or (b) in the event of failure to execute such further contractual documents and give such bonds, pays the Government for any cost of procuring the work which exceeds the amount of the bid.

Each Surety executing this instrument agrees that its obligation is not impaired by any extension(s) of the time for acceptance of the bid that the Principal may grant to the Government. Notice to the surety(ies) of extension(s) is waived. However, waiver of the notice applies only to extensions aggregating not more than sixty (60) calendar days in addition to the period originally allowed for acceptance of the bid.

WITNESS:

The Principal and Surety(ies) executed this bid bond and affixed their seals on the above date.

PRINCIPAL				
SIGNATURE(S)	1.	2.	3.	Corporate Seal
	(Seal)	(Seal)	(Seal)	
NAME(S) & TITLE(S) <i>(Typed)</i>	1.	2.	3.	

INDIVIDUAL SURETY(IES)		
SIGNATURE(S)	1. (Seal)	2. (Seal)
NAME(S) <i>(Typed)</i>	1.	2.

CORPORATE SURETY(IES)					
SURETY A	NAME & ADDRESS		STATE OF INCORPORATION	LIABILITY LIMIT (\$)	Corporate Seal
	SIGNATURE(S)	1.	2.		
	NAME(S) & TITLE(S) <i>(Typed)</i>	1.	2.		

SURETY B	NAME & ADDRESS		STATE OF INCORPORATION	LIABILITY LIMIT (\$)	Corporate Seal
	SIGNATURE(S)	1.	2.		
	NAME(S) & TITLE(S) (Typed)	1.	2.		
SURETY C	NAME & ADDRESS		STATE OF INCORPORATION	LIABILITY LIMIT (\$)	Corporate Seal
	SIGNATURE(S)	1.	2.		
	NAME(S) & TITLE(S) (Typed)	1.	2.		
SURETY D	NAME & ADDRESS		STATE OF INCORPORATION	LIABILITY LIMIT (\$)	Corporate Seal
	SIGNATURE(S)	1.	2.		
	NAME(S) & TITLE(S) (Typed)	1.	2.		
SURETY E	NAME & ADDRESS		STATE OF INCORPORATION	LIABILITY LIMIT (\$)	Corporate Seal
	SIGNATURE(S)	1.	2.		
	NAME(S) & TITLE(S) (Typed)	1.	2.		
SURETY F	NAME & ADDRESS		STATE OF INCORPORATION	LIABILITY LIMIT (\$)	Corporate Seal
	SIGNATURE(S)	1.	2.		
	NAME(S) & TITLE(S) (Typed)	1.	2.		
SURETY G	NAME & ADDRESS		STATE OF INCORPORATION	LIABILITY LIMIT (\$)	Corporate Seal
	SIGNATURE(S)	1.	2.		
	NAME(S) & TITLE(S) (Typed)	1.	2.		

INSTRUCTIONS

1. This form is authorized for use when a bid guaranty is required. Any deviation from this form will require the written approval of the Administrator of General Services.
2. Insert the full legal name and business address of the Principal in the space designated "Principal" on the face of the form. An authorized person shall sign the bond. Any person signing in a representative capacity (e.g., an attorney-in-fact) must furnish evidence of authority if that representative is not a member of the firm, partnership, or joint venture, or an officer of the corporation involved.
3. The bond may express penal sum as a percentage of the bid price. In these cases, the bond may state a maximum dollar limitation (e.g., 20% of the bid price but the amount not to exceed _____ dollars).
4. (a) Corporations executing the bond as sureties must appear on the Department of the Treasury's list of approved sureties and must act within the limitations listed therein. The value put into the LIABILITY LIMIT block is the penal sum (i.e., the face value) of the bond, unless a co-surety arrangement is proposed.

(b) When multiple corporate sureties are involved, their names and addresses shall appear in the spaces (Surety A, Surety B, etc.) headed "CORPORATE SURETY(IES)." In the space designated "SURETY(IES)" on the face of the form, insert only the letter identifier corresponding to each of the sureties. Moreover, when co-surety arrangements exist, the parties may allocate their respective limitations of liability under the bond, provided that the sum total of their liability equals 100% of the bond penal sum.

(c) When individual sureties are involved, a completed Affidavit of Individual Surety (Standard Form 28) for each individual surety, shall accompany the bond. The Government may require the surety to furnish additional substantiating information concerning its financial capability.
5. Corporations executing the bond shall affix their corporate seals. Individuals shall execute the bond opposite the word "Corporate Seal"; and shall affix an adhesive seal if executed in Maine, New Hampshire, or any other jurisdiction requiring adhesive seals.
6. Type the name and title of each person signing this bond in the space provided.
7. In its application to negotiated contracts, the terms "bid" and "bidder" shall include "proposal" and "offeror."

AFFIDAVIT OF INDIVIDUAL SURETY*(See instructions on reverse)***OMB Control Number: 9000-0001****Expiration Date: 2/28/2021**

Paperwork Reduction Act Statement - This information collection meets the requirements of 44 USC § 3507, as amended by section 2 of the Paperwork Reduction Act of 1995. You do not need to answer these questions unless we display a valid Office of Management and Budget (OMB) control number. The OMB control number for this collection is 9000-0001. We estimate that it will take 0.3 hours to read the instructions, gather the facts, and answer the questions. Send only comments relating to our time estimate, including suggestions for reducing this burden, or any other aspects of this collection of information to: General Services Administration, Regulatory Secretariat Division (M1V1CB), 1800 F Street, NW, Washington, DC 20405.

STATE OF	SS.
COUNTY OF	

I, the undersigned, being duly sworn, depose and say that I am: (1) the surety to the attached bond(s); (2) a citizen of the United States; and of full age and legally competent. I also depose and say that, concerning any stocks or bonds included in the assets listed below, that there are no restrictions on the resale of these securities pursuant to the registration provisions of Section 5 of the Securities Act of 1933. I recognize that statements contained herein concern a matter within the jurisdiction of an agency of the **Navajo Nation** and the making of a false, fictitious or fraudulent statement may render the maker subject to prosecution under Title 18, United States Code Sections 1001 and 494. This affidavit is made to induce the **Navajo Nation** to accept me as surety on the attached bond.

1. NAME (First, Middle, Last) (Type or Print)	2. HOME ADDRESS (Number, Street, City, State, ZIP Code)
3. TYPE AND DURATION OF OCCUPATION	4. NAME AND ADDRESS OF EMPLOYER (If Self-employed, so State)
5. NAME AND ADDRESS OF INDIVIDUAL SURETY BROKER USED (Number, Street, City, State, ZIP Code)	6. TELEPHONE NUMBER HOME - BUSINESS -

7. THE FOLLOWING IS A TRUE REPRESENTATION OF THE ASSETS I HAVE PLEDGED TO THE **Navajo Nation** IN SUPPORT OF THE ATTACHED BOND:
(a) Real estate (Include a legal description, street address and other identifying description; the market value; attach supporting certified documents including recorded lien; evidence of title and the current tax assessment of the property. For market value approach, also provide a current appraisal.)

(b) Assets other than real estate (describe the assets, the details of the escrow account, and attach certified evidence thereof).

8. IDENTIFY ALL MORTGAGES, LIENS, JUDGEMENTS, OR ANY OTHER ENCUMBRANCES INVOLVING SUBJECT ASSETS INCLUDING REAL ESTATE TAXES DUE AND PAYABLE.

9. IDENTIFY ALL BONDS, INCLUDING BID GUARANTEES, FOR WHICH THE SUBJECT ASSETS HAVE BEEN PLEDGED WITHIN 3 YEARS PRIOR TO THE DATE OF EXECUTION OF THIS AFFIDAVIT.

DOCUMENTATION OF THE PLEDGED ASSET MUST BE ATTACHED.

10. SIGNATURE	11. BOND AND CONTRACT TO WHICH THIS AFFIDAVIT RELATES (Where Appropriate)
---------------	---

12. SUBSCRIBED AND SWORN TO BEFORE ME AS FOLLOWS:

a. DATE OATH ADMINISTERED MONTH DAY YEAR	b. CITY AND STATE (Or other jurisdiction)	Official Seal
c. NAME AND TITLE OF OFFICIAL ADMINISTERING OATH (Type or print)	d. SIGNATURE	

INSTRUCTIONS

1. Individual sureties on bonds executed in connection with Government contracts must complete and submit this form with the bond. (See 48 CFR 28.203, 53.228(e).) The surety must have the completed form notarized.
2. No corporation, partnership, or other unincorporated association or firm, as such, is acceptable as an individual surety. Likewise, members of a partnership are not acceptable as sureties on bonds that a partnership or an association, or any co-partner or member thereof, is the principal obligor. However, stockholders of corporate principals are acceptable provided (a) their qualifications are independent of their stockholdings or financial interest therein, and (b) that the fact is expressed in the affidavit of justification. An individual surety will not include any financial interest in assets connected with the principal on the bond that this affidavit supports.
3. United States citizenship is a requirement for individual sureties for contracts and bonds when the contract is awarded in the United States. However, when the Contracting Officer is located in an outlying area or a foreign country, the individual surety is only required to be a permanent resident of the area or country in which the contracting officer is located.
4. All signatures of the affidavit submitted must be originals. Affidavits bearing reproduced signatures are not acceptable. An authorized person must sign the bond. Any person signing in a representative capacity (e.g., an attorney-in-fact) must furnish evidence of authority if that representative is not a member of a firm, partnership, or joint venture, or an officer of the corporation involved.

PERFORMANCE BOND <i>(See instructions on reverse)</i>	DATE BOND EXECUTED <i>(Must be same or later than date of contract)</i>	OMB Control Number: 9000-0045 Expiration Date: 8/31/2022
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Paperwork Reduction Act Statement - This information collection meets the requirements of 44 USC § 3507, as amended by section 2 of the Paperwork Reduction Act of 1995. You do not need to answer these questions unless we display a valid Office of Management and Budget (OMB) control number. The OMB control number for this collection is 9000-0045. We estimate that it will take 1 hour to read the instructions, gather the facts, and answer the questions. Send only comments relating to our time estimate, including suggestions for reducing this burden, or any other aspects of this collection of information to: General Services Administration, Regulatory Secretariat Division (M1V1CB), 1800 F Street, NW, Washington, DC 20405.

PRINCIPAL <i>(Legal name and business address)</i>	TYPE OF ORGANIZATION <i>("X" one)</i>			
	<input type="checkbox"/> INDIVIDUAL <input type="checkbox"/> PARTNERSHIP <input type="checkbox"/> JOINT VENTURE <input type="checkbox"/> CORPORATION <input type="checkbox"/> OTHER <i>(Specify)</i>			
	STATE OF INCORPORATION			
SURETY(IES) <i>(Name(s) and business address(es))</i>	PENAL SUM OF BOND			
	MILLION(S)	THOUSAND(S)	HUNDRED(S)	CENTS
	CONTRACT DATE		CONTRACT NUMBER	

OBLIGATION:

We, the Principal and Surety(ies), are firmly bound to the **Navajo Nation** (hereinafter called the Government) in the above penal sum. For payment of the penal sum, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally. However, where the Sureties are corporations acting as co-sureties, we, the Sureties, bind ourselves in such sum "jointly and severally" as well as "severally" only for the purpose of allowing a joint action or actions against any or all of us. For all other purposes, each Surety binds itself, jointly and severally with the Principal, for the payment of the sum shown opposite the name of the Surety. If no limit of liability is indicated, the limit of liability is the full amount of the penal sum.

CONDITIONS:

The Principal has entered into the contract identified above.

THEREFORE:

The above obligation is void if the Principal-

(a) (1) Performs and fulfills all the understanding, covenants, terms, conditions, and agreements of the contract during the original term of the contract and any extensions thereof that are granted by the Government, with or without notice of the Surety(ies) and during the life of any guaranty required under the contract, and

(2) Performs and fulfills all the undertakings, covenants, terms, conditions, and agreements of any and all duly authorized modifications of the contract that hereafter are made. Notice of those modifications to the Surety(ies) are waived.

(b) Pays to the Government the full amount of the taxes imposed by the Government, if the said contract is subject to 41 USC Chapter 31, Subchapter III, Bonds, which are collected, deducted, or withheld from wages paid by the Principal in carrying out the construction contract with respect to which this bond is furnished.


WITNESS:

The Principal and Surety(ies) executed this performance bond and affixed their seals on the above date.

PRINCIPAL						
SIGNATURE(S)	1.	2.	3.	Corporate Seal		
	(Seal)	(Seal)	(Seal)			
NAME(S) & TITLE(S) <i>(Typed)</i>	1.	2.	3.			
INDIVIDUAL SURETY(IES)						
SIGNATURE(S)	1.	2.				
	(Seal)	(Seal)				
NAME(S) <i>(Typed)</i>	1.	2.				
CORPORATE SURETY(IES)						
SURETY A	NAME & ADDRESS		STATE OF INCORPORATION	LIABILITY LIMIT (\$)	Corporate Seal	
	SIGNATURE(S)	1.	2.			
	NAME(S) & TITLE(S) <i>(Typed)</i>	1.	2.			

CORPORATE SURETY(IES) (Continued)

SURETY B	NAME & ADDRESS		STATE OF INCORPORATION	LIABILITY LIMIT (\$)	Corporate Seal
	SIGNATURE(S)	1.	2.		
	NAME(S) & TITLE(S) (Typed)	1.	2.		
SURETY C	NAME & ADDRESS		STATE OF INCORPORATION	LIABILITY LIMIT (\$)	Corporate Seal
	SIGNATURE(S)	1.	2.		
	NAME(S) & TITLE(S) (Typed)	1.	2.		
SURETY D	NAME & ADDRESS		STATE OF INCORPORATION	LIABILITY LIMIT (\$)	Corporate Seal
	SIGNATURE(S)	1.	2.		
	NAME(S) & TITLE(S) (Typed)	1.	2.		
SURETY E	NAME & ADDRESS		STATE OF INCORPORATION	LIABILITY LIMIT (\$)	Corporate Seal
	SIGNATURE(S)	1.	2.		
	NAME(S) & TITLE(S) (Typed)	1.	2.		
SURETY F	NAME & ADDRESS		STATE OF INCORPORATION	LIABILITY LIMIT (\$)	Corporate Seal
	SIGNATURE(S)	1.	2.		
	NAME(S) & TITLE(S) (Typed)	1.	2.		
SURETY G	NAME & ADDRESS		STATE OF INCORPORATION	LIABILITY LIMIT (\$)	Corporate Seal
	SIGNATURE(S)	1.	2.		
	NAME(S) & TITLE(S) (Typed)	1.	2.		

BOND PREMIUM 	RATE PER THOUSAND (\$)	TOTAL (\$)

INSTRUCTIONS

- This form is authorized for use in connection with Government contracts. Any deviation from this form will require the written approval of the Administrator of General Services.
- Insert the full legal name and business address of the Principal in the space designated "Principal" on the face of the form. An authorized person shall sign the bond. Any person signing in a representative capacity (e.g., an attorney-in-fact) must furnish evidence of authority if that representative is not a member of the firm, partnership, or joint venture, or an officer of the corporation involved.
- (a) Corporations executing the bond as sureties must appear on the Department of the Treasury's list of approved sureties and must act within the limitations listed therein. The value put into the LIABILITY LIMIT block is the penal sum (i.e., the face value) of bonds, unless a co-surety arrangement is proposed.

(b) When multiple corporate sureties are involved, their names and addresses shall appear in the spaces (Surety A, Surety B, etc.) headed "CORPORATE SURETY(IES)." In the space designated "SURETY(IES)" on the face of the form, insert only the letter identifier corresponding to each of the sureties. Moreover, when co-surety arrangements exist, the parties may allocate their respective limitations of liability under the bonds, provided that the sum total of their liability equals 100% of the bond penal sum.

(c) When individual sureties are involved, a completed Affidavit of Individual Surety (Standard Form 28) for each individual surety shall accompany the bond. The government may require the surety to furnish additional substantiating information concerning its financial capability.
- Corporations executing the bond shall affix their corporate seals. Individuals shall execute the bond opposite the words "Corporate Seal", and shall affix an adhesive seal if executed in Maine, New Hampshire, or any other jurisdiction requiring adhesive seals.
- Type the name and title of each person signing this bond in the space provided.

PAYMENT BOND <i>(See instructions on reverse)</i>	DATE BOND EXECUTED <i>(Must be same or later than date of contract)</i>	OMB Control Number: 9000-0045 Expiration Date: 8/31/2022
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Paperwork Reduction Act Statement - This information collection meets the requirements of 44 USC § 3507, as amended by section 2 of the Paperwork Reduction Act of 1995. You do not need to answer these questions unless we display a valid Office of Management and Budget (OMB) control number. The OMB control number for this collection is 9000-0045. We estimate that it will take 1 hour to read the instructions, gather the facts, and answer the questions. Send only comments relating to our time estimate, including suggestions for reducing this burden, or any other aspects of this collection of information to: General Services Administration, Regulatory Secretariat Division (M1V1CB), 1800 F Street, NW, Washington, DC 20405.

PRINCIPAL <i>(Legal name and business address)</i>	TYPE OF ORGANIZATION ("X" one) <input type="checkbox"/> INDIVIDUAL <input type="checkbox"/> PARTNERSHIP <input type="checkbox"/> JOINT VENTURE <input type="checkbox"/> CORPORATION <input type="checkbox"/> OTHER <i>(Specify)</i>																				
	STATE OF INCORPORATION																				
SURETY(IES) <i>(Name(s) and business address(es))</i>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="4" style="text-align: center;">PENAL SUM OF BOND</th> </tr> <tr> <td style="width: 25%;">MILLION(S)</td> <td style="width: 25%;">THOUSAND(S)</td> <td style="width: 25%;">HUNDRED(S)</td> <td style="width: 25%;">CENTS</td> </tr> <tr> <td style="height: 40px;"></td> <td></td> <td></td> <td></td> </tr> <tr> <td colspan="2" style="vertical-align: top;">CONTRACT DATE</td> <td colspan="2" style="vertical-align: top;">CONTRACT NUMBER</td> </tr> <tr> <td colspan="2" style="height: 40px;"></td> <td colspan="2"></td> </tr> </table>	PENAL SUM OF BOND				MILLION(S)	THOUSAND(S)	HUNDRED(S)	CENTS					CONTRACT DATE		CONTRACT NUMBER					
PENAL SUM OF BOND																					
MILLION(S)	THOUSAND(S)	HUNDRED(S)	CENTS																		
CONTRACT DATE		CONTRACT NUMBER																			

OBLIGATION:

We, the Principal and Surety(ies), are firmly bound to the **Navajo Nation** (hereinafter called the Government) in the above penal sum. For payment of the penal sum, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally. However, where the Sureties are corporations acting as co-sureties, we, the Sureties, bind ourselves in such sum "jointly and severally" as well as "severally" only for the purpose of allowing a joint action or actions against any or all of us. For all other purposes, each Surety binds itself, jointly and severally with the Principal, for the payment of the sum shown opposite the name of the Surety. If no limit is indicated, the limit of liability is the full amount of the penal sum.

CONDITIONS:

The above obligation is void if the Principal promptly makes payment to all persons having a direct relationship with the Principal or a subcontractor of the Principal for furnishing labor, material or both in the prosecution of the work provided for in the contract identified above, and any authorized modifications of the contract that subsequently are made. Notice of those modifications to the Surety(ies) are waived.

WITNESS:

The Principal and Surety(ies) executed this payment bond and affixed their seals on the above date.

PRINCIPAL				
SIGNATURE(S)	1.	2.	3.	Corporate Seal
	(Seal)	(Seal)	(Seal)	
NAME(S) & TITLE(S) <i>(Typed)</i>	1.	2.	3.	

INDIVIDUAL SURETY(IES)		
SIGNATURE(S)	1.	2.
	(Seal)	(Seal)
NAME(S) <i>(Typed)</i>	1.	2.

CORPORATE SURETY(IES)					
SURETY A	NAME & ADDRESS		STATE OF INCORPORATION	LIABILITY LIMIT \$	Corporate Seal
	SIGNATURE(S)	1.	2.		
	NAME(S) & TITLE(S) <i>(Typed)</i>	1.	2.		

CORPORATE SURETY(IES) (Continued)

SURETY B	NAME & ADDRESS		STATE OF INCORPORATION	LIABILITY LIMIT \$	Corporate Seal
	SIGNATURE(S)	1.	2.		
	NAME(S) & TITLE(S) (Typed)	1.	2.		
SURETY C	NAME & ADDRESS		STATE OF INCORPORATION	LIABILITY LIMIT \$	Corporate Seal
	SIGNATURE(S)	1.	2.		
	NAME(S) & TITLE(S) (Typed)	1.	2.		
SURETY D	NAME & ADDRESS		STATE OF INCORPORATION	LIABILITY LIMIT \$	Corporate Seal
	SIGNATURE(S)	1.	2.		
	NAME(S) & TITLE(S) (Typed)	1.	2.		
SURETY E	NAME & ADDRESS		STATE OF INCORPORATION	LIABILITY LIMIT \$	Corporate Seal
	SIGNATURE(S)	1.	2.		
	NAME(S) & TITLE(S) (Typed)	1.	2.		
SURETY F	NAME & ADDRESS		STATE OF INCORPORATION	LIABILITY LIMIT \$	Corporate Seal
	SIGNATURE(S)	1.	2.		
	NAME(S) & TITLE(S) (Typed)	1.	2.		
SURETY G	NAME & ADDRESS		STATE OF INCORPORATION	LIABILITY LIMIT \$	Corporate Seal
	SIGNATURE(S)	1.	2.		
	NAME(S) & TITLE(S) (Typed)	1.	2.		

INSTRUCTIONS

1. This form, for the protection of persons supplying labor and material, is used when a payment bond is required under 40 USC Chapter 31, Subchapter III, Bonds. Any deviation from this form will require the written approval of the Administrator of General Services.
2. Insert the full legal name and business address of the Principal in the space designated "Principal" on the face of the form. An authorized person shall sign the bond. Any person signing in a representative capacity (e.g., an attorney-in-fact) must furnish evidence of authority if that representative is not a member of the firm, partnership, or joint venture, or an officer of the corporation involved.
3. (a) Corporations executing the bond as sureties must appear on the Department of the Treasury's list of approved sureties and must act within the limitations listed therein. The value put into the LIABILITY LIMIT block is the penal sum (i.e., the face value) of the bond, unless a co-surety arrangement is proposed.

(b) When multiple corporate sureties are involved, their names and addresses shall appear in the spaces (Surety A, Surety B, etc.) headed "CORPORATE SURETY(IES)." In the space designated "SURETY(IES)" on the face of the form, insert only the letter identifier corresponding to each of the sureties. Moreover, when co-surety arrangements exist, the parties may allocate their respective limitations of liability under the bonds, provided that the sum total of their liability equals 100% of the bond penal sum.

(c) When individual sureties are involved, a completed Affidavit of Individual Surety (Standard Form 28) for each individual surety shall accompany the bond. The Government may require the surety to furnish additional substantiating information concerning its financial capability.
4. Corporations executing the bond shall affix their corporate seals. Individuals shall execute the bond opposite the words "Corporate Seal", and shall affix an adhesive seal if executed in Maine, New Hampshire, or any other jurisdiction requiring adhesive seals.
5. Type the name and title of each person signing this bond in the space provided.

GOVERNMENT

Affidavit of Non-Collusion

BIDDER: _____ TELEPHONE: (____) _____

ADDRESS: _____

The Bidder shall execute this Certification of Bidder. I _____ hereby affirm as a condition to the **Government**'s execution of this Contract that I have not either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with the Bid for this Contract

Further affiant sayeth not.

Title: _____

Bidder (print): _____

Bidder Signature: _____

STATE OF _____)

COUNTY OF _____)

SUBSCRIBED AND SWORN TO BEFORE ME ON THIS:

_____ day of _____ 20____

Notary Public _____

My Commission Expires: _____

Failure to comply with the completion and timely submission of the Affidavit of Non-Collusion shall result in the Bidder's Bid being rejected as non-responsive.

EXHIBIT F
STANDARD SPECIFICATION FOR CONSTRUCTION OF ROADS &
BRIDGES- FP-2014 &
SUPPLEMENTAL SPECIFICATIONS

The (metric version) FP-2014 book is available in electronic format at

<https://flh.fhwa.dot.gov/resources/specs/fp-14/fp14.pdf>

website.

SUPPLEMENTAL SPECIFICATION

SECTION 101. - TERMS, FORMAT, AND DEFINITIONS

101. 04 **Definitions:** The following terms with their respective definitions are added, or redefined, as supplement to Article 1 of Exhibit A:

Contracting Officer (CO).-- Wherever the term "Contracting Officer" or "CO" is used in Division 100, the construction plans, or elsewhere in the specifications and contract documents, it is referred to as the Navajo Nation President who has the authority to enter into, administer, and/or terminate contracts and make related determinations and findings. The term includes certain authorized representatives of the Contracting Officer acting within the limits of their authority as delegated by the CO.

Construction Manager (CM).-- The CM is the duly authorized resident project site representative of the Contracting Officer (CO), and will act for the CO in administering the contract at the project site. The CM's duties and responsibilities are delineated by letter from the CO to the CM with a copy sent to the Contractor. The CM does not have any authority to make changes to the contract, or direct any of the work; only those duties and responsibilities as authorized by the CO and/or as provided for in the contract documents.

Engineer (Engineer of Record). -- The Engineer is the duly authorized Engineer of Record of the Contracting Officer (CO), and will act for the CO in the technical aspects of the contract. The Engineer's duties and responsibilities are delineated by letter from the CO to the CM and Engineer with a copy sent to the Contractor. The Engineer does not have any authority to make changes to the contract, or direct any of the work; only those duties and responsibilities related to the designs and interpretation of the design requirements including any design changes as authorized by the CO and/or as provided for in the contract documents.

NRDOT. -- Wherever the term "NRDOT" is used in the FP-14 supplemental specifications or other contract documents, it refers to the BIA Navajo Region Division of Transportation.

NDOT. -- Wherever the term "NDOT" is used in the FP-14 supplemental specifications or other contract documents, it refers to the Navajo Nation Division of Transportation.

Government. -- The term "Government" refers to the Navajo Nation through the Contracting Officer (CO).

Owner. -- The term "Owner" refers to the owner of the project or facility being built.

Major Floods. Major floods are define as wide spread flooding encompassing and inundating an area of 1300 hectares or more with water and debris within and adjacent to the project site.

The definition for the word “Unsuitable” is superseded with the following:

Unsuitable or Deleterious Material – Defined as Material not capable of providing stable foundations, embankments, drainage structure installations, retaining wall construction, or roadbeds. Unsuitable material may include muck, sod, or soils with high organic and/or high PH (low resistivity) contents depending upon the materials proposed use on the project.

Staked Limits – Staked limits is the final subgrade catch points as reflected on the Government furnished staking notes and adjusted by the surveyor to fit actual field conditions.

Section 102. — BID, AWARD, AND EXECUTION OF CONTRACT

This section supplements section 11 of Exhibit B & section 18 of Exhibit C.

This section 102 is superseded with the following:

102.01 Acquisition Regulations. Bid, award, and execution of the contract are governed by 12 N.N.C §332 Competitive Sealed Proposals, Article 5 of Exhibit A, section 18 of Exhibit C, Exhibit D and Exhibit E. Execute and submit all required forms, bid schedule, and solicitation provisions contained in the solicitation as part of the bid.

102.02 Preparation of Bids. Preparation of Bids shall be in accordance with Clause NN-214-18 of the Special Contract Requirements Exhibit C and Bid Instructions/Schedule of Exhibit D.

102.03 Bid Guarantee. Bid Guarantee shall be in accordance with Clause NN-228-1 of the Special Contract Requirements Exhibit C.

102.04 Individual Surety. Individual Surety shall be in accordance with Clause NN-228-11 of the Special Contract Requirements Exhibit C.

102.05 Opening of Bids. Bids will be opened by the Government and evaluated as specified in the Request for Proposals. The Government reserves the right to reject bids as set forth in the requirements of section 102.01.

102.06 Performance and Payment Bonds. Performance and Payment Bond shall be in accordance with Clause NN-228-15 of the Special Contract Requirements Exhibit C and form in Exhibit E.

Use NN-25, Performance Bond, and NN-25A, Payment Bond, for submitting the bonds.

The requirements contained in Subsections 102.03 and 102.04 relating to power of attorney, evidence of guarantee assistance, and individual sureties also apply to performance and payment bonds.

102.07 Site Investigation and Conditions Affecting the Work; shall be in accordance with Clause NN-236-3 of the Special Contract Requirements Exhibit C.

102.08 Federal, State, and Local Taxes; shall be in accordance with Article 15 of Exhibit B.

Rev: 01/31/18

SECTION 103. - SCOPE OF WORK

Subsection 103.03 is superseded with the following:

103.03 Value Engineering. See Clause NN-248-3 of the Special Contract Requirements Exhibit C.

103.05 Partnering.

The third paragraph is superseded with the following:

If the partnering offer is accepted, mutually agree with the Government on the level of organizational involvement and the need for a professional to facilitate the partnering process. The Contractor shall engage a qualified facilitator and other resources for key Contractor and Government staff to attend a partnership development and team-building workshop at least 30 days prior to given “Notice to Proceed”. Hold additional progress meetings upon mutual agreement.

To insure that all the work under this contract including any special contract requirements are adequately addressed and properly coordinated, attendance at the first partnering meeting shall include the Contractor’s Construction Manager, Project Superintendent, Project Foremen, Sub-contractor representatives, and Supplier representatives, QCM, Alternate QCM, Contractor Surveyors, and QC Inspectors/Technicians. The Government key personnel that may attend the first partnering meeting are NDOT Executive Staff, Construction Manager, Inspectors, Engineer and/or technicians, and utility representative as required. The above key personnel shall attend any other subsequent meeting(s) deemed necessary by both parties.

The Government may invite utility owners, environmental and archeological staff to the first partnering meeting and/or any other subsequent meeting(s) as deemed necessary.

rev: 01/18/18

SECTION 104. - CONTROL OF WORK

This section 104 supplements Article 6.11 of Exhibit A

104.03 Specifications and Drawings: The first sentence is superseded with the following: Follow the requirements of clause NN236-21 of Exhibit C.

104.04 Coordination of Contract Documents:

The last sentence is superseded with the following:

The contract documents govern in the following order:

- (a) Navajo Nation Procurement Code 12- N.N.C. §301 - 371
- (b) 25 CFR Part 170, as amended
- (c) Government & Contractor Agreement (EJCDC C-520)
- (d) Standard General Conditions of the Construction Contract (Exhibit A)
- (e) Navajo Nation Supplemental General Conditions (Exhibit B)
- (f) Special Contract Requirements (Exhibit C) and Environmental Requirements & Permits (Exhibit I)
- (g) Supplemental Specifications to the FP2014 (Exhibit F)
- (h) Standard Specifications FP2014 (Exhibit F)
- (i) Plans (Exhibit G)

rev: 01/18/18

SECTION 105. – CONTROL OF MATERIAL

105.01 **Source of Supply and Quality Requirements.** The first sentence is superseded with the following: Follow the requirements of NN-236-5 of Exhibit C.

Rev: 01/18/18

SECTION 106. - ACCEPTANCE OF WORK

- 106.01** **Conformity with Contract Requirements.** Add the following sentence: Section 106 supplements Article 13 of Exhibit A.

Add the following:

All applicable sections in the latest edition (as referenced in the FP-14) with updates of the Federal Lands Highway, Field Materials Manual (FLHFM) shall apply to the work under this contract. If any requirements in the FLHFM conflict in either the FP-14, or these supplemental specifications, then the FP-14 and these supplemental specifications shall prevail.

- 106.04** **Measured or Tested Conformance.**

The second paragraph of this section is superseded with the following:

Results from Contractor inspection or testing shall have values within the specified tolerances or specification limits. Results from Government verification testing and inspection (as specified in the contract) shall be used to support or reject the work incorporated into the project as specified within the tolerances and/or specified limits within the contract. When no tolerance values are identified in the contract, the work shall be inspected, tested, and accepted based on customary manufacturing and construction standards.

- 106.05** **Statistical Evaluation of Work for Acceptance and Determination of Pay Factor (Value of Work).**

The first sentence of paragraph (a) is superseded with the following:

(a) General. For work accepted based on statistical evaluation, both the Government and Contractor assume some risk. Unless otherwise specified in the contract, it is the responsibility of the Construction Manager and/or Engineer of record to conduct the analysis described, and to provide the Contractor with the results that shall be used for determination of acceptance of the work and pay factors based under this section.

rev: 10/01/18

SECTION 107. - LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

107.02 **Protection and Restoration of Property and Landscape.** This section 107 supplements Article 6.11 of Exhibit A. The first sentence is superseded with the following: Follow the requirements of clause NN-236-9 of Exhibit C.

Add the following to paragraph three:

Unless otherwise modified in writing by the Construction Manager, the construction clearing limits shall be (depending upon the type of project) the cut or fill limits shown on the plan and profile drawings, or staking notes provided plus 3 meters, or the new Typical Section width plus 3 meters for pavement rehabilitation projects. At bridges, culverts, furrow ditches, turnouts, existing road obliteration, fencing or other structures the limits shall be the minimum needed to construct the improvement as determined by the Government. In no case shall any work be done outside the right-of-way limits (not already called for in the design plans) without prior approval from the Construction Manager.

Only remove vegetation that is necessary to construct the project and all its features. The Contractor shall use due care in his clearing and grubbing operations so as not to destroy vegetation that is not required for removal to the fullest extent possible.

107.03 Add the following to **Bulletin Board**, Section 107.03:

(k) All 401,402,404 and NPDES Permits.

107.06 **Contractor's Responsibility for Work.**

The fourth paragraph is superseded with the following:

The Government will only be responsible for losses, injuries, and damage cause by declared enemies and terrorists of the United States Government and cataclysmic natural phenomenon such as tornadoes, earthquakes, major floods, and other federally declared natural disasters by the United States Government. The Government will only be responsible for costs attributable to repairing or replacing damaged work. The Government will not be responsible for delay costs, impact costs, or extended overhead costs.

107.08 **Sanitation, Health, and Safety;** shall follow the requirements of NN-236-13 of Exhibit C.

rev: 10/01/18

SECTION 108. - PROSECUTION AND PROGRESS

108.01 Commencement, Prosecution, and Completion of Work; This section 108 supplements Article 6 of Exhibit A.

108.02 Subcontracting. This section supplements the requirements of NN-219-14 of Exhibit C and Article 6.6 of Exhibit A.

108.03 Determination and Extension of Contract Time. The first sentence is superseded with the following: Follow the requirements of Article 12 of Exhibit A.

108.04 Failure to Complete Work on Time.

The first sentence of the first paragraph is deleted.

Add the following to Paragraph two:

The Contractor shall be subject to the Liquidated Damages as a result of the actions they take or that of their subcontractors in the amount specified in Table 108-1 for each day beyond the time allowed to complete the contract work, until final acceptance of the work is given. The Liquidated Damages shall be assessed when the entire project work cannot be completed due to delays as a result of any actions or inactions taken by the Contractor and/or sub-contractors including failure to complete all the work by the contract end date.

108.05 Stop Order. This section supplements Article 15 of Exhibit A.

Paragraph two is superseded with the following:

No adjustment in contract time or amount will be made for stop work orders issued under **(a)** or **(b)**. An adjustment in contract time may be made (under the following) when the Contractor is able to demonstrate that the weather was unusually severe based on the most recent 10 years of certified historical data provided by the Contractor.

(a) If the Contractor refuses or fails to prosecute the work or any separable part, with the diligence that will insure its completion within the time specified in this contract including any extension, or fails to complete the work within this time, the CO may, by written notice to the Contractor, terminate the right to proceed with the work (or the separable part of the work) that has been delayed. In this event, the government may take over the work and complete it by contract or otherwise, and may take possession of and use any materials, appliances, and plant on the work site necessary for completing the work. The Contractor and its sureties shall be liable for any damage to the Government resulting from the Contractor's refusal or failure to complete the work within the specified time, whether or

not the Contractor's right to proceed with the work is terminated. This liability includes any increased costs incurred by the Government in completing the work.

(b) The Contractor's right to proceed shall not be terminated nor the Contractor charged with damages under this section, if -

(1) The delay in completing the work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor. Examples of such causes include (i) acts of God or of the public enemy, (ii) acts of the Government in either its sovereign or contractual capacity, (iii) acts of another Contractor in the performance of a contract with the Government, (iv) fires, (v) floods, (vi) epidemics, (vii) quarantine restrictions, (viii) strikes, (ix) freight embargoes, (x) unusually severe weather, or (xi) delays of subcontractors or suppliers at any tier arising from unforeseeable causes beyond the control and without the fault or negligence of both the Contractor and the subcontractors or suppliers; and

(2) The Contractor, within 10 days from the beginning of any delay (unless extended by the Contracting Officer), notifies the Contracting Officer in writing of the causes of delay. The Contracting Officer shall ascertain the facts and the extent of delay. If, in the judgment of the Contracting Officer, the findings of fact warrant such action, the time for completing the work shall be extended. The findings of the Contracting Officer shall be final and conclusive on the parties, but subject to appeal under Article 16 of Exhibit A.

(c) If, after termination of the Contractor's right to proceed, it is determined that the Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the termination had been issued for the convenience of the Government.

(d) The rights and remedies of the Government in this section are in addition to any other rights and remedies provided by law or under this contract.

rev: 01/18/18

SECTION 109. - MEASUREMENT AND PAYMENT

109.01 Measurement of Work. This section 109 supplements Article 14 of Exhibit A.

Add the following:

The metric unit of measure shall prevail in both measurement and payment of items as shown in the bid schedule. However this does not preclude the contractor from furnishing the English units equivalent for materials incorporated into the work from suppliers. The contractor shall be responsible for any misalignment and any other problems arising out of such conversions.

109.02 Measurement Terms and Definitions.

Subparagraph (a) is superseded with the following:

(a) Contract quantity. The quantity to be paid is the quantity shown in the bid schedule (designated as "CQ") and is the final quantity to be paid. The contract quantity will be adjusted for authorized changes that affect the quantity or for errors made in computing this quantity. If there is evidence that a quantity specified as a "*contract quantity*" is incorrect, submit calculations, drawings, or other evidence indicating why the quantity is in error and request, in writing, that the quantity be adjusted.

Subparagraph (b)(1)(a) is superseded with the following:

(a) Take cross sections of original ground for the Construction Manager comparison to the design models. Do not collect data outside the designated slope stake limits.

Add the following subsection:

(s) Contingent sum. Perform the work only when authorized by written change order. The work will be measured and paid for at agreed unit prices, lump sum prices, or force account as established in the order authorizing the work. When the unit bid price is designated "contingent sum", the quantity is designated as "All".

109.03 Weighing Procedures and Devices.

Add the following:

All scales shall be re-certified annually or after each time they are moved, or as directed in writing by the Construction Manager. Provide current scale certification documents to the Construction Manager.

The first sentence of subparagraph (c) is superseded with the following:

Furnish, erect, and maintain acceptable scales.

Paragraphs 6 and 7 of subparagraph (c) are superseded with the following:

For pay quantities based on weight, an automatic printer hooked up to the scales shall be provided that shall provide the following information for each weighing, or manually weigh and record masses with the same information below:

- (1) Project Number
- (2) Item number and description
- (3) Date
- (4) Time
- (5) Ticket number
- (6) Haul unit number
- (7) Gross Weight (haul unit and mass); to the nearest 50 kilograms
- (8) Tare Weight (haul unit); to the nearest 50 kilograms
- (9) Net Weight (mass); to the nearest 50 kilograms
- (10) Accumulated total net mass for all haul units since the beginning of the shift

The Contractor shall weigh the empty weight of vehicles with full fuel tanks hauling materials weighed on platform scales at the start of the day's operations, then at noon time. If the vehicle is replaced with another one during the operations, then the new vehicle shall be weighed empty with full fuel tanks and at the end of the day's operations.

Paragraph 8, in subparagraph (c) is superseded with the following:

Furnish competent scale operator(s) to operate the system when materials are Contractor-furnished from his own pit/source. Otherwise, the Contractor's commercial supplier shall furnish a competent scale operator(s) when materials are furnished from a commercial pit/source.

Add the following to paragraph 10 in subparagraph (c):

The Contractor's QCM shall furnish the certified Accumulated Total Net Mass record to the Construction Manager the following workday.

109.04 Receiving Procedures.

The last paragraph is superseded with the following:

Use an approved format/form for the delivery record(s), which must be part of the Quality Control Plan. Furnish the original record(s) and a written certification of the delivery to the QCM with a copy to the Construction Manager at the end of each shift. If any delivery report(s) does not contain the signature of the contractor's delivery acceptance person or missing delivery report(s) cannot be found, or missing loads cannot be accounted for, the material shall not be paid for.

109.05 Scope of Payment.

Add the following to subparagraph (b):

This also includes work that is identified in the contract specifications as being incidental to other items of work or work called for in the specifications for which a bid items is not provided.

109.06 Pricing of Adjustments.

The first paragraph is superseded with the following:

At the time of award of contract, the Contractor shall provide the CO with a complete breakdown of their bid including the direct costs for each bid item, overhead rate, profit rate, and applicable taxes rates. Determine all costs according to the contract cost principles and procedures of NNPC 12 N.N.C§350. Follow the requirements of all sections providing for an equitable price adjustment.

Paragraph **(b)(2) – Overhead** is superseded with the following:

(2) Overhead. The overhead rate(s) that apply to the prime Contractor shall be the actual rate used in the Contractor's bid for the work the Prime Contractor performs under this contract but cannot exceed 30% for any post work pricing. For all prime and subcontract work, identify overhead rate(s) and provide supporting data, which justifies the rate(s). List the types of costs, which are included in overhead pool. Identify the cost pool(s) to which overhead is applied. Apply the overhead to the appropriate pool.

Limit Contractor overhead applied to subcontractor payments to 5 percent of such payments unless a higher percentage is justified.

Paragraph **(b)(3)-Profit** is superseded with the following:

(3) Profit. Except when precluded by the 12 N.N.C. §350, the profit shall be the actual rate used in the original bid but no more than 10% of the total direct costs reflecting the efficiency and economy of the Contractor and subcontractors in performing the work, the contract risk type, the work difficulty, and management effectiveness and diversity.

For work priced after all or most of the work is performed, profit is limited by statute to 10% of the total direct cost provided this rate can be justified.

Add the following paragraph to subparagraph **(b) Post work pricing**:

(4) Bonding. The rate charged by any Contractor or subcontractor under this contract is capped at 1% of the total cost of the work or any modification work unless a higher rate can be justified.

Paragraph 109.06(b)(1)c is superseded with the following:

(c) Equipment. Provide a complete descriptive listing of equipment including the make, model, and year of manufacture. Support rented or leased equipment costs with invoices. Determine allowable ownership and operating costs for contractor- and sub-contractor-owned equipment as follows:

(1) Use actual equipment cost data when such data can be acceptably determined from the Contractor's or sub-Contractor's ownership and operating cost records taking into account depreciation.

(2) When actual costs cannot be determined, use the rates shown in the “*CE00ES*” (where applicable) published by The Army Corps of Engineers, for the area where costs are incurred. Adjust the rates for used equipment and for other variable parameters used in the schedules. Provide copies of data sheets taken from these rates books with your submission. DO NOT use a combination of rates from these sources. Actual contractor rates cannot exceed the rates in the ACOE *CE00ES* book.

(3) Compute proposed standby costs from acceptable ownership records or when actual costs cannot be determined, according to the ACOE *CE00ES* book. Do not exceed 8 hours in any 24-hour period or 40 hours in any calendar week. Do not include standby for periods when the equipment would have otherwise been in an idle status, used on other projects during the same time period, or for equipment that was not in operational condition.

Add subparagraph **(c)** as follows:

(c) Construction Price adjustments. The CO will not consider price adjustments for material and other Contractor and/or subcontractor price increases during the life of the contract unless the contract allow for such.

109.07 Eliminated Work. The first sentence of this section is superseded with the following:

(a) The Contracting Officer may, at any time, without notice to the sureties, if any, by written order designated or indicated to be a change order, make changes in the work within the general scope of the contract, including changes -

(1) In the specifications (including drawings and designs);

(2) In the method or manner of performance of the work;

(3) In the Owner-furnished property or services; or

(4) Directing acceleration in the performance of the work.

(b) Any other written or oral order (which, as used in this paragraph (b), includes direction, instruction, interpretation, or determination) from the Contracting Officer that causes a change shall be treated as a change order under this clause; provided, that the Contractor gives the Contracting Officer written notice stating (1) the date, circumstances, and source of the order and (2) that the Contractor regards the order as a change order.

(c) Except as provided in this section, no order, statement, or conduct of the Contracting Officer shall be treated as a change under this section or entitle the Contractor to an equitable adjustment.

(d) If any change under this clause causes an increase or decrease in the Contractor's cost of, or the time required for, the performance of any part of the work under this contract, whether or not changed by any such order, the Contracting Officer shall make an equitable adjustment and modify the contract in writing. However, except for an adjustment based on defective specifications, no adjustment for any change under paragraph (b) of this clause shall be made for any costs incurred more than 20 days before the Contractor gives written notice as required. In the case of defective specifications for which the Government is responsible, the equitable adjustment shall include any increased cost reasonably incurred by the Contractor in attempting to comply with the defective specifications.

(e) The Contractor must assert its right to an adjustment under this clause within 30 days after (1) receipt of a written change order under paragraph (a) of this clause or (2) the furnishing of a written notice under paragraph (b) of this clause, by submitting to the Contracting Officer a written statement describing the general nature and amount of proposal, unless this period is extended by the Government. The statement of proposal for adjustment may be included in the notice under paragraph (b) above.

(f) No proposal by the Contractor for an equitable adjustment shall be allowed if asserted after final payment under this contract.

109.08 Progress Payments. The first sentence of this section is superseded with the following:

Follow the requirements of Exhibit A, Article 14.2 of the Standard General Conditions of the Construction Contract.

Subparagraph (b) is superseded with the following:

(b) Closing date and invoice submittal date. On the first (1st) of each month or the following work day should the date fall on a weekend or holiday, the Contractor may elect (in accordance with the special contract requirements) to have the Construction Manager prepare and submit a pay estimate to the Contractor, based on the receiving report, for approval on a form acceptable to both the Contractor and Government. However, no invoice payment can be submitted to the billing office without the Construction Manager agreeing with the work accepted in place and the quantities are reviewed and approved. The progress payment preparation as outlined in subparagraph (c) & (d). The pay estimate must be signed by the Construction Manager and Contractor representative before an invoice can be submitted.

Subparagraph (c)

Add the following subparagraph (c)(9):

(9) Unless otherwise agreed to, the pay estimate will be reviewed and approved (in writing) by both the Contractor's and Construction Manager prior to the Contractor submission of any invoice to the CO for approval and processing. Any errors found in the pay estimate shall result in the progress pay estimate being returned to the Contractor for corrections and re-submission. A copy of the pay estimate must be included with the Contractor's invoice with a line for the Construction Manager to concur in the invoice accuracy.

Subparagraph (c)(2) is superseded with the following:

(2) A tabulation of total quantities, applicable calculations, and unit prices of work accomplished or completed, and accepted, on each pay item as of the closing date shall be provided to the Construction Manager to validate (by closing date) the pay estimate request. Do not include any quantities unless field note documentation and calculations for those quantities was submitted by the closing date. Do not include quantities of work involving material for which test reports required under Sections 153 or 154 or certifications required by Subsection 106.03 are, or will be, past due as of the closing date unless otherwise agreed to by the Construction Manager.

Subparagraph (d) is superseded with the following:

(d) Government's receiving report. The Government's receiving report will be developed using the measurement notes received by the QCM and determined acceptable by the Construction Manager. Within 7 days after the closing date, the Construction Manager will be available by appointment at the Government's designated office to advise the Contractor of quantities and unit prices appearing on the Government's receiving report.

Progress payments may include partial payment for material to be incorporated in the work, provided the material meets the requirements of the contract and that the Contractor

includes in his request, a signed statement from the Construction Manager that the materials have been inspected and appear to meet the project specifications and match the quantities given in the pay estimate.

Add the following to subparagraph (f) **Partial payments**:

For stockpiled aggregates, the Contractor's request must include test results and certifications indicating compliance with the specifications to verify the request. The materials must be delivered on or in the vicinity of the project site and/or stored in acceptable (secured) storage places to be considered for partial payment.

109.09 Final Payment.

Add the following to paragraph two (2):

Final payment of the contract should be made no later than **120 days** from the date of **Final Acceptance** and verification of final pay records provided the Contractor provides all the necessary records within 5 days after the final inspection.

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SECTION 151. - MOBILIZATION

This section 109 supplements Article 6 of Exhibit A

151.03 Payment. This section is superseded with the following:

The accepted quantity, measured as provided in Subsection 109.02, will be paid at the contract price per unit of measurement for the Section 151 pay item shown in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

Progress payments for mobilization lump sum will be paid as follows:

- (a) Bond premiums will be reimbursed for the amount of premiums paid for performance and payment bonds (including coinsurance and reinsurance agreements, when applicable) after the Contractor has furnished evidence of full payment to the surety. The retainage provisions in Article 16 of Exhibit B shall not apply to that portion of progress payments attributable to bond premiums.
- (b) When 5 percent of the original contract amount is earned from other bid items, 50 percent of the mobilization item, or 5 percent of the original contract amount, whichever is less, will be paid.
- (c) When 10 percent of the original contract amount is earned from other bid items, 100 percent of the mobilization item, or 10 percent of the original contract amount, whichever is less, will be paid.
- (d) Any portion of the mobilization item in excess of 10 percent of the original contract amount will be paid after final acceptance.

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SECTION 152. - CONSTRUCTION SURVEY AND STAKING

152.01 **Description:** This section 152 supplements Article 6 of Exhibit A.

The first paragraph is superseded with the following:

This work consists of furnishing qualified personnel and necessary equipment, materials, and incidentals to survey, stake, calculate, and record data for the control of work. The Layout of work shall be in accordance with Clause NN-236-17 of Exhibit C.

The Contractor shall lay out its work from Government-established base lines and bench marks indicated on the drawings, and shall be responsible for all measurements in connection with the layout. The Contractor shall furnish, at its own expense, all stakes, templates, platforms, equipment, tools, materials, and labor required to lay out any part of the work. The Contractor shall be responsible for executing the work to the lines and grades that may be established or indicated by the Contracting Officer. The Contractor shall also be responsible for maintaining and preserving all stakes and other marks established by the Contracting Officer until authorized to remove them. If such marks are destroyed by the Contractor or through its negligence before their removal is authorized, the Contracting Officer may replace them and deduct the expense of the replacement from any amounts due or to become due to the Contractor.

The following sentence supersedes the first sentence of the second paragraph:

Personnel, equipment, material, and survey notes shall conform to the following:

Subparagraph (a) is superseded with the following:

(a) Personnel. Furnish a technically qualified survey crew capable of performing the work in a timely and accurate manner. The survey crew shall be under the supervision of a Registered Land Surveyor (RLS) with a survey crew supervisor having at least 10 years of experience in highway construction survey and staking. The survey crew supervisor shall be on the project at all times during the survey and staking of each item of work and during the measurement of each pay item. The Contractor shall furnish résumé's on all members of the survey crew and the RLS to the Construction Manager for review and approval prior to any survey work being performed.

Add subparagraph (d) to the second paragraph:

(d) Survey Notes. Furnish survey notes for the Survey and Staking Requirements:

(1) Roadway cross-sections. Furnish the original and final cross-sections taken of the roadway excavation and embankment, channel, parking areas, and borrow areas,

in final position in electronic format (to 3 significant figures) with the feature label coding table file used (if the government furnished coding (.xin file) table format is not used). The Contractor shall submit his/her definitions file for the codes used in text format and the cross section and staked alignment survey data shall be in ASCII format consisting of Point Number, Northing, Easting, Elevation, and Feature Code (P, N, E, Z, C) that identifies ground points, break lines, and centerline alignment strings with a Digital Terrain Model (*.DTM or *.XML) file capable of being read correctly in the InRoads V8i S3 software. The **Contractor RLS Surveyor** shall prepare graphical plane view and cross section plots of both the original and final cross-section data in AutoCAD 2019 (*.DWG) or Microstation V8i S2 or S3 (*.DGN) file format and review them AND ALL SURVEY DATA for accuracy and errors before submitting all the data to the Construction Manager with a certification of its accuracy.

Under no circumstance shall any original ground disturbing activities or base course placement be allowed until all the ORIGINAL ground cross-section data (including at borrow pits after overburden is removed) has been collected, reviewed, and accepted in writing by the Construction Manager. See section 109.02(b), 204.08, and 204.16(b) for further details.

(2) Slope stakes and references. Furnish slope staking and reference notes in hand written field books or electronic files in the same format provided to the Contractor by the government. Slope stake notes shall be provided in accordance with section 152.03(c).

(3) Drainage structures. The Contractor shall submit for approval graphical plots of the revised drainage structure lengths to fit the existing field conditions on maximum size 279 mm x 432 mm (11" x 17") sheets as well as in AutoCAD 2019 (*.DWG) or Microstation V8 (*.DGN) file format.

(4) Other survey and staking requirements. Furnish other survey and staking notes in hand written field books in an agreed upon format with the Construction Manager and the QCM.

152.02 General:

Add the following paragraph after the first paragraph:

The Contractor is authorized to proceed with construction survey and staking prior to approval of the overall Quality Control Plan. The Contractor shall conduct all survey and staking per the Surveying QCP attached and these specifications. The work may be in the presence of a representative of the CO. A QCP herein must be adhered to. The Contractor shall notify the Construction Manager at least one week before the actual surveying is to begin to allow the government time to have a representative on site.

The following sentence supersedes the first sentence of the fifth paragraph:

Before surveying or staking, discuss and coordinate the following with the Construction Manager:

The sixth paragraph is superseded with the following:

Survey and establish controls within the tolerances shown in Table 152-1. The Contractor shall recheck all Government furnished control point data prior to staking the alignment and other features. A report shall be provided to the Construction Manager on the control point checks in a format and method agreed to with the Construction Manager and Engineer. Once the control point data is verified and within the tolerances, the alignment can then be staked and the data furnished in (*.alg or xml) format to the Construction Manager with all the cross section, staking, and DTM data. During construction, any survey data that does not meet the tolerance requirements or is not in close conformance with the Government furnished staking notes **MUST** be immediately reported to the Construction Manager for further direction to resolve the problem.

The following paragraph supersedes the seventh paragraph:

The Contractor shall prepare field notes in an agreed upon format with the Construction Manager and the Quality Control Manager (QCM) for the various bid items requiring survey measurements. The RLS shall review and certify the original copies of all survey notes at least weekly unless otherwise directed in writing by the Construction Manager. All original survey notes (certified by the RLS) shall be submitted through the QCM to the Construction Manager and become the property of the Government upon completion of project.

The Government will withhold payment in the event the Contractor fails to furnish survey notes and calculations that measure and demonstrate work performed. The Contractor's submittal of their survey notes should have no errors outside the specified tolerances otherwise; the Government will send back the submittal for corrections at the entire expense of the Contractor.

152.03 Survey and Staking Requirements:

Add the following paragraphs to subparagraph **(b) Roadway cross-sections:**

During roadway slope staking, the Contractor shall field survey the **original** ground cross-sections, and/or existing pavement surface between centerline alignment and the proposed and/or existing right-of-way limits, to the maximum interval station and point spacing specified under 152.03(b) and Table 152-1. The Contractor shall QC check the data and submit the **original** ground cross-section survey data, with the RLS certification to the Construction Manager for review and approval.

Perform the same procedure as outlined above for the **final** as-built subgrade cross-sections (subgrade blue-top), up to the construction catchpoint limits (including all cut/fill slope sections) prior to placement of aggregate base course material. The data must exclude any waste or other stock piles within the right-of-way limits. The Contractor shall furnish the final as-built subgrade cross-section survey data with the RLS certification to the Construction Manager for review and acceptance. Do not begin any ABC or paving work until the survey data is reviewed and accepted by the Government in writing.

(c) Slope stakes and references. Add the following to subparagraph:

When earthwork is called for in the contract documents, submit the revised, government furnished, hard copy slope stake notes at completion of the slope staking operations to the Construction Manager & QCM for review and approval. The slope stake notes shall reflect the actual measurements in the field in red pencil or pen unless otherwise agreed to in writing between the Contractor and Construction Manager.

For machine grade control grading, the Contractor shall submit a details plan, for review and approval, on how they will carry out the work including setting up of local control points, model file formats needed, to insure the work complies with the tolerances in table 152-1.

Any substantial deviations in the staking from what is shown on the government furnished staking notes must **immediately** be reported to the Construction Manager for corrective measures to be taken.

Add the following to Subsection (f):

It is recommended to set the red top stakes for finish subgrade 5mm above the slope stake notes elevations provided to compensate for compaction and to achieve the proper crown. This will still allow for the finish subgrade to be within the ± 10 mm tolerance shown on Table 152-1. Set the blue top stakes for finish Aggregate Base Course (ABC) to the elevations provided in the slope stake notes for blue topping making sure the required uniform design thickness of ABC is achieved to insure the design template geometry is maintained (i.e. crown, hinge points, driving lanes, etc.).

Subparagraph (g) is superseded with the following:

(g) Drainage structures.

The Contractor shall stake drainage structures to fit existing field conditions. The location of the structures may differ from that shown on the design plans. Perform the following:

- (1) Slope stake the entire project according to **Subsection 152.03(c)**. The Construction Manager and Contractor Quality Control Manager (QCM), shall review with the surveyor, the slope stakes at each drainage structure locations to verify the

inlet and outlet locations, elevations, and skew of the proposed drainage structure (insuring that the drainage structures are not below the existing flow-line).

(2) After the Construction Manager and QCM agree with the location geometry, obtain the original ground profile along centerline of each structure including a distance of 20 meters upstream and downstream along the flow-line.

(3) Using engineering software (i.e. AutoCAD, MicroStation, etc.) plot the original ground cross-section and overlay the “as staked” roadway template with the appropriate skew on top of the original ground cross-section. Based upon these combined cross-sections, determine the structure invert elevations at the inlet and outlet. Plot the structure profile on the combined cross-section drawing. Calculate the total length of structure required and round up to the nearest 610 mm (2 ft) increment along the skew angle. When calculating pipe invert elevations and lengths, the lengths of any pipe end sections shall be subtracted from the total required pipe length per guidelines furnished upon written request.

(4) Perform the same procedure as outlined in (3) above for drainage pipes under the turnouts and driveways.

(5) Plot the final structure profiles on to the existing ground/proposed roadway template cross-sections for all drainage structures. These profiles shall be on maximum size 279 mm x 432 mm (11” x 17”) sheets to a scale provided by the Construction Manager. Assemble all pertinent structure information, into a spreadsheet acceptable to the Construction Manager, from the profiles, including station, length without end section(s), number of end sections, size of structure, number of structures per station, skew, invert elevations at inlet, roadway centerline, and outlet, roadway template distances and elevations, project number, contract number, current date, and name of person who prepared the document. Submit the complete revised structure list spreadsheet, including the final structure profiles, signed by the Prime Contractor, to the Construction Manager for review and approval.

(6) After the revised structure list is approved by the Construction Manager and prior to installing the drainage structures, the Contractor shall stake the final structure location and give the Construction Manager three (3) business days to review the locations. Any structure location problems noted as a result of survey errors by the Construction Manager shall be corrected at no additional cost to the government.

Add the following subparagraph:

(m) For rehabilitation projects, the Contractor shall re-locate all existing right-of-way monuments (as reflected in the **existing** right-of-way map) and insure the “*English*” stationing is placed on the reference markers (i.e. angle irons) as defined in the bid schedule. For new road construction projects, and if bid items are shown in the bid

schedule for installation of new right-of-way monuments and/or reference markers, stake the right-of-way monuments as shown in the design plans and label the reference markers with stationing in metric. Stamp or furnish the true state plane coordinates and elevations (to 3 significant figures) on the brass caps for all right-of-way monuments in metric regardless of the type of project unless directed otherwise by the Construction Manager.

152.05 Acceptance:

Add the following paragraph:

The Contractor's quality control inspection personnel shall make all the computations (with detailed and clear sketches as determined by the Construction Manager for any items of work requiring measurements based on the survey data provided (except for the final earthwork items as outlined in Subsection 204.16) or for periods for which progress payments are requested and record these calculations and sketches in bound inspection books. These calculations shall be reviewed and certified by the QCM and two copies forwarded to the Construction Manager for further review and processing.

152.05 Measurement:

Add the following paragraph:

All work outlined and required in this section, including surveying for roadway construction, bridge construction, slope staking, retaining walls, reference and clearing and grubbing staking, centerline re-establishment, blue topping, drainage structure survey and staking, grade finishing stakes (subgrade and aggregate base), right-of-way monument and marker location surveying and staking, quantity measurements, and miscellaneous surveying and staking shall be measured by the lump sum.

152.06 Payment:

This section is superseded with the following:

The accepted quantities, measured as provided in Section 152.05, Measurement, above, will be paid at the contract price per unit of measurement for the pay item listed below and as shown in the bid schedule beginning with the Notice to Proceed issued. Payment will be full compensation for the work prescribed in Section 152, Construction Survey and Staking.

When the bid schedule does not contain a bid item for Construction Survey and Staking, then it shall be considered incidental obligations to completion of the items of work described in the bid schedule.

Item 15201-0000, as measured above, will be paid as follows:

- (a) Up to 30% of the lump sum will be paid following completion of the control point and alignment data verification, existing ground cross-section surveys, and slope staking work and furnish copies of these staking notes to the Construction Manager hard copy and electronic format through the QCM for review and approval before payment is made. The Engineer of Record shall review the data before the Construction Manager can recommend payment.
- (b) Up to an additional 30% of the lump sum will be paid following complete staking of the drainage structures and approval of the revised drainage structure list submittal in accordance with the outline under **Subsection 152.03(g) Drainage structures**.
- (c) Up to an additional 30% of the lump sum will be paid following completion of the final subgrade cross-sections taken and furnished the survey data to the Construction Manager in the format outlined under **Subsection 152.01(d) Survey Notes**. Once reviewed and approved by the government, payment shall be made.
- (d) The remaining 10% of the lump sum will be paid when the staking and surveying needed for all other items of work are completed and the Contractor submits all the original survey field books to the Construction Manager.

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Survey Quality Control Plan

The Construction Surveyor/ Party Chief (“RLS”), shall furnish technically qualified surveyors capable of performing the work in a timely, accurate and professional manner. The field crews shall be under the supervision of a Professional Land Surveyor with a minimum of 10 years’ experience in highway construction staking. Each member of the survey crew will have highway construction knowledge in performing GEOMETRIC computations. Crew members will assist and check the party chief in performing calculations and interpretations of the plans. Construction survey and staking will be performed within the tolerances specified in Table 152-1, and in accordance with section 152 of the FP-14 and the contract documents. All survey information will be forwarded to the CM and critical attention be made to any potential changed to the construction plans.

Check shots on the horizontal and vertical control points will be taken, at a minimum, at the beginning and end of each instrument setup, or GPS session. This procedure will minimize errors due to installment “setting” and/or “drifting” satellite progression, or simple identifying the wrong point. Each instrument set-up will be verified by checking into two vertical benchmarks to ensure that the proper benchmark and elevation is being utilized and by measuring the distance to the “backsite” and one other control point to insure horizontal accuracy. All survey instruments will be well maintained and checked for proper adjustment on a regular basis.

The “Surveyor” shall develop a reporting form to ensure the Government and Contractor that all of the survey data in conformance to the contract requirements. This form will be signed by the Field Supervisor and submitted along with the weekly reports and survey notes to the Construction Manager and the QCM on a weekly basis for review and approval.

At the beginning of each instrument set-up, or GPS session, “Surveyor” will spot check previously established positions for horizontal and vertical accuracy. This will provide an independent check on both the previously staked and the position and instrument session. Miscellaneous items such as cattle guards, turnouts, guardrail, paved waterways’ etc. will be checked by station/offset.

Independent checks by Government surveyors will check the accuracy and reinforce this Quality Control Plan. “RLS” will schedule locations for Government to perform the independent checks. Any variation, between the “RLS” and Government furnished surveys should be brought to the attention of our field supervisor or party chief. Any discrepancies shall first be discussed among “Surveyor” and Government. Discrepancies should be resolved in the field if all possible.

This Quality Control Plan has been written to correspond with Section 152 of the specifications. Various sections of the specifications are discussed with specifics related to this project.

Section 152.02 Requirements:

Before any work begins, the Surveyor shall discuss and coordinate with the Construction Manager:

1. Surveying & Staking methods to be used;
2. Stake markings and their meaning;
3. Grade control for each course of material;

4. Referencing and project control points (bench marks);
5. Structure control; and
6. Any other procedures, calibrations, and controls necessary for the work to be carried out

Prior to the beginning of construction, the centerline alignment, horizontal and vertical control and design grade initially provided by the Government will be field checked and confirmed prior to beginning any other survey work with a verification report provided to the Construction Manager. “RLS” will notify Contractor and the Government immediately if the said references do not meet the required tolerances in Table 152-1. No further staking will be performed until the Government has approved the verification report.

The “RLS” will collect all existing ground and (if required) existing ground on borrow pits and field check all data using GPS and/or conventional field equipment and process the survey data with surveying software into files that can be encoded in the Microstation platform and InRoads v8i S3 format per section 152.01(d). All duplicate points and lines shall be cleaned up prior to generating a digital terrain model of the existing and final subgrade/ground. The “Surveyor” will perform conventional optical differential level loops on all vertical benchmarks (i.e. control point data) furnished by the Government to verify that the reported elevations fall within the tolerances. The “RLS” will hold all control point elevations furnished by the Government, provided it meets the tolerances of plus or minus ten millimeters (10mm).

GPS equipment will be used for horizontal verification and staking out of the sub grade. This work will include an independent network check using Government provided control points and one National Geodetic Survey (NGS) control monuments. Once the network is complete, a minimum of a six point horizontal: vertical calibration will be developed not exceeding 4 kilometers for localizing from grid to ground. All Calibrations will be recorded electronically and a hard copy will be provided to the Government.

All vertical BMs will be verified by performing optical differential levels. A tolerance of plus or minus 10 mm will be allowed. In the course of running differential levels, a daily collimation test (peg test) will be run to avoid errors.

When using conventional and total station equipment, the “RLS” will perform weekly collimation tests which shall consist of a Compensator test, HA/HV test, and Trunnion Axis Tilt test using the manufactures specification.

Any inconsistency with the Government’s alignment, control and or grade data shall be brought to the attention of Contractor and the Government (Construction Manager) prior to continuing any surveys or construction.

Bi-monthly meetings (during construction) shall be scheduled with Contractor and the Construction Manager to discuss all surveying activities and changes in activities as listed in Section 152.02(a) through (f), and the Tolerances listed in Table 152- 1. All field notes shall be scanned to PDF format and also submitted in hard copy. All field notes shall be marked in red for changes made in the field for adjustment to fit actual field ground conditions.

The project will be divided into multiple sections and field staked according to the Government furnished slope staking notes. All subgrade staking (red top) shall be staked by GPS, conventional total station and/or optical level surveying equipment in accordance with Table 152-1. All finish grades (blue top) shall be staked by conventional total station and/or optical level surveying equipment accordance with Table 152-1. A Governmental field check shall be scheduled for the slope staking and to resolve any non-tolerance issues. In the event that issues are not resolved, no field survey will continue until arrangements have been made with the Government.

Section 152-03 Surveying and Staking Requirements:

(a) Control Points:

Horizontal and vertical control points will be located upon the start of the project. The points will be verified to within acceptable limits per table 152-1 and a detailed summary submitted for review. This also includes temporary benchmarks established along the project area.

The “RLS” shall perform all horizontal and vertical construction and control surveys in a professional manner utilizing “self-checking” procedures (i.e. use of conventional total station or GPS setting up on one known control point and fore sighting or back sighting another known control point). Horizontal control and layout surveys will utilize a minimum of two control points. A GPS calibration will be developed initially using Government supplied horizontal and vertical control points utilizing a minimum of six (6) horizontal and six (6) vertical control points. Prior to establishing this calibration, vertical and horizontal control points will be checked and referenced off of the project site. Once an acceptable GPS calibration is developed, it will be used exclusively for the remainder of the project.

Any update to control datum will comply with Table 152-1.

SAMPLE OF RTK FIELD CONTROL CHECK: THIS EXHIBIT SHOWS THE RESULTS OF A FIELD CHECK OF OUR LOCALIZATION COMPUTATIONS.

PT	Control North(m)	Control East(m)	Control Elev(m)	PT	RTK North(m)	RTK East(m)	RTK Elev(m)	North Diff	East Diff	Height Diff	CODE
23	562986.4	238585.3	1844.246	70	562986.4	238585.3	1844.257	0	0	-0.011	SCP301
10	562884	238631	1844.967	68	562884	238631	1844.974	0.026	0	-0.007	SCP3000
10	562884	238631	1844.967	480	562884	238631	1844.985	0.025	0.003	-0.018	CK_68
22	562881.5	238716.5	1843.5	60	562881.5	238716.5	1843.432	0.022	0.007	0.068	SCP300
11	562836.1	238659.2	1844.517	66	562836.1	238659.2	1844.513	0.019	0.005	0.004	SCP1
12	562827.4	238556.1	1846.781	72	562827.4	238556.1	1846.778	0.006	0.005	0.003	SCP2
13	562740.2	238538.4	1846.486	74	562740.2	238538.3	1846.492	-0.008	0.018	-0.006	SCP2A
14	562725.2	238482	1847.754	76	562725.2	238482	1847.757	0.011	0.018	-0.003	SCP3
15	562674.9	238497.8	1847.671	78	562674.8	238497.8	1847.672	0.012	0.009	-0.001	SCP4
20	562619.3	238477.4	1849.218	84	562619.3	238477.4	1849.218	0	0	0	SCP5
20	562619.3	238477.4	1849.218	148	562619.3	238477.4	1849.23	0.01	0.007	-0.012	CK_84

SAMPLE OF RTK FIELD CENTERLINE CONTROL CHECK: THIS EXHIBIT SHOWS THE RESULTS OF A FIELD CHECK OF OUR LOCALIZATION COMPUTATIONS.

Point	Ground North(m)	Ground East(m)	Action	Point	Control North(m)	Control East(m)	North Diff	East Diff	Center Sta
161	562896.1	238652.6	SET	1	562896.1	238652.6	-0.005	-0.01	POB 0+000.000
159	562880.7	238639.9	SET	2	562880.7	238639.9	-0.004	-0.002	BOP 0+019.980
157	562828.5	238597.2	SET	3	562828.5	238597.2	0.002	-0.007	PC 0+087.400
155	562767.5	238551.6	SET	5	562767.5	238551.6	0.003	-0.007	PT 0+163.590
154	562634.8	238461	SET	6	562634.8	238461	-0.004	0.007	PC 0+324.290
152	562611.8	238462.5	SET	8	562611.8	238462.5	-0.005	0.001	PT 0+3493.090
150	562591.1	238480.9	SET	9	562591.1	238480.9	-0.007	-0.001	POE 0+376.770

SAMPLE OF DIFFERENTIAL LEVEL LOOP CONTROL CHECK:

RTK PT#	RTK Elevation (m)	Control PT#	Control Elevation (m)	RTK Height Difference	RTK PT#	SL Elevation (m)	SL Height Difference	RTK VS SL Height Difference
84	1849.218	SCP5	1849.218	0	20	1849.218	0	0
82	1849.497	SCP200	1849.483	0.014	19	1849.484	-0.001	0.013
80	1849.617	SCP6	1849.626	-0.009	18	1849.625	0.001	-0.008
90	1849.742	BASE			90	1849.746		-0.004
78	1847.672	SCP4	1847.671	0.001	15	1847.663	0.008	0.009
76	1847.757	SCP3	1847.754	0.003	14	1847.744	0.01	0.013
74	1846.492	SCP2A	1846.486	0.006	13	1846.476	0.01	0.016
72	1846.778	SCP2	1846.781	-0.003	12	1846.768	0.013	0.01
68	1844.974	SCP3000	1844.967	0.007	10	1844.965	0.002	0.009
66	1844.513	SCP1	1844.517	-0.004	11	1844.498	0.019	0.015
60	1843.432	SCP300	1843.5	-0.068	22	1843.481	0.019	-0.049
70	1844.257	SCP301	1844.246	0.011	23	1844.23	0.016	0.027

(b) Roadway Cross-Sections:

Roadway cross sections will be taken at a maximum spacing of 20 meters along tangent of roadway and every 10 meters along curve of roadway sections. Each cross section shall be located based on known control points with all breaks or changes noted.

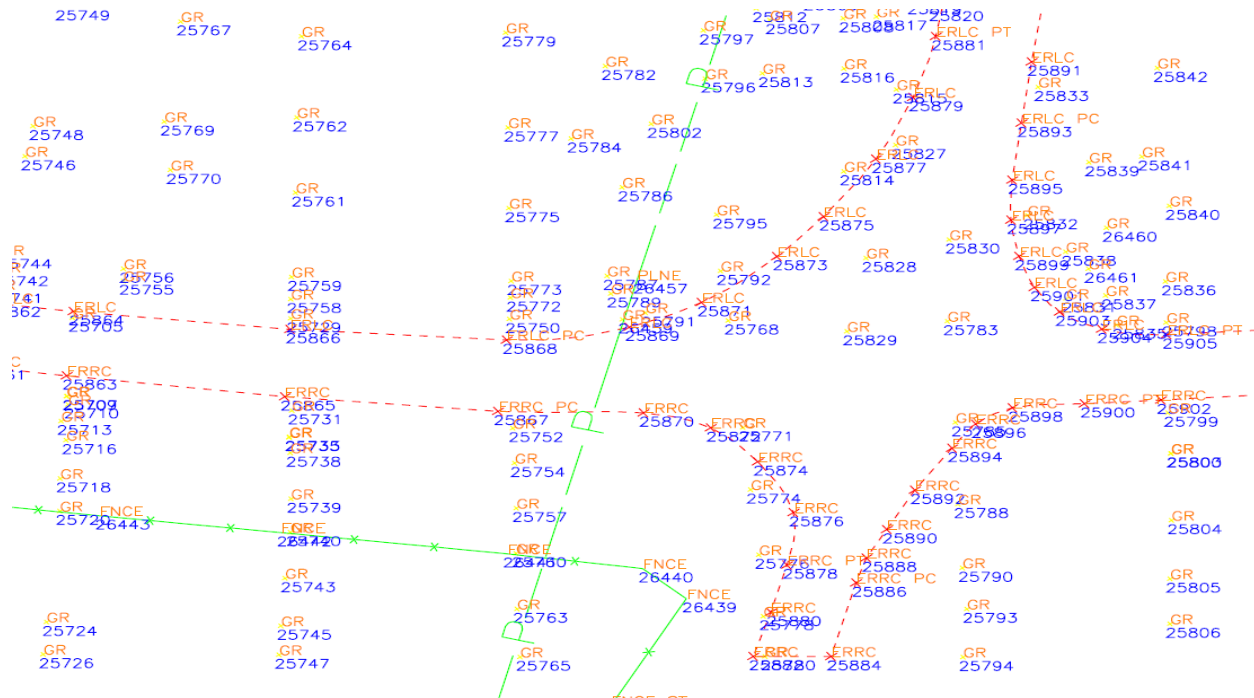
All topographic terrain breaks will be classified as break lines and all topographic flat surfaces will be classified as ground points. All break lines will be measured and recorded in a continuous pattern. The data points will be numbered in a sequential order and all break lines will be coded to best describe feature and stringed separately (i.e. TW, BB, DL, FL, etc.). Any topographic breaks within 5 meters of the 20 meter station increment will be measured and recorded. The project terrain model will be treated as single DTM with regards to data processing. All cross section data shall be formatted in an ASCII delimited point file (Point Number, Northing, Easting, Elevation and Code) and submitted to the Government along with an electronic copy of the survey raw data file to three significant figures. A complete description of the feature codes used for the breaklines and other point data will be provided to the Government in a Microsoft Word or Excel file that encompasses the entire feature code library. All survey data will be converted into a DTM

using Bentley InRoads V8i S3. A planimetric drawing for plan and profile and cross sections in 20m increments shall be prepared using Microstation or equivalent to check the data (i.e. breaklines and other point features) before submission. The drawing will be used by the surveyor to correct any common geometry errors resulting from duplicate line features and survey data points in the data files.

SAMPLE OF SURVEY CROSS SECTION DATA IN ASCII FORMAT

5009,562748.586,226201.669,1907.62,TOEL ST
5016,562761.356,226177.938,1907.86,TOEL
5019,562766.636,226156.843,1907.74,TOEL
5025,562773.642,226134.921,1907.98,TOEL
5047,562793.013,226045.727,1907.98,TOEL ST
5048,562788.462,226063.213,1907.87,TOEL
5049,562786.385,226076.845,1907.61,TOEL
5050,562784.637,226083.787,1907.39,TOEL
5051,562779.541,226099.846,1907.32,TOEL
5052,562768.373,226102.379,1907.31,TOEL
5053,562765.775,226104.285,1906.96,TOEL
5054,562761.967,226114.021,1906.78,TOEL
5055,562770.319,226105.855,1906.68,TOEL ST
5056,562773.88,226108.926,1906.38,TOEL
5064,562781.127,226106.864,1907.7,TOEL ST
5065,562785.257,226090.849,1907.68,TOEL
5068,562789.308,226075.723,1907.85,TOEL
5069,562792.694,226060.411,1907.96,TOEL
5072,562795.618,226046.363,1908.1,TOEL
5116,562796.318,226045.005,1908.17,TOEL ST
5118,562799.192,226025.045,1908.35,TOEL
5127,562801.807,226007.887,1908.62,TOEL
5130,562803.345,225989.244,1908.84,TOEL
5137,562806.272,225961.669,1909.49,TOEL
5140,562805.696,225940.881,1909.71,TOEL
5145,562805.533,225921.438,1909.84,TOEL

SAMPLE OF SURVEY CROSS SECTION DATA PROCESSED IN TGO.INROADS, OR OTHER EQUIVALENT SOFTWARE:



(c) Slope Stakes and References:

The “RLS” shall field stake the project according to the Government’s slope stake notes. In the event that field stakes require field adjustments due to terrain changes, the “RLS” will make the necessary field adjustments and redline all changes in their slope stake field book and on the Government furnished staking notes. If field adjustments become too extreme (i.e. catch points exceeding 305 mm from the reported slope stake notes, elevations exceeding 152mm, or slopes exceed the typical section slope for a given height criteria), the “RLS” will notify Contractor and the Government (Construction Manager) immediately prior to continuing any more field surveying.

For machine control grading using the design model files, the Contractor shall submit a separate detailed Survey Quality Control Plan for this work and submit with a formal letter to the Construction Manager for review including a request for the digital data in the specified format needed with sample.

The “RLS” will reset all slope stakes that may have been removed or is in conflict with construction activities.

All subgrade staking will be staked by GPS, conventional total station and/or optical level surveying equipment meeting the tolerances of Table 152-1. All finish grades will be staked by conventional total station and/or optical level surveying equipment meeting the tolerances of Table 152-1.

Sample Government Marked up Staking Notes:

Station:	38+120.000									
Feature		LFill 1	LSP	L_Subgr	Subgr_CL	R_Subgr	RSP	RFill1		
Elevation	F 0.625	1909.783	1910.408	1910.853	1911.435	1911.900	1911.455	1910.034	F 1.421	
Offset	@ 2.499	13.251	10.752	8.082	0.000	6.465	9.135	14.819	@ 5.684	
Slope	-25.00%	-25.00%	-16.67%	-7.20%		7.20%	-16.67%	-25.00%	-25.00%	
Station:	38+140.000									
Feature		LFill 1	LSP	L_Subgr	Subgr_CL	R_Subgr	RSP	RFill1		
Elevation	F 0.705	1909.934	1910.639	1911.084	1911.666	1912.131	1911.686	1910.839	F 0.846	
Offset	@ 2.818	13.570	10.752	8.082	0.000	6.465	9.135	12.521	@ 3.386	
Slope	-25.00%	-25.00%	-16.67%	-7.20%		7.20%	-16.67%	-25.00%	-25.00%	
Station:	38+160.000									
Feature		LFill 1	LSP	L_Subgr	Subgr_CL	R_Subgr	RSP	RFill1		
Elevation	F 0.734	1910.135	1910.869	1911.314	1911.896	1912.361	1911.916	1910.654	F 1.263	
Offset	@ 2.935	13.687	10.752	8.082	0.000	6.465	9.135	14.186	@ 5.051	
Slope	-25.00%	-25.00%	-16.67%	-7.20%		7.20%	-16.67%	-25.00%	-25.00%	
Station:	38+180.000									
Feature		LFill 1	LSP	L_Subgr	Subgr_CL	R_Subgr	RSP	RFill1		
Elevation	F 0.912	1910.186	1911.097	1911.542	1912.124	1912.590	1912.145	1910.769	F 1.375	
Offset	@ 3.647	14.400	10.752	8.082	0.000	6.465	9.135	14.636	@ 5.501	
Slope	-25.00%	-25.00%	-16.67%	-7.20%		7.20%	-16.67%	-25.00%	-25.00%	
Station:	38+200.000									
Feature		LFill 1	LSP	L_Subgr	Subgr_CL	R_Subgr	RSP	RFill1		
Elevation	F 0.968	1910.305	1911.274	1911.719	1912.300	1912.766	1912.321	1910.950	F 1.371	
Offset	@ 3.873	14.625	10.752	8.082	0.000	6.465	9.135	14.619	@ 5.484	
Slope	-25.00%	-25.00%	-16.67%	-7.20%		7.20%	-16.67%	-25.00%	-25.00%	
Station:	38+220.000									
Feature		LFill 1	LSP	L_Subgr	Subgr_CL	R_Subgr	RSP	RFill1		
Elevation	F 0.921	1910.456	1911.377	1911.822	1912.404	1912.870	1912.425	1910.983	F 1.442	
Offset	@ 3.684	14.437	10.752	8.082	0.000	6.465	9.135	14.902	@ 5.767	
Slope	-25.00%	-25.00%	-16.67%	-7.20%		7.20%	-16.67%	-25.00%	-25.00%	

(d) Clearing and Grubbing Limits:

Clearing and grubbing limits will be staked in conjunction with determining the existing right-of-way lines along the project. The clearing/grubbing limits (catch point location plus one meter) will be staked in accordance Section 201. The right-of-way will be staked with flagging (lath) on (1m) wooden stake during the cross section survey based on the data provided by the government from the right-of-way plats. All clearing and grubbing will be staked based on established control and calibration procedures.

Any potential project encroachment outside the right-of-way for culverts, cut or fill slopes shall be brought to the attention of the Construction Manager if not already noted in the design plans. No

construction outside of the right-of-way will occur without specific authorization from the Government.

(e) Centerline Reestablishment:

Upon the Government acceptance of the “RLS” centerline alignment verification, the “RLS” will field stake the centerline using wooden stakes and lath to properly identify the alignment. Stakes will be set every 10 meter interval along the horizontal alignment curvatures and every 20 meter interval along the horizontal alignment tangents.

(f) Grade Finishing Stakes:

The “RLS” will field stake all finish grades in accordance with the grades provided by the Government (i.e. P&P sheets and slope staking notes). All finish grades will be staked by conventional total station and/or optical level surveying equipment in accordance with Table 152-1. The “RLS” will use standard wood pegs and brushes to mark the subgrade and the top of aggregate. Stakes will be set at 10 meter intervals along the curved alignments and at 20 meter intervals along the horizontal alignment tangents.

For machine control grading, the Contractor and Government staff will meet to come up with a grading procedure that will meet the tolerances, super elevations, and profile required for the finish subgrade and surfacing and still maintain the proper base course and surfacing thickness and crown.

(g) Culverts:

The “RLS” will stake all culvert locations in accordance to the grades provided by the Government’s slope staking notes following the governments QCP and guidelines. Due to terrain changes caused by seasonal runoff, the culvert size and location may change. Prior to any pipe staking, the “RLS” will conduct the following:

- 1) Reference the topographic cross section survey and reestablish a ground profile from the culvert centerline extending 20 meters beyond the preliminary design inlet and outlet.
- 2) Field stake the catch points at the 20 meter station interval before and after the pipe location and at each inlet and outlet culvert pipe.
- 3) Set reference points to determine pipe skew, length and depth. The length is measured from the top of the pipe at the point where the fill slope intercepts the top of the pipe at both ends unless otherwise shown on the design plans or directed by the Construction Manager.
- 4) Create a standard profile and cross section along the culvert centerline skew in 6 or 8 equal distances (5 to 10 meters apart) beginning 20 meters from the inlet and ending 20 meters from the outlet of the culvert location. The “RLS” will label the culvert size, length, grade, embankment slopes, elevations, and degree of skew.
- 5) Create a detailed drawing to scale Microstation or equal software illustrating the profile and cross sections for each culvert pipe location on 11” X 17” format conforming to

section 152.03(g) and submit to the Government for approval. The complete typical section details shall be reflected on the drawing. Submit the drawings with the as staked revised pipe listing.

- 6) Upon the Government's acceptance, the "RLS" will provide all surveying stakes on the ground and all referencing data for the drainage, controls, and culvert inlet and outlet locations for the Contractor.

(h) Bridges: (When Required)

The "RLS" will set a minimum of four No. 5 rebar for horizontal and vertical control to construct the bridge structure and superstructure components to the tolerances in Table 152-1. Bridge staking will be performed with a 3 to 5 second total station and differential levels, to ensure the tight tolerances that bridges (prefab iron and concrete structures, ie. pier, bent and abutment) require. Set the centerline for all piers, bents, and abutments. All piers, bents and abutment corners will be cross checked with a steel tape adjusted for temperature correction for horizontal accuracy. All elevations associated with the bridge will be determined by differential elevations to ensure the vertical accuracy and tolerance. Pier cap cutoff elevations will be performed with a differential level. The outside face of concrete on the abutments will be staked on offsets with cuts and fills to the top and bottom of the structures. The pier wall at the center of the bridge will be staked on offsets with cuts and fills to the top and bottom of the structure.

The toe of the riprap will be staked and "as-built" with a total station to determine both horizontal and vertical location before backfilling begins. The bridge beams will be staked with offsets to each end of the beams for proper alignment, once the bearing pads and beams are in place the diaphragm locations will be marked on the top of the beams.

The "as-builts" (other than those done during road construction) will be updated to reflect the "as-built" geometric location of the bridge.

(i) Retaining Walls: (When Required)

The "RLS" will set a No. 5 rebar for all horizontal and vertical control datum to construct the retaining wall. Survey and record profile measurements along the face of the proposed wall, 2 meters in front of the wall face, and 5 meters along the length of the wall. The "RLS" shall survey and record cross sections 5 meters apart at every major terrain break.

(j) Borrow and Waste Sites:

All horizontal and vertical control points will be established prior to any excavations or spoil displacements. The General Contractor **must** clear and grub the borrow limits prior to measuring and recording all topographical cross section data.

The "RLS" will set at least two (2) No. 5 rebar for all horizontal and vertical control datum to survey and record the initial baseline, site limits, clearing limits and cross section grid points. The "RLS" shall survey and record initial and final grid cross sections for the project and follow the same procedure as Section 152.03 for verifying the data before submission to the Government.

(k) Permanent Monuments and Markers:

The “RLS” will set 4 initial swing-tie reference points for each location of all permanent monuments. The “RLS” will stake out and mark each monument at the centerline point using GPS and/or conventional survey equipment using the coordinates provided by the Government. The “RLS” will measure and record (in bound survey books) each centerline point. All measurements will be in accordance with Section 152, Table 152-1. The data will then be provided to the Government for future reference.

(l) Miscellaneous Survey Staking:

The “RLS” will perform all surveying, staking, and recording of data for establishing the layout and control of the following (but not limited to);

- 1) Approach roads and trails;
- 2) Curb and gutter;
- 3) Waterways;
- 4) Parking areas;
- 5) Special ditches;
- 6) Turf or seeding and mulching limits;
- 7) Signs, delineators and object markers;
- 8) Pavement markers.
- 9) Utilities
- 10) Ditches
- 11) Guard rails

The “RLS” will consult with the Construction Manager on issues arising that requires assistance beyond the Surveyor’s control.

This Surveying QC plan shall be incorporated into the Contractors project QC plan and implemented as provided.

Rev: 10/01/18

SECTION 153. - CONTRACTOR QUALITY CONTROL

153.01 **Description.** This section 153 supplements Article 13 of Exhibit A.

This paragraph is superseded with the following:

This work consists of the Contractor furnishing an AASHTO certified laboratory to obtain samples for quality control testing, perform tests for Contractor quality control, provide construction inspections, enforce contract specifications, ensure construction plans are followed and exercise management control to ensure that all items of work conform to the contract requirements.

(a) Work includes, but is not limited to, materials, workmanship, and manufacture and fabrication of components.

(b) The Contractor shall maintain an adequate inspection system and perform such inspections as will ensure that the work performed under the contract conforms to contract requirements. The Contractor shall maintain complete inspection records and make them available to the Government. All work shall be conducted under the general direction of the Construction Manager and is subject to Government inspection and test at all places and at all reasonable times before acceptance to ensure strict compliance with the terms of the contract.

(c) Government inspections and tests are for the sole benefit of the Government and do not -

(1) Relieve the Contractor of responsibility for providing adequate quality control measures;

(2) Relieve the Contractor of responsibility for damage to or loss of the material before acceptance;

(3) Constitute or imply acceptance; or

(4) Affect the continuing rights of the Government after acceptance of the completed work under paragraph (i) below.

(d) The presence or absence of a Government inspector does not relieve the Contractor from any contract requirement, nor is the inspector authorized to change any term or condition of the specification without the Construction Manager's written authorization.

(e) The Contractor shall promptly furnish, at no increase in contract price, all facilities, labor, and material reasonably needed for performing such safe and convenient inspections and tests as may be required by the Construction Manager. The Government

may charge to the Contractor any additional cost of inspection or test when work is not ready at the time specified by the Contractor for inspection or test, or when prior rejection makes re-inspection or retest necessary. The Government shall perform all inspections and tests in a manner that will not unnecessarily delay the work. Special, full size, and performance tests shall be performed as described in the contract.

(f) The Contractor shall, without charge, replace or correct work found by the Government not to conform to contract requirements, unless in the public interest the Government consents to accept the work with an appropriate adjustment in contract price. The Contractor shall promptly segregate and remove rejected material from the premises.

(g) If the Contractor does not promptly replace or correct rejected work, the Government may (1) by contract or otherwise, replace or correct the work and charge the cost to the Contractor or (2) terminate for default the Contractor's right to proceed.

(h) If, before acceptance of the entire work, the Government decides to examine already completed work by removing it or tearing it out, the Contractor, on request, shall promptly furnish all necessary facilities, labor, and material. If the work is found to be defective or nonconforming in any material respect due to the fault of the Contractor or its subcontractors, the Contractor shall defray the expenses of the examination and of satisfactory reconstruction. However, if the work is found to meet contract requirements, the Contracting Officer shall make an equitable adjustment for the additional services involved in the examination and reconstruction, including, if completion of the work was thereby delayed, an extension of time.

(i) Unless otherwise specified in the contract, the Government shall accept, as promptly as practicable after completion and inspection, all work required by the contract or that portion of the work the Contracting Officer determines can be accepted separately. Acceptance shall be final and conclusive except for latent defects, fraud, gross mistakes amounting to fraud, or the Government's rights under any warranty or guarantee.

153.02 **Qualifications.**

This section is superseded with the following:

Government Personnel

(a) **Quality Control Manager.** The Government shall designate a qualified Quality Control Manager (QCM) who will be paid for by the Government directly and will be an agent for the Government on this contract. **The Government's QCM will provide direction and assist the Contractor in carrying out the Quality Control Plan (QCP).** The QCM will work directly with and take direction from the Construction Manager; and may be a full time employee of the Government's independent/accredited testing laboratory (who is not associated with the Contractor's QC lab). The duties and responsibility the QCM shall have on this contract is: directing contractor inspectors and lab technicians, monitoring, implementing and as necessary, adjusting the processes to

assure the proper execution of the QCP. The QCM may perform inspection and testing on a periodic basis, verifying quantities for progress payments, and issuing of written non-conformance orders to the Contractor. The QCM is required to attend and participate in the preconstruction meetings, partnering meetings, conduct the QC meetings for the work at least once weekly, perform the three phases of control, perform submittal review, ensure testing and inspections are performed, ensure construction plans are followed, review construction plans for errors or conflicts that may arise with testing and inspection procedures, and prepare QC certifications and documentation required in this contract.

The QCM shall report (through a written non-compliance order) any deficiencies in the work directly to an officer of the Contractor's firm and the Construction Manager. Furthermore, it is the QCMs responsibility to enforce all “non-compliance orders” even those issued by the Construction Manager to the Contractor. The QCM shall also recommend “stop work” orders to the Construction Manager for the purpose of unsafe conditions. **The QCM cannot be an employee of the Contractor’s lab.**

Contractor Personnel

The Contractor shall provide for approval the names, authorities, résumé’s, and relevant experience of all personnel directly responsible for the testing and inspection. **The Contractor shall work cooperatively with the QCM and the CM to accommodate the inspection and testing requirements.** The inspectors and testing technicians must meet the following:

(b) Inspectors. Inspectors who perform inspection work shall be materials lab civil engineering technicians with at least 2 years of experience in inspection of highway/bridge construction or similar construction which includes basic sampling and field testing of materials, welding, basic surveying, use simple plans and specifications, read topographic maps or be currently certified by NICET, Level I (or equivalent certification program) or higher in the sub-field of Highway Construction or an equivalent certification program.

The Inspector is responsible for performing daily inspection and testing (i.e. compaction tests) of the work in place that he/she is **certified** for (i.e. structural welding, false work, embankment construction, pipe installations, nuclear gage operation, etc.) and prepares inspection and testing reports as outlined in the QCP. The Inspector is further responsible for reporting any deficiencies back to the QCM and Construction Manager. The Inspector shall not be allowed to inspect more items of work at one time than can be adequately accomplished in a day without sacrificing quality of the inspections and/or testing.

(c) Quality Testing Technician (Soils & Aggregates). Materials lab Quality Testing Technicians who perform actual sampling and testing of soils and aggregates shall have 2 years or more of recent job experience and the following:

- (1) Certified under a State DOT “Technician Training and Certification Program (TTCP)” in the field of soils and aggregates or other state/industry certification program in the field of soils and aggregates or;

(d) Quality Testing Technician (Hot Mix). Materials lab Quality Testing Technicians who perform actual sampling and testing of hot asphaltic concrete shall have 3 years or more of recent job experience and the following:

- (1) Certified under a State DOT “Technician Training and Certification Program (TTCP)” in the field of asphalt/asphaltic concrete.

(e) Quality Testing Technician (Concrete). Materials lab Quality Testing Technicians who perform actual sampling and testing of concrete shall have 1 year or more of recent job experience and the following:

- (1) Certified under the American Concrete Institute (ACI), “Concrete Field Testing Technician, Grade I”.

(f) Quality Testing Technician (striping & signs). Quality Testing Technician who uses specialized equipment to measure the reflectivity of the sign or painted striping and the thickness of the paint to conform to the contract requirements. This person must have at least one year experience in this field using such equipment as the Roadvista 922 for signs and StripMaster 2 reflectometers or equivalent for striping.

(g) AWS Certified Welding Inspector. This inspector must be certified by AWS to inspect all types of weld in highway construction. This person must have at least 5 years of experience in this field using visual, ultra sound, spectrometers, Magnetic Particle, and Radiographic equipment.

The Testing Technician, under the direction of the QCM, is solely responsible for testing of materials **within their expertise**. Under no circumstance shall a Testing Technician/QC Inspector be performing tests outside their qualifications. Should the QCP identify a Testing Technician and/or Inspector to be performing both testing and inspection, they shall not perform outside their qualifications.

153.03 Contractor Quality Control Plan (QCP).

This section is superseded with the following:

Twenty-one (21) calendar days prior to construction work, the Contractor shall submit a detailed written Quality Control Plan (QCP), which includes all subcontractors, and suppliers/fabricators of major construction components, and subcontracted surveying services for review and approval. The Contractor shall not be allowed to begin construction on major items of work until the Construction Manager has approved all QCP’s. With prior approval, submission of a quality control plan for major items of work not immediately scheduled to begin may be deferred. Subsequent submission of deferred QCP major items shall require 14 days for review and approval.

The only construction work that is authorized to proceed prior to the approval of the QCP is mobilization of storage and office trailers, temporary utilities, and any other work that does not require sampling, testing, and/or inspection.

(a) Quality control personnel. Furnish the name, authority, responsibilities, and qualifications of the quality control personnel directly involved in inspection, testing and authorized to review and certify submittals prior to approval by the CM. Conform to Subsection 153.02.

A résumé of all QC staff shall be included in the QCP and must be detailed on the duration/dates of past and current education, work experience, duties and current certifications that relate to field of work that is specified in this contract. Copies of current certifications shall be included with the resume. The resume of any proposed Inspector and/or Quality Testing Technician shall meet the requirements as outlined in Subsection 153.02. The Government reserves the right to contact past employers and/or interview any member of the QC organization at any time in order to verify his/her submitted resume and/or qualifications.

To minimize project disruption, and to maintain communication and project record keeping, the designated Inspectors and Quality Testing Technicians are encouraged to stay with their assigned task/work until the project records are completed to the satisfaction of the QCM and Construction Manager.

All QC personnel whose duties require them to drive a vehicle during their assigned duties, under this contract, must comply with a driving policy consistent with the government/owner's driving policies and must possess a valid State driver's license.

(b) Inspection/quality control procedures.

Provide a comprehensive and detailed inspection plan for each item of work showing each construction requirement criteria by phase, with cross-references to the contract drawings and specifications, and the results from the action taken by the Quality Control Manager. A sample of an acceptable format for providing the information required shall be provided upon request. While use of this specific format is not required, any other format used shall contain the same information.

A Testing Plan and Log (examples shall be provided upon request) that includes the tests required, referenced by the FP specification section number and paragraph number requiring the test, the frequency, and the person responsible for each test.

(c) Submittal transmittal, review, approval, and record keeping. Procedural requirements for transmittal, review, approval, and record keeping of submittals (Log of Submittals) shall be the responsibility of the QCM consistent with the NDOT form provided at the end of this section. While use of the NDOT specific form and/or formats is not required, any other format used shall contain the same information. This form shall only be used for material certifications, shop drawings, mix designs, test/inspection reports, and résumé's for QCP staff.

The Contractor shall prepare, in accordance with the Special Contract Requirements, 3 hard copies of all Shop Drawings and one electronic copy (AutoCAD 2015 or compatible software programs) with Certifications and submit to the Construction Manager for approval. Each submittal shall be accompanied with a Transmittal, Review, and Approval

form signed by the Contractor. Clearly mark each item proposed to be incorporated into the contract and identify in the submittals, with cross-references to the contract specifications and drawings, so as to identify clearly the use for which it is intended. Each submittal shall be certified by the Contractor. The Contractor's certification shall be worded as follows:

"It is hereby certified that the (document) (equipment) (material) shown and marked in the enclosed submittal is that proposed to be incorporated into Contract Number _____, and is in compliance with the Contract specifications and drawings, and is submitted for Government approval."

Certified by _____ Date _____

The person signing the certification shall be the Project Superintendent or one who is designated in writing by the Contractor as having the authority.

(d) Manpower needs. The QCM shall coordinate with the Construction Manager and Project Superintendent and agree on the level of inspection and testing man power needed for each week's work or operation in order for the Construction Manager to measure and pay for the testing and inspection work under this section.

The Government reserves the right to require changes in the QCP, QC personnel, and operations as necessary to ensure the specified quality of work to be performed in a safe manner. The Contractor can propose changes to the QC personnel by submitting a completed "**Submittal, Transmittal, Review and Approval Form**", along with complete résumé's of personnel to be added or replaced on the QC staff to the Construction Manager, **a minimum of seven (7) calendar days prior to a proposed change**. The resume and any proposed changes must be approved by the Construction Manager prior to implementation. Non-compliance with this requirement shall result in no payment for the hours claimed.

153.04 Prosecution of Work.

(c) Production phase. Add the following subparagraph (4):

(4) Inspect materials and/or assemblies accepted under subsection 106.03 Certification to ensure that the materials comply with all contract requirements. Furnish the results of the inspection, along with the production certifications or commercial certifications (as applicable) to the Construction Manager prior to incorporating the materials into the work. This requirement includes fabrication of bridge girders, concrete or steel cattleguards, steel corrugated pipes, steel guardrail sections, etc.

153.05 Sampling and Testing.

Add the following subparagraphs:

(a) Quality Control Laboratory.

Provide an AASHTO accredited testing laboratory qualified to perform sampling, testing, and inspection required by this contract. Only the AASHTO accredited testing laboratory identified and approved in the Contractor's Quality Control Plan shall perform sampling, testing and inspection on the project.

(b) Accredited Laboratories

The acceptable accreditation programs are the American Association of State Highway and Transportation Officials (AASHTO) program, and the Cement and Concrete Reference Laboratory (CCRL). Furnish to the Construction Manager Accreditation documentation including, a copy of the Certificate of Accreditation, and Scope of Accreditation. The scope of the laboratory's accreditation shall include the test methods required by the contract.

(c) Inspection of Testing Laboratories

The testing laboratory facilities and records may be subject to inspection by the Construction Manager. Records subject to inspection include equipment inventory, equipment calibration dates and procedures, library of test procedures, audit and inspection reports by agencies conducting laboratory evaluations and certifications, testing and management personnel qualifications, test report forms, and the internal QC procedures.

(d) Test Results

Cite applicable contract requirements, tests or analytical procedures used. Provide **all original** actual test results and **worksheets**. Include a statement that the item tested or analyzed conforms or fails to conform to specified requirements. Conspicuously stamp the cover sheet for each report in large red letters "CONFORMS" or "DOES NOT CONFORM" to the specification requirements, whichever is applicable. Test results shall be signed by a testing laboratory representative authorized to sign certified test reports. Furnish the **original** signed reports, certifications, and other documentation to the Construction Manager within one (1) calendar day after the performance of the test. Furnish a summary report of field tests at the end of each week in a format to the satisfaction of the Construction Manager. Attach a copy of the weekly summary report to the last daily Contractor Quality Control Report of each month.

If an Inspector or Quality Control Testing Technician performs work, but has not been approved on the QCP personnel list, all test results and/or inspection work performed and hours claimed by the non-approved Inspector or Quality Control Testing Technician shall be rejected. The rejected work shall comply with Section 106-Acceptance of Work, Subsection 106.01 Conformity with Contract Requirements. The work hours claimed shall not be paid for.

153.07 Records and Control Charts.

Add the following to the first paragraph:

In accordance with the Government/owner's Records Management requirements, the QCM and Contractor Superintendent shall be **responsible** for the measurement of quantities (including all verification of calculations, sketches, etc.) of all items of work in accordance with **Subsection 109.01** and these measurements (quantities and calculations) kept in chronological order and in bound record books (bound books can be the steel strapped press board type or survey/lab grade) in a format agreed to by both the QCM and Construction Manager. **These record books shall be updated daily throughout the life of this contract.** The measurements for accepted work shall be based on material certifications, testing reports, inspection reports, and any other appropriate documents that have been reviewed and verified by the Construction Manager in writing. Copies of material measurements shall be furnished to the Construction Manager and Contractor for review, approval, and preparation of progress pay estimates. Any **errors/mistakes** found by the Construction Manager shall be corrected immediately by the **QCM** as outlined in this subsection and in accordance with the Special Contract Requirements 4(b) unless the Contractor can clearly show documentation otherwise.

The quantities, sketches, calculations entered into the quantity books shall be done in a neat and legible fashion. Any mistakes shall be scratched out with one red ink line and corrections shown above or below the figure, red lined out, with the writer initializing off and dating the corrections. **Under no circumstance shall erasure of errors or white out corrections be made in any book.**

The QCM is also responsible for all inspection reports, test records, correspondence, material certifications, as-builts, etc. in accordance with the Government/Owner Record's Management policies, procedures, and requirements. These records must be kept in and approved format and secured bound book (i.e. survey quality note books). **No 3-ring binders allowed. Under no circumstances shall any QC personnel alter any previous report(s) without notifying the Construction Manager first and the Construction Manager initials off on the corrections.**

Allow unrestricted access by the Government for inspection and review of the quantity and other record book(s) at all times.

Revise the certification statement by adding "*by the Contractor's Lab*" between the words "*certified*" and "*that*".

Add the following subparagraph:

(a) As-built drawings. The QCM is required to keep the as-built drawings updated on a daily basis and accurately marked to show all deviations, which have been made from the original contract drawings based on data provided by the Contractor. The QCM shall initial each deviation and each revision.

The QCM shall maintain, at the job site, one set of full-size contract drawings labeled "**As-Built**" (either in AutoCAD format or red lined hard copy) marked in legible red pencil to show any deviations which have been made to the contract drawings, including buried or concealed construction and utility features revealed during the course of

construction. The QCM shall record horizontal and vertical locations of buried utilities that differ from the contract drawings. Show the size, manufacturer's name, model number, capacity, and electrical power characteristics of the equipment installed. These drawings shall be available for review by the CO and/or Construction Manager at all times. **No progress payment(s) shall be considered for the QC bid items if marked prints are not shown to be current and request for final contract payments shall not be approved until the required drawings are delivered to the Construction Manager in hard copy or electronic AutoCAD 2015 format within three (3) calendar days after the Final Inspection date.**

Upon submittal of the as-built plans to the Construction Manager, the QCM shall provide a certification statement to the following:

"It is hereby certified, to the best of my knowledge, that the As-Built Plans marked and documented are accurate and herein complies with the requirements in Contract Number _____, and are in compliance with the Contract specifications and are submitted for Government review and approval."

Certified by _____ Date _____

(b) Project Records for Audit. The QCM and Construction Manager shall jointly determine a format for project record keeping while being consistent with the Records Management requirements. This format must include contract item quantities, material certifications, and any other information deemed necessary and related to the contract item for audit purposes and conform to the government/owner's records management requirements. The QCM shall review all project documents and final quantities for each item of work in this contract and submit the final **original** quantity books, inspection records, material certifications, test records, log of submittals, etc. and the "As-Built" construction plans to the Construction Manager for final audit purposes within **3** calendar days **after** the Final Inspection date or just prior to the final acceptance inspection if agreed to by the Construction Manager. The Construction Manager, with the governments audit staff will review the final quantity books and all other records for completeness within 30 days of receiving such documents. As an incidental obligation of the Contractor, the Project Superintendent shall be made available for meeting with the QCM, Construction Manager, and audit staff to answer any questions relating to the final quantities and/or project records. Any project file records (quantity book(s), "As-Built" construction plans, inspection reports, material certifications, etc.) that are found to be incomplete or lacking information shall be returned to the Contractor for corrections at the entire expense of the Contractor. The Contractor shall be available and in contact with the Construction Manager during this review stage to insure compliance with audit requirements until the audit has been completed.

The Government shall provide copies of the as-built plans and other construction documents to the project owner for their records.

Measurement

Supersede this subsection as follows:

Measure Contractor Quality Control, including sampling, testing, and inspection by the Man Hours or Lump Sum as shown on the bid schedule.

Measurement by the Man-Hour for payment shall include the following:

1. A detailed daily confirmation report prepared by the Contractor indicating the number of hours worked each day on the project of all QC staff subject to the review and approval by the QCM. This report shall be submitted to the Construction Manager on a weekly basis.
2. Only those authorized Inspectors and Testing Technicians actually on the project performing work (or work at a fabrication plant) under this section during the contract time period based on the date of the Notice to Proceed notice issued by the CO.

Man-hours **not measured** for payment include the following:

1. QC inspection and testing man-hours during period(s) of project shutdowns, period after "Contract Ending" date, time outside the normal work day used in performing retesting of work due to QC personnel mistakes (i.e. improper testing methods, defective equipment, or improper use of equipment) or lack of keeping all records current as outlined herein (for example catch-up paperwork from previous work day(s) or correcting mistakes).
2. Any other testing and/or inspection of Contractor's work beyond the Final Inspection date shall be considered incidental obligations of the Contractor and those QC hours shall not be measured for payment.
3. The project records and "As-Built" construction plans shall be released to the Construction Manager within 3 calendar days **after** the Final Inspection date. Measurement of QC hours shall cease upon the Final Inspection date.
4. Travel time for each inspector/tester (i.e. from the main office to the project or from temporary living quarters to the project and return) including travel time for an inspector or tester to deliver samples to the central laboratory and back to the project site or temporary living quarters shall be considered incidental obligations under terms of this contract.
5. All other QC Central Laboratory/Office personnel performing indirect work on this project (i.e. such as administrative staff, Materials Engineers, Project Manager, other geotechnical staff, etc.) shall be considered incidental obligations under the terms of this contract unless specifically addressed in a contract modification for purposes of addressing a specific problem unknown to both the Contractor and Government.

6. QC Central Laboratory personnel performing any quality tests (including but not limited to) aggregate base coarse, mineral aggregate, aggregate gradations, soil classifications, Pls, lime stabilization mix designs, hot mix designs, and concrete mix designs. Concrete cylinder breaks, TSR's and any other test(s) that are more cost effective for the Government to be performed elsewhere or required inspections of structural members at fabrication plants will not be measured for payment unless otherwise agreed to in writing between the Construction Manager and Contractor and that such work is specifically and clearly identified in the approved QCP. Project QC personnel performing any quality sampling and testing (i.e. borrow pits, aggregate pits, etc.) during the contract period shall be considered incidental obligations under the terms of this contract.

7. Any QC personnel that are not identified on the approved QCP or subsequent revised and approved QCPs.

8. No "stand-by time" shall be paid but shall be considered incidental obligations under the terms of this contract. Stand-by time shall be defined as time when the Contractor is shut-down or work delayed due to weather, equipment break-down, supplier's delivery delayed (i.e. concrete, ABC, hot mix, etc.) or any other work delay(s).

Add the following subsection:

153.10 Payment

The accepted quantity, measured as provided above, will be paid at the contract price per unit of measurement for the pay item listed below that is shown in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

When the Contractor Quality Control is based by the "lump sum" including sampling, testing, and inspection then it shall be paid as follows:

(a) 10 percent of the lump sum, not to exceed 0.5 percent of the original contract amount, will be paid after all the Contractor Quality Control Plan is approved and all the testing and inspection facilities are in place, qualified sampling, testing and inspection personnel are identified, and the work being tested has started.

(b) Payment for the remaining portion of the lump sum will be prorated based on the total work of all other bid items completed.

When the Contractor Quality Control is based on Man-Hours, the Construction Manager will make progress payments, in accordance with section 153.09, at the contract price per unit of measurement for the pay items listed below and/or as shown on the bid schedule. Any hours claimed for work beyond the contract ending date as shown in these contract documents (including any extensions approved by the CO) shall not be measured for payment. If the

contract time is extended then this action by the CO will be taken into consideration when establishing the new contract ending date so that valid QC hours would be paid for during this extended period. It is only after this time expires that the QC hours will not be measured for payment as technically the contract is ended.


Payment will be full compensation for the work prescribed in this section unless otherwise described herein and in the special contract requirements.

Payment for all or part of this item of work may be retained, if the Government cannot agree on the hours claimed, or verification testing or inspection invalidates the Contractor testing or inspection work.

Payment will be made under the following or as shown in the bid schedule:

Pay Item		Pay Unit
15301-0020	Contractor Quality Control	Man-Hrs.
15302-0000	Contractor Quality Control	Lump Sum

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Navajo Division of Transportation Submittal Transmittal, Review & Approval Form			
rev. 10/19/17			
Submittal No. (from Log of Submittals)	Part 1 - For Contractor Transmittal		
Routing (for NDOT use)	From (Contractor):	To: Navajo Division of Transportation P.O. Box 4620 Window Rock, AZ 86515 Attn: NDOT Project Manager	
	Project No.:	Project Location:	
	Contract No.:		
	Description of submittal:		
(For Contractor Use)	Certification (This form shall not be used to forward substitutions or spec changes)		
(A) (Check One)	It is hereby certified that the <input type="checkbox"/> document <input type="checkbox"/> material shown and marked in the enclosed submittal is that proposed to be incorporated into this contract is in compliance with the contract specifications: _____		
<input type="checkbox"/> Approval			
<input type="checkbox"/> Record Only			
(B) Person Designated By Contractor as having authority to sign certification	Certified by (B):	Date:	
	Signature		
(For Reviewer Use)	Part II - For Reviewer Use		
	From: NDOT Project Manager Navajo Division of Transportation Window Rock, AZ 86515	To: NDOT Principal Civil Engineer Navajo Division of Transportation Window Rock, AZ 86515	
(C) Detailed review required on submittals for approval	This submittal has been reviewed: <input type="checkbox"/> (C) <input type="checkbox"/> (D)		
(D) Cursory review required on submittals for record	The following recommendation is made: <input type="checkbox"/> (a) <input type="checkbox"/> (b) <input type="checkbox"/> (c) <input type="checkbox"/> (d)		
(a) Approval recommended			
(b) Approval as noted recommended			
(c) Disapproved/Resubmittal recommended			
(d) Submittal for record			
	Signature:	Date:	
(For Approver Use)	Part III - For NDOT Principal Civil Engineer Approval		
	From: NDOT Principal Civil Engineer Division of Transportation Window Rock, AZ 86515	To (Contractor):	
(a) Approved as submitted	Enclosures are returned as noted: <input type="checkbox"/> (a) <input type="checkbox"/> (b) <input type="checkbox"/> (c) <input type="checkbox"/> (d)		
(b) Approved as noted			
(c) Disapproved/Resubmit			
(d) Submitted for record			
	cc: CO:	COTR:	QC Firm:
	Signature:	Date:	
This form is only to submit material certs, shop drawings, testing & inspection report, QC personnel changes, flagger personnel changes, permits, QC Plan updates, TCP updates, Safety Plan changes, & Construction Schedule updates. All other submittals MUST be submitted by formal letter to the CO for action.			

SECTION 154. - CONTRACTOR SAMPLING AND TESTING

154.01 Description. This section 154 supplements Article 13 of Exhibit A.

This paragraph is superseded with the following:

This work consists of obtaining samples for testing and reporting required test results. There is no contract pay item for this work. This work does not include Contractor quality control testing required under Section 153. However, include the work required under this Section in the Section 153 Quality Control Plan (QCP).

154.03 Sampling.

The first sentence of the second paragraph is superseded with the following:

The Contractor's QCP shall include a specific written method of sampling materials from a final processed windrow on the roadway, aggregate stockpile(s), behind a "jersey spreader", behind a chip spreader, out of a haul truck or any other acceptable method the Contractor is using to place or spread aggregate materials. Include sampling aggregates at the crushing site and/or hot plant site.

The second sentence of the first paragraph is superseded with the following:

The sampling schedules and times shall be determined and provided by the Contractor's quality control firm using a random number system. Provide the schedules at least seven (7) calendar days before the work begins.

Add the following paragraph:

Splitting: A riffle sample splitter shall be used that meets AASHTO T-248. The QCP shall include a very specific written method of splitting and the number of splits the aggregate materials will take. Immediately perform splits of samples upon receiving the material. Furnish approved containers for the Government portion of split samples. Label Government samples to include project number, contract number, pay item number, material type, sample number, date sampled, time sampled, station location, distance left or right of centerline location, name of person sampling, name of person witnessing sampling and type of test required on sample. The Construction Manager will take possession of the Government samples.

Allow the Quality Control Manager (QCM), Construction Manager and/or Government Inspector/staff the opportunity to witness all sampling and splitting.

154.04 Testing.

This subsection is superseded with the following:

The Contractor's Quality Control Testing Technician or Inspector shall perform all tests required by the Sampling and Testing Tables for all applicable work. Allow the QCM, Inspector and/or Construction Manager the opportunity to witness all testing. Testing of trial samples may be required to demonstrate testing competence.

Use equipment that is calibrated and meets the applicable testing requirements of the contract. Tag all necessary equipment indicating the date of last inspection, inspector, and calibration number.

The Construction Manager or QCM may check equipment to verify condition and calibration. The Contractor shall repair or replace equipment not meeting applicable requirements.

Submit documentation supporting the calibration of all necessary equipment **before actual testing**. Include the following:

1. Description of the equipment calibrated or verified, including model number, serial number, or other acceptable identification.
2. Identification of the individual performing the calibration or verification.
3. Identification of the calibration or verification procedure used.
4. The calibration number for each calibration.

154.05 Records.

This subsection is superseded with the following:

Record test results on approved acceptable forms containing all the information as required in 154.03. Furnish to the Construction Manager all original completed forms with original test results and work sheets. When tests are on material being incorporated in the work, report all test result(s) and original completed form(s) within 24 hours of date of test. **Payment for work will be delayed or work suspended until test results are provided.**

154.06 Measurement.

This paragraph is superseded with the following:

Do not measure Contractor sampling and testing for payment.

154.07 Payment.

This subsection is deleted in its entirety.

rev: 10/02/18

SECTION 155. - SCHEDULES FOR CONSTRUCTION CONTRACTS

155.03 **General.** This section 155 supplements Article 6.4 of Exhibit A.

The first sentence is replaced with the following:

Use the Bar Chart Method (BCM) as described below to develop the construction schedule for the total contracted work. Critical Path Method construction schedules are not allowed.

155.05 **(a) Bar Chart Method (BCM).**

Add the following subparagraph (4):

(4) Submit **3 copies** of the construction schedule at the preconstruction conference. Allow **14 days** for acceptance or rejection of the construction schedule or a revised schedule. If rejected, submit a revised schedule within 5 days. **Do not begin work**, except mobilization, survey staking, and traffic control work, without an accepted construction schedule. The Contractor shall update this Construction Schedule as necessary (during the life of the project) to reflect any delays, change in schedules, and revisions to activities shown and furnish a copy to the Construction Manager when necessary for review and approval/disapproval back to the Contractor. The preparing, furnishing and updating of this bar chart schedule shall not be measured for payment but shall be a subsidiary obligation of the Contractor. Failure to provide the Government with an updated construction schedule, for review and acceptance prior to continuation of work, may result in the Construction Manager issuing a stop work order.

Review and acceptance of any and all construction schedules is rendered as a service only and is not considered a guarantee of the work being completed within the time shown on the schedule or will not result in delays as a result of the work under the schedule(s), nor shall it be considered as relieving the Contractor from complying with the specifications and other requirements in this contract.

Accelerated construction schedules, where the Contractor plans to complete all the work well within the contract time may be permissible, but cannot be used by the Contractor in any delay claim against the Government. The Construction Manager will enforce the contract time given and if the Contractor fails to complete all the work within that time, the Contractor shall be subject to liquidated damages under section 108.04. Any proposed accelerated schedule must adhere to the 40 hour work week and any request for work beyond the normal 40 hour work week is subject to Government review and approval.

155.05 **(b) Critical Path Method (CPM).** This subsection is deleted in its entirety.

Subsection 155.09 Measurement is superseded with the following.

155.09 **Measurement.** Do not measure schedules for payment.

Subsection 155.10 Payment is superseded with the following.

155.10 **Payment.** The development and updating of the construction schedule will not be measured for payment but shall be considered an incidental obligation of the Contractor under this contract.

rev: 10/02/18

SECTION 156. - PUBLIC TRAFFIC

156.01 **Description.** The second sentence is superseded with the following: Follow clause NN-236-13 of Exhibit C. This section 156 supplements Article 6 of Exhibit A.

156.04 **Accommodating Traffic During Work.**

The first paragraph is superseded with the following:

The Contractor shall prepare a Traffic Control Plan (TCP) in accordance with Section 635, the MUTCD latest edition, and the details shown in the construction drawings and submit for review and acceptance. Accommodate traffic according to the approved TCP, the MUTCD, Section 635, and this section.

156.09 **Traffic and Safety Supervisor.**

The first sentence of the first paragraph is superseded with the following:

Provide a traffic and safety supervisor who is certified by a federal or other acceptable certification program. Provide current copies of the certifications to the Construction Manager for review and approval.

rev: 10/02/18

Section 157. - SOIL EROSION CONTROL

157.01 **Description.** This Section 157 supplements Article 6.8 of Exhibit A and the Special Contract Requirements of Exhibit C.

This paragraph is superseded with the following:

This work consists of developing a **Storm Water Pollution Prevention Plan (SWPPP)**, implementing and maintaining this plan to control erosion, pollution, sediment, and runoff during the construction of the project, use of borrow pit, haul roads, construction yards, and aggregate/soil stockpiles.

157.04 **General.**

The second paragraph is superseded with the following:

The storm water pollution, erosion, sediment, and runoff control details in the contract plans reflect special measures to be considered in the SWPPP for the project. The Contractor shall prepare and submit to the Construction Manager a detailed SWPPP in compliance with all 401, 402, 404, and NPDES permit applicable requirements (in full design details by station , hand sketches not allowed) and reflecting the requirements in the contract plans and specifications in such detail that the plan will adequately address the potential for erosion of soil and other pollutants into the waters of the USA, on the entire project, due to each phase of the Contractor's grading and drainage operations. The SWPPP must be prepared by a **qualified registered professional engineer or a qualified storm water pollution prevention specialist** with the current qualifications certificates and registration incorporated into the SWPPP. The SWPPP shall show measures to control erosion, runoff, sediment, and pollutants and shall further include, but not limited to the following:

1. Measures to be taken at the toe of fill slopes (i.e. silt fencing, straw bales, etc.) that have the potential of eroding into the waters of the USA. This includes all slopes steeper than 1:3. However, this does not preclude the use of erosion control measures taken on slopes flatter than 1:3 depending upon the soil type and its erosive potential.
2. Measures to be taken in cut sections to preserve the back slopes and shoulder ditches from eroding into the waters of the USA. This includes placement of silt fencing spaced every 60 meters maximum (or as shown on the approved SWPPP) in the cut ditches. Place straw bales along the upper ridge lines of the cut slopes or use of wattles to redirect runoff away from cut slopes. **The use of straw bales in cut ditches is not permitted.** See also subsection 157.04(H).

3. Measures to be taken to protect all live streams, lakes, ponds, creeks, and wetlands from sediment infiltration in accordance with the contract plans and 401, 402/404 permit and other environmental requirements.

4. Details of sediment control structures (facilities) and locations where runoff is temporarily being diverted from its natural course;

A. Structures utilizing compacted earth material shall be composed of material free of roots, woody vegetation, excessive rocks, and other objectionable materials. The construction shall be in accordance with section 157.06(b).

B. The slopes of any settling basin shall be 1:3 or flatter. All settling basins shall have safety fence (1.2 meters in height snow fence or equivalent) enclosing them.

C. Measures for maintaining all sediment control facilities at all times of the day and night.

5. Measures for diversion dikes to be constructed at the end of each day's operation, as necessary, around all drop inlets to divert runoff into existing sediment basins (traps) or into outfall chutes.

6. Measures to install permanent erosion and sediment controls as soon as practical or when sections of final grading and drainage work is complete.

7. Other erosion and pollution control measures and permits required due to the nature of the contractor's construction sequencing and procedures including temporary turf establishment, temporary mulching, type of erosion control materials to be used, and installation procedures for such things as (but not limited to):

A) protection of soil and aggregate stockpiles.

B) protection of temporary cut and fill slopes

C) protection for detour roads.

D) temporary watering ponds.

E) protection of top soils.

F) protection of waters from pollutants

8. A **Construction Sequencing Plan (CSP)** that addresses each phase and location of the grubbing, grading, and drainage work to take place over the course of the contract.
9. Details on storage of hazardous materials or waste.
10. Measure and procedures in addressing spills of hazardous materials.
11. Procedures on documenting inspections and maintenance of the SWPPP implementation.
12. Measure to prevent tracking of weeds and other invasive species onto the project site.

The erosion and pollution control measures installed shall remain in place and be continuously maintained until the permanent measures (i.e. seeding and mulching of slopes, outlet protections, channel lining, etc) are completed. The Contractor can remove any SWPPP features at their discretion once all the permanent erosion control features are in place and accepted for those completed areas of the project which must include the seeding and mulching. Failure to properly maintain the SWPPP may result in a violation of the Clean Water Act with possible fines levied by the USEPA which will be deducted from the Contractor's final payments. The Contractor shall have 5 working days from given notice of non-compliance to correct the problems. Failure to bring the work under this section into compliance within 5 working days of non-compliance notice will be cause for the Government to deduct the prorated progress payments for this work from the bid item in the contract until compliance is met.

If field conditions change as a result of the Contractor's construction operation which causes the SWPPP to be ineffective, then the Contractor shall revise the SWPPP and resubmit for review and approval. No work within the areas of deficiencies, identified by the QC inspector's and/or Government personnel, shall be allowed until the revised SWPPP is approved and implemented.

Any deviations to the approved SWPPP shall be requested in writing at least 14 calendar days before implementation for review and approval. Minor adjustments in the approved SWPPP are allowed to meet actual field conditions. Any major deviation from the approved SWPPP will result in a notice of violation of the Clean Water Act where fines may be levied by the USEPA.

If the Construction Manager finds that the SWPPP is not providing sufficient erosion control protection, the Contractor shall be required to stop all work in the area and revise his SWPPP to address the problems immediately and when the revised SWPPP is approved, immediately implement the changes. Such changes and revisions of the SWPPP is at the entire cost of the Contractor.

Allow 30 calendar days for review and approval of the initial SWPPP in accordance with Subsection 104.03. Any delays associated with the SWPPP implementation will be the responsibility of the Contractor and will not result in any adjustment of the period of performance or contract price.

157.05 Controls and Limitations on Work.

The first paragraph is superseded with the following:

Before clearing & grubbing, and grading work begin, the contractor shall construct all pollution, erosion, and sediment control measures around the area to be worked on including any perimeter erosion and sediment control measures. This shall include the construction of sediment traps, filter barriers, diversion dikes, silt fencing, and settling structures as required by the approved SWPPP.

Paragraph three is superseded with the following:

Construct erosion control and sediment control measures as follows:

- A) Construct temporary erosion controls in incremental stages as construction proceeds in accordance with the **Construction Sequencing Plan (CSP)** and section 157.04, paragraph (2).
- B) Construct temporary slope drains, diversion channels, and earth berms to protect disturbed areas and slopes as reflected in the approved erosion control plan.
- C) Apply permanent turf establishment (i.e. seeding & mulching) in accordance with section 625 on sections of completed slopes and other disturbed areas **within 10 days of final grading**.
- D) Construct temporary outlet protection on all new and existing culverts and other drainage structures in accordance with the details shown in the contract plans and the approved SWPPP.
- E) Construct permanent erosion controls (as shown in the contract plans and specifications) including waterway linings, slope treatments, gabions, riprap, and permanent sediment traps within 20 days of completion of the roadbed and/or drainage structures.
- F) Apply permanent turf establishment and landscaping to finished slopes and ditches according to section 624 through 629 as required.
- G) Construct and maintain erosion controls on and around all soil and aggregate stockpiles within the project limits to prevent soil loss into the waters of the USA.

H) During each day's grading operations, shape and roughen all embankment slopes to minimize and control erosion from storm runoff as follows:

1. For cut and fill slopes run a bulldozer or other approved track equipment up and down the slope to create grouser tracks parallel to the roadway leaving small (approximately 51mm in depth) valleys in which water can be trapped (see design drawings for further details). This work is an incidental obligation of the contractor under item 15701-0000, and/or
2. Place straw mulch under bid item 15708-0000 (as required) to cover all completed slopes (and other disturbed areas) that cannot be track walked under (1) above. Crimp the mulch by running a crimping tiller up and down the slope or use a polymer tackifier if crimping is not possible. This method of slope protection shall also be used when permanent seeding, under bid item 62510-1000, cannot be completed within 10 days of final grading. Placing of straw mulch, tackifier, and crimping shall be an incidental obligation of the Contractor under item 15708-0000. The mulch shall be applied at a rate of 4500kg/ha. Apply tackifier at a rate of between 44-67kg/ha or as recommended by the manufacturer.

157.14 Inspection and Reporting.

The first paragraph is superseded with the following:

The qualified Erosion Control Representative (ECR) assigned by the Contractor in writing, responsible for implementation of the SWPPP shall inspect, and report on all erosion control features and facilities at least once every week, within 24 hours after more than 10mm of rain event in a 24-hour period, and as required by the approved SWPPP and/or US EPA permitting requirements. The Contractor Erosion Control Specialist responsible for the preparation of the SWPPP shall perform monthly inspections with the Construction Manager and ECR of the project and provide a report of his findings to the Construction Manager within 3 days after the inspection.

157.15 Maintenance and Cleanup. The third paragraph is superseded with the following:

Remove and dispose of all remaining temporary erosion control measures (SWPPP) two weeks prior to final inspection and clean up all debris. Remove and dispose of erosion control measures according to subsection 203.05.

157.17 Measurement.

Add the following:

It is the Contractor's responsibility to determine the amount of silt fence, straw bales and/or wattles or sand bags and other erosion control features that will be required for the project meeting the Section 402 of the Clean Water Act and details provide on the design plans. However, this does not preclude the Contractor from using any or all of the other measures shown in the design plan details and/or other measures required in the Contractor's SWPPP as a result of the construction sequencing. All those measures required by the approved Contractor's SWPPP shall be considered incidental obligations under the unit price bid for Temporary Erosion Control.

Temporary straw mulching shall be measured by the hectare (ha) in place. Any secondary applications or touch ups as directed by the Construction Manager shall not be measured for payment but shall be incidental obligations under this item of work.

157.18 Payments.

Add the following:

When the bid schedule does not contain a bid item for this work, it shall be considered incidental obligations of the contractor under other bid items of work where no additional payment shall be made.

When soil erosion control is bid by the Lump Sum, payment shall be made as follows:

(A) 25 percent of the Lump Sum, not to exceed 0.5% of the original contract amount shall be paid after all required erosion control measures sufficient to begin construction as determined by the Construction Manager are in place.

(B) Payment for the remaining portion of the Lump Sum shall be prorated based on the total work completed, provided the additional and necessary erosion control measures are constructed, maintained, and accepted.

Payment will be made under the items below or as reflected in the bid schedule:

Pay Item	Pay Unit
15701-0000 Soil Erosion Control	Lump Sum

rev: 10/02/18

Section 158. – WATERING FOR DUST CONTROL

158.05 Measurement. This section is replaced as follows:

This section 158 supplements Article 6 of Exhibit A.

Measure the Section 158 work under section 206 as listed in the bid schedule according to Subsection 109.02 and the following as applicable:

When measuring water for dust control, either by the volume or mass, measure in the hauling vehicle, or by metering system.

Do not measure water for dust control applied according to Subsection 158.03(b).

158.06 Payment. This section is replaced with the following:

The accepted quantities will be paid at the contract price per unit of measurement for this section of work under section 206 bid items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

If no bid item is provided in the bid schedule for work under this section, then the work shall be considered incidental to other bid items using water in the bid schedule.

Rev: 09/25/17

SECTION 203. - REMOVAL OF STRUCTURES & OBSTRUCTIONS

203.01 **Description.** This section 203 supplements Article 6 of Exhibit A.

Add the following paragraph:

This work shall include the complete removal of structures as shown in the design plans, including all appurtenances.

203.03 **Salvaging Material.**

The third paragraph is superseded with the following:

Stockpile salvageable material in a location as directed by the Construction Manager for project owner's road maintenance office or landowner pickup unless otherwise specified in the design plans. Unsalvageable material shall be disposed of in accordance with section 203.05 of the Standard Specifications and as modified below.

All existing pipe culverts and/or pipe arches, cattle guards, concrete box structures, and fencing shall be removed, cleaned, and stockpiled in a location designated in the design plans unless specified otherwise to remove to an approved waste landfill. This work shall be included in the unit price bid under the appropriate bid items shown in the bid schedule.

203.04 **Removing Material.**

The first paragraph is superseded with the following:

Saw cut pavement (full depth), and structures when partial removal is required. All saw cut edges shall be protected until the new material is placed up against the exposed edges. If the saw cut edges are damaged (i.e. chipped, broken, crumbling, or loses its underlying support) shall, as an incidental obligation, be repairs by the Contractor by saw cutting the damaged edges/sections again to a smooth clean face to accept the new material .

Add the following to the end of the second paragraph:

Miscellaneous structures designated for removal shall be removed at the locations and to the depths shown in the design plans and/or as directed by the Construction Manager. These structures shall be disposed of in accordance with section 203.05 (as applicable) and as directed in the design plans.

Any existing pavement shall be broken up to minus 152mm size, reprocess with other embankment material for shoulder and/or roadway construction requiring additional embankment material. Any excess or pulverized pavement materials can be used as part of the embankment construction or used for turnout construction as directed by the Construction Manager provided the milled material is grades to minus 75mm size.

Any concrete foundation bases from any and all existing fence posts called for removal shall be removed and disposed of in accordance with section 203.05 (as applicable).

203.05 Disposing of Material.

The first paragraph of subparagraph (c) is superseded with the following:

(c) Bury. Bury non-hazardous debris in trenches or pits in a Construction Manager approved areas within the ROW. Do not bury debris near underground utilities, beneath drainage ditches, or in any areas subject to free flowing water or in areas that drain to the waters of the US. All waste from any bathroom facilities shall be hauled off to a sanitary facility off the project.

Add the following sub-section:

(e) Utilization. Stone, masonry, asphalt pavement and/or concrete debris may be incorporated into embankment provided the material is broken into minus 152mm (longest dimension) pieces and placed at least 1 meter below the subgrade surface. Stone, masonry, asphalt pavement and/or concrete debris shall not be place in embankment where piling is to be driven or utilities present.

Stone masonry may be incorporated into riprap provided the material meets the requirements of riprap rock, including hardness and gradation.

Removal of hazardous materials that were not identified in the design plans, specifications, or elsewhere in the contract, shall be disposed of in accordance with section 109.02(m).Removal of Contractor generated hazardous materials shall be considered an incidental obligation of the Contractor.

rev: 04/28/17

SECTION 204. - EXCAVATION AND EMBANKMENT

204.01 **Description.** Add the following to the first paragraph: This section 204 supplements Article 6 of Exhibit A.

204.04 **Preparation for Roadway Excavation and Embankment Construction.**

Add the following:

Earthwork construction requiring compaction shall not be performed unless the air temperature is 4° C and rising (taking into account the wind chill factor) and the top 305mm of ground and/or roadway embankment (including all backfill previously placed) temperature is a minimum of 4°C in the shade. The Construction Manager shall make the final determination (in writing) as to whether earthwork construction can proceed or not.

204. 07 **Sub-excavation:**

The first sentence is superseded with the following:

Excavate unsuitable material and replace with select borrow meeting the requirements of section 704.07 to a depth of 610mm from existing subgrade or natural ground, and to the limits designated by the Construction Manager. The sub-excavation work shall be measured and paid for at the contract unit price for Roadway Excavation, bid item, as applicable. The select borrow shall be measured and paid for at contract price for the borrow bid item as applicable. When items for roadway excavation or select borrow is not in the bid schedule, measurement and payment shall be in accordance with section 109.02(m).

204. 10 **Embankment Construction:**

(b) Embankment Construction within the roadway prism.

The first sentence, in the first paragraph, is superseded with the following:

Within the roadway prism, place earth embankment in horizontal layers not exceeding 300 millimeters loose measurement.

Add the following:

In no case shall any embankment lift material be placed upon frozen, muddy, or unstable natural ground or existing embankment. If existing subgrade or natural ground is wet and/or unstable due to conditions not attributable to the contractor's operations, it shall be plowed and/or scarified to a depth of 457mm and aerated before compacting (in accordance with section 204.11) as directed by the

Construction Manager. This work shall be measured and paid for under the roadway excavation items in the bid schedule. When bid items for roadway excavation is not in the bid schedule, measurement and payment shall be in accordance with section 109.02(s) or other Construction Manager approved methods. Any subgrade and/or natural ground that are wet or unstable as a result of the contractor's construction operations shall be stabilized as described above at the Contractor's entire expense.

204. 11 Compaction:

Subparagraph (b) and (c) are deleted and superseded with the following:

(b) Less than 80 percent retained on a 4.75-millimeter sieve.

The material shall be classified according to AASHTO M 145. For material classified A-1 or A-2-4, the maximum density shall be determined according to AASHTO T 180, method D.

For other material classification, the maximum density shall be determined according to AASHTO T 99, method C.

Adjust the moisture content of material classified A-1 to A-5 and material classified A-6 to A-7 to within ± 2 percent of the optimum moisture content.

Use compression-type or vibratory rollers. Compact each layer of material full width to at least 95% of the maximum density. Determine the in-place density and moisture content according to AASHTO T - 310 or other approved test procedures. When required, use AASHTO T - 224 to correct for coarse particles.

The Contractor shall compact the following materials listed below until a uniform density of not less than 95% of maximum density is obtained as determined in accordance with 204.11(b):

- (1) Material placed in all embankment layers in accordance with section 204.10.
- (2) Scarified material in the upper layer of existing ground in accordance with section 204.06 and 204.09 respectively:
 - (1) Under the subgrade in cut sections.
 - (2) Under embankments in fill sections.

204.13 Sloping, Shaping, and Finishing:

The first 3 sentences of subsection 204.13(d) are superseded with the following:

Remove all material larger than 150mm from the top 305 mm of finished roadbed and replace it as required with suitable material. The top surface of the finished subgrade shall not vary more than finished red top staking required in section 152.03(f) in both transverse (full width of roadway) and longitudinal directions (every 20 meter station maximum) and be continuously maintained in accordance with section 156 for public traffic until project completion. Continuously maintain all roadside ditches for proper drainage until final acceptance of project.

204.15 Acceptance: Add the following to the second paragraph:

All Government computed final earthwork quantities shall be based on **approved** Contractor furnished original and final subgrade cross sections taken on the roadway subgrade, channels, borrow, and roadway prism cut and embankment sections in the final position to the staked limits only and as specified in section 152. Any over built roadway typical embankments and/or cuts (not authorized by the Construction Manager) shall be deducted from the final earthwork quantities per section 109.02(b). The Government will take the Contractor's final survey data to determine the final earthwork quantities and furnish the results to the Construction Manager and Contractor. The final volumes are not to be adjusted by any tolerances in section 152 or elsewhere in the contract.

204.16 Measurement:

Subparagraph (c)(1) is superseded with the following:

(1) Include the following volumes in embankment construction:

- (a) Roadway embankments that are in reasonable close conformance with the contract typical sections.
- (b) Material used to backfill sub-excavated areas, holes, pits, and other depressions as authorized.
- (c) Material used to restore obliterated roadbeds to original contours.
- (d) Material used for dikes, turnouts, and ditch blocks not paid under separate bid items.

204.17 Payment:

Add the following paragraph:

For periodic progress payment purposes only, contract bid items for roadway excavation and borrow quantities can be measured and paid by an **approved** load count method as agreed to (**in writing**) by the Contractor and Construction Manager. Final payment adjustments shall be made based on the government calculated final earthwork.

agreed to (**in writing**) by the Contractor and Construction Manager. Final payment adjustments shall be made based on the government calculated final earthwork.

Quantities used for progress payments by the load count method are not considered a true representation of quantities placed for roadway embankments; therefore cannot be used to compare with the government calculated quantities or for final payments.

Table 204-1, Sampling and Testing Requirements shall be used as written, except the requirements for the “Top of Subgrade” material is superseded with the following:

Table 204-1
Sampling and Testing Requirements

Material or Product	Type of Acceptance (Subsection)	Characteristic	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Top of Subgrade (204.11)	Measured and tested for conformance (106.04)	Compaction	AASHTO T 310 or other approved procedures	1 per 2000 m ²	In-place	-	Before placing next layer
		Classification	AASHTO M 145	1 per 152 m	Top 305mm	Yes, when requested	Before placing next layer
		Sulfate Content ⁽²⁾	AASHTO T 290	1 per 152 m	Center of lane; staggered	Yes, when requested	Before placing next layer

(2) Determine the sulfate content of all soils with soil classification of A-6 and A-7 when lime stabilization work is called for in the plans. If the soils have sulfate content of 2500 ppm or more, the Contractor shall take additional soil samples to determine limits of the high sulfate content soil area(s). The soils with high sulfate content shall be used to determine a lime/soil mix design under Section 213.

rev: 04/26/17

SECTION 205. - ROCK BLASTING

205.01 **Description.** This section 205 supplements Article 6 of Exhibit A.

The first paragraph is superseded with the following:

The work consists of fracturing rock and constructing stable final rock cut faces using controlled and/or production blasting and non-blasting techniques as may be required by environmental requirements.

205.08 **Blasting.**

Add the following subparagraph:

(e) non-Blasting. Free each drill hole of obstructions for the entire depth. Place non-toxic expansive chemical agent into each hole and cover with approved stemming material.

Use non-toxic type expansive chemical agents to fracture the rock in accordance with the manufacturer's recommendations.

205.11 **Measurement.**

Add the following:

If no item is shown in the bid schedule for rock blasting, then all rock blasting and rock excavation shall be considered incidental to the earthwork items shown in the bid schedule for section 204.

205.12 **Payment.**

Add the following paragraph to subparagraph:

It is the Contractor's responsibility to review all the information provided, including any geotechnical data available during the bidding of this project and to conduct a detailed on-site review of the project conditions, and rock hardness (if any) before bidding the earthwork bid items provided in the bid schedule. Failure of the Contractor to adequately conduct due diligence of the site conditions will not grant the Contractor any additional compensation if rock blasting is required during the earthwork operations. The Contractor must determine if the roadway excavation operations will encounter rock excavation and whether it can be removed by either ripping or blasting and include that cost in the roadway excavation bid items when there is not a bid item specifically for rock blasting.

rev:4/23/17

SECTION 206. - WATERING

Add this new section as follows:

206.01 Description. This section 206 supplements Article 6.3 of Exhibit A.

This work shall consist of developing an adequate water supply and applying water for all contract items that require water, hauling, and applying water including turf establishment. This work shall also include furnishing and applying water for the control of dust caused by the contractor's operations and public traffic within the construction zones only and in a conservative manner (i.e. only apply water for dust control caused by the contractor's operations and public traffic use in those location on the project as identified and directed by the Construction Manager in accordance with section 158). Any dust control on Contractor haul or detour routes (outside the right-of-way limits) is considered an incidental obligation of the Contractor and no measurement for payment shall be made.

206. 03 General.

Water shall be applied at the project locations, in the amounts, and during the hours, including nights, and approved shutdowns, as directed by the Construction Manager and in a conservative manner. Water shall be applied by means of a pressure-type distributor or pipe lines equipped with a spray system that will insure a uniform application of water in the quantities necessary.

206. 05 Measurement.

No measurement of quantities will be made when the Bid Schedule contains a lump sum pay item for the development of water supply.

When the bid schedule contains quantities based by the M-liter (1,000,000 liters) then the actual verified quantity used per pay estimate shall be paid for. Measurement for payment shall be based upon a load count method where each water truck to be used on the project shall be weighed (by certified scales) empty and full to determine the capacity of each truck in liters. The scale man shall certify the volume of the trucks and provide a certification with volume calculations to the Construction Manager for review and approval prior to each truck used on the project. The Contractor shall then provide the QCM and Construction Manager with daily load counts of water used on the project. Any truck left (at the end of each day) with water in the tank shall not be measured for payment until all the water is used in the work requiring water the following day. Only water actually used on the project shall be measured for payment that was authorized by the Construction Manager.

206.06 Payment.

The contract lump sum amount will be paid in accordance with the following partial payments when the bid schedule contains a "Lump Sum" item:

A) 50 percent of the total contract lump sum bid amount will be paid for developing an adequate water supply.

B) The remaining 50 percent of the total contract lump sum bid amount will be paid on a prorated basis in accordance with the job progress.

When the Bid Schedule does not contain an Item for Watering, then Watering shall be considered incidental to the earthwork, road reconditioning, and/or paving items shown and no additional payment shall be made.

Payment will not be made for watering not directed by the Construction Manager.

Payment will be made under the bid Items for Development of Water Supply as shown in the bid schedule.

rev:04/26/17

SECTION 209. - STRUCTURE EXCAVATION AND BACKFILL

209.04 **General.** This section 206 supplements Article 6.3 of Exhibit A.

The last sentence is superseded with the following:

Compact the foundation in accordance to Subsection 209.11.

209.09 **Bedding.**

Add the following:

Soil classification reports shall be submitted to the Construction Manager for review and approval prior to use of the bedding material.

209. 10 **Backfill.**

(b) Pipe culverts.

Add the following:

Soil classification reports shall be submitted to the Construction Manager for review and approval prior to use of the backfill material. Backfilling and compaction shall meet the temperature requirements of section 204.04

Table 209-1 is superseded with the following:

Table 209-1
Sampling and Testing Requirements

Material or Product	Type of Acceptance (Subsection)	Characteris- tic	Test Methods Specifications	Sampling Frequency	Point of Sampling	Reporting Time
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Backfill material (704.03)	Measured and tested for conformance (106.04)	Gradation/Soil classification	AASHTO T27 & T11/ AASHTO M 145	1 per soil type	Source of material	Before using in work
		Moisture-density	AASHTO T 99, method C \bullet	1 proctor curve per week or installation; to be determined by CM	Source of material	Before using in work
		Compaction	AASHTO T 310 or other approved procedures	3 per lift	In-place	Before placing next layer
		Resistivity ²	AASHTO T 288	1 per soil type	Source of material	Before using in work
Bedding material (704.02)	Measured and tested for conformance (106.04)	Gradation/Soil classification	AASHTO T27 & T11/ AASHTO M 145	1 per soil type	Source of material	Before using in work
		Moisture-density	AASHTO T99, method C \bullet	1 proctor curve per week or installation; to be determined by CM	Source of material	Before using in work
		Compaction	AASHTO T 310 or other approved procedures	3 per lift	In-place	Before placing next layer
		Resistivity ²	AASHTO T 288	1 per soil type	Source of material	Before using in work

Foundation fill (704.01)	Measured and tested for conformance (106.04)	Gradation/Soil classification	AASHTO T27 & T11/ AASHTO M 145	1 per soil type	Source of material	Before using in work
		Moisture-density	AASHTO T99, method C ⁽¹⁾	1 proctor curve per week or installation; to be determined by CM	Source of material	Before using in work
		Compaction	AASHTO T 310 or other approved procedures	3 per lift	In-place	Before placing next layer
Unclassified borrow (704.06)	Measured and tested for conformance (106.04)	Gradation/Soil classification	AASHTO T27 & T11/ AASHTO M 145	1 per soil type	Source of material	Before using in work
		Moisture-density	AASHTO T99, method C ⁽¹⁾	1 proctor curve per week or installation; to be determined by CM	Source of material	Before using in work
		Compaction	AASHTO T 310 or other approved procedures	3 per lift	In-place	Before placing next layer
		Resistivity ²	AASHTO T 288	1 per soil type	Source of material	Before using in work

(1) Minimum of 5 points per proctor.

(2) Only required for backfill of steel drainage structures called for in the bid schedule in accordance with section 704.

Rev: 04/26/17

SECTION 211. - ROADWAY OBLITERATION

211.01 **Description.** This section 206 supplements Article 6.3 of Exhibit A.

Add the following subparagraph:

Roadway obliterations shall be performed within and outside the right-of-way limits as called for on the approved construction plans and specifications. The Contractor shall immediately conduct and coordinate all roadway obliterations outside the right-of-way with the Construction Manager once the new roadway is ready for traffic.

211.05 **Measurement.**

Add the following:

When the bid schedule contains no bid item for Roadway Obliteration, then this work shall be incidental to the earthwork items shown.

Rev: 04/28/17

SECTION 213. - SUBGRADE STABILIZATION

Replace Section 213 with the following:

Description

This section 206 supplements Article 6.3 of Exhibit A.

- 213.01** This work shall consist of processing and incorporating liquid soil stabilizer (RoadBond EN 1 or approved equal) into the upper layer of a subgrade. The quantity for stabilization is based on the geotechnical borings at preconstruction elevation. The PI and classification may change at the final subgrade profile.

Materials

- 213.02** Conform to the following Sections and Subsections. Liquid soil stabilizer shall meet the manufacturer's requirements. The Contractor shall submit Material Certification(s) to the Construction Manager for review and approval.

Soil AASHTO T90PI > 12 * AASHTO M 145 Classification A-6 or A-7 *

Water 725.01(c)

*When used with Cold Recycle Asphalt Base test for recording purpose only.

Construction Requirements

- 213.03** **General.** Liquid soil stabilizer shall be stored and handled in closed, weatherproof shipping containers. Prepare the subgrade according to Section 303. Provide Construction Manager the PI, classification, and DCP results prior to application, for verification of station to station application. Scarify approved subgrade locations to a depth of 152 millimeters (6-inches). Size and shape the subgrade material to a windrow or blanket that is suitable for mixing.
- 213.04** **Equipment.** The machinery, tools and equipment necessary for proper execution of the work shall be on the project. The basic equipment required shall be a 3,785 liter (1,000 gallon) minimum water truck with a spray bar; a motorized grader, an approved pulverizing/mixing machine, sheepsfoot roller and static pneumatic (rubber tire) roller. All machinery, tools and equipment used shall be maintained in satisfactory working condition.

The Contractor shall employ adequate methods in performing the work and shall conduct operations in a satisfactory and workmanlike manner.

213.05 Weather Limitation. Place and work the EN 1/soil mixture on a dry, unfrozen surface when the air temperature in the shade is 4°C (40°F) and rising; and when the temperature of the ground surface (in the shade) is 4°C (40°F). No work shall be permitted when weather conditions indicate that the air temperature is expected to fall below 0°C (32°F) during the same working day.

213.06 Application. Diluted liquid soil stabilizer shall be sprayed only on the subgrade area where the mixing and compaction operations shall be completed during the same working day. The application and mixing of stabilizer with the soil shall be accomplished by the stabilizer/mix spray placing method. When diluting the stabilizer with water, the Contractor may use the method specified by the manufacturer which is as follows:

- a. When diluted 200:1 (200 parts water to 1 part stabilizer concentrate) with water, 3.785 liters (1 gallon) of stabilizer concentrate treats 22.95 cubic meters (30 cubic yards) of soil or 0.165 liters concentrate per cubic meter of material. To determine the total liters of stabilizer required, calculate the total cubic meters of soil to be treated and multiply by 0.165 liters per cubic meter.

213.05 Mixing. Keep all traffic, except mixing equipment, off the spread material. The stabilizer and required water (dilution ratio 200:1 with concentrate stabilizer) shall be thoroughly mixed in the water truck. For ease of mixing and safety considerations, the stabilizer concentrate shall be mixed in 18.93 liter (5 gallon) increments. The subgrade material and the diluted stabilizer is mixed and blended until a homogeneous mixture is achieved with an approved pulverizing machine and to the manufacturer's instructions plus to the satisfaction of the Construction Manager / QCM.

213.06 Compacting, Stability and Finishing. Immediately after mixing, spread and compact the mixture to at least 95 percent of the maximum density. Determine the in-place density and moisture content according to AASHTO T 310 or other approved test procedures. At final compaction, the moisture content shall be at optimum or within optimum plus or minus one percent ($\pm 1\%$). Determine the optimum moisture content and maximum density according to AASHTO T-99, Method C after treatment with diluted stabilizer. Determine the stability of the soil according to ASTM D6951.

(a) Stability Acceptable Maximum DCP index value of 10

When tying into the previous day's work, provide a construction joint by remixing approximately 0.5 meters (2 feet) of the completed course before processing additional sections. The material shall be reworked as necessary until it meets all requirements. The shape of the course shall be maintained throughout the operation. Upon completion, the final surface shall be smooth and to the established lines and grades and in conformity with the typical section on the plans.

213.07 Curing. Do not allow traffic on the stabilized subgrade until final acceptance by the Construction Manager /QCM.

213.08 Maintenance. Maintain the stabilized subgrade to the correct line, grade, and cross-section. If the subgrade loses stability, density, or finish before placement of the next course, reprocess or re-compact the subgrade as necessary to restore the strength of the damaged material to that specified in Subsection 213.06.

213.09 Acceptance. See **Table 213-2** for sampling and testing. See **Table 303-1** for sampling and testing of roadway reconditioning.

Material for liquid soil stabilizer and water will be evaluated under Subsection 106.03.

Density, stability, and in-place depth measurements will be evaluated and accepted under Subsection 106.02 and 106.04. In-place depth measurements deficient by more than 25mm (1-inch), the Contractor shall correct such areas in a manner satisfactory to the Construction Manager. This corrective work shall be at no cost to the Government.

Construction of subgrade stabilization work will be evaluated and accepted under Subsection 106.02 and 106.04.

Should the final surface and/or shoulders begin to show signs of heaving, swelling, movement, cracks or any other distress as a result of the Contractor not allowing the material to cure out in accordance with Subsection 213.07; the Contractor shall correct these area(s). This corrective work shall be at the Contractor's entire expense.

Reconditioning of subgrade will be evaluated under Section 303.

Measurement

213.10 Measure subgrade stabilization by the square meter. Measure the **width** horizontally across the top of the final finished stabilized subgrade width **only** by the meter. Measure **length** horizontally along the centerline of the roadway by the meter.

Measure liquid soil stabilizer by the liter. Only stabilizer used and accepted in the soil stabilization work shall be measured for payment if the bid schedule provides a bid item. Otherwise the soil stabilizer shall be incidental to the soil stabilization bid items.

Subgrade preparation or roadway reconditioning within approved stabilization limits will not be measured and will be subsidiary to the stabilization bid item.

Payment

213.11 The accepted quantities, measured as provided above, will be paid at the contract price per unit of measurement for the Section 213 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

Table 213-2

Sampling and Testing Requirements

Material or Product	Type of Acceptance (Subsection)	Characteristic	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Treated Soil	Measured and tested for conformance (106.04)	Moisture-density	AASHTO T 99, Method C (1)	1 proctor curve for <u>each</u> station to station location	Processed and treated material	—	Before using in work
		Compaction	AASHTO T 310 or other approved method	5 per day	In-place	—	Before placing next layer
		Thickness	Contractor shall furnish a method	3 per day	Compacted subgrade	—	Before placing next layer
		Stability	ASTM D-6951 (2)	Every 200 m	In-Place	—	Before placing next layer
Before soil treatment	Measured and tested for conformance (106.04)	Stability	ASTM D-6951 (2)	Every 200 m	In-Place	—	Prior to stabilization

(1) Minimum of 5 points per proctor.

(2) 8kg hammer

rev: 10/03/18

SECTION 251. - RIP RAP

251.03 General. This section 206 supplements Article 6.3 of Exhibit A.

Add the following:

Steel stakes, for wire enclosed riprap, shall be fabricated to the required lengths from L102x102x10mm angles as shown on the plans for minor drainage structures. All bridge embankment riprap shall also be anchored with the L102x102x10mm angles.

Tie wire shall be 3.8mm wire with Medium Temper Class 3 coating. Hexagonal woven mesh and wire ties shall conform to ASTM A 641/A 641M specifications with Class 3 zinc coating.

251.04 Placed Riprap.

Add the following definition:

Placed riprap shall also be defined as “loose riprap”.

Subsection 251.07 is superseded with the following:

251.07 Wire-Enclosed Riprap.

Wire enclosed riprap shall consist of mats or baskets fabricated from wire mesh, filled with stone, connected together and anchored to the slope or channel.

A foundation bed shall be excavated in accordance with section 209 and in accordance with the plans or as directed by the Construction Manager.

Embankment construction for wire enclosed riprap shall be in accordance with section 204.

Wire fabric shall be laid and rock shall be laid on the wire fabric in close contact to avoid excessive voids. The thickness and dimensions shall conform to the details shown on the plans.

The wire fabric shall be stretched over the top of the rock with the top and bottom of the wire fabric laced through the rock with galvanized wire ties to obtain a tight fitting mat. The wire fabric shall consist of woven fencing material having a Class 3 zinc coating in conformance with section 710.02.

All open spaces between the trench walls and the wire enclosed riprap mat shall be backfilled with the excavated material from the trench. This backfill material shall be thoroughly tamped to 95% in accordance with AASHTO T-99, method C.

The finished surfaces of the riprap shall be in reasonably close conformity with the lines and grades shown on the construction plans as adjusted in the field by the Construction Manager.

Any unsuitable or unstable material encountered during foundation bed preparation (not attributable to the contractor's operations) shall be replaced as directed by the Construction Manager. This work shall be paid for in accordance with section 204.07 and will be paid for under section 109.02(m).

Any riprap that must be placed over or tucked under exposed sandstone shall be done in accordance with the details provided in the plans. All materials, labor, equipment, and incidentals needed to carry out such work shall be included in the unit price bid for the wire enclosed riprap bid items.

Subsection 251.08 is superseded with the following:

251.08 Acceptance.

See Table 251-1 for sampling and testing requirements here in.

Rock for riprap will be evaluated under Subsection 106.02 and 106.03.

Rock placement for riprap will be evaluated under Subsections 106.02 and 106.04.

Structure excavation and backfill will be evaluated under Section 209.

Geotextile will be evaluated under Section 207.

Material for grout will be evaluated under Subsections 106.02 and 106.03. Grout will be evaluated under Subsections 106.02 and 106.04. Grout placement will be evaluated under Subsection 106.02.

Subsection 251.09 is superseded with the following:

251.09 Measurement.

Measure the Section 251 items listed in the bid schedule according to Subsection 109.02 and the following as applicable.

All wire mesh, steel stakes, tie wire, and installation described in section 251.07 above shall be included in the unit price bid for Wire Enclosed Riprap.

Foundation bed excavation shall be considered incidental obligations of the Contractor except as otherwise defined under section 251.07.

Embankment construction shall be measured and paid for in accordance with section 204 and the appropriate bid items shown in the bid schedule.

Measure all types of riprap by the cubic meter in place.

Add the following new subsection:

251.10 Payment.

The accepted quantities will be paid at the contract unit price per unit of measurement for the Section 251 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

Table 251-1
Sampling and Testing Requirements

Material or Product	Type of Acceptance (Subsection)	Characteristic	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Riprap (705.02)	Measured and tested for conformance (106.04)	Apparent specific gravity & absorption	AASHTO T 85	1 per material type	Source of material	Yes, when requested	Before using in work
		Coarse durability index	AASHTO T 210	"	"	"	"
		Sodium sulfate soundness	AASHTO T 104	"	"	"	"
		LA abrasion	AASHTO T 96	"	"	"	"
		Gradation	AASHTO T 27 & T 11 or other methods	1 per material type	Source of material	"	Before using in work
		Gradation	AASHTO T27 & T11 or other methods	1 per 400m ³	Plan location(s)	Yes, when requested	Following work day after test

Grout	Measured and tested for conformance (106.04)	Making test specimens Compressive strength ²	AASHTO T 22 & T 23	1 sample per installation ¹	Plan location(s)	Yes, when requested	2 work days after tests
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1. Sample consists of two (2) test specimens.

2. The compressive strength shall be the average of two (2) test specimens.

rev:04/23/17

SECTION 301. - UNTREATED AGGREGATE COURSES

301.03 General. This section 206 supplements Article 6.3 of Exhibit A.

Paragraph one is superseded with the following:

Seven (7) calendar days before the placement of any aggregate base material, the Contractor shall notify the Construction Manager in writing advising the area(s) and location(s) where the base material will be placed. Immediately, prepare the final roadbed surface according to Section 204 or 303 as applicable. The Construction Manager, QCM, and Contractor shall jointly check the final roadbed surface area(s) and location(s) for any defects. If defective areas are noted, correct all areas with moisture/density control. The above construction personnel shall recheck the entire final roadbed surface area(s). When approved and accepted by the government, the Contractor can place aggregate base material. The Contractor shall place aggregate base material **only** at government approved area(s) and location(s).

Paragraph two and three are deleted.

301.04 Mixing and Spreading.

Add the following:

The aggregate base material shall be placed on an approved, firm and stable roadbed in a continuous uniform layer or windrow. The layer or windrow shall be of such size that when spread and compacted the thickness of the finished layer shall conform to the nominal thickness shown on the plans or a thickness determined by the Construction Manager.

Aggregate base shall be constructed on a dry, unfrozen surface where the air temperature is 4°C and rising (taking into account the wind chill factor) and the top 305mm of finished subgrade must be 4°C minimum in the shade. The Construction Manager shall make the final determination as to whether the work can proceed.

When the weather conditions (just prior to aggregate base placement) is projected to be foggy, showers, rain, snow, or the surface temperature drops below 4°C such that the ground is freezing (i.e. appearance of frost), no aggregate base course materials shall be placed.

Where aggregate base course is placed on geotextile materials, in order to prevent damage to the geotextile materials, the Contractor shall not process the bottom 51mm (2-inches) of the lower lift.

301.06 Surface Tolerance.

The first paragraph is superseded with the following:

Grade finishing stakes are required during the placement process unless machine grading is allowed. Finish the final surface to within ± 10 mm from staked line and grade elevations and plan thickness. The surface tolerance shall be checked by the string line method and depth stick. Defective areas or surface deviations that do not meet the above tolerance and crown shall be corrected. If spot dumping of base material is necessary to meet the staked line and grade elevation(s), this material shall be added to the existing base material by scarifying down 76mm (3-inches), mix, blend, and process with moisture/density control (as required under subsection 301.05). Finish to the staked lines and grade elevation(s) and recheck for surface tolerance. This work shall be considered incidental obligations of the Contractor.

301.07 Maintenance.

Add the following:

This work shall be performed during construction and periods of suspended work as required under Subsection 107.06.

If the roadway with aggregate base course in place is used by traffic before the final surfacing is placed, it shall be maintained in a safe and adequate manner as directed by the Construction Manager. Prior to the placement of the next base course layer, pavement layer or application of the prime coat, the aggregate base course in-place shall be checked (by QCM, Construction Manager and Contractor) for defective areas. If defective areas are found, these areas shall be corrected to meet the requirements of subsections 301.05 and 301.06. This work shall be incidental obligations of the Contractor and no additional payment shall be made.

301.08 Acceptance.

The second paragraph is superseded with the following:

Aggregate gradation and surface course plasticity index shall be evaluated under Subsection 106.04 Measured or Tested Conformance. Other aggregate quality properties will be evaluated under Subsection 106.02 and 106.04.

Subparagraph (a) is superseded with the following:

(a) Aggregate gradation. The upper and lower specification limits are the values shown in Grading Special, Table 703-2 as modified in these supplemental specifications.

Materials, which fail to meet the aggregate gradation specification limits, shall be corrected by the Contractor by adding coarse and/or fine aggregate to bring the material into specification limits. The Contractor's Quality Control Testing Technician shall sample and test the corrected processed material. Repeat the corrective work until the aggregate base course gradation is within the upper and lower specification limits under Grading (D). Once the Contractor can show compliance with the contract requirements, then the material on the roadway, including any added aggregates shall be paid for at the full contract unit price. No separate payment for the added labor, overhead, traffic control, and equipment costs for adding coarse and/or fine aggregates shall be made but shall be an incidental obligation of the Contractor to bring the aggregate base course into contract aggregate gradation specification.

(b) Plasticity index. See table 301-1 for acceptance quality characteristics category.

301.09 Measurement.

Add the following:

When the bid schedule calls for the aggregate base course to be measured by the metric ton, only the natural moisture in the material will be included for payment. Should the Contractor add water before weighing (prewet), then the weight of the added moisture shall be deducted by the Construction Manager and QCM before payment is made.

No separate measurement or payment for the corrective work (i.e. additional labor, overhead, traffic control, and equipment costs) shall be made but shall be an incidental obligation of the Contractor to bring the aggregate base course into contract aggregate gradation specification. Once the material has been corrected to meet the specifications, then the material on the roadway shall be measured for payment at full contract price.

Any aggregate base material that is wasted, wasted along the shoulders, used for over-built roadway prism sections, material not used on the project and/or is not a part of the aggregate base course design roadway typical shall not be measured for payment. The Construction Manager and QCM shall determine and use a method of measuring the waste; measure any aggregate base used on over-built roadway sections and make the appropriate adjustments in the quantities before payments are made.

Any base course materials use to correct for crown resulting in thicker base course, will not be measured for payment.

Any base course material that the Contractor wasted along the shoulders or elsewhere on the project shall be deducted from the final payment for this bid item.

301.10 Payment.

The first paragraph is superseded with the following:

The accepted quantities, measured as provided above, will be paid at the contract unit price bid of which price and payment will be full compensation for the work prescribed in this section. See Subsection 109.05.

Roadbed preparation/reconditioning will be measured and paid for as specified under Section 204, 212, and/or 303, and/or 408 as applicable and as specified in the design plans. If there is no pay item in the bid schedule for roadbed preparation/reconditioning, then this work shall be considered incidental to completion of the project and no additional payment will be made.

Table 301-1, Sampling and Testing is superseded with the following:

Table 301-1
Sampling and Testing Requirements

Material or Product	Type of Acceptance Subsection)	Characteristic	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
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SECTION 304. - AGGREGATE STABILIZATION

Replace Section 304 with the following:

304.01 Description. This work shall consist of constructing a stabilized aggregate layer with either imported or in-place aggregate. The aggregate layer is stabilized by incorporating cement (aggregate cement) or liquid RoadBond EN-1. This section 304 supplements Article 6.3 of Exhibit A.

304.02 Materials. Conform to the following Subsections:

Aggregate	703.05
Portland cement	701.01(a)
RoadBond EN-1	Manufacturer's certification

The Contractor shall submit a Material Certification of the EN-1 to the CM for review and approval.

304.03 General Construction Requirements. RoadBond EN-1 shall be stored and handled in closed, weatherproof shipping containers. Prepare the aggregate surfacing course special according to Section 301. Scarify the aggregate surfacing course special to a depth of 152 mm (6-inches) on main roadway only. Size and shape the aggregate surface material to a windrow or blanket that is suitable for mixing.

304.04 Equipment. The machinery, tools and equipment necessary for proper execution of the work shall be on the project. The basic equipment required shall be a 3,785 liter (1,000 gallon) minimum water truck with a spray bar; a motorized grader, approved pulverizing/mixing machine, and approved rollers. All machinery, tools and equipment used shall be maintained in satisfactory working condition. The Contractor shall employ adequate methods in performing the work and shall conduct operations in a satisfactory and workmanlike manner.

304.05 Weather Limitation. Place and work the EN-1 aggregate surface mixture on a dry, unfrozen surface when the air temperature in the shade is 4°C (40°F) and rising; and when the temperature of the ground surface (in the shade) is 4°C (40°F). No work shall be permitted when weather conditions indicate that the air temperature is expected to fall below 0°C (32°F) during the same working day.

304.06 Application. Diluted Road Bond EN-1 liquid soil stabilizer shall be sprayed only on the aggregate surfacing area where the mixing and compaction operations shall be completed during the same working day. The application and mixing of EN-1 with the soil shall be

accomplished by the stabilizer/mix spray placing method. When diluting the EN-1 with water, the Contractor may use the method specified by the manufacturer which is as follows:

1. When diluted 200:1 (200 parts water to 1 part EN-1 concentrate) with water, 3.785 liters (1 gallon) of EN-1 concentrate treats 22.95 cubic meters (30 cubic yards) of base or 0.165 liters concentrate per cubic meter of material. To determine the total liters of EN-1 required, calculate the total cubic meters of aggregate material to be treated and multiply by 0.165 liters per cubic meter.

304.07 **Mixing.** Keep all traffic, except mixing equipment, off the spread material. The EN-1 and required water (dilution ratio 200:1 with concentrate EN-1) shall be thoroughly mixed in the water truck. For ease of mixing and safety considerations, the EN-1 concentrate shall be mixed in 18.93 liter (5 gallon) increments. The aggregate surfacing material and the diluted EN-1 is mixed and blended until a homogeneous mixture is achieved with an approved pulverizing machine and to the EN-1 manufacturer's instructions plus to the satisfaction of the QCM.

304.08 **Compacting and Finishing.** Immediately after mixing, spread and compact the mixture to at least 95 percent of the maximum density. Determine the in-place density and moisture content according to AASHTO T 310 or other approved test procedures after final rolling/compaction but before the aggregate with RoadBond EN-1 begins to "set-up" and harden. At final compaction, the moisture content shall be at optimum or within optimum plus or minus one percent ($\pm 1\%$). Determine the optimum moisture content and maximum density according to AASHTO T-180 using water.

When tying into the previous day's work, provide a construction joint by remixing approximately 0.5 meters (2 feet) of the completed surface course before processing additional sections. The material shall be reworked as necessary until it meets all requirements. The shape of the course shall be maintained throughout the operation. Upon completion, the final surface shall be smooth and to the established lines and grades and in conformity with the typical section on the plans.

304.09 **Curing.** Do not allow traffic on the stabilized subgrade until final acceptance by the CM.

304.10 **Maintenance.** Maintain the stabilized base to the correct line, grade, and cross-section. If the base loses stability, density, or finish before placement of the next course, reprocess or re-compact the base as necessary to restore the strength of the damaged material to that specified in Subsection 304.07.

304.11 **Acceptance.** See **Table 304-3** for sampling and testing requirements.

Material for Road Bond EN-1 and water will be evaluated under Subsection 106.03.

Density and in-place depth measurements will be evaluated and accepted under Subsection 106.02 and 106.04. When the in-place depth measurement shows deficiency by more than 13mm (1/2-inch); the Contractor shall correct such areas in a manner satisfactory to the CM. This corrective work shall be at no cost to the Government.

Construction of reconditioning and base stabilization work will be evaluated and accepted under Subsection 106.02 and 106.04.

Should the final surface and/or shoulders begin to show signs of heaving, swelling, movement, cracks or any other distress as a result of the Contractor not allowing the material to cure out in accordance with Subsection 304.08; the Contractor shall correct these area(s). This corrective work shall be at the Contractor's entire expense.

304.12 **Measurement.** Measure the treated aggregate surfacing stabilization by the square meter. Measure the **width** horizontally across the top of the final finished stabilized subgrade width **only** by the meter. Measure **length** horizontally along the centerline of the roadway by the meter.

Liquid RoadBond EN-1 soil stabilizer shall not be measured for payment but shall be included in the cost of the treated aggregate surfacing.

304.13 **Payment.** The accepted quantities, measured as provided above, will be paid at the contract price per unit of measurement for the Section 304 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

Table 304-1, Sampling and Testing is superseded with the following:

Table 304-1

Sampling and Testing Requirements

Material or Product	Type of Acceptance (Subsection)	Characteristic	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Treated Base	Measured and tested for conformance (106.04)	Moisture-density (max. density)	AASHTO T 180, method D ¹	1 proctor curve for <u>each</u> station to station location	From roadbed after processing	-	Before using in work
		Compaction	AASHTO T 310, or other approved method	5 per day	In-place	-	Before placing next layer
		Thickness	Appropriate test by Contractor	3 per day	Compacted roadbed after processing	-	Before placing next layer

1. Minimum of 5 points per proctor.

rev: 03/18/20

SECTION 551. - PILING

551.01 **Description.** Add the following to this subsection: This section 551 supplements Article 6.3 of Exhibit A.

551.02 **Material:**

Add the following:

Reinforced pile tips for H-Piles shall conform to ASTM A27 and shall be specifically fabricated for the type and size of pile shown in the plans.

551.04 Subsection 551.04(b) is superseded with the following:

(b) Include a wave equation analysis of the proposed pile driving system in accordance with Subsection 551.05(b) and 551.05(b) (1).

551.05 **Pile Driving Equipment:**

Subsection 551.05(a)(4) is superseded with the following:

(4) Air or steam hammers shall not be used.

Subsection 551.05(b), second paragraph, is superseded with the following:

Approval of the pile driving equipment will be based on a wave equation analysis of the proposed system, including the specific pile type(s) shown in the plans and the subsurface profile indicated by the geotechnical investigation. **The wave equation analysis shall be developed by the Contractor and submitted for review and approval.** Approval will be given when the wave equation analysis shows that the driving stresses produced by proposed pile driving system on the specified piles will not exceed the allowable pile driving stresses indicated by AASHTO Standard Specification for Highway Bridges, Section 4.5.11.

551.06 **Pile Lengths:**

Add the following to subsection 551.06:

The pile quantities and pile lengths shown on the plans are estimated based on available geotechnical investigations and preliminary design analysis. The actual pile lengths necessary to meet the contract requirements shall be determined in the field based on the

actual driving operations while meeting the contract requirements, and from the results of the test pile program if required in the Contract.

551.07 Test Piles:

The third paragraph is superseded with the following:

Excavate the ground or construct embankment at the foundation element (abutment or pier) to the elevation of the bottom of the footing before piles are driven, unless otherwise approved. Excavation shall be in accordance with Section 208 including any supplemental specifications. Embankment construction shall be in accordance with Section 204 including any supplemental specifications. Furnish all piling material for test piles in the longest practical, full, unspliced commercially available lengths not less than 12.2 m. Pile driving equipment shall be the same as that used to install production piles.

The last paragraph is superseded with the following:

Test piles shall be utilized for the following purposes;

- (a) to verify and supplement information provided by the geotechnical investigation(s);
- (b) to verify that the Contractor's proposed method(s) of pile installation is adequate for installation of piling to the Contract requirements;
- (c) to verify and/or aid in determining the lengths of production piling required for each foundation element, including the need and location of splices;
- (d) to assure that piles will not be damaged during installation by the proposed methods;
- (e) to evaluate the effectiveness of procedures and documentation of pile installation quality control inspection to be utilized during the production pile installation.

The Contractor shall install one test pile at each foundation element as indicated in the Contract, or as determined by the Construction Manager. The test pile in each foundation element shall be at or near the center of the pile group. Test piles are to be installed in accordance with the plans and specifications pertaining to production piles utilizing the same equipment as proposed for the production piles. The first section of test piles driven shall be full length un-spliced lengths driven until the nominal bearing Capacity (R_{ndr}) is reached or until the full length is driven. If the nominal bearing Capacity (R_{ndr}) is not reached in the first full length section of test pile driven, another full length section shall be spliced onto the previously driven section and the driving continued until the nominal bearing Capacity (R_{ndr}) is reached. Full length pile sections shall be used in this fashion until the nominal bearing Capacity (R_{ndr}) is attained. Test piles shall not be "pre-spliced"

prior to driving. The remaining production pile lengths in each foundation element shall be estimated based on the test pile length with consideration of the anticipated sloping of the founding surface.

At his option the Contractor may propose an alternate method of pile installation in order to better attain the ultimate bearing capacities, minimum pile tip elevations, and other contract requirements. Alternate methods shall be based on the Contractor's or subcontractor's pile installation experience and careful and complete review of the plans, specifications and geotechnical investigation reports (provided upon request). Detailed plans and procedures for alternate methods of pile installation shall be submitted with justification as to why the proposed change(s) should be considered. Alternate methods of pile installation, including detailed cost information, shall be reviewed and approved by the Construction Manager prior to implementation.

Test piles shall be documented on the Test Pile Record or equivalent form, which will be furnished upon request. Legible copies of results and documentation of test pile installations shall be provided to the Construction Manager as soon as possible, but no later than 9:00 AM the next working day after installation of the subject test pile.

An acceptable test pile shall be one that satisfies the all of the following requirements:

- (a) achieve or exceed the minimum tip elevation specified on the plans, and
- (b) achieve or exceed the nominal bearing Capacity (R_{ndr}), and
- (c) address the test pile purposes indicated above, and
- (d) achieve or exceed the all other contract requirements for pile installation.

When nominal bearing Capacity (R_{ndr}) is reached above the minimum tip elevation pre-boring, additional pre-boring, or other method of pile advancement to the minimum tip elevation shall be required. The required quantity of pre-boring, additional pre-boring, or other method of pile advancement to reach the minimum tip elevation shall be determined by the Contractor, and shall be utilized to install adjacent production piles to the required minimum tip elevations specified. Any test piles achieving ultimate bearing capacity above the minimum tip elevation will be evaluated on a case by case basis based on anticipated scour depth and other structural stability factors, and will be deemed either approved or unacceptable as a production pile by the Construction Manger after such evaluation. Pre-boring or other method of pile advancement shall be paid under the applicable item shown in the bid schedule, or if not shown shall be included as an incidental obligation under Item 55120-0000.

Approved test piles will be accepted as planned production piles when all Contract requirements are met, or as determined by the Construction Manager. Approved test piles will be paid for under Item 55120-0000. **Installation of production piles representative of an acceptable test pile within an abutment or pier shall be performed with the same equipment and methods as the approved test pile, and shall not begin until notification of the test pile approval is provided by the Construction Manager.**

Unacceptable test piles shall be removed and replaced with another test pile in which the installation method or equipment is revised or modified to produce an approved test pile, or may be modified in a manner approved by the Construction Manager to be acceptable as a production pile, all at the Contractor's expense.

All work, materials, equipment and labor required for Test Piles shall be measured and paid for under bid Item 55120-0000, Test Piles.

551.09 Pre-boring:

Add the following:

The Contractor shall use casing if necessary to stabilize the sides of the pre-bore hole in order to advance the pre-bore hole to the required depth. Casing shall be removed after the required depth of the pre-bore hole is achieved. Casing of the pre-bore hole and all work and materials involved, if necessary, shall be considered as incidental to the completion of Item 55115-1000, Pre-boring.

551.10 Preparation & Driving:

Add the following to the second paragraph:

The plan location tolerances stated herein are allowable horizontal deviations from the planned location of the in place pile measured at the cutoff elevation.

Furthermore, the axial alignment tolerances shall be measured from the planned location of the top of the pile at the cutoff elevation and proceed downward while maintaining the plan location tolerances stated above. Piles not meeting the tolerances specified herein shall be corrected by the Contractor in a manner approved by the Construction Manager and at the Contractor's expense.

Subsection (b), the first paragraph is superseded with the following:

- (b) The Contractor shall order and furnish pile lengths on site so that in place piles of 12 m or less are full un-spliced lengths; in place piles greater than 12 m but less than 25 m have no more than one splice; in place piles greater than 25 m have no more than two splices; unless otherwise specifically approved by the Construction Manager. When test piles or first piles driven show that splices will be required, the Contractor shall make every effort to place the splice in the lower half of the production or subsequent piles. The Contractor shall also order and furnish pile lengths on site so that splice lengths of less than 3 meters not utilized unless specifically approved by the Construction Manager on a case by case basis.

551.11 Splices:

Delete the first paragraph and insert the following:

Splices shall be as detailed on the plans. Align and connect pile sections so the axis of the spliced pile is straight.

Subsection (a), last paragraph, delete the last sentence and add the following:

All field welding (splices and other connections to piling) shall be tested for structural integrity by magnetic particle testing in accordance with AASHTO/AWS D 1.5 Welding Code by a certified welding inspector. The welding inspector's certification shall be submitted for review and approval prior to any testing. All welds shall pass the magnetic particle test or be removed and re-welded. If additional driving of a pile is required after a splice is made, the splice shall be tested and approved prior to further driving of the pile.

rev: 10/03/18

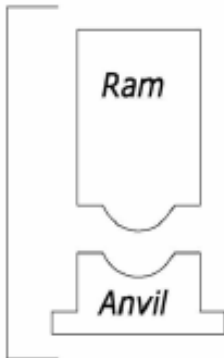
SECTION 551. - PILING

Pile Driving Equipment Data Sheet

Project: _____ Structure Name: _____

Contract No.: _____ Pile Driving Contractor: _____

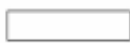
Hammer Components



Hammer

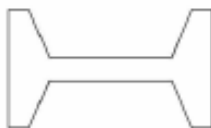
Manufacturer: _____
 Model: _____ Type: _____
 Serial No.: _____
 Rated Energy: _____ at _____ length of stroke

Modifications: _____



**Capblock
(Hammer
Cushion)**

Material: _____
 Thickness: _____ Area: _____
 Modulus of Elasticity (E): _____
 Coefficient of Restitution (e): _____



Pile Cap

Helmet
Bonnet
Anvil Block
Drivehead

Weight: _____



**Pile
Cushion**

Cushion Material: _____
 Thickness: _____ Area: _____
 Modulus of Elasticity (E): _____
 Coefficient of Restitution (e): _____



Pile

Pile Type: _____ Weight/foot: _____
 Wall Thickness: _____ Taper: _____
 Cross Sectional Area: _____
 Design Pile Capacity: _____ (Tons)
 Length (in leads): _____
 Description of Splice: _____

 Tip Treatment Description: _____

Note: If mandrel is used to drive the pile, attach separate manufacturer's detail sheet(s) including weight and dimensions.

Submitted by: _____ Date: _____

Pile Driving Record

Project: _____						Date: _____					
Contractor: _____						Inspector: _____					
Structure: _____						Pile Location: _____					
Saximeter No: _____			Time			Start: _____			Stop: _____		
Pile No.: _____		Type: _____		Size: _____		Length: _____		Batter: _____			
Elev. Ground: _____			Pile Tip: _____			Cutoff: _____					
Hammer Make/Model: _____											
Hammer Cushion Type/Thickness: _____											
Pile Cushion Type/Thickness: _____											
Throttle Setting: _____				Energy/Blow: _____				Blows/Min: _____			

Depth	Blows /Inch	Stroke Pressure	Depth	Blows /Inch	Stroke Pressure	Depth	Blows /Inch	Stroke Pressure	Depth	Blows /Inch	Stroke Pressure
3 ft.			24 ft.			45 ft.			66 ft.		
6 ft.			27 ft.			48 ft.			69 ft.		
9 ft.			30 ft.			51 ft.			72 ft.		
12 ft.			33 ft.			54 ft.			75 ft.		
15 ft.			36 ft.			57 ft.			78 ft.		
18 ft.			39 ft.			60 ft.			81 ft.		
21 ft.			42 ft.			63 ft.			84 ft.		

Remarks:

TEST PILE RECORD

For specified test pile, otherwise for first pile driven in each abutment or pier.

Page _____ of _____

Project No.: _____ Abut/Pier No.: _____ Contractor: _____

Pile No.: _____ Pile Type: _____ Heat No.: _____

Date: _____ Starting Time: _____ Ending Time: _____

Hammer Make: _____ Hammer Model: _____ Hmr. Ser. No.: _____

Ground Elev.: _____ Cut-off Elev.: _____ Observers: _____

FINAL TIP ELEVATION: _____ FINAL PILE LENGTH: _____ FINAL ULT. PILE CAP.: _____

[illegible]

Inspection Firm:

Inspector's Signature:

SECTION 552. - STRUCTURAL CONCRETE

552.01 **Description.** Add the following to this subsection: This section 552 supplements Article 6.3 of Exhibit A.

552.03 **Composition (Concrete Mix Design).**

Add the following to Paragraph two:

FWHA Form 1608 is provided at the end of this Supplemental Specification.

Add to subparagraph (s):

Material certifications for fly ash when used in a concrete mix design.

552.08 **Delivery.**

Add the following:

If the time limits provided in Table 552-4 cannot be met, the Contractor shall deliver by the dry batch method or utilize a portable batch plant on site in order to achieve the time limits specified. Extended time limits may be considered on a case by case basis provide that supporting data and case histories showing conformance to all contract specifications for similar class and strength concrete delivered to similar remote locations are submitted for review and approval.

552.11 **Handling and Placing Concrete.**

Add the following to subparagraph 552.11(a):

Concrete shall not be placed next to adjacent previous concrete placements until 24 hours has elapsed.

Add the following to subparagraph 552.11(b)(3):

When cast in place concrete bridge decks are specified, the Contractor shall develop and submit to the Construction Manager for review and approval a bridge deck placement plan addressing all applicable requirements within the contract. No concrete shall be placed in the bridge deck until the bridge deck placement plan is approved in writing by the Construction Manager.

552.13 **Expansion and Contraction Joints.**

Add the following subparagraph 552.13(f):

(f) Bridge Deck Expansion Joints. The Contractor shall submit to the Construction Manager for review approval by the Engineer shop drawings for manufactured expansion/contraction joints to be placed at expansion joints in the bridge deck. The shop drawings shall conform to Subsection 104.03 of the Standard Specifications and the details shown in the plans. Expansion joint installation shall not begin until approval of the shop drawings has been given in writing by the Construction Manager. An expansion joint manufacturer's representative shall be present during installation procedures.

The Contractor shall submit for approval material certifications in accordance with Section 106 of the Standard Specifications for all materials incorporated into manufactured expansion/contraction joints. The material certifications shall certify conformance of material to specified requirements of this contract.

552.14 Finishing Plastic Concrete.

Add the following to subparagraph 552.14(a):

The finishing machine, unless otherwise shown on the plans or approved in writing by the Construction Manager, shall be operated with the skew. The finishing machine shall not be allowed to travel over in-place concrete after initial set takes place, or on forms supporting concrete or support rails for the finishing machine, until the previously placed concrete has cured for at least 3 days.

When float finishing is provided by hand, the float finishing shall commence immediately after the finishing machine.

Add the following to the first paragraph of subparagraph 552.14(b):

Check all abutment cap, pier cap, back wall and wing wall top surfaces where elevations are given on the construction plans. Check the entire surface from given elevation to given elevation in all directions.

Add the following to subparagraph 552.14(c)(1):

When tining grooves are provided by tining float, the tining groove placement operations shall begin immediately after the finishing machine and float finishing are completed.

Add the following to subparagraph 552.14(d):

Alternatively, the concrete area beneath bearing devices may be finished to the exact elevation and/or grade specified on the plans, by using a steel trowel. The surface produced shall be a smooth and uniform plane.

Add the following subparagraph:

(f) Abutment Caps and Pier Caps.

Finish the tops of abutment caps and pier caps to within 5 millimeters of the plan elevations. When tops of abutment caps and pier caps are to be bearing surfaces for prestressed box beams, provide straight edging in accordance with Section 552.14 (b), including supplemental specifications, and finish with a steel trowel to produce a smooth surface free of bleed water.

552.15 Curing Concrete.

Add the following to this subparagraph:

(a) Forms in-place method

All joints in the forms and the joints between the end of forms and concrete shall be kept moisture tight during the curing period. Cracks in the forms and cracks between the forms and the concrete shall be resealed by methods subject to the approval of the CM.

552.17 Concrete Anchorage Devices.

Add the following:

The Contractor shall submit for approval shop drawings for fabricated devices (such as guard angles) other than reinforcing steel to be inserted or cast in structural concrete. The shop drawings shall conform to Subsection 104.03.

The Contractor shall submit for approval material certifications in accordance to Section 106 of the Standard Specifications for all materials incorporated into fabricated devices to be inserted or cast in structural concrete. The material certifications shall certify conformance of material to specified requirements of this contract.

Add the following renumbered-sections:

552.20 Sealing Existing Concrete Surface.

552.21 Acceptance.

552.22 Measurement

552.23 Payment.

552.20 Sealing Existing Concrete Surface.

When specified in the plans, existing bridge decks and all approach slabs shall receive a sealer using a High Molecular Weight Methacrylate (HMWM) concrete sealant. The sealant shall be placed in accordance with the construction plans and manufacturer recommendations. Prior to placement of sealant, the Contractor shall:

(a) Prepare a complete work plan addressing all aspects of the sealant work including:

- (1) Preparation
- (2) Method of placement
- (3) Application rates
- (4) Curing methods
- (5) Cleanup
- (6) Traffic Control
- (7) Brand name of the product proposed with manufacturers requirements
- (8) Environmental compliance procedures

No work on sealant placement may proceed until the work plan has been reviewed by the CM and approved.

- (b) Insure that all required personnel and traffic control is in place at the time of sealant placement.
- (c) Delineate the application area and insure that enough sealant material is on hand as required by the manufacturer.
- (d) Clean the bridge deck and approach slabs by either high pressure air blasting or high pressure water at least two hours before the application is to take place unless the manufacturer recommends otherwise in writing.
- (e) Insure that all environmental requirements are adhered to throughout the sealant placement process.
- (f) Apply anti-skid material (i.e. such as clean sand) as recommended by the manufacturer prior to curing.
- (g) Do not allow traffic onto the sealed areas until curing is completed or unless otherwise directed by the manufacturer in writing.

552.21 Acceptance.

Add the following:

Acceptance of structural concrete shall be based on the sampling, testing and results obtained by the Contractor in accordance with subsection 552.09 of the Standard Specifications and as modified by these Supplemental Specifications.

Table 552-9 is superseded with the following:

**Table 552-9
Sampling and Testing Requirements**

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Aggregate source quality (703.02)	Measured and tested for conformance (106.04 & 105)	Quality	—	AASHTO M 80	1 per material type	Source of material	Yes, when requested	Before producing
Concrete composition (mix design)	Measured and tested for conformance (106.04 & 105)	All	—	Subsection 552.03	1 per mix design	Source of material	Submit to Construction Manager	Before producing
Produced aggregate (fine & coarse)	Measured and tested for conformance (106.04	Gradation	—	AASHTO T 27 & T11	1 per day	Flowing aggregate stream (bin, belt, discharge conveyor belt, or stockpile)	Yes, when requested	Before batching
		Fineness modulus	—	AASHTO T 27	1 per day	“	“	“
		Moisture test	—	AASHTO T 225	1 per day	“	“	“

**Table 552-9
Sampling and Testing Requirements**

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Concrete (552.09(b)(3))	Measured and tested for conformance (106.04)	Slump	--	AASHTO T 119	1 per load ⁽²⁾	Point of discharge ⁽¹⁾	—	Upon completing tests
		Air content	--	AASHTO T 152 or AASHTO T 196	1 per load ⁽²⁾	“	—	“
		Unit mass	--	AASHTO T 121	1 per load ⁽²⁾	“	—	“
		Temperature	--	Thermometer	1 per load	“	—	“
		Yield	--	AASHTO T 121 & approved mix design	First 3 loads; Note (4)	Point of discharge ⁽¹⁾	—	Upon completing tests
Structural concrete (552.09(b)(3))	Statistical (106.05)	Compressive strength	II	AASHTO T 22 & T23	1 set per 25m ³ but not less than 1 per day	Discharge stream at point of placing	Note 5	See Subsection 552.09(b)(4)

(1) Sample according to AASHTO T 141 except composite samples are not required.

(2) Cast at least 4 compressive strength test cylinders and carefully transport the cylinders to the job site curing facility.

(3) A single compressive strength test result is the average result from 2 cylinders cast from the same load and tested at 28 days.

(4) The yield of the concrete shall be determined by taking the total weight of the batch divided by the average unit weight of the first three (3) concrete truck loads. If the yield value is "under-yield" (less than 0.765 cubic meters or 27 cubic feet per cubic yard); the Contractor and his supplier shall make an adjustment to the concrete mix design. Once the adjustment is made, the Contractor shall check the yield again to ensure the yield is at 0.765 cubic meters or more.

(5) Deliver cylinders to designated laboratory for test.

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552 STRUCTURAL CONCRETE MIX DESIGN SUBMITTAL

Project: _____ Date: _____

Contractor: _____ Concrete for _____ Concrete producer: _____

Class of concrete: _____ Exposure Class: _____ Producer Mix designation: _____

☐ METRIC ☐ ENGLISH

SPECIFIED CONCRETE COMPRESSIVE STRENGTH (@ 28 Days)..... (f'c) _____

Required average concrete compressive strength used for mixture proportion selection¹ (f'cr) _____

MIXTURE PROPORTIONS

Material	Specific Gravity	Mass	Absolute Volume	Tolerance % (±)	Admixtures	Dosage
Cement (Portland or Blended)	_____	_____	_____	1	Air entraining	_____
Fly Ash (Class F or C)	_____	_____	_____	1	Type A (Water Reducer - WR)	_____
Water	1.0	_____	_____	1	Type B (Set Retarder - SR)	_____
Coarse aggregate (SSD)	_____	_____	_____	2	Type C (Set Accelerator - SA)	_____
Fine aggregate (SSD)	_____	_____	_____	2	Type D (WR & SR)	_____
Fibers	_____	_____	_____	3	Type E (WR & SA)	_____
Color Pigments	_____	_____	_____	3	Type F (High Range WR)	_____
Other _____	_____	_____	_____		Type G (High Range WR & SR)	_____
Total air _____					Hydration Stabilizer (B or D)	_____
Totals		0.0	0		Other _____	_____

FRESH CONCRETE PROPERTIES

Water/cementitious materials ratio (by mass)² _____ Theoretical unit mass: _____
Measured unit mass (AASHTO T 121): _____ Measured air content (AASHTO T 152 or T 196): _____ %
Concrete Temperature (AASHTO T 309): _____ Measured slump (AASHTO T 119): _____

HARDENED CONCRETE PROPERTIES

Average 28-day strength designated in specifications, _____ : _____ Average 7-day strength, _____ : _____
If the concrete is subjected to elevated temperature curing, note the maximum curing temperature: _____
Water-soluble chloride-ion (Cl⁻) in hardened concrete by weight of cement: _____ %³

Signature _____ Print Name _____ Date _____

¹ Design in accordance with FP and specified ACI standards found in the contract.

² The ratio of the mass of water, exclusive only of that absorbed by the aggregate, to the combined mass of cementitious materials (i.e. cement, fly ash, silica fume and ground granulated blast furnace slag (GGBFS)).

³ Provide for reinforced and prestressed concrete when required in accordance with contract specifications.

552 STRUCTURAL CONCRETE MIX DESIGN SUBMITTAL (Continued)**CEMENT (AASHTO M 85 – TYPES I, IA, II, IIA, III, IIIA or V OR AASHTO M 240 – TYPES I(PM), IP, P, I(SM) or IS) ⁴**Certification attached : ☐ Yes ☐ No _____**FLY ASH (AASHTO M 295 – CLASS C or F) ⁴**Certification attached : ☐ Yes ☐ No _____**SILICA FUME (AASHTO M 307 – RAW, SLURRIED OR DENSIFIED) ⁴**Certification attached : ☐ Yes ☐ No _____**GROUND GRANULATED BLAST FURNACE SLAG (GGBFS) (AASHTO M 302 – GRADE 100 or 120) ⁴**Certification attached : ☐ Yes ☐ No _____**WATER (AASHTO M 157 AND AASHTO T 26)**Reclaimed water or water of questionable quality will be used? ☐ Yes ☐ NoWill water be added at the discharge site? ☐ Yes ☐ No If yes, how much? _____**CHEMICAL, COLOR PIGMENTS, FIBERS AND OTHER ADMIXTURES ⁴**

Admixture Type ⁵	Point Admixture Added ⁶	Certification Attached
Air entraining (AASHTO M 154)	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No
Type A – Water reducing	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No
Type B – Set Retarding (AASHTO M 194)	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No
Type C – Set Accelerating (AASHTO M 194)	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No
Type D – Water Reducing and Set Retarding (AASHTO M 194)	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No
Type E – Water Reducing and Set Accelerating (AASHTO M 194)	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No
Type F – High Range Water Reducing (AASHTO M 194)	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No
Type G – High Range Water Reducing and Set Retarding (AASHTO M 194)	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No
Type B – Hydration Stabilizing (AASHTO M 194) _____ hours	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No
Type D – Hydration Stabilizing (AASHTO M 194) _____ hours	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No
Color Pigments (ASTM C 979)	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No
Fibers (ASTM C 1116) Type: _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No
Other _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No

⁴ Certifications documentation is required prior to approval of a mix design.⁵ Admixtures must be compatible and of the same type as those used in the mixtures from which strength data were obtained. Do not use chloride accelerators. Do not use set accelerating admixtures with Class P (Prestressed Concrete).⁶ Each point where admixture is added must be noted (i.e. concrete batching facilities, project site, etc) as well as the corresponding dosage.

552 STRUCTURAL CONCRETE MIX DESIGN SUBMITTAL (Continued)**FINE AGGREGATE (FP SECTION 703.01 AND AASHTO M 6, CLASS B)**

Name and phone number of fine aggregate supplier/producer: _____

Location of material source: _____

Material type: Manufactured sand ☐ % Natural sand ☐ % Blend ☐ %

Sieve Analysis: (AASHTO T 27)			Property	Specification	Specification	Value
Sieve Size	% Passing (P) (Specification)	Cumulative % Retained (CPR)	(1) Clay lumps and friable particles	AASHTO T 112	3.0% max	
	(100)		(2) Coal and lignite	AASHTO T 113	1.0% max	
	(95-100)		(3) Minus	AASHTO T 11	3.0% max	
	(80-100)		(4) Organic Impurities	AASHTO T 21	Color not darker than standard	<input type="checkbox"/> Yes <input type="checkbox"/> No
	(50-85)		(5) Sodium sulfate soundness, 5 cycles	AASHTO T 104	10% max	
	(25-60)		(6) Sand Equivalent, Alt method 2, referee method	AASHTO T 176	75% min	
	(10-30)		(7) Bulk specific gravity	AASHTO T 84	--	
	(2-10)		(8) Bulk SSD specific gravity	AASHTO T 84	--	
Fineness modulus ($\Sigma \text{CPR}/100$)			(9) Absorption	AASHTO T 84	--	
			(10) Alkali Silica Reactivity ⁷	Select/Enter		

COARSE AGGREGATE (FP SECTION 703.02 AND AASHTO M 80, CLASS A)

Name and phone number of coarse aggregate supplier/producer: _____

Grading number (AASHTO M43) Location of material source: _____ Material type: _____

Sieve Analysis: (AASHTO T 27)			Property	Specification	Specification	Value
Sieve Size	Percent Passing	AASHTO M 43 Specification ⁴	(1) Clay lumps and friable particles	AASHTO T 112	2.0% max	
			(2) Deleterious chert	AASHTO T 113	3.0% max	
			(3) Σ (1) + (2)	AASHTO T 112 & T 113	3.0% max	
			(4) Minus	AASHTO T 11	1.0 or 1.5% max	
			(5) Coal and lignite	AASHTO T 113	0.5% max	
			(6) LA abrasion Grading	AASHTO T 96	40% max	
			(7) Sodium sulfate soundness, 5 cycles	AASHTO T 104	12% max	
			(8) Adherent coating	ASTM D 5711	1.0% max	
			(9) Dry rodded unit mass	AASHTO T 19	--	
			(10) Mass of insoluble residue (bridge decks or surface courses)	ASTM D 3042	25% min	
			(11) Bulk specific gravity	AASHTO T 85	--	
			(12) Bulk SSD specific gravity	AASHTO T 85	--	
			(13) Absorption	AASHTO T 85	--	
			(14) Alkali Silica Reactivity ⁷	Select/Enter		

⁷ See specific contract requirements for ASR test methods and limits..

552 STRUCTURAL CONCRETE MIX DESIGN (Continued)
DATA FOR COMPUTING THE STANDARD DEVIATION

Cylinder Size: ☐

or ☐

1 Test Record⁸ ☐ or 2 Test Records ☐

Consecutive Strength Test	Date Batched ⁸	Compressive Strength - at 28 days			
		Cylinder 1	Cylinder 2	Cylinder 3	Strength Test X _i ⁹
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					

$$\bar{X} = \frac{\sum X_i}{n} = \frac{\quad}{\quad} = \quad$$

For One Test Record:

$$s_s = \sqrt{\frac{\sum (X_i - \bar{X})^2}{(n - 1)}} = \quad$$

For Two Test Records:

$$\bar{s}_s = \sqrt{\frac{(n_1 - 1)(s_{s1})^2 + (n_2 - 1)(s_{s2})^2}{(n_1 + n_2 - 2)}} = \quad$$

Where:

\bar{X} = average of n strength test results n = number of consecutive strength tests s_{s1}, s_{s2} = sample standard deviations (1 & 2)
 X_i = individual strength tests s_s = sample standard deviation, n_1, n_2 = number of tests in each test record

\bar{s}_s = statistical average standard deviation where two test records are used to estimate the sample standard deviation.

⁸ The test records must be no more than 12 months old and consist of at least 30 consecutive tests or two groups of consecutive tests totaling at least 30 tests. If 15 to 29 consecutive test records are provided, they must represent a single record of consecutive tests that span a period of not less than 45 calendar days. All test records must also represent materials, quality control procedures and conditions similar to those expected and changes in materials and proportions within the test records must not have been more restricted than those for proposed work. In addition, they must represent concrete produced to meet a specified strength or strengths within of f'c.

⁹ A strength test shall be the average of at least two 6 by 12-inch cylinders or at least three 4 by 8-inch cylinders made from the same sample of concrete and tested at 28 days or at test age designated in the specification for f'c.

552 STRUCTURAL CONCRETE MIX DESIGN SUBMITTAL (Continued)
DETERMINATION OF REQUIRED AVERAGE COMPRESSIVE STRENGTH

REQUIRED AVERAGE COMPRESSIVE STRENGTH (f_{cr})¹⁰

☐ **Case 1 – Required Average Compressive Strength with Test Records of 30 or More Consecutive Tests:**

Table 1	
Specified Compressive Strength, f'_c	Required Average Compressive Strength* f_{cr}
$f'_c \leq$	<i>Use the larger value computed from the following equations:</i> $f_{cr} = f'_c + 1.34ks_s$ (1) $f_{cr} = f'_c + 2.33ks_s -$ (2)
$f'_c >$	<i>Use the larger value computed from the following equations:</i> $f_{cr} = f'_c + 1.34ks_s$ (1) $f_{cr} = 0.90f'_c + 2.33ks_s$ (3)

* k is equal to 1.00 if the total number of tests are greater than or equal to 30

$f_{cr} =$ $\bar{X} =$ $\bar{X} \geq f_{cr}$ ☐ Yes ☐ No

☐ **Case 2 – Required Average Compressive Strength with Test Records of 15 to 29 Consecutive Tests:**

Table 2 (k-modification Factor for use in Table 1)	
Number of Tests*	k-modification Factor for Sample Standard Deviation ⁺
15	1.16
20	1.08
25	1.03
30 or more	1.00

*Interpolate for intermediate numbers of tests

⁺k-modified sample standard deviation used to determine required average strength f_{cr} in Table 1

$f_{cr} =$ $\bar{X} =$ $\bar{X} \geq f_{cr}$ ☐ Yes ☐ No

☒ **Case 3 – Required Average Compressive Strength with Test Records less than 15 Consecutive Tests:**

Table 3	
	Required Average Compressive Strength
$f'_c <$	$f_{cr} = f'_c +$
$\leq f'_c \leq$	$f_{cr} = f'_c +$
$f'_c >$	$f_{cr} = 1.10f'_c +$

$f_{cr} =$ $\bar{X} =$ $\bar{X} \geq f_{cr}$ ☐ Yes ☐ No

¹⁰ Required concrete proportions may be established by interpolation between strengths and proportions of two or more test records. When an acceptable record of field test results is not available, concrete proportions shall be established from trial mixtures or based upon experience or information, if approved by the Materials Engineer. Submit documentation of test records, trial mixtures or information.

SECTION 553. - PRESTRESSED CONCRETE

553.01 **Description.** Add the following to this subsection: This section 553 supplements Article 6.3 of Exhibit A.

553.08 **Pretensioned Members.**

Add the following:

Prepare and submit shop drawings (to the Construction Manager) for the required pretensioned members for review and approval according to subsection 104.03 and Special Contract Requirement #9.

Show full detailed dimensions and sizes of manufactured or fabricated components of the prestressed member and details of all miscellaneous and incidental parts (such as prestressing strands, reinforcing steel, inserts, bearing pads, restrainer devices, bearing plates, lifting devices, etc.) on shop drawings for prestressed concrete members. Submit shop drawings at least 4 weeks prior to fabrication. Fabrication shall not begin prior to written approval of prestressed member shop drawings.

Identify on the shop drawings the specification, type, grade, class and/or other specified characteristic, as stated in the plans and specifications, of all materials and parts indicated above where applicable.

Identify on the shop drawings the individual members required by the contract by separate mark suitable for use as reference during inspection, transportation and erection.

553.09 **Storing, Transporting and Erecting.**

Add the following:

Use plastic, wooden, (or other material that will not damage or discolor precast beams) corner protectors for securing precast beams during transporting so that corners and edges of precast members are not damaged by tie down chains.

When erecting prestressed concrete box beams, begin placement of the first member at the centerline of roadway and proceed outwards on each side of centerline (in an alternating fashion) in order to assure all members are properly centered on the bridge centerline.

When box beams are designed to be tied together by tie rods, place box beams in direct contact with adjacent beams during erection operations. Do not rely on tie rod tensioning to produce beam contact.

553.12 Acceptance.

Add the following:

The Contractor shall submit for approval material certifications in accordance with Section 106 and Special Contract Requirements for all materials incorporated into fabricated precast prestressed members and for the bearing devices. The material certifications shall certify conformance of material to specified requirements of this contract.

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SECTION 554. - REINFORCING STEEL

554.01 **Description.** Add the following to this subsection: This section 554 supplements Article 6.3 of Exhibit A.

554.08 **Placing and Fastening:**

Delete the first paragraph and substitute the following:

Reinforcing bars shall be supported on metal (Class 1 or Class 2, Type B) supports for concrete placements against forms or false work. Support reinforcing bars on concrete (mortar) block supports only for concrete placements against compacted soil.

554.09 **Splices:**

Add the following:

Splices added for the convenience of the Contractor (i.e. splices not shown on the plans) shall be requested in writing by the Contractor and be approved in writing by the Engineer prior to utilization. Material required for splices for the convenience of the Contractor shall not be measured for payment but shall be provided at the entire expense of the Contractor.

Delete the third paragraph and substitute the following:

Welding of splices shall not be permitted.

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SECTION 556. – BRIDGE RAILING

556.01 **Description.** Add the following to this subsection: This section 556 supplements Article 6.3 of Exhibit A.

556.03 **General.**

Add the following:

The Contractor shall submit shop drawings (to the Construction Manager) for review and approval of fabricated bridge railing or parts thereof. The shop drawings shall conform to Subsection 104.03 and Special Contract Requirement (9). Shop drawings shall convey the layout and dimensions shown in the construction plans.

The Contractor shall submit for approval material certifications in accordance with Section 106 and the Special Contract Requirement (9) for all materials incorporated into fabricated bridge railing or parts thereof. The material certifications shall certify conformance of material to specified requirements of this contract.

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SECTION 562. - TEMPORARY WORKS

562.01 **Description.** Add the following to this subsection: This section 562 supplements Article 6.3 of Exhibit A.

562.02 **Material:**

Add the following:

When permanent steel (stay in place) deck forms are permitted by the Contract, all material and elements of the permanent steel deck form units shall be fabricated from steel conforming to ASTM A 653M (A653) Grades 275 (40) or 340 (50). Coating shall be a minimum of Class Z500 (G165). Thickness and grade of form sheets and form supports shall be designated on the shop drawings as such, and shall be submitted for review and approval of the Construction Manager. In no case shall thickness be less than 0.85 mm (22 gauge) and 1.61 mm (16 gauge) for sheets and form supports, respectively.

562.03 **Design Requirements:**

Delete the last sentence in this Section and add the following:

Use permanent steel (stay in place) deck forms only when permitted by the Contract. Permanent steel forms shall not be used in decks where longitudinal deck slab construction joints are located between stringers.

Permanent steel forms shall be designed to support superimposed dead loads of the forming system, reinforcement, plastic concrete, and a live load of 2.4 kPa (50 psf). Unit working stresses shall not exceed $0.725 f_y$ (72.5%) of the specified minimum yield strength of the material furnished or 248 MPa (36 ksi), whichever is less.

Maximum deflections under the weight of the plastic concrete, reinforcement, and form system, shall not exceed $1/240$ of the form span, or 13 mm (1/2 in.), whichever is less. In no case shall the loading used to compute the deflection be less than 5.8 kPa (120 psf). The form span for design and deflection shall be the clear distance between the flanges of the supporting beams or girders minus 50 mm (2 in.), measured parallel to the form flutes.

The increase in dead load due to the use of permanent steel deck forms shall be limited to 0.7 kPa (15 lbs./ft²). If this limit is exceeded, the Contractor shall show that the effects of the additional load on the bridge will not be detrimental, or shall strengthen the structure as will be necessary to accommodate the extra load, at the Contractors expense.

Physical design properties of the forming system shall be computed in accordance with requirements of the American Iron and Steel Institute Specification for the Design of Cold-Formed Steel Structural Members, latest published edition. The Contractor shall design the permanent steel deck forms so that the deck slab laterally supports the beam or girder top flanges in compression, except where shear connectors are provided.

562.06 Construction:

Add the following:

When permanent steel (stay in place) deck forms are permitted by the Contract, install forms according to fabrication and erection drawings that have been approved for the specific project by the Construction Manager.

Form sheets shall not be permitted to rest directly on the top of the stringer, diaphragms or floor beam flanges. Sheets shall be securely fastened to form supports and shall have a minimum bearing width parallel to the beam or girder of 25 mm (1 in.) at each end. Form supports shall be placed in direct contact with the flange of beams or girders. All attachments shall be made by welds, bolts, clips or other approved method. Welding directly to steel girder or beam flanges shall not be permitted. Other methods of attachment for steel girders or beams shall be used. Welding to steel clips embedded into precast concrete girders or beams is permitted.

Clean, wire brush, and paint with 2 coats of zinc dust zinc-oxide primer (FSS TT-P-641 Type II, no color added) any permanently exposed form metal where the galvanized coating has been damaged. Minor heat discoloration, as determined by the Construction Manager, in areas of welds need not be touched up.

All bottom reinforcement shall have a minimum cover of 25 mm (1 in.). Except in cases where reinforcing bars are not parallel to form corrugations, bars in the bottom layer of the main reinforcement shall be approximately centered over the valleys of the forms when necessary to achieve the required concrete cover. The distance from the top of the slab to the bottom layer of main slab reinforcement shall not be less than the originally designed dimension shown in the contract.

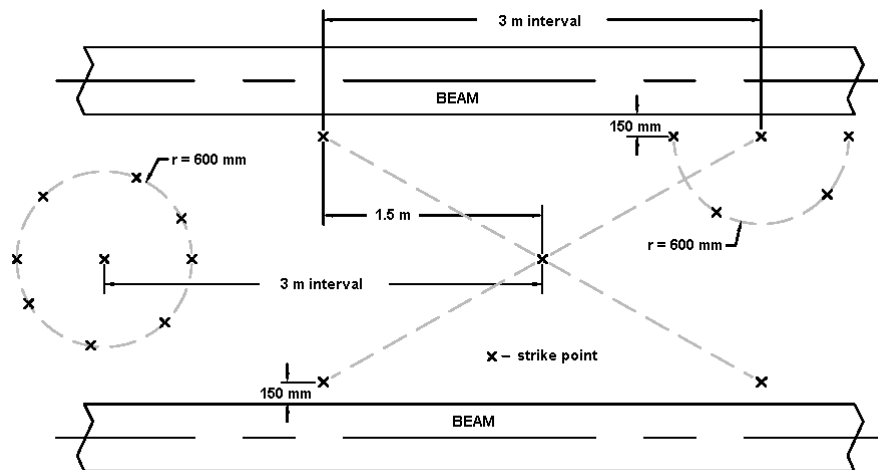
Locate transverse construction joints in slabs, when approved or allowed, in line with the bottom of a flute. Field drill six (6) millimeter diameter weeps holes at not less than 300 millimeters on center along the line of the transverse construction joint.

562.07 Maintenance and Inspection:

Add the following:

When permanent steel (stay in place) deck forms are permitted by the Contract, proper vibration of the concrete shall be provided to avoid honeycombs and voids, especially at construction joints, expansion joints, and valleys and ends of form sheets. If during the placement of the deck concrete there is evidence provided by the Construction Manager to question the consolidation of the concrete, the procedure outlined below shall apply. The Contractor shall furnish suitable facilities to provide safe access to the work for the purpose of inspection. A minimum of two days after the deck concrete has been placed one or more from the following inspection procedures may be followed:

- (a) The forms shall be tested for soundness of the concrete and bonding of the forms to the concrete by striking the forms a sharp blow with a geologist hammer as detailed below and as instructed by the Construction Manager. The geologist hammer shall be furnished by the Contractor.
- (b) As a minimum, the forms shall be struck at 3 m (10 ft.) intervals parallel to and 150 mm (6 in.) from the edge of the beam or girder flanges and at 3 m (10 ft.) intervals along the centerline of each bay between the beams or girders in an X pattern with those along the beams or girders. Forms shall also be struck at random points on a semicircle or circle of about a 600 mm (2 ft.) radius from the above points. See figure below for minimum strike pattern. Forms shall be struck in other places as directed by the Construction Manager to define suspicious or defective areas.



- (c) The cost of the inspection including providing access shall be measured and paid under bid Item 15301-0020, Contractor Quality Control. If areas of voids, honey combs, water pockets, or other defects are discovered, they shall be replaced or repaired to the satisfaction of the Construction Manager at the expense of the Contractor.

SECTION 564. - BEARING DEVICES

564.01 **Description.** Add the following to this subsection: This section 564 supplements Article 6.3 of Exhibit A.

564.11 **Measurement.**

This paragraph is superseded with the following:

Any bearing devices, including elastomeric bearing pads, specified in the design plans shall not be measured for payment but shall be considered incidental to the Steel Girder members and/or Prestressed Concrete Structural Members furnished under the appropriate bid items.

rev: 09/26/17

SECTION 570. - PREFORMED CLOSED CELL FOAM BRIDGE JOINT SEALS

570.1 Description. This Work consists of providing and installing ultraviolet resistant Evazote or equivalent joint seal systems in accordance with the manufacture's recommendations and as approved by the Construction Manager.

570.2 Materials

General. Select sealing material and the nosing elements from the Arizona DOT or New Mexico DOT's Approved Products Lists for Preformed Closed Cell Foam Bridge Joints. Provide sealing, bonding and nosing elements from the same manufacturer.

Closed Cell Foam Joint Seal. Use a joint seal that:

- is an impermeable, closed-cell, cross-linked, ethylene vinyl acetate, low density polyethylene copolymer, nitrogen blown foam material,
- has a minimum working range of 60% compression and 30% tension,
- meets or exceeds the requirements listed in Table 570.2.2:1 below,
- has 1/8 inch deep by 1/8 inch wide grooves spaced at 1/4 inch to 1/2 inch along both sides of the joint and running the entire length of the joint to increase bond surface area,
- is resistant to degradation due to ultraviolet radiation,
- is self-extinguishing,
- is resistant to abrasion, oxidation, oils, gasoline, road salts and other petroleum products that may be spilled on the surface.

Table 570.2.2:1
Minimum Requirements for Preformed Joint Sealer

Property	Requirement
Service Range	-94 – 160 degrees F
Tensile Strength	110 psi min
Elongation at break	235% min
Tear Resistance (ASTM D-624)	20 lb/inch min
Water Absorption (ASTM 3573, Suffix L)	0.035 psf max
Density	2.6 – 4.0 psf
Weathering (ASTM G-154)	3000 Hrs no chalking, flaking, blistering, checking, and cracking
Recovery (ASTM D-545)	97% min
Compression / Deflection	
@ 25% Deflection of original width	10 psi
@ 59% Deflection of original width	20 psi

Bonder. Use a bonder that is a two (2) component, 100% solid epoxy adhesive designed to bond joint material to steel, cured concrete or wood, and is approved by the manufacturer.

570.3 Measurement. Any bridge joint sealing systems specified in the design plans shall not be measured for payment but shall be considered incidental to the structural concrete furnished under the appropriate bid items.

571.04 Payment. No individual payment will be made.

Rev: 03/18/20

SECTION 571. – CONCRETE CRACK SEALING USING LOW-VISCOSITY, GRAVITY-FED SEALERS

Add this new section as follows:

571.01 Description.

This work consists of crack sealing horizontal concrete surfaces such as concrete bridge decks and approach slabs using low-viscosity, gravity-fed sealers.

571.02 Materials.

High Molecular Weight Methacrylate (HMWM); provide low viscosity, non-fuming HMWM resin in accordance with Table 570-1, “HMWM Resin Property Requirements.”

Table 570-1 HMWM Resin Property Requirements

Property	Test	Requirements
Viscosity, centipoises ^a	-	8 - 25
Specific gravity	-	1.00 – 1.07
Flash point, °C (°F), minimum	Pinsky-Martens CC	82 (180)
Tensile elongation, %, minimum	ASTM D 638	5
Surface cure, hours, max. @ 23 °C (73 °F)	-	8
Surface cure, hours, max. @ application temperature	-	24
Gel time, minutes, @ application temperature, 50 ml sample	-	20 - 90

^a Brookfield Model LVT Viscometer, Spindle I at 60 rpm.

Low Viscosity, Low Surface Tension Polymer; use low-viscosity, low surface tension polymer in accordance with Table 570-2 “Low-Viscosity, Low Surface Tension Crack Sealer Requirements.”

Table 570-2 Low-Viscosity, Low Surface Tension Crack Sealer Requirements

Property	Value
Compressive strength MPa (psi), ASTM D 695, minimum @ 24 hours	37.9 - 41.4 (5,500 - 6,000)
Tensile strength MPa (psi), ASTM D 638, minimum @ 24 hours	21.4 - 23.4 (3,100 - 3,400)
Tensile elongation, %, ASTM D 638, minimum @ 24 hours	30
Water absorption, % by weight, ASTM D 570, maximum @ 24 hours	0.10
Shore D hardness, 25 °C (77 °F), minimum	65
Gel time, minutes – 207 mL (7.0 oz)	48 – 52
Surface tension, maximum	32 Dynes/cm
Percent solids	100
Adhesion to concrete	100% concrete failure

Sand; provide clean sand for spreading over treated areas that is free from dirt, clay, asphalt, and other Deleterious Materials, and has moisture content as specified by the sealer manufacturer. Provide sand in accordance with Table 570-3, “Fine Aggregate Gradation Requirements.”, unless otherwise recommended by the approved sealer manufacturer.

Table 570-3 Fine Aggregate Gradation Requirements

Sieve size	Percent (%) passing	
	Minimum	Maximum
2.36 mm (No. 8)	95	100
1.18 mm (No. 16)	30	70
600 µm (No. 30)	0	1
150 µm (No. 100)	0	1

Construction Requirements

571.03 General. Concrete surfaces to be sealed will be shown or described on the plans. Concrete surfaces to be sealed shall be sealed by applying the sealer to the entire surface shown or described on the plans in accordance with the sealer manufacturer's recommended method. When concrete sealing is specified for new concrete surfaces, do not apply sealant until after 28 days of curing has occurred and until the concrete has been accepted as conforming to the Contract specifications by the Government. When concrete sealing is specified for Latex Modified Overlays, do not apply sealant until after 7 days of curing has occurred and until the overlay has been accepted as conforming to the Contract specifications by the Government. Quality Control shall be performed during all aspects of the concrete sealing operations including inspection, documentation and recommendations for approval or non-conformance.

571.04 Planning and Demonstration. At least 15 days prior to the beginning of the concrete sealing work, submit a written crack-sealing plan that addresses all aspects of work for the preparation, furnishing, application and cleanup of the concrete sealant, and that includes the following for review and approval:

1. Traffic control details for all phases of work including preparation, application, sure and cleanup. Traffic control shall be in accordance with the MUTCD, latest edition;
2. Material descriptions including the brand name of the proposed product to be used, product data sheets, and manufacturer's recommendations for use as a concrete sealant;
3. Concrete deck preparation and application methods;
4. Safety considerations for concrete deck preparation personnel and sealing personnel; and
5. Plans to protect other persons, vehicles, and property from injury or damage.

No work shall commence until written approval of the work plan and the proposed product is granted by the Construction Manager.

571.05 Surface Preparation. Clean concrete surfaces specified to be sealed by high pressure water washing or compressed air blasting. If the sealer manufacturer recommends a different method of cleaning, then the recommended method shall be used. Remove asphalt material, oil, dirt, rubber, curing compounds, paint, and other Deleterious Materials by an approved method that will not damage the underlying concrete. Air blast, with oil free compressed air, or vacuum all loose material from visible cracks. Delineate the concrete surface to be sealed and assure there

is sufficient amount of sealer on hand to cover the delineated surface at the manufacturer's recommended application rate. Apply sealer when concrete surfaces and cracks are dry, and after approval is given by the Construction Manager.

- 571.06 Storage of Sealer.** Store the sealer or its components separately and within the manufacturer recommended temperature ranges.
- 571.07 Application of Sealer.** All environmental conditions (including but not limited to air temperature, concrete surface temperature, humidity, wind velocity, falling temperatures, any other condition that will prevent satisfactory application and/or performance) specified by the sealer manufacturer shall be adhered to. Follow the manufacturer's mixing and application recommendations. Apply the sealer in accordance with the manufacturer's application rate. Cease application if any condition changes beyond the manufacturer's recommended limit. Prior to use ensure that the curing period recommended by the manufacturer produces proper curing of the sealer. The Contractor shall inspect the underside of the concrete deck to determine if sealer is seeping through full depth cracks. If full depth cracks are discovered top deck surface sealing shall terminate and the full depth crack shall be sealed at the bottom surface with an approved sealer or filler that will stop further seeping. Top deck surface sealing may commence when further seeping is no longer observed.
- 571.08 Excess Sealer.** After the manufacturer's recommended time for allowing filling of cracks sweep away sealer that does not fill cracks, is not absorbed by the concrete surface, and fills or partially fills the grooves of a tined or grooved surface. Collect excess sealer in an approved manner and dispose of in accordance with manufacturer's recommendations, the Contract requirements, and local and Federal regulations.
- 571.09 Sand Application.** Apply dry silica sand conforming to the fine aggregate specifications shown in Subsection 571.02 at the manufacturer's recommended application rate. Place sand before the sealer starts to gel. Remove excess sand after the curing period. Moisture content of the sand shall not exceed the manufacturer's recommended value.
- 571.10 Limitation of Operations.** Prevent the sealer from leaking through cracks or over the edge of the deck onto persons, traffic, and property. If deck preparation procedures or the sealer deface the appearance of bridge components other than the crack sealed areas, repair those components at no additional cost to the Government.
- 571.11 Acceptance.** Concrete crack sealers will be evaluated under Subsections 106.02 and 106.03. Fine aggregate (sand) will be evaluated under Subsection 106.02 and 106.03. Concrete crack sealing work will be evaluated under Subsection 106.02 and 106.04.
- 571.12 Measurement.** Any concrete crack sealing material specified in the design plans shall not be measured for payment but shall be considered incidental to the structural concrete furnished under the appropriate bid items.

571.13 Payment. No individual payment will be made.

Rev: 03/18/20

SECTION 601. - MINOR CONCRETE STRUCTURES

601.01 **Description.** This section 206 supplements Article 6 of Exhibit A.

601.03 **Concrete Composition.**

Subparagraph (g) is superseded with the following:

(g) Target values for concrete air content. Include the proposed range of air content for concrete to be incorporated into the work. Describe the methods by which air content will be monitored and controlled. Provide acceptable documentation that the slump and compressive strength of the concrete are within specified limits throughout the full range of proposed air content.

Add:

(j) Unit weight of concrete.

The compressive strength in table 601-1 is superseded with the following:

Minimum 28-day compressive strength, 20.7 MPa

601.07 **Acceptance.**

The third and last paragraphs are superseded with the following:

Portland cement concrete shall be evaluated for acceptance based on the concrete mixture's slump, air content, unit mass, and temperature per subsection 106.04.

Concrete compressive strength shall be evaluated under Subsection 106.05 for 25 cubic meters or more concrete placed and subsection 106.04 for less than 25 cubic meters of concrete placed. The lower specification limit is the minimum required compressive strength at 28 days specified in the contract.

Construction (including batching, placing, finishing, and curing concrete) will be evaluated under Subsections 106.02 and 106.04.

601.08 **Measurement.**

Add:

Reinforcing steel will not be measured for payment but shall be considered incidental to the work described in the design plans.

Table 601-2 is superseded with the following:

Table 601-2
Sampling and Testing Requirements

Material or Product	Property or Characteristic	Category	Test Methods or Specifications	Frequency	Sampling Point
Concrete	Slump	--	AASHTO T 119	1 per load ⁽²⁾	Discharge stream at point of placement ⁽¹⁾
	Air content	--	AASHTO T 152 or AASHTO T 196	1 per load ⁽²⁾	Discharge stream at point of placement ⁽¹⁾
	Unit weight	--	AASHTO T 121	1 per load ⁽²⁾	Discharge stream at point of placement ⁽¹⁾
	Temperature	--	Thermometer	First load	Discharge stream at point of placement ⁽¹⁾
	Making test specimens Compressive strength ⁽⁴⁾	II	AASHTO T 23 AASHTO T 22	1 set per 25 m ³ but not less than 1 set each day ⁽³⁾	Discharge stream at point of placement ⁽¹⁾

(1) Sample according to AASHTO T 141 except composite samples is not required.

(2) See Subsection 552.09(b) (3).

(3) Cast at least 4 compressive strength test cylinders and carefully transport the cylinders to the job site curing facility.

(4) A single compressive strength test result is the average result from 2 cylinders cast from the same load and tested at 28 days.

rev: 12/19/17

SECTION 602 - CULVERTS AND DRAINS

602.01 **Description:** This section 206 supplements Article 6 of Exhibit A.

This section is superseded with the following:

This work consists of constructing culverts, drains, and cast-in-placed and precast Concrete Box Culverts.

602.02 **Material:**

Add the following:

Concrete for cast-in-placed and precast box culverts552

Corrugated Steel (metal) Pipe culverts.....707.02

602.03 **Construction Requirements:**

Add the following:

Preparation for Placement of Precast Concrete Box Culvert Sections. In addition to the requirements of Section 209 and the construction plan details, perform the following:

- (a) The bedding under the box culvert must be able to support the full load of the installed box culvert, its contents, and the loading above the box culvert.
- (b) Control surface and subsurface water and moisture so dry conditions are present during excavation and site preparation. Dewatering shall be performed to produce dry conditions during foundation construction and section joining operations.
- (c) Compaction of foundation and bedding shall be provided in accordance with Section 209.11 of the FP-14.
- (d) The minimum thickness of bedding material conforming to Section 704.02 of the FP-03 shall be 150 mm.
- (e) Final grading of bedding material prior to placement of precast concrete box culvert sections shall be performed by screed board or other approved methods.

Lift holes and mechanical connections holes cast into sections of precast concrete box culverts shall be filled with an approved non-shrink grout and allowed to cure prior to backfilling.

A representative of the precast concrete box culvert manufacturer shall be present during the all phases of installation of the precast concrete box culvert sections.

602.04 Add the following:

(c) Joints for Precast Concrete Box Culvert Sections; Joints for precast sections shall be tongue and groove type. Joint surfaces shall be protected from mud, silt gravel or other foreign material prior to and during the joining procedures. Joints shall be sealed with preformed flexible joint seals conforming to ASTM C 990. Use the joint seal manufacturer's recommended primer for applicable conditions during joining of the precast sections. Remove and replace joint seals that become disturbed, displaced or contaminated. Sides and top surfaces of precast concrete box culvert section joints shall be further sealed with an exterior joint wrap conforming to ASTM C 990.

Precast concrete box culvert sections shall be joined by a method recommended by the manufacturer that does not cause any damage to the sections. Do not drive or ram sections by hand or machinery.

602.08 **Acceptance:**

The first paragraph is superseded with the following:

Material for culverts, drains, and cast-in-place concrete box culverts furnished will be evaluated under Subsections 106.02 and 106.03.

The second paragraph is superseded with the following:

Installation for culverts, drains, and cast-in-placed Concrete Box Culverts will be evaluated under Subsections 106.02 and 106.04.

602.09 **Measurement**

Add the following:

Wing walls for the cast-in-placed Concrete Box Culverts will not be measured for payment but will be considered a subsidiary obligation of the Contractor covered under the work for this section.

602.10 **Payment.** Payment for the work under this section shall be under the following bid items or as shown in the bid schedule:

<u>Pay Item</u>	<u>Pay Unit</u>
60221-3200 ___ Span, ___ Rise cast-in-place concrete box single barrel	Meter
60221-3250 ___ Span, ___ Rise cast-in-place concrete box single barrel	Meter
60222-3250 ___ Span, ___ Rise cast-in-place concrete box double barrel	Meter
60223-1000 ___ Span, ___ Rise precast concrete box single barrel	Meter

rev: 10/03/18

SECTION 617. - GUARDRAIL

This section 617 supplements Article 6 of Exhibit A.

617.06 Terminal Sections.

Add the following:

Use the MSKT-TL3-8 breakaway terminals, as shown on the design plans and bid schedule only for guardrail installations meeting the 2016 MASH standards with an eligibility letter from the FHWA. The SKT-350 or ET-2000 Plus is no longer ALLOWED.

617.12 Measurement.

The second paragraph is superseded with the following:

Guardrail for roadway shoulders (including asphaltic curbing where applicable) shall be measured by the linear meter beginning at the centerline of the first terminal connector post to the last terminal connector post of the guard railing at the opposite end complete in-place and accepted including the breakaway terminal section assembly, MSKT-TL3-8, SGR04b, Type PDE02.

Add the following:

Approach guardrail for bridges (including asphaltic curbing where applicable) shall be measured by the linear meter, from the centerline of the first post of the breakaway terminal section to the beginning of the bridge railing complete in-place and accepted, including the breakaway terminal section assembly, Rubrail and Rubrail connection hardware and all W-Beam connection hardware to the concrete barrier, unless otherwise noted on the contract plans or bid schedule.

rev: 03/18/20

SECTION 619. - FENCES, GATES, AND CATTLE GUARDS

619.01 **Description.** Add the following to this subsection: This section 619 supplements Article 6 of Exhibit A.

619.03 **Fences and Gates:**

Add the following:

Remove and replace existing fence at locations specified on the design plans and/or as designated by the Construction Manager and replace with new fence material. Salvage fence material, as determined by the Construction Manager, shall be cleaned (including the removal of any concrete from posts) and stockpile/deliver to a storage site as may be called for in the design plans unless otherwise directed by the Construction Manager.

When the design plans call for cutting of an existing fence, the Contractor shall install end posts, as per the fencing details, at ends of existing fence, which are to remain unless there are existing end posts, in-place, that can retain the wire tension as directed by the Construction Manager. These end posts are to be installed and wire securely attached, prior to cutting the existing fence, regardless of whether or not the fence will be reinstalled or not. This will prevent lose in tension of the remaining fence.

619.04 **Grounding Fences.**

Add the following:

Grounding of fence line at all overhead power lines crossings shall be done only after the Contractor has notified the utility owner at least 10 days in advance of work.

Paragraph two is superseded with the following:

Where electric lines run parallel or nearly parallel and within 6 meters of the fence line, ground the fence at each end or gate post or at intervals not to exceed 250 meters.

619.05 **Remove and Reset Fence.**

Add the following:

The location and length of fencing to be removed and/or reset shall be as called for in the design plans. Otherwise the Construction Manager will determine the location and lengths during construction where applicable. The Contractor shall supply new materials to replace

removed and un-reusable existing fencing and/or posts as required to reattach fence line to its new or existing position under section 109.02(m).

619.07 Cattle Guards.

(d) Painting

Add the following to this subparagraph:

The top coat of paint for all cattle guards shall be Highway Safety Yellow or equivalent, as approved by the Construction Manager.

619.09 Acceptance.

Add the following:

Temporary fence construction for livestock control shall be considered incidental to completion of the project and no separate payment shall be made.

619.10 Measurement.

Add the following:

When the bid schedule does not provide a bid item for temporary fence and/or the work described in this section, then the work shall be considered incidental to completion of the project and no measurement shall be made.

Installation of ground wires under 619.04 shall be included in the unit price bid for the fencing items shown in the bid schedule.

rev: 10/03/18

SECTION 625. -TURF ESTABLISHMENT

625.01 **Description.** Add the following to this subsection: This section 625 supplements Article 6.3 of Exhibit A.

625.02 **Material.**

Add the following:

The seed shall be delivered to the project site in standard, sealed, undamaged containers. Each container shall be labeled in accordance with the U.S. Department of Agriculture rules and regulations under the Federal Seed Act. Labels shall indicate the variety or strain of seed, the percentage of germination, purity and weed content, and the date of analysis which shall not be more than nine (9) months prior to the delivery date.

Seed shall consist of the type shown in section 625.07 below. Application rates of seed as specified are for Pure Live Seed (PLS). PLS is determined by multiplying the sum of the germination and hard or dormant seed by the purity.

Weed content shall not exceed 0.5%.

625.03 **General.**

Add the following:

Seeding and mulching shall be performed immediately following final slope grading to the fullest extent possible. If seeding cannot be performed at final grading, then refer to section 157.04, subparagraph (H.2) for further requirements. In no case shall permanent non-dormant seeding and mulching be performed during the months of November 15 through March 15. Dormant seeding may take place during November 1st to December 15th.

No seeding and/or mulching can take place when the wind speed is 5mph or greater.

625.04 **Preparing Seedbed.**

The second sentence of the first paragraph is superseded with the following:

Remove all weeds, sticks, high stone concentration areas with stones of 75 mm in size or larger, and other debris detrimental to application, growth, or maintenance of the turf. If there is a substantial amount of rock/stone larger than 75 mm in size that requires removal

prior to seeding, then this additional work shall be compensable in accordance with section 109.02(m).

Add the following:

Seedbed preparation shall be accomplished with a disc harrow, chiseling tool or with other equipment, which will provide an even mixture of fertilizer into the soil.

Tillage will not be required on slopes of 2:1 or steeper. However, such slopes shall be fertilized, seeded and mulched as required. Tillage operation shall be performed so as to produce a soil surface that is rough, firm and free of clods.

Tillage shall be performed across the slope when practical. No work shall be done when the moisture content of the soil is unfavorable.

In areas, which in the opinion of the Construction Manager, are too rocky for tilling without drastically disturbing the completed roadway sections, the Construction Manager will adjust the area of tilling accordingly.

625.05 Watering.

This section is superseded with the following:

If watering is called for under other sections of the contract, it shall be paid for under the development of water bid items shown in the bid schedule. Otherwise watering for dry method seeding is not required for work under this section.

625.06 Fertilizing.

Add the following:

All areas to be seeded shall have ammonium phosphate, at a rate of 56 kg per Ha, uniformly applied to the surfaces to be seeded and tilled into a minimum of 76 mm of the surface.

625.07 Seeding.

Add the following:

Seeding shall be accomplished by the Dry Method.

After the tillage is completed and accepted by the Construction Manager, seed shall be planted by drill, except that on slopes too steep or rocky, seed may be broadcast provided

that it is covered by dragging, hand raking or other approved methods. The type of seed and pure live seed rate is as follows:

Species	Cultivar	Kg (PLS)/Ha
Intermediate Wheatgrass	Oahe	3.36
Pubescent Wheatgrass	Luna	3.36
Western Wheatgrass	Arriba	3.36
Indian Ricegrass	Paloma	3.36
Blue Grama	Hachita Blue	2.24
Blanketflower	Red/Yellow	0.56
Little Bluestem		2.24
Red Mexican Hat	Red/Yellow petal tips	0.56
Total		19.04 (kg/Ha)

Seed shall be planted approximately 6mm deep, with a maximum depth of 13mm. The distance between the drilled furrows shall not be more than 203mm. If the furrow openers on the drill exceed 203 mm, the area shall be drilled twice. Seeding shall be done with grass seeding equipment with double disc openers, depth bands, packer wheels or drag chains, rate control attachments, seed boxes with agitators and separate boxes for small seed.

Seed of different sizes shall be sowed from at least two separate boxes adjusted or set to provide the seeding rate specified above.

625.08 Mulching:

The first sentence is superseded with the following:

Apply straw mulch at a rate of 4500kg/Ha after seeding by the following methods:

625.10 Acceptance. Add the following this subsection.

The Construction Manager and QCM will evaluate the placement of seeding and mulching and if during the life of the project finds that the placement was not installed correctly, those areas shall be reseeded and mulched at the entire expense of the Contractor. The Construction Manager will withhold payments for this bid item until the corrections are done to the Construction Manager satisfaction.

625.11 Method of Measurement.

The first sentence is superseded with the following:

Measure the seeding by the hectare, on the ground surface, or by the slurry. Fertilizer and mulching shall not be measured for payment but shall be considered a subsidiary obligation of the Contractor covered under the work for this section.

rev: 03/18/20

SECTION 633. - PERMANENT TRAFFIC CONTROL

633.01 **Description.** Add the following to this subsection: This section 633 supplements Article 6 of Exhibit A.

The second paragraph is superseded with the following:

All permanent traffic control signs shall be fabricated out of aluminum only. Permanent sign post type shall be in accordance with the construction plans and bid schedule.

633.03 **General.**

Add the following:

Any existing signs which require removal (prior to the installation of the permanent signs) due to construction activity shall be temporarily reset as directed by the Construction Manager. The Contractor shall notify the Construction Manager three (3) working days prior to sign removal. This work shall be incidental to the construction bid item to which the sign removal was required.

633.05 **Sign Panels.**

Add the following:

The letters, numerals, arrows, symbols, borders, etc. shall be applied in accordance with subsection 633.05 (b) Type L-3 (Direct Applied Characters) having a Class 2 adhesive, and as shown on the design plans.

Table 633-1

Table 2A-3. Minimum Maintained Retroreflectivity Levels¹

Sign Color	Sheeting Type (ASTM D4956-04)				Additional Criteria
	Beaded Sheeting			Prismatic Sheeting	
	I	II	III	III, IV, VI, VII, VIII, IX, X	
White on Green	W*; G ≥ 7	W*; G ≥ 15	W*; G ≥ 25	W ≥ 250; G ≥ 25	Overhead
	W*; G ≥ 7	W ≥ 120; G ≥ 15			Post-mounted
Black on Yellow or Black on Orange	Y*; O*	Y ≥ 50; O ≥ 50			2
	Y*; O*	Y ≥ 75; O ≥ 75			3
White on Red	W ≥ 35; R ≥ 7				4
Black on White	W ≥ 50				—
¹ The minimum maintained retroreflectivity levels shown in this table are in units of cd/lx/m ² measured at an observation angle of 0.2° and an entrance angle of -4.0°.					
² For text and fine symbol signs measuring at least 48 inches and for all sizes of bold symbol signs					
³ For text and fine symbol signs measuring less than 48 inches					
⁴ Minimum sign contrast ratio ≥ 3:1 (white retroreflectivity ÷ red retroreflectivity)					
* This sheeting type shall not be used for this color for this application.					
Bold Symbol Signs					
<ul style="list-style-type: none">• W1-1,2 – Turn and Curve• W1-3,4 – Reverse Turn and Curve• W1-5 – Winding Road• W1-6,7 – Large Arrow• W1-8 – Chevron• W1-10 – Intersection in Curve• W1-11 – Hairpin Curve• W1-15 – 270 Degree Loop• W2-1 – Cross Road• W2-2,3 – Side Road• W2-4,5 – T and Y Intersection• W2-6 – Circular Intersection• W2-7,8 – Double Side Roads		<ul style="list-style-type: none">• W3-1 – Stop Ahead• W3-2 – Yield Ahead• W3-3 – Signal Ahead• W4-1 – Merge• W4-2 – Lane Ends• W4-3 – Added Lane• W4-5 – Entering Roadway Merge• W4-6 – Entering Roadway Added Lane• W6-1,2 – Divided Highway Begins and Ends• W6-3 – Two-Way Traffic• W10-1,2,3,4,11,12 – Grade Crossing Advance Warning		<ul style="list-style-type: none">• W11-2 – Pedestrian Crossing• W11-3,4,16-22 – Large Animals• W11-5 – Farm Equipment• W11-6 – Snowmobile Crossing• W11-7 – Equestrian Crossing• W11-8 – Fire Station• W11-10 – Truck Crossing• W12-1 – Double Arrow• W16-5P,6P,7P – Pointing Arrow Plaques• W20-7 – Flagger• W21-1 – Worker	
Fine Symbol Signs (symbol signs not listed as bold symbol signs)					
Special Cases					
<ul style="list-style-type: none">• W3-1 – Stop Ahead: Red retroreflectivity ≥ 7• W3-2 – Yield Ahead: Red retroreflectivity ≥ 7; White retroreflectivity ≥ 35• W3-3 – Signal Ahead: Red retroreflectivity ≥ 7; Green retroreflectivity ≥ 7• W3-5 – Speed Reduction: White retroreflectivity ≥ 50• For non-diamond shaped signs, such as W14-3 (No Passing Zone), W4-4P (Cross Traffic Does Not Stop), or W13-1P,2,3,6,7 (Speed Advisory Plaques), use the largest sign dimension to determine the proper minimum retroreflectivity level.					

633.06 Delineators and Object Markers.

Add the following:

Delineator posts and all Type II object markers shall be fiber glass or aluminum with square tube posts as specified in the bid schedule. The posts shall be as shown on the design plans. Type II object markers and signs shall be fabricated in accordance with the manufacturer's specifications to the requirements provided in the bid schedule and construction plans.

Type III object markers shall be mounted on galvanized steel Square tube posts with the marker fabricated out of aluminum per the construction plans and bid schedule.

633.09 Measurement.

Add the following:

The Type 1a & 1b delineators, Type II, and Type III object markers and posts shall be measured and paid for as a complete sign system, respectively.

The milepost markers with post and two signs shall be measured as a complete sign system each.

rev: 10/03/18

Section 634. - PERMANENT PAVEMENT MARKINGS

634.01 **Description.** Add the following to this subsection: This section 634 supplements Article 6 of Exhibit A.

Add the following:

The Contractor shall provide temporary traffic control in accordance with Section 635.- Temporary Traffic Control and the approved traffic control plan.

Add:

Type L – Ultra High Build Waterborne Acrylic traffic paint with glass beads

634.02 **Material.**

Add:

Ultra High Build Waterborne Acrylic traffic paint under 718.24

634.03 **General.**

The second paragraph is superseded with the following:

Remove loose particles, dirt, tar, grease, old or temporary striping, and other deleterious material from the surface to be marked by water, sand, nut shell blasting, or other approved methods without damaging the pavement surface just prior to placement of new pavement markings. Where markings are placed on rigid pavement, less than 1 year old, the Contractor shall clean the pavement of all residue and curing compounds. Apply markings to a clean, dry surface according to the MUTCD. Damaged pavement surfaces, as a result of the cleaning process, shall be repaired to its original condition using an approved method and at the entire expense of the Contractor.

Add the following:

Permanent pavement markings **shall begin no earlier than 7 days and no later than (2) weeks after completion** of the asphalt pavement, fog seal, and/or chipseal work unless otherwise agreed to by the Construction Manager in writing. If the Contractor fails to comply with the above, the Construction Manager will withhold all pending and future progress payments under this contract until the Contractor complies with this requirement.

The third paragraph is superseded with the following:

At least **7 days** before applying pavement markings, furnish a written copy of the markings manufacturer's recommendations for use. A field demonstration shall be conducted **on**

each route to be striped before the Contractor is authorized to place permanent pavement markings to verify the adequacy of the manufacturer's recommendations, equipment compliance, application rates of the traffic markings and beads, and quality. The field demonstration shall be 30 meter for the white traffic markings with glass beads and 60 meter for the yellow markings with glass beads meeting the contract requirements under this section. Cease demonstration after placement of pavement markings until the demonstration is evaluated and accepted.

The field demonstration is accepted if the manufacturer's recommendations are verified and the application rates, mil thickness of the traffic markings, glass beads, and stripe location and width are within the contract specification limits.

Repeat the field demonstration until an acceptable demonstration is produced. See Subsection 106.01 for the disposition of material in unacceptable demonstration(s). Accepted field demonstrations shall remain in place and will be accepted and measured as a part of the completed work. When a field demonstration is accepted, full production may begin.

If the Contractor changes manufacturer or if the marking operation is producing unsatisfactory results, the field demonstration procedures shall be repeated as necessary until the desired results are achieved.

The Contractor shall ensure that all paint and other markings sampling and handling procedures are performed in accordance with the following where applicable:

1. Drums of markings shall have tamper proof seals as required under Subparagraph **634.03(b) DrumSeals**;
2. The markings and bead tanks on the striping machine shall be empty, unless the Contractor provides a *Letter of Transfer for Markings* from a previous BIA /State project as required under Subparagraph **634.03(f) Letter of Transfer for Markings**;
3. Settled pigment shall be re-disbursed before loading markings as required under Subparagraph **634.03(a) Re-disbursement of Settled Markings**;
4. The Contractor shall strap the tanks as described in Subparagraph **634.03(e) Volume Control Requirements**.

Add the following subparagraphs:

- (a) **Re-disbursement of Settled Markings.** When markings have settled excessively, the Contractor shall re-disburse the settled pigments at the bottom of the markings drums with a mixing device before pumping or loading into the striping unit so that excess pigments are not left on the bottom of the markings drums. Thinner shall not be allowed to be pumped into the markings tanks.

(b) Drum Seals. Drums of markings used on Government projects shall be sealed at the point of manufacture and consecutively numbered with tamper proof seals. These seals shall only be removed with the Construction Manager present at the time of actual use. Drums with broken seals shall not be accepted.

(c) Equipment. The traffic markings and beads shall be placed on the pavement by a spray type, self-propelled pavement marking machine, except that temporary striping during construction may be placed with other equipment designed for application of markings, or beads.

The machine shall be capable of applying clear-cut 102mm lines. The machine shall be equipped with an air-operated glass bead drop-in dispenser controlled by the spray gun mechanism. The machine shall be equipped with a mechanical device capable of placing a broken reflectorized centerline stripe having a 3.0 meter length and 9 meter gap between stripes.

The dispenser shall be capable of placing the glass spheres immediately into the markings line as it is applied to the pavement in such a manner as to provide satisfactory marking and delineation.

The pavement marking equipment for longitudinal lines shall have a system capable of spraying both yellow and white pavement markings. The marking vehicle shall be of sufficient size and stability with an adequate power supply to produce lines of uniform dimension, with square edges, and proper mix of the two component parts to ensure proper application. The equipment shall be capable of placing markings and applying glass beads at both the left and right sides of the truck, and placing two lines simultaneously with either line in a solid or intermittent pattern in either yellow or white. All sprayers shall be in full view of the operators at all times. The equipment shall be provided with a metering device to register the accumulated installed pavement marking for each sprayer, each day. The Contractor shall provide a certificate from the American Traffic Safety Services Association (A.T.S.S.A.) or equivalent documentation to the Construction Manager to verify that the driver and operator of the application truck are fully trained and experienced in the application of the dual component marking system being applied. The equipment shall include pressure gauges for each proportioning pump which is visible to the operator at all times, so that any fluctuations can be detected immediately during the marking operations.

The longitudinal line application vehicle shall be equipped with high pressure air spray jets in front of the striping material and glass bead applicators to remove loose matter on the pavement surface where the marking material is to be applied.

The vehicle shall be equipped with two separate glass bead supply tanks and two glass bead dispensers per each marking material sprayer. The Contractor shall provide documentation to the Construction Manager that bead dispensers are

specifically manufactured for the glass bead application rates contained herein. When Type 4 or 5 gradations of glass beads are applied, the vehicle shall be equipped with high-capacity cone-shaped pressure or gravity dispensers. All bead dispenser outlets shall have enclosed wind shrouds or equivalent devices to direct the glass beads as they are applied. The shroud may include an opening which faces the operator so that the flow rate of the glass beads can be monitored. The bottom of the shroud shall be mounted within three to four inches (76 to 102 mm) off the pavement surface and be configured to allow for even distribution of glass beads on the applied markings.

Equipment for the application of transverse lines, longitudinal lines less than 200 feet (61 meters) in length, legends and symbols shall be either a hand wand attachment to a longitudinal line application vehicle, or a separate motorized trailer application system. Application equipment for short or transverse lines, legends, and symbols can be suitable for only one color.

(d) Measurement Devices. A method of measuring the actual volume of markings and beads in the tanks shall be provided on the tanks either by strap measurement or other externally approved gaging methods.

The Contractor shall provide current certification of calibration of all marking equipment at least 7 calendar days before the field demonstration for review and approval.

(e) Volume Control Requirements. The volume of markings and glass beads in place shall be measured by the quantity per kilometer method or by the use of markings and beads gauges.

The Contractor shall strap the tanks before beginning striping operations and again after **1 kilometer** has been striped or if the striping machine is equipped with air atomized spray units (not airless) and markings and bead gauges, the volume may be determined by said gauges.

The volume shall be measured again at the beginning and end of each day. This information shall be given to the Construction Manager.

(f) Letter of Transfer for Markings. The markings and bead tanks of the striper must be **empty** before filling for the beginning of the striping operations for the project, unless a *Letter of Transfer for Markings* has been obtained.

Paint markings or glass beads left over in the striping truck tank can be transferred from one NDOT/BIA project by providing a *Letter of Transfer for Markings* which shall include the following information:

1. The quantity left in the tanks;

2. The NDOT/BIA project it is coming from, including the termini and project name;
3. The project it is going to;
4. The date;
5. The batch number the markings came from;
6. The seal numbers of the markings in the tank;
7. The previous Construction Manager's signature.

(g) Tolerance Requirements for Placing Markings & Beads. The finished lines shall be smooth, aesthetically acceptable and free from undue waviness. The finished marking material shall be rectangular in shape with well-defined edges.

(h) Repair & Replacement of Unacceptable or Damaged Striping. If the markings are not adhering to the existing pavement, the Contractor shall **REMOVE** the striping (under an approved method) and shall **RESTRIPE** the existing pavement. All damage to the pavement markings because of the Contractor's negligence or failure to maintain traffic control shall be **repaired at no additional cost to the Government.**

634.05 Waterborne Traffic Paint (Type B & C).

This section is superseded with the following:

634.05 Waterborne Traffic Paint (Type B and C) and Ultra High Build Waterborne Acrylic (Type L).

Apply paint when the pavement and air temperatures are above 4°C (50°F). Spray paint at 0.38 millimeters (15 mils) minimum wet film thickness before glass beads are applied.

- (a) Type B.** Immediately apply type 1 glass beads on the paint at a minimum rate of 0.7 kilograms per liter (6 pounds per gallon) of paint.
- (b) Type C.** Immediately apply type 3 glass beads on the paint at a minimum rate of 1.4 kilograms per liter (12 pounds per gallon) of paint.
- (c) Type L.** Immediately apply glass beads (see **Table 718-2**) on the paint at a minimum rate of 1.4 kilograms per liter (12 pounds per gallon) of paint. When two coats of Type L paint are required only the top coat shall receive the required glass beads.

This maintenance-type asphalt pavement project will require application of two (2) coats. Apply each coat at 5.2 square meters per liter (210 square feet per gallon).

634.07 Thermoplastic Markings (Type H and I).

Add the following:

When thermoplastic paint is applied to concrete surfaces, the concrete surface shall be primed and sealed in accordance with the paint manufactures recommendations prior to application of the paint. A copy of the primer and sealer material specifications shall be provided to the Construction Manager for review and approval prior to application.

634.11 Acceptance. This section is replaced with the following:

Materials for permanent pavement markings will be evaluated under Subsections 106.02, 106.03, and 106.04.

634.12 Measurement.

This subsection is superseded with the following:

Measure the Section 634 items listed in the bid schedule according to Subsection 109.02 and the following.

Measure the pavement markings by the meter. The number of meters of lines applied will be measured along the centerline of each 102mm wide line applied regardless of color. Broken or dotted pavement lines will be measured from end to end of the line including gaps. Solid pavement lines will be measured from end to end of each continuous line. For line widths other than 102mm, the measured length of line is adjusted in the ratio of the required width to 102mm.

634.14 Payment.

Add the following to this subsection:

The Government will not pay for striping until the Construction Manager receives all the required certification and documentation. If the Contractor has not installed the specified quantity/amount of glass beads and paint (i.e. the Construction Manager will observe the striping at night to determine whether re-striping is necessary) the Contractor shall re-strip at no additional cost to the Government. The Government will require the Contractor to re-stripe the roadway if the Construction Manager determines that the striping is not adhering to the pavement or the glass beads are not adhering to the paint.

The Government reserves the right to have the QCM conduct random striping thickness or reflectivity tests on a random basis for compliance with these specifications under the bid item for Quality Control or Quality Assurance.

The following work and items will be considered as included in the payment for the striping bid items and will not be measured or paid for separately:

1. Removal of temporary marking tape or paint;
2. Repair or replacement of damaged striping due to Contractor's negligence or operations;
3. Furnishing, mixing, and applying adhesive; and
4. Surface preparation.

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SECTION 635. - TEMPORARY TRAFFIC CONTROL

This section 635 supplements Article 6 of Exhibit A.

635.03 General.

Add the following:

The construction plans will show Temporary Traffic Control Details of general requirements. After award of contract, the Contractor shall be required to develop his Traffic Control Plan (TCP) in accordance with the details shown in the design plans and the *Manual on Uniform Traffic Control Devices for Streets and Highways*, latest edition, and amendments.

The Contractor shall submit (at least 21 calendar days prior to the **Notice to Proceed**) his TCP in full professionally developed details using the Government's traffic control details as a guide, to the Construction Manager for review. Neat hand drawn sketches will be accepted for emergency addendums to the original TCP ONLY with written justification. The Contractor assumes full responsibility and expense for errors and/or omissions in the TCP regardless of whether the plan was reviewed by the Government before the errors and/or omissions were discovered or after. The Contractor is also responsible for insuring a TCP that meets the contract requirements is in hand before construction begins. Failure to insure the TCP meets the contract requirements may result in a "Stop Work" order to be filed with the Contractor.

The Construction Manager will review and return the TCP within 14 calendar days, after receipt of the new TCP from the Contractor, stating either "Accepted", "Accepted as Noted", or "Resubmit".

Once the Construction Manager has notified the Contractor that the TCP has been accepted for use on the project, it will be the responsibility of the Contractor to implement and maintain the TCP prior to construction so as to accommodate traffic safely. The TCP shall be in force at all times during construction and at all locations where construction equipment is being used within the roadway prism. This shall include the area 457 meters (1500 feet) preceding the beginning of project and 457 meters (1500 feet) beyond the end of project.

Should the Contractor elect to perform other minor shoulder or corrective work outside the zone of the accepted TCP, or at various other work zones, it will be the Contractor's responsibility to provide additional traffic control (warning signs, barrels, barricades, flaggers, etc.) to direct traffic in a safe manner in accordance with the MUTCD manual as directed by the Construction Manager. Any additional traffic control required shall

be considered incidental to completion of project and no additional payment shall be made.

The latest edition of the MUTCD manual is incorporated by reference into the Contractor's TCP. In cases of inconsistencies between the Contractor's TCP and what the MUTCD manual requires, the provisions of the MUTCD shall govern.

The Government's Safety Manager and/or Engineer will make periodic inspections of the project and report to the Construction Manager regarding the Contractor's compliance with his TCP.

Failure by the Contractor to comply with his TCP, or perform work which could be dangerous to the safety of the traveling public (without proper traffic control devices) shall be just cause for the Construction Manager to issue a "Stop Order" per section 108.05 for immediate corrective action to be taken.

When the Contractor has taken satisfactory corrective action, a written order to resume work shall be issued as required. The Contractor shall not be entitled to any extension of contract time; any claims for damages or to any excess cost by reason of the stop order and/or suspension orders. Failure of the Contracting officer to order suspension of any or all work in progress shall not relieve the Contractor of his responsibilities or obligations defined herein.

Flagging, signing, and any other traffic control required on haul routes from material pits and all detour roads shall not be measured for payment, but shall be considered a subsidiary obligation of the Contractor where the cost shall be included in the appropriate bid items.

Add the following subparagraphs:

(j) Any existing side routes (i.e. roads outside the project r/w) used as detours for road and drainage structure construction shall be properly signed and maintained (in a safe manner) at least twice per week in accordance with sections 212, 107 and 156. These existing side routes proposed for use as detour roads shall not be modified without the Contractor first obtaining proper permits to do so. The use and maintenance of these side routes shall be included in the unit price bid for item 63501-0000.

(k) Any proposed detour roads (within the project r/w) as shown on the contractor's TCP shall be constructed, maintained, and signed in accordance with sections 212, 107.01, and 156. It shall be the responsibility of the contractor to adequately design and install any and all drainage structures for such detour roads that cross existing washes including obtaining all necessary permits. All proposed temporary drainage structures shall be shown on the contractor's TCP and ECP. The construction, maintenance, and subsequent removal and restoration work of proposed detour roads shall be included in the unit price bid for item 63501-0000.

635.07 Construction Signs:

Add the following:

All sign sheeting shall have a reflectivity in accordance with section 718.01 as modified in these supplemental specifications.

635.09 Flaggers.

Add the following:

Copies of the Flaggers certifications must be current (in accordance with the certification program criteria) and provided to the Construction Manager for review and acceptance at the time the NTP is given. Flaggers that have current certification from other federally approved flagger certification programs (i.e. states, counties, and tribal safety programs) may be allowed provided the Contractor submits documentation that the program is recognized and approved by either the FHWA, TRB, or ATSSA. Flaggers with training certificates are not allowed.

635.25 Acceptance.

Add the following:

Any damaged traffic control devices used on the project that is considered ineffective for its intended use (by the Construction Manager) shall be replaced at the Contractor's expense. Should the Contractor neglect or refuse to replace any traffic control device that the Construction Manager considers damaged to the extent that it no longer serves as an effective traffic control device (through a "noncompliance work order"), then the Construction Manager shall issue a "stop work order" in accordance with section 108.05 until the Contractor has complied with the Construction Manager directive.

635.26 Measurement.

The sixth paragraph is superseded with the following:

Measure flaggers by the Man-Hours for each hour the flagger(s) are actually performing flagging work within the project limits. Round portions of an hour up to the half hour for pay estimates. Flagger hours in excess of 40 hours in a week will not be measured for payment unless approved by the Construction Manager prior to the overtime in writing. Hours of flaggers attending meetings not related to traffic safety, haul roads, or attending to placement or removal of traffic control devices shall not be measured for payment.

rev: 04/23/17

SECTION 638. - SELECTIVE/NON-SELECTIVE HERBICIDE APPLICATION

638.01 **Description.** This section 638 supplements Article 6 of Exhibit A.

This work consists of furnishing all labor, equipment, herbicide, materials, and all incidentals necessary for placing approved herbicide on the subgrade to kill noxious weeds prior to any earthwork activities and after the subgrade is completed in compliance with these specifications and the requirements and locations shown in the construction plans per section 109.02m.

The Contractor shall store, handle, mix and apply all herbicide(s) as specifically stipulated in the manufacture's label and in compliance with Federal, State and local laws and regulations.

638.02 **Materials.**

The herbicide shall conform to the following:

Non-selective pre-emergents herbicide shall be Glyphosate (Roundup®) containing the active ingredient metsulfuron (Escort® or Ally®) or an approved equal and may include 2,4-D applied at 1.1-2.2 kg per hectare to young plants in the spring prior to the bloom stage. The herbicide shall be approved for invasive weeds including Camelthorn (Alhagipseudalhagi) and Halogeton (Halogetonglomeratus).

638. 03 **Construction Requirements:**

(a) Mixing, Loading, and storage.

The Contractor shall keep all livestock, pets, and persons away from the herbicide including the mixing thereof and loading. The Contractor shall ensure that the mixing area is well ventilated. In no case shall any herbicides be mixed or loaded at night and all instructions and warning labels shall be followed during the mixing and loading to protect against spills, splash, and wind-drift. Protective equipment and clothing shall be worn during the mixing, loading and applying of mix.

The herbicide manufacture, through the Contractor, must provide appropriate specimen and manufacturer's labels, Material Safety Data Sheets, technical bulletins, toxicity ratings, and EPA registration numbers to the Construction Manager, a minimum of 14 days before using the chemical(s).

All herbicides shall be stored in strict accordance with applicable manufacturer's labels and requirements as well as other federal, state and tribal rules and regulations.

(b) Certification of Applicators.

The Contractor shall ensure that all herbicide(s) are applied by an appropriately licensed and certified applicator. The Applicator shall be licensed as a Commercial Applicator, in the State in which the herbicide will be applied, and certified in the application of the specified herbicide. Verification of licensing, training and testing in the safe and effective handling and use of herbicide(s) shall be submitted to the Construction Manager, a minimum of 14 days before using the chemical(s). Verification shall, at a minimum, include a copy the Applicator's license and current safety/testing certifications.

Application of the herbicide shall cover the width of the finished subgrade, fill, and cut slopes to the right-of-way limits between stations TO BE DETERMINED during construction left and right just prior to Halogeton blooming usually in the spring. The herbicide applicator shall work with the Construction Manager in determining the exact time to initiate the application of the herbicide. The Construction Manager will specify the exact beginning and ending locations, at the time of application. Repeat treatments will be necessary to control any flushes emerging later in the season. The subgrade shall meet the requirements of FP-2014, Section 204 at the time of the herbicide application.

Application shall include the existing and new subgrades of all shoulder ditch areas, all fill, and all cut slopes within the road right of way, including turnouts. Areas outside the road right of way shall not be included. The application of the herbicide(s) shall be within any maximum /minimum manufacturer's recommended time frames as related to seasonal times. The opening of sprayed areas to traffic/public shall also follow the manufacturer's recommendations.

The Government, upon recommendation from the Construction Manager, reserves the right to reject any herbicide related equipment on the basis of suitability; safety to the environment, the traveling public, the Contractor's employees, and employees of the government. Approved equipment shall be equipment meeting the applicable requirements of the U.S. Occupational Safety and Health Administration, the U.S. Department of Transportation, and applicable State Departments/Agencies.

(c) Safety Guidelines.

The Contractor shall be familiar with all the pertinent information printed on the labels with special attention given to the precautionary statements regarding potential hazards to humans, animals, and the environment. Physical and chemical hazards that the product may have including fire, explosion, or chemical reactions to other products shall be properly addressed before use. Strict compliance with the labeling requirements shall be maintained by the Contractor.

No herbicide shall be applied upon frozen or unstable subgrade or base coarse surface. The Contractor shall avoid spraying the product near ditches, channels, or irrigation channels where damage to adjacent property or livestock can occur. No spraying shall be done when

the wind speed exceeds 20km/hr unless otherwise approved by the manufacturer.

The application width shall be as stated in the design plans and as directed by the Construction Manager. The application rate shall be in accordance with the manufacturer's recommendations.

All spray trucks and equipment shall be properly licensed and shall carry the appropriate plaques of registration as required by state and local laws.

(d) Records and Documentation.

The QCM shall be required to keep a daily record of the herbicide application showing the:

- A. Date of application;
- B. Types and application rates of herbicides applied;
- C. Time of day of application;
- D. Air temperature;
- E. Wind velocity;
- F. Area covered;
- G. Location(s) of areas treated; and
- H. Equipment calibration information.

The Construction Manager shall verify the QCM's daily herbicide record.

Copies of all daily herbicide records shall be submitted to the Construction Manager within seven (7) days of the application.

(e) Samples and Inspections

Tank samples shall be furnished to the Construction Manager upon request. The Federal Government reserves the right to inspect the tank mix and/or equipment at any point before, during or after the application process.

638.04 Acceptance.

Application of herbicides shall be evaluated in accordance with section 106.02 through 106.04.

638.05 Measurement.

Measure the herbicide by the lump sum in place.

rev: 10/04/18

SECTION 703. - AGGREGATE

This section 703 supplements Article 6 of Exhibit A.

703.05 Subbase, Base, and Surface Course Aggregate.

(b) Subbase or base aggregate.

(1) Gradation Table 703-2

Table 703-2 is superseded with the following:

Table 703-2

Aggregate Base Gradation Special

Sieve Size	Percent by Mass Passing Designated Sieve, AASHTO T 27 & T11
37.5mm (1½-inch)	100
25mm (1-inch)	80 – 100 ()
19mm (¾-inch)	65 – 80 ()
9.5mm (3/8-inch)	40 – 65 ()
4.75mm (No.4)	30 – 50 ()
425µm (No.40)	8 – 30 ()
75µm (No.200)	2 – 12 ()

() Allowable deviations do not apply.

(c) Surface course aggregate.

The statistical procedures and allowable deviations do not apply.

703.07 Asphalt Concrete Aggregate.

(b) Adherent coating on the aggregate,

(1) FLH T 512 0.5% maximum

(c) Percent Carbonates in Aggregate,

(1) Arizona Test Method ARIZ 238a Maximum 75%

The last paragraph is deleted.

703.09 Chip Seal Aggregate.

Add the following paragraphs:

(g) Density, AASHTO T 19M Min. 1100 kg/m³ (70 lbs./ft³)

(h) Coating and stripping of bitumen-aggregate Mixtures, AASHTO T 182
Min. 95%

Table 703-7 is superseded with the following:

Table 703-7
Target Value Ranges for
Single and Double Course Chip Seal Aggregate Grading Special

Sieve Size	Percent by Mass Designated Sieve (AASHTO T 27 & T 11)
	Grading Designation – Special
12.5mm (1/2-inch)	100 (1)
9.5mm (3/8-inch)	70-85 (3)
6.3mm (1/4-inch)	0-15 (5)
4.75mm (No.4)	0-5 (3)
2.36mm (No.8)	0-2 (1)
75µm (No.200)	0-1 (1)

(1) Statistical procedures do not apply.

() The value in the parentheses is the allowable deviation (±) from the target values.

703.13 Blotter.

This subsection is superseded with the following:

Furnish sound durable particles of sand, gravel or crushed stone conforming to the following:

Table 703-13

Blotter Material Gradation

Sieve Size	Percent Passing by Weight, AASHTO T 27 & T 11
9.5mm (3/8-inch)	100
1.18mm (No.16)	40 – 80
75µm (No.200)	0 – 10

(a) Plastic limit, AASHTO T90 Non-plastic

(b) Free of organic matter and clay balls.

PERCENT CARBONATES IN AGGREGATE

SCOPE:

1. (a) This test method describes the procedure for determining the percentage of carbonates in aggregate. A combination of hydrogen peroxide and nitric acid is used to react with the carbonates.

(b) This test method involves hazardous material, operations, and equipment. This test method does not purport to address all of the safety concerns associated with its use. It is the responsibility of the user to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

(c) Metric (SI) units and values are shown in this test method with English units and values following in parentheses. Values given for metric and English units may be numerically equivalent (soft converted) for the associated units, or they may be given as rounded or rationalized values (hard converted). Either the metric or English units along with their corresponding values shall be used in accordance with the applicable specifications. See Appendix A2 of the Arizona Materials Testing Manual for additional information on the metric system.

(d) See Appendix A1 of the Arizona Materials Testing Manual for information regarding the procedure to be used for rounding numbers to the required degree of accuracy.

APPARATUS AND MATERIALS:

2. Requirements for the frequency of equipment calibration and verification are found in Appendix A3 of the Arizona Materials Testing Manual. Apparatus and materials for this test procedure shall consist of the following:
 - (a) Drying apparatus--Any suitable device capable of drying samples at a temperature of 110°C plus or minus 5°C (230°F plus or minus 9°F).
 - (b) 100 mL heavy duty beaker.
 - (c) Hydrogen Peroxide (3% solution) - H₂O₂.
 - (d) Nitric Acid (concentrated)--HNO₃.
 - (e) Distilled water.
 - (f) A balance or scale capable of measuring the maximum weight to be determined and conforming to the requirements of AASHTO M 231, except the readability and sensitivity of any balance or scale utilized shall be at least 0.1 gram.
 - (g) Neutral Litmus Paper.
 - (h) Glass or Plastic Stirring Rod.

SAMPLE PREPARATION:

3. Prepare the sample according to the following:

(a) For material samples from stockpile(s), obtain a representative 300 gram plus or minus 10 gram sample of plus 4.75 mm (No.4) material. Wash the sample over a 4.75 mm (No.4) sieve and discard minus 4.75 mm (No.4) material.

(b) For uncrushed material samples, obtain a representative sample and crush to appropriate grading. Obtain a representative 300 gram plus or minus 10 gram sample of plus 4.75 mm (No.4) material.

(c) The prepared sample shall be oven dried to constant weight at 110°C plus or minus 5°C (230°F plus or minus 9°F).

TEST PROCEDURE:

4. (a) Allow sample to cool and place in a tared 1000 mL beaker. Weigh and record the weight of aggregate as the "weight of original sample" or "A" to the nearest 0.1 gram.

(b) Under a fume hood, add approximately 300 mL of H₂O₂ (3% solution) and stir. When the bubbling subsides, begin adding small amounts (approximately 10 mL) of concentrated HNO₃ to the beaker. Bubbling will be vigorous as the carbonates are being dissolved. Stir occasionally.

(c) When the bubbling has ceased and addition of HNO₃ causes no more bubbles, begin to wash by decantation, using distilled water. Care shall be taken not to lose any of the coarse aggregate. Wash by decantation at least 4 times. At this point, neutral litmus paper in the water should show only slight pink.

(d) Decant the water and oven dry to constant weight at 110°C plus or minus 5°C (230°F plus or minus 9°F).

(e) Let cool, weigh, and record the weight of aggregate as the "weight of non-reactive aggregate" or "B" to the nearest 0.1 gram.

CALCULATIONS:

5. (a) Calculate the percent of carbonates as follows:

$$\text{Percent of Carbonates} = \frac{A-B}{A} \times 100$$

Where: A = weight of original sample

B = weight of non-reactive aggregate

(b) Report the percent of carbonates to the nearest 1%.

rev: 10/04/18

SECTION 704. - SOIL

704.01 Foundation Fill. This section 704 supplements Article 6 of Exhibit A.

704.02 Bedding Material.

Add the following subparagraphs:

(c) Resistivity, AASHTO T 288 ≥ 2000 ohm-cm, Min.

(d) pH, AASHTO T289 ≥ 6.0

Volcanic ash type material for bedding shall not be used.

704.03 Backfill Material.

Add the following to subparagraph 704.03(a):

(3) Resistivity, AASHTO T 288 ≥ 2000 ohm-cm, Min.

(4) pH, AASHTO T289 ≥ 6.0

Volcanic ash type material for backfill shall not be used.

704.06 Unclassified Borrow.

This subsection is superseded with the following:

Furnish granular material free of excess moisture, muck, frozen lumps, roots, sod, or other deleterious material. Material composed of lava or volcanic cinder is disallowed as borrow material. Material shall conform to the following:

(a) Maximum dimension 600 mm

(b) Soil classification, AASHTO M 145 A-1, A-3, or A-2-4

If unclassified borrow is used as bedding and/or backfill material under Section 209, the material shall also conform to 704.02 and 704.03.

rev: 10/04/18

SECTION 705. - ROCK

705.01 Gabion and Revet Mattress Rock. Add the following to this subsection: This section 705 supplements Article 6 of Exhibit A.

705.02 Riprap Rock.

This subsection is superseded with the following:

Furnish hard, durable, angular rock that is resistant to weathering and water action and free of organic or other unsuitable material. **Do Not Use** shale, rock with shale seams, sandstone, rounded river rock, or other fissile or fissured rock that may break into smaller pieces in the process of handling and placing. Conform to the following unless the material is coming from a source previously tested for and met the quality requirements for other contract items:

(a) Apparent specific gravity, AASHTO T 85	2.50 min.
(b) Absorption, AASHTO T 85	4.2% max.
(c) Coarse durability index, AASHTO T 210	50 min.
(d) Gradation for the class specified	Table 705-1

rev: 10/04/18

SECTION 710. - FENCE AND GUARDRAIL

This section 710 supplements Article 6 of Exhibit A.

710.01 Barbed Wire:

Add the following:

Stays for barbed wire fences shall conform to the requirements of ASTM A 641, and shall have a coated diameter of at least 0.142 inch (3.6 mm), shall be class 1, and soft temper.

Tie wire, wire fasteners or wire clips for fastening barbed wire to steel posts shall have a coated diameter of 0.120 inch (3.0 mm) or greater and shall be Class 1, soft temper, and meet the requirements of ASTM A 641.

All woven wire shall conform to the requirements of AASHTO M 279 Design 832-6-14 ¹/₂, grade 125.

710.04 Fence Posts and Bollards

Add the following to paragraph (c) Steel:

- 1) Powder Coated post will be evaluated under Subsection 106.03. Furnish a commercial certification including the name of the manufacturer, product name, style number, chemical composition, and other pertinent information to fully describe the product.
 - a) Hardness ASTM D3363 Min 2H
 - b) Adhesion ASTM D3359 5B
 - c) Impact Resistance ASTM D2794
 - d) Direct Impact ASTM D2794
- 2) Galvanized steel posts shall be evaluated under Subsection 106.03 and section 710.04(c).

rev: 10/04/18

SECTION 713. - ROADSIDE IMPROVEMENT MATERIAL

This section 713 supplements Article 6 of Exhibit A.

713.12 Fiber Rolls and Socks

Add the following subparagraph 713.12(g) with the following

- (g) **Straw Bales.** Furnish bales tied with either commercial quality baling
 - (1) wire or string. Conform to the following:
 - (2) Straw Subsection 713.05(c)
 - (3) Approximate length 1 meter
 - (4) Shape rectangular
 - (5) Approximate mass 30 kilograms
- (h) **Wood excelsior bales.** Furnish bales of curled wood excelsior. Tie the bales with either a commercial baling wire, plastic, or string. Conform to the following:
 - (1) Approximate dimensions 400 by 450 by 900 mm
 - (2) Approximate mass 33 kilograms

713.16 Silt Fence.

This section is superseded with the following:

Furnish a combination of the following material constructed as specified and in close conformance with the design plans. If approved, variations may be furnished to accommodate pre-manufactured fences and field conditions and accepted practices.

- (a) Posts. Furnish 75-millimeter diameter wood or 1.86-kilogram per meter steel fence posts.
- (b) Supports. Furnish 2.03-millimeter steel wire with a mesh spacing of 150 by 150 millimeters or a prefabricated polymeric mesh of equivalent strength.
- (c) Geotextile. Conform to Subsection 714.01 and Table 714-5 as applicable.
- (d) Height. Minimum height above the ground is 760 millimeters. Minimum embedment depth is 150 millimeters.

rev: 10/04/18

SECTION 718. - TRAFFIC SIGNING AND MARKING MATERIAL

This section 718 supplements Article 6.3 of Exhibit A.

718.01 Retro reflective Sheeting.

Add the following:

Retroreflective sheeting materials proposed shall be Type III Prismatic or better per Table 718-3 below, with certifications, for all signs shall be submitted for review and approval prior to ordering the materials.

718.08 Signposts.

The first paragraph is replaced with the following:

Furnish galvanized steel, or aluminum signposts as specified.

Subsection (b) is replaced with the following:

(b) Steel posts. Furnish posts that are straight, smooth, and free from defects affecting strength, durability, or appearance. Conform to the following:

(1) U-channel steel posts. Furnish flanged, channel, galvanized steel posts conforming to ASTM A 499, grade 60, and the following:

(a) Dimensions of U cross-section

(1) Width of opened end of U 75 – 90 mm including flanges

(2) Width of closed end of U 25 – 40 mm

(3) Depth of U 25 – 50 mm

(4) Thickness of steel 3 – 5 mm

(b) Punching shall be performed prior to coating. Starting 25 millimeters from the top and extending the full length of the post, drill or punch 10-millimeter holes on 25-millimeter centers along the centerline of the bottom of the U. Remove all burrs and sharp edges.

(c) Coating

(1) Galvanized coated post according to AASHTO M 111M

(2) Powder Coat will be evaluated under Subsection 106.03. Furnish a commercial certification including the name of the manufacturer, product name, style number, chemical composition, and other pertinent information to fully describe the product.

a) Hardness ASTM D3363 Min 2H

b) Adhesion ASTM D3359 5B

c) Impact Resistance ASTM D2794

d) Direct Impact ASTM D2794

(2) Square tubular steel posts. Furnish square tubular galvanized steel posts conforming to ASTM A 1011M, grade 55, or ASTM A 715, grade 60, and the following:

(a) Dimensions

(1) Outside dimensions 44.5 mm by 44.5 mm or

50.8 mm by 50.8 mm

(2) Wall thickness 2.1 mm

(3) Mass 2.5 – 3.0 kg/m

(b) Punching. Starting 25 millimeters from the top and extending the full length of the post, drill or punch 11-millimeter holes on 25-millimeter centers along the centerline of all four sides, in true alignment and opposite each other directly and diagonally. Remove all burrs and sharp edges.

(c) Coating

- 1) Galvanizing after punching ASTM A 635M, (inside and outside of post) coating Z275 designation
- 2) Powder Coat after punching. Powder Coat will be evaluated under Subsection 106.03. Furnish a commercial certification including the name of the manufacturer, product name, style number, chemical composition, and other pertinent information to fully describe the product.
 - a) Hardness ASTM D3363 Min 2H
 - b) Adhesion ASTM D3359 5B
 - c) Impact Resistance ASTM D2794
 - d) Direct Impact ASTM D2794

718.18 Ultra-High Build Waterborne Acrylic traffic paint. Furnish a waterborne acrylic paint meeting the following requirements:

Parameter	1110 Ultra High Build	Test Methods
Density (#/gal.)	14.0 ± 0.2	ASTM D1475
Viscosity (KU), @ 77F	88 - 90	ASTM D562

rev: 10/04/18

Total Non Volatile (%)	77 min	ASTM D2369
Pigment Solids (%)	60 min	ASTM D3723
Non-Volatile Vehicle (%)	43 min	FTMS 4051
Vehicle Composition	100% HD-21	ASTM D3168
Rutile TiO2(#/ gal)	1.00	ASTM D1394
Scrub Resistance(Cycles)	1500 +	ASTM D2486
pH	9.8	ASTM E70
Non Pick Up Time (minute), 15 mils wet,no beads @ 50 % humidity	5 max	ASTM D711
VOC (grams/liter)	100	EPA method 24
Dry Through at 77°F and 60% RH		ASTM D1640
At 8 mils	10 minutes	
At 15 mils	30 minutes	
At 25 mils	60 minutes	
Freeze-Thaw 5 cycles (KU)	± 2 KU	ASTM D2243
Color	Pass	Federal # 595
Contrast Ratio @ 5 mils wet	0.93 min	ASTM D2805
Contrast Ratio @ 15 mils wet	0.99 min	ASTM D2805
Directional Reflectance (%)	88 min	ASTM E1347
Flexibility at 77°F		
1) At 8 mils	Pass	ASTM D522
2) At 15 mils	Pass	
3) At 25 mils	Pass	

EXHIBIT G

PROJECT DESIGN PLANS

A set of the design plans can be obtained from the Navajo Division of Transportation Website below during the Request for Proposal process.

<http://www.navajodot.org/RFP.aspx>

EXHIBIT H
DAVIS BACON WAGE DETERMINATION

AZ20200009 01/03/2020

"General Decision Number: AZ20200009 01/03/2020

Superseded General Decision Number: AZ20190009

State: Arizona

Construction Type: Highway

Counties: Apache, Cochise, Gila, Graham, Greenlee, La Paz,
Navajo and Santa Cruz Counties in Arizona.

HIGHWAY CONSTRUCTION PROJECTS

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.80 for calendar year 2020 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.80 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2020. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate, if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/03/2020

CARP0408-007 07/01/2019

APACHE, COCHISE & SANTA CRUZ COUNTIES

	Rates	Fringes
CARPENTER (Including Cement Form Work)	\$ 28.08	12.74

ENGI0428-004 07/01/2019		

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
Oiler Driver.....	\$ 29.21	11.04

* IRON0075-006 08/01/2019		

Apache, Cochise, Gila, Graham, Greenlee, La Paz, Navajo Counties

	Rates	Fringes
Ironworker, Rebar.....	\$ 27.80	19.05
Zone 1: 0 to 50 miles from City Hall in Phoenix or Tucson		
Zone 2: 050 to 100 miles - Add \$4.00		
Zone 3: 100 to 150 miles - Add \$5.00		
Zone 4: 150 miles & over - Add \$6.50		

SUAZ2009-002 04/23/2009

	Rates	Fringes
CARPENTER		
Gila, Graham, Greenlee, La Paz & Navajo.....	\$ 21.71	3.82
CEMENT MASON.....	\$ 17.74	3.59
ELECTRICIAN.....	\$ 24.43	5.38
IRONWORKER, Rebar		
Santa Cruz county.....	\$ 21.75	13.59
LABORER		
Asphalt Raker.....	\$ 14.97	5.88
Concrete Worker.....	\$ 13.38	4.50
Fence Builder.....	\$ 12.20	3.84
Flagger.....	\$ 12.31	3.96
General/Cleanup.....	\$ 12.78	2.50
Guard Rail Installer.....	\$ 12.20	3.84
Landscape Laborer.....	\$ 11.02	
Water Blaster.....	\$ 14.90	2.90
OPERATOR: Power Equipment		
Backhoe < 1 cu yd.....	\$ 17.76	3.89
Compactor Self Propelled (with blade-grade operation..	\$ 22.53	6.57
Compactor Small Self Propelled (with blade-backfill, ditch operation)..	\$ 22.29	6.31
Concrete Pump.....	\$ 20.31	6.48
Crane (under 15 tons).....	\$ 22.98	4.26
Drilling Machine (including wells).....	\$ 21.79	4.10
Grade Checker.....	\$ 23.41	6.54
Hydrographic Seeder.....	\$ 19.73	5.40
Mass Excavator.....	\$ 23.33	6.98
Milling Machine/Rotomill....	\$ 21.87	6.84

Power Sweeper.....	\$ 19.33	4.85
Roller (all types asphalt).. <td>\$ 17.46</td> <td>5.58</td>	\$ 17.46	5.58
Roller (excluding asphalt).. <td>\$ 19.23</td> <td>5.09</td>	\$ 19.23	5.09
Scraper (pneumatic tire)....	\$ 22.41	6.90
Screed.....	\$ 20.90	6.72
Skip Loader (all types 3 <		
6 cu yd).....	\$ 20.91	7.35
Skip Loader (all types 6 <		
10 cu yd).....	\$ 22.24	6.83
Skip Loader < 3 cu yd.....	\$ 17.97	6.60
Tractor (dozer, pusher-all).. <td>\$ 22.53</td> <td>6.47</td>	\$ 22.53	6.47
Tractor (wheel type).....	\$ 24.62	7.57
PAINTER.....	\$ 13.94	2.56
TRUCK DRIVER		
2 or 3 axle Dump or		
Flatrack.....	\$ 16.17	4.24
Oil Tanker Bootman.....	\$ 21.94	
Pickup.....	\$ 12.88	1.73
Water Truck < 2500 gal.....	\$ 19.59	5.90
Water Truck > 3900 gal.....	\$ 18.70	4.79
Water Truck 2500 < 3900 gal.	\$ 17.13	

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical

order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current

negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

=====

END OF GENERAL DECISION

"

EXHIBIT I
Environmental Requirements & Permits

FINDING OF NO SIGNIFICANT IMPACT
ENVIRONMENTAL ASSESSMENT DOCUMENT EA-02-071
RIO PUERCO BRIDGE, PROJECT N9402(2)1,2 & 3

NAVAJO REGION BRANCH OF ROADS

LOCATION: Lupton Quadrangle, USGS, 7.5 Minute Map
Section 4, T13N, R31E
Lupton, Apache County, Arizona

The proposed action is the replacement of an existing bridge (No. 656) which crosses the Rio Puerco River on Navajo Route 9402 approximately 1 kilometer (0.6 mile) south of the Lupton Chapter House, Lupton, Apache County, Arizona. The new bridge, a two-lane, five-span reinforced concrete bridge, will be installed at the same location as the existing bridge. The road approaches will be graveled, pending asphalt paving in the future. The project is sponsored by the Navajo Region Branch of Roads, P.O. Box 1060, Gallup, New Mexico 87305.

The project environmental assessment (EA) was reviewed in the Branch of Environmental Services, Navajo Regional Office. Based on the proposed action information contained in the environmental assessment, and the mitigation measures specified in the document, it is determined that the proposed project will not have a significant impact on the natural and human environment. Therefore, in accordance with the National Environmental Policy Act, Section 102 (2) (C), an environmental impact statement will not be required.

The following references, incorporated in the project environmental assessment document, serve as the bases for this decision:

1. Agency and public involvement was solicited, and environmental issues relative to the bridge replacement project were identified. Alternative courses of action and mitigation measures were developed in response to environmental concerns and issues.

2. The EA disclosed the environmental consequences of the proposed and "no action" alternatives.

3. In compliance with the Endangered Species Act, informal consultation was held with the Navajo Fish and Wildlife Department (NFWD), Natural Heritage Program and the U.S. Fish and Wildlife Service. The project is not expected to affect any federally listed species or significantly impact any tribally listed species or other species of concern (Appendix D - NFWD Letter). If active bird nests are found prior to or during construction, the NFWD is to be contacted immediately for coordination of mitigation (Appendix D - Biological Resources Compliance Form, NNDF&WL Review No. 003-008).

4. Potential impacts to flood plains and wetlands by the proposed project have been evaluated in accordance with Executive Orders 11988 and 11990. There are no jurisdictional wetlands in the project area (Appendix D - Biological Evaluation Report). The described action will have no effect on wetlands, riparian areas, flood plains, or other sensitive areas.

5. In compliance with the National Historic Preservation Act of 1966, as amended, Section 106 and 36 CFR 800.9 (b) consultation, a cultural resource inventory was performed for the proposed project by archaeologists from the Navajo Nation Historic Preservation Department (NNHPD), Roads Section. The NNHPD issued Cultural Resources Compliance Form (CRCF) NNHPD No. 03-110 indicating that no historic properties will be affected by the undertaking (Appendix C).

In the event of a discovery [discovery means any previously unidentified or incorrectly identified cultural resources including, but not limited to, archaeological deposits, human remains, or locations reportedly associated with Native American religious/traditional beliefs or practices] all operations in the immediate vicinity of the discovery must cease, and the Navajo Nation Historic Preservation Department must be notified.

6. The contractor shall be responsible for recontouring and reclaiming all disturbed areas within the right-of-way according to recommendations provided by the Navajo Department of Agriculture (Appendix E).

7. In compliance with the Clean Water Act, as amended, Section 401 consultation with the U.S. Environmental Protection Agency for Clean Water Act Certification shall be conducted prior to construction (EA, Part 3.4.).

8. In compliance with the Clean Water Act, as amended, Section 402 (p), Storm Water Pollution Protection, the contractor shall comply with all the conditions of the general NPDES permit and shall develop a Storm Water Pollution Prevention Plan prior to initiating construction activities (EA, Part 3.4.).

9. In compliance with the Clean Water Act, Section 404, as amended, the contractor shall consult with the Army Corps of Engineers prior to construction regarding 404 determination. It is anticipated that the project will be authorized under Nationwide Permit No. 14, Linear Transportation Crossings.

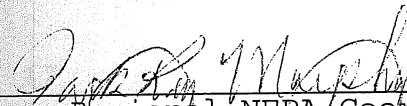
10. In accordance with the Resource Conservation and Recovery Act, Subtitle C, Hazardous Waste, the contractor shall implement Best Management Practices (BMPs) Nos. 7 and 8 regarding potential spills and handling of oil, fuel, lubricants and hydraulic fluids (Appendix E - BMPs).

11. In accordance with the Resource Conservation and Recovery Act, Subtitle D, Non-Hazardous Waste, the contractor shall implement Best Management Practices (BMPs) No. 6 regarding trash disposal (Appendix E - BMPs).

12. Cumulative and secondary effects on soil, water, air, vegetation, cultural resources, wildlife resources (species and habitat) were considered, and the proposed mitigation measures were found to be acceptable.

13. In accordance with Executive Order 12898 on Environmental Justice, impacts to minority and low-income populations and communities have been considered by the Regional NEPA Coordinator, as have impacts to Indian trust resources.

The proposed project, supported by resolution of the Lupton Chapter (Appendix A), would alleviate the safety hazards associated with the existing bridge, and allow safe travel for community residents living on the south side of the Rio Puerco River.



Regional NEPA/Coordinator
For

5/15/03
Date

CULTURAL RESOURCES COMPLIANCE FORM
HISTORIC PRESERVATION DEPARTMENT
PO BOX 4950
WINDOW ROCK, ARIZONA 86515

ROUTING: COPIES TO

<u>AZ</u>	SHPO
<u>X</u>	ACHP
<u>X</u>	REAL PROPERTY MGT/330
<u>X</u>	BIA Branch of Roads
<u>X</u>	Pueblo of Acoma
<u>X</u>	Pueblo of Laguna
<u>X</u>	Hopi Tribe
<u>X</u>	Pueblo of Zia
<u>X</u>	Pueblo of Zuni

NNHPD NO. 03-110
OTHER PROJECT NO. BOR-02-010;
Sponsor # N9402 - N3640400

PROJECT TITLE: A Cultural Resources Assessment of the N9402 (1)/656 Rio Puerco Bridge Easement in Lupton, Fort Defiance Agency, Apache County, Arizona.

LEAD AGENCY: Bureau of Indian Affairs, Navajo Regional Office.

SPONSOR: Harold Riley, Bureau of Indian Affairs, Navajo Regional Office, Branch of Roads

PROJECT DESCRIPTION: The undertaking will involve the construction of a new bridge and approach roads on either end. Bridge improvements will involve the construction of a single-span, prestressed, concrete-beam bridge with a cast in place concrete deck. Approach road improvements on either end will include heavy grading and minor realignments of the existing roadway. Ground disturbance will be intensive and extensive within the proposed right-of-way. All improvements will take place between stations 0+100 m and 0+490 m. The area of effect for the north approach road 92 m wide (46 m on both sides of the center line) and 110 m long; for the bridge it is 130 m wide (70 m right and 60 m left of the center line); and for the south approach road it is 90 m long and 92 m wide (46 m on both sides of the center line). The total area of effect 10.6 acres (4.3 ha).

LAND STATUS: Navajo Tribal Trust

CHAPTER(S): Lupton

LOCATION: Project crosses Rio Puerco near the community of Lupton, Arizona. See 7.5' USGS map entitled "Lupton, Arizona."

BOP - Township 22N, Range 31E; Section 8, NE 1/4, NE 1/4, NW 1/4; UTM 3910532N, 675344E

Bridge center point - Township 22N, Range 31E; Section 8, NE 1/4, NE 1/4, NW 1/4;
UTM 3940745N, 675269E

EOP - Township 22N, Range 31E; Section 8, NE 1/4, NE 1/4, NE 1/4; UTM 3910889N, 675280E

PROJECT ARCHAEOLOGIST(S): Loretta Holyan
PROJECT ETHNOGRAPHER (S): Paul Jim, Patsy Dehiya
NAVAJO ANTIQUITIES PERMIT NO.: Navajo Tribal Code

DATE INSPECTED: January 22, February 6 - 7, and February 19, 2003.

DATE OF REPORT: March 13, 2003.

TOTAL ACREAGE INSPECTED: 10.6 acres (4.3 ha).

METHOD OF INVESTIGATION: Archaeological Methods: Class III pedestrian survey for total area of effect with transects spaced no more than 15 meters apart. Ethnographic Methods: Interviews with local residents and knowledgeable individuals.

LIST OF CULTURAL RESOURCES FOUND: AZ-P-41-129; In use bridge.

LIST OF ELIGIBLE PROPERTIES: None.

LIST OF NON-ELIGIBLE PROPERTIES: AZ-P-41-129; In use bridge.

LIST OF ARCHAEOLOGICAL RESOURCES: None.


EFFECT/CONDITIONS OF COMPLIANCE: Pursuant to Stipulation 3 of "A Programmatic Agreement among the Navajo Nation, the Bureau of Indian Affairs-Navajo Area Office, the Advisory Council on Historic Preservation, the Arizona State Historic Preservation Officer, the New Mexico State Historic Preservation Officer, and the Utah State Historic Preservation Officer for Cultural Resource Management Projects Conducted Under the Auspices of the Navajo Nation Historic Preservation Department, Roads Planning Section within the Boundaries of the Navajo Nation," the Navajo Nation Historic Preservation Department has determined that **no historic properties** will be affected by the undertaking.

In the event of a discovery ["discovery" means any previously unidentified or incorrectly identified cultural resources including but not limited to archaeological deposits, human remains, or locations reportedly associated with Native American religious/ traditional beliefs or practices], all operations in the immediate vicinity of the discovery must cease and the Navajo Nation Historic Preservation Department must be notified at 928-871-7688.

FORM PREPARED BY: Reid Nelson
FINALIZED: April 9, 2003

Notification to
Proceed Recommended:
Conditions:

Yes ☒ No ☐
Yes ☐ No ☒


Alan Downer
Navajo Nation Historic
Preservation Officer

4-9-03
Date

Agency Approval:

Yes ☒ No ☐


ACTING Regional Director

4-9-03
Date

CULTURAL RESOURCES INVENTORY REPORT DOCUMENTATION PAGE (HPD JAN/91)

1. HPD Report No. HPD-03-110	2. (For HPD Use Only)	3. Recipient's Accession No.
4. Title of Report: A Cultural Resources Assessment of the N9402(1)/ 656 Rio Puerco Bridge Easement in Lupton, Fort Defiance Agency, Apache County, Arizona. HPD-03-110\BIA-BOR-02-010.		
Author(s): Paul Jim, Loretta Holyan and Patsy Dehiya		
5. Fieldwork Dates: February 06, 07, 19, 2003	6. Report Date: 03/13/03	
7. Consultant's Name and Address General Charge: Reid Nelson, Program Manager Name: Navajo Nation Historic Preservation Dept. (NNHPD) Roads Planning Program Organization Address: P.O. Box 4950, Window Rock, Arizona 86515 Phone: (928) 871-7688	8. Permit: NTC (Navajo Tribal Code)	
	9. Consultant's No.: BIA-BOR No. 02-010	
10. Sponsor's Name and Address: Individual: Mr. Harold Riley Organization: BIA Navajo Region-Branch of Roads Address: Box 1060, Gallup NM 87305 Phone: (505) 863-8200 x281	11. Sponsor's Project No.: N3640400	
	12. Area of Effect: 10.6 ac (4.3 ha) Area Surveyed: 10.6 ac (4.3 ha)	
13. Location (map attached): See Figures 1 - 2		
a. Chapter(s): Lupton	f. UTMs (see Table 1)	
b. Agency: Fort Defiance	g. Legals (see Table 1)	
c. County: Apache	h. USGS 7.5' map(s): Lupton, Arizona - New Mexico (Map Tech. Inc. 1997)	
d. State: Arizona		
e. Land Status: Navajo Tribal Trust Land		

Table 1. UTM Coordinates and Legal Description for the Proposed N9402(1) Rio Puerco Wash Bridge located in Lupton, Arizona. Points taken with hand-held Global Positioning System (GPS).

Map UTM Point	UTM Zone 12		Legal Description					
	Easting	Northing	Section	¼	¼	¼	T	R
BOP	675344 E	3910532 N	Section 8 ; NE; NE; NW				22 N	31 E
AZ-P-41-129	675310 E	3910465N	Section 8 ; NE; NE; NW				22 N	31 E
N656 Bridge	675269 E	3940745 N	Section 8 ; NE; NE; NW				22 N	31 E
EOP	675280 E	3910889 N	Section 8 ; NE; NE; NE				22 N	31 E

† Point is taken at the center of the bridge and site.

Best Management Practices

In order to avoid, reduce, or mitigate potentially adverse impacts during the construction of this project, the Contractor will incorporate the following best management practices (to the fullest extent).

1. Construct the project in accordance with the Manual for Standard Specifications for Construction of roads on Federal Highway Projects (FP-14), and in compliance with all applicable Navajo Tribal and Federal laws, codes, safety regulations, and executive orders.

2. The Contractor will avoid any increase in sedimentation of bodies of water on or near the project by preparing and implementing a Storm Water Pollution Prevention Plan (SWPPP). The Contractor will implement the SWPPP prior to any ground-disturbing activities. Adjustments in the SWPPP, during construction, shall be coordinated with the Construction Manager to insure compliance with the Clean Water Act.

3. The Contractor shall stockpile the existing topsoil for uses in re-vegetation of borrow pits and roadway slopes, where feasible in accordance with the FP-14 and contract specifications.

4. The cut and fill volumes will be balanced as much as possible to avoid the use of borrow sources and all slopes shall be rounded to blend into the existing terrain. All disturbed ground on the project will be disked, seeded, mulched, and re-vegetated as described in the supplemental specifications for section 625.

Reclamation will be considered successful when the desirable native vegetation is established, erosion is controlled, weeds are a minimal threat, and it is likely that ground cover will return to a desirable condition. Cover of desirable native vegetation will be considered sufficient when it reaches 70% cover relative to the surrounding vegetation.

5. The following BMPs will be followed for all structural improvements, including any pipelines, storage tanks, and troughs:

- All construction trash and debris would be removed from project site.
- All equipment brought in from off the site will be power washed before entering the site to avoid the possible introduction and invasion of noxious and invasive weeds. All construction trash and debris would be removed from project site.
- Ground disturbance from the heavy equipment would be re-seeded with a certified weed free seed mix per section 625 of the FP-14 supplemental specifications. The seed would be suitable to area and match existing native species.

- If an archeological site is encountered, construction must cease, and the Construction Manager and project Owner representative must be notified immediately.
- If at any time, populations of noxious weeds are encountered, construction must cease and measures must be taken to clear the right of way. The problem area would be sprayed with the appropriate herbicide in accordance with section 109.02m of the FP-14. By law, the target weed must be listed on the label of the herbicide being applied, and the rate applied must be in accordance with the manufacturer's recommendations.

6. Construction hours (limited to 40 hour work weeks) will be between 6:00 am and 8:00 pm, Monday through Friday, (weather permitting). In high wildlife use areas, an alternate construction schedule may be used in consultation with the Navajo Fish and Wildlife Department and/or U.S. Fish and Wildlife Service.

7. The Contractor's camp and equipment storage area will be kept clean and free of litter at all times, to prevent debris and litter from entering bodies of water. All trash will be disposed of in accordance with USEPA regulations and all camp sites and equipment storage areas will be restored to their natural condition at project completion (in accordance with government, Tribal, State or BLM permit requirements).

8. The Contractor will daily inspect all construction equipment for leaks and notify the Construction Manager on the removal of leaking equipment from the project site until the leaking equipment is repaired and spills cleaned up to the satisfaction of the Construction Manager and Environmental Quality Office. Equipment will be washed down in a designated area to prevent transport of mud, noxious weeds, and other debris from leaving the project limits when transporting equipment off the project site. Such debris will be collected and hauled off to a disposal site by the Contractor.

9. **Noxious weed control Standard Operating Procedures** for work on Tribal lands will be followed:

- Ensure equipment involved in land disturbing actions, be clean of noxious weed seeds or propagative parts prior to entry on site. When working in areas with noxious weeds equipment should be cleaned prior to moving off site.
- Survey and inventory proposed work areas for noxious weeds; take reasonable measures to avoid spread of noxious weeds found (i.e. - cleaning equipment with pressure washers, stockpiling overburden material for later treatment, avoiding driving through weed patches). The following noxious weeds have been identified as occurring on lands within the boundaries the Navajo Reservation.

- 1) Russian Knapweed (*Centaurea repens*)
- 2) Musk Thistle (*Carduus nutans*)

- 3) Bull Thistle (*Cirsiumvulgare*)
- 4) Canada Thistle (*Cirsiumarvense*)
- 5) Scotch Thistle (*Onopordumacanthium*)
- 6) Hoary Cress (*Cardariaadraba*)
- 7) Perennial Pepperweed (*Lepidiumlatifolium*)
- 8) Halogeton (*Halogetonglomeratus*)
- 9) Spotted Knapweed (*Centaureamaculosa*)
- 10) Dalmation Toadflax (*Linariagenistifolia*)
- 11) Yellow Toadflax (*Linaria vulgaris*)
- 12) Camelthorn (*Alhagipseudalhagi*)
- 13) Yellow Starthistle (*Centaureasolstitialis*)
- 14) Saltcedar (*Tamarix spp.*)
- 15) Diffuse Knapweed (*Centaureadiffusa*)

- Use only certified weed free erosion control and re-vegetation materials (e.g. mulch, seed, natural fiber mats).
- If fill dirt or gravel will be required, the source needs to be noxious weed free to the fullest extent possible.
- The site should be monitored by the Contractor for the life of the project for the presence of noxious weeds (includes maintenance & construction activities). If weeds are found the Contractor will notify the Construction Manager who will determine the best method for the control of the particular weed species.

Reclamation and re-vegetation of the work site will use species specified by the contract. All seed should be certified weed free. The area will be monitored to determine the success of the re-vegetation, and re-vegetation may have to be continued until successful.

Any need for noxious weeds treatment shall be in accordance with section 109.02(s) of the FP-2014.

10. All oils, fuels, lubricants, and hydraulic fluids will be kept in sealed storage containers and or facilities that meet EPA regulations for preventing contamination of the environment.

11. Damage to trees and shrubs outside of the construction limits will be replaced by the Contractor at his expense as directed by the Construction Manager.

12. Parking and staging areas will be limited to the construction limits. Existing roads may be used for detours, storage of equipment, and the hauling of materials and water to the fullest extent possible with proper permits. Storage areas within the construction limits will utilize existing disturbed areas and be kept as small as possible.

13. The installation of drainage structures will be undertaken in such fashion so as to minimize soil erosion and to provide for a minimum of 610 mm of cover over the pipe as measured from the roadway shoulder.

14. Structural replacements will be performed during periods of low- or no-flow periods to minimize water quality impacts. No dumping of waste concrete will be allowed on the project site except in approved and lined pits on the project. Any and all excess concrete and asphalt materials will be disposed of (off site) in accordance to EPA regulations and section 107.10 of the FP-2014.

15. The Contractor will acquire water-use and aggregate material permissions/permits through the landowner process, and follow all requirements of such permits, including royalties and environmental and Clean Water Act requirements.

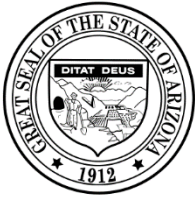
16. The Government and project owner will acquire and construction Contractor will comply with the following regulations regarding the Federal Clean Water Act permits:

- a) Section 401 & 404 permits
- b) Water Quality (Section 402) Certification
- c) National Pollution Discharge Elimination System (NPDES) permit and the Storm Water Pollution Prevention Plan to be prepared by Contractor and approved by the Construction Manager.

17. Comply with all mitigation requirements concerning archaeological sites on or near the project site as defined in the compliance documents provided herein.

EXHIBIT I

401/404 PERMITS



Douglas A. Ducey
Governor

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY



Misael Cabrera
Director

April 8, 2020

George Padilla
DOI-BIA Navajo Region Branch, Environmental Compliance
P.O. Box 1060
Gallup, NM 87305

Re: Clean Water Act § 401 Water Quality Certification for N9402(2)1,2&3 Bridge N656 Replacement (Rio Puerco)

Dear Mr. Padilla:

The Arizona Department of Environmental Quality (ADEQ) received your § 401 application for N9402(2)1,2&3 Bridge N656 Replacement (Rio Puerco) on April 1, 2020. ADEQ's review was conducted pursuant to Section 401(a) of the Federal Clean Water Act (CWA) (33 U.S.C. §1251 et seq.) and Arizona Revised Statutes Section 49-202, which specifies that ADEQ shall process requests by applicants for §401 certification of nationwide or general permits required by Section 404 of the CWA to determine whether the effect of a discharge will comply with the Arizona's surface water quality standards for navigable waters.

ADEQ has reviewed the information in the application and determined that this project is conditionally certified pursuant to the U.S. Army Corps of Engineers (USACE) Nationwide Permit #14 (NWP), Linear Transportation Projects.

Required Actions

- The applicant is responsible for complying with all general conditions specified in the State of Arizona's CWA § 401 Water Quality Certification of the USACE NWP #14.

Recommendations

The suggestions below are not required by State law and there are no legal consequences should you choose to disregard them; however, ADEQ appreciates your cooperation and asks you to consider the following:

Main Office

1110 W. Washington Street • Phoenix, AZ 85007
(602) 771-2300

Southern Regional Office

400 W. Congress Street • Suite 433 • Tucson, AZ 85701
(520) 628-6733

www.azdeq.gov

printed on recycled paper

- The issuance of a State § 401 Water Quality Conditional Certification does not imply or suggest that requirements for other permits including, but not limited to: Aquifer Protection Permits, Arizona Pollutant Discharge Elimination System Permits, Construction General Permits, DeMinimis Permits, Pesticide General Permits, and Reclaimed Water permits are met or superseded. Applicant should contact ADEQ to ensure all applicable permits are obtained.

Correspondence

For any correspondence regarding this project, the ADEQ mailing address is:

Arizona Department of Environmental Quality
Rosi Sherrill
Surface Water Section / §401 Certifications / mailstop 5415A-1
1110 West Washington Street
Phoenix, Arizona 85007

For questions or general comments:

Email: sherrill.laurie@azdeq.gov

Voice: (602) 771-4409

In any correspondence, reference:

N9402(2)1,2&3 Bridge N656 Replacement (Rio Puerco)

ADEQ LTF No.: 81980

Thank you for your efforts to comply with Arizona's environmental requirements. Should you have any comments or questions regarding this matter, please do not hesitate to contact me.

Sincerely,

Rosi Sherrill

Laurie (Rosi) Sherrill
Surface Water Permits

electronic copies: DOI-BIA Navajo Region DOT – Attn: Harold J. Riley
U.S. Army Corps of Engineers, Regulatory Branch – Attn.: Ann Palaruan
USEPA, Wetlands Regulatory Office



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, LOS ANGELES DISTRICT
3636 N CENTRAL AVENUE, SUITE 900
PHOENIX, AZ 85012-1939

April 22, 2020

SUBJECT: Nationwide Permit (NWP) Verification

George Padilla
BIA Navajo Region
P.O. Box 1060
Window Rock, AZ 86515

Dear Ms. Padilla:

I am responding to your request (SPL-2020-00239) for a Department of the Army permit concerning your proposal to grade and replace the existing bridge number N656 crossing the Rio Puerco River. This proposed project is located within 8.30 acres of land along the existing N9402 roadway, in a portion of Section 8, T22N, R31E (35.193973°N, -109.42033°W), Lupton, Apache County, Arizona.

Because this project would result in a discharge of dredged and/or fill material into waters of the U.S., a Department of the Army permit is required pursuant to Section 404 of the Clean Water Act (33 USC 1344; 33 CFR parts 323 and 330).

I have determined construction of your proposed project, if constructed as described in your application, would comply with Nationwide Permit (NWP) No. 14, "Linear Transportation Projects". Specifically, you are authorized to:

Discharge dredged and/or fill material involving 0.44 acres into the Rio Puerco River. This activity is associated with BIA's proposal to grade and replace the existing bridge crossing number N656. These activities are specifically described and shown in BIA's 404 application dated March 31, 2020.

For this NWP verification letter to be valid, you must comply with all of the terms and conditions in Enclosure 1. Furthermore, you must comply with the non-discretionary Special Condition listed below:

The permittee shall comply with the Clean Water Act Section 401 Certification provisions outlined in the April 8, 2020 letter from Arizona Department of Environmental Quality.

This verification is valid through March 18, 2022. If on March 18, 2022, you have commenced or are under contract to commence the permitted activity you will have an additional twelve (12) months to complete the activity under the present NWP terms and conditions.

However, if I discover noncompliance or unauthorized activities associated with the permitted activity I may request the use of discretionary authority in accordance with procedures in 33 CFR § 330.4(e) and 33 CFR § 330.5(c) or (d) to modify, suspend, or revoke this specific verification at an earlier date. Additionally, at the national level the Chief of Engineers, any time prior to March 18, 2022, may chose to modify, suspend, or revoke the nationwide use of a NWP after following procedures set forth in 33 CFR § 330.5. It is incumbent upon you to comply with all of the terms and conditions of this NWP verification and to remain informed of any change to the NWPs.

A NWP does not grant any property rights or exclusive privileges. Additionally, it does not authorize any injury to the property, rights of others, nor does it authorize interference with any existing or proposed Federal project. Furthermore, it does not obviate the need to obtain other Federal, state, or local authorizations required by law.

Thank you for participating in the regulatory program. If you have any questions, please contact Ann Palaruan at (602) 230-6955 or via e-mail at Cynthia.A.Palaruan@usace.army.mil.

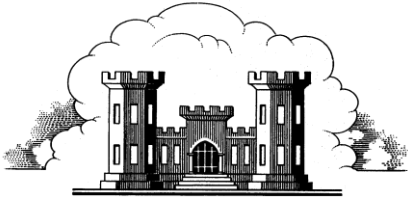
Please help me to evaluate and improve the regulatory experience for others by completing the [customer survey](http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey) form at http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey.

Sincerely,



Sallie Diebolt
Chief, Arizona Branch
Regulatory Division

Enclosures



**LOS ANGELES DISTRICT
U.S. ARMY CORPS OF ENGINEERS**

**CERTIFICATE OF COMPLIANCE WITH
DEPARTMENT OF THE ARMY NATIONWIDE PERMIT**

Permit Number: *SPL-2020-00239*

Name of Permittee: *George Padilla, BIA Navajo Region*

Date of Issuance: *April 22, 2020*

Upon completion of the activity authorized by this permit and the mitigation required by this permit, sign this certificate, and return it by **ONE** of the following methods;

1) Email a digital scan of the signed certificate to Cynthia.A.Palaruan@usace.army.mil
OR

2) Mail the signed certificate to
U.S. Army Corps of Engineers
ATTN: Regulatory Division SPL-2020-00239
3636 N Central Avenue, Suite 900
Phoenix, AZ 85012-1939

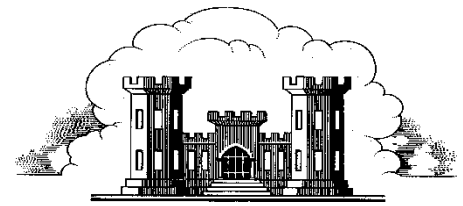
I hereby certify that the authorized work and any required compensatory mitigation has been completed in accordance with the NWP authorization, including all general, regional, or activity-specific conditions. Furthermore, if credits from a mitigation bank or in-lieu fee program were used to satisfy compensatory mitigation requirements I have attached the documentation required by 33 CFR 332.3(l)(3) to confirm that the appropriate number and resource type of credits have been secured.

Signature of Permittee

Date

NATIONWIDE PERMIT NUMBER 14

LINEAR TRANSPORTATION PROJECTS



**US Army Corps of Engineers
Los Angeles District
Regulatory Division/Arizona Branch**

A. General Information

This document is an aid to understanding the terms and conditions of your nationwide permit (NWP) by bringing together information issued separately in: (1) the [Federal Register \(82 FR 1860-2008\)*](#), (2) the Special Public Notice for NWP "Reissuance of the Nationwide Permits and Issuance of Final Regional Conditions for the Los Angeles District"*, and (3) the Clean Water Act Section 401 water quality certification decisions (401 WQCs)* issued by the White Mountain Apache Tribe, Hopi Tribe, Hualapai Tribe, Navajo Nation, U.S. Environmental Protection Agency, and Arizona Department of Environmental Quality. Please note that website addresses enclosed herein may have been changed and updated since publication of the original document.

- 1) Pursuant to Section 404 of the Clean Water Act (33 U.S.C. 1344) and/or Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 401 et seq) the U.S. Army Corps of Engineers (Corps) published the "Issuance and Reissuance of Nationwide Permits" in the Federal Register (82 FR 1860-2008) on January 6, 2017. These NWPs are in effect from March 19, 2017 through March 18, 2022 unless modified, reissued, or revoked before that time. It is incumbent upon the permittee to remain informed of changes to the NWPs.
- 2) The Los Angeles District of the Corps issued a Special Public Notice (March 22, 2017) announcing final regional conditions for NWPs to ensure protection of high value waters within the State of Arizona.
- 3) The Los Angeles District of the Corps requested and obtained for the entire State of Arizona the 401 WQC decision for all NWPs on all tribal lands from the White Mountain Apache Tribe, Hopi Tribe, Hualapai Tribe, Navajo Nation, and U.S. Environmental Protection Agency and on all non-tribal lands from the Arizona Department of Environmental Quality.

A description of all NWPs and 401 WQCs can be found in the "Nationwide Permits for Arizona" Special Public Notice.*

***Note:** The Federal Register can be accessed at <https://www.gpo.gov/fdsys/pkg/FR-2017-01-06/pdf/2016-31355.pdf>

Key Sections:

B. Nationwide Permit Terms (page 1)
D. District Engineer's Decision (page 7)
F. 401 Water Quality Certifications (page 8)

C. Nationwide Permit General Conditions (page 2)
E. Nationwide Permit Regional Conditions (page 8)

B. Nationwide Permit Terms

14. Linear Transportation Projects. Activities required for crossings of waters of the United States associated with the construction, expansion, modification, or improvement of linear transportation projects (e.g., roads, highways, railways, trails, airport runways, and taxiways) in waters of the United States. For linear transportation projects in non-tidal waters, the discharge cannot cause the loss of greater than 1/2-acre of waters of the United States. For linear transportation projects in tidal waters, the discharge cannot cause the loss of greater than 1/3-acre of waters of the United States. Any stream channel modification, including bank stabilization, is limited to the minimum necessary to construct or protect the linear transportation project; such modifications must be in the immediate vicinity of the project.

This NWP also authorizes temporary structures, fills, and work, including the use of temporary mats, necessary to construct the linear transportation project. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to preconstruction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

This NWP cannot be used to authorize non-linear features commonly associated with transportation projects, such as vehicle maintenance or storage buildings, parking lots, train stations, or aircraft hangars.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if: (1) the loss of waters of the United States exceeds 1/10-acre; or (2) there is a discharge in a special aquatic site, including wetlands. (See general condition 32.) (Authorities: Sections 10 and 404)

Note 1: For linear transportation projects crossing a single waterbody more than one time at separate and distant locations, or multiple waterbodies at separate and distant locations, each crossing is considered a single and complete project for purposes of NWP authorization. Linear transportation projects must comply with 33 CFR 330.6(d).

Note 2: Some discharges for the construction of farm roads or forest roads, or temporary roads for moving mining equipment, may qualify for an exemption under section 404(f) of the Clean Water Act (see 33 CFR 323.4).

Note 3: For NWP 14 activities that require pre-construction notification, the PCN must include any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings that require Department of the Army authorization but do not require preconstruction notification (see paragraph (b) of general condition 32). The district engineer will evaluate the PCN in accordance with Section D, "District Engineer's Decision." The district engineer may require mitigation to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see general condition 23).

C. Nationwide Permit General Conditions

Note: To qualify for NWP authorization, the prospective permittee must comply with the following general conditions, as applicable, in addition to any regional or case-specific conditions imposed by the division engineer or district engineer. Prospective permittees should contact the appropriate Corps district office to determine if regional conditions have been imposed on an NWP. Prospective permittees should also contact the appropriate Corps district office to determine the status of Clean Water Act Section 401 water quality certification and/ or Coastal Zone M management Act consistency for a NWP. Every person who may wish to obtain permit authorization under one or more NWPs, or who is currently relying on an existing or prior permit authorization under one or more NWPs, has been and is on notice that all of the provisions of 33 CFR 330.1 through 330.6 apply to every NWP authorization. Note especially 33 CFR 330.5 relating to the modification, suspension, or revocation of any NWP authorization.

1. Navigation. (a) No activity may cause more than a minimal adverse effect on navigation. (b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States. (c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

2. Aquatic Life Movements. No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species. If a bottomless culvert cannot be used, then the crossing should be designed and constructed to minimize adverse effects to aquatic life movements.

3. Spawning Areas. Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

4. Migratory Bird Breeding Areas. Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

5. Shellfish Beds. No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.

6. Suitable Material. No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).

7. Water Supply Intakes. No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

8. Adverse Effects from Impoundments. If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

9. Management of Water Flows. To the maximum extent practicable, the preconstruction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization, storm water management activities, and temporary and permanent road crossings, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the preconstruction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

10. Fills Within 100-Year Floodplains. The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. Equipment. Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. Soil Erosion and Sediment Controls. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow, or during low tides.

13. Removal of Temporary Fills. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

14. Proper Maintenance. Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.

15. Single and Complete Project. The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

16. Wild and Scenic Rivers. (a) No NWP activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status. (b) If a proposed NWP activity will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, the permittee must submit a pre-construction notification (see general condition 32). The district engineer will coordinate the PCN with the Federal agency with direct management responsibility for that river. The permittee shall not begin the NWP activity until notified by the district engineer that the Federal agency with direct management responsibility for that river has determined in writing that the proposed NWP activity will not adversely affect the Wild and Scenic River designation or study status. (c) Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency responsible for the designated Wild and Scenic River or study river (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service). Information on these rivers is also available at: <http://www.rivers.gov/>.

17. Tribal Rights. No NWP activity may cause more than minimal adverse effects on tribal rights (including treaty rights), protected tribal resources, or tribal lands.

18. Endangered Species. (a) No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which “may affect” a listed species or critical habitat, unless ESA section 7 consultation addressing the effects of the proposed activity has been completed. Direct effects are the immediate effects on listed species and critical habitat caused by the NWP activity. Indirect effects are those effects on listed species and critical habitat that are caused by the NWP activity and are later in time, but still are reasonably certain to occur. (b) Federal agencies should follow their own procedures for complying with the requirements of the ESA. If pre-construction notification is required for the proposed activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation has not been submitted, additional ESA section 7 consultation may be necessary for the activity and the respective federal agency would be responsible for fulfilling its obligation under section 7 of the ESA. (c) Non-federal permittees must submit a pre-construction notification to the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, the pre-construction notification must include the name(s) of the endangered or threatened species that might be affected by the proposed activity or that utilize the designated critical habitat that might be affected by the proposed activity. The district engineer will determine whether the proposed activity “may affect” or will have “no effect” to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps’ determination within 45 days of receipt of a complete pre-construction notification. In cases where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the activity, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification that the proposed activity will have “no effect” on listed species or critical habitat, or until ESA section 7 consultation has been completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps. (d) As a result of formal or informal consultation with the FWS or NMFS the district engineer may add species-specific permit conditions to the NWPs. (e) Authorization of an activity by an NWP does not authorize the “take” of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with “incidental take” provisions, etc.) from the FWS or the NMFS, the Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where “take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word “harm” in the definition of “take” means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. (f) If the non-federal permittee has a valid ESA section 10(a)(1)(B) incidental take permit with an approved Habitat Conservation Plan for a project or a group of projects that includes the proposed NWP activity, the non-federal applicant should provide a copy of that ESA section 10(a)(1)(B) permit with the PCN required by paragraph (c) of this general condition. The district engineer will coordinate with the agency that issued the ESA section 10(a)(1)(B) permit to determine whether the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation conducted for the ESA section 10(a)(1)(B) permit. If that coordination results in concurrence from the agency that the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation for the ESA section 10(a)(1)(B) permit, the district engineer does not need to conduct a separate ESA section 7 consultation for the proposed NWP activity. The district engineer will notify the non-federal applicant within 45 days of receipt of a complete pre-construction notification whether the ESA section 10(a)(1)(B) permit covers the proposed NWP activity or whether additional ESA section 7 consultation is required. (g) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the FWS and NMFS or their World Wide Web pages at <http://www.fws.gov/> or <http://www.fws.gov/ipac> and <http://www.nmfs.noaa.gov/pr/species/esa/> respectively. (Note: Arizona endangered species information is available at <http://www.fws.gov/southwest/es/arizona/Threatened.htm#CountyList>)

19. Migratory Birds and Bald and Golden Eagles. The permittee is responsible for ensuring their action complies with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The permittee is responsible for contacting appropriate local office of the U.S. Fish and Wildlife Service to determine applicable measures to reduce impacts to migratory birds or eagles, including whether “incidental take” permits are necessary and available under the Migratory Bird Treaty Act or Bald and Golden Eagle Protection Act for a particular activity.

20. Historic Properties. (a) In cases where the district engineer determines that the activity may have the potential to cause effects to properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied. (b) Federal permittees should follow their own procedures for complying with the requirements of section 106 of the National Historic Preservation Act. If pre-construction notification is required for the proposed NWP activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation is not submitted, then additional consultation under section 106 may be necessary. The respective federal agency is responsible for fulfilling its obligation to comply with section 106. (c) Non-federal permittees must submit a pre-construction notification to the district engineer if the NWP activity might have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties might have the potential to be affected by the proposed NWP activity or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of, or potential for, the presence of historic properties can be sought from the State Historic Preservation Officer, Tribal Historic Preservation Officer, or designated tribal representative, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of section 106 of the National Historic Preservation Act. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted in the PCN and these identification efforts, the district engineer shall determine whether the proposed NWP activity has the potential to cause effects on the historic properties. Section 106 consultation is not required when the district engineer determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR 800.3(a)). Section 106 consultation is required when the district engineer determines that the activity has the potential to cause effects on historic properties. The district engineer will conduct consultation with consulting parties identified under 36 CFR 800.2(c) when he or she makes any of the following effect determinations for the purposes of section 106 of the NHPA: no historic properties affected, no adverse effect, or adverse effect. Where the non-Federal applicant has identified historic properties on which the activity might have the potential to cause effects and so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects to historic properties or that NHPA section 106 consultation has been completed. (d) For non-

federal permittees, the district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA section 106 consultation is required. If NHPA section 106 consultation is required, the district engineer will notify the non-Federal applicant that he or she cannot begin the activity until section 106 consultation is completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps. (e) Prospective permittees should be aware that section 110k of the NHPA (54 U.S.C. 306113) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

21. Discovery of Previously Unknown Remains and Artifacts. If you discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by this permit, you must immediately notify the district engineer of what you have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal, and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

22. Designated Critical Resource Waters. Critical resource waters include, NOAA-managed marine sanctuaries and marine monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or ecological significance, such as outstanding national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment. (a) Discharges of dredged or fill material into waters of the United States are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, and 52 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters. (b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, 38, and 54, notification is required in accordance with general condition 32, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after it is determined that the impacts to the critical resource waters will be no more than minimal.

23. Mitigation. The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal: (a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site). (b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal. (c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. For wetland losses of 1/10-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in only minimal adverse environmental effects. (d) For losses of streams or other open waters that require pre-construction notification, the district engineer may require compensatory mitigation to ensure that the activity results in no more than minimal adverse environmental effects. Compensatory mitigation for losses of streams should be provided, if practicable, through stream rehabilitation, enhancement, or preservation, since streams are difficult-to-replace resources (see 33 CFR 332.3(e)(3)). (e) Compensatory mitigation plans for NWP activities in or near streams or other open waters will normally include a requirement for the restoration or enhancement, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, the restoration or maintenance/protection of riparian areas may be the only compensatory mitigation required. Restored riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to restore or maintain/protect a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or maintaining/protecting a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of minimization or compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses. (f) Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332. (1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in no more than minimal adverse environmental effects. For the NWPs, the preferred mechanism for providing compensatory mitigation is mitigation bank credits or in-lieu fee program credits (see 33 CFR 332.3(b)(2) and (3)). However, if an appropriate number and type of mitigation bank or in-lieu credits are not available at the time the PCN is submitted to the district engineer, the district engineer may approve the use of permittee-responsible mitigation. (2) The amount of compensatory mitigation required by the district engineer must be sufficient to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see 33 CFR 330.1(e)(3)). (See also 33 CFR 332.3(f)). (3) Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, aquatic resource restoration should be the first compensatory mitigation option considered for permittee-responsible mitigation. (4) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2) through (14) must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)). (5) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan only needs to address the baseline conditions at the impact site and the number of credits to be provided. (6) Compensatory mitigation requirements (e.g., resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan (see 33 CFR 332.4(c)(1)(ii)). (g) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2-acre, it cannot be used

to authorize any NWP activity resulting in the loss of greater than 1/2-acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that an NWP activity already meeting the established acreage limits also satisfies the no more than minimal impact requirement for the NWPs. **(h)** Permittees may propose the use of mitigation banks, in-lieu fee programs, or permittee-responsible mitigation. When developing a compensatory mitigation proposal, the permittee must consider appropriate and practicable options consistent with the framework at 33 CFR 332.3(b). For activities resulting in the loss of marine or estuarine resources, permittee-responsible mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee-responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management. **(i)** Where certain functions and services of waters of the United States are permanently adversely affected by a regulated activity, such as discharges of dredged or fill material into waters of the United States that will convert a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse environmental effects of the activity to the no more than minimal level.

24. Safety of Impoundment Structures. To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with established state dam safety criteria or have been designed by qualified persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.

25. Water Quality. Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR 330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

26. Coastal Zone Management. In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). The district engineer or a State may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

27. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

28. Use of Multiple Nationwide Permits. The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.

29. Transfer of Nationwide Permit Verifications. If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:

“When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.”

(Transferee)

(Date)

30. Compliance Certification. Each permittee who receives an NWP verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and implementation of any required compensatory mitigation. The success of any required permittee-responsible mitigation, including the achievement of ecological performance standards, will be addressed separately by the district engineer. The Corps will provide the permittee the certification document with the NWP verification letter. The certification document will include: **(a)** A statement that the authorized activity was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions; **(b)** A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the certification must include the documentation required by 33 CFR 332.3(l)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and **(c)** The signature of the permittee certifying the completion of the activity and mitigation. The completed certification document must be submitted to the district engineer within 30 days of completion of the authorized activity or the implementation of any required compensatory mitigation, whichever occurs later.

31. Activities Affecting Structures or Works Built by the United States. If an NWP activity also requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers (USACE) federally authorized Civil Works project (a “USACE project”), the prospective permittee must submit a pre-construction notification. See paragraph (b)(10) of general condition 32. An activity that requires section 408 permission is not authorized by NWP until the appropriate Corps office issues the section 408 permission to alter, occupy, or use the USACE project, and the district engineer issues a written NWP verification.

32. Pre-Construction Notification. (a) Timing: Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to

request the additional information necessary to make the PCN complete. The request must specify the information needed to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either: (1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or (2) 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or are in the vicinity of the activity, or to notify the Corps pursuant to general condition 20 that the activity might have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)) has been completed. Also, work cannot begin under NWPs 21, 49, or 50 until the permittee has received written approval from the Corps. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) Contents of Pre-Construction Notification: The PCN must be in writing and include the following information: (1) Name, address and telephone numbers of the prospective permittee; (2) Location of the proposed activity; (3) Identify the specific NWP or NWP(s) the prospective permittee wants to use to authorize the proposed activity; (4) A description of the proposed activity; the activity's purpose; direct and indirect adverse environmental effects the activity would cause, including the anticipated amount of loss of wetlands, other special aquatic sites, and other waters expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; a description of any proposed mitigation measures intended to reduce the adverse environmental effects caused by the proposed activity; and any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings for linear projects that require Department of the Army authorization but do not require pre-construction notification. The description of the proposed activity and any proposed mitigation measures should be sufficiently detailed to allow the district engineer to determine that the adverse environmental effects of the activity will be no more than minimal and to determine the need for compensatory mitigation or other mitigation measures. For single and complete linear projects, the PCN must include the quantity of anticipated losses of wetlands, other special aquatic sites, and other waters for each single and complete crossing of those wetlands, other special aquatic sites, and other waters. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the activity and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans); (5) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many wetlands, other special aquatic sites, and other waters. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate; (6) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse environmental effects are no more than minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan. (7) For non-Federal permittees, if any listed species or designated critical habitat might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat, the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed activity or utilize the designated critical habitat that might be affected by the proposed activity. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with the Endangered Species Act; (8) For non-Federal permittees, if the NWP activity might have the potential to cause effects to a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, the PCN must state which historic property might have the potential to be affected by the proposed activity or include a vicinity map indicating the location of the historic property. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with section 106 of the National Historic Preservation Act; (9) For an activity that will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, the PCN must identify the Wild and Scenic River or the "study river" (see general condition 16); and (10) For an activity that requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers federally authorized civil works project, the pre-construction notification must include a statement confirming that the project proponent has submitted a written request for section 408 permission from the Corps office having jurisdiction over that USACE project.

(c) Form of Pre-Construction Notification: The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is an NWP PCN and must include all of the applicable information required in paragraphs (b)(1) through (10) of this general condition. A letter containing the required information may also be used. Applicants may provide electronic files of PCNs and supporting materials if the district engineer has established tools and procedures for electronic submittals.

(d) Agency Coordination:

(1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the activity's adverse environmental effects so that they are no more than minimal.

(2) Agency coordination is required for: (i) all NWP activities that require pre-construction notification and result in the loss of greater than 1/2-acre of waters of the United States; (ii) NWP 21, 29, 39, 40, 42, 43, 44, 50, 51, and 52 activities that require pre-construction notification and will result in the loss of greater than 300 linear feet of stream bed; (iii) NWP 13 activities in excess of 500 linear feet, fills greater than one cubic yard per running foot, or involve discharges of dredged or fill material into special aquatic sites; and (iv) NWP 54 activities in excess of 500 linear feet, or that extend into the waterbody more than 30 feet from the mean low water line in tidal waters or the ordinary high water mark in the Great Lakes. (3) When agency coordination is required, the district engineer will immediately provide (e.g., via e-mail, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (FWS, state natural resource or water quality agency, EPA, and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to notify the district engineer via telephone, facsimile transmission, or e-mail that they intend to provide substantive, site-specific comments. The comments must explain why the agency believes the adverse environmental effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district

engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms and conditions of the NWP, including the need for mitigation to ensure the net adverse environmental effects of the proposed activity are no more than minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5. (4) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act. (5) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of pre-construction notifications to expedite agency coordination.

D. District Engineer's Decision

1. In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. If a project proponent requests authorization by a specific NWP, the district engineer should issue the NWP verification for that activity if it meets the terms and conditions of that NWP, unless he or she determines, after considering mitigation, that the proposed activity will result in more than minimal individual and cumulative adverse effects on the aquatic environment and other aspects of the public interest and exercises discretionary authority to require an individual permit for the proposed activity. For a linear project, this determination will include an evaluation of the individual crossings of waters of the United States to determine whether they individually satisfy the terms and conditions of the NWP(s), as well as the cumulative effects caused by all of the crossings authorized by NWP. If an applicant requests a waiver of the 300 linear foot limit on impacts to streams or of an otherwise applicable limit, as provided for in NWPs 13, 21, 29, 36, 39, 40, 42, 43, 44, 50, 51, 52, or 54, the district engineer will only grant the waiver upon a written determination that the NWP activity will result in only minimal individual and cumulative adverse environmental effects. For those NWPs that have a waivable 300 linear foot limit for losses of intermittent and ephemeral stream bed and a 1/2-acre limit (i.e., NWPs 21, 29, 39, 40, 42, 43, 44, 50, 51, and 52), the loss of intermittent and ephemeral stream bed, plus any other losses of jurisdictional waters and wetlands, cannot exceed 1/2-acre.

2. When making minimal adverse environmental effects determinations the district engineer will consider the direct and indirect effects caused by the NWP activity. He or she will also consider the cumulative adverse environmental effects caused by activities authorized by NWP and whether those cumulative adverse environmental effects are no more than minimal. The district engineer will also consider site specific factors, such as the environmental setting in the vicinity of the NWP activity, the type of resource that will be affected by the NWP activity, the functions provided by the aquatic resources that will be affected by the NWP activity, the degree or magnitude to which the aquatic resources perform those functions, the extent that aquatic resource functions will be lost as a result of the NWP activity (e.g., partial or complete loss), the duration of the adverse effects (temporary or permanent), the importance of the aquatic resource functions to the region (e.g., watershed or ecoregion), and mitigation required by the district engineer. If an appropriate functional or condition assessment method is available and practicable to use, that assessment method may be used by the district engineer to assist in the minimal adverse environmental effects determination. The district engineer may add case-specific special conditions to the NWP authorization to address site-specific environmental concerns.

3. If the proposed activity requires a PCN and will result in a loss of greater than 1/10-acre of wetlands, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for NWP activities with smaller impacts, or for impacts to other types of waters (e.g., streams). The district engineer will consider any proposed compensatory mitigation or other mitigation measures the applicant has included in the proposal in determining whether the net adverse environmental effects of the proposed activity are no more than minimal. The compensatory mitigation proposal may be either conceptual or detailed. If the district engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse environmental effects are no more than minimal, after considering mitigation, the district engineer will notify the permittee and include any activity-specific conditions in the NWP verification the district engineer deems necessary. Conditions for compensatory mitigation requirements must comply with the appropriate provisions at 33 CFR 332.3(k). The district engineer must approve the final mitigation plan before the permittee commences work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the proposed compensatory mitigation plan within 45 calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure the NWP activity results in no more than minimal adverse environmental effects. If the net adverse environmental effects of the NWP activity (after consideration of the mitigation proposal) are determined by the district engineer to be no more than minimal, the district engineer will provide a timely written response to the applicant. The response will state that the NWP activity can proceed under the terms and conditions of the NWP, including any activity-specific conditions added to the NWP authorization by the district engineer.

4. If the district engineer determines that the adverse environmental effects of the proposed activity are more than minimal, then the district engineer will notify the applicant either: (a) that the activity does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (b) that the activity is authorized under the NWP subject to the applicant's submission of a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal; or (c) that the activity is authorized under the NWP with specific modifications or conditions. Where the district engineer determines that mitigation is required to ensure no more than minimal adverse environmental effects, the activity will be authorized within the 45-day PCN period (unless additional time is required to comply with general conditions 18, 20, and/or 31, or to evaluate PCNs for activities authorized by NWPs 21, 49, and 50), with activity-specific conditions that state the mitigation requirements. The authorization will include the necessary conceptual or detailed mitigation plan or a requirement that the applicant submit a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal. When compensatory mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan or has determined that prior approval of a final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation.

E. Nationwide Permit Regional Conditions

Of the ten regional conditions effective within the Los Angeles District of the Corps, six apply to projects within Arizona (1-4, 9 and 10). The remaining four regional conditions apply to specific geographic areas, resources, or species not located in Arizona.

The following regional conditions must be complied with for any authorization by a NWP to be valid in the State of Arizona:

Regional Condition 1. For all activities in waters of the U.S. that are suitable habitat for federally listed fish species, including designated critical habitat for such species, the permittee shall design all new or substantially reconstructed linear transportation crossings (e.g. roads, highways, railways, trails, bridges, culverts) to ensure that the passage and/or spawning of fish is not hindered. In these areas, the permittee shall employ bridge designs that span the stream or river, including pier- or pile-supported spans, or designs that use a bottomless arch culvert with a natural stream bed, unless determined to be impracticable by the Corps.

Regional Condition 2. Nationwide Permits (NWP) 3, 7, 12-15, 17-19, 21, 23, 25, 29, 35, 36, or 39-46, 48-54 cannot be used to authorize structures, work, and/or the discharge of dredged or fill material that would result in the "loss" of wetlands, mudflats, vegetated shallows or riffle and pool complexes as defined at 40 CFR Part 230.40-45. The definition of "loss" for this regional condition is the same as the definition of "loss of waters of the United States" used for the Nationwide Permit Program. Furthermore, this regional condition applies only within the State of Arizona and within the Mojave and Sonoran (Colorado) desert regions of California. The desert regions in California are limited to four USGS Hydrologic Unit Code (HUC) accounting units (Lower Colorado -150301, Northern Mojave-180902, Southern Mojave- 181001, and Salton Sea-181002).

Regional Condition 3. When a pre-construction notification (PCN) is required, the appropriate U.S. Army Corps of Engineers (Corps) District shall be notified in accordance with General Condition 32 using either the South Pacific Division PCN Checklist or a signed application form (ENG Form 4345) with an attachment providing information on compliance with all of the General and Regional Conditions. The PCN Checklist and application form are available at: <http://www.spl.usace.army.mil/Missions/Regulatory/PermitProcess.aspx>. In addition, unless specifically waived by the Los Angeles District, the PCN shall include: **a)** A written statement describing how the activity has been designed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States; **b)** Drawings, including plan and cross-section views, clearly depicting the location, size and dimensions of the proposed activity as well as the location of delineated waters of the U.S. on the site. The drawings shall contain a title block, legend and scale, amount (in cubic yards) and area (in acres) of fill in Corps jurisdiction, including both permanent and temporary fills/structures. The ordinary high water mark or, if tidal waters, the mean high water mark and high tide line, should be shown (in feet), based on National Geodetic Vertical Datum (NGVD) or other appropriate referenced elevation. All drawings shall follow the Updated Map and Drawing Standards for the South Pacific Division Regulatory Program (Feb 2016), or most recent update (available at the South Pacific Division website at: <http://www.spd.usace.army.mil/Missions/Regulatory/PublicNoticesandReferences.aspx>); **c)** Numbered and dated pre-project color photographs showing a representative sample of waters proposed to be impacted on the project site, and all waters proposed to be avoided on and immediately adjacent to the project site. The compass angle and position of each photograph shall be documented on the plan-view drawing required in subpart b of this regional condition. **d)** Delineation of aquatic resources in accordance with the current Los Angeles District's Minimum Standards for Acceptance of Aquatic Resources Delineation Reports (available at: <http://www.spl.usace.army.mil/Missions/Regulatory/Jurisdictional-Determination/>).

Regional Condition 4. Submission of a PCN pursuant to General Condition 32 and Regional Condition 3 shall be required for specific regulated activities in the following locations: **a)** All perennial waterbodies and special aquatic sites throughout the Los Angeles District as well as intermittent waters within the State of Arizona for any regulated activity that would result in a loss of waters of the United States. The definition of "loss of waters of the United States" for this regional condition is the same as the definition used for the Nationwide Permit Program. **b)** All areas designated as Essential Fish Habitat (EFH) by the Pacific Fishery Management Council, and that would result in an adverse effect to EFH, in which case the PCN shall include an EFH assessment and extent of proposed impacts to EFH. EFH Assessment Guidance and other supporting information can be found at: http://www.westcoast.fisheries.noaa.gov/habitat/fish_habitat/efh_consultations_go.html. **c)** All watersheds in the Santa Monica Mountains in Los Angeles and Ventura counties bounded by Calleguas Creek on the west, by Highway 101 on the north and east, and by Sunset Boulevard and Pacific Ocean on the south. **d)** The Santa Clara River watershed in Los Angeles and Ventura counties, including but not limited to Aliso Canyon, Agua Dulce Canyon, Sand Canyon, Bouquet Canyon, Mint Canyon, South Fork of the Santa Clara River, San Francisquito Canyon, Castaic Creek, Piru Creek, Sespe Creek and the main-stem of the Santa Clara River. **e)** The Murrieta and Temecula Creek watersheds in Riverside County, California for any regulated activity that would result in a loss of waters of the U.S. The definition of "loss of waters of the United States" for this regional condition is the same as the definition used for the Nationwide Permit Program. **f)** All waterbodies designated by the Arizona Department of Environmental Quality as Outstanding Arizona Waters (OAWs), within 1600 meters (or 1 mile) upstream and/or 800 meters (1/2 mile) downstream of a designated OAW, and on tributaries to OAWs within 1600 meters of the OAW (see <http://www.azdeq.gov/index.html>). **g)** All waterbodies designated by the Arizona Department of Environmental Quality as 303(d)-impaired surface waters, within 1600 meters (or 1 mile) upstream and/or 800 meters (1/2 mile) downstream of a designated impaired surface water, and on tributaries to impaired waters within 1600 meters of the impaired water (see <http://www.azdeq.gov/index.html>).

Regional Condition 9. Any requests to waive the applicable linear foot limitations for NWPs 13, 21, 29, 39, 40 and 42, 43, 44, 51, 52, and 54, must include the following: **a)** A narrative description of the affected aquatic resource. This should include known information on: volume and duration of flow; the approximate length, width, and depth of the waterbody and characters observed associated with an Ordinary High Water Mark (e.g. bed and bank, wrack line, or scour marks) or Mean High Water Line; a description of the adjacent vegetation community and a statement regarding the wetland status of the associated vegetation community (i.e. wetland, non- wetland); surrounding land use; water quality; issues related to cumulative impacts in the watershed, and; any other relevant information. **b)** An analysis of the proposed impacts to the waterbody in accordance with General Condition 32 and Regional Condition 3; **c)** Measures taken to avoid and minimize losses, including other methods of constructing the proposed project; and **d)** A compensatory mitigation plan describing how the unavoidable losses are proposed to be compensated, in accordance with 33 CFR Part 332.

Regional Condition 10. The permittee shall complete the construction of any compensatory mitigation required by special condition(s) of the NWP verification before or concurrent with commencement of construction of the authorized activity, except when specifically determined to be impracticable by the Corps. When mitigation involves use of a mitigation bank or in-lieu fee program, the permittee shall submit proof of payment to the Corps prior to commencement of construction of the authorized activity.

F. 401 Water Quality Certification (401 WQC)

A 401 WQC is mandatory for any activity that requires a Clean Water Act Section 404 permit. A 401 WQC is required prior to discharging any dredged or fill material into a water of the United States. Only one of the following 401 WQCs listed below will apply to your project. The geographical location of your project will determine which 401 WQC is applicable. The 401 WQCs issued for this NWP will remain in effect through March 18, 2022.

On all "Non-Tribal Lands", lands that are not part of federally recognized Indian Reservation, the Arizona Department of Environmental Quality (ADEQ) is the agency responsible for issuing the 401 WQC.

On all "Tribal Lands", lands that are part of a federally recognized Indian Reservation, the U.S. Environmental Protection Agency (EPA) is responsible for issuing the 401 WQC except where EPA has delegated the 401 WQC authority to the White Mountain Apache Tribe (Fort Apache Indian Reservation), Hopi Tribe (Hopi Indian Reservation), Hualapai Tribe (Hualapai Indian Reservation), or Navajo Nation (Navajo Indian Reservation).

If "Individual Certification" is required you must apply for, receive, and comply with the 401 WQC issued by ADEQ, EPA, or the appropriate Tribe.

Non-tribal Lands - 401 ADEQ WQCs*

ADEQ 401 WQC definitions:

Not Attaining Waters are surface waters that are identified pursuant to CWA Section 305(b) as not attaining (e.g. not meeting surface water quality standards) and as a result, merit special consideration. The current list of Not Attaining Waters (Category 4A, 4B and 4C) is available on the ADEQ website at www.azdeq.gov.

Native Fill means soil, sand, gravel and other natural materials that are similar in physical, chemical and biological composition to existing natural materials in the project area; and which are free from pollutants in quantities and concentrations that can cause or contribute to an exceedance of applicable Surface Water Quality Standards (SWQS).

ADEQ requires that an applicant submit an application to ADEQ for a Water Quality Certification if the proposed activity will occur within the ordinary high water mark of any of the following: An Outstanding Arizona Water; an impaired water; a water that is listed as not attaining; or a lake.

The following 401 water quality conditions apply to regulated discharges of dredged or fill material occurring within the ordinary high water mark (OHWM) of Waters of the US (WUS) under all applicable NWP (hereinafter referred to as "certified activities"):

1. Submission of a PCN pursuant to General Condition 32 and Regional Condition 3 shall be required for all waterbodies designated by ADEQ as Not Attaining, within 1600 meters (or 1 mile) upstream and/or 800 meters (or 1/2 mile) downstream of a not attaining water.
2. Any discharge occurring as a result of certified activities of the project shall not cause an exceedance of any Surface Water Quality Standard (SWQS). Applicability of this condition is as defined in A.A.C. R1 8-11-102.
3. This certification does not authorize the discharge of wastewater, process residues or other waste to any WUS.
4. Runoff of water used for irrigation or dust control for certified activities within WUS shall be limited to the extent practicable and shall not cause downstream erosion, flooding or an exceedance of applicable surface water quality standards (SWQS) in any WUS.
5. Clearing, grubbing, scraping or otherwise exposing erodible surfaces in WUS shall be minimized to the extent necessary for each construction phase or location.
6. Dredged or fill material in WUS shall be placed so that it is stable, meaning after placement, the material does not show signs of excessive erosion, such as gully ing, head cutting, caving, block slippage, material sloughing, etc. Dredged or fill material placed in WUS shall not discharge (e.g., via leaching, runoff) pollutants into streams or wetlands at levels exceeding any applicable SWQS.
7. The effectiveness of all pollution control measures, including sediment and erosion control measures, shall be inspected, maintained and modified (as necessary) to reduce pollutants and ensure compliance with SWQS in any WUS.
8. Except where certified activities are intended to permanently alter any WUS, all disturbed areas within WUS shall be restored and (re)vegetated or stabilized. Vegetation shall be maintained on unarmored banks and slopes to stabilize soil and prevent erosion.
9. Silt laden or turbid water resulting from certified activities shall be managed in a manner to reduce sediment load prior to discharging so as not to exceed SWQS in any WUS.
10. Any washing or dewatering of fill material must occur outside of any WUS prior to placement.
11. Acceptable fill material that can be placed in any WUS includes: untreated logs and lumber; natural stone (crushed or not), crushed clean concrete (recycled concrete); native fill; precast, sprayed or cast-in-place concrete (including soil cement and unmodified grouts); steel (including galvanized); plastic; aluminum; and other material that is free from pollutants in quantities or combinations that can cause an exceedance of applicable SWQS. Other fill materials may be placed in WUS with prior written approval from ADEQ.
12. Upon completion of the certified activities, areas within any WUS shall be promptly cleared of all forms, pilings, construction residues, equipment, debris and other obstructions, including temporary structures.
13. If fully, partially or occasionally submerged structures in WUS are constructed of cast-in-place concrete instead of pre-cast concrete, applicant will take steps; e.g., sheet piling or temporary dams, to prevent contact between water (instream and runoff) and the concrete until it cures and until any curing agents have evaporated or otherwise cease to be available; i.e., are no longer a pollutant source.
14. Any permanent WUS crossings other than fords, shall be equipped with conveyances that direct untreated runoff away from WUS.
15. Permanent and temporary pipes and culvert crossings in WUS shall be adequately sized to handle expected flow and properly set with end section, splash pads, headwalls or other structures that dissipate water energy to control erosion.
16. Debris will be cleared as needed from culverts, ditches, dips and other drainage structures in any WUS to prevent clogging or conditions that may lead to washout.
17. All temporary structures in WUS constructed of imported materials and all permanent structures, including but not limited to, access roadways; culvert crossings; staging areas; material stockpiles; berms, dikes and pads, shall be constructed so as to accommodate overtopping and resist washout by streamflow.
18. Any temporary WUS crossing, other than fords on native material, shall be constructed in such a manner so as to provide armoring of the stream channel. Materials used to provide this armoring shall not include anything easily transportable by flow.

Tribal Lands - 401 WQCs

Fort Apache Indian Reservation (White Mountain Apache Tribe):	Individual Certification required for all projects.*
Hopi Indian Reservation (Hopi Tribe):	Individual Certification required for all projects.*
Hualapai Indian Reservation (Hualapai Tribe):	Individual Certification required for all projects.*
Navajo Indian Reservation (Navajo Nation):	Individual Certification required for all projects.*

401 WQC Contact Information

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

APPROVED
By Harold J Riley at 3:31 pm, Jan 12, 2018



N9402

PROJ. N9402(2)1,2&3
RIO PUERCO BRIDGE

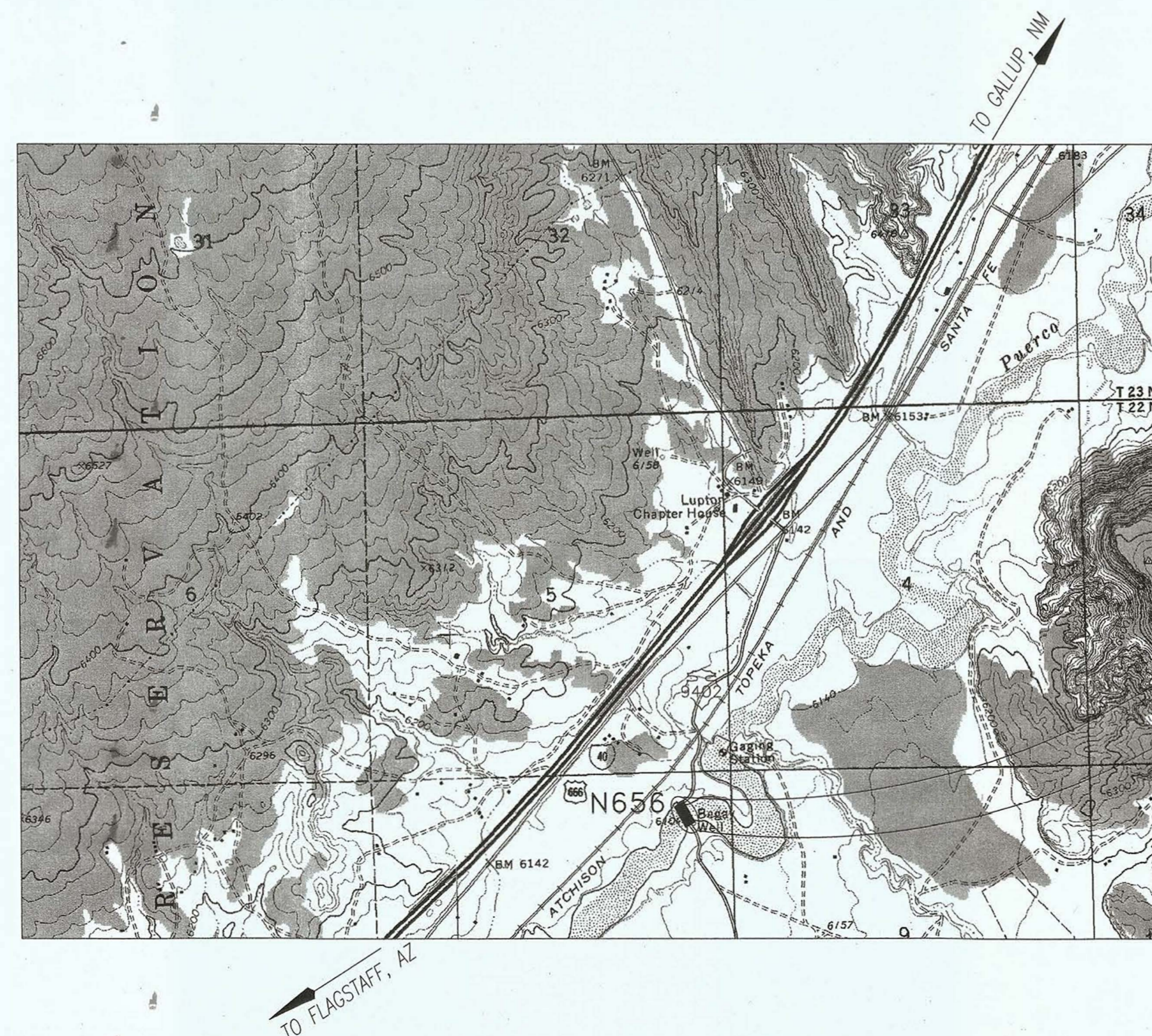
BRIDGE AND APPROACH ROADWAY
I.D. NO. N36403

DESIGN DATA

Design Speed	50 km/h
Minimum Radius	100 m
Maximum Gradient	7%
Min. Stopping Sight Distance	65m
Min. Passing Sight Distance	345m
Current ADT (2001)	482 VPD
Future ADT (2021)	717 VPD
R.O.W. Width	23.0m RT & LT EXCEPT 70.0m RT & 60.0m LT STA 0+190 to STA 0+380

LENGTH OF PROJECT

STATION TO STATION	LIN. METERS	KILOMETERS
B.O.P. Station 0+100.000	124.032	0.1240
B.O.B. Station 0+224.032	126.914	0.1269
E.O.B. Station 0+350.946	139.054	0.1390
E.O.P. Station 0+490.000		
TOTAL	390.000	0.3900



B.O.B. Sta. 0+224.032
E.O.B. Sta. 0+350.946

INDEX TO SHEETS

SHT. NO.	DESCRIPTION
1	TITLE SHEET
2	TYPICAL SECTIONS & GENERAL NOTES
3	ESTIMATED QUANTITIES
4	PLAN AND PROFILE
5	BRIDGE NOTES AND DESIGN DATA
6	STRUCTURE LOCATION PLAN
7	STRUCTURE LOCATION PROFILE
8	PILE AND BORING PLAN
12	GUIDEBANK GRADING PLAN
12A	WIRE ENCLOSED RIPRAP DETAILS AND RIPRAP NOTES
12B	CULVERT SECTION AND DETAILS
13	ABUTMENT DETAILS
14	WINGWALL DETAILS
15	FIXED PIER DETAILS, PIER 3
15A	EXPANSION PIER DETAILS, PIERS 1, 2 & 4
16	BEAM BEARING DETAILS
17	BEAM SEAT ELEVATIONS
18	FRAMING PLAN
19	TYPE BT-1370 BEAM DETAILS
20	ABUTMENT DIAPHRAGM DETAILS
20A	PIER DIAPHRAGM DETAILS
21	TRANSVERSE SECTION
22	STEEL DIAPHRAGM DETAILS
23	DECK ELEVATIONS
24	DECK SLAB REINFORCING PLAN
25	APPROACH SLAB
26	REINFORCING SCHEDULE
27	GUARDRAIL DETAILS
27A	BRIDGE/RAILROAD TRANSITION DETAILS
28,28A	STANDARD GUARDRAIL END BARRIER SKT-350, sht 1of3, 2of3, 3of3
29	STEEL BRIDGE RAILING
30	TEMPORARY TRAFFIC CONTROL
31	RIPRAP CUT TO FILL TRANSITION AND DITCH LINE W/ RIPRAP DETAILS
32	DELINEATOR & R/W MONUMENT DETAILS
33-34	STORMWATER POLLUTION AND EROSION/SEDIMENT CONTROL DETAILS 1&2
35	SIGN POST SIZE DETAILS
36	LAP SPICE U-CHANNEL BREAKAWAY POSTS & HARDWARE DETAILS
37	SQUARE STEEL TUBE POSTS & HARDWARE DETAILS
40	TOTAL SHEETS (DUE TO A AND B VERSIONS OF VARIOUS SHEETS)

LEGEND

STATE LINE	RESERVATION LINE	COUNTY LINE	TOWNSHIP or RANGE LINE	SECTION LINE	HIGHWAY RIGHT-OF-WAY LINE	SECTION CORNER and 1/4 CORNER	POWER LINE and POLES	TELEPHONE LINE and POLES	WATER LINE	TRAFFIC SIGN	GUARD RAIL	DELINEATOR	BARBED WIRE FENCE	CATTLE GUARD	CULVERTS	CONCRETE BOX CULVERTS	GROUND LINE - EARTH	GROUND LINE - ROCK	EXISTING ROAD	TREES and SHRUBS	CHANNEL or DITCH	RIPRAP	RAILROAD TRACK	DWELLING	SCHOOL	CHURCH	WINDMILL	RIGHT-OF-WAY MONUMENT
INDIAN SERVICE	COUNTY	STATE	FEDERAL																									
PAVED	GRADED	UNIMPROVED																										

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

RECOMMENDED APPROVAL

AGENCY ROAD ENGINEER
DIVISION MANAGER
PLANNING AND DESIGN CHIEF
DATE
1/3/2018
DATE
1/3/18
DATE
1/12/2018

APPROVAL



REGIONAL DIRECTOR
DATE

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REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET
NAVAJO	AZ	NAVAJO	N9402	N9402(2)1,2&3	3 of 40

ESTIMATE OF QUANTITIES FOR ROADWAY & BRIDGE

ITEM	DESCRIPTION	QUANTITY	UNIT	AS BUILT
10901-0000	EXTRA AND MISC. WORK AUTHORIZED UNDER SECTION 109.02(s)	All Req'd	LS	
15101-0000	MOBILIZATION	All Req'd	LS	
15201-0000	CONSTRUCTION SURVEY AND STAKING	All Req'd	LS	
15301-0000	CONTRACTOR QUALITY CONTROL	8000	Man hr	
15701-0000	SOIL EROSION CONTROL	All Req'd	LS	
20102-0000	CLEARING AND GRUBBING	All Req'd	LS	
20304-1000	REMOVAL OF STRUCTURES AND OBSTRUCTIONS	All Req'd	LS	
20401-0000	ROADWAY EXCAVATION	744	m ³	
20403-0000	UNCLASSIFIED BORROW	3,604	m ³	
20601-0000	DEVELOPMENT OF WATER SUPPLY	1.39	ML	
25101-3000	PLACED RIPRAP, CLASS 3 (DITCHES)	1,025	m ³	
25112-2000	WIRE ENCLOSED RIPRAP, CLASS 2 (ABUTMENT PROTECTION)	833	m ³	
30101-2000	AGGREGATE BASE, GRADING SPECIAL	154	t	
30401-0000	AGGREGATE STABILIZATION With EN-1 ROADBOND, IMPORTED SURFACE COURSE AGGREGATE GRADING D, 152 mm DEPTH	2,731	m ²	
55101-0200	CONCRETE FILLED STEEL PIPE PILES, IN PLACE, PP610 x 9.53	269	m	
55120-0000	TEST PILES	100	m	
55201-0200	STRUCTURAL CONCRETE, CLASS A(AE)	500	m ³	
55301-1700	PRECAST, PRESTRESSED CONCRETE BULB TEE GIRDERS, BT-1370	20	EA	
55401-1000	REINFORCING STEEL GRADE 420	9,114	kg	
55401-2000	REINFORCING STEEL, EPOXY COATED GRADE 420	58,288	kg	
55502-0000	STRUCTURAL STEEL, FURNISHED, FABRICATED, AND ERECTED (DIAPHRAGMS)	3,738	kg	
55502-0010	STRUCTURAL STEEL, FURNISHED, FABRICATED AND ERECTED (GIRT AND SWAY)	7,121	kg	
55601-0900	BRIDGE RAILING, STEEL	269	m	
56301-2000	PAINTING, STEEL STRUCTURE (PIPE PILES)	All Req'd	LS	
60201-0810	610mm CORRUGATED STEEL PIPE CULVERT	30.40	m	
60210-0810	END SECTION FOR 610mm CORRUGATED STEEL PIPE CULVERT	1	EA	
61701-5000	GUARDRAIL SYSTEM, SGR04b, TYPE PDE02, WITH MSKT-TL3-8 END TREATMENT TYPE A INSTALLATION	164	m	
62101-0000	MONUMENT (RIGHT OF WAY)	16	EA	
62102-0000	MARKER (REFERENCE)	16	EA	
62510-1000	SEEDING, DRY METHOD	0.64	HA	
62515-1000	MULCHING, DRY METHOD	0.47	HA	
62901-1100	ROLLED EROSION CONTROL PRODUCT, TYPE 4	1,664	m ²	
63302-2002	SIGN INSTALLATION, 1 POST & HARDWARE: 44mm x 44mm	0.92	m ²	
63302-2006	SIGN INSTALLATION, 2 POSTS & HARDWARE: 50mm x 50mm	1.13	m ²	
63308-3000	OBJECT MARKER, TYPE 3	4	EA	
63309-0020	DELINEATOR, TYPE 1b, 51mm x 51mm	7	EA	
63501-0000	TEMPORARY TRAFFIC CONTROL	All Req'd	LS	

ESTIMATED EARTHWORK QUANTITIES

STATION TO STATION	CUT (m ³)	*FILL (m ³)	BORROW (m ³)	WASTE (m ³)
0+100.000 to 0+224.032	29	2982	2953	
ABUT. 1 GUIDE BANK **	160	2469	2309	
ABUT. 2 GUIDE BANK **	1756	758		998
0+350.946 to 0+490.000	715	1366	650	
TOTAL	744	4348	3604	0

*Firteen % SHRINKAGE FACTOR APPLIED

** these quantities are incidental to the riprap
see note 4 of sheet 12A

REVISED
10:46 am, Apr 01, 2020

BASIS OF ESTIMATED SURFACING QUANTITIES

MATERIAL	UNIT WEIGHT	APPLICATION RATE
AGGREGATE SURFACE COURSE GRADING D	2,243 kg/m ³	152 mm THICKNESS

ITEM 20304-1000 REMOVAL OF STRUCTURES AND OBSTRUCTIONS

STATION	LOCATION	DESCRIPTION
0+287	℄	EXISTING BRIDGE (SEE NOTE 12 Sht 5)

ITEM 61701-5000 GUARDRAIL SYSTEM, SGR04b, TYPE PDE02, WITH MSKT-TL3-8 END TREATMENT

LOCATION	ITEM 61701 LENGTH (m)	REMARKS
0+170.842 to 0+220.372 RT	49.530	WITHOUT CURB
0+170.842 to 0+220.372 LT	49.530	
0+354.606 to 0+377.466 RT	22.860	
0+354.606 to 0+396.516 LT	41.910	
TOTAL	163.83	

ITEM 62101-0000 MONUMENT (RIGHT OF WAY)

ITEM 62102-0000 MARKER (REFERENCE)

STATION	LOCATION	REQUIRED
0+100.000	23.0m RT & LT	2
0+190.000	23.0m RT & LT, 70.0m RT, 60.0m LT	4
0+357.490	70.0m RT, 60.0m LT	2
0+380.000	23.0m RT & LT, 70.0m RT, 60.0m LT	4
0+450.145	23.0m RT & LT	2
0+490.000	23.0m RT & LT	2
	TOTAL	16

ITEM 30101-2000 AGGREGATE BASE, GRADING SPECIAL

LOCATION	VOLUME (m ³)	WEIGHT(t)
APPROACH SLABS	69	154
TOTAL:	69	154

ITEM 30401-0000 ROADBOND EN-1 AGGREGATE GRADING D STABILIZATION, IMPORTED SURFACE COURSE AGGREGATE, 152mm DEPTH

STATION	DESCRIPTION	BEGIN WIDTH (m)	END WIDTH (m)	LENGTH	SURFACE AREA
0+100 to 0+130	BOP taper to roadway width	7.700	10.200	30.000	268.500
0+130	Begin typical roadway width	10.200	10.200	34.842	355.388
0+164.842	Begin guardrail widening taper	10.200	12.800	6.000	69.000
0+170.842	Full guardrail widening	12.800	12.800	48.592	621.978
0+219.434	Sleeper slab edge @ BOB	12.800	12.800		
	BRIDGE				
0+355.544	Sleeper slab edge @ EOB	12.800	12.800		
0+377.466	Full guardrail widening, Rt.	6.400	6.400	21.922	140.301
0+396.516	Full guardrail widening, Lt.	6.400	6.400	40.972	262.221
0+383.466	End guardrail widening, Rt.	5.100	5.100	6.000	30.600
0+402.516	End guardrail widening, Lt.	5.100	5.100	6.000	30.600
Rt. 0+460	End typical roadway width	5.100	5.100	76.534	390.323
Lt. 0+460	End typical roadway width	5.100	5.100	57.484	293.168
0+460 to 0+490	typical roadway width taper	10.200	7.700	30.000	268.500
	TOTAL:				2,730.379

CENTERLINE ALIGNMENT DATA

POINT	NORTHING	EASTING	ELEVATION	REMARKS
B.O.P. STA. 0+100.000	480236.805	312994.375		BEGINNING OF PROJECT
B.O.B. STA. 0+224.032	480355.270	312957.632		
E.O.B. STA. 0+350.946	480476.487	312920.035		
P.C. STA. 0+357.490	480482.737	312918.096		
P.I. STA. 0+405.988	480529.058	312903.729		
P.T. STA. 0+450.145	480573.165	312923.894		
E.O.P. STA. 0+490.000	480609.412	312940.466		END OF PROJECT
CP-1	480537.751	312865.174	1870.549	SET RED PLASTIC CAP
CP-2	480291.630	313041.192	1871.180	SET RED PLASTIC CAP
CP-3	480470.872	312949.112	1863.690	SET RED PLASTIC CAP

Coordinate system are Modified State Plane NAD83 AZ-E
Ground to Grid CFS= 0.999723303

ITEM 63308-3000 OBJECT MARKER, TYPE 3, WITH 1 POST AND HARDWARE:

STATION	REQUIRED	LOCATION
0+220	1	LEFT
0+220	1	RIGHT
0+354	1	LEFT
0+354	1	RIGHT
TOTAL REQ'D :		4

ITEM 63309-0020 DELINEATOR, TYPE 1b

STATION	REQUIRED	LOCATION
0+110.000	1	LEFT
0+404.000	1	LEFT
0+427.000	1	LEFT
0+450.000	1	LEFT
0+491.000	1	LEFT
0+560.000	1	LEFT
0+697.000	1	LEFT
TOTAL REQ'D :		7

ITEM 25101-3000 PLACED RIPRAP, CLASS 3

STATION TO STATION	LOCATION	LENGTH (L)	WIDTH (W)	THICKNESS	QUANTITY (m ³)	REMARKS
(BOP)0+100.000 - 0+147.651	LT.	49.32m*	4 m	610mm	120 *	℄ DITCH
0+147.651 - 0+151.459	LT.	3.808m *	VARIES	610mm	12 *	DITCH END SECTION
0+190.087	LT.		VARIES	610mm	6 *	1-610 CMP OUTLET
0+375.528 - 0+378.592	LT.	3.370m*	VARIES	610mm	12 *	DITCH END SECTION
0+378.592 - 0+490.000 (EOP)	LT.	119.8m*	4m	610mm	292 *	℄ DITCH
(BOP)0+100.000 - 0+188.179	RT.	89.3m*	4m	610mm	218 *	℄ DITCH
0+188.179 - 0+193.085	RT.	9.909m*	VARIES	610mm	24 *	1-610 CMP INLET
0+343.423 - 0+490.000 (EOP)	RT.	139.600m*	4 m	610mm	341 *	℄ DITCH
				TOTAL:	1025 m ³	

* = COMPUTER CALCULATED TOTAL (AUTOCAD)

ITEM 62901-1100 ROLLED EROSION CONTROL PRODUCT, TYPE 4

STATION TO STATION	LOCATION	LENGTH (L)	WIDTH (W)	QUANTITY (m ²)
0+164.000 TO 0+224.032	LT.	60.032	VARIES	577 *
0+350.946 TO 0+400.000	LT.	49.054m	VARIES	438 *
0+167.000 TO 0+224.032	RT.	57.032m	VARIES	448 *
0+350.946 TO 0+385.000	RT.	34.054m	VARIES	201 *
			TOTAL:	1664 m ²

* = COMPUTER CALCULATED TOTAL (AUTOCAD)

ITEM 25112-2000 WIRE ENCLOSED RIPRAP, CLASS 2

LOCATION	AREA (m ²)	THICKNESS	QUANTITY (m ³)
ABUT-1 WIRE ENCLOSED RIPRAP	934.110*	457mm	427
ABUT-2 WIRE ENCLOSED RIPRAP	889.143*	457mm	406
		TOTAL:	833

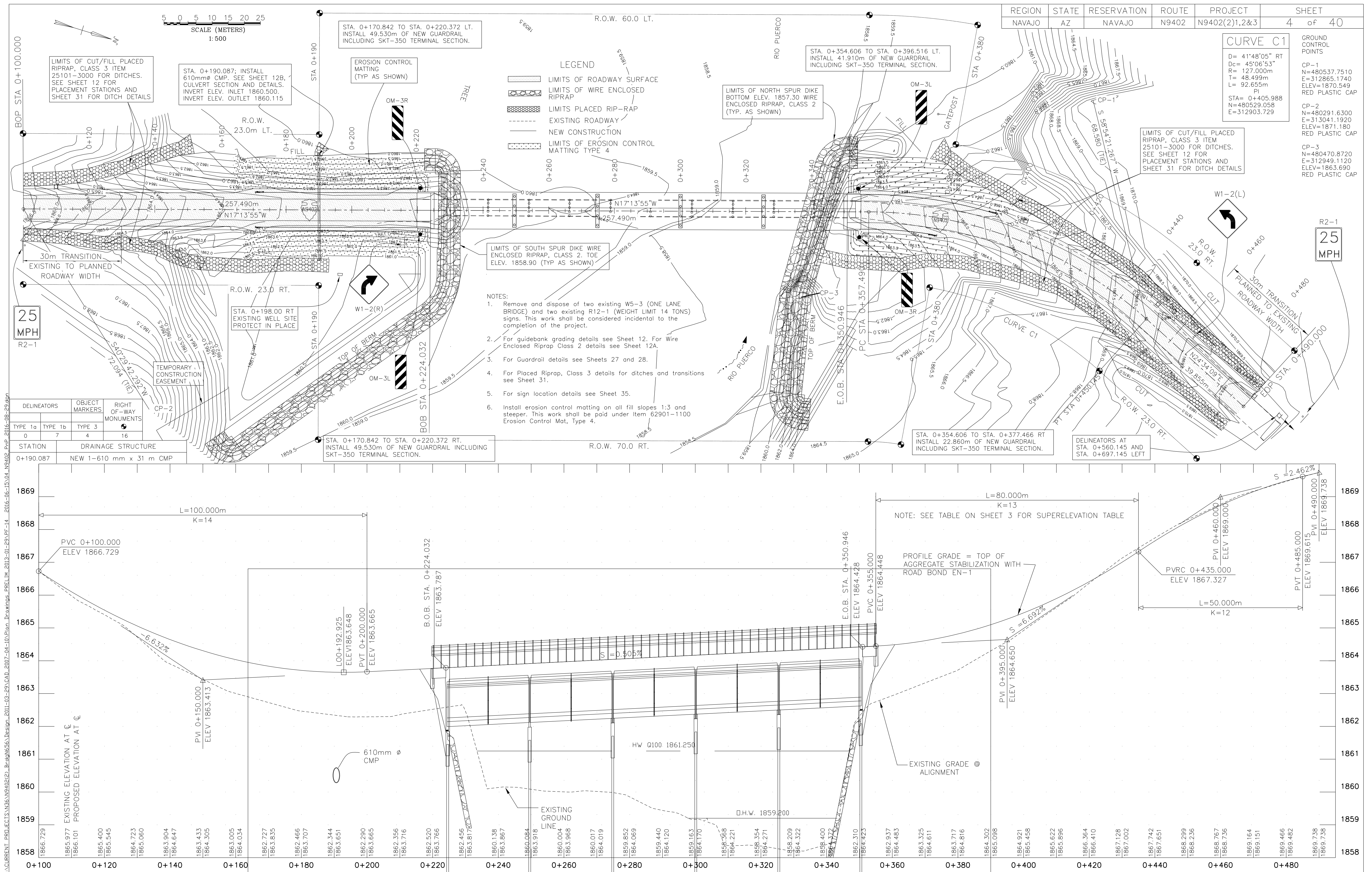
* = COMPUTER CALCULATED TOTAL (AUTOCAD)

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ESTIMATED QUANTITES

Designed by: CK	
Drawn by: PF, rsh	Date: 11/14/17
Revised by:HRiley	Date: 3/18/2020
File Name: 03_N9402_Quantities	





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REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	
NAVAJO	AZ	NAVAJO	N9402	N9402(2)1,2&3	5	of 40

BRIDGE NOTES

- SPECIFICATIONS: DESIGN: AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SEVENTEENTH EDITION, 2002, AND SUBSEQUENT INTERIM SPECIFICATIONS. CONSTRUCTION: FEDERAL HIGHWAY ADMINISTRATION, STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS, FP-14, 2003, AND SUPPLEMENTAL SPECIFICATIONS.
- UNITS: ALL DIMENSIONS ARE IN SI (METRIC) UNITS, DIMENSIONS ARE IN METERS UNLESS OTHERWISE NOTED.
- CONCRETE: CAST IN PLACE CONCRETE IN SUPERSTRUCTURE AND SUBSTRUCTURE SHALL BE CLASS A(AE) WITH A MINIMUM 28 DAY STRENGTH OF 27.6 MPa. THE AIR CONTENT FOR CLASS A(AE) CONCRETE SHALL NOT BE LESS THAN SPECIFIED IN THE FP-14, TABLE 552-2. CONCRETE IN PRECAST, PRESTRESSED CONCRETE TYPE BT 1370 BEAMS SHALL BE CLASS P AND SHALL HAVE AN $f'_{ci} = 37.9\text{MPa}$ AT RELEASE OF PRESTRESSING STRANDS. CHAMFER EXPOSED CORNERS OF ALL CONCRETE 19mm UNLESS OTHERWISE SHOWN. ALL SUBSTRUCTURE CONCRETE SHALL CONTAIN TYPE II PORTLAND CEMENT. ALL STEEL EMBEDDED IN CONCRETE SUCH AS GUARD ANGLES, ABUTMENT ANCHOR BOLTS AND EXPANSION JOINTS SHALL BE CONSIDERED INCIDENTAL TO ITEM 55201-0200, STRUCTURAL CONCRETE, CLASS A(AE). THE TIME LIMITS FOR DISCHARGE OF CONCRETE FROM THE MIXER SPECIFIED IN THE FP-14, TABLE 552-4 SHALL APPLY. IF CONCRETE CANNOT BE DISCHARGED WITHIN THE SPECIFIED TIME LIMIT ALTERNATIVES SUCH AS DRY BATCHING, A SITE BATCHING PLANT COMFORMING TO SPECIFICATIONS, OR SET RETARDANT ADMIXTURES SHALL BE USED. ANY SUCH ALTERNATIVES SHALL BE DISCUSSED AT PRE-CONSTRUCTION MEETING. APPROVAL OF ALTERNATIVE METHODS SHALL BE BASED ON REVIEW OF HISTORICAL DATA FOR IDENTICAL STRENGTH CONCRETE PLACED AT SIMILARLY REMOTE LOCATIONS. HISTORICAL DATA SHALL INDICATE CONFORMANCE TO THE SPECIFICATIONS FOR THIS PROJECT. DRIVING SURFACES OF THE BRIDGE DECK AND APPROACH/SLEEPER SLABS SHALL BE GIVEN A FINISH IN ACCORDANCE WITH SECTIONS 552.14(a), (b) AND (c)(1) OF THE FP-14. EXPOSED SURFACES OF THE SUBSTRUCTURE DOWN TO 300mm BELOW THE GROUND LINE AS WELL AS EDGES AND BOTTOMS OF THE BRIDGE DECK OVERHANG, SHALL BE GIVEN A CLASS 2 RUBBED FINISH AS SPECIFIED IN SECTION 552.16 OF THE FP-14, (b). ALL OTHER SURFACES OF CONCRETE SHALL BE GIVEN A CLASS 1 ORDINARY FINISH.
- REINFORCING STEEL: ALL REINFORCING STEEL SHALL CONFORM TO AASHTO M 31M, GRADE 420, UNLESS A DIFFERENT GRADE IS SPECIFIED. THE MINIMUM COVER OF ANY REINFORCING STEEL SHALL BE 50 mm UNLESS OTHERWISE SPECIFIED. DIMENSIONS SHOWN REFER TO THE CENTERLINE OF BARS UNLESS NOTED OTHERWISE. LENGTHS OF REINFORCING STEEL BARS SHOWN INCLUDE REQUIRED SPLICE LENGTHS FOR SPLICES SHOWN. ANY ADDITIONAL SPLICES NOT SHOWN IN THE PLANS SHALL BE REQUESTED FOR APPROVAL BY THE CONTRACTOR AND SHALL NOT BE UTILIZED UNTIL WRITTEN APPROVAL IS GRANTED BY THE AOTR/COR. ADDITIONAL REINFORCING STEEL QUANTITIES REQUIRED FOR ADDITIONAL SPLICES NOT SHOWN IN THE PLANS AND REQUESTED BY THE CONTRACTOR SHALL NOT BE PAID FOR. ALL REINFORCING STEEL IN OR PROTRUDING FROM THE BRIDGE DECK AND APPROACH SLABS SHALL BE EPOXY COATED AND IS DESIGNED AS SUCH IN THESE PLANS.
- STRUCTURAL STEEL: ALL STRUCTURAL STEEL SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M 270M, GRADE 250. SEE SHEET 22 FOR STEEL DIAPHRAGMS.
- PRESTRESSED CONCRETE BEAMS: PRESTRESSED CONCRETE BEAMS SHALL BE MANUFACTURED AS DETAILED IN THESE PLANS. ALL CONCRETE, REINFORCED STEEL, PRESTRESSING STEEL, LIFTING DEVICES, INSERTS, SHOE PLATES, SOLE PLATES, BOLTS, WASHERS, NUTS, ELASTOMERIC BEARING PADS, AND ANY OTHER MATERIALS NECESSARY FOR THE FABRICATION, TRANSPORTATION AND INSTALLATION OF THE PRESTRESSED CONCRETE BEAMS SHALL BE CONSIDERED INCIDENTAL TO ITEM 55301-1700 PRECAST, PRESTRESSED CONCRETE BULB TEE GIRDERS, BT-1370. SEE SHEET 19 FOR PRESTRESSED CONCRETE BEAM INFORMATION.
- STAY-IN-PLACE DECK FORMS: PERMANENT STEEL DECK FORMS MAY BE UTILIZED FOR BRIGDE DECK CONSTRUCTION PROVIDED THAT BOTH TOP AND BOTTOM MATS OF DECK SLAB REINFORCING BARS ARE EPOXY COATED, COMPLETE SHOP DRAWINGS, DESIGN CALCULATIONS, AND SPECIFICATIONS IN ACCORDANCE WITH FP-14 SECTION 562 AND SUPPLEMENT SPECIFICATIONS, FOR THE PROPOSED FORMING SYSTEM MUST BE APPROVED IN WRITING BY THE CONTRACTING OFFICER PRIOR TO INSTALLATION.
- CONTRACTOR SHALL VERIFY IN THE FIELD ALL DIMENSIONS, ELEVATIONS, AND DETAILS WHICH WILL BE INVOLVED IN THE NEW CONSTRUCTION BEFORE PROCEEDING WITH NEW WORK.
- ALL STEEL PILES AND THEIR SWAYS AND GIRTS AT THE PIERS SHALL BE GIVEN A PROTECTIVE COATING IN ACCORDANCE WITH SECTION 551.14(b) OF THE FP-14 AND SECTION 563.07 OF FP-14. THE COATING SHALL CONFORM TO PAINT SYSTEM 3 OF TABLE 563-1. ALL PAINTING WORK SHALL CONFORM TO SECTION 563 OF FP-14 AND ANY APPLICABLE STATE, TRIBAL AND LOCAL REGULATIONS. SEE SHEET 8 FOR ADDITIONAL NOTES.
- TEST PILES THIS BRIDGE PROJECT INCLUDES TEST PILES. SEE SUPPLEMENTAL SPECIFICATIONS, SECTION 551 FOR IMPORTANT DETAILS, INCLUDING DETERMINATION OF PILE QUANTITIES REQUIRED FOR THE PROJECT. TEST PILES SHALL BE A PILE ADJACENT TO THE CENTERLINE OF THE ROADWAY IN EACH ABUTMENT AND PIER AS SHOWN IN THESE PLANS.
- SPLICES OF ALL STEEL PILES SHALL CONFORM TO THE REQUIREMENTS OF SECTION 551.10(b) AND 551.11(a) OF FP-14. SPLICES SHALL BE IN ACCORDANCE TO THE DETAILS ON THESE PLANS. IF NOT DETAILS ARE SHOWN, THE CONTRACTOR SHALL SUBMIT A SPLICE DETAIL TO THE CO FOR REVIEW AND APPROVAL. ALL SPLICES SHALL BE CONSIDERED INCIDENTAL TO STEEL PILES.
- EXISTING BRIDGE REMOVAL: THE CONTRACTOR SHALL REMOVE, CLEAN (IF SO DIRECTED) AND STOCKPILE ALL EXISTING SALVAGEABLE MATERIAL, AS INDICATED BY THE COR AND AS CALLED FOR ON THESE PLANS UNDER ITEM 20304-1000 REMOVAL OF STRUCTURES AND OBSTRUCTIONS. SALVAGEABLE MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR TO TRANSPORTED TO A SALAVAGE YARD OFF THE PROJECT. ANY EXISTING MATERIALS DETERMINED TO BE UNSALVAGEABLE BY THE COR & CONTRACTOR SHALL BE DISPOSED OF BY THE CONTRACTOR IN ACCORDANCE WITH SECTIONS 107 AND 203 OF THE FP-14 AND APPLICABLE SUPPLEMENTAL SPECIFICATIONS. EXISTING BRIDGE PILING SHALL BE REMOVED TO ONE (1) METER BELOW THE PLANNED FLOWLINE, OR LOWER IN ORDER TO ACCOMMODATE NEW CONSTRUCTION. ALL WORK INVOLVING SALVAGEABLE AND UNSALVAGEABLE MATERIAL SHALL BE INCLUDED IN THE UNIT BID PRICE FOR ITEM 20304-1000 REMOVAL OF STRUCTURES AND OBSTRUCTIONS.
- STRUCTURE EXCAVATION AND BACKFILL: ALL STRUCTURE EXCAVATION AND BACKFILL SHALL BE COMPLETED IN ACCORDANCE WITH FP-14, SECTION 208 - STRUCTURE EXCAVATION AND BACKFILL FOR SELECT MAJOR STRUCTURES. STRUCTURE EXCAVATION AND BACKFILLING IS CONSIDERED INCIDENTAL TO OTHER APPLICABLE PAY ITEMS IN THE CONTRACT.

DESIGN DATA

DESIGN IS IN ACCORDANCE WITH AASHTO SPECIFICATIONS FOR HIGHWAY BRIDGES SEVENTEENTH EDITION, 2002 AND INTERIM SPECIFICATIONS TO DATE. SUPERSTRUCTURE IS DESIGNED IN ACCORDANCE WITH AASHTO LOAD FACTOR DESIGN AND STRENGTH DESIGN METHODS. SUBSTRUCTURE FOUNDATION ELEMENTS ARE DESIGNED IN ACCORDANCE WITH THE WORKING STRESS METHOD.

DESIGN STRESS:

STRUCTURAL STEEL:
AASHTO M 270M, GRADE 250
 $f_y = 250\text{ MPa}$ $f_s = 137.5\text{ MPa}$
ASTM A252, GRADE 2
 $f_y = 240\text{ MPa}$ $f_s = 132.0\text{ MPa}$

REINFORCED CONCRETE:
SUPERSTRUCTURE $f'_c = 27.6\text{ MPa}$ (28 DAYS) $f_c = 11.04\text{ MPa}$
SUBSTRUCTURE $f'_c = 27.6\text{ MPa}$ (28 DAYS) $f_c = 11.04\text{ MPa}$

REINFORCING STEEL:
AASHTO M 31M, GRADE 420
 $f_y = 420\text{ MPa}$ $f_s = 168\text{ MPa}$ $n = 8$

LOADS:

DEAD LOADS:
CONCRETE = 23.56 kN/m^3
STEEL = 76.97 kN/m^3

LIVE LOADS:
MS-18 PLUS IMPACT
IMPACT = $15/L + 38$, WHERE L = SPAN LENGTH IN METERS.
MAXIMUM IMPACT FACTOR = 0.30

WEARING SURFACE:
1.139 kPa ALLOWABLE FOR FUTURE WEARING SURFACE

STAY-IN-PLACE FORMS:
720 Pa ALLOWANCE FOR STAY IN PLACE FORMS

WIND VELOCITY:
130 km/hr

HORIZONTAL EARTH PRESSURE:
ACTIVE PRESSURE: 5.66 kPa/m (EQUIVALENT FLUID PRESSURE)
AT REST PRESSURE: 9.0 kPa/m
PASSIVE PRESSURE: 35.33 kPa/m
SURCHARGE: 610mm (EQUIVALENT HEIGHT OF SOIL)

CAPACITY RATINGS:

INVENTORY: MS18
OPERATING: MS49

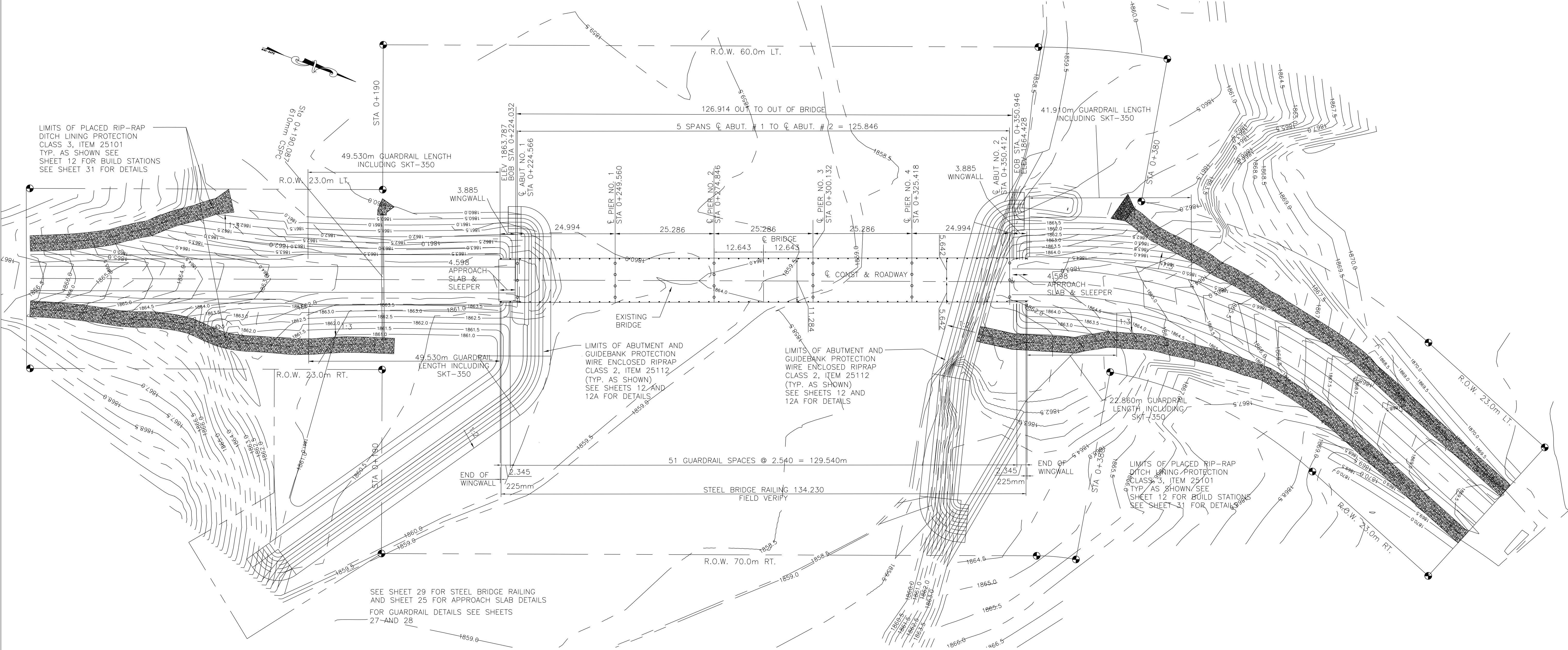
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BRIDGE NOTES AND DESIGN DATA

Designed by: CK	
Drawn by: PF, rsh	Date: 11/14/17
Revised by:HRiley	Date: 3/18/2020
File Name: 05_N9402_BridgeNotes	

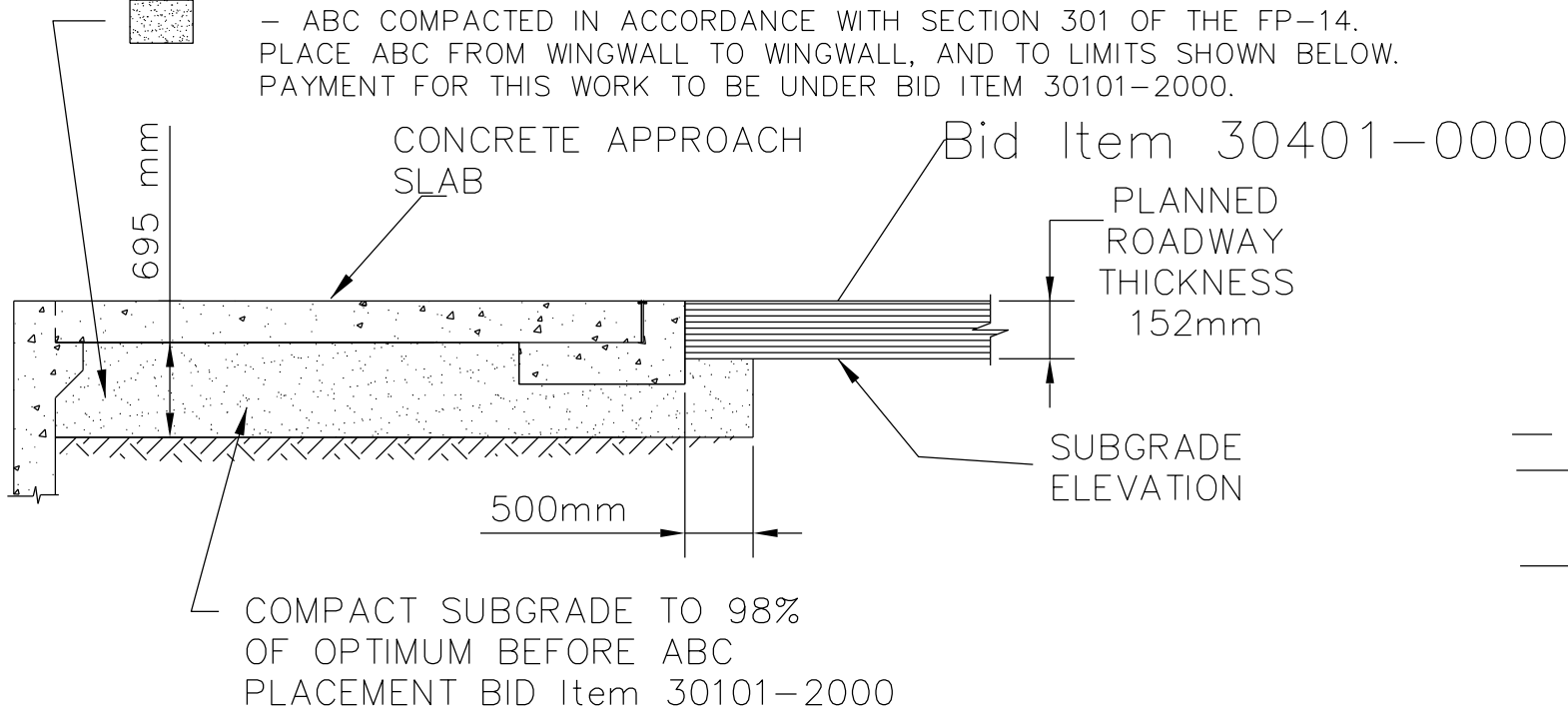


REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	
NAVAJO	AZ	NAVAJO	N9402	N9402(2)1,2&3	6	of 40



CONTROL POINTS

REFER TO PLAN AND PROFILE (SHEET 4) FOR CONTROL POINTS FOR STATIONS AND ELEVATIONS. CONTROL POINTS ARE DESIGNATED AS CP



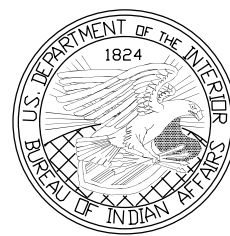
LEGEND

- EXISTING FEATURES
- NEW CONSTRUCTION
- R.O.W. MONUMENT
- R.O.W. LIMITS

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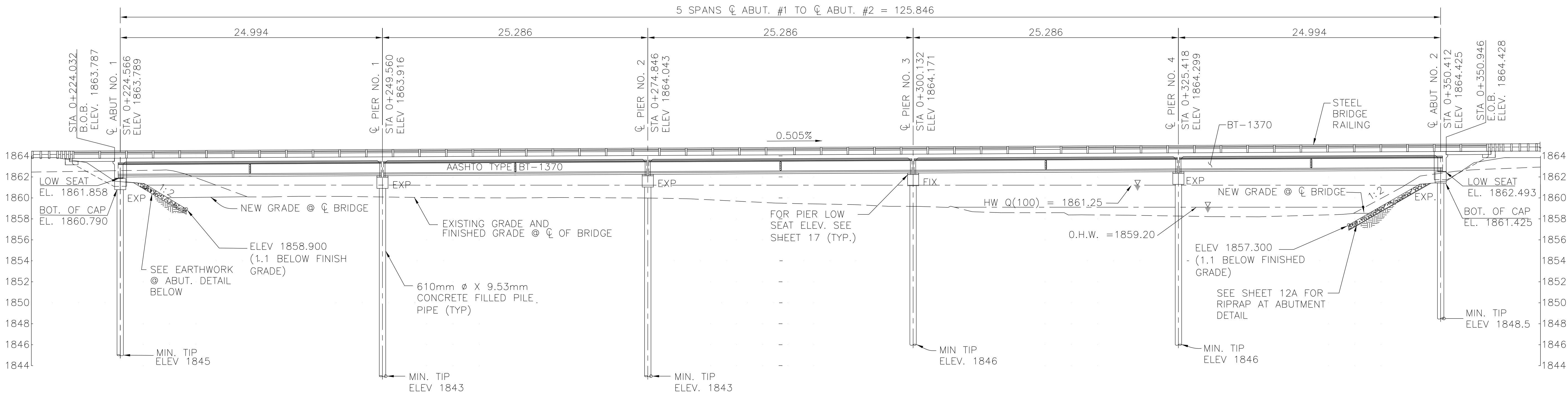
STRUCTURE LOCATION PLAN

Designed by: CK
Drawn by: PF, rsh Date: 6/16/16
Revised by: HRiley Date: 3/18/2020
File Name: 06_N9402_BridgeNotes

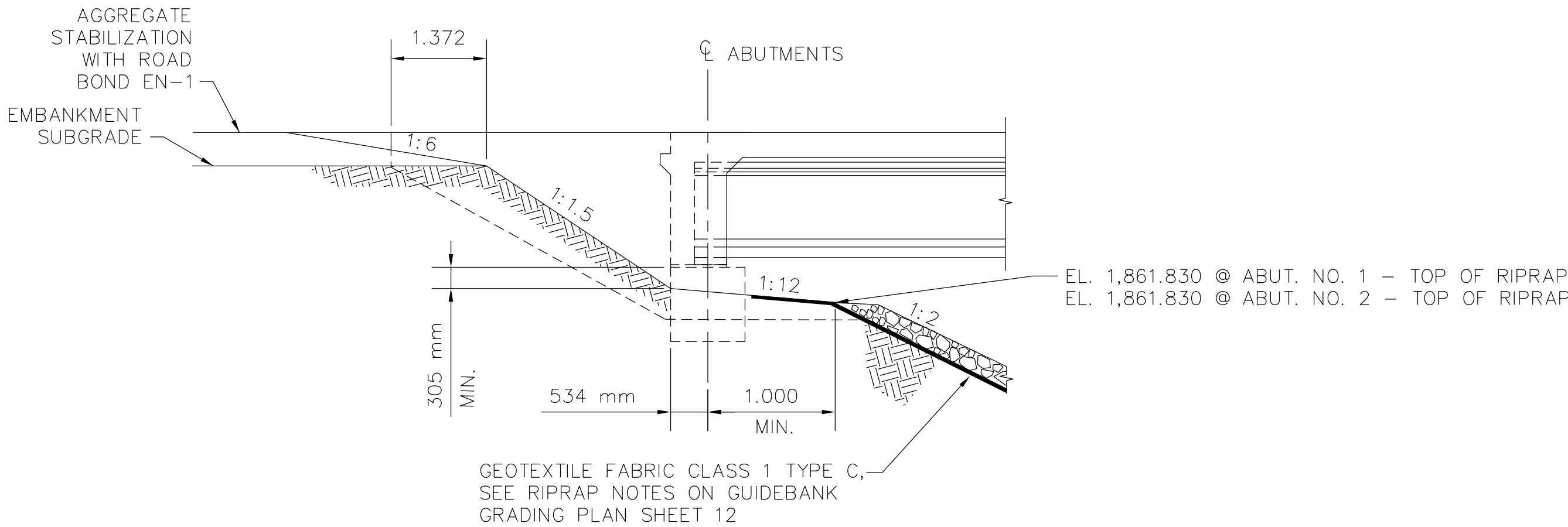


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REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	
NAVAJO	AZ	NAVAJO	N9402	N9402(2)1,2&3	7	of 40



BRIDGE PROFILE ALONG ϕ CONSTRUCTION/ROADWAY
SCALE=1:200



EARTHWORK AT ABUTMENTS
SCALE=1:60

WATERWAY DATA

DRAINAGE AREA = 2680.6 km²

Q(100) = 504.4 m³/sec

A(REQ'D) = 201.76 m²

A(PROVIDED) = 348.95 m²

V(100) = 2.50 m/sec

HW ELEV.(100) = 1861.25 m

FREE BOARD = 730 mm
PROVIDED)

Q(500) = 857.5 m³/sec

V(500) = 3.20 m/sec

A(REQ'D) = 267.97 m²

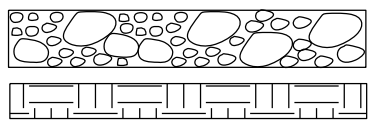
A(PROVIDED) = 348.95 m²

HW(500) = 1861.90 m

MAX. SCOUR(500) PIER = 3.71 m

SCOUR(500) ABUT = 12.13 m

LEGEND



RIPRAP

COMPACTED SUBGRADE

UNITED STATES
DEPARTMENT OF INTERIOR
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NAVAJO REGIONAL OFFICE - D.O.T.

STRUCTURE LOCATION
PROFILE

Designed by: CK

Drawn by: PF, rsh Date: 11/15/17

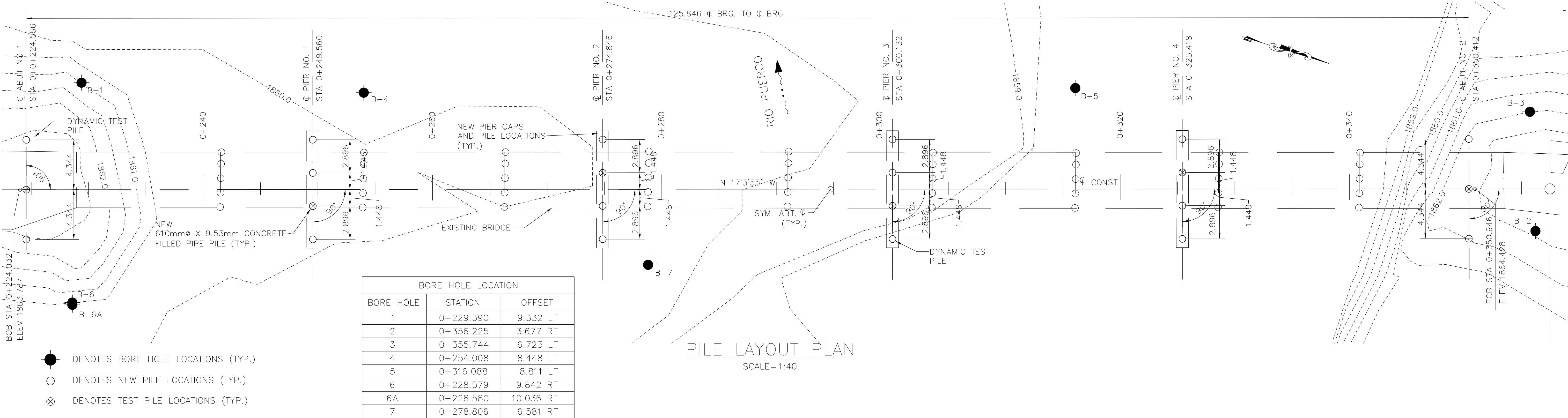
Revised by: HRILEY Date: 3/18/2020

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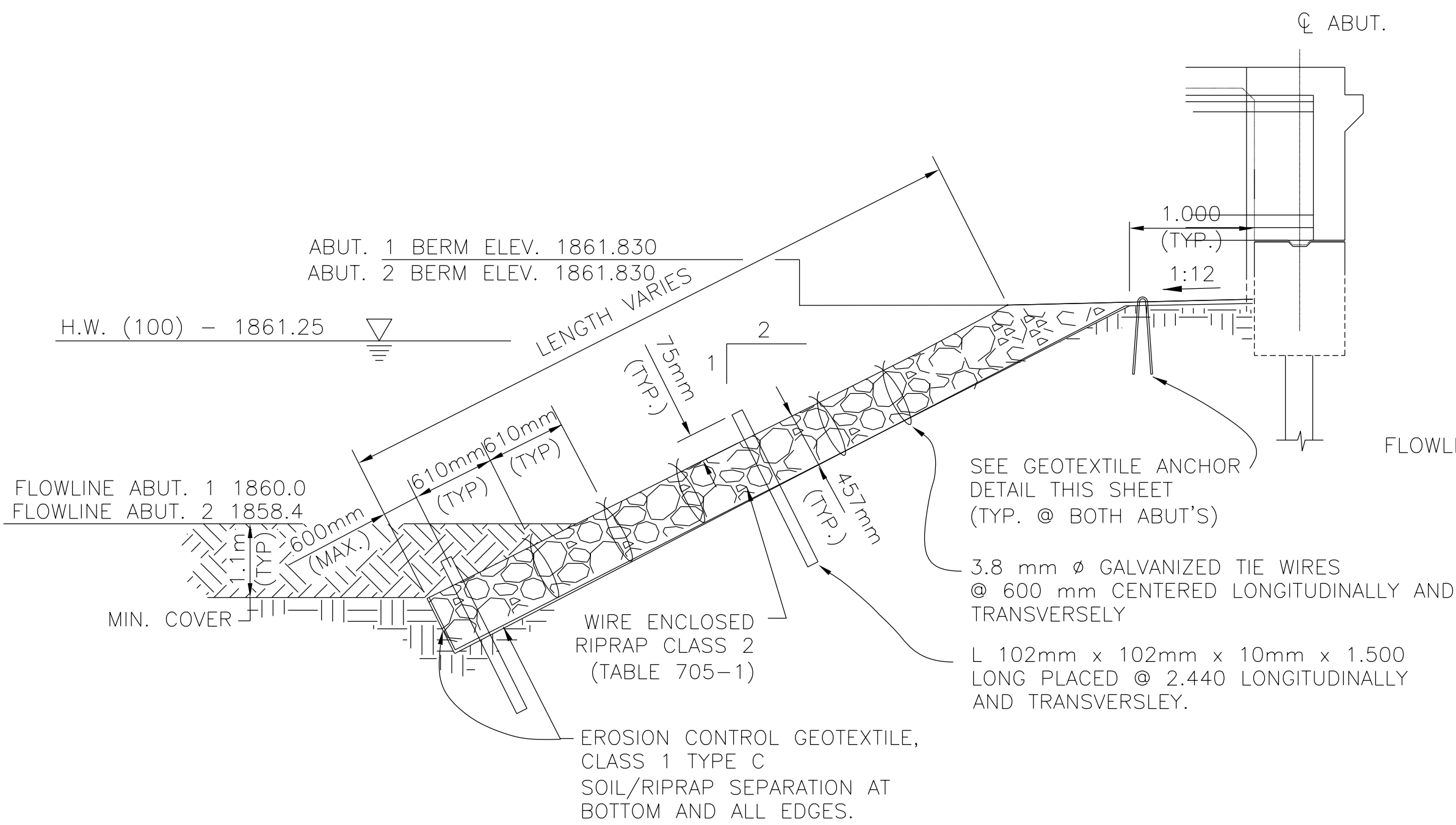


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REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET
NAVAJO	AZ	NAVAJO	N9402	N9402(2)1,2&3	8 of 40

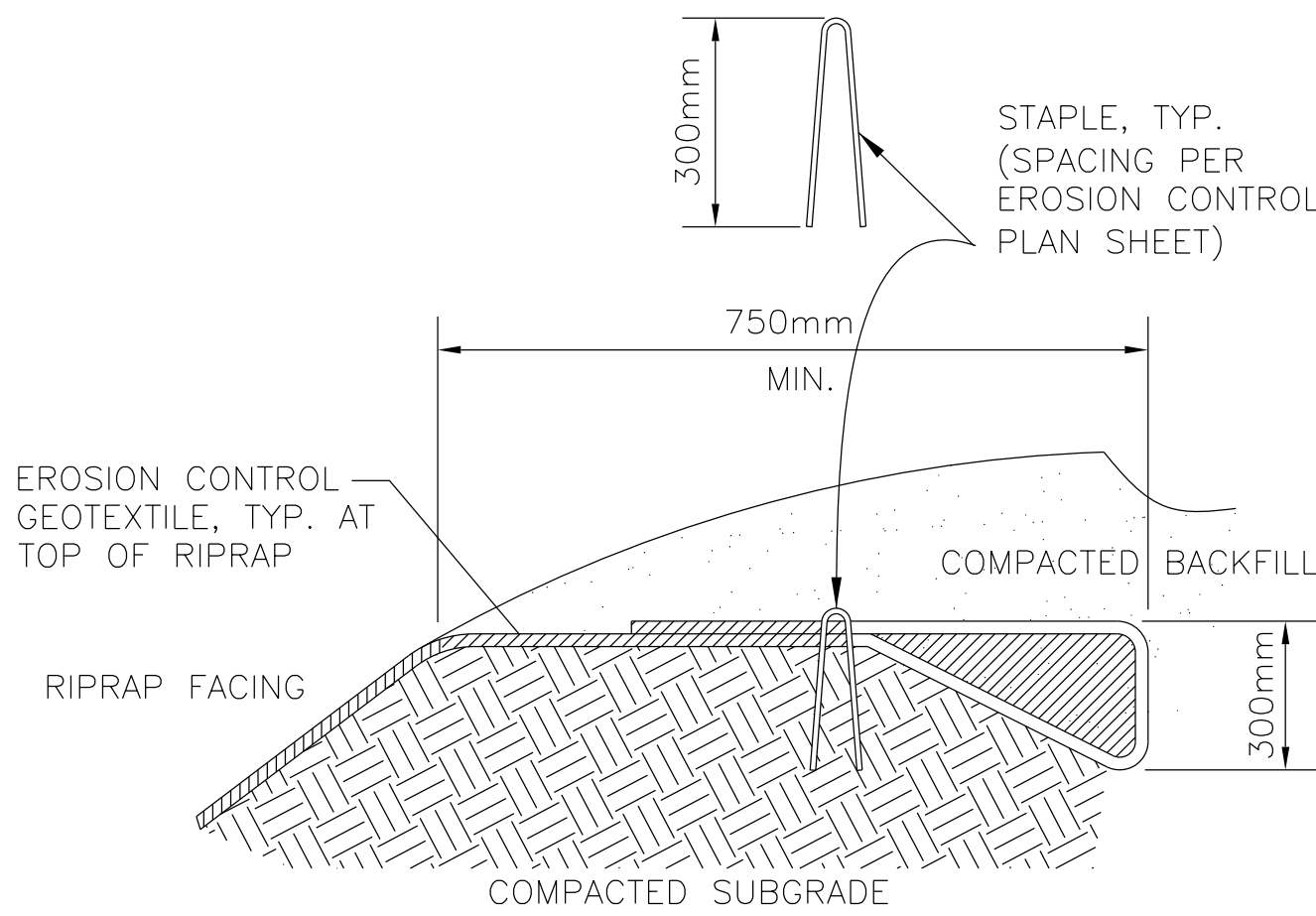


REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET
NAVAJO	AZ	NAVAJO	N9402	N9402(2)1,2&3	12A of 40



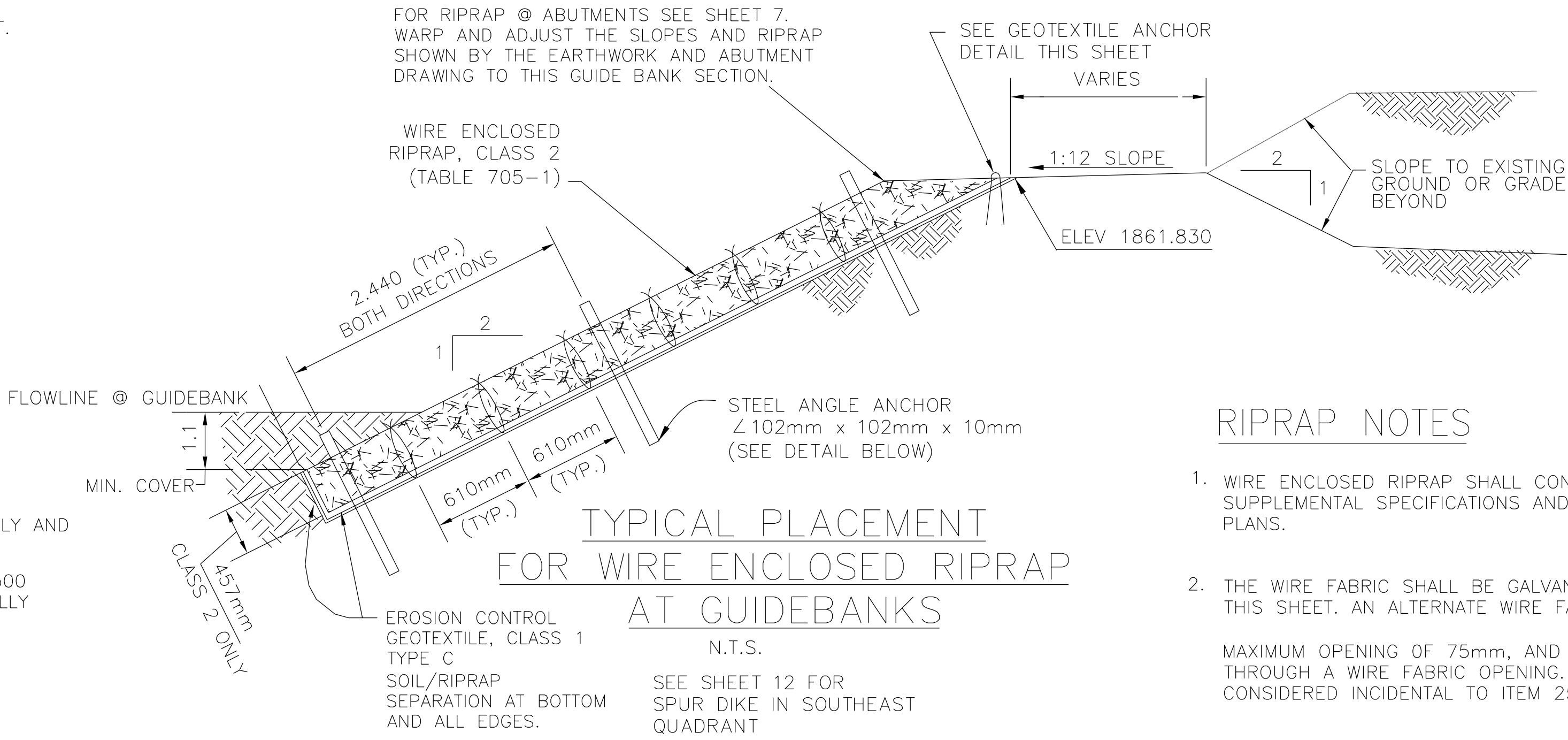
TYPICAL PLACEMENT OF WIRE ENCLOSED RIPRAP AT CL ABUTMENTS

N.T.S.

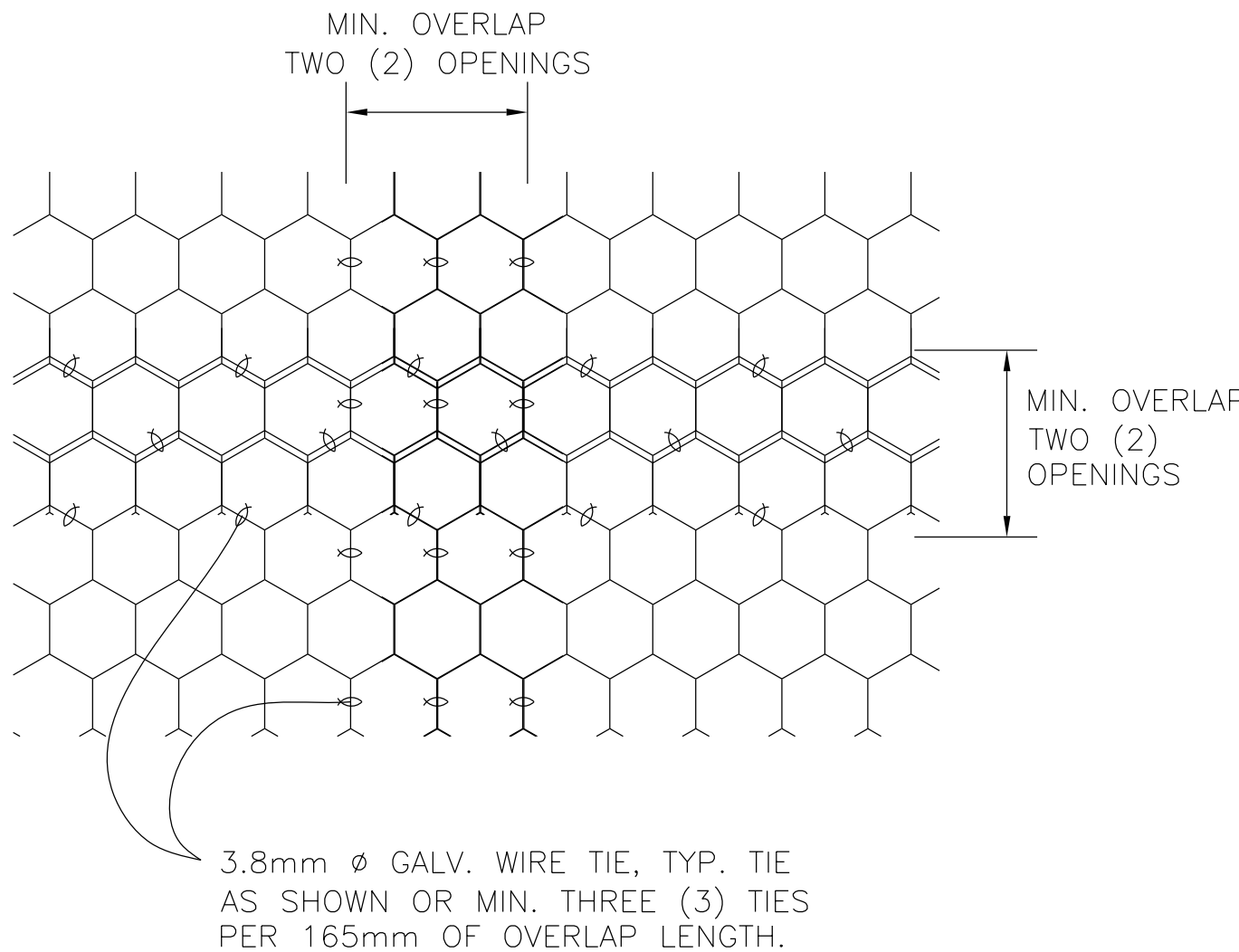


EROSION CONTROL GEOTEXTILE KEY DETAIL @ TOP OF RIPRAP

N.T.S.

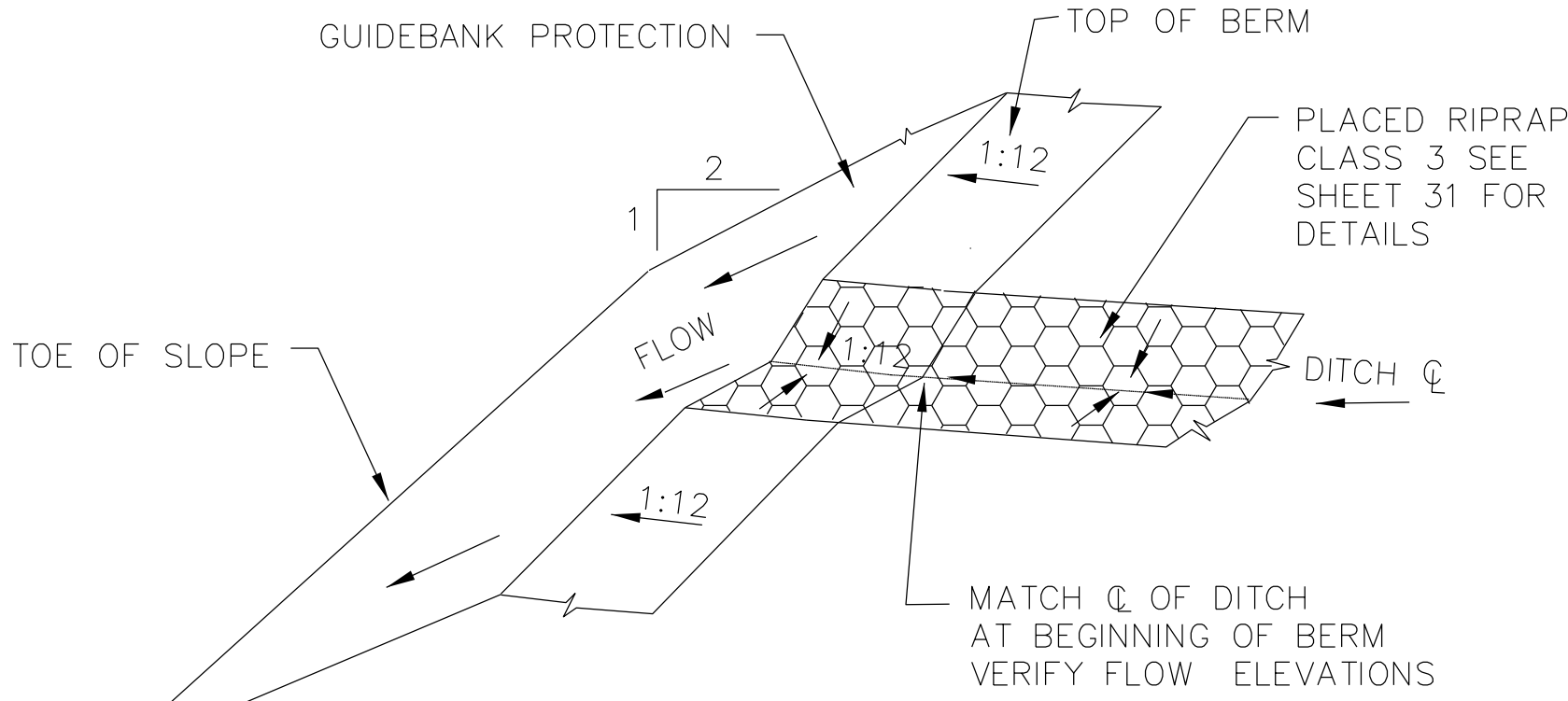


TYPICAL PLACEMENT FOR WIRE ENCLOSED RIPRAP AT GUIDE BANKS



FABRIC SPLICING DETAIL

N.T.S.

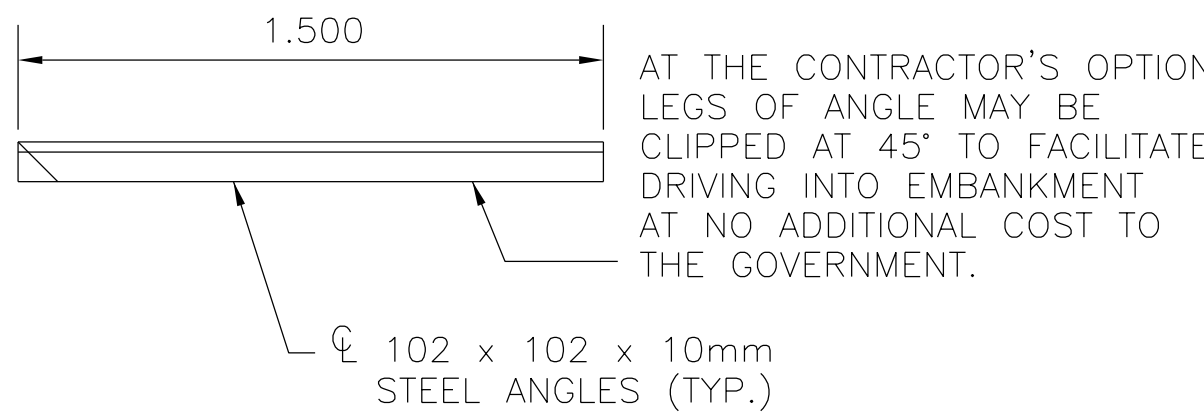


DITCH TO GUIDE BANK DETAIL

N.T.S.

RIPRAP NOTES

1. WIRE ENCLOSED RIPRAP SHALL CONFORM TO SECTION 251 OF THE FP-14 AND THE SUPPLEMENTAL SPECIFICATIONS AND TO THE DETAILS SHOWN IN THESE CONSTRUCTION PLANS.
2. THE WIRE FABRIC SHALL BE GALVANIZED AND BE OF THE CONFIGURATION SHOWN ON THIS SHEET. AN ALTERNATE WIRE FABRIC MAY BE SUBMITTED FOR REVIEW AND APPROVAL. MAXIMUM OPENING OF 75mm, AND SHALL NOT ALLOW A 75mm Ø SPHERE TO PASS THROUGH A WIRE FABRIC OPENING. COST FOR PLACING FABRIC AND MATERIAL SHALL BE CONSIDERED INCIDENTAL TO ITEM 25112 AND NO DIRECT PAYMENT SHALL BE MADE.
3. WIRE ENCLOSED RIPRAP SHALL BE ANCHORED AS SHOWN WITH L 102mm x 102mm x 10mm STEEL ANGLES SHALL EXTEND 75mm ABOVE THE TOP SURFACE OF WIRE ENCLOSED RIPRAP WHEN PLACED. COST OF PLACING STEEL ANGLES AND MATERIAL SHALL BE CONSIDERED INCIDENTAL TO ITEM 25112 AND NO DIRECT PAYMENT SHALL BE MADE.
4. EMBANKMENT BELOW RIPRAP SHALL CONFORM TO SECTION 204 OF THE FP-14. EXCAVATION FOR RIPRAP FOUNDATION SHALL CONFORM TO SECTION 209 OF THE FP-14. ALL EMBANKMENT AND EXCAVATION WORK FOR RIPRAP CONSTRUCTION SHALL BE CONSIDERED INCIDENTAL TO ITEM 25112, WIRE ENCLOSED RIPRAP, CLASS 2.
5. ROCK SIZE FOR WIRE ENCLOSED RIPRAP SHALL CONFORM TO FP-14, SECTION 705, TABLE 705-1, CLASS 2.
6. EROSION CONTROL GEOTEXTILE SHALL BE INSTALLED UNDER ALL RIPRAP AS SHOWN AND SHALL BE INCIDENTAL TO ITEM 25101, PLACED RIPRAP CLASS 3, AND ITEM 25112, WIRE-ENCLOSED RIPRAP. GEOTEXTILE SHALL CONFORM TO SECTION 714.01 Class 1 OF THE FP-14 FOR TYPE C.



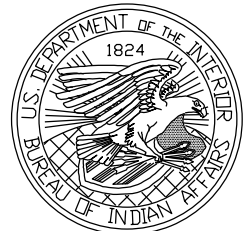
STEEL ANCHOR DETAIL

N.T.S.

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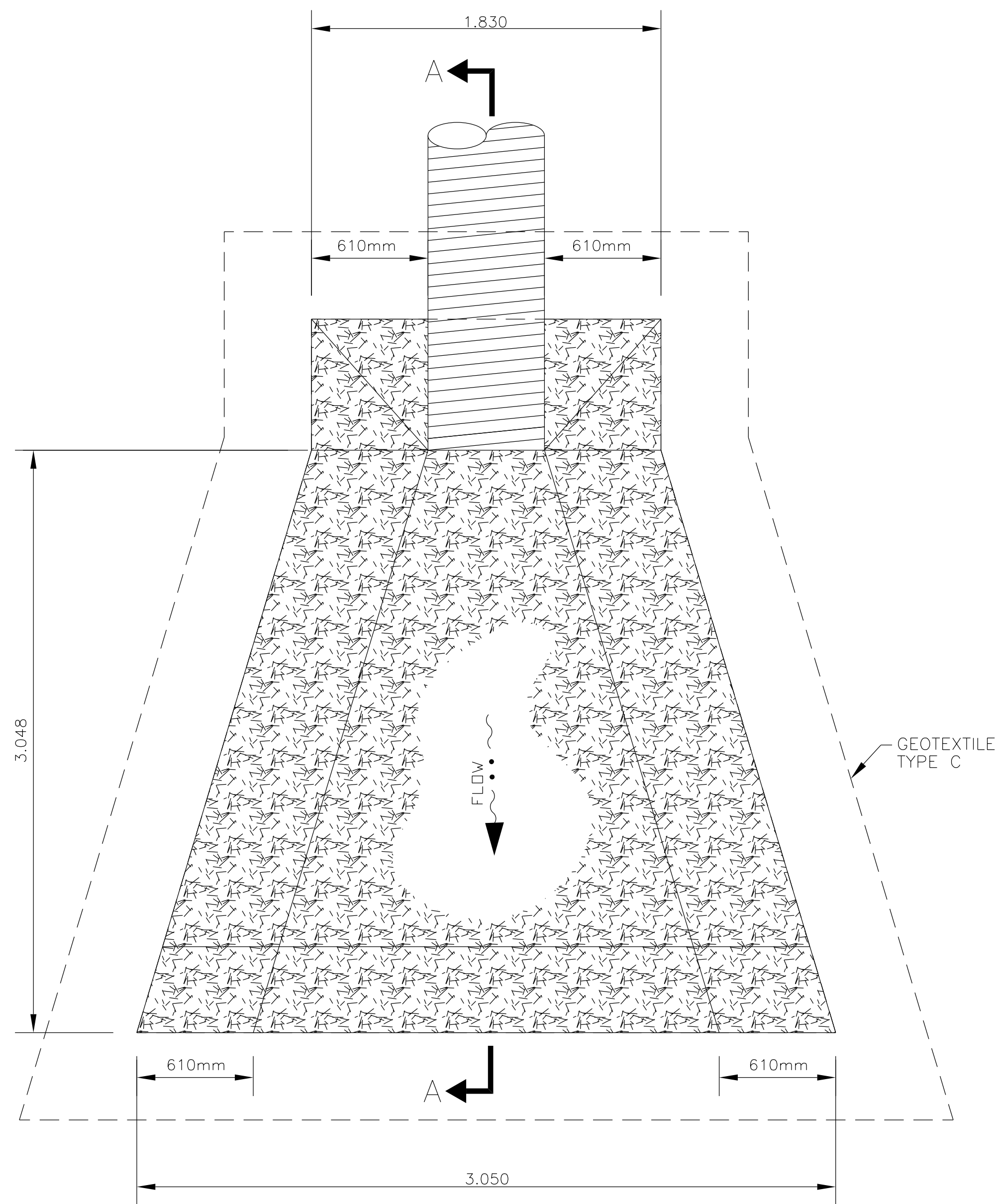
WIRE ENCLOSED RIPRAP DETAILS AND RIPRAP NOTES

Designed by: CK	
Drawn by: TC, rsh	Date: 7/03/17
Revised by: HRiley	Date: 3/18/2020
File Name: 12A_N9042_new12a_DETAILS	

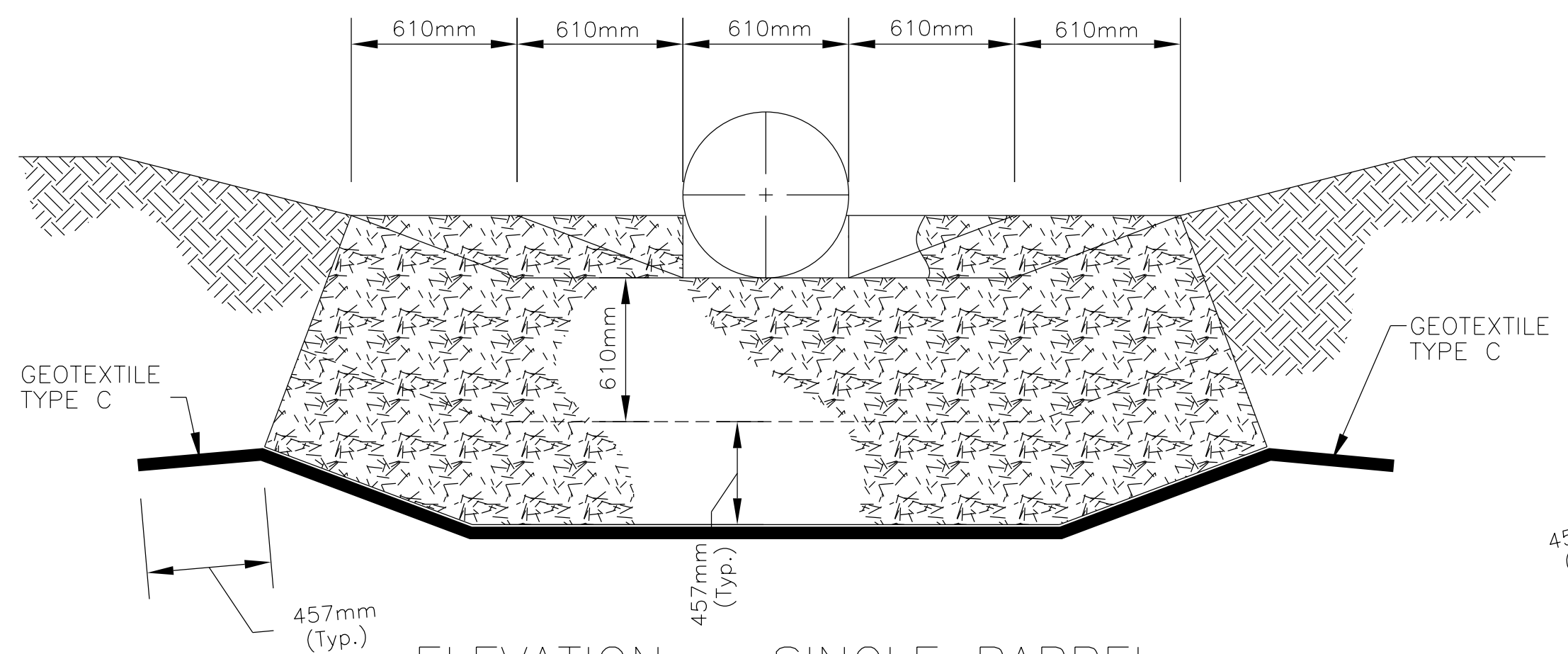


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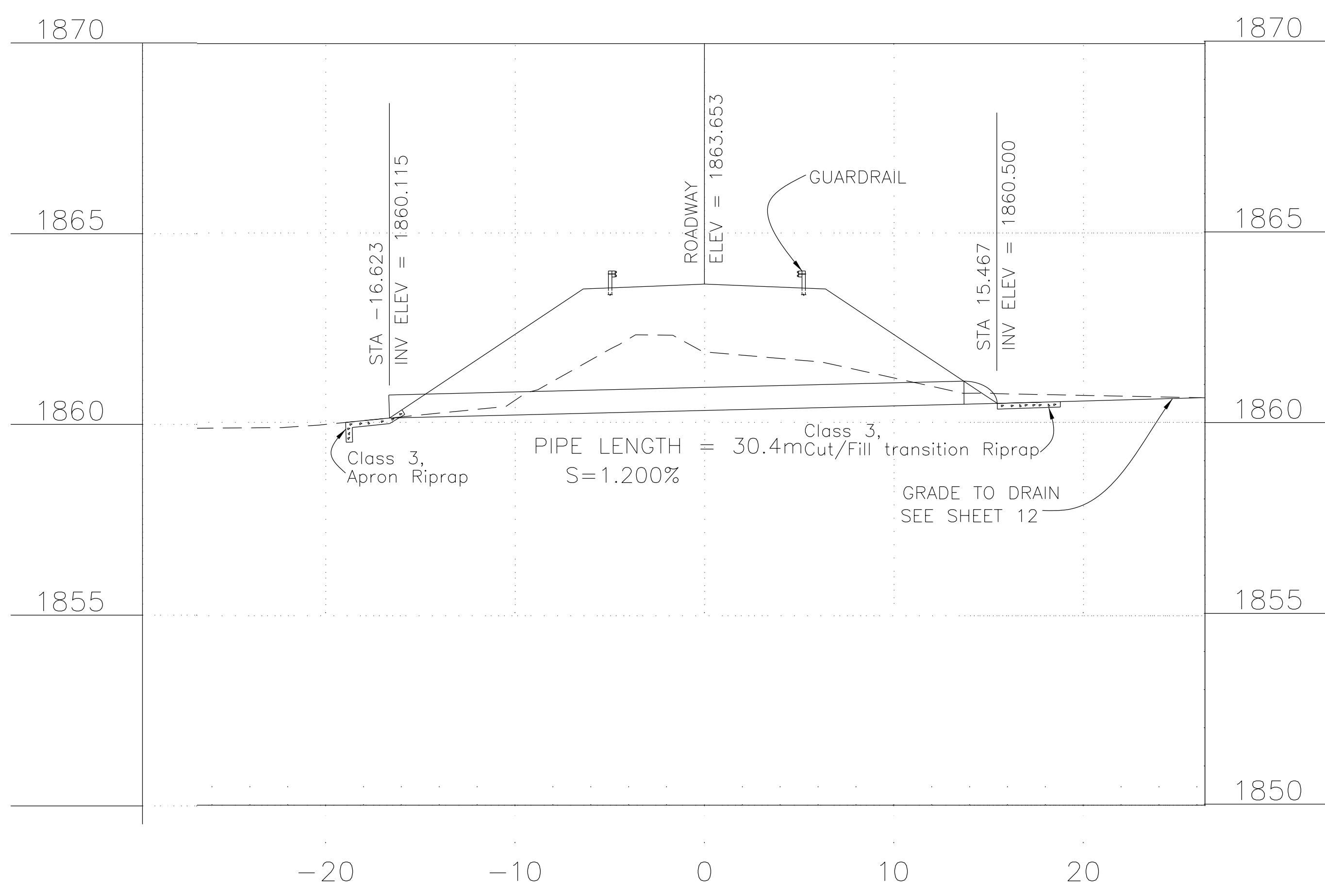
REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET
NAVAJO	AZ	NAVAJO	N9402	N9402(2)1,2&3	12B of 40



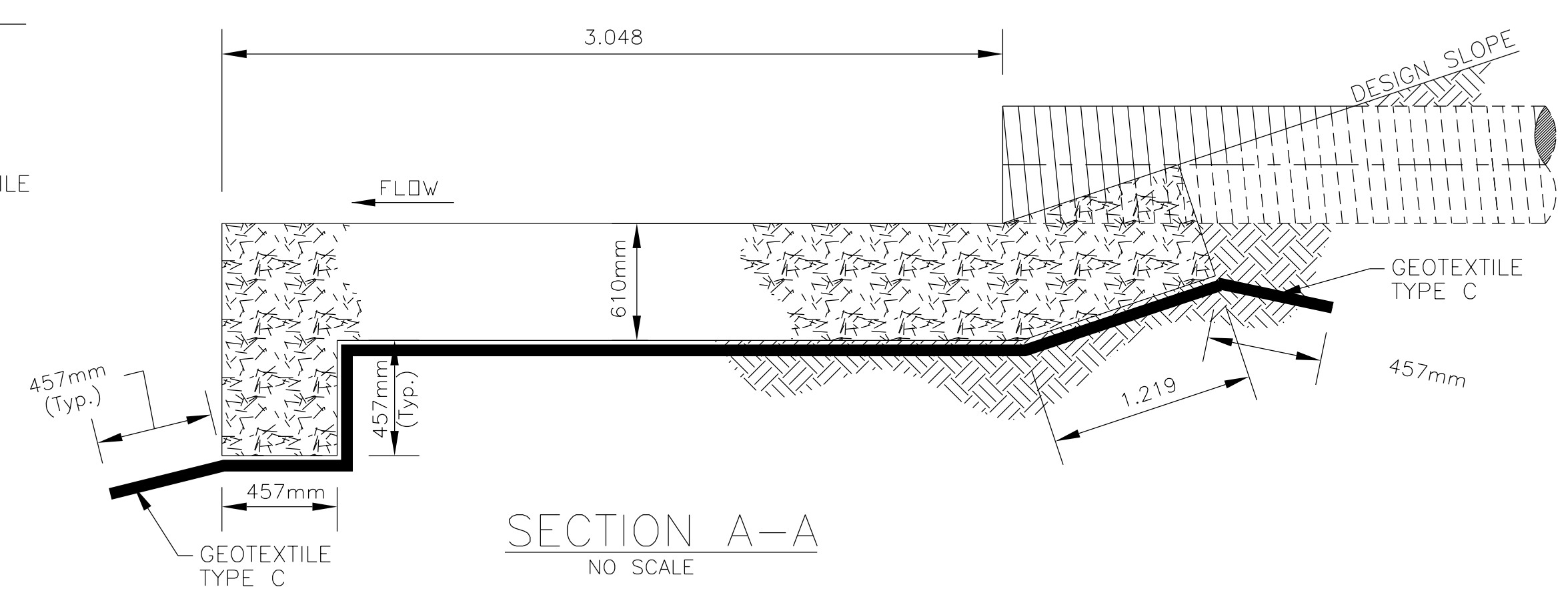
PLAN - SINGLE BARREL
NO SCALE



ELEVATION - SINGLE BARREL
NO SCALE



610mm PIPE CULVERT
CULVERT SECTION @
STA 0+190.087
NO SCALE



SECTION A-A
NO SCALE

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NAVAJO REGIONAL OFFICE - D.O.T.

CULVERT SECTION
AND DETAILS

Designed by: CK	
Drawn by: A.O., rsh	Date: 11/14/17
Revised by: HRiley	Date: 3/18/2020
File Name: 12B_N9402_new12b_details	



PIER DIAPHRAGM

EDGE OF PIER CAP

EDGE OF DIAPHRAGM

1,068mm

280mm

509mm min.

280mm

KNOCK OUTS FOR ANCHOR BOLTS, TYP.

3

4

#22PD5

241mm

586mm

241mm

BRG

PIER

BRG

BEAM

BEAM

HALF PLAN -PIER DIAPHRAGM, SECTION "3-3"

NOTE: UNLESS OTHERWISE NOTED
ALL REBAR MINIMUM CLEARANCE
SHALL BE 50mm.



Technical drawing of a column joint. The beam is labeled "L 152mmx152mmx7.9mm" and the column is labeled "C 200mmX17.1mm". The joint is labeled "SWAY OR GIRT". Reinforcement bars are shown with dimensions 6/6 and 6/6.

GIRT & SWAY
SECTION "2-2"

Technical drawing of a pier and pile cap assembly. Key dimensions and components include:

- Pier Width:** 1.068m total, with two 534mm sections.
- Reinforcement:** #13PH4, #13PV2, #13PV1, #13PH3 (both sides), #29PH1, #29PH1, #25PH2, and #29PV3.
- Beam Seat:** Indicated on the left side of the pile cap.
- Pile Cap Dimensions:** 750mm EMBED, 4 EQ SP.
- Pile Dimensions:** 610mm ϕ PIPE PILE.
- Other Dimensions:** 20mm TYP, 58mm (TYP), 152mm, 2.910, and 58mm (TYP.).

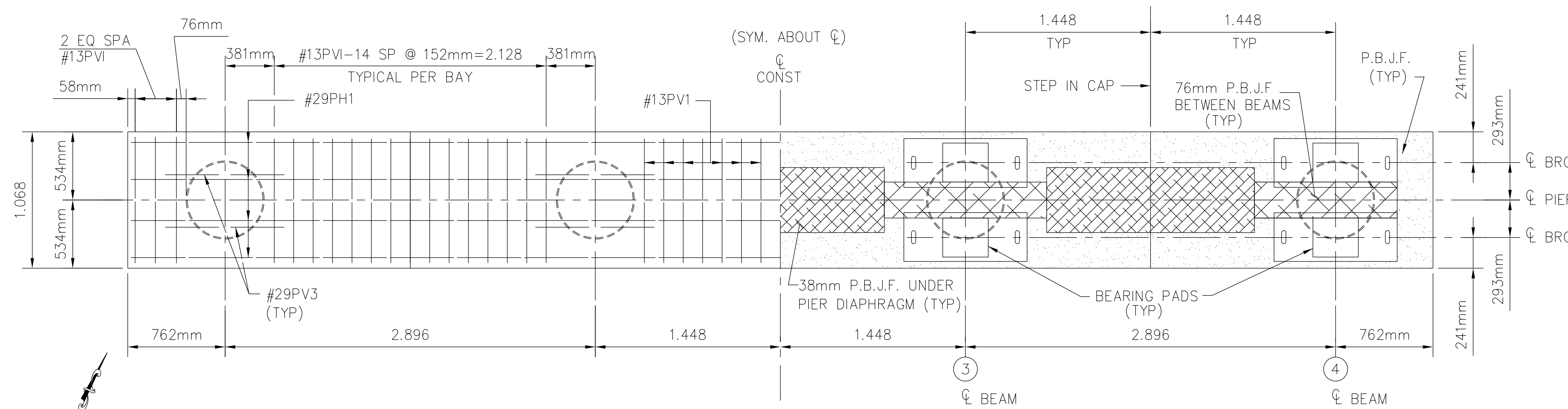
TYPICAL SECTION

SCALE=1:25

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EXPANSION PIER DETAILS
PIERS 1, 2 & 4

File Name: 15A_N9402_ExpPierDtl



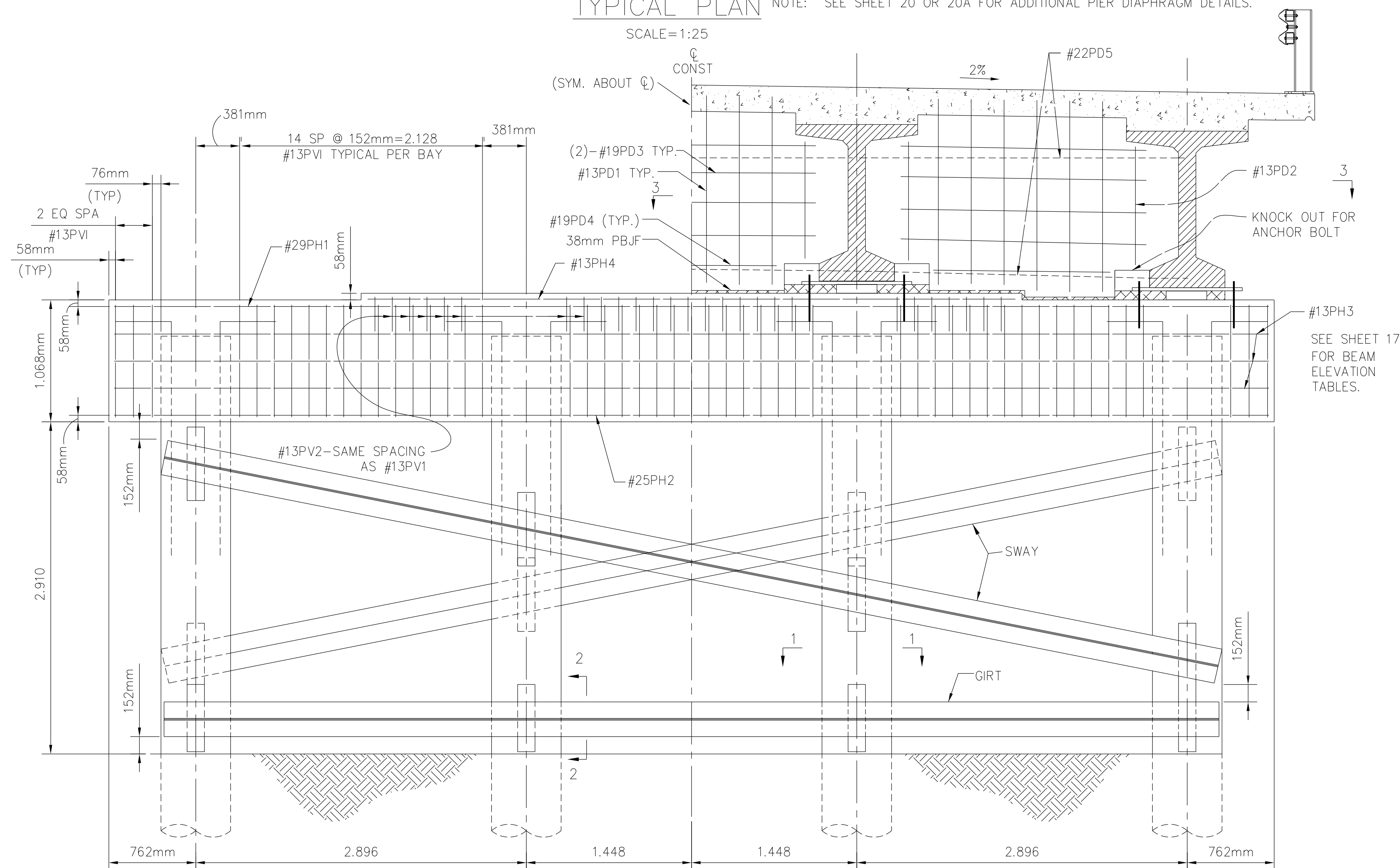
HALF PLAN PILE CAP/BEAM SEAT REINFORCEMENT



NOTE: SEE SHEET 20 OR 20A FOR ADDITIONAL PIER DIAPHRAGM DETAILS.

TYPICAL PLAN

SCALE=1:25



TYPICAL ELEVATION

SCALE=1:25

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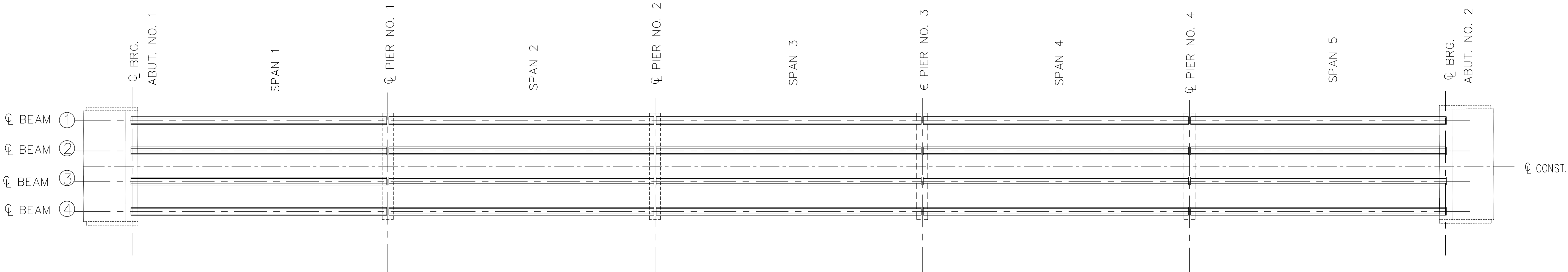
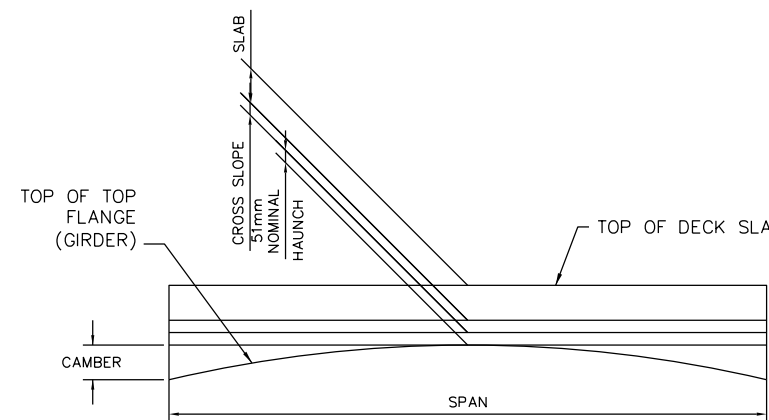
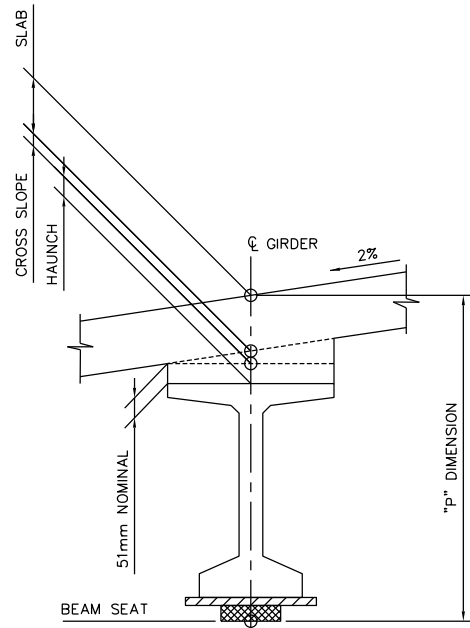
REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET
NAVAJO	AZ	NAVAJO	N9402	N9402(2)1,2&3	17 of 40

BEAM SEAT ELEVATIONS

Description	Location	Girder				Location	Girder				Location	Girder				Location	Girder			
		1	2	3	4		1	2	3	4		1	2	3	4		1	2	3	4
Deck Elev (m)	Abut 1	1863.703	1863.761	1863.761	1863.703	Pier 1	1863.827	1863.885	1863.885	1863.827	Pier 1	1863.830	1863.888	1863.888	1863.830	Pier 2	1863.955	1864.013	1864.013	1863.955
Slab (mm)		230	230	230	230		230	230	230	230		230	230	230	230		230	230	230	230
Cross Slope (mm)		11	11	11	11		11	11	11	11		11	11	11	11		11	11	11	11
Haunch (mm)		51	51	51	51		51	51	51	51		51	51	51	51		51	51	51	51
Camber (mm)		42	42	42	42		43	43	43	43		43	43	43	43		43	43	43	43
Beam (mm)		1372	1372	1372	1372		1372	1372	1372	1372		1372	1372	1372	1372		1372	1372	1372	1372
Sole Plate (mm)		38	38	38	38		38	38	38	38		38	38	38	38		38	38	38	38
Pad (mm)		101	101	101	101		101	101	101	101		101	101	101	101		101	101	101	101
"P" (mm)		1845	1845	1845	1845		1846	1846	1846	1846		1846	1846	1846	1846		1846	1846	1846	1846
Seat Elev (m)		1861.858	1861.916	1861.916	1861.858		1861.981	1862.039	1862.039	1861.981		1861.984	1862.042	1862.042	1861.984		1862.109	1862.167	1862.167	1862.109

Description	Location	Girder				Location	Girder				Location	Girder				Location	Girder			
		1	2	3	4		1	2	3	4		1	2	3	4		1	2	3	4
Deck Elev (m)	Pier 2	1863.958	1864.016	1864.016	1863.958	Pier 3	1864.083	1864.141	1864.141	1864.083	Pier 3	1864.086	1864.144	1864.144	1864.086	Pier 4	1864.210	1864.268	1864.268	1864.210
Slab (mm)		230	230	230	230		230	230	230	230		230	230	230	230		230	230	230	230
Cross Slope(mm)		11	11	11	11		11	11	11	11		11	11	11	11		11	11	11	11
Haunch (mm)		51	51	51	51		51	51	51	51		51	51	51	51		51	51	51	51
Camber (mm)		43	43	43	43		43	43	43	43		43	43	43	43		43	43	43	43
Beam (mm)		1372	1372	1372	1372		1372	1372	1372	1372		1372	1372	1372	1372		1372	1372	1372	1372
Sole Plate (mm)		38	38	38	38		38	38	38	38		38	38	38	38		38	38	38	38
Pad (mm)		101	101	101	101		76	76	76	76		76	76	76	76		101	101	101	101
"P" (mm)		1846	1846	1846	1846		1821	1821	1821	1821		1821	1821	1821	1821		1846	1846	1846	1846
Seat Elev (m)		1862.112	1862.170	1862.170	1862.112		1862.262	1862.320	1862.320	1862.262		1862.265	1862.323	1862.323	1862.265		1862.364	1862.422	1862.422	1862.364

Description	Location	Girder				Location	Girder			
		1	2	3	4		1	2	3	4
Deck Elev (m)	Pier 4	1864.213	1864.271	1864.271	1864.213	Abut 2	1864.338	1864.396	1864.396	1864.338
Slab (mm)		230	230	230	230		230	230	230	230
Cross Slope (mm)		11	11	11	11		11	11	11	11
Haunch (mm)		51	51	51	51		51	51	51	51
Camber (mm)		43	43	43	43		42	42	42	42
Beam (mm)		1372	1372	1372	1372		1372	1372	1372	1372
Sole Plate (mm)		38	38	38	38		38	38	38	38
Pad (mm)		101	101	101	101		101	101	101	101
"P" (mm)		1846	1846	1846	1846		1845	1845	1845	1845
Seat Elev (m)		1862.367	1862.425	1862.425	1862.367		1862.493	1862.551	1862.551	1862.493



FRAMING DIAGRAM FOR ELEVATION LOCATIONS

SCALE: 1:25
FOR TOP OF WINGWALL STATION AND ELEVATIONS SEE SHEET 23

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NAVAJO REGIONAL OFFICE – D.O.T.

BEAM SEAT ELEVATIONS

Designed by: CK

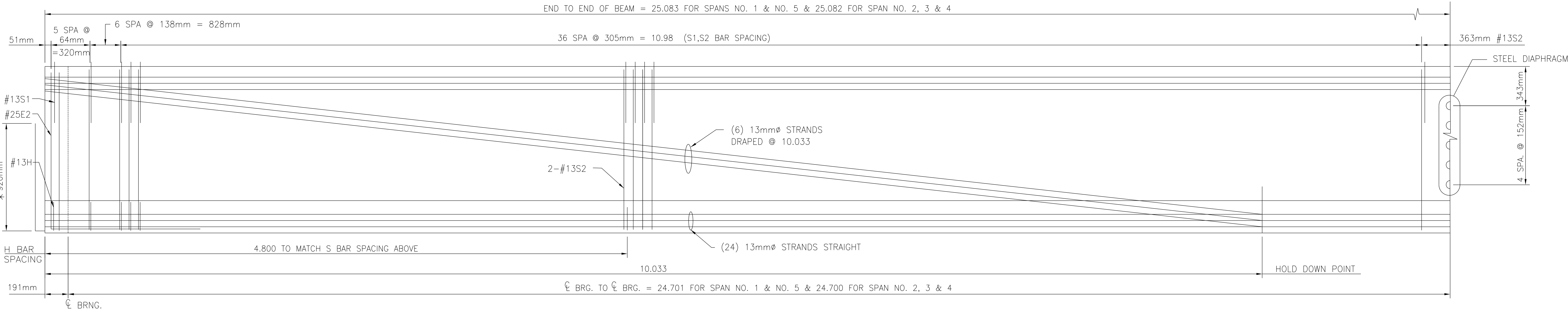
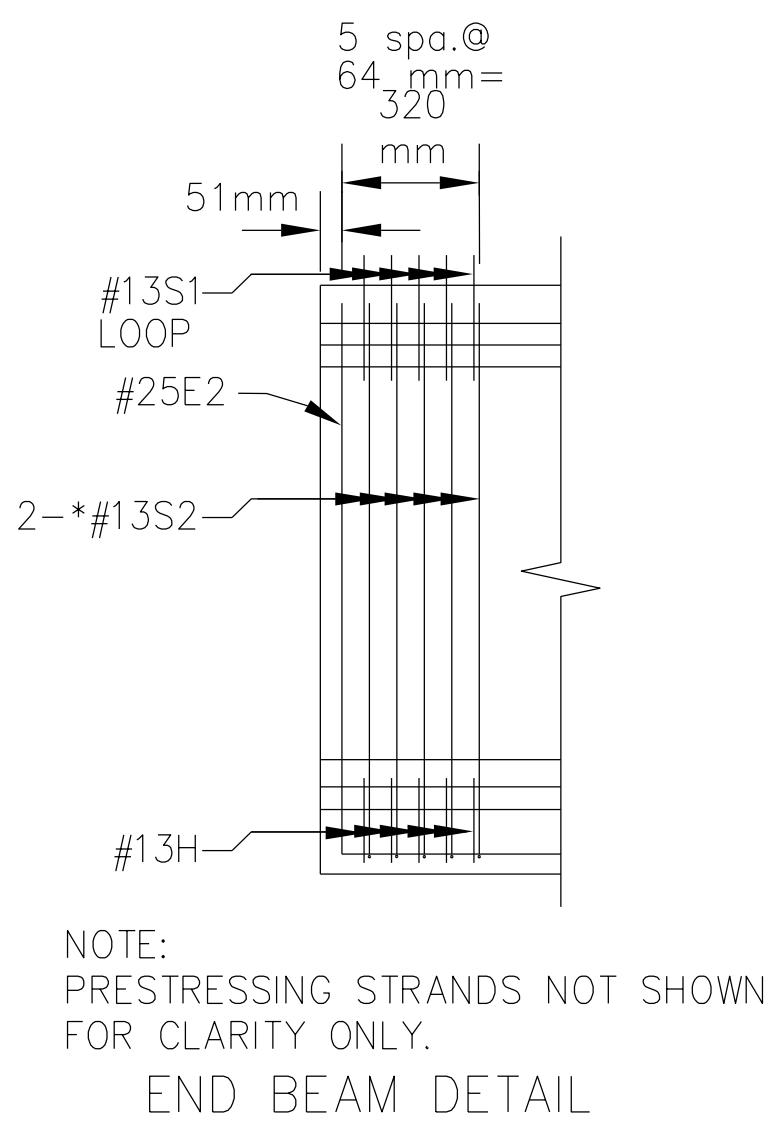
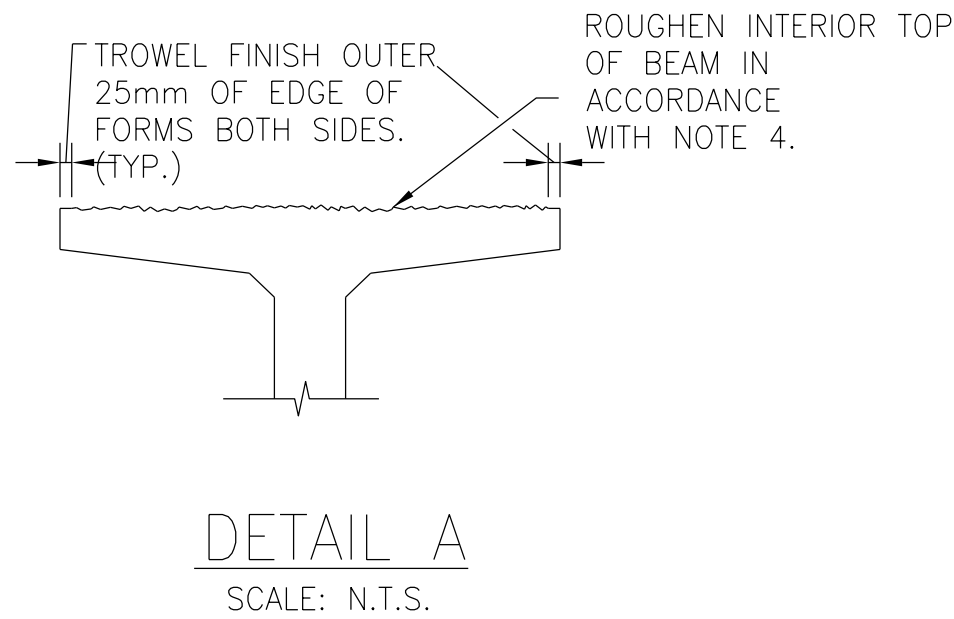
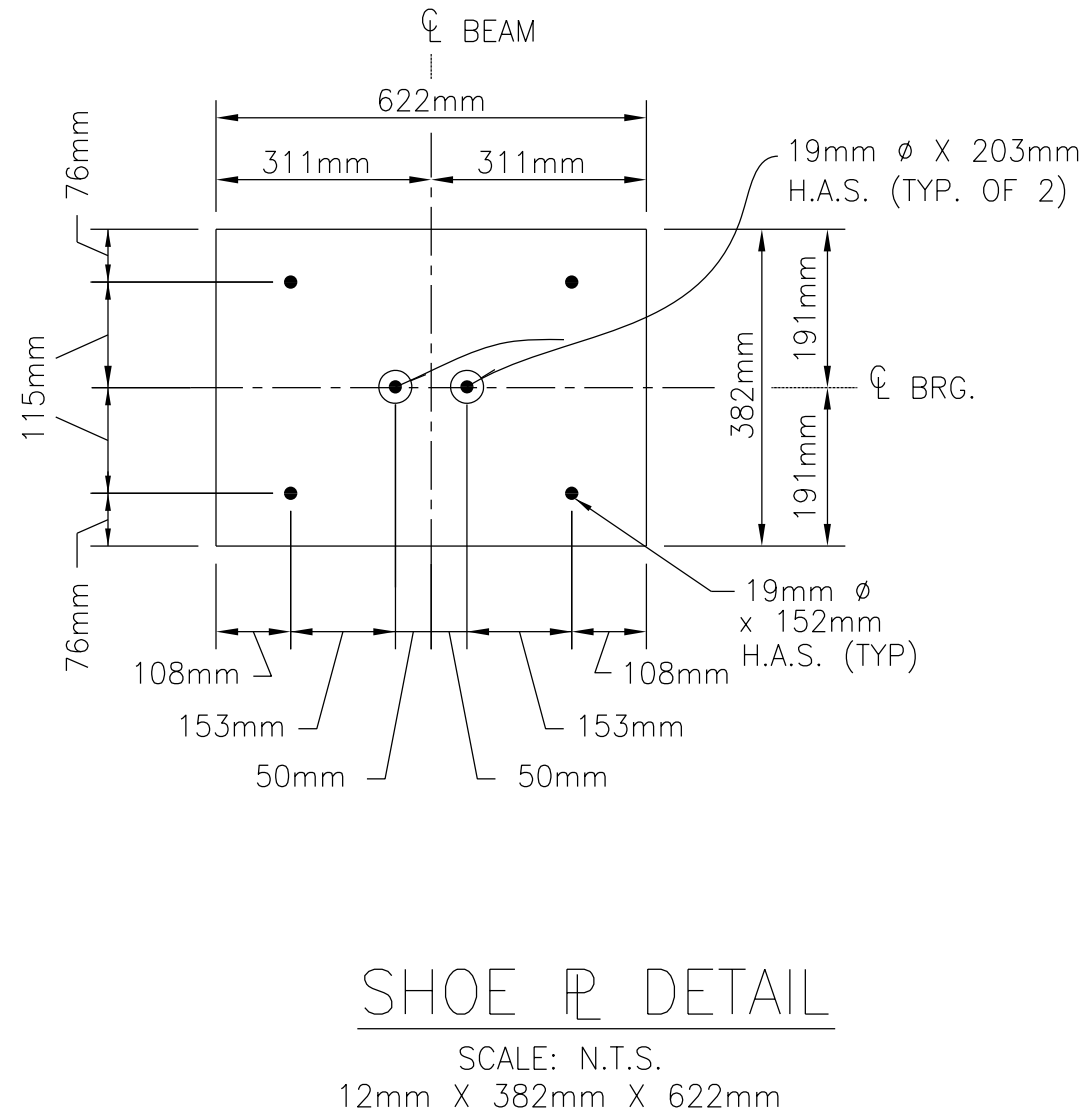
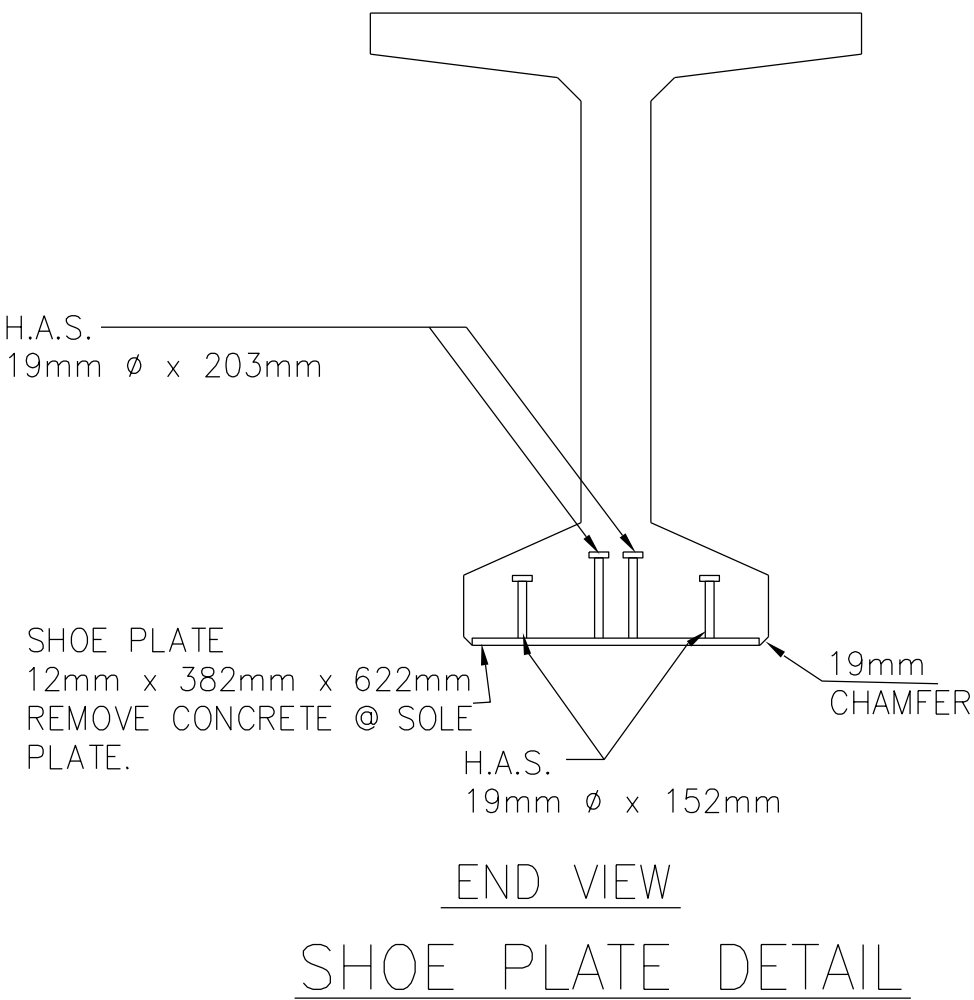
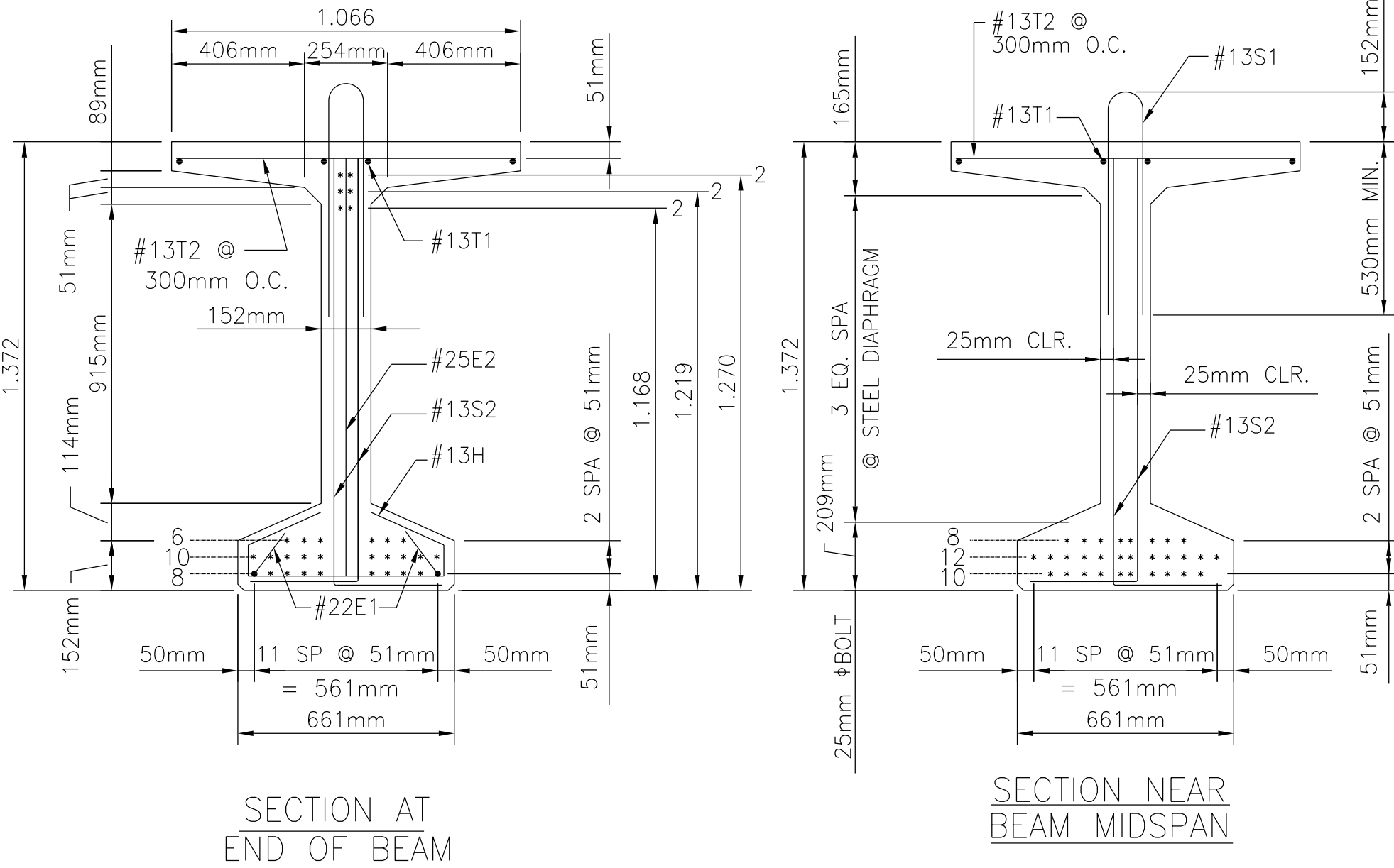
Drawn by: PF, rsh Date: 9/19/2017

Revised by:HRiley Date: 3/18/2020

File Name: 17_N9402_BeamSeat

C:\Users\Harold.Riley\Documents\Projects\19_N9402_BT1370-BEAM_2017-03-20.dgn

REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET
NAVAJO	AZ	NAVAJO	N9402	N9402(2)1,2&3	19 of 40



HALF ELEVATION TYPE BT-1370 BEAMS, 20 REQUIRED

(Pse = 112.43 kN PER STRAND; LOSSES = 26.45 kN PER STRAND)

DESIGN DATA

DESIGN ACCORDING TO AASHTO SPECIFICATIONS DATED 2002 AND CURRENT INTERIM.

BEAMS:

f'ci (MIN. COMPRESSIVE STRENGTH OF CONCRETE AT TIME OF INITIAL PRESTRESS) = 35.0 MPa
f'c = 43.75 MPa; n = 7

PRESTRESSING STEEL:

12.7 mm DIAMETER SEVEN WIRE LOW RELAXATION STRANDS.
f's = 185.2 kN PER STRAND;
f*y = 165.0 kN PER STRAND.

CONVENTIONAL REINFORCING BARS:

f'y = 420 MPa

COMPOSITE SLAB:

f'c = 27.6 MPa
ALLOWANCE FOR STEEL DECK FORMS = 0.720 kPa
ALLOWANCE FOR FUTURE WEARING SURFACE = 1.139 kPa
LIVE LOAD = MS 18

GENERAL NOTES

- ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE ON THE DRAWING (SOFT CONVERSION).
- COST OF REINFORCING BARS AND STRUCTURAL STEEL EMBEDDED IN BRIDGE BEAMS IS TO BE INCLUDED IN THE UNIT PRICE BID ITEM 55301 FOR PRECAST, PRESTRESSED CONCRETE STRUCTURAL MEMBERS TYPE BT-1370.
- BEAMS TO BE LIFTED BY MEANS OF DEVICES SATISFACTORY TO THE AOTR/CO. LIFTING DEVICES MUST BE APPROVED BY THE AOTR/CO PRIOR TO USE. BEAMS TO BE CAST, STORED, AND HAULED IN UPRIGHT POSITION.
- THE TOP SURFACES OF THE BEAMS ARE TO BE THOROUGHLY WIRE BRUSHED AND SCORED TRANSVERSELY AFTER INITIAL SET IN ACCORDANCE WITH DETAIL A AND HAVE MINIMUM ROUGHNESS PROJECTION OF 6mm AND 13mm MAXIMUM.
- THE CAMBER AT ERECTION DIMENSION LISTED IS THE CALCULATED VALUE DUE TO THE EFFECT OF PRESTRESSING WITH THE WEIGHT OF THE BEAM ACTING, WITH AN ALLOWANCE FOR CAMBER GROWTH TO 90 DAYS. THE CONTRACTOR SHALL LIMIT THE CAMBER GROWTH TO A VALUE NOT TO EXCEED THE PREDICTED CAMBER AT ERECTION DIMENSION BY 25 mm AT THE TIME OF DECK SLAB PLACEMENT. CAMBER GROWTH IS TO BE LIMITED BY WEIGHTING, FABRICATION SCHEDULING OR OTHER APPROVED MEANS.
- DEAD LOAD DEFLECTION IS THE COMPUTED DEFLECTION DUE TO WEIGHT OF SLAB, DIAPHRAGMS, AND SUPERIMPOSED DEAD LOAD.
- THE DESIGN SHOWN IS BASED ON THE USE OF 12.7mm DIAMETER LOW-RELAXATION STRANDS MEETING THE REQUIREMENTS OF AASHTO M-203 (GRADE 1860). INITIAL PRESTRESSING FORCE SHALL BE 137.8 kN PER STRAND. SLIGHT OVERSTRESSING UP TO 146.8 kN PER STRAND WILL BE ALLOWED TO OFFSET SEATING LOSSES.
- TYPE III CEMENT MAY BE USED AT THE FABRICATOR'S OPTION.
- SHOE PLATES MUST BE STRAIGHTENED PRIOR TO CASTING INTO BEAM.
- MATERIAL CERTIFICATIONS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL FOR ALL MATERIALS.

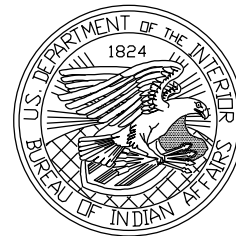
WEIGHT	CAMBER @ RELEASE	CAMBER @ ERECTION	DEAD LOAD DEFLECTION
25,624kg	39mm	69mm	27mm

BEAM DATA

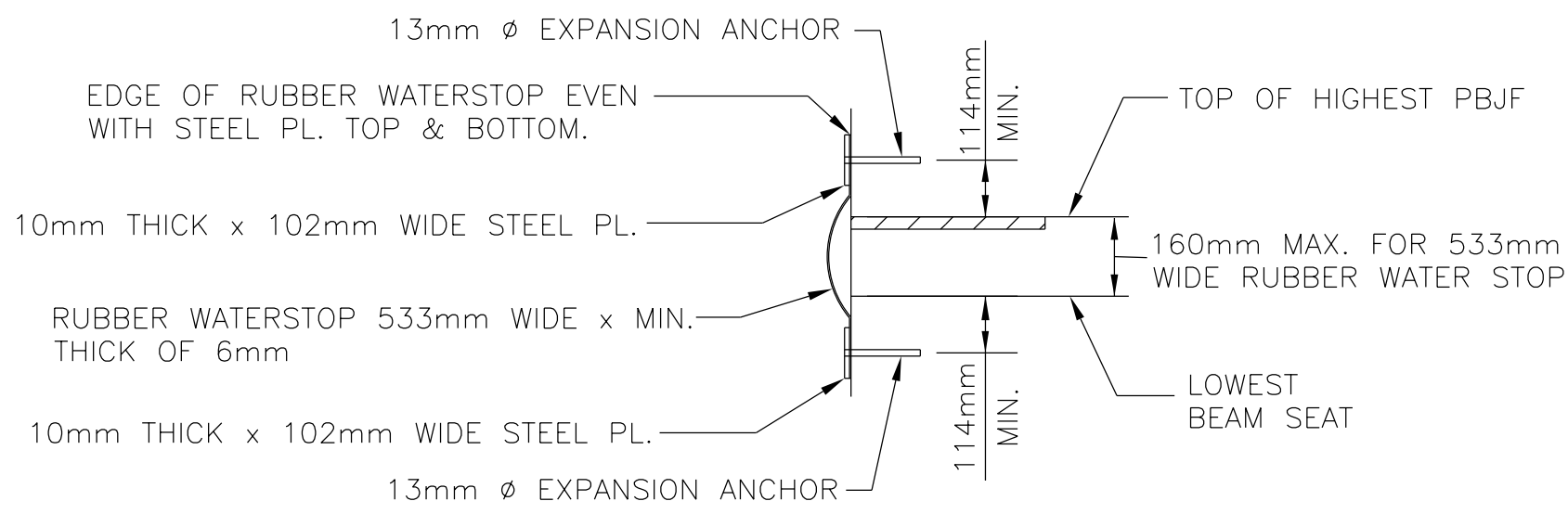
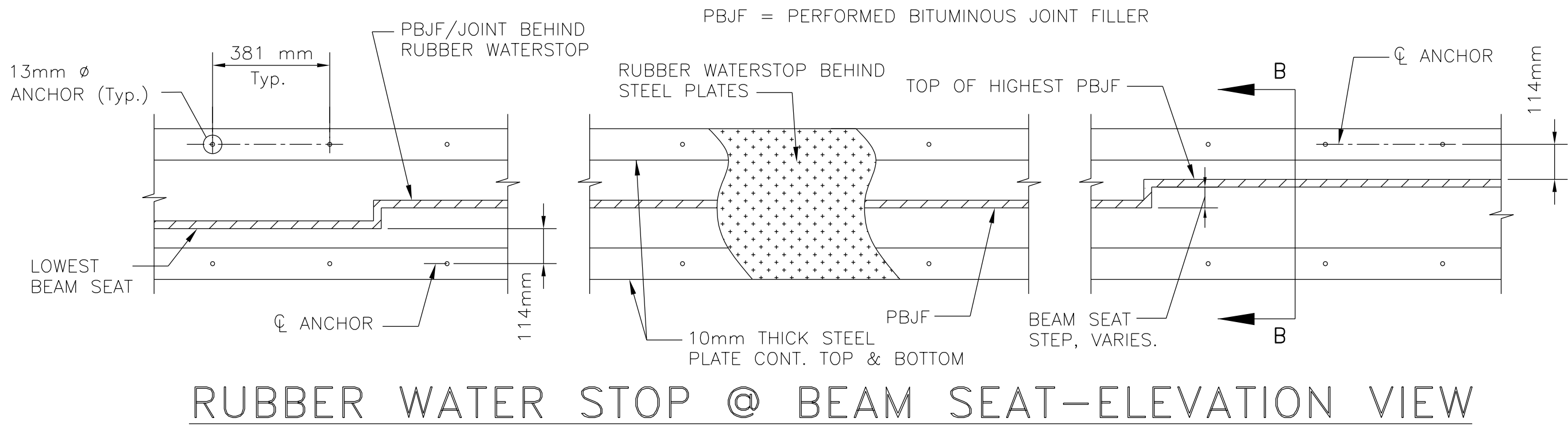
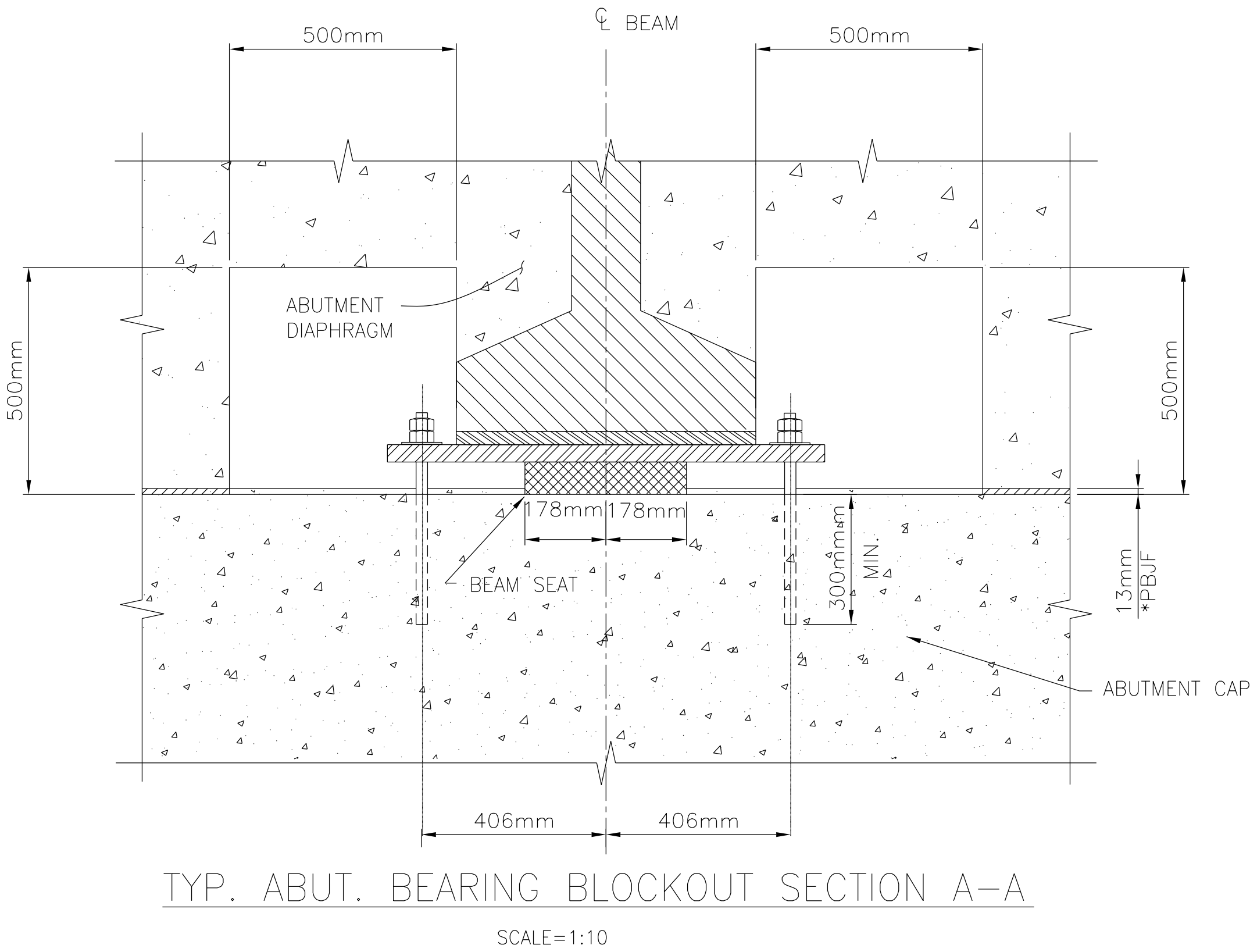
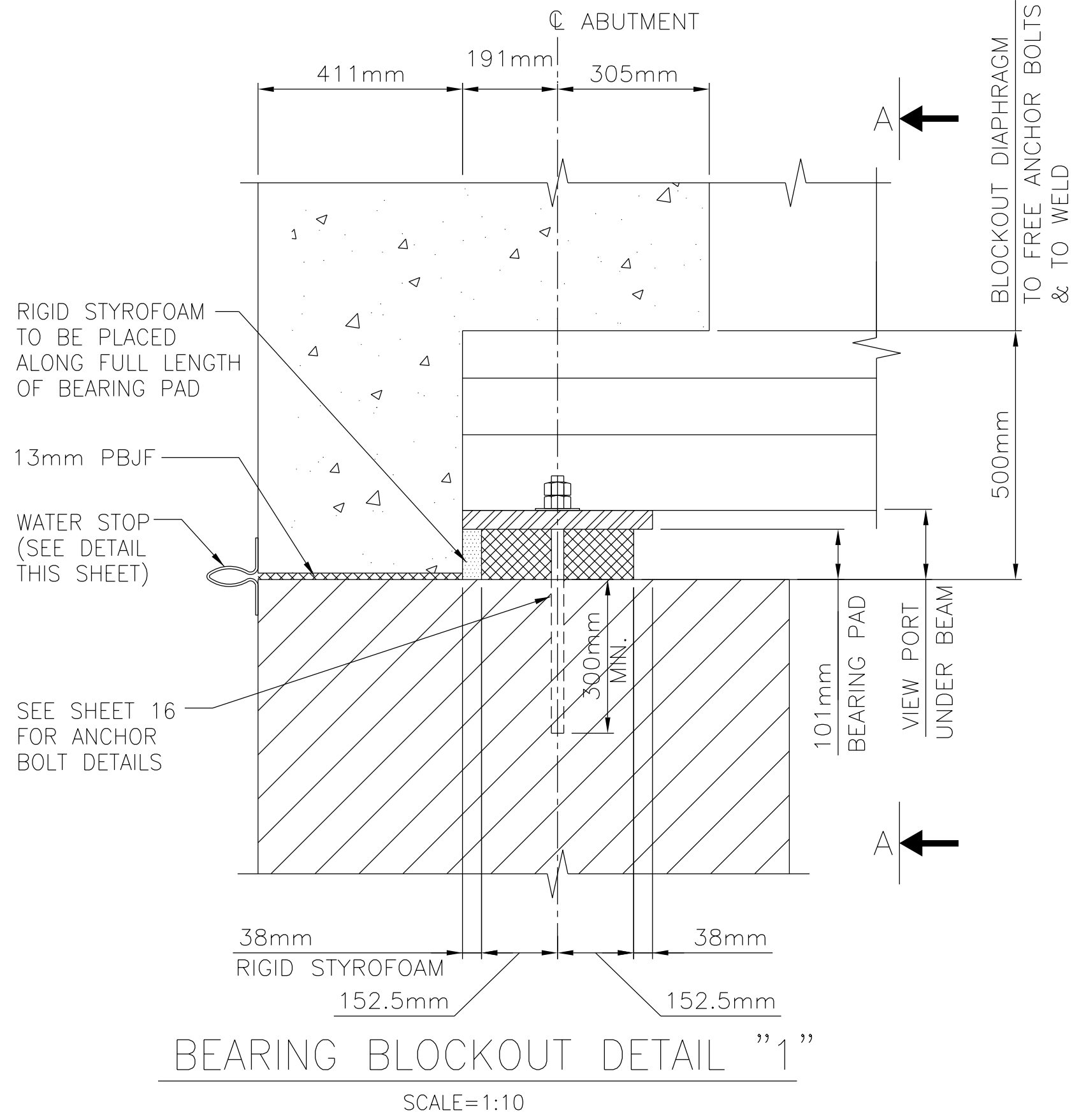
UNITED STATES
DEPARTMENT OF INTERIOR
BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL OFFICE – D.O.T.

TYPE BT-1370 BEAM DETAILS

Designed by: CK	
Drawn by: TC, rsh	Date: 3/20/17
Revised by:HRiley	Date: 3/19/2020
File Name: 19_N9402_BT1370-BEAM	



REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET
NAVAJO	AZ	NAVAJO	N9402	N9402(2)1,2&3	20 of 40



WATERSTOP NOTES:

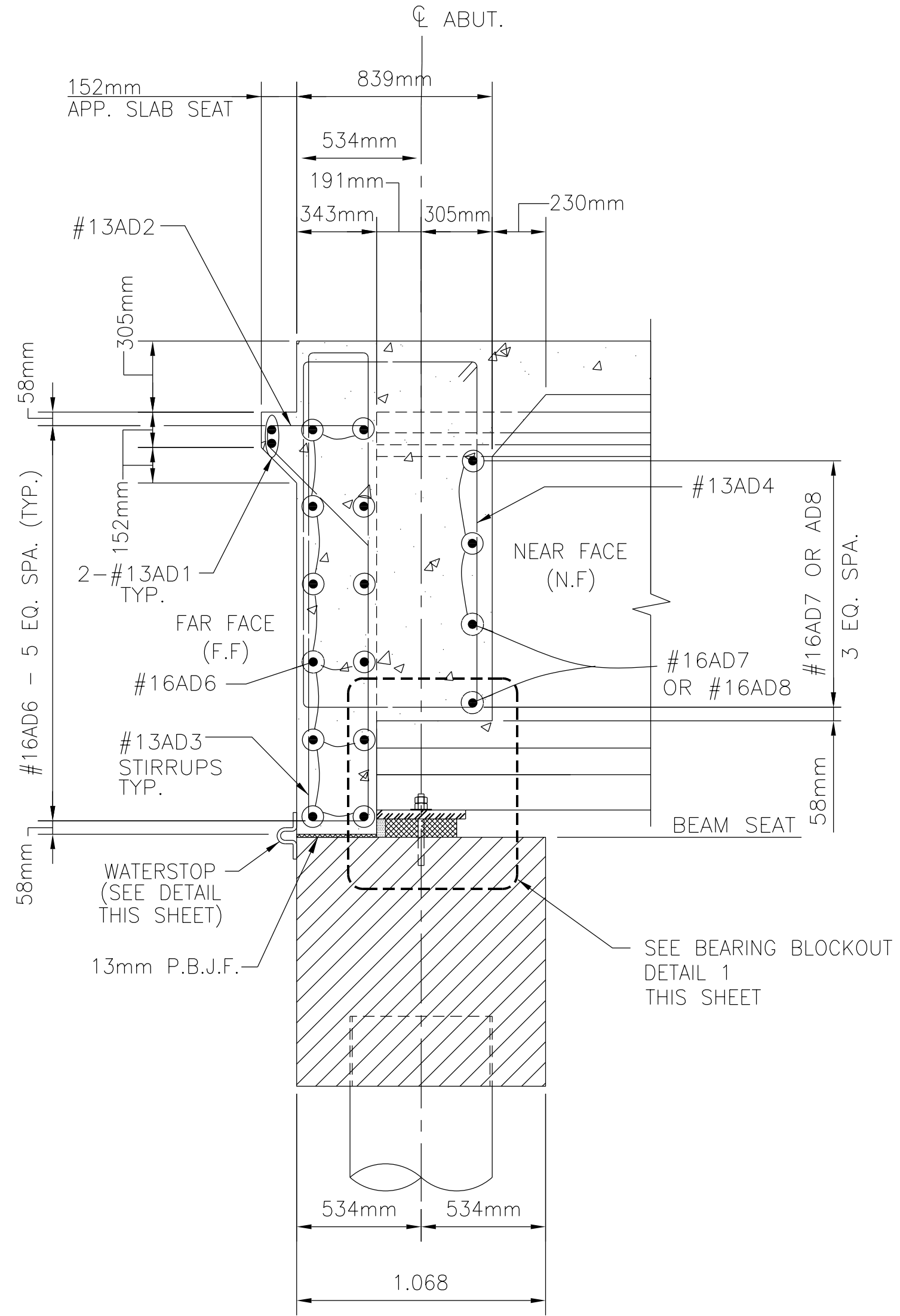
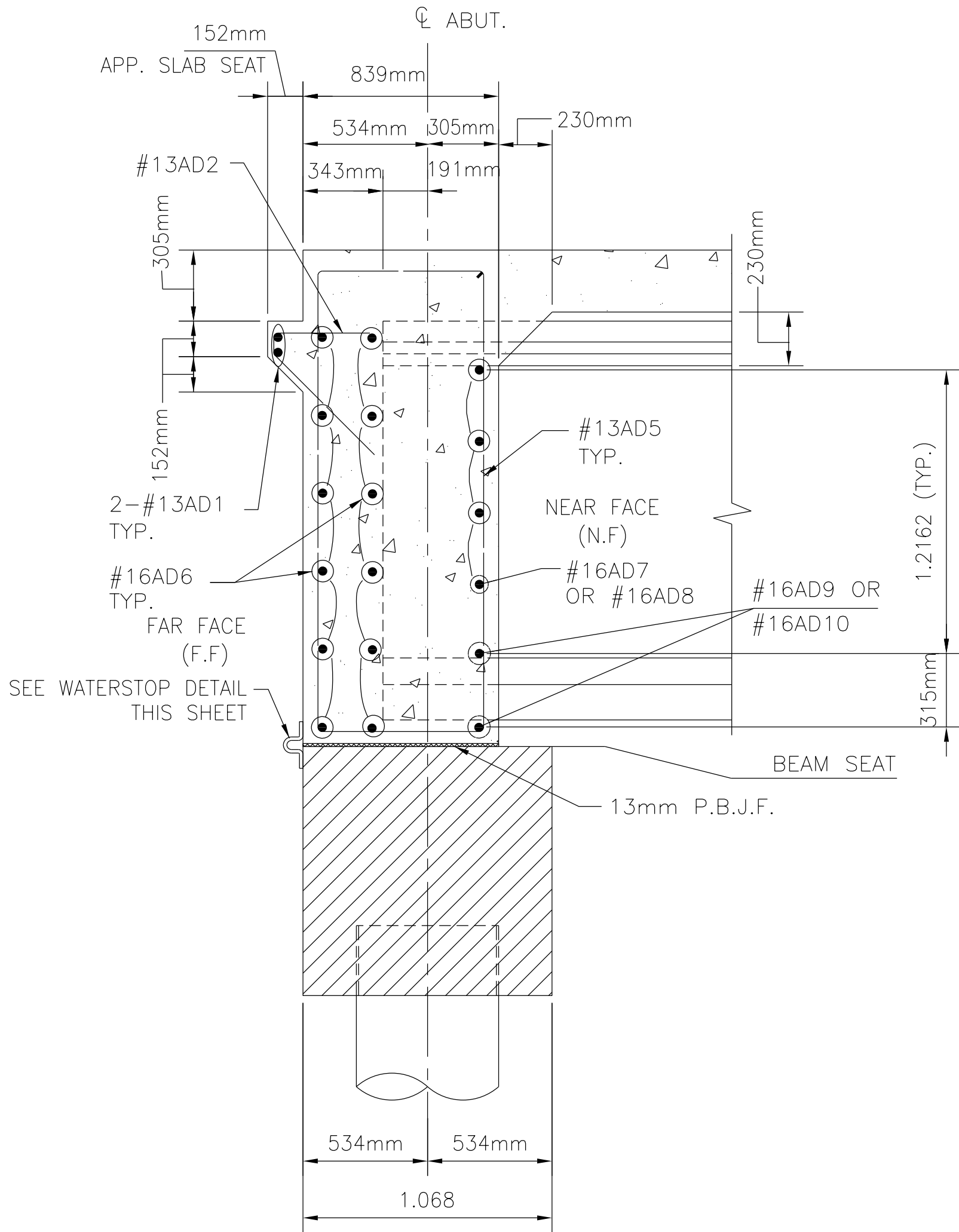
CONTINUOUS RUBBER WATERSTOP SHALL BE 533mm WIDE x 6mm THICK AND LONG ENOUGH TO PROVIDE A CONTINUOUS SEAL ACROSS THE ABUTMENT, AND SHALL CONFORM TO THE SUPPLEMENTAL SPECIFICATION 712.06.

THE RUBBER WATERSTOP SHALL BE SECURED WITH CONTINUOUS STEEL PLATES 102mm WIDE x 10mm THICK CONFORMING TO AASHTO M270M, GRADE 250 AT ONE(1) AT TOP AND ONE(1) AT BOTTOM AS SHOWN.

CONTINUOUS STEEL PLATES SECURING RUBBER WATERSTOP SHALL BE BOLTED TO THE CONCRETE WITH 13mm DIA., ASTM A307, GRADE A EXPANSION BOLTS AT 381mm c/c. EMBED THE BOLTS INTO PREDRILLED HOLES OF A MINIMUM DEPTH OF 152mm. PROVIDE STANDARD GALVANIZED WASHERS FOR ALL BOLTS.

GALVANIZE THE CONTINUOUS STEEL PLATES AND EXPANSION BOLTS IN ACCORDANCE WITH AASHTO M298, CLASS 50 OR AASHTO M232.

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



TYPICAL ABUTMENT DIAPHRAGM
SECTION AT ANCHOR BOLT

SCALE=1:20

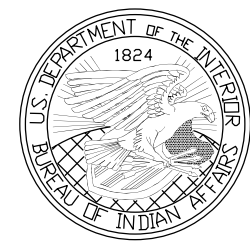
NOTES:

- UNLESS OTHERWISE NOTED ALL REBAR CLEARANCE SHALL BE 50mm.
- *P.B.J.F. : PREFORMED BITUMINOUS JOINT FILLER

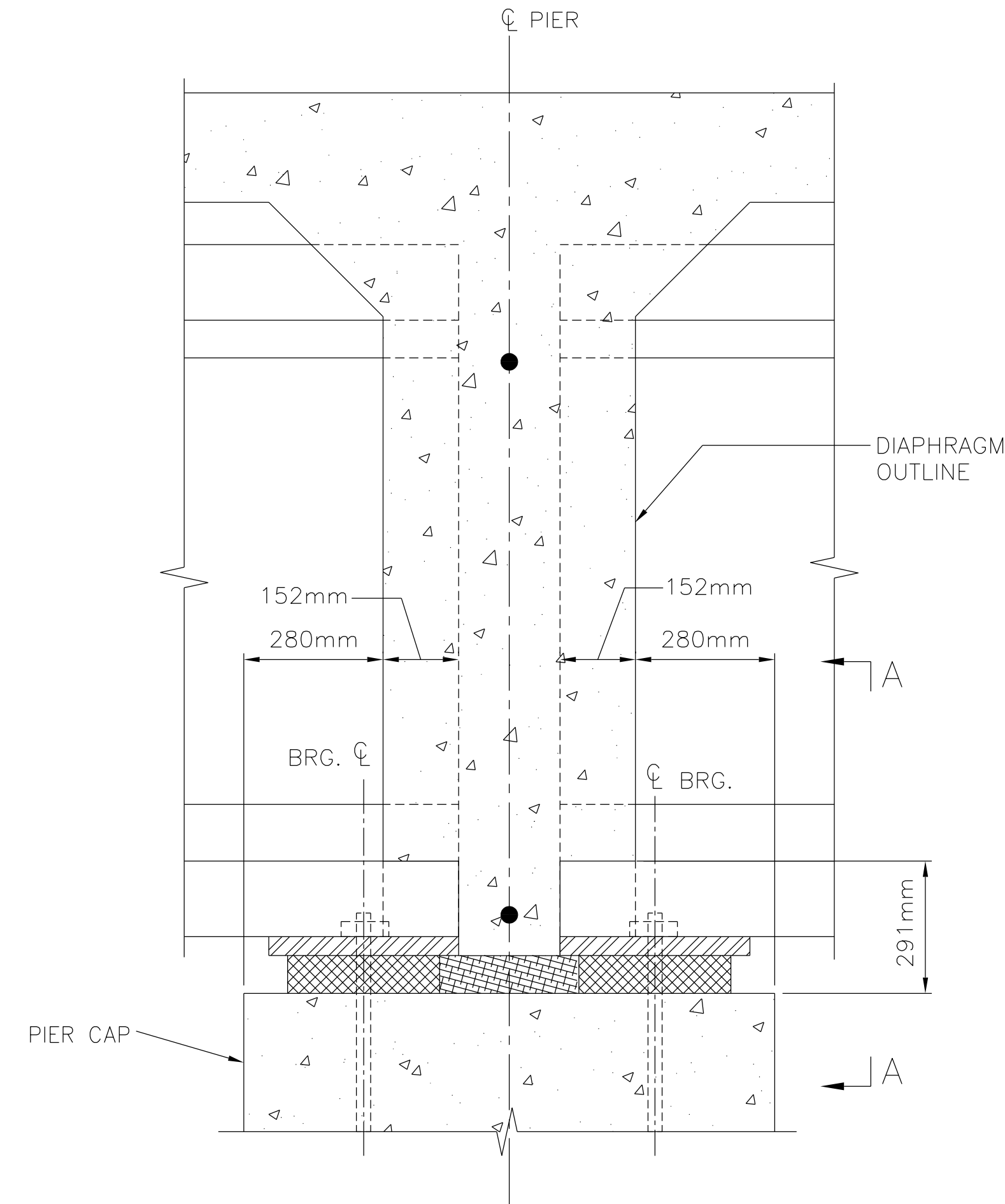
UNITED STATES
DEPARTMENT OF INTERIOR
BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL OFFICE – D.O.T.

ABUTMENT
DIAPHRAGM DETAILS

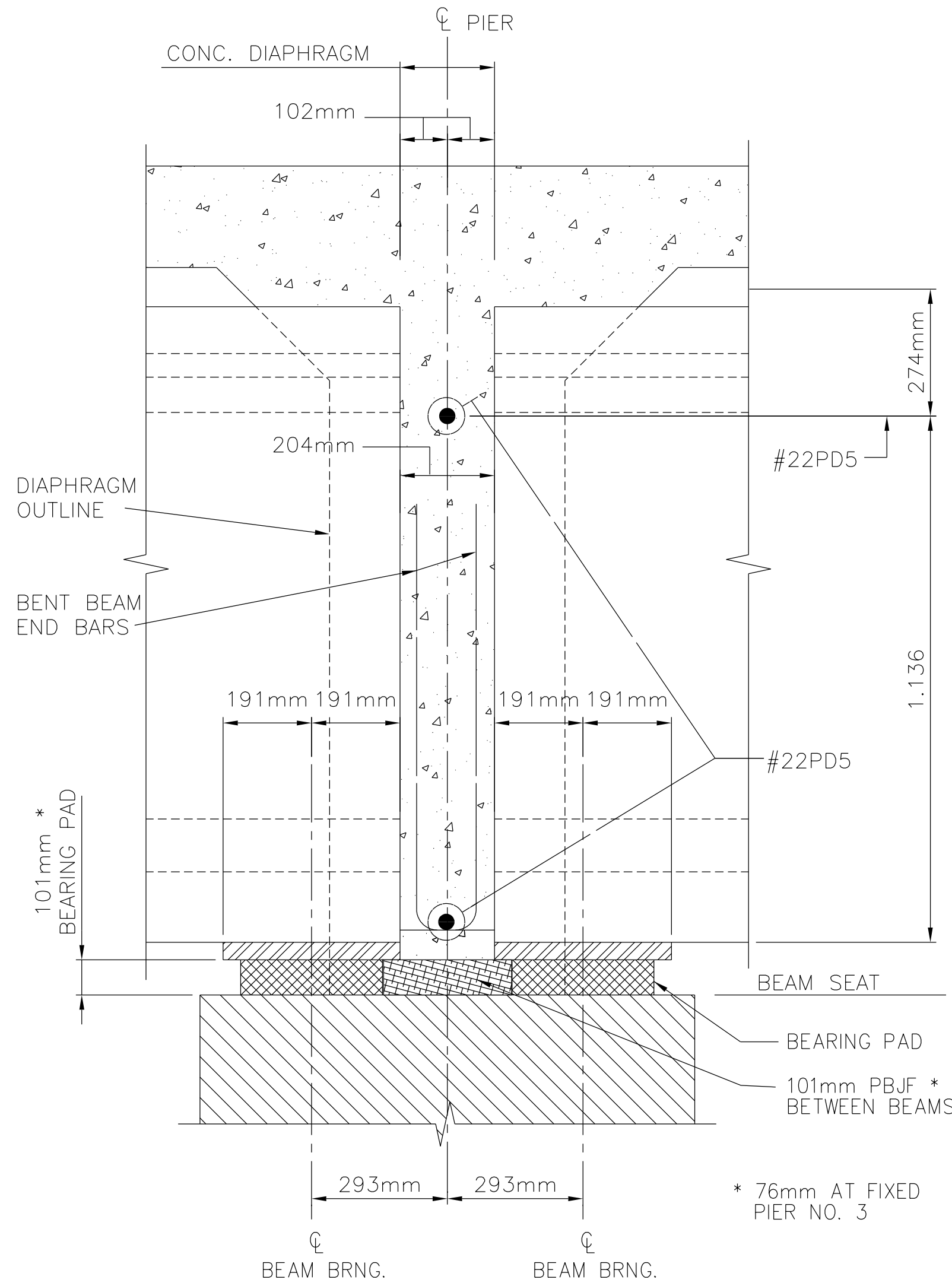
Designed by: CK	
Drawn by: PF, rsh	Date: 3/20/17
Revised by: HRiley	Date: 3/19/2020
File Name:	20_N9402_End_DiaphDet



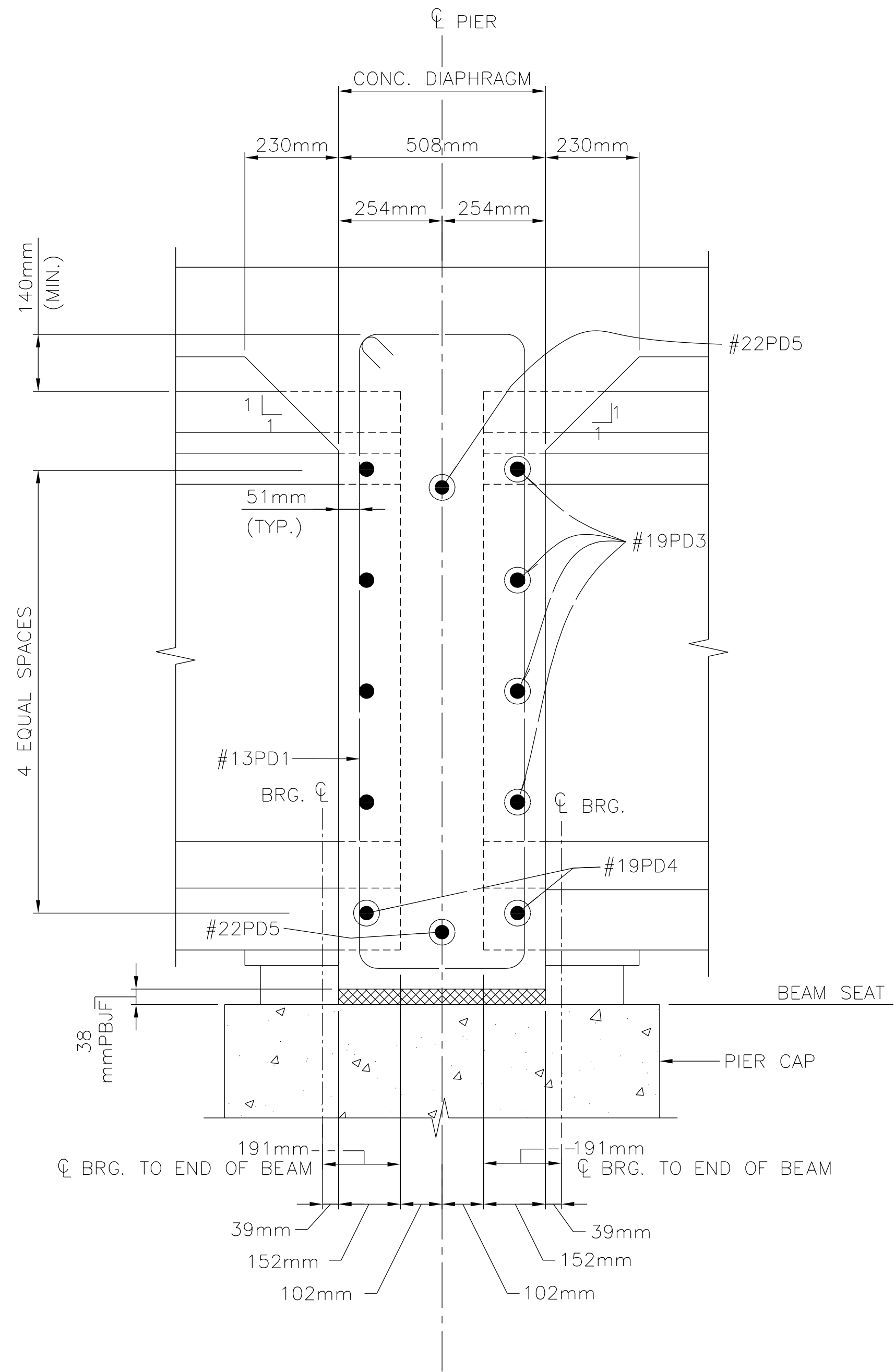
REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET
NAVAJO	AZ	NAVAJO	N9402	N9402(2)1,2&3	20A of 40



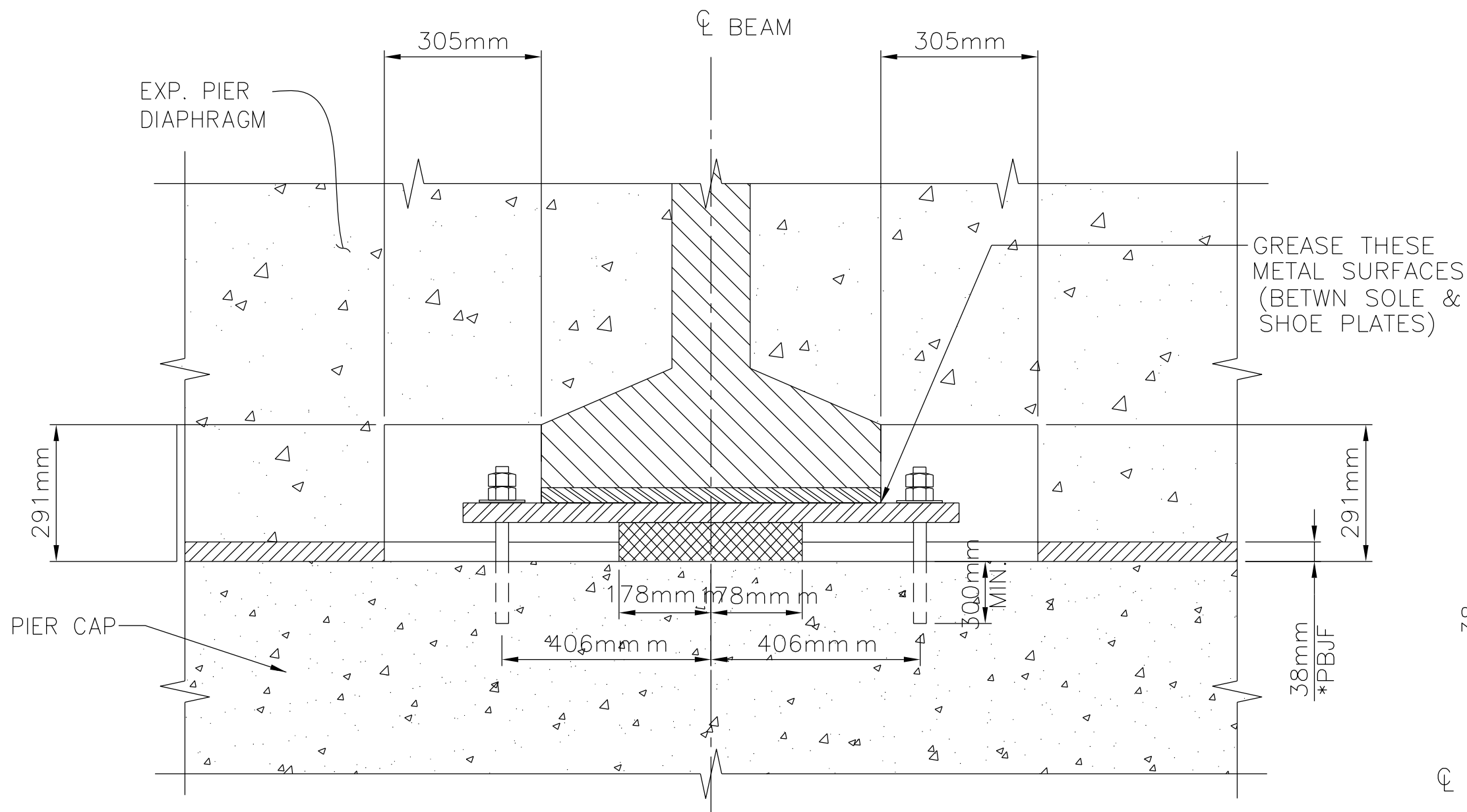
EXPANSION PIER BEARING BLOCKOUT DETAIL "1"
PIERS NO. 1, 2 & 4
SCALE=1:10



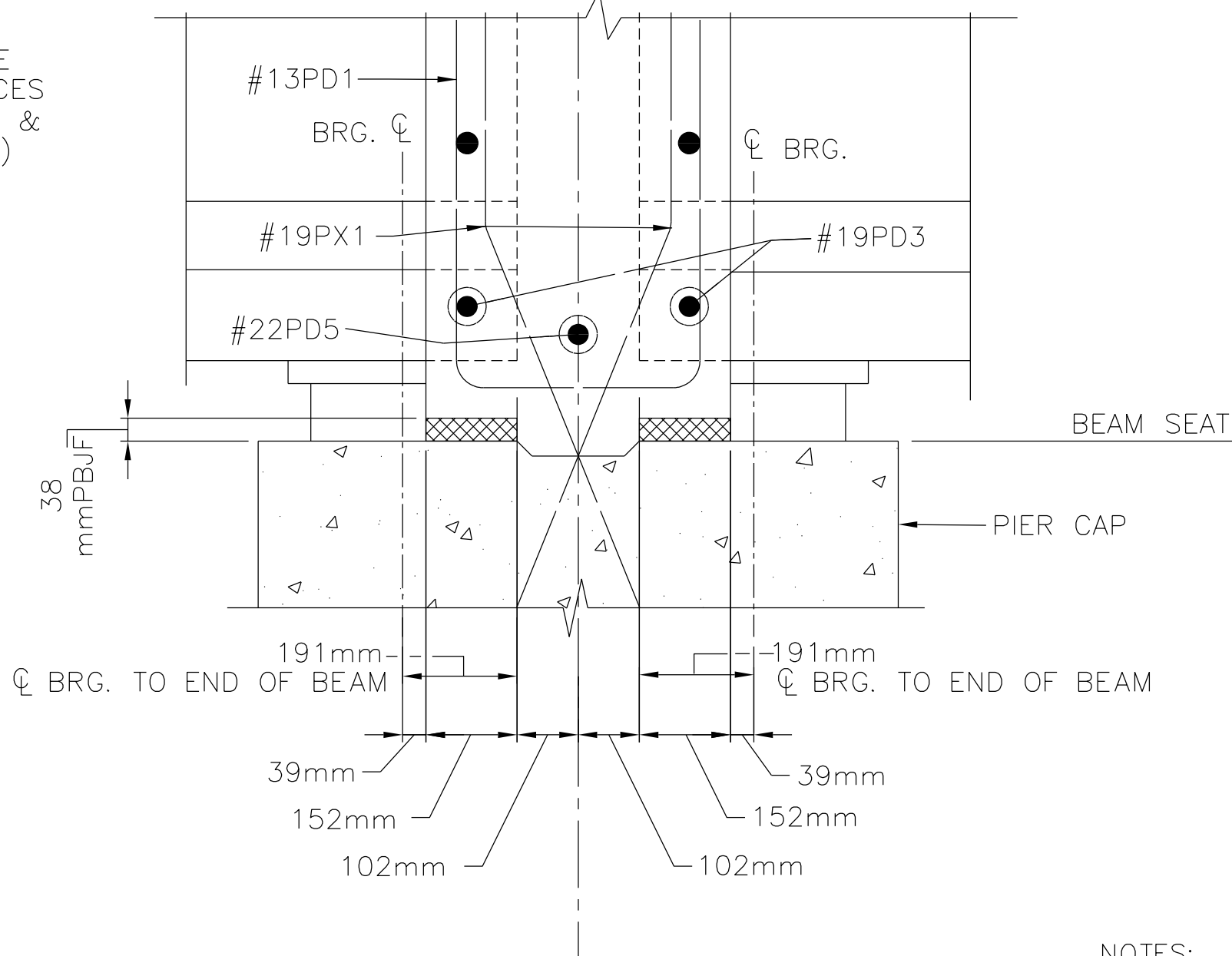
TYPICAL PIER DIAPHRAGM
SECTION AT CL BEAMS
SCALE=1:10



EXPANSION PIER DIAPHRAGM
FULL SECTION BETWEEN BEAMS
SCALE=1:10



TYP. BEARING BLOCKOUT SECTION A-A
PIERS NO. 1, 2 & 4
SCALE=1:10



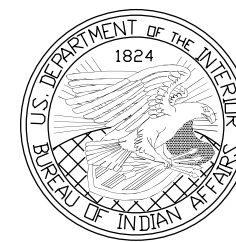
FIXED PIER NO. 3 DIAPHRAGM
PARTIAL SECTION BETWEEN BEAMS
SCALE=1:10

- NOTES:
1. UNLESS OTHERWISE NOTED ALL REBAR CLEARANCE SHALL BE 50mm.
 2. *P.B.J.F. : PREFORMED BITUMINOUS JOINT FILLER

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DEPARTMENT OF INTERIOR
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NAVAJO REGIONAL OFFICE - D.O.T.

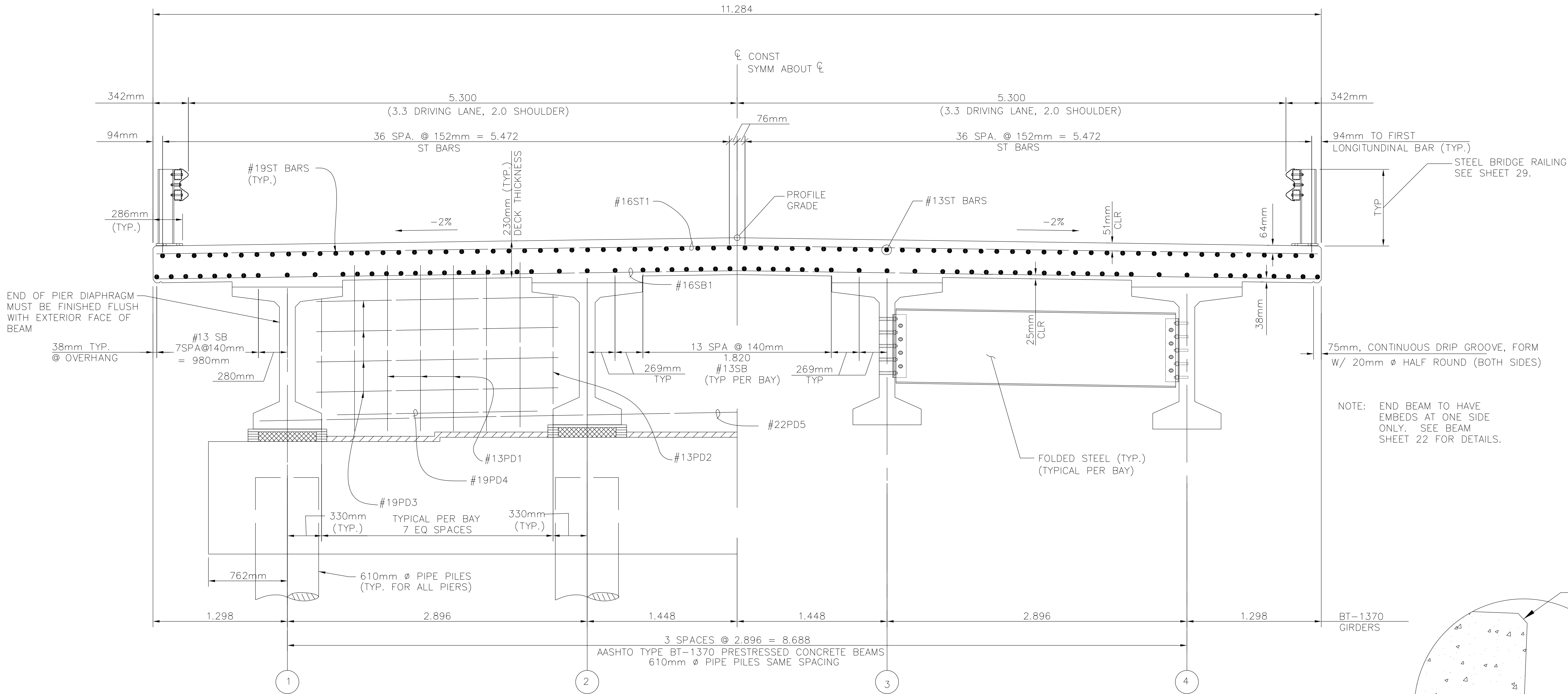
PIER DIAPHRAGM DETAILS

Designed by: CK
Drawn by: PF, rsh Date: 3/20/17
Revised by:HRiley Date: 3/19/2020
File Name: 20A_N9402_End_DiaphDet2



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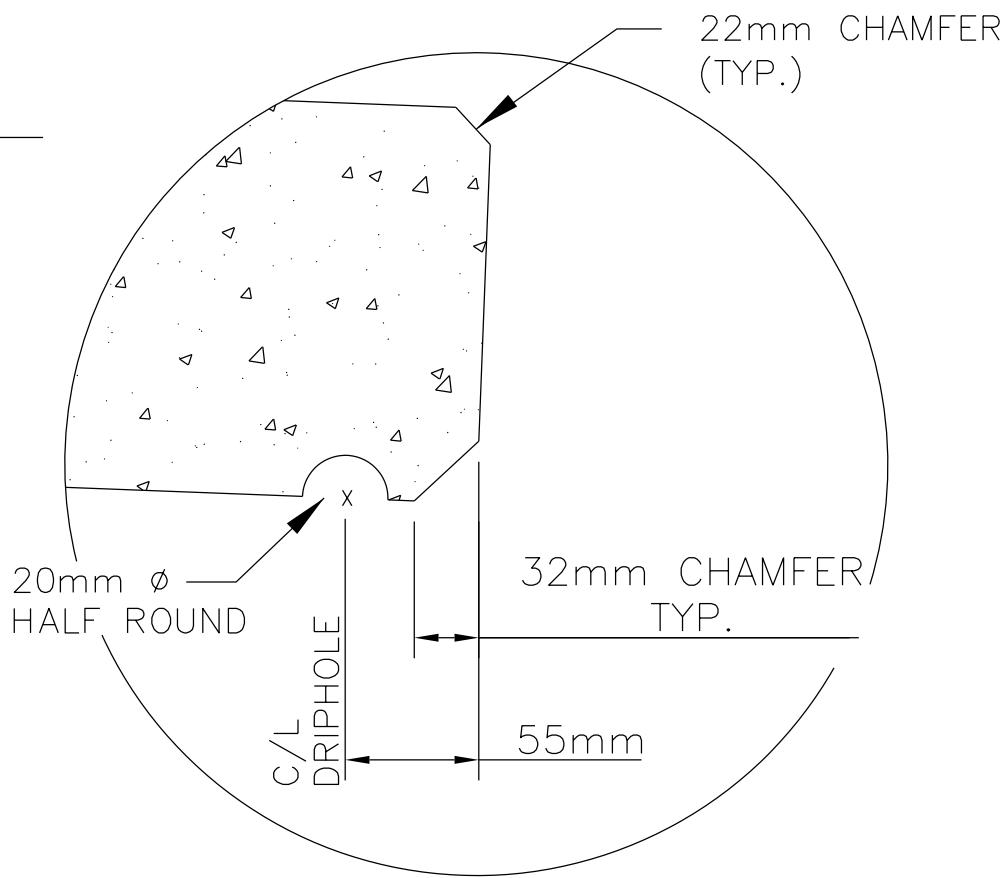
REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET
NAVAJO	AZ	NAVAJO	N9402	N9402(2)1,2&3	21 of 40



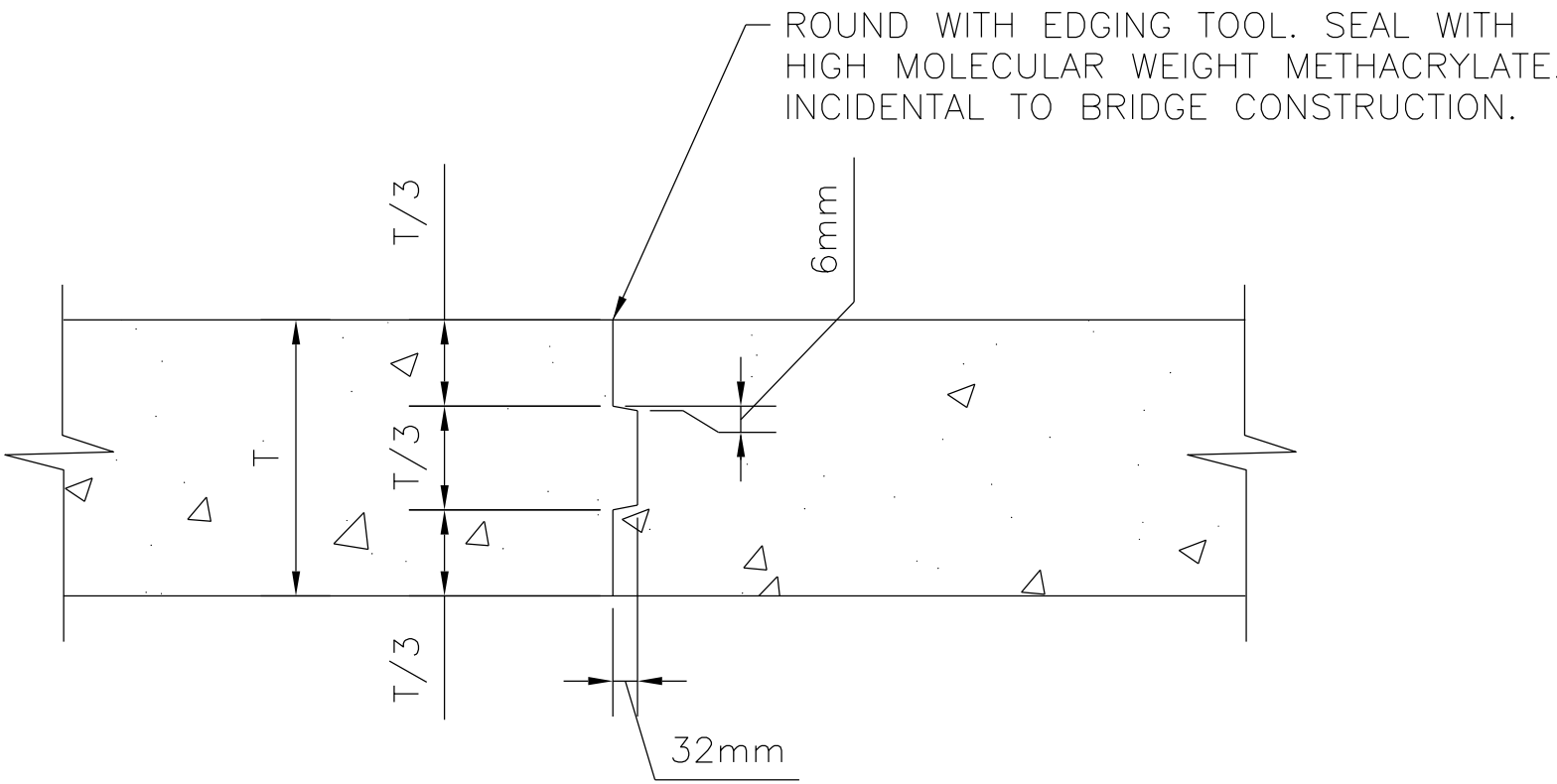
SECTION (LOOKING @ PIER NO. 3)

SECTION (NEAR C OF SPAN)

TRANSVERSE SECTION
SCALE=1:20



D RIP E DGE D E T A I L
SCALE: NTS



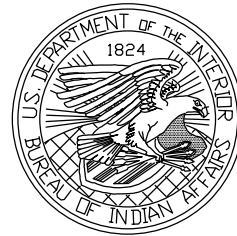
T = DECK THICKNESS

PERMISSIBLE TRANSVERSE
CONSTRUCTION JOINT
SCALE=1:10

UNITED STATES
DEPARTMENT OF INTERIOR
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NAVAJO REGIONAL OFFICE – D.O.T.

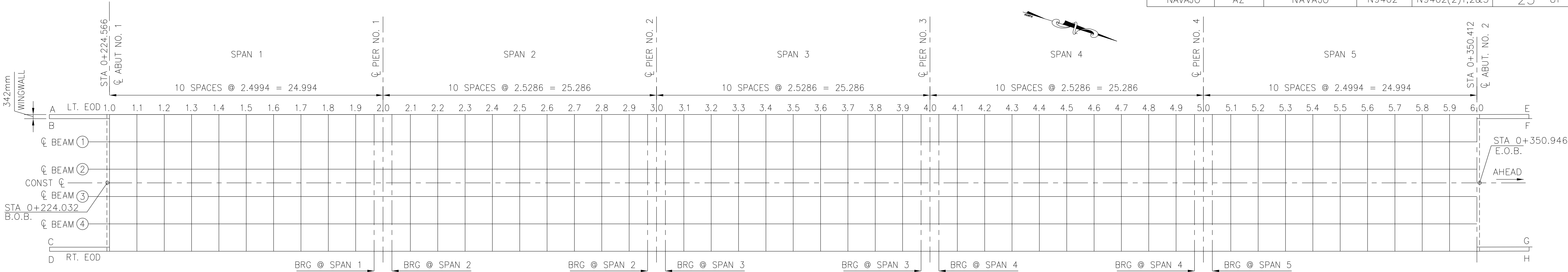
TRANSVERSE SECTION

Designed by: CK	
Drawn by: PF, rsh	Date: 3/20/17
Revised by: HRiley	Date: 3/19/2020
File Name: 21_N9402_TransSect	



C:\Users\Harold Riley\Documents\Projects\N9402\2- done\Microstation\final drawings\23_N9402_DeckElev_2017-03-20.dgn

REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET
NAVAJO	AZ	NAVAJO	N9402	N9402(2)1,2&3	23 of 40



REFERENCE DIAGRAM FOR ELEVATIONS AT 10TH POINTS

DECK ELEVATIONS AT 10TH POINTS

SPAN 1	CL ABUT 1	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	CL PIER 1	Brg at Span 1	Brg at Span 2
Lt. EOD	1863.677	1863.689	1863.701	1863.714	1863.727	1863.740	1863.752	1863.765	1863.778	1863.790	1863.803	1863.801	1863.804
BEAM 1	1863.703	1863.715	1863.727	1863.740	1863.753	1863.766	1863.778	1863.791	1863.804	1863.816	1863.829	1863.827	1863.830
BEAM 2	1863.761	1863.773	1863.785	1863.798	1863.811	1863.824	1863.836	1863.849	1863.862	1863.874	1863.887	1863.885	1863.888
CL CONST	1863.789	1863.802	1863.814	1863.827	1863.840	1863.853	1863.865	1863.878	1863.891	1863.903	1863.916	1863.914	1863.917
BEAM 3	1863.761	1863.773	1863.785	1863.798	1863.811	1863.824	1863.836	1863.849	1863.862	1863.874	1863.887	1863.885	1863.888
BEAM 4	1863.703	1863.715	1863.727	1863.740	1863.753	1863.766	1863.778	1863.791	1863.804	1863.816	1863.829	1863.827	1863.830
Rt. EOD	1863.677	1863.689	1863.701	1863.714	1863.727	1863.740	1863.752	1863.765	1863.778	1863.790	1863.803	1863.801	1863.804

SPAN 2	CL PIER 1	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	CL PIER 2	Brg at Span 2	Brg at Span 3
Lt. EOD	1863.803	1863.816	1863.828	1863.841	1863.854	1863.867	1863.879	1863.892	1863.905	1863.917	1863.930	1863.929	1863.932
BEAM 1	1863.829	1863.842	1863.854	1863.867	1863.880	1863.893	1863.905	1863.918	1863.931	1863.943	1863.956	1863.955	1863.958
BEAM 2	1863.887	1863.900	1863.912	1863.925	1863.938	1863.951	1863.963	1863.976	1863.989	1864.001	1864.014	1864.013	1864.016
CL CONST	1863.916	1863.929	1863.941	1863.954	1863.967	1863.980	1863.992	1864.005	1864.018	1864.030	1864.043	1864.042	1864.045
BEAM 3	1863.887	1863.900	1863.912	1863.925	1863.938	1863.951	1863.963	1863.976	1863.989	1864.001	1864.014	1864.013	1864.016
BEAM 4	1863.829	1863.842	1863.854	1863.867	1863.880	1863.893	1863.905	1863.918	1863.931	1863.943	1863.956	1863.955	1863.958
Rt. EOD	1863.803	1863.816	1863.828	1863.841	1863.854	1863.867	1863.879	1863.892	1863.905	1863.917	1863.930	1863.929	1863.932

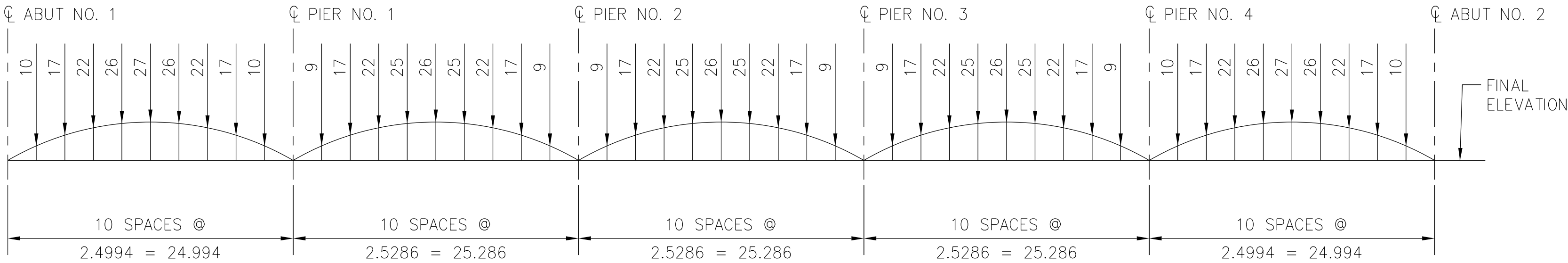
SPAN 3	CL PIER 2	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	CL PIER 3	Brg at Span 3	Brg at Span 4
Lt. EOD	1863.930	1863.943	1863.956	1863.968	1863.981	1863.994	1864.007	1864.020	1864.032	1864.045	1864.058	1864.057	1864.060
BEAM 1	1863.956	1863.969	1863.982	1863.994	1864.007	1864.020	1864.033	1864.046	1864.058	1864.071	1864.084	1864.083	1864.086
BEAM 2	1864.014	1864.027	1864.040	1864.052	1864.065	1864.078	1864.091	1864.104	1864.116	1864.129	1864.142	1864.141	1864.144
CL CONST	1864.043	1864.056	1864.069	1864.081	1864.094	1864.107	1864.120	1864.133	1864.145	1864.158	1864.171	1864.170	1864.173
BEAM 3	1864.014	1864.027	1864.040	1864.052	1864.065	1864.078	1864.091	1864.104	1864.116	1864.129	1864.142	1864.141	1864.144
BEAM 4	1863.956	1863.969	1863.982	1863.994	1864.007	1864.020	1864.033	1864.046	1864.058	1864.071	1864.084	1864.083	1864.086
Rt. EOD	1863.930	1863.943	1863.956	1863.968	1863.981	1863.994	1864.007	1864.020	1864.032	1864.045	1864.058	1864.057	1864.060

SPAN 4	CL PIER 3	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	CL PIER 4	Brg at Span 4	Brg at Span 5
Lt. EOD	1864.058	1864.071	1864.084	1864.096	1864.109	1864.122	1864.135	1864.148	1864.160	1864.173	1864.186	1864.184	1864.187
BEAM 1	1864.084	1864.097	1864.110	1864.122	1864.135	1864.148	1864.161	1864.174	1864.186	1864.199	1864.212	1864.210	1864.213
BEAM 2	1864.142	1864.155	1864.168	1864.180	1864.193	1864.206	1864.219	1864.232	1864.244	1864.257	1864.270	1864.268	1864.271
CL CONST	1864.171	1864.184	1864.197	1864.209	1864.222	1864.235	1864.248	1864.261	1864.273	1864.286	1864.299	1864.297	1864.300
BEAM 3	1864.142	1864.155	1864.168	1864.180	1864.193	1864.206	1864.219	1864.232	1864.244	1864.257	1864.270	1864.268	1864.271
BEAM 4	1864.084	1864.097	1864.110	1864.122	1864.135	1864.148	1864.161	1864.174	1864.186	1864.199	1864.212	1864.210	1864.213
Rt. EOD	1864.058	1864.071	1864.084	1864.096	1864.109	1864.122	1864.135	1864.148	1864.160	1864.173	1864.186	1864.184	1864.187

SPAN 5	CL PIER 4	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	CL ABUT 2
Lt. EOD	1864.186	1864.199	1864.211	1864.224	1864.236	1864.249	1864.262	1864.274	1864.287	1864.299	1864.312
BEAM 1	1864.212	1864.225	1864.237	1864.250	1864.262	1864.275	1864.288	1864.300	1864.313	1864.325	1864.338
BEAM 2	1864.270	1864.283	1864.295	1864.308	1864.320	1864.333	1864.346	1864.358	1864.371	1864.383	1864.396
CL CONST	1864.299	1864.312	1864.324	1864.337	1864.349	1864.362	1864.375	1864.387	1864.400	1864.412	1864.425
BEAM 3	1864.270	1864.283	1864.295	1864.308	1864.320	1864.333	1864.346	1864.358	1864.371	1864.383	1864.396
BEAM 4	1864.212	1864.225	1864.237	1864.250	1864.262	1864.275	1864.288	1864.300	1864.313	1864.325	1864.338
Rt. EOD	1864.186	1864.199	1864.211	1864.224	1864.236	1864.249	1864.262	1864.274	1864.287	1864.299	1864.312

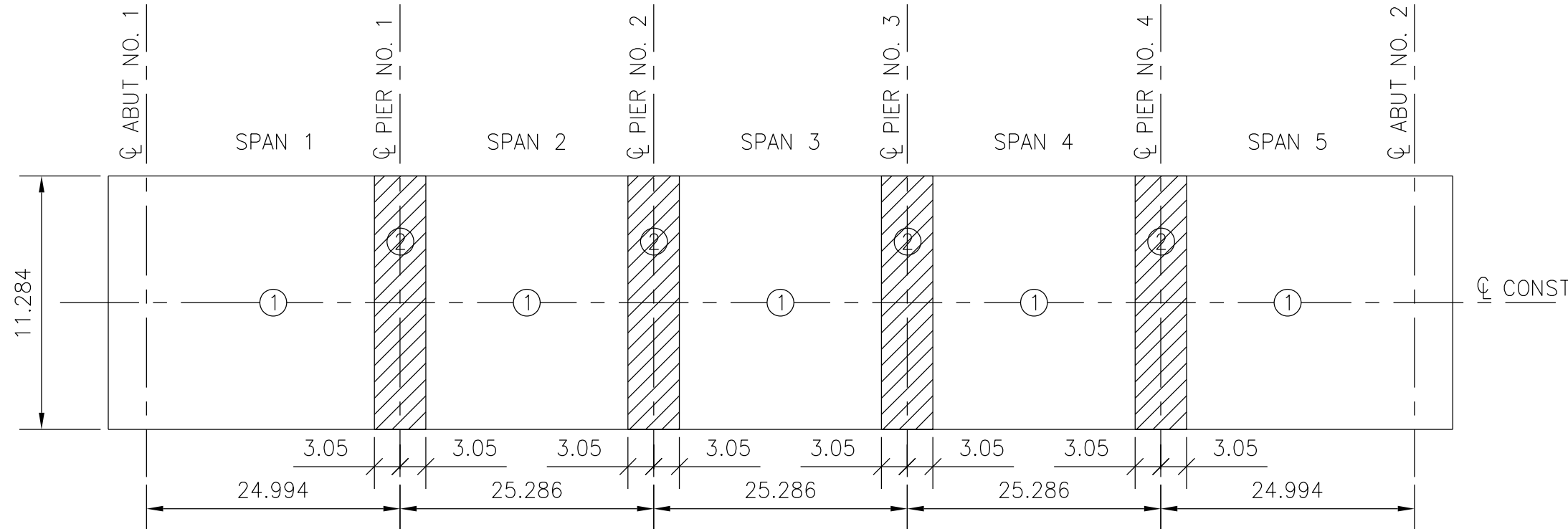
EOD = Edge of Deck

TOP OF WING WALL ELEVATIONS			
	STA	OFFSET	ELEVATION
A	0+220.147	5.642 LT.	1863.654
B	0+220.147	5.3 LT.	1863.661
C	0+220.147	5.3 RT.	1863.661
D	0+220.147	5.642 RT.	1863.654
E	0+354.831	5.642 LT.	1864.334
F	0+354.831	5.3 LT.	1864.341
G	0+354.831	5.3 RT.	1864.341
H	0+354.831	5.642 RT.	1864.334



DEAD LOAD DEFLECTION DIAGRAM

TO COMPENSATE FOR DEAD LOAD DEFLECTION DUE TO WEIGHT OF SLAB AND COMPOSITE DEAD LOAD, SET SCREEDS ABOVE FINISHED GRADES BY DIMENSIONS (mm) SHOWN ABOVE.



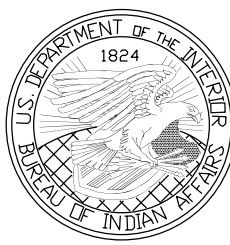
CONCRETE DECK PLACEMENT DETAIL

NOTE: CONCRETE SHALL BE PLACED THE FULL WIDTH OF THE DECK SLAB IN THE SEQUENCE SHOWN ABOVE AT A FORWARD RATE OF PROGRESS OF NOT LESS THAN 9.15m PER HOUR. PLACEMENT ① MAY BE MADE ON THE SAME OR SEPARATE DAYS AND PLACEMENT ② MAY BE MADE ON THE SAME OR SEPARATE DAYS. PLACEMENT ② SHALL NOT BE MADE UNTIL THE CONCRETE IN ADJACENT PLACEMENT ① AREAS HAS BEEN IN PLACE AT LEAST 48 HOURS. SET RETARDANT SHALL NOT BE USED IF THE ATMOSPHERIC TEMPERATURE AT THE TIME OF PLACEMENT IS LESS THAN 16° C.

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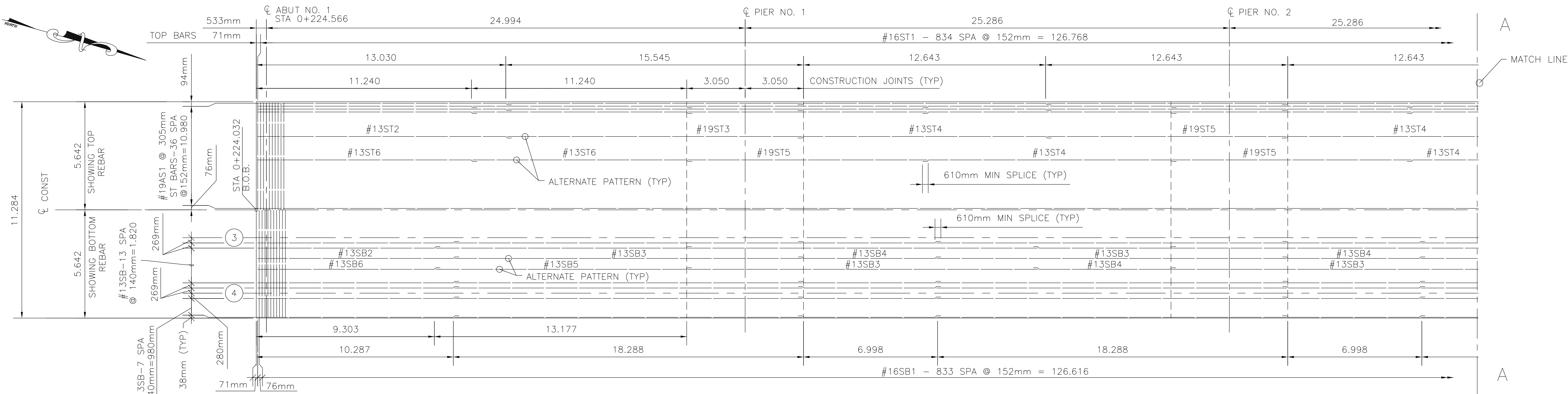
DECK ELEVATIONS

Designed by: CK
Drawn by: PF, rsh Date: 3/20/17
Revised by: HRiley Date: 3/19/2020
File Name: 23_N9402_DeckElev



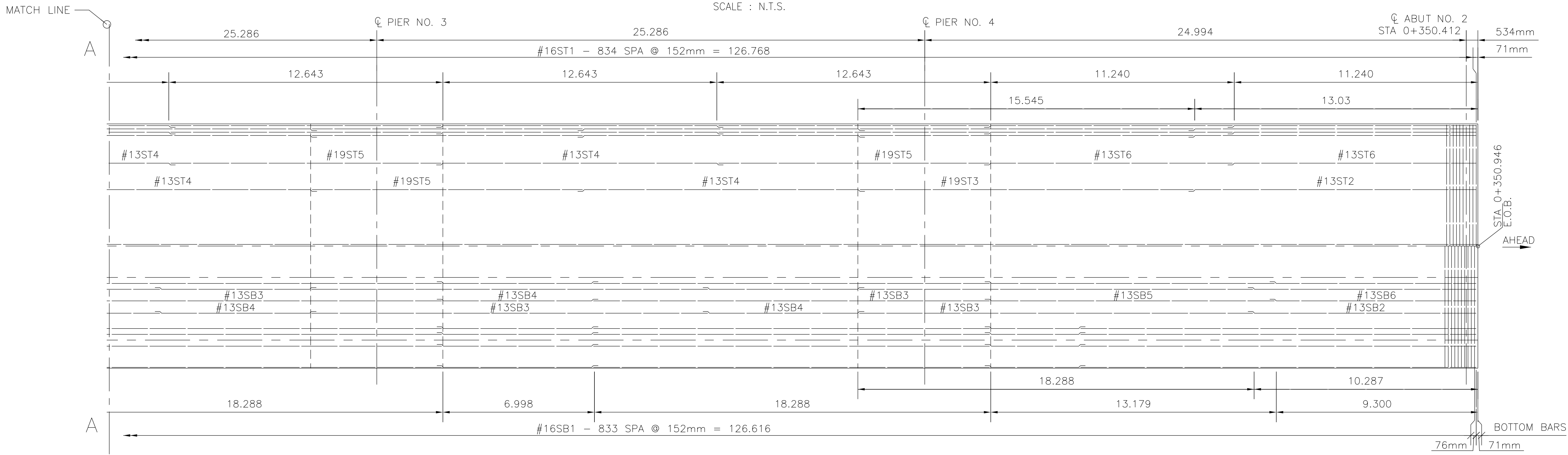
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REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET
NAVAJO	AZ	NAVAJO	N9402	N9402(2)1,2&3	24 of 40



DECK SLAB REINFORCING PLAN

SCALE : N.T.S.



TOP RE-BAR	#13ST2	#19ST3	#13ST4	#19ST5	#13ST4	#19ST5	#13ST4	#19ST5	#13ST6	#13ST6
ALTERNATING PATTERN (PAIRED)	13.7	15.6	13.9	12.7	13.9	12.7	13.9	12.7	11.9	11.9
BOTTOM RE-BAR	#13SB2	#13SB3	#13SB4	#13SB3	#13SB4	#13SB3	#13SB4	#13SB3	#13SB5	#13SB6
ALTERNATING PATTERN (PAIRED)	10.9	18.3	8.3	18.3	8.3	18.3	8.3	18.3	13.8	10.0
	#13SB6	#13SB5	#13SB3	#13SB4	#13SB3	#13SB4	#13SB3	#13SB4	#13SB3	#13SB2
	10.0	13.8	18.3	8.3	18.3	8.3	18.3	8.3	18.3	10.9

LONGITUDINAL REBAR PARTIAL SPLICING PLAN

SCALE N.T.S.
(ALTERNATE RUNS TO STAGGER SPLICES)

UNITED STATES
DEPARTMENT OF INTERIOR
BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL OFFICE - D.O.T.

DECK SLAB
REINFORCING PLAN

Designed by: CK
Drawn by: PF, rsh Date: 3/27/17
Revised by: Date:
File Name: 24_N9402_DeckPlan



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SUPERSTRUCTURE

REINFORCING BAR SCHEDULE

	MARK	SIZE	TYPE	NO. REQD	LENGTH	a	b	c	d	REMARK
DECK	#16ST1	16	1	835	11.182					EPOXY COATED
	#13ST2	13	1	74	13.700					EPOXY COATED
	#19ST3	19	1	74	15.600					EPOXY COATED
	#13ST4	13	1	222	13.900					EPOXY COATED
	#19ST5	19	1	222	12.700					EPOXY COATED
	#13ST6	13	1	148	11.900					EPOXY COATED
	#16SB1	16	1	834	11.182					EPOXY COATED
	#13SB2	13	1	68	10.900					EPOXY COATED
	#13SB3	13	1	272	18.300					EPOXY COATED
	#13SB4	13	1	204	8.300					EPOXY COATED
	#13SB5	13	1	68	13.800					EPOXY COATED
	#13SB6	13	1	68	10.000					EPOXY COATED
	#19AS1	19	1	74	1.220					EPOXY COATED

ABUT. NO. 1 DIAPH. AND ABUT. NO. 2 DIAPH	#13AD1	13	1	4	11.182					
	#13AD2	13	4	66	1.050	395mm	50mm	556mm		
	#13AD3	13	3	16	4.046	227mm	1.716	80mm		EPOXY COATED
	#13AD4	13	3	16	3.880	723mm	1.137	80mm		EPOXY COATED
	#13AD5	13	3	34	5.038	723mm	1.716	80mm		EPOXY COATED
	#16AD6	16	1	24	11.182					
	#16AD7	16	1	24	2.640					
	#16AD8	16	1	16	1.120					
	#16AD9	16	1	12	1.140					
	#16AD10	16	1	8	360mm					
	#25AW1	25	5	20	1.830	1.220	305mm			

APP SLAB @ ABUT. NO. 1 & ABUT NO. 2	#13AST1	13	1	56	10.500					EPOXY COATED
	#13AST2	13	1	72	4.100					EPOXY COATED
	#29ASB1	29	1	142	4.165					EPOXY COATED
	#16ASB2	16	1	30	10.500					EPOXY COATED
	#13ASF1	13	1	16	10.460					EPOXY COATED
	#13ASF2	13	1	8	10.460					EPOXY COATED
	#13ASF3	13	2	72	2.438	1.117	204mm			EPOXY COATED
	#13ASF4	13	2	72	916mm	508mm	204mm			EPOXY COATED

PIER

	MARK	SIZE	TYPE	NO. REQD	LENGTH	a	b	c	d	REMARKS
CAP (TOTAL OF 4 PIERS)	#29PH1	29	1	16	10.110					
	#25PH2	25	1	16	10.110					
	#13PH3	13	1	24	10.110					
	#13PH4	13	1	16	5.690					
	#13PV1	13	3	204	3.968	952mm	952mm	80mm		
	#13PV2	13	2	108	1.562	305mm	952mm			
	#29PV3	29	8	64	2.65	650mm	2.0			

DIAPHRAGM (TOTAL OF 4 PIERS)	#13PD1	13	3	72	4.086	406mm	1.557	80mm		EPOXY COATED
	#13PD2	13	3	24	3.016	406mm	1.022	80mm		
	#19PD3	19	1	102	2.390					*
	#19PD4	19	1	18	1.550					**
	#22PD5	22	1	8	8.688					
	#19PX1	19	6	36	1.408	400mm	608mm			PAIRED, PIER 3 ONLY

* USE IN PLACE OF #19PD4 AT PIER NO. 3

** = PIER NO. 1, 2 & 4 ONLY

SUBSTRUCTURE

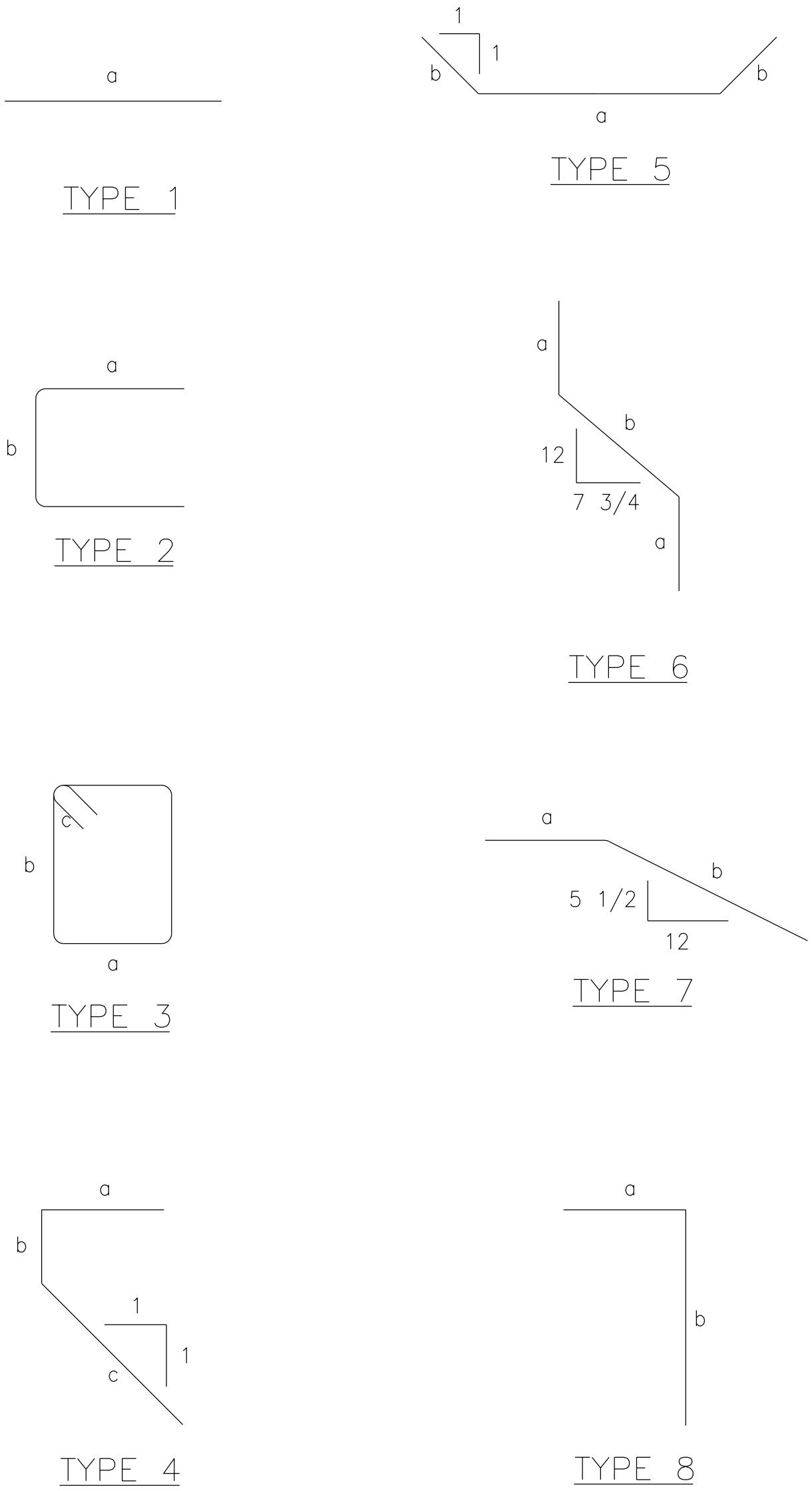
	MARK	SIZE	TYPE	NO. REQD	LENGTH	a	b	c	d	REMARKS
ABUT NO. 1 CAP AND ABUT NO. 2 CAP	#16AC1	16	3	112	4.012	968mm	942mm	96mm		
	#13AC2	13	2	36	1.578	305mm	968mm			
	#32AC3	32	1	12	10.470					
	#16AC4	16	1	12	10.470					
	#13AC5	13	1	8	5.690					
	#29AC6	29	1	8	10.470					
	#29AC7	29	8	24	2.65	650mm	2.0			

WING WALL @ ABUT. NO. 1 AND ABUT. NO. 2	#13WV1 thru	13	1	8	508mm					INCREASE BY EQUAL INCREMENTS OF 140mm
	#13WV14	13	1	8	2.325					
	#13WV15	13	1	16	2.325					
	#13WH1	13	7	8	5.260	1.017	4.243			
	#25WH2 thru	25	1	8	1.524					INCREASE BY EQUAL INCREMENTS OF 586mm
	#25WH7	25	1	8	4.454					
	#25WH8	25	1	16	4.851					

NOTE: TABLES INCLUDE QUANTITIES FOR BOTH ABUTMENTS, APPROACH SLABS AND WINGWALLS, AND FOR ALL PIERS AND DIAPHRAGMS.

REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET
NAVAJO	AZ	NAVAJO	N9402	N9402(2)1,2&3	26 of 40

BENDING DIAGRAMS
ALL DIMENSIONS ARE ϕ TO ϕ



AASHTO MINIMUM DIAMETERS OF BEND

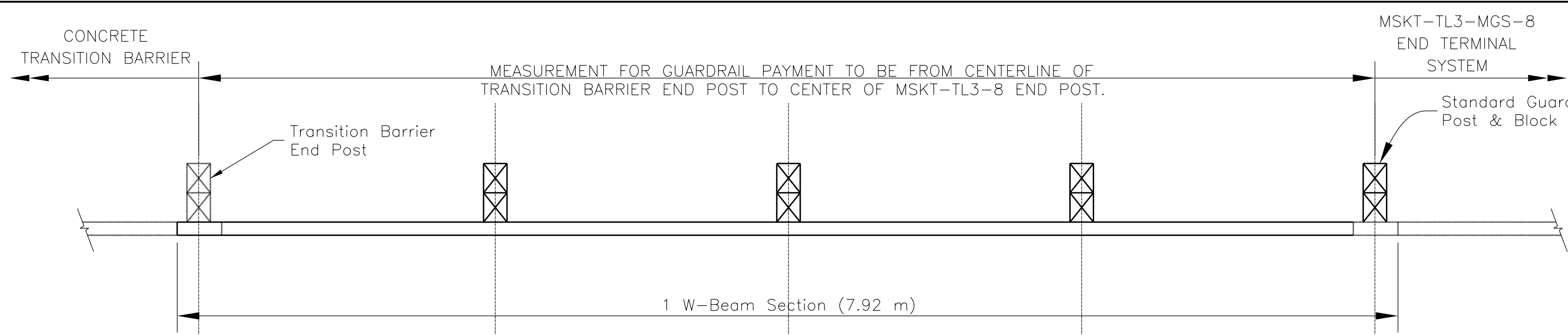
BAR SIZE	MINIMUM DIAMETER
NOS. 10 THROUGH 25	6-BAR DIAMETERS
NOS. 29, 32, AND 36	8-BAR DIAMETERS
NOS. 43 AND 57	10-BAR DIAMETERS

UNITED STATES
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NAVAJO REGIONAL OFFICE – D.O.T.

REINFORCING SCHEDULE

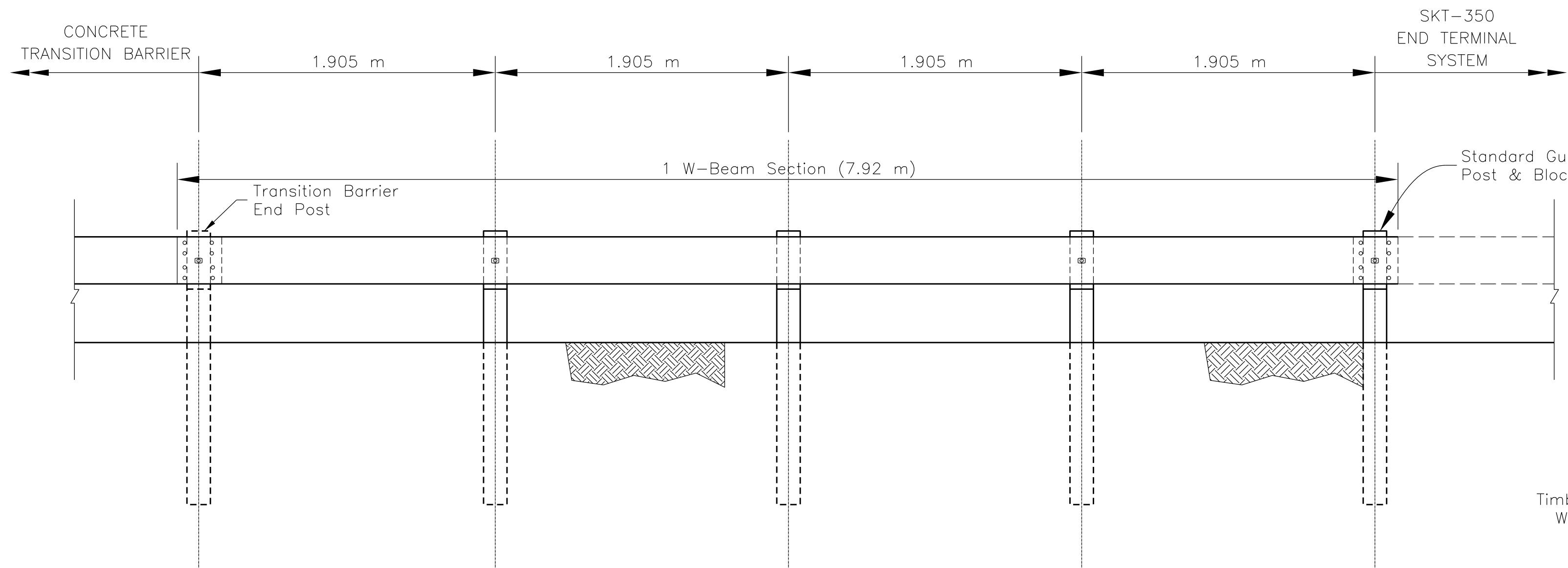
Designed by: CK	
Drawn by: PF, rsh	Date: 3/27/17
Revised by: HRiley	Date: 3/19/2020
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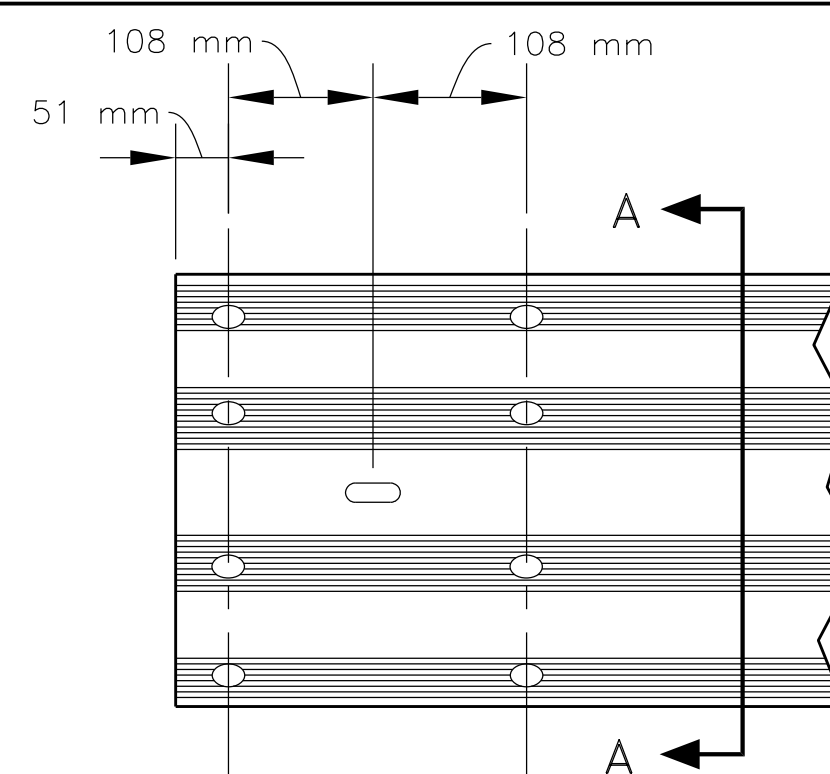


PLAN

TRAFFIC DIRECTION



ELEVATION

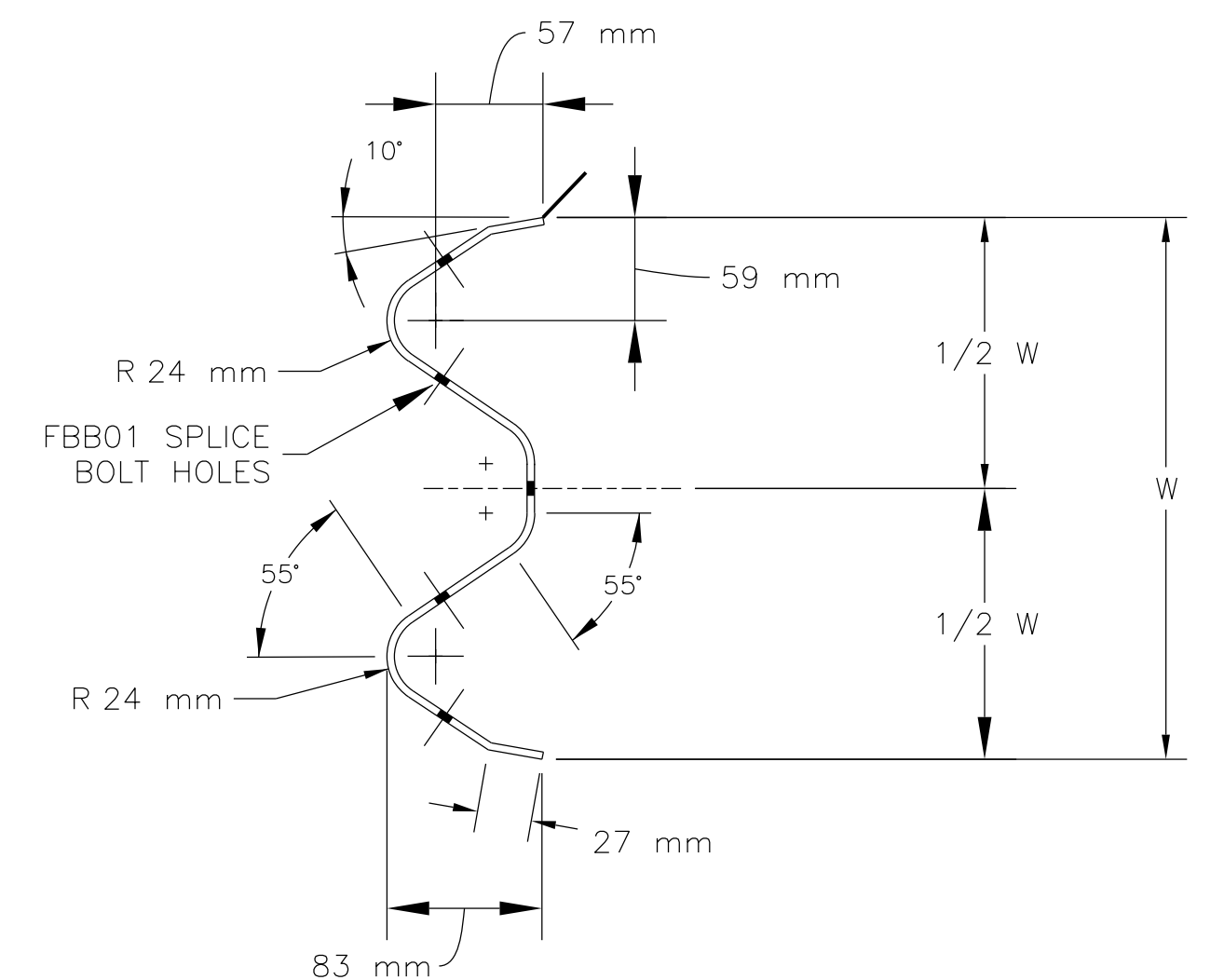


ELEVATION
RAIL

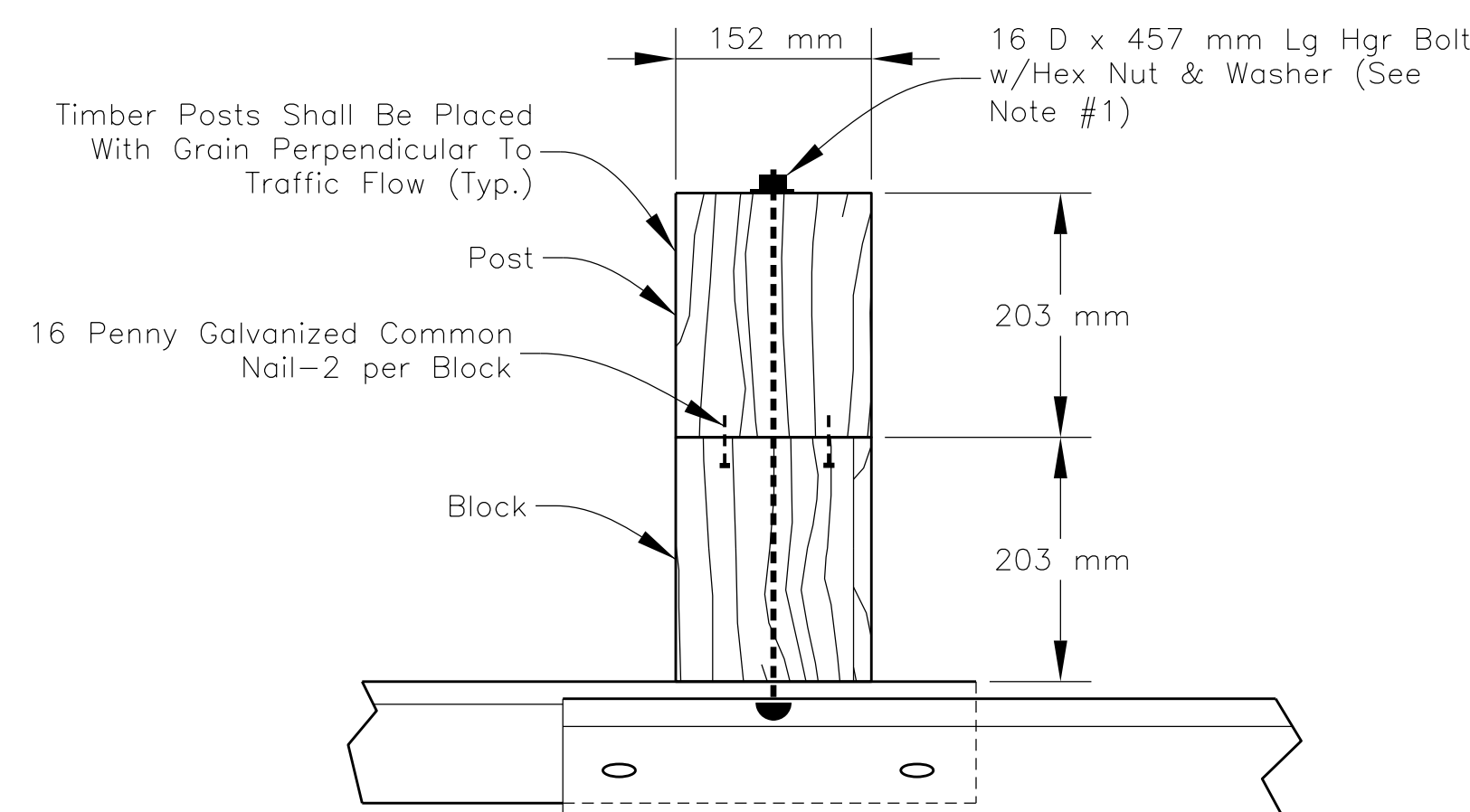
DESIGNATOR

DESIGNATOR	COMPONENT	NUMBER
FBBO1	Splice Bolt and Nut	2
FBBO2	Guardrail-Post Bolt and Nut	2
FBBO3	Guardrail-Post Bolt and Nut	2
FBBO4	Guardrail-Post Bolt and Nut	2
FBX16a	Post Blockout Bolt (40 mm)	4
FWC16a	Round Washer	2
PDB01a	Timber Post Blockout	2
PDB01b	Timber Post Blockout	2
PDE02	Timber Post	2
PDE13	Timber Post	2
PWB01	Steel Post Blockout	2
PWE01	Steel Post	2
PWE02	Steel Post	2
RWB01a	W-Beam Backup Plate	1
RWM02a	W-Beam Rail	1

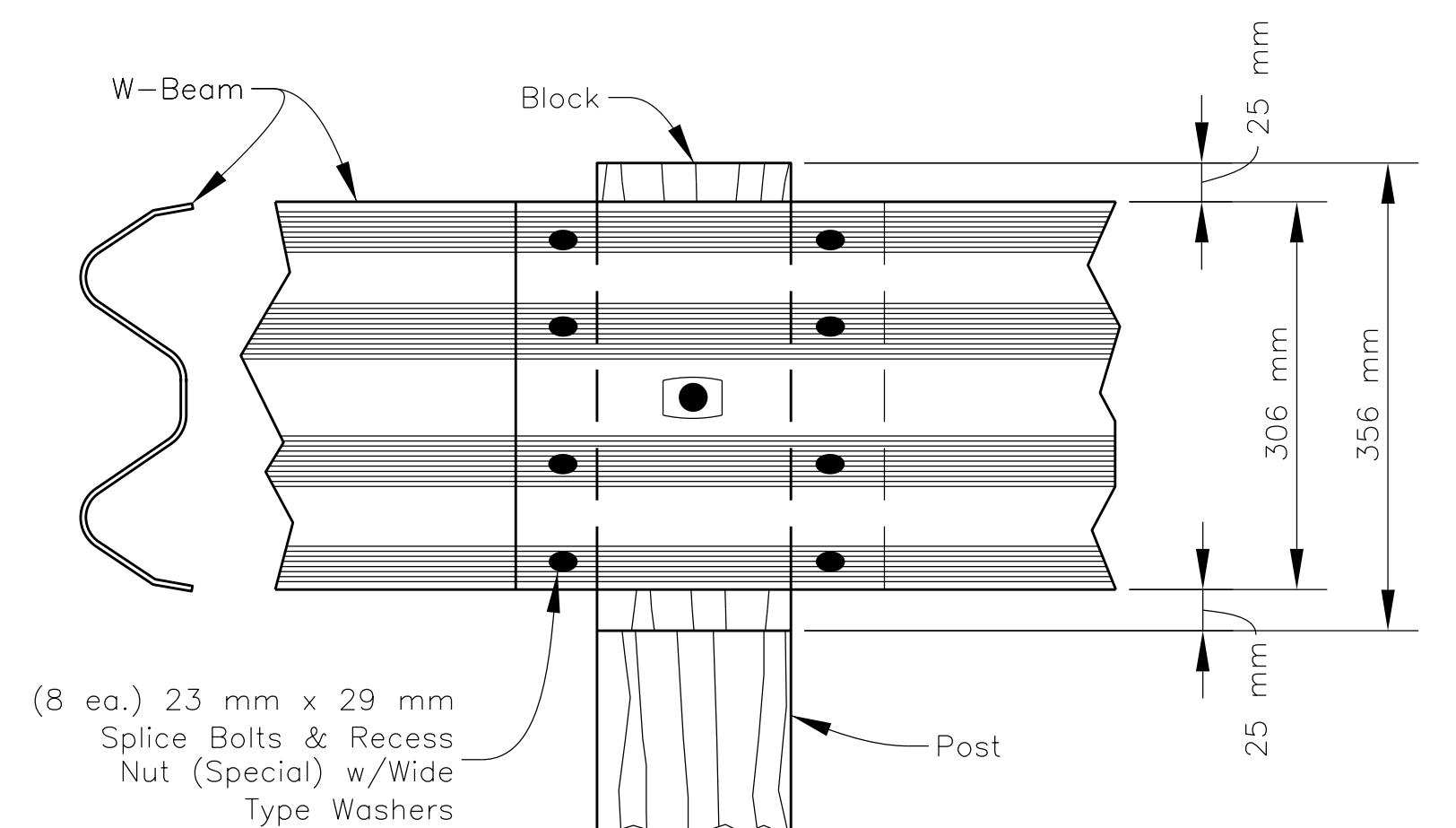
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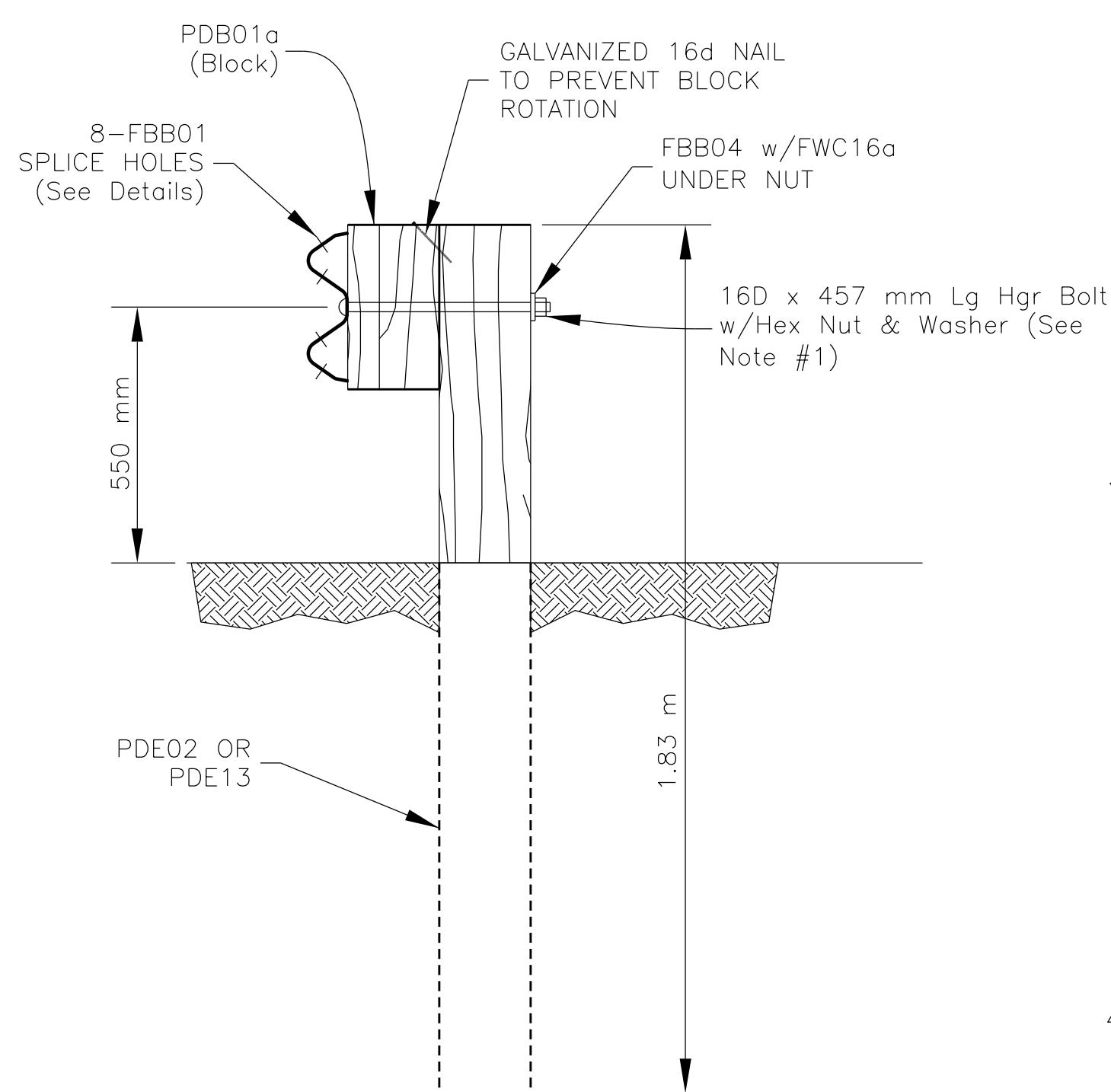
SECTION A-A
W-BEAM (RWM02A)



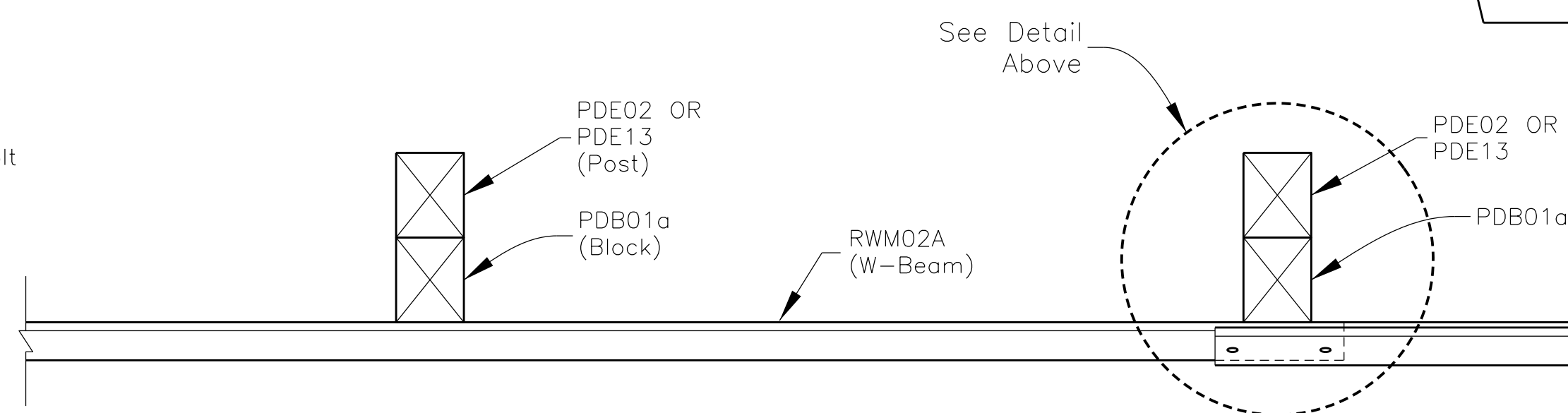
PLAN
POST/BLOCK &
SPLICE DETAIL



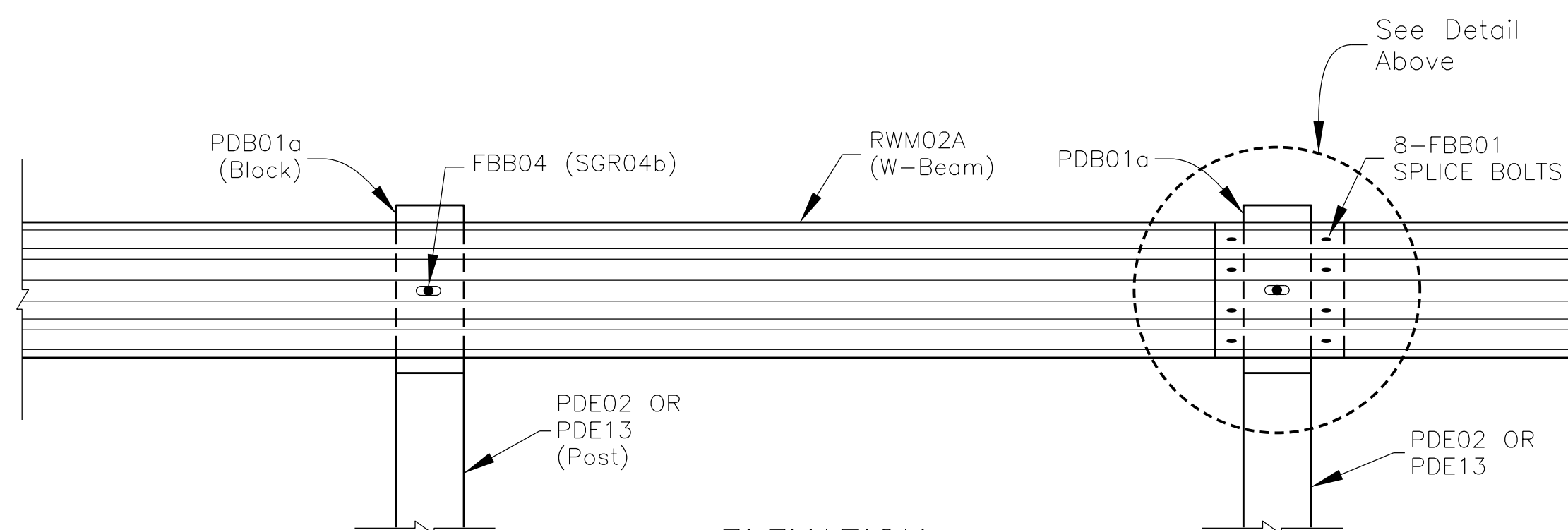
ELEVATION
POST/BLOCK
SPLICE DETAIL



ELEVATION
STRONG-POST W-BEAM



PLAN
W-BEAM/POST & BLOCK DETAILS



ELEVATION
W-BEAM/POST & BLOCK DETAILS

GENERAL NOTES


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

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STANDARD GUARDRAIL
DETAIL 1

DRAWN BY: NRDOT
DESIGNED BY: NRDOT
REVISED: 7/5/2019
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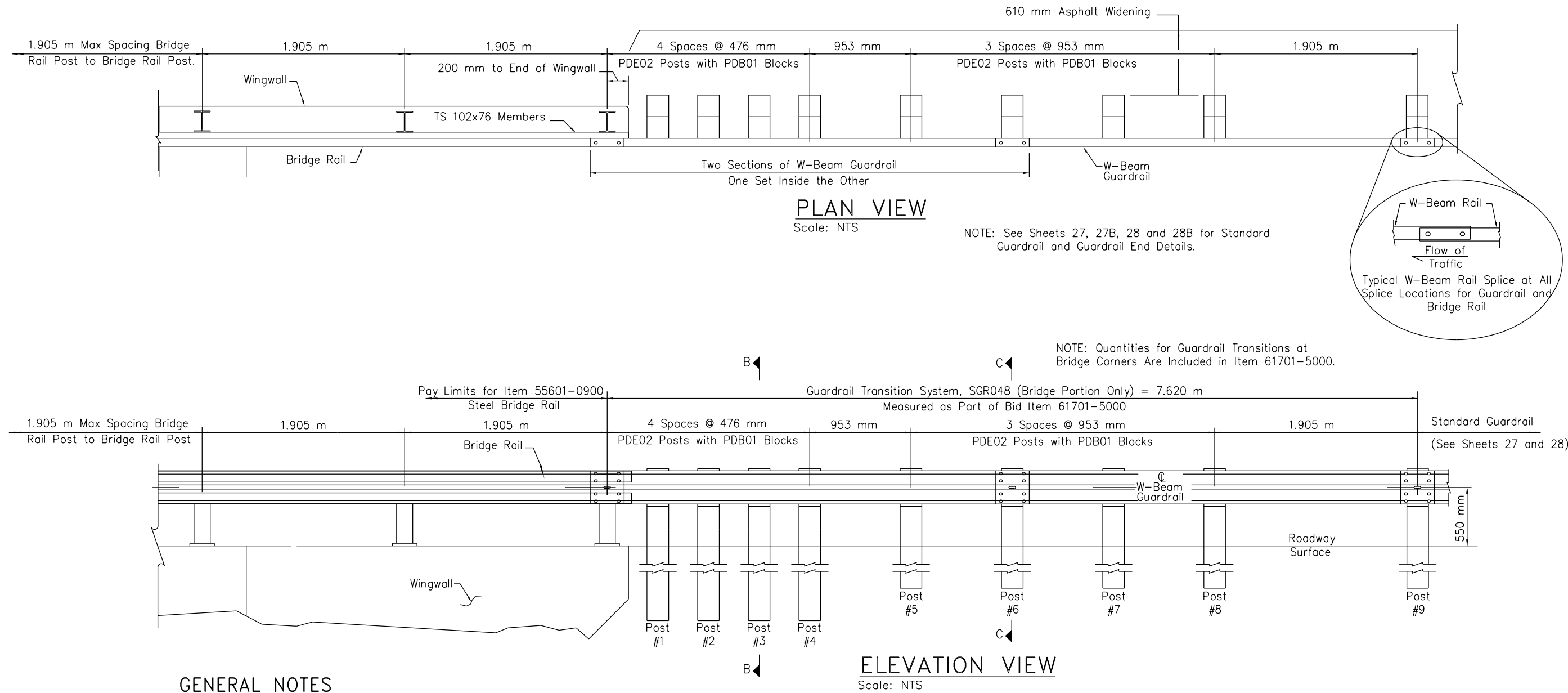
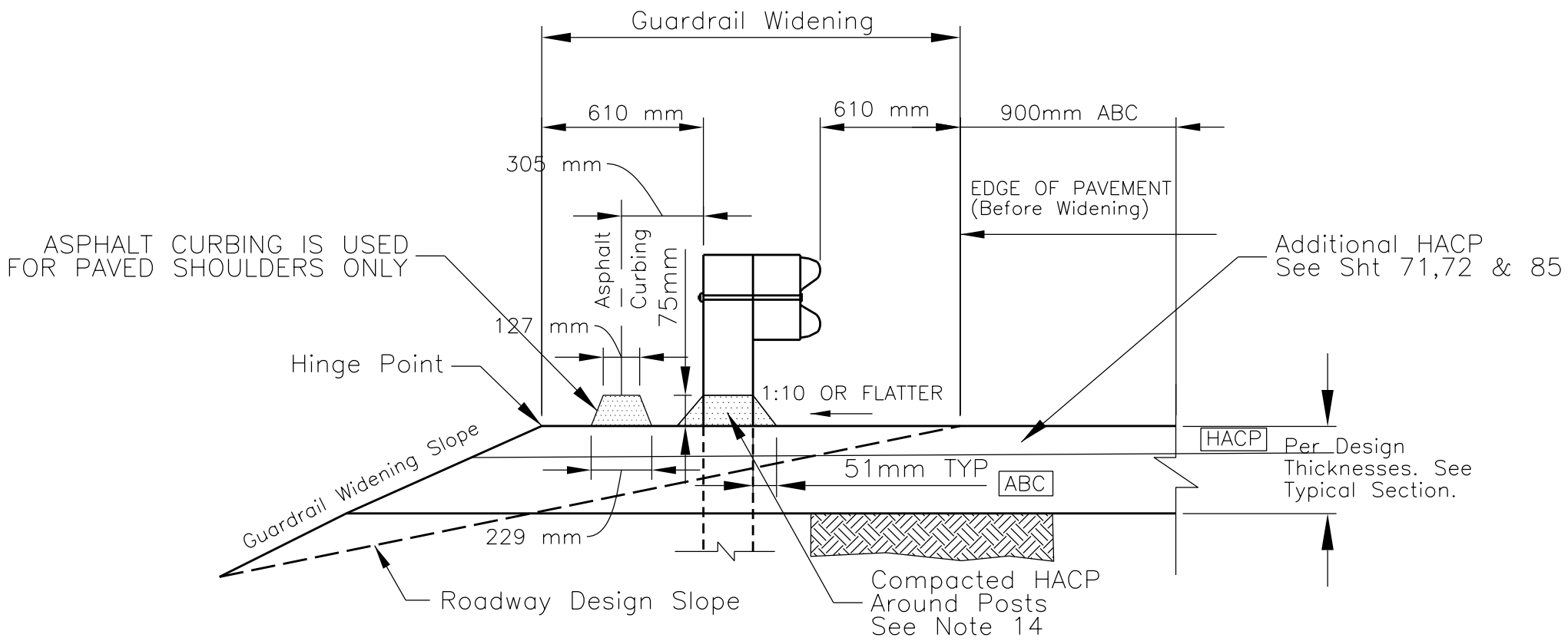
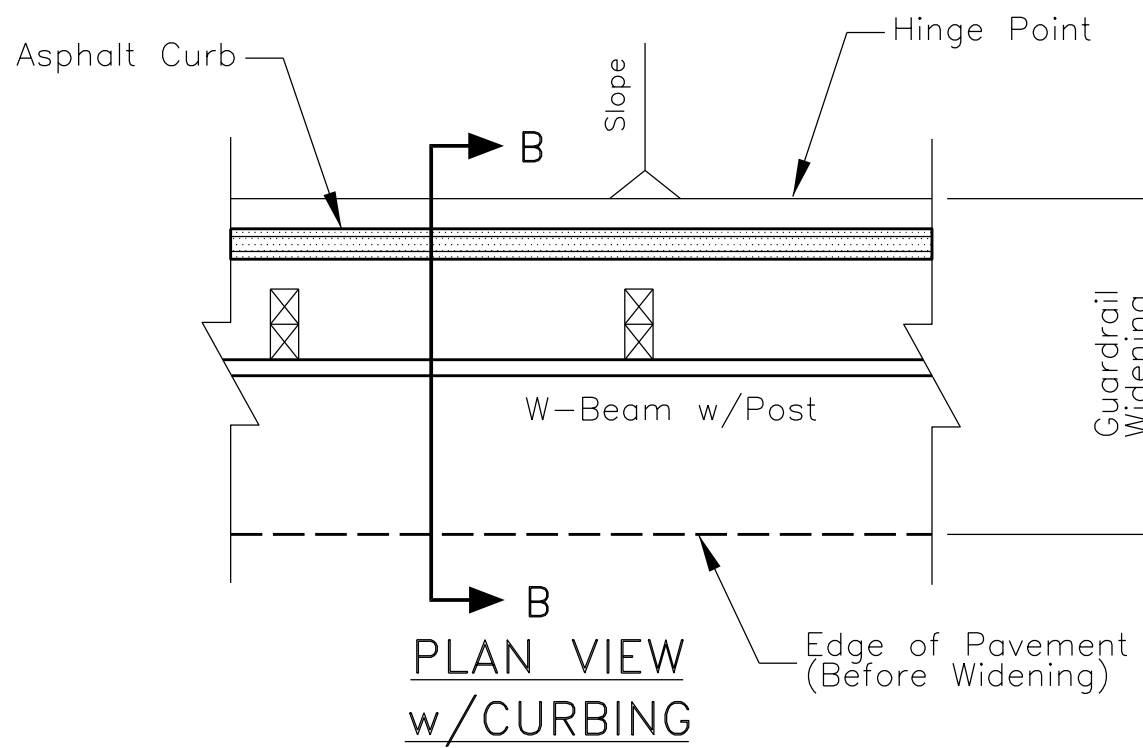
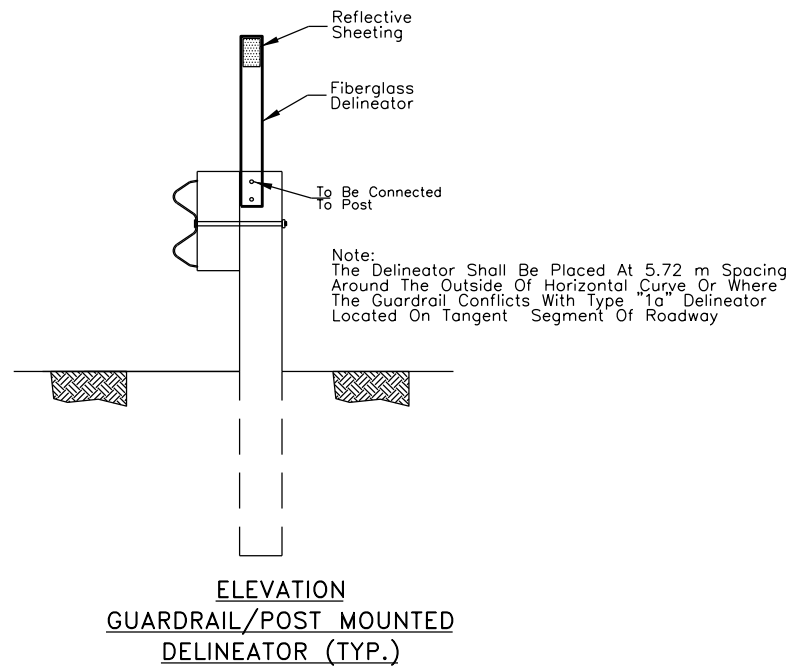
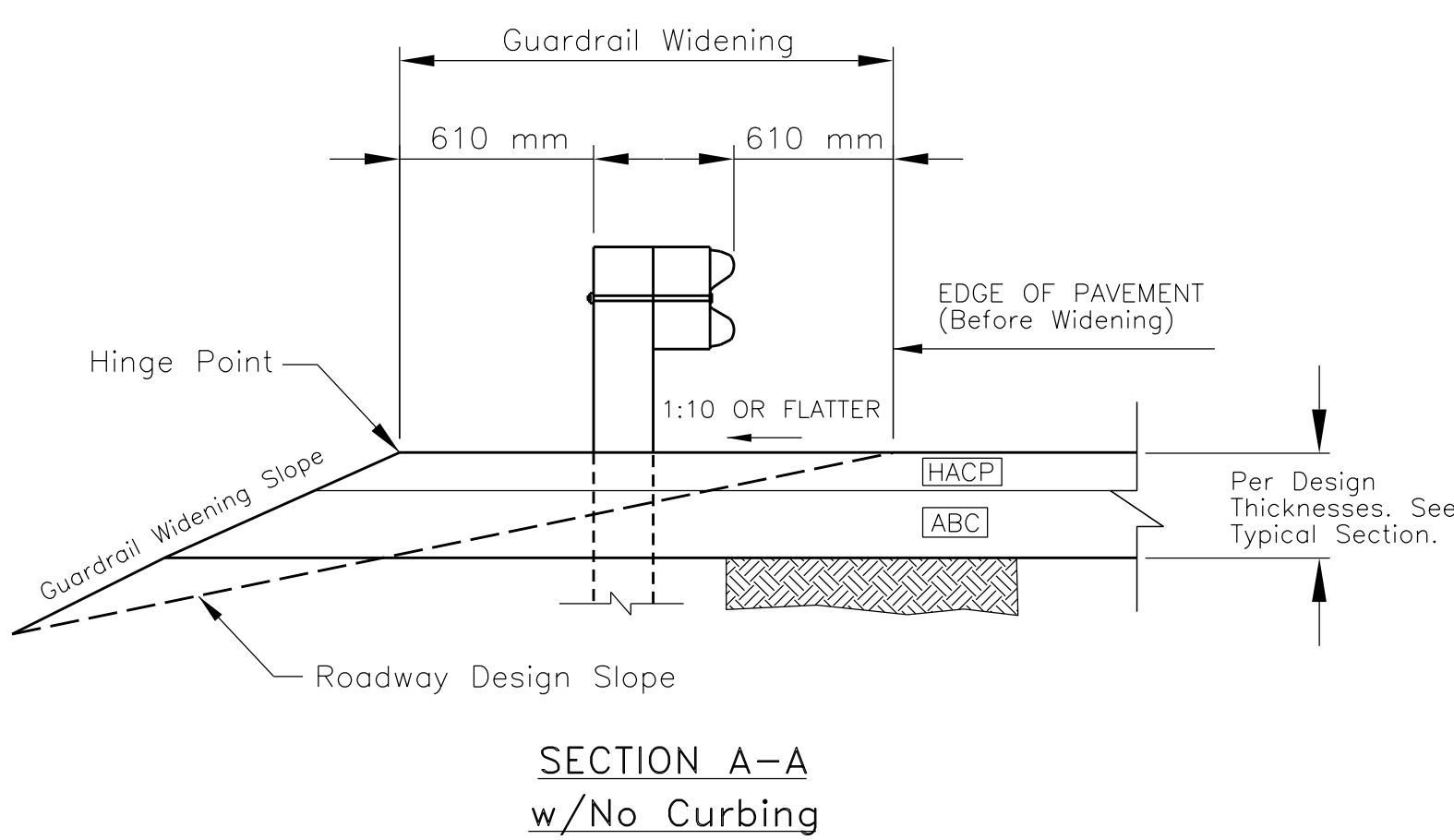
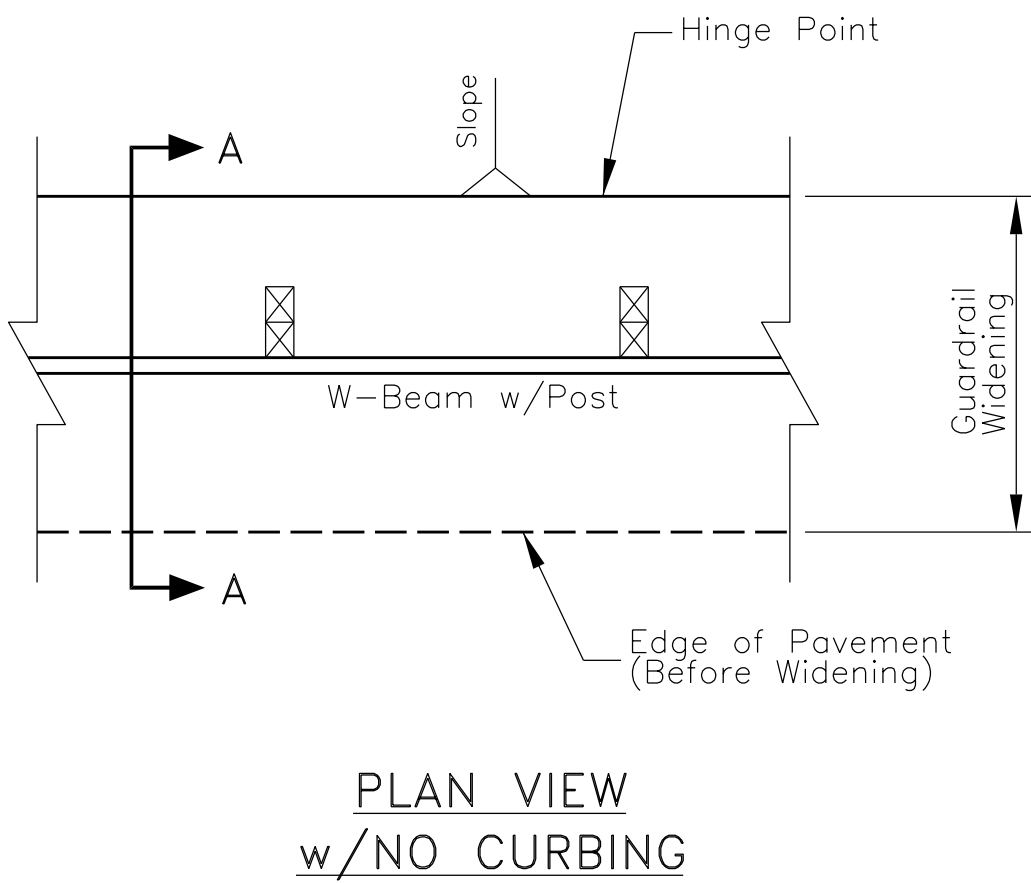
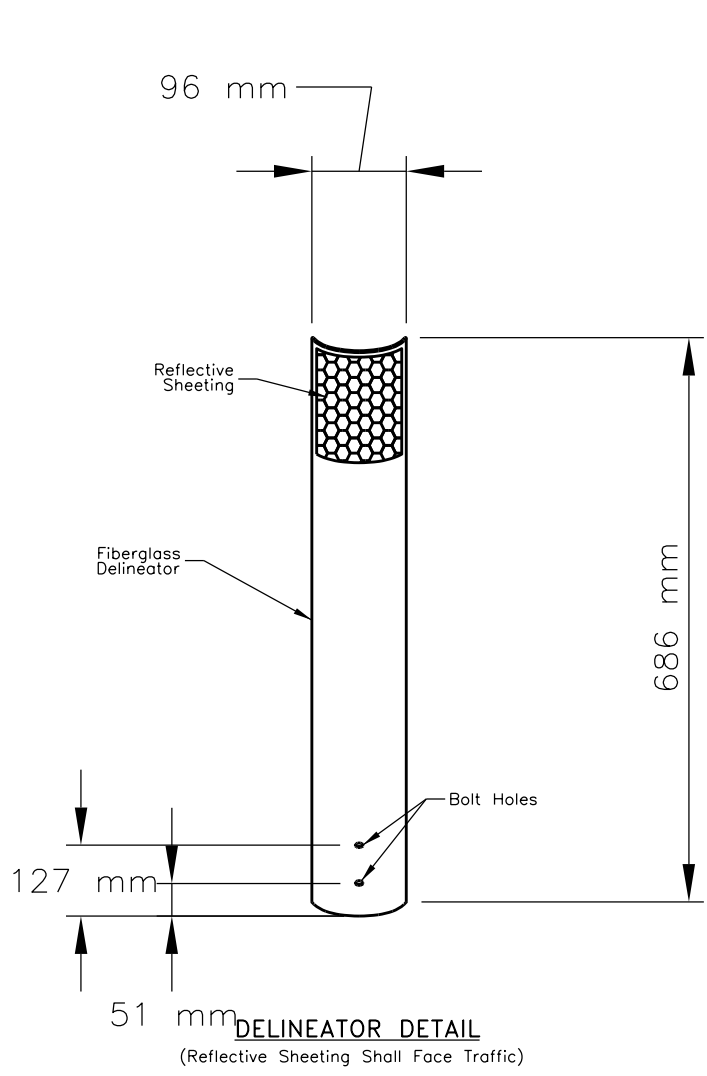
DATE: 7/5/2019
DATE: 7/5/2019
BY: HRiley



REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	AZ	NAVAJO	N9402	N9402(2)1,2&3	27A	40

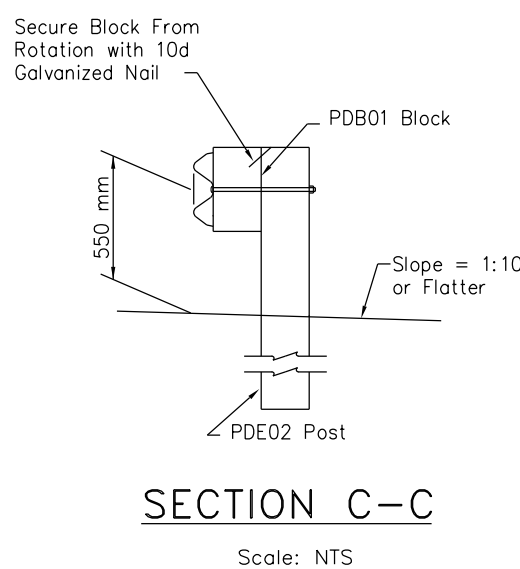
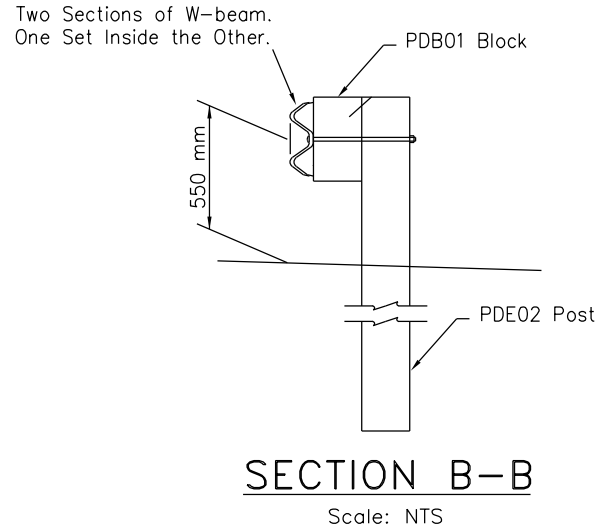
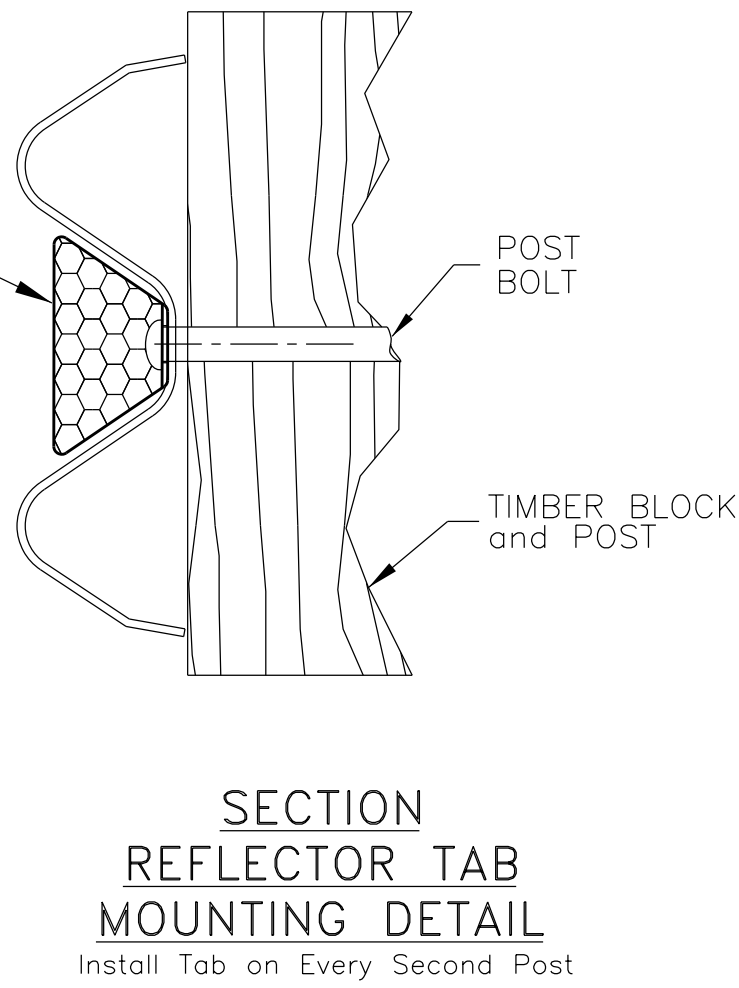
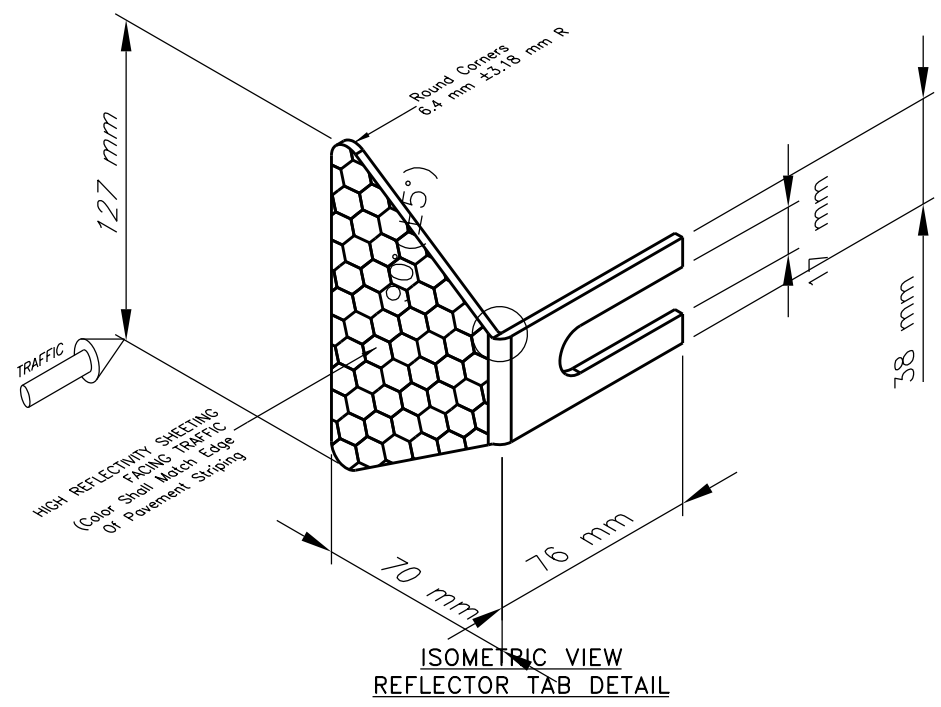
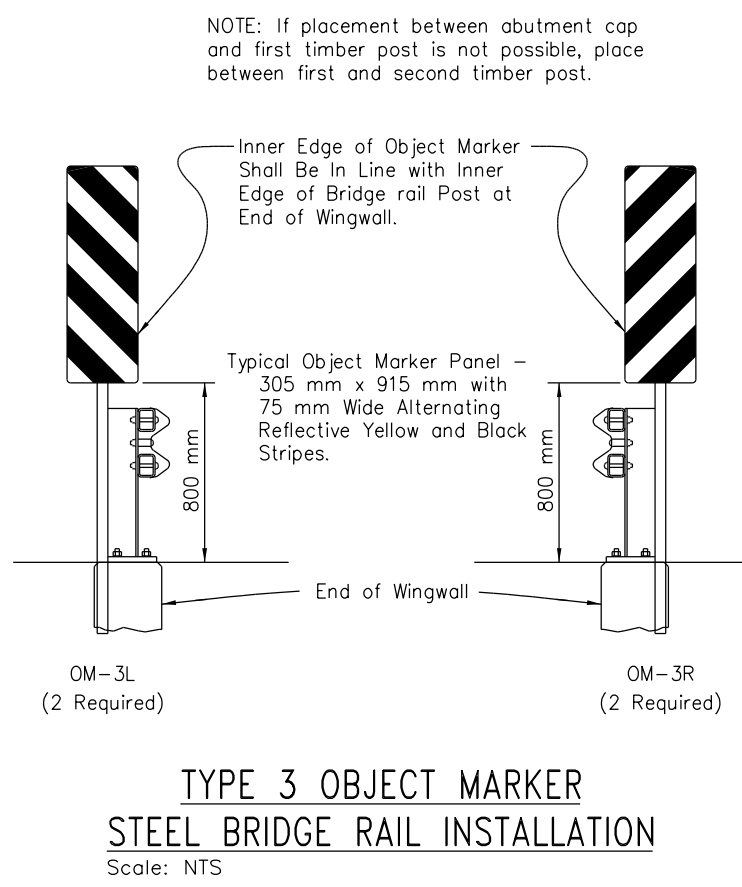
GENERAL NOTES

- ALL GUARDRAIL "W" BEAMS, SHALL BE GALVANIZED IN ACCORDANCE WITH (AASHTO M-180, CLASS A, TYPE 1) SPECIFICATION. ALL HARDWARE SHALL CONFORM TO (ASTM A-325) AND GALVANIZED IN ACCORDANCE WITH (ASTM A-153).
- ALL STRUCTURAL STEEL ITEMS SHOWN SHALL CONFORM TO (AASHTO N183/ASTM A36) AND BE GALVANIZED IN ACCORDANCE WITH (AASHTO M-111) SPECIFICATION.
- WIRE ROPE, FITTINGS AND HARDWARE SHALL CONFORM TO (ASSHTO M-30) SPECIFICATION TYPE II WITH A 19 mm DIAMETER AND A CLASS B ZINC COATING.
- WOOD POSTS AND BLOCKS SHALL BE ROUGH SAWN LUMBER OR (S4S) HAVING MINIMUM BENDING STRENGTH OF 8.27 MPa (SINGLE MEMBER USE) AND MEETING AASHTO N168 (21TH EDITION), ALL POSTS SHALL BE TREATED IN ACCORDANCE WITH (AASHTO M-133) SPECIFICATION.
- ASPHALT CONCRETE CURBING SHALL BE INSTALLED IN ACCORDANCE WITH SECTION B-B, AND CONSIDERED INCIDENTAL TO PAVING ITEMS AND NO DIRECT PAYMENT SHALL BE MADE.
- ALL EMBANKMENT AND AGGREGATE BASE COURSE MATERIALS SHALL BE COMPACTED TO 95% OF MAXIMUM DRY DENSITY.
- THE EMBANKMENT MATERIALS AND THE PLACING THEREOF SHALL BE INCLUDED IN CONTRACT BID ITEM 20401-0000 AND NO DIRECT PAYMENT SHALL BE MADE.
- THE CONTRACTOR SHALL BE REQUIRED TO COMPACT THE BACKFILL AND THE ASPHALT ALL AROUND EACH GUARD RAIL POST WITH HAND TAMPERS TO INSURE INTEGRITY OF THE PAVEMENT AND GUARDRAIL AND TO PREVENT SEEPAGE OF WATER INTO THE PAVEMENT FROM THE GUARD RAIL POST HOLES. THIS WORK SHALL BE INCIDENTAL OBLIGATIONS OF THE WORK DESCRIBED HEREIN.
- PLACEMENT OF HOT ASPHALT AND ABC MATERIAL FOR GUARDRAIL WIDENING SHALL BE INCLUDED IN BID ITEMS 30101-2000 AND 40201-0500.
- FURNISHING & PLACEMENT OF 371 mm x 701 mm REFLECTIVE SHEETING AND REFLECTIVE TABS SHALL BE CONSIDERED INCIDENTAL TO ITEM 61701-5000 AND NO DIRECT PAYMENT SHALL BE MADE.
- ANY RELATED PATENT RIGHTS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AS PER SECTION 107.01 OF THE FP-14.
- THE CONTRACTOR HAS THE OPTION TO USE STEEL POSTS. IF STEEL POSTS ARE APPROVED THEN RUBBER OR RECYCLED PLASTIC BLOCKS WILL BE REQUIRED.
- PLACE REFLECTIVE TABS ON POSTS AT EVERY FOURTH POST. THE COLOR OF THE TABS SHALL CONFORM TO THE COLOR OF THE ADJACENT EDGE LINE
- PLACE 75mm mound of Asphalt around each post and compact for paved shoulders. Place 75mm mound of bag mixed concrete around each post to a 101mm depth and let cure before mounting railing for gravel or dirt shoulders. This work shall be considered incidental work under the guardrail bid item.



GENERAL NOTES

- Standard Barrier Hardware Has Been Used To Develop This Guardrail Transition. Designations Provided in Brackets Relate to Standard Elements Detailed In "A Guide To Standard Highway Barrier Rail Hardware", 1995, AASHTO-ACC-ARTBAM Joint Cooperative Committee and Modified Standard Elements As Detailed on This Sheet.
- All W-beams Shall Be Galvanized In Accordance With AASHTO M180-class A, Type 1. Furnishing, Fabricating and Installing These Items Shall Be Included in Item 61701-5000.
- W-Beam is Not Bolted to Posts and Blocks at Posts #1, #2, #3, #5, #7 and #8. Blocks Bolted Directly to Posts.
- Certificates of Compliance Shall Be Required for All Guardrail and Wood Post Materials and Associated Hardware Prior to Installation of Any Material Under Item 61701-5000.
- See Additional Notes On this sheet above



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STANDARD GUARDRAIL
DETAIL 2

DRAWN BY: NRDOT DATE: 7/5/2019

DESIGNED BY: NRDOT DATE: 7/5/2019

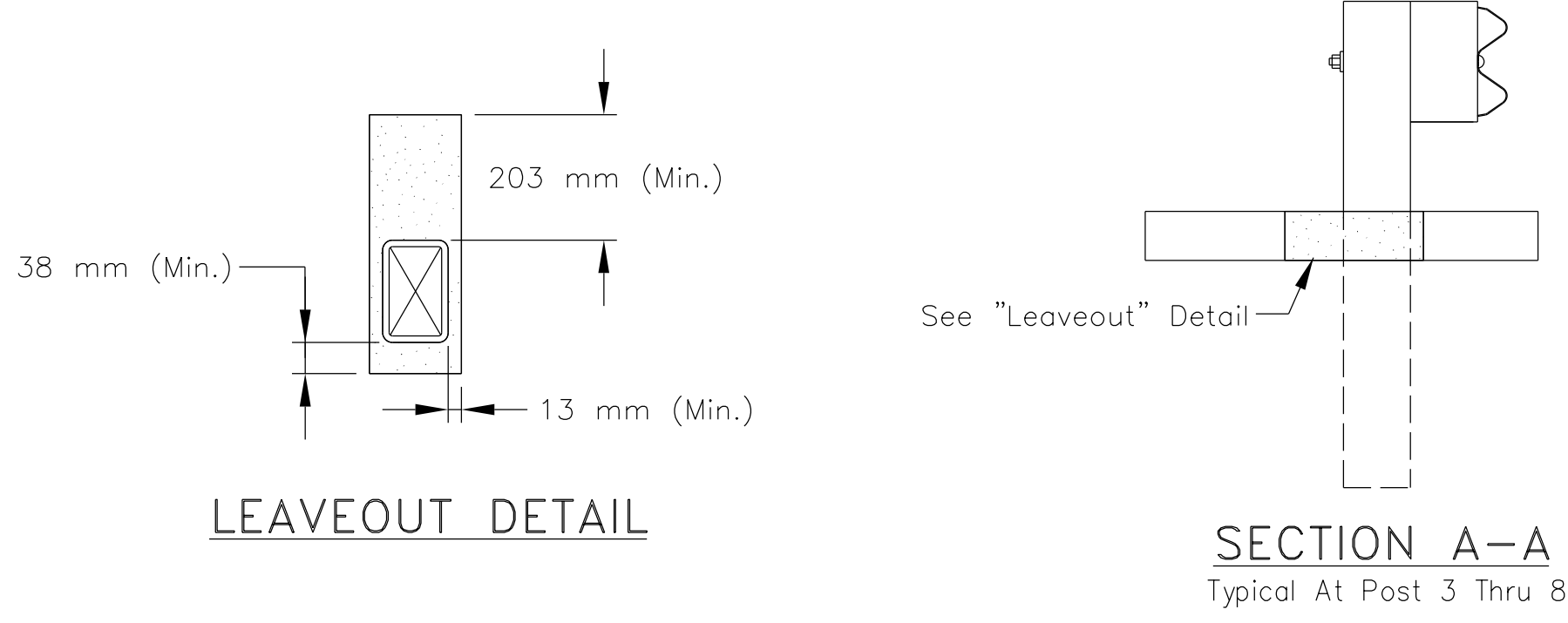
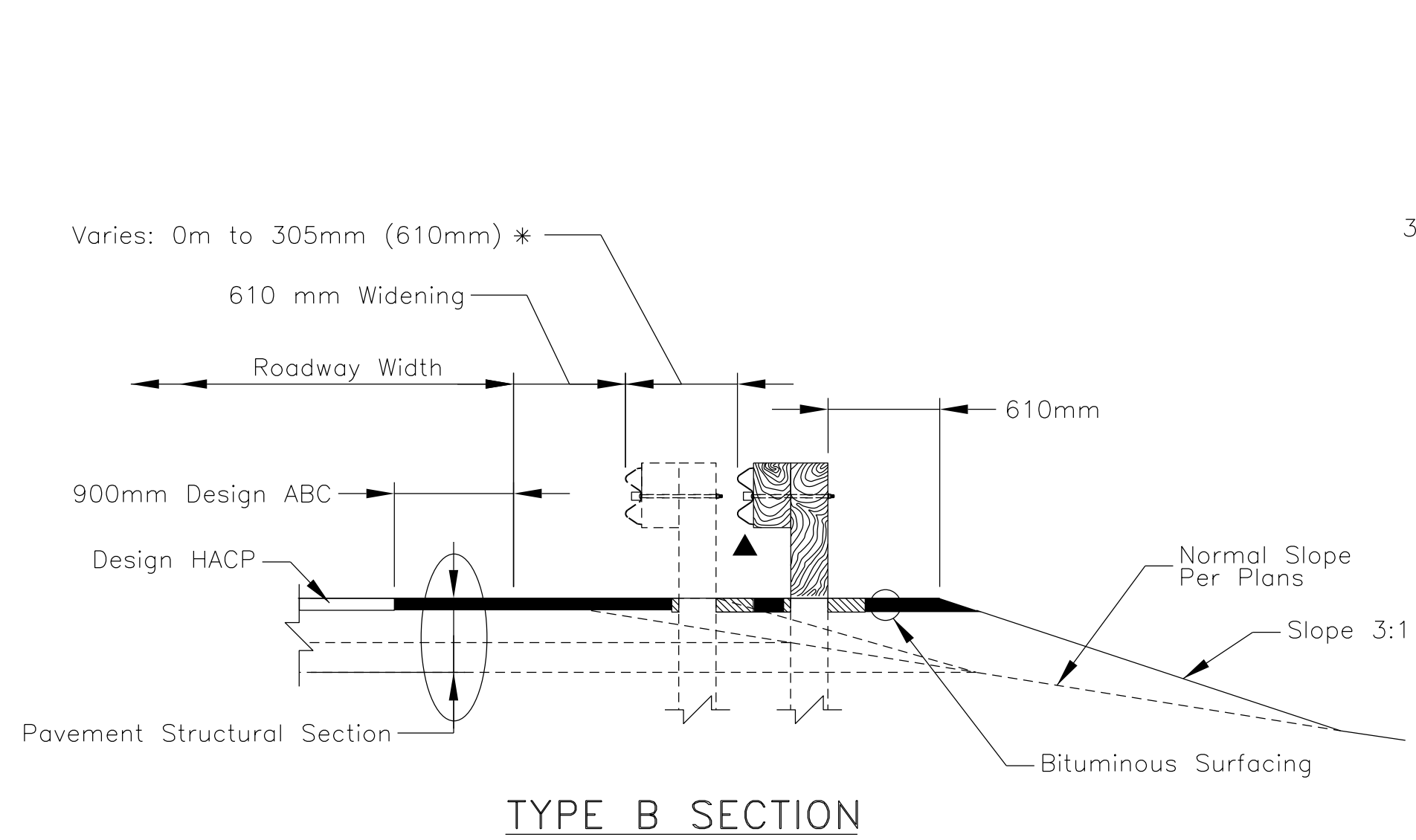
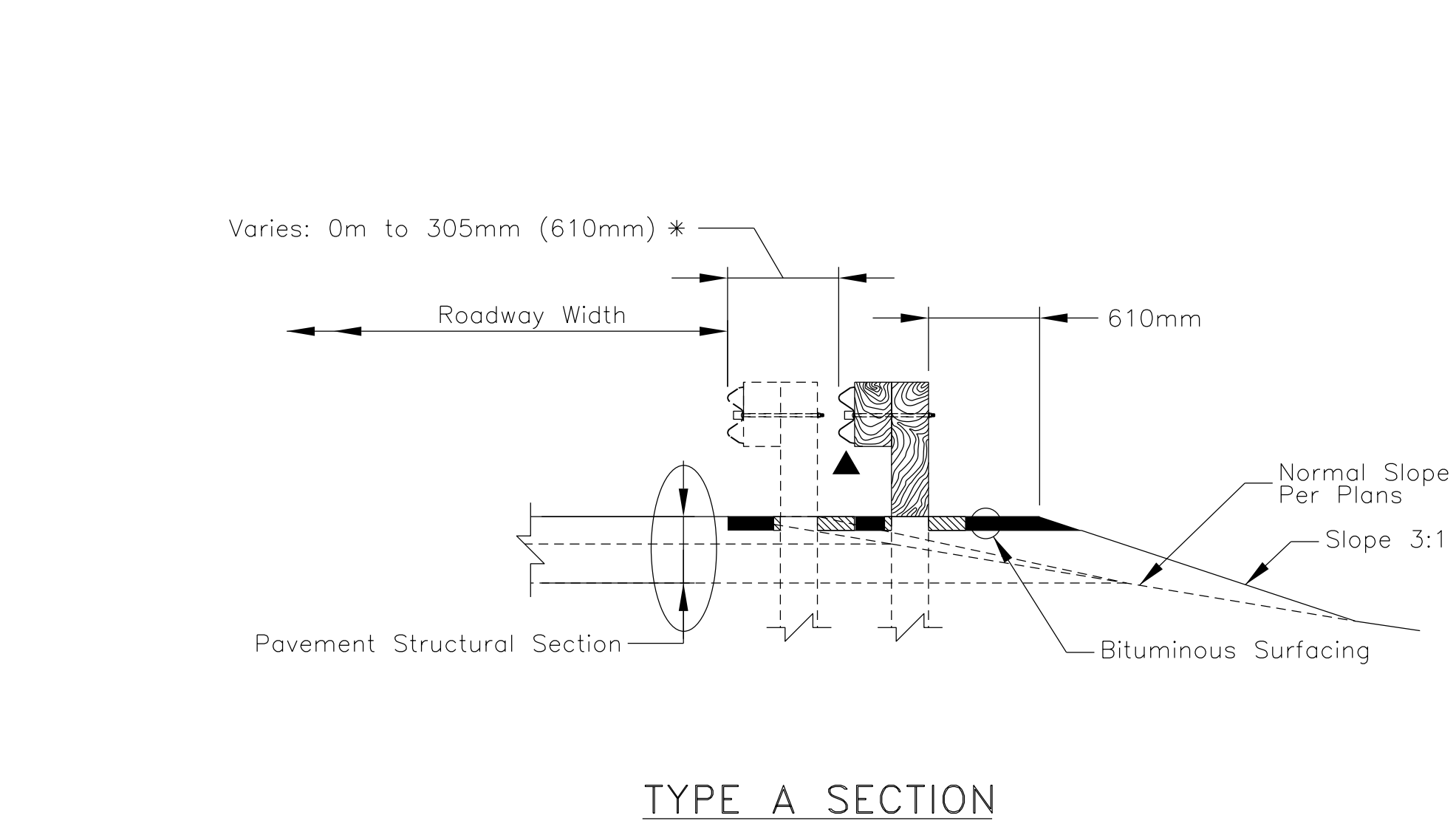
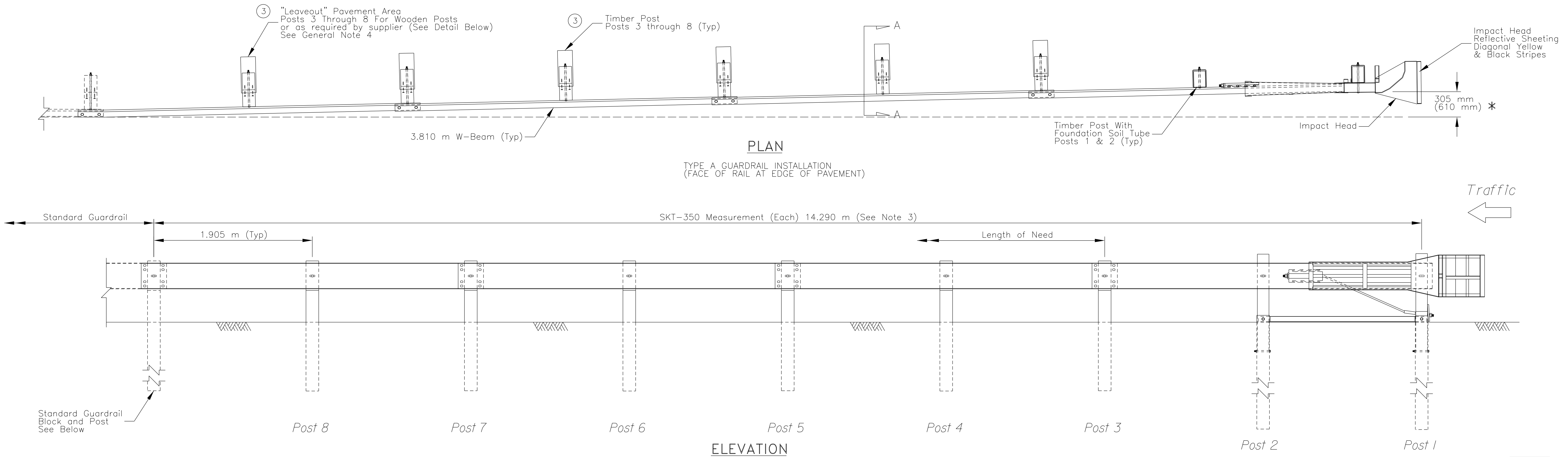
REVISED: 3/18/2020 BY: HRiley

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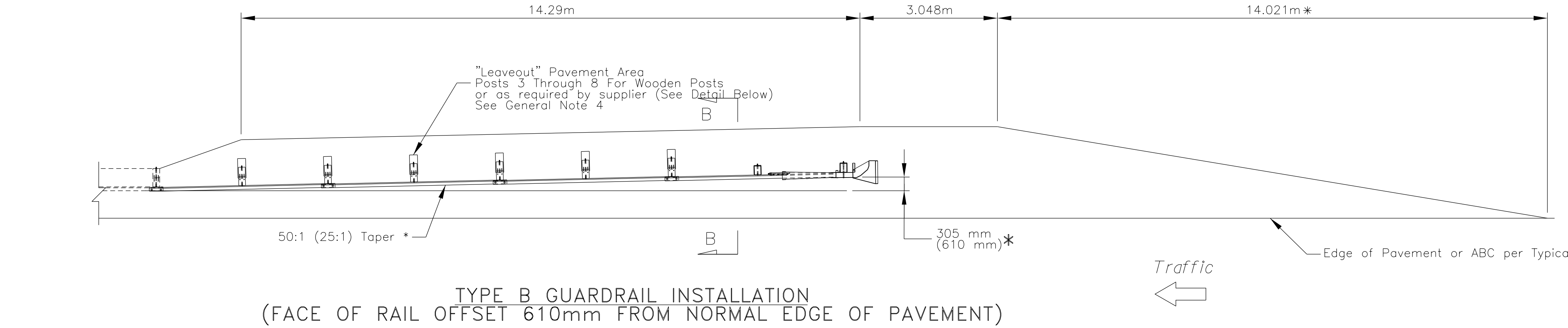


REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO		NAVAJO	N9402	N9402(1)1,2&3	28A	40

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



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



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

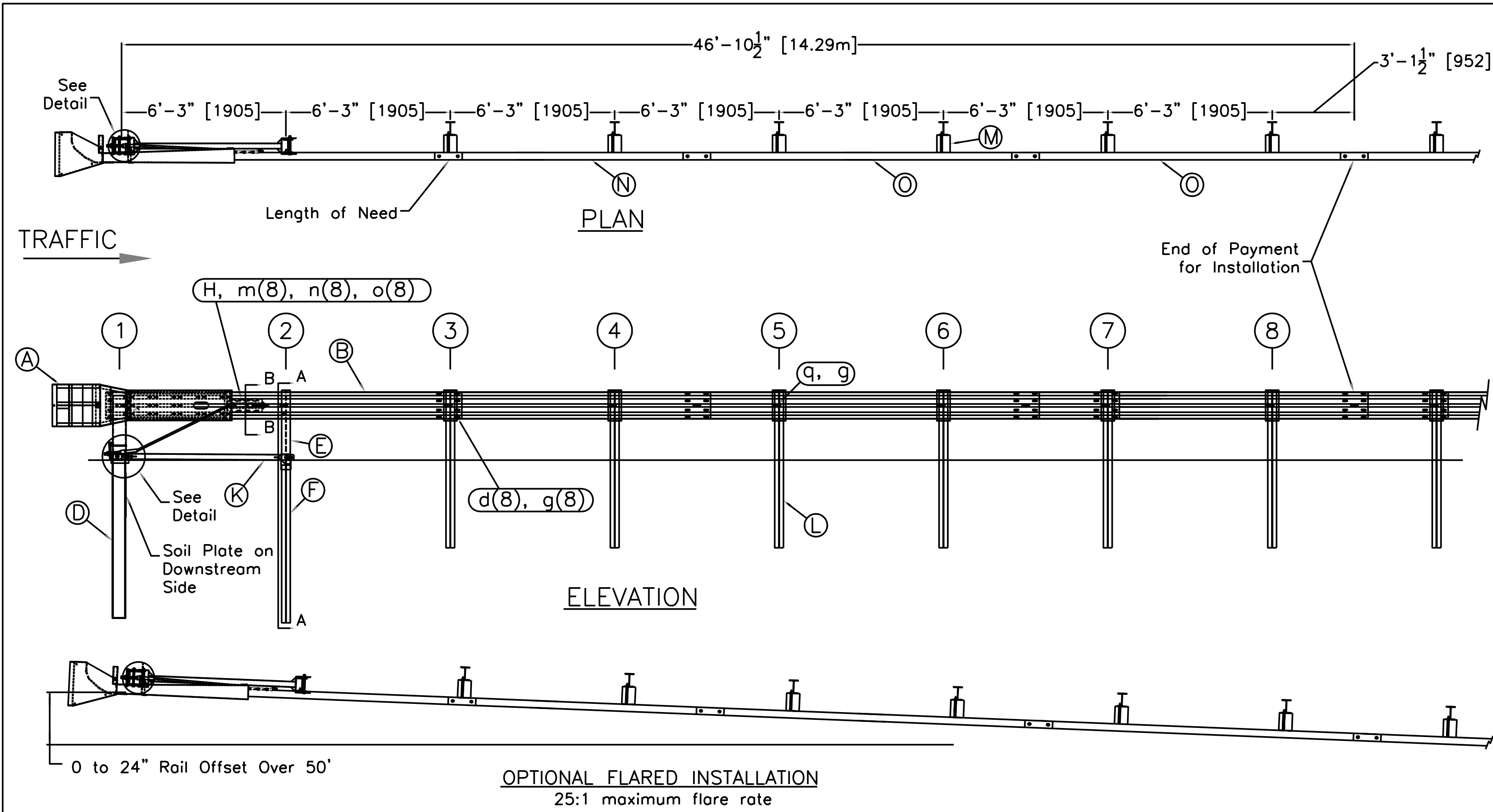
DRAWN BY: NRDOT
DESIGNED BY: NRDOT
REVISED: 3/17/2020

DATE: 3/17/2020
DATE: 7/05/2019
BY: Harold.Riley

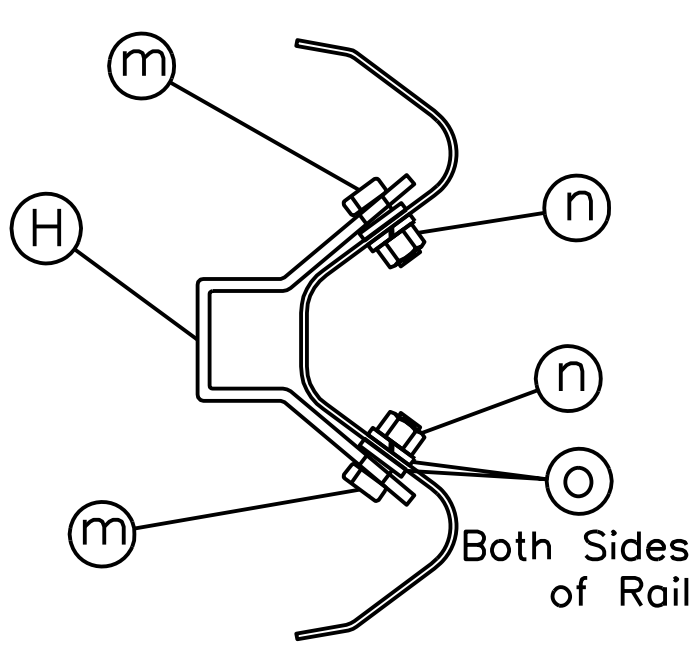
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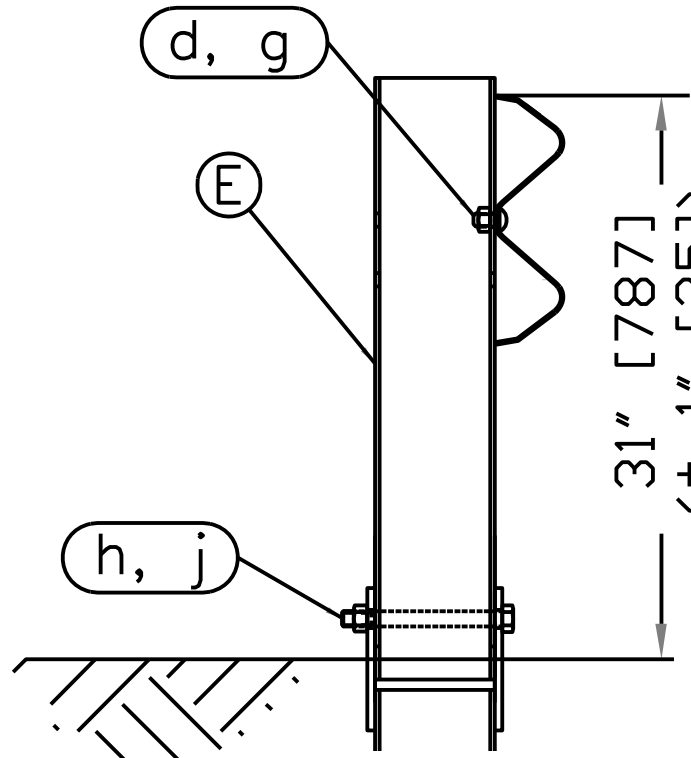
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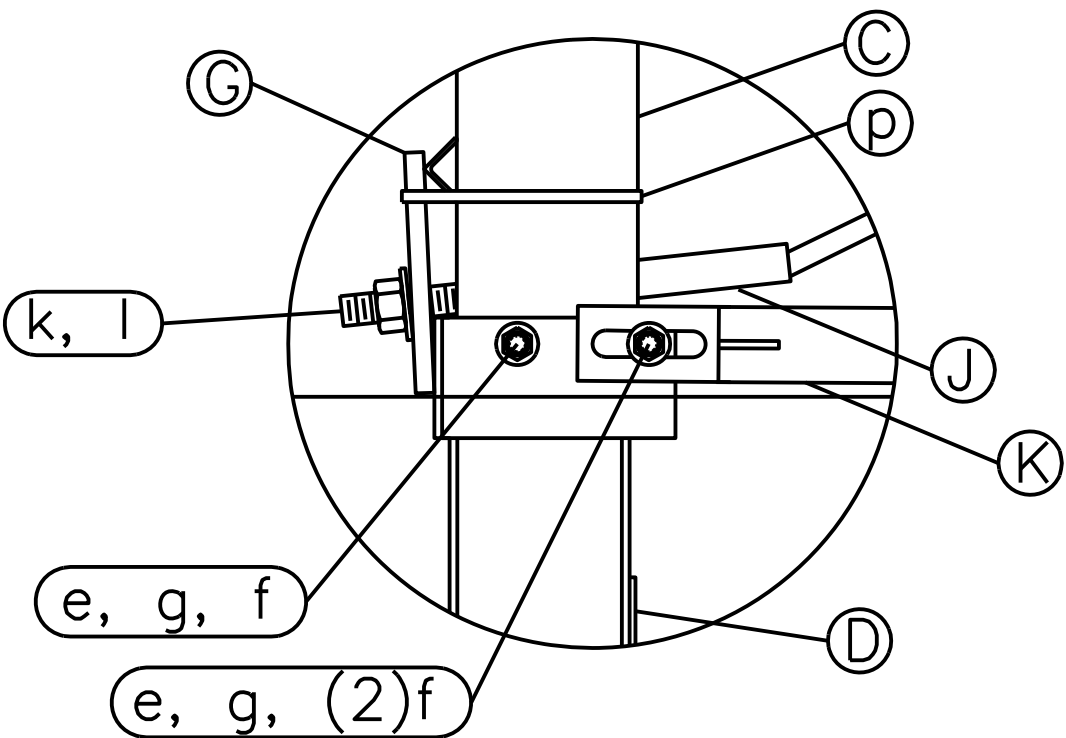
OPTIONAL FLARED INSTALLATION
25:1 maximum flare rate



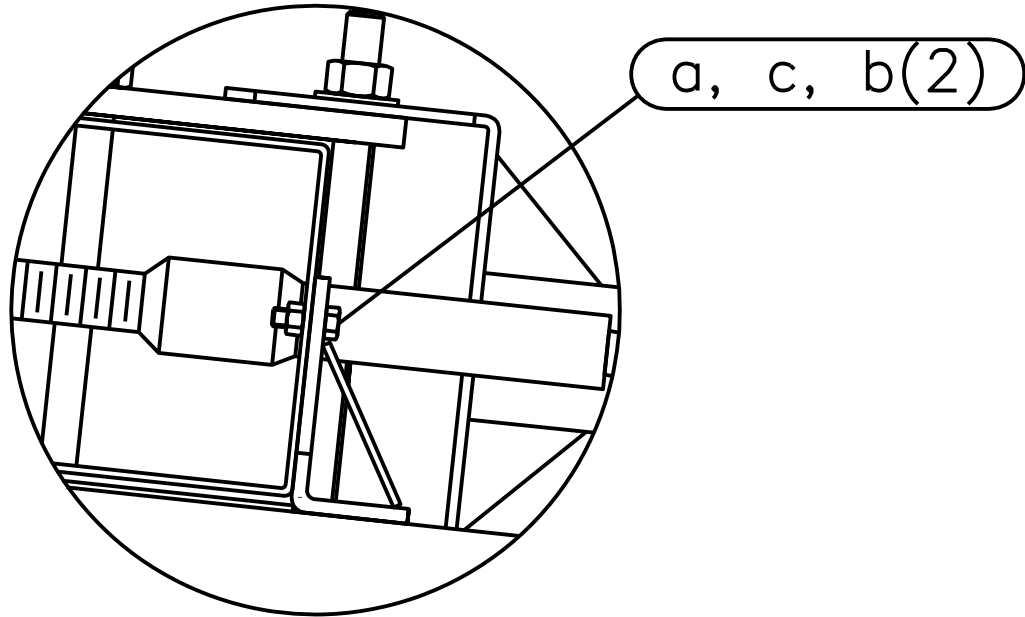
SECTION B-B
Anchor Bracket



SECTION A-A
Post #2



Post #1 Connection Detail



Impact Head Connection Detail

NOTES:

- BREAKAWAY POSTS ARE REQUIRED WITH THE SEQUENTIAL KINKING TERMINAL AS REQUIRED BY THE SUPPLIER.
- ALL BOLTS, NUTS, CABLE ASSEMBLIES, CABLE ANCHORS AND BEARING PLATES SHALL BE GALVANIZED.
- THE MSKT-TL3-8 CAN BE FLARED AT A RATE OF 25:1 TO PREVENT THE IMPACT HEAD FROM ENCRANCHING ON THE SHOULDER. THE FLARE IS NOT REQUIRED AND MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS.
- THE SOIL TUBES SHALL NOT PROTRUDE MORE THAN 102 mm ABOVE GROUND (MEASURED ALONG A 1.5m CHORD). SITE GRADING MAY BE NECESSARY TO MEET THIS REQUIREMENT.
- THE SOIL TUBES MAY BE DRIVEN WITH AN APPROVED DRIVING HEAD. SOIL TUBES SHOULD NOT BE DRIVEN WITH THE POST IN THE TUBE. IF THE TUBES ARE PLACED IN DRILLED HOLES, THE BACKFILL MATERIAL MUST BE SATISFACTORILY COMPACTED TO PREVENT SETTLEMENT.
- WHEN ROCK IS ENCOUNTERED DURING EXCAVATION, A 305 mm DIA. POST HOLE, 508 mm INTO ROCK MAY BE USED IF APPROVED BY THE ENGINEER. GRANULAR MATERIAL WILL BE PLACED IN THE BOTTOM OF THE HOLE APPROX. 64 mm DEEP TO PROVIDE DRAINAGE. THE SOIL TUBES WILL BE FIELD CUT TO LENGTH, PLACED IN THE HOLE AND BACKFILLED WITH ADEQUATELY COMPACTED MATERIAL EXCAVATED FROM THE HOLE.
- THE BREAKAWAY CABLE ASSEMBLY MUST BE TAUT. A LOCKING DEVICE, (VICE-GRIPS OR CHANNEL-LOCK PLIERS) SHOULD BE USED TO PREVENT THE CABLE FROM TWISTING WHEN TIGHTENING NUTS.
- A SPECIAL SITE EVALUATION SHOULD BE CONSIDERED PRIOR TO USING THE MSKT-TL3-8 WHERE THERE IS LESS THAN 7.620 m BETWEEN THE OUTLET SIDE OF THE MSKT-TL3-8 AND ANY ADJACENT DRIVING LANE.
- THE WOOD BLOCKOUTS SHOULD BE "TOE-NAILED" TO THE WOOD POSTS TO PREVENT THEM FROM TURNING WHEN THE WOOD SHRINKS.
- GUARDRAIL SPLICES SHALL BE OVERLAPPED IN THE DIRECTION OF THE ADJACENT TRAFFIC.

- BILL OF MATERIALS AND SOME OF THE DETAILS HEREIN ARE PROVIDED BY ROAD SYSTEMS INC.
- ALL BOLTS, NUTS, CABLE ASSEMBLIES, CABLE ANCHORS AND BEARING PLATES SHALL BE GALVANIZED.
- THE LOWER SECTIONS OF THE POSTS 1 & 2 SHALL NOT PROTRUDE MORE THAN 4 in [100mm] ABOVE THE GROUND (MEASURED ALONG A 5' [1.5M] CORD LONGITUDINAL TO THE SYSTEM). SITE GRADING MAY BE NECESSARY TO MEET THIS REQUIREMENT.
- THE LOWER SECTION OF THE HINGED POST SHOULD NOT BE DRIVEN WITH THE UPPER POST ATTACHED. IF THE POST IS PLACED IN A DRILLED HOLE, THE BACKFILL MATERIAL MUST BE SATISFACTORILY COMPACTED TO PREVENT SETTLEMENT.
- WHEN COMPETENT ROCK IS ENCOUNTERED, A 12" [300mm] Ø POST HOLE, 20 in. [500mm] DEEP CORED INTO THE ROCK SURFACE MAY BE USED IF APPROVED BY THE ENGINEER FOR POSTS 1 AND/OR 2. GRANULAR MATERIAL WILL BE PLACED IN THE BOTTOM OF THE HOLE, APPROXIMATELY 2.5" [60mm] DEEP TO PROVIDE DRAINAGE. THE FIRST AND/OR SECOND POST CAN BE FIELD CUT TO LENGTH, PLACED IN THE HOLE AND BACKFILLED WITH SUITABLE BACKFILL. THE SOIL PLATE MAY BE TRIMMED IF REQUIRED.
- THE BREAKAWAY CABLE ASSEMBLY MUST BE TAUT. A LOCKING DEVICE (VICE GRIPS OR CHANNEL LOCK PLIERS) SHOULD BE USED TO PREVENT THE CABLE FROM TWISTING WHEN TIGHTENING NUTS.
- THE TERMINAL BREAK-AWAY SYSTEM SHALL MEET THE CRASH TEST AND EVALUATION CRITERIA (MASH) (NCHRP) REPORT 350.
- THE DETAILS PROVIDED ARE FROM ROAD SYSTEMS INC. THE CONTRACTOR SHALL PROVIDE THIS TYPE MASH SKT IMPACT HEAD WITH 350 SKT TERMINALS OR EQUAL FROM ANY APPROVED VENDOR.
- DIMENSIONS IN BRACKETS [] ARE METRIC.
- SEE THE CONTRACT SPECIAL CONTRACT REQUIREMENTS AND SUPPLEMENTAL SPECIFICATION FOR SECTION 617 FOR ADDITIONAL REQUIREMENTS.

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

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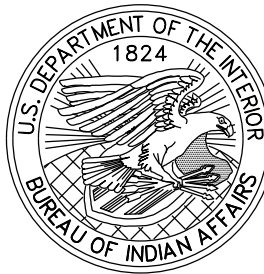
GUARDRAIL END TREATMENT
MSKT-TL3-8 LAYOUT; SHEET 2 of 2

DRAWN BY: NRDOT DATE: 3/17/2020

DESIGNED BY: NRDOT DATE: 7/05/2019

REVISED: 3/18/2020 BY: Harold.Riley

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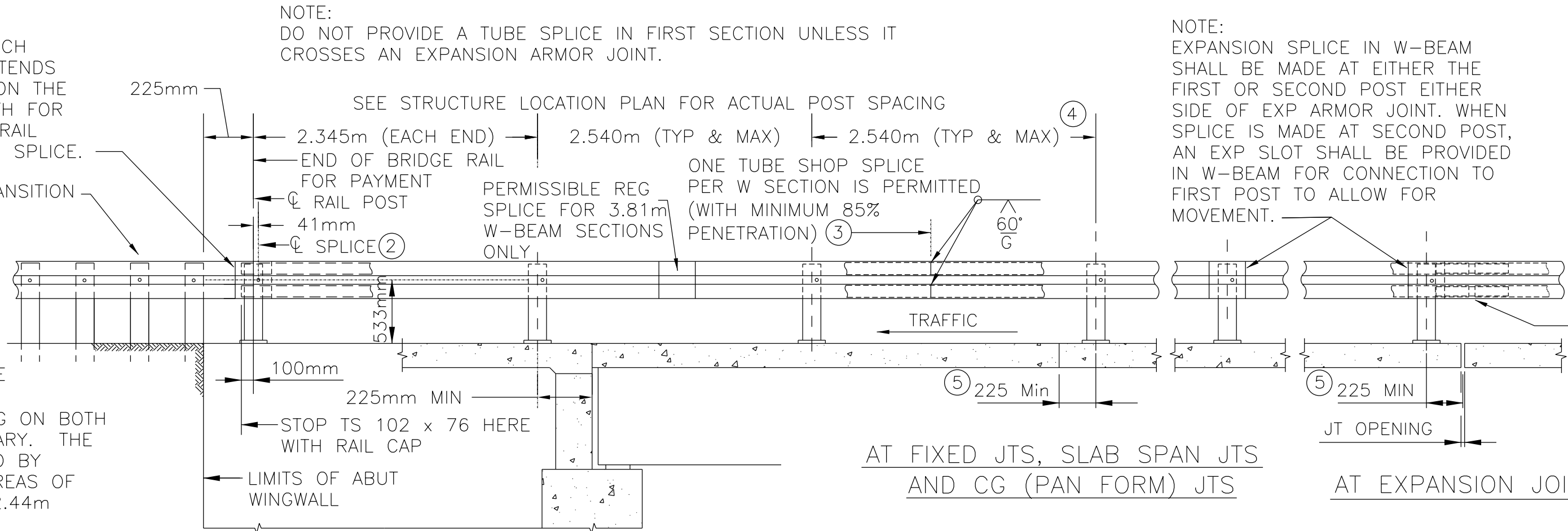


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REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET	
NAVAJO	AZ	NAVAJO	N9402	N9402(2)1,2&3	29	of 41

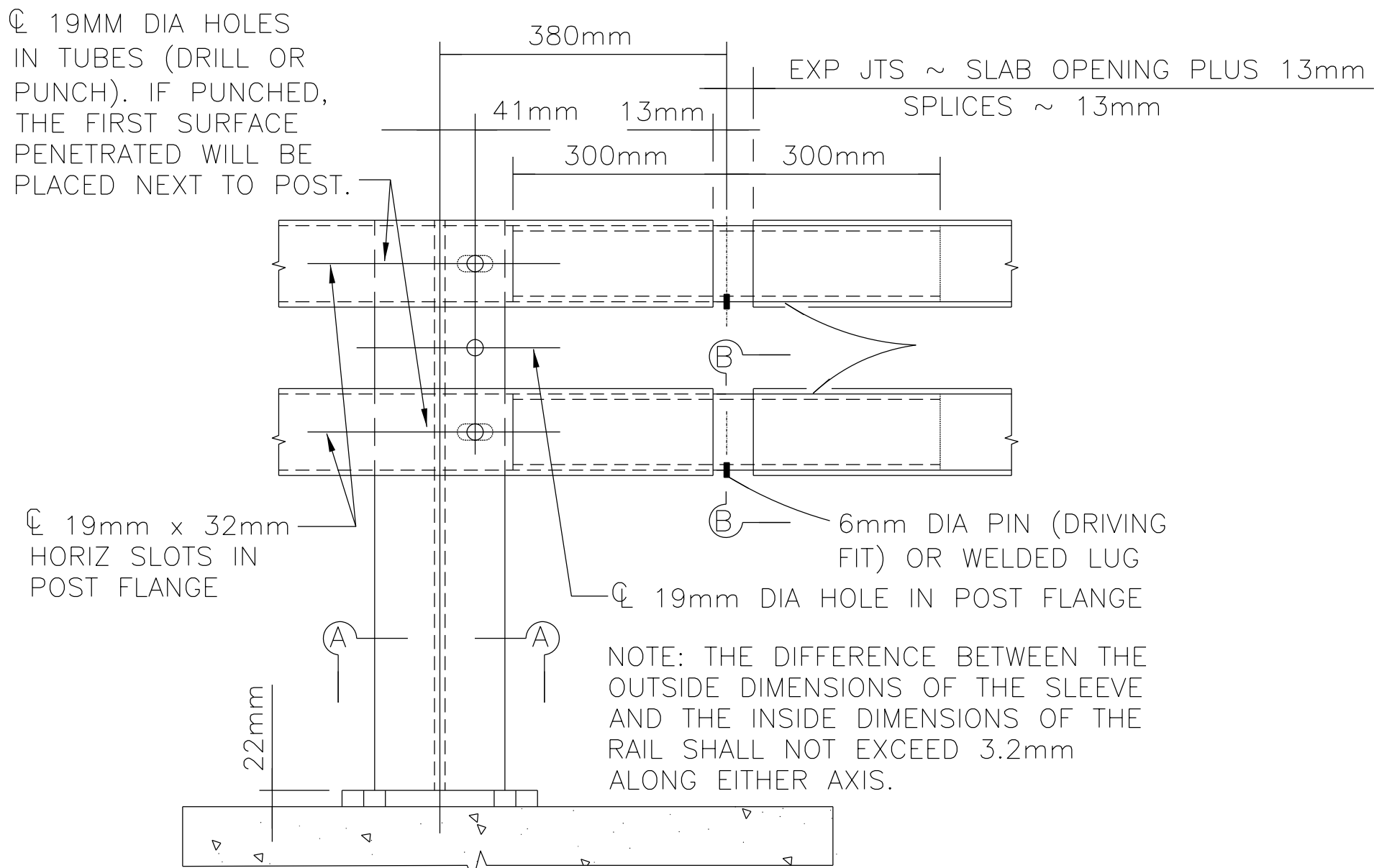
NOTE: BRIDGE RAIL MUST BE ATTACHED TO A W-BEAM GUARDRAIL TRANSITION SECTION (NESTED W-BEAM) WHICH THEN ATTACHES TO A METAL BEAM GUARDRAIL AND EXTENDS ALONG THE EMBANKMENT UNLESS SHOWN OTHERWISE ON THE PLANS. SEE PLAN SHEET 27 FOR DETAILS AND LENGTH FOR PAYMENT. THE SPICE JOINING THE APPROACH GUARDRAIL TRANSITION TO THE BRIDGE RAIL SHALL BE A REGULAR SPICE.

- 1 INCREASE 50mm FOR STRUCTURES WITH OVERLAY.
- 2 SPICE MAY BE IN EITHER SIDE OF BRIDGE RAIL POST WEB.
- 3 THE WELD MAY BE SQUARE GROOVE OR SINGLE VEE GROOVE. GRIND SMOOTH.
- 4 MAINTAIN 2.54m POST SPACING WHEREVER POSSIBLE FOR USE WITH NOMINAL 7.62m W-BEAM SECTIONS (7.94m OVERALL). SYMMETRY OF THE POST SPACING ON BOTH SIDES AND ALONG THE STRUCTURE IS NOT NECESSARY. THE NOMINAL 7.62m SECTIONS MAY ALSO BE MAINTAINED BY INTRODUCING FOUR POST SPACES AT 1.905m AT AREAS OF CONFLICT. TWO ADJACENT SPACES OF 2.64m AND 2.44m EACH ARE ALSO PERMISSIBLE.

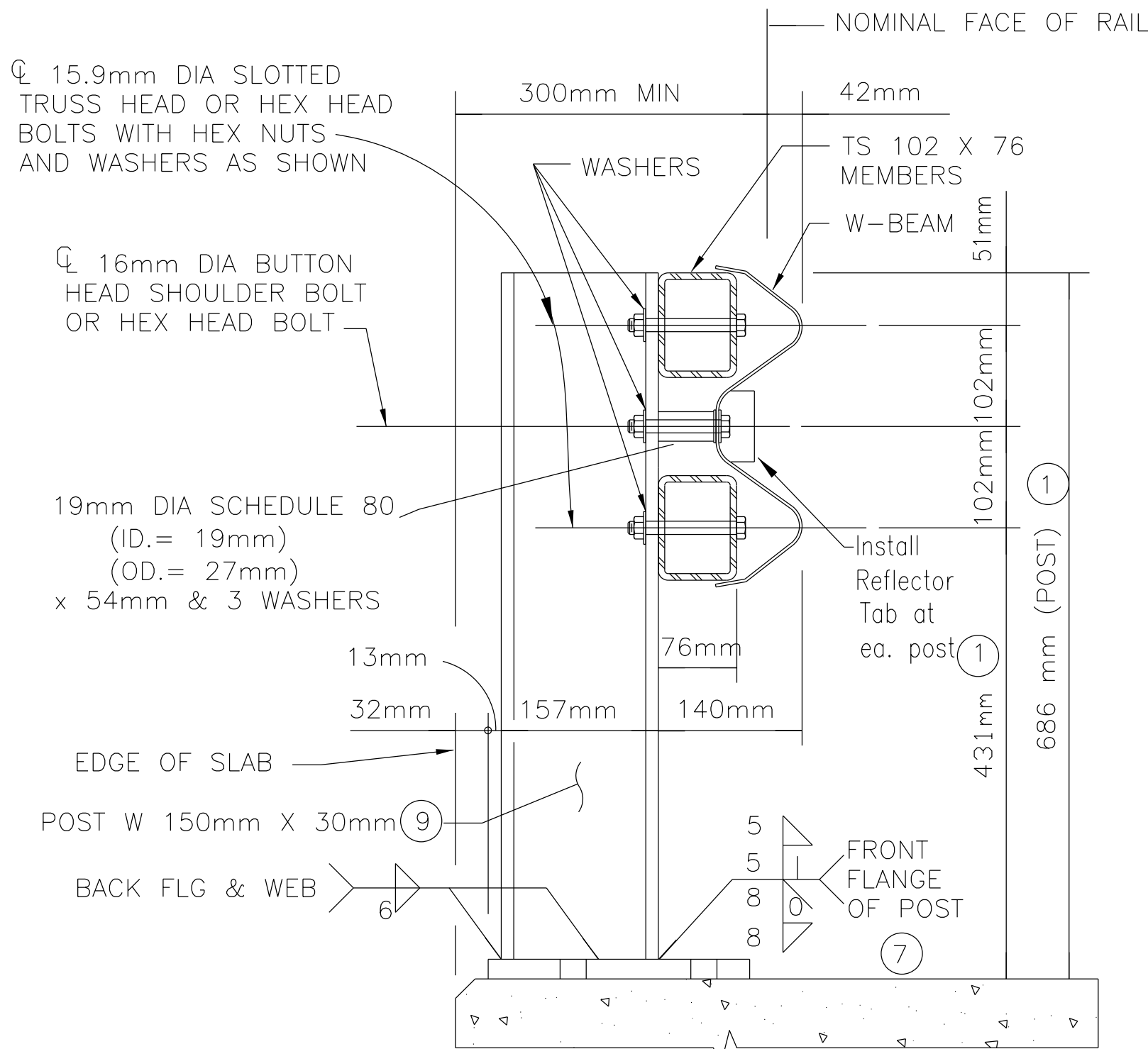


AT ABUTMENT BENTS INSIDE ELEVATION OF RAIL

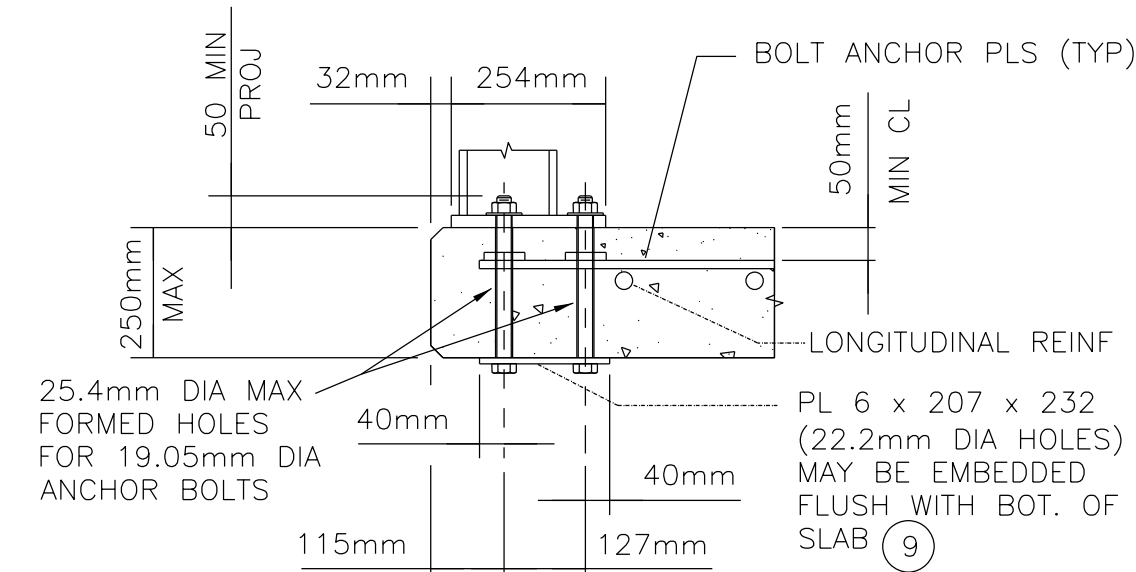
NOTE: W-BEAM RAIL NOT SHOWN. W-BEAM RAIL SHALL COVER STRUCTURAL TUBING FOR ALL BRIDGE RAIL. SEE SECTION THRU RAIL DETAIL ON THIS SHEET.



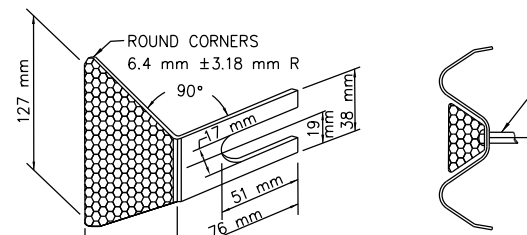
TUBE SPICE DETAILS



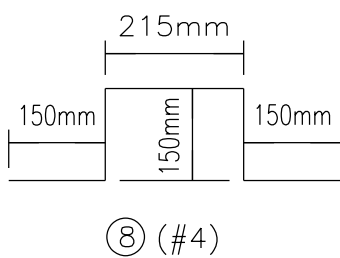
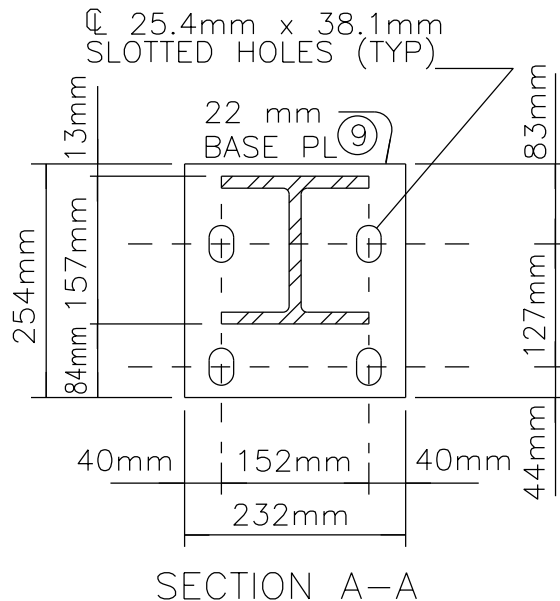
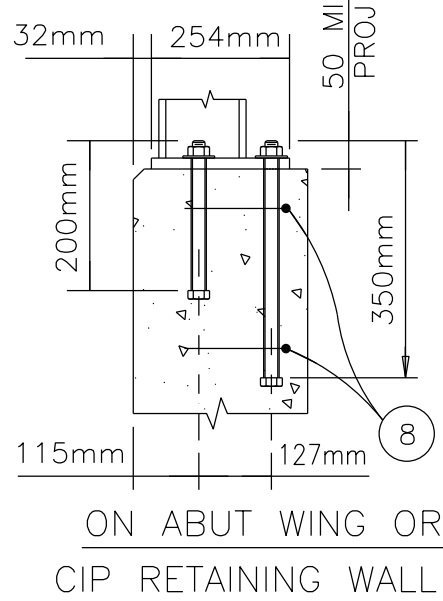
SECTION THRU RAIL



ON 250 MAX SLAB DEPTH POST MOUNTING DETAILS



REFLECTOR TAB DETAIL BOTH SIDES

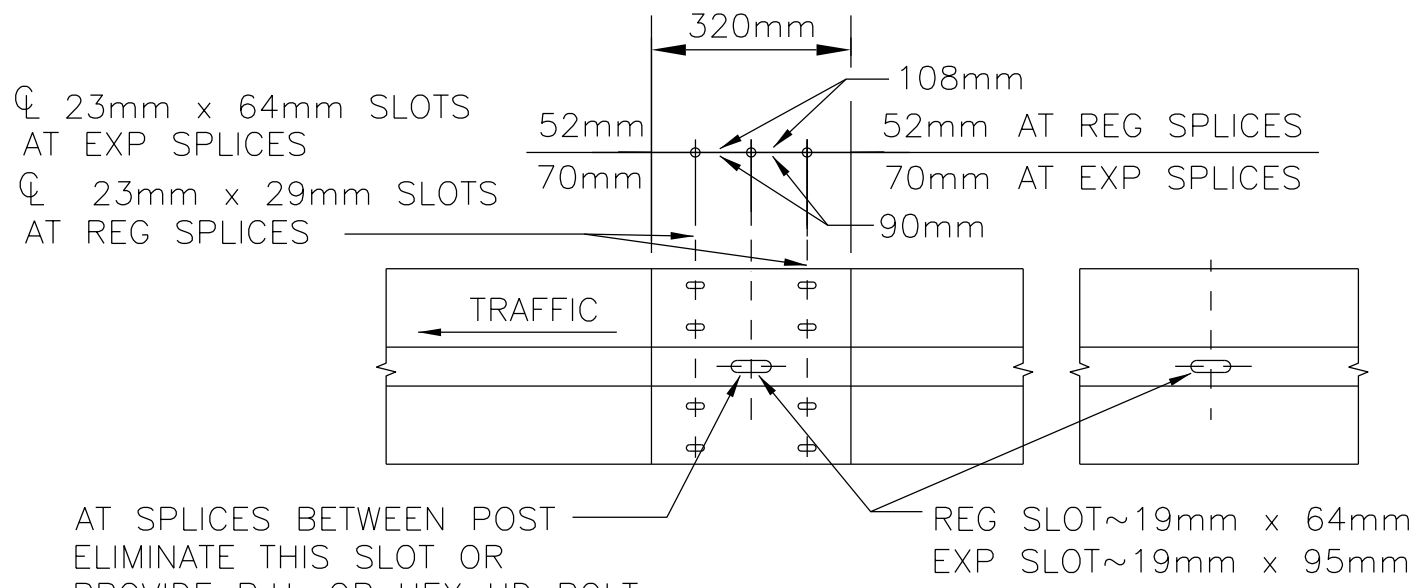
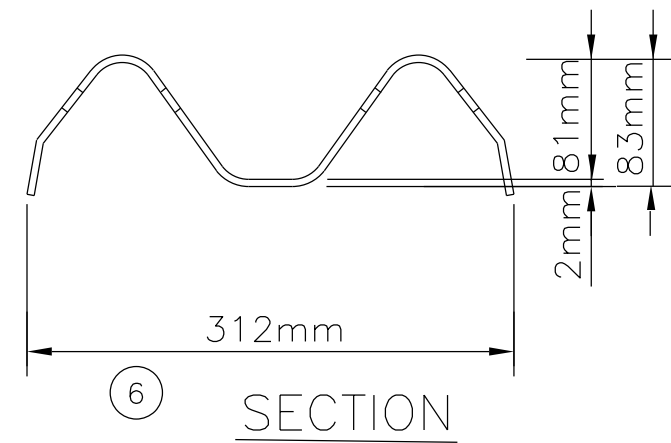


- 7 IN LIEU OF FRONT FLG WELD SHOWN, A 10mm FILLET WELD ALL AROUND INCLUDING EDGES OF FLANGE MAY BE USED.
- 8 ADJUST HORIZONTAL REINFORCING AS NECESSARY AND PLACE TWO #13 BARS AROUND ANCHOR BOLTS. THESE BARS ARE TO BE CONSIDERED SUBSIDIARY TO RAIL.
- 9 ALL STEEL POSTS AND PLATES SHALL BE ASTM A36.
- 10 SET PLATES UNDER LONGITUDINAL REINFORCING IF NECESSARY.
- 11 INSTALL ONE ANCHORAGE PLATE ASSEMBLY IN SLAB AT EACH RAIL POST. FIELD CUT OR BEND AS REQUIRED TO FIT SPECIAL CONDITIONS. DO NOT GALVANIZE OR OIL THIS ASSEMBLY.

- 5 FOR PRESTRESSED BOX BEAM SPANS THE MINIMUM DISTANCE FROM END OF BOX TO CL OF POST IS 150MM.

- 6 MEMBER SHALL BE 12 GAGE STEEL NOM THICKNESS = 2.66mm EXCLUSIVE OF PROTECTIVE COATING. ACTUAL SECTION MAY VARY SLIGHTLY WITH THE MANUFACTURER AND CONFORMS TO AASHTO M-180

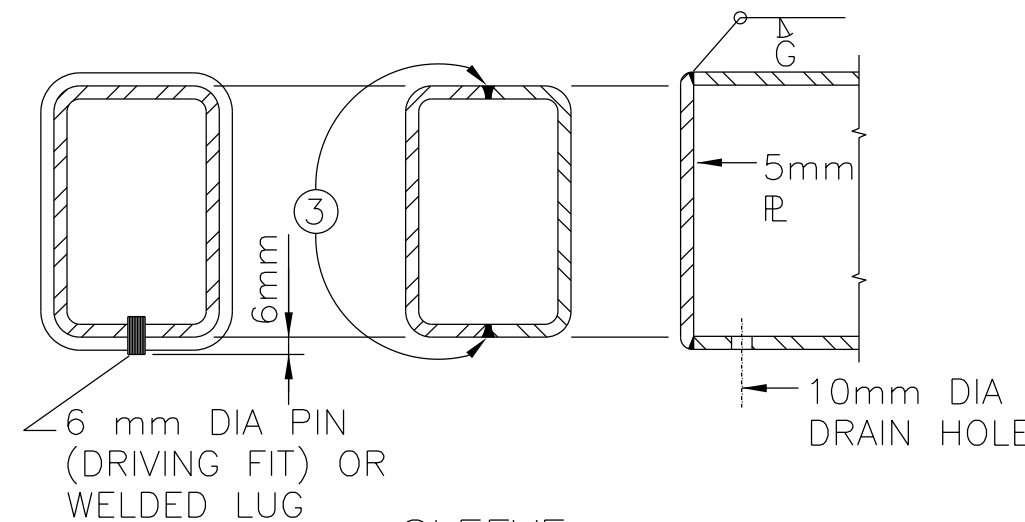
TUBE SPLICES SHALL BE PROVIDED FOR TUBES WITHIN PANEL OVER EXP ARMOR JTS



SPLICE POST CONN

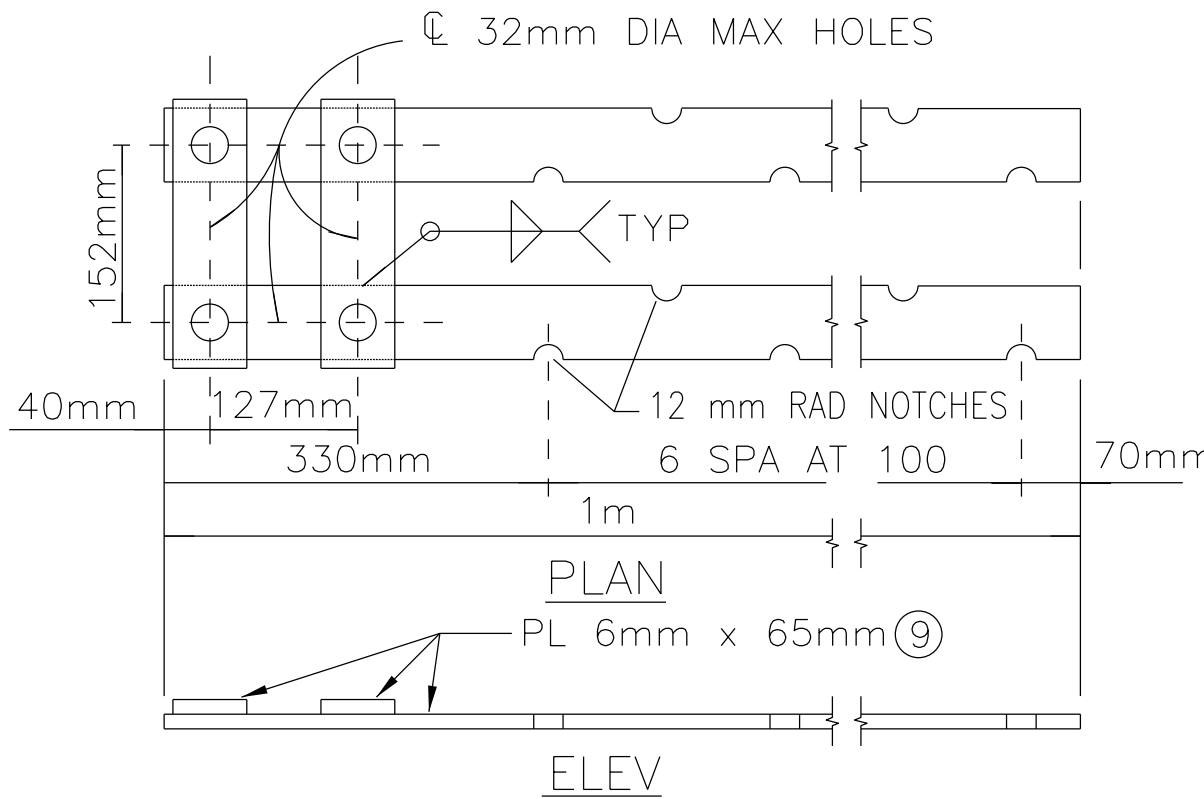
NOTE: PROVIDE 16mm DIA BUTTON HEAD SHOULDER BOLTS OR HEX HEAD BOLTS WITH HEX NUTS AT ALL SPICE SLOTS

W-BEAM DETAILS



SLEEVE FABRICATION

SECTION B-B OPTION RAIL CAP

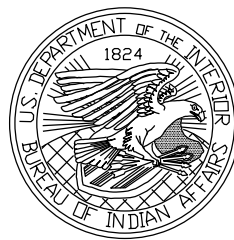


BOLT ANCHORAGE PLATES

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NAVAJO REGIONAL OFFICE - D.O.T.

STEEL BRIDGE RAILING

Designed by:	TxDOT
Drawn by:	TxDOT
Revised by:	Date:
File Name:	29_N9402_TYPE T101M

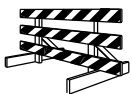

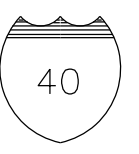


8. SHOP DRAWINGS TO BE SUBMITTED.
9. SHOP DRAWINGS MAY BE SUBMITTED AS 280mm X 432mm PRINTS PROVIDED THEY ARE CLEARLY LEGIBLE.
10. THIS RAIL REQUIRES A MIN. SLAB THICKNESS OF 203mm AND IS NOT RECOMMENDED FOR USE WITH BOX BEAM OR DOUBLE-T STRUCTURES WITH ASPHALT OVERLAY.
11. AVERAGE MASS OF RAILING WITH NO OVERLAY AND WITH 6.4mm TUBES IS 58 kg/m.

C:\Users\HaroldRiley\0 Drive\projects backup\N9402(2)- done\Microstation\final drawings\30_N9402_Traffic_Control_2017-03-27.dgn

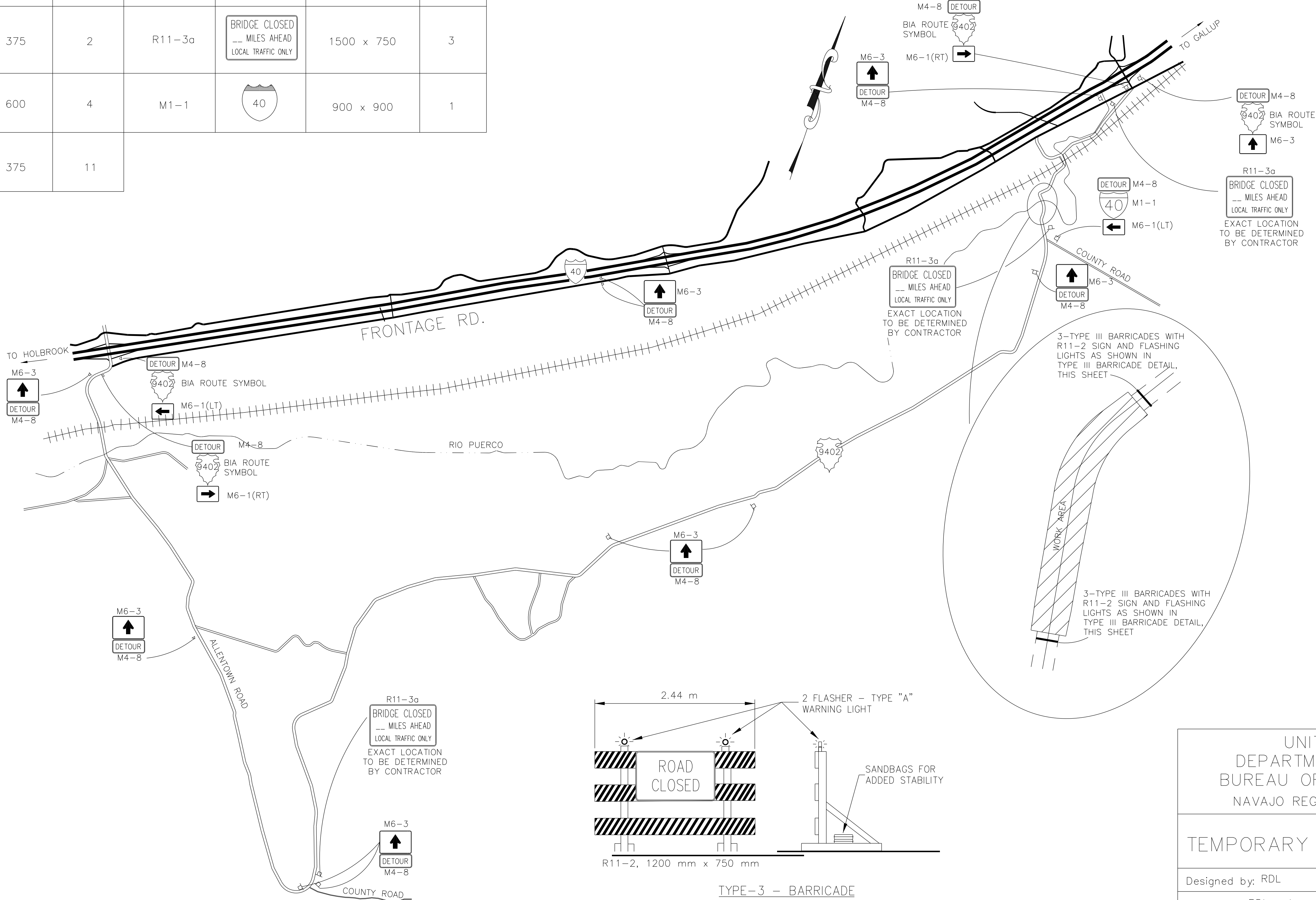
REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET
NAVAJO	AZ	NAVAJO	N9402	N9402(2)1,2&3	30 of 40

TEMPORARY TRAFFIC CONTROL DEVICES

DESIGNATION	DETAIL	MINIMUM SIZE (mm)	QUANTITY	DESIGNATION	DETAIL	MINIMUM SIZE (mm)	QUANTITY
M4-8	DETOUR	600 x 300	13	R11-2	ROAD CLOSED	1200 x 750	6
M6-1(LT)	←	525 x 375	2	Type III Barricade		As Shown	6
M6-1(RT)	→	525 x 375	2	R11-3a	BRIDGE CLOSED --- MILES AHEAD LOCAL TRAFFIC ONLY	1500 x 750	3
BIA ROUTE SYMBOL		600 x 600	4	M1-1		900 x 900	1
M6-3	↑	525 x 375	11				

GENERAL NOTES

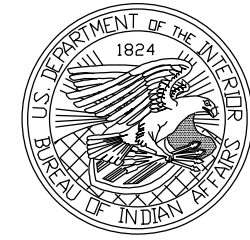
1. THE TEMPORARY TRAFFIC CONTROL DETAILS SHOWN ARE TO BE CONSIDERED A GUIDE SHOWING ONLY MINIMUM REQUIREMENTS. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PREPARING AND IMPLEMENTING HIS/HER TRAFFIC CONTROL PLAN IN ACCORDANCE WITH THESE DETAILS AND THE MUTCD, UNDER CONTRACT ITEM 63501.
2. ALL CONSTRUCTION SIGNING, CHANNELIZING DEVICES AND DELINEATORS SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION AND THE SUPPLEMENTAL SPECIFICATIONS FOR THIS PROJECT.
3. BIDDERS ARE STRONGLY ADVISED TO DRIVE THE PROPOSED DETOUR ROUTE TO DETERMINE NEEDED (MUTCD) DETOUR REQUIREMENTS. THERE MAY BE ADDITIONAL INTERSECTING ROADS, OR OTHER FEATURES, THAT REQUIRE ADDITIONAL SIGNAGE.
4. THE CONTRACTOR MAY USE THE PROPOSED DETOUR ROUTE SHOWN, PROVIDED A GOVERNMENT APPROVED DETOUR/SIGNAGE PLAN IS DEVELOPED. THE CONTRACTOR MAY, HOWEVER, SUBMIT FOR APPROVAL AN ALTERNATE DETOUR ROUTE(S) PLAN.



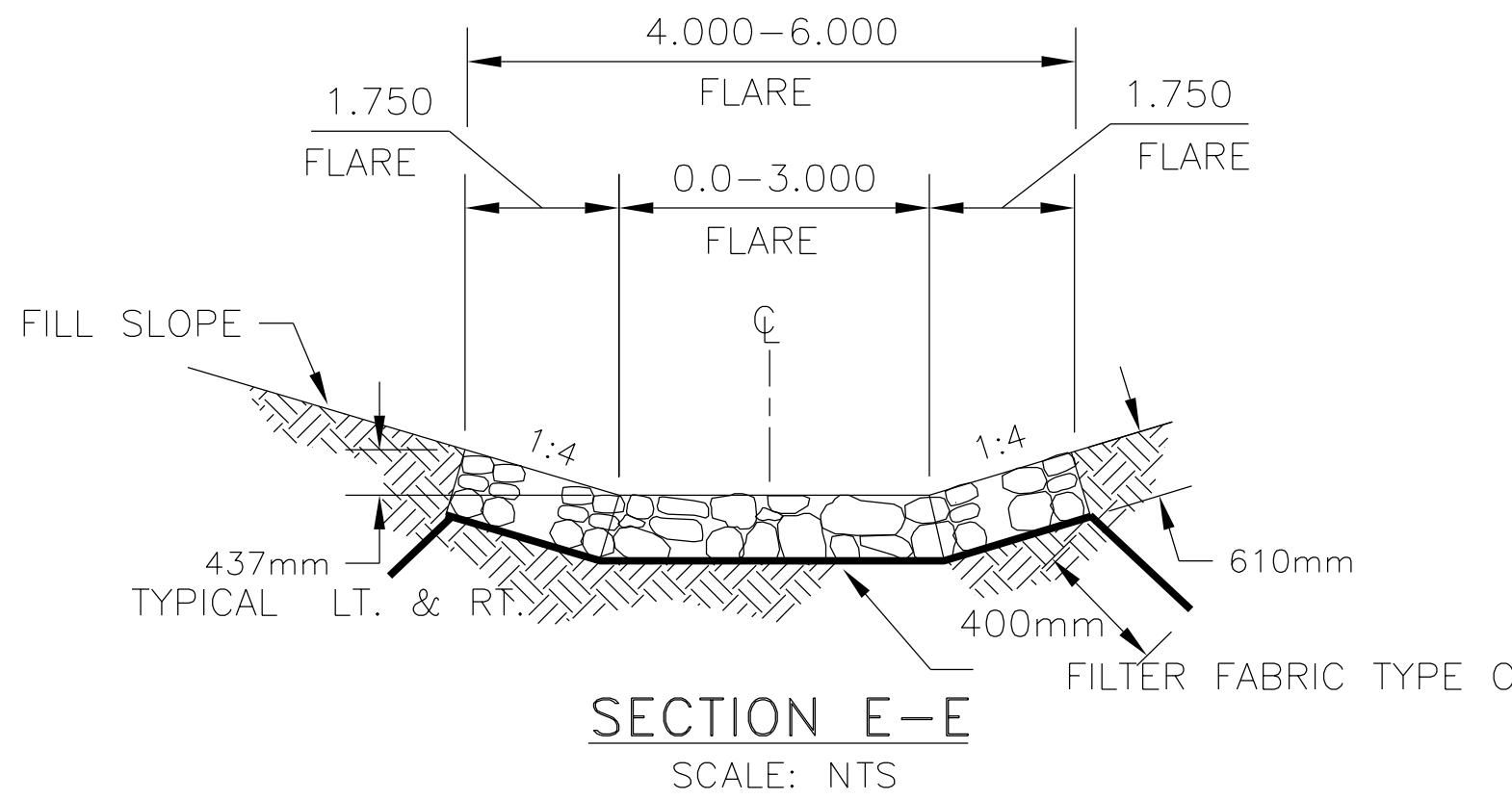
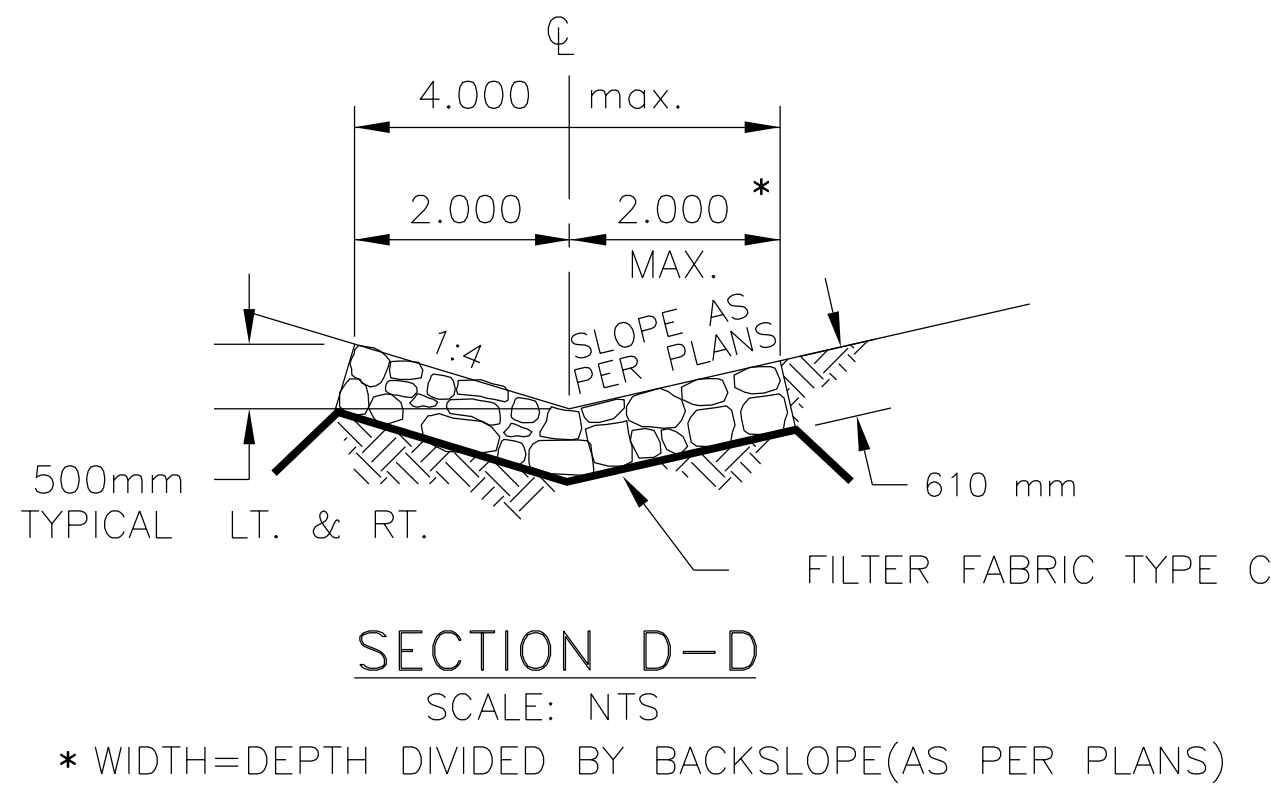
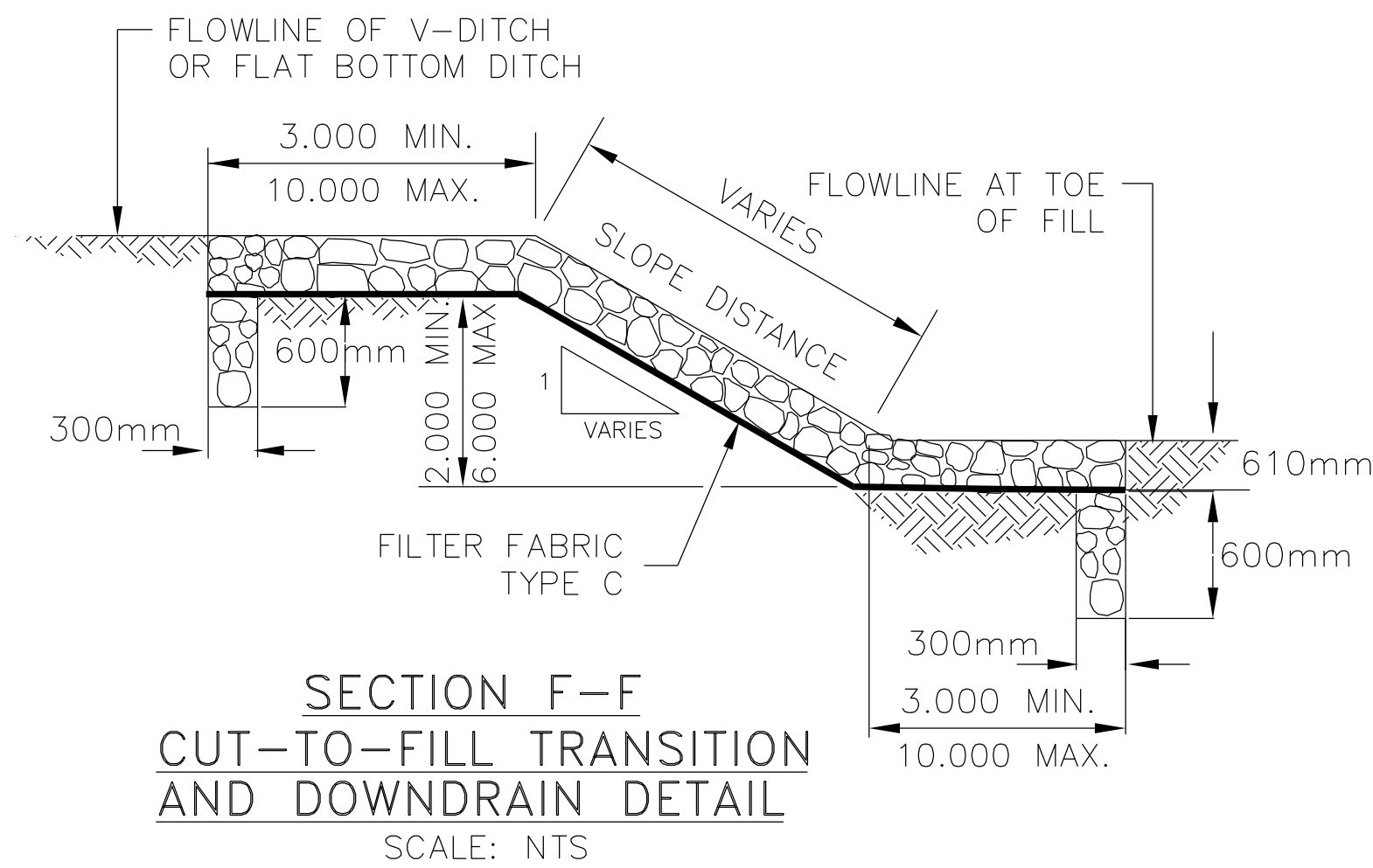
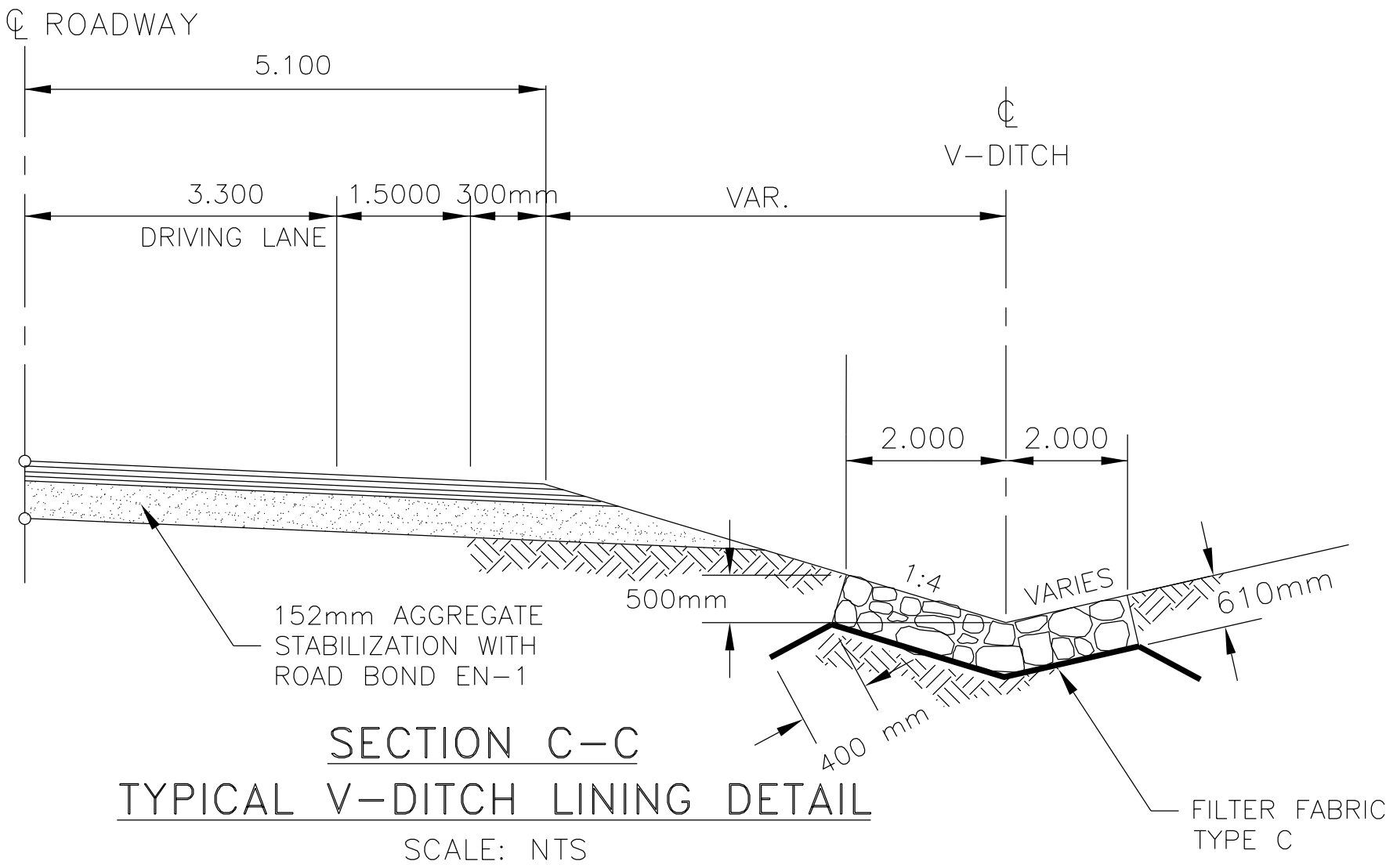
UNITED STATES
DEPARTMENT OF INTERIOR
BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL OFFICE - D.O.T.

TEMPORARY TRAFFIC CONTROL

Designed by: RDL	
Drawn by: RDL, rsh	Date: 3/27/17
Revised by: HRiley	Date: 3/19/2020
File Name: 30_N9402_Traffic_Control	



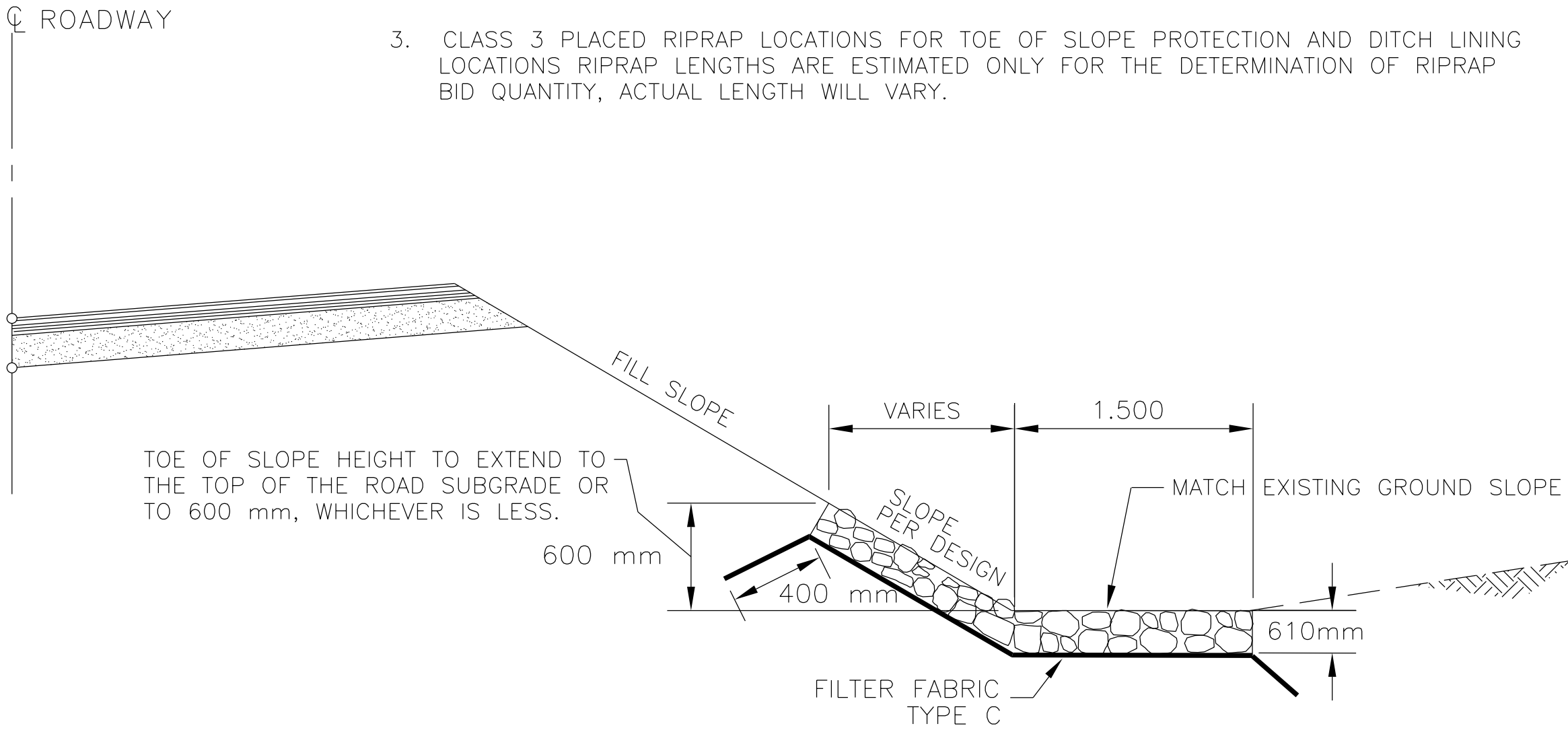
REGION	STATE	RESERVATION	ROUTE	PROJECT	SHEET
NAVAJO	AZ	NAVAJO	N9402	N9402(2)1,2&3	31 of 40



DITCH CUT-TO-FILL TRANSITION
SCALE: NTS

GENERAL NOTES

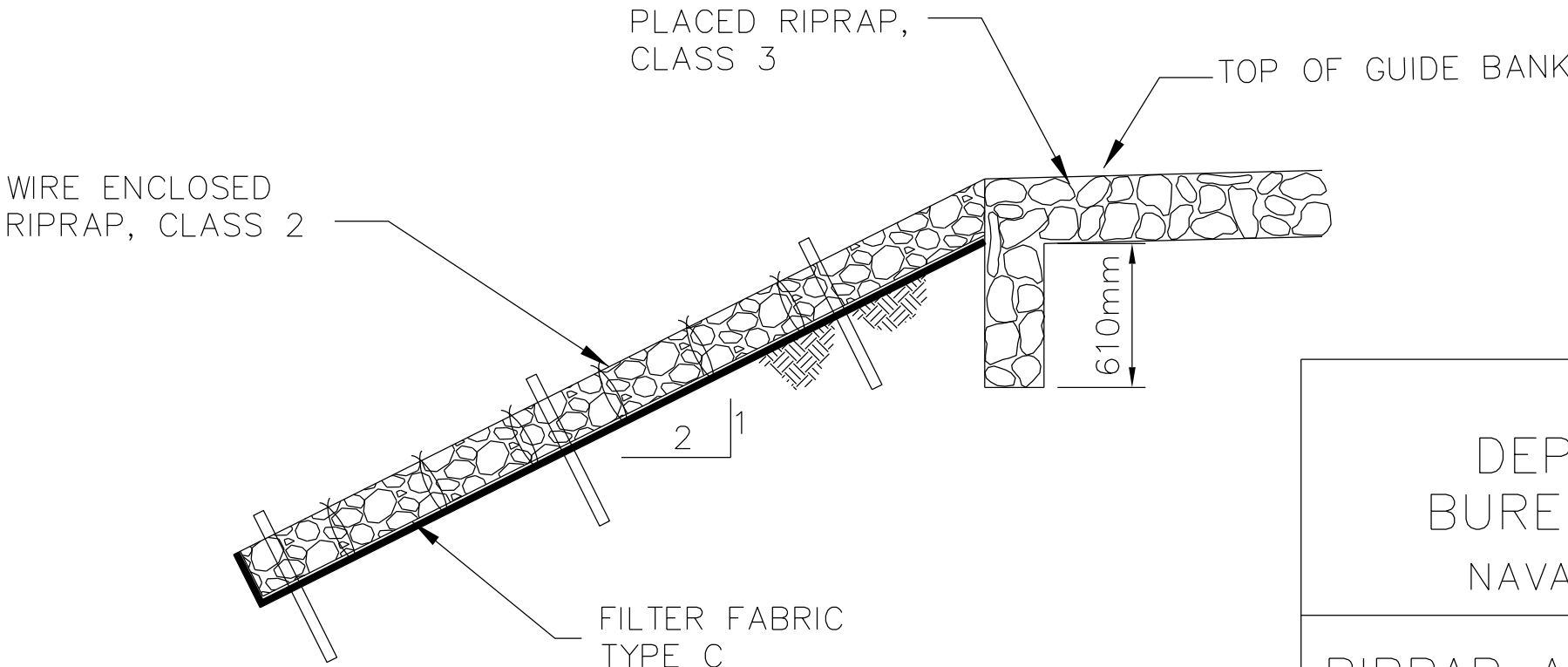
- SEE SHEET 02 FOR GENERAL NOTES.
- CLASS 3 PLACED RIPRAP LOCATIONS FOR CUT-TO-FILL TRANSITIONS, RIPRAP LENGTHS ARE ESTIMATED ONLY FOR THE DETERMINATION OF RIPRAP BID QUANTITY, ACTUAL LENGTH WILL VARY.
- CLASS 3 PLACED RIPRAP LOCATIONS FOR TOE OF SLOPE PROTECTION AND DITCH LINING LOCATIONS RIPRAP LENGTHS ARE ESTIMATED ONLY FOR THE DETERMINATION OF RIPRAP BID QUANTITY, ACTUAL LENGTH WILL VARY.



TOE OF SLOPE PROTECTION WITH PLACED RIPRAP, CLASS 3

CONSTRUCTION NOTES:

- IN TOE OF SLOPE AREAS WITH EXISTING GROUND SLOPING AWAY FROM ROADWAY, RIPRAP PROTECTION TO BE DELETED.
- THE DITCH LINING AND TOE OF SLOPE DETAILS SHOWN ON THIS SHEET REPRESENT THE TWO (2) TYPES OF RIPRAP PROTECTION TO BE IN THE GENERAL STATIONS SHOWN FOR ITEM 25101. HOWEVER, IT IS THE COR/COTR'S RESPONSIBILITY, BASED ON FINAL EARTH WORK GRADING AND EXISTING GROUND CONDITIONS, TO FIELD DETERMINE THE TYPE OF REQUIRED RIPRAP PROTECTION FOR SPECIFIC AREAS. THE COR/COTR SHALL PROVIDE THE CONTRACTOR WITH A RIPRAP LOCATION AND TYPE PLAN PRIOR TO INSTALLATION OF THE RIPRAP.
- IN ADDITION TO IDENTIFYING THE DITCH LINING VS. TOE OF SLOPE PROTECTION LAYOUT PLAN, THE COR/COTR WILL ALSO REVIEW ALL ROCK AREAS AFTER THE DITCHES HAVE BEEN "ROUGHED-IN". IF IN THE OPINION OF THE COR/COTR, THE EXISTING ROCK IS "STABLE", THE COR/COTR MAY SELECT TO DELETE SECTIONS OF RIPRAP PROTECTION. THE COR/COTR WILL ALSO REVIEW TOE OF SLOPE AREAS FOR DIRECTION OF FLOW. IF THE EXISTING GROUND SLOPES AWAY FROM THE TOE OF SLOPE, IN THESE AREAS, THE RIPRAP CAN BE DELETED.
- FILTER FABRIC SHOWN HEREIN SHALL BE EARTHWORK GEOTEXTILE TYPE C. PLACEMENT OF FILTER FABRIC SHALL BE INCIDENTAL TO ITEM 25101, PLACED RIPRAP CLASS 3.
- SEE SCHEDULES FOR SLOPE PROTECTION ON SHEET 3, ITEM 25101.

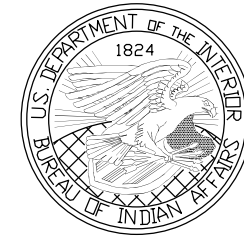


DITCH OUTLET AT GUIDE BANK
SCALE: NTS
(At Station 0+341, right)

UNITED STATES
DEPARTMENT OF INTERIOR
BUREAU OF INDIAN AFFAIRS
NAVAJO REGIONAL OFFICE - D.O.T.

RIPRAP AT CUT-TO-FILL TRANSITION
AND TOE-OF-SLOPE PROTECTION

Designed by: BOR
Drawn by: BOR, rsh Date: 11/15/17
Revised by: HRiley Date: 3/19/2020
File Name: 31_N9402_CutFill Ditch

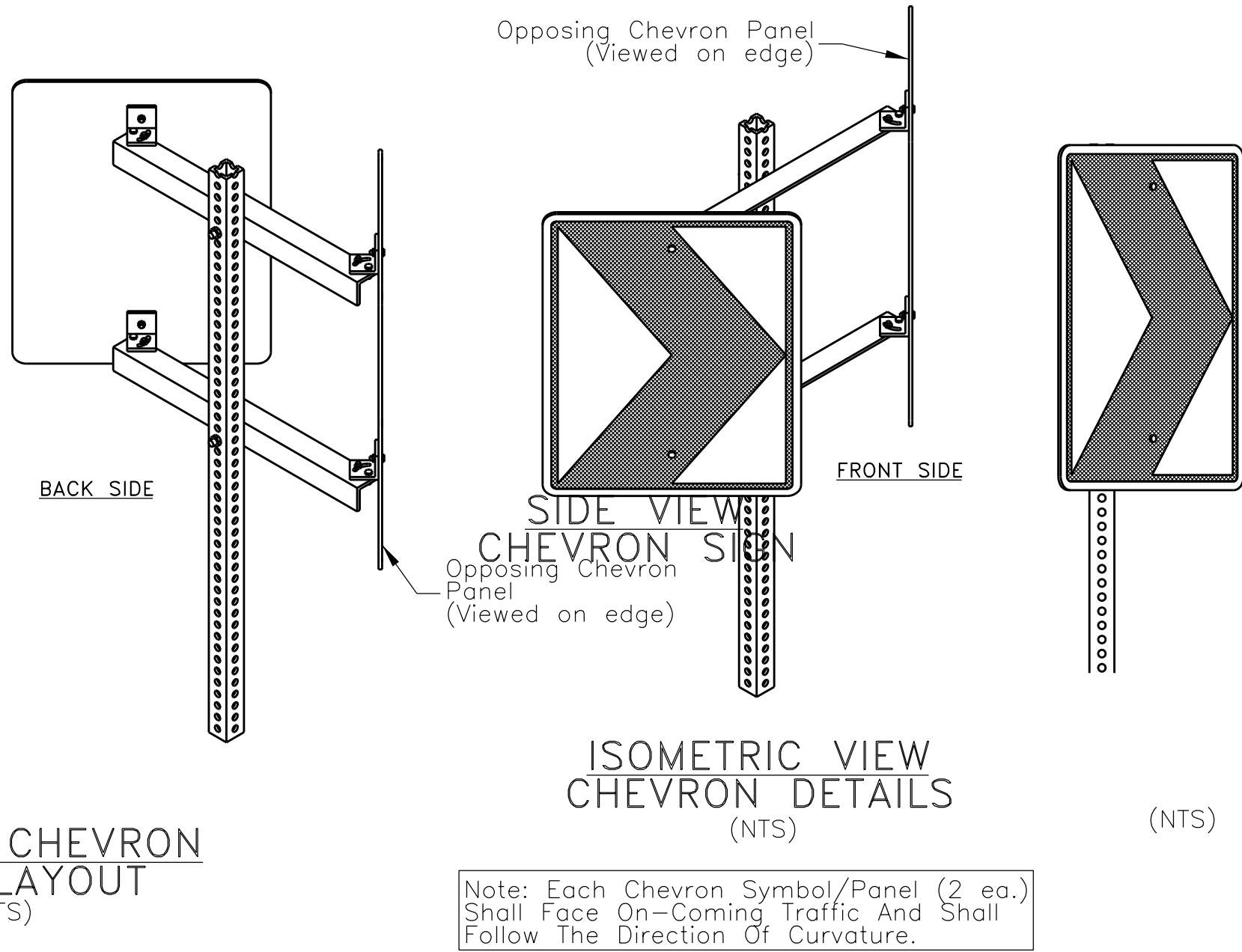
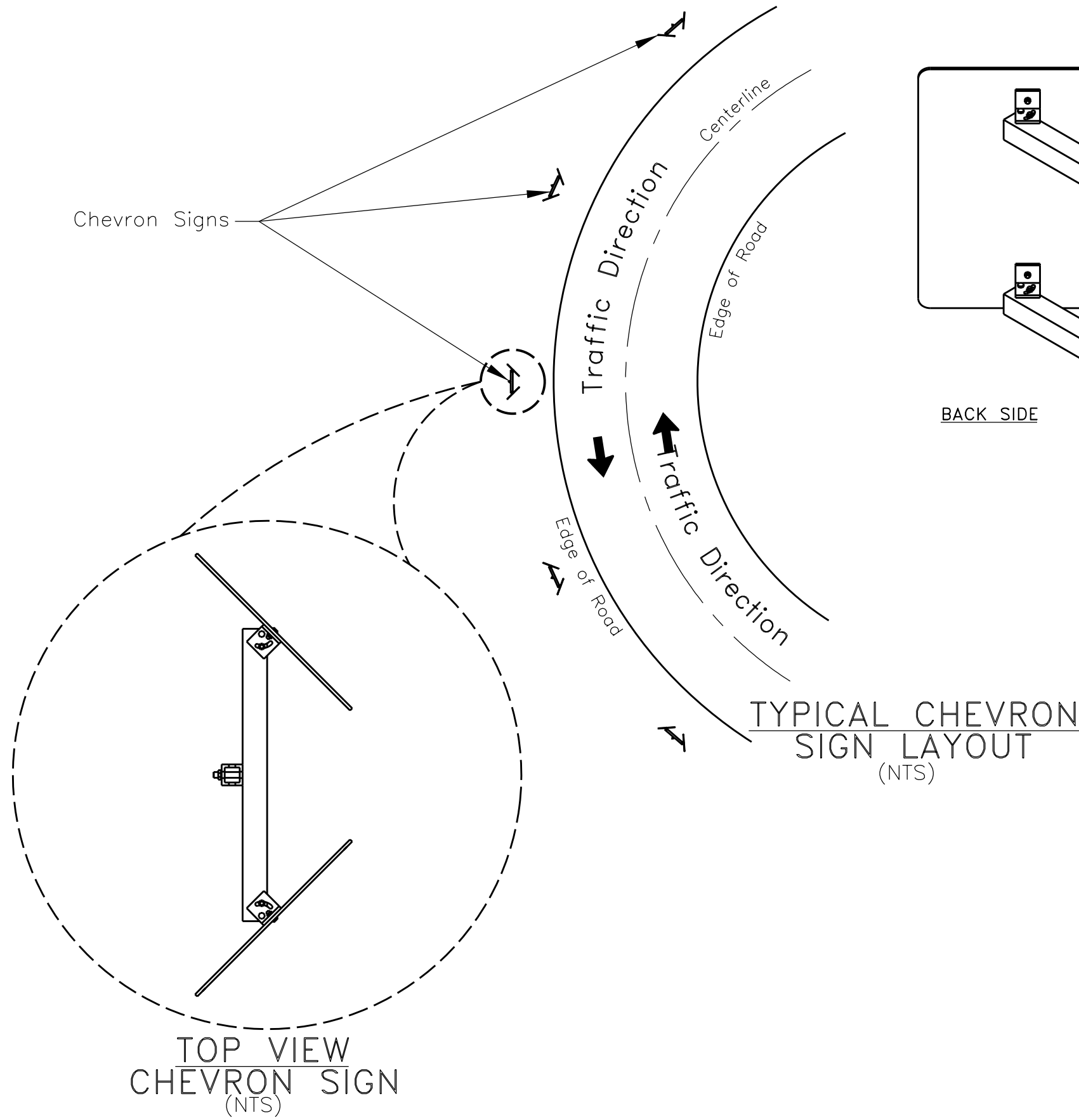
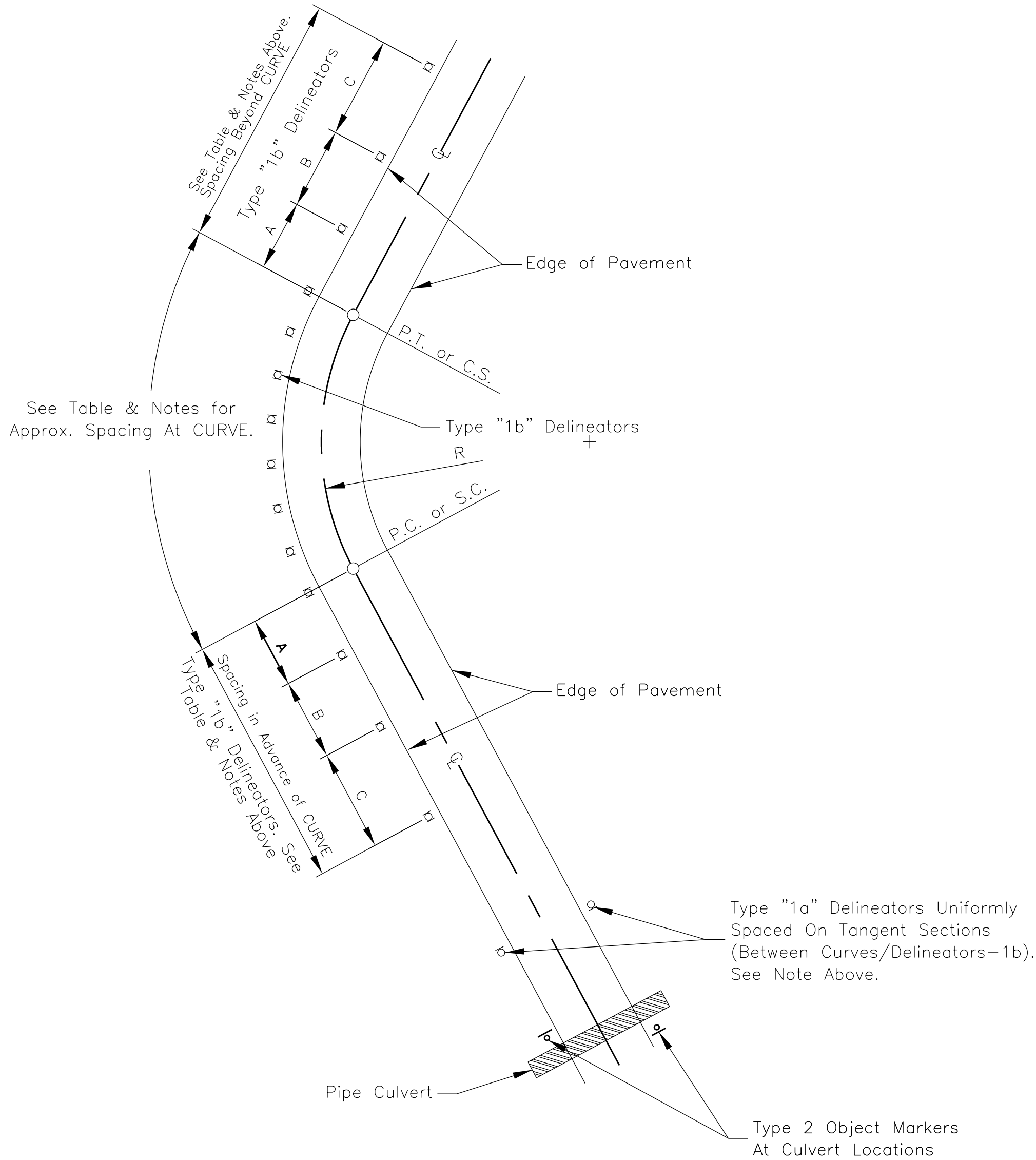


RADIUS OF CURVE (m)	APPROXIMATE SPACING (S) ON CURVE (m)	SPACING ON ADVANCE OF OR BEYOND A CURVE (m)		
		A (2S)	B (3S)	C (6S)
15	6	12	18	36
35	8	16	24	48
55	11	22	33	66
75	13	26	39	78
95	15	30	45	90
125	18	36	54	108
155	20	40	60	120
185	22	44	66	132
215	24	48	72	144
245	26	52	78	156
275	27	54	81	162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

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

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

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



REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N9402	N9402(2)1,2&3	32	40

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

DELINEATORS & OBJECT MARKER
LAYOUT DETAIL & QUANTITY TABLES

DRAWN BY: NRDOT DATE: 1/24/2013
DESIGNED BY: NRDOT DATE: 1/24/2013
REVISED: 11/15/2017 BY: rsh
FILE NAME: 32_N9402_STD Delineators

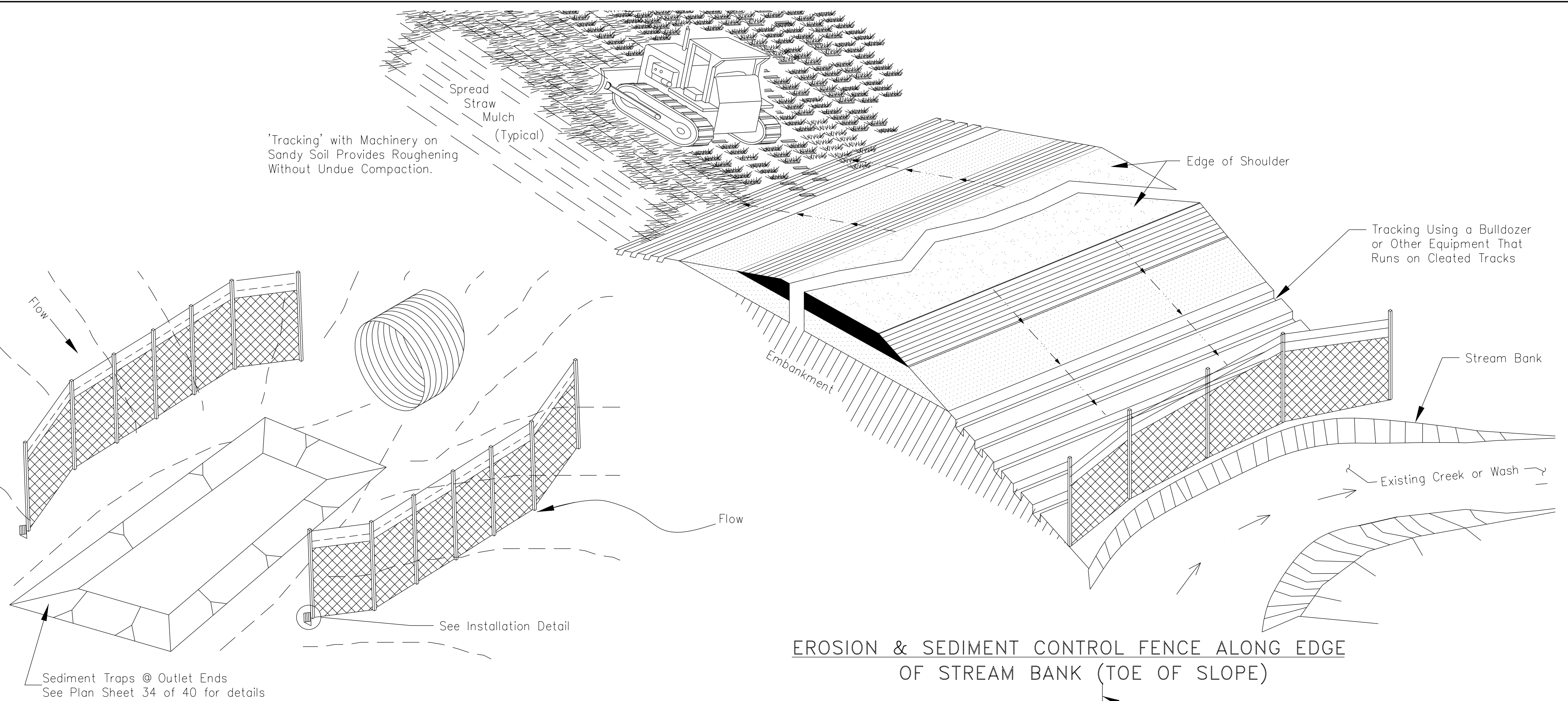


REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N9402	N9402(2)2&3	33	40

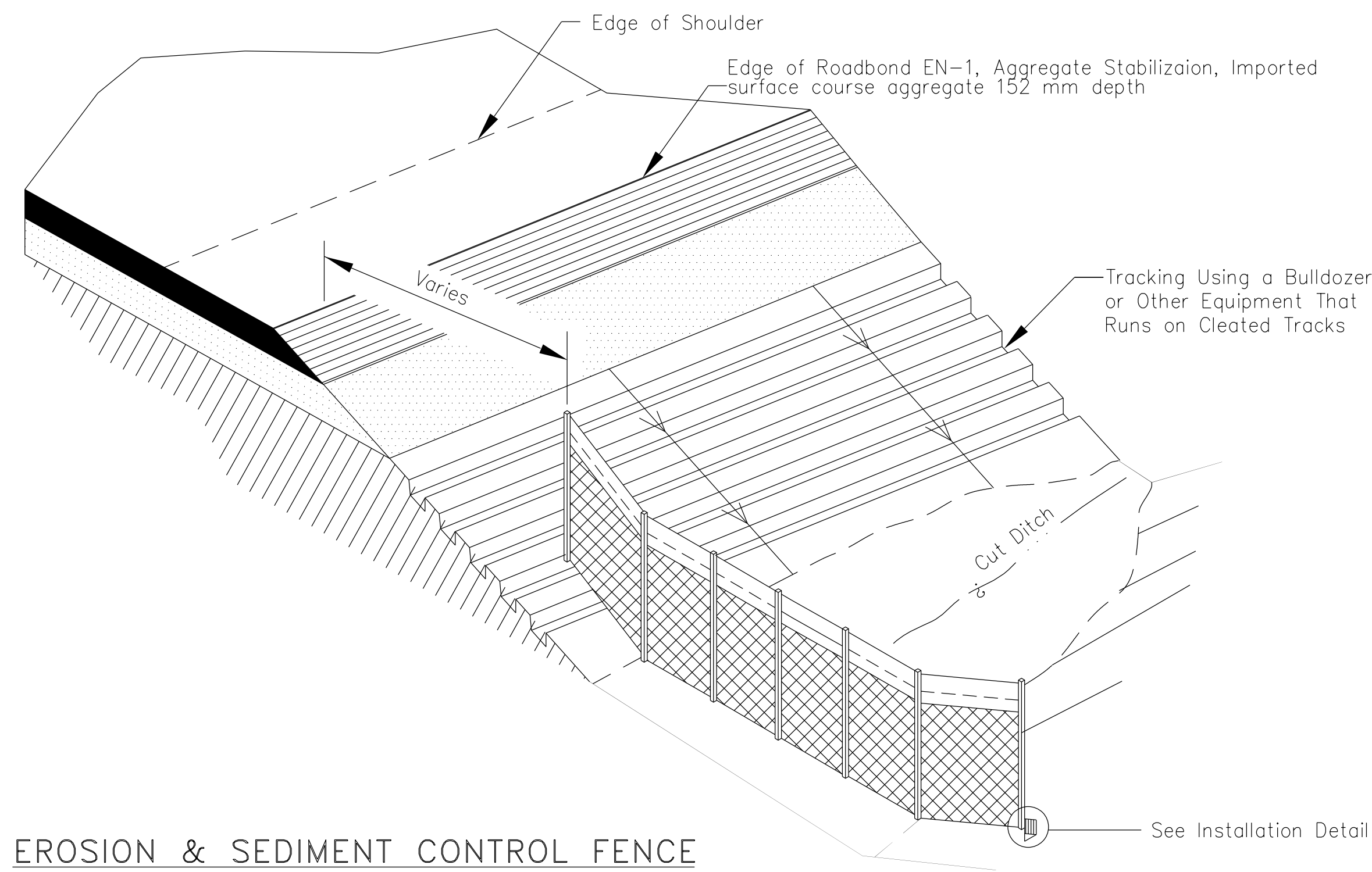
GENERAL NOTES

1. The Contractor Shall Prepare and Submit a Storm Water Pollution Prevention Plan (SWPPP) in Full Details For All Phases of the Work For Review and Approval at Least 14 Calendar Days Before Implementation. The Plan Shall Meet the Requirements Herein and in Section 157 of FP-14 As Modified in the Supplemental Specifications. See Special Contract Requirements For NPDES Permit Requirements.
2. The Silt Fencing Consists of 914 mm Sediment Control Fabric Cloth With Buried-Toe, and Steel Posts (Tee or U Type) Spaced at 2.0 m With 2 mm Size Welded Wire Back-Up Fence.
3. Woven Wire Fabric to Be Fastened Securely to Fence Posts With Wire Ties or Staples. Filter Cloth to Be Fastened Securely to Woven Wire Fence With Ties Spaced Every 610 mm At the Top and Mid-Section. Geotextile Material For Silt Fencing Shall Be Class 1 Type C Under Sub-Section 714.01 of FP-14.
4. When Two Sections of Filter Cloth Adjoin Each Other They Shall Be Overlapped By 152 mm and Folded. Maintenance Shall Be Performed as Needed and Material Removed to Prevent "Bulges" Developing in the Silt Fence.
5. The Silt Fence Shall Be Installed Along the Roadway Ditches, Along the Bottom of All Embankment Fills That Are Within 2.0 m of Existing Streams, Creeks, or Washes, and in Areas With Highly Erosive Soils. Silt Fence to Be Placed 1-2 Meters Toward the R.O.W. Lines From the Base of Fill Slopes 1:3 or Steeper in Accordance With Section 157 of FP-14 and the Supplemental Specifications.
6. Straw Bales May Be Used at the Top of Cut Backslopes and For Dikes Provided They Are Properly Anchored With Steel Fence Posts or 51x51 mm X 1.22 m Wood Stakes (Two Per Bale) Chored 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 Nor in 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.
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 COR) Showing Erosion Damage Caused by the Contractor's Failure to Properly Maintain His Erosion Control Structures Shall Be Repaired. Any Specified Erosion Control Materials, Structures, or Devices Damaged or Lost Due to Improper Installation, the Contractor's Negligence or Improper Maintenance, Shall Also Be Repaired and/or Replaced Prior to Final Acceptance at the Contractor's Entire Expense.

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

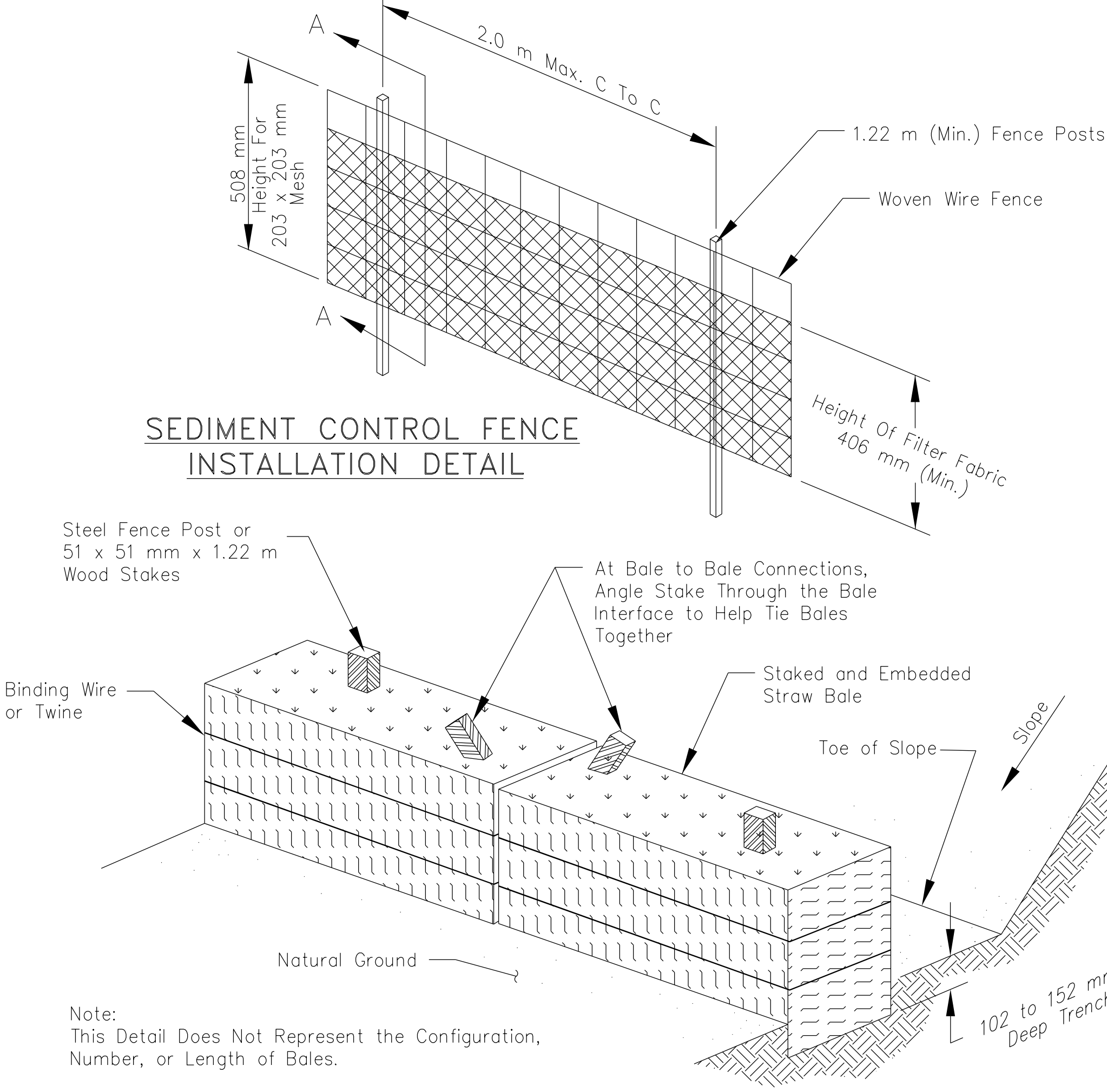


EROSION & SEDIMENT CONTROL FENCE AT DRAINAGE STRUCTURE

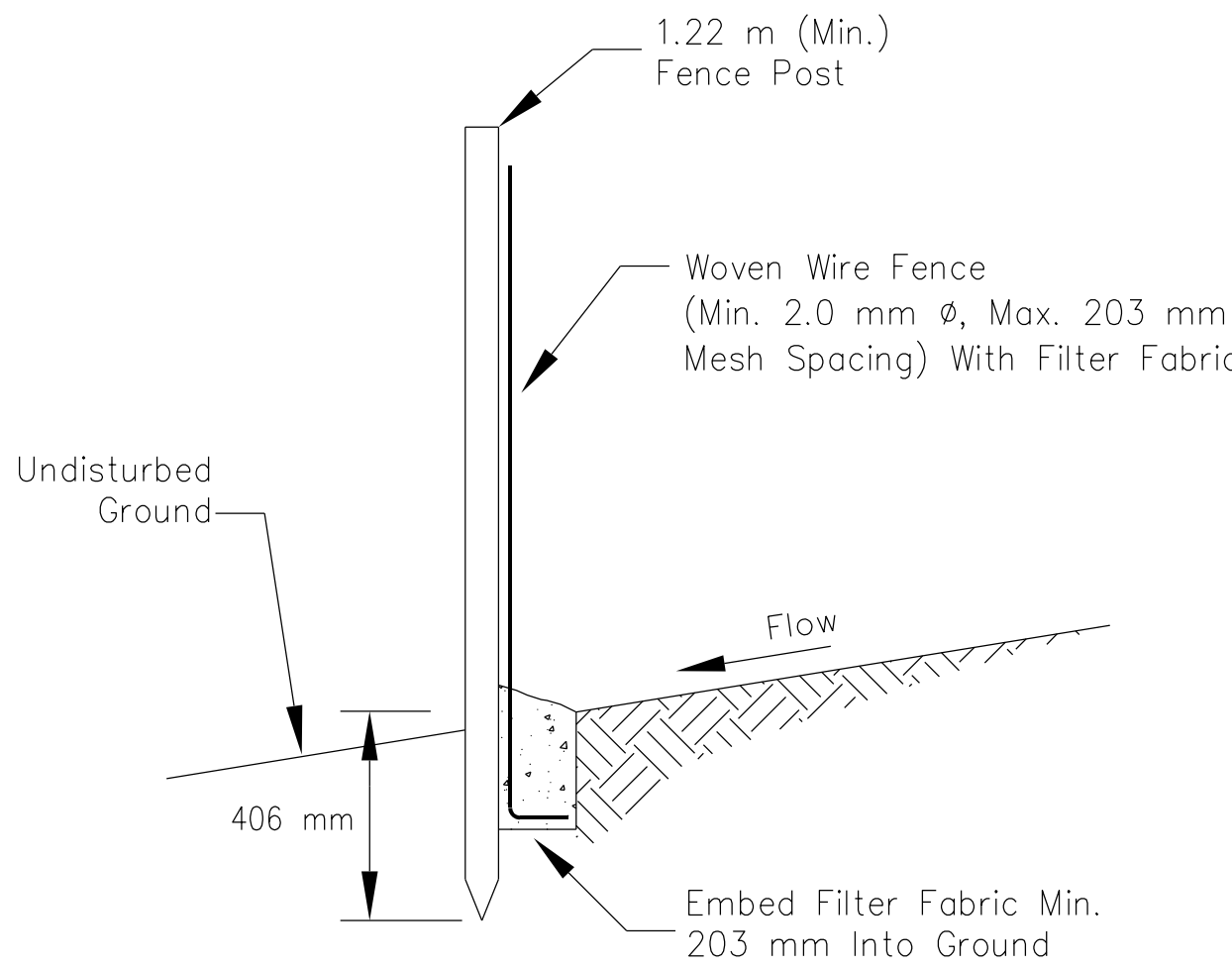


EROSION & SEDIMENT CONTROL FENCE IN MINOR SWALES OR CUT DITCHES (APPROX. 60 m SPACING FOR FABRIC)

SEDIMENT CONTROL FENCE INSTALLATION DETAIL



TYPICAL STRAW BALE STAKING AND TRENCHING DETAIL



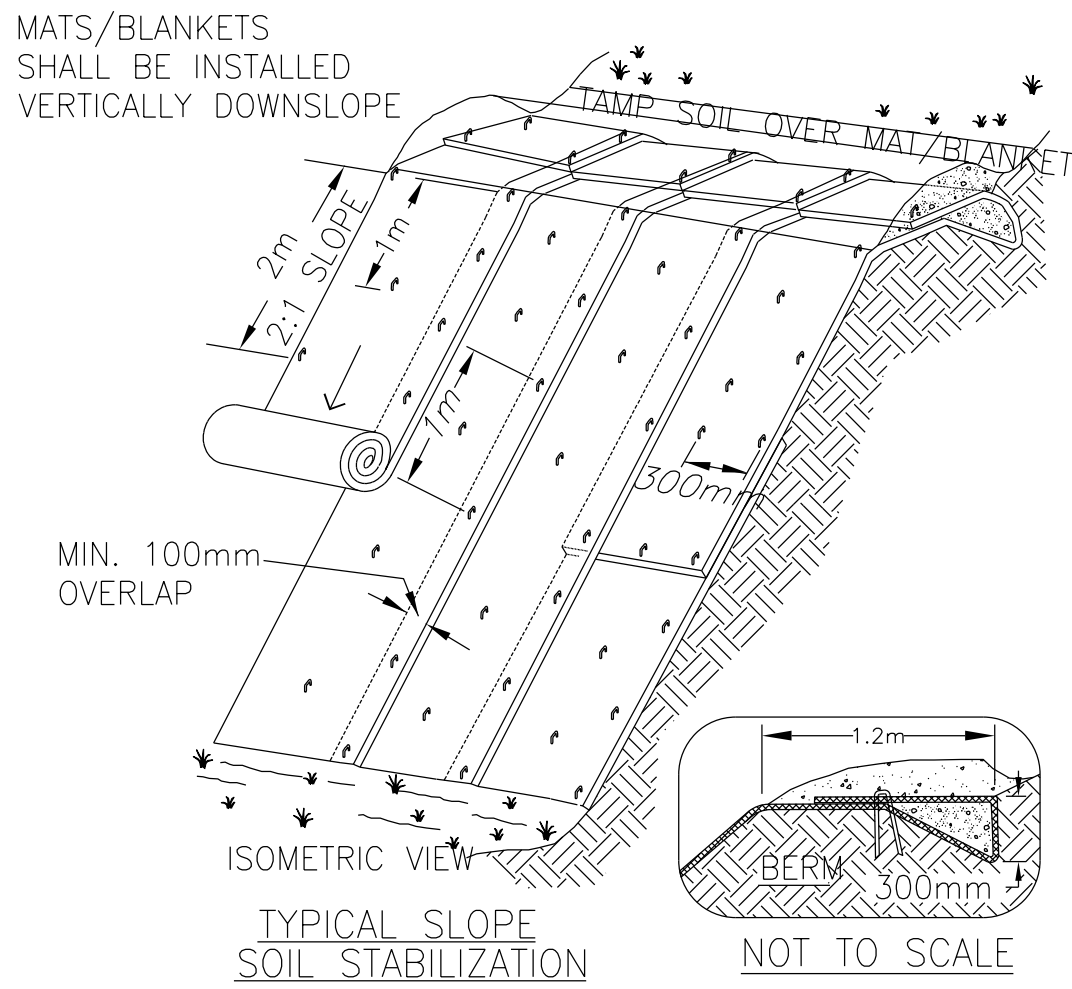
SECTION A-A

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

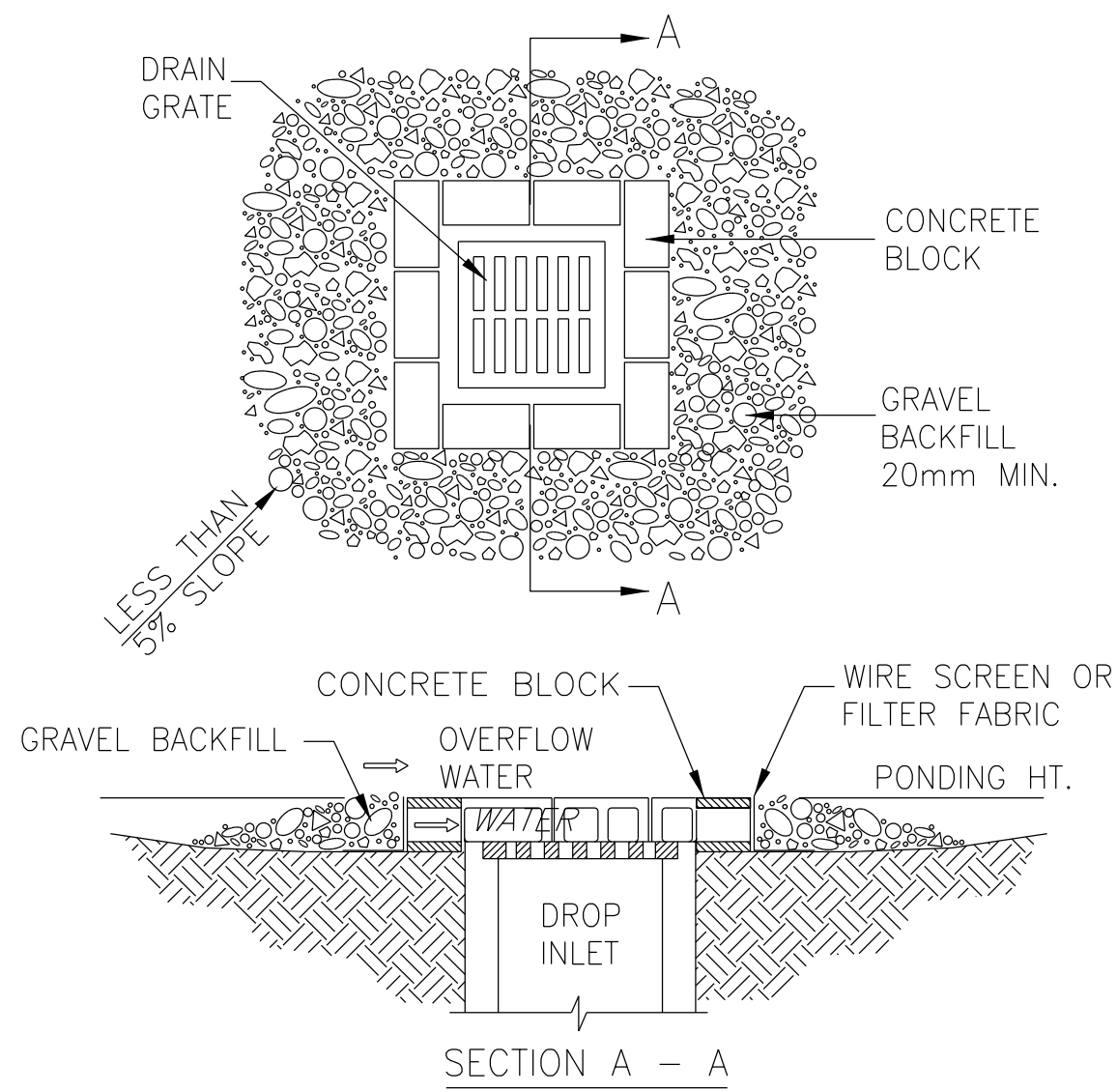
STORMWATER POLUTION &
EROSION CONTROL DETAILS

DRAWN BY: NRDOT	DATE: 1/24/2013
DESIGNED BY: NRDOT	DATE: 1/24/2013
REVISED: 3/19/2020	BY: HRiley
\$FILES\$	





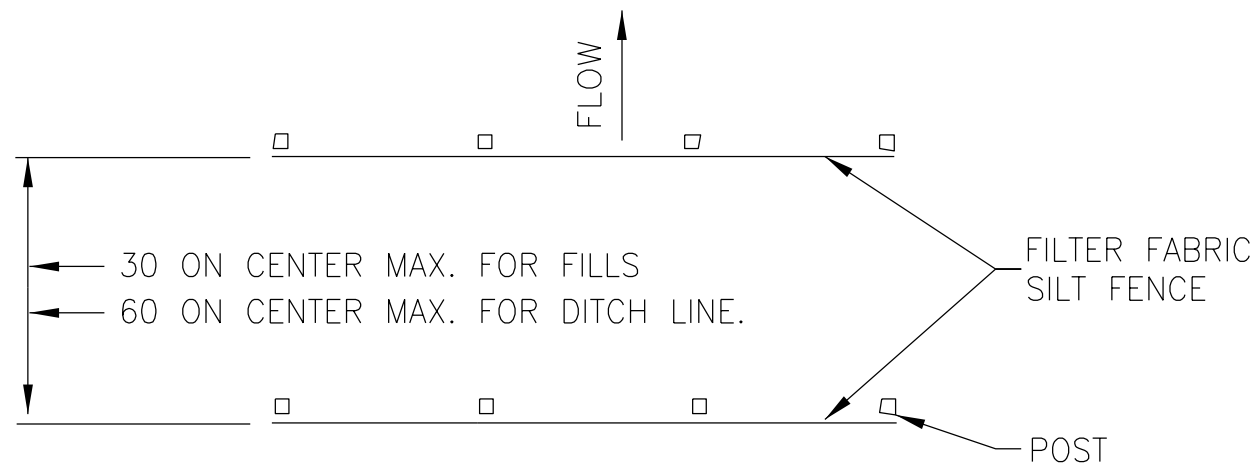
EROSION BLANKETS & TURF
REINFORCEMENT SLOPE INSTALLATION



BLOCK AND GRAVEL
DROP INLET SEDIMENT BARRIER

BLOCK AND GRAVEL DROP INLET NOTES:

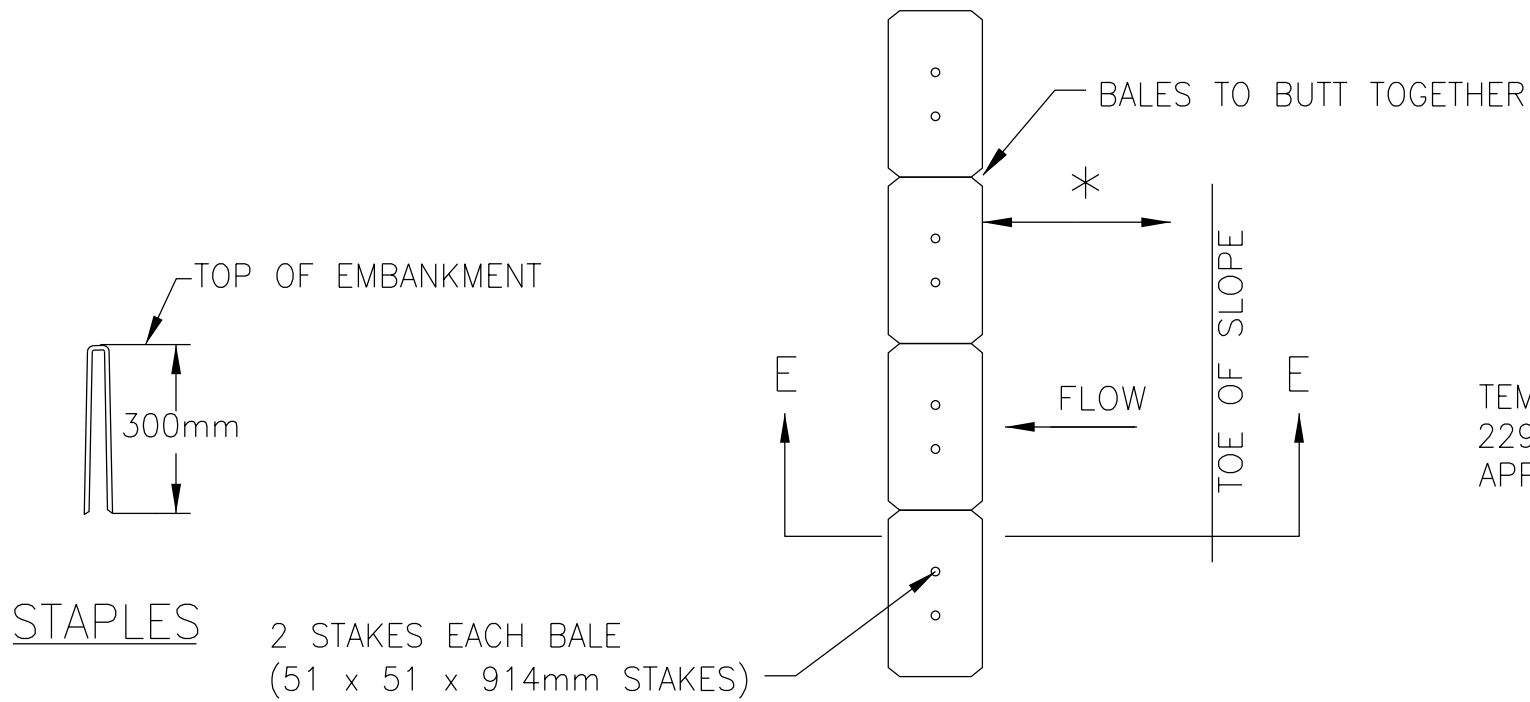
1. DROP INLET SEDIMENT BARRIERS ARE TO BE USED FOR SMALL, NEARLY LEVEL DRAINAGE AREAS (LESS THAN 5% SLOPE).
2. EXCAVATE A BASIN OF SUFFICIENT SIZE ADJACENT TO THE DROP INLET.
3. THE TOP OF THE STRUCTURE (PONDING HEIGHT) MUST BE WELL BELOW THE GROUND ELEVATION DOWNSLOPE TO PREVENT RUNOFF FROM BYPASSING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



SILT FENCE EROSION CHECK PLAN

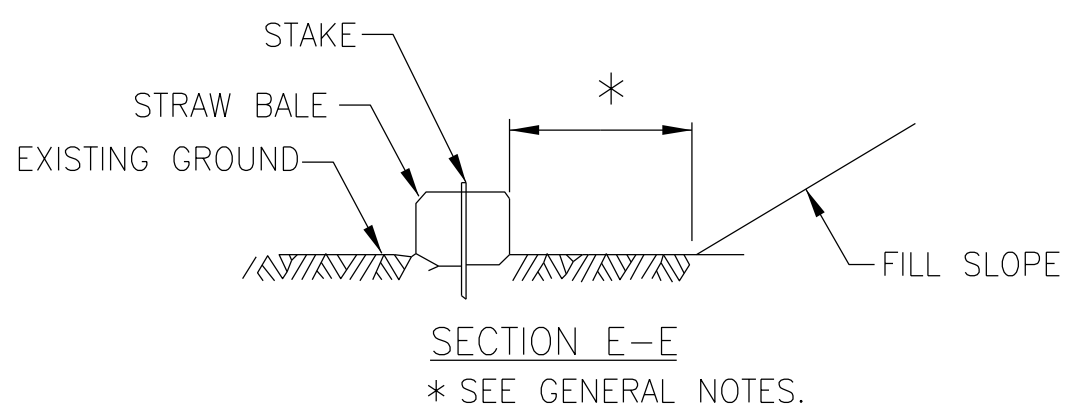
EROSION BLANKET NOTES:

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

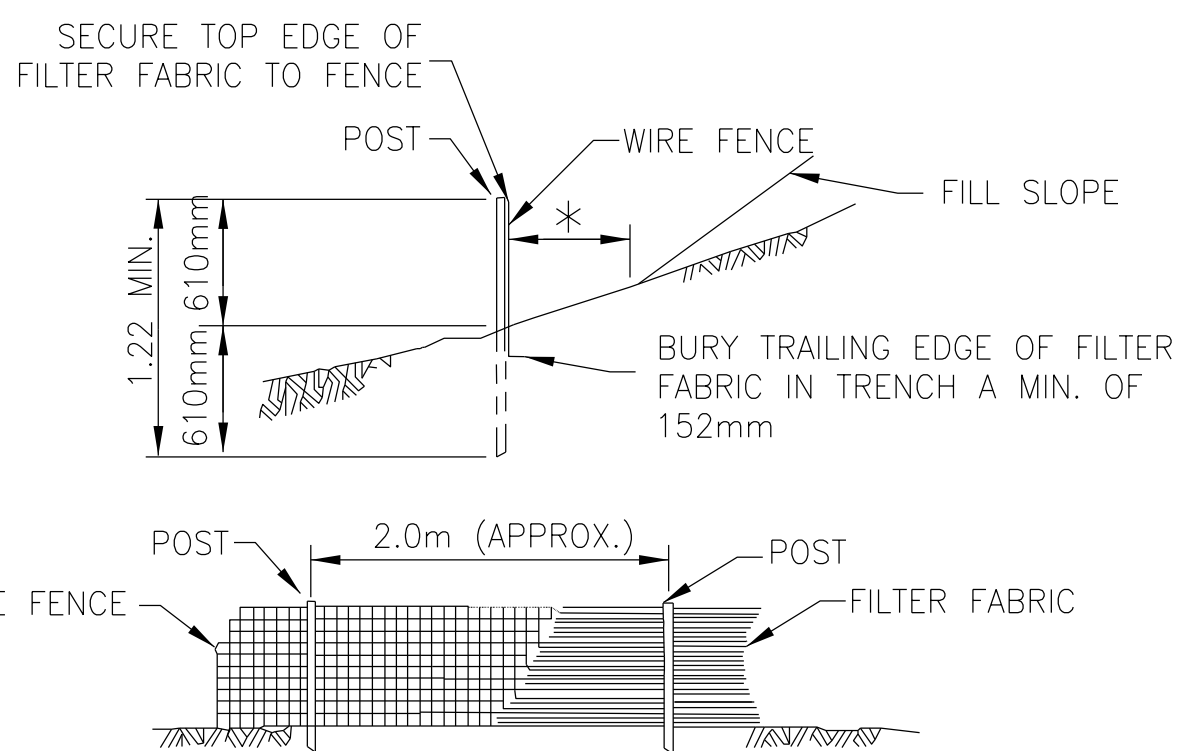


STRAW BALE SILT BARRIER PLAN

* SEE GENERAL NOTES.

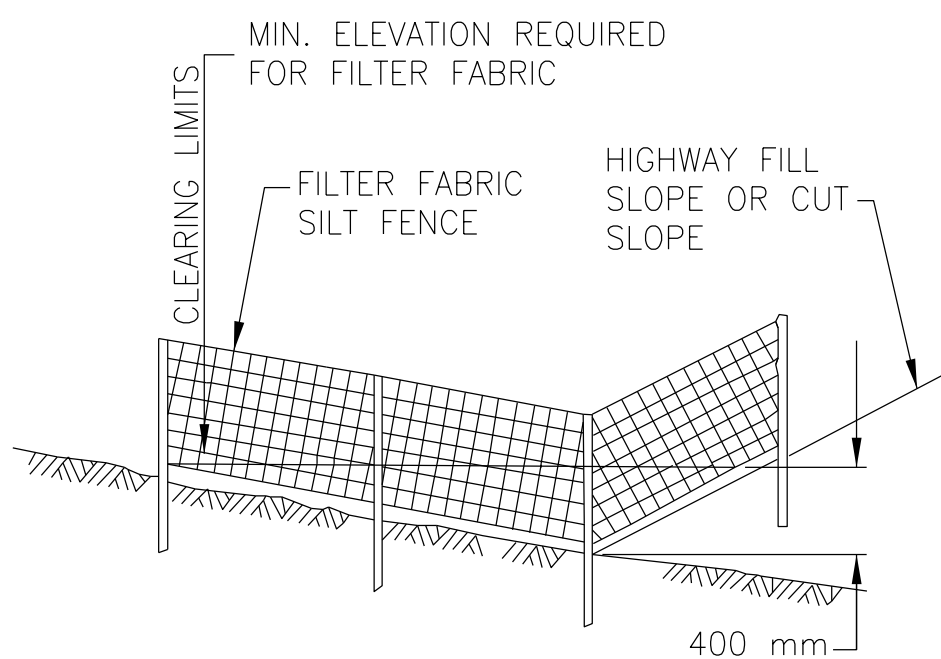


SECTION E-E
* SEE GENERAL NOTES.

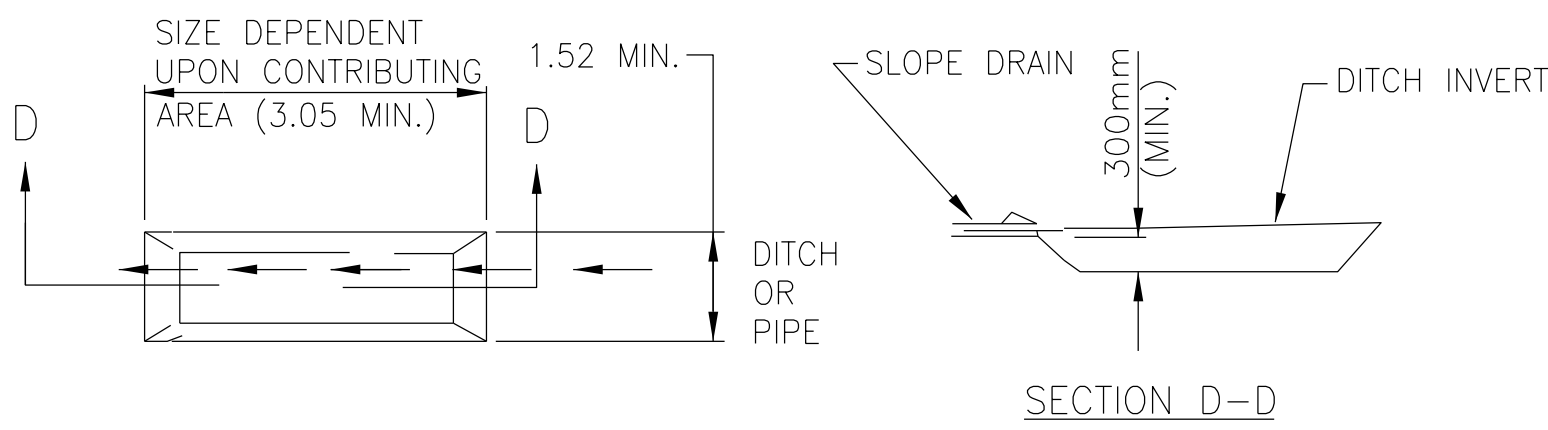


FILTER FABRIC SILT FENCE

* SEE GENERAL NOTES.

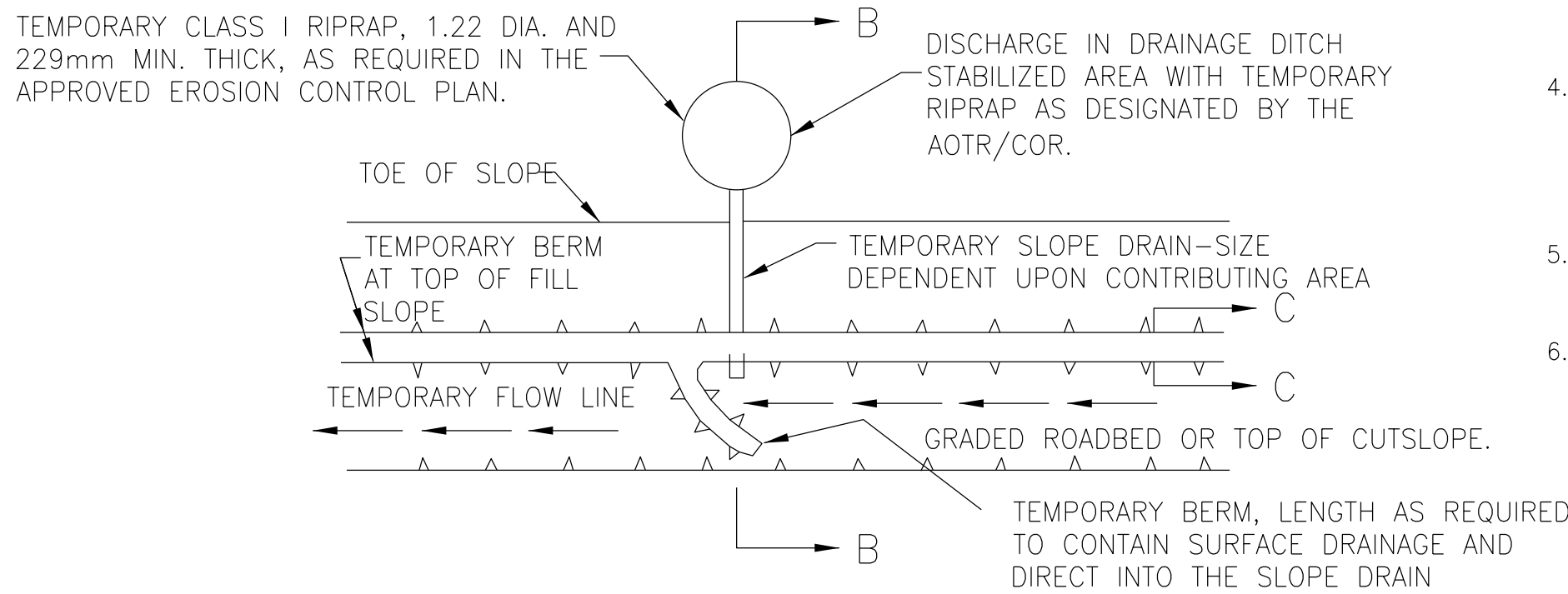


SILT FENCE ELEVATION

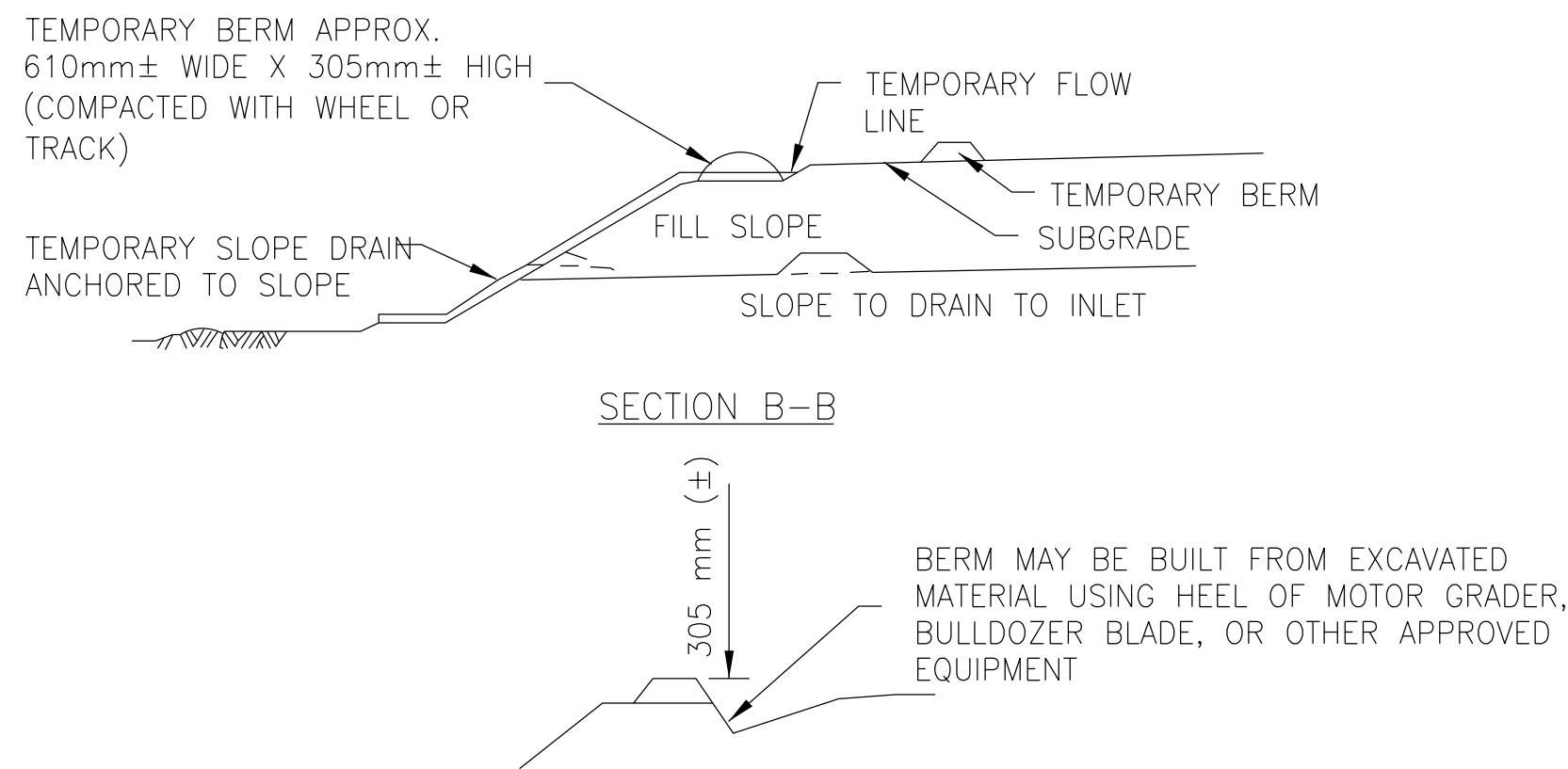


SEDIMENT TRAP

(TRAPS SHALL NOT FILL TO BEYOND ONE-HALF CAPACITY PRIOR TO CLEANING)



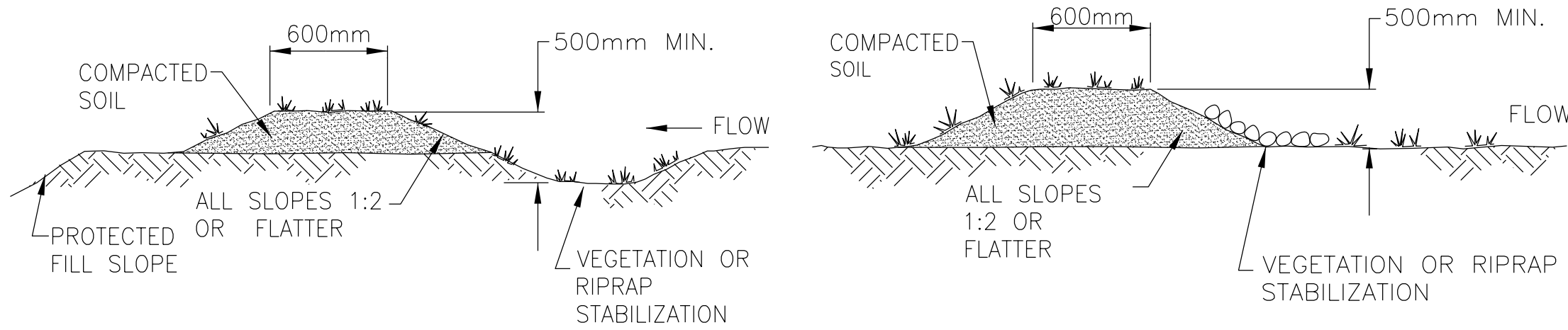
TEMPORARY BERM PLAN



SECTION B-B

SECTION C-C

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



TYPICAL FILL DIVERSION

TEMPORARY DIVERSION DIKE

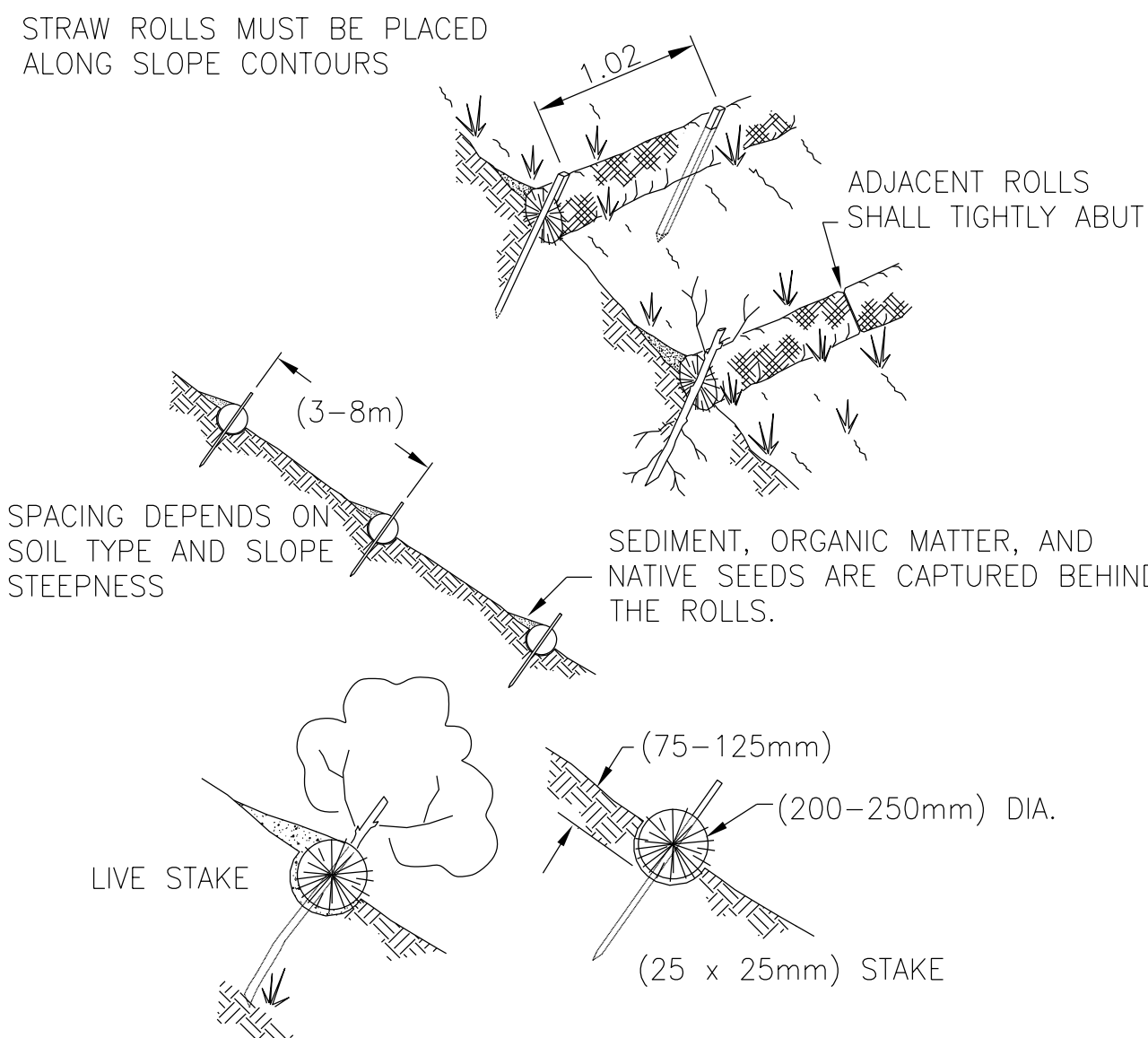
DIVERSION DIKE NOTES:

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

GENERAL NOTES

1. SEE SHEET 33 FOR ADDITIONAL NOTES AND DETAILS.
2. CONSTRUCT SEDIMENT BASINS AND TRAPS, EROSION CHECKS AND/OR FILTERS IN STRATEGIC LOCATIONS ON THE PROJECT TO FILTER STORM RUNOFF BEFORE IT LEAVES THE PROJECT CONSTRUCTION LIMITS OR ENTERS A STREAM AS SHOWN IN THE APPROVED SWPPP.
3. CLEAN ALL SEDIMENT BASINS AND TRAPS OF ACCUMULATED SEDIMENT HALF FULL OF SEDIMENT.
4. USE DRAIN PIPE, RIPRAP, GEOTEXTILE FABRIC, OR GRASS-LINED WATERWAY FOR TEMPORARY SLOPE DRAINS TO CHANNEL RUNOFF DOWN SLOPES. CHANNEL WATER INTO SLOPE DRAINS WITH STRAW BALES, WATTLES OR EARTH BERMS CONSTRUCTED AT THE TOP OF A CUT SLOPE. ANCHOR SLOPE DRAINS TO THE SLOPE.
5. THE CONTRACTOR SHALL ADJUST THE DIMENSIONS AND/OR LOCATIONS OF TEMPORARY SEDIMENT AND EROSION CONTROL DEVICES TO FIT ACTUAL FIELD CONDITIONS.
6. REMOVE AND DISPOSE OF EROSION CONTROL MEASURES WHEN THE PERMANENT EROSION CONTROL MEASURES ARE SATISFACTORILY ESTABLISHED AND DRAINAGE DITCHES AND CHANNELS ARE LINED AND STABILIZED, IN ACCORDANCE WITH SECTION 157 OF FP-14.

STRAW ROLLS MUST BE PLACED
ALONG SLOPE CONTOURS



STRAW ROLLS

NOT TO SCALE

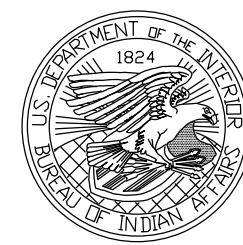
STRAW ROLL NOTES:

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

UNITED STATES
DEPARTMENT OF INTERIOR
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NAVAJO REGIONAL OFFICE - D.O.T.

STORMWATER POLLUTION & EROSION /SEDIMENT CONTROL DETAILS 2

Designed by: B.O.R.
Drawn by: DESIGN2 Date: 3/27/17
Revised by: HRiley Date: 03/20/2020
File Name: 34_N9402_STD Ersn Det-2



REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N9402	N9402(2)1,2&3	35	40

Square Tube Selection: Single Post – 2.80 mm thickness

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

Square Tube Selection: Double Post – 2.80 mm thickness

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

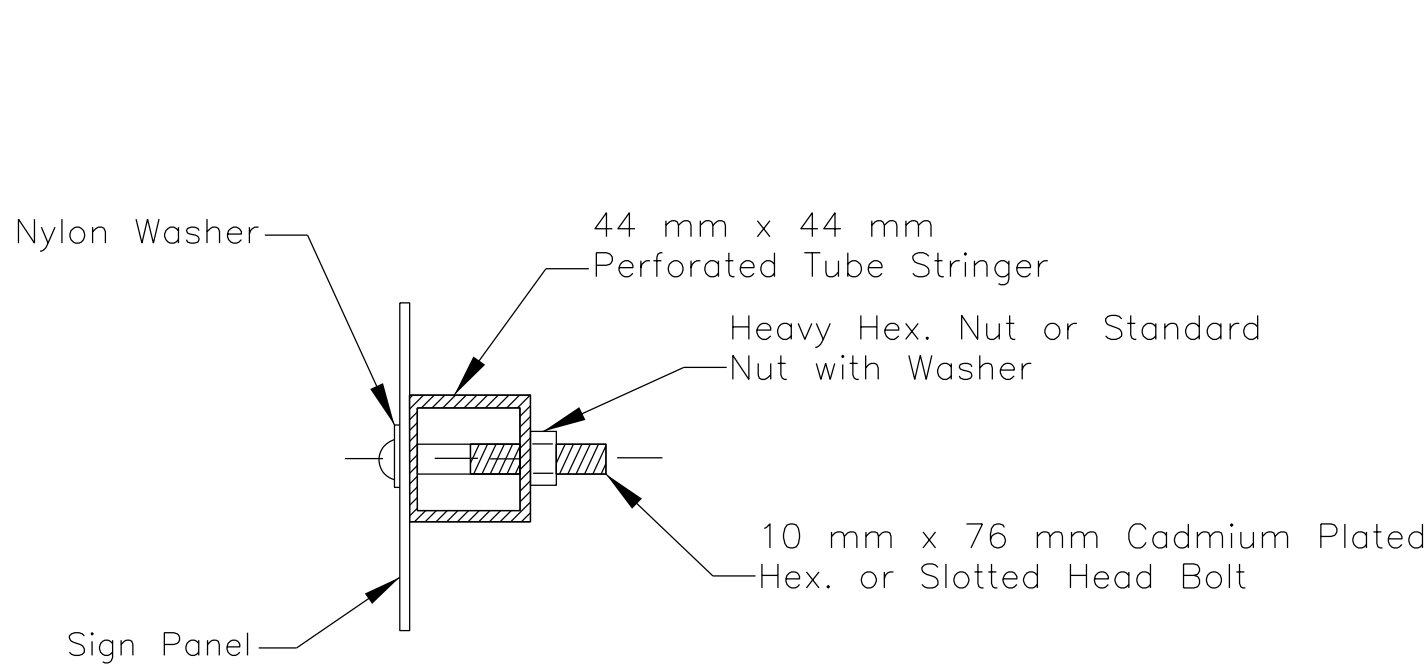
Square Tube Selection: Triple Post – 2.80 mm thickness

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

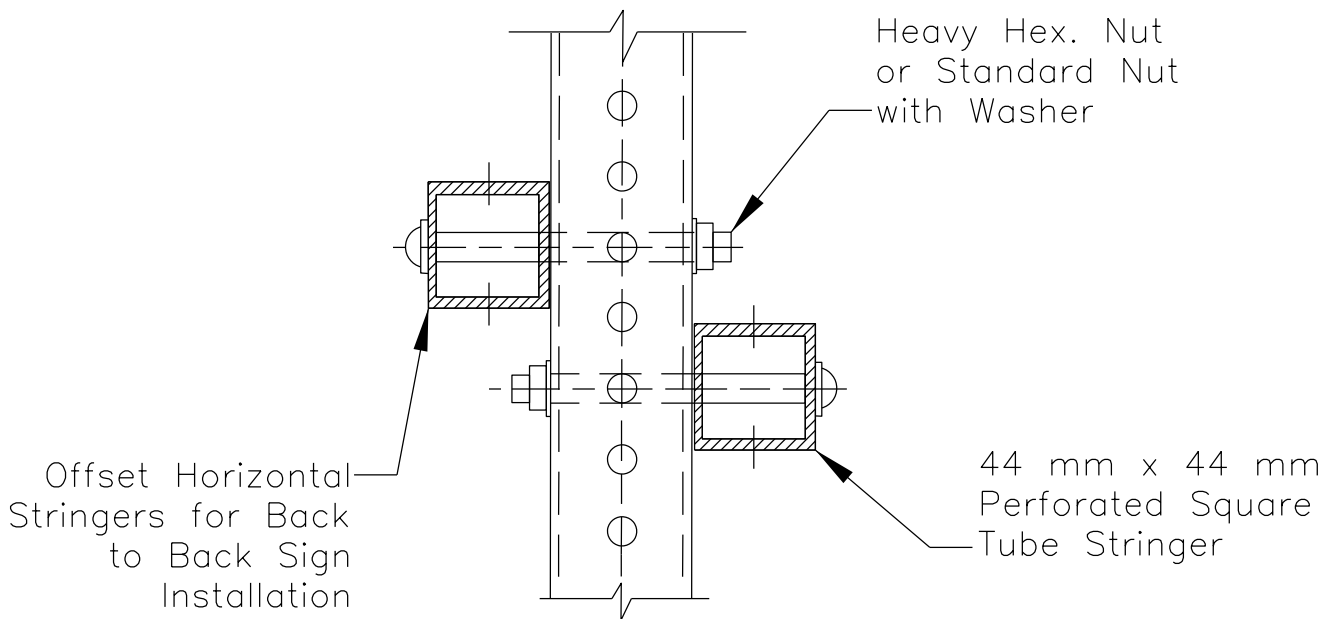
Guide Sign Post Dimensions

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

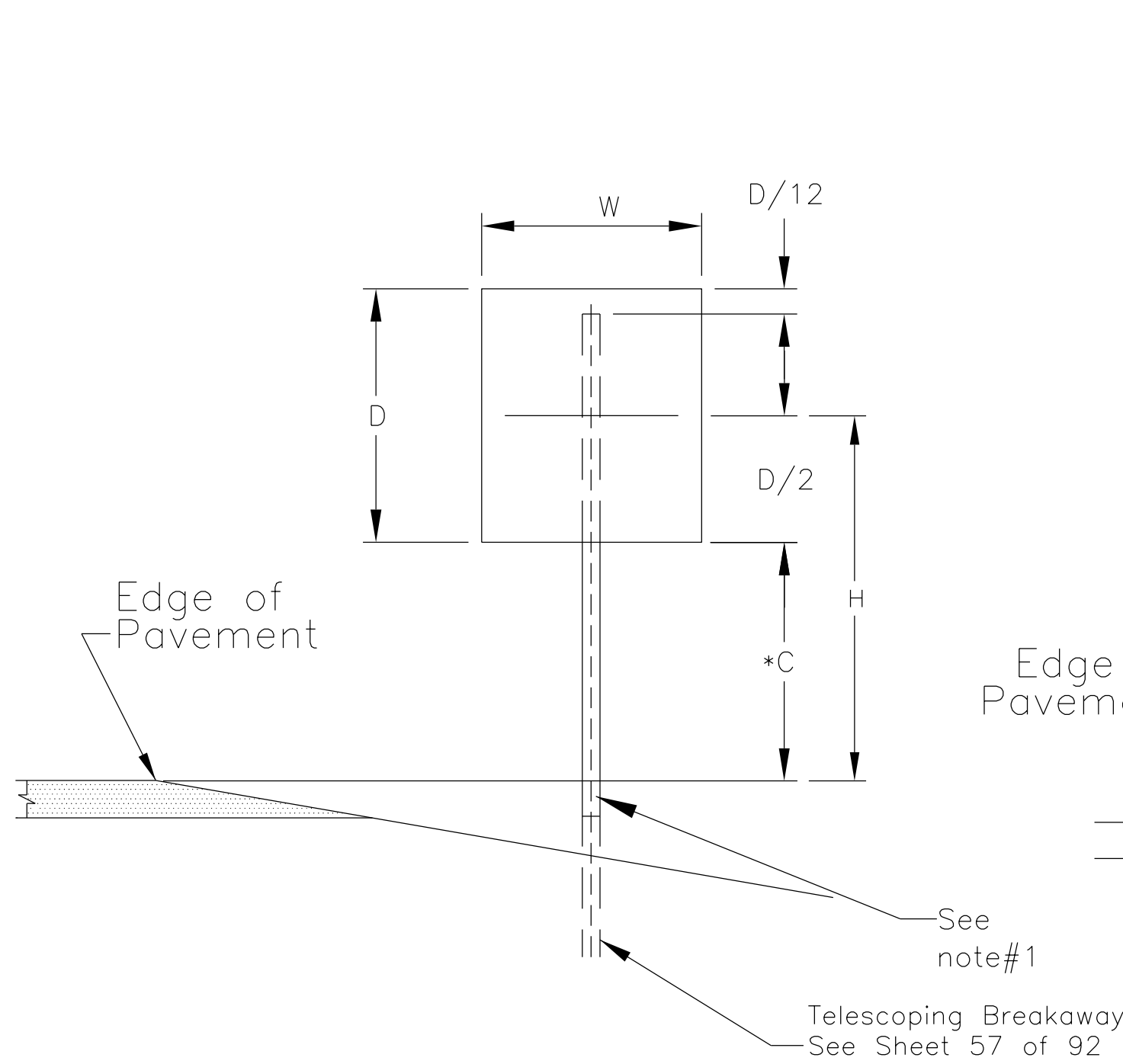
Panel Width	914 mm	1.22 m	1.52 m	1.83 m	2.13 m	2.44 m	2.74 m	3.05 m
two posts spacing (A)	559 mm	711 mm	914 mm	1.12 m	1.27 m	1.47 m	1.63 m	1.83m
bolts to panel (per stringer)			3	3	3	3	4	4
length of each stringer			1.22 m	1.42 m	1.57 m	1.78 m	1.93 m	2.13 m
two posts spacing (B)			533 mm	635 mm	737 mm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



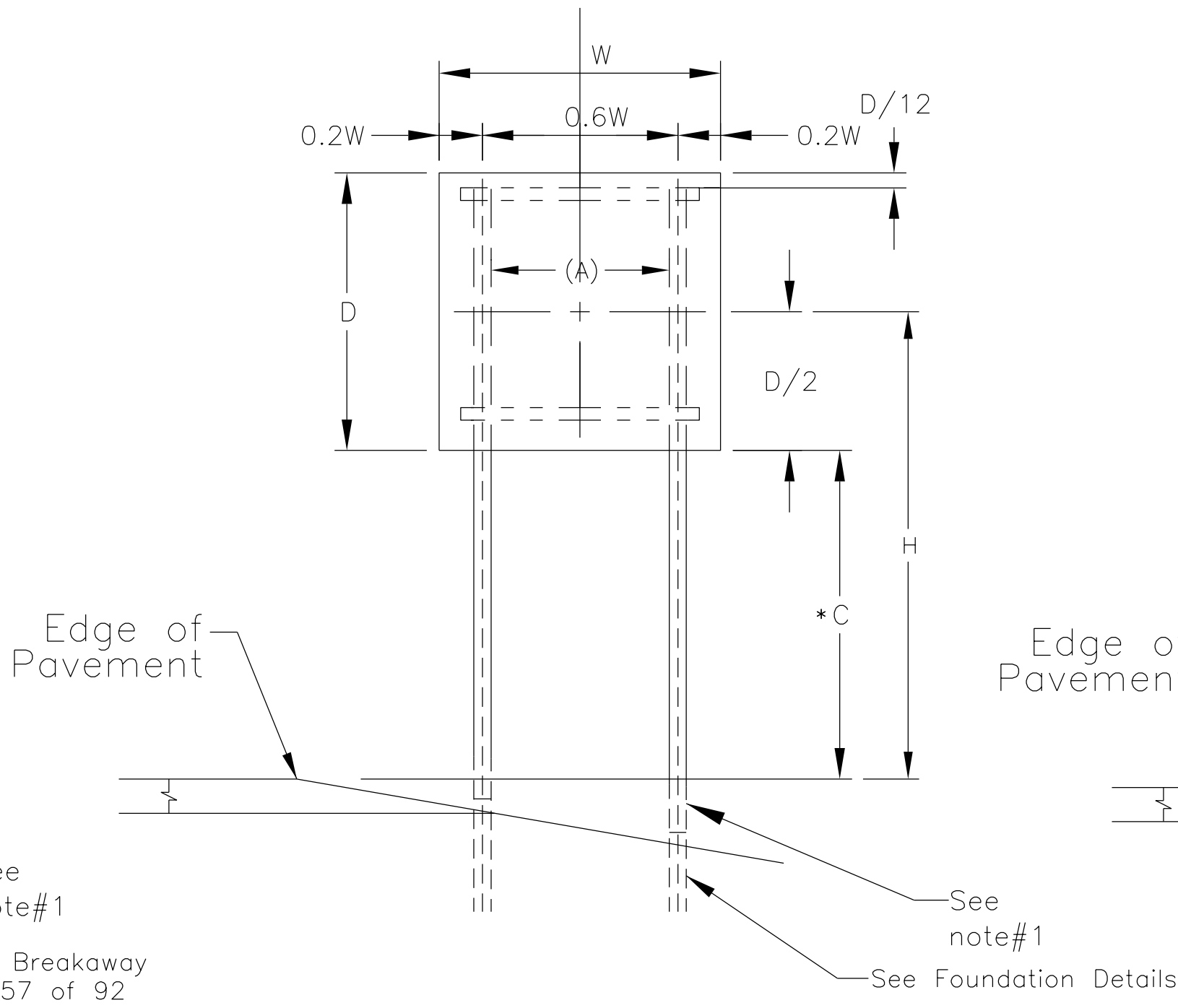
PANEL TO STRINGER OR POST



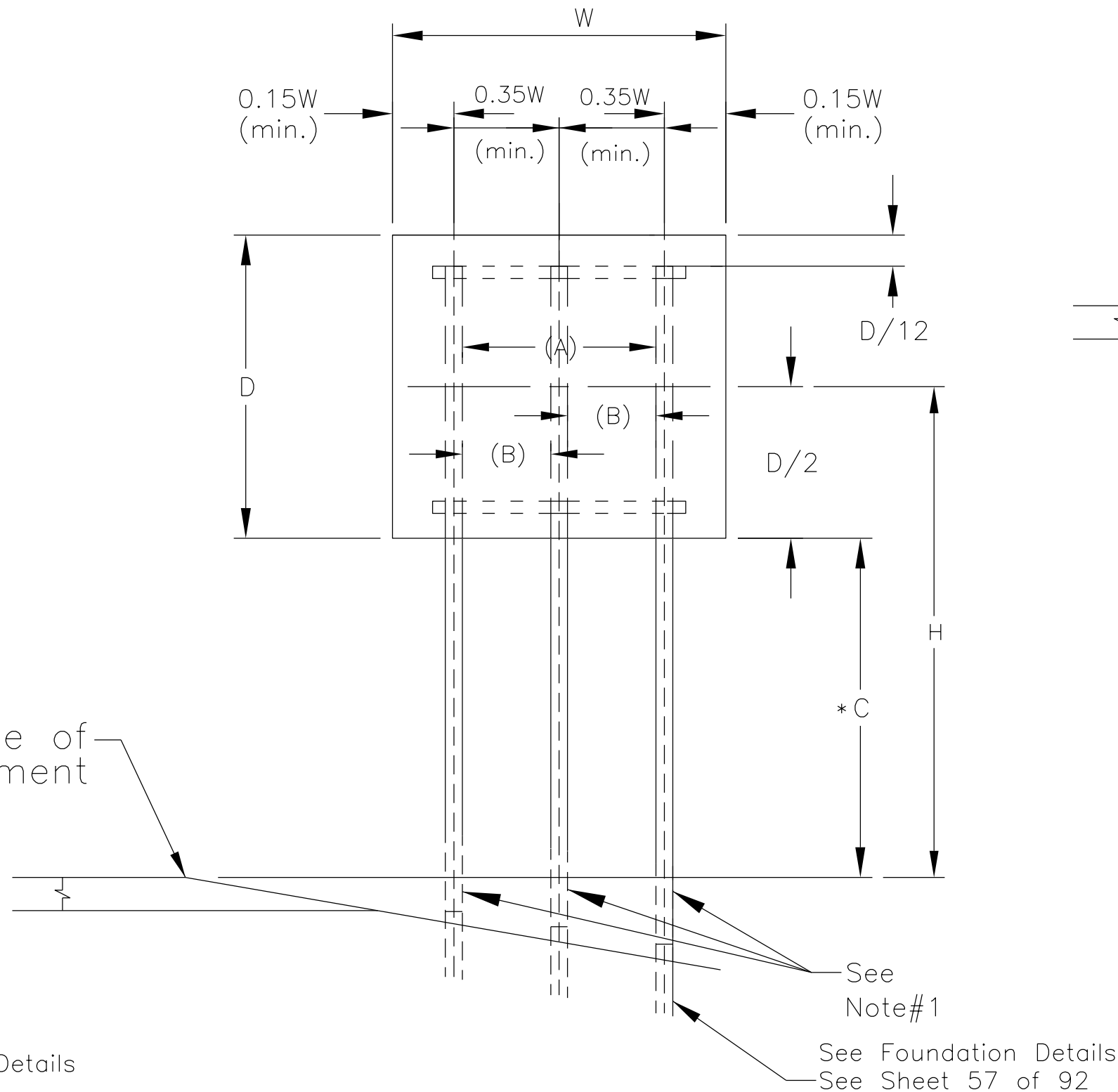
STRINGER TO POST



SINGLE POST SIZE (typ.)



DOUBLE POST SIZE (typ.)

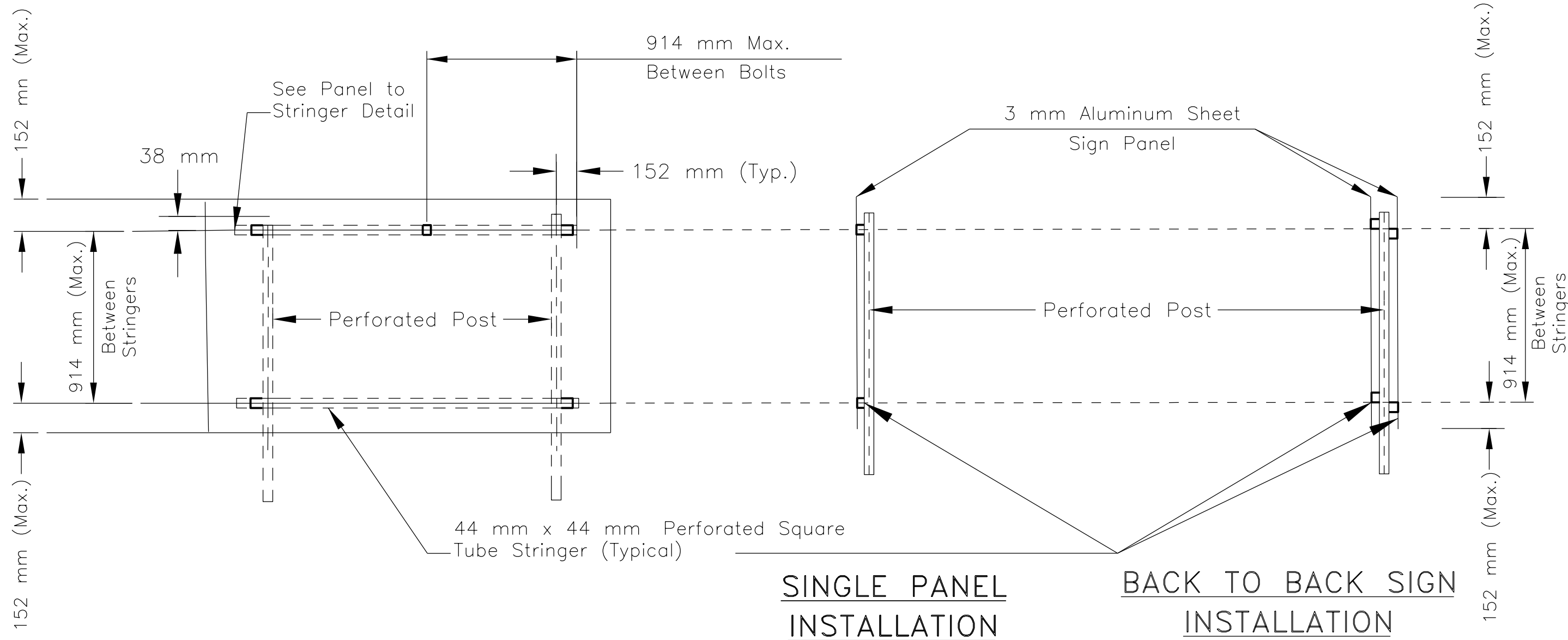


THREE POST SIZE (typ.)

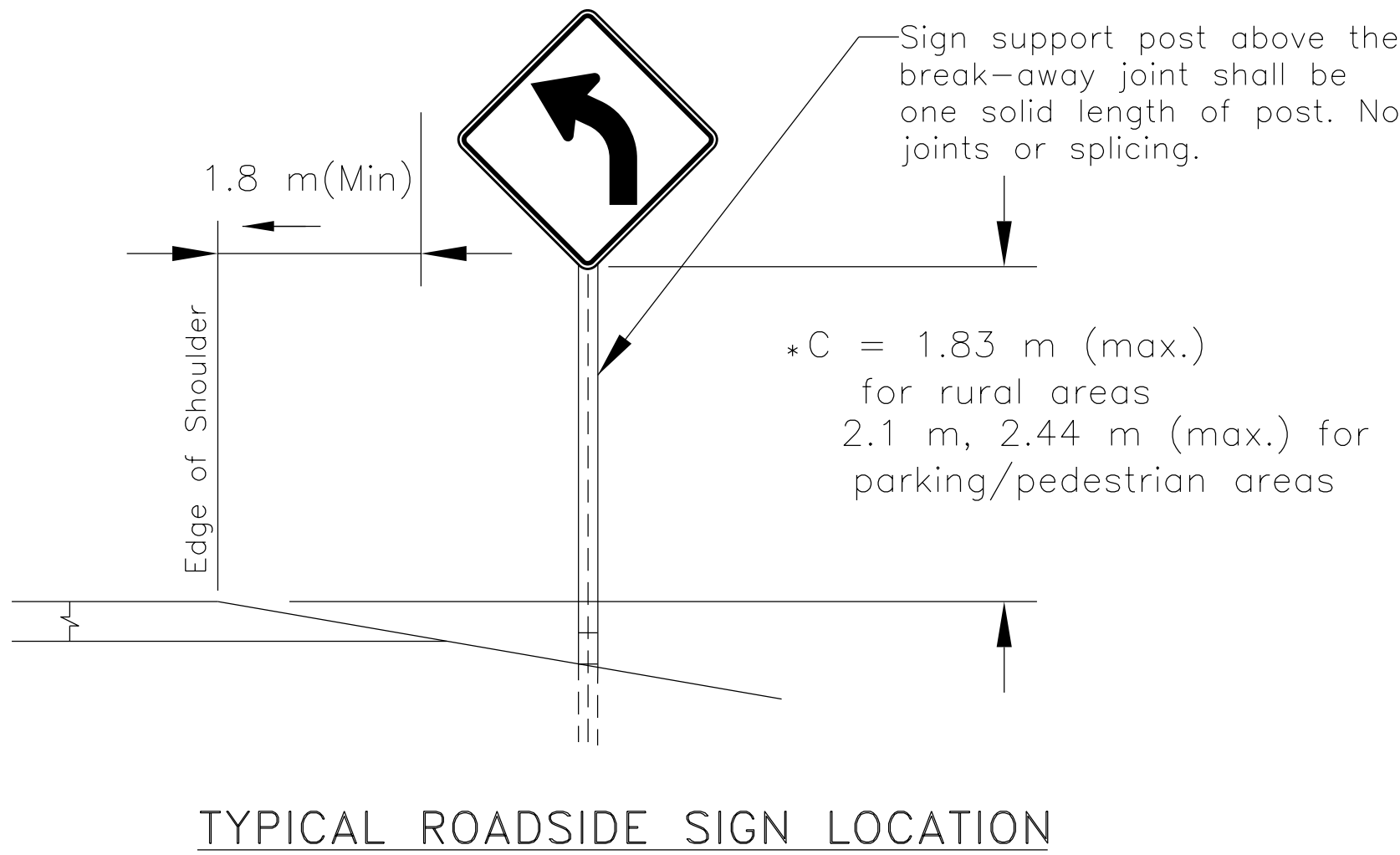
STATION AND PAY ITEM	LOC.	SIZE DETAIL NO.	DESCRIPTION	SIGN PANEL SIZE (mm)	SQUARE METER OF SIGN	NO. OF POSTS	Sign post (mm)	TOTAL SIGN PANELS
0+215	RT	W1-2 (R)		750 x 750	0.563	2	50	1
0+465	LT	W1-2 (L)		750 x 750	0.563	2	50	1
0+100	RT	R2-1		610 x 750	0.458	1	44	1
0+510	LT	R2-1		610 x 750	0.458	1	44	1
63302-2002	SIGN INSTALLATION, 1 POSTS AND HARDWARE,							0.92 m ²
63302-2006	SIGN INSTALLATION, 2 POSTS AND HARDWARE,							1.13 m ²

GENERAL NOTES:

1. THE CONTRACTOR SHALL BE REQUIRED TO ADJUST THE LENGTH OF SIGN SUPPORT POSTS. THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE FOR THE APPROPRIATE BID ITEMS SHOWN IN THE BID SCHEDULE.
2. SIGNS GREATER THAN 762 mm IN WIDTH SHALL BE MOUNTED ON TWO OR MORE POSTS.
3. SIGN POST CONCRETE FOUNDATION SHALL BE USED IN LOOSE FINE GRAVITY SOILS THAT ARE HARD TO COMPACT AS DIRECTED BY COTR. THE CONCRETE SHALL MEET THE REQUIREMENTS OF SECTION 601.



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



TYPICAL ROADSIDE SIGN LOCATION

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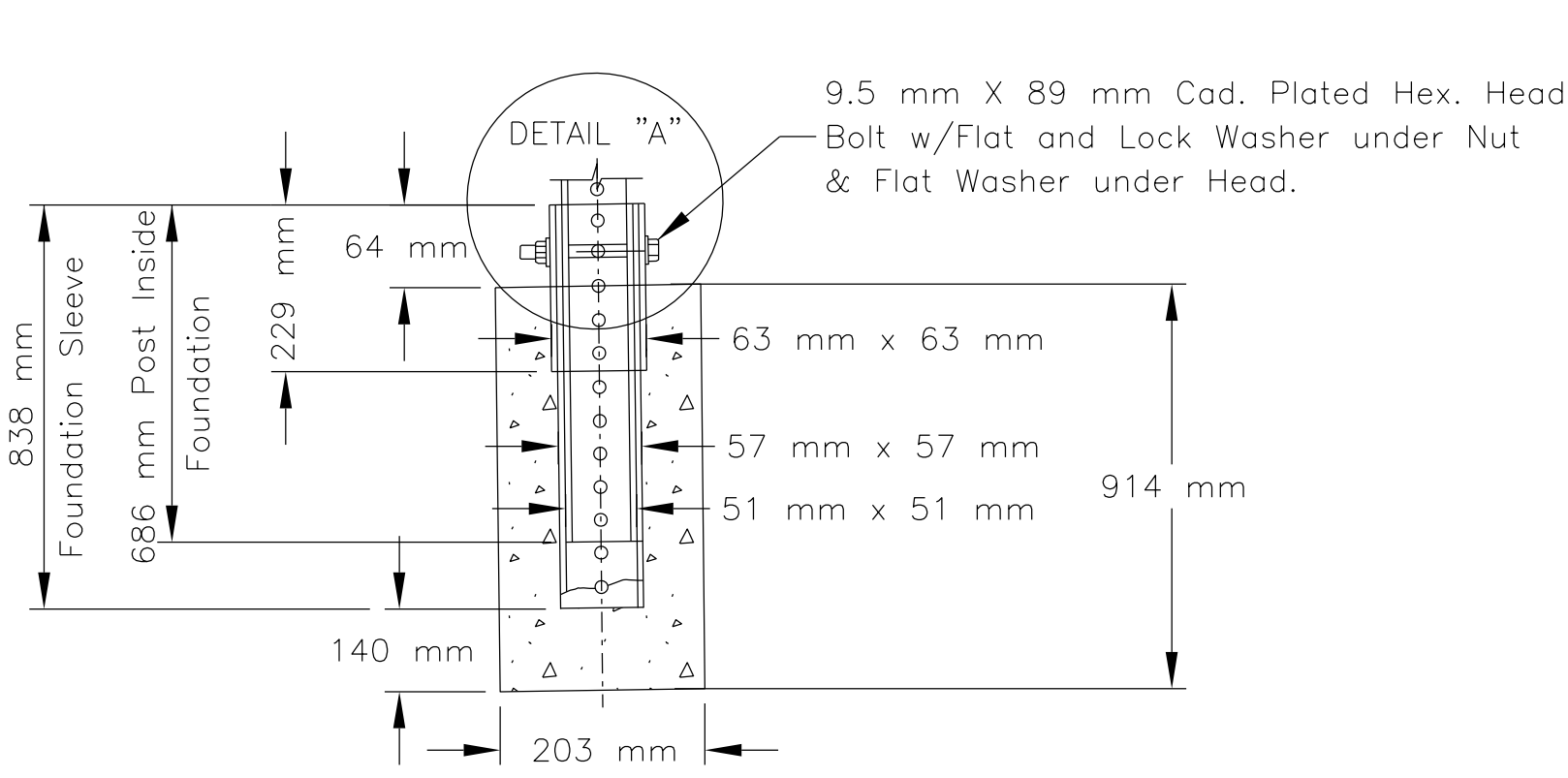
POST SELECTION AND
SIGN MOUNTING DETAILS

DRAWN BY: NRDOT	DATE: 7/29/2014
DESIGNED BY: NRDOT	DATE: 7/29/2014
REVISED: 11/15/2017	BY: rsh
FILE NAME:	35_N9402_STDsignDet-1

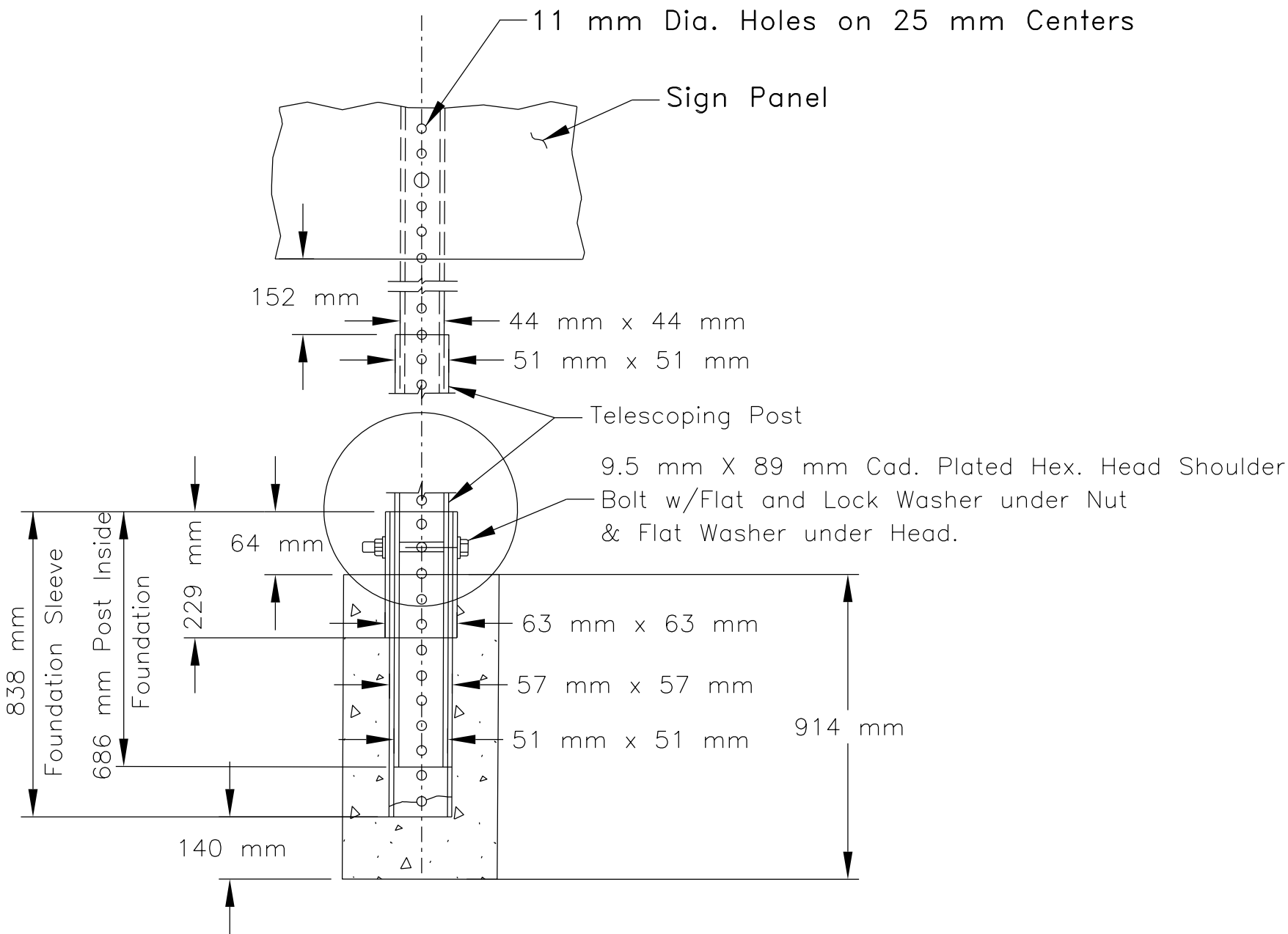


\$FILE:\$.C:\Users\Harold.Riley\Drive\projects\backup\N9402(2)- done\Microstation\final drawings\36_N9402_STDsignDet-2_2017-11-15.dgn

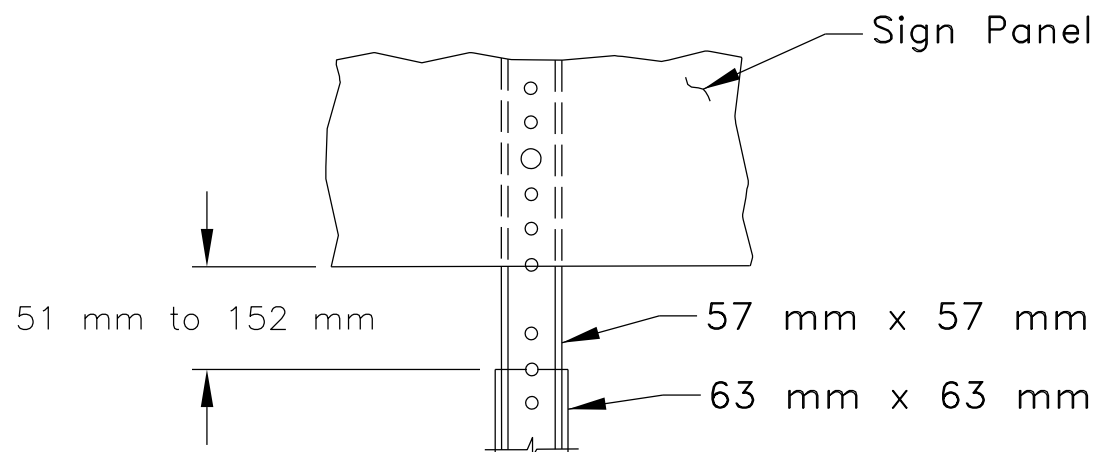
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N9402	N9402(2)1,2&3	36	40



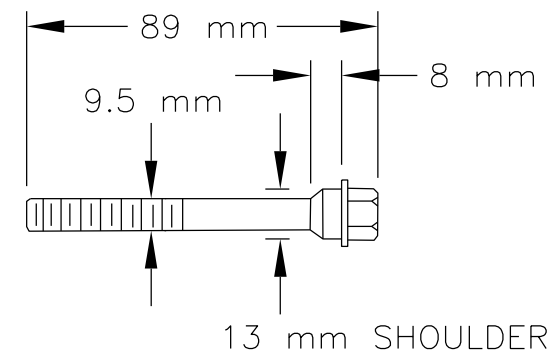
SINGLE POST FOUNDATION DETAIL



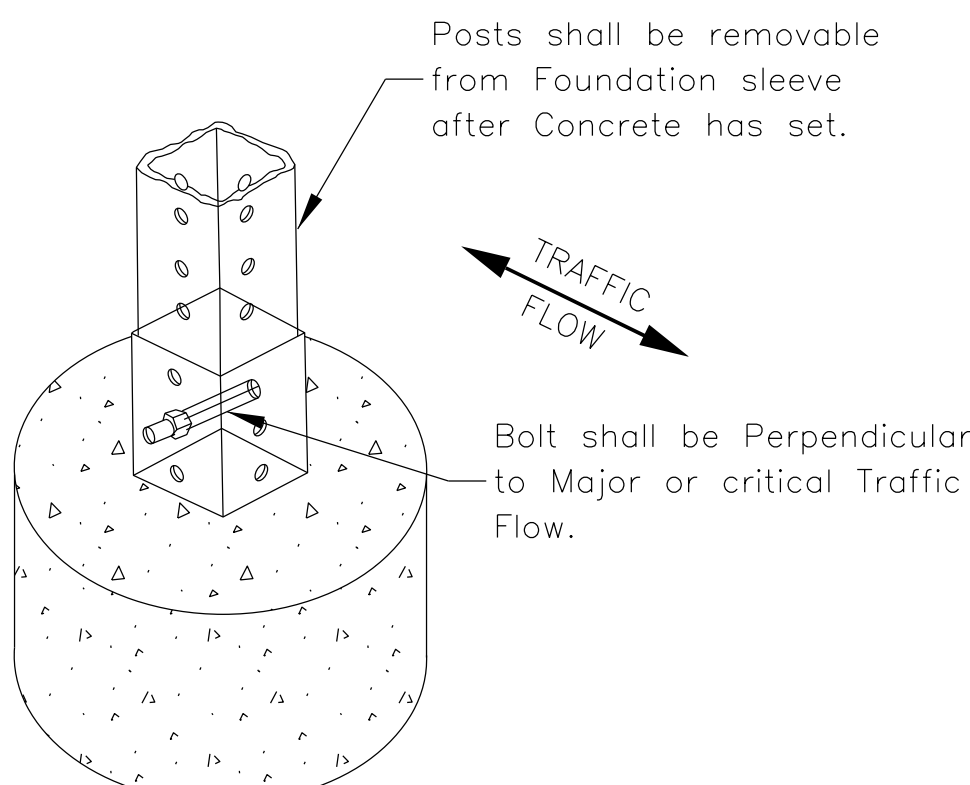
TELESCOPING POST DETAIL



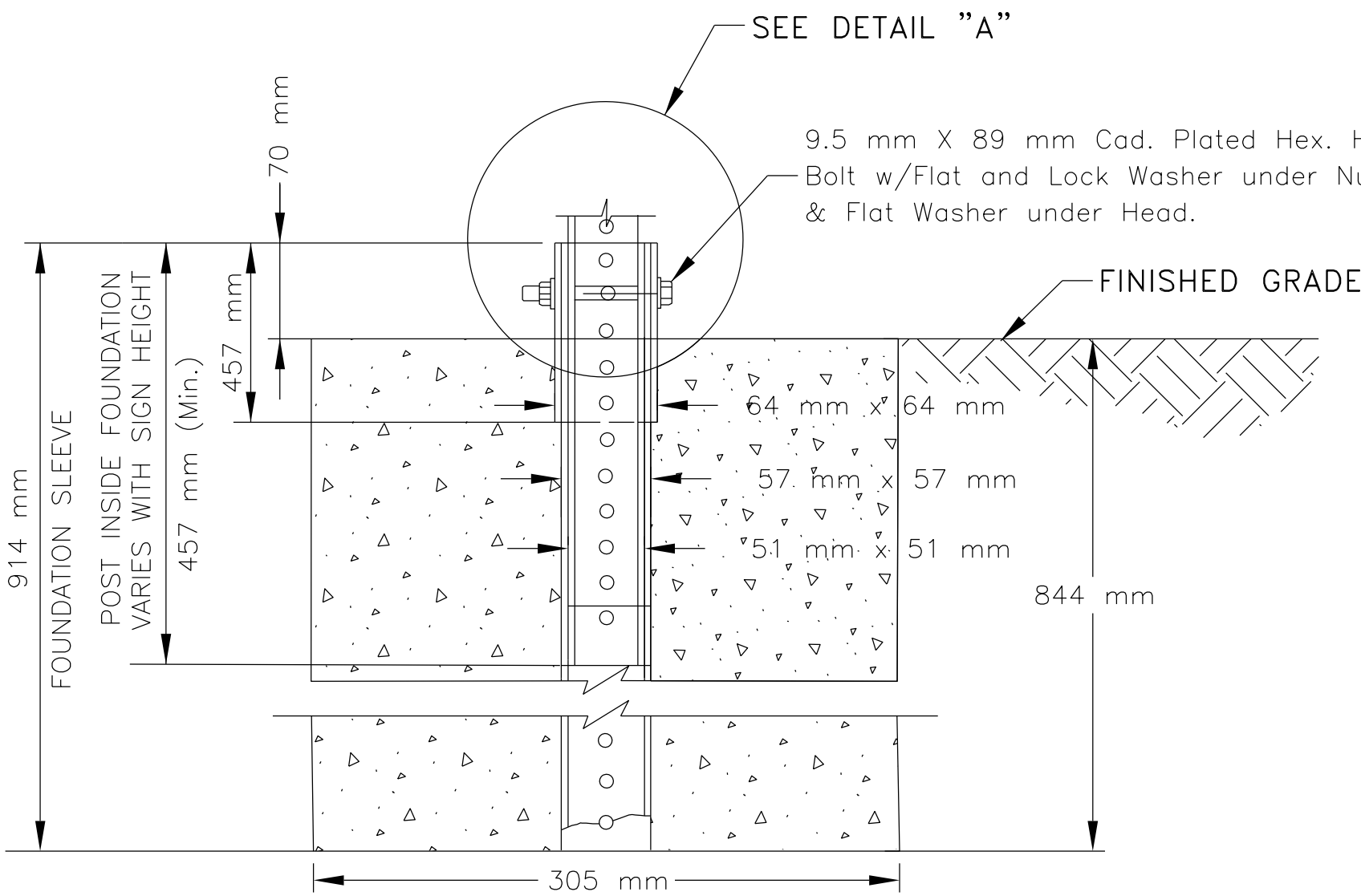
TELESCOPING POST INSTALLATION



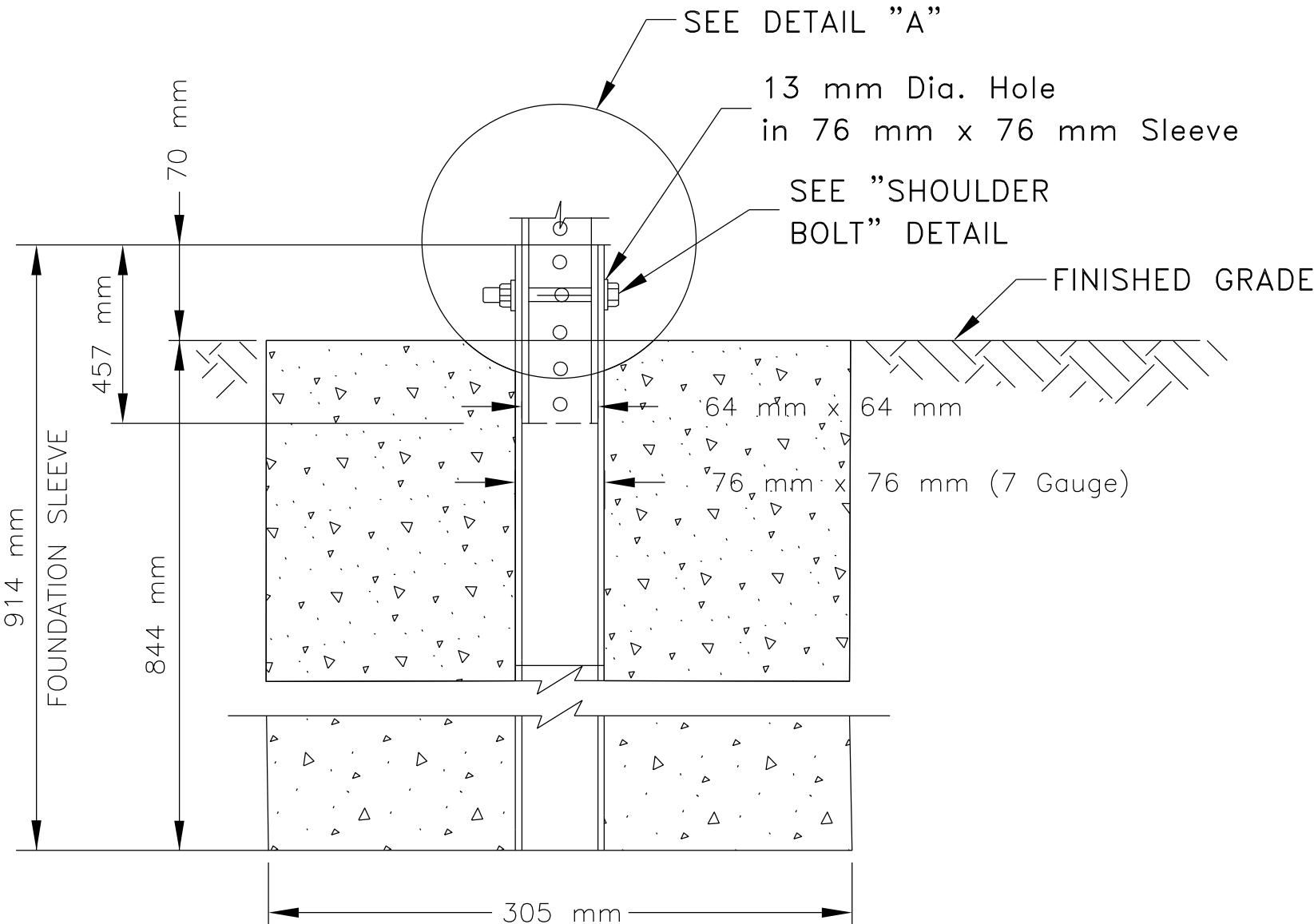
SHOULDER BOLT (HEAD)



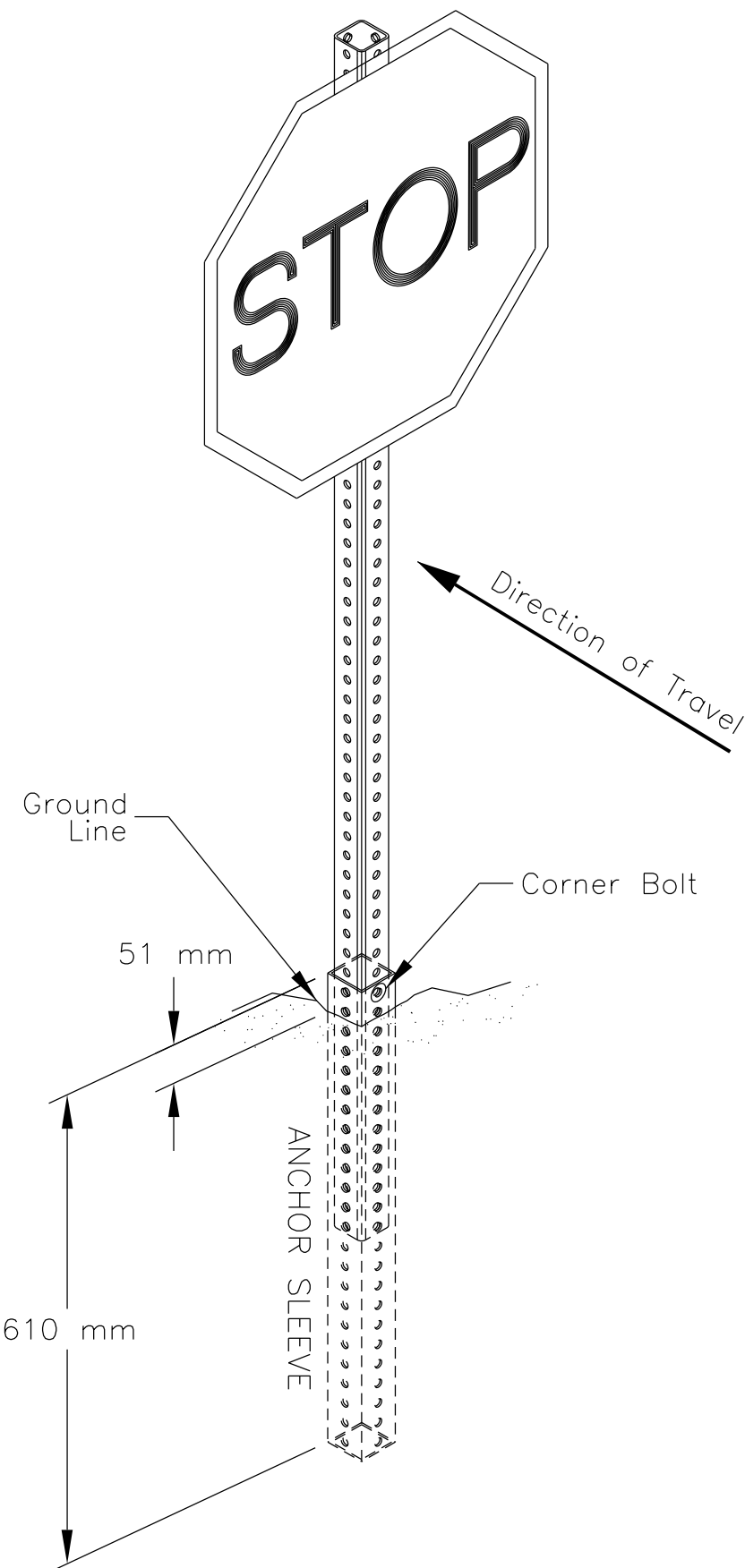
DETAIL "A"



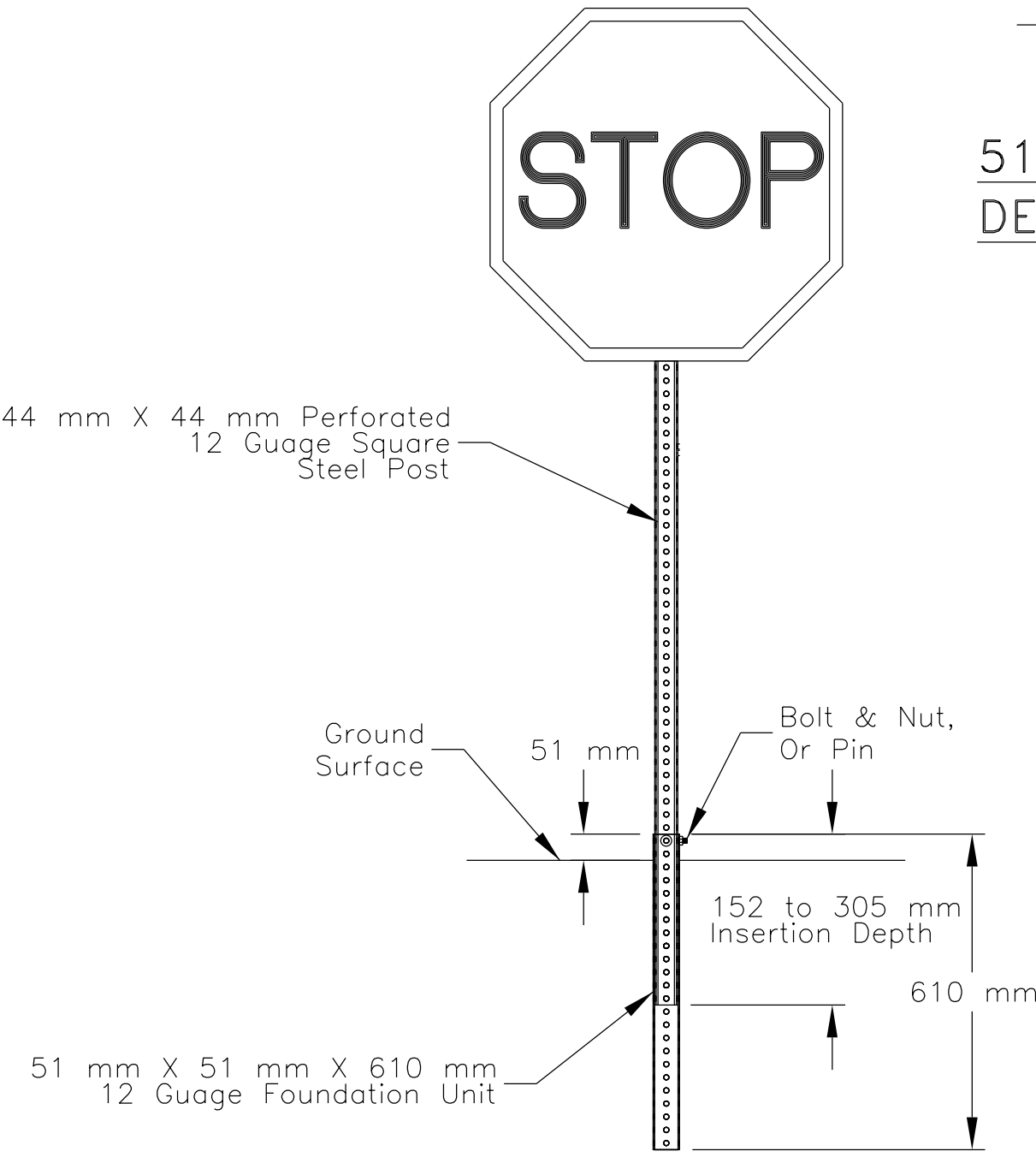
51 mm SINGLE POST CONCRETE FOUNDATION DETAIL (IN WEAK SOILS)



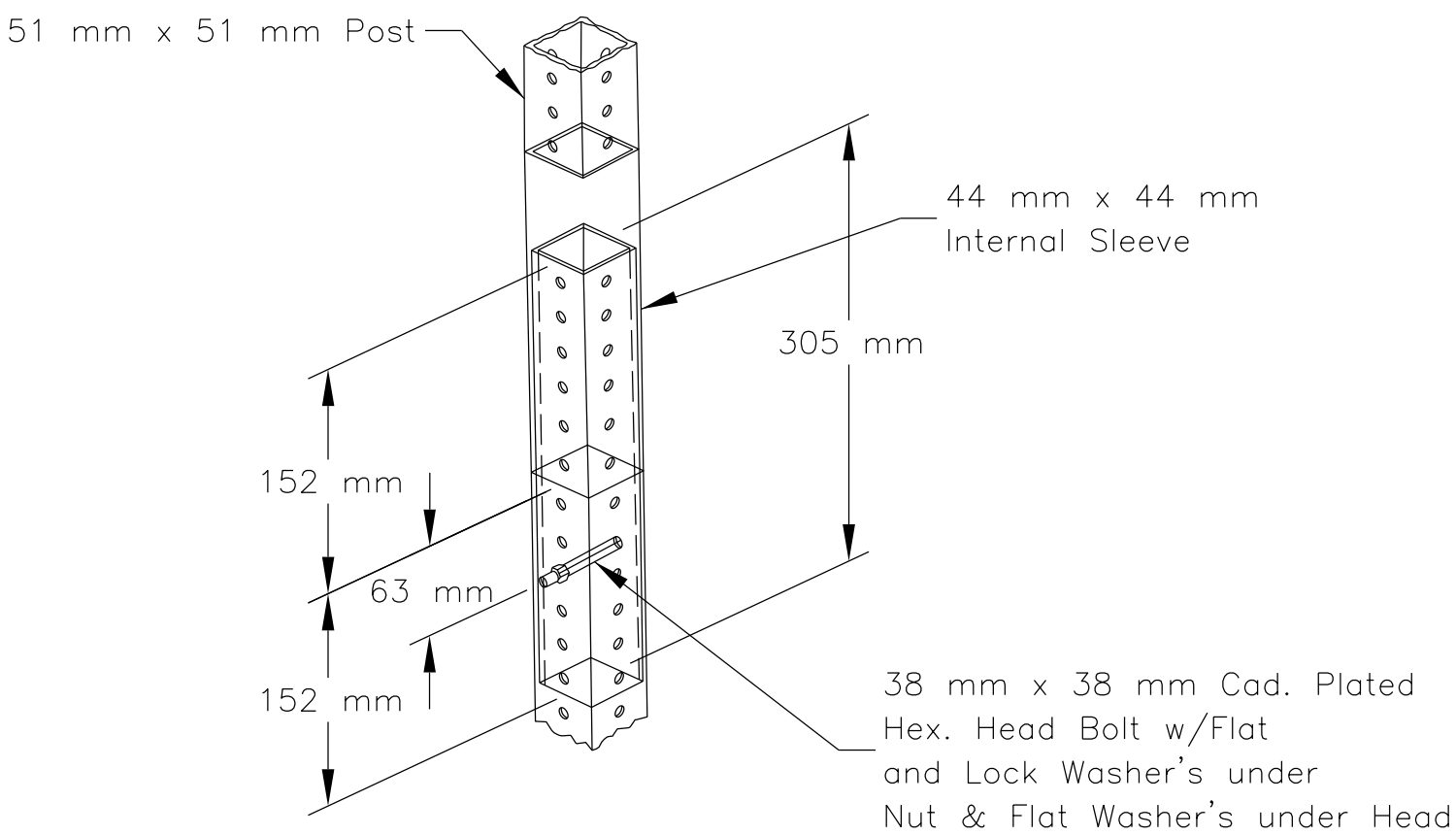
64 mm SINGLE POST CONCRETE FOUNDATION DETAIL (IN WEAK SOILS)



ISOMETRIC VIEW



TELESCOPING BREAKAWAY (Single Post)



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

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NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

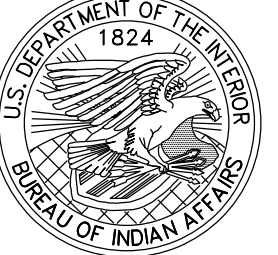
SQUARE POST AND
SIGN MOUNTING DETAILS

DRAWN BY: NRDOT DATE: 7/29/2014

DESIGNED BY: NRDOT DATE: 7/29/2014

REVISED: 11/15/2017 BY: rsh

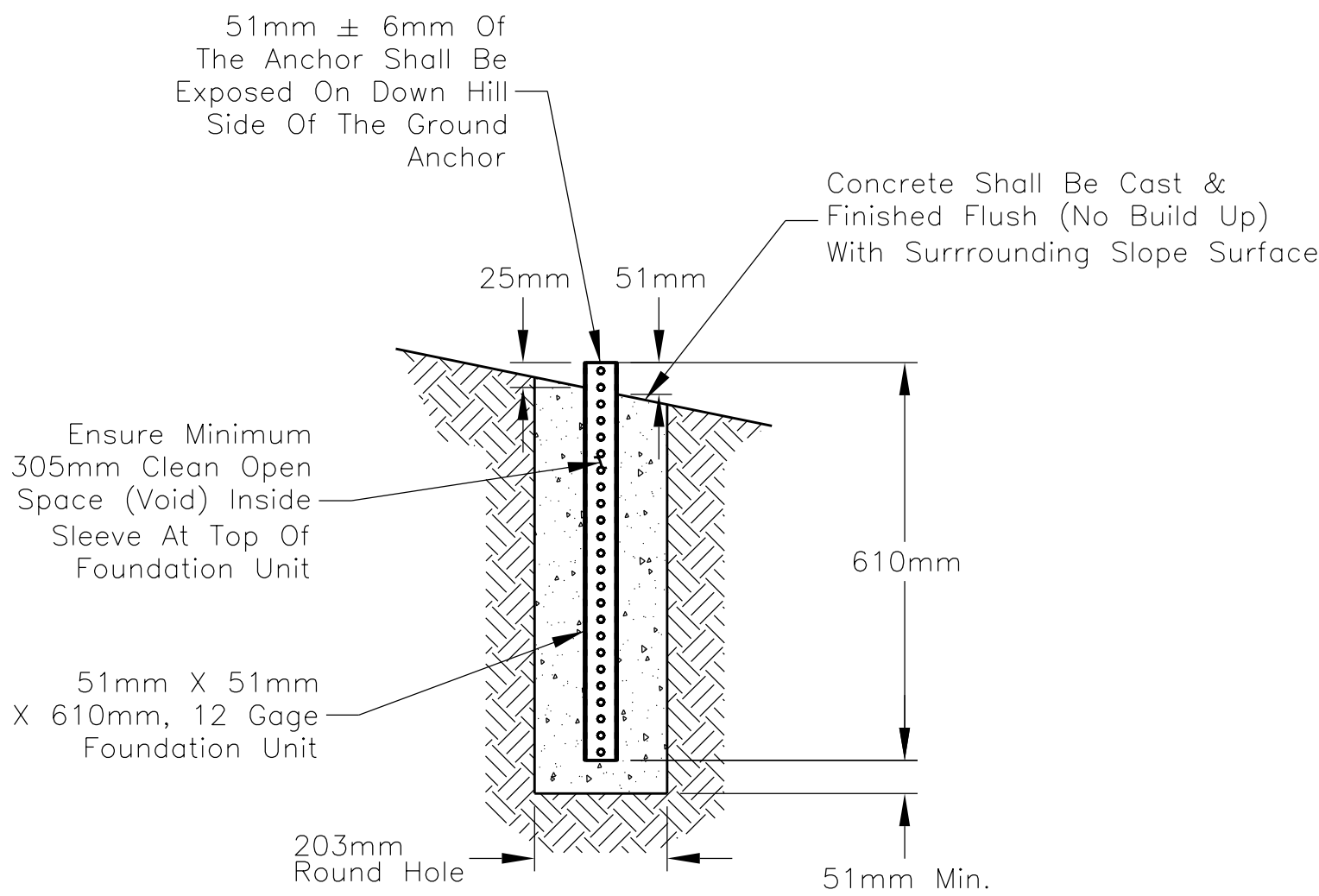
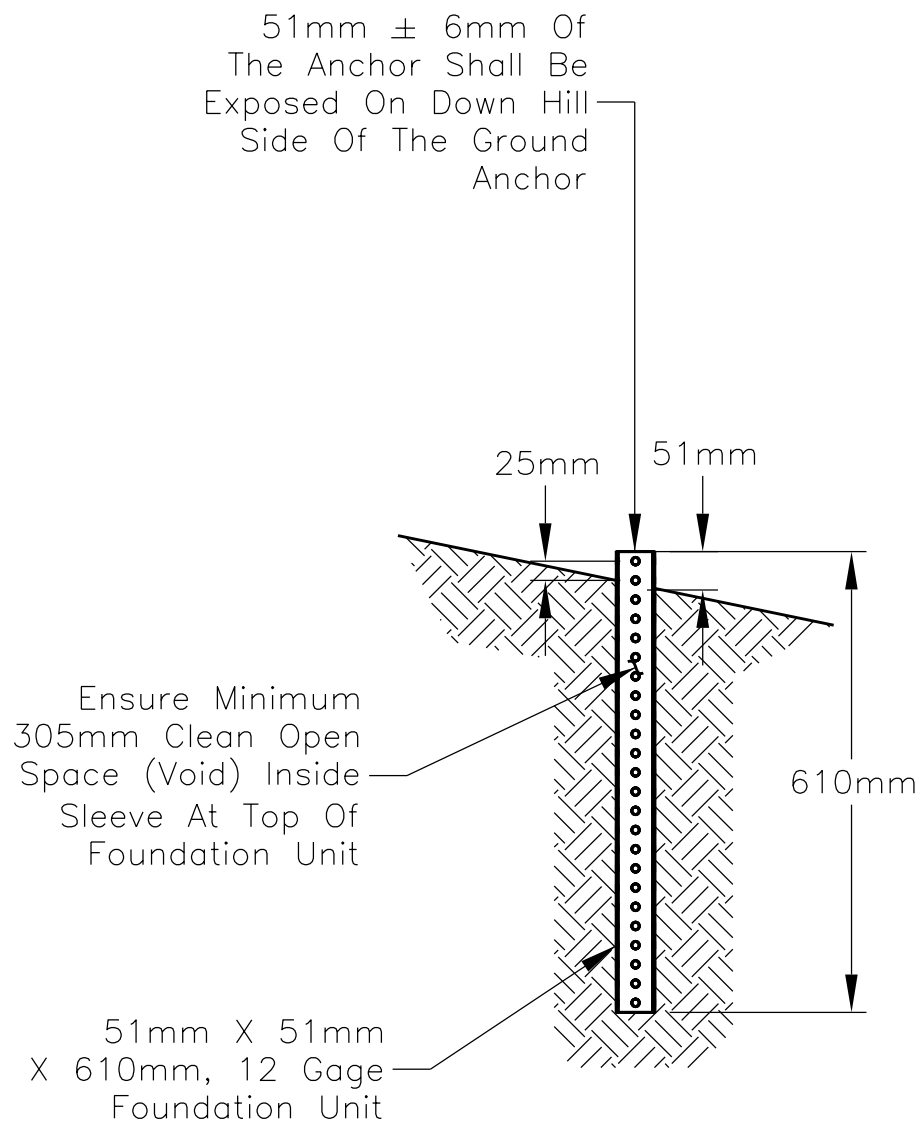
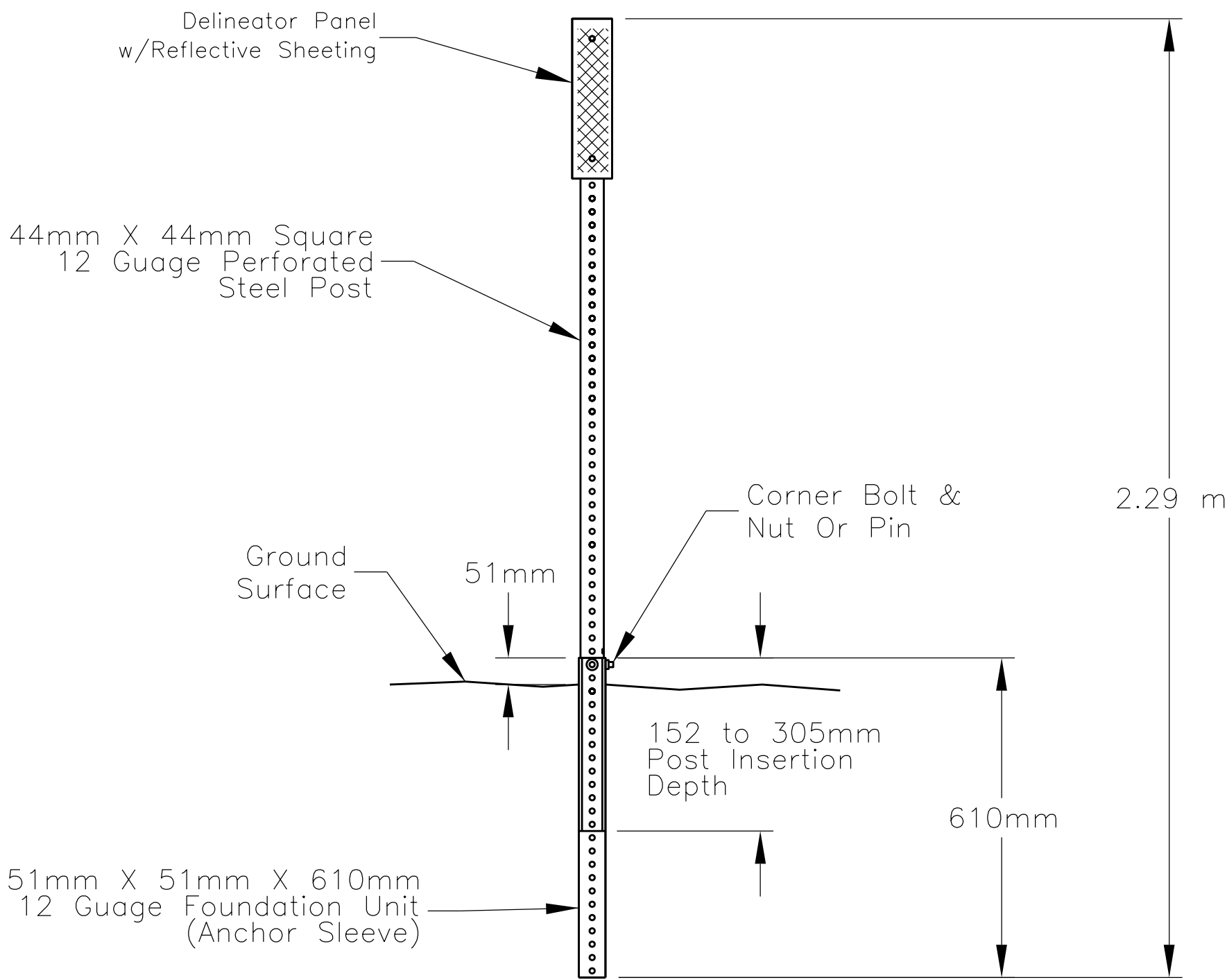
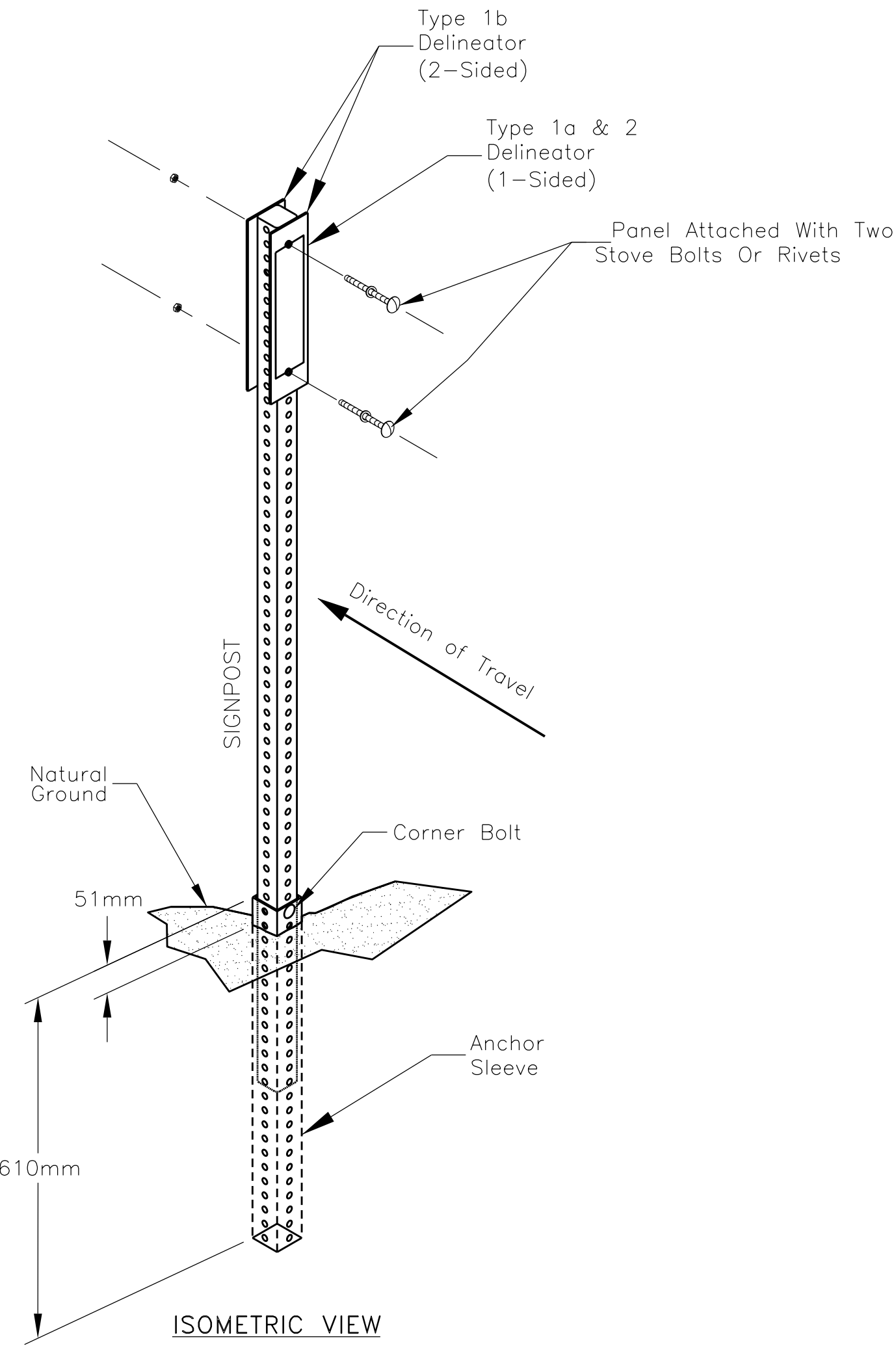
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REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
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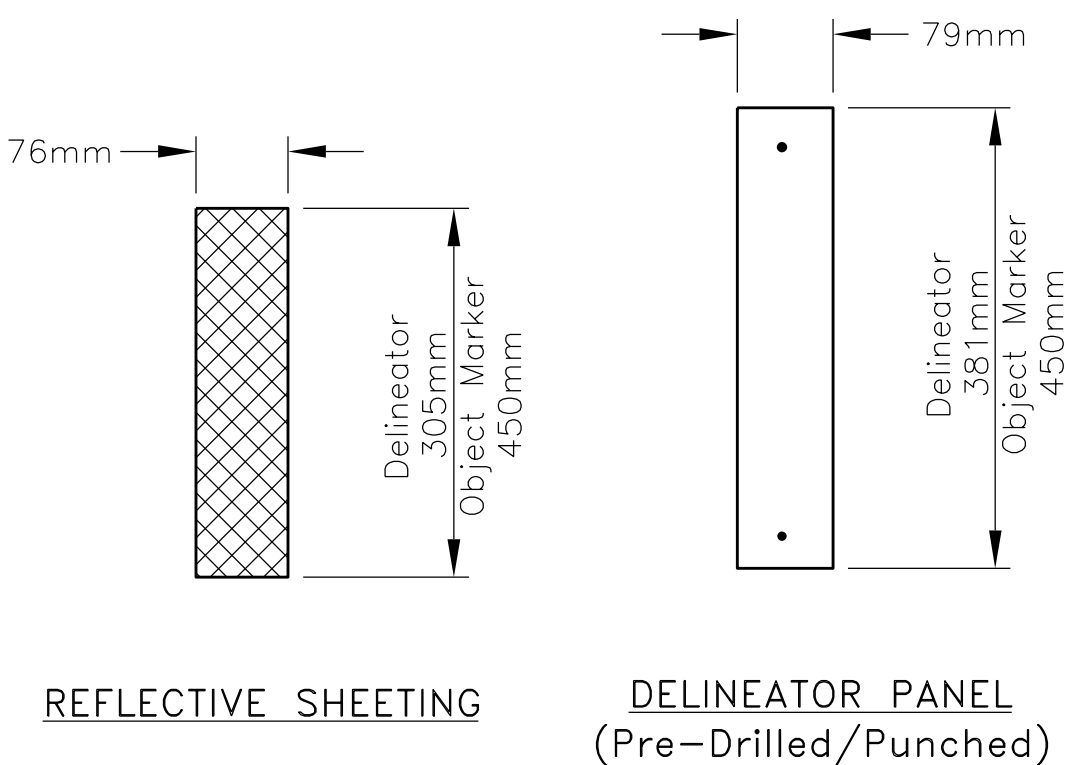
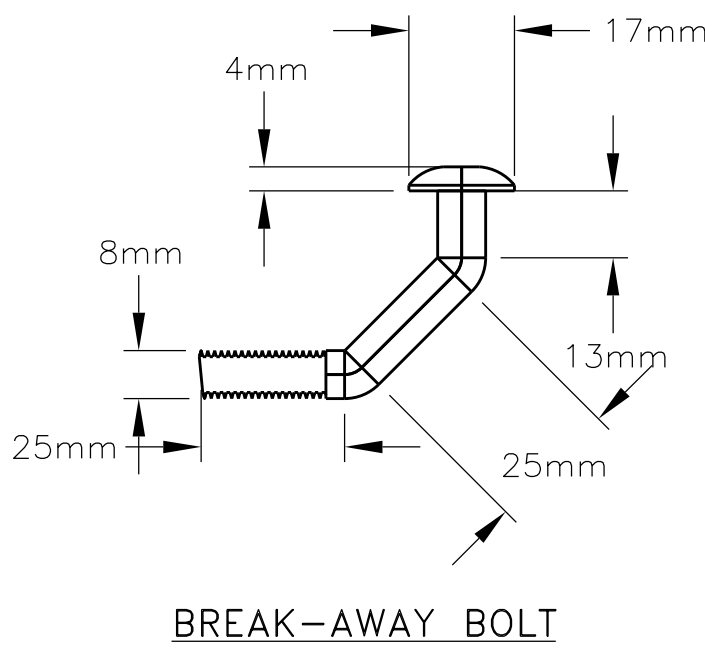
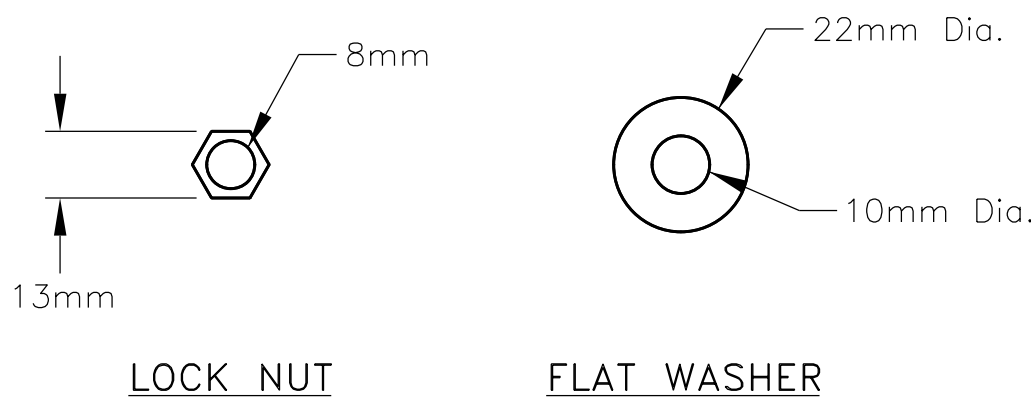
GENERAL NOTES

1. ALL CONCRETE SHALL BE CLASS A(AE) AND SHALL CONFORM TO SECTION 601 OF THE FP-14. FURNISHING AND PLACING OF CONCRETE, WHEN REQUIRED, SHALL BE CONSIDERED INCIDENTAL TO ITEMS 63308-2000, 63309-0010, AND 63309-0020.
2. THE CONTRACTOR SHALL USE SQUARE STEEL TUBE HIGHWAY DELINEATORS. THE COST OF SUPPLYING MATERIALS AND INSTALLATION SHALL BE INCLUDED IN THE UNIT PRICE BID UNDER ITEMS 63308-2000, 63309-0010, AND 63309-0020. SEE SHEET 63 FOR POST SPACING.

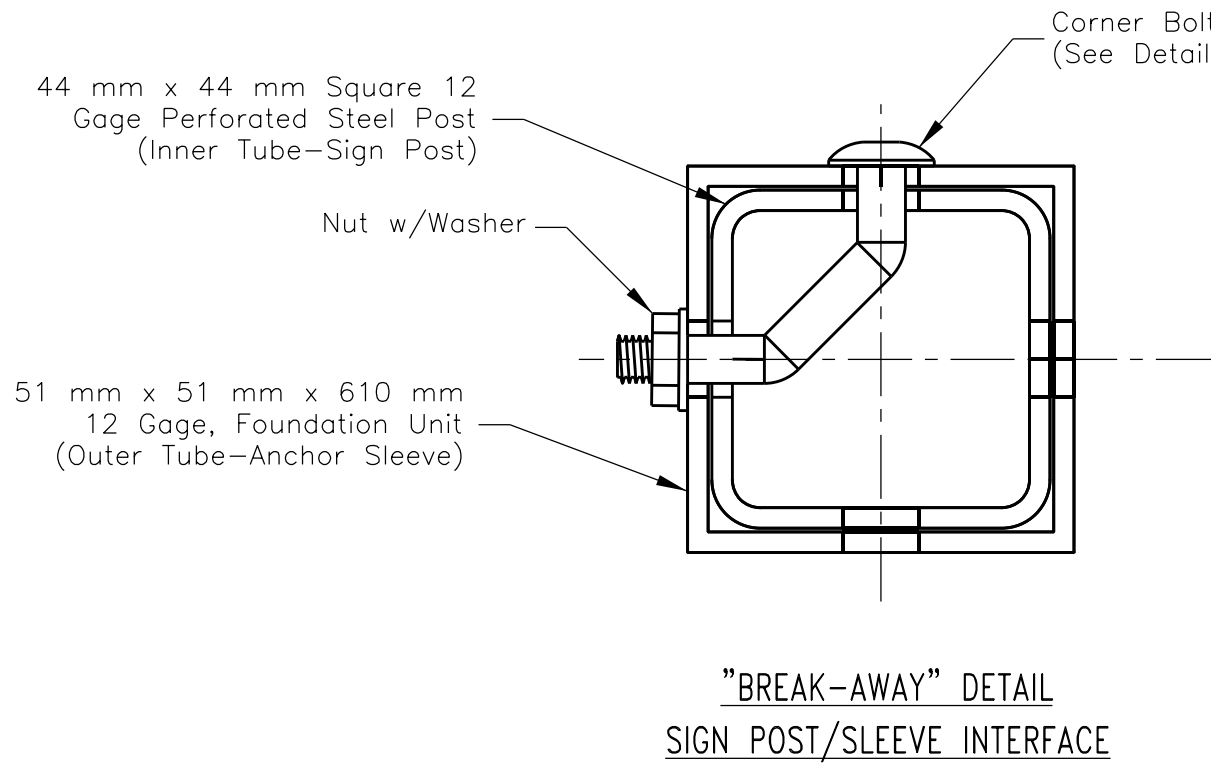
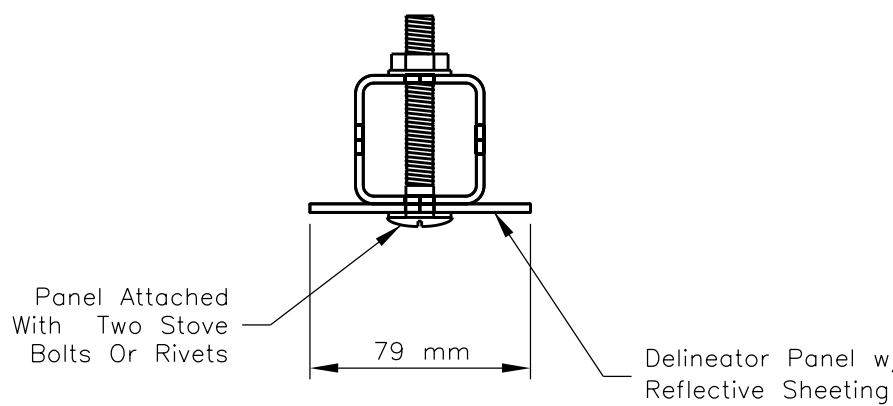
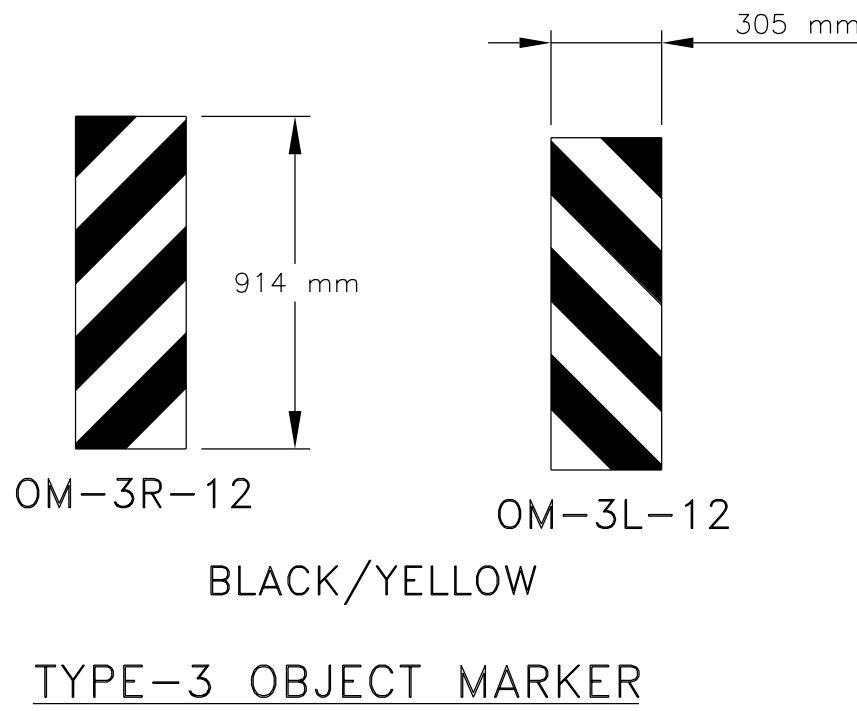


IN-GROUND CONCRETE

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



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



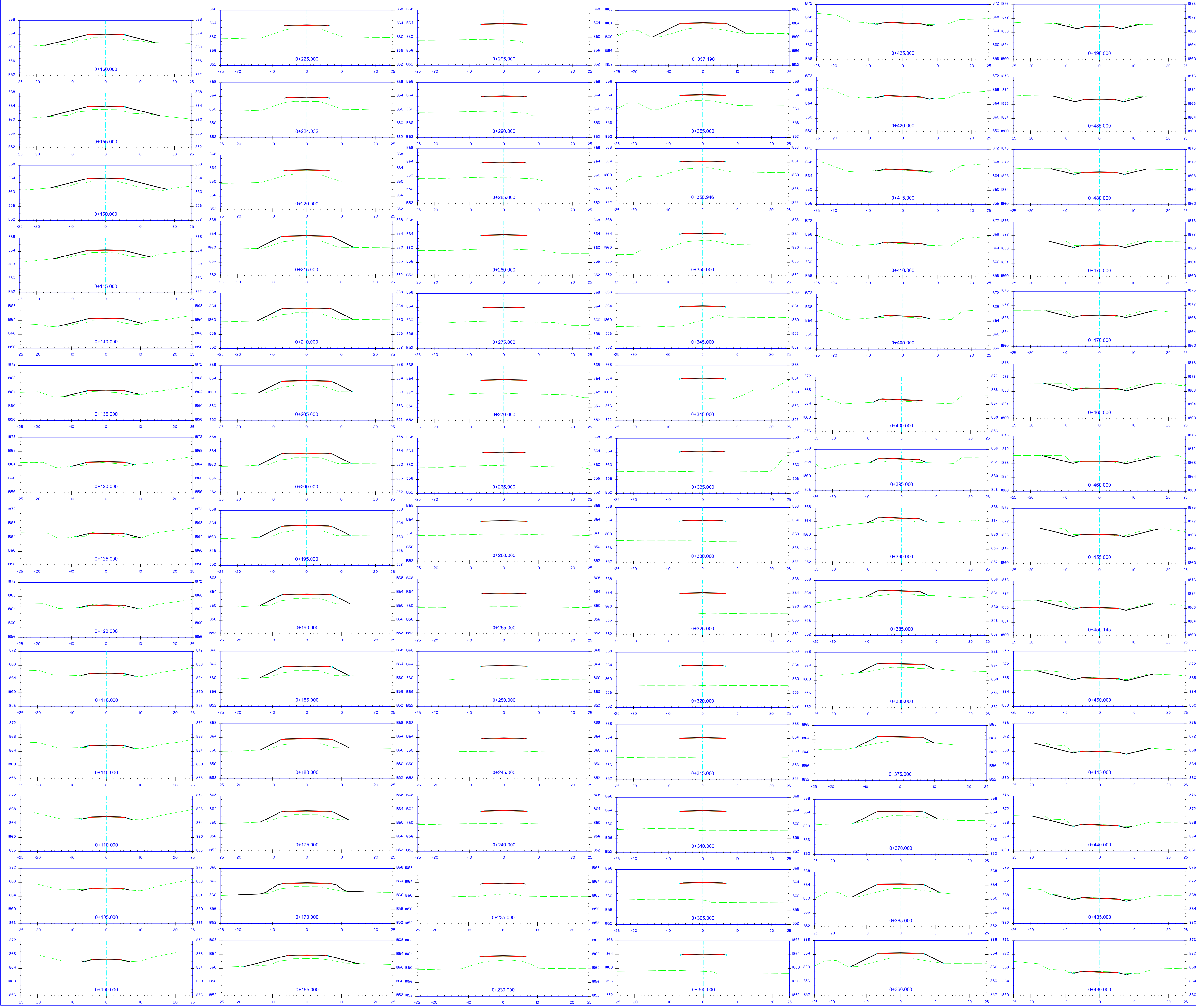
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NAVAJO REGIONAL OFFICE * DIVISION OF TRANSPORTATION

SQUARE TUBE STEEL POST
REFLECTIVE PANEL
DELINEATOR DETAILS

DRAWN BY: NRDOT	DATE: 1/31/2013
DESIGNED BY: NRDOT	DATE: 1/31/2013
REVISED: 11/15/17	BY: rsh
FILE NAME:	37_N9402_DelinObjMkr detail



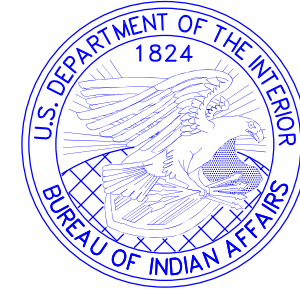
REGION	STATE	RESERVATION	ROUTE	PROJECT NO.	SHEET	TOTAL SHEETS
NAVAJO	ARIZONA	NAVAJO	N9402	N9402(2)1,2,3	41	41



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

N9402
X-SECTIONS

DRAWN BY: DRAWN BY	DATE: 06/18/20
DESIGNED BY: HRiley	DATE: 6/18/20
REVISED:	BY:
SCALE: N/A	
FILENAME: N9402 X-Sections	
SHEET MODEL NAME: LAYOUT	



GEOTECHNICAL INVESTIGATION AND FOUNDATION RECOMMENDATION REPORT

**RIO PUERCO BRIDGE REPLACEMENT (N656)
NAVAJO NATION
APACHE COUNTY, ARIZONA**

**TERRACON PROJECT NO. 66015021C
September 23, 2002**

Prepared for:

**PAIKI
11200 Lomas Boulevard NE
Suite 100
Albuquerque, New Mexico 87112**

Prepared by:

**Terracon
4416 Anaheim NE
Albuquerque, New Mexico 87113
Phone: 505-797-4287
Fax: 505-797-4288**

Terracon

September 23, 2002

Terracon

4416 Anaheim, NE
Albuquerque, New Mexico 87113
(505) 797-4287 Fax: (505) 797-4288

PAIKI
11200 Lomas Boulevard NE
Suite 100
Albuquerque, New Mexico 87112

Attn: Mr. Neil Rousseau

**Re: Geotechnical Investigation and Foundation Recommendation Report
Rio Puerco Bridge Replacement (N656)
Navajo Nation
Apache County, Arizona
Terracon Project No. 66015021C**

Terracon has completed the geotechnical exploration for the proposed Rio Puerco Bridge (N656) replacement to be located within the Navajo Nation, approximately 2.4 kilometers south of Lupton, in Apache County, Arizona. This study was performed in general accordance with Terracon proposal P01-019G in reference to the project.

The draft results of our engineering study, including the site plan, laboratory test results, logs of borings, and the geotechnical recommendations needed to aid in the design and construction of foundations and other earth connected phases of this project were provided to the structural engineer. This report presents the results of the design option chosen by the structural engineer and provides recommendations needed to aid in the construction of the foundations and other earth connected phases of the project.

We appreciate being of service to you in the geotechnical engineering phase of this project, and are prepared to assist you during the construction phases as well. If you have any questions concerning this report or any of our testing, inspection, design and consulting services, please do not hesitate to contact us.

Sincerely,
TERRACON



Kevin J. Scott, P.E.
Geotechnical Department Manager

A handwritten signature in blue ink that reads "Nathan A. Dowden".

Nathan A. Dowden, P.E.
Manager, New Mexico Operations

Copies to: Addressee (3)

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GEOTECHNICAL INVESTIGATION AND FOUNDATION RECOMMENDATION REPORT

RIO PUERCO BRIDGE REPLACEMENT (N656) NAVAJO NATION APACHE COUNTY, ARIZONA

**TERRACON PROJECT NO. 66015021C
SEPTEMBER 23, 2002**

INTRODUCTION

This Geotechnical Investigation and Foundation Recommendation (GIFR) report contains the results of our geotechnical exploration for the proposed bridge replacement to be located on Navajo Route N9402, approximately 2.4 kilometers (km) south of Lupton, in Apache County, Arizona. The approximate location of the bridge is shown on the Site Location Map, Figure A1.

The opinions and recommendations presented herein incorporate comments provided by PAIKI and the BIA regarding the previously submitted Draft GIFR dated June 18, 2002.

The purpose of these services is to provide information and geotechnical engineering recommendations for the chosen design option relative to:

- subsurface soil conditions
- groundwater conditions
- foundation design and construction
- lateral earth pressures
- earthwork
- drainage

The recommendations contained in this report are based upon the results of field and laboratory testing, engineering analyses, and experience with similar soil conditions, structures and our understanding of the proposed project.

PROPOSED CONSTRUCTION

We understand that the new Rio Puerco Bridge, will cross the Rio Puerco on the Navajo Nation Reservation and will replace the existing bridge. The new bridge is to be a five-span, concrete beam structure with concrete decking approximately 126.3 meters (m) in length and 10.6 m wide. Based on previous discussions and review of the 60% Design Submittal, it is our understanding that the alignment of the new bridge will follow the existing roadway. Information provided by the structural engineer indicates that axial design loading conditions (dead and live loads) at the abutments are 1215 kN and the piers are 850 kN.

SITE EXPLORATION

The scope of the services performed for this project included site reconnaissance by Terracon's field engineer, a subsurface exploration program, laboratory testing and engineering analyses.

Field Exploration: A total of eight test borings were drilled between June 20 and July 17, 2001. The borings were drilled to approximate depths of about 23.9 m to about 29.3 m below existing site grades at the approximate locations shown on the Boring Location Plan, Figure A2. The borings were advanced with a CME-75, truck-mounted drilling rig utilizing of 8.25 centimeter (cm) inside diameter, hollow-stem augers and 6.35 centimeter inside diameter rock coring bits. A ninth boring was proposed for the northern most proposed pier location, however, due to the depth of water in the channel, the boring was not drilled. It was determined during discussions with the structural engineer, based on the uniformity of the subsurface soils encountered in the area of the northern piers and abutments, that this boring could be eliminated from the drilling requirements.

The borings were located in the field by measurements from the existing bridge abutments, piers, and roadway centerline. Surface elevations at each boring location were interpolated from a topographical map provided by PAIKI. The boring locations, as referenced to the closest abutment and offset from the centerline, are shown on the following table. The accuracy of the boring locations and elevations should only be assumed to the level implied by the methods used.

Boring Number	Approximate Distance from existing abutment	Approximate Offset from Centerline	Elevation (m)
B-1	1.1 m South of South Abutment	8.6 m West	1862.5
B-2	2.7 m North of North Abutment	4.6 m East	1862.8
B-3	2.4 m North of North Abutment	5.8 m East	1862.5
B-4	25.7 m North of South Abutment	7.6 m West	1860.0
B-5	83.8 m North of South Abutment	7.9 m West	1858.7
B-6	0.5 m South of South Abutment	10.7 m East	1862.8
B-6A	0.5 m South of South Abutment	10.9 m East	1862.2
B-7	51.2 m North of South Abutment	7.5 m East	1858.7

Logs of each boring were recorded by the Terracon field engineer during the drilling operations. At selected intervals, samples of the subsurface materials were taken by driving either split-barrel or ring-barrel samplers or hydraulically pushing thin-walled Shelby Tube samplers.

Penetration resistance measurements were obtained by driving the sampler into the subsurface materials with a 63.5-kilogram (kg) hammer falling 76.2 cm. The number of blows required to drive the sampler the last 30 cm of the total 45 cm is referred to as the SPT blow count or "N-value". The penetration resistance value is a useful index in estimating the consistency, relative density or hardness of the materials encountered.

Groundwater conditions were evaluated in each boring at the time of site exploration, and upon completion of drilling.

Laboratory Testing: Samples retrieved during the field exploration were returned to the laboratory for observation by the project geotechnical engineer and were classified in general accordance with the Unified Soil Classification System described in Appendix C. At that time, an applicable laboratory testing program was formulated to determine engineering properties of the subsurface materials and the field descriptions were confirmed or modified as necessary. Logs of Borings were prepared and are presented in Appendix A.

Laboratory tests were conducted on selected soil and rock samples and the results are presented on the Logs of Borings and in Appendix B. The test results were used for the geotechnical engineering analyses, and the development of foundation and earthwork recommendations. Laboratory tests were performed in general accordance with the applicable local or other accepted procedures.

Selected soil samples were tested for the following engineering properties:

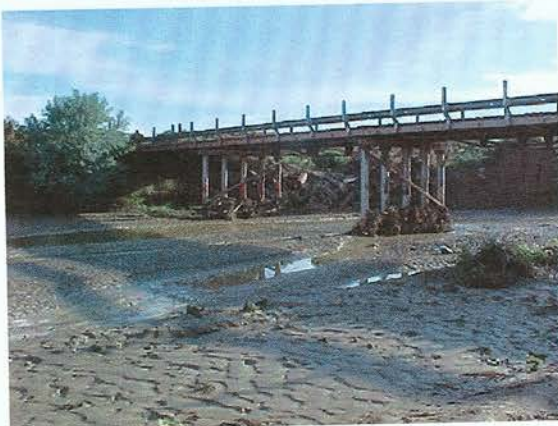
- | | |
|----------------------------|---|
| • Water Content | • Grain size |
| • Dry Density | • Plasticity Index |
| • Consolidation/Swell | • Unconfined Compressive Strength of Rock Cores |
| • P[H ⁺] Level | • Chloride Content |
| • Electrical Resistivity | • Water Soluble Sulfate Content |

SITE CONDITIONS



As evidenced from the photographs opposite and below and the boring location plan, the existing bridge is a ten span, steel beam bridge with a wooden deck. The abutments are supported by an unknown foundation type. The piers are supported by five pipe piles of about 406.4 mm in diameter. At the time of the exploration, and as indicated on the opposite photograph, the existing roadway on either side of the bridge is an unpaved road,

two lanes in width with minimal shoulders. The topography on either side of the bridge is moderately to steeply sloping towards the Rio Puerco. The area surrounding the bridge approaches and the flood plain area immediately adjacent to the channel is covered with native vegetation. Large amounts of debris and trash was noted beneath the bridge structure and surrounding the piers in the main channel.



The wash has a small main channel between the two northernmost piers abutments that appeared to be about 0.5 m deep by about 15.0 m wide. There is a broader channel on southern side of the main channel that, during periods of heavy runoff as observed during the drilling operations, extend the channel width to about 40 m. The slope of the channel banks vary from near vertical on the northern side of the Rio Puerco to slightly sloping at the southern abutment. However, both upstream

and downstream from the bridge, the channel banks are, generally, very steeply sloping to near vertical. The channel and side slopes are covered with a moderate growth of native vegetation. The slopes immediately adjacent to the abutments have no rip-rap protection and show evidence of apparent erosion.

Geology: The project area is located in the Colorado Plateau physiographic province of the (¹Cooley, 1967) North American Cordillera (²Stern, et al, 1979) of the southwestern United States. The Colorado Plateau province is situated between the Rocky Mountains to the east, and the Basin and Range physiographic province to the southwest. Formed during middle and late Tertiary time (100 to 15 m.y. ago), the Colorado Plateau is characterized by alternating cliffs and slopes formed as a result of different rates of erosion on resistant and weak sedimentary rocks. Ledges, cliffs and rock benches formed of resistant beds of sandstone and limestone are separated by slopes, valleys, and badlands carved on the weaker intervening shaley strata. The entire province has similar rock formations, which have nearly horizontal bedding or which are inclined slightly to the southwest. The entire plateau drains to the Colorado River.

The physiographic features within the province are related to their distance from the Colorado River and to the amount of downcutting caused by erosional processes. In areas adjacent to the Colorado River, canyon lands are developed extensively. In the areas surrounding the canyon lands and in part of the uplands adjoining the canyon rims, rock terraces form a series of platforms and high cliffs that include Marble Platform, Coconino Plateau, Echo Cliffs, Black Mesa, and Defiance Plateau. In the southern part of the province beyond the belt of rock terraces, the relief is rather subdued and broad slopes and low mesa-like features predominate. Structurally, the site is located on the Kaibito Plateau.

The geology of the project area is situated in an area defined by three geologic formations, the San Rafael and Glen Canyon groups of the early Jurassic age and the Chinle Formation of the Late Triassic age. These formations are comprised of mudstones, ledge-forming sandstones and layering of siltstone, claystone and sandstone deposited in river flood plains and lakes.

Soil and Rock Conditions: As presented on the Log of Boring, the subsurface soil conditions overlying rock encountered across the length of the bridge vary significantly. The surficial soils encountered at the abutment borings, and as evidenced in the channel side slopes, (opposite photograph) generally consisted of fine grained sands, sandy silts, and silty sands to depths varying from about 4 m to about 8.5 m. Underlying the surficial soils, interbedded layers of silts, sands and clays were encountered of varying



¹Cooley, M.E., 1967, **Arizona Highway Geologic Map**, Arizona Geological Society.

²Stern, C.W., et al, 1979, **Geological Evolution of North America**, John Wiley & Sons, Santa Barbara, California.

thickness. Occasionally, as evidenced in borings B-2 and B-4, the thickness of the layer was significant and could be defined. Underlying these interbedded soils, sedimentary bedrock consisting of Triassic and Jurassic age sandstones, claystones, and siltstones of varying degrees of competency was encountered. In general, the bedrock was weakly cemented and could be augered through. However, as evidenced in borings B-2 and B-3, the degree of cementation was significantly greater in these borings and core samples of the material could be obtained.

Generalized soil profiles along the north and south abutments and along the length of the proposed bridge are shown on Figures A12 through A14 in Appendix A. Photographs of representative sandstone samples obtained from the coring process are included in Appendix B.

Field and Laboratory Test Results: Field test results indicate that the overlying fine grained material (silts and clays) vary greatly across the site, with the consistency varying from soft to stiff. The relative density of the overlying coarse grained soils (sand) varied from very loose to medium dense. This upper layer is consistent with a typical alluvium deposition. The relative density/consistency correlation is based upon the Standard Penetration Test results obtained in the field. The underlying sandstone, siltstone and claystone varied from extremely weathered to slightly weathered but generally hard.

Laboratory test results indicate that clay soils may have a moderate expansion potential should they be allowed to become dry and then re-wetted, however, if these soils remain in their current moisture condition, the expansion potential is negligible. Laboratory test results further indicate that the silty and clayey subsoils exhibit moderate to high compression at in-situ and elevated moisture contents. The clay material encountered also showed moderate to high plasticity for the material. Correlation of the laboratory testing to published information indicate that the potential for liquefaction of the sands and silts is possible under certain dynamic conditions such as earthquake loading and possibly pile driving, depending upon the methods used for pile foundation installation.

Groundwater Conditions: Groundwater was observed in the test borings at depths varying from 1.5 m to about 5.5 m below the existing ground surface at the time of field exploration. These observations represent groundwater conditions at the time of the field exploration, and may not be indicative of other times, or at other locations. Groundwater conditions can change with varying seasonal and weather conditions, and other factors.

ENGINEERING ANALYSES AND RECOMMENDATIONS

The analyses and recommendations presented in this report have been prepared in general accordance with the guidelines established in Division 1 of the *Standard Specifications for Highway Bridges, 16th Edition* as prepared by the American Association of State Highway and Transportation Officials (AASHTO). Recommendations pertaining to the construction and installation of the various

foundation elements, abutments, and approach slabs should be in accordance with Division 2 of the Standard Specifications.

Geotechnical Considerations: The subsurface conditions at the bridge consisted of variable strength soil underlain by weathered sandstone, siltstone, and claystone. Shallow foundations bearing on these soils could experience severe and damaging settlements and are considered incompatible with the anticipated foundation loads. To provide positive foundation support, it was our opinion that the bridge should be supported on a deep foundation system consisting of drilled piers, driven H-piles, or driven concrete-filled pipe piles. Based on our draft GIFR, the structural engineer chose concrete-filled pipe piles.

Final design, as prepared by PAIKI, is based upon the utilization of 610 mm diameter concrete filled pipe piles at the abutments and pier bents. Design and construction recommendations for the chosen foundation system was evaluated and other earth related phases of the project are outlined below. It should be also be noted that the project site is identified as having no seismic risks in accordance with AASHTO guidelines.

Driven Pile Foundation Systems: A driven pile system consisting of 610 mm diameter concrete filled pipe piles will be utilized for support of the structure. The piles chosen for foundation support transmit structural loads to a stratum of high bearing capacity and should experience relatively small amounts of movement.

Due to the existing soil conditions encountered in the borings, the piles will fully extend through the overburden soils and bear a minimum of 150 mm into the sandstone, siltstone or claystone in order to reach the design capacity. The sloping nature of the bedrock encountered could lead to some variability in pile lengths across the piers and/or abutments.

The design capacity of a single-driven pile is a function of several factors including:

- the size and type of the pile and
- the engineering properties of the subsurface soils.

Analysis was performed utilizing FHWA design guidelines and FHWA *Driven 1.0* computer analysis program for estimation of ultimate axial load capacity. Utilizing this method, a safety factor of 2.75 is applied to determine the allowable pile capacity and estimated embedment depth. However, it may be possible to increase the allowable pile capacity by;

1. Performing a Static Pile Load test(s) allowing the factor of safety to be reduced to 2.0.
2. Performing Dynamic Measurements and Analysis coupled with a GRLWeep Analysis allows the factor of safety to be reduced to 2.25.

3. Installation of Indicator Piles, coupled with a GRLWeep Analysis allows the factor of safety to be reduced to 2.50. As stated, the reduction in the safety factor may enable the pile length to be reduced or could allow for the increase of the allowable pile capacity, which may reduce the costs of pile installation.

For the *Driven 1.0* analysis the following soil condition parameters were used:

TABLE 1: Soil Properties

Soil Layer	Type	Unit Weight	Undrained Shear Strength or Internal Angle of Friction
Upper Silty Sand/Sandy Silt	Cohesionless Loose Sands	14-16 kN/m ³	26.0° to 30.0° Friction Angle
Lower Sandy Clays/Silts	Cohesive Soft Clay or Elastic Silt	15.5 kN/m ³	7 to 8 kPa Shear Strength
Lower Silty Sands/Poorly Graded Sands	Cohesionless Loose Sands	16.0 kN/m ³	28.0° to 32.0° Friction Angle
Weathered Sandstone	Cohesionless Very Dense Sand	16.0 kN/m ³	38.0° to 41.0° Friction Angle
Underlying Siltstone/Claystone Layer	Cohesive Hard Elastic/Plastic Silt/Clay	15.0 kN/m ³	30.0 kPa Shear Strength

Uplift capacity of the piles will be developed by friction in the soils surrounding the piles. Allowable uplift capacity for either type pile can be determined using 4.8 kN/m² of surface area for length of pile above the siltstone and sandstone layers. The pile area embedded in the sandstone, siltstone or claystone will provide an uplift capacity of 14.4 kN/m² can be used. The depth of scour along the pile should be neglected for uplift resistance.

Axial and uplift pile capacities may be increased by as much as one-third when considering wind and/or transient loading.

Lateral load analysis of piles was performed using the microcomputer program LPILE[®] which was developed by ENSOFT, Inc. Input data for this analysis was based on the subsurface profile presented in Figures A12 through A14 and the lateral load information provided by the bridge structural engineer. Our lateral load analysis for the pier bents accounted for the loss of lateral support due to about 4 m of scour as indicated by the Zia Engineering Drainage Analysis. Results of the lateral load analysis indicate that the piles and soil structure are sufficient to resist the lateral loads as provided by the structural engineer.

Groups of piles required to support concentrated loads will require appropriate reductions of the axial, uplift and lateral capacities based on the effective envelope of the pile group. This reduction can be avoided by spacing piles at a minimum distance of at least 3.5 diameters

center to center. Piles spaced less than 3.5 diameters center to center should be evaluated on an individual basis to determine appropriate reductions in axial, uplift and lateral capacities.

The contractor should select a driving hammer and cushion combination that is capable of installing the selected piling without overstressing the pile material. The contractor should submit the pile driving plan and the pile hammer-cushion combination to the engineer for evaluation of the driving stresses in advance of pile installation.

The pile driving system should be analyzed using the wave equation to evaluate the potential for overstressing the pile materials during driving. Dynamic analysis may also be used to evaluate the driving resistance required to obtain the predicted design load. As an alternative, the pile capacity could be verified during construction by performing a pile load test in accordance with ASTM D1143, Standard Test Method for Piles Under Static Compressive Load.

The pile hammer should be operated at the manufacturer's recommended stroke when measuring penetration resistance. All piles should be provided with driving shoes to protect the pile tip from damage when penetrating the dense granular soils. A representative of the geotechnical engineer should observe pile driving operations on a full-time basis. Each pile should be observed and checked for buckling, crimping and alignment in addition to recording penetration resistance, depth of embedment and general pile driving operations.

Lateral Earth Pressures: For soils above any free water surface, recommended equivalent fluid pressures for unrestrained foundation elements are:

- Active:
Cohesionless soil backfill (on-site sand)..... 5.6 kPa/m
Undisturbed subsoil 6.3 kPa/m
Compacted granular backfill..... 5.6 kPa/m
- At-rest:
Cohesionless soil backfill (on-site sand)..... 9.0 kPa/m
Undisturbed subsoil 10.1 kPa/m
Compacted granular backfill..... 9.0 kPa/m
- Passive:
Provided the abutments are armored per Federal Highway Guidelines to minimize scour and as shown on the design drawings, then a passive resistance for on-site soils of 35.3 kPa/m can be utilized for abutment and wing walls.

The lateral earth pressures herein do not include any factor of safety and are not applicable for submerged soils/long-term hydrostatic loading. Additional recommendations may be necessary if submerged conditions are to be included in the design. Short-term hydrostatic

loading typically associated with flooding and/or short-term saturation due to storm water run-off/snow melt do not require additional recommendations.

Fill against grade beams and retaining walls should be compacted to densities specified in the Earthwork section of this report. Compaction of each lift adjacent to walls should be accomplished with hand-operated tampers or other lightweight compactors. Overcompaction may cause excessive lateral earth pressures which could result in wall movement.

Below Grade Wall Drainage: To reduce hydrostatic loading on below grade walls, such as abutment and wing walls, a subsurface drain system should be placed behind the wall. The drain system should consist of free-draining granular soils containing less than five percent fines (by weight) passing a 0.075 μm (No. 200) sieve placed adjacent to the wall. The free-draining granular material should be graded to prevent the intrusion of fines or encapsulated in a suitable filter fabric. A drainage system consisting of either weep holes or perforated drain lines (placed near the base of the wall) should be used to intercept and discharge water that may saturate the backfill. Where used, drain lines should be embedded in a uniformly graded filter material and provided with adequate clean-outs for periodic maintenance. An impervious soil should be used in the upper layer of backfill to reduce the potential for water infiltration. As an alternative, a prefabricated drainage structure, such as geocomposite, may be used as a substitute for the granular backfill adjacent to the wall.

Corrosion Protection: Results of soluble sulfate testing indicate that ASTM Type II Portland cement should be specified for all project concrete on and below grade. Foundation concrete should be designed for moderate sulfate exposure in accordance with the provisions of the ACI Design Manual, Section 318, Chapter 4.

Laboratory test results indicate that on-site soils have resistivities ranging from 1,300 to 52,000 ohm-centimeters, and pH values ranging from 8.1 to 9.4. These values should be used to determine potential corrosive characteristics of the on-site soils with respect to contact with the various underground materials which will be used for project construction.

Criteria published by the Cast Iron Pipe Research Institute indicates that these values make the soils non-corrosive to slightly corrosive to buried ferrous materials. Review of data published by the National Association of Corrosion Engineers indicates that the resistivity places the soils in the mildly corrosive category.

While resistivity and pH are two parameters which indicate the potential of corrosion, these properties alone are not solely responsible for the corrosive effects of soil. One major consideration in combination with other parameters is the in-situ moisture content of the soils. As the moisture content of soils increases, the corrosion potential increases in like manner provided that other properties of the soils indicate corrosive potential.

Earthwork:

General Considerations: The following presents recommendations for site preparation, excavation, subgrade preparation and placement of engineered fills on the project.

Earthwork on the project should be observed and tested by Terracon. These services should include observation and testing of engineered fill, subgrade preparation, foundation bearing soils, and other geotechnical conditions exposed during the construction of the project.

Site Preparation: Strip and remove existing vegetation, debris, and other deleterious materials from the proposed construction areas. Exposed surfaces should be free of mounds and depressions which could prevent uniform compaction.

Stripped materials consisting of vegetation and organic materials should be wasted from the site, or used to revegetate landscaped areas or exposed slopes after completion of grading operations. If it is necessary to dispose of organic materials on-site, they should be placed in non-structural areas, and in fill sections not exceeding 1.5 m in height.

The site should be initially graded to create a relatively level surface to receive fill, and to provide for a relatively uniform thickness of fill beneath proposed building structures.

If fill is placed in areas of the site where existing slopes are steeper than 5:1 (horizontal:vertical), the area should be benched to reduce the potential for slippage between existing slopes and fills. Benches should be wide enough to accommodate compaction and earth moving equipment, and to allow placement of horizontal lifts of fill.

Exposed areas which will receive fill, once properly cleared and benched where necessary, should be scarified to a minimum depth of 20 cm, conditioned to near optimum moisture content, and compacted.

Demolition of the existing bridge should include complete removal of all foundation systems within the proposed construction area to the recommended sour depth to reduce the potential of added restrictions within the channel. However, if existing foundation elements (existing piles) conflict with proposed foundation elements (new piles) or are located within a 0.5 m radius of the new piles, the existing foundation elements should be removed in their entirety. This should include removal of any loose backfill found adjacent to existing foundations. If the existing piles are removed the resulting void should be backfilled with a lean concrete/slurry fill. All

materials derived from the demolition of existing structures and pavements should be removed from the site, and not be allowed for use in any on-site fills.

Based upon the subsurface conditions determined from the geotechnical exploration, subgrade soils exposed during construction are anticipated to be relatively stable. However, the stability of the subgrade may be affected by precipitation, repetitive construction traffic or other factors. If unstable conditions develop, workability may be improved by scarifying and drying. Overexcavation of wet zones and replacement with granular materials may be necessary.

The individual contractor(s) is responsible for designing and constructing stable, temporary excavations as required to maintain stability of both the excavation sides and bottom. All excavations should be sloped or shored in the interest of safety following local, and federal regulations, including current OSHA excavation and trench safety standards.

Subgrade Preparation: Areas of loose soils may be encountered after excavations are completed. When such conditions exist beneath planned structural areas, the subgrade soils should be compacted prior to placement of the foundations or engineered fill.

Subgrade soils beneath approach slabs, footings and beneath pavements should be scarified, moisture conditioned and recompact to a minimum depth of 20 cm. The moisture content and compaction of subgrade soils should be maintained until slab, footing or pavement construction.

Fill Materials and Placement: Clean on-site soils or approved imported materials may be used as fill material. Imported soils (if required) should conform to the following:

<u>Gradation</u>	<u>Percent finer by weight (ASTM C136)</u>
25 mm.....	100
4.75 mm.....	50-100
0.075 μ m.....	12-35
• Liquid Limit.....	35 (max)
• Plasticity Index	14 (max)

Engineered fill should be placed and compacted in horizontal lifts not exceeding 20 cm in loose thickness, using equipment and procedures that will produce recommended moisture contents and densities throughout the lift. Recommended

compaction criteria for engineered fill materials and scarified subgrade soils are as follows:

<u>Material</u>	<u>Minimum Percent (ASTM D1557)</u>
Scarified subgrade soils	95
On-site and imported fill soils:	
Beneath foundations and embankment fills	95
Beneath pavements	95
Aggregate base (beneath slabs)	95
Miscellaneous backfill (non-structural areas).....	90

On-site and imported soils should be compacted within a moisture content range of 3 percent below, to 3 percent above optimum.

Slopes: For permanent slopes in native soils or in compacted fill areas comprised of on-site material, the recommended maximum configurations for on-site materials is 2.5:1 (Horizontal:Vertical). If steeper slopes are required for site development, stability analyses should be completed to design the grading plan.

The face of all fill slopes should be compacted to the minimum specification for fill embankments. Alternately, fill slopes can be over-built and trimmed to compacted material. If any slope in cut or fill will exceed 7.5 m in height, the grading design should include mid-height benches to intercept surface drainage and divert flow from the face of the embankment.

Excavation and Trench Construction: Excavations into the on-site soils may encounter caving soils, depending upon the final depth of excavation. The individual contractor(s) should be made responsible for designing and constructing stable, temporary excavations as required to maintain stability of both the excavation sides and bottom. All excavations should be sloped or shored in the interest of safety following local, and federal regulations, including current OSHA excavation and trench safety standards.

The soils to be penetrated by excavations may vary across the site. The soil classifications presented in this report are based solely on the materials encountered in the test borings. The contractor should verify that similar conditions exist throughout the proposed area of excavation. If different subsurface conditions are encountered at the time of construction, the actual conditions should be evaluated to determine any excavation modifications necessary to maintain safe conditions.

As a safety measure, it is recommended that all vehicles and soil piles be kept to a minimum lateral distance from the crest of the slope equal to no less than the slope height. The exposed slope face should be protected against the elements.

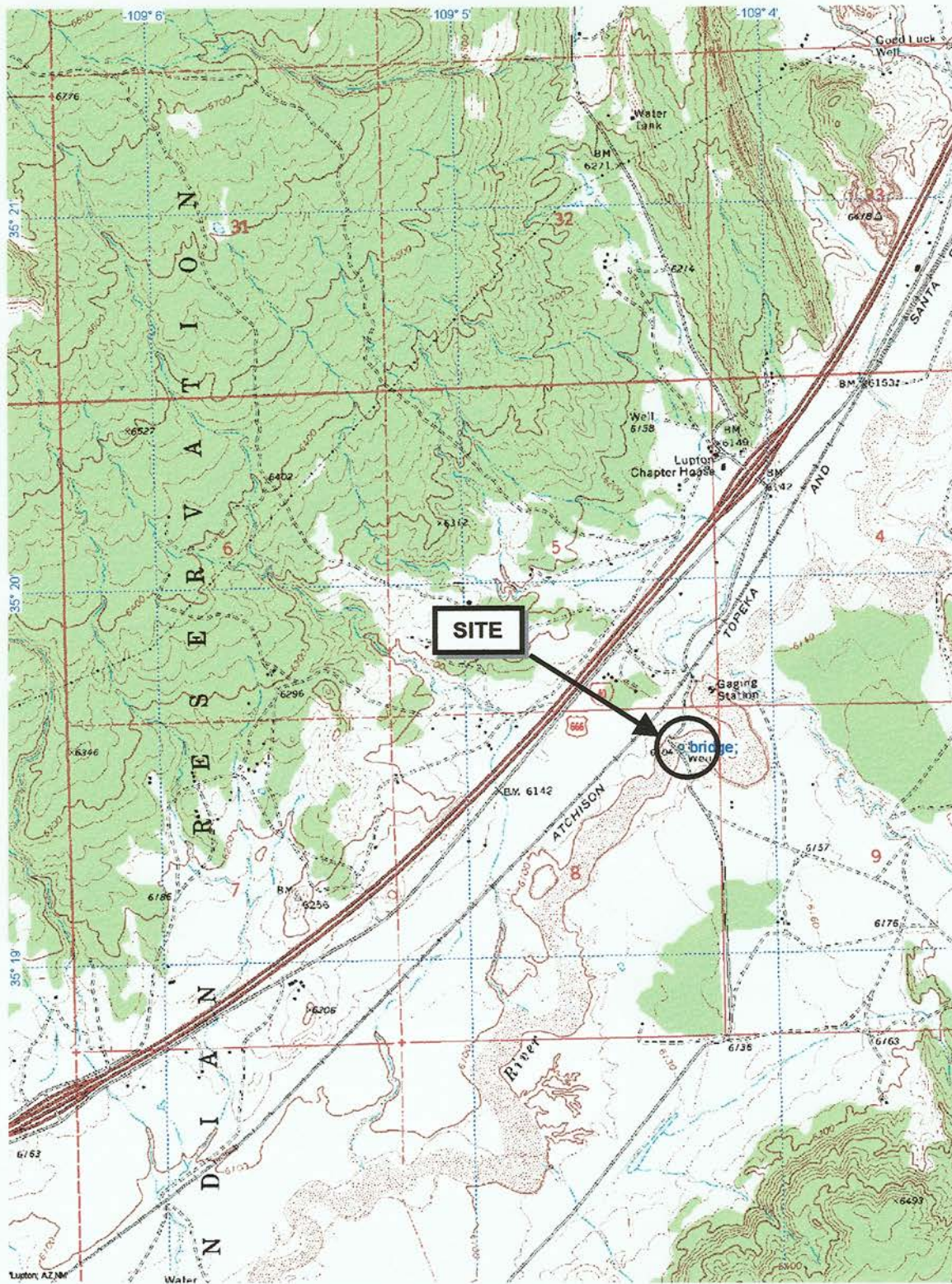
GENERAL COMMENTS

Terracon should be retained to review the final design plans and specifications so comments can be made regarding interpretation and implementation of our geotechnical recommendations in the design and specifications. Terracon also should be retained to provide testing and observation during excavation, grading, foundation and construction phases of the project.

The analysis and recommendations presented in this report are based upon the data obtained from the borings performed at the indicated locations and from other information discussed in this report. This report does not reflect variations that may occur between borings or across the site. The nature and extent of such variations may not become evident until construction. If variations appear, it will be necessary to reevaluate the recommendations of this report.

The scope of services for this project does not include either specifically or by implication any environmental assessment of the site or identification of contaminated or hazardous materials or conditions. If the owner is concerned about the potential for such contamination, other studies should be undertaken.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made. In the event that changes in the nature, design, or location of the project as outlined in this report, are planned, the conclusions and recommendations contained in this report shall not be considered valid unless Terracon reviews the changes, and either verifies or modifies the conclusions of this report in writing.



SOURCE: USGS TOPOGRAPHIC MAP, 7.5-MINUTE SERIES, Lupton, Arizona/New Mexico, 1971.

Terracon

1416 Anaheim Northeast
Albuquerque, New Mexico 87113
(505) 797-4287 Fax (505) 797-4288

SITE LOCATION MAP

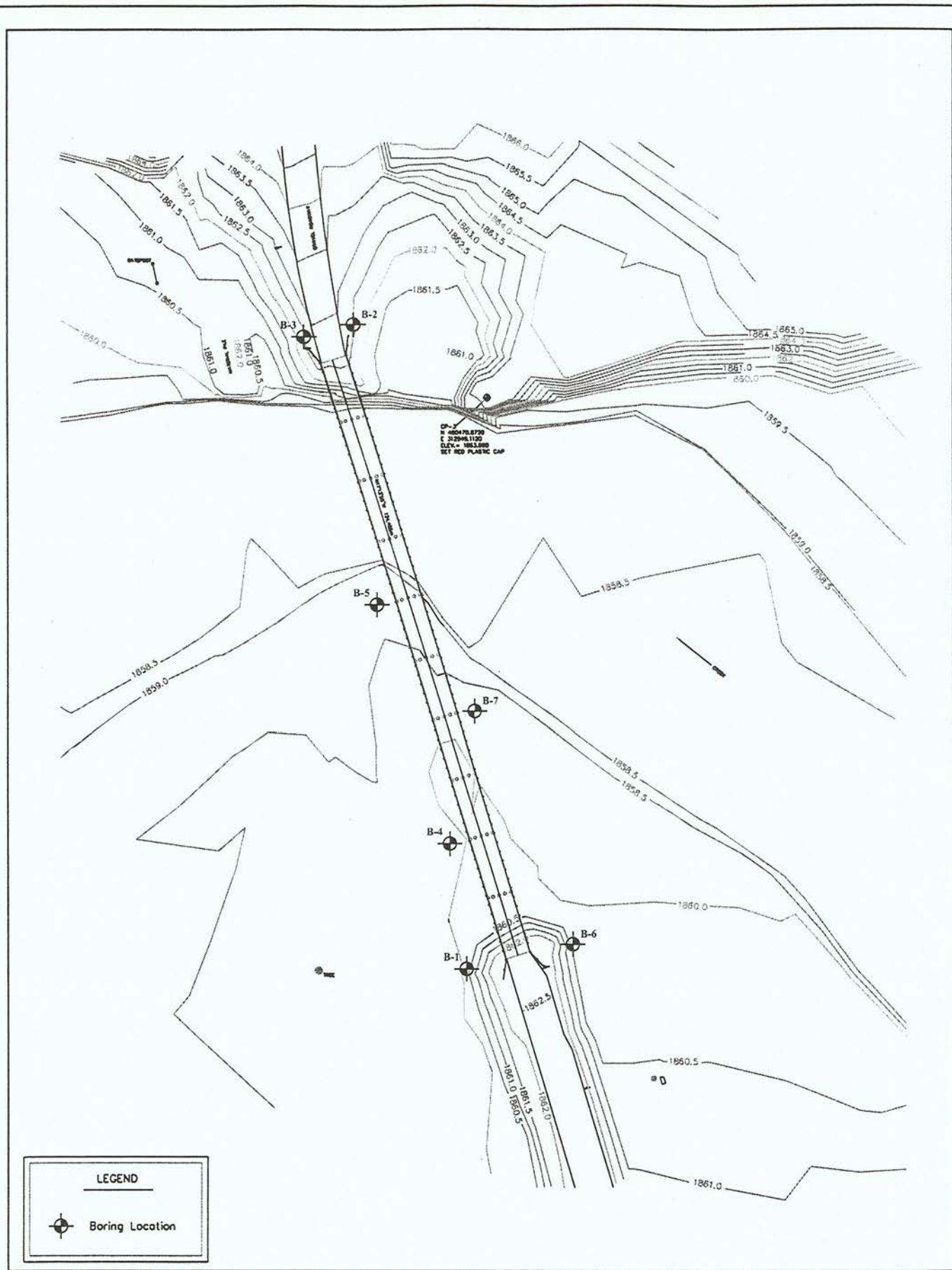
Rio Puerco Bridge No. 656
Navajo Nation
Apache County, Arizona

Project No. 66015021C

Date: August 22, 2001

Scale: 1 cm. = 240 m. (approx.)

FIGURE A1



Terracon

4416 ANAHEIM AVE NE
ALBUQUERQUE, NEW MEXICO
(505) 797-4287 FAX (505) 797-4288

BORING LOCATION PLAN

TERRACON PROJECT NO. 66015021-C

DRAWN BY:
GAS
CHECKED BY:
EJS
FILE:
SITE SKETCH
SCALE:
N/A
DATE:
08/22/01

Navajo Bridge Replacement Project
Rio Puerco Bridge (N656)
Apache County, Arizona

FIGURE NO.

A2

LOG OF BORING NO. B-1

Page 1 of 3

CLIENT		PAIKI							
SITE		APACHE, ARIZONA							
PROJECT		RIO PUERCO/BRIDGE NO. 656							
GRAPHIC LOG	DESCRIPTION	DEPTH, m.	USCS SYMBOL	SAMPLES				TESTS	
				NUMBER	TYPE	RECOVERY, m.	SPT - N BLOWS / 0.3m.	WATER CONTENT, %	DRY UNIT WT kN/m ³
Approx. Surface Elev.: 1862.5 m									
	SILTY SAND/SANDY SILT; Brown, Loose To Medium Dense/Medium Stiff To Stiff, Fine To Medium Grained, Dry to Wet.	1	SP SM	1	SS	0.08	6	2.3	
		2							
		3	SP SM	2	RS	0.2	5	5.0	15.6
		4							
		5	SP SM	3	SS	0.46	13	16.6	
		6	CL CH	4	SS	0.41	6	13.0	
		7							
		8	CL ML	5	RS	0.46	5	19.0	14.8
		9	CL ML	6	SS	0.46	4	33.5	
		10							
5.9		1856.5							
INTERBEDDED LAYERS OF CLAY, SILT, AND SAND; Reddish Brown And Grey Clays, Grey Silts, Brown Sands, Very Soft Clays And Silts, Very Loose Sands, Medium To High Plasticity, Fine To Coarse Grained Sands, Wet.									

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, m

WL	2.3	WD	
WL		WD	
WL		WD	


Terracon

BORING STARTED	6-20-01
BORING COMPLETED	6-20-01
RIG	CME-75
FOREMAN	GAB
APPROVED	KJS
JOB #	66015021C

BOREHOLE 99 3021C.GPJ TERRACON.GDT 9/23/02

LOG OF BORING NO. B-1

Page 2 of 3

CLIENT		PAIKI										
SITE		PROJECT										
APACHE, ARIZONA		RIO PUERCO/BRIDGE NO. 656										
GRAPHIC LOG	DESCRIPTION	DEPTH, m.	USCS SYMBOL	SAMPLES			TESTS					
				NUMBER	TYPE	RECOVERY, m.	SPT - N BLOWS / 0.3m.	WATER CONTENT, %	DRY UNIT WT kN/m ³	UNCONFINED STRENGTH, kPa		
	11.3	1851.2	<u>POORLY GRADED SAND WITH SILT:</u> Grey, Very Loose to Loose, Fine To Medium Grained, Wet.	SP SM	7	SS	0.41	2	29.1			
	12			SP SM	8	SS	0.46	0	27.1			
	13											
	14	1848.5		SP SM	9	SS	0.46	5	16.6			
	15											
	16			CH	10	SS	0.43	11	23.1			
	17											
	18			CH	11	RS	0.3	100/2	5.4	19.9		
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Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, m

WL	2.3	WD	
WL			
WL			

Terracon

BORING STARTED		6-20-01	
BORING COMPLETED		6-20-01	
RIG	CME-75	FOREMAN	GAB
APPROVED	KJS	JOB #	66015021C

LOG OF BORING NO. B-1

Page 3 of 3

CLIENT PAIKI									
SITE APACHE, ARIZONA		PROJECT RIO PUERCO/BRIDGE NO. 656							
GRAPHIC LOG	DESCRIPTION	DEPTH, m.	USCS SYMBOL	SAMPLES				TESTS	
				NUMBER	TYPE	RECOVERY, m.	SPT - N BLOWS / 0.3m.	WATER CONTENT, %	DRY UNIT WT kN/m ³
	CLAYSTONE/SILTSTONE: Grey To Dark Grey, Slightly To Moderately Cemented, Some Fine Grained Sand, Dry To Moist, Grading to Claystone/Shale With Depth.	21							
			14	SS	0.1	50/08	13.1		
		22							
			15	SS	0.05	50/08	8.2		
		23							
			16	SS	0.05	50/13	5.2		
		24							
			17	SS	0.05	50/1	7.3		
		25							
			18	SS	0.05	50/02	3.3		
26									
27									
28									
29		19	SS		50/05				
29.3	1833.2								
Boring Terminated at 29.3 m.									

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, m

WL	▽ 2.3	WD	▽
WL	▽	WD	▽
WL			

Terracon

BORING STARTED	6-20-01
BORING COMPLETED	6-20-01
RIG	CME-75
FOREMAN	GAB
APPROVED	KJS
JOB #	66015021C

BOREHOLE 99 6615021C.GPJ TERRACON.GDT 9/23/02

LOG OF BORING NO. B-2

Page 1 of 3

CLIENT

PAIKI

SITE

APACHE, ARIZONA

PROJECT

RIO PUERCO/BRIDGE NO. 656

GRAPHIC LOG

DESCRIPTION

Approx. Surface Elev.: 1862.8 m

DEPTH, m.

USCS SYMBOL

NUMBER

TYPE

RECOVERY, m.

SPT - N
BLOWS / 0.3m.

WATER
CONTENT, %

DRY UNIT WT
kN/m³

UNCONFINED
STRENGTH, kPa

SILTY SAND/SANDY SILT: Brown, Loose To Medium Dense/Soft To Stiff, Fine To Medium Grained, Dry To Moist.

1

SM
ML

1

SS

0.3

26

9.7

2

3

SM
ML

2

RS

0.3

20

1.2

12.4

4

4.9

1857.9

SP
SM

3

SS

0.46

7

21.2

POORLY GRADED SAND WITH SILT: Brown, Loose, Fine To Coarse Grained, Wet.

6

SP
SM

4

SS

0.46

6

19.9

7

8

SP
SM

5

ST

0.61

8.5

1854.3

SANDY CLAY: Dark Brown, Medium Stiff To Stiff, Medium To High Plasticity, Medium To Coarse Grained, Moist.

9

CH

6

RS

0.3

9

20.2

14.9

10

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, m

WL 5 WD
WL 7
WL

Terracon

BORING STARTED 6-26-01

BORING COMPLETED 6-26-01


RIG CME-75 FOREMAN WSJ

APPROVED KJS JOB # 66015021C

BOREHOLE 99-021C.GPJ TERRACON.GDT 9/23/02

LOG OF BORING NO. B-2

Page 2 of 3

CLIENT		PAIKI							
SITE		PROJECT							
APACHE, ARIZONA		RIO PUERCO/BRIDGE NO. 656							
GRAPHIC LOG	DESCRIPTION	DEPTH, m.	USCS SYMBOL	SAMPLES			TESTS		
				NUMBER	TYPE	RECOVERY, m.	SPT - N BLOWS / 0.3m.	WATER CONTENT, %	DRY UNIT WT kN/m ³
	SANDY CLAY; Dark Brown, Medium Stiff To Stiff, Medium To High Plasticity, Medium To Coarse Grained, Moist.	11	CH	7	SS	0.46	50/.1	22.2	
	WEATHERED SANDSTONE; Grey, Slightly Cemented, Fine To Coarse Grained, Moist.	12		8	RS	0.46	50/.05	11.7	17.0
		13							
	CLAYSTONE/SILTSTONE; Grey To Dark Grey, Slightly To Moderately Cemented, Some Fine Grained Sand, Dry.	14		9	SS	0.46	79	14.7	
		15							
		16		10	SS	0.3	50/.13	12.2	
		17		11	SS	0.2	50/05	14.9	
		18							
		19		12	SS	0.46	50/.08	8.1	
		20							
		20							

11.9

1850.9

13.4

1849.4

1842.8

Continued Next Page

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, m

WL	5	WD	
WL		WD	
WL			

Terracon

BORING STARTED	6-26-01
BORING COMPLETED	6-26-01
RIG	CME-75
FOREMAN	WSJ
APPROVED	KJS
JOB #	66015021C

BOREHOLE 99 6615021C.GPJ TERRACON.GDT 9/23/02

LOG OF BORING NO. B-2

Page 3 of 3

CLIENT

PAIKI

SITE

APACHE, ARIZONA

PROJECT

RIO PUERCO/BRIDGE NO. 656

GRAPHIC LOG

DESCRIPTION

CLAYSTONE/SHALE; Grey To Light Grey With Purple Nodules, Slightly Weathered, Moderately Jointed, Bedding Plane Horizontal To About 10 Degrees Dipping, Moderate To Widely Banded.

23.5

1839.3

Very Weathered, Extremely Jointed Below 23.46 m.

25.9

1836.9

Boring Terminated at 25.9 m.

DEPTH, m.

USCS SYMBOL

NUMBER

TYPE

RECOVERY, m.

SPT - N
BLOWS / 0.3m.

WATER
CONTENT, %

DRY UNIT WT
kN/m³

UNCONFINED
STRENGTH, kPa

13

SS

0.1

50/03

8.6

14

DB

77%

15

DB

88%

16

DB

79%

17

DB

89%

18

DB

98%

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, m

WL	5	WD	
WL			
WL			

Terracon

BORING STARTED		6-26-01	
BORING COMPLETED		6-26-01	
RIG	CME-75	FOREMAN	WSJ
APPROVED	KJS	JOB #	66015021C

LOG OF BORING NO. B-3

Page 1 of 3

CLIENT

PAIKI

SITE

APACHE, ARIZONA

PROJECT

RIO PUERCO/BRIDGE NO. 656

GRAPHIC LOG

DESCRIPTION

Approx. Surface Elev.: 1862.5 m

POORLY GRADED SAND; Brown, Medium Dense, Fine To Medium Grained, Trace To Some Gravel, Dry.

2.3

1860.2

SILTY SAND/SANDY SILT; Brown, Medium Dense/Medium Stiff, Fine To Coarse Grained, Dry to Moist.

5.9

1856.5

INTERBEDDED LAYERS OF CLAY, SILT, AND SAND; Reddish Brown And Grey Clays, Grey Silts, Brown Sands, Very Soft Clays And Silts, Very Loose Sands, Medium To High Plasticity, Fine To Coarse Grained Sands, Wet.

DEPTH, m.	USCS SYMBOL	SAMPLES				TESTS		
		NUMBER	TYPE	RECOVERY, m.	SPT - N BLOWS / 0.3m.	WATER CONTENT, %	DRY UNIT WT kN/m ³	UNCONFINED STRENGTH, kPa
1								
2	SP	1	SS	0.18	23	7.3		
3								
4								
5	SM ML	2	RS	0.3	24	7.7		
6								
7								
8	SM ML	3	RS	0.1	16	7.0		
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
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35								
36								
37								
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								
49								
50								
51								
52								
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71								
72								
73								
74								
75								
76								
77								
78								
79								
80								
81								
82								
83								
84								
85								
86								
87								
88								
89								
90								
91								
92								
93								
94								
95								
96								
97								
98								
99								
100								

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, m

WL	5.5	WD	
WL		WD	
WL		WD	

Terracon

BORING STARTED	6-28-01
BORING COMPLETED	7-11-01
RIG	CME-75
FOREMAN	GAB/WSJ
APPROVED	KJS
JOB #	66015021C

BOREHOLE 99 6615021C.GPJ TERRACON.GDT 9/23/02

LOG OF BORING NO. B-3

Page 2 of 3

CLIENT

PAIKI

SITE

APACHE, ARIZONA

PROJECT

RIO PUERCO/BRIDGE NO. 656

GRAPHIC LOG

DESCRIPTION

DEPTH, m.

USCS SYMBOL

NUMBER

TYPE

RECOVERY, m.

SPT - N
BLOWS / 0.3m.

WATER
CONTENT, %

DRY UNIT WT
kN/m³

UNCONFINED
STRENGTH, kPa

11.3

1851.2

WEATHERED SANDSTONE: Grey, Slightly Cemented, Fine To Coarse Grained, Moderately Weathered Thinly Banded, Bedding At 10 To 15 Degrees.

13.1

1849.4

CLAYSTONE/SILTSTONE: Dark Grey To Grey, Very Weathered, Extremely Jointed, Moderately Banded, Weakly Cemented.

19.2

1843.3

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, m

WL	5.5	WD	
WL			
WL			

Terracon

BORING STARTED	6-28-01
BORING COMPLETED	7-11-01
RIG	CME-75 FOREMAN GAB/WSJ
APPROVED	KJS JOB # 66015021C

5021C.GPJ TERRACON.GDT 9/23/02

BOREHOLE

LOG OF BORING NO. B-3

Page 3 of 3

CLIENT PAIKI									
SITE APACHE, ARIZONA		PROJECT RIO PUERCO/BRIDGE NO. 656							
GRAPHIC LOG	DESCRIPTION	DEPTH, m.	USCS SYMBOL	SAMPLES				TESTS	
				NUMBER	TYPE	RECOVERY, m.	SPT - N BLOWS / 0.3m.	WATER CONTENT, %	DRY UNIT WT kN/m ³
	CLAYSTONE/SHALE; Grey To Light Grey With Purple Nodules, Slightly Weathered, Moderately Jointed, Bedding Planes Horizontal To About 10 Degrees Dipping, Moderately Banded, Numerous Vertical Joint And Fractures.								
		18	DB	44%					
		19	DB	67%					
		20	DB	74%					
		21							
		22							
		23	21	DB	87%				
24.1	1838.4	Boring Terminated at 23.9m.							

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, m

WL	5.5	WD	
WL		WD	
WL		WD	

Terracon

BORING STARTED	6-28-01
BORING COMPLETED	7-11-01
RIG	CME-75
APPROVED	KJS
FOREMAN	GAB/WSJ
JOB #	66015021C

LOG OF BORING NO. B-4

Page 1 of 3

CLIENT		PAIKI									
SITE		APACHE, ARIZONA		PROJECT							
				RIO PUERCO/BRIDGE NO. 656							
GRAPHIC LOG	DESCRIPTION	DEPTH, m.	USCS SYMBOL	SAMPLES				TESTS			
				NUMBER	TYPE	RECOVERY, m.	SPT - N BLOWS / 0.3m.	WATER CONTENT, %	DRY UNIT WT kN/m ³	UNCONFINED STRENGTH, kPa	
	Approx. Surface Elev.: 1860 m										
	SILTY SAND/SAND SILT: Brown, Very Loose To Loose/Very Soft To Soft, Fine To Medium Grained, Moist To Wet.	1	SM ML	1	SS	0.2	4	12.1			
		2									
		3	SM ML	2	RS		4				
		4									
		5	SM ML	3	RS	0.33	4	20.8			
		6	SM ML	4	SS	0.46	4	22.5			
		7									
		8	ML	5	RS	0.41	7	23.4	16.3		
		9	CL	6	SS	0.46	5	37.8			
		10									
	6.4 1853.6										
	SILT WITH SAND: Brown, Soft, Fine To Coarse Grained, Wet.										
	8.7 1851.4										
	SANDY CLAY: Reddish Brown, Very Soft To Soft, Low To Medium Plasticity, Fine To Medium Grained, Wet.										

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, m			
WL	1.5	WD	2.4 AB
WL		WD	
WL		WD	


Terracon

BORING STARTED	7-11-01
BORING COMPLETED	7-12-01
RIG CME-75	FOREMAN GAB
APPROVED KJS	JOB # 66015021C

BOREHOLE 99 6615021C.GPJ TERRACON.GDT 9/23/02

LOG OF BORING NO. B-4

Page 2 of 3

CLIENT		PAIKI											
SITE		APACHE, ARIZONA		PROJECT									
				RIO PUERCO/BRIDGE NO. 656									
GRAPHIC LOG	DESCRIPTION	DEPTH, m.	USCS SYMBOL	SAMPLES				TESTS					
				NUMBER	TYPE	RECOVERY, m.	SPT - N BLOWS / 0.3m.	WATER CONTENT, %	DRY UNIT WT kN/m ³	UNCONFINED STRENGTH, kPa			
	SANDY CLAY; Reddish Brown, Very Soft To Soft, Low To Medium Plasticity, Fine To Medium Grained, Wet.	11.4											
			CL	7	RS	0.41	2						
	INTERBEDDED LAYERS OF CLAY, SILT, AND SAND; Reddish Brown And Grey Clays, Grey Silts, Brown Sands, Very Soft Clays And Silts, Very Loose Sands, Medium To High Plasticity, Fine To Coarse Grained Sands, Wet.	1848.6											
			SM ML	8	ST	0.61							

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, m

WL	1.5	WD	2.4	AB
WL				
WL				

Terracon

BORING STARTED	7-11-01
BORING COMPLETED	7-12-01
RIG	CME-75
FOREMAN	GAB
APPROVED	KJS
JOB #	66015021C

BOREHOLE 99 6615021C.GPJ TERRACON.GDT 9/23/02

LOG OF BORING NO. B-4

Page 3 of 3

CLIENT

PAIKI

SITE

APACHE, ARIZONA

PROJECT

RIO PUERCO/BRIDGE NO. 656

GRAPHIC LOG

DESCRIPTION

DEPTH, m.

USCS SYMBOL

NUMBER

TYPE

RECOVERY, m.

SPT - N
BLOWS / 0.3m.

WATER
CONTENT, %

DRY UNIT WT
kN/m³

UNCONFINED
STRENGTH, kPa

CLAYSTONE/SILTSTONE: Grey To Dark Grey, Slightly To Moderately Cemented, Some Fine Grained Sand, Dry To Moist. Grading to Claystone/Shale With Depth.

21

14

SS

0.1

50/.13

11.9

22

23

15

SS

0.05

50/.08

24

16

SS

0.08

50/.01

13.6

25

26

17

SS

0.08

50/.08

15.3

27

18

SS

0

50/.03

27.7

1832.3

Boring Terminated at 27.7 m.

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, m

WL	1.5	WD	2.4	AB
WL		WD		
WL		WD		

Terracon

BORING STARTED 7-11-01

BORING COMPLETED 7-12-01

RIG CME-75 FOREMAN GAB

APPROVED KJS JOB # 66015021C

BOREHOLE 5 15021C GPJ TERRACON GDT 9/23/02

LOG OF BORING NO. B-5

Page 1 of 3

CLIENT		PAIKI							
SITE		PROJECT							
APACHE, ARIZONA		RIO PUERCO/BRIDGE NO. 656							
GRAPHIC LOG	DESCRIPTION	DEPTH, m.	USCS SYMBOL						
				SAMPLES		TESTS			
			NUMBER	TYPE	RECOVERY, m.	SPT - N BLOWS / 0.3m.	WATER CONTENT, %	DRY UNIT WT kN/m ³	UNCONFINED STRENGTH, kPa
	Approx. Surface Elev.: 1858.7 m								
	SILTY SAND/SANDY SILT; Brown, Very Loose To Loose/Very Soft To Soft, Fine To Medium Grained, Trace Clay, Dry.	1	SM ML	1	SS	0.25	4	20.5	
		2							
	Intermittent Clay Seams Beginning About 10 Feet, Seams Vary In Thickness From About 1 Inch To About 6 Inches, Low To Medium Plasticity.	3	SM ML	2	RS	0.3	4	20.0	16.2
		4							
		5	SM ML	3	SS	0.08	6	25.7	
		6	SM ML	4	RS	0.41	11	18.7	16.0
		7							
		8	SM ML	5	SS	0.08	50/08	13.4	
		9	SM ML	6	SS	0.13	2	23.0	
		10							
	8.5	1850.1							
	INTERBEDDED LAYERS OF CLAY, SILT, AND SAND; Reddish Brown And Grey Clays, Grey Silts, Brown Sands, Very Soft Clays And Silts, Very Loose Sands, Medium To High Plasticity, Fine To Coarse Grained Sands, Wet.								
	Continued Next Page								

Plugged Sample

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, m

WL	▽ 1.8	WD	▽
WL	▽	WD	▽
WL			

Terracon

BORING STARTED	7-12-01
BORING COMPLETED	7-13-01
RIG	CME-75
FOREMAN	GAB
APPROVED	KJS
JOB #	66015021C

BOREHOLE 99 6615021C.GPJ TERRACON.GDT 9/23/02

LOG OF BORING NO. B-5

Page 2 of 3

CLIENT		PAIKI							
SITE		APACHE, ARIZONA							
PROJECT		RIO PUERCO/BRIDGE NO. 656							
GRAPHIC LOG	DESCRIPTION	DEPTH, m.	USCS SYMBOL	SAMPLES			TESTS		
				NUMBER	TYPE	RECOVERY, m.	SPT - N BLOWS / 0.3m.	WATER CONTENT, %	DRY UNIT WT kN/m ³
	INTERBEDDED LAYERS OF CLAY, SILT, AND SAND: Reddish Brown And Grey Clays, Grey Silts, Brown Sands, Very Soft Clays And Silts, Very Loose Sands, Medium To High Plasticity, Fine To Coarse Grained Sands, Wet.	11	CL	7	ST	0.61			
		12							
		12.2							
		12	SP SM	8	SS	0.46	50/15	12.5	
		13							
		14	SM ML	9	SS	0.1	50/08	10.6	
		14.6							
		15							
		15		10	SS	0.46	77	15.8	
		16							
		17		11	SS	0.25	50/15		
		18		12	SS	0.03	50/1	17.5	
		19							
	20		13	SS	0.1	50/05	11.3		

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, m

WL	1.8	WD	
WL			
WL			

Terracon

BORING STARTED	7-12-01
BORING COMPLETED	7-13-01
RIG	CME-75
FOREMAN	GAB
APPROVED	KJS
JOB #	66015021C

BOREHOLE 99 6615021C.GPJ TERRACON.GDT 9/23/02

LOG OF BORING NO. B-5

Page 3 of 3

CLIENT

PAIKI

SITE

APACHE, ARIZONA

PROJECT

RIO PUERCO/BRIDGE NO. 656

GRAPHIC LOG

DESCRIPTION

DEPTH, m.

USCS SYMBOL

NUMBER

TYPE

RECOVERY, m.

SPT - N
BLOWS / 0.3m.

WATER
CONTENT, %

DRY UNIT WT
kN/m³

UNCONFINED
STRENGTH, kPa

CLAYSTONE/SILTSTONE: Grey To Dark Grey, Slightly To Moderately Cemented, Some Fine Grained Sand, Dry.

21

14

SS

0.2

50/03

14.9

22

23

15

SS

0.08

50/05

17.9

24

16

SS

0.06

50/05

9.6

24.7

1834

Boring Terminated at 24.7 m.

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, m

WL 1.8 WD

WL

WL

Terracon

BORING STARTED 7-12-01

BORING COMPLETED 7-13-01

RIG CME-75 FOREMAN GAB

APPROVED KJS JOB # 66015021C

BOREHOLE 95 5021C.GPJ TERRACON.GDT 9/23/02

LOG OF BORING NO. B-6

Page 1 of 2

CLIENT

PAIKI

SITE

APACHE, ARIZONA

PROJECT

RIO PUERCO/BRIDGE NO. 656

GRAPHIC LOG

DESCRIPTION

Approx. Surface Elev.: 1862.8 m

DEPTH, m.

USCS SYMBOL

NUMBER

TYPE

RECOVERY, m.

SPT - N
BLOWS / 0.3m.

WATER
CONTENT, %

DRY UNIT WT
kN/m³

UNCONFINED
STRENGTH, kPa

SILTY SAND/SANDY SILT; Brown, Very Loose To Loose/Soft To Medium Stiff, Fine To Medium Grained, Dry To Wet.

1

SM
ML

1

SS

4

12.7

2

3

SM
ML

2

SS

3

17.0

4

SM
ML

3

SS

9

16.9

5

6

SM
ML

4

SS

5

43.1

7

7.3

1855.5

INTERBEDDED LAYERS OF CLAY, SILT, AND SAND; Reddish Brown And Grey Clays, Grey Silts, Brown Sands, Very Soft Clays And Silts, Very Loose Sands, Medium To High Plasticity, Fine To Coarse Grained Sands, Wet.

8

SM
ML

5

SS

3

33.9

9

CL

6

RS

7

30.1

13.9

10

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, m

WL 3.8 WD

WL

WL

Terracon

BORING STARTED 7-13-01

BORING COMPLETED 7-14-01


RIG CME-75 FOREMAN LM

APPROVED KJS JOB # 66015021C

BOREHOLE 99 6615021C.GPJ TERRACON.GDT 9/23/02

LOG OF BORING NO. B-6

Page 2 of 2

CLIENT		PAIKI									
SITE		APACHE, ARIZONA		PROJECT							
				RIO PUERCO/BRIDGE NO. 656							
GRAPHIC LOG	DESCRIPTION	DEPTH, m.	USCS SYMBOL	SAMPLES				TESTS			
				NUMBER	TYPE	RECOVERY, m.	SPT - N BLOWS / 0.3m.	WATER CONTENT, %	DRY UNIT WT kN/m ³	UNCONFINED STRENGTH, kPa	
	INTERBEDDED LAYERS OF CLAY, SILT, AND SAND: Reddish Brown And Grey Clays, Grey Silts, Brown Sands, Very Soft Clays And Silts, Very Loose Sands, Medium To High Plasticity, Fine To Coarse Grained Sands, Wet.	11	CL ML	7	SS		5	33.4			
		12	SM	8	SS		4	19.7			
		13									
		13.6									1849.2
		Boring Stopped at 13.6 m Due To Lost Drill Steel.									

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, m

WL	▽ 3.8	WD	▽
WL	▽		▽
WL			

Terracon

BORING STARTED	7-13-01
BORING COMPLETED	7-14-01
RIG	CME-75
FOREMAN	LM
APPROVED	KJS
JOB #	66015021C

LOG OF BORING NO. B-6A

Page 1 of 3

CLIENT PAIKI									
SITE APACHE, ARIZONA		PROJECT RIO PUERCO/BRIDGE NO. 656							
GRAPHIC LOG	DESCRIPTION	DEPTH, m.	USCS SYMBOL	SAMPLES				TESTS	
				NUMBER	TYPE	RECOVERY, m.	SPT - N BLOWS / 0.3m.	WATER CONTENT, %	DRY UNIT WT kN/m ³
	Approx. Surface Elev.: 1862.2 m								
	SILTY SAND/SANDY SILT; Brown, Very Loose To Loose/Very Soft To Medium Stiff, Fine To Medium Grained, Moist To Wet.	1							
			SM ML	1	SS		8	26.8	
		2							
		3	SM ML	2	SS		2	18.2	
		4							
			SM ML	3	SS		6	18.1	
		5							
		6	SM ML	4	SS		4	23.4	
		7							
			ML	5	SS		5	18.2	
		8							
		9	SC	6	SS		7	29.4	
		10							
	6.6 1855.6								
	INTERBEDDED LAYERS OF CLAY, SILT, AND SAND; Reddish Brown And Grey Clays, Grey Silts, Brown Sands, Very Soft Clays And Silts, Very Loose Sands, Medium To High Plasticity, Fine To Coarse Grained Sands, Wet.								

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, m

WL	2.7	WD	
WL			
WL			

Terracon

BORING STARTED		7-14-01	
BORING COMPLETED		7-15-01	
RIG	CME-75	FOREMAN	LM
APPROVED	KJS	JOB # 66015021C	

BOREHOLE 99 6615021C.GPJ TERRACON.GDT 9/23/02

LOG OF BORING NO. B-6A

Page 2 of 3

CLIENT		PAIKI										
SITE		APACHE, ARIZONA										
PROJECT		RIO PUERCO/BRIDGE NO. 656										
GRAPHIC LOG	DESCRIPTION	DEPTH, m.	USCS SYMBOL	SAMPLES			TESTS					
				NUMBER	TYPE	RECOVERY, m.	SPT - N BLOWS / 0.3m.	WATER CONTENT, %	DRY UNIT WT kN/m ³	UNCONFINED STRENGTH, kPa		
	INTERBEDDED LAYERS OF CLAY, SILT, AND SAND: Reddish Brown And Grey Clays, Grey Silts, Brown Sands, Very Soft Clays And Silts, Very Loose Sands, Medium To High Plasticity, Fine To Coarse Grained Sands, Wet.	11	SM	7	RS		9	17.0	16.0			
		12	SP SM	8	SS		11	21.5				
		13										
		14	SC	9	SS		14	22.9				
		15										
		16	CH	10	SS		16	8.9				
		17		11	SS		50/1	23.9				
		18		12	SS		50/03	22.2				
		19										
		20		13	SS		50/13	8.6				
		16		1846.2								
		CLAYSTONE/SILTSTONE: Grey To Dark Grey, Slightly To Moderately Cemented, Some Fine Grained Sand, Dry To Moist. Grading to Claystone/Shale With Depth.										
Continued Next Page												

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, m

WL	2.7	WD	
WL		WD	
WL		WD	

Terracon

BORING STARTED		7-14-01	
BORING COMPLETED		7-15-01	
RIG	CME-75	FOREMAN	LM
APPROVED	KJS	JOB #	66015021C

LOG OF BORING NO. B-6A

Page 3 of 3

CLIENT PAIKI									
SITE APACHE, ARIZONA		PROJECT RIO PUERCO/BRIDGE NO. 656							
GRAPHIC LOG	DESCRIPTION	DEPTH, m.	USCS SYMBOL	SAMPLES				TESTS	
				NUMBER	TYPE	RECOVERY, m.	SPT - N BLOWS / 0.3m.	WATER CONTENT, %	DRY UNIT WT kN/m ³
	CLAYSTONE/SILTSTONE: Grey To Dark Grey, Slightly To Moderately Cemented, Some Fine Grained Sand, Dry To Moist. Grading to Claystone/Shale With Depth.	21							
			14	SS		50/.15	26.5		
		22							
		23	15	SS		50/.08	14.5		
		24							
			16	SS		50/.08	9.3		
	24.7	1837.5	Boring Terminated at 24.7 m.						

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, m

WL	2.7	WD	
WL			
WL			

Terracon

BORING STARTED	7-14-01
BORING COMPLETED	7-15-01
RIG CME-75	FOREMAN LM
APPROVED KJS	JOB # 66015021C

LOG OF BORING NO. B-7

Page 1 of 3

CLIENT		PAIKI							
SITE		APACHE, ARIZONA							
PROJECT		RIO PUERCO/BRIDGE NO. 656							
GRAPHIC LOG	DESCRIPTION	DEPTH, m.	USCS SYMBOL	SAMPLES			TESTS		
				NUMBER	TYPE	RECOVERY, m.	SPT - N BLOWS / 0.3m.	WATER CONTENT, %	DRY UNIT WT kN/m ³
	Approx. Surface Elev.: 1858.7 m								
	SILTY SAND/SANDY SILT: Brown, Loose/Soft To Medium Stiff, Fine To Medium Grained, Dry.	1	SM ML	1	SS	0.41	4	14.4	
		2							
		3	SM ML	2	SS	0.41	7	19.4	
		4							
	SANDY CLAY: Dark Brown, Medium Stiff, Medium To High Plasticity, Medium To Coarse Grained, Moist.	5	CL CH	3	SS	0.3	10	21.5	
		6	SC	4	SS	0.25	9	13.3	
		7							
	INTERBEDDED LAYERS OF CLAY, SILT, AND SAND: Reddish Brown And Grey Clays, Grey Silts, Brown Sands, Very Soft Clays And Silts, Very Loose Sands, Medium To High Plasticity, Fine To Coarse Grained Sands, Wet.	8	CL CH	5	SS	0.3	3	22.0	
		9	SC	6	SS	0.3	6	24.6	
		10							

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, m

WL	4	WD	
WL		WD	
WL		WD	

Terracon

BORING STARTED	7-15-01
BORING COMPLETED	7-16-01
RIG	CME-75
FOREMAN	LM
APPROVED	KJS
JOB #	66015021C

BOREHOLE 99 6615021C.GPJ TERRACON.GDT 9/23/02

LOG OF BORING NO. B-7

Page 2 of 3

CLIENT

PAIKI

SITE

APACHE, ARIZONA

PROJECT

RIO PUERCO/BRIDGE NO. 656

GRAPHIC LOG

DESCRIPTION

DEPTH, m.

USCS SYMBOL

NUMBER

TYPE

RECOVERY, m.

SPT - N
BLOWS / 0.3m.

WATER
CONTENT, %

DRY UNIT WT
kN/m³

UNCONFINED
STRENGTH, kPa

11.3

1847.4

POORLY GRADED SAND WITH SILT;
Grey, Loose, Fine To Medium Grained,
Wet.

11

SM
ML

7

SS

0.18

11

14.8

12

SP
SM

8

SS

0.2

4

13

14

1844.6

WEATHERED SANDSTONE; Grey,
Slightly Cemented, Fine To Coarse
Grained, Moist.

14

SP
SM

9

SS

0.18

8

14.8

15

10

SS

0.1

50/08

9.0

16

17

11

SS

0.2

72

5.5

17.7

1841

CLAYSTONE/SILTSTONE; Grey To
Dark Grey, Slightly To Moderately
Cemented, Some Fine Grained Sand, Dry
To Moist. Grading to Claystone/Shale with
Depth.

18

12

SS

0.25

50/13

15.7

19

20

13

SS

50/13

19.4

Continued Next Page

The stratification lines represent the approximate boundary lines
between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, m

WL

4

WD

4

WL

4

4

WL

Terracon

BORING STARTED

7-15-01

BORING COMPLETED

7-16-01

RIG

CME-75

FOREMAN

LM

APPROVED

KJS

JOB # 66015021C

BOREHOLE 89 6615021C.GPJ TERRACON GDT 9/23/02

LOG OF BORING NO. B-7

Page 3 of 3

CLIENT

PAIKI

SITE

APACHE, ARIZONA

PROJECT

RIO PUERCO/BRIDGE NO. 656

GRAPHIC LOG

DESCRIPTION

DEPTH, m.

USCS SYMBOL

NUMBER

TYPE

RECOVERY, m.

SPT - N
BLOWS / 0.3m.

WATER
CONTENT, %

DRY UNIT WT
kN/m³

UNCONFINED
STRENGTH, kPa

CLAYSTONE/SILTSTONE: Grey To Dark Grey, Slightly To Moderately Cemented, Some Fine Grained Sand, Dry To Moist. Grading to Claystone/Shale with Depth.

21

14 SS 0.13 50/13 15.0

22

23

15 SS 0.15 50/01 8.3

24

16 SS 50/05 7.5

25

26

17 SS 50/05 14.7

26.2

1832.5

Boring Terminated at 26.2 m.

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, m

WL 4 WD
WL
WL

Terracon

BORING STARTED 7-15-01

BORING COMPLETED 7-16-01

RIG CME-75 FOREMAN LM

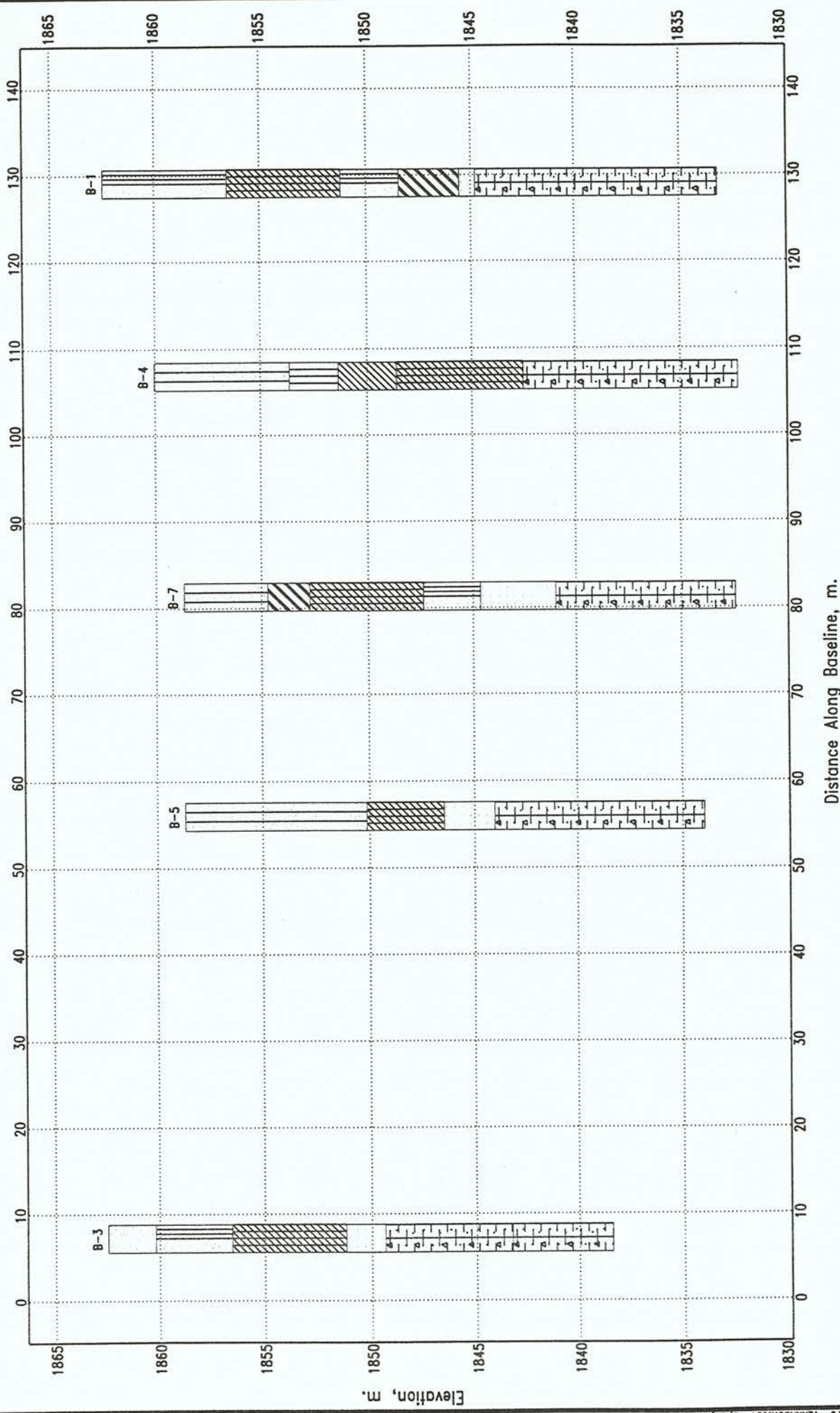
APPROVED KJS JOB # 66015021C

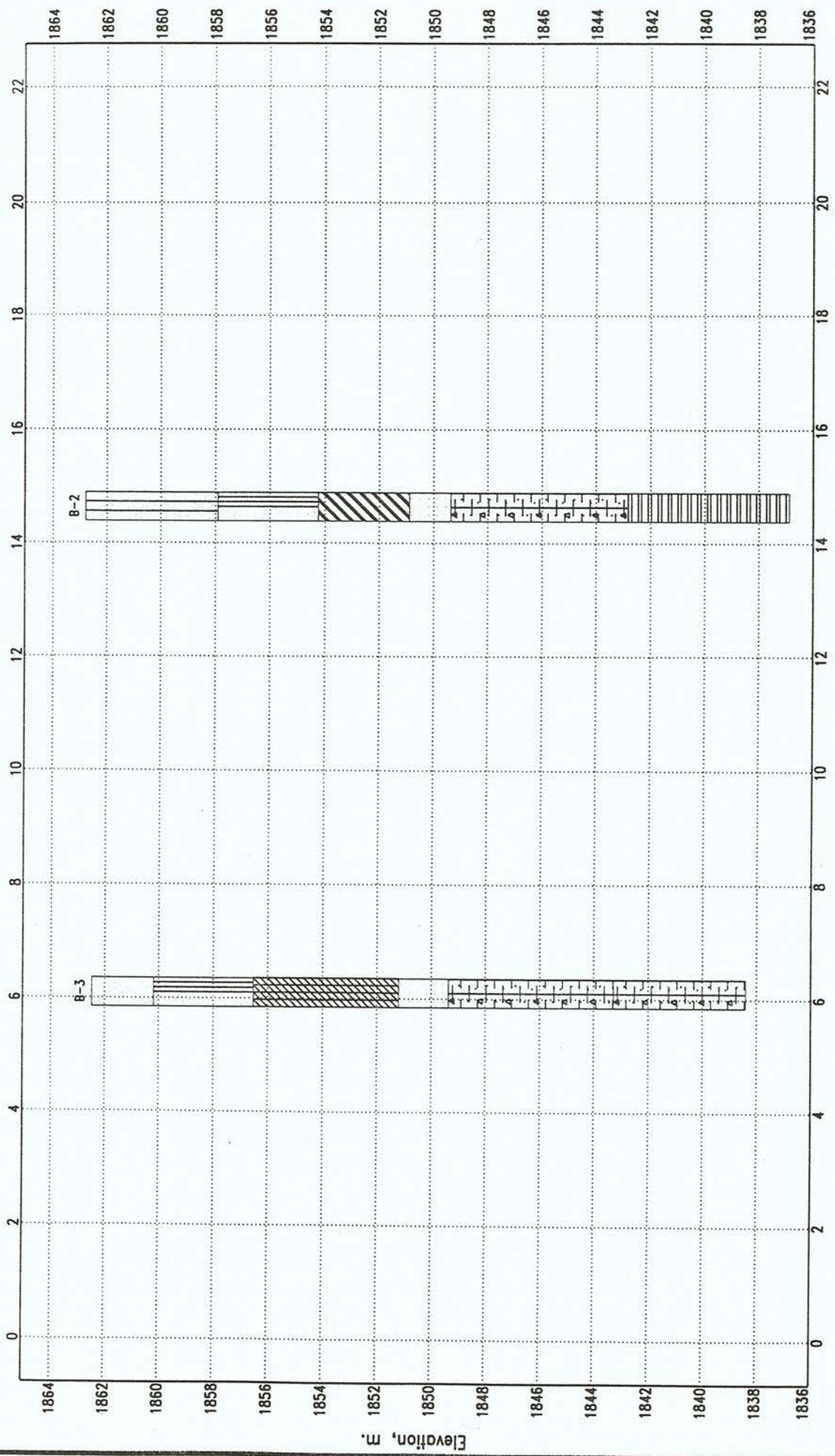
BOREHOLE 9. 5021C.GPJ TERRACON.GDT 9/23/02

Terracon

SUBSURFACE DIAGRAM Rio Puerco Roadway Profile

Project: RIO PUERCO/BRIDGE NO. 656
Site: APACHE COUNTY, ARIZONA
Job #: 66015021C
Date: 8-23-01



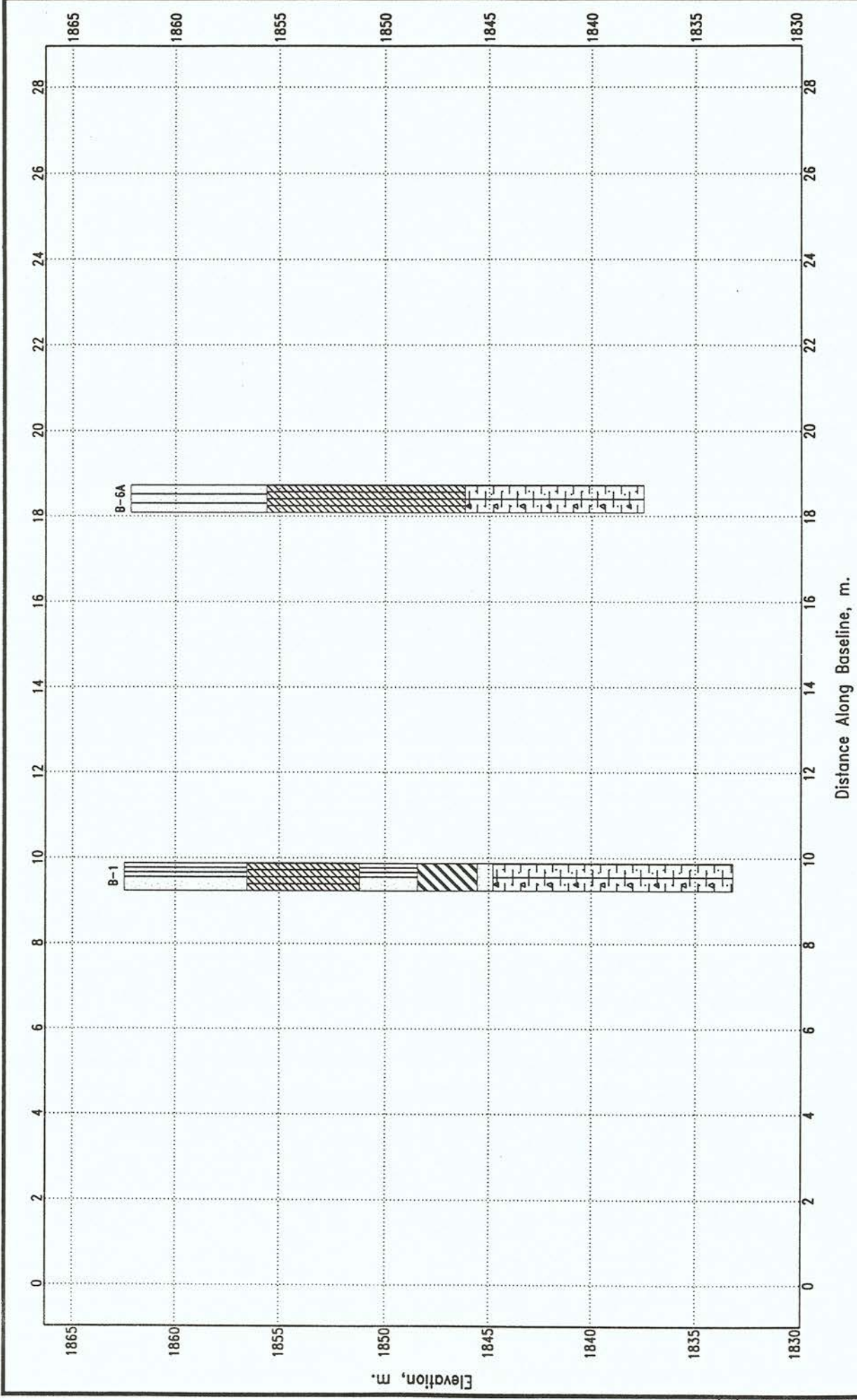


Distance Along Baseline, m.

SUBSURFACE DIAGRAM Rio Puerco North Abutment

Project: RIO PUERCO/BRIDGE NO. 656
Site: APACHE COUNTY, ARIZONA
Job #: 66015021C
Date: 8-23-01





SUBSURFACE DIAGRAM Rio Puerco South Abutment

Project: RIO PUERCO/BRIDGE NO. 656
Site: APACHE COUNTY, ARIZONA
Job #: 66015021C
Date: 8-23-01

Terracon



Figure B1



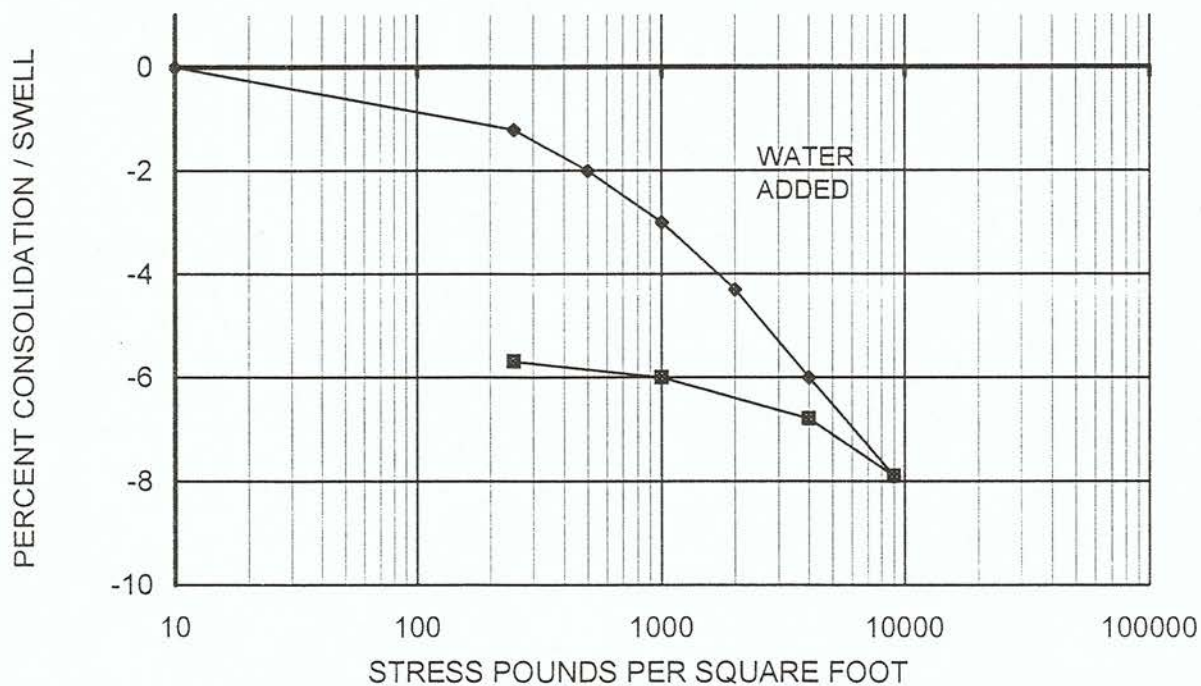
Figure B2

Rio Puerco Bridge
Bridge #526
Apache County, Arizona

TERRACON

4416 Anaheim NE
Albuquerque, NM 87113
(505) 797-4287
fax (505) 797-4288

SWELL/CONSOLIDATION CHART



Sample Location Boring B-1 @ 7.5 m

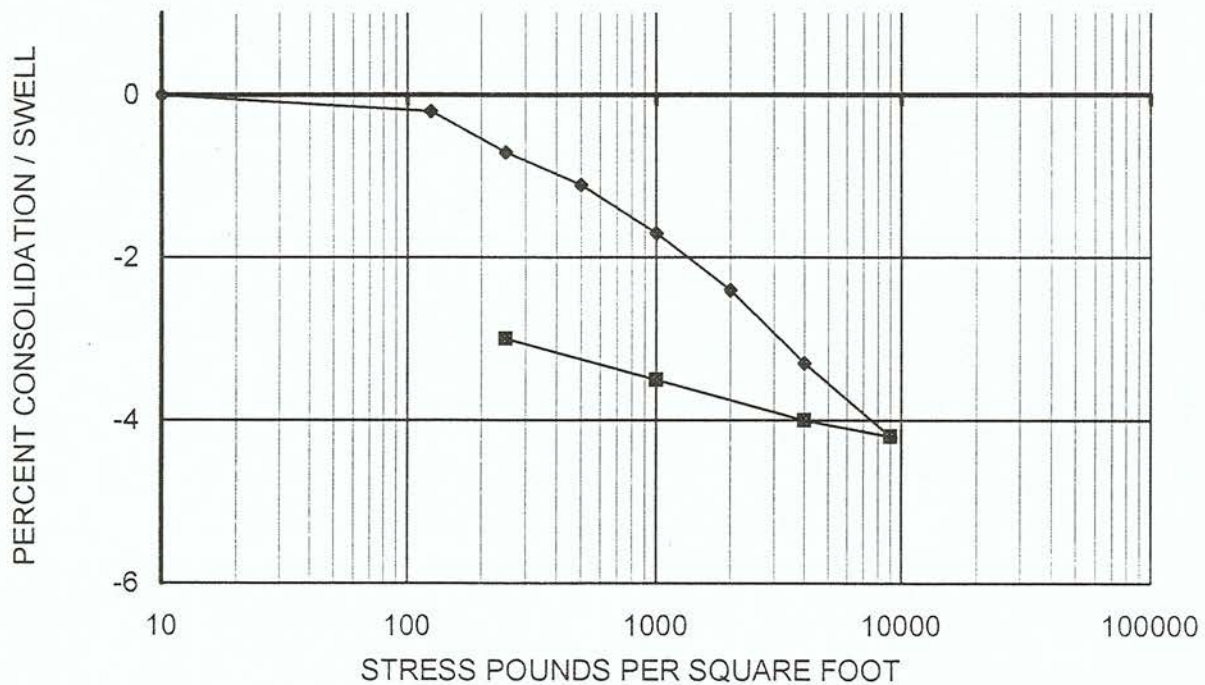
Sandy Lean Clay
USCS Classification: CL
Dry Density: 14.8 kN/m^3
Moisture Content: 19.0%

Rio Puerco Bridge
Bridge #526
Apache County, Arizona

TERRACON

4416 Anaheim NE
Albuquerque, NM 87113
(505) 797-4287
fax (505) 797-4288

SWELL/CONSOLIDATION CHART



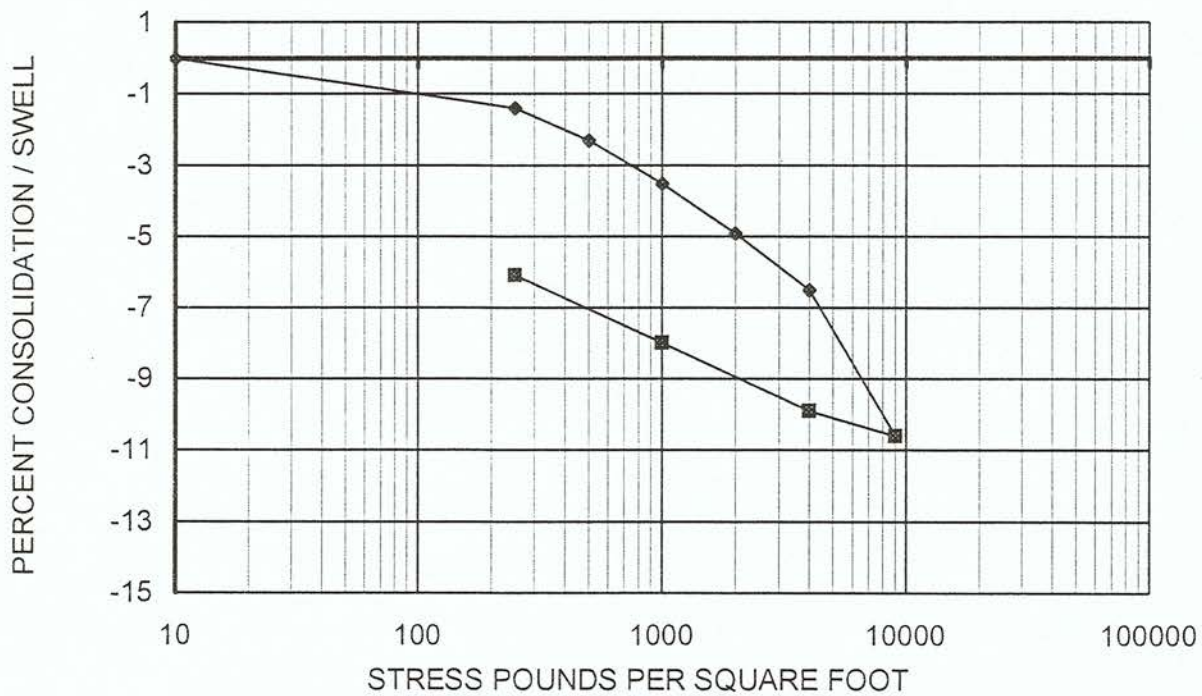
Sample Location Boring B-4 @ 7.5 m

Sandy Lean Clay
USCS Classification: CL
Dry Density: 14.8 kN/m^3
Moisture Content: 19.0%

Rio Puerco Bridge
Bridge #526
Apache County, Arizona

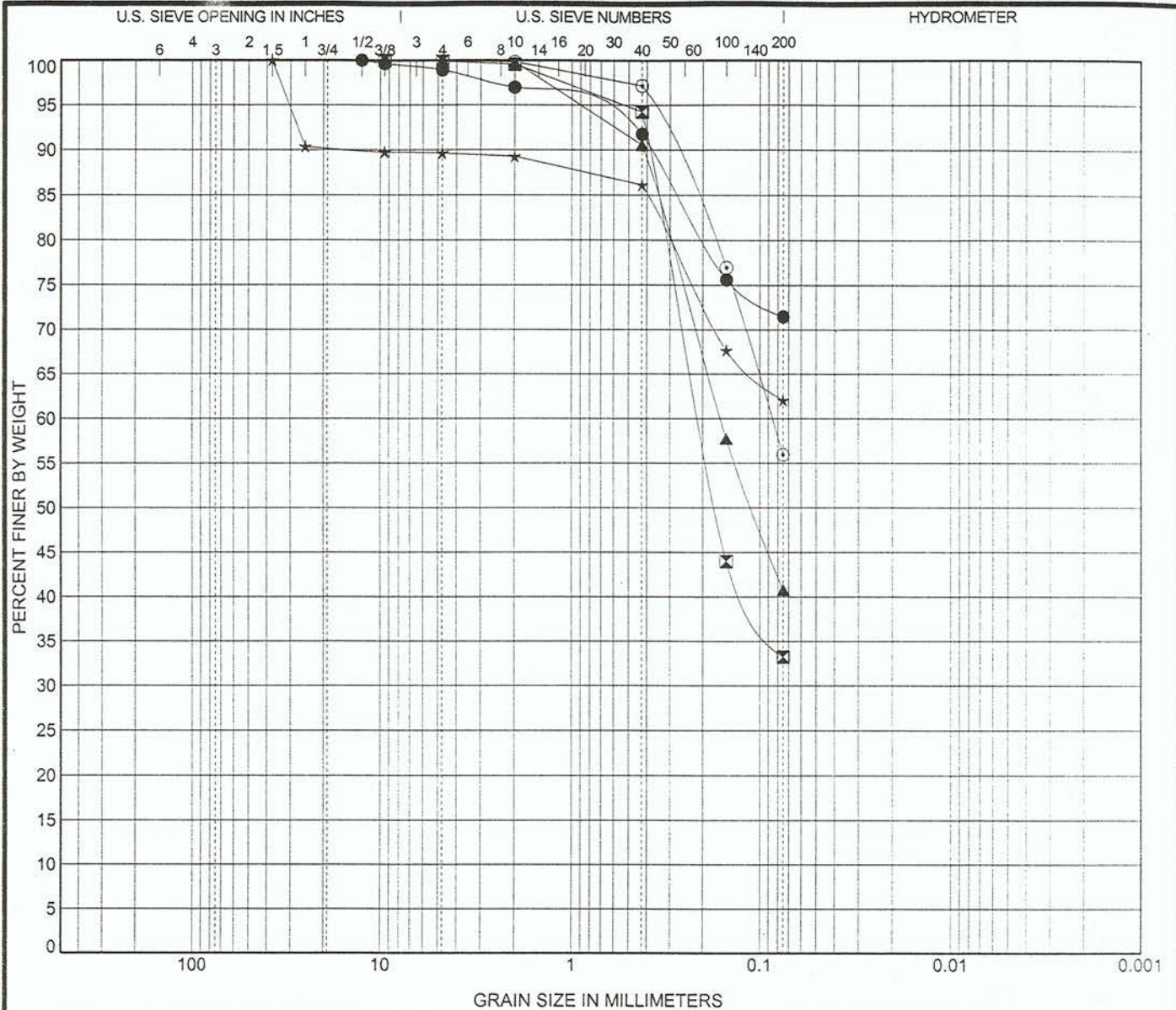
TERRACON
4416 Anaheim NE
Albuquerque, NM 87113
(505) 797-4287
fax (505) 797-4288

SWELL/CONSOLIDATION CHART



Sample Location Boring B-6 @ 8.99 m

Sandy Lean Clay
USCS Classification: CL
Dry Density: 14.8 kN/m³
Moisture Content: 19.0%



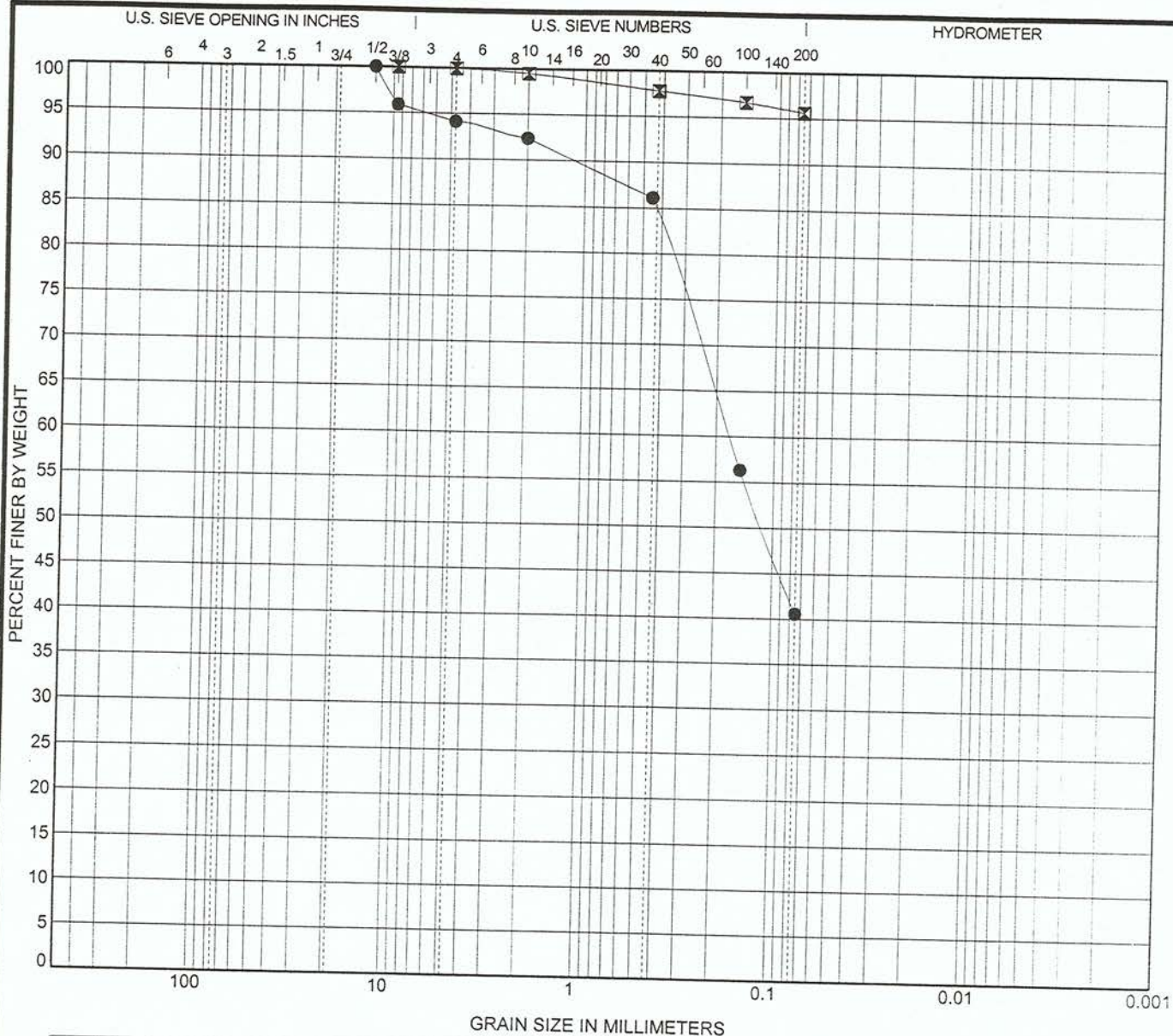
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification			LL	PL	PI	Cc	Cu
●	B-1	2.90 m	SILT with SAND ML			0	0	0		
⊠	B-2	12.19 m	SILTY SAND SM			0	0	0		
▲	B-2	15.24 m	CLAYEY SAND SC			40	24	16		
★	B-3	7.62 m	SANDY LEAN CLAY CL			38	14	24		
⊙	B-4	7.47 m	SANDY SILT ML			0	0	0		
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-1	2.90 m	12.5				1.1	27.5	71.4	
⊠	B-2	12.19 m	9.5	0.209			0.1	66.6	33.2	
▲	B-2	15.24 m	4.75	0.161			0.0	59.2	40.8	
★	B-3	7.62 m	37.5				10.4	27.6	62.0	
⊙	B-4	7.47 m	9.5	0.086			0.1	44.0	55.9	

GRAIN SIZE DISTRIBUTION

Terracon

Project: RIO PUERCO/BRIDGE NO. 656
 Site: APACHE, ARIZONA
 Job #: 66015021C
 Date: 9-23-02



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification		LL	PL	PI	Cc	Cu
●	B-5 15.09 m	SILTY SAND SM		42	33	9		
⊗	B-6 8.99 m	FAT CLAY CH		50	23	27		

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-5 15.09 m	12.5	0.172			5.9	53.5	40.6	
⊗	B-6 8.99 m	9.5				0.1	4.3	95.6	

GRAIN SIZE DISTRIBUTION

Terracon

Project: RIO PUERCO/BRIDGE NO. 656
 Site: APACHE, ARIZONA
 Job #: 66015021C
 Date: 9-23-02

Compressive Strength of Rock Cores

Terracon

4416 Anaheim NE
Albuquerque, NM 87113
505-797-4287

Client Name: PAIKI
Client Address: 11000 Spain Road NE, Suite D-2
Albuquerque, NM 87111
Project Name: Rio Puerco Bridge No. 656
Project Location: Apache County, Arizona

Date: 8/22/2001
Job No.: 66015021C
Tested by: D. Baca

TEST RESULTS

Boring No.	B-3	B-3	B-3			
Depth (m)	12.2	12.8	22.9			
Compressive Strength Results						
Capped Height (mm))	118.10	126.00	117.10			
Diameter (mm)	60.40	60.40	60.80			
Area (mm ²)	2863.81	2863.81	2901.86			
L/D Ratio	1.96	2.09	1.93			
Correction Factor	1.00	1.00	1.00			
Total Load (kgf)	12,798	11,560	20,296			
Unit Load (kg/cm ²)	447	404	699			
Corrected Load (kg/cm ²)	450	410	700			
Date Tested	08/22/01	08/22/01	08/22/01			

Comments:

Copies To:

Reviewed by: Kevin J. Scott, P.E.

**DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS
ASTM D3080**



AT 12.7 mm HORIZONTAL DEFORMATION		FRICTION ANGLE 30.0 deg	COHESION 0.0 kPa	NORMAL STRESS, kPa 49.16	NORMAL STRESS, kPa 98.32	NORMAL STRESS, kPa 189.62
INITIAL AREA, mm2	3166.92	INITIAL MOISTURE, %		23.9	24.7	23.9
INITIAL LENGTH, mm	25.40	INITIAL DRY DENSITY, kg/m3		1640	1619	1641
SPECIFIC GRAVITY	2.70	INITIAL SATURATION, %		100	100	100
SG TESTED		INITIAL VOID RATIO		0.65	0.67	0.64
SG ASSUMED	X	FINAL MOISTURE, %		NA	NA	NA
LIQUID LIMIT	NP	FINAL SATURATION, %		NA	NA	NA
PLASTIC LIMIT	NP	FINAL VOID RATIO		0.64	0.60	0.55
PLASTICITY INDEX	NP	MAXIMUM SHEAR STRESS, kPa		28.71	71.91	133.58
SAMPLE TYPE	REMOLED	12.7mm HORIZONTAL DEF. SHEAR STRESS, kPa		28.48	56.41	109.35
SAMPLE DESCRIPTION	SILTY SAND, BROWN					

PROJECT NAME: RIO PUERCO BRIDGE #656

BORING NO. B-3

LOCATION: APACHE, COUNTY, ARIZONA

SAMPLE NO. _____

JOB NO.: 66015021C

DEPTH, meter 6.10 to 6.71

DATE: 7/21/2001

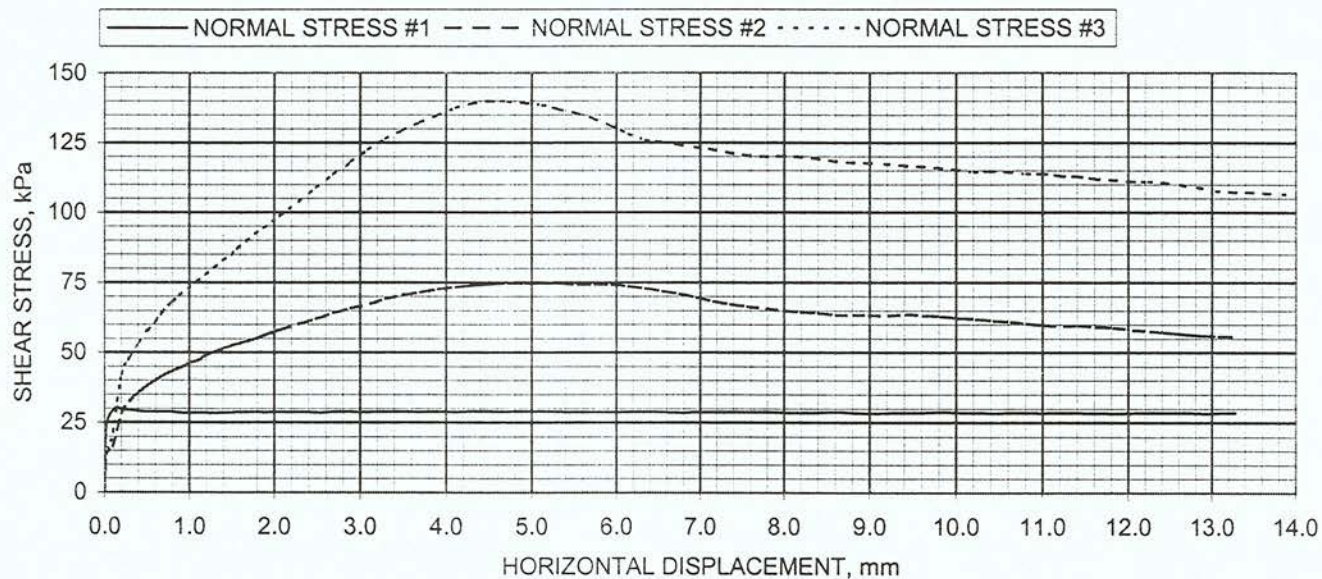
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Terracon

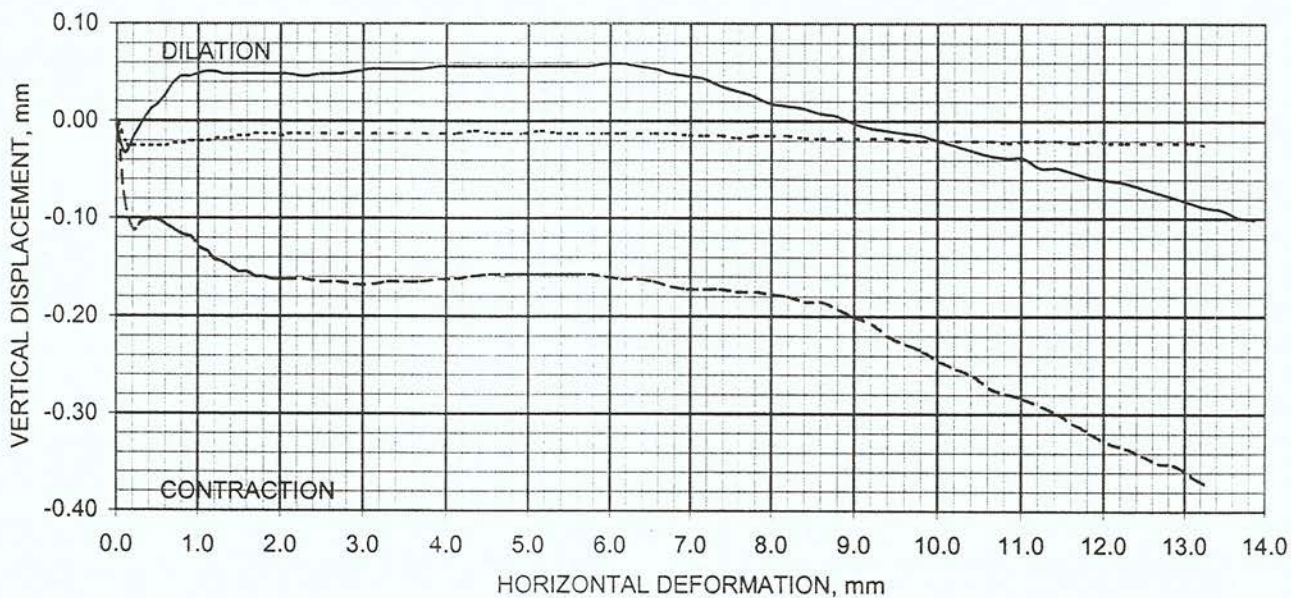
RIO PUERCO BRIDGE #656
APACHE, COUNTY, ARIZONA
66015021C
7/21/2001

BORING NO. B-3
SAMPLE NO.
DEPTH, meter 6.10 to 6.71

SHEAR STRESS vs DISPLACEMENT



VERTICAL DISPLACEMENT vs HORIZONTAL DISPLACEMENT





**International
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Fuel Consultants Inc.**
Creating the standards for industry.

ILFC LABORATORY REPORT

FOR:

Terracon

4416 Anaheim Northeast
Albuquerque, NM 87113

PROJECT ID: **Not Given**
PROJECT PO NO: **66015021 C**
PROJECT LOCATION: **Not Given**
ILFC BATCH NO.: **01064**

Accredited in accordance with

NELAC

National Environmental Laboratory Accreditation Conference

New York Certification No.: 11141

New Jersey Certification No.: 71800

Prepared By: 
(Quality Assurance Officer/ Chemist)

Date: 9-12-2001

Reviewed By: 

Date: 9-12-2001

Laboratory report meets the requirements for NELAC accredited states.

Mail: P.O. Box 15212 • Rio Rancho, NM 87174

Deliveries: 1201 Rio Rancho Blvd., Suite C • Rio Rancho, NM 87124

Phone: (505) 892-1666 -or- (800) 237-4532

Fax: (505) 892-9601

Visit our website: <http://www.ilfcinc.com>

E-mail: ilfcinc@ilfcinc.com

Client ID:	Terracon	Project Name:		Sample ID:	B-3 35-36 1/2 B-2 15-16 1/2
Project PO Number:	66015021 C	Not Given			B-2 5-6 1/2 B-2 55-56 1/2
ILFC, Inc Batch Number:	01064	Laboratory Number:	10211-->10214	Date Sampled:	08/30/01
% Moisture:	N/A	Temperature upon delivery:	N/A	Time Sampled:	2:00pm
Matrix:	X Soil	Other	Water	Date Received:	08/30/01
Reporting in:	Dry Weight	X Wet Weight	N/A	Time Received:	2:00pm

<u>Client I. D.</u>	<u>ILFC Lab#</u>	<u>Method</u>	<u>Analyte</u>	<u>Results</u>	<u>MDL</u>	<u>Units</u>	<u>Date Completed</u>
B-3 35-36 1/2	10211	EPA 300.0	Soluble Sulfate	38.5	0.05	mg/Kg	09/08/01
B-2 15-16 1/2	10212	EPA 300.0	Soluble Sulfate	165	0.05	mg/Kg	09/08/01
B-2 5-6 1/2	10213	EPA 300.0	Soluble Sulfate	356	0.05	mg/Kg	09/08/01
B-2 55-56 1/2	10214	EPA 300.0	Soluble Sulfate	27.8	0.05	mg/Kg	09/08/01

<u>Client I. D.</u>	<u>ILFC Lab#</u>	<u>Method</u>	<u>Analyte</u>	<u>Results</u>	<u>MDL</u>	<u>Units</u>	<u>Date Completed</u>
B-3 35-36 1/2	10211	-----	pH	8.4	-----	-----	09/03/01
B-2 15-16 1/2	10212	-----	pH	8.4	-----	-----	09/03/01
B-2 5-6 1/2	10213	-----	pH	8.1	-----	-----	09/03/01
B-2 55-56 1/2	10214	-----	pH	9.2	-----	-----	09/03/01

<u>Client I. D.</u>	<u>ILFC Lab#</u>	<u>Method</u>	<u>Analyte</u>	<u>Results</u>	<u>MDL</u>	<u>Units</u>	<u>Date Completed</u>
B-3 35-36 1/2	10211	Soil Box	Resistivity	1,300	ohm-cm	-----	09/07/01
B-2 15-16 1/2	10212	Soil Box	Resistivity	2,800	ohm-cm	-----	09/07/01
B-2 5-6 1/2	10213	Soil Box	Resistivity	52,000	ohm-cm	-----	09/07/01
B-2 55-56 1/2	10214	Soil Box	Resistivity	15,000	ohm-cm	-----	09/07/01

<u>Client I. D.</u>	<u>ILFC Lab#</u>	<u>Method</u>	<u>Analyte</u>	<u>Results</u>	<u>MDL</u>	<u>Units</u>	<u>Date Completed</u>
B-3 35-36 1/2	10211	-----	Chloride	< MDL	10	ppm	09/03/01
B-2 15-16 1/2	10212	-----	Chloride	18	10	ppm	09/03/01
B-2 5-6 1/2	10213	-----	Chloride	22	10	ppm	09/03/01
B-2 55-56 1/2	10214	-----	Chloride	< MDL	10	ppm	09/03/01

Page # 2 of 2

These laboratory results are intended to be helpful and informative. They are based on our experience, current industry testing procedures, proper sampling procedure and information provided with the sample, which we believe to be reliable. We cannot assume responsibility for any loss or accident that may result from the use of the information given here. This report shall not be reproduced except in full, without the written approval of our laboratory.

Accredited in accordance with
NELAC

T2F07A

NY Cert. No. 11141
NJ Cert. No. 71800

Date: 9/12/01
Time: 12:47 PM

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Fuel Consultants Inc.**
Creating the stars

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Suite C
Rio Rancho, NM 87124
(505) 892-1666 (800) 237-4532

Project Manager & Company:

Phone #: 797 11287

Gabe Burgess, Terran

Address: 4916 Franklin DE

FAX #: 797 4288

Albuquerque, NM 87113

Project PO No.:	Project No.:
0	0

Project Name:

66095021-C

Same R. 10 Puerto

Project Location:

Sampler Signature:

Lupin, AZ

Adm. Secy.

[illegible][illegible]

ANALYSTS REQUEST

OTHER

HANDLING

ANALYSIS REQUEST AND CHAIN OF CUSTODY FORM

*APO No. must be included or work may be delayed. Please call 1-2 days in advance to arrange for priority or expedited service, if not samples may be delayed.

GENERAL NOTES

DRILLING & SAMPLING SYMBOLS:

SS: Split Spoon - 1-3/8" I.D., 2" O.D., unless otherwise noted
 ST: Thin-Walled Tube - 2" O.D., unless otherwise noted
 RS: Ring Sampler - 2.42" I.D., 3" O.D., unless otherwise noted
 DB: Diamond Bit Coring - 4", N, B
 BS: Bulk Sample or Auger Sample

HS: Hollow Stem Auger
 PA: Power Auger
 HA: Hand Auger
 RB: Rock Bit
 WB: Wash Boring or Mud Rotary

The number of blows required to advance a standard 2-inch O.D. split-spoon sampler (SS) the last 12 inches of the total 18-inch penetration with a 140-pound hammer falling 30 inches is considered the "Standard Penetration" or "N-value". For 3" O.D. ring samplers (RS) the penetration value is reported as the number of blows required to advance the sampler 12 inches using a 140-pound hammer falling 30 inches, reported as "blows per foot," and is not considered equivalent to the "Standard Penetration" or "N-value".

WATER LEVEL MEASUREMENT SYMBOLS:

WL: Water Level
 WCI: Wet Cave in
 DCI: Dry Cave in
 AB: After Boring

WS: While Sampling
 WD: While Drilling
 BCR: Before Casing Removal
 ACR: After Casing Removal

Water levels indicated on the boring logs are the levels measured in the borings at the times indicated. Groundwater levels at other times and other locations across the site could vary. In pervious soils, the indicated levels may reflect the location of groundwater. In low permeability soils, the accurate determination of groundwater levels may not be possible with only short-term observations.

DESCRIPTIVE SOIL CLASSIFICATION: Soil classification is based on the Unified Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

CONSISTENCY OF FINE-GRAINED SOILS

<u>Unconfined Compressive Strength, Qu, psf</u>	<u>Standard Penetration or N-value (SS) Blows/Ft.</u>	<u>Consistency</u>
< 500	<2	Very Soft
500 - 1,000	2-3	Soft
1,001 - 2,000	4-6	Medium Stiff
2,001 - 4,000	7-12	Stiff
4,001 - 8,000	13-26	Very Stiff
8,000+	26+	Hard

RELATIVE DENSITY OF COARSE-GRAINED SOILS

<u>Standard Penetration or N-value (SS) Blows/Ft.</u>	<u>Ring Sampler (RS) Blows/Ft.</u>	<u>Relative Density</u>
0 - 3	0-6	Very Loose
4 - 9	7-18	Loose
10 - 29	19-58	Medium Dense
30 - 49	59-98	Dense
50+	99+	Very Dense

RELATIVE PROPORTIONS OF SAND AND GRAVEL

<u>Descriptive Term(s) of other constituents</u>	<u>Percent of Dry Weight</u>
Trace	< 15
With	15 - 29
Modifier	> 30

GRAIN SIZE TERMINOLOGY

<u>Major Component of Sample</u>	<u>Particle Size</u>
Boulders	Over 12 in. (300mm)
Cobbles	12 in. to 3 in. (300mm to 75 mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm)
Silt or Clay	Passing #200 Sieve (0.075mm)

RELATIVE PROPORTIONS OF FINES

<u>Descriptive Term(s) of other constituents</u>	<u>Percent of Dry Weight</u>
Trace	< 5
With	5 - 12
Modifiers	> 12

PLASTICITY DESCRIPTION

<u>Term</u>	<u>Plasticity Index</u>
Non-plastic	0
Low	1-10
Medium	11-30
High	30+

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UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests^a

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests ^A				Soil Classification		
				Group Symbol	Group Name ^B	
Coarse Grained Soils More than 50% retained on No. 200 sieve	Gravels More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels Less than 5% fines ^c	$Cu \geq 4$ and $1 \leq Cc \leq 3^E$	GW	Well-graded gravel ^F	
			$Cu < 4$ and/or $1 > Cc > 3^E$	GP	Poorly graded gravel ^F	
		Gravels with Fines More than 12% fines ^c	Fines classify as ML or MH	GM	Silty gravel ^{F,G,H}	
			Fines classify as CL or CH	GC	Clayey gravel ^{F,G,H}	
	Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands Less than 5% fines ^c	$Cu \geq 6$ and $1 \leq Cc \leq 3^E$	SW	Well-graded sand ^I	
			$Cu < 6$ and/or $1 > Cc > 3^E$	SP	Poorly graded sand ^I	
		Sands with Fines More than 12% fines ^c	Fines classify as ML or MH	SM	Silty sand ^{G,H,I}	
			Fines Classify as CL or CH	SC	Clayey sand ^{G,H,I}	
Fine-Grained Soils 50% or more passes the No. 200 sieve	Sils and Clays Liquid limit less than 50	inorganic	$PI > 7$ and plots on or above "A" line ^J	CL	Lean clay ^{K,L,M}	
			$PI < 4$ or plots below "A" line ^J	ML	Silt ^{K,L,M}	
		organic	Liquid limit - oven dried	< 0.75	OL	Organic clay ^{K,L,M,N}
			Liquid limit - not dried		Organic silt ^{K,L,M,Q}	
	Sils and Clays Liquid limit 50 or more	inorganic	PI plots on or above "A" line	CH	Fat clay ^{K,L,M}	
			PI lots below "A" line	MH	Elastic Silt ^{K,L,M}	
		organic	Liquid limit - oven dried	< 0.75	OH	Organic clay ^{K,L,M,P}
			Liquid limit - not dried		Organic silt ^{K,L,M,Q}	
Highly organic soils	Primarily organic matter, dark in color, and organic odor			PT	Peat	

^a Based on the material passing the 3-in. (75-mm) sieve

^b If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

^c Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

^d Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

$$^e Cu = D_{50}/D_{10} \quad Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$$

^f If soil contains $\geq 15\%$ sand, add "with sand" to group name.

^g If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

^h If fines are organic, add "with organic fines" to group name.

ⁱ If soil contains $\geq 15\%$ gravel, add "with gravel" to group name.

^j If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

^k If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

^l If soil contains $\geq 30\%$ plus No. 200 predominantly sand, add "sandy" to group name.

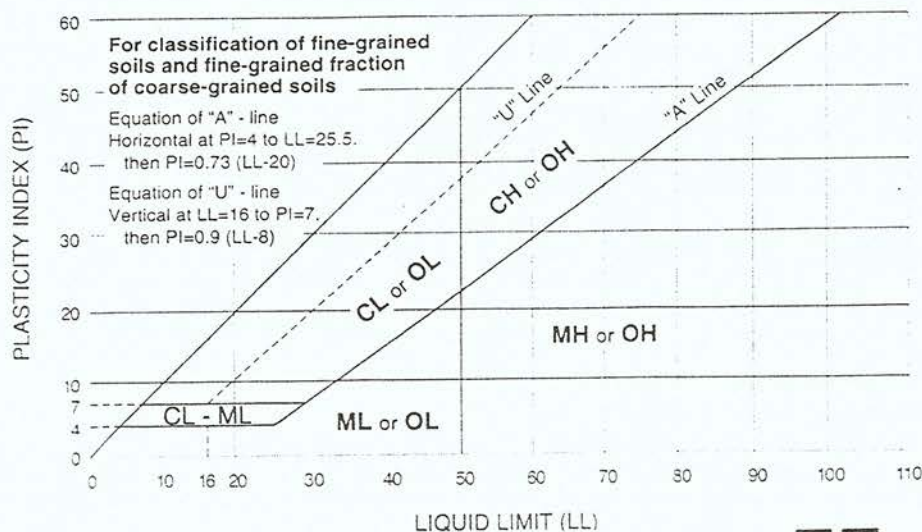
^m If soil contains $\geq 30\%$ plus No. 200, predominantly gravel, add "gravelly" to group name.

ⁿ $PI \geq 4$ and plots on or above "A" line.

^o $PI < 4$ or plots below "A" line.

^p PI plots on or above "A" line.

^q PI plots below "A" line.



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ROCK CLASSIFICATION

(Based on ASTM C-294)

Sedimentary Rocks

Sedimentary rocks are stratified materials laid down by water or wind. The sediments may be composed of particles of pre-existing rocks derived by mechanical weathering, evaporation or by chemical or organic origin. The sediments are usually indurated by cementation or compaction.

- Chert:** Very fine-grained siliceous rock composed of micro-crystalline or crypto-crystalline quartz, chalcedony or opal. Chert is various colored, porous to dense, hard and has a conchoidal to splintery fracture.
- Claystone:** Fine-grained rock composed of or derived by erosion of silts and clays or any rock containing clay. Soft massive; gray, black, brown, reddish or green and may contain carbonate minerals.
- Conglomerate:** Rock consisting of a considerable amount of rounded gravel, sand and cobbles with or without interstitial or cementing material. The cementing or interstitial material may be quartz, opal, calcite, dolomite, clay, iron oxides or other materials.
- Dolomite:** A fine-grained carbonate rock consisting of the mineral dolomite [$\text{CaMg}(\text{CO}_3)_2$]. May contain noncarbonate impurities such as quartz, chert, clay minerals, organic matter, gypsum and sulfides. Reacts with hydrochloric acid (HCL).
- Limestone:** A fine-grained carbonate rock consisting of the mineral calcite (CaCO_3). May contain noncarbonate impurities such as quartz, chert, clay minerals, organic matter, gypsum and sulfides. Reacts with hydrochloric acid (HCL).
- Sandstone:** Rock consisting of particles of sand with or without interstitial and cementing materials. The cementing or interstitial material may be quartz, opal, calcite, dolomite, clay, iron oxides or other material.
- Shale:** Fine-grained rock composed of, or derived by erosion of silts and clays or any rock containing clay. Shale is hard, platy, or fissile may be gray, black, reddish or green and may contain some carbonate minerals (calcareous shale).
- Siltstone:** Fine grained rock composed of, or derived by erosion of silts or rock containing silt. Siltstones consist predominantly of silt sized particles (0.0625 to 0.002 mm in diameter) and are intermediate rocks between claystones and sandstones, may be gray, black, brown, reddish or green and may contain carbonate minerals.