



*New Mexico* DEPARTMENT OF  
**TRANSPORTATION**  
MOBILITY FOR EVERYONE

CONTRACT DOCUMENTS  
FOR  
THE CONSTRUCTION OF

Control Number ("CN"): 4101490

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ADVERTISEMENT

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NEW MEXICO DEPARTMENT OF TRANSPORTATION (NMDOT)  
BID SOLICITATION FOR – July 20, 2018  
SANTA FE, NEW MEXICO

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The NMDOT will only receive Bids through the Bid Express website at <https://www.bidx.com/> before 11:00 A.M. local prevailing time National Institute of Standards and Technology, atomic clock, on July 20, 2018. Bids received after this time will not be accepted. Tutorials on electronic bidding are available through Bid Express website at <https://www.bidx.com/site/trainingcenter>. In order to receive Addenda and notifications all Bidders shall log into Bid Express and select the proposal and letting activity message and e-mail boxes in the manage messages and notifications tab at <https://www.bidx.com/site/managesubscriptions?display=messages>.

The NMDOT will open and publicly read the Total Bid Amount for Bids in the presence of one or more witnesses at the NMDOT's General Office (Room 223), 1120 Cerrillos Road Santa Fe, NM 87505. Individuals with disabilities who desire to attend or participate in this Bid Opening shall contact the NMDOT Title VI Liaison a minimum of ten Days before the date of Bid Opening at (505) 629-9890.

The Advertisement, Bid Form, Bid Guaranty, Supplemental Specifications, Special Provisions, Addenda, Notice to Contractors and Plans are available for a membership fee and for examination only through the Bid Express website. Fee schedules are available through the Bid Express website. The 2014 Edition of the NMDOT Standard Specifications for Highway and Bridge Construction (Standard Specifications) shall govern construction of this Project. The Standard Specifications and Standard Drawings are available for no cost to the Bidder through the NMDOT website at <http://dot.state.nm.us/en/PSE.html>.

In the case of disruption of national communications or loss of services by Bid Express the morning of the Bid Opening, the NMDOT may delay the deadline for Bids. Instructions will be communicated through the Bid Express website.

As a condition to submitting a Bid all Bidders bidding as Contractors are required to be prequalified with the NMDOT's Office of Inspector General seven (7) Days before Bid Opening per 18.27.5 NMAC. All Subcontractors are required to be prequalified before performing any Work and prior to supplying goods or services to the Project. The Contractor Prequalification Rule, 18.27.5 NMAC, and Prequalification Packet are located at <http://dot.state.nm.us/en/prequalification.html>. The Bidder's prequalification factor rolling average will be applied to any Project with an engineer's estimate greater than \$5 million.

All Bidders submitting Bids valued over sixty thousand dollars (\$60,000.00) shall be registered with the Department of Workforce Solutions (DWS), Labor Relations before Bidding. The Bidder's registration number shall be included on the Bid Form. The Bidder's DWS registration number can be obtained through the website <http://www.dws.state.nm.us/>. If a Bidder appears on the DWS list of willful violators of the Public Works Minimum Wage Act (NMSA 13-4-14), the NMDOT shall reject the Bid and shall continue to reject Bids from that Bidder for three years after the date of publication of the list.

The Bidder's Bid Guaranty shall be five percent (5%) of the Bidder's Total Bid Amount and shall be submitted before Bid Opening through either Surety 2000 or Surepath Network.

For state funded Projects proof of the Bidder's valid license in the form of its wallet card from the Construction Industries Division (CID) shall be submitted with the Bid per the Construction Industries Licensing Act NMSA (1978), Sections 60-13-1 to -57 (1967, as amended through 1989). The Bidder's valid license shall cover the Project's type of Work specified in this Advertisement. The Bidder shall submit in the form of a zip file to the "file attachment upload" tab in the Project Bids.EBSX file through Bid Express the CID wallet card.

If a Bidder is seeking, for state funded Projects, a resident business preference the Bidder shall submit a copy of its resident business certification in the form of a zip file to the "file attachment upload" tab in the Project Bids .EBSX file through Bid Express before Bid Opening per NMSA 1978, § 13-4-2 (1984, amended 2012).

If a Bidder is seeking, for state funded Projects, a resident veteran contractor preference the Bidder shall submit a copy of its resident veteran contractor certification and its application for the resident veteran contractor certification, not including the attachments for the application, in the form of a zip file to the "file attachment upload" tab in the Project Bids .EBSX file through Bid Express before Bid Opening per NMSA 1978, § 13-4-2 (1984, amended 2012).

For federally funded Projects, the Bidder is not required to have a license from the CID for the Project's Work in order to submit a Bid. However, upon becoming the apparent successful Bidder, the Bidder must obtain a valid license with the proper classification for the Project's Work within 30 Days of the date on the notice of preliminary Award letter.

For federally funded Projects, a Bidder shall submit in the form of a zip file to the "file attachment upload" tab in the Project Bids .EBSX file through Bid Express the Affidavit of Bidder before Bid Opening.

For federally funded and state funded Projects, a Bidder shall submit in the form of a zip file to the "file attachment upload" tab in the Project Bids .EBSX file through Bid Express any documents before Bid Opening required by a Notice to Contractors.

Failure of the Bidder to comply with this Advertisement shall render the Bid non-responsive and the Bid shall be rejected.

(1)  
CN 5100500

TERMINI: NM 574, MP 0.237 to 0.464 for 0.227 miles  
 COUNTY: San Juan (District 5)  
 TYPE OF WORK: Bridge Replacement, Roadway Reconstruction  
 CONTRACT TIME: 150 Working Days  
 DBE GOAL: At this time NMDOT will meet the State DBE on Federally assisted projects through a combination of race-neutral and race-conscious measures. This project is subject to race-conscious measures. The established DBE goal for this project is 0.00%.  
 LICENSES: (GF-2 or GF-98) and (GA-1 or GA-98)  
 FUNDING TYPE: Federal-aid funded  
 LISTING THRESHOLD: None

(2)  
CN 4101490

TERMINI: NM 93, MP 0.057 to MP 0.224 for 0.167 miles  
 COUNTY: Quay (District 4)  
 TYPE OF WORK: Bridge Rehabilitation, Roadway Reconstruction  
 CONTRACT TIME: 75 Working Days  
 DBE GOAL: At this time NMDOT will meet the State DBE on Federally assisted projects through a combination of race-neutral and race-conscious measures. This project is subject to race-conscious measures. The established DBE goal for this project is 0.00%.  
 LICENSES: (GF-2 or GF-98) and (GA-1 or GA-98)  
 FUNDING TYPE: Federal-aid funded  
 LISTING THRESHOLD: None

Advertisement dates: June 22 and 29, 2018 and July 6 and 13, 2018.



## INDEX OF PROJECT SPECIFIC NOTICE(S) TO CONTRACTORS

Cooperation with Utilities-No Anticipated Impacts  
Incentive/Disincentive Provision  
Lead Based Paint Abatement for Bridges Built Before 1986 Pavement  
Smoothness Measurement  
Ramp-Up Time  
Rapid Set Concrete for Detour Repairs  
Restrictions to Locations and Times for Work Zones with Disincentives  
Traffic Control Coordination with Adjacent Project  
Warranty Bond Requirement  
Water

## Notice to Contractors

### Cooperation with Utilities-No Anticipated Impacts

CN 4101490

#### Utility Relocation

Utility relocation is not anticipated for this Project as there are no known utility impacts within the Project limits. If utilities are discovered within the Project limits the Contractor shall take the necessary precautions to protect the utility from damage caused by the Work. If any such utility is damaged, the Contractor shall bear the cost of repair to the satisfaction of the utility owner. The Contractor shall be responsible for all associated repair costs and no additional Contract Time will be granted for repairs.

Although there are no known utility impacts, for construction purposes this Notice to Contractors (“NTC”) does not supersede or alter the obligations in the 2014 Edition of the New Mexico Department of Transportation (“NMDOT”) Standard Specifications for Highway and Bridge Construction, (“Standard Specifications”) Section 105.6 – “Cooperation with Utilities” should a utility or utility facility be encountered during the Work.

If utilities or utility facilities are encountered during the Work the Contractor shall preserve line location markings or provide an offset mark before obliterating a locate mark. Restrictions exist regarding the use of emergency line locates. An emergency is defined as an excavation that must be performed due to circumstances beyond the control of the Contractor and that affects public health, safety or welfare. Emergency locate request shall not be used to circumvent poor job planning or economic consequences.

#### NMDOT Owned Facility Infrastructure

If a Contractor’s or Subcontractor’s activities at any tier, destroys, obliterates, covers or in any way alters utility markings put in place by the NMDOT, the Contractor shall ensure that those line markings are reestablished or provide offset markings before the Contractor or Subcontractor at any tier begins Work in the affected area. The Contractor shall both photo document the utility markings in their construction area prior to disturbing those markings and photo document the remarked utility alignment or the offset markings to ensure accuracy to the original markings. Photos will clearly identify distances and/or recognizable features needed to ensure re-markings or offset marks are accurate.

If the Contractor or Subcontractor at any tier fails to accurately reestablish previously placed line markings and damage occurs to any NMDOT owned facility infrastructure the Contractor shall be responsible for all associated repair costs and no additional Contract Time will be granted for repairs. If any NMDOT owned facility is damaged, the Contractor shall bear the cost of repair to the satisfaction of the NMDOT. NMDOT incurred costs related to damage to NMDOT owned facility infrastructure may be recovered from the Contractor by Progress Payment offset or the Contractor’s Project performance bond. All damaged

## Cooperation with Utilities-No Anticipated Impacts

CN 4101490

Page 2 of 2

infrastructure will be repaired as an emergency repair (within 24-hours), and shall be in accordance with the Standard Specifications.

### Non-NMDOT Owned Utility Infrastructure

Utilities shown on the Plans, which will not be relocated, shall require the Contractor to take the necessary precautions to protect the utility from damage caused by the Work. If any such utility is damaged, the Contractor shall bear the cost of repair to the satisfaction of the utility owner. The Contractor shall be responsible for all associated repair costs and no additional Contract Time will be granted for repairs.

## NOTICE TO CONTRACTORS

### Incentive /Disincentive Provision

#### CN 4101490

The New Mexico Department of Transportation (“NMDOT”) 2014 Edition of the Standard Specifications for Highway and Bridge Construction (“Standard Specifications”) Section 102.9 - “Innovative Contract Incentives” allows for the use of Incentive / Disincentive provisions. This Contract and the Work associated with this Project may be eligible for Incentive/Disincentive provisions applied as incentive payments and disincentive assessments. Eligible incentive payments / disincentive assessments are road user costs (“RUC”) and are developed for this Project’s limits by taking into account the additional costs borne by motorists and the community at large as a result of the Work. The road user costs are calculated using Federal Highway Administration guidelines.

For this Project, to minimize the impact to the travelling public and businesses at the Exit 369 interchange, it is mandatory to have the Work completed at Bridge 7345 and all lanes open to traffic in the amount of time listed in Table 1. Failure to comply with this Notice to Contractors shall result in the forfeiture on an incentive payment, disincentive assessments, issuance of a non-conformance or a declaration that the Contractor is in default.

If an incentive payment or disincentive assessment is due, either will be made in the next Progress Payment following the date the Assistant District Engineer-Construction provides written declaration that the Project is Substantially Complete.

For this Project, incentive payments will be associated to locations of Work identified in the Table 1. The incentive amounts in this section are considered inclusive of gross receipts tax. No separate gross receipts tax payment will be made with the incentive payment.

Table 1: Incentive / Disincentive

Phase	Location of Work	Incentive	Disincentive	Days to Completion
3, 4, 5, 6	Bridge 7345 and approach roadway	\$14,000 / Day with maximum incentive payment of \$98,000	\$14,000 / Day without maximum disincentive assessment	28 Days

This NTC does not supersede or alter Standard Specification Section 109.10.8 - “Physical Completion and Release of Retainage and Final Payment” and does not supersede or alter Standard Specification Section 108.8 - “Liquidated Damages”. Only incentive payments/disincentive assessments shall apply until the expiration of Contract Time. Upon the expiration of Contract Time only liquidated damages shall apply.

For the purpose of calculating the applicable incentive payments and disincentive assessments, a Day will be counted from 12:01 AM to 12:00 PM (midnight) local prevailing time. Incentive payment or disincentive assessment calculations will not be apportioned for partial Days.

## NOTICE TO CONTRACTORS

### Lead Based Paint Abatement for Bridges Built Before 1986

CN 4101490  
BR 7345

The Contractor responsible for the abatement Work shall perform the same in accordance with Section 547 of the 2014 Edition of the New Mexico Department of Transportation's Standard Specifications for Highway and Bridge Construction ("Standard Specifications").

The Contractor shall use a qualified lead-based paint abatement firm to perform the Work associated with lead-based paint abatement. A qualified lead-based paint abatement firm means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the Work, or the Project. Documentation reflecting the qualifications of the abatement firm and the detailed abatement plan shall be provided to the Project Manager per Standard Specification Section 108.2 (15) Pre-Construction Conference.

The abatement firm shall be responsible for measuring the weight of lead-based paint waste generated from each bridge (or bridge pair, where applicable). If, based on weight and 20 NMAC 4.1, an EPA ID number is required, the abatement firm shall submit a completed EPA Form 8700-12 to the NMED Hazardous Waste Bureau and reference the assigned number on all waste profiles, disposal manifests, and state required reporting documents and provide copies to the Project Manager.

In addition to the items listed in Section 547, the EPA-ID number, annual reporting, and the payment of applicable fees, are incidental.

EPA Form 8700-12 and instructions may be found by clicking on the form link found at:

<https://www.env.nm.gov/HWB/notifiers.html>.



Chief Engineer  
January 27, 2017

## NOTICE TO CONTRACTORS

### Pavement Smoothness Measurement

CN 4101490

In accordance with the 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction, Section 401 - Pavement Smoothness Measurement, this Project shall utilize Category III for pavement smoothness measurement.

Chief Engineer  
March 7, 2016

## NOTICE TO CONTRACTORS

### Ramp-Up Time

CN 4101490

Ramp-up time for this Project is 120 Days.

Contract Work shall begin no later than the latest start date in the Notice to Proceed plus the ramp-up time.

At the end of ramp-up time, Contract Time shall automatically commence.

If the Contractor elects to commence Work before the end of the ramp-up time, the Contractor shall provide the Project Manager 48 hour written notice of the date elected to commence Project Work.

The Contractor shall not impact traffic within the Project's limits during ramp-up time.

No Progress Payments shall be made to the Contractor during ramp-up time unless for stockpile Bid Items designated in the Notice to Contractors for Stockpile.

Chief Engineer  
June 18, 2018

## NOTICE TO CONTRACTORS

### Rapid Set Concrete for Detour Repairs

CN 4101490

The Contractor shall have available before implementation of Phase 4 a minimum of 50 square yards of Rapid Set Concrete (RSC). RSC shall be used as directed by the Project Manager for repairs of the detour. RSC shall be paid under Bid Item 533000 - Repair of Concrete Structures for quantities placed. Any RSC Material that remains after the completion of the Project shall be paid for in accordance with the 2014 Standard Specifications, Section 109.7-Eliminated Items.

Remaining RSC Material shall be hauled to the San Jon patrol yard. Costs associated with hauling shall be considered Incidental to completion of the Project.

## NOTICE TO CONTRACTORS

### Restrictions to Locations and Times for Work Zones with Disincentives

#### CN 4101490

Restrictions exist to locations and times for this Project's Work. Bids submitted by Bidders shall account for the restrictions in this Notice to Contractors ("NTC"). Table 1 incorporated herein shows the restricted locations and times during which the Contractor shall not perform Work.

The Project Manager (PM) will have the authority to waive the restrictions. To seek a waiver to the restrictions, the Contractor shall submit a written request to the PM no less than four (4) Days before the proposed Work date with the Work the Contractor will perform. The PM will make a determination on the request for waiver within two (2) Days of the submission of the request for waiver by the Contractor.

Failure by the Contractor to comply with this NTC shall result in withholding from the Progress Payment. The withholding amounts and schedule are in this NTC. The withholding assessment is independent from and in addition to the other withholdings established by Contract including but not limited to liquidated damages and road user costs.

If the Contractor does not have all lanes fully opened to traffic with no work in progress on the lanes in accordance with the restricted times given in Table 1, the Contractor will be assessed road user costs at a rate of \$2,000 per hour per lane. This fee will be assessed and pro-rated in 15 minute increments.

After the expiration of Contract Time withholding assessments shall cease and only liquidated damages per the 2014 New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction, Section 108.8 – "Liquidated Damages" shall apply.

Table 1

Work Type/Location	Restricted Days and Times	Exceptions
Closure of Interstate 40	Sunset to Sunrise	None

Chief Engineer  
May 3, 2015

## NOTICE TO CONTRACTORS

### Traffic Control Coordination with Adjacent Project

CN 4101490

The Contractor shall comply with the 2014 Edition of the New Mexico Department of Transportation ("NMDOT") Standard Specifications for Highway and Bridge Construction ("Standard Specifications") Section 105.7 – "Cooperation Between Contractors". Traffic Control configurations shall be coordinated with adjacent Projects. Traffic control phasing shall be governed by the Project with the earliest Work start date, unless otherwise determined by the Project Manager. Requests for additional Contract Time or compensation shall be in conformance with the NMDOT's Standard Specifications.

## NOTICE TO CONTRACTORS

### Warranty Bond Requirement

CN 4101490

The Contractor shall provide a warranty bond ("bond") in addition to the requirements set forth in the 2014 Edition of the New Mexico Department of Transportation Standard Specification for Highway and Bridge Construction Sections – 103.6 "Requirement of Contract Bonds" and 106.10 "Equipment and Material Guarantees and Warranties". The bond shall be provided within 14 Days of the Project Manager's written acceptance of the Bid Item. Items will not be accepted incrementally. The bond shall be for a value equal to that of the Bid Item Price for the respective Bid Item(s) listed below.

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Provide a warranty bond for the following Bid Item(s):

Bid Item	Bid Item Description	Bond Duration
536001	Epoxy Urethane Polymer Concrete Bridge Deck Overlay	5years

## NOTICE TO CONTRACTORS

### Water

CN 4101490

This Project is located in Quay County in District 4 and is situated in the Tucumcari Basin. The Contractor is required to abide by the water laws of the State and the rules and regulations of the Office of the State Engineer when appropriating water.

The Project will require less than One million (1,000,000) gallons of water, therefore, a three acre-foot permit should supply ample water for the Contractor's needs. The Contractor shall locate a source of water and/or a well near the Project and contact David Salazar at 505-827-5232 with the legal description by Section, Township and Range, down to a forty (40) acre subdivision, unless otherwise prescribed by the State Engineer. If more water is required, please contact David Salazar and necessary arrangements will be made with the appropriate Office of the State Engineer.

All water used from a State Engineer permitted water source on this Project must be metered by an accurate totalizing meter furnished and installed by the Contractor under the supervision of the Project Manager. The Project Manager will be responsible for reporting each month the amount of water used by the Contractor to the Office of the State Engineer in accordance with the special provisions of the water permit.

The water reports will be numbered. The first report will indicate that it is the "Initial Report". The last report will indicate that it is the "Final Report". The water report will include the control number and Project number, name of the contractor and the State Engineer's water permit number. An informational copy of the water report will be forwarded by mail to the New Mexico Department of Transportation ("NMDOT"), Right of Way Bureau, P. O. Box 1149, Attn: David Salazar, Santa Fe, New Mexico 87504-1149, or by e-mail at [david.salazar@state.nm.us](mailto:david.salazar@state.nm.us) and the water vendor, if applicable.

Surface water of any kind may not be used anywhere within the State without first making application to and obtaining a permit from the Office of the State Engineer.

The NMDOT and its Project Manager will act as coordinators with the Office of the State Engineer and/or private water vendors relative to all water matters on this Project, if called upon.

The NMDOT assumes no responsibility or provides no assurance to its Contractors that water and/or water rights will be available on any particular Project, either prior to or after the letting.

The Contractor shall hold the NMDOT and private water vendors harmless from any and all Claims or causes of action that may arise as a result of the use and services provided the Contractor relative to water on this Project.



## INDEX OF STANDARD NOTICE(s) to CONTRACTORS

Affidavit of Bidder  
Approved Products List  
Buy America  
Chief Engineer  
Electronic Data Files  
Environmental and Archaeological Approvals for Pit Areas  
ET-PLUS & ET-31 Removed from Approved Products List  
Federal Requirements  
Gross Receipts Tax  
New Mexico Employees Health Coverage  
Office of Inspector General  
Patents on Milling Equipment and Milling Operations  
Professional Services  
Quality Standards for Traffic Control Devices  
Return of Contract Documents  
Returning of Lobbying Disclosure/Disclosure of Lobbying Activities Form  
Specialty Items  
Subcontractor List  
Wage Rates (Federal/State)



New Mexico Department of Transportation ("NMDOT")  
Affidavit of Bidder

BIDDER: \_\_\_\_\_ TELEPHONE: (    ) \_\_\_\_\_  
ADDRESS: \_\_\_\_\_

The Bidder shall execute this Certification of Bidder. I \_\_\_\_\_ hereby affirm per 23 C.F.R. § 635.112(f) (2009) and as a condition to the NMDOT'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: \_\_\_\_\_

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STATE OF \_\_\_\_\_ )

COUNTY OF \_\_\_\_\_ )

SUBSCRIBED AND SWORN TO BEFORE ME ON THIS:

\_\_\_\_\_ day of \_\_\_\_\_ 2018

\_\_\_\_\_  
Notary Public

My Commission Expires: \_\_\_\_\_

Before Bid Opening, the Bidder shall submit this Affidavit of Bidder in the form of a zip file to the "file attachment upload" tab in the Project Bids.EBSX file through Bid Express. Refer to this Project's Advertisement for questions regarding this process.

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

## NOTICE TO CONTRACTORS

### Approved Products List

Products used on New Mexico Department of Transportation (“NMDOT”) Projects must be approved by the NMDOT’s product evaluation program and listed on the NMDOT’s approved products list (“APL”).

The Bidder’s Bid Item Unit Price for the Project shall be deemed to rely on the use of the products listed on the APL. The Contractor shall comply with all APL procedures required by the hyperlink below:

<http://dot.state.nm.us/content/nmdot/en/APL.html>

As used in this Notice to Contractors, “product” means any manufactured item, Material, traffic operational device or other feature used in the maintenance or construction of a NMDOT Project. All products must meet requirements in accordance with the 2014 Edition of the NMDOT’s Standard Specifications for Highway and Bridge Construction.

Products defined in NMDOT Administrative Directive (“AD”) 206, 4.08 (a-g) are not required to be on the APL. The product evaluation engineer makes the determination on which products meet the criteria in AD 206 4.08 (a-g).

Approval to use a non-APL product may be granted by the Project Manager on a Project specific basis only. For products not on the APL and not exempted by AD 206 4.08 (a-g), the Contractor shall submit an application to be evaluated consistent with the processes described in the above hyperlink.

If a non-APL product is used by the Contractor without approval of the Project Manager, the Contractor shall remove any non-APL product. Removal and replacement will be made at the sole expense of the Contractor if a non-APL Product is used. Any disruption to the Project schedule related to the Contractor’s use of a non-APL Product is solely the Contractor’s responsibility and no additional Contract Time will be granted.

## NOTICE TO CONTRACTORS

### Buy America

The following clarifies the 2014 Edition of the New Mexico Department of Transportation's (NMDOT) Standard Specifications for Highway and Bridge Construction Section 106.12 - "Preference for Domestic Materials" 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 NMDOT 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 NMDOT Project Manager invoices showing the cost of the foreign steel or iron Material that cannot be certified as delivered to the Project.

Chief Engineer  
May 3, 2015

## NOTICE TO CONTRACTORS

### Chief Engineer

Requests for Contract interpretation shall be directed in writing to the Chief Engineer in accordance with the 2014 Edition of the New Mexico Department of Transportation's Standard Specifications for Highway and Bridge Construction, Section 102.7 - "Examination of Contract, Plans, Specifications, Special Provisions, and Site of Work".

The contact information for the Chief Engineer is as follows:

[chief.engineer@state.nm.us](mailto:chief.engineer@state.nm.us)

## NOTICE TO CONTRACTORS

### Electronic Data Files

The New Mexico Department of Transportation ("NMDOT") will only provide electronic data files in the format and software version in which the files were produced and subject to the conditions set out in this Notice to Contractors ("NTC").

Providing electronic data files under this NTC does not alter the Bidder's obligations found in the NMDOT's 2014 Edition of the Standard Specifications for Highway and Bridge Construction ("Standard Specifications"), Section 102.7 - "Examination of Contract, Plans, Specifications, Special Provisions, and Site of Work".

The NMDOT will make available the following electronic data files for this Project:

A) Survey Data, in accordance with the Standard Specifications Section 801.1.2 - "Department-Supplied Documents and Services":

1. Existing Computer Aided Design Drafting ("CADD") survey files; and,
2. Existing Digital Terrain Model ("DTM") files.

B) Design Files, subject to the terms and conditions below:

1. Centerline Alignment Files ("CAF"), including horizontal and vertical alignment files for all alignments referenced in the plans.

The electronic data provided in sub-section "B" is for information purposes only. The data is furnished in an "as is" condition without any warranty as to fitness for a particular use beyond information purposes. The Contractor accepts all risks associated with the use of the data provided in sub-section "B" as modifications may have been made to the official hard copy Contract which do not appear in the electronic data files. The Contractor is solely responsible for confirming, conforming and correlating the accuracy and completeness of the electronic data files to the official Contract.

This NTC does not alter the definition of the Contract nor modify the order of importance of the documents as specified in the Standard Specifications, Section 105.4 - "Coordination of Contract Documents".

The electronic data referenced in sub-sections "A" and "B" will be available to the requestor on discs and will be available at the Plans Specifications & Estimate Bureau, located at 1120 Cerrillos Road, Santa Fe, NM 87504, Room 223.

## NOTICE TO CONTRACTORS

### Environmental and Archaeological Approvals for Pit Areas

In addition to the requirements contained in the 2014 Edition of the New Mexico Department of Transportation (“NMDOT”) Standard Specifications for Highway and Bridge Construction Section 107.14.1 – “Environmental and Cultural Resource Studies and Approvals” the Contractor shall coordinate pit activity with the NMDOT in order to facilitate government-to-government tribal consultation, excluding commercial pits with affected tribes. The listing of affected tribes can be obtained from the following link:

<http://nmhistoricpreservation.org/outreach/native-american-consultations.html>

The Contractor shall initiate tribal consultation in writing through the NMDOT Project Manager (“PM”). The Contractor shall include, in the request to initiate tribal consultation, its scope of Work and clearly delineate plan view location of the Contractor located activity on a United State Geological Service 7.5’ map. This process takes approximately 45 Days from the PM’s receipt of the Contractor’s written request to initiate tribal consultation. If concerns are expressed by the affected tribes this process will exceed 45 Days.

Maintenance  
May 3, 2015

## NOTICE TO CONTRACTORS

### ET-PLUS & ET-31 Removed from Approved Products List

The New Mexico Department of Transportation, removed the ET-Plus and ET-31 guardrail end terminal sections, manufactured by Trinity Highway Products, LLC from the approved products list ("APL"). These products shall not be installed on New Mexico roadways.

The Bidder's Bid Item Unit Price for the Project shall be deemed to rely on the use of the alternate products listed on the APL.

## NOTICE TO CONTRACTORS

### Federal Requirements

- I. TITLE VI
- II. DISADVANTAGED BUSINESS ENTERPRISE (DBE)
- III. SUBCONTRACTOR PROMPT PAYMENT PROVISIONS
- IV. REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS AND SUPPLEMENTS
- V. SUPPLEMENTAL EEO REQUIREMENTS
- VI. INDIAN PREFERENCE
- VII. NMDOT ON THE JOB TRAINING/SUPPORTIVE SERVICES ("OJT/SS") PROGRAM
- VIII. WAGE RATES
- IX. LABOR REPORTING AND SUBMISSION OF WEEKLY PAYROLLS
- X. TITLE VI ASSURANCES APPENDIX A AND APPENDIX E

References made to the New Mexico Department of Transportation ("NMDOT") web page can be accessed through the following link: <http://dot.state.nm.us/en.html>.

#### I. TITLE VI

The text United States Department of Transportation (USDOT) Order No. 1050.2A has been excerpted for this section with minimal modification by the NMDOT.

The Contractor (herein referred to as the "Recipient"), HEREBY AGREES THAT, as a condition to receiving any Federal financial assistance from the U.S. Department of Transportation (DOT), through the NMDOT, is subject to and will comply with the following:

#### Statutory/Regulatory Authorities

Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d et seq., 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin); 49 C.F.R. Part 21 (entitled Nondiscrimination In Federally-Assisted Programs Of The Department Of Transportation—Effectuation Of Title VI Of The Civil Rights Act Of 1964); 28 C.F.R. section 50.3 (U.S. Department of Justice Guidelines for Enforcement of Title VI of the Civil Rights Act of 1964);

The preceding statutory and regulatory cites hereinafter are referred to as the "Acts" and "Regulations," respectively.

#### General Assurances

In accordance with the Acts, the Regulations, and other pertinent directives, circulars, policy, memoranda, and/or guidance, the Recipient hereby gives assurance that it will promptly take any measures necessary to ensure that:

"No person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity," for which the Recipient receives Federal financial assistance from DOT, including NMDOT.



The Civil Rights Restoration Act of 1987 clarified the original intent of Congress, with respect to Title VI and other Nondiscrimination requirements (The Age Discrimination Act of 1975, and Section 504 of the Rehabilitation Act of 1973), by restoring the broad, institutional-wide scope and coverage of these nondiscrimination statutes and requirements to include all programs and activities of the Recipient, so long as any portion of the program is Federally assisted.

“The NMDOT, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively insure that any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award”.

The NMDOT's Title VI Assurances, Appendices A and E are included in Section X at the end of this Notice to Contractors (“NTC”).

For further information, contact the Title VI coordinator for the NMDOT through the following link: <http://dot.state.nm.us/en/OEOP.html#f>.

## II. DISADVANTAGED BUSINESS ENTERPRISE (“DBE”)

Per 49 C.F.R. § 26.13(b) (2014), the Contract NMDOT signs with the Contractor (and each Subcontract the Contractor signs with a Subcontractor) must include the following assurance:

“The contractor, sub recipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate, which may include, but is not limited to:

- (1) withholding of monthly progress payments;
- (2) assessing sanctions;
- (3) liquidated damages; and/or
- (4) disqualifying the contractor from future bidding as non-responsible.”

For the purposes of the assurance, DOT-assisted Contracts means Contracts that receive federal funding and recipient means the NMDOT.

### Terms and Definitions

Terms and Definitions contained in 49 C.F.R. § 26.5 are incorporated in this NTC by reference. Terms and definitions in the same control over terms that conflict with the terms and definitions in the 2014 Edition of the NMDOT Standard Specifications for Highway and Bridge Construction (“Standard Specifications”) Section – 101.4 “Terms and Definitions”.

### Pre-Award Procedures

Projects that have DBE goals established in the Advertisement are subject to race-conscious measures. When a DBE goal is established the following DBE form and NTC, or evidence of the Bidder's good faith efforts, are required in order for the Bid to be considered responsive:

1. Disadvantaged Business Enterprise Goal Form A-585 (“A-585”); and

2. NTC Disadvantaged Business Enterprise (DBE) Bidder's Commitment and DBE's Confirmation Form A-644 ("A-644").

In the event the Bidder is also a certified DBE Contractor, and intends to self-perform a portion of the Work, the Bidder shall list itself and any other DBE it will use on Form A-585. Failure to comply with this requirement shall render the Bid non-responsive.

#### Pre-Award Bidder's Good Faith Efforts

When a Project has an established DBE goal, a Bidder may meet the requirements even if it doesn't meet the goal through documenting adequate good faith efforts. This means that the Bidder must show that it took all necessary and reasonable steps to achieve a DBE goal or other requirement of this part which, by their scope, intensity, and appropriateness to the objective, could reasonably be expected to obtain sufficient DBE participation, even if they were not fully successful. The documentation of good faith efforts shall include, but is not limited to, copies of each DBE and non-DBE quote submitted to the Bidder when a non-DBE was selected over a DBE for Work on the Contract.

Per 49 C.F.R. § 26.53 (b)(3) (2014) and 49 C.F.R. § 26 Appendix A the NMDOT has the responsibility to make a fair and reasonable judgment as to whether a Bidder, that did not meet the goal, made adequate good faith efforts.

The below contains a list of types of actions, which the NMDOT may consider as part of the Bidder's good faith efforts to obtain DBE participation. This is not intended to be a mandatory checklist, nor is it intended to be exclusive or exhaustive, as other factors or types of efforts may be relevant in appropriate cases. The following is a list of the type of actions, and documentation, which the NMDOT will consider as part of the Bidder's good faith efforts to obtain DBE participation:

- 1) The Bidder's copies of each DBE and non-DBE subcontractor quote submitted to the Bidder when a non-DBE subcontractor was selected over a DBE for Work on the Contract to review whether DBE prices were substantially high; and the NMDOT may contact the DBEs listed on a the Bidder's List of Quoters submitted by the Bidder to inquire whether DBE primes were contacted by the Bidder. Pro forma mailings to DBEs requesting bids are not alone sufficient to satisfy good faith efforts under this NTC or rule;
- 2) The Bidder's solicitation of the interest of DBEs as early in the acquisition process as possible and as practicable to allow the DBEs to respond to the solicitation and submit a timely offer for the Subcontract. The Bidder should determine with certainty if the DBEs are interested by taking appropriate steps to follow-up initial solicitations;
- 3) The Bidder's selection of portions of the Work to be performed by the DBEs in order to increase the likelihood that the DBE goals will be achieved. This includes, where appropriate, breaking out Contract Work items into economically feasible units to facilitate DBE participation even when the Bidder might otherwise prefer to perform these Work items with its own forces;
- 4) The Bidder's negotiations in good faith with interested DBEs. It is the Bidder's responsibility to make a portion of the Work available to DBE subcontractors, sub-consultants and Suppliers and to select those portions of the Work or material needs consistent with the available DBE subcontractors, sub-consultants and Suppliers, so as to facilitate DBE participation. Evidence of such negotiations includes the names, addresses and telephone numbers of DBEs that were considered, a description of the information provided regarding the construction plans and

specifications for the Work selected for subcontracting or requirements of Work, and evidence as to why additional agreements could not be reached for DBEs to perform the Work; and,

- 5) The Bidder's rejection of DBEs as being unqualified. The Bidder shall not reject a DBE as being unqualified without sound reasons based on a thorough investigation of their capabilities. The DBE's standing within its industry, membership in specific groups, organizations, or associations and political or social affiliations (for example union vs. non-union employee status) are not legitimate causes for the rejection or non-solicitation of Bids in the Bidder's efforts to meet the Project goal. Another practice considered insufficient good faith effort is the rejection of the DBE because its' quotations for Work were not the lowest received. However, nothing in this paragraph will be considered to require the Bidder to accept unreasonable quotes to satisfy the Contract goal.

If the NMDOT determines that the Bidder has failed to make adequate good faith efforts to meet the DBE goal requirements, the NMDOT shall reject the Bid as non-responsive. The Bidder may dispute this determination and rejection of the Bid through the procedures in Standard Specification Section - 103.3 "Bidding Dispute Resolution Procedures".

### Post-Award

#### Counting DBE Participation Toward Goals

This section in no way alters the obligations in Standard Specification Section - 108.1 "Subcontracting" and is only used to determine DBE participation levels for each Bidder. The Contractor must still comply with Standard Specification Section - 108.1 and perform with its own organization at least 40% of the Work based on the Total Bid Amount.

Only the value of the Work actually performed by the DBE will be counted towards DBE Project goals. DBE participation shall be credited as follows:

1. Count the entire amount of that portion of the Contract Work that is performed by the DBE's own forces. Include the cost of supplies and Materials obtained by the DBE for the Work including supplies purchased or equipment leased by the DBE. Supplies and equipment purchased or leased by a DBE from a prime contractor shall not be counted toward the DBE Project goal.
2. Count the entire amount of fees or commissions charged by a DBE for providing a bona fide service, such as professional, technical, consultant, or managerial services, or for providing bonds or insurance specifically required of the performance of the Contract, toward DBE goals, provided NMDOT determines the fee to be reasonable and not excessive as compared with fees customarily allowed for similar services.
3. When a DBE subcontracts part of its Work to another firm, the value of the subcontracted Work may be counted toward DBE goals only if the DBE's Subcontractor is itself a DBE. Work that a DBE subcontracts to a non-DBE does not count toward DBE goals.

When a DBE performs as a participant in a joint venture, count the portion of the total dollar value of the Contract equal to the distinct, clearly defined portion of the Work of the Contract that the DBE performs with own forces toward DBE goals.

The NMDOT counts expenditures to a DBE toward DBE goals only if the DBE is performing a commercially useful function (“CUF”) on the Contract.

1. A DBE performs a CUF when it is responsible for execution of the Work of the Contract and is carrying out its responsibilities by actually performing, managing, and supervising the Work involved. To perform a CUF, the DBE must also be responsible, with respect to Materials and supplies used on the Contract, for negotiating price, determining quality and quantity, ordering the Material and installing (where applicable) and paying for the Material itself.
2. A DBE does not perform a CUF if its role is limited to that of an extra participant in a transaction, Contract, or Project through which funds are passed in order to obtain the appearance of DBE participation.
3. If a DBE Contractor, Subcontractor, at any tier, or Supplier does not perform or exercise responsibility for at least 30% of the total cost of its Contract with its own forces, or the DBE subcontracts a greater portion of the Work of a Contract than would be expected on the basis of normal industry practice for the type of Work involved, it will be presumed that the DBE is not performing a CUF.
4. When a DBE is presumed not to be performing a CUF as provided in paragraph 3 of this section, the DBE may present evidence to rebut this presumption.
5. Decisions concerning CUF matters are not administratively appealable to USDOT.

#### DBE Trucking

Per the Standard Specification Section 108.1 “Subcontracting”...“A Trucker is not a Subcontractor unless the Contractor is using the Trucker to meet the DBE requirement associated with the Project”. The following factors shall be used to determine whether DBE trucking Subcontractors are performing a CUF:

1. The DBE must be responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular Contract, and there cannot be a contrived arrangement for the purpose of meeting DBE goals.
2. The DBE must itself own and operate at least one fully licensed, insured, and operational truck used on the Contract.
3. The DBE receives credit for the total value of the transportation services it provides on the Contract using trucks it owns, insures, and operates using drivers it employs.
4. The DBE may lease trucks from another DBE, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the Contract.
5. The DBE may also lease trucks from a non-DBE, including from an owner-operator. The DBE that leases trucks equipped with drivers from a non-DBE is entitled to credit for the total value of transportation services provided by non-DBE leased trucks equipped with drivers not to exceed the

value of transportation services on the Contract provided by DBE-owned trucks or leased trucks with DBE employee drivers. Additional participation by non-DBE owned trucks equipped with drivers receives credit only for the fee or commission it receives as a result of the lease arrangement.

6. The DBE may lease trucks without drivers from a non-DBE truck leasing company. If the DBE leases trucks from a non-DBE truck leasing company and uses its own employees as drivers, it is entitled to credit for the total value of these hauling services.
7. For purposes of this DBE trucking section a lease must indicate that the DBE has exclusive use of and control over the truck. This does not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for use of the leased truck. Leased trucks must display the name and identification number of the DBE.

### DBE Supplying Materials

1. If the Materials or supplies are obtained from a DBE manufacturer, count 100 % of the cost of the Materials or supplies toward the DBE goal. A DBE manufacturer is a firm that operates or maintains a factory or establishment that produces, on the premises the Materials, supplies, articles, or Equipment required under the Contract.
2. If the Materials or supplies are purchased from a DBE regular dealer, count 60 % of the cost of the Materials or supplies toward DBE goals. A DBE regular dealer is a firm that owns, operates, or maintains a store, warehouse, or other establishment in which the Materials, supplies, articles or Equipment required under the Contract are bought, kept in stock and regularly sold or leased to the public in the usual course of business. The DBE regular dealer, must be an established regular business that engages, as its principal business and under its own name, in the purchase and sale or lease of the products in question.

A DBE may be a regular dealer in such bulk items as petroleum products, steel, cement, gravel, stone, or asphalt without owning, operating, or maintaining a place of business as required in paragraph 1 of this section if the DBE both owns and operates distribution equipment for the products. Any supplementing of regular dealers' own distribution equipment shall be by a long-term lease agreement and not on ad hoc or contract-by-contract basis.

Packagers, brokers, manufacturers' representatives, or other person who arrange or expedite transactions are not regular dealers for the purpose of paragraph 2 of this section.

3. With respect to Materials or supplies purchased from a DBE which is neither a manufacturer nor a regular dealer, count the entire amount of fees and commissions charged for assistance in the procurement of the Materials and supplies, or fees or transportation charges for the delivery of Materials and supplies required on a job site, toward DBE goals, provided the NMDOT determines the fees to be reasonable and not excessive as compared with fees customarily allowed for similar services. The cost of the Materials or supplies themselves is not creditable toward DBE goals.

Credit for Work performed shall not be counted toward the DBE project goal until the amount committed has been paid to the DBE.

Pre-Award Substitution/Replacement and Post-Award Termination of DBE for Projects Having a DBE Goal

The Contractor shall use the DBE listed on the A-585 and confirmed on the A-644 to perform the specific Work identified. The Contractor shall not substitute, replace or terminate a DBE listed on the A-585 and confirmed on the A-644 (or an approved substitute DBE) without the prior written consent of NMDOT. The NMDOT considers it an improper DBE substitution, replacement or termination when a Contractor performs Work originally designated for a DBE with its own forces or those of an affiliate, or with a non-DBE, or with a substitute DBE. Unless NMDOT consent is provided, the Contractor shall not be entitled to any payment for Work or Materials unless it is performed by the listed DBE.

NMDOT will provide written consent to the termination request only if NMDOT agrees, for reasons stated in its concurrence document, that the Contractor has good cause to terminate the DBE. For purposes of this paragraph, good cause includes the following circumstances:

1. The listed DBE fails or refuses to execute a written Contract;
2. The listed DBE fails or refuses to perform the Work consistent with normal industry standards, provided, however, that good cause does not exist if the failure or refusal to perform results from the bad faith or discriminatory action of the Contractor;
3. The listed DBE fails or refuses to meet the Contractor's reasonable, nondiscriminatory bond requirements;
4. The listed DBE becomes bankrupt, insolvent, or exhibits credit unworthiness;
5. The listed DBE is ineligible to Work on public works projects because of suspension or debarment proceedings pursuant to 26 CFR Parts 180, 215 or 1200 or applicable state law;
6. The listed DBE is not a responsible Contractor;
7. The listed DBE voluntarily withdraws from the Project and provides to NMDOT written notice of its withdrawal;
8. The listed DBE is ineligible to receive DBE goal credit for the type of Work required;
9. A DBE owner dies or becomes disabled with the result that the listed DBE is unable to complete its Work on the Project; or
10. Other documented good cause that NMDOT determines compels the termination of the DBE. Provided that good cause does not exist if the Contractor seeks to terminate a DBE it relied on to obtain the Contract so that the Contractor can self-perform the Work for which the DBE was engaged or so that the Contractor can substitute another DBE or non-DBE after Contract Award.

Before seeking concurrence from the NMDOT to substitute, replace or terminate a DBE (or an approved substitute DBE) the Contractor must provide the DBE written notice including the reason of its intent to substitute, replace or terminate and give the DBE 5 Days to respond to the Contractor's notice. If required in a particular case as a matter of public necessity the NMDOT may allow a response period shorter than 5 Days. The DBE in response to the notice may provide the Contractor and NMDOT with the reasons, if any, why it objects to the proposed substitution, replacement or termination and why NMDOT should not approve the Contractor's request.

After receipt and review of the DBE response the NMDOT will provide a written response to the Contractor's request. NMDOT's decision is not appealable to USDOT.

After an approved termination of a DBE the Contractor shall make good faith efforts to subcontract with a substitute DBE which can perform the same type of work on the Project as the substituted, replaced or terminated DBE or to subcontract with a replacement DBE which can perform other types of work remaining on the Project. The good faith efforts shall be documented by the Contractor. The NMDOT may request a copy of the documented good faith efforts and the Contractor shall submit the same in 7 Days, which may be extended to an additional 7 Days at the request of the Contractor. The NMDOT will provide a written determination stating whether or not good faith efforts have been demonstrated. The Contractor may refer to Appendix A of 49 C.F.R. § 26 for guidance on good faith efforts.

NMDOT may allow a DBE contract goal waiver, adjust the DBE goal, or assess construction contract liquidated damages or design contract liquidated damages as may be appropriate, depending on the individual project's overall circumstances. NMDOT's decision to waive or adjust the contract goal is not appealable to USDOT.

### Record Keeping Requirements

The Contractor shall keep such records as necessary to ensure compliance with its DBE utilization obligations, in accordance with Standard Specification Section - 107.28 "Contractor Records".

### Compliance Procedures

The Contractor is solely responsible and obligated to ensure DBE compliance at all tiers until the final payment is made in accordance with Standard Specification Section - 109.10 "Project Closure".

If it is found that the Contractor or Subcontractor at any tier is not in compliance with this NTC and DBE program, NMDOT will notify the non-compliant party in writing. Failure to be compliant is a material breach of the Contract and may result including, but not limited to, the NMDOT exercising the remedies below. The NMDOT may conduct a compliance conference with the non-compliant party or parties to discuss the area(s) of non-compliance. In the event that the non-compliant party or parties fails or refuses to perform in compliance the NMDOT will send the non-compliant party or parties a "Notice of Non-Compliance" containing a deadline for the compliance. If the non-compliant party becomes compliant after the "Notice of Non-Compliance" the NMDOT will rescind the "Notice of Non-Compliance" and notify the party or parties. If the deficiencies are not corrected, NMDOT will initiate administrative action against the non-compliant party or parties, which may include but not be limited to:

1. Termination of the Contract;

2. Withholding of monthly progress payments;
3. Initiation of appropriate suspension or debarment proceedings;
4. Referral of any unlawful actions to the appropriate enforcement agencies; or
5. Other actions as appropriate, at the discretion of NMDOT.

### III. SUBCONTRACTOR PROMPT PAYMENT PROVISIONS

This NTC does not alter the sole discretion of the NMDOT to make good cause determinations concerning Contractor prompt payment matters.

To ensure that all obligations to promptly pay Subcontractors are met Contractors shall pay all Subcontractors, Suppliers and Fabricators their respective Subcontract amount by electronic transfer, if available, for NMDOT undisputed Accepted Work within the timeframes specified in the Standard Specification Section 108.1 - "Subcontracting".

The Contractor is solely responsible and obligated to ensure prompt payment obligations and compliance reporting through all tiers until the final payment is made in accordance with Standard Specification Section 109.10 - "Project Closure". Contractors, Subcontractors or Suppliers, at all tiers, shall be required to submit payment information, as provided for in the B2GNow supporting software system, indicating when payments are made to any Subcontractor, Supplier and or Fabricator, regardless of DBE status. The Subcontractor, Supplier or Fabricator shall in B2GNow timely select whether payment was or was not received for the undisputed and Accepted Work. The NMDOT may recognize supporting documentation of such payment(s) in one or more of the following forms:

1. Proof of the timely deposit of funds into the Subcontractor, Supplier and or Fabricator bank account;
2. Proof of timely hand delivery of payment to the Subcontractor, Supplier and or Fabricator; or
3. Proof of timely mailing payment to the Subcontractor, Supplier and or Fabricator.

The Contractor shall notify the NMDOT in all situations when it will not make full prompt payment to its Subcontractor, Supplier or Fabricator before the payment becomes due. The Contractor shall also notify the Subcontractor, Supplier or Fabricator in all situations when it will not make full prompt payment before the payment becomes due. A Contractor will be required to fully document any alleged disputes with its Subcontractors, Suppliers and or Fabricators and provide the documentation to the NMDOT upon request.

The Contractor shall have good cause for any failure to fully or partially provide prompt payment for Accepted Work. The NMDOT determines good cause. Good cause recognized by the NMDOT to excuse a failure to promptly pay includes, but is not limited to, a claim concerning the Subcontractor's or Supplier's Work, failure to provide certified payrolls, and other required Project documentation. The amount withheld cannot exceed the amount in dispute between the Contractor and Subcontractor or Supplier. The



Contractor has the burden to support the Contractor's assertion of good cause. If the failure to fully or partially provide prompt payment is based on a claim, the Contractor shall submit a verifiable explanation and/or proof of the claim between the parties to the Project Manager.

#### Retainage

The NMDOT will require Contractors to pay all retainage owed to the Subcontractor, Supplier or Fabricator within 30 Days of the Progress Payment indicating Acceptance of the completed Subcontract Work, even if the NMDOT continues to withhold retainage from the Contractor. The Subcontract Work is completed when all the tasks called for in the Subcontract have been accomplished, documented and Accepted by the NMDOT. The Contractor may request partial acceptance in accordance with Standard Specifications Section - 105.18.1 "Partial Acceptance" upon satisfactory completion of the Subcontract Work. Good cause recognized by the NMDOT to excuse a failure to promptly release retainage includes, but is not limited to, a claim concerning the Subcontractor's or Supplier's Work, failure to provide certified payrolls, and other required Project documentation. The amount withheld cannot exceed the amount in dispute between the Contractor and Subcontractor or Supplier. The Contractor has the burden to support the Contractor's assertion of good cause for the failure to promptly release retainage. If the failure to promptly release retainage is based on a claim, the Contractor shall submit verifiable explanation and/or proof of the claim between the parties to the Project Manager.

#### Cross-Project Offsets

The NMDOT will not recognize cross-Project offsets as "good cause" excusing untimely payment for Accepted Work. The Contractor's Contract with Subcontractors or Suppliers shall not contain any provision that allows the Contractor to withhold payment from the Subcontractor or Supplier as a result of the Subcontractor's or Supplier's performance on separate Contract(s). Any such provision will be without effect, and shall not be recognized as good cause excusing a failure to make prompt payment.

### **IV. REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS AND SUPPLEMENTS**

FHWA-1273 -- Revised May 1, 2012

#### **REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS**

- I. General
- II. Nondiscrimination
- III. Non-segregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act

- X. Compliance with Government-wide Suspension and Debarment Requirements
- XI. Certification Regarding Use of Contract Funds for Lobbying

## I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.
3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.
4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

## II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding \$10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:
  - a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.
  - b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."
2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.
3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved

in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

- a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.
  - b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.
  - c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.
  - d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.
  - e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.
4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.
- a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.
  - b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.
  - c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.
5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

- a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.
- b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.
- c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.
- d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

- a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.
- b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).
- c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.
- d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

- a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and

increasing the skills of minorities and women so that they may qualify for higher paying employment.

- b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.
  - c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.
  - d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.
8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.
9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.
- a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.
  - b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.
10. Assurance Required by 49 CFR 26.13(b):
- a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

- b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

- a. The records kept by the contractor shall document the following:

- (1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;
- (2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and
- (3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

- b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on [Form FHWA-1391](#). The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

### III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

#### IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding \$2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

##### 1. Minimum wages

- a. 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, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. of this section; 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 weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). 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. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

- b.
  - (1) The contracting officer shall require that any class of laborers or mechanics, including helpers, 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 contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when 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; and
  - (ii) The classification is utilized in the area by the construction industry; and
  - (iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.
- (2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer 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 contracting officer 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 contracting officer or will notify the contracting officer 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 contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.
- (4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, 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.
- c. 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.
- d. 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 Davis-Bacon Act 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.

## 2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

### 3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b.

(1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of

Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

#### 4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

- c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended and 29 CFR part 30.

- d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

- 5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.
- 6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.
- 7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.
- 8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.
10. Certification of eligibility.
  - a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
  - b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
  - c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

#### V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.
2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.
3. Withholding for unpaid wages and liquidated damages. The FHWA or the contacting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime

contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

## VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).
  - a. The term "perform work with its own organization" refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:
    - (1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
    - (2) the prime contractor remains responsible for the quality of the work of the leased employees;
    - (3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
    - (4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.
  - b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.
3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.
4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.
5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

#### VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.
2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).
3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

#### VIII.FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.



In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

## IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.
2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

## X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more – as defined in 2 CFR Parts 180 and 1200.

### 1. Instructions for Certification – First Tier Participants:

- a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.
- b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.
- c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.
- d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
- e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).
- f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

- g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.
  - h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.
  - i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
  - j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.
2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:
- a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:
    - (1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;
    - (2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
    - (3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

### 3. Instructions for Certification - Lower Tier Participants:

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered

transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

- g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.
- h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
- i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

#### Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

- 1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.
- 2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

#### XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 (49 CFR 20).

- 1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:
  - a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the

extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

- b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.
3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

#### V. SUPPLEMENTAL EEO REQUIREMENTS

Incorporated in this Contract, by reference, are supplemental requirements to the Department of Labor, Office of Federal Contract Compliance Programs ("OFCCP") Equal Employment Opportunity Program ("EEO"). The supplemental requirements are:

1. Exec. Order No. 11246, 30 FR 12319 (September 24, 1965);
2. 41 C.F.R. § 60-4.1 through 60-4.9 (2015);
3. Exec. Order No. 13665 Non-Retaliation for Disclosure of Compensation Information (April 8, 2014); and
4. Further Amendments to Exec. Order No. 11478, Equal Employment Opportunity in the Federal Government and Exec. Order No. 11246, Equal Employment Opportunity (July 21, 2014).

Per 41 C.F.R. § 60-4.2 all federally-assisted Contracts shall include (information has been interlineated applicable to this Contract as required):

"(a) All Federal contracting officers and all applicants shall include the notice set forth in paragraph (d) of this section and the Standard Federal Equal Employment Opportunity Construction Contract Specifications set forth in § 60-4.3 of this part in all solicitations for offers and bids on all Federal and federally assisted construction contracts or subcontracts to be performed in geographical areas designated by the Director pursuant to § 60-4.6 of the part. Administering agencies shall require the inclusion of the notice set forth in paragraph (d) of this section and the specifications set forth in § 60-4.3 of this part as a condition of any grant, contract, subcontract, loan, insurance or guarantee involving federally assisted construction covered by this part 60-4.

(b) All non-construction contractors covered by Executive Order 11246 and the implementing regulations shall include the notice in paragraph (d) of this section in all construction agreements which are necessary in whole or in part to the performance of the covered non-construction contract.

(c) Contracting officers, applicants and non-construction contractors shall give written notice to the Director within 10 working days of award of a contract subject to these provisions. The notification shall include the name, address and telephone number of the contractor; employer identification number; dollar amount of the contract, estimated starting and completion dates of the contract; the contract number; and geographical area in which the contract is to be performed.

(d) The following notice shall be included in, and shall be a part of, all solicitations for offers and bids on all Federal and federally assisted construction contracts or subcontracts in excess of \$10,000 to be performed in geographical areas designated by the Director pursuant to § 60–4.6 of this part (see 41 CFR 60–4.2(a)):

Notice of Requirement for Affirmative Action To Ensure Equal Employment Opportunity (Executive Order 11246)

1. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Specifications" set forth herein.

2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

The most current participation goals for minorities and females can be found at [http://www.dol.gov/ofccp/TAGuides/TAC\\_FedContractors\\_JRF\\_QA\\_508c.pdf](http://www.dol.gov/ofccp/TAGuides/TAC_FedContractors_JRF_QA_508c.pdf) and are:

New Mexico:

160 Albuquerque, NM:

SMSA Counties.

0200 Albuquerque, NM-38.3%

NM Bernalillo; NM Sandoval.

Non-SMSA Counties-45.9%

NM Catron. NM Colfax; NM De Baca; NM Guadalupe; NM San Juan; NM San Miguel; NM Santa Fe; NM Socorro; NM Taos; NM Torrance; NM Valencia.

Goals for females:

Nationwide goal-6.9%

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the contractor also is subject to the goals for both its federally involved and non-federally involved construction.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60–4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations

required by the specifications set forth in 41 CFR 60–4.3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR Part 60–4. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed.

The most current OFFCP staffing can be found at <http://www.dol.gov/ofccp/contacts/regkeyp.htm> and are:

#### SOUTHWEST and ROCKY MOUNTAIN REGION

Covered States/Territories: Arkansas, Colorado, Louisiana, Montana, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Utah, Wyoming

Regional Director: Melissa L. Speer

Deputy Regional Director: Aida Collins

Regional Outreach Coordinator: E. Michelle Hernandez

#### Contact Information:

U.S. Department of Labor for OFCCP  
Federal Building, Room 840  
525 South Griffin St.  
Dallas, TX 75202  
(972) 850-2550  
(972) 850-2552 (Fax)  
(877) 889-5627 (TTY-National Office)  
Pre-Award Email Address: [OFCCP-SW-PreAward@dol.gov](mailto:OFCCP-SW-PreAward@dol.gov)  
For Complaints: [OFCCP-SW-CC4@dol.gov](mailto:OFCCP-SW-CC4@dol.gov)

4. As used in this Notice, and in the contract resulting from this solicitation, the “covered area” is in the Advertisement.”

## VI. INDIAN PREFERENCE

This Contract preference requirement is an expansion of the provisions of the equal employment opportunity responsibilities for Contractors contained elsewhere in this NTC and the provisions contained under FHWA-1273.



If the Project is located on or near a reservation the Contractor, or its Subcontractor at any tier, may be required to extend a publically announced preference in employment to Indians living on or near an Indian reservation in connection with employment opportunities on or near an Indian reservation. The word “near” includes all areas where a person seeking employment could reasonably expected to commute in the course of a work day. Contractors or Subcontractors, at any tier, shall not discriminate among Indians on the basis of religion, sex, tribal affiliation, and the use of such a preference shall not excuse compliance with the remaining EEO provisions of this NTC.

If the Contractor extends an Indian preference, then this NTC requires that Contractors shall afford preference to initial hiring, reassignment, transfer, competitive promotion, reappointment, reinstatement, or any personnel action to fill a vacant position to qualified and enrolled members of federally recognized Indian tribe. The extended preference shall extend to Indians and not extend to a specific tribe or tribal affiliation. There may be tribal laws and regulations that the Contractor is required to follow if an Indian preference is extended. Contractors shall make themselves aware of any labor requirements, taxes, fees, licenses, permits or conditions that may be imposed by the affected tribes for the Project work performed in the area. In order to be apprised of the tribal law or regulation requirements, the Contractor shall establish a liaison with local tribe employment offices and provide this individual’s name and contact information to the Project Manager at the Pre-Construction Conference per Standard Specification Section 108.2 “Notice to Proceed and Pre-Construction Conference”. The tribe’s employment office may then assist the Contractor in identifying qualified and tribally enrolled individuals and assist in guidance related to applicable tribal laws or regulations. Verification of available, qualified and enrolled individuals will be provided to the Contractor by the tribe’s employment office. A list of contacts to facilitate the Contractor’s coordination with the tribal liaison is at:

[http://dot.state.nm.us/content/dam/nmdot/planning/Tribal\\_Contact\\_Listing.pdf](http://dot.state.nm.us/content/dam/nmdot/planning/Tribal_Contact_Listing.pdf)

## VII. NMDOT ON THE JOB TRAINING/SUPPORTIVE SERVICES (“OJT/SS”) PROGRAM

The primary objective of the Special Provisions referenced in the below-link is to address the underrepresentation of minority and female workers in the construction trades through the assignment of OJT goals. To that end, the primary objective of the OJT program is the training and upgrading of minorities and females to journeyman status on NMDOT state lead, federal-aid contracts. Accordingly, the Contractor shall make every effort to enroll minority, women and economically disadvantaged persons to the extent that such persons are available within a reasonable area of recruitment. This training commitment is not intended, and will not be used to discriminate against any applicant for training, whether or not he/she is a member of a minority group.

If Federal-aid funding is available and the NMDOT elects that the Project will be subject to the OJT/SS requirements then the Contractor or Subcontractor, at any tier, shall comply with the procedures outlined in Appendix B to Subpart A of 230 C.F.R. § 230. The OJT/SS program implemented by the Contractor or Subcontractor, at any tier, must be formally approved by the NMDOT before use of the program. In lieu of the use of a formally approved OJT/SS program the Contractor, or Subcontractor at any tier, may submit its own individual OJT/SS program for NMDOT consideration and approval. Until formal approval is received from the NMDOT CCRB through ACNM the individual Contractor or Subcontractor OJT/SS program cannot be used.

<http://dot.state.nm.us/en/OEOPFormsManuals.html#OTJforms>.

Contractors meeting the selection criteria for implementation of an OJT/SSS program, and who have a formally approved OJT/SSS program will be notified by the NMDOT's CCRB of its training assignment at the beginning of the reporting year, typically commencing with the calendar year beginning in January through December. The reporting year and the training assignment will be identified in the notification from the NMDOT's CCRB.

The Contractor shall fulfill all of the requirements of the OJT training program including the maintenance of records and submittal of periodic reports documenting program performance. The requirements and reports related to the OJT/SSS program shall include the Contractor's use of forms A-2201, A-2202, A-2203. The forms are incorporated herein by reference. The Contractor shall submit Form A-2202 by the tenth (10<sup>th</sup>) of each month of the reporting period or as indicated on the form itself.

The Contractor has the option to pay its trainees either the full prevailing wage for the trainee's job classification or at least 60% of the minimum prevailing wage for the trainee's job classification for the first half of the training period, 75% for the third quarter, and 90% for the last quarter respectively. Prevailing wages are those specific to this Contract.

For federally-funded Projects, and if requested the Contractor may be reimbursed \$0.80 per training hour by the NMDOT. Requests for reimbursement shall be submitted by the Contractor to the Project Manager in writing and after Substantial Completion for the Project is declared. Reimbursement is not available for 100% state-funded Projects.

Noncompliance with the responsibilities and requirements of this section, including being a non-responsive participant in the program, may be cause for the NMDOT to issue a show cause notice and other action as deemed necessary by the NMDOT.

## VIII. WAGE RATES

The higher wage rates shall govern in the event of a discrepancy between the minimum wage rates in the Wage Decision of the DWS and the U.S. Department of Labor Wage Decision applicable to this Contract.

## IX. LABOR REPORTING AND SUBMISSION OF WEEKLY PAYROLLS

Contractors and Subcontractors must pay employees weekly. Certified Payrolls and Statements of Compliance on federally funded Projects are due to the NMDOT seven (7) Days after date that the actual payment is processed by Contractor or Subcontractor, at any tier, to its employee.

The date that the actual payment is processed to the employee may be different that the payroll end date in some situations. Notwithstanding the difference between a payroll end date and actual payment date, the Contractor or Subcontractor at any tier shall make actual full payment to the employee no later than seven (7) Days after the payroll end date. And then shall submit the Certified Payrolls and Statements of Compliance no later than seven (7) Days after the actual payment date.

The Contractor and Subcontractors at all tiers Working on federal-aid Projects shall use the following EEO Software Programs to report specific EEO, Labor Compliance and DBE information as required by the Contract and as specified by this NTC. The two software programs are:

- B2GNow software
- LCPtracker software

Use of B2GNow and LCPtracker software programs is required and shall be considered Incidental. Failure of a Contractor or Subcontractor to use the required software programs to report specific EEO, Labor Compliance and DBE information may result in the issuance of a Non-Conformance per Standard Specification Section – 109.8.2 “Non-Conformance” or other Contract remedies.

B2GNow - (Business to Government Now), is a web-based software program used to collect, verify and manage payment information for Contractors and Subcontractors working on federal-aid Projects. Additionally, the software is used to collect and report DBE participation and utilization on federal-aid Projects. Information related to the use of the software is available at <https://nmdot.dbesystem.com/>.

The Contractor shall upload the fully executed contract between the Contractor and Subcontractor at any tier, the completed permission to subcontract form and associated attachments, and subcontract checklist to B2GNow.

LCPtracker - (Labor Compliance Program Tracker) is a web-based software program used to collect, verify and manage prevailing wage certified payrolls and related labor compliance documentation for Contractors and Subcontractors on federal-aid Projects. Information related to the use of the software is available at <https://lcpprod.lcptracker.net/>.

On all Projects, the Contractor shall submit and shall ensure all Subcontractors submit weekly payroll information into the LCPtracker software program.

To adequately track timely submission of weekly payrolls the Contractor shall enter the actual payment date in the field on the weekly Certified Payroll reporting form in LCPtracker titled “payment date”.

Information on access to the software programs, log-on information, use of the programs, available training, user manuals, etc. can be obtained by accessing the web page referenced in this NTC.

## X. TITLE VI Assurances Appendix A and E

Appendix A of the Title VI Assurances  
49 C.F.R. § Pt. 21, App. A

### Appendix A of the Title VI Assurances

During the performance of this contract, the contractor, for itself, its assignees and successors in interest (hereinafter referred to as the “contractor”) agrees as follows:

1. **Compliance with Regulations:** The contractor (hereinafter includes consultants) will comply with the Regulations relative to Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, Title 49, Code of Federal Regulations, Part 21, as they may be amended from time-to-time, (hereinafter referred to as the "Regulations"), which are herein incorporated by reference and made a part of this contract.
2. **Non-discrimination:** The contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor will not participate either directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of the 49 CFR Part 21.
3. **Solicitations for Subcontracts, Including Procurements of Materials and Equipment:** In all solicitations, either by competitive bidding or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials or leases of equipment, each potential subcontractor or supplier will be notified by the contractor of the contractor's obligations under this contract and the Acts and the Regulations relative to Non-discrimination on the grounds of race, color, or national origin.
4. **Information and Reports:** The contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the New Mexico Department of Transportation or the Federal Highway Administration to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish this information, the contractor shall so certify to the New Mexico Department of Transportation (NMDOT), or the Federal Highway Administration, as appropriate, and will set forth what efforts it has made to obtain the information.
5. **Sanctions for Noncompliance:** In the event of the contractor's non-compliance with the nondiscrimination provisions of this contract, the New Mexico Department of Transportation (NMDOT) will impose such contract sanctions as it or the Federal Highway Administration may determine to be appropriate, including, but not limited to:
  - a. withholding payments to the contractor under the contract until the contractor complies; and/or
  - b. cancelling, terminating or suspending the contract, in whole or in part.
6. **Incorporation of Provisions:** The contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The contractor shall take such action with respect to any subcontract or procurement as the NMDOT or the Federal Highway Administration may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the contractor may request the NMDOT to enter into any litigation to protect the interests of the NMDOT. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

## Appendix E of the Title VI Assurances

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the “contractor”) agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

### Pertinent Non-Discrimination Authorities:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq.*, 78 stat. 252), (prohibits discrimination on the basis of race, color national origin); and 49 CFR Part 21.
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Federal-Aid Highway Act of 1973, (29 U.S.C. § 324 *et seq.*), (prohibits discrimination on the basis of sex);
- Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 *et seq.*), as amended, (prohibits discrimination on the basis of disability); and 49 CFR Part 27;
- The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 *et seq.*), (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982, (49 U.S.C. § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms “programs or activities” to include all of the program or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);
- Titles II and III of the Americans with Disabilities Act, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131 – 12189) as implemented by Department of Transportation regulations at 49 C.F.R. parts 37 and 38;
- The Federal Aviation Administration’s Non-discrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your program (70 Fed. Reg. at 74087 to 74100);
- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (U.S.C. 1681 *et seq.*)

## NOTICE TO CONTRACTORS

### Gross Receipts Tax

The New Mexico Procurement Code, NMSA 1978, § 13-1-108 (1984) requires the New Mexico Department of Transportation ("NMDOT") to exclude the applicable state gross receipts tax, or applicable local option tax, from Bids received for this Project. The NMDOT will pay the applicable tax including any increase in the applicable tax effective after the Contract is executed by the NMDOT. The applicable gross receipts tax or applicable local option tax will be shown as a separate amount on each Progress Payment.

## NOTICE TO CONTRACTORS

### New Mexico Employees Health Coverage

If the Bidder has, or grows to, six (6) or more employees who Work, or who are expected to Work, an average of at least 20 hours per week over a six (6) month period during the term of this Contract, the Bidder certifies by the submission of its Bid and if Awarded the Contract agrees to have in place, and agrees to maintain for the term of the Contract, health insurance for those employees and to offer that health insurance to those employees if the expected annual value in the aggregate of any and all Contracts between the Bidder and the New Mexico Department of Transportation ("NMDOT") exceeds \$250,000.00.

The Bidder agrees to maintain a record of the number of employees who have:

- A. Accepted health insurance;
- B. Declined health insurance due to other health insurance coverage already in place; or
- C. Declined health insurance for other reasons.

These records are subject to review and audit by a representative of the NMDOT.

The Bidder agrees to advise all employees of the availability of State publicly financed health care coverage programs by providing each employee with, as a minimum, the following web site link to additional information: <http://www.insurenewmexico.state.nm.us/>.

For all Contracts exceeding \$250,000, the Bidder Awarded the Contract will be required to provide a letter stating that they currently offer health insurance to its New Mexico employees.

## NOTICE TO CONTRACTORS

### Office of Inspector General

The New Mexico Department of Transportation (“NMDOT”) Office of Inspector General (“OIG”) has the authority to carry out all duties required to collect information, conduct audits, special studies and investigations. The duties of the NMDOT’s OIG also arise from the responsibility all state Departments of Transportation have for ensuring that all Projects are carried out in accordance with federal or state requirements.

The NMDOT’s OIG shall be provided access to all documents associated with the Project per the 2014 Edition of the NMDOT’s Standard Specifications for Highway and Bridge Construction, Section 107.28 - “Contractor Records”.

### To Report Fraud, Waste & Abuse

1-800-671-STOP  
(1-800-671-7867)

The NMDOT OIG has established the above toll free number for reports of fraud, waste, abuse or similar illegal or unethical activity affecting the cost, completion or correct and safe construction of a Project. All information will be treated confidentially and caller anonymity will be respected.

#### The New Mexico Fraud Against Taxpayers Act:

The New Mexico Fraud Against Taxpayers Act, NMSA 1978, §§ 44-9-1 to -14 (2007, as amended through 2015) provides civil penalties for submitting a claim to a state agency based on false, fraudulent or misleading information. The Act also includes a financial incentive for parties with knowledge of such a claim to come forward.

### To Report Bid Rigging Activities

1-800-424-9071

The U.S. Department of Transportation, Office of Inspector General has established the above toll free number for reports of Bid rigging, Bidder collusion, or other similar illegal or unethical activity affecting the cost, completion or correct and safe construction of a Project. All information will be treated confidentially and caller anonymity will be respected.



Materials  
May 3, 2015

## NOTICE TO CONTRACTORS

### Patents On Milling Equipment and Milling Operations

Milling equipment and processes intended for use by the Bidder to perform any milling Work required under this Contract may be subject to United States patents. It is the responsibility of the Bidder to investigate the applicability of such patents to the milling Work, and pay royalties and other lawfully imposed charges by the patent holders. Royalties and other lawfully imposed charges are incidental and shall be factored into the Project Bid Item Unit Price for milling.

Chief Engineer  
May 3, 2015

## NOTICE TO CONTRACTORS

### Professional Services

The following has been added to the 2014 Edition of the New Mexico Department of Transportation's Standard Specifications for Highway and Bridge Construction Section 101.4 - "Terms and Definitions".

A Professional Service provider is considered a Subcontractor when Work is performed within the Project limits and shall be prequalified in accordance with 18.27.5 NMAC (12/07/2000, as amended through 01/01/2015).

Traffic  
May 3, 2015

## NOTICE TO CONTRACTORS

### Quality Standards for Traffic Control Devices

The Contractor shall comply with quality standards for traffic control devices in the Intra-Departmental Design Directive (“IDD”) 2009-05 and incorporated herein by reference. The IDD adopts quality standards in accordance with 23 C.F.R. § 630 (2007) Subpart K-Temporary Traffic Control Devices.

PSE  
January 13, 2016

## NOTICE TO CONTRACTORS

### Return of Contract Documents

In accordance with the 2014 Edition of the New Mexico Department of Transportation's Standard Specifications for Highway and Bridge Construction, Section 103.7 - "Execution and Approval of Contract", the successful Bidder shall return the documents listed in the notice of preliminary award of contract letter within fifteen (15) Days of the date on the letter.

Pursuant to Section 103.8 - "Failure to Execute Contract", failure by the successful Bidder to comply with this Notice to Contractors may constitute just cause for cancellation of the Award and the forfeiture of the Bid Guaranty.

## NOTICE TO CONTRACTORS

### Return of Lobbying Disclosure

#### Pre-Award

This Project is Federal-aid funded. Per 49 C.F.R. § 20.105 and 31 U.S.C. 1352 the Bidder is prohibited from using Federal-aid funds for certain lobbying activities. In addition to this prohibition, the Bidder is required to certify that no Federal-aid funds have been or will be used for such lobbying activities. The Bidder makes this certification through the submission of its Bid with its digital id. The terms and conditions of the certification appear in the Notice to Contractors (“NTC”) titled “Federal Requirements” in the section called “Required Contract Provisions Federal-aid Construction Contracts and Supplements (FHWA-1273)” in subsection “XI Certification Regarding Use of Contract Funds for Lobbying”.

In addition to the certification above, if any funds other than Federal-aid funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Project the attached form titled “Disclosure of Lobbying Activities” (“Disclosure”) shall be submitted. After receipt of the notice of preliminary award of contract letter the successful Bidder shall complete and return the Disclosure with the documents in the notice of preliminary award of contract letter.

Failure by the successful Bidder to comply with this Notice to Contractors may constitute just cause for cancellation of the Award and the forfeiture of the Bid Guaranty.

#### Post-Award

At the end of each calendar quarter in which there occurs any event that materially affects the accuracy of the information contained in any Disclosure previously submitted the Contractor shall immediately submit an updated Disclosure to the Project Manager.

In addition, for subcontracts at any tier over \$100,000.00, the Contractor as a recipient of Federal-aid funds is required to:

1. Add the NTC titled “Federal Requirements” in all subcontracts at any tier. The inclusion of the NTC ensures that the terms and conditions of the certification are incorporated into the Subcontract at any tier;
2. If any funds other than Federal-aid funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee or any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Project require its Subcontractors at any tier to complete and return the Disclosure with its permission to subcontract request form A-1086; and
3. Require its Subcontractors at any tier to submit an updated Disclosure to the Contractor at the end of each calendar quarter in which there occurs any event that materially affects the accuracy of the information contained in any Disclosure previously submitted by the Subcontractor. The Contractor shall immediately submit the same to the Project Manager.

Per 31 U.S.C.A. § 1352 (d)(1)(A)(C)(2) exclusions exist regarding the requirements of this lobbying certification and completion of Disclosure. Some of the applicable exclusions are:

1. Payment of a reasonable compensation made to employed officers or employees of a person requesting or receiving Federal-aid funds.
2. A request of or receipt of a Contract that does not exceed \$100,000.00.



## INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to title 31 U.S.C. section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a covered Federal action. Use the SF-LLLA Continuation Sheet for additional information if the space on the form is inadequate. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.
2. Identify the status of the covered Federal action.
3. Identify the appropriate classification of this report. If this is a followup report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity for this covered Federal action.
4. Enter the full name, address, city, State and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be, a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.
5. If the organization filing the report in item 4 checks "Subawardee," then enter the full name, address, city, State and zip code of the prime Federal recipient. Include Congressional District, if known.
6. Enter the name of the Federal agency making the award or loan commitment. Include at least one organizational level below agency name, if known. For example, Department of Transportation, United States Coast Guard.
7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.
8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitation for Bid (IFB) number; grant announcement number; the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Include prefixes, e.g., "RFP-DE-90-001."
9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.
10. (a) Enter the full name, address, city, State and zip code of the lobbying entity engaged by the reporting entity identified in item 4 to influence the covered Federal action.  
  
(b) Enter the full names of the individual(s) performing services, and include full address if different from 10 (a). Enter Last Name, First Name, and Middle Initial (MI).
11. Enter the amount of compensation paid or reasonably expected to be paid by the reporting entity (item 4) to the lobbying entity (item 10). Indicate whether the payment has been made (actual) or will be made (planned). Check all boxes that apply. If this is a material change report, enter the cumulative amount of payment made or planned to be made.
12. Check the appropriate box(es). Check all boxes that apply. If payment is made through an in-kind contribution, specify the nature and value of the in-kind payment.
13. Check the appropriate box(es). Check all boxes that apply. If other, specify nature.
14. Provide a specific and detailed description of the services that the lobbyist has performed, or will be expected to perform, and the date(s) of any services rendered. Include all preparatory and related activity, not just time spent in actual contact with Federal officials. Identify the Federal official(s) or employee(s) contacted or the officer(s), employee(s), or Member(s) of Congress that were contacted.
15. Check whether or not a SF-LLLA Continuation Sheet(s) is attached.
16. The certifying official shall sign and date the form, print his/her name, title, and telephone number.

According to the Paperwork Reduction Act, as amended, no persons are required to respond to a collection of information unless it displays a valid OMB Control Number. The valid OMB control number for this information collection is OMB No. 0348-0046. Public reporting burden for this collection of information is estimated to average 30 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, DC 20503.

Chief Engineer  
May 3, 2015

## NOTICE TO CONTRACTORS

### Specialty Items

To clarify the definition of Specialty Items in the 2014 Edition of the New Mexico Department of Transportation's Standard Specifications for Highway and Bridge Construction ("Standard Specifications"), Section 101.4 - "Terms and Definitions":

All Technician Training and Certification Program requirements for testing of Materials are Specialty Items.

Specialty Item Work will not be counted towards the Contractor's obligation to perform 40% of the Work with its own forces as noted in Standard Specifications, Section 108.1 – "Subcontracting".

The Contractor shall obtain the Project Manager's approval to Subcontract Specialty Items prior to starting Work.

Subcontractors performing Specialty Item Work are not required to be prequalified.



Form No. A-1310  
New 12/17  
Date Submitted: \_\_\_\_\_

Initial Subcontractor List  
 Updated Subcontractor List

## SUBCONTRACTOR LIST

**Wage Decision No.:** \_\_\_\_\_

**Control No.:** \_\_\_\_\_

**Prime Contractor** \_\_\_\_\_

Federal Employer Identification Number (FEIN) \_\_\_\_\_

**LIST ALL SUBCONTRACTORS AT ALL TIERS THAT ARE SUBJECT TO THE APPLICABLE WAGE DECISION(S).  
DO NOT LIST SUPPLIERS OR PROFESSIONAL SERVICES. PROVIDE ALL REQUESTED INFORMATION.  
MAKE ADDITIONAL COPIES OF THIS FORM AS NECESSARY.**

Subcontractor Company Name: \_\_\_\_\_

Federal Employer Identification Number (FEIN) \_\_\_\_\_

Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Email Address: \_\_\_\_\_ Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Contractor License No: \_\_\_\_\_ NMDWS Registration No: \_\_\_\_\_

1<sup>st</sup> Tier Sub  2<sup>nd</sup> Tier Sub to: \_\_\_\_\_  3rd Tier Sub to: \_\_\_\_\_

Work to be performed: \_\_\_\_\_ Amount (\$): \_\_\_\_\_

Start Date: \_\_\_\_\_

Subcontractor Company Name: \_\_\_\_\_

Federal Employer Identification Number (FEIN) \_\_\_\_\_

Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Email Address: \_\_\_\_\_ Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Contractor License No: \_\_\_\_\_ NMDWS Registration No: \_\_\_\_\_

1<sup>st</sup> Tier Sub  2<sup>nd</sup> Tier Sub to: \_\_\_\_\_  3rd Tier Sub to: \_\_\_\_\_

Work to be performed: \_\_\_\_\_ Amount (\$): \_\_\_\_\_

Start Date: \_\_\_\_\_

Subcontractor Company Name: \_\_\_\_\_

Federal Employer Identification Number (FEIN) \_\_\_\_\_

Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Email Address: \_\_\_\_\_ Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Contractor License No: \_\_\_\_\_ NMDWS Registration No: \_\_\_\_\_

1<sup>st</sup> Tier Sub  2<sup>nd</sup> Tier Sub to: \_\_\_\_\_  3rd Tier Sub to: \_\_\_\_\_

Work to be performed: \_\_\_\_\_ Amount (\$): \_\_\_\_\_

Start Date: \_\_\_\_\_

General Decision Number: NM180051 01/05/2018 NM51

Superseded General Decision Number: NM20170051

State: New Mexico

Construction Type: Highway

Counties: Cibola, Colfax, Guadalupe, Harding, Los Alamos, McKinley, Mora, Quay, Rio Arriba, San Miguel, Taos and Union Counties in New Mexico.

HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects & railroad construction; bascule, suspension & spandrel arch bridges designed for commercial navigation, bridges involving marine construction; and other major bridges).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.35 for calendar year 2018 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 \$10.35 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 2018. 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](http://www.dol.gov/whd/govcontracts).

Modification Number	Publication Date
0	01/05/2018

\* SUNM2011-005 08/26/2011

	Rates	Fringes
CARPENTER (Includes Form Work)		
Cibola, Ria Arriba.....	\$ 14.27	0.44
Guadalupe, Los Alamos, Colfax, Harding, Guay, Taos, Union.....	\$ 13.84	0.44
McKinley.....	\$ 13.51	0.44
Mora.....	\$ 14.44	0.44
San Miguel.....	\$ 13.93	0.44

CEMENT MASON/CONCRETE FINISHER		
Cibola.....	\$ 15.58	0.26
Colfax, Guadalupe, Harding, Los Alamos, McKinley, mora, Quay, Union.	\$ 15.07	0.26
Rio Arriba, San Miguel.....	\$ 15.58	1.54
Taos.....	\$ 14.98	0.26
ELECTRICIAN (Including Traffic Signal Installation).....		
	\$ 24.66	8.56
HIGHWAY/PARKING LOT STRIPING: Includes Highway Line/Parking Lot Line Striping and Line Striping Truck Driver		
Cibola.....	\$ 13.66	0.35
Colfax, Guadalupe, Harding, Los Alamos, Mora, Rio Arriba, Taos, Union.....	\$ 15.16	0.35
McKinley.....	\$ 14.55	0.35
Quay.....	\$ 16.37	0.26
San Miguel.....	\$ 15.31	0.35
INSTALLER: (Guardrails, Handrails and Signs)		
Cibola.....	\$ 12.35	0.35
Colfax.....	\$ 11.68	0.35
Guadalupe, Harding, Los Alamos, McKinley, Mora, Rio Arriba, San Miguel, Taos, Union.....	\$ 12.37	0.35
Quay.....	\$ 12.00	0.35
IRONWORKER, REINFORCING/REBAR		
Cibola.....	\$ 23.05	1.54
Colfax, Guadalupe, Harding, Los Alamos, Mora, Quay, San Miguel, Taos, Union.....	\$ 21.57	4.80
McKinley.....	\$ 22.44	5.85
Rio Arriba.....	\$ 21.98	6.03
IRONWORKER, STRUCTURAL.....	\$ 21.77	6.03
LABORER		
Asphalt Raker.....	\$ 14.39	0.35
Common or General		
Cibola.....	\$ 12.27	0.35
Colfax.....	\$ 9.60	0.35
Guadalupe, Los Alamos.....	\$ 11.83	0.35
Harding.....	\$ 11.57	0.35
McKinley.....	\$ 11.22	0.35
Mora.....	\$ 11.34	0.35

Quay.....	\$ 12.15	0.35
Rio Arriba.....	\$ 12.28	0.35
San Miguel.....	\$ 12.56	0.35
Taos.....	\$ 12.61	0.35
Union.....	\$ 10.89	0.35
Flagger/Cone Setter		
Cibola.....	\$ 13.14	0.35
Colfax, Guadalupe, Harding, Los Alamos, Mora, Rio Arriba, San Miguel, Taos, Union.....	\$ 12.15	0.99
McKinley.....	\$ 11.66	0.35
Quay.....	\$ 12.21	0.26
Grade Checker.....	\$ 14.67	1.60
MasonTender-		
Brick/Cement/Concrete		
Cibola, Colfax, Guadalupe, Harding, Los Alamos, McKinley, Mora, Quay, San Miguel, Taos, Union.....	\$ 13.04	1.78
Rio Arriba.....	\$ 13.33	1.97
Pipelayer.....	\$ 16.99	0.35

PAINTER (Brush, Roller and  
Spray)

Cibola, Colfax, Guadalupe, Harding, Los Alamos, McKinley, Mora, Quay, Rio Arriba, San Miguel, Taos, Union.....	\$ 15.06	0.44
McKinley.....	\$ 14.15	0.44

POWER EQUIPMENT OPERATOR:

Asphalt/Concrete Paver, Laydown Machine, and Plant..	\$ 16.43	1.51
Backhoe/Excavator/Trackhoe		
Cibola, Colfax, Guadalupe, Los Alamos, Mora, Rio Arriba, San Miguel, Taos, Union.....	\$ 16.80	0.26
Harding.....	\$ 20.74	0.26
McKinley.....	\$ 16.70	0.26
Quay.....	\$ 16.27	0.26
Bobcat/Skid Loader.....	\$ 18.06	0.26
Broom Operator.....	\$ 15.72	0.26
Bulldozer		
Cibola, Colfax, Guadalupe, Harding, Los Alamos, McKinley, Mora, Rio Arriba, San Miguel, Taos, Union.....	\$ 14.97	0.26
Quay.....	\$ 14.89	0.26
Crusher.....	\$ 16.53	0.26

Distributor.....	\$ 14.50	0.26
Forklift.....	\$ 17.16	0.26
Grader/Blade		
Cibola, Colfax,		
Guadalupe, Harding, Los		
Alamos, McKinley, Mora,		
Rio Arriba, San Miguel,		
Taos, Union.....	\$ 17.48	0.26
Quay.....	\$ 19.50	0.26
Loader (Front End)		
Cibola, Guadalupe, Los		
Alamos, Rio Arriba, San		
Miguel, Taos, Union.....	\$ 16.27	0.26
Colfax.....	\$ 15.72	0.26
Harding.....	\$ 19.37	0.26
McKinley.....	\$ 16.13	0.26
Mora.....	\$ 16.21	0.26
Quay.....	\$ 16.10	0.26
Mechanic.....	\$ 17.48	0.26
Milling Machine.....	\$ 16.89	0.26
Oiler.....	\$ 14.29	0.26
Piledriver		
Cibola, Colfax,		
Guadalupe, Harding, Los		
Alamos, Mora, Rio Arriba,		
San Miguel, Taos, Union....	\$ 15.87	0.26
McKinley.....	\$ 14.95	0.26
Quay.....	\$ 15.99	0.26
Roller (Asphalt and Dirt)		
Cibola, Colfax,		
Guadalupe, Harding, Los		
Alamos, McKinley, Mora,		
Rio Arriba, San Miguel,		
Taos, Union.....	\$ 14.39	0.98
McKinley.....	\$ 16.49	0.26
Quay.....	\$ 14.74	0.26
Rotomill.....	\$ 15.80	0.26
Scraper.....	\$ 15.91	0.26
Screed.....	\$ 15.96	0.26
Tractor.....	\$ 16.84	0.26
Trencher.....	\$ 16.26	0.26

TRUCK DRIVER

Distributor.....	\$ 13.56	0.26
Dump Truck		
Cibola, Guadalupe,		
Harding, Los Alamos,		
Mora, Rio Arriba, Taos,		
Union.....	\$ 14.75	0.26
Colfax, San Miguel.....	\$ 13.24	0.26
McKinley.....	\$ 13.15	0.26
Quay.....	\$ 15.20	0.26
Flatbed Truck		
Cibola.....	\$ 12.71	0.26

Colfax, Guadalupe, Harding, Los Alamos, Mora, Taos, Union.....	\$ 13.27	0.26
McKinley.....	\$ 13.55	0.26
Quay, San Miguel.....	\$ 13.30	0.26
Rio Arriba.....	\$ 12.95	0.26
Pickup and Pilot Car.....	\$ 12.74	0.26
Semi-Trailer Truck.....	\$ 16.58	0.26
Tractor Haul Truck.....	\$ 14.00	
Water Truck.....	\$ 13.13	0.26

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WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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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](http://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)).

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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.

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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.

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END OF GENERAL DECISION

## TYPE "A" - STREET, HIGHWAY, UTILITY & LIGHT ENGINEERING

Effective January 1, 2018

Trade Classification	Base Rate	Fringe Rate
Bricklayer/Blocklayer/Stonemason	23.52	8.84
Carpenter/Lather	24.00	9.97
Cement Mason	17.42	6.35
Ironworker	26.50	15.30
Painter (Brush/Roller/Spray)	16.75	6.28
Plumber/Pipefitter	28.95	12.23
<b>Electricians (outside)</b>		
Groundman	22.36	11.56
Equipment Operator	32.08	14.09
Lineman/Wireman or Tech	37.75	15.57
Cable Splicer	41.53	16.56
<b>Laborers</b>		
Group I	11.96	5.55
Group II	12.26	5.55
Group III	12.66	5.55
<b>Operators</b>		
Group I	16.94	6.33
Group II	17.69	6.33
Group III	17.80	6.33
Group IV	17.88	6.33
Group V	18.00	6.33
Group VI	18.14	6.33
Group VII	18.52	6.33
Group VIII	18.75	6.33
Group IX	25.70	6.33
Group X	28.60	6.33
<b>Truck Drivers</b>		
Group I	16.00	7.17
Group II	16.00	7.17
Group III	16.00	7.17
Group IV	16.00	7.17

**NOTE: All contractors are required to pay SUBSISTENCE, ZONE AND INCENTIVE PAY according to the particular trade. Details are located in a PDF attachment at [WWW.DWS.STATE.NM.US](http://WWW.DWS.STATE.NM.US). Search Labor Relations/Labor Information/Public Works/Prevailing Wage Rates.**



## CN 4101490

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction (Standard Specifications) shall govern construction of this Project unless otherwise noted.

The following Special Provisions shall supplement the above Standard Specifications.

SPECIAL PROVISION	PAGE
Modifying Sections - 303 - Base Course, 403 - Open Graded Friction Course (Non-QLA) 412 - Hot In-Place Recycling Of Asphalt Pavement, 413 - Single-Machine Hot In-Place Surface Repaving, 415 - Pavement Surface Restoration, 416 - Minor Paving, 417 - Miscellaneous Paving, 451 - Portland Cement Concrete Pavement, 517 - Precast Concrete Structures, 518 - Pre-Stressed Concrete Members (2/12/14)	1-2
Modifying Sections 203 - Excavation, Borrow, and Embankment, 405 - Detour Pavements, 408 - Prime Coat, 605 - Drains, 608 - Sidewalks, Drive Pads and Concrete Median Pavement, 609 - Curb and Gutter (2/24/14)	3
Modifying Section 201 - Clearing and Grubbing (6/28/17)	4-6
Modifying Section 203 - Excavation Borrow and Embankment (6/28/17)	7-21
Modifying Section 206 - Excavation and Backfill For Culverts and Minor Structures (6/28/17)	22-25
Modifying Section 207 - Subgrade Preparation (6/28/17)	26-27
Modifying Section 209 - Blading and Reshaping (7/28/17)	28-29
Modifying Section 210 - Excavation And Backfill For Major Structures (4/25/18)	30-34
Modifying Section 213 - Obliterating Old Road (6/28/17)	35
Modifying Section 401 - Pavement Smoothness Measurement (5/30/17)	36-37
Modifying Section 402 - Asphalt Materials, Hydrated Lime, and Anhydrite Based Material (2/22/16)	38
Modifying Section 403 - Open Graded Friction Course (Non-QLA) (4/7/14)	39-40
Modifying Section 405 - Detour Pavements (2/13/14)	41
Modifying Section 408 - Prime Coat (2/22/16)	42
Modifying Section 423 - Hot Mix Asphalt Superpave (QLA and Non QLA) (4/8/16)	43-45
Modifying Section 424 - Warm Mix Asphalt (4/8/16)	46-49
Modifying Section 450 - Portland Cement Concrete Pavement (PCCP) (QLA) (6/6/17)	50-53
Modifying Section 451 - Portland Cement Concrete Pavement (PCCP) (Non-QLA) (4/16/14)	54
Modifying Section 452 - Sealing and Resealing Concrete Pavement Joints (1/27/15)	55
Modifying Section 455 - Diamond Grinding and Diamond Grooving of Portland Cement Concrete Pavement (PCCP) (1/30/15)	56

**Special Provisions  
CN 4101490**

Modifying Section 501 - Driven Piles (4/25/18)	57-72
Modifying Section 502 - Drilled Shafts (4/25/18)	73-87
Modifying Section 504 - Load Testing of Bearing Piles (4/25/18)	88-97
Modifying Section 505 - Pile Integrity Testing (4/25/18)	98-102
Modifying Section 506 - Mechanically Stabilized Earth Retaining Structures (4/25/18)	103-112
Modifying Section 510 - Portland Cement Concrete (4/25/17)	113
Modifying Section 511 - Concrete Structures (4/25/18)	114-138
Modifying Section 512 - Superstructure Concrete (2/2/15)	139
Modifying Section 519 - Shotcrete (7/14/16)	140
Modifying Section 530 - Bridge Deck and Pccp Preparation for Repair (4/25/18)	141
Modifying Section 532 - Penetrating Water Repellent Treatment (3/4/15)	142
Modifying Section 533 - Concrete Structure Repair (4/25/18)	143-149
Modifying Section 536 - Polymer Concrete Bridge Deck Overlay (11/20/17)	150
Modifying Section 537 - Polyester/Epoxy Concrete Bridge Deck Overlay (4/25/18)	151-159
Modifying Section 541 - Steel Structures (4/25/18)	160-174
Modifying Section 544 - Protective Coating of New Structural Steel (3/31/16)	175-184
Modifying Section 545 - Protective Coating of Miscellaneous Structural Steel (3/31/16)	185-196
Modifying Section 546 - Recoating Structures (9/15/17)	197-209
For Section 548 - Coating of Concrete (9/15/17)	210-215
Modifying Section 564 - Preformed Closed Cell Foam Bridge Joint Seals (11/17/16)	216
For Section 565 - Preformed Silicone Coated Foam Joint System (9/15/17)	217-219
Modifying Section 602 - Slope and Erosion Protection Structures (7/7/15)	220
Modifying Section 606 - Metal and Concrete Wall Barrier (7/17/17)	221-234
Modifying Section 607 - Fence (7/6/15)	235
Modifying Section 608 - Sidewalks, Drive Pads, and Concrete Median Pavement (11/17/16)	236
Modifying Section 610 - Cattle Guards (7/6/15)	237
Modifying Section 618 - Traffic Control Management (9/21/16)	238-239
Modifying Section 622 - Field Laboratories and Field Offices (7/6/15)	240
Modifying Section 631 - Rumble Strips (7/6/15)	241
Modifying Section 632 - Revegetation (4/25/18)	242-256
Modifying Section 664 - Landscape Planting (11/17/16)	257
Modifying Section 702 - Construction Traffic Control Devices (4/4/16)	258
Modifying Section 704 - Pavement Markings (11/9/16)	259-260
Modifying Section 705 - General Requirements For Traffic Signal and Lighting Systems (4/4/14)	261
Modifying Section 802 - Post Construction Plans (1/30/09)	262
Modifying Section 901 - Quality Control/Quality Assurance (QC/QA) (1/29/15)	263-266

**PROJECT SPECIFIC SPECIAL PROVISIONS**

For Section 203-A Unstable Subgrade Stabilization (11/23/16)	1-4
For Section 512-A Special Concrete (Rapid Hardening Concrete) (3/24/17)	5-15
For Section 512-D Ultra High Performance Concrete (6/18/18)	16-24
For Section 518-A Full-Depth Precast Concrete Deck Panels (6/18/18)	25-31
For Section 618-A Public Awareness (7/21/10)	32-33
For Section 702-A Law Enforcement in Construction Zone (9/26/17)	34
For Section 702-C Traffic Control Devices for Construction and Traffic Control Devices for Pedestrians	

**Special Provisions**  
**CN 4101490**

and Bicyclists (11/9/16)	35-37
For Section 702-E Portable Floodlight System (3/16/16)	38-39
For Section 702-G Speed Detector Radar Trailer (2/23/16)	40-41

February 12, 2014

## SPECIAL PROVISIONS MODIFYING

### SECTIONS:

303 BASE COURSE

403 OPEN GRADED FRICTION COURSE (NON-QLA)

412 HOT IN-PLACE RECYCLING OF ASPHALT PAVEMENT

413 SINGLE-MACHINE HOT IN-PLACE SURFACE REPAVING

415 PAVEMENT SURFACE RESTORATION

416 MINOR PAVING

417 MISCELLANEOUS PAVING

451 PORTLAND CEMENT CONCRETE PAVEMENT

517 PRECAST CONCRETE STRUCTURES

518 PRE-STRESSED CONCRETE MEMBERS

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

#### 303.5.1 Work Included in Payment

The development of the Contractor Quality Control Plan shall be included in the payment and is considered incidental to the completion of this Bid Item. All references to 901.2 "Contractor Quality Control" is for reference only and no separate measurement will be made.

#### 403.5.2 Work Included in Payment

The development of the Contractor Quality Control Plan shall be included in the payment and is considered incidental to the completion of this Bid Item. All references to 901.2 "Contractor Quality Control" is for reference only and no separate measurement will be made.

#### 412.5.1 Work Included in Payment

The development of the Contractor Quality Control Plan shall be included in the payment and is considered incidental to the completion of this Bid Item. All references to 901.2 "Contractor Quality Control" is for reference only and no separate measurement will be made.

#### 413.5.1 Work Included in Payment

The development of the Contractor Quality Control Plan shall be included in the payment and is considered incidental to the completion of this Bid Item. All references to 901.2 "Contractor Quality Control" is for reference only and no separate measurement will be made.

## 2

### 415.5.2 Work Included in Payment

The development of the Contractor Quality Control Plan shall be included in the payment and is considered incidental to the completion of this Bid Item. All references to 901.2 "Contractor Quality Control" is for reference only and no separate measurement will be made.

### 416.5.1 Work Included in Payment

The development of the Contractor Quality Control Plan shall be included in the payment and is considered incidental to the completion of this Bid Item. All references to 901.2 "Contractor Quality Control" is for reference only and no separate measurement will be made.

### 417.5.1 Work Included in Payment

The development of the Contractor Quality Control Plan shall be included in the payment and is considered incidental to the completion of this Bid Item. All references to 901.2 "Contractor Quality Control" is for reference only and no separate measurement will be made.

### 451.5.2 Work Included in Payment

The development of the Contractor Quality Control Plan shall be included in the payment and is considered incidental to the completion of this Bid Item. All references to 901.2 "Contractor Quality Control" is for reference only and no separate measurement will be made.

### 517.5.1 Work Included in Payment

The development of the Contractor Quality Control Plan shall be included in the payment and is considered incidental to the completion of this Bid Item. All references to 901.2 "Contractor Quality Control" is for reference only and no separate measurement will be made.

### 518.5.1 Work Included in Payment

Add the following:

The development of the Contractor Quality Control Plan shall be included in the payment and is considered incidental to the completion of this Bid Item. All references to 901.2 "Contractor Quality Control" is for reference only and no separate measurement will be made.

February 24, 2014

## SPECIAL PROVISIONS MODIFYING

### SECTIONS:

203 EXCAVATION, BORROW, AND EMBANKMENT

405 DETOUR PAVEMENTS

408 PRIME COAT

605 DRAINS

608 SIDEWALKS, DRIVE PADS AND CONCRETE MEDIAN PAVEMENT

609 CURB AND GUTTER

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete reference to 304 Base Course and replace with 303 Base Course for the following subsections:

203.3.3 Rock Cuts

405.3.1 General

408.3.3 Preparation of Surface

605.2.3 Granular Materials

608.2.3 Bed Course Material

609.2.3 Bed Course Material

609.3.1 Foundation



**SPECIAL PROVISIONS  
MODIFYING  
SECTION 201 CLEARING AND GRUBBING**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete Section 201: CLEARING AND GRUBBING in its entirety and replace with the following:

**201.1 DESCRIPTION**

This Work consists of clearing, grubbing, scalping, removing, and disposing of vegetation and debris. This Work includes protecting vegetation designated to remain and removal or control of all State-listed noxious weed species identified in the Contract. Scalping includes the removal of material such as brush, roots, sod, stumps, and the residue of agricultural crops.

**201.2 MATERIALS**

**201.3 CONSTRUCTION REQUIREMENTS**

**201.3.1 General**

The Department will establish Right of Way lines, construction limits, and designate trees, shrubs, plants, and other items to remain. The Contractor shall comply with Section 620, "Selective/Non-Selective Herbicide Application" for herbicide application.

The Contractor shall remove and dispose of all refuse and non-organic material from within the Project limits. Surface debris, trees, stumps, roots, organic matter, and other obstructions that can be chipped or broken down to an appropriate size and readily blended into the topsoil during final stabilization may remain within the Project limits. When approved by the Project Manager, the Contractor may leave undisturbed stumps and other solid objects within the Roadway Prism that do not extend more than six (6) inches above existing ground and will be at least four (4) ft below the finished Subgrade elevation. The Contractor shall backfill and compact material placed in stump holes and other holes in accordance with Section 203.3.5, "Embankments."

The Contractor shall prune low-hanging branches from trees or shrubs designated to remain and prune overhanging tree branches to provide a clearance 20 ft above the Roadway surface. Pruning of trees and shrubs shall be performed in accordance with American National Standards Institute (ANSI) A300 Standard Part 1 Pruning.

The Contractor shall confine operations including dragging, piling, and burning of debris to Department approved areas.

The Contractor shall remove or control all State-listed Class A noxious weed species within the Right of

Way Project limits as identified in the Contract in a manner that prevents their re-growth and spread. Herbicide use shall comply with all applicable Federal, State, County and Municipal regulations and ordinances.” The Contractor shall comply with Section 620, “Selective/Non-Selective Herbicide Application” of the current New Mexico State Department of Transportation Standard Specifications for Highway and Bridge Construction for herbicide application.

The current New Mexico Noxious Weed List is available at:  
<http://plants.usda.gov/java/noxious?rptType=State&statefips=35> .

### 201.3.2 Salvageable Timber

The Contractor shall fell and cut timber (to the specified length) in accordance with the Contract. The Contractor shall stack cut logs as directed by the Project Manager.

### 201.3.3 Scalping

The Contractor shall scalp before excavation or placement of Embankment and remove organic material under pipe Culvert bedding, regardless of Embankment height.

### 201.3.4 Removal and Disposal of Material

The Contractor shall remove from the Right of Way, Materials that cannot be safely and properly disposed (burned or chipped) of within the Project, and dispose at locations outside the Project.

The Contractor shall obtain written permission from the owners of property used for debris material disposal.

The Contractor shall burn Materials:

1. In accordance with applicable laws and regulations;
2. Under the constant care of competent watchmen; and
3. Without damage to items designated to remain on the Right of Way, surrounding property, or vegetative cover.

The Roadway and adjacent areas shall have a neat and finished appearance after any removal and disposal of material. The Contractor shall not accumulate flammable Materials on or adjacent to the Right of Way.

## 201.4 METHOD OF MEASUREMENT

Clearing and grubbing will be measured as a Lump sum unit.

## 201.5 BASIS OF PAYMENT

Pay Item	Pay Unit
<i>Clearing and Grubbing</i>	Lump Sum

# 6

## 201.5.1 Work Included in Payment

The Department will consider the following Work as included in the payment for Clearing and Grubbing and no separate payment will be made:

1. Obtaining disposal locations and in making the disposal;
2. When clearing and grubbing is not established as a pay item;
3. Herbicide applied for noxious weed control; and
4. Delivery to storage site if required of salvageable timber.

Selective / Non-Selective Herbicide Application will be paid only if the Plans list this item in the Estimated Quantities table.

**SPECIAL PROVISIONS**  
**MODIFYING**  
**SECTION 203: EXCAVATION, BORROW, AND EMBANKMENT**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete Section 203: EXCAVATION, BORROW, AND EMBANKMENT in its entirety and replace with the following:

### 203.1 DESCRIPTION

This Work consists of performing excavation in soil and rock Material, providing borrow Material, constructing Embankment, hauling, disposing, placing, and compacting Materials.

### 203.2 MATERIALS

The Department will provide geotechnical investigation and pavement investigation results (when available) in the Contract documents. The Contractor shall use the results for information only.

#### 203.2.1 Material Classifications

##### 203.2.1.1 Rock Excavation

Rock excavation is material that meets one (1) of the following field test criteria:

1. **Ripping Test.** Material that cannot be broken down with two passes parallel to construction centerline with a single tooth ripper mounted on a crawler-type tractor in low gear with a minimum net flywheel power rating of 312 hp;
2. **Seismic Test.** Material that has a seismic velocity greater than 6,000 ft/s. The Contractor shall submit the qualifications of the individual performing and interpreting the seismic testing to Project Manager for approval a minimum of 14 Days prior to testing. Perform the Ripping Test to resolve differences in material classification if seismic velocities fall below 6,000 ft/s;
3. **Handling Test.** Boulders or detached stones having a volume greater than one (1) yd<sup>3</sup> that cannot be readily broken down with excavation Equipment.

##### 203.2.1.2 Unclassified Excavation

Unclassified excavation shall consist of the excavation of all Materials other than rock excavation obtained within the right of way. Suitable Material obtained from unclassified excavation shall be used for areas that require Embankment.

##### 203.2.1.3 Borrow

Borrow shall consist of Contractor provided suitable Embankment Materials obtained from an approved source outside the Right of Way, unless otherwise specified in the Contract. The Contractor shall only

# 8

utilize borrow when the following conditions are met, unless approved otherwise by the Project Manager.

1. All unclassified excavation material has be utilized in the contractor's current phase of construction;
2. The contractor has requested to begin Borrow operations and the Project Manager has concurred; and
3. Embankment areas that require borrow have been bladed and cross sectioned by the Contractor and provided to the Project Manager.

Borrow Material placed within two (2) Ft, vertically and laterally, of final Subgrade elevations shall meet the design R-Value as shown in the Contract. Prior to borrow operations the Contractor shall perform R-value testing in accordance with AASHTO T-190 at the best fit exudation pressure of 300 psi at each borrow source. This information shall be submitted to the Project Manager with the request to begin borrow operations. During borrow placement, if the Project Manager observes changes in soil properties, including gradation, plasticity limits, and/or additional soil characteristics, then, at the Project Manager's request, additional AASHTO T-190 tests may be required, at the Contractors expense.

When work conforming to Section 306 "Portland Cement or Lime Treated Subgrade" is specified in the Contract, the Contractor shall perform sulfate testing in accordance with AASHTO T290 at each borrow source. Sulfate content shall be determined and reported as parts per million (ppm). Soils with sulfate contents equal to or greater than 2,000 ppm shall not be used as borrow.

## 203.2.1.4 Unstable Subgrade Stabilization

See Section 203A, "Unstable Subgrade Stabilization", when specified in the Contract.

## 203.2.1.5 Unsuitable Embankment Material

Unsuitable Material includes organic Materials, frozen lumps, ice, and soils such as peat, shale, gypsum or other Materials that may degrade with time, or are contaminated. Suitable Material that is unstable may be reworked to create a stable platform as directed by the Project Manager.

Material below embankment and areas identified by the Project Manager and determined to be unsuitable shall be excavated and disposed of in accordance with Section 107, "Legal Relations, Environmental Requirements, and Responsibility to the Public" unless otherwise specified in the Contract.

When unsuitable Material is removed and disposed of, the resulting void shall be filled with Material suitable for its planned use as directed by the Project Manager. Such suitable Material shall be placed and compacted in accordance with this specification.

## 203.3 CONSTRUCTION REQUIREMENTS

### 203.3.1 General

The Contractor shall finish excavation and Embankment for the Roadway, intersections, and entrances to reasonably smooth and uniform surfaces. The Contractor shall not remove Materials from the Project limits without the approval of the Project Manager.

The Contractor shall ensure Borrow Material placed within the top two (2) Ft of the finished Subgrade

meets the minimum design R-value.

The Contractor shall preserve the Materials below and beyond the lines and grades while conducting excavation operations. Before beginning excavation, grading, and Embankment operations, the Contractor shall perform the necessary clearing and grubbing in accordance with Section 201, "Clearing and Grubbing." The Contractor shall notify the Project Manager before opening excavation or borrow areas. The Contractor shall take cross section elevations of the ground surface before opening excavation or borrow areas.

The Contractor shall terminate operations in the immediate area of environmental or Cultural Resources not listed in the Contract, until the Department reviews and completes appropriate mitigation actions in accordance with Section 107.12, "Environmental, Hazardous Materials and Cultural Resource Discoveries."

### 203.3.2 Excavation

Within cut sections, the Contractor shall remove excavated Material from the limits of the cut section to the Subgrade elevation for the width of the Roadbed. The Contractor shall finish Roadbed cut sections to a smooth and uniform surface. The Contractor shall remove unsuitable Material below finished Subgrade in accordance with 203.2.1.5, "Unsuitable Material." The Contractor shall take cross-sectional measurements after the removal of unsuitable Material.

### 203.3.3 Rock Cuts

The Contractor shall perform proper drilling and blasting operations in accordance with the specified practices. When required, the Contractor shall perform controlled blasting of rock excavation to produce a clean face on the excavated cut. The Contractor shall ensure subsequent blasting and excavation operations do not affect previously excavated faces. The Contractor shall not excavate more than six (6) inches below the specified Subgrade elevation for Roadbed cuts in rock, unless directed otherwise. The Contractor shall not leave undrained pockets on the Roadbed surface. The Contractor shall place and compact Base Course on the rock cut foundation in accordance with Section 303, "Base Course."

#### 203.3.3.1 Blasting Requirements

The Contractor shall use controlled blasting to establish a specified backslope with minimal blast damage, and production blasting to facilitate excavation. Before the start of blasting, the Contractor shall notify adjacent property owners, occupants and utility owners.

##### 203.3.3.1.1 Definitions

**Blasting Operations.** Activities related to blasting including, but not limited to the following:

1. Collaring and drilling blast holes;
2. Preparing, fixing, loading, and firing explosive charges;
3. Assessing the blast after detonation; and
4. Handling misfires.

**Buffer Row.** The first row of production blast holes immediately adjacent and drilled in a plane

# 10

parallel to the controlled blast line. The explosive load in the buffer row should be reduced from standard production loads to minimize damage to the backslope of the final excavation.

**Controlled Blasting.** The controlled use of explosives and blasting accessories in carefully spaced and aligned blast holes to provide a free surface or shear plane in the rock along the specified backslope, and to limit fly rock, permanent ground displacement, air concussion, and overbreak. Controlled blasting methods include pre-splitting and cushion blasting.

**Cushion Blasting (Trim Blasting).** The simultaneous detonation of one (1) line of blast holes along a specified excavation backslope after the main excavation is complete. This method is performed to trim the excavation to the final backslope.

**Final Line (Controlled Blast Line).** Refers to the row of controlled blast holes drilled in the plane of a specified excavation backslope. The controlled blast holes drilled in this plane constitute the basis for payment under the Controlled Blasting pay item. The Department considers the blast holes drilled in front of the final line blast holes to be production blast holes, which are Incidental to the Rock Excavation pay item.

**Pre-Splitting.** The simultaneous detonation of one (1) line of blast holes drilled along a specified excavation backslope before production blast holes are fired.

**Production Blasting.** Fragmentation blasting in the main excavation area.

## 203.3.3.1.2 Submittals

### 203.3.3.1.2.1 Blaster in Charge

The Contractor shall not begin drilling or blasting Work until the Project Manager approves of the Blaster in Charge. The Contractor shall submit the name and qualifications of the proposed Blaster in Charge to the Project Manager for approval at least 30 Days before the delivery of explosive Material to the Project. The Contractor shall provide the following information:

1. Proof of a license by the applicable State and/or local regulatory agencies to possess, transport, and use explosives; and
2. A list of, and references, for at least three (3) blasting Projects, of similar complexity, successfully completed within the previous five (5) years.

The Blaster in Charge must be on site during blasting operations.

### 203.3.3.1.2.2 Blasting Plans

The Contractor shall submit a General Blasting Plan to the Project Manager for each cut that requires blasting, at least two (2) weeks before the start of drilling and blasting operations on a specified cut. The Contractor shall provide the following information in the General Blasting Plan:

1. Description of the proposed blasting operation;
2. Preliminary design criteria for production and controlled blasting, including blast hole depths and patterns; and

3. Details regarding the proposed explosives and blasting accessories;

The Contractor shall submit a Detailed Blasting Plan at least 48 H before an individual blast. The Contractor shall provide the following information in the Detailed Blasting Plan:

1. Station limits of the proposed location of the blast, including the bench elevation, if applicable;
2. Date and time the blasting will occur;
3. Required removal of overburden, if applicable;
4. Plan and cross section diagrams of proposed drill pattern for controlled and production blast holes, including buffer rows, free face, burden, blast hole spacing, blast hole diameters, blast hole angles, lift height, and subdrill depth. Draw these Plans and cross sections to scale;
5. Loading diagram showing the type and amount of explosives, primers, and initiators; and the location, depth, and type of stemming;
6. Initiation sequence of controlled and production blast holes, including delay times and the delay system; and
7. Manufacturer's data sheets for the explosives, primers, and initiators to be used.

The Contractor shall submit the blasting Plans to the Project Manager for review and acceptance. The Project Manager will review and provide comments to the Contractor. The Contractor shall submit revisions to the blasting Plans for final review and acceptance. The Contractor shall not proceed with drilling and blasting operations related to a General Blasting Plan or loading of blast holes associated with a Detailed Blasting Plan without written notice.

The Contractor shall cease blasting operations and submit revised blasting Plans if the Department determines that the blasting operations under the employed methods are causing property damage in and beyond the Right of Way.

#### 203.3.3.1.2.3 Blasting Records

The Contractor shall prepare and submit to the Department a Blasting Record for each blast, on the Day of the blast. The Contractor shall provide the following information in a Blasting Record:

1. Actual dimensions of the shot, including blast hole diameters and depths, burden, spacing, subdrilling depths, stemming, powder loads, powder factors, and timing;
2. A drawing or sketch showing the direction of the face and the physical shot layout;
3. The location of the blast in relation to Project stationing and elevation;
4. The date and time of loading and detonation;
5. The name and signature of the person responsible for loading and firing;
6. Comments by Blaster in Charge regarding misfires, fly rock occurrences, unusual results or effects; and damage to existing facilities, adjacent property, or completed Work;
7. Vibration and blast monitoring results; and
8. Any complaints received due to the blasting.



# 12

## 203.3.3.1.3 Explosives

The Contractor shall transport, store, handle, and use explosives in accordance with applicable federal, State, and local laws and regulations. The Contractor shall purchase explosives and accessory devices from industry recognized Suppliers and manufactures. The Contractor shall use explosives and accessory devices in accordance with manufacturer instructions. The Contractor shall not use expired products.

The CFR specifies responsibility for the following federal agencies regarding the administration of regulations involving explosive Materials:

1. Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF). Storage and accountability of record keeping and security in accordance with 27 CFR part 555;
2. OSHA. Transportation, worker safety, and health in accordance with title 29 CFR; storage and safe blasting practices in handling and use in accordance with 29 CFR part 1926.900 et seq; and
3. Federal Department of Transportation (USDOT). Transportation and public safety, 49 CFR.

The fire marshal, sheriff, or other local officials, may have additional regulations for explosive Materials.

## 203.3.3.1.4 Safety

The Contractor shall follow safe practices, including the following:

1. Federal, State, and local regulations pertaining to the transportation, storage, and use of explosives must be strictly followed;
2. When required, the Blaster in Charge must obtain a blasting permit from the local regulatory agency before blasting;
3. Only persons authorized and qualified based on training and experience will handle and use explosives;
4. No person will smoke; carry matches or other flame producing devices; or carry firearms or loaded cartridges while in or near a motor vehicle that is transporting explosives;
5. Keep track of explosives at all times. Explosives must be stored and locked in an approved magazine facility in accordance with the applicable provisions of the Department, ATF, and OSHA until used in blasting;
6. Post appropriate signs in the required areas and vehicles in accordance with federal regulations;
7. Safely station the necessary guards or flag persons on Highways during blasting to control Highway traffic; and
8. Before starting Work in the cut, observe the entire blast area for at least five (5) minutes after each blast. Remove potentially dangerous rocks or other Material located beyond the excavation limits. Cease blasting operations if the required slopes are not stable, or if the safety and convenience of the public are being jeopardized.

### 203.3.3.1.5 Vibration Risk Survey

For each cut that requires blasting, the Contractor shall perform a vibration risk survey of nearby buildings, Structures, utilities, water supplies, or environmentally sensitive areas that may be at risk of blasting or construction damage. The Contractor shall perform the vibration risk survey in accordance with Section 617, "Vibration Monitoring and Video Taping." The Contractor shall obtain written approval for the vibration risk survey from the Project Manager before drilling blast holes.

### 203.3.3.1.6 Blasting Test Sections

The Contractor shall demonstrate the adequacy of proposed Blasting Plan with a blasting test section(s) for Material of different geologic characteristics. For Projects involving multiple cuts in similar geologic Materials, the Project Manager may reduce the requirement for a blasting test section in each cut. Blasting test sections include drilling, blasting, and excavating cut sections approximately 100 Ft long to determine the optimal combination of method, blast hole spacing, and charge. When field conditions warrant, the Project Manager may direct the Contractor to use test section lengths less than 100 Ft long.

Blasting test section requirements include the following:

1. The Contractor shall perform the blasting test section in accordance with Section 203.3.3.1, "Blasting Requirements." The Contractor shall prepare and submit a Detailed Blasting Plan for the test section to the Project Manager at least 48 H before the planned time of the blast. The Contractor shall not start blasting the test section until the Project Manager accepts the Detailed Blasting Plan;
2. Unless the Contractor's Detailed Blasting Plan indicates otherwise, the Contractor shall begin the tests with the controlled blast holes spaced at 30 inches; and
3. After blasting, the Contractor shall remove a sufficient amount of material from the test section to determine if the blast hole diameter, blast hole spacing, and amount of explosives are adequate to provide the required backslope. The Contractor shall not continue drilling of the test section area until the test section is excavated and the Department evaluates the results.

If, at any time during the progress of the main blasting operation, the methods of drilling and blasting do not produce the desired results, the Contractor shall revise and retest the blasting techniques until a technique produces the required results. The Department will consider the results to be unsatisfactory if:

1. There is an excessive amount of breakage beyond the indicated lines and grade;
2. There is excessive flyrock;
3. The final backslope within the specified tolerances is not uniform or overhangs are created;
4. Ground vibration and air blast levels exceed limits as stated in Section 617, "Vibration Monitoring and Video Taping;"
5. There are violations of other requirements of the Specifications;
6. The slopes are unstable;
7. The safety of the public is jeopardized; and
8. Property or natural features are endangered.

# 14

## 203.3.3.1.7 Blasting Execution

### 203.3.3.1.7.1 Notification and Schedule

The following requirements will apply to the notification and scheduling of blasting procedures:

1. The Contractor shall coordinate blasting operations with the Project Manager and notify the Project Manager a minimum of 1.5 H before the blast. The Contractor shall provide a one (1) hour timeframe for the blast. For example, if the Contractor notifies the Project Manager by 9:00 a.m. the blast may occur between 10:30 a.m. and 11:30 a.m.;
2. The Contractor shall provide notice to the required federal, State, and local agencies before each blast, as required by the blasting permits;
3. The Contractor shall notify occupants of buildings and owners of Structures and utilities of the blast time and location at least 48 H before the start of drilling or blasting; and
4. The Contractor shall detonate blasts at the planned time, unless approved otherwise by the Project Manager.

### 203.3.3.1.7.2 General Requirements

The Contractor shall cover the blast area with blasting mats, soil, or another equally serviceable material, before firing blasts in areas where flying rock may result in personal injury or damage to property or the Work.

### 203.3.3.1.7.3 Controlled Blasting Requirements

The Contractor shall perform controlled blasting in accordance with the Detailed Blasting Plans that produced acceptable results in blasting test sections. The Contractor shall perform control blasting using either pre-splitting or cushion blasting in accordance with the following requirements:

1. If the overburden does not support the drill holes, completely remove the overburden soil and loose rock along the top of the cut to expose the rock surface before drilling the controlled blast holes;
2. Mechanically monitor the blast hole angles;
3. Drill and space blast holes with a nominal diameter from two (2) inch to three (3) inch, in accordance with the blasting test sections or the results achieved in similar geologic Materials. Do not exceed three (3) Ft;
4. Use proper Equipment and technique to ensure that no blast holes deviate from the plane of the backslope shown in the Plans by more than eight (8) inches, parallel or normal to the slope. The Department will not pay for blast holes exceeding these limits unless the Project Manager approves the obtained slopes;
5. Drill the controlled blast holes at the required slope inclination, to the full depth of the cut, or to a pre-determined stage elevation. The maximum drill depth is 30 Ft. Use shallower holes if the directional control is inadequate. If more than five percent (5%) of the controlled blast holes are misaligned in any one (1) lift, reduce the height of the lifts until the eight (8) inch tolerance is met. The length of controlled blast holes may be incrementally increased once satisfactory directional control and blast results are demonstrated;
6. Drill unloaded and un-stemmed guide holes to the same diameter, in the same plane, and to the same tolerance as the controlled blast holes;

7. The Department will allow a maximum offset of 24 inches from the bottom of each lift to allow for drill Equipment clearances, when the cut requires more than one (1) lift. Begin drilling the control blast hole at a point that allows the necessary offsets, and adjust at the start of lower lifts as necessary to compensate for drift in the upper lifts;
8. Do not use horizontal blast holes for controlled blasting;
9. Use explosive charges, detonating cord, and other items necessary for the blasting operation in accordance with the manufacturer's recommendations and instructions;
10. Before placing charges, ensure the hole is free of obstructions. Use casing if necessary to prevent the walls of the hole from collapsing;
11. Use only standard explosives manufactured especially for the type of controlled blasting (cushion or pre-splitting). Do not load ammonium nitrate and fuel oil in the controlled blast holes. Use explosives and blasting accessories appropriate for the conditions of the blast hole (including water in the holes) and necessary to achieve satisfactory results;
12. Assemble and affix continuous column cartridge-type explosives to the detonating cord in accordance with the explosive manufacturer's instructions;
13. The bottom charge in a blast hole may be larger than the charges above, but not large enough to cause overbreak. Place the top charge far enough below the collar and sufficiently reduced in size to avoid overbreaking or heaving; and
14. Use a dry, angular, and granular Material that passes a 3/8 inch sieve to stem the controlled blast holes, from the top charge to the hole collar.

#### 203.3.3.1.7.4 Pre-Split Blasting

The Contractor shall perform pre-split blasting in accordance with Section 203.3.3.1.7.3, "Controlled Blasting Requirements," and the following requirements:

1. Detonate the pre-split blast holes before drilling for production blasting; or fire the pre-split blast holes at least 75 Ms before the production holes if detonated in the same blast;
2. Fire pre-split blast holes simultaneously, unless ground vibrations, noise, or air blast are excessive. Fire pre-split holes in delayed sections and reduce the charge weight per delay to mitigate excessive effects;
3. The line of pre-split blast holes will extend beyond the limits of the production blast holes to be detonated. The minimum length of this extension will be 30 Ft or to the end of the cut, but will not be greater than one-half of the distance of the expected blast advance; and
4. Do not perform pre-split blasting if the distance between the controlled blast line and free face is less than 20 Ft or less than three (3) times the blast hole depth, whichever is greater.

#### 203.3.3.1.7.5 Cushion Blasting

The Contractor shall perform cushion blasting in accordance with item No. 3 of Section 203.3.3.1.7.3, "Controlled Blasting Requirements," and the following requirements:

1. Perform cushion blasting as part of the final shot after other blasting is finished;
2. If the final shot includes production blast holes, detonate the cushion blast no more than 75 Ms or less than 25 Ms after the production blast; and
3. Fire cushion blast holes simultaneously, unless ground vibrations, noise, or air blast are excessive.

# 16

Fire cushion blast holes in delayed sections and reduce the charge weight per delay to mitigate excessive effects.

## 203.3.3.1.7.6 Production Blasting

The Contractor shall perform production blasting in accordance with the Blasting Plan that produced acceptable results in blasting test sections and the following requirements:

1. Minimize blast damage to the final excavation backslope;
2. Drill buffer rows of production blast holes on a plane approximately parallel to the controlled blast line;
3. Place the buffer row of production blast holes no closer than 6 Ft to the controlled blast line unless the Contractor can prove the final excavation backslope will not be damaged by the production blast;
4. Where necessary to minimize damage to the excavation backslope, load blast holes in the buffer row lighter than other production holes;
5. Ensure the bottoms of production blast holes are not lower than the bottom of controlled blast holes, except in the lowest lift;
6. Ensure the diameter of production blast holes does not exceed six (6) inches, unless approved by the Project Manager;
7. Before placing charges, ensure the hole is free of obstructions. Use casing, if necessary, to prevent the walls of the hole from collapsing;
8. Use a dry, angular, and granular Material that passes a 3/8 inch sieve to stem the holes, from the top charge to the hole collar;
9. Detonate production blast holes in a controlled delay sequence toward a free face;
10. Do not use horizontal holes for production blasting, except for Equipment access; and
11. Use explosives and blasting accessories appropriate for wet or dry blast hole conditions as necessary to achieve satisfactory results.

## 203.3.3.1.7.7 Scaling and Stabilization of Slopes Established by Controlled Blasting

The Contractor shall perform scaling and stabilization of slopes established by controlled blasting in accordance with the following requirements:

1. Observe the entire blast area following a blast before starting Work in the cut. If any rocks are loose, hanging, or potentially dangerous within a blast area, the Contractor shall remove them. Scale slopes by hand using a standard steel mine scaling rod. Use other methods to supplement or in lieu of hand scaling, such as, machine scaling, hydraulic splitters, or light blasting, if approved by the Project Manager;
2. Slopes shall be scaled and stabilized before further construction activities take place. Scale slopes throughout the span of the Contract and as often as necessary to keep the slopes free of hazardous loose rock or overhangs; and
3. Cease blasting operations if the following conditions exist:
  - 3.1. There is an excessive amount of breakage beyond the specified lines and grade;
  - 3.2. There is excessive flyrock;
  - 3.3. The final backslope within the specified tolerances is not uniform;

- 3.4. Ground vibration and air blast levels exceed limits specified in Section 617, "Vibration Monitoring and Video Taping;"
- 3.5. There are violations of other requirements of the Specifications;
- 3.6. The slopes are unstable;
- 3.7. The safety of the public is jeopardized; and
- 3.8. Property or natural features are endangered.

#### 203.3.4 Borrow

The Contractor shall be responsible for obtaining the borrow source, unless otherwise specified in the Contract. The Contractor shall exhaust all available suitable Material from unclassified excavation operations prior to utilizing a borrow source. The Contractor shall notify the Project Manager, in writing, when there is no longer unclassified excavation Material for Embankment and request that borrow operations commence. Borrow placed prior to this notification shall not be paid. If the Contractor places more than the specified amount of borrow and causes a waste of unclassified excavation, the Department will deduct the wasted amount from the borrow volume, as measured in the borrow area. After unclassified excavation is complete, the Contractor shall blade the areas that require borrow to allow accurate payment measurements by cross sectioning by the Contractor. The Contractor shall maintain and restore Right of Way fencing removed for borrow operations to its original condition or better to prevent livestock from entering Right of Way at all times during the project.

#### 203.3.5 Embankments

The Contractor shall not place Embankment Material on frozen earth, or incorporate frozen soils in Embankments. The Contractor shall suspend Embankment construction if Embankment Materials become frozen. The Contractor shall not resume until the Materials are thawed and suitable for compaction. Before beginning Embankment construction, the Contractor shall perform scalping in accordance with Section 201, "Clearing and Grubbing." The Contractor shall bench new Embankments into the following:

1. Natural slopes including rock;
2. Existing Embankments; or
3. Phased Embankment construction.

The Contractor shall ensure benches are wide enough to allow operation and placement of compacting Equipment. The Contractor shall recompact new Embankment Material and Material that is cut out at no additional cost to the Department. The Contractor shall not place rock, broken concrete, or other solid Materials in Embankment areas where driven pilings, drilled shafts, utility lines, or other Structures are specified in the Plans.

##### 203.3.5.1 Roadbed Embankments

The Contractor shall break up the original ground surface to at least six (6) inches by plowing, scarifying, or stepping up. The Contractor shall compact this area in accordance with Section 203.3.6, "Moisture and Density Control." The Contractor shall place Material for Roadbed Embankment in uniform lifts not exceeding eight (8) inches thick and compact in accordance with Section 203.3.6, "Moisture and Density Control."

# 18

The Department will allow rocks no larger than three (3) Ft (in any dimension) as long as the Contractor distributes and fills the interstices to form a dense mass. If the interstices between the rock fragments cannot be completely filled and compacted, the Contractor shall use bridging geotextile, approved by the Project Manager, over the top of the rock fragments to prevent the overlying Embankment Material from filling the interstices. The Contractor shall not use rock fragments that may degrade with time or may be water sensitive (such as shale or gypsum) as rock fill in Roadbed Embankments.

The Contractor may place larger rocks greater than three (3) Ft in any dimension in the toe of the slope in accordance with the following requirements:

1. No rock is larger than one-half the Embankment height or ten (10) Ft;
2. No rock is placed in fill height less than eight (8) Ft, measured at the edge of the Roadway Shoulder; and
3. Place rocks inside a line six (6) inches from the slope stake, space a minimum of three (3) Ft from edge to edge, and cover with approved Embankment Material.

The Contractor shall construct rock Embankments to a maximum of six (6) inches below Subgrade elevation. The Contractor shall consolidate rock fills by using the appropriate Equipment and methods approved by the Project Manager.

## 203.3.5.2 Non-Roadbed Embankment

The Contractor shall break up the original ground surface to at least six (6) inches by plowing, scarifying, or stepping up. The Contractor shall compact this area in accordance with Section 203.3.6, "Moisture and Density Control." The Contractor shall place Material for Non-Roadbed Embankment in uniform lifts not exceeding eight (8) inches thick and compact in accordance with Section 203.3.6, "Moisture and Density Control."

If the Embankment Material consists of rock, place the rock in layers of sufficient depth to contain the largest rock in the Material, and carefully distribute and fill the interstices to form a dense mass.

## 203.3.6 Moisture and Density Control

Maximum dry density of all soil types encountered or used will be determined in accordance with AASHTO T 180 (Modified Proctor), Method A or D (TTCP Modified) and AASHTO T 224.

The Contractor shall construct Roadbed, Roadbed Embankment, non-roadbed Embankment, and Roadway Median excavation or Embankment, with moisture and density control. The Contractor shall compact each layer of Embankment to at least 95% of maximum density as specified above. The Contractor shall ensure that the in-place moisture content of the soil shall not be less than five percent (5%) below optimum moisture content or greater than two percent (2%) above optimum moisture content, at the time of compaction. For soils with a plasticity index of 15 or greater, the Contractor shall ensure the moisture content of the soil at the time of compaction is between optimum moisture to optimum moisture plus four percent (4%). If the moisture content at the time of compaction is not within the specified range, the Contractor shall moisten or dry the Material, then thoroughly mix the Material to the full lift depth before re-compacting. No additional payment shall be made for the reworking of materials that do not fall within the ranges specified above.

Roadbed Embankments that contain mostly rock or coarse-grained Material (65% or greater retained on the No. 4 sieve) do not require moisture and density control, except the top six (6) inches of the Embankment; construct in accordance with Section 207.3, "Construction Requirements." Non-roadbed Embankments of rock Material will not require moisture and density control unless otherwise specified in the Contract.

The Department will perform field densities in accordance with AASHTO T 310 or other Department approved methods. Densities shall be measured at each lift before the next subsequent lift is placed in accordance with Minimum Testing Requirements.

## 203.4 METHOD OF MEASUREMENT

### 203.4.1 Rock Excavation

The Department will measure Rock Excavation based on the estimated percentages if shown in the Contract, unless otherwise requested by the Contractor and approved by the Department.

If the Contractor requests, the Department will measure Rock Excavation in its original position for Material classified as Rock Excavation in accordance with Section 203.2.1.1, "Rock Excavation." Before excavation, the Contractor and Project Manager must agree on the limits of Material classified as rock excavation. The Contractor shall calculate volumes in accordance with Section 203.4.3, "Unclassified Excavation and Borrow." The Contractor shall include in measurements the overbreakage in rock excavation a maximum of ten (10) inches beyond the backslope specified in the Plans or as directed by the Project Manager. The Department will use the blaster's drill-hole log cards to determine the quantities of rock excavation covered by soil or overburden. The Contractor shall provide these log cards as part of the surveying records.

The Department will pay for stabilization necessitated by existing geological conditions and for Base Course and geotextile if necessary as required to backfill rock Subgrade conditions.

### 203.4.2 Controlled Blasting

The Department will measure Controlled Blasting by the blast holes drilled along the final line, whether loaded or not; and will measure the lengths from the top of the rock surface to the elevation of the Roadway ditch or to a bench elevation set by the Project Manager. The Department based the quantities for Controlled Blasting shown in the Plans on assumed blast hole spacing; the actual quantities depend on field conditions and the results from test sections.

### 203.4.3 Unclassified Excavation and Borrow

For each phase of the Project, identified in the Contract or approved by the Department, the Contractor shall measure the original ground surface of any areas that are designated as unclassified excavation (cut sections) and/or Embankment (fill sections using available unclassified excavation Material), or Borrow (fill sections when all unclassified excavation Material has been exhausted). Prior to any Work continuing in completed excavation areas, the Contractor shall measure the newly excavated ground surface "final surface". For embankment and borrow areas the contractor shall measure the final surface once these operations are completed and accepted by the Project Manager. Prior to commencing Borrow operations the Contractor must ensure that all requirements of 203.2.1.3, "Borrow" have been met. Earthwork



## 20

quantities will be calculated as the neat volume from the original ground surface (less the existing roadway surfacing) between the limits shown on the plans, and/or authorized changes by the Project Manager, and the new ground surface. The Department will not apply any shrinkage or swell factor due to payment being made on the final cross sectioned volume.

For the measurements described above the Contractor shall survey and submit the original ground surface and final surface data at completion of each phase of construction using an electronic XML-compatible format approved by the Project Manager. The Contractor shall use a New Mexico licensed Engineer or New Mexico licensed surveyor to stamp and certify cross-sections at 50 Ft. intervals, unless otherwise specified in the Contract or approved by the Project Manager prior to commencement of earthwork operations. The Contractor shall submit certified volume summary reports to the Project Manager based on this electronic data for each phase of construction including a report that summarizes the basis for the final volumes.

### 203.5 BASIS OF PAYMENT

Pay Item	Pay Unit
<i>Rock Excavation</i>	Cubic Yard
<i>Unclassified Excavation</i>	Cubic Yard
<i>Borrow</i>	Cubic Yard
<i>Unsuitable Material Excavation</i>	Cubic Yard
<i>Controlled Blasting</i>	Linear Foot

#### 203.5.1 Double Handling

The Department will pay for excavated Materials that require more than one (1) handling as identified within the Contract before final placement, including fertile topsoil required to be stockpiled and reserved for later use in the Work:

1. At the Bid Item Unit Price for unclassified excavation, for each handling approved by the Project Manager; or
2. As another item of Work for the second handling if specified in the Contract.

However, if the Contractor handles excavated and borrow Materials more than once, at the Contractor's request or at the convenience of the Contractor, there will be no additional cost to the Department. If the Contractor chooses to stockpile excess unclassified excavation Material to be used as borrow in a later phase, the Department will not pay for this Material as double handling. Double handling shall not be paid for Material that is excavated and placed in the same phase of the Project.

#### 203.5.2 Work Included in Payment

The Department will consider the item(s) listed in this section as included in the pay items(s) listed 203.5, "Basis of Payment" and will not measure or pay for them separately:

1. Controlled blasting drill holes through overburden;
2. Production blasting;

3. Scaling within the limits of a final backslope established by controlled blasting;
4. Damage resulting from blasting;
5. Mobilization of any Equipment and testing of rock in accordance with Section 203.2.1.1, "Rock Excavation;"
6. Time Delays to perform testing of rock in accordance with Section 203.2.1.1, "Rock Excavation;"
7. Material required to fill the voids and irregularities in Embankment areas below the tolerance limit from the specified elevation;
8. Bridging geotextiles required to prevent overlying Embankment Material from migrating into the interstices between rock fragments;
9. Fence removal and replacement;
10. AASHTO T-190 Resistance R-Value and Expansion Pressure of Compacted Soils, including sampling, laboratory testing and reporting;
11. AASHTO T-290 Water-Soluble Sulfate Ion Content in Soil, including sampling, laboratory testing, and reporting;
12. Survey, calculations, and engineering;
13. Hauling and/or disposal related to Rock Excavation, Unclassified Excavation, Borrow, and Unsuitable Material Excavation; and
14. Suitable backfill Material for Unsuitable Material Excavation.

The Contractor shall dispose of Material in accordance with Section 107, "Legal Relations, Environmental Requirements, and Responsibility to the Public" unless otherwise specified in the Contract. The Contractor shall not dispose of Material within the project limits without written approval from the Project Manager.

**SPECIAL PROVISIONS**  
**MODIFYING**  
**SECTION 206: EXCAVATION AND BACKFILL FOR CULVERTS AND MINOR**  
**STRUCTURES**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete Section 206: EXCAVATION AND BACKFILL FOR CULVERTS AND MINOR STRUCTURES in its entirety and replace with the following:

**206.1 DESCRIPTION**

This Work consists of excavating, placing and compacting select backfill, bedding, and flowable fill materials, and disposing of material related to construction of Minor Structures. Excavation includes dewatering, pumping, bailing, draining, sheeting, bracing, and Incidentals required for proper execution of the Work.

Ditches required at Culvert inlets and outlets, and other locations indicated in the Plans are included under the item for Unclassified Excavation.

**206.2 MATERIALS**

**206.2.1 Select Backfill**

The Contractor shall furnish a suitable, well-graded, compactible material free of Recycled Asphalt Pavement (RAP), organic matter, clay balls, lumps, rock fragments that may degrade with time such as shale or gypsum and other deleterious materials. Select backfill material shall conform to the following and be placed in accordance with the Contract:

- a) For structures and pipes other than plastic pipe:
  - 1) Maximum particle size: two (2) inch
  - 2) Soil classification, AASHTO M 145 A-1 or A-2-4
- b) For plastic pipe:
  - 1) Maximum particle size: 1½ inch
  - 2) Soil classification, AASHTO M 145 A-1 or A-2-4

All Backfill Material shall meet the electrochemical criteria where specified in the Contract.

**206.2.2 Flowable Fill**

The Contractor may substitute flowable fill for select backfill in accordance with Section 516, "Flowable Fill," at no additional cost to the Department. The Contractor shall secure Culverts and minor Structures to prevent flotation.

### 206.2.3 Bedding

The Contractor shall furnish a suitable, well-graded, non-plastic, free draining material, free of Recycled Asphalt Pavement (RAP), organic matter, clay balls, lumps, rock fragments that may degrade with time such as shale or gypsum and other deleterious materials. Bedding material shall conform to the following and be placed in accordance with the Contract:

- (a) Maximum particle size: ½ inch or half the corrugation depth, whichever is smaller
- (b) Material passing No. 200 (75-µm) sieve: ten percent (10.0%) max AASHTO T 27 and AASHTO T 11

All Bedding Material shall meet the electrochemical requirements where specified in the Contract.

### 206.2.4 Unsuitable Material

Unsuitable Material includes organic materials, frozen lumps, ice; soils such as peat, shale, gypsum or other Materials that may degrade with time, or are contaminated soil. Suitable Material that is unstable may be reworked to create a stable platform as directed by the Project Manager.

Material below minor Structures and areas identified by the Project Manager, determined to be unsuitable shall be excavated and disposed of in accordance with Section 107, "Legal Relations, Environmental Requirements, and Responsibility to the Public" unless otherwise specified in the Contract.

When unsuitable Material is removed and disposed of, the resulting void shall be filled with Material suitable for its planned use as directed by the Project Manager. Such suitable Material shall be placed and compacted in accordance with this specification.

## 206.3 CONSTRUCTION REQUIREMENTS

### 206.3.1 General

The Contractor shall remove unsuitable foundation material below the specified bottom-of-structure elevation and replace with approved Material, as directed by the Project Manager. The Contractor shall use backfill Material to backfill Culverts in accordance with Section 206.2.1, "Select Backfill," or Section 206.2.2, "Flowable Fill," unless otherwise shown on the Plans. The Contractor shall ensure the moisture content of the soil; at the time of compaction is not less than five percent (5%) below optimum moisture content or greater than optimum moisture content. The Contractor shall compact the top six (6) inches of existing ground to at least 95% of maximum density in accordance with AASHTO T 180 (Modified Proctor), Method A or D (TTCP Modified). The Contractor shall maintain the density, approved surface elevation, and shape of the foundation immediately before placing Structures and forms.

The Contractor shall distribute backfill Material in uniform layers, each no more than eight (8) inches thick (loose measurement) and compact to 95 percent (95%) maximum density. At the time of compaction, the Contractor shall ensure that the in-place moisture content of the soil is not less than three percent (3%) below optimum moisture content or greater than three percent (3%) above optimum moisture content in accordance with AASHTO T 180 (Modified Proctor), Method A or D (TTCP Modified) and AASHTO T 224. Test for field density and moisture content using nuclear methods in accordance with AASHTO T 310.

Application of load including backfill against new masonry or concrete Structures shall be in accordance with Section 511.3.5.6, "Sequence of Placement and Application of Load." The Contractor shall maintain Structure alignment and integrity during backfill compaction. The Contractor shall not place backfill on frozen earth or with frozen Materials. The Contractor shall suspend operations until Material is thawed and meets requirements of this specification. The Contractor shall remove sheeting and bracing before placing backfill.

### 206.3.2 Pipe Culverts, Storm Drains, and Structural Plate Pipe

For preparation and installation of pipe culverts, storm drains, and structural plate pipes with bottoms the Contractor shall remove rock and other unyielding foundation material a minimum of four (4) inches (maximum 12 inches) below the bottom of the Structure. The Contractor shall backfill this added depth with an approved Material as identified in the Contract. The Contractor shall excavate trenches as described in the Contract to allow for pipe joining and compaction of the bedding and backfill Material under and around the pipe in accordance with Section 206.3.1, "Construction Requirements, General." The Contractor shall ensure that the trench width for pipes and Culverts conforms to the trench widths requirements in Section 570.3.2, "Excavation and Backfill." The Contractor shall uniformly compact the trench for its full length and width. If specified in the Contract, the Contractor shall provide the longitudinal camber of the specified magnitude for cross drains.

### 206.3.3 Box Culverts and Other Drainage Structures

For preparation and installation of box culverts and other drainage structures the Contractor shall excavate material to the elevations established by the Contract. The Contractor shall not remove material, except unsuitable material, below the final grade, if placing footings on excavated surfaces other than rock. The Contractor shall remove rock and other unyielding foundation material a maximum 12 inches below the bottom of the Structure. The Contractor shall clean rock seams and cavities, and fill with concrete or grout. If the Contractor's excavation extends beyond the neat lines shown in the Contract, the Contractor shall use concrete (of the same class as the footing) to backfill these areas, at no additional cost to the Department.

The Contractor shall notify the Project Manager after each footing excavation. The Contractor shall not place footings until the excavation depth and foundation materials are approved by the Project Manager. The Contractor shall maintain the moisture and density and the approved surface elevation and shape of the foundation before installing reinforcing steel.

## 206.4 METHOD OF MEASUREMENT

The Project Manager will measure the void created by the removal of Unsuitable Material Excavation below the bottom-of-structure elevation.

## 206.5 BASIS OF PAYMENT

Pay Item	Pay Unit
<i>Unsuitable Material Excavation</i>	Cubic Yard

The Department will pay for rock excavation in accordance with Section 203, "Excavation, Borrow, and Embankment."

### 206.5.1 Work Included in Payment

Excavation, disposal of unsuitable material, bedding, backfill and select backfill Materials, placement and compaction of bedding and select backfill Materials for Culverts, storm drains, other drainage Structures, box Culverts, and minor Structures shall be included in the Contract unit price per linear foot of Structure identified in the Contract.

Excavation shall include all dewatering, pumping, bailing, draining, sheeting, bracing, and Incidentals required for proper execution of the Work. Select backfill shall include the use of Section 516, "Flowable Fill." Backfilling with concrete of the same class as the footings where the Contractor excavates below the established final elevation for bottom of footings or beyond the neat lines of the footings in rock or other hard foundation material shall be included in the Contract unit price per linear foot of Culvert. Unrippable rock or unyielding material will be defined and paid for as covered in Section 203, "Excavation, Borrow, and Embankment."

**SPECIAL PROVISIONS  
MODIFYING  
SECTION: 207 SUBGRADE PREPARATION**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete Section 207: SUBGRADE PREPARATION in its entirety and replace with the following:

**207.1 DESCRIPTION**

This Work consists of compacting and finishing the Subgrade.

**207.2 MATERIALS—Reserved**

**207.3 CONSTRUCTION REQUIREMENTS**

Maximum dry density of all soil types encountered or used will be determined in accordance with AASHTO T 180 (Modified Proctor), Method A or D (TTCP Modified) and AASHTO T 224.

The Contractor shall ensure the top two (2) ft of borrow Materials in the finished Subgrade is comprised of material with the design R-value.

The Contractor shall compact the top six (6) inches of the Roadbed to 95% of maximum density.

The Contractor shall ensure the soil moisture content (at the time of compaction) is from optimum to optimum minus five percent (5%). For soils with a PI of 15 or greater, the Contractor shall ensure the moisture content of the soil at the time of compaction is from optimum moisture to optimum moisture plus four percent (4%).

Field density tests shall be performed in accordance with the "Minimum Testing Requirements", in accordance with AASHTO T 310, or by other Department approved methods.

**207.3.1 Tolerances**

The Contractor shall ensure the top surface of the finished subgrade along centerline shall not vary by more than 0.1 foot above or below established grade and 0.05 foot above or below the typical cross-section measured on the finished surface at right angles to the centerline. All deviations from these tolerances shall be corrected.

**207.4 METHOD OF MEASUREMENT**

The Department will measure Subgrade preparation using the dimensions shown in the Contract and/or approved modifications.

207.5 BASIS OF PAYMENT

Pay Item

*Subgrade Preparation*

Pay Unit

Square Yard

207.5.1 Work Included in Payment

No payment will be made for rehandling or reworking material to meet moisture and density requirements.

Proof rolling for Unstable Subgrade Stabilization shall be considered Incidental to the Contract and will not be measured or paid for separately.



**SPECIAL PROVISIONS  
MODIFYING  
SECTION 209 BLADING AND RESHAPING**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete Section 209: **BLADING AND RESHAPING** in its entirety and replace with the following:

**209.1 DESCRIPTION**

This Work consists of constructing or restoring and shaping Roadbeds and Base Course to the typical section or as specified in the Contract.

**209.2 MATERIALS—Reserved**

**209.3 CONSTRUCTION REQUIREMENTS**

The Contractor shall shape the surface of the Roadbed or Base Course Materials to the typical section or as specified in the Contract with approved existing Materials. Any unapproved existing Roadbed or Base Course materials shall be replaced in accordance with the requirements of Section 203, "Excavation, Borrow, and Embankment" and Section 303, "Base Course", as directed by the Project Manager.

**209.3.1 Compaction**

The Contractor shall perform the following to the top six (6) inches of the Roadbed or Base Course, after restoring the grade and typical section:

1. Scarify;
2. Water; and,
3. Compact to 95% of maximum density per AASHTO T180 Method A or D (TTCP Modified). Ensure the moisture content of the Roadbed and Base Course Materials meet the requirements of Section 203, "Excavation, Borrow and Embankment;" and Section 303, "Base Course".

**209.3.2 Tolerances**

The Contractor shall ensure the top surface of the finished Roadbed or Base Course Materials along centerline shall not vary by more than 0.1 foot above or below established grade and 0.05 foot above or below the typical cross-section measured on the finished surface at right angles to the centerline. All deviations from these tolerances shall be corrected.

#### 209.4 METHOD OF MEASUREMENT

The Department will measure blading and reshaping along the Roadbed centerline or the typical section.

#### 209.5 BASIS OF PAYMENT

Pay Item	Pay Unit
<i>Blading and Reshaping</i>	Mile

##### 209.5.1 Work Included in Payment

The Department will consider as included in the payment for the pay item(s) listed in this section and will not measure or pay separately for the following Work:

1. Restoring Grade and typical section;
2. Material placement and compaction;
3. Reworking or rehandeling of Materials to meet compaction requirements; and
4. Finishing Roadbed or Base Course to uniform grade and typical section.

## SPECIAL PROVISIONS MODIFYING

### SECTION 210: EXCAVATION AND BACKFILL FOR MAJOR STRUCTURES

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete Section 210: EXCAVATION AND BACKFILL FOR MAJOR STRUCTURES in its entirety and replace with the following:

#### 210.1 DESCRIPTION

This Work consists of excavating, disposing of Material, supplying and placing backfill Material related to the construction of Major Structures identified in the Contract. Excavation and backfill for major Structures includes dewatering, temporary shoring and bracing and other Incidentals required for proper execution of the Work.

#### 210.2 MATERIALS

##### 210.2.1 Select Backfill

The Contractor shall use Base Course per Section 303 "Base Course", A-1 or A-2-4 Material as determined by AASHTO M145 composed of stone, crushed stone, crushed or screened gravel, caliche, sand, or a combination thereof, unless otherwise specified in the Contract. The Contractor shall use Material that is free of Deleterious Materials, peat, gypsum, shale or other Materials that may degrade with time. Material shall not contain lumps or stones with an average dimension greater than two (2) inches.

The Contractor shall not use Recycled Asphalt Pavement (RAP) as select backfill Materials. The Contractor shall not use Base Course containing RAP for use as select backfill Materials.

##### 210.2.2 Approach Slab

The Contractor shall use AASHTO Soil Classifications A-1-a Material with a maximum coarse fraction size of 1.5 inches or Base Course per Section 303, "Base Course" under the approach slab. The Contractor shall extend the Material to a minimum of ten (10) feet beyond the end of the approach, unless otherwise specified in the Contract, for the full width of the abutment and to the depth indicated in the Contract. Recycled Asphalt Material (RAP) shall not be used within this prism.

##### 210.2.3 Unsuitable Material

Unsuitable Material includes organic Materials, frozen lumps, ice, and soil/rock such as peat, shale, gypsum or other Materials that may degrade with time, or are contaminated. Suitable Material that is unstable may be reworked to create a stable platform as directed by the Project Manager.

Material identified by the Project Manager and determined to be unsuitable shall be excavated and disposed of in accordance with Section 107, "Legal Relations, Environmental Requirements, and Responsibility to the Public" unless otherwise specified in the Contract.

When unsuitable Material is removed and disposed of, the resulting void shall be filled with Material suitable for its planned use as directed by the Project Manager. Such suitable Material shall be placed and compacted in accordance with Section 210.3.2, "Compaction."

### 210.3 CONSTRUCTION REQUIREMENTS

#### 210.3.1 General

The Contractor shall excavate material to the elevations established in the Contract. The Contractor shall not remove material, except unsuitable material, below the final grade, if placing footings on excavated surfaces other than rock. The Contractor shall remove rock and other unyielding foundation material a maximum of 12 inches below the bottom of the Structure. The Contractor shall clean rock seams and cavities, and fill with concrete or grout. This additional concrete or grout is Extra Work. The Contractor shall notify the Project Manager after each footing excavation. The Contractor shall not place footings until the Project Manager approves the excavation depth and the foundation material.

The Contractor shall dewater wet pits for inspection and for construction of footings. When necessary, the Contractor shall install well-braced cofferdams, built as watertight as practical. The Contractor shall not use timber or bracing inside cofferdams that cannot be removed without damage to the concrete. The Contractor shall make temporary Structures large enough to provide ample room for pile driving, drilled shaft construction, form construction, inspection, and sump pumps. The Contractor shall straighten or move cofferdams that threaten to damage the Structure. The Contractor shall submit to the Project Manager Working Drawings showing proposed methods of constructing cofferdams, cribs, shoring, or similar temporary Structures sealed by a New Mexico licensed Engineer. The submittal of Working Drawings does not relieve the Contractor of any responsibility.

The Contractor shall backfill excavated areas not occupied by piles, shafts, abutments, or other permanent Structures to the adjoining finished surface elevation. The Contractor shall not use rock in backfill that is within two (2) ft of the Structure. The Contractor shall place backfill Material in approximately level layers for the length and width of the backfilled area. When necessary to prevent wedge action, the Contractor shall bench the slopes bounding the area being backfilled in accordance with Section 203.3.5.1, "Roadbed Embankments." The Contractor shall dispose of unsuitable excavated material outside of the Roadway Prism as directed by the Project Manager. Before placing backfill Material against new masonry or concrete Structures, the Contractor shall wait until the concrete has developed its specified design strength as determined in Section 510.3.5.1, "Concrete Strength" or until the concrete reaches 80% of the specified compressive strength but no less than 2,500 psi, as determined by the Maturity Method, in accordance with Section 510.3.5.2, "In-place Concrete Strength Measurements." The Contractor shall prevent unbalanced loading while placing backfill Material.

### 210.3.2 Compaction

The Contractor shall make layers of uncompacted backfill no more than eight (8) inches thick. Before placing the next layer, the Contractor shall compact to 95% of the maximum density near optimum moisture content for AASHTO Soil Classifications A-1-a Material and Roadway Embankment as determined by AASHTO T 180 (Modified Proctor), Method A or D (TTCP Modified). The Contractor shall use nuclear methods to determine field densities in accordance with AASHTO T 310.

Prior to concrete placement the foundation soils shall be compacted to at least 95% of maximum density as determined by AASHTO T 180 (Modified Proctor), Method A or D (TTCP Modified).

## 210.4 METHOD OF MEASUREMENT

### 210.4.1 Major Structure Excavation

For each phase of the Project, identified in the Contract or approved by the Department, the Contractor shall measure the original ground surface of any areas that are designated as Structure Excavation. Prior to any Work continuing in completed excavation areas, the Contractor shall measure the newly excavated ground surface "final surface." Major structure excavation quantities shall be measured and calculated as the neat volume below the original ground surface between the limits shown in the Contract, and/or approved changes by the Project Manager, and the final excavated ground surface.

For the measurements described above the Contractor shall survey and submit the original ground surface and final excavated ground surface data at completion of each phase of construction or completed major structure using an electronic XML-compatible format approved by the Project Manager with a volume summary report summarizing the basis for the final volumes. If no cross section intervals are shown in the plans the Contractor shall purpose cross-section intervals, to the Project Manager, that adequately quantify the volumes. The approved intervals shall be used for the entire project unless otherwise specified in the Contract and/or approved by the Project Manager prior to commencement of earthwork operations. The Contractor shall use a New Mexico licensed Engineer or New Mexico licensed surveyor to stamp and certify the surveyed cross-sections and the volume summary report.

Do not include the following volumes in structure excavation:

1. Material excavated outside vertical planes located 18 inches outside and parallel to the limits of the footings or foundations;
2. Excavation required because of slides, cave-ins, silting or filling due to lack of support of sides, the action of the elements or carelessness of the Contractor;
3. Any material included within the staked limits of the surfacing and unclassified excavation for which measurement is covered under other sections;
4. Water or other liquid material;
5. Material excavated before measurements of the original ground or embankment placement;
6. Material rehandled, except when the contract specifically requires excavation after embankment placement; and
7. Rock encountered during structural excavation will be paid per Section 203.4.1, "Rock Excavation."

#### 210.4.2 Major Structure Backfill

For each phase of the Project, identified in the Contract or approved by the Department, the Contractor shall measure major structure backfill by the cubic yard compacted in place in accordance with the limits show in the Contract. The Contractor shall calculate major structure backfill as the neat volume above the existing or excavated ground surface between the limits shown on the plans, and/or authorized changes by the Project Manager, and the final compacted ground surface. The Department will not apply any shrinkage or swell factors due to payment being made on the final cross sectioned volume.

For the measurements described above the Contractor shall survey and submit the existing or excavated ground surface and final compacted ground surface data at completion of each phase of construction or completed major structure using an electronic XML- compatible format approved by the Project Manager with a volume summary report summarizing the basis for the final volumes. If no cross section intervals are shown in the plans the Contractor shall purpose cross-section intervals, to the Project Manager, that adequately quantify the volumes. The approved intervals shall be used for the entire project unless otherwise specified in the Contract and/or approved by the Project Manager prior to commencement of earthwork operations. The Contractor shall use a New Mexico licensed Engineer or New Mexico licensed surveyor to stamp and certify the surveyed cross-sections and the volume summary report.

No measurement for payment will be made of backfill required because of slides, cave-ins, silting or filling due to lack of support of sides, over excavation or any other the action of the elements or carelessness of the Contractor.

#### 210.5 BASIS OF PAYMENT

Pay Item	Pay Unit
<i>Major Structure Excavation</i>	Cubic Yard
<i>Major Structure Backfill</i>	Cubic Yard
<i>Unsuitable Material Excavation</i>	Cubic Yard

##### 210.5.1 Work Included in Payment

Payment will be full compensation for the Work and Materials prescribed in this Section.

Excavation and Backfill for Major Structures includes the following:

1. Material compaction to 95% of maximum density as determined by AASHTO T 180 (Modified Proctor), Method A or D (TTCP Modified);
2. All temporary shoring and bracing;
3. Dewatering;
4. Suitable backfill Material for Unsuitable Material Excavation;
5. Hauling and disposal of Material related to Structure Excavation and Unsuitable Material Excavation; and
6. Survey, calculations, and engineering.

The Contractor shall dispose of Material in accordance with Section 107, "Legal Relations, Environmental Requirements, and Responsibility to the Public" unless otherwise specified in the Contract. The Contractor shall not dispose of Material within the project limits without written approval from the Project Manager.

July 28, 2107

**SPECIAL PROVISIONS  
MODIFYING  
SECTION 213 OBLITERATING OLD ROAD**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete Section 213: OBLITERATING OLD ROAD in its entirety and replace with the following:

**213.1 DESCRIPTION**

This Work consists of obliterating old Road.

**213.2 MATERIALS—Reserved**

**213.3 CONSTRUCTION REQUIREMENTS**

After the old Road is no longer needed for traffic, the Contractor shall remove and stockpile existing surfacing Materials to Subgrade in an environmentally acceptable manner.

The Contractor shall fill ditches, rough grade the Road (to blend with the surrounding terrain) and form natural rounded slopes (approved by the Project Manager). Next, the Contractor shall scarify or plow (to thoroughly mix the remaining surfacing material with earth), harrow, and smooth the Roadbed.

**213.4 METHOD OF MEASUREMENT**

The Contractor shall measure obliterating old road along the centerline of the old Road.

**213.5 BASIS OF PAYMENT**

Pay Item	Pay Unit
<i>Obliterating Old Road</i>	Mile

**213.5.1 Work Included in Payment**

The Department will consider as included in the payment for the pay item(s) listed in this section and will not measure or pay separately for the following Work:

1. Removing and stockpiling existing surfacing Materials; and
2. Grading, scarifying, and plowing.



## SPECIAL PROVISIONS MODIFYING

### SECTION 401: PAVEMENT SMOOTHNESS MEASUREMENT

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete Table 401.5.1.2:2 of subsection 401.5.1.2 Pay Adjustment for PCC Pavement and substitute the following:

Table 401.5.1.2:2  
MRI Based Profile Pay Adjustment Schedule  
for Category II PCCP Projects

Pay Adjustment (\$ per square Yard)			
MRI (Mean Roughness Index) inch/0.1mi			Category II
<65.0			0.00
65.0	to	66.0	-0.12
66.1	to	67.0	-0.24
67.1	to	68.0	-0.36
68.1	to	69.0	-0.48
69.1	to	70.0	-0.60
70.1	to	71.0	-0.72
71.1	to	72.0	-0.84
72.1	to	73.0	-0.96
73.1	to	74.0	-1.08
74.1	to	75.0	-1.20
75.1	to	76.0	-1.32
76.1	to	77.0	-1.44
77.1	to	78.0	-1.56
78.1	to	79.0	-1.68
79.1	to	80.0	-1.80
>80.0			Corrective Work Required

Delete the fourth paragraph of Subsection 401.3.1.4 Profile Measurement Operations in its entirety and replace with the following:

Measure the longitudinal smoothness of the final surface of HMA, WMA, OGFC, PCCP, and CRCP using a Department certified profile measurement device. Operate the profile measurement device in accordance with AASHTO R 57 "Operating Inertial Profiling Systems" and manufacturer's recommendations and procedures established by TTCP. The profile measurement device shall be equipped with dual-sensors, bar lasers up to four (4.0) inches long, that measures the profile traces for each wheel path. Locate outside trace three (3) feet from and parallel to the approximate location of the pavement edge line. Ensure the center line distance between sensors is 70.0 inches  $\pm$  (1.0) inch. At transverse joints, commence profile traces at the joint location. Operate the device on the driving surface of the Roadway at the manufacturer's recommended speed without interfering with traffic or its own operation.

**SPECIAL PROVISIONS  
MODIFYING  
SECTION 402: ASPHALT MATERIALS, HYDRATED LIME, AND ANHYDRITE BASED  
MATERIAL**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

**402.2 MATERIALS**

Include the following subsection:

**402.2.7.6 Emulsified Petroleum Resin Prime (EPR-1)**

Provide EPR-1 designated emulsified petroleum resin prime in accordance with Table 402.2.7.6:1, "Emulsified Petroleum Resin Prime."

Table 402.2.7.6:1  
Emulsified Petroleum Resin Prime

Test	EPR-1
Particle Charge Test	Positive
Residue from Evaporation Test, % <sup>a</sup>	60+
Sieve Test, Retained on 0.850mm Sieve, % <sup>b</sup>	0.1-
Viscosity, Saybolt Furol at 77 °F, Seconds	14-60

<sup>a</sup>ASTM D-244 Evaporation Test for percent of residue is modified by heating 50 gram sample to 300°F until foaming ceases, then cool immediately and calculate results

<sup>b</sup>Test procedure with ASTM except that distilled water shall be used in place of 2%w sodium oleate solution

April 7, 2014

**SPECIAL PROVISIONS**  
**MODIFYING**  
**SECTION 403: OPEN GRADED FRICTION COURSE (NON-QLA)**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete Subsection 403.2.5 Mix Design and replace with the following:

**403.2.5 Mix Design**

A Department approved Private Testing Lab will develop the OGFC mix design in accordance with ASTM D 7064, "Standard Practice for Open Graded Friction Course (OGFC) Mix Design", as modified by the New Mexico Department of Transportation State Asphalt Engineer. The mix design shall be signed by a professional Engineer licensed by the NM Board of Registration for Professional Engineers and Land Surveyors. The JMF gradation will be within the master range for the specified type of OGFC. The mix design will establish a single percentage of aggregate passing each required sieve size and a single percentage of asphalt Material to be added to the aggregate. The mix design will specify whether to add hydrated lime or anhydrite based material and how much to use. The Mix Design shall identify the minimum and maximum mixing and placement temperatures of the mix. Add a minimum of one percent (1%) hydrated lime or anhydrite based material, include it in the gradation for establishing the mix design.

Delete Subsection 403.3.6.1.1 Suspension of Operations and replace with the following:

**403.3.6.1.1 Suspension of Operations**

If one (1) or more properties listed in Subsection 403.3.6.2, Department Quality Assurance, fail to meet the specification requirements for a period of one (1) Day or a maximum production of 1000 tons; the production will be halted by the Project Manager. Use the gradation information to determine causes or factors that may be a contribution to the problem and prepare a plan to solve the problem. Approval of the plan must be obtained from the Project Manager before resumption of paving operations. Upon approval of the proposed plan, the Contractor may resume operations to determine if the actions taken have corrected the problem. Limit production to 1000 tons that will be tested in 500 ton increments. If that testing indicates that the problem has been corrected, the Contractor may resume full operations. If the problem has not been corrected, further trial runs and testing as described herein will be required. Take corrective action to remedy any property of the mix that is out of specification. Contractors who elect to produce Material that is not within the specification limits do so at their own risk. Price reductions due to out of specification Material being placed will be deducted from the unit price of the item in accordance with the Department's current Acceptance and Price Reduction Procedures. All Material that is rejected shall be removed and replaced with specification Material at the Contractor's expense. Material that is improperly

# 40

graded or segregated or fails to meet the requirements herein provided shall be corrected or removed and disposed of immediately as directed by the Project Manager at the Contractor's expense.

February 13, 2014

**SPECIAL PROVISIONS  
MODIFYING  
SECTION 405: DETOUR PAVEMENTS**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Amend Subsection 405.3 CONSTRUCTION REQUIREMENTS to include the following:

**405.3.1 General**

Construct the Detour pavement in accordance with the following applicable Specifications:

6. Section 423 Hot-Mix Asphalt – Superpave (QLA & NON-QLA);”
7. Section 424 Warm Mix Asphalt.”

**SPECIAL PROVISIONS  
MODIFYING  
SECTION 408: PRIME COAT**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

**408.2 MATERIALS**

Revise the following subsection:

**408.2 Materials**

Provide one (1) of the following types of prime coat asphalt Material:

1. Asphalt emulsified prime (AE-P);
2. Penetrating emulsified prime (PE-P);
3. Emulsified Petroleum Resin Prime (EPR-1);
4. MC-70; or
5. Other Material approved by the Project Manager.

Provide prime coat asphalt Material in accordance with Section 402, "Asphalt Materials, Hydrated Lime, and Anhydrite Based Material."

April 8, 2016

**SPECIAL PROVISIONS  
MODIFYING  
SECTION 423: HOT MIX ASPHALT – SUPERPAVE (QLA AND NON-QLA)**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Insert the following paragraph as third paragraph in Subsection 423.2.7 Reclaimed Asphalt Pavement:

**423.2.7 Reclaimed Asphalt Pavement**

If Plus Grades of PG asphalt binder is specified on the project, for quantities greater than 15% RAP, the Contractor shall extract, recover, and combine the RAP's asphalt binder with a virgin asphalt binder per AASHTO M 323, Appendix A. The Contractor shall ensure the resultant binder meets the entire AASHTO M 320 required Project PG asphalt binder properties indicated on the approved mix design including the additional Plus Grade requirements for Elastic Recovery and Solubility.

Delete Subsection 423.3.4.2 Haul Equipment in its entirety and replace with the following:

**423.3.4.2 Haul Equipment**

Haul asphalt mixtures with trucks that are tarped and have tight, clean, smooth metal beds and a thin coat (a minimal amount) of Department approved release agent in accordance with Section 423.3.4.2.1.

Include the following subsection:

**423.3.4.2.1 Asphalt Release Agents (ARA)**

Use Asphalt Release Agents (ARA) for prevention of asphalt mixtures adhering to haul trucks and any other type of equipment that is used for asphalt paving operations. ARA shall meet the requirement of Table 423.3.4.2.1:1 and shall be on the NMDOT's Approved Products List. All testing will be in accordance with the NTPEP Evaluation of Asphalt Release Agents AASHTO ARA 14-01.



Table 423.3.4.2:1  
Asphalt Release Agent Properties

Test	Result
7-Day Asphalt Stripping Test	
Diluted	No Stripping
Full Strength	No Stripping
Mixture Slide Test (Truck beds)	10 g retained, maximum
Asphalt Performance Test	Does not fail after 3 pours

Delete Subsection 423.3.5.7 Test Strip & Shakedown Period in its entirety and replace with the following:

#### 423.3.5.7 Test Strip & Shakedown Period

Construct a test strip for each HMA mix design to be incorporated in the project prior to placing the material on mainline. The test strip will consist of a maximum of 1,000 tons, the minimum test strip size will be 500 tons or as approved by the Project Manager. Construct the test strip on shoulders, low volume segments of the pavement, or area approved by the Project Manager.

Obtain a minimum of three (3) Contractor and three (3) agency samples to evaluate the JMF, process control, and placement operations. If necessary, based on the results obtained from the test strip, develop a revised JMF, modify placement operations, and/or implement adjustments to process control procedures. Production and placement operations performed prior to approval of a revised JMF are at the Contractor's risk.

The test strip will be evaluated for acceptance according to Table 423.3.5.7:1 "Test Strip Acceptance Limits". If accepted, the test strip will be paid at the unit price for HMA Complete or HMA per Section 423.5 "Payment". If rejected, said material shall be handled in accordance with Section 423.3.6.1.3 Adherence to Specifications and Rejection of Non-specification Material. Remove rejected test strip material placed within the Roadway Prism at no cost to the Department. If the Contractor disagrees with removing and replacing unacceptable material placed in test strips outside the Roadway Prism, the Assistant District Engineer for Construction, based on engineering judgment, will decide if the material can remain in place with a maximum pay factor of 50%, or shall be removed and replaced at no cost to the Department.

If the test strip is rejected, construct a subsequent test strip. Do not proceed to full production until an accepted test strip is produced. After the test strip is accepted, continue to evaluate the mix properties and the JMF during the placement of the first two (2) sublots in the first lot. Changes may be made to the JMF or the mix proportions and/or properties with the concurrence of the State Materials Bureau, Project Manager, and Assistant District Engineer for Construction. For changes made prior to the completion of the first two (2) sublots, the adjustments will be applied to the entire lot for purposes of payment.

The Project Manager may waive test strip requirements for the Project, if requested by the Contractor based on prior experience with the JMF.

For QLA Projects, the Shakedown Period is defined as the first two (2) sublots produced in the first lot.

For Non-QLA Projects, the Shakedown Period is defined as the test strip. As the test strip is placed, evaluate the mix properties and the JMF. Changes may be made to the JMF or the mix proportions and/or properties with the concurrence of the State Materials Bureau, Project Manager, and the Assistant District Engineer for Construction.

Table 423.3.5.7:1  
Test Strip Acceptance Testing Limits <sup>a,c</sup>

Characteristic	Allowable Tolerances from TV
Air Voids, %	± 2.0
Pavement Density % <sup>c</sup>	90% to 97%
Hydrated Lime or Anhydrite Based Material %	±0.2%
Voids in the Mineral Aggregate (VMA), % <sup>a</sup>	± 2.0
Asphalt Content % <sup>a,b</sup>	± 0.50

<sup>a</sup> Asphalt Content will be determined using AASHTO T308 as modified by TTCP.

<sup>b</sup> HMA will not be rejected based on Asphalt Content Determined by AASHTO T 308

<sup>c</sup> Acceptance will be based on the average test values.

Include the following to Subsection 423.3.7 Dispute Resolution:

#### 423.3.7 Dispute Resolution

Include the following to the list of possible Laboratory selections:

The State Asphalt Engineer will select a Laboratory, without disclosing the name of the lab to Department Project personnel or Contractor personnel from the following, not in priority order:

#### 3. State Materials Bureau Laboratory

**SPECIAL PROVISIONS  
MODIFYING  
SECTION 424: WARM MIX ASPHALT**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete the first sentence of Subsection 424.2.3 Asphalt Binder in its entirety and replace with the following:

After the Warm Mix Additive is introduced, the PG grade of the binder shall comply with the PG grade as specified in the Contract.

Delete Subsection 424.2.3.1 Warm Mix Additive or Technology in its entirety and replace with the following:

**424.2.3.1 Warm Mix Additive or Technology**

Only Warm Mix Additives or Technologies approved by the Product Evaluation Program and listed on the NMDOT Approved Products List can be used on Department Projects.

To be placed on the Approved Products List, the WMA additive Supplier shall verify that the binder with the additive meets the PG grade of the specified binder. The potential additive Supplier shall demonstrate this to the Department by evaluating the Asphalt Binder containing the WMA additive at the expected additive dosage rates for compliance with the specified PG grade in accordance with AASHTO M320, Table 1 and Section 402.2.5, "Performance Graded Asphalt Binder ( PGAB)."

The type and dosage rate of Warm Mix Additives shall comply with the recommendations of the Warm Mix Additive Supplier. Warm Mix Additive dosage rates shall not deviate from those recommended by the Warm Mix Additive Supplier. If a terminal blend Warm Mix Additive is used, the dosage rate shall be shown on the Materials Certificate of Compliance.

For foamed asphalt systems, only foam systems that are approved by the State Asphalt Engineer shall be used.

Insert the following paragraph as third paragraph in Subsection 424.2.7 Reclaimed Asphalt Pavement:

**424.2.7 Reclaimed Asphalt Pavement**

If Plus Grades of PG asphalt binder is specified on the project, for quantities greater than 15% RAP, the Contractor shall extract, recover, and combine the RAP's asphalt binder with a virgin asphalt binder per AASHTO M 323, Appendix A. The Contractor shall ensure the resultant binder meets the entire AASHTO M

320 required Project PG asphalt binder properties indicated on the approved mix design including the additional Plus Grade requirements for Elastic Recovery and Solubility.

Delete Subsection 424.3.2 Mix Temperature Requirements in its entirety and replace with the following:

#### 424.3.2 Mix Temperature Requirements

For Non-foamed asphalt mixtures, the Contractor shall not allow the temperature of the WMA discharged from the mixer into the transport vehicle to be greater than 275 degrees F or less than 215 degrees F unless written recommendations by the asphalt cement Supplier, the Warm Mix Additive Supplier and the Mix Design Laboratory are provided to the Project Manager.

For Foamed asphalt mixtures utilizing RAP, the temperature may be increased up to 10 degrees above 275 degrees F when discharged from the mixer into the transport vehicle, as allowed in the approved mix design. The mix shall not be less than 215 degrees F unless written recommendations by the asphalt cement Supplier, the Warm Mix Additive Supplier and the Mix Design Laboratory are provided to the Project Manager.

WMA delivered to the Project with mix temperatures outside the acceptable range shall, at the sole discretion of the Project Manager, be removed and replaced at no cost to the Department.

Delete Subsection 424.3.4.2 Haul Equipment in its entirety and replace with the following:

#### 424.3.4.2 Haul Equipment

Haul asphalt mixtures with trucks that are tarped and have tight, clean, smooth metal beds and a thin coat (a minimal amount) of Department approved release agent in accordance with Section 424.3.4.2.1.

Include the following subsection:

##### 424.3.4.2.1 Asphalt Release Agents (ARA)

Use Asphalt Release Agents (ARA) for prevention of asphalt mixtures adhering to haul trucks and any other type of equipment that is used for asphalt paving operations. ARA shall meet the requirement of Table 424.3.4.2.1:1 and shall be on the NMDOT's Approved Products List. All testing will be in accordance with the NTPEP Evaluation of Asphalt Release Agents AASHTO ARA 14-01.

Table 424.3.4.2.1:1  
Asphalt Release Agent Properties

Test	Result
7-Day Asphalt Stripping Test	
Diluted	No Stripping
Full Strength	No Stripping
Mixture Slide Test (Truck beds)	10 g retained, maximum
Asphalt Performance Test	Does not fail after 3 pours

Delete Subsection 424.3.5.7 Test Strip & Shakedown Period in its entirety and replace with the following:

#### 424.3.5.7 Test Strip & Shakedown Period

Construct a test strip for each WMA mix design to be incorporated in the project prior to placing the material on the mainline. The test strip will consist of a maximum of 1,000 tons, the minimum test strip size will be 500 tons or as approved by the Project Manager. Construct the test strip on shoulders, low volume segments of the pavement, or area approved by the Project Manager.

Obtain a minimum of three (3) Contractor and three (3) agency samples to evaluate the JMF, process control, and placement operations. If necessary, based on the results obtained from the test strip, develop a revised JMF, modify placement operations, and/or implement adjustments to process control procedures. Production and placement operations performed prior to approval of a revised JMF are at the Contractor's risk.

The test strip will be evaluated for acceptance according to Table 424.3.5.7:1 "Test Strip Acceptance Limits". If accepted, the test strip will be paid at the unit price for WMA Complete or WMA per Section 424.5 "Payment." If rejected, said material shall be handled in accordance with Section 424.3.6.1.3 Adherence to Specifications and Rejection of Non-specification Material. Remove rejected test strip material placed within the Roadway Prism at no cost to the Department. If the Contractor disagrees with removing and replacing unacceptable material placed in test strips outside the Roadway Prism, the Assistant District Engineer for Construction, based on engineering judgment, will decide if the material can remain in place with a maximum pay factor of 50%, or shall be removed and replaced at no cost to the Department.

If the test strip is rejected, construct a subsequent test strip. Do not proceed to full production until an accepted test strip is produced. After the test strip is accepted, continue to evaluate the mix properties and the JMF during the placement of the first two (2) sublots in the first lot. Changes may be made to the JMF or the mix proportions and/or properties with the concurrence of the State Materials Bureau, Project Manager and Assistant District Engineer for Construction. For changes made prior to the completion of the first two (2) sublots, the adjustments will be applied to the entire lot for purposes of payment.

The Project Manager may waive test strip requirements for the Project, if requested by the Contractor based on prior experience with the JMF.

For QLA Projects, the Shakedown Period is defined as the first two (2) sublots produced in the first lot.

For Non-QLA Projects, the Shakedown Period is defined as the test strip. As the test strip is placed, evaluate the mix properties and the JMF. Changes may be made to the JMF or the mix proportions and/or properties with the concurrence of the State Materials Bureau, Project Manager and the Assistant District Engineer for Construction.

Table 424.3.5.7:1  
Test Strip Acceptance Testing Limits <sup>a,c</sup>

Characteristic	Allowable Tolerances from TV
Air Voids, %	± 2.0
Pavement Density % <sup>c</sup>	90% to 97%
Hydrated Lime or Anhydrite Based Material %	±0.2%
Voids in the Mineral Aggregate (VMA), % <sup>a</sup>	± 2.0
Asphalt Content % <sup>a,b</sup>	± 0.50

<sup>a</sup> Asphalt Content will be determined using AASHTO T308 as modified by TTCP.

<sup>b</sup> HMA will not be rejected based on Asphalt Content Determined by AASHTO T 308

<sup>c</sup> Acceptance will be based on the average test values.

Include the following to Subsection 424.3.7 Dispute Resolution:

#### 424.3.7 Dispute Resolution

Include the following to the list of possible Laboratory selections:

The State Asphalt Engineer will select a Laboratory, without disclosing the name of the lab to Department Project personnel or Contractor personnel from the following, not in priority order:

#### 3. State Materials Bureau Laboratory

**SPECIAL PROVISIONS**  
**MODIFYING**  
**SECTION 450: PORTLAND CEMENT CONCRETE PAVEMENT (PCCP) (QLA)**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

**450.3.1 Proportioning**

Use a Class F-LS concrete mix that has been reviewed and approved in accordance with Section 509 by the State Concrete Engineer. If the concrete is not slip-formed, an approved Class AA-HPD concrete mix shall be used instead of Class F.

Mix and place all concrete in accordance with Section 510.3 except for the following subsections: 510.3.5.5 "Price Adjustments", 510.3.5.5.1 "Cylinder Based Price Adjustments", and 510.3.5.5.2 "Price Adjustment based on In-Place Strength Tests".

Use a concrete mix that has been approved for use in the Freeze-Thaw zone, as defined in Section 509.2.8.2, "Freeze-Thaw Risk Zones" in which the Project is located.

Keep a copy of the approved mix design available on the jobsite when using the concrete mix.

**450.3.4 Joints**

Delete the first paragraph, and replace with the following:

Submit the proposed joint layout plan in .pdf format to the Project Manager, State Pavement Engineer and the State Materials Bureau for review and approval at least four (4) weeks before starting concrete slab construction. The proposed joint layout plan shall have the lane markings, and manholes and utilities where applicable, clearly depicted. Attempts shall be made in the submitted jointing plan for mainline paving not to place longitudinal joints in the wheel path. After receiving the recommendations and/or responses from the State Pavement Engineer and from the State Materials Bureau, the Project Manager will either approve or reject the submittal within 10 Working Days from the date of submittal.

Delete the second paragraph, and replace with the following:

Construct joints at the locations, intervals, and dimensions shown in the approved joint layout plan, and seal them in accordance with Section 452, "Sealing and Resealing Concrete Pavement Joints." Ensure no re-entrant corners. For typical slabs the longitudinal joint spacing shall not exceed 12 feet and the transverse joint spacing shall not exceed 15 feet. The maximum slab length-to-width ratio shall not be greater than 1.25:1 for the primary traveled lanes and longitudinal joints shall be placed within the lane stripe or as approved by the Project Manager and NMDOT Pavement Engineer. For joints in shoulders and non-mainline paving, length to width ratios exceeding 1.25:1 may be required to maintain the continuity of

the joints. Longitudinal tied joints shall be placed between bike lanes and primary traveled lanes. Skewed joints are not allowed. Avoid tapered joints if possible. If a tapered joint is formed, place a control joint at:

Delete fifth paragraph that states "Begin sawcutting of the joints as soon as possible"

Add to seventh paragraph, at the beginning:

Time to cut longitudinal and transverse joints is to be determined by the contractor. Approval of jointing plan by NMDOT does not absolve the contractor from responsibility of PCCP panels containing uncontrolled cracks. The Project shall not be granted Substantial Completion until all panels containing cracks have been removed and replaced.

#### **450.3.4.1 Longitudinal Joints**

Delete the second paragraph, and replace with the following:

The combined width of all concrete slabs tied together in any one placement shall not be more than 40 feet.

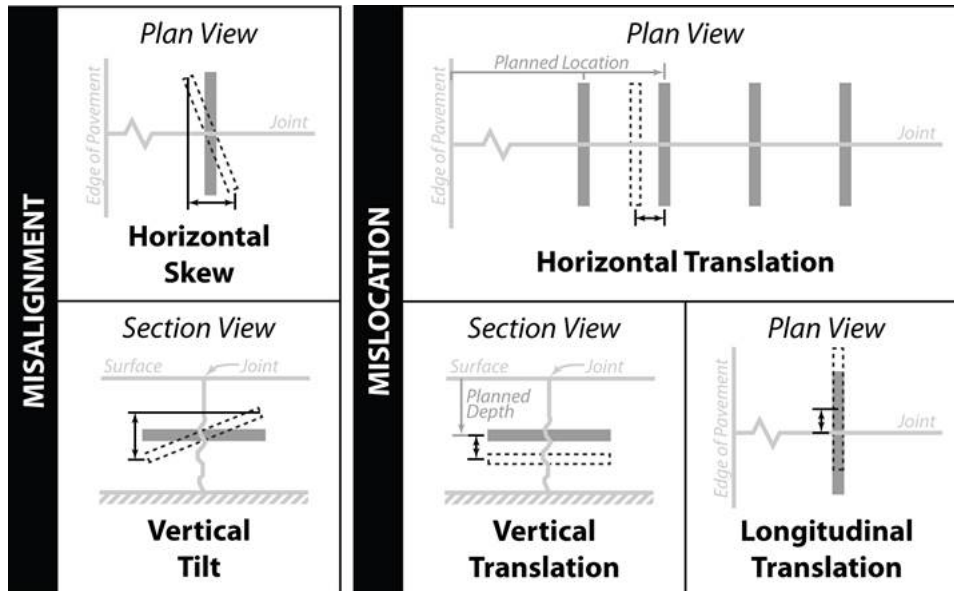
#### **450.3.4.2 Transverse Joints**

Delete the last sentence of the second paragraph, and replace with the following;



Dowel placement tolerances are:

- Horizontal Skew = 3/8 inch
- Vertical Tilt= 3/8 inch
- Horizontal translation = two (2) inches
- Vertical Translation = one (1) inch
- Longitudinal Translation / Side Shift = one (1) inch



- Horizontal Skew – The deviation of the dowel bar from true parallel alignment from the edge of the pavement, measured over the entire length of the dowel bar.
- Vertical Tilt – The deviation of the dowel bar from true parallel alignment from the surface of the pavement, measured over the entire length of the dowel bar.
- Alignment – The degree to which a dowel bar aligns true (e.g., parallel) to the horizontal and vertical planes of the pavement.
- Misalignment – Any deviation in either the horizontal or vertical plane from a true alignment condition (e.g., horizontal skew or vertical tilt).

#### 450.3.4.4 Final Location of Dowels and Tie Bars

Delete the first paragraph, and replace with the following;

Within 72 hours of concrete placement confirm that the final location of the transverse dowel bars and the longitudinal tie bars comply with the specified location and placement tolerances for every transverse joint and longitudinal joint in the first 120 linear feet of paving, or as otherwise specified. Ground Penetrating Radar equipped with dual side-by-side antennas or approved equal approved by the Project Manager and

State Concrete Engineer can be used for all embedded steel reinforcement. Magnetic Tomography (i.e.: MIT Scan 2) may be utilized. Regardless of the equipment used, the results from the nondestructive testing shall be confirmed by drilling or coring for at least three (3) dowel bars within the first 120 linear feet of paving.

#### 450.3.5.3 Surfacing Smoothness Requirements

Delete the second paragraph and 1. in its entirety;

Test the longitudinal smoothness of the PCCP finished surface in each through traffic lane and passing lane with an approved Profile, in accordance with Section 401, "Pavement Smoothness Measurement."

#### 450.3.5.4 Straightedge Measurements

Measure the surface of PCCP not subject to Profiler measurements using an approved 10-foot straightedge at both right angles and parallel to the centerline. Correct surface deviations in accordance with Section 401.

#### 450.3.8 Protections from and Opening to Traffic

Delete the second paragraph, and replace with the following:

Contractor is required to use Maturity Method, in accordance with Section 510.3.5.2 "In-Place Concrete Strength Measurements" and Section 450.3.3.2 "Placing, Spreading, and Consolidating Concrete" to determine time to allow traffic to operate on concrete pavement.

#### 450.5 BASIS OF PAYMENT

Include the following paragraph to BASIS OF PAYMENT.

##### Work Included in Payment

The Department considers dowels, tie bars, joint Materials, and required coring, including filling the core holes with concrete, Incidental to the Work in accordance with Section 452, "Sealing and Resealing Concrete Pavement Joints."

**SPECIAL PROVISIONS  
MODIFYING**

**SECTION 451: PORTLAND CEMENT CONCRETE PAVEMENT (PCCP) (Non-QLA)**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete subsection 451.3.9.1 Contractor Quality Control, and replace with the following;

**451.3.9.1 Contractor Quality Control**

See Section 450.3.10.1, "Contractor Quality Control"

January 27, 2015

**SPECIAL PROVISIONS**  
**MODIFYING**  
**SECTION 452: SEALING AND RESEALING CONCRETE PAVEMENT JOINTS**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete subsection 452.2.1 Sealant, and replace with the following;

**452.2.1 Sealant**

Joint sealant Material will either be a Type NS or SL single component silicone formulation meeting the requirements of ASTM D 5893 or a single component low modulus polyurethane formulation meeting the requirements of ASTM C 920 and Table 452.2.2:1, "Polyurethane Sealant Physical Requirements."

Provide a qualified manufacturer's representative on the Project for at least the first Day of sealant application. Prepare and seal the joints in accordance with proper procedures approved by the manufacturer's representative.

Obtain the manufacturer's written verification of primer, backer, and sealant compatibility.

**SPECIAL PROVISIONS**  
**MODIFYING**  
**SECTION 455: DIAMOND GRINDING AND DIAMOND GROOVING OF PORTLAND**  
**CEMENT CONCRETE PAVEMENT (PCCP)**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Replace the following sub-section with:

**455.3.4 Final Surface Finish**

Produce a pavement surface in accordance with Section 450.3.5.3, "Surfacing Smoothness Requirements."

Ensure the texture has parallel longitudinal corrugations that present a narrow ridge corduroy-type appearance. Make the peaks and grooves approximately 0.08 inch apart in elevation. Make the grooves from 0.08 inch to 0.16 inch wide, and the peaks from 0.08 inch to 0.12 inch wide. Determine the appropriate number of grooves per yard to produce the specified surface requirements.

April 25, 2018

**SPECIAL PROVISIONS  
MODIFYING  
SECTION 501: DRIVEN PILES**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete Section 501: DRIVEN BEARING PILES in its entirety and replace with the following:

### 501.1 DESCRIPTION

The Work consists of providing and driving piles, including splicing additional pile lengths and cut-offs.

### 501.2 MATERIALS

#### 501.2.1 Standards

The Contractor shall provide Materials in accordance with Table 501.2.1:1, "Applicable Pile Standards."

Table 501.2.1:1  
Applicable Pile Standards

Material description	Standard
Structural Steel piles and columns (HP)	ASTM A 572, Grade 50
Splice plates for Structural Steel piles	AASHTO M 270, Grade 50
Castings for pile shoes	ASTM A 148
Steel pipe (longitudinal or continuous spiral welded) piles and columns	ASTM A 252, Gr. 3
Backing rings for steel pipe pile splices	ASTM A 252, Gr. 3
End plate for closed end pipe piles	AASHTO M 270, Grade 50
Portland cement concrete, Class G	Section 509, "Portland Cement Concrete Mix Designs."
Precast pre-stressed concrete piles	Section 518, "Pre-Stressed Concrete Members."
Paint	Section 544, "Protective Coating of New Structural Steel."

#### 501.2.2 Piles

##### 501.2.2.1 Steel Piles

The Contractor shall use no more than one (1) field splice to make steel piles that are from 30 ft to 80 ft long. The Contractor shall use no more than two (2) field splices to make steel piles longer than 80 ft. The minimum acceptable splice length is five (5) ft.) The Contractor shall not use more than two (2) splices per steel pile. The Department will not accept camber and sweep more than the mill tolerance.

#### 501.2.2.2 Continuous Spiral Weld Pipe Piles

The Contractor shall provide longitudinal or spiral welded pipe, on the Department's Approved Products List, with only complete full joint penetration welds conforming to the requirements of AWS D1.1 – Structural Welding Code.

#### 501.2.2.3 Pre-cast Pre-stressed Concrete Piles

The Contractor shall manufacture pre-cast pre-stressed concrete piles in accordance with Section 518, "Pre-Stressed Concrete Members."

#### 501.2.2.4 Pile Splices

The Contractor shall provide Materials in accordance with Table 501.2.1:1, "Applicable Pile Standards." The Contractor shall use prefabricated splices only when specified. If the Contract requires additional length due to inadequate capacity, the Contractor shall construct splices in accordance with Section 501.3.5.5, "Splices."

The Contractor shall perform field welding inspection in accordance with Section 541.3.7.4, "Field Welding."

#### 501.2.3 Submittals

The Contractor shall submit the following to the Project Manager:

1. Three (3) certified copies of mill test reports (MTR) for the following:
  - 1.1. Structural Steel piles;
  - 1.2. Pile columns;
  - 1.3. Steel pipe piles and pipe pile columns;
  - 1.4. Splice plates;
  - 1.5. Backing rings;
  - 1.6. End plates;
  - 1.7. Pile shoes;

Indicate heat numbers on test reports and on each pile provided.
2. Welder Certification in accordance with Section 541, "Steel Structures," sufficient for welding field splices and end plates;
3. Class G concrete mix design approved by the State Concrete Engineer in accordance with Section 509, "Portland Cement Concrete Mix Designs;"
4. Pre-cast pre-stressed concrete piles certification and testing in accordance with Section 518, "Pre-Stressed Concrete Members;" and

5. Paint certification in accordance with Section 544, "Protective Coating of New Structural Steel."

#### 501.2.3.1 Pile Driving Equipment Submittals

The Contractor shall submit pile driving Equipment information to the Project Manager 30 Days before beginning pile driving. The Contractor shall submit the information on the Department's *Pile and Driving Equipment Data Form*. The Contractor shall provide information required on the form including the following:

1. Pile hammer make, model number, and serial number;
2. Driving head assembly, type, model number, and weight;
3. Hammer cushion, material, size, and thickness; and
4. Pile cushion, material, size, and thickness.

The Department has fourteen (14) Days to accept or reject the proposed pile driving Equipment after the Project Manager receives the *Pile and Driving Equipment Data Form*. Acceptance will be in accordance with Section 501.3.1.4, "Approval of Driving System."

If the Department rejects the Equipment, the Contractor shall modify or replace the pile driving Equipment and revise and resubmit the form. The Department will have seven (7) Days to accept or reject the revised *Pile and Equipment Data Form*.

The Contractor shall submit the manufacturer's chart showing stroke and blows per minute when proposing the use of open-end (single-acting) diesel hammers.

The Contractor shall submit a chart equating bounce chamber pressure and hose length to either equivalent energy or stroke when proposing use of closed-end (double-acting) diesel hammers. The Contractor shall specify hose lengths for closed-end hammers. The Contractor shall calibrate the chart to atmospheric pressure based on the Project site elevation to the nearest 1,500 ft elevation.

The Contractor shall submit a chart equating the plant operating pressure to the equivalent delivered energy of the hammer, including losses in the hose, when proposing the use of double acting or differential acting air/steam hammers. The Contractor shall calibrate the chart to atmospheric pressure based on the Project site elevation to the nearest 1,500 ft elevation.

The Contractor shall submit a certificate of calibration to the Project Manager for the pressure gauge required for double acting hammers or for delivered energy for hydraulic hammers. The Contractor shall provide certificate of calibration from a National Institute of Standards and Technology traceable Laboratory performed no more than six (6) months before use.

### 501.3 CONSTRUCTION REQUIREMENTS

#### 501.3.1 Driven Pile Pre-construction Conference

The Project Manager will hold a Driven Pile Pre-construction Conference at least seven (7) Days before the anticipated pile driving begins to review the specification requirements and discuss the Contractor's preparations. The Contractor shall ensure that at a minimum the following attend the



conference:

1. Pile Driving Superintendent;
2. Pile Driving Inspector;
3. Foundation Engineer of Record (available for consult via teleconference);
4. Prime Contractor

The recommended agenda is available from the State Geotechnical Engineer.

## 501.3.2 Equipment

### 501.3.2.1 Pile Hammers

The Contractor shall use, diesel, or hydraulic hammers for driving piles. The Contractor shall only use gravity hammers where specified for use in dynamic testing of drilled shafts.

#### 501.3.2.1.1 Diesel Hammers

The Contractor shall use open-end diesel hammers that allow the Inspector to see the hammer stroke during pile driving operations, unless accompanied by a saximeter stroke measurement device.

The Contractor shall use closed-end diesel hammers equipped with a bounce chamber pressure gauge, mounted with a hose long enough for the Inspector to read.

#### 501.3.2.1.2 Hydraulic Hammers

The Contractor shall use hydraulic hammers equipped with a digital display of delivered hammer energy for each stroke. The Contractor shall provide certification of hammer energy measurement read-out to the Project Manager.

### 501.3.2.2 Driving Apparatus

#### 501.3.2.2.1 Hammer Cushion

The Contractor shall equip impact pile driving Equipment (except gravity and hydraulic hammers) with hammer cushion material to prevent damage to the hammer or pile and to ensure uniform driving. The Contractor shall use hammer cushions made in accordance with the hammer manufacturer's guidelines. The Contractor shall not use wood, wire rope, or asbestos hammer cushions. The Contractor shall place a manufacturer-recommended striker plate on the hammer cushion to ensure uniform compression of the cushion material.

#### 501.3.2.2.2 Drive Head

The Contractor shall equip impact hammer driven piles with a steel drive head to distribute the hammer blow. The Contractor shall align the drive head axially with the hammer and the pile. The Contractor shall ensure that it is guided by leads and not free-swinging.

The Contractor shall use a drive head that fits around the pile head to maintain the proper alignment of the hammer and pile and not transfer the torsional forces during driving. The Contractor shall cut pile heads squarely. The Contractor shall provide a drive head insert to fit the pile type and dimensions, as recommended by the hammer manufacturer.

For pre-cast concrete and pre-stressed concrete piles, the Contractor shall use a pile head that is perpendicular to the longitudinal axis of the pile to prevent eccentric impacts.

#### 501.3.2.2.3 Pile Cushion

Before driving, the Contractor shall place a plywood pile cushion that is at least four (4) inches thick on the pile head. Greater thicknesses may be required if the Wave Equation Analysis (per Section 501.3.3.1.1, "Wave Equation Analysis") or dynamic testing (per Section 501.3.3.1.2, "Dynamic Formula") determines that the pile compressive or tensile stresses are unacceptable.

#### 501.3.2.2.4 Leads

While being driven, the Contractor shall support piles in line and position with leads. The Contractor shall construct pile driver leads to allow the hammer free movement while maintaining alignment of the hammer and the pile to ensure concentric impacts.

The Contractor shall not extend the pile section being driven above the leads. The Contractor shall embed the leads in the ground or restrain by a rigid brace to maintain alignment. The Contractor shall ensure that the leads are long enough to make a follower unnecessary, and design the leads to permit alignment of batter piles.

The Contractor shall use fixed or swinging leads. The Contractor shall fit swinging leads with a pile gate at the bottom. For batter piles, the Contractor shall use a horizontal brace between the crane and the leads.

#### 501.3.2.2.5 Pile Extensions

The Contractor shall not use followers. Where required and approved by the State Geotechnical Engineer, the Contractor shall use an extra length pile with splices (if necessary) and ensure that the leads are of adequate length so that followers will not be required. After cut-off, undamaged extra length pile may be re-used as a production pile.

#### 501.3.2.2.6 Templates

The Contractor shall use securely anchored heavy metal templates to maintain pile positions when driving a pile bent.

#### 501.3.2.2.7 Pre-Boring Equipment

The Contractor shall use pre-boring Equipment in accordance with Section 501.3.4.2, "Pre-Boring."

501.3.2.2.8 Inspection Equipment

The Contractor shall provide and use Equipment to illuminate the entire interior length of pipe piles after they are driven.

501.3.2.3 Minimum Manufacturer’s-Rated Hammer Energy

Unless the Contract specifies a minimum hammer energy, the Contractor shall use a manufacturer-rated hammer at or above the appropriate minimum energy level corresponding to the required nominal pile capacity in accordance with Table 501.3.2.3:1, “Required Hammer Energy.”

**Table 501.3.2.3:1  
Required Hammer Energy**

Nominal Pile Capacity (Kips)	Minimum Manufacturer’s Rated Hammer Energy (Ft - lb)
≤ 225	45,000
226 – 350	50,000
351 – 400	55,000
401 – 450	60,000
≥ 451	Wave Equation Analysis required

501.3.2.4 Approval of Driving System

The State Geotechnical Engineer will approve the driving system. The driving system includes the hammer and driving apparatus proposed on the Department’s *Pile and Driving Equipment Data Form*. Transporting the driving system to the Project site before it is approved will be done at the Contractor’s risk.

The driving system will be approved based on the following:

1. The driving system meets the requirements of Sections 501.3.2.1, “Pile Hammers,” and 501.3.2.2, “Driving Apparatus;”
2. The manufacturer’s rated hammer energy meets or exceeds the minimum hammer energy requirements established in Section 501.3.2.3, “Minimum Manufacturer’s-Rated Hammer Energy;”
3. The Wave Equation Analysis indicates that the expected driving resistance (required nominal capacity) can be achieved at less than ten (10) blows per inch;
4. The Wave Equation Analysis indicates that the pile stresses will not exceed the allowable stresses at the expected driving resistance (required ultimate capacity) as indicated in Table 501.3.2.4:1, “Wave Equation Analysis Allowable Driving Stress;”
5. When dynamic tests are specified in accordance with Section 504, “Load Testing of Driven Piles,” Acceptance of the hammer system will be based on the measured energy transfer efficiency in accordance with Section 501.3.5, “Variations of Approved Driving Systems.”

Table 501.3.2.4:1  
Wave Equation Analysis Allowable Driving Stress

Description	Maximum stress <sup>a,b</sup>
<b>Steel piles</b>	
Compressive stress	90% of yield strength (0.90 F <sub>y</sub> )
<b>Concrete piles</b>	
	85% of the compressive strength <sup>c</sup> minus the effective pre-stress
Compressive stress	(0.85 F' <sub>c</sub> - effective pre-stress)
Tensile stress	(3√F' <sub>c</sub> + effective pre-stress)

<sup>a</sup>If the pile stresses determined by Wave Equation Analysis exceed the allowable stresses, the Department may approve the hammer system if a heavier pile section approved by the State Geotechnical Engineer is substituted. If necessary, provide heavier piles at no additional cost to the Department.

<sup>b</sup>If the pile stresses determined by Wave Equation Analysis exceed the allowable stresses, the Department may approve the hammer system if additional static or dynamic testing is performed and verifies that pile driving resistances will produce stresses in the pile within acceptable ranges. Perform additional testing at no additional cost to the Department.

<sup>c</sup>Compressive strength at 28 Days

### 501.3.3 Driven Pile Capacity

The nominal pile capacity will generally be the required factored design resistance of the pile divided by the specified AASHTO LRFD resistance factor, unless specified otherwise. The specified AASHTO resistance factor depends on the specified pile testing and the specified method for monitoring the pile capacity. The Contractor shall determine resistance factors in accordance with Table 501.3.3:1, "LRFD Resistance Factors for Driven Piles," unless otherwise specified.

Table 501.3.3:1  
LRFD Resistance Factors for Driven Piles

Test Method	Capacity Monitoring Method	LRFD Resistance Factor
Static load test	Wave Equation Analysis	0.8
Dynamic load test	Wave Equation Analysis	0.65
None performed	Wave Equation Analysis	0.5
None performed	Dynamic Formula	0.4

In some cases, the required nominal pile capacity shown may be higher than the factored pile design resistance divided by the specified LRFD resistance factor. In these cases, the required nominal pile capacity includes resistance to be encountered penetrating unsuitable layers in addition to the required factored design resistance divided by the specified LRFD resistance factor.

501.3.3.1 Determination of Pile Capacity with Impact Hammer

501.3.3.1.1 Wave Equation Analysis

The State Geotechnical Engineer will determine the nominal pile capacity based on a Wave Equation Analysis.

The Contractor shall drive piles to the required resistance based on the operating energy of the hammer. The *Pile Driving Acceptance Chart* will indicate the resistance criteria.

The Contractor shall obtain pile penetration by achieving the Wave Equation resistance criteria in accordance with Section 501.3.6.2, "Minimum Penetration Elevation," and Section 501.3.6.3, "Estimated Penetration Elevation." If the predicted pile penetration varies from the Plan length by ± 25% or more, the State Geotechnical Engineer will perform a revised Wave Equation Analysis in accordance with Section 501.3.5.2, "Revised Wave Equation Analysis."

501.3.3.1.2 Dynamic Formula

The Contractor shall use the dynamic formula to determine nominal pile capacity only if specified or approved by the State Geotechnical Engineer. The Contractor shall drive piles to the depth necessary to obtain the nominal pile capacity according to the following equation and in accordance with Section 501.3.6.2, "Minimum Penetration Elevation:"

$$R_n = 2 \times F \times E \times \ln(10N) \tag{1}$$

Where,

- $R_n$  = nominal bearing resistance, (kips)
- $F$  = a constant that varies with hammer and pile type
 

Air/Steam hammers; all piles	$F = 1.8$
Open ended diesel hammers with concrete	$F = 1.2$
Open ended diesel hammers with steel piles	$F = 1.6$
Closed ended diesel hammers	$F = 1.2$
- $E$  = developed energy (ft-kips)
- $N$  = average penetration resistance in blows per inch for the last four (4) inches of driving

501.3.4 Preparation for Driving

501.3.4.1 Abutment Piles

Unless otherwise shown, and before driving the abutment piles, the Contractor shall place and compact the approach Embankment Material underneath and adjacent to the abutment to the required density. After compaction, the Contractor shall ensure that the surface of the approach Embankment is not lower than the elevation of the bottom of the abutment.

501.3.4.2 Pre-Boring

If specified, the Contractor shall pre-bore holes at pile locations to the depths and size in accordance

with the Plans. If the Contract does not specify pre-bored, but the State Geotechnical Engineer approves the use of pre-bored holes, the Contractor shall drill the holes to the depth established by the State Geotechnical Engineer. The Contractor shall ensure that the depth permits the piles to be driven to the minimum penetration elevation and required bearing capacity without overstress or damage to the piles. The Contractor shall pre-bore holes in the presence of the Inspector. After placing pile, the Contractor shall fill voids remaining around the pile with sand or other approved material.

#### 501.3.4.2.1 Application of Pre-Bored Holes

The Contractor shall only use pre-bored holes as specified, or when demonstrated to the satisfaction of the State Geotechnical Engineer that a pile cannot be driven to the minimum penetration elevation in accordance with Section 501.3.6.2, "Minimum Penetration Elevation."

The Department will determine the need for pre-bored pile holes based on the following driving resistances:

1. Steel piles: when, in ten (10) blows, the set is less than 3/4 inch with the hammer delivering the minimum energy required;
2. Pre-cast concrete piles: when, in ten (10) blows, the set is less than one (1) inch with the hammer delivering the minimum energy as required in the Contract;
3. All piles: if the resistance is sufficient to overstress the pile as indicated by the Wave Equation Analysis Field Acceptance Chart for the approved hammer system.

#### 501.3.4.2.2 Diameter of Pre-bored Holes

The State Geotechnical Engineer will establish the diameter of pre-bored holes. In general, the diameter established will be as shown in Table 501.3.4.2.5:1, "Diameter of Pre-Bored Holes in Soil," or Table 501.3.4.2.5:2, "Diameter of Pre-Bored Holes in Rock, Shale, or Conglomerate."

#### 501.3.4.2.3 Obstructions

If the Contractor encounters subsurface obstructions, the Contractor may increase the borehole diameter to the smallest dimension adequate for pile installation. The Contractor shall penetrate obstructions in accordance with Section 502.3.5.2.2, "Obstructions."

#### 501.3.4.2.4 Rock Sockets

If the Contract requires the Contractor to drive a pile in a rock socket and the bore hole is larger than the diameter of the pile, the Contractor shall fill around that part of the pile in solid material with Class G concrete. The Contractor shall place concrete in accordance with Section 502.3, "Construction Requirements." The Contractor shall fill the part of the pile above the rock socket with sand or other suitable material.

#### 501.3.4.2.5 Temporary Casing

Temporary casing may be required if the soil sloughs or caves into the hole or if a hole is required to be kept dry from groundwater, such as socketed holes into shale. The Contractor shall increase the diameter of the drilled hole as necessary to place the temporary casing. The Contractor shall pull the

casing after driving the pile and after the hole is backfilled with the appropriate Material.

Table 501.3.4.2.5:1  
Diameter of Pre-Bored Holes in Soil

Pile type	Diameter
Cylindrical concrete and pipe piles	two (2) inch smaller than the outside pile diameter
Square concrete piles	Minimum pile width
H-piles	two (2) inch smaller than the diagonal measurement of pile

Table 501.3.4.2.5:2  
Diameter of Pre-Bored Holes in Rock, Shale, or Conglomerate

Pile type	Diameter
Cylindrical concrete and pipe piles	Outside pile diameter
Square concrete piles and H-piles	Diagonal measurement of pile

501.3.4.3 Pile and Hammer Cushion Preparation

Before the drive head is attached, the Contractor shall make the pile heads plane and perpendicular to the longitudinal axis of the pile. The Contractor shall protect pre-cast concrete pile heads with a pile cushion in accordance with Section 501.3.2.2.3, "Pile Cushion." The Contractor shall provide a new pile cushion for each pre-cast concrete pile. The Contractor shall replace the pile cushion if it is either compressed more than one-half of the original thickness or begins to burn during driving.

The Contractor shall inspect the hammer cushion with the Inspector present when beginning pile driving at each Structure or after each 100 h of pile driving, whichever is less. If the hammer cushion thickness is reduced by more than 25% of the original thickness, the Contractor shall replace the cushion before proceeding with driving.

501.3.4.4 Conditions to Proceed

The Contractor shall not drive production piles until it meets the following conditions:

1. The State Geotechnical Engineer approves the driving system in accordance with Section 501.3.2.4, "Approval of Driving System;"
2. The Inspector completes the *Pile Driving Field Inspection Form* and the form is then approved by the Project Manager;
3. All required load testing is complete as specified and in accordance with Section 504, "Load Testing of Driven Piles", Project Manager may approve driving production piles in a foundation element upon satisfactory completion of a load test prior to completion of remaining load tests;
4. The *Pile Driving Acceptance Chart* is completed and stamped with New Mexico P.E. seal by the State Geotechnical Engineer and approved by the State Geotechnical Engineer and submitted to the Project Manager;
5. The hammer and leads are aligned with the pile plan in vertical or battered position; and

6. The Inspector is present before beginning operations.

### 501.3.5 Variations of Approved Driving Systems

The Contractor shall only use the approved pile driving system. The Contractor shall submit a new *Pile and Driving Equipment Data Form* to the Project Manager for variations to the approved driving system. The Project Manager will notify the Contractor of Acceptance or rejection within 72 h of the receipt of the data form. The time required for submission, review, and approval of a variation in the driving system will not constitute a basis for a Contract Time extension.

#### 501.3.5.1 Variations Due to Dynamic Testing

The State Geotechnical Engineer will reject the hammer if the hammer is unable to transfer sufficient energy to perform the dynamic testing in accordance with Section 504, "Load Testing of Driven Piles." Reasons for rejection include pre-ignition from overheating or malfunctioning of the injection system and poor hammer or capblock maintenance. After rejection, the Contractor shall repair or replace the hammer.

#### 501.3.5.2 Revised Wave Equation Analysis

The Department will perform a revised Wave Equation Analysis to establish revised driving resistance criteria when the following conditions occur:

1. Variations in the driving system;
2. Pre-boring not originally specified in the Contract is used to facilitate pile penetration; or
3. The pile penetrations are considerably more or less than that estimated in the Contract.

The Contractor shall not drive piles until the Project Manager receives the revised Pile Acceptance Chart.

### 501.3.6 Pile Driving Operations

Approval of a pile hammer relative to allowable driving stresses will not relieve the Contractor of responsibility for damaged piles for the following reasons:

1. Misalignment of the leads;
2. Failure of capblock or cushion material;
3. Failure of splices;
4. Malfunctioning of the pile hammer; or
5. Other improper construction methods.

If the State Geotechnical Engineer determines that damage caused by one (1) of the above reasons impairs the pile strength, or questions the measured resistance, the Contractor shall replace the piles at no additional cost to the Department.

The Contractor shall schedule pile driving to prevent vibrations and pressure from damaging piles or other in-place concrete structural components that have reached their initial set, but that do not have



sufficient strength to resist damage.

The Contractor shall replace the hammer cushion and pile cushion when necessary in accordance with Section 501.3.4.3, "Pile and Hammer Cushion Preparation," to avoid excessive compression or damage.

#### 501.3.6.1 Pile Measurement and Recording

The Contractor shall ensure that the first pile driven at each Substructure element is accessible so the Inspector can measure and mark the pile in 12-inch increments. On the first pile driven, the Inspector will record blows per 12 inches of penetration until the pile tip is within five (5) ft of the specified penetration elevation or until the pile begins to set up, whichever comes first. Then, the Inspector will measure and record the penetration in inches per ten (10) or 20 blows, as directed by the State Geotechnical Engineer, until the Contractor achieves the specified set.

#### 501.3.6.2 Minimum Penetration Elevation

If the Contract specifies a "Minimum Penetration Elevation" and the driven piles do not develop the required nominal bearing capacity at that elevation, the Contractor shall continue driving the piles until the required resistance is obtained. If the piles develop a set, determined in accordance with Section 501.3.4.2.3, "Application of Pre-Bored Holes," before the pile tip reaches the minimum penetration elevation, the Contractor shall perform drilling to prevent damaging the pile while driving to the minimum penetration elevation.

#### 501.3.6.3 Estimated Penetration Elevation

If the Contract specifies an estimated penetration elevation, the Contractor shall drive the piles to the required nominal capacity. If the piles attain the required resistance above the estimated penetration elevation, the Contractor shall terminate driving and the Department will accept the piles at the shallower penetration.

#### 501.3.6.4 Pile Groups

If driving multiple rows of piles for pile cap foundations, the Contractor shall drive the piles to the estimated or minimum penetration elevation, before determining pile capacity for Acceptance. After driving the piles in the group to the required tip elevation, the Contractor shall re-strike to determine the pile nominal capacity. If the piles do not develop the required nominal bearing capacity at that elevation, the Contractor shall continue to drive until the required resistance is attained.

#### 501.3.6.5 Splices

The Contractor shall ensure that steel pile splices are in accordance with Section 541, "Steel Structures." The Contractor shall make splices for closed-end pipe piles watertight.

The Contractor shall use the cement dowel method to make splices for pre-cast concrete piles unless the State Geotechnical Engineer approves an alternate splice detail. The Contractor shall select mechanical splices for concrete or steel piles from the Department's *Approved Products List*.

#### 501.3.6.6 Cut-Off Lengths

The Contractor shall cut off the tops of all permanent piles at the elevation shown or as directed. The Contractor shall remove the cut off lengths from the Project.

#### 501.3.6.7 Filling Closed-End Pipe Piles

After driving closed-end steel-pipe piles, the Contractor shall inspect for water or other Deleterious Material inside the piles. The Contractor shall remove water and foreign substances from inside the piles. After the Project Manager approves the piles, the Contractor shall fill them with Class A (any risk zone) concrete with a 4 1/2 inch to eight (8) inch slump. The Contractor shall provide a superplasticizer in accordance with Section 510.3.4.4, "Superplasticizers" from the Department's *Approved Products List* to achieve the slump. The Contractor shall place the concrete in accordance with Section 502.3.4.4, "Concrete Placement."

#### 501.3.6.8 Filling Open-End Pipe Piles

After driving open-end steel pipe piles, the Contractor shall inspect for water inside the piles. If water is present, the Contractor shall place pea gravel in the pile to an elevation of three (3) feet above the water level. If the Project Manager approves the piles, the Contractor shall fill them with Class A (any risk zone) concrete with a 4 1/2 inch to six (6) inch slump. The Contractor shall provide a superplasticizer in accordance with Section 510.3.4.4, "Superplasticizers" from the Department's *Approved Products List* to achieve the slump. The Contractor shall place the concrete in at least the upper ten (10) ft of the piles in accordance with Section 502.3.5.4, "Concrete Placement."

#### 501.3.7 Pile Acceptance

##### 501.3.7.1 Pile Load Capacity and Penetration

The Contractor shall drive piles to the required nominal capacity as determined by the specified capacity monitoring method in accordance with Section 501.3.3, "Driven Pile Capacity."

If specified, the Contractor shall install piles to the penetration elevation in accordance with Section 501.3.6.2, "Minimum Penetration Elevation."

##### 501.3.7.2 Location and Alignment Tolerances

The Contractor shall not pull laterally on piles to correct misalignment or splice a properly aligned section on a misaligned section to meet tolerances.

##### 501.3.7.2.1 Trestle and Abutment Beam Piling

The Contractor shall drive trestle piling and abutment beam piling with a maximum variation of 1/4 inch per foot from the vertical or batter shown. The pile variance will be no more than three (3) inches from the Plan position at any point along its length.

## 501.3.7.2.2 Foundation Piling

The Contractor shall drive foundation piling capped below grade with a maximum variation of 1/4 inch per foot from the vertical or batter shown, with the tops of the piles at cut off elevation varying no more than three (3) inches from the Plan position.

## 501.3.7.2.3 Edge Distance

The Contractor shall not place piles within nine (9) inches of an edge of a cap or beam. The Contractor shall increase the size of the cap or beam to meet this edge distance requirement at no additional cost to the Department.

## 501.3.7.2.4 Pile Orientation

The Contractor shall ensure that H-piles do not rotate more than 15° out of Plan orientation of the strong axis and weak axis of the pile shown.

## 501.3.7.2.5 Pile Tops

The Contractor shall cut off the tops of piles perpendicular to the longitudinal axis of the pile or to a specified bevel, and within the specified tolerance.

## 501.3.7.3 Damaged Pile Limitations

The Department will reject damaged piles based on the following criteria:

1. Piles that are broken, cracked, or split;
2. Pre-cast concrete piles that show signs of crushing and spalling of the concrete, splitting, or visible cracks that affect the strength or service life of the pile;
3. Steel piles bent or deformed during installation and exceed mill tolerances for sweep and camber;  
or
4. Closed-end pipe piles that show evidence of groundwater infiltration, or breaks or deformation that would impair the strength of the completed piles.

## 501.3.7.4 Correcting Rejected Piles

The Contractor shall correct piles damaged during driving because of internal defects or improper driving with methods approved by the Project Manager, at no additional cost to the Department.

If the Contractor exceeds the location or alignment tolerances, and the State Geotechnical Engineer determines that corrective measures are necessary, the Contractor shall design and construct corrective measures at no additional cost to the Department. The State Geotechnical Engineer will approve the design.

Corrective methods may include the following:

1. Removing and replacing the pile with a new, and when necessary, longer pile;

2. Driving additional piles next to the defective piles; or
3. Extending the footing to properly embed the pile.

#### 501.4 METHOD OF MEASUREMENT

##### 501.4.1 Pile Extensions

The Project Manager will include any approved extension lengths in the pile measurement.

##### 501.4.2 Driven Piles

The Department will measure *Driven Piles* below the cut-off elevation to the nearest foot.

##### 501.4.3 Pile Cut-Offs

The Department will calculate *Pile Cut-Offs* to the nearest foot by subtracting the total lengths of the in-place piles (after cut-off) from the total Plan lengths.

##### 501.4.4 Pre-bored Holes for Driven Piles

The Department will only measure that portion of *Pre-Bored Holes for Bearing Piles* below the Plan grade elevation. The Department will not measure that portion of pre-bored holes drilled through soil or rock layers (overburden) that the Contractor later excavates.

##### 501.4.5 Pile Splices

The Department will measure *Pile Splices* required for piles driven deeper than the estimated penetration elevation to achieve the required nominal capacity. The Department will only measure up to two (2) splices per pile in order to drive the piles beyond the specified penetration elevation to meet the required resistance.

#### 501.5 BASIS OF PAYMENT

Pay Item	Pay Unit
<i>Driven Piles (type)</i>	Linear Foot
<i>Pre-bored Holes for Driven Piles, ___in diameter</i>	Linear Foot
<i>Pile Splices</i>	Each
<i>Pile Shoes</i>	Each
<i>Pile Cut-Offs</i>	Linear Foot

##### 501.5.1 Work Included In Payment

The following Work will be considered as included in the payment for the main item(s) and will not be measured or paid for separately:

1. Extra length pile used as a follower;
2. Material and backfill placement for prebored holes for bearing piles, including Class G concrete in rock sockets;
3. Temporary casing and oversizing of prebored holes to accommodate temporary casing;
4. Steel reinforcement required in steel pipe piles filled with concrete;
5. Furnishing and driving pile to replace piles which were previously accepted by the Project Manager and are subsequently damaged through improper handling, driving, or construction operations prior to completion of the Contract;
6. Increases to the Contract quantity of prebored holes for bearing piles which are not called for in the Contract, but are approved by the State Geotechnical Engineer, will be paid for at a negotiated unit price per foot as established by the Project Manager;
7. Piles that have been driven or partially driven and are subsequently rejected by the Project Manager and are pulled or left in place;
8. Class A concrete and placement in pipe piles;
9. Mobilization and time lost due to re-mobilization of new hammer due to poor hammer performance or as determined by dynamic testing;
10. Restriking of piles in pile groups to determine pile capacity.
11. Pile splices provided within the Plan pile length.

April 25, 2018

## SPECIAL PROVISIONS MODIFYING

### SECTION 502: DRILLED SHAFTS

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete Section 502: DRILLED SHAFTS in its entirety and replace with the following:

#### 502.1 DESCRIPTION

This Work consists of constructing drilled shafts. Drilled shaft construction, with or without under-reamed bottoms ("bell bottoms"), includes excavation, bottom hole cleaning, reinforcing steel placement and concrete.

##### 502.1.1 Work Experience

The Contractor shall demonstrate to the State Geotechnical Engineer that the Contractor is able to perform the Work in accordance with the Contract. The Contractor shall provide evidence of two (2) Projects within two (2) years of the Bid date involving drilled shaft construction for the conditions expected and use a Superintendent with experience from one (1) of those Projects who will provide all oversight responsibility of all aspects of drilled shaft construction covered in Section 502, "Drilled Shafts." The Contractor shall provide the latest NMDOT drilled shaft inspection form of each drilled shaft element signed by the Drilled Shaft Superintendent indicating drilled shaft construction completed in accordance with Section 502, "Drilled Shaft" requirements.

##### 502.1.2 Geotechnical Data Information

Project *Foundation and/or Geotechnical Reports* include subsurface conditions present at the time of field investigation. The Contractor shall use this information to anticipate conditions that include but are not limited to subsurface water, obstructions, soil stability, and presence of rock.

If Foundation and/or Geotechnical Report information is unavailable, the Contractor shall assume the Casing Construction Method and/or the Slurry Displacement Construction Method referenced in 502.3.4.

##### 502.1.3 Submittals

The Contractor shall submit construction and field designs to the Project Manager for review and approval by the State Geotechnical Engineer. 30 Days shall be allowed for submittal review, 14 additional Days shall be allowed for resubmittal review.

#### 502.2 MATERIALS

### 502.2.1 General

The Contractor shall provide Materials in accordance with Table 502.2.1:1, “Applicable Bearing Pile Standards.”

Table 502.2.1:1  
Applicable Bearing Pile Standards

Material description	Standard
Portland cement concrete, Class G	Section 510, “Portland Cement Concrete”
Reinforcing steel cage	Section 540, “Steel Structures”
Reinforcing steel HP pile	ASTM A 572, Grade 50
Steel pipe (longitudinal or continuous spiral welded) piles and columns	ASTM A 252, Grade 3

### 502.2.2 Additional Requirements

#### 502.2.2.1 Concrete

For Class G concrete requirements see Section 509, “Portland Cement Concrete Mix Designs.”

#### 502.2.2.2 Temporary Casings

The Contractor shall provide temporary steel casings with an inside diameter equal to or greater than the shaft size in accordance with the Contract. The Contractor shall ensure the casings are smooth, clean, watertight, and of ample strength to withstand both handling and driving stresses, pressures of concrete, and the surrounding soils.

#### 502.2.2.3 Permanent Casings

The Contractor shall provide permanent casing with a wall thickness that is at least the thickness specified for the shaft construction. The Contractor shall provide a greater wall thickness if necessary to withstand handling and installation stresses. The casing dimensions are subject to the American Pipe Institute tolerances applicable to regular steel pipe. If approved by the Project Manager, the Contractor may use casings larger than specified, at no additional cost to the Department.

## 502.3 CONSTRUCTION REQUIREMENTS

### 502.3.1 Drilled Shaft Preconstruction Conference

The Project Manager will hold a Drilled Shaft Preconstruction Conference at least seven (7) Days before the anticipated drilling begins to review the specification requirements and discuss the Contractor’s preparations.

The recommended conference agenda is available from the State Geotechnical Engineer.

## 502.3.2 Equipment

### 502.3.2.1 Excavation and Drilling Equipment

The Contractor shall use excavation and drilling Equipment that can excavate a hole of the specified diameter 20% deeper than what is shown in the Contract. The Contractor shall use excavation Equipment that can complete a flat shaft bottom. The Contractor shall ensure that the cutting edges are normal to the vertical axis of the Equipment within a tolerance of 0.25 inch per foot of diameter. The Contractor shall ensure that under-reaming tools do not allow the base diameter to exceed three (3) times the specified shaft diameter. The State Geotechnical Engineer may approve a change in other under-reaming Plan dimensions to accommodate the Equipment. When the State Geotechnical Engineer requires over-reaming of the shaft sidewall, the Contractor shall use an over-reaming bucket, grooving tool, or other approved Equipment. The Contractor shall use an over-reaming tool that over sizes the shaft diameter from 0.5 inch to three (3) inch. If the Contractor cannot drill the material with conventional earth augers, the Contractor shall use special drilling Equipment, such as core barrels, rock tools and other Equipment, as necessary. Blasting is not allowed.

### 502.3.2.2 Slurry Equipment

The Contractor shall use desanding Equipment to keep the slurry sand content to less than eight percent (8%) by volume for mineral slurry and less than one percent (1%) by volume for polymer slurry. This is required during shaft excavation to maintain mix consistency of the slurry in the shaft. The Contractor shall use slurry tanks for slurry circulation, storage, and treatment. The Contractor shall not use excavated slurry pits in place of slurry tanks without the written permission of the Project Manager. The Contractor shall use a slurry-sampling tool to conduct the slurry control tests in accordance with Section 502.3.4.1.3.3, "Slurry Control Tests." The Contractor shall use a slurry sampler capable of sampling slurry from the bottom of the hole and withdrawing the sample without loss or contamination of sample fluid.

### 502.3.2.3 Concrete Placement Equipment

Depending on the type of shaft construction method, the Contractor shall place the concrete in the excavated shaft with a rigid tremie pipe, a concrete pump line, or a drop chute.

#### 502.3.2.3.1 Tremies

The Contractor shall use a rigid tremie pipe that can deposit concrete at the shaft bottom. The Contractor shall not use a tremie with aluminum parts that will have contact with the concrete. The Contractor shall ensure the inside diameter is at least ten (10) inches. The Contractor shall ensure the tremie's inside and outside surfaces are clean and smooth. The Contractor shall ensure that the tremie is watertight. In slurry displacement shafts, the Contractor shall use a plug initially placed at the top of the tremie to separate the concrete from the displacement fluid until the concrete is flowing through the orifice. The Contractor shall ensure that plugs left in the shaft concrete are made of material approved by the Project Manager. The Contractor shall construct the discharge end of the tremie to permit the free radial flow of concrete during placement operations.

#### 502.3.2.3.2 Concrete Pumps and Lines



The Contractor shall use watertight pump lines with a diameter of at least five (5) inches. The Contractor shall use schedule-40 steel pipe or heavier. The Contractor shall use plugs in accordance with Section 502.3.2.3.1, "Tremies."

#### 502.3.2.3.3 Drop Chutes

The Contractor shall use rigid-pipe drop chutes that are either one-piece or sectional. The Contractor shall ensure they can be added and removed from a metal hopper. The Contractor shall not use flexible trunk line hose.

#### 502.3.3 Submittals

The Contractor shall provide the required drilled shaft submittals to the Project Manager for the State Geotechnical Engineer's review and approval. The Contractor may use documented Work experience (per Section 502.3.3.1, "Work Experience") and proposed construction procedure submittals (per Section 502.3.3.2, "Proposed Construction Procedure") approved on previous Department Projects of similar size, difficulty, and geology, in lieu of the detailed submittal requirements listed below.

Administrative approvals are subject to field verification of performance.

##### 502.3.3.1 Work Experience

The Contractor shall submit documentation verifying the required Work experience in accordance with Section 502.1.1, "Work Experience." The Contractor shall include the names and phone numbers of references that can verify successful completion of the listed Projects.

##### 502.3.3.2 Proposed Construction Procedure

At least 30 Days before the drilled shaft concrete bearing pile Work begins, the Contractor shall submit a complete written proposal of the construction procedure. The following information is required:

1. Superintendent name and experience record;
2. List of proposed Equipment including: cranes, drills, augers, bailing buckets, final cleaning Equipment, desanding Equipment, slurry pumps, core sampling Equipment, tremies or concrete pumps, casing, etc.;
3. Description of construction operation sequence;
4. Description of shaft excavation methods;
5. Details of mixing, circulating, and slurry desanding methods;
6. Manufacturer and type of apparatus for testing slurry;
7. Description of methods for cleaning the shaft excavation;
8. Description of methods for dewatering shaft excavation;
9. Description of methods for managing caving or unstable zones within the shaft excavation;
10. Details for placing reinforcement including support and centralization methods; and
11. Details for placing concrete including operational procedures for free fall, tremie or pumping

methods.

### 502.3.4 Construction Preparations

#### 502.3.4.1 Site and Subsurface Conditions

The Department's test results and rock core samples are available for examination upon request.

#### 502.3.4.2 Protection of Existing Structures

If specified in the Contract, the Contractor shall submit a preventative-measures plan to the Project Manager, at least 14 Days before the construction of the shaft.

#### 502.3.4.3 Site Preparation

If footings are present, the Contractor shall excavate to the footings' bottom elevation before beginning shaft construction, unless the Contract or Project Manager allows otherwise. If the Contractor drills shafts in conjunction with placing Embankment, the Contractor shall drill the shafts after placing the fill, unless the Contract or Project Manager allows otherwise.

#### 502.3.4.4 Proof Drilled Shafts

The Contractor shall construct a proof drilled shaft, when specified in the Contract, at the location shown in the Plans. The Contractor shall construct the shaft after the State Geotechnical Engineer approves the Equipment and methods. If specified in the Contract, the Contractor shall load test the proof shaft in accordance with the Contract and Section 504, "Load Testing of Bearing Piles." The Contractor shall drill the shaft to the maximum depth of any production shaft unless otherwise shown in the Contract. If specified in the Contract, the Contractor shall underream the proof shaft to establish the feasibility of under-reaming in a specific soil strata or rock. The Contractor shall fill the proof shaft with concrete in the same way as the production shafts. If the methods and Equipment produce inadequate results as determined in 502.3.8, "Acceptance," the Project Manager will require the Contractor to demonstrate acceptable results with another proof shaft. Once the proof shaft is approved, the Contractor shall construct production shafts using the same means and methods. The Contractor shall not change the means or methods without written approval from the State Geotechnical Engineer. The Contractor shall cut off the proof shafts five (5) ft below finished grade and leave in place. The Contractor shall restore the proof shaft sites to their original condition.

### 502.3.5 Construction of Drilled Shafts

#### 502.3.5.1 Construction Methods

##### 502.3.5.1.1 Dry Construction Method

The dry method consists of the following:

1. Drilling the shaft;
2. Removing accumulated water and loose material from the excavation;

3. Testing and approving bottom hole conditions by Project Manager;
4. Placing the reinforcing cage; and
5. Concreting the shaft.

The State Geotechnical Engineer will approve the dry construction method in accordance with the Proposed Construction Procedure submittal when the following occurs:

1. The shaft accumulates less than 12 inches of water above the base over a one (1) hr period without pumping;
2. The shaft remains stable without caving, sloughing or swelling over a four (4) hr period immediately following excavation;
3. The Contractor can remove loose material and water before inspection and concrete placement; and
4. The use of low strength grout collars is able to stabilize running sands or unstable zones within the drilled shaft excavation.

The Contractor's Proposed Construction Procedure submittal shall include the use of the slurry-displacement construction method or the casing construction method for shafts that do not meet these requirements.

#### 502.3.5.1.2 Casing Construction Method

The Contractor shall use the casing construction method when called for in the Contract or where the dry construction method is inadequate. If necessary, the Contractor shall use the casing method combined with the slurry displacement or dry construction method. The Contractor shall place the casing by twisting, driving, or vibrating into the ground before cleaning it out, unless the Contract requires the Contractor to place the casing in a predrilled hole. If the Contractor elects to use casings or shafts larger than those specified the Contractor shall provide the concrete necessary to fill the additional volume, at no additional cost to the Department.

##### 502.3.5.1.2.1 Temporary Casing

The Department will consider subsurface casing to be temporary unless shown as permanent in the Contract. The Contractor shall remove the temporary casing when placing concrete for the drilled shaft when the concrete is in a fluid state. If the Contractor removes a casing or replaces it with a longer or larger diameter casing through caving soils, the Contractor shall stabilize the excavation with slurry before installing the new casing. Other methods to control the stability of an excavation require approval of the State Geotechnical Engineer. Before withdrawing the casing, the Contractor shall ensure that the level of concrete in the casing is at least ten (10) ft above either the hydrostatic water level or the drilling fluid level, whichever is higher. The Contractor shall maintain a concrete level in the casing as it is removed so that fluid trapped behind it is displaced upward and discharged without contaminating or displacing the shaft concrete. Temporary casings that become bound or fouled during shaft construction, and cannot be practically removed, constitute a defect. The Contractor shall repair defective shafts in accordance with 502.3.9, "Correction of Defective Drilled Shafts."

#### 502.3.5.1.2.2 Permanent Casing

The Contractor shall make permanent casing continuous from top to bottom. The Contractor shall cut off the permanent casing at the prescribed elevation after installation. The Contractor shall complete the shaft by placing the reinforcing steel and concrete in the casing. If using temporary casings in conjunction with permanent casings, the Contractor shall keep the temporary inner casing aligned with the permanent outer casing. The Contractor shall maintain a water-tight seal between the two (2) casings during excavation and concrete placement where an oversized hole or temporary casing is approved by the Project Manager. When approved by the State Geotechnical Engineer to allow drilling an oversize hole to aid in the placement of the permanent casing, the Contractor shall post grout the exterior annular space outside of the permanent casing, such that the direct contact between casing and the surrounding soil/rock is created.

#### 502.3.5.1.3 Slurry Displacement Construction Method

The Contractor shall use the slurry displacement method at sites where maintaining a dry excavation is not possible. The Contractor shall use a mineral or polymer slurry, or water to maintain stability around the hole's perimeter while advancing excavating, placing the reinforcing cage, and placing concrete. The Contractor shall displace the slurry during final cleaning of the excavation with a bailing bucket, air lift, or submersible pump. The Contractor shall place concrete with a tremie or concrete pump beginning at the shaft bottom. During construction, the Contractor shall keep the slurry level in the shaft excavation high enough to prevent caving and at least five (5) ft above the highest expected piezometric pressure head along the depth of the shaft. If not using permanent casings, the Contractor shall provide temporary surface casings to aid shaft alignment and to prevent sloughing, unless otherwise approved by the State Geotechnical Engineer. If the slurry construction method does not produce the necessary results, the Contractor shall discontinue operations and make corrective modifications to the procedures and Equipment.

#### 502.3.5.1.3.1 Polymer Slurry Requirements

The Contractor shall use polymer slurry that will stabilize the hole and inhibit the influx of ground water. Table 502.3.4.1.3.1:1, "Polymer Slurry Requirements, Emulsified or Dry partially hydrolyzed polyacrylamide (PHPA) Polymer," lists acceptable ranges of values for slurry viscosity and gel.

Table 502.3.5.1.3.1:1  
Polymer Slurry Requirements, Emulsified or Dry PHPA Polymer

Property (units)	Requirements (at time of introduction or before concreting)	Test Method
Density (pcf)	62.4 – 64.0	Density Balance
Viscosity (seconds/quart)	50–120	Marsh Funnel
pH	8–11.7	pH Paper
Sand Content (% by volume)	0–1	API Method

Note: Perform tests when the slurry temperature is above 40 °F.

The Contractor shall premix the polymer slurry according to the manufacturer’s directions. The Contractor shall prevent the slurry from losing the required viscosity and gel characteristics in the shaft. The Contractor shall neutralize expended polymer slurry with bleach or in accordance with the manufacturer’s recommendations and dispose of it in accordance with Section 107 “Legal Relations, Environmental Requirements, and Responsibility to the Public”

502.3.5.1.3.2 Mineral Slurry Requirements

The Contractor shall use attapulgite, in lieu of bentonite, where saline or chemically contaminated groundwater occurs. The Contractor shall use mineral slurry with a grain size that remains in suspension and has sufficient viscosity and gel characteristics to transport excavated material to the screening system. The Contractor shall provide mineral slurry in accordance with Table 502.3.5.1.3.2:1, “Mineral Slurry Requirements, Sodium Bentonite or Attapulgite in Fresh Water.”

**Table 502.3.5.1.3.2:1**  
**Mineral Slurry Requirements, Sodium Bentonite or Attapulgite in Fresh Water**

Property (units)	At time of slurry introduction	In hole at time of concreting	Test method
Density (pcf)	N/A	64.0 – 75.0	Density Balance
Viscosity (seconds/quart)	28–45	N/A	Marsh Cone
PH	8–10	8–10	pH paper
Sand Content	N/A	0–4	API Method

**Note:** Perform tests when the slurry temperature is above 40 °F.

The Contractor shall premix the slurry according to the manufacturer’s directions. The Contractor shall prevent the slurry from “setting up” in the shaft. The Contractor shall dispose of the slurry offsite in accordance with Section 107.14.8, “Disposal of Other Materials and Debris.”

502.3.5.1.3.3 Slurry Control Tests

The Contractor shall perform control tests on the mineral slurry to determine density, viscosity, pH, and sand content. The Contractor shall not place concrete unless the Project Manager has approved the bottom hole test results and after test results show acceptable values. The Contractor shall provide test reports to the Project Manager upon completion of each drilled shaft.

502.3.5.1.3.3.1 Pre-entry Tests

The Contractor shall perform tests to determine viscosity and pH before pumping the slurry into the excavation. The Contractor shall take at least two (2) sets of tests during the first eight (8) h of slurry processing. The Contractor shall decrease the testing frequency to one (1) set every eight (8) hours when the results are consistent.

502.3.5.1.3.3.2 Bottom Hole Tests

The Contractor shall test slurry samples taken from the shaft base before placing concrete in any shaft excavation. The Contractor shall test until samples produce acceptable values for density, pH, and sand content.

#### 502.3.5.2 Shaft Excavation

The Contractor shall extend drilled shaft tip elevations when the State Geotechnical Engineer determines that the material encountered during excavation is unsuitable. The Contractor shall dispose of Materials from the shaft excavation as directed by the Project Manager.

When using vibrating casing, the Contractor shall not place adjacent casings or excavate shafts until 48 h after pour completion of an adjacent shaft, or when concrete from the adjacent shaft pour breaks at least 2,000 psi, whichever comes first. This requirement applies to excavating any shaft within four (4) shaft diameters measured center to center.

##### 502.3.5.2.1 Underream and Overream

The Contractor shall use sidewall overreaming when the State Geotechnical Engineer determines the sidewall has: softened due to excavation methods; swelled due to concrete placement Delays; or, degraded because of slurry cake build-up. The State Geotechnical Engineer will direct the thickness and elevation of sidewall overreaming.

##### 502.3.5.2.2 Obstructions

The Contractor shall remove surface and subsurface obstructions that are anticipated in the Contract. Obstructions may include manmade Materials, such as old concrete foundations, or natural Materials, such as boulders or nested cobble zones. When unanticipated obstructions are encountered, the Contractor shall notify the Department Project Manager as shown in Section 502.4.3, "Unanticipated Obstruction Removal."

##### 502.3.5.2.3 Soil Samples and Rock Cores

The Contractor shall take soil samples or rock cores at the locations shown in the Contract or as directed by the State Geotechnical Engineer to determine the character of material directly below the bottom shaft elevation. The Contractor shall perform soil borings before excavating the shafts. The Contractor shall perform rock cores before excavating the shaft from the bottom of an exploration hole at no additional cost to the Department. The Contractor shall extract and ship the core samples in accordance with the Department's *Manual of Highway Structure Foundation Investigation and Subsurface Exploration*. Unless otherwise specified in the Contract, the Contractor shall begin bore holes or rock cores at the top of the rock socket elevation to at least ten (10) ft below the bottom of the drilled shaft excavation. The Contractor shall record the rock quality designation, percent recovery, joint orientation and infilling, and joint water from the rock cores extracted. After exploration, the Contractor shall fill the core holes with grout, slurry, or mortar having a minimum compressive strength of 3,000 psi at 28 Days. The Contractor shall deliver the geologist's field log cards to the Project Manager after completing the logs. The Department will not require the Contractor's geotechnical consultant to perform Laboratory testing on soil samples or rock cores unless specifically specified in the Contract. The State Geotechnical Engineer will notify the Contractor of the final required shaft depth after receiving the geologist's field log

sheets and the lab testing results. This notification may take as long as 48 h from the time the State Geotechnical Engineer receives the field log sheets or the soil and rock samples test results.

#### 502.3.5.2.4 Shaft Excavation Inspection

The Contractor shall measure the final shaft depths. The Contractor shall ensure that at least 50% of each shaft base has less than one (1.0) inch of sediment when placing the concrete. The Contractor shall ensure that the sediment depth or debris at any place on the shaft base does not exceed 1.5 inches. For dry shafts, the Contractor shall ensure that the water depth does not exceed three (3) inches before pouring concrete. The Contractor shall inspect slurry displacement shafts using the methods that the State Geotechnical Engineer deems appropriate. The Contractor shall receive approval of bottom hole conditions from the Project Manager prior to continuing with the Work.

##### 502.3.5.2.4.1 Inspection Procedures

The Project Manager will notify the Contractor which procedures will be used for the shaft inspections. The Contractor shall supply Equipment and labor for inspection of the shaft. Inspection procedures may include:

1. Inserting a casing in the shaft excavation temporarily for alignment, cleanliness, and dimension checks;
2. Inserting a rigid rod assembly with several 90° offsets equal to the shaft diameter;
3. Using Department video Equipment; or
4. Using a weighted tape and evaluation of results of desanding and density tests for slurry displacement excavations.

##### 502.3.5.2.4.2 Remedial Work for Substandard Excavation

If the State Geotechnical Engineer determines that a shaft excavation is substandard, the Contractor shall develop, propose, and implement corrective measures. Corrective measures may include:

1. Overdrilling to a larger diameter to permit reinforcing steel placement with the required minimum cover;
2. Overreaming sidewalls of the shaft;
3. Increasing steel reinforcement bar number and size; or
4. Enlarging the underream within allowed tolerance.

#### 502.3.5.3 Reinforcing Steel Unit Placement

The reinforcing steel unit consists of longitudinal bars and circular ties or a Structural Steel shape. The Contractor shall place the structural shape or the reinforcing steel cage as a unit immediately after the Project Manager approves the shaft excavation and before placing concrete. The Contractor shall tie and support the reinforcing steel unit in the shaft so that it remains within allowable tolerances given in Section 502.3.6, "Location and Alignment Tolerances." The Contractor shall use concrete spacers or other approved non-corrosive spacing devices at sufficient intervals, near the bottom and at maximum intervals of ten (10) ft up the shaft, to ensure concentric spacing for the entire reinforcement unit length. The Contractor shall use spacers equal in quality and durability to the concrete specified for the shaft.

The Contractor shall inspect the bottom of the shaft immediately before placing of the cage to ensure that there is no sloughing.

The Contractor shall check the top elevation of the reinforcement unit before and after placing the concrete. If the reinforcement unit is not maintained within the specified tolerances, the Contractor shall make corrections. The Contractor shall not construct additional shafts before modifying the reinforcement unit support to the satisfaction of the Project Manager. The Contractor shall maintain the reinforcement unit at the proper elevation and orientation with an approved support mechanism at the ground surface. The Contractor shall place shaft concrete immediately after installing the cage. If more than 24 h elapses between the placement of the cage and concrete placement, the Contractor shall remove the cage and inspect the shaft for sloughing or other damage.

#### 502.3.5.4 Concrete Placement

The Contractor shall place concrete in accordance with Section 511, "Concrete Structures." The Contractor shall place concrete as soon as possible after placing reinforcing steel.

The Contractor shall ensure that the time from when the concrete is batched at the plant to placement does not exceed two (2) h. The Project Manager may approve a longer time period if the concrete mixture remains workable and plastic. The Contractor shall use admixtures for the job conditions so the concrete remains in a workable plastic state through the approved placement limit.

##### 502.3.5.4.1 Concrete Placement by Free Fall

The Contractor may use free fall placement in a stable shaft where the maximum water depth does not exceed three (3) inches. The Contractor shall ensure that free fall-placed concrete falls directly to the base without contacting either the rebar cage or hole sidewall. The Contractor shall use a hopper at the top of the shaft or a rigid pipe extension from the hopper. The Contractor shall ensure that free fall placement does not exceed 60 ft below the bottom of the hopper or the rigid pipe extension. The Contractor shall not use free fall in slurry displacement shafts. If the Project Manager determines that concrete cannot be placed using the free fall method, the Contractor shall use either a tremie or pump to accomplish the pour.

##### 502.3.5.4.2 Concrete Placement with Tremie or by Pumping

The Contractor shall use rigid tremie pipe and/or concrete pumps for concrete placement in either dry or slurry displacement shafts. The Contractor shall place plug within tremie or pump line to ensure concrete does not segregate prior to developing concrete pressure head within tremie or pump line and that plug does not discharge from tremie or pump line prior to concrete developing continuous flow. The Contractor shall not begin underwater placement before placing the tremie or pump line within one (1) tremie or pump line diameter of the shaft base elevation. The Contractor shall remove plugs from the excavation if the Project Manager does not specifically approve them to remain in the shaft. The Contractor shall keep the discharge end continually immersed at least five (5) ft in concrete after starting the flow of concrete. The Contractor shall keep the concrete flow continuous. The Contractor shall maintain the concrete in tremies or pump lines continuously at a positive pressure differential to prevent water or slurry intrusion into the shaft concrete. When lifting pump lines during concrete placement; the Contractor shall temporarily reduce the line pressure until the orifice has been repositioned at a higher



level in the excavation. If at any time during the concrete pour, the orifice is removed from the fluid concrete column and discharges concrete above the rising concrete level, the Department will consider the shaft defective. The Contractor may at its own risk and cost, remove the reinforcing cage and concrete to complete the necessary sidewall removal as directed by the State Geotechnical Engineer. The Department will base final Acceptance in accordance with Section 502.3.8, "Acceptance."

#### **502.3.6 Location and Alignment Tolerances**

The Contractor shall adhere to the following construction tolerances unless otherwise stated in the Contract:

1. Ensure the drilled shaft and the concentric reinforcement steel unit is within three (3) inches of the position shown on the Plans at the top of the shaft;
2. Do not vary the vertical alignment of a vertical drilled shaft from the alignment shown on the Plans by more than 1/4 inch per foot of depth. Do not vary alignment of a battered drilled shaft by more than 0.5 inch per foot of depth from the specified batter;
3. Ensure that the top of the reinforcing steel unit is no more than six (6) inches above and no more than three (3) inches below the elevation shown on the Plans; and
4. Ensure that the top elevation has a tolerance of +1 inch or -3 inch from the top of shaft elevation.

#### **502.3.7 Load Testing**

When the Contract includes load testing, the Contractor shall complete the testing before construction of production shafts, unless otherwise approved by the State Geotechnical Engineer. The Contractor shall allow three (3) Working Days after the last load test is completed before receiving tip elevations of the production shafts from the State Geotechnical Engineer and proceeding with the construction of production shafts. After testing is completed, the Contractor shall cut off the test shafts and reaction shafts at an elevation of five (5) ft below the finished ground elevation.

#### **502.3.8 Acceptance**

##### **502.3.8.1 Concrete Strength**

The Department will accept drilled shafts in accordance with Section 510.3.5, "Acceptance."

Loads may be placed on the drilled shafts once 75% of compressive strength has been met. In place concrete strength shall be determined in accordance with Section 510.3.5.2, "In-Place Concrete Strength Measurements."

##### **502.3.8.2 Location and Alignment Tolerances**

The Department will accept drilled shafts if the construction tolerances are satisfied in accordance with Section 502.3.6, "Location and Alignment Tolerances." If the shafts exceed the location or alignment tolerances, the Department will reject the shafts. If the State Geotechnical Engineer determines that the extent of overloading is not detrimental to the performance of the shaft, the Department will accept the

shaft.

### 502.3.8.3 Shaft Integrity

If applicable, the Department will accept shafts when the pile integrity testing reports verify the structural integrity of the piles. The Department may reject a shaft if integrity testing shows conclusive evidence that a defect exists in the shaft that may result in inadequate or unsafe performance under service loads. If the report is inconclusive, the State Geotechnical Engineer may require the Contractor to drill a core hole in the shaft. If the core hole confirms the defect, the Department will not pay the coring costs. If the core hole does not find a defect, the Department will pay for coring costs, including pressure grouting.

### 502.3.9 Correction of Defective Drilled Shafts

If the Department determines that a shaft is unacceptable, the Contractor shall submit a plan for remedial action to the Project Manager for approval. The Contractor shall provide calculations and Working Drawings, stamped by a New Mexico licensed professional Engineer for all foundation elements affected by the proposed corrections. The Contractor shall make corrections to drilled shafts at no additional cost to the Department.

## 502.4 METHOD OF MEASUREMENT

### 502.4.1 Drilled Shafts

The Department will not measure additional shaft depth or additional shafts used due to defective procedures.

The Department will only measure the first proof shaft constructed in place.

### 502.4.2 Soil Borings and Rock Cores

The Department will measure *Soil Borings* from the bottom of the exploration hole to existing grade.

The Department will measure Rock Cores from the point at which rock cores are recovered to the bottom of the rock coring.

### 502.4.3 Unanticipated Obstruction Removal

The Department will measure and pay for obstruction removal only when it is not anticipated in the Contract Documents.

The Department will measure an obstruction vertically beginning where it is encountered and ending where conventional drilling Equipment adequately advances the hole. To qualify for Obstruction Removal measurement, the Contractor shall get the State Geotechnical Engineer's authorization and meet the following requirements:

1. Hole advancement requires special procedures and tools, such as: chisels; boulder breakers; percussion hammers; core barrels; air tools; hand excavation; temporary casing; or increasing

hole diameter; or

2. The rate of auger advancement is decreased to where the drilling rate through the obstruction is less than 50% of the drilling rate above the obstruction.

Obstruction Removal cost will include Delay costs. The Department will not allow additional Contract Time unless the Project Manager approves a detailed schedule analysis establishing the critical path of the additional time required to complete the Obstruction Removal. The Department will not measure *Obstruction Removal* outside the specified shaft diameter.

#### 502.4.4 Certified Drilled Shaft Inspector

The Contractor shall provide a Certified Drilled Shaft Inspector to oversee and inspect all aspects of the drilled shaft construction and sign the NMDOT Drilled Shaft Inspection Reports. The Contractor shall provide certification through NMDOT TTCP or International Association of Foundation Drilling, also identified as ADSC.

#### 502.5 BASIS OF PAYMENT

Pay Item	Pay Unit
<i>Drilled Shaft Foundation</i> ____ <i>Diameter</i>	Linear Foot
<i>Permanent Casing</i> ____ <i>Diameter</i>	Linear Foot
<i>Steel Shape Reinforcement</i>	Pound
<i>Soil Borings</i>	Linear Foot
<i>Rock Cores</i>	Linear Foot
<i>Obstruction Removal</i>	Linear Foot

Steel Reinforcement in the drilled shaft is paid for under Section 540, "Steel Reinforcement" except for overhead sign structures which are address in Section 701, "Traffic Signs and Sign Structures."

#### 502.5.1 Work Included in Payment

The following Work and items will be considered as included in the payment for the main item(s) and will not be measured or paid for separately:

1. Methods employed by the Contractor to maintain stability of the shaft, including the use of temporary casings, slurry assisted shaft excavation, or use of grout collars;
2. All Work associated with sidewall overreaming;
3. Drilled shaft concrete required to fill shafts including oversized excavations, underreams, and overreams;
4. Excavation of anticipated Materials shown in the Contract of different densities and character, including employment of special tools and procedures necessary to accomplish the excavation through anticipated Materials;
5. Additional wall thickness required for handling and installation of casing;
6. The Equipment and labor required for the shaft inspection procedure; and
7. Certified Drilled Shaft Inspection.

“The Contractor shall dispose of Material in accordance with Section 107, “Legal Relations, Environmental Requirements, and Responsibility to the Public” unless otherwise specified in the Contract. The Contractor shall not dispose of Material within the project limits without written approval from the Project Manager.”

## SPECIAL PROVISIONS MODIFYING

### SECTION 504: LOAD TESTING OF PILES

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete Section 504: LOAD TESTING OF BEARING PILES in its entirety and replace with the following:

#### 504.1 DESCRIPTION

This Work consists of static axial compressive load tests (pile load test), static axial tensile load tests (pile pullout tests), and high strain dynamic measurements (dynamic measurements) of piles for the purpose of determining ultimate bearing capacity and pile pullout capacity.

For driven piles, dynamic measurements determine driving stresses, pile integrity, and hammer efficiency. For cast-in-place concrete piles (drilled shafts), dynamic measurements verify pile integrity.

##### 504.1.1 Contractor's Responsibilities

###### 504.1.1.1 Dynamic Measurements

The Contractor shall provide labor, Equipment, and Materials necessary to drill the dynamic test piles holes and for mounting transducers. The Contractor shall provide the analysis Equipment power supply.

Where dynamic measurements are to be made on cast-in-place piles, the Contractor shall provide a gravity drop hammer and pile cushioning. The Contractor shall excavate around the pile, cut the permanent casing, drill holes in the test pile(s) and provide impacts on cast-in-place dynamic test piles as required.

If a Pile Dynamic Test Consultant Testing is required as designated on the plans, the consultant's qualifications and equipment must meet the requirements of this Section and Section 504.3 "Construction Requirements." Pile Dynamic Consultant Equipment must meet the requirements of Section 504.3.1.5 "Pile Driving Analyzer." Perform field Pile Dynamic Testing with an experienced technician or engineer having at least two (2) years of experience with Pile Dynamic Testing methods. Use a licensed Professional Engineer having at least three (3) years of experience in Pile Dynamic Testing performed to interpret the recorded measurements and generate reports.

At the option of the State Geotechnical Engineer, Department personnel may perform the Pile Dynamic Testing.

###### 504.1.1.2 Pile Load and Pile Pullout Tests

The Contractor shall provide everything necessary to perform pile load or pile pullout tests. The Contractor shall record load measurement and pile movement readings, and produce a report(s) showing

the load displacement curve(s).

## 504.1.2 Department's Responsibilities

### 504.1.2.1 Dynamic Measurements

If Pile Dynamic Testing performed by the Department is required, as designated on the plans, the Department will provide the Equipment to perform dynamic measurements and the Department will provide personnel to take the dynamic measurements.

### 504.1.2.2 Pile Load and Pile Pullout Tests

The Contract will specify the anchor pile requirements. The Department will provide personnel to observe and monitor the Contractor's test apparatus, test methods, and data collection.

## 504.1.3 Pile Testing Mobilization

The Contractor shall mobilize testing Equipment as needed and as designated by the Contract or authorized by the State Geotechnical Engineer. The Contractor shall mobilize testing Equipment only after receipt of written authorization.

## 504.2 MATERIALS

### 504.2.1 Submittals

#### 504.2.1.1 Load Test Frame

The Contractor shall submit the proposed load test frame and anchorage method, details, and design computations 30 Days before the start of pile load tests and pile pullout tests. The Contractor shall use a professional Engineer licensed in New Mexico to prepare and seal the proposed loading apparatus detail Plans.

#### 504.2.1.2 Certificates of Calibration

The Contractor shall submit a calibration certificate and a calibration chart relating pressure to load for the load pressure gauge(s) from a certified Laboratory before use. The Contractor shall calibrate each jack and its gauge as a unit. The Contractor shall submit a calibration certificate for load cell(s). The Contractor shall calibrate gauges and cells within six (6) months before use.

#### 504.2.1.3 Pile and Equipment Data Form

The Contractor shall submit a *Pile and Driving Equipment Data Form* as required in Section 501.2.3.1, "Pile Driving Equipment Submittals," when proposing a gravity drop hammer for dynamic measurements of cast-in-place piles.

## 504.3 CONSTRUCTION REQUIREMENTS

### 504.3.1 Equipment

# 90

## 504.3.1.1 Equipment for Dynamic Testing

### 504.3.1.1.1 Power Supply

The Contractor shall provide dynamic test Equipment electric power that supplies 10 A, 115 V, 55 Hz to 60 Hz, A.C. only. If a field generator is used as the power source, the Contractor shall provide functioning voltage and frequency level monitoring meters.

### 504.3.1.1.2 Gauge Mounting Equipment

The Contractor shall provide a power drill, bits, taps, and expandable masonry anchor studs to drill holes in the dynamic test piles for bolting transducers to the piles. The Contractor shall provide a six (6) lb rubber mallet hammer when dynamic testing is specified on precast concrete piles.

### 504.3.1.1.3 Personnel Lift

To assist with the installation of instruments, the Contractor shall provide a hydraulic, telescoping arm personnel lift. The Contractor shall provide a personnel lift with adequate length to reach the top of the pile while the pile is located in the leads.

The Contractor may use an alternative to a personnel lift in accordance with Section 504.3.4.1.2, "Preparation for Testing."

### 504.3.1.1.4 Gravity Drop Hammer

The Contractor shall provide a gravity drop hammer and pile cushion when cast-in-place piles dynamic testing is specified. The Contractor shall provide the minimum hammer ram weight and free fall height and cushion thickness specified in the Contract. The Contractor shall equip gravity hammers with guides to ensure concentric drive head impact.

If approved by the State Geotechnical Engineer, the Contractor may use a diesel hammer with the minimum required ram weight and impact energy. The Contractor shall cut-off the fuel flow.

### 504.3.1.1.5 Pile Driving Analyzer

Perform the Pile Dynamic Testing using a Pile Driving Analyzer® (PDA) system (Model 8G or PAX) or equivalent. The Dynamic Testing Consultant shall furnish all equipment necessary for the Pile Dynamic Testing such as sensors, cables or wireless transmitters, etc.,. The equipment shall conform to the requirements of ASTM D-4945.

## 504.3.2 Equipment for Pile Load Test

The Contractor shall provide testing Equipment and measuring systems in accordance with ASTM D 1143, except as modified within these Specifications.

### 504.3.2.1 Load System

The Contractor shall provide a load system capable of applying 250% of the required ultimate pile

capacity. The Contractor shall provide a load test frame design compatible with the anchor pile requirements in accordance with Section 504.3.4.2.1, "Test Pile and Anchor Pile Requirements."

The Contractor shall construct the apparatus so that it is possible to place load increments gradually without causing test pile or load test frame vibration.

#### 504.3.2.2 Load Application System

The Contractor shall use hydraulic jacks to apply the load. When using multiple jacks, fit each jack with a pressure gauge in addition to the master hydraulic pressure gauge. The Contractor shall use jacks from the same manufacturer with the same rated capacity. The Contractor shall connect jacks to a common manifold with pressure supplied by one (1) hydraulic pump.

#### 504.3.2.3 Load Measuring System

The Contractor shall provide a dual load measuring system (gauge and load cell) to verify the test pile load. The Contractor shall calibrate the load cell and mount it between the load frame and the pile head to confirm the load recorded from the pressure gauge.

#### 504.3.2.4 Settlement Measuring System

The Contractor shall use a dual settlement measuring system. The Contractor shall provide two (2) dial gauges bearing on the reference beams at opposite sides of the pile, below the test plate. The Contractor shall support the reference beams outside of pile-soil movement influences. The Contractor shall provide two (2) linear variable differentiating transformers, with remote digital read-outs bearing on reference beams on opposite sides of the pile.

#### 504.3.3 Equipment for Pile Pullout Test

The Contractor shall use testing Equipment and measuring systems in accordance with Section 504.3.2, "Equipment for Pile Load Test," except as modified within these Specifications.

##### 504.3.3.1 Load System

The Contractor shall provide a load system capable of applying 200% of the required ultimate pile pullout capacity.

##### 504.3.3.2 Reaction System

It is permissible to use suitable cribbing or other bearing plates for reaction points instead of anchor piles. The Contractor shall use cribbing or bearing plates of sufficient size and stiffness to limit undesirable reaction frame movement.

#### 504.3.4 Testing Requirements

##### 504.3.4.1 Preconstruction Wave Equation Analysis



The State Geotechnical Engineer or Dynamic Testing Consultant shall use the submitted information required in Section 501.2.3.1 "Pile Driving Equipment Submittals" to perform wave equation analyses and shall prepare a summary report of the wave equation results. The wave equation analysis (using GRLWEAPTM software by Pile Dynamics, Inc. or equivalent) shall be used to assess the ability of the proposed driving system to install the pile to the required capacity and desired penetration depth within the allowable driving stresses.

Approval of the proposed driving system by the Engineer shall be based upon the wave equation analyses indicating that the proposed driving system meeting the requirements of Section 501.3.2.4 "Approval of Driving System."

A Preliminary Wave Equation Analysis Acceptance Chart shall be developed and submitted to the Project Manager a minimum of seven (7) Days before commencing pile driving. Submit the Preliminary Wave Equation Analysis Acceptance Chart meeting the template requirements as provided by the NMDOT Geotechnical Section.

#### 504.3.4.1 Dynamic Pile Testing Requirements

The Contractor shall perform dynamic testing during the pile driving as described in the Contract as "Dynamic Test Piles." The State Geotechnical Engineer may decide to designate additional piles shown in the Contract as dynamic test piles.

##### 504.3.4.1.1 Notification to Proceed

The Contractor shall notify the Project Manager at least 21 Days before commencing dynamic test pile testing. The Contractor shall confirm the testing schedule with the Project Manager three (3) Days before the testing date. The Contractor shall notify the Project Manager promptly of any changes in the schedule. The Contractor shall test dynamic test piles before any other piles are driven or installed. Contractor shall drive production piles no deeper than the estimated or minimum penetration elevation as applicable before receiving the field Acceptance criteria.

##### 504.3.4.1.2 Preparation for Testing

The Contractor shall prepare dynamic test piles as follows:

1. **Drilling for Mounting Transducers.** Drill holes for mounting the transducers. Bolt the instruments near the head of the pile at the location and using a bolt pattern designated by the State Geotechnical Engineer.

Drilling requirements for each test pile include the following:

- 1.1. Steel pipe piles: Seven (7) holes drilled with a 7/32 inch diameter bit, tapped to accommodate ¼ in bolts;
- 1.2. Steel HP piles: Five (5) holes drilled with a 5/16 inch diameter bit through the web;
- 1.3. Precast concrete or cast-in-place concrete piles: Seven (7) ¼ inch x 1 ½ inch holes with ¼ inch expandable anchor studs set in the holes to accommodate ¼ inch bolts;
2. **Wave Speed Measurements.** When precast concrete piles are specified as dynamic test piles, place the pile horizontally on wooden sleepers so that it is not in contact with the ground or with

other piling. The State Geotechnical Engineer will take wave speed measurements for the Pile Driving Analyzer (PDA) by hitting the pile with a six (6) lb rubber mallet hammer.

The Department will not require wave speed measurements for steel piles;

3. **Transducer Installation.** Install the instruments while the pile is in the leads using a man-lift raised to the top of the pile.

As an alternative to the man-lift requirement, the State Geotechnical Engineer may install the instruments after the pile is driven to a tip elevation of ten (10) ft above the Plan tip elevation.

#### 504.3.4.1.3 Procedure for Testing Driven Piles

1. The following are the procedures for testing driven piles for either Department or Consultant Pile Dynamic Testing: Drive the test pile in accordance with Section 501.3.6, "Pile Driving Operations," while the State Geotechnical Engineer monitors the dynamic measurements;
2. Monitor the test pile stresses that result from the driving to ensure that the compressive or tensile stresses do not exceed the allowable driving stresses as defined in Table 501.3.2.4:1, "Wave Equation Analysis Allowable Driving Stress." If the monitored pile stresses exceed these criteria, stop driving. Perform necessary modifications to the driving operation to ensure that pile damage does not occur;
3. Monitor the test pile stresses on individual gauges to determine if non-axial driving is indicated. If the pile bends beyond acceptable allowances, stop driving and realign the driving system;
4. If the Contract specifies an estimated penetration elevation, drive the first dynamic test pile until the required ultimate capacity or the estimated penetration elevation is achieved;  
If the Contract specifies a minimum penetration elevation, drive the first dynamic test pile to that elevation;  
If the test pile does not achieve the required ultimate capacity at the estimated or minimum penetration elevation, splice the test pile with additional length of pile. Remove and relocate the instruments to the spliced section. Proceed with driving until the ultimate driving capacity is achieved;
5. Forty-eight hours after the initial drive, restrike each test pile previously driven with the dynamic measuring Equipment installed. The State Geotechnical Engineer may allow shorter wait periods depending on soil and test conditions. Alternatively, the Contract may require longer wait periods, multiple restrike intervals, or both on a given test pile. Use a "warm" hammer that has previously driven at least one (1) pile other than the test pile(s), to restrike the test pile(s). The maximum total number of hammer blows for the restrike is 40.

#### 504.3.4.1.4 Procedure for Testing Cast-in-Place Piles

The following are the procedures for testing cast-in-place piles:

1. When the Contractor casts the dynamic test pile(s), the Inspector will make three (3) test cylinders of concrete or grout for each test pile in accordance with AASHTO T 23M.  
Provide concrete that will achieve a compressive strength at seven (7) Days of 3,000 psi;
2. After seven (7) Days, weigh the three (3) concrete test cylinders and report the average unit weight to the State Geotechnical Engineer.

Test one (1) concrete cylinder at seven (7) Days. If the compressive strength is at least 3,000 psi, test the other two (2) cylinders. Report the average of the three (3) breaks to the State Geotechnical Engineer.

Perform the dynamic test on the test pile the same Day that the cylinders are broken;

3. If the first test cylinder breaks at less than 3,000 psi, report the result to the State Geotechnical Engineer. The State Geotechnical Engineer may decide either to have the last two (2) cylinders tested the same Day or to wait up to a maximum of 14 additional Days before breaking the last two (2) cylinders. The Day the last two (2) cylinders are tested, re-weigh the cylinders and determine the average unit weight of the concrete.

Perform the dynamic test on the test pile the same Day the last two (2) cylinders are broken;

There will be no added compensation to the Contractor and no time extension to the Contract if Delays occur because the concrete does not achieve the required strength at seven (7) Days.

4. Use the average compressive strength and the average unit weight of the concrete to estimate the modulus of elasticity and the wave speed of the concrete for input into the PDA;
5. Perform excavation around the test pile as needed to mount the gauges. Typically, the required depth of excavation will be twice the diameter of the pile;
6. Attach the instruments to the pile head and impact the pile with the ram at the free fall height directed by the State Geotechnical Engineer. Each test pile will not require more than 40 blows.

Monitor the pile stresses that result from the ram impact to ensure that the compressive or tensile stresses do not exceed the allowable pile driving stresses defined in Table 501.3.1.4:1, "Wave Equation Analysis Allowable Driving Stress." If the monitored pile stresses exceed these criteria, the Department will direct the Contractor to reduce the ram free fall height or add pile cushioning.

#### 504.3.4.1.5 Case Pile Wave Analysis

NMDOT Geotechnical Section personnel or approved Pile Dynamic Testing Consultant will perform the Case Pile Wave Analysis as designated on the plans or determined by the NMDOT State Geotechnical Engineer.

Signal matching analysis (by CAPWAP® software, available from Pile Dynamics, Inc. or equivalent) of the dynamic pile testing data shall be performed on data obtained from the end of initial driving and the beginning of restrrike of specified Pile Dynamic Test piles. CAPWAP analysis should be performed by an engineer who meets the minimum requirements outlined in Section 504.1.1.1 "Dynamic Measurements" and is capable of returning analysis within one (1) working day from time of transmission. The State Geotechnical Engineer or Dynamic Testing Consultant may request additional analyses at selected pile penetration depths.

#### 504.3.4.2 Pile Load and Pile Pullout Testing Requirements

##### 504.3.4.2.1 Test Pile and Anchor Pile Requirements

1. **Driven Piles.** Apply the load to a production pile driven in the final Plan location, unless otherwise specified in the Contract, and apply the test frame against anchor (tension) piles;  
Use production piles driven in final Plan locations for the anchor piles unless the layout of the test frame reaction points is fixed and inconsistent with the production pile layout or unless an alternative pile type is required to develop adequate pullout resistance. The Project Manager will

decide if anchor piles that are not final production piles may be cut-off below final grade or pulled after the testing is completed;

2. **Cast-in-Place Piles.** Apply the load to a production pile located in the final Plan location, unless otherwise shown in the Contract. Use either driven piles or cast-in-place piles as anchor piles. Do not use anchor piles as final production piles. Provide cast-in-place anchor piles with reinforcement capable of carrying the pile tension force.

#### 504.3.4.2.2 Commencement of Load Test

Unless otherwise specified in the Contract, the Contractor shall wait a minimum of 24 h between driving or installing anchor piles or the test pile and commencing with the pile load or pile pullout test.

When testing pipe piles filled with concrete or cast-in-place concrete piles, the Contractor shall begin load tests after the concrete has attained a compressive strength of 2,500 psi.

#### 504.3.4.2.3 Load Testing Procedures

The Contractor shall conduct pile load tests and pile pullout tests in accordance with the following requirements:

1. Perform the *Quick Load Test Method for Individual Piles* in accordance with ASTM D 1143, but take the load test to the first of either failure of the test pile or capacity of the load system;
2. Test pile failure is defined as total vertical pile movement equal to the greater of either five percent (5%) of the pile diameter or two (2) inches;
3. If failure occurs, remove the test load in four (4) approximately equal amounts with a five-minute interval between removals;
4. For pile load tests where piles are 24 inch or less in diameter or width, the ultimate capacity is the load that produces a settlement of the pile head in accordance with the following equation:

$$Sf = S + (0.15 + 0.008D) \quad (1)$$

Where,

$Sf$  is the settlement at the ultimate pile capacity in inches

$D$  is the pile diameter or width in inches

$S$  is the elastic deformation of pile length in inches

Use the following equation for piles with diameters or widths greater than 24 inches:

$$Sf = S + \frac{D}{30} \quad (2)$$

Where,

$Sf$  is the settlement at the ultimate pile capacity in inches

$D$  is the pile diameter or width in inches

$S$  is the elastic deformation of pile length in inches

5. For pile pullout tests, the State Geotechnical Engineer will determine when the ultimate pile

capacity is attained.

#### **504.3.4.3 Completion of Dynamic Testing of Driven Piles**

After completing the dynamic test pile(s) at a Substructure element, the Contractor shall prepare the pile(s) for any specified pile load or pile pullout test(s).

If no load testing is required as determined in Section 501.3.7, "Pile Acceptance" the Final Wave Equation Analysis Acceptance Charts based on results of the Pile Dynamic Testing should be submitted to the Project Manager within thirty six (36) hours after completion of PDA testing and CAPWAP analyses at the applicable bridge or structure element.

The Dynamic Testing Consultant shall prepare a written report of the of the Pile Dynamic Testing results within seven (7) days of completion of all dynamic test piles specified. This report shall include the results of static load test(s) (if performed) and shall contain a discussion of the pile capacity obtained from the dynamic and static testing. The report shall also discuss hammer and driving system performance, driving stress levels, and pile integrity.

The Contractor shall drive production piles no deeper than the estimated or minimum penetration elevation before receiving the field Acceptance criteria. The Contractor shall record the average hammer stroke and pile set after driving of each pile to determine pile Acceptance once the driving criteria is established. After receiving the field Acceptance criteria, the Contractor shall drive piles until attaining the required ultimate capacity.

#### **504.3.4.4 Completion of Dynamic Testing of Cast-in-Place Piles**

The Contractor shall base the required production pile tip elevation on the dynamic testing and load testing results if specified. The State Geotechnical Engineer will require up to 36 h after completion of the last test pile to provide the pile tip elevation.

Unless the State Geotechnical Engineer directs otherwise, the Contractor shall place no other piles until receiving the production pile tip elevation.

#### **504.3.4.5 Completion of Load Testing**

After completing the specified load test(s) to the Project Manager's satisfaction, the Contractor shall dismantle the test apparatus and Equipment and remove from the site. The Contractor shall use the load test results to determine the ultimate pile capacity Acceptance criteria of driven piles as established under Section 501.3.7, "Pile Acceptance," and to confirm ultimate pile capacities determined by dynamic pile tests.

Pulled anchor piles of the same type as the production piles may be reused as production piles if not rejected by the Project Manager due to damage as covered in Section 501.3.7.3, "Damaged Pile Limitations."

For cast-in-place piles, the Contractor shall use the load test results to determine the pile penetration requirements if no subsequent dynamic testing is specified.

The State Geotechnical Engineer will require up to 36 h after completion of the last test pile to provide the pile tip elevation.

The Contractor shall re-drive production piles used as anchor piles in accordance with Section 501.3.7, "Pile Acceptance."

#### 504.4 METHOD OF MEASUREMENT

The Department will measure the actual number of pile tests administered and approved. Pile testing mobilization will be measured as a Lump sum unit.

#### 504.5 BASIS OF PAYMENT

Pay Item	Pay Unit
<i>Pile Testing Mobilization</i>	Lump Sum
<i>Pile Load Test</i>	Each
<i>Pile Pullout Test</i>	Each
<i>Pile Dynamic Test</i>	Each
<i>Case Pile Wave Analysis Test</i>	Each
<i>Pile Dynamic Test Consultant Testing</i>	Each
<i>Case Pile Wave Analysis Test Consultant Testing</i>	Each

##### 504.5.1 Work Included in Payment

The following Work will be considered as included in the payment for the main item(s) and will not be measured or paid for separately:

1. Non-production anchor and test piles which will not remain in use as part of the permanent structure.

## SPECIAL PROVISIONS MODIFYING

### SECTION 505: PILE INTEGRITY TESTING

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete Section 505: PILE INTEGRITY TESTING in its entirety and replace with the following:

#### 505.1 DESCRIPTION

##### 505.1.1 General

This Work consists of pile integrity testing for verifying structural integrity and determining the extent and location of cast-in place pile (drilled shaft) defects. Defects may include internal voids, necking of the pile's perimeter, transverse cracks, soil intrusions, weak concrete or grout in drilled shaft foundations.

##### 505.1.2 Test Methods

The Contractor shall use crosshole sonic logging (CSL) performed in accordance with ASTM D6760 (latest edition) or low strain integrity (LSI) performed in accordance with ASTM D5882 (latest edition) testing for integrity testing. The Department may require LSI testing to corroborate the results of CSL testing that show potential defects. Only an approved Integrity Testing Consultant or Department personnel will perform CSL or LSI Testing.

##### 505.1.3 Consultant Integrity Testing

If an Integrity Testing Consultant is required, the consultant's qualifications must meet the requirements of the Geotechnical Design Section and the Equipment used must meet the requirements of ASTM D6760 and Section 505.3.1.1, "CSL Testing Equipment," and ASTM D5882 and Section 505.3.1.2, "LSI Testing Equipment." The Contractor shall perform field testing with an experienced technician or Engineer having at least one (1) year of experience with the integrity testing methods. The Contractor shall use a licensed professional Engineer having at least three (3) years of experience in the integrity testing methods performed to interpret the recorded measurements.

##### 505.1.4 Department Integrity Testing

Department personnel will only perform integrity testing when the Contract specifies CSL or LSI Department testing. Department personnel will use Department-owned Equipment to perform testing.

##### 505.1.5 Assistance

The Contractor shall provide additional labor to perform the testing if required by the testing consultant or Department personnel. The Contractor shall provide access to the piles. If required, the Contractor shall

provide a 110 V, 55 Hz to 60 Hz, AC power supply.

## 505.2 MATERIALS

### 505.2.1 CSL Access Tubes

The Contractor shall use two (2) inch internal diameter (ID) access tubes of schedule 40 PVC with a round, regular ID free of defects or obstructions to allow passage of the source and receiver probes. The Contractor shall provide watertight tubes with clean internal and external surfaces to ensure a good bond between the concrete and tubes. The Contractor shall fit the tubes with glued caps at the bottom and threaded caps at the top.

## 505.3 CONSTRUCTION REQUIREMENTS

### 505.3.1 Equipment

#### 505.3.1.1 CSL Testing Equipment

The Contractor shall use CSL Equipment in accordance with the following requirements:

1. Use ultrasonic source and receiver probes capable of producing records with strong signal amplitude and energy through uniform, high quality concrete. Use probes with a diameter and cabling that will descend freely through two (2) inch ID pipe for the full pile depth;
2. Record probe depth;
3. Use a microprocessor-based CSL measurement system for analog-digital conversion and data recording, individual record display, receiver response analysis, and log printing;
4. Ensure that the CSL system has filter/amplification of data and cables;
5. Use a CSL system that has a synchronized triggering feature with the ultrasonic pulse for the recording system.

#### 505.3.1.2 LSI Testing Equipment

The Contractor shall use LSI Testing Equipment that meets the following requirements:

1. Use Equipment that has a digital data acquisition system with a dynamic signal analyzer, magnetic disk storage and hardcopy plotting capabilities. Ensure that the analyzer has both signal conditioning and power supply with high signal-to-noise ratios and variable frequency filtering to mitigate steel reinforcing and surface waves vibration noise. Ensure that the data is displayed in the field so that a preliminary data quality evaluation is possible;
2. Provide a receiver that is a suitable velocity transducer or accelerometer and place on the pile head.

### 505.3.2 CSL Testing Requirements

#### 505.3.2.1 Preparation of CSL Access Tubes

The Contractor shall place access tubes in drilled shafts where the wet-hole construction method was



used, or as directed by the State Geotechnical Engineer. The Contractor shall install access tubes as shown in the Contract. The Contractor shall fasten the tubes to the reinforcement cage, so the tube bottoms are three (3) inches above the shaft bottom and the tube tops are 24 inches above the shaft top. The Contractor shall ensure that the conduit is tied to the reinforcing cage in a plumb and straight position so that the ultrasonic probe may be lowered freely to the bottom of the shaft. Immediately after concrete or grout placement, the Contractor shall fill the tubes with clean water and cap.

### 505.3.2.2 CSL Testing Procedure

Before construction of the Substructure above the foundation, the Contractor shall direct the CSL consultant to test the completed piles from two (2) Days to ten (10) Days after completing concrete or grout placement. The Contractor shall provide information about the pile's bottom and top elevations, tube lengths and positions, and construction dates to the Integrity Testing Consultant or Department personnel before logging.

The Contractor shall log between each adjacent pair of tubes in the pile. The Contractor shall place the source and receiver probes in the same horizontal plane unless test results indicate potential defects. If potential defects are indicated, the Contractor shall evaluate the area further using angled tests with the source and receiver vertically offset in the tubes. Additional testing of other untested tube pair combinations may be required.

The Contractor shall simultaneously pull the probes from the tube bottom of the over the depth wheel or other measuring device, once the slack is taken out of the cables, to provide accurate depth measurements. The Contractor shall take the CSL measurements at 2 3/8 inch intervals or less from the bottom to top of the pile. The Contractor shall report defects indicated by longer pulse arrival times and significantly lower amplitude/energy signals to the State Geotechnical Engineer. The State Geotechnical Engineer may require further tests to evaluate the extent of the defects.

The Contractor shall refill CSL tubes with water after testing the shafts containing defects indicated by the initial CSL testing.

### 505.3.2.3 CSL Testing Results

1. The Contractor shall report the results of completed CSL testing at a given Substructure element within five (5) Days after testing completion for that element. The Contractor shall provide reports, prepared in accordance with ASTM D6760 (latest edition) to the State Geotechnical Engineer and the Project Manager

## 505.3.3 LSI Testing Requirements

### 505.3.3.1 Pile Head Preparation

The Contractor shall ensure that the pile head is perpendicular to the pile's vertical axis and is made of sound concrete. The Contractor shall remove weak, poor quality, or broken concrete from the pile head to expose sound concrete. The Contractor shall clearly expose the pile head and free it of debris and water. The Contractor shall ground the pile head center impacted by the impulse hammer smooth along with the pile edge area where transducers are attached to provide a flat, horizontal surface for the LSI test.

### 505.3.3.2 LSI Testing Procedure

The Contractor shall perform LSI testing only when specified or when required by the State Geotechnical Engineer due to potential defects indicated by CSL testing results. The Contractor shall impact the pile head with a hammer that can produce a compression wave capable of being reflected from the pile toe. LSI testing may only be effective to depths of 20 times to 30 times the pile diameter. The Contractor shall take LSI testing measurements in both the time and frequency domains.

The Contractor shall display the motion record (pile top velocity) on a hard copy as a function of time. High soil friction may require velocity signal magnification using integration with exponentially increasing magnitude to enhance the pile toe reflection. The Contractor shall average several consistent records. In addition to the velocity records as a function of time, the amplified and averaged difference between velocity and force may be displayed to provide additional information about the pile top quality, including dynamic stiffness.

The Contractor shall use transient response or impulse response, using hammer force in the frequency domain (mobility) to provide additional defect determination of the pile.

### 505.3.3.3 LSI Testing Results

The Contractor shall report LSI testing results completed at a given Substructure element within ten (10) Days after completing testing for that element. The Contractor shall provide report performed in accordance with ASTM D5882 (latest edition) to the State Geotechnical Engineer and the Project Manager.

### 505.3.4 Acceptance and Rejection of Piles

The Department will accept piles if pile integrity testing reports verify the structural integrity of the piles. Pile rejection will require conclusive evidence that a defect exists that may result in inadequate or unsafe performance under factored load in LRFD. If the report is inconclusive, the State Geotechnical Engineer may require the Contractor to drill a core hole into the defective pile.

The Department will reject shafts where velocities are less than 10,000 ft. per second and the anomalous velocity is less than 25% of the baseline velocity of the CSL record. Such rejection may be due to tubes not being tied in a plumb position and with equal offsets from adjacent tubes.

If a pile is unacceptable, the Contractor shall submit a remedial action plan to the State Geotechnical Engineer. The Contractor shall provide calculations and Working Drawings stamped by a licensed professional Engineer for foundation elements affected by modifications to the foundation piles and load transfer mechanisms caused by the remedial action.

## 505.4 METHOD OF MEASUREMENT

The Department will measure the actual number of tests administered and approved.

## 505.5 BASIS OF PAYMENT

Pay Item	Pay Unit
<i>CSL Consultant Testing</i>	Each
<i>CSL Department Testing</i>	Each
<i>LSI Consultant Testing</i>	Each
<i>LSI Department Testing</i>	Each

505.5.1 Work Included in Payment

The following Work and items will be considered as included in the payment for the main items and no direct payment will be made therefore;

1. Furnishing all Materials, labor, tools and Equipment necessary to complete the Work;
2. Assistance to the consultant or Department personnel necessary to complete the Work;
3. CSL Access tubes; and
4. Calculations and Working Drawings stamped by a licensed professional Engineer for all foundation elements requiring remedial action, and all labor and Materials necessary to complete corrections for rejected piles. If a defect is confirmed by coring of the concrete, Materials and labor for coring will be at the expense of the Contractor. If no defects are found, the Department will pay for all coring costs, including pressure grouting of the core holes. The time period allowed to perform testing shall be no less than 48 hours to no more than ten (10) Days from time of completion of the construction of the pile.

April 25, 2018

## SPECIAL PROVISIONS MODIFYING

### SECTION 506: MECHANICALLY STABILIZED EARTH RETAINING STRUCTURES

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete SECTION 506: MECHANICALLY STABILIZED EARTH RETAINING STRUCTURES in its entirety and replace with the following:

#### 506.1 DESCRIPTION

This Work consists of designing, furnishing all materials, and constructing mechanically stabilized earth (MSE Panel Walls) retaining structures in accordance with these specifications and in compliance with the lines and grades, dimensions and details shown in the Contract.

#### 506.2 MATERIALS

##### 506.2.1 Precast Concrete Elements

Provide precast concrete panel elements conforming to Section 517, "Precast Concrete Structures." Provide Class AA concrete. The concrete mix design shall be prepared in accordance with Section 509 "Portland Cement Concrete Mix Design" and approved by the State Materials Bureau.

##### 506.2.1.1 Casting

For precast concrete face panels, place the panel forms on a horizontal surface with the front face of the panel at the bottom of the form. Set connection hardware in the rear face. Place the concrete in each precast concrete panel form without interruption and consolidate it with an approved vibrator and hand tamping to force the concrete into the corner of the forms and eliminate the formation of stone pockets or cleavage planes. Use clear form oil throughout the casting operation.

##### 506.2.1.2 Finish

##### 506.2.1.2.1 Non-exposed Surfaces

Screed the rear faces of precast concrete panels to create a uniform surface texture that is free of open pockets of aggregates and surface distortions greater than 3/16 inch. Apply a Class I finish, per Section 511 "Concrete Structures," to other non-exposed surfaces.

## 506.2.1.2.2 Exposed Surfaces

Provide the type of finish on the exposed surface per the Contract. If the Contract requires an exposed aggregate finish, produce as follows:

1. Before placing concrete, apply a set retarder to the casting forms in accordance with the manufacturer's instructions;
2. After removing the forms and after the concrete has set sufficiently to prevent dislodging, expose the aggregate with a combination of brushing and washing (using clean water) to a depth of between 3/8 inch and 1/2 inch; and
3. Apply an acrylic resin sealer, consisting of 80% thinner and 20% acrylic solids by weight, to the exposed aggregate surface at a rate of one (1) gal per 250 ft<sup>2</sup>.

## 506.2.1.3 Tolerances

Manufacture the precast concrete elements in accordance with the following tolerances:

1. Dimensions within precast concrete panels,  $\pm 0.2$  inch;
2. Surface defects:
  - 2.1. Smooth formed surfaces not greater than  $\pm 3/16$  inch within five (5) feet;
  - 2.2. Textured-finish surfaces not greater than  $\pm 5/16$  inch within five (5) feet.
3. Differences in diagonal lengths not greater than 1/2 inch.

## 506.2.1.4 Identification and Markings

Inscribe the manufacture date, the production lot number, and the piece mark on a non-exposed surface of each element.

## 506.2.1.5 Handling, Storage, and Shipping

Handle, store, and ship units in a manner that eliminates damage and discoloration.

## 506.2.1.6 Compressive Strength

Do not ship or place elements in the wall until the design strength is reached. Cast wall panels on a flat area and fully support them until the concrete reaches a minimum compressive strength of 1,500 psi as determined by the Maturity Method detailed in Section 510.3.5.2, "In-Place Concrete Strength Measurements." Unless otherwise specified by the wall manufacturer, do not handle the elements until they reach a compressive strength of 1,500 psi.

## 506.2.1.7 Rejection

The following defects are sufficient cause for rejection:

1. Connection defects and out-of-tolerance connection imbeds/inserts;
2. Defects indicating imperfect molding;
3. Defects indicating honeycombing or open texture concrete;

4. Cracked or severely chipped panels;
5. Color variation on front face of panel due to excess form oil or other reason; and
6. Presence of oil on panels.

#### 506.2.6 Reinforcing Steel

Provide reinforcing steel in accordance with Section 540, "Steel Reinforcement."

#### 506.2.7 Soil Reinforcement

Provide galvanized steel, geosynthetics soil reinforcement will not be allowed. Provide galvanized steel connection hardware in accordance with AASHTO M 111. Support the soil reinforcement while lifting and placing so that the galvanization remains intact and does not crack.

##### 506.2.7.1 Steel Reinforcing Strips

Hot roll reinforcing strips from bars to the required shape and dimensions. Provide reinforcing strips with physical and mechanical properties in accordance with AASHTO M 223M, Grade 65, or equivalent. Provide shop-fabricated tie strips of hot rolled steel in accordance with ASTM A 1011, Grade 50, or equivalent. The minimum bending radius of the tie strips is one (1) inch. Apply galvanization after strip fabrication.

##### 506.2.7.2 Steel Reinforcing Bar Mats

Provide reinforcing bar mats of cold-drawn steel wire in accordance with AASHTO M 32 and weld the mats into the finished mesh fabric in accordance with AASHTO M 55. Form mesh button heads so that variations between the longest and shortest wire in any mesh is less than one (1) inch. Apply galvanization after mesh fabrication. Provide a 1-inch coil embed of cold drawn steel wire in accordance with AISI C 1035.

#### 506.2.8 Connector Pins

Provide connector pins and mat bars from A-36 steel and weld to the soil reinforcement mats. Provide connector bars of cold drawn steel wire in accordance with AASHTO M 32.

#### 506.2.9 Precast Concrete Panel Fasteners

Provide fasteners in accordance with the Contract or the approved Working Drawings. Cast fasteners in the precast concrete panels so that the fasteners are in alignment and will result in fasteners transferring a full and even load to the steel grid or steel strap reinforcement. The tolerance between the fastener and the steel reinforcement grid or steel straps for field installation is 3/16 in. Provide galvanized steel fasteners in accordance with AASHTO M 164.

## 506.2.10 Precast Concrete Panel Joints

Where walls wrap around a corner, provide a corner block panel with flange extensions that will allow differential movement without exposing the panel joints. Provide joint filler, bearing pads, and filter fabric in accordance with the wall manufacturer's recommendations and the approved Working Drawings.

If required, provide flexible foam strips for filler in vertical joints between panels, and in horizontal joints where pads are used, in accordance with the Plans.

Provide the following for horizontal joints between panels:

1. Pre-formed Ethylene Propylene Diene Monomer (EPDM) rubber pads in accordance with ASTM D 2000 for 4AA, 812 rubbers;
2. Neoprene elastomeric pads having a Durometer Hardness (ASTM D 2240) of  $55 \pm 5$ ; or
3. High-density polyethylene pads with a minimum density of 60 lb per cubic foot in accordance with ASTM D 1505.

Cover the joints between panels on the backside of the wall with a geotextile meeting the requirements for filtration applications in accordance with Section 604.2.4 Separator Geotextile, Class 3. Provide a minimum lap width of one (1) ft.

## 506.2.11 Reinforced Soil Backfill Material

Provide backfill that is free of shale, organic matter, and other soft particles of poor durability. Provide backfill with a soundness loss of 30 or less if tested in accordance with AASHTO T 104 using a magnesium sulfate solution with a test duration of four (4) cycles. Determine gradations in accordance with AASHTO T 27 and Table 506.2.11:1, "Backfill Gradation Requirements," unless otherwise specified.

Table 506.2.11:1  
Backfill Gradation Requirements

Sieve size	% passing
Four (4) inch	100
No. 40	0–60
No. 200	0–15

Provide backfill with a PI, no greater than 6 in accordance with AASHTO T 90.

The Department defines "rock backfill" as the Material that is composed primarily of rock fragments (Material having less than 15% passing a 1/2 inch sieve and no more than five percent (5%) passing a No. 4 sieve). If using "rock backfill," place a separator geotextile over the top of the backfill Material before placing the top two (2) ft of backfill. Also place a separator geotextile between the rock backfill and the random fill as the reinforced soil backfill is placed. Provide a separator geotextile in accordance with the minimum requirements for filtration applications in AASHTO M 288 and Section 604, "Soil and Drainage Geotextiles." Ensure the upper two (2) ft of backfill does not contain stones larger than three (3) inches at their greatest dimension and is free of rock backfill.

### 506.2.11.1 Internal Friction Angle Requirement

Provide backfill that exhibits a minimum angle of internal friction of at least 34° in accordance with AASHTO T 236 unless otherwise specified in the Contract. Run the test on the backfill Material passing the No. 10 sieve. Compact the sample in accordance with Section 506.3.5.1, “Compaction,” at optimum moisture content, to 95% of maximum density. The Department will not require direct shear testing for backfills when the gradation is less than 20% passing a 3/4 inch sieve.

### 506.2.11.2 Electrochemical Requirements

Provide backfill in accordance with Table 506.2.11.2:1, “Electrochemical Requirements,” when using steel soil reinforcement.

**Table 506.2.11.2:1**  
**Electrochemical Requirements for Steel Reinforcement**

Characteristic	Requirement	Test method
pH	5–10	AASHTO T 289
Resistivity	>2,500 ohm/cm	AASHTO T 288
Chlorides	<100 ppm	AASHTO T 291
Sulfates	<200 ppm	AASHTO T 290
Organic content	<one percent (1%)	AASHTO T 267

The Department will not require electrochemical testing for backfills when the gradation is less than 20% passing a 3/4 inch sieve and less than five percent (5%) passing the No. 200 sieve. Recycled concrete aggregate is not allowed.

### 506.2.12 Cast-in-Place Concrete

Provide cast-in-place concrete in accordance with Section 509, “Portland Cement Concrete Mix Designs,” Section 510, “Portland Cement Concrete,” and Section 511, “Concrete Structures.” Unless otherwise approved, use Class A concrete for cast-in-place concrete.

### 506.2.13 Submittals

Ensure a New Mexico registered Engineer signs and seals Working Drawings and design calculations.

#### 506.2.13.1 Working Drawings

Submit Working Drawings to the State Bridge Engineer for review and approval at least 40 Days before beginning Work on MSE retaining structures. Submit three (3) complete sets of half-size prints for preliminary review. The State Bridge Engineer will return one (1) set of prints to the Contractor with notations. Make necessary corrections and submit eight (8) sets of prints for final review, approval and distribution. Do not begin fabrication or erection before receiving written notification that the drawings are approved. Working Drawings shall include the following:



1. Layout of the wall including plan and elevation views;
2. Existing ground elevations field verified by the Contractor for each location that will involve wall construction wholly, or in part, on natural ground;
3. Complete details of elements and component parts required for the proper construction of the system;
4. A complete listing of Materials Specifications;
5. Earthwork requirements, including Specifications for Material and compaction; and
6. Other information required by the Contract or requested by the State Bridge Engineer.

Approval of the final Working Drawings covers the requirements for strength and detail, and the Department assumes no responsibility for errors or omissions in the Working Drawings. Provide three (3) sets of the manufacturer's written erection instructions with the final Working Drawings submittal.

### 506.2.13.2 Design Calculations

Along with the Working Drawing submittals, submit complete design calculations, including those required to establish service life, to the State Geotechnical Engineer for approval. Ensure the calculations confirm that the proposed design satisfies the design parameters in accordance with the Contract and:

1. FHWA NHI-10-024 Vol I and NHI-10-025 Vol II, "Design of MSE Walls and Reinforced Slopes," (Berg et al., 2009).
2. 2014, "AASHTO LRFD Bridge Design Specifications," 7th Edition (and latest interims)

Provide structures meeting the requirements of Table 506.2.13.2:1 "Design Parameters", unless otherwise specified in the contract.

Table 506.2.13.2:1  
Design Parameters

Description	Value
Resistance factors	
Sliding	Strength (all)
<sup>b</sup> Bearing	Strength (all)
<sup>b</sup> Deep Seated Stability	Service I
<sup>b</sup> Compound Stability	Service I
Pullout resistance	2014, "AASHTO LRFD Bridge Design Specifications," 7th Edition (and latest interims) Section 11
Static	Strength (all)
Combined static/earthquake	Strength (all)
Tensile resistance of metallic reinforcements and connectors	
Static	
Strip and Grid reinforcement	Strength (all)
Combined static/earthquake	
Strip and Grid reinforcement	Strength (all)
Service life	75 years
Service life (supporting structure loads)	100 years
Soil unit weight (retained )	120 lb/ft <sup>3</sup>
Soil unit weight (reinforced)	125 lb/ft <sup>3</sup>
Friction angle (retained soil)	30°
Friction angle (reinforced soil)	34°
Coefficient of sliding friction	a
Factored bearing resistance	a
Minimum soil reinforcement embedment depth	a

<sup>a</sup> In accordance with the Contract.

<sup>b</sup> Global Stability Responsibility of NMDOT

### 506.2.13.3 Certificates of Compliance

Provide the Project Manager with a Certificate of Compliance for the Material (excluding backfill and concrete) that certifies that the Material is in accordance with the Contract and the approved Working

### 506.2.13.4 Exposed Surface Finish Panel Sample

If the Contract requires an exposed aggregate or other architectural finish, deliver a 36 inch × 36 inch panel, finished as specified, to the Project Manager for approval by the Landscape Architect.

## 506.3 CONSTRUCTION REQUIREMENTS

### 506.3.1 Excavation

Conduct wall construction excavation as unclassified excavation in accordance with Section 203, "Excavation, Borrow, and Embankment."

### 506.3.2 Foundation Preparation

Grade the foundation for the structural volume level for the entire area of the base of the Structure plus 12 inches on all sides, or as shown in the Contract. Before wall construction, break up the original ground surface to at least 6 inches by plowing or scarifying. Compact this area to 95% of maximum density in accordance with Section 203.3.6, "Moisture and Density Control."

Remove unacceptable foundation material, replace with suitable Material, and compact in accordance with Section 203.2.1.4, "Unstable Subgrade Stabilization", unless otherwise approved by the State Geotechnical Engineer.

### 506.3.3 Concrete Leveling Pad

Provide a leveling pad in accordance with the approved Working Drawings. Cure the pads at least 12 hours before placement of wall panels.

### 506.3.4 Wall Erection

Erect walls in accordance with the manufacturer's written instructions. Ensure that a field representative from the manufacturer is available during the erection of the first ten percent (10%) of the wall (and as directed by the Project Manager) to assist the Fabricator, Contractor, and Project Manager. Place panels so that their final position is vertical or battered in accordance with the Contract. Sequence the placement of panels in successive horizontal lifts during backfill placement in accordance with the Working Drawings.

#### 506.3.4.1 Placement Tolerances for Precast Elements

When placing backfill Material, maintain precast elements in the specified vertical alignment with temporary wedges or bracing as recommended by the manufacturer. Ensure that vertical and horizontal alignment tolerances do not exceed 0.75 inch if measured with a ten (10) foot straightedge. Ensure that the overall horizontal tolerance (plumbness) of the vertical wall does not exceed 0.5 inch per ten (10) feet. Ensure that the offset at any panel joint does not exceed 0.4 inch.

#### 506.3.4.3 Placement of Reinforcement Elements

Place the reinforcement elements normal to the face of the wall, unless otherwise shown on the Plans. Ensure that the reinforcement bears uniformly on the compacted reinforced soil from the connection to the wall to the end of the reinforcing elements. Do not cut the reinforcement elements to accommodate obstructions within the reinforced soil zone. Do not weld soil reinforcements (shop or field welds) to extend

lengths of longitudinal reinforcements. The Department will allow approved shop welds at the connections and approved spot-welds at the transverse and longitudinal intersections of bar mats.

#### 506.3.5 Backfill Placement

Perform backfill placement immediately after erecting each level of wall panels. Place backfill carefully to avoid damage or disturbance of the wall Materials, misalignment of wall panels, or damage to soil reinforcement. Replace wall Materials damaged during backfill placement at no additional cost to the Department. If backfill placement causes misalignment or distortion of wall panels, correct at no additional cost to the Department.

##### 506.3.5.1 Compaction

Compact backfill in accordance with AASHTO T 180 (Modified Proctor), Method D (TTCP Modified), Note 7, to 95% of the maximum density, except as modified in accordance with Section 506.3.5.1.2, "Compaction Against Faces of Walls."

##### 506.3.5.1.2 Compaction Against Faces of Walls

Compact the backfill to 90% density as determined by AASHTO T 180 (Modified Proctor), Method D (TTCP Modified), within 3 ft of the wall. Compact with a minimal number of passes using a lightweight mechanical tamper, roller, or vibratory system. Determine the number of passes with a test section before compaction against the wall, as approved by the Project Manager. Use approved compaction Equipment from the test section for production Work. If changing Equipment, create a new test section to determine the number of passes for the Project Manager's approval.

##### 506.3.5.2 Moisture Control

Uniformly distribute the moisture content of the backfill Material throughout each layer before and during compaction. Ensure that backfill Materials have an in-place moisture content of three percent (3%) less than optimum to optimum. Remove backfill Material with in-place moisture content greater than optimum and rework, or replace with acceptable backfill Material.

##### 506.3.5.3 Lift Thickness

Ensure that the maximum lift thickness after compaction does not exceed eight (8) inches. Decrease the lift thickness, if necessary, to obtain the specified density.

##### 506.3.5.4 Protection of the Work

At the end of each Day's operation, slope the last level of backfill away from the wall to direct runoff away from the Structure. Do not allow surface runoff from adjacent areas to enter the wall construction site.

#### 506.4 METHOD OF MEASUREMENT

The Department will measure the face of MSE Walls based on the dimensions shown in the Contract or

# 112

approved modifications.

The Department will measure authorized *Excavation of Unsuitable Foundation Material* from the foundation surface to the depth of excavation in its original location. The Department will not measure material excavated outside the area bounded by vertical planes two (2) feet beyond the limits of the material designated for removal.

## 506.5 BASIS OF PAYMENT

Pay Item	Pay Unit
<i>MSE Panel Wall</i>	<i>Square Foot</i>
<i>Excavation of Unsuitable Foundation Material</i>	Cubic Yard

### 506.5.1 Work Included In Payment

The Department will consider the following Work as included in the payment for *MSE Panel Walls* and will not pay for it separately:

1. Excavation for MSE Panel Wall retaining Structures other than authorized excavation of unsuitable foundation material, and including any required temporary shoring;
2. Placement and compaction of suitable Material for excavation of unsuitable foundation material;
3. Dewatering for excavation of MSE Retaining Wall or authorized unsuitable foundation Materials;
4. Leveling pads, facing elements, reinforcing bars, soil reinforcements, attachment devices, backfill, coping, drainage elements, foundation preparation, and geotextile fabric; and
5. Providing the manufacturer’s field representative.

April 25, 2017

**SPECIAL PROVISIONS  
MODIFYING  
SECTION 510: PORTLAND CEMENT CONCRETE**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete Subsection 510.3.4.3.2 Continuous Concrete Placements in its entirety and replace with the following:

**510.3.4.3.2 Continuous Concrete Placements**

It is common practice to place and test concrete at the same time, therefor:

As concrete is being placed and tested, concrete tests which are outside the allowable concrete test ranges may be encountered and are to be immediately reported to the Project Manager. Concrete that has already been placed shall be removed if the slump is more than one (1) inch over the specified limits or air is more than  $\frac{1}{2}\%$  below the minimum air specified. The Project Manager then can determine to place or halt the placement of the remaining concrete. The Project Manager can determine if the placed concrete needs to be removed or if it can remain. In the event that two (2) consecutive trucks or any two (2) out of six (6) trucks are outside the allowable testing ranges, concrete shall not be placed in the structure until the concrete testing is performed prior to the placement operation and the allowable concrete test ranges are shown to be in the allowable range. If concrete from five (5) consecutive trucks are delivered within allowable concrete testing parameters, then the placement and testing of concrete can once again be performed concurrently.

Payment of concrete that deviated from required parameters will receive a 50% pay reduction in addition to the outcome of the final pay factors for the concrete.

## SPECIAL PROVISIONS MODIFYING

### SECTION 511: CONCRETE STRUCTURES

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete Section 511 CONCRETE STRUCTURES in its entirety and replace with the following:

#### 511.1 DESCRIPTION

This Work consists of constructing concrete box Culverts, headwalls, retaining walls, abutments, bents, piers, slabs, girders, and Incidental Structures requiring the use of concrete, except pre-stressed members.

#### 511.2 MATERIALS

When waterproofing is required by the Contract but a type is not specified, either fluid-applied waterproofing or sheet membrane waterproofing shall be used.

##### 511.2.1 Portland Cement Concrete

The Contractor shall use concrete mixes that have been designed in accordance with Section 509, "Portland Cement Concrete Mix Designs" and approved for use on NMDOT Projects by the State Materials Bureau for the freeze/thaw risk zone in which the Project is located. A higher risk zone concrete may be substituted.

##### 511.2.1.1 Concrete Surface Finishing Materials

For Class 2 Surface Finish, the Contractor may use a thin mortar composed of one (1) part cement and four (4) parts sand passing the No. 16 sieve. The cement used in the thin mortar shall be of the same type and source as that used in freshly placed concrete.

Alternatively, the Contractor may use a prepackaged, polymer modified mortar, designed specifically for concrete surface finishing with a with minimum 28 day compressive strength of 2,000 psi per ASTM C109.

##### 511.2.2 Steel Reinforcing

The contractor shall provide steel reinforcement in accordance with Section 540. "Steel Reinforcement"

##### 511.2.3 Bonding Agent

The Contractor shall use a bonding agent that meets the requirements of ASTM C1059, Type II or C-881 Type V.

#### 511.2.4 Form Release Agent

The Contractor may use form release agents at their discretion. Compatibility must be confirmed in a letter from the Manufacturer of subsequent surface treatments including but not limited to penetrating water repellent treatment, stains, and/or paints. If compatibility cannot be confirmed, form release residue shall be removed per the surface preparation recommendations of the manufacturer of the subsequent product.

When integrally colored concrete is used, the Contractor shall use form release agents that are non-staining and minimize surface imperfections of concrete.

#### 511.2.5 Liquid Applied Evaporation Reducers

Unless otherwise specified in the Contract Documents, the Contractor may utilize liquid-applied evaporation reducers to reduce the effects of excessive rate of evaporation at the surface of plastic concrete. Evaporation reducers shall be commercially available water-based compounds that are specifically designed to form a thin monomolecular film to reduce rapid moisture loss from the concrete surface prior to curing. The product shall be certified to have no adverse effects on the cement hydration process or the concrete and that it reduces surface moisture evaporation from the concrete when performing concrete operations in direct sun, wind, high temperatures, and/or low relative humidity.

#### 511.2.6 Curing Materials

##### 511.2.6.1 Liquid Membrane Forming Compounds

The Contractor shall use Type 1-D or Type 2 liquid membrane-forming concrete curing compounds that comply with ASTM C 309.

When integrally colored concrete is used, the Contractor shall use only curing compounds specifically recommended for use with colored concrete and in accordance with ASTM C309 Type 1.

##### 511.2.6.2 Linseed Oil Emulsion

The Contractor shall not use linseed oil emulsion-curing agent.

##### 511.2.6.3 Sheet Materials for Curing Concrete

The Contractor shall use concrete curing sheet Materials in accordance with AASHTO M 171. The Department will only allow the white reflective type.

#### 511.2.7 Joint Materials

The Contractor shall provide joint filler material in accordance with AASHTO M213 or AASHTO M153



Type I or IV (no cork).

The Contractor shall provide liquid-applied joint sealant in accordance with Section 452, "Sealing and Resealing Concrete Pavement Joints" at non-Bridge joint locations.

511.2.8 Extruded Polystyrene

The Contractor shall provide extruded polystyrene that complies with ASTM C578 Types X or XII (15 psi), Type IV (25 psi), or Type VII (60 psi). If strength is not shown in contract documents, use Type IV (25 psi). Extruded or expanded polystyrene may be used interchangeably.

511.2.9 Tear-Web Waterstop

Waterstop at the joint between abutment cap and abutment diaphragm shall be tear-web waterstop. The Contractor shall provide a product that meets the requirements of Table 511.2.8:1.

TABLE 511.2.9:1

Typical Properties	ASTM Method	Minimum Value
Water Absorption	D-570	0.10%
Tear Resistance, lb/in	D-624	225
Specific Gravity, (+/- 0.05)	D-792	1.38
Hardness, Shore A (+/-5, 10 sec. delay)	D-2240	80
Tensile, psi	D-638, Type IV	2000
Elongation %	D-638, Type IV	350
Low Temperature Brittleness @ -35° F	D-746	No Failure
Stiffness in Flexure, psi	D-747	600
Accelerated Extraction, USACE CRD-C572		
Tensile, psi	D-638, Type IV	1600

Elongation, %	D-638, Type IV	300
Effect of Alkali, USACE CRD-C572		
Weight Change, %	-----	+0.25%, -0.10%
Change in Hardness, Shore A	D-2240	+/-5 points

#### 511.2.10 Sheet Membrane Waterproofing

When specified in the Contract Documents, the Contractor shall install waterproof membrane materials. For this application, the Contractor shall provide flexible, sheet membrane waterproofing material that is a minimum 50 mil thickness. Compatible surface primers, adhesives and flashings shall be used as recommended by the manufacturer's application instruction. The material shall meet the requirements of Table 511.2.10:1.

TABLE 511.2.10:1

Typical Properties	ASTM Method	Value
water vapor permeance	ASTM E96	0.05 perms max
Elongation	ASTM D412	300% min
tensile strength	ASTM D412	300 psi min
peel strength	ASTM D903	8 lbs/in min
puncture resistance	ASTM E154	45 lbf min

#### 511.2.11 Fluid-Applied Waterproofing

When specified in the Contract Documents, the Contractor shall install cold, fluid-applied waterproof membrane materials on concrete walls prior to backfill. For this application, the Contractor shall provide seamless rubberized asphalt membrane at a minimum thickness of 30 mils. Compatible surface primers, and joint, crack, and corner treatments shall be used as recommended by the manufacturer's application instruction. The material shall meet the requirements of Table 511.2.11:2.

TABLE 511.2.11:2

Typical Properties	ASTM Method	Value
solids by weight	ASTM D1644	60% min
Elongation	ASTM D412	300% min

water vapor permeance	ASTM E96	0.1 perms max
Hardness	ASTM C661	60 max

511.2.12 Swellable Hydrophilic Waterstop

Swellable hydrophilic waterstop shall meet the requirements of ASTM D-71, ASTM D-6, and ASTM D-217.

- 1. Properties:
  - a. Specific gravity — ASTM D71: 1.35
  - b. Hydrocarbon content — ASTM D4: 47%
  - c. Volatile matter — ASTM D6: 1%
  - d. Penetration cone in accordance with ASTM D217 at 77 degrees F (25 degrees C): 40 mm
  - f. Service temperature range: -30 to 180 degrees F (-34 to 82 degrees C)

511.3 CONSTRUCTION REQUIREMENTS

511.3.1 Concrete Placement

Concrete shall be placed and tested for compliance with the Project Specifications in accordance with Section 510.

511.3.2 Temporary Works and Falsework

511.3.2.1 Temporary Works

The Contractor shall perform temporary works in accordance with the current edition of the AASHTO Guide Design Specification for Bridge Temporary Works and the AASHTO Construction Handbook for Bridge Temporary Works.

Although the document contains "Guide Design Specifications," consider them to have the same importance and standing as a code or a specification. If the content of the collaboration documents appears permissive with words such as "should," "could," "may," etc., consider the content to be a requirement unless otherwise approved by the State Bridge Engineer.

In the event of a conflict between a referenced code and this specification, this specification will take precedence.

511.3.2.2 Falsework and Falsework Foundations

The Contractor shall construct Structure in accordance with Section 511, "Concrete Structures," and Section 512, "Superstructure Concrete", as applicable.

The Contractor shall design, construct, and maintain falsework and falsework foundation to provide the

required strength and rigidity, and to support loads without settlement. The Contractor shall have a professional Engineer licensed in the State of New Mexico design the falsework and its foundation. The design of the falsework and foundation will be required if one (1) or more of the following conditions apply:

1. If the height of the Structure is greater than ten (10) ft, (excluding concrete Culverts with bottom slabs);
2. Where the supported span is greater than 15 ft.;
3. Where traffic, other than workmen involved in constructing the Structure, will travel under the falsework.

The Contractor shall place the falsework on an adequate foundation. The maximum foundation bearing pressure is 2,000 pounds per square foot unless a Geotechnical investigation indicates a higher value can be used. The Contractor shall provide methods for measuring settlement or movement of falsework and forms under load. If falsework shows settlement greater than 3/8 inch at the vertical supports, the Contractor shall stop the Work and correct the settlement or movement.

If pilings are used for falsework, the Contractor shall pull or cut off falsework pilings. The Contractor shall ensure the cut-off elevations are one (1) ft below the low water level, natural ground, or bottom of proposed channel.

If required, the Contractor shall submit Plans for falsework to the State Bridge Engineer for approval. The Contractor shall submit proposed changes to existing Structures required for maintenance of traffic to the Project Manager for approval. 30 Days shall be allowed for the initial review. 15 additional Days shall be allowed for each resubmittal.

### 511.3.3 Form Construction

The Contractor shall make forms mortar tight and sufficiently rigid to prevent deformation due to the pressure of the concrete and other loads incidental to the construction operations, including vibration. The Contractor shall construct and maintain forms to prevent the joints from opening. The Contractor shall construct and maintain forms used on surfaces in public view such that the finished concrete surface will be smooth and of uniform color and texture.

The Contractor shall remove loose dirt, laitance and miscellaneous debris from the bottom of the forms before placing concrete.

The Contractor shall fillet forms and chamfer them 3/4 inch, unless required otherwise in the Contract, and give them a bevel or draft for easy removal of projections such as girders and copings.

#### 511.3.3.1 Form Lumber

The Contractor shall use lumber that is planed on at least one (1) side and the two (2) edges for exposed concrete surfaces. The Contractor shall place the planed face so that it will be the formed surface for the concrete being placed.

#### 511.3.3.2 Metal Ties

The Contractor shall construct metal ties and anchorages within the forms to permit the removal of a portion of the tie connections without damaging the concrete, and provide at least 1/2 inch depth of cover

from the concrete surface.

### 511.3.3.3 Surface Treatment of Forms

The Contractor shall ensure that forms have been properly wetted before placing concrete.

The Contractor shall use form release agents at their discretion before placing reinforcing steel. The Contractor shall not use form release agents that adhere to or discolor the concrete.

### 511.3.3.4 Metal Forms

The Contractor shall provide metal forms thick enough to prevent bending and maintain their shape. The Contractor shall use countersunk bolts and rivet heads. The Contractor shall use clamps, pins, and other connecting devices designed to hold forms rigidly together and for removal without damaging the concrete. The Contractor shall use metal forms that have a smooth surface and line up properly.

The Contractor may use metal forms that remain part of the Structure in accordance with the Contract or as approved by the State Bridge Engineer. The Contractor shall use permanent steel Bridge deck forms in accordance with Section 512.3.4.1, "Permanent Steel Deck Forms."

### 511.3.3.5 Reuse of Forms

The Contractor shall continuously maintain the shape, strength, rigidity, water tightness, and surface smoothness of reused forms. The Contractor shall resize warped or bulged lumber before reusing it.

## 511.3.4 Temperature and Weather Limitations

The Contractor shall keep the concrete mixture temperature between 50°F to 90°F at the time of placement.

### 511.3.4.1 Cold Weather Concrete

The Contractor shall place cold weather concrete in accordance with ACI 306, *Cold Weather Concreting*.

If air temperatures are likely to fall below 40°F during the placement or curing periods, the Contractor shall submit a cold weather concreting and curing plan to the Project Manager for approval by the State Concrete Engineer before concrete placement. The Contractor shall allow 14 Days for review. The Contractor shall ensure that the plan details the methods and Equipment to maintain the required concrete temperatures over the entire concrete pour area.

Information submitted will include, but not be limited to:

- Whether or not outside heating sources will be used (and how the exhaust will be vented away from the fresh concrete);
- Whether or not the rate of surface evaporation is expected to exceed the limitations detailed in 511.3.4.3, "Rate of Evaporation Limitations" and measures to be taken
- What the target mix temperature will be;

- How the concrete will be protected from the ambient conditions;
- Curing methods to be used during and following the protection period;
- How soon after the placement the protection from the ambient conditions will be implemented;
- Who will be responsible for insuring that the proper protection from the environment is properly implemented;
- How the actual temperature of the concrete will be monitored;
- How often will this be checked;
- Who will do the checking;
- What actions will be taken if the temperatures fall below the target points;
- Who will be responsible for taking the necessary actions;
- Who the contact will be if Department Personnel need to transmit notices or information about the cold weather conditions.

Review and acceptance of the Cold Weather Concreting and Curing Plan shall not relieve the Contractor from its obligation to perform the Work and provide Materials in strict conformance with the Contract.

The Contractor shall not place concrete directly onto any surface that is less than 40°F unless otherwise approved by the Project Manager. The Contractor shall not place concrete on frozen ground.

If placing concrete at or below air temperatures of 35°F, the Contractor shall provide suitable enclosures and heating devices. The Contractor shall vent exhaust from combustion type heating devices outside the placing area so that the exhaust fumes cannot come in contact with the freshly placed concrete.

The Contractor shall ensure the concrete surface temperatures never fall below 45°F during placement and the first three (3) Days after placing. The Contractor shall not let the surface temperature fall below 40°F during the next four (4) Days after the initial 3 Day curing period, or until the in-place strength determined by the *Maturity Method*, in accordance with Section 510.3.5.2, "In-Place Concrete Strength Measurements" indicates that 75% of the design strength is achieved.

The Contractor shall monitor the minimum concrete temperatures at various locations including edges and corners of slabs or other Structures, and check immediately before placing insulating material over the concrete.

If heating the aggregates or water, the Contractor shall use heating methods and Equipment that can heat the Material uniformly. The Contractor shall not heat the Materials to more than 110°F. During the heating or mixing process, the Contractor shall not add cement to water and aggregate combinations that are hotter than 90°F.

#### 511.3.4.2 Hot Weather Concrete

The Contractor shall place hot weather concrete in accordance with ACI 305, *Hot Weather Concreting*.

Hot weather is any combination of the following conditions that tends to impair the quality of freshly mixed or hardened concrete by accelerating the rate of moisture loss and rate of cement hydration or otherwise causing detrimental results: high ambient temperature; high concrete temperature; low relative humidity; wind speed; solar radiation.

The Contractor shall estimate the rate of evaporation at the surface of the concrete per 511.3.4.3, "Rate of Evaporation Limitations". If the rate of evaporation is anticipated to be greater than 0.2 lb per sq ft per hour, the Contractor shall submit a hot weather concreting and curing plan to the Project Manager for approval by the State Concrete Engineer before concrete placement. The Contractor shall allow 14 Days for review.

The Contractor's Hot Weather Concreting and Curing Plan shall include measures that shall be taken by the Contractor at their expense and maintained to the satisfaction of the Project Manager to reduce the rate of evaporation during initial cure to within the specified rate. The methods can include but not be limited to following

1. Erect windbreaks to reduce the wind velocity over the concrete surface;
2. Place concrete during nighttime or early morning hours;
3. Use cool aggregate and mixing water to lower the fresh concrete temperature;
4. Increase the relative humidity at the site with a fog spray; and/or
5. Apply a liquid-applied evaporation reducer

Review and acceptance of the Hot Weather Concreting and Curing Plan shall not relieve the Contractor from its obligation to perform the Work and provide Materials in strict conformance with the Contract.

#### 511.3.4.3 Rate of Evaporation Limitations

The "Rate of Evaporation Limitations" are detailed in ACI 305 – Hot Weather Concrete. These procedures lessen the potential of plastic-shrinkage cracking in concrete. The "Rate of Evaporation Limitations" apply to Bridge decks, approach slabs, CBC (top and bottom slabs), slipped formed concrete Structures, all PCCP and structural shotcrete. ACI 308 – Guide to Curing Concrete emphasizes that the rate of evaporation limitations can be exceeded in both cold and hot weather and must be addressed in both conditions.

The Contractor shall determine the anticipated rate of evaporation of surface moisture from the concrete by utilizing Figure 511.3.4.3:1 – "Surface Evaporation from Concrete". The Contractor shall not place concrete if the anticipated rate of evaporation exceeds 0.20 lb. per square foot per hour at the site over any ten (10) minute period, unless measures are taken to prevent excessive moisture loss from the surface of the concrete during initial curing. See 511.3.4.2 for acceptable measures. These measures must be detailed in the Cold Weather Concrete Plan per 511.3.4.1 or the Hot Weather Concrete Plan per 511.3.4.2.

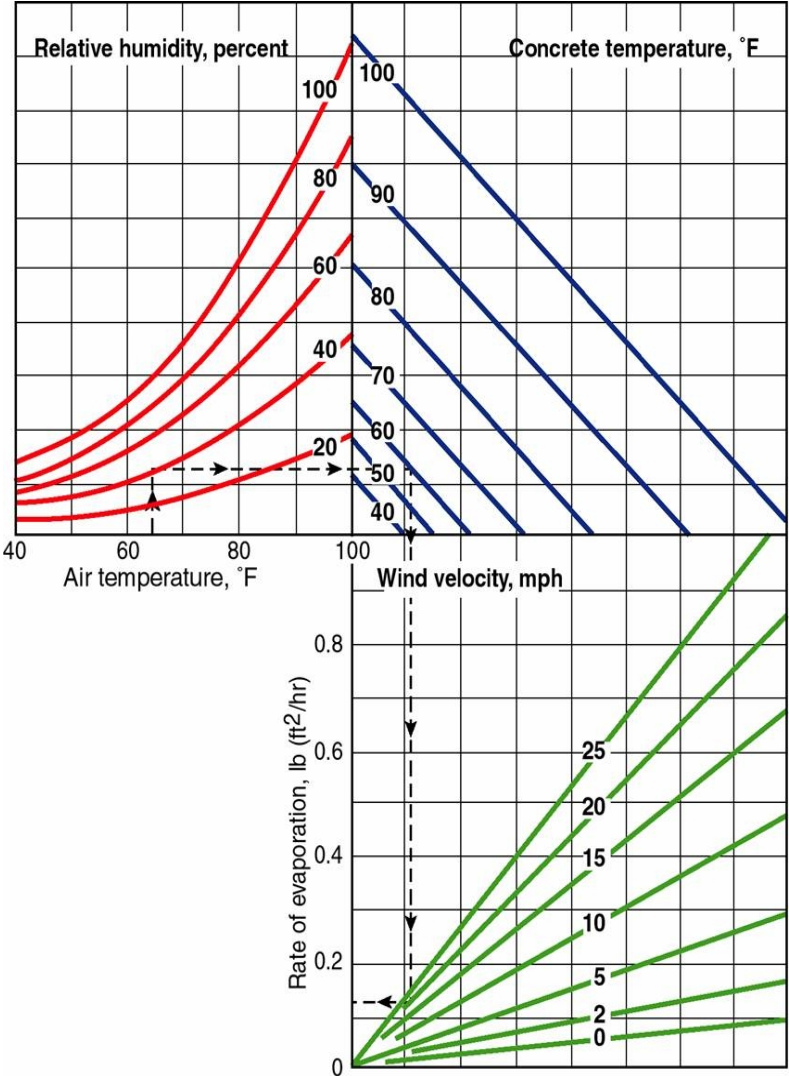
During the concrete placement, the wind speed, relative humidity and ambient air temperature shall be collected via a computerized weather station that shall be provided and retained by the Contractor. The weather station shall be an automated system that does not require any human support or effort after its initial set-up. The Contractor shall record readings at minimum five (5) minute intervals until the final curing system has been physically applied. Copies of these readings shall be submitted to the Project Manager within 24 hours of the placement. Measurements to determine the Surface Evaporation from the Concrete shall be taken at a height of approximately five (5) feet above the deck for relative humidity and ambient air temperature, and between a height of 20 inches and five (5) feet for wind speed.

For concrete placements that are smaller than 10 cubic yards, a handheld anemometer may be used in lieu of a weather station. The handheld anemometer shall be capable of measuring wind speed,

humidity and air temperature; and shall be supplied and retained by the Contractor.



Figure 511.3.4.3:1  
Surface Evaporation from Concrete (reference ACI 305)



To use this chart:

- 1. Enter with air temperature, move up to relative humidity
- 2. Move right to concrete temperature
- 3. Move down to wind velocity
- 4. Move left; Read approximate rate of evaporation

#### 511.3.4.3.1 Wind Break

If a wind break is used, the wind break shall be a minimum height of eight (8) ft.- 0 inches protecting the Bridge deck, approach slabs, sleeper footings and/or transition slabs (if applicable). All areas of the freshly placed concrete must be protected by the wind break. The nature and type of windbreak to be used shall be approved by the Project Manager prior to placement of any Superstructure concrete.

#### 511.3.4.3.2 Fogging System

If a fogging system is used, a water fog shall be continuously applied over the surface of the freshly placed concrete in such a manner that the entire surface is kept at a relative humidity of 90% or greater and the surface of concrete is kept at an evaporation potential of 0.15 pound/square foot/hour or less, as determined from Figure 511.3.4.3.1. The evaporation potential shall be determined prior to fogging and outside the wind protection, and continuously monitored with evaporation potential measurements taken and recorded at least once every five (5) min throughout the entire placement, and continuing until the concrete curing system has been completely installed. If a wind break and/or fogging are being used, the Contractor shall obtain these readings from the protected area at a height of approximately five (5) feet above the protected concrete.

The area to be fogged shall be the entire area of the freshly placed concrete, which has not had the final finish applied. This fog shall be delivered through a network of nozzles, which are properly spaced to provide a uniform fog at the surface of the concrete. The nozzles used shall be of the type, which atomizes the water so that there are no visually discernible droplets of water. The area of coverage from each nozzle shall overlap all adjacent nozzle coverage by at least one (1) ft. It shall be demonstrated prior to the placement of the concrete that the intended system is capable of delivering the required fogging environment for at least twice the anticipated required time. The Contractor shall not finish or otherwise mix any of the fogging water into the fresh concrete.

The intended system must be properly field tested, and approved by the State Materials Bureau before being used on any Superstructure concrete. Fogging shall continue until the surface is treated with an approved curing method.

#### 511.3.4.3.3 Liquid Applied Evaporation Reducers

If a liquid-applied evaporation reducer is used, it shall be selected from the Departments Approved Products list and must be applied in strict accordance with manufacturer's application instructions.

Liquid applied evaporation reducers are not curing compounds and are not finishing aids. Liquid applied evaporation reducers are to be used to reduce surface evaporation during the initial cure of concrete. Initial cure of concrete typically occurs up to and including bull-floating. Multiple applications of liquid applied evaporation reducer may be required, reference manufacturer's application instructions.

Upon commencing surface finishing (beyond bull-floating), further application of liquid evaporation reducers shall not be allowed (liquid evaporation reducers cannot be used as finishing-aids). Cure concrete after surface finishing in accordance with 511.3.9 – Curing.

#### 511.3.5 Concrete Placement

Concrete shall be placed and tested for compliance with the Project Specifications in accordance with Section 510, "Portland Cement Concrete".

The Contractor shall not place concrete until the Project Manager approves the reinforcing steel and forms. The Contractor shall ensure that forms are clean and free of rust, grease, and other Deleterious Material immediately before placing the concrete. The Contractor shall remove wooden form spacers immediately before placing concrete in that area.

The Contractor shall vibrate the concrete during placement to force the coarse aggregate from external surfaces and to bring mortar against the forms to produce a smooth finish significantly free of water, air pockets, and honeycombs.

The Contractor shall place concrete in girders, walls, and other similar Structures in horizontal layers. The Contractor shall ensure that the concrete is not too thick for the vibrator to consolidate and merge it with the previous layer. The Contractor shall not pour concrete layers deeper than two (2) ft.

The Contractor shall not place concrete faster than the rate used for the design of the forms. The Contractor shall adjust the rate for the temperature of the concrete being placed.

#### 511.3.5.1 Chutes and Troughs

The Contractor shall avoid segregation of the Materials and the displacement of the reinforcement when placing the concrete. The Contractor shall use metal or metal-lined open troughs and chutes; do not use aluminum. All tools used for the moving and/or spreading of the concrete shall be square pointed tools. The Contractor shall not use round nose shovels and spreading tools.

Where the Contract requires steep slopes, the Contractor shall equip the chutes with baffle boards or use short lengths that reverse the direction of movement.

The Contractor shall keep chutes, troughs, and pipes clean and free of hardened concrete by thoroughly flushing with water after each pour. The Contractor shall discharge the water used for flushing away from the placed concrete.

The Contractor shall not allow concrete to free fall for more than three (3) ft. For CBC walls and retaining walls that are less than or equal to ten (10) inches thick, maximum free fall heights shall not apply. For CBC walls and retaining walls greater than ten (10) inch thick, concrete may have a free fall of less than nine (9) ft.

The Contractor shall fill each part of the form by placing the concrete as close to the final position as possible. The Contractor shall vibrate the concrete during placement to force the coarse aggregate back from the forms and around the reinforcement without displacing the bars. After the concrete's initial set, the Contractor shall not jar the forms or place strain on the ends of projecting reinforcement.

#### 511.3.5.2 Concrete Pumping

If placing concrete by pumping, the Contractor shall install pumping Equipment so that vibrations

resulting from the operation do not damage the concrete being placed. The Contractor shall obtain Project Manager approval before using concrete pumping Equipment.

Before placing the concrete, the Contractor shall clean the Equipment thoroughly. The Contractor shall operate the Equipment so that it pumps a continuous flow of concrete without air pockets and without an appreciable loss of slump or entrained air.

The Contractor shall control the loss of entrained air by one (1) or more of the following methods:

1. Tie the end of the pump hose so that the discharge end is pointing upward, forming a “J” at the end of the hose;
2. Install a series of four (4) consecutive elbows to form a 360° loop;
3. Reduce the diameter of the end of the pump line; or
4. Limit the enclosed angle of the boom arms to an angle of 135° or more.

The Contractor shall make sure that the discharge of the concrete from the pump is as close as possible to the bottom of the structure being placed, but in no case shall it be allowed to drop a distance greater than four (4) feet with the exception of CBC walls where the walls equal to or less than ten (10) inch thick, concrete may have a free fall of less than nine (9) ft.

The Contractor shall not use aluminum pipe. The Contractor shall not add water to the concrete during pumping. If water is added at the pump hopper to clear a clogged pump, the Contractor shall dispose of the concrete in the hopper and the line.

#### 511.3.5.3 Conveyers and Belts

The Contractor may use conveyor belts to transport the concrete from the point of delivery to the point of placement. If using multiple belts, the Contractor shall ensure that the drop from one (1) belt to the next is no greater than 18 inches. At the end of the last belt, the Contractor shall not allow the concrete to free-fall more than four (4) ft. The Contractor shall ensure that the concrete coming off the end of any belt is not being segregated. If segregation occurs, the Contractor shall slow down the speed of the belt until segregation no longer occurs.

#### 511.3.5.4 Placing Concrete Under Water

If placing concrete under water, the Contractor shall submit a mix design and procedure plan to the Project Manager. The Project Manager may require up to 30 Days to approve them. The Contractor shall allow time in the schedule to accommodate this approval process.

#### 511.3.5.5 Vibrating/Consolidation

Unless otherwise directed by the Project Manager, and excluding drilled shafts, the Contractor shall consolidate concrete with suitable mechanical vibrators operating within the concrete. During concrete placement, the Contractor shall keep enough personnel, vibrators, and other tools available to assure adequate consolidation. If necessary, the Contractor shall supplement vibrating with hand spading with suitable tools to assure proper consolidation. If using vibrators, the Contractor shall use procedures in accordance with ACI 309 – Consolidation of Concrete.

The Contractor shall not use a “jitterbug” or any other flat tool that could cause concrete segregation.

The Contractor shall use vibrators that have each been certified within the last 90 Days to provide 8,500 to 12,500 vpm.

The Contractor shall operate vibrators to consolidate the concrete thoroughly around the reinforcement and embedded fixtures and into corners and angles of the forms. The Contractor shall not use vibrators to make concrete flow or run. The Contractor shall vibrate long enough to accomplish consolidation, but do not vibrate so long to cause segregation or air bubbles. The Contractor shall insert the vibrators vertically into the concrete, and immediately withdraw upward along the same line with the opposite motion. The Contractor shall not drag the vibrator horizontally across the placing area.

When operating vibrators, the Contractor shall avoid contact with reinforcing bars, particularly epoxy coated reinforcing bars or bars that extend into concrete that has taken an initial set. If vibrating concrete in areas reinforced with epoxy-coated bars, the Contractor shall cover the vibrators with nonmetallic sleeves to prevent damage to the epoxy coating.

#### 511.3.5.6 Sequence of Placement and Application of Load

The Contractor shall not place superimposed loads on or against load carrying members, floor slabs, or retaining walls until the concrete reaches 75% of specified design compressive strength but no less than 2,500 psi, determined in accordance with Section 510.3.5.2, “In-Place Concrete Strength Measurements.” Concrete Box Culverts and CBC wingwalls shall not be backfilled until specified design compressive strength has been achieved.

The Contractor shall submit a concrete placement schedule to the Project Manager upon request. The Contractor shall plan and schedule concrete placement to prevent damage to previously placed concrete or to the curing or protection systems of previously placed concrete.

The following applies to concrete placement scheduling:

1. The Contractor may erect reinforcement and formwork for walls, columns, and pier caps 24 h after placement of footings or floor slab concrete. Unless otherwise provided, the Contractor may place concrete columns, walls, and pier caps, 48 h after placement of footing or floor slab concrete;
2. Do not set beams or girders, or place Superstructure concrete until Substructure forms have been stripped sufficiently to determine the quality of the concrete;
3. Do not place the load of the Superstructure on the Substructure until the Substructure concrete has been in place for at least 14 Days or until in-place strength measured by the *Maturity Method* indicates that the concrete has attained 75% of the design strength;
4. Ensure that the concrete has achieved sufficient strength as determined by the *Maturity Method* in accordance with the form design before placing concrete for integral horizontal members, such as pier caps or top slabs;
5. Place the vertical members at least seven (7) Days before mounting friction collars or falsework brackets that will support the weight of horizontal members. Ensure that the vertical members have attained the specified strength before applying loads, unless the Department approves otherwise;
6. Limit monolithic casting of walls and deck slabs of concrete box Culverts to Culverts that are six (6) ft. high or less. Construct box Culvert walls higher than six (6) ft. in accordance with this subsection;
7. If the concrete is not gaining strength as expected, the Assistant District Engineer of Construction may

extend the waiting periods. Conduct construction operations in a manner that does not damage the previously placed concrete.

#### 511.3.5.7 Supplementary Lighting

The Contractor shall not mix, place, or finish concrete when the natural light is insufficient without using an adequate artificial lighting system, approved by the Project Manager. The Contractor shall test the lighting system at least one (1) Day before placing the concrete to assure that the system will provide sufficient light, without shadows or dark areas for placing, testing and finishing concrete. The Contractor shall ensure that the lights do not create a hazard for traffic on adjacent Roadways or Detours.

#### 511.3.6 Removal of Forms

The Contractor shall not remove the forms until the concrete is strong enough to avoid damage by removing the forms.

If in-place strength tests in accordance with Section 510.3.5.2, "In-Place Concrete Strength Measurements," are not used to control field operations, remove forms in accordance with Table 511.3.6:1, "Timetable for Removal of Forms," not counting those Days when the temperature is below 40°F.

Table 511.3.6:1  
Timetable for Removal of Forms

Structural component	Minimum time for removal
Bottom of beams	14 Days
Bridge decks <sup>a</sup>	seven (7) Days
Floor slabs	seven (7) Days
CBC Floors	seven (7) Days
CBC Top Slab	seven (7) Days
Walls	24 h
Columns	48 h
Sides of beams	24 h
All other parts	24 h

<sup>a</sup>Additional requirements of Section 512, "Superstructure Concrete," shall apply.

If one (1) of the test methods in Section 510.3.5.2, "In-Place Concrete Strength Measurements," is used to control the field operations, the Contractor may remove forms from the bottom of beams and floor slabs when the concrete reaches 75% of the design compressive strength.

511.3.7 Joints

The Contractor shall make construction joints in concrete Structures in accordance with the Plans, unless otherwise directed or approved by the Project Manager.

If the concrete placement is interrupted and additional construction joints are required, the Contractor shall place the additional joints in planes perpendicular to the principal lines of stress, and at points of minimum shear, as approved by the Project Manager.

511.3.7.1 Keyed Joints

The Contractor shall mechanically bond construction joints with keys formed by beveled strips embedded in the surface of the concrete. The Contractor shall make the keys from 1 3/8 inch to 1 1/2 inch deep. The Contractor shall place the keys centrally within the thickness of the joint. The Contractor shall ensure that the keys have a width that is one-third of the depth of the smallest dimension of the joint. The keys do not need to exceed the clear distance between reinforcing mats, or be greater than eight (8) inches. The Contractor shall provide raised keys in accordance with the Plans.

511.3.7.2 Bonding New Concrete to Existing

If bonding new and existing concrete, the Contractor shall retighten the forms before depositing new concrete on or against the hardened concrete. The Contractor shall roughen the surface of the hardened concrete without loosening the aggregate or damaging the concrete on the surface. The Contractor shall thoroughly clean the surface of foreign matter and laitance.

The Contractor shall utilize a bonding method at the interface between the hardened and fresh concrete by covering the cleaned and saturated surfaces with a coating of enriched mortar (reference

Section 533 for enriched mortar specifications or a bonding agent from the Approved Product List. The Contractor shall place the new concrete before the enriched mortar reaches an initial set. If using a bonding agent, the Contractor shall follow the manufacturer's application instructions. The Contractor shall place the concrete continuously from joint to joint, and finish the face edges of exposed joints in accordance with the Plans.

#### 511.3.7.3 Water Stops and Flashings

The Contractor shall provide and place water stops, and flashings per the Contract documents. The Contractor shall splice or solder water stops and flashings to form continuous watertight joints.

Swellable hydrophilic waterstop shall be installed with 2" minimum concrete cover. Materials shall be installed per manufacturer's installation instructions.

#### 511.3.7.4 Joint Sealing Materials

The Contractor shall install joint sealers in accordance with the manufacturer's recommendations, including surface preparation and the use of primers and backer-rod as required.

#### 511.3.8 Miscellaneous Construction

##### 511.3.8.1 Setting of Bearings

The Contractor shall ensure the surfaces on which metal masonry plates and elastomeric bearing pads will rest are flat and on level planes. If using elastomeric bearing pads, the Contractor shall finish the Bridge seats slightly high and grind to the correct elevation.

If it is necessary to adjust the elevation of a bearing upward, the Contractor shall make the adjustment by placing full size shim plates. If it is necessary to adjust the elevation of a bearing downward, the Contractor shall make the adjustment by diamond grinding to a level plane-bearing surface. The Contractor shall not use grout to level or adjust elevation.

If placing a bearing surface below the level of adjacent concrete, the Contractor shall ensure water drains away from the masonry plate or elastomeric bearing pad.

The Contractor shall finish sections of Bridge seats on abutments or piers on both sides of bearing assemblies to drain, with a slope of from 1/16 inch to 1/8 inch per foot. The Contractor shall correct depressions that retain water.

##### 511.3.7.2 Waterproofing

If required in the Contract, the Contractor shall protect the backsides of abutment backwalls and wingwalls by waterproofing. The Contract shall define the vertical and horizontal limits of the waterproofing. The material shall be installed in conformance with the manufacturer's application instructions.

#### 511.3.8 Finishing



The Contractor shall perform finishing after removing forms in accordance with the Contract.

## 511.3.8.1 Exposed Surfaces

The Department considers “exposed surfaces” as surfaces that are not buried in the ground or permanently covered by the fill, or against which the fill is not permanently placed. However, the Department does not consider the inside surfaces of concrete box drainage Culverts and concrete box girders, and the bottom side of concrete Bridge decks as “exposed surfaces.”

## 511.3.8.2 Class 1, Ordinary Surface Finish

The Contractor shall apply a Class 1 finish to exposed surfaces as a final finish or before a Class 2, Rubbed Surface Finish, or a Class 4, Special Surface Finish.

A Class 1 finish includes the removal of rods, bolts, or other form ties to at least 1/2 inch deep from the face of the concrete. The Contractor shall fill tie holes and honeycombs with mortar composed of one (1) part cement and two (2) parts sand; use the same brand and type of cement as used in the concrete.

The Contractor shall remove objectionable fins, bulges, and projections by rubbing with carborundum bricks or by other methods approved by the Project Manager. If necessary, the Contractor shall clean the entire surface. The Contractor shall keep such surfaces in an acceptable condition until final Acceptance of the Work.

The Contractor shall apply a Class 1 finish to surfaces buried in the ground or permanently against the fill, except that form ties may be cut off even with the concrete surface, and fins, minor bulges, projections, stains, and discolorations do not need to be removed.

Unless specified otherwise in the Contract, the Contractor shall apply a Class 1 finish to the front faces of backwalls of abutments, the top surfaces of Bridge seats on piers and abutments, and concrete curtain walls between pier pilings.

The Contractor shall apply a Class 1 finish to the inside surfaces of concrete box drainage Culverts, except as noted in Section 511.3.8.3, “Class 2, Rubbed Surface Finish.”

## 511.3.8.3 Class 2, Rubbed Surface Finish

The Contractor shall apply a Class 2 finish to concrete surfaces generally exposed to public view.

The Contract may specify a Class 4, Special Surface Finish with selected colors, for various components or parts of components. If the Contract specifies a Class 4, Special Surface Finish, the Contractor shall apply a Class 2 finish first, unless otherwise approved by the Project Manager.

A Class 2 finish consists of a Class 1 finish, then thoroughly wetting the surface and applying a mortar.

The Contractor shall apply a thin mortar in accordance with Section 511.2.1.1 – Concrete Surface Finishing Materials, and rub it into holes and pockets in the surface of the concrete. The Contractor shall allow the mortar to remain until it has set sufficiently to prevent removal by subsequent rubbing operations.

The Contractor shall rub the surface with a No. 25 to No. 30 carborundum brick, then, rub with burlap to remove excess mortar. If the completed rubbed surface does not look uniform, the Contractor shall make a final finish by wet rubbing with a No. 30 carborundum brick.

The Contractor shall apply Class 2 finish to the following:

1. Outside vertical surfaces of Bridge decks;
2. Outside surfaces of exterior girders, curb and rail posts seen in elevation view;
3. Curb tops, post tops, inside faces of curbs, and faces of hand rails;
4. Exposed surfaces of pier columns and caps;
5. Abutment wingwalls and Bridge seats one (1) ft. below final grade;
6. Bridge rehabilitation Projects with existing slope paving;
7. Top surface of slope paving (tops of Bridge seats require only a Class 1 finish);
8. Exposed surfaces of barrier railings on Bridges or concrete box Culverts;
9. Exposed surfaces of miscellaneous concrete Structures extending above Shoulder line grade and inside walls of concrete underpass Structures.
10. Concrete box Culverts used for drainage, on the soffit and streamside faces of headwalls and wingwalls, and for six (6) inches down the back side of wingwalls; and
11. The interiors of sidewalls to one (1) ft back from the face of the Culvert at the tops of the sidewalls, and extending on a 45 line downward and inward.

#### 511.3.8.4 Class 3, Float Finish

The Contractor shall apply a Class 3 finish to upper surfaces not formed, such as tops of walls, headwall, tops of slabs and bottom slabs of box Culverts, copings and Bridge seats, except tops of Bridge decks, Sidewalks, or curbs.

A Class 3 finish consists of placing an excess amount of concrete in the forms and striking off this excess concrete with a template, forcing the coarse aggregate below the surface. After striking off the concrete, the Contractor shall thoroughly work the surface with a wooden, cork, or canvas float without adding water or cement. Before the final finish has set, the Contractor shall use a fine brush to remove surface film and to produce a fine grain, smooth, sanded texture.

#### 511.3.8.5 Class 4, Special Surface Finish

When specified in the Contract documents, the Contractor shall apply a Class 4, Special Surface Finish. The Class 4, Special Surface Finish shall be applied in accordance with Specification Section 548 - Concrete Coatings.

The Contractor shall apply the Class 4 finish over the Class 2 finish, unless directed otherwise by the Project Manager.

The Contractor shall apply the Class 4 finish consistent with the location requirements of 511.3.8.3 Class 2, Rubbed Surface Finish. If repairing existing Structures, apply a Class 4 finish to the entire surface of the repaired components.

#### 511.3.9 Curing

The Contractor shall cure all concrete in accordance with ACI 308 – Guide to Curing Concrete. All concrete shall receive a minimum of seven (7) Days of curing treatment. The Contractor shall use curing methods in accordance with Table 511.3.10:1, “Curing of Concrete Structures,” unless the Contract specifies otherwise.

If the Department allows the Contractor to choose the curing method, the Contractor shall obtain the approval of the Project Manager before beginning curing operations.

Table 511.3.10:1  
Curing of Concrete Structures

Method designation	Curing method description
Method 1	Water curing
Method 2	Curing compound
Method 3	Form curing
Method 4	Combination of Method 1 and Method 2
Structure description	Curing methods
Top surfaces of:	
Bridge decks <sup>a</sup>	4
Approach slabs	4
Concrete curbs, gutters and Sidewalks	1 or 2
Pier caps, abutment Bridge seats	1 or 2
Wingwalls and parapet walls	1 or 2
All vertical concrete surfaces that begin in contact with form materials, including but not limited to: Barrier walls, barrier railing, wingwalls, parapet walls, abutments, box culverts, decks, slabs, curbs, gutters, sidewalks, construction joints	3
Elevated horizontal surfaces on the underside of structural elements that begin in contact with temporary form materials including but not limited to: pier caps, girders, structural slabs	3
Slip Formed Concrete elements including but not limited to: concrete wall barriers, curb, gutter	2
All other concrete <sup>b</sup>	1, 2, or 3

<sup>a</sup>See Section 512.3.10.1, “Curing,” for additional curing requirements for Bridge decks.

<sup>b</sup>Unless the Contract specifies otherwise.

#### 511.3.9.1 Method 1, Water Curing

The Contractor shall keep the concrete thoroughly and continuously wet and covered for at least seven (7) Days. The Contractor shall place and anchor covers, mats, and sheeting to ensure continuous contact with the concrete surfaces.

The Contractor shall cover concrete slabs as soon as possible with a double layer of clean, wet burlap or cotton mats, or other moisture retaining Material approved by the Project Manager. The Contractor shall ensure that the moisture retaining Materials lay flat with no wrinkles and that adjacent strips of moisture retaining materials overlap at least 12 inches. After installation, the Contractor shall soak the moisture retaining material and add moisture as required to ensure that it is not allowed to become dry for the duration of the specified curing period. The Project Manager will determine the suitability of the moisture retaining material for reuse, based on the cleanliness and absorptive ability of the Materials.

In addition to the moisture absorptive material, the Contractor shall install plastic sheeting over the moisture absorptive material. If the slabs are on grade, the Contractor shall extend the cover materials at least twice the slab's thickness beyond the edges of the slab, and make sure that the entire exposed surface of the concrete is protected. If the slab is a Bridge deck, the Contractor shall place the cover materials to fully protect exposed edges and unformed surfaces of the concrete.

The Contractor may temporarily remove the cover from surfaces that require a rubbed finish for finishing, but shall restore the cover as soon as possible.

#### 511.3.9.2 Method 2, Curing Compound

Application of curing compound shall be in accordance with manufacturer's application recommendations.

For slabs, Bridge decks and other flatwork, the Contractor shall apply the curing compound to the fresh concrete as soon after finishing as allowed by the manufacturer.

The Contractor shall thoroughly mix the membrane forming curing compound per the manufacturer's recommendations.

The Contractor shall not apply the curing compound in rainy conditions. The Contractor shall adhere to the thermal limitations as specified by the manufacturer – typically, the product when stored should not be allowed to freeze and should not be applied when the air or concrete temperature is less than 40 degrees Fahrenheit.

The Contractor shall apply the curing compound under pressure with an atomizing-type spray nozzle. The Contractor shall uniformly cover the entire surface area at the rate recommended by the manufacturer or at a rate of at least one (1) gal per 175 ft<sup>2</sup> whichever rate is greater. The Contractor shall use spray Equipment with enough pressure to force the curing compound to leave the nozzle as a fine mist. If the nozzle becomes plugged, the Contractor shall immediately clear the nozzle before continuing the application. The Contractor shall not continue to spray curing compound through a nozzle that has become plugged or obstructed.

The Contractor shall apply the curing compound by first spraying back and forth in one (1) direction until a uniform covering has been achieved. Then, the Contractor shall spray back and forth in a direction perpendicular to the first application until a second, uniform covering has been achieved. The Contractor shall ensure that the entire curing surface has been uniformly covered with two (2) coatings of curing compound. The Contractor shall not apply the curing compound to exposed reinforcing steel.

The Contractor shall protect all surfaces covered with curing compound for seven (7) Days after application. The Contractor shall provide walkways and mats for workmen, Material, and Equipment.

The Contractor shall not use a curing compound that exhibits separation, segregation, or skimming.

The Contractor shall not apply curing compound to surfaces that will receive a Class 2 or Class 4 finish, unless the Contractor thoroughly cleans the surfaces per the recommendations of the manufacturer of the Class 2 or Class 4 finish product.

#### **511.3.9.3 Method 3, Form Curing**

The Contractor shall leave forms in place in accordance with 511.3.6. The Contractor shall keep wood forms moist during the curing period and replenish the system with water to maintain a continuously moist condition. The Contractor shall cure exposed surfaces with Methods 1 or 2.

Form removal shall be in accordance with 511.3.6 "Removal of Forms". Should forms be removed prior to the specified seven (7) day curing period, the Contractor shall immediately resume curing by Method 2.

For Structures with formed surfaces that require the application of a finish per 511.3.8 "Finishing" such as barrier walls, barrier railings on Bridges, wingwalls, or parapets on Bridges or box Culverts, the Contractor shall remove the forms in accordance with 511.3.6 "Form Removal", finish the concrete in accordance with 511.3.8 "Finishing", and resume curing with Method 2 for the duration of the curing period. The Contractor shall not pause curing for more than two (2) hours.

#### **511.3.9.4 Method 4, Combination of Curing Compound and Water Curing**

The Contractor shall apply Method 2 curing compound as soon after finishing as is allowed by the manufacturer.

When the concrete is hard enough that placement loads and burlap or cotton mats can be applied without marring the concrete surface or deformation of structural elements, the Contractor shall apply Method 1 curing directly over the curing compound coated surface.

#### **511.3.9.5 Equipment and Personnel Readiness**

The Contractor shall show the Project Manager that curing Material and Equipment (including backup sprayers and mixers) are in working order, at least one (1) Day before concrete placement.

#### **511.3.9.6 Temperature Requirements for Storage and Application**

The Contractor shall store curing compounds in protected areas away from weather and extreme temperatures and per the manufacturer's recommendations. The Contractor shall dispose of compounds that have been frozen in storage. The Contractor shall apply curing compounds when the temperature of the compound is between 50°F and 95°F.

#### 511.3.10 Penetrating Water Repellent Treatment Solution

The Contractor shall saturate the exposed surfaces of the following concrete Structures with a penetrating water repellent treatment in accordance with Section 532, "Penetrating Water Repellent Treatment;"

1. Bridge wingwalls;
2. Front and side faces of abutment Bridge seats;
3. Front faces of abutments, backwalls and diaphragms;
4. Top surfaces of Bridge seats on piers and abutments;
5. Pier columns, stem walls and vertical surfaces of pier caps;
6. Top and vertical side surfaces of Bridge decks, except in the areas where using epoxy Bridge deck overlays;
7. Top surfaces of concrete approach slabs;
8. Concrete barrier railings;
9. Concrete wall barriers; and
10. Sidewalks, curbs and gutters on Structures.

The Contractor shall extend treatment to at least one (1) ft. below the final groundline.

The Contractor shall not treat the underside of pier caps, or side and end surfaces of concrete approach slabs.

#### 511.4 METHOD OF MEASUREMENT

The Department will measure all pay items using the dimensions shown in the Contract or approved modifications.

#### 511.5 BASIS OF PAYMENT

Pay Item	Pay Unit
<i>Structural Concrete, Class _____</i>	Cubic Yard
<i>Structural Concrete, Class _____, _____ inch</i>	Square Yard
<i>Substructure Concrete, Class _____</i>	Cubic Yard

#### 511.5.1 Work Included in Payment

The following Work and items will be considered as included in the payment for the main item(s) and will not be measured or paid for separately:

1. Waterstops and flashings;
2. Waterproofing;

3. Premolded and preformed joint fillers;
4. Concrete required to fill overbreakage in excavation when footings or walls are cast against vertical or horizontal faces of excavation;
5. Installation of drains and weep holes;
6. Extruded polystyrene;
7. Means and methods associated with placement of concrete in hot and cold weather conditions, including but not limited to wind break, fogging systems, and temporary heat.

February 2, 2015

**SPECIAL PROVISIONS  
MODIFYING  
SECTION 512: SUPERSTRUCTURE CONCRETE**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

**512.3 CONSTRUCTION REQUIREMENTS**

Delete Subsection 512.3.7.3 Rate of Evaporation Limitations and substitute with the following:

Comply with Section 511.3.4.5 Rate of Evaporation Limitations.

**512.3.10 Final Operations**

Delete Subsection 512.3.10.1 Curing and substitute with the following:

Unless otherwise specified in the Contract, cure Bridge decks and approach slabs in accordance with Section 511.3.10, "Curing." Ensure forms supporting Bridge decks remain in place for at least seven (7) Days.



**SPECIAL PROVISIONS  
MODIFYING  
SECTION 519: SHOTCRETE**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Include Subsection 519.2.1.1 and 519.2.1.2 to include the following:

**519.2.1.1 Fine Aggregate Quality Requirements**

Provide fine aggregate with the following properties:

1. A soundness Loss of 12 or less when tested in accordance with AASHTO T 104 using magnesium sulfate solution and a test duration of five (5) cycles; and
2. A sand equivalent of at least 75 when tested in accordance with AASHTO T 176.

**519.2.1.2 Fine Aggregate Gradation Requirements**

Fine aggregates shall comply with Table 519.2.1.2:1 for either Grading No.1 or Grading No. 2

**Table 519.2.1.2:1 Fine Aggregate Gradation**

Sieve size, U.S. standard square mesh	Percent by weight passing individual sieves	
	Grading No. 1	Grading No. 2
3/4 in. (19 mm)	—	—
1/2 in. (12 mm)	—	100
3/8 in. (10 mm)	100	90 to 100
No. 4 (4.75 mm)	95 to 100	70 to 85
No. 8 (2.4 mm)	80 to 98	50 to 70
No. 16 (1.2 mm)	50 to 85	35 to 55
No. 30 (600 μm)	25 to 60	20 to 35
No. 50 (300 μm)	10 to 30	8 to 20
No. 100 (150 μm)	2 to 10	2 to 10

April 25, 2018

**SPECIAL PROVISIONS  
MODIFYING**

**SECTION 530: BRIDGE DECK AND PCCP PREPARATION FOR REPAIR**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete SECTION 530: BRIDGE DECK AND PCCP PREPARATION FOR REPAIR in its entirety:

**SPECIAL PROVISIONS  
MODIFYING  
SECTION 532: PENETRATING WATER REPELLENT TREATMENT**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

**532.4 METHOD OF MEASUREMENT**

Delete Subsection 532.4 METHOD OF MEASUREMENT and substitute with the following:

Penetrating Water Repellent Treatment of existing concrete surface areas will be paid for at the contract unit price per square yard.

**532.5 BASIS OF PAYMENT**

Pay Item	Pay Unit
Penetrating Water Repellent Treatment	Square Yard

Include the following Subsection:

**532.51 Work Included in Payment**

Penetrating Water Repellent Treatment applied to surfaces of new concrete structures will be considered as included in the payment for the main items and will not be paid for separately.

## SPECIAL PROVISIONS MODIFYING

### SECTION 533: CONCRETE STRUCTURE REPAIR

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete SECTION 533: CONCRETE STRUCTURE REPAIR in its entirety and replace with the following:

#### 533.1 DESCRIPTION

This Work consists of the following:

1. Establishing repair areas;
2. Removing loose, unsound, and deteriorated concrete;
3. Preparing and cleaning concrete surfaces;
4. Removing and replacing or supplementing compromised reinforcing bars;
5. Furnishing, placing, finishing, and curing concrete repair Materials;

#### 533.2 MATERIALS

##### 533.2.1 Concrete Repair Material (referred to as "Concrete" or "Repair Material")

The Contractor shall use enriched mortar where the repair depth is less than one (1) inch, and use enriched concrete where the repair depth is one (1) inch or greater, unless otherwise directed by the manufacturer. If the repair depth is four (4) inches or greater, the Contractor shall use enriched concrete or the appropriate class concrete per Section 509 – Portland Cement Concrete Mix Designs. Concrete repair Material may optionally be pre-packaged rapid-hardening cementitious Materials or two-part epoxy and aggregate repair material.

When using enriched mortar, enriched concrete, or rapid-hardening cementitious Material, the Contractor may use concrete mixtures developed and approved in accordance with Section 509 -Portland Cement Concrete Mix Designs or pre-packaged, pre-blended cementitious materials in accordance with this Section, that are combined with water at the site.

Manufacturer's certified strength tests shall be accepted instead of tests by the State Materials Bureau. Testing may be performed by the State Materials Bureau at any time. Tests by the State Materials Bureau shall supersede manufacturer's certified tests.

##### 533.2.1.1 Enriched Mortar

The Contractor shall provide enriched mortar that consists of a blended patching Material and water. The Contractor shall provide enriched mortar with physical properties in accordance with Table 533.2.1.1:1, "Enriched Mortar Physical Property Requirements."

Table 533.2.1.1:1  
Enriched Mortar Physical Property Requirements

Property	ASTM Test	Requirements
Compressive strength, minimum	C-109	1 Day: 2,700 psi seven (7) Days: 3,200 psi 28 Days: 4,500 psi
Bond strength, minimum	C-882	1 Day: 1,000 psi seven (7) Days: 2,000 psi 28 Days: 3,000 psi
Linear length change, Maximum	C-157	28 Days wet: +0.05 % <sup>a</sup> 28 Days dry: -0.05 %
Coefficient of thermal expansion (in/in/°F)	C-531	3.9 x 10 <sup>-6</sup> to 7.1 x 10 <sup>-6</sup>
Freeze/thaw resistance @ 300 cycles, minimum	C-666	Per Section 509.2.8.4.2, Note 3

<sup>a</sup>The maximum allowable expansion is 0.4% if the locations where enriched mortar is used can tolerate such expansions without exceeding the elastic limit.

#### 533.2.1.2 Enriched Concrete

The Contractor shall provide enriched concrete consisting of enriched mortar extended with recommended amounts of coarse aggregate. The Contractor shall provide enriched concrete with physical properties in accordance with Table 533.2.1.2:1, "Enriched Concrete Physical Property Requirements."

Table 533.2.1.2:1  
Enriched Concrete Physical Property Requirements

Property	ASTM Test	Requirements
Compressive strength, minimum	C-39	1 Day: 2,500 psi seven (7) Days: 3,000 psi 28 Days: 4,000 psi
Bond strength, minimum	C-882	1 Day: 900 psi seven (7) Days: 1,800 psi 28 Days: 2,200 psi
Linear length change (%), maximum	C-157	28 Days wet: +0.04 % <sup>a</sup> 28 Days dry: -0.04 %
Coefficient of thermal expansion (in/in/°F)	C-531	3.9 x 10 <sup>-6</sup> to 7.1 x 10 <sup>-6</sup>
Freeze/thaw resistance @ 300 cycles, minimum	C-666	Per Section 509.2.8.4.2, Note 3

<sup>a</sup>The maximum allowable expansion can be 0.4% as long as the locations where enriched concrete is used can tolerate such expansions without exceeding the elastic limit.

### 533.2.1.3 Rapid-Hardening Cementitious Material

If rapid-hardening cementitious Material is used, it shall comply with all the fresh and hardened properties of the specified concrete, with the additional requirement that the product meet the requirements of ASTM C 928 R3 Standard Specifications for Packaged, Dry, Rapid-Hardening Cementitious Materials for Concrete Repair (3,000 psi at 3 hours, 5,000 psi at 1 Day, 5,000 psi at 7 Days). The structure may be opened to traffic when it has achieved 75% of the design strength. The in-place concrete strength shall be determined in accordance with Section 510.3.5.2 "In-Place Concrete Strength Measurement."

### 533.2.1.4 Water

The Contractor shall provide water in accordance with Section 509.2.6, "Water."

### 533.2.1.5 Epoxy Repair Materials

#### 533.2.1.5.1 Epoxy Repair Materials – Traffic Bearing Surfaces

Epoxy used in bonding skid-resistant materials to hardened concrete and as a binder in epoxy mortars or epoxy concretes used on traffic bearing surfaces (or surfaces subject to thermal or mechanical movements) shall conform to ASTM C881 – Type III.

#### 533.2.1.5.2 Epoxy Repair Materials – Load Bearing Applications

Epoxy used in load bearing applications for bonding hardened concrete to hardened concrete and other materials and as a binder for epoxy mortars and concretes shall conform to ASTM C881 – Type IV.

### 533.2.2 Steel Reinforcement

The Contractor shall provide reinforcing steel in accordance with Section 540 – Steel Reinforcement.

### 533.2.3 Submittals

The Contractor shall submit manufacturer's product data sheets at least 14 Days before the start of concrete repair Work that describe the product's intended use in Structure repair to the Project Manager. The submittal shall include mixing, application, and curing instructions.

## 533.3 CONSTRUCTION REQUIREMENTS

Care shall be taken during all repair and removal operations to prevent damage to structural components and reinforcing steel being retained.

### 533.3.1 Establishment of Repair Areas

The Contract will specify approximate repair locations and quantities. The Contractor shall field verify, locate and mark the precise areas of delamination and repair. The Contractor shall obtain Project

Manager's concurrence of established repair areas and establish estimated pay quantities.

## 533.3.2 Unsound Concrete Removal

The Contractor shall saw cut all boundaries to 3/4" inch depth, and remove concrete with hand-operated devices, chipping hammers, or pavement breakers to a uniform depth within each concrete Structure repair area. The Contractor shall only use removal Equipment that has been approved by the Project Manager.

The following restrictions apply to concrete removal tools:

1. It is acceptable to use pavement breakers of the 60 lb class for full depth removal and for initial removal of deteriorated concrete located above the top mat of rebar. Do not use pavement breakers of the 60 lb class over girders. Maximum 30 lb class shall be used for all else. If, in the opinion of the Project Manager, the use of such devices is detrimental to the integrity of the adjacent concrete structure, the Contractor shall discontinue the use of pavement breakers. Requests to use 90 lb class pavement breakers may be submitted to the State Bridge Engineer for consideration.
2. Do not use chipping hammers heavier than the 15 lb class.
3. Hydro-demolition may be used upon approval by the Project Manager. A plan must be submitted by the Contractor for review and acceptance.

If removal exceeds 50% of the depth of the deck, the Contractor shall perform a full depth repair.

The Contractor shall obtain approval from the Project Manager after completing concrete removal before proceeding with surface preparation.

## 533.3.3 Concrete Surface Preparation and Cleaning

The Contractor shall prepare the surface in conformance with the manufacturer's application instructions. If the manufacturer does not specify surface preparation, cleaning or bonding, the Contractor shall conform to the following:

1. Mechanically roughen the existing surface using Equipment such as chipping hammers and remove loose debris generated by roughening.
2. Abrasive blast all concrete Structure repair bond surfaces.
3. Ensure the surface substrate is clean, sound, and dry. Remove substances that may prevent a bond between existing and new concrete. If using acid etchers, concrete cleaners, or degreasers to clean the existing surface, remove them completely after cleaning. Before placing repair Materials, clean repair areas with oil-free compressed air or clean pressurized water. The Contractor shall place a four (4) inch piece of duct tape every square yard to test for cleanliness. The Department will not allow concrete placement if more than 25% of the tape surface shows dust coverage.
4. Moisten the substrate with clean water in accordance with Section 509.2.6 "Water" and remove excess water to achieve a saturated surface dry condition.
5. Use a bonding method per Section 511.3.7.2 – Bonding New Concrete to Existing.

The Contractor shall verify that both the existing substrate and the existing concrete around the perimeter of the concrete Structure repair area is sound in the presence of the Project Manager. If any unsound concrete is detected, remove that concrete per Section 533.3.2 "Unsound Concrete Removal."

#### 533.3.4 Furnishing, Placing, Curing, and Finishing Concrete Structure Repair Material

The Contractor shall place, finish and cure the repair Material in conformance with the manufacturer's application instructions. If the manufacturer does not specify placement, finishing and curing of the repair material, Section 511 – Concrete Structures, and 512 – Superstructure Concrete shall apply as applicable. Epoxy repair materials shall be used in strict conformance with the Manufacturer's instructions.

With regard to forms, the Contractor shall conform to Section 511 – Concrete Structures and the following:

1. For full depth replacement, the Contractor shall provide forms to adequately support concrete placed in the full depth repair areas.
2. When stay-in-place forms are present and intact:
  - a. The Project Manager may acceptable the utilization of the stay-in-place forms in lieu of temporary forms.
  - b. The Contractor shall be responsible for determining the structural adequacy of the stay-in-place forms.
  - c. If the stay-in-place forms are damaged beyond acceptability for re-use during demolition, the Contractor shall remove the unacceptable stay-in-place form and utilize temporary forms.
3. Any form bulges and/or failures will be cause for rejection and shall be addressed to the satisfaction of the Project Manager at no additional cost to the Department.
4. All concrete Structure repair forming shall be constructed so that final finishes match the lines and grades of the surrounding concrete and/or the proposed new lines and grade per the Contract Documents.
5. The Contractor shall not mix repair Materials within the repair area.
6. The Contractor shall place mortar or concrete in a continuous operation for each repair area.
7. For vertical surfaces, the Contractor shall start the Work at the bottom of the patch and continue upwards, and from one edge to the other to prevent the entrapment of air pockets.
8. If the repair area abuts or crosses a working joint, the Contractor shall place a temporary strip of waxed wood or pre-molded filler in the joint before placing repair Material. The Contractor shall remove the strips before the concrete sets. The Contractor may also repair areas that occur on both sides of a joint by patching the entire cavity and restoring the joint by saw cutting immediately after the repair Material has set, instead of using a temporary vertical insert strip.

If specified in the Contract Documents, the Contractor shall Finish exposed surfaces of piers, abutments, edges of decks and barrier railings, and other specified locations to a Class 4 finish in accordance with Section 511.3.8.5, "Class 4, Special Surface Finish," and Section 548 "Coating of Concrete" after repairs and curing are complete.

The Contractor shall apply penetrating Water Repellent Treatment in accordance with Section 532, "Penetrating Water Repellent Treatment."

#### 533.3.5 Reinforcing Steel

All standard placement and construction requirements shall apply. Reference Section 540 "Reinforcing Steel," and the following:



1. If the Contractor exposes corroded reinforcing steel during concrete removal, the Contractor shall preserve existing reinforcing steel exposed during concrete removal.
2. The Contractor shall use only hand tools such as hammers and chisels to remove the final concrete particles from reinforcing bars.
3. On decks, if the rebar is exposed, the Contractor shall always chip at least 3/4 inch deep into the adjacent concrete around the entire bar.
4. On anything other than decks, if the bond between exposed bars and adjacent concrete breaks; the Contractor shall chip at least 3/4 inch deep into the adjacent concrete around the entire bar.
5. The Contractor shall remove and replace reinforcing steel displaying deep pitting or loss of more than 20% of cross-sectional area as directed by the Project Manager. Any rebar that is abandoned in place shall be prepared in the same manner as the adjacent rebar prior to embedment.
6. The Contractor shall strengthen corroded or damaged existing #5 or smaller bars by splicing an equal sized bar at least two (2) ft. longer than the corroded or damaged length. The minimum splice length shall be one (1) ft. on each end. The State Bridge Engineer will determine the length of lap for larger reinforcing bars.
7. Any reinforcing steel damaged during concrete removal operations by the Contractor shall be supplemented or removed and replaced by the Contractor at no additional cost to the Department.
8. Mechanical couplers may be used in accordance with Section 540.3.1.4 "Splicing".
9. The Contractor shall prepare the surface of the reinforcing steel in conformance with the recommendations of the repair Material manufacturer. In the absence of direction from the patch Material supplier, the Contractor shall use abrasive grit blasting or wire brushing to bare metal.
10. The Contractor may leave tight "flash" rust occurring after blast cleaning if acceptable to the repair Material manufacturer.
11. When epoxy coated bar is present, the Contractor shall repair any damage to the epoxy coating prior to embedment.
12. When galvanic anodes are utilized and epoxy coated rebar is present, repair of epoxy coating is not required.
13. The Contractor shall ensure that minimum concrete cover is maintained. Minimum concrete cover shall match the original design or shall be a minimum of two inches or shall be as noted in the Contract.
14. Reinforcing bars shall be replaced and/or supplemented with the same bar type as is existing unless otherwise noted in the Contract. All reinforcing bar types, including epoxy coated, shall be paid as "Replacement Reinforcing Bars."

### 533.3.6 Acceptance

The Project Manager will examine repaired areas after the curing period is completed to ensure soundness of the repairs and complete bonding with the existing surface. The Contractor shall remove and replace unacceptable areas at no additional cost to the Department.

### 533.3.7 Acceptance for 509 Approved Concrete Mixtures

Concrete mixtures that have been approved in accordance with Section 509, "Portland Cement Concrete Mix Designs" shall be tested and accepted in accordance with Sections 510, "Portland Cement Concrete," 511, "Concrete Structures," and 512, "Superstructure Concrete" as applicable.

#### 533.3.7.1 Acceptance for Prepackaged, Preblended Cementitious Materials

Frequency of testing shall be determined by the Project Manager. If testing is required by the Project Manager, three (3) concrete cylinders for 24 hour compressive strength shall be made by the Department. It is recommended that testing be performed on the first batch and every third batch thereafter. The water to cement ratio of the tested batch(s) shall be consistent with all other batches.

#### 533.4 METHOD OF MEASUREMENT

If the repair depth does not exceed four (4) inches, the Department will measure and pay for the Work by the square yard. For girder bridges, if the repair depth exceeds four (4) inches, the Department will pay for the deck repair on a prorated rate of 25% of the Bid Item Unit Price for Repair of Concrete Structures per inch deeper than four (4) inches. For concrete slab bridges, if the repair depth exceeds four (4) inches, the Department will pay for the deck repair on a prorated rate of 10% of the Bid Item Unit Price for Repair of Concrete Structures per inch deeper than four (4) inches. The Department will measure exposed surfaces before the application of the special surface finish.

#### 533.5 BASIS OF PAYMENT

Pay Item	Pay Unit
<i>Repair of Concrete Structures</i>	Square Yard
<i>Replacement Reinforcing Bars</i>	Pound

#### 533.5.2 Work Included in Payment

The following Work and items will be considered as included in the payment for the main item(s) and will not be measured or paid for separately:

1. Sounding;
2. Removal of unsound concrete;
3. Removal and replacement of compromised reinforcing steel to include epoxy anchoring if required;
4. Disposal of old concrete and debris;
5. Surface preparation of concrete and reinforcing bar surfaces;
6. Any additional costs associated with rapid-hardening concrete;
7. Saw cutting operations;
8. Placement and removal of forms;
9. Compliance with manufacturer's instructions;
10. Penetrating water repellent treatment of repaired concrete surfaces;
11. Bonding agent.

**SPECIAL PROVISIONS**  
**MODIFYING**  
**SECTION 536: POLYMER CONCRETE BRIDGE DECK OVERLAY**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Replace the following Subsection 536.3.6 Usage Limitations in its entirety.

The manufacturer's application requirements shall govern. If the manufacturer does not provide guidance on the following items, the following shall apply:

1. PCC shall not be less than 28 Days of age at the time of overlay.
2. The concrete shall be dry at the time of overlay application. The criteria for "dry" shall be established by:
  - a. ASTM D 4263: for every 500 square feet, an 18 inch x 18 inch plastic sheet shall be taped to the deck with 2" duct tape. The test area shall be protected from direct sunlight, direct heat, and damage to the plastic. After 16 hours, the concrete shall be considered dry when no moisture appears on the bottom of the plastic.
  - b. It is also acceptable to use a moisture meter in conformance with ASTM F2659.
    - i. Unless otherwise directed by the manufacturer, the reading shall be 4% or less.
    - ii. The meter shall be an electrical impedance moisture meter specifically developed and calibrated for the non-destructive measurement of the comparative moisture condition in concrete floor slabs.
    - iii. The moisture meter shall be used and calibrated in accordance with the manufacturer's written recommendations. The moisture meter manufacturer's recommendations and the calibration data shall be provided to the Project Manager for acceptance prior to use on the project.
3. The air and deck temperature shall be a minimum of 40 °F at the time of overlay application, and for eight (8) hours after overlay application. Do not use artificial methods to raise the deck temperature.

For new Bridge decks with unventilated stay-in-place forms, in addition to the manufacturer's application requirements, the Contractor shall not install the overlay on PCC that is less than 56 Days of age.

Delete Subsection 536.3.11 Warranty in its entirety.

April 25, 2018

## SPECIAL PROVISIONS MODIFYING SECTION 537: POLYESTER/EPOXYCONCRETE BRIDGE DECK OVERLAY

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete SECTION 537: POLYESTER/EPOXYCONCRETE BRIDGE DECK OVERLAY in its entirety and replace with the following:

### 537.1 DESCRIPTION

This Work consists of providing and applying polyester/epoxy concrete overlay for Bridge deck, approach slab, transition slab, and PCCP repairs and/or grade corrections.

### 537.2 MATERIALS

Use prime coat and polyester or epoxy resin binder from the Department's Approved Products List. Notify the Project Manager of the selection at least 14 Days before start of work. Provide materials in accordance with tables 537.2.1:1 and 537.2.2:1.

#### 537.2.1 Prime Coat

For polyester polymer concrete (PPC) the prime coat used with the polymer concrete shall be a wax free, high molecular weight methacrylate resin conforming to the requirements in Table 537.2.1:1, "Prime Coat Physical Requirements:" For epoxy polymer concrete (EPC), the prepared surface shall receive a primer layer of two-component, low modulus epoxy resin conforming to the requirements in Table 537.2.1:1: Prime Coat Physical Requirements", or as recommended by manufacturer.

Table 537.2.1:1  
Prime Coat Physical Requirements

Property	Test method	Minimum	Maximum	Remarks
Viscosity (PPC)	ASTM D 2196	—	0.25 poise	—
Viscosity (EPC)	ASTM D 2393		1.5 poise	---
Specific Gravity	ASTM D1475	0.90 min	—	—
Flash Point*	ASTM D3278	180 F	—	—

\* Polyester polymer concrete only

The promoter/initiator system for the methacrylate resin shall consist of a metal drier and peroxide. If supplied separately from the resin, at no time shall the metal drier be mixed with or allowed to contact the

peroxide directly. The Contractor shall not store the containers in a manner that will allow leakage or spillage from one (1) material to contact the container or material of the other.

537.2.2 Polyester/Epoxy Resin Binder

Polymer concrete shall consist of polyester or epoxy resin binder. For polyester polymer concrete, the resin shall be an unsaturated isophthalic polyester-styrene co-polymer and shall conform to the requirements in Table 537.2.2:1, "Resin Physical Requirements:" For epoxy polymer concrete, the resin shall be a two-component, low modulus epoxy polymer conforming to the requirements of Table 537.2.2:1 "Resin Physical Requirements."

Table 537.2.2:1  
Resin Binder Physical Requirements

Property	Test method	Minimum	Maximum	Remarks
Viscosity	ASTM D 2196	0.75 poise	2.0 poise	Test before addition of initiator *
Specific Gravity	ASTM D 1475	1.05	1.10	Test before addition of initiator *
Tensile strength (neat) @ 7 Days	ASTM D 638	2,200 psi	5,000 psi	—
Elongation (neat) @ 7 Days	ASTM D 638	35%	80%	—
Adhesive strength @ 24 h	ACI 503R, Appendix A, VTM 92	250 psi	—	Mixed with aggregate with 100% failure in concrete
Absorption (neat) @ 24 h	ASTM D 570	—	one percent (1%)	—
Styrene Content*	ASTM D 2369	40%	50%	% mass as volatiles before addition of initiator
Infrared spectrum	AASHTO T 237, Paragraphs 5 and 6	To be established for each component		—

\*Polyester polymer concrete only

The silane coupler shall be an organosilane ester, gammamethacryloxy-propyltrimethoxysilane. The promoter shall be compatible with suitable methyl ethyl ketone peroxide (MEKP) and cumenehydroperoxide (CHP) initiators.

537.2.3 Aggregate

Aggregate for polyester/epoxy concrete shall conform to the requirements of Section 509.2.4, "Aggregate," of the Standard Specifications, except the gradation shall meet the following:

Table 537.2.3:1  
Polymer Concrete Aggregate Gradation

COMBINED AGGREGATE		
Sieve Size	Percentage Passing	
	3/8 inch Max.	No.4 Max.
1/2 inch	100	100
3/8 inch	83 - 100	100
No. 4	65 - 82	62 - 85
No. 8	45 - 64	45 - 67
No. 16	27 - 48	29 - 50
No. 30	12 - 30	16 - 36
No. 50	6 - 17	5 - 20
No. 100	0 - 7	0 - 7
No. 200	0 - 3	0 - 3

Aggregate retained on the #8 sieve shall have a maximum of 45 percent crushed particles when tested in accordance with AASHTO Test Method T 27. Fine aggregate shall consist of natural sand only.

Aggregate absorption shall not exceed one percent (1%) as determined by AASHTO Test Methods T 84 and T 85.

At the time of mixing with the resin, the moisture content of the aggregate, as determined by AASHTO Test Method T 255, shall not exceed one half of the aggregate absorption.

#### 537.2.4 Wear Surface Sand

The sand shall be commercial quality blast sand, conforming to the absorption capacity and moisture content requirements of polyester/epoxy concrete aggregate of this Specification. The Contractor shall provide sand such that 95% shall pass the No. 8 sieve and 95% shall be retained on the No. 20 sieve.

#### 537.2.5 Submittals

The Contractor shall submit the material product data and manufacturer's application instruction for the proposed material to the Project Manager 14 Days before use.

The Contractor shall submit proposed locations of the longitudinal and transverse joints for approval. The Contractor shall not locate the longitudinal joints in wheel lines.

### 537.3 CONSTRUCTION REQUIREMENTS

#### 537.3.1 Equipment

##### 537.3.1.1 Concrete Surfacing and Cleaning Equipment

Use of scabblers, milling machines, diamond grinders, or sandblasting will be at the discretion of the Project Manager.

The use of air compressors and/or vacuum trucks is permitted. The Contractor shall use an air compressor that produces oil-free and moisture-free compressed air to remove dust and loose material from the application surface before applying the prime coat. The Contractor shall use vacuum trucks that are clean and do not drip engine fluids, or install drip pans to protect the clean concrete surfaces and overlay.

### **537.3.1.2 Placing and Finishing Equipment**

A continuous mixer, employing an auger screw/chute device, will be approved for use by the Project Manager contingent on a demonstration that the device can consistently produce a satisfactory product. The continuous mixer shall 1) be equipped with a metering device that automatically measures and records the aggregate volumes and the corresponding resin volumes, and 2) have a readout gage, visible to the Project Manager at all times, that displays the volumes being recorded. The volumes shall be recorded at no greater than five (5) minute intervals along with the time and date of each recording. A printout of the recording shall be furnished to the Project Manager at the end of each Work shift. The Contractor shall furnish slip-form finishing Equipment with an automatic grade control device to strike off the overlay to the established grade and cross section, unless otherwise pre-approved by the State Bridge Engineer. The Contractor shall fit finishing Equipment with vibrators or other means of consolidating the overlay material. Finishing machines shall be self-propelled and capable of forward and reverse movement under positive control. Finishing machines shall be operated normal to the longitudinal Bridge or Roadway centerline.

Equipment shall be fitted with suitable traps, filters, drip pans, or other devices as necessary to prevent oil or other Deleterious Material from being deposited onto the existing concrete surfaces.

### **537.3.2 Pre-Application**

#### **537.3.2.1 Material Suppliers**

The polyester/epoxy concrete overlay system Supplier shall make available a technical representative for up to three (3) Days to make recommendations to facilitate overlay installation. This shall include, but not be limited to, trial batch preparation, trial overlay placement, surface preparation, overlay application and overlay cure.

The system Supplier shall also provide health and safety training for personnel who are to handle the Materials.

#### **537.3.2.2 Trial Batches and Trial Overlay**

The Contractor shall mix one (1) or more trial batches of polyester/epoxy concrete for various percentages of resin binder according to manufacturer's recommendations. The approximate percentage of polyester resin binder to use will be determined from the trial batches.

The Materials, methods and Equipment used in the trial batches shall be the same as those intended for use in the trial overlay. If at any time different Materials, methods or Equipment are to be used, new trial batches will be required.

The Contractor shall place one (1) or more trial overlays on a previously constructed concrete base to demonstrate the effectiveness of the proposed mixing, placing, and finishing Equipment. Each trial overlay shall be 12 ft wide, at least six (6) ft. long, and the same thickness as the overlay to be constructed. The trial overlay area shall be within the Project limits and at a location approved by the Project Manager.

The Contractor shall remove and dispose of all Materials used in the trial batches, including the concrete base.

#### 537.3.2.3 Deck Preparation

The Contractor shall complete concrete repairs for patches, delamination, and crack filling per Section 533, "Concrete Structure Repair" as specified in the Contract, before applying the overlay. The Contractor shall use polyester/epoxy concrete as a patching material in accordance with the manufacturer's instructions.

The Contractor shall close and protect Bridge deck drains and areas of curb or railing above the proposed surface to ensure that the prime coat, polyester/epoxy concrete and aggregate do not contaminate these areas.

The Contractor shall adequately isolate expansion joints and weakened plane joints before overlaying or saw them by approved methods within four (4) hours after overlay placement.

#### 537.3.2.4 Surface Preparation

The Contractor shall prepare the concrete surface per the manufacturer's recommendations. In the absence of the manufacturer's recommendations, the Contractor shall prepare the concrete surface to produce a surface relief equal to the International Concrete Repair Institute (ICRI) Surface Preparation CSP 5-8, or ASTM E 965 pavement macrotexture depth from 0.04 inch to 0.10 inch. The Contractor shall provide ICRI concrete surface profile chips to the Project Manager for inspection of prepared surface. ICRI concrete surface profile chips will become the property of the Department.

#### 537.3.2.5 Cleaning

Before placing the overlay, the Contractor shall clean the concrete surface to remove Materials that may interfere with bonding or curing. The Contractor may use a vacuum truck or air compressor to remove dust and other loose material. The Contractor shall not use brooms or power brooms.

The Contractor shall obtain Project Manager's inspection of concrete cleaning and preparation before placing the prime coat.

#### 537.3.3 Safety Provisions

The Contractor shall use personnel certified in the safe application and handling of Materials in accordance with the manufacturer's requirements. The Contractor shall provide a soap and water wash station for the workers at the job site. The Contractor shall submit written documentation of material applicators' training to the Project Manager before applying the overlay.



## 537.3.4 Storage of Materials

The Contractor shall store Materials in accordance with the manufacturer's recommendations.

## 537.3.5 Usage Limitations

The manufacturer's application requirements shall govern. If the manufacturer does not provide guidance on the following items, the following shall apply:

1. PCC shall not be less than 28 Days of age at the time of overlay.
2. The concrete shall be dry at the time of overlay application. The criteria for "dry" shall be established by:
  - a. ASTM D 4263: for every 500 square feet, an 18 inch x 18 inch plastic sheet shall be taped to the deck with 2" duct tape. The test area shall be protected from direct sunlight, direct heat, and damage to the plastic. After 16 hours, the concrete shall be considered dry when no moisture appears on the bottom of the plastic.
  - b. It is also acceptable to use a moisture meter in conformance with ASTM F2659.
    - i. Unless otherwise directed by the manufacturer, the reading shall be 4% or less.
    - ii. The meter shall be an electrical impedance moisture meter specifically developed and calibrated for the non-destructive measurement of the comparative moisture condition in concrete floor slabs.
    - iii. The moisture meter shall be used and calibrated in accordance with the manufacturer's written recommendations. The moisture meter manufacturer's recommendations and the calibration data shall be provided to the Project Manager for acceptance prior to use on the project.
3. The air and deck temperature shall be a minimum of 40 °F at the time of overlay application, and for eight (8) hours after overlay application. Do not use artificial methods to raise the deck temperature.

For new Bridge decks with unventilated stay-in-place forms, in addition to the manufacturer's application requirements, the Contractor shall not install the overlay on PCC that is less than 56 Days of age.

## 537.3.6 Application

The prime coat shall be uniformly applied to completely cover the surface to receive the polyester/epoxy concrete. The Contractor shall apply the prime coat at an approximate rate of 0.09 to 0.11 gal/yd<sup>2</sup> or per the manufacturer's recommendations prior to placement of polyester/epoxy concrete. The Contractor shall flood concrete surfaces with the prime coat, allowing penetration into the concrete and filling of all cracks. The Contractor shall redistribute the applied prime coat in cracks by squeegees or brooms. The quantity of initiated, promoted resin shall be no more than what is needed to apply a prime coat. A noticeable increase in viscosity prior to placement will be cause for rejection. If the primed surface becomes contaminated, or if there is a failure of the material, the Contractor shall clean the contaminated or failed area by abrasive blasting and re-prime.

Immediately after the prime coat has been applied, the polyester/epoxy concrete overlay shall be placed, in accordance with manufacturer's guidelines.

The Contractor shall mix polyester/epoxy concrete in mechanically operated mixers. The Contractor shall use a sufficient amount of initiator in the polyester/epoxy concrete to produce set times between 30 and 120 minutes after placement. Accelerators or inhibitors may be required to achieve proper set times and shall be used as recommended by the resin Supplier. The use of initiators, accelerators, and inhibitors may not be required for epoxy concrete materials, follow manufacturer requirements.

The Contractor shall place and finish polyester/epoxy concrete before gelling or within 15 minutes following addition of the initiator, whichever occurs first. The Contractor shall discard polyester/epoxy concrete not placed within this time.

The Contractor shall construct longitudinal construction joints parallel to the Roadway alignment only at the submitted and approved locations. The Contractor shall construct vertical joints perpendicular to the deck surface.

The smoothness of the polyester/epoxy concrete surface will be tested with a straightedge. The surface shall not vary by more than 0.02 feet from the lower edge of a 10 foot +/- 0.2 feet long straightedge placed in any direction. Any surface that fails to conform to the above tolerance shall be ground to meet this requirement.

The Contractor shall apply abrasive sand finish to polyester/epoxy concrete surfaces. The Contractor shall apply the sand finish by mechanical means immediately after overlay strike-off. The Contractor shall broadcast sand uniformly onto the surface before gelling occurs at the rate from the manufacturer's application instructions.

For polyester concrete materials, it is acceptable to tine or groove. For epoxy concrete materials, grooving is required, tining is not allowed.

The Contractor shall groove in accordance with 512.3.10.3 Grooving of Hardened Concrete.

For tining of polyester concrete materials, after application of the sand finish and before gelling occurs, the Contractor shall texture the overlay by tining with a steel-tined rake with tines 1/8 inch wide and spaced from 3/4 inch to 1 1/2 inch apart. The Contractor shall tine to a depth of 1/8 inch to 3/16 inch. The surface texture of the overlay shall be uniform and shall have a coefficient of friction of not less than 0.35. If the coefficient of friction is less than 0.35, the Contractor shall additionally groove in accordance with 512.3.10.3 Grooving of Hardened Concrete.

### 537.3.7 Curing

The Contractor shall protect the finished overlay from moisture, Equipment, and public traffic until the overlay achieves an average Schmidt hammer reading of 24. The Schmidt hammer test shall consist of the average of ten (10) readings (strikes), all taken in an area approximately 18 inches in diameter. The Contractor shall perform one (1) such test per 500 sq. ft. of overlay. Traffic may be allowed on the overlay when the reading of 24 is achieved.

The Contractor shall not contaminate concrete surfaces during clean-up of tools and Equipment. The Contractor shall not dump or spill polyester/epoxy concrete Materials or cleaning solvents in areas that will cause environmental or fire hazards.

#### 537.3.9 Testing

The Contractor shall provide the necessary Equipment and supplies for conducting adhesion tests on the completed overlay. The Contractor shall perform adhesion tests according to ACI 503R - Appendix A of the ACI Manual of Concrete Practice. Adhesion tests shall obtain a 250 psi minimum pulloff or cohesive failure within existing concrete. The Contractor shall perform tests at a frequency of one (1) test per every 1600 sq. ft. of deck surface in a random location. The Contractor shall prime and patch test holes with polyester/epoxy concrete immediately after testing.

#### 537.3.10 Corrective Work

See 537.3.6 for smoothness requirements. If the smoothness exceeds the allowable tolerance, the Contractor shall submit a corrective action plan to the Project Manager.

The Contractor shall correct surfaces that exceed the allowable smoothness tolerance unless otherwise directed by the Project Manager.

The Contractor shall repair damaged overlay areas by saw cutting in rectangular sections to the top of the concrete surface and replacing the material at no additional cost to the Department.

In the event that the testing performed under 537.3.9 does not meet minimum pulloff, the material shall be removed and replaced in the areas in which low adhesion is determined from additional testing. Any additional testing required shall be incidental to the Work.

### 537.4 METHOD OF MEASUREMENT

Polyester/epoxy concrete will be measured by the cubic yard. The volume to be paid for will be determined from calculations based on the quantity of resin binder or prime coat used, the percent by weight of resin binder or prime coat in the polyester/epoxy concrete, and a unit weight of 135 pcf. The Contractor shall furnish suitable measuring devices to assure correct proportioning of Materials and accurate measurement for calculating payment quantities. The payment quantity shall be the calculated quantity of polyester/epoxy concrete used in the Work, exclusive of material used in trial overlay and any wasted or unused material. Payment quantity will include patches.

The Contract price paid per cubic yard for polyester/epoxy concrete shall include full compensation for furnishing all labor, Materials, tools, Equipment, and Incidentals, and for doing all the Work involved in placing polyester/epoxy concrete, including furnishing methacrylate resin prime coat or epoxy resin binder for polyester concrete and furnishing Materials for trail overlays, removal of unsound concrete and preparation of repair areas when polyester/epoxy concrete is used as the patching material, and as shown on the Plans, as specified in the Standard Specifications and as directed by the Project Manager.

Removal of loose concrete and preparation of repair areas for patching material other than polyester/epoxy concrete will be measured by the square yard in accordance with Section 533, "Concrete Structure Repair."

**537.5 BASIS OF PAYMENT**

The accepted quantities, measured as provided above, will be paid for at the Contract price per unit of measurement for the pay items listed below that are shown in the proposal. Payment will be full compensation for the Work described in this Section.

Pay Item	Pay Unit
<i>Polyester/Epoxy Concrete Bridge Deck Overlay</i>	Cubic Yard

**537.5.1 Work Included in Payment**

The following Work and item(s) will be considered as included in the payment for polyester/epoxy concrete and will not be measured or paid for separately:

1. ICR1 concrete surface profile chips;
2. Surface preparation;
3. Technical representative.

## SPECIAL PROVISIONS MODIFYING

### SECTION 541: STEEL STRUCTURES

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete Section 541 STEEL STRUCTURES in its entirety and replace with the following:

#### 541.1 DESCRIPTION

This Work consists of providing, fabricating, erecting, and coating Structural Steel.

Structural Steel includes forged or cast steel, bolts, tie rods, other ferrous or nonferrous Materials, and miscellaneous steel. Steel shall be divided into the following categories:

Tier 1 – rolled steel beams, plate girders, diaphragms and cross frames for steel bridges, and overhead sign structures.

Tier 2 – metal bridge barrier rails, diaphragms for concrete bridges, and steel bearing components.

Tier 3 – drop inlets, safety grates, cattle and game guards, pedestrian rails, gates, access panels, and other miscellaneous steel.

For welding of driven pile splices, see 541.3.6.4.

#### 541.2 MATERIALS

##### 541.2.1 Structural Steel

The Contractor shall provide Structural Steel in accordance with AASHTO M270, Grade 50, unless otherwise designated in the Contract. The Contractor shall provide steel for anchor bolts, sole plates, minor bridge components, inlet grates, and cattle guards in accordance with AASHTO M270, Grade 36 or Grade 50.

##### 541.2.1.1 Impact Testing Requirements for Non-Fracture-Critical Structures

For Materials requiring impact testing, the Contractor shall not weld repair the base metal at the producing mill. The Department will consider Structures to be non-fracture-critical, unless otherwise designated in the Contract. The Contractor shall fabricate the following in accordance with AASHTO M270, Table 10 when subject to tensile stresses:

1. Wide flange beams used as main load carrying members;

2. Flanges and web plates used in plate girders;
3. Flange cover plates;
4. Flange and web splice plates; and
5. Other components designated in the Contract.

The Contractor shall conduct Charpy V-notch (CVN) impact “H” or “P” frequency testing in accordance with AASHTO T243.

The Contractor shall ensure that Structural Steel meets requirements for minimum service temperatures as described for Zone 2 of the AASHTO’s *Standard Specifications for Highway Bridges* (–1°F–30°F).

The Contractor shall conduct plate-frequency testing instead of hat-lot testing for plate Material thicker than 1-1/2inch.

#### 541.2.1.2 Impact Testing Requirements for Fracture-Critical Bridge Components

The Contract will specify the CVN requirements for fracture-critical bridge components.

#### 541.2.2 Shear Connector Studs

The Contractor shall provide shear connector studs fabricated from cold-drawn bars, grades 1015, 1018, or 1020, either semi-killed or fully-killed in accordance with AASHTO M169.

If using flux-retaining caps, the Contractor shall use the low carbon grade steel for the caps that is suitable for welding and in accordance with ASTM A109. The Contractor shall produce the finish by cold drawing, cold rolling, or machining.

The Contractor shall ensure stud tensile properties are in accordance with Table 541.2.2:1, “Tensile Properties of Shear Connector Studs,” as determined by tests of bar stock (after drawing) or finished studs, in accordance with ASTM A370.

**Table 541.2.2:1**  
**Tensile Properties of Shear Connector Studs**

Property	Minimum requirement
Tensile strength	60,000 psi
Yield strength @ 0.2% offset	50,000 psi
Elongation in two (2) inch	20%
Reduction of area	50%

The Contractor shall weld studs with automatic stud welding guns that shall be used to weld studs to girders. The operator shall be qualified per AWS D1.5 Subsection 7.7.4. The base metal where the stud is to be welded shall be ground to bright metal immediately prior to the weld being made. Manual welding will

not be allowed except to make repairs. Repairs shall be in accordance with AWS D1.5 Subsection 12.6. Repair fillet size shall be a minimum of 5/16 inch.

541.2.3 Aluminum

The Contractor shall provide aluminum and aluminum alloy Materials in accordance with ASTM aluminum alloy designation and in accordance with the Plans.

541.2.4 Bolts

The Contractor shall provide high-strength bolts in accordance with Section 542, "High-Strength Bolts." The Contractor shall provide other bolts in accordance with ASTM A307, Grade A.

541.2.4.1 Unfinished Bolts

The Contractor shall provide unfinished ASTM A307 bolts. The Contractor shall provide thread bolts so that not more than two (2) threads are within the grip of the connected parts. The Contractor shall use bolts that will extend beyond the nut at least two (2) threads, but not more than 1/2 inch.

541.2.5 Structural Steel Coating

The Contractor shall provide coated Structural Steel in accordance with Table 541.2.5:1, "Coating of Structural Steel."

Table 541.2.5:1  
Coating of Structural Steel

Item	Coating requirement
Galvanizing, Hot-Dip Galvanizing, or Zinc Coating	Section 541.2.5.1
Structural Steel for Steel Bridges	Section 544, "Protective Coating of New Structural Steel"
Structural Steel for Concrete Bridges	Section 544, "Protective Coating of New Structural Steel"
Structural Steel for Miscellaneous Structures	Section 545, "Protective Coating of Miscellaneous Structural Steel"
Metal Bridge Railing	Section 545, "Protective Coating of Miscellaneous Structural Steel"
New Exposed Steel Bridge Piling and Similar Applications	Section 545, "Protective Coating of Miscellaneous Structural Steel"
Recoating Bridges	Section 546, "Recoating Structures"

### 541.2.5.1 Galvanizing or Zinc Coating

If the Contract requires a galvanized coating, the Contractor shall coat steel after fabrication in accordance with AASHTO M111.

Bolts, washers, nuts, and position dowels used in the assembly and erection of galvanized railing and posts or where specified, shall be galvanized in accordance with AASHTO M232 Class C or shall be zinc coated in accordance with ASTM B695.

After erecting the steel, the Contractor shall coat the galvanized hardware with a product meeting ASTM A780, Type 2.

#### 541.2.5.1.1 Quality Control and Repair of Galvanizing

Uncleaned slag lines, bare spots, blisters, flux spots or inclusions, dross, acid, or black spots that exceed 1 square inch or occur on more than 5 percent of the exposed surface area shall be cause for rejection of the lot. The Materials may be stripped, regalvanized, and again submitted for inspection; otherwise the entire lot shall be rejected.

Pieces with damage to less than 5 percent of the exposed surface area may, with the approval of the Project Manager, be repaired in accordance with ASTM A780 Type 1 - zinc-based solders which includes low melting point zinc alloy repair rods or powders or Type 3 - metallizing.

With the approval of the Project Manager, on areas that are concealed from direct weathering and on areas that are not aesthetically visible to the travelling public, ASTM A780 Type 2 (paints containing zinc dust, commonly referred to as "cold galvanizing") may be used on areas less than one square inch and less than 5 percent of the exposed surface area. The dried film must contain no less than 90% pure zinc. Surface preparation and application shall be in accordance with the manufacturer's requirements.

In any case, galvanizing repair shall not compromise the aesthetic acceptability of the project as determined by the Project Manager.

## 541.3 CONSTRUCTION REQUIREMENTS

### 541.3.1 Applicable Codes and Documents

The Contractor shall fabricate and erect steel Structures in accordance with the current edition of the following codes and documents:

1. AASHTO/AWS D1.5 – *Bridge Welding Code*;
2. AASHTO/AWS D1.1 – *Structural Welding Code*;
3. AWS D1.4 – *Structural Welding Code – Reinforcing Steel*;
4. AISC 204 – *AISC Certification Program for Bridge and Highway Metal Component Manufacturers*
5. The following AASHTO/NSBA Steel Collaboration documents:
  - 5.1. *S2.1 Steel Bridge Fabrication Guide Specification*
  - 5.2. *S 4.1 Steel Bridge Fabrication QC/QA Guide Specification*



- 5.3. S10.1 *Steel Bridge Erection Guide Specification*
- 5.4. G 1.1 *Shop Detail Drawing Review / Approval Guidelines*
- 5.5. G 1.3 *Shop Detail Drawing Presentation Guidelines*
- 5.6. G12.1 *Guidelines to Design for Constructability*

Although the AASHTO/AWS Steel Collaboration documents are titled “Guidelines” or “Guide Specifications,” consider them to have the same importance and standing as a code or a specification. If the content of the collaboration documents appears permissive with words such as “should,” “could,” “may,” etc., consider the content to be a requirement unless otherwise approved by the State Bridge Engineer.

In the event of a conflict between a referenced code and this specification, this specification will take precedence.

In AASHTO/NSBA Steel Bridge Collaboration S 4.1, all references to Quality Assurance Inspector (QAI) shall be equivalent to referencing the Project Manager.

#### 541.3.2 Quality Control and Quality Assurance (Contractor)

Quality Control and Quality Assurance shall be in accordance with the following:

Tier 1 – AASHTO/NSBA Steel Bridge Collaboration, S 4.1 Steel Bridge Fabrication QC/QA Guide Specification.

Tier 2 – NMDOT Approval of fabrication shop is required, AISC Certification Program for Bridge and Highway Metal Component Manufacturers (AISC 204) current edition shall be used as the basis for approval (AISC Certification is not required)

Tier 3 – NMDOT Approval of fabrication shop is required, AISC Certification Program for Bridge and Highway Metal Component Manufacturers (AISC 204) current edition shall be used as the basis for approval (AISC Certification is not required)

Fabricators shall contact the State Bridge Engineer to request shop inspection and approval.

##### 541.3.2.1 Qualification of QA Inspector (NMDOT Representative)

Tier 1 – AASHTO/NSBA Steel Bridge Collaboration, S 4.1 Steel Bridge Fabrication QC/QA Guide Specification, Part C is superseded by the following requirement: current AWS Welding Inspector Certification

Tier 2 – Licensed Professional Engineer or a certified AWS Welding Inspector

Tier 3 – Project Manager or a certified AWS Welding Inspector

The individual qualified for steel inspection shall also perform coating inspections with no further qualification with the exception of Tier 2 which may be performed by the Project Manager or certified AWS Welding Inspector. AASHTO/NSBA Steel Bridge Collaboration, S 4.1 Steel Bridge Fabrication QC/QA

Guide Specification 3.2 and 8.1.2 shall not apply to the QAI inspector of coatings.

### 541.3.3 Submittals

For Tier 1, prior to installation, the Contractor shall provide all submittals in accordance with Section 106, "Control of Materials." Additional required submittals follow but are not limited to:

1. Structural Steel Mill Test Reports (MTRs);
2. Certificates of Compliance and other documentation for the protective coating;
3. The manufacturer's Certificate of Compliance for welding consumables;
4. QC inspection reports; and
5. A general Certificate of Compliance for the fabricated product.

The Contractor shall submit Certificates of Compliance instead of MTRs for Materials subjected to minimal stress levels, such as sole plates, shoe plates, anchor bolts, and fill plates.

#### 541.3.3.1 Working Drawings

The Contractor shall allow 30 Days for review and Acceptance of Working Drawings and calculations. Any re-submittals will require an additional 14 Days for review. The Working Drawing submittal process must be complete prior to the Pre-Fabrication conference (541.3.5.1).

The Contractor shall prepare Working Drawings in accordance with AASHTO/NSBA G 1.3, Shop Detail Drawing Presentation Guidelines. The Department will review Working Drawings for Acceptance in accordance with AASHTO/NSBA G 1.1, Shop Detail Drawing Review / Approval Guidelines. The Working Drawing submittal shall include a detailed bill-of-material in accordance with AASHTO/NSBA Steel Bridge Collaboration G 1.1 with the letter of intent to fabricate. The Contractor shall submit Working Drawings electronically in PDF format to the Project Manager.

The Contractor shall not make any changes to accepted Working Drawings. If changes are made, the Contractor shall re-submit the Working Drawings for acceptance.

The Contractor shall include the submittal and review time for its shop drawings and schedule for fabrication of the specialized structural steel components as a milestone per 108.3.1.1 (5) "CPM Baseline Schedule".

#### 541.3.3.2 Working Drawings for Structural Steel Items Detailed on Standard Drawings

The Contractor may submit standardized Working Drawings instead of Project-specific drawings for Structural Steel items such as cattle guard grills and drop inlet grates.

The Contractor shall include the Fabricator's name and address, drawing title, drawing number, drawing date, revision dates, and Standard Drawing number on Working Drawings.

#### 541.3.3.3 Erection Plan

The Contractor shall submit an erection plan for Tier 1 steel. Erection plans are not required for OH Sign Structures.

The Contractor shall submit an Erection Plan conforming to Section 2 of the AASHTO/NSBA Steel Bridge Erection Guide Specification S-10.1, 2014 Edition and the following Department requirements:

1. The Erection Plan shall be prepared by a Professional Engineer licensed in the State of New Mexico and shall be accompanied by calculations verifying the safety of all aspects of erection.
2. The Erection Plan shall consider the load-bearing capacities of any temporary or permanent structures used in the erection of the new bridge, including any need for shoring.
3. The Erection Plan shall be submitted no less than thirty (30) Days prior to any steel erection operations.
4. All costs for the Erection Plan and shoring of any temporary or permanent structure used for the erection of the new bridge shall be considered included in Bid Item 541100 – Structural Steel for Steel Bridges.

The Contractor shall allow 30 Days for review and acceptance of the erection plan. Any re-submittals will require an additional 14 Days for review. The erection plan submittal process must be complete prior to the start of erection.

The Contractor shall include the submittal and review time for its erection plan and schedule for erection of the specialized structural steel components as a milestone per 108.3.1.1 (5) "CPM Baseline Schedule".

#### 541.3.4 Rolled Girders and Plate Girders

The Contractor shall provide girders to the full length shown in the Plans. Bolted or welded girder splices will not be permitted unless noted otherwise in the Plans.

#### 541.3.5 Fabrication

The Contractor shall ensure that the fabrication shop for Tier 1 steel is certified in accordance with AASHTO/NSBA *Steel Collaboration S-2.1, Steel Bridge Fabrication Guide Specification*. The Department will not require AISC certification for fabrication shops fabricating Tier 2 and Tier 3 steel items, but the Department must inspect and approve these shops before fabrication.

Steel will be fabricated in the shop unless otherwise approved by the Project Manager.

Tier 1 – AASHTO/NSBA Steel Bridge Collaboration, S-2.1 Steel Bridge Fabrication Guide Specification.

Tier 2 – AISC Certification Program for Bridge and Highway Metal Component Manufacturers (AISC 204) current edition.

Tier 3 – AISC Certification Program for Bridge and Highway Metal Component Manufacturers (AISC 204) current edition.

#### 541.3.5.1 Pre-Fabrication Conference

A Prefabrication Conference is required for Tier 1 steel (a Prefabrication Conference is not required for OH Sign Structures). The Prefabrication Conference shall be held in conjunction with the Preconstruction Conference. The Prefabrication Conference may be held on an alternate date at the discretion of the Project Manager. The agenda for the Prefabrication Conference shall be based upon S2.1, "Steel Bridge Fabrication Guide Specification."

#### 541.3.5.2 Attachment and Fit of Gussets and Stiffeners

Where welding of gusset plates, stiffeners or other secondary attachments to main structural members would otherwise result in intersections of welds, the Contractor shall clip back the corners of the attachments 1-1/4 inch minimum from the corner in each direction to avoid such intersections.

The Contractor shall terminate welds attaching secondary components to main members 1/4 inch short of the end of the attachments.

If the Plans require bearing stiffeners "finished to bear," the Contractor shall mill or grind the ends and obtain an even bearing against the flange the stiffeners will bear on.

If the Plans require "tight fit" stiffeners, the Contractor shall fit the stiffeners tight against the flange to exclude water after being coated.

#### 541.3.5.3 Straightening of Flanges

At pier bearings, abutment bearings and splices, the Contractor shall straighten girder or beam flanges perpendicular to the webs. At bearings, the Contractor shall straighten flanges before fitting stiffeners. At splices, the Contractor shall straighten flanges before coating and shipment. The Contractor shall not cold bend.

#### 541.3.5.4 Bearing Plates, Pins, and Rollers

##### 541.3.5.4.1 Sole, Masonry, and Shoe Plates

The Contractor shall flatten the top and bottom surfaces of sole masonry and shoe plates to within  $\pm$  1/32 inch.

The Contractor shall machine sole plate surfaces that will contact elastomeric bearing pads perpendicular to the direction of expansion.

The Contractor shall machine other expansion surfaces in the direction of expansion.

##### 541.3.5.4.2 Pins and Rollers

The Contractor shall accurately turn pins and rollers to dimensions and ensure that they are smooth, straight, and free of flaws.

## 541.3.5.4.3 Pin Holes

The Contractor shall bore a two (2) inch diameter hole longitudinally through the center of pins with an eight (8) inch diameter or larger.

The Contractor shall bore pinholes true to the specified diameter, smooth and straight, at right angles to the axis of the member and parallel with each other unless otherwise required. The Contractor shall produce the final surface with a finishing cut.

The Contractor shall not vary the outside to outside distance of end holes in tension members and inside to inside distance of end holes in compression members by more than 1/32 inch. The Contractor shall bore holes in built-up members after shop assembly.

## 541.3.5.4.4 Threads

The Contractor shall ensure that bolt and pin threads are in accordance with Unified Standard Series UNC-ANSI B1.1, Class 2A for external threads and Class 2B for internal threads. The Contractor shall thread pin ends with a diameter of 1 3/8 inch or greater with six (6) threads per inch.

## 541.3.5.4.5 Surface Finish

The Contractor shall finish the surfaces of bearings, base plates, pins, rollers, and other bearing steel that will come into contact with each other or with concrete in accordance with ANSI B46.1, Surface Roughness, Waviness and Lay.

## 541.3.5.5 Connections

### 541.3.5.5.1 Welding

#### 541.3.5.5.1.1 Welder Qualifications

The Contractor shall use annually certified welders or those who provide documentation demonstrating continuing experience in the process. Welder must be qualified for the position the weld is performed in. All welders shall be certified by AASHTO/AWS D1.1 or D1.5 unless otherwise noted by the Contract Documents.

Tier 1 – AASHTO/NSBA Steel Bridge Collaboration, S2.1 Steel Bridge Fabrication Guide Specification (Built-up plates and open rolled-shape structural elements AWS D1.5, welded tubular structural elements in accordance with D1.1)

Tier 2 – AISC Certification Program for Bridge and Highway Metal Component Manufacturers (AISC 204) current edition. The welder shall be AWS D1.1 certified.

Tier 3 – The welder shall be AWS D1.1 certified.

#### 541.3.5.5.1.2 Testing of Complete Penetration Welds

The Contractor shall conduct nondestructive QC radiographic testing on complete penetration welds in accordance with AWS D1.5 or D1.1 (as applicable).

The Department may allow ultrasonic testing as a substitute for radiography. The Contractor shall submit an ultrasonic testing plan for approval at least 30 Days before the start of fabrication. The Contractor shall provide detailed information about the Fabricator's previous experience with ultrasonic testing and resumes showing the training and experience of persons performing the testing. The Contractor shall not use ultrasonic testing for cases described in Section 6.7.1.1 of the AASHTO/AWS D1.5-Bridge Welding Code.

#### 541.3.5.5.2 Bolted Connections

The Contractor shall bolt with high strength bolts in accordance with Section 542, "High-Strength Bolts."

The Contractor shall make bolt holes 1/16 inch larger than the nominal diameter of the connector, unless otherwise specified.

#### 541.3.5.5.3 Gaps Between Ends of Abutting Members

Where the Contract requires abutting milled joints, the Contractor shall ensure there are no gaps. The Contractor shall face the ends to provide a full and even bearing when assembled.

Where the Contract requires close joints, the Contractor shall not exceed 1/8 inch between the ends of abutting members. The Contractor shall not exceed 1/4 inch between abutting ends of girders at splices.

#### 541.3.5.6 Camber Verification

The Contractor shall verify girder camber during the laydown operation. Unless assembling girders in the horizontal position, the Contractor shall meet the total camber dimensions less the deflections produced by the weight of the girder.

#### 541.3.6 Erection Requirements

The Contractor shall erect the Structure in accordance with AASHTO/NSBA Steel Bridge Collaboration S10.1, *Steel Bridge Erection Guide Specification*.

If requested by the Project Manager, a pre-erection conference shall be held prior to start of erection. The agenda shall be the review of the erection plan.

#### 541.3.6.1 Placement of Bearings

The Contractor shall ensure that column bases and bearing devices bear fully and uniformly on substructures. The Contractor shall not place bearings on pier or abutment bridge seat areas that are improperly finished or irregular. The Contractor shall grout to achieve uniform bearing only when the Contract allows grouting.

The Contractor shall place masonry plates and beam and girder span pedestals on impregnated fabric pads approved by the Project Manager at least 1/8 inch thick.

541.3.6.2 Anchor Bolt Holes

The Contractor shall core drill anchor bolt holes in accordance with Table 541.3.6.2:1, "Required Nominal Anchor Bolt Hole Diameters."

Table 541.3.6.2:1  
Required Nominal Anchor Bolt Hole Diameters

Bolt diameter (inch)	Hole diameter (inch)
3/4	1-1/2
1	1-3/4
1-1/4	2

The Contractor shall set anchor bolts using non-shrink grout from the Department’s Approved Products List. The Contractor shall remove excess mortar after the grout has set. The Contractor shall ensure that anchor bolt washers and nuts bear evenly against the steel-bearing surface. The Contractor shall ensure anchor bolts at the expansion ends of spans allow the free movement of the span.

541.3.6.3 Field Bolting

The Contractor shall install high strength bolts in accordance with Section 542, "High-Strength Bolts."

The Contractor shall block main structural members to the desired camber before torquing the bolted splice connections.

For skewed steel bridges with diaphragms perpendicular to the longitudinal centerline, the Contractor shall finger tighten diaphragm attachment bolts before deck placement. The Contractor shall fully torque bolts after the deck slab is in place.

Following completion of the superstructure and after priming, the Contractor shall fill open holes in exterior beams and girders with button head bolts before final acceptance.

541.3.6.4 Field Welding

Field welding of permanent steel elements will not be permitted unless shown in the Plans, with the following exceptions:

1. Field welds shown in the Plans;
2. Splices for driven pile;
3. Sole plate to girder shoe plate;
4. Pedestrian rails;
5. Shear studs installed in the field for construction means and methods; or
5. As approved by the Project Manager

#### 541.3.6.4.1 Field Welding Submittal and Qualifications

The Contractor shall submit a welding procedure and the welder's certification for the welder performing the Work. The welder certification must be consistent with the welding procedure and the welding position required to perform the Work. Qualifications of the welders shall be consistent with the 541.3.5.4.1.1.

#### 541.3.6.4.2 Field Welding Inspections

The Contractor shall provide a certified AWS Welding Inspector. This Inspector shall review and approve the welding procedure and the welder qualifications. This Inspector shall provide testing and documentation in accordance with 541.3.1, "Applicable Codes and Documents." Documentation shall be submitted to the Project Manager within Seven (7) Days of completion of the welding activity.

#### 541.3.6.4.3 Field Installation of Shear Studs

Should the Contractor elect to install shear studs in the field, the Contractor shall field weld studs with automatic stud welding guns that shall be used to weld studs to girders. The operator shall be qualified per AWS D1.5 Subsection 7.7.4. The base metal where the stud is to be welded shall be ground to bright metal immediately prior to the weld being made. Manual welding will not be allowed except to make repairs. Repairs shall be in accordance with AWS D1.5 Subsection 12.6. Repair fillet size shall be a minimum of 5/16 inch.

Field welded studs shall be inspected in accordance with 541.3.6.4.2, "Field Welding Inspections."

#### 541.3.6.5 Pilot and Driving Nuts

The Contractor shall use pilot and driving nuts in driving pins. The Contractor shall show details on the Working Drawings. The Contractor shall furnish one (1) pilot and one (1) driving nut for each size pin.

#### 541.3.7 Removal of Lead-Paint Coated Steel Items

The Contractor shall dispose of lead paint debris in accordance with Section 547, "Safety and Environmental Requirements for Painting Operations."

#### 541.3.8 Disposal of Steel Structures, Reinforcing Steel, Steel Debris or Steel Waste

The Contractor shall not reuse salvaged steel items from existing Structures on NMDOT Projects unless directed otherwise in the Plans. Salvaged steel shall be disposed of by Contractor as approved by the Project Manager.

#### 541.3.9 QUALITY ASSURANCE INSPECTION FREQUENCY

##### 541.3.9.1 Steel Inspections

The following Quality Assurance Inspections shall be performed by the Quality Assurance Inspector



(QAI). Unless otherwise noted, the Inspections shall take place in the fabrication shop.

Tier 1 –

Rolled steel beams – minimum of one (1) QA Inspections per project

Plate girders – minimum of three (3) QA Inspections per project

Diaphragms and cross frames – include with the above inspections

Overhead sign structures – minimum of one (1) inspection per fabrication shop per year

Tier 2 –

Metal bridge barrier rails – 40% of welds by length

Diaphragms for concrete bridges – visual inspection upon delivery to site

Steel bearing components – 40% of welds by length

Tier 3 –

Drop inlets – visual inspection upon delivery to site

Safety grates – visual inspection upon delivery to site

Cattle & game guards – visual inspection upon delivery to site

Pedestrian rails – visual inspection upon delivery to site

Gates – visual inspection upon delivery to site

Access panels – visual inspection upon delivery to site

Miscellaneous steel – visual inspection upon delivery to site

It is recommended that a QA Inspection be performed at or near the completion of erection; this is in addition to those listed above.

### 541.3.9.2 Coating Inspections for paint and powder coating

The following Quality Assurance Inspections shall be performed by the Quality Assurance Inspector (QAI). Unless otherwise noted, the Inspections shall take place in the fabrication shop. The Project Manager may waive coating inspections.

Tier 1 –

Rolled steel beams – one (1) inspection concurrent with a steel inspection

Plate girders – one (1) inspection concurrent with a steel inspection

Diaphragms and cross frames – no requirement

Overhead sign structures – photos of coating process shall be provided to the QAI with QC traveler documentation, visual inspection upon delivery to site

Tier 2 –

Metal bridge barrier rails – two (2) shop inspections are recommended per project; this may be waived by the Project Manager.

Diaphragms for concrete bridges – no requirement

Steel bearing components – visual inspection upon delivery to site

Tier 3 –

Drop inlets – visual inspection upon delivery to site

Safety grates – visual inspection upon delivery to site

Cattle & game guards – visual inspection upon delivery to site  
 Pedestrian rails – visual inspection upon delivery to site  
 Gates – visual inspection upon delivery to site  
 Access panels – visual inspection upon delivery to site  
 Miscellaneous steel – visual inspection upon delivery to site

It is recommended that a QA inspection be performed at or near the completion of erection; this is in addition to those listed above.

#### 541.3.9.3 Galvanized Elements

Galvanized elements shall be visually inspected upon delivery to the site by the Project Manager.

#### 541.4 METHOD OF MEASUREMENT

If structural members are specified by a nominal unit weight, the Department will calculate weight based on the nominal weights and dimensions.

When structural members are not designated by a nominal unit weight, the Department will calculate weight using the unit weights listed in Table 541.4:1, "Metal Unit Weights for Measurement."

The Department will deduct the weight of copes, cuts, bevels, and open holes from the gross weight. The Department will not make deductions for bolt holes.

Table 541.4:1  
 Metal Unit Weights For Measurement

Material	Unit weight (lb./ft <sup>3</sup> )
Steel	490
Cast iron	445
Bronze	536

#### 541.4.1 Bolts

The Department will pay the weight of fasteners as indicated on the accepted Working Drawings.

#### 541.5 BASIS OF PAYMENT

Pay Item	Pay Unit
<i>Structural Steel for Concrete Bridges</i>	Pound
<i>Structural Steel for Steel Bridges</i>	Pound
<i>Structural Steel for Miscellaneous Structures</i>	Pound

#### 541.5.1 Work Included in Payment

The following Work and items will be considered as included in the payment for the main items and will not be measured or paid for separately:

1. Submittals including re-submittals;
2. Nondestructive testing;
3. Protective coatings;
4. Additional weight of heavier sections provided solely for the Contractor's convenience;
5. All Incidentals necessary for the completion of the Work;
6. Weld Material weight; and
7. All QC/QA requirements.

March 31, 2016

## SPECIAL PROVISIONS MODIFYING SECTION 544 – PROTECTIVE COATING OF NEW STRUCTURAL STEEL

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Replace Section 544 Protective Coating of New Structural Steel in its entirety with the following:

### 544.1 DESCRIPTION

This Work consists of applying liquid coating materials to steel surfaces.

Refer to Section 541 “Steel Structures” for galvanized (hot-dipped)” applications. Refer to Section 545 “Protective Coating of Miscellaneous Structural Steel” for two coat and powder coating applications. Note that bridge railings are included in 545. Refer to Section 546 “Recoating Structures” for repairs to new coatings. The Contractor shall adhere to all requirements in Section 547 “Safety and Environmental Requirements for Painting Operations” of this specification.

#### 544.1.1 Terminology and Standards

The Contractor shall use terminology in accordance with the following standards:

- Society for Protective Coatings (SSPC) Painting Manual Volume 2
- Surface Preparation Standards, Guides, and Specifications, Section 2 of the SSPC Painting Manual Volume 2 (SSPC-SP)
- American Architectural Manufacturer’s Association (AAMA)
- American Association of State Highway and Transportation Official (AASHTO)
- American Society for Testing and Materials (ASTM)
- American Institute of Steel Construction (AISC)

### 544.2 MATERIALS

#### 544.2.1 Coating System

The Contractor shall select a complete coating system comprised of products meeting all performance requirements as listed in Table 544.2.1:1 below. Testing shall be in accordance with AASHTO R-31. All products in each system shall be from the same manufacturer. All products shall be represented on the latest version of the manufacturer’s product data sheet as being suitable for use on bridges and capable of being applied at the specified dry film thickness requirements in Table 544.3.4.4:1

Inorganic Zinc-Rich Primer – Shall achieve minimum SSPC Paint 20 Level 2 requirements for amount of zinc dust in the dry film of equal to or greater than 77% by weight.

Epoxy Intermediate Coat – Shall be a two-component epoxy, polyamide or polyamidoamine, including Phenalkamine coatings with minimum solids by volume of 65%.

Polyurethane Topcoat – Shall be a two-component aliphatic polyurethane coating with minimum solids by volume of 65%.

Table 544.2.1:1  
Acceptable Product Requirements

TEST	REF. NO.	PRODUCT(S)	ACCEPTANCE CRITERIA	COMMENTS
Slip Coefficient	ASTM A 325, Appendix A.	IOZ	Class B, Min. 0.5	
Salt Fog Resistance	ASTM B 117	P/I/T (IOZ)	(A) No Delamination Allowed (B) Rust – Max creep 4mm, Avg. creep 2mm @5000 Hrs. (C) Blister – Conversion #8 @ 4000 Hrs.	
Cyclic Weathering Resistance	ASTM D 5894	P/I/T (IOZ)	(A) No Delamination Allowed (B) Rust – Max creep 4mm, Avg. creep 2mm @5040 Hrs. (C) Blister – Conversion #9 @ 4032 Hrs.	
Adhesion Pull-Off Strength	ASTM D 4541	IOZ Alone  P/I/T (IOZ)	2.4 MPa (600 psi)  2.4 MPa (600 psi)	
Freeze-Thaw Stability Pull-Off Strength	ASTM D 4541	P/I/T (IOZ)	2.4 MPa (350 psi) 4.1 MPa (600 psi) 2.4 MPa (350 psi) 4.1 MPa (600 psi)	Requires same average as adhesion pull-off strength results, with no tests measuring less than 60% of those results
Field History	NA	P/I/T (IOZ)	Five (5) Bridges with Minimum two (2) year successful field history	

P = Primer; I = Intermediate coat; T = Topcoat; IOZ = Inorganic Zinc Rich Primer

For structural components that require a galvanized (hot-dipped) coating, reference 541.2.6 “Structural Steel Coatings”.

Primer information for the use of organic zinc for touch-up and repair is included in Section 546: Recoating Structures

If the Contract does not specify a color, the Contractor shall use the color Federal Standard 16307, RAL 7004, Pantone 423, or approved equal.

#### 544.2.2 Submittals

The Contractor shall provide a submittal for the proposed coating option and manufacturer to the Project Manager at least 30 Days before coating operations. If the color varies from the specified color, the Contractor shall submit color samples on boards at least eight (8) inches by ten (10) inches for review and approval.

The Department may take random coating Materials samples during the Work for testing.

When the contract requires painting more than 1,500 sq ft of steel surface, the Contractor shall submit a coating plan 30 Days prior to start of coating operations. Sample coating plans are available on the NMDOT website.

##### 544.2.2.1 Certification

After the Department approves the coating Material, the Contractor shall submit:

1. Notarized manufacturer's Certificates of Compliance stating that the Materials are the same as those described in the manufacturer's product data sheets.
2. Certified test reports from an independent laboratory performed in accordance with AASHTO R-31, showing acceptable performance results as listed on the chart in Section 544.2.1. The Contractor shall submit two (2) copies of each to the Department.

##### 544.2.2.2 Product Data Sheets

The Contractor shall provide manufacturer's product data sheets and SDS with each Submittal that shows the following:

1. Mixing and thinning directions;
2. Recommended spray nozzles and pressures;
3. Minimum/maximum drying time, including re-coat times, for shop or field applied coats; and
4. Manufacturer recommended application procedures, including temperature requirements.

##### 544.2.2.3 Contractor Qualifications

When the contract requires painting more than 1,500 sq. ft of steel surface, the Contractor shall demonstrate qualification by one of the following two methods:

###### Method 1

Obtain SSPC QP 1 certification for field painting or either SSPC-QP 3 certification or the AISC Sophisticated Paint Endorsement (SPE) for shop painting. The Contractor shall perform and

document QA/QC inspections daily. QA/QC inspection documents shall be electronically submitted to the Project Manager on a weekly basis.

#### Method 2

Provide a coating plan and provide for NACE certified inspection (Level 2 minimum). The inspection services shall include but not be limited to:

1. Surface preparation and cleanliness inspection verifying profile and appropriate surface preparation.
2. Confirm and document products match approved submittals and certification letters. Document the batch numbers of all coatings.
3. Inspection of primer coat to include dry film thickness readings. Review contractors QA/QC reports for environmental conditions and document.
4. Observe application of stripe coat on the intermediate coat and document environmental readings during the start and stop of application. Review contractors QA/QC reports.
5. Inspect intermediate coat to include dry film thickness readings. Review Contractor's QA/QC reports.
6. Observe start and stop of finish coat application and document environmental conditions.
7. Inspect members after transportation, prior to subsequent coating and / or final acceptance.
8. Final inspection to include visual inspection for runs, sags, and foreign material in coating. Also perform final dry film thickness inspection.
9. Electronically submit interim reports after each inspection to the Project Manager within 3 working days.
10. Electronically submit comprehensive final report including photos to the Project Manager within 14 Days of completion of inspection. Final report shall include QA/QC daily inspections performed by the Contractor.
11. Add field connection points

Any deficiencies shall be corrected and re-inspected by the NACE inspector prior to proceeding.

Samples of a coating plan and QA/QC inspection documents are available on the NMDOT website.

Provisions for demonstration of qualifications are incidental to the performance of the coating; no additional payment shall be made. NMDOT shall be granted open access to the coating operation to perform inspections and to review documentation of Contractor inspections.

### 544.3 CONSTRUCTION REQUIREMENTS

The Contractor shall apply coatings in conformance with SSPC – PA 1 “Shop, Field and Maintenance Painting of Steel” and with SSPC – PA Guide 13 “Guide Specification for Application of Coating Systems with Zinc-Rich Primers to Steel Bridges” (aka AASHTO/NSBA Steel Bridge Collaboration S 8.1)

#### 544.3.1 Surface Preparation for Priming

The Contractor shall remove oil, grease, and other contaminants with methods specified in SSPC-SP I

Solvent Cleaning, or other Department-approved methods.

The Contractor shall blast-clean the carbon steel surfaces, in preparation for coating, in accordance with SSPC-SP 10 Near White Metal Blast Cleaning.

Prior to commencing full surface preparation activities, the Contractor shall prepare an acceptance standard on a flat portion of the surface to be cleaned, located by the Project Manager. The Project Manager shall make the final determination as to whether prepared surfaces meet the specification. The surfaces shall be evaluated using the SSPC-Vis 1, Visual Standard for Dry Abrasive Blast Cleaning. The Contractor shall provide the SSPC-Vis 1 manual for the Project Manager for inspection and acceptance. The Vis 1 Guide shall become the property of the Department.

The Contractor shall select the type of abrasive. All abrasives brought to the site shall be stored in a clean and dry environment. Abrasives shall not be recycled or re-used without NMDOT approval. The Contractor shall ensure that the abrasives produce a uniform profile from one (1) mil to three (3) mils with an angular pattern as measured in accordance with SSPC-PA 17 / ASTM D 4417 Standard Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel. If surface profile requirements of the coating manufacturer differ from those specified herein, the Contractor shall comply with the coating manufacturer's requirements. Actual replica test tapes used shall be maintained with the permanent project inspection records. The profile shall be measured a minimum of three (3) times for every 500 feet of surface area, or as directed by the Project Manager.

The Contractor shall prepare all corners, pockets, re-entrant angles, splice plates and bolted or riveted connection plates. The Contractor shall remove fins, tears, slivers, and burred or sharp edges found during the blast cleaning operation. The Contractor shall grind and re-blast the area in accordance with SSPC-SP 10 Near White Metal Blast Cleaning.

Immediately prior to coating application, the Contractor shall ensure that the surface complies with the degree of cleaning specified in SSPC-SP 10, including but not limited to ensuring the absence of dust, loose residue, oil, grease, rust or other contaminants.

### 544.3.2 Coating Preparation

#### 544.3.2.1 Mixing Coatings

The Contractor shall mix coatings using a power mixer. The Contractor shall not use paint shakers. The Contractor shall mix the coatings, as much as possible, in the original containers. Only complete kits shall be mixed and used.

The Contractor shall strain coatings through a 30 – 60 mesh screen, or per coating the manufacturer's recommendations. Zinc pigmented primers shall have no clumps of zinc remaining in the coating after mixing and during application.

The Contractor shall agitate mixed primers continuously from straining through application.

#### 544.3.2.2 Thinning Coatings



The Contractor shall not thin the coatings without the approval of the Project Manager. If it is necessary to thin the coatings, the Contractor shall thin the Material in accordance with the manufacturer's recommendations.

### 544.3.3 Temperature and Weather Limitations

The application of a coating system shall occur only when the air and substrate temperature is within the range indicated by the manufacturer's written instructions for both application and curing and can be expected to remain in that range.

The following conditions shall be considered but shall not supersede the manufacturer's written instructions. The Contractor shall apply the coating when the air and surface temperatures are above 40 °F and at least 5 °F above the dew point. The Contractor shall apply the coatings when the relative humidity is 85% or lower. Coatings shall not be applied in rain, wind, snow, fog or mist. Coatings shall not be applied on frosted or ice-coated surfaces. The Contractor shall apply inorganic zinc primers when the relative humidity is 50% or higher. Manufacturer may require water misting of inorganic zinc primers for proper curing.

### 544.3.4 Coating Applications

The Contractor shall not apply coatings until the Project Manager approves the surface preparation. Prior to application of subsequent coats the Project Manager shall verify that surfaces are free of dust and any deleterious contaminants. The Project Manager may waive this approval.

When the contract requires painting more than 1,500 square feet of steel surface, the Contractor shall have a coating manufacturer representative present to provide technical assistance at the start of each coating operation.

The Contractor shall apply subsequent coats within the recoat window specified by the manufacturer. If the recoat time period is exceeded, the undercoat surface shall be specially treated as recommended by the manufacturer before subsequent coats are applied. Such treatments include but are not limited to mild abrasion, solvent treatment, or use of a fog coat.

#### 544.3.4.2 Coating Options

The Contractor shall use one (1) of the following coating options:

1. Apply the primer, intermediate, and protective topcoat in the shop; or
2. Apply the prime coat in the shop and the intermediate and protective topcoat in the field; or
3. Apply the primer and intermediate coat in the shop and the protective topcoat in the field.

#### 544.3.4.3 Spray Equipment

The Contractor shall apply coatings with spray nozzles at pressures recommended by the coating system manufacturer.

The Contractor shall use conventional or airless spray systems to apply the coatings, following manufacturer application instructions.

#### 544.3.4.4 Film Thickness Requirements

The Contractor shall provide coating thicknesses in accordance with Table 544.3.4.4:1, "Required Film Thicknesses." The Department will reject the coating if the DFT (dry film thickness) gauge shows less than the specified minimum thickness for any coating.

Table 544.3.4.4:1  
Required Film Thicknesses

Coating	Dry film thickness range (mils)
Primer	2.0 – 4.0
Intermediate	4.0 – 6.0
Polyurethane Protective Topcoat	3.0 – 5.0

The Contractor shall determine the dry film thickness using magnetic film thickness gauges, SSPC PA 2 Procedure for Determining Conformance to Dry Coating Thickness Requirements. The Contractor shall calibrate the gauges on blasted steel with plastic shims approximately the same thickness as the minimum dry film thickness. All dry film thickness requirements are to be measures above the peaks of the blast profile.

#### 544.3.4.5 Primer Application

The Contractor shall prime coat all Structural Steel surfaces, except as noted in Section 544.3.4.6, "Bolted and Welded Connections."

The Contractor shall not apply primers over blasted steel that has begun to rust or bloom. The Contractor shall apply primer in a smooth, wet, continuous film.

A stripe coat of primer material shall be applied to all edges, corners, seams, crevices, interior angles, junctions of joining members, rivets, bolt heads, nuts and threads, welds and similar irregularities. The stripe coats shall be of sufficient thickness to completely hide the surface being covered and shall be followed, as soon as practicable, by a full application of the appropriate coating to its specified thickness.

The Contractor shall apply all coatings according to the latest manufacturer's written instructions. The Contractor shall repair deficiently primed areas in accordance with the manufacturer's recommendations and as directed by the Project Manager. The Contractor shall remove dry overspray with light sanding.

The Contractor shall give steel Bridge sole plates one (1) coat of zinc rich primer. The Contractor shall mask-off strips where sole plates will be welded to beam flanges and surfaces that will be in contact with elastomeric bearing pads. After welding, the Contractor shall apply a primer touch-up to the welded areas.

#### 544.3.4.6 Bolted and Welded Connections

The Contractor shall blast clean faying (contact) surfaces in accordance with SSPC-SP 10 Near White Metal Blast Cleaning, and leave uncoated for bolting and/or field welding.

The Contractor shall make uncoated areas slightly larger than the contact areas to ensure that the bolted connections clamp down only on the blast-cleaned Material and not on painted surfaces.

The Contractor shall mask off faying areas to protect them from rust during hauling and storage. The Contractor shall apply a rust prohibitor to the faying surfaces or coat the faying areas with a Class B primer (slip coefficient equal to or greater than 0.50), as listed in Table 544.2.1:1. The Department will approve the rust prohibitor or Class B primer. Before bolting, the Contractor shall remove the rust prohibitor. The Contractor shall not remove Class B primers before bolting, unless required.

Immediately before bolting and/or field welding, the Contractor shall ensure the exposed connection areas are in accordance with SSPC-SP 10 Near White Metal Blast Cleaning. The Contractor shall apply the complete coating system to these surfaces after erection. The Contractor shall mask-off connection areas to leave neat lines between the connection area coating and previously coated areas.

The Contractor shall apply the topcoats on bolted field connections after placing the deck.

#### 544.3.4.7 Intermediate Coat Application

After cleaning and before applying the intermediate coating system, the Contractor shall mask opposite sides of the diaphragms and stiffeners over areas that the direct tension indicators will bear on. The Contractor shall not coat these areas until after erection and bolt tightening.

Before applying the intermediate coat, the Contractor shall tie coat the galvanized components using manufacturer's recommended tie coat Material. The Contractor shall apply the tie coat with a brush.

The Project Manager will inspect the primed surfaces before the Contractor applies the intermediate coat.

The Contractor shall not apply the intermediate coat to the following Structural Steel surfaces:

1. Faying surfaces of bolted connections (Section 544.3.4.6, "Bolted and Welded Connections");
2. The top flange top surfaces of beams, girders or diaphragms to be embedded in concrete;
3. Bearing surfaces resting on concrete Substructures or are subject to sliding and rotational movement; and
4. Bearing surfaces in contact with elastomeric bearing pads.

A stripe coat of intermediate material shall be applied to all edges, corners, seams, crevices, interior angles, junctions of joining members, rivets, bolt heads, nuts and threads, welds and similar irregularities. The stripe coats shall be of sufficient thickness to completely hide the surface being covered and shall be followed, as soon as practicable, by a full application of the appropriate coating to its specified thickness.

#### 544.3.4.8 Urethane Protective Topcoat Application

The Contractor shall apply the polyurethane protective topcoat only on cured intermediate coat.

#### 544.3.5 Handling Steel

The Contractor shall protect uncoated faying surfaces to minimize corrosion during shipping and storage.

The Contractor shall store Structural Steel on pallets so it does not rest on dirt. The Contractor shall store beams and girders in an upright (as erected) position.

The Contractor shall use softeners to insulate steel from chains. The Contractor shall pad hooks and slings for hoisting steel. The Contractor shall space parts during shipment so that no rubbing occurs.

The Contractor shall use rubber rollers, soft support pads, or other protective devices on Equipment support members or fasteners resting on or attached to newly coated surfaces.

#### 544.3.6 Protection of the Work and the Public

During the coating operations, the Contractor shall protect structures from blast cleaning operations, paint splatter, splashes and smirches with protective covering or other methods approved by the Project Manager.

When the protective devices or procedures are ineffective, the Project Manager may suspend the Work until corrections take place.

The Contractor shall remove blasting and coating debris from all on-site work before reopening the area to traffic.

#### 544.3.6 Field Repair of Liquid Coatings

Field repair of liquid coatings shall be performed in accordance with Section 546 "Recoating Structures" and the manufacturer's recommendations. Field repair shall be accomplished with the same coating system used for the original application with the exception that organic zinc rich primer may always be used.

The Contractor shall field repair coated areas that are rusted or damaged. The Contractor shall prepare the surface in accordance with 546.3.1 "Surface Preparation of Existing Bridges and Structures" or with methods approved by the Project Manager.

The Contractor shall prime large areas using spray Equipment, brush, or roller. The Contractor shall prime small areas with a brush. The Contractor shall spray or brush the topcoat. Two (2) or more coats may be necessary to build up the required film thickness. The Contractor shall apply topcoat only to areas where the topcoat is damaged. Requirements of Section 546.3, "Construction Requirements" apply to field repairs.

#### 544.3.7 Inspection

The Contractor will be responsible for performing and documenting Quality Control (QC) inspections of all shop / field surface preparation and coating activities. When the contract requires painting more than 1,500 square feet of steel surface, the Contractor shall reference Section 544.2.2.3 Contractor Qualifications. When the contract required painting less than 1,500 square feet of steel surface, the Contractor shall document all QC inspection activities, measurements and observations on the Daily Inspection report. These reports shall be submitted to the Project Manager at a minimum on a weekly basis and shall account for all work performed.

The Contractor shall notify the Project Manager at least ten (10) Days before surface preparation and/or coating to allow adequate time to plan inspection activities.

After completing erection, the Project Manager will inspect the surfaces to be embedded in concrete. The Contractor shall repair damaged or rusted surfaces before placing decks. After placing the deck and at an agreed upon time, the Project Manager will inspect the entire steel Structure for coating system damage. The Project Manager will mark damaged areas for repair and will re-inspect after repairs are complete.

#### **544.3.7 Final Operations**

##### **544.3.7.1 Final Cleaning**

The Contractor shall clean the steel Structure, bearings, and Bridge seat tops after completing coating activities.

##### **544.3.7.2 Stenciling**

At the completion of coating operations, the Contractor shall stencil in four (4) inch high black letters on the inside of the fascia girders at two (2) locations designated by the Project Manager:

1. The completion month and year;
2. The term "Section 544;" and
3. The coating manufacturer.

The Contractor shall make the markings with the same material used for the urethane protective coats.

Example: "6/93-Section 544, Excel Coatings"

#### **544.4 METHOD OF MEASUREMENT—Reserved**

#### **544.5 BASIS OF PAYMENT**

The Department will pay for the coating system as Incidental to Structural Steel, in accordance with Section 541, "Steel Structures."

March 31, 2016

## SPECIAL PROVISIONS MODIFYING

### SECTION 545 – PROTECTIVE COATING OF MISCELLANEOUS STRUCTURAL STEEL

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Replace SECTION 545 PROTECTIVE COATING OF MISCELLANEOUS STRUCTURAL STEEL in its entirety with the following:

#### 545.1 DESCRIPTION

This Work consists of coating new steel elements including:

1. bridge railing
2. pedestrian railing
3. drop inlet grates and frames,
4. cattle guards grates,
5. field coating of new steel piling
6. CWB access panels
7. gates
8. headgates & flapgates
9. I-beam posts
10. safety grates
11. sole plates and bearing devices
12. misc. steel elements

#### 545.1.1 Terminology and Standards

The Contractor shall use terminology in accordance with the following standards:

Society for Protective Coatings (SSPC) Painting Manual Volume 2  
Surface Preparation Standards, Guides, and Specifications, Section 2 of the SSPC Painting Manual  
Volume 2 (SSPC-SP)  
American Architectural Manufacturer's Association (AAMA)  
American Association of State Highway and Transportation Official (AASHTO)  
American Society for Testing and Materials (ASTM)  
American Institute of Steel Construction (AISC)  
National Association of Corrosion Engineers (NACE)

#### 545.2 MATERIALS

The Contractor shall apply the coating system specified within the Contract Documents. If the Contract Documents do not specify a specific coating system, the Contractor may select the coating system from Table 545.2:1.

Table 545.2:1  
Coating System Selection Matrix

Specification Section	Coating System								Color Comments
	galvanize	3-Coat poly	2-Coat epoxy s	2-Coat epoxy f	2-Coat acrylic	Powder Coat	3-Coat poly	2-Coat acrylic	if not galvanized, color (unless otherwise noted in drawings)
	541	544	545	545	545	545	546	546	
541.2.6.1	544.2.1	545.2.1	545.2.2	545.2.3	545.2.4	546.2.1	546.2.2		
<b>Element</b>									
new structural steel	X	X					R		light gray*
metal Bridge railing	X					X		R	light gray*
metal Pedestrian railing	X					X		R	light gray*
drop inlet grates & frames	X		X	X				R	light gray*
cattle guard grates			X	X				R	safety yellow
CWB Access Panels	X		X	X	X	X		R	light gray*
Gates	X		X	X	X	X		R	interstate green
Headgates & Flapgates **			X	X	X				light gray**
I-Beam Posts	X		X	X	X	X		R	interstate green
new steel pilings							X R		light gray*
sole plates & bearing devices			X					R	light gray*
safety grates	X		X	X		X		R	light gray*
Misc. steel	X		X	X	X	X		R	light gray*
<b>Coating Component</b>									
galvanizing	C								
inorganic zinc primer		C	C		C				
organic zinc primer				C	C		C	C	
epoxy intermediate		C					C	***	
polyurethane topcoat		C					C		
epoxy topcoat			C	C					
acrylic topcoat					C			C	
powder coating						C			

“X” denotes a coating system that is acceptable for each element. Specific coating systems noted in the Contract Documents supersede the information provided in this table.

“R” denotes the coating system that is allowable for recoating unless otherwise specified in the Contract Documents. Reference 546 “Recoating Structures” for additional information. All recoating is allowable as field applied.

“C” denotes the coating system component, reference specification section for details.

\* If the Contract does not specify a color, the Contractor shall use the color Federal Standard 16307, RAL 7004, Pantone 423, or approved equal.

\*\* If purchased as an assembly, any corrosion inhibiting coating that is provided by the manufacturer is acceptable.

\*\*\* Intermediate or tie-coat to be provided if recommended by the manufacturer.

### 545.2.1 Coating System No. 1: Shop Applied 2-Coat with Epoxy Topcoat

The Contractor shall select a complete coating system comprised of products meeting all performance requirements as listed in Table 545.2.1:1 below. Testing shall be in accordance with AASHTO R-31. All products in each system shall be from the same manufacturer. All products shall be represented on the latest version of the manufacturer's product data sheet as being suitable for use on bridges and capable of being applied at the specified dry film thickness requirements in Table 545.3.6:1.

Inorganic Zinc-Rich Primer – Shall achieve minimum SSPC Paint 20 Level 2 requirements for amount of zinc dust in the dry film of equal to or greater than 77% by weight.

Epoxy Topcoat Coat – Shall be a two-component epoxy polyamide or polyamidoamine coating, including Phenalkamine coatings with minimum solids by volume of 65%.

**Table 545.2.1:1  
Acceptable Product Requirements**

TEST	REF. NO.	PRODUCT(S)	ACCEPTANCE CRITERIA	COMMENTS
Slip Coefficient	ASTM A 325, Appendix A.	IOZ	Class B, Min. 0.5	
Salt Fog Resistance	ASTM B 117	P/T (IOZ)	(A) No Delamination Allowed (B) Rust – Max creep 4mm, Avg. creep 2mm @5000 Hrs. (C) Blister – Conversion #8 @ 4000 Hrs.	
Cyclic Weathering Resistance	ASTM D 5894	P/T (IOZ)	(A) No Delamination Allowed (B) Rust – Max creep 4mm, Avg. creep 2mm @5040 Hrs. (C) Blister – Conversion #9 @ 4032 Hrs.	
Adhesion Pull-Off Strength	ASTM D 4541	IOZ Alone  P/T (IOZ)	2.4 MPa (350 psi)  2.4 MPa (350 psi)	
Freeze-Thaw Stability Pull-Off Strength	ASTM D 4541	P/T (IOZ)	2.4 MPa (350 psi)  4.1 MPa (600 psi)  2.4 MPa (350 psi)  4.1 MPa (600 psi)	
Field History	NA	P/T (IOZ)	Five (5) Bridges with Minimum two (2) year successful field history	

P = Primer; T = Topcoat, IOZ = Inorganic Zinc Rich Primer



Primer information for the use of organic zinc for touch-up and repair is included in Section 546: Recoating Structures.

545.2.2 Coating System No. 2: Field Applied 2 Coat with Epoxy Topcoat

The Contractor shall select products meeting all performance requirements as listed in Table 546.2.1:1 below. Testing shall be in accordance with AASHTO R-31. All products used in a system shall be from the same manufacturer. All products shall be represented on the latest version of the manufacturer’s product data sheet as being suitable for use on bridges and capable of being applied at the specified dry film thickness requirements in Table 546.3.5:1.

Epoxy Organic Zinc-Rich Primer (used to prime exposed bare steel areas only, spot prime) shall achieve minimum SSPC Paint 20 Level 2 requirements for amount of zinc dust in the dry film of equal to or greater than 77% by weight.

Epoxy Top Coat over existing finishes (applied over zinc primer and other sound existing coatings deemed suitable for over coating by the coating manufacturer’s representative) shall be a two-component, surface tolerant epoxy coating with minimum solids by volume of 65%.

Table 545.2.2:1  
Acceptable Product Requirements

TEST	REF. NO.	PRODUCT(S)	ACCEPTANCE CRITERIA	COMMENTS
Salt Fog Resistance	ASTM B 117	P/T (OZ)	(A) No Delamination Allowed (B) Rust – Max creep 8mm, Avg. creep 4mm @5000 Hrs. (C) Blister – Conversion #7 @ 4000 Hrs.	
Cyclic Weathering Resistance	ASTM D 5894	P/T (OZ)	(A) No Delamination Allowed (B) Rust – Max creep 8mm, Avg. creep 4mm @5040 Hrs. (C) Blister – Conversion #8 @ 4032 Hrs.	
Adhesion Pull-Off Strength	ASTM D 4541	OZ Alone  P/T (OZ)	4.1 MPa (600 psi)  4.1 MPa (600 psi)	
Freeze-Thaw Stability Pull-Off Strength	ASTM D 4541	P/T (OZ)	2.4 MPa (350 psi) 4.1 MPa (600 psi) 2.4 MPa (350 psi) 4.1 MPa (600 psi)	Requires same average as adhesion pull-off strength results, with no tests measuring less than 60% of those results
Field History	NA	P/T (OZ)	Five (5) Bridges with Minimum two (2) year successful field history	

P = Primer; T = Topcoat, OZ = Epoxy Organic Zinc Rich Primer

### 545.2.3 Coating System No. 3: Shop or Field Applied 2 - Coat with Acrylic Topcoat

The Contractor shall select products meeting all performance requirements as listed in Table 545.2.1:1 above for Inorganic Zinc Rich Primer or Table 545.2.2:1 for Organic Zinc Rich Primer and 545.2.3:1 for Acrylic Top Coat below as applicable. It is acceptable to use either inorganic or organic zinc rich primer for 545.2.3 Coating System 3. All products used in a system shall be from the same manufacturer. All products shall be represented on the latest version of the manufacturer's product data sheet as being suitable for use on bridges and capable of being applied at the specified dry film thickness requirements in Table 546.3.5:1.

Epoxy Organic Zinc-Rich Primer (used to prime exposed bare steel areas) shall achieve minimum SSPC Paint 20 Level 2 requirements for amount of zinc dust in the dry film of equal to or greater than 77% by weight (Table 545.2.1:1), or;

Inorganic Zinc-Rich Primer (used to prime exposed bare steel areas) shall achieve minimum SSPC Paint 20 Level 2 requirements for amount of zinc dust in the dry film of equal to or greater than 77% by weight (Table 545.2.2:1), and;

Acrylic Topcoat (applied as overcoat over sound existing coatings deemed suitable for over coating by the coating manufacturer's representative or for repair to the finish of certain items per Section 545 Miscellaneous Steel) shall be a high performance DTM acrylic coating with minimum solids by volume of 38%. Suitable for application over zinc rich primers (Table 545.2.3:1).

Table 545.2.3:1  
Acceptable Product Requirements

TEST	REF. NO.	PRODUCT(S)	ACCEPTANCE CRITERIA	COMMENTS
Adhesion Pull-Off Strength	ASTM D 4541	HPA	> 500 lbs.	One coat applied over blasted steel
Flexibility	ASTM D 522	HPA	Pass: No cracking / flaking	1/8 " conical mandrel One coat applied over blasted steel
Hardness (Pencil)	ASTM D 3363	HPA	Final Cure: "F"	One coat applied over blasted steel
Impact	ASTM D 2794	HPA	> 140 in. lbs.	One coat applied over blasted steel

HPA = High Performance Acrylic

## 545.2.4 Coating System No. 4 – Powder Coating

The Contractor shall obtain primer and topcoat from one (1) manufacturer. The Contractor shall select a coating system that meets the requirements of AAMA 2604.

## 545.2.5 Galvanizing or Zinc Coating

Reference Section 541.2.6.1.

## 545.2.6 Submittals

The Contractor shall provide a submittal for the proposed coating option and manufacturer to the Project Manager at least 30 Days before coating operations. If the color varies from the specified color, the Contractor may submit color samples on boards at least eight (8) inches by ten (10) inches for review and approval.

The Department may take random coating Materials samples during the Work for testing.

When the contract requires painting more than 1,500 square feet of steel surface, the Contractor shall submit a coating plan 30 Days prior to start of coating operations. Sample coating plans are available on the NMDOT website. The Project Manager shall have the option to waive the coating plan requirement.

### 545.2.6.1 Certification

Prior to coating application, the Contractor shall submit:

1. Notarized manufacturer's Certificates of Compliance stating that the Materials are the same as those described in the manufacturer's product data sheets.
2. Certified test reports from an independent laboratory performed in accordance with AASHTO R-31, showing acceptable performance results as listed on the chart in Section 545.

### 545.2.6.2 Product Data Sheets

The Contractor shall provide manufacturer's product data sheets and SDS with each Submittal that shows the following:

1. Mixing and thinning directions;
2. Recommended spray nozzles and pressures;
3. Minimum/maximum drying time, including re-coat times, for shop or field applied coats; and
4. Manufacturer recommended application procedures, including surface preparation and temperature requirements.

## 545.2.7 Contractor Qualifications

When the contract requires painting more than 1,500 sq ft of steel surface, the Contractor shall demonstrate qualification by one of the following two methods:

**Method 1**

Obtain SSPC QP 1 certification for field painting or either SSPC-QP 3 certification or the AISC Sophisticated Paint Endorsement (SPE) for shop painting. The Contractor shall perform and document QA/QC inspections daily. QA/QC inspection documents shall be electronically submitted to the Project Manager on a weekly basis.

**Method 2**

Provide a coating plan and provide for NACE certified inspection (Level 2 minimum). The inspection services shall include but not be limited to:

1. Surface preparation and cleanliness inspection verifying profile and appropriate surface preparation.
2. Confirm products match approved submittals and certification letters. Document the batch numbers of all coatings.
3. Inspection of primer coat to include dry film thickness readings. Review contractors QA/QC reports for environmental conditions and document.
4. Observe application of stripe coat on the intermediate coat and document environmental readings during the start up of application. Review contractors QA/QC reports.
5. Inspect intermediate coat to include dry film thickness readings. Review Contractor's QA/QC reports.
6. Observe start up of finish coat application and document environmental conditions.
7. Final inspection to include visual inspection for runs, sags, and foreign material in coating. Also perform final dry film thickness inspection.
8. Inspect members after transportation, prior to subsequent coating and / or final acceptance.
9. Electronically submit interim reports after each inspection to the Project Manager within 3 working days.
10. Electronically submit comprehensive final report including photos to the Project Manager within 14 days of completion of inspection. Final report shall include QA/QC daily inspections performed by the Contractor.

Any deficiencies shall be corrected and reinspected by the NACE inspector prior to proceeding.

Samples of a coating plan and QA/QC inspection documents are available on the NMDOT website.

Provisions for demonstration of qualifications are incidental to the performance of the coating, no additional payment shall be made. NMDOT shall be granted open access to the coating operation to perform inspections and to review documentation of Contractor inspections.

The Project Manager shall have the option to waive the Contractor Qualification requirement for Miscellaneous Structural Steel scope.

**545.3 CONSTRUCTION REQUIREMENTS****545.3.1 Liquid Coating Systems No. 1, No. 2, and No. 3**

The Contractor shall apply coatings in conformance with SSPC – PA 1 “Shop, Field and Maintenance Painting of Steel” and with SSPC – PA Guide 13 “Guide Specification for Application of Coating Systems with Zinc-Rich Primers to Steel Bridges” (aka AASHTO/NSBA Steel Bridge Collaboration S 8.1) and the manufacturer’s application instructions.

### 545.3.1.1 Surface Preparation

The Contractor shall remove contaminants in accordance with SSPC-SP 1, or other methods approved by the Project Manager.

Surface preparation for all steel elements include in Section 545 shall be in accordance with SSPC-SP10 / NACE 2 Near White Blast Cleaning: When viewed without magnification shall be free of all visible oil, grease, dust, dirt, mill scale, rust, coating, oxides, corrosion products and other foreign matter of at least 95% of each unit area. Staining shall be limited to no more than 5 percent of each unit area, and may consist of light shadows, slight streaks, or minor discolorations caused by stains of rust, stains of mill scale, or stains of previously applied coatings. Unit area shall be approximately 3 in. x 3 in. (9 sq. in.).

Prepared surfaces shall be evaluated using the SSPC-VIS 3 Guide and Reference Photographs. The Contractor shall provide a current copy of the SSPC-VIS 3 Guide and Standard to the Project Manager. It shall become the property of the Department.

The Contractor shall maintain the steel dust free and prime within eight (8) hours after blast cleaning. The Contractor shall re-clean rusted or contaminated surfaces at no additional cost to the Department. The Contractor shall mask areas that require field welding before coating.

The Contractor shall clean again before applying each subsequent coat.

### 545.3.1.2 Coating

#### 545.3.1.2.1 Mixing the Coating

The Contractor shall mix the coating with a power mixer to a smooth and lump-free consistency, in accordance with the coating manufacturer’s Specifications.

The Contractor shall mix the coating as much as possible in the original containers and continue mixing until the metallic powder or pigment is in suspension. The Contractor shall keep mixed primers continuously agitated before and during application.

#### 545.3.1.2.2 Thinning the Coating

The Contractor shall not thin the coatings without the approval of the Project Manager. If it is necessary to thin the coatings, the Contractor shall thin the Material in accordance with the manufacturer’s recommendations.

#### 545.3.1.2.3 Temperature and Weather Limitations

The Contractor shall only apply the coatings when the ambient air temperature and surface

temperature of the steel are both above 50 °F and at least five (5) °F above the dew point.

The Contractor shall not apply the coatings when there is condensation or frost on the metal surfaces.

The Contractor shall not apply the coatings when the relative humidity is higher than 85 percent.

#### 545.3.1.2.4 Coating Applications

The Contractor shall not apply coating until the Department approves the surface preparation. The Department may waive this inspection.

A stripe coat of primer and intermediate material shall be applied to all edges, corners, seams, crevices, interior angles, junctions of joining members, rivets, bolt heads, nuts and threads, welds and similar irregularities. The stripe coats shall be of sufficient thickness to completely hide the surface being covered and shall be followed, as soon as practicable, by a full application of the appropriate coating to its specified thickness.

The Contractor shall repair coated areas where the primer or topcoat runs, sags or cracks.

The Contractor shall not apply any coating until the previous coat has fully cured or per the manufacturer's application requirements.

The Contractor shall allow the manufacturer's minimum recommended cure time to lapse between coats. If more than 30 Days elapse between the primer application and the topcoat application, the Contractor shall contact the coating system manufacturer for surface preparation recommendations before applying subsequent coats.

The Department may accept minor cosmetic defects in ground level miscellaneous Structural Steel components not in public view, if the defects will not affect durability.

#### 545.3.1.2.5 Required Coating of Components

The Contractor shall apply the primer and topcoat to steel surfaces, except those that will contact elastomeric bearing pads or are subject to sliding and rotational movements.

The Contractor shall coat new steel piling from the bottoms of the pier caps to two (2) ft. below the finished grade or streambed elevations.

#### 545.3.1.2.6 Coating of Sole Plates for Concrete Bridges

The Contractor shall deliver sole plates to the Project with one (1) coat of primer applied to all surfaces except masked-off strips, where the sole plates will be welded to the shoe plates, and surfaces that will contact elastomeric bearing pads.

Before installation, the Contractor shall clean surfaces that will contact pads in accordance with SSPC-SP 6. The Contractor shall clean off all rust on sole plates prior to installing and welding.

After installing the pads and welding the sole plates to the shoe plates, the Contractor shall touch up the primer and apply topcoat to exposed surfaces.

545.3.1.2.7 Spray Equipment

The Contractor shall apply the coatings with spray nozzles at the manufacturer recommended pressures.

545.3.1.2.8 Film Thickness Requirements

The Contractor shall apply coatings in accordance with Table 545.3.1.2.8:1, "Required Film Thicknesses."

**Table 545.3.1.2.8:1  
Required Film Thicknesses**

Coating	Dry film thickness range (mils)
Primer (IOZ) OR Primer (OZ)	2 - 4  3 - 5
Topcoat (epoxy) OR Topcoat (acrylic)	4 - 6  2 - 4

545.3.1.2.9 Field Repair of Liquid Coatings

Field repair of liquid coatings shall be performed in accordance with Section 546 "Recoating Structures" and the manufacturer's recommendations. Field repair shall be accomplished with the same coating system used for the original application with the exception that organic zinc rich primer may always be used.

The Contractor shall field repair coated areas that are rusted or damaged. The Contractor shall prepare the surface in accordance with 546.3.1 "Surface Preparation of Existing Bridges and Structures" or with methods approved by the Project Manager.

The Contractor shall prime large areas using spray Equipment, brush, or roller. The Contractor shall prime small areas with a brush. The Contractor shall spray or brush the topcoat. Two (2) or more coats may be necessary to build up the required film thickness. The Contractor shall apply topcoat only to areas where the topcoat is damaged. Requirements of Section 546.3, "Construction Requirements" apply to field repairs.

545.3.2 Powder Coating System No. 3

545.3.2.1 Surface Preparation

The Contractor shall remove contaminants in accordance with SSPC-SP 1, or other methods approved by the Project Manager. The Contractor shall blast clean in accordance with SSPC-SP10 Near-

White Metal Blast Cleaning. Additionally, for powder-coated surfaces, an iron or zinc phosphate wash shall be included to provide long-term corrosion protection.

#### 545.3.2.2 Primer Application

The Contractor shall use a primer that is a zinc rich epoxy powder coating designed for use over ferrous metal substrates. The Contractor shall apply the zinc rich epoxy powder coat primer to a minimum of two (2) mils dry film thickness, above the peaks of any blast profile.

#### 545.3.2.3 Topcoat Application

The Contractor shall use a topcoat that is a super durable polyester powder coating designed to provide for maximum UV exposure protection. The Contractor shall apply the polyester topcoat to a minimum of three (3) mils dry film thickness before the primer has cured or as recommended by the manufacturer.

Table 545.3.2.3:1  
Required Film Thicknesses

Coating	Dry film thickness range (mils)
Zinc-rich epoxy primer	Min. 2 mils
Polyester topcoat	Min. 3 mils

The Contractor shall use a magnetic film thickness gage or an electronic film thickness detector to determine dry film thickness per SSPC – PA 2 “Procedure for Determining Conformance to Dry Coating Thickness Requirements”.

#### 545.3.2.4 Fixturing

The Contractor shall suspend the components by suitable metal hooks or fixtures to provide a sufficient electrical grounding path. The Contractor shall affix the components with a minimum of direct contact area with the fixture device.

#### 545.3.2.5 Curing

The Contractor shall place the powder-coated components in a suitable oven and cure per the manufacturer’s recommended cure cycle. The Contractor shall remove the components from the oven and allow cooling. The Contractor shall visually inspect the components to ensure a smooth continuous uniform finish, free from runs, sags, pinholes or other defects.

#### 545.3.2.6 Touch-up Painting / Field Repair of Powder Coatings

Field repair of powder coatings shall be performed in accordance with Section 546 “Recoating Structures” and the manufacturer’s recommendations. The Contractor shall use Coating System No. 1 from Section 546.2.1, using the epoxy organic zinc-rich primer only where bare metal is exposed.



The Contractor shall field repair coated areas that are rusted or damaged.

## 545.4.8 Handling Steel

The Contractor shall handle or load newly coated Structural Steel only when the coating has fully cured.

The Contractor shall store coated components on pallets or in other approved ways so that the steel does not rest on soil.

The Contractor shall protect steel coatings from binding chains with approved softeners. The Contractor shall hoist with padded hooks and slings. The Contractor shall space parts during shipment to ensure that no rubbing occurs.

## 545.4.9 Provisions for Inspection

The Contractor will be responsible for performing and documenting Quality Control (QC) inspections of all shop / field surface preparation and coating activities. When the contract requires painting more than 1,500 sq. ft. of steel surface, the Contractor shall reference Section 544.2.2.3 Contractor Qualifications. When the contract required painting less than 1,500 sq. ft. of steel surface, the Contractor shall document all QC inspection activities, measurements and observations on the Daily Inspection report. These reports shall be submitted to the Project Manager at a minimum on a weekly basis and shall account for all work performed.

The Contractor shall notify the Project Manager at least ten (10) Days before surface preparation and/or coating to allow adequate time to plan inspection activities.

After completing erection, the Project Manager will inspect the surfaces to be embedded in concrete. The Contractor shall repair damaged or rusted surfaces before placing decks. After placing the deck and at an agreed upon time, the Project Manager will inspect the entire steel Structure for coating system damage. The Project Manager will mark damaged areas for repair and will re-inspect after repairs are complete.

## 545.4.10 Protection of the Work and Public

During the coating operations, the Contractor shall protect the work and the public from blast cleaning operations, paint splatter, splashes and smirches with protective covering or other methods approved by the Project Manager.

When the protective devices or procedures are ineffective, the Project Manager may suspend the Work until corrections take place.

## 545.4.11 METHOD OF MEASUREMENT—Reserved

## 545.4.12 BASIS OF PAYMENT

The Department will pay for the coating system as Incidental to Structural Steel, in accordance with Section 541, "Steel Structures."

## SPECIAL PROVISIONS MODIFYING SECTION 546: RECOATING STRUCTURES

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Replace Section 546 – Recoating Structures in its entirety with the following:

### SECTION 546: RECOATING STRUCTURES

#### 546.1 DESCRIPTION

This Work consists of surface preparation and recoating existing Structural Steel. Touch-up paint of surfaces coated per Sections 544, 545 and 546 is included.

The Contractor shall adhere to Section 547: Safety and Environmental Requirements for Painting Operations.

#### 546.2 MATERIALS

Projects that require SSPC – SP 6 shall engage 546.2.1 Coating System 1, unless otherwise specified in the contract documents.

Projects that require SSPC – SP 3, SSPC – SP 11, and/or SSPC 16 shall engage 546.2.2 Coating System 2, unless otherwise specified in the contract documents.

Reference 545.2:1 for additional information regarding coating systems that are allowable for specific elements.

If the Contract does not specify a color, the Contractor shall use the color Federal Standard 16307, RAL 7004, Pantone 423, or approved equal. If another color is specified in the Contract, the Contractor shall select an approved system that is available in the specified color.

All products shall be on the Approved Products List.

##### 546.2.1 Coating System No. 1 – Polyurethane Topcoat

The Contractor shall select products meeting all performance requirements as listed in Table 546.2.1:1 below. Testing shall be in accordance with AASHTO R-31. All products used in a system shall be from the same manufacturer. All products shall be represented on the latest version of the manufacturer's product data sheet as being suitable for use on bridges and capable of being applied at the specified dry film thickness requirements in Table 546.3.5:1.

Epoxy Organic Zinc-Rich Primer shall achieve minimum SSPC Paint 20 Level 2 requirements for

amount of zinc dust in the dry film of equal to or greater than 77% by weight. Epoxy Organic Zinc-Rich Primer shall not be required when surface preparation of SSPC – SP 3 and / or SSPC – SP 11 are employed.

Epoxy Intermediate Coat or Tie-Coat over existing finishes shall be a two-component epoxy, polyamide or polyanidoamine, including phenkamine coating with minimum solids by volume of 65%. Epoxy Intermediate Coat or Tie-Coat shall be required unless specifically excluded by the manufacturer in the compatibility confirmation letter that shall be submitted per 546.2.3.

Polyurethane Topcoat shall be a two-component aliphatic polyurethane coating with minimum solids by volume of 65%.

**Table 546.2.1:1  
Acceptable Product Requirements**

TEST	REF. NO.	PRODUCT(S)	ACCEPTANCE CRITERIA	COMMENTS
Salt Fog Resistance	ASTM B 117	P//I/T (OZ)	(A) No Delamination Allowed (B) Rust – Max creep 8mm, Avg. creep 4mm @5000 Hrs. (C) Blister – Conversion #7 @ 4000 Hrs.	
Cyclic Weathering Resistance	ASTM D 5894	P//I/T (OZ)	(A) No Delamination Allowed (B) Rust – Max creep 8mm, Avg. creep 4mm @5040 Hrs. (C) Blister – Conversion #8 @ 4032 Hrs.	
Adhesion Pull-Off Strength	ASTM D 4541	OZ Alone	4.1 MPa (600 psi)	
		P//I/T (OZ)	4.1 MPa (600 psi)	
Freeze-Thaw Stability Pull-Off Strength	ASTM D 4541	P//I/T (OZ)	2.4 MPa (350 psi)	Requires same average as adhesion pull-off strength results, with no tests measuring less than 60% of those results
			4.1 MPa (600 psi)	
			2.4 MPa (350 psi)	
			4.1 MPa (600 psi)	
Field History	NA	P//I/T (OZ)	Five (5) Bridges with Minimum two (2) year successful field history	

P = Primer; I = Intermediate coat; T = Topcoat; OZ = Epoxy Organic Zinc Rich Primer

**546.2.2 Coating System No. 2 – Acrylic Topcoat**

The Contractor shall select products meeting all performance requirements as listed in Table 546.2.1:1 above and 546.2.2:1 below as applicable. All products used in a system shall be from the same manufacturer. All products shall be represented on the latest version of the manufacturer's product data sheet as being suitable for use on bridges and capable of being applied at the specified dry film thickness requirements in Table 546.3.5:1.

Epoxy Organic Zinc-Rich Primer shall achieve minimum SSPC Paint 20 Level 2 requirements for amount of zinc dust in the dry film of equal to or greater than 77% by weight (Table 546.2.1:1). Epoxy Organic Zinc-Rich Primer shall not be required when surface preparation of SSPC – SP 3 and / or SSPC – SP 11 are employed.

Epoxy Intermediate Coat or Tie-Coat over existing finishes shall be a two-component epoxy, polyamide or polyanidoamine, including phenikamine coating with minimum solids by volume of 65% (Table 546.2.1:1). Epoxy Tie-Coat shall be required unless specifically excluded by the manufacturer in the compatibility confirmation letter that shall be submitted per 546.2.3.

Acrylic Topcoat shall be a high performance DTM acrylic coating with minimum solids by volume of 38% (Table 546.2.2:1).

**Table 546.2.2:1  
Acceptable Product Requirements**

TEST	REF. NO.	PRODUCT(S)	ACCEPTANCE CRITERIA	COMMENTS
Adhesion Pull-Off Strength	ASTM D 4541	HPA	> 500 lbs.	One coat applied over blasted steel
Flexibility	ASTM D 522	HPA	Pass: No cracking / flaking	1/8 " conical mandrel One coat applied over blasted steel
Hardness (Pencil)	ASTM D 3363	HPA	Final Cure: "F"	One coat applied over blasted steel
Impact	ASTM D 2794	HPA	> 140 in. lbs.	One coat applied over blasted steel

HPA = High Performance Acrylic

The Contractor may substitute Polyurethane topcoat for Acrylic topcoat at their discretion pending full system submittal and approval.

### 546.2.3 Submittals

In addition to the submittals require per Section 106 Control of Materials, the Contractor shall provide the following submittals to the Project Manager at least 30 Days before coating operations:

1. Product data and SDS for each product in the system
2. Surface preparation requirements
3. Application instructions
  - a. Mixing and thinning directions
  - b. Recommended spray nozzles and pressures
  - c. Minimum / maximum drying times, including re-coat times for shop or field coatings
  - d. Temperature requirements
4. Letter from the manufacturer detailing the coating system components and the compatibility of those components to adjacent materials including but not limited to:
  - a. every product in the system (primer, intermediate, topcoat, etc)
  - b. any preapplied or preexisting products (such as existing coatings)
  - c. any post applied products (such as anti-graffiti coating)
  - d. any modifications to the surface preparation or application instructions related to the total system performance.
5. If the color varies from the specified color, the Contractor shall submit color samples on boards at least eight (8) inches by ten (10) inches for review and approval.
6. Documentation related to Contractor Qualifications per 546.2.3.1

Prior to coating application, the Contractor shall submit a notarized manufacturer's Certificates of Compliance stating that the Materials are the same as those described in the manufacturer's product data sheets.

### 546.2.3.1 Contractor Qualifications

When the contract requires painting more than 500 square feet of steel surface, the Contractor shall demonstrate qualification by one of the following two methods:

#### Method 1

Obtain SSPC QP 1 certification for field painting or either SSPC-QP 3 certification or the AISC Sophisticated Paint Endorsement (SPE) for shop painting. The Contractor shall perform and document QA/QC inspections daily. QA/QC inspection documents shall be electronically submitted to the Project Manager on a weekly basis.

#### Method 2

Provide a coating plan and provide for NACE certified inspection (Level 2 minimum). The inspection services shall include but not be limited to:

1. Surface preparation and cleanliness inspection verifying profile and appropriate surface preparation.
2. Confirm products match approved submittals and certification letters. Document batch numbers of all coatings.
3. Inspection of primer coat to include dry film thickness readings. Review contractors QA/QC reports for environmental conditions and document.
4. Observe application of stripe coat on the intermediate coat and document environmental readings during the start-up of application. Review contractors QA/QC reports.
5. Inspect intermediate coat to include dry film thickness readings. Review Contractor's QA/QC reports.
6. Observe start-up of finish coat application and document environmental conditions.

7. Final inspection to include visual inspection for runs, sags, and foreign material in coating. Also perform final dry film thickness inspection.
8. Inspect members after transportation, prior to subsequent coating and / or final acceptance.
9. Electronically submit interim reports after each inspection to the Project Manager within 3 working days.
10. Electronically submit comprehensive final report including photos to the Project Manager within 14 Days of completion of inspection. Final report shall include QA/QC daily inspections performed by the Contractor.

Any deficiencies shall be corrected and re-inspected by the NACE inspector prior to proceeding.

Provisions for demonstration of qualifications are incidental to the performance of the coating, no additional payment shall be made. NMDOT shall be granted open access to the coating operation to perform inspections and to review documentation of Contractor inspections. The Project Manager shall have the option to waive the Contractor Qualification requirement.

### 546.3 CONSTRUCTION REQUIREMENTS

The Contractor shall apply coatings in conformance with SSPC – PA 1 “Shop, Field and Maintenance Painting of Steel” and with SSPC – PA Guide 13 “Guide Specification for Application of Coating Systems with Zinc-Rich Primers to Steel Bridges” (aka AASHTO/NSBA Steel Bridge Collaboration S 8.1), SSPC-TU 3 “Technical Update No. 3 Overcoating”, and the manufacturer’s application instructions.

#### 546.3.1 Surface Preparation of Existing Bridges and Structures

The Contractor shall perform surface preparation in accordance with the most stringent of the following:

1. At locations where loosely adherent coatings or corrosion are NOT present: SSPC – SP 1, and
2. At locations where loosely adherent coatings are present: SSPC – SP 3, and
3. At locations where corrosion is present: SSPC – SP 11 or
4. Specific contract document requirements or
5. Specific guidance by the Project Manager or
6. Manufacturer recommendations (per the application instructions as amended by the manufacturer’s letter submitted per 546.2.3 #4d if applicable)

##### 546.3.1.1 Surface Preparation Description and Evaluation

Various SSPC surface preparation standards are cited in this section. For reference, a brief summary of each is listed below. The Contractor is responsible to perform to the current versions of all requirements of the full and complete standards available directly from SSPC, The Society for Protective Coatings.

###### SSPC-SP1 Solvent Cleaning

Removes all visible oil, grease, soil, drawing and cutting compounds, and other soluble contaminants from steel surfaces with solvent, vapor, cleaning compound, alkali, emulsifying

agent, or steam. SSPC-SP 1 is a prerequisite to all hand tool, power tool and abrasive cleaning standards. SSPC-SP1 shall be incidental.

#### SSPC-SP3 Power Tool Cleaning

Removes all loose mill scale, loose rust, loose paint, and other loose detrimental foreign matter by power wire brushing, power sanding, power grinding, power tool chipping, and power tool descaling. Tightly adherent, intact materials may remain.

#### SSPC-SP6 Commercial Blast Cleaning

When viewed without magnification shall be free of all visible oil, grease, dirt, dust, loose mill scale, rust, and coating, but will permit staining from rust, mill scale, or previously applied coatings. The surface will not necessarily be uniform in color.

#### SSPC-SP7 / NACE 4 Brush-Off Blast Cleaning

When viewed without magnification, the surface shall be free of all visible oil, grease, dirt, dust, loose mill scale, loose rust, and loose coating. Tightly adherent mill scale, rust, and coating may remain on the surface. Mill scale, rust, and coating are considered tightly adherent if they cannot be removed by lifting with a dull putty knife.

#### SSPC-SP10 / NACE 2 Near-White Blast Cleaning

When viewed without magnification shall be free of all visible oil, grease, dust, dirt, mill scale, rust, coating, oxides, corrosion products and other foreign matter of at least 95% of each unit area. Staining shall be limited to no more than 5 percent of each unit area, and may consist of light shadows, slight streaks, or minor discolorations caused by stains of rust, stains of mill scale, or stains of previously applied coatings. Unit area shall be approximately 3 in. x 3 in. (9 sq. in.). SSPC-SP10 shall only be engaged when required by the manufacturer. It shall be paid under the bid item for SSPC-SP6.

#### SSPC-SP11 Power Tool Cleaning to Bare Metal

When viewed without magnification, the surface shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter. Slight residues of rust and paint may be left in the lower portion of pits if the original surface is pitted. The surface profile shall not be less than 1 mil (25 microns).

SSPC-SP16 Brush-Off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals. When viewed without magnification, the surface shall be free of all visible oil, grease, dirt, dust, metal oxides (corrosion products), and other foreign matter. Intact, tightly adherent coating is permitted to remain. A coating is considered tightly adherent if it cannot be removed by lifting with a dull putty knife. The surface shall have a minimum profile of 0.75 mil (19 microns).

Prepared surfaces shall be evaluated using the SSPC standards. The following references will be provided to the Project Manager by the Contractor for inspection and acceptance of prepared surfaces:

- If SP 10, SP 6, SP 14 or SP 7 are engaged: SSPC-VIS 1 Guide and Standard (includes reference photographs)

- If SP 2, SP 3, SP 11 are engaged: SSPC-VIS 3 Guide and Standard (includes reference photographs)
- If SP 12 is engaged: SSPC-VIS 4 Guide and Standard (includes reference photographs)

SSPC VIS Guide and Standard shall become the property of the Department. Provide current version.

#### 546.3.1.2 SSPC-SP 1 - Solvent and Pre-Cleaning

The Contractor shall clean exposed areas in accordance with SSPC-SP 1 Solvent Cleaning.

The Project Manager may approve cleaning with high pressure water and an approved, mild detergent to supplement solvent cleaning, where more effective or suitable. This method of pre-cleaning is required on all surfaces that have been exposed to chloride contamination from the use of road salts for snow and ice control.

#### 546.3.1.3 SSPC-SP 3 Power-Tool Cleaning

The Contractor shall remove poorly adhering coatings and prepare the surface with power-tools in accordance with SSPC-SP 3, Power Tool Cleaning. At the Contractor's discretion, SSPC-SP 7 or SSPC \_ SP 12 WJ 3 may be employed in lieu of SSPC-SP 3.

#### 546.3.1.4 SSPC-SP 6 – Commercial Blast Cleaning

The requirement for commercial blast cleaning shall be established by the more stringent of contract documents or the manufacturer's recommendations.

#### 546.3.1.5 SSPC-SP 7 – Brush-Off Wet Blast Cleaning

The requirement for brush-off wet blast cleaning shall be established by the more stringent of contract documents or the manufacturer's recommendations. Acceptability of wet cleaning shall be determined by the Project Manager as confirmed against project environmental constraints.

#### 546.3.1.6 SSPC-SP 10 – Near-White Blast Cleaning

The requirement for near-white blast cleaning shall be established by the manufacturer's recommendations. SSPC-SP 10 shall be paid under the same bid item as SSPC-SP 6.

#### 546.3.1.7 SSPC-SP 11 – Power-Tool Cleaning to Bare Metal

The Contractor shall clean areas that show moderate to severe corrosion in accordance with SSPC-SP 11, *Power-Tool Cleaning to Bare Metal*. Areas too large to be prepared using power tools may be cleaned per SSPC SP-6 Commercial Blast Cleaning at the Contractor's discretion.

The Project Manager will mark additional areas for cleaning in accordance with SSPC-SP 11. The Contractor shall clean at least two (2) inches beyond the damaged areas in all directions. The Contractor shall feather the exposed edges of the cleaned areas in accordance with SSPC-SP 11. The Contractor



## 204

shall not leave ragged edges of intact paint. During and after power-tool cleaning, the Contractor shall maintain the degree of cleaning specified in accordance with SSPC-SP 11.

The Department will accept these surfaces by visually comparing them to a prepared standard on the Project. The Contractor shall prepare a Project standard by power-tool cleaning an area designated for recoating. Before cleaning, the Contractor shall ensure that the prepared standard is in accordance with SSPC-Vis 3, *Visual Standard for Power and Hand-Tool Cleaned Steel*, Pictorial Standard E SP 11, F SP 11, and G SP 11, and obtain Department approval. The Contractor shall prepare at least one (1) standard for each Structure. More than one (1) standard may be necessary if the cleaned steel differs significantly from the photographic standards. For recoating Bridges, the Contractor shall make the standard at least one (1) ft. × one (1) ft. For recoating Bridge railing or minor Structures, the standard may be smaller. The Contractor shall protect the Project standard from corrosion and contamination by applying a clear polyurethane coat. Upon completing the cleaning Work, the Contractor shall re-clean and coat the standard. If the standard becomes deteriorated or ineffective, the Contractor shall re-establish it at no additional cost to the Department.

The SSPC VIS 1 “Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning” shall be used in this same manner to prepare a standard for surfaces that are blast cleaned per SSPC SP-7 and SP-10.

SSPC \_ SP 12 WJ 3 may be employed in lieu of SSPC-SP 3. At the Contractor’s discretion, SSPC-SP 7 or

### 546.3.1.8 SSPC-SP 12 WJ-3 – Thorough Waterjetting

The requirement for thorough waterjetting shall be established by the more stringent of contract documents or the manufacturer’s recommendations. Acceptability of waterjet cleaning shall be determined by the Project Manager as confirmed against project environmental constraints.

### 546.3.1.9 SSPC SP-16 – Galvanized Surfaces

Previously galvanized surfaces shall be prepared by the Contractor in accordance with SSPC-SP16 – Brush-Off Blast Cleaning of Coated and Uncoated Galvanized Steel. Brush-off blast cleaning includes SSPC-SP1 solvent cleaning or other method approved by the project manager to remove oil, grease, or other contaminants. The SSPC-SP1 is followed by a dry abrasive blasting using compressed air, blast nozzles, and abrasives. To avoid formation of zinc oxides that will result in potential coating failure, blast cleaning must occur when the surface temperature is a minimum of 5 degrees above the dew point and the surface cannot be permitted to get damp after cleaning. The Contractor shall apply coating as soon as possible after surface cleaning.

The Contractor shall apply intermediate and top coat products in accordance with manufacturer’s application instructions and this specification.

### 546.3.1.10 Preparing Glossy Surfaces

All previously coated glossy surfaces shall be lightly abraded / deglossed prior to re-coating.

### 546.3.1.11 Testing for Chloride Contamination

Prepared surfaces with exposed metal will be tested by the Contractor for chloride contamination. All test areas will be recorded for retesting purposes. A minimum of five (5) tests per 1,000 s.f. or fraction thereof shall be conducted prior to surface preparation. If results greater than 7micrograms per cubic centimeter are detected, the surface shall be re-cleaned as specified and re-tested at the same frequency. If acceptable results are achieved, surface preparation may begin.

#### 546.3.1.9 Abrasives Used in Blast Cleaning Operations

When blast cleaning options are employed in lieu of SSPC SP – 3 and SP – 11 standards (ie SP-7 and SP-6), the Contractor shall select the type of abrasive. All abrasives brought to the site shall be stored in a clean and dry environment. Abrasives shall not be recycled or re-used without NMDOT approval.

#### 546.3.1.10 Limited Access Areas

A best effort with the specified methods of cleaning shall be performed in limited access areas. These methods may need to be supplemented with other equipment such as angle nozzles, to properly clean the limited access areas. The acceptability of the best effort cleaning in these areas is at the sole discretion of the Project Manager.

When replacing a concrete Bridge deck, the Contractor shall not clean or coat the top surfaces of top flanges of beams and girders and shear connectors.

#### 546.3.1.11 Chemical Paint Removal

Chemical removal products and methods may be approved by the Department.

### 546.3.2 Coating

#### 546.3.2.1 Mixing the Coatings

The Contractor shall mix the coatings with a power mixer in accordance with the coating manufacturer's directions until the Material is smooth and lump-free. The Contractor shall not use paint shakers.

The Contractor shall mix the Material as far as possible in its original container and continue mixing until the metallic powder or pigment is in suspension.

The Contractor shall thoroughly disperse the coating solids that may have settled to the bottom of the container. The Contractor shall strain coatings through a 30 – 60 mesh screen, or per coating manufacturer's recommendations.

The Contractor shall continuously agitate mixed coatings until application.

#### 546.3.2.2 Thinning the Coating

The Contractor shall not thin the coatings without the approval of the Project Manager. If it is necessary to thin the coatings, the Contractor shall thin the Material in accordance with the manufacturer's

## 206

recommendations.

### 546.3.2.3 Coating Application

The Contractor shall apply the coating system with a brush, roller, or by spraying (preferred). The Contractor shall use nozzles and pressures in accordance with the manufacturer's recommendations.

A stripe coat shall be applied to all edges, corners, seams, crevices, interior angles, junctions of joining members, rivets, bolt heads, nuts and threads, welds and similar irregularities. The stripe coats shall be of sufficient thickness to completely hide the surface being covered and shall be followed, as soon as practicable, by a full application of the appropriate coating to its specified thickness.

### 546.3.2.4 Temperature and Weather Limitations

#### 546.3.2.4.1 Temperature

The Contractor shall apply the coating when the air and surface temperatures are above 50 °F and at least five (5) °F above the dew point.

The Contractor shall not apply coatings on metal surfaces with condensation or frost.

#### 546.3.2.4.2 Humidity

The Contractor shall not apply the coatings when the relative humidity is above 85 %.

### 546.3.3 Priming

The Contractor shall prime coat all steel surfaces prepared in accordance with SSPC SP-11. The Contractor shall apply primer the same day as cleaning, unless otherwise authorized by the Project Manager. The Contractor shall re-clean surfaces that develop rust or are contaminated with deleterious material before coating, at no additional cost to the Department.

### 546.3.4 Intermediate and Topcoat

The Contractor shall ensure the primer is cured and dry before applying subsequent coats.

The Contractor shall not allow the manufacturer's recommended maximum time to lapse between coats.

### 546.3.5 Thickness of Coatings

The Department will reject the coating if the DFT (dry film thickness) gauge shows less than the specified minimum thickness for any coating. The Contractor shall provide coating thicknesses in accordance with Table 546.3.5:1, "Required Film Thicknesses."

Table 546.3.5:1  
Required Film Thicknesses

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Coating	Dry film thickness range (mils)
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Coating System No. 1 - Polyurethane Topcoat Overcoat / Repair System (As required For Surfaces Coated Per Section 544 New Structural Steel and Certain Items Per Section 545 Miscellaneous Steel)

Primer (epoxy organic zinc)	3.0 – 5.0 mils
Intermediate (epoxy)	5.0 – 8.0 mils
Topcoat (polyurethane)	3.0 – 5.0 mils

Coating System No. 2 - Acrylic Topcoat Overcoat / Repair System (As Required for Designated Items Per Section 545 Miscellaneous Steel)

Primer (epoxy organic zinc)	3.0 – 5.0 mils
Topcoat (acrylic)	2.0 – 4.0 mils

The Contractor shall determine the dry film thickness using magnetic film thickness gauges, per latest version of SSPC PA-2 Procedure for Determining Conformance to Dry Coating Thickness Requirements. The Contractor shall calibrate the gauges on blasted steel with plastic shims approximately the same thickness as the minimum dry film thickness. All dry film thickness requirements are to be measures above the peaks of the blast profile.

#### 546.3.6 Field Repair of Liquid Coatings

Field repair shall be accomplished with the same coating system used for the original application with the exception that organic zinc rich primer may always be used.

The Contractor shall field repair coated areas that are rusted or damaged. The Contractor shall prepare the surface in accordance with 546.3.1 “Surface Preparation of Existing Bridges and Structures” or with methods approved by the Project Manager.

The Contractor shall prime large areas using spray Equipment, brush, or roller. The Contractor shall prime small areas with a brush. The Contractor shall spray or brush the topcoat. Two (2) or more coats may be necessary to build up the required film thickness. The Contractor shall apply topcoat only to areas where the topcoat is damaged.

#### 546.3.7 Protection of the Work and Public

During the coating operations, the Contractor shall protect the work and the public from blast cleaning operations, paint splatter, splashes and smirches with protective covering or other methods approved by the Project Manager.

## 208

When the protective devices or procedures are ineffective, the Project Manager may suspend the Work until corrections take place.

The Contractor shall remove blasting and coating debris from all on-site work before reopening the area to traffic.

### 546.3.8 Inspection

The Contractor will be responsible for performing and documenting Quality Control (QC) inspections of all shop / field surface preparation and coating activities. When the contract requires painting more than 500 square feet of steel surface, the Contractor shall reference Section 544.2.2.3 Contractor Qualifications. When the contract required painting less than 500 square feet of steel surface, the Contractor shall document all QC inspection activities, measurements and observations on the Daily Inspection report. These reports shall be submitted to the Project Manager at a minimum on a weekly basis and shall account for all work performed.

The Contractor shall notify the Project Manager at least ten (10) Days before surface preparation and/or coating to allow adequate time to plan inspection activities.

After completing erection, the Project Manager will inspect the surfaces to be embedded in concrete. The Contractor shall repair damaged or rusted surfaces before placing decks. After placing the deck and at an agreed upon time, the Project Manager will inspect the entire steel Structure for coating system damage. The Project Manager will mark damaged areas for repair and will re-inspect after repairs are complete.

### 546.4 METHOD OF MEASUREMENT

The Project Manager will measure cleaned areas in accordance with SSPC-SP 11 and SSPC-SP 3 before the application of the prime coat.

### 546.5 BASIS OF PAYMENT

Pay Item	Pay Unit
Recoating Structures	Lump Sum
SP 6 Commercial Blast Cleaning	Lump Sum
SP 3 Power Tool Cleaning	Square Foot
SP 11 Power Tool Cleaning	Square Foot
SP 16 Brush-Off Blast Cleaning of Galvanized Steel	Lump Sum

#### 546.5.1 Work Included in Payment

The following items will be considered as included in the payment for Recoating Structures and will not be measured and paid for separately:

1. Cleaning all exposed areas of existing steel members in accordance with SSPC-SP 1;
2. When SSPC-SP 6 is performed at the Contractor's discretion in lieu of SSPC-SP 11, SSPC-SP 11 shall be used as the pay item;

3. When SSPC-SP 7 is performed at the Contractor's discretion in lieu of SSPC-SP 3, SSPC-SP 3 shall be used as the pay item;
4. SSPC-SP 11 power-tool cleaning and priming of those areas designated in the Contract to be so included in the Lump sum price.
5. SSPC-SP 3 power-tool cleaning and priming of those areas designated in the Contract to be so included in the Lump sum price;
6. When the manufacturer requires surface preparation other than SSPC-SP 6, 3, 11, or 16 and the surface preparation is not called out to be incidental to other bid items, the surface preparation shall be paid through an existing pay item that is closest in effort to that required. The Project Manager shall determine which pay item shall be used.
7. Furnishing and applying the appropriate coating system to all exposed steel surfaces of the structure;
8. Any field touch-up required to correct shipping or installation damage.
9. Final cleanup of the structure and the immediate area; and
10. Re-caulking the perimeters of all railing post base plates per Section 543.

## SPECIAL PROVISIONS MODIFYING SECTION 548 COATING OF CONCRETE

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

### 548.1 DESCRIPTION

This Work consists of applying Class 4, Special Surface Finish to concrete. Reference 511.3.8 "Finishing" for additional required surface treatment. This section includes specifications for colored concrete stain/sealer, thin film liquid applied coatings (referred to as paint), and textured coating.

For Penetrating Water Repellent Treatment, see Section 532. For Permanent Anti-Graffiti Protective Coating, see Section 531.

### 548.2 MATERIALS

The following coating systems are included in this specification:

1. Coating System 548-1: colored concrete stain/sealer
2. Coating System 548-2: paint
3. Coating System 548-3: textured coating

When the Contract Documents require a Class 4 Special Surface Finish, the Contractor shall provide Coating System 1: colored concrete stain/sealer, unless another method is specifically required in the Contract Documents.

For new construction with no drainage systems, Coating Systems 1, 2, and 3 require the application of waterproofing materials on the backside of below grade walls such as retaining walls and planter boxes. Waterproofing shall be per Section 511.

Unless noted in the Contract Documents, the color shall be selected by the Project Manager from the Federal Standard 595C color chart for Coating Systems 1, 2, and 3.

The Contractor shall select a coating system from the Department's Approved Products List for Coating Concrete.

#### 548.2.1 Coating System 548-1: Colored Concrete Stain/Sealer

The Contractor shall provide an acrylic polymer penetrating concrete stain. Compositions including acrylic, silicone, silane and / or siloxane are acceptable. Solid, opaque, and semi-transparent products are acceptable. The stain shall contain a minimum of 40.3% solids by mass and meet the requirements described in Table 548.2.1:1

Table 548.2.1:1

Test Description	Test	Criteria
Water Vapor Transmission	ASTM D1653	0.4-0.8 grains/ sq.ft. / hr.
Adhesion to Concrete	ASTM D7234	500 psi
Wind Driven Rain Resistance	ASTM D6904 or TT-C-555B 48 hr duration	no visible leaks, no weight gain
Accelerated Weathering	ASTM D4587 - 11 cycle, 1,000 hour duration	pass

The Contractor shall apply two (2) coats. The manufacturer shall determine the composition of the two coats: ie one coat of stain and one coat of sealer, or two coats of stain. Both coats shall be provided by the same manufacturer.

#### 548.2.2 Coating System 548-2: Paint

The Contractor shall provide paint products from the Master Painters Institute's Approved Product List – MPI #108. The product shall possess the following properties:

1. Does not show excessive settling in a freshly opened full container
2. Easily re-disperses with a paddle to a smooth, homogeneous state free of curdling, livering, caking, color separation, lumps and skins
3. Brushes on easily
4. Shows no running or sagging tendencies when applied to smooth vertical surfaces
5. Dries to a uniform finish.

The final condition of the concrete must have penetrating water repellent properties consistent with ASTM D6532, water absorption shall perform a minimum of 80% better than untreated material. A combination of products may be required to meet this requirement (paint, sealer, penetrating water repellent, etc.). For coating system 548-2, the Contractor shall provide a letter from the manufacturer recommending the order of application of products that will meet their product requirements and water repellent capability. This letter shall confirm the compatibility of all products in the system.

#### 548.2.3 Coating System 548-3: Textured Coating

The Contractor shall provide a textured coating product from the Master Painters Institute's Approved Product List MPI #42.

A light sand texture shall be provided unless otherwise specified in the Contract Documents (note: textured coatings can be specified as smooth).



The final condition of the concrete must have penetrating water repellent properties consistent with ASTM D6532, water absorption shall perform a minimum of 80% better than untreated material. A combination of products may be required to meet this requirement (textured coating, sealer, penetrating water repellent, etc.). For coating system 548-3, the Contractor shall provide a letter from the manufacturer recommending the order of application of products that will meet their product requirements and water repellent capability. This letter shall confirm the compatibility of all products in the system.

## 548.2.4 Submittals

The Contractor shall submit manufacturer's product data sheets, application instructions, paint certifications and an application plan 30 Days prior to application of coatings.

The Contractor shall provide a coating Application Plan according to the manufacturer's written recommendations. The Plan shall include:

1. Proposed surface preparation
2. Mixing and thinning directions
3. Rate of application
4. Recommended spray nozzles and pressures
5. Number of necessary coats
6. Allowable ambient air temperature range
7. Allowable ambient surface temperature range
8. Application equipment qualification of workers
9. Safety and damage protection plan

If the color varies from the specified color, the Contractor shall submit color samples on boards at least eight (8) inches by ten (10) inches for review and approval.

## 548.3 CONSTRUCTION REQUIREMENTS

### 548.3.1 General

Prior to application of a Class 4 Special Surface Finish (reference 511.3.9.5), the Contractor shall ensure that the surface meets the requirements of a Class 2, Rubbed Surface Finish (reference 511.3.9.3).

The Class 2 Rubbed Surface Finish, including any patch material, must be allowed 28 days to cure prior to the application of coating systems unless otherwise recommended by the manufacturer and approved by the Department.

### 548.3.2 Surface Preparation

The Contractor shall prepare the surface in conformance with the manufacturer's recommendations and shall, at a minimum, include power spraying with a minimum 4000 PSI sprayer with a zero degree rotary nozzle at a 6" stand-off distance. The Contractor may also find it necessary to employ detergents or abrasives. Unless otherwise directed by the manufacturer, the prepared surface shall be in conformance with SSPC-SP 13 / NACE No. 6 'Surface Preparation of Concrete.' The concrete surface

must be free of contaminants, curing compounds, form release agents, efflorescence, and existing incompatible coatings, laitance, loosely adhered concrete, and dust and shall provide a sound, uniform substrate.

Alkalinity testing by the Contractor and associated follow-up action shall be required if recommended by the manufacturer.

#### 548.3.3 Temperature and Weather Limitations

The Contractor shall apply coatings on concrete surfaces that have cured for a minimum of 28 Days and only when the atmospheric temperature is in the range from 50 degrees F to 100 degrees F, and when the relative humidity is at or below 85 percent. Coatings shall only be applied to a surface which is at least 5 degrees F above the dew point. The surface temperature should remain above the minimum temperature specified above until the coating is thoroughly dry. Coatings shall not be applied when weather conditions exist which might damage the work such as windborne dust. With the approval of the Project Manager, temperature and weather limitations may be adjusted to those conditions recommended by the Manufacturer.

#### 548.3.4 Precoating Requirements

The Contractor shall allow the surface to visually dry completely before application of coatings.

All concrete surfaces shall be inspected by the Project Manager prior to application of coatings.

Do not apply penetrating water repellent treatment to the concrete surface before coating the concrete, unless otherwise recommended by the manufacturer.

#### 548.3.5 Coating Application

Coating shall be applied in accordance with SSPC-PA 14.

No coating shall be applied until the preceding coat has dried/cured to the extent specified by the manufacturer.

All coatings shall be applied so that the cured film is continuous and pin-hole free.

##### 548.3.5.1 Thinning the Coatings

The Contractor shall not thin the coating Material without Manufacturer and Department approval.

##### 548.3.5.2 Application Equipment Requirements

Spray application equipment shall be employed to apply the coatings unless otherwise recommended by the manufacturer. The Contractor shall employ application equipment that meets the requirements of the manufacturer. Brushes and rollers may be used for touch-up paint and on areas less than 20 SQFT.

# 214

## 548.3.5.3 Dry Film Thickness

The Contractor shall apply the coatings at the dry film thickness recommended by the manufacturer. Dry film thickness shall be measured by the Contractor in accordance with ASTM D6132 using an ultrasonic film thickness gage that shall be provided and retained by the Contractor. Dry film thickness readings shall be taken and recorded every 1,000 SQFT or at a minimum of once per workshift.

## 548.3.6 Inspection and Reporting

The Contractor shall maintain daily field reports that include:

- weather and temperature data
- surface preparation observations including photographs
- product tracking information including lot and batch numbers of the products applied
- description of equipment used and names of applicators
- records of dry film thickness (reference 548.3.5.3)

The Contractor shall submit the inspection reports to the Project Manager on a weekly basis.

## 548.3.7 Project Test Area

For areas greater than 500 square feet, a project test area shall be prepared and tested by the Contractor. The test area can be either on the structure itself or on a sample that is representative of the substrate to be coated. The test panel shall be no smaller than three (3) sq. ft. in size. The test panel shall be of the same material and application process as the final product.

Following cure, adhesion testing shall be performed by the Contractor on the test panel in accordance with ASTM D7234. The location of the disbondment for each of the three pulls shall be within the concrete substrate (ie, cohesive failure of the concrete). Testing shall be observed by the Project Manager. Results of the test shall be submitted in writing to the Project Manager.

## 548.4 METHOD OF MEASUREMENT

Coating of the Concrete surfaces will be measured by the square foot.

## 548.5 BASIS OF PAYMENT

Pay Item	Pay Unit
<i>Coating of Concrete – Stain</i>	Square Foot
<i>Coating of Concrete – Paint</i>	Square Foot
<i>Coating of Concrete – Textured Coating</i>	Square Foot

### 548.5.1 Work Included in Payment

The Department will consider as included in the payment for the pay item(s) listed in this section and will not measure or pay separately for the following Work:

1. Preparation of the concrete surfaces to be painted;
2. Protection of pedestrian, vehicular or other traffic near or under the work from paint spatter and disfigurement; and
3. Inspection and testing as required by this Specification and the Contract Documents.

**SPECIAL PROVISIONS**  
**MODIFYING**  
**SECTION 564: PREFORMED CLOSED CELL FOAM BRIDGE JOINT SEALS**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete Subsection 564.3.8 Warranty in its entirety.

September 15, 2017

## SPECIAL PROVISIONS FOR SECTION 565 – PREFORMED SILICONE-COATED FOAM JOINT SYSTEM

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

### 565.1 DESCRIPTION

This Work consists of providing and installing preformed, pre-compressed, self-expanding foam with silicone precoated surface. The foam is bonded in place with a structural epoxy adhesive. The silicone precoated surface is sealed to the bridge with silicone sealant. This system is referred to herein as “joint system.”

### 565.2 MATERIALS

#### 565.2.1 Joint System

The Contractor shall provide 100% waterproof pre-compressed polymer impregnated open cell polyurethane foam topped with a silicone coating. Provide a joint system comprised of the following three (3) components:

1. Cellular polyurethane foam impregnated with 100% hydrophobic polymer, water based emulsion and factory coated with highway-grade, fuel resistant silicone.
2. Field-applied epoxy adhesive primer.
3. Field-injected silicone sealant.

The Contractor shall provide a total system from a single manufacturer.

#### 565.2.1.1 Open Cell Polyurethane

Provide a foam seal with the following properties:

1. Provide a foam with a working range of 50% in tension and 50% in compression. Factory fabricate changes in plane and direction using factory fabricated watertight transition assemblies on inside and outside corners for 45 degrees and 90 degree bends.
2. Bleeding: none at 180 deg. F@ 50% compression for 3 hrs.
3. UV Resistance, no changes 2000 hrs., in accordance with ASTM G155.
4. Provide a polymer impregnation agent.

#### 565.2.1.2 Epoxy Adhesive

Use 100% solids, two component moisture sensitive modified epoxy adhesive which meets ASTM C-881.

### 565.2.1.3 Silicone Sealant

Use a one part, cold applied chemically curing silicone joint sealant which meets ASTM D 5893. Silicone shall be fuel resistant.

## 565.3 CONSTRUCTION REQUIREMENTS

### 565.3.1 General

The Contractor shall be certified by the manufacturer for installation of the joint system. If the Contractor is not certified, the Contractor shall ensure that a technical representative from the manufacturer is present for the duration of the joint system installation.

### 565.3.2 Installation

The Contractor shall install the components of the joint system when the temperature is within the range specified by the manufacturer of each system component. The Contractor shall store materials in accordance with the manufacturer's requirements.

The Contractor shall install field-applied epoxy adhesive primer and field-injected silicone sealant as directed by the manufacturer. Prior to installation, measure the opening of the existing joint at different locations and compute the mean opening. Furnish the seal joint topped with fuel resistant silicone in a width greater than the mean measured joint extension which when compressed will form bellow(s) as recommended by the manufacturer. Furnish a foam seal having a depth appropriate for the joint width as recommended by the manufacturer.

The Contractor shall prepare surfaces to receive the sealant. For concrete surfaces, repair spalls, chips, irregular or unsound joint surfaces to provide smooth joint surfaces in a manner approved by the Project Manager. Blast clean steel surfaces in accordance with SSPC-SP 6, "Industrial Blast Cleaning." After preparing the surface, notify the Project Manager for inspection of the joint before installing the joint system. Ensure joint sides are dry of solvents or other cleaning agents prior to installation.

At deck edges, the joint material shall not extend horizontally beyond the deck, but shall turn down and seal the deck edge in the vertical plane. The joint material shall extend 1" below the bottom of the deck.

When factory fabricated universal 90's are required, the Contractor shall start installation with these members. Apply epoxy adhesive to the sides of the joint header as directed by the manufacturer. Unwrap joint system and place in joint opening as directed by the manufacturer. Provide a minimum recess of 1/2" for joint sizes 1/2" – 1-1/4" and a minimum recess of 3/4" for sizes 1-1/2" – 4". Prior to placing joint system in the joint opening, verify depth using a wooden block shaped in the form of a 'T.' Before the epoxy cures, install a bead of silicone sealant between the foam and the silicone topping.

### 565.3.3 Acceptance Test Procedures

The Contractor shall perform a watertight integrity test of the joint system if required by the Project Manager. The test shall be observed by the Project Manager. The test results shall be photographically recorded and transmitted to the Project Manager. Unless otherwise directed by the manufacturer, the water integrity test shall be as follows: Wait a minimum of 72 hours after the joint is placed. Flood the joint with water. Visually verify that there are not any leaks on the underside of the joint as observed by the Project Manager. Joints that leak will not be accepted. Repair leaky joints in accordance with the manufacturer's recommendations.

#### 565.4 METHOD OF MEASUREMENT

The joint system will be measured by the linear foot from end to end along the joint centerline.

#### 565.5 BASIS OF PAYMENT

Pay Item	Pay Unit
Preformed Silicone-Coated Foam Joint System	Linear Foot

##### 565.5.1 Work Included in Payment

The Department will consider as included in the payment for the joint system and will not measure or pay separately for the following Work:

1. All material, labor and Certificate of Compliance;
2. All other costs associated with providing and installing of the joint system; and
3. Technical representative if required.



**SPECIAL PROVISIONS  
FOR  
SECTION 602: SLOPE AND EROSION PROTECTION STRUCTURES**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

602.2.1 Classifications Delete Class D Classification from Table 602.2.1:1 and substitute the following:

The Department will classify riprap and gabions in accordance with Table 602.2.1:1 "Riprap Classifications and Gabion Requirements" with the exception of Class D, Derrick Stone. Class D, Derrick Stone will follow the gradation requirements in Table 602.2.1:2 "Gradation Requirements for Class D, Derrick Stone" shown below.

Table 602.2.1:2  
Gradation Requirements for Class D, Derrick Stone

CLASS, DESCRIPTION	PERCENT OF ROCK EQUAL OR SMALLER BY COUNT, $D_x$	RANGE OF INTERMEDIATE DIMENSION <sup>1</sup> , (inches)	RANGE OF ROCK WEIGHT <sup>2</sup> , (pounds)
D, Derrick Stone <sup>3</sup>	100	30	5000
	70	24 – 18	1780 – 2500
	40	11 – 14	360 – 500
	20	6 – 8	70 - 100

<sup>1</sup> Intermediate dimension measured as the shortest straight-line distance from one side of the rock or rock particle to the other on the maximum projection plane (plane of rock or rock particle with the largest projected surface area).

<sup>2</sup> Weights based on a specific gravity of 2.65.

<sup>3</sup> Include spalls and rock fragments to provide a stable dense mass.

July 17, 2017

**SPECIAL PROVISIONS  
MODIFYING  
SECTION 606: METAL AND CONCRETE WALL BARRIER**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete Section 606: METAL AND CONCRETE WALL BARRIER in its entirety and replace with the following:

**606.1 DESCRIPTION**

This Work consists of constructing guardrail, permanent concrete wall barrier (CWB), temporary concrete wall barrier (TCWB), end treatments, transitions, and protection systems.

**606.2 MATERIALS**

**606.2.1 Guardrail**

The types of guardrail are as follows:

- Single face W-beam guardrail;
- Double faced W-beam guardrail;
- Single face Thrie beam guardrail; and
- Double faced Thrie beam guardrail.

Each guardrail type shall have galvanized rail elements unless otherwise specified in the Contract. Use Materials for guardrail installations in accordance with the current edition of the AASHTO Task Force 13 *Guide to Standardized Highway Barrier Hardware*.

**606.2.1.1 Rail Elements**

**606.2.1.1.1 Galvanized Guardrail**

Provide guardrail elements with a corrugated beam in accordance with AASHTO M 180, Type 2, Class A.

Galvanize steel rail elements before or after fabrication in accordance with AASHTO M 180 if necessary.

Provide required hardware and fittings in accordance with AASHTO M 30 for the specified diameter and strength class.

#### **606.2.1.1.2 Weathering Guardrail**

Provide corrosion-resistant "weathering" guardrail Materials if specified in the Contract. Weathering guardrail Materials shall consist of A 606 Type 4 steel, be in accordance with AASHTO M 180, Class A, Type 4 standards, and shall ensure they have a corrosion resistance at least four times that of plain carbon steel.

#### **606.2.1.1.3 Double Nested Guardrail**

Provide a second rail element attached to each face as specified in the Contract. The second rail element shall have the same galvanization or "weathering" properties as that of the exterior rail element.

#### **606.2.1.2 Fasteners**

Unless otherwise specified, galvanize fasteners in accordance with AASHTO M 111 or ASTM A 153. Galvanize after fabrication.

Provide bolts in accordance with ASTM A 307 and nuts in accordance with ASTM A 563, Grade A or better.

Provide fasteners for weathering guardrail in accordance with AASHTO M 180 for Type 4 steel.

#### **606.2.1.3 Posts**

##### **606.2.1.3.1 Reserved**

##### **606.2.1.3.2 Structural Shape Posts**

Provide structural shape posts in accordance with ASTM A 36 and galvanize them in accordance with ASTM A 123. Do not perform punching, drilling, or cutting after galvanizing. Provide posts for guardrail in accordance with NCHRP Report 350 Recommended Procedures for the Safety Performance Evaluation of Highway Features and the AASHTO Manual for Assessing Safety Hardware (MASH).

#### 606.2.1.4 Offset Blocks

##### 606.2.1.4.1 Wood Offset Blocks

Provide wood offset blocks as specified for the guardrail and end treatment type. Wood offset blocks shall be Southern Yellow Pine, Western Larch, Ponderosa Pine, Douglas Fir, or Lodgepole Pine and either rough sawn (unplaned) or S4S with nominal dimensions specified and with a stress grade of at least 1,200 psi.

The size tolerance of rough-sawn blocks in the direction of the bolt holes will be within  $\pm 1/4$  in. of specified dimensions. Only use one combination of post and block for any one continuous length of barrier.

Provide wood preservatives and treatment in accordance with AASHTO M 133 and AWPA C14.

##### 606.2.1.4.2 Plastic and Composite Offset Blocks

Provide plastic or composite offset blocks as specified for the guardrail and end treatment type and in accordance with the guardrail manufacture's recommendations.

Ensure Suppliers of plastic or composite blocks proposed for inclusion on the Department's Approved Products List submit certification to the Project Manager for approval by the State Traffic Engineer.

#### 606.2.2 Reserved

#### 606.2.3 Concrete Wall Barrier (CWB) and Temporary Concrete Wall Barrier (TCWB)

The types of CWB are as follows:

1. Slip-formed CWB;
2. Cast-in-place CWB; and
3. Precast CWB.

CWB shall be installed by slip-forming or cast-in-place. TCWB shall be precast.

Use Class A concrete in accordance with Section 509, "Portland Cement Concrete Mix Designs." Provide reinforcing steel in accordance with Section 540, "Steel Reinforcement." Provide preformed asphalt joint filler in accordance with AASHTO M 213. Provide penetrating water repellent in accordance with Section 532, "Penetrating Water Repellent Treatment."

A 3/8" diameter, ASTM A416 Grade 270, AASHTO M 203M, uncoated seven-wire steel strands may be substituted for the AASHTO M31, Grade 60 deformed bars provided that the steel strands are uncoated, clean and free from dirt, loose rust, oil, grease or other Deleterious Material, for Slip-formed CWB.

#### 606.2.3.1 CWB Steel Access Panel

Provide and install CWB steel access panels in accordance with the Plans or as directed by the Project Manager.

Contour the steel access panel to the shape of and flush with the CWB. The Department will not allow the steel access panel to compromise the structural integrity and performance of the CWB assembly. Provide steel in accordance with AASHTO M 270, Grade 36. Coat the steel access panel in accordance with Section 545, "Protective Coating of Miscellaneous Structural Steel."

#### 606.2.4 End Treatments

The types of end treatments are as follows:

- End Treatment – W-beam TL-3 end terminal (for all speeds);
- End Treatment – W-beam TL-2 end terminal (for speeds of 40 mph or less);
- End Treatment – W-beam end anchor;
- End Treatment – Thrie beam end anchor; and
- End Treatment – W-beam driveway end anchor (for curved guardrail for minor approaches and driveways).

Provide End Treatments on the Department's Approved Products List which are required to meet NCHRP Report 350 or the AASHTO Manual for Assessing Safety Hardware (MASH).

W-beam TL-3 End Terminals may be used for all posted speeds.

W-beam TL-2 End Terminals may be used for posted speeds of 40 mph or less.

W-beam End Anchors shall be used on the downstream end of W-beam guardrail runs when a crash-worthy TL-3 or TL-2 terminal is not required.

Thrie beam End Anchors shall be used on the downstream end of thrie beam guardrail runs when a crash-worthy TL-3 or TL-2 end terminal is not required.

Driveway End Anchors maybe used on curved W-beam guardrail installations at minor roadway intersections such as driveways and low speed roadway approaches to the mainline.

### 606.2.5 Transitions

Transition types may include the following or others as specified in the Contract:

- Transition from W-Beam to thrie beam;
- Transition from guardrail to rigid barrier;
- Transition from existing guardrail to 31" guardrail.

### 606.2.6 Protection Systems

Protection Systems may include the following or others as specified in the Contract:

- Median Protection System;
- Drainage Structure Protection System.

Each system is comprised of W-beam, thrie beam, and expansion/reducer sections working in conjunction to provide increased protection for bridge piers, fixed objects and drainage structures. The minimum lengths required for each component of the system, as well as the required post spacing, shall be as indicated in the Contract.

### 606.2.7 Materials Certification

Provide MTRs and certificates of compliance in accordance with Section 106.4 "Certificates of Compliance" to the Project Manager, certifying that the Materials and fabrication are in accordance with these specifications. Fabrication shall be done by an identifiable source.

### 606.2.8 Member Identification and Marking

Ensure the manufacturer permanently stamps the specific type of guardrail end treatment at each location to correspond with those shown on the shop drawings provided to the Project Manager, so that each is readily identifiable in the field.

### 606.2.9 Reflective Barrier Delineators

Provide amber-colored reflective barrier delineators for median barriers and white reflectors for shoulder-side barriers in accordance with the Contract and Section 703, "Traffic Markers."

Place reflective barrier delineators back to back on median barriers.

## 606.3 CONSTRUCTION REQUIREMENTS

During construction, prevent exposed Steel or concrete barrier ends from creating a hazard to the traveling public.

### 606.3.1 Guardrail Installation

Installation of guardrail shall be done by personnel certified by the manufacturer. Provide certification to the Project Manager.

Position steel parts stored in transit, in open cars or trucks, or outside in yards or at job sites to allow free drainage and air circulation. Handle fabricated steel parts to avoid gouges, scratches, and dents.

Keep the steel clean of Deleterious Material. If the Contract specifies a weathering guardrail, the Department will not consider natural oxidation (mill scale) to be Deleterious Material and will not allow galvanizing, blast cleaning, or pickling of weathering guardrail to remove the mill scale.

Draw bolts tight (except adjustment bolts). Use bolts that are long enough to extend beyond the nuts.

#### 606.3.1.1 Steel Posts

Set posts plumb, in hand-dug or mechanically made holes, or by driving. If upward vertical adjustment of posts is necessary, remove and reinstall the post.

##### 606.3.1.1.1 Steel Posts in Asphalt

The Contractor shall construct a leave out for all W-beam locations in asphalt.

Perform post drilling or driving operations that does not cause bulging, distressing, or other disturbance of the asphalt surface.

If bulging or other distress of the asphalt surfacing occur when drilling or driving steel posts, remove and reinstall these posts using guide holes drilled through the asphalt surfacing. Make the guide holes with a minimum 8-inch diameter.

If after precutting or drilling the guide holes, bulging or other distress of the asphalt surfacing occurs or if posts cannot be driven to the specified depths, cease the driving, remove the posts, and extend the guide holes as necessary or as directed by the Project Manager.

Backfill and compact postholes with acceptable Material, such as Base Course or cold mix, placed in thin layers, to within three (3) inches of the surface grade. Place three (3) inches of Base Course in accordance with Section 303, manually tamp and neatly level to surface grade. Apply an emulsion to the leave out area within 24 hours of compaction as approved by the Project Manager.

Steel posts in asphalt thicker than 8 inches shall be constructed as steel posts in rock per section 606.3.1.1.3.

#### 606.3.1.1.2 Steel Posts in Concrete

The Contractor shall construct a leave-out for all W-beam and thrie-beam locations in concrete.

Backfill and compact postholes with acceptable Material, such as Base Course or cold mix, placed in thin layers, to within three (3) inches of the surface grade. Place three (3) inches of Base Course in accordance with Section 303, manually tamp and neatly level to surface grade. Apply an emulsion to the leave out area within 24 hours of compaction as approved by the Project Manager.

#### 606.3.1.1.3 Steel Posts in Rock

When W-beam posts are restrained by asphalt or concrete surfacing, a leaveout shall be constructed.

Perform post drilling operations that does not cause bulging, distressing, or other disturbance of the asphalt surface.

If bulging or other distress of the asphalt surfacing occur when driving steel posts, remove and reinstall these posts using guide holes drilled through the asphalt surfacing. Make the guide holes with a minimum 8 inch diameter.

If after precutting or drilling the guide holes, if bulging or other distress of the asphalt surfacing occurs or if posts cannot be driven to the specified depths, cease the driving, remove the posts, and extend the guide holes as necessary or as directed by the Project Manager.

Backfill and compact postholes with acceptable Material, such as Base Course or cold mix, placed in thin layers, to within three (3) inches of the surface grade. Place three (3) inches of Base Course in accordance with Section 303, manually tamp and neatly level to surface grade. Apply an emulsion to the leave out area within 24 hours of compaction as approved by the Project Manager.

#### 606.3.1.2 Thrie Beams and W-Beams

Erect smooth and continuous rail elements. Overlap rails in the same direction as the traffic flow



of the nearest lane. The Department will only allow such drilling or cutting that is necessary for special connections and for sampling in the field.

Shop-fabricate curved rails having a radius of 150 ft. or less to the appropriate curvature specified in the Plans.

#### **606.3.1.3 Repair of Damaged Coating**

If the galvanizing of guardrail or appurtenances is damaged, repair the coating by galvanizing or by coating with two coats of zinc dust-zinc oxide paint in accordance with Federal Specification TT-P-641 or Military Specification ML-P-21035.

#### **606.3.2 Reserved**

#### **606.3.3 Concrete Wall Barrier and Temporary Concrete Wall Barrier Installation**

##### **606.3.3.1 Concrete Wall Barrier and Temporary Concrete Wall Barrier Fabrication**

Fabricate CWB in accordance with Section 510, "Portland Cement Concrete," and Section 511, "Concrete Structures."

Construct TCWB in accordance with the Plans.

Construct CWB in accordance with the Plans. Ensure that the top of the completed barrier does not deviate from the Plans more than  $\pm 0.19$  inches. Place reinforcement in accordance with Section 540. Give the CWB a Class 2, Rubbed Surface Finish, or Class 4, Special Surface Finish, in accordance with Section 511.3.8, "Finishing."

The reinforcement shall be placed as shown on the approved drawings. When substituting steel strands caution must be taken to prevent and avoid displacement from detailed orientation.

If the manufacturer requires sandblasting, do not displace mortar used in the surface finish from the bubble pockets, pits, depressions, and honeycombs.

Cure CWB in accordance with Section 511.3.9, "Curing".

Treat the entire exposed surfaces of CWB with penetrating water-repellent treatment in accordance with Section 532, "Penetrating Water Repellent Treatment."

When called for in the Contract, apply penetrating water repellent first, then the Special Surface Finish.

The Department will not require fly ash in the PCC used to fabricate TCWB.

#### 606.3.3.2 Permanent Concrete Wall Barrier Joint Treatment

When sawing transverse weakened-plane joints, perform the sawing after the concrete has hardened enough to prevent raveling, crumbling, or shape deformation. Saw control joints at intervals designated in the Plans or as directed by the Project Manager. After completing the sawing operations, clean the sawed area of debris.

Make a construction joint after the day's permanent placement operations and at locations when concrete placement is interrupted for 30 minutes or more.

#### 606.3.3.3 Permanent Concrete Wall Barrier Installation

Construct footings and foundations, and prepare the Subgrade to 95% of maximum density in accordance with AASHTO T 180 (Modified Proctor), Method D (TTCP Modified) as necessary, before placing the CWB.

Construct vertically offset (atypical) CWB as specified in the Plans.

##### 606.3.3.3.1 Temporary Concrete Wall Barrier Requirements

The Contractor shall precast TCWB as specified in the Plans. The Contractor shall not intermix CWB of different designs, shapes, or lengths. The Contractor shall set TCWB in accordance with the Contract and the approved traffic control plan. Provide necessary loading, hauling, and unloading at designated sites.

The Contractor shall reset the TCWB during construction, as required by the Contract.

After completing the project, the Contractor shall remove, load, haul, unload, and stockpile the Department retained or Department provided CWB at the locations required in the Contract or as directed by the Project Manager.

##### 606.3.3.3.2 Temporary Concrete Wall Barrier (Retained by the Contractor)

If the Contract specifies TCWB retained by the Contractor, the Contractor shall provide new or used TCWB. TCWB retained by the Contractor will remain the property of the Contractor upon completion of the project.

The Contractor shall provide connecting hardware for the TCWB assembly.

### 606.3.3.3 Temporary Concrete Wall Barrier (Retained by the Department)

If the Contract specifies TCWB retained by the Department, the Contractor shall provide new TCWB.

TCWB retained by the Department , including shop drawings and connecting hardware, as approved by the Project Manager, will become the property of the Department upon completion of the project.

The Contractor shall remove, dispose and replace Department retained TCWB that is not Accepted by the Project Manager.

### 606.3.3.4 Department-Furnished Temporary Concrete Wall Barrier

If the Contract specifies Department-furnished TCWB, the Contractor shall load, haul, and unload Department-furnished TCWB from origins to destinations.

Department-furnished TCWB will remain the property of the Department upon completion of the project.

If the Contract specifies Department-furnished TCWB, the Contractor shall provide connecting hardware for the TCWB assembly, if missing from the TCWB units.

### 606.3.4 End Terminal or End Anchorage Installation (End Treatment Systems)

Install end treatment systems in accordance with the manufacturer's recommendations and approved shop drawings. Installations shall be performed by certified personnel.

### 606.3.5 Transition Installation

Install transitions in accordance with project plans and approved shop drawings.

### 606.3.6 Protection System Installation

Install Protection Systems in accordance with the project plans and approved drawings.

Assembly and installation of each component of the Protection System shall be supervised at all times by the Contractor's representative certified by the manufacturer.

### 606.3.7 Embankment Grading Requirements

Compact Embankment Material to 95% of maximum density in accordance with AASHTO T 180 (Modified Proctor), Method D (TTCP Modified). Unless otherwise specified in the Contract, the ground surface between the edge of the shoulder and the hinge point of the slope behind the guardrail shall be graded at 10:1 (H:V) or flatter. Warp all grade transitions to create smooth surface contours.

### 606.3.8 Drainage Requirements

Provide guardrail drainage components as specified in the Contract.

When asphalt paving is specified in the project plans, a minimum thickness of 1 ½ inches of hot mix asphalt shall be placed and compacted beneath the guardrail area.

Asphalt curb or concrete curb may be used to direct surface runoff as specified in the project plans. Metal curbs are not allowed. For Transitions from guardrail to rigid barrier, do not extend the asphalt curb or concrete curb beyond the thrie beam to W-beam reducer element. If additional curb length is needed, then extend the curb through the entire Transition and add 12.5 ft. of nested W-beam adjacent to and upstream of the thrie beam to W-beam reducer element. All asphalt curb or concrete curb shall be placed below the guardrail offset block with the face of the curb aligned with the face of the guardrail.

### 606.3.9 Vegetation Management Requirements

Provide vegetation management as specified in the Contract. Vegetation management may consist of asphalt paving, concrete paving, or application of an approved herbicide.

## 606.4 METHOD OF MEASUREMENT

### 606.4.1 Guardrail Measurement

Guardrail will be measured and paid in linear feet of guardrail that has been satisfactorily completed and accepted, exclusive of that length of guardrail that is within the pay limits of end treatments and transitions, as specified. Measurement will be made along the centerline of the barrier.

Weathering Guardrail will be measured and paid in linear feet of guardrail that has been satisfactorily completed and accepted, exclusive of that length of guardrail that is within the pay limits of end treatments and transitions, as specified. Measurement will be made along the centerline of the barrier.

Curved Guardrail will be measured and paid as linear feet of standard Guardrail.

## 606.4.2 Reserved

## 606.4.3 Concrete Wall Barrier Measurement

CWB and TCWB will be measured along the centerline of the barrier. CWB flare within CWB Transition Section will be measured as CWB.

## 606.4.4 End Terminal or End Anchor (End Treatment System) Measurement

End Treatment Systems will be measured and paid in units of each completed and accepted, inclusive of integral transition sections connecting the End Treatment to the corresponding guardrail or concrete wall barrier. Each End Treatment is inclusive of all necessary posts, blocks, connections, anchorage, fasteners, grading, drainage elements, vegetation management components and leave-outs.

## 606.4.5 Transition Measurement

Transitions will be paid by each for transitions that have been satisfactorily completed and accepted. Measurement will be made along the transition centerline and exclusive of that length of barrier that is within the pay limits of end treatments or the corresponding guardrail or concrete wall barrier. Transitions that are integral to the end treatment system shall be considered to be part of the end treatment system and shall not be measured or paid separately. Each Transition is inclusive of all necessary anchorage fasteners, grading, drainage elements, and vegetation management components.

## 606.4.6 Protection System Measurement

Protection Systems will be measured and paid in units of linear feet of the protection system that has been satisfactorily completed and accepted. Measurement will be made along the protection system centerline and exclusive of that length of barrier that is within the pay limits of end treatments. Each Protection System is inclusive of all necessary anchorage, fasteners, grading, drainage elements, vegetation management components and leave-outs.

## 606.4.7 Removal and Reinstall Guardrail

Remove and Reinstall Guardrail will be measured and paid in linear feet of guardrail that has been satisfactorily removed, replaced, and accepted exclusive of end treatments and transitions. Measurement will be made along the railing face center to center of the outermost post in the length of guardrail being measured.

## 606.5 BASIS OF PAYMENT

Pay Item	Pay Unit
Guardrail	Linear Foot
Weathering Guardrail	Linear Foot
End Terminals	Each
End Anchors	Each
Transitions	Each
Protection Systems	Linear Foot
Remove and Reinstall Guardrail	Linear Foot
Concrete Wall Barrier	Linear Foot
TCWB Retained by the Contractor	Linear Foot
Resetting of TCWB	Linear Foot
TCWB Retained by the Department (___ ft)	Linear Foot
Resetting of TCWB (___ ft)	Linear Foot
Department-Furnished TCWB (___ ft)	Linear Foot
TCWB Retained by the Contractor (___ ft)	Linear Foot
Concrete Wall Barrier (Modified)	Linear Foot
Concrete Wall Barrier (Half Section)	Linear Foot

### 606.5.1 Work Included in Payment

The following work and items will be considered as included in the payment for the main item(s) and will not be measured or paid for separately:

- A. All loading, hauling, unloading, stockpiling, or disposal;
- B. Moving or removal of temporary barrier;
- C. Footings and foundations;
- D. Offset Blocks;
- E. Reflective sheeting and reflectors installed on guardrail, end treatments, and transitions;
- F. End treatment posts, sleeves, anchors, barrier rail and impact head;
- G. Backfilling and compacting of holes created by removal and installation of posts;
- H. Embankment material, placement, and grading;
- I. Placement and compaction of asphalt material;
- J. Construction of surfacing;
- K. Construction of post leaveouts;

- L. Construction of asphalt curbs;
- M. Patching material at posts;
- N. All connecting hardware;
- O. Reflective barrier delineators installed on CWB and TCWB;
- P. Curing of CWB and application of penetrating water-repellent treatment;
- Q. Connection pins for TCWB;
- R. Concrete wall barrier access panel;
- S. Reinforcing Steel;
- T. Transitions that are integral to end treatment systems; and
- U. Replacement of unacceptable Department retained TCWB due to Contractor mishandling.
- V. Guardrail post installation in rock.

July 6, 2015

**SPECIAL PROVISIONS  
MODIFYING  
SECTION 607: FENCE**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete 607.2.2.2 Posts and replace with the following:

Provide metal or wood corner, brace, intermediate brace gate, and line posts of the specified type, size, and length in accordance with the Contract.

Permanently cap all vertical metal pipes on fence and gate supports. Ensure that the top coating and color of the pipe is maintained.



**SPECIAL PROVISIONS  
MODIFYING**

**SECTION 608: SIDEWALKS, DRIVE PADS, AND CONCRETE MEDIAN PAVEMENT**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete Subsection 608.3.8.4 Warranties in its entirety.

Delete Subsection 608.5.1 Work Included in Payment in its entirety and replace with the following:

The following Work and items will be considered Incidental to the main items:

1. Excavation, backfill, compaction, expansion joint, coloring, and other related items and appurtenances;
2. Bedding Material;
3. All labor, manufacturer field assistance, Materials, Equipment, submittals, repairs, and cleanup; and
4. Detectable warning surface.

July 6, 2015

**SPECIAL PROVISIONS  
MODIFYING  
SECTION 610: CATTLE GUARDS**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

**610.2.1 General**

Permanently cap all vertical metal pipes.

Replace the following under SECTION 610:

**610.2.2 Precast Concrete Cattle Guards**

Use Class AA concrete in accordance with Section 510. "Portland Cement Concrete".

The Department will reject cattle guards with cracks, chips, spalls, or honeycombed or patched areas in excess of 30 in<sup>2</sup>; or those that fail to meet the minimum strength requirements.

Provide shop drawings in accordance with section 105.2 of the New Mexico State Department of Transportation Standard Specifications for Highway and Bridge Construction 2014 Edition, and in accordance with the current edition of the ACI Detailing Manual

Fabricate precast concrete cattle guard steel grids and other steel "appurtenances" in accordance with Section 541.

**SPECIAL PROVISIONS  
MODIFYING  
SECTION 618: TRAFFIC CONTROL MANAGEMENT**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete Subsection 618.2.2 Duties in its entirety and replace with the following;

**618.2.2 Duties**

The TCS's only responsibility is traffic control management. The Department may allow exceptions to this rule if the Project is small and requires limited traffic control. The Project Manager and the District Traffic Engineer will determine approval of the exception at the preconstruction conference.

The TCS's primary duties include the following:

1. Providing management and supervision services at the Project site;
2. Preparing revisions requested by the Contractor to the traffic control plan in the Contract and submitting the new traffic control plan, in CAD format or hand drafted on a 12 inch × 18 inch piece of 20-pound paper using current drafting standards, to the Project Manager for approval by the District Traffic Engineer. Complex traffic control Plans require development by a registered professional Engineer prior to submittal to the Project Manager;
3. Coordinating the flagging and signing personnel training;
4. Supervising the flagging and signing personnel;
5. Coordinating traffic control operations for the duration of the Contract, including those of Subcontractors, utility companies, and Suppliers, to ensure that traffic control is in place and fully operational before the commencement of Work. When dealing with utility companies, the TCS shall coordinate concurrent utility traffic control with other construction traffic control to avoid conflicts;
6. Coordinating, in writing, Project activities with the appropriate individual traffic control, law enforcement, and fire control agencies;
7. Preparing and submitting statements concerning Road closures, Delays, and other Project activities to the news media, as necessary. Before submittal to the news media, the Contractor shall submit news releases to the Project Manager for review and approval;
8. Notifying the Project Manager of accidents related to the Project traffic control;
9. Recording time and date of accident notification in accordance with Section 618.2.2.1, "Traffic Control Diary;"
10. Attending the preconstruction conference;
11. Maintaining, cleaning, and replacing traffic control devices in use per the current traffic control plan during working and non-working hours.

12. Throughout the duration of construction the Contractor shall be responsible to keep the Project Manager and the District Public Relations Officer informed of any lane closures that will restrict the normal flow of traffic and any information regarding construction activities at least forty-eight (48) hours in advance.

**SPECIAL PROVISIONS  
MODIFYING  
SECTION 622: FIELD LABORATORIES AND FIELD OFFICES**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete 622.2.1.8 Field Laboratory Facsimile Machine Facilities in its entirety and replace with the following:

**622.2.1.8 Field Laboratory Internet Access**

Provide Internet access as approved by the Project Manager.

July 6, 2015

**SPECIAL PROVISIONS  
MODIFYING  
SECTION 631: RUMBLE STRIPS**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete 631.5.1 Work Included in Payment and include the following:

The following Work and items will be considered as included in the payment for the main items and will not be measured or paid for separately: Equipment and labor; repair of incorrectly placed rumble strips; continuous application of seal coat to completed rumble strips in accordance with Section 407; and repair of damaged pavement.

## SPECIAL PROVISIONS MODIFYING SECTION 632: REVEGETATION

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete Section 632 - REVEGETATION in its entirety and replace with the following:

### 632.1 DESCRIPTION

This revegetation Work consists of preparing the soil, seeding, mulching, crimping, and the application of tackifier to areas stripped of vegetation during construction operations and are required to be revegetated. For additional information refer to the US Clean Water Act as outlined in the Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) Storm Water Pollution Prevention Plan (SWPPP). Construction staking and digital submittals are included in the scope of the revegetation Work. The Department and Subcontractor shall each have at least one Section 632 TTCP-certified person on the project at all times.

### 632.2 MATERIALS

Provide submittals as per Table 632.3.4:1, "Operations Sequence for Classes of Seeding," for all Materials to the Project Manager at a minimum of ten (10) working days before revegetation Work commences. Submittals shall conform to the specifications and the revegetation Plan, and shall be on the Approved Products List. After submittals have been approved as per procedures identified in Section 632.3.3 the Contractor may substitute products on the Approved Products List with prior approval as per the same process. Rock Mulch material submittal shall be required and will not appear on the Approved Product List. Submittal shall be a full five gallon bucket sample provided to the PM for sieve analysis.

All bulk materials delivered to the project shall be accompanied by a certified weigh master ticket for materials utilized per project as per Section 109.1, "Measurement of Quantity." Split loads of fertilizer, seed, straw, tackifier, and bonded fiber matrix may be allowed with proper weigh master ticket and contractor affidavit. Split loads shall not be allowed for compost mulch and rock mulch.

All packaged Materials delivered to the Project shall be wrapped or otherwise securely protected from weather which might affect their integrity. Materials in weather-damaged packaging shall be rejected for use on the Project.

Certification for bulk Materials shall comply with Section 106.4, "Certificates of Compliance." Notify Project Inspectors when bulk Materials are delivered so loads may be inspected and verified.

The Contractor shall ensure that straw bales stored on the Project shall not exceed 20% moisture content.

### 632.2.1 Temporary Soil Stabilant/Tackifiers for Class A Seeding

Temporary soil stabilant and tackifier shall be considered the same and the terms used interchangeably. Tackifiers shall have a blue or green dye lasting a minimum of 36 hours to aid in application and inspection, and be bio-degradable. When used as part of seeding operations it shall be applied at a rate of 200 pounds per acre.

Tackifiers shall be plant-derived and bio-degradable and be composed of either guar, psyllium (*Plantago ovata*), or starch.

**Guar.** Guar is a plant based product derived from the ground endosperm of the guar plant, treated with dispersant agents for easy mixing.

**Psyllium.** Psyllium is composed of the finely ground muciloid coating of *Plantago ovata* seeds that is applied as a dry powder or in a wet slurry to the surface of the soil. It dries to form a firm but re-wettable membrane that binds soil particles together but permits germination and growth of seed. Psyllium requires twelve (12) to eighteen (18) hours drying time.

**Starch.** Starch is non-ionic, cold-water soluble (pre-gelatinized) granular cornstarch. The Material is mixed with water. Approximate drying time is nine (9) to twelve (12) hours.

### 632.2.2 Seed for Class A and C Seeding

The Project seed list shall conform to the NMDOT Revegetation Zone and Seed List Maps at the NMDOT website or at the following link: <https://arcg.is/2peB6Cc>

The list used shall be the year the Project was let. The Contract shall specify varieties of noxious weed-free seed in accordance with New Mexico Seed Law (NMSA 1978, § 76-10-11 et seq.).

Seed submittal shall be a list from a seed producer showing the common name, botanical name, pure live seed, total poundage, source locality (county and state), and NMDOT Project control number as per the revegetation/erosion control Plan.

All seed suppliers must be on the current Approved Products List and provide documentation that their regulating state agency belongs to the Association of Official Seed Certifying Agencies (AOSCA).

Seed mixtures shall be pre-mixed and bagged certifying the mixture quantity and percentage as noted in the contract.

Substitutions for unavailable seeds shall be performed by adding the quantity of the unavailable seed to the quantity of the next seed species listed within that subcategory of the seed list. Before substitutions can be made the contractor must provide proof of unavailability in letter form from three seed suppliers listed on the NMDOT Approved Products List that the seed is not available.

All seed delivered to the Project shall be stored in a container protected from rodents and moisture and not subject to temperatures higher than 90°F.

#### 632.2.2.1 Seed Labeling



Seal and label each bag in accordance with the Federal Seed Act (7 U.S.C. § 1551 et seq.) and NMDA seed labeling requirements (NMSA 1978, § 76-10-13). Provide the following information on each bag tag for each species:

1. Variety (specify if certified);
2. Kind of seed;
3. Lot number;
4. Purity;
5. Germination;
6. Percentage crop seed, percentage inert, percentage noxious weeds, in accordance with New Mexico Seed Law (NMSA 1978, § 76-10-11. et seq)
7. Origin;
8. Test date; and
9. Weight (in pounds) of this species or percentage of total lot.

Provide seed analysis results that are not older than twelve (12) months prior to use.

Seed suppliers shall provide one-acre seed bags.

Provide to the Project Manager documentation of seed origin and pure live seed content from a certified testing Laboratory. Seed must arrive in the original sealed containers from the Supplier and the Revegetation Contractor must provide all tags and certifications to the Project Manager. Certification must be provided that the seed has been stored in appropriate conditions in the twelve (12) months before arriving at the Project. Each seed tag shall be affixed to the bag and have the project control number clearly identified. The certified seed Supplier shall maintain records of seed tag control numbers for a period of three (3) years.

### 632.2.3 Fertilizer for Class A and C Seeding

Fertilizer shall be organic, slow release with an N-P-K (nitrogen, phosphorous, potassium) analysis of either 3-6-3 or 3-7-2 and blended with endo-mycorrhizza and humates. Application rate shall be 1,000 lbs. per acre. Humates must comprise a minimum of 15% by weight. Endo-mycorrhiza must be arbuscular with a minimum propagule of 1.33 propagules per gram. Provide fertilizer (specified type and formulation) and supplier's certification in accordance with the contract. Each bag or tote of fertilizer shall have a visible, sealed, and un-altered analysis tag from the manufacturer that must be approved by an authorized person prior to application of the material. The tag must include the manufacturer's information, the N-P-K analysis of the product, and the weight of the bag or tote. NMDOT reserves the right to inspect any bill of lading or packing slips from the supplier to verify quantity of material on site.

### 632.2.4 Hydro-Mulch - Bonded Fiber Matrix (BFM) for Class C Seeding

Hydro-mulch shall be Bonded Fiber Matrix (BFM). BFM is a hydraulically-applied blanket that controls soil erosion and accelerates seed germination. BFM is a three-dimensional composite of wood

or paper fibers bonded by polymer tackifier that provides high performance erosion prevention on slopes. Dye and tackifier shall be included in the BFM formulation. BFM shall be applied at a rate of 2,000 lbs. per acre. As a hydraulic erosion control product (HECP) as defined by the Erosion Control Technology Council, the BFM or its equivalent shall be Type 3 or higher in functional longevity as defined in Table 1 of the 2014 Standard Specifications for Hydraulic Erosion Control Products (HECPs) Part 2.01

#### 632.2.5 Rock Mulch for Class C Seeding

Rock Mulch shall be between  $\frac{3}{4}$ " and no greater than 1  $\frac{1}{4}$ " in size, with no more than 3% passing the  $\frac{1}{2}$ " sieve. Rock shall have a minimum of two Fractured Faces. Rock which is black in color will not be acceptable. Pumice rock is not acceptable.

#### 632.2.6 Composted Mulch for Class A Seeding

Furnish and place composted mulch as shown on the revegetation plan and in accordance with the criteria as described below. Composted mulch provider must be registered with or permitted by the New Mexico Environment Department Solid Waste Bureau and must be in compliance with 20 NMAC 9.1.

Composted mulch is defined as the product of a controlled aerobic thermophilic biological decomposition process that meets the quality requirements in Table 632.2.6:1, "Material and Operations for Classes of Seeding." Raw Materials used in producing composted mulch may include green waste, animal manure, animal bedding, paper waste, food waste, biosolids or other non-toxic organic matter, but shall not include animal mortalities.

**Table 632.2.6:1  
Requirements of Compost Mulch**

Material	Measure	Method	Criterion
All Composted Mulches	Moisture Content*	Evaporative loss at 105°C	Between 35 % and 60%
	Carbon/Nitrogen Ratio*	Nitrogen by AOAC 993.13, Carbon by ASTM D5373	Between 15:1 and 20:1
	Particle Size	Sieve	40% minimum to 100% maximum of Material may pass ¾ inch screen; 100% of pieces smaller than 4 inches in length and 2 inches in diameter
	Electrical Conductivity*	1:5 slurry (mass basis)	<10 mmho/cm
	pH*	1:5 slurry (mass basis)	pH 5.0 – pH 8.0
	Organic Matter*	Loss on ignition at 550°C	25% - 100% of dry weight
	Maturity	Germination test in 50:50 (volume basis) mixture of ¾ inch screened composted mulch and twice-rinsed nursery sand.	Minimum 50% germination to second set of leaves for marigold seeds
	Stability	By temperature and moisture content	Maximum core temperature of 110°F after 48 hours in 5 foot tall conical pile, with moisture adjusted to between 40% and 60%.
	Debris	By volume	Less than one percent (1%) inorganic debris, including but not limited to, glass, plastic, stones and metal.
Composted Mulches with Wastewater Biosolids	Trace Metals*	HNO <sub>3</sub> digestion	Complies with Table 3 of 40CFR503.13
	Fecal Coliforms*	MPN with A-1 broth	<1000 MPN/dry gram
*Tests marked with asterisks must be performed by a suitable analytical Laboratory; other tests may be performed by the composted mulch producer.			

### 632.2.6.1 Acceptance

Compost mulch suppliers on the Approved Products List are approved for project use. The NMDOT Landscape Architect shall review lab analysis and submittals from the compost producers every 180 days and confirm their listing on the Approved Products List.

Before delivering composted mulch, provider shall furnish documentation that includes the following:

1. The raw Materials, by percentage of volume, used in the production of the delivered composted mulch;
2. Daily temperature records for at least 20% of the piles or batches used to produce the delivered composted mulch, illustrating attainment of at least 130°F for at least seven (7) consecutive Days;
3. A Laboratory analysis for criteria shown in Table 632.2.6:1, "Requirements of Compost Mulch" performed on composted mulch no more than 180 Days prior to delivery;
4. An affidavit, signed by a corporate officer, confirming that the composted mulch meets each requirement shown in Table 632.2.6:1, "Requirements of Compost Mulch"

### 632.2.6.2 Straw Mulch for Class A Seeding

Do not use rotten or moldy straw. All straw mulch must be barley straw and is to be free of noxious weeds as certified by an industry-recognized forage certification authority. Certification twine must appear on all certified straw bales. The color of the certified twine for straw bales shall be listed on the certification submittal for identification purposes. The date on the straw certification provided to NMDOT may not be older than one (1) year from the date of purchase. Before Acceptance the Contractor shall provide to the Project Manager weigh tickets signed by a certified weighmaster as per Section 109.1, "Measurement of Quantity," which confirms that the amount of bulk Materials delivered to the Project equals tonnage required for the Project per the determined acreage.

## 632.3 CONSTRUCTION REQUIREMENTS

### 632.3.1 Equipment

All Equipment shall be inspected by the Contractor to confirm Equipment is in good working order prior to commencing work. An Inspector shall witness the inspection and calibration.

To avoid the spread of noxious weeds, all revegetation Equipment (including but not limited to trucks, trailers, tractors, hydro-seeders, drill seeders, straw blasters, and disks) shall be pressure-washed to remove all visible mud, soil, and debris prior to entering the Project limits within the state right of way. If Equipment leaves the Project for any reason it shall be re-inspected when returned to the job site.

Disking attachments shall have a minimum six (6) foot carriage with front and rear discs.

Crimping Equipment shall have a minimum eight (8) foot wide carriage.

Skid steer attachments may only be used on confined areas for seeding operations.

Skid steers shall not be used for spreading compost unless in a confined area.

#### **632.3.1.1 Drill Seeder**

Drill seeding Equipment shall be inspected so that drill seed drop tubes are not torn or clogged. All seed loaded into Equipment shall be verified by an Inspector to confirm correct application rates. An Inspector must verify that the auger in the seed bin is rotating and that seed is dropping through drop tubes.

The drill seeder must be inspected daily to prevent loss of seed or to prevent over-seeding. Calibration is necessary to control rate and depth of seed distribution. Calibration procedure and demonstration shall be as per manufacturer's specifications. The drill seeder shall be calibrated once per project unless it is replaced on the project. Drill seeders shall only be modified by manufacturer recommendation and documentation of the modification must be available.

The inspection shall ensure that the Equipment has the following:

1. Double disc openers with 'A' frames
2. Depth bands;
3. Drop tubes;
4. Packer wheels or drag chains;
5. Rate control attachments;
6. Seed boxers with covers and agitators for trashy seed; and
7. Keyway holding auger to shaft

#### **632.3.1.2 Hydro-Seeder**

The hydro-seeder cannons, hoses and agitators shall be in good working condition. The hydro-seeder shall be capable of applying materials up to distances of 200'.

#### **632.3.2 Materials and Sampling**

Inspector must be present when Materials are to be loaded into Equipment or distributed on the areas to be seeded. Contractor shall provide all containers and bags to the Project Inspector for verification.

A one (1) quart sealed zip lock bag of seed Material labeled with the Material identification and the Project control number is to be provided to the NMDOT Landscape Architect for examination and testing. The Department may reject Materials not in accordance with the Contract.

#### **632.3.3 Pre-Seeding Conference**

A mandatory pre-seeding conference called by the Project Manager shall be held on the Project

before revegetation Work begins. Attending will be the NMDOT Project Manager or representative, the NMDOT Landscape Architect or certified seeding Inspector, the General Contractor, and the Revegetation Contractor.

The purpose of the meeting is to inspect the project, and off-site yards, pits, and borrow roads for confirmation of their revegetation requirements. The Project Manager shall have at the pre-seeding meeting documentation of all pits, Contractor yards, etc. approved for use on the Project. Per 632.3.12, "Seeding Operations for Class A and Class C Seeding," test strip location shall be verified following the Pre-seeding Conference. Construction staking must be completed and quantities must be verified by the Project Manager before test strip commences.

Submittals must be provided to the Project Manager and Landscape Architect ten (10) Days prior to the proposed start of revegetation Work. Any revegetation Work done prior to this inspection shall be rejected.

All areas to be revegetated shall be measured and confirmed for each class of seeding in accordance with Section 801, "Construction Staking By The Contractor." The Project Manager and the Contractor shall field verify and agree on the acreage for each Class of seeding, including Modified Class A, before any Materials are ordered or delivered to the Project.

Construction staking shall also identify all areas which have less than 4" of soil cover and qualify for Modified Class A seeding.

The Prime Contractor shall provide minutes of this meeting for review and approval by the Project Manager and Landscape Architect or representative.

There will be no change in Materials or the scope of revegetation Work after the Contractor begins seeding operations.

For revegetation Work areas to be considered ready for revegetation they shall be accessible, free of Equipment, and no further construction processes occurring which would interfere with seeding operations. No further revegetation Work or Equipment access shall occur on areas which have been revegetated.

The Prime Contractor shall maintain a minimum twelve (12) foot wide Equipment access to all revegetated areas for use by revegetation Subcontractor until revegetation Work is complete.

#### 632.3.3.1 Weather Limitations

Revegetation Work shall not be performed when the ground is frozen or when temperatures are below 32°F. No revegetation work shall be performed when wind speed exceeds fifteen (15) miles per hour as measured with a wind meter by the Inspector.

#### 632.3.4 Seeding Classes

Provide the various classes and the Material and operations for each class in accordance with Table 632.3.4:1, "Operations Sequence for Classes of Seeding."

Table 632.3.4:1  
Operations Sequence for Classes of Seeding

Operation	Class		
	A	MOD A	C
Disk seed bed to four (4)"	X	X	—
Apply fertilizer by broadcast, then disk to four (4)"	X	X	—
Apply one (1) inch compost mulch, disk to four (4)"	X	X	—
Drill seed	X	—	—
Straw crimp; apply tackifier, dye	X	—	—
Track slopes with ridges horizontal and parallel to bottom of slope	—	—	X
Hand rake or chain harrow surface horizontally	—	X	X
Hydro apply seed, fertilizer, dye, tackifier	—	X	X
Scarify seeded areas horizontally to slope	—	—	X
Hydro mulch; apply tackifier, dye	—	X	X
Rock Mulch	—	—	X

Note: No seeding shall be applied on frozen ground

Key: X = required;  
— = not required

The Department defines the seeding classes as follows:

1. Class A = seeding with a drill seeder (slopes up to 3:1 or flatter)
2. Class C = seeding with hydro seeder (slopes steeper than 3:1 to a maximum of 2:1).

#### 632.3.5 Modified Class A Seeding for Narrow Areas or Areas Inaccessible to Drill Seeding Equipment

Any project areas with slopes less than 3:1 requiring revegetation which are less than eight (8) ft. wide, or are inaccessible to drill seeding Equipment, or are too rocky to disk to a 4" depth, shall use the following procedure and payment is to be made at the Class A rate.

Disk soil to a four (4) inch depth with one (1) inch of incorporated compost mulch and fertilize as per Class A treatment. A skid steer with attachments may be used. If the seed bed is too rocky to disk to 4" omit compost mulch and chain harrow or hand rake the entire area and proceed with Steps 1 and 2 below.

A hydro-seeder shall then be used to apply the seed, dye, tackifier, and hydro mulch in two (2) steps as described below.

Step 1. Apply seed and dye to the newly disked soil, rake or chain harrow so seed is covered with soil.

Step 2. Apply an approved bonded fiber mulch with tackifier applied in two (2) coats from opposing directions at rate of 2,000 lbs. per acre.

Seed in these areas shall be applied at twice the specified rates and no extra payment shall be made therefore.

### 632.3.6 Revegetation of Areas Outside the Project Limits

Revegetation of all disturbed off-site locations will be in accordance with Sec. 104.7, "Final Cleanup," and the appropriate class of seeding will be used for the terrain. Section 632, "Revegetation," procedures will be followed for all public lands and private lands that are required to be revegetated unless other seed lists and procedures are required in a resource agency permit. All revegetation work done for permitted contractor- located activities shall be done at the Contractor's expense.

The Contractor must provide as part of submittals a letter of intent from landowners for off-site locations to be used as per Section 104.7, "Final Cleanup." The letter of intent must acknowledge the landowner's right to have revegetation performed as per our specifications and if that revegetation right is waived the owner acknowledges that neither the Contractor nor NMDOT shall be responsible for any claims, including but not limited to fugitive dust, noxious weeds, and siltation of waterways, related to the owner's decision to forgo revegetation. When revegetation Work is being performed on private land, a right of access permit for inspection of the revegetation Work for that private land must be provided by the Contractor to Project Management and shall be considered incidental to the Work.

The Contractor shall provide documentation of the treatment used and notify Project Management when the revegetation Work is being performed so Inspectors may be present.

Table 632.3.6:1  
Schedule of Materials for Class A Seeding

CLASS A REVEGETATION MATERIALS PER ACRE				
<u>TACKIFIER</u>	<u>COMPOST MULCH</u>	<u>SEED</u>	<u>STRAW</u>	<u>FERTILIZER</u>
200 lbs	134 cubic yards	Per revegetation zone list	2 tons	1000 lbs.

Table 632.3.6.2  
Schedule of Materials for Class A Modified Seeding

CLASS A MODIFIED REVEGETATION MATERIALS PER ACRE			
<u>COMPOST MULCH</u>	<u>SEED</u>	<u>HYDRO MULCH WITH TACKIFIER</u>	<u>FERTILIZER</u>
134 cubic yards	Per revegetation zone list X2	2,000 lbs	1000 lbs.

Table 632.3.6:3  
Schedule of Materials for Class C Seeding

CLASS C REVEGETATION MATERIALS PER ACRE			
<u>HYDRO MULCH WITH TACKIFIER</u>	<u>SEED</u>	<u>ROCK MULCH</u>	<u>FERTILIZER</u>
2,000 lbs.	Per revegetation zone list X2	300 tons	1,000 lbs.



## 632.3.7 Materials Certifications

Provide all certifications for required Material to the Project Manager before the Project begins.

## 632.3.8 Seedbed Preparation for Class A Seeding

Till the seedbed with a disk, harrow, or chiseling tools to at least four (4) inches deep. Uproot competitive vegetation during seedbed preparation, and uniformly work the soil to a surface free of clods, large stones, or other Deleterious Material that would interfere with seeding Equipment. Ensure Inspector approves area that was disked before compost is added to the soil.

Add one (1) inch of compost mulch as specified by disc, harrow, or chisel to a depth of four (4) inches.

The same day as and preceding tilling compost mulch into the seedbed water shall be added to the compost mulch at a rate of 2,500 gallons per each 134 cubic yards. This is to aid in the incorporation of the mulch into the seedbed. All compost mulch must be incorporated into the seedbed before adding fertilizer and commencing drill seeding. Add fertilizer by broadcast and disc, harrow, or chisel to a depth of four (4) inches.

Till across the slope, along the contour. Do not till the seedbed if the moisture content of the soil is outside the limits recommended by the seed Supplier for planting, or the ground is in a non-tillable condition.

Do not prepare more seedbed area on which the entire seeding operation can be applied before the surface crusts or loses seed and fertilizer to erosion. If erosion or crusting occurs, perform seedbed preparation again.

After seed bed preparation and before drill seeding commences all rocks larger than four (4) inches in diameter shall be removed from the seed bed and no payment shall be made therefore.

## 632.3.9 Tracking and Scarification for Class C Seeding

Areas designated as Class C treatment shall be track-walked as per Table 632.3.4:1 with tracks parallel to the toe of slope to compact and score the slopes within seven working days prior to the commencement of Class C operations.

Slopes which have eroded or otherwise degraded in the seven working day period before seeding may need to be re-graded before revegetation.

Competitive vegetation shall be uprooted before hydro-seeding so that seed has good adherence to the surface and soil cover and no payment shall be made therefore.

Following tracking slopes shall be scarified by hand raking or chain harrowing horizontally and parallel to the bottom of the slope.

Following tracking of the slopes all rocks larger than four (4) inches in diameter shall be removed

from the hydro-seed bed and no payment shall be made therefore.

#### 632.3.10 Fertilizer for Class A and Class C Seeding

Fertilizer bags shall be examined before use to confirm correct analysis and content. Notify Project Inspector when bags are to be loaded into machines and all bags shall be collected and counted confirming correct amounts used.

Apply the fertilizer uniformly to the prepared seedbed. Class A shall be broadcast and Class C shall be hydro-applied. Mix fertilizer in the hydro-seeder for a minimum of ten (10) minutes before applying.

#### 632.3.11 Compost Mulch for Class A Seeding

The Contractor shall wet down compost mulch so that wind loss is kept to a minimum. Stockpiles shall be less than six (6) ft. tall and oriented perpendicularly to the prevailing winds to prevent wind loss.

The compost mulch moisture content shall be indicated on the delivery ticket at the time of delivery and shall be within the 35 – 60 % range.

Regardless of the compost mulch moisture content, Project Management may require further wetting of compost mulch at delivery to prevent loss through wind. No extra payment shall be made therefore.

The certified Inspector shall verify the load is full before unloading to confirm the Material is up to the front of the trailer. Indications of a short load are gaps at the front of the truck, overloading at the back of the truck, and slip staining of the Material from the original loading line

#### 632.3.12 Seeding Operations for Class A and Class C Seeding

Uniformly apply the seed mix at a rate in accordance with the Contract. Do not drive vehicles or other Equipment on seeded areas. The Contractor is responsible for protecting revegetation Work until Acceptance.

A test strip of each class of seeding shall be provided by Contractor before commencing general seeding. Each test strip shall measure no less than one acre in a configuration which works for the Equipment and the site, shall be at a location of the Contractor's choosing within the Project, and shall be done as per specifications with a certified Inspector and the Landscape Architect or representative present. Equipment calibration and a test strip are not required for projects less than an acre in size. The test strip is to verify equipment functionality, proper adjustment, application rate, and the Contractor's ability to perform the Work as per specification.

Upon Acceptance of the test plot the Contractor may proceed with seeding operations. If the test strip is not accepted, establish a new one acre strip location and re-verify. The Contractor shall not proceed to full seeding operation until an acceptable test strip has been produced. Payment will only be made for accepted test strips and shall be made under appropriate class of seeding.

The Contractor shall coordinate with Project Management prior to starting seeding operations to ensure that an Inspector is present at all times. No revegetation Work shall be performed without the presence of a certified Inspector.

Once seed is installed on a given Project area all operations to complete that class of seeding for that area must be completed the same Day.

If rainfall or some other factor prevents the Contractor from seeding to the specified depth on prepared surfaces, the Contractor shall prepare the seedbed and apply seed again, at no additional cost to the Department.

Class C areas are to be seeded at twice the standard rate and no extra payment is to be made therefore.

Do not perform seeding operations when wind velocity exceeds fifteen (15) mph. Disking may still be performed with winds exceeding 15 mph.

#### **632.3.13 Drill Seeding for Class A Seeding**

Plant seed 1/2 inch deep unless otherwise specified in the Contract. Ensure that the distance between the drilled furrows is no more than eight (8) inches. If the furrow openers on the drill exceed eight (8) inches, re-drill the area and no extra payment shall be made therefore.

#### **632.3.14 Hydro-Seeding for Class C Seeding**

Seed shall be applied in a slurry with fertilizer and dye. All Materials loaded into Equipment shall be verified by NMDOT Project Inspectors to confirm correct application rates. Mix all materials for a minimum of ten (10) minutes before application.

#### **632.3.15 Hydro-Mulching for Class C Seeding**

Hydro-mulching shall be applied in two sweeps from opposing directions to ensure coverage is complete. The BFM must contain a tackifier when applied. A dye capable of lasting 36 hours shall be included in slurry so that Project Inspectors can confirm coverage. Mulch must be applied the same Day as the seed to protect seed. All Materials loaded into Equipment shall be verified by NMDOT Project Inspectors to confirm correct application rates. Mix all Materials for a minimum of ten (10) minutes before application.

Contractor shall provide Project Management a laminated color reference card from the BFM manufacturer showing a close-up reference photograph of their product installed at the rate of 2,000 lbs. per acre.

#### **632.3.16 Straw Mulching for Class A Seeding**

Anchor straw mulch using a crimper with flat serrated discs at least one (1) inch thick with dull edges, spaced no more than nine (9) inches apart. Ensure that the disc diameter is large enough to prevent the frame of the Equipment from dragging in mulch.

Ensure that straw mulch crimping is at least two (2) inches deep and do not cover it with excessive amounts of soil. Perform mulch anchoring across the slope where practical, with no more than two (2)

passes of the anchoring Equipment. Straw shall be evenly distributed over entire bedding area with no bare areas showing or areas with straw deeper than four (4) inches in depth before crimping.

Ensure that the rate of application of straw mulch is at least two (2) tons of air-dry straw per acre. The Inspector shall verify the total tons per acre of straw required per acre.

Ensure that straw mulch has at least 50% of fibers exceeding ten (10) inches long on the ground after application.

Spread straw mulch following drill seeding with a mechanical mulch spreader or by hand. If spreading by hand, tear apart the bales of mulch and fluff it before spreading.

Anchor straw following crimping with an approved tackifier with green dye at a rate of 200 lbs. per acre. The tackifier shall be incidental to the seeding.

When crimping the straw is impractical due to rocky areas it may be spread and not crimped. Tackifier will be applied as per specification. This method shall be approved by the Project Manager for rocky areas only.

When the revegetation Work is being done the Contractor shall verify straw bale moisture content with a straw bale moisture meter with an eight (8) inch minimum length probe for the duration of the Project. An Inspector must be present and record this test. The moisture meter shall remain the property of the Contractor following Project completion and the testing shall be considered incidental to the Project. Each bale must be tested to confirm that the bale interior moisture content is no greater than 20%. Any bales with moisture above this level shall be rejected and removed from the Project. Higher levels of moisture may indicate the presence of mold and the risk of spontaneous combustion.

#### 632.3.17 Rock Mulch

The finished rock mulch surface must be smooth and uniform maintaining the original flow lines, slope gradients, and contours of the job. Rock mulch must be applied in a fashion not to tear up or damage the hydro-mulch when being placed. Methods and means of rock mulch installation are not specified and may vary as per access. Damaged hydro-mulch shall be replaced and no extra payment made therefore.

#### 632.3.18 Class C Slopes with over 50' of Slope Length

Class C slopes in excess of 50' of slope length (measured along the slope face from toe to crest) shall have the following treatment.

Class G rip-rap shall be used for the lower portion of the slope from the toe upwards to the point where there will not be more than 50' of slope length covered with 3/4 inch to one (1) inch rock mulch described in 632.2.5, "Rock Mulch for Class C Seeding," and Table 632.3.4:1, "Operations Sequence for Classes of Seeding." The rip rap shall be placed over the hydro-seeded and mulched surface in a way that does not damage the applied mulch treatment, shall be installed from the toe of the slope upwards and shall be one layer of Class G rip-rap in thickness.

#### 632.4 METHOD OF MEASUREMENT

The Contractor shall digitally provide for approval a to-scale printable revegetation plan as part of the submittals before the mandatory pre-seeding meeting. The plan shall identify each area by station, numerical order, project left, project right, and is to indicate the class of seeding as per Table 632.3.4:1, "Operations Sequence for Classes of Seeding." Quantities shall match those produced by construction staking and shall include all off-site areas.

The Contractor shall identify on the plan all areas identified by Construction Staking which have less than 4" of soil cover and qualify for Modified Class A treatment as per 632.3.5

An accompanying table to the plan shall be submitted showing the amount of each Material apportioned for each area on the Project and the acreage of that sub-area. Included in the plan shall be all off-Project areas requiring revegetation as enumerated in Section 632.5, "Basis of Payment."

**632.5 BASIS OF PAYMENT**

Pay Item	Pay Unit
<i>Class A Seeding</i>	Acre
<i>Class C Seeding</i>	Acre

**632.5.1 Revegetation Work Included in Payment**

The following revegetation Work items shall be considered as included in payment for the main items and shall not be measured or paid for separately:

- A. Tackifier for straw mulch;
- B. All compost mulch, fertilizer Materials, and water added at tilling;
- C. Rock for rock mulch;
- D. Moisture probe for straw bales;
- E. Weed removal and disposal prior to seed operations;
- G. Revegetation plan;
- H. Right of access permit to be provided by Contractor for inspection of off-site locations located on private property;
- I. Multiple mobilizations to meet NPDES requirements; and
- J. Construction staking

November 17, 2016

**SPECIAL PROVISIONS  
MODIFYING  
SECTION 664: LANDSCAPE PLANTING**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete Subsection 664.3.2 Care and Replacement in its entirety and replace with the following:

If the Contractor installs a drip irrigation system, the Contractor shall hand water the plants until the drip irrigation system is in place and operational.

Delete Subsection 664.5.1 Work Included in Payment in its entirety and replace with the following:

The following Work and items will be considered as included in the payment for the main items and will not be measured or paid for separately:

1. Furnishing, transporting, and planting of plants; and
2. Excavation, furnishing prepared backfill mixture, wrapping, staking, watering, care, and maintenance; of plants.

April 4, 2016

**SPECIAL PROVISIONS  
MODIFYING  
SECTION 702: CONSTRUCTION TRAFFIC CONTROL DEVICES**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Add to Subsection 702.5.1 **WORK INCLUDED IN PAYMENT**;

E. Removal of signs and devices as well as all other items associated with and required for installation or function of devices used for construction traffic control devices.

**SPECIAL PROVISIONS  
MODIFYING  
SECTION 704: PAVEMENT MARKINGS**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Add the following to Subsection 704.2.2 Reflectorized Glass Beads:

Glass beads are not required for black paint used for contrast pavement markings.

Delete the following sentence from Subsection 704.3.2 Equipment:

The Department will allow placing temporary striping during construction with other Equipment designed for application of paint or beads.

Add the following sentence to the end of Subsection 704.3.4.4 Number of Striping Applications:

Temporary reflectorized painted markings consist of a single (1) application of markings, unless otherwise specified in the Contract.

Add the following to the end of Subsection 704.3.4.5 Repair and Replacement of Unacceptable or Damaged Striping:

Temporary reflectorized painted markings shall be replaced or repaired when damaged, or when retroreflectance falls below minimum levels as defined in Table 704.3.4.5:1, at no additional cost to the Department. If problem areas are found, at the Department's discretion, the Department will take measurements at a minimum of every  $\frac{1}{4}$  (0.25) mile and an average will be calculated for every mile, as applicable. Measurements will be taken using 30-meter geometry in units of mcd/m<sup>2</sup>/lux. At the Department's discretion, the striping may be inspected at night to determine if the markings have sufficient retroreflectivity.

Table 704.3.4.5:1  
Temporary Reflectorized Painted Markings Minimum Retroreflectance

Stripe Color	Minimum Retroreflectance (millicandelas)
White	187.5
Yellow	112.5

Delete Subsection 704.3.5.2 Paint Application Rate and replace with the following:

For permanent markings, apply paint at a rate of 22 to 25 wet mils. (25.15 gal per mile of paint for a solid four (4) inch line and 6.31 gal per mile for a broken four (4) inch line).

For temporary markings, apply paint at a rate of 15 wet mils (16.5 gal per mile of four (4) inch solid and 4.13 gallons per mile for a broken four (4) inch line).



## 260

Apply other widths of striping at appropriate multiples of these minimum rates for solid and broken paint stripes.

Add the following to Subsection 704.3.5.5 Glass Reflectorizing Beads Application Rate:

Glass beads are not required for black paint used for contrast pavement markings.

Add the following to Subsection 704.5.2 Work Included in Payment:

F. Black out lines for contrast markings if specified in the Contract.

April 4, 2014

**SPECIAL PROVISIONS  
MODIFYING**

**SECTION 705: GENERAL REQUIREMENTS FOR TRAFFIC SIGNAL AND LIGHTING  
SYSTEMS**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete Subsection 705.5 BASIS OF PAYMENT and replace with the following;

**705.5 BASIS OF PAYMENT**

Signal/Lighting System Start-up Costs will be paid for the actual cost incurred, not to exceed the fixed amount entered by the Department into the Bid Schedule.

Provide the Project Manager with a detailed cost breakdown, including receipts and invoices of actual costs incurred.

For the purpose of bidding, the Department will enter into the Bid Schedule a fixed amount for Signal/Lighting System Start-up Costs.

<b>Pay Item</b>	<b>Pay Unit</b>
Signal/Lighting System Start-up Costs	Allowance

**SPECIAL PROVISIONS  
MODIFYING  
SECTION 802: POST CONSTRUCTION PLANS**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Delete Subection 802.3 BASIS OF PAYMENT and replace with the following;

**802.3 BASIS OF PAYMENT**

Post Construction Plans will be paid for the actual cost incurred, not to exceed the fixed amount entered by the Department into the Bid Schedule.

Provide the Project Manager with a detailed cost breakdown, including receipts and invoices of actual costs incurred.

For the purpose of bidding, the Department will enter into the Bid Schedule a fixed amount for Post Construction Plans.

Pay Item	Pay Unit
Post Construction Plans	Lump Sum

January 29, 2015

**SPECIAL PROVISIONS  
MODIFYING  
SECTION 901: QUALITY CONTROL/QUALITY ASSURANCE (QC/QA)**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

Add subsection 901.4.1 Aggregate Index to follow 901.4 EVALUATION OF MATERIALS FOR ACCEPTANCE.

**901.4.1 Aggregate Index**

**901.4.1.1 Description**

The AI combines test values from the Los Angeles Wear Test, Soundness Loss Test, and Absorption Test. The AI is a single value representing the overall quality of the source from which the aggregates are obtained. Do not use to evaluate individual aggregate stockpile quality.

**901.4.1.2 Sampling and Testing Procedures**

Determine Los Angeles Wear, Soundness Loss, and Absorption values for the AI equation using at least five (5) random test samples obtained from all stockpiles at the source in accordance with AASHTO T 2. Submit all of the five (5) samples to a Department approved private Laboratory for combination into a single sample. The Project Manager or the State Materials Bureau will have a list of approved private Laboratories. Extract a representative test sample from the single sample to determine the Los Angeles Wear and Absorption values. Prepare the sample used to determine the Absorption as follows:

Plus 3/4 in	1000 grams
3/4 in to 1/2 in	1000 grams
1/2 in to 3/8 in	1000 grams
3/8 in to #4	1000 grams

Separate the remaining amount of the single sample into five (5) test samples using the procedures in AASHTO T 248. Calculate a Soundness Loss value for each of these five (5) samples using Table 901.4.1.2:1, "Standard Gradation for Soundness Loss Testing."

Table 901.4.1.2:1  
Standard Gradation for Soundness Loss Testing

Sieve size	% passing
1 1/4 in	100
1 in	100
3/4 in	79
1/2 in	53
3/8 in	34
No. 4	0

Average the five (5) soundness loss results to obtain the overall soundness loss value for the subject aggregate pit.

#### 901.4.1.3 Testing of Aggregates

Perform the following tests using a Department-approved private Laboratory or the State Materials Bureau:

1. Los Angeles Wear (in accordance with AASHTO T 96, Method B);
2. Soundness Loss (in accordance with AASHTO T 104); and
3. Absorption (in accordance with AASHTO T 85 or NMDOT 001 (20066)).

Use the same private Laboratory for the entire project unless otherwise approved (in writing) by the Project Manager.

Obtain samples under the observation of the Project Manager or Department designee. Split samples into two (2) samples in accordance with AASHTO T 248, if requested by the Project Manager. The private Laboratory and the State Materials Bureau will each test one (1) sample. Send copies of test reports to the Project Manager.

#### 901.4.1.4 Frequency of Testing

Submit samples at least once every year to maintain continuous approval of Commercial Material Sources.

## 901.4.1.5 Equation

Calculate the AI of a coarse aggregate to the nearest whole number in accordance with the following equation:

$$AI = \frac{1}{3} \sqrt{LA^{2.2} + SL^{3.0} + A^{4.0}} \quad (1)$$

Where:

*AI* is the aggregate index

*LA* is the Los Angeles Wear, the percent of aggregate wear at 500 revolutions if tested in accordance with AASHTO T 96

*SL* is the soundness loss of the sample if tested in accordance with AASHTO T 104 using magnesium sulfate with a test duration of 5 cycles and a standard gradation

*A* is the absorption, the amount of moisture retained if tested in accordance with AASHTO T 85

Example:

1. Determine the L.A. Wear as a whole number – for example, 25;
2. Determine the Soundness Loss as a whole number – for example, 15;
3. Determine the Absorption as a whole number – for example, 3;
4. Calculate the value of the L.A. Wear taken to the 2.2 power – that is,  $25^{2.2} = 1189.8$ ;
5. Calculate the value of the Soundness Loss taken to the 3rd power – that is,  $15^3 = 3375.0$ ;
6. Calculate the value of the Absorption taken to the 4th power – that is,  $3^4 = 81.0$ ;
7. Add the value obtained from steps 4, 5, and 6 – that is,  $1189.8 + 3375.0 + 81.0 = 4645.8$ ;
8. Determine the square root of Step 7 – that is,  $\sqrt{4645.8} = 68.2$ ;
9. Divide the result from Step 8 by 3 – that is,  $68.2 \div 3 = 22.7$ ; The A.I. for this sample is 23.

## 901.7 BASIS OF PAYMENT

Replace Table 901.7:5 with the following:

Table 901.7:5			
Minimum Process Control Guidelines for Portland Cement Concrete Pavement (QC)			
Item	Property	Testing frequency	Test method
Fresh Concrete for PCCP	Unit Weight	1 per 125 yd <sup>3</sup>	AASHTO T 121
	Air Entrainment	1 per 125 yd <sup>3</sup>	AASHTO T 121
	Slump	1 per 125 yd <sup>3</sup>	AASHTO T 119
	Compressive Strength	1 per 125 yd <sup>3</sup>	AASHTO T 22, 23, 231
PCCP in Place	Thickness <sup>a</sup>	2 per 2,500 yd <sup>2</sup> <sup>b</sup>	—
<p><sup>a</sup>Complete corrective Work specified in Section 450.3.5.2, "Surfacing Smoothness Requirements," before determining pavement thickness</p> <p><sup>b</sup>Determine thickness by actual survey conducted before and after the construction of the PCCP at fixed, randomly selected locations.</p>			

November 23, 2016

## SPECIAL PROVISIONS FOR SECTION 203-A - UNSTABLE SUBGRADE STABILIZATION

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

### 203A.1 DESCRIPTION

This work consists of stabilizing unstable subgrade soils encountered in non-borrow sections such as cuts or existing grades within and not exceeding the top two (2) feet of finished subgrade elevation due to no fault or neglect of the Contractor. This work includes costs associated with design/development of the Contractor's proposed stabilization option, Materials, labor, tools, equipment, storage, laboratory and field testing, sampling, handling, excavation, disposal, removal, placement, hauling, processing with the subgrade, shaping, compacting, surveying, finishing to grade, proof-rolling the subgrade including all appurtenances, and incidentals necessary to complete the work.

For purpose of this Specification, unstable subgrade is defined as subgrade that is saturated, soft, gummy, pumping, and/or displaces with applied loading.

Subgrade modified by this specification is for stabilization only and is not considered in the structural design of the pavement structure; thus no modification of the pavement structure shall be made.

### 203A.2 MATERIALS

The Contractor shall use Materials included on the Department's current approved products list for its intended use or use Materials currently accepted in the Contract.

### 203A.3 CONSTRUCTION REQUIREMENTS

Where unstable subgrade is due to the failure of the Contractor to maintain adequate surface drainage, or is damaged due to the operations or any other fault or neglect of the Contractor, the unstable condition shall be corrected at no expense to the Department.

Prior to base course placement over subgrade or proposed stabilization option, the Contractor shall proof roll the subgrade with either a pneumatic roller weighing a minimum of 25 tons or a 4000 gallon water truck filled to capacity. Areas lacking sufficient stability, as defined above, in the opinion of the Project Manager shall be treated as unstable subgrade.



## 2

Areas that exhibit displacement under lightly loaded equipment may also be considered unstable by the Project Manager. For areas that become unstable prior to reaching subgrade level (i.e., foundations, intermediate lifts, etc.), the Project Manager may designate these areas as unstable.

The Contractor shall choose any of the stabilization options listed below unless otherwise indicated in the Contract. If site conditions warrant a change in the stabilization method, it shall be at no additional cost to the Department. The Contractor shall submit options to the Project Manager for concurrence prior to stabilization.

1. Ripping, drying, and recompacting;
2. Excavation and replacement with material that meets or exceeds the project design R-value with laboratory tests performed in accordance with AASHTO T-190;
3. Use of Base Course, RAP, or select backfill;
4. Installation of underdrains and associated geotextiles and material;
5. Geotextiles, geogrid base, and/or reinforcement materials;
6. Blending of existing materials with materials approved by Project Manager; or
7. Combinations thereof.

The Project Manager may approve the use of excess Material obtained within the ROW that has previously been shown to be stable and workable. The Material associated with the listed options and the work involved to obtain and place the material shall be incidental to the “unstable subgrade stabilization” item and will not be paid separately. Areas disturbed within the ROW but not designated in the Contract shall be revegetated in accordance with Section 632, “Revegetation” at the Contractor’s expense.

After stabilization and prior to placement of the base material, the Contractor shall proof roll the stabilized subgrade with either a pneumatic roller weighing a minimum of 25 tons or a 4000 gallon water tank filled to capacity and the subgrades shall exhibit no displacement when proof rolled.

The Contractor shall make the necessary adjustments in the equipment or operation so that underground utilities and permanent structures are not damaged.

The Contractor shall handle the processing of Material in such a manner that the dust or debris created by the operation will not be hazardous to the public or workers.

The Contractor shall construct stabilized subgrade in such a manner that proper drainage is maintained.

When within the top six (6) inches of the subgrade elevation, the stabilized subgrade shall meet the grade and compaction requirements of SECTION 207 - SUBGRADE PREPARATION, or as approved by the Project Manager. Additional payment will not be made under Item Number 207000 – “Subgrade Preparation”.

### 203A.3.1 Equipment

Stabilization of unstable subgrade shall be performed with a machine or combination of machines or equipment that will produce a satisfactory product meeting the requirements for ripping, drying, recompaction, excavation, replacement, and blending of Materials as provided in these specifications.

Single-shaft or multiple-shaft mixers are required for blending of existing materials with materials approved by Project Manager. Agricultural disks or motor graders are not acceptable mixing equipment unless Contractor can demonstrate thorough mixing and processing to the satisfaction of the Project Manager.

### 203A.3.2 Acceptance

The stabilized subgrade shall meet the requirements of SECTION 303 - BASE COURSE, subsection 303.3.1, "Preparation of Subgrade." Prior to placement of the base material, the stabilized subgrade shall be proof rolled with either a pneumatic roller weighing a minimum of 25 tons or a 4000 gallon water tank filled to capacity and shall exhibit no displacement when proof rolled. Stabilized subgrade locations that continue to exhibit displacement are to be corrected at no additional cost to the Department.

### 203A.4 METHOD OF MEASUREMENT

Unstable subgrade stabilization shall be measured from the subgrade elevation as shown in the Contract, by the square yard regardless of depth up to two (2) feet.

### 203A.5 BASIS OF PAYMENT

The Department will only pay for the accepted quantities of unstable subgrade stabilization in accordance with Section 203A.3.2, "Acceptance."

#### PAY ITEM

*Unstable Subgrade Stabilization*

#### PAY UNIT

Square Yard

### 203A.5.1 Work Included in Payment

The unit price bid per square yard shall include costs associated with the following:

1. Design/Development of Contractor proposed stabilization option(s);
2. All Materials required for stabilization;
3. Labor, tools, and equipment;
4. Sampling and laboratory and field testing;
5. Handling, excavating, removing, disposing, hauling, and placement;
6. Processing Material with existing subgrade;

# 4

7. Shaping, compacting, surveying, finishing to grade, proof-rolling, and all appurtenances and incidentals necessary to complete the work;
8. Subgrade Preparation; and
9. Revegetation of areas disturbed within the ROW, used to obtain Materials for stabilization.

March 24, 2017

**SPECIAL PROVISIONS  
FOR  
SECTION 512-A: SPECIAL CONCRETE  
(RAPID-HARDENING CONCRETE)**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

**1. DESCRIPTION**

This work consists of placing Rapid-Hardening Concrete (RHC)

**2. MATERIALS**

The Contractor shall test materials in accordance with AASHTO and ASTM methods or other test procedures designated by the Department. The State Materials Bureau will decide questions about test procedure interpretation. The Contractor shall remove segregated non-complying and rejected material that fails to meet the requirements as directed by the Project Manager and at no additional cost to the Department.

The Contractor shall use pre-approved materials in accordance with the current Department's *Approved Products List*. The Department will not allow changes in the source or character of the materials without notifying the State Materials Bureau and obtaining written approval.

**2.2 Rapid-Hardening Cement Concrete Mixture**

The contractor shall use a Rapid-Hardening Concrete mixture that has been developed in an approved testing laboratory to achieve a compressive strength of at least 3000 psi in five (5) hours and 4000 psi at 24 hours and that has been reviewed and approved by the State Concrete Engineer in accordance with Section 509 for the freeze-thaw risk zone in which the project is located.

The concrete strength must achieve 3000 psi prior to opening to traffic.

**2.3 Aggregate**

The Contractor shall use aggregates that are the same as those used on the approved mixture design. The Contractor shall not use aggregate from a different source as that shown on the approved mix design.

If the concrete mixture is approved under the conventional stockpile procedures, the Contractor shall ensure the gradations comply with Table 509.2.4.2.3:1 "Coarse Aggregate Gradation Requirements" and Table 509.2.4.3.3:1 "Fine Aggregate Gradation Requirements."

# 6

If the concrete mixture is approved under the combined gradation procedures, the Contractor shall ensure that the most current gradations have been reviewed, and the Coarseness Factor and the Workability Factor comply with Section 509.2.8.3.1 “Combined Gradations.”

## 2.4 Curing Materials

See section 510.2.3 “Curing Materials”

## 2.5 Water

See Section 509.2.6, “Water.”

## 3. CONSTRUCTION REQUIREMENTS

### General Use

#### 3.1 Freeze-Thaw

The Contractor shall use a concrete mixture which has been approved for use in a freeze-thaw zone of equal or greater risk than the zone in which the project is located, in accordance section 509.2.8.2 “Freeze-Thaw Risk Zones”.

#### 3.2 Plastic Properties

The plastic properties shall be measured after all of the mix constituents have been thoroughly mixed at full mixing speed for at least five (5) minutes. However, once the initial sample has been obtained, the mixture shall be immediately placed into its intended location at the Contractor’s discretion.

The Contractor shall test the plastic properties of RHC in accordance with section 3.8.10.3 of this special provision.

The plastic properties measured shall be the slump flow, air, temperature and unit weight. The slump flow of the concrete shall be determined in accordance with AASHTO T-347. The air content will be determined by AASHTO T-121.

The target slump flow shall not exceed 20” and there shall be no evidence of segregation.

Measure the air content in accordance with AASHTO T 121. The target air contents shall be in accordance with the freeze/thaw risk zone as described below

1. Low Risk Freeze/Thaw Zone – from 4.5% to 8.0%; or
2. Medium Risk Freeze/Thaw Zone – from 5.0% to 8.0%; or
3. High Risk Freeze/Thaw Zone – from 6.0% to 8.0%.

#### 3.3 Troubleshooting

If the approved mixture design fails to meet requirements, the Project Manager will immediately contact the State Concrete Engineer. The State Concrete Engineer will work with the project team and with the PTL that designed the mixture to resolve the problems. Efforts to evaluate problems with the concrete do not relieve the Contractor of the responsibility to provide a Rapid-Hardening Concrete mixture that meets project requirements.

### 3.4 Batching

The Contractor shall produce RHC in accordance with AASHTO M 157, Section 9 to 11 or ASTM C685. Ensure that production facilities are certified in accordance with the National Ready Mix Concrete Association (NRMCA) criteria for concrete production facilities.

### 3.5 Batching Plant

The Department may review and approve facilities and equipment before batching operations begins. Ensure that batching plants have clearly separated aggregate bins or stockpiles; silos or acceptable containers for the cement and fly ash; weighing hoppers; and scales. Ensure that the batch plants are equipped to proportion aggregates, bulk cement and fly ash using calibrated weighing devices. Weigh aggregates on separate scales or accumulatively on a single scale. If weighing fly ash on the same scale as the cement, weigh the cement first, and then add the fly ash.

Ensure that the batch plant operator has a direct view or live video of each scale and admixture sight tube while preparing batches of concrete. It is not sufficient to be able to see only the computer measurements. Ensure that the batch plant is capable of:

1. Accurately weighing and batching materials for the cement/fly ash concrete mixture within the tolerances specified;
2. Providing readily visible scale dials or instrumentation devices for admixture bottles, beam scales and load cells, even if using a computer to prepare the batch;
3. Using weighing hoppers of sufficient size to contain the material without loss or spillage; and
4. Properly combining and re-combining various mixture components to obtain the required uniformity and consistency.

Use weighing hoppers that efficiently discharge weighed materials for each batch. Ensure that the material charging equipment can deliver the batch to the mixer without loss or spillage. Provide scales for weighing aggregates, cement, water, and fly ash in accordance with Section 109.1, "Measurement of Quantity."

### 3.6 Rapid-Hardening Cement and Fly Ash

The Contractor shall use cement and fly ash in bulk or in sacks. Weigh fractions of sacks before using cement or fly ash in a concrete batch. Measure cement and fly ash by weight. Weigh bulk cement and fly ash on an approved scale, except when using continuous proportioning and mixing equipment.

# 8

Provide cement and combined cementitious weights within  $\pm 1\%$  of the required weights. If the weight of cementitious materials is expected to weigh less than 1,000 lb, ensure that those materials weigh within 30 lb of the target weight.

Any load that contains a cement weight or a total cementitious weight that differs from the target cement or total cementitious weight by more than  $\pm 1.0\%$  will be rejected and not allowed to be placed on the project. The Contractor shall dispose of rejected loads at no additional cost to the Department.

Equip cement and fly ash scales and hoppers with a device that indicates the complete discharge of cement and fly ash into the mixer. Contain bulk cement and fly ash in weather tight bins and weighing hoppers. Do not suspend discharge chutes from the weighing hoppers. Arrange the discharge chutes so that cement and fly ash do not lodge in or leak from them.

Protect cement and fly ash from moisture. Store different brands or types of cement and flyash from different production facilities separately. Provide separate, identifiable blended portland-fly ash cement storage at the project or plant site. Store Cement and fly ash at the batch facility separately.

## 3.7 Water

Mixing water consists of free water, ice added to the batch and surface moisture on the aggregates. Measure the added water by weight or volume to ensure that the amount of water in the mixture design is not exceeded. Measure added ice by weight. For truck mixers, discharge the wash water before loading the next batch of concrete.

## 3.8 Aggregates

### 3.8.1 Stockpiles

Ensure the separation of aggregate stockpiles of different sizes or from different sources. Stockpile aggregates so that the coarse and fine particles do not separate. Provide stockpiles that can produce enough concrete for the section constructed during a scheduled operation. Ensure that aggregates are not contaminated by material from adjacent stockpiles or from contact with the ground, dust, or other deleterious materials. Do not use aggregates that become segregated or mixed with deleterious material. Do not use frozen lumps of aggregate in concrete batching.

Ensure that a "sacrificial" layer of the same size aggregate at least 6 inches deep is maintained below the bottom of the stockpile so that the front-end loader will not pick up non-complying materials that would contaminate the concrete mixture.

### 3.8.2 Gradations

The Contractor shall perform all gradation tests to fulfill the requirements of this section and must be performed by TTCP certified technicians.

The Project Manager may cancel concrete placements that have gradation data that is more than 7 Days old.

1. If the mixture design is approved with the Conventional Stockpile Procedure, ensure that the stockpile gradations comply with the standard gradation requirements for each sieve size shown in Table 509.2.4.2.3:1, "Coarse Aggregate Gradation Requirements," and Table 509.2.4.3.3:1, "Fine Aggregate Gradation Requirements."

2. If the mixture design is approved with the combined gradation procedure, it is the Contractor's responsibility to continuously monitor the gradation of each of the stockpiles. Provide new gradation results to the Project Manager, in one of the following ways:

2.1 If placing more than 1000 yd<sup>3</sup> per week, provide new gradation results once per 1000yd<sup>3</sup>.

2.2 If regularly making placements that total less than 1000 yd<sup>3</sup> per week, provide new gradation results once per week.

2.3 If placements are irregular and limited to no more than two placements in a single week, provide new gradation results at least 24 hours before the first scheduled placement in any week.

3. The Contractor's responsibilities to monitor gradations are not related to the QC testing requirements. The Department considers these responsibilities to be part of the standard operation and maintenance of the batching facilities.

4. Determine if the combined gradation is within the following limits:

4.1 Coarseness factor is  $\pm 3$  percentage points of the value in the approved mixture design;

4.2 Workability factor is  $\pm 2$  percentage points of the value in the approved mixture design;

5. The aggregate batch weights will automatically be adjusted when the gradation information determined by the supplier is entered into the Field Report form. The supplier will be required to use the most recent gradations to determine if the Coarseness Factor or the Workability Factor does not comply with 4.1 or 4.2 above. If the Coarseness Factor or the Workability Factor do not comply with 4.1 or 4.2 above, the mix batch weights must be adjusted to bring these factors into compliance. When adjusting these factors, adjust them to the tolerances in 5.1 and 5.2, below.

5.1 Coarseness factor is  $\pm 2$  percentage points of the value in the approved mixture design;

5.2 Workability factor is  $\pm 1.5$  percentage points of the value in the approved mixture design;

6. If the gradation tolerances in 4.1 and 4.2 cannot be met, do not place concrete until the gradations are corrected to meet the designated tolerances.

### 3.8.3 Batch Weights



# 10

The Contractor shall ensure batch aggregate target weights over 1,000 lb are within  $\pm 2\%$  of the target weight. For target weights less than 1,000 lb, batch to within  $\pm 50$  lb of the target weight.

Any loads with an actual batch weight that differs from the target batch weight by more than  $\pm 2\%$  will be rejected from the project and cannot be placed on the project. Dispose of rejected loads at no additional cost to the Department.

## 3.8.4 Moisture Control

1. For a manually operated facility or for hoppers not equipped with automatic moisture sensors, measure the moisture content of each stockpile not monitored by automatic moisture sensors at least every 4 hours, or as required by changing moisture conditions within the stockpiles.

2. For plants equipped with automatic moisture probes, for each stockpile monitored by an automatic moisture probe, measure moisture content manually at least once a day. Compare the manual measurement immediately before preparing the first concrete load to the measurement shown by the moisture sensing equipment. If the measurements differ by more than 0.5%, re-correlate the moisture probe.

For stockpiles not monitored by an automatic moisture probe, follow the requirements of 510.3.2.4.4(1).

3. Send a certificate showing the moisture content determined by manual methods in accordance with Paragraph 4 below, and the moisture correlation to the Project Manager with the first load of concrete. If this information is not included with the first load of concrete delivered to the project, that load of concrete and all subsequent loads of concrete are subject to rejection until the information is received at the project.

4. Determine the aggregate moisture content to the nearest 0.5% in accordance with one of the following procedures:

4.1 AASHTO T 217: The shelf life of the calcium carbide is relatively short. Closely monitor the age of the calcium carbide and replace it in strict accordance with the manufacturer's recommendations.

4.2 AASHTO T 255: The Department will allow the hot-plate or microwave methods for this purpose, as long as no material is lost and the pan is continuously agitated during the drying process.

5. Provide the following information on the moisture certificate to the Project Manager:

5.1 Pan weight (it is not acceptable to tare out the pan weight on scales equipped to do so);

5.2 Wet weight of the pan and the sample;

5.3 First dry weight of the pan and the sample;

5.4 Second dry weight of the pan and the sample;

5.5 Third dry weight of the pan and the sample (if necessary);

5.6 Absolute moisture content of the sample;

- 5.7 The moisture probe reading from the tested sample (if equipped); and
- 5.8 The calculated difference between the actual moisture content test and that shown by the moisture sensing equipment.

Allow washed aggregates to drain before use. The Project Manager may require the aggregates to remain in the stockpile or storage area for longer, if the moisture contents are excessive.

### 3.8.5 Air-Entraining and Chemical Admixtures

Store admixtures in separate containers to avoid contamination, evaporation, and damage. Protect liquid admixtures from freezing and from damaging temperatures. For admixtures used as suspensions in non-stable solutions, provide agitating equipment to ensure the thorough distribution of the ingredients. Measure liquid admixtures within  $\pm 3\%$  of the target amount.

### 3.8.6 Mixing

Ensure that the uniformity of the concrete mixture complies with AASHTO M 157, Section 10.2 or ASTM C685. If using a central plant mixer it must have a rated mixing capacity of at least 3 yd<sup>3</sup>. Batch and deliver concrete in accordance with NRMCA standards.

#### Extended Delivery Time:

If the mixed concrete cannot be delivered to the project within 20 minutes from the time of batching then all cement and all of the chemical admixtures shall be added to the mixer truck after it has arrived at the project. All other mix constituents can be batched at the approved batch plant and delivered to the project prior to the addition of the cement and the chemical admixtures.

If fly ash has been approved in the mix design, then it must also be added with the cement and the chemical admixtures after the mixer truck has arrived at the project.

### 3.8.7 Transporting

A revolving-drum mixer truck or a volumetric concrete mixing truck must be used to transport RHC.

### 3.8.8 Truck Mixers and Agitators

Equip agitator trucks with a plate directly attached to the truck in a readily visible location, labeled with the specific truck properties, including the designated drum mixing speed.

Keep documentation for review by Department personnel upon request to show that the mixers and agitators have been inspected in accordance with NRMCA Guidelines within the last 12 months.

Department personnel will check the water tank site tube when the truck arrives at the project site. If there is water missing from the tank, the Department will reject the truck unless the Driver can account for the missing water.

# 12

## 3.8.9 Upon Arrival at the Project (and after addition of the cement, fly ash and the chemical admixtures if added at the project site)

Re-mix the RHC that arrives at the project site in agitator trucks as follows:

1. For RHC that is completely batched with the cement and all admixtures mixed in a central mix plant: mix at the designated mixing speed for a minimum of 2 min, before discharging;
2. For RHC mixed inside an Agitator Truck or one to which the cement, fly ash (if necessary) and the admixtures are added after arriving on-site: mix at the designated mixing speed for a minimum of 5 min, before discharging;
3. If any water, water-reducing admixtures, entrained air, or other ingredients are added to the RHC, mix the additional material at the designated mixing speed for at least 5 min before discharging.

## 3.8.10 Placing

### 3.8.10.1 Temperature and Weather Limitations

See Section 511.3.4, "Temperature and Weather Limitations."

### 3.8.10.2 Mixing Time

"Mixing time" is the elapsed time from when the cement is exposed to the aggregates until the RHC has been placed into its final location. Do not use RHC mixed less than the minimum specified time. Insure that the RHC has been completely discharged from the truck and placed with sufficient time for the Contractor to provide the required surface finish. Adjust the dosage rate of the citric acid to insure sufficient time for placement AND all finishing operations if required.

RHC arriving at the project with a temperature greater than 90° F cannot be used without specific approval from the Project Manager.

### 3.8.10.3 Concrete Sampling and Testing

The Department will test for acceptance, acceptance shall be based on compressive strength at 24 hours.

The Contractor shall test for Quality Control

1. Measure concrete for specification compliance only by the test methods shown above. The Department will not accept results from the in-place test methods described in Section 510.3.5.2, "In-Place Concrete Strength Measurements" as an alternative to acceptance requirements for "full depth repairs".

The Department will allow results from the test methods described in Section 510.3.5.2 as an alternative to acceptance requirements for "partial depth repairs".

2. The Contractor will determine the fresh properties for samples obtained for each of the first three (3) trucks to determine the admixture dosages required to achieve setting time, slump flow and entrained air contents as targeted in "Plastic Properties" in the Construction Section at the beginning of this Special Provision. If necessary subsequent trucks will be tested until consistent mixture properties are being achieved. It is the Department's option to test trucks as often as is felt to be necessary to properly ensure consistency of the concrete mixture being placed.
3. Samples to be measured by the Department for compressive strength compliance with the Contract Requirements shall be obtained as follows:
  - a. One set from a randomly selected load in the first (3) trucks delivered;
  - b. One randomly selected load from each six (6) truck sub-lot or portion there-of for the duration of the placement.
4. The Department will provide test results to the Contractor after the final compressive strength tests for each set of test specimens. Mold and cure concrete cylinders for compressive strength tests in accordance with AASHTO T 23.
5. Use a rod to consolidate the concrete for all air content, unit weight and compressive strength tests. Do not use a rod to consolidate the concrete for the slump flow test.
6. Provide all necessary support for all testing and to maintain sufficient safe storage space, including but not limited to generators (and alternate power sources, as needed).
7. Immediately after molding, begin curing of test cylinders by submerging in a water bath with a temperature of  $70\text{ }^{\circ}\text{F} \pm 10^{\circ}$ . Do not exceed 25 minutes from the time the concrete was sampled to the start of the initial curing. Use water that complies with section 510.2.4 "Water," for the initial curing.
8. All cylinder curing containers for testing of the concrete must be in the same location, and within 50 ft. of the testing site, chosen in advance by Department inspection personal unless an alternative location has been approved by the Project Manager prior to the placement. The Project Manager cannot authorize any location that does not provide sufficient time for the casting of the test specimens and subsequent delivery to the initial curing location within the 25 minutes allowed to begin initial curing of the test specimens.

Maintain the water-filled containers with the test cylinders undisturbed for a minimum of 21 hours, but not more than 27 hours from the time of placement.
9. When one or more of the cylinders are ready to be tested, strip the concrete cylinders and complete the testing in accordance with TTCP procedures.
10. Protect the test specimens from being damaged in any way. Specific attention will be paid to protection from sun, wind, rain, vibrations, moisture loss and any sudden drops or impacts during transport.

11. The Contractor shall be responsible for verifying all in place concrete strength requirements for traffic loadable condition in accordance with section 510.3.4.3 for “full depth repairs”, 510.3.5.2 for “partial depth repairs”- and 2.2 of this Special Provision for all repairs.

### 3.8.11 Superplasticizers

If using a superplasticizer, do not exceed a spread of 20 inches after adding and mixing the superplasticizer into the concrete. Check super-plasticized concrete for segregation before and during placement. Do not place segregated concrete.

### 3.8.12 Acceptance

#### 3.8.12.1 Concrete Strength

Determine the compressive strength for compliance by averaging three concrete cylinder test results from the same concrete sample and tested at the designated age. Make, handle, and store in accordance with AASHTO T 23 , Section 10.2.1 and test in accordance with AASHTO T 22 as certified by TTCP. Consider the result from a single cylinder only as an indicator. A single cylinder result will not be considered an actual strength measurement.

#### 3.8.12.2 Individual Strength Test

The Department will make at least 4 cylinders for each set. The Department will test the cylinders for acceptance at 24 hours. The average of three (3) of the cylinders tested at 24 hours will determine the Individual Strength Test. The fourth cylinder will be reserved to test at 28 days unless any of the following conditions exist:

1. There is a visible cylinder defect or a defect in the capping.
2. A significant irregularity occurred while loading the test specimen to failure, such as a sudden load burst, cyclic or pulsating loads, or a loading rate not in accordance with AASHTO T 22.

#### 3.8.12.3 Compressive Strength Compliance of Concrete Based on Cylinders

The Department will accept concrete based on the compressive strength cylinder tests when the compliance test equals or exceeds the specified strength at 24 hours.

If the compliance test does not meet cylinder-based acceptance requirements, the Department will review the strength tests and notify the Contractor whether the concrete will be accepted at a reduced price, or if the concrete must be removed and replaced in accordance with section 510.3.5.5 “Price Adjustments”.

## 4. METHOD OF MEASUREMENT

The Department will measure Special Concrete (Rapid Hardening Concrete) using the dimensions shown in the Contract or approved modifications.

## 5. BASIS OF PAYMENT

PAY ITEM

PAY UNIT

Special Concrete

Cubic Yard

## SPECIAL PROVISIONS FOR SECTION 512-D: ULTRA HIGH PERFORMANCE CONCRETE

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

### 1 DESCRIPTION

#### 1.1 General

This work shall consist of batching, pouring, curing and grinding Ultra-High Performance Concrete (UHPC) deck closure joints between the precast deck panels as shown in the contract documents. A Trial Batch and Mock-up Pour are required.

The Contractor and UHPC Manufacturer (hereafter Manufacturer) shall furnish all materials, storage, handling, tools, equipment, labor and other appurtenances necessary to complete the work. The UHPC material shall be supplied by the Manufacturer. The mixing, and placing equipment shall be supplied by or approved by the Manufacturer. Work associated with UHPC shall be performed in accordance with the Manufacturer's published recommendations.

All testing (unless otherwise stated herein) shall be performed by the Contractor and UHPC Manufacturer using ACI Certified Technicians.

The Contractor's field foreman, the Manufacturer's Representative(s), their Technician(s) required for testing, and the Project Manager shall be present during the Trial Batch and Mock-up Pour, Pre-Pour Meeting, and the Production Pour.

All information shall be provided in English units.

### 2 MATERIALS

#### 2.1 Ultra High Performance Concrete

UHPC is a cementitious composite material composed of an optimized gradation of granular constituents, water, admixtures and a high percentage of discontinuous internal steel fiber reinforcement. The material is to be a self-leveling, self-consolidating cementitious UHPC containing a well-graded matrix so as to provide ductility in bending and an ultra-low permeability. All of the components of the UHPC mixture are to be supplied by a single material manufacturer.

UHPC shall be a premixed ultra-high performance composite material with the manufacturer's recommended steel fibers and admixtures meeting the following material requirements:

##### 2.1.1 Premixed Cementitious Material

The premixed cementitious material shall be from the Ductal product line, manufactured by LafargeHolcim.

### 2.1.2 Admixtures

Use only admixtures approved in writing by the Manufacturer. With Manufacturer approval, accelerators, polycarboxylate-based super-plasticizers, and phosphonate-based super-plasticizers may be added to the UHPC mix.

### 2.1.3 Water

Provide water in accordance with Section 509.2.6 and manufacturer's recommendations. If concrete temperatures rise above 80° F, ice cubes may be required to decrease mix temperatures in lieu of liquid water.

### 2.1.4 Steel Fibers

Provide steel fibers in accordance with ASTM A 820, Type 1, cold drawn high-carbon steel with a minimum tensile strength of 290,000 psi. Minimum steel fiber content shall be 2% of the mix's dry volume. The steel fibers shall be in accordance with Section 106.12, "Preference for Domestic Materials".

### 2.1.5 UHPC Material Test Performance Properties

UHPC material used on the project shall meet the performance criteria in Table 2.1-1 UHPC Material Test Performance Properties.

**Table 2.1-1. UHPC Material Test Performance Properties**

<b>Description</b>	<b>Test Method</b>	<b>Acceptance Criteria</b>
Compressive Strength	ASTM C39 with C1856/C1856M modifications	21,000 psi at 28 days, 14,000 psi at 4 days,
Long-Term Shrinkage	ASTM C157 with C1856 modifications, 28 days	≤ 800 microstrain
Freeze-Thaw Resistance	ASTM C666A with C1856 modifications (300 cycles)	Relative Dynamic Modulus of Elasticity > 99%
Rapid Chloride Permeability	ASTM C 1202 with C1856 modifications	≤ 360 coulombs
Chloride Ion Penetration	C1202 (AASHTO T 259, ½" depth)	< 0.1 lbs/cy
Abrasion Resistance	ASTM C 944 with C1856 modifications, double load abrasion device, 6" cores	< 0.73 grams lost
Scaling Resistance	ASTM C 672	No Scaling
Alkali-Silica Reaction	ASTM C1260	≤ 0.10%
High Strength Steel Fibers		> 290 ksi, 2% by volume
Flowability	ASTM C1437	7 to 10 inches



Water/Cement Ratio		≤ 0.25
Alkali-Silica Reaction (ASR)	ASTM C1260	Innocuous

2.2 High Molecular Weight Methacrylate (HMWM)

The Contractor shall apply low viscosity sealer in accordance with Section 535 to unacceptable cracks.

3 CONSTRUCTION REQUIREMENTS

3.1 Submittals

3.1.1 Manufacturer’s Product Data

At least 90 Days prior to construction, and prior to conducting the Trial Batch and Mock-up Pour, submit the UHPC material product Manufacturer’s testing data demonstrating compliance with the material requirements to the Project Manager.

3.1.2 Quality Control Plan

A minimum of 30 Days prior to the Trial Batch and Mock-up Pour, the Contractor shall submit a UHPC Quality Control Plan The Manufacturer shall provide Quality Control on site for the UHPC using the Manufacturer’s on site Representatives. A minimum of one Manufacturer’s Representative shall provide quality control of the mixing operation and placement operation. A second on site Representative is required if three or more mixers are used for batching operations.

3.1.3 Construction Procedures

A minimum of 30 Days prior to the Trial Batch and Mock-up Pour, and 90 Days prior to placing the UHPC closure pours, the Contractor shall submit construction procedures to the Project Manager for approval. The construction procedures must be consistent with the Manufacturer’s recommendations. The construction procedures shall include, but not be limited to:

1. The Trial Batch and Mock-up Pour procedures – materials, equipment, and procedures, including forming and placement details, casting, testing and storing cylinders.
2. The Production Pour procedures – materials, equipment, and procedures for the closure production pours and the casting of the test cylinders. The submittal shall include information on the forming details, timing and sequencing of the pours, the number of crews and equipment used to mix and place the UHPC. Curing of the closure pours and the cylinders shall be included here, as well.

3.1.4 Experience of the Manufacturer’s Representative

The Contractor shall submit the experience of the Manufacturer's Representative(s) who will be present at the pour(s). The UHPC manufacturer's representative shall have a minimum of three years experience or five projects providing oversight of mixing and placing UHPC.

### 3.2 Trial Batch and Mock-Up Pour

A minimum of 60 Days prior to the proposed use of UHPC for the production closure pours and 30 Days prior to the fabrication of the production precast deck panels, the Contractor shall perform a Trial Batch and Mock-up Pour. The Trial Batch and Mock-up Pour shall not proceed until all related submittals have been reviewed and accepted. The Trial Batch and Mock-up Pour shall take place at an off-site location proposed by the Contractor and agreed to by the Project Manager.

It is acceptable for the Trial Batch material to be used for the Mock-up Pour.

#### 3.2.1 Trial Batch

The Trial Batch shall be representative of the production pour and shall consist of the same materials, equipment, methods of mixing, testing, cylinder preparation, and curing. UHPC batch temperatures shall be recommended by the Manufacturer and shall be representative of the proposed batch temperatures required for the production pours. The temperature shall be recorded.

The basis for acceptance of the Trial Batch test results will be that the concrete compressive strength at 7 days is equal to or greater than 14,000 psi. The 2 day, 4 day and 28 day test results shall be recorded for information only. Trial Batch test results shall be submitted to the Project Manager for review and acceptance. If the material fails to meet this acceptance criteria, the Contractor may be required to perform additional Trial Batches. Delays in achieving acceptance due to material failure shall not be considered cause for changes to the contract schedule or justification for claims by the Contractor.

#### 3.2.2 Mock-up Pour

The Mock-up Pour shall be a simulation of the production closure pour, including the amount of hydrostatic pressure, and shall consist of the same UHPC materials, equipment, mixing, batching, forming, surface preparations, placement, making of test cylinders, quality control by the Manufacturer's representative, and curing as for the production closure pours joining the precast deck panels. The Mock-up shall consist of linking two precast deck panels together with a closure pour of exactly the same dimensions and reinforcement as the production panels. Uncoated reinforcement may be used for the Mock-up. Each of the panels will be a minimum of 3 feet wide, 20 feet long, and of the same thickness and edge profile as the production panels.

As with the proposed production closure pours, the Mock-up joints shall be over-poured with the UHPC material by 1/4 inch to 3/8 inch above the tops of the joining precast concrete edges to account for settlement. Curing of the joint shall be as specified. After curing is completed, the Contractor shall diamond grind the closure pour to demonstrate to the Project Manager the outcome and effective use of the equipment proposed to be used for the production closure pours.

A minimum of one slump flow test for each batch of UHPC during the Mock-up shall be performed and recorded by the Contractor for Quality Control. The slump flow shall be approved by the Manufacturer, prior to being placed in the Mock-up closure pour joint.

If the slump is not acceptable, the Manufacturer's Representative shall be consulted and a new batch shall be mixed, if required. Water shall not be added to increase the slump without the approval of the Manufacturer's Representative. If required to adjust the slump, additives shall only be added as directed by the Manufacturer's Representative. The Contractor shall provide a copy of the daily report to the Engineer within 24 hours after completion of that day's work.

Acceptance of the Mock-up shall be by the Project Manager, and shall be based upon the adequacy of the forms, the placement procedure, curing method, and final surface profile.

### **3.3 Production Pour**

#### **3.3.1 Approval to Proceed to Production Pour**

No work for the fabrication of the precast deck panels or the UHPC closure pours shall commence until the results of the Trial Batch, the Mock-up and all required submittals have been accepted by the Project Manager.

#### **3.3.2 Pre-Pour Conference**

A Pre-Pour Conference shall be held on-site no less than 24 hours prior to start of the Production Pour. The Project Manager will schedule the meeting, the Contractor and the Manufacturer's Representative shall facilitate the meeting. The objective of the meeting is to clearly outline the procedures for batching, mixing, moving, pouring, finishing, and curing of the UHPC material.

#### **3.3.3 Equipment**

The Contractor shall have all equipment to be used for mixing, placing, and finishing of the UHPC accepted by the Representative prior to the start of work.

1. **Mixing Equipment:** Batch UHPC on site with mixing equipment specified and approved by the manufacturer. A backup generator shall be on-site at all times during mixing operations.
2. **Placing and Finishing Equipment:** The material shall not be internally vibrated.

#### **3.3.4 Formwork, Batching, Mixing, and Curing**

The Manufacturer's Representatives shall provide written acceptance on the quality of the UHPC being placed and have the authority to stop work. The Representatives shall be knowledgeable in the supply, mixing, movement, placement, and curing of the UHPC material.

The design and fabrication of forms shall follow submitted and accepted Construction Procedure and the recommendations of the Manufacturer. The forms shall be coated to prevent absorption of water as per the Manufacturer's recommendations. Due to the highly flowable nature of UHPC, leakproof formwork is essential and thus, the Contractor shall ensure that the formwork is water tight and that the UHPC components will not leak out. Use only properly secured solid high density EVA foam of appropriate size. Backer rod shall not be permitted. Trapped air must be provided an exit so that the space can be filled by UHPC

Prior to placement, the Contractor shall ensure that the precast surface is roughened to provide an exposed aggregate surface with an average 0.25 inch amplitude. The amplitude shall not exceed  $\frac{1}{2}$  the diameter of the course aggregate. Ensure that the joints are clean and free of debris.

Precast surface shall be kept wet for at least eight hours prior to placing the UHPC and allowed to dry to a saturated surface dry (SSD) condition just prior to placing the UHPC.

Deliver materials in undamaged packaging to the batch site. The Contractor shall provide for the proper storage of premix, fibers and additives as required by the Manufacturer's specifications in order to protect materials against loss of physical and mechanical properties.

The Contractor shall follow the mixing and batching procedures as recommended by the Manufacturer. The UHPC closure pours shall be filled and over-poured by 1/4 inch to 3/8 inch above the precast deck panels in accordance with the Manufacturer's recommendations. Overfill UHPC joints with a positive head to provide for settlement. Hardened UHPC joints must be within a tolerance of -0", +1/8" of the precast panels prior to grinding.

UHPC shall be placed from the lower to the higher elevation of each closure pour without the use of vibration. Place new batches of UHPC behind the leading edge of the flow from the previous placement to maintain the distribution of the steel fibers. Rodding may be used in situations where two successive pours meet with the approval of the Representative.

The UHPC placed in the form shall be cured according to the Manufacturer's recommendations to attain the required strength specified herein. This shall include, but may not be limited to, sealing the area of the closure pour with a sheet of plastic to protect it from the weather and debris, and regulate the hydration process. UHPC shall be cured at the range of temperatures as specified by the Manufacturer in order to achieve required strengths at the specified timeframes.

A minimum curing period prior to any subsequent work on the bridge superstructure shall be four (4) days and until the Project Manager receives the satisfactory results of the specified 4-day compressive strength test, in writing, as per these Special Provisions.

The UHPC shall not be subjected to freezing temperatures until it has cured for at least 4 days and has attained 14,000 psi compressive strength. Heat sources that use forced air shall not be applied to the exposed surface of the UHPC.

Formwork may be stripped after a compressive strength of 14,000 psi is reached.

### 3.3.5 Placement

Do not start placement until a Manufacturer's Representative, who is knowledgeable about supplying, mixing, delivery, placing, and curing of UHPC material, is on site for the joint placement.

Do not place concrete when the relative humidity at the job site is predicted to be below 35%, unless approved otherwise by the Manufacturer. Place concrete at a concrete temperature between 50°F and 80°F, unless approved otherwise by the Manufacturer.

Closure pours over supports shall be placed last after the full dead load is in place.

External vibration is commonly impractical because of the site condition. Rodding is acceptable and is sometimes used in situations where two successive pours meet.

### 3.3.6 Sequence of Placement and Application of Load

Do not place superimposed loads on or against the precast deck panels and load carrying members until the concrete reaches a compressive strength equal to or greater than 14,000 psi, as determined by testing of the field cured test cylinders or by the Maturity Method.

### 3.3.3 Acceptance of Production Pour UHPC

The acceptance of the Production UHPC will be based upon the compressive strength test results for the 7 day and 28 day tests. The UHPC must achieve a compressive strength at 7 days equal to or greater than 14,000 psi and at 28 days equal to or greater than 21,700 psi. The 2 day and 4 day test results shall be recorded for information only.

### 3.3.4 Surface Profile

Diamond grind the surface smooth to obtain the surface tolerance to match the profile of the structural elements that are being connected in accordance with the Contract.

### 3.3.5 Repair of Unacceptable Cracks

The use of HMWM is required any cracks that permit the flow of water through the deck thickness as determined by the Project Manager. Unacceptable cracks shall be repaired at no additional cost to the Department.

### 3.3.6 Bonding New to Existing UHPC

If bonding new and existing UHPC, retighten the forms before depositing new material on or against the hardened material. Thoroughly clean the surface of foreign matter and laitance. Apply a bonding agent approved by the Manufacturer. Seal the joint with HMWM.

## 3.4 Quality Control

All testing shall be by the Contractor. The Manufacturer's Representative shall be present during the all testing and casting of the cylinders to ensure they are cast correctly and will be present to evaluate the closure pour in terms of consistency, composition, flow and placement, environmental conditions, and concrete temperature.

The Quality Control sampling, casting, curing and testing shall be performed by the Contractor/Manufacturer using ACI Certified Technicians.

### 3.4.1 Testing Requirements

The testing requirements shall be consistent for the Trial Batch, Mock-up Pour, and Production pour unless otherwise noted or recommended by the Manufacturer. The Contractor shall record all test results and submit them to the Project Manager.

#### 3.4.1.1 Slump Testing

Measure the slump flow on each batch of UHPC according to ASTM C1437 with C1856 modifications. An acceptable slump flow range is between 7" and 10", unless approved otherwise by the Manufacturer.

#### 3.4.1.2 Compressive Strength Testing

Cast compressive strength test cylinders according to ASTM C1856/C1856M. Field cure cylinders with the UHPC joint. Test for compressive strength according to ASTM C1856/C1856M. The test days shall be at 2 days, 4 days, 7 days, and 28 days. A minimum of four (4) 3-inch diameter by 6-inch cylinders shall be used for each test day for a total of 16 cylinders for each series of tests.

The Trial Batch test cylinders and the production pour test cylinders used for the 2 and 4 day tests shall be field cured in the same environment as the UHPC joint material they represent. The cylinders for the remaining 7 day and 28 day, tests shall be standard cured in accordance with ASTM C1856/C1856M Section 7.3.

### 3.4.2 Testing Equipment

The Contractor shall furnish all necessary testing equipment at the site for the Trial Batch Testing, and for the Production Testing. The equipment shall include but not be limited to:

1. A mini-slump cone meeting the requirements of ASTM C230 with C1856 modifications, for on-site testing.
2. Concrete thermometer meeting the requirements of AASHTO T309.
3. Three inch diameter by six inch tall cylinder molds for making samples for compressive testing in accordance with ASTM C39 with C1856 modifications.
4. Curing boxes shall be supplied by the Contractor to store standard cured cylinders in a humidity and temperature control environment as recommended by the Manufacturer prior to testing.

3.4.3 Maturity Method Testing

The Contractor has the option to use the Maturity Method, ASTM C1074, for determining in-place strength. The procedure for utilizing the maturity method to determine in-place UHPC strengths includes three steps: obtain Manufacturers’ strength-maturity relationship, monitoring the maturity of the placement by taking periodic temperature readings as recommended by the Manufacturer, and regular validation of the strength maturity relationship. Any changes in the mix design, its components, or proportions will require that a new strength-maturity relationship be developed.

The procedure used to develop the strength-maturity relationship shall be submitted to the Project Manager for review and approval along with the product data submittal.

A minimum of three thermocouples per each UHPC joint shall be installed, one at each end, and one at midway with additional thermocouples as recommended by the manufacturer.

4 MEASUREMENT

The Department will measure UHPC by the cubic yard of the in place material for completed and accepted joints.

5 BASIS OF PAYMENT

Pay Item	Pay Unit
Ultra High Performance Concrete	Cubic Yard

5.1 Work Included In Payment

The following items will be considered as included in the payment for the main item(s) and will not be measured or paid for separately:

- A. Submittals
- B. Trial Batch and Testing
- C. Mock-Up
- D. Quality Control
- E. Manufacturer’s Representatives
- F. HMWM Resin Sealer
- G. Formwork and formwork removal
- H. Diamond grinding of Joints
- I. All Testing

June 18, 2018

## SPECIAL PROVISIONS FOR SECTION 518-A: FULL-DEPTH PRECAST CONCRETE DECK PANELS

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

### 1 DESCRIPTION

#### 1.1 General

This work shall consist of manufacturing and installing full-depth precast concrete deck panels on bridges as shown in the contract documents.

The Contractor shall furnish all materials, storage, handling, tools, equipment, labor and other appurtenances necessary to complete the work.

This work shall incorporate applicable requirements of Special Provision 512-D, "Ultra High Performance Concrete" (UHPC) as relates to manufacturing and installation of full-depth precast concrete deck panels.

### 2 MATERIALS

#### 2.1 Concrete

Concrete shall conform to the minimum strength requirements specified in the contract documents and shall conform to all other specification requirements (other than strength) for bridge deck High Performance Concrete (HPD). Concrete air content shall conform to the appropriate freeze-thaw risk zone. The concrete shall be from an approved mix design in accordance with Section 509 – Portland Cement Concrete Mix Designs.

#### 2.2 Reinforcing Steel

Provide Grade 60 epoxy coated steel reinforcement in accordance with Section 540 - Steel Reinforcement as detailed in the contract documents.

#### 2.3 Structural Steel

Provide structural steel items in accordance with Section 541 - Steel Structures. Galvanize all structural steel items unless otherwise specified in the contract documents.

### 3 CONSTRUCTION REQUIREMENTS

#### 3.1 General



The Contractor shall manufacture precast components in a plant with one of the following certifications:

- 3.1.1 A National Precast Concrete Association certified plant (excludes concrete pipe products), or
- 3.1.2 PCI certified plant regularly engaged in design and fabrication.

### 3.2 Submittals

The Contractor shall provide all submittal to the Project Manager for written approval. All submittals shall be electronic documents that are formatted to be legible when printed in 8-1/2"X11" or 11"X17" format. Place the NMDOT Control Number and Bridge Number in the lower right-hand corner of each sheet.

The Contractor shall provide Working Drawings prepared, stamped, and sealed by a Professional Engineer licensed in New Mexico and with 5 years experience with precast concrete design. Working Drawings shall include but not be limited to:

- 1. Mock-up construction procedures
- 2. Shop drawings
- 3. Erection plans
- 4. Calculations associated with the above

The Project Manager will review the initial submittal within 30 Days.

#### 3.2.1 Mock-up Construction Procedures

A minimum of 60 calendar days prior to the UHPC Trial Batch and Mock-up Pour, the Contractor shall submit fabrication drawings and construction procedures for the Mock-up Pour to the Project Manager for approval. The construction procedures shall include, but may not be limited to the support method for the panels during the Mock-up Pour.

#### 3.2.2 Shop Drawings

Shop drawings shall contain the following information:

- 3.2.2.1 Panel and keyway dimensions, panel and keyway geometry, blockout dimension and locations, reinforcement, clearances, finishes, lifting devices, leveling bolt assemblies, inserts, and surface preparations.
- 3.2.2.2 Design, show, and locate all lifting inserts, hardware or devices, and vertical adjustment hardware on the shop drawings. The Contractor's Engineer may propose alternate lifting locations, lifting hardware and vertical adjustment hardware than those shown on the plans.

### 3.2.3 Erection Plans

The Contractor shall check that all handling and erection bracing conform to Chapter 5 of the PCI Design Handbook. Include the following at a minimum on the erection plans:

- 3.2.3.1 Minimum clearances of reinforcing to panel edges.
- 3.2.3.2 Locations and details of lifting devices including supporting calculations. Design all lifting devices based on the no cracking criteria in Chapter 5 of the PCI Design Handbook.
- 3.2.3.3 Type and amount of any additional reinforcing required.
- 3.2.3.4 Calculations showing that tensile stresses on both faces do not exceed the modulus of rupture during the handling, fabrication, shipping, and erection of the panel.
- 3.2.3.5 Minimum compressive strength attained prior to handling the panels.
- 3.2.3.6 Load distribution.
- 3.2.3.7 Cables and lifting equipment.
- 3.2.3.8 Details of vertical adjusting hardware.
- 3.2.3.9 Crane load calculations for the most extreme pick verifying crane capacity will not exceed safe loads determined by the crane manufacturer.
- 3.2.3.10 Include details showing the erection and installation of the proposed deck panels in accordance with the design plans.
- 3.2.3.11 Accompanying the Erection Plan, submit Erection Plan drawings including the following minimum information:
  - 3.2.3.11.1 Handling and storage plan for the precast deck panels
  - 3.2.3.11.2 Crane and pick locations
  - 3.2.3.11.3 Crane charts
  - 3.2.3.11.4 Panel erection and sequence
  - 3.2.3.11.5 Temporary shoring as required

### 3.3 Sequence of Work.

- 3.3.1 Fabricate the Mock-up panels and conduct the Mock-up Testing of the UHPC as specified in this Special Provision and referenced in Special Provision 512-D, "Ultra High Performance Concrete".
- 3.3.2 Fabricate the deck panels. Allow the deck panels to cure for a minimum of 14 calendar days prior to shipping using Method 1 - Water Cure as described in Section 511.3.9.1 of the Special Provisions Modifying Section 511. Do not move the panels until they have achieved a concrete strength of 4,500 psi.
- 3.3.3 Check for proper fit-up and alignment as per Section 3.4. Verify that all precast deck panels have been constructed in compliance with all plan requirements.
- 3.3.4 Ship the precast deck panels.
- 3.3.5 Before the precast deck panels are set in place, adjust the leveling bolts to the appropriate expected extension based on survey elevation data for the girders and required roadway profile.
- 3.3.6 Erect the precast deck panels. After placement of the panel, adjust the bolts to give the required roadway profile, and then torque each leveling bolt to approximately the same amount. Each bolt should have a resulting torque within 20% of the average of all bolts in a panel. The tolerance to flush condition of adjacent deck panel edges shall be +/- 1/4".
- 3.3.7 Place UHPC in the transverse shear keyways and block-outs, after sealing the bottom of this joint with a form. All UHPC will be poured high and ground to elevation to prevent low areas
- 3.3.8 Place UHPC in the haunch and shear connector pockets.
- 3.3.9 Construct the end closure pours if required by contract documents.
- 3.3.10 At no time will construction equipment be allowed on deck panels until construction of the deck is complete and the compressive strength of the UHPC in the haunches and transverse joint keyways are equal to or greater than 14,000 psi.
- 3.3.11 Remove the protrusions of all leveling bolts, and place UHPC in the subsequent voids.
- 3.3.12 Place the bridge barriers if required by the contract documents.
- 3.3.13 Grind and clean the deck if required by contract documents.
- 3.3.14 Seal deck with an overlay if required per the contract documents.

The work listed above is not all-inclusive. The Contractor is to develop the detailed sequence of work tasks to be performed and shall submit them with the shop drawings. The Contractor shall obtain the work plan and all project related approvals prior to performing the erection of the panels.

### 3.4 Fabrication

#### 3.4.1 Mock-Up Panels

Construct the Mock-up full-depth precast concrete deck panel Mock-up for testing of the panel joints, formwork and UHPC materials and placement as referenced in Special Provision 512-D, "Ultra High Performance Concrete".

A minimum of 30 calendar days prior to the fabrication of the production precast deck panels, the Contractor shall perform a Mock-up Pour.

The Mock-up shall take place at the precast deck panel fabricator's yard and be performed in the presence of the Project Manager or his representatives.

The Mock-up shall be a simulation of the production deck panels and closure pour, including the fabrication of the exposed aggregate finish and blockouts, and shall consist of the same dimensions, materials, forming, and surface preparations as for the production closure pours joining the precast deck panels. The Mock-up shall consist of linking two precast deck panels together with a closure pour of exactly the same dimensions, orientation (skew) and reinforcement as shown on the Plans. Uncoated reinforcement may be used for the Mock-up. Two deck panels are required. Each of the panels on either side of the Mock-up joint will be a minimum of 3 feet wide, 20 feet long, and of the same thickness and skew as what is shown on the Plans.

#### 3.4.2 Approval to Proceed to Production Pour

No work for the fabrication of the production precast deck panels shall commence until the results of the Mock-up and all required submittals have been approved by the Project Manager.Engineer.

#### 3.4.3 Placement of Reinforcing Bars and Appurtenances.

The Contractor shall place and secure reinforcing bars, forms for cored holes, and cellular spaces with methods approved by the Project Manager. The Contractor shall pay particular attention to concrete cover requirements over reinforcing bars near and at ends of beams.

#### 3.4.4 Finishes.

Unless otherwise specified in the Contract, apply a Class 1 finish to the exposed edges of the deck panels.

Edges of the precast deck panels that will form closure pours, key ways or UHPC joints between adjacent deck panels and all edges of blockouts shall have an exposed aggregate finish. The exposed aggregate finish shall have a surface relief equal to the International Concrete Repair Institute (ICRI) Surface Preparation CSP 10 with a 1/4" amplitude roughness.

### 3.5 Yard Fit-Up

For precast deck panels, the Contractor shall ensure that the precast deck panels will fit-up and align properly before shipping from the precast plant. Verification of alignment of block-outs is particularly critical. The Contractor shall pre-assemble all panels in the yard, use blocking to simulate the support of the deck panels on the beam top flanges including differences in elevation. The Contractor shall verify the construction of all deck panel units are in compliance with all plan requirements. Yard fit up must be performed by the Contractor and accepted by the Project Manager prior to shipment of the panels. Any damage to the panels during the yard fit-up shall be repaired by the Contractor at no additional cost to the Department.

### 3.6 Handling and Storage

The Contractor is responsible for the handling and storage of the precast deck panels in such a manner that does not cause undue stress or cracking in the panel. The Department will inspect all panels and reject any defective panel in accordance with the current version of the "PCI Manual for the Evaluation and Repair of Precast, Prestressed Concrete Bridge Products." The Contractor shall replace any rejected panel at the Contractor's expense. The Contractor will be responsible for any schedule delays due to rejected panels.

### 3.7 Installation

- 3.7.1 The full depth panels shall be set to the elevations detailed on the plans. Final panel elevations shall be attained by adjusting the torque on leveling screws to promote an equal distribution of panel dead load to all girders. The torque schedule shall be submitted with the shop drawings for the panels. The torque tolerance shall be +/- 20%.
- 3.7.2 Panels shall not be used to support construction loads until the design compressive strength of the panels is verified by the maturity method as per Section 510.3.5.2 of the Standard Specifications and the UHPC has attained a compressive strength equal to or greater than 14,000 psi and approved by the Project Manager.
- 3.7.3 The transverse shear keys and recesses between the precast deck panels shall be thoroughly cleaned prior to delivery by means of high pressure washing using a pressure of at least 1,000 psi and a delivery rate of not less than 4 gallons per minute. The shear key surface shall be cleaned on site by air blasting prior to placing the UHPC.
- 3.7.4 After the shear studs have been installed, UHPC shall be placed throughout the shear connector pockets in the deck panels to completely fill the area under the panels and over the flanges. All leveling screws and other supplemental supports shall be removed after the UHPC has attained a compressive strength equal to or greater than 14,000 psi. Holes left by the removal of the leveling screws shall be filled with UHPC.

### 3.8 Tolerances

Fabricate Precast Deck Panels to the tolerances shown on the contract documents.

### 3.9 References

The Contractor shall provide the following reference documents to the Project Manager concurrent with the first project submittals. Provide the most current version of the reference documents, the price shall be incidental to this section and the documents shall be retained by the NMDOT upon completion of the project.

3.9.1 PCI Manual for the Evaluation and Repair of Precast, Prestressed Concrete Bridge Products

3.9.2 PCI Erector's Manual, Standards and Guidelines for the Erection of Precast Concrete Products

Clear cover of panel reinforcement shall be no more than  $\frac{1}{4}$ " greater than, and shall be no less than, the value specified in the contract documents.

## 4 MEASUREMENT

The Department will measure Full-Depth Precast Concrete Deck Panels by the square foot for each precast deck panel completed and accepted.

## 5 BASIS OF PAYMENT

Pay Item	Pay Unit
Precast Deck Panels ___ in. Depth	Square Foot

### 5.1 WORK INCLUDED IN PAYMENT

The following items will be considered as included in the payment for the main item(s) and will not be measured or paid for separately:

- A. All concrete and steel reinforcement required for each panel;
- B. Exposed aggregate finish for UHPC joints and blockouts
- C. Embedded structural steel components, leveling bolt assemblies, lifting devices, inserts, and blockouts;
- D. Mock-up deck panels, Mock-up Testing and Mock-up disposal;
- E. Yard Fit-up;
- F. Shipping and Erection, including leveling of panels;
- G. Removal of leveling bolts and protrusions; and
- H. Engineering and submittals as required by this Special Provision
- I. Reference manuals as required by this Special Provision

## SPECIAL PROVISIONS FOR SECTION 618-A: PUBLIC AWARENESS

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

### 1.0 DESCRIPTION.

1.1 The Contractor shall be responsible for all media notifications to perform public awareness for the project.

The Contractor, through his Traffic Control Supervisor (TCS) and the Department's Public Information Officer (PIO), will keep the public informed through the media. Public awareness shall consist of providing information on the general scope of the project, all milestones, and any other information required by the Department, as directed and approved by the Project Manager.

### 2.0 PRE-CONSTRUCTION REQUIREMENTS.

The Contractor shall provide at the pre-construction conference, a plan for public awareness by both newspaper and radio at the vicinity shown in the contract. The plan shall also provide information on any other radio station, or media, useful for public awareness throughout the project.

The Contractor shall also provide a plan for notifying the traveling public (i.e. temporary signs), indicating the radio stations and media used for public awareness.

### 3.0 PUBLIC NOTIFICATIONS.

3.1 Public Notifications. The Contractor shall provide radio spots on local and surrounding radio stations, as well as ads in the local and surrounding newspaper(s) regarding project information.

Prior to any media submittal, the Traffic Control Supervisor shall prepare and submit statements for approval to the Project Manager concerning lane or road closures, emergencies, utility disruptions, hazardous conditions, delays, weekly project activities and work plan, or any other Department requested information about the project.

Immediately after the Project Manager has approved the submitted statements, the Traffic Control Supervisor shall coordinate with, and submit all approved statements to the Department's PIO. The Department's PIO will submit all approved statements to the media.

4.0 BASIS OF PAYMENT.

Pay Item	Pay Unit
Public Awareness	Lump Sum

4.1 Public awareness will be paid for the actual costs incurred, as approved by the Project Manager upon receipt of a detailed cost breakdown for the project.

For the purpose of bidding, the Department will enter into the Bid Schedule a contingent sum.

Payment shall be considered full compensation for all associated media expenses and all necessary coordination between the Contractor's TCS and the Department's PIO.



**SPECIAL PROVISIONS  
FOR  
SECTION 702-A: LAW ENFORCEMENT IN CONSTRUCTION ZONE**

All pertinent provisions of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

**1. DESCRIPTION.**

Provide "Law Enforcement in Construction Zone" services by providing an officially uniformed Police Officer and marked police vehicle within the limits of the project. The Project Manager will review and approve the number of officer(s) and the locations and times required for the officer(s) to be present on the project. If additional time is required, it will be authorized in writing by the Project Manager. The Project Manager can reduce or eliminate the service of "Law Enforcement in Construction Zone" at any time. The officer(s) shall be an authorized off duty New Mexico State Police or in local law enforcement. The officer(s) shall have the authority to impose all the local Traffic Enforcement Laws for the duration of the project.

The Contractor is required to establish an agreement with the appropriate law enforcement agency to ensure that Law Enforcement can be present on the job site when requested. Submit this agreement to the Project Manager.

**2. METHOD OF MEASUREMENT.**

Law Enforcement in Construction Zone will be measured by an allowance. This allowance will provide the Contractor with reimbursement for actual documented cost incurred.

**3. BASIS OF PAYMENT.**

Law enforcement in construction zone will be paid for actual costs incurred, not to exceed allowance.

Contractor will provide the Project Manager with a detailed cost breakdown of actual costs incurred.

For the purpose of bidding, the Department will enter into the Bid Schedule an allowance for law enforcement in construction zone.

**PAY ITEM**

**PAY UNIT**

Law Enforcement in Construction Zone

Allowance

November 9, 2016

**SPECIAL PROVISIONS  
FOR  
SECTION 702-C: TRAFFIC CONTROL DEVICES FOR CONSTRUCTION and  
TRAFFIC CONTROL DEVICES FOR PEDESTRIANS AND BICYCLISTS**

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

**1.0 DESCRIPTION.**

1.0.1 This work shall consist of implementing the necessary traffic control during construction in conformance with the contract and the Manual of Uniform Traffic Control Devices. The Contractor shall submit all proposed traffic control changes to the contract traffic control plan detailed in the construction plans to the Project Manager, for review and approval by the District Traffic Engineer/or Local Government Agency Engineer or designee, prior to beginning construction operations.

1.0.2 The Contractor shall furnish all materials, tools, labor, equipment and all other appurtenances necessary to complete the work. The materials shall include, all interim and temporary signing, construction signing, steel posts, base posts, portable sign supports, barricades, drums, sequential arrow displays, and flaggers as necessary to complete the traffic control detailed in the construction plans or modifications to the plan details as approved by the District Traffic Engineer including all setups and resetting of devices.

1.0.3 **Submittals.** The Contractor shall submit a summary of all necessary traffic control devices for this project in the format shown as TABLE 1 and/or TABLE 2 to the Project Manager at least two (2) weeks prior to the pre-construction conference. A minimum of five (5) copies shall be provided to the Project Manager. The summary shall be complete with appropriate supporting sections referenced, device descriptions, units of measure, quantities required, unit costs, and total costs for each type of device. The itemized costs for each device shall include all associated work and materials defined in the appropriate supporting section of the standard specifications, including all revisions. The Contractor will not be allowed to initiate any work on the project until TABLE 1 and/or TABLE 2 are provided to the Project Manager.

TABLE 1

SUPPORTING SECTION	DEVICE DESCRIPTION	UNIT OF MEASURE	QTY.	UNIT COST	TOTAL COST
SECTION 702 - CONSTRUCTION TRAFFIC CONTROL DEVICES					
SS 702	CONSTRUCTION SIGNING	SQ. FT.			
SS 702	STEEL POSTS AND BASE POSTS FOR CONSTRUCTION SIGNING	LN. FT.			
SS 702	PORTABLE SIGN SUPPORT	EACH			
SS 702	BARRICADE, TYPE I	EACH			
SS 702	BARRICADE, TYPE II	EACH			
SS 702	BARRICADE, TYPE III-6 ft.	EACH			
SS 702	BARRICADE, TYPE III-8 ft.	EACH			
SS 702	VERTICAL PANEL, TYPE SINGLE	EACH			
SS 702	VERTICAL PANEL, TYPE BACK TO BACK	EACH			
SS 702	CONSTRUCTION TRAFFIC MARKER	EACH			
SS 702	CHANNELIZATION DEVICES TYPE DRUM	EACH			
SS 702	TRAFFIC CONES	EACH			
SS 702	SEQUENTIAL ARROW DISPLAY	EACH			
SS 702	TEMPORARY PORTABLE RUMBLE STRIPS	LN. FT.			
TOTAL FOR ITEM # 702810 TRAFFIC CONTROL DEVICES FOR CONSTRUCTION (LUMP SUM)				\$	

TABLE 2

SUPPORTING SECTION	DEVICE DESCRIPTION	UNIT OF MEASURE	QTY.	UNIT COST	TOTAL COST
SECTION 702 - CONSTRUCTION TRAFFIC CONTROL DEVICES					
SS 702	CONSTRUCTION SIGNING	SQ. FT.			
SS 702	PORTABLE SIGN SUPPORT	EACH			
SS 702	VERTICAL PANEL, TYPE SINGLE	EACH			
SS 702	TEMPORARY PEDESTRIAN CHANNELIZATION DEVICES	LN. FT.			
SS 702	TEMPORARY DETECTABLE WARNING SURFACE	EACH			
SS 702	TEMPORARY ADA RAMP	EACH			
SS 702	TEMPORARY ADA PLATFORM	EACH			
SS 702	TEMPORARY PEDESTRIAN BARRICADE	EACH			
TOTAL FOR ITEM # 702811 TRAFFIC CONTROL DEVICES FOR PEDESTRIANS AND BICYCLISTS (LUMP SUM)				\$	

## 2.0 MATERIALS.

2.0.1 All materials shall conform to the applicable requirements of SECTION 701 - TRAFFIC SIGNS AND SIGN STRUCTURES and SECTION 702 - CONSTRUCTION TRAFFIC CONTROL DEVICES.

## 3.0 CONSTRUCTION REQUIREMENTS.

3.0.1 All construction shall be effected by the Contractor in accordance with the applicable plan details and specifications shown in the contract or modifications to the plan details as approved by the District Traffic Engineer.

3.0.2 All materials and devices shall be maintained and replaced if necessary for the duration of the project in conformance with these specifications.

3.0.3 Traffic control shall be maintained in conformance with all specifications of SECTION 618 - TRAFFIC CONTROL MANAGEMENT, for the duration of the project.

**4.0 METHOD OF MEASUREMENT.**

4.0.1 When specifically designated for measurement and payment in the contract, Traffic Control Devices for Construction and Traffic Control Devices for Pedestrian and Bicyclist will be measured as a lump sum unit.

**5.0 BASIS OF PAYMENT.**

5.0.1 The accepted work for Traffic Control Devices for Construction and Traffic Control Devices for Pedestrian and Bicyclist will be paid for at the contract unit price lump sum. Payment shall be full compensation for furnishing all materials, tools, labor, equipment, hauling, and any other appurtenances necessary to satisfactorily complete and maintain adequate and safe traffic control until completion of the project.

This shall include all interim and temporary signing, construction signing, steel posts, base posts, portable sign supports, barricades, drums, sequential arrow displays, traffic cones and flaggers as necessary to complete the traffic control detailed in the construction plans or modifications to the plan details as approved by the District Traffic Engineer. Setting and resetting of devices shall also be included in payment of this item.

5.0.3 Traffic Control Devices for Construction and Traffic Control Devices for Pedestrian and Bicyclist shall not be considered as eligible for a cost savings suggestion.

Payment will be made under:

PAY ITEM	PAY UNIT
Traffic Control Devices for Construction	Lump Sum
Traffic Control Devices for Pedestrian and Bicyclist	Lump Sum

## SPECIAL PROVISIONS FOR SECTION 702-E: PORTABLE FLOODLIGHT SYSTEM

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

### 1.0 DESCRIPTION.

1.01 The Contractor shall furnish, safely install, and maintain a self-contained trailer-mounted portable floodlight system to provide continuous operation for the traveling public.

The position of the portable floodlight system shall be as shown in in the Contract, and as approved by the Project Manager.

The Contractor shall provide the portable floodlight system until Physical Completion of the project unless otherwise directed by the Project Manager.

Note: The Contractor shall retain ownership of the floodlight system.

The Contractor shall maintain the portable floodlight system, and shall provide *immediate* 24 hour service assistance, 7 days a week, and at the request of the Project Manager.

The portable floodlight system shall also be secured against theft, replacement or repairs due to theft or vandalism will be at the Contractors expense.

### 2.0 MATERIALS.

The portable floodlight system shall each consist of the following:

A 4000 watt Floodlight System each equipped with four (4) 1000 watt mercury halogen lights to illuminate a minimum of 5000 square feet per each setup, and which shall consist of the following:

- Safe, rugged design that can withstand any climatic conditions.
- A retractable power cord that automatically recoils into a protective sleeve to prevent damage when raising, lowering and moving of the 30' tower.
- Galvanized outriggers with pre-set position stops to ensure quick and proper spacing for safe operation in heavy winds.
- Plug-in ballasts installed in galvanized steel boxes that can be replaced without disconnecting wiring terminals.
- Spring-loaded pin that automatically locks the galvanized 360 degree rotatable tower in upright position.

- Light fixtures that plug into a weatherproof receptacle box at the top of the tower with UL and CSA-approved connectors.
- Winch handle ergonomically positioned for easy raising and lowering of tower, and the winch drum located inside the cabinet.
- Control panel located inside the cabinet, away from the elements, which houses the main and branch circuit breakers and hour meter.
- A 30-gallon fuel tank provide a minimum of 60 hours of continuous run time.
- Replacement 1000 watt mercury halogen lights or any other replacement components as required.

### 3.0 METHOD OF MEASUREMENT.

3.1 Portable floodlight system will be measured by the unit per each. Each complete system is defined as being self-contained; mounted on a single trailer, including all fuel and all maintenance needed to provide continuous operation.

### 4.0 BASIS OF PAYMENT

Pay item	Pay Unit
Portable Floodlight System	Each

## SPECIAL PROVISIONS FOR SECTION 702-G: SPEED DETECTOR RADAR TRAILER

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

### 1.0 DESCRIPTION.

1.01 Furnish, safely install, and maintain a self-contained trailer-mounted Speed Detector Radar Trailer (SDRT) to provide continuous operation for the traveling public. The SDRT shall meet or exceed all state and federal highway MUTCD traffic safety specifications,

The placement of the SDRT on the roadway shall comply with the current edition of the MUTCD guidelines.

Supply the SDRT until Physical Completion of the project unless otherwise directed by the Project Manager.

Note: The Contractor shall retain ownership of the SDRT.

Maintain the SDRT, and shall provide *immediate* 24 hour service assistance, 7 days a week, and at the request of the Project Manager.

The SDRT shall also be secured against theft, replacement or repairs due to theft or vandalism will be at the Contractors expense.

The SDRT shall be easily transported and simple to operate, providing an elevated, amber display with large, 18" high digits to ensure enhanced driver visibility.

Furnish with pre-programmed capabilities with over-speed messages.

### 2.0 MATERIALS.

The SDRT system shall each consist of the following:

#### Trailer Construction

- Height sign up -139"
- Height sign down – 89"
- Weight – 1,500 lbs., MUTCD compliant.
- Safe, rugged design that can withstand harsh climatic conditions.
- Galvanized outriggers with pre-set position stops to ensure quick and proper spacing for safe operation in heavy winds.

Batteries

- Batteries - 6v or 12v deep cycle with varying options.
- Battery enclosure – Lockable, ventilated, acid resistant, powder coat finish.

Radar Detector

- Type – One true Doppler radar.
- Speed range 5-200 mph or km/h
- Distance range – ¼ to ½ mile
- Band type – K, 12 degrees

Numeric Display

- Pixel matrix – 7 rows by 15 columns
- Character size – 18" 3 numeric digits 4 alpha digits with preset messages when threshold speed is exceeded (eg: Too Fast, Slow down, \$100 Fine)
- Angularity - 25 degrees total
- Brightness – Manual/automatic levels
- Photo Sensor – Shielded from extraneous light
- Speed limit sign(s) – (3) regulation signs double sided

3.0 METHOD OF MEASUREMENT.

3.1 Speed Detector Radar Trailer will be measured by the unit per each. Each complete system is defined as being self-contained; mounted on a single trailer, including all appurtenances and all maintenance needed to provide continuous operation.

4.0 BASIS OF PAYMENT.

Pay Item	Pay Unit
Speed Detector Radar Trailer	Each